

REPORT NUMBER: 5FEM-MGA-2001-025

35 MPH FRONTAL BARRIER IMPACT TEST

**Ford Motor Company
2001 Ford Windstar SE
NHTSA NUMBER: M10212**

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



April 18, 2001

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590**

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Date of Acceptance

COTR, Frontal Barrier Impact Program

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2001 Ford Windstar SE at MGA Research Corporation on April 18, 2001. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity was 56.3 km/h. The ambient temperature at the barrier face at the time of impact was 21 degrees Celsius. The vehicle's maximum post test static crush is 642 mm located to the right of the vehicle centerline. The test vehicle is equipped with a 3-point continuous belt system with a pretensioner and a second generation supplemental airbag in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;"><u>Measurement Description</u></th> <th style="text-align: left;"><u>Units</u></th> <th style="text-align: left;"><u>Threshold</u></th> <th style="text-align: left;"><u>Driver ATD</u></th> <th style="text-align: left;"><u>Pass. ATD</u></th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>113</td> <td>382</td> </tr> <tr> <td>N_{te}</td> <td>N/A</td> <td>1.0</td> <td>0.2</td> <td>0.4</td> </tr> <tr> <td>N_{tf}</td> <td>N/A</td> <td>1.0</td> <td>0.3</td> <td>0.2</td> </tr> <tr> <td>N_{ce}</td> <td>N/A</td> <td>1.0</td> <td>0.0</td> <td>0.0</td> </tr> <tr> <td>N_{cf}</td> <td>N/A</td> <td>1.0</td> <td>0.2</td> <td>0.1</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>2620</td> <td>735</td> <td>1016</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>2520</td> <td>105</td> <td>173</td> </tr> <tr> <td>3 msec CLIP</td> <td>N/A</td> <td>60</td> <td>30</td> <td>35</td> </tr> <tr> <td>Chest Deflection</td> <td>mm</td> <td>52</td> <td>19</td> <td>16</td> </tr> <tr> <td>Left Femur</td> <td>Newtons</td> <td>6805</td> <td>1795</td> <td>2247</td> </tr> <tr> <td>Right Femur</td> <td>Newtons</td> <td>6805</td> <td>750</td> <td>2044</td> </tr> </tbody> </table>				<u>Measurement Description</u>	<u>Units</u>	<u>Threshold</u>	<u>Driver ATD</u>	<u>Pass. ATD</u>	Head Injury Criteria (HIC ₁₅)	N/A	700	113	382	N _{te}	N/A	1.0	0.2	0.4	N _{tf}	N/A	1.0	0.3	0.2	N _{ce}	N/A	1.0	0.0	0.0	N _{cf}	N/A	1.0	0.2	0.1	Neck Tension	Newtons	2620	735	1016	Neck Compression	Newtons	2520	105	173	3 msec CLIP	N/A	60	30	35	Chest Deflection	mm	52	19	16	Left Femur	Newtons	6805	1795	2247	Right Femur	Newtons	6805	750	2044
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SECTION 1

PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier crashworthiness evaluation program is sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract Number DTNH22-01-D-12005. The purpose of this test is to obtain vehicle crashworthiness, occupant restraint system performance, lower leg data, and child seat research data for a frontal barrier impact. The impact velocity used in this test is in excess of the current 30 mph (48.3 km/h) FMVSS 208/212/219/301 requirements.

1.2 TEST PROCEDURE

This 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Test Procedure, dated December 1999 and the corresponding MGA Research Corporation Test Procedure NHTSA3, dated January 5, 2001. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion (Partial)"; and FMVSS 301, "Fuel System Integrity" performance. Procedures for receiving, inspection, and reporting of test results are described in the test procedures and are not repeated in this report.

The test was conducted at MGA Research Corporation on April 18, 2001 at a speed of 56.3 km/h. The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The driver's and passenger's restraint systems were instrumented with two (2) seat belt load cells to measure lap belt tension. The specified impact velocity range was 55.5 to 57.1 km/h. The frontal barrier impact event was documented by one (1) real-time panning motion picture camera and sixteen (16) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information is documented in the data sheets. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The test vehicle contained four (4) anthropomorphic test devices (ATDs). Two (2) part 572O 5th percentile female ATDs and two (2) part 572P 3 year old ATDs. Both adult ATDs were instrumented with head, chest, and pelvic tri-axial accelerometers, left and right femur load cells, upper and lower tibia sensors, and foot accelerometers. In addition, chest displacement and upper neck six-axis force and moment sensors were utilized. The adult ATDs were positioned in the front outboard seating positions according to a draft dummy placement procedure provided by NHTSA. Both child ATDs were instrumented with head, chest, and pelvic tri-axial accelerometers, and upper and lower neck load cells. The child ATDs were positioned according to the child seat manufacturer's instructions. One hundred forty-seven (147) channels of data were recorded with an EME on-board data acquisition system. The data was digitally sampled at 10,000 samples per second and processed per section IP11 of the Laboratory Test Procedure.

The driver (Serial No. 288) and the right-front passenger (Serial No. 273) were calibrated one test prior to this test. FMVSS 208 "Occupant Crash Protection" injury criteria were not exceeded by either ATD during this frontal barrier impact test.

1.3 SUMMARY OF FRONTAL IMPACT TEST

A rigid load cell barrier was impacted by a 2001 Ford Windstar SE at a velocity of 56.3 km/h. The test vehicle weight was 2115 kilograms with two (2) part 572O 5th percentile female ATDs and two (2) part 572P 3 year old ATDs. Six (6) load cell barrier data channels were obtained in conducting the test. The test vehicle is equipped with a laterally mounted 3.8-liter, 6 -cylinder engine and an automatic transmission.

The occupant injury criteria summary is as follows:

	Requirement	Driver	Passenger
Head Injury Criteria (HIC ₁₅)	700	113	382
N _{te}	1.0	0.2	0.4
N _{tf}	1.0	0.3	0.2
N _{ce}	1.0	0.0	0.0
N _{cf}	1.0	0.2	0.1
Neck Tension (N)	2620	735	1016
Neck Compression (N)	2520	105	173
3 msec CLIP	60	30	35
Chest Deflection (mm)	52	19	16
Left Femur (N)	6805	1795	2247
Right Femur (N)	6805	750	2044

Maximum seat belt spool out was not measured at the request of the manufacturer.

There was 100 percent windshield retention (minimum 50 percent required for passive restraint systems). No intrusion occurred into the protected or unprotected zone of the windshield. No Stoddard Solvent leakage occurred after impact or during any phase of the rollover.

The test vehicle sustained a maximum static crush of 642mm located to the right of the vehicle centerline. Both the driver and passenger side doors opened without the aid of tools.

1.4 GENERAL COMMENTS

The 2001 Ford Windstar SE passed the requirements of FMVSS 208, FMVSS 212, FMVSS 219, and FMVSS 301-75. Data pertaining to these standards are presented in the data sheets.

The vehicle, occupant, camera, and measurement data are presented in Section 2. Appendix A contains the still photograph prints. Appendix B Contains the dummy and vehicle response data traces. Appendix C contains the dummy calibration data. Appendix D contains the instrumentation calibration data and Appendix E contains the owner's manual instructions for the occupant seating and restraint systems and Appendix F contains the child data and photos.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 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**CRASH TEST SUMMARY**Test Vehicle: 2001/Ford/Windstar SENHTSA No.: M10212Test Program: 35 mph Frontal Barrier ImpactTest Date: April 18, 2001**PRIMARY IMPACT DATA**

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.3
Test Weight	kg	2115
Impact Angle	degrees	0
Average Rebound	mm	1142
Maximum Static Crush	mm	642

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door Opening	Yes	Yes
Rear Door Opening	Yes	Yes
Seat Track Shift (mm)	0	0
Seat Back Failure	none	none

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type / Serial No.	288	273
Head Contact	Airbag	Airbag
Chest Contact	Airbag	Airbag
Abdomen Contact	none	none
Left Knee Contact	Dash panel	Dash panel
Right Knee Contact	Dash panel	Dash panel

16mm MOVIE COVERAGE

High Speed	16
Real Time	1
Total	17

Driver ATD Sensors	42
Passenger ATD Sensors	42
Belt Assessment Sensors	2
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	30
Total	125

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

TEST VEHICLE INFORMATION

Manufacturer	Ford Motor Co.
Model	Windstar SE
Body Style	Van
NHTSA No.	M10212
VIN	2FMZA52441BB19604
Color	Red
Delivery Date	2/28/2001
Odometer Reading (mile)	26
Dealer	Martin Ford Sales
Transmission	4 speed automatic O/D
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3.8
Engine Placement	Lateral

TEST VEHICLE OPTIONS

Driver Airbag	Yes
Passenger Airbag	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	Ford Motor Company	GVWR (kg)	2522
Date of Manufacture	1/2001	GAWR Front (kg)	1315
		GAWR Rear (kg)	1208

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	241	241
Cold Pressure (kPa)	241	241
Recommended Tire Size	P215/65R16	P215/65R16
Tire Size on Vehicle	P215/65R16	P215/65R16
Tire Manufacturer	Uniroyal	Uniroyal

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket	Bench	
Number of Occupants	2	2	3	7
Capacity Wt. (VCW) (kg)				544.3
Cargo Weight (RCLW) (kg)				68.0

DATA SHEET NO. 2...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	576.1	385.6		599.7	466.8	
Right	kg	556.1	381.5		588.3	460.0	
Ratio	%	59.6	40.4		56.2	43.8	
Totals	kg	1132.2	767.1	1899.3	1188.0	926.8	2114.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1899.3
Weight of 2 P5720 ATDs	kg	156.0
Rated Cargo/Luggage Weight (RCLW)	kg	68.0
Calculated Vehicle Target Weight (TVTWT)	kg	2123.3

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	756	743	739	765	1240
As Tested	mm	731	733	722	735	1345
Post Test	mm	801	789	750	709	

Vehicle Wheelbase (mm): 3070

Weight of Ballast secured in cargo area (kg): 28.6

Vehicle Components Removed Spare tire and jack, third row seats

Ballast weight does not include cameras, instrumentation, and brake abort system.

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual (L): 98.4

Usable Capacity Figure Furnished by COTR (L): 98.4

Actual Test Volume (L): 88.9

Test Fluid Type: Stoddard Solvent ; Specific Gravity: 0.77

Is Vehicle Fuel Pump Electric or Mechanical?: Electric

If electric, does pump operate with ignition switch "ON" & engine "OFF"?: Yes

Fuel System Particulars: The fuel pump operates for 3 seconds when the ignition is turned on and when the engine is running

DATA SHEET NO. 3**POST IMPACT DATA**Test Vehicle: 2001/Ford/Windstar SENHTSA No.: M10212Test Program: 35 mph Frontal Barrier ImpactTest Date: April 18, 2001

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	55.5 to 57.1	56.3
Trap No. 1 Entry Distance	mm	<1524	1300
Trap No. 1 Exit Distance	mm	<1524	300
Trap No. 2 Velocity (Redundant)	km/h	55.5 to 57.1	56.6
Trap No. 2 Entry Distance	mm	<1524	1425
Trap No. 2 Exit Distance	mm	<1524	425

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	5035	4630	405
Center	mm	5106	4467	639
Right Side	mm	5019	4622	397

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1114
Center	mm	1108
Right Side	mm	1205
Average	mm	1142

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

Test Vehicle: 2001/Ford/Windstar SE

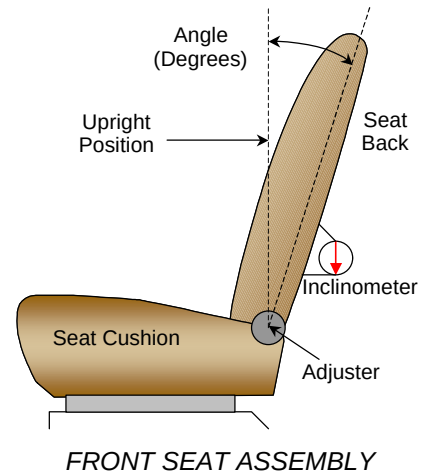
NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The driver seat back was set in the second position rearward from the full upright position. The passenger seat back was set in the third position rearward from full upright.



Driver seat back angle: Second position back from full forward

Passenger seat back angle: Third position back from full forward

SEAT FORE/AFT POSITIONS

The driver seat is power operated and passenger seat is manually operated . The fore/aft position is set at the full forward position for both driver and passenger.

Driver seat fore/aft total travel:	<u>185 mm</u>
Passenger seat fore/aft total travel:	<u>19 positions</u>
Driver seat fore/aft position:	<u>Full forward</u>
Passenger seat fore/aft position:	<u>Full forward</u>

SEAT BELT UPPER ANCHORAGE

The test vehicle is equipped with adjustable anchorages for both the driver and passenger seat positions. There are 3 positions or detents. The anchorages are placed in the full down position.

DATA SHEET NO. 4...(continued)

TEST VEHICLE INFORMATION

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

FUEL TANK CAPACITY DATA

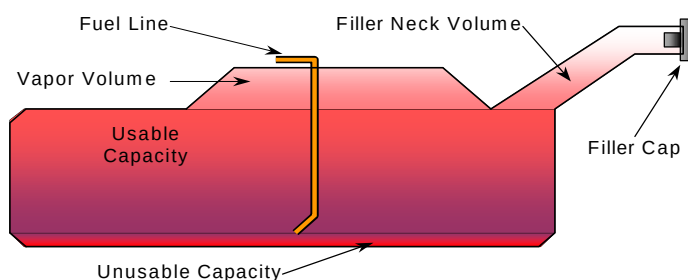
The "Usable Capacity" of the standard equipment fuel tank is: 98.4 liters

The "Usable Capacity" of any optional equipment fuel tank is: NA liters

The "Usable Capacity" used for certification to FMVSS 301 requirements: 98.4 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 88.9 liters

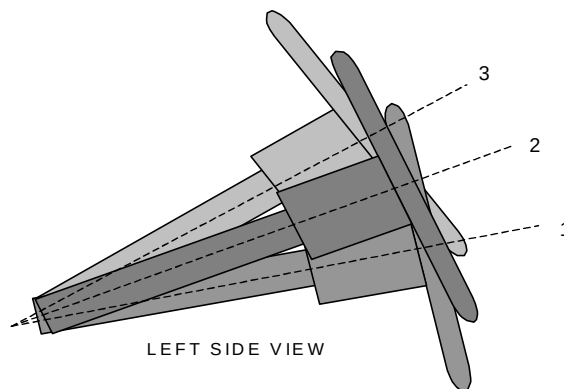
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for three seconds when the ignition is turned to the on position and when the engine is running. The fuel filler door is located on the left rear fender.



VEHICLE FUEL TANK ASSEMBLY

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. A metal 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 1: 18.8 °

Geometric center, position 2: 26.1 °

Uppermost, position 3: 34.4 °

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

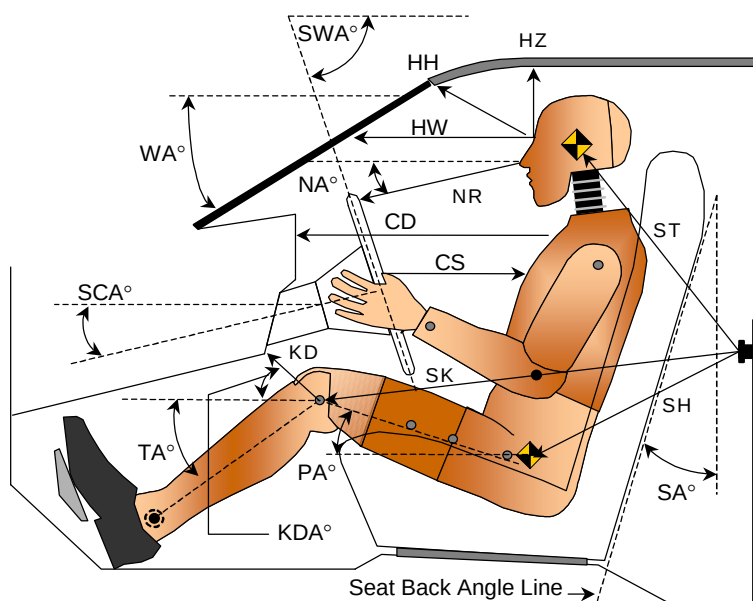
Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

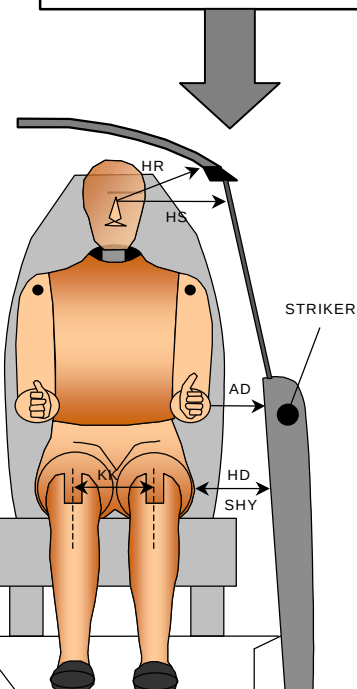
Test Program: 35 mph Frontal Barrier Impact

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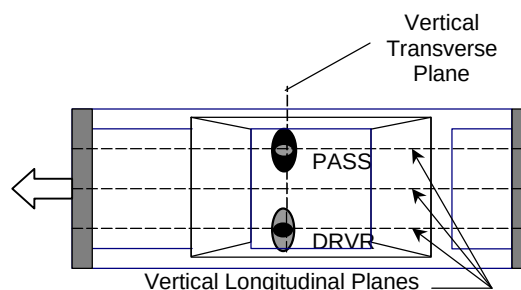
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



AD	Arm to Door
HD	H-Point to Door
HR	Head to Side Header
HS	Head to Side Window
KK	Knee to Knee
SHY	Striker to H-Point (Y Axis)



CD	Chest to Dash
CS	Chest to Steering Wheel Hub
HH	Head to Header
HW	Head to Windshield
HZ	Head to Roof
KDA	Knee to Dash Angle
KDL	Left Knee to Dash
KDR	Right Knee to Dash
NA	Nose to Rim Angle
NR	Nose to Rim
PA	Pelvic Angle
RA	Rim to Abdomen
SA	Seat Back Angle
SCA	Steering Column Angle
SH	Striker to H-Point
SK	Striker to Knee
ST	Striker to Head
SWA	Steering Wheel Angle
TA	Tibial Angle
WA	Windshield Angle



DATA SHEET NO. 5...(continued)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		30.7		
SWA	Steering Wheel Angle		63.9		
SCA	Steering Column Angle		25.2		
SA	Seat Back Angle		2nd notch		3rd notch
HZ	Head to Roof (Z)	269	90.0	262	90.0
HH	Head to Header	372	42.5	385	40.5
HW	Head to Windshield	688	0.0	719	0.0
HR	Head to Side Header (Y)	324		291	
NR	Nose to Rim	286	4.5		
CD	Chest to Dash	482		576	
CS	Chest to Steering Hub	228	-1.4		
RA	Rim to Abdomen	125	0.0		
KDL	Left Knee to Dash	121	0.0	98	
KDR	Right Knee to Dash	109		122	0.0
PA	Pelvic Angle		20.1		20.2
TA	Tibia Angle		64.4		65.1
KK	Knee to Knee (Y)	209		164	
SK	Striker to Knee	663	89.0	672	88.8
ST	Striker to Head	568	29.2	558	24.7
SH	Striker to H-Point	287	87.3	272	89.9
SHY	Striker to H-Point (Y)	324		292	
HS	Head to Side Window	401		360	
HD	H-Point to Door (Y)	212		171	
AD	Arm to Door (Y)	170		139	
AA	Ankle to Ankle	215		162	

DATA SHEET NO. 6

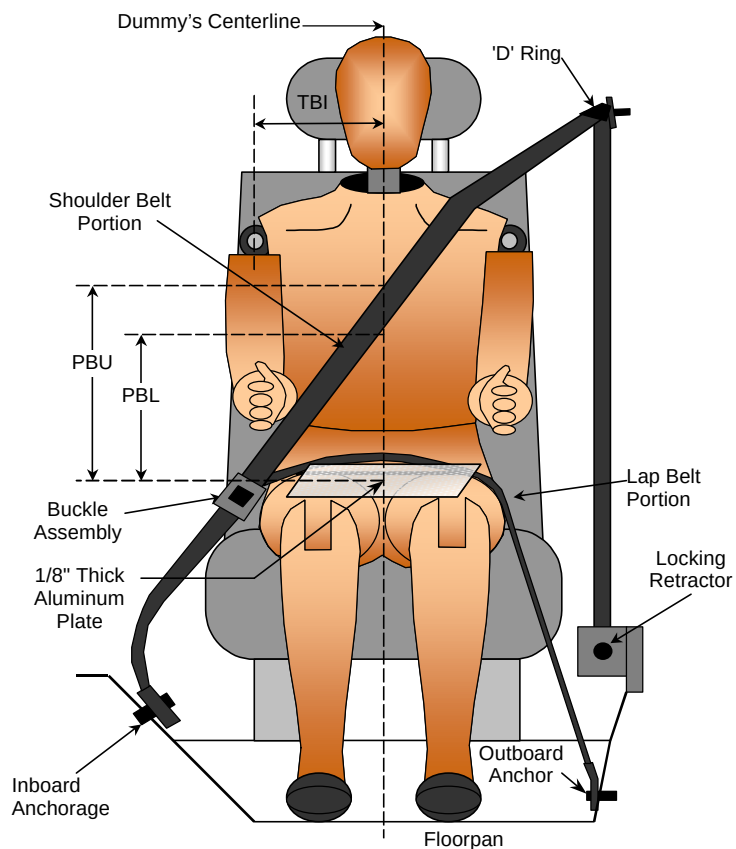
SEAT BELT POSITIONING DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	162	162
PBU - Top surface of reference to belt upper edge	mm	290	290
PBL - To surface of reference to belt lower edge	mm	210	210

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

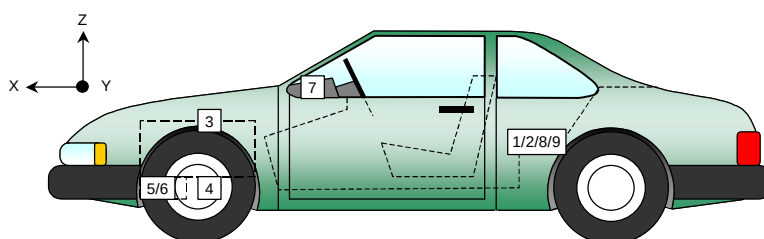
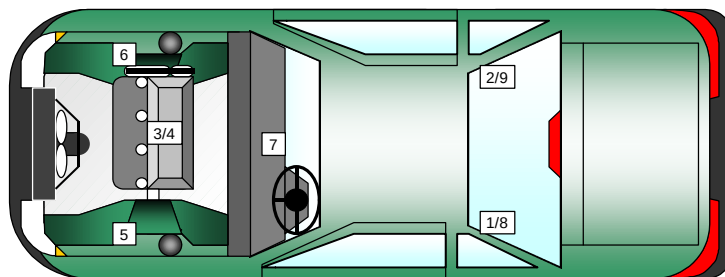
VEHICLE X-AXIS ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member (Primary)	2165	-590	462	G's	1.8	199	-29.7	81
2	Right Rear X-Member (Primary)	2165	590	465	G's	2.9	172	-33.9	79
3	Engine Top	4473	-25	892	G's	*	*	-191.4	32
4	Engine Bottom	4368	-82	240	G's	15.1	82	-99.9	30
5	Left Brake Caliper	4340	-723	236	G's	40.2	72	-133.3	44
6	Right Brake Caliper	4340	723	234	G's	112.9	58	-129.5	37
7	Instrument Panel	3279	0	1162	G's	3.7	156	-58.4	27
8	Left Rear X-Member (Redundant)	2165	-590	462	G's	1.7	199	-29.9	81
9	Right Rear X-Member (Redundant)	2165	590	465	G's	2.4	173	-31.6	79

Reference Points: X - From Rear Surface of Vehicle (+ forward) * Not valid after 40 msec

Y - Vehicle Centerline (+ to right)

Z - Ground Plane (+ up)



DATA SHEET NO. 8

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	.5	195	-36.4	61	26.2	172	-62.8	87
Head CG	Y	G's	1.4	32	-11.2	62	9.8	81	-6.9	103
Head CG	Z	G's	16.8	99	-8.6	68	24.5	95	-.2	11
Head CG Resultant	N/A	G's	38.0	61			63.4	87		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	4.9	198	-29.6	96	5.4	173	-35.1	95
Chest CG	Y	G's	3.6	26	-5.4	24	1.7	181	-7.9	86
Chest CG	Z	G's	6.8	100	-18.1	69	3.2	181	-12.7	75
Chest CG Resultant	N/A	G's	30.3	96			35.8	95		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	469	37	-1795	49	304	32	-2247	53
Right Femur	Z	Newtons	750	46	-450	94	346	31	-2044	91

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	2410	98			1722	45		

HEAD INJURY CRITERIA (HIC₁₅)

Location	Driver				Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Primary	113	35.5	58.5	73.5	382	57.9	75.8	90.8

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	29.8	94.3	97.4	35.4	93.9	97.0

NECK INJURY CRITERIA

Location	Driver	Passenger
N _{te}	0.2	0.4
N _{tf}	0.3	0.2
N _{ce}	0.0	0.0
N _{cf}	0.2	0.1

DATA SHEET NO. 8...(continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	1.8	143	-31.9	49	1.7	133	-34.8	61
Pelvis	Y	G's	6.3	100	-4.1	75	4.1	93	-7.7	65
Pelvis	Z	G's	3.2	19	-23.7	59	2.9	200	-21.0	76

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	263	60	-263	114	47	178	-445	80
Neck Force	Y	Newtons	68.8	77	-167	60	63	17	-262	89
Neck Force	Z	Newtons	735	98	-105	146	1016	101	-173	16
Neck Moment	X	N•m	16.6	62	-5.8	89	6.5	168	-11.2	124
Neck Moment	Y	N•m	28.7	60	-11.6	39	11.1	175	-19.3	78
Neck Moment	Z	N•m	9.7	94	-4.8	152	4.8	106	-2.7	70

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	14.5	51	-62.4	36	2.7	71	-63.8	59
Left Foot Aft	Z	G's	22.8	49	13.0	78	16.1	69	-44.0	45
Left Foot Fore	Z	G's	43.5	40	-24.8	55	46.4	69	-102.5	57
Right Foot Aft	X	G's	3.8	19	-127.3	50	2.8	191	-55.1	35
Right Foot Aft	Z	G's	14.5	82	-67.3	52	8.8	69	-24.2	37
Right Foot Fore	Z	G's	103.6	50	-117.5	44	23.4	41	-80.7	33

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Lower Moment	X	N•m	10.7	77	-7.0	53	6.3	60	-10.5	91
Left Lower Moment	Y	N•m	5.4	50	-30.6	35	11.7	91	-52.2	59
Left Lower Force	Z	Newtons	921	38	-58	149	1592	47	-121	64
Left Upper Moment	X	N•m	29.6	76	-12.7	162	17.3	75	-5.8	165
Left Upper Moment	Y	N•m	8.6	136	-48.9	38	13.3	133	-69.5	59
Left Upper Force	Z	Newtons	600	79	-52	143	1032	47	-234	64
Right Lower Moment	X	N•m	24.1	69	-19.6	51	2.7	153	-8.1	47
Right Lower Moment	Y	N•m	30.9	71	-20.2	52	16.1	39	-29.8	60
Right Lower Force	Z	Newtons	2396	51	-159	146	1301	38	-190	81
Right Upper Moment	X	N•m	13.7	69	-30.5	52	10.3	135	-23.7	52
Right Upper Moment	Y	N•m	14.4	130	-64.1	52	12.1	134	-50.8	60
Right Upper Force	Z	Newtons	1696	51	-135	33	926	47	-249	87

DATA SHEET NO. 8...(continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	mm			-19.0	99			-15.6	55

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	.6	14	-38.3	61	26.0	172	-61.7	87
Head CG	Y	G's	2.0	147	-11.5	62	10.7	81	-5.2	118
Head CG	Z	G's	17.1	101	-11.5	67	24.7	95	-.3	4
Head CG Resultant	N/A	G's	39.5	61			62.5	87		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	4.8	198	-29.3	96	5.5	173	-34.9	95
Chest CG	Y	G's	3.7	26	-5.6	24	1.7	180	-7.6	62
Chest CG	Z	G's	7.0	99	-17.9	69	3.5	41	-12.6	73
Chest CG Resultant	N/A	G's	30.3	74			35.7	94		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Redundant	112	35.4	58.4	73.4	377	57.6	76.0	91.0

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	29.7	72.6	75.7	35.4	93.7	96.8

DATA SHEET NO. 9**SEAT BELT PERFORMANCE ASSESSMENT TEST DATA**Test Vehicle: 2001/Ford/Windstar SENHTSA No.: M10212Test Program: 35 mph Frontal Barrier ImpactTest Date: April 18, 2001**SEAT BELT PLACEMENT MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	162	162
PBU - Top surface of reference to belt upper edge	mm	290	290
PBL - Top surface of reference to belt lower edge	mm	210	210

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to "D" ring	mm	134	125
Shoulder belt length as measured on ATD	mm	825	955
Lap belt length as measured on ATD	mm	871	980
Total belt length for continuous webbing systems	mm	1830	2060

SHOULDER BELT SPOOL-OUT DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	NR	NR
As determined electronically	mm	NR	NR

NR = Not recorded at the manufacturer's request

DATA SHEET NO. 10

SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

Windshield Mounting Details:

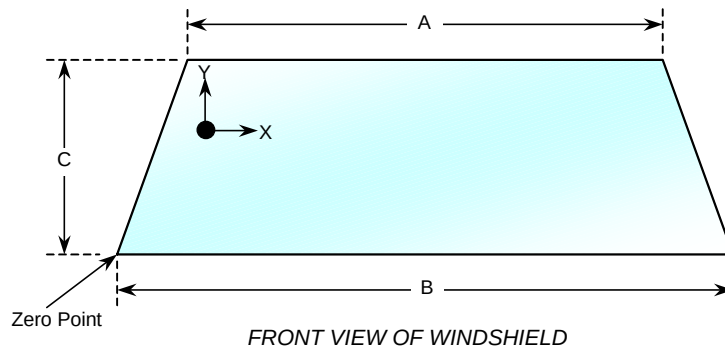
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles, which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2352	2352	100
Right Side	2325	2325	100
Total	4677	4677	100



WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1301	25
B	mm	1708	17
C	mm	835	24

DATA SHEET NO. 11

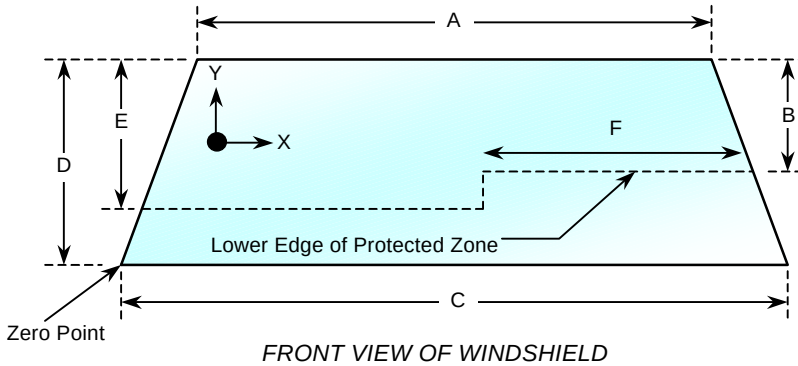
WINDSHIELD ZONE INTRUSION FMVSS 219 (Partial) DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001



Item	Units	Value
A	mm	1301
B	mm	472
C	mm	1708
D	mm	835
E	mm	541
F	mm	818

AREA OF PROTECTED ZONE FAILURES

- A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one that is normally in contact with the windshield.

X	Y

- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y

DATA SHEET NO. 12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

Test Time: 10:30

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. 13

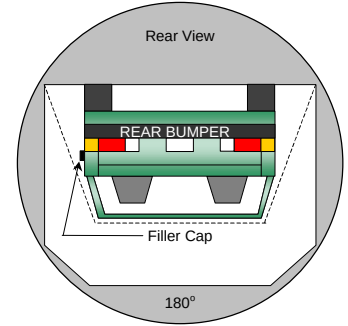
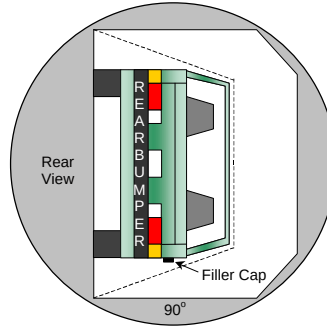
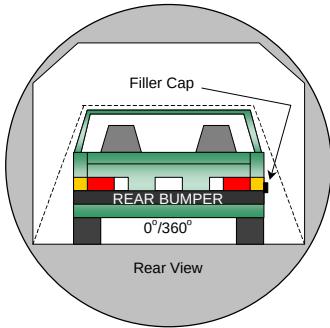
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

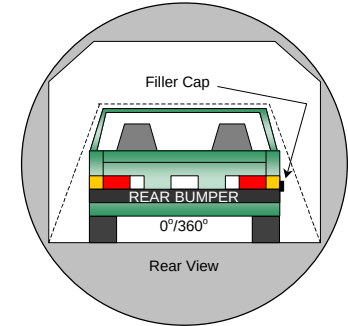
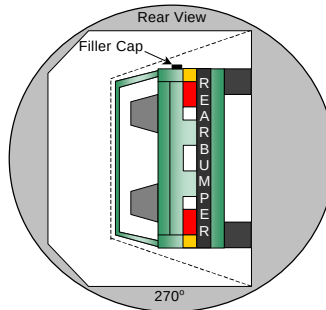
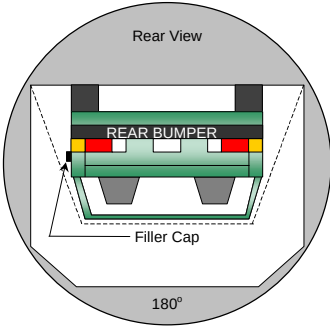
Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 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:

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° TO 90°	164	300	0
90° TO 180°	151	300	0
180° TO 270°	140	300	0
270° TO 360°	162	300	0

DATA SHEET NO. 14
VEHICLE MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	5106	4467	639
2	RSOV to front of engine	mm	4633	NR	NR
3	RSOV to firewall centerline	mm	3905	3830	75
4	RSOV to leading edge of right door	mm	3705	3661	44
5	RSOV to leading edge of left door	mm	3705	3669	36
6	RSOV to lower leading edge of right door	mm	3580	3541	39
7	RSOV to lower leading edge of left door	mm	3572	3545	27
8	RSOV to upper leading edge of right door	mm	2480	2415	65
9	RSOV to upper leading edge of left door	mm	2470	2403	67
10	RSOV to lower trailing edge of right door	mm	2505	2474	31
11	RSOV to lower trailing edge of left door	mm	2520	2485	35
12	RSOV to bottom of right 'A' pillar	mm	3543	3495	48
13	RSOV to bottom of left 'A' pillar	mm	3552	3519	33
14	RSOV to firewall on right side	mm	3885	3870	15
15	RSOV to firewall on left side	mm	3961	3807	154
16	RSOV to steering column	mm	3158	3009	149
17	Center of steering column to left 'A' pillar	mm	381	405	-24
18	Center of steering column to headlining	mm	457	482	-25
19	RSOV to right side of front bumper	mm	5019	4622	397
20	RSOV to left side of front bumper	mm	5035	4630	405
21	Length of engine block	mm	385	385	0
RD	RSOV to right side of dash panel	mm	3460	3432	28
CD	RSOV to center of dash panel	mm	3469	3455	14
LD	RSOV to left side of dash panel	mm	3445	3410	35

RSOV = Rear Surface of Vehicle

NR = Not Recorded

DATA SHEET NO. 14...(continued)

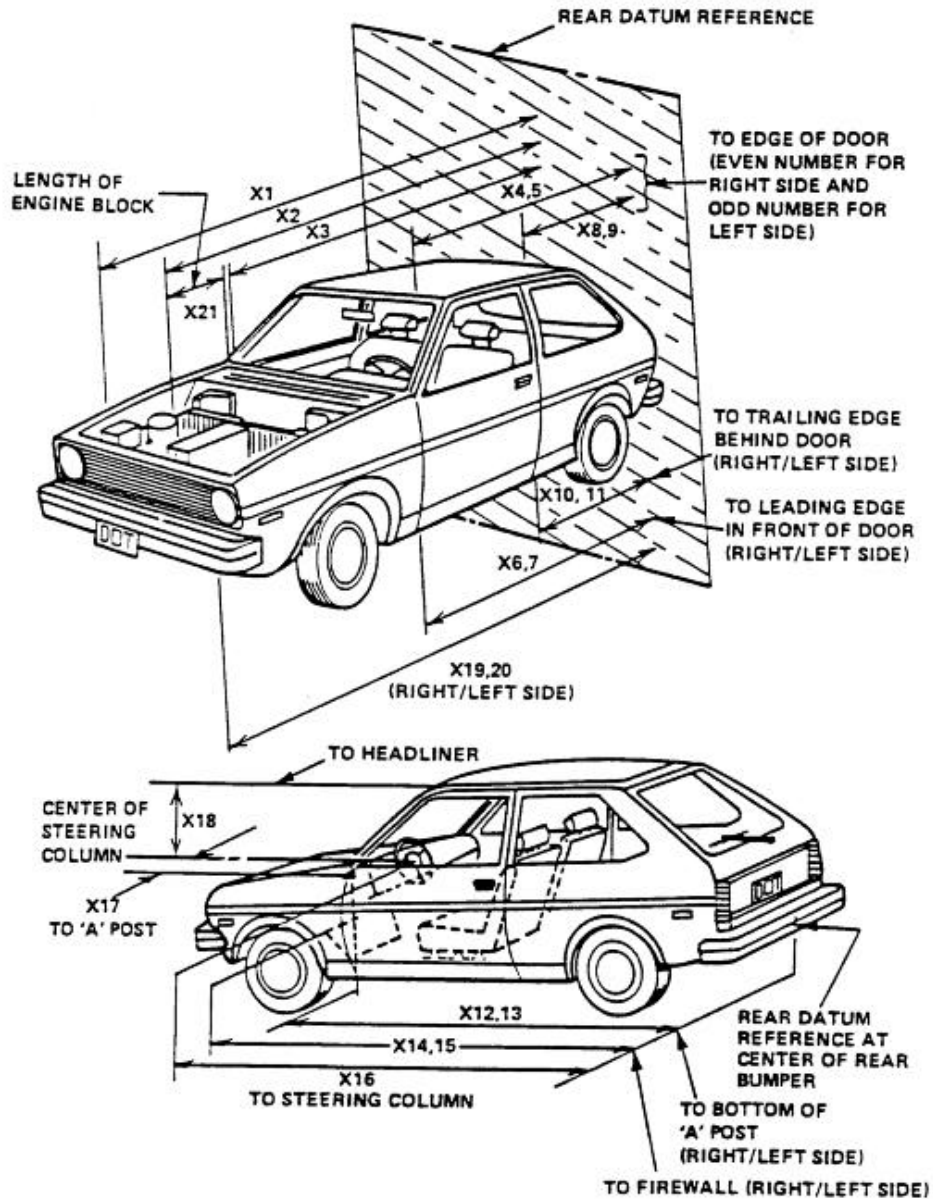
VEHICLE MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001



DATA SHEET NO. 15

CAMERA LOCATIONS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				17	32
2	Left Front View	1000	-2000	1580	25	1005
3	Steering Column Top	2000	-8333	1570	25.4	1042
4	Steering Column Bottom	2000	-8322	1038	25	1026
5	Driver Close-up	1500	-10100	1475	50	1058
6	Driver Angle	4790	-5150	2022	50	**
7	Onboard Driver				8	513
8	Onboard Passenger				8	506
9	Right Overall	2636	8271	1537	13	1010
10	Right Passenger Half	1180	8270	1533	25	1010
11	Right Close-up	1800	10500	1545	50	909
12	Right Angle	4940	5649	2130	50	1117
13	Windshield	-450	0	2700	13	1010
14	Windshield Driver	70	-440	1780	13	1010
15	Windshield Passenger	80	400	1770	13	1020
16	Pit Front	1150	0	-3200	13	1000
17	Pit Rear	2890	0	-3200	13	1010

*COORDINATES:

+X = film plane rearward of barrier

+Y = film plane to right of monorail centerline

+Z = film plane to above ground level

ORIGIN: For X and Y it is the Impact Point. For Z it is the Floor.

** No timing marks

CAMERA LOCATIONS

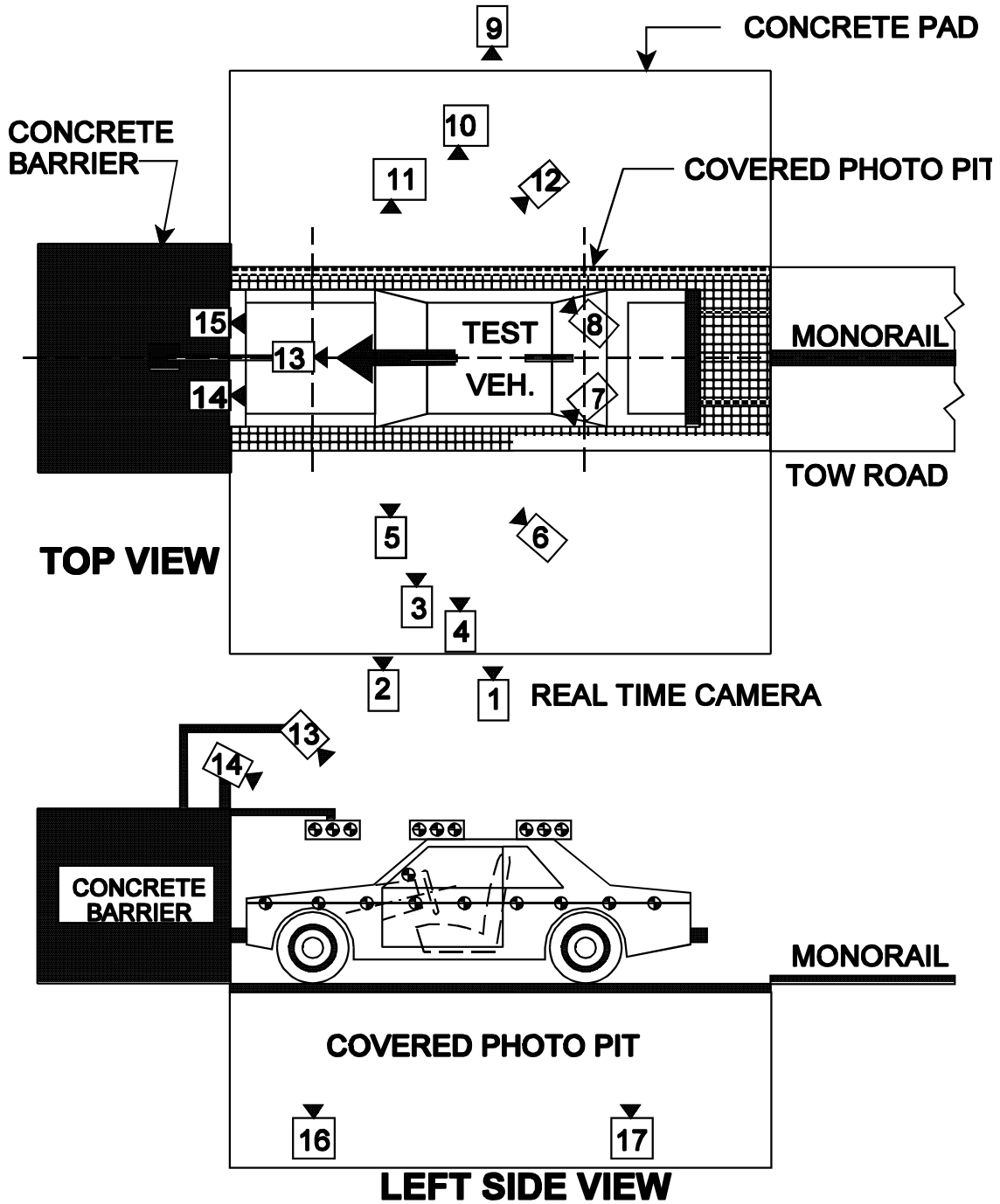
Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 16

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

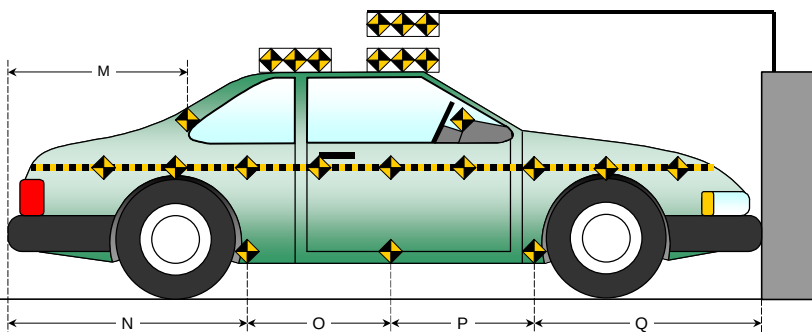
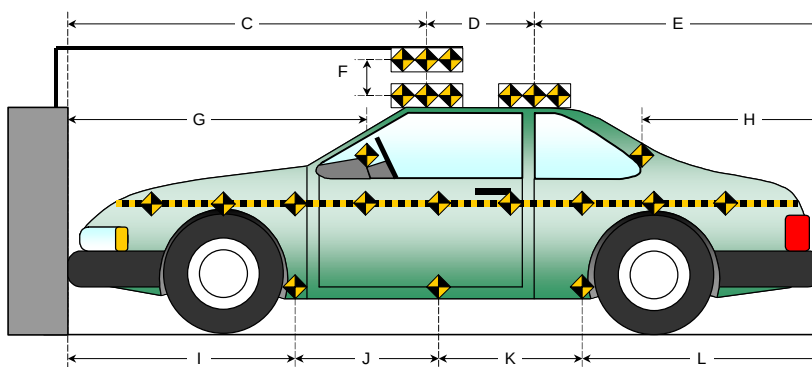
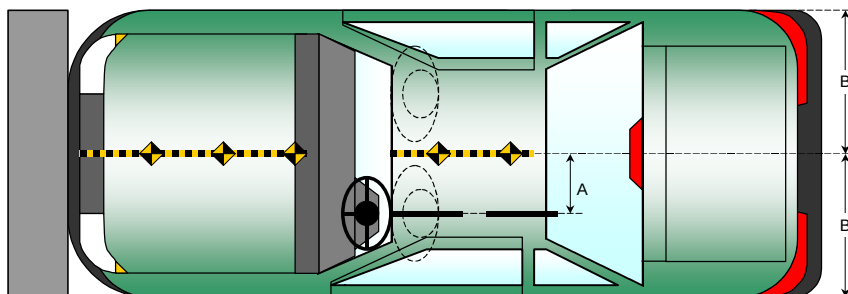
Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

Item	Value
A	399
B	982
C	2285
D	610
E	2211
F	310
G	1775
H	1463
I	1534
J	1030
K	1030
L	1512
M	1285
N	1488
O	1030
P	1030
Q	1558



DATA SHEET NO. 17

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

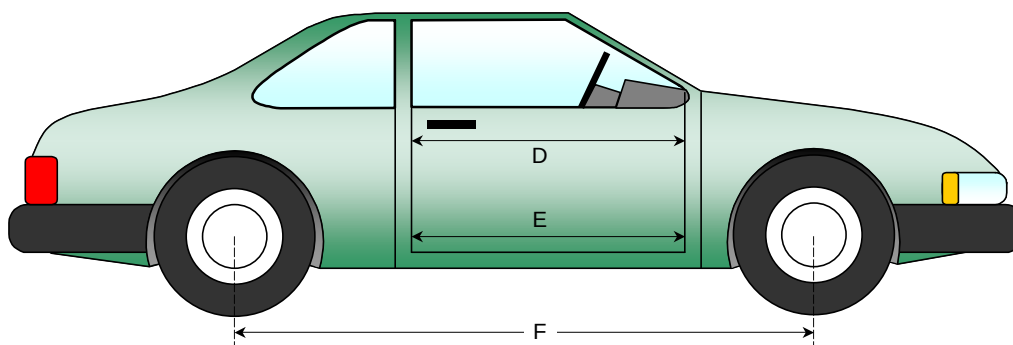
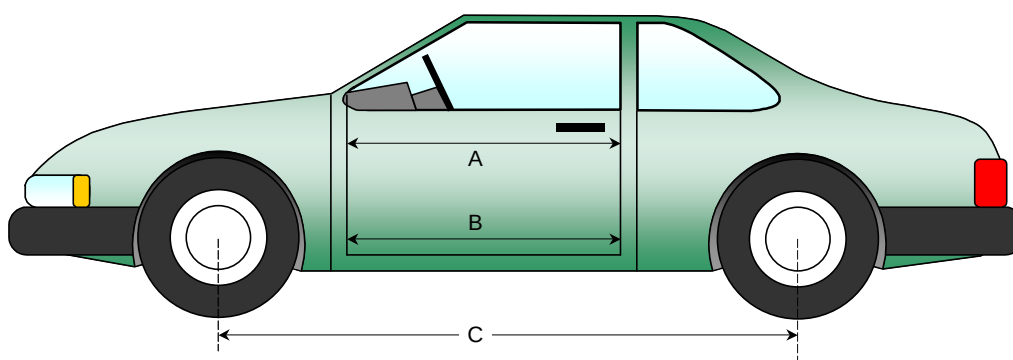
Test Date: April 18, 2001

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1055	1050	5
B	Left Side Lower	mm	938	936	2
D	Right Side Upper	mm	1053	1043	10
E	Right Side Lower	mm	953	938	15

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3078	2939	139
F	Right Side Wheelbase	mm	3073	2914	159



DATA SHEET NO. 17...(continued)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

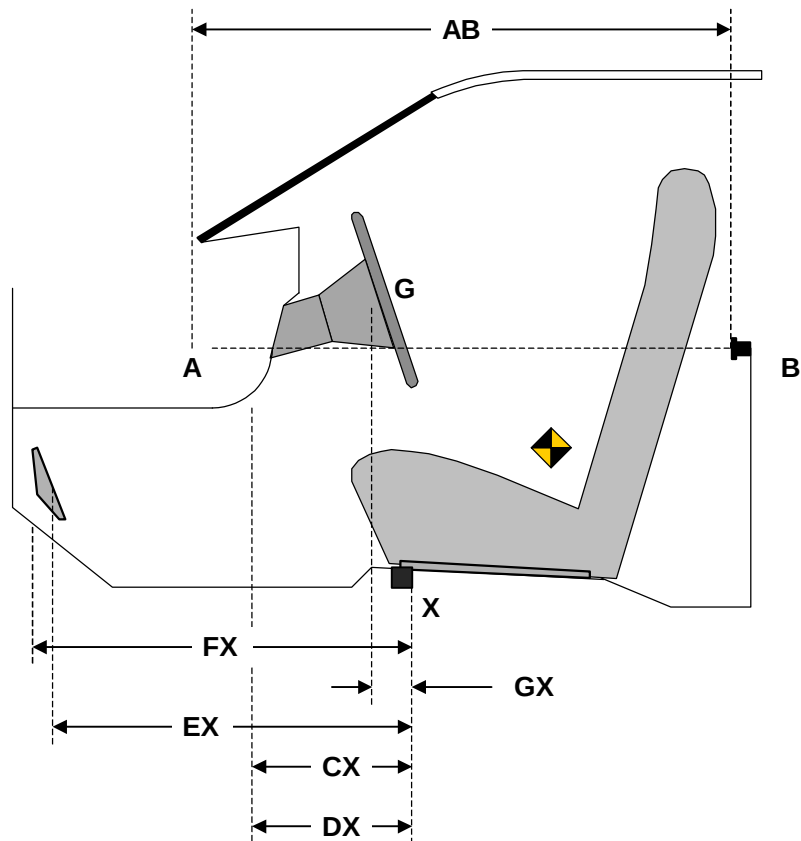
Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	1055	1045	10
CX	Left Knee Bolster to X	mm	735	729	6
DX	Right Knee Bolster to X	mm	724	735	-11
EX	Brake Pedal to X	mm	975	900	75
FX	Foot Rest to X	mm	1120	1100	20
GX	Center of Steering Column Wheel Hub to X	mm	485	508	-23

X = Left Front Seat Front Outboard Anchor Bolt Head



DRIVER COMPARTMENT

DATA SHEET NO. 17...(continued)

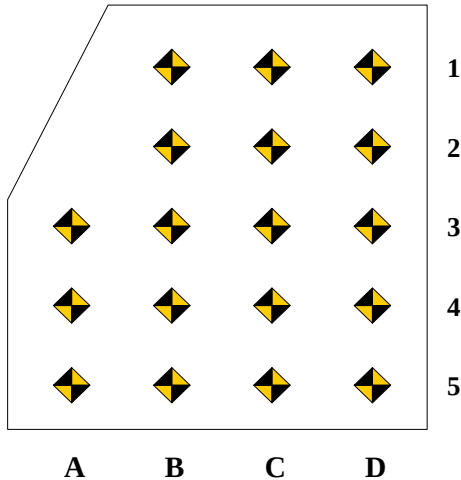
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001



Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4, and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		760	762	762		728	716	700		32	46	62
2		622	623	623		597	589	588		25	34	35
3	480	480	480	480	479	480	478	480	1	0	2	0
4	330	330	330	330	330	330	328	330	0	0	2	0
5	180	180			180	180			0	0		

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-38	-30	-30		-67	-59	-52		29	29	22
2		22	20	30		16	-27	-20		6	14	50
3	73	62	66	75	77	87	114	116	-4	-25	-48	-41
4	56	62	60	65	61	70	86	95	-5	-8	-26	-30
5	64	56			60	66			4	-10		

DATA SHEET NO. 17...(continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

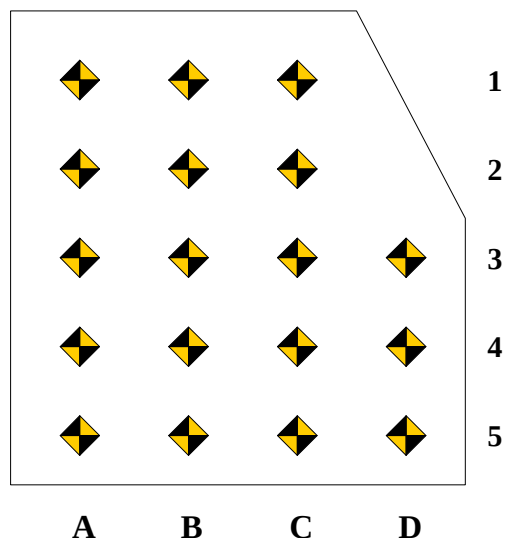
Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan.

Rows 3, 4, and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	725	729	735		628	631	653		97	98	82	
2	612	618	620		530	542	556		82	76	64	
3	480	480	480	480	466	468	465	465	14	12	15	15
4	330	330	330	330	316	315	312	318	14	15	18	12
5			180	180			166	166			14	14

PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-35	-40	-45		78	74	35		-113	-114	-80	
2	-115	-126	-130		-60	-68	-175		-55	-58	45	
3	-193	-193	-185	-193	-184	-200	-187	-132	-9	7	2	-61
4	-182	-182	-182	-190	-168	-179	-180	-177	-14	-3	-2	-13
5			-175	-182			-178	-168			3	-14

DATA SHEET NO. 17...(continued)

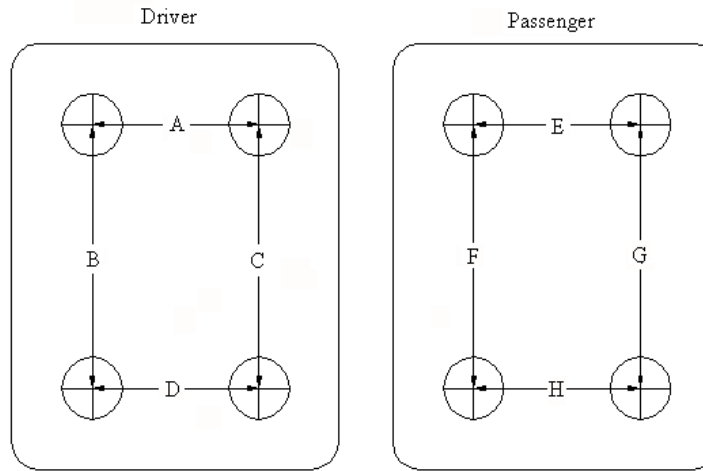
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001



UNDERBODY FLOORBOARD DEFORMATION

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	274	264	10
B	407	335	72
C	351	322	29
D	248	246	2
E	189	184	5
F	343	284	59
G	396	370	26
H	260	255	5

DATA SHEET NO. 18

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2001/Ford/Windstar SE

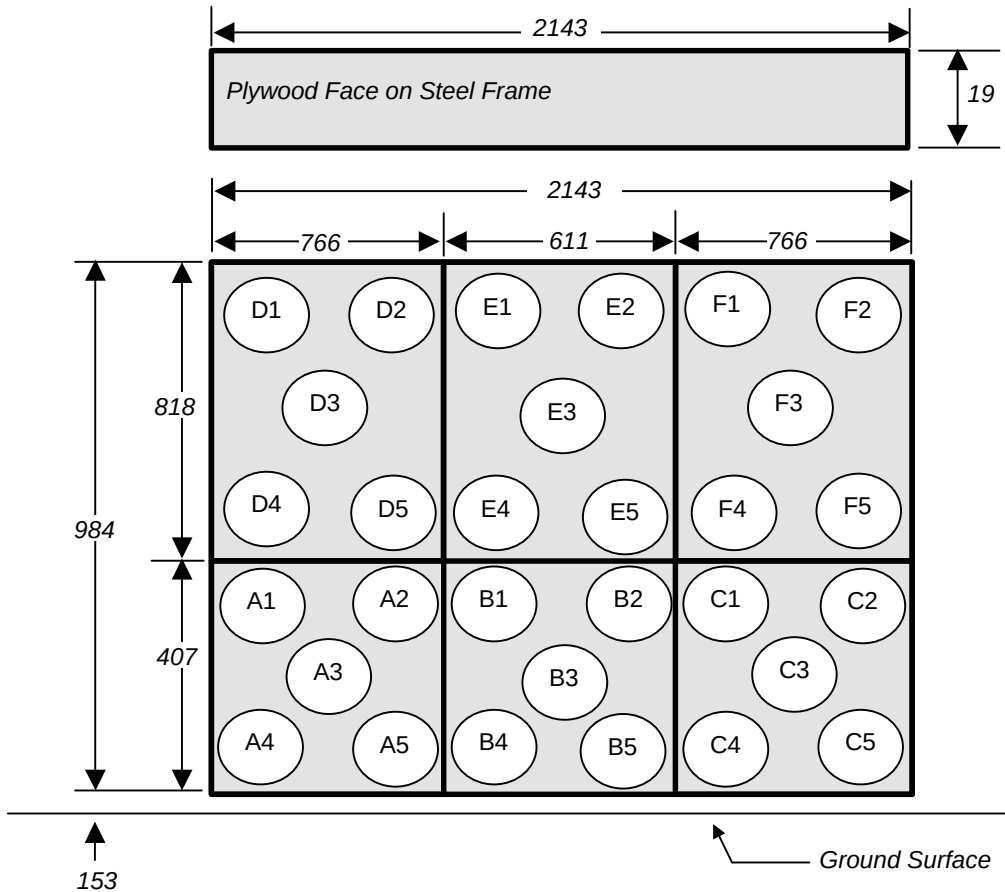
NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

30 Load Cell Rigid Barrier

Load Cell Locations on Fixed Barrier



Group 4 D1-D5	Group 5 E1-E5	Group 6 F1-F5
Group 1 A1-A5	Group 2 B1-B5	Group 3 C1-C5

6 Groups of 5 Load Cells Each

The Data is presented in Appendix C with the following requirements:

1. Data from 30 individual load cells
2. Sum data from 6 groupings shown above (5 cells/group)
3. Total or sum of all 30 individual load cells

DATA SHEET NO. 19

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2001/Ford/Windstar SE
 Test Program: 35 mph Frontal Barrier Impact

NHTSA No.: M10212
 Test Date: April 18, 2001

VEHICLE INFORMATION

VIN: 2FMZA52441BB19604
 Vehicle Size Category: Van

Wheelbase (mm): 3070
 Test Weight (kg): 2115

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on page 13

Cal. Procedure/Interval: MGA procedure / 6 month

Integration Algorithm: Trapezoidal

Linearity: >99.9%

Impact Velocity (km/h): 56.3

Velocity Change (km/h): 67.8

Time of Separation (msec): 200

CRUSH PROFILE

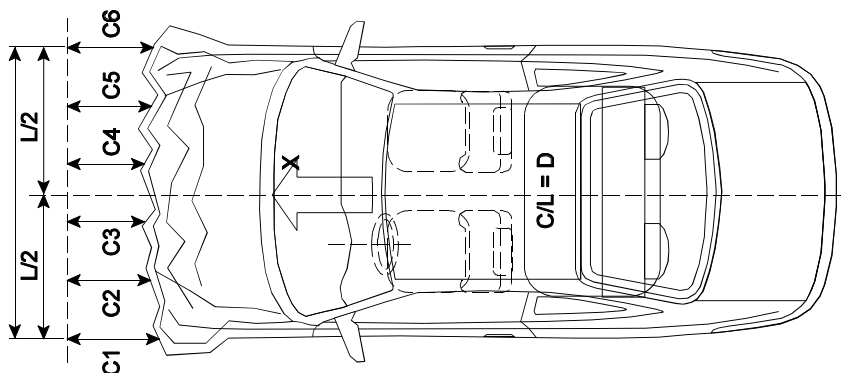
Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1964

Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4885	4446	439
C2	Crush zone 2 at left side	mm	5060	4430	630
C3	Crush zone 3 at left side	mm	5104	4465	639
C4	Crush zone 4 at right side	mm	5097	4455	642
C5	Crush zone 5 at right side	mm	5046	4433	613
C6	Crush zone 6 at right side	mm	4882	4443	439



DATA SHEET NO. 20

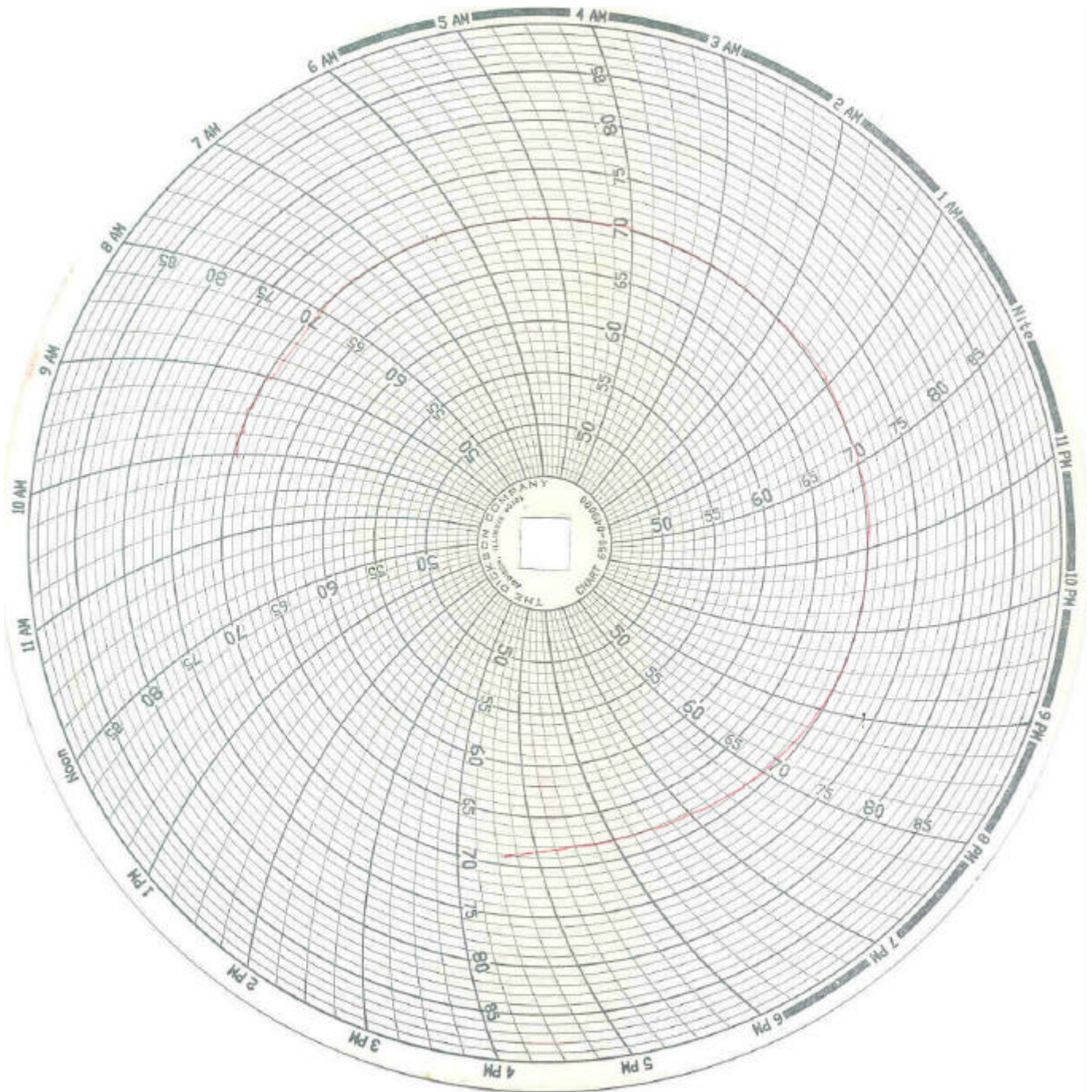
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001



A = Dummies installed in vehicle at 7:20 a.m.

B = Test conducted at 10:30 a.m.

APPENDIX A

PHOTOGRAPHS

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

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

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



Photo No. A-4 - Pre-Test Left Side View of Test Vehicle

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



Photo No. A-6 - Pre-Test Left Rear Three-Quarter View of Test Vehicle

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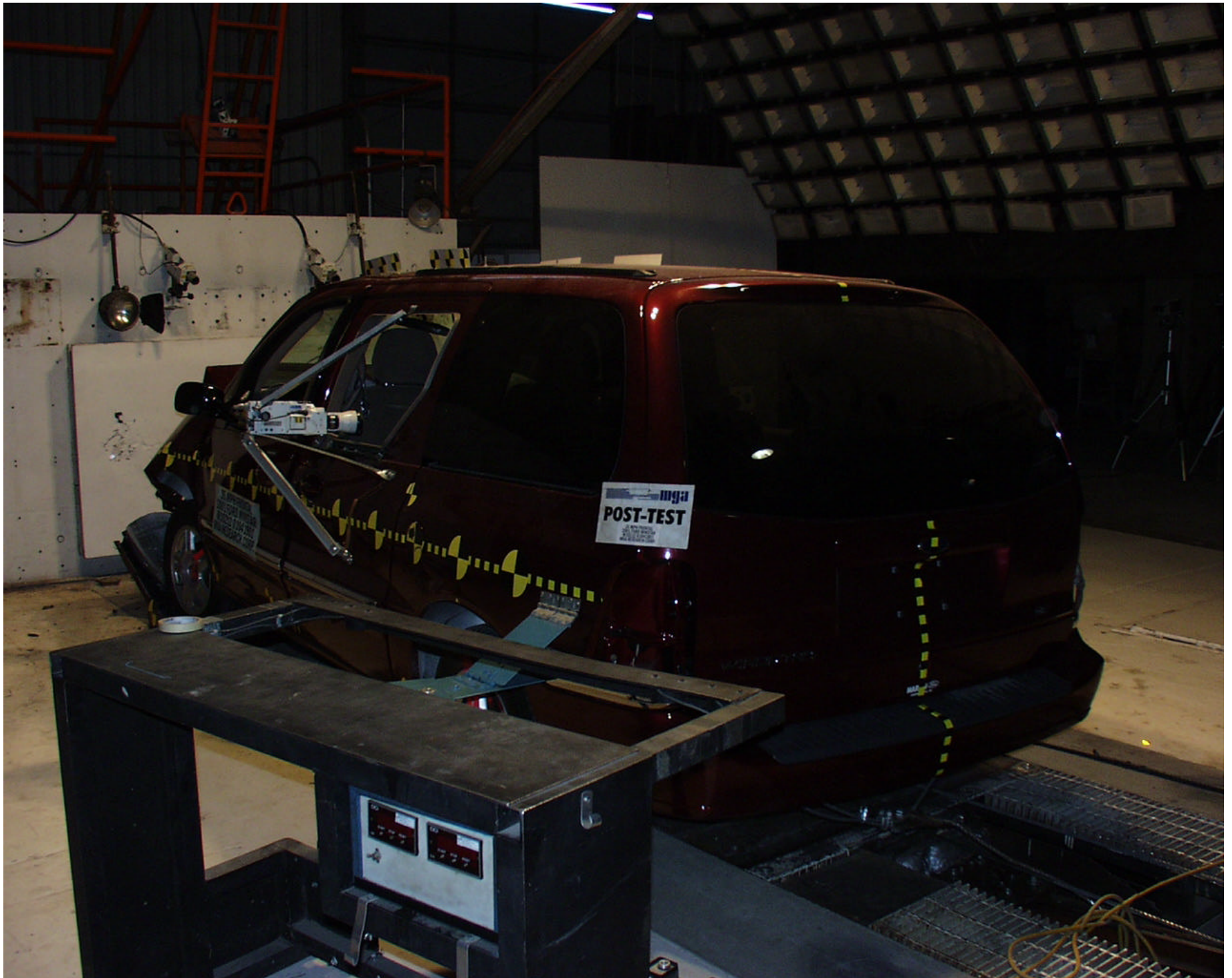


Photo No. A-7 - Post-Test Left Rear Three-Quarter View of Test Vehicle



Photo No. A-8 - Pre-Test Right Side View of Test Vehicle



Photo No. A-9 - Post-Test Right Side View of Test Vehicle



Photo No. A-10 - Pre-Test Right Front Three-Quarter View of Test Vehicle



Photo No. A-11 - Post-Test Right Front Three-Quarter View of Test Vehicle



Photo No. A-12 - Pre-Test Fuel Filler Cap View

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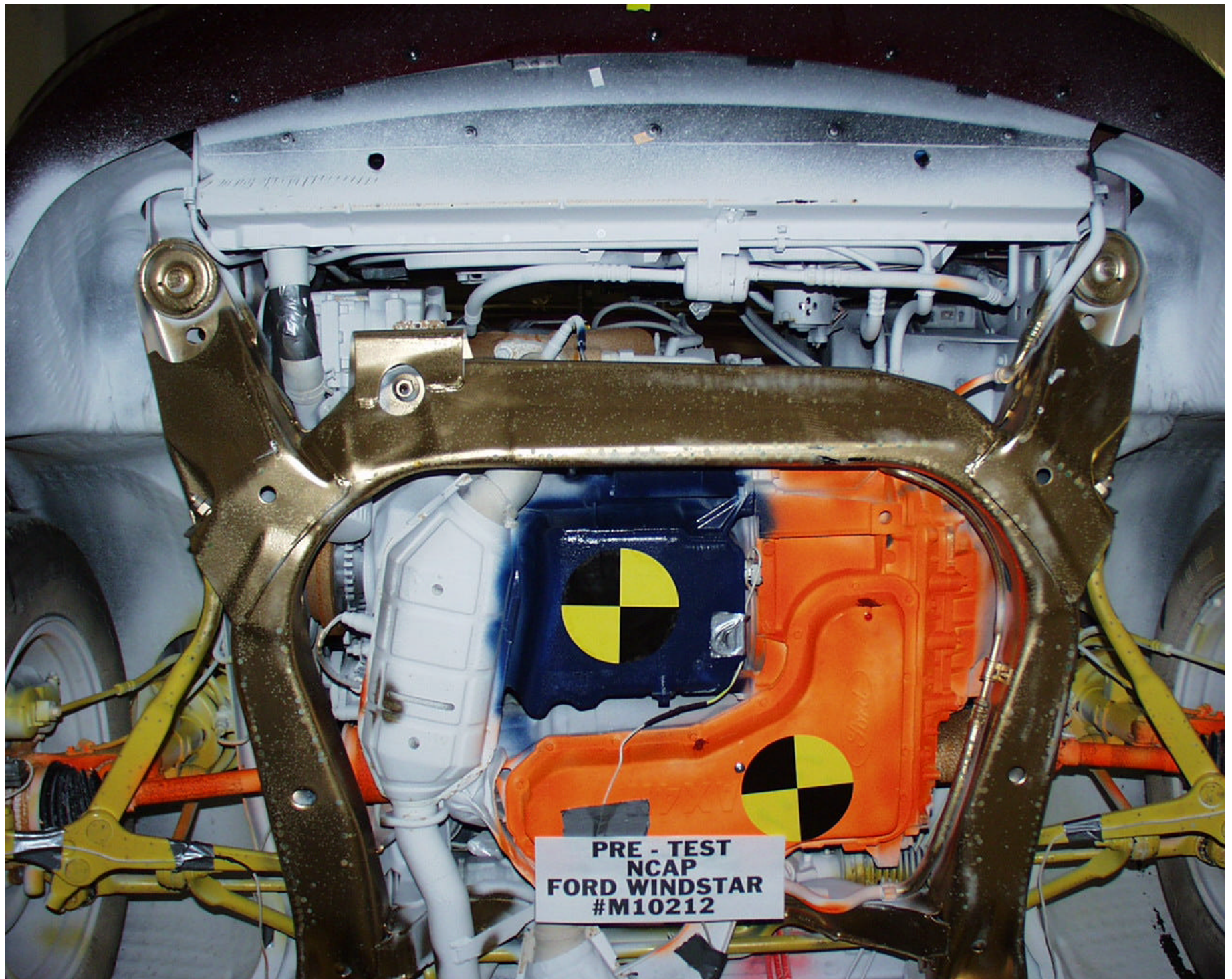


Photo No. A-13 - Pre-Test Front Underbody View

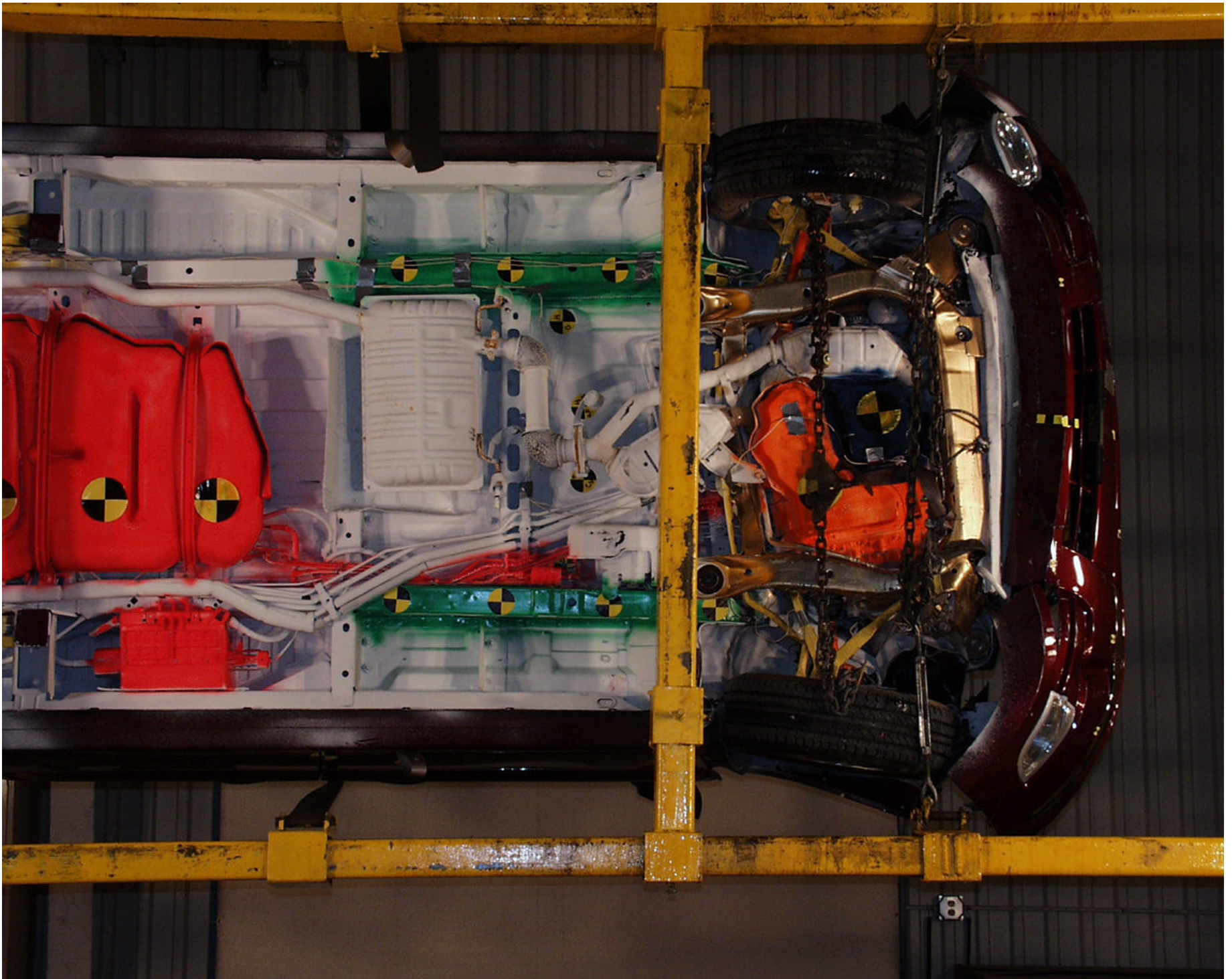


Photo No. A-14 - Post-Test Front Underbody View



Photo No. A-15 - Pre-Test Rear Underbody View

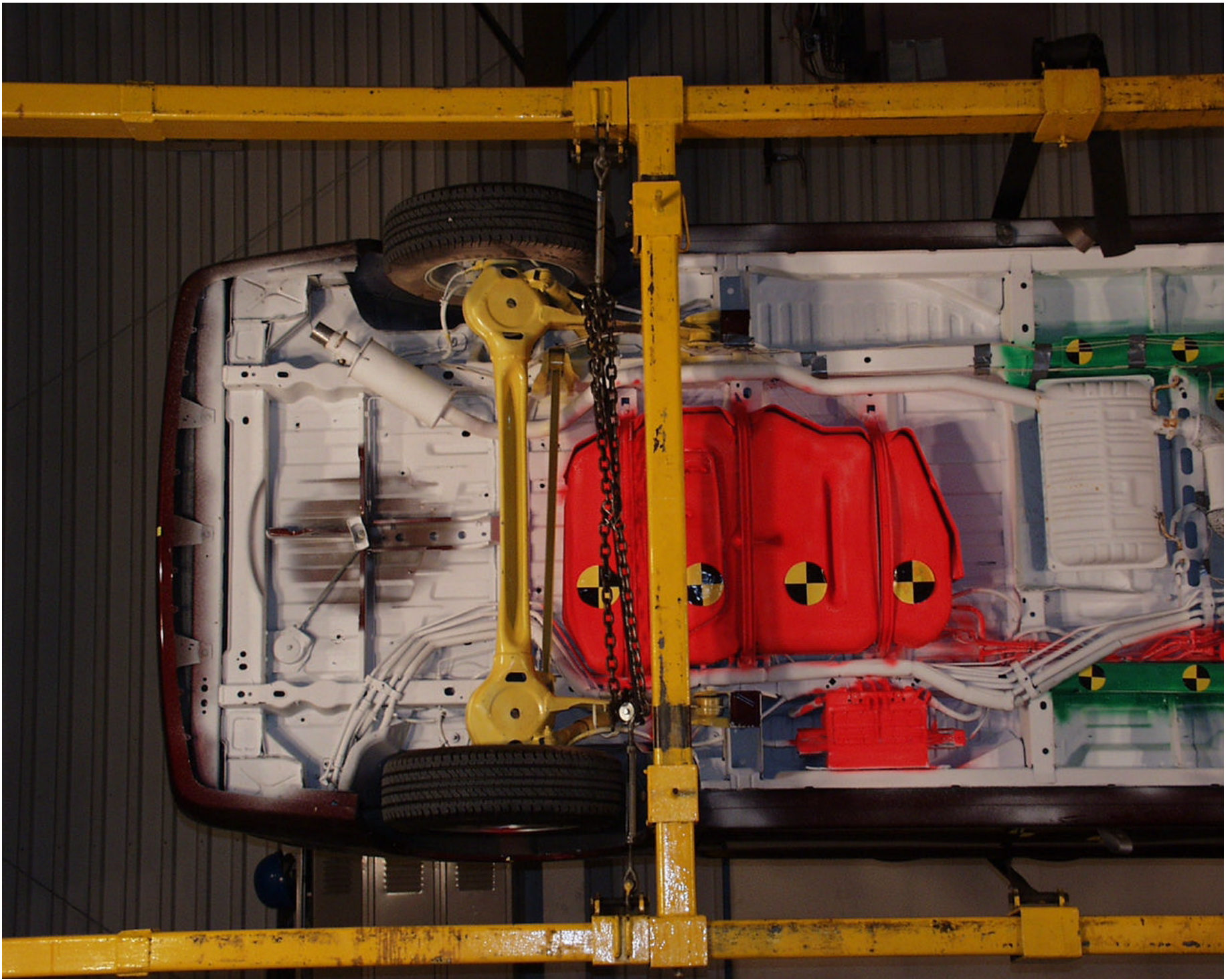


Photo No. A-16 - Post-Test Rear Underbody View



35 MPH FRONTAL
2001 FORD WINSTAR
M10212 01041801
MGA RESEARCH CORP.

mga research corporation
PRE-TEST
35 MPH FRONTAL
2001 FORD WINSTAR
M10212 01041801

Photo No. A-17 - Pre-Test Windshield View



Photo No. A-18 - Post-Test Windshield View

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Photo No. A-19 - Pre-Test Driver Dummy Position Left Side View

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Photo No. A-20 - Pre-Test Driver Dummy Position Left Side View (Door Open)

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Photo No. A-21 - Post-Test Driver Dummy Position Left Side View (Door Open)



Photo No. A-22 - Pre-Test Driver Seat Position View

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Photo No. A-23 - Post-Test Driver Seat Position View



Photo No. A-24 - Pre-Test Driver Dummy Knee Position



Photo No. A-25 - Post-Test Driver Dummy Knee Position



Photo No. A-26 - Post-Test Driver Airbag Contact



Photo No. A-27 - Post-Test Driver Knee Contact View



Photo No. A-28 - Pre-Test Driver Windshield View



Photo No. A-29 - Post-Test Driver Windshield View

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

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

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Photo No. A-32 - Pre-Test Passenger Dummy Position Right Side View (Door Open)

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Photo No. A-33 - Post-Test Passenger Dummy Position Right Side View (Door Open)

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Photo No. A-34 - Pre-Test Passenger Seat Position View

A-35



Photo No. A-35 - Post-Test Passenger Seat Position View



Photo No. A-36 - Pre-Test Passenger Dummy Knee Position



Photo No. A-37 - Post-Test Passenger Dummy Knee Position



Photo No. A-38 - Post-Test Passenger Airbag Contact

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Photo No. A-39 - Post-Test Passenger Knee Contact View

A-40



Photo No. A-40 - Pre-Test Passenger Windshield View



Photo No. A-41 - Post-Test Passenger Windshield View

MFD. BY FORD MOTOR CO.

DATE: 01/01

FRONT GAWR: 1315KG/2900LB

GVWR: 2521KG/5560LB

REAR GAWR: 1207KG/2663LB

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

VIN: 2FMZA52441BB19604 TYPE: MPV

MAXIMUM LOAD = OCCUPANTS + LUGGAGE = 544KG/1200LB

OCCUPANTS = 7 TOTAL;

2 FRONT, 2 2ND, 3 REAR

TIRE: 215/65R16

PRESSURE(FR): 241 kPa/ 35 PSI COLD

PRESSURE(RR): 241 kPa/ 35 PSI COLD

OCCUPANTS	LUGGAGE
-----------	---------

2	408KG/0900LB
---	--------------

4	272KG/0600LB
---	--------------

7	068KG/0150LB
---	--------------



2FMZA52441BB19604

TRAILER TOWING - SEE OWNER GUIDE

EXT PNT: D6

BRK

INT TR

TP/PS

R

AXLE

IRC: 41

TR

SPR

DSO:

1A31A

F0095

T0166

D

HH

K

15

N

ED

S05

MADE IN CANADA

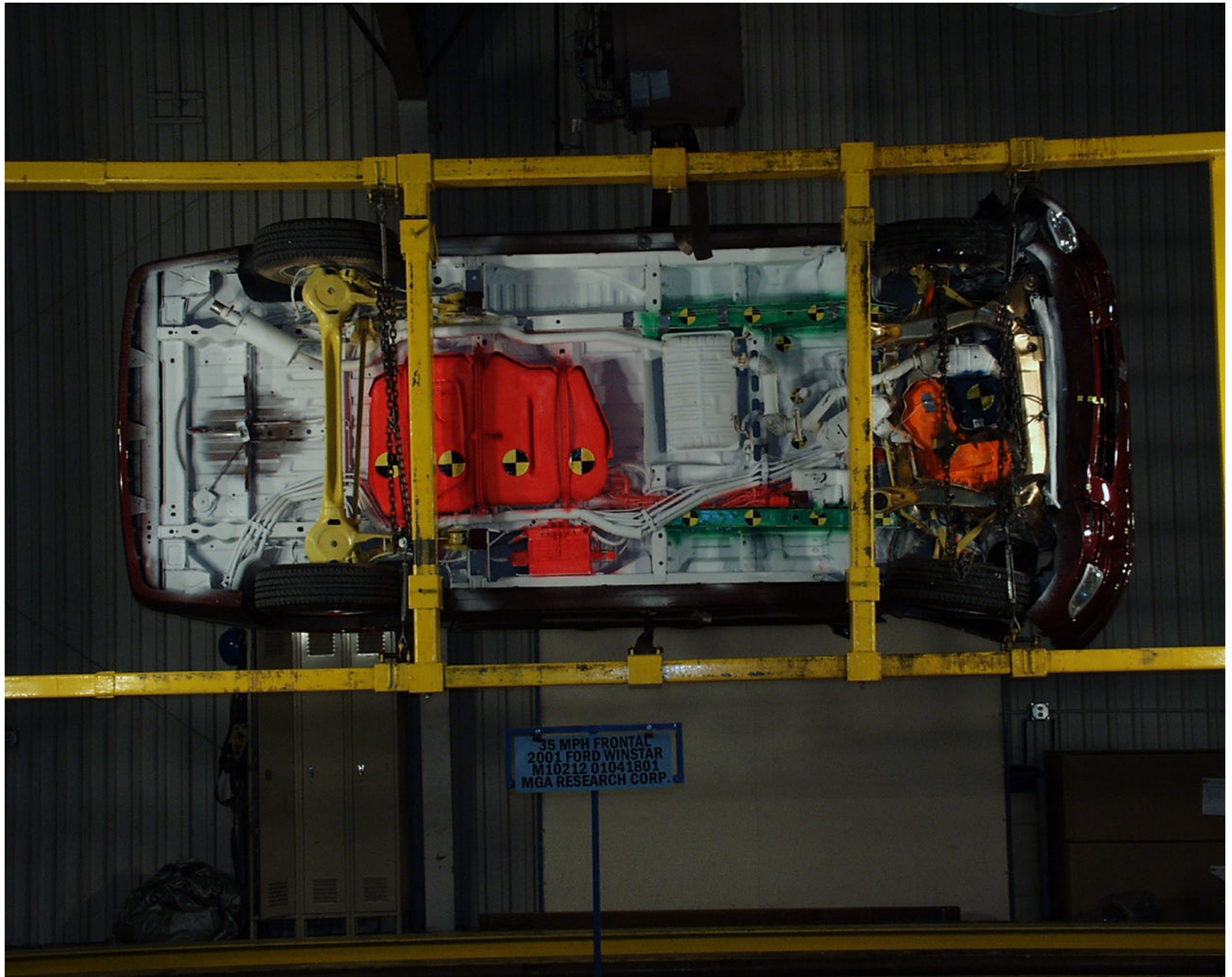
CBC

▽F8DB-5420472-AB

A-43



Photo No. A-43 - Vehicle Impact



A-44

Photo No. A-44 - Rollover 90E



Photo No. A-45 - Rollover 180E



Photo No. A-46 - Rollover 270E



Photo No. A-47 - Rollover 360E

APPENDIX B

DUMMY AND VEHICLE RESPONSE DATA TRACES

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VEHICLE DATA FILTER CHANNEL CLASS

Head Accelerations 1000 (1650 Hz)
 Chest Accelerations 180 (300 Hz)
 Vehicle Accelerations 60 (100 Hz)
 Barrier Load Cells 60 (100 Hz)
 Femur Load Cells 600 (1000 Hz)
 Lap and Torso Belts 60 (100 Hz)
 Tibia Load Cells 600 (1000Hz)
 Foot Accelerations 180 (300Hz)

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* Data not valid after 40 msec.



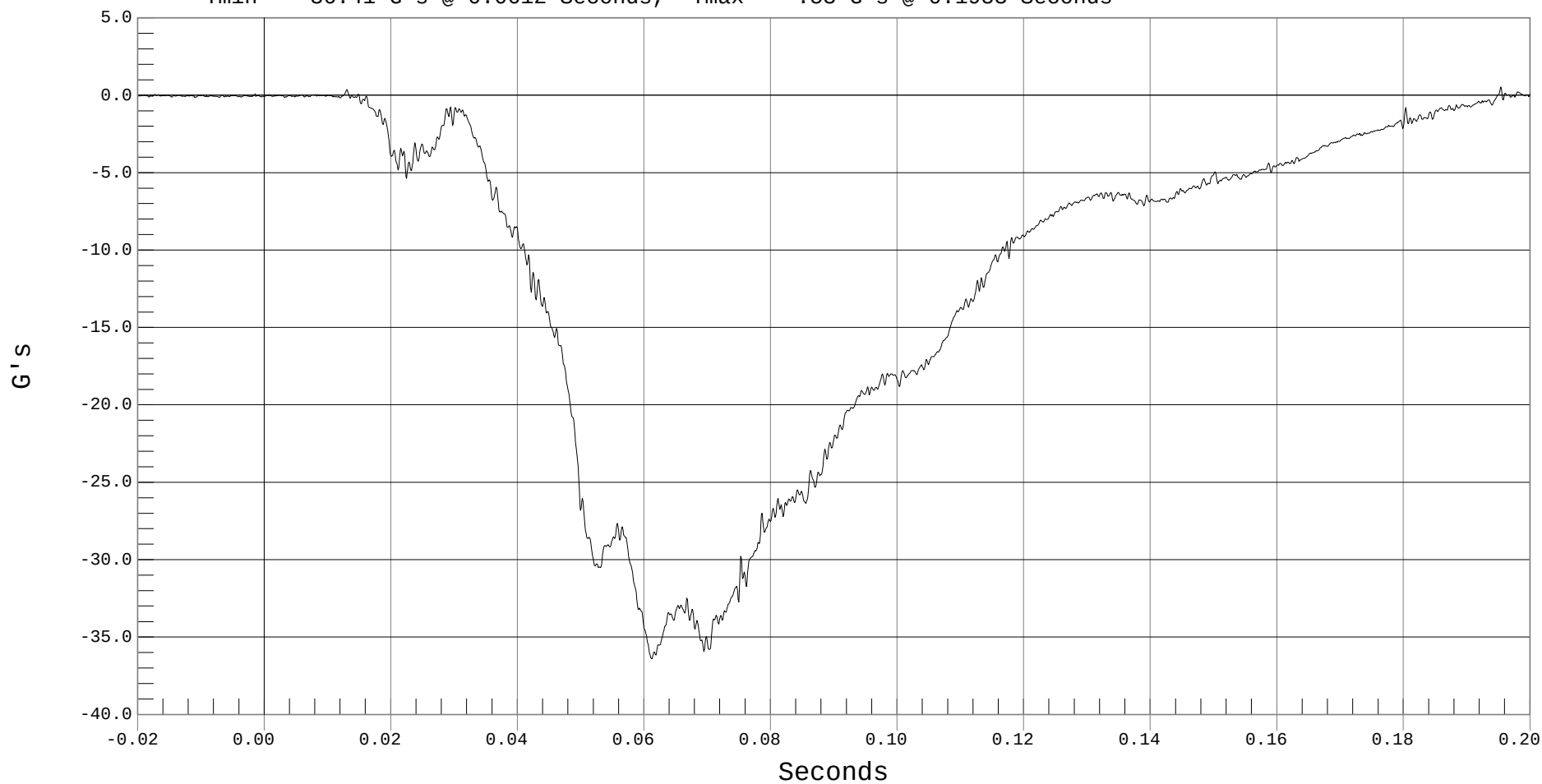
DRIVER HEAD X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

1 DRIVER HEAD X, B01043AT.A01

Ymin = -36.41 G's @ 0.0612 Seconds, Ymax = .53 G's @ 0.1953 Seconds





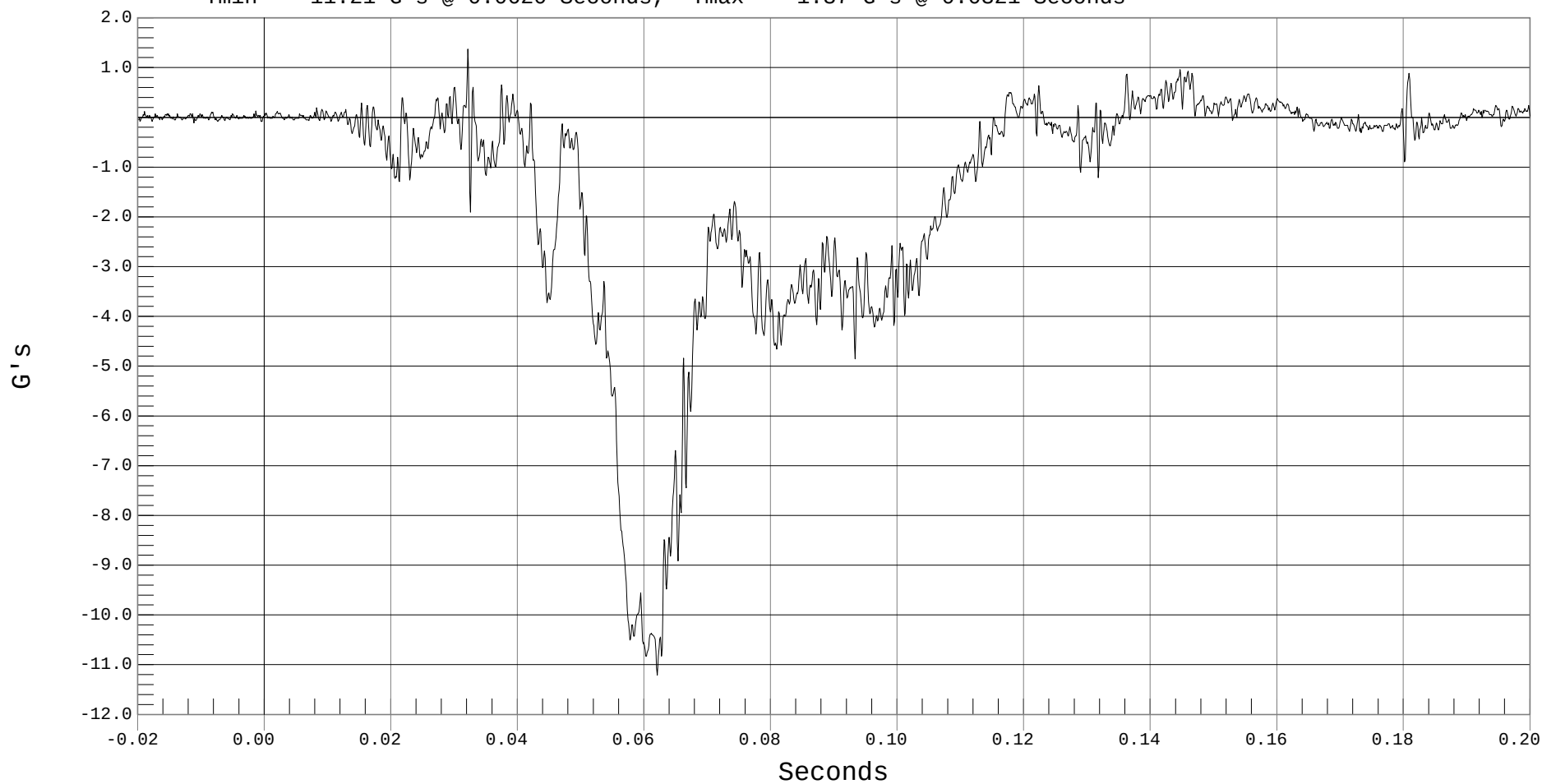
DRIVER HEAD Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD Y, B01043AT.A02

Ymin = -11.21 G's @ 0.0620 Seconds, Ymax = 1.37 G's @ 0.0321 Seconds





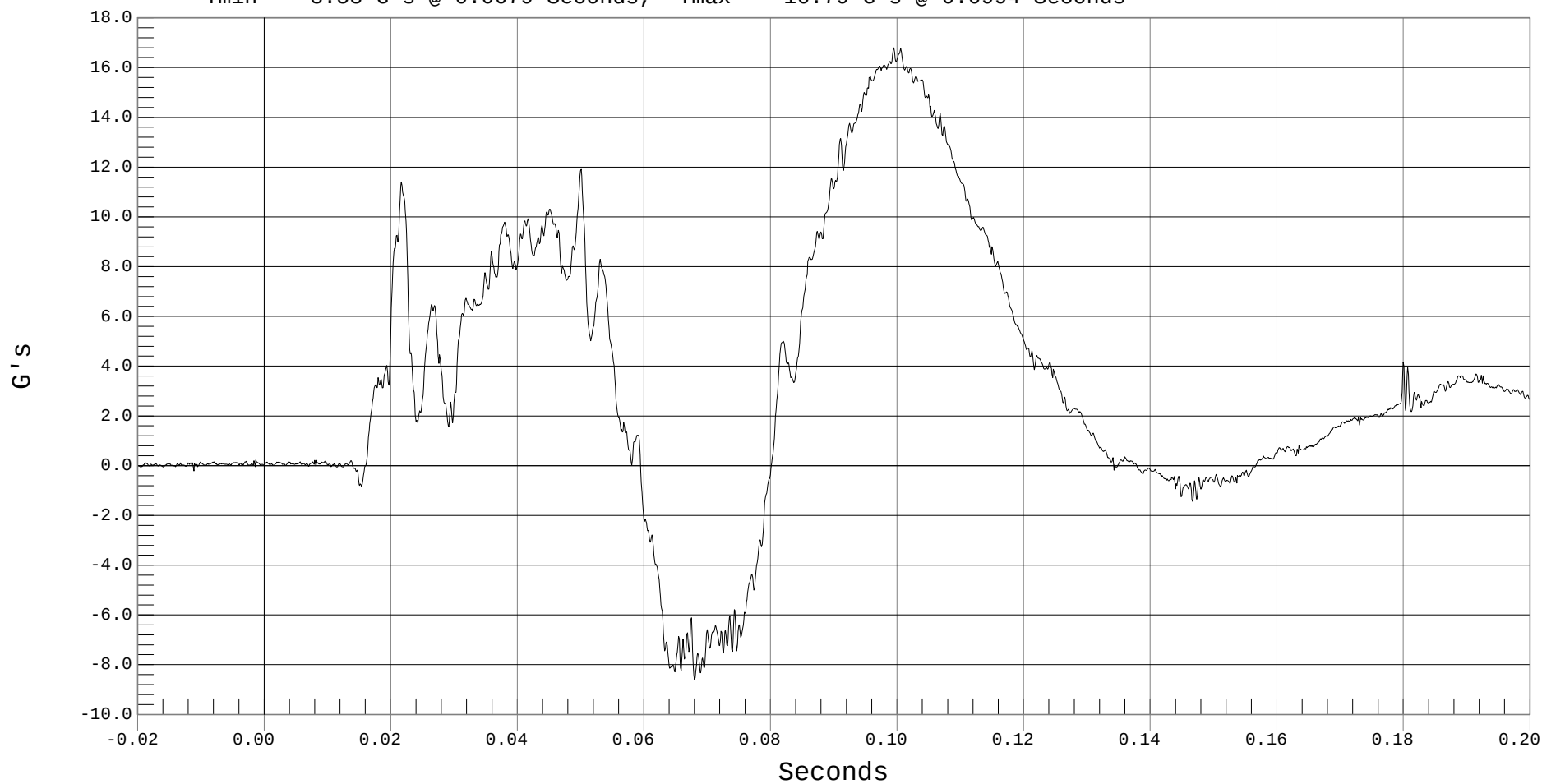
DRIVER HEAD Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD Z, B01043AT.A03

Ymin = -8.58 G's @ 0.0679 Seconds, Ymax = 16.79 G's @ 0.0994 Seconds





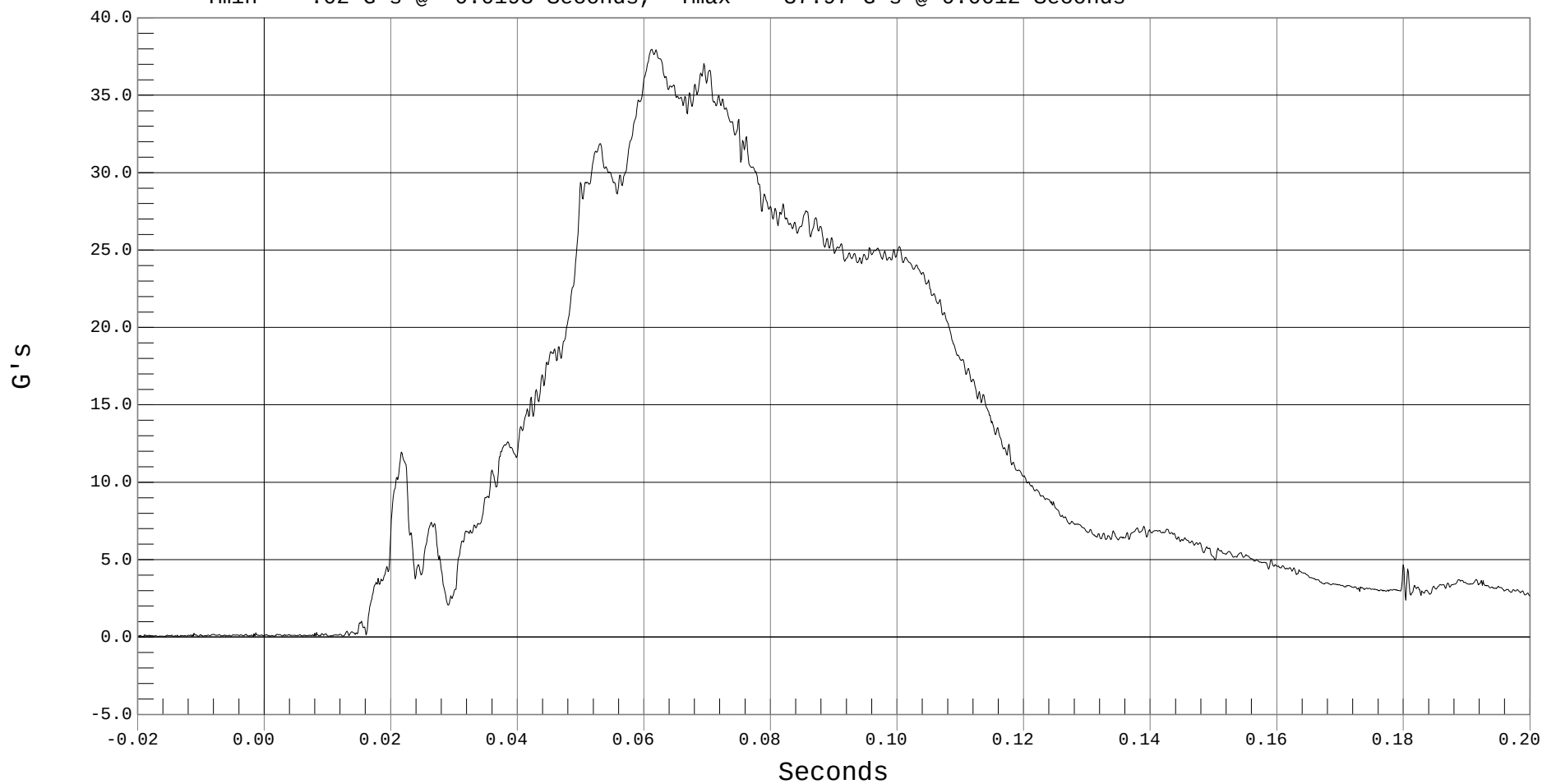
DRIVER HEAD RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

1 DRIVER HEAD RESULTANT ACCELERATION, B01043AV.A01

Ymin = .02 G's @ -0.0193 Seconds, Ymax = 37.97 G's @ 0.0612 Seconds





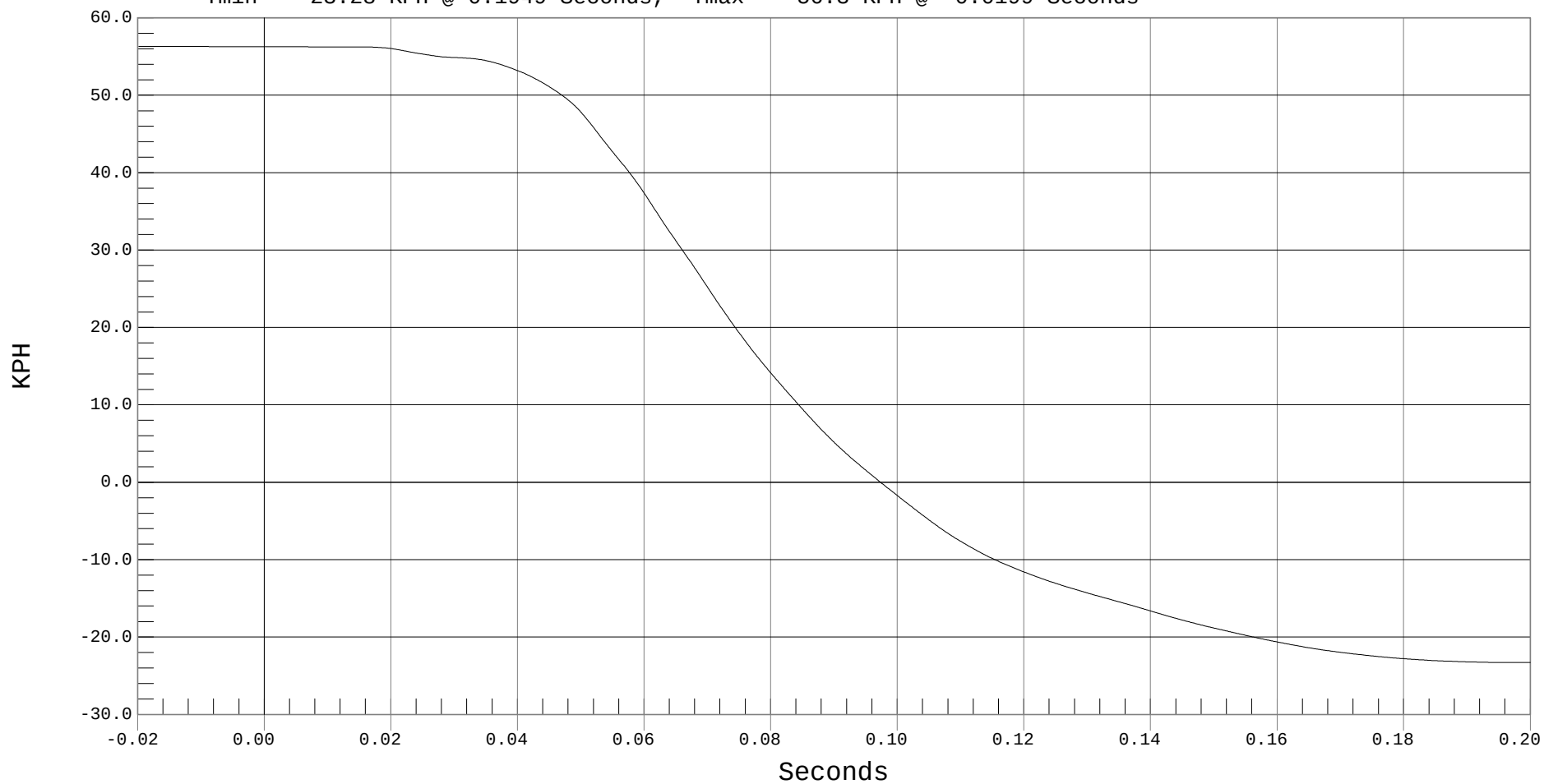
DRIVER HEAD X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER HEAD X VELOCITY, B01043AI.V01

Ymin = -23.28 KPH @ 0.1949 Seconds, Ymax = 56.3 KPH @ -0.0199 Seconds





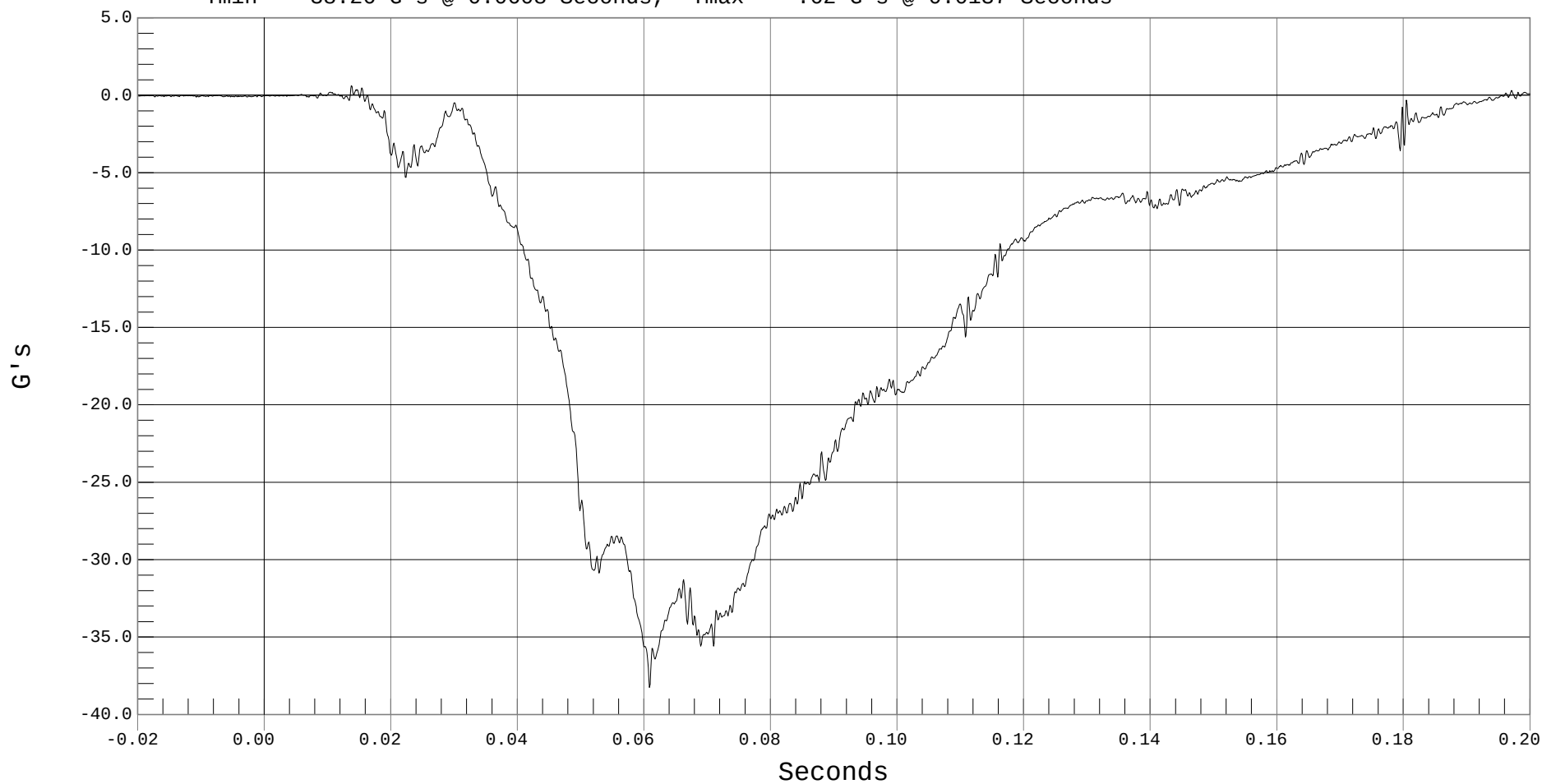
DRIVER HEAD REDUNDANT X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD Xr, B01043AT.A33

Ymin = -38.26 G's @ 0.0608 Seconds, Ymax = .62 G's @ 0.0137 Seconds





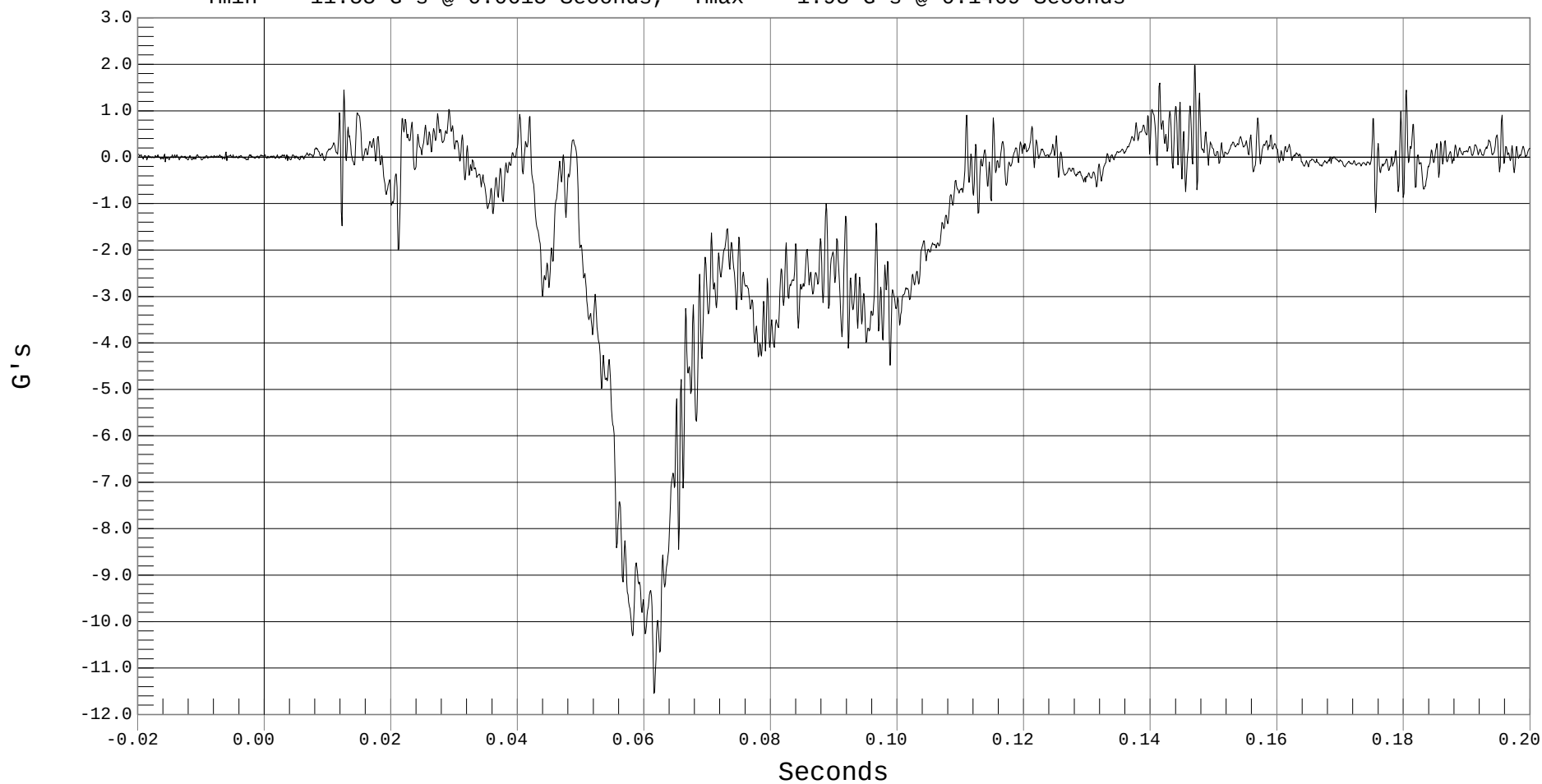
DRIVER HEAD REDUNDANT Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD Yr, B01043AT.A34

Ymin = -11.55 G's @ 0.0615 Seconds, Ymax = 1.98 G's @ 0.1469 Seconds





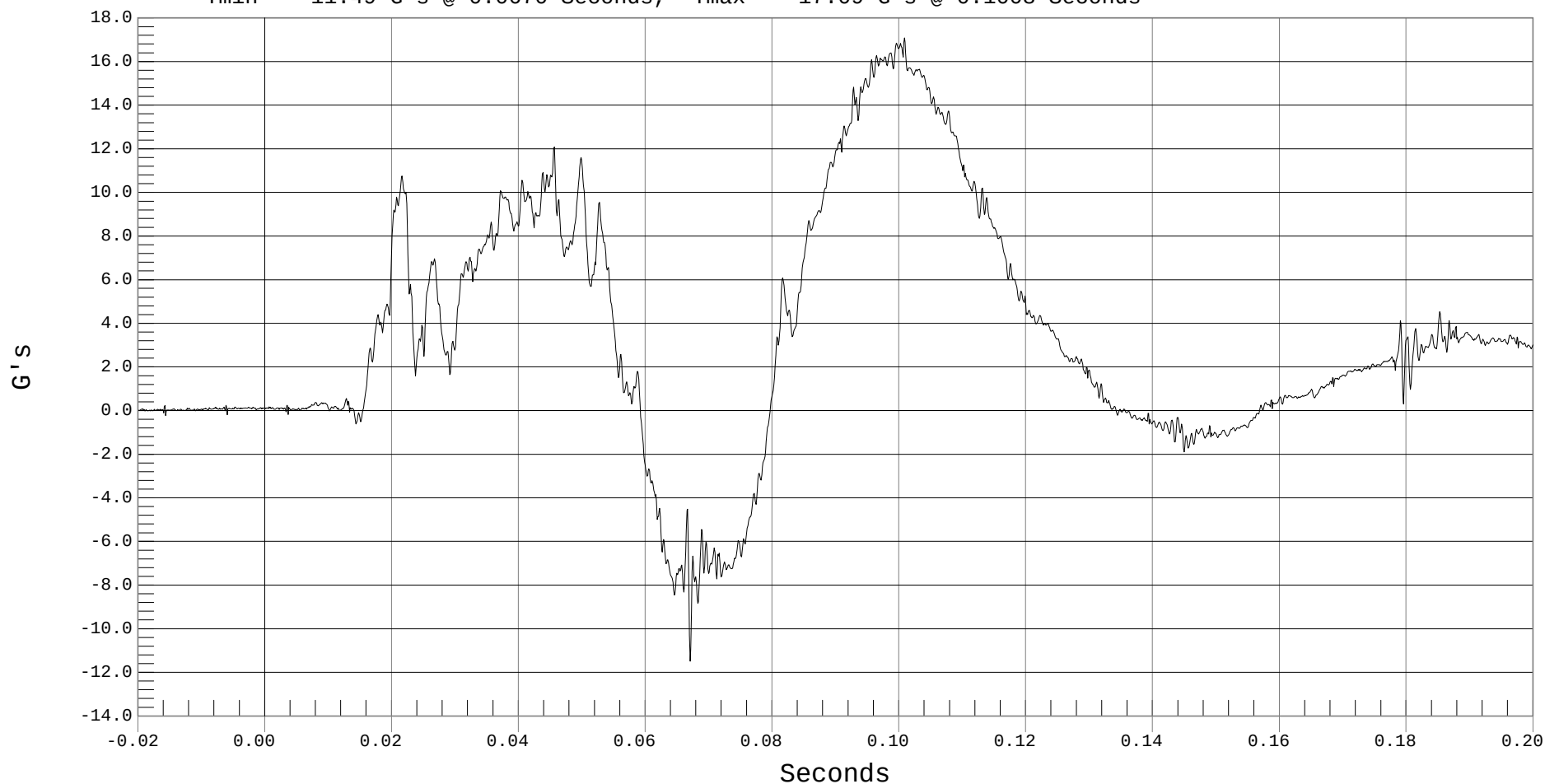
DRIVER HEAD REDUNDANT Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD Zr, B01043AT.A35

Ymin = -11.49 G's @ 0.0670 Seconds, Ymax = 17.09 G's @ 0.1008 Seconds





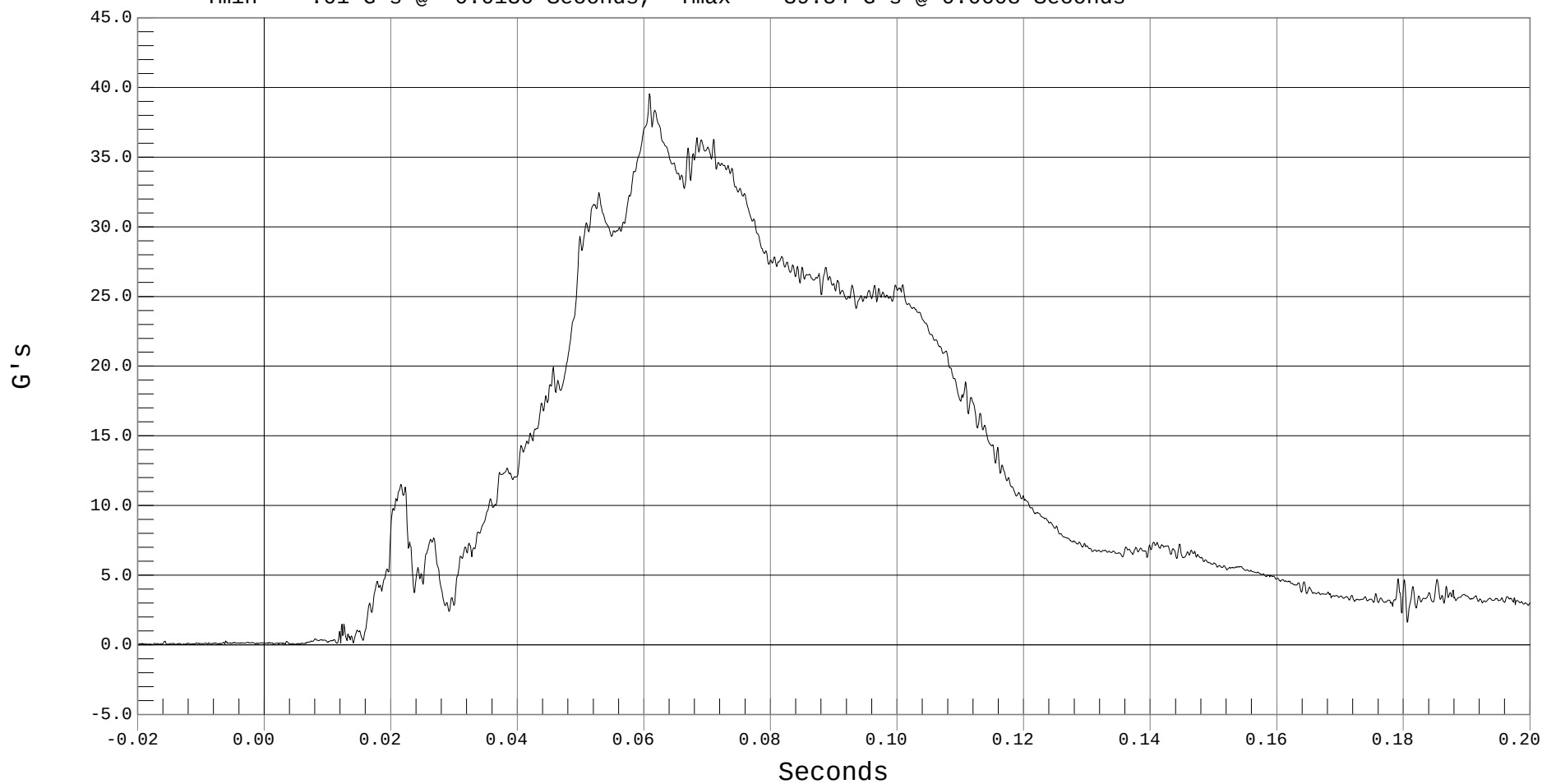
DRIVER HEAD REDUNDANT RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD REDUNDANT RESULTANT ACCELERATION, B01043AV.A33

Ymin = .01 G's @ -0.0130 Seconds, Ymax = 39.54 G's @ 0.0608 Seconds





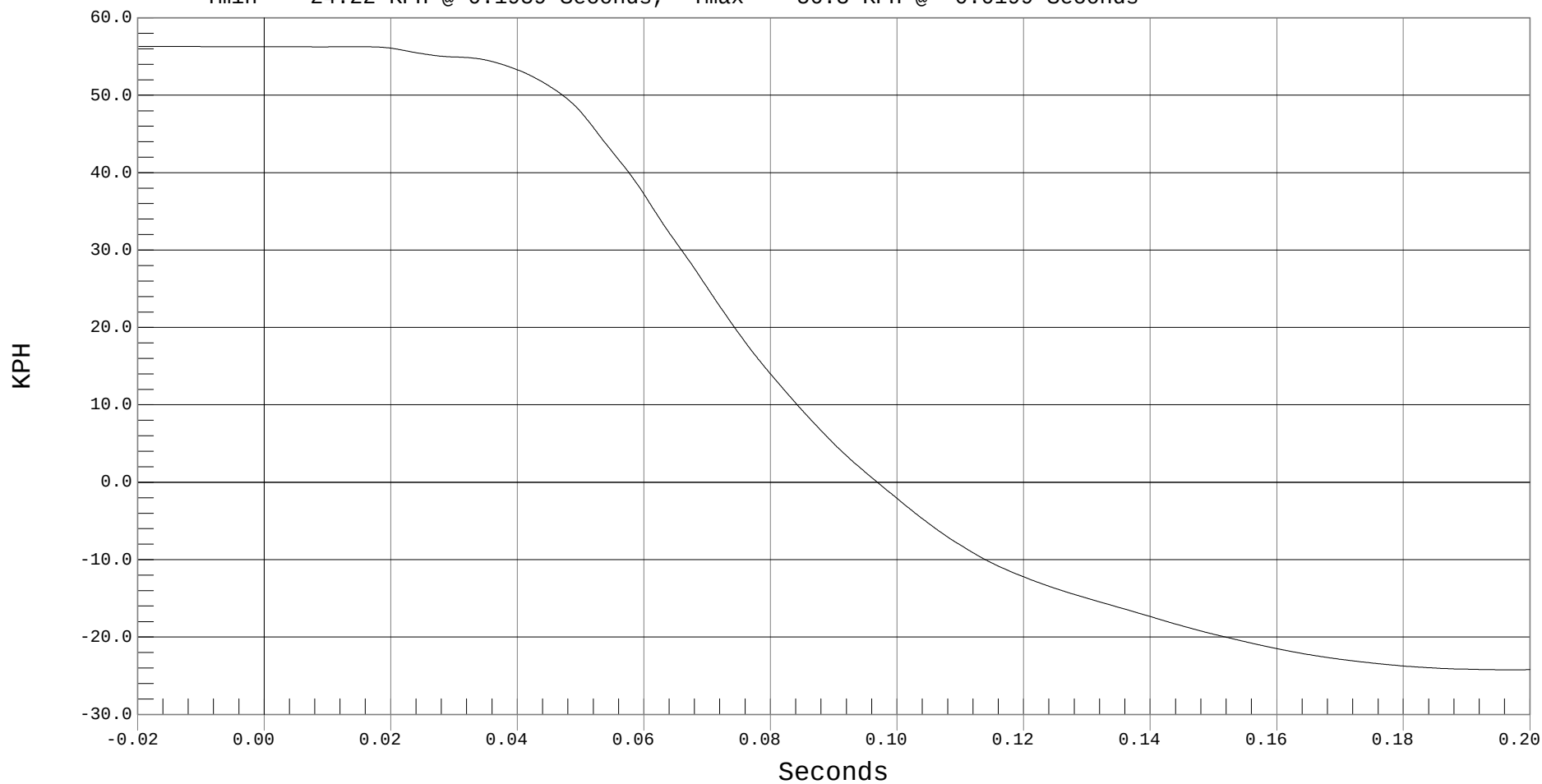
DRIVER HEAD REDUNDANT X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER HEAD REDUNDANT X VELOCITY, B01043AI.V33

Ymin = -24.22 KPH @ 0.1959 Seconds, Ymax = 56.3 KPH @ -0.0199 Seconds





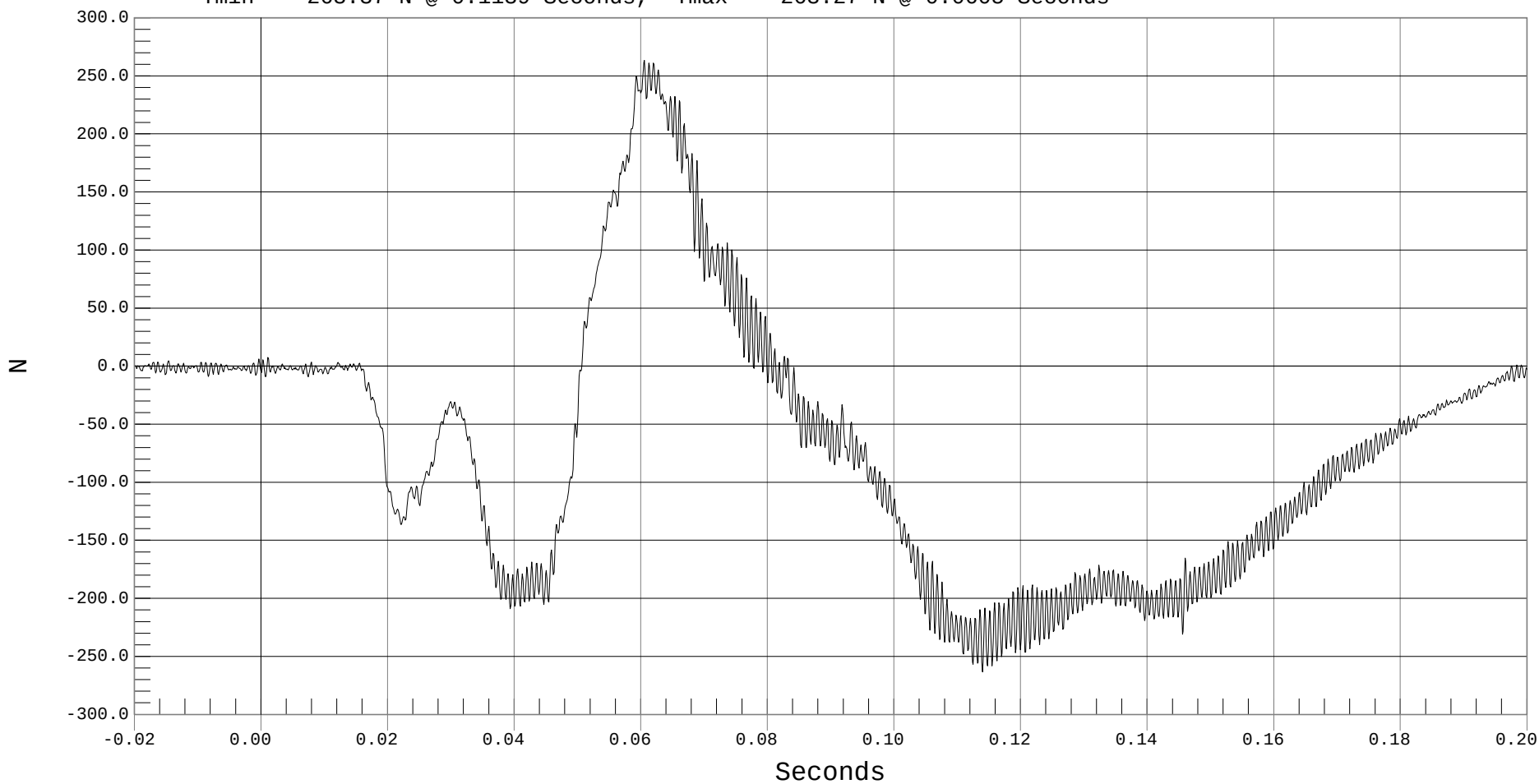
DRIVER NECK FORCE X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER NECK FX, B01043FT.F04

Ymin = -263.37 N @ 0.1139 Seconds, Ymax = 263.27 N @ 0.0605 Seconds





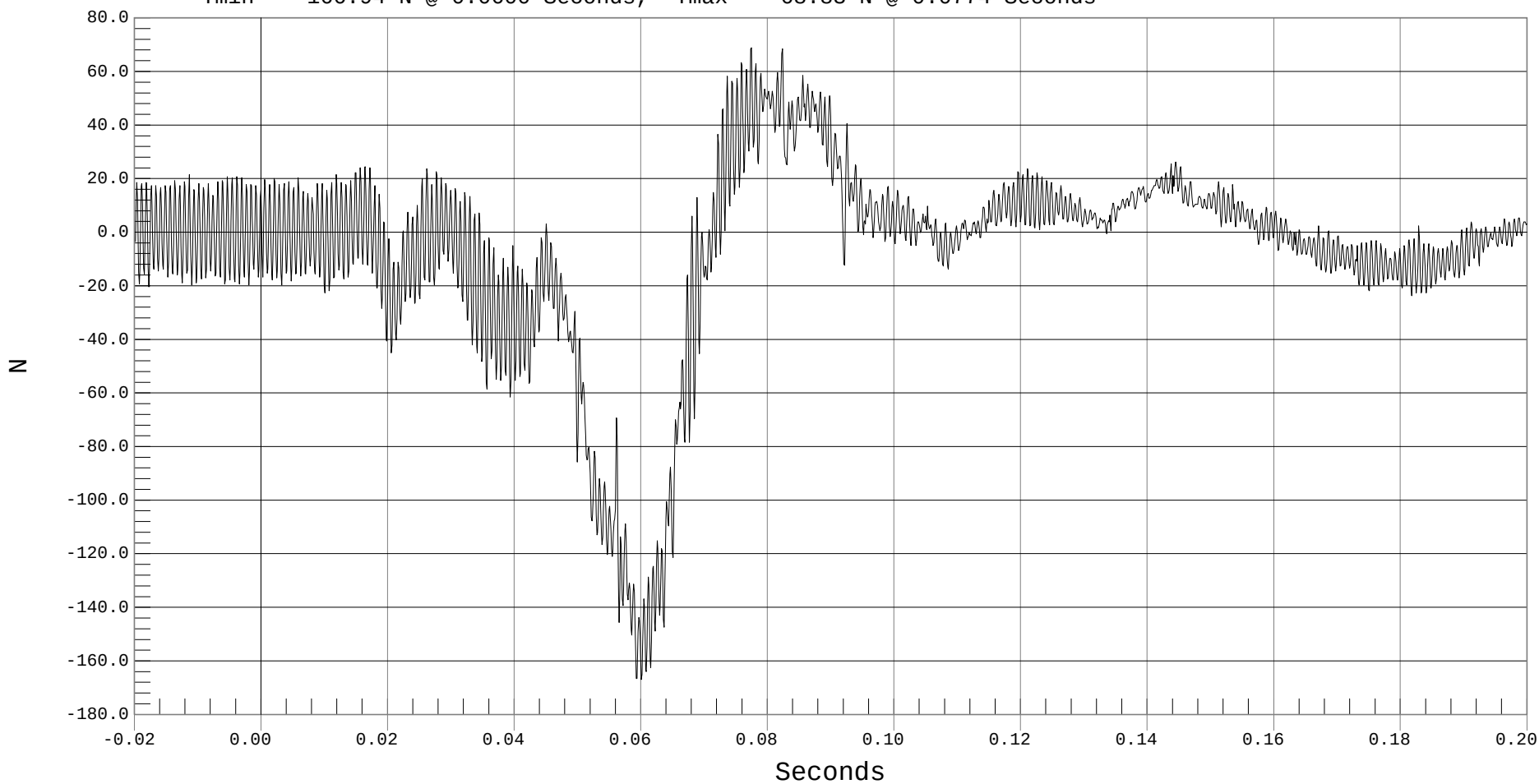
DRIVER NECK FORCE Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER NECK FY, B01043FT.F05

Ymin = -166.94 N @ 0.0600 Seconds, Ymax = 68.83 N @ 0.0774 Seconds





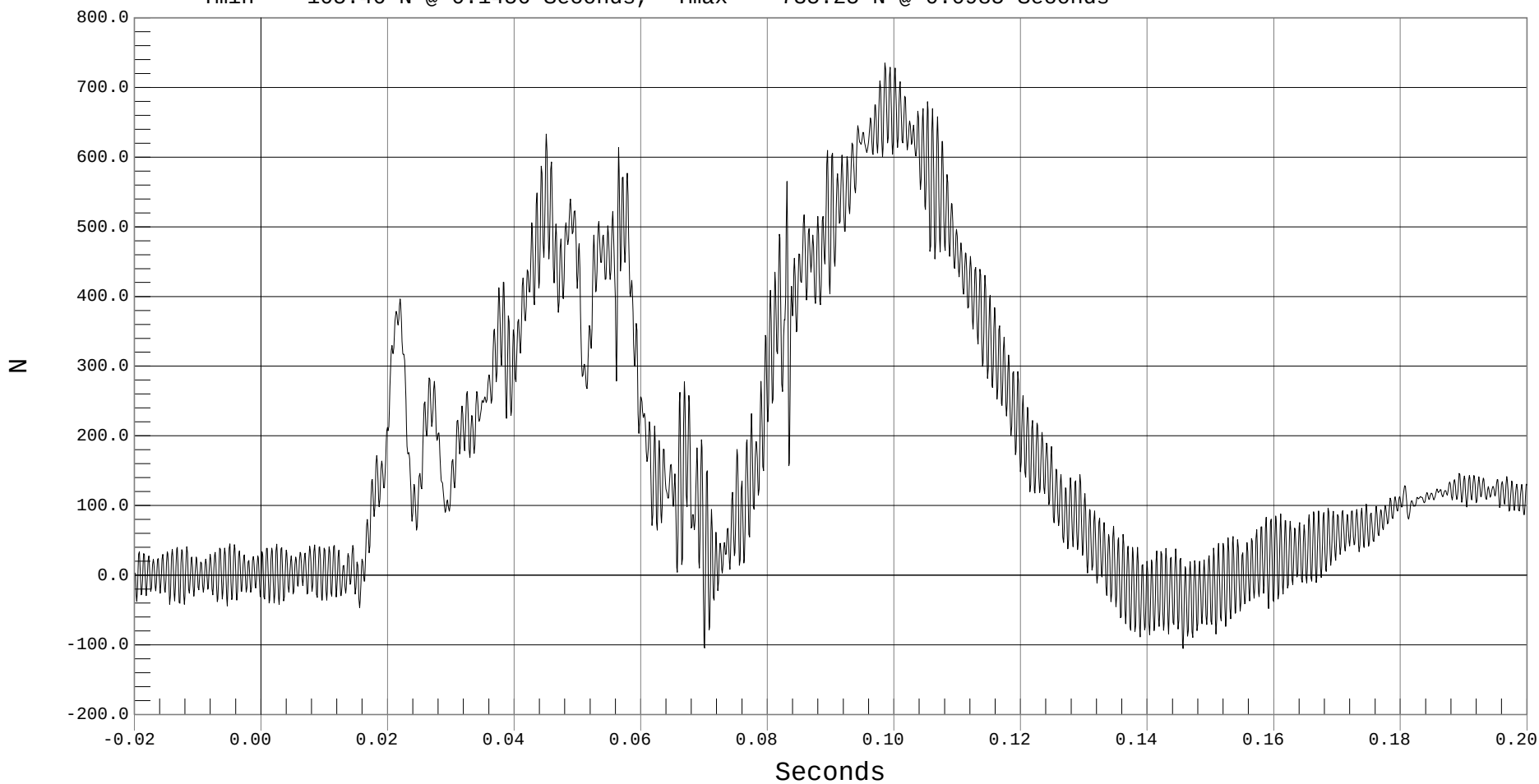
DRIVER NECK FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER NECK FZ, B01043FT.F06

Ymin = -105.46 N @ 0.1456 Seconds, Ymax = 735.25 N @ 0.0985 Seconds





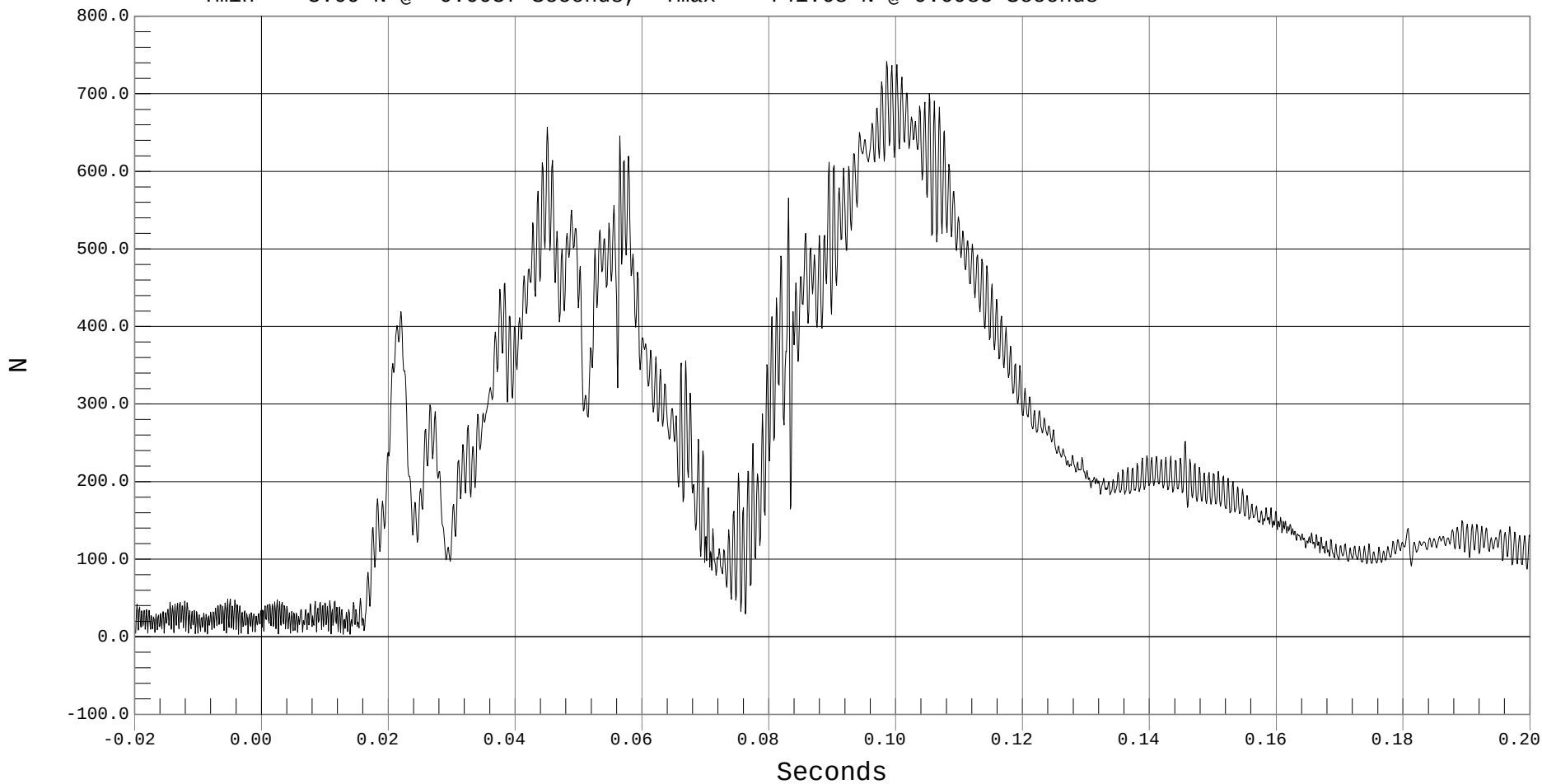
DRIVER NECK FORCE RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER NECK FORCE RESULTANT, B01043FV.F04

Ymin = 3.09 N @ -0.0037 Seconds, Ymax = 741.68 N @ 0.0985 Seconds





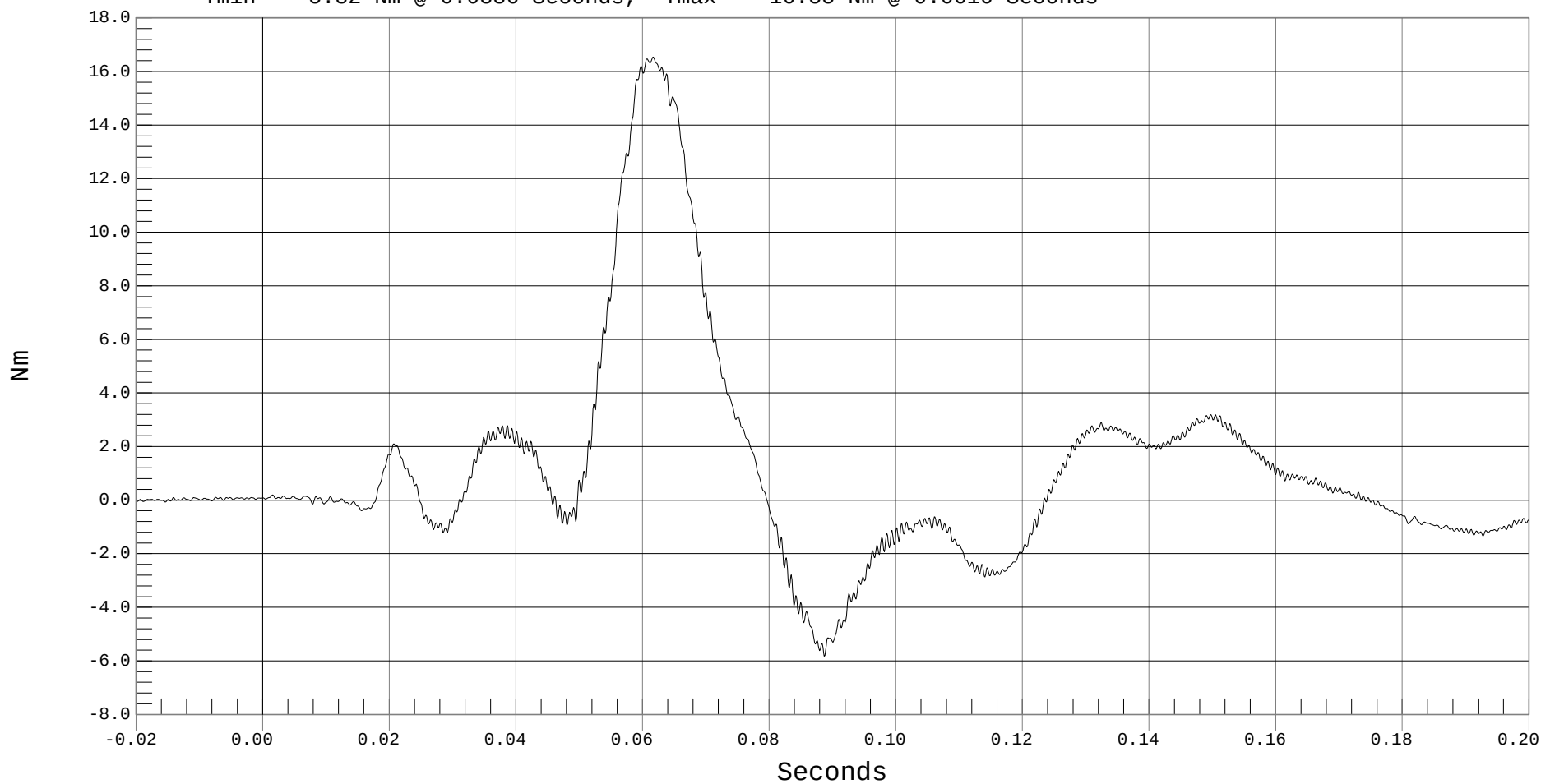
DRIVER NECK MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER NECK MX, B01043MF.M07

Ymin = -5.82 Nm @ 0.0886 Seconds, Ymax = 16.55 Nm @ 0.0616 Seconds





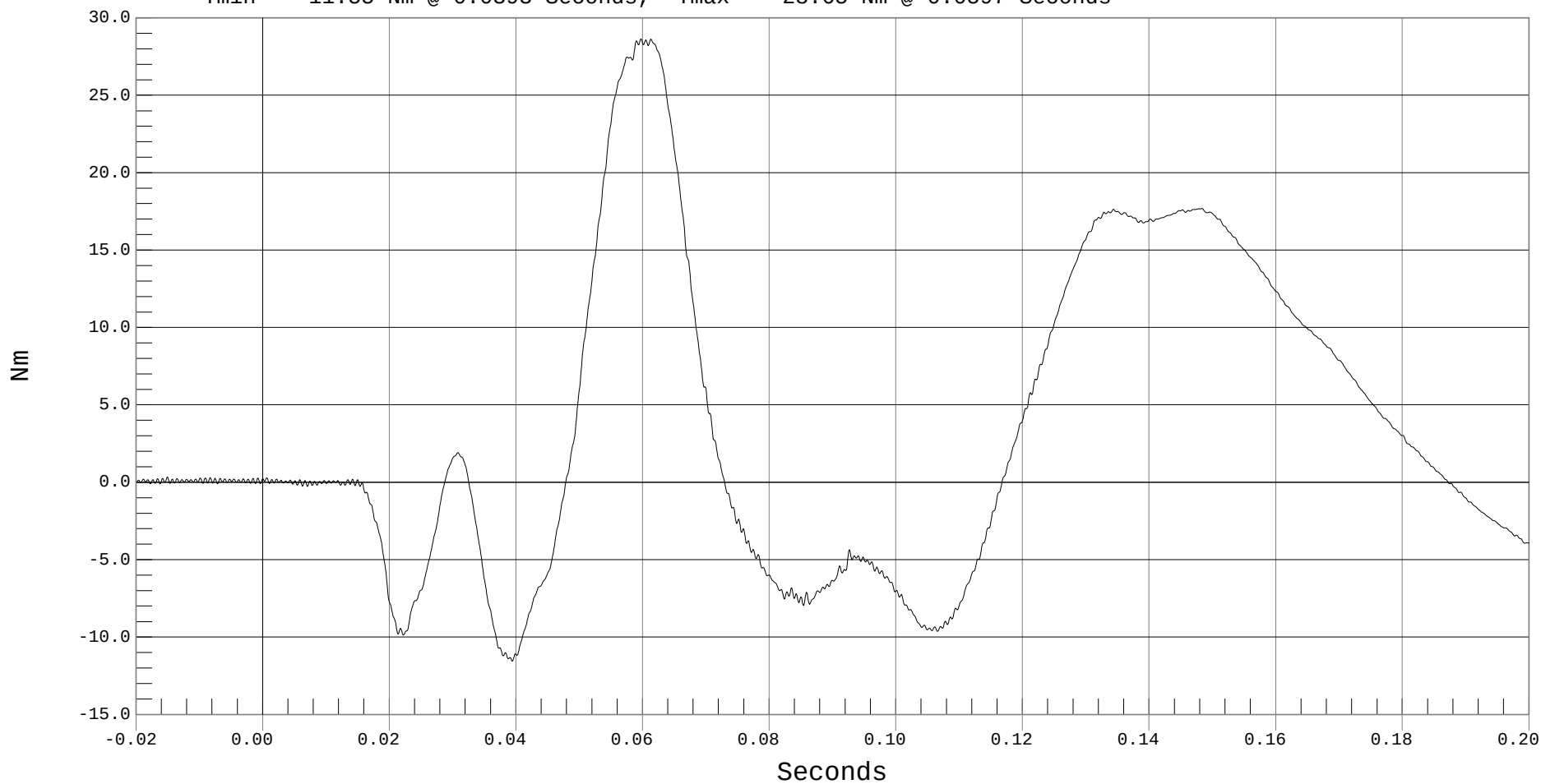
DRIVER NECK MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER NECK MY, B01043MF.M08

Ymin = -11.55 Nm @ 0.0393 Seconds, Ymax = 28.65 Nm @ 0.0597 Seconds





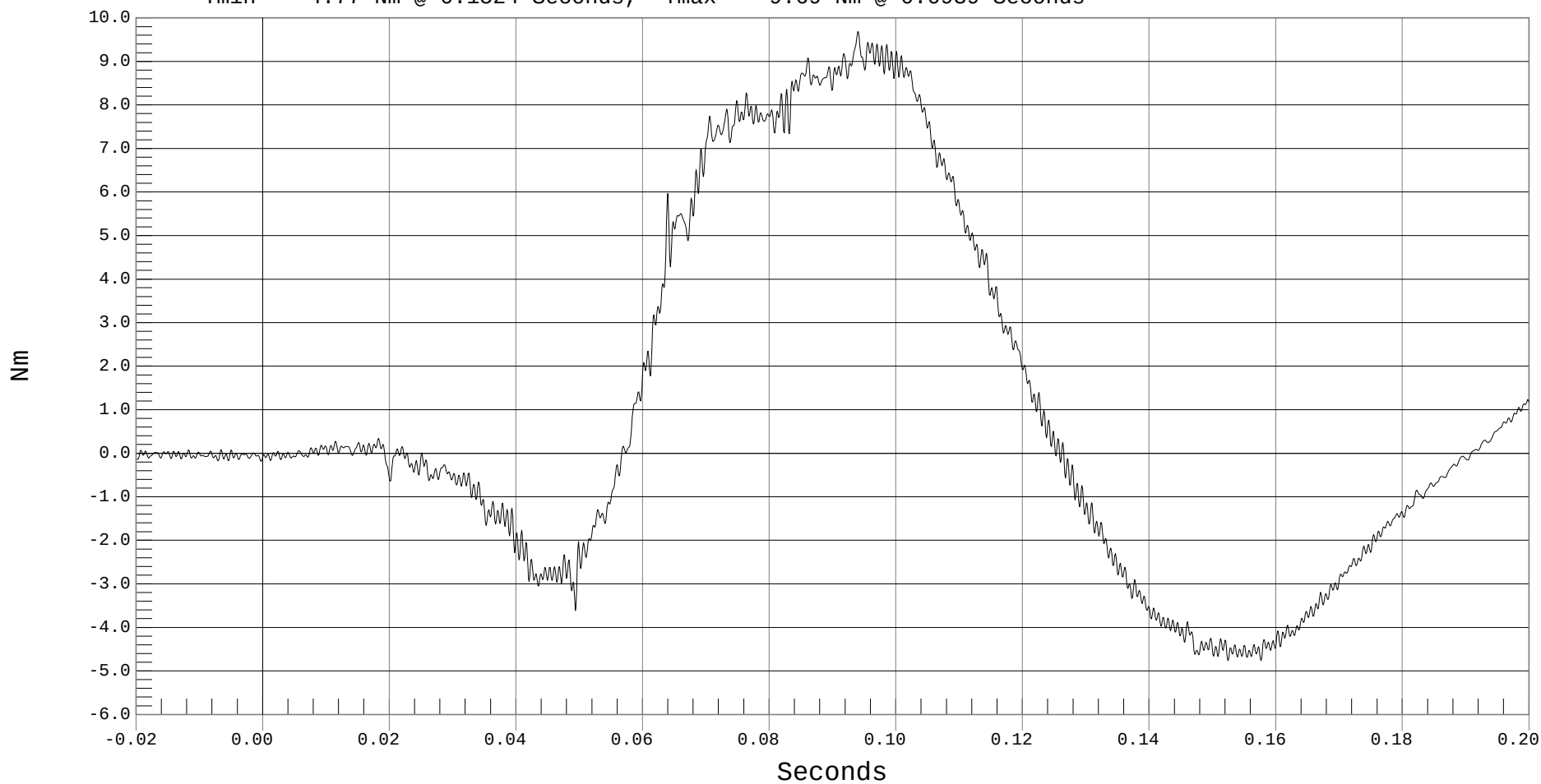
DRIVER NECK MOMENT Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER NECK MZ, B01043MF.M09

Ymin = -4.77 Nm @ 0.1524 Seconds, Ymax = 9.69 Nm @ 0.0939 Seconds





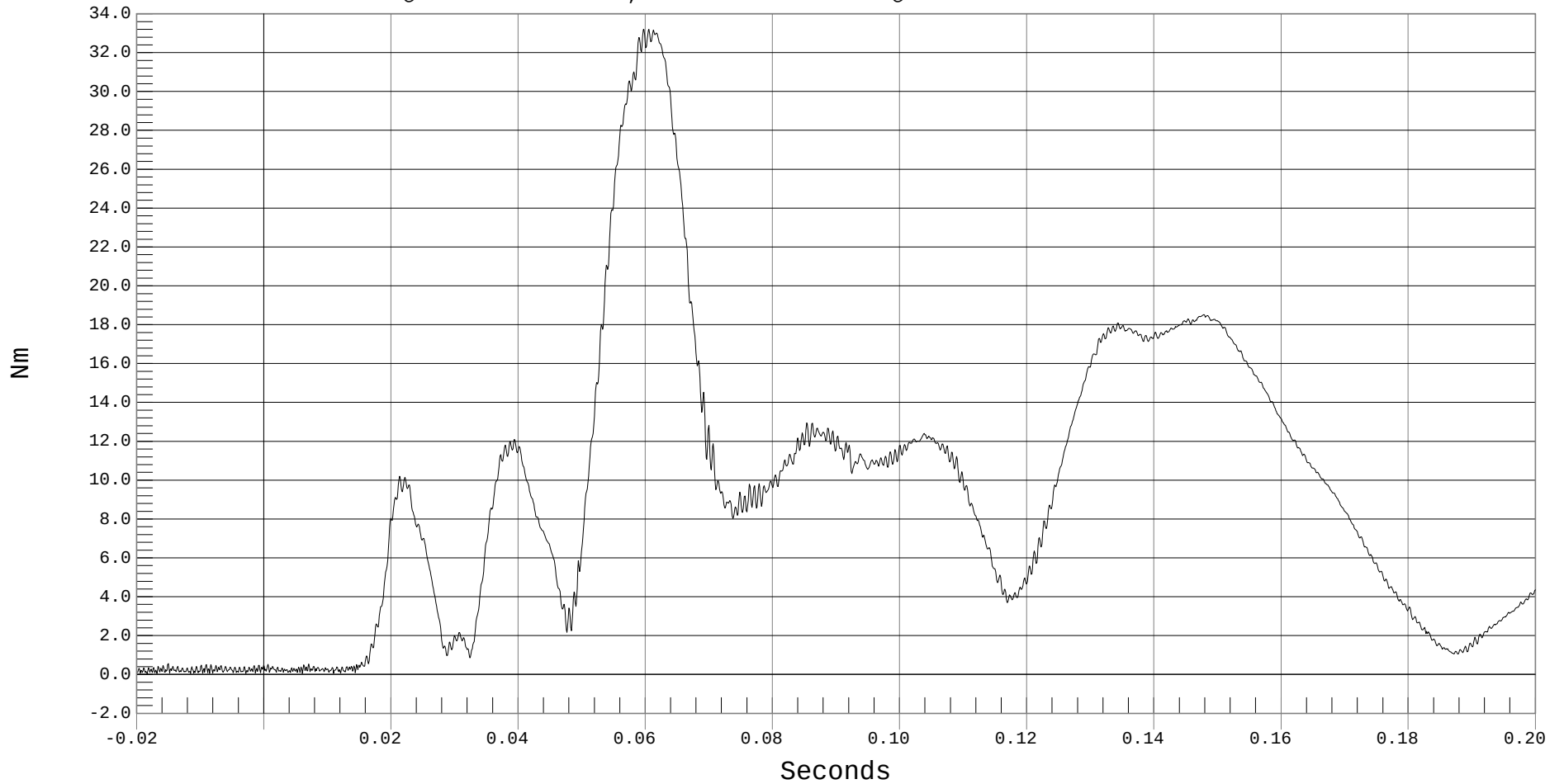
DRIVER NECK MOMENT RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER NECK MOMENT RESULTANT, B01043MV.M07

Ymin = .03 Nm @ -0.0184 Seconds, Ymax = 33.21 Nm @ 0.0597 Seconds





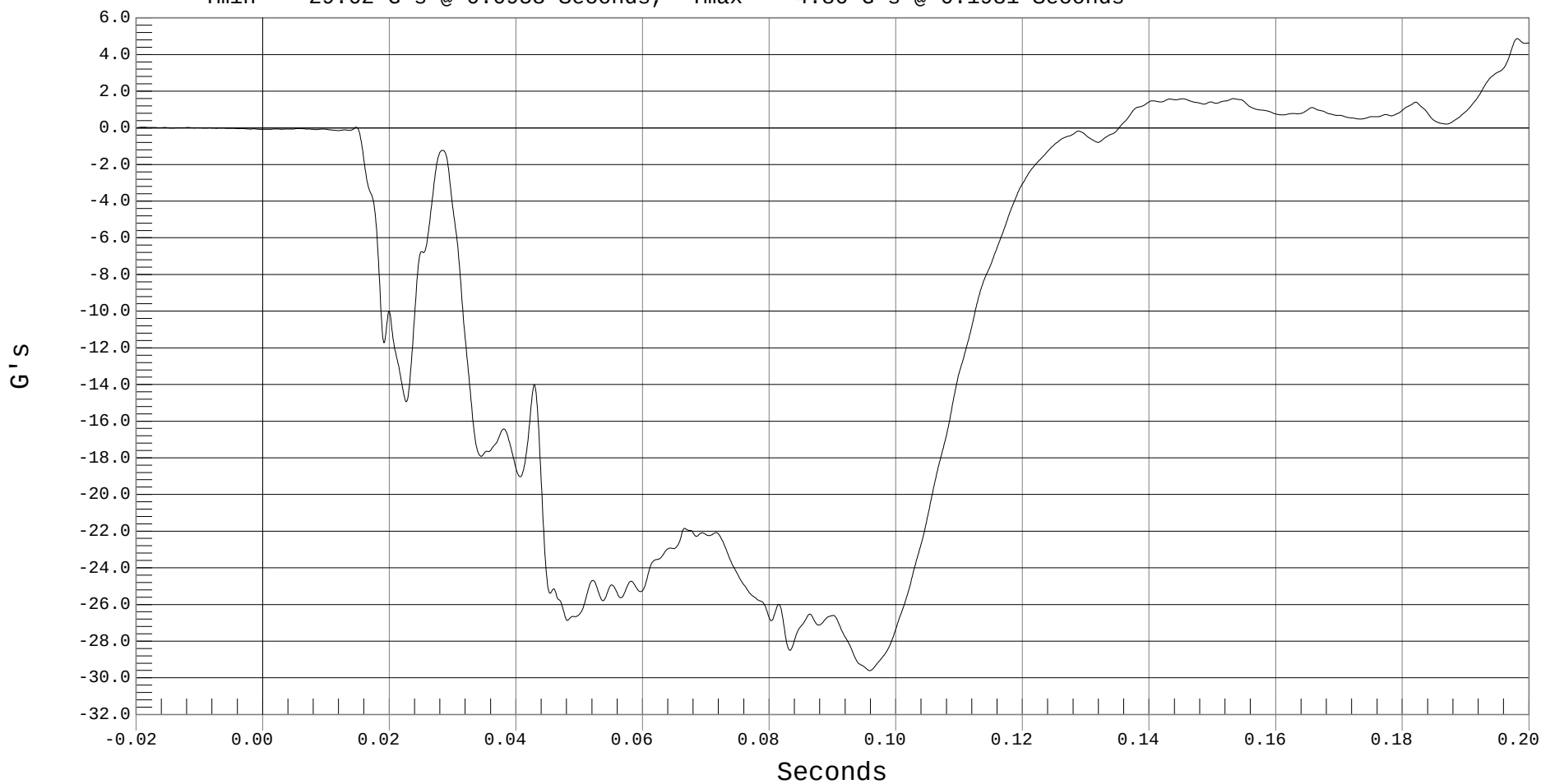
DRIVER CHEST X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER CHEST X, B01043AF.A10

Ymin = -29.62 G's @ 0.0958 Seconds, Ymax = 4.86 G's @ 0.1981 Seconds





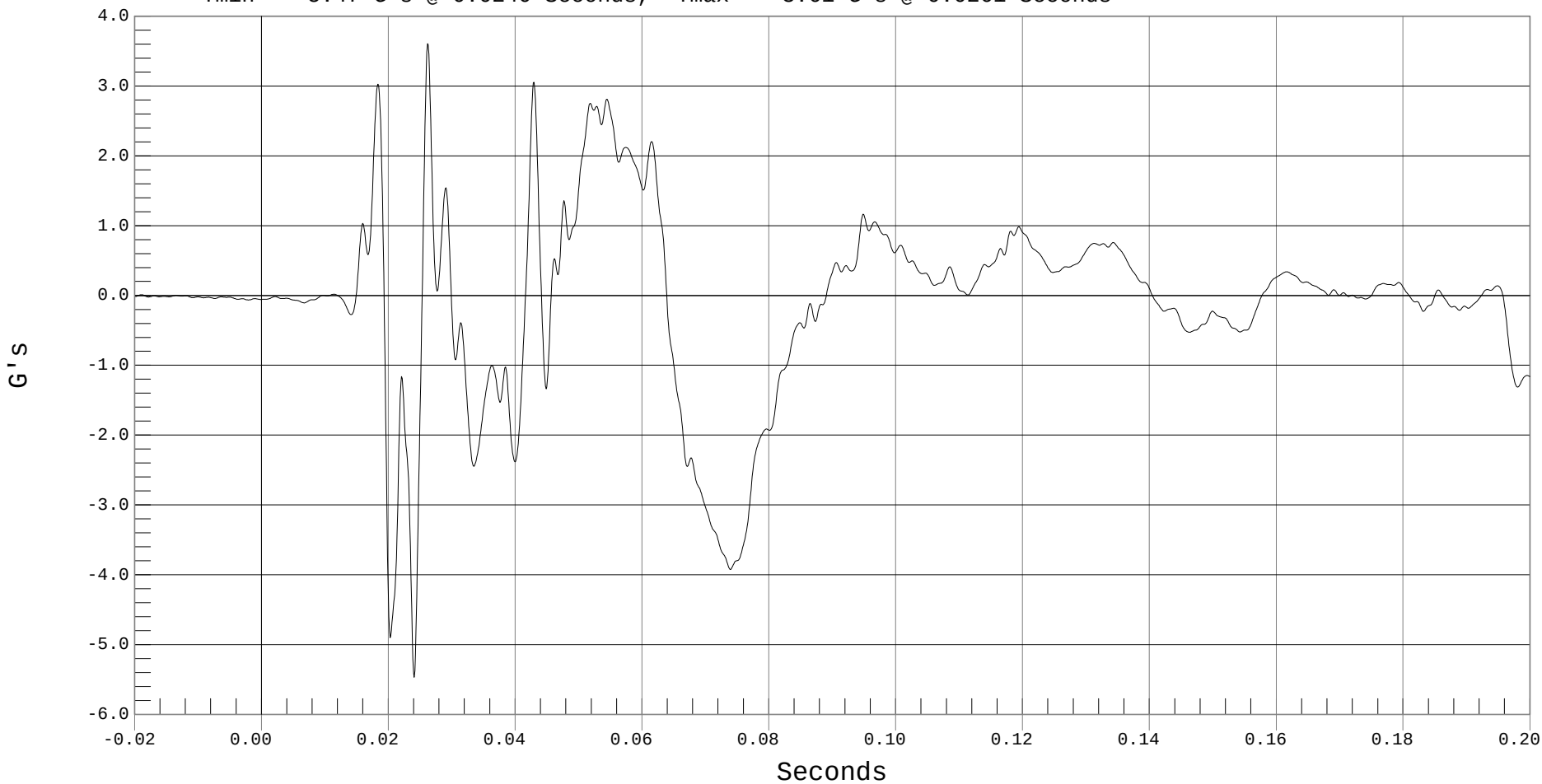
DRIVER CHEST Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER CHEST Y, B01043AF.A11

Ymin = -5.47 G's @ 0.0240 Seconds, Ymax = 3.61 G's @ 0.0261 Seconds





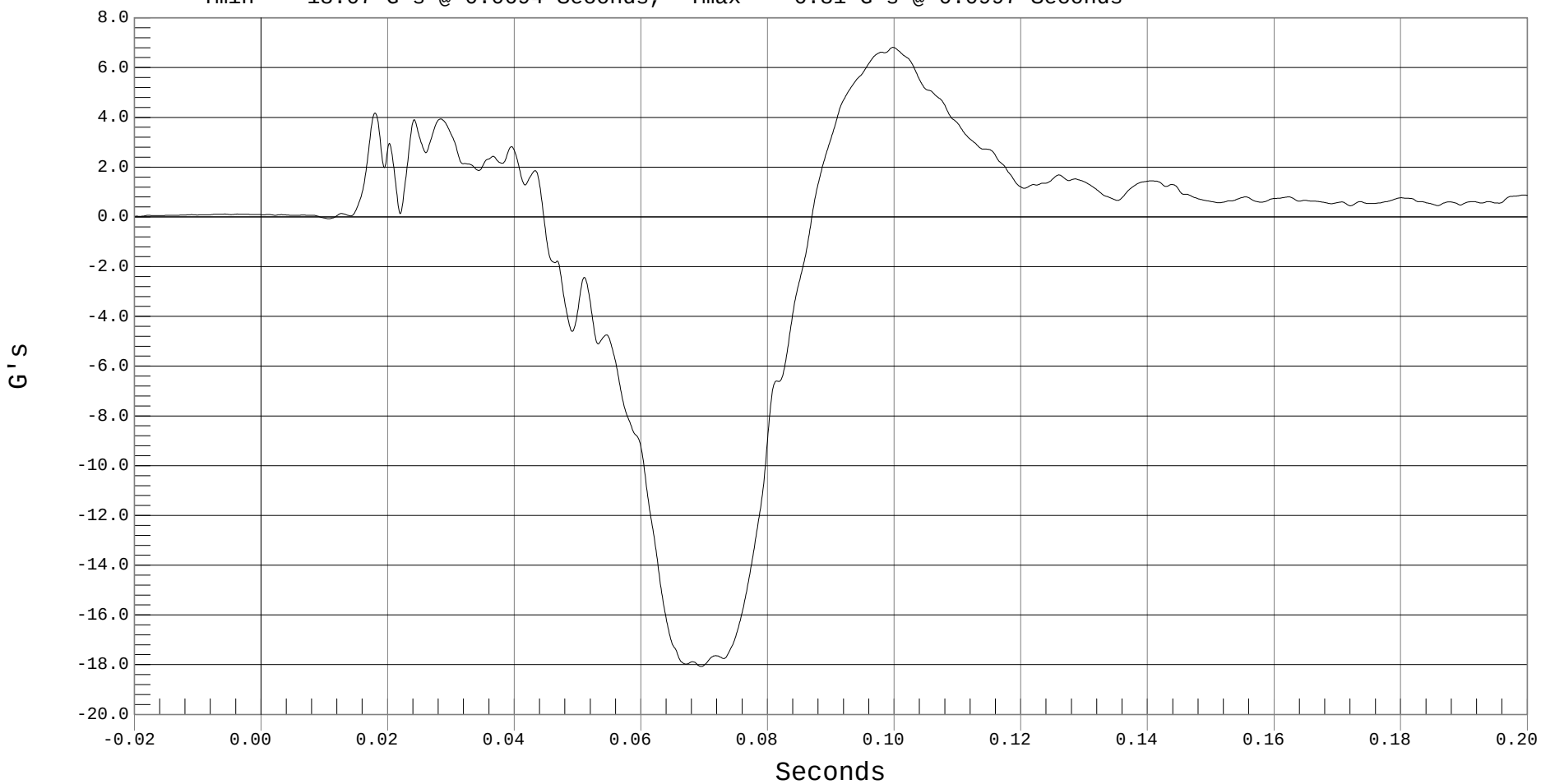
DRIVER CHEST Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER CHEST Z, B01043AF.A12

Ymin = -18.07 G's @ 0.0694 Seconds, Ymax = 6.81 G's @ 0.0997 Seconds





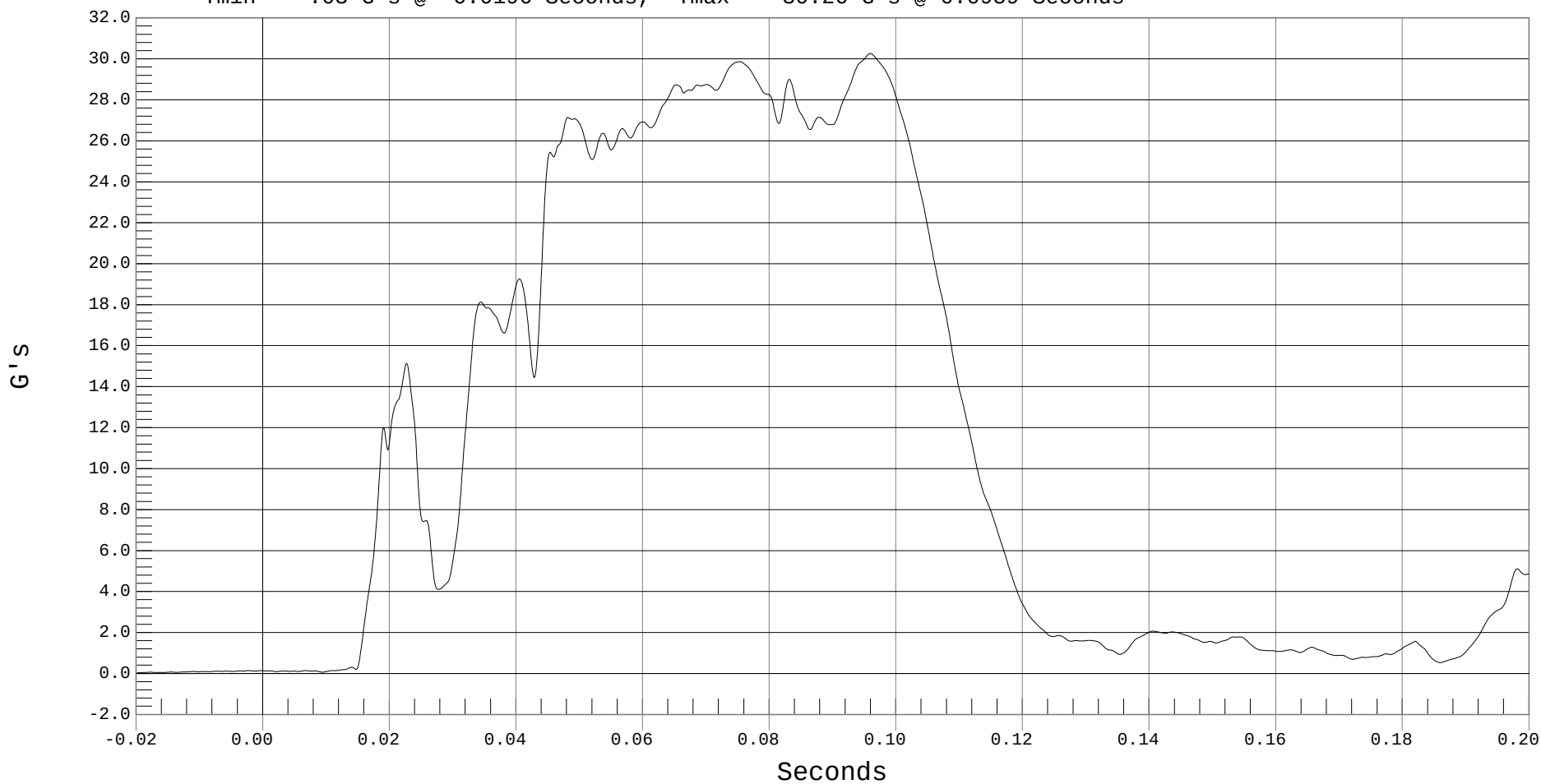
DRIVER CHEST RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER CHEST RESULTANT ACCELERATION, B01043AV.A10

Ymin = .03 G's @ -0.0196 Seconds, Ymax = 30.26 G's @ 0.0959 Seconds





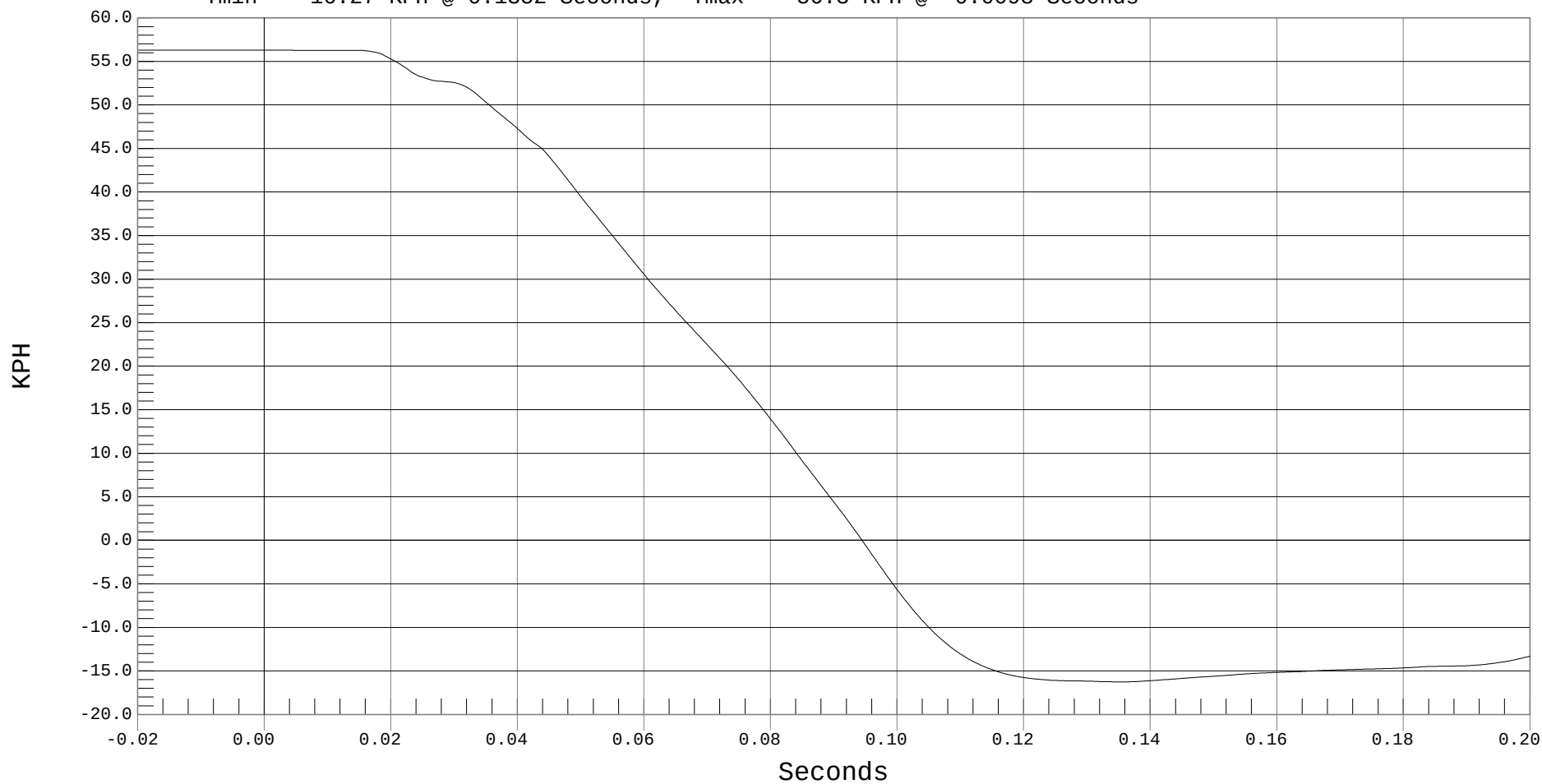
DRIVER CHEST X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER CHEST X VELOCITY, B01043AI.V10

Ymin = -16.27 KPH @ 0.1352 Seconds, Ymax = 56.3 KPH @ -0.0098 Seconds





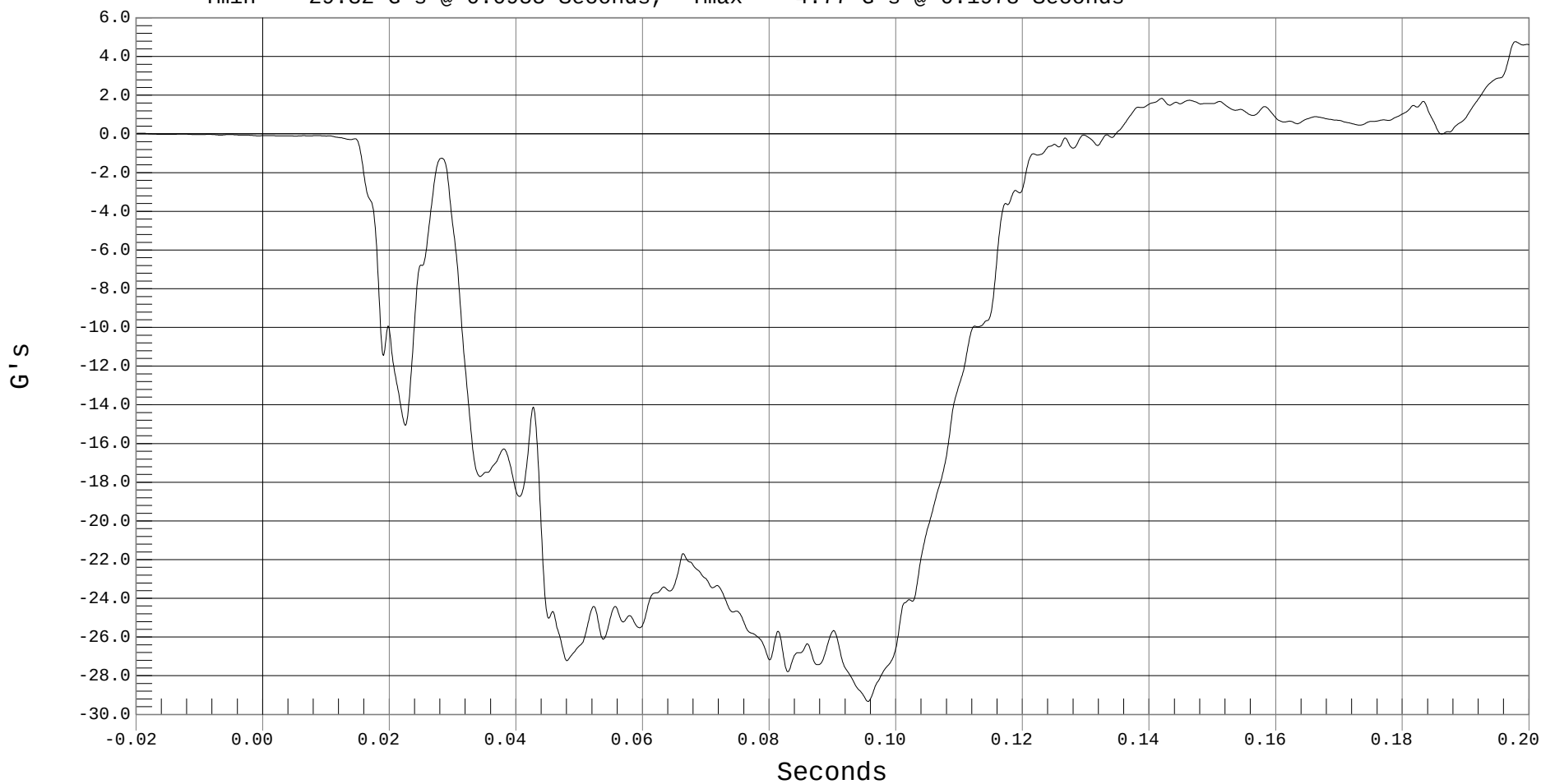
DRIVER CHEST REDUNDANT X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER CHEST Xr, B01043AF.A36

Ymin = -29.32 G's @ 0.0955 Seconds, Ymax = 4.77 G's @ 0.1978 Seconds





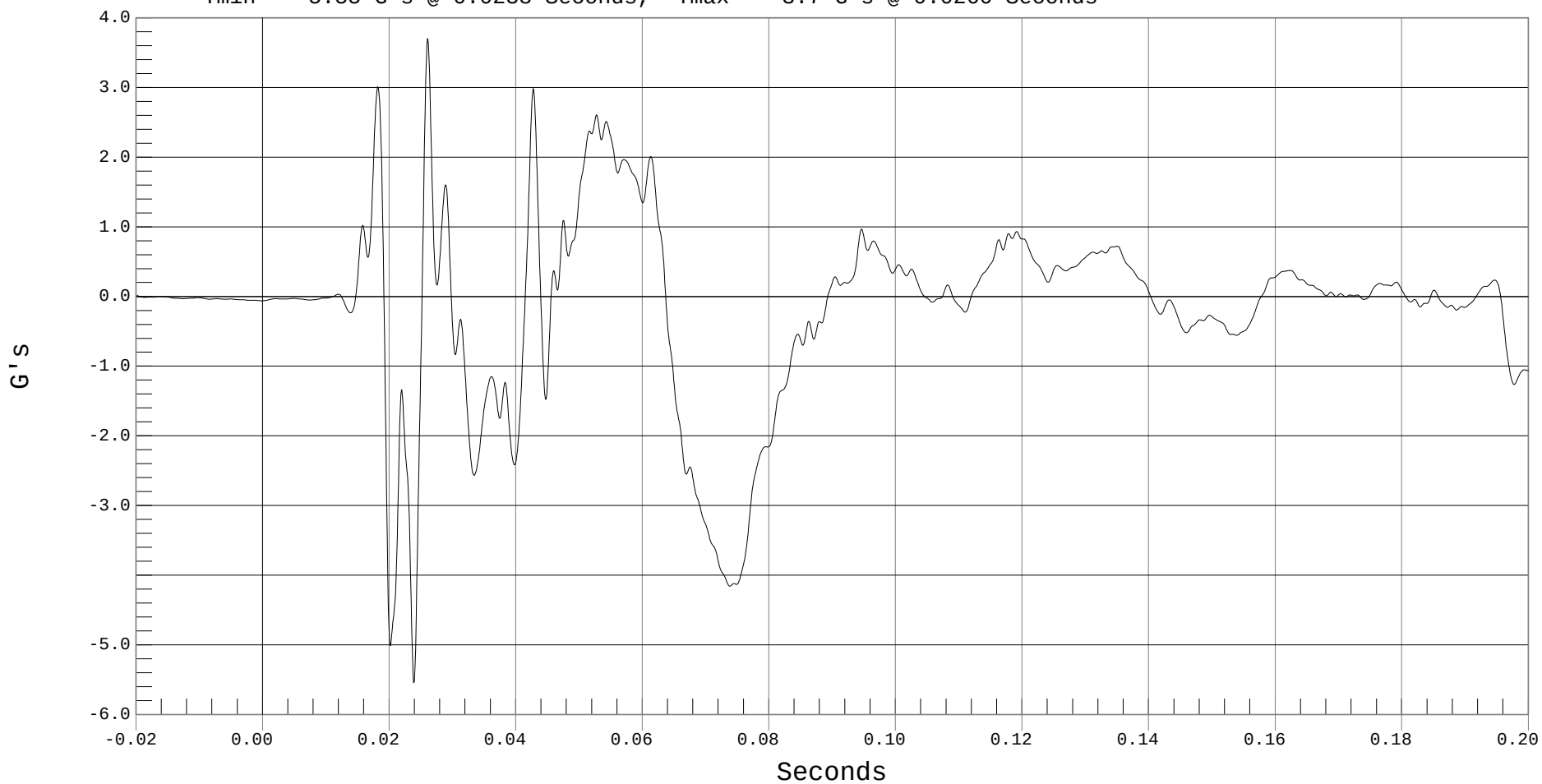
DRIVER CHEST REDUNDANT Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER CHEST Yr, B01043AF.A37

Ymin = -5.55 G's @ 0.0238 Seconds, Ymax = 3.7 G's @ 0.0260 Seconds





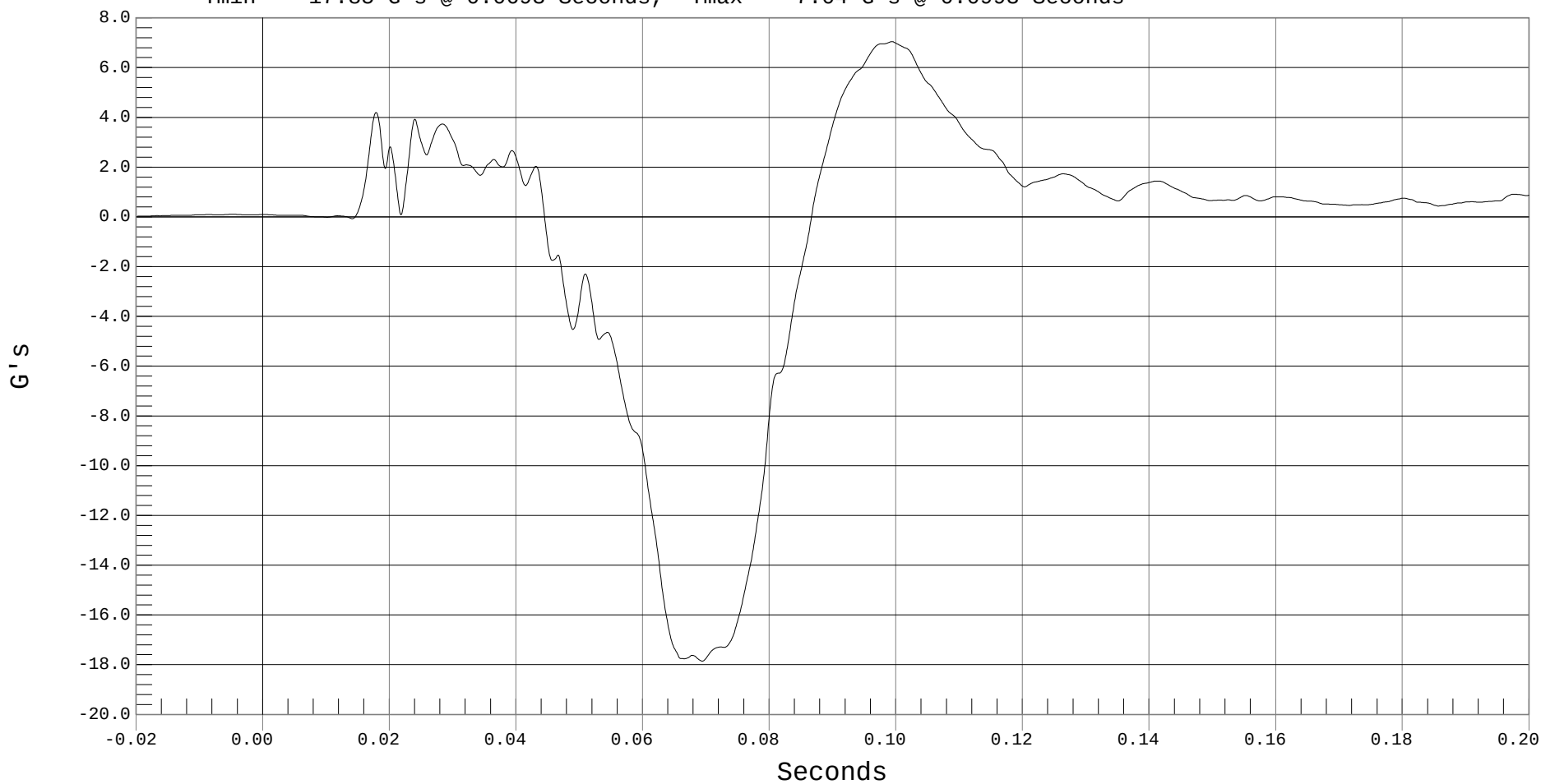
DRIVER CHEST REDUNDANT Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER CHEST Zr, B01043AF.A38

Ymin = -17.85 G's @ 0.0693 Seconds, Ymax = 7.04 G's @ 0.0993 Seconds





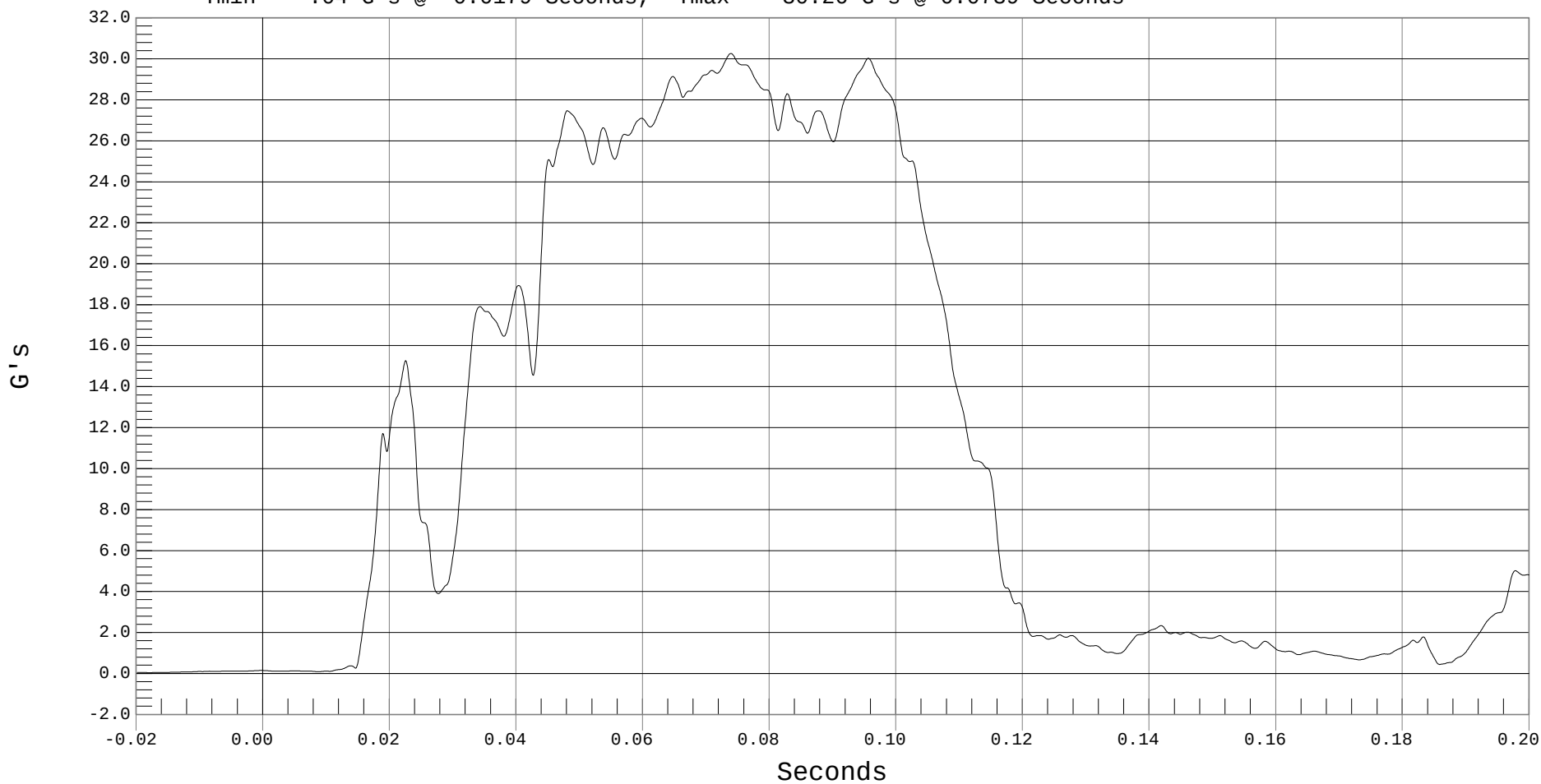
DRIVER CHEST REDUNDANT RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH

— 1 DRIVER CHEST REDUNDANT RESULTANT ACCELERATION, B01043AV.A36

Ymin = .04 G's @ -0.0179 Seconds, Ymax = 30.26 G's @ 0.0739 Seconds





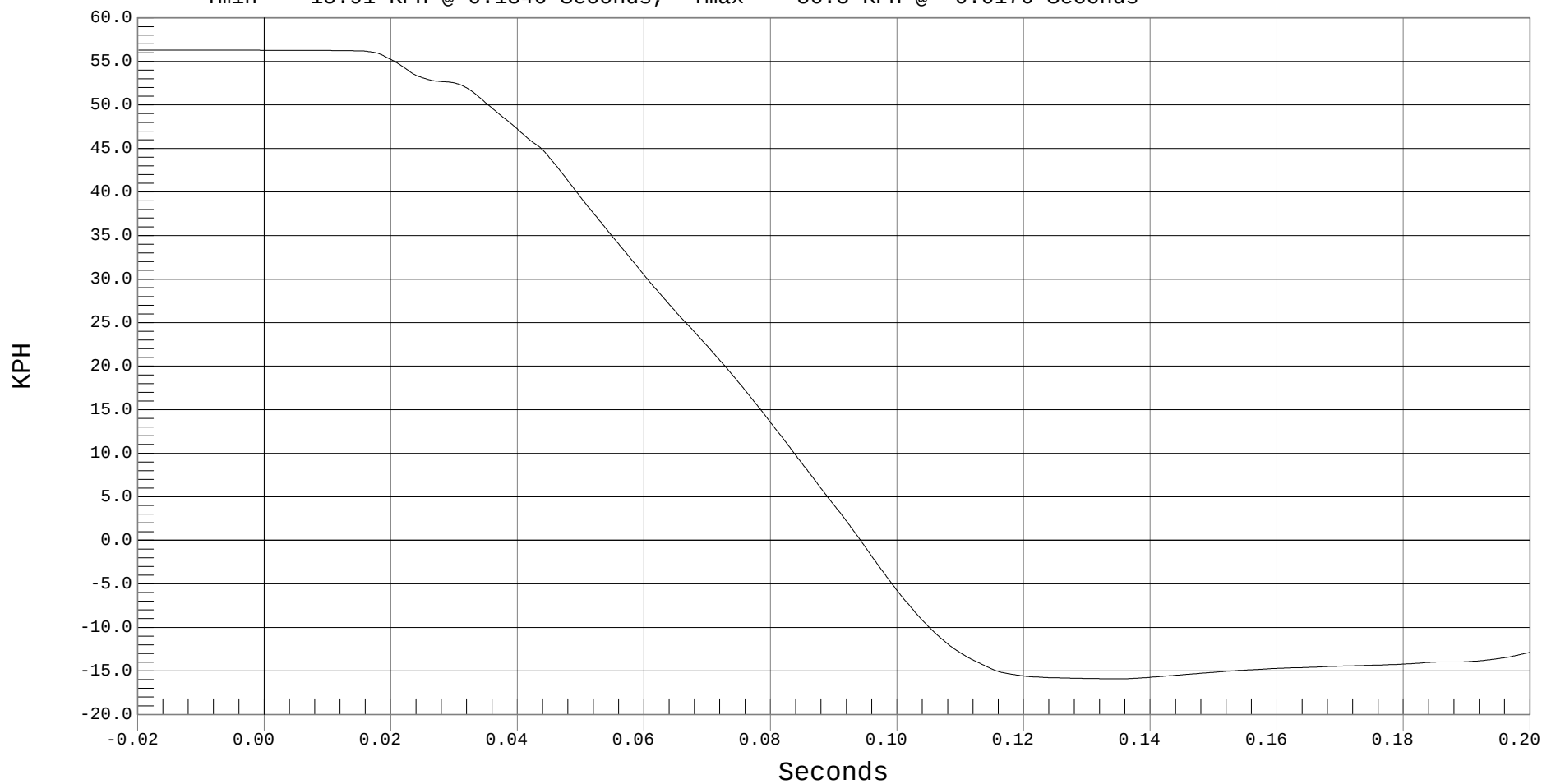
DRIVER CHEST REDUNDANT X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

1 DRIVER CHEST REDUNDANT X VELOCITY, B01043AI.V36

Ymin = -15.91 KPH @ 0.1346 Seconds, Ymax = 56.3 KPH @ -0.0176 Seconds





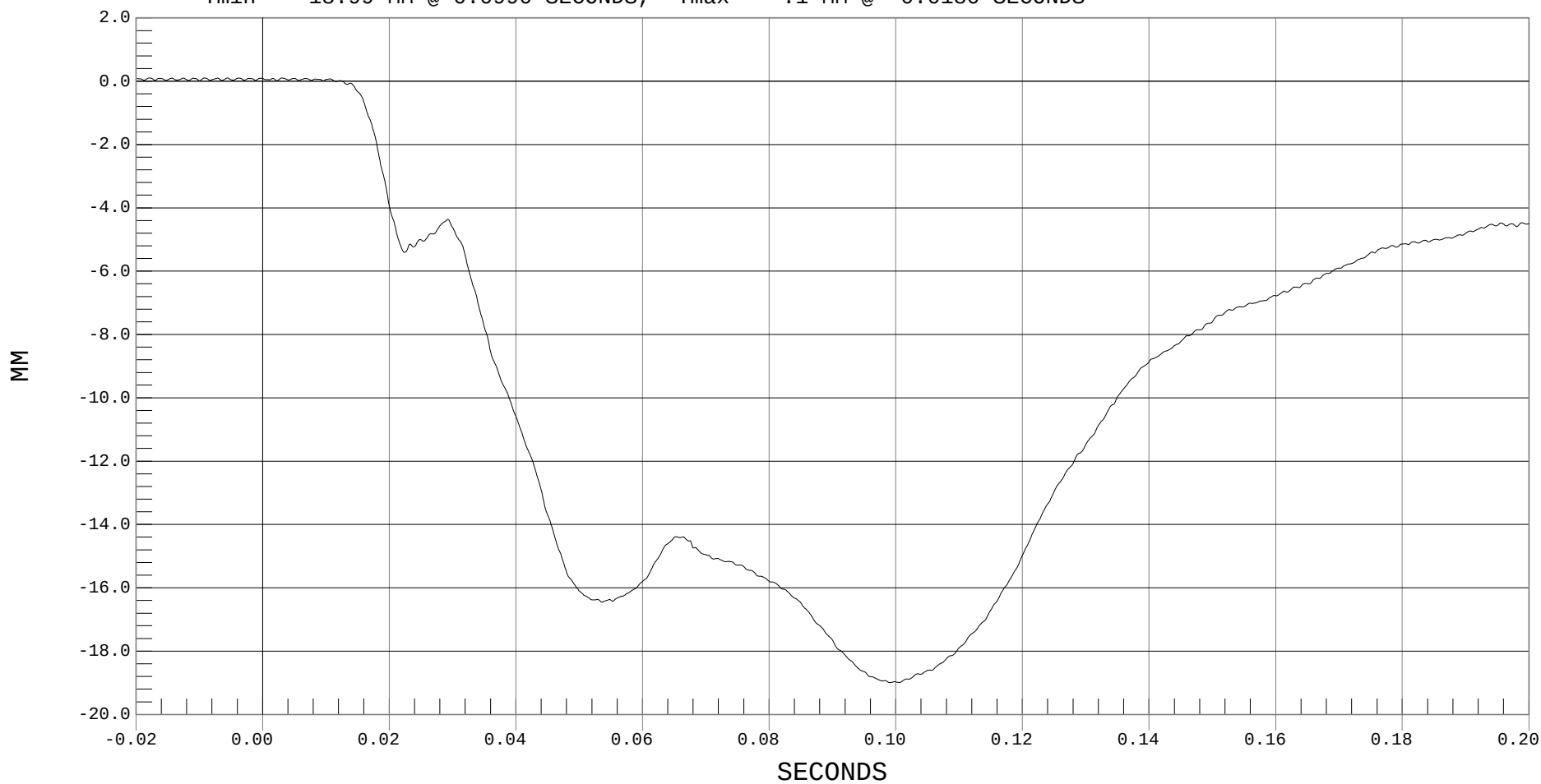
DRIVER CHEST COMPRESSION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DISPLACEMENT, B01043DF.D13

Ymin = -18.99 MM @ 0.0990 SECONDS, Ymax = .1 MM @ -0.0180 SECONDS





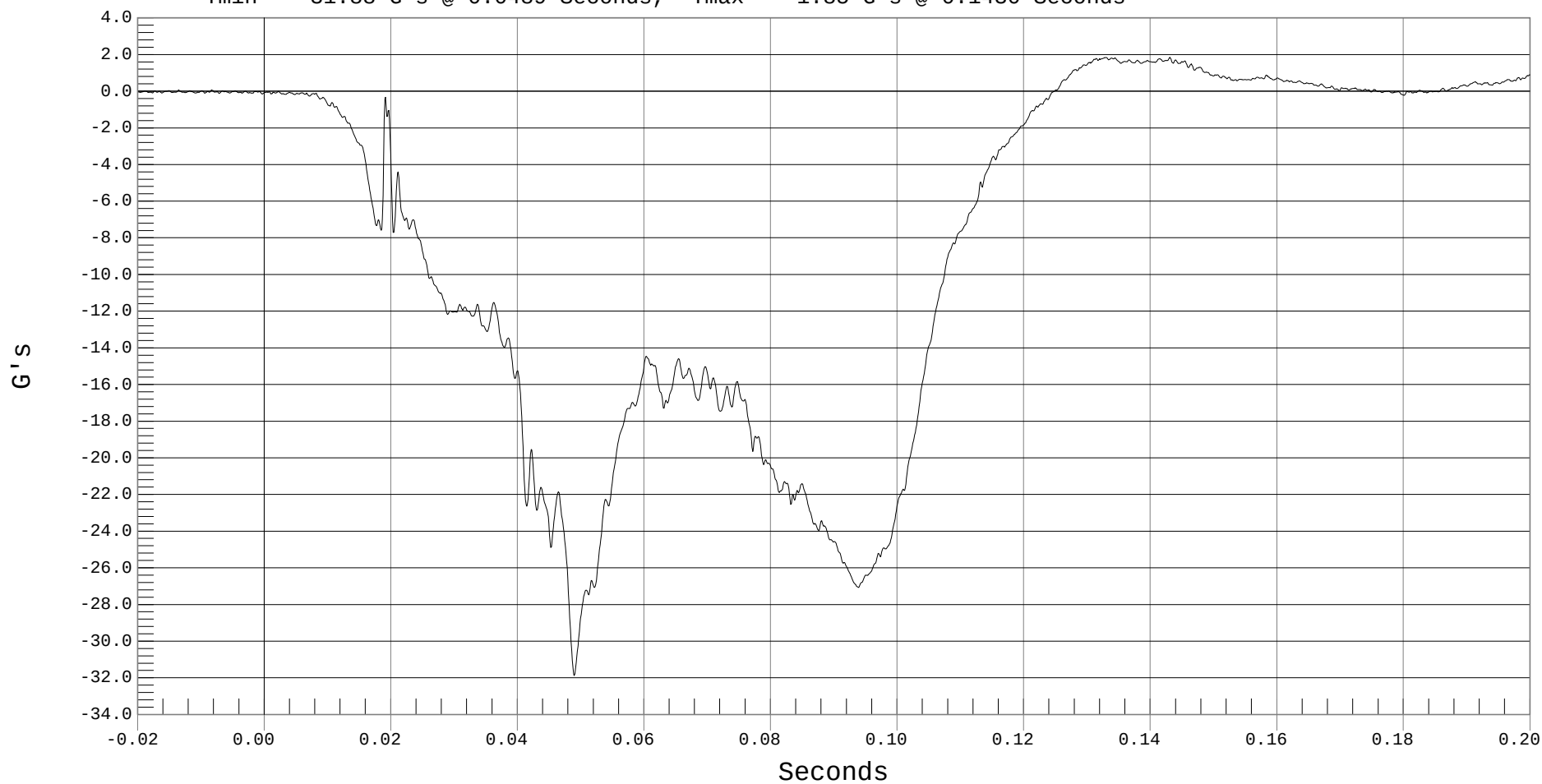
DRIVER PELVIS X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS X, B01043AT.A14

Ymin = -31.88 G's @ 0.0489 Seconds, Ymax = 1.85 G's @ 0.1430 Seconds





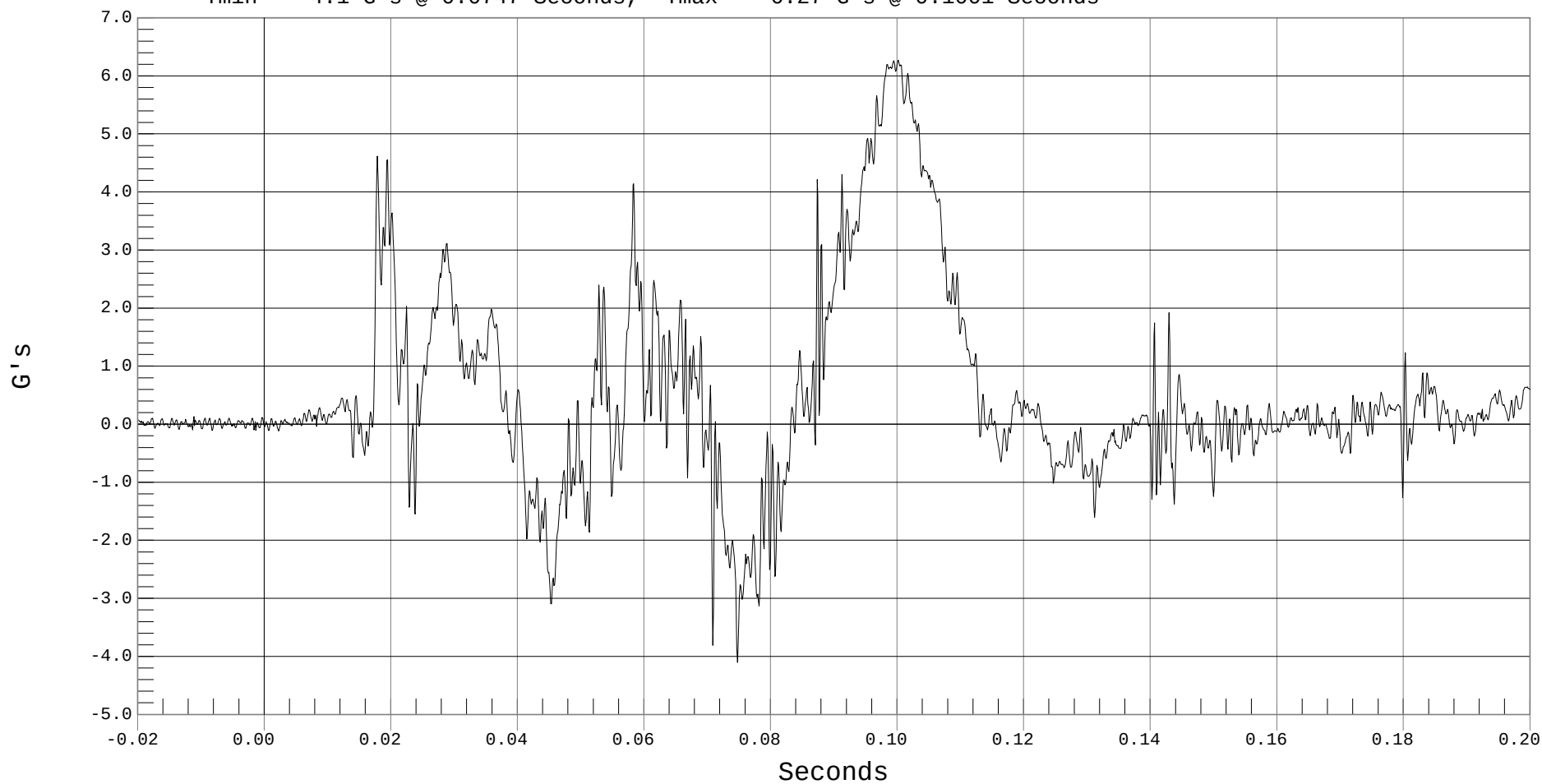
DRIVER PELVIS Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Y, B01043AT.A15

Ymin = -4.1 G's @ 0.0747 Seconds, Ymax = 6.27 G's @ 0.1001 Seconds





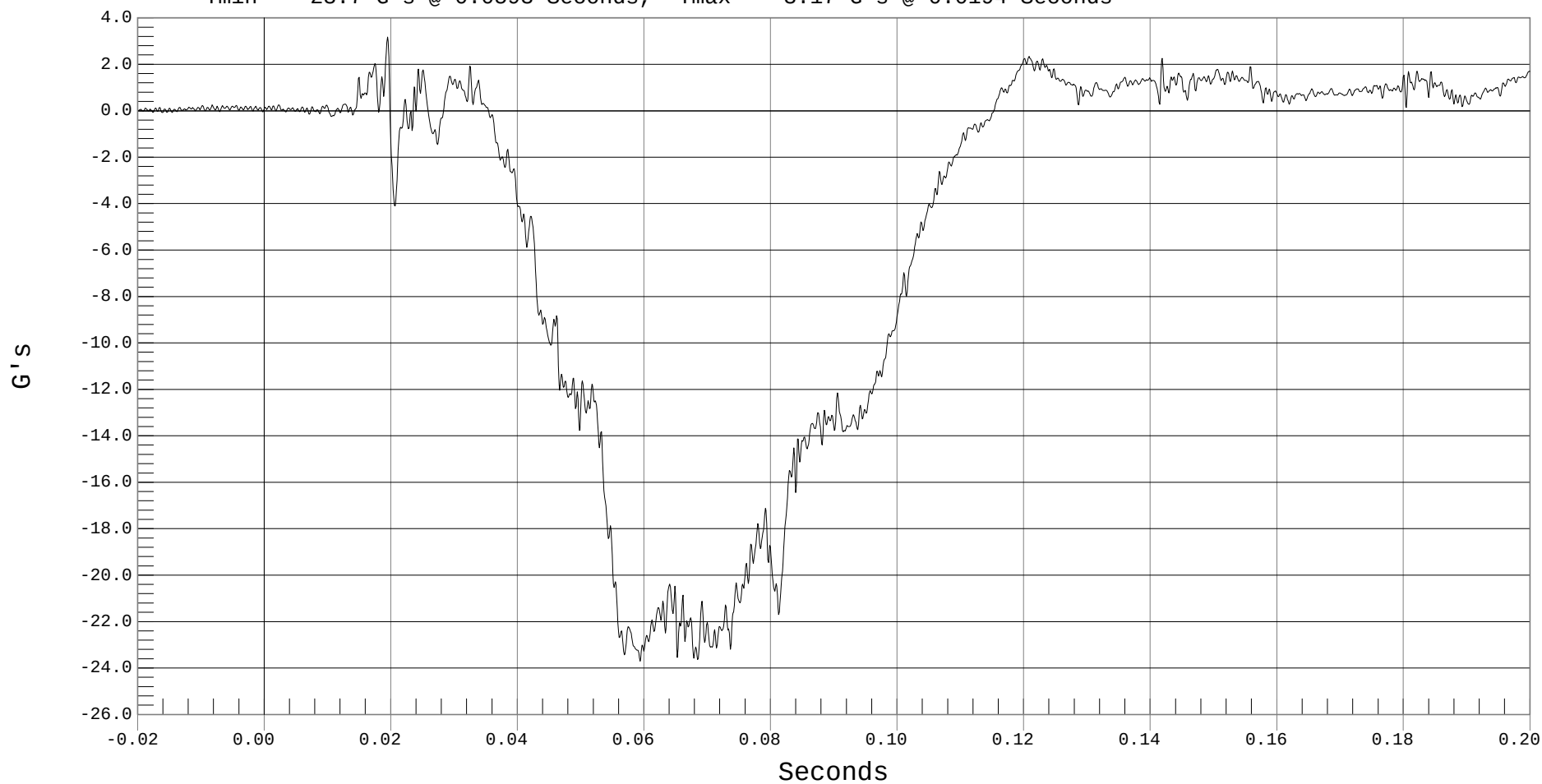
DRIVER PELVIS Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Z, B01043AT.A16

Ymin = -23.7 G's @ 0.0593 Seconds, Ymax = 3.17 G's @ 0.0194 Seconds





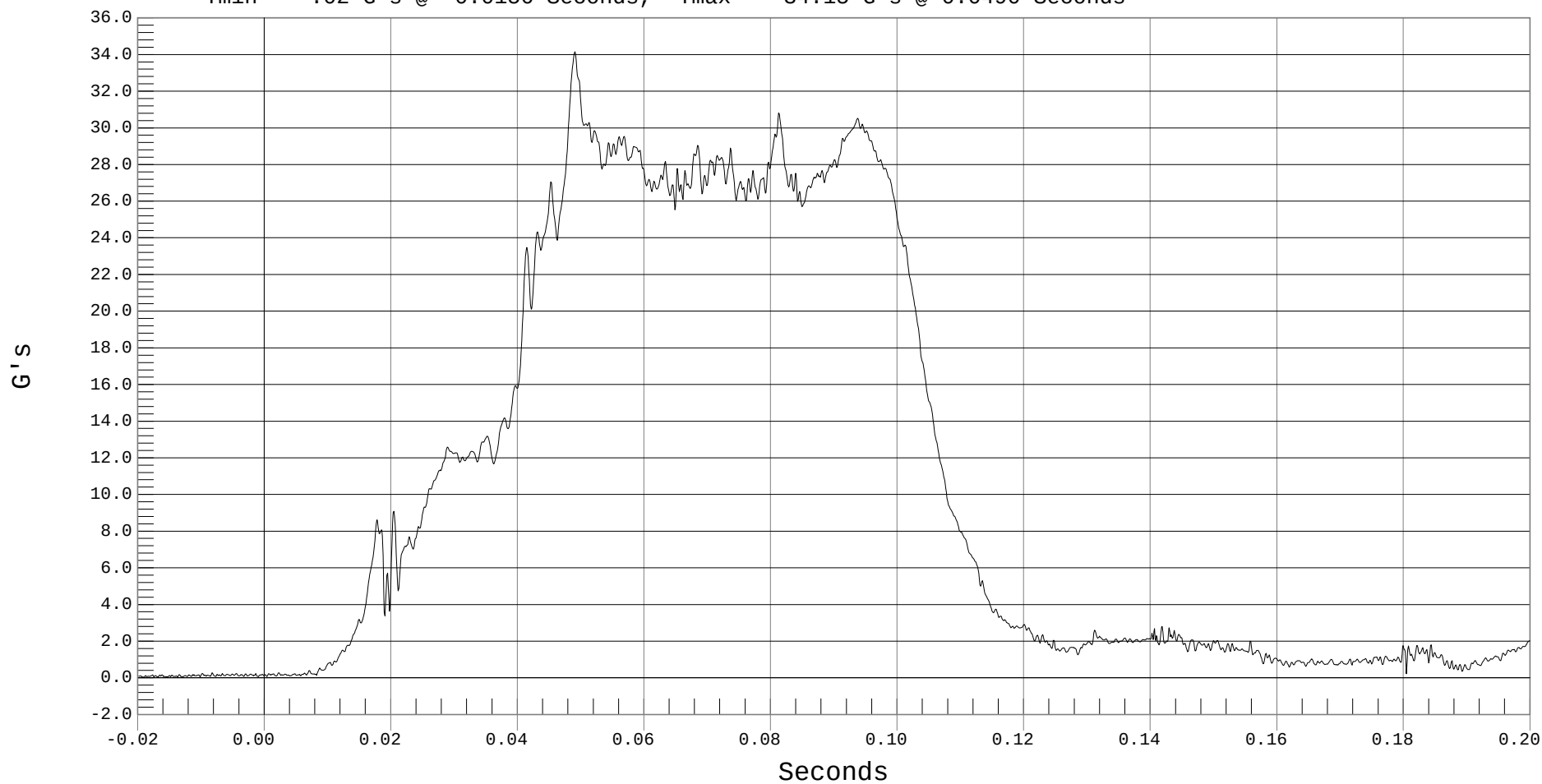
DRIVER PELVIS RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS RESULTANT ACCELERATION, B01043AV.A14

Ymin = .02 G's @ -0.0156 Seconds, Ymax = 34.15 G's @ 0.0490 Seconds





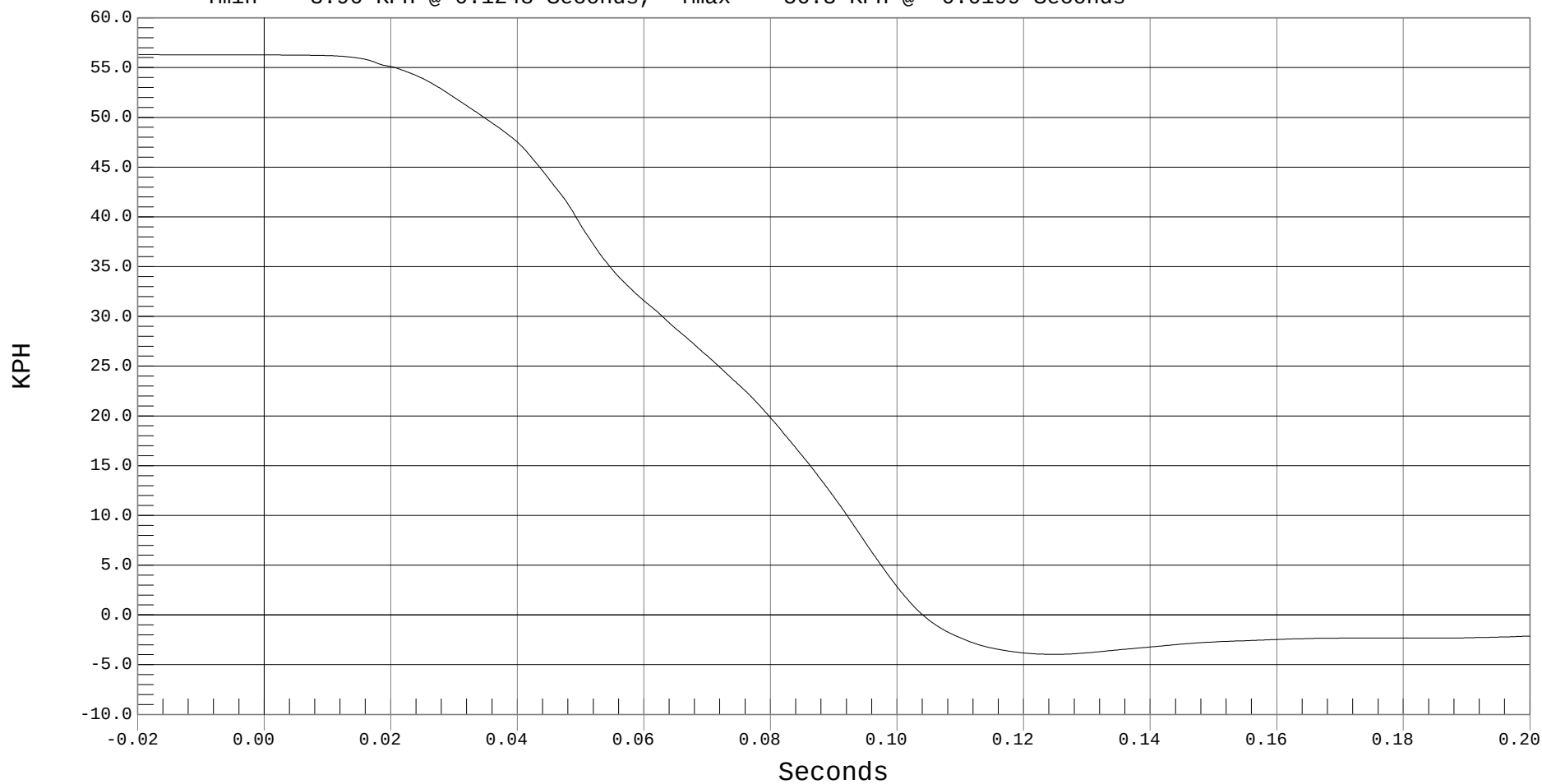
DRIVER PELVIS X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

1 DRIVER PELVIS X VELOCITY, B01043AI.V14

Ymin = -3.96 KPH @ 0.1248 Seconds, Ymax = 56.3 KPH @ -0.0199 Seconds





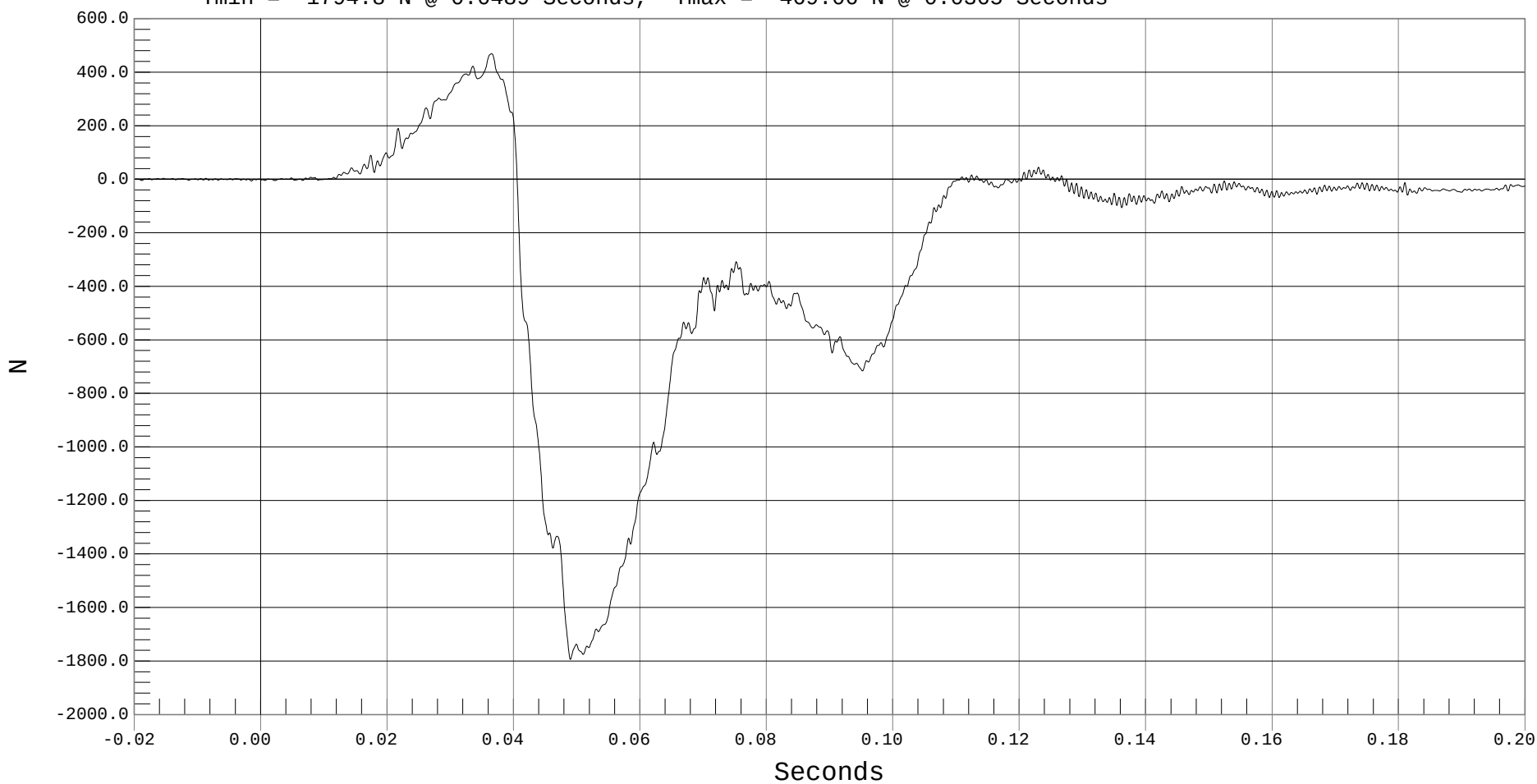
DRIVER LEFT FEMUR FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR X, B01043FF.F18

Ymin = -1794.8 N @ 0.0489 Seconds, Ymax = 469.06 N @ 0.0365 Seconds





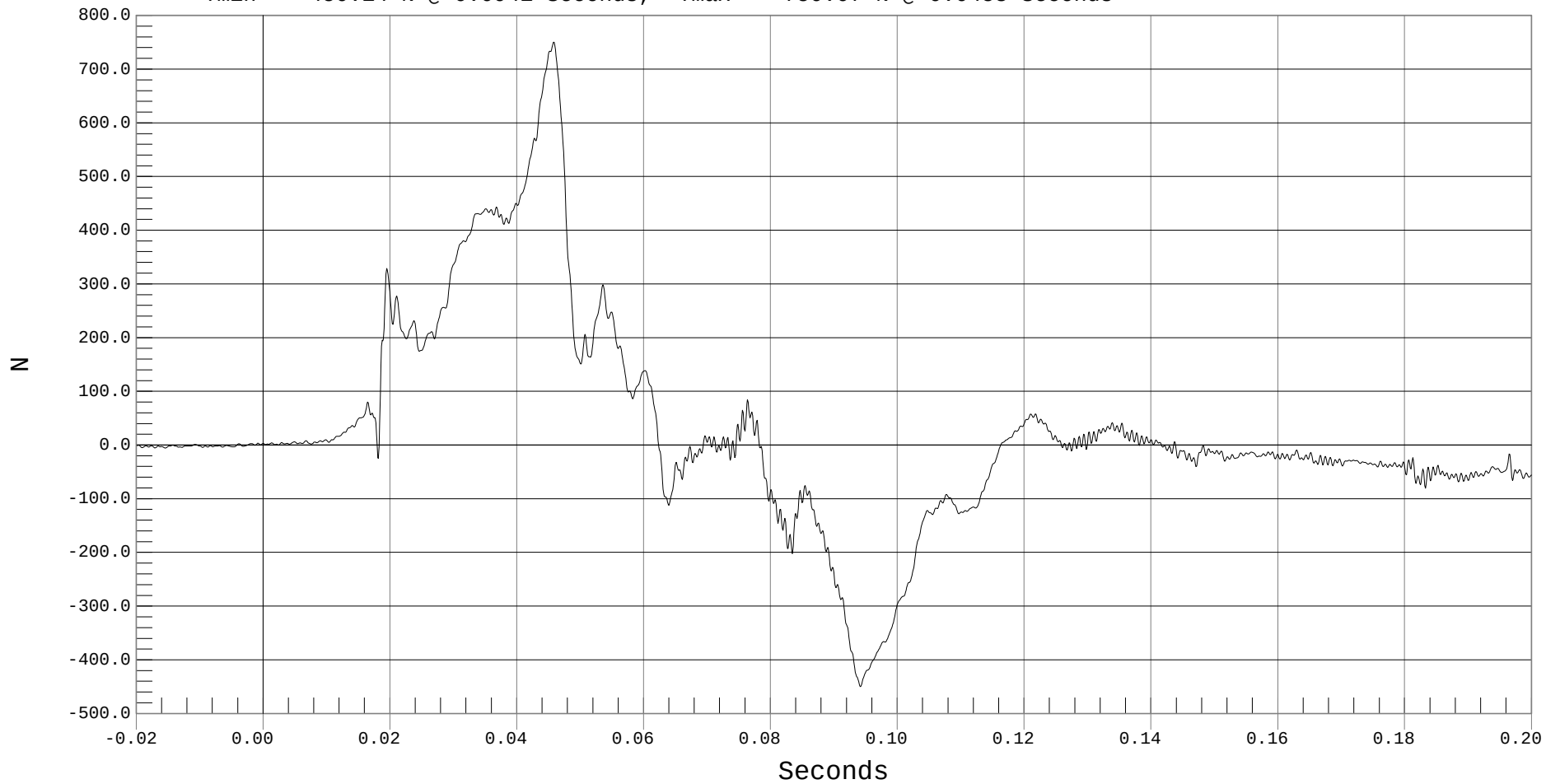
DRIVER RIGHT FEMUR FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR X, B01043FF.F17

Ymin = -450.14 N @ 0.0941 Seconds, Ymax = 750.07 N @ 0.0458 Seconds





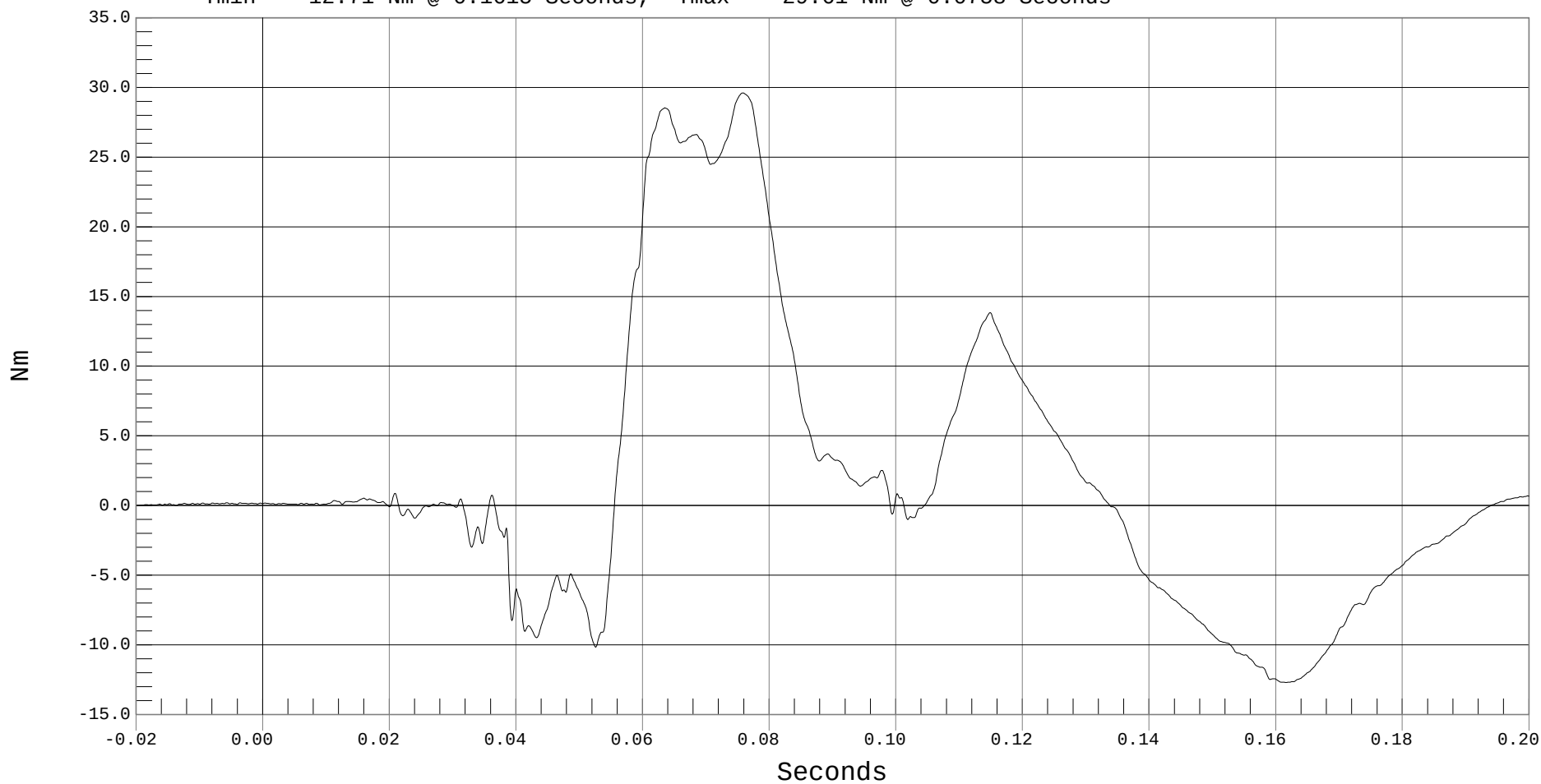
DRIVER LEFT UPPER TIBIA MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER LEFT UPPER TIBIA MX, B01043MF.M75

Ymin = -12.71 Nm @ 0.1615 Seconds, Ymax = 29.61 Nm @ 0.0758 Seconds





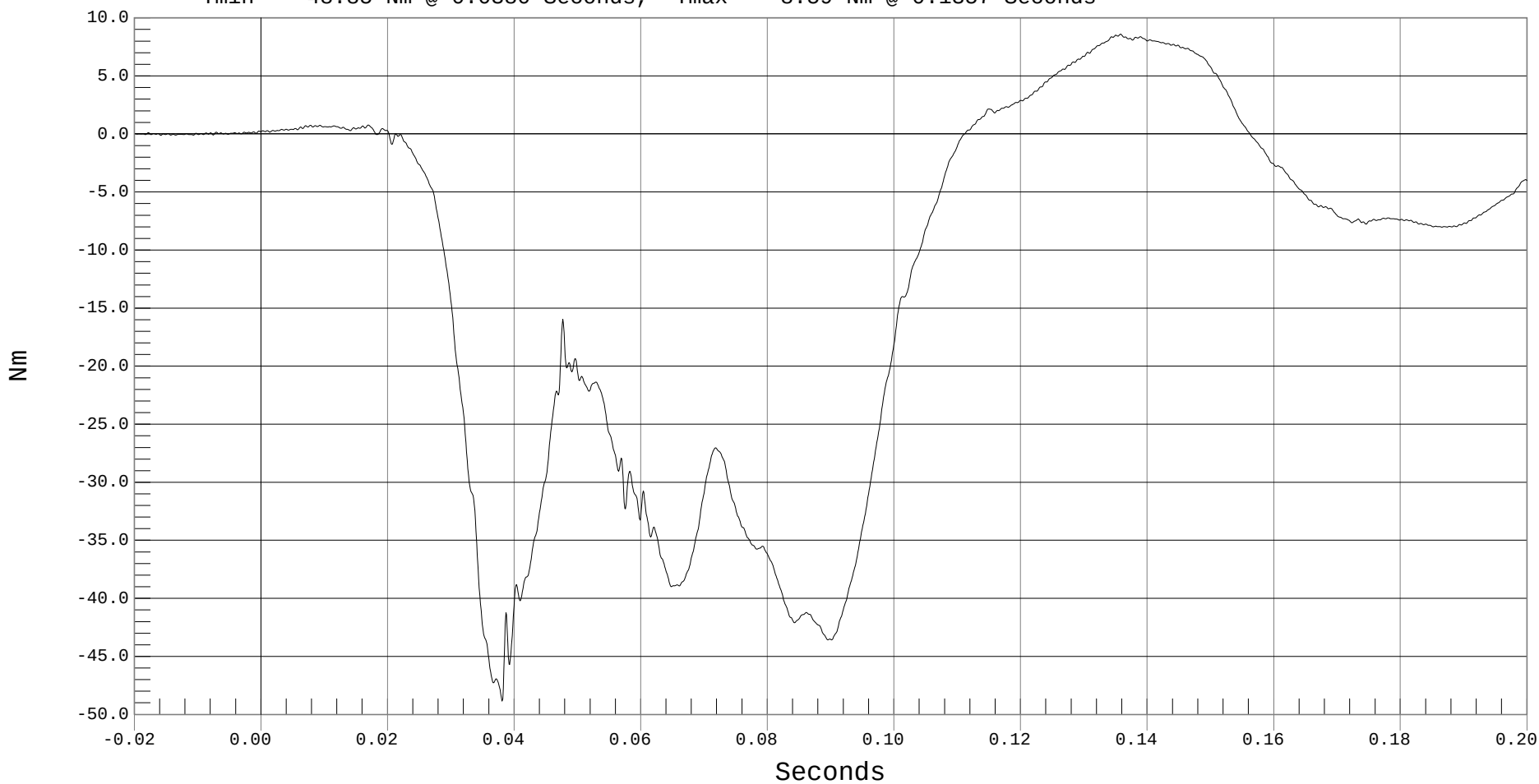
DRIVER LEFT UPPER TIBIA MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER LEFT UPPER TIBIA MY, B01043MF.M76

Ymin = -48.85 Nm @ 0.0380 Seconds, Ymax = 8.59 Nm @ 0.1357 Seconds





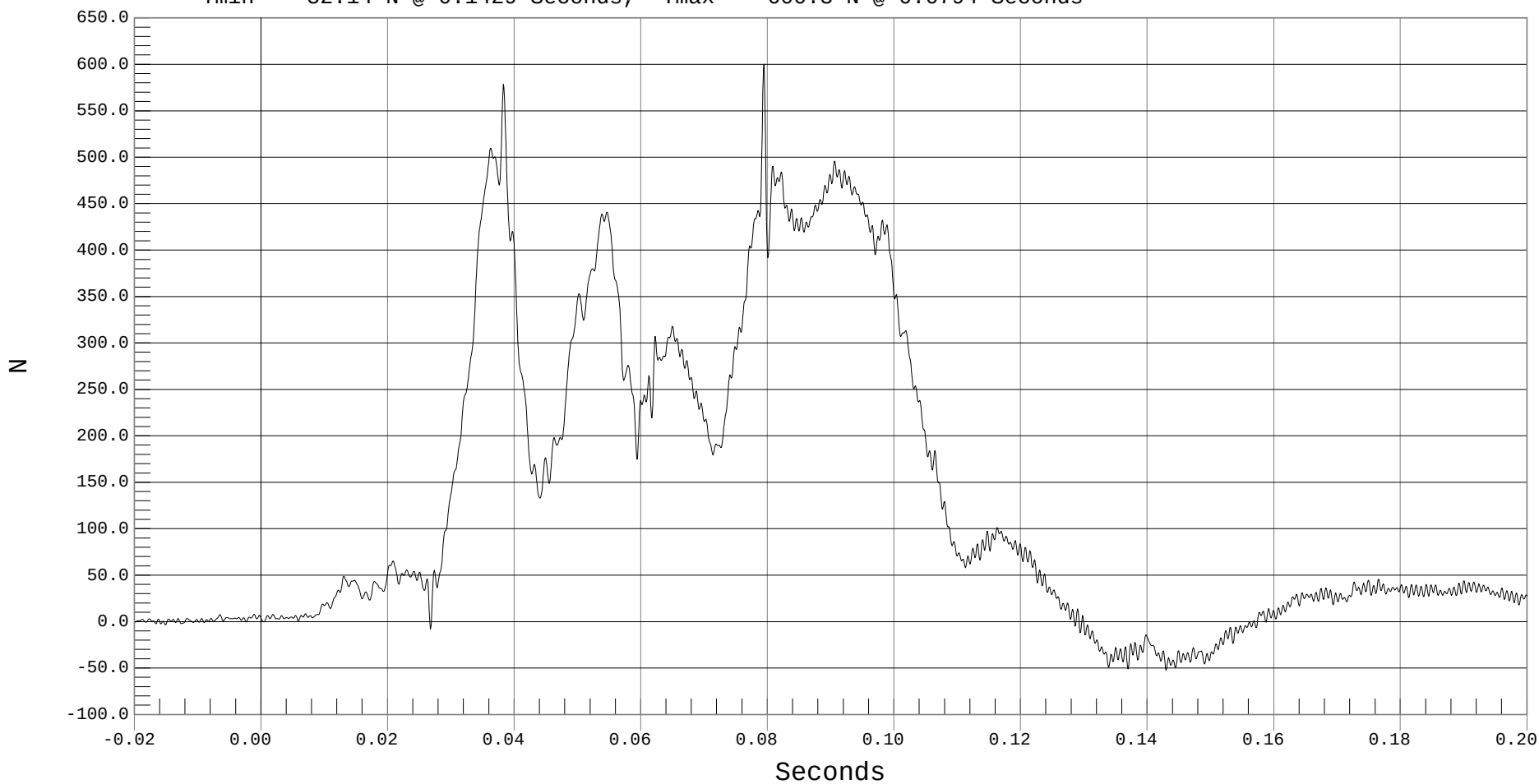
DRIVER LEFT UPPER TIBIA FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER LEFT UPPER TIBIA FZ, B01043FF.F77

Ymin = -52.14 N @ 0.1429 Seconds, Ymax = 600.3 N @ 0.0794 Seconds





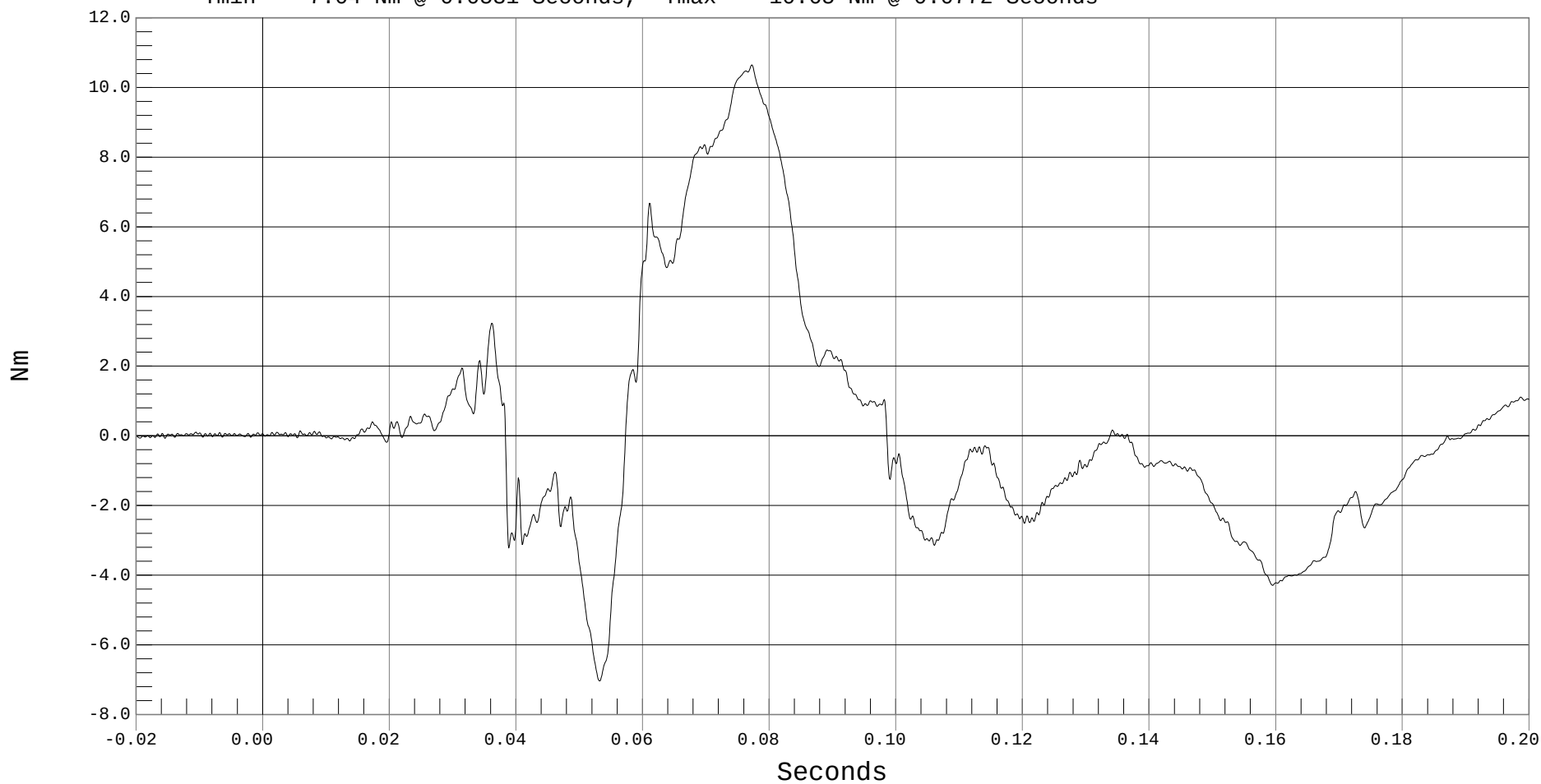
DRIVER LEFT LOWER TIBIA MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER LEFT LOWER TIBIA MX, B01043MF.M78

Ymin = -7.04 Nm @ 0.0531 Seconds, Ymax = 10.65 Nm @ 0.0772 Seconds





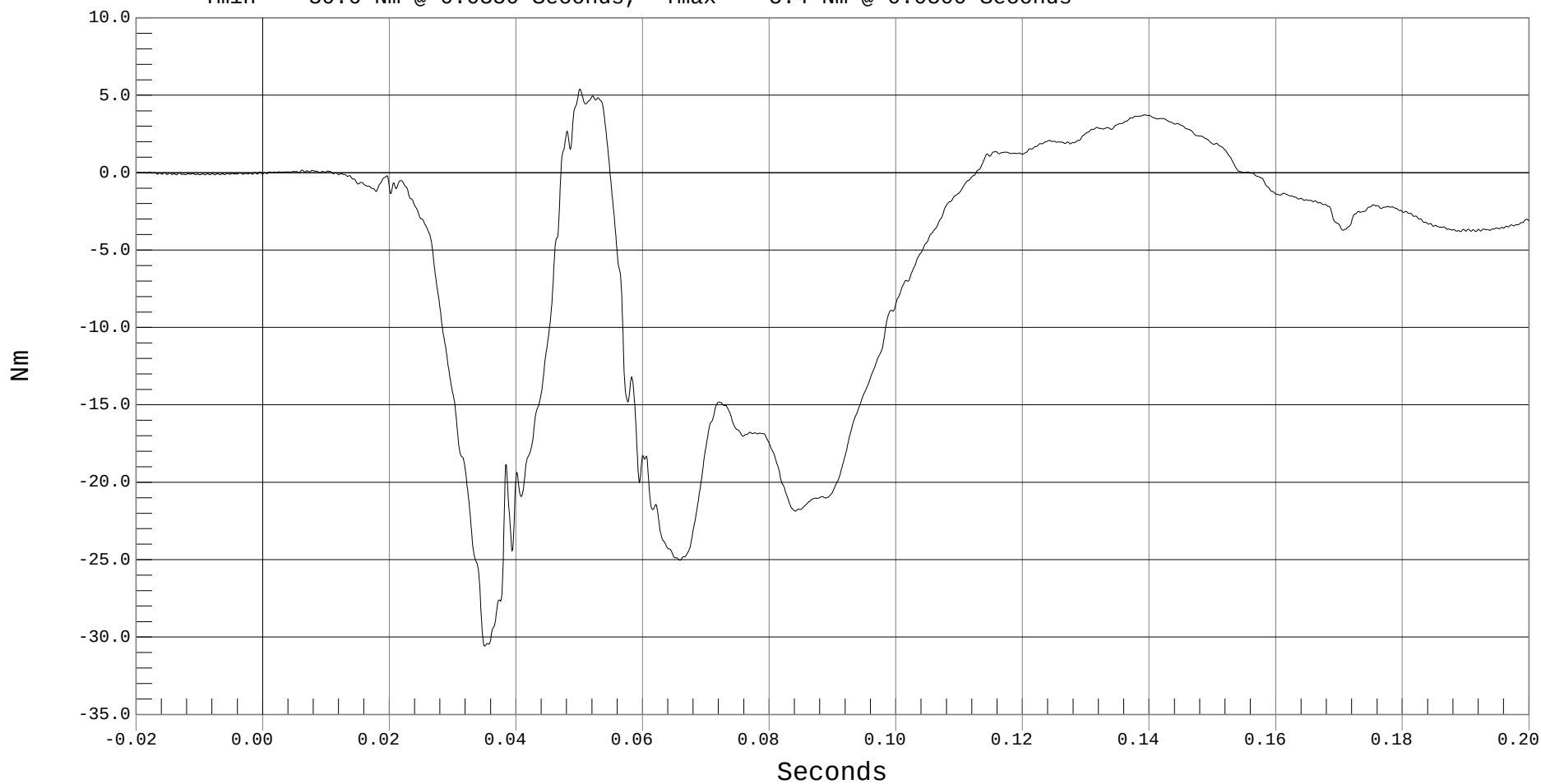
DRIVER LEFT LOWER TIBIA MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER LEFT LOWER TIBIA MY, B01043MF.M79

Ymin = -30.6 Nm @ 0.0350 Seconds, Ymax = 5.4 Nm @ 0.0500 Seconds





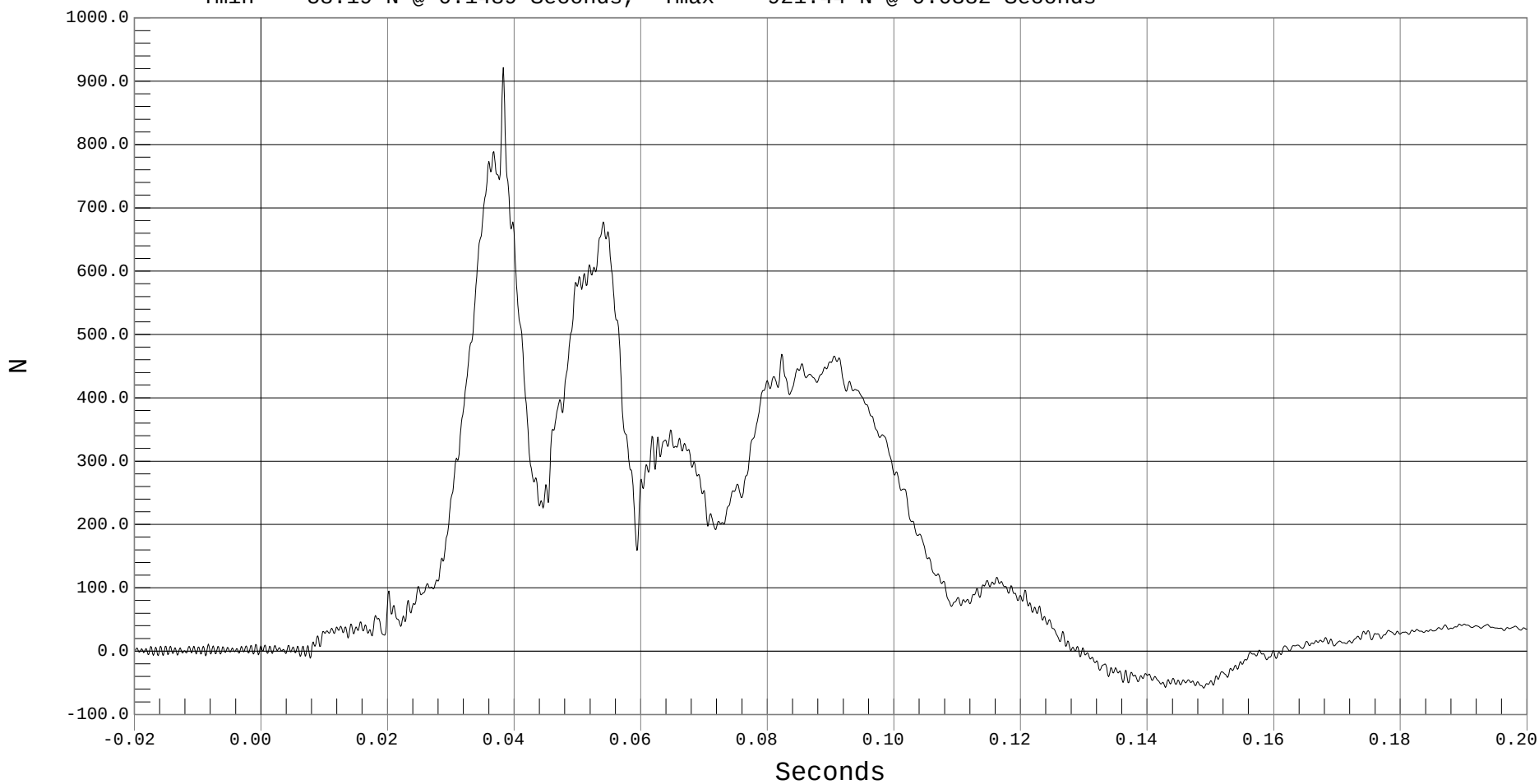
DRIVER LEFT LOWER TIBIA FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER LEFT LOWER TIBIA FZ, B01043FF.F80

Ymin = -58.19 N @ 0.1489 Seconds, Ymax = 921.44 N @ 0.0382 Seconds





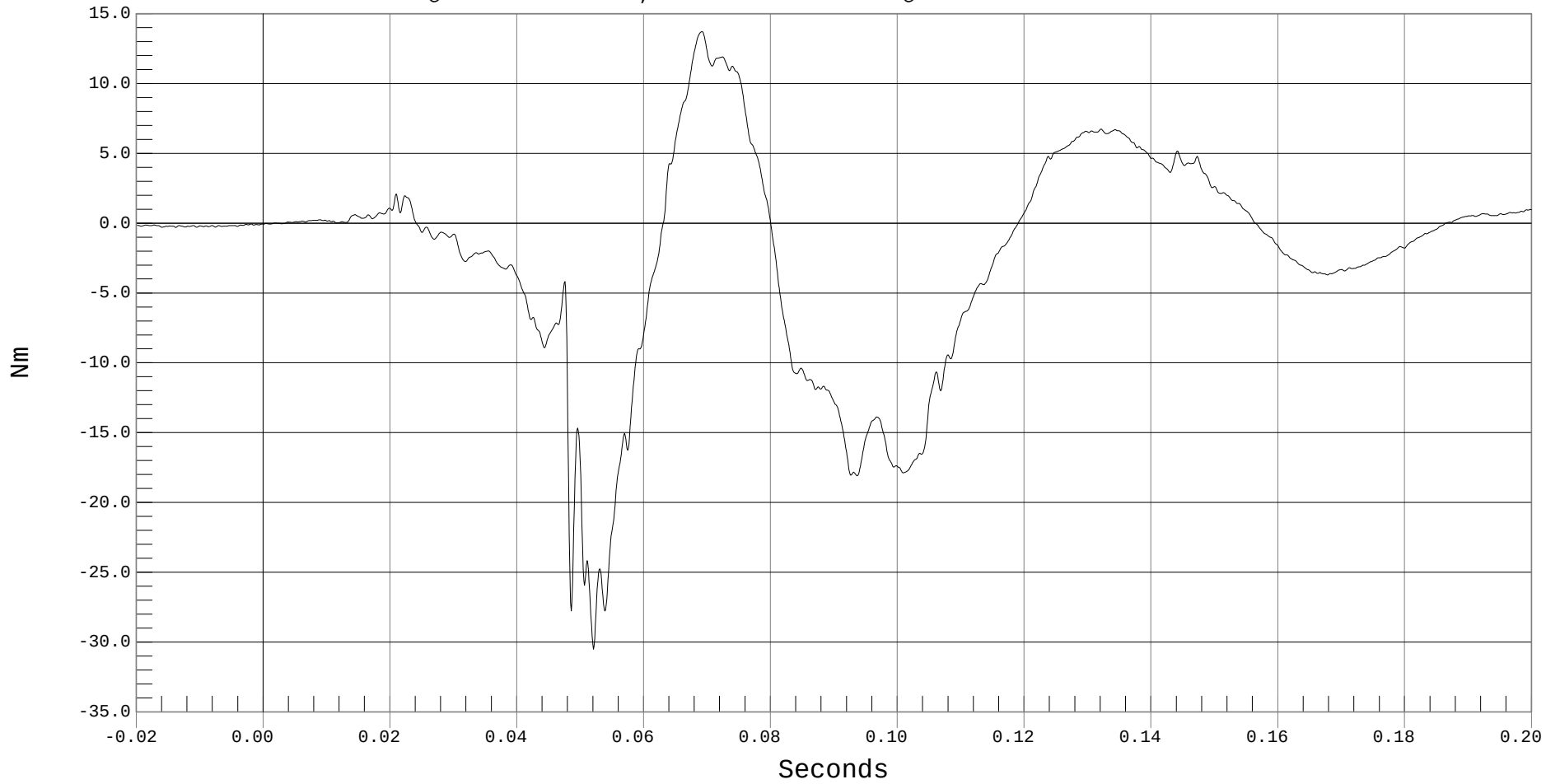
DRIVER RIGHT UPPER TIBIA MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT UPPER TIBIA MX, B01043MF.M69

Ymin = -30.52 Nm @ 0.0520 Seconds, Ymax = 13.73 Nm @ 0.0691 Seconds





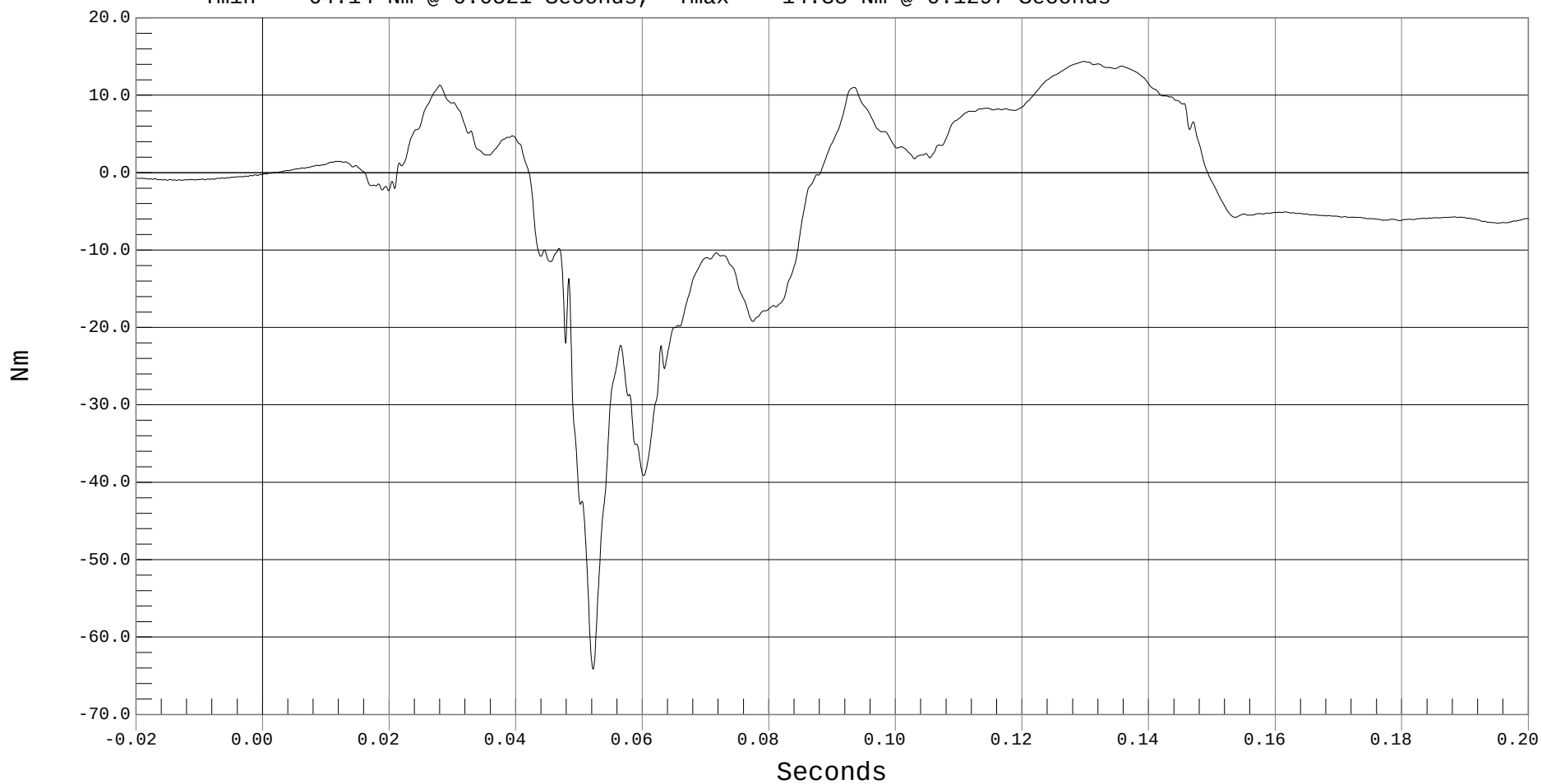
DRIVER RIGHT UPPER TIBIA MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

1 DRIVER RIGHT UPPER TIBIA MY, B01043MF.M70

Ymin = -64.14 Nm @ 0.0521 Seconds, Ymax = 14.38 Nm @ 0.1297 Seconds





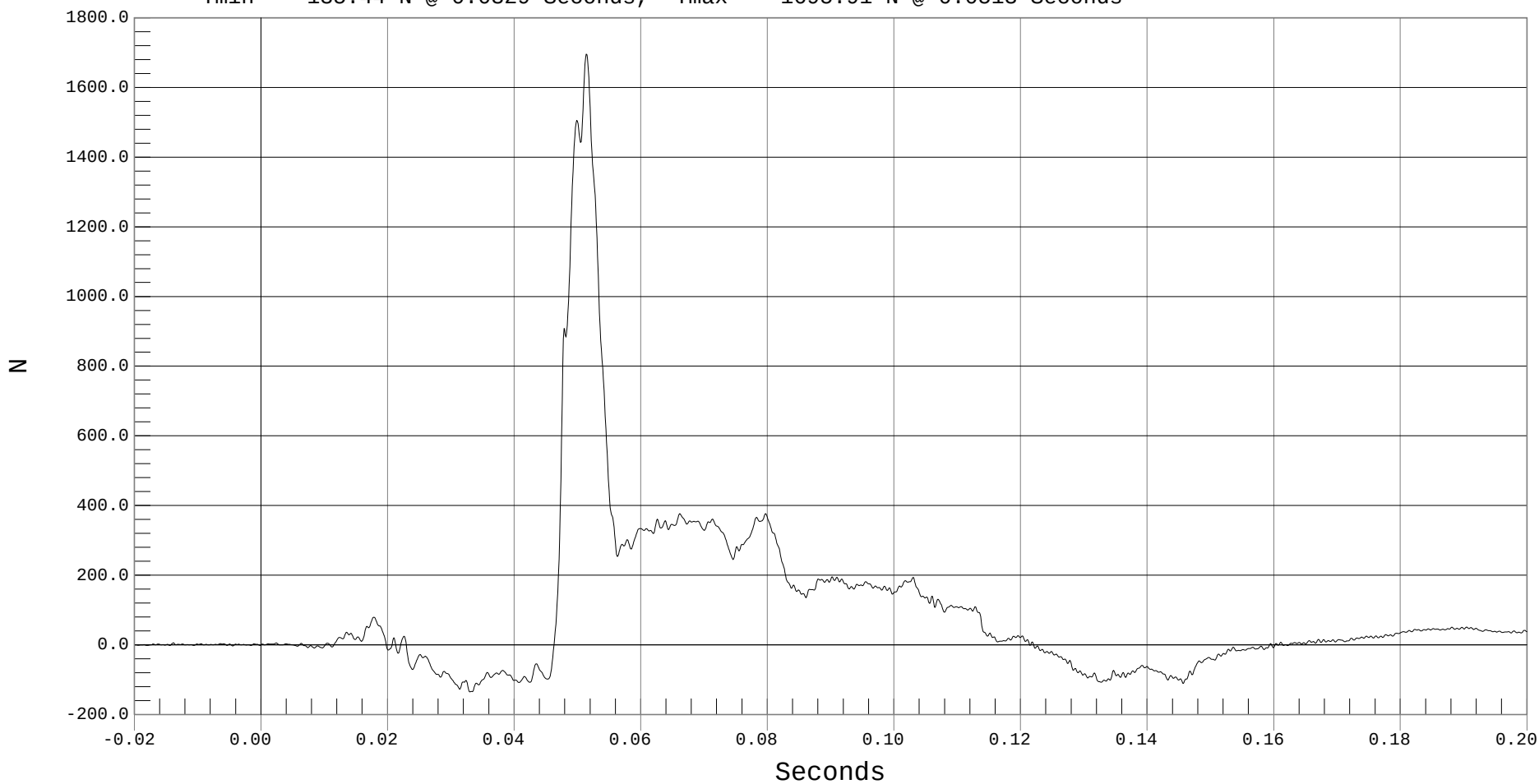
DRIVER RIGHT UPPER TIBIA FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT UPPER TIBIA FZ, B01043FF.F71

Ymin = -135.44 N @ 0.0329 Seconds, Ymax = 1695.91 N @ 0.0513 Seconds





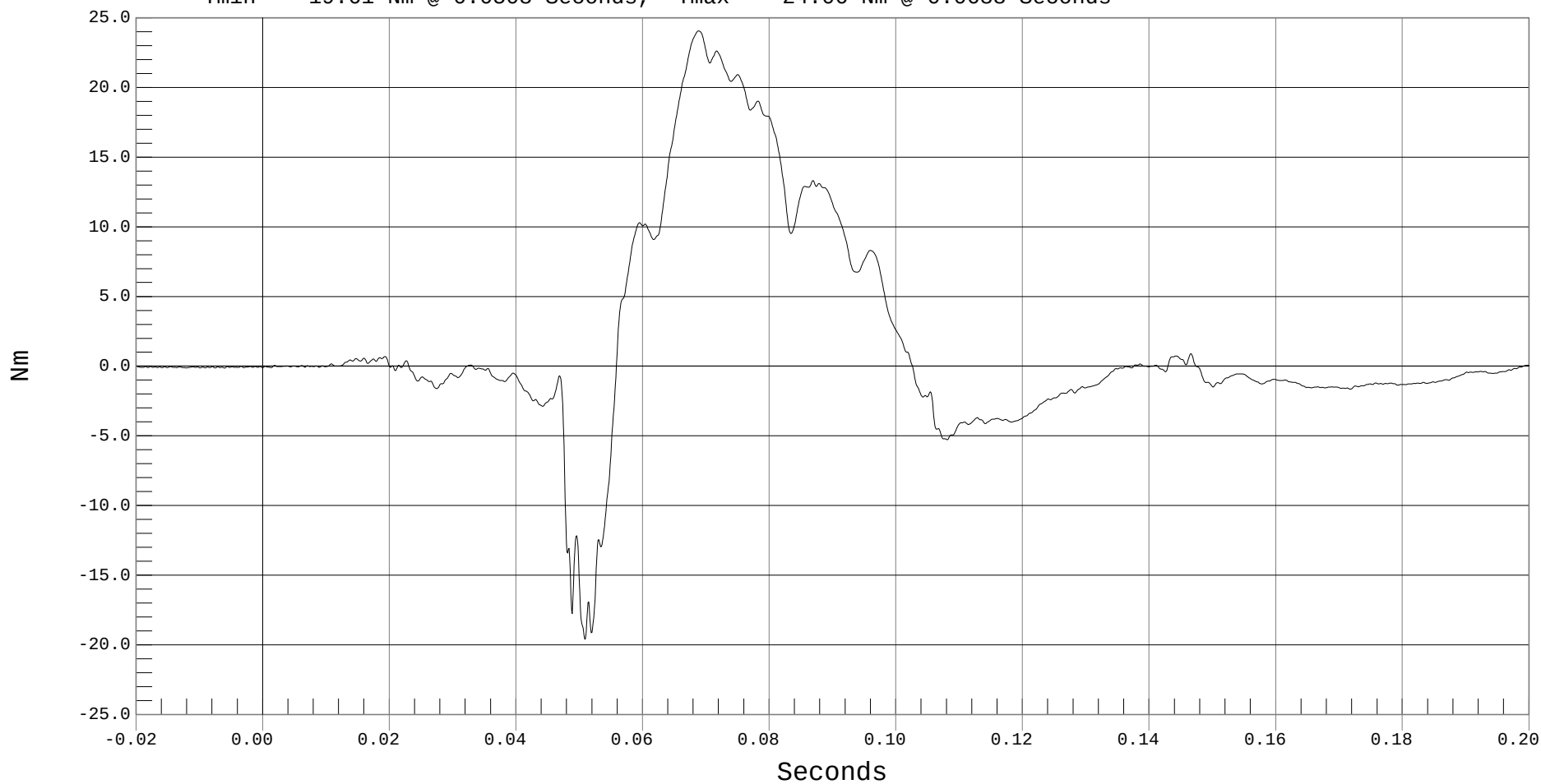
DRIVER RIGHT LOWER TIBIA MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT LOWER TIBIA MX, B01043MF.M72

Ymin = -19.61 Nm @ 0.0508 Seconds, Ymax = 24.06 Nm @ 0.0688 Seconds





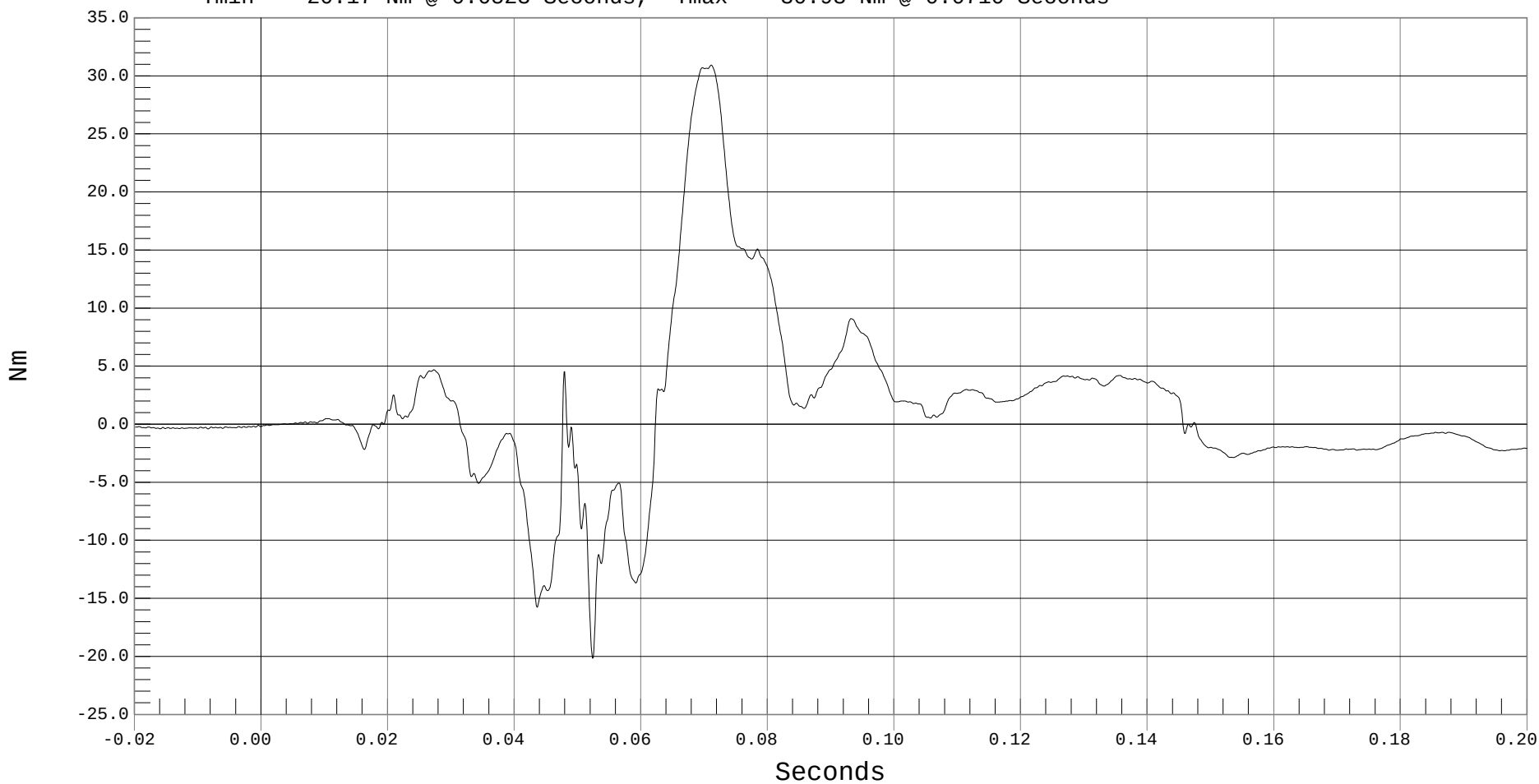
DRIVER RIGHT LOWER TIBIA MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT LOWER TIBIA MY, B01043MF.M73

Ymin = -20.17 Nm @ 0.0523 Seconds, Ymax = 30.93 Nm @ 0.0710 Seconds





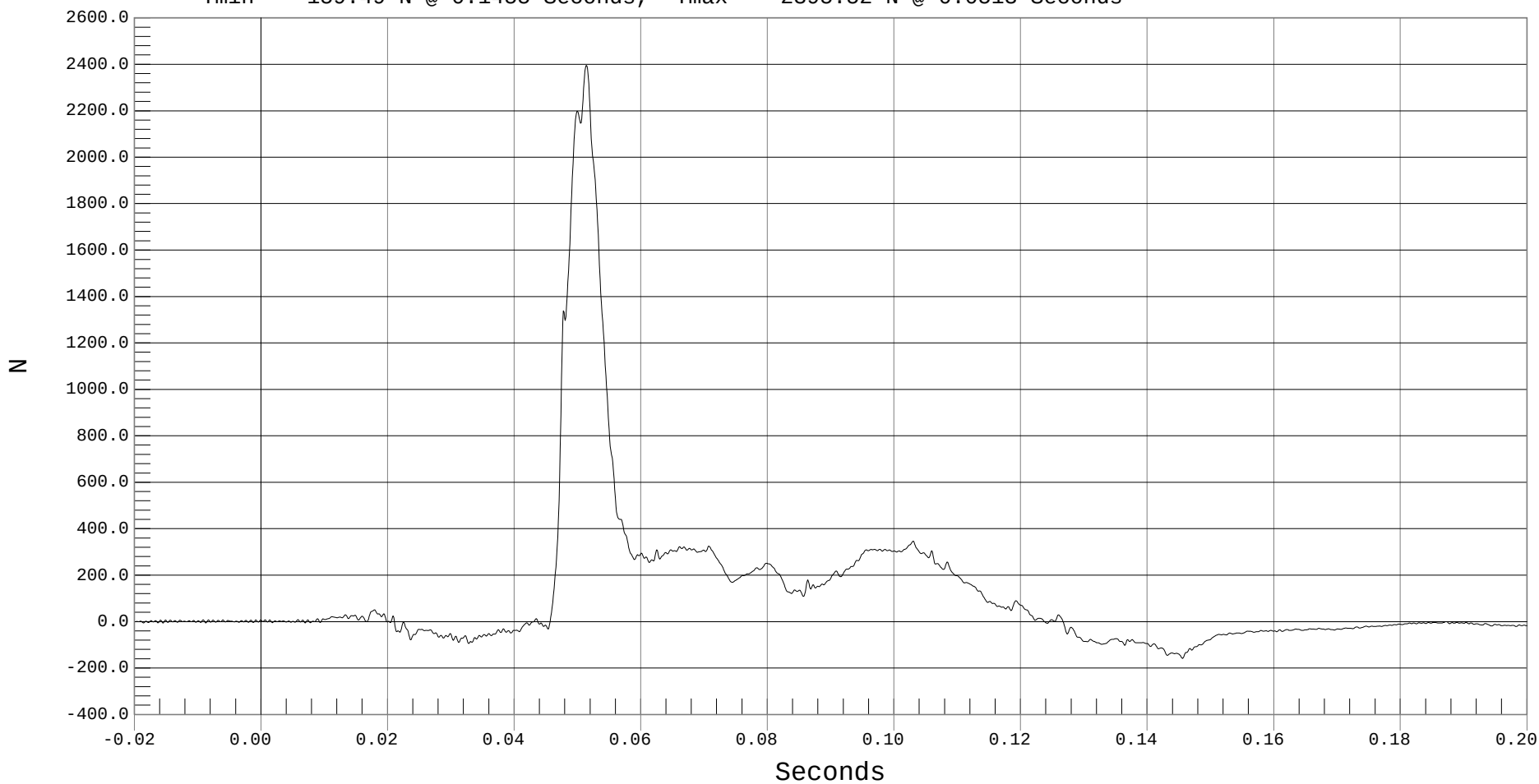
DRIVER RIGHT LOWER TIBIA FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT LOWER TIBIA FZ, B01043FF.F74

Ymin = -159.49 N @ 0.1455 Seconds, Ymax = 2395.52 N @ 0.0513 Seconds





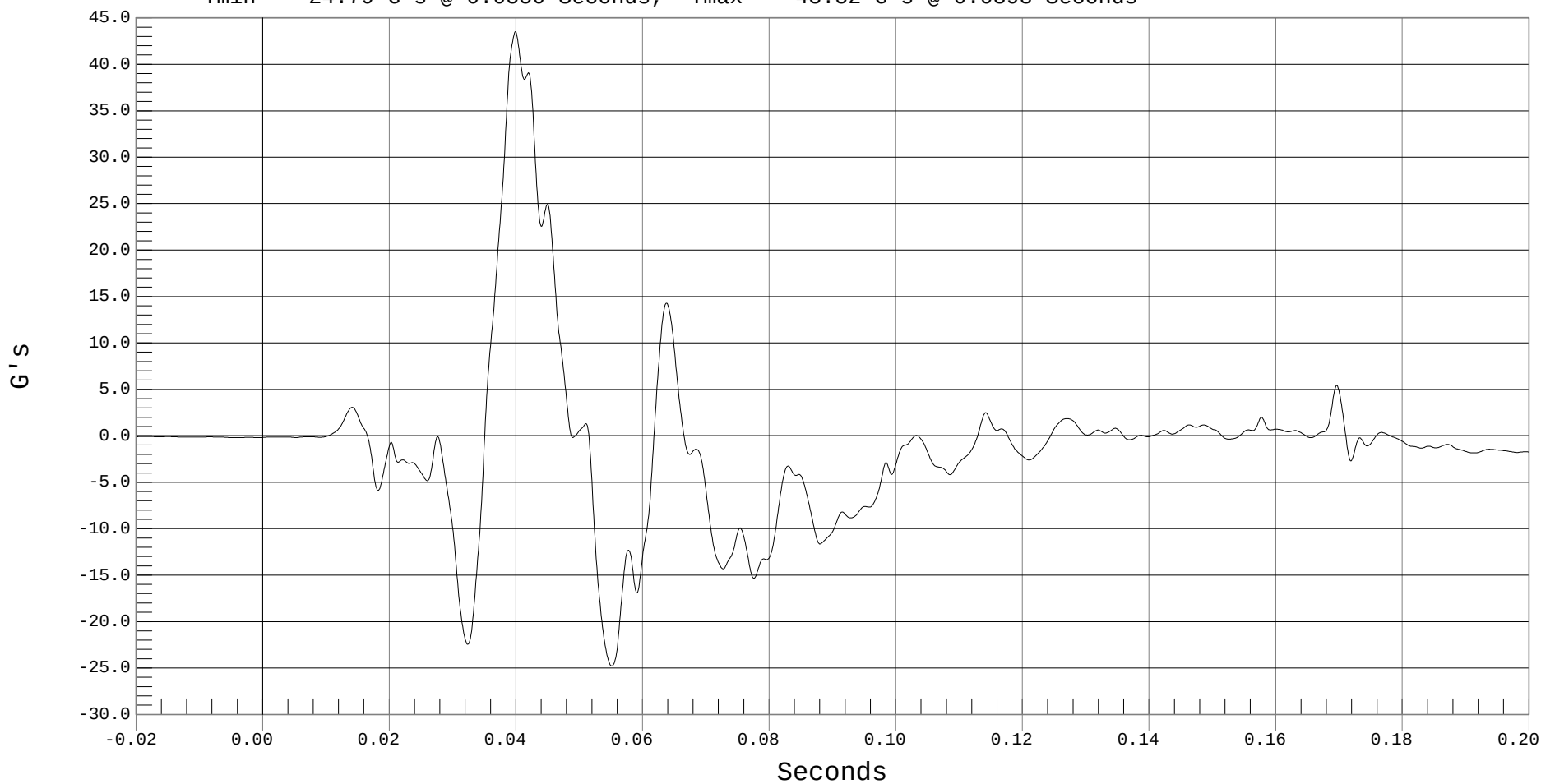
DRIVER LEFT FOOT @ BALL Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER LEFT FOOT @ BALL Z, B01043AF.A12

Ymin = -24.79 G's @ 0.0550 Seconds, Ymax = 43.52 G's @ 0.0398 Seconds





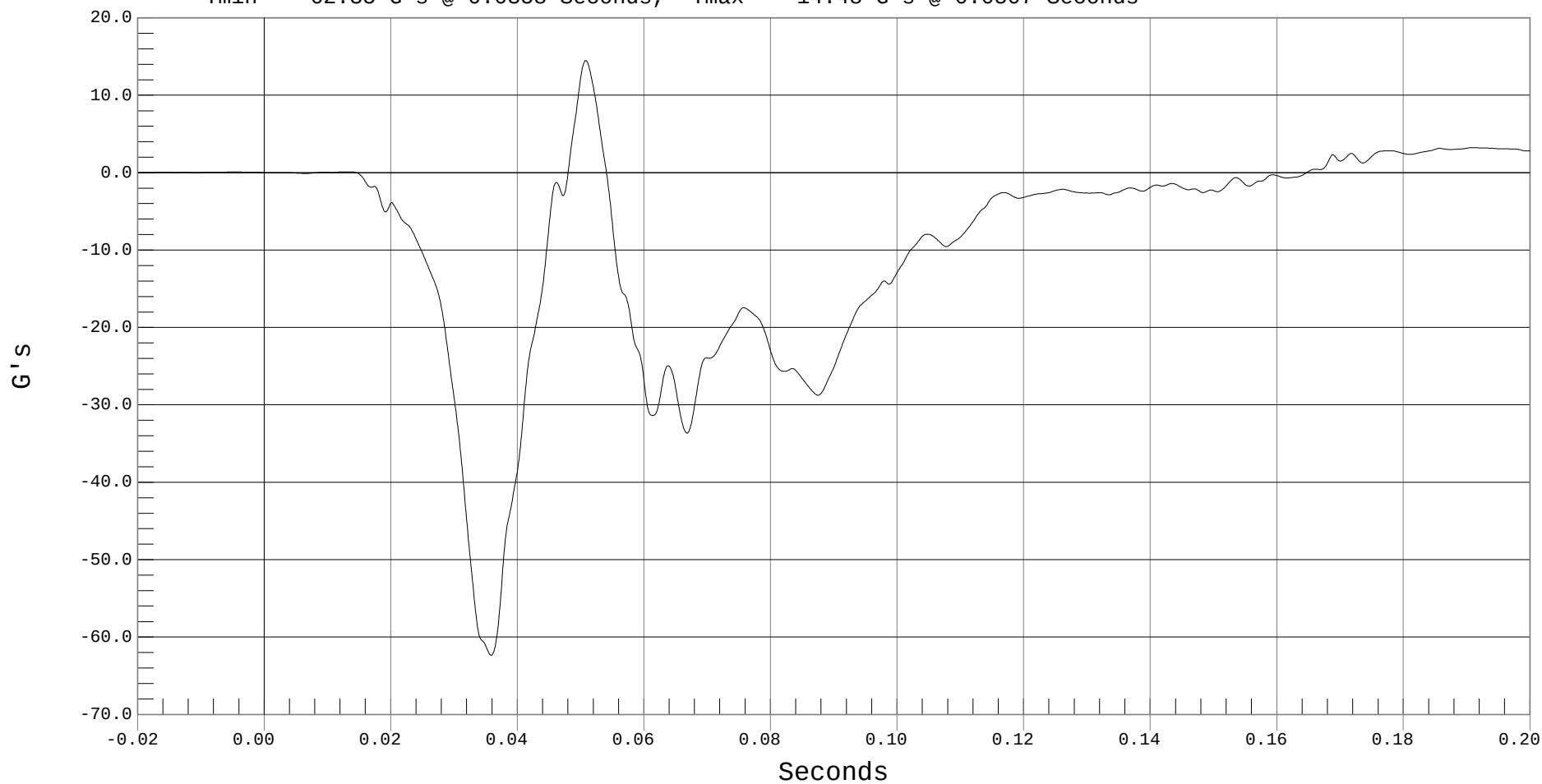
DRIVER LEFT FOOT @ HEEL X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

1 DRIVER LEFT FOOT @ HEEL X, B01043AF.A10

Ymin = -62.35 G's @ 0.0358 Seconds, Ymax = 14.48 G's @ 0.0507 Seconds





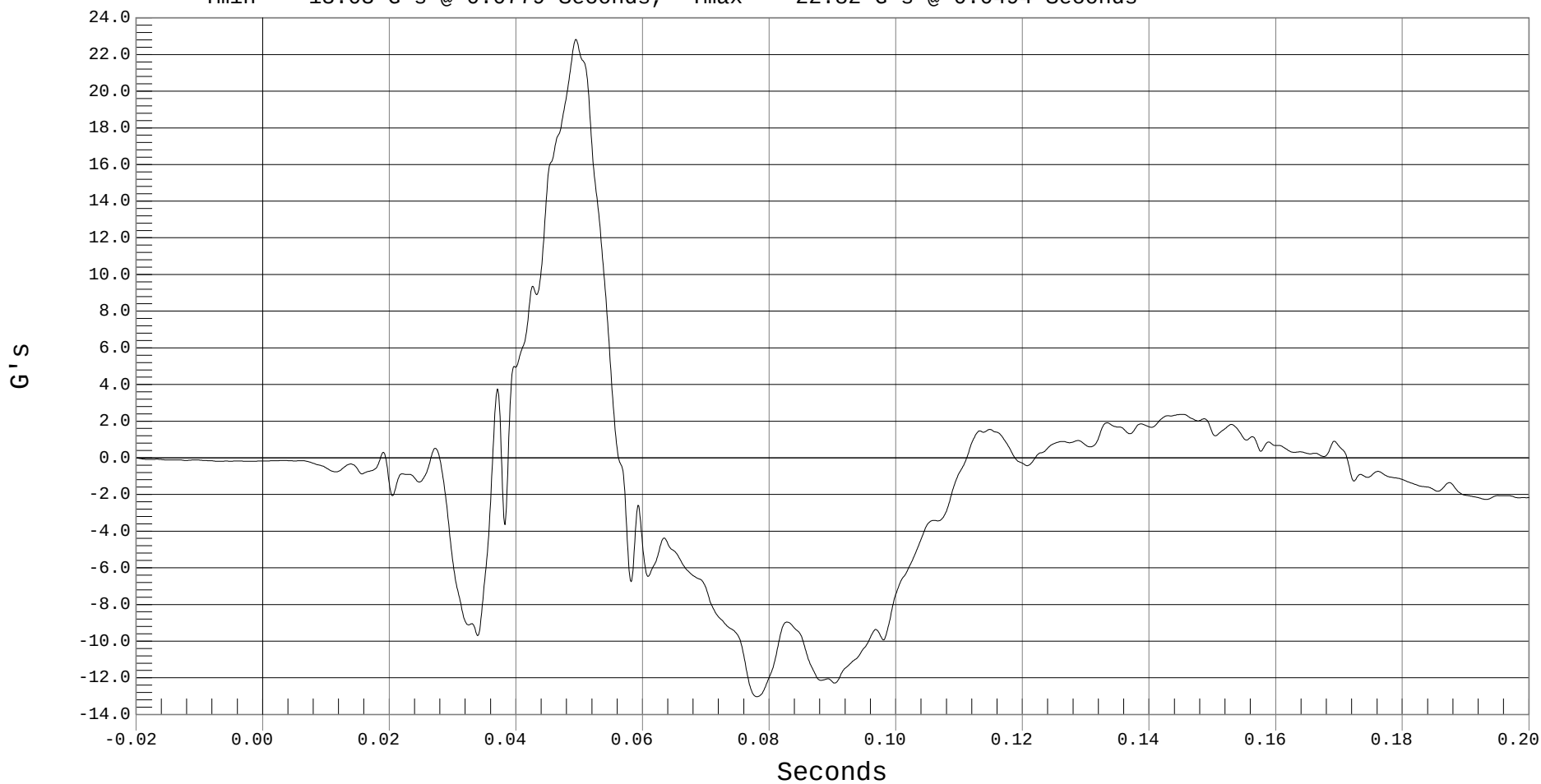
DRIVER LEFT FOOT @ HEEL Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER LEFT FOOT @ HEEL Z, B01043AF.A11

Ymin = -13.03 G's @ 0.0779 Seconds, Ymax = 22.82 G's @ 0.0494 Seconds





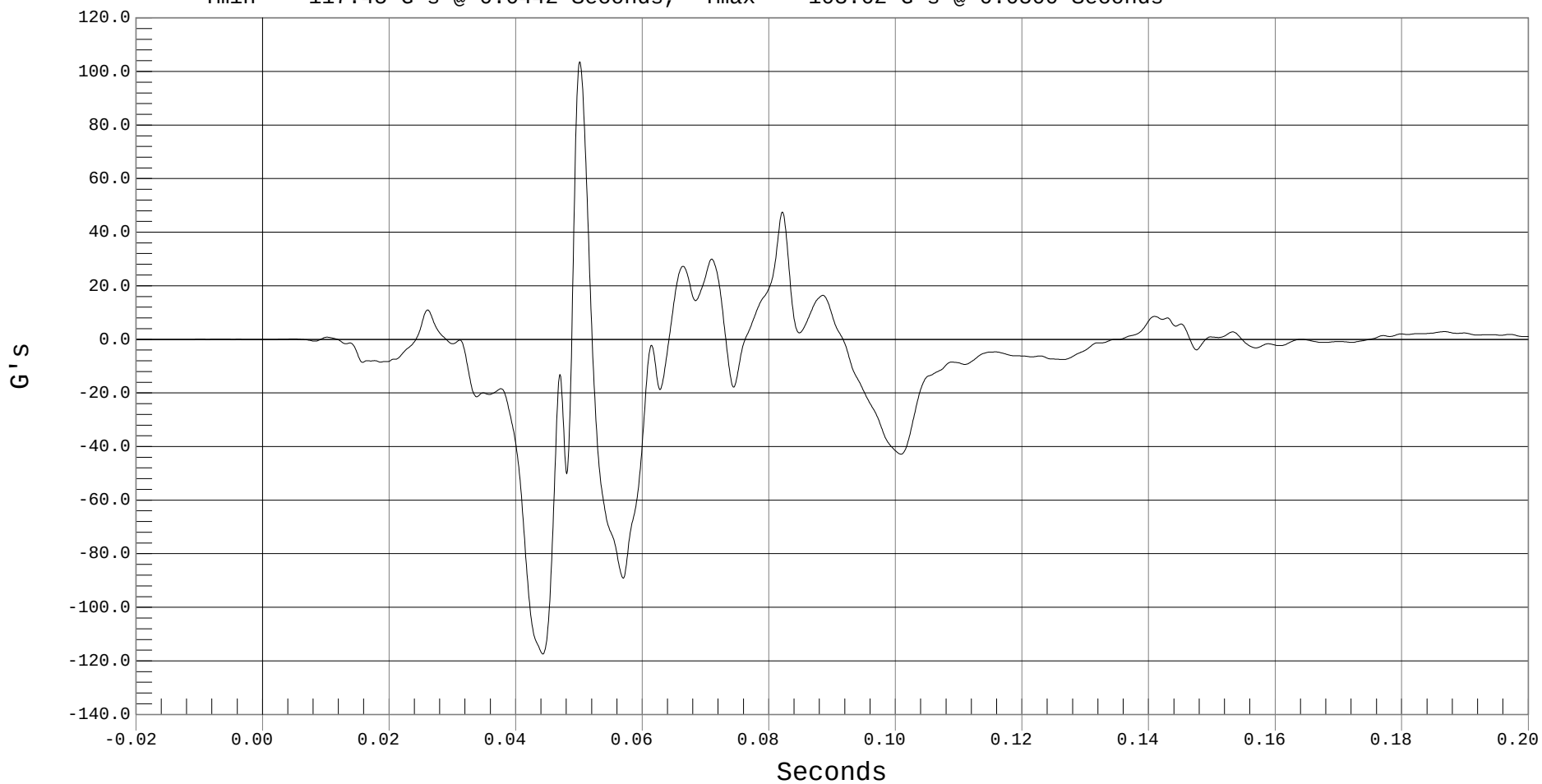
DRIVER RIGHT FOOT @ BALL Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER RIGHT FOOT @ BALL Z, B01043AF.A95

Ymin = -117.45 G's @ 0.0442 Seconds, Ymax = 103.62 G's @ 0.0500 Seconds





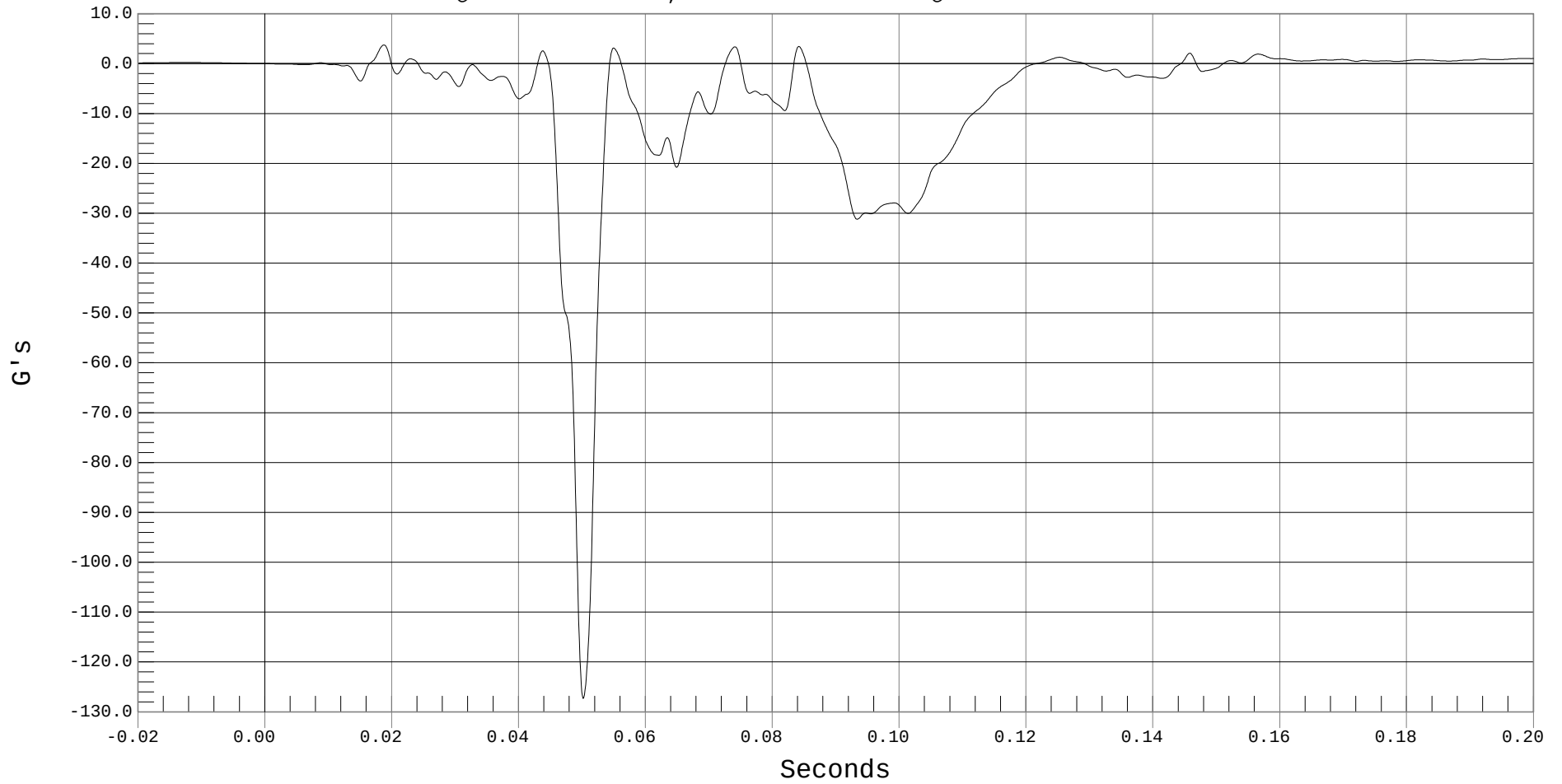
DRIVER RIGHT FOOT @ HEEL X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER RIGHT FOOT @ HEEL X, B01043AF.A93

Ymin = -127.33 G's @ 0.0501 Seconds, Ymax = 3.76 G's @ 0.0187 Seconds





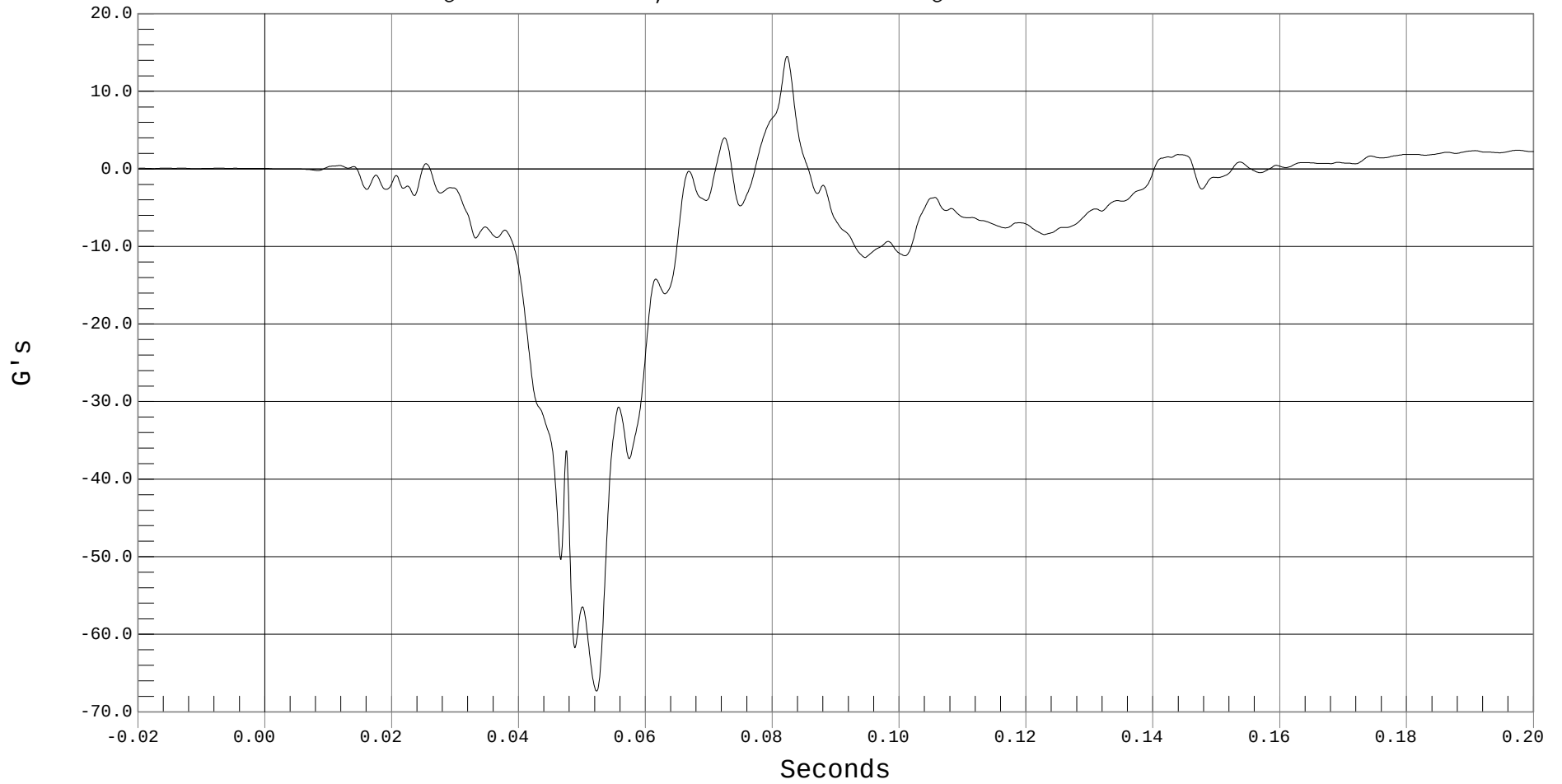
DRIVER RIGHT FOOT @ HEEL Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 DRIVER RIGHT FOOT @ HEEL Z, B01043AF.A94

Ymin = -67.33 G's @ 0.0522 Seconds, Ymax = 14.51 G's @ 0.0822 Seconds





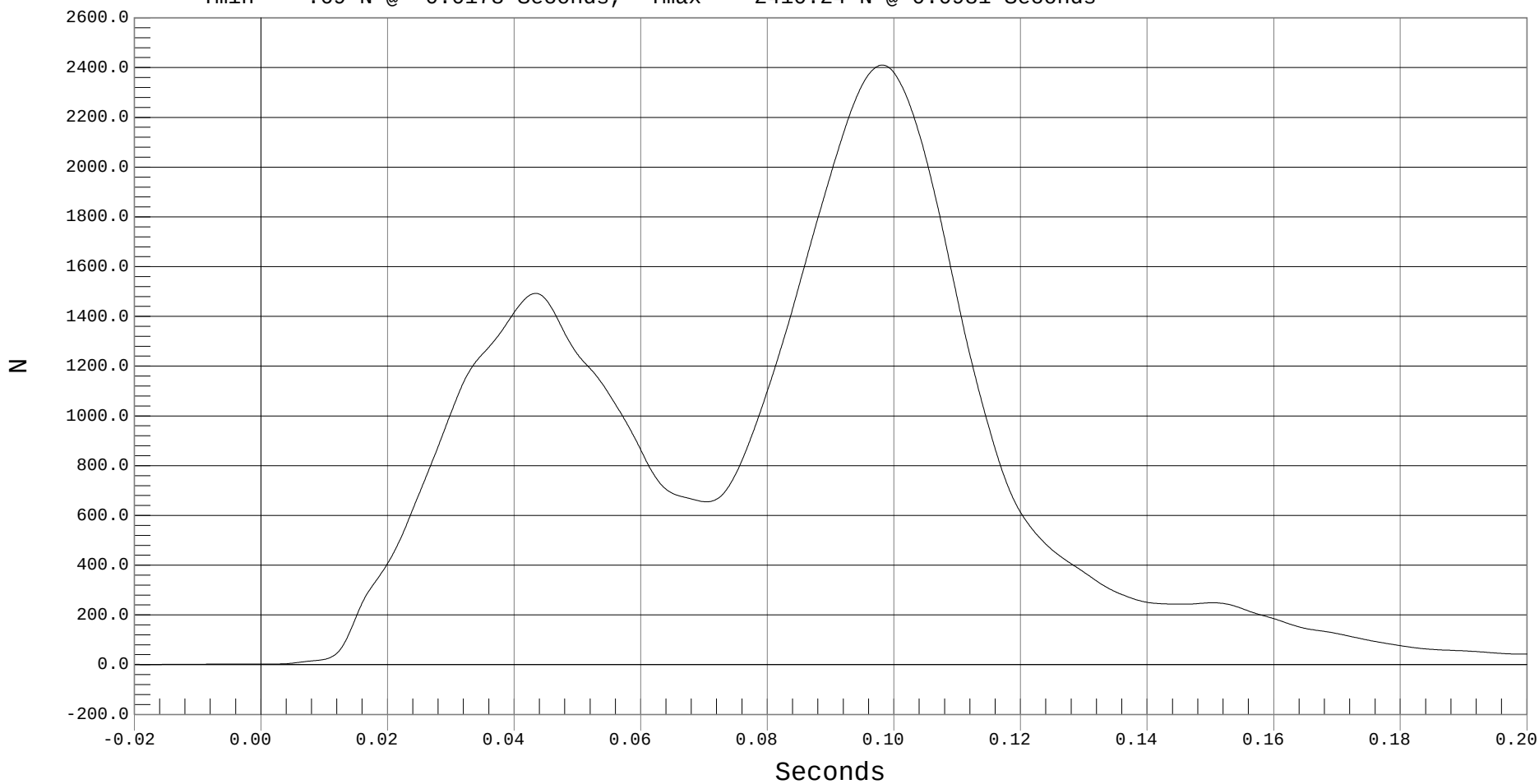
DRIVER LAP BELT FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 DRIVER LAP BELT, B01043FF.F66

Ymin = .69 N @ -0.0178 Seconds, Ymax = 2410.24 N @ 0.0981 Seconds





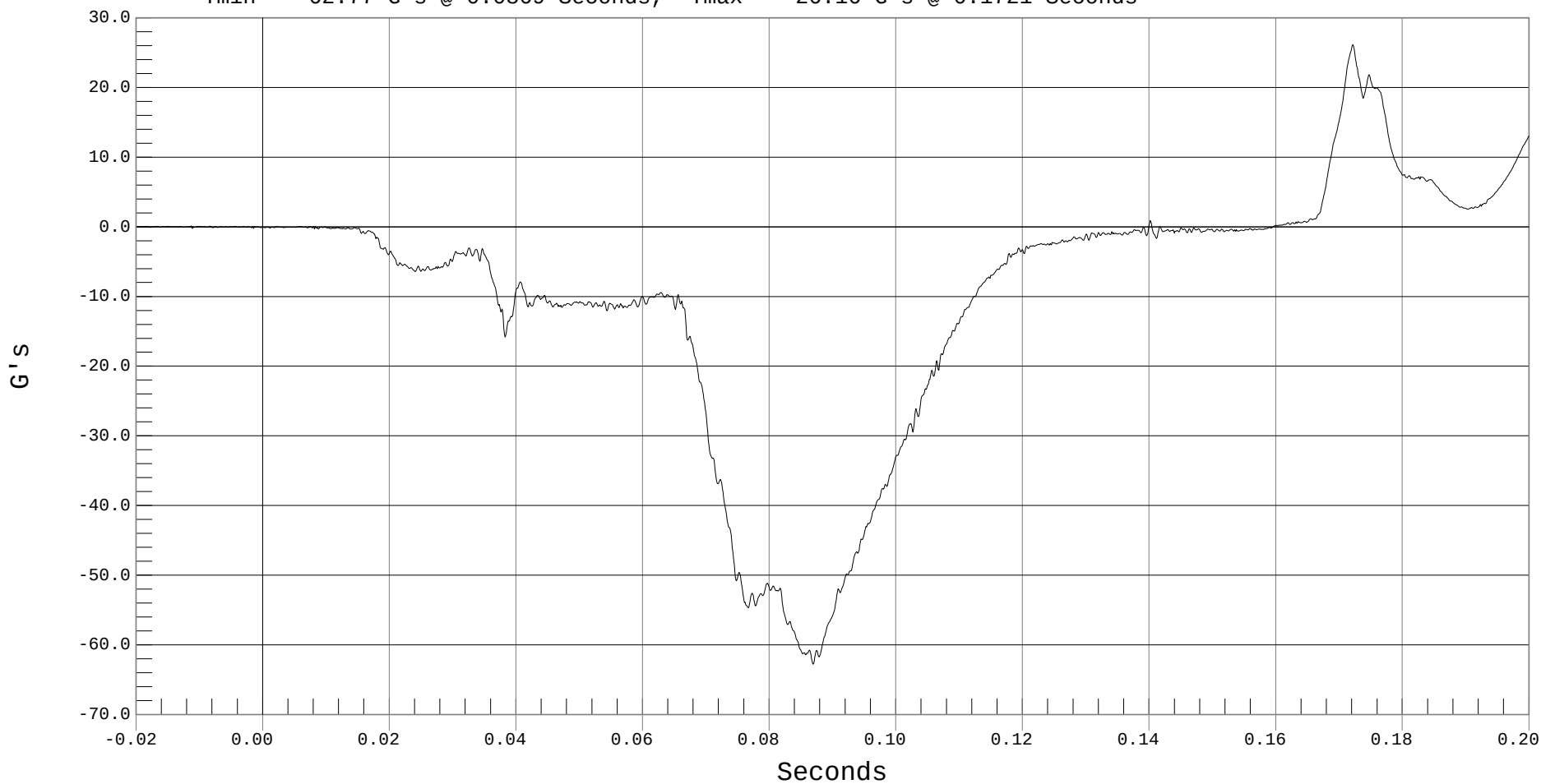
PASSENGER HEAD X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER HEAD X, B01043AT.A19

Ymin = -62.77 G's @ 0.0869 Seconds, Ymax = 26.16 G's @ 0.1721 Seconds





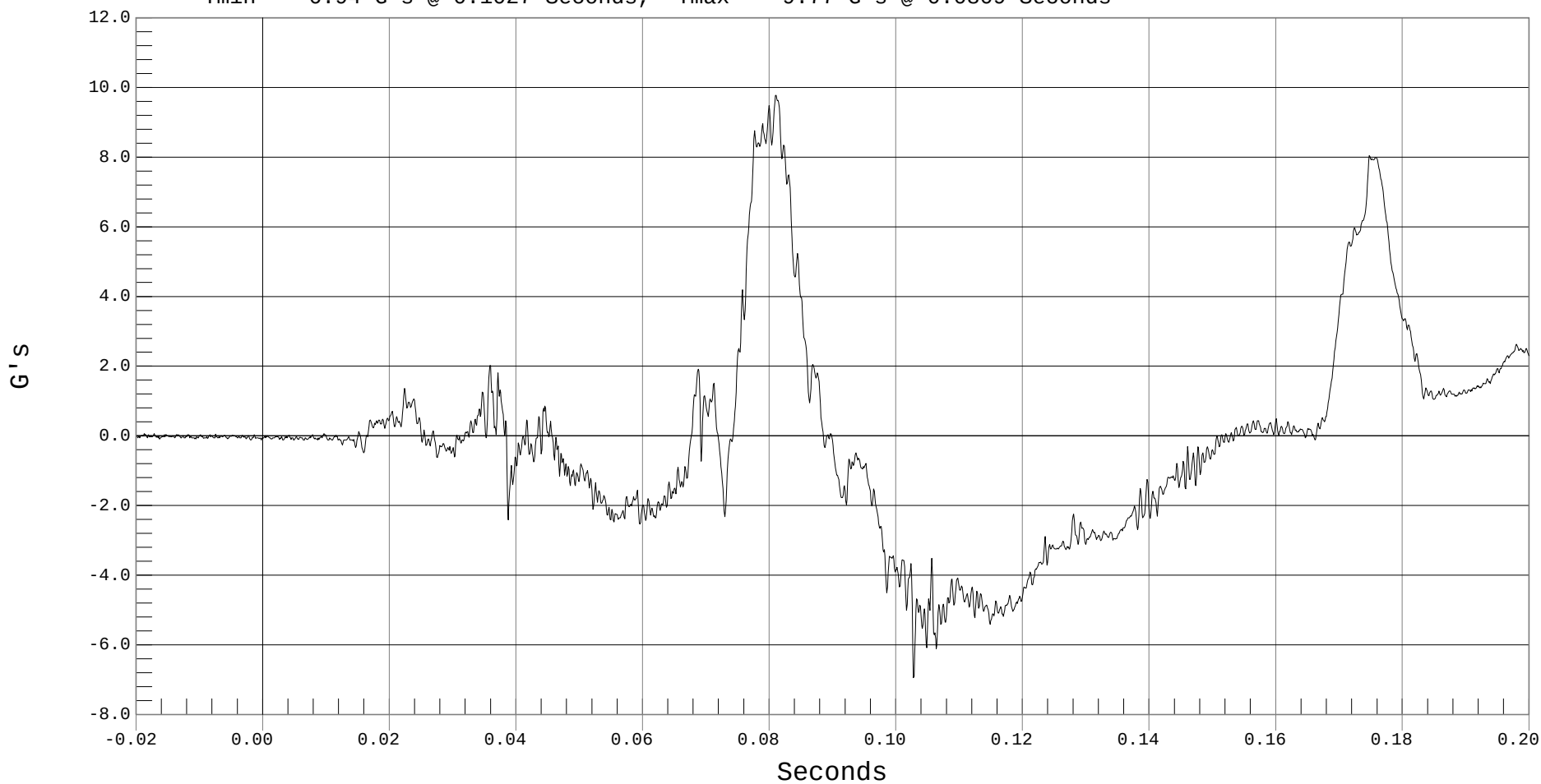
PASSENGER HEAD Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Y, B01043AT.A20

Ymin = -6.94 G's @ 0.1027 Seconds, Ymax = 9.77 G's @ 0.0809 Seconds





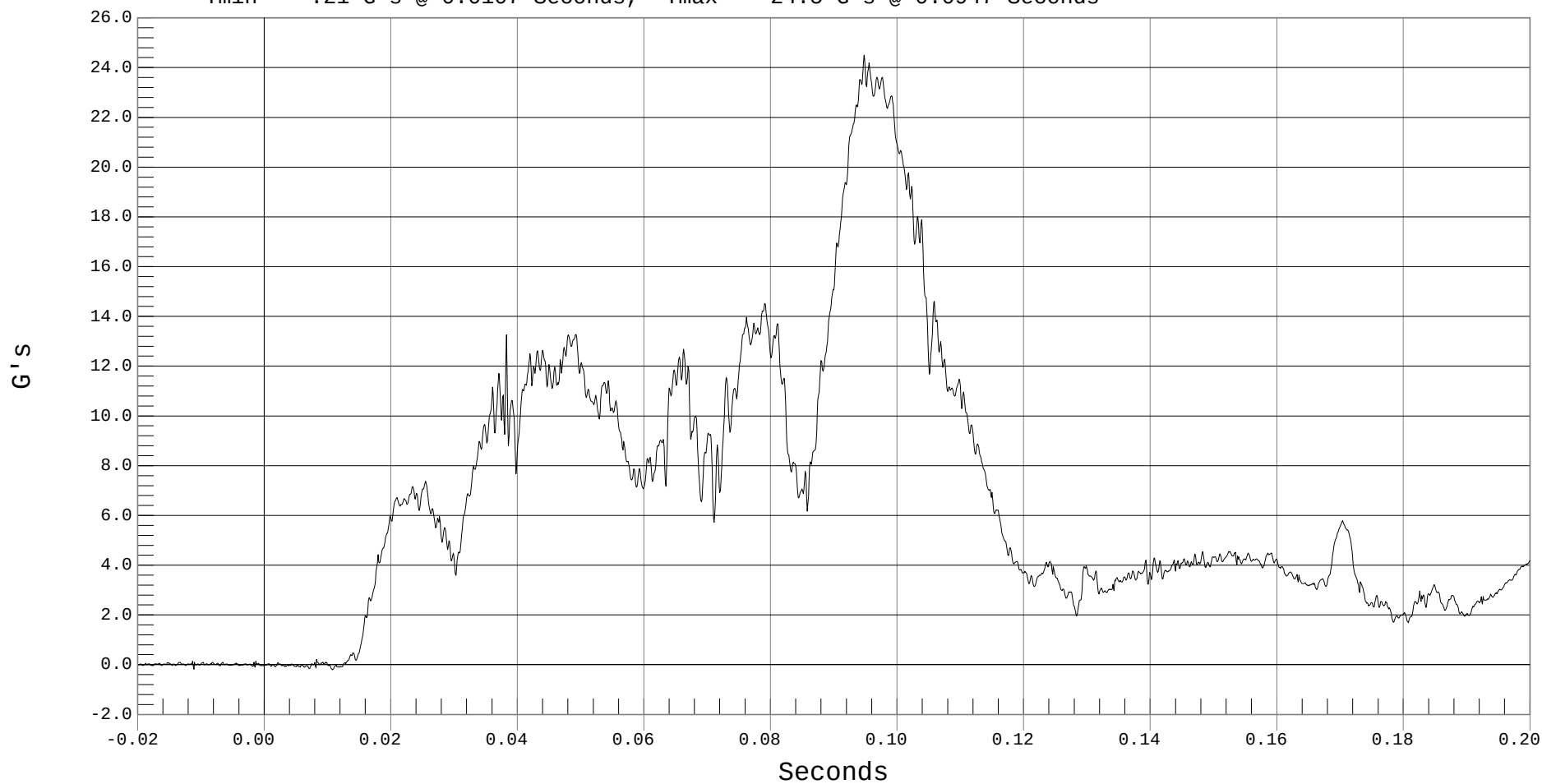
PASSENGER HEAD Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Z, B01043AT.A21

Ymin = -.21 G's @ 0.0107 Seconds, Ymax = 24.5 G's @ 0.0947 Seconds





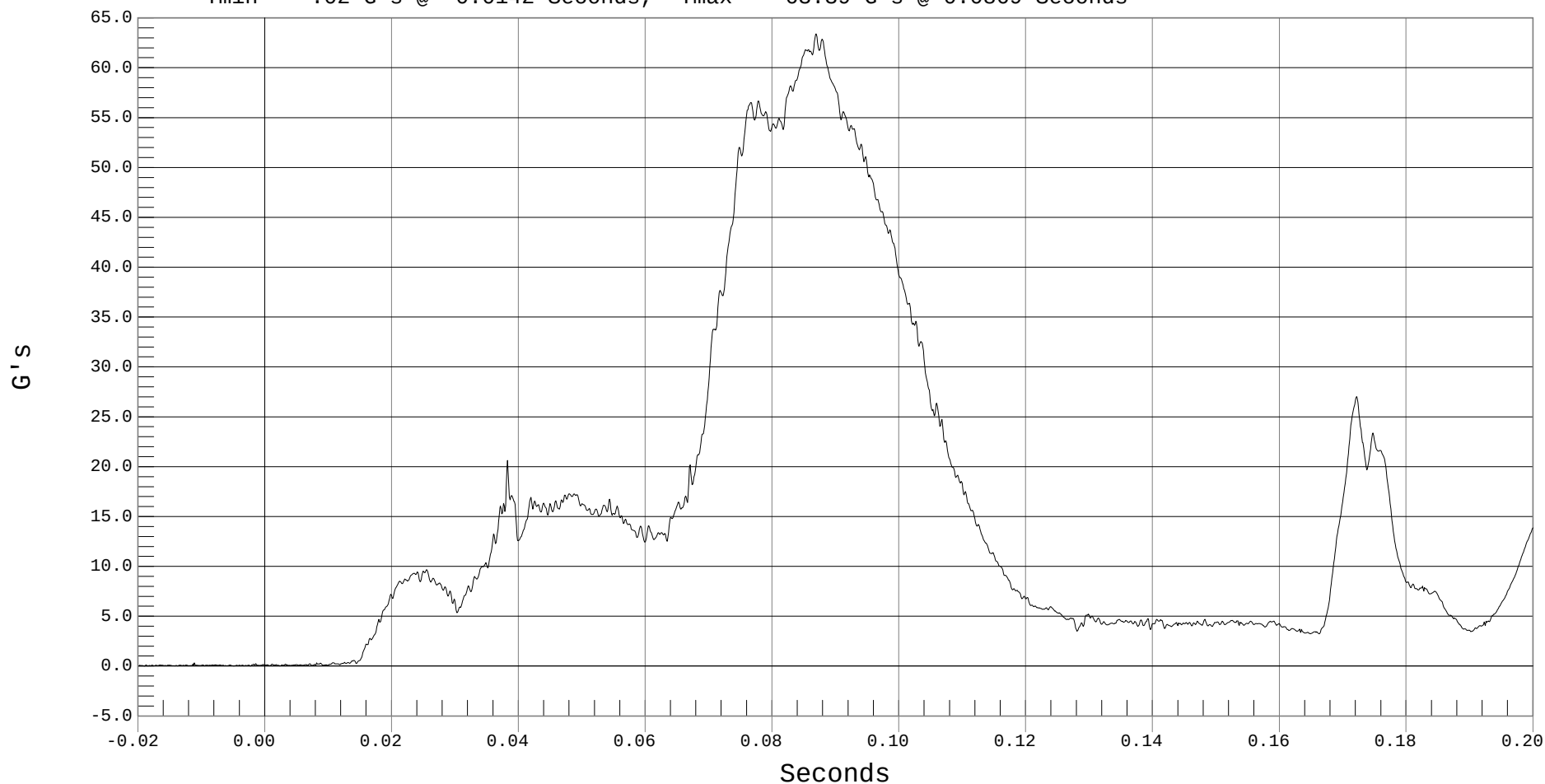
PASSENGER HEAD RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER HEAD RESULTANT ACCELERATION, B01043AV.A19

Ymin = .02 G's @ -0.0142 Seconds, Ymax = 63.39 G's @ 0.0869 Seconds





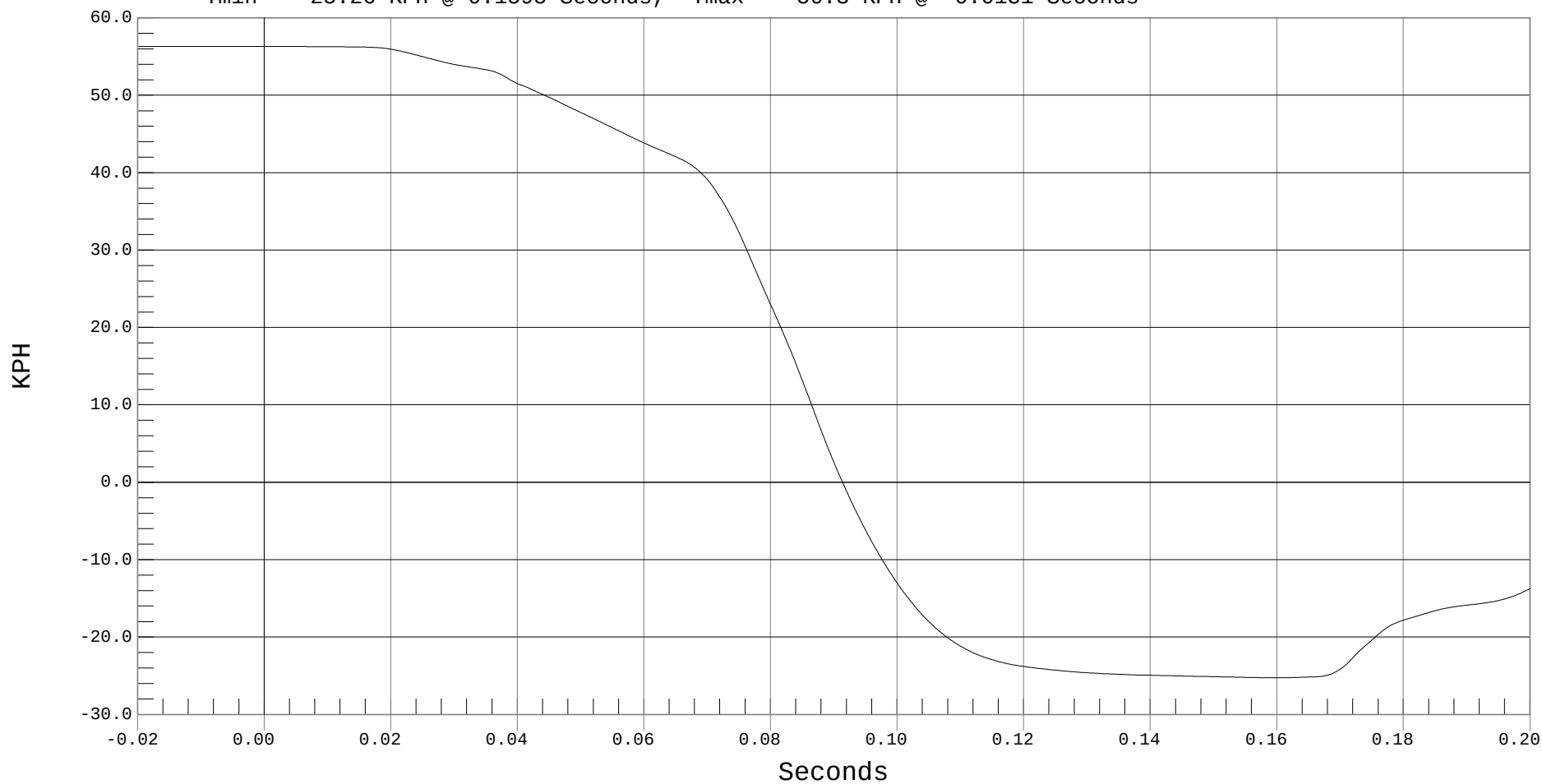
PASSENGER HEAD X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER HEAD X VELOCITY, B01043AI.V19

Ymin = -25.26 KPH @ 0.1595 Seconds, Ymax = 56.3 KPH @ -0.0131 Seconds





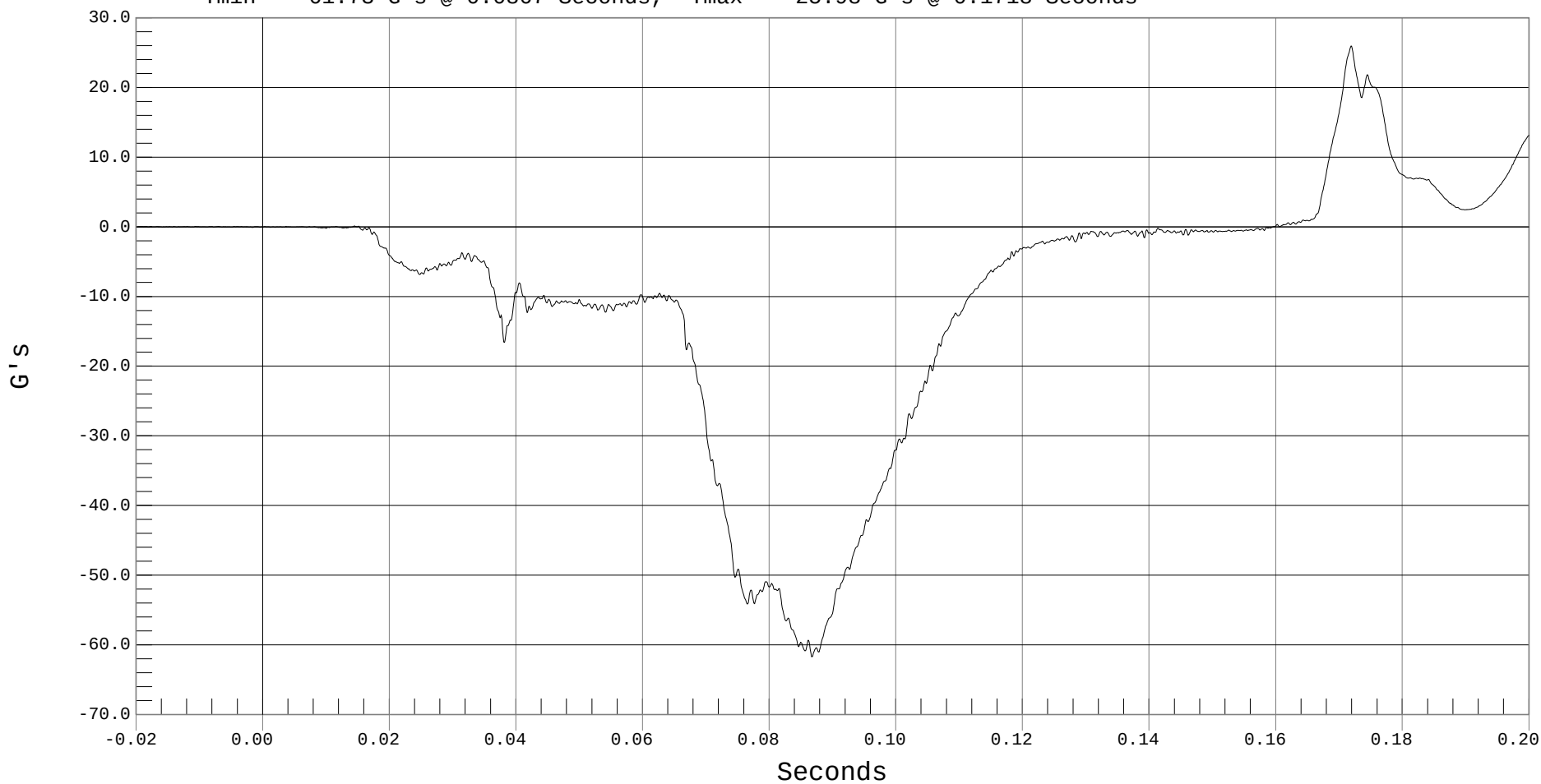
PASSENGER HEAD REDUNDANT X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Xr, B01043AT.A41

Ymin = -61.73 G's @ 0.0867 Seconds, Ymax = 25.98 G's @ 0.1718 Seconds





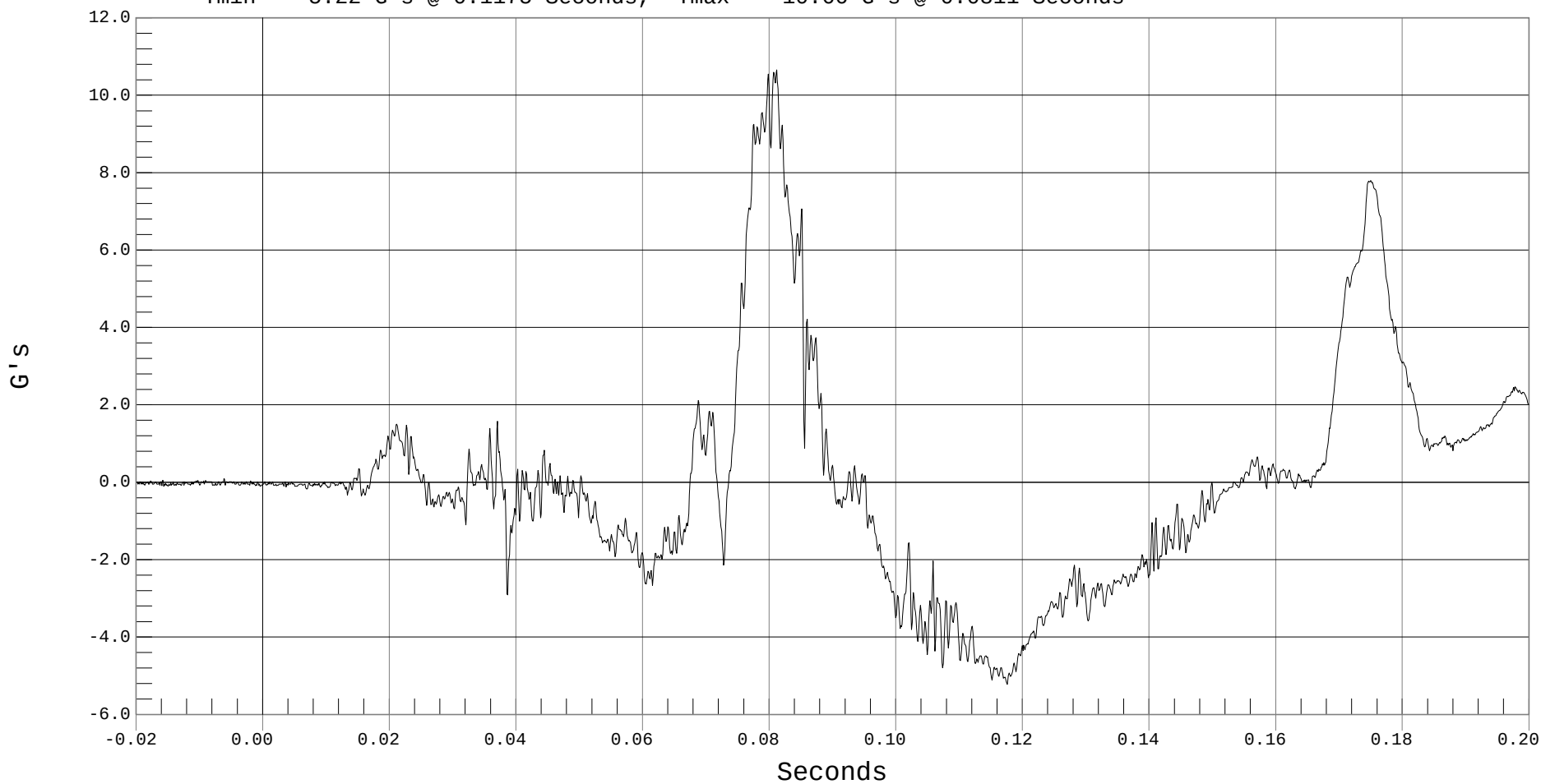
PASSENGER HEAD REDUNDANT Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Yr, B01043AT.A42

Ymin = -5.22 G's @ 0.1175 Seconds, Ymax = 10.66 G's @ 0.0811 Seconds





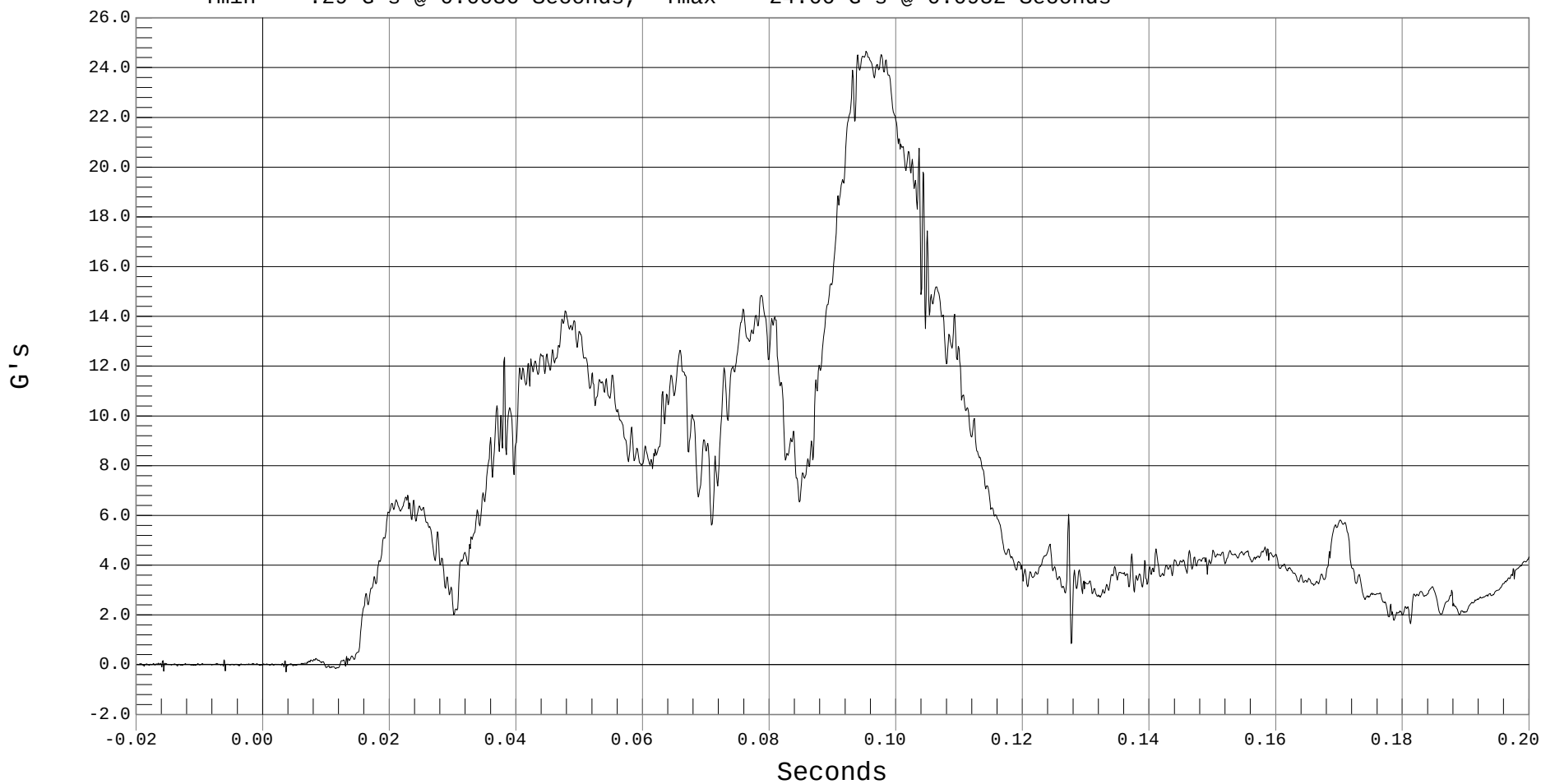
PASSENGER HEAD REDUNDANT Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Zr, B01043AT.A43

Ymin = -.29 G's @ 0.0036 Seconds, Ymax = 24.66 G's @ 0.0952 Seconds





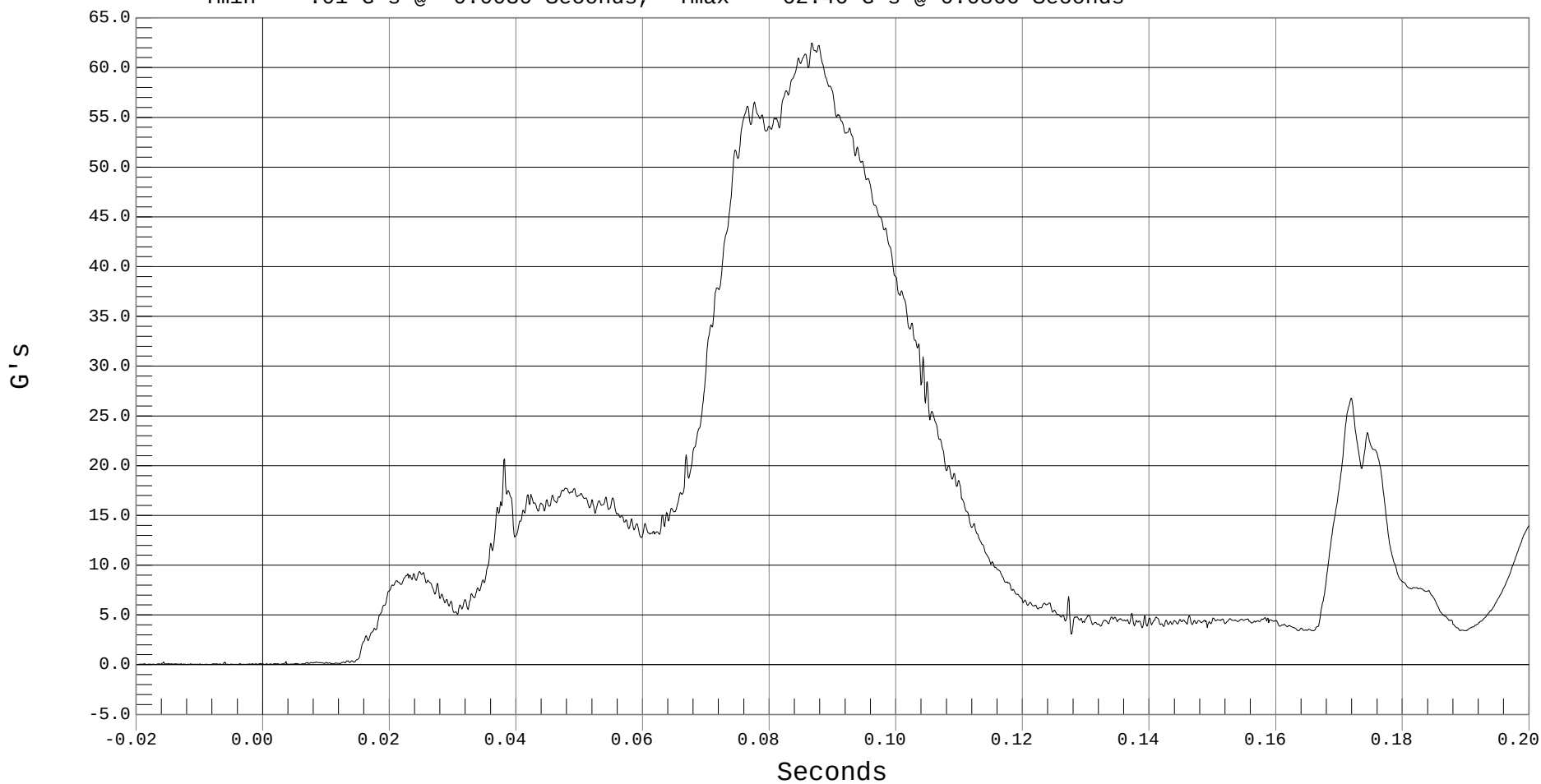
PASSENGER HEAD REDUNDANT RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER HEAD REDUNDANT RESULTANT ACCELERATION, B01043AV.A41

Ymin = .01 G's @ -0.0030 Seconds, Ymax = 62.46 G's @ 0.0866 Seconds





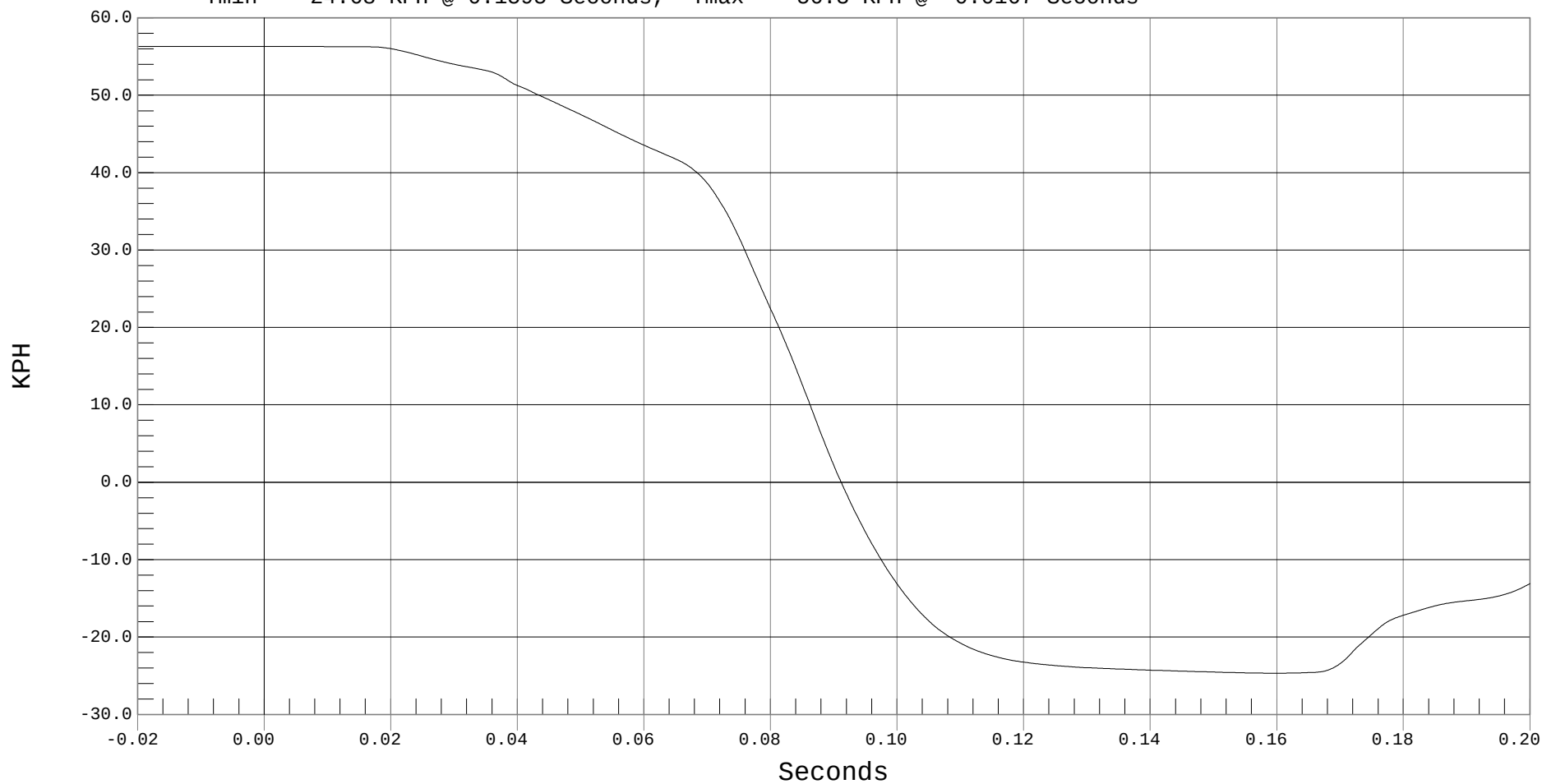
PASSENGER HEAD REDUNDANT X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER HEAD REDUNDANT X VELOCITY, B01043AI.V41

Ymin = -24.68 KPH @ 0.1595 Seconds, Ymax = 56.3 KPH @ -0.0167 Seconds





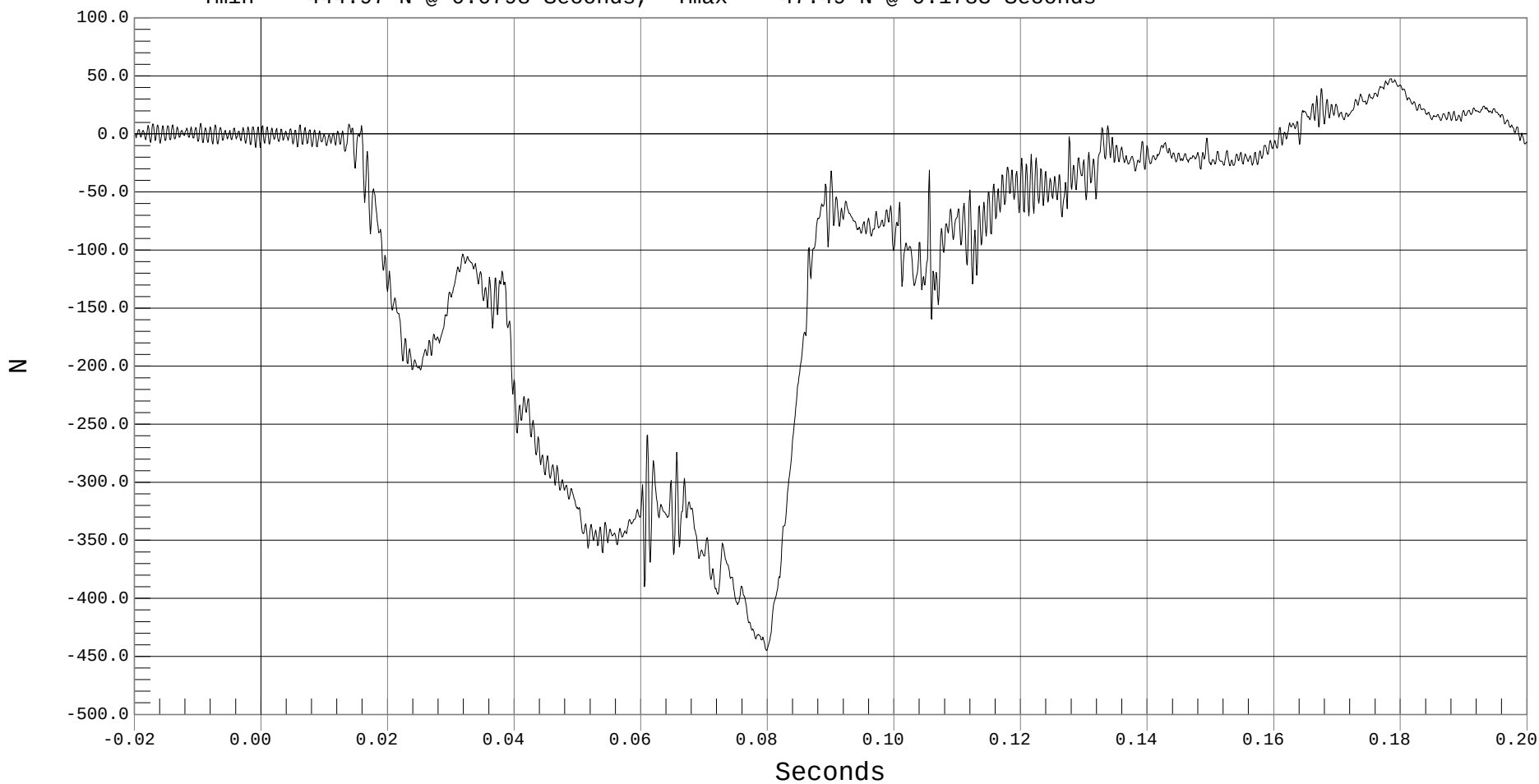
PASSENGER NECK FORCE X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER NECK FX, B01043FT.F44

Ymin = -444.97 N @ 0.0798 Seconds, Ymax = 47.49 N @ 0.1783 Seconds





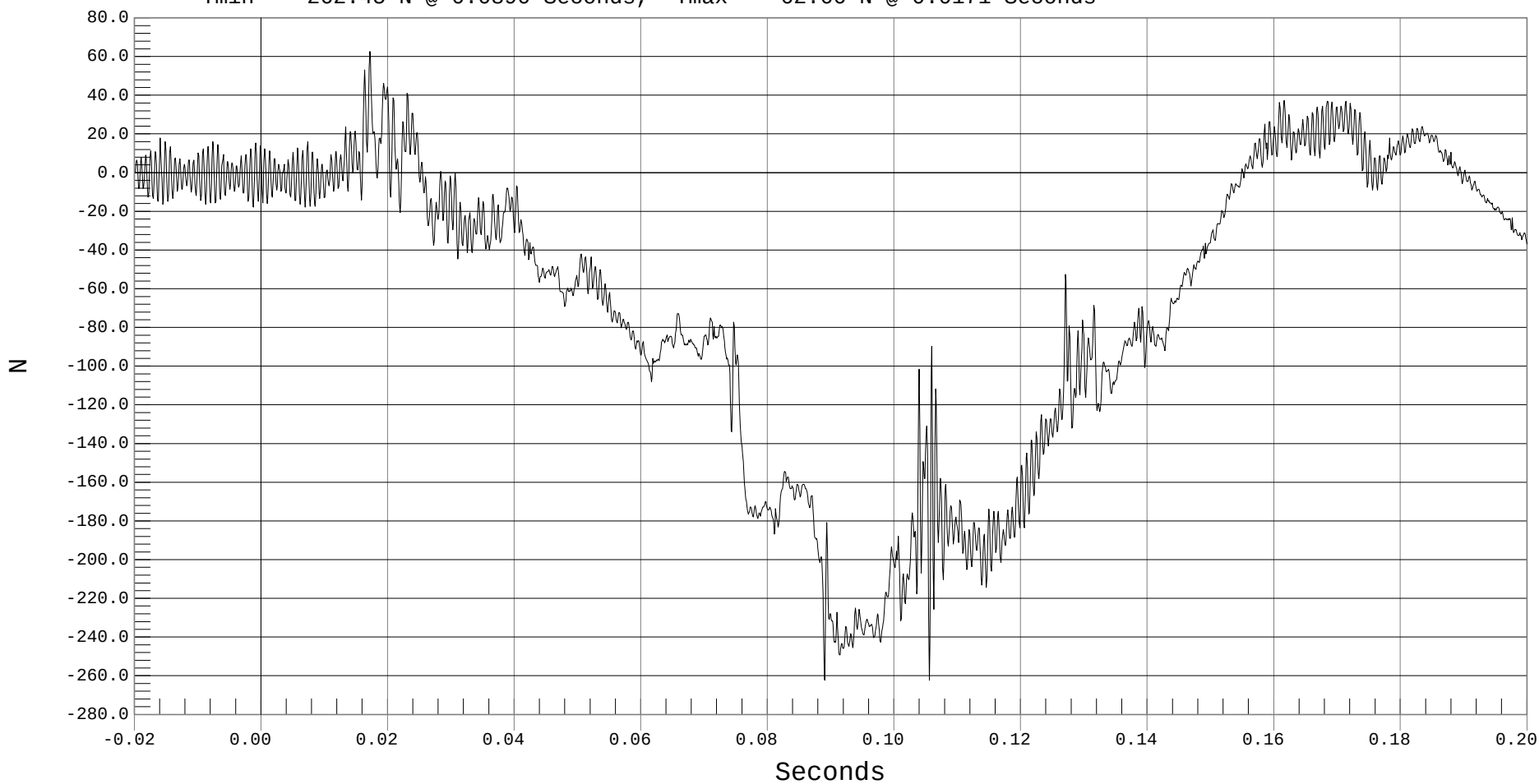
PASSENGER NECK FORCE Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER NECK FY, B01043FT.F45

Ymin = -262.45 N @ 0.0890 Seconds, Ymax = 62.66 N @ 0.0171 Seconds





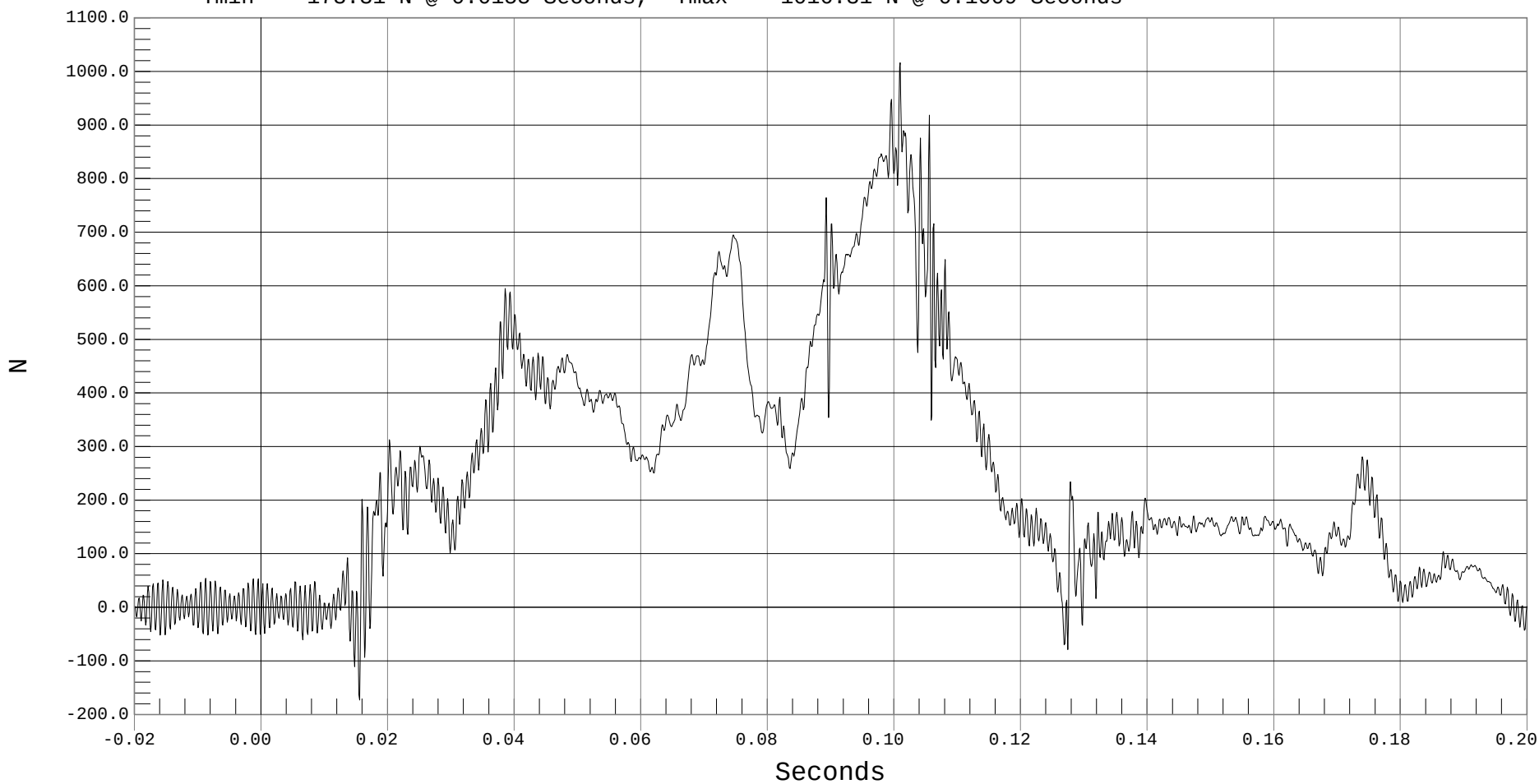
PASSENGER NECK FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER NECK FZ, B01043FT.F46

Ymin = -173.31 N @ 0.0155 Seconds, Ymax = 1016.31 N @ 0.1009 Seconds





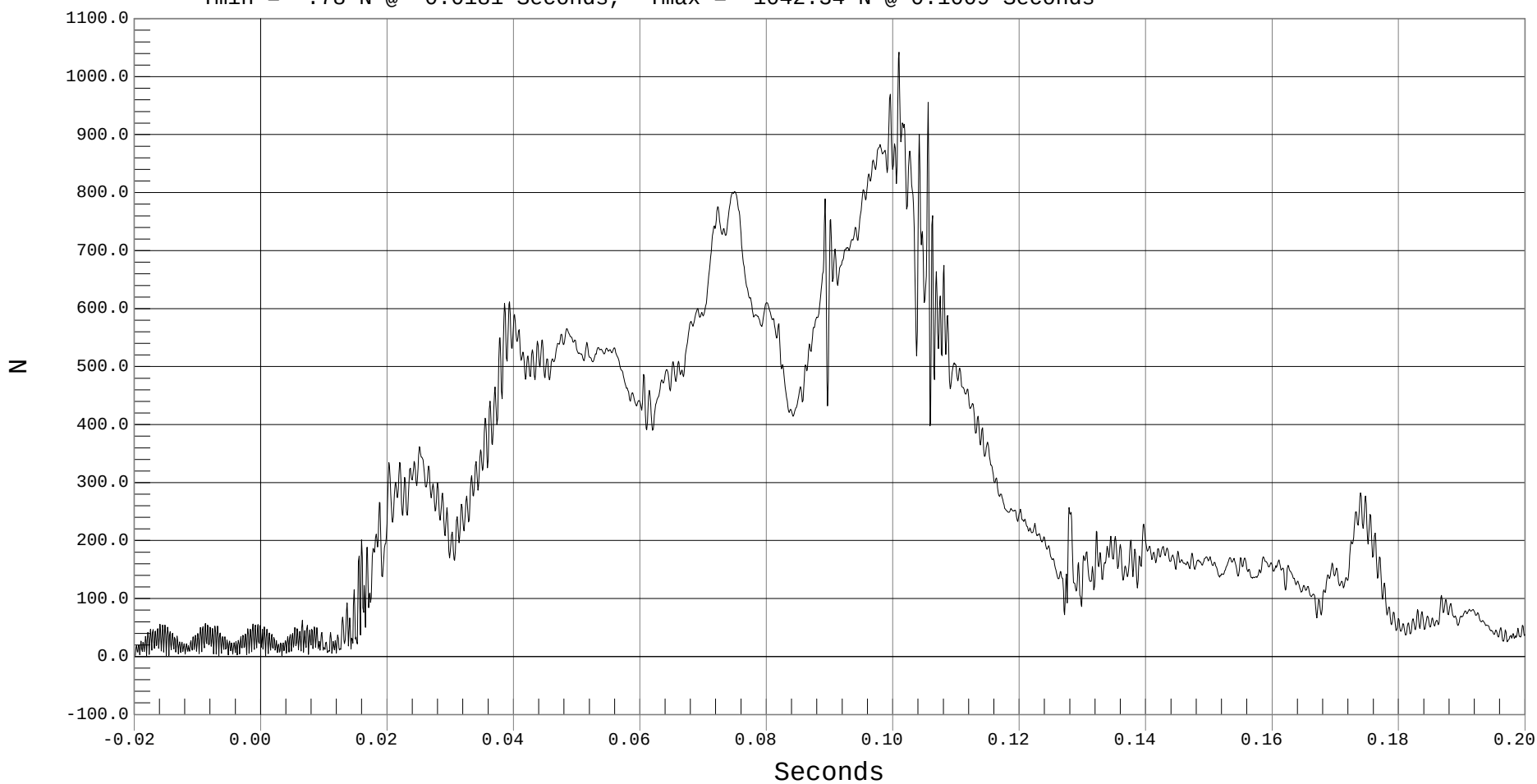
PASSENGER NECK FORCE RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER NECK FORCE RESULTANT, B01043FV.F44

Ymin = .78 N @ -0.0181 Seconds, Ymax = 1042.34 N @ 0.1009 Seconds





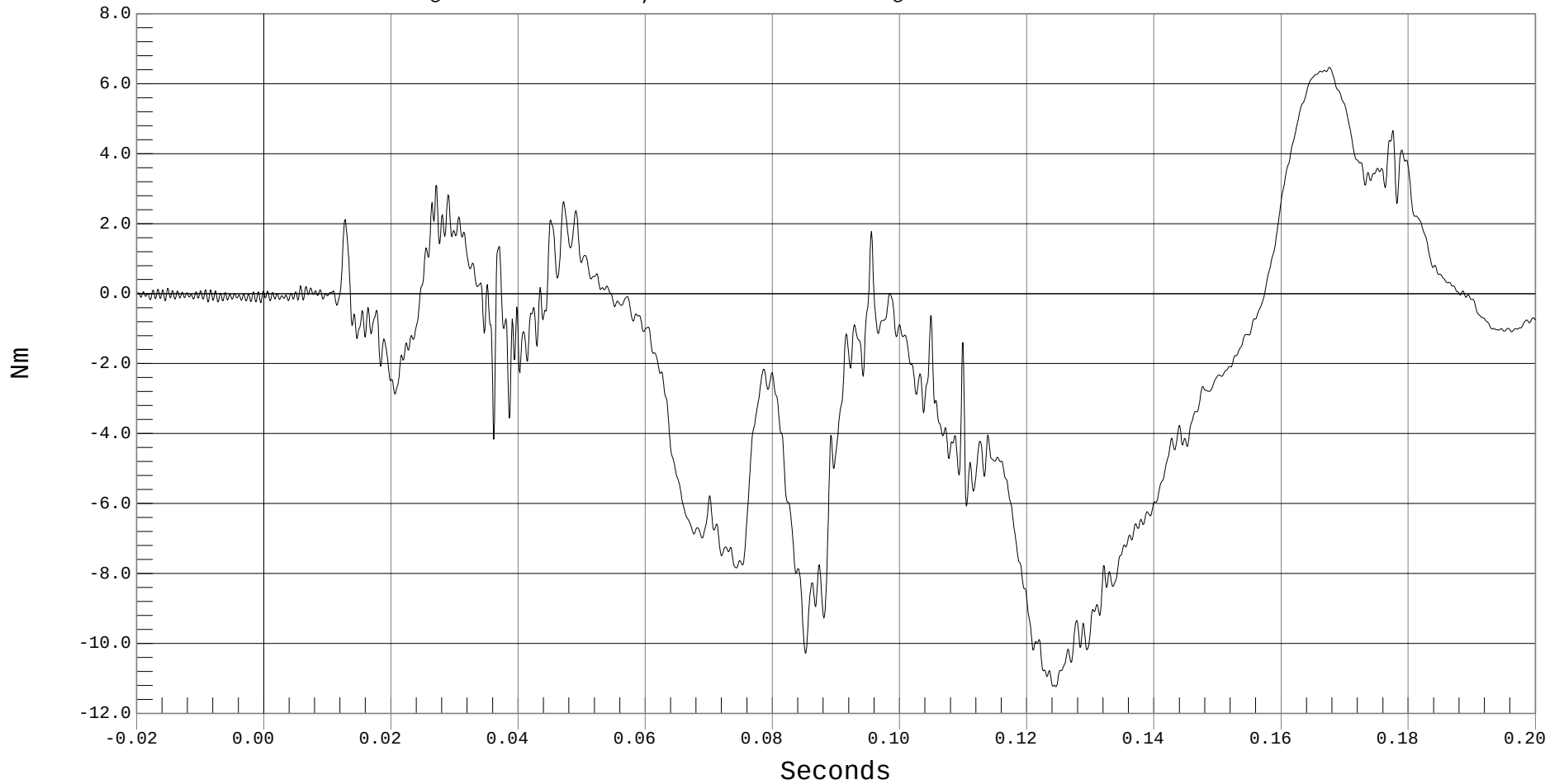
PASSENGER NECK MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER NECK MX, B01043MF.M47

Ymin = -11.24 Nm @ 0.1245 Seconds, Ymax = 6.47 Nm @ 0.1675 Seconds





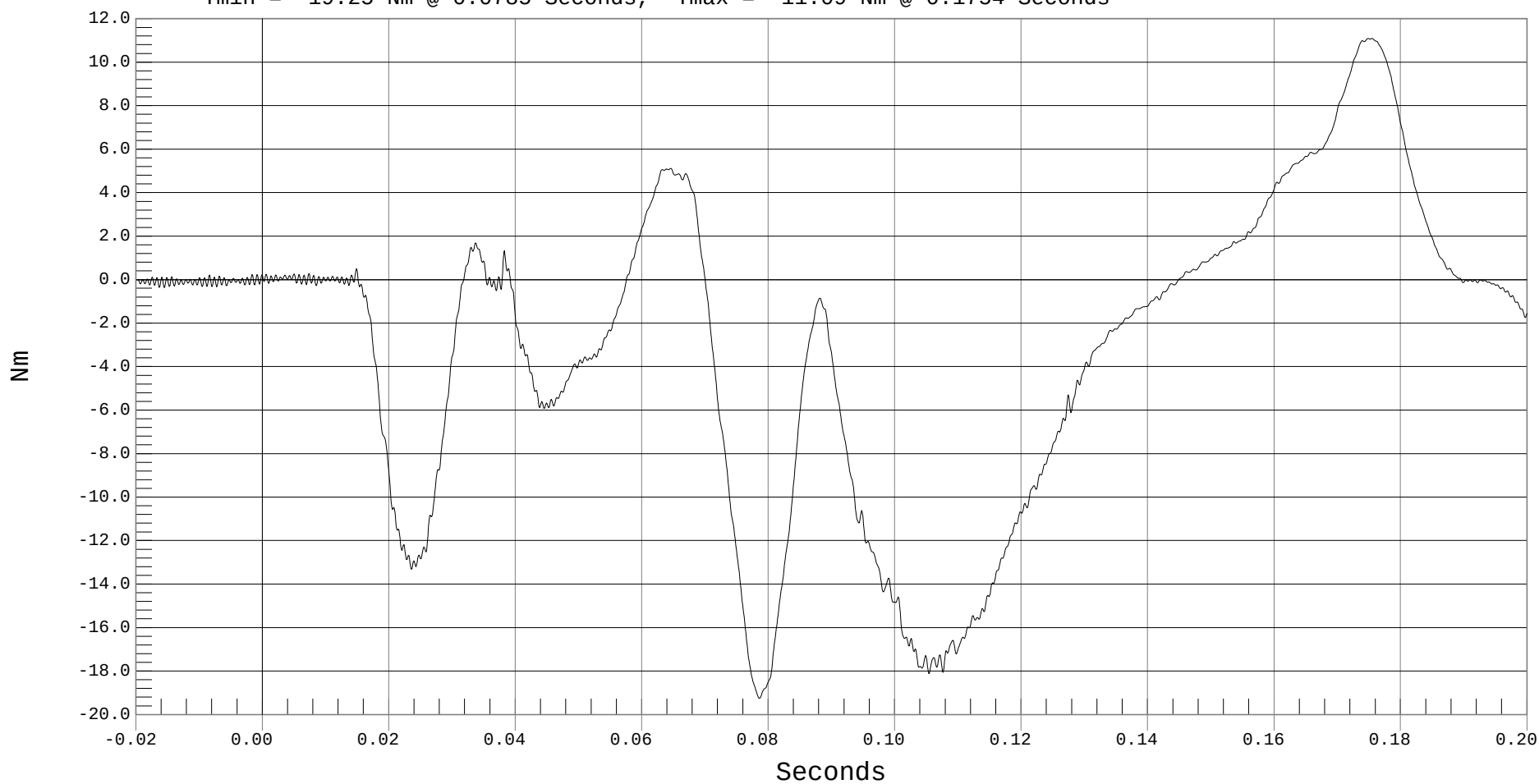
PASSENGER NECK MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER NECK MY, B01043MF.M48

Ymin = -19.25 Nm @ 0.0785 Seconds, Ymax = 11.09 Nm @ 0.1754 Seconds





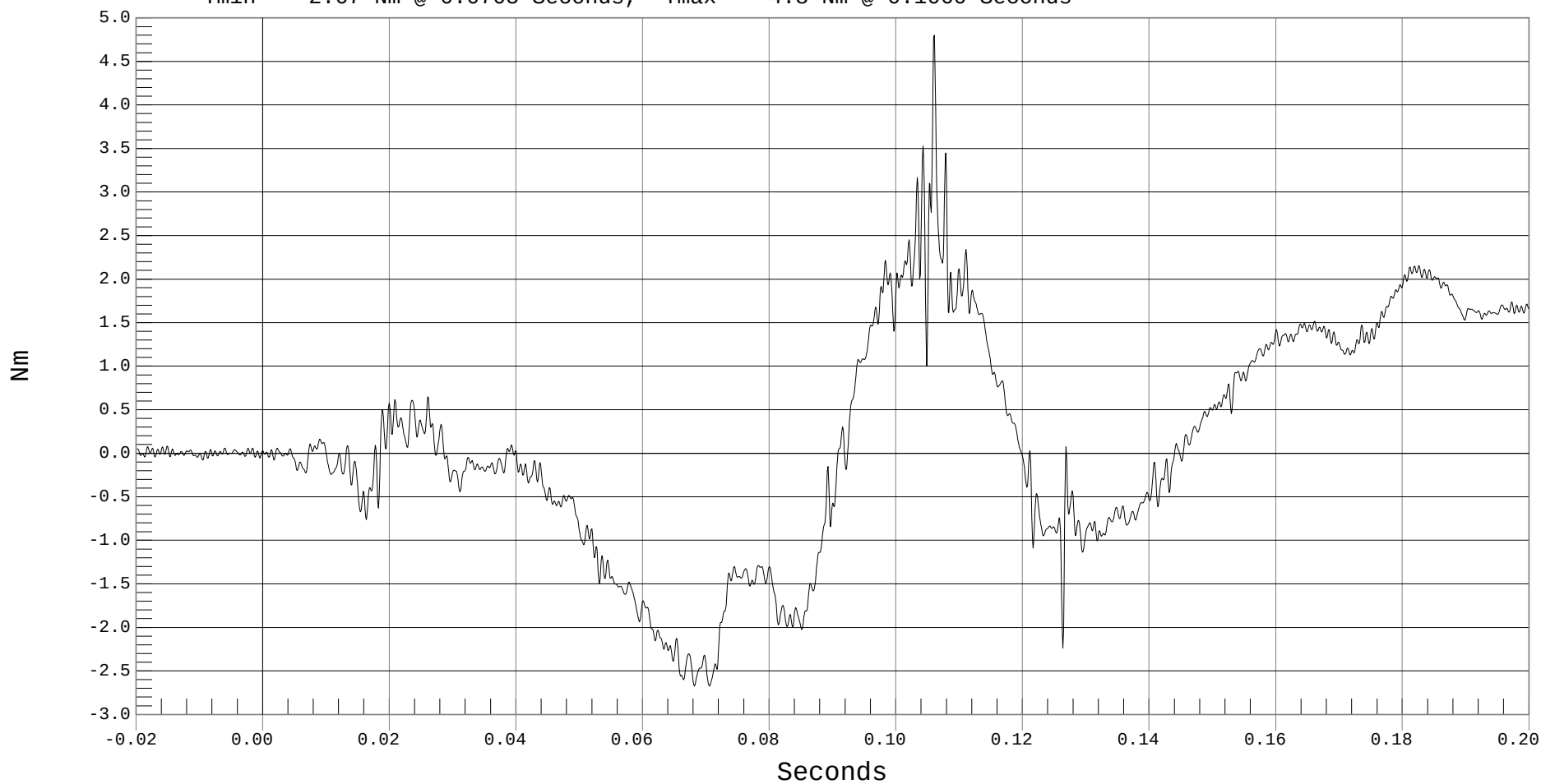
PASSENGER NECK MOMENT Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER NECK MZ, B01043MF.M49

Ymin = -2.67 Nm @ 0.0705 Seconds, Ymax = 4.8 Nm @ 0.1060 Seconds





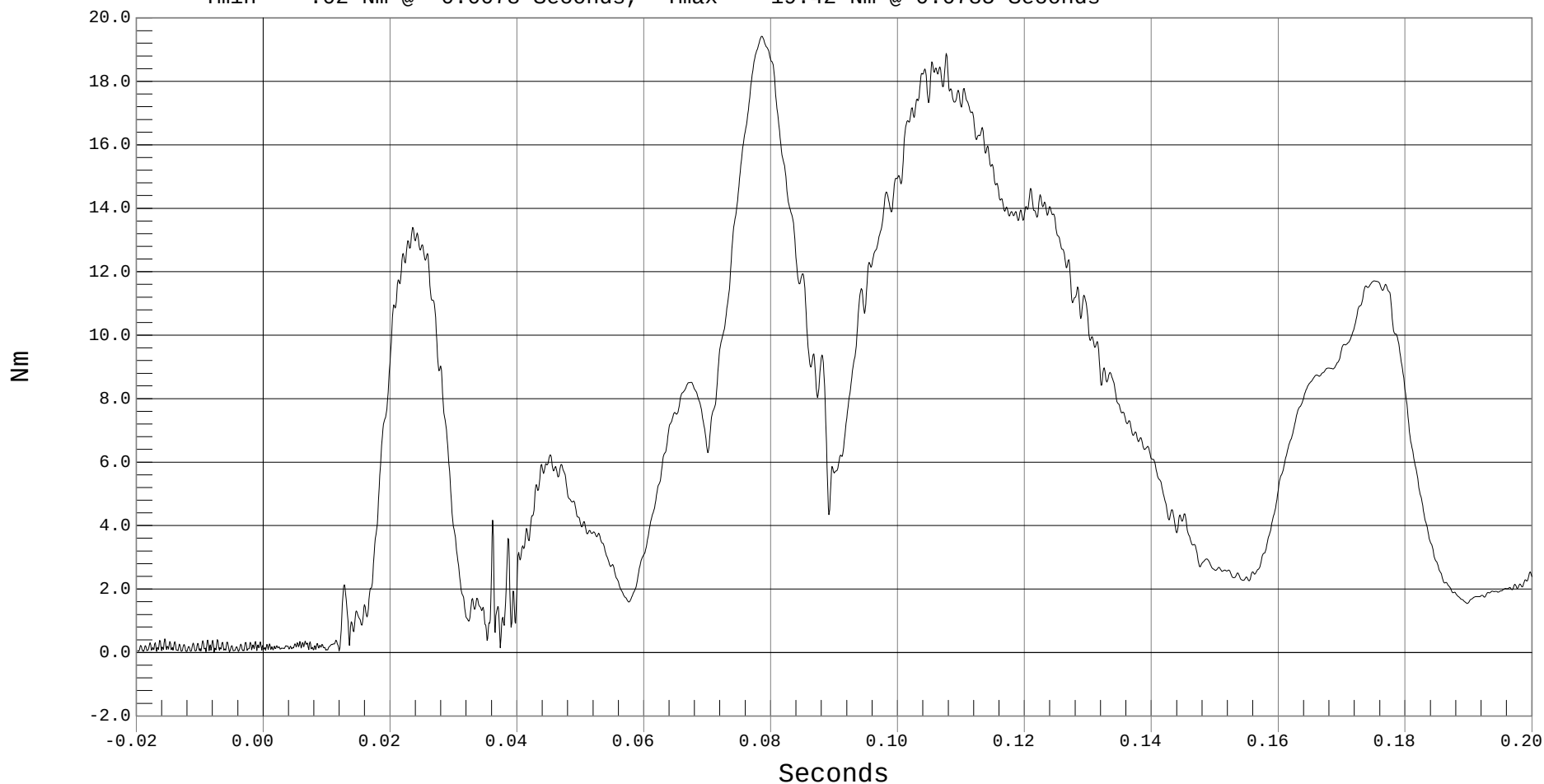
PASSENGER NECK MOMENT RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER NECK MOMENT RESULTANT, B01043MV.M47

Ymin = .02 Nm @ -0.0078 Seconds, Ymax = 19.42 Nm @ 0.0785 Seconds





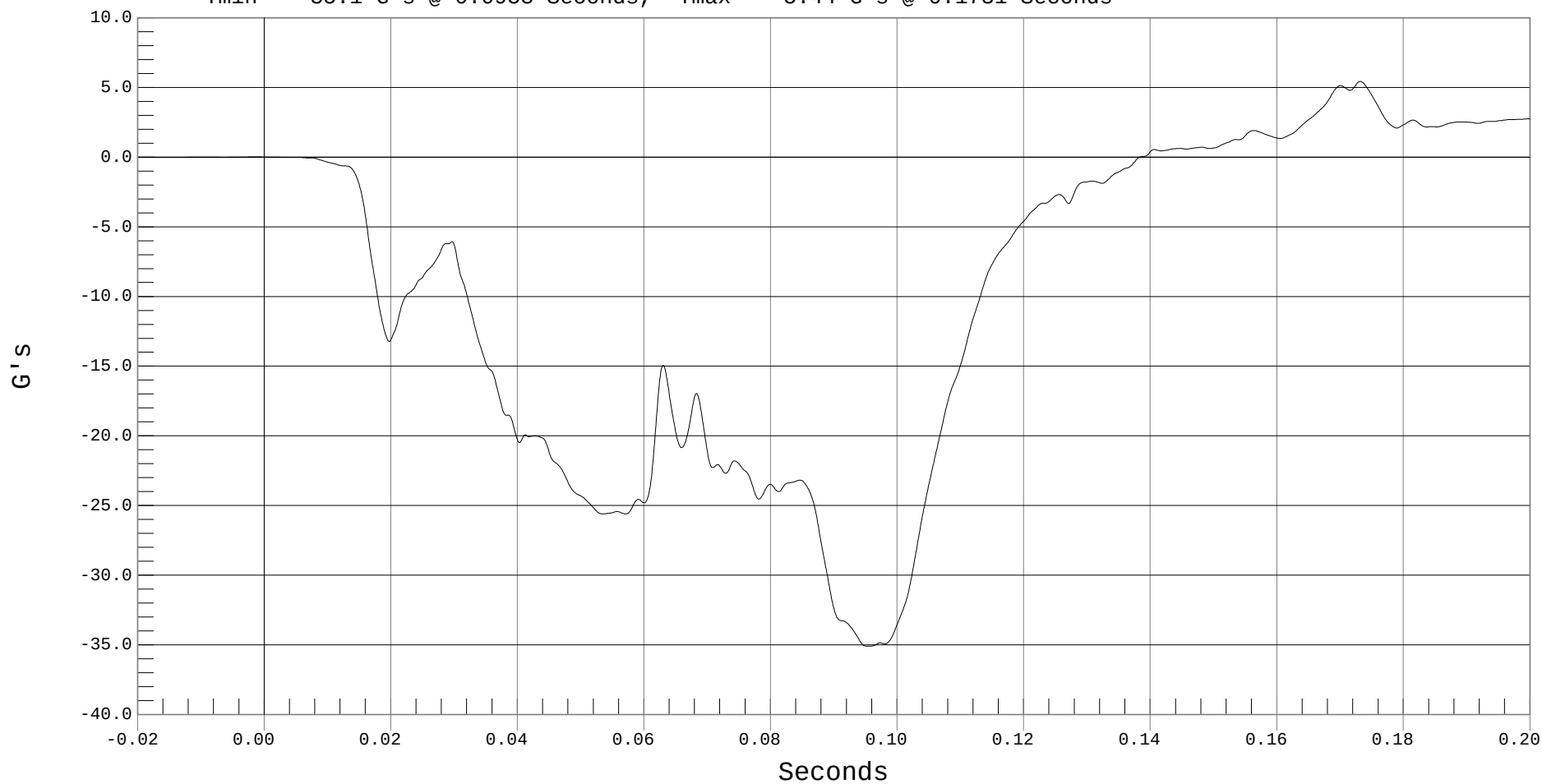
PASSENGER CHEST X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST X, B01043AF.A22

Ymin = -35.1 G's @ 0.0953 Seconds, Ymax = 5.44 G's @ 0.1731 Seconds





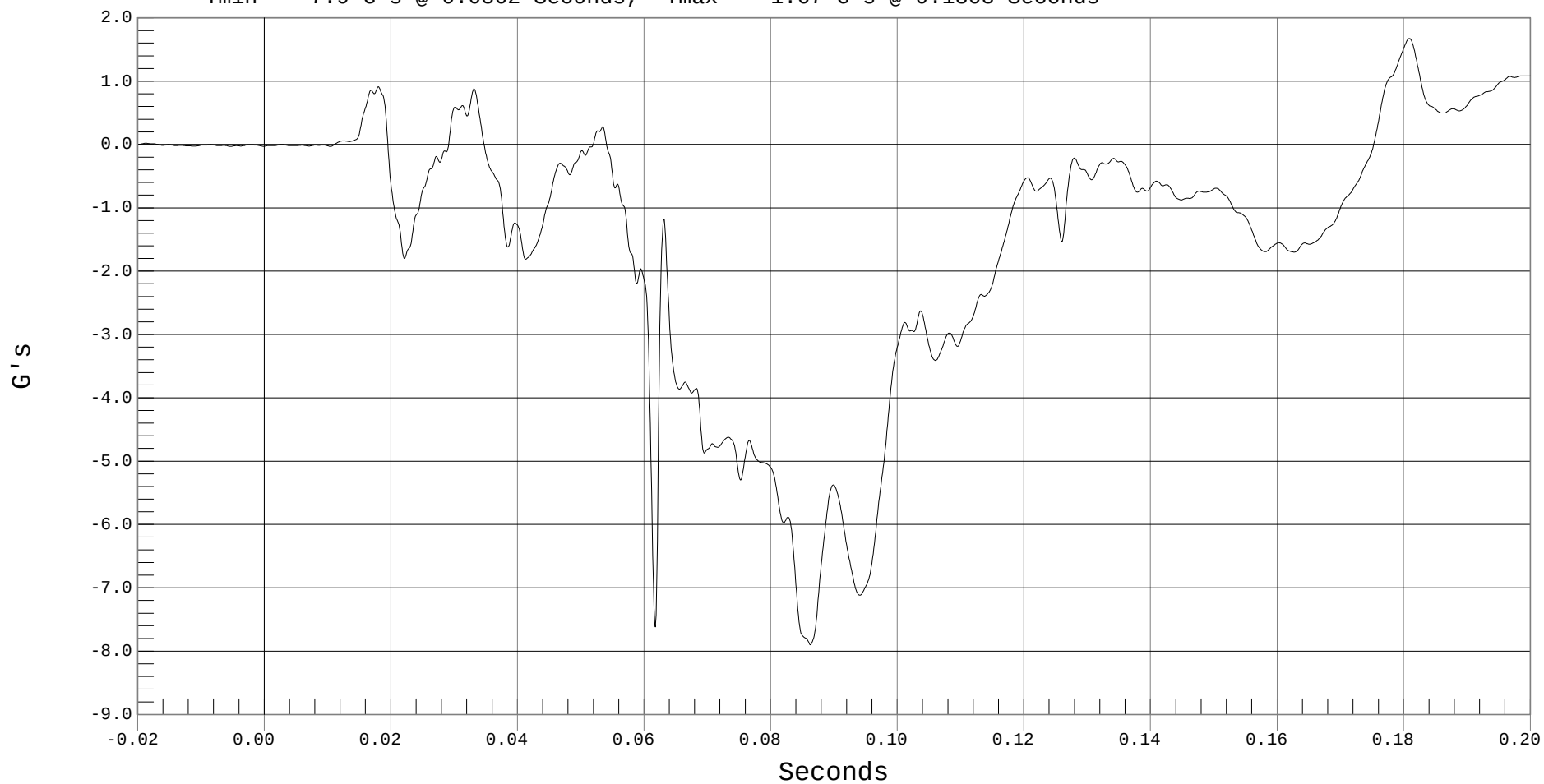
PASSENGER CHEST Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST Y, B01043AF.A23

Ymin = -7.9 G's @ 0.0862 Seconds, Ymax = 1.67 G's @ 0.1808 Seconds





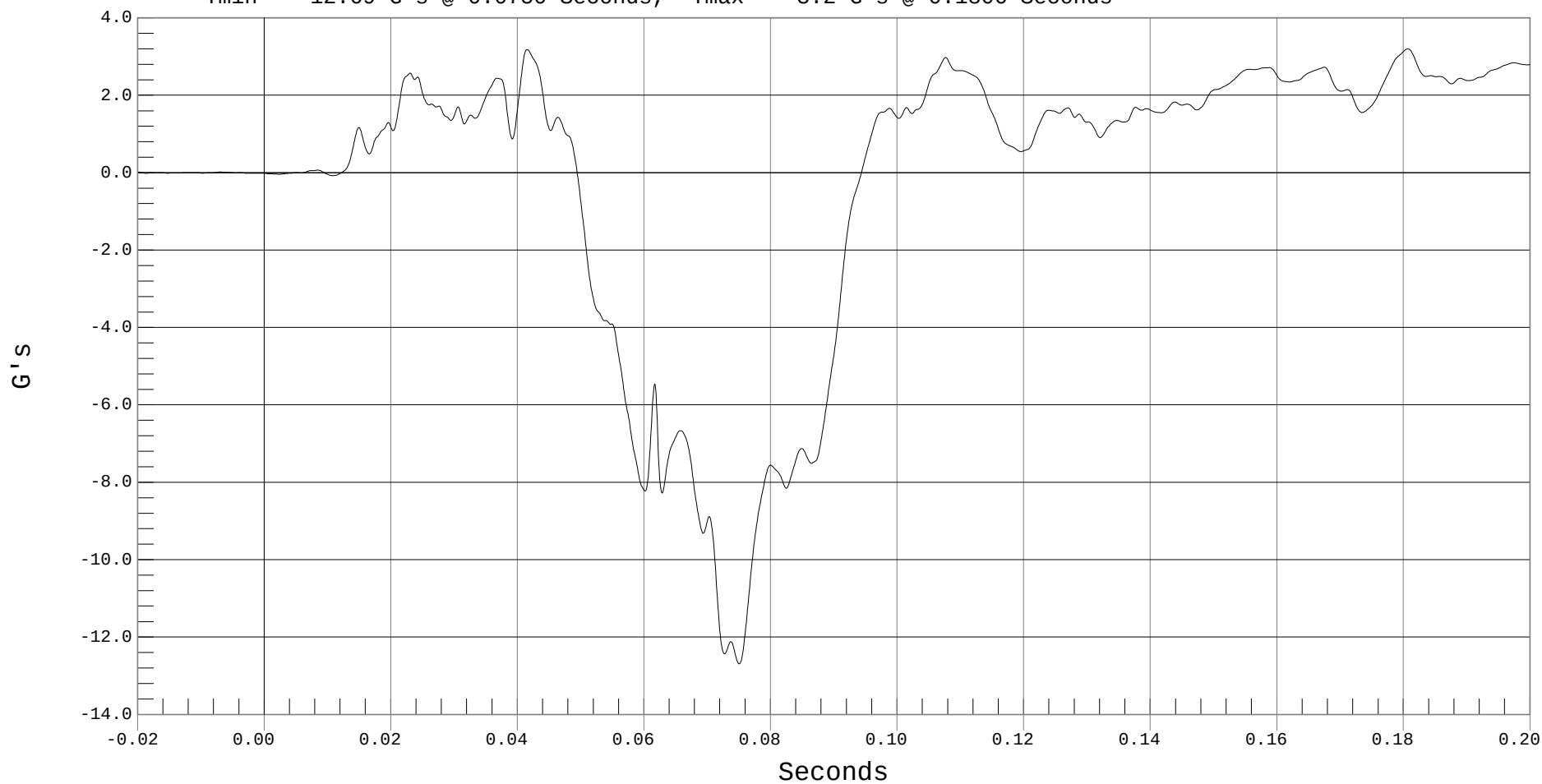
PASSENGER CHEST Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST Z, B01043AF.A24

Ymin = -12.69 G's @ 0.0750 Seconds, Ymax = 3.2 G's @ 0.1806 Seconds





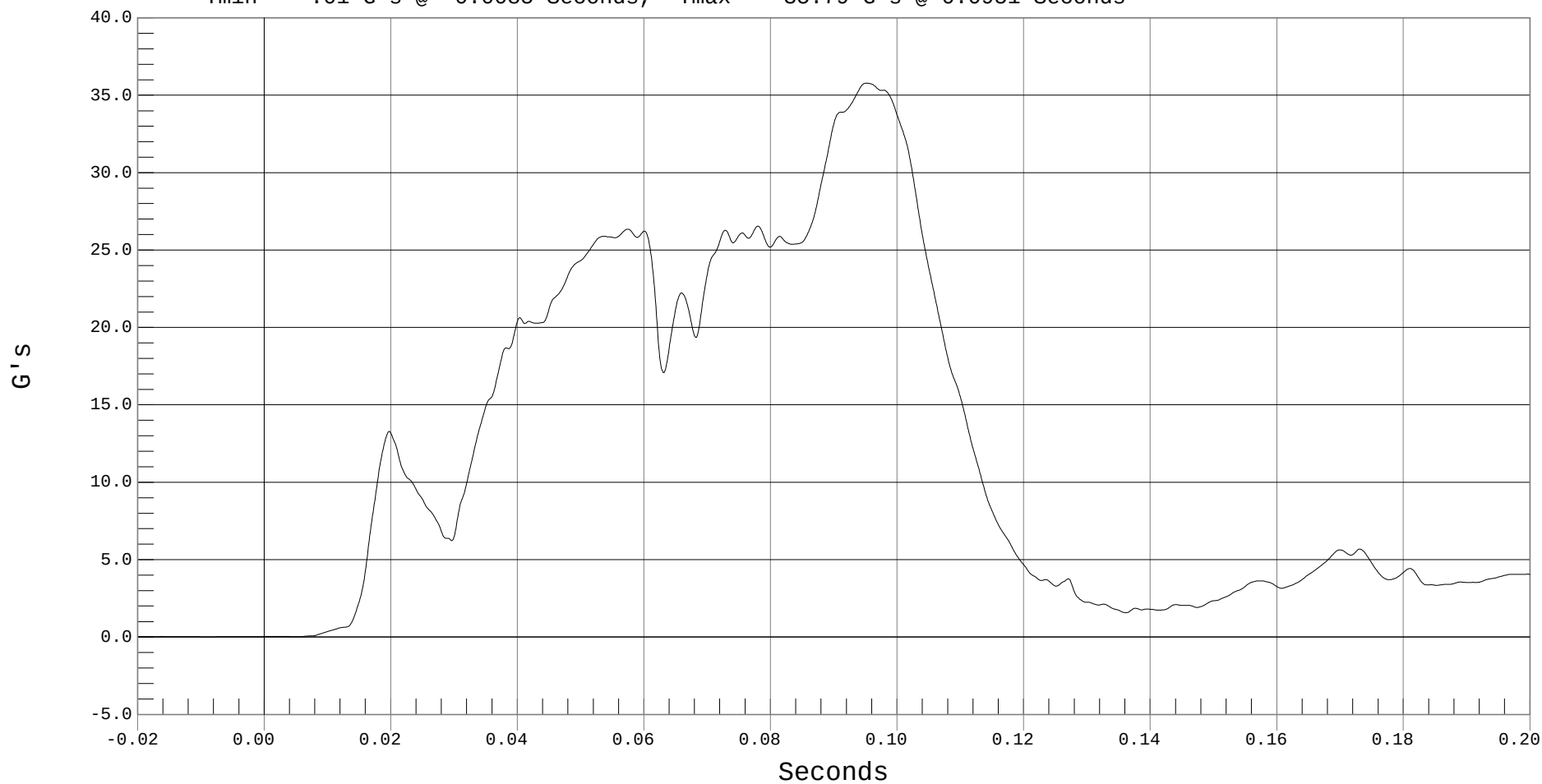
PASSENGER CHEST RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST RESULTANT ACCELERATION, B01043AV.A22

Ymin = .01 G's @ -0.0085 Seconds, Ymax = 35.79 G's @ 0.0951 Seconds





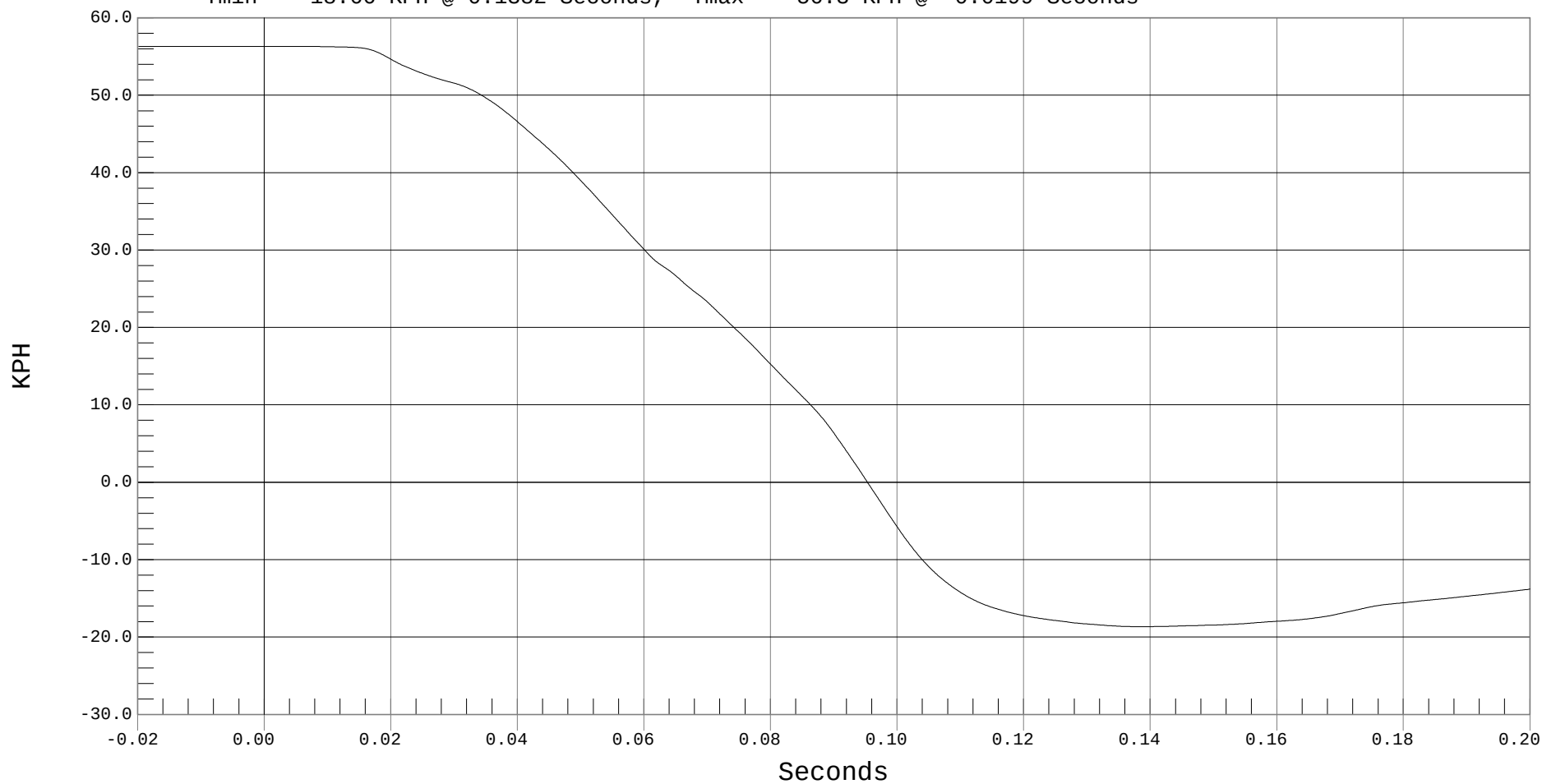
PASSENGER CHEST X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST X VELOCITY, B01043AI.V22

Ymin = -18.66 KPH @ 0.1382 Seconds, Ymax = 56.3 KPH @ -0.0199 Seconds





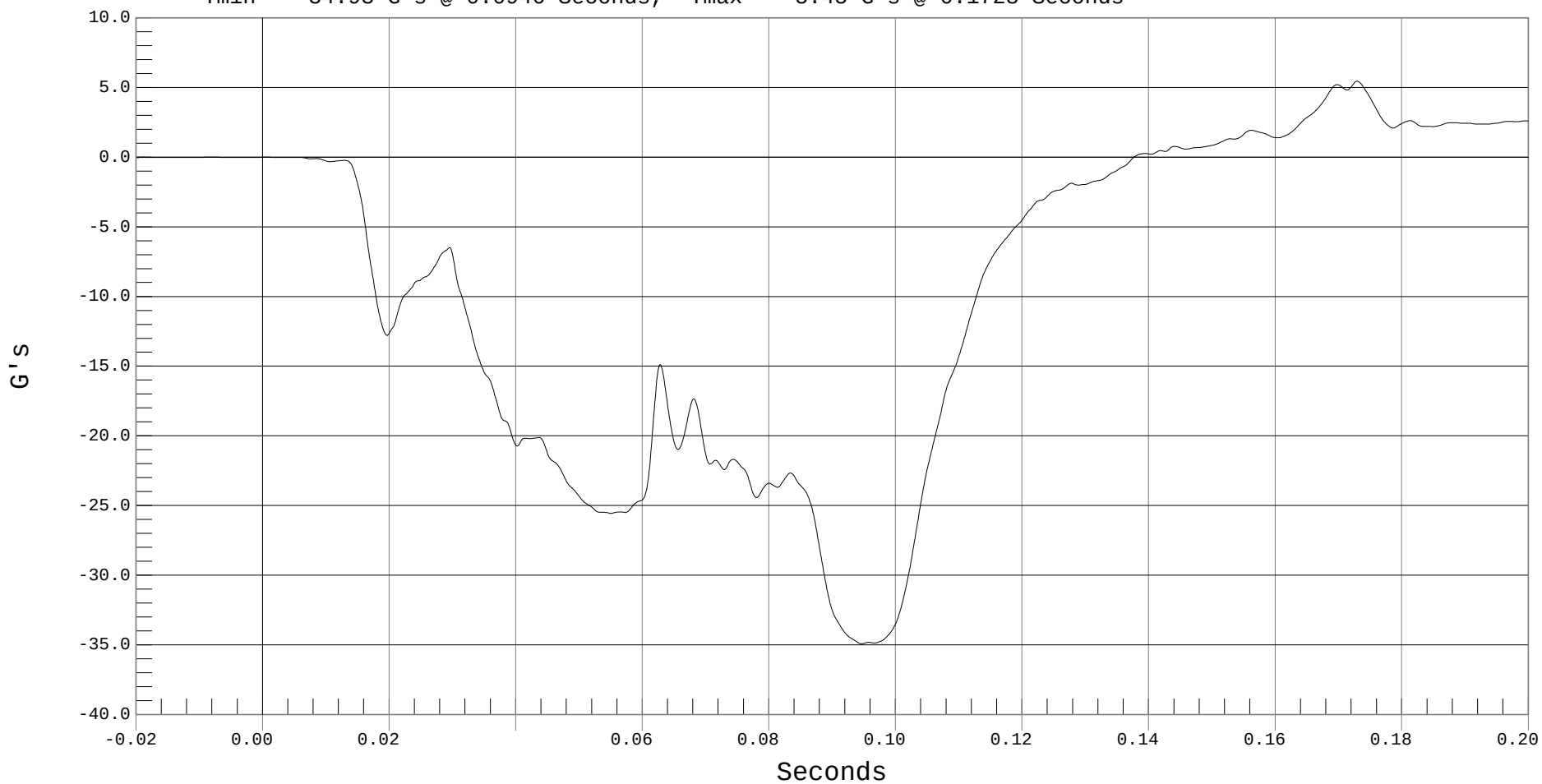
PASSENGER CHEST REDUNDANT X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST Xr, B01043AF.A50

Ymin = -34.93 G's @ 0.0946 Seconds, Ymax = 5.45 G's @ 0.1728 Seconds





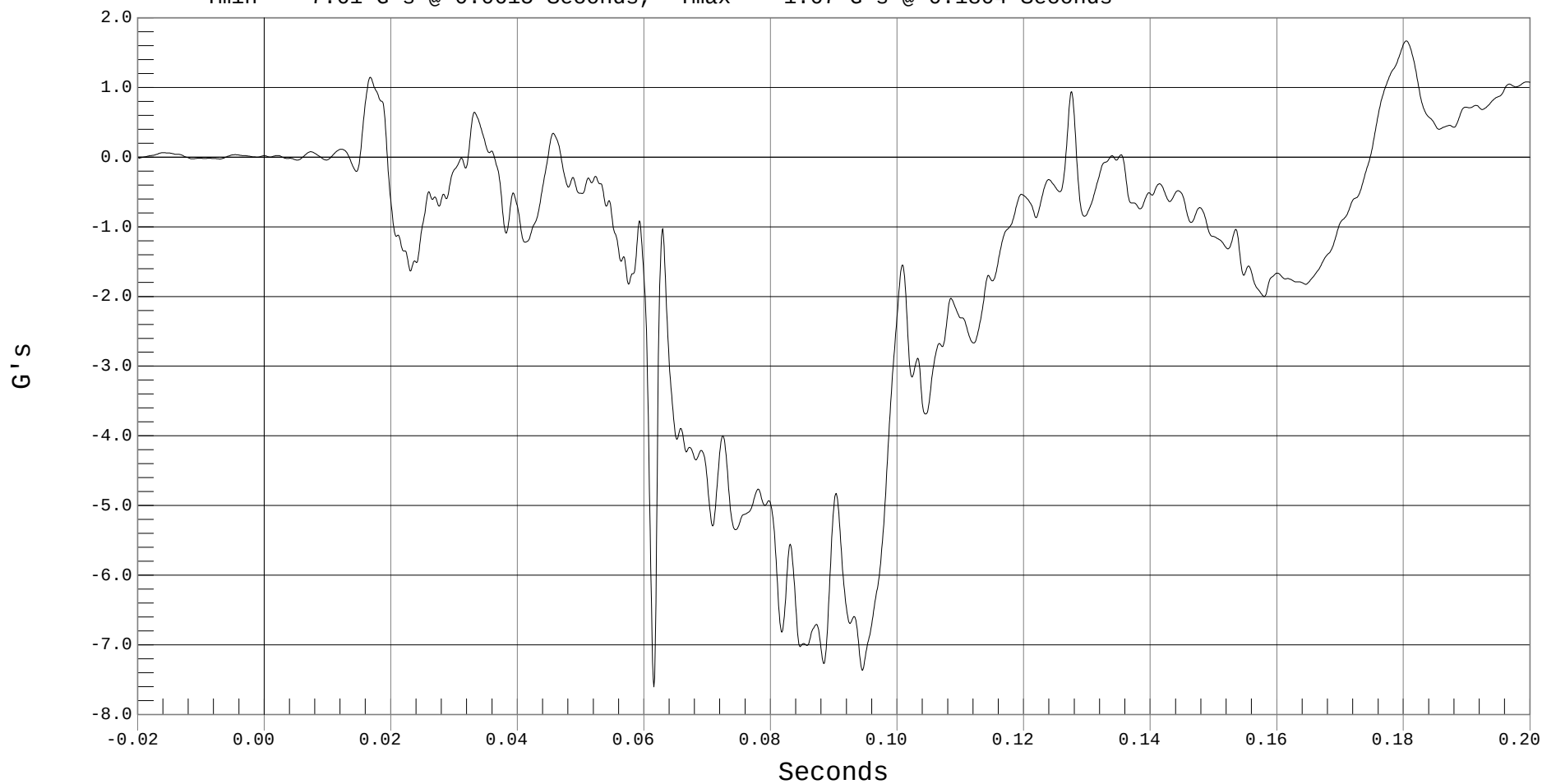
PASSENGER CHEST REDUNDANT Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST Yr, B01043AF.A51

Ymin = -7.61 G's @ 0.0615 Seconds, Ymax = 1.67 G's @ 0.1804 Seconds





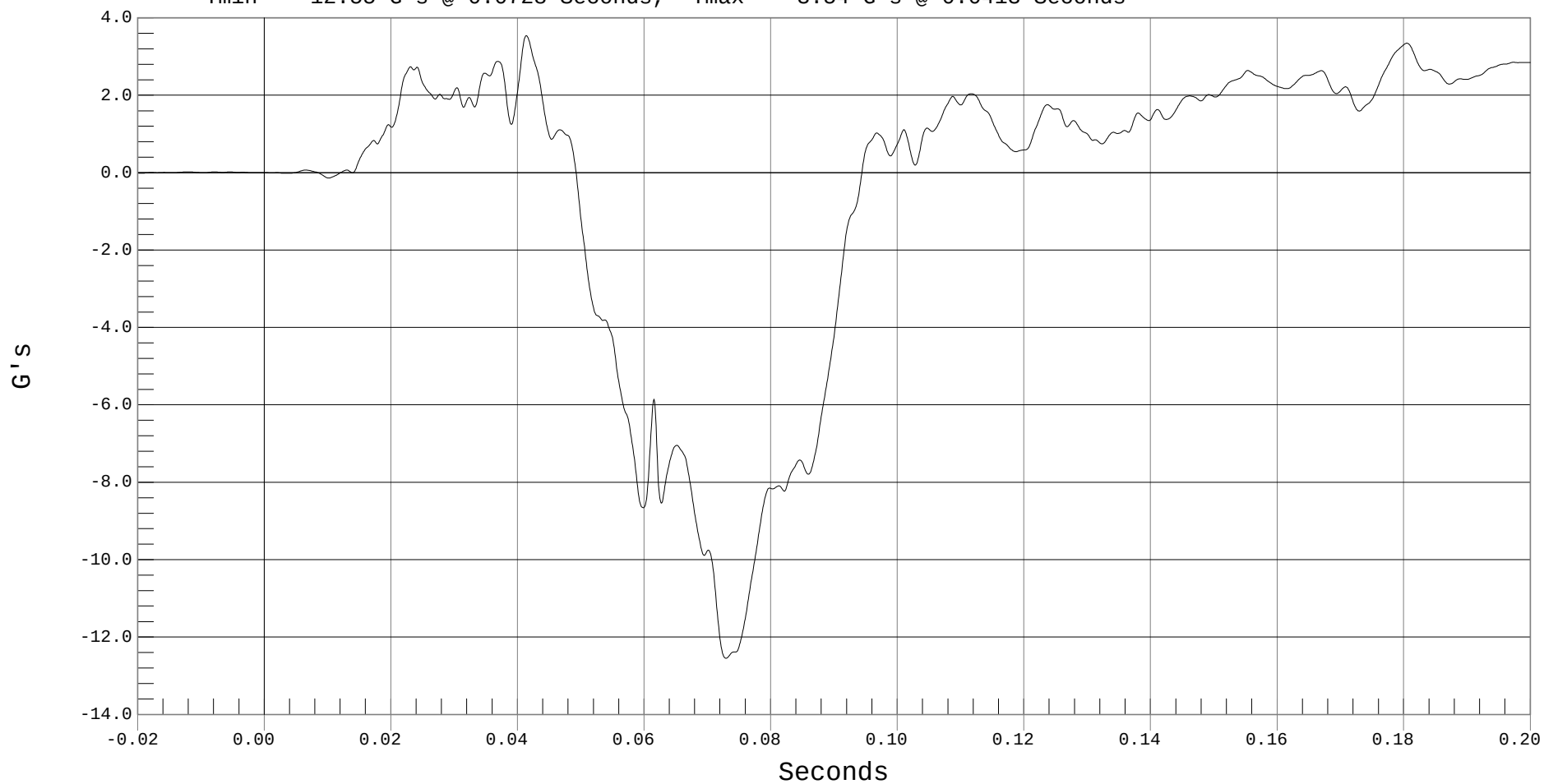
PASSENGER CHEST REDUNDANT Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST Zr, B01043AF.A52

Ymin = -12.55 G's @ 0.0728 Seconds, Ymax = 3.54 G's @ 0.0413 Seconds





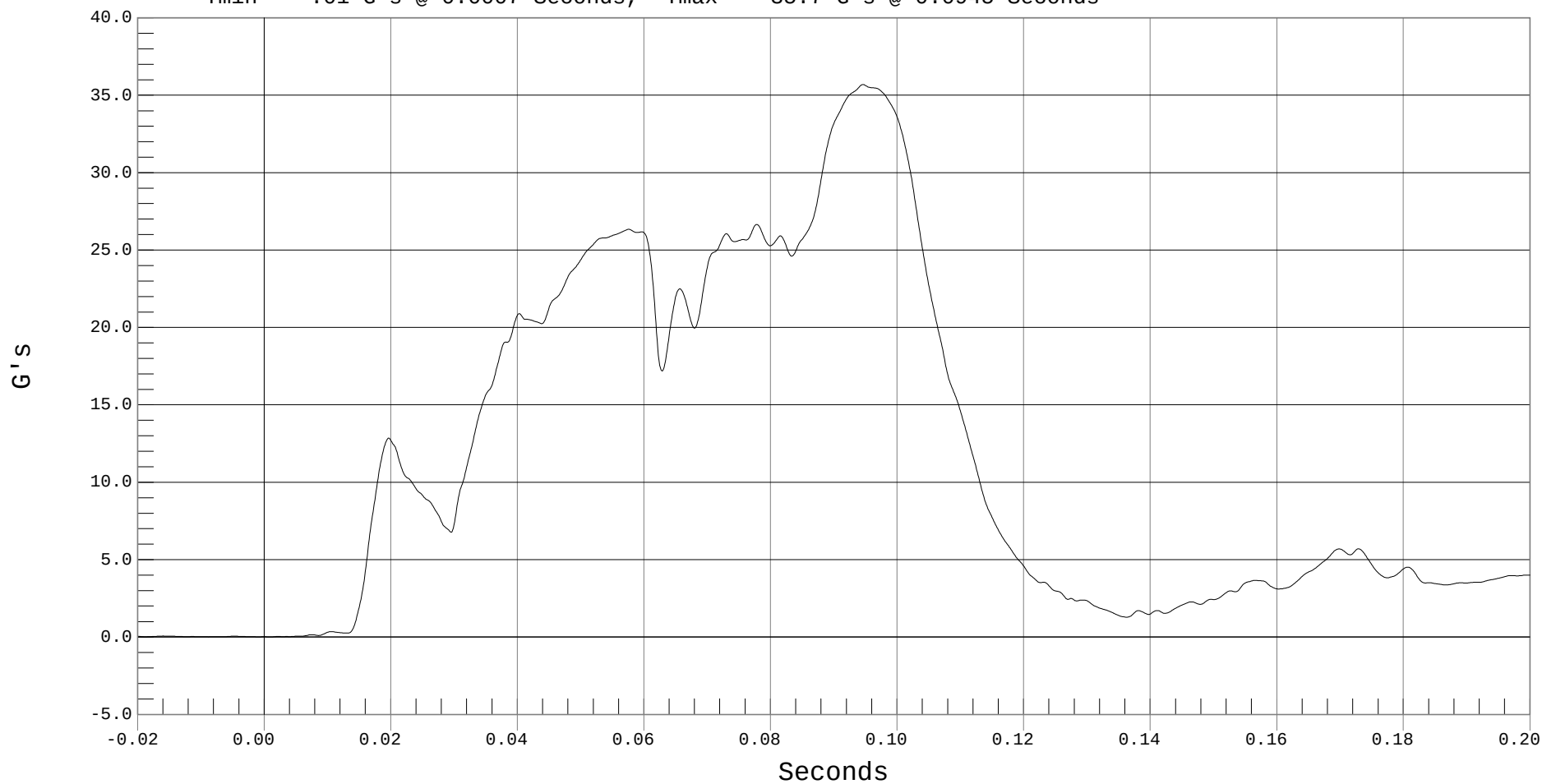
PASSENGER CHEST REDUNDANT RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST REDUNDANT RESULTANT ACCELERATION, B01043AV.A50

Ymin = .01 G's @ 0.0007 Seconds, Ymax = 35.7 G's @ 0.0945 Seconds





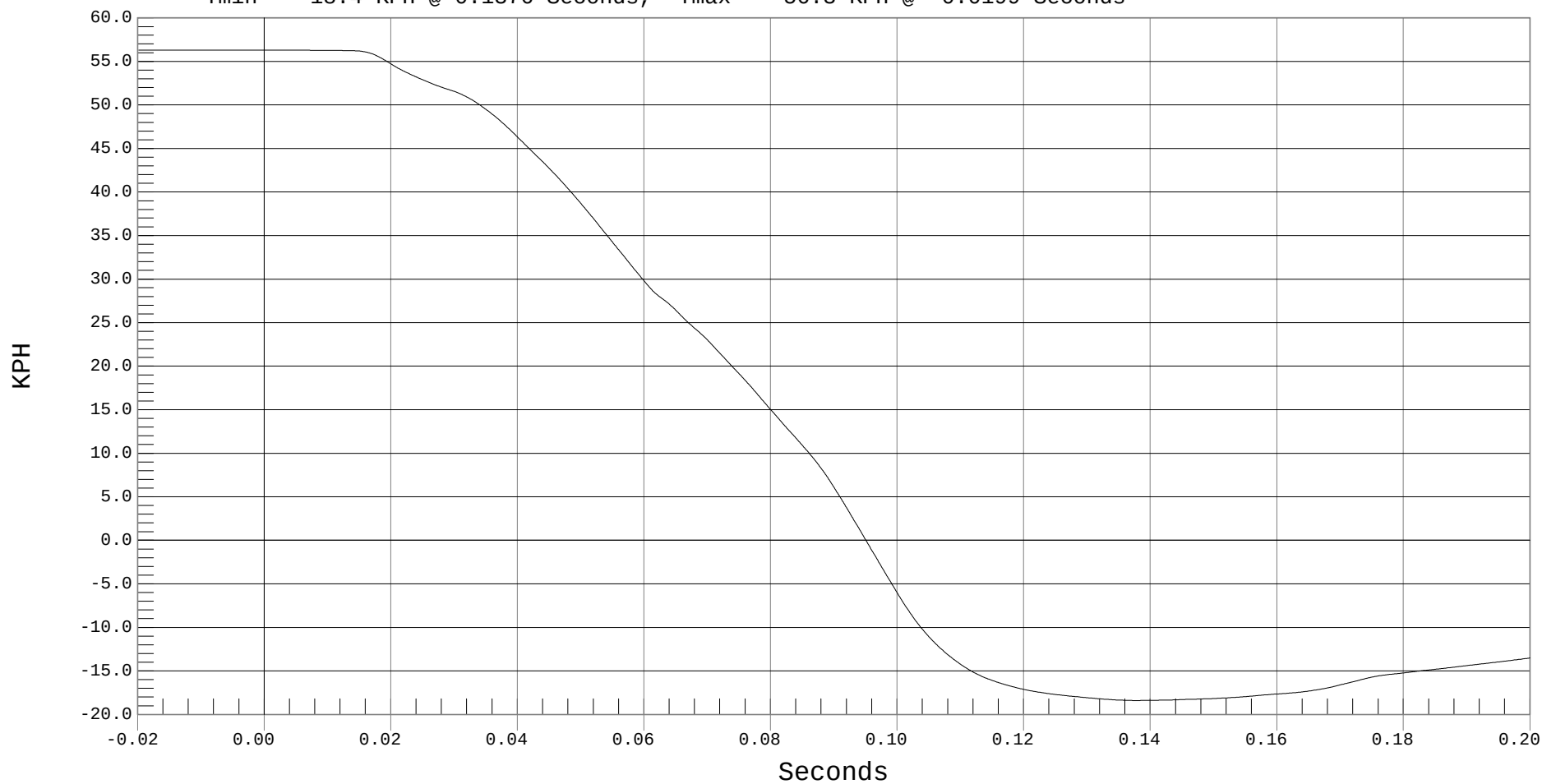
PASSENGER CHEST REDUNDANT X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER CHEST REDUNDANT X VELOCITY, B01043AI.V50

Ymin = -18.4 KPH @ 0.1376 Seconds, Ymax = 56.3 KPH @ -0.0199 Seconds





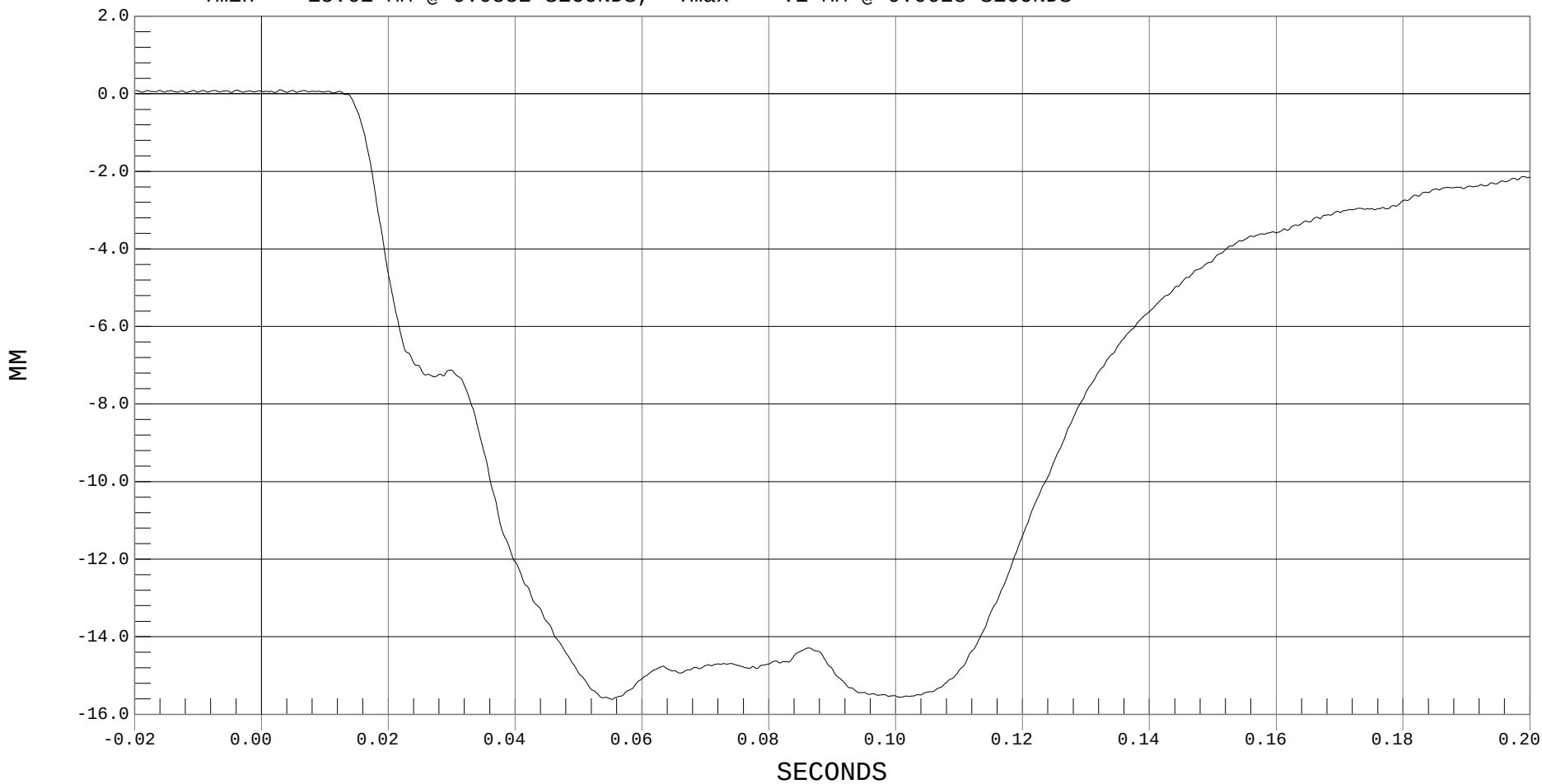
PASSENGER CHEST COMPRESSION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DISPLACEMENT, B01043DF.D25

Ymin = -15.61 MM @ 0.0552 SECONDS, Ymax = .1 MM @ 0.0028 SECONDS





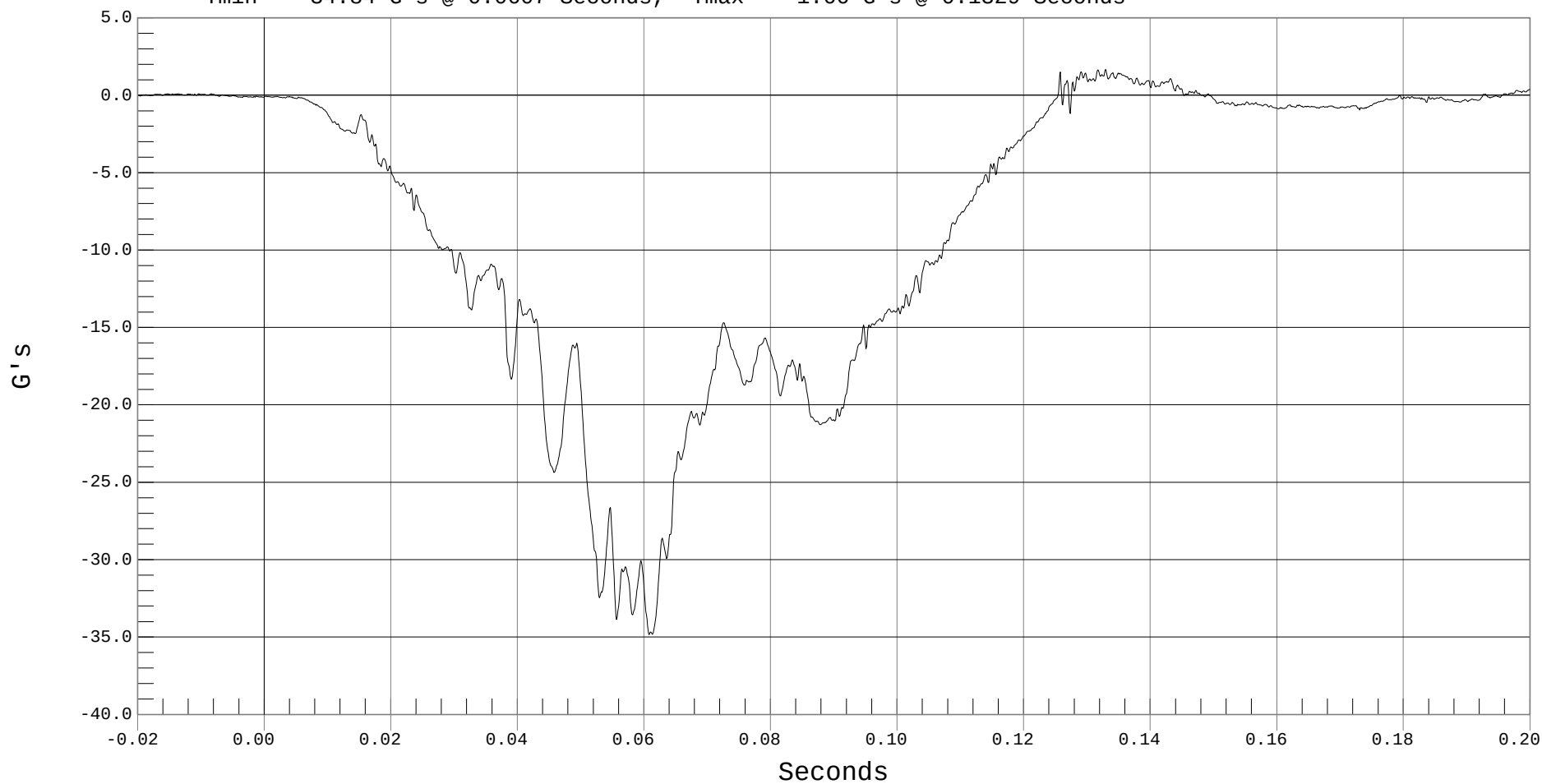
PASSENGER PELVIS X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS X, B01043AT.A26

Ymin = -34.84 G's @ 0.0607 Seconds, Ymax = 1.66 G's @ 0.1329 Seconds





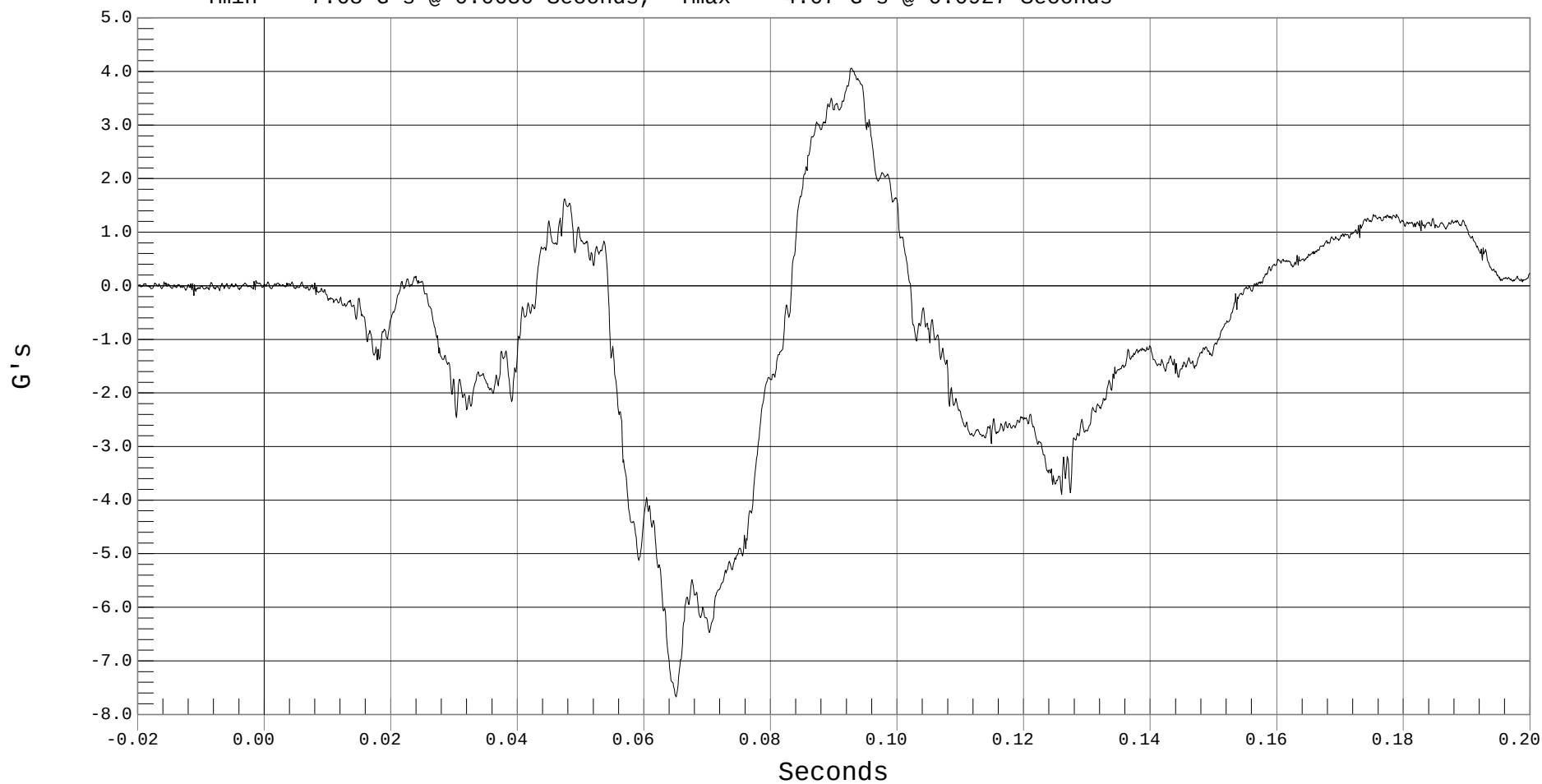
PASSENGER PELVIS Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS Y, B01043AT.A27

Ymin = -7.68 G's @ 0.0650 Seconds, Ymax = 4.07 G's @ 0.0927 Seconds





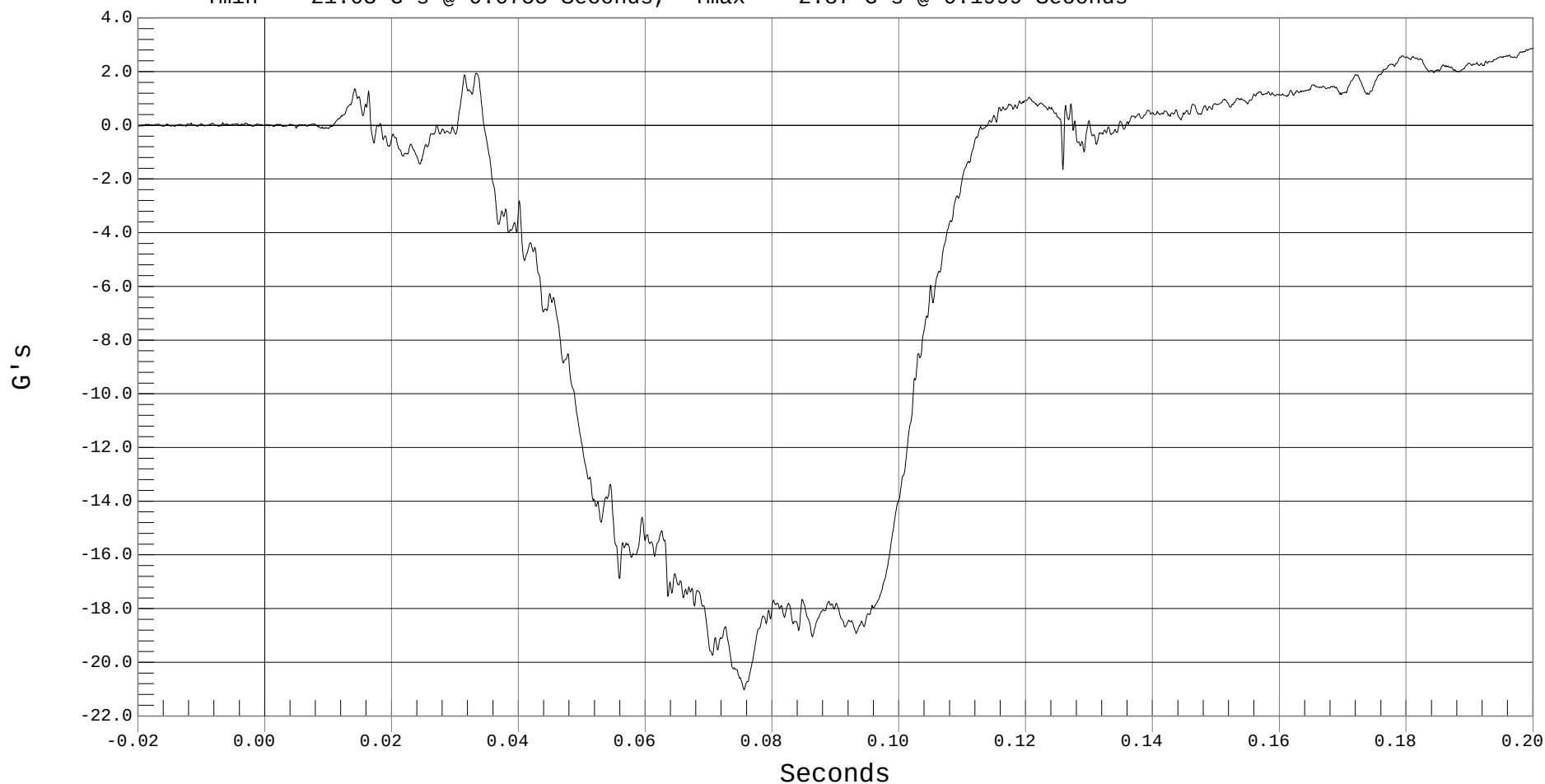
PASSENGER PELVIS Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS Z, B01043AT.A28

Ymin = -21.03 G's @ 0.0755 Seconds, Ymax = 2.87 G's @ 0.1999 Seconds





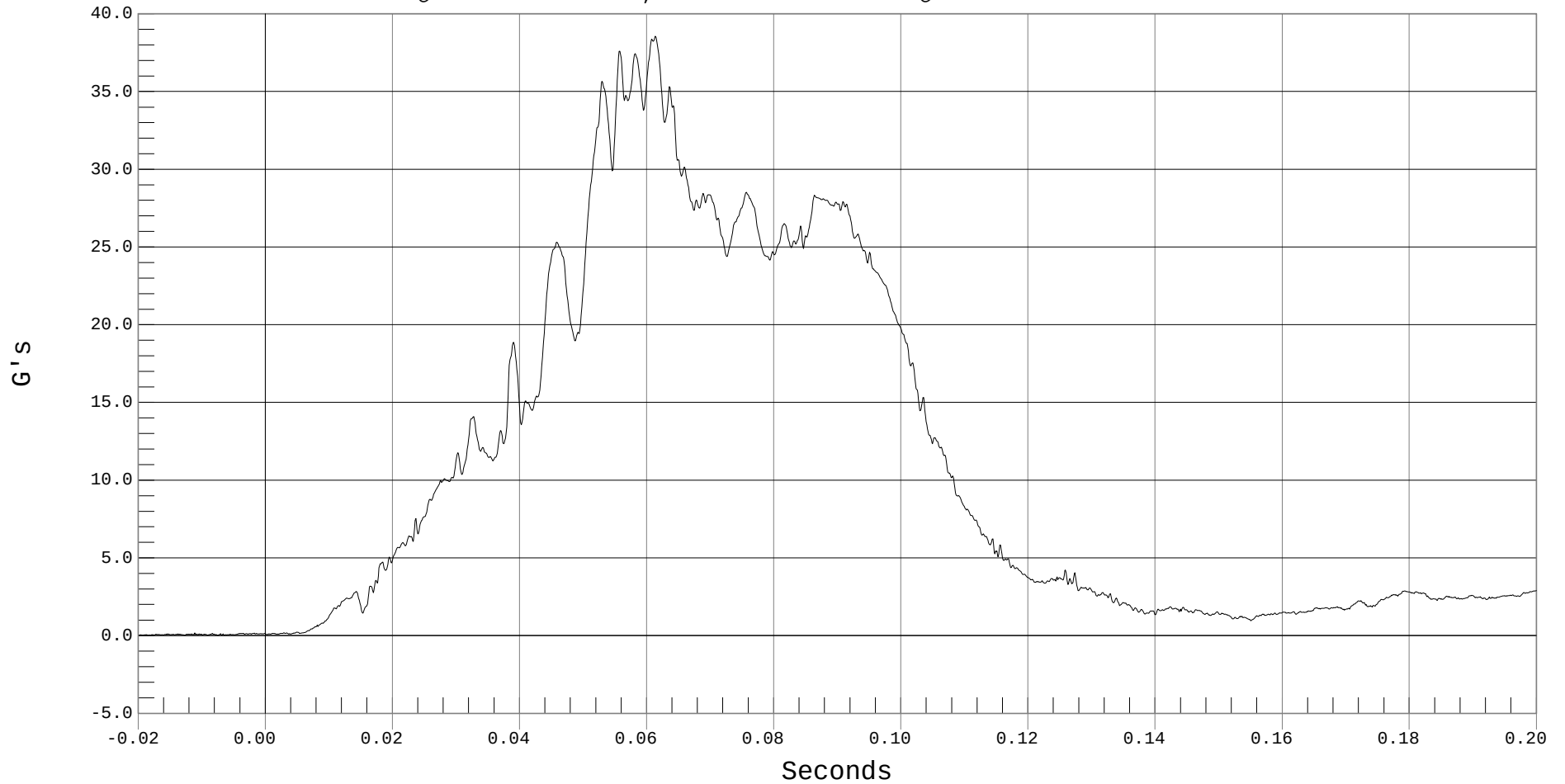
PASSENGER PELVIS RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS RESULTANT ACCELERATION, B01043AV.A26

Ymin = .01 G's @ -0.0075 Seconds, Ymax = 38.56 G's @ 0.0613 Seconds





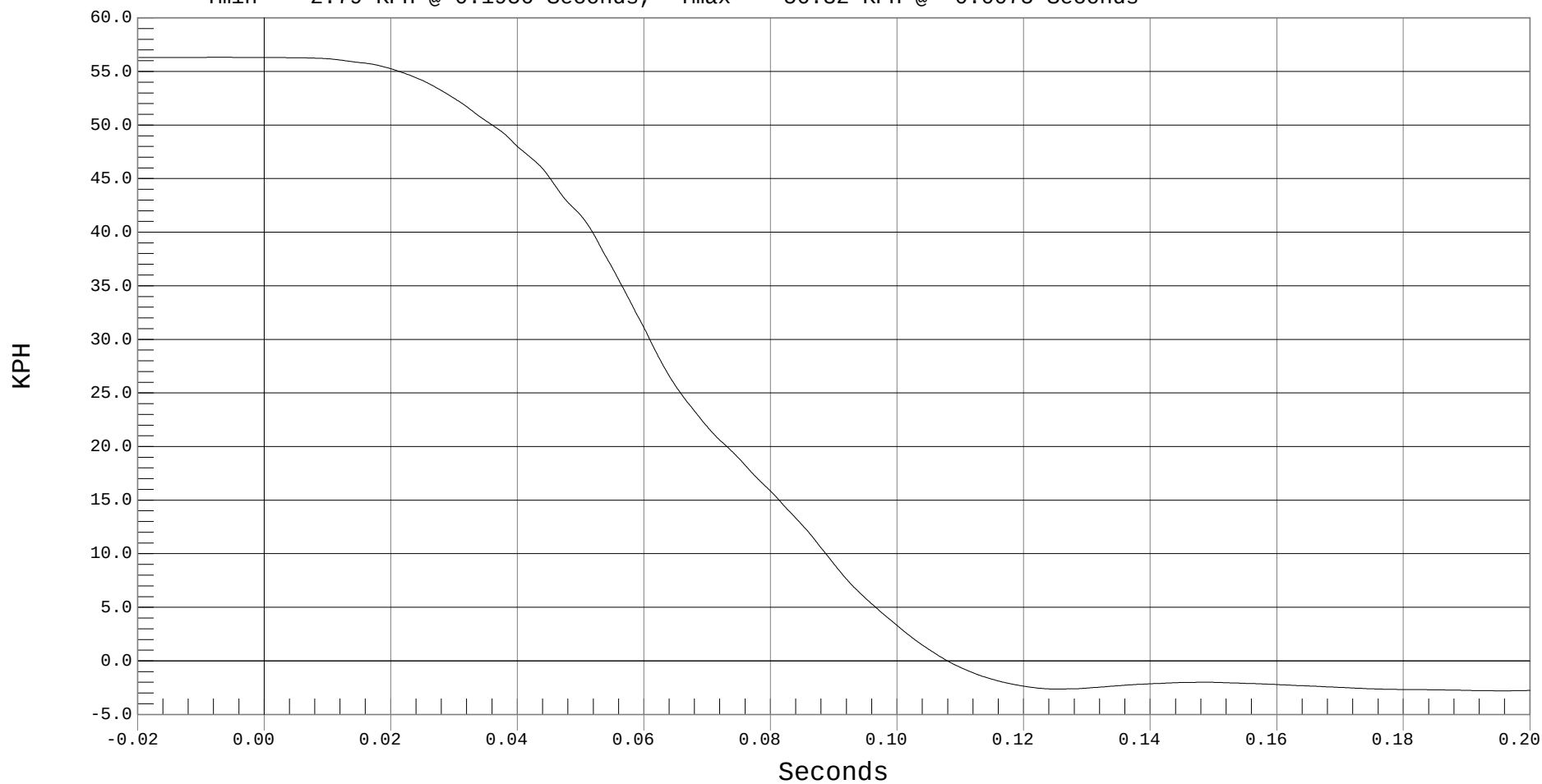
PASSENGER PELVIS X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER PELVIS X VELOCITY, B01043AI.V26

Ymin = -2.79 KPH @ 0.1956 Seconds, Ymax = 56.32 KPH @ -0.0075 Seconds





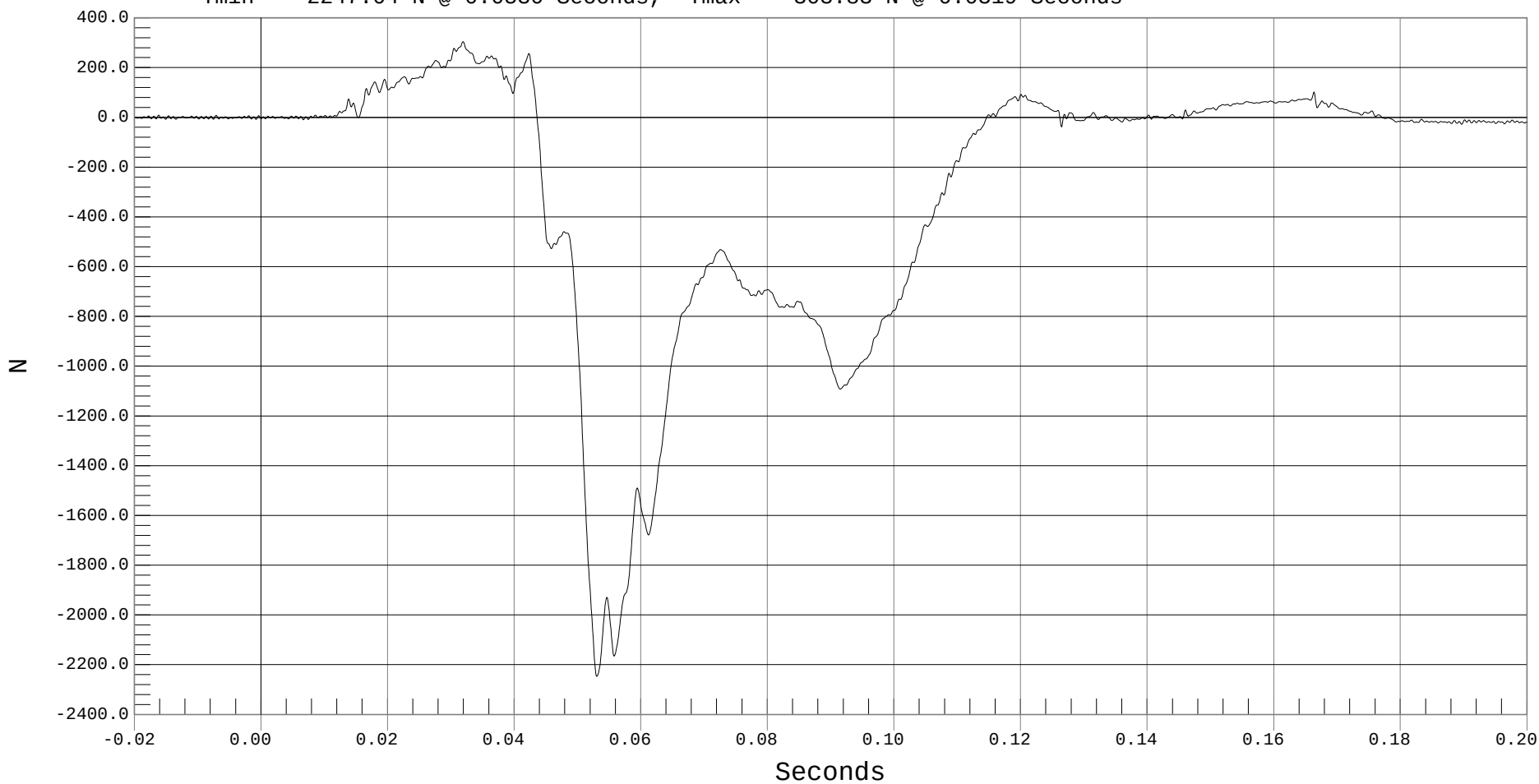
PASSENGER LEFT FEMUR FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER LEFT FEMUR, B01043FF.F30

Ymin = -2247.04 N @ 0.0530 Seconds, Ymax = 303.83 N @ 0.0319 Seconds





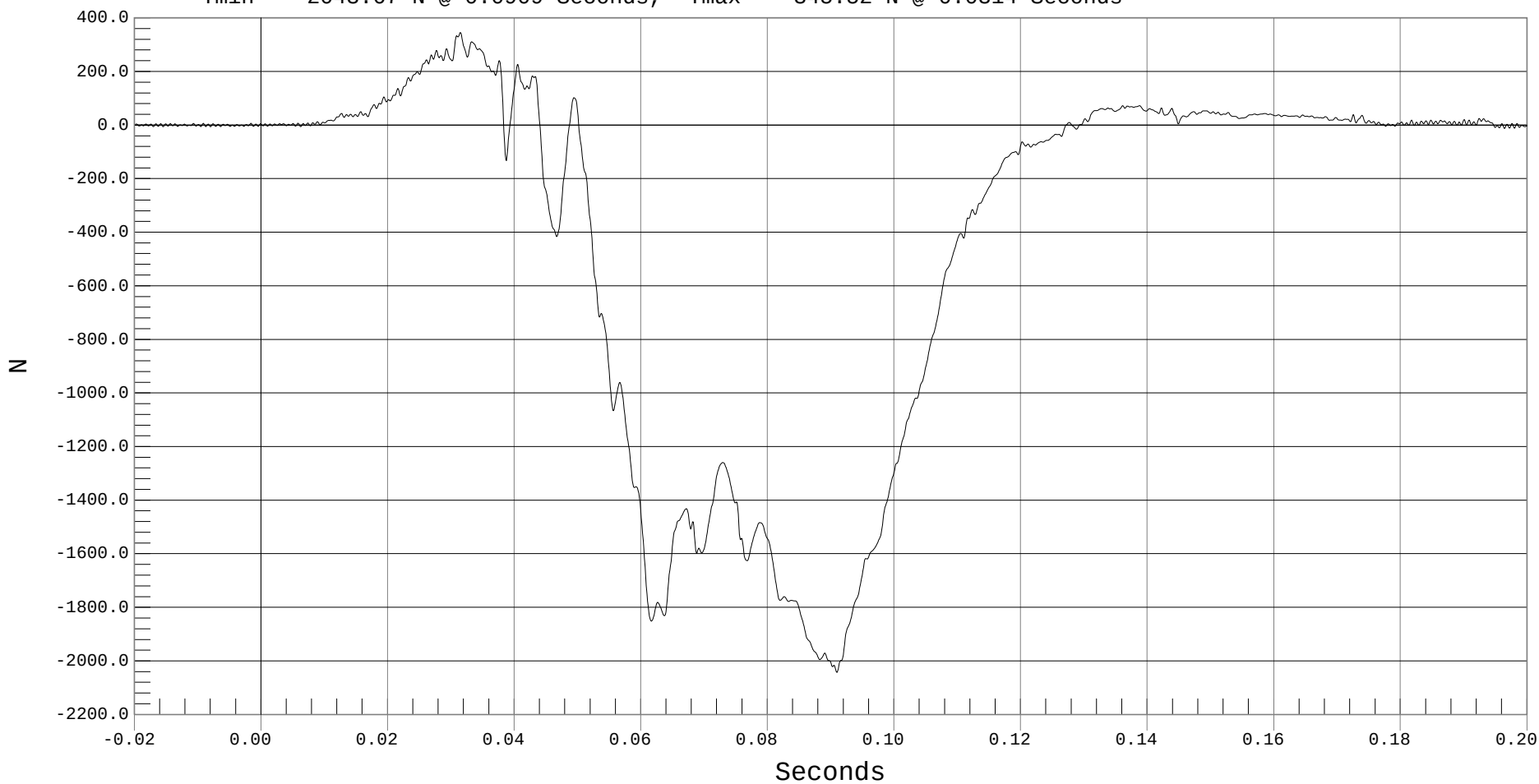
PASSENGER RIGHT FEMUR FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER RIGHT FEMUR, B01043FF.F29

Ymin = -2043.67 N @ 0.0909 Seconds, Ymax = 345.52 N @ 0.0314 Seconds





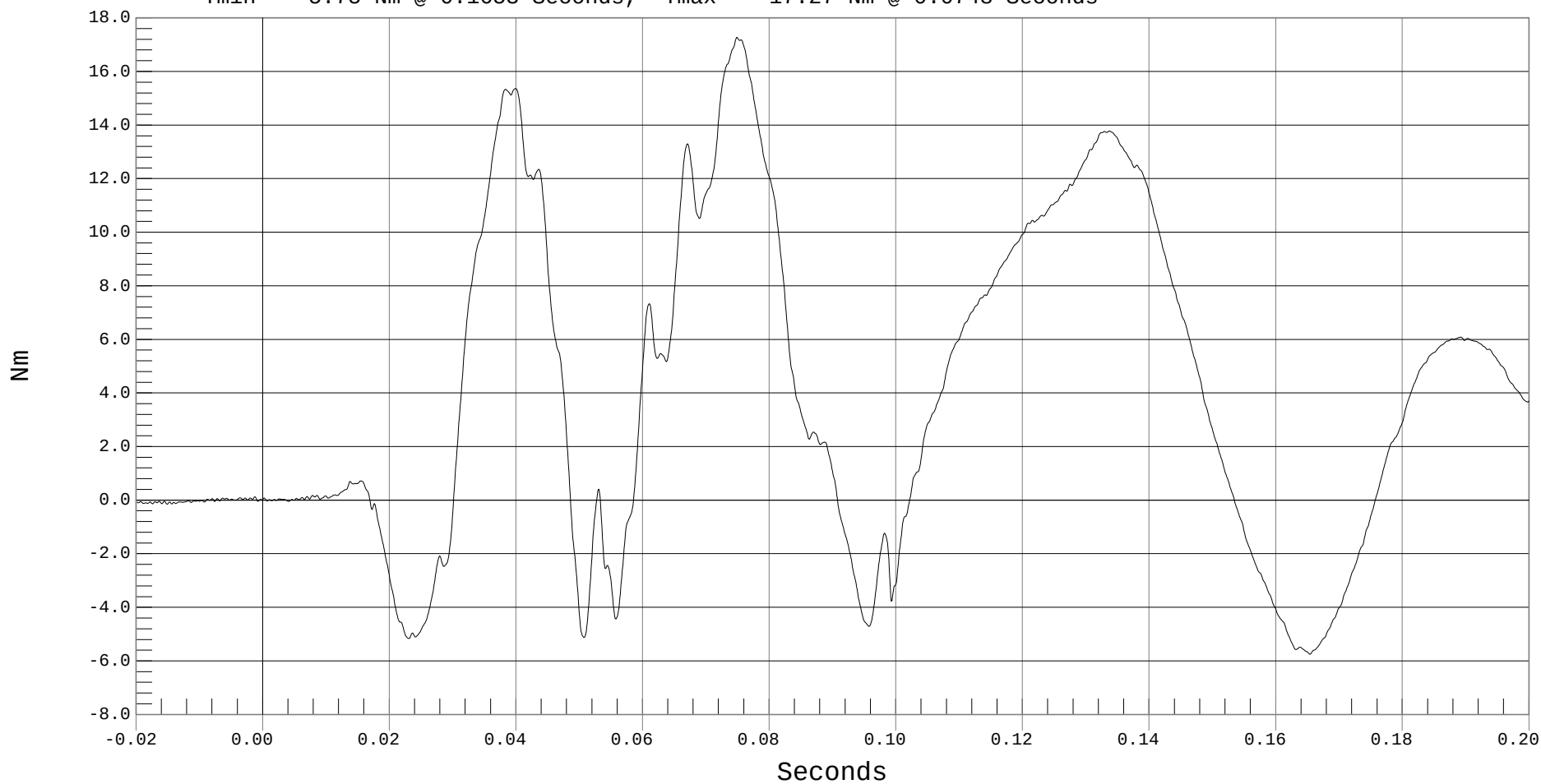
PASSENGER LEFT UPPER TIBIA MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER LEFT UPPER TIBIA MX, B01043MF.M87

Ymin = -5.75 Nm @ 0.1653 Seconds, Ymax = 17.27 Nm @ 0.0748 Seconds





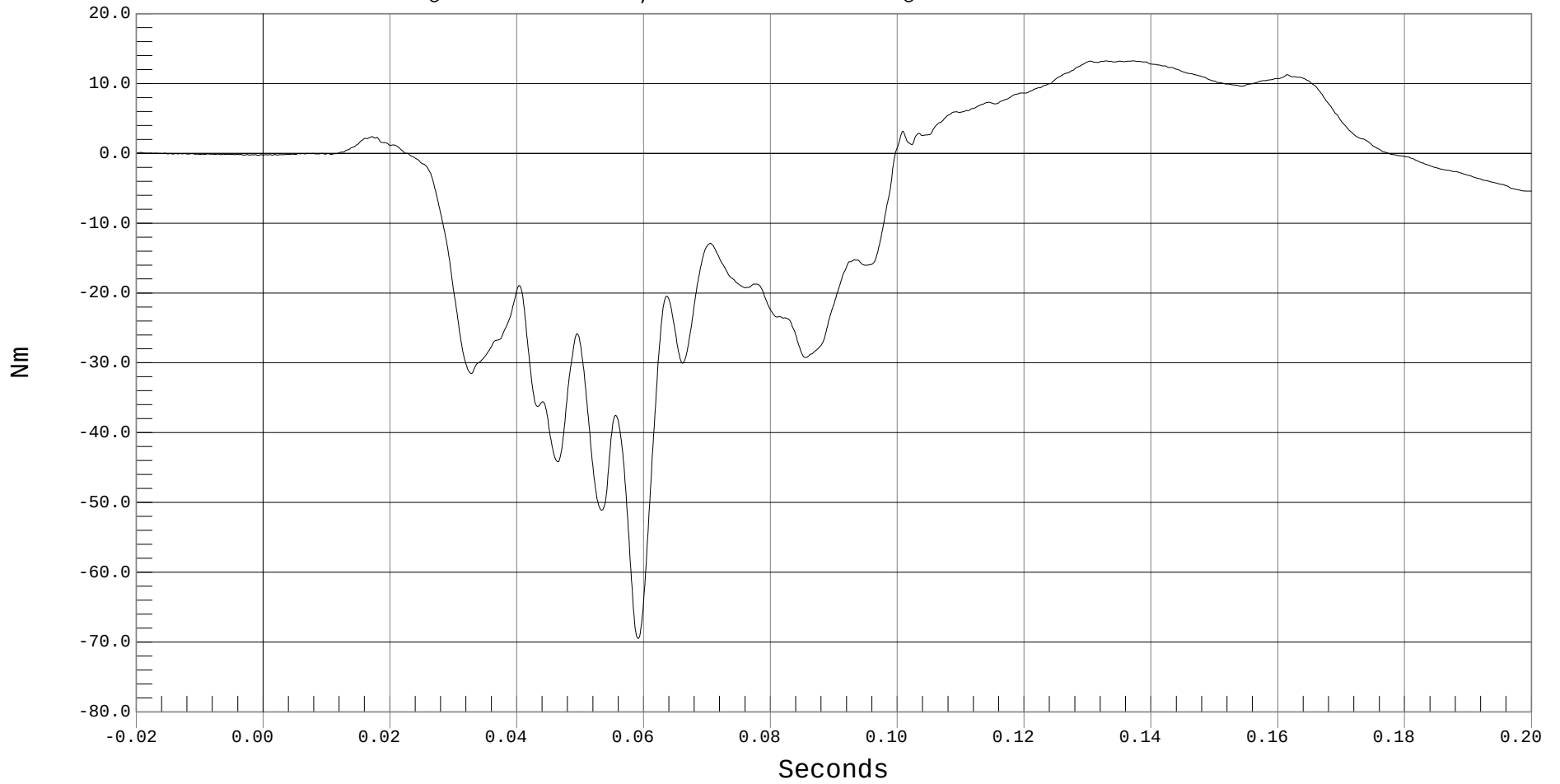
PASSENGER LEFT UPPER TIBIA MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER LEFT UPPER TIBIA MY, B01043MF.M88

Ymin = -69.49 Nm @ 0.0591 Seconds, Ymax = 13.26 Nm @ 0.1328 Seconds





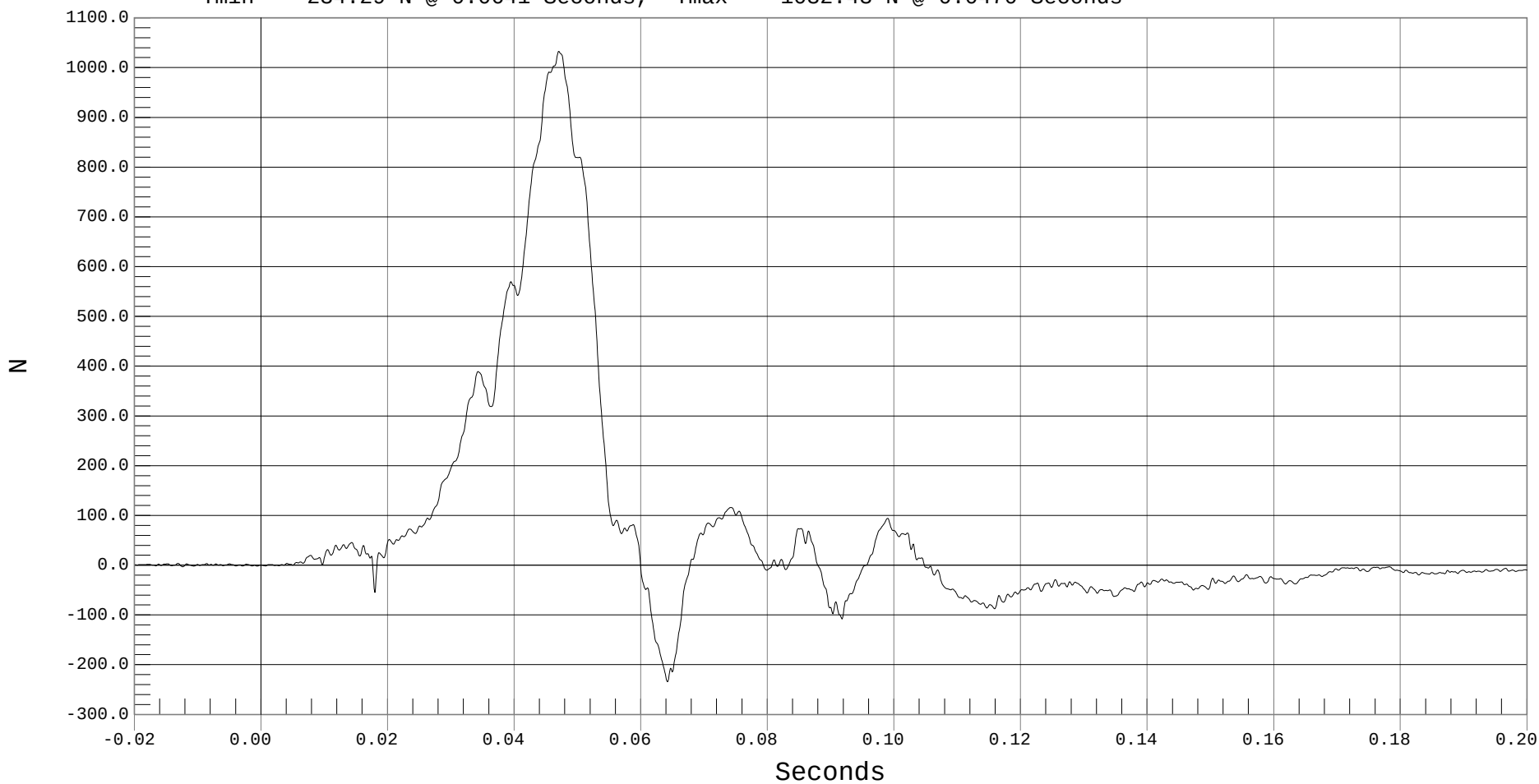
PASSENGER LEFT UPPER TIBIA FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER LEFT UPPER TIBIA FZ, B01043FF.F89

Ymin = -234.29 N @ 0.0641 Seconds, Ymax = 1032.43 N @ 0.0470 Seconds





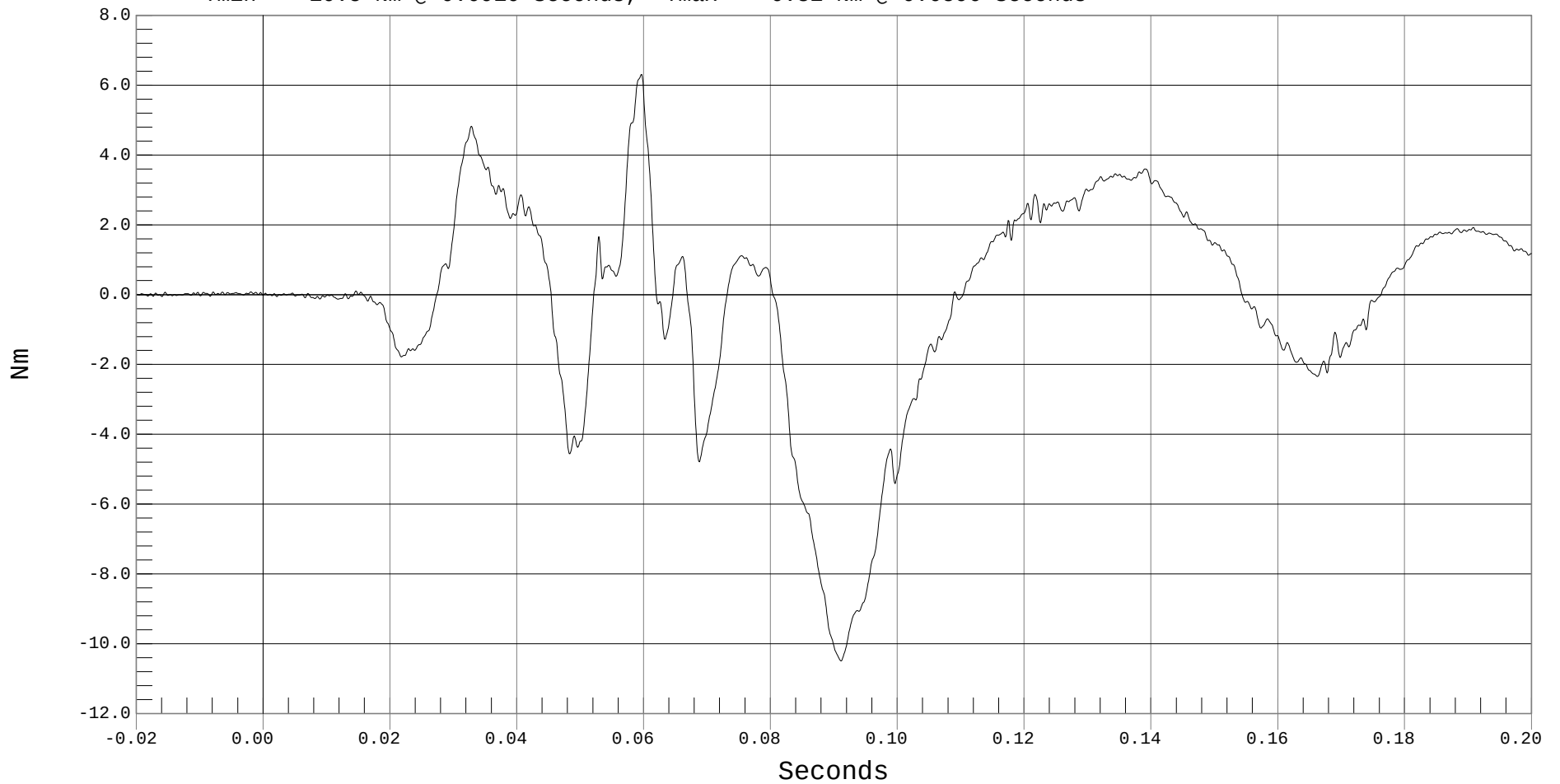
PASSENGER LEFT LOWER TIBIA MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER LEFT LOWER TIBIA MX, B01043MF.M90

Ymin = -10.5 Nm @ 0.0910 Seconds, Ymax = 6.31 Nm @ 0.0596 Seconds





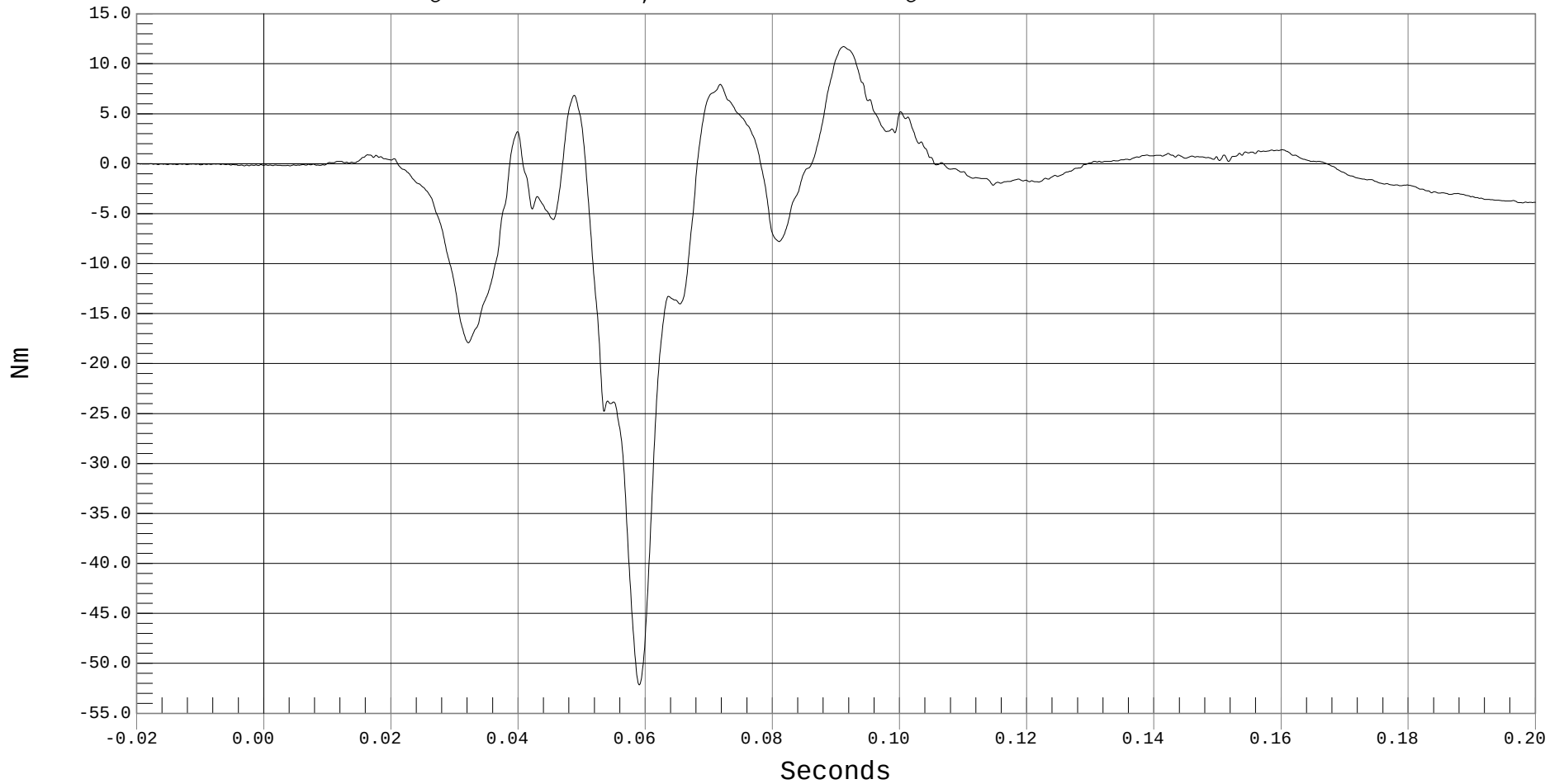
PASSENGER LEFT LOWER TIBIA MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER LEFT LOWER TIBIA MY, B01043MF.M91

Ymin = -52.16 Nm @ 0.0590 Seconds, Ymax = 11.71 Nm @ 0.0911 Seconds





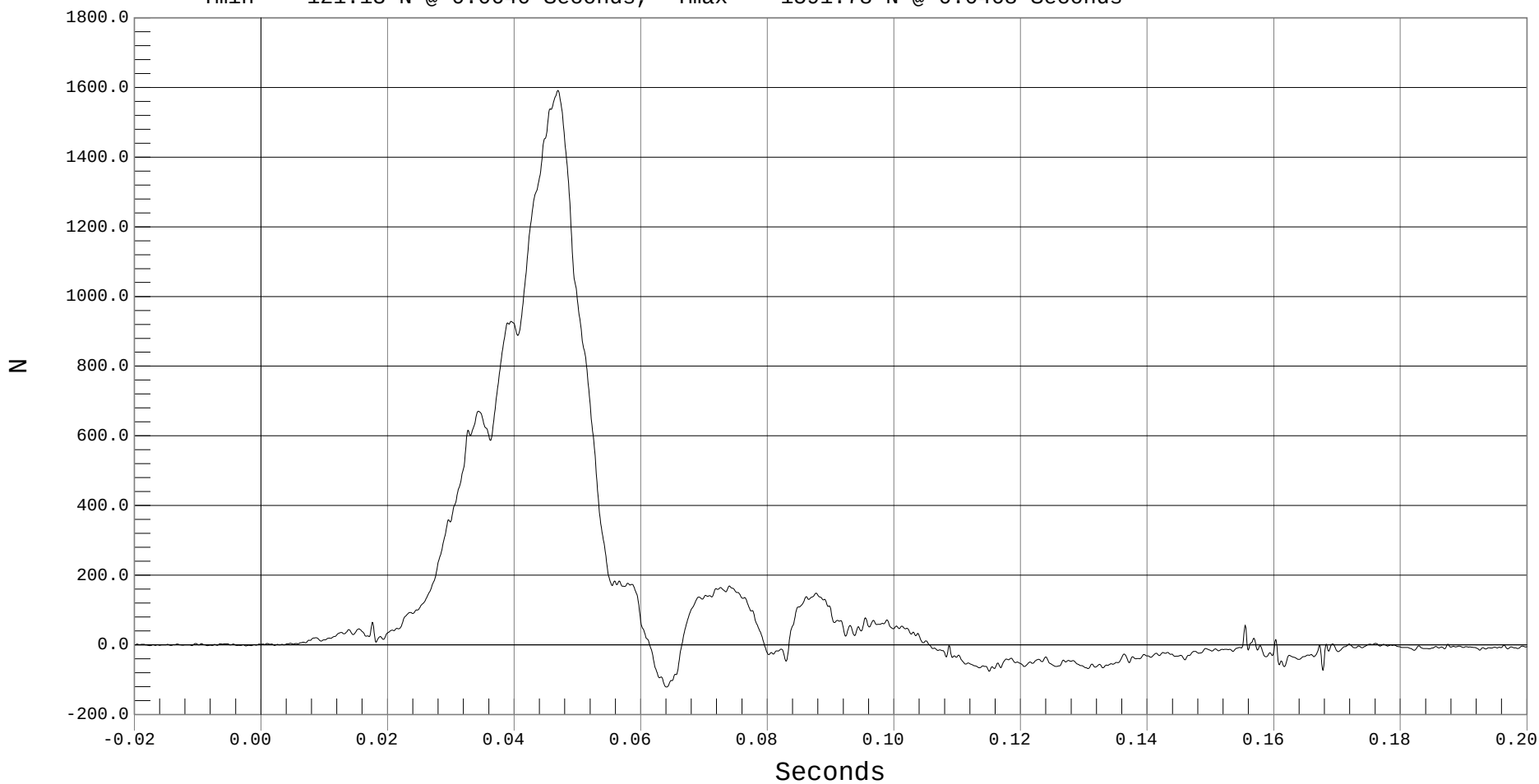
PASSENGER LEFT LOWER TIBIA FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER LEFT LOWER TIBIA FZ, B01043FF.F92

Ymin = -121.13 N @ 0.0640 Seconds, Ymax = 1591.78 N @ 0.0468 Seconds





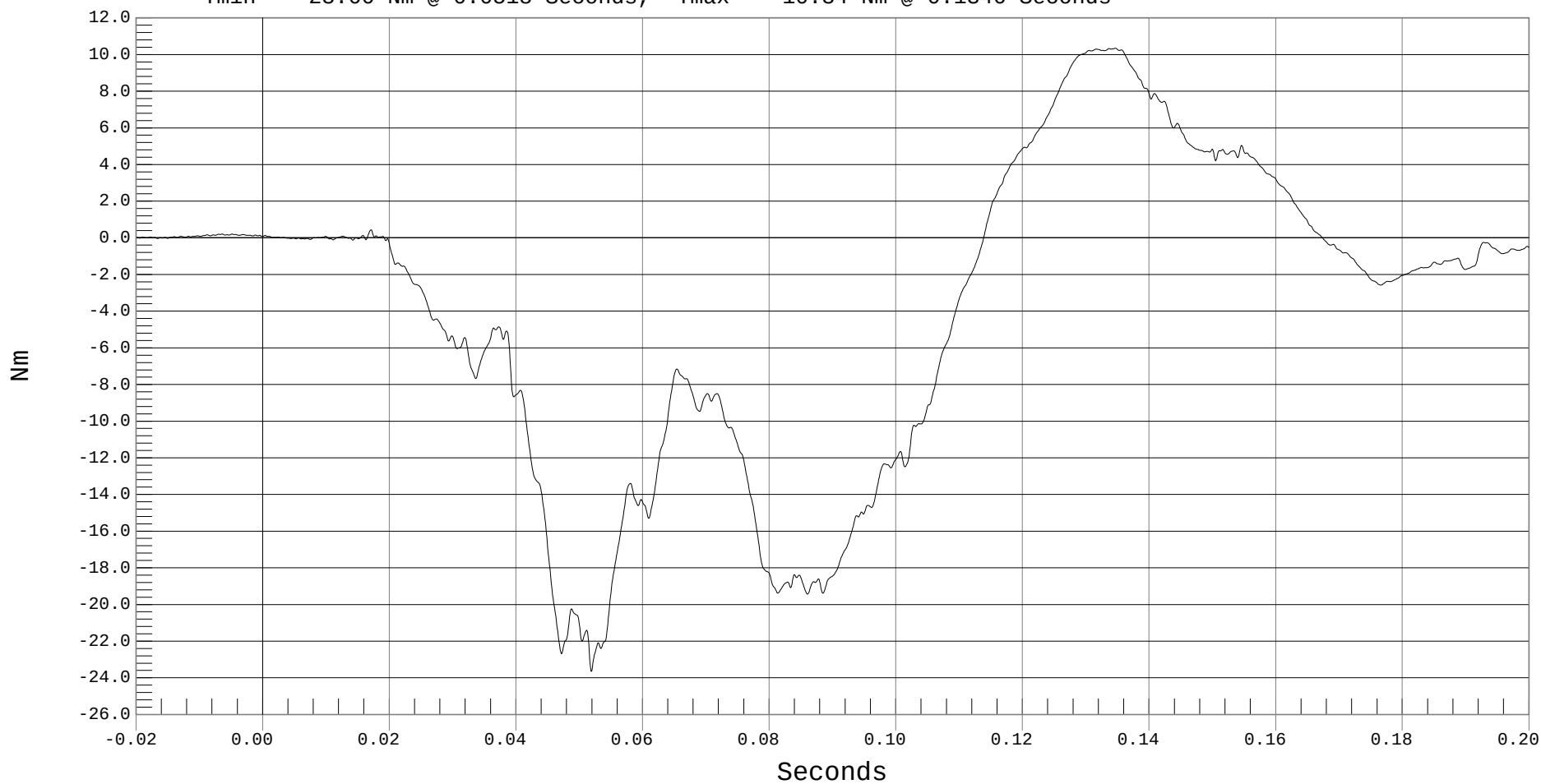
PASSENGER RIGHT UPPER TIBIA MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER RIGHT UPPER TIBIA MX, B01043MF.M81

Ymin = -23.66 Nm @ 0.0518 Seconds, Ymax = 10.34 Nm @ 0.1346 Seconds





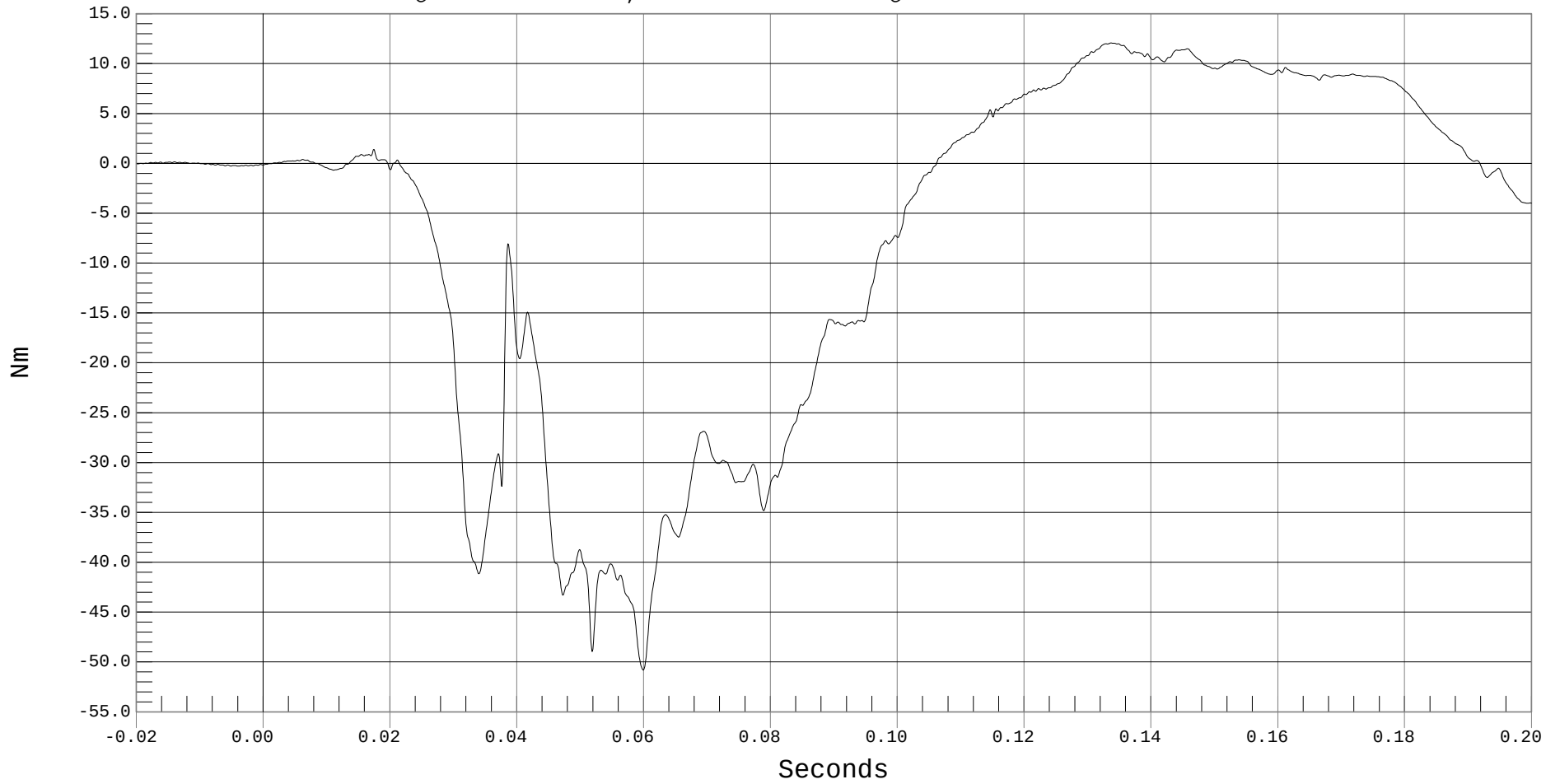
PASSENGER RIGHT UPPER TIBIA MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER RIGHT UPPER TIBIA MY, B01043MF.M82

Ymin = -50.8 Nm @ 0.0599 Seconds, Ymax = 12.07 Nm @ 0.1336 Seconds





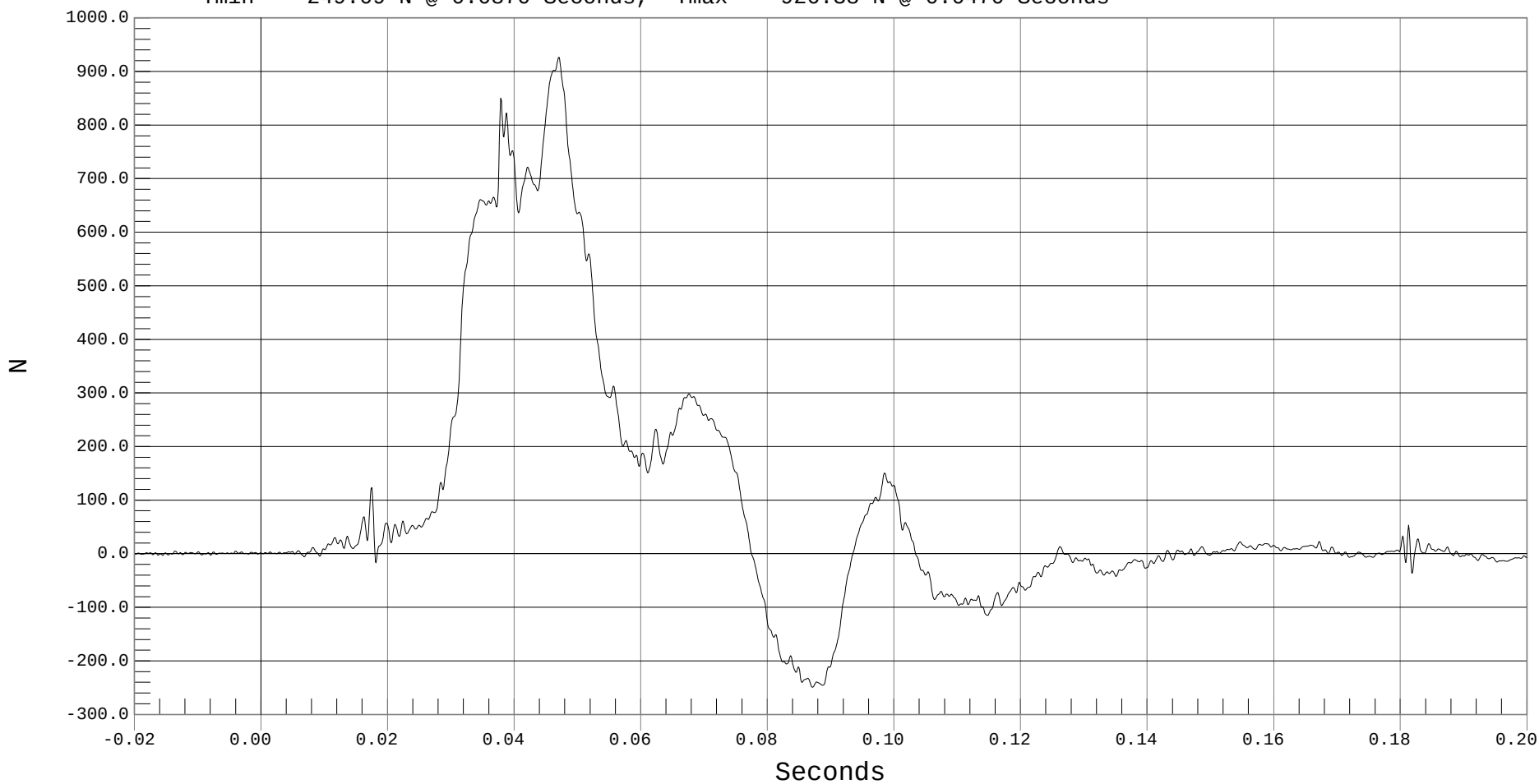
PASSENGER RIGHT UPPER TIBIA FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER RIGHT UPPER TIBIA FZ, B01043FF.F83

Ymin = -249.09 N @ 0.0870 Seconds, Ymax = 926.38 N @ 0.0470 Seconds





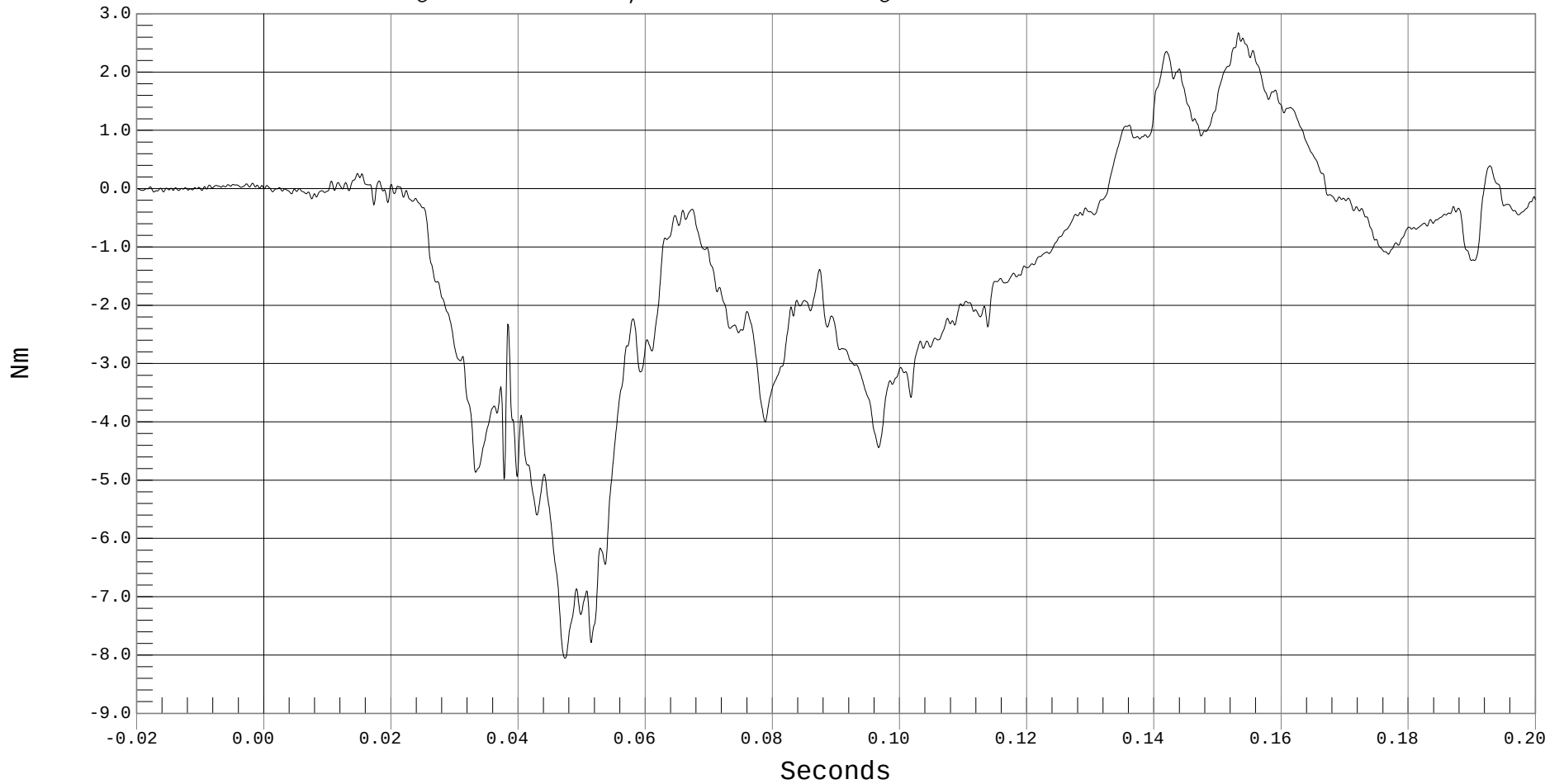
PASSENGER RIGHT LOWER TIBIA MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER RIGHT LOWER TIBIA MX, B01043MF.M84

Ymin = -8.05 Nm @ 0.0473 Seconds, Ymax = 2.67 Nm @ 0.1532 Seconds





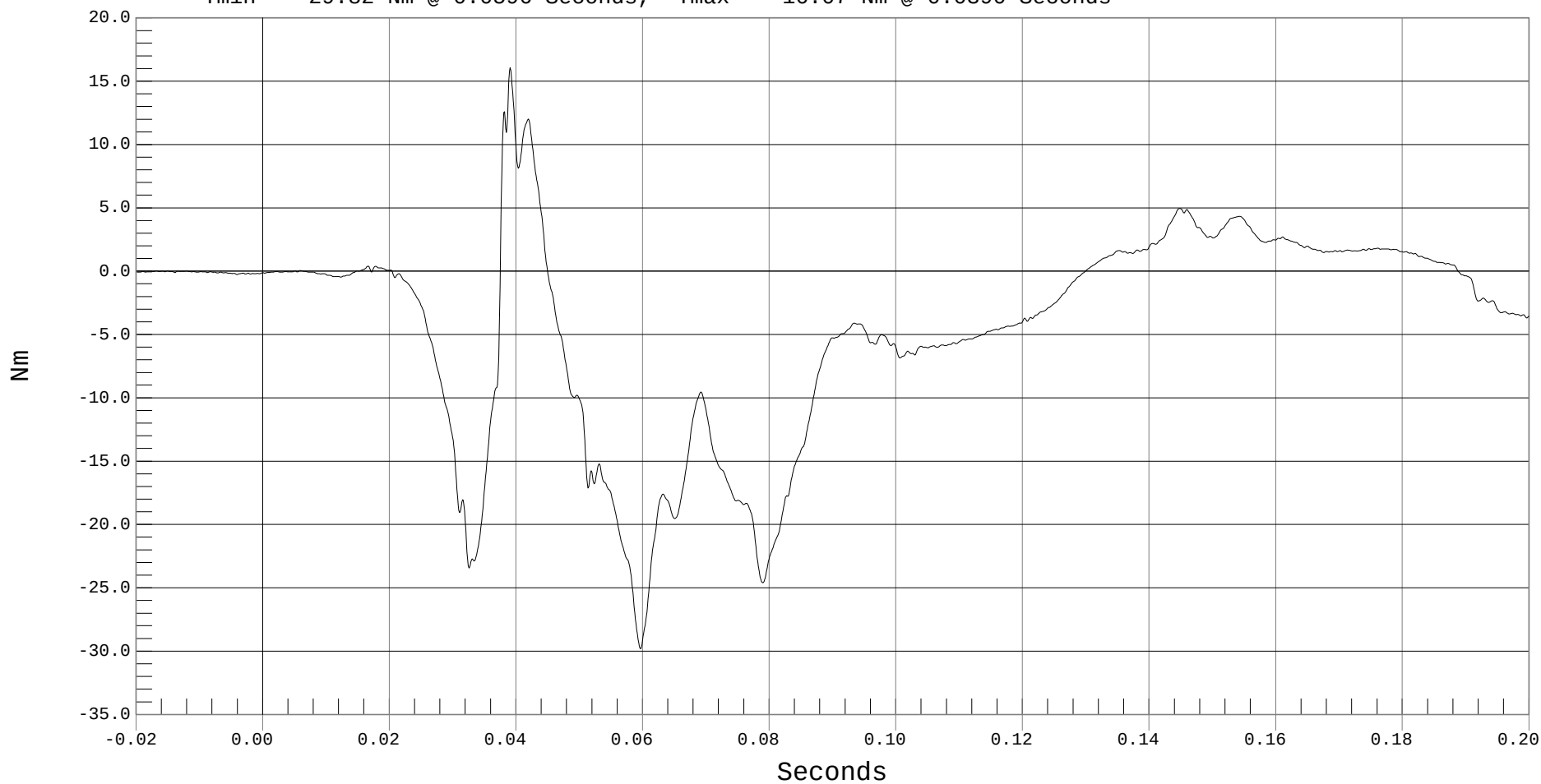
PASSENGER RIGHT LOWER TIBIA MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER RIGHT LOWER TIBIA MY, B01043MF.M85

Ymin = -29.82 Nm @ 0.0596 Seconds, Ymax = 16.07 Nm @ 0.0390 Seconds





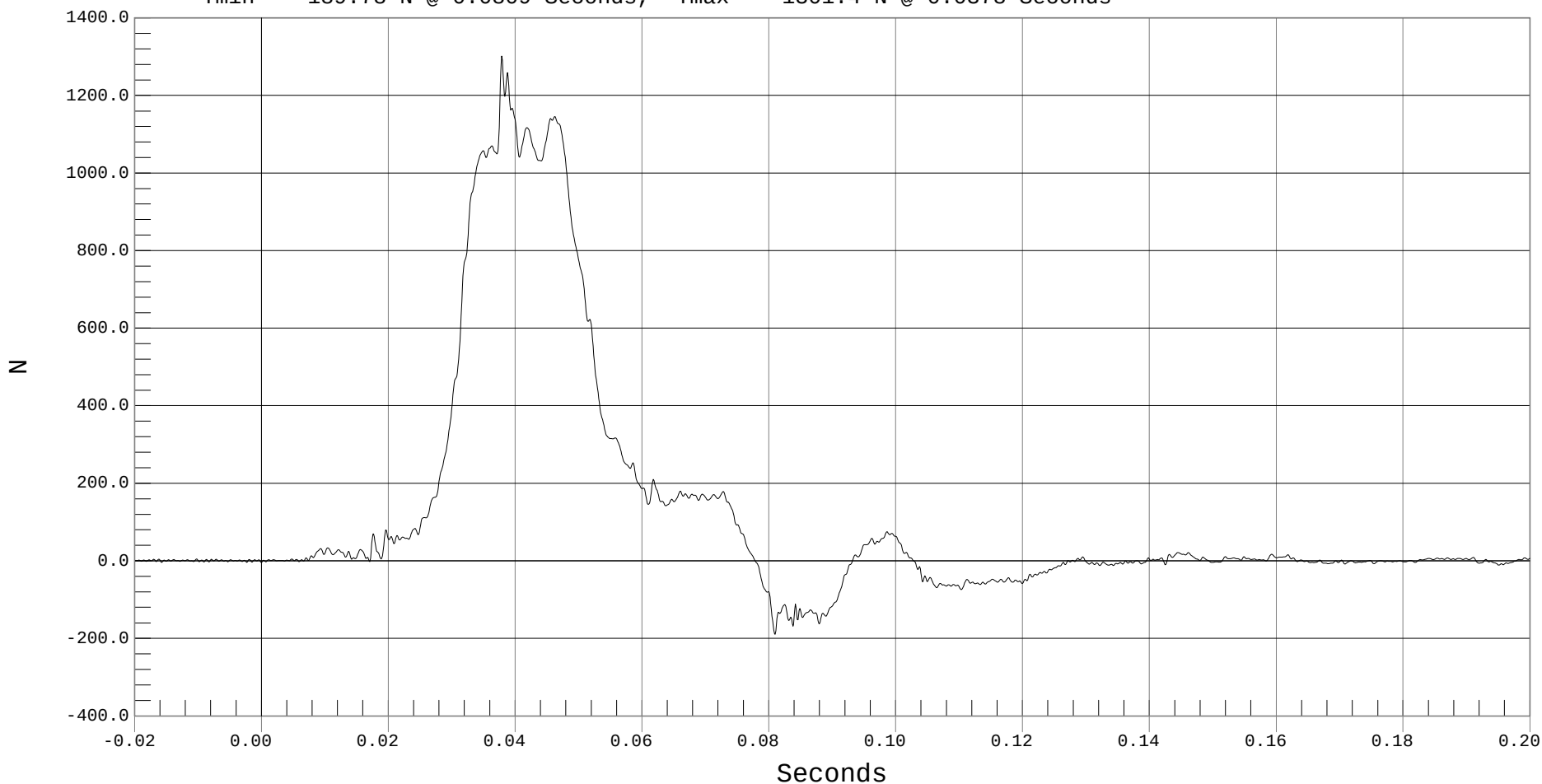
PASSENGER RIGHT LOWER TIBIA FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 PASSENGER RIGHT LOWER TIBIA FZ, B01043FF.F86

Ymin = -189.78 N @ 0.0809 Seconds, Ymax = 1301.4 N @ 0.0378 Seconds





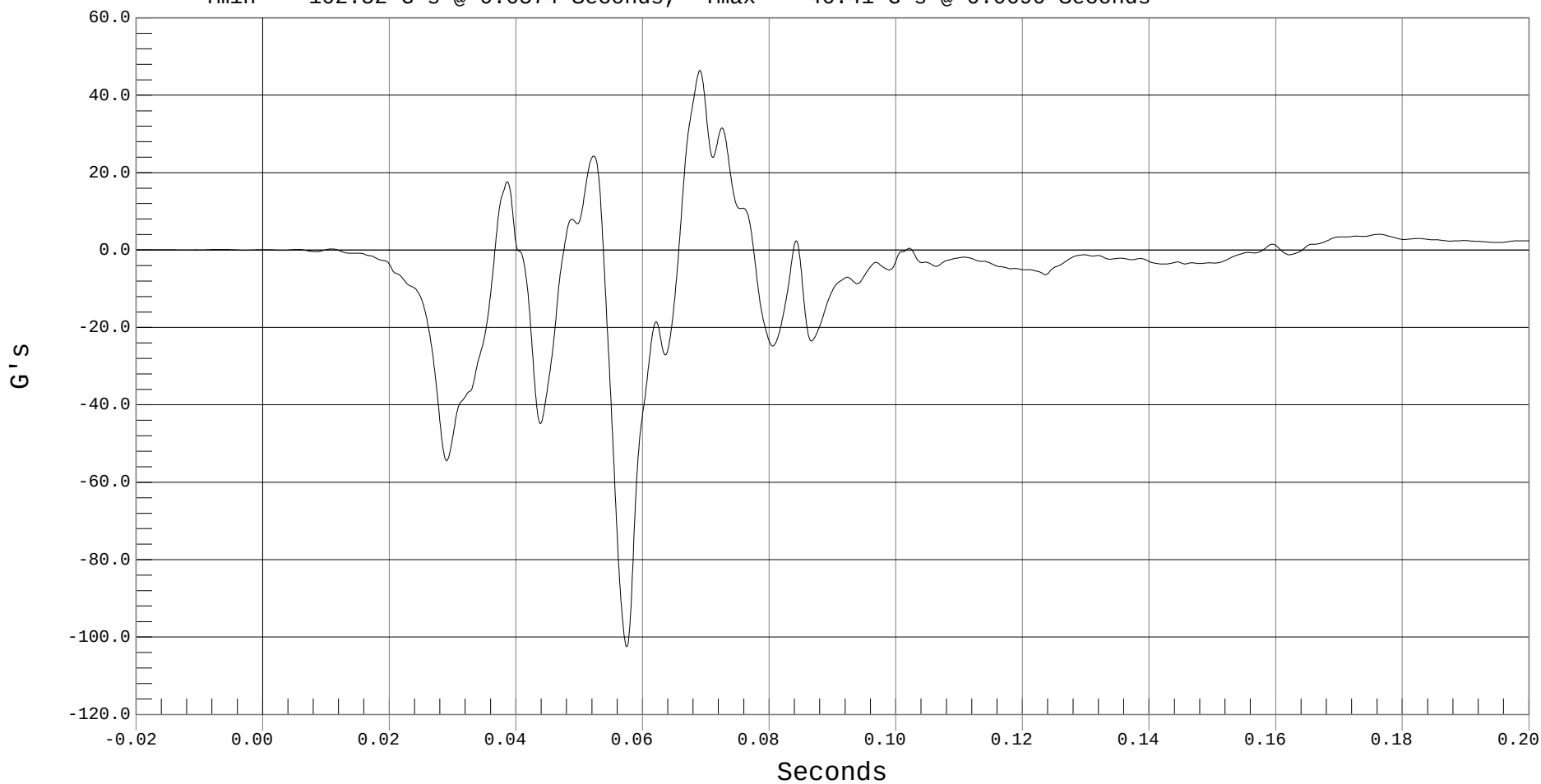
PASSENGER LEFT FOOT @ BALL Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER LEFT FOOT @ BALL Z, B01043AF.A09

Ymin = -102.52 G's @ 0.0574 Seconds, Ymax = 46.41 G's @ 0.0690 Seconds





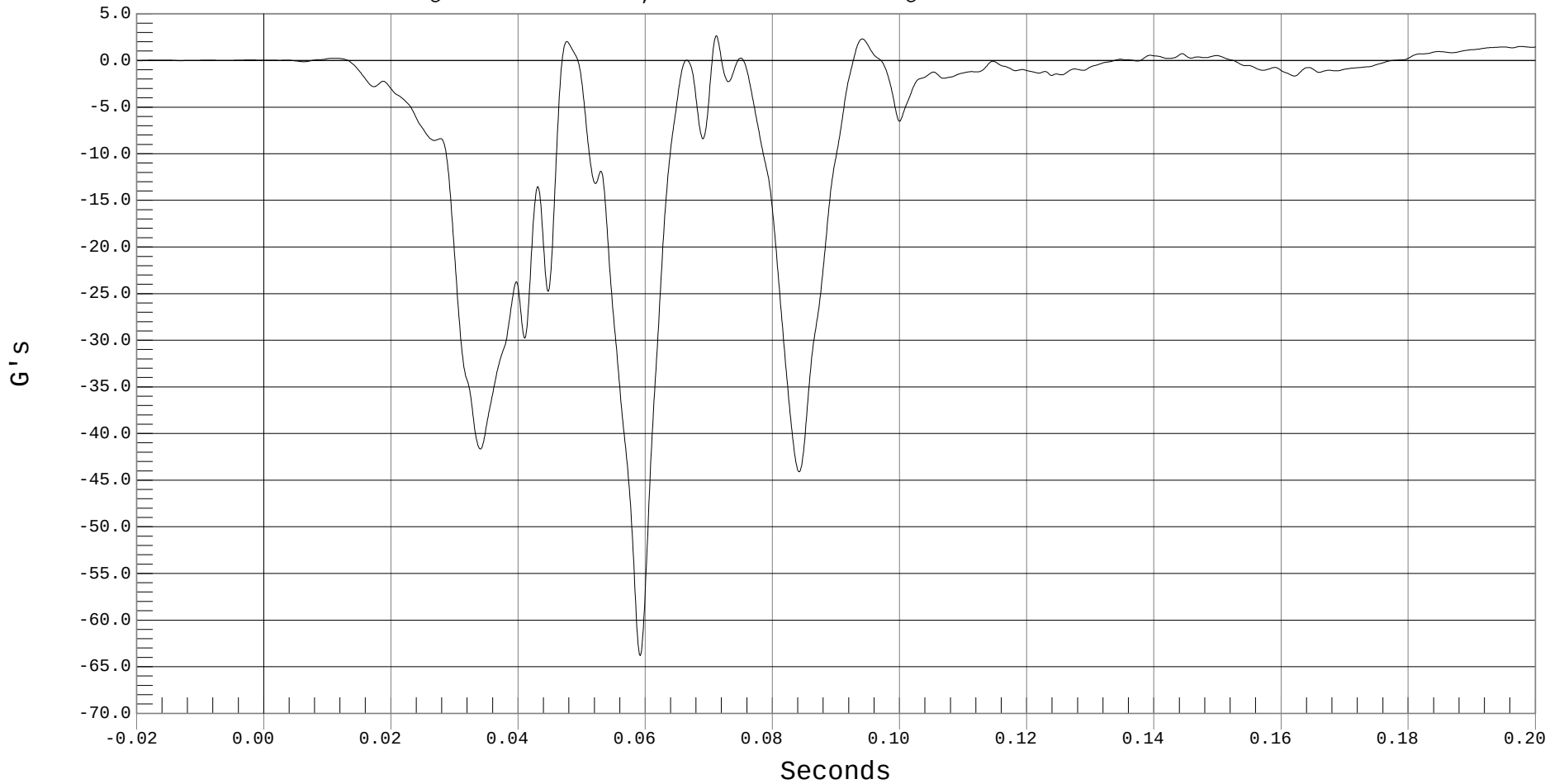
PASSENGER LEFT FOOT @ HEEL X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER LEFT FOOT @ HEEL X, B01043AF.A07

Ymin = -63.8 G's @ 0.0591 Seconds, Ymax = 2.65 G's @ 0.0711 Seconds





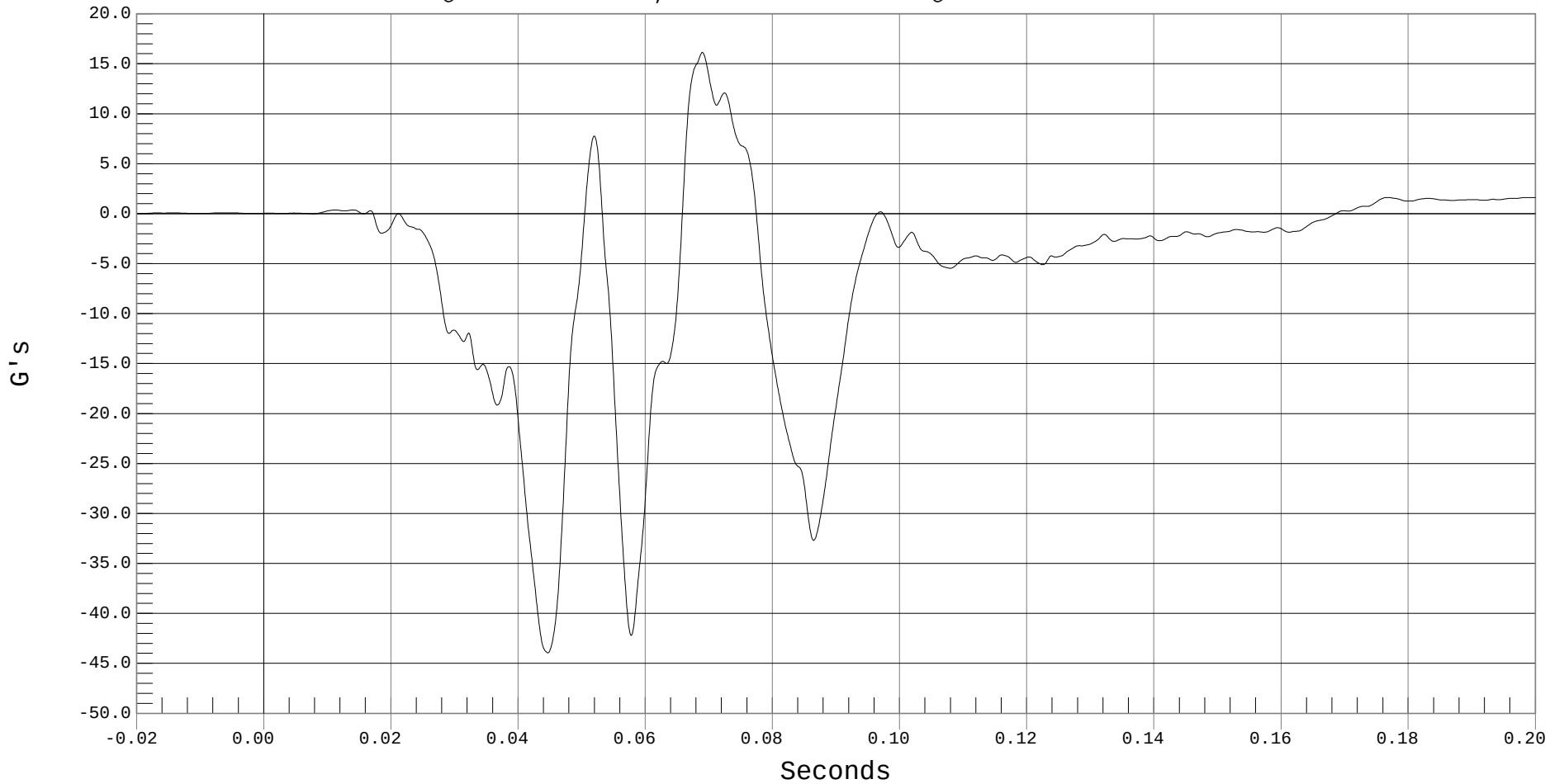
PASSENGER LEFT FOOT @ HEEL Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER LEFT FOOT @ HEEL Z, B01043AF.A08

Ymin = -43.95 G's @ 0.0446 Seconds, Ymax = 16.14 G's @ 0.0689 Seconds





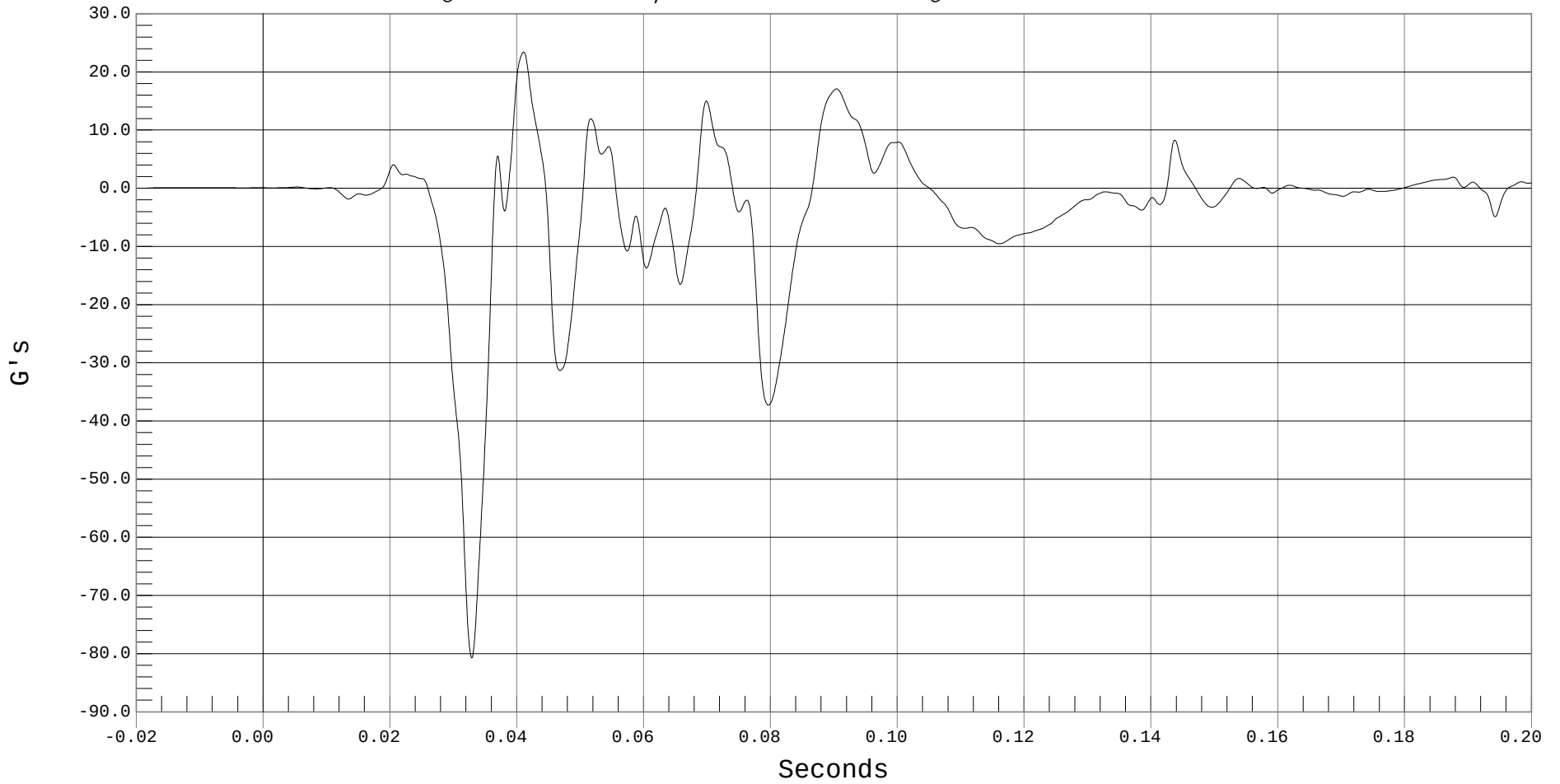
PASSENGER RIGHT FOOT @ BALL Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER RIGHT FOOT @ BALL Z, B01043AF.A06

Ymin = -80.74 G's @ 0.0328 Seconds, Ymax = 23.43 G's @ 0.0410 Seconds





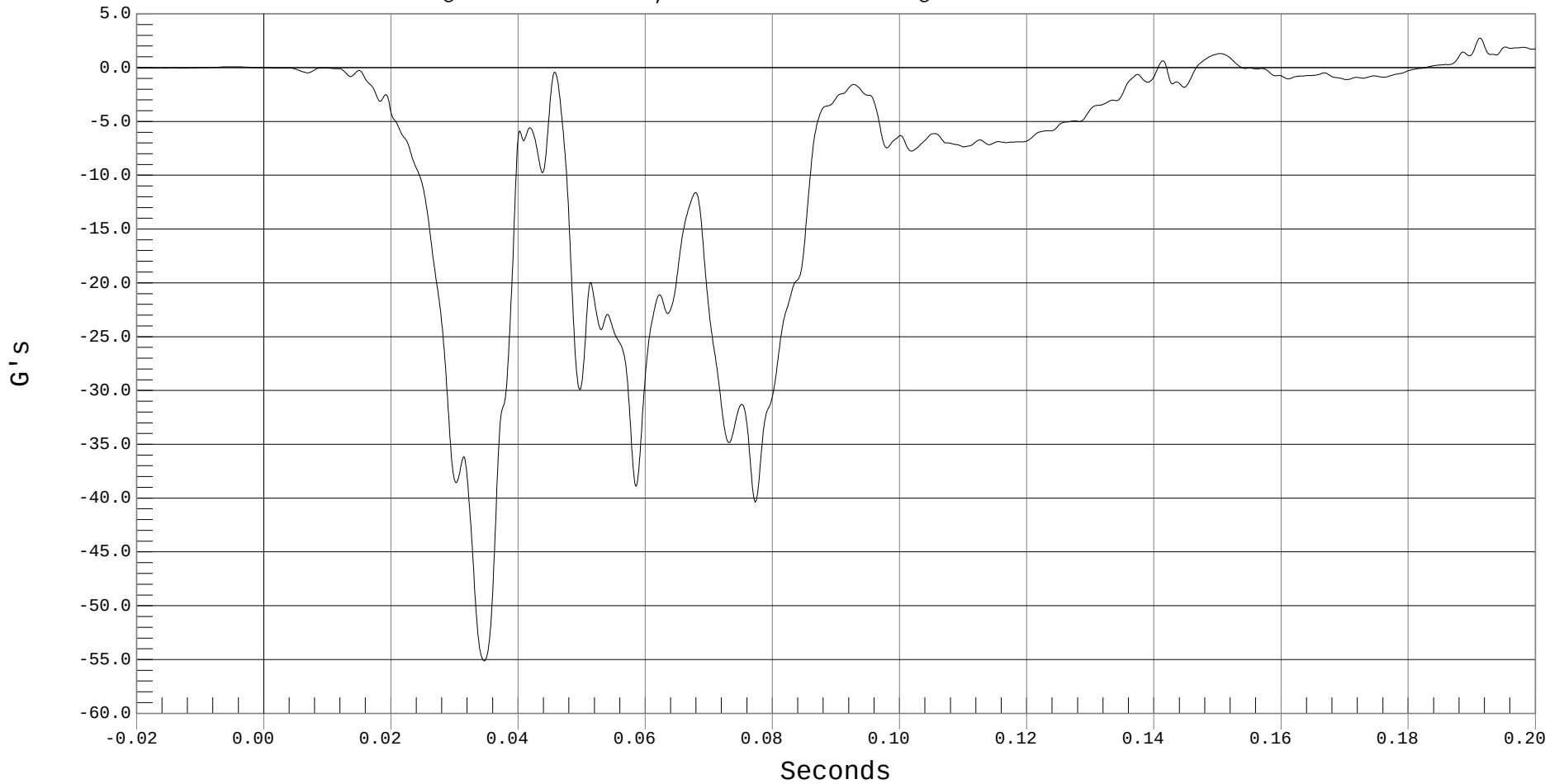
PASSENGER RIGHT FOOT @ HEEL X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER RIGHT FOOT @ HEEL X, B01043AF.A04

Ymin = -55.13 G's @ 0.0346 Seconds, Ymax = 2.75 G's @ 0.1912 Seconds





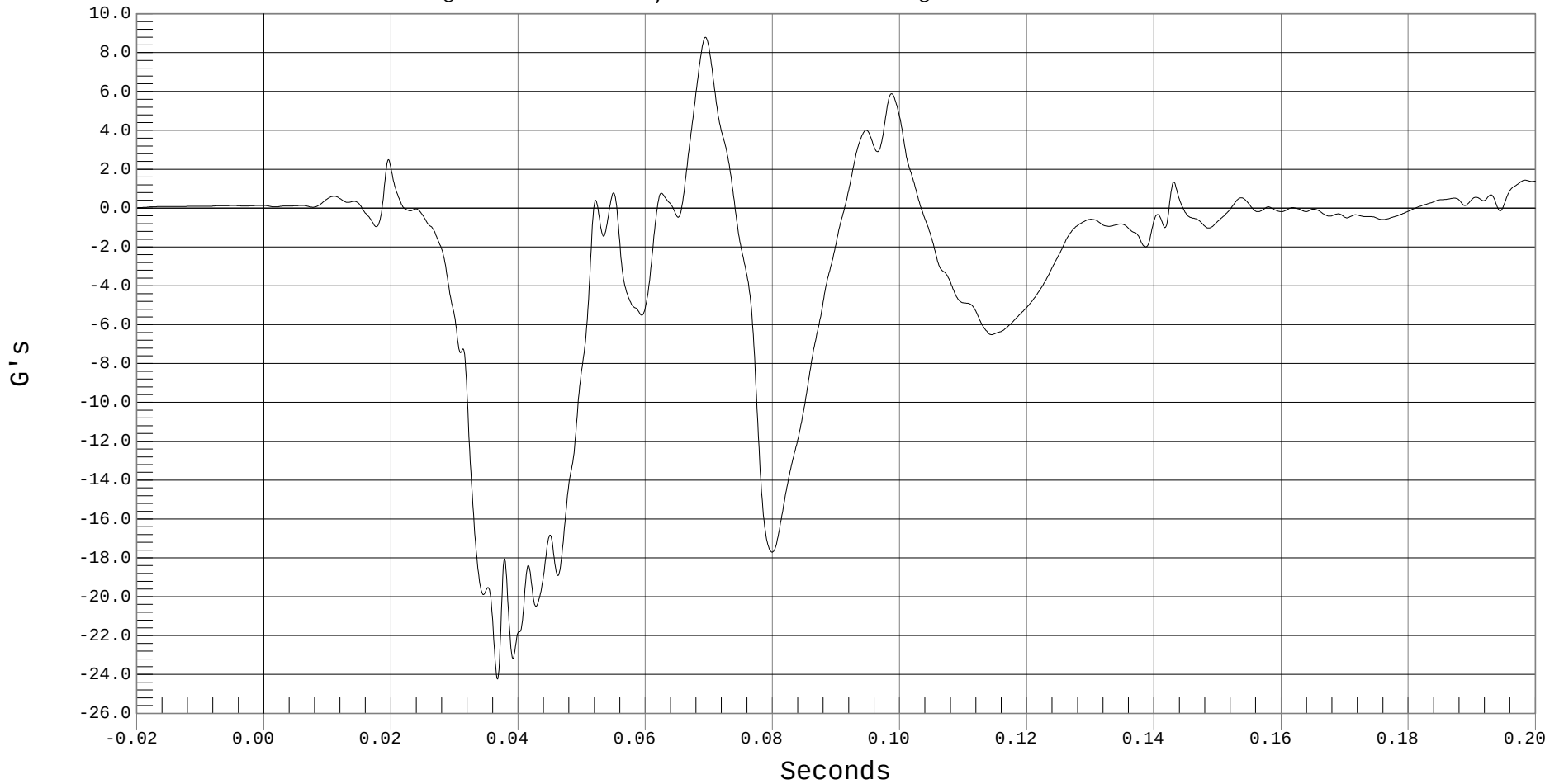
PASSENGER RIGHT FOOT @ HEEL Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 PASSENGER RIGHT FOOT @ HEEL Z, B01043AF.A05

Ymin = -24.24 G's @ 0.0367 Seconds, Ymax = 8.79 G's @ 0.0694 Seconds





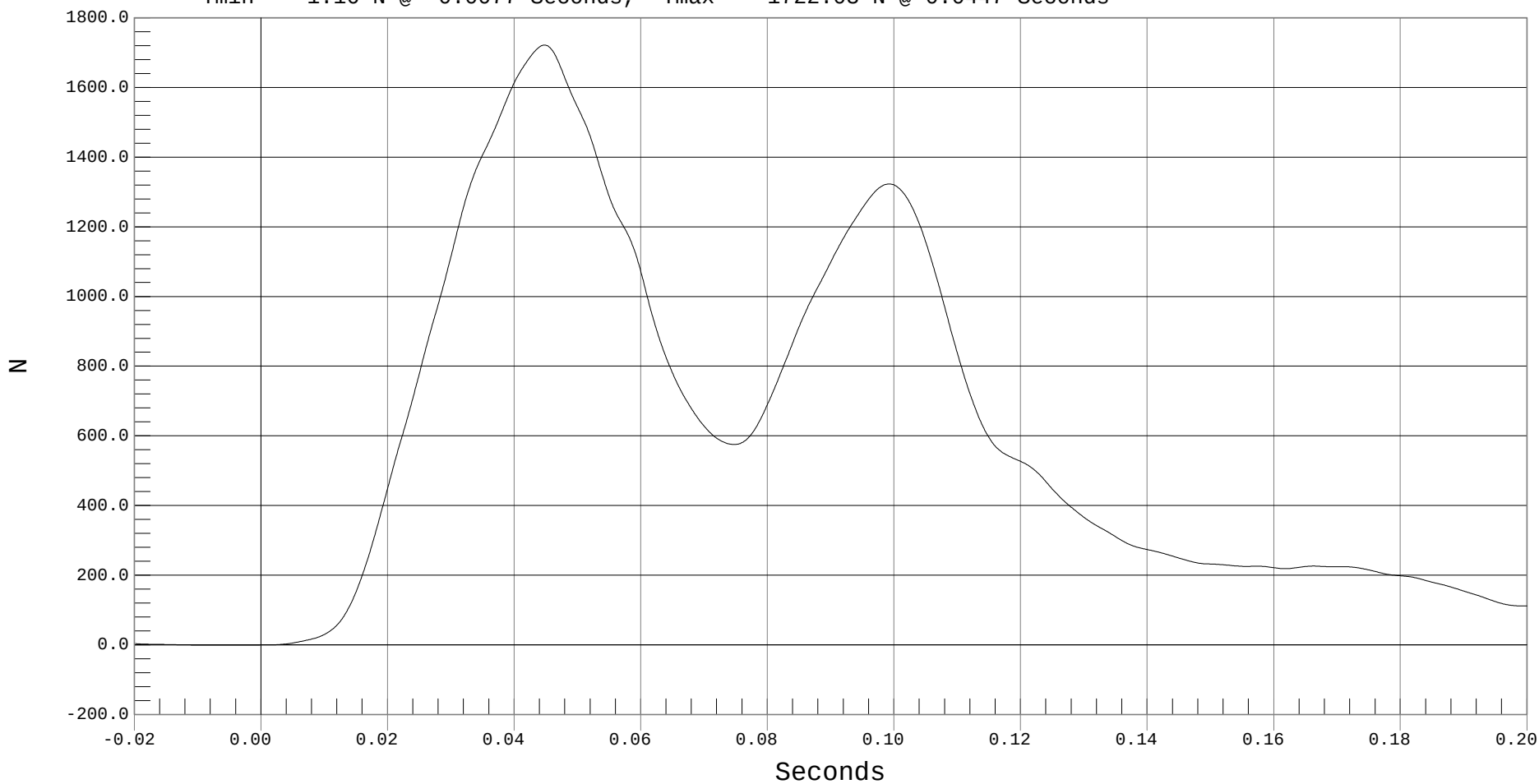
PASSENGER LAP BELT FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 PASSENGER LAP BELT, B01043FF.F68

Ymin = -1.16 N @ -0.0077 Seconds, Ymax = 1722.03 N @ 0.0447 Seconds





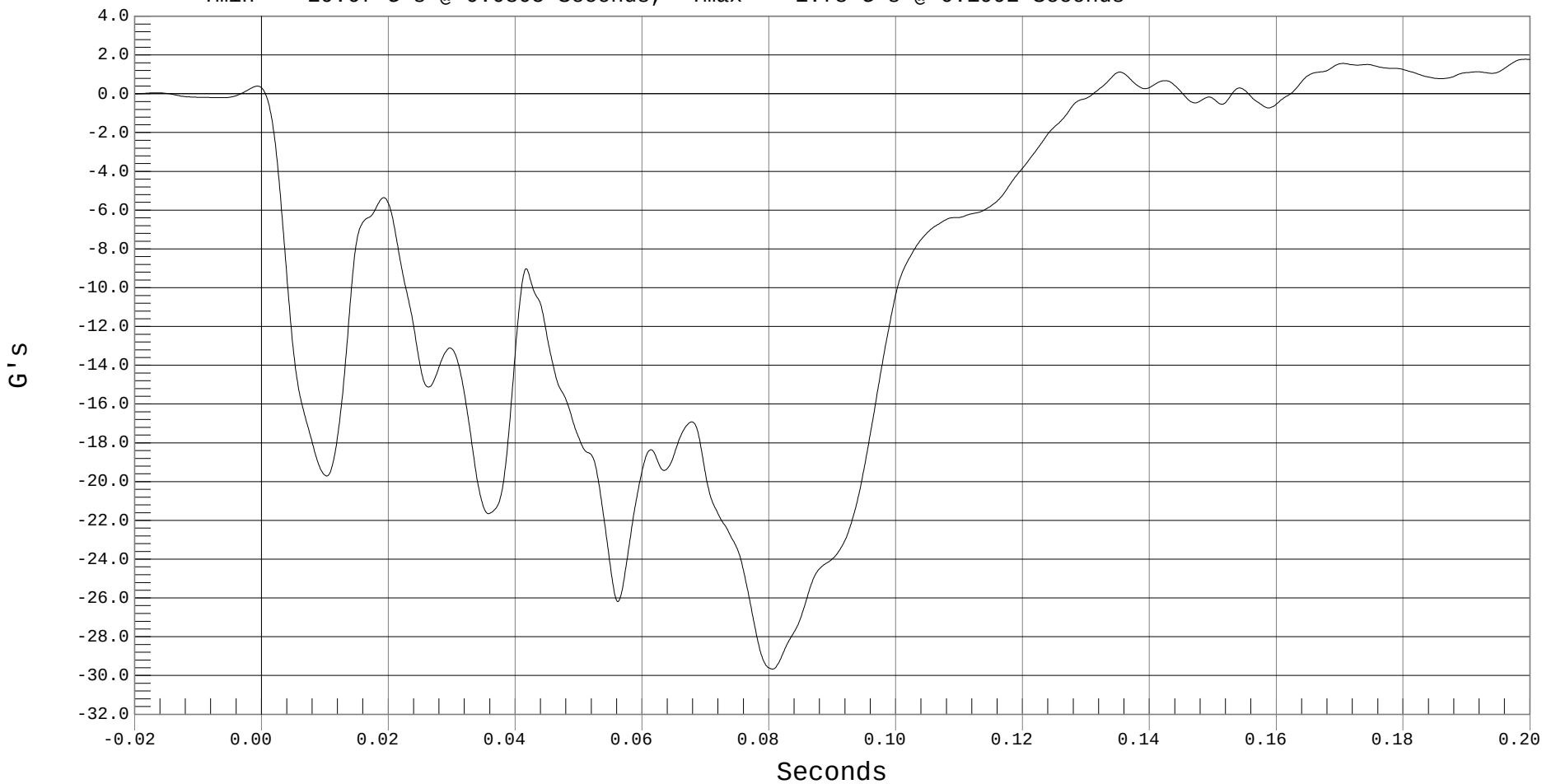
LEFT REAR SEAT CROSSMEMBER X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 LEFT REAR SEAT CROSSMEMBER X, B01043AF.A59

Ymin = -29.67 G's @ 0.0805 Seconds, Ymax = 1.78 G's @ 0.1992 Seconds





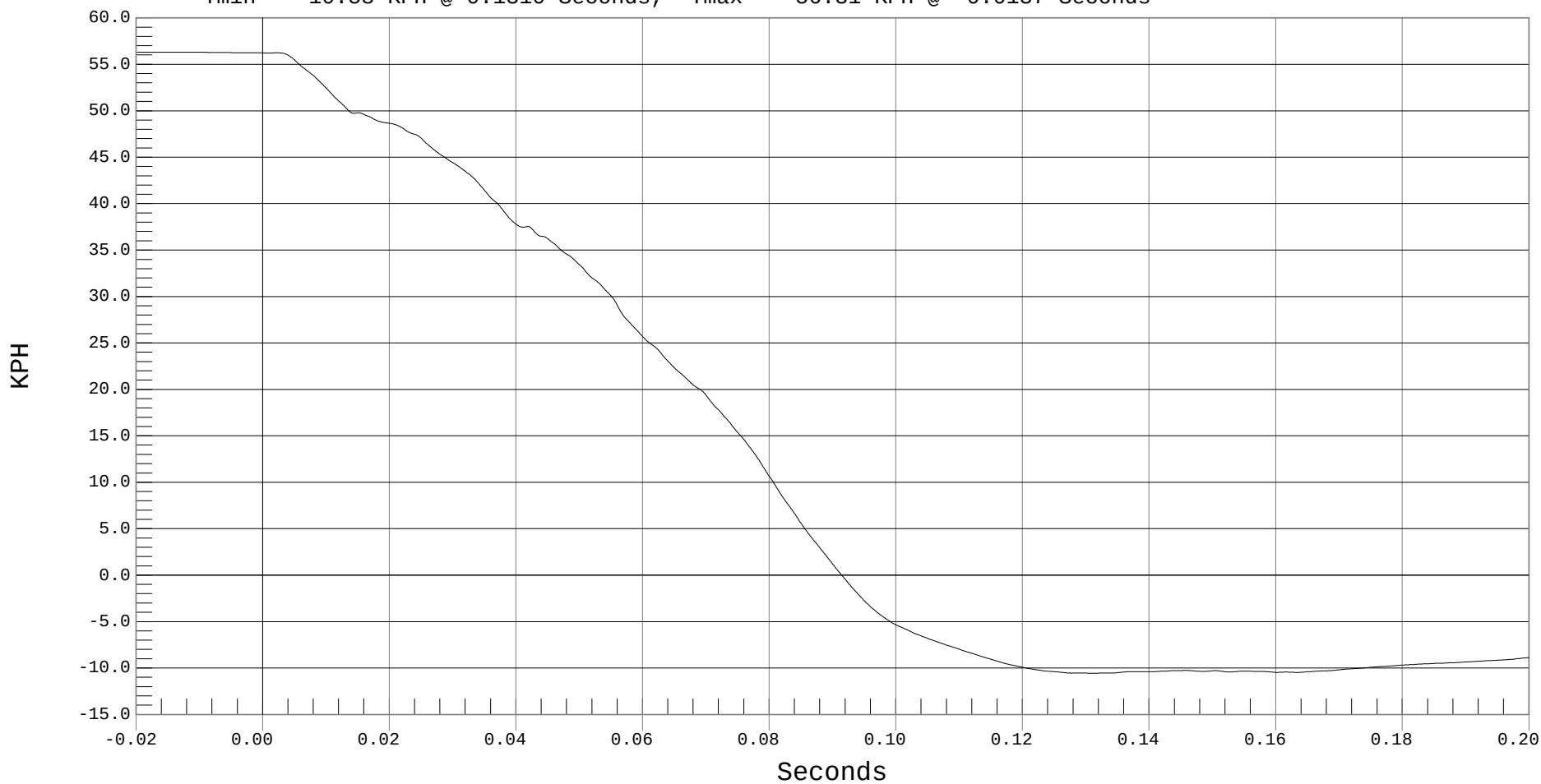
LEFT REAR SEAT CROSSMEMBER X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LEFT REAR SEAT CROSSMEMBER X VELOCITY, B01043AI.V59

Ymin = -10.58 KPH @ 0.1310 Seconds, Ymax = 56.31 KPH @ -0.0137 Seconds





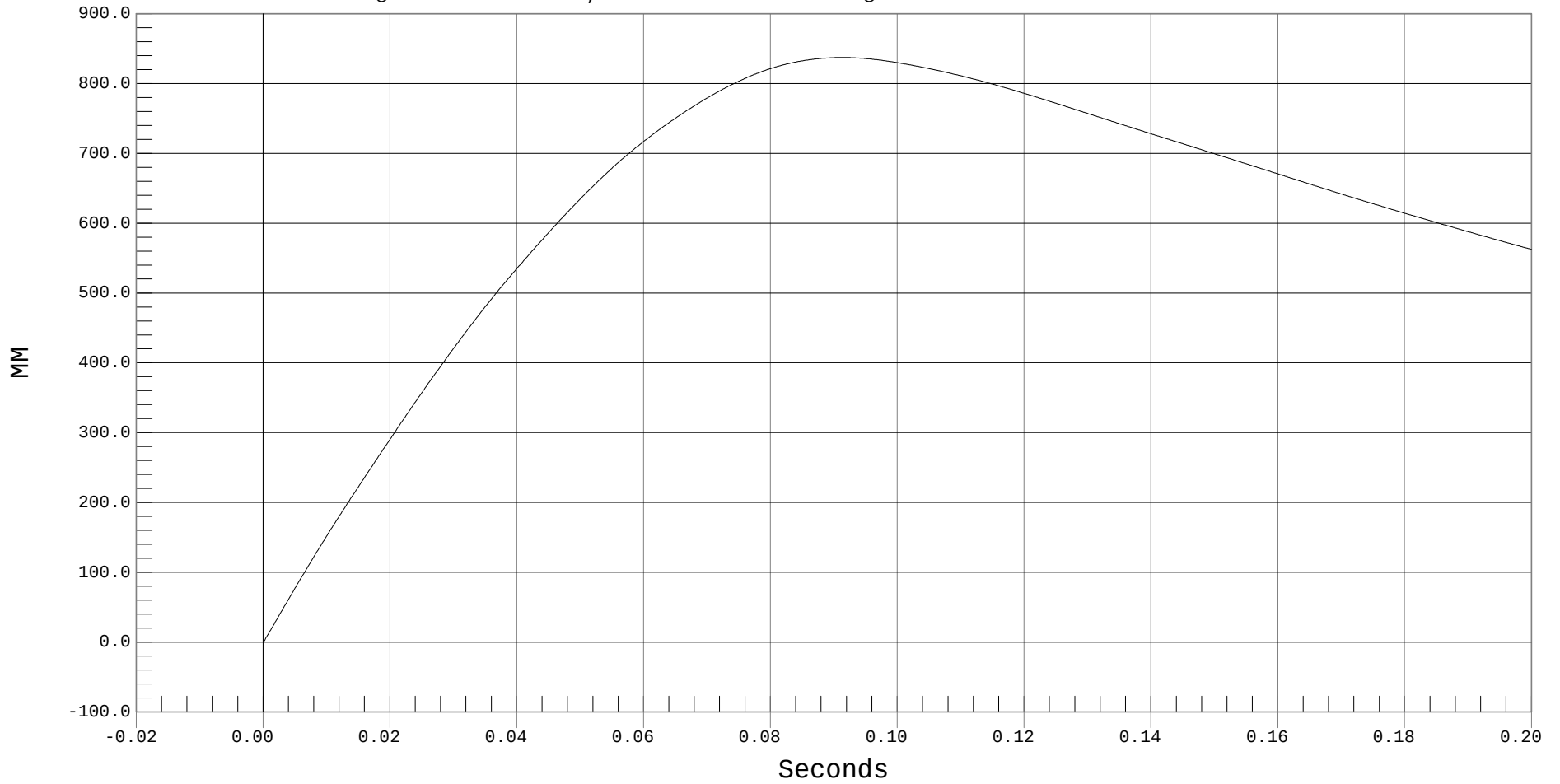
LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT, B01043AI.D59

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 837.34 MM @ 0.0913 Seconds





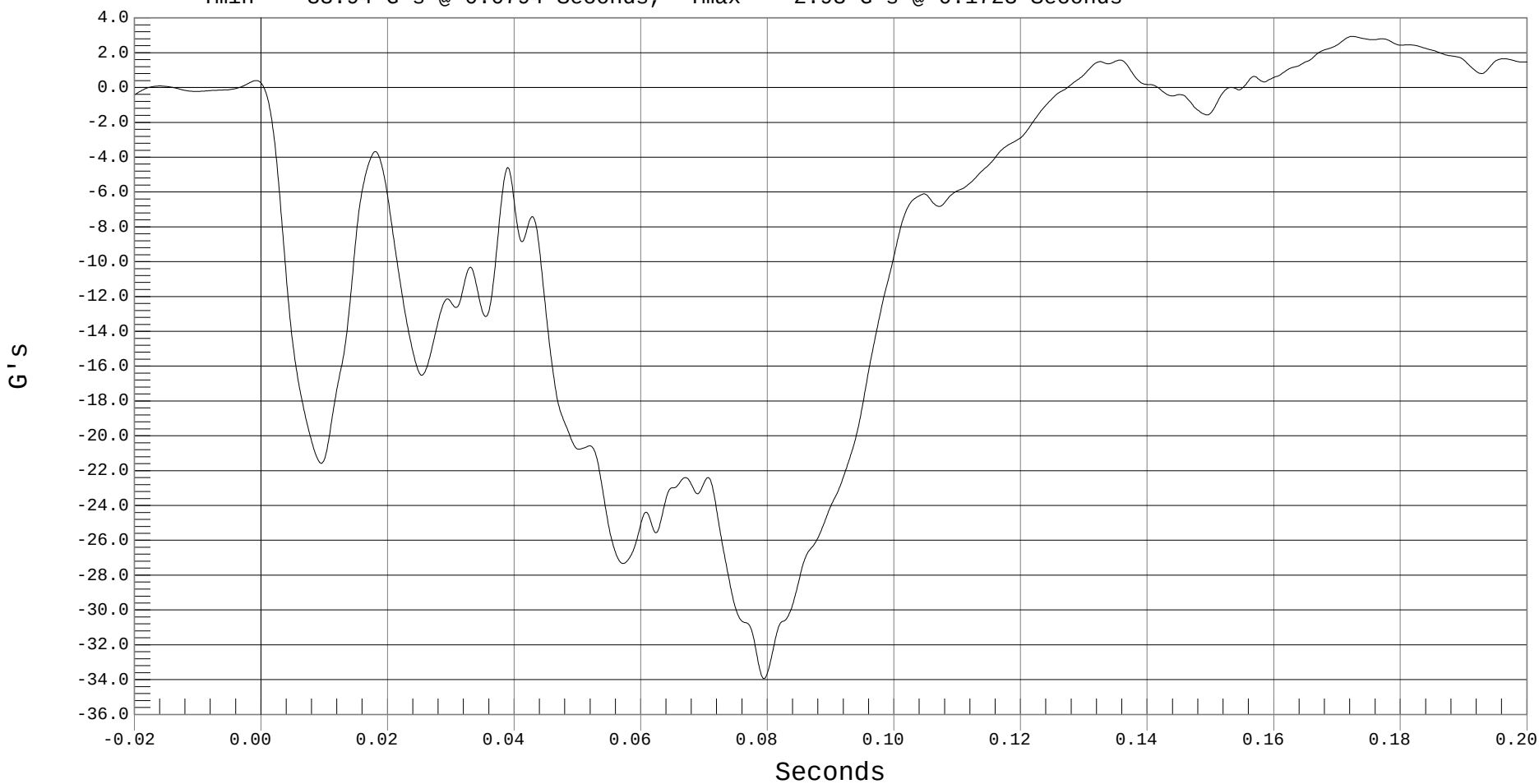
RIGHT REAR SEAT CROSSMEMBER X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 RIGHT REAR SEAT CROSSMEMBER X, B01043AF.A58

Ymin = -33.94 G's @ 0.0794 Seconds, Ymax = 2.93 G's @ 0.1723 Seconds





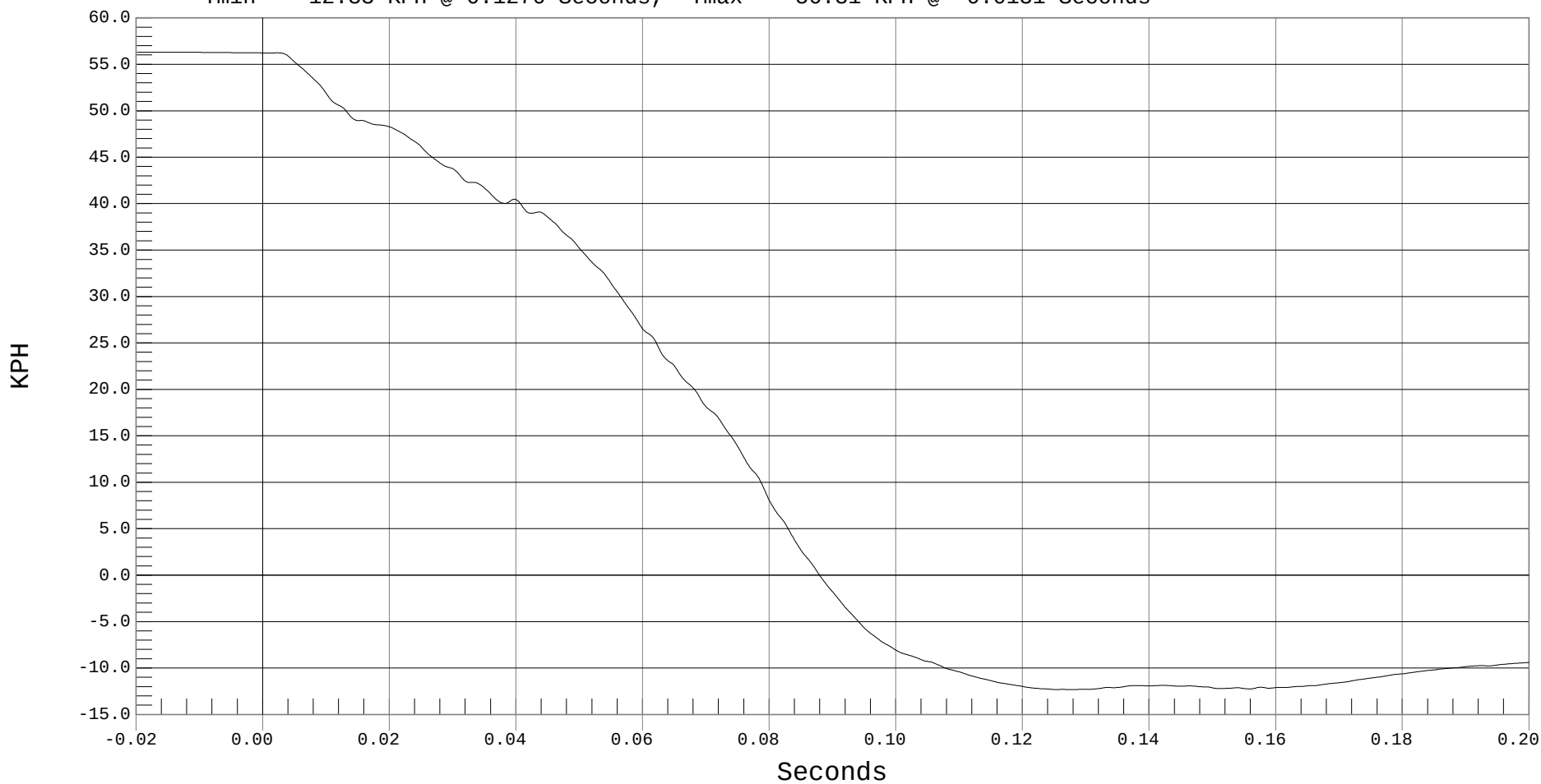
RIGHT REAR SEAT CROSSMEMBER X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RIGHT REAR SEAT CROSSMEMBER X VELOCITY, B01043AI.V58

Ymin = -12.33 KPH @ 0.1276 Seconds, Ymax = 56.31 KPH @ -0.0131 Seconds





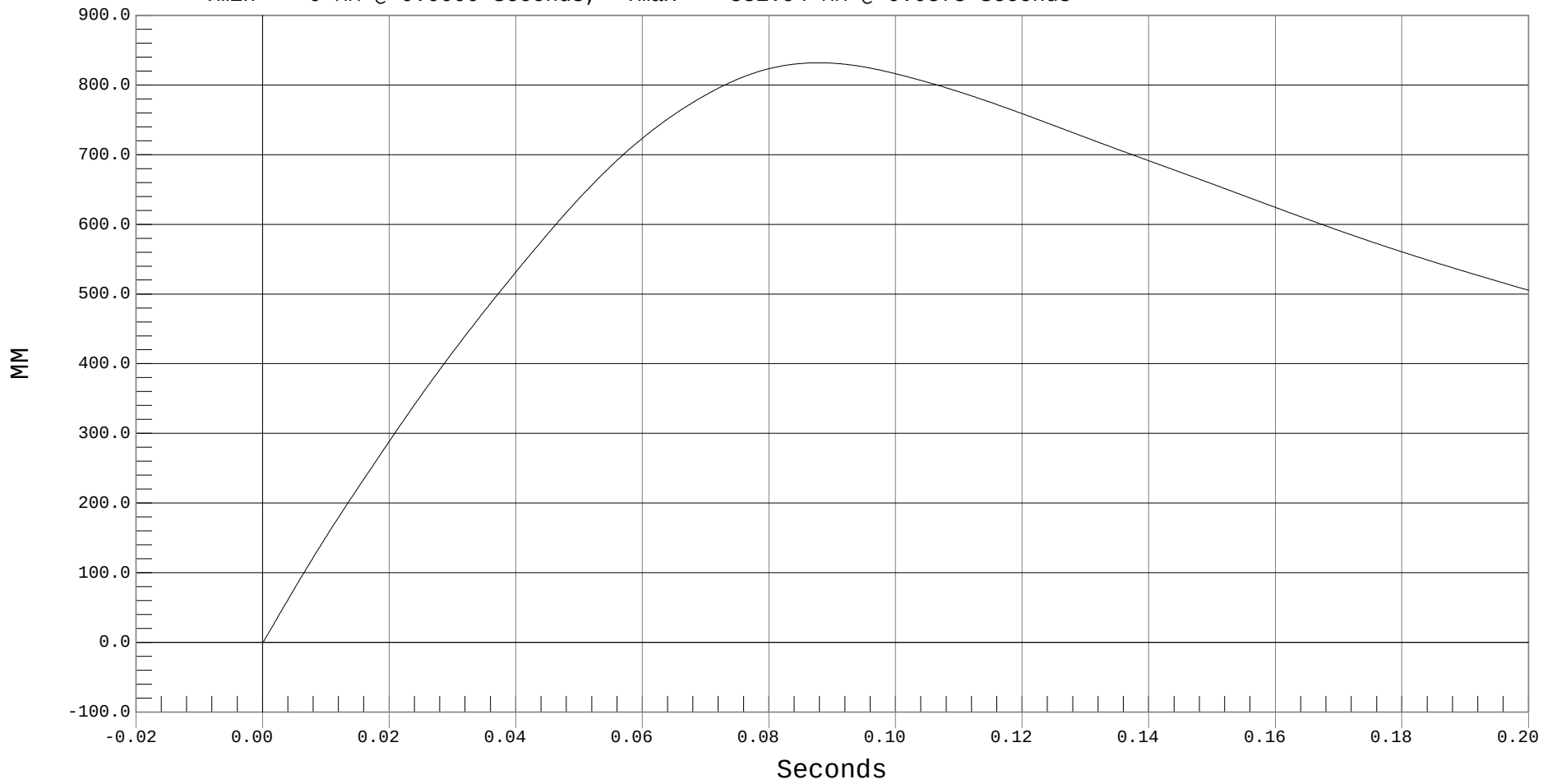
RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT, B01043AI.D58

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 831.94 MM @ 0.0878 Seconds





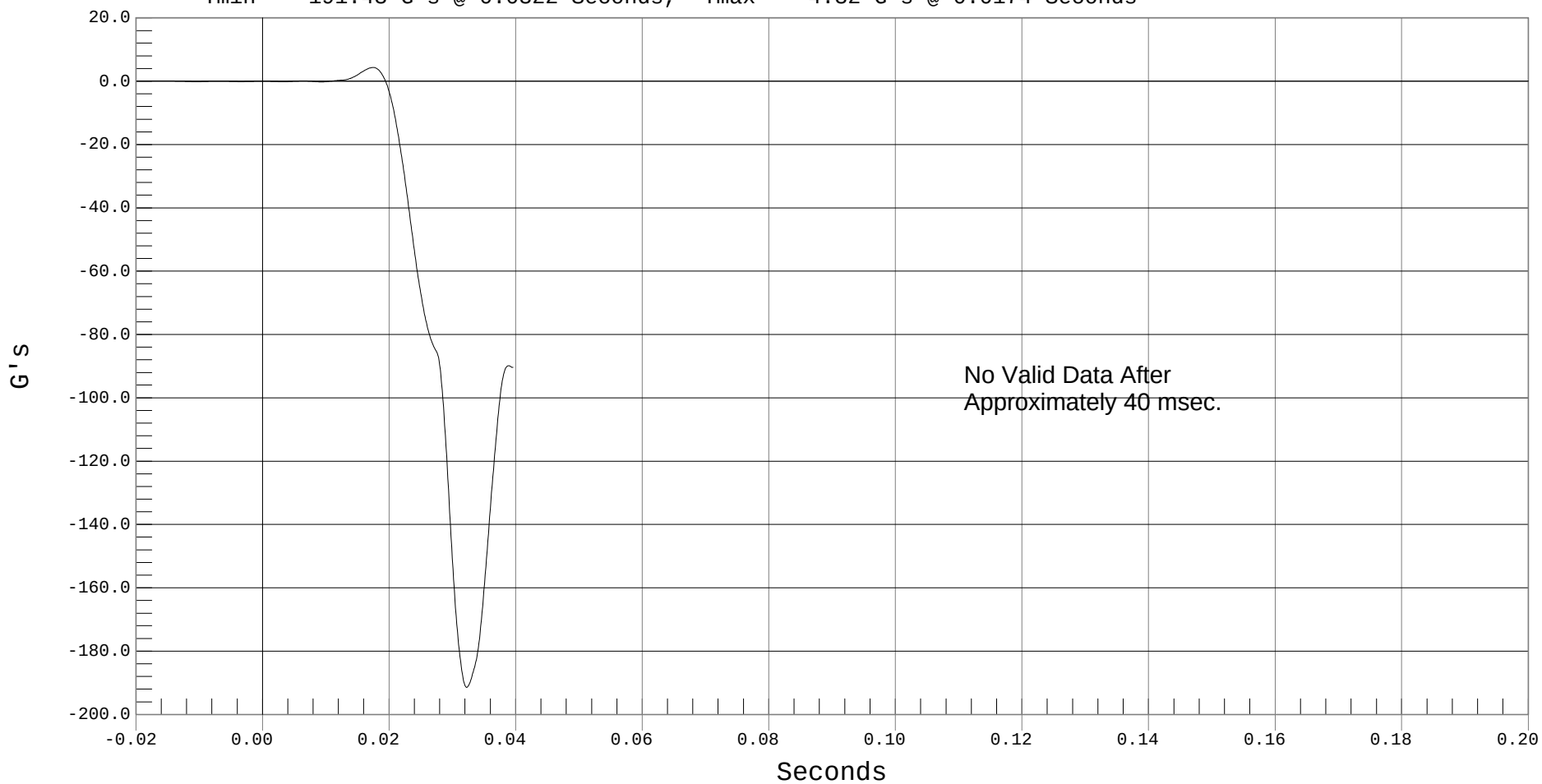
UPPER ENGINE X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 ENGINE UPPER X, B01043AF.A55

Ymin = -191.43 G's @ 0.0322 Seconds, Ymax = 4.32 G's @ 0.0174 Seconds





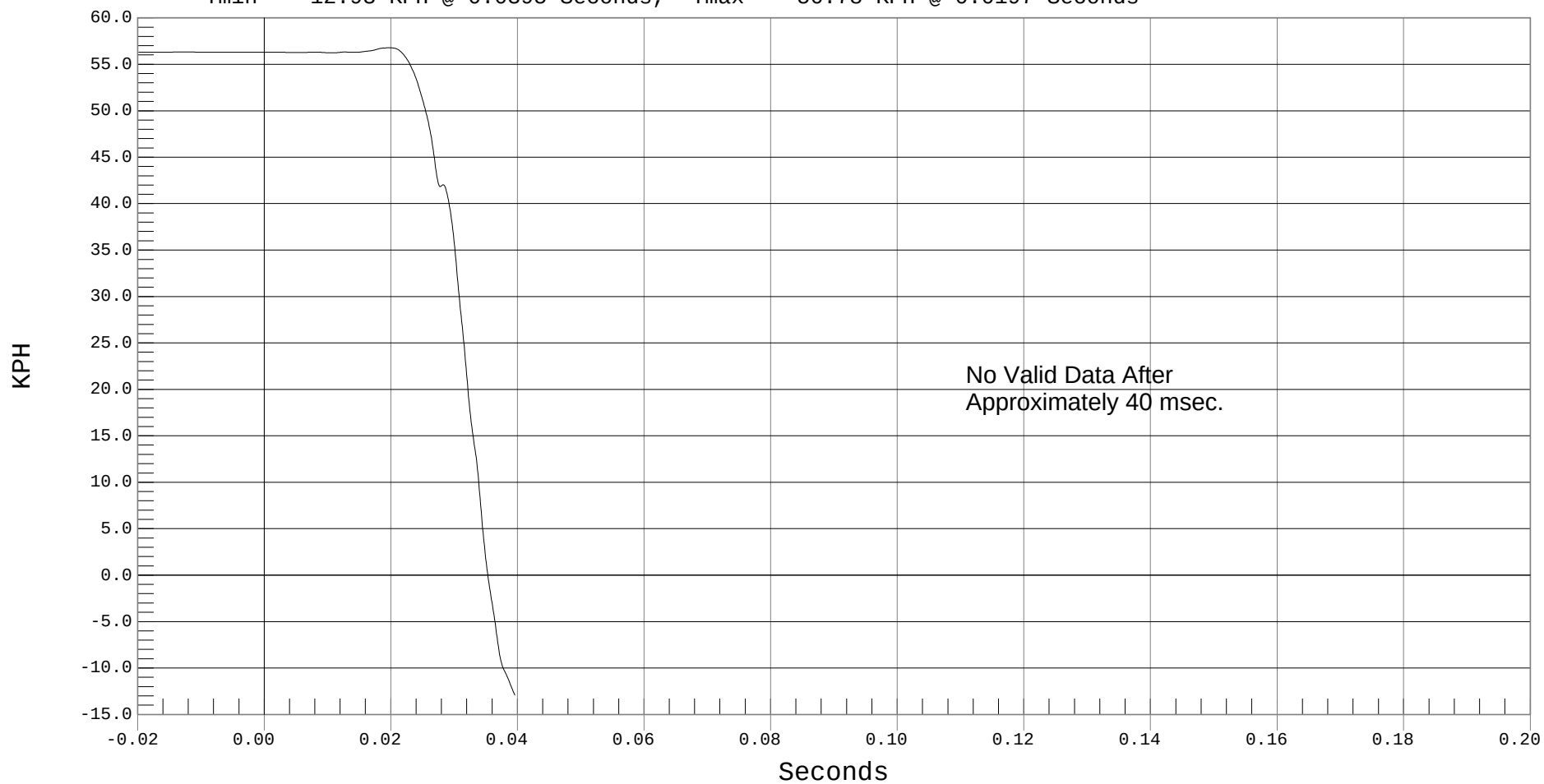
UPPER ENGINE X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 TOP OF ENGINE BLOCK X VELOCITY, B01043AI.V55

Ymin = -12.93 KPH @ 0.0395 Seconds, Ymax = 56.78 KPH @ 0.0197 Seconds





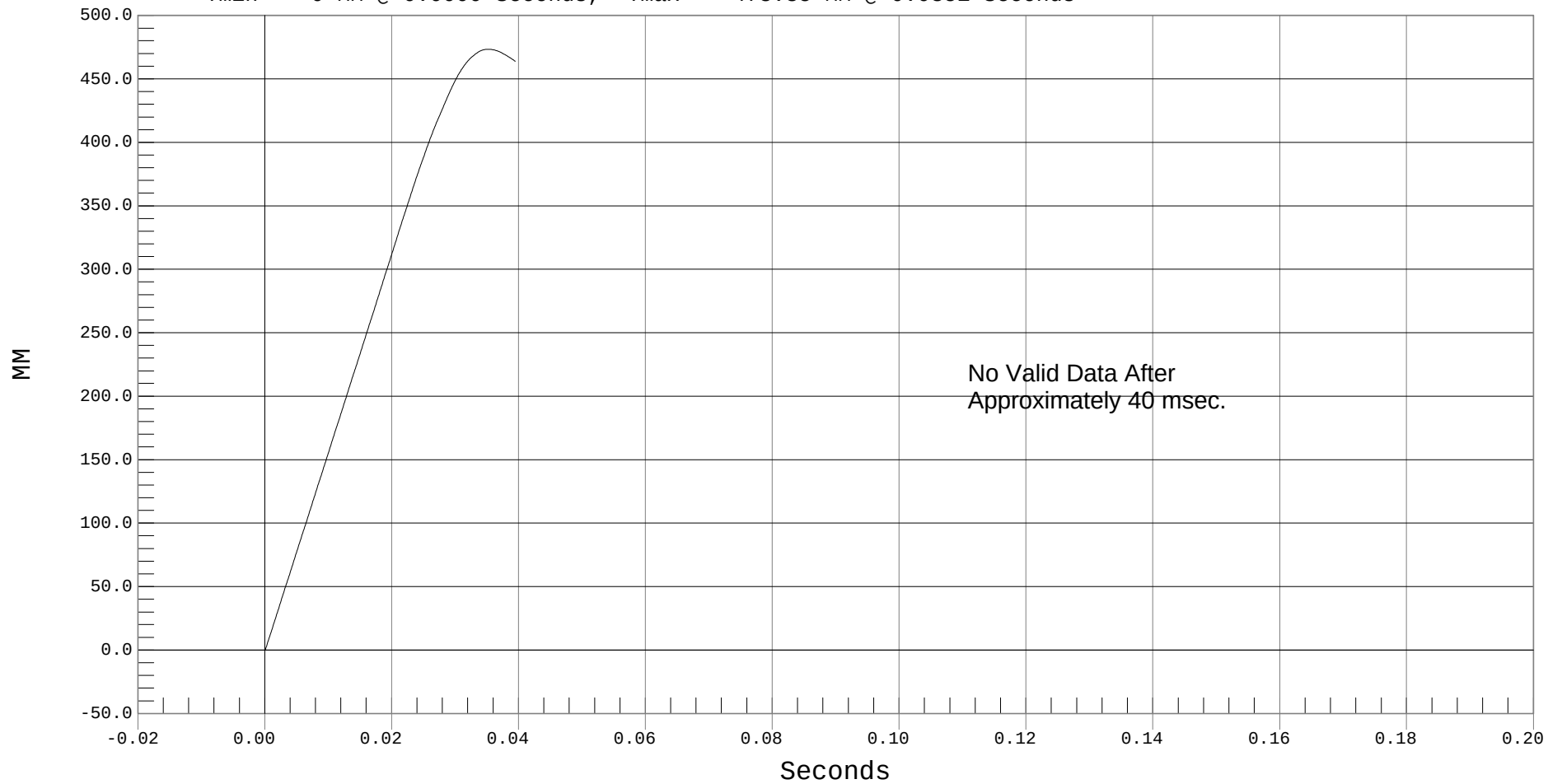
UPPER ENGINE X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 TOP OF ENGINE BLOCK X DISPLACEMENT, B01043AI.D55

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 473.35 MM @ 0.0351 Seconds





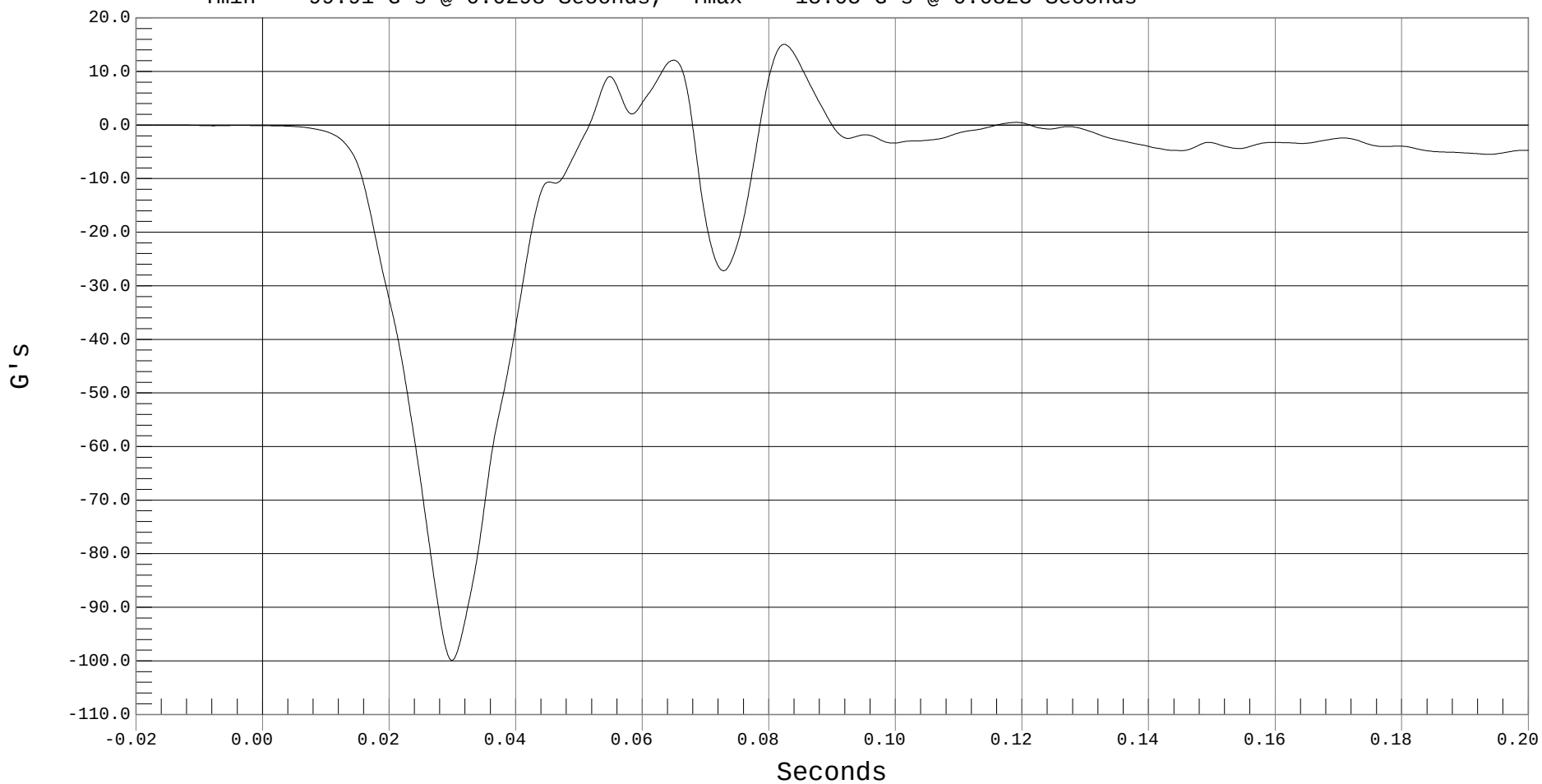
LOWER ENGINE X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 ENGINE LOWER X, B01043AF.A56

Ymin = -99.91 G's @ 0.0298 Seconds, Ymax = 15.05 G's @ 0.0823 Seconds





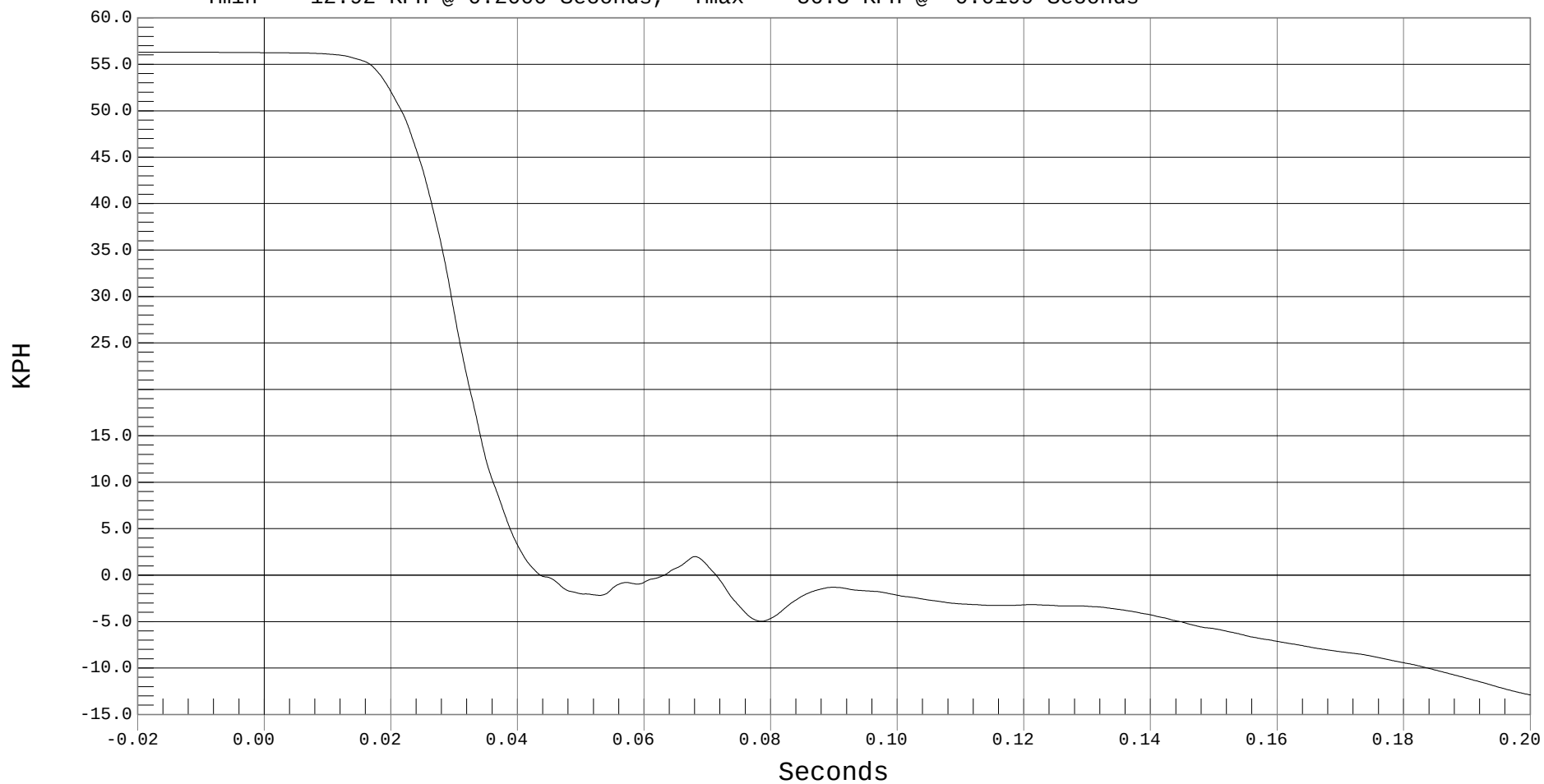
LOWER ENGINE X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 BOTTOM OF ENGINE X VELOCITY, B01043AI.V56

Ymin = -12.92 KPH @ 0.2000 Seconds, Ymax = 56.3 KPH @ -0.0199 Seconds





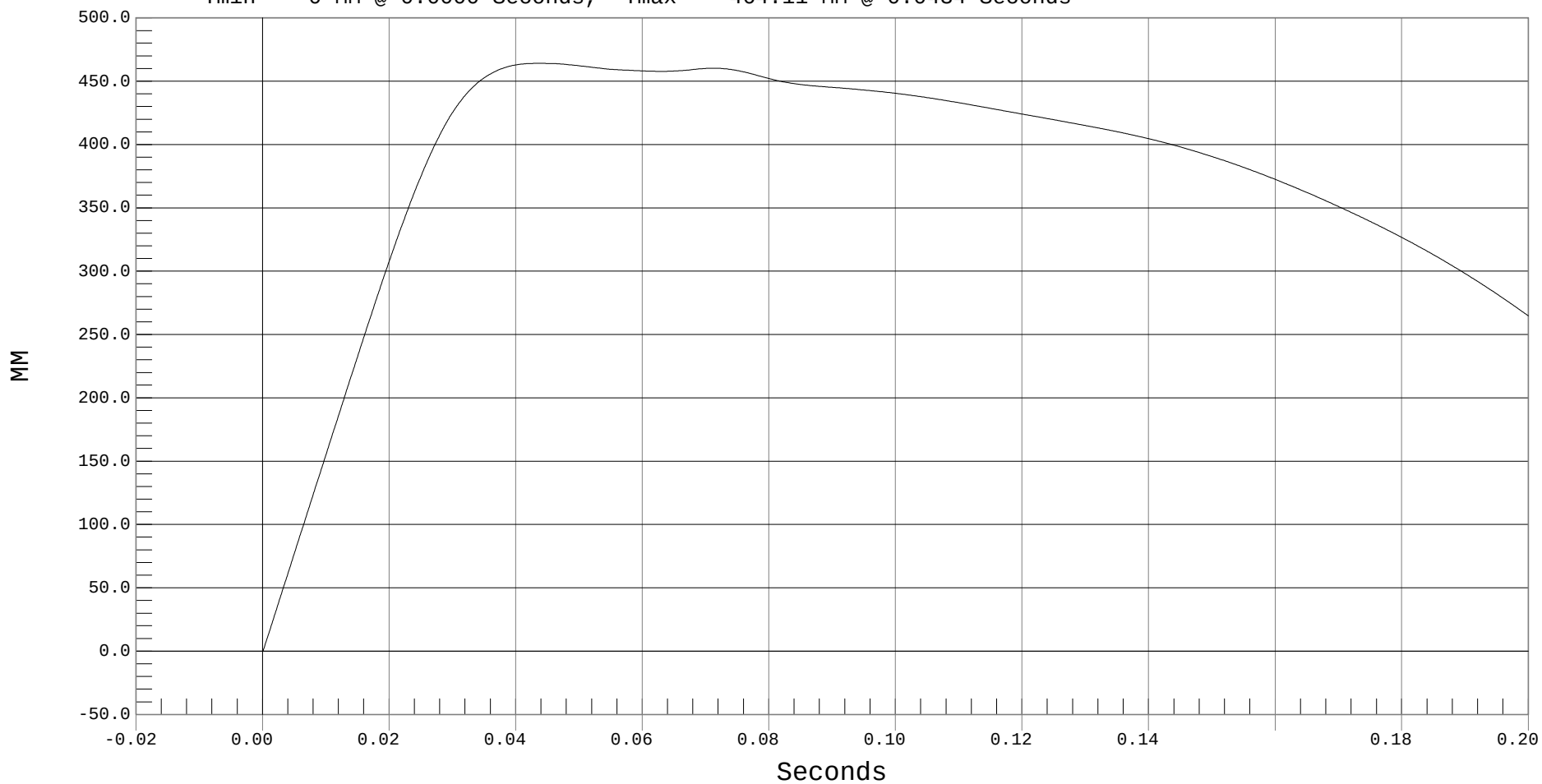
LOWER ENGINE X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 BOTTOM OF ENGINE X DISPLACEMENT, B01043AI.D56

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 464.11 MM @ 0.0434 Seconds





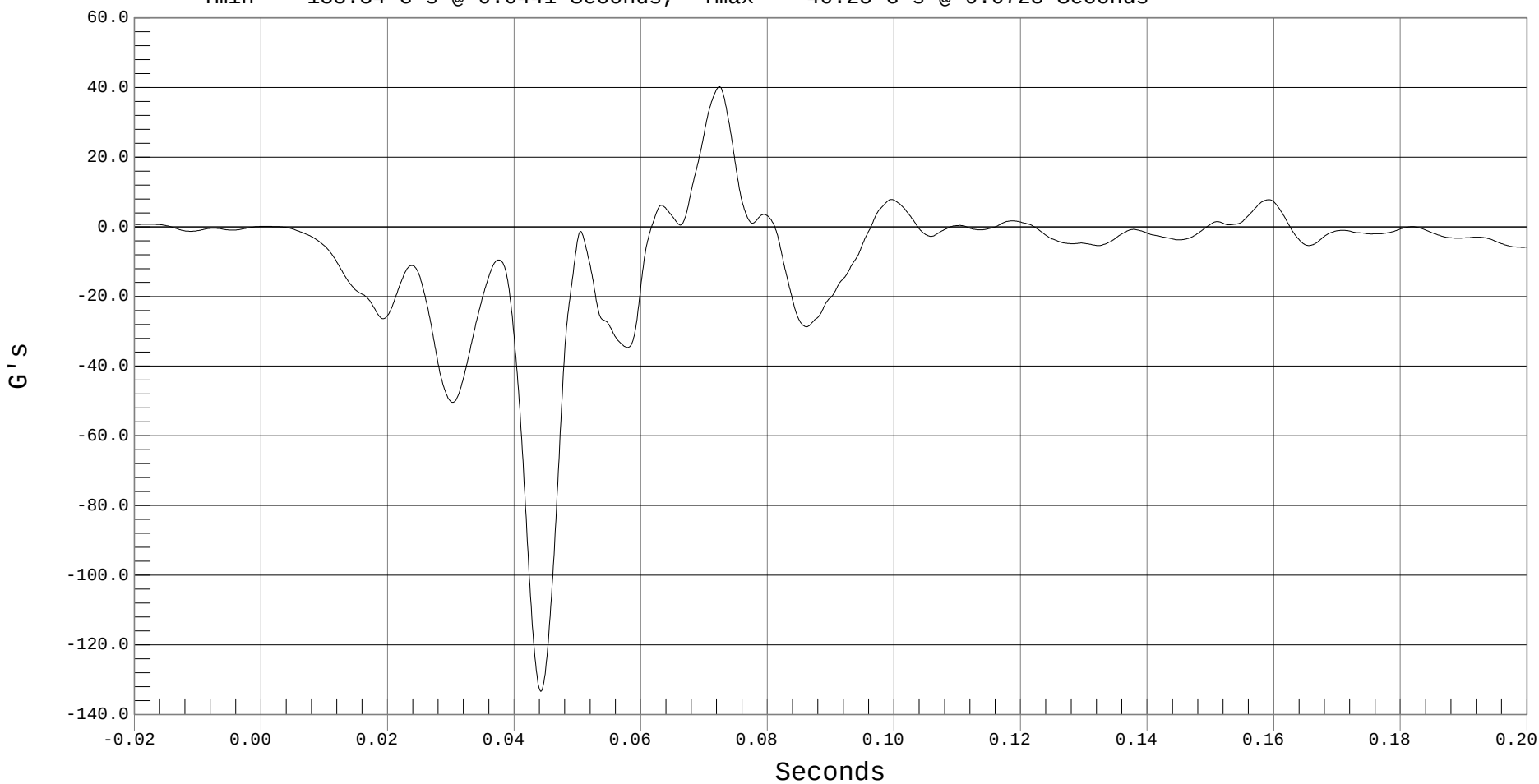
LEFT BRAKE CALIPER X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 LEFT BRAKE CALIPER X, B01043AF.A61

Ymin = -133.34 G's @ 0.0441 Seconds, Ymax = 40.25 G's @ 0.0723 Seconds





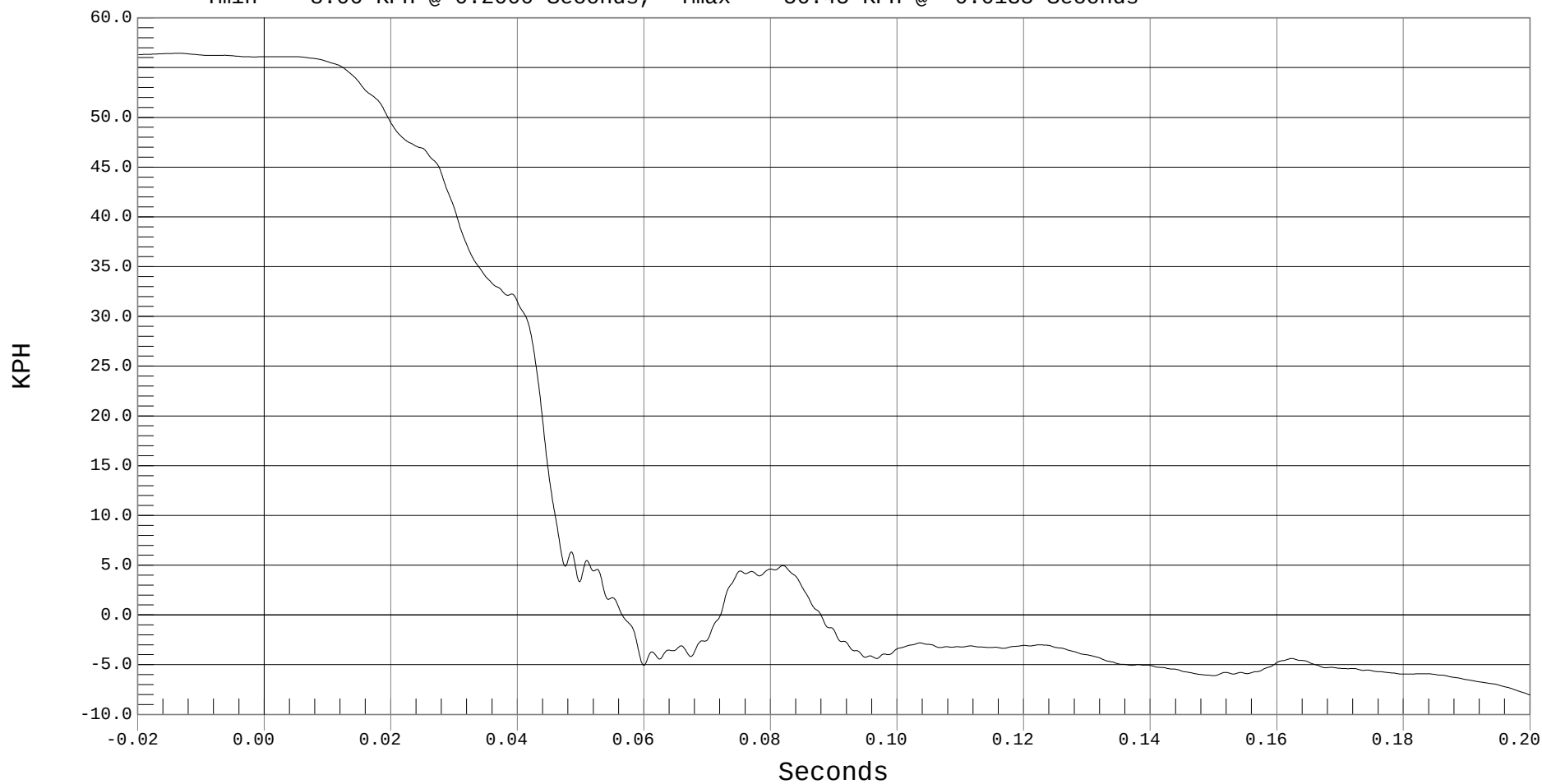
LEFT BRAKE CALIPER X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LEFT BRAKE CALIPER X VELOCITY, B01043AI.V61

Ymin = -8.06 KPH @ 0.2000 Seconds, Ymax = 56.45 KPH @ -0.0135 Seconds





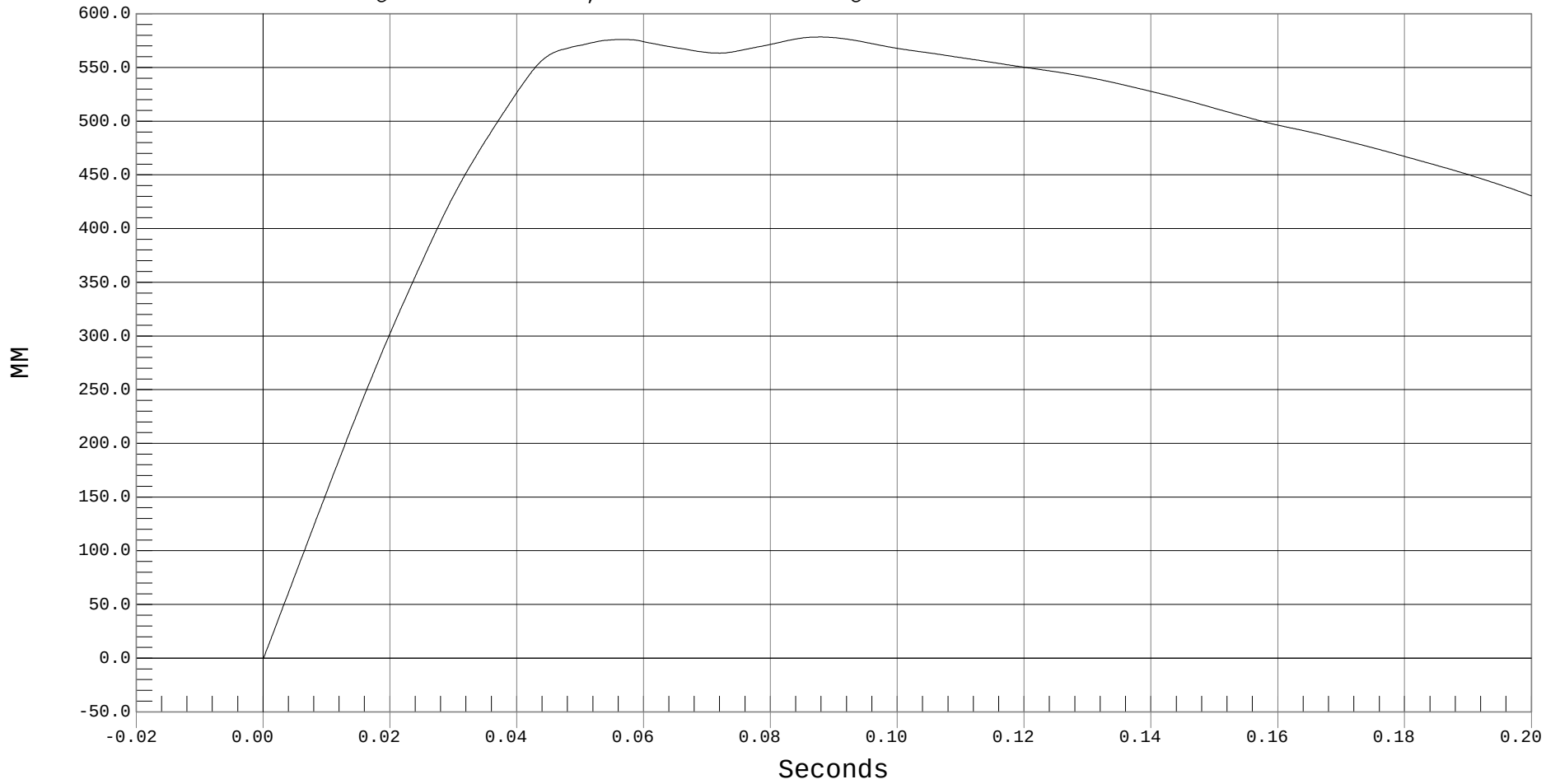
LEFT BRAKE CALIPER X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LEFT BRAKE CALIPER X DISPLACEMENT, B01043AI.D61

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 578.4 MM @ 0.0878 Seconds





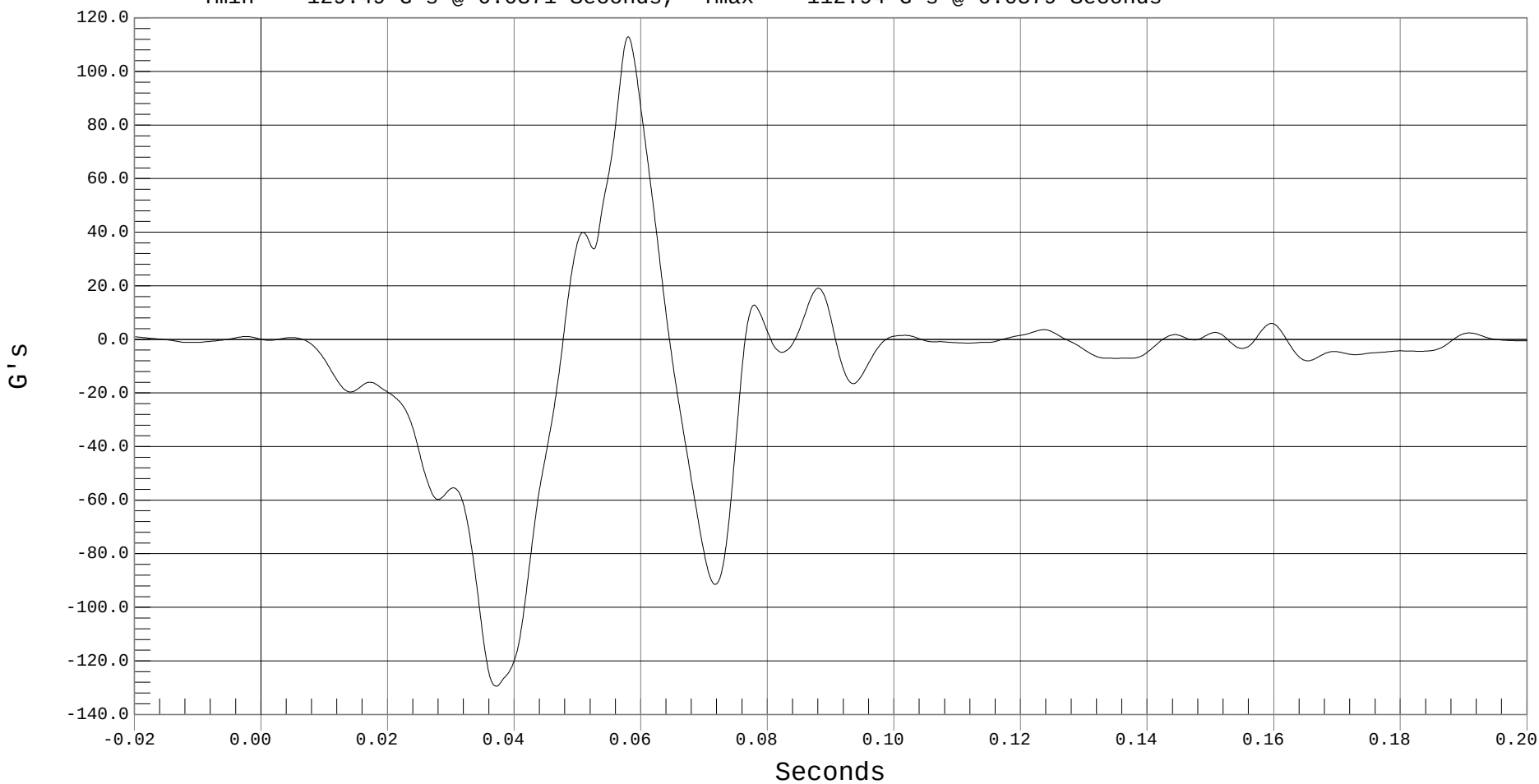
RIGHT BRAKE CALIPER X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 RIGHT BRAKE CALIPER X, B01043AF.A60

Ymin = -129.49 G's @ 0.0371 Seconds, Ymax = 112.94 G's @ 0.0579 Seconds





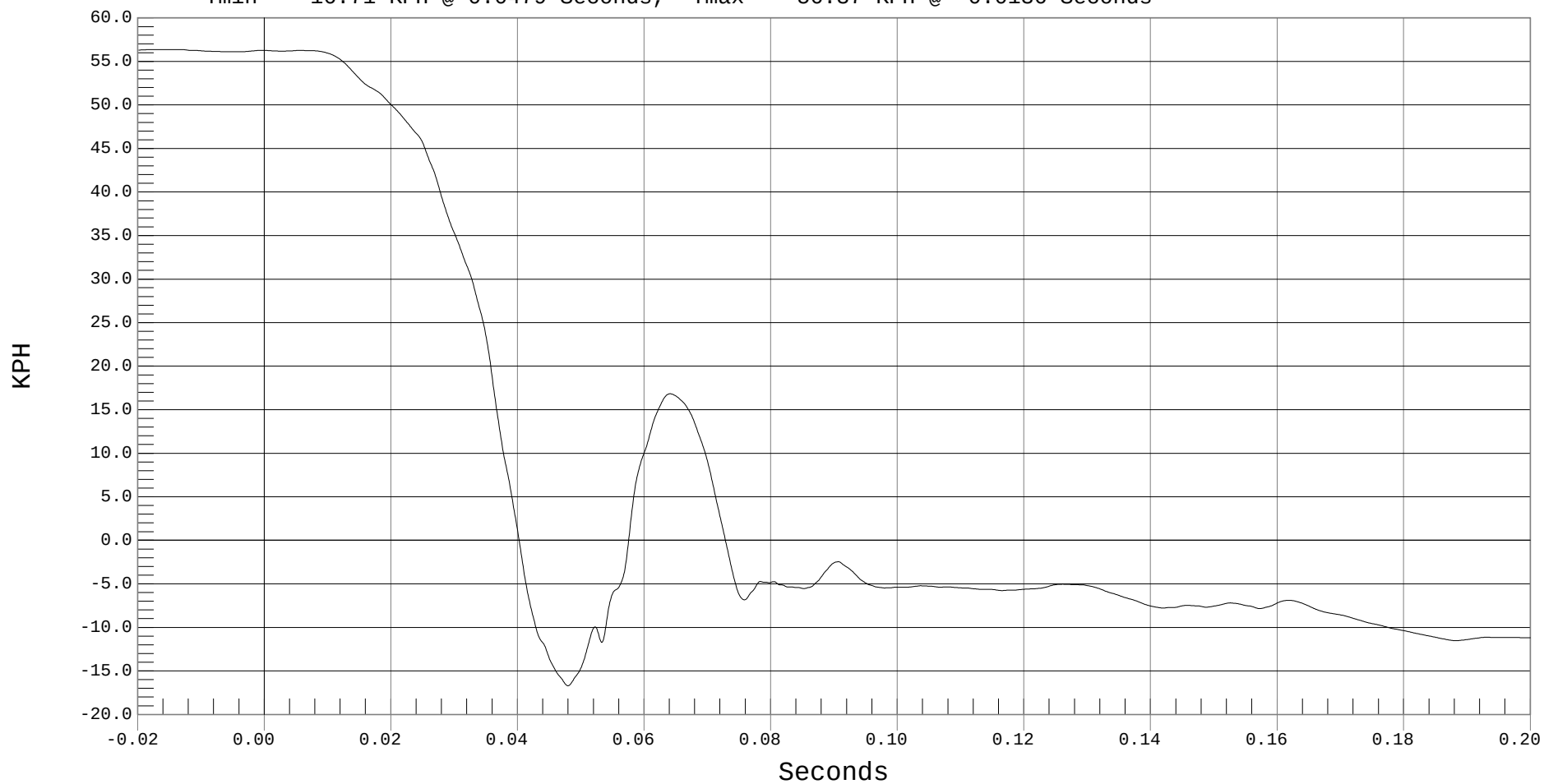
RIGHT BRAKE CALIPER X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RIGHT BRAKE CALIPER X VELOCITY, B01043AI.V60

Ymin = -16.71 KPH @ 0.0479 Seconds, Ymax = 56.37 KPH @ -0.0136 Seconds





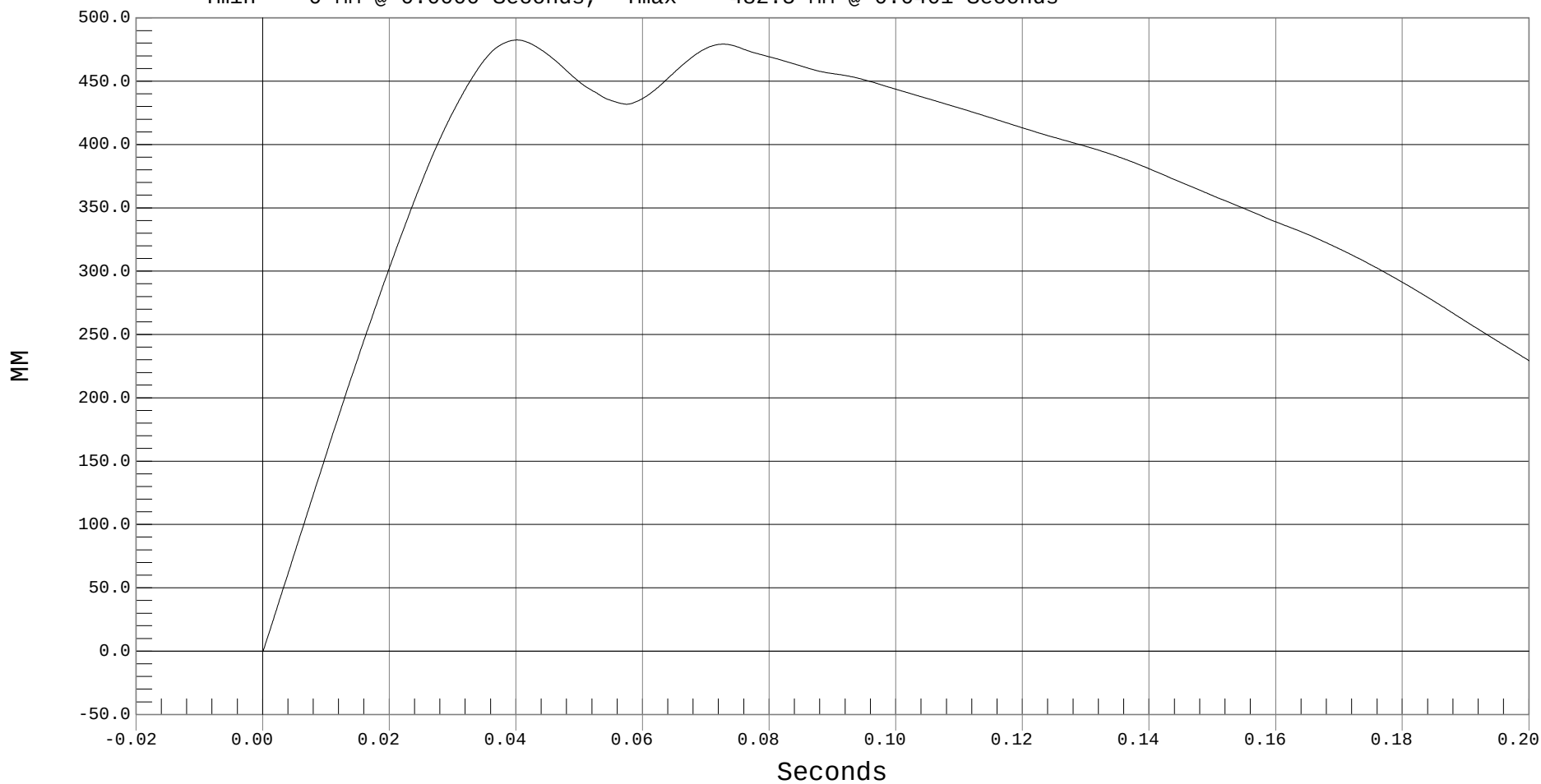
RIGHT BRAKE CALIPER X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RIGHT BRAKE CALIPER X DISPLACEMENT, B01043AI.D60

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 482.5 MM @ 0.0401 Seconds





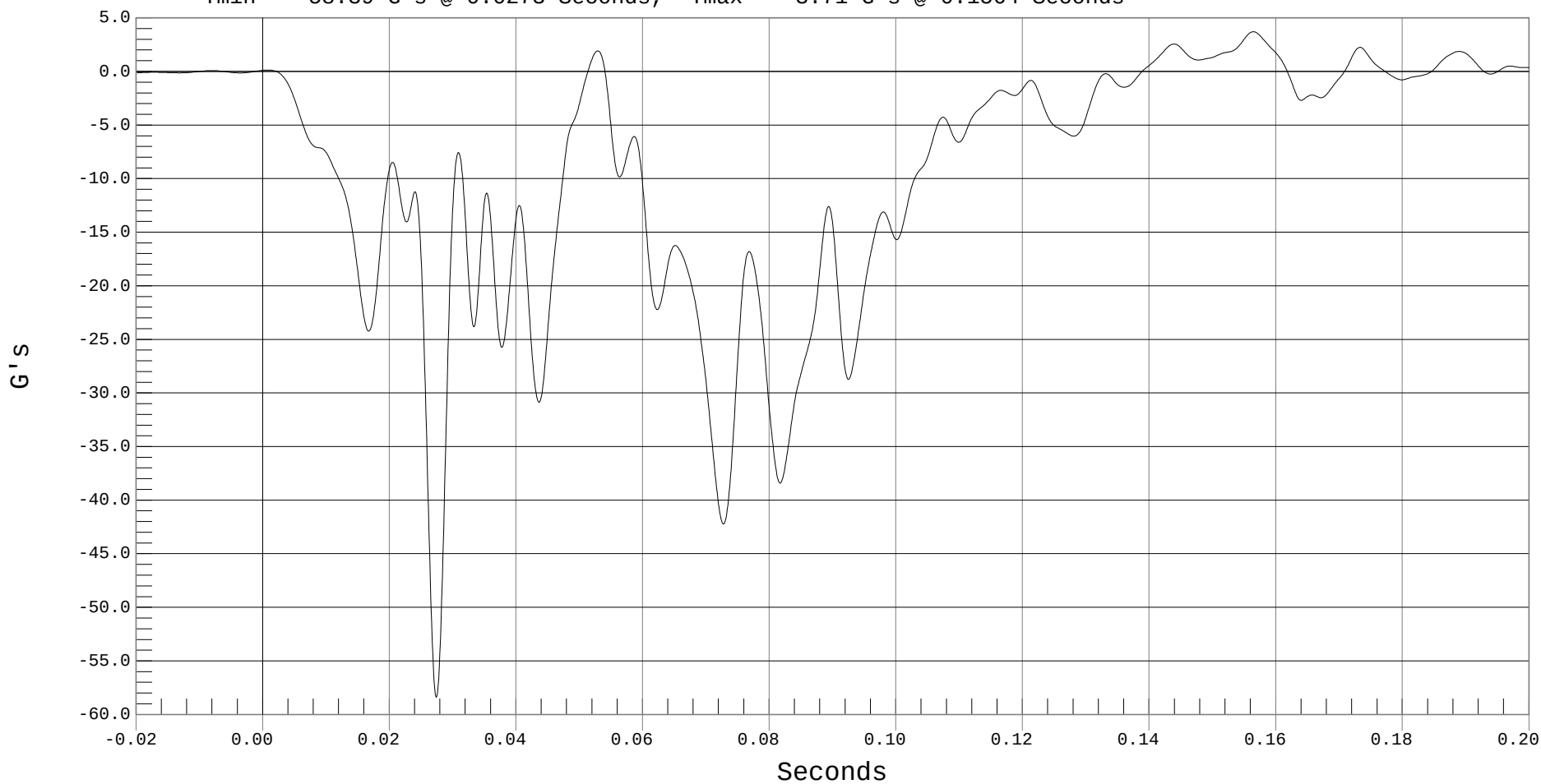
INSTRUMENT PANEL X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH

— 1 INSTRUMENT PANEL X, B01043AF.A57

Ymin = -58.39 G's @ 0.0273 Seconds, Ymax = 3.71 G's @ 0.1564 Seconds





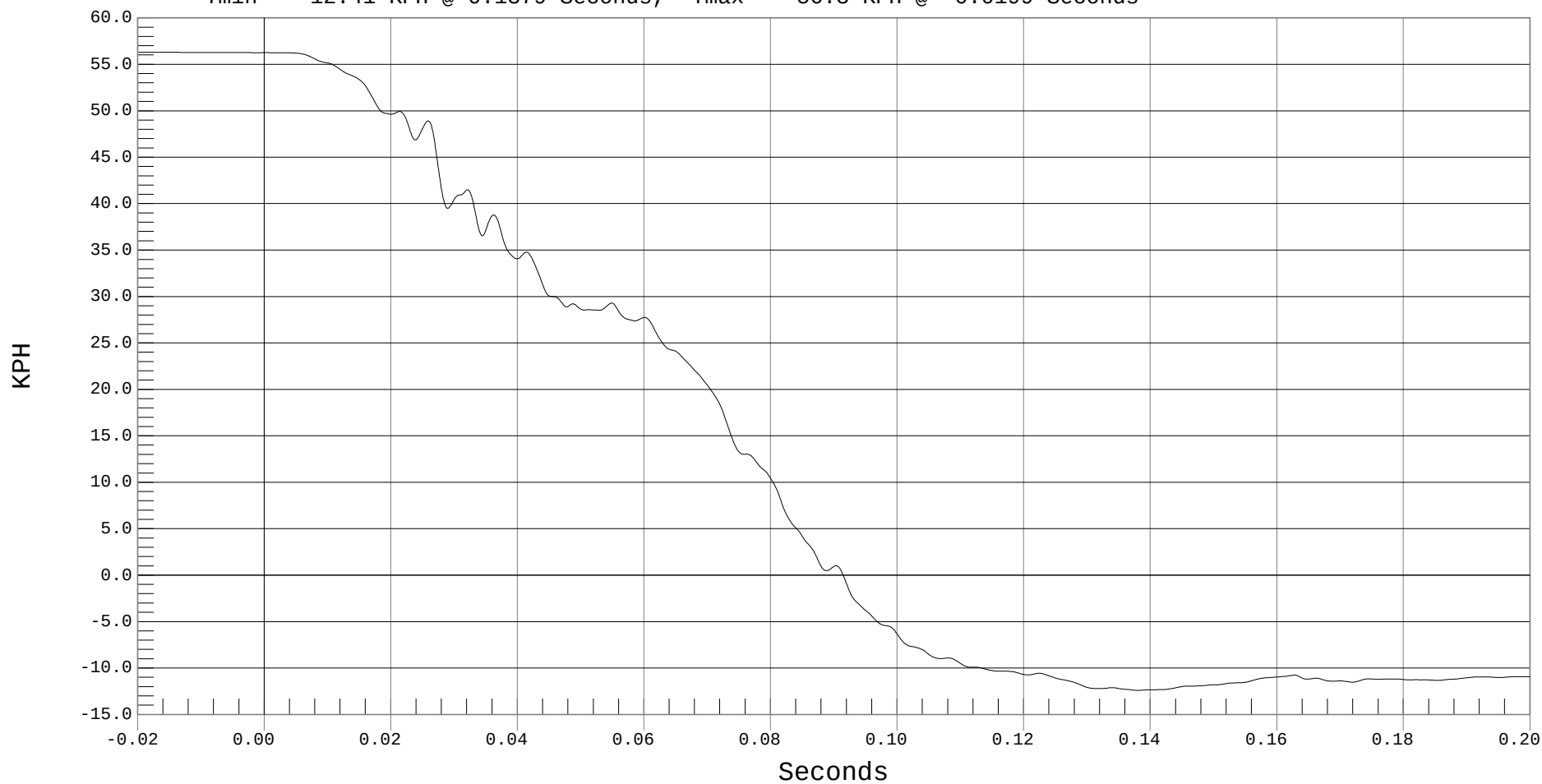
INSTRUMENT PANEL X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 INSTRUMENT PANEL X VELOCITY, B01043AI.V57

Ymin = -12.41 KPH @ 0.1379 Seconds, Ymax = 56.3 KPH @ -0.0199 Seconds





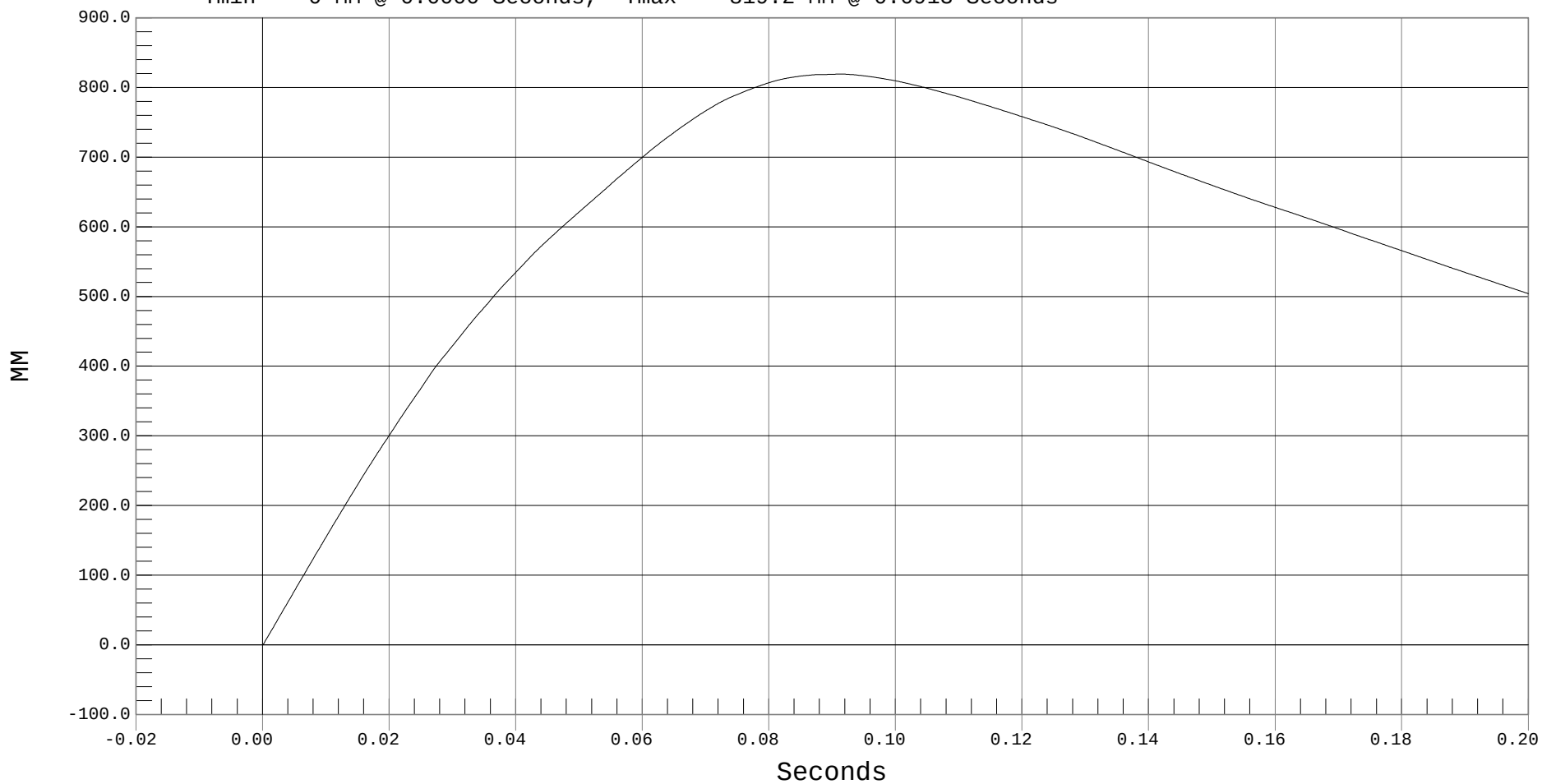
INSTRUMENT PANEL X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 INSTRUMENT PANEL X DISPLACEMENT, B01043AI.D57

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 819.2 MM @ 0.0913 Seconds





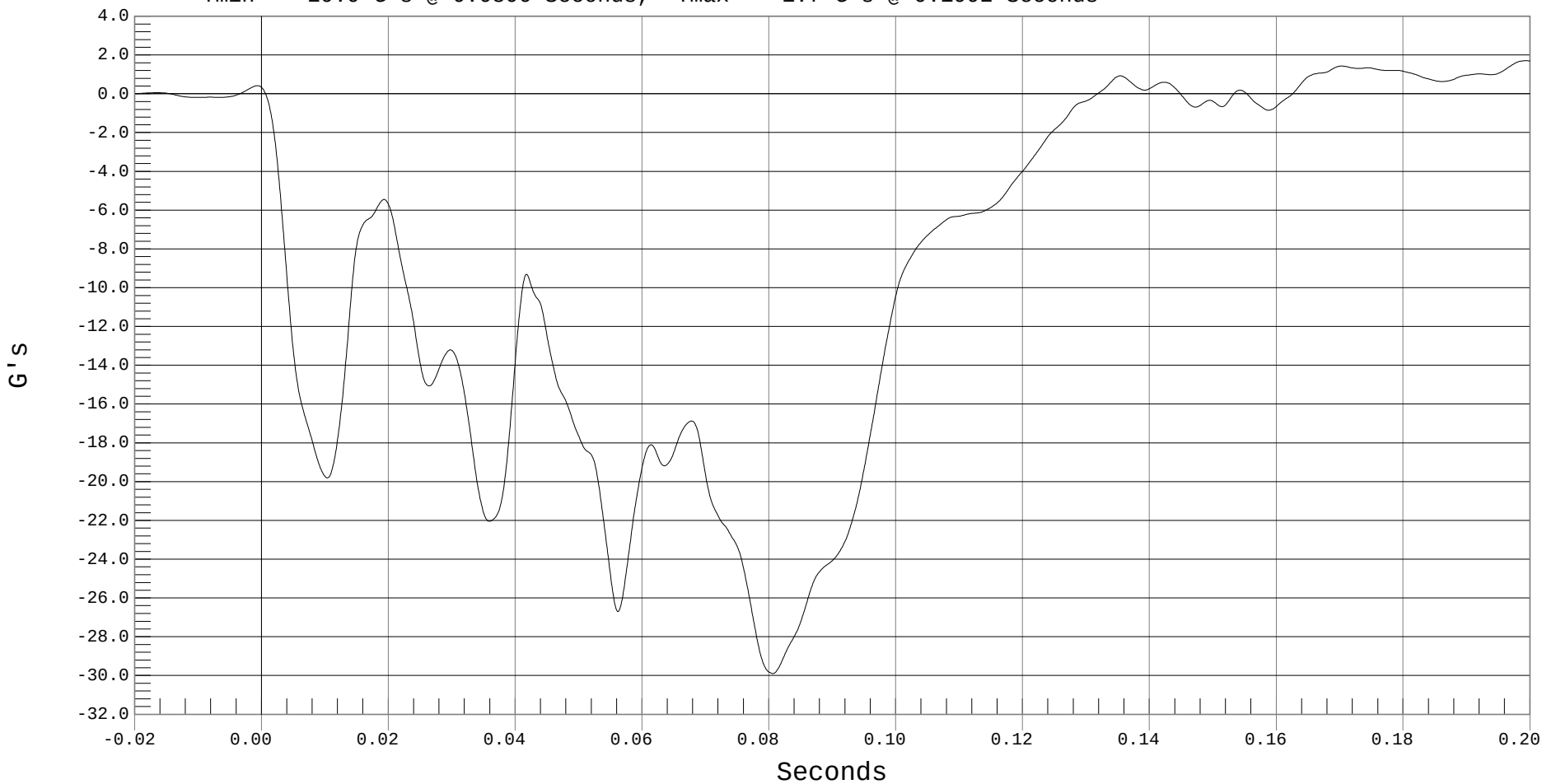
LEFT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 LEFT REAR SEAT X-MEMBER Xr, B01043AF.A03

Ymin = -29.9 G's @ 0.0806 Seconds, Ymax = 1.7 G's @ 0.1992 Seconds





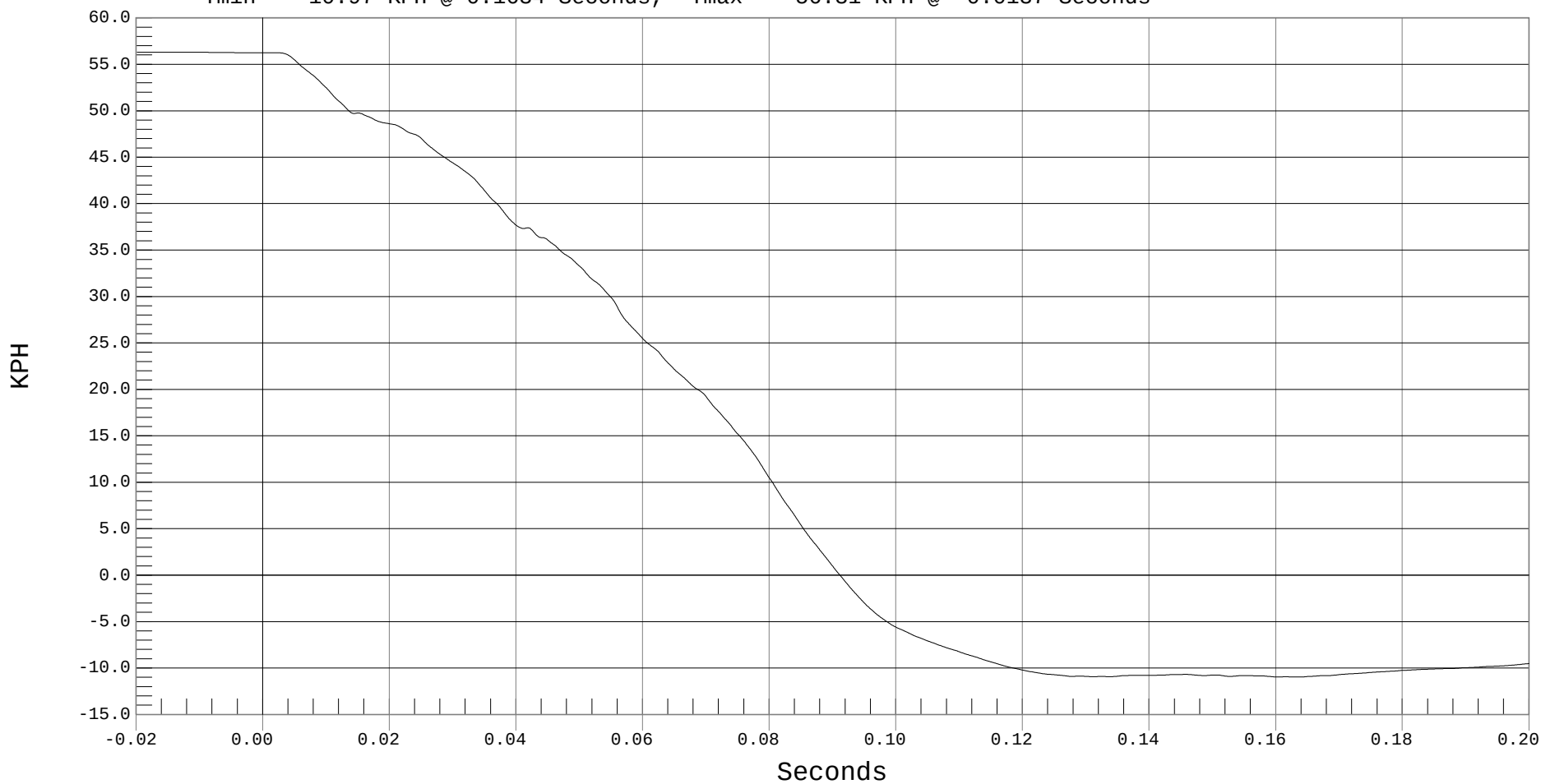
LEFT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LEFT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY, B01043AI.V03

Ymin = -10.97 KPH @ 0.1634 Seconds, Ymax = 56.31 KPH @ -0.0137 Seconds





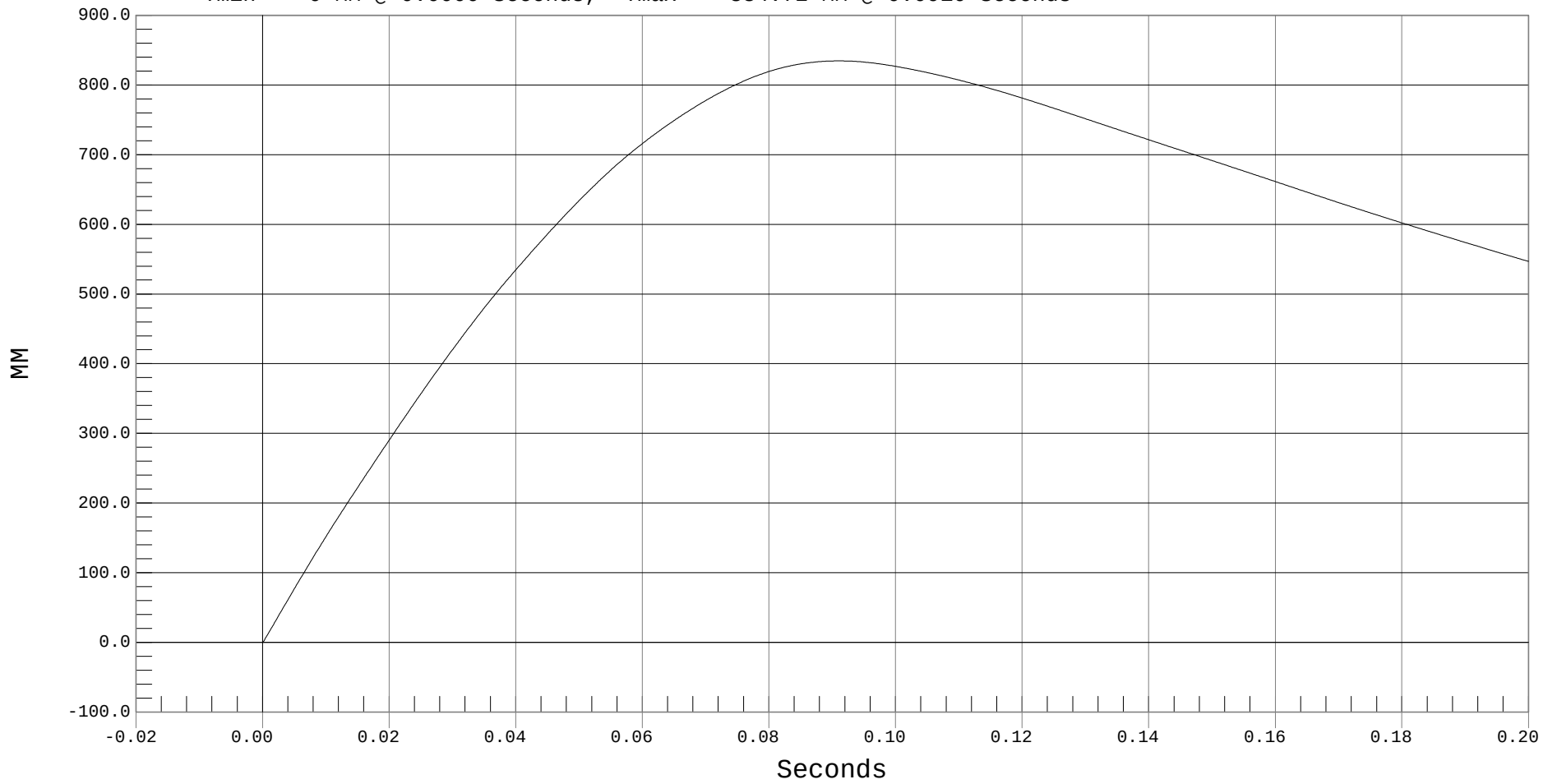
LEFT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LEFT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT, B01043AI.D03

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 834.72 MM @ 0.0910 Seconds





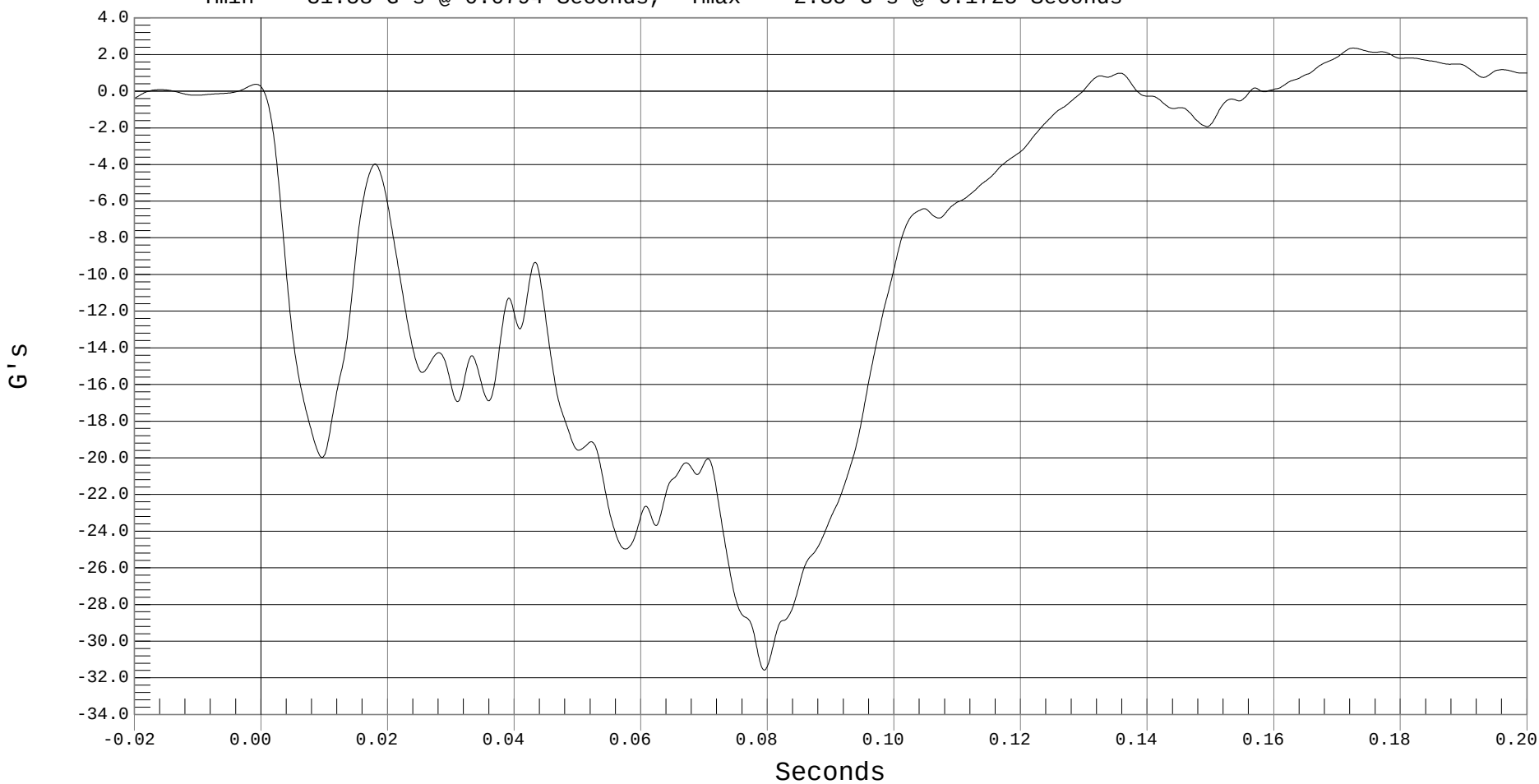
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 RIGHT REAR SEAT X-MEMBER Xr, B01043AF.A02

Ymin = -31.58 G's @ 0.0794 Seconds, Ymax = 2.35 G's @ 0.1725 Seconds





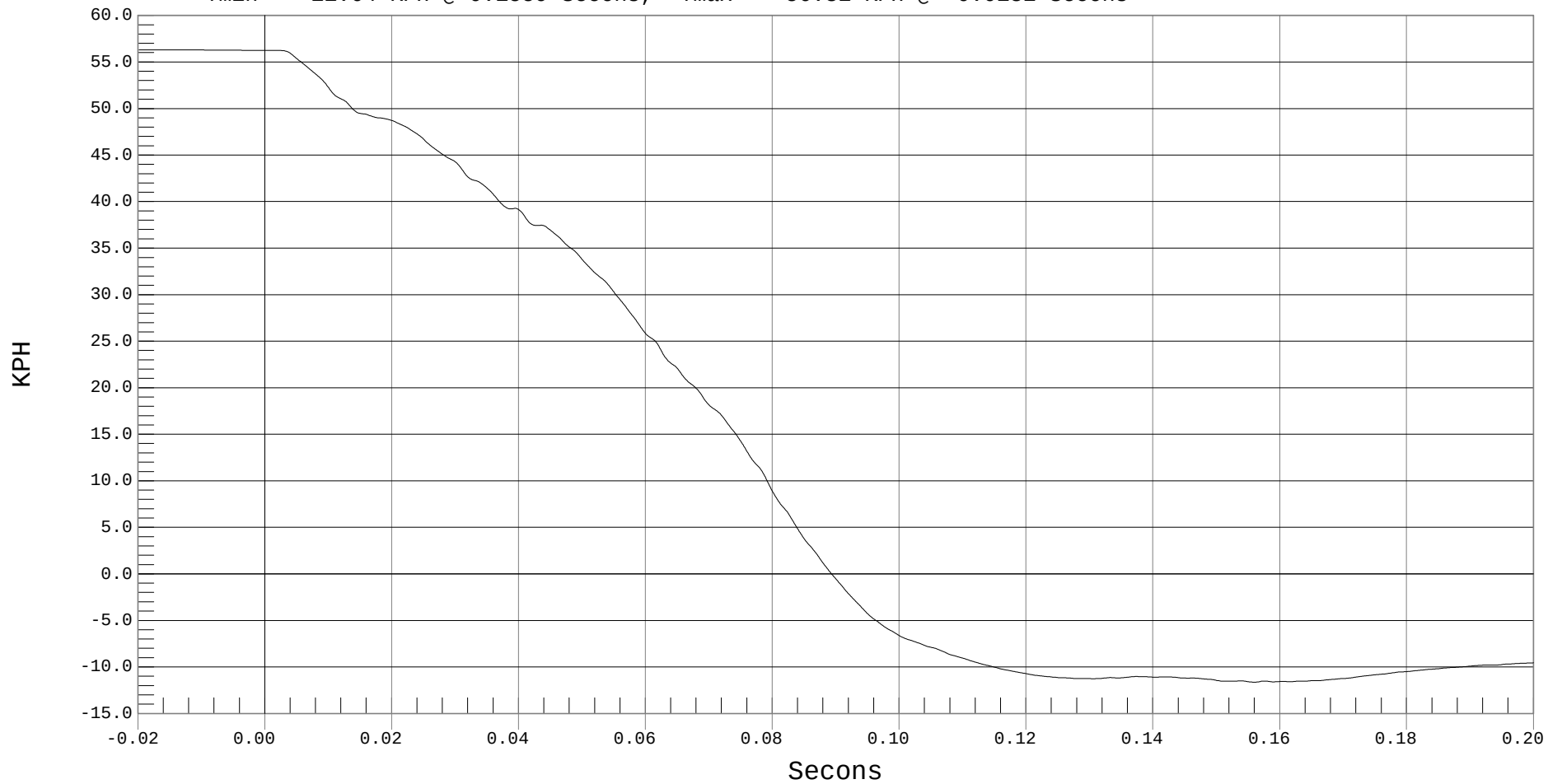
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RIGHT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY, B01043AI.V02

Ymin = -11.64 KPH @ 0.1559 Secons, Ymax = 56.31 KPH @ -0.0131 Secons





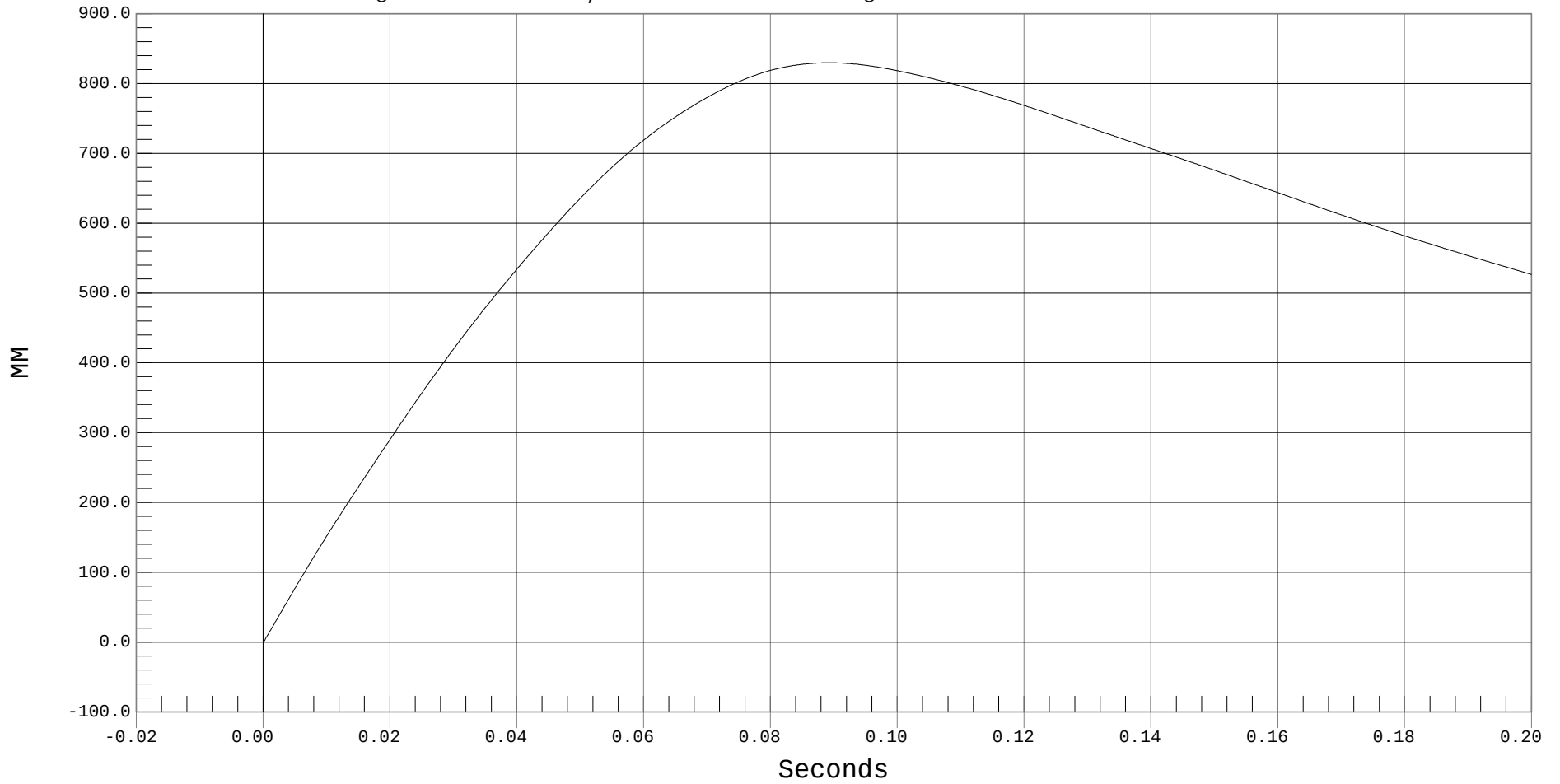
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RIGHT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT, B01043AI.D02

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 829.79 MM @ 0.0891 Seconds





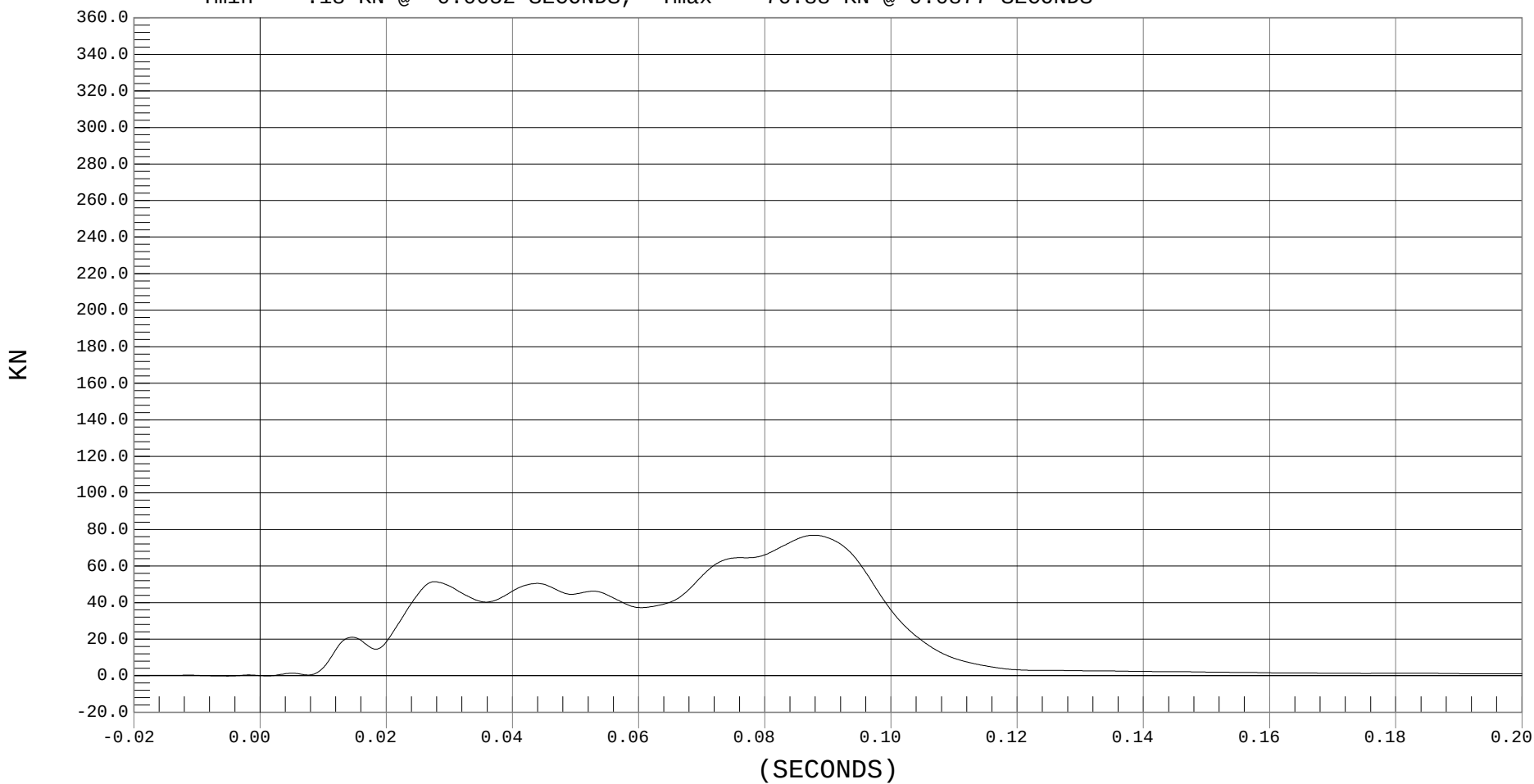
UPPER LEFT BARRIER FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 BARRIER UPPER LEFT, B01043FF.F02

Ymin = -.18 KN @ -0.0052 SECONDS, Ymax = 76.88 KN @ 0.0877 SECONDS





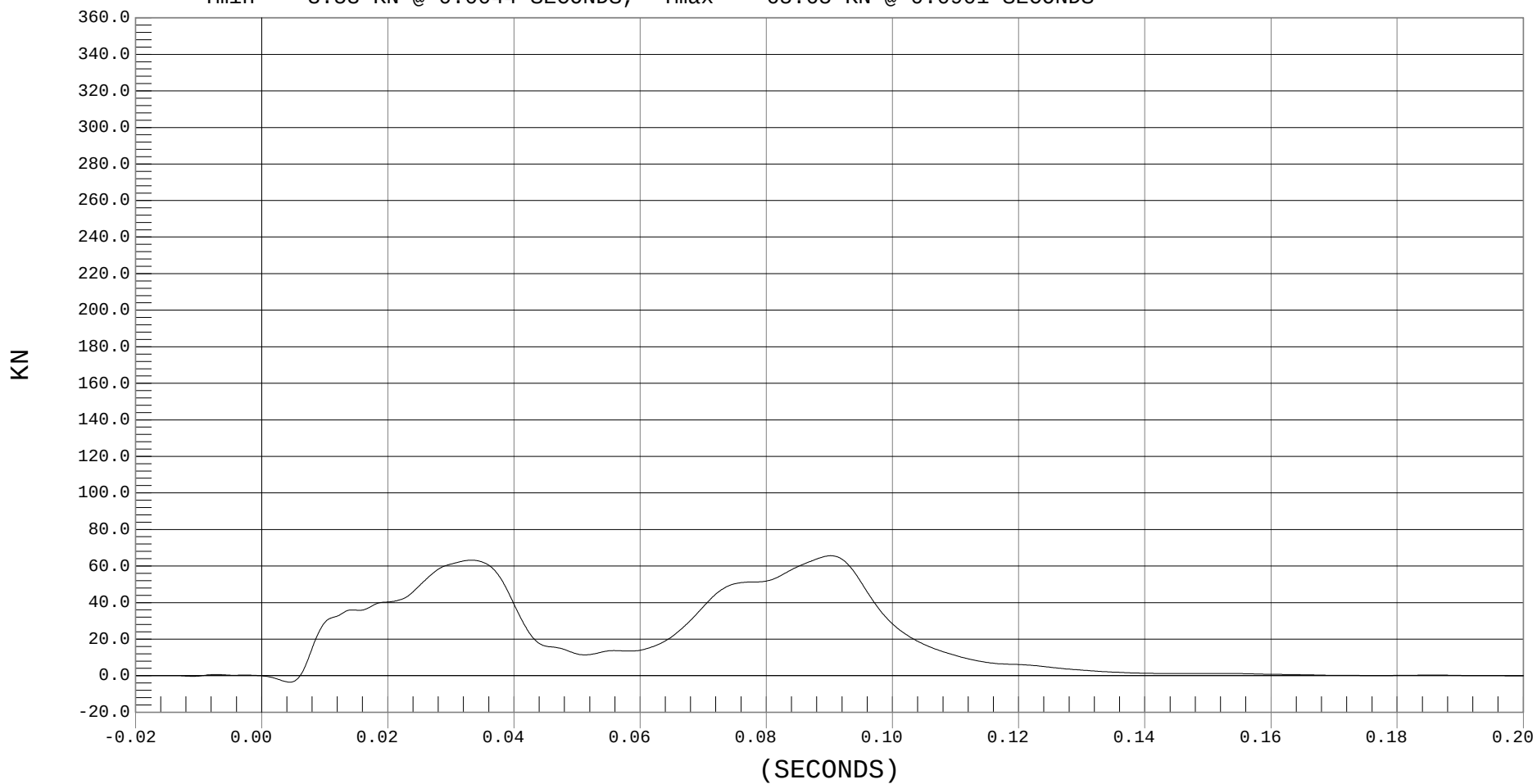
UPPER CENTER BARRIER FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 BARRIER UPPER CENTER, B01043FF.F03

Ymin = -3.53 KN @ 0.0044 SECONDS, Ymax = 65.65 KN @ 0.0901 SECONDS





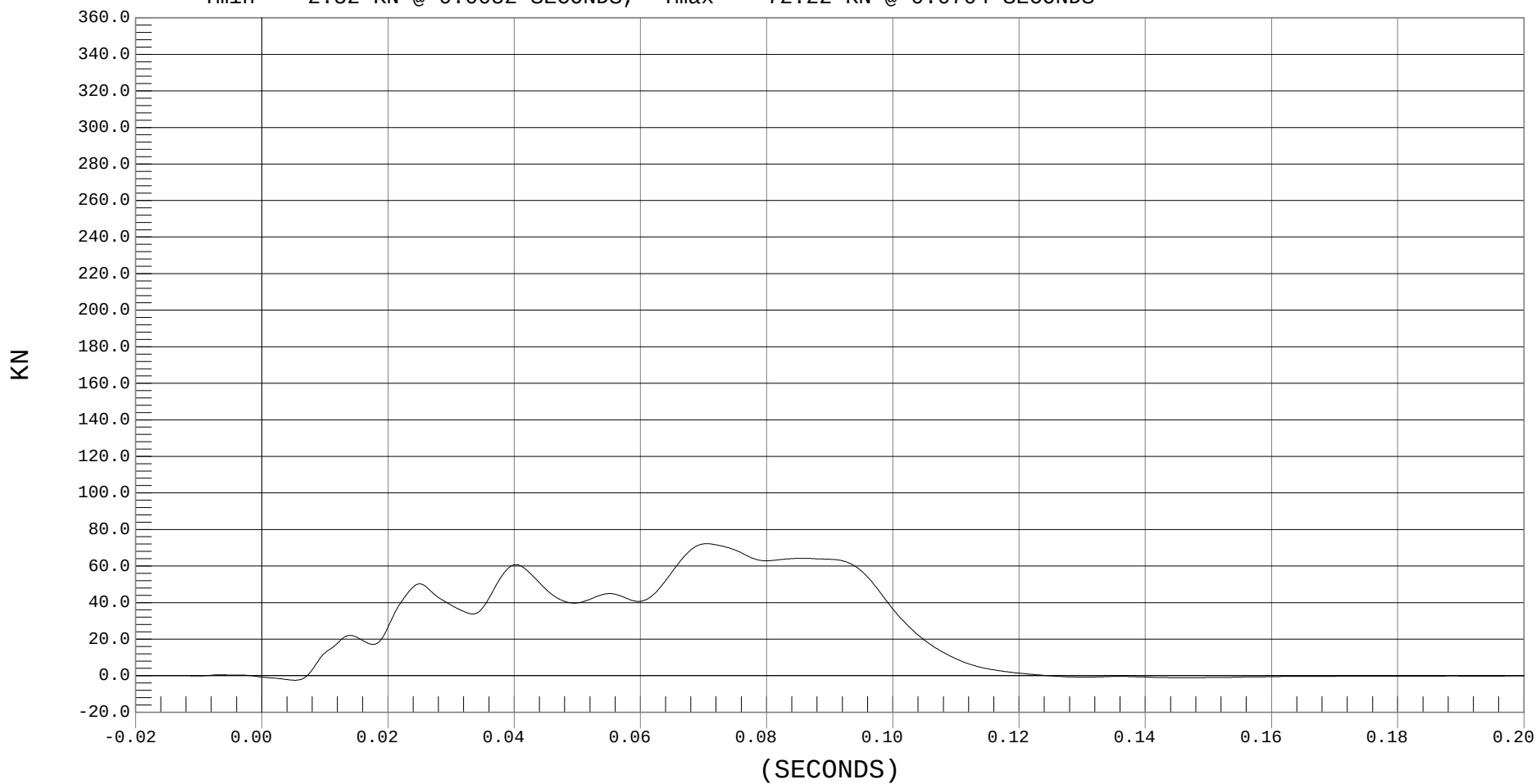
UPPER RIGHT BARRIER FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 BARRIER UPPER RIGHT, B01043FF.F04

Ymin = -2.52 KN @ 0.0052 SECONDS, Ymax = 72.22 KN @ 0.0704 SECONDS





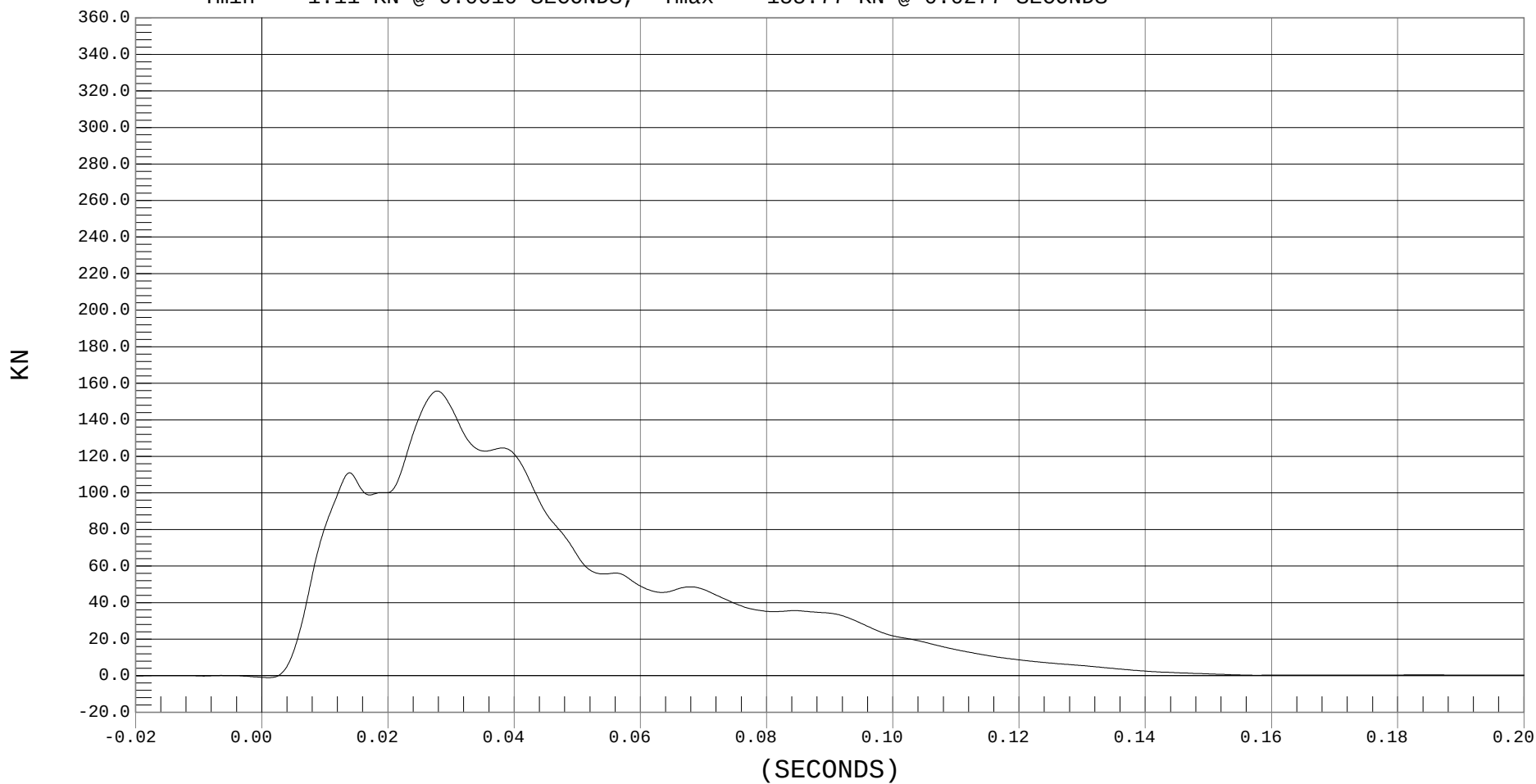
LOWER LEFT BARRIER FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 BARRIER LOWER LEFT, B01043FF.F05

Ymin = -1.11 KN @ 0.0010 SECONDS, Ymax = 155.77 KN @ 0.0277 SECONDS





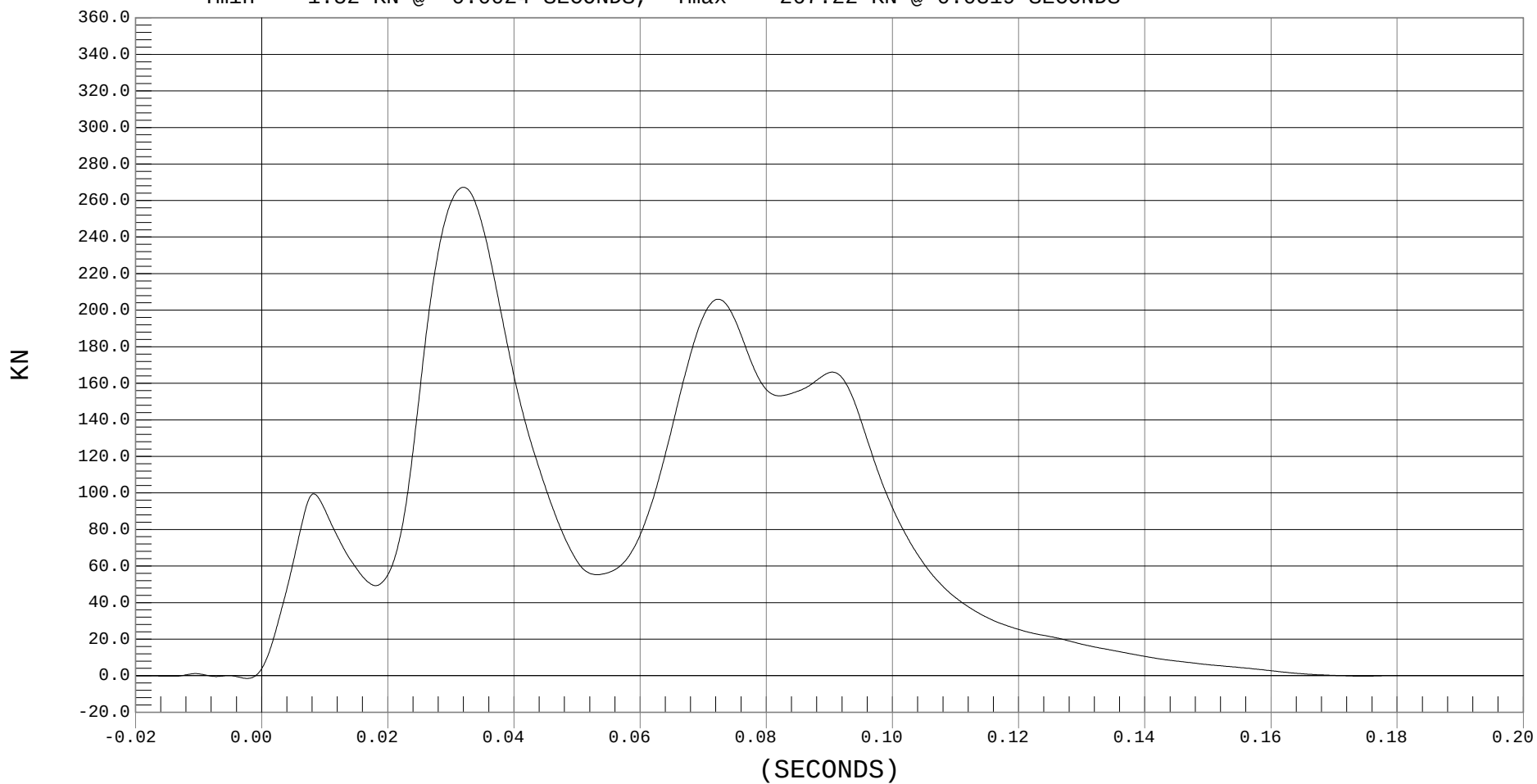
LOWER CENTER BARRIER FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 BARRIER LOWER CENTER, B01043FF.F06

Ymin = -1.52 KN @ -0.0024 SECONDS, Ymax = 267.22 KN @ 0.0319 SECONDS





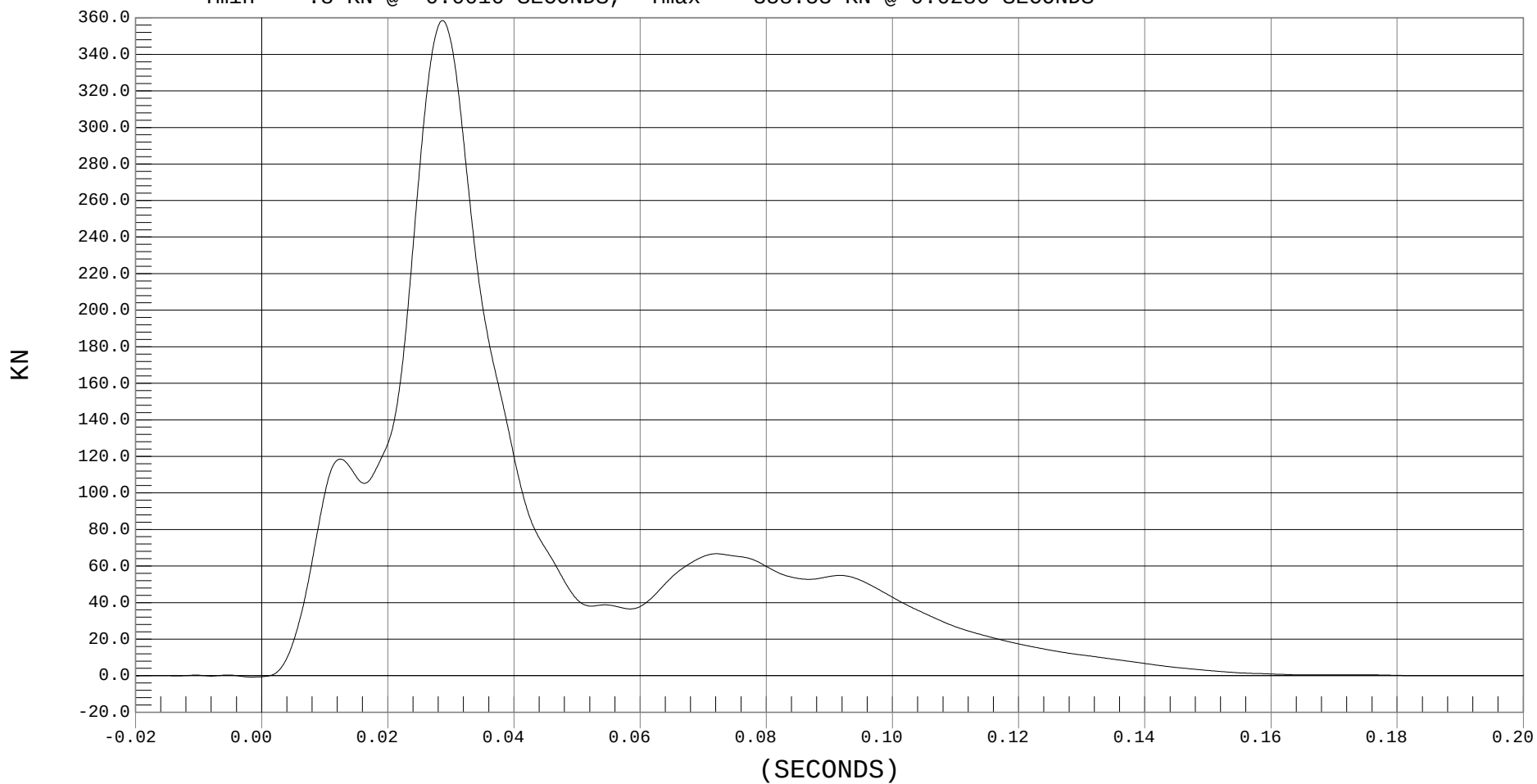
LOWER RIGHT BARRIER FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 BARRIER LOWER RIGHT, B01043FF.F07

Ymin = -.8 KN @ -0.0016 SECONDS, Ymax = 358.53 KN @ 0.0286 SECONDS





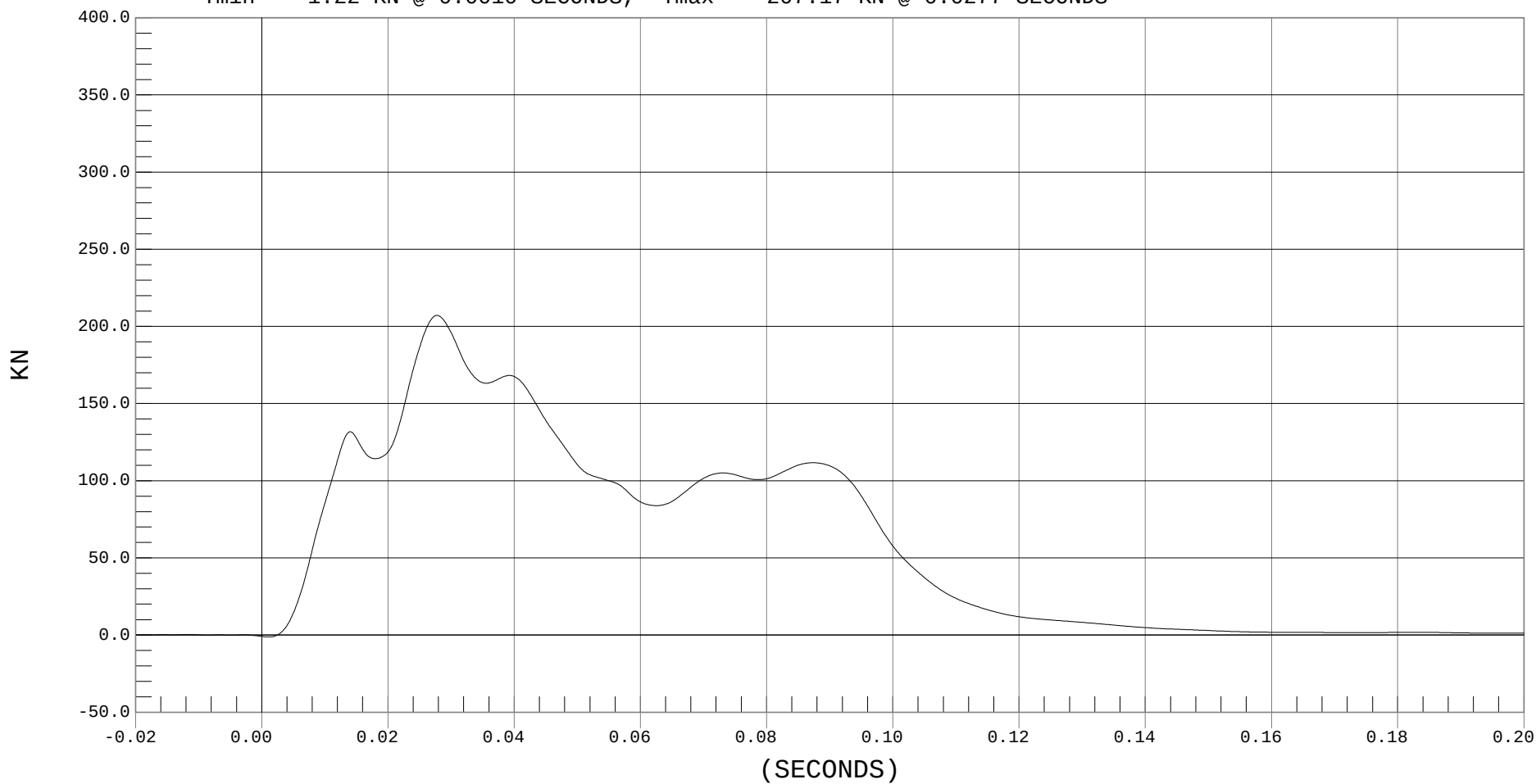
SUM OF LEFT BARRIER FORCES

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 SUM OF LEFT BARRIER FORCES, B01043FU.F02

Ymin = -1.22 KN @ 0.0010 SECONDS, Ymax = 207.17 KN @ 0.0277 SECONDS





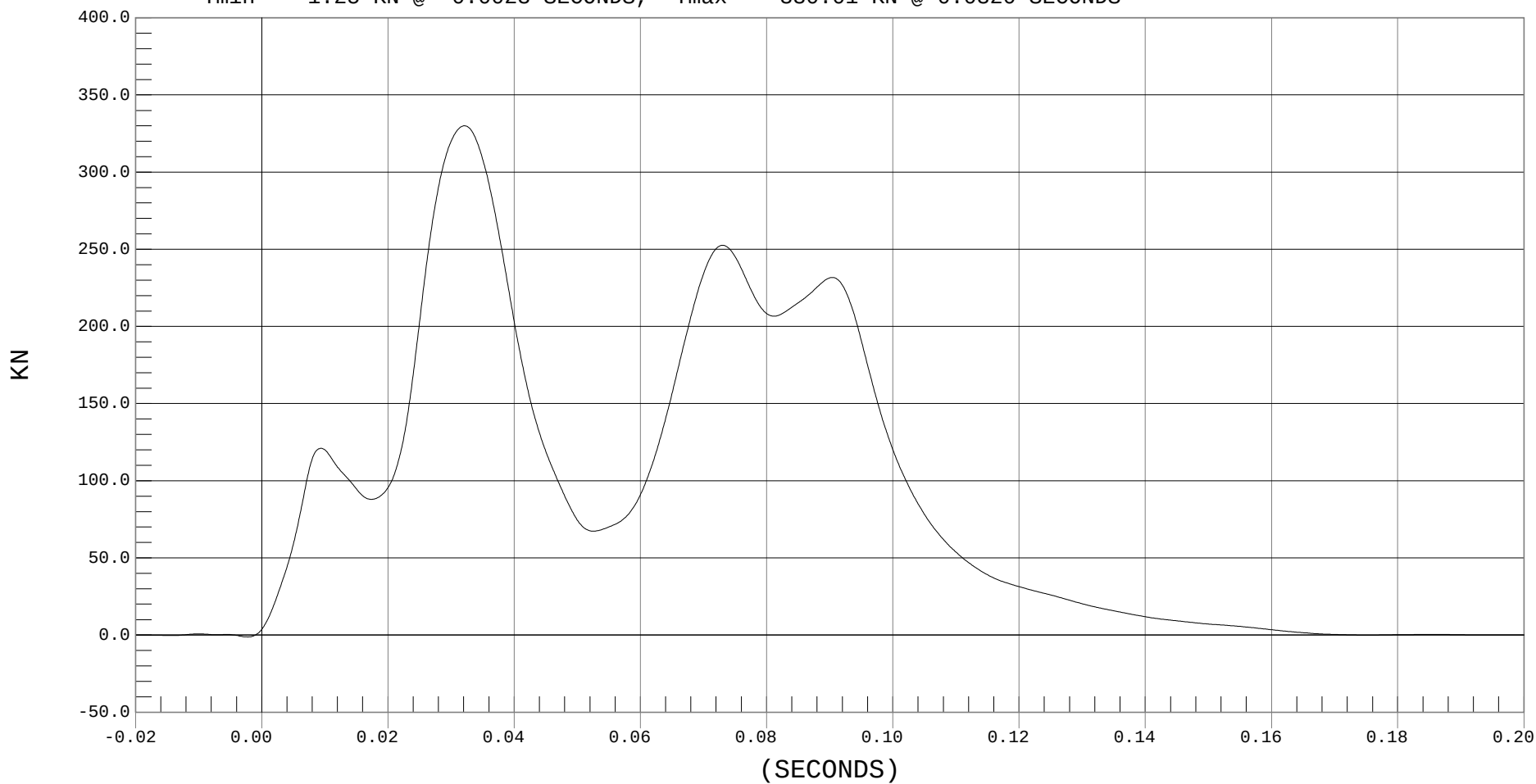
SUM OF CENTER BARRIER FORCES

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 SUM OF CENTER BARRIER FORCES, B01043FU.F03

Ymin = -1.25 KN @ -0.0023 SECONDS, Ymax = 330.01 KN @ 0.0320 SECONDS





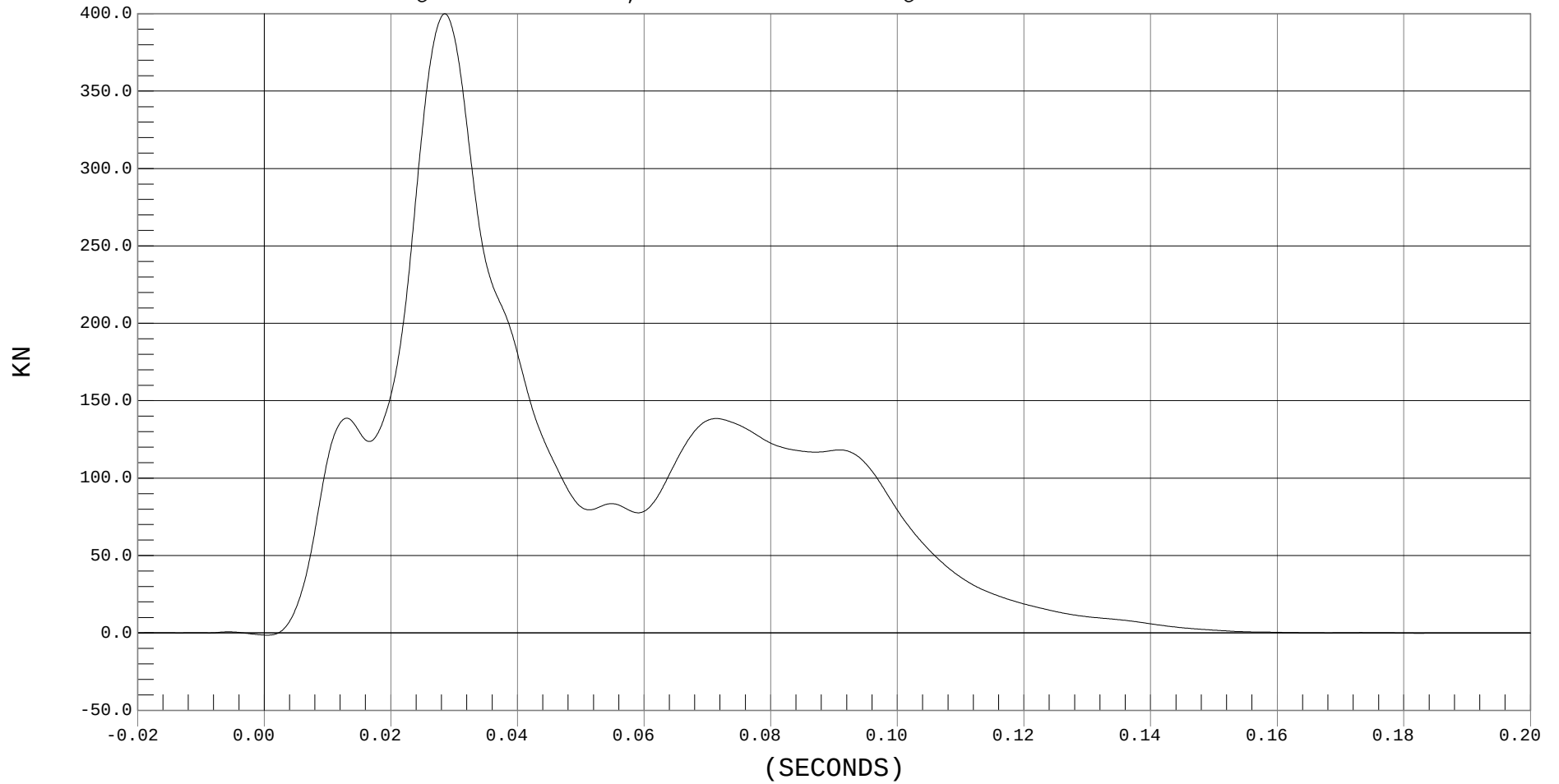
SUM OF RIGHT BARRIER FORCES

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 SUM OF RIGHT BARRIER FORCES, B01043FU.F04

Ymin = -1.43 KN @ 0.0004 SECONDS, Ymax = 399.99 KN @ 0.0284 SECONDS





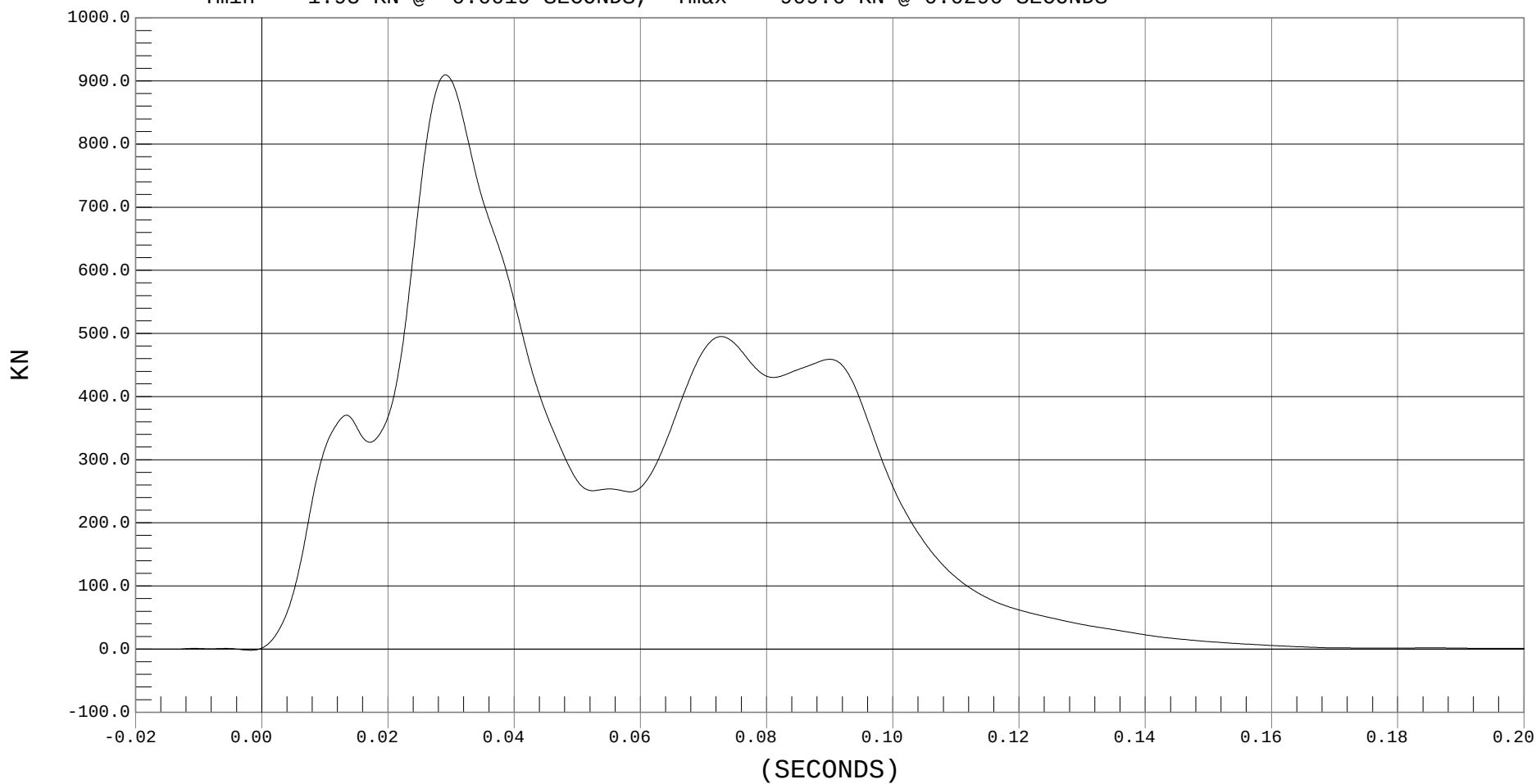
SUM OF BARRIER FORCES

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 SUM OF BARRIER FORCES, B01043FU.F01

Ymin = -1.95 KN @ -0.0019 SECONDS, Ymax = 909.6 KN @ 0.0290 SECONDS



APPENDIX C

DUMMY CALIBRATION DATA TRACES AND TABLES

Hybrid III Calibration Data Sheet
5th Percentile Female
Left Knee Impact Test

ATD Serial No.: 288

Test I.D.: D01436

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	kN	3.45 – 4.06	3.69	Pass
Overall Test Results				Pass

Laboratory Technician

4/10/01

Test Date

Approved By



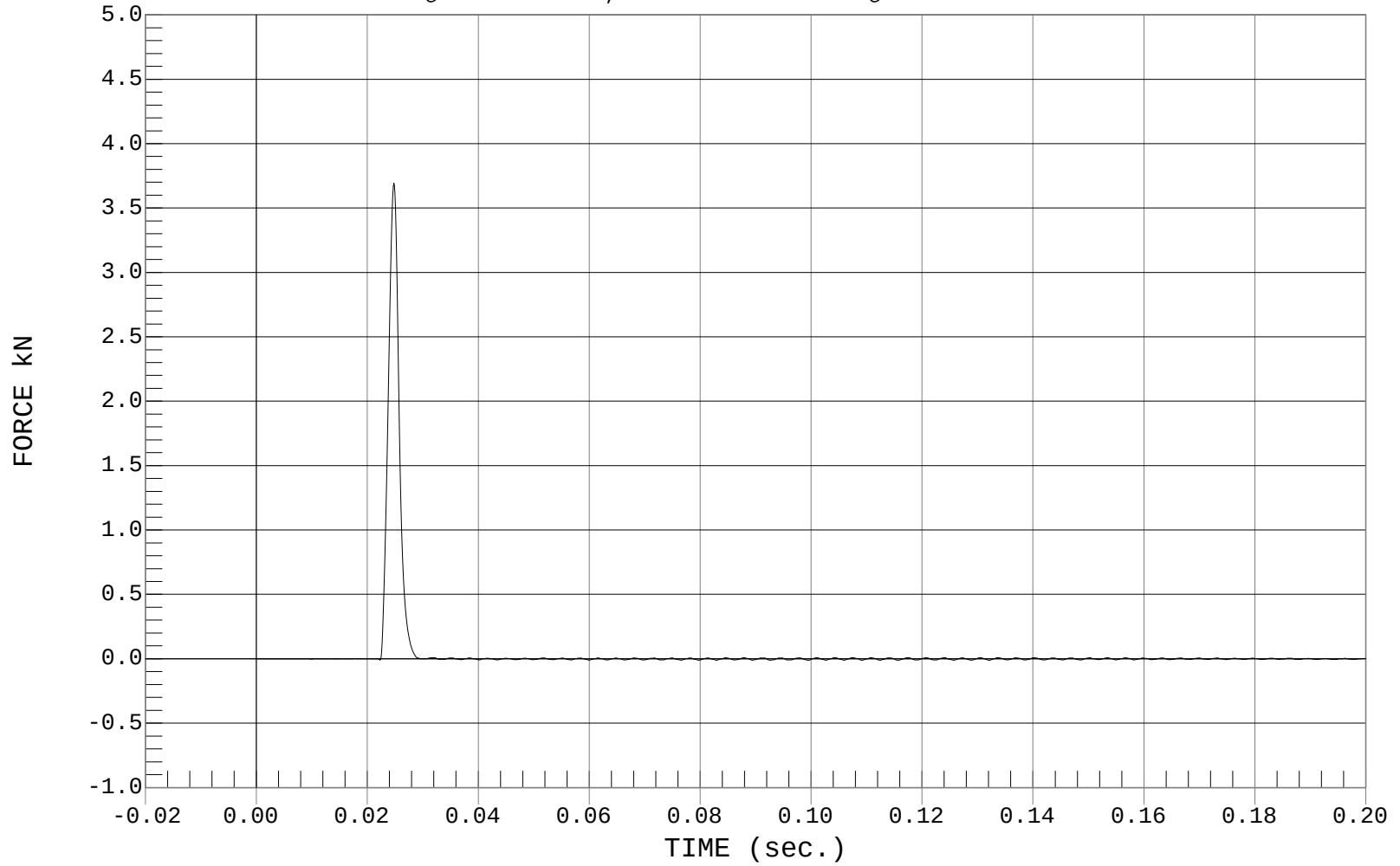
LEFT KNEE IMPACT

Test Desc.: Dummy Calibration - Left Knee Impact
Component: Dummy #288

Test Date: 04-10-01
Speed: 6.92 FT/SEC, 2.11 M/SEC

— 1 FORCE, D01436FF.F09

Ymin = -.01 kN @ 0.1321 sec., Ymax = 3.69 kN @ 0.0248 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Right Knee Impact Test

ATD Serial No.: 288

Test I.D.: D01435

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	kN	3.45 – 4.06	3.72	Pass
Overall Test Results				Pass

Laboratory Technician

4/10/01
Test Date

Approved By



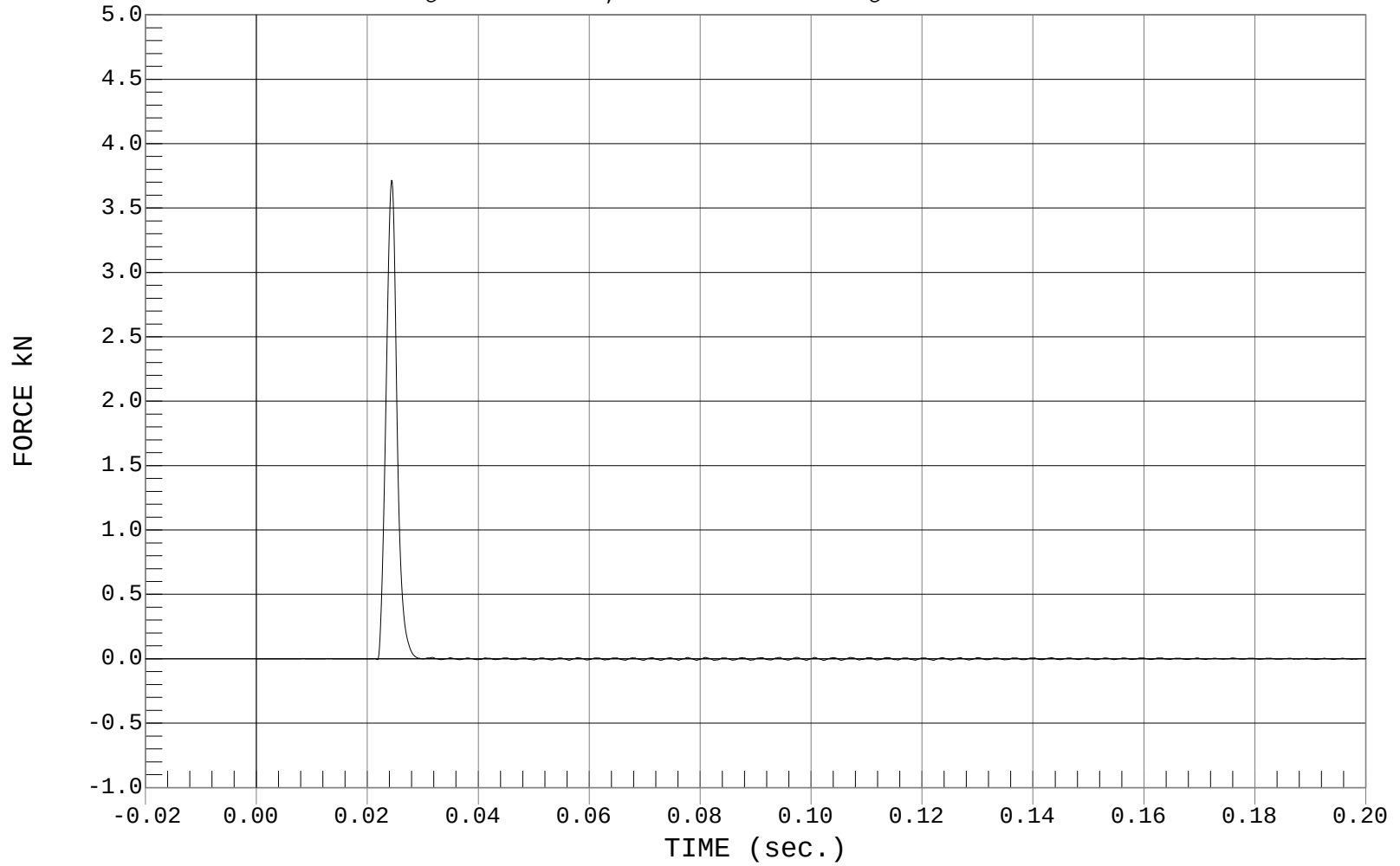
RIGHT KNEE IMPACT

Test Desc.: Dummy Calibration - Right Knee Impact
Component: Dummy #288

Test Date: 04-10-01
Speed: 6.96 FT/SEC, 2.12 M/SEC

— 1 FORCE, D01435FF.F09

Ymin = -.01 kN @ 0.1023 sec., Ymax = 3.72 kN @ 0.0244 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Head Drop Calibration

ATD Serial No.: 288

Test I.D.: D01431

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Peak Resultant Acceleration	G's	250 to 300	268	Pass
Peak Lateral Acceleration	G's	$\leq \pm 15.0$	-10	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

4/10/01

Test Date

Approved By



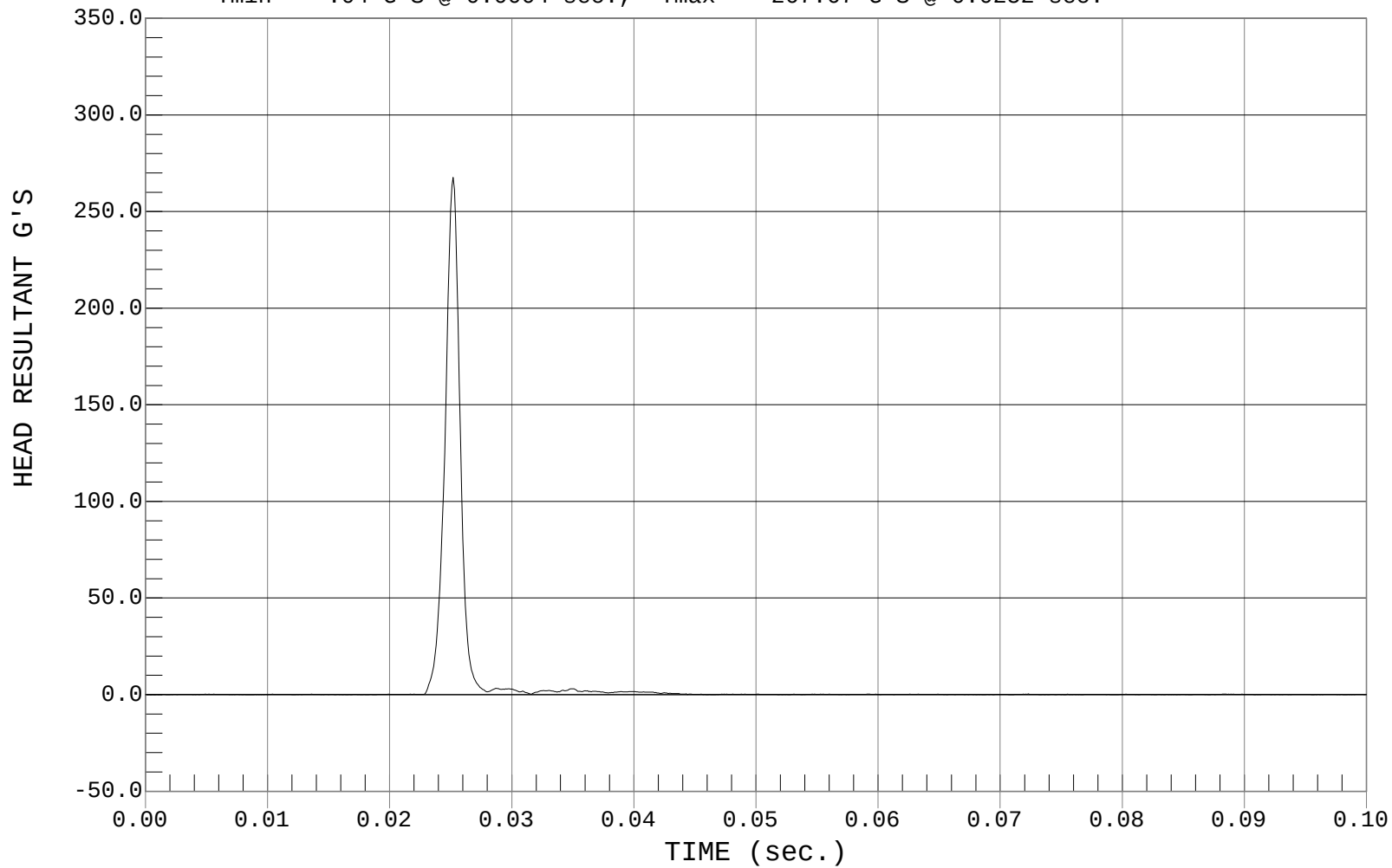
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #288

Test Date: 04-10-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT, D01431AV.A01

Ymin = .04 G'S @ 0.0004 sec., Ymax = 267.67 G'S @ 0.0252 sec.





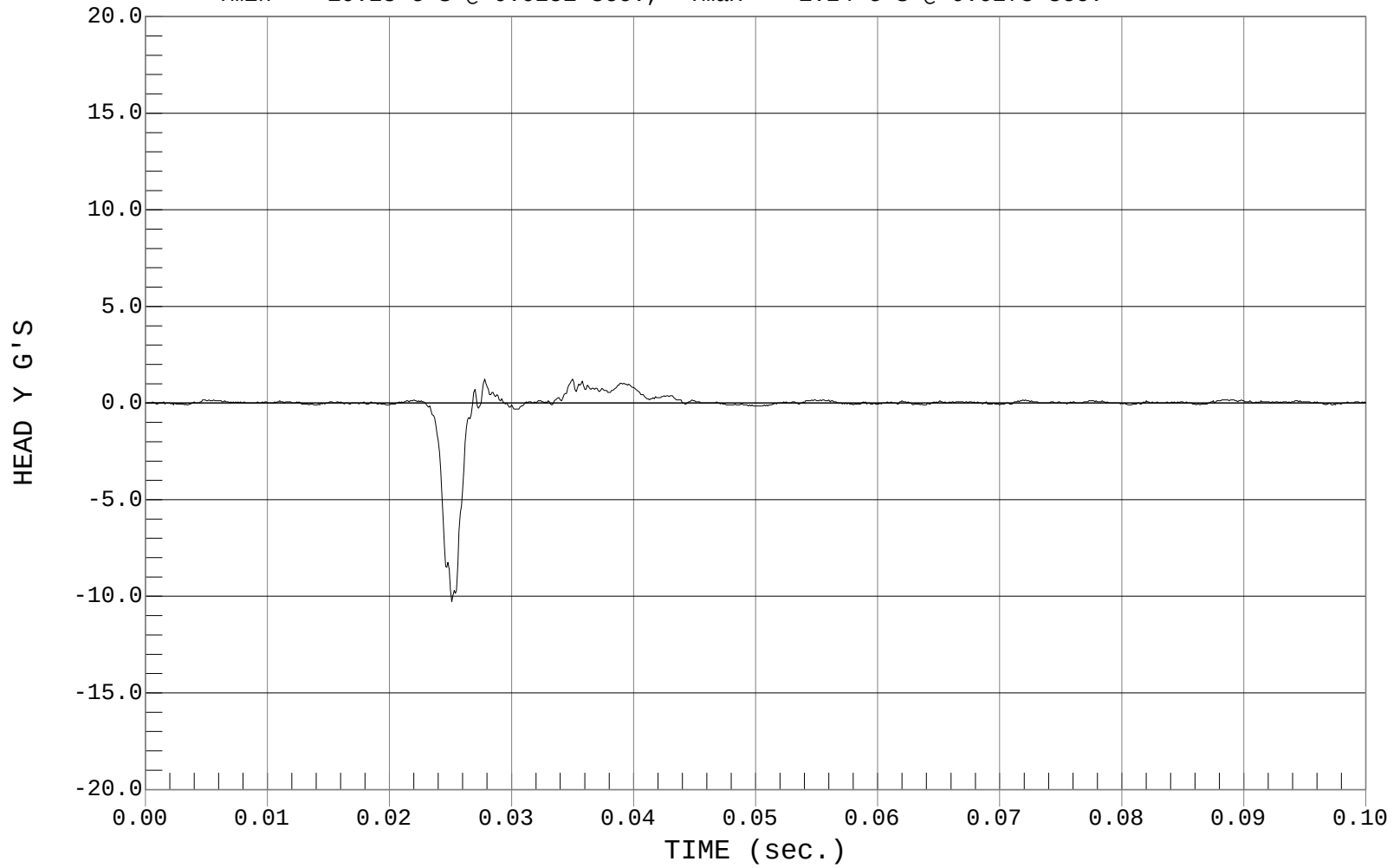
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #288

Test Date: 04-10-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01431AR.A02

Ymin = -10.28 G'S @ 0.0251 sec., Ymax = 1.24 G'S @ 0.0278 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Thorax Impact Test

ATD Serial No.: 288

Test I.D.: D01434

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Probe Velocity	m/s	6.59 to 6.83	6.66	Pass
Peak Deflection	mm	50 – 58	54	Pass
Peak Resistive Force within Deflection Corridor	kN	3.9 – 4.4	4.3	Pass
Peak Force 18mm – 50mm	%	<105% of Peak Force in Deflection Corridor	99	Pass
Internal Hysteresis	%	69 to 85	74	Pass
Overall Test Results			Pass	

Laboratory Technician

4/9/01
Test Date

Approved By



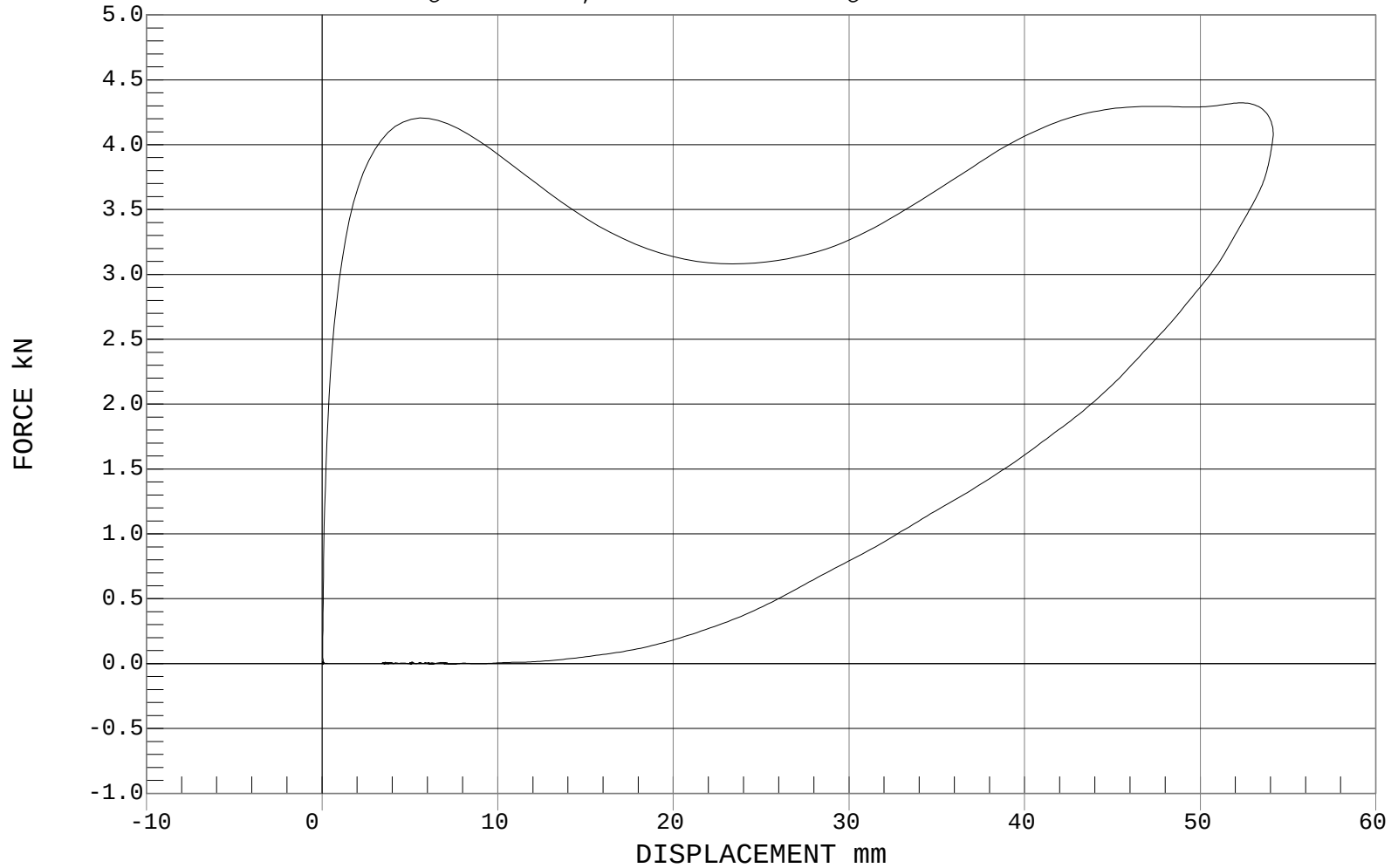
THORAX IMPACT

Test Desc.: Dummy Calibration - Chest Impact
Component: Dummy #288

Test Date: 04-09-01
Speed: 21.84 FT/SEC, 6.66 M/SEC

— 1 FORCE, D01434CH.FVD

Ymin = -.01 kN @ 6.0981 mm, Ymax = 4.32 kN @ 52.3270 mm



Hybrid III Calibration Data Sheet
5th Percentile Female
Neck Flexion Test

ATD Serial No.: 288

Test I.D.: D01432

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	33	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 msec	m/s	2.1 to 2.5	2.2	Pass
	20 msec	m/s	4.0 to 5.0	4.5	Pass
	30 msec	m/s	5.8 to 7.0	6.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	77 – 91	84	Pass
Moment About Occipital Condyle within Deflection Corridor	Maximum	Nm	69 – 83	71	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 – 100	87	Pass
Overall Test Results					Pass

Laboratory Technician

4/10/01
Test Date

Approved By



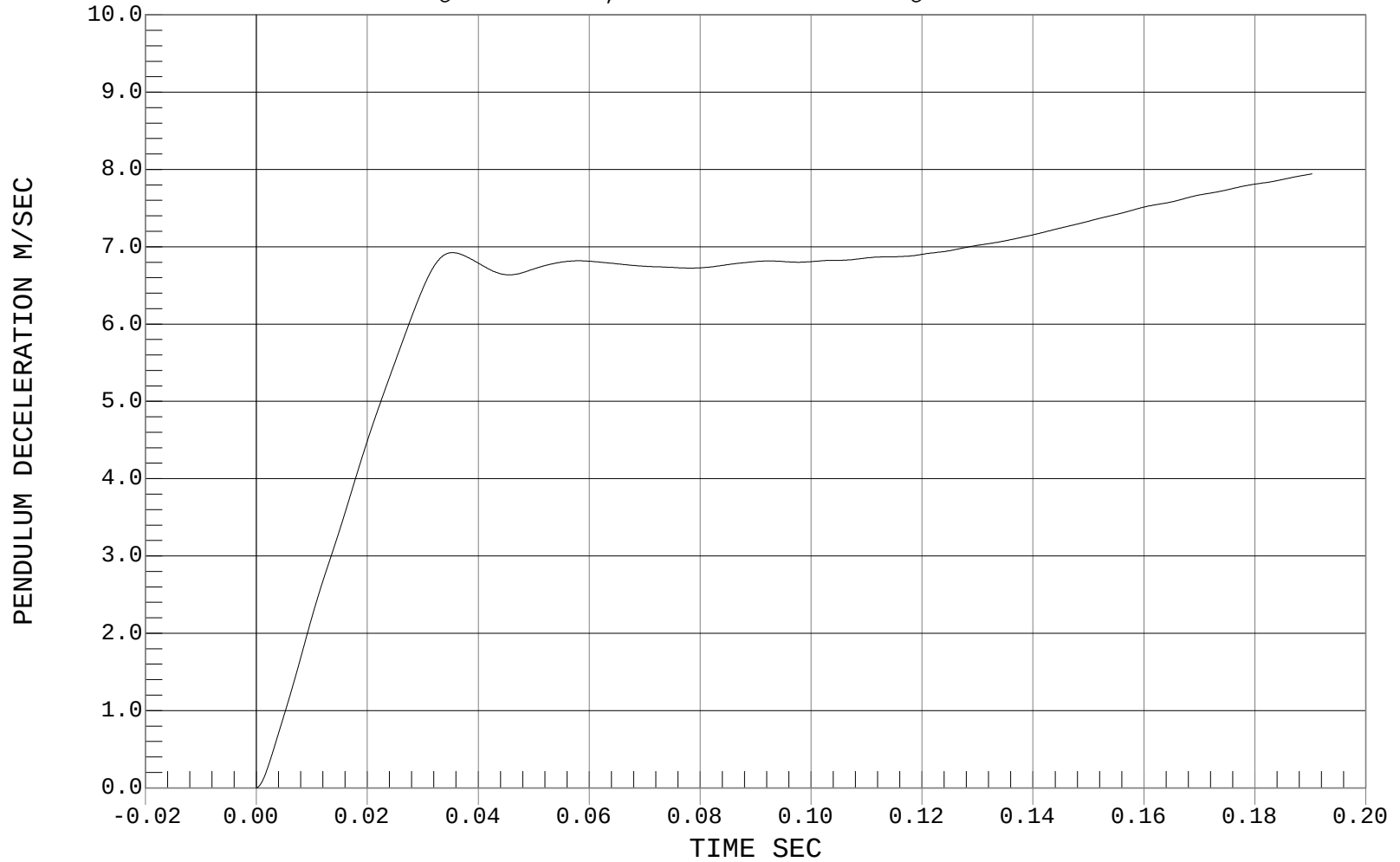
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #288

Test Date: 04-10-01
Speed: 23.02 FT/SEC, 7.02 M/SEC

— 1 PENDULUM DECELERATION, D01432AI.V04

Ymin = 0 M/SEC @ 0.0001 SEC, Ymax = 7.94 M/SEC @ 0.1903 SEC





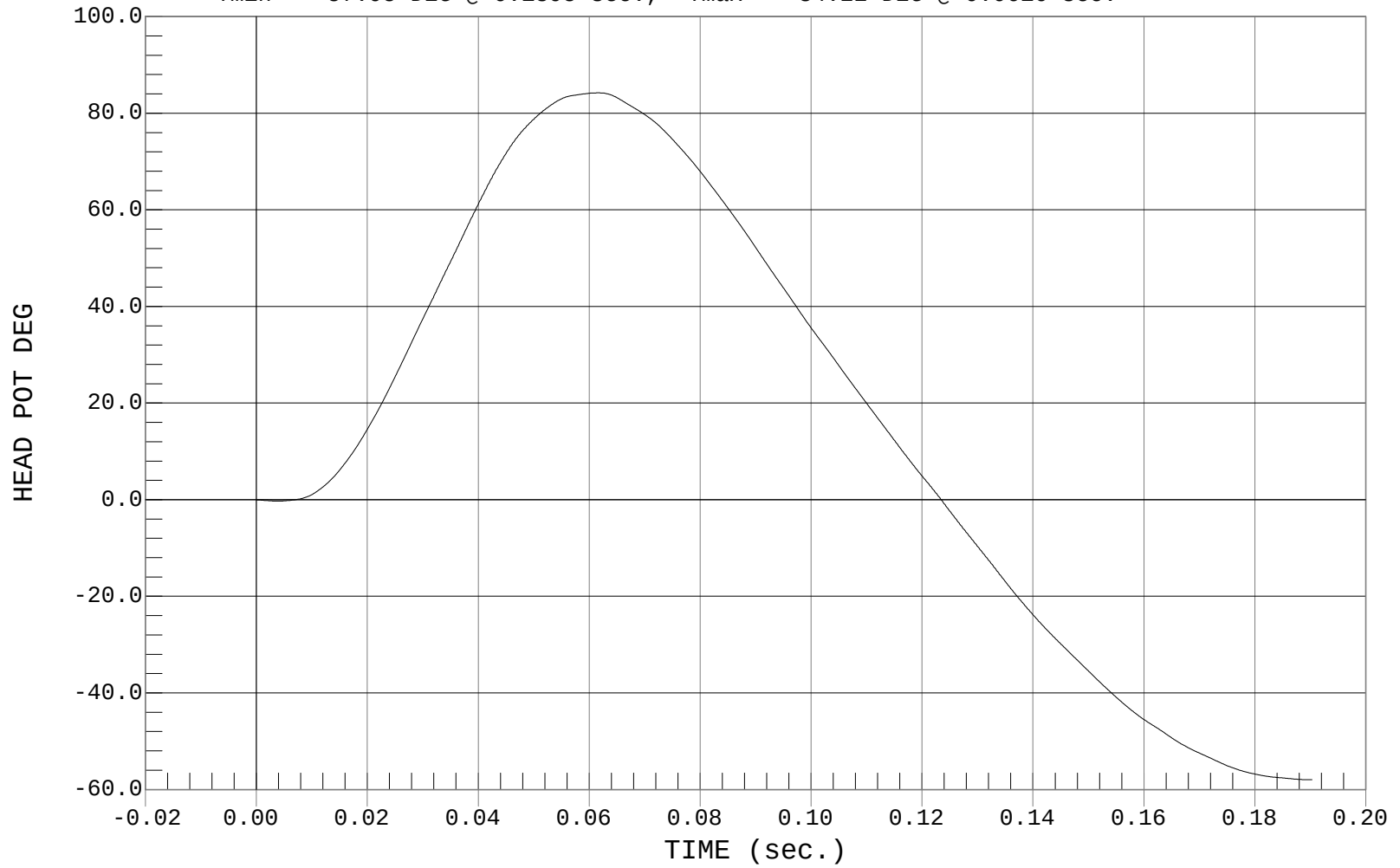
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #288

Test Date: 04-10-01
Speed: 23.02 FT/SEC, 7.02 M/SEC

— 1 HEAD POT, D01432DU.D05

Ymin = -57.95 DEG @ 0.1895 sec., Ymax = 84.22 DEG @ 0.0616 sec.





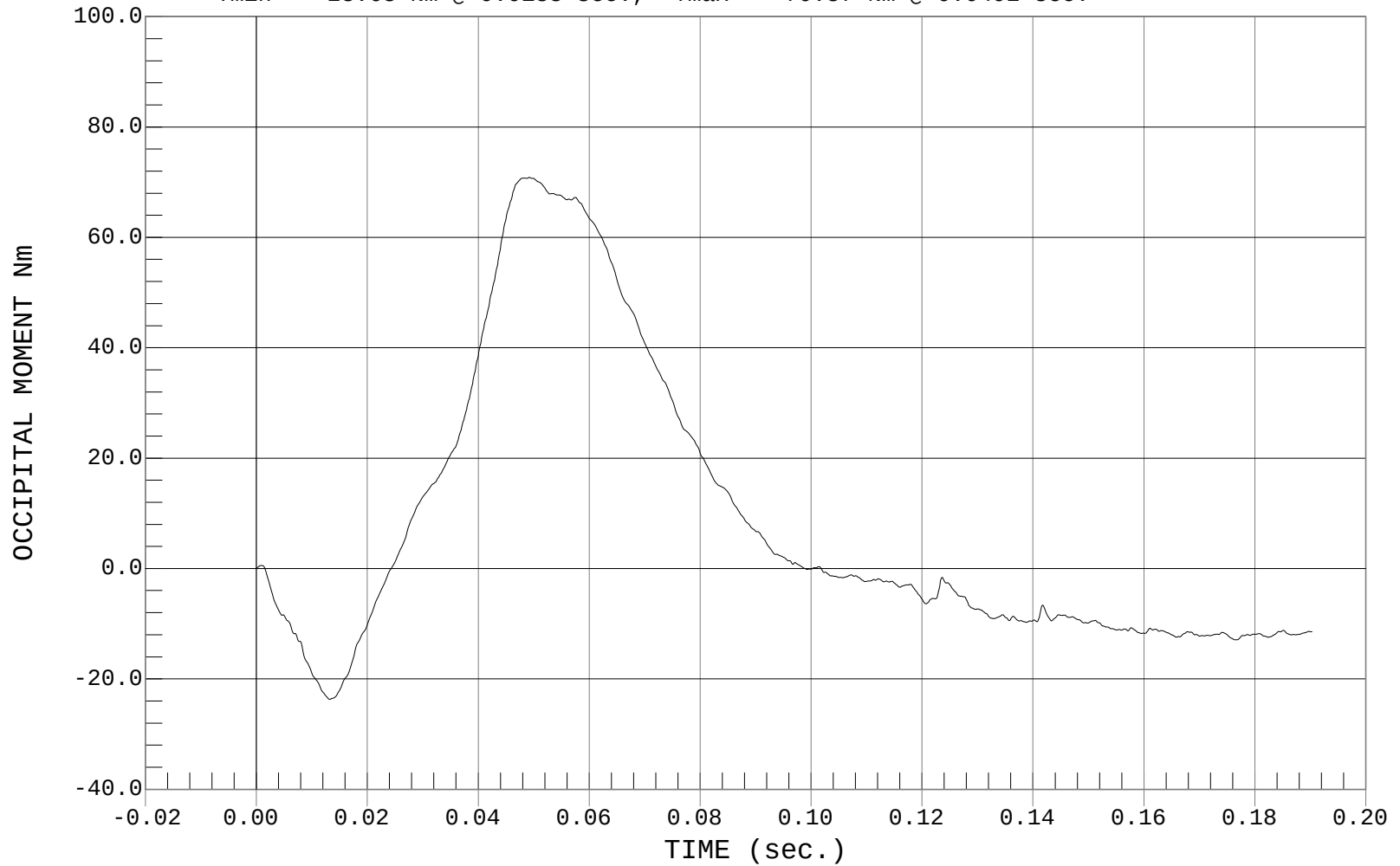
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #288

Test Date: 04-10-01
Speed: 23.02 FT/SEC, 7.02 M/SEC

— 1 OCCIPITAL MOMENT, D01432NK.MNT

Ymin = -23.68 Nm @ 0.0133 sec., Ymax = 70.87 Nm @ 0.0492 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Neck Extension Test

ATD Serial No.: 288

Test I.D.: D01433

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.3	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	33	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 msec	m/sec	1.5 – 1.9	1.7	Pass
	20 msec	m/sec	3.1 – 3.9	3.6	Pass
	30 msec	m/sec	4.6 – 5.6	5.3	Pass
Maximum “D” Plane Rotation	Maximum	Degrees	99 – 114	111	Pass
Moment About Occipital Condyle in Deflection Corridor	Minimum	Nm	-65 - -53	-54	Pass
Negative Moment Time Curve Decay to –10 Nm		msec	94 – 114	99	Pass
Overall Test Results					Pass

Laboratory Technician

4/10/01
Test Date

Approved By



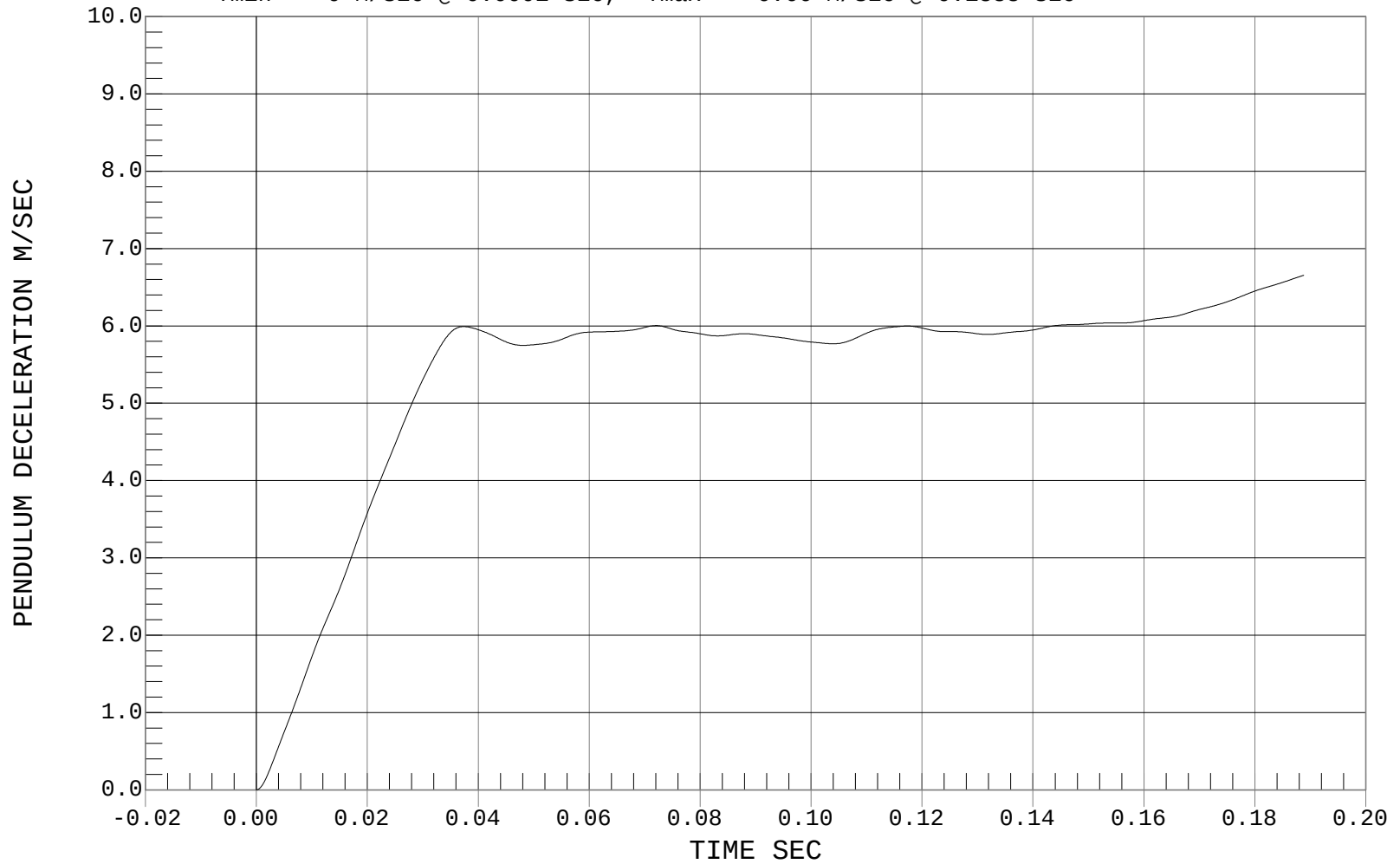
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #288

Test Date: 04-10-01
Speed: 19.83 FT/SEC, 6.05 M/SEC

— 1 PENDULUM DECELERATION, D01433AI.V04

Ymin = 0 M/SEC @ 0.0001 SEC, Ymax = 6.66 M/SEC @ 0.1888 SEC





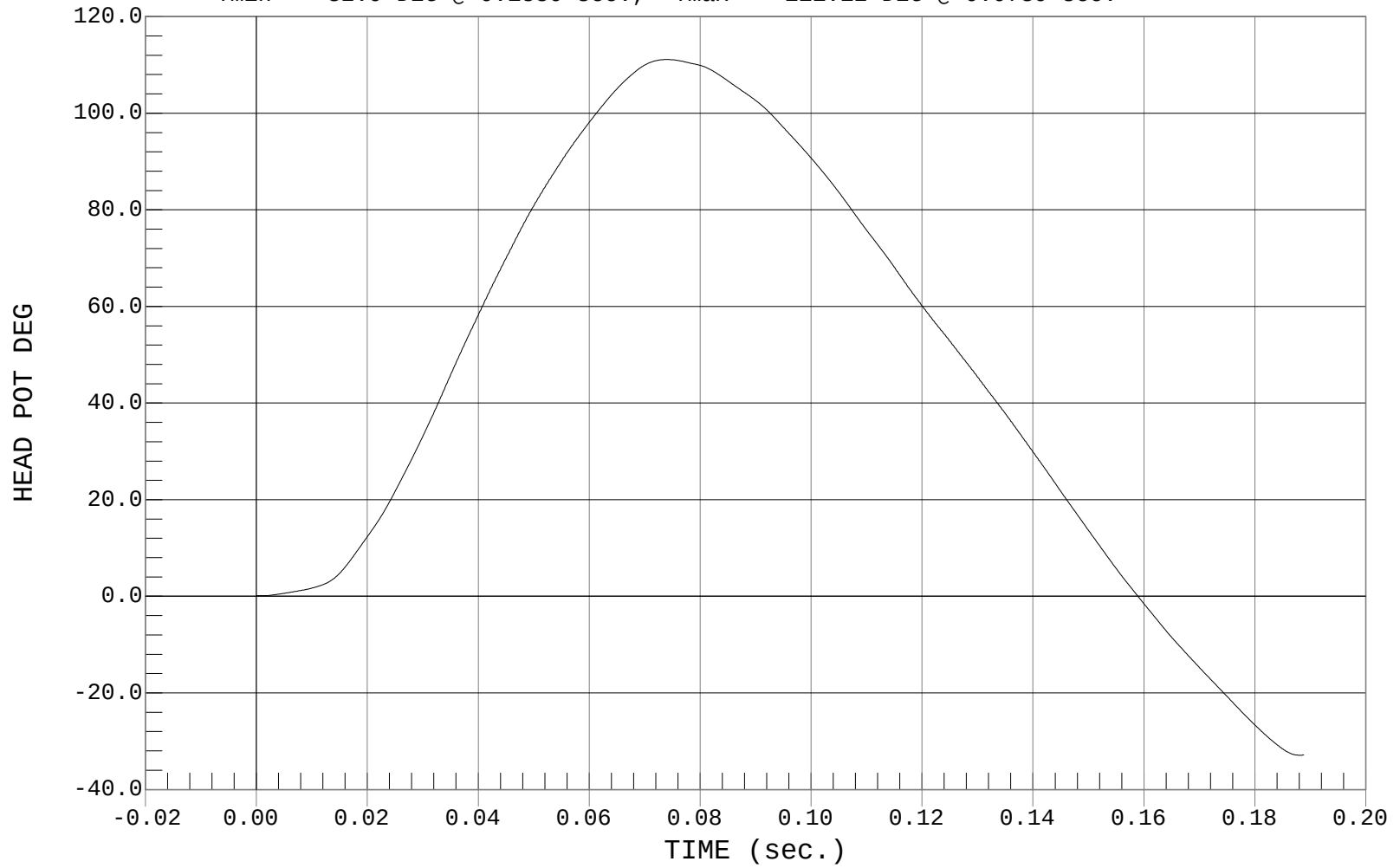
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #288

Test Date: 04-10-01
Speed: 19.83 FT/SEC, 6.05 M/SEC

— 1 HEAD POT, D01433DU.D05

Ymin = -32.9 DEG @ 0.1880 sec., Ymax = 111.12 DEG @ 0.0739 sec.





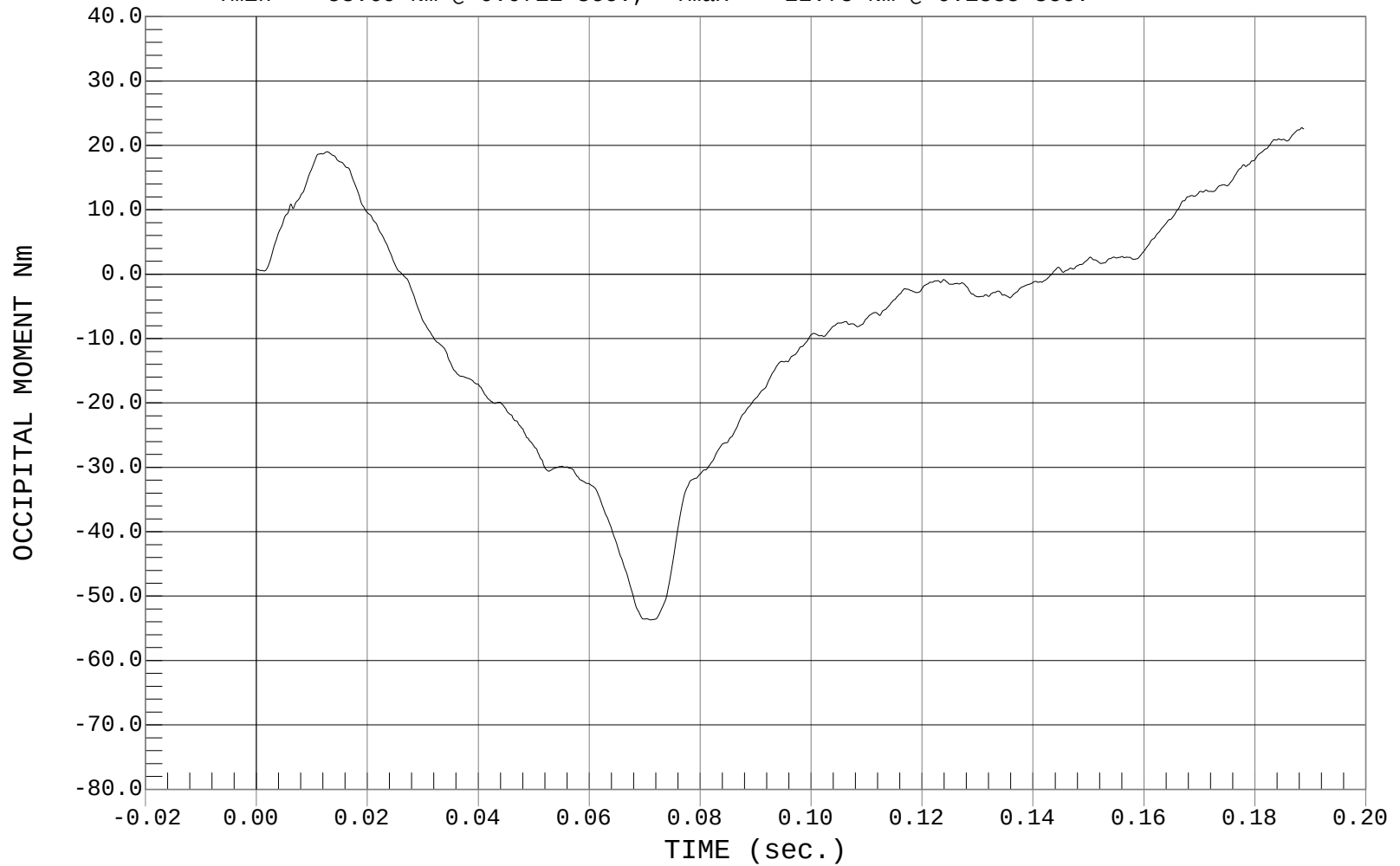
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #288

Test Date: 04-10-01
Speed: 19.83 FT/SEC, 6.05 M/SEC

— 1 OCCIPITAL MOMENT, D01433NK.MNT

Ymin = -53.69 Nm @ 0.0711 sec., Ymax = 22.75 Nm @ 0.1885 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Torso Flexion Test

ATD Serial No.: 288

Test I.D.: D0143A

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	°C	18.9 to 25.6	22.0	Pass
Relative Humidity	%	10 to 70	36	Pass
Initial Angle	Deg	0 – 20	9	Pass
Return Angle	Deg	0 – 8	6	Pass
Force @ 45°	N	320 – 390	349	Pass
Overall Test Results				Pass

Laboratory Technician

4/9/01
Test Date

Approved By

Hybrid III Calibration Data Sheet

5th Percentile Female

External Measurements

ATD Serial No.: 288

Test I.D.: D0143

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6-22.2	21.9	Pass
Laboratory Relative Humidity	%	10-70	33	Pass
A – Total sitting height	mm	775 – 800	787	Pass
B – Shoulder pivot height	mm	432 – 457	446	Pass
C – “H” point height	mm	81 – 86	84	Pass
D – “H” point from back line	mm	145 – 150	147	Pass
E – Shoulder pivot from back line	mm	69 – 84	75	Pass
F – Thigh clearance	mm	119 – 135	128	Pass
G – Back of elbow to wrist pivot	mm	244 – 259	252	Pass
H – Head back from back line	mm	43 – 48	46	Pass
I – Shoulder to elbow length	mm	277 – 297	292	Pass
J – Elbow rest height	mm	183 – 203	191	Pass
K – Buttock to knee length	mm	521 – 546	537	Pass
L – Popliteal length	mm	356 – 376	362	Pass
M – Knee pivot height	mm	394 – 419	405	Pass
N – Buttock popliteal length	mm	414 – 439	422	Pass
O – Chest depth without jacket	mm	175 – 191	186	Pass
P – Foot length	mm	218 – 234	226	Pass
R – Buttock to knee pivot length	mm	457 – 483	471	Pass
S – Head breadth	mm	137 – 147	144	Pass
T – Head depth	mm	178 – 188	181	Pass
U – Hip breadth	mm	300 – 315	307	Pass
V – Shoulder breadth	mm	351 – 366	359	Pass
W – Foot breadth	mm	79 – 94	86	Pass
X – Head circumference	mm	528 – 549	535	Pass
Y – Chest circumference with jacket	mm	851 – 881	862	Pass
Z – Waist circumference	mm	759 – 790	772	Pass
AA – Location for chest circumference	mm	300 – 310	305	Pass
BB – Location for waist circumference	mm	160 – 170	165	Pass
Overall Test Results				Pass

Laboratory Technician

4/10/01
Test Date

Approved By

Hybrid III Calibration Data Sheet
5th Percentile Female
Left Knee Impact Test

ATD Serial No.: 273

Test I.D.: D01426

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	kN	3.45 – 4.06	3.58	Pass
Overall Test Results				Pass

Laboratory Technician

4/10/01

Test Date

Approved By



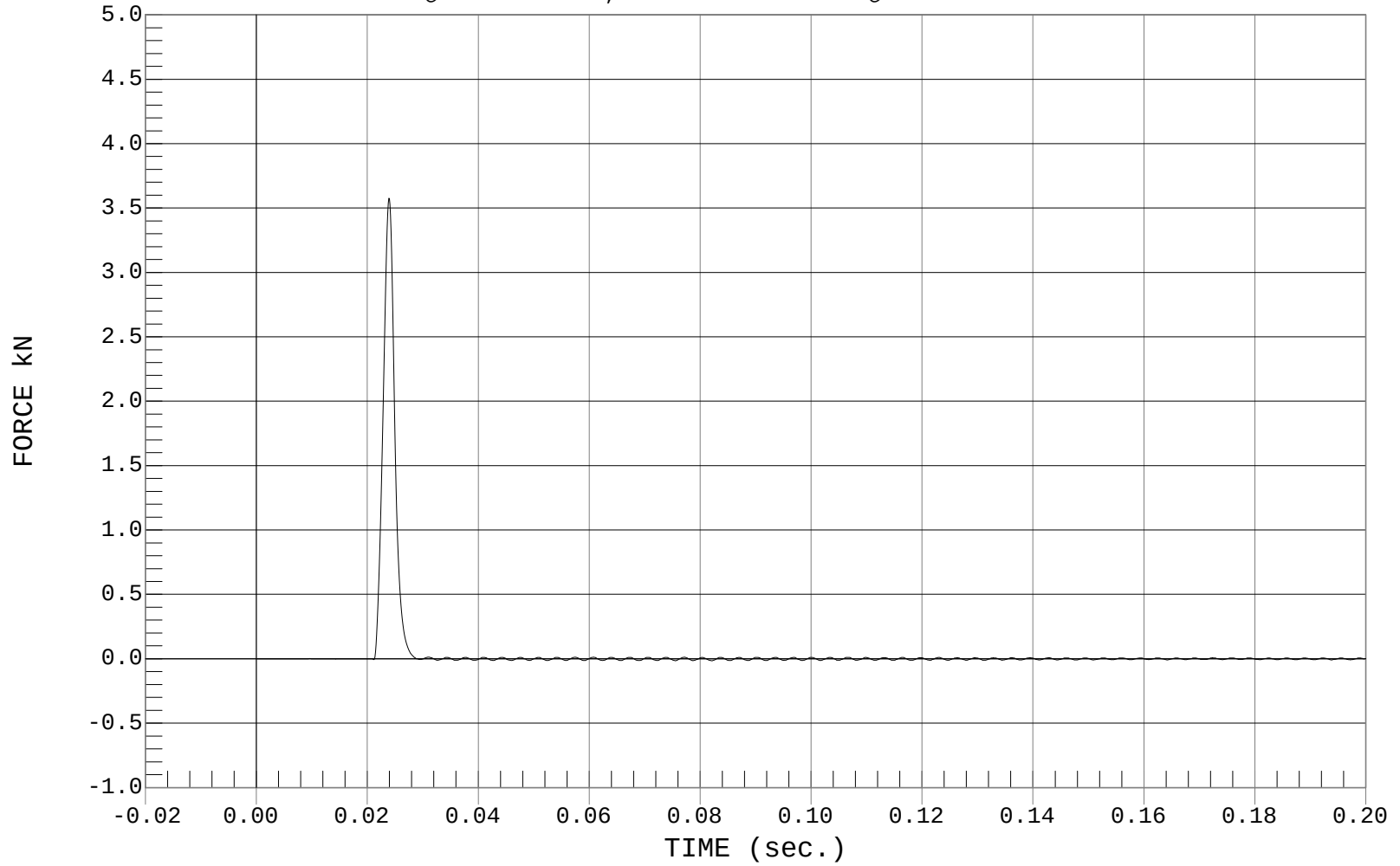
LEFT KNEE IMPACT

Test Desc.: Dummy Calibration - Left Knee Impact
Component: Dummy #273

Test Date: 04-10-01
Speed: 6.97 FT/SEC, 2.12 M/SEC

— 1 FORCE, D01426FF.F09

Ymin = -.01 kN @ 0.0821 sec., Ymax = 3.58 kN @ 0.0239 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Right Knee Impact Test

ATD Serial No.: 273

Test I.D.: D01425

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	2.07 to 2.13	2.12	Pass
Peak Probe Force	kN	3.45 – 4.06	3.50	Pass
Overall Test Results				Pass

Laboratory Technician

4/10/01

Test Date

Approved By



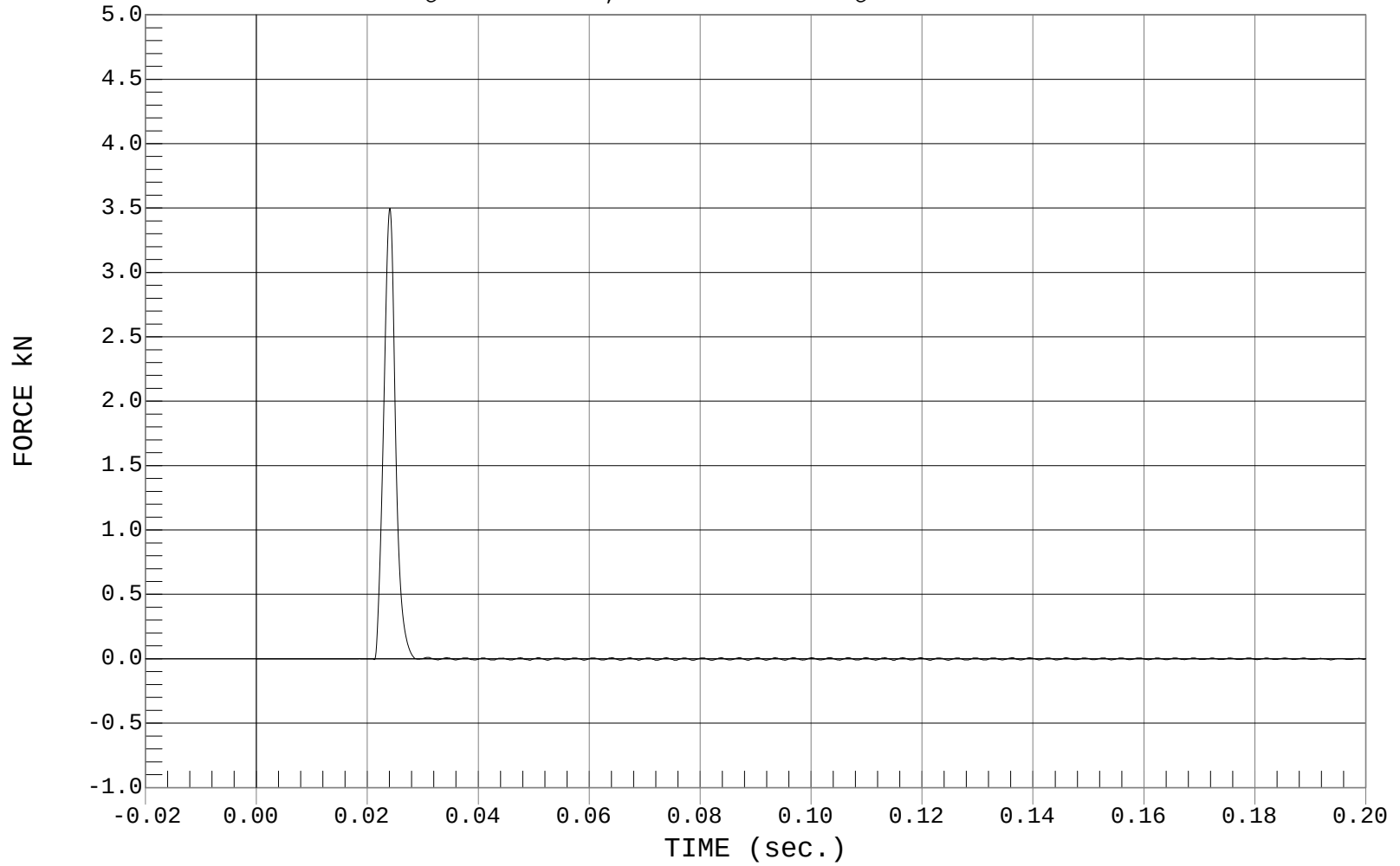
RIGHT KNEE IMPACT

Test Desc.: Dummy Calibration - Right Knee Impact
Component: Dummy #273

Test Date: 04-10-01
Speed: 6.97 FT/SEC, 2.12 M/SEC

— 1 FORCE, D01425FF.F09

Ymin = -.01 kN @ 0.0787 sec., Ymax = 3.5 kN @ 0.0241 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Head Drop Calibration

ATD Serial No.: 273

Test I.D.: D01421

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Peak Resultant Acceleration	G's	250 to 300	276	Pass
Peak Lateral Acceleration	G's	$\leq \pm 15.0$	-5.3	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

4/10/01

Test Date

Approved By



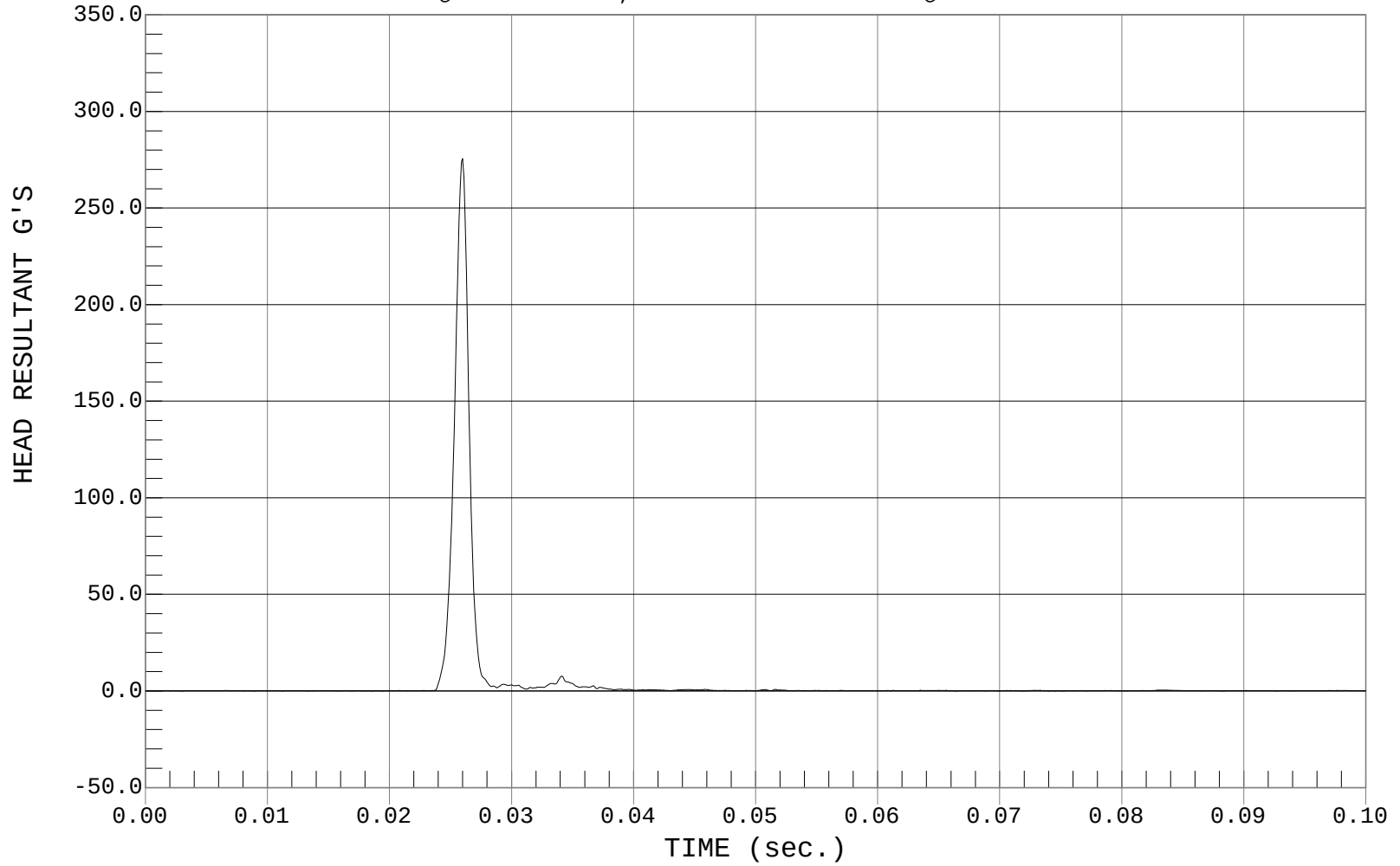
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #273

Test Date: 04-10-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT, D01421AV.A01

Ymin = .06 G'S @ 0.0002 sec., Ymax = 275.58 G'S @ 0.0260 sec.





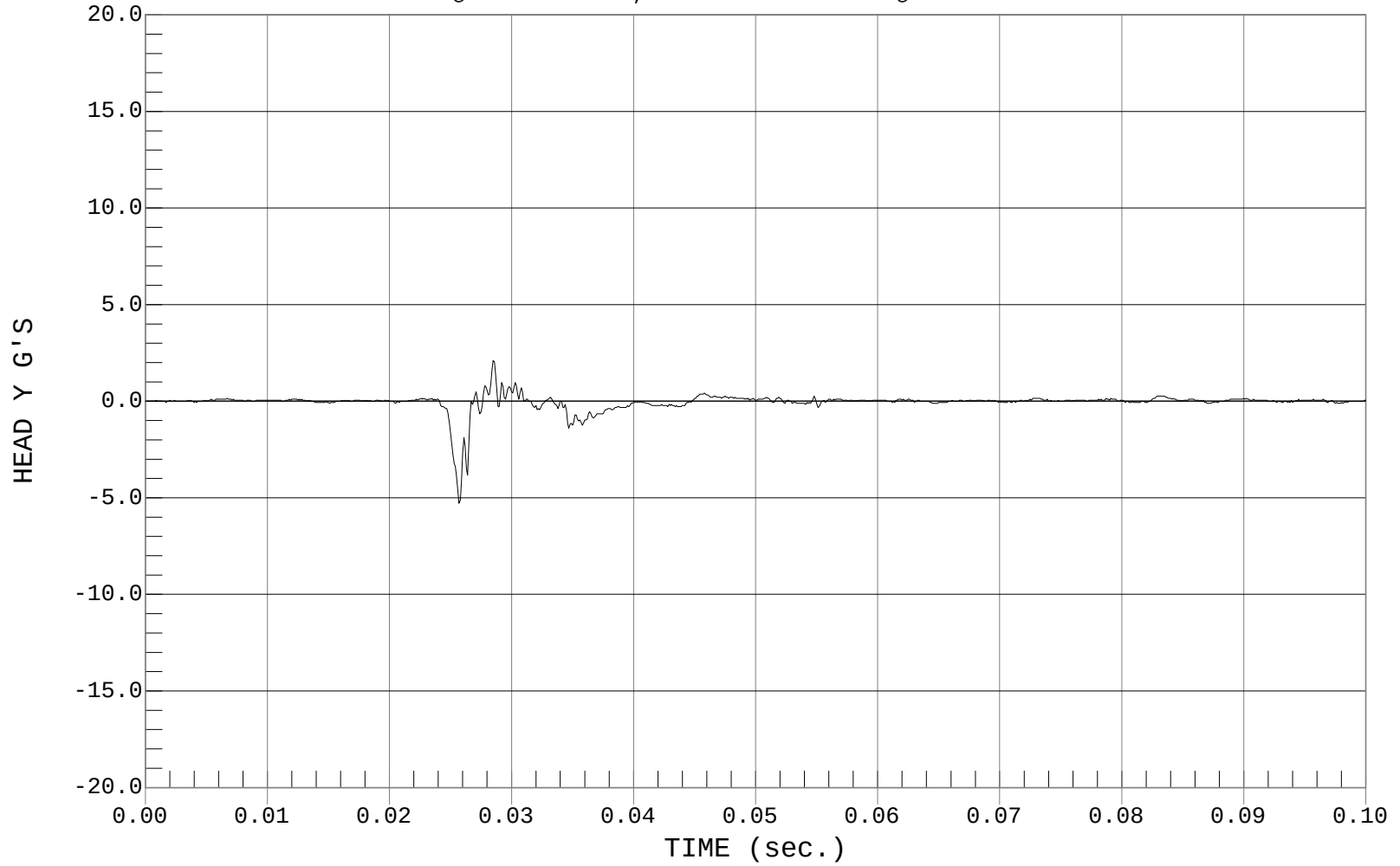
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #273

Test Date: 04-10-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01421AR.A02

Ymin = -5.28 G'S @ 0.0257 sec., Ymax = 2.1 G'S @ 0.0285 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Thorax Impact Test

ATD Serial No.: 273

Test I.D.: D01424

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Probe Velocity	m/s	6.59 to 6.83	6.74	Pass
Peak Deflection	mm	50 – 58	52	Pass
Peak Resistive Force within Deflection Corridor	kN	3.9 – 4.4	4.3	Pass
Peak Force 18mm – 50mm	%	<105% of Peak Force in Deflection Corridor	100	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Overall Test Results			Pass	

Laboratory Technician

4/9/01
Test Date

Approved By



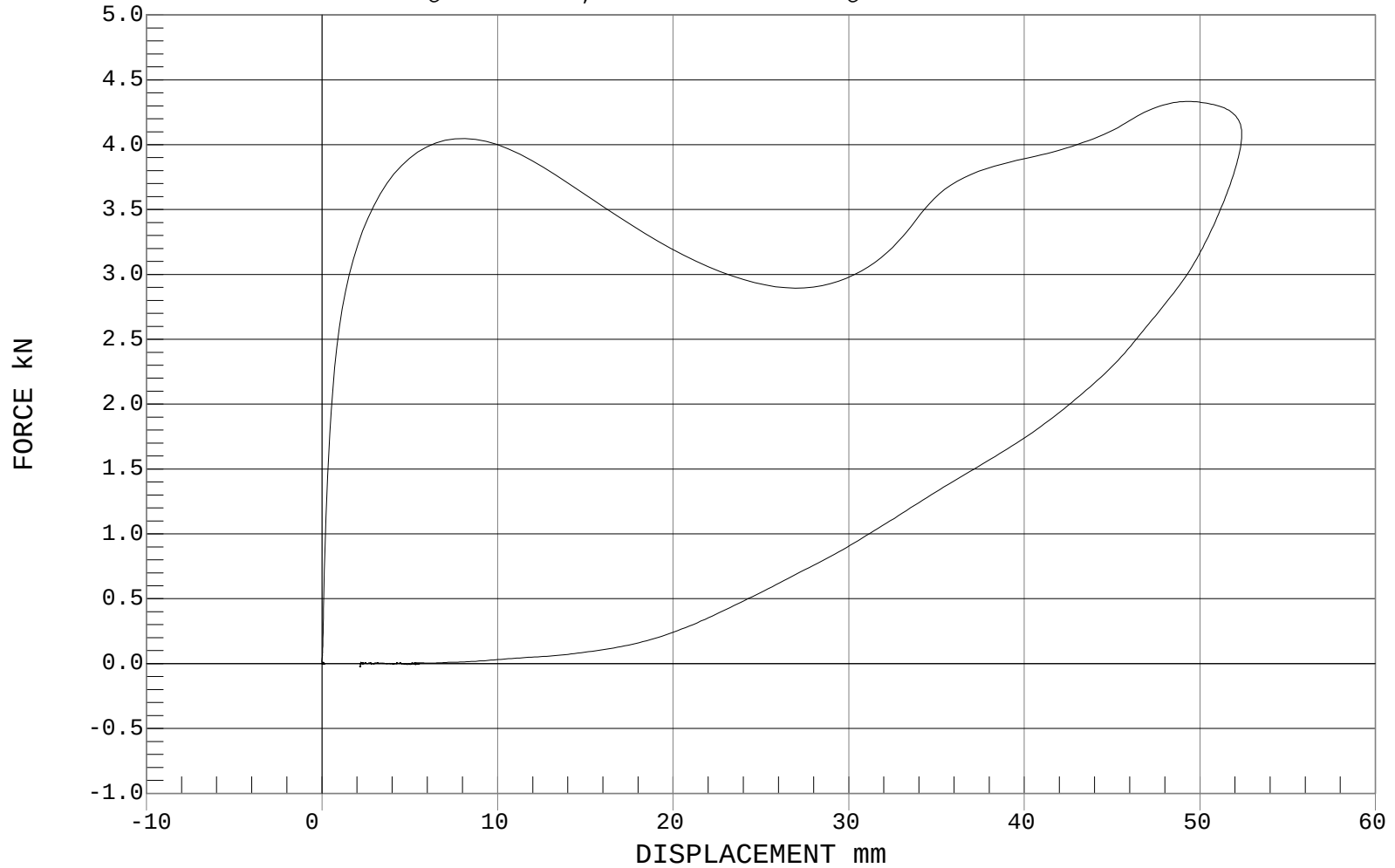
THORAX IMPACT

Test Desc.: Dummy Calibration - Chest Impact
Component: Dummy #273

Test Date: 04-09-01
Speed: 22.11 FT/SEC, 6.74 M/SEC

— 1 FORCE, D01424CH.FVD

Ymin = -.02 kN @ 2.1821 mm, Ymax = 4.33 kN @ 49.3440 mm



Hybrid III Calibration Data Sheet
5th Percentile Female
Neck Flexion Test

ATD Serial No.: 273

Test I.D.: D01422

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	33	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.99	Pass
Pendulum Deceleration	10 msec	m/s	2.1 to 2.5	2.2	Pass
	20 msec	m/s	4.0 to 5.0	4.6	Pass
	30 msec	m/s	5.8 to 7.0	6.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	77 – 91	87	Pass
Moment About Occipital Condyle within Deflection Corridor	Maximum	Nm	69 – 83	71	Pass
Positive Moment Time Curve Decay to 10 Nm		ms	80 – 100	87	Pass
Overall Test Results					Pass

Laboratory Technician

4/10/01
Test Date

Approved By



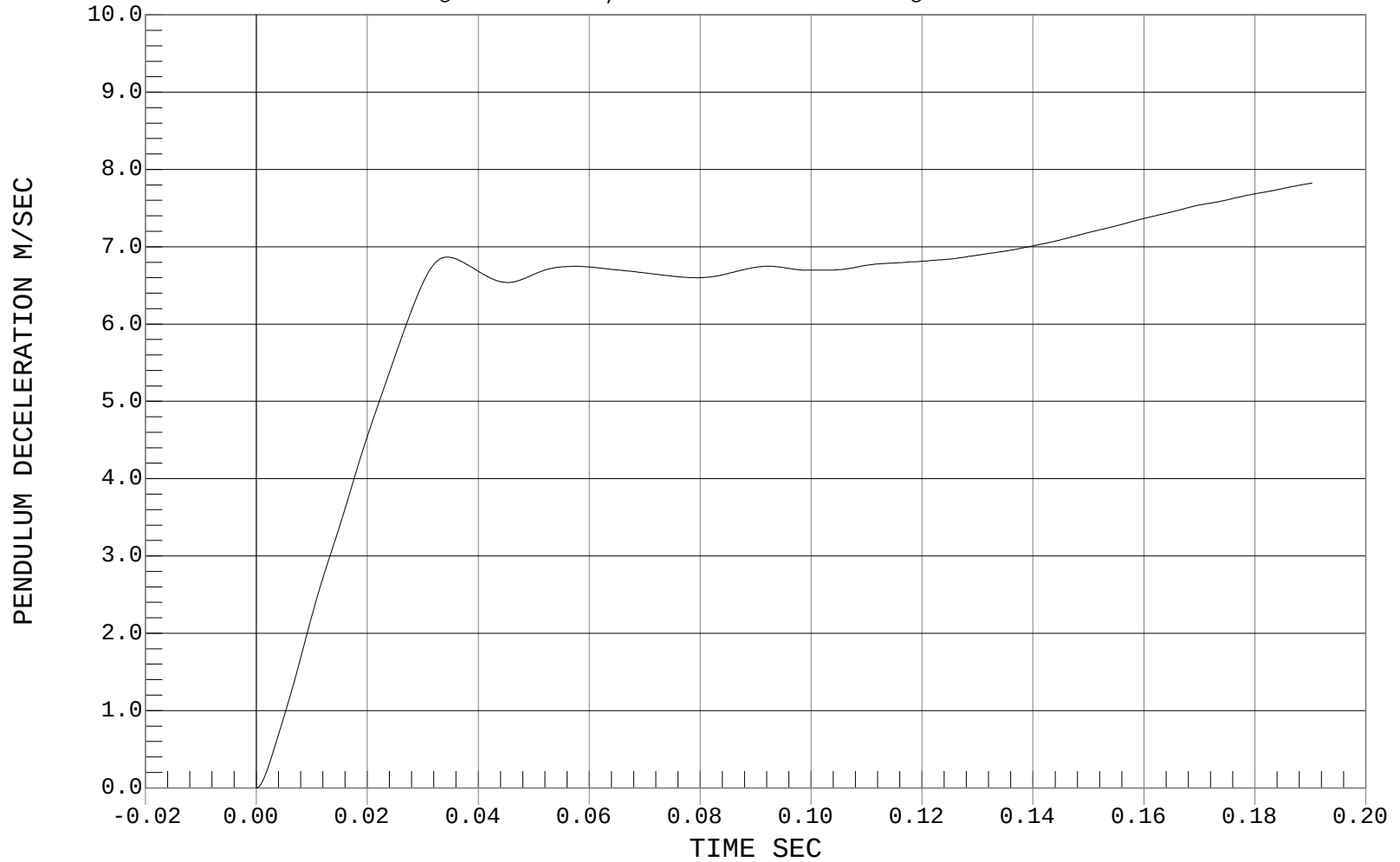
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #273

Test Date: 04-10-01
Speed: 22.93 FT/SEC, 6.99 M/SEC

— 1 PENDULUM DECELERATION, D01422AI.V04

Ymin = 0 M/SEC @ 0.0001 SEC, Ymax = 7.82 M/SEC @ 0.1903 SEC





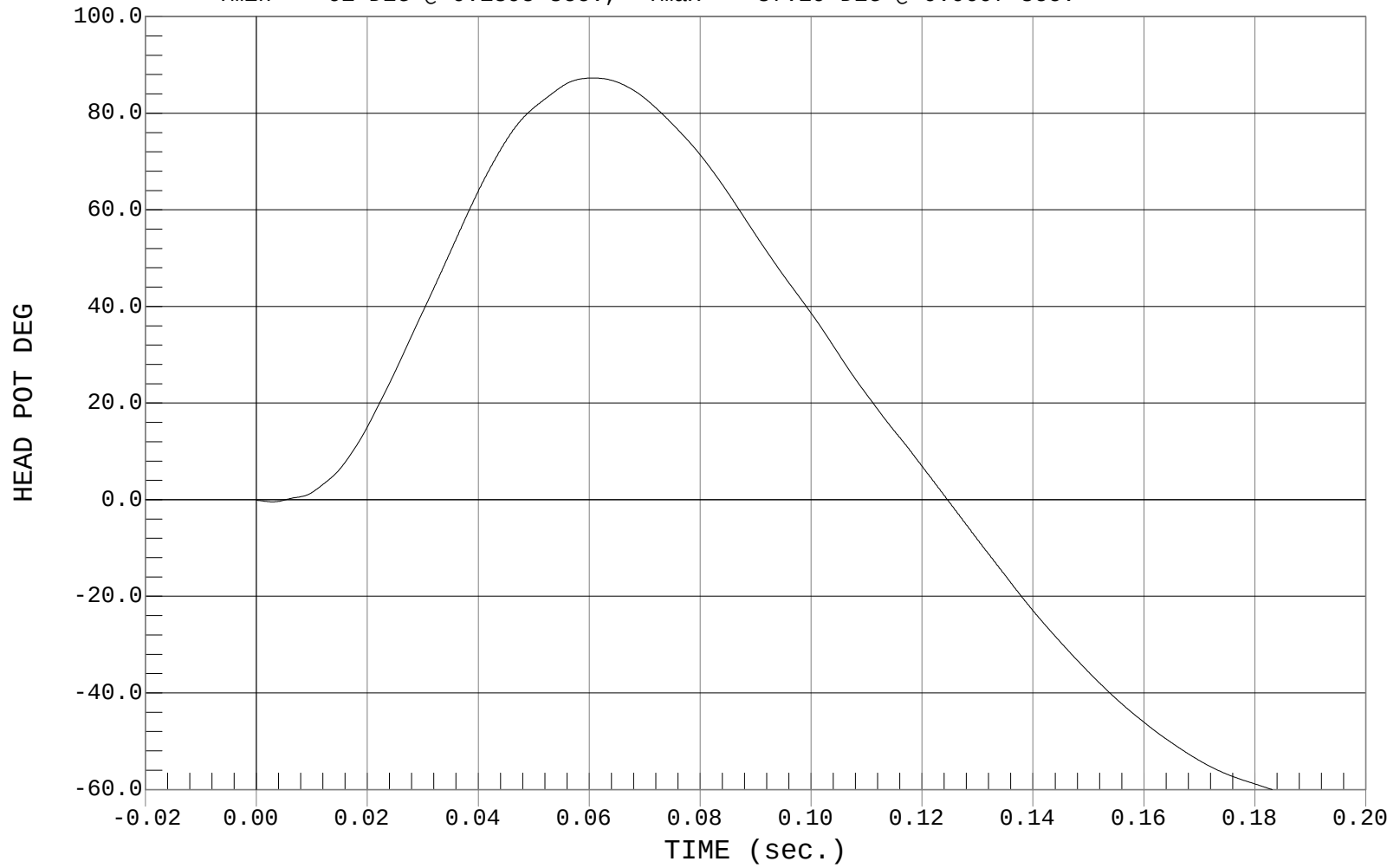
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #273

Test Date: 04-10-01
Speed: 22.93 FT/SEC, 6.99 M/SEC

— 1 HEAD POT, D01422DU.D05

Ymin = -61 DEG @ 0.1895 sec., Ymax = 87.29 DEG @ 0.0607 sec.





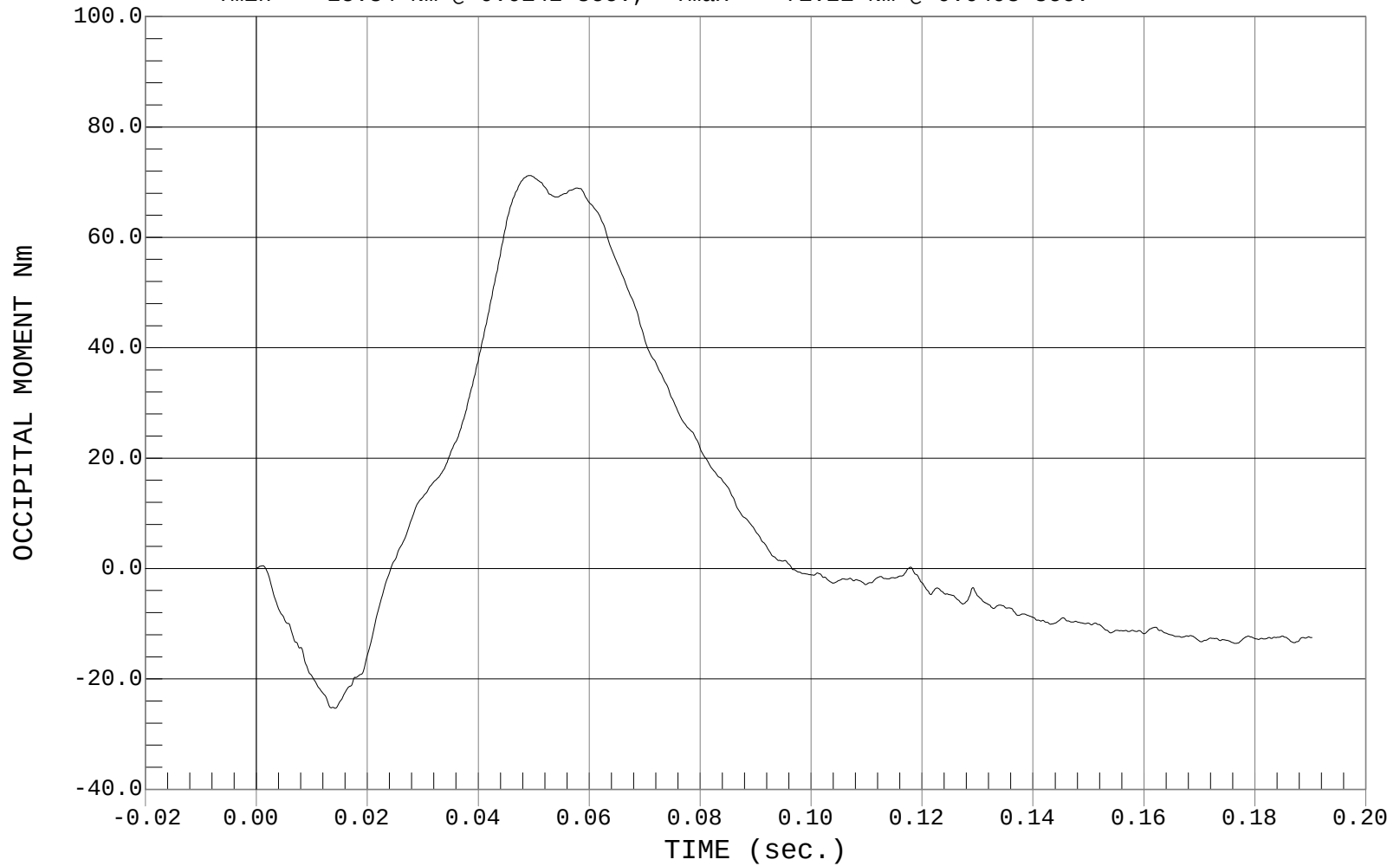
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #273

Test Date: 04-10-01
Speed: 22.93 FT/SEC, 6.99 M/SEC

— 1 OCCIPITAL MOMENT, D01422NK.MNT

Ymin = -25.34 Nm @ 0.0142 sec., Ymax = 71.21 Nm @ 0.0493 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Neck Extension Test

ATD Serial No.: 273

Test I.D.: D01423

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.3	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	33	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.08	Pass
Pendulum Deceleration	10 msec	m/sec	1.5 – 1.9	1.8	Pass
	20 msec	m/sec	3.1 – 3.9	3.7	Pass
	30 msec	m/sec	4.6 – 5.6	5.3	Pass
Maximum “D” Plane Rotation	Maximum	Degrees	99 – 114	111	Pass
Moment About Occipital Condyle in Deflection Corridor	Minimum	Nm	-65 - -53	-54	Pass
Negative Moment Time Curve Decay to –10 Nm		msec	94 – 114	100	Pass
Overall Test Results					Pass

Laboratory Technician

4/10/01
Test Date

Approved By



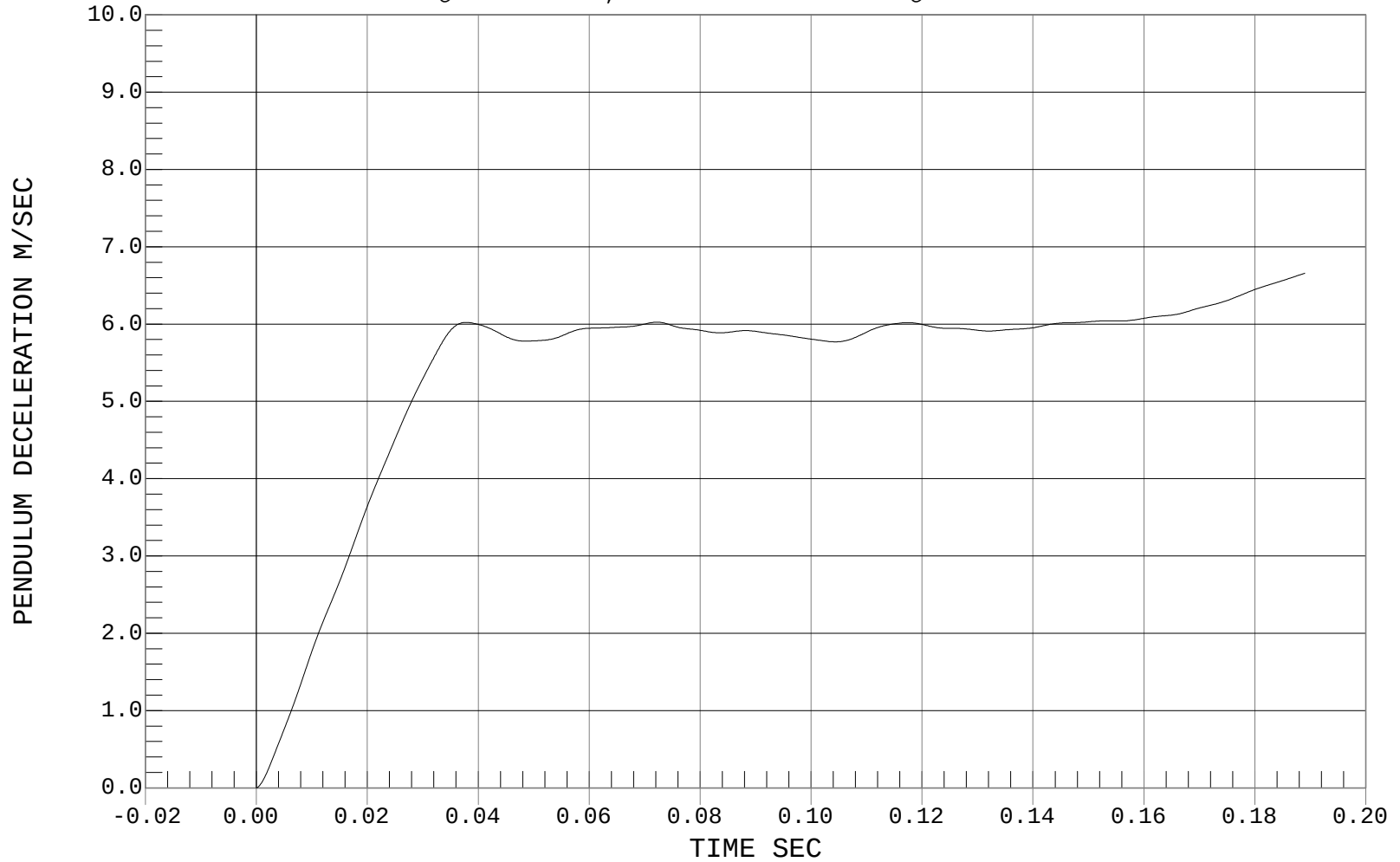
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #273

Test Date: 04-10-01
Speed: 19.96 FT/SEC, 6.08 M/SEC

— 1 PENDULUM DECELERATION, D01423AI.V04

Ymin = 0 M/SEC @ 0.0001 SEC, Ymax = 6.66 M/SEC @ 0.1890 SEC





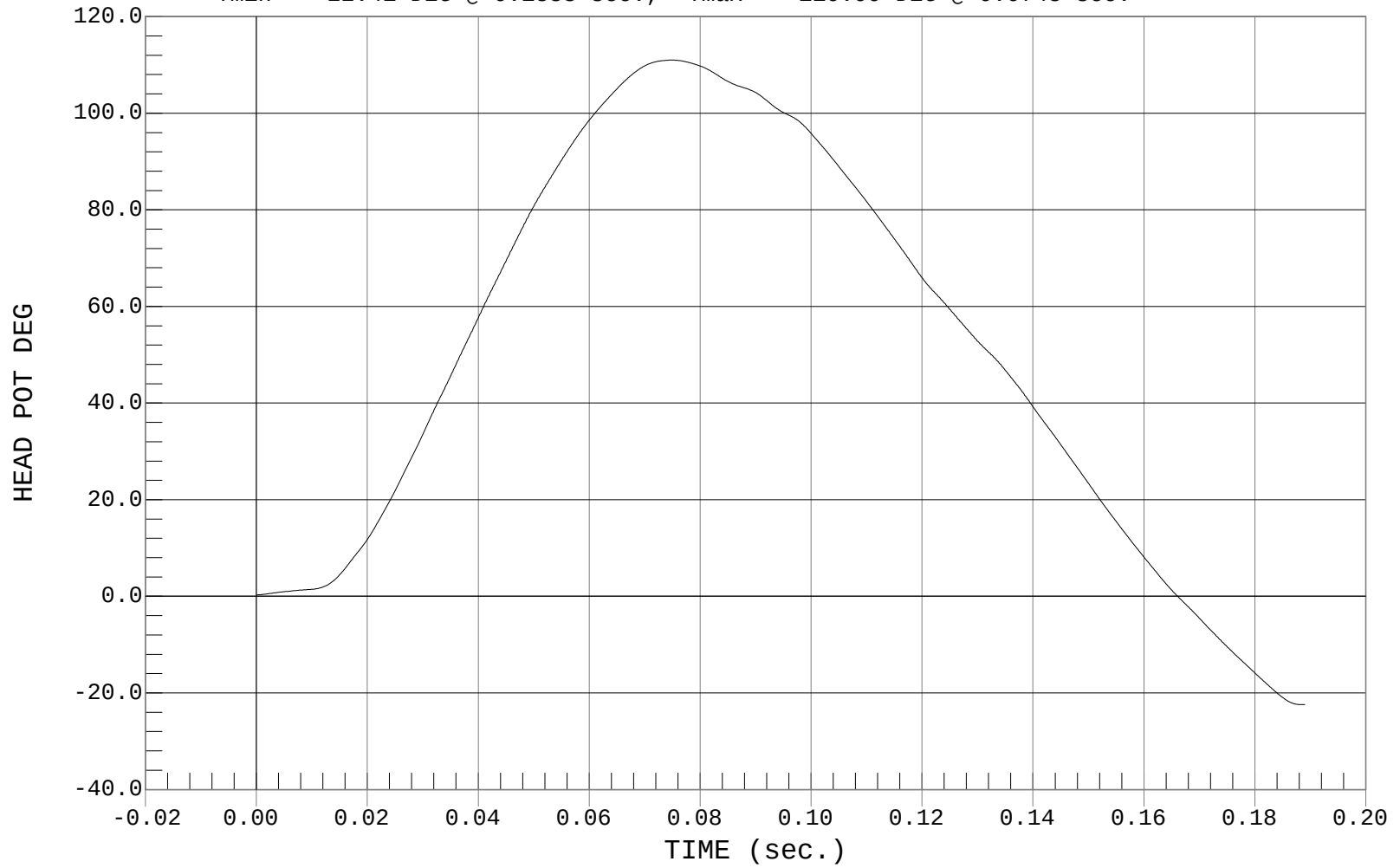
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #273

Test Date: 04-10-01
Speed: 19.96 FT/SEC, 6.08 M/SEC

— 1 HEAD POT, D01423DU.D05

Ymin = -22.41 DEG @ 0.1883 sec., Ymax = 110.99 DEG @ 0.0748 sec.





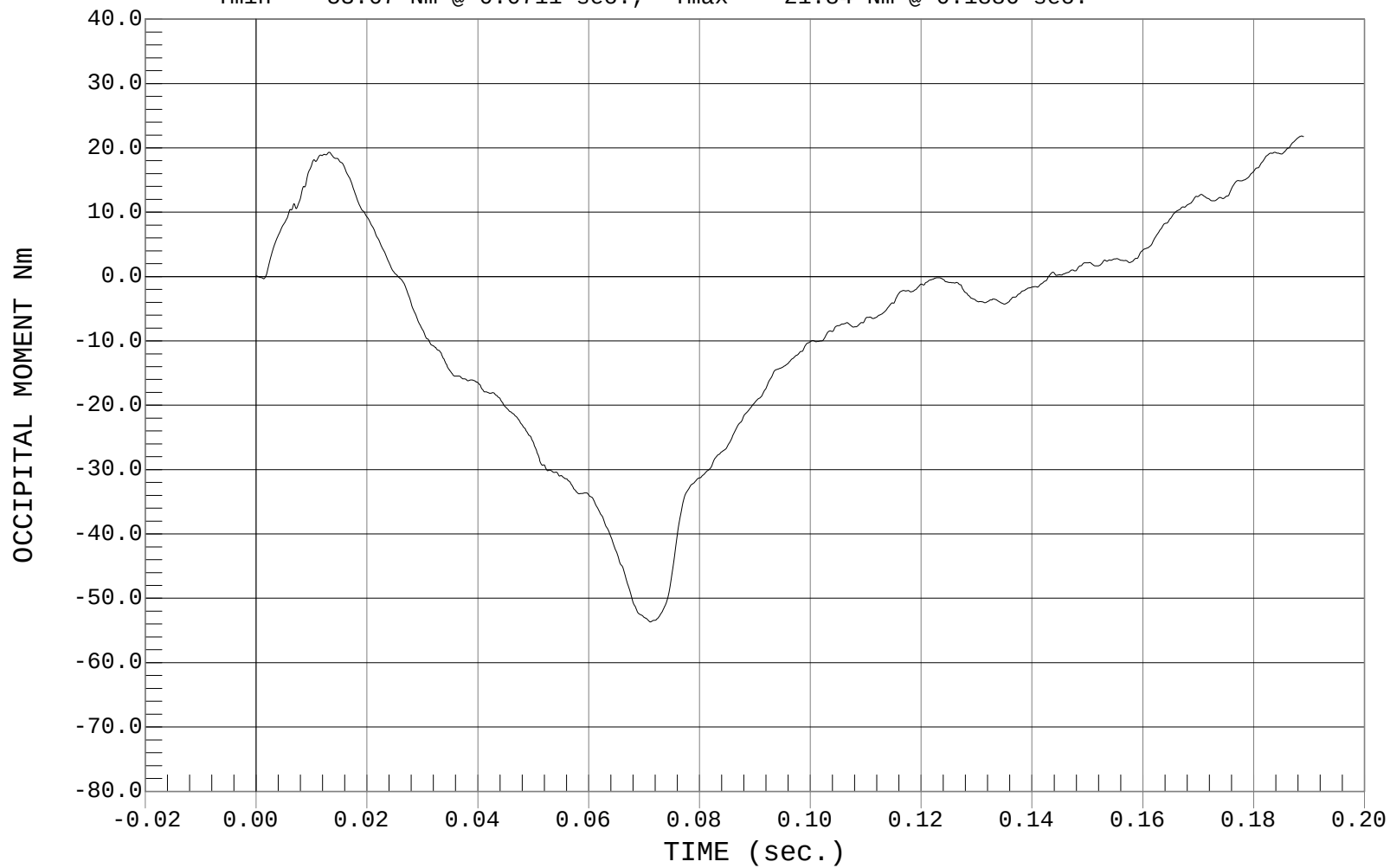
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #273

Test Date: 04-10-01
Speed: 19.96 FT/SEC, 6.08 M/SEC

— 1 OCCIPITAL MOMENT, D01423NK.MNT

Ymin = -53.67 Nm @ 0.0711 sec., Ymax = 21.84 Nm @ 0.1886 sec.



Hybrid III Calibration Data Sheet
5th Percentile Female
Torso Flexion Test

ATD Serial No.: 273

Test I.D.: D0142A

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	°C	18.9 to 25.6	22.1	Pass
Relative Humidity	%	10 to 70	36	Pass
Initial Angle	Deg	0 – 20	11	Pass
Return Angle	Deg	0 – 8	7	Pass
Force @ 45°	N	320 – 390	358	Pass
Overall Test Results				Pass

Laboratory Technician

4/9/01
Test Date

Approved By

Hybrid III Calibration Data Sheet

5th Percentile Female

External Measurements

ATD Serial No.: 273

Test I.D.: D0142

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6-22.2	21.9	Pass
Laboratory Relative Humidity	%	10-70	33	Pass
A – Total sitting height	mm	775 – 800	785	Pass
B – Shoulder pivot height	mm	432 – 457	442	Pass
C – “H” point height	mm	81 – 86	84	Pass
D – “H” point from back line	mm	145 – 150	147	Pass
E – Shoulder pivot from back line	mm	69 – 84	74	Pass
F – Thigh clearance	mm	119 – 135	125	Pass
G – Back of elbow to wrist pivot	mm	244 – 259	254	Pass
H – Head back from back line	mm	43 – 48	46	Pass
I – Shoulder to elbow length	mm	277 – 297	290	Pass
J – Elbow rest height	mm	183 – 203	196	Pass
K – Buttock to knee length	mm	521 – 546	536	Pass
L – Popliteal length	mm	356 – 376	366	Pass
M – Knee pivot height	mm	394 – 419	406	Pass
N – Buttock popliteal length	mm	414 – 439	432	Pass
O – Chest depth without jacket	mm	175 – 191	183	Pass
P – Foot length	mm	218 – 234	226	Pass
R – Buttock to knee pivot length	mm	457 – 483	470	Pass
S – Head breadth	mm	137 – 147	145	Pass
T – Head depth	mm	178 – 188	183	Pass
U – Hip breadth	mm	300 – 315	310	Pass
V – Shoulder breadth	mm	351 – 366	358	Pass
W – Foot breadth	mm	79 – 94	87	Pass
X – Head circumference	mm	528 – 549	536	Pass
Y – Chest circumference with jacket	mm	851 – 881	866	Pass
Z – Waist circumference	mm	759 – 790	775	Pass
AA – Location for chest circumference	mm	300 – 310	305	Pass
BB – Location for waist circumference	mm	160 – 170	165	Pass
Overall Test Results				Pass

Laboratory Technician

4/10/01

Test Date

Approved By

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

DUMMY, VEHICLE, AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 273

	INSTRUMENTS FOR DRIVER DUMMY NO. 273		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACCY6	Endevco	10/3/00
Head Y	ACCH1	Endevco	10/3/00
Head Z	AAMW5	Endevco	10/3/00
Head X Redundant	AJ9D2	Endevco	10/3/00
Head Y Redundant	AH1E2	Endevco	10/3/00
Head Z Redundant	AJ7K3	Endevco	10/3/00
Chest X	ACC78	Endevco	10/3/00
Chest Y	ACCE6	Endevco	10/3/00
Chest Z	ACCY3	Endevco	10/3/00
Chest X Redundant	AJ9J7	Endevco	10/3/00
Chest Y Redundant	AJ7A2	Endevco	10/3/00
Chest Z Redundant	AJ819	Endevco	10/3/00
Right Femur Load Cell	259	Denton	10/13/00
Left Femur Load Cell	260	Denton	10/13/00
Pelvis X	AM748	Endevco	9/19/00
Pelvis Y	ALCH7	Endevco	9/19/00
Pelvis Z	AALH1	Endevco	9/19/00
Neck Force X	442	Denton	1/3/01
Neck Force Y	442	Denton	1/3/01
Neck Force Z	442	Denton	1/3/01
Neck Moment X	442	Denton	1/3/01
Neck Moment Y	442	Denton	1/3/01
Neck Moment Z	442	Denton	1/3/01
Chest Deflection Gauge	273	Servo	2/22/01
Lap Belt Load Cell	191	Denton	10/6/00

DUMMY, VEHICLE, AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 273

	INSTRUMENTS FOR DRIVER DUMMY NO. 273		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	694	Denton	12/8/00
Upper Right Tibia Moment Y	694	Denton	12/8/00
Upper Right Tibia Force Z	694	Denton	12/8/00
Lower Right Tibia Moment X	554	Denton	12/14/00
Lower Right Tibia Moment Y	554	Denton	12/14/00
Lower Right Tibia Force Z	554	Denton	12/14/00
Upper Left Tibia Moment X	695	Denton	12/8/00
Upper Left Tibia Moment Y	695	Denton	12/8/00
Upper Left Tibia Force Z	695	Denton	12/8/00
Lower Left Tibia Moment X	555	Denton	12/14/00
Lower Left Tibia Moment Y	555	Denton	12/14/00
Lower Left Tibia Force Z	555	Denton	12/14/00
Left Foot Ball Z Acceleration	AGMT2	Endevco	11/16/00
Left Heel X Acceleration	AH0A2	Endevco	11/16/00
Left Heel Z Acceleration	AJ837	Endevco	11/16/00
Right Foot Ball Z Acceleration	AP2D6	Endevco	11/16/00
Right Heel X Acceleration	J11548	Endevco	11/16/00
Right Heel Z Acceleration	J10866	Endevco	11/16/00

DUMMY, VEHICLE, AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 288

	INSTRUMENTS FOR PASSENGER DUMMY NO. 288		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AJ9H0	Endevco	1/5/01
Head Y	ANAN3	Endevco	1/5/01
Head Z	ANAN6	Endevco	1/5/01
Head X Redundant	AP120	Endevco	1/5/01
Head Y Redundant	ALEK9	Endevco	1/5/01
Head Z Redundant	AP042	Endevco	1/5/01
Chest X	AMRR4	Endevco	1/8/01
Chest Y	ALCR0	Endevco	1/8/01
Chest Z	AMP44	Endevco	1/8/01
Chest X Redundant	AC9B7	Endevco	1/8/01
Chest Y Redundant	AMR94	Endevco	1/8/01
Chest Z Redundant	AMTB1	Endevco	1/8/01
Right Femur Load Cell	261	Denton	10/16/00
Left Femur Load Cell	262	Denton	10/16/00
Pelvis X	AHY98	Endevco	1/8/01
Pelvis Y	AHTW6	Endevco	1/8/01
Pelvis Z	AHWP2	Endevco	1/8/01
Neck Force X	443	Denton	11/11/00
Neck Force Y	443	Denton	11/11/00
Neck Force Z	443	Denton	11/11/00
Neck Moment X	443	Denton	11/11/00
Neck Moment Y	443	Denton	11/11/00
Neck Moment Z	443	Denton	11/11/00
Chest Deflection Gauge	288	Servo	3/90/01
Lap Belt Load Cell	192	Denton	10/6/00

DUMMY, VEHICLE, AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 288

	INSTRUMENTS FOR PASSENGER DUMMY NO. 288		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	696	Denton	12/8/00
Upper Right Tibia Moment Y	696	Denton	12/8/00
Upper Right Tibia Force Z	696	Denton	12/8/00
Lower Right Tibia Moment X	556	Denton	12/14/00
Lower Right Tibia Moment Y	556	Denton	12/14/00
Lower Right Tibia Force Z	556	Denton	12/14/00
Upper Left Tibia Moment X	705	Denton	1/10/01
Upper Left Tibia Moment Y	705	Denton	1/10/01
Upper Left Tibia Force Z	705	Denton	1/10/01
Lower Left Tibia Moment X	557	Denton	12/14/00
Lower Left Tibia Moment Y	557	Denton	12/14/00
Lower Left Tibia Force Z	557	Denton	12/14/00
Left Foot Ball Z Acceleration	AH0A5	Endevco	11/16/00
Left Heel X Acceleration	AJ9C4	Endevco	11/16/00
Left Heel Z Acceleration	AN8A4	Endevco	11/16/00
Right Foot Ball Z Acceleration	ALDD6	Endevco	11/16/00
Right Heel X Acceleration	J20392	Endevco	11/16/00
Right Heel Z Acceleration	AGT18	Endevco	11/16/00

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	D05-R25	Entran	2/7/01
Right Rear Seat Crossmember X	J04-F10	Entran	2/15/01
Top of Engine Block X	I14-D18	Entran	11/17/00
Bottom of Engine X	A08-A11	Entran	2/8/01
Left Brake Caliper X	G13-F01	Entran	2/7/01
Right Brake Caliper X	G13-F07	Entran	2/15/01
Instrument Panel X	A08-A12	Entran	2/8/01
Redundant Left Rear Seat Crossmember X	D06-A03	Entran	2/7/01
Redundant Right Rear Seat Crossmember X	J10-E18	Entran	2/15/01

	LABORATORY INSTRUMENTS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Bending Pendulum Accelerometer	C12885	Endevco	1/17/01
Neck Bending Head Rotary Potentiometer	018	Spectrol	10/2/00
Neck Bending Pendulum Rotary Potentiometer	019	Spectrol	10/2/00
Chest Probe Accelerometer	J14396	Endevco	1/11/01
Knee Impact Accelerometer	J14398	Endevco	1/11/01

APPENDIX E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT INSTRUCTIONS

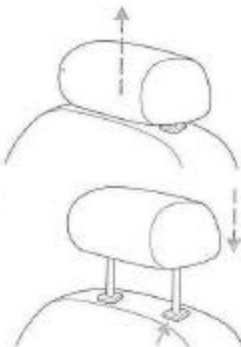
Seating and safety restraints

SEATING

Adjustable head restraints (if equipped)

Your vehicle's seats may be equipped with head restraints which are vertically adjustable. The purpose of these head restraints is to help limit head motion in the event of a rear collision. To properly adjust your head restraints, lift the head restraint so that it is located directly behind your head or as close to that position as possible. Refer to the following to raise and lower the head restraints.

The head restraints can be moved up and down.



Push control to lower head restraint.

Adjusting the front manual seat

Never adjust the driver's seat or seatback when the vehicle is moving.

Do not pile cargo higher than the seatbacks to reduce the risk of injuring people in a collision or sudden stop.

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Seating and safety restraints

Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

Reclining the seatback can reduce the effectiveness of the seat's safety belt in the event of a collision.

Lift handle to move seat forward or backward.



Pull lever up to adjust seatback.



Adjusting the power seats (if equipped)

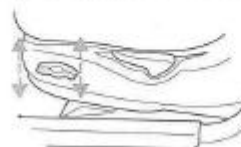
Never adjust the driver's seat or seatback when the vehicle is moving.

Seating and safety restraints

Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

Reclining the seatback can reduce the effectiveness of the seat's safety belt in the event of a collision.

Press control to move front or rear of seat up and down.



Press control to raise or lower the seat, or to move the seat forward or backward.



Heated seats (if equipped)

To operate the heated seats:

- Push the control located on the seat to activate.
- Push again to deactivate.



The indicator light on the control will illuminate when activated.

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Seating and safety restraints

Using the power lumbar support (if equipped)

The power lumbar control is located on the inboard side of the seat.

Press one side of the control to adjust firmness.

Press the other side of the control to adjust softness.

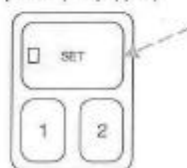


Memory seats/rearview mirrors/adjustable pedals (if equipped)

This system allows automatic positioning of the driver seat, outside rearview mirrors, and adjustable pedals to two programmable positions.

The memory seat control is located on the driver door.

- To program position one, move the driver seat to the desired position using the seat controls. Press the SET control. The SET control indicator light will briefly illuminate. While the light is illuminated, press control 1.
- To program position two, repeat the previous procedure using control 2.



A position can only be recalled when the transmission gearshift is in Park. A memory seat position may be programmed at any time.

The memory seat positions are also recalled when you press your remote entry transmitter UNLOCK control.

To program the memory seat to remote entry transmitter, refer to Remote entry system in the Controls and features chapter.

Rear seats

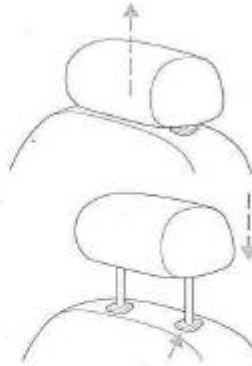
Head restraints

Your vehicle's seats may be equipped with head restraints which are vertically adjustable. The purpose of these head restraints is to help limit head motion in the event of a rear collision. To properly adjust your head restraints, lift the head restraint so that it is located directly behind your

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Seating and safety restraints

head or as close to that position as possible. Refer to the following to raise and lower the head restraints.
The head restraints can be moved up and down.



Push control to lower head restraint.

Seat mounted cup holders (if equipped)

Your vehicle may be equipped with cupholders mounted on the outboard sides of the second row seat(s). The cupholder is designed to detach from the seat when subjected to a heavy load. The cupholder can be reinstalled by lining up the arms with the side shield holes and pushing toward the seat.

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Seating and safety restraints

Adjusting rear seats

Lift control to move seat forward or backward.

- 2nd row bucket seat.



- 2nd / 3rd row bench seat or 2nd row bucket console seat.



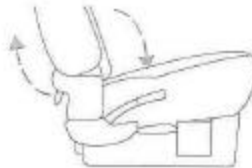
Pull control up to adjust seatback position.



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Seating and safety restraints

Pull control up to flip seatback to forward flat position.



Accessing the 3rd row seat

If your vehicle has an adjustable 2nd row bench seat or 2nd row bucket console seat, it can be adjusted to allow easier access to the 3rd row seat by sliding the seat forward, folding the seatback to the forward flat position, or using the recline control to adjust seatback forward.

If your vehicle has 2nd row bucket seats, it has an easy entry seat feature which allows ready access to the 3rd row seat.

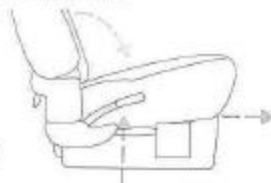
To access the 3rd row seat with 2nd row buckets:

1. Pull the seatback recline control up and allow seatback to flip forward.

2. Push seatback toward front of vehicle. This releases the seat track automatically and the seat will move forward.

3. After entering the 3rd row seat, pull back the seatback until it latches. This will latch and lock the seatback and the seat track. The seatback and seat will not return to their original position.

Do not attempt to use this feature when the seatback is folded in the forward flat position. The seatback must be in an upright position, as shown, for the system to work properly.



⚠ Check to see that the seat and seatback is latched securely in position. Keep floor area free of objects that would prevent proper seat engagement. Never attempt to adjust the seat while the vehicle is in motion.

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Seating and safety restraints

Bench seat or Bucket Console seat

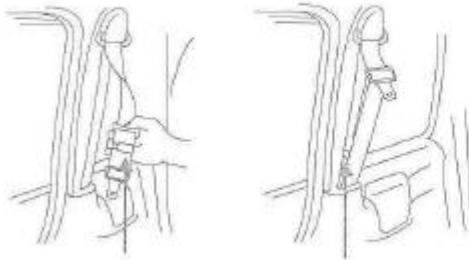
To remove the seats:

1. (For 2nd row bench seat only.) Disengage the lap/shoulder belt from the side of the seat belt detach anchors (if equipped) by inserting the seatbelt tongue or a key into the slot in the detachable anchor and lifting upward.



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Seating and safety restraints



2. (For 2nd row bench seat only.) Using the clip attached to the end of the shoulder belt(s), clip the end of the belt to the stationary portion of the shoulder belt coming out of the trim panel. The end of the shoulder belt **must** be clipped in order to keep it from striking anything during vehicle operation.

If your bench seat is equipped with the forward fold down seatback, position the seatback in the full down position to make removing the seat easier.



3. From behind the seat, pull straight back on the release controls located on each side of the seat, releasing the rear floor latches.

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Seating and safety restraints

4. Lift up the back of the seat by the release controls to clear the floor latches and then pull the seat rearward until the front hooks have come out of the floor tubes.

5. Remove the seat.

To install the seat:

1. Remove (if necessary) tub covers from the floor to expose the seat mounts.

- To remove the tub cover(s), use a screwdriver to pry the tub cover (where indicated) upward and out of the floor tub.



- To install the tub cover(s), first insert the tabs located on the opposite side of the pry location into the slots of the floor tub then press down on the other side of the cover until it snaps into place securely. (Additional tub covers can be purchased as an accessory from your dealer.)



2. Position the seat in the vehicle.

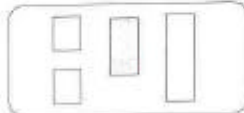
The second row bench or bucket console seat may be indexed to be positioned to either the far left or right hand side of the vehicle. (4-door vehicles only). The left side of the figure is the front of the vehicle.

Seating and safety restraints

- Indexed to far left



- Indexed to far right



The 3rd row bench seat can be placed in the 2nd row position.



3. Align seat front hooks to front tub pins, lower back of seat into the rear tubs until both release controls latch into place. Be sure that the seat is locked in place both front and back.

4. Make sure the safety belt is not twisted, then insert the seat belt tongue into detachable anchor (if equipped) until you hear a "click" and feel the latch engage.

Always latch the vehicle seat to the floor, whether the seat is occupied or empty. If not latched, the seat may cause injury during a sudden stop.

Bucket seats

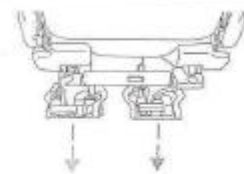
To remove the seat(s):

Position the seatback in the full down position to make removing the seat easier.

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Seating and safety restraints

1. From behind the seat, pull straight back on the release controls located on each side of the seat, releasing the rear floor latches.



2. Lift up the back of the seat by the release controls to clear the floor latches and then pull the seat rearward until the front hooks have come out of the floor tubes.

3. Remove the seat.

4. Repeat steps 1-3 for other bucket seat.

To install the seat(s):

Before installing the bucket seats, be sure that the seats are on the correct side of the vehicle. They cannot be interchanged from one side to the other. Each seat base has a bracket on the outboard side that extends into a depression on the floor to ensure proper seat location. Always be sure that the seat is positioned so that the seat belt buckle is near the center aisle of the vehicle.

1. Position the seat in the vehicle.

2. Align seat front hooks to front tub pins, lower back of seat into the rear tubs until both release controls latch into place. Be sure that the seat is locked in place both front and back.

Always latch the vehicle seat to the floor, whether the seat is occupied or empty. If not latched, the seat may cause injury during a sudden stop.

SAFETY RESTRAINTS

Personal Safety System

The Personal Safety System provides an improved overall level of frontal crash protection to front seat occupants and is designed to help further reduce the risk of air bag-related injuries. The system is able to analyze different occupant conditions and crash severity before activating the

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Seating and safety restraints

appropriate safety devices to help better protect a range of occupants in a variety of frontal crash situations.

Your vehicle's Personal Safety System consists of:

- Driver and passenger dual-stage air bag supplemental restraints.
- Front safety belts with pretensioners, energy management retractors, and safety belt usage sensors.
- Driver's seat position sensor.
- Passenger occupant classification sensor (if equipped).
- Front crash severity sensor.
- Restraints Control Module (RCM) with impact and safing sensors.
- Restraint system warning light and back-up tone.
- The electrical wiring for the air bags, crash sensor(s), safety belt pretensioners, front safety belt usage sensors, driver seat position sensor, passenger occupant classification sensor (if equipped), and indicator lights.

How does the personal safety system work?

The Personal Safety System can adapt the deployment strategy of your vehicle's safety devices according to crash severity and occupant conditions. A collection of crash and occupant sensors provides information to the Restraints Control Module (RCM). During a crash, the RCM activates the safety belt pretensioners and/or either one or both stages of the dual-stage air bag supplemental restraints based on crash severity and occupant conditions.

The fact that the pretensioners or air bags did not activate for both front seat occupants in a collision does not mean that something is wrong with the system. Rather, it means the Personal Safety System determined the accident conditions (crash severity, belt usage, etc.) were not appropriate to activate these safety devices. Front air bags and pretensioners are designed to activate only in frontal and near-frontal collisions, not rollovers, side-impacts, or rear-impacts unless the collision causes sufficient longitudinal deceleration.

Driver and passenger dual-stage air bag supplemental restraints

The dual-stage air bags offer the capability to tailor the level of air bag inflation energy. A lower, less forceful energy level is provided for more common, moderate-severity impacts. A higher energy level is used for

Seating and safety restraints

the most severe impacts. Refer to *Air bag Supplemental Restraints* section in this chapter.

Front crash severity sensor

The front crash severity sensor enhances the ability to detect the severity of an impact. Positioned up front, it provides valuable information early in the crash event on the severity of the impact. This allows your Personal Safety System to distinguish between different levels of crash severity and modify the deployment strategy of the dual-stage air bags and safety belt pretensioners.

Driver's seat position sensor

The driver's seat position sensor allows your Personal Safety System to tailor the deployment level of the driver dual-stage air bag based on seat position. The system is designed to help protect smaller drivers sitting close to the driver air bag by providing a lower air bag output level.

Passenger occupant classification sensor (OCS) (if equipped)

If your vehicle is equipped with this feature, there will be a label located under the front passenger seat which is marked "OCS". Alternatively, you may take your vehicle to any Ford or Lincoln Mercury dealer for assistance.

For air bags to do their job they must inflate with great force, and this force can pose a potentially deadly risk to occupants that are very close to the air bag when it begins to inflate. For some occupants, like infants in rear-facing child seats, this occurs because they are initially sitting very close to the air bag. For other occupants, this occurs when the occupant is not properly restrained by seat belts or child safety seats and they move forward during pre-crash braking. The most effective way to reduce the risk of unnecessary injuries is to make sure all occupants are properly restrained. Accident statistics suggest that children are much safer when properly restrained in the rear seating positions than in the front.

⚠ Air bags can kill or injure a child in a child seat. **NEVER** place a rear-facing child seat in front of an active air bag. If you must use a forward-facing child seat in the front seat, move the seat all the way back.

⚠ Always transport children 12 years old and under in the back seat and always properly use appropriate child restraints.

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Seating and safety restraints

The passenger occupant classification sensor can automatically turn off the passenger front air bag and side air bag (if equipped). The system is designed to help protect small (child size) occupants from air bag deployments when they are improperly seated or restrained in the front passenger seat contrary to proper child-seating or restraint usage recommendations. Even with this technology, parents are **STRONGLY** encouraged to always properly restrain children in the rear seat. The sensor also turns off the air bag(s) when the passenger seat is empty to prevent unnecessary replacement of the air bag(s) after a collision.

Front safety belt usage sensors

The front safety belt usage sensors detect whether or not the driver and front outboard passenger safety belts are fastened. This information allows your Personal Safety System to tailor the air bag deployment and safety belt pretensioner activation depending upon safety belt usage. Refer to *Safety Belts* section in this chapter.

Front safety belt pretensioners

The safety belt pretensioners are designed to tighten the safety belts firmly against the occupant's body during a collision. This maximizes the effectiveness of the safety belts and helps properly position the occupant relative to the air bag to improve protection. The safety belt pretensioners can be either activated alone or, if the collision is of sufficient severity, together with the air bags.

Front safety belt energy management retractors

The front safety belt energy management retractors allow webbing to be pulled out of the retractor in a gradual and controlled manner in response to the occupant's forward momentum. This helps reduce the risk of force-related injuries to the occupant's chest by limiting the load on the occupant. Refer to *Safety Belts* section in this chapter.

Determining if the Personal Safety System is operational

The Personal Safety System uses a warning light in the instrument cluster or a back-up tone to indicate the condition of the system. Refer to the *Restraints Warning Light* section in the *Instrumentation* chapter. Routine maintenance of the Personal Safety System is not required.

Seating and safety restraints

The Restraints Control Module (RCM) monitors its own internal circuits and the circuits for the air bag supplemental restraints, crash sensor(s), safety belt pretensioners, front safety belt buckle sensors, driver seat position sensor, and passenger occupant classification sensor (if equipped). In addition, the RCM also monitors the restraints warning light in the instrument cluster. A difficulty with the system is indicated by one or more of the following:

- The warning light will either flash or stay lit.
- The warning light will not illuminate immediately after ignition is turned on.
- A series of five beeps will be heard. The tone pattern will repeat periodically until the problem and warning light are repaired.

If any of these things happen, even intermittently, have the Personal Safety System serviced at your dealership or by a qualified technician immediately. Unless serviced, the system may not function properly in the event of a collision.

Safety belt precautions

⚠ Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

⚠ To reduce the risk of injury, make sure children sit where they can be properly restrained.

⚠ Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

⚠ All occupants of the vehicle, including the driver, should always properly wear their safety belts, even when an air bag SRS is provided.

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Seating and safety restraints

! It is extremely dangerous to ride in a cargo area, inside or outside of a vehicle. In a collision, people riding in these areas are more likely to be seriously injured or killed. Do not allow people to ride in any area of your vehicle that is not equipped with seats and safety belts. Be sure everyone in your vehicle is in a seat and using a safety belt properly.

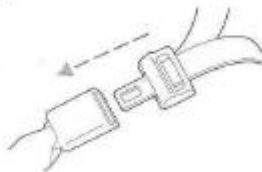
! In a rollover crash, an unbelted person is significantly more likely to die than a person wearing a seat belt.

! Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair. 1) Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. 2) Never swing the safety belt around your neck over the inside shoulder. 3) Never use a single belt for more than one person.

! Always transport children 12 years old and under in the back seat and always properly use appropriate child restraints.

Combination lap and shoulder belts

1. Insert the belt tongue into the proper buckle (the buckle closest to the direction the tongue is coming from) until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.



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Seating and safety restraints

2. To unfasten, push the release button and remove the tongue from the buckle.



The front and rear outboard safety restraints in the vehicle are combination lap and shoulder belts. The front and rear seat passenger outboard safety belts have locking cinch tongues described below.

Safety belts with locking cinch tongue

The locking cinch tongue will slide up and down the belt webbing when the belt is in the stowed position or while putting seat belts on. When the locking cinch tongue of the lap/shoulder combination seat belt is latched into the buckle, the cinch tongue will allow the lap portion to become shorter, but locks the webbing in place to restrict it from becoming longer.

Before you can reach and latch a combination lap and shoulder belt having a cinch tongue into the buckle, you may have to lengthen the lap belt portion of it.

1. To lengthen the lap belt, pull some webbing out of the shoulder belt retractor.

2. While holding the webbing below the tongue, grasp the tip (metal portion) of the tongue so that it is parallel to the webbing and slide the tongue upward.

3. Provide enough lap belt length so that the tongue can reach the buckle.



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How to fasten the cinch tongue

1. Pull the combination lap and shoulder belt from the retractor so that the shoulder belt portion of the safety belt crosses your shoulder and chest.
2. Be sure the belt is not twisted. If the belt is twisted, remove the twist.
3. Insert the belt tongue into the proper buckle for your seating position until you hear a snap and feel it latch.
4. Make sure the tongue is securely fastened to the buckle by pulling on the tongue.

! The lap belt should fit snugly and as low as possible around the hips, not across the waist.

! Front and rear seat occupants, including pregnant women, should wear safety belts for optimum protection in an accident.

! Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair. 1) Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. 2) Never swing the safety belt around your neck over the inside shoulder. 3) Never use a single belt for more than one person.

While you are fastened in the seat belt, the combination lap/shoulder belt with a cinch tongue adjusts to your movement. However, if you brake hard, turn hard, or if your vehicle receives an impact of 8 km/h (5 mph) or more, the safety belt will become locked and help reduce your forward movement.

Energy Management Feature

- This vehicle has a seat belt system with an energy management feature at the driver and front passenger seating positions and second row bench seat belt assemblies adjacent to a sliding door to help further reduce the risk of injury in the event of a head-on collision.
- This seat belt system has a retractor assembly that is designed to pay out webbing in a controlled manner. This feature is designed to help reduce the belt force acting on the occupant's chest.

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Seating and safety restraints

! Failure to replace the Belt and Retractor assembly after an accident could increase the risk of injury in a collision.

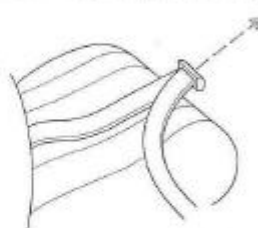
Lap belts

Adjusting the center lap belt

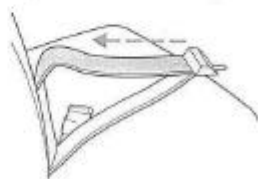
The lap belt does not adjust automatically.

! The lap belt should fit snugly and as low as possible around the hips, not across the waist.

Insert the tongue into the correct buckle (the buckle closest to the direction the tongue is coming from). To lengthen the belt, turn the tongue at a right angle to the belt and pull across your lap until it reaches the buckle. To tighten the belt, pull the loose end of the belt through the tongue until it fits snugly across the hips.



Shorten and fasten the belt when not in use.



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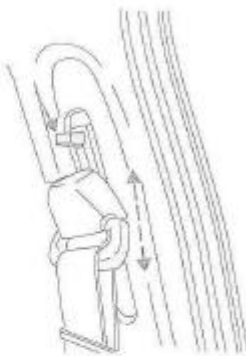
Seating and safety restraints

Safety belt height adjustment

Your vehicle has safety belt height adjustments for the driver, front passenger and second row passengers. Adjust the height of the shoulder belt so the belt rests across the middle of your shoulder.

To lower the shoulder belt height, push the button and slide the height adjuster down. To raise the height of the shoulder belt, push the button and slide the height adjuster up. Pull down on the height adjuster to make sure it is locked in place.

! Position the shoulder belt height adjuster so that the belt rests across the middle of your shoulder. Failure to adjust the safety belt properly could reduce the effectiveness of the seat belt and increase the risk of injury in a collision.



Safety belt extension assembly

If the safety belt assembly is too short for you, even when fully extended, 20 cm (8 inches) can be added to the safety belt assembly by adding a safety belt extension assembly (part number 611C32). Safety belt extension assemblies can be obtained from your dealer at no cost.

Use only extensions manufactured by the same supplier as the safety belt. Manufacturer identification is located at the end of the webbing on the label. Also, use the safety belt extension only if the safety belt is too short for you when fully extended. Do not use extensions to change the fit of the shoulder belt across the torso.

Safety belt warning light and indicator chime

The seat belt warning light illuminates in the instrument cluster and a chime sounds to remind the occupants to fasten their safety belts.

Seating and safety restraints

Conditions of operation

If...	Then...
The driver's safety belt is not buckled before the ignition switch is turned to the ON position...	The safety belt warning light illuminates 1-2 minutes and the warning chime sounds 4-8 seconds.
The driver's safety belt is buckled while the indicator light is illuminated and the warning chime is sounding...	The safety belt warning light and warning chime turn off.
The driver's safety belt is buckled before the ignition switch is turned to the ON position...	The safety belt warning light and indicator chime remain off.

Belt minder

The Belt Minder feature is a supplemental warning to the safety belt warning function. This feature provides additional reminders to the driver that the driver's safety belt is unbuckled by intermittently sounding a chime and illuminating the safety belt warning lamp in the instrument cluster.

If...	Then...
The driver's safety belt is not buckled before the vehicle has reached at least 5 km/h (3 mph) and 1-2 minutes have elapsed since the ignition switch has been turned to ON...	The Belt Minder feature is activated - the safety belt warning light illuminates and the warning chime sounds for 6 seconds every 30 seconds, repeating for approximately 5 minutes or until safety belt is buckled.
The driver's safety belt is buckled while the safety belt indicator light is illuminated and the safety belt warning chime is sounding...	The Belt Minder feature will not activate.
The driver's safety belt is buckled before the ignition switch is turned to the ON position...	The Belt Minder feature will not activate.

The purpose of the Belt Minder is to remind occasional wearers to wear safety belts all of the time.

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Seating and safety restraints

The following are reasons most often given for not wearing safety belts: (All statistics based on U.S. data)

Reasons given...	Consider...
"Crashes are rare events"	36 700 crashes occur every day. The more we drive, the more we are exposed to "rare" events, even for good drivers. <i>1 in 4 of us will be seriously injured in a crash during our lifetime.</i>
"I'm not going far"	3 of 4 fatal crashes occur within 25 miles of home.
"Belts are uncomfortable"	Ford designs its safety belts to enhance comfort. If you are uncomfortable - try different positions for the safety belt upper anchorage and seatback which should be as upright as possible; this can improve comfort.
"I was in a hurry"	Prime time for an accident. Belt Minder reminds us to take a few seconds to buckle up.
"Seat belts don't work"	Safety belts, when used properly, reduce risk of death to front seat occupants by 45% in cars, and by 60% in light trucks.
"Traffic is light"	Nearly 1 of 2 deaths occur in single-vehicle crashes, many when no other vehicles are around.
"Belts wrinkle my clothes"	Possibly, but a serious crash can do much more than wrinkle your clothes, particularly if you are unbelted.
"The people I'm with don't wear belts"	Set the example, teen deaths occur 4 times more often in vehicles with TWO or MORE people. Children and younger brothers/sisters imitate behavior they see.
"I have an air bag"	Air bags offer greater protection when used with safety belts. Frontal airbags are not designed to inflate in rear and side crashes or rollovers.
"I'd rather be thrown clear"	Not a good idea. People who are ejected are 40 times more likely to DIE. Safety belts help prevent ejection. WE CAN'T "PICK OUR CRASH"

! Do not sit on top of a buckled safety belt to avoid the Belt Minder chime. Sitting on the safety belt will increase the risk of injury in an accident. To disable (one-time) or deactivate the Belt Minder feature please follow the directions stated below.

Seating and safety restraints

One time disable

Anytime the safety belt is buckled and then unbuckled during an ignition ON cycle, Belt Minder will be disabled for that ignition cycle only.

Deactivating/activating the belt minder feature

Read steps 1 - 9 thoroughly before proceeding with the deactivation/activation programming procedure.

The Belt Minder feature can be deactivated/activated by performing the following procedure:

Before following the procedure, make sure that:

- the parking brake is set
- the gearshift is in P (Park) (automatic transmission).
- the ignition switch is in the OFF position
- all vehicle doors are closed
- the driver's safety belt is unbuckled
- the parklamps/headlamps are in OFF position (If vehicle is equipped with Autolamps, this will not affect the procedure.)

! To reduce the risk of injury, do not deactivate/activate the Belt Minder feature while driving the vehicle.

- Turn the ignition switch to the RUN (or ON) position. (DO NOT START THE ENGINE)
- Wait until the safety belt warning light turns off. (Approximately 1 minute)
- Steps 3-5 must be completed within 60 seconds or the procedure will have to be repeated.
- Buckle then unbuckle the safety belt three times, ending with the safety belt unbuckled. This can be done before or during Belt Minder warning activation.
- Turn on the parklamps/headlamps, turn off the parklamps/headlamps.
- Buckle then unbuckle the safety belt three times, ending with the safety belt unbuckled.
- After step 5 the safety belt warning light will be turned on for three seconds.

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Seating and safety restraints

6. Within seven seconds of the safety belt warning light turning off, buckle then unbuckle the safety belt.
- This will disable Belt Minder if it is currently enabled, or enable Belt Minder if it is currently disabled.
7. Confirmation of disabling Belt Minder is provided by flashing the safety belt warning light four times per second for three seconds.
8. Confirmation of enabling Belt Minder is provided by flashing the safety belt warning light four times per second for three seconds, followed by three seconds with the safety belt warning light off, then followed by flashing the safety belt warning light four times per second for three seconds again.
9. After receiving confirmation, the deactivation/activation procedure is complete.

Safety belt maintenance

Inspect the safety belt systems periodically to make sure they work properly and are not damaged. Inspect the safety belts to make sure there are no nicks, wears or cuts, replacing if necessary. All safety belt assemblies, including retractors, buckles, front seat belt buckle assemblies, buckle support assemblies (slide bar-if equipped), shoulder belt height adjusters (if equipped), child safety seat tether bracket assemblies (if equipped), and attaching hardware, should be inspected after a collision. Ford recommends that all safety belt assemblies used in vehicles involved in a collision be replaced. However, if the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly, they do not need to be replaced, except as described in the *Replacing the front passenger and second row bench seat belt assemblies after a collision* section of this chapter. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

! Failure to inspect and if necessary replace the safety belt assembly under the above conditions could result in severe personal injuries in the event of a collision.

Refer to *Cleaning and maintaining the safety belts* in the *Maintenance and care* section.

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Seating and safety restraints

Replacing the front passenger and second row bench seat belt assemblies after a collision

All front passenger and second row bench seat belt assemblies adjacent to a sliding door have special energy management retractors designed to further reduce the risk of injury in the event of a head-on collision. These retractors should be replaced if they were used in any accident in which the front airbags deploy. If the safety belt assemblies are not replaced, there may be increased risk of injury in the event of a subsequent collision.

! Failure to inspect and if necessary replace the safety belt assembly under the above conditions could result in severe personal injuries in the event of a collision.

AIR BAG SUPPLEMENTAL RESTRAINT SYSTEM



Your vehicle is equipped with a crash sensing and diagnostic module which records information about the air bag and sensor systems. In the event of a collision this module may save information related to the collision including information about the air bag system and impact severity. This information will assist Ford in the servicing of your vehicle and may help Ford better understand real world collisions and further improve the safety of future vehicles.

The air bag supplemental restraint system is designed to work in conjunction with the safety belts to help protect the driver and front outboard passenger from certain upper body injuries. The term "supplemental restraint" means the air bags are intended as a supplement to the safety belts. Air bags alone cannot protect as well as

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Seating and safety restraints

air bags plus safety belts in impacts for which the air bags are designed to deploy, and air bags do not offer any protection in crashes for which they do not deploy.

Important supplemental restraint system (SRS) precautions

The supplemental restraint system is designed to work with the safety belt to help protect the driver and right front passenger from certain upper body injuries.

Air bags DO NOT inflate slowly or gently and the risk of injury from a deploying air bag is greatest close to the trim covering the air bag module.



! All occupants of the vehicle, including the driver, should always properly wear their safety belts, even when an air bag SRS is provided.

! Always transport children 12 years old and under in the back seat and always properly use appropriate child restraints.

! National Highway Traffic Safety Administration (NHTSA) recommends a minimum distance of at least 25 cm (10 inches) between an occupant's chest and the driver air bag module.

! Never place your arm over the air bag module as a deploying air bag can result in serious arm fractures or other injuries.

Steps you can take to properly position yourself away from the air bag:

- Move your seat to the rear as far as you can while still reaching the pedals comfortably.
- Recline the seat slightly (one or two degrees) from the upright position.

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Seating and safety restraints

! Do not put anything on or over the air bag module. Placing objects on or over the air bag inflation area may cause those objects to be propelled by the air bag into your face and torso causing serious injury.

! Do not attempt to service, repair, or modify the Air Bag Supplemental Restraint System or its fuses. See your Ford or Lincoln Mercury dealer.

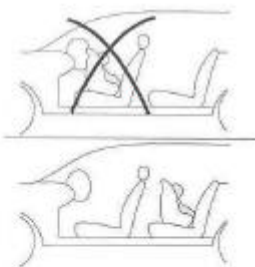
! Modifications to the front end of the vehicle, including frame, bumper, front end body structure and tow hooks may affect the performance of the air bag sensors increasing the risk of injury. Do not modify the front end of the vehicle.

Children and air bags

For additional important safety information, read all information on safety restraints in this guide.

Children must always be properly restrained. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in the front seating position. Failure to follow these instructions may increase the risk of injury in a collision.

! Air bags can kill or injure a child in a child seat. NEVER place a rear-facing child seat in front of an active air bag. If you must use a forward-facing child seat in the front seat, move the seat all the way back.



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Seating and safety restraints

Determining if the system is operational

The supplemental restraint system uses a warning indicator in the instrument cluster or a back-up tone to indicate the condition of the system. Refer to the *Restraints Warning Indicator* section in the *Instrumentation* chapter. Routine maintenance of the air bag is not required.

A difficulty with the system is indicated by one or more of the following:

- The readiness light (same light for front and side air bag system) will either flash or stay lit.
- The readiness light will not illuminate immediately after ignition is turned on.
- A series of five beeps will be heard. The tone pattern will repeat periodically until the problem and/or light are repaired.

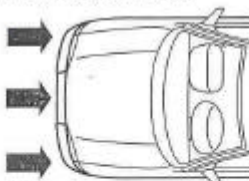


If any of these things happen, even intermittently, have the supplemental restraint system serviced at your dealership or by a qualified technician immediately. Unless serviced, the system may not function properly in the event of a collision.

How does the air bag supplemental restraint system work?

The air bag SRS is designed to activate when the vehicle sustains longitudinal deceleration sufficient to cause the sensors to close an electrical circuit that initiates air bag inflation.

The fact that the air bags did not inflate in a collision does not mean that something is wrong with the system. Rather, it means the forces were not of the type sufficient to cause activation. Front air bags are designed to inflate in frontal and near-frontal collisions, not rollover, side-impact, or rear-impacts unless the collision causes sufficient longitudinal deceleration.



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Seating and safety restraints

The air bags inflate and deflate rapidly upon activation. After air bag deployment, it is normal to notice a smoke-like, powdery residue or smell the burnt propellant. This may consist of cornstarch, talcum powder (to lubricate the bag) or sodium compounds (e.g., baking soda) that result from the combustion process that inflates the air bag. Small amounts of sodium hydroxide may be present which may irritate the skin and eyes, but none of the residue is toxic.



While the system is designed to help reduce serious injuries, contact with a deploying air bag may also cause abrasions, swelling or temporary hearing loss. Because air bags must inflate rapidly and with considerable force, there is the risk of death or serious injuries such as fractures, facial and eye injuries or internal injuries, particularly to occupants who are not properly restrained or are otherwise out of position at the time of air bag deployment. Thus, it is extremely important that occupants be properly restrained as far away from the air bag module as possible while maintaining vehicle control.

Several air bag system components get hot after inflation. Do not touch them after inflation.

If the air bag has deployed, the air bag will not function again and must be replaced immediately. If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

The SRS consists of:

- driver and passenger air bag modules (which include the inflators and air bags).
- side air bags (if equipped). Refer to *Side air bag system* later in this chapter.
- one or more impact and safing sensors.

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Seating and safety restraints

- a readiness light and tone.
- diagnostic module.
- and the electrical wiring which connects the components.

The diagnostic module monitors its own internal circuits and the supplemental air bag electrical system warning (including the impact sensors), the system wiring, the air bag system readiness light, the air bag back up power and the air bag igniters.

Side air bag system (if equipped)

Do not place objects or mount equipment on or near the air bag cover on the side of the seatbacks of the front seats or in front seat areas that may come into contact with a deploying air bag. Failure to follow these instructions may increase the risk of personal injury in the event of a collision.

Do not use accessory seat covers. The use of accessory seat covers may prevent the deployment of the side air bags and increase the risk of injury in an accident.

Do not lean your head on the door. The side air bag could injure you as it deploys from the side of the seatback.

Do not attempt to service, repair, or modify the air bag Supplemental Restraint System, its fuses or the seat cover on a seat containing an air bag. See your Ford or Lincoln Mercury dealer.

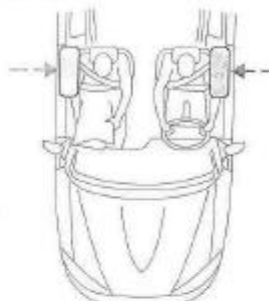
All occupants of the vehicle including the driver should always wear their safety belts even when an air bag SRS is provided.

Seating and safety restraints

How does the side air bag system work?

The side air bag system consists of the following:

- An inflatable nylon bag (air bag) with a gas generator concealed behind the outboard bolster of the driver and front passenger seatbacks.
- A special seat cover designed to allow airbag deployment.
- The same warning light, electronic control and diagnostic unit as used for the front air bags.
- Two crash sensors located under the outboard side of the front seats, attached to the floor.



Side air bags, in combination with seat belts, can help reduce the risk of severe injuries in the event of a significant side impact collision.

The side air bags are fitted on the outboard side of the seatbacks of the front seats. In certain lateral collisions, the air bag on the side affected by the collision will be inflated, even if the respective seat is not occupied. The air bag was designed to inflate between the door panel and occupant to further enhance the protection provided occupants in side impact collisions.

The air bag SRS is designed to activate when the vehicle sustains lateral deceleration sufficient to cause the sensors to close an electrical circuit that initiates air bag inflation.

The fact that the air bags did not inflate in a collision does not mean that something is wrong with the system. Rather, it means the forces were not of the type sufficient to cause activation. Side air bags are designed to inflate in side-impact collisions, not roll-over, rear-impact, frontal or near-frontal collisions, unless the collision causes sufficient lateral deceleration.

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⚠ Several air bag system components get hot after inflation. Do not touch them after inflation.

⚠ If the side air bag has deployed, the air bag will not function again. The side air bag system (including the seat) must be inspected and serviced by a qualified technician in accordance with the vehicle service manual. If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.



Disposal of air bags and air bag equipped vehicles (including pretensioners)

For disposal of air bags or air bag equipped vehicles, see your local dealership or qualified technician. Air bags **MUST BE** disposed of by qualified personnel.

SAFETY RESTRAINTS FOR CHILDREN

See the following sections for directions on how to properly use safety restraints for children. Also see *Air Bag Supplemental Restraint System (SRS)* in this chapter for special instructions about using air bags.

Important child restraint precautions

You are required by law to use safety restraints for children in the U.S. and Canada. If small children ride in your vehicle (generally children who are four years old or younger and who weigh 18 kg [40 lbs] or less), you must put them in safety seats made especially for children. Check your local and state or provincial laws for specific requirements regarding the safety of children in your vehicle.

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Seating and safety restraints

⚠ Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Always follow the instructions and warnings that come with any infant or child restraint you might use.

When possible, always place children under age 12 in the rear seat of your vehicle. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in the front seating position.

Children and safety belts

If the child is the proper size, restrain the child in a safety seat.

Children who are too large for child safety seats (as specified by your child safety seat manufacturer) should always wear safety belts.

Follow all the important safety restraint and air bag precautions that apply to adult passengers in your vehicle.

If the shoulder belt portion of a combination lap and shoulder belt can be positioned so it does not cross or rest in front of the child's face or neck, the child should wear the lap and shoulder belt. Moving the child closer to the center of the vehicle may help provide a good shoulder belt fit.

⚠ Do not leave children, unreliable adults, or pets unattended in your vehicle.

To improve the fit of lap and shoulder belts on children who have outgrown child safety seats, Ford recommends use of a belt-positioning booster seat that is labelled as conforming to all applicable Federal motor vehicle safety standards. Belt-positioning booster seats raise the child and provide a shorter, firmer seating cushion that encourages safer seating posture and better fit of lap and shoulder belts on the child.

A belt-positioning booster should be used if the shoulder belt rests in front of the child's face or neck, or if the lap belt does not fit snugly on both thighs, or if the thighs are too short to let the child sit all the way back on the seat cushion when the lower legs hang over the edge of the seat cushion. You may wish to discuss the special needs of your child with your pediatrician.

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Seating and safety restraints

SAFETY SEATS FOR CHILDREN



Child and infant or child safety seats

Use a safety seat that is recommended for the size and weight of the child. Carefully follow all of the manufacturer's instructions with the safety seat you put in your vehicle. If you do not install and use the safety seat properly, the child may be injured in a sudden stop or collision.

When installing a child safety seat:

- Review and follow the information presented in the *Air Bag Supplemental Restraint System* section in this chapter.
- Use the correct safety belt buckle for that seating position.
- Insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.
- Keep the buckle release button pointing up and away from the safety seat, with the tongue between the child seat and the release button, to prevent accidental unbuckling.
- Place seat back in upright position.



Ford recommends the use of a child safety seat having a top tether strap. Install the child safety seat in a seating position which is capable of providing a tether anchorage. For more information on top tether straps, refer to *Attaching safety seats with tether straps*.

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Seating and safety restraints

⚠ Carefully follow all of the manufacturer's instructions included with the safety seat you put in your vehicle. If you do not install and use the safety seat properly, the child may be injured in a sudden stop or collision.

Installing child safety seats in cinch tongue combination lap and shoulder belt seating positions

The belt webbing below the tongue is the lap portion of the combination lap/shoulder belt, and the belt webbing above the tongue is the shoulder belt portion of the combination lap/shoulder belt.

1. Position the child safety seat in a seat with a combination lap and shoulder belt.



⚠ Air bags can kill or injure a child in a child seat. If you must use a forward-facing child seat in the front seat, move seat all the way back.

⚠ Rear-facing seats should **NEVER** be placed in the front seat.

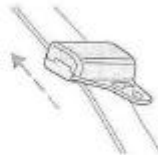
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Seating and safety restraints

2. Grasp the belt webbing below the tongue and pull as much of the belt out of the retractor as possible. Hold the belt out.



3. With your other hand, grasp the tip (metal portion) of the tongue (not the cover) and slide the tongue up the webbing as far as it will go. Release the tongue, but do not let go of the lap portion of the belt webbing.



4. While holding the shoulder and lap portions together, route the tongue and webbing through the child seat according to the child seat manufacturer's instructions. Be sure that the belt webbing is not twisted.



5. Insert the belt tongue into the proper buckle for that seating position until you hear a snap and feel it latch. Make sure the tongue is securely latched to the buckle by pulling on the tongue.



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6. While pushing down with your knee on the child seat pull up on the shoulder belt portion to tighten the lap belt portion of the combination lap and shoulder belt.



7. Allow the safety belt to retract and remove any slack in the belt to securely tighten the child safety seat in the vehicle.



8. Before placing the child into the child seat, forcibly tilt the child seat forward and back to make sure that the seat is held securely in place.

9. Check from time to time to be sure that there is no slack in the lap/shoulder belt. The shoulder belt must be snug to keep the lap belt tight during a collision.

Installing child safety seats in the lap belt seating positions

1. Lengthen the lap belt. To lengthen the belt, hold the tongue so that its bottom is perpendicular to the direction of webbing while sliding the tongue up the webbing.
2. Place the child safety seat in the center seating position.
3. Route the tongue and webbing through the child seat according to the child seat manufacturer's instructions.
4. Insert the belt tongue into the proper buckle for the center seating position until you hear a snap and feel it latch. Make sure the tongue is securely fastened to the buckle by pulling on tongue.

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Seating and safety restraints

5. Push down on the child seat while pulling on the loose end of the lap belt webbing to tighten the belt.

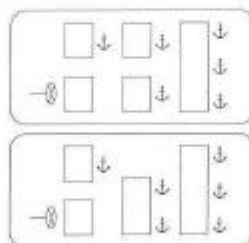
6. Before placing the child into the child seat, forcibly tilt the child seat from side to side and in forward direction to make sure that the seat is held securely in place. If the child seat moves excessively, repeat steps 5 through 6, or properly install the child seat in a different position.

Some manufacturers make safety seats that include a tether strap that goes over the back of the vehicle seat and attaches to an anchoring point. Other manufacturers offer the tether strap as an accessory. Contact the manufacturer of your child safety seat for information about ordering a tether strap.

Tether anchorage hardware

Children should be placed in the rear in an appropriate child safety seat that is properly secured to the vehicle.

Tether strap anchorage locations have been provided in your vehicle. The left side of the figure is the front of the vehicle.



The tether can be attached directly to the rear of all passenger seating except the front passenger seat equipped with power adjustment. The front passenger seat with manual adjustment does have a tether anchor.

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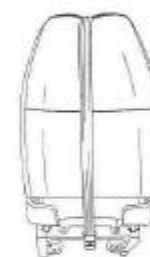
Seating and safety restraints

Front passenger seating position (manual adjusting seats only)

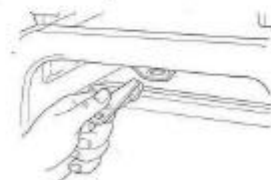
1. Position the child safety seat on the passenger seat cushion.



2. Route the child safety seat tether strap over the back of the seat.



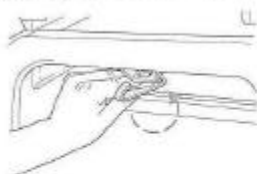
3. Grasp the tether strap and position it to the seat frame.



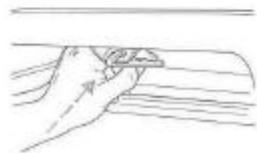
161

Seating and safety restraints

4. Rotate the tether strap.



5. Clip the tether strap to the seat frame.



If the tether strap is clipped incorrectly (as shown) the child safety seat may not be retained properly in the event of a collision.



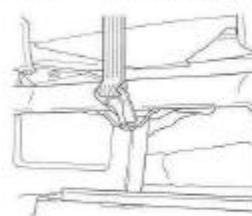
6. Rotate the tether strap clip.

7. Refer to the instructions in this section under *installing child safety seats in which tongue combination lap and shoulder belt seating positions* to secure the child safety seat.



Seating and safety restraints

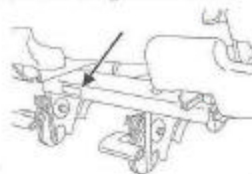
8. Tighten the child safety seat tether strap according to the manufacturer's instructions.



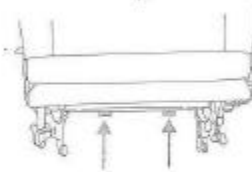
Rear seating positions

Follow steps 1-8 as described above for the following available seats:

- 2nd row bucket

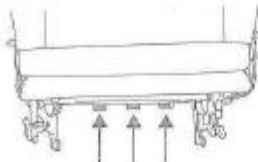


- 2nd row bench



Seating and safety restraints

- 3rd row bench



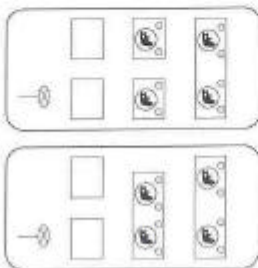
For additional important safety information on the proper use of seatbelts, child seats and infant seats, please read the entire *Seating and safety restraints* chapter in this owner's guide.

Attaching child safety seats with LATCH attachments for child seat anchors

Some child safety seats are labeled as LATCH or LATCH-compatible child seats. These seats include two rigid or webbing mounted attachments that connect to two anchors at specific seating positions in your vehicle. This type of child seat eliminates the need to use seat belts to attach the child seat. For forward-facing child seats, the tether strap must also be attached to the proper tether anchor point. For information on using tether straps with the child safety seats, refer to *Attaching safety seats with tether straps* in this chapter.

LATCH anchors for child seat installation have been provided in your vehicle at the following locations:

The anchors at the center of the rear seat are further apart than the sets of lower anchors for child seat installation at other seating positions. A child seat with rigid LATCH attachments cannot be installed at this seating position. LATCH compatible child seat (with attachments on belt webbing) can be used at this seating position. Do not attach a child seat to any lower anchor if an adjacent child seat is attached to that anchor.

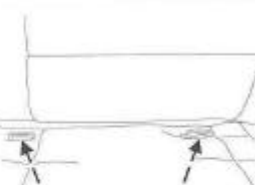


Seating and safety restraints

! Do not attach a child seat to any lower anchors used for child seat installation if an adjacent child seat is attached to that anchor. In a crash, one anchor may not be strong enough to hold two child seat attachments and may break, causing serious injury or death.

The lower anchors for child seat installation are located at the rear section of the rear seat between the cushion and seat back.

Follow the child seat manufacturer's instructions to properly install safety seats with LATCH lower anchors and LATCH-compatible attachments.



! Attach the lower anchors for child seat installation or lower anchors for child seat installation-compatible child seat only to the appropriate locations shown.

If you install a child seat with rigid LATCH attachments, do not tighten the tether strap enough to lift the child seat off the seat when the child is seated in it. Keep the tether strap just snug without raising the front of the child seat. Keeping the child seat just touching the front of the vehicle seat gives the best protection in a severe crash. Once you have installed the lower anchors for child seat installation safety seat, assure that the seat is properly attached to the lower anchors for child seat installation and tether anchors. Also, test the safety seat before you place the child in it. Tilt the seat from side to side. Also try to tug the seat forward. Check to see if the anchors hold the seat in place.

! If the safety seat is not anchored properly, the risk of a child being injured in a collision greatly increases.

APPENDIX F

CHILD SEAT

POST-TEST OBSERVATIONS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

	Left Rear Passenger	Right Rear Passenger
Child Seat	Cosco Triad - secured with belt	Cosco Triad - secured with latch
Child Seat Mass (kg)	4.5	4.5
Belt Fraying	none	none
Stress Marks	none	none
Cracks	none	none
Buckle Stress	no marks	no marks
Latch Hooks	no marks	no marks
Contact	feet to seatback	feet to seatback

HYBRID III 3 YEAR OLD ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Left Rear Passenger				Right Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	31.0	240	-35.7	116	38.5	233	-44.6	112
Head CG	Y	G's	5.0	241	-16.8	116	6.9	114	-13.0	112
Head CG	Z	G's	61.7	92	-6.2	40	60.9	92	-7.7	39
Head CG Resultant	N/A	G's	65.1	92			64.6	92		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Left Rear Passenger				Right Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	10.9	234	-37.4	93	5.0	249	-34.1	97
Chest CG	Y	G's	3.6	99	-5.2	81	6.8	99	-2.7	235
Chest CG	Z	G's	16.0	99	-23.7	70	17.9	101	-17.5	73
Chest CG Resultant	N/A	G's	39.2	98			37.7	98		

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Left Rear Passenger				Right Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Tether	N/A	Newtons	1011	79			862	100		

HEAD INJURY CRITERIA (HIC)

Location	Left Rear Passenger				Right Rear Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Primary (36 msec)	660	50.7	80.9	116.9	717	52.4	79.4	115.4
Head CG Primary (15 msec)	422	60.2	84.8	99.8	409	59.5	84.7	99.7

CHEST CLIP (3 MSEC)

Location	Left Rear Passenger			Right Rear Passenger		
	Clip	T ¹	T ²	Clip	T ¹	T ²
Chest CG Primary	38.1	93.0	96.1	37.3	96.5	99.6

HYBRID III 3 YEAR OLD ATD INJURY CRITERIA AND SENSOR DATA...(continued)

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Left Rear Passenger				Right Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	7.5	163	-44.7	84	8.6	161	-32.1	89
Pelvis	Y	G's	5.8	109	-8.8	70	5.1	81	-3.7	127
Pelvis	Z	G's	9.0	240	-24.2	68	9.1	238	-22.7	72

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Left Rear Passenger				Right Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	48	22	-633	115	21	23	-619	121
Neck Force	Y	Newtons	52	62	-88	90	82	75	-39	167
Neck Force	Z	Newtons	1835	97	-261	52	1593	95	-211	38
Neck Moment	X	N*m	4.3	98	-6.2	137	4.8	78	-3.2	172
Neck Moment	Y	N*m	8.2	95	-11.9	72	7.5	97	-13.6	73
Neck Moment	Z	N*m	1.7	128	-2.8	243	1.5	104	-1.7	185

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Left Rear Passenger				Right Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	299	238	-1161	97	256	233	-934	97
Neck Force	Y	Newtons	39	236	-253	90	59	70	-47	120
Neck Force	Z	Newtons	1103	94	-237	61	1148	89	-268	38
Neck Moment	X	N*m	13.9	101	-7.1	75	15.0	82	-6.0	170
Neck Moment	Y	N*m	16.4	238	114.1	99	16.1	233	-98.5	100
Neck Moment	Z	N*m	**	**	**	**	6.3	106	-3.3	172

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Left Rear Passenger		Right Rear Passenger	
			Min	Time	Min	Time
Chest CG	X	mm	-12.0	120	-12.9	121

** No valid data collected

DUMMY DIMENSIONS

Test Vehicle: 2001/Ford/Windstar SE

NHTSA No.: M10212

Test Program: 35 mph Frontal Barrier Impact

Test Date: April 18, 2001

Measurement Description	Left Rear Passenger	Right Rear Passenger
	Length (mm)	Length (mm)
Head to Roof (Z)	425	432
Head to Seatback (X)	726	775
Chest to Door (Y)	568	460
Left Foot to Seatback	185	2235
Right Foot to Seatback	187	233

CHILD SEAT PHOTOGRAPHS

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Photo 2 - Post-Test LRS 3 Year Old Left Side View



Photo 3 - Pre-Test LRS 3 Year Old Left Side View (Door Open)



Photo 4 - Post-Test LRS 3 Year Old Left Side View (Door Open)



Photo 5 - Post-Test LRS 3 Year Old Feet Contact View



Photo 6 - Post-Test LRS Child Seat View



Photo 7 - Pre-Test RRS 3 Year Old Right Side View



Photo 8 - Post-Test RRS 3 Year Old Right Side View



Photo 9 - Pre-Test RRS 3 Year Old Right Side View (Door Open)



Photo 10 - Post-Test RRS 3 Year Old Right Side View (Door Open)



Photo 11 - Post-Test RRS 3 Year Old Feet Contact View



Photo 12 - Post-Test RRS Child Seat View



Photo 13 - Pre-Test LRS 3 Year Old Tether View



Photo 14 - Post-Test LRS 3 Year Old Tether View



Photo 15 - Pre-Test RRS 3 Year Old Tether View



Photo 16 - Post-Test RRS 3 Year Old Tether View

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* No Valid Data Collected

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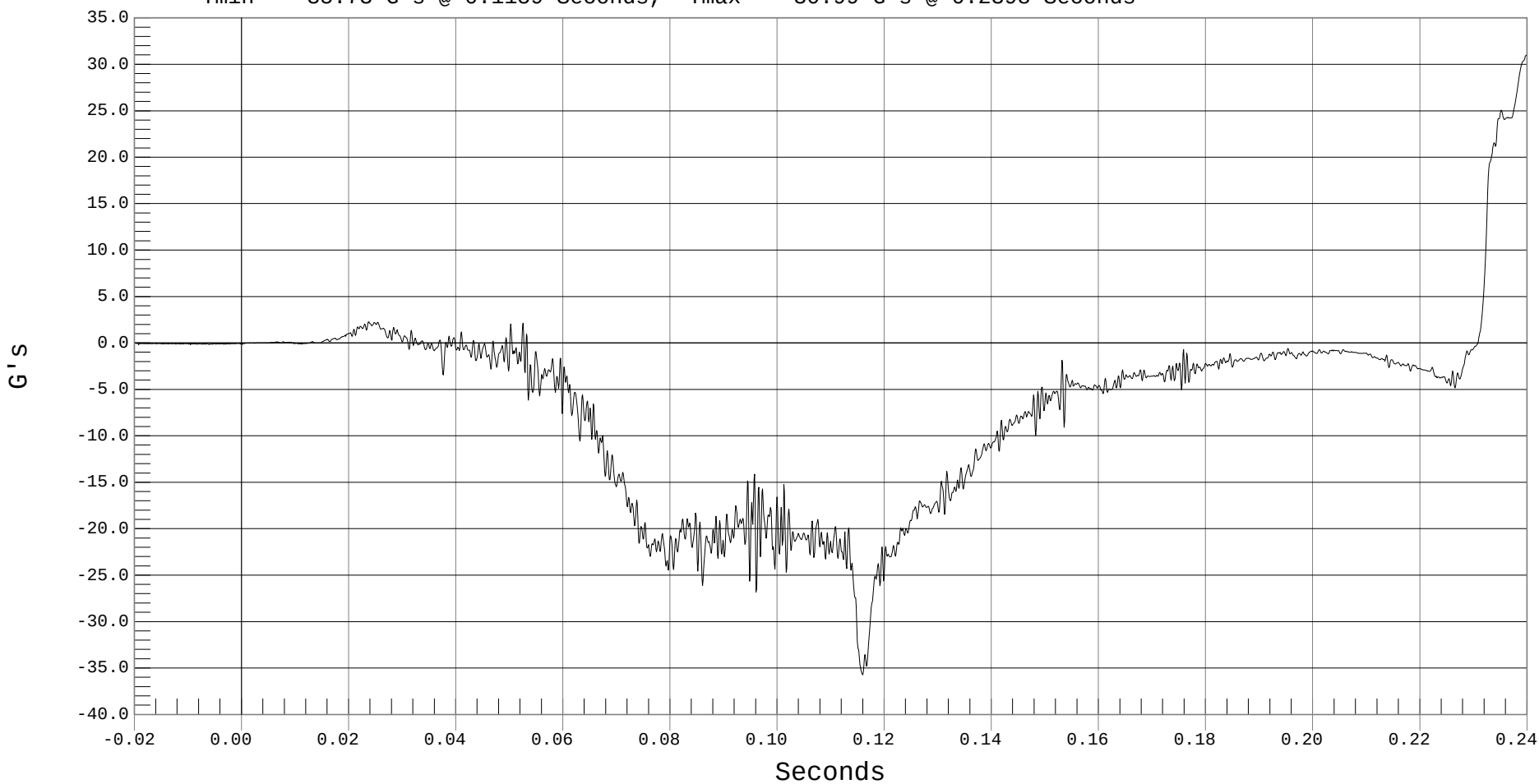
LRS 3 YR OLD HEAD X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD HEAD X, B01043AT.A13

Ymin = -35.73 G's @ 0.1159 Seconds, Ymax = 30.99 G's @ 0.2398 Seconds





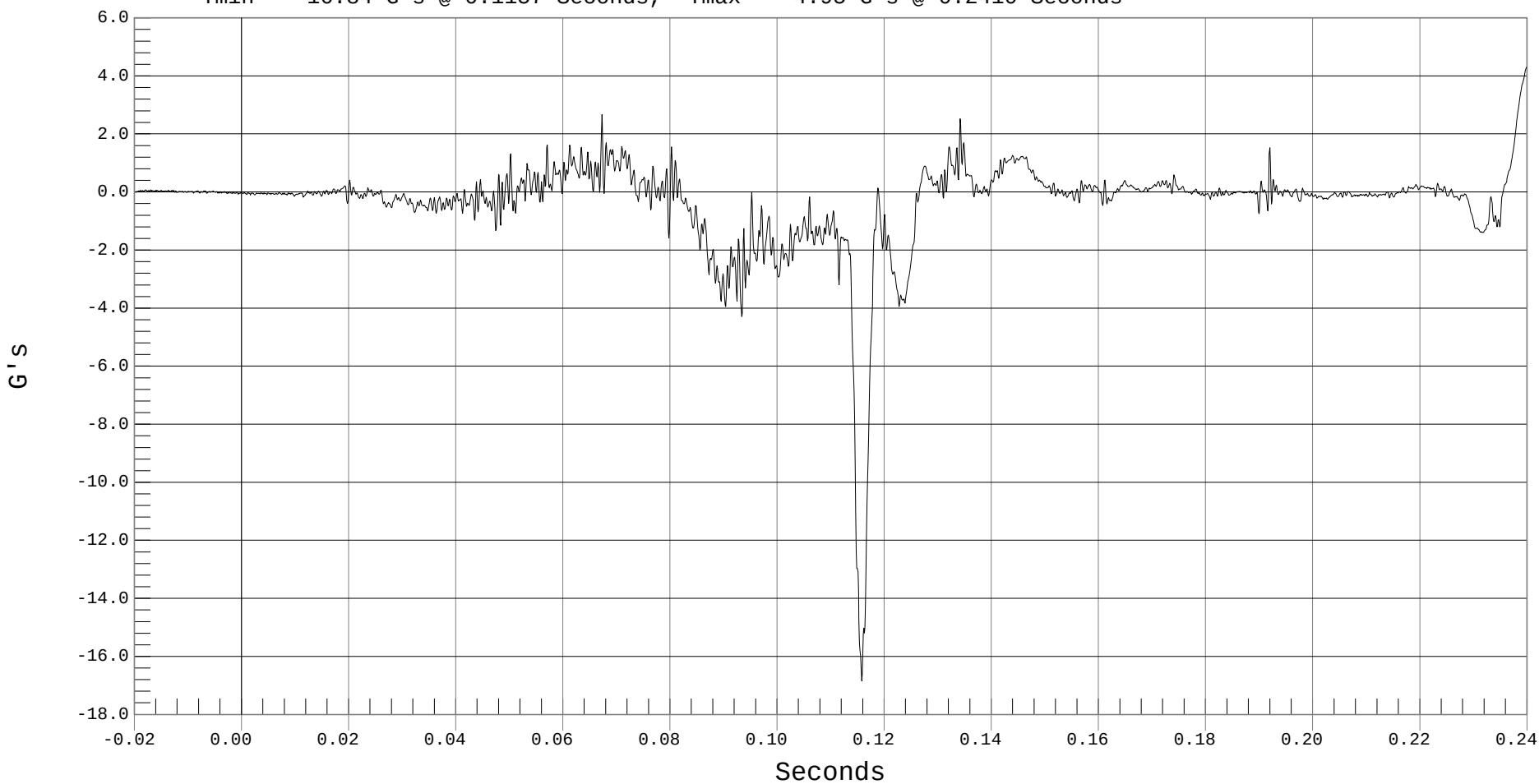
LRS 3 YR OLD HEAD Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD HEAD Y, B01043AT.A14

Ymin = -16.84 G's @ 0.1157 Seconds, Ymax = 4.95 G's @ 0.2410 Seconds





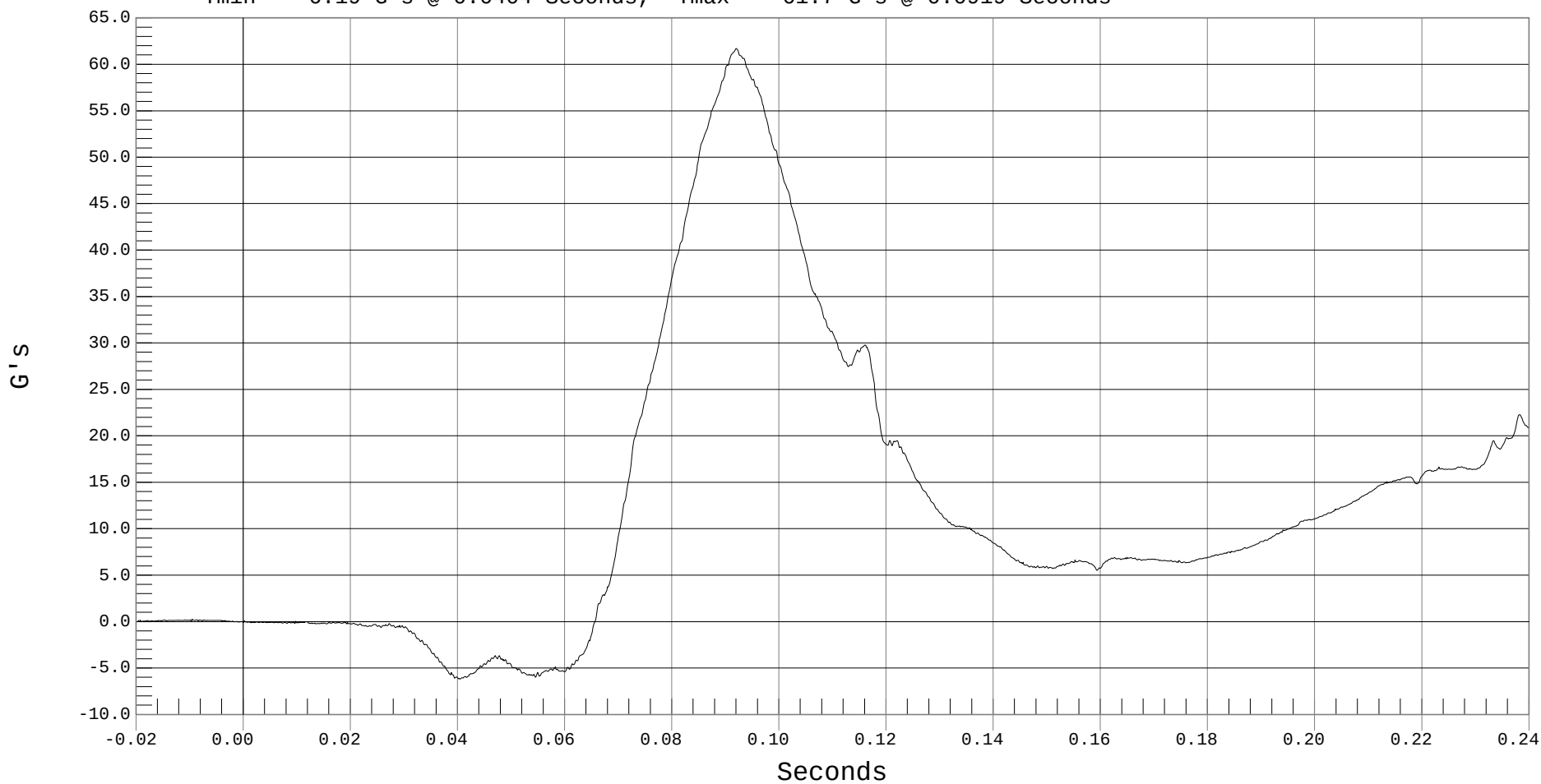
LRS 3 YR OLD HEAD Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD HEAD Z, B01043AT.A15

Ymin = -6.19 G's @ 0.0404 Seconds, Ymax = 61.7 G's @ 0.0919 Seconds





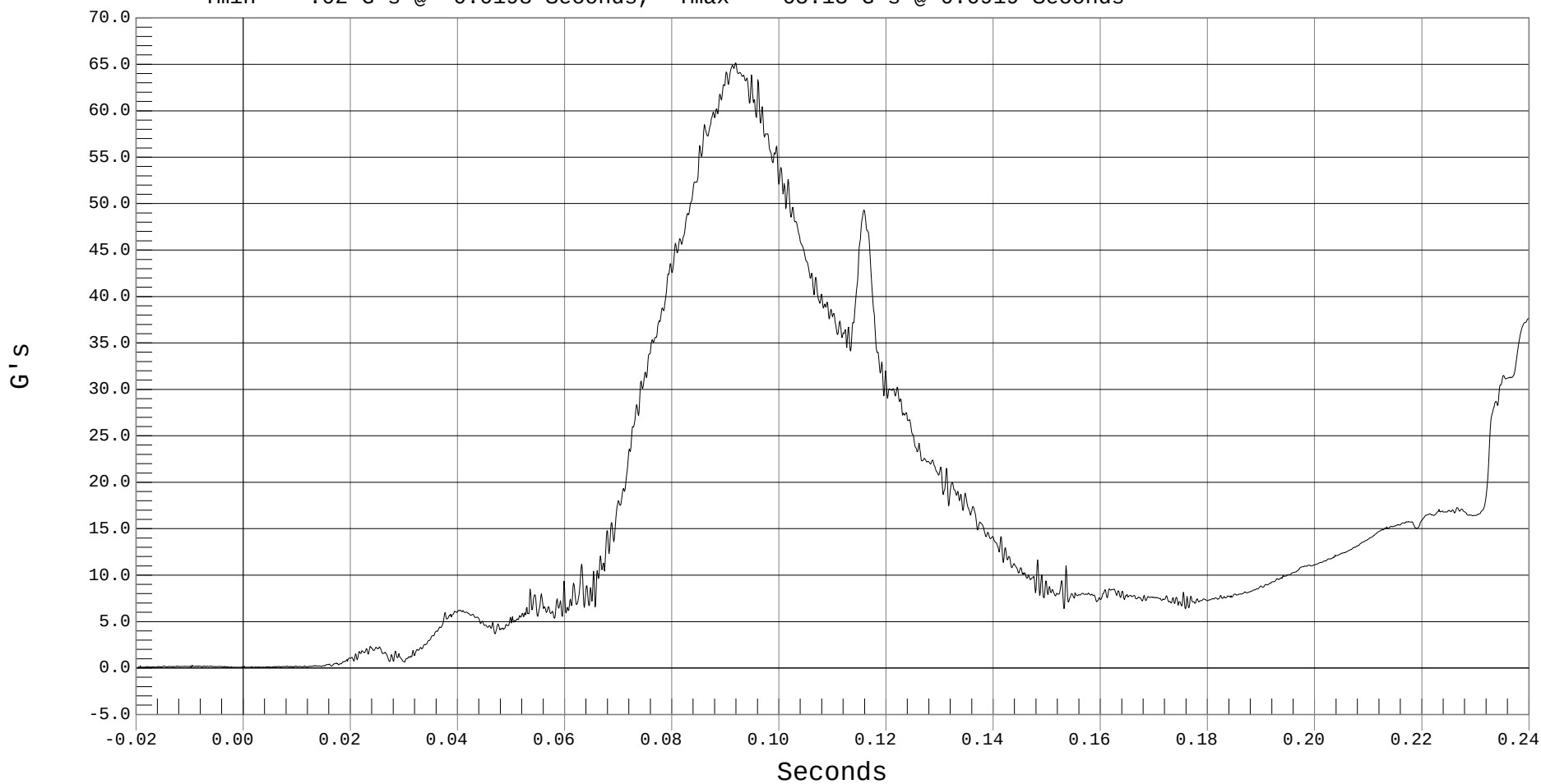
LRS 3 YR OLD HEAD RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS 3 YR OLD HEAD RESULTANT ACCELERATION, B01043AV.A13

Ymin = .02 G's @ -0.0198 Seconds, Ymax = 65.13 G's @ 0.0919 Seconds





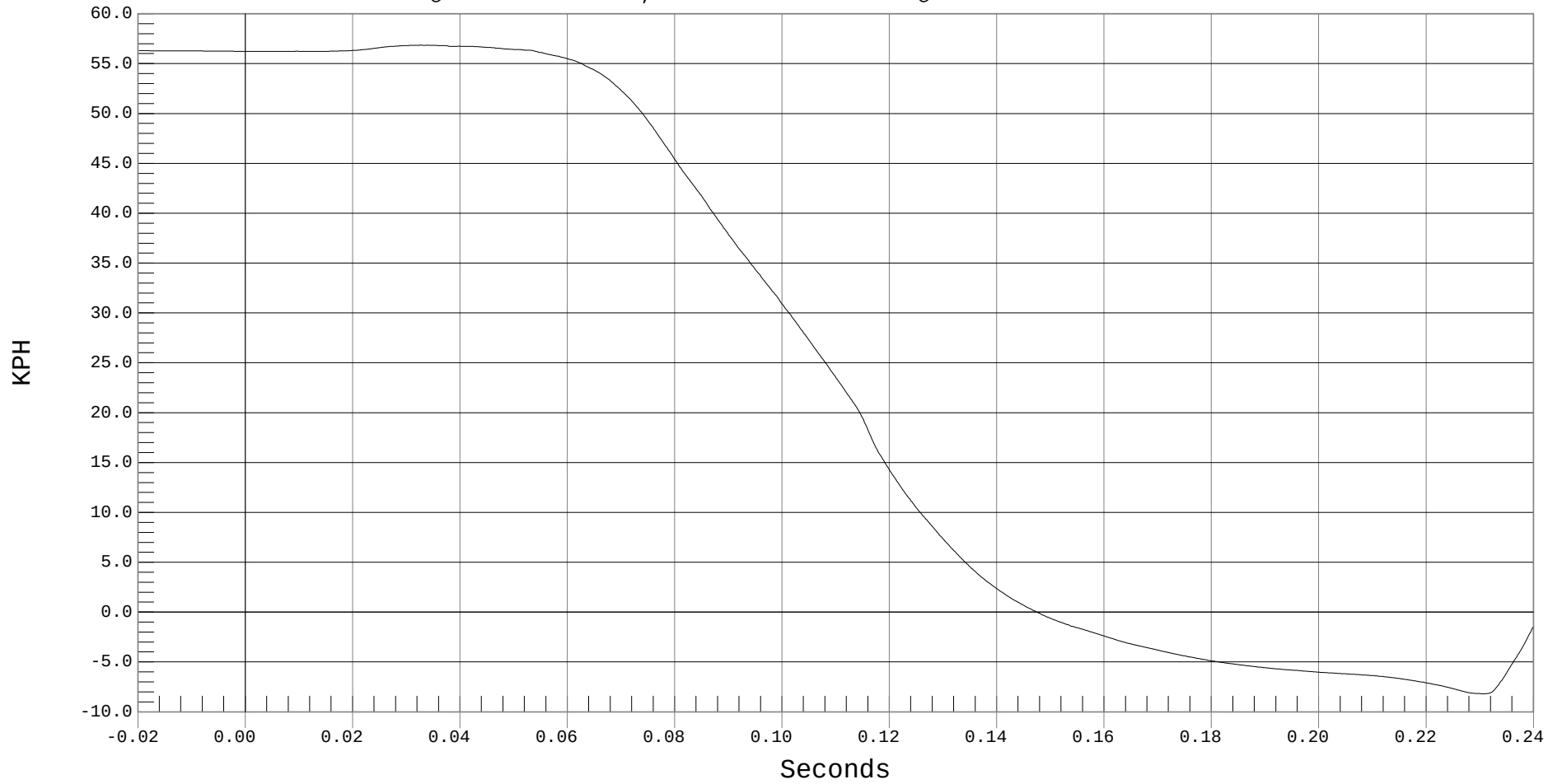
LRS 3 YR OLD HEAD X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS 3 YR OLD HEAD X VELOCITY, B01043AI.V13

Ymin = -8.18 KPH @ 0.2307 Seconds, Ymax = 56.85 KPH @ 0.0327 Seconds





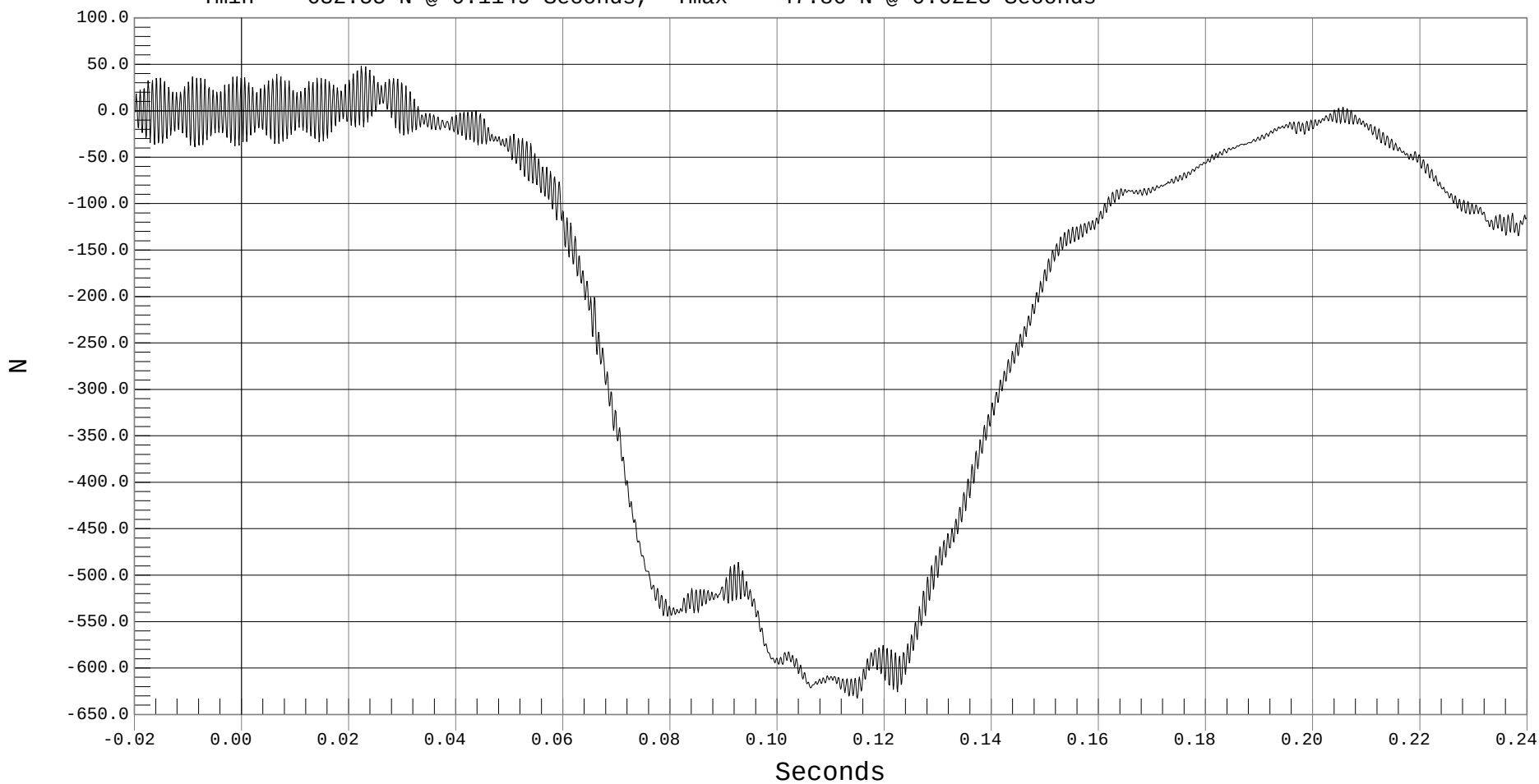
LRS 3 YR OLD UPPER NECK FORCE X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD LOWER NECK FORCE X, B01043FT.F22

Ymin = -632.55 N @ 0.1149 Seconds, Ymax = 47.86 N @ 0.0223 Seconds





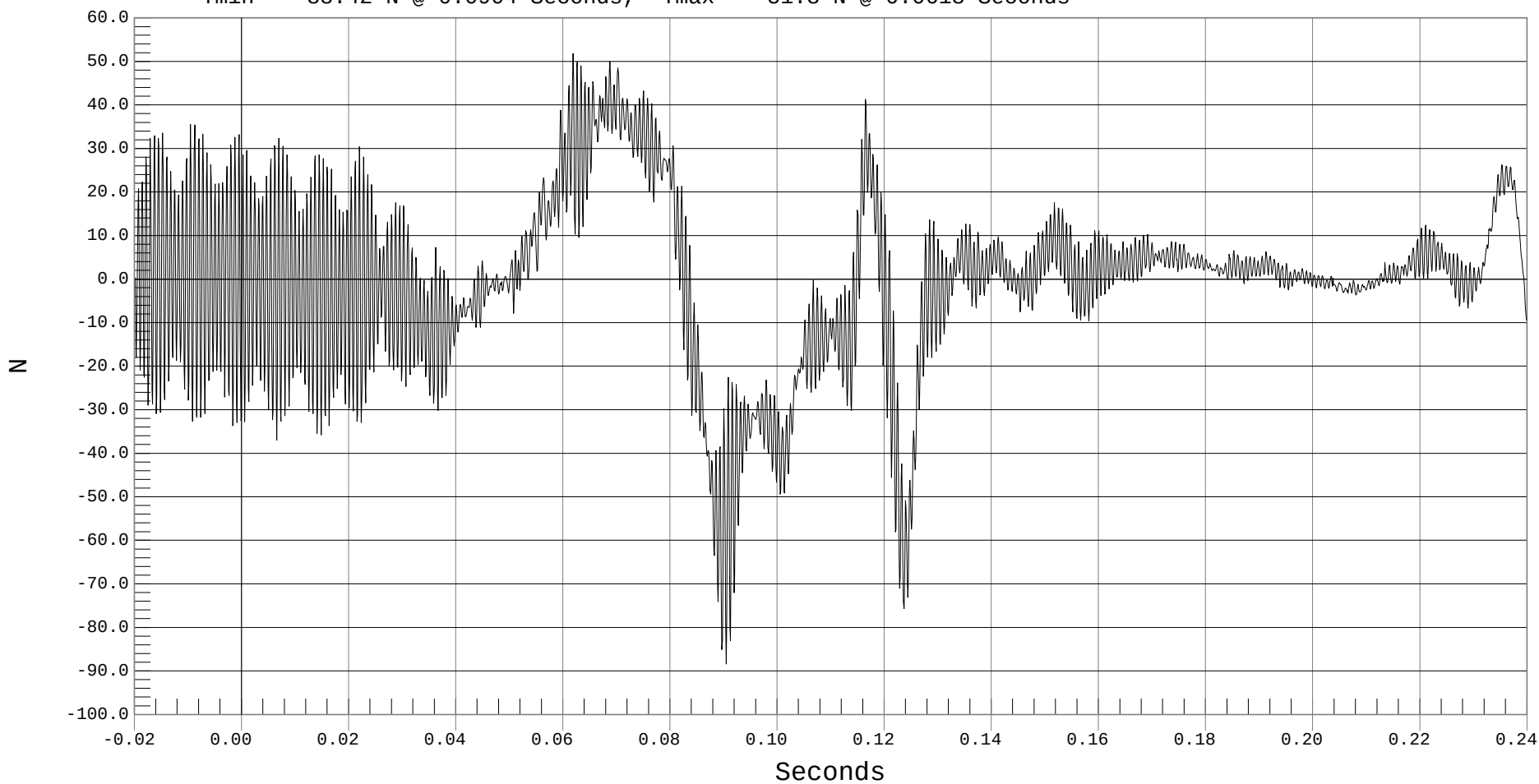
LRS 3 YR OLD UPPER NECK FORCE Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD LOWER NECK FORCE Y, B01043FT.F23

Ymin = -88.42 N @ 0.0904 Seconds, Ymax = 51.8 N @ 0.0618 Seconds





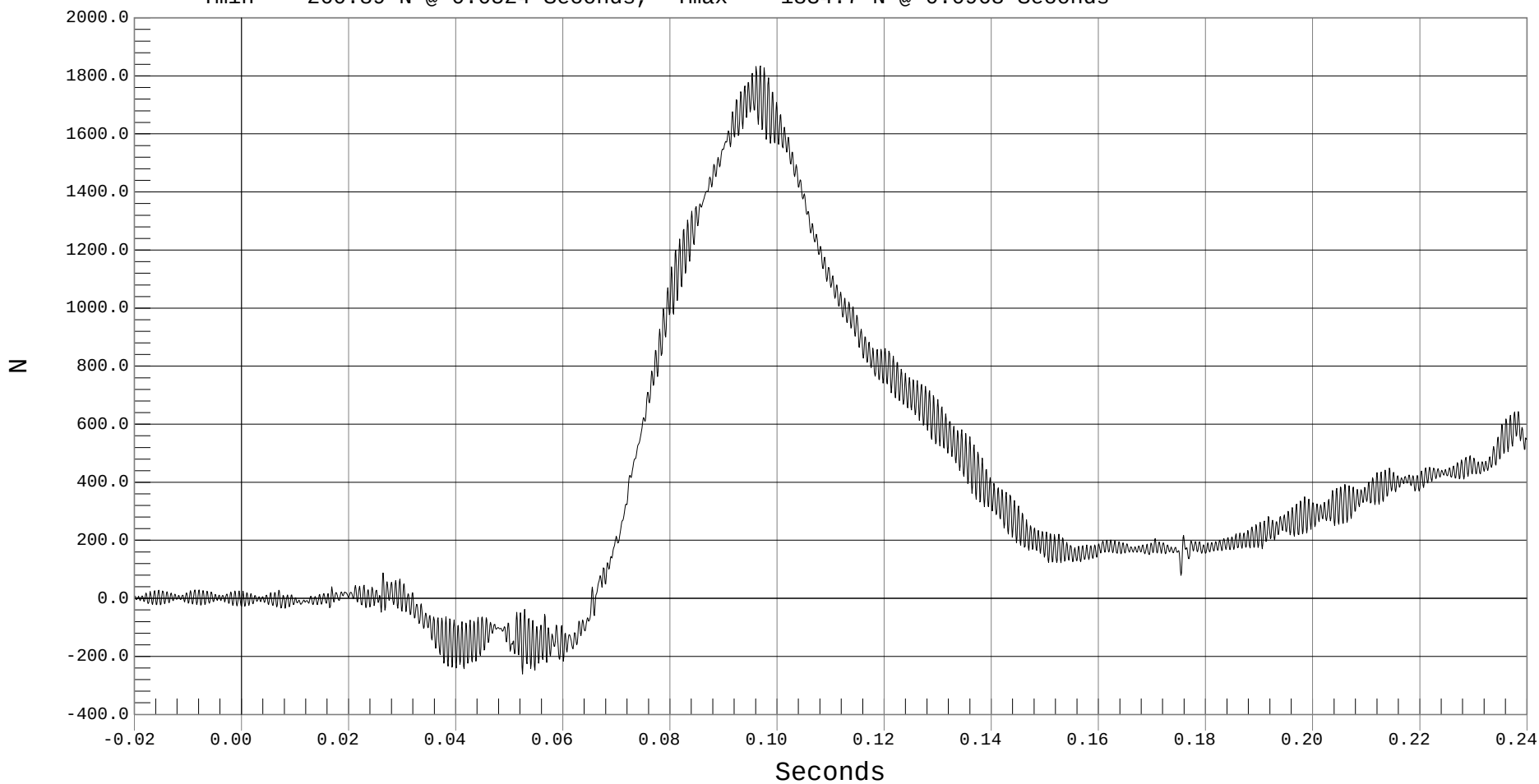
LRS 3 YR OLD UPPER NECK FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD LOWER NECK FORCE Z, B01043FT.F24

Ymin = -260.89 N @ 0.0524 Seconds, Ymax = 1834.7 N @ 0.0968 Seconds





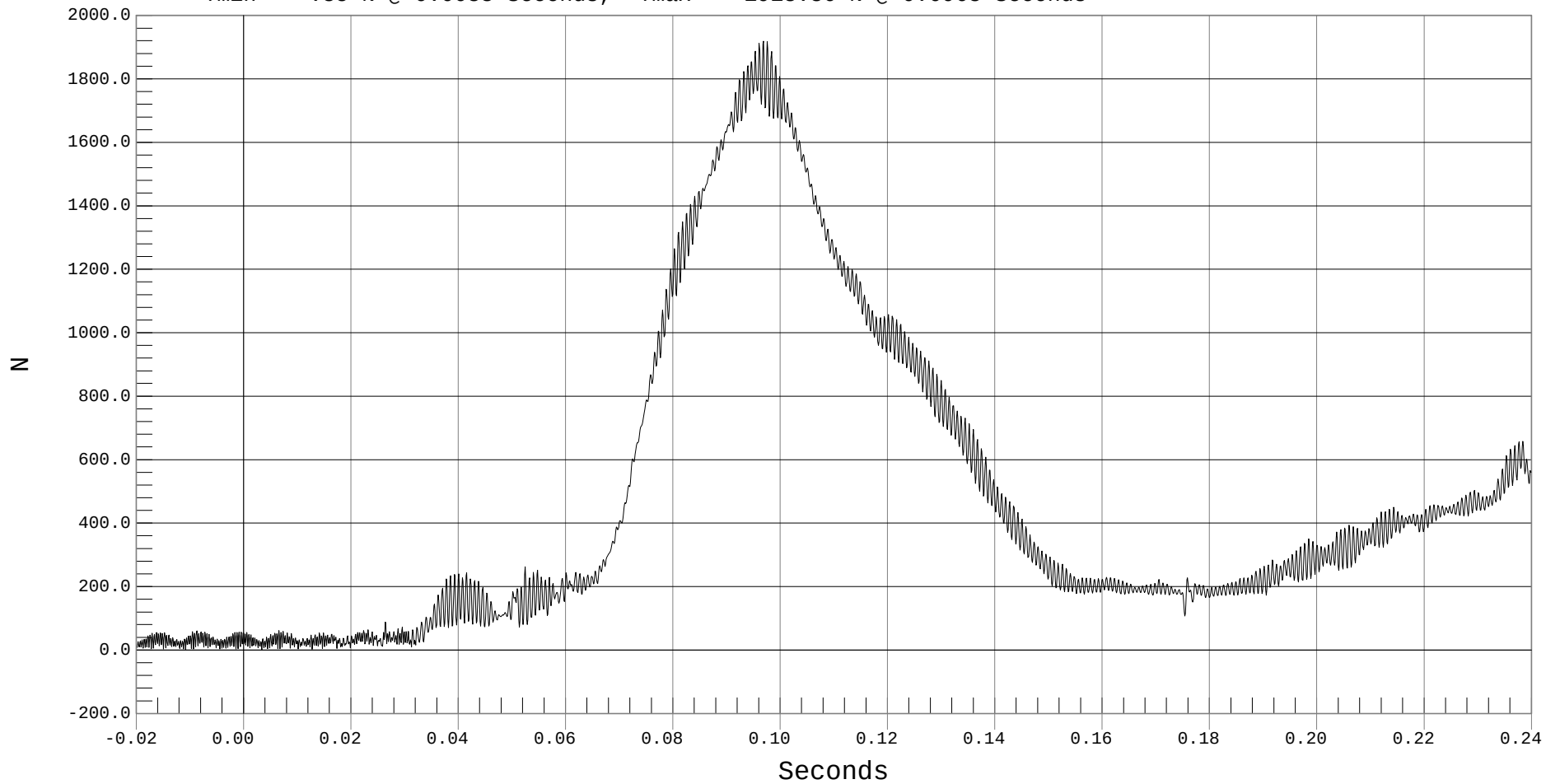
LRS 3 YR OLD UPPER NECK FORCE RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS 3 YR OLD UPPER NECK FORCE RESULTANT, B01043FV.F22

Ymin = .85 N @ 0.0033 Seconds, Ymax = 1918.86 N @ 0.0968 Seconds





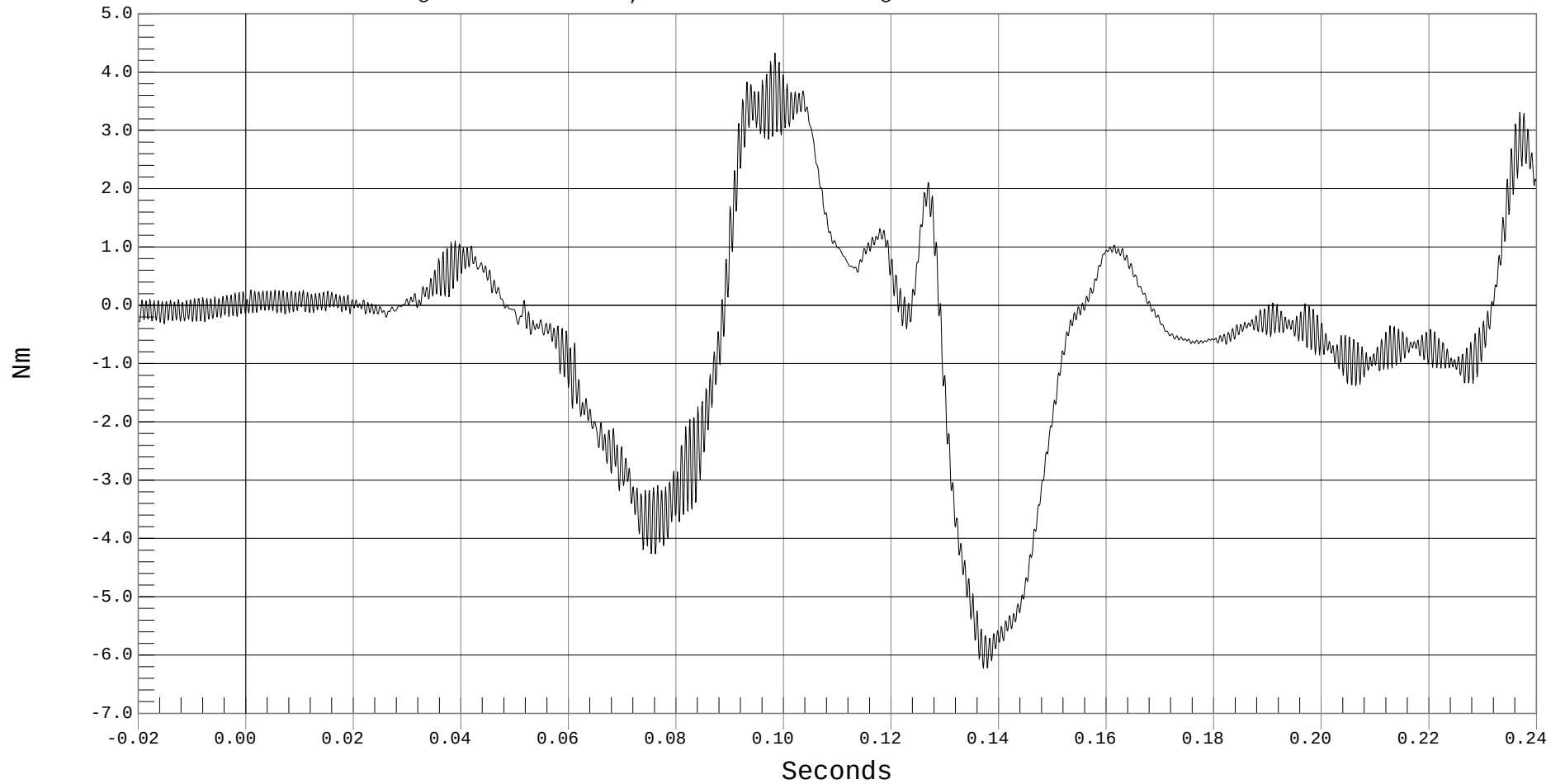
LRS 3 YR OLD UPPER NECK MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 LRS CHILD LOWER NECK MOMENT X, B01043MF.M25

Ymin = -6.23 Nm @ 0.1371 Seconds, Ymax = 4.33 Nm @ 0.0983 Seconds





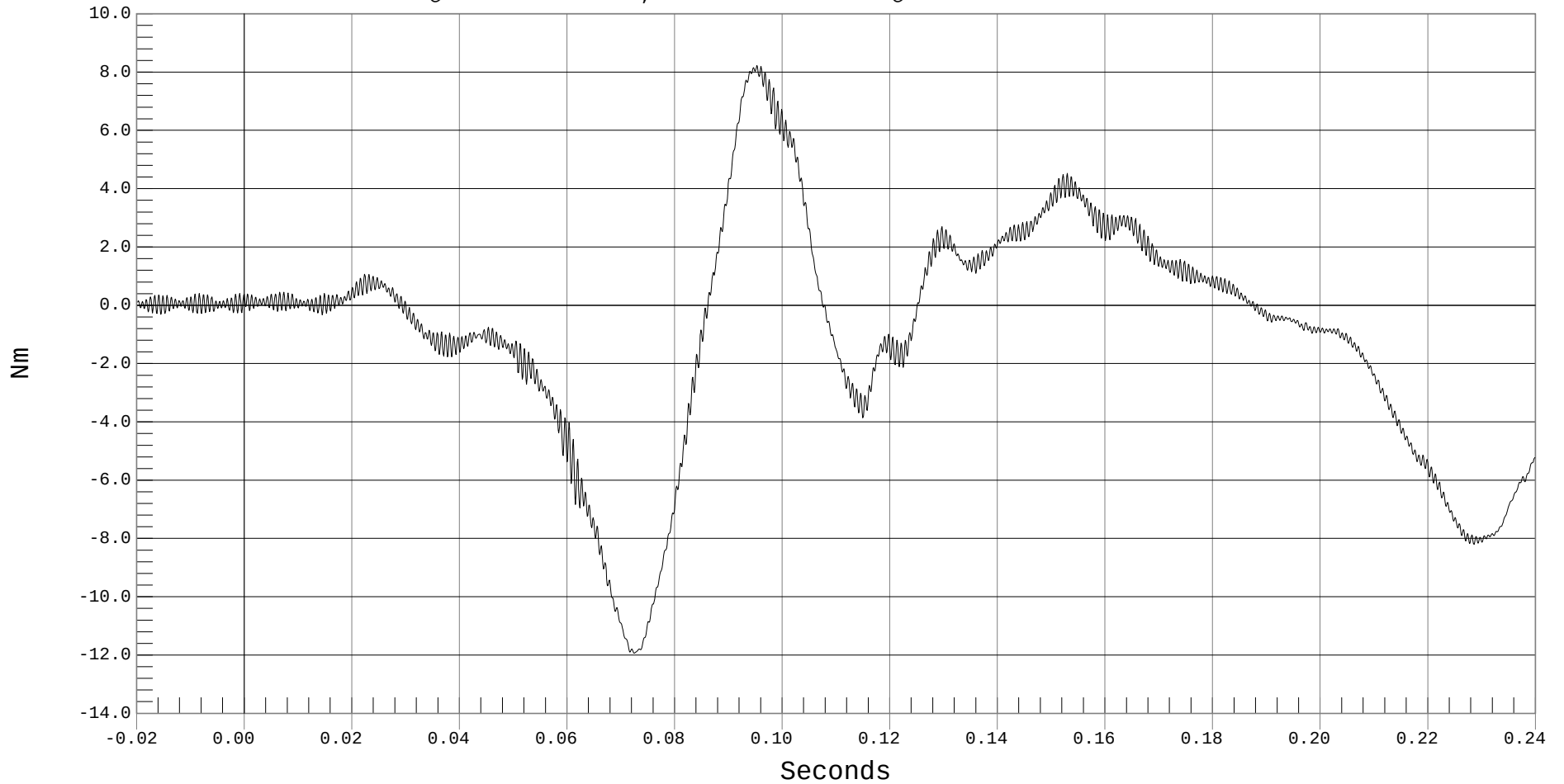
LRS 3 YR OLD UPPER NECK MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 LRS CHILD LOWER NECK MOMENT Y, B01043MF.M26

Ymin = -11.94 Nm @ 0.0724 Seconds, Ymax = 8.23 Nm @ 0.0952 Seconds





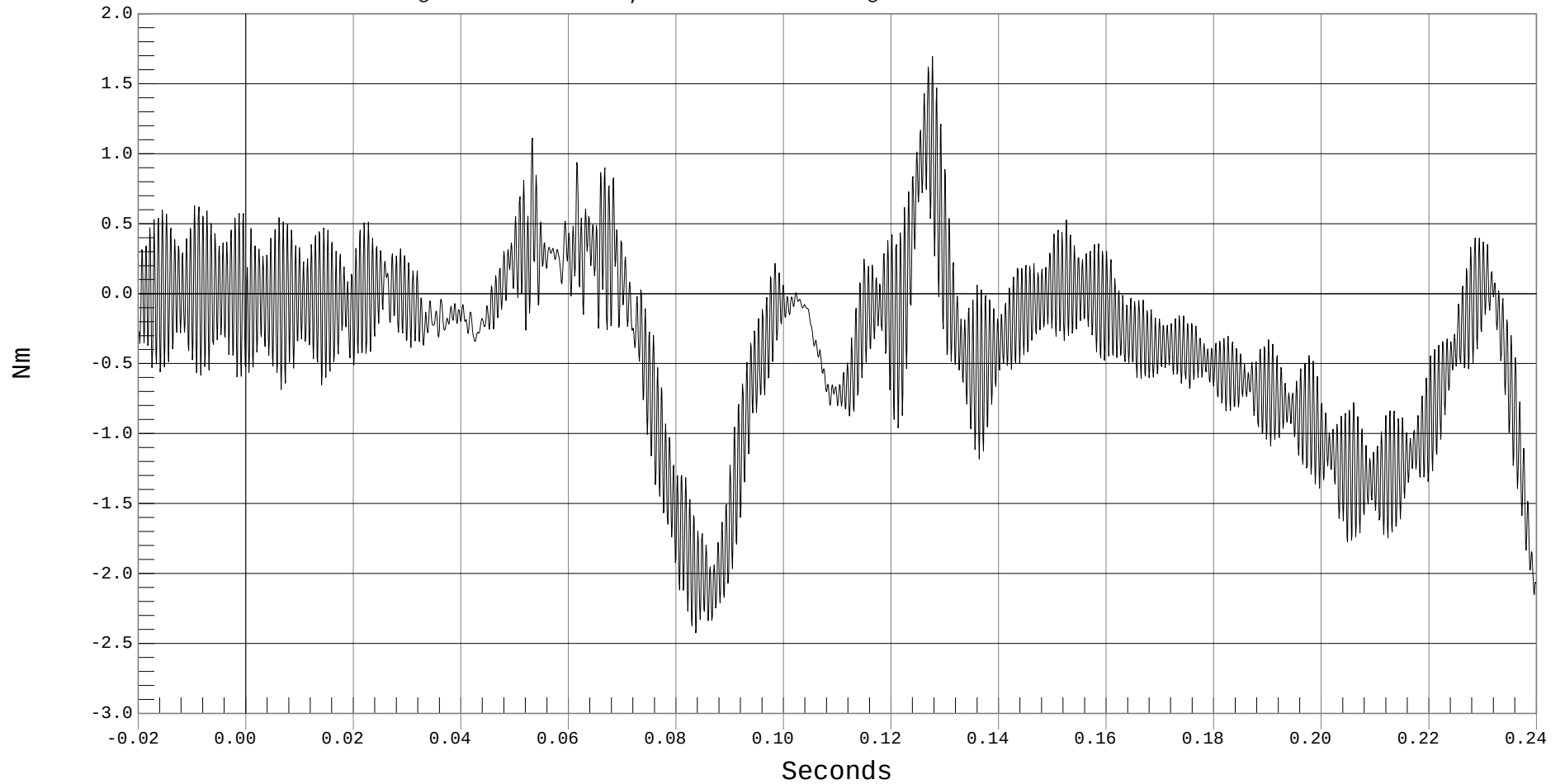
LRS 3 YR OLD UPPER NECK MOMENT Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 LRS CHILD LOWER NECK MOMENT Z, B01043MF.M27

Ymin = -2.81 Nm @ 0.2432 Seconds, Ymax = 1.7 Nm @ 0.1276 Seconds





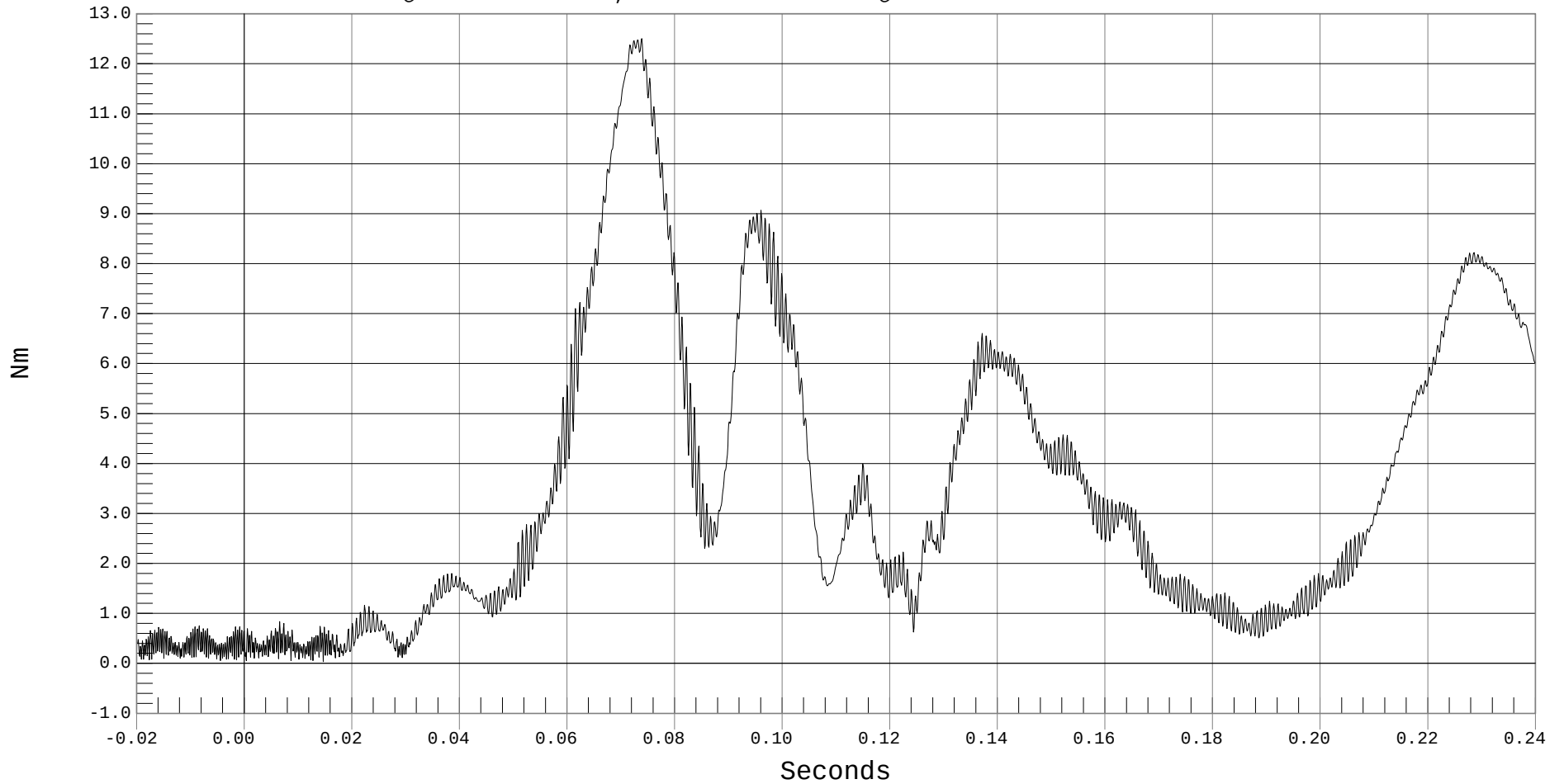
LRS 3 YR OLD UPPER NECK MOMENT RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 LRS 3 YR OLD UPPER NECK MOMENT RESULTANT, B01043MV.M25

Ymin = .04 Nm @ 0.0146 Seconds, Ymax = 12.51 Nm @ 0.0738 Seconds





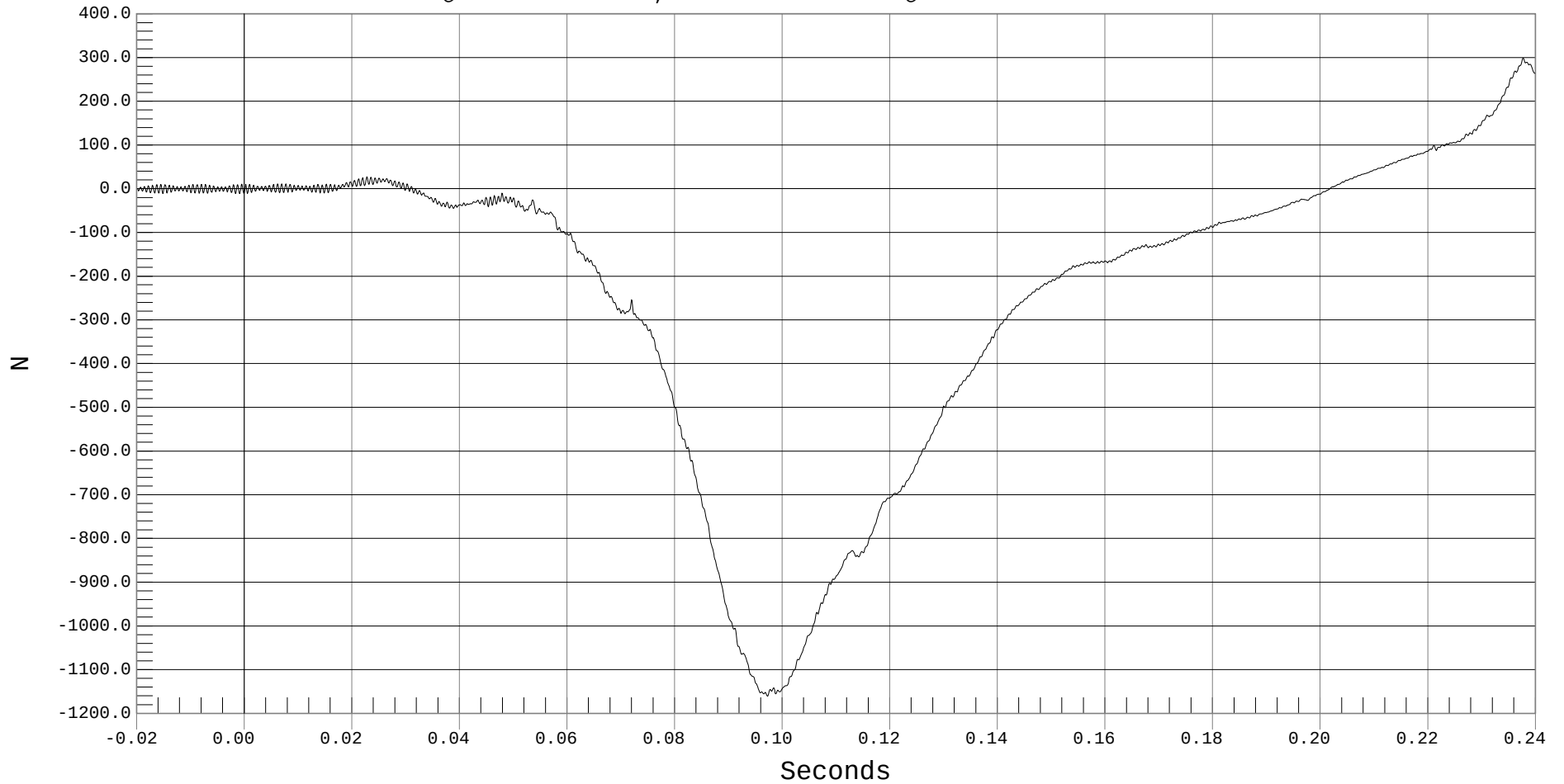
LRS 3 YR OLD LOWER NECK FORCE X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD UPPER NECK FORCE X, B01043FT.F16

Ymin = -1160.75 N @ 0.0972 Seconds, Ymax = 298.5 N @ 0.2376 Seconds





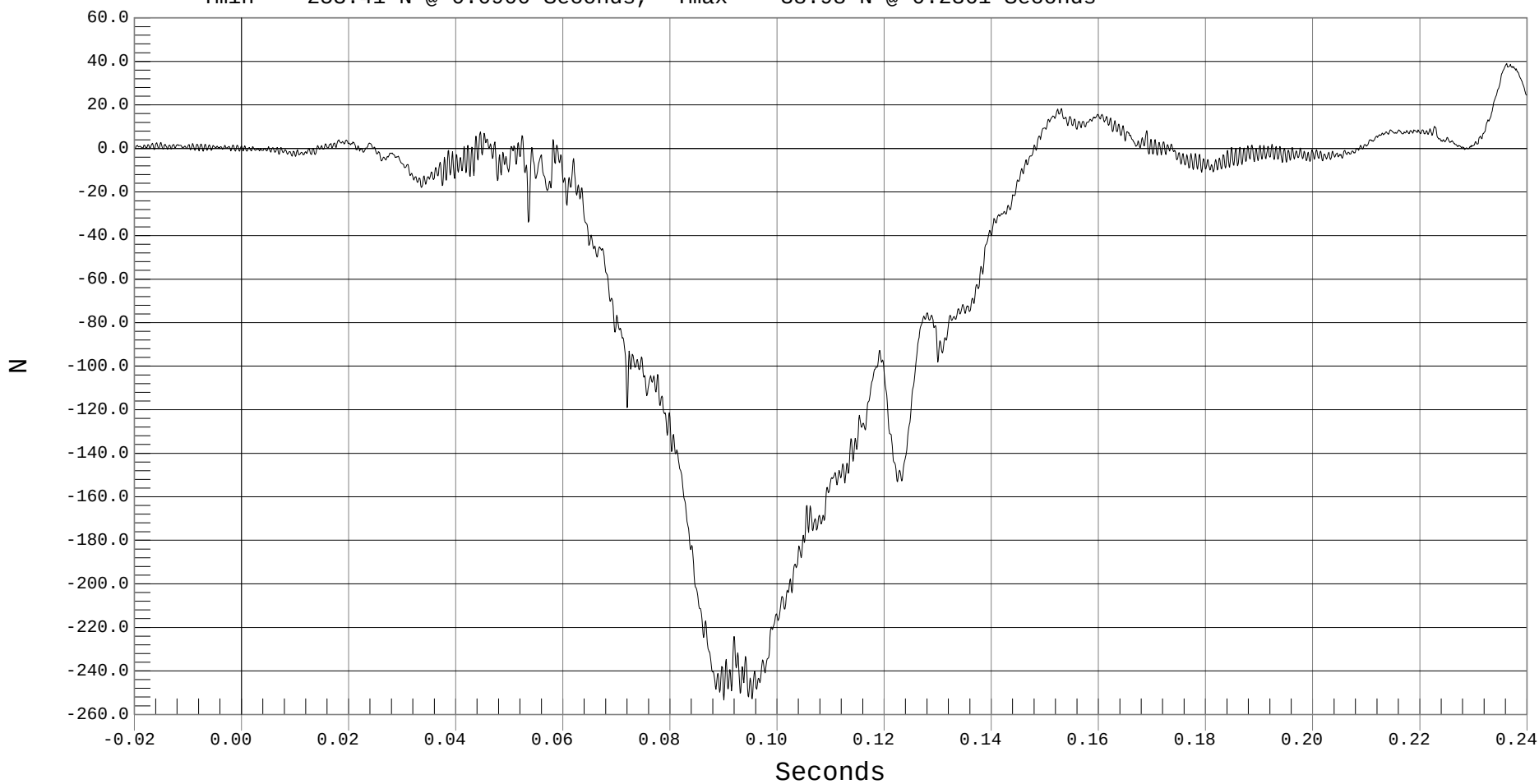
LRS 3 YR OLD LOWER NECK FORCE Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD UPPER NECK FORCE Y, B01043FT.F17

Ymin = -253.41 N @ 0.0900 Seconds, Ymax = 38.98 N @ 0.2361 Seconds



F-40



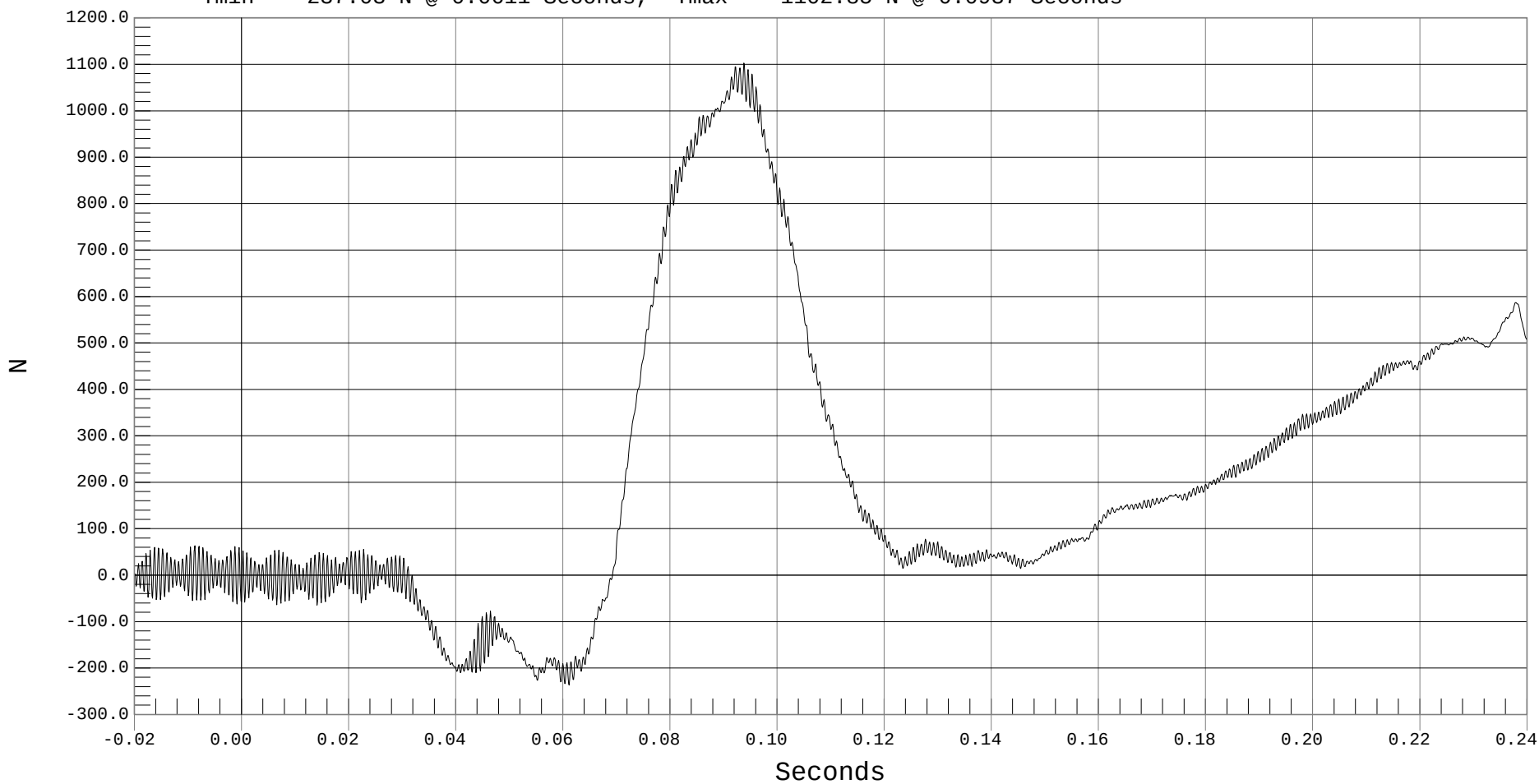
LRS 3 YR OLD LOWER NECK FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD UPPER NECK FORCE Z, B01043FT.F18

Ymin = -237.03 N @ 0.0611 Seconds, Ymax = 1102.85 N @ 0.0937 Seconds





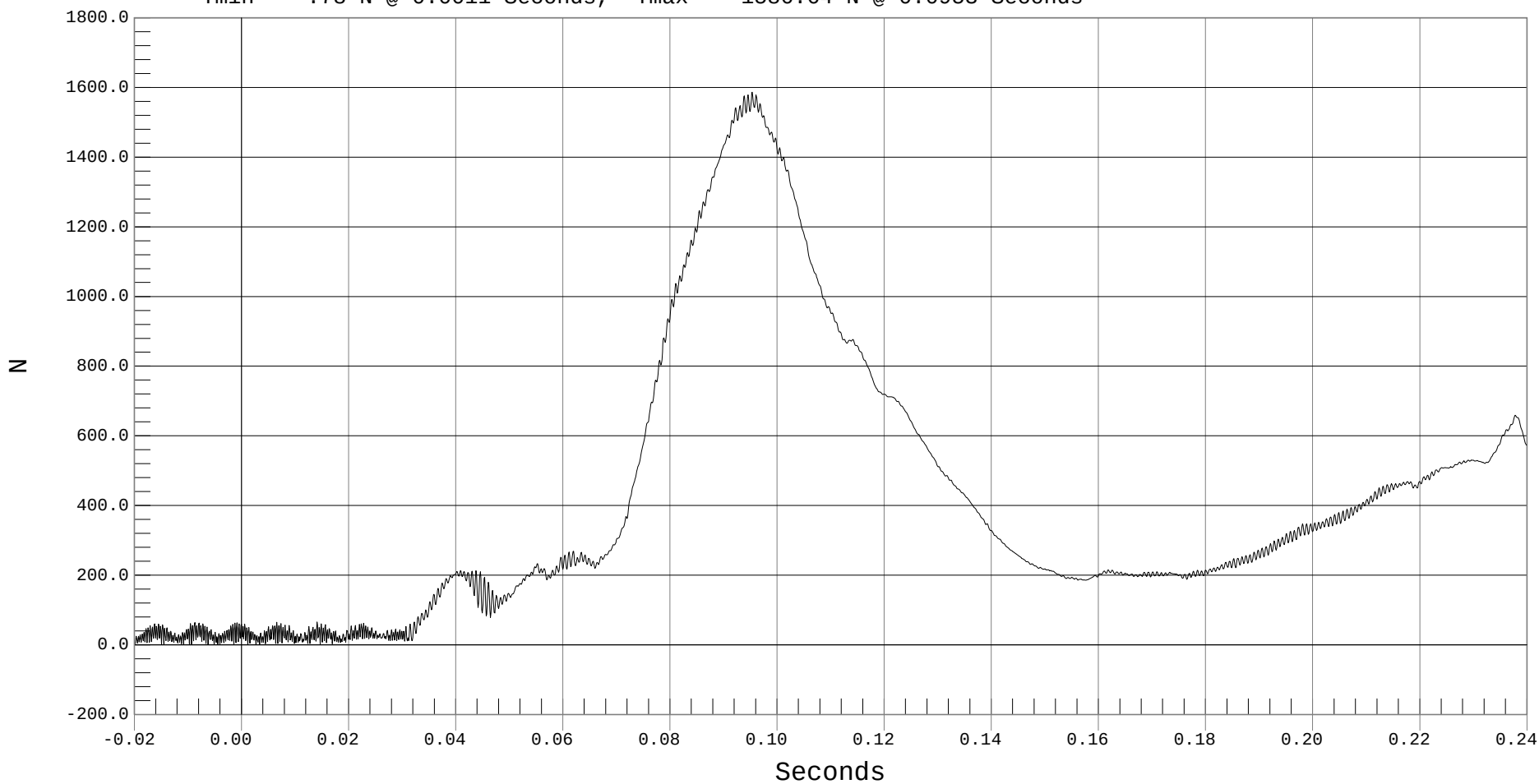
LRS 3 YR OLD LOWER NECK FORCE RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS 3 YR OLD LOWER NECK FORCE RESULTANT, B01043FV.F16

Ymin = .78 N @ 0.0011 Seconds, Ymax = 1586.64 N @ 0.0953 Seconds





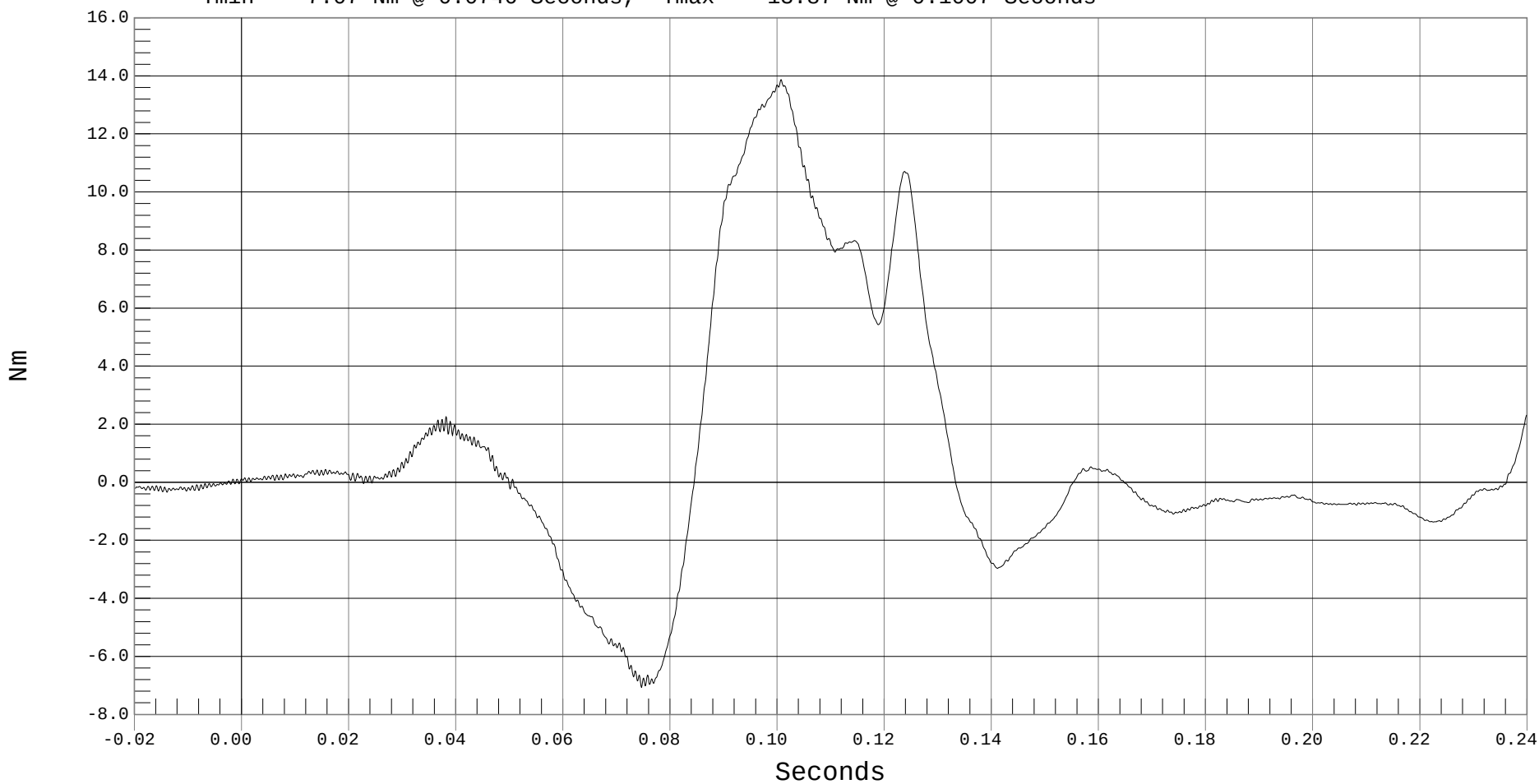
LRS 3 YR OLD LOWER NECK MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 LRS CHILD UPPER NECK MOMENT X, B01043MF.M19

Ymin = -7.07 Nm @ 0.0746 Seconds, Ymax = 13.87 Nm @ 0.1007 Seconds





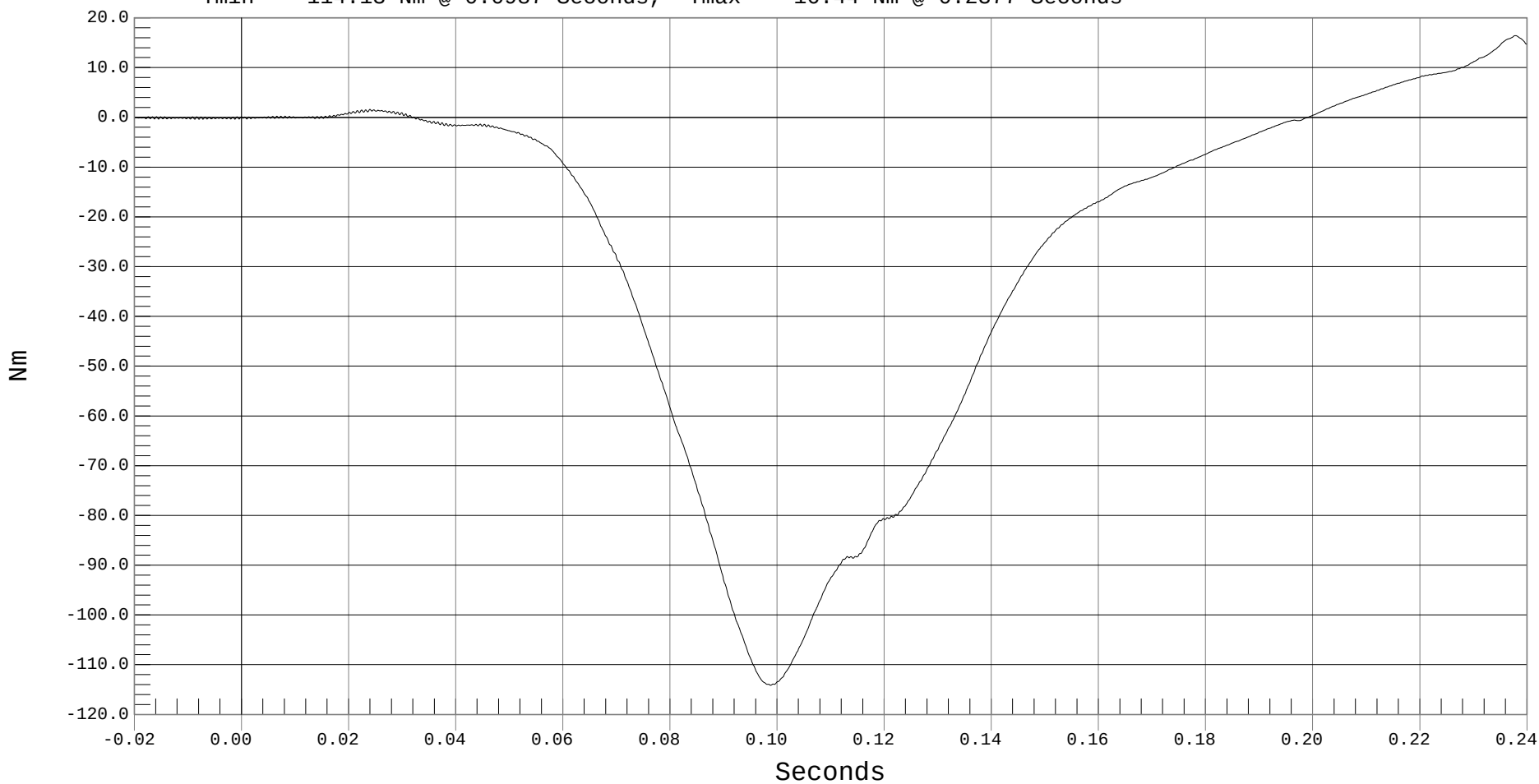
LRS 3 YR OLD LOWER NECK MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 LRS CHILD UPPER NECK MOMENT Y, B01043MF.M20

Ymin = -114.13 Nm @ 0.0987 Seconds, Ymax = 16.44 Nm @ 0.2377 Seconds



LRS 3 YEAR OLD LOWER NECK MOMENT Z VS. TIME
NO VALID DATA COLLECTED



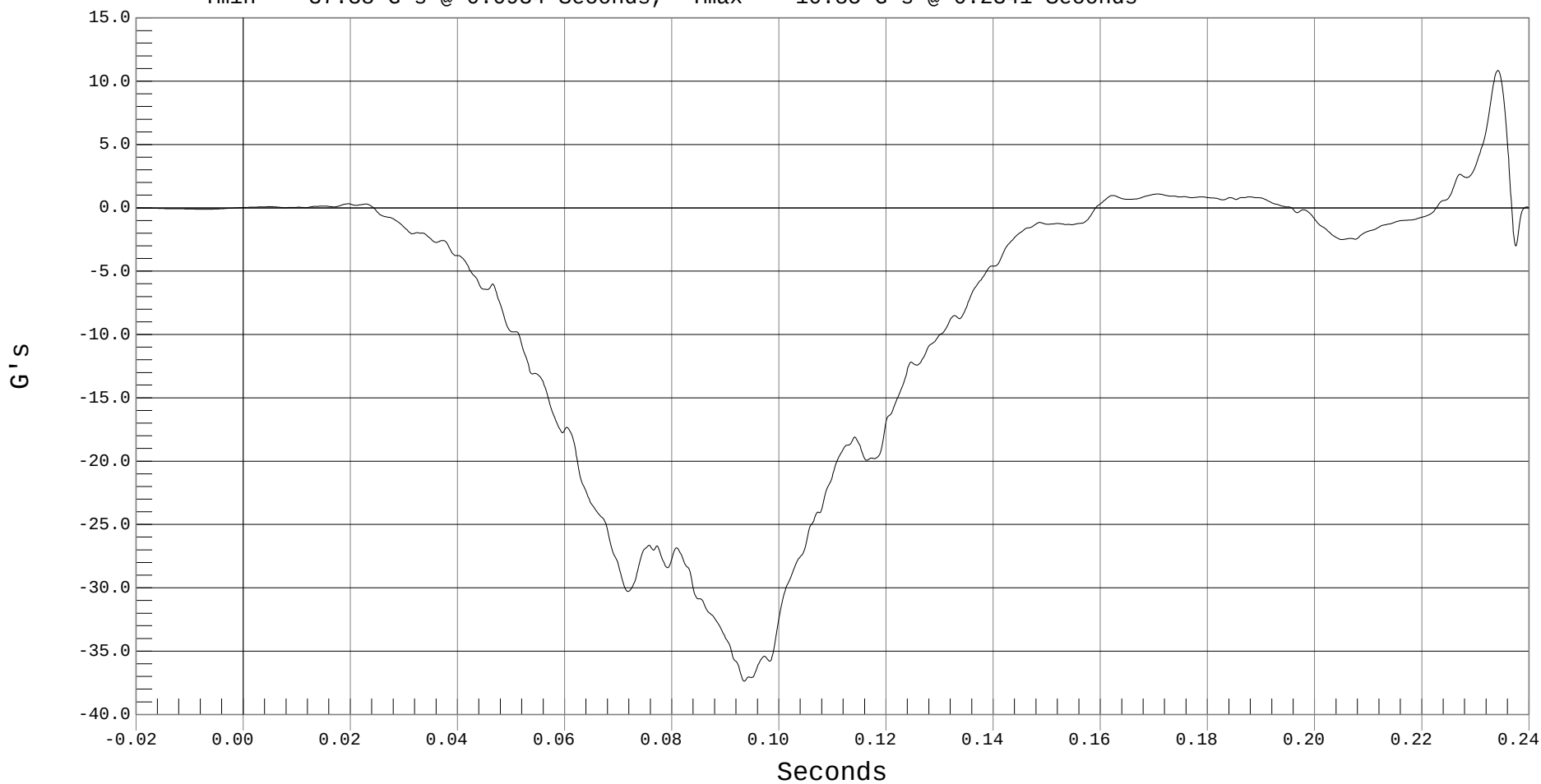
LRS 3 YR OLD CHEST X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LRS CHILD CHEST X, B01043AF.A28

Ymin = -37.38 G's @ 0.0934 Seconds, Ymax = 10.85 G's @ 0.2341 Seconds





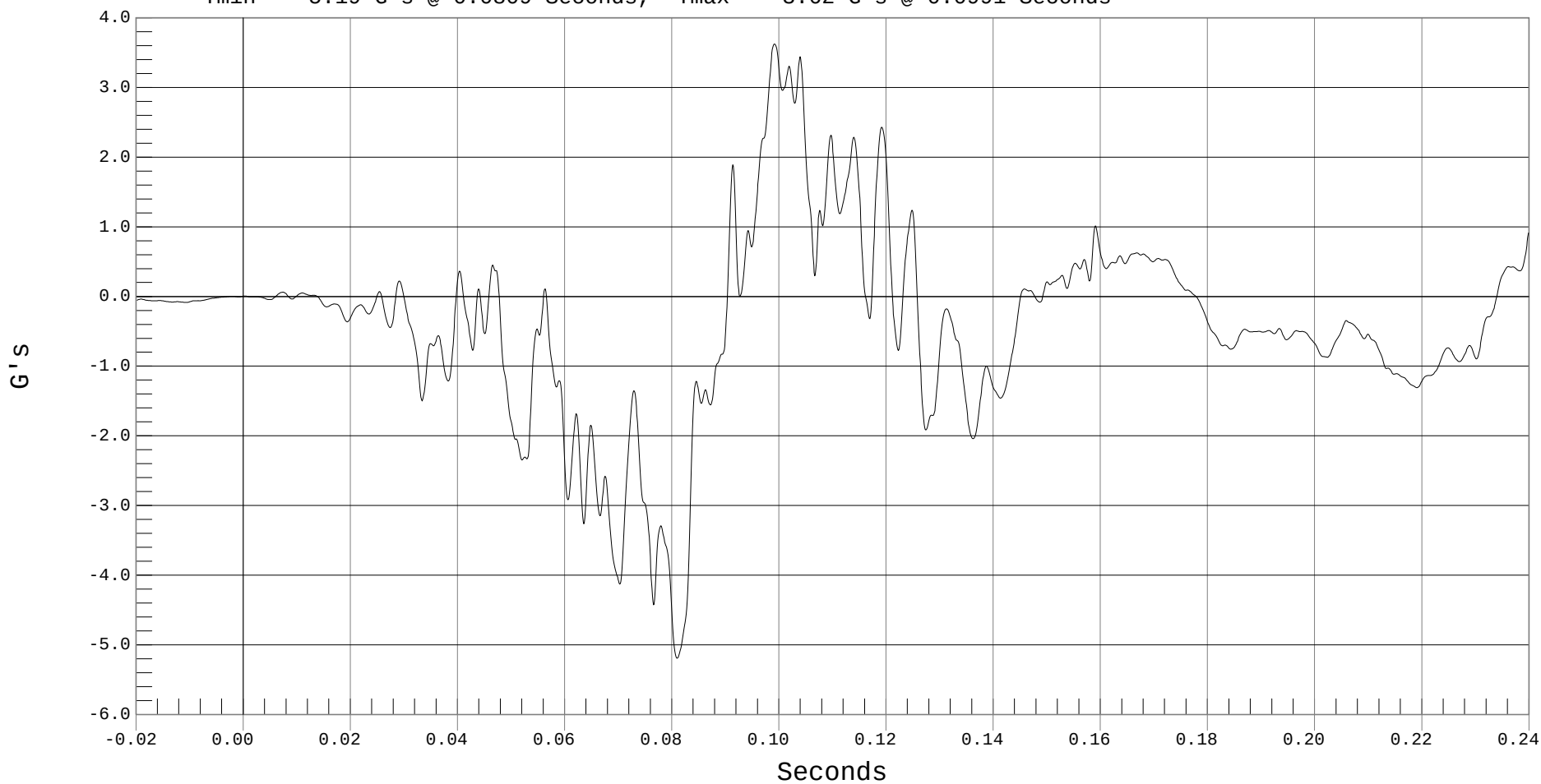
LRS 3 YR OLD CHEST Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LRS CHILD CHEST Y, B01043AF.A29

Ymin = -5.19 G's @ 0.0809 Seconds, Ymax = 3.62 G's @ 0.0991 Seconds





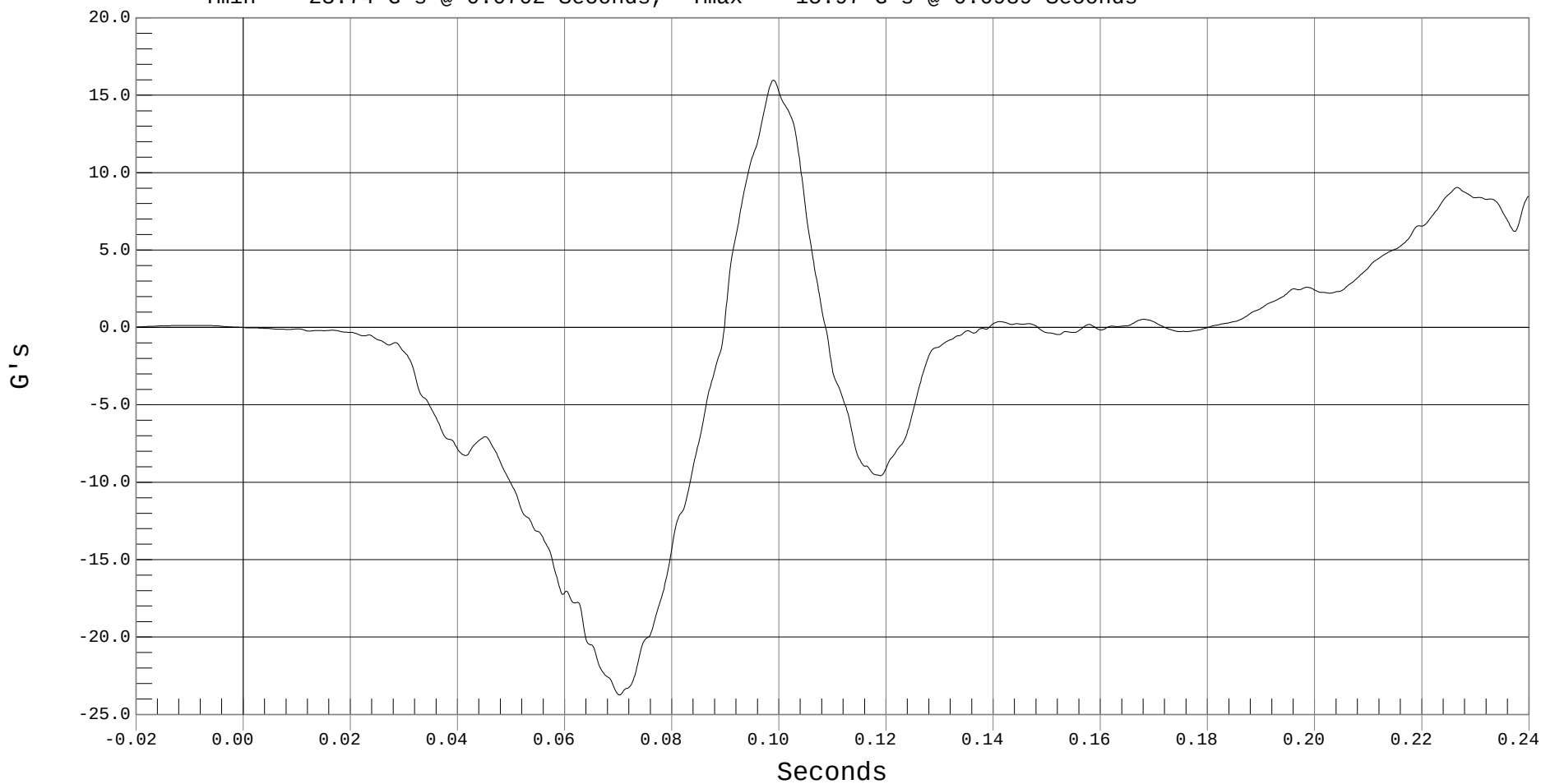
LRS 3 YR OLD CHEST Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LRS CHILD CHEST Z, B01043AF.A30

Ymin = -23.74 G's @ 0.0702 Seconds, Ymax = 15.97 G's @ 0.0989 Seconds





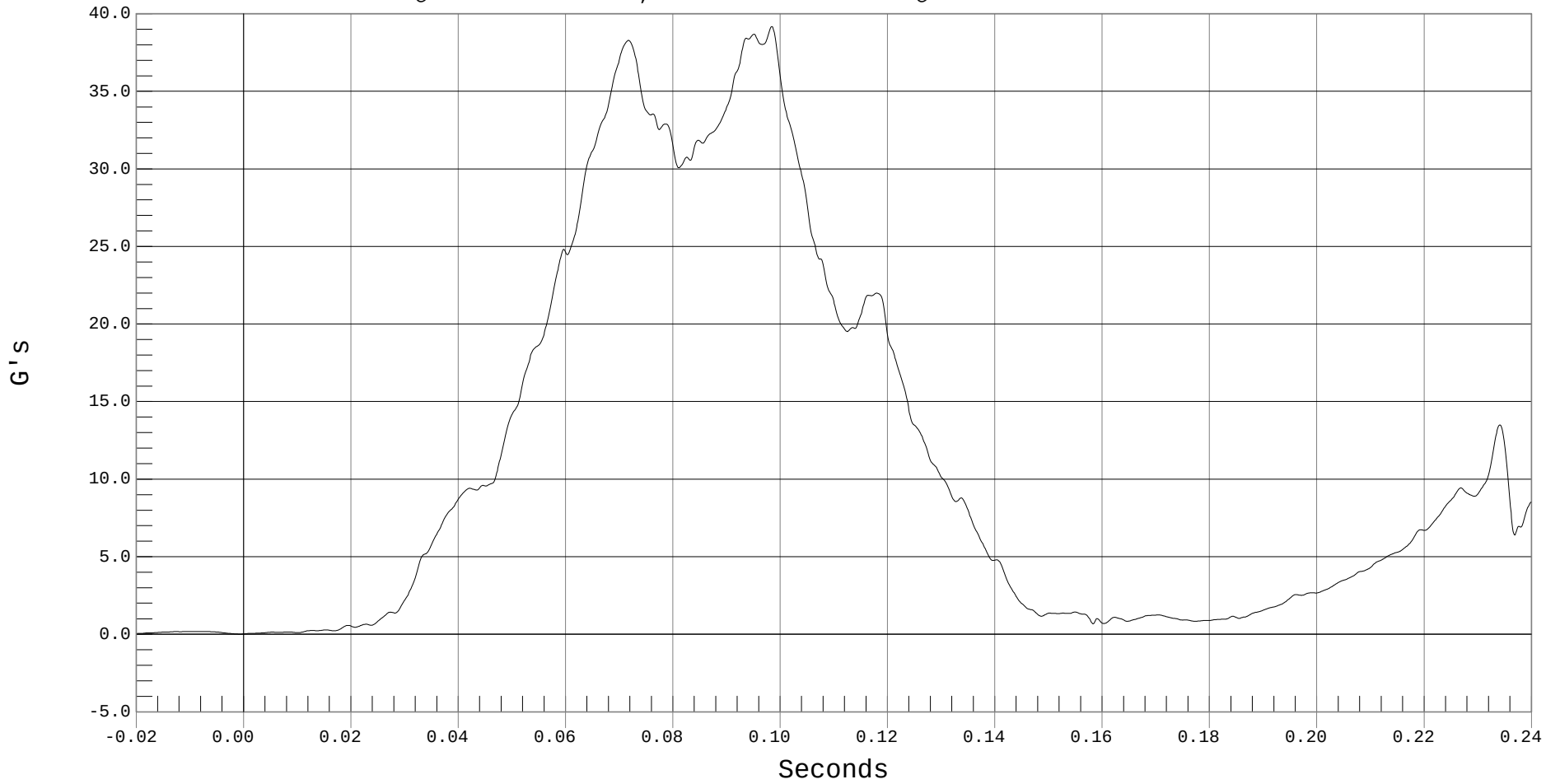
LRS 3 YR OLD CHEST RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 LRS 3 YR OLD CHEST RESULTANT ACCELERATION, B01043AV.A28

Ymin = .01 G's @ -0.0007 Seconds, Ymax = 39.18 G's @ 0.0984 Seconds





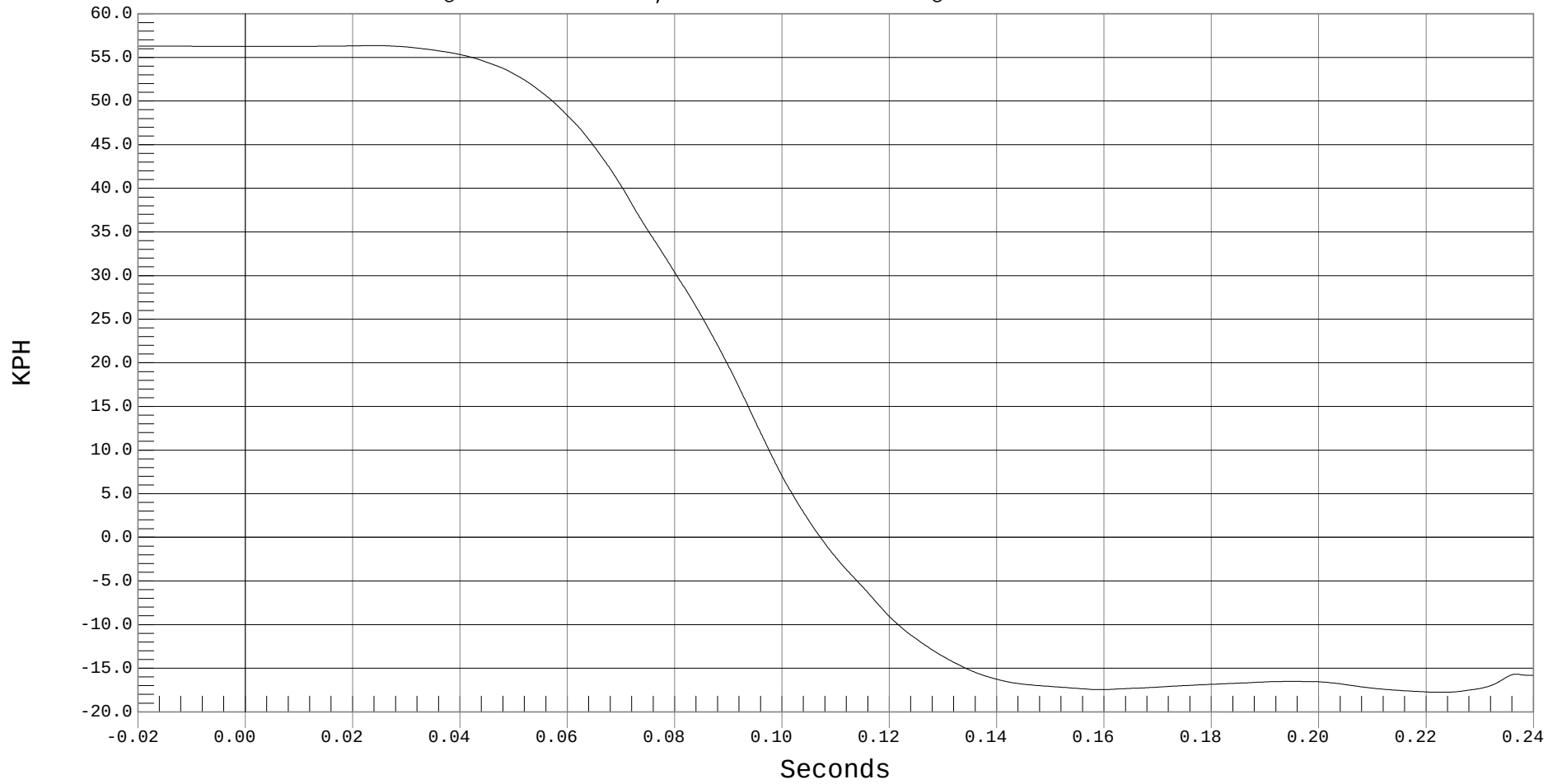
LRS 3 YR OLD CHEST X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

1 LRS 3 YR OLD CHEST X VELOCITY, B01043AI.V28

Ymin = -17.76 KPH @ 0.2226 Seconds, Ymax = 56.35 KPH @ 0.0243 Seconds





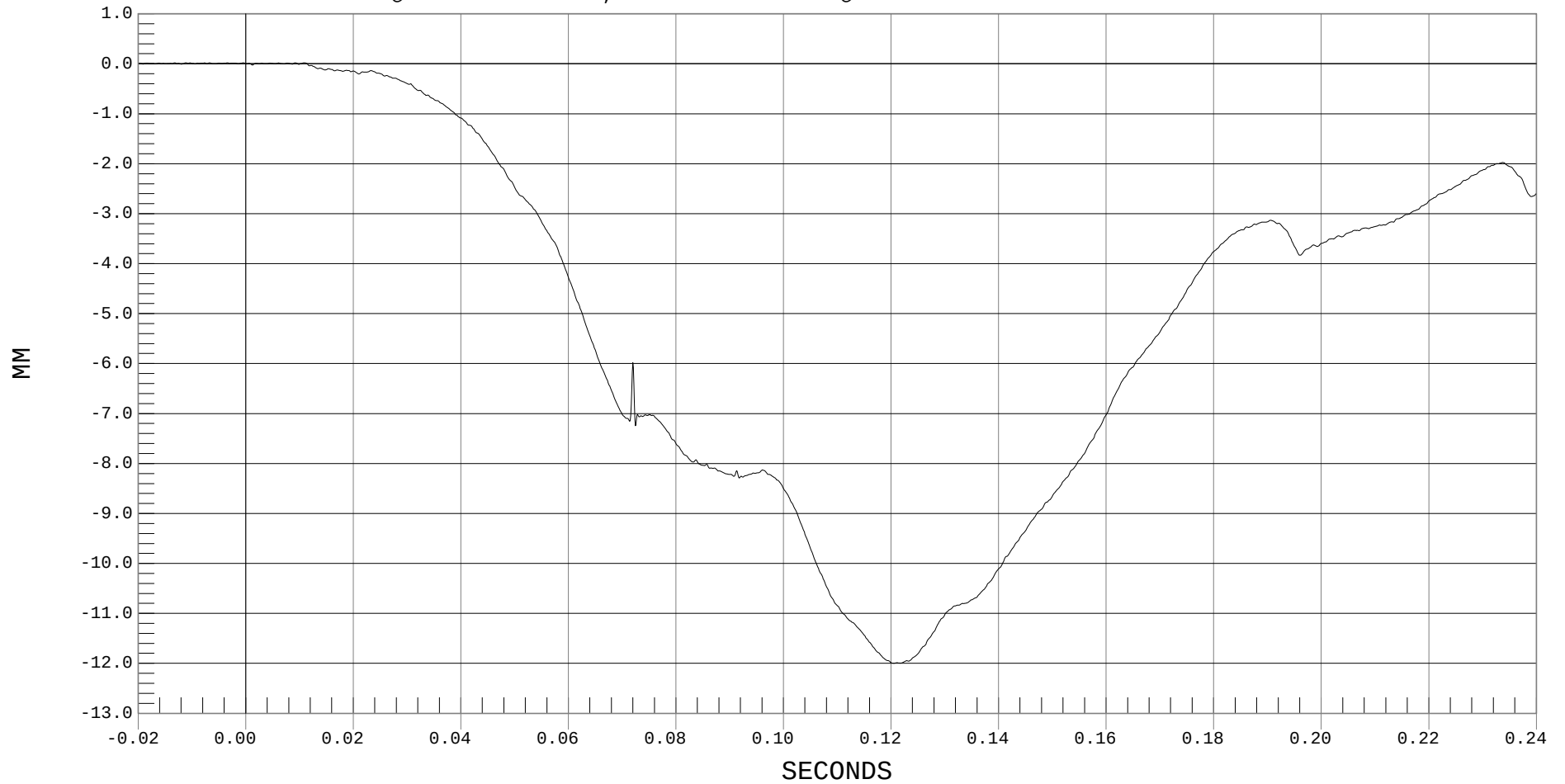
LRS 3 YR OLD CHEST COMPRESSION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DISPLACEMENT, B01043DF.D31

Ymin = -12 MM @ 0.1205 SECONDS, Ymax = .02 MM @ -0.0113 SECONDS





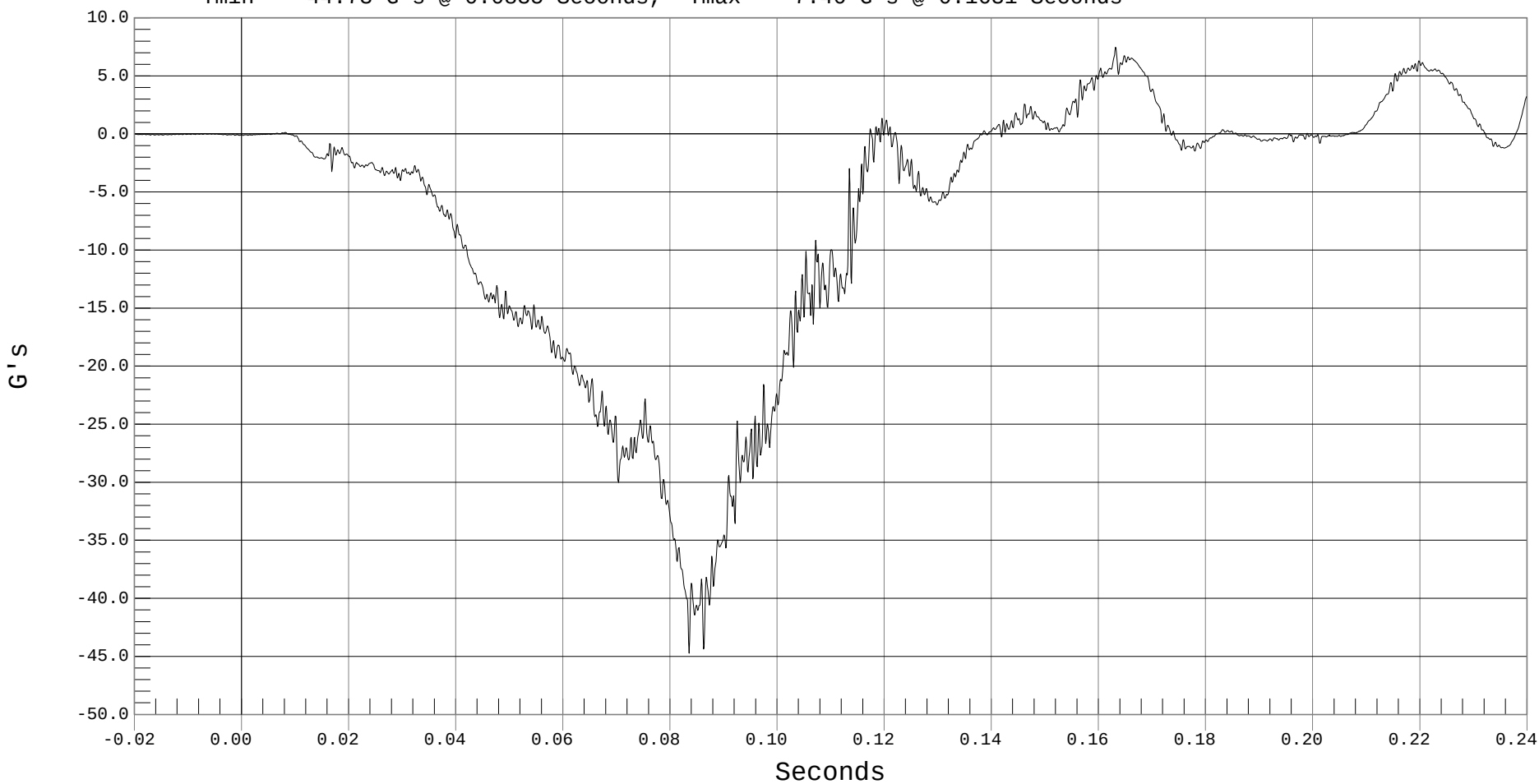
LRS 3 YR OLD PELVIS X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD PELVIS X, B01043AT.A34

Ymin = -44.73 G's @ 0.0835 Seconds, Ymax = 7.46 G's @ 0.1631 Seconds





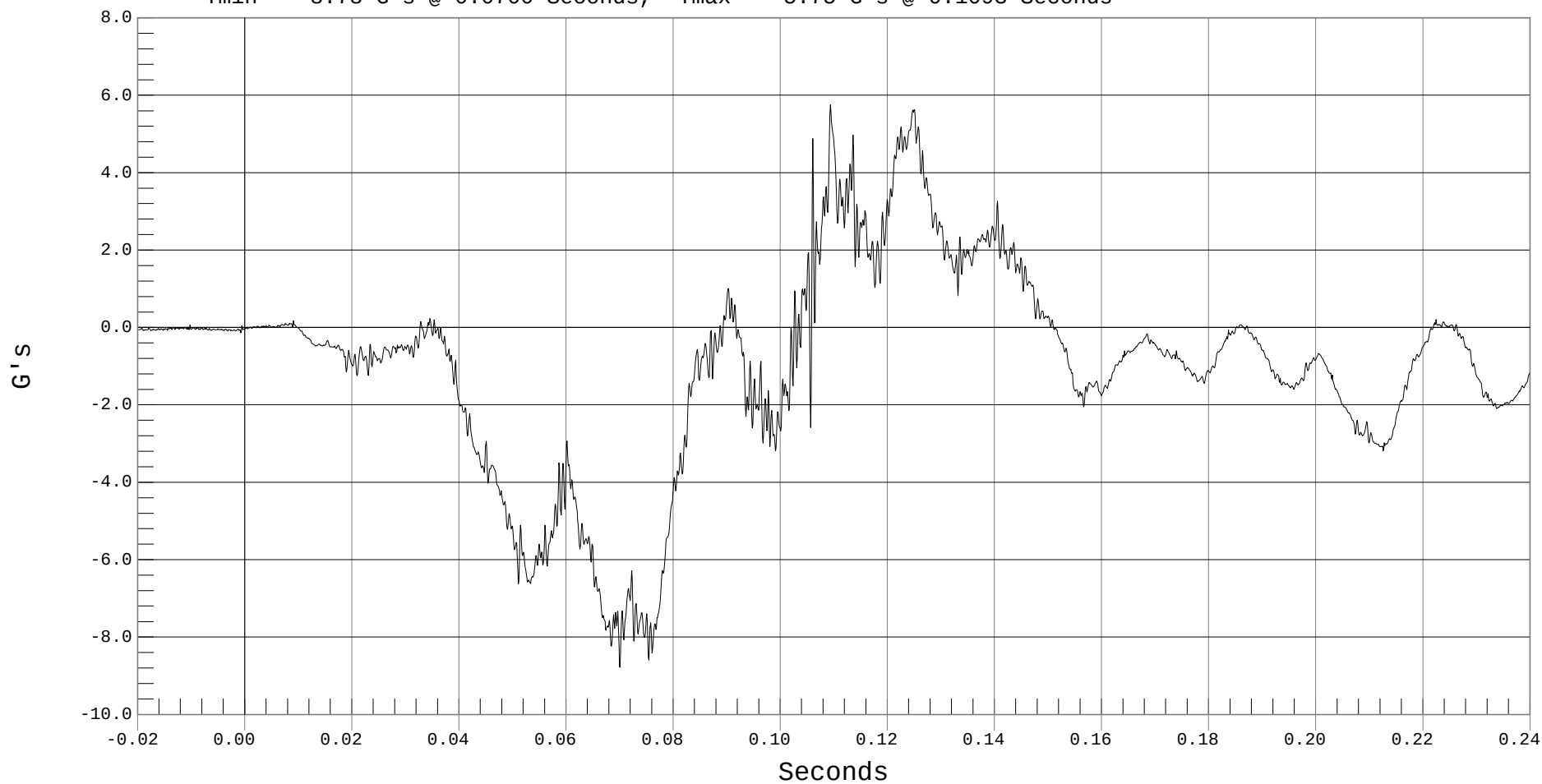
LRS 3 YR OLD PELVIS Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD PELVIS Y, B01043AT.A35

Ymin = -8.78 G's @ 0.0700 Seconds, Ymax = 5.75 G's @ 0.1093 Seconds





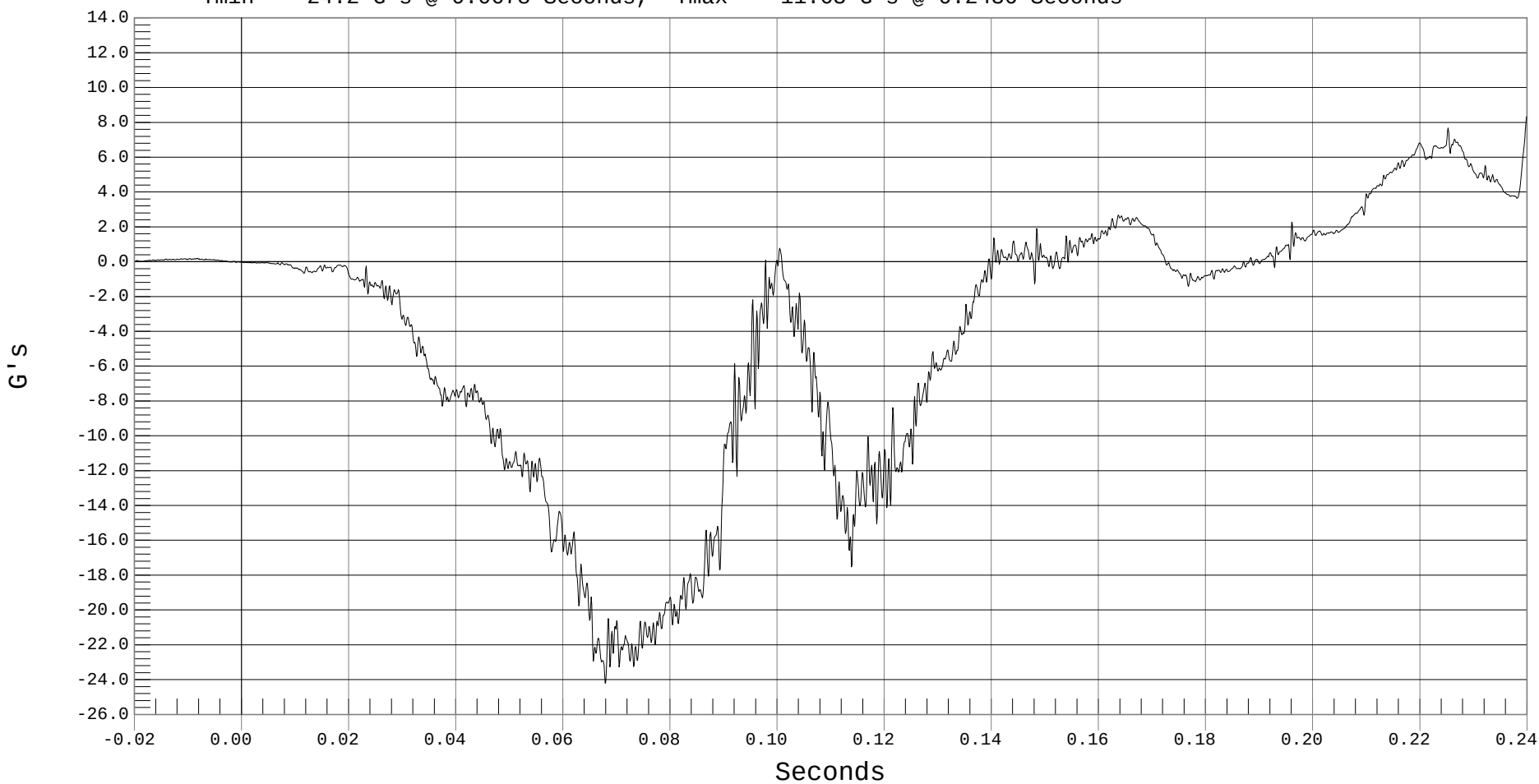
LRS 3 YR OLD PELVIS Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS CHILD PELVIS Z, B01043AT.A36

Ymin = -24.2 G's @ 0.0678 Seconds, Ymax = 11.63 G's @ 0.2436 Seconds





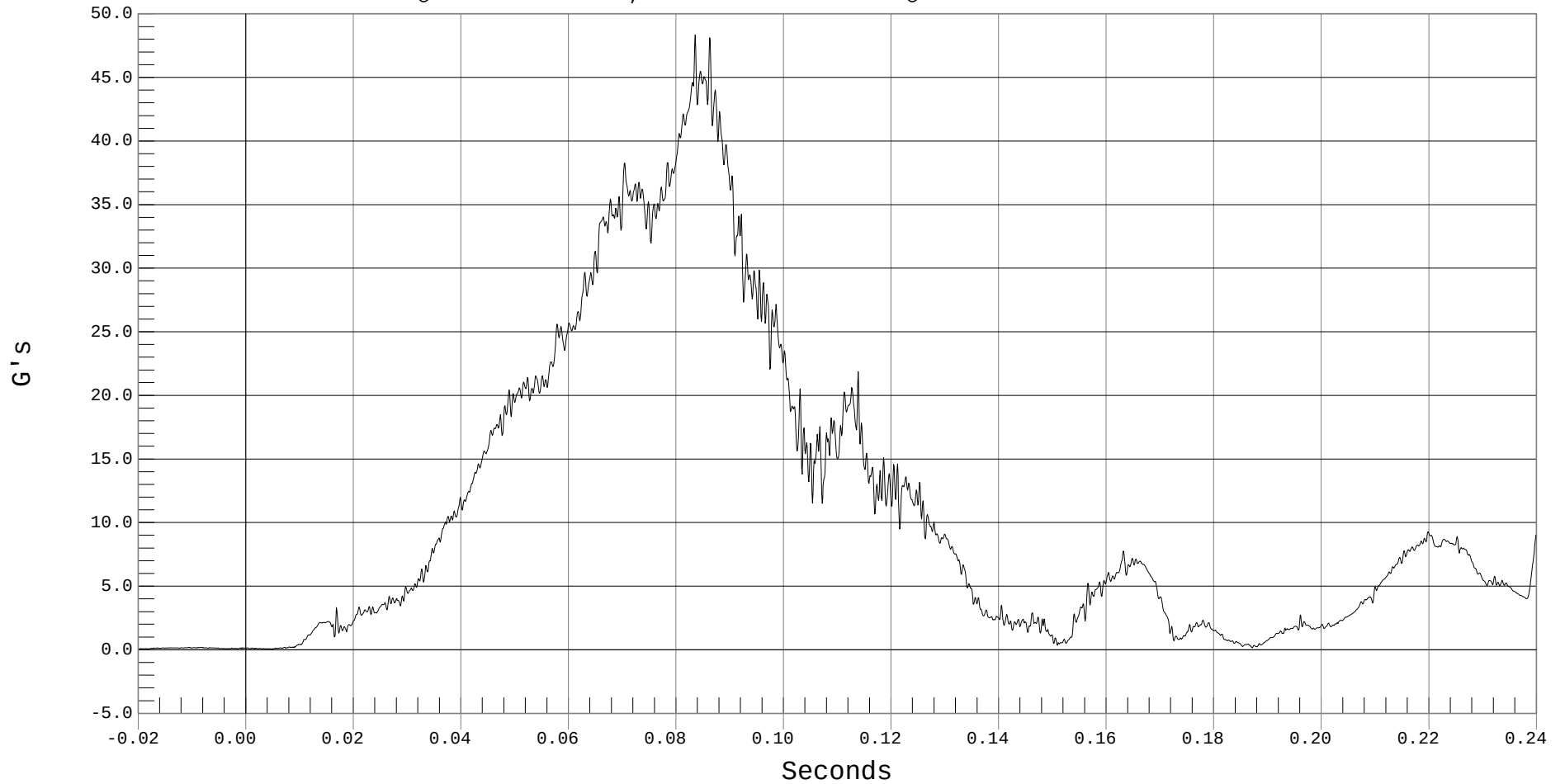
LRS 3 YR OLD PELVIS RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 LRS 3 YR OLD PELVIS RESULTANT ACCELERATION, B01043AV.A34

Ymin = .06 G's @ 0.0050 Seconds, Ymax = 48.35 G's @ 0.0835 Seconds





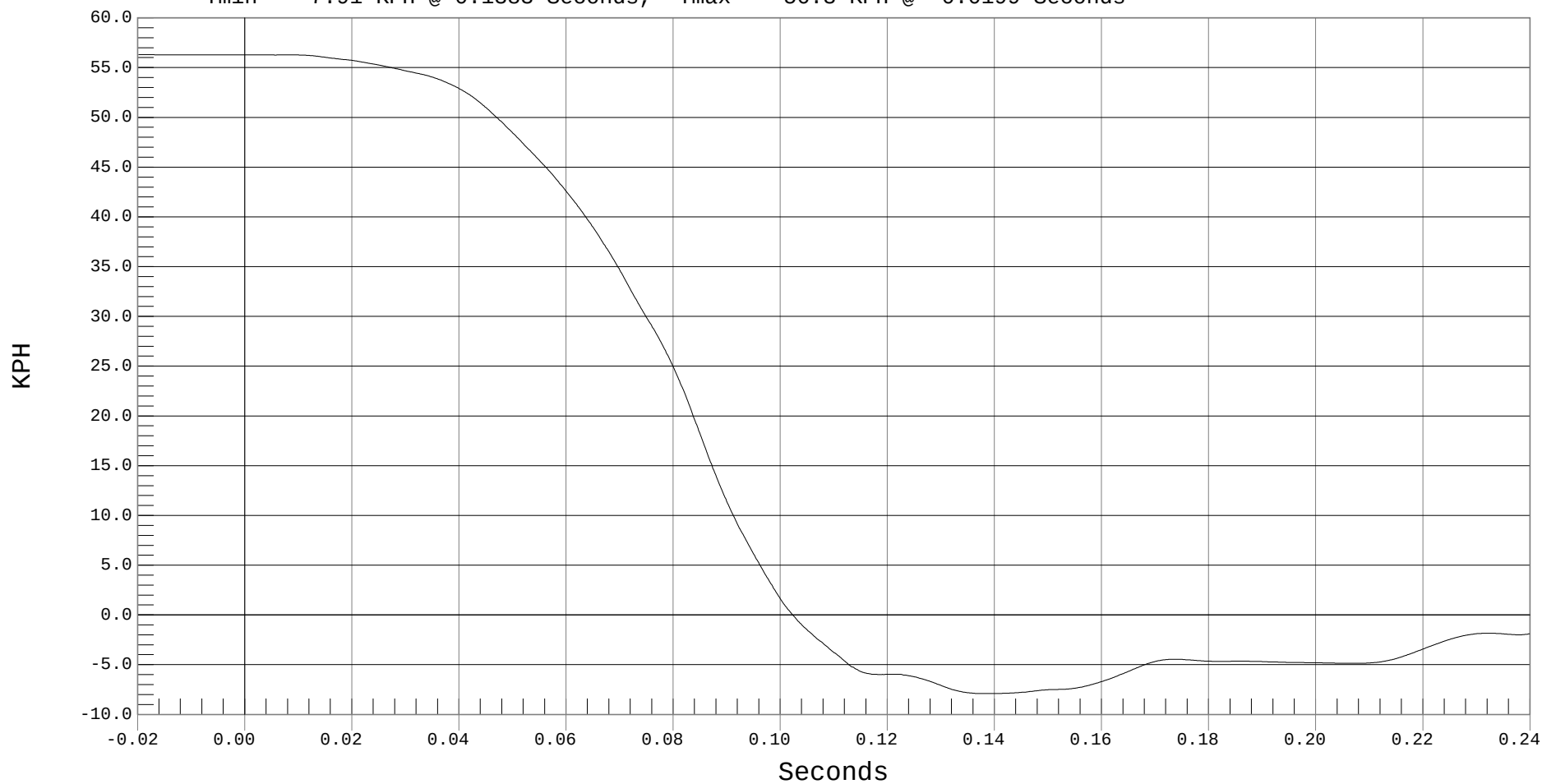
LRS 3 YR OLD PELVIS X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 3 YR OLD PELVIS X VELOCITY, B01043AI.V34

Ymin = -7.91 KPH @ 0.1383 Seconds, Ymax = 56.3 KPH @ -0.0199 Seconds





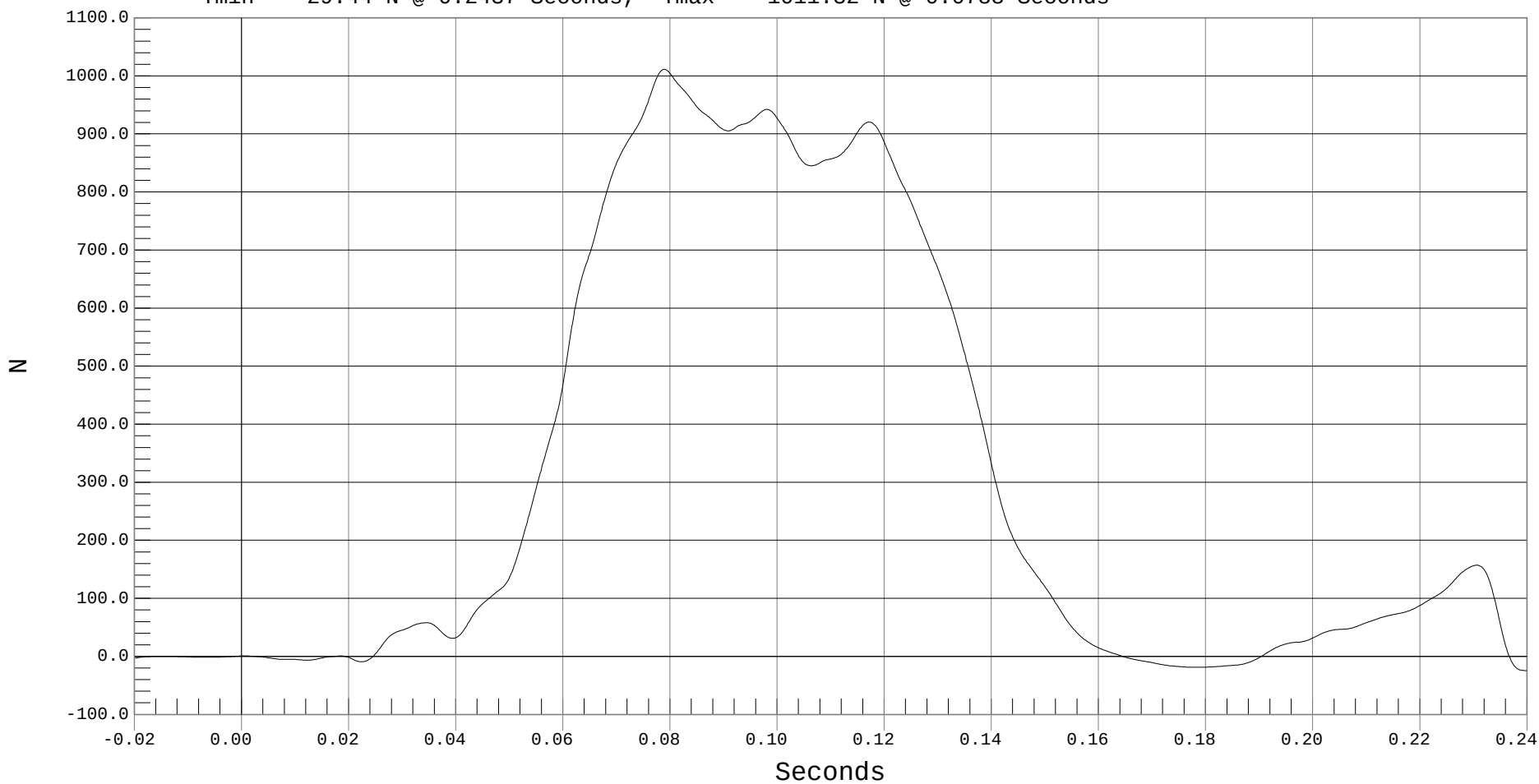
LRS TETHER FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 LRS TETHER FORCE, B01043FF.F62

Ymin = -29.44 N @ 0.2437 Seconds, Ymax = 1011.32 N @ 0.0788 Seconds





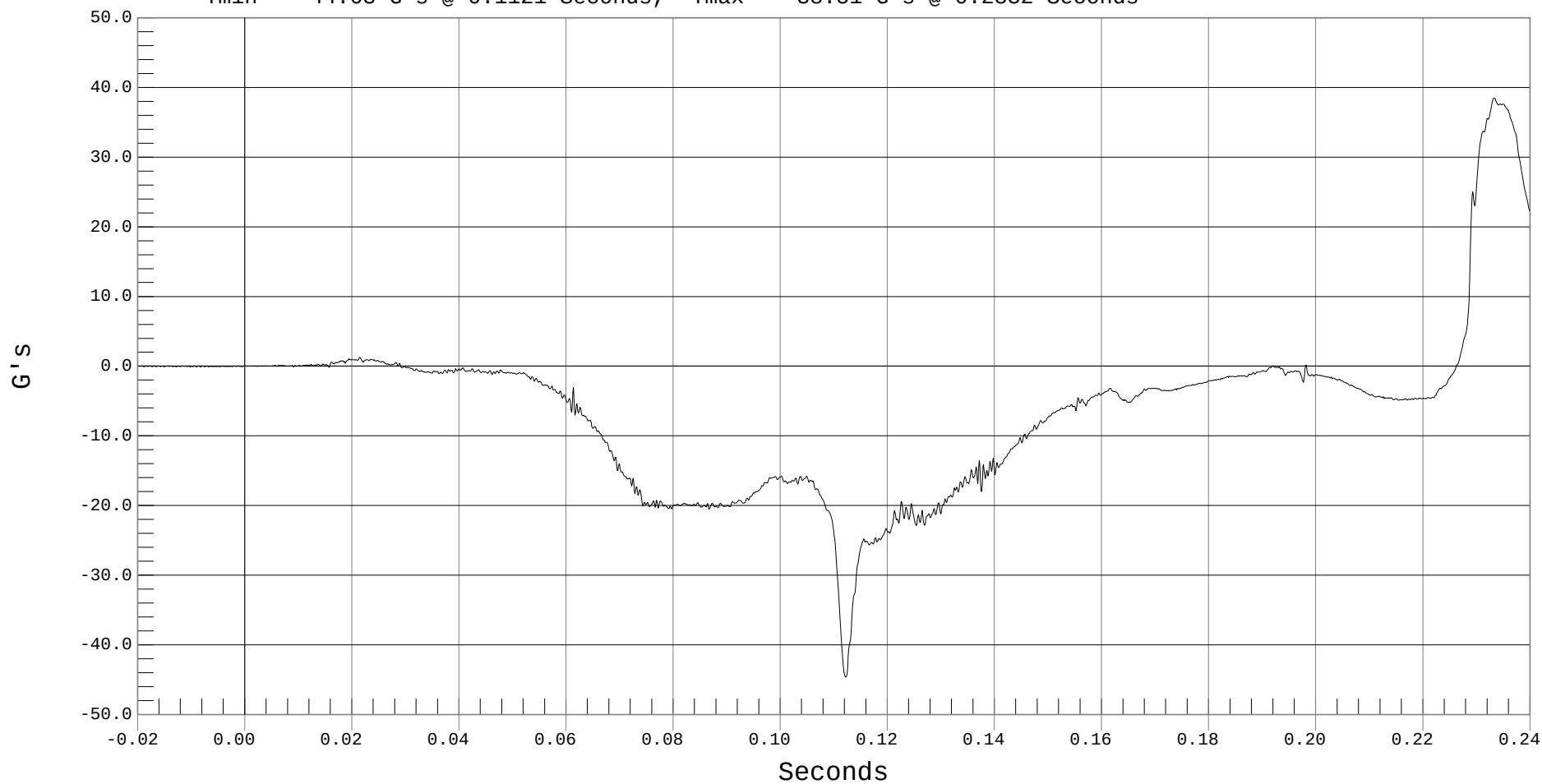
RRS 3 YR OLD HEAD X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD HEAD X, B01043AT.A37

Ymin = -44.63 G's @ 0.1121 Seconds, Ymax = 38.51 G's @ 0.2332 Seconds





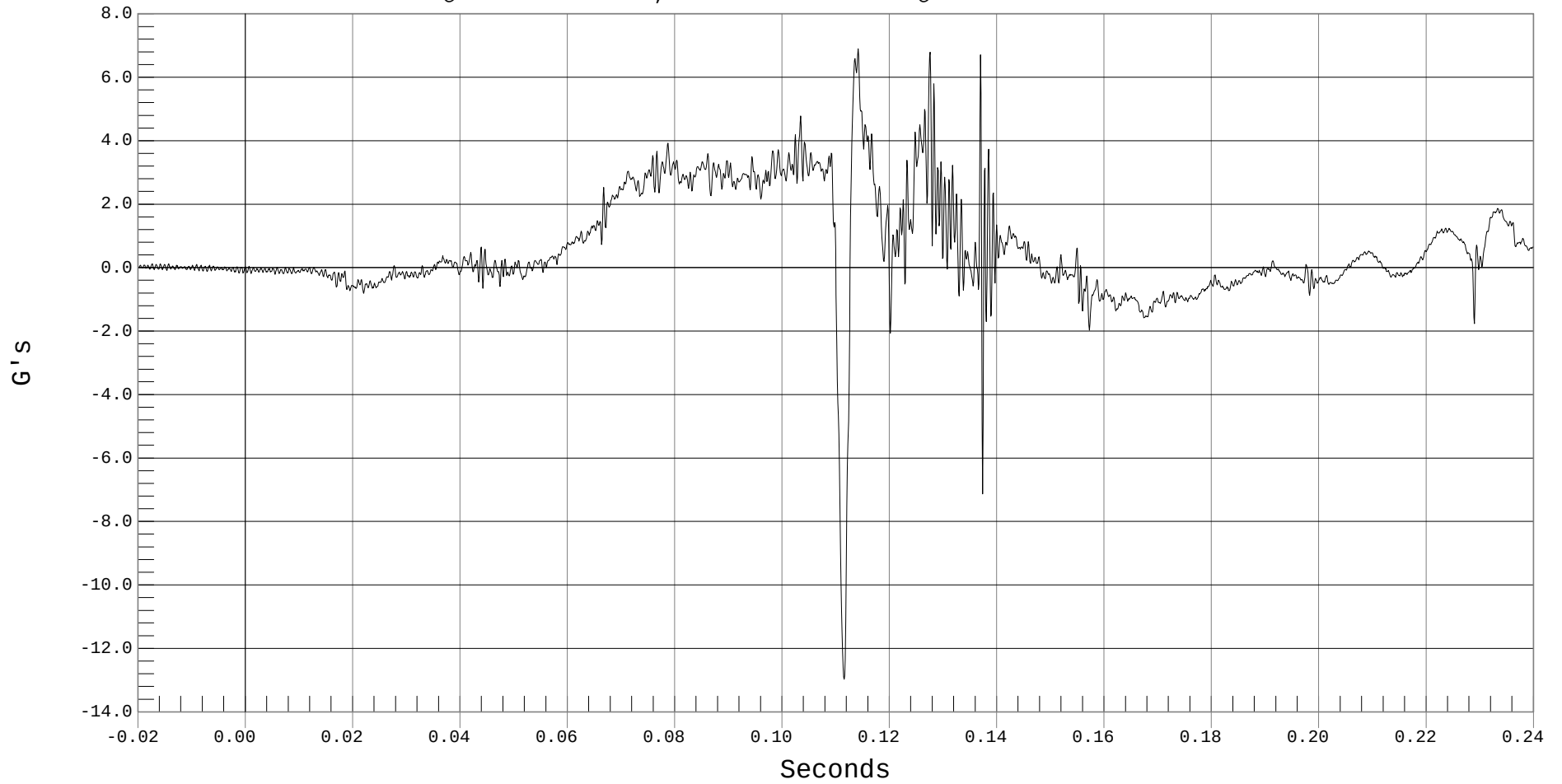
RRS 3 YR OLD HEAD Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD HEAD Y, B01043AT.A38

Ymin = -12.97 G's @ 0.1115 Seconds, Ymax = 6.89 G's @ 0.1141 Seconds





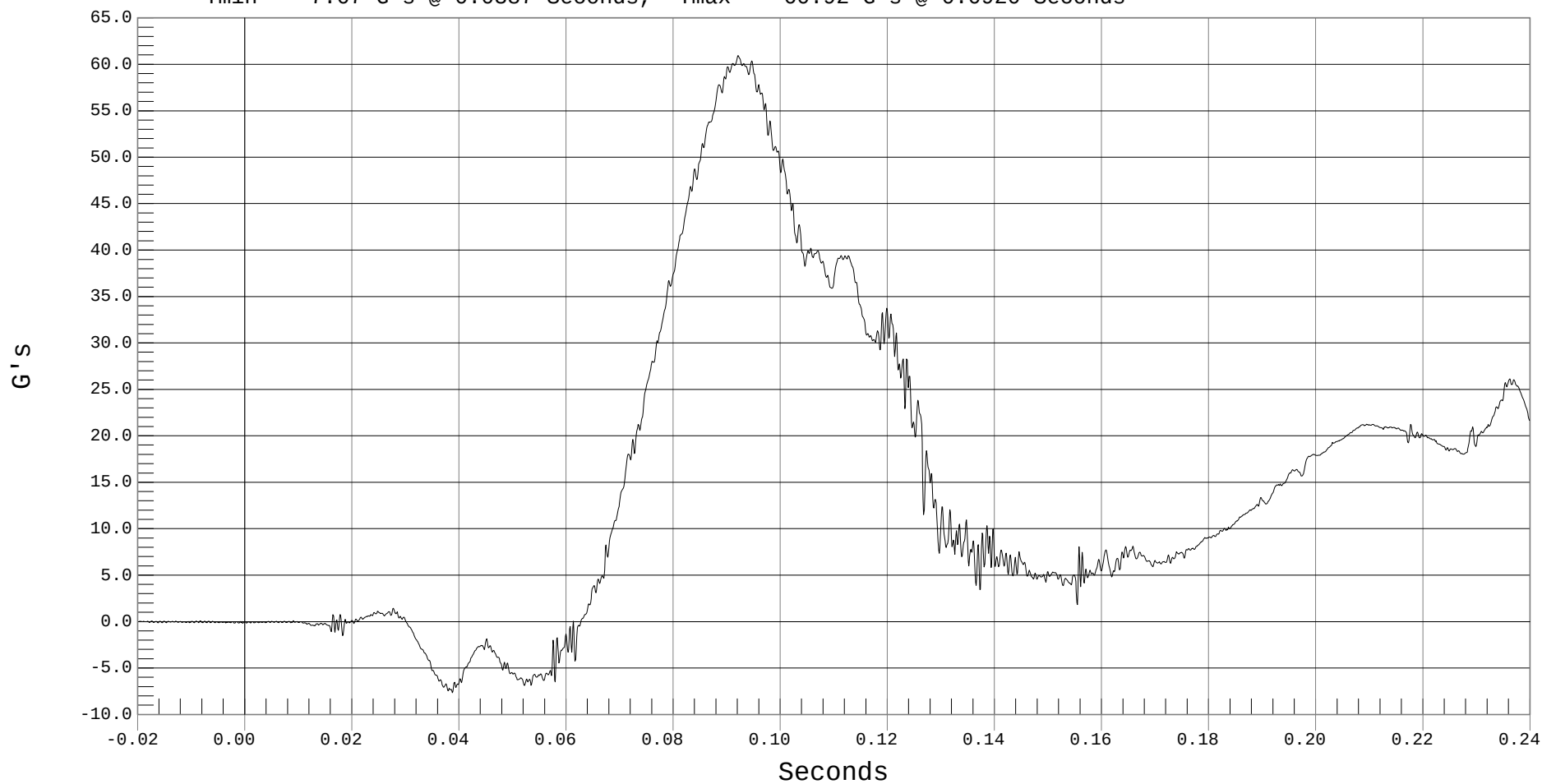
RRS 3 YR OLD HEAD Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD HEAD Z, B01043AT.A39

Ymin = -7.67 G's @ 0.0387 Seconds, Ymax = 60.92 G's @ 0.0920 Seconds





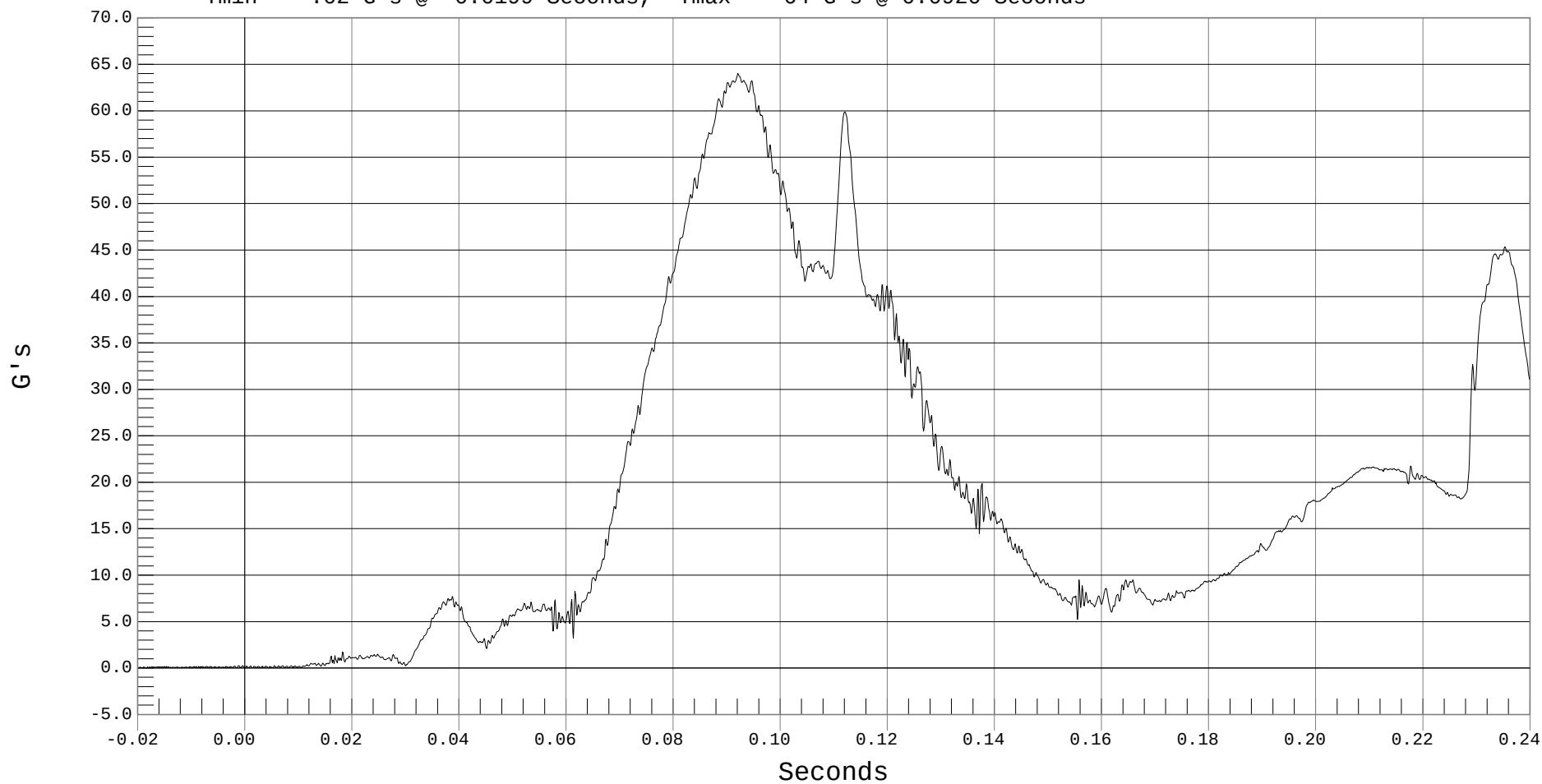
RRS 3 YR OLD HEAD RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS 3 YR OLD HEAD RESULTANT ACCELERATION, B01043AV.A37

Ymin = .02 G's @ -0.0199 Seconds, Ymax = 64 G's @ 0.0920 Seconds





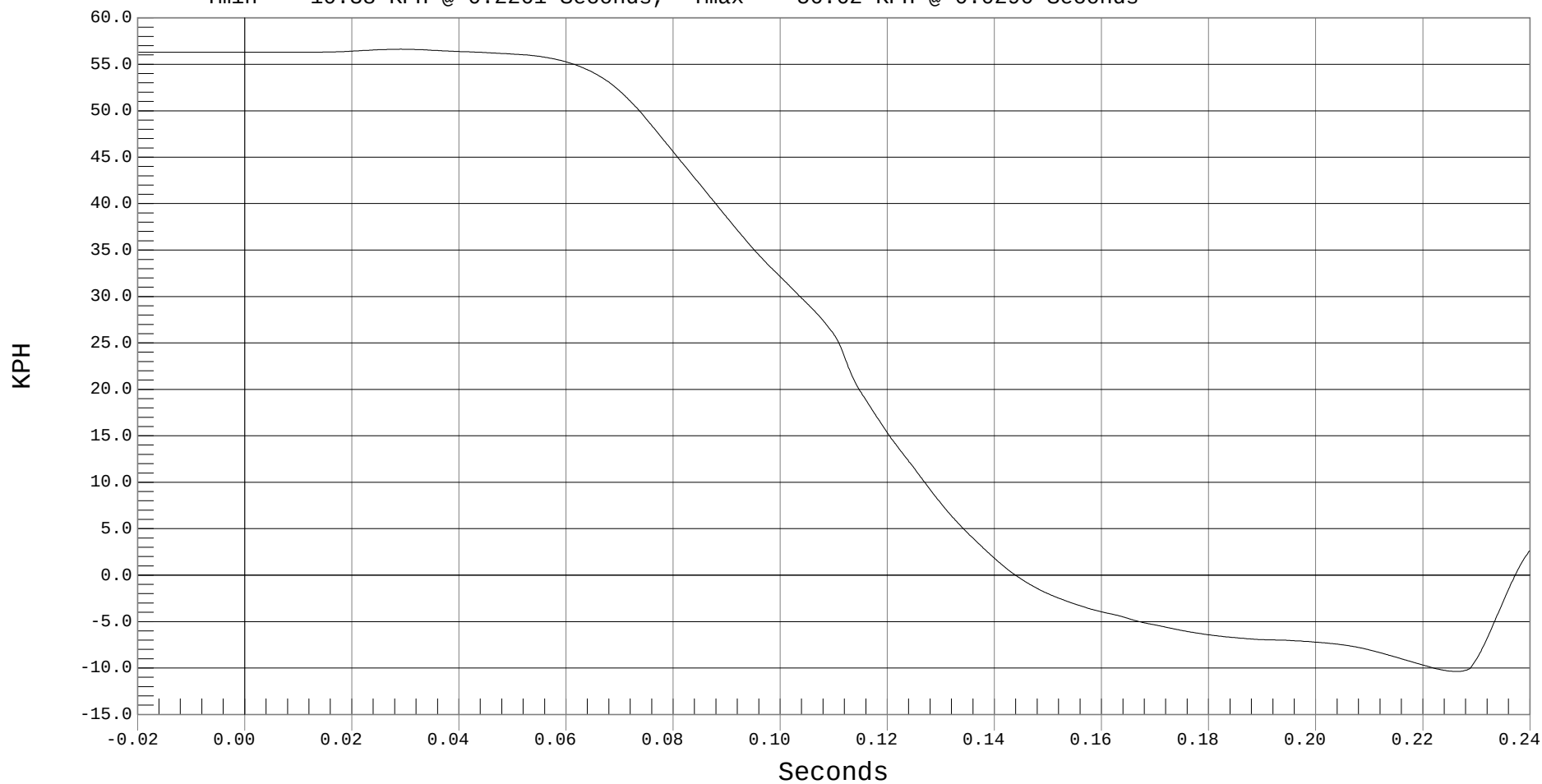
RRS 3 YR OLD HEAD X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

1 RRS 3 YR OLD HEAD X VELOCITY, B01043AI.V37

Ymin = -10.38 KPH @ 0.2261 Seconds, Ymax = 56.62 KPH @ 0.0290 Seconds





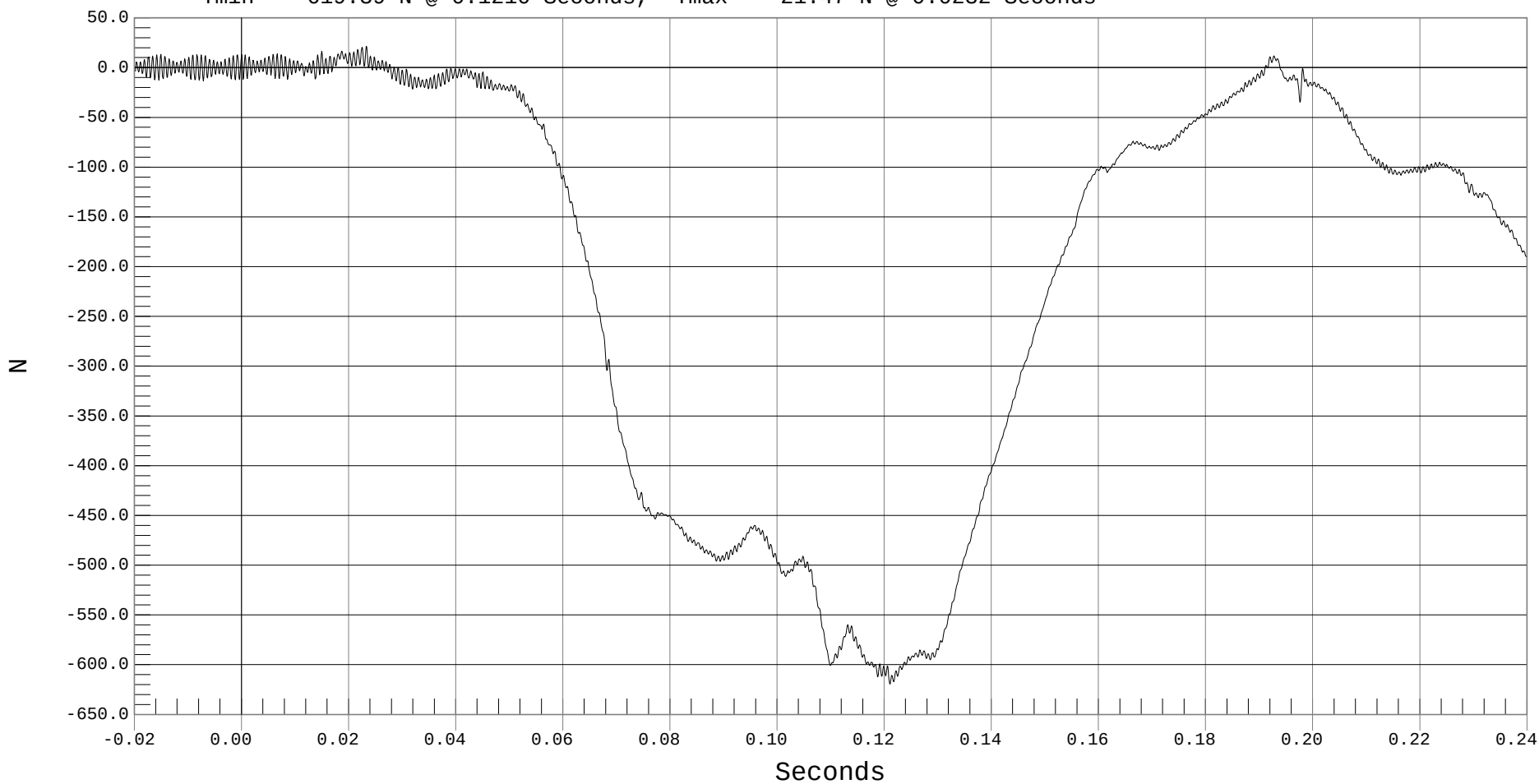
RRS 3 YR OLD UPPER NECK FORCE X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD UPPER NECK FORCE X, B01043FT.F40

Ymin = -619.39 N @ 0.1210 Seconds, Ymax = 21.47 N @ 0.0232 Seconds





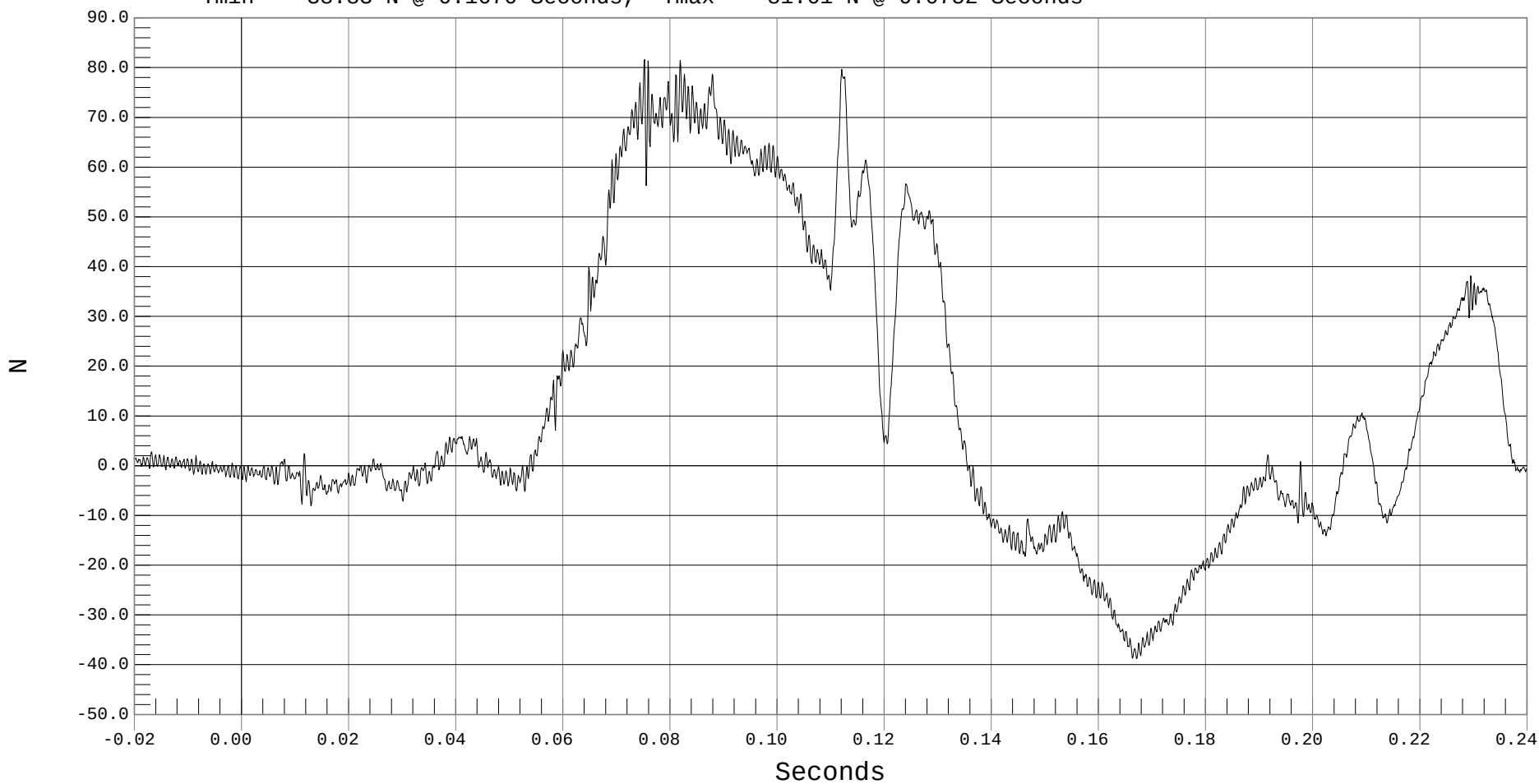
RRS 3 YR OLD UPPER NECK FORCE Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD UPPER NECK FORCE Y, B01043FT.F41

Ymin = -38.83 N @ 0.1670 Seconds, Ymax = 81.61 N @ 0.0752 Seconds





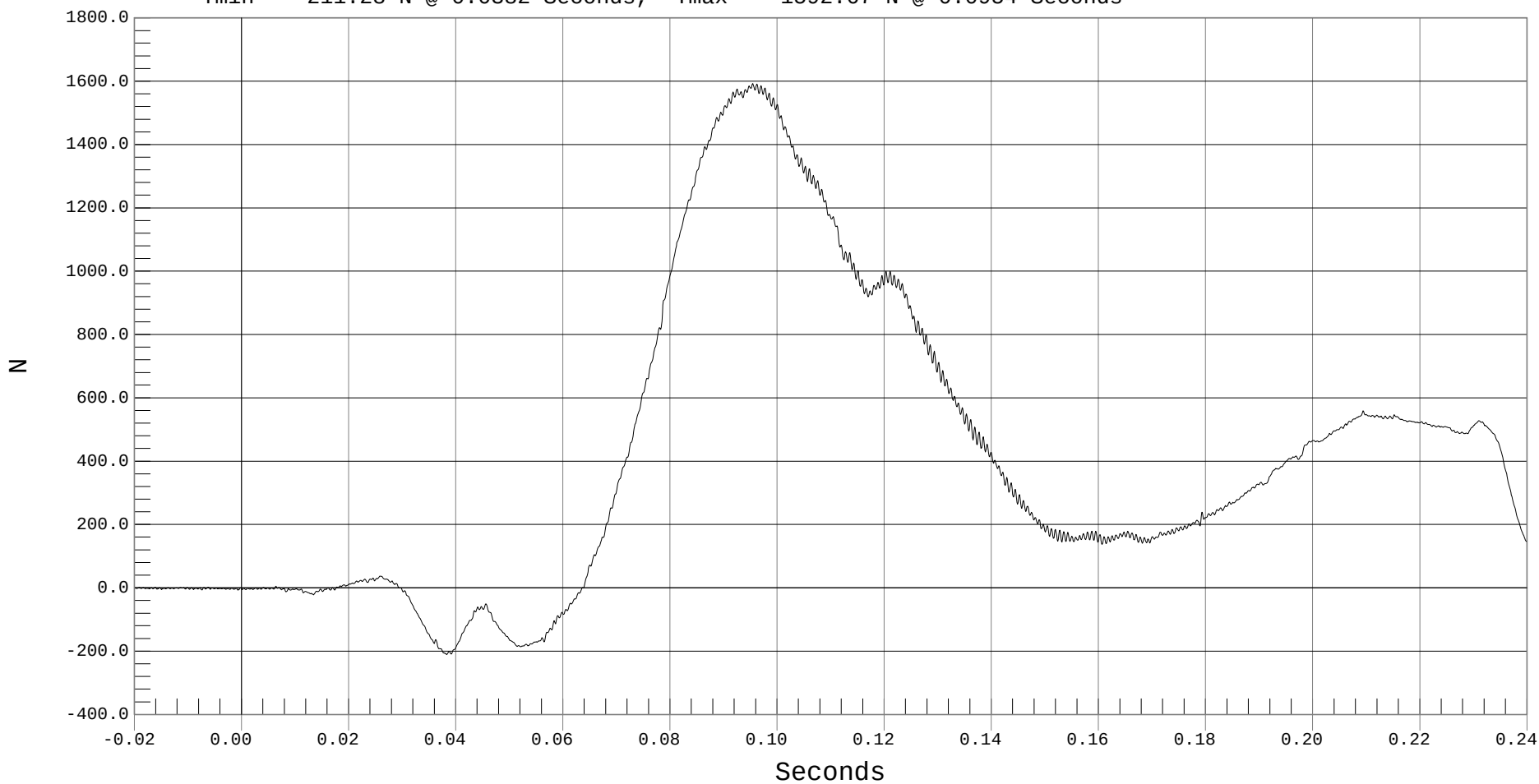
RRS 3 YR OLD UPPER NECK FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD UPPER NECK FORCE Z, B01043FT.F42

Ymin = -211.28 N @ 0.0382 Seconds, Ymax = 1592.67 N @ 0.0954 Seconds





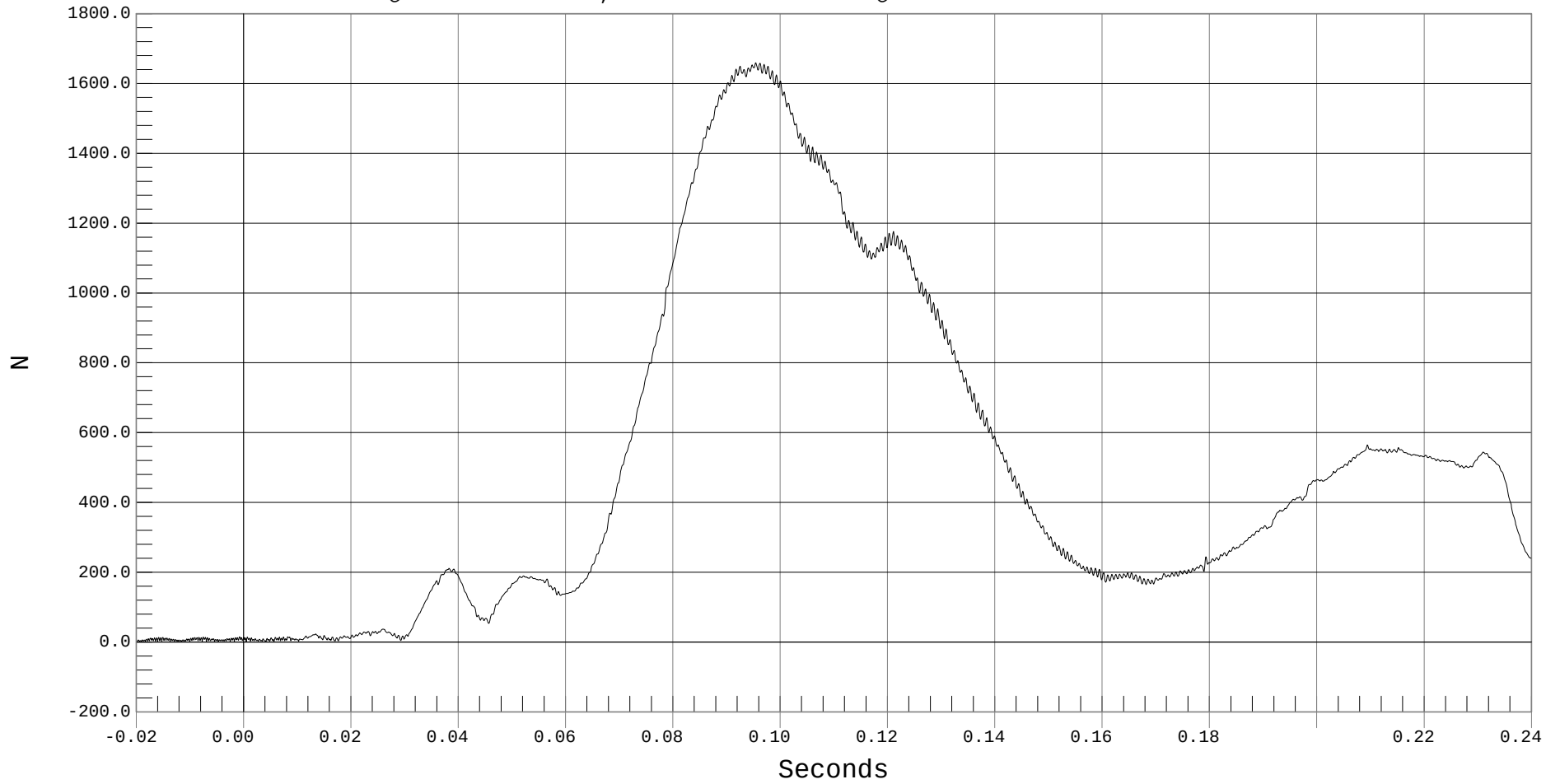
RRS 3 YR OLD UPPER NECK FORCE RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS 3 YR OLD UPPER NECK FORCE RESULTANT, B01043FV.F40

Ymin = .58 N @ 0.0056 Seconds, Ymax = 1659.97 N @ 0.0954 Seconds





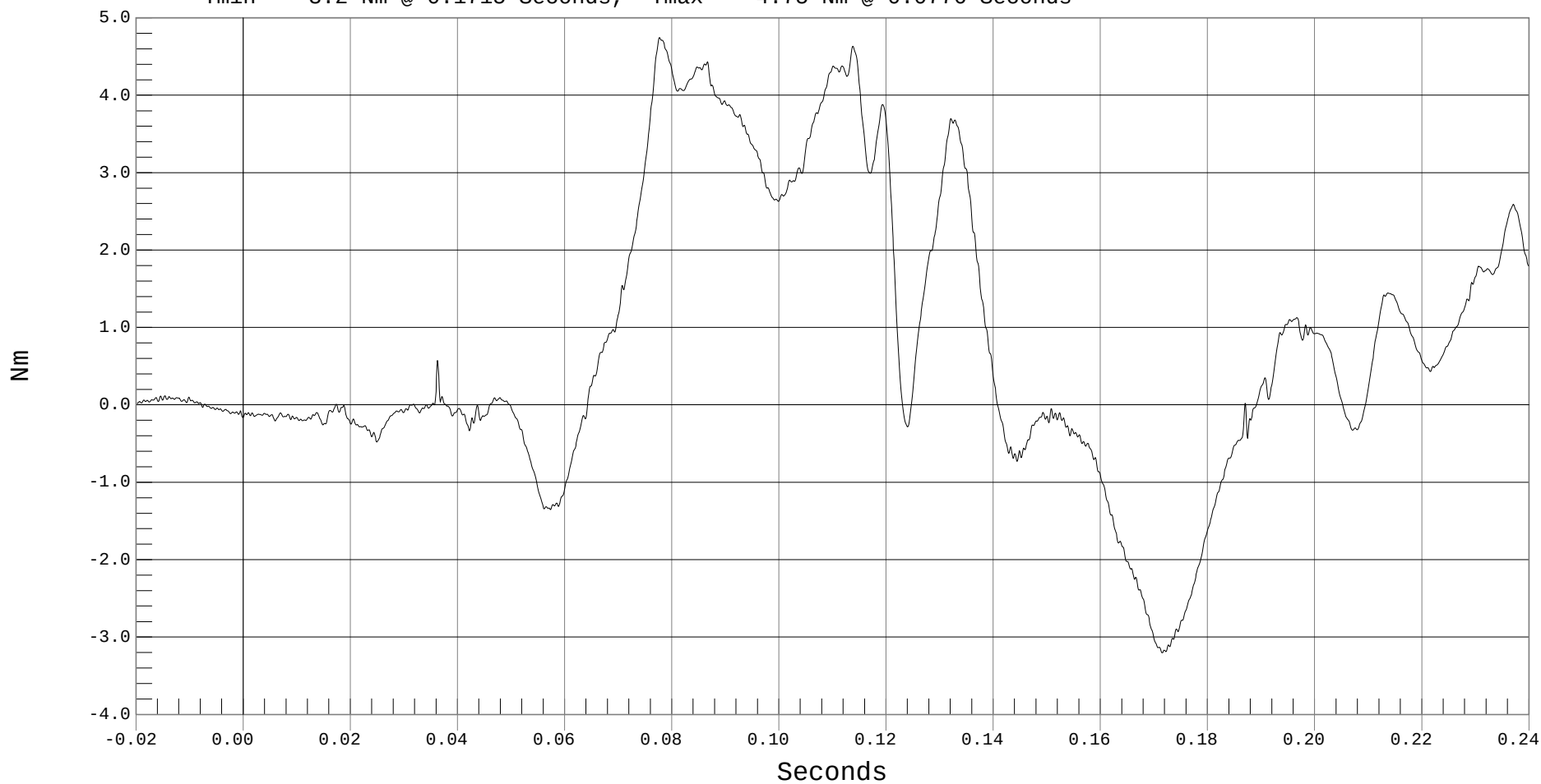
RRS 3 YR OLD UPPER NECK MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 RRS CHILD UPPER NECK MOMENT X, B01043MF.M43

Ymin = -3.2 Nm @ 0.1715 Seconds, Ymax = 4.75 Nm @ 0.0776 Seconds





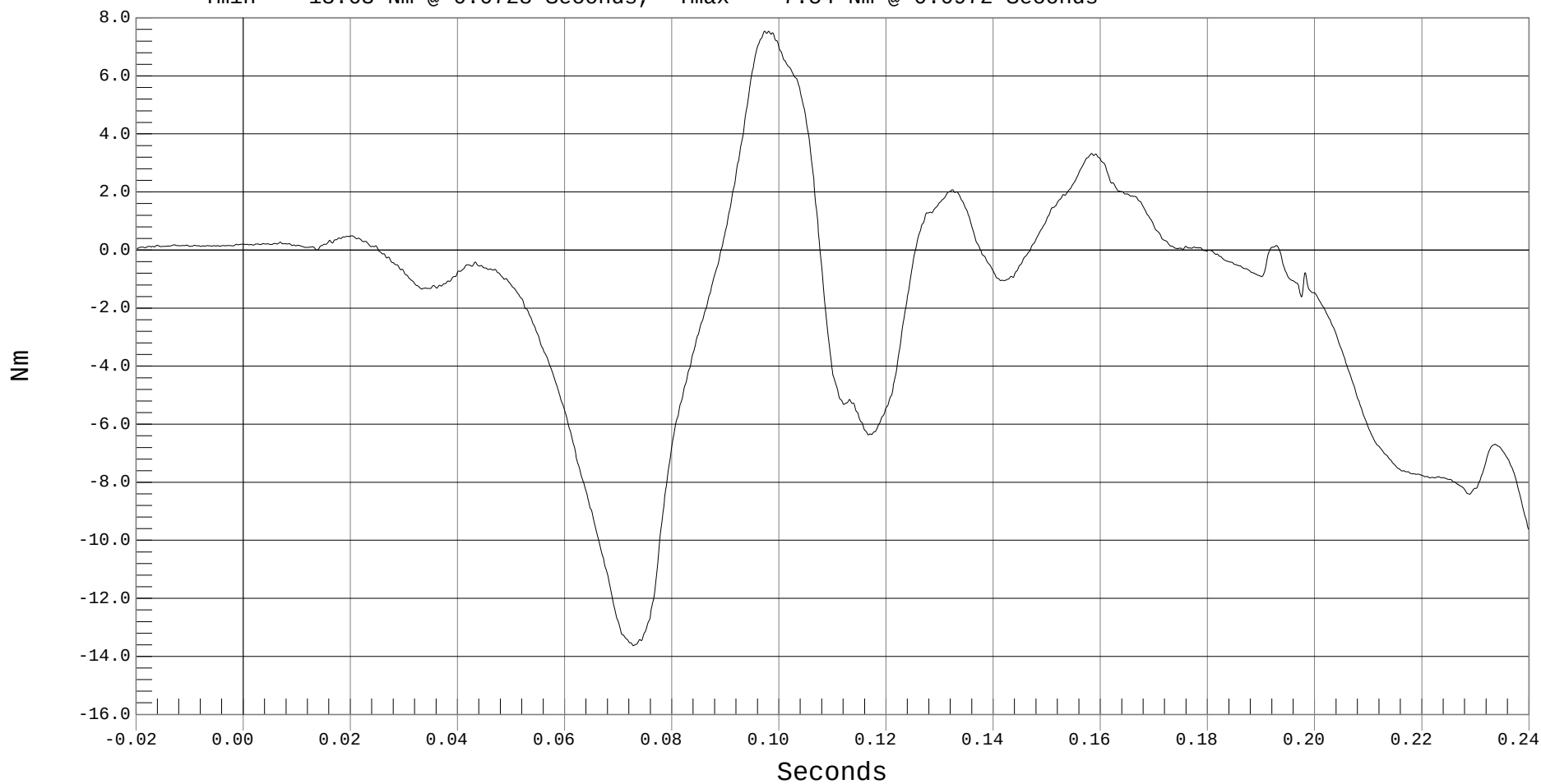
RRS 3 YR OLD UPPER NECK MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 RRS CHILD UPPER NECK MOMENT Y, B01043MF.M44

Ymin = -13.63 Nm @ 0.0728 Seconds, Ymax = 7.54 Nm @ 0.0972 Seconds





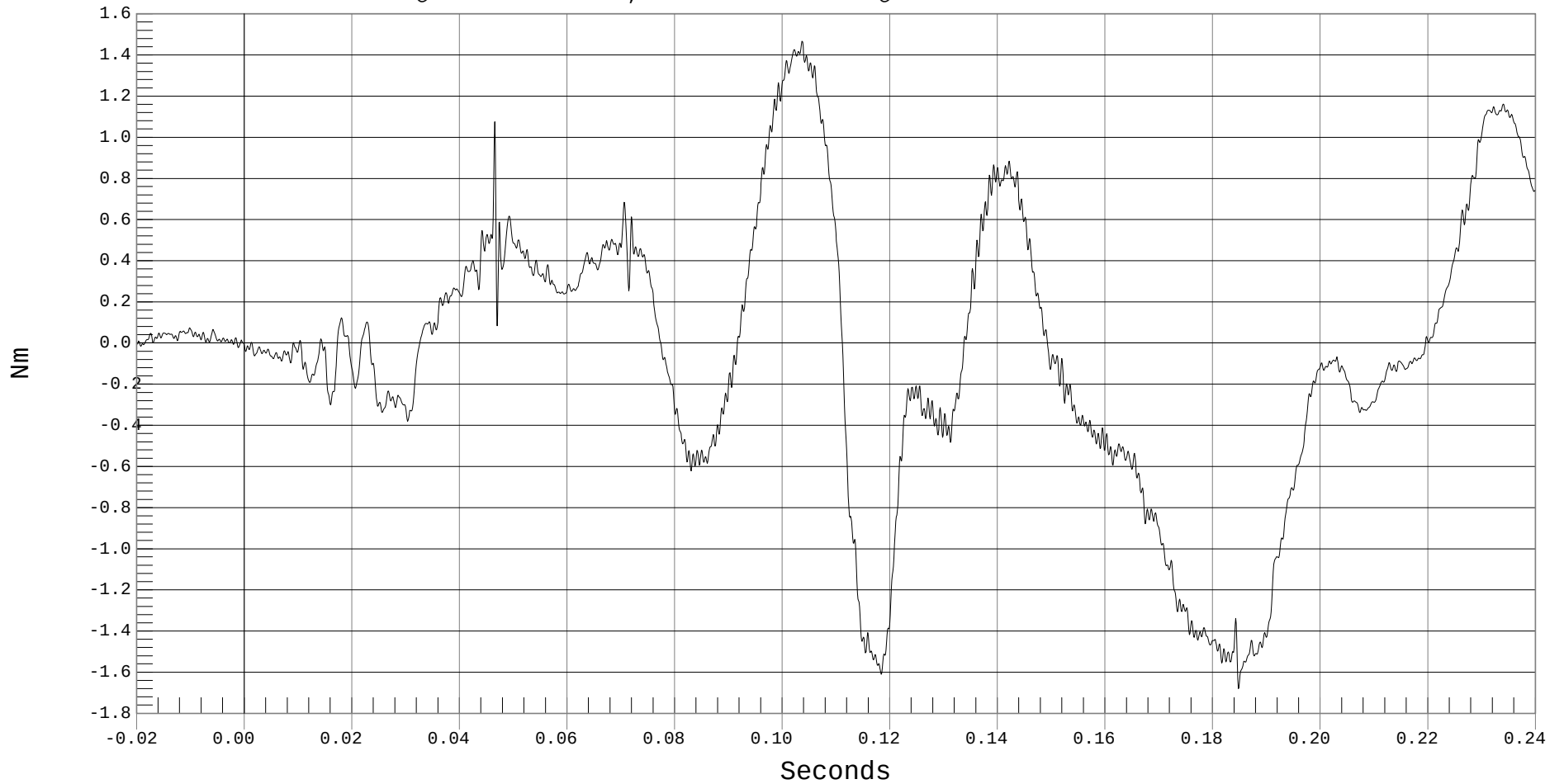
RRS 3 YR OLD UPPER NECK MOMENT Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 RRS CHILD UPPER NECK MOMENT Z, B01043MF.M45

Ymin = -1.68 Nm @ 0.1847 Seconds, Ymax = 1.47 Nm @ 0.1036 Seconds





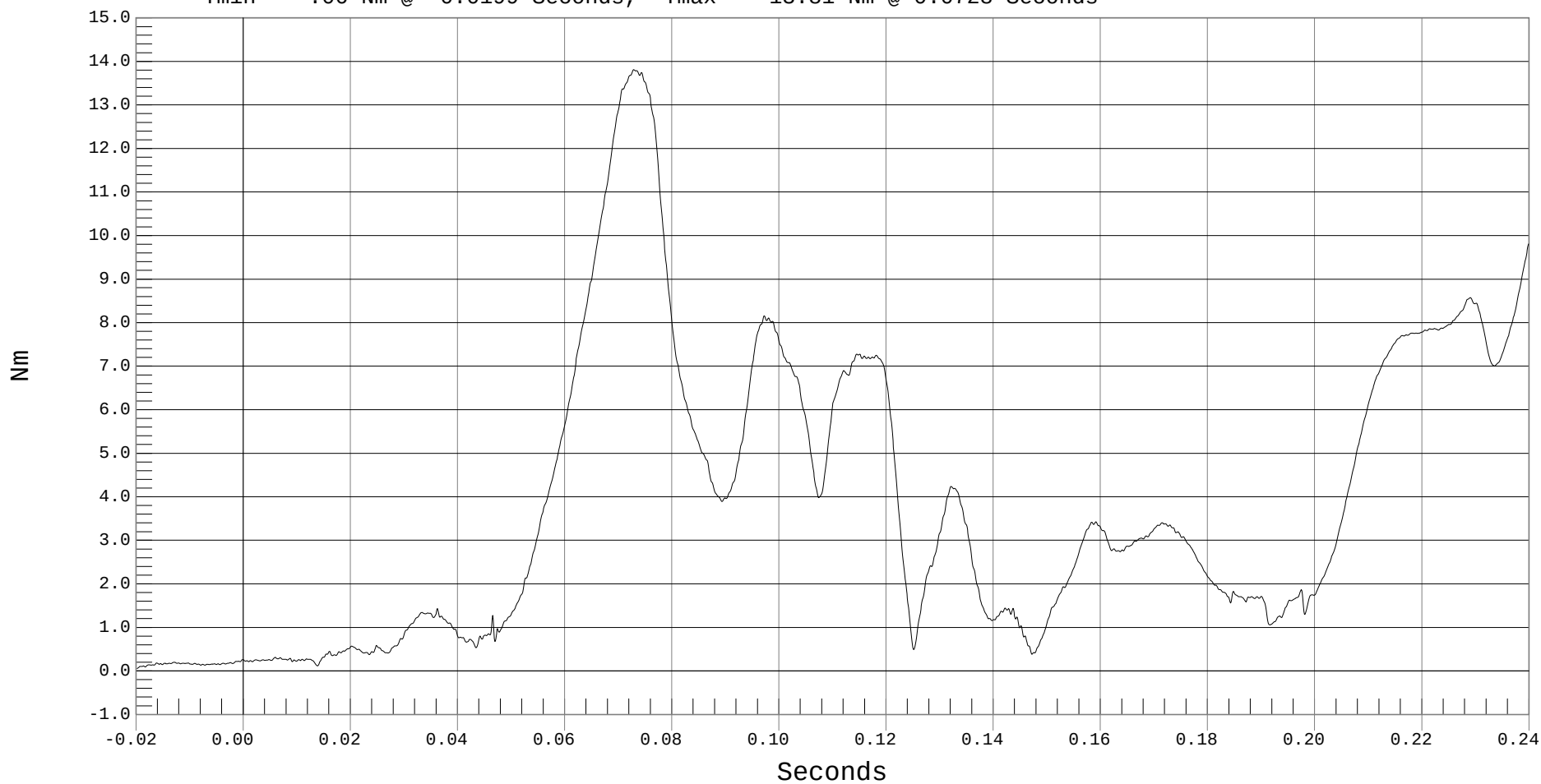
RRS 3 YR OLD UPPER NECK MOMENT RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

1 RRS 3 YR OLD UPPER NECK MOMENT RESULTANT, B01043MV.M43

Ymin = .06 Nm @ -0.0199 Seconds, Ymax = 13.81 Nm @ 0.0728 Seconds





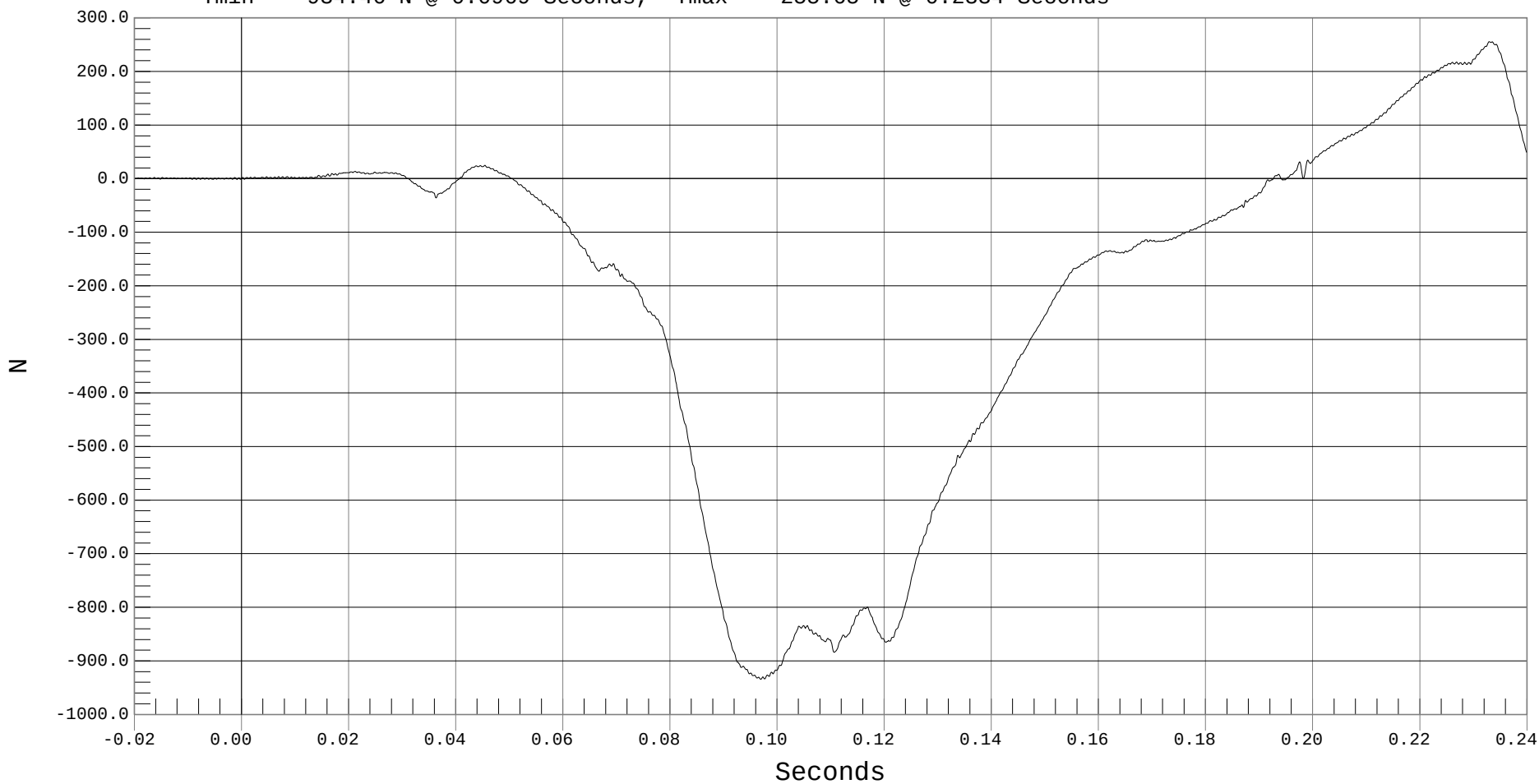
RRS 3 YR OLD LOWER NECK FORCE X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD LOWER NECK FORCE X, B01043FT.F46

Ymin = -934.46 N @ 0.0969 Seconds, Ymax = 255.65 N @ 0.2334 Seconds





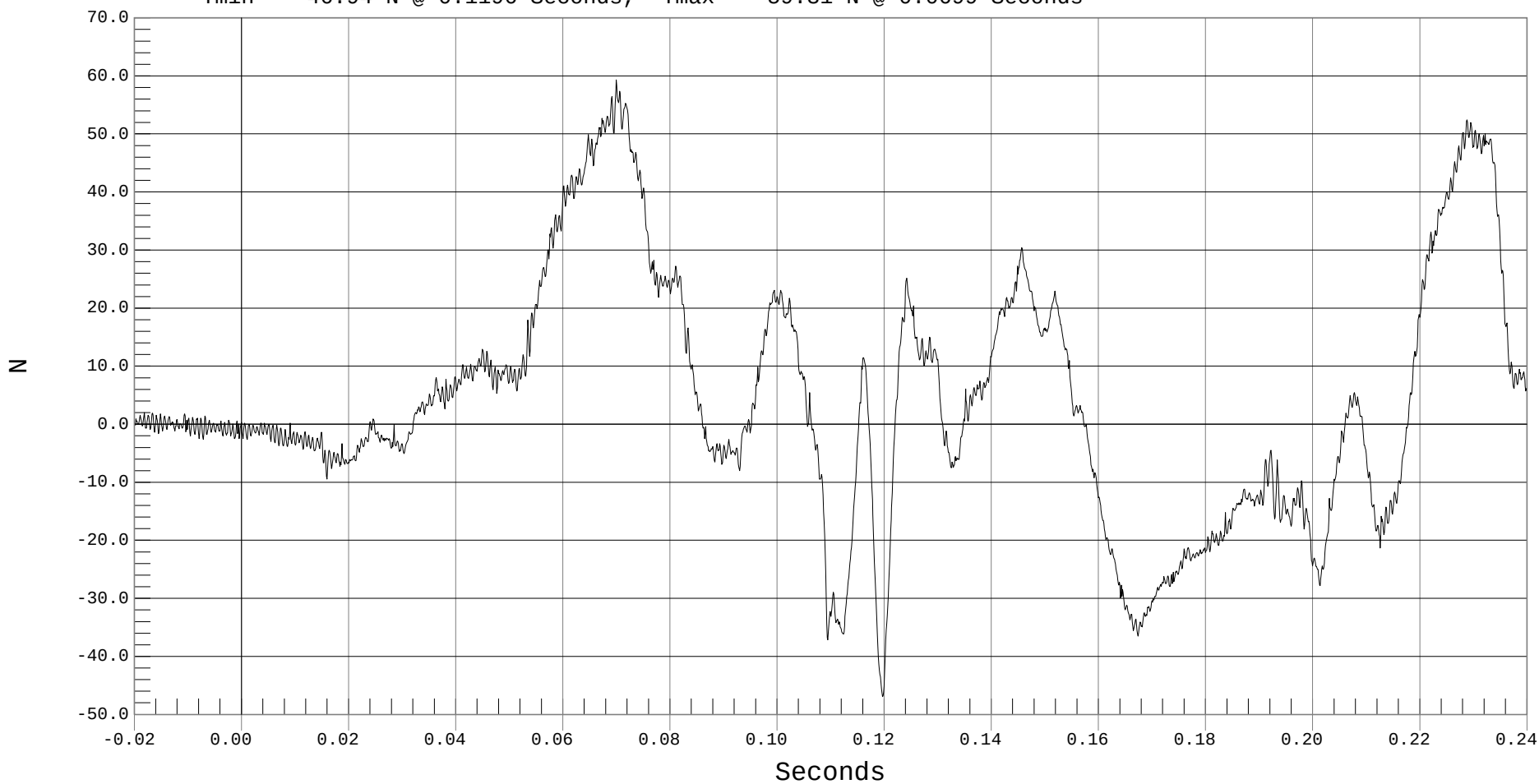
RRS 3 YR OLD LOWER NECK FORCE Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD LOWER NECK FORCE Y, B01043FT.F47

Ymin = -46.94 N @ 0.1196 Seconds, Ymax = 59.31 N @ 0.0699 Seconds





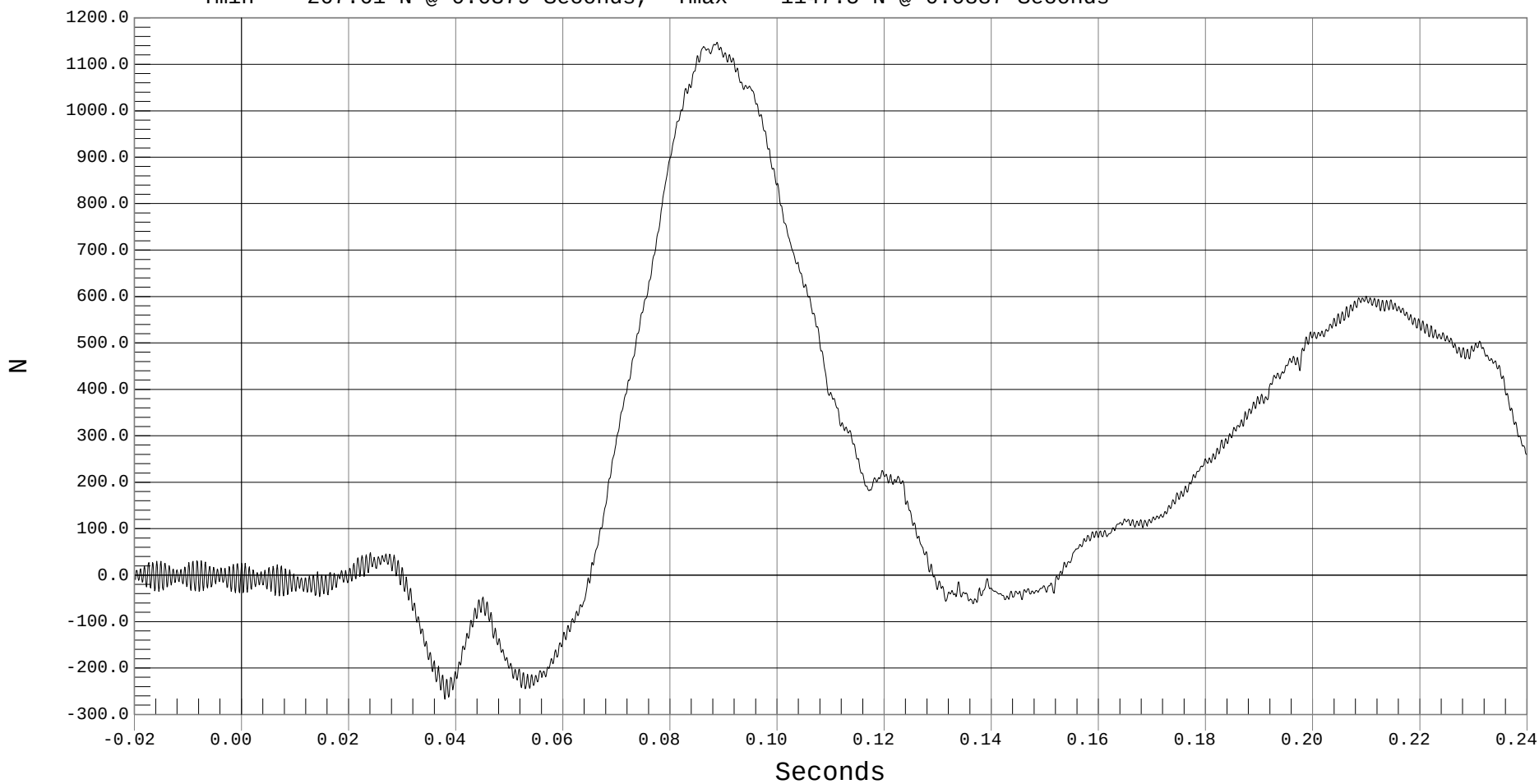
RRS 3 YR OLD LOWER NECK FORCE Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD LOWER NECK FORCE Z, B01043FT.F48

Ymin = -267.61 N @ 0.0379 Seconds, Ymax = 1147.5 N @ 0.0887 Seconds





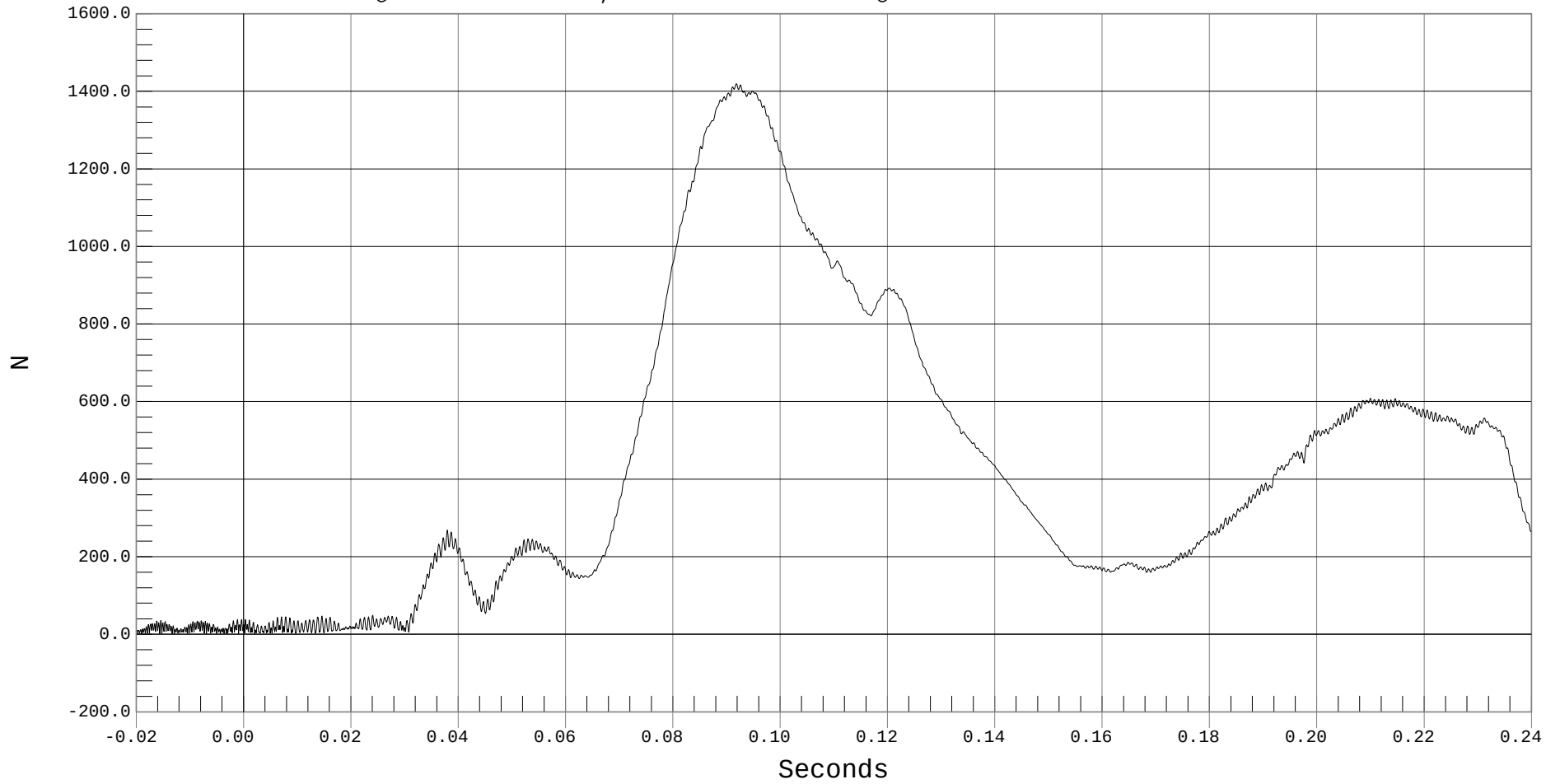
RRS 3 YR OLD LOWER NECK FORCE RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS 3 YR OLD LOWER NECK FORCE RESULTANT, B01043FV.F46

Ymin = .5 N @ -0.0130 Seconds, Ymax = 1419.77 N @ 0.0917 Seconds





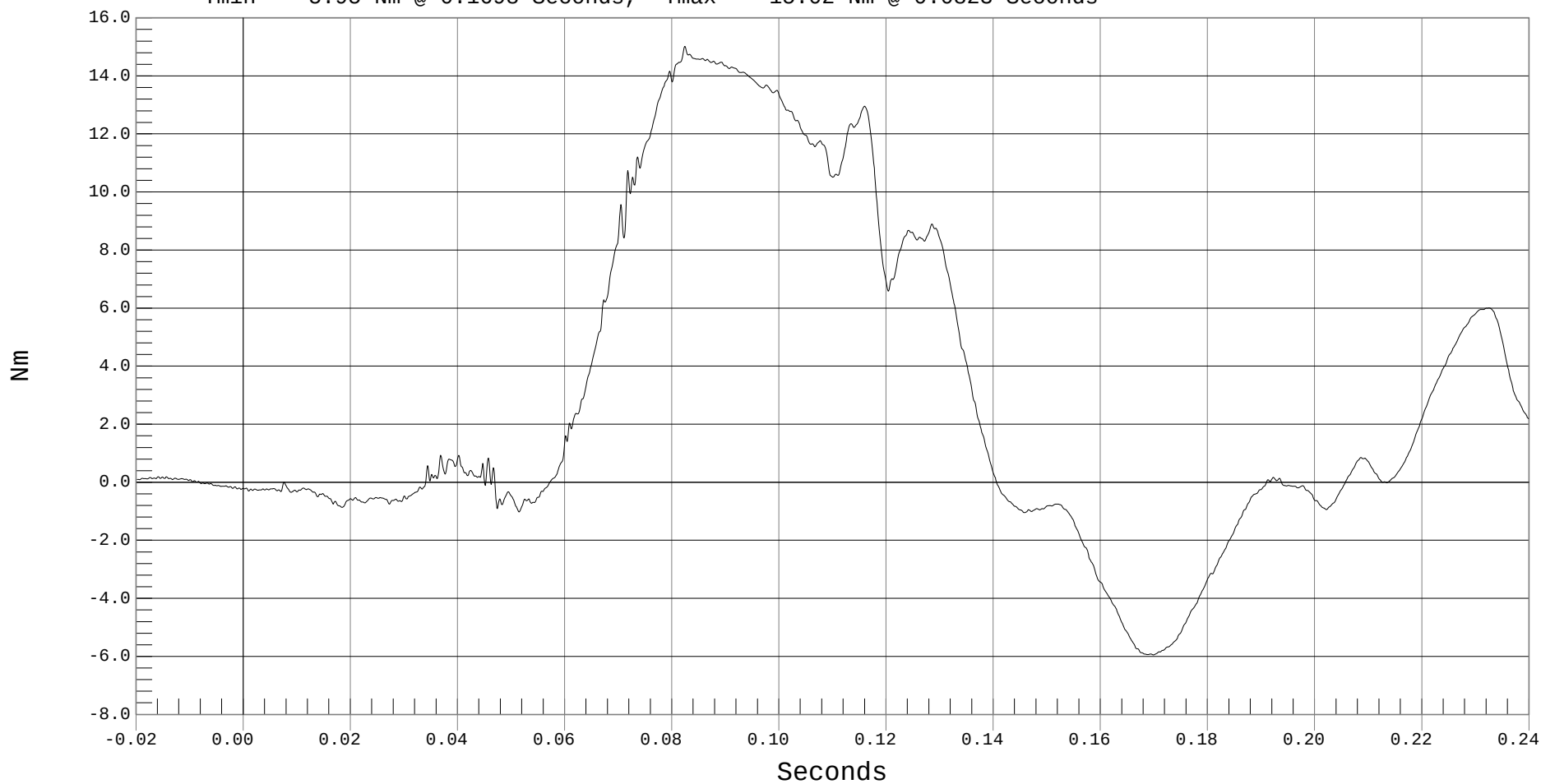
RRS 3 YR OLD LOWER NECK MOMENT X

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 RRS CHILD LOWER NECK MOMENT X, B01043MF.M49

Ymin = -5.95 Nm @ 0.1698 Seconds, Ymax = 15.02 Nm @ 0.0823 Seconds





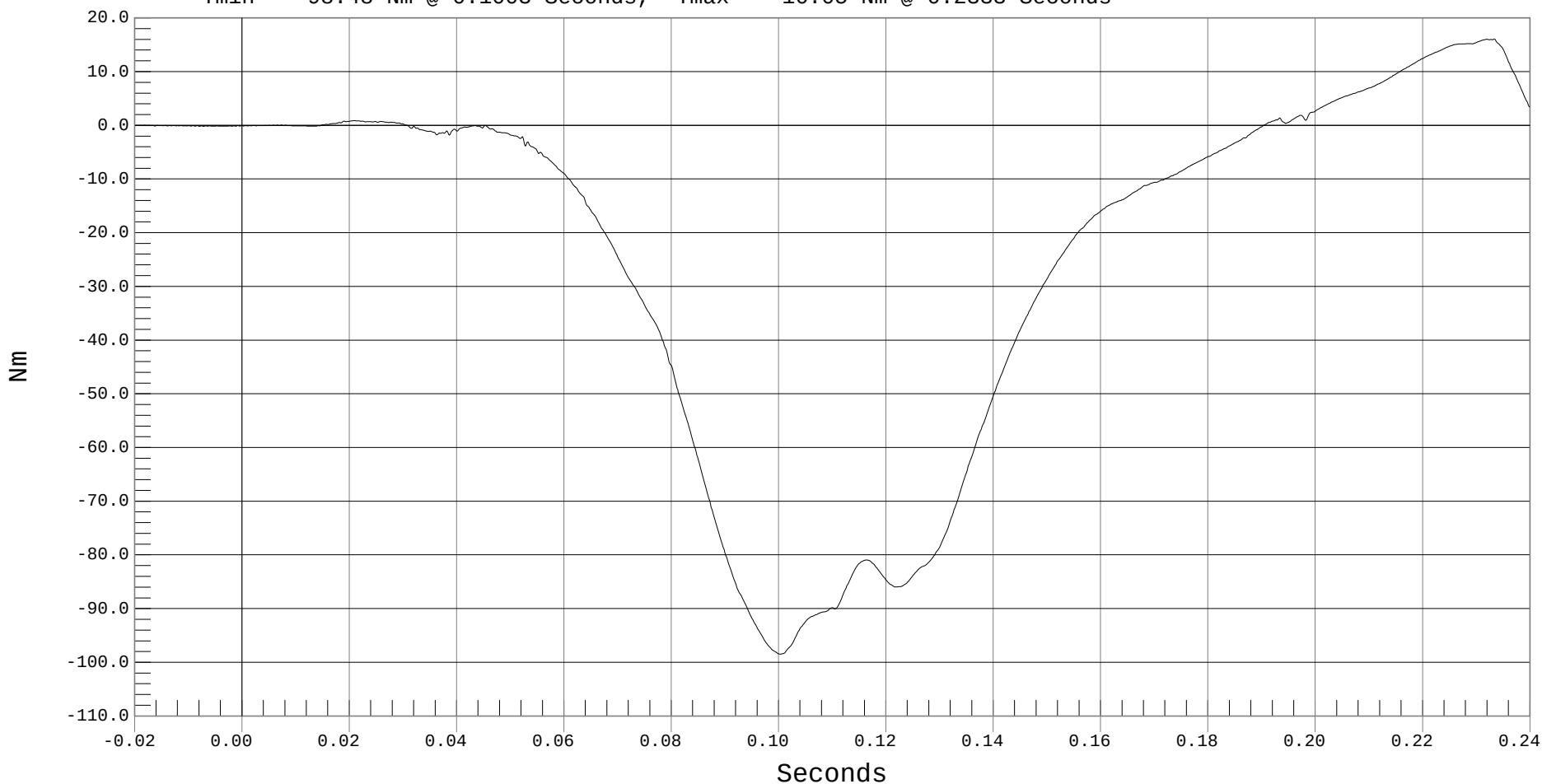
RRS 3 YR OLD LOWER NECK MOMENT Y

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 RRS CHILD LOWER NECK MOMENT Y, B01043MF.M50

Ymin = -98.48 Nm @ 0.1003 Seconds, Ymax = 16.05 Nm @ 0.2333 Seconds





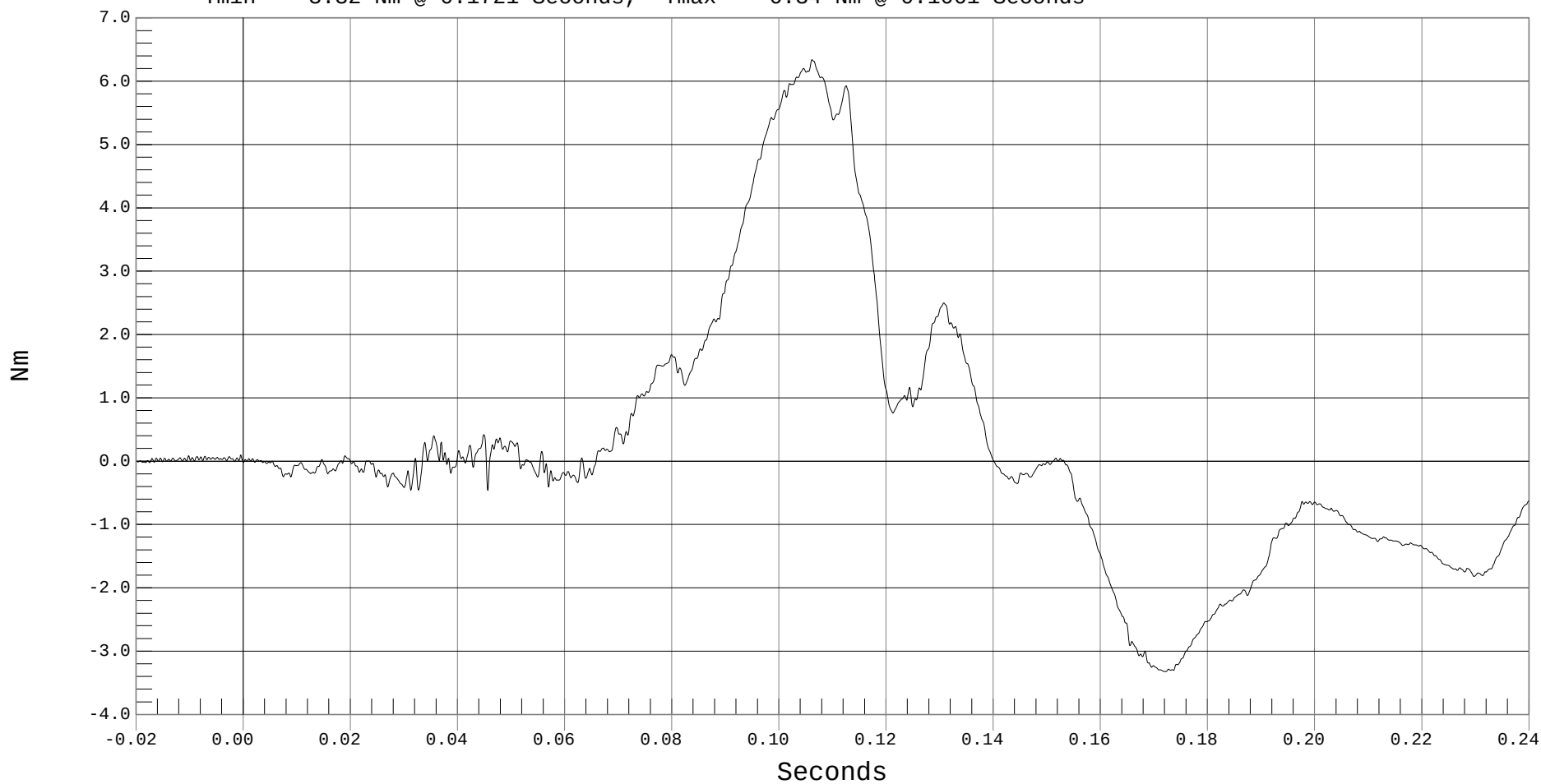
RRS 3 YR OLD LOWER NECK MOMENT Z

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 RRS CHILD LOWER NECK MOMENT Z, B01043MF.M51

Ymin = -3.32 Nm @ 0.1721 Seconds, Ymax = 6.34 Nm @ 0.1061 Seconds





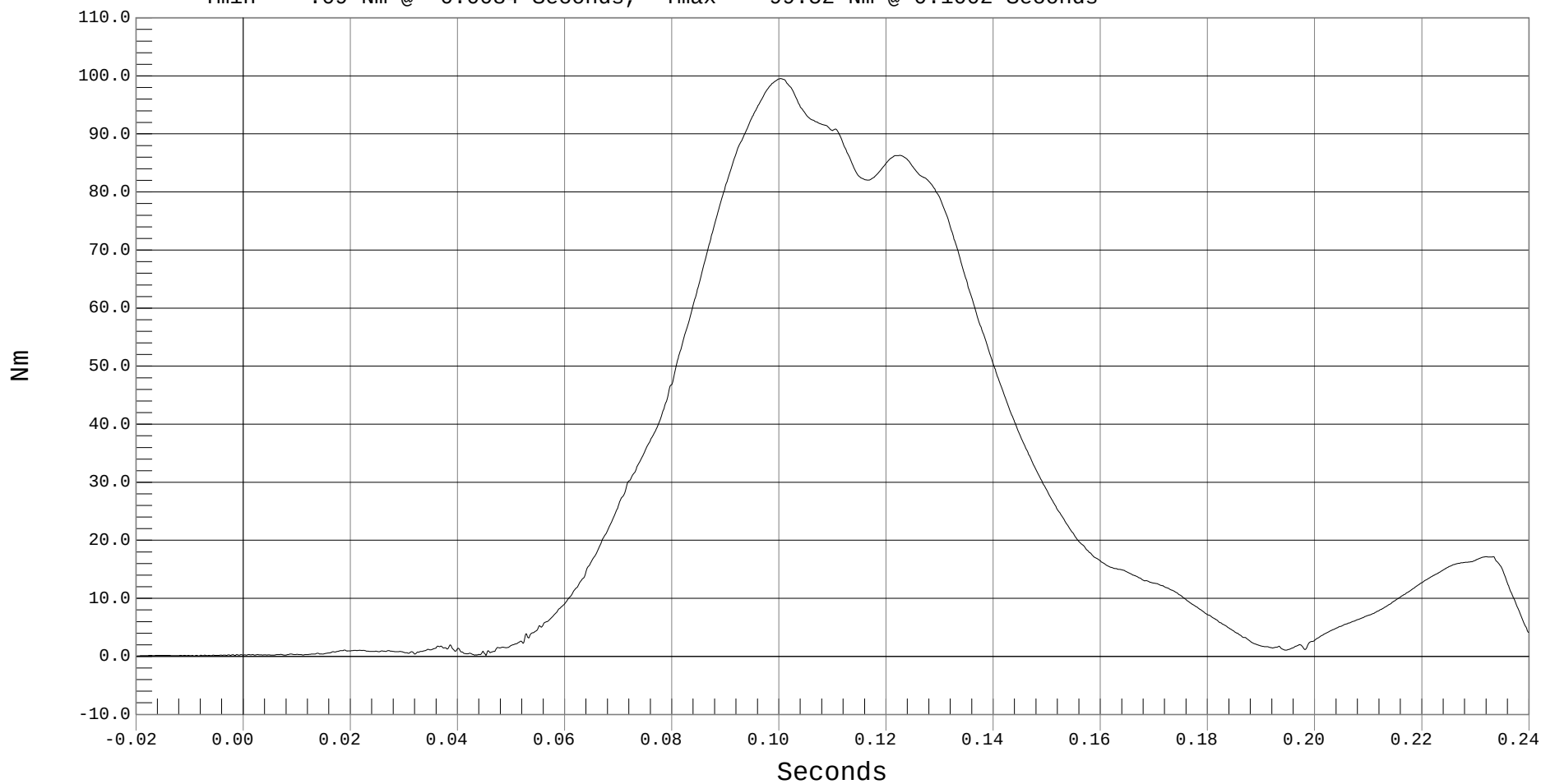
RRS 3 YR OLD LOWER NECK MOMENT RESULTANT

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 RRS 3 YR OLD LOWER NECK MOMENT RESULTANT, B01043MV.M49

Ymin = .09 Nm @ -0.0084 Seconds, Ymax = 99.52 Nm @ 0.1002 Seconds





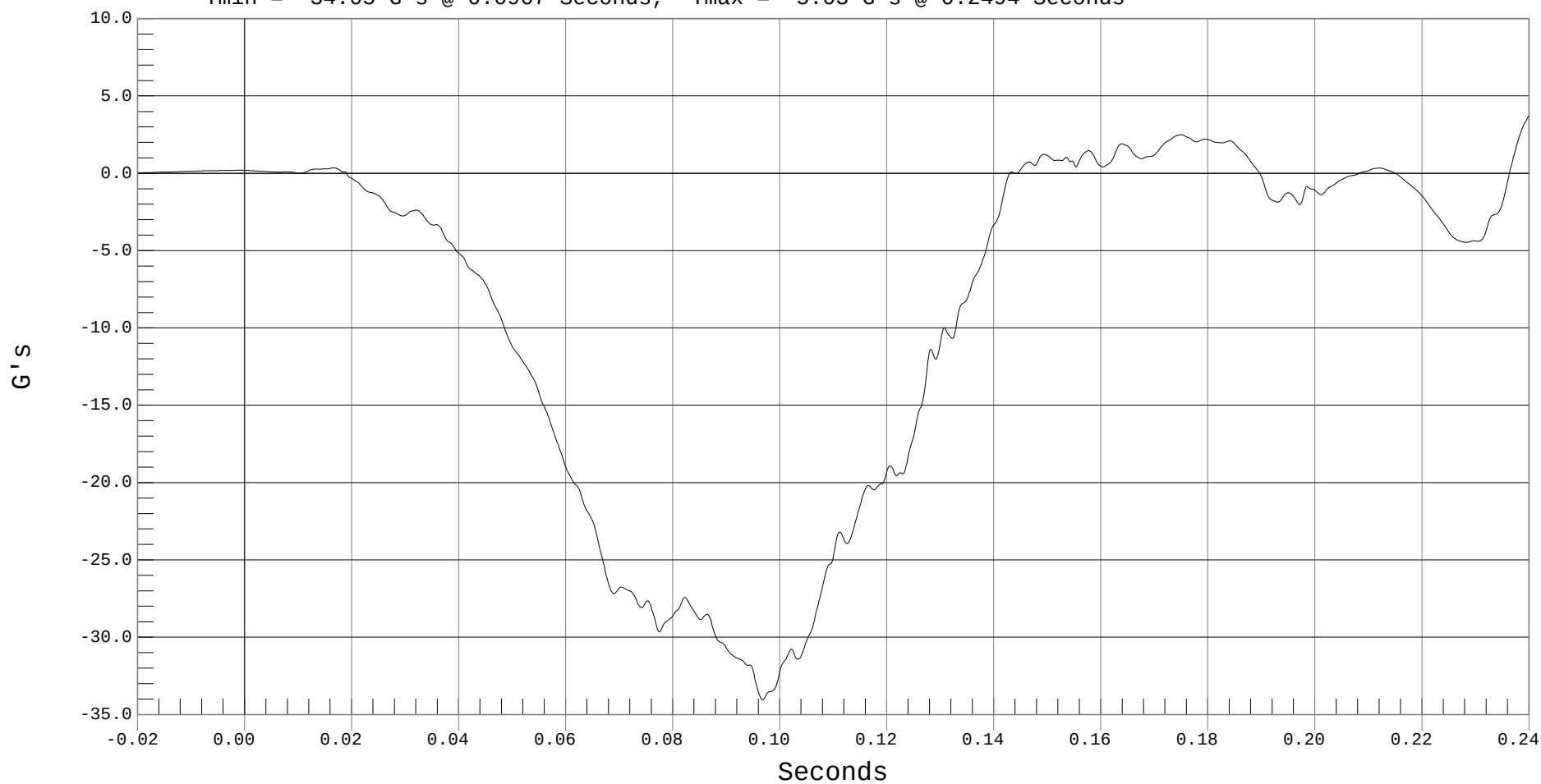
RRS 3 YR OLD CHEST X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RRS CHILD CHEST X, B01043AF.A52

Ymin = -34.05 G's @ 0.0967 Seconds, Ymax = 5.03 G's @ 0.2494 Seconds





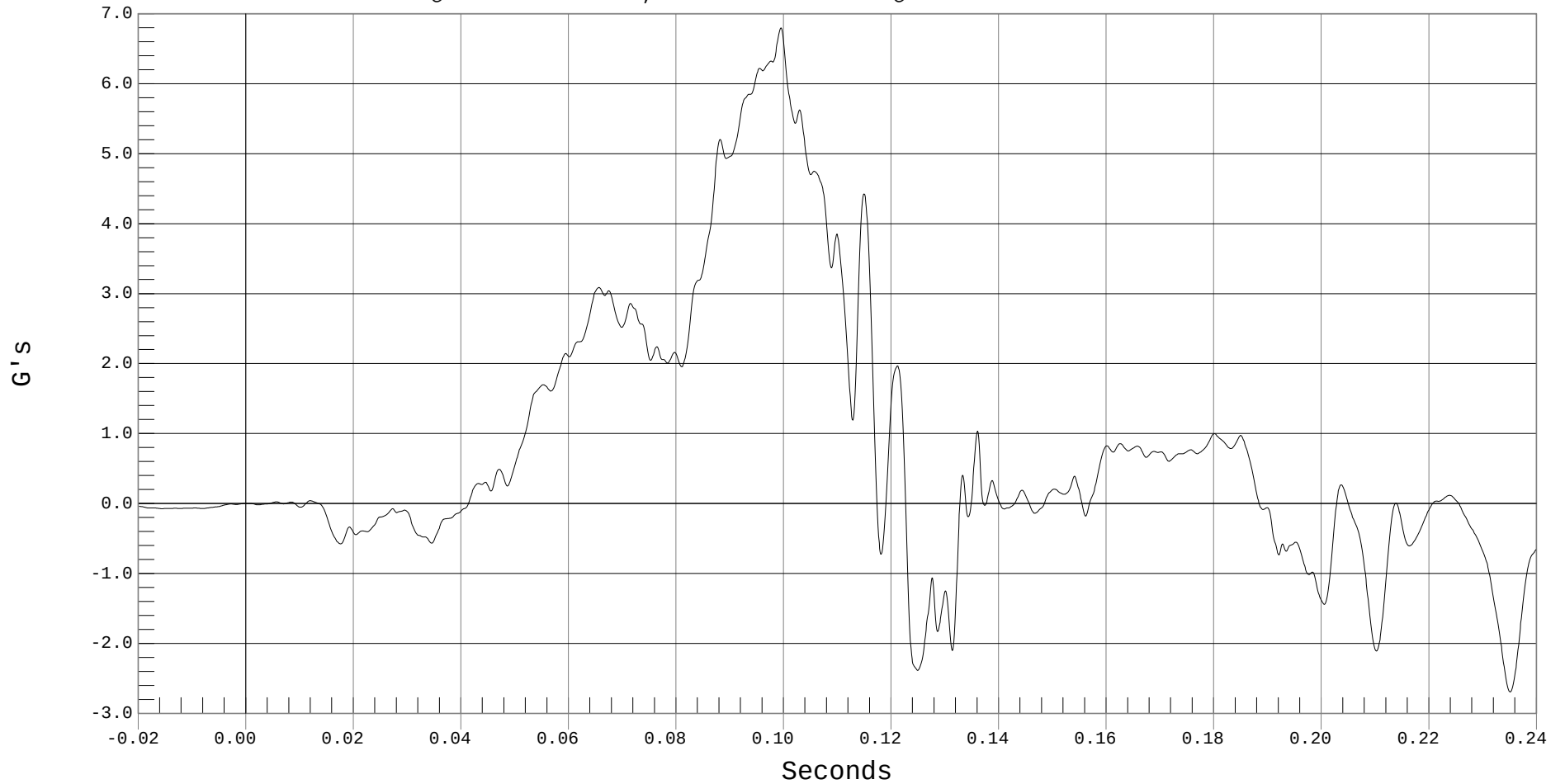
RRS 3 YR OLD CHEST Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RRS CHILD CHEST Y, B01043AF.A53

Ymin = -2.69 G's @ 0.2350 Seconds, Ymax = 6.8 G's @ 0.0994 Seconds





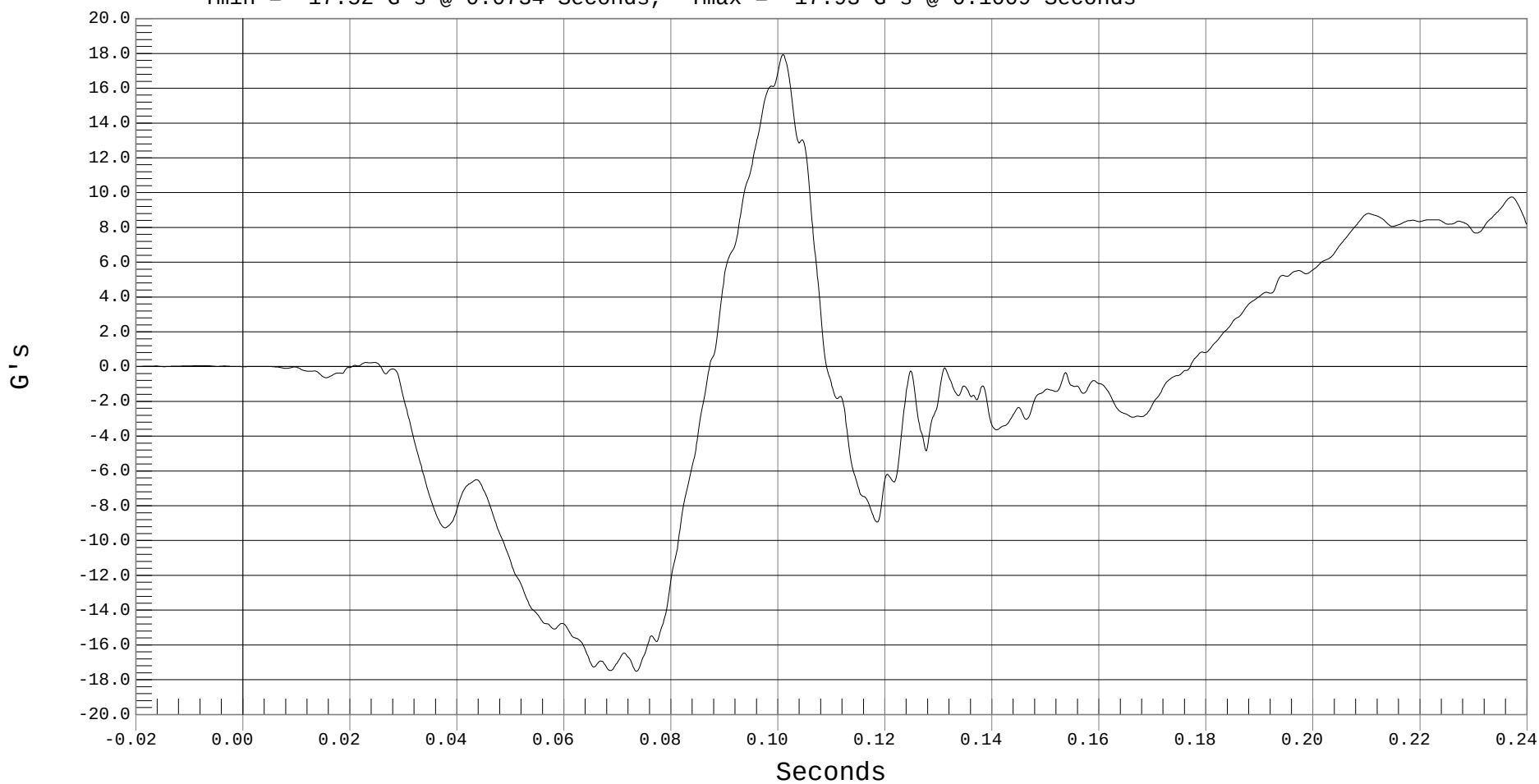
RRS 3 YR OLD CHEST Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RRS CHILD CHEST Z, B01043AF.A54

Ymin = -17.52 G's @ 0.0734 Seconds, Ymax = 17.93 G's @ 0.1009 Seconds





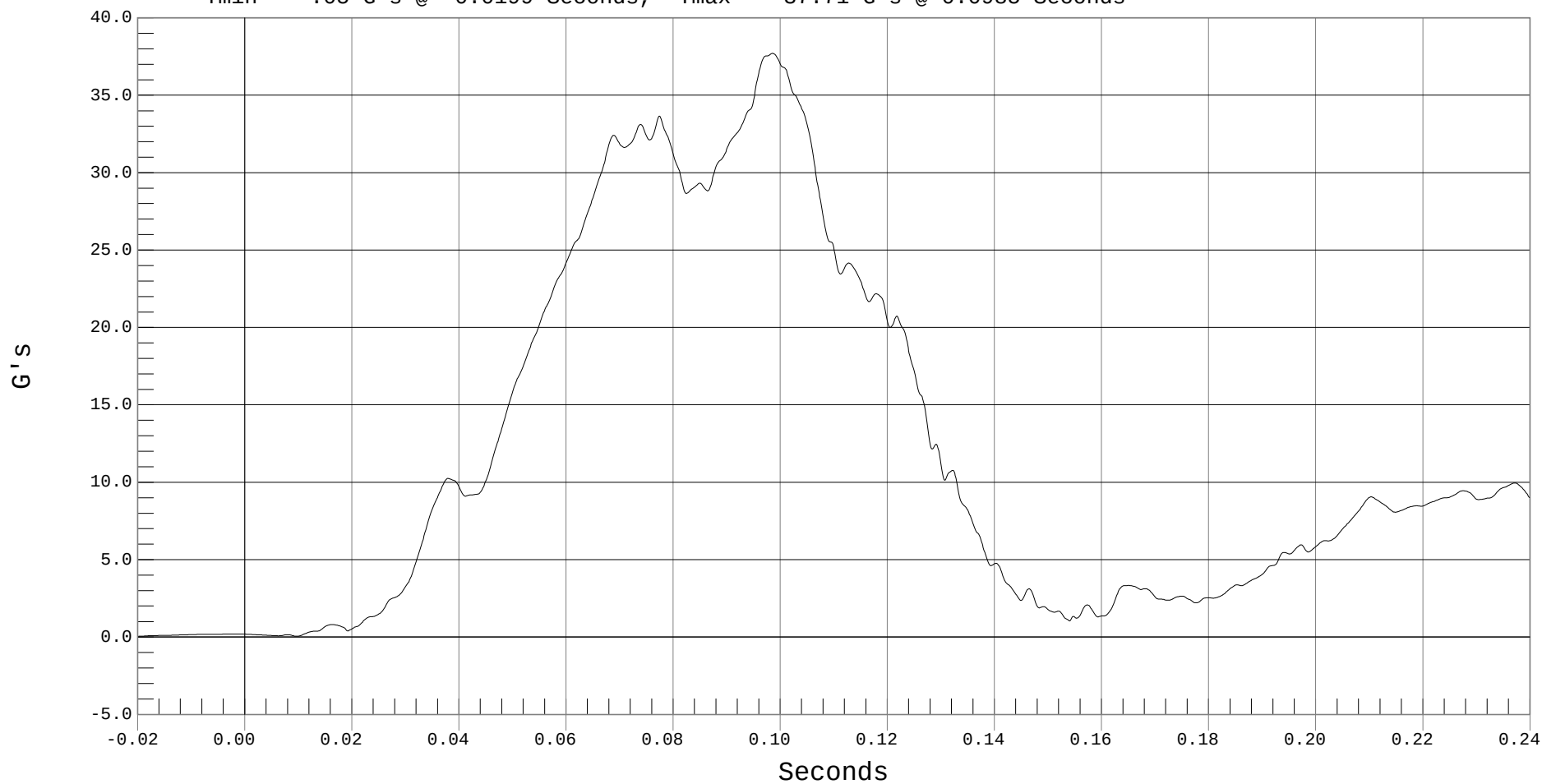
RRS 3 YR OLD CHEST RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RRS 3 YR OLD CHEST RESULTANT ACCELERATION, B01043AV.A52

Ymin = .05 G's @ -0.0199 Seconds, Ymax = 37.71 G's @ 0.0985 Seconds





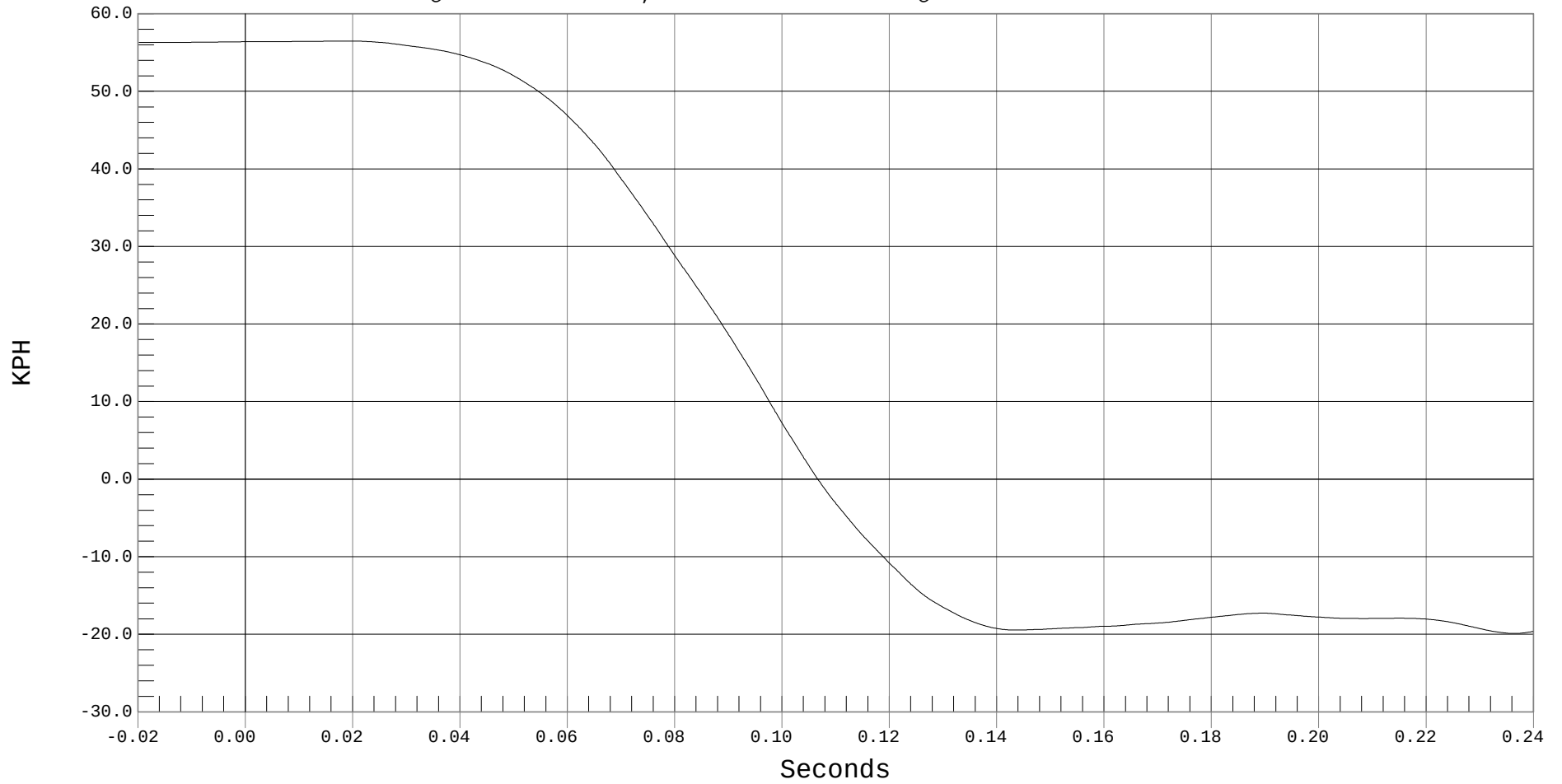
RRS 3 YR OLD CHEST X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 180

— 1 RRS 3 YR OLD CHEST X VELOCITY, B01043AI.V52

Ymin = -19.9 KPH @ 0.2363 Seconds, Ymax = 56.49 KPH @ 0.0190 Seconds





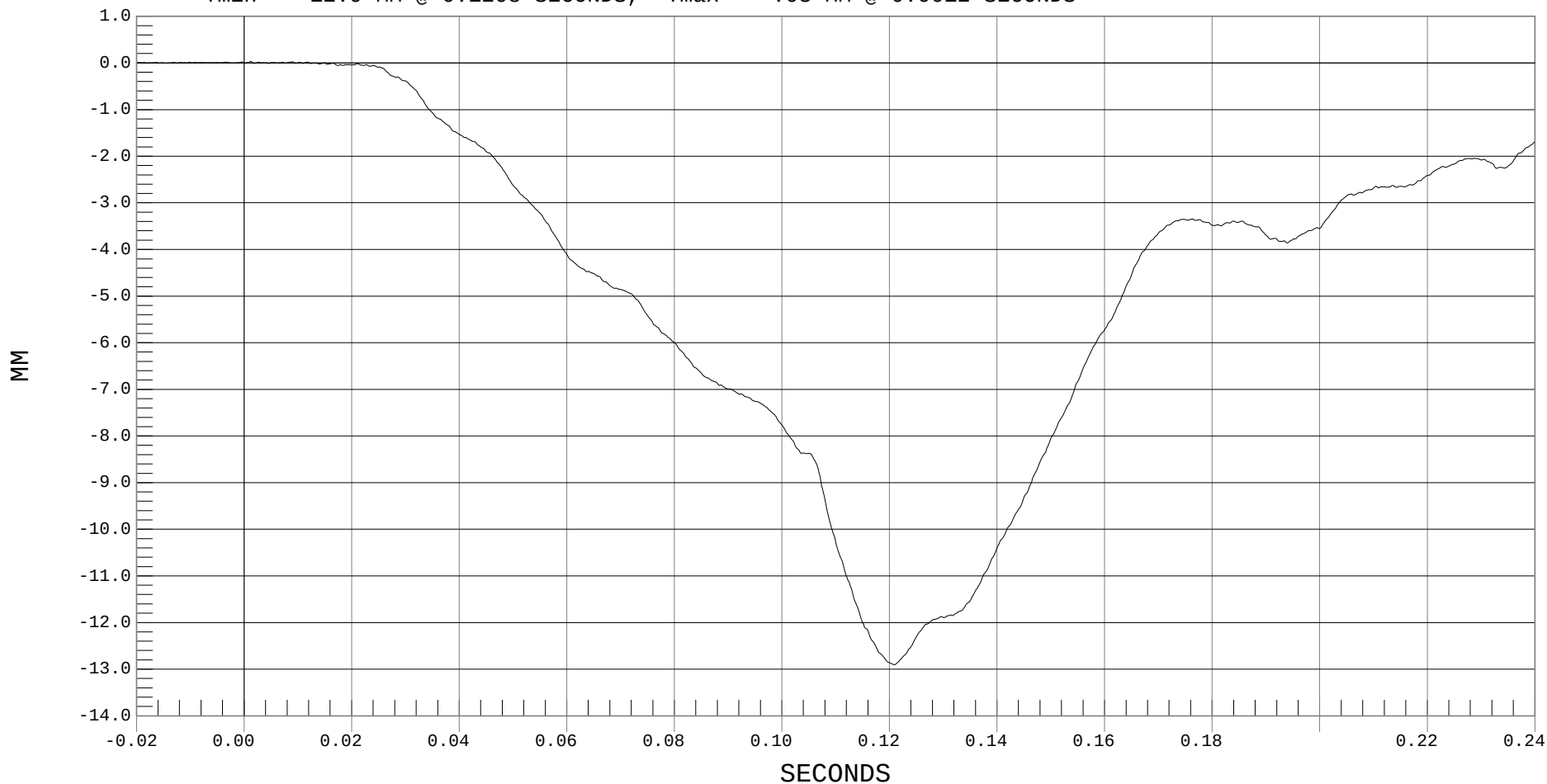
RRS 3 YR OLD CHEST COMPRESSION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 600

— 1 DISPLACEMENT, B01043DF.D55

Ymin = -12.9 MM @ 0.1208 SECONDS, Ymax = .03 MM @ 0.0012 SECONDS





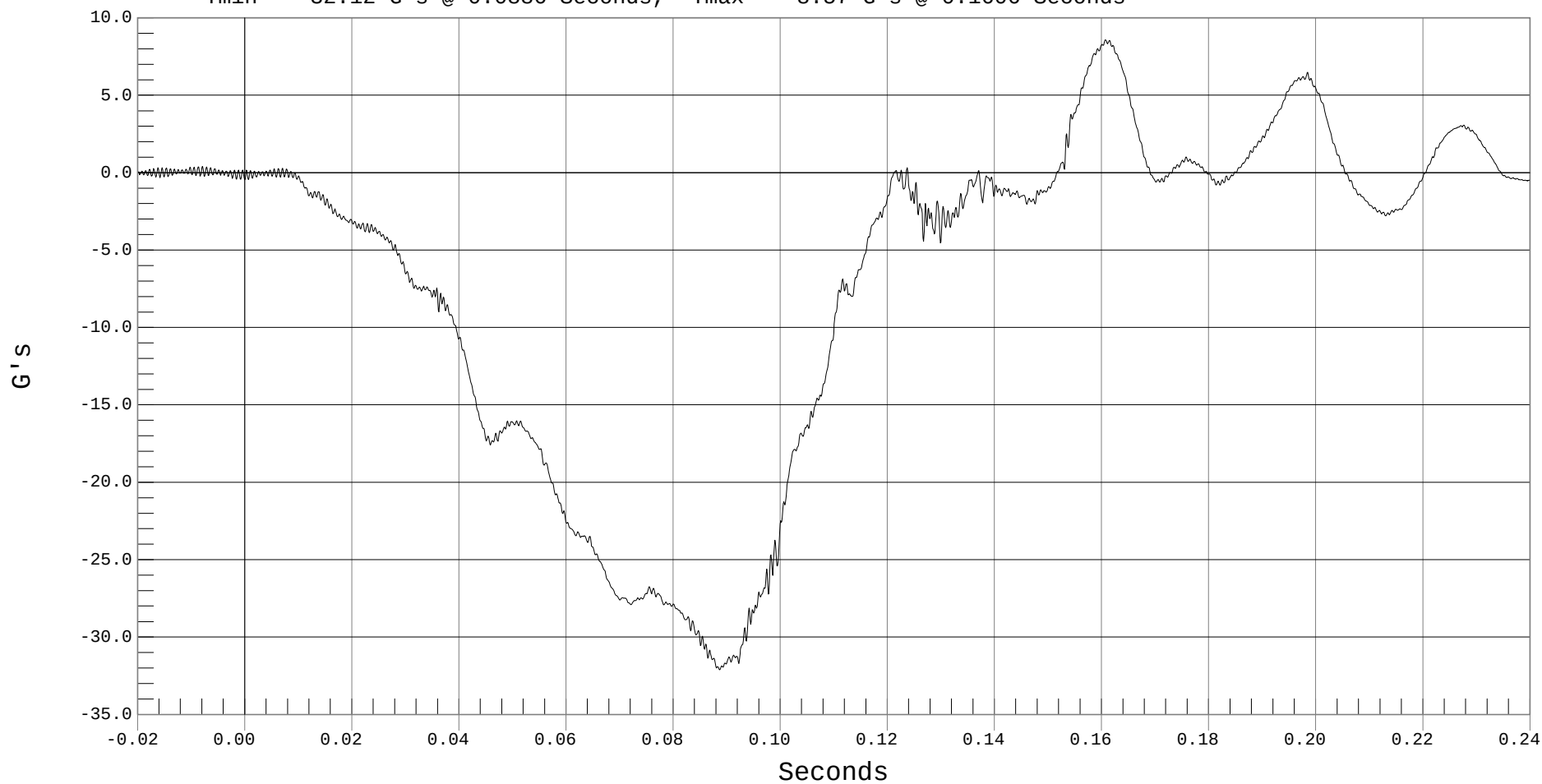
RRS 3 YR OLD PELVIS X ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD PELVIS X, B01043AT.A56

Ymin = -32.12 G's @ 0.0886 Seconds, Ymax = 8.57 G's @ 0.1606 Seconds





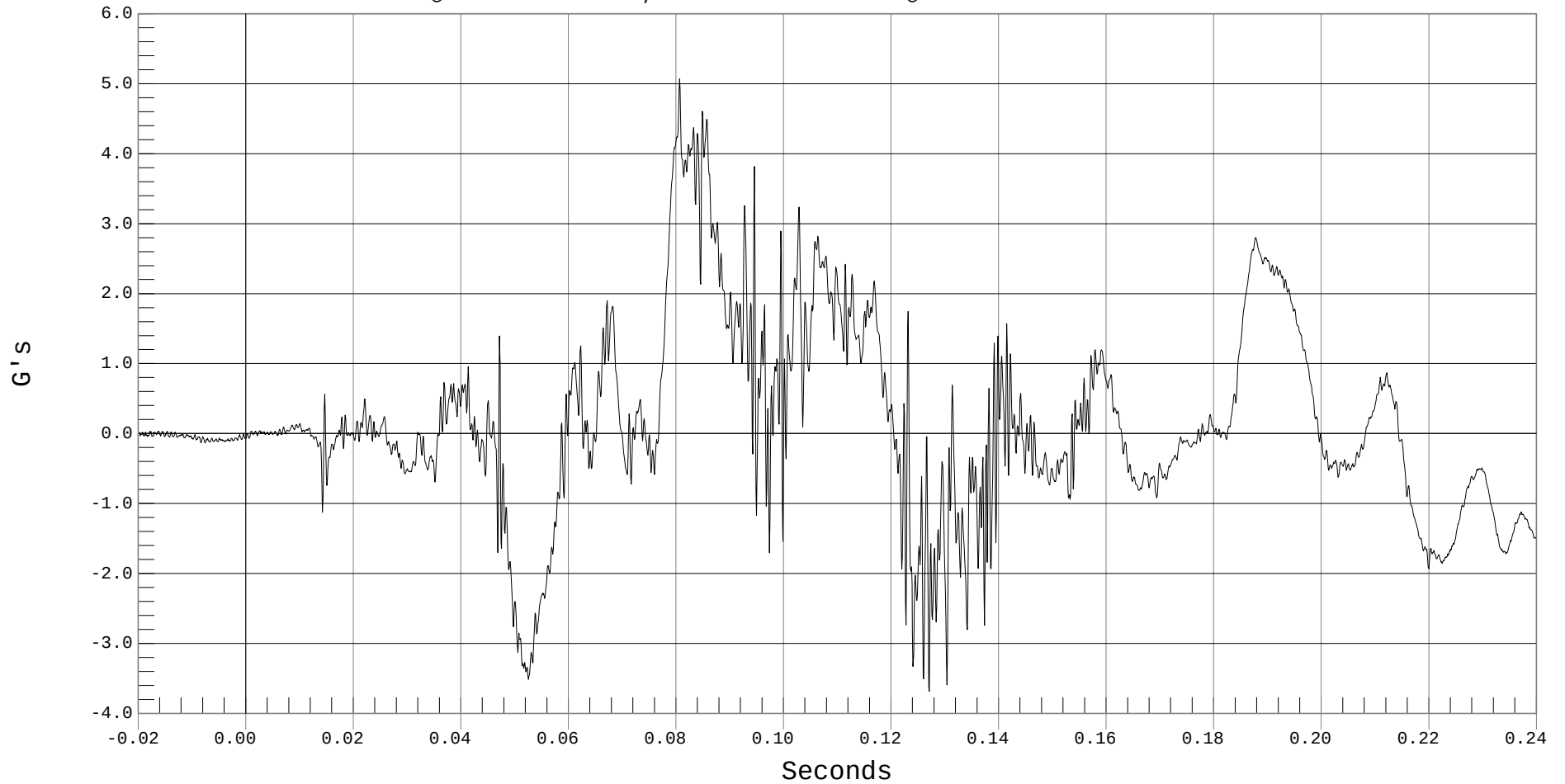
RRS 3 YR OLD PELVIS Y ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD PELVIS Y, B01043AT.A57

Ymin = -3.69 G's @ 0.1270 Seconds, Ymax = 5.07 G's @ 0.0806 Seconds





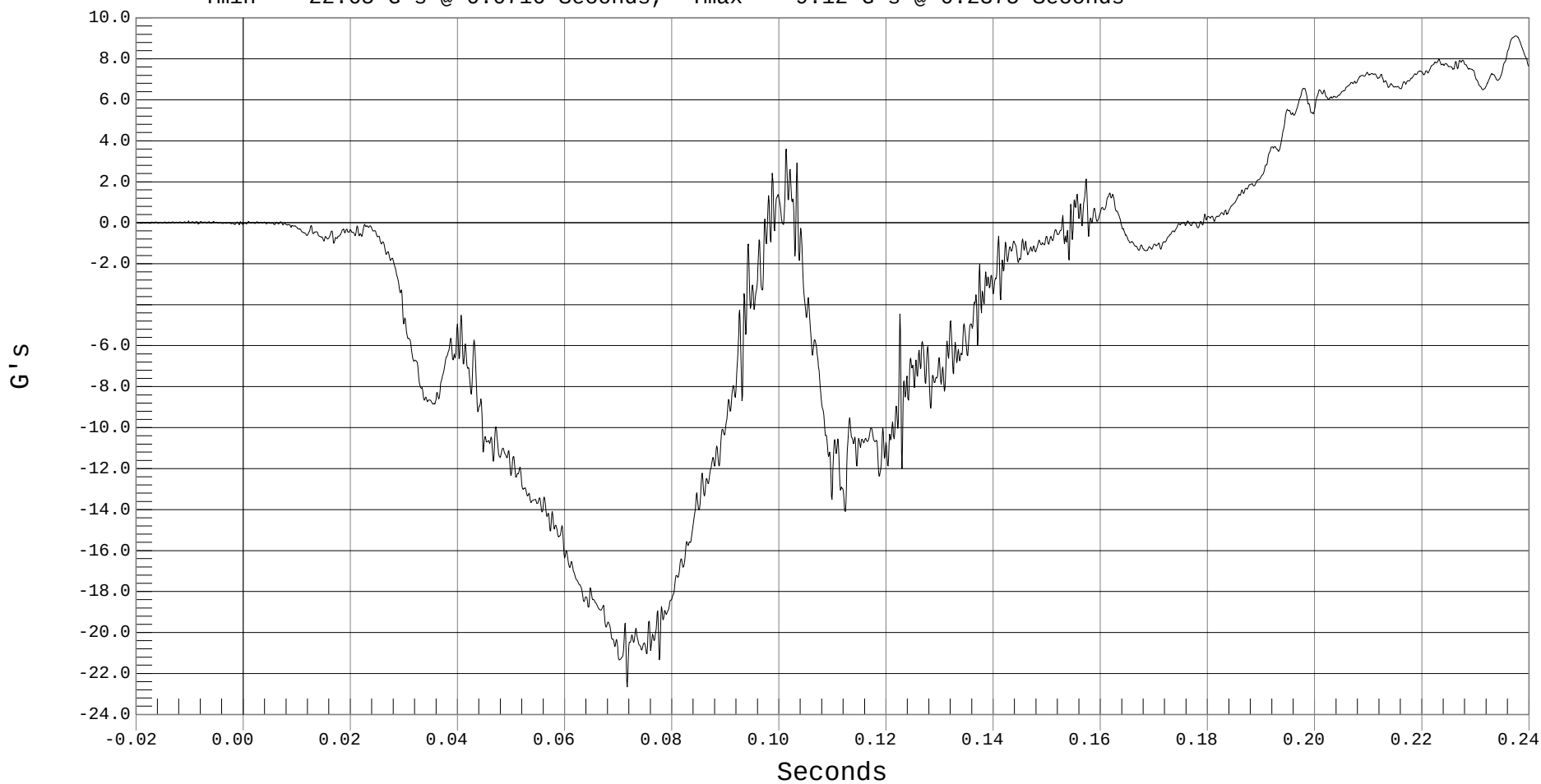
RRS 3 YR OLD PELVIS Z ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS CHILD PELVIS Z, B01043AT.A58

Ymin = -22.65 G's @ 0.0716 Seconds, Ymax = 9.12 G's @ 0.2375 Seconds





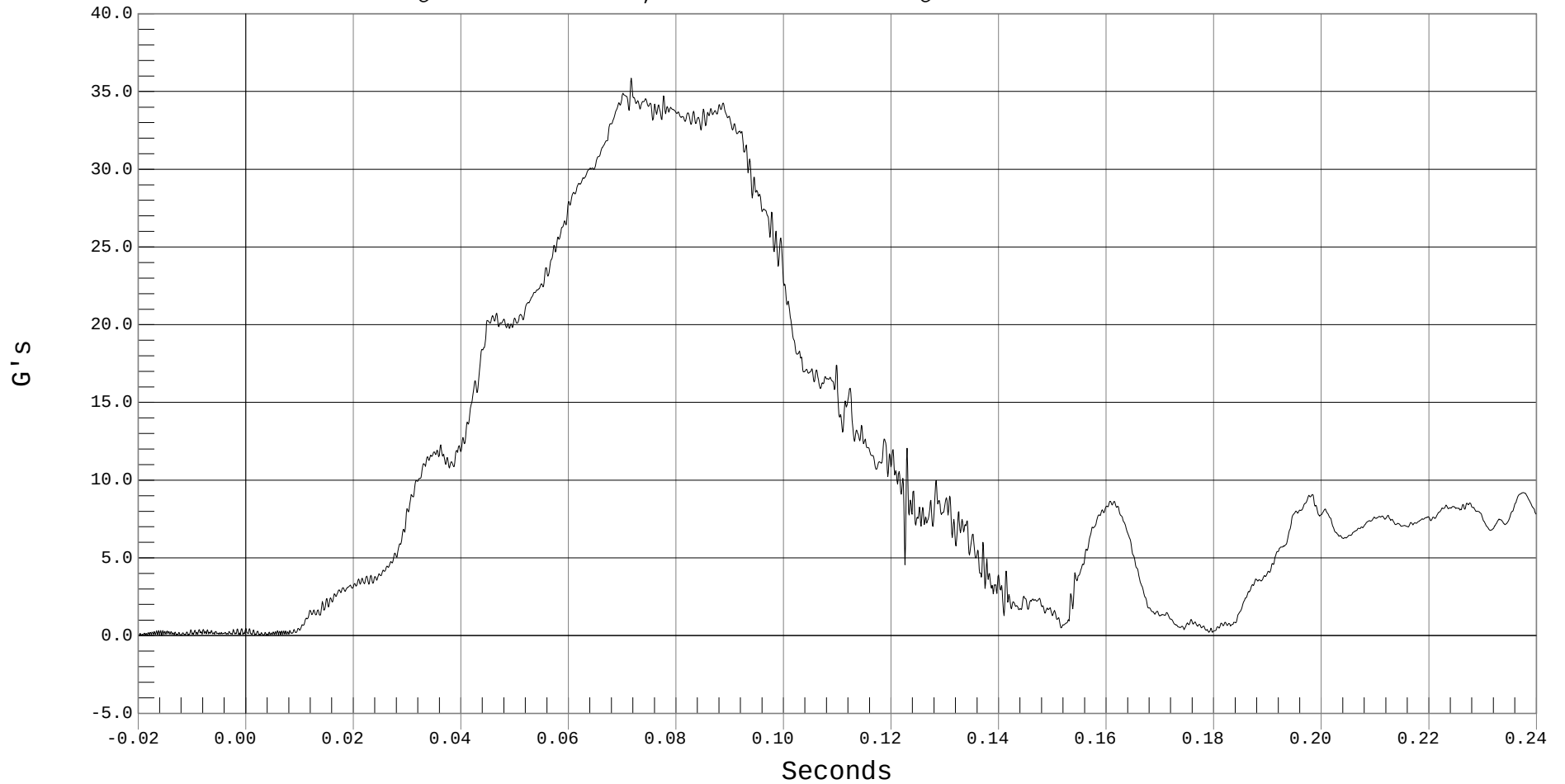
RRS 3 YR OLD PELVIS RESULTANT ACCELERATION

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS 3 YR OLD PELVIS RESULTANT ACCELERATION, B01043AV.A56

Ymin = .01 G's @ -0.0157 Seconds, Ymax = 35.86 G's @ 0.0716 Seconds



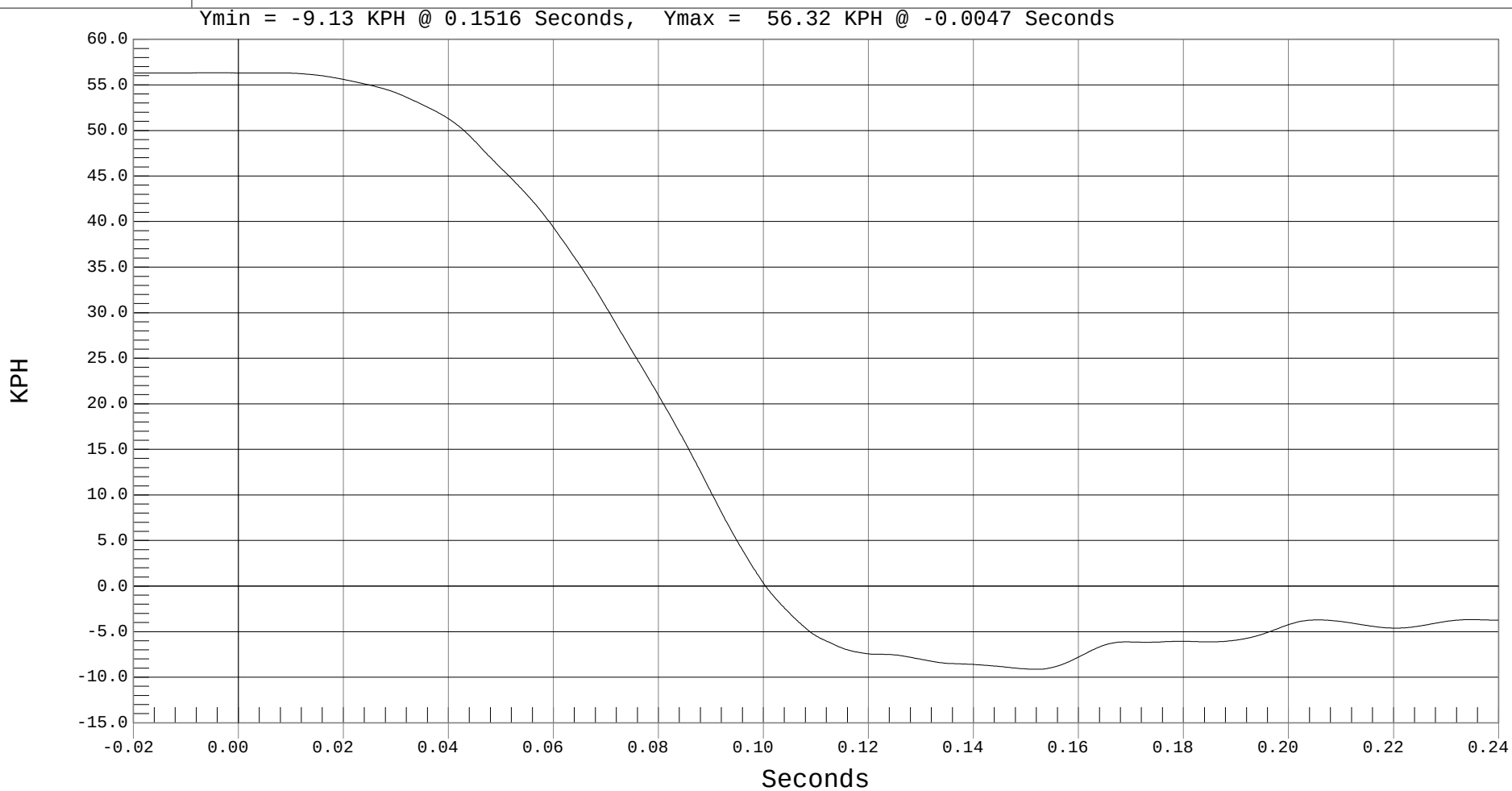


RRS 3 YR OLD PELVIS X VELOCITY

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 1000

— 1 RRS 3 YR OLD PELVIS X VELOCITY, B01043AI.V56





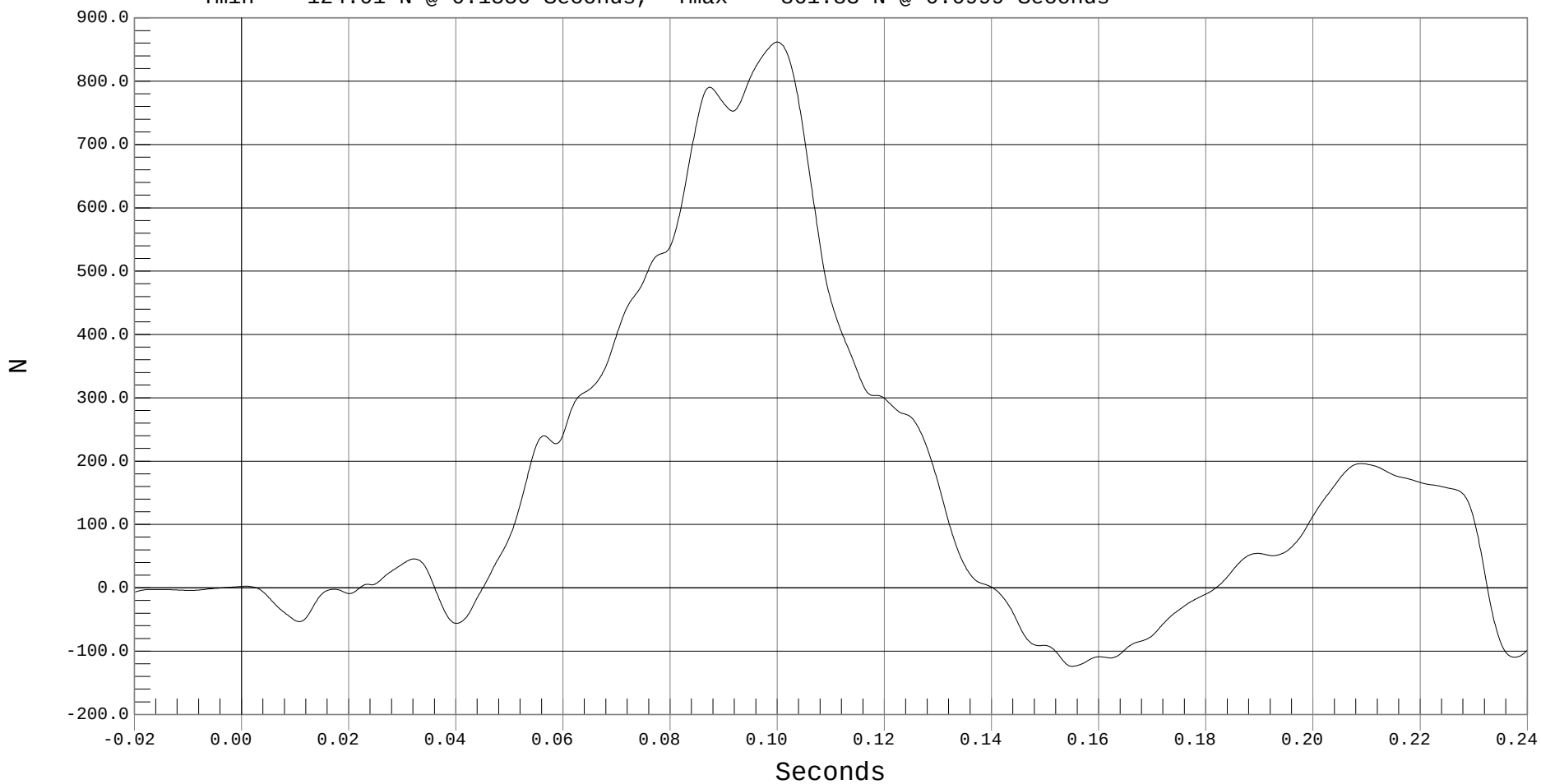
RRS TETHER FORCE

Test Desc.: 35 MPH FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10212)
Other Info:

Test Date: 04-18-01
Speed: 35.0 MPH, 56.3 KPH
Filter Class: 60

— 1 RRS TETHER FORCE, B01043FF.F63

Ymin = -124.01 N @ 0.1550 Seconds, Ymax = 861.83 N @ 0.0999 Seconds



CHILD DUMMY CALIBRATION DATA TRACES AND TABLES

Hybrid III Calibration Data Sheet
3 Year Old
Head Drop Calibration

ATD Serial No.: 139

Test I.D.: D01061

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	PASS
Laboratory Relative Humidity	%	10 to 70	23	PASS
Peak Resultant Acceleration	G's	250.0 to 280.0	261.7	PASS
Peak Lateral Acceleration	G's	$\leq \pm 15.0$	1.7	PASS
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	PASS
Overall Test Results				PASS

Laboratory Technician

1/11/01

Test Date

Approved By



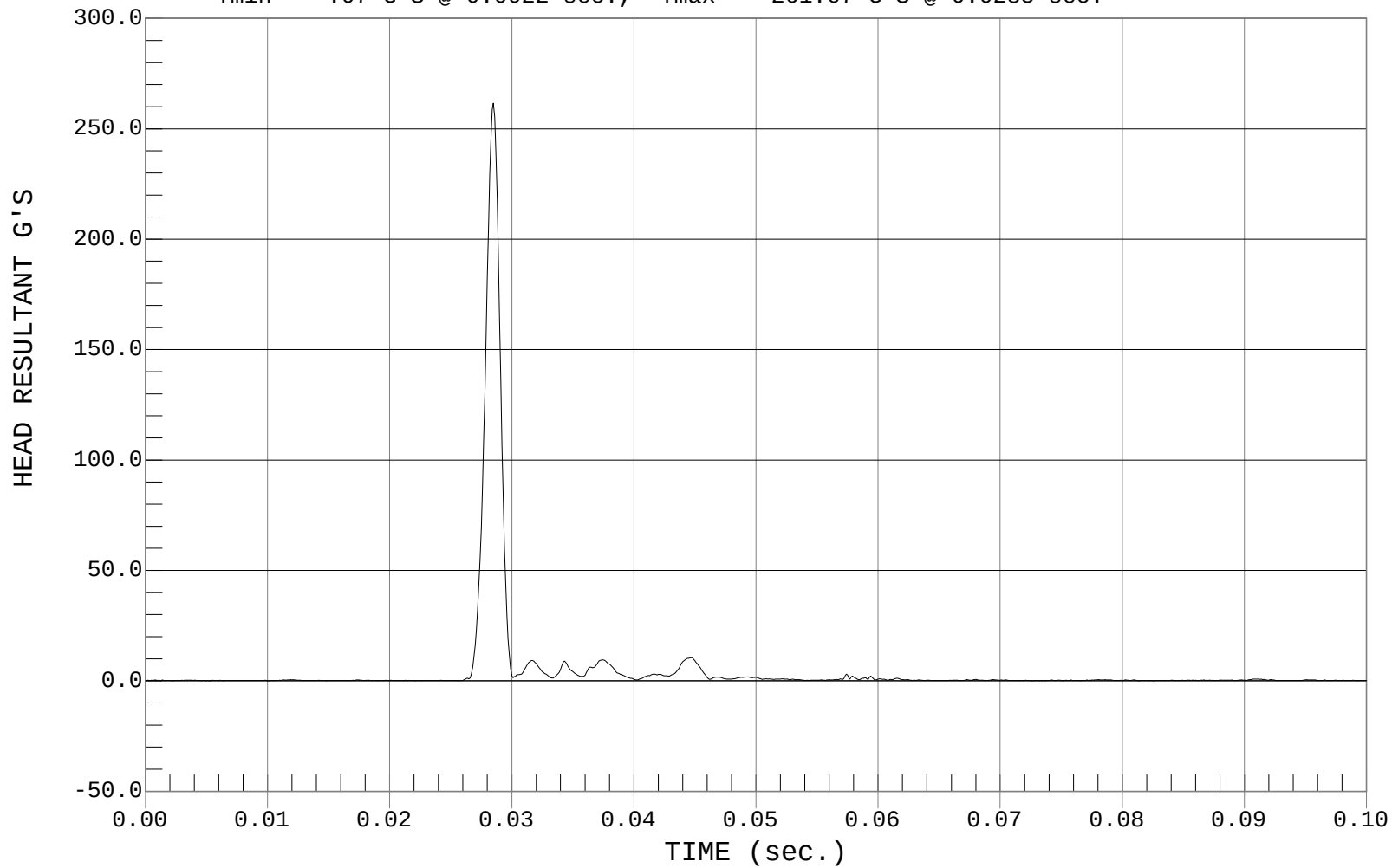
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #139

Test Date: 01-11-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT, D01061AV.A01

Ymin = .07 G'S @ 0.0022 sec., Ymax = 261.67 G'S @ 0.0285 sec.





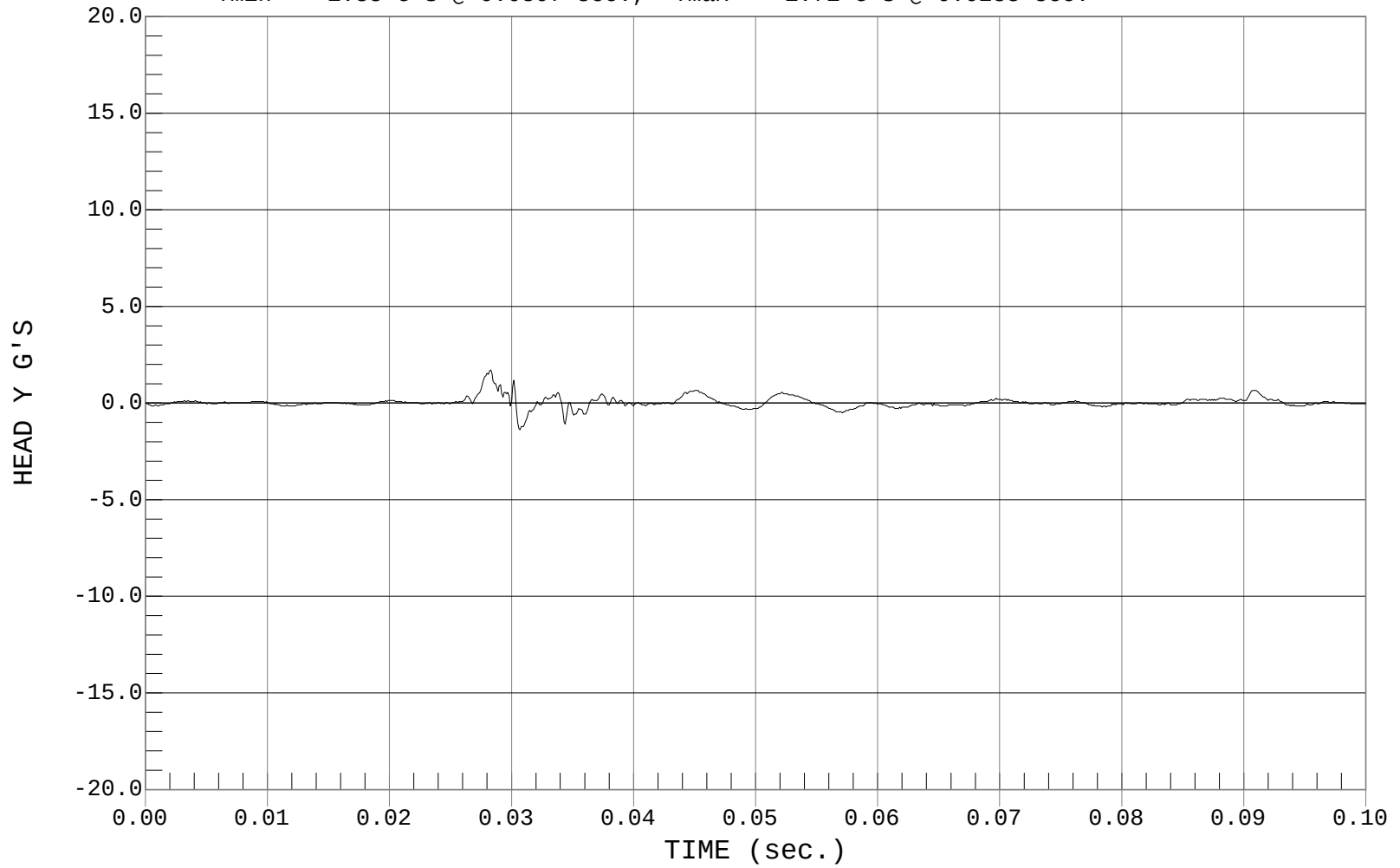
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #139

Test Date: 01-11-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01061AR.A02

Ymin = -1.38 G'S @ 0.0307 sec., Ymax = 1.71 G'S @ 0.0283 sec.



Hybrid III Calibration Data Sheet
3 Year Old
Thorax Impact Test

ATD Serial No.: 139

Test I.D.: D01064

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	PASS
Laboratory Relative Humidity	%	10 to 70	29	PASS
Probe Velocity	m/s	5.9 to 6.1	6.0	PASS
Peak Deflection	mm	32 to 38	33	PASS
Peak Resistive Force Within Deflection Corridor	kN	.68 to .81	.78	PASS
Internal Hysteresis	%	65 to 85	71	PASS
Max Force 12.5 mm – 32 mm Deflection	kN	Max .86	.83	PASS
Overall Test Results				PASS

Laboratory Technician

1/14/01
Test Date

Approved By



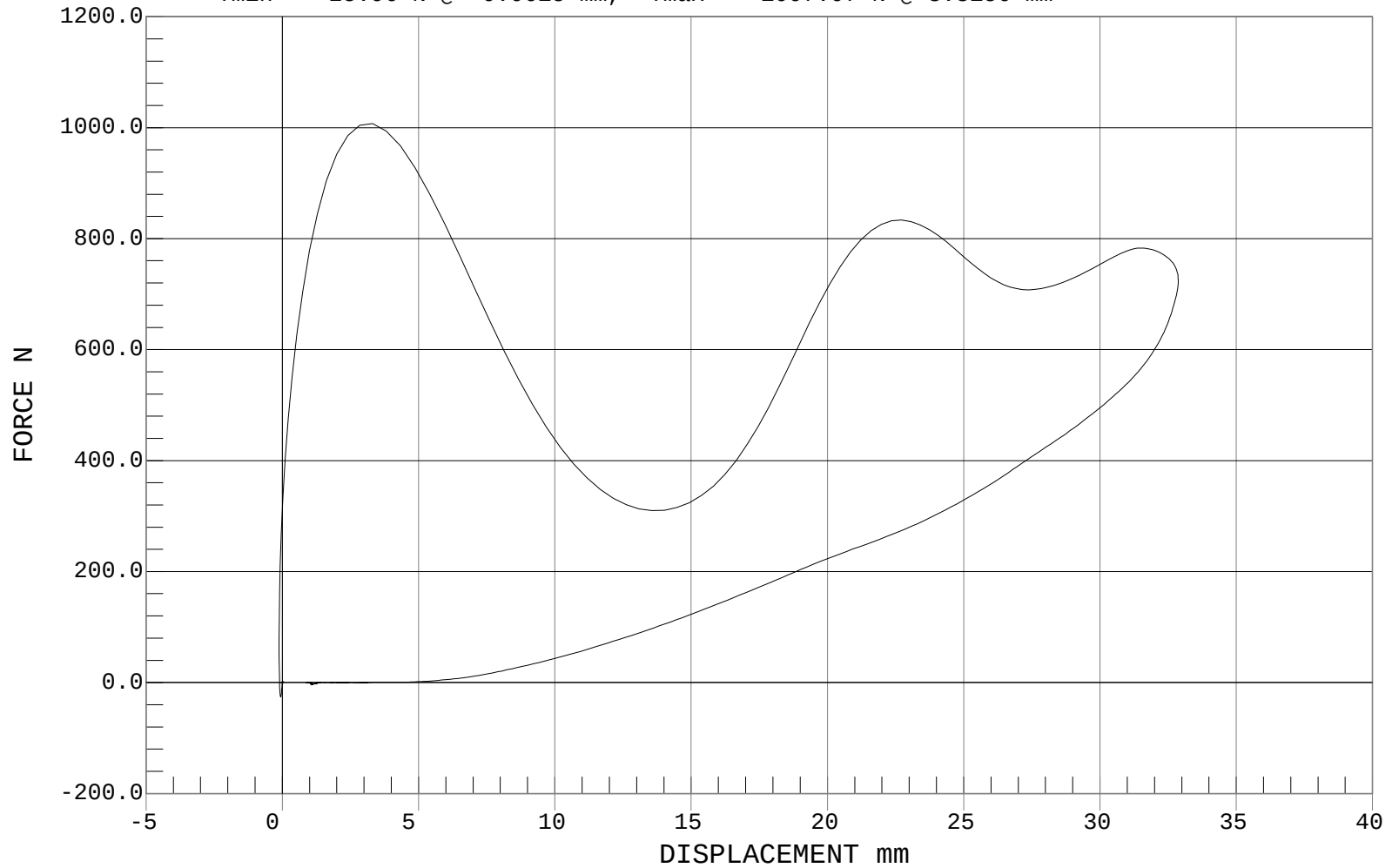
THORAX IMPACT

Test Desc.: Dummy Calibration - Chest Impact
Component: Dummy #139

Test Date: 01-14-01
Speed: 19.62 FT/SEC, 5.98 M/SEC

— 1 FORCE, D01064CH.FVD

Ymin = -25.96 N @ -0.0615 mm, Ymax = 1007.07 N @ 3.3156 mm



Hybrid III Calibration Data Sheet
3 Year Old
Neck Flexion Test

ATD Serial No.: 139

Test I.D.: D01062

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	PASS
Laboratory Relative Humidity		%	10 to 70	23	PASS
Pendulum Velocity		m/s	5.4 to 5.6	5.5	PASS
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.4	PASS
	15 Msec.	m/s	3.0 to 4.0	3.5	PASS
	20 Msec.	m/s	4.0 to 5.1	4.7	PASS
"D" Plane Rotation	Maximum	Deg.	70.0 to 82.0	73.1	PASS
Moment About Occipital Condyle	Maximum	Nm	42.0 to 53.0	43.4	PASS
Positive Moment Decay Time To 10 Nm		Msec.	60.0 to 80.0	71.3	PASS
Overall Test Results					PASS

Laboratory Technician

1/11/01

Test Date

Approved By



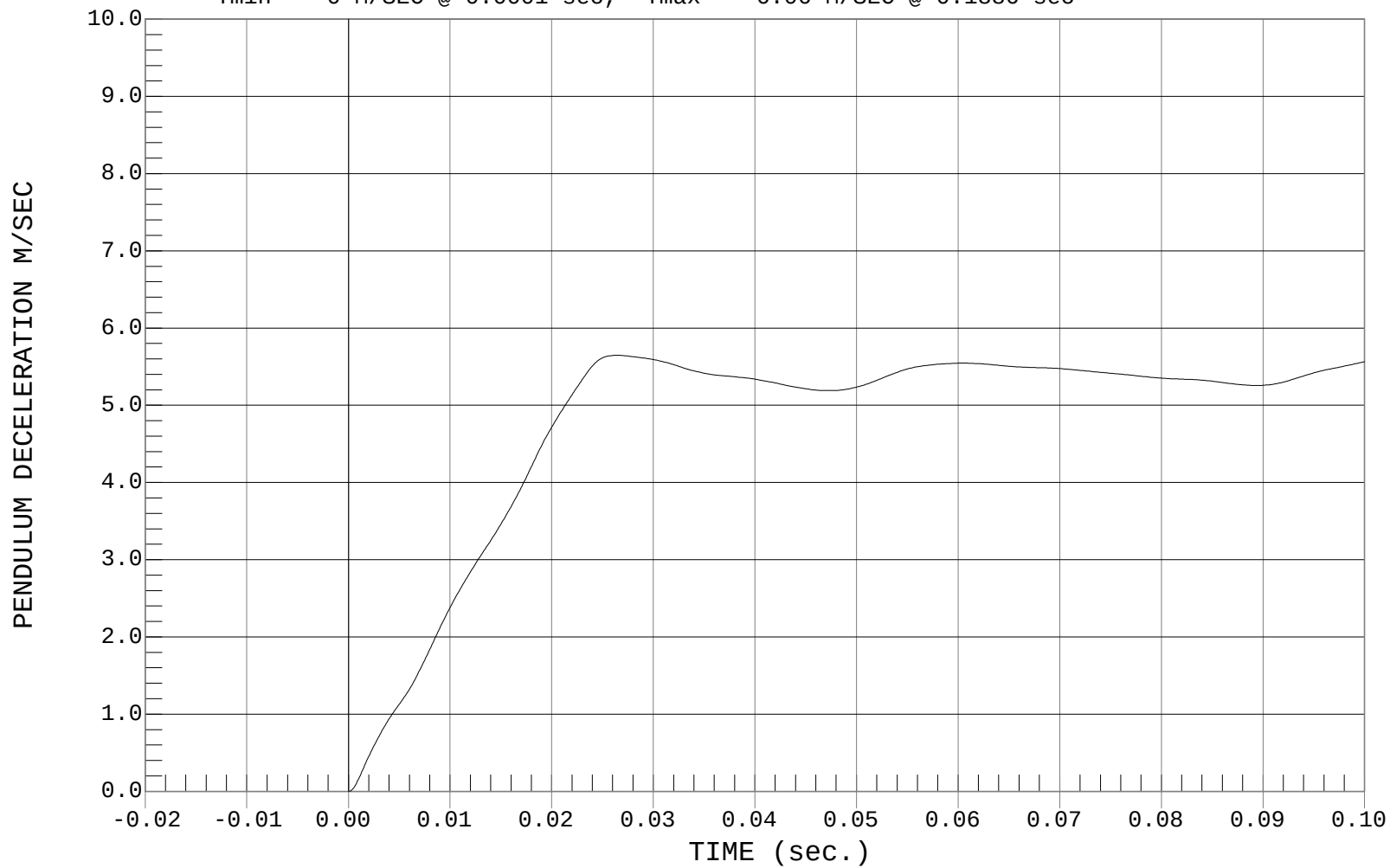
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #139

Test Date: 01-11-01
Speed: 18.00 FT/SEC, 5.49 M/SEC

— 1 PENDULUM DECELERATION, D01062AI.A04

Ymin = 0 M/SEC @ 0.0001 sec, Ymax = 6.06 M/SEC @ 0.1886 sec





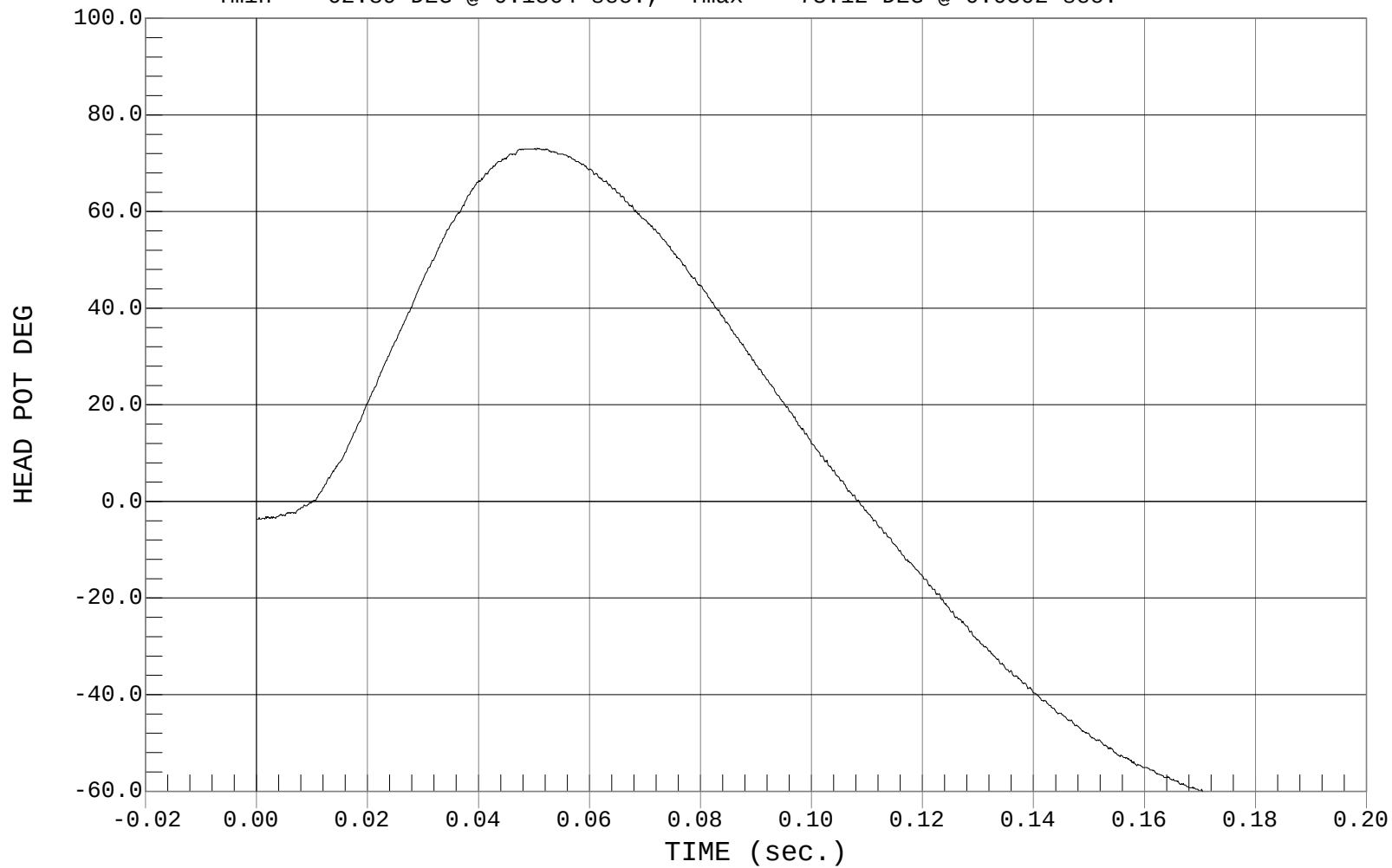
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #139

Test Date: 01-11-01
Speed: 18.00 FT/SEC, 5.49 M/SEC

— 1 HEAD POT, D01062DU.D05

Ymin = -62.89 DEG @ 0.1864 sec., Ymax = 73.12 DEG @ 0.0502 sec.



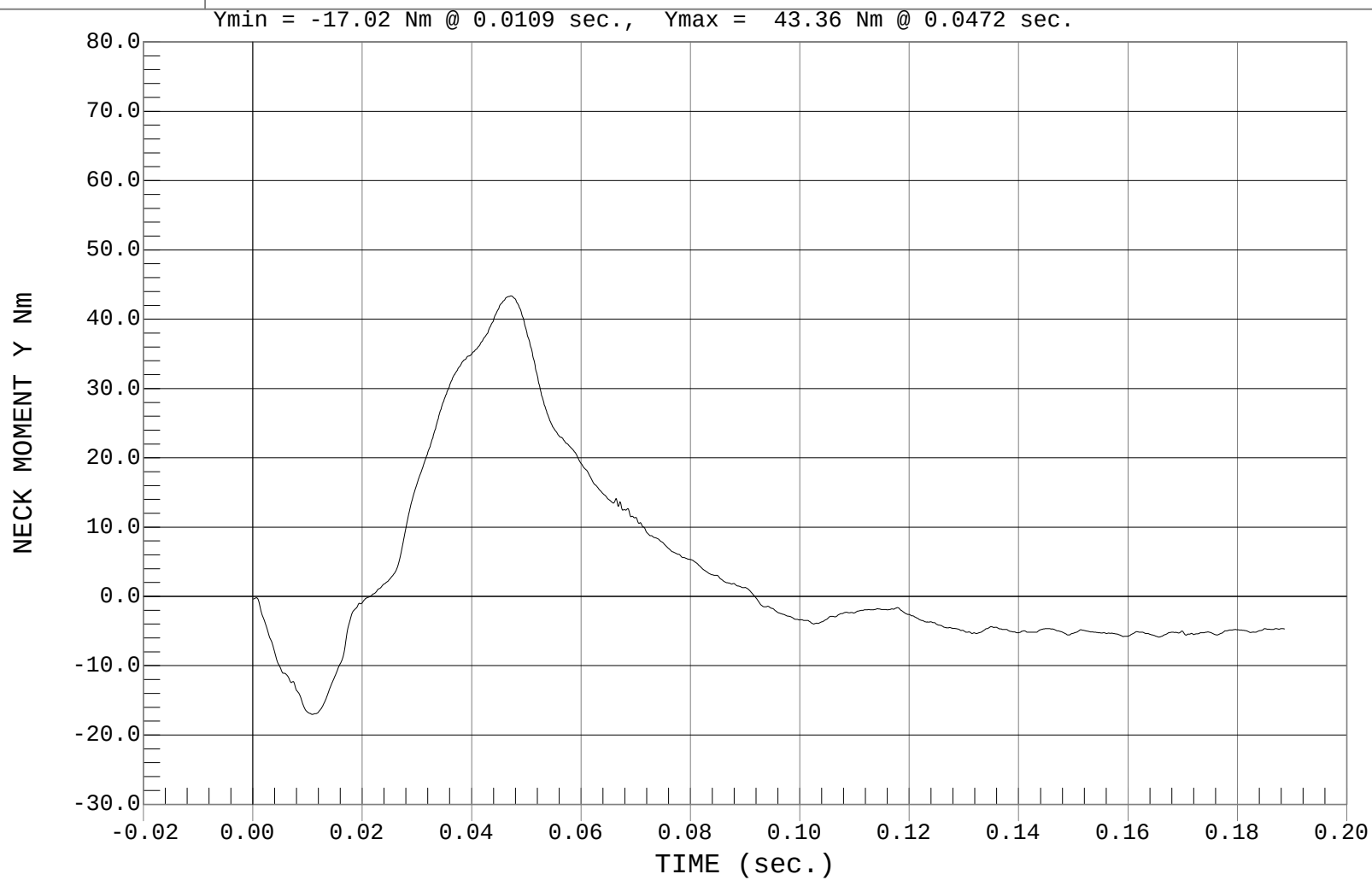


OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #139

Test Date: 01-11-01
Speed: 18.00 FT/SEC, 5.49 M/SEC

— 1 NECK MOMENT Y, D01062MF.M01



Hybrid III Calibration Data Sheet

3 Year Old

Neck Extension Test

ATD Serial No.: 139

Test I.D.: D01063

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.5	PASS
Laboratory Relative Humidity		%	10 to 70	24	PASS
Pendulum Velocity		m/s	3.55 to 3.75	3.66	PASS
Pendulum Deceleration	6 Msec.	m/s	1.0 to 1.4	1.2	PASS
	10 Msec.	m/s	1.9 to 2.5	2.1	PASS
	14 Msec.	m/s	2.8 to 3.5	2.9	PASS
"D" Plane Rotation	Maximum	Deg.	83.0 to 93.0	88.5	PASS
Moment About Occipital Condyle	Minimum	Nm	-53.3 to -43.7	-46.4	PASS
Negative Moment Decay Time To -10Nm		Msec.	60.0 to 80.0	68.9	PASS
Overall Test Results					PASS

Laboratory Technician

1/11/01

Test Date

Approved By



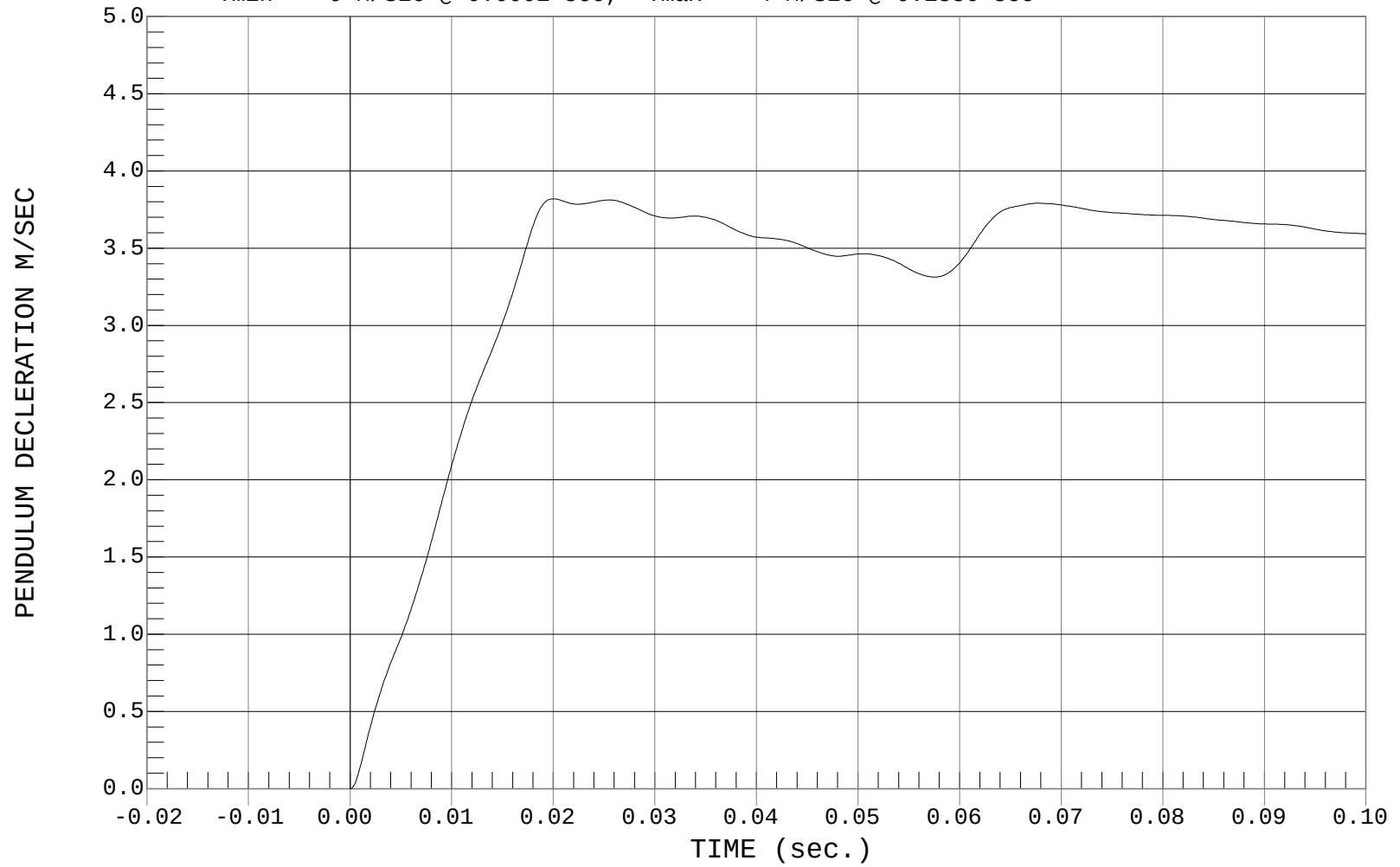
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #139

Test Date: 01-11-01
Speed: 12.00 FT/SEC, 3.66 M/SEC

— 1 PENDULUM DECLERATION, D01063AI.A04

Ymin = 0 M/SEC @ 0.0001 sec, Ymax = 4 M/SEC @ 0.1886 sec





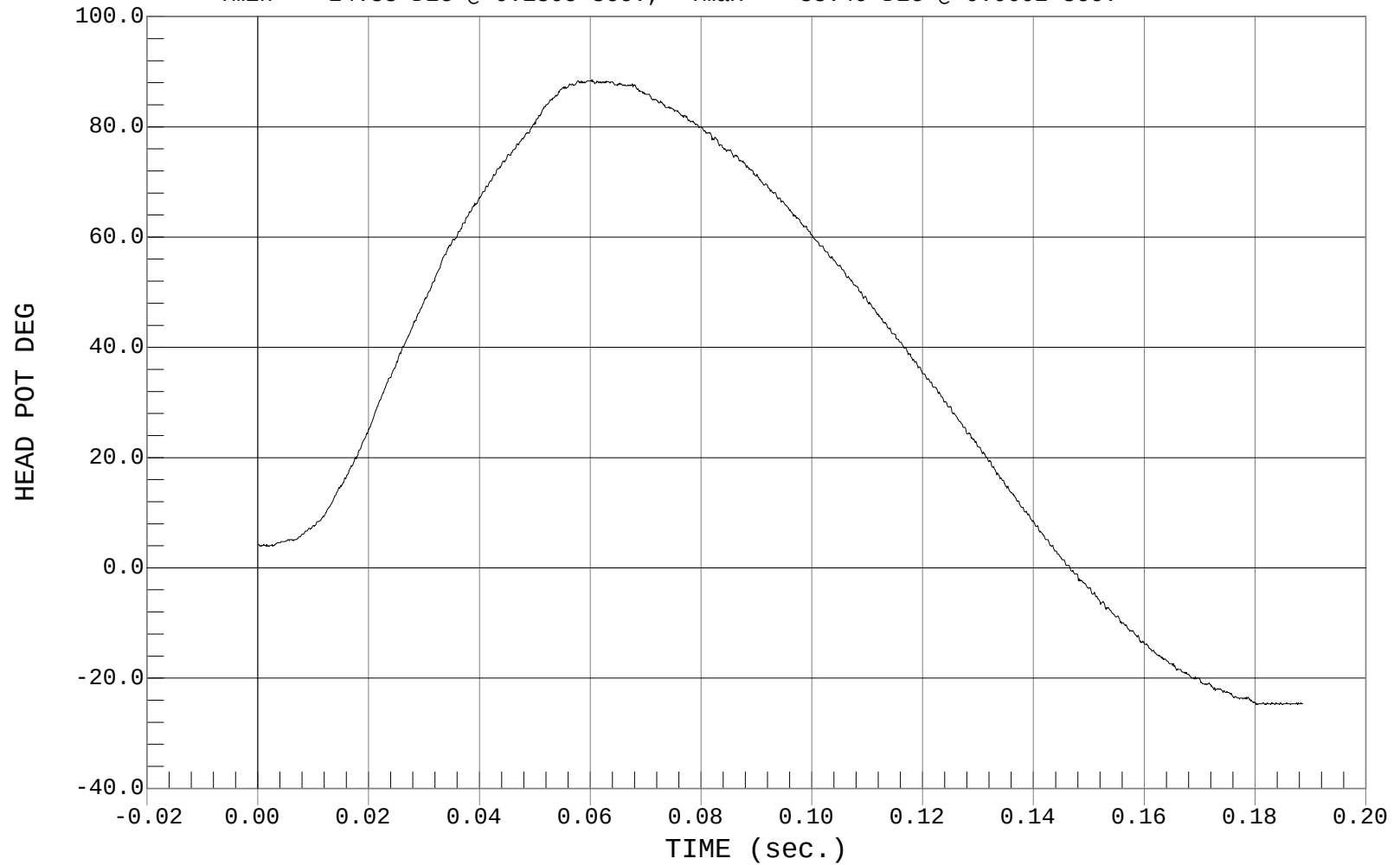
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #139

Test Date: 01-11-01
Speed: 12.00 FT/SEC, 3.66 M/SEC

— 1 HEAD POT, D01063DU.D05

Ymin = -24.83 DEG @ 0.1805 sec., Ymax = 88.49 DEG @ 0.0602 sec.





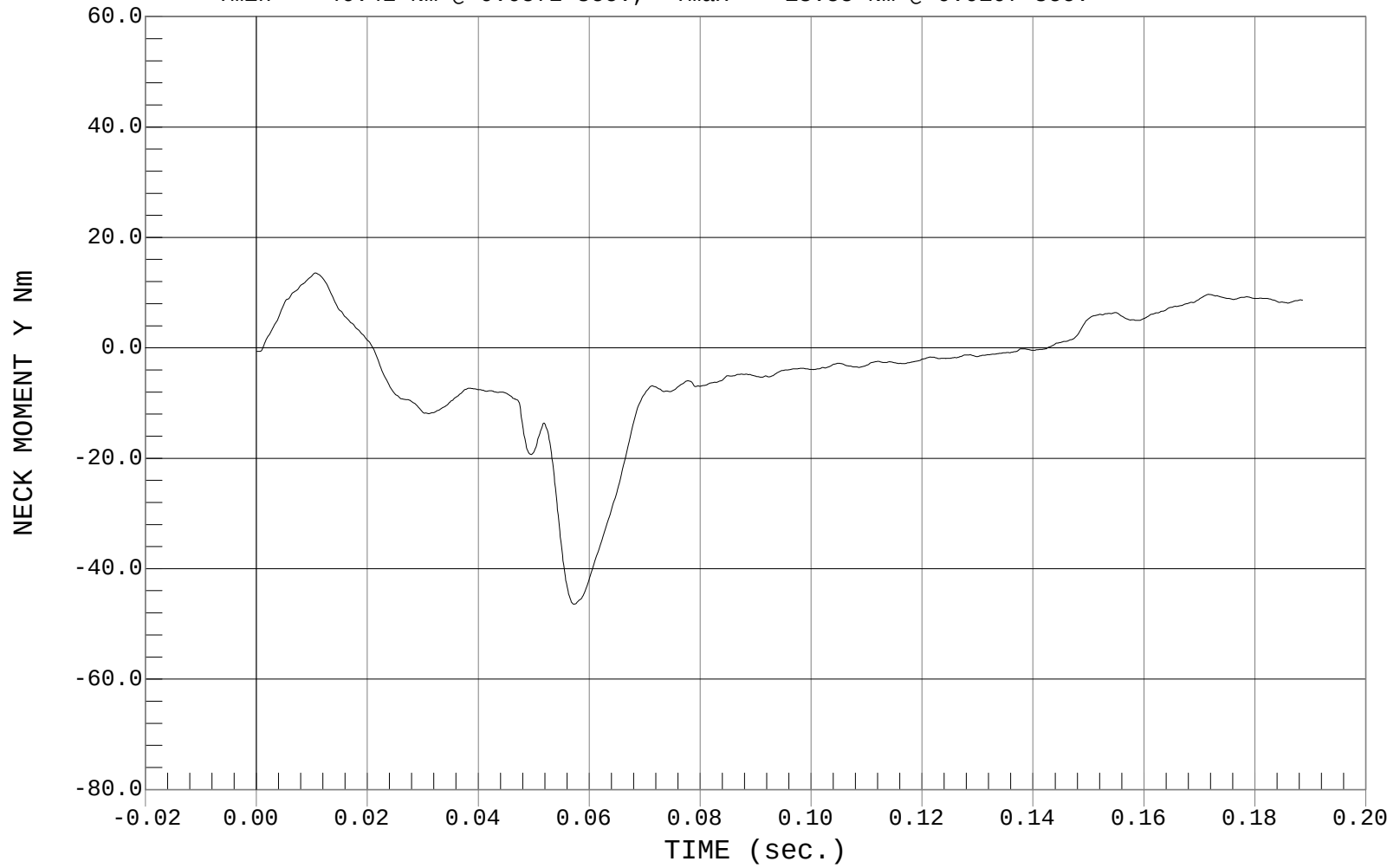
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #139

Test Date: 01-11-01
Speed: 12.00 FT/SEC, 3.66 M/SEC

— 1 NECK MOMENT Y, D01063MF.M01

Ymin = -46.42 Nm @ 0.0572 sec., Ymax = 13.55 Nm @ 0.0107 sec.



Hybrid III Calibration Data Sheet
3 Year Old
Torso Flexion Test

ATD Serial No.: 139

Test I.D.: D01065

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	°C	18.9 to 25.6	21.4	PASS
Relative Humidity	%	10 to 70	24	PASS
Force @ 45°	N	130 to 180	161	PASS
Initial Angle	Deg	0-15	10	PASS
Return Angle	Deg	0-10	2	PASS
Overall Test Results				PASS

Laboratory Technician

1/12/01

Test Date

Approved By

Hybrid III Calibration Data Sheet
3 Year Old
Head Drop Calibration

ATD Serial No.: 142C

Test I.D.: D01071

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	22.1	PASS
Laboratory Relative Humidity	%	10 to 70	23	PASS
Peak Resultant Acceleration	G's	250.0 to 280.0	267.9	PASS
Peak Lateral Acceleration	G's	$\leq \pm 15.0$	-4.0	PASS
Is Acceleration Unimodal?	Yes/No	<10% Peak	Yes	PASS
Overall Test Results				PASS

Laboratory Technician

1/11/01
Test Date

Approved By



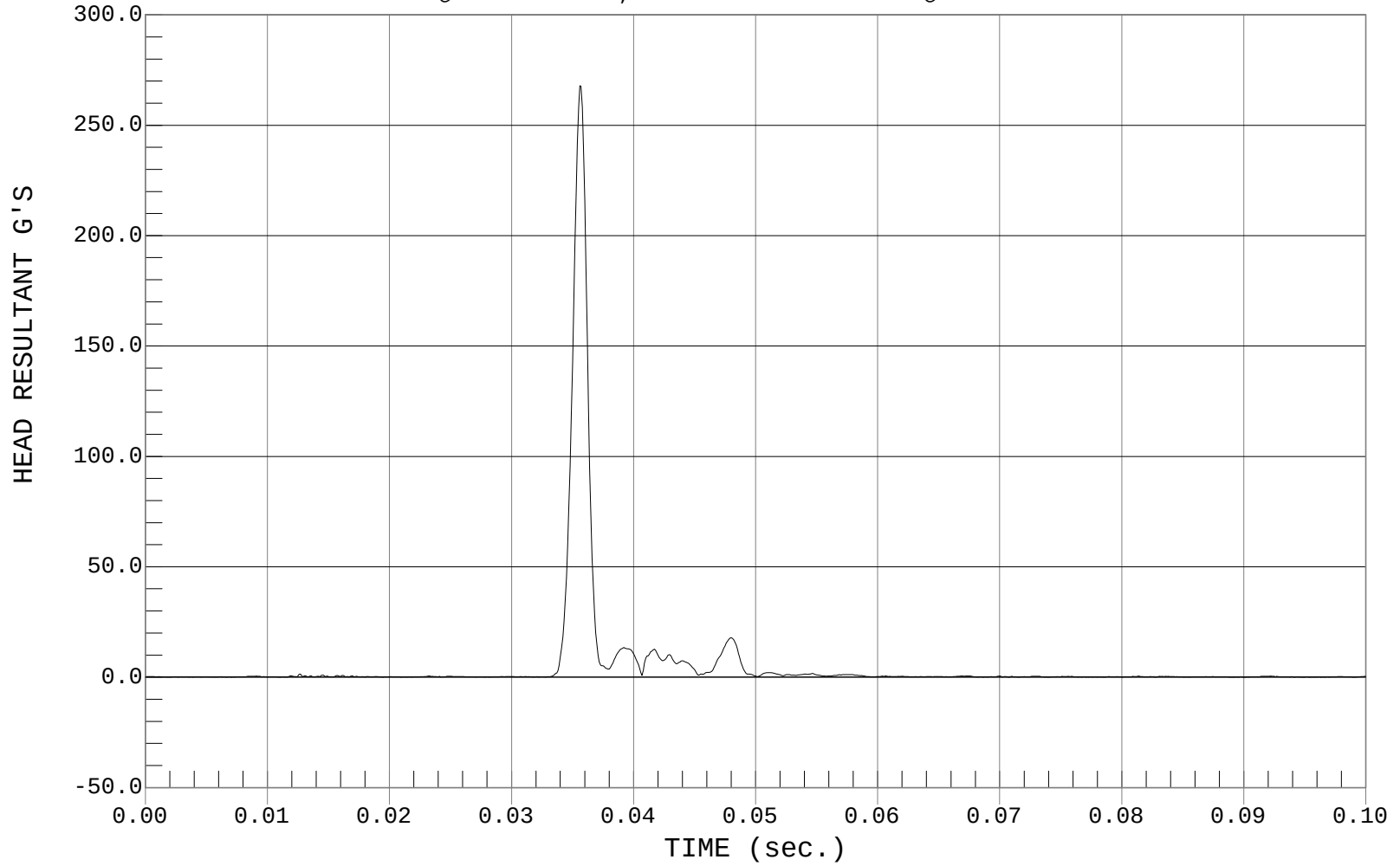
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #142C

Test Date: 01-11-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT, D01071AV.A01

Ymin = .07 G'S @ 0.0015 sec., Ymax = 267.89 G'S @ 0.0356 sec.





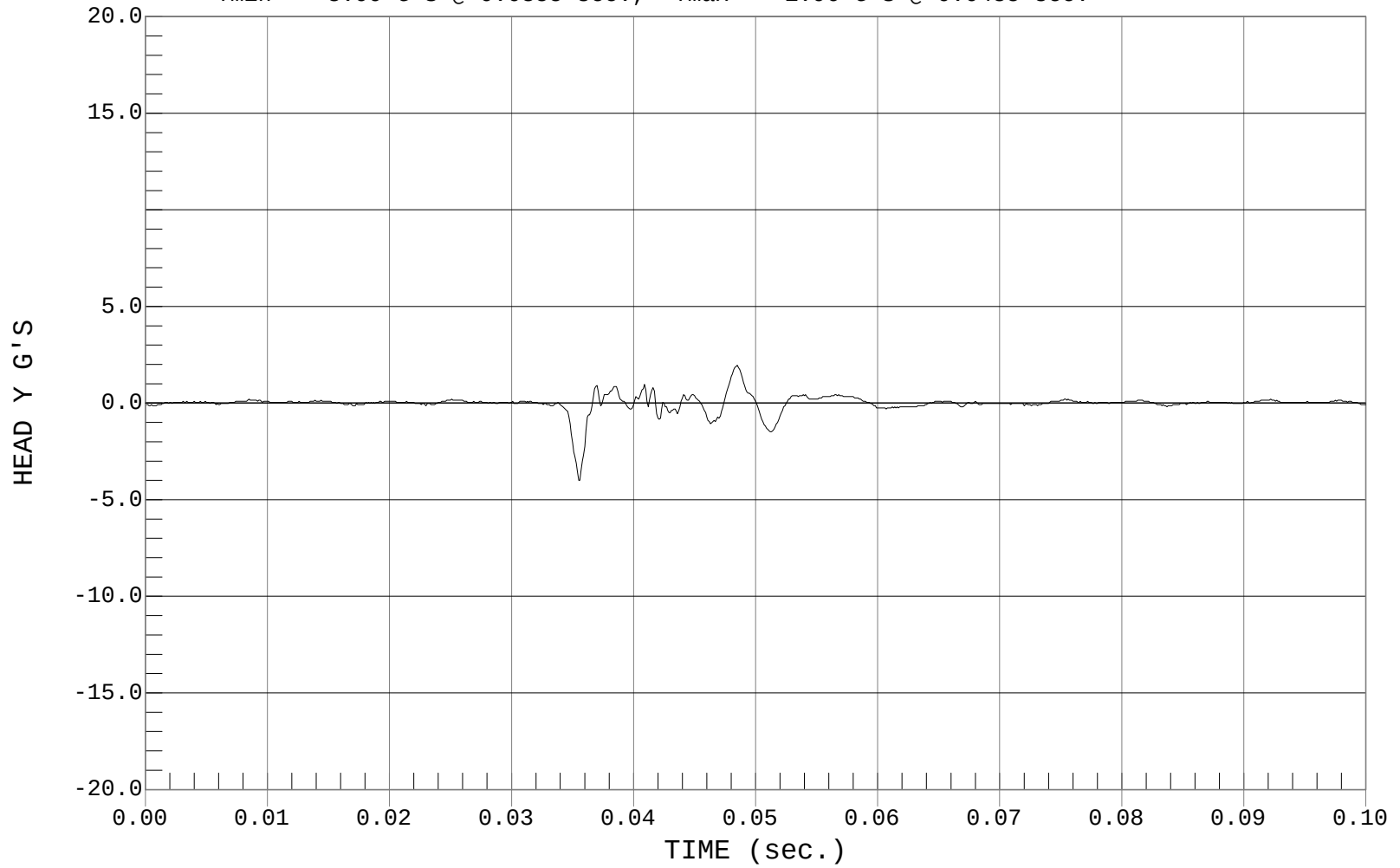
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #142C

Test Date: 01-11-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01071AR.A02

Ymin = -3.99 G'S @ 0.0355 sec., Ymax = 1.96 G'S @ 0.0485 sec.



Hybrid III Calibration Data Sheet
3 Year Old
Thorax Impact Test

ATD Serial No.: 142C

Test I.D.: D01074

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	PASS
Laboratory Relative Humidity	%	10 to 70	29	PASS
Probe Velocity	m/s	5.9 to 6.1	6.0	PASS
Peak Resistive Force Within Deflection Corridor	kN	.68 to .81	.80	PASS
Internal Hysteresis	%	65 to 85%	73	PASS
Max Force 12.5 mm to 32 mm Deflection	kN	Max .86	.88*	FAIL
Overall Test Results				FAIL

* TEST DOES NOT MEET SPECIFICATION

Laboratory Technician

1/14/01
Test Date

Approved By



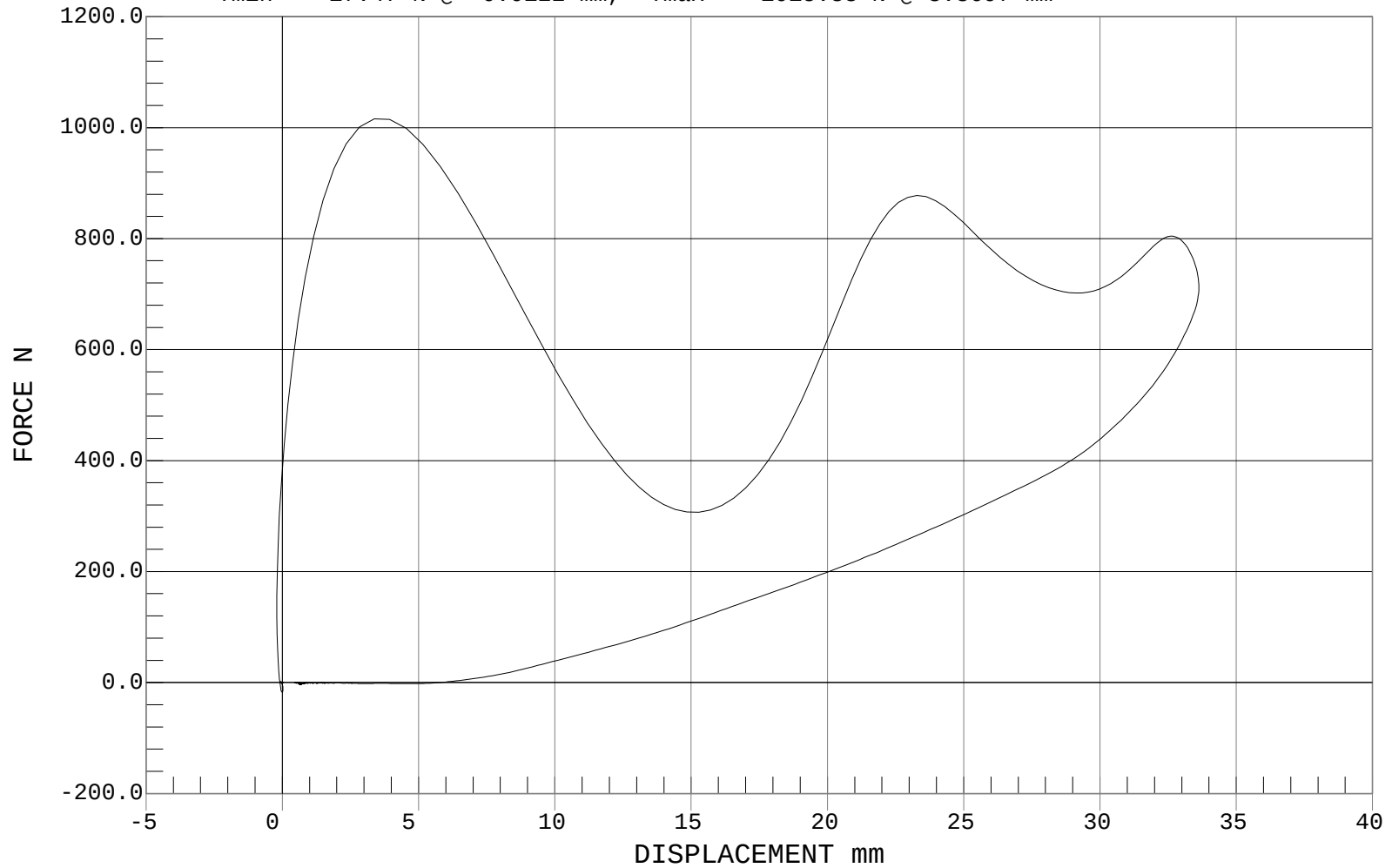
THORAX IMPACT

Test Desc.: Dummy Calibration - Chest Impact
Component: Dummy #142C

Test Date: 01-14-01
Speed: 19.72 FT/SEC, 6.01 M/SEC

— 1 FORCE, D01074CH.FVD

Ymin = -17.47 N @ -0.0122 mm, Ymax = 1015.88 N @ 3.3697 mm



Hybrid III Calibration Data Sheet
3 Year Old
Neck Flexion Test

ATD Serial No.: 142C

Test I.D.: D01072

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	PASS
Laboratory Relative Humidity		%	10 to 70	22	PASS
Pendulum Velocity		m/s	5.4 to 5.6	5.5	PASS
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.4	PASS
	15 Msec.	m/s	3.0 to 4.0	3.4	PASS
	20 Msec.	m/s	4.0 to 5.1	4.6	PASS
"D" Plane Rotation	Maximum	Deg.	70.0 to 82.0	73.8	PASS
Moment About Occipital Condyle	Maximum	Nm	42.0 to 53.0	44.4	PASS
Positive Moment Decay Time to 10Nm		Msec.	60.0 to 80.0	73.4	PASS
Overall Test Results					PASS

Laboratory Technician

1/12/01
Test Date

Approved By



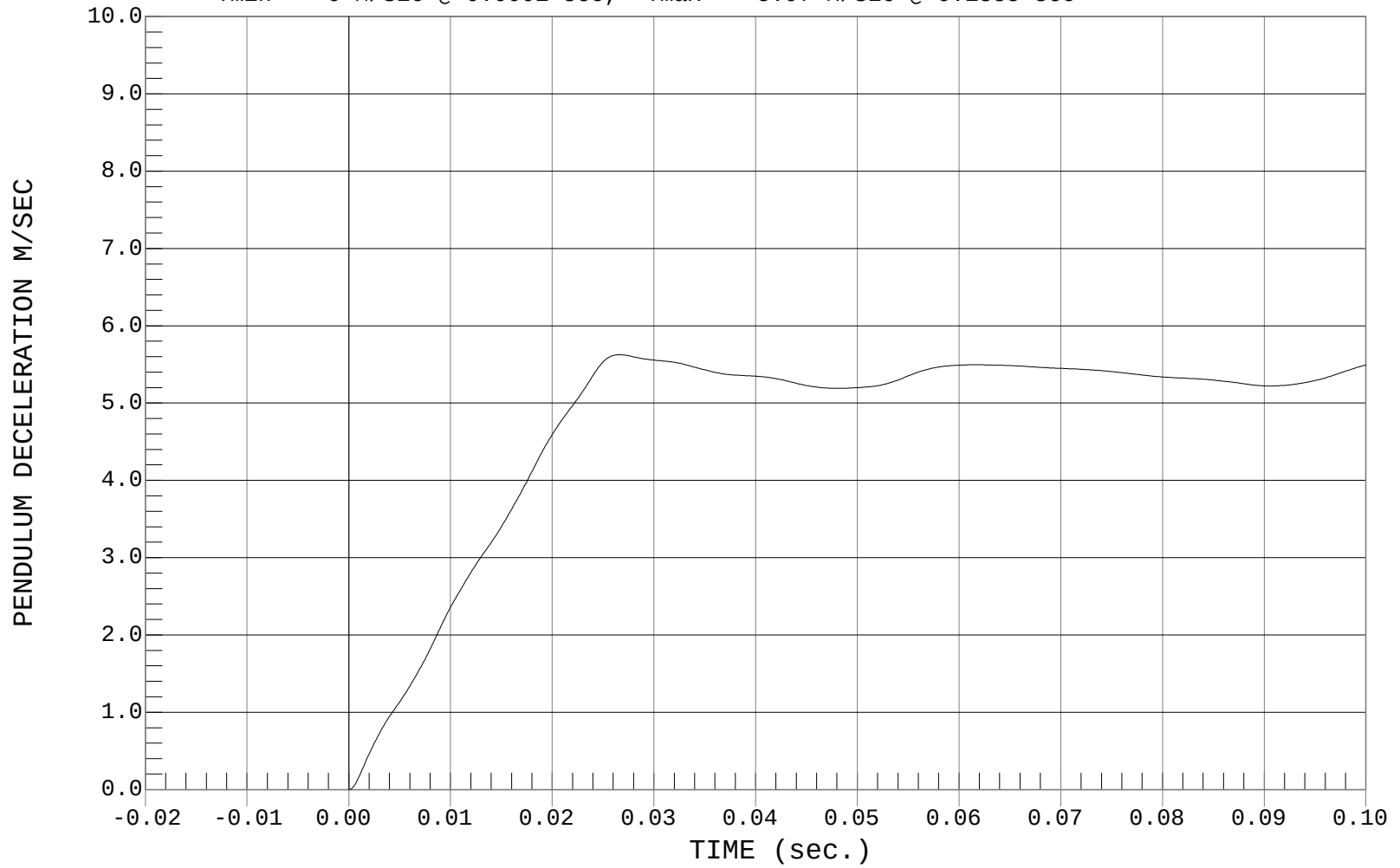
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #142C

Test Date: 01-12-01
Speed: 18.00 FT/SEC, 5.49 M/SEC

— 1 PENDULUM DECELERATION, D01072AI.A04

Ymin = 0 M/SEC @ 0.0001 sec, Ymax = 5.97 M/SEC @ 0.1885 sec





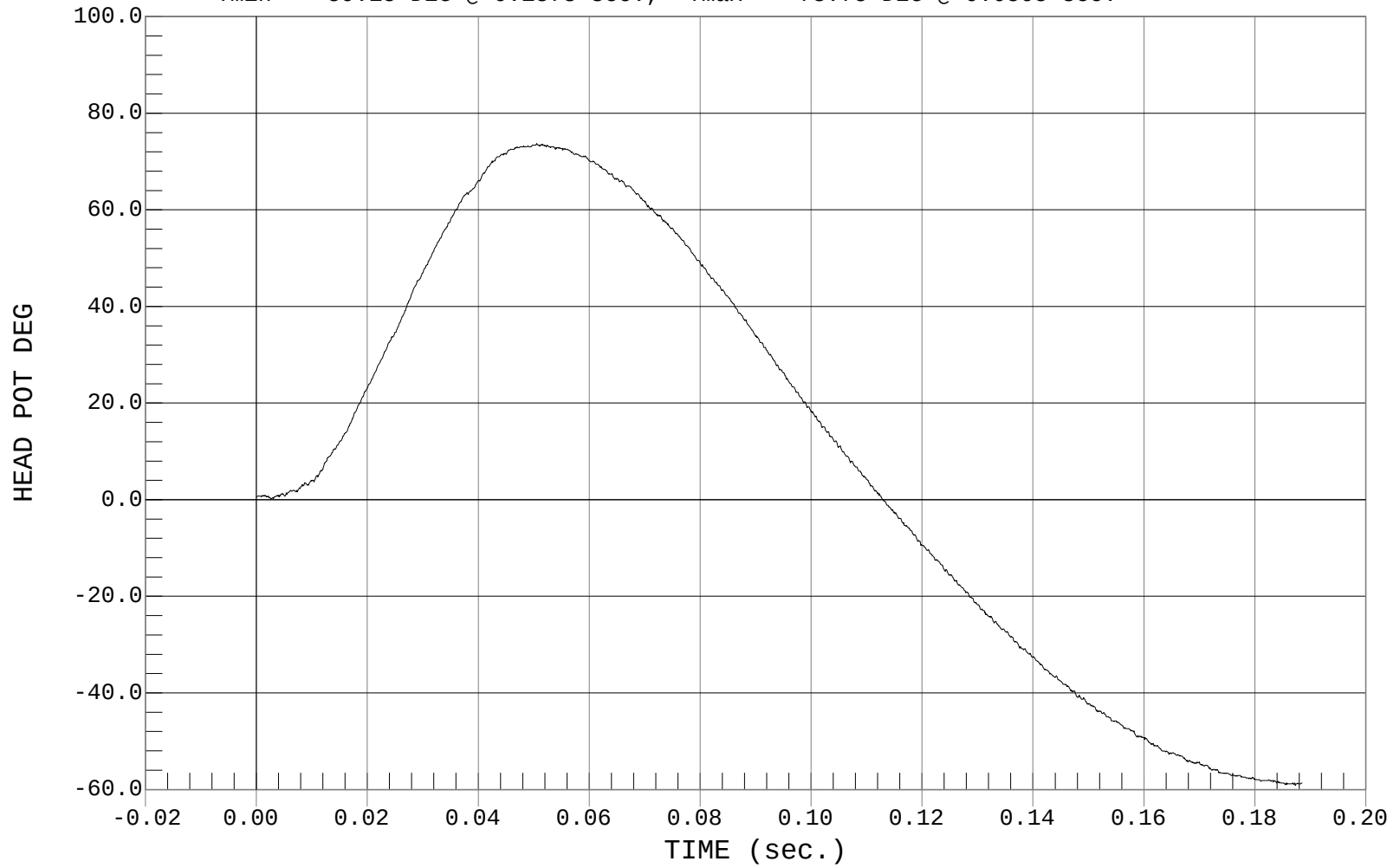
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #142C

Test Date: 01-12-01
Speed: 18.00 FT/SEC, 5.49 M/SEC

— 1 HEAD POT, D01072DU.D05

Ymin = -59.15 DEG @ 0.1873 sec., Ymax = 73.75 DEG @ 0.0505 sec.





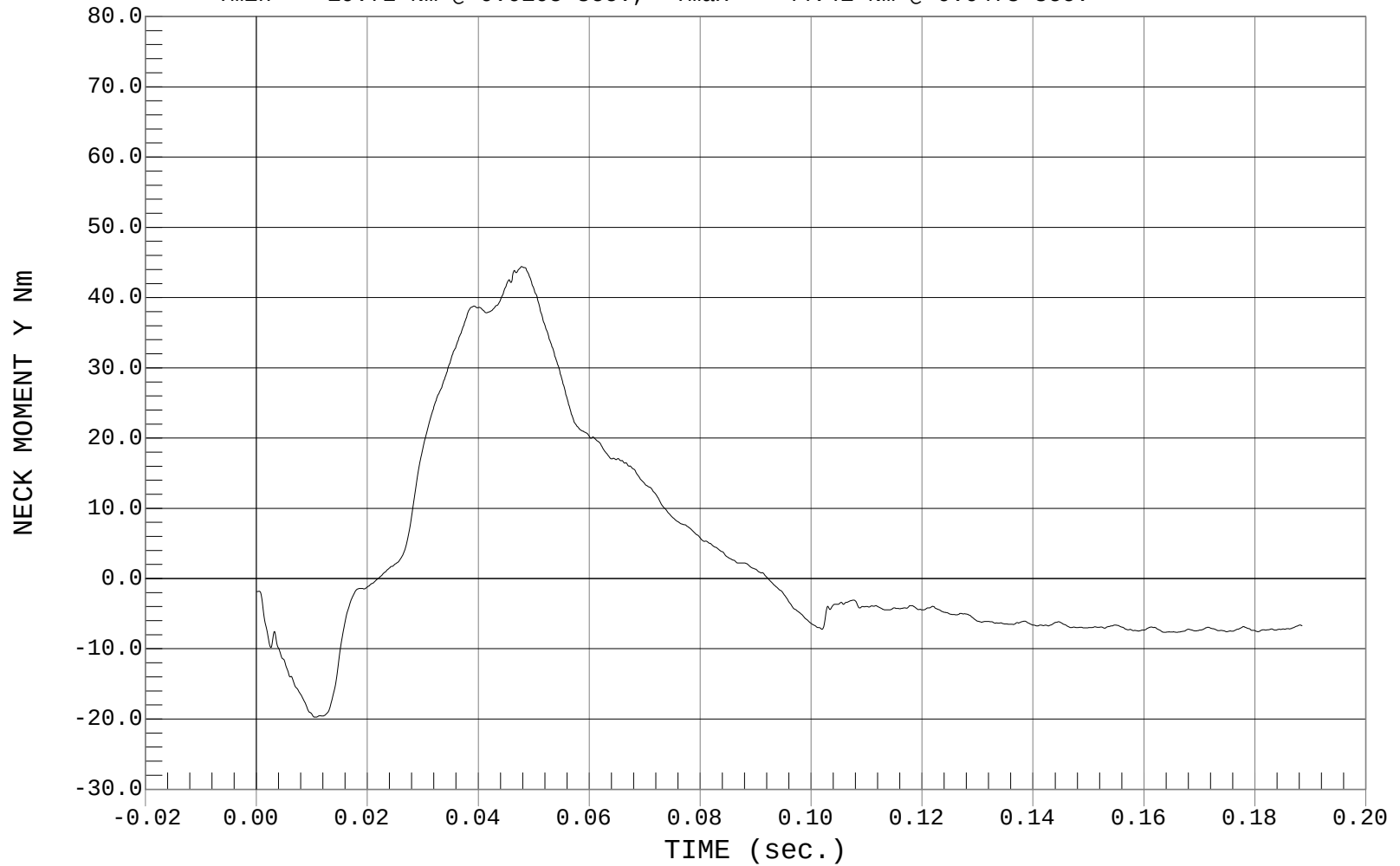
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #142C

Test Date: 01-12-01
Speed: 18.00 FT/SEC, 5.49 M/SEC

— 1 NECK MOMENT Y, D01072MF.M01

Ymin = -19.72 Nm @ 0.0105 sec., Ymax = 44.41 Nm @ 0.0478 sec.



Hybrid III Calibration Data Sheet
3 Year Old
Neck Extension Test

ATD Serial No.: 142C

Test I.D.: D01073

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	PASS
Laboratory Relative Humidity		%	10 to 70	22	PASS
Pendulum Velocity		m/s	3.55 to 3.75	3.66	PASS
Pendulum Deceleration	6 Msec.	m/s	1.0 to 1.4	1.2	PASS
	10 Msec.	m/s	1.9 to 2.5	2.1	PASS
	14 Msec.	m/s	2.8 to 3.5	2.9	PASS
"D" Plane Rotation	Maximum	Deg.	83.0 to 93.0	88.8	PASS
Moment About Occipital Condyle	Minimum	Nm	-53.3 to -43.7	-46.3	PASS
Negative Moment Decay Time to -10 Nm		Msec.	60.0 to 80.0	68.8	PASS
Overall Test Results					PASS

Laboratory Technician

1/12/01
Test Date

Approved By



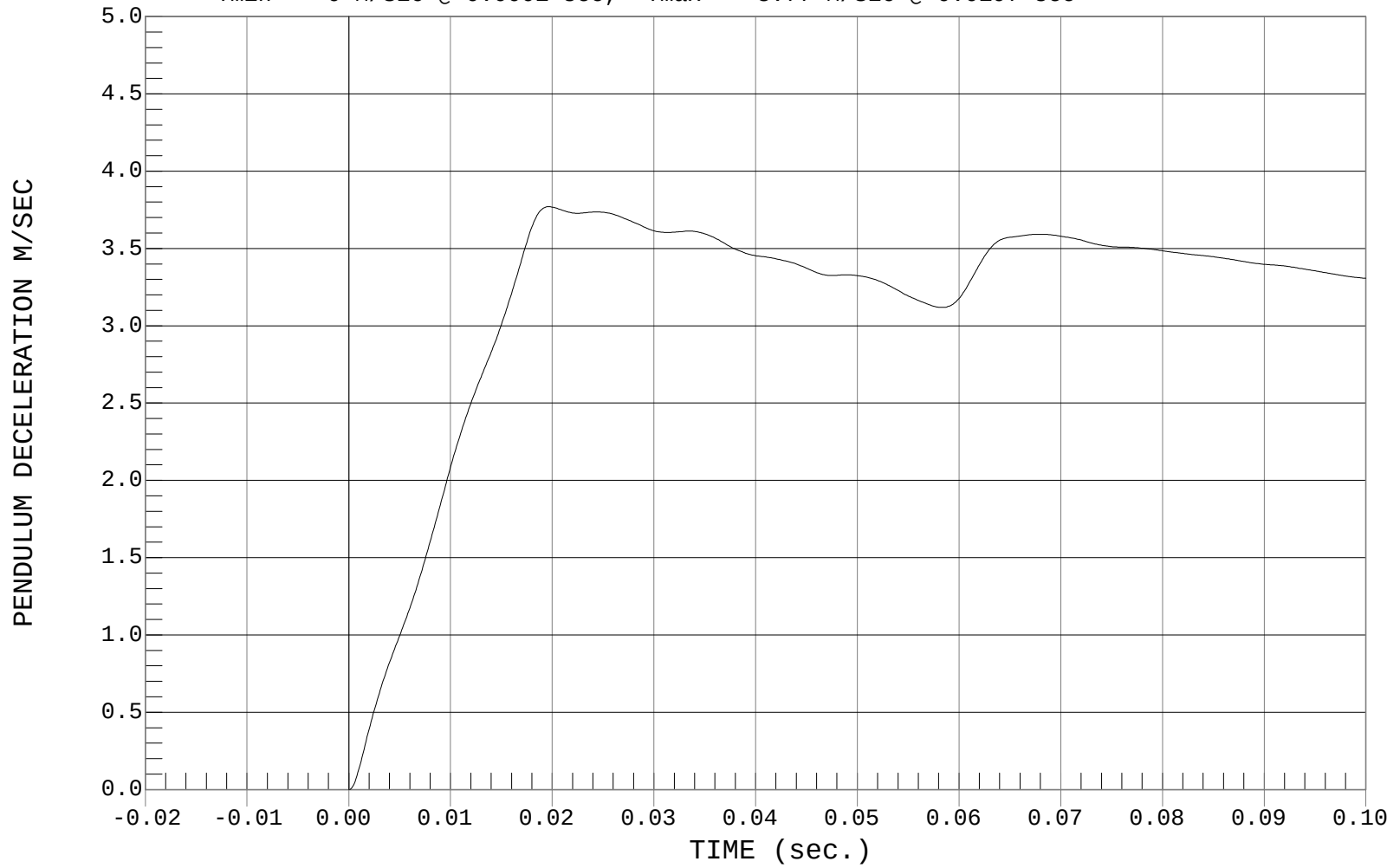
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #142C

Test Date: 01-12-01
Speed: 12.00 FT/SEC, 3.66 M/SEC

— 1 PENDULUM DECELERATION, D01073AI.A04

Ymin = 0 M/SEC @ 0.0001 sec, Ymax = 3.77 M/SEC @ 0.0197 sec





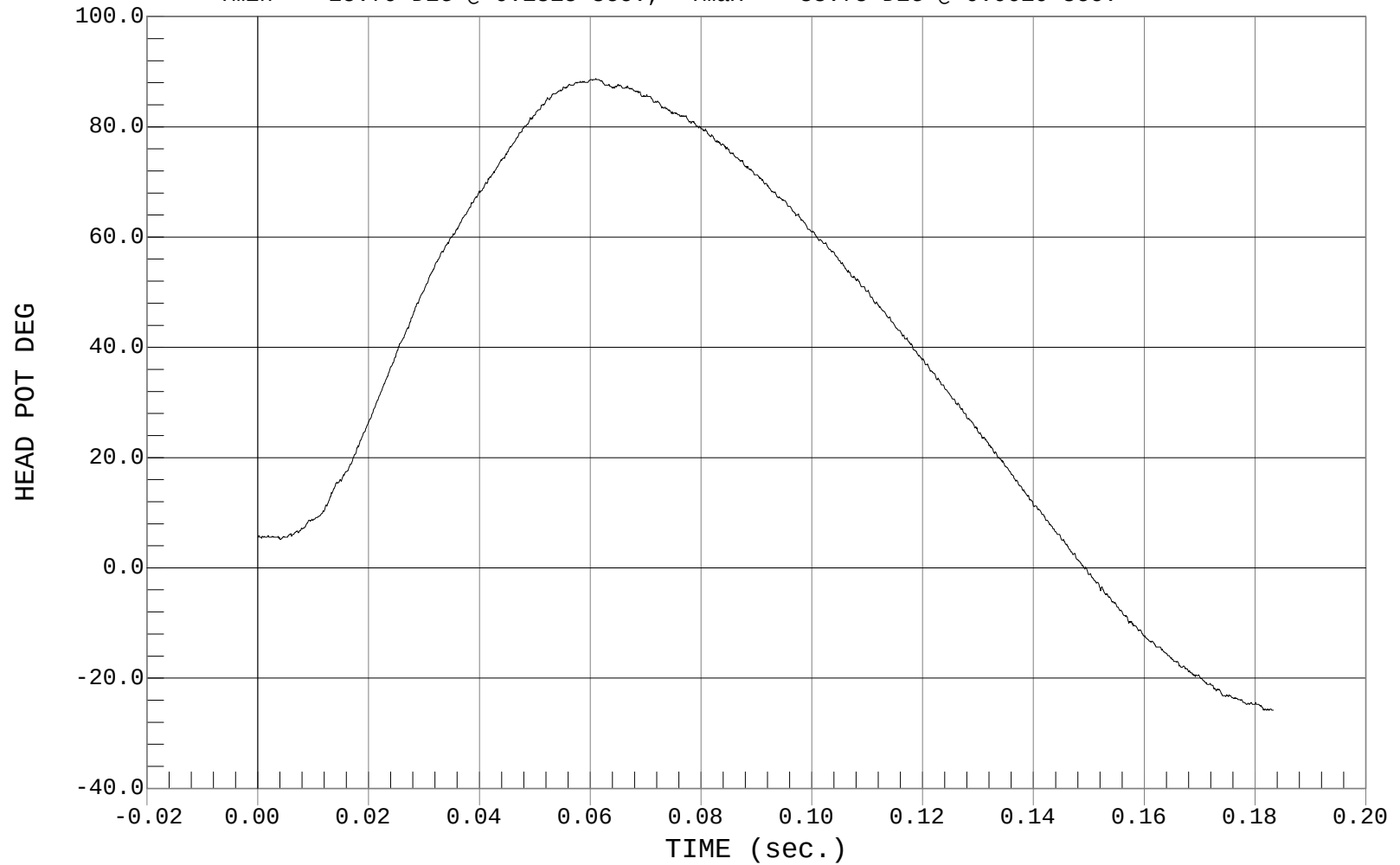
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #142C

Test Date: 01-12-01
Speed: 12.00 FT/SEC, 3.66 M/SEC

— 1 HEAD POT, D01073DU.D05

Ymin = -25.79 DEG @ 0.1815 sec., Ymax = 88.75 DEG @ 0.0610 sec.





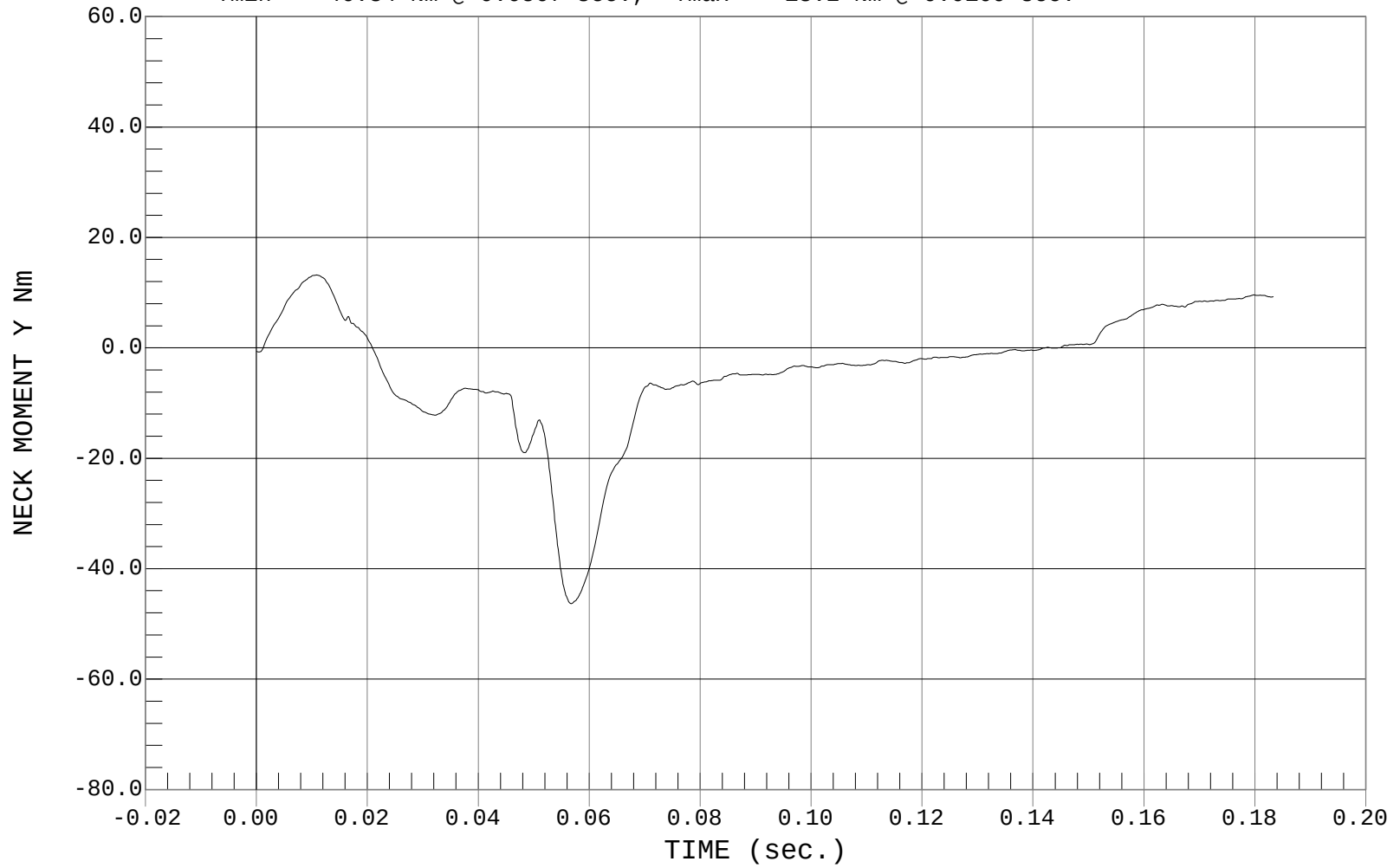
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #142C

Test Date: 01-12-01
Speed: 12.00 FT/SEC, 3.66 M/SEC

— 1 NECK MOMENT Y, D01073MF.M01

Ymin = -46.34 Nm @ 0.0567 sec., Ymax = 13.2 Nm @ 0.0109 sec.



Hybrid III Calibration Data Sheet
3 Year Old
Torso Flexion Test

ATD Serial No.: 142C

Test I.D.: D01075

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	°C	18.9 to 25.6	21.4	PASS
Relative Humidity	%	10 to 70	25	PASS
Force @ 45°	N	130 to 180	158	PASS
Initial Angle	Deg	0 to 15	6	PASS
Return Angle	Deg	0 to 10	2	PASS
Overall Test Results				PASS

Laboratory Technician

1/12/01

Test Date

Approved By

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

DUMMY AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR CHILD DUMMY NO. 139

	INSTRUMENTS FOR DUMMY NO. <u>139</u>		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AJ7F6	Endevco	1/4/01
Head Y	J19843	Endevco	1/4/01
Head Z	J19244	Endevco	1/4/01
Chest X	AJ7F7	Endevco	1/4/01
Chest Y	AJ454	Endevco	1/4/01
Chest Z	J23757	Endevco	1/4/01
Pelvis X	AJ8C0	Endevco	1/4/01
Pelvis Y	J14189	Endevco	1/4/01
Pelvis Z	J23943	Endevco	1/4/01
Upper Neck Force X	114	FTSS	11/7/00
Upper Neck Force Y	114	FTSS	11/7/00
Upper Neck Force Z	114	FTSS	11/7/00
Upper Neck Moment X	114	FTSS	11/7/00
Upper Neck Moment Y	114	FTSS	11/7/00
Upper Neck Moment Z	114	FTSS	11/7/00
Lower Neck Force X	119	FTSS	11/8/00
Lower Neck Force Y	119	FTSS	11/8/00
Lower Neck Force Z	119	FTSS	11/8/00
Lower Neck Moment X	119	FTSS	11/8/00
Lower Neck Moment Y	119	FTSS	11/8/00
Lower Neck Moment Z	119	FTSS	11/8/00
Chest Deflection Gauge	139	Servo	1/8/01

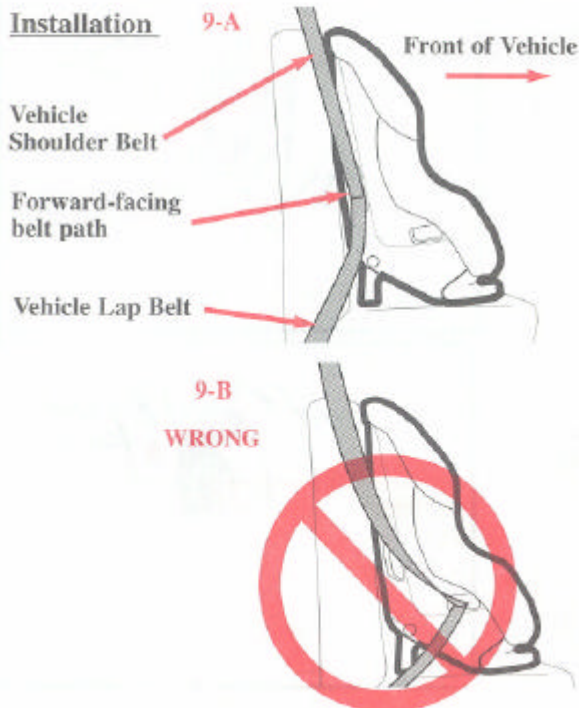
DUMMY AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR CHILD DUMMY NO. 142C

	INSTRUMENTS FOR DUMMY NO. <u>142C</u>		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	J19927	Endevco	1/4/01
Head Y	J18736	Endevco	1/4/01
Head Z	J14674	Endevco	1/4/01
Chest X	J14235	Endevco	1/4/01
Chest Y	J18724	Endevco	1/4/01
Chest Z	AJ5R0	Endevco	1/4/01
Pelvis X	J19440	Endevco	1/4/01
Pelvis Y	AJ4W2	Endevco	1/4/01
Pelvis Z	J20093	Endevco	1/4/01
Upper Neck Force X	120	FTSS	11/6/00
Upper Neck Force Y	120	FTSS	11/6/00
Upper Neck Force Z	120	FTSS	11/6/00
Upper Neck Moment X	120	FTSS	11/6/00
Upper Neck Moment Y	120	FTSS	11/6/00
Upper Neck Moment Z	120	FTSS	11/6/00
Lower Neck Force X	121	FTSS	11/8/00
Lower Neck Force Y	121	FTSS	11/8/00
Lower Neck Force Z	121	FTSS	11/8/00
Lower Neck Moment X	121	FTSS	11/8/00
Lower Neck Moment Y	121	FTSS	11/8/00
Lower Neck Moment Z	121	FTSS	11/8/00
Chest Deflection Gauge	68.514	Servo	1/12/01

CHILD SEAT OWNER'S MANUAL RESTRAINT INSTRUCTIONS

Toddler Installation: over 22 and up to 40 lbs (over 10 and up to 18 kg) and 40" (102 cm) or less

In the forward-facing toddler position, the shoulder harness must be just at or above the child's shoulders. You must change the harness height before installing the seat in the vehicle. See "To Change Harness Height" on Page 3. Read general warnings on page 2 and seat belt compatibility information on pages 6 and 7 before installing this child restraint.



! To Install:

1. Toddlers over 22 up to 35 pounds (over 10 up to 15.9 kg) who are over 1 year old may ride facing the front of the vehicle. Toddlers 35-40 pounds (15.9-18 kg) and under 40 inches (102 cm) tall must ride facing the front of the vehicle (Fig 9-A.). Either the upright or a reclined position may be used forward-facing. To change positions, see Page 3.
2. Thread the vehicle lap belt through the forward-facing belt path as shown in Fig. 9-A. If the lap and shoulder belts are attached, pass both through the belt path.
3. Buckle the vehicle belt and adjust as tightly as possible. Put one knee in the seat and push down firmly on the car seat while pulling up on the shoulder belt until the lap belt is tight. It is not necessary to make the seat completely immobile. Some "play" from front to back is acceptable. The car seat should not move more than an inch or two from side to side. If it does, you may need to use a locking clip or move the seat; use of the tether will also help stabilize the car seat. See information on pages 6, 7 and 10.
4. Place your toddler in the car seat. Secure and adjust the harness system as described in "Putting Your Child in the Restraint" on page 4.

! Do not use the child restraint in any vehicle seat where the lap belt cannot be tightened securely and properly or where it can be loosened by pulling on it. (See Pages 2, and 6-7).

Tether strap installation and removal

Vehicles manufactured after 1989 have pre-drilled holes but need to have the anchor hardware installed. Some dealers may offer free installation. Vehicles made after 9/1/99 have the anchor hardware already installed. Refer to your owner's manual or call your dealer.

⚠ You must follow the threading diagram exactly. Failure to follow these steps could cause the strap to loosen in a crash, which could result in injury to your child.

#1 Thread end down in between the pad and the shell, out through the top center slot of shell, around reinforcement and through lower slot, then back up between shell and pad.

#2 Thread end back up through both adjuster slides and then down through both adjusters.

#3 Loop tether end up and over the adjuster slides. Thread down between adjuster slides. Tighten.

To adjust tether:

Loosen slides. Pull on the end of the strap (A) to tighten. Pull on the anchor attachment (B) to loosen. Tighten strap completely so there is no slack or play.

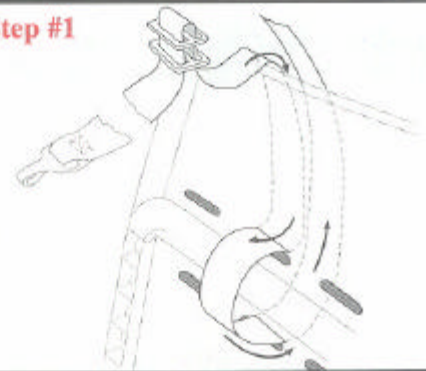
Use and storage:

The tether is used for the forward-facing position, 22-40 lbs (10-18 kg) **only**. When not in use, it is preferable for the tether to be removed. To do so, reverse steps 1-3 above.

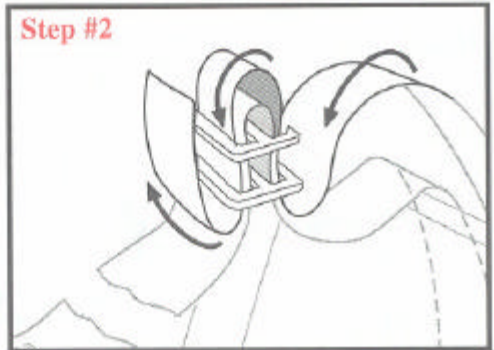
If the tether is attached and the car seat is used in the rear-facing infant position, the tether should be placed over the back of the car seat with the anchor hook secured under the base or recline stand of the car seat.

NOTE: If you need a longer tether (for example, to tether a car seat in a van), call Cosco's Consumer Relations Department, 1-800-544-1108.

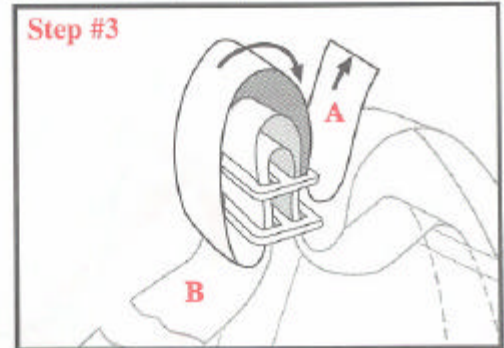
Step #1



Step #2



Step #3



LATCH (Lower Anchors and Tether for CHildren) Attachment System

This car seat is also equipped with the LATCH attachment system. These are the two extra sets of belts already threaded through the belt paths. The LATCH attachment system can **only** be used in vehicles that already have the anchor bars installed in the vehicle seat bight. These anchor bars **cannot** be retrofit onto the vehicle.

The LATCH system allows a car seat to be secured in the vehicle without using the vehicle belt system, which may not be compatible with car seats. No extra parts, such as a locking clip, are required.

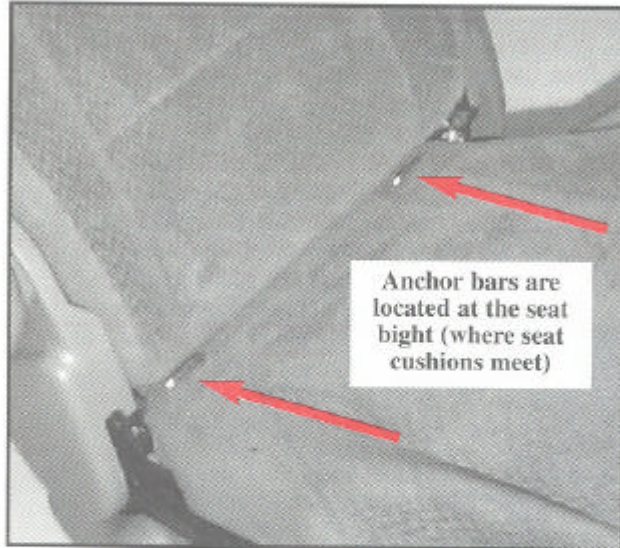
If your vehicle is equipped with this system, the bars should either be visible or clearly marked. Refer to your vehicle owner's manual to see which seating positions may be equipped with the LATCH system. The owner's manual may refer to it as a universal attachment system.

The car seat is used with the LATCH system the same way as it is for the vehicle belt system. The LATCH system does not, for example, allow an infant to be placed rear-facing in the front passenger seat with an active air bag. See warnings on page 2.

Refer to pages 12-14 for specific installation instructions.



WARNING! Make sure that LATCH hooks that are NOT in use are securely hooked together or they could seriously injure someone in a crash or sudden stop.



The back belt hooks should be hooked together behind the seat when using the seat rear-facing.



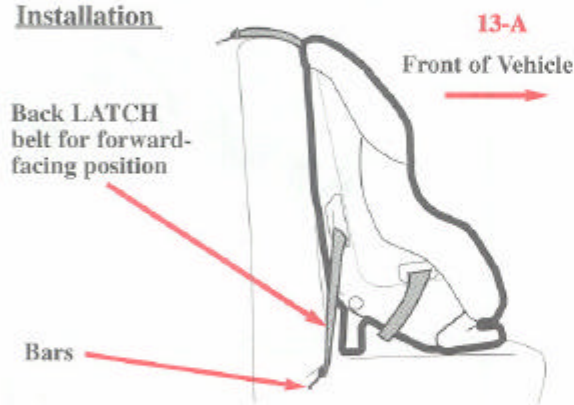
The front belt hooks should be hooked together under the seat when using the seat forward-facing.



Toddler Installation–LATCH system ONLY
over 22 and up to 40 lbs
(over 10 and up to 18 kg) and 40" (102 cm) or less

In the forward-facing toddler position, the shoulder harness must be just at or above the child's shoulders. You must change the harness height before installing the seat in the vehicle. See "To Change Harness Height" on Page 3. Read general warnings on page 2 and information on page 11 before installing this car seat.

Installation



WARNING! Make sure LATCH hooks are securely fastened or car seat will come out and child will be injured or killed. If you cannot get the seat to remain tight, do not use the car seat in this seating location with this LATCH attachment system. Do not use the LATCH system along with the adult lap or lap/shoulder belt.

To Install:

1. Toddlers over 22 up to 35 pounds (10-15.9 kg) who are over 1 year old may ride facing the front of the vehicle. Toddlers 35-40 pounds (15.9-18 kg) and under 40 inches (102 cm) tall must ride facing the front of the vehicle (Fig 9-A.). Either the upright or a reclined position may be used forward-facing. To change positions, see Page 3.
2. The shoulder harness must be threaded properly at or just below the child's shoulders. (See "To Change Harness Height", page 3).
3. Lengthen the back belt by pushing in on button and pulling on harness. Always pull slowly to make sure belt remains flat so it doesn't twist and get stuck.
4. Fasten both LATCH hooks onto the bars (Fig. 13-B); see your vehicle owner's manual and page 11 for location and information.
5. Push down firmly on the car seat while pulling up on the loop to tighten belt securely (Fig. 13-C). Putting one knee in the seat and pushing down firmly while pulling up on the belt may provide a tighter fit, but it is not necessary to make the seat completely immobile. All vehicles with these attachment bars also have a built-in tether anchor for use with a forward-facing car seat. You should secure and tighten the tether as shown on page 14.
6. Place your toddler in the car seat. Secure and adjust the harness system as described in "Putting Your Child in the Restraint" on page 4.
7. To remove car seat, push down on release button and pull away from car seat (Fig. 13-D). Remove the LATCH hooks from bars.



Latch System

Tether strap installation and removal

Vehicles manufactured after 1989 have pre-drilled holes but need to have the anchor hardware installed. Some dealers may offer free installation. Vehicles made after 9/1/99 have the anchor hardware already installed. Refer to your owner's manual or call your dealer.

! You must follow the threading diagram exactly. Failure to follow these steps could cause the strap to loosen in a crash, which could result in injury to your child.

#1 Thread end down in between the pad and the shell, out through the top center slot of shell, around reinforcement and through lower slot, then back up between shell and pad.

#2 Thread end back up through both adjuster slides and then down through both adjusters.

#3 Loop tether end up and over the adjuster slides. Thread down between adjuster slides. Tighten.

To adjust tether:

Loosen slides. Pull on the end of the strap (A) to tighten. Pull on the anchor attachment (B) to loosen. Tighten strap completely so there is no slack or play.

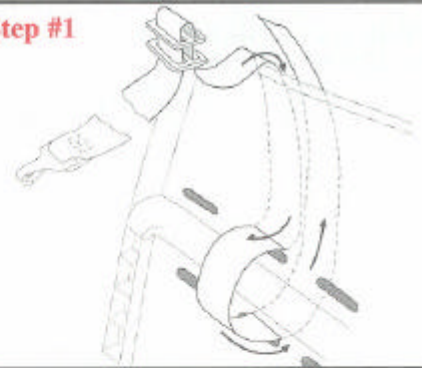
Use and storage:

The tether is used for the forward-facing position, 22-40 lbs (10-18 kg) **only**. When not in use, it is preferable for the tether to be removed. To do so, reverse steps 1-3 above.

If the tether is attached and the car seat is used in the rear-facing infant position, the tether should be placed over the back of the car seat with the anchor hook secured under the base or recline stand of the car seat.

NOTE: If you need a longer tether (for example, to tether a car seat in a van), call Cosco's Consumer Relations Department, 1-800-544-1108.

Step #1



Step #2



Step #3

