

REPORT NUMBER: NCAP-MGA-2001-014

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**Ford Motor Company
2001 Ford Windstar SE Sport
NHTSA NUMBER: M10200**

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



March 5, 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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Prepared by: _____
Gary Strassburg, Project Engineer

Date: _____

Reviewed by: _____
David Winkelbauer, Facility Director

Date: _____

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

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16. <i>Abstract</i> <p>A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2001 Ford Windstar SE Sport at MGA Research Corporation on March 5, 2001. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity was 56.6 km/h. The ambient temperature at the barrier face at the time of impact was 22 degrees Celsius. The vehicle's maximum post test static crush is 567 mm located to the left of the vehicle centerline. The test vehicle is equipped with a 3-point continuous belt system and an airbag in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:</p> <table 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 (HIC)</td> <td>N/A</td> <td>1000</td> <td>256</td> <td>516</td> </tr> <tr> <td>Max. Thorax Accel. (3msec Clip)</td> <td>G's</td> <td>60</td> <td>31</td> <td>32</td> </tr> <tr> <td>Left Femur force</td> <td>Newtons</td> <td>10009</td> <td>1720</td> <td>2493</td> </tr> <tr> <td>Right Femur force</td> <td>Newtons</td> <td>10009</td> <td>457</td> <td>1833</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)	N/A	1000	256	516	Max. Thorax Accel. (3msec Clip)	G's	60	31	32	Left Femur force	Newtons	10009	1720	2493	Right Femur force	Newtons	10009	457	1833
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SECTION 1

PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the FY' 01 New Car Assessment Program (NCAP) frontal barrier crashworthiness evaluation program 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 frontal barrier impacts. 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 March 5, 2001 at a speed of 56.6 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 anthropomorphic test devices (ATDs). Two (2) part 572E 50th percentile adult male 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 the dummy placement procedures specified in the Laboratory Indicant Test Procedure. 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 manufacturers instructions. One hundred forty three (143) 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. 142) and the right-front passenger (Serial No. 192) were calibrated 2 tests 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 Sport at a velocity of 56.6 km/h. The test vehicle weight was 2135.1 kilograms with two (2) part 572E 50th percentile adult male ATDs and two (2) part 572P 3 year old ATDs. Six (6) load cell barrier data channels were obtained in conducting the NCAP Test. The test vehicle is equipped with a laterally mounted 3.8 -liter, 6 -cylinder engine and an automatic transmission.

The driver Head Injury Criteria (HIC) was 256. The maximum resultant chest deceleration over three (3) milliseconds was 31 g's. The left and right femur loads were 1720 and 457 Newtons, respectively. Chest deflection for the driver ATD peaked at 28 mm. The driver ATD head contacted the airbag and headrest, its chest and abdomen contacted the airbag, and the left and right knees contacted the knee bolster.

The right front passenger's HIC was 516. The maximum resultant chest deceleration over three (3) milliseconds was 32 g's. The left and right femur loads were 2493 and 1833 Newtons, respectively. Chest deflection for the passenger ATD peaked at 24 mm. The passenger ATD head contacted the airbag and headrest, the chest and abdomen contacted the airbag, and the left and right knees contacted the glovebox.

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 567 mm located to the left 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 Sport 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 Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 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	$=(tf - 32)/1.8$
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 SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.6
Test Weight	kg	2135.1
Impact Angle	degrees	90
Average Rebound	mm	1122
Maximum Static Crush	mm	567

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door Opening	yes	yes
Rear Door Opening	yes	yes
Seat Track Shift (mm)	0	4
Seat Back Failure	none	none

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type / Serial No.	HIII/142	HIII/192
Head Contact	airbag, headrest	airbag, headrest
Chest Contact	airbag	airbag
Abdomen Contact	airbag	airbag
Left Knee Contact	knee bolster	knee bolster
Right Knee Contact	knee bolster	knee bolster

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	6
Total	101

**DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

TEST VEHICLE INFORMATION

Manufacturer	Ford Motor Co.
Model	Windstar Se Sport
Body Style	Van
NHTSA No.	M10200
VIN	2FMZA57411BB19603
Color	Silver
Delivery Date	February 28, 2001
Odometer Reading (mile)	4
Dealer	Martin Ford Sales
Transmission	4 spd. Automatic W/OD
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3.8
Engine Placement	Transverse

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 Co.	GVWR (kg)	2522
Date of Manufacture	February 2001	GAWR Front (kg)	1315
		GAWR Rear (kg)	1427

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	241	241
Cold Pressure (kPa)	241	241
Recommended Tire Size	P225/60R16	P225/60R16
Tire Size on Vehicle	P225/60R16	P225/60R16
Tire Manufacturer	Michelin	Michelin

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 Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	577.4	397.4		634.6	447.7	
Right	kg	560.2	384.2		617.8	435.0	
Ratio	%	59.3	40.7		58.7	41.3	
Totals	kg	1137.6	781.6	1919.2	1252.4	882.7	2135.1

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1919.2
Weight of 2 P572E ATDs	kg	156.0
Rated Cargo/Luggage Weight (RCLW)	kg	68.0
Calculated Vehicle Target Weight (TVTW)	kg	2143.2

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	743	743	752	762	1249
As Tested	mm	724	720	724	733	1268
Post Test	mm	867	766	752	705	

Vehicle Wheelbase (mm): 3066

Weight of Ballast secured in cargo area (kg): 0

Vehicle Components Removed: Spare tire, jack, rear seat, taillights, 3rd row seat, rear wiper and motor

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): 90.8

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 electric fuel pump is activated (1) for 3 seconds for priming when the ignition key is turned from the "off" position to the "on" position and (2) anytime the engine is turning and the ignition is on.

DATA SHEET NO. 3**POST IMPACT DATA**Test Vehicle: 2001/Ford/Windstar SE SportNHTSA No.: M10200Test Program: NCAPTest Date: March 5, 2001

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	55.5 - 57.1	56.6
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 - 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	4855	4342	513
Center	mm	4997	4450	547
Right Side	mm	4848	4363	485

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1096
Center	mm	1156
Right Side	mm	1114
Average	mm	1122

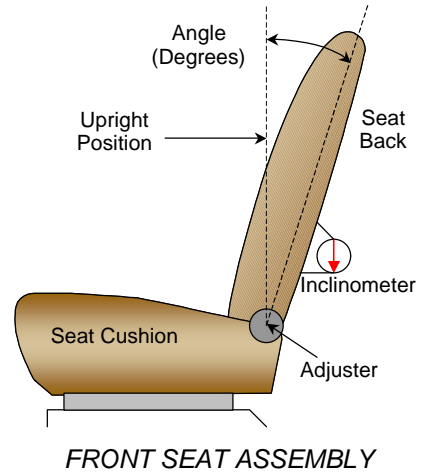
DATA SHEET NO. 4
TEST VEHICLE INFORMATION

Test Vehicle: 2001/Ford/Windstar SE Sport
Test Program: NCAP

NHTSA No.: M10200
Test Date: March 5, 2001

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows: The seat back angle is measured relative to the rocker sill. On the rearward, lower, inboard side of the seat back, cut the fabric to expose the seat frame. Locate the two tooling holes in the seat frame. Measure the seatback angle by placing an inclinometer flush against the seat frame, on the line connecting the center of these two tooling holes. The seatback should be 21 degrees.



Driver seat back angle: 21.4 degrees
Passenger seat back angle: 21.4 degrees

SEAT FORE/AFT POSITIONS

The driver seat is power operated and the passenger seat is manually operated. The total travel on the driver seat is 185 mm and the passenger is 19 seat positions. The fore/aft position is set at the middle position for both driver and passenger.

Driver seat fore/aft total travel: 185 mm
Passenger seat fore/aft total travel: 19 seat positions
Driver seat fore/aft position: 92 mm
Passenger seat fore/aft position: 10th seat position

SEAT BELT UPPER ANCHORAGE

The test vehicle is equipped with adjustable anchorages for both the driver and passenger seat positions. The anchorages are placed in the mid position.

DATA SHEET NO. 4...(continued)

TEST VEHICLE INFORMATION

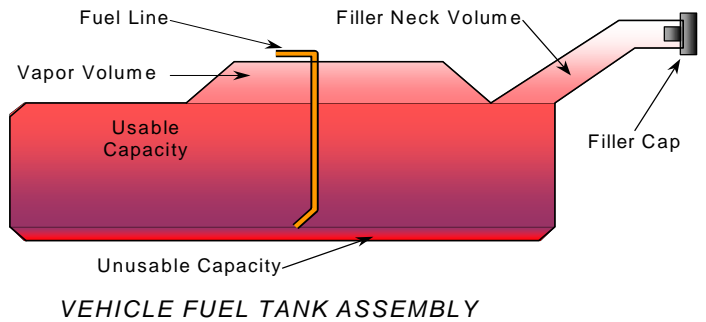
Test Vehicle: 2001/Ford/Windstar SE Sport
Test Program: NCAP

NHTSA No.: M10200
Test Date: March 5, 2001

FUEL TANK CAPACITY DATA

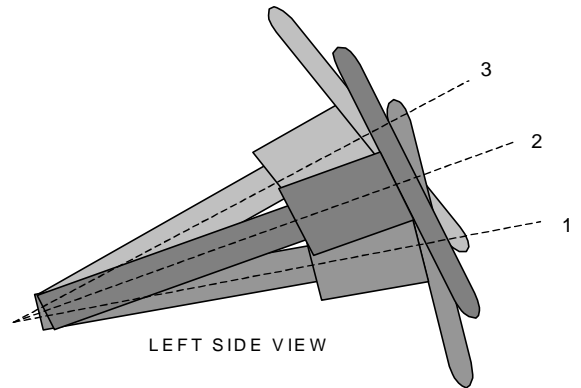
The "Usable Capacity" of the standard equipment fuel tank is: 98.4 liters
The "Usable Capacity" of any optional equipment fuel tank is: N/A liters
The "Usable Capacity" used for certification to FMVSS 301 requirements: 98.4 liters
Actual amount of Stoddard solvent added to vehicle for certification test: 90.8 liters

The test vehicle is equipped with an electric fuel pump. The fuel filler door is located on the left rear fender. The electric fuel pump is activated (1) for 3 seconds for priming when the ignition key is turned from the "off" position to the "on" position and (2) anytime the engine is turning and the ignition is on.



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: 18.3 °
Geometric center, position 2: 25.9 °
Uppermost, position 3: 33.9 °

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

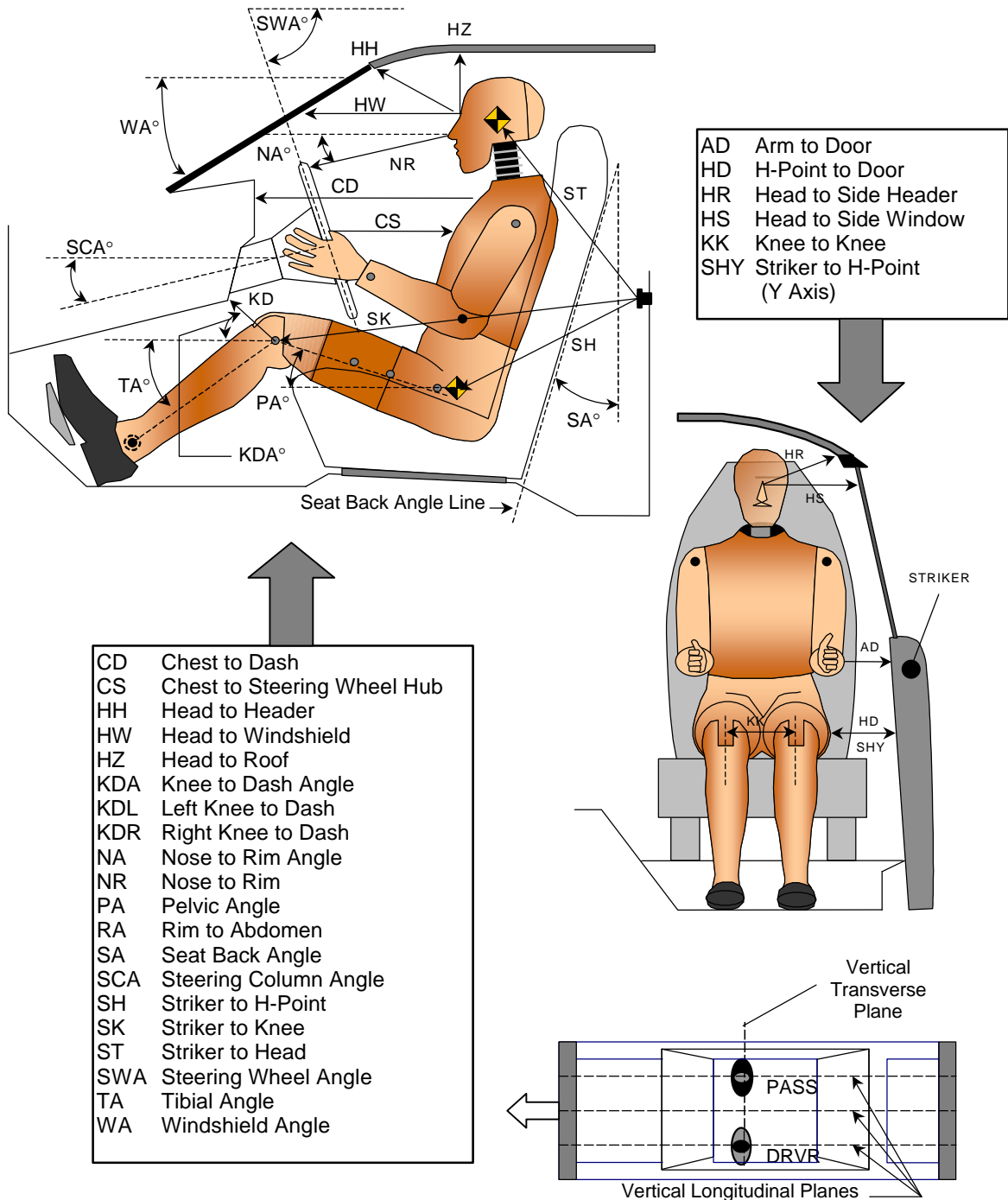
Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



DATA SHEET NO. 5...(continued)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		29.8		
SWA	Steering Wheel Angle		64.1		
SCA	Steering Column Angle		25.1		
SA	Seat Back Angle		21.4		21.4
HZ	Head to Roof (Z)	253	90.0	123	90.0
HH	Head to Header	399	26.2	385	24.6
HW	Head to Windshield	690	0.0	657	0.0
HR	Head to Side Header (Y)	271		236	
NR	Nose to Rim	385	8.2		
CD	Chest to Dash	561		544	
CS	Chest to Steering Hub	299	1.1		
RA	Rim to Abdomen	212	0.0		
KDL	Left Knee to Dash	173	0.0	160	
KDR	Right Knee to Dash	145		172	24.9
PA	Pelvic Angle		24.8		23.2
TA	Tibia Angle		46.5		52.4
KK	Knee to Knee (Y)	286		248	
SK	Striker to Knee	600	90.3	632	91.5
ST	Striker to Head	573	14.9	597	9.5
SH	Striker to H-Point	209	105.9	193	97
SHY	Striker to H-Point (Y)	282		262	
HS	Head to Side Window	373		330	
HD	H-Point to Door (Y)	182		150	
AD	Arm to Door (Y)	138		117	
AA	Ankle to Ankle	319		230	

DATA SHEET NO. 6

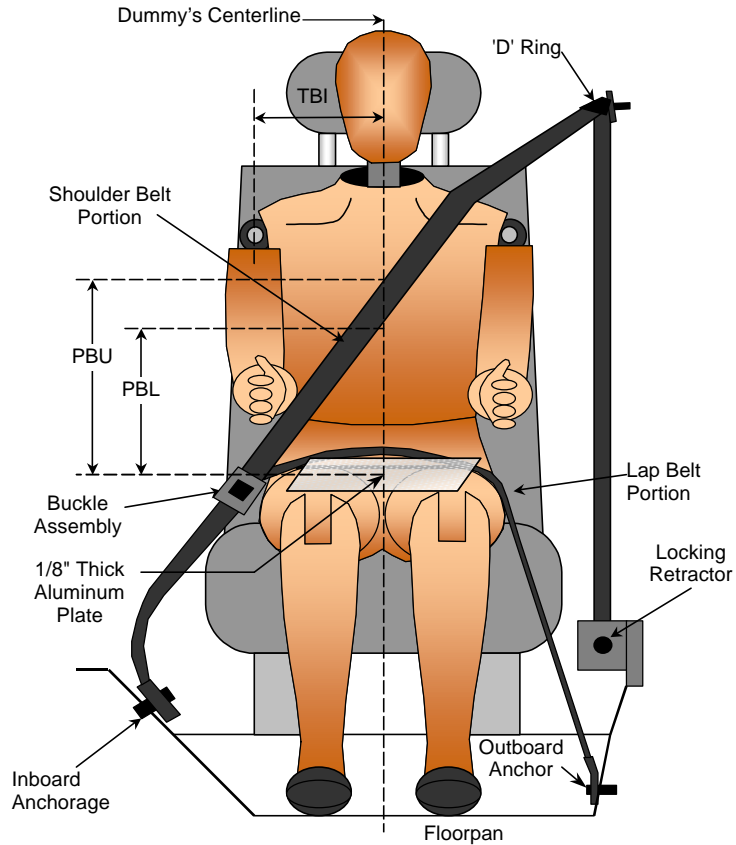
SEAT BELT POSITIONING DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	178	226
PBU - Top surface of reference to belt upper edge	mm	297	346
PBL - To surface of reference to belt lower edge	mm	210	256

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 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)	2022	-610	440	G's	2.3	182	-31.2	59
2	Right Rear X-Member (Primary)	2022	610	436	G's	3.2	188	-33.2	57
3	Engine Top*	4345	75	882	G's	42.9	61	-164.7	32
4	Engine Bottom**	4110	148	192	G's				
5	Left Brake Caliper***	4095	-715	238	G's	24.6	83	-131.3	47
6	Right Brake Caliper****	4095	715	240	G's	135.3	60	-130.3	39
7	Instrument Panel	3230	0	1122	G's	4.2	161	-56.2	30
8	Left Rear X-Member (Redundant)	2022	-610	440	G's	2.6	182	-28.1	59
9	Right Rear X-Member (Redundant)	2022	610	436	G's	2.8	188	-34.9	57

Reference Points: X - From Rear Surface of Vehicle (+ forward)

Y - Vehicle Centerline (+ to right)

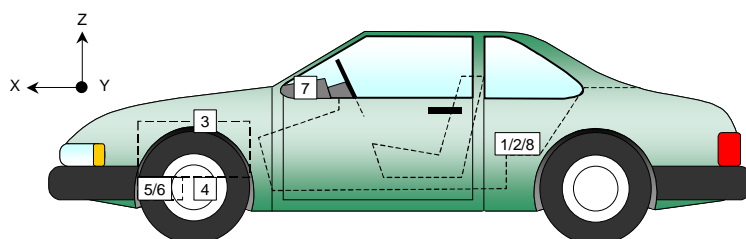
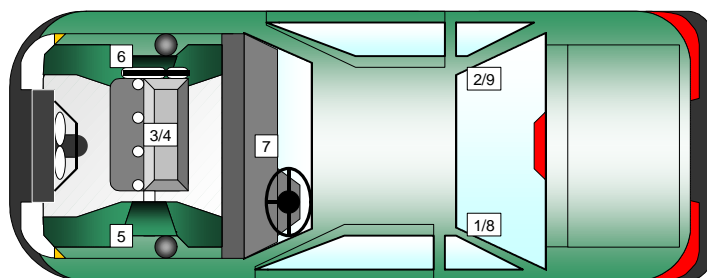
Z - Ground Plane (+ up)

* No valid data collected after 65 msec.

** No valid data collected.

*** No valid data collected after 104 msec.

**** No valid data collected after 76 msec.



DATA SHEET NO. 8

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	1.8	196	37.7	70	.6	162	60.3	98
Head CG	Y	G's	1.4	31	22.4	69	5.2	81	7.6	149
Head CG	Z	G's	23.7	91	2.9	89	24.8	83	1.3	155
Head CG Resultant	N/A	G's	44.0	70			61.8	98		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	1.7	157	31.0	89	1.6	199	32.2	103
Chest CG	Y	G's	4.7	100	5.6	46	4.1	99	3.4	91
Chest CG	Z	G's	5.9	48	6.9	71	8.1	115	7.7	92
Chest CG Resultant	N/A	G's	31.5	68			32.3	95		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	707	54	1720	68	510	53	2493	67
Right Femur	Z	Newtons	747	76	457	42	538	51	1833	58

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	4070	63			4005	68		
Shoulder Belt Force	N/A	Newtons	**	**			**	**		

** Not used at vehicle manufacturers request

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 Primary	256	34.7	58.0	94.0	516	46.1	76.1	111.9

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	30.9	66.7	69.8	32.0	101.6	104.7

DATA SHEET NO. 8...(continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	1.2	176	37.5	68	3.5	160	50.1	67
Pelvis	Y	G's	4.6	79	5.1	45	3.9	81	5.1	111
Pelvis	Z	G's	1.9	151	24.8	70	3.1	150	24.9	80

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	261	69	262	130	154	109	548	61
Neck Force	Y	Newtons	278	87	112	68	43	186	249	99
Neck Force	Z	Newtons	1046	91	78	154	774	76	49	21
Neck Moment	X	N•m	22.9	69	9.4	55	6.4	86	6.7	129
Neck Moment	Y	N•m	42.2	65	15.7	48	17.0	76	14.7	58
Neck Moment	Z	N•m	33.5	82	13.7	155	4.0	200	6.1	133

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	12.6	49	32.4	73	10.5	65	56.8	57
Left Foot Aft	Z	G's	4.3	57	37.4	34	16.6	71	49.7	35
Left Foot Fore	Z	G's	31.9	61	62.6	69	35.0	65	70.8	58
Right Foot Aft	X	G's	8.7	51	66.4	42	1.5	197	32.8	78
Right Foot Aft	Z	G's	3.2	63	59.7	48	7.4	67	50.6	36
Right Foot Fore	Z	G's	42.2	53	134.3	38	20.3	66	55.2	39

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	29.8	42	76.9	46	3.8	132	9.0	61
Left Lower Moment	Y	N•m	39.7	86	19.7	38	37.5	36	44.8	58
Left Lower Force	Z	Newtons	2940	44	176	155	3574	36	376	63
Left Upper Moment	X	N•m	39.6	42	35.3	66	19.4	117	37.1	87
Left Upper Moment	Y	N•m	12.8	173	96.2	42	18.5	132	77.5	33
Left Upper Force	Z	Newtons	2130	42	105	137	2622	36	192	64
Right Lower Moment	X	N•m	17.5	81	18.5	66	11.7	80	12.7	62
Right Lower Moment	Y	N•m	5.9	39	35.8	67	31.8	35	31.3	62
Right Lower Force	Z	Newtons	1879	34	118	156	3820	36	210	153
Right Upper Moment	X	N•m	1.1	23	52.7	66	22.2	155	28.0	85
Right Upper Moment	Y	N•m	26.7	172	74.7	66	33.3	158	86.2	37
Right Upper Force	Z	Newtons	1376	33	199	155	2878	35	84	156

DATA SHEET NO. 8...(continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	mm			28.0	99			23.6	103

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	0.5	198	36.6	70	3.3	137	62.0	94
Head CG	Y	G's	1.6	32	21.6	70	4.6	100	4.4	114
Head CG	Z	G's	24.0	91	3.8	89	21.0	83	.8	21
Head CG Resultant	N/A	G's	42.4	70			63.9	99		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	1.7	158	30.8	89	1.7	199	31.9	95
Chest CG	Y	G's	6.8	110	5.3	47	4.8	99	2.4	71
Chest CG	Z	G's	5.6	48	6.8	71	7.3	112	9.0	92
Chest CG Resultant	N/A	G's	31.1	71			32.7	95		

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	246	34.2	58.6	94.6	523	46.8	76.4	111.3

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	30.7	66.3	69.4	31.3	93.3	96.4

DATA SHEET NO. 9**SEAT BELT PERFORMANCE ASSESSMENT TEST DATA**Test Vehicle: 2001/Ford/Windstar SE SportNHTSA No.: M10200Test Program: NCAPTest Date: March 5, 2001**SEAT BELT PLACEMENT MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	178	226
PBU - Top surface of reference to belt upper edge	mm	297	345
PBL - Top surface of reference to belt lower edge	mm	210	256

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to "D" ring	mm	144	144
Shoulder belt length as measured on ATD	mm	837	904
Lap belt length as measured on ATD	mm	827	964
Total belt length for continuous webbing systems	mm	1808	2012

SHOULDER BELT SPOOL-OUT DATA

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

** Not recorded at vehicle manufacturers request

DATA SHEET NO. 10

SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

Windshield Mounting Details:

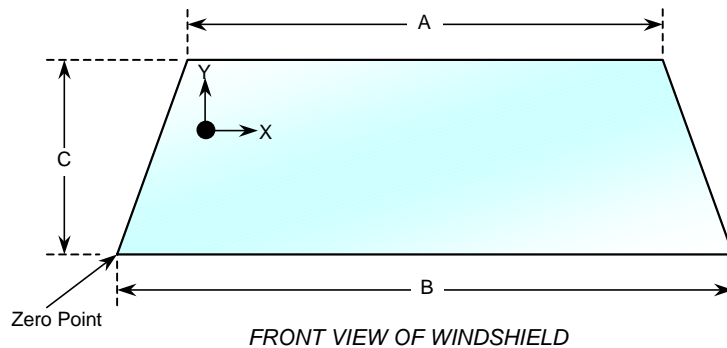
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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: 22 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2363	2363	100
Right Side	2338	2338	100
Total	4701	4701	100



WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1299	25
B	mm	1714	17
C	mm	835	25

DATA SHEET NO. 11

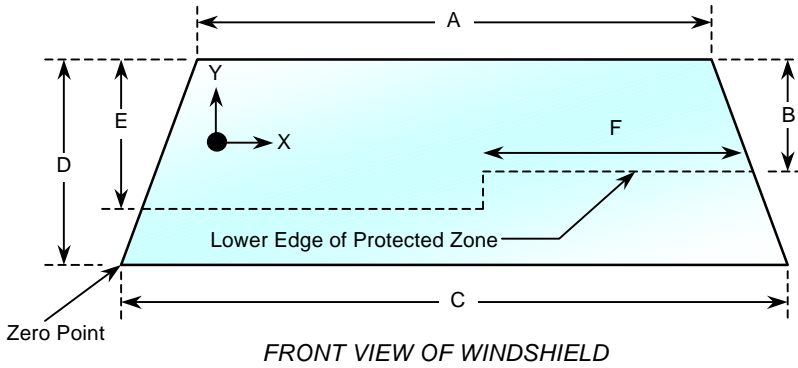
WINDSHIELD ZONE INTRUSION FMVSS 219 (Partial) DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001



Item	Units	Value
A	mm	1299
B	mm	491
C	mm	1714
D	mm	835
E	mm	542
F	mm	785

AREA OF PROTECTED ZONE FAILURES - NONE

- 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. **None**

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. **None**

X	Y

DATA SHEET NO. 12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

Test Time: 7:06 PM

Temperature at Time of Impact: 22°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

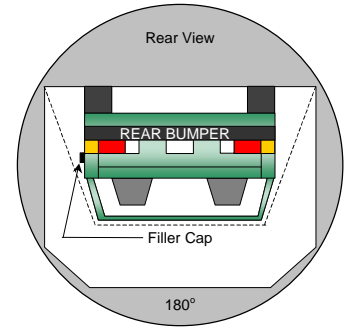
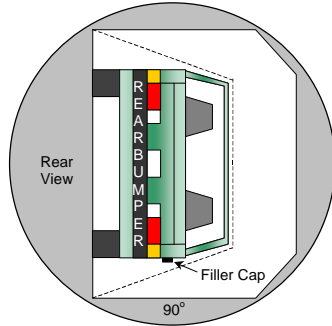
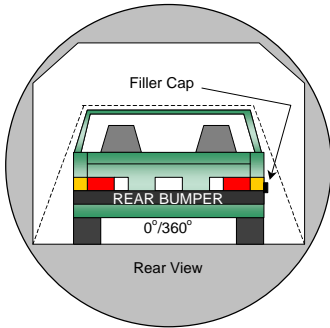
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

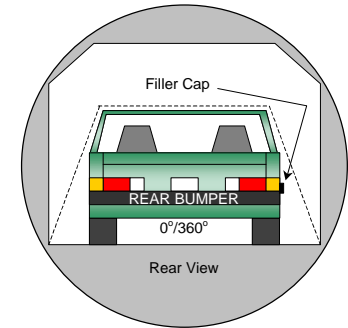
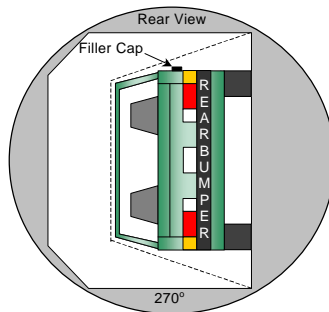
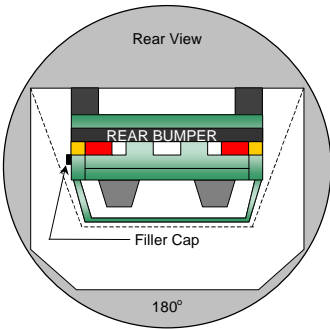
Test Program: NCAP

Test Date: March 5, 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°	162	300	0
90° TO 180°	153	300	0
180° TO 270°	147	300	0
270° TO 360°	166	300	0

DATA SHEET NO. 14
VEHICLE MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE Sport
Test Program: NCAP

NHTSA No.: M10200
Test Date: March 5, 2001

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4997	4450	547
2	RSOV to front of engine	mm	4502	4130	372
3	RSOV to firewall centerline	mm	3792	3755	37
4	RSOV to leading edge of right door	mm	3595	3582	13
5	RSOV to leading edge of left door	mm	3600	3580	20
6	RSOV to lower leading edge of right door	mm	3489	3479	10
7	RSOV to lower leading edge of left door	mm	3489	3487	2
8	RSOV to upper leading edge of right door	mm	2380	2360	20
9	RSOV to upper leading edge of left door	mm	2382	2375	7
10	RSOV to lower trailing edge of right door	mm	2398	2388	10
11	RSOV to lower trailing edge of left door	mm	2402	2398	4
12	RSOV to bottom of right 'A' pillar	mm	3456	3448	8
13	RSOV to bottom of left 'A' pillar	mm	3463	3455	8
14	RSOV to firewall on right side	mm	4143	4072	71
15	RSOV to firewall on left side	mm	4151	4088	63
16	RSOV to steering column	mm	3044	3067	-23
17	Center of steering column to left 'A' pillar	mm	345	340	5
18	Center of steering column to headlining	mm	404	430	-26
19	RSOV to right side of front bumper	mm	4848	4363	485
20	RSOV to left side of front bumper	mm	4855	4342	513
21	Length of engine block	mm	385	385	0
RD	RSOV to right side of dash panel	mm	3194	3178	16
CD	RSOV to center of dash panel	mm	3248	3222	26
LD	RSOV to left side of dash panel	mm	3216	3209	7

RSOV = Rear Surface of Vehicle

DATA SHEET NO. 14...(continued)

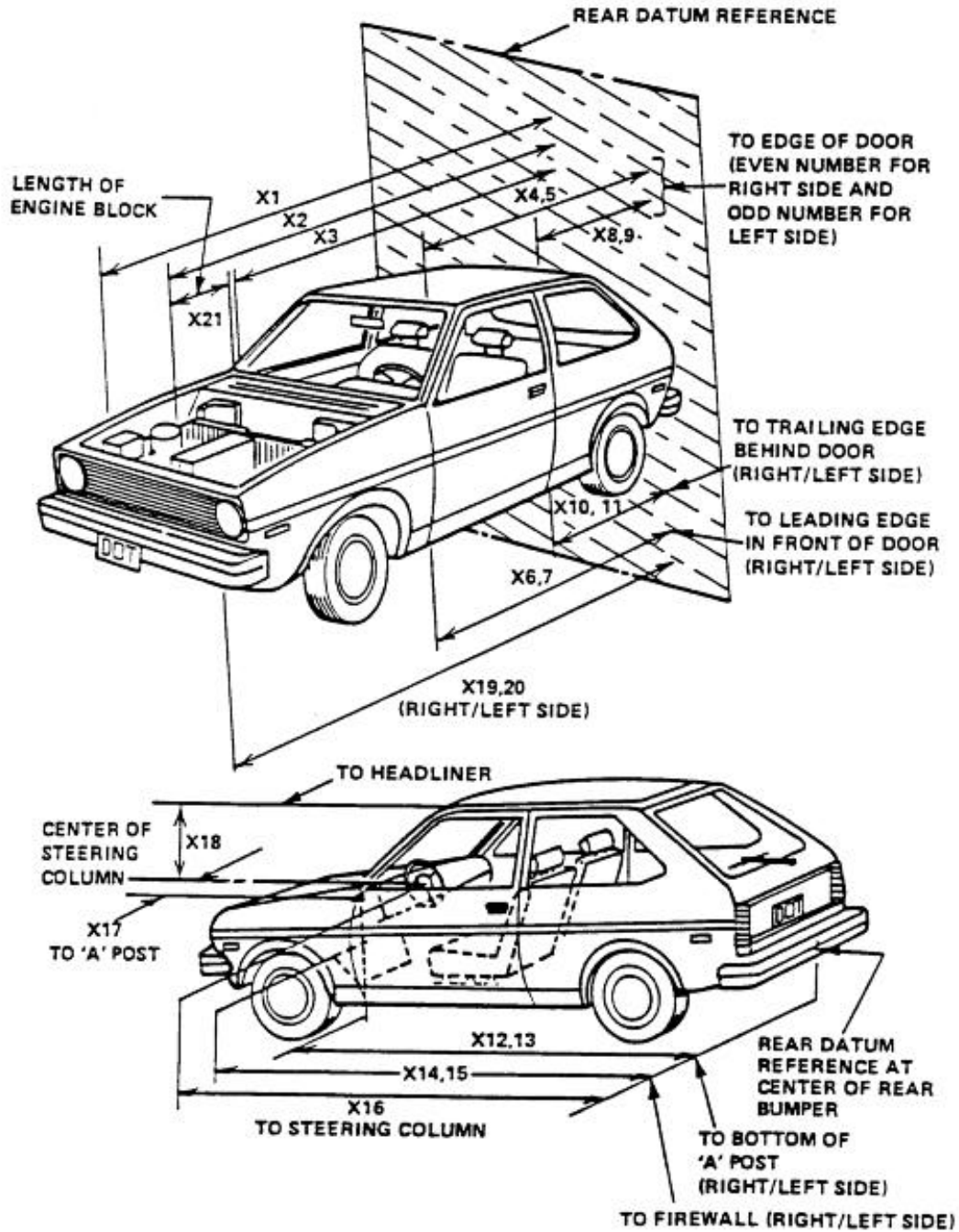
VEHICLE MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001



DATA SHEET NO. 15
CAMERA LOCATIONS

Test Vehicle: 2001/Ford/Windstar SE Sport
Test Program: NCAP

NHTSA No.: M10200
Test Date: March 5, 2001

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				18	32
2	Left Front View	600	8420	1490	25	743
3	Steering Column Top	1900	7270	1560	25	1087
4	Steering Column Bottom	1900	7270	1030	25	1015
5	Driver Close-up	1360	10290	1350	25	1010
6	Driver Angle	5000	5180	2030	50	1064
7	Left Rear Passenger				8	**
8	Right Rear Passenger				8	1070
9	Right Overall	2630	8380	1700	13	1010
10	Right Passenger Half	950	7000	1580	25	1010
11	Right Close-up	1640	9630	1480	25	1010
12	Right Angle	5000	5680	2130	50	1020
13	Windshield	-450	0	2710	13	1000
14	Top Driver	70	-440	1780	13	1020
15	Top Passenger	80	400	1770	13	1000
16	Pit Front	1100	0	-3200	13	1005
17	Pit Rear	3000	0	-3200	13	1005

*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.

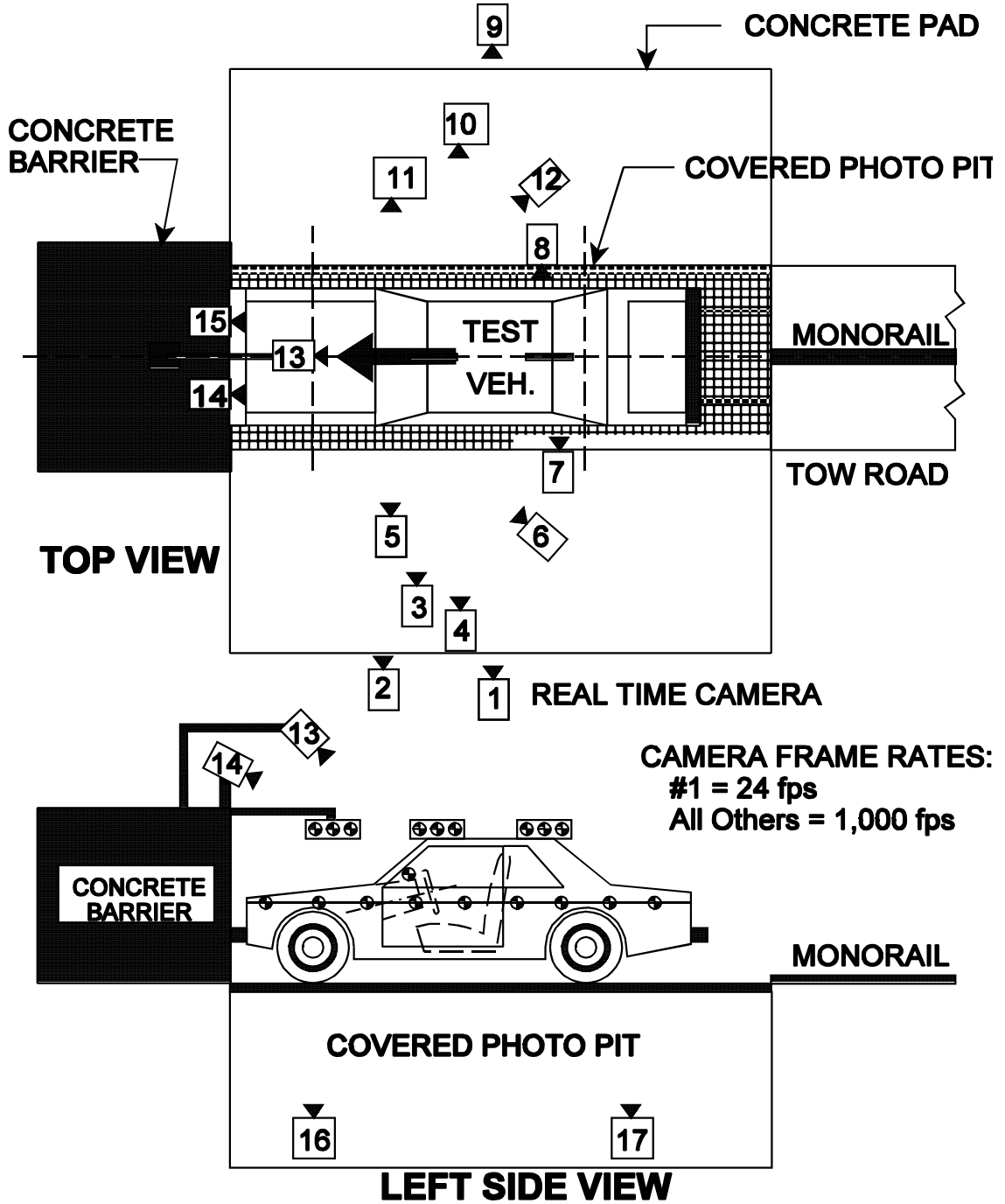
** Ran out of film.

CAMERA LOCATIONS

Test Vehicle: 2001/Ford/Windstar SE Sport
Test Program: NCAP

NHTSA No.: M10200
Test Date: March 5, 2001

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 16

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

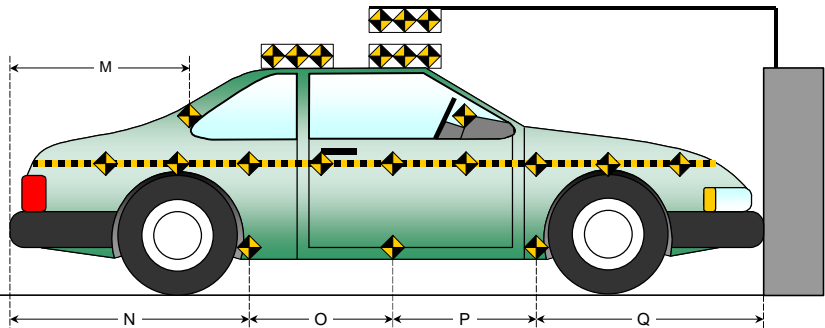
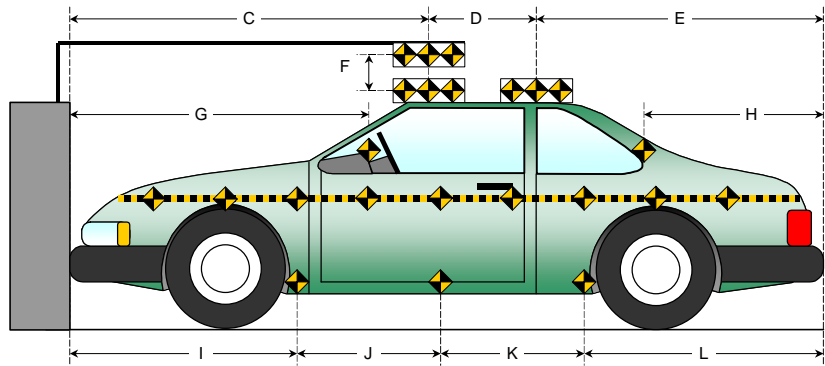
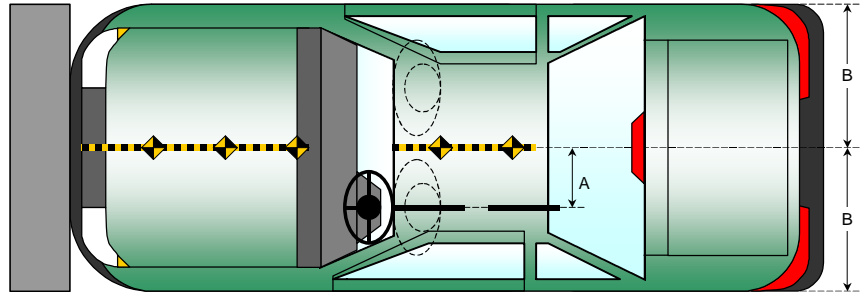
Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

Item	Value
A	420
B	965
C	2196
D	610
E	2191
F	610
G	1953
H	1382
I	1470
J	1090
K	1090
L	1347
M	1242
N	1370
O	1089
P	1090
Q	1448



DATA SHEET NO. 17

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

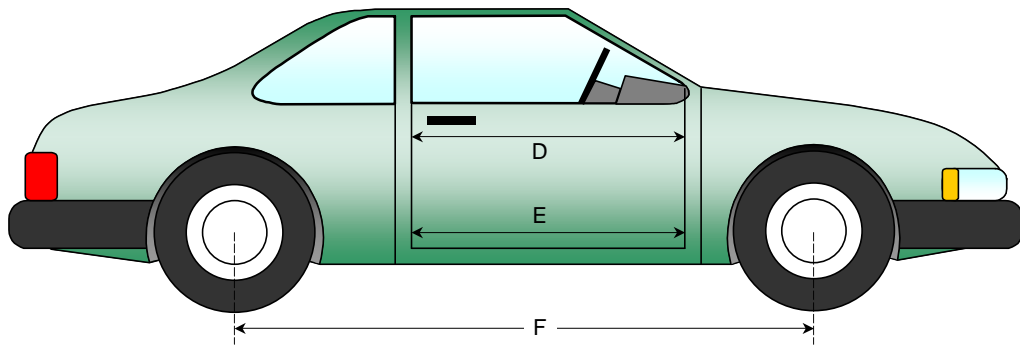
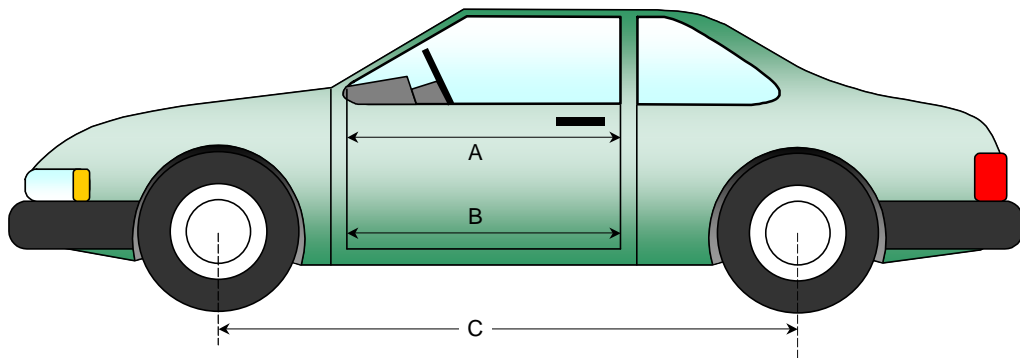
Test Date: March 5, 2001

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1028	1017	11
B	Left Side Lower	mm	1000	987	13
D	Right Side Upper	mm	1028	1010	18
E	Right Side Lower	mm	1003	978	25

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3075	2977	98
F	Right Side Wheelbase	mm	3075	2984	91



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

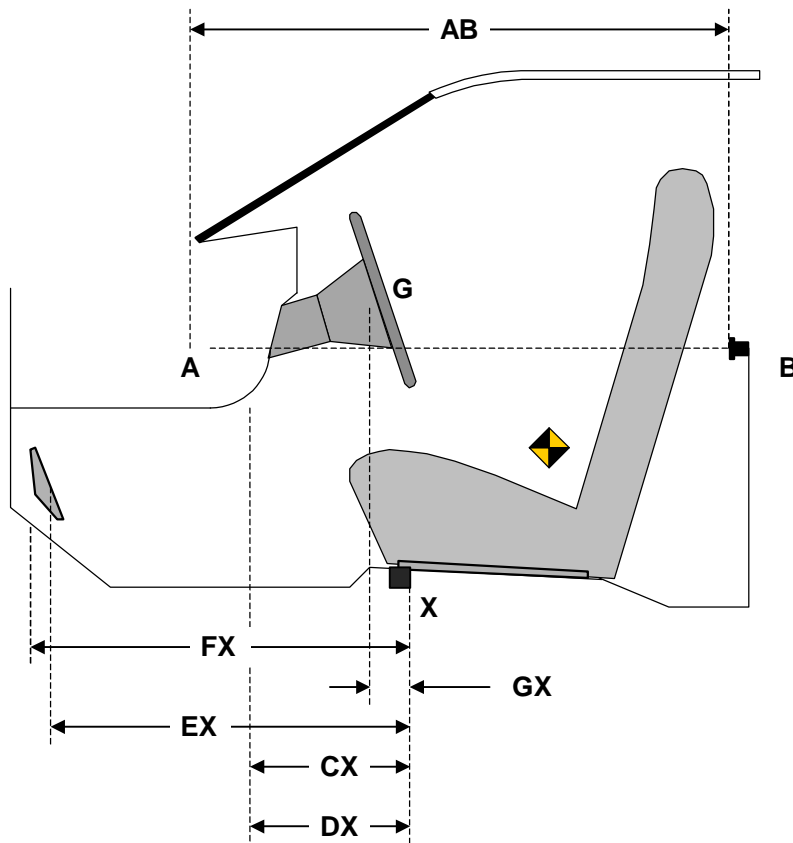
Test Vehicle: 2001/Ford/Windstar SE Sport
 Test Program: NCAP

NHTSA No.: M10200
 Test Date: March 5, 2001

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	1028	1017	11
CX	Left Knee Bolster to X	mm	300	328	-28
DX	Right Knee Bolster to X	mm	300	339	-39
EX	Brake Pedal to X	mm	558	515	43
FX	Foot Rest to X	mm	626	588	38
GX	Center of Steering Column Wheel Hub to X	mm	92	118	-26

X = Left Front Seat Front Outboard Anchor Bolt Head

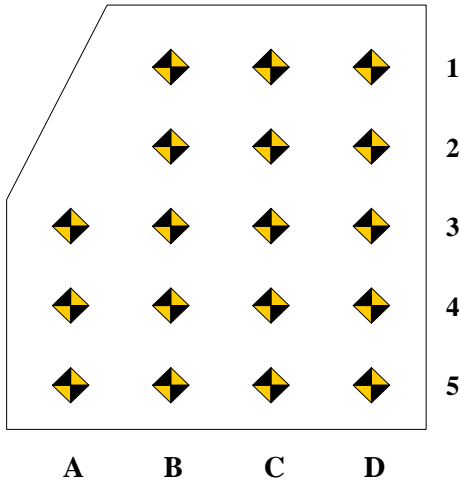


DRIVER COMPARTMENT

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

Test Vehicle: 2001/Ford/Windstar SE Sport
 Test Program: NCAP

NHTSA No.: M10200
 Test Date: March 5, 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		705	705	699		668	648	638		37	57	61
2		614	607	598		577	562	558		37	45	40
3	516	516	512	505	492	482	475	479	24	34	37	26
4	374	373	368	370	347	343	337	346	27	30	31	24
5	235	233	231	230	221	207	211	215	14	26	20	15

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-50	-63	-76		-18	-10	-14		32	53	62
2		-98	-101	-110		-62	-61	-78		36	40	32
3	-136	-115	-119	-134	-90	-84	-90	-122	46	31	29	12
4	-120	-116	-170	-133	76	-88	-90	-118	196	28	80	15
5	-114	-118			-85	-72			29	46		

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

Test Vehicle: 2001/Ford/Windstar SE Sport
 Test Program: NCAP

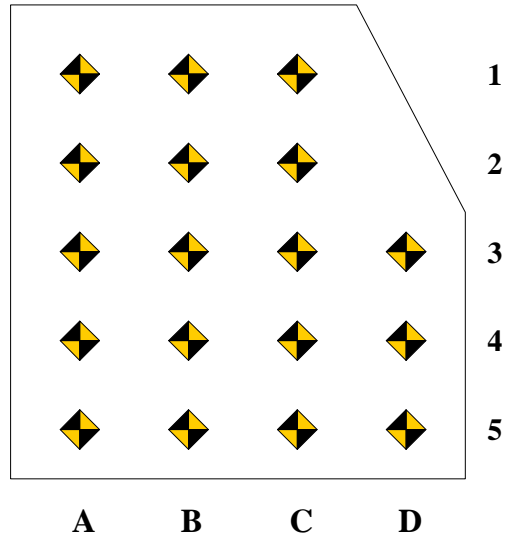
NHTSA No.: M10200
 Test Date: March 5, 2001

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	656	666	664	660	558	608	622	584	98	58	42	76
2	573	580	582	585	518	540	549	544	55	40	33	41
3	490	488	490	491	475	473	477	474	15	15	13	17
4	390	386	389	391	375	374	378	380	15	12	11	11
5	285	285	287	291	271	275	279	284	14	10	8	7

PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	38	32	20	36	110	99	98	114	72	67	78	78
2	-15	-31	-25	-10	39	22	26	44	54	53	36	54
3	-70	-70	-60	-70	-50	-58	-44	-40	20	12	16	30
4	-70	-68	-68	-68	-52	-60	-62	-52	18	8	6	16
5	-60	-60	-60	-63	-49	-53	-54	-42	11	7	6	21

DATA SHEET NO. 17...(continued)

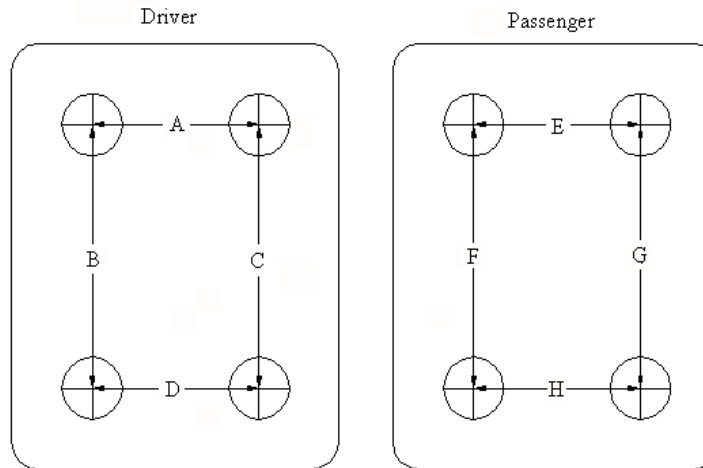
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001



UNDERBODY FLOORBOARD DEFORMATION

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	207	201	6
B	504	460	44
C	470	421	49
D	209	209	0
E	274	265	9
F	376	318	58
G	368	336	32
H	273	271	2

DATA SHEET NO. 18

LOAD CELL LOCATIONS ON FIXED BARRIER

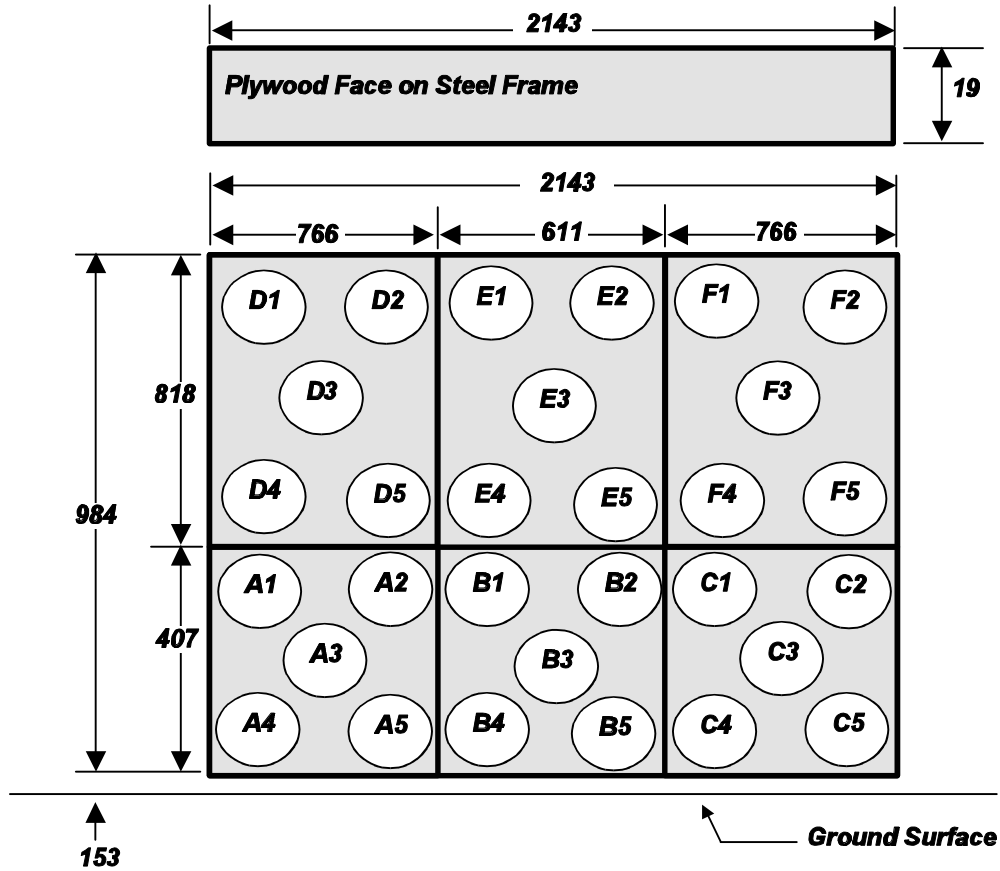
Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 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 Sport
 Test Program: NCAP

NHTSA No.: M10200
 Test Date: March 5, 2001

VEHICLE INFORMATION

VIN: 2FMZA57411BB19603 Wheelbase (mm): 3066
 Vehicle Size Category: Minivan Test Weight (kg): 2135.1

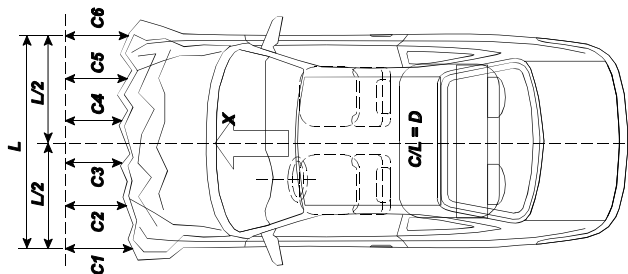
ACCELEROMETER DATA

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): 56.6
 Velocity Change (km/h): 70.3 Time of Separation (msec): 138

CRUSH PROFILE

Collision Deformation Classification: Frontal Midpoint of Damage: CL
 Damage Region Length (mm): 1870 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4855	4342	513
C2	Crush zone 2 at left side	mm	4952	4385	567
C3	Crush zone 3 at left side	mm	4991	4442	549
C4	Crush zone 4 at right side	mm	4981	4431	550
C5	Crush zone 5 at right side	mm	4951	4400	551
C6	Crush zone 6 at right side	mm	4848	4363	485



DATA SHEET NO. 20

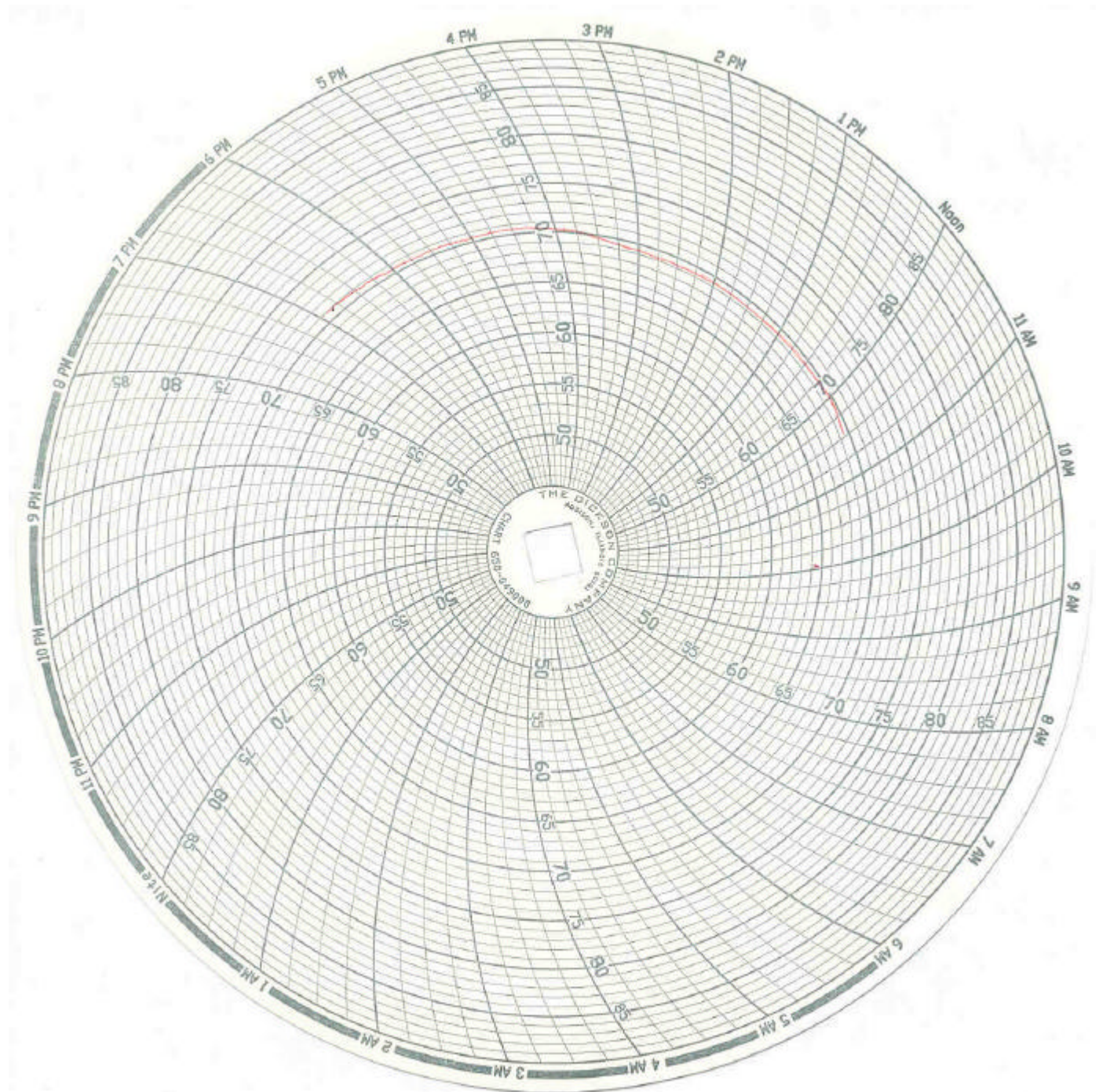
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001



A = Dummies installed in vehicle at 11:30 a.m.

B = Test conducted at 7:06 p.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

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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

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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

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

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

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



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



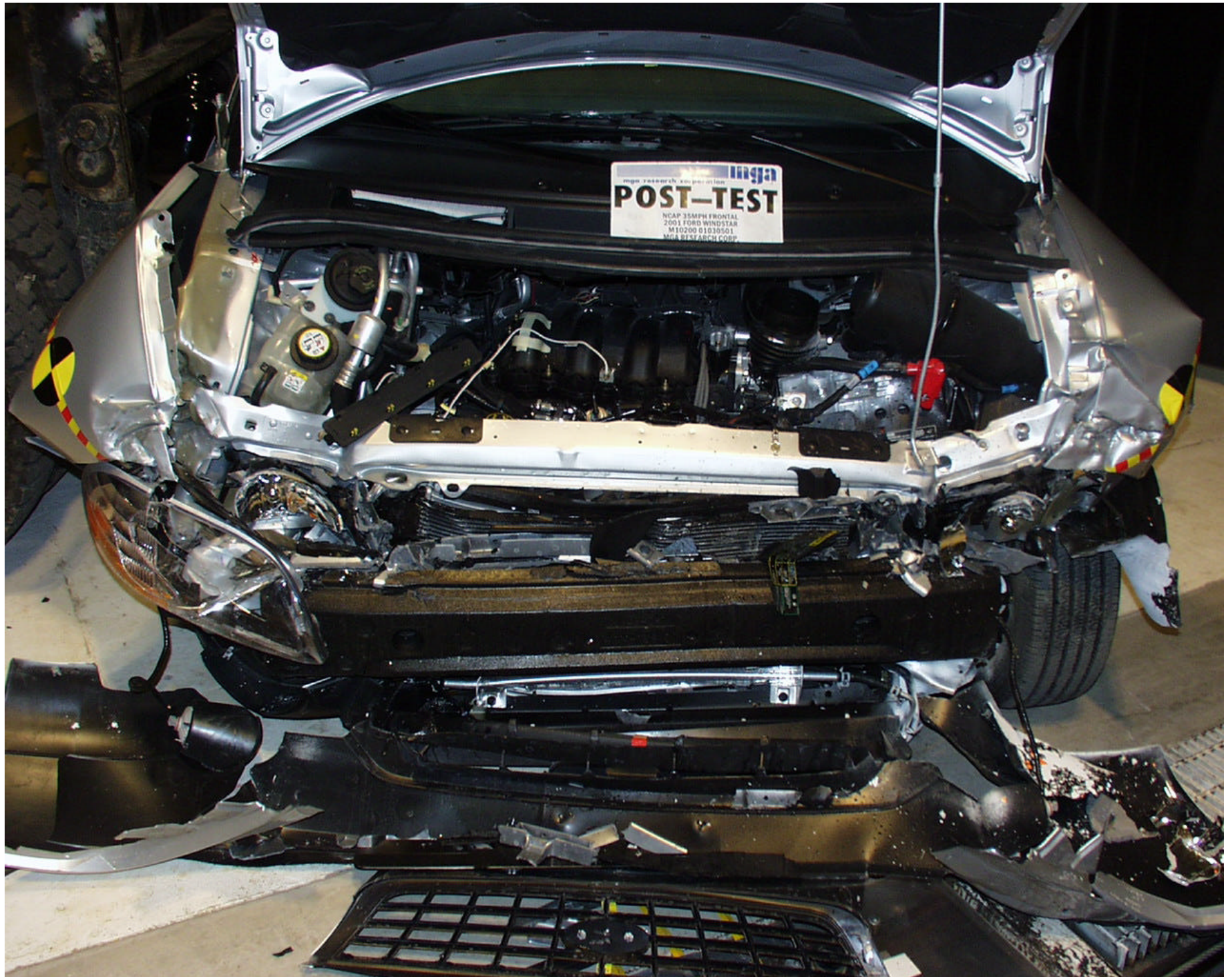
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Photo No. A-12 - Pre-Test Fuel Filler Cap View

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Photo No. A-13 - Pre-Test Engine Compartment View



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Photo No. A-14 - Post-Test Engine Compartment View

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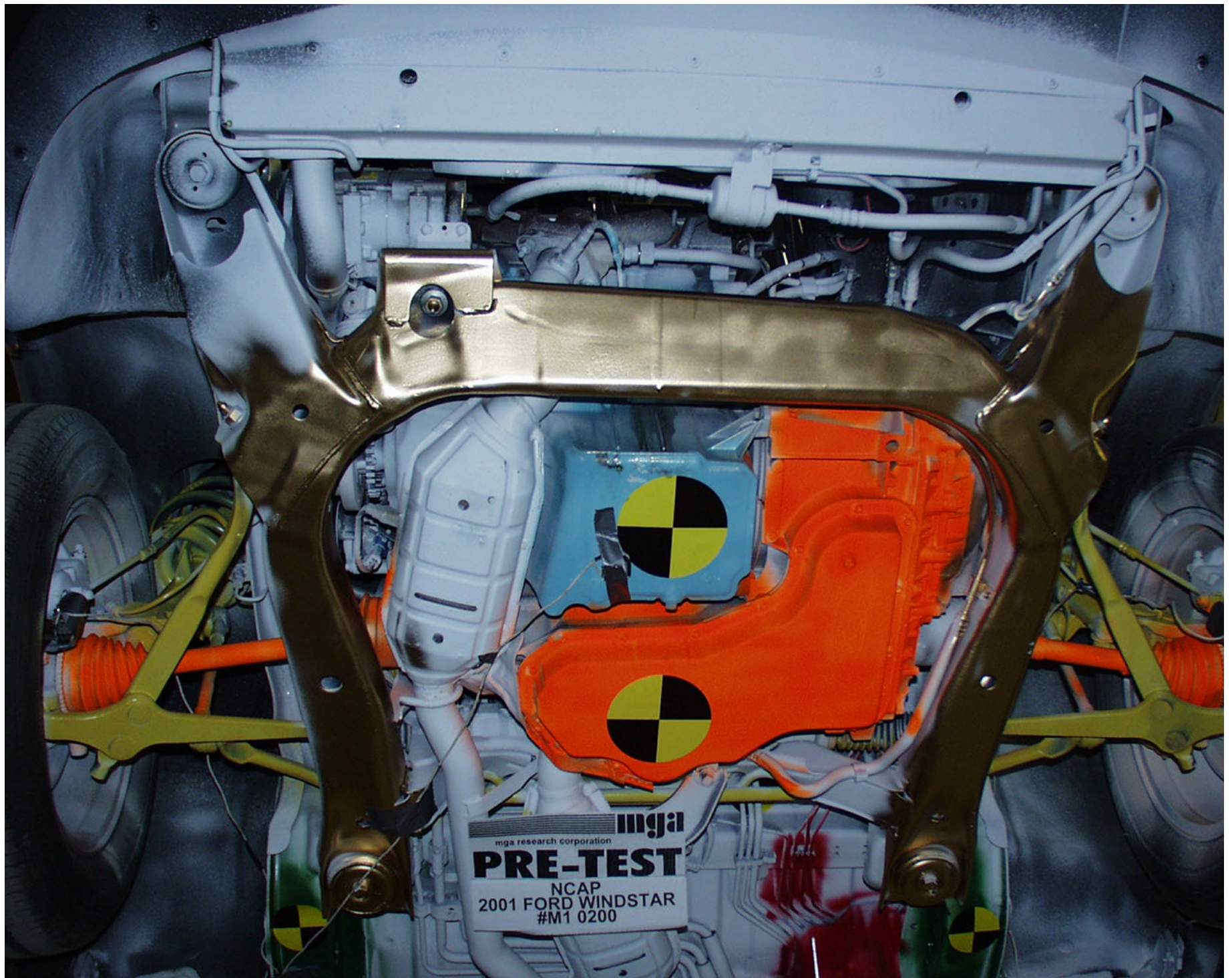


Photo No. A-15 - Pre-Test Front Underbody View

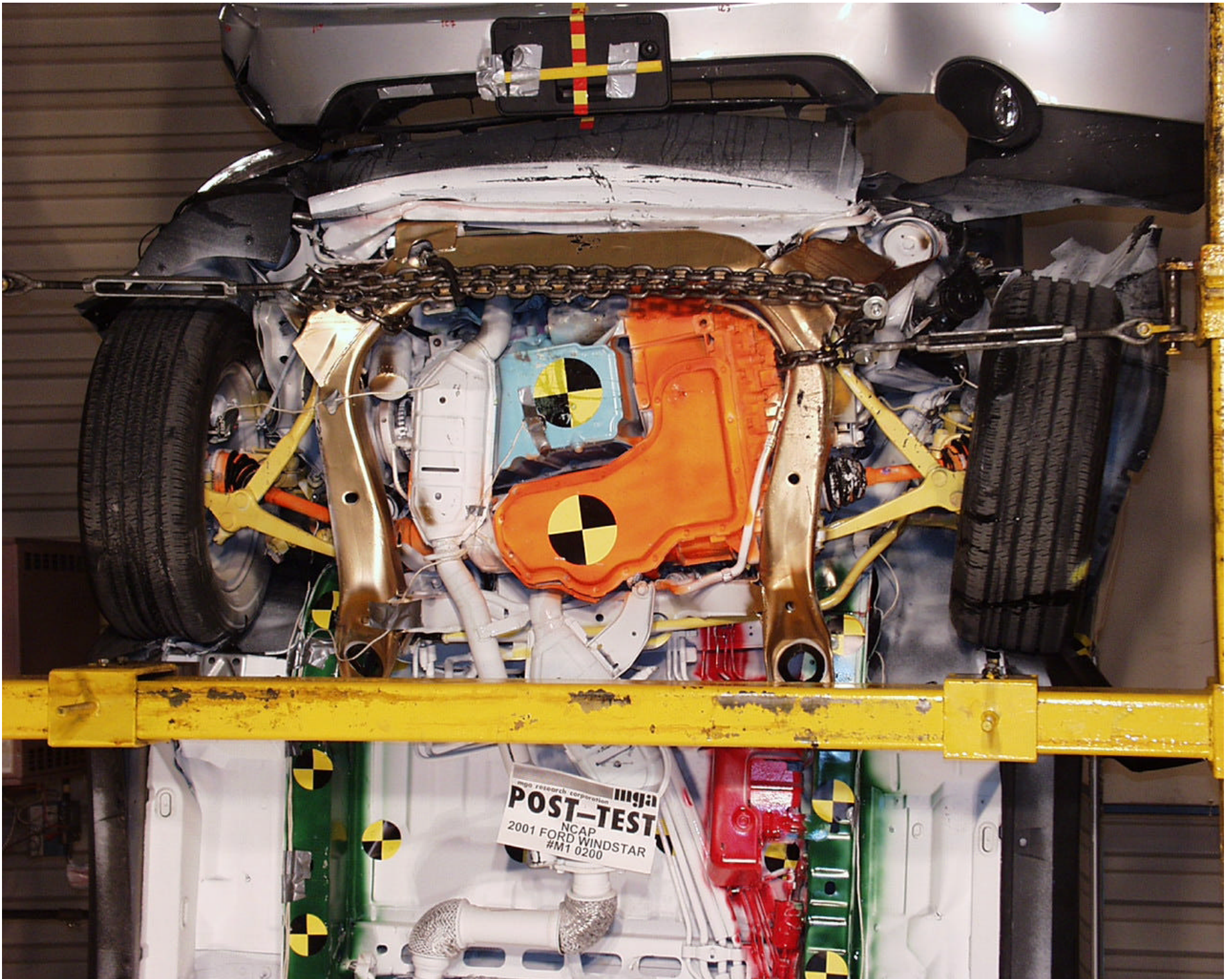


Photo No. A-16 - Post-Test Front Underbody View

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Photo No. A-17 - Pre-Test Rear Underbody View




Photo No. A-18 - Post-Test Rear Underbody View

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Photo No. A-19 - Pre-Test Windshield View



NCAP 35MPH FRONTAL
2001 FORD WINDSTAR
M10200 01030501
MGA RESEARCH CORP.

Photo No. A-20 - Post-Test Windshield View

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

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



Photo No. A-23 - Pre-Test Driver Dummy Position Left Side View (Door Open)

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Photo No. A-24 - Post-Test Driver Dummy Position Left Side View (Door Open)



Photo No. A-25 - Pre-Test Driver Seat Position View

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Photo No. A-26 - Post-Test Driver Seat Position View



Photo No. A-27 - Pre-Test Driver Dummy Knee Position



Photo No. A-28 - Post-Test Driver Dummy Knee Position

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Photo No. A-29 - Post-Test Driver Airbag Contact

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Photo No. A-30 - Post-Test Driver Knee Contact View

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Photo No. A-31 - Pre-Test Driver Windshield View

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Photo No. A-32 - Post-Test Driver Windshield View

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Photo No. A-33 - Pre-Test Passenger Dummy Position Right Side View

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Photo No. A-34 - Post-Test Passenger Dummy Position Right Side View

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Photo No. A-35 - Pre-Test Passenger Dummy Position Right Side View (Door Open)

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Photo No. A-36 - Post-Test Passenger Dummy Position Right Side View (Door Open)

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Photo No. A-37 - Pre-Test Passenger Seat Position View

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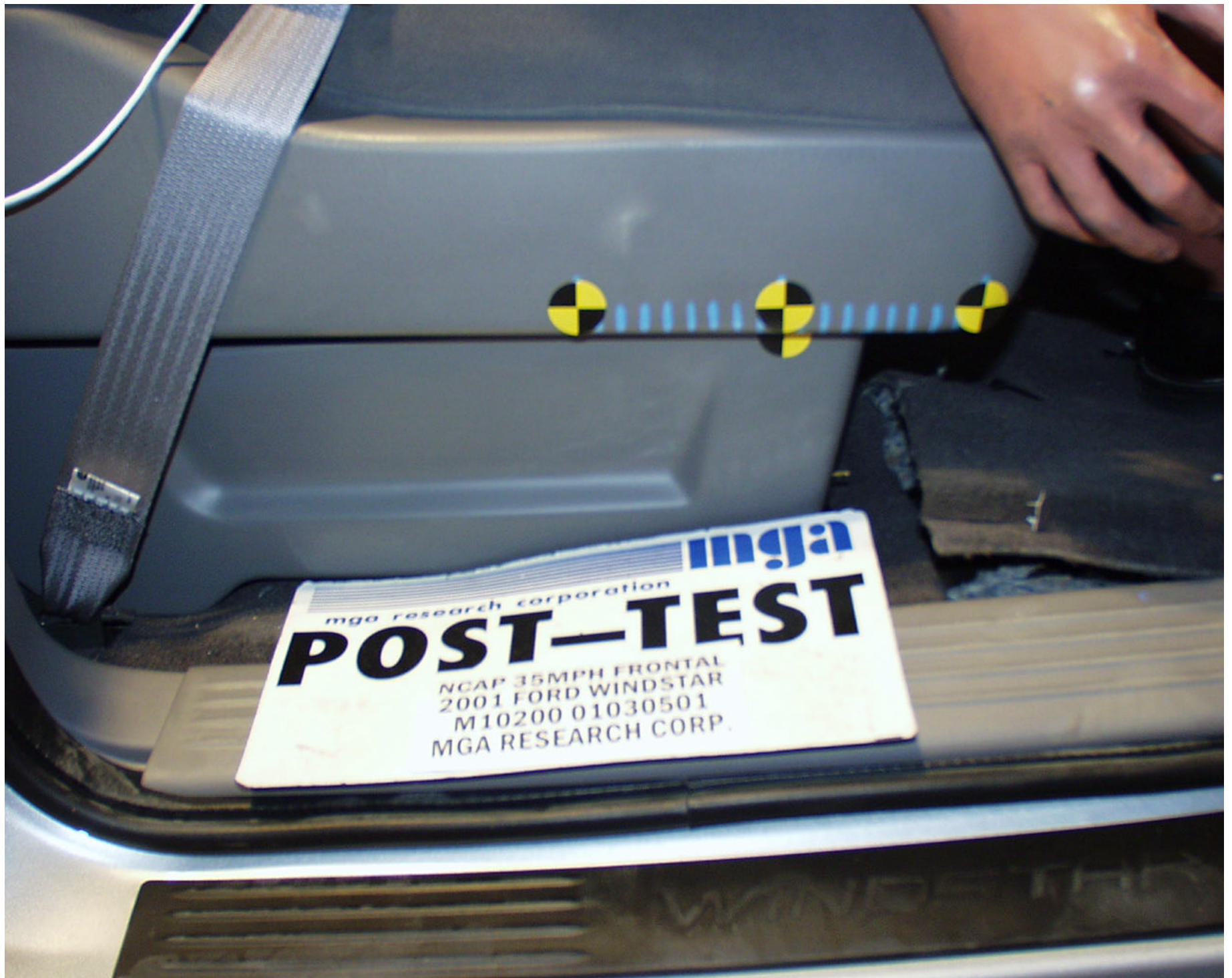


Photo No. A-38 - Post-Test Passenger Seat Position View

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Photo No. A-39 - Pre-Test Passenger Dummy Knee Position

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Photo No. A-40 - Post-Test Passenger Dummy Knee Position

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Photo No. A-41 - Post-Test Passenger Airbag Contact

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Photo No. A-42 - Post-Test Passenger Knee Contact View



Photo No. A-43 - Pre-Test Passenger Windshield View

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Photo No. A-44 - Post-Test Passenger Windshield View

MFD. BY FORD MOTOR CO.

DATE: 02/01

GVWR: 2521KG/5560LB

FRONT GAWR: 1315KG/2900LB

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: 2FMZA57411BB19603 TYPE: MPV

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

OCCUPANTS = 7 TOTAL:

2 FRONT, 2 2ND, 3 REAR

TIRE: P225/60R16

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



2FMZA57411BB19603

TRAILER TOWING - SEE OWNER GUIDE

EXT PNT: TS

BRK	INT TR	TP/PS	R	AXLE	TR	SPR	1A31A	F0078
D	H2		K	15	N	ED	S05	T0102

MADE IN CANADA

CBC ▽ F8DB-5420472-AB

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Photo No. A-45 - Vehicle Certification Label and Tire Placard

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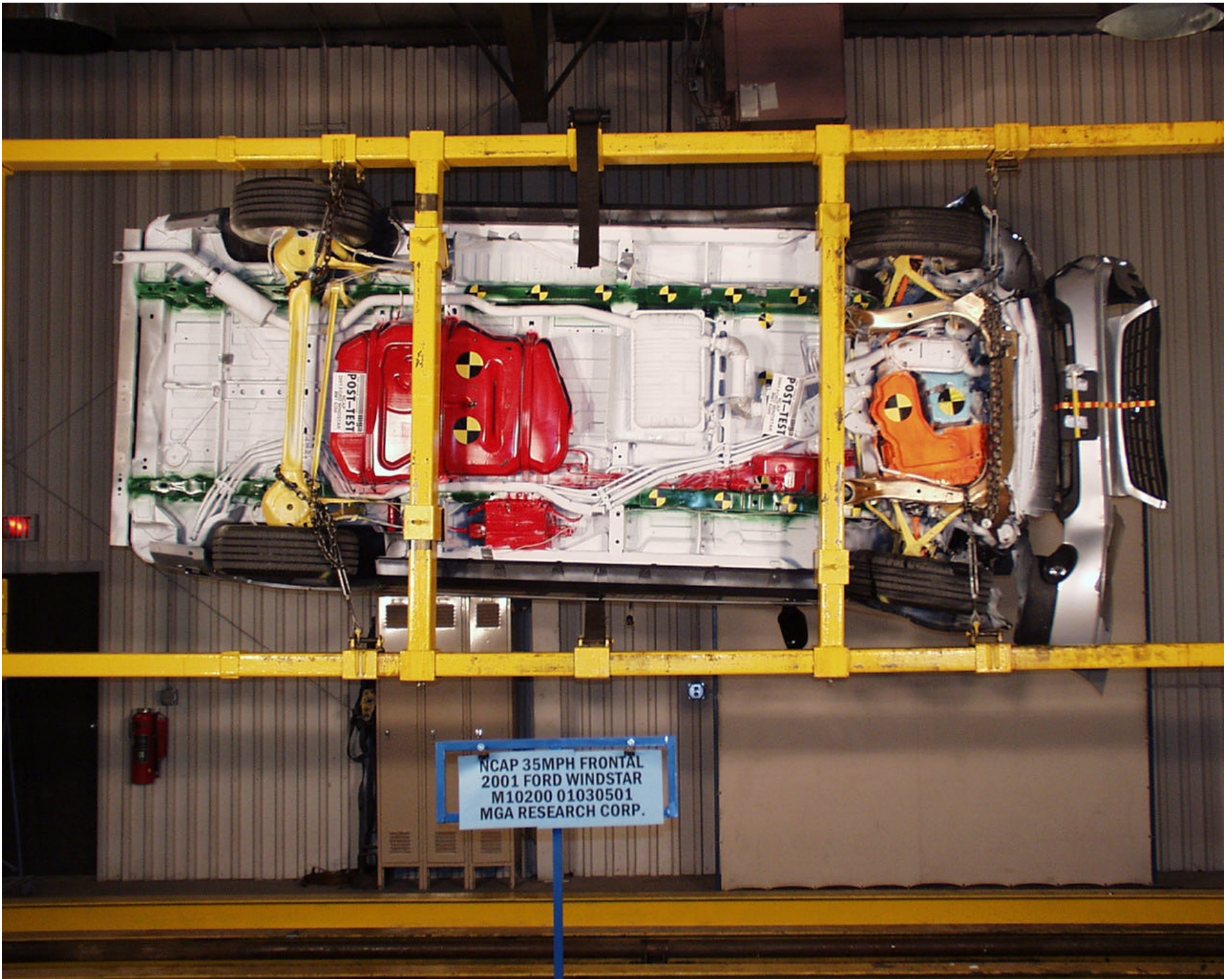


Photo No. A-46 - Rollover 90E



Photo No. A-47 - Rollover 180E

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Photo No. A-48 - Rollover 270E

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Photo No. A-49 - 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)

Occupant Data

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* No valid data collected after 65 msec.

** No valid data collected.

*** No valid data collected after 104 msec.

****No valid data collected after 76 msec.



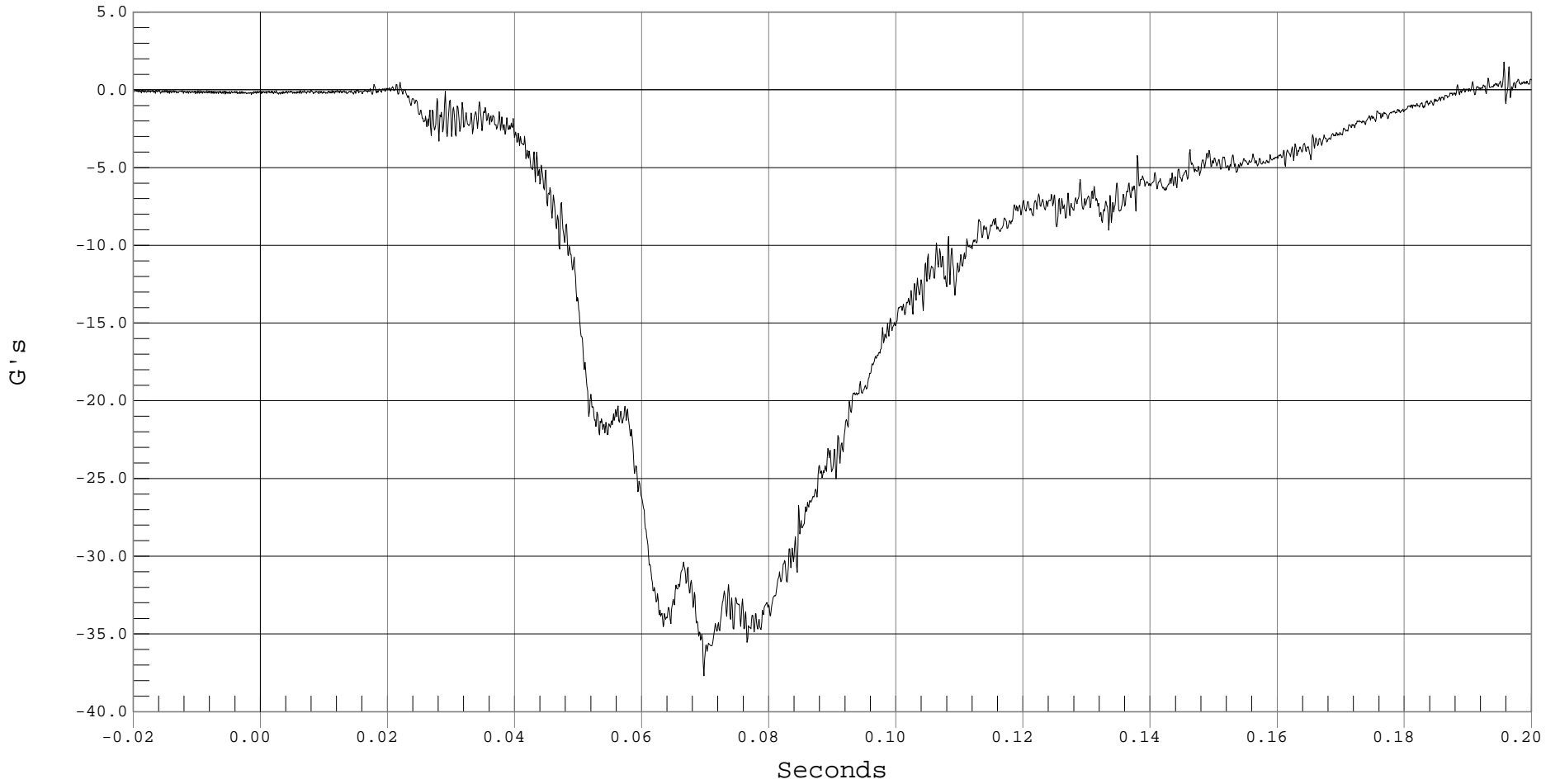
DRIVER HEAD X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD X, B01025AT.A01

Ymin = -37.69 G's @ 0.0697 Seconds, Ymax = 1.8 G's @ 0.1956 Seconds



B-1



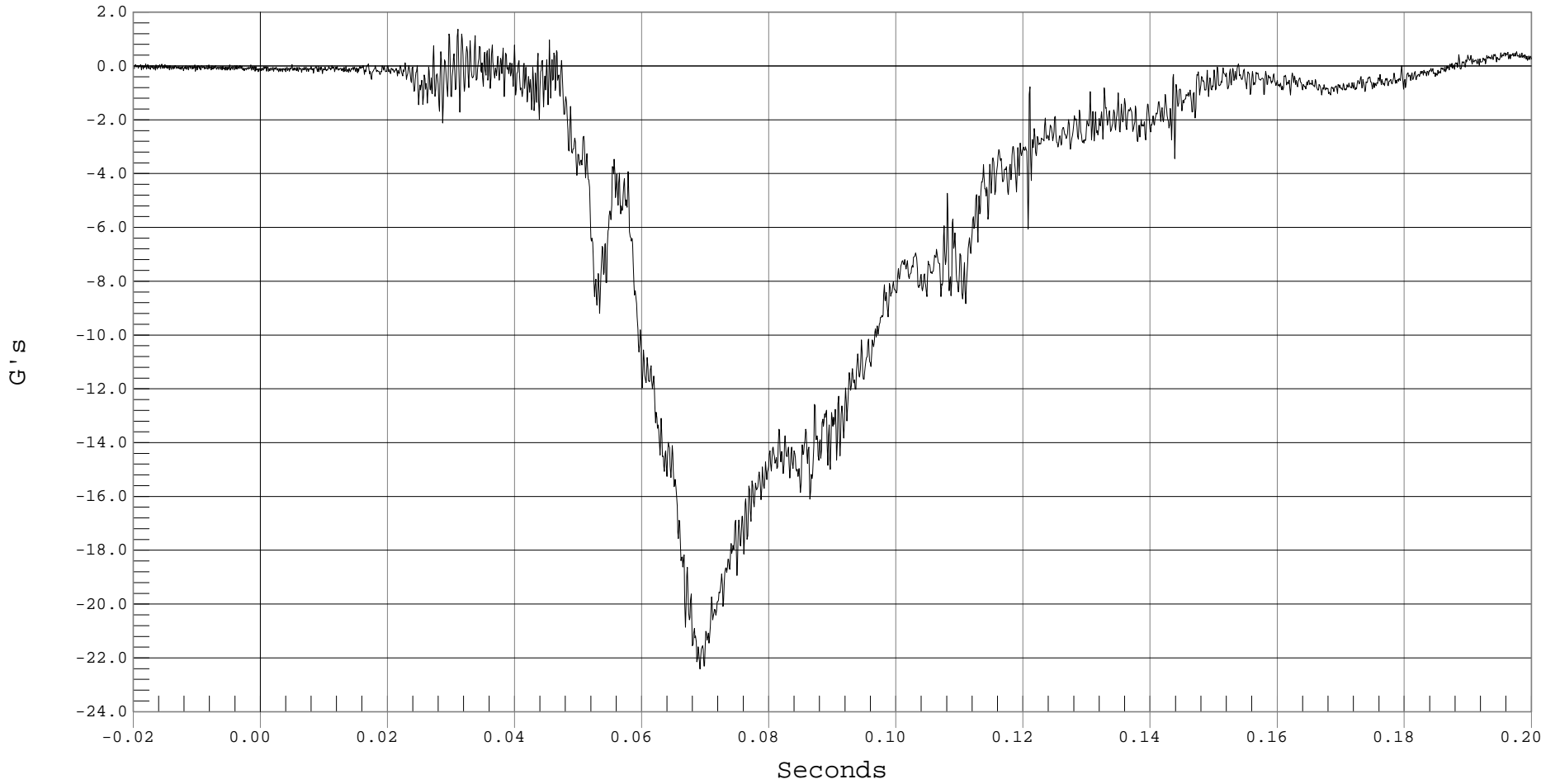
DRIVER HEAD Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD Y, B01025AT.A02

Ymin = -22.41 G's @ 0.0691 Seconds, Ymax = 1.37 G's @ 0.0310 Seconds



B-2



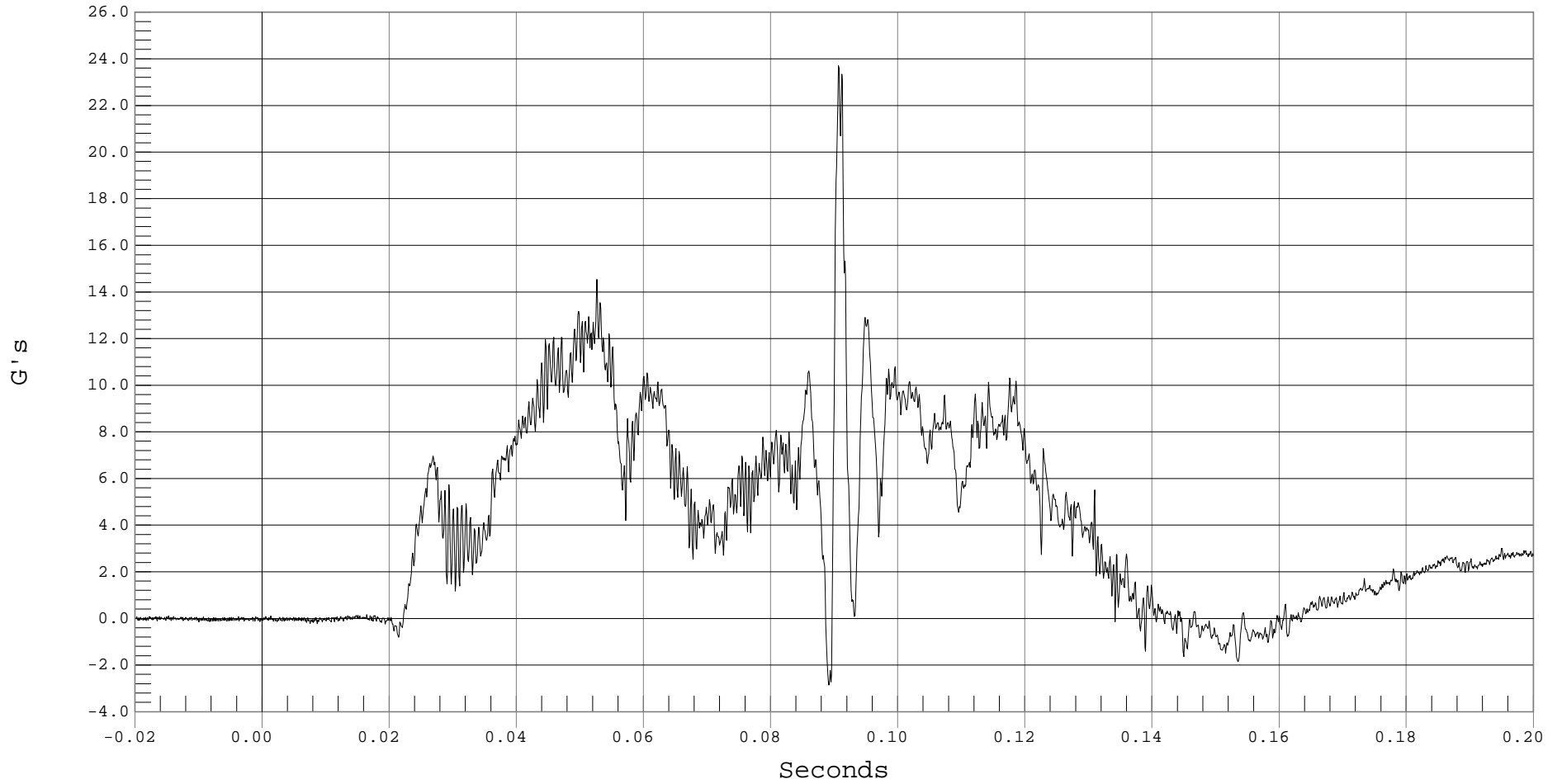
DRIVER HEAD Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD Z, B01025AT.A03

Ymin = -2.86 G's @ 0.0891 Seconds, Ymax = 23.71 G's @ 0.0906 Seconds





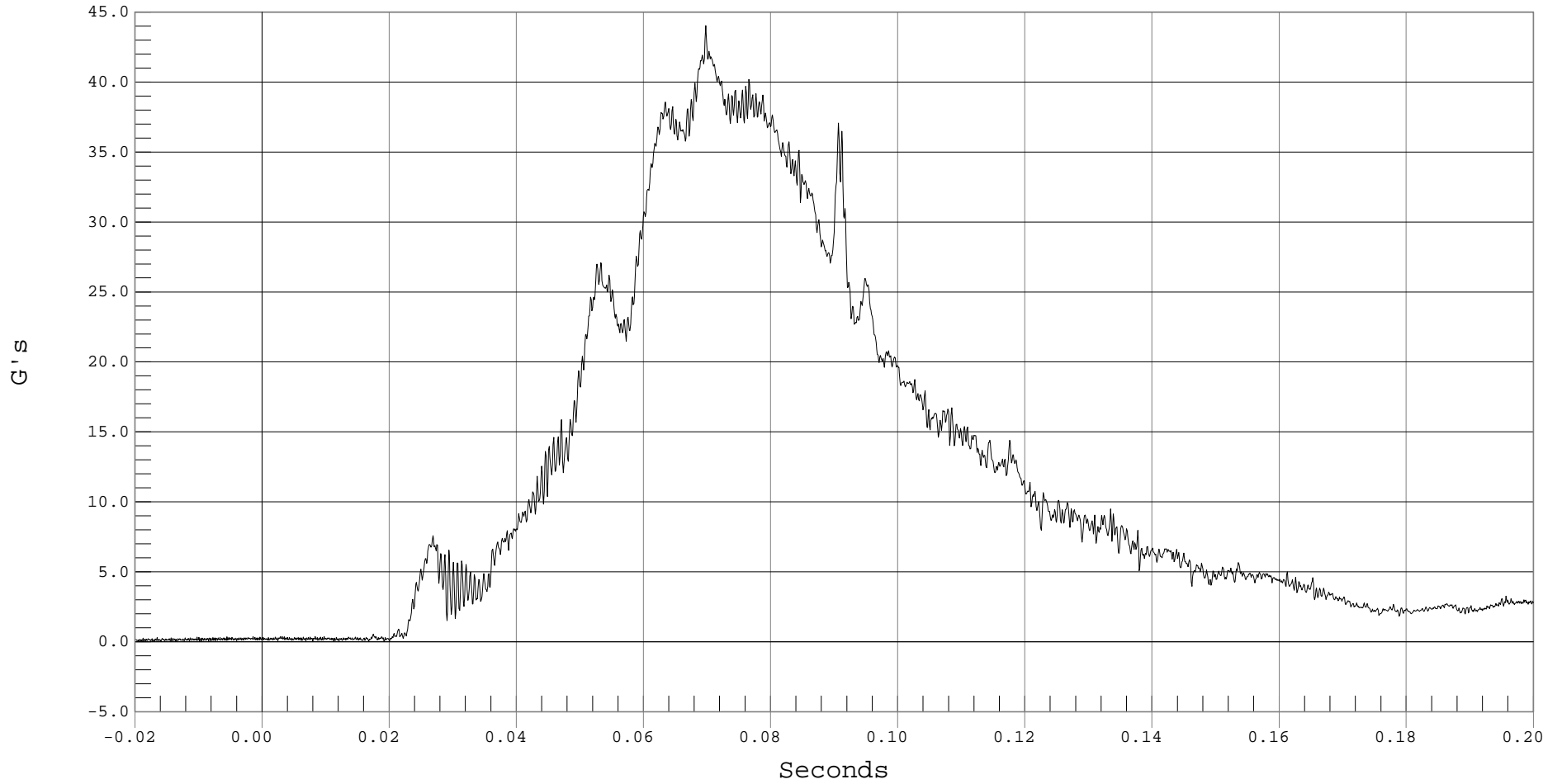
DRIVER HEAD RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD RESULTANT ACCELERATION, B01025AV.A01

Ymin = .03 G's @ -0.0195 Seconds, Ymax = 44.03 G's @ 0.0697 Seconds



B-4



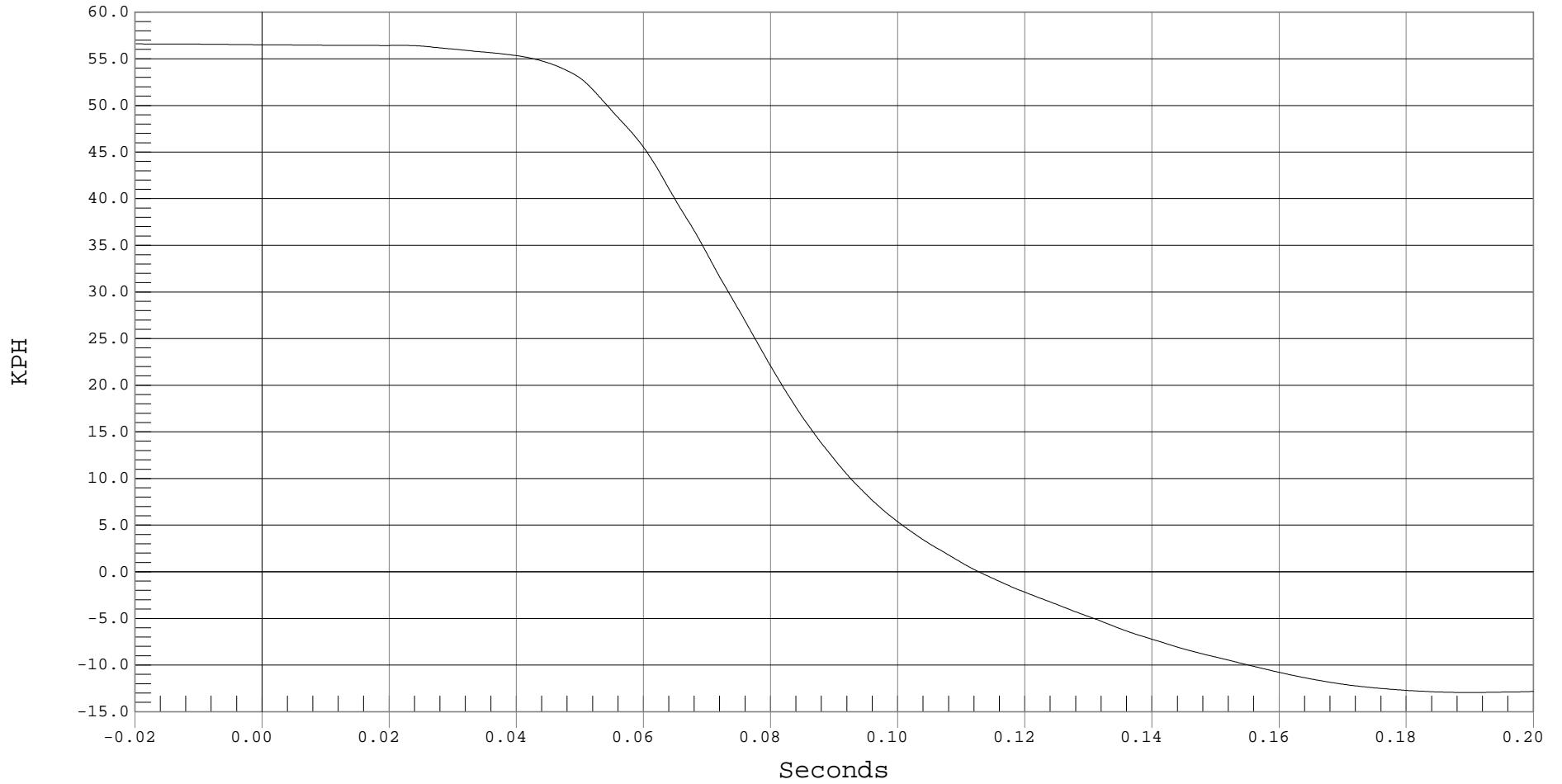
DRIVER HEAD X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER HEAD X VELOCITY, B01025AI.V01

Ymin = -12.94 KPH @ 0.1896 Seconds, Ymax = 56.6 KPH @ -0.0199 Seconds





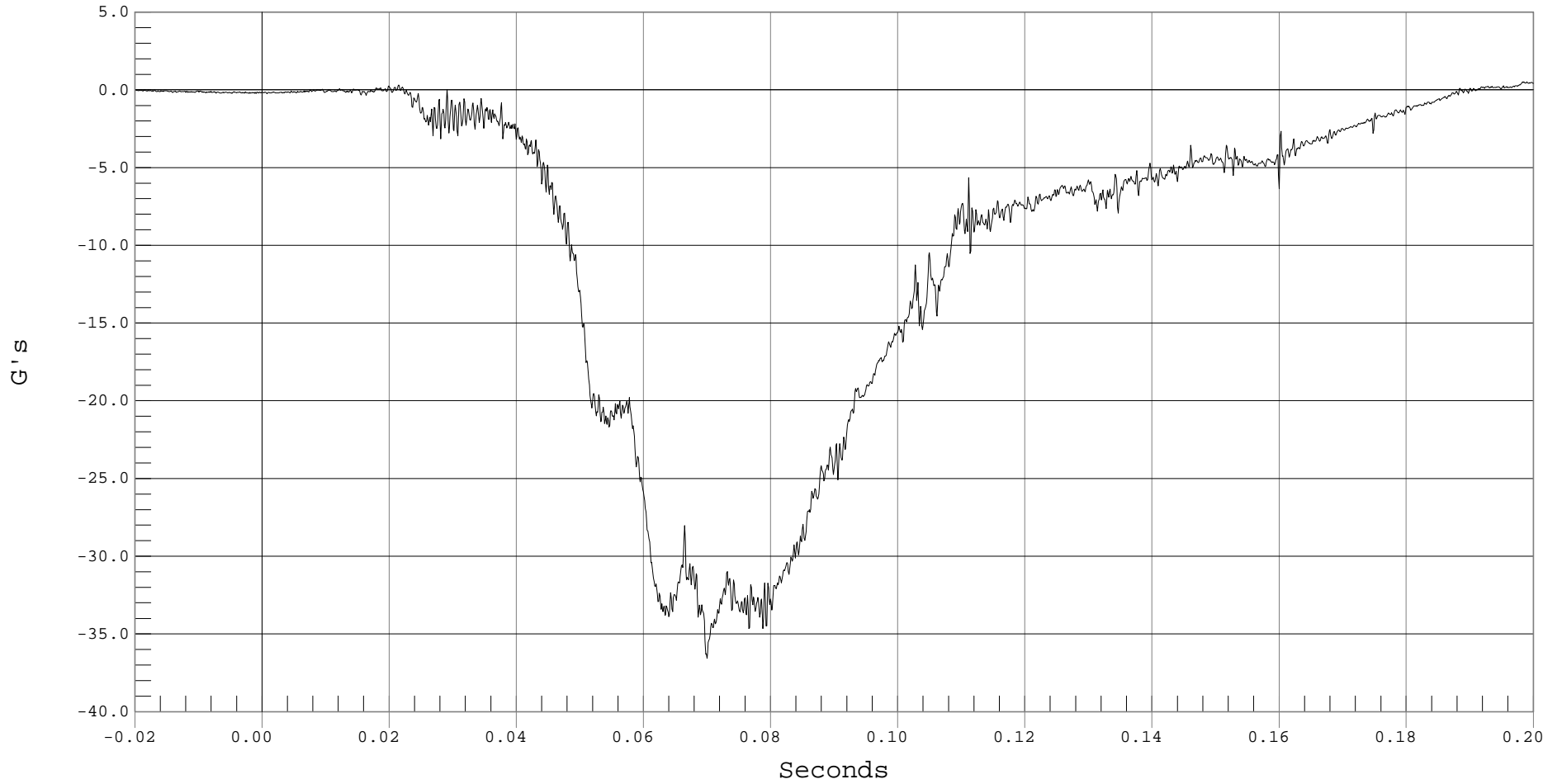
DRIVER HEAD REDUNDANT X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD Xr, B01025AT.A33

Ymin = -36.58 G's @ 0.0699 Seconds, Ymax = .52 G's @ 0.1982 Seconds



B-6



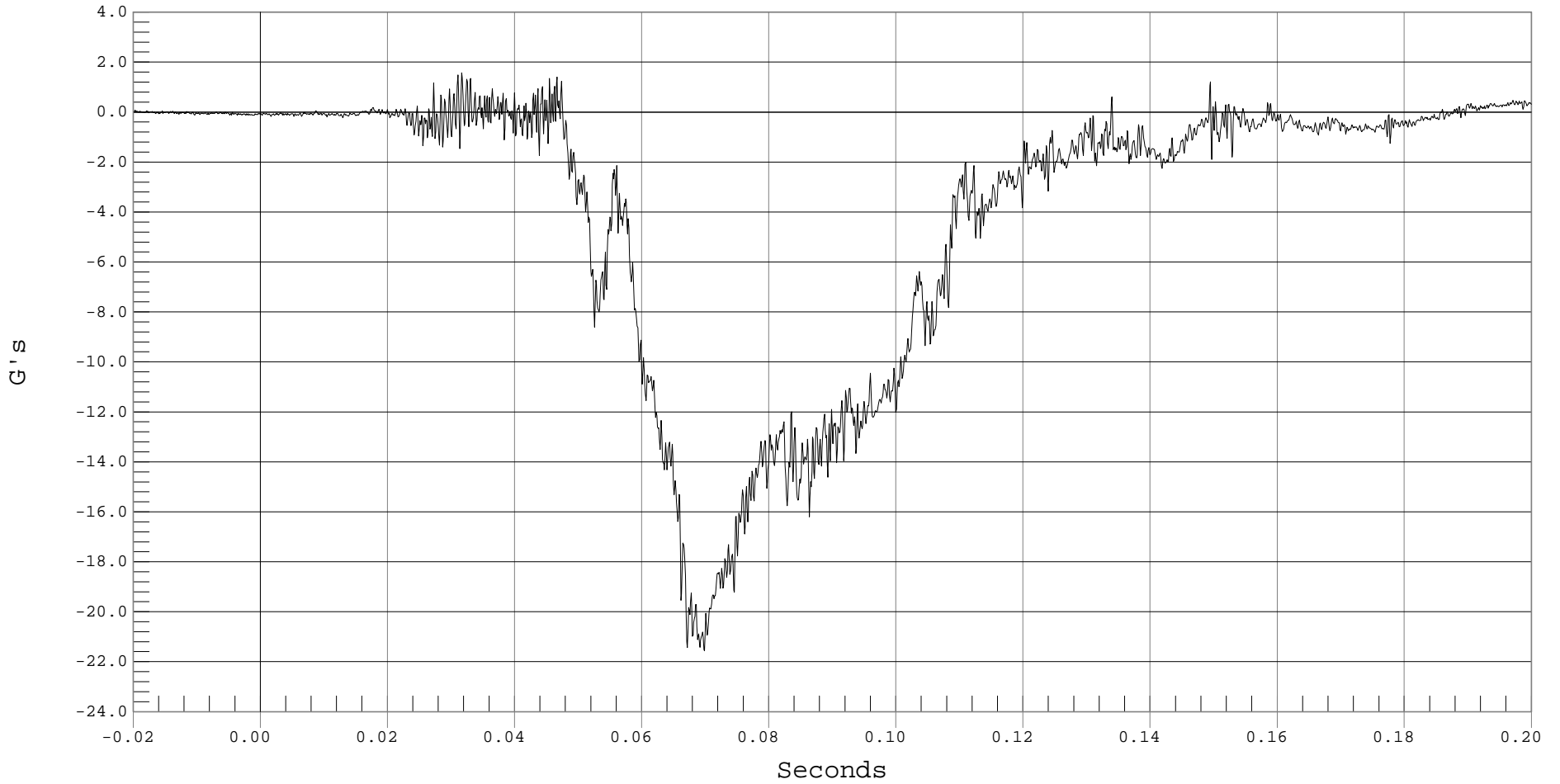
DRIVER HEAD REDUNDANT Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD Yr, B01025AT.A34

Ymin = -21.56 G's @ 0.0698 Seconds, Ymax = 1.57 G's @ 0.0316 Seconds





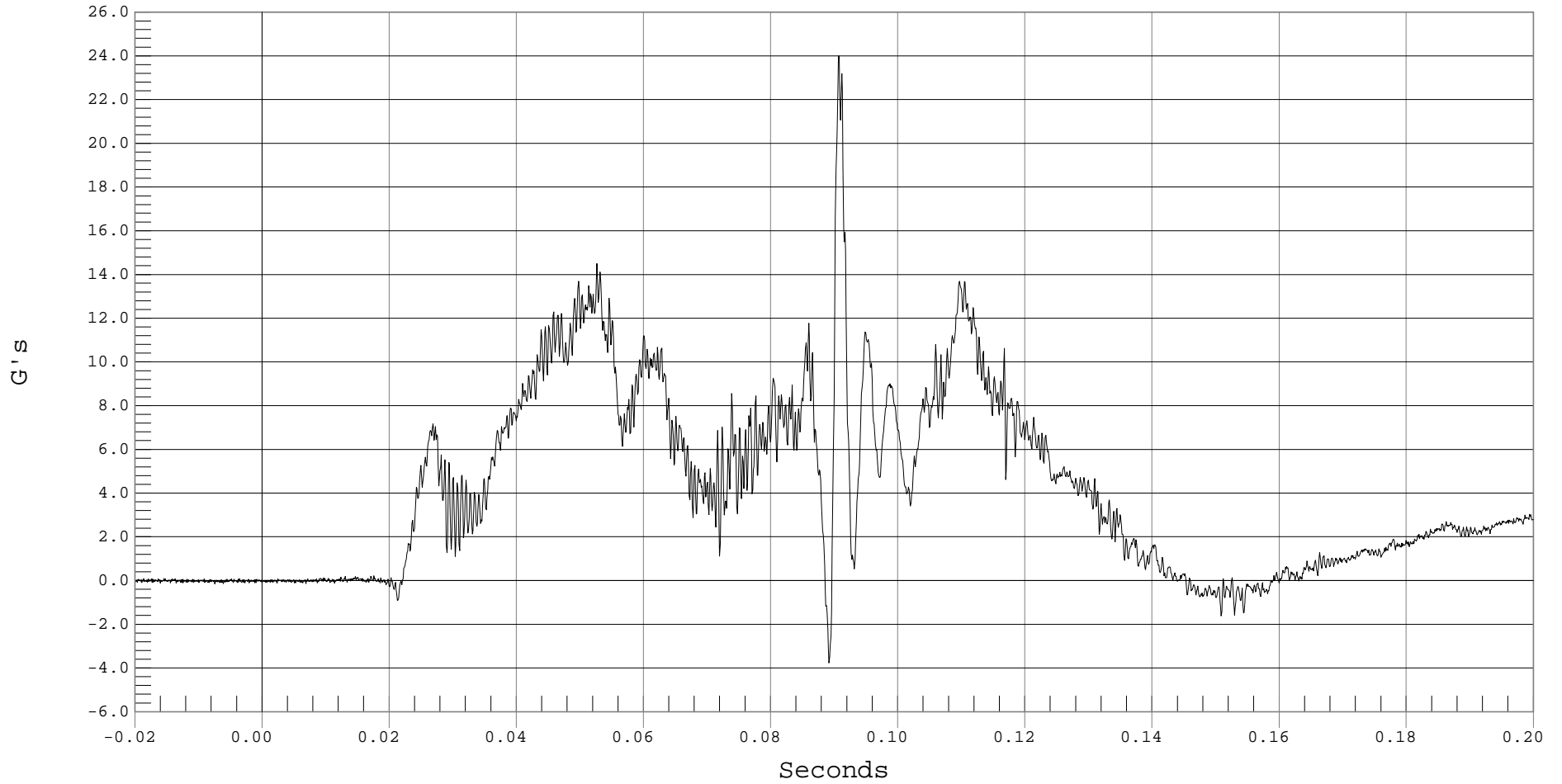
DRIVER HEAD REDUNDANT Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD Zr, B01025AT.A35

Ymin = -3.77 G's @ 0.0891 Seconds, Ymax = 24 G's @ 0.0906 Seconds





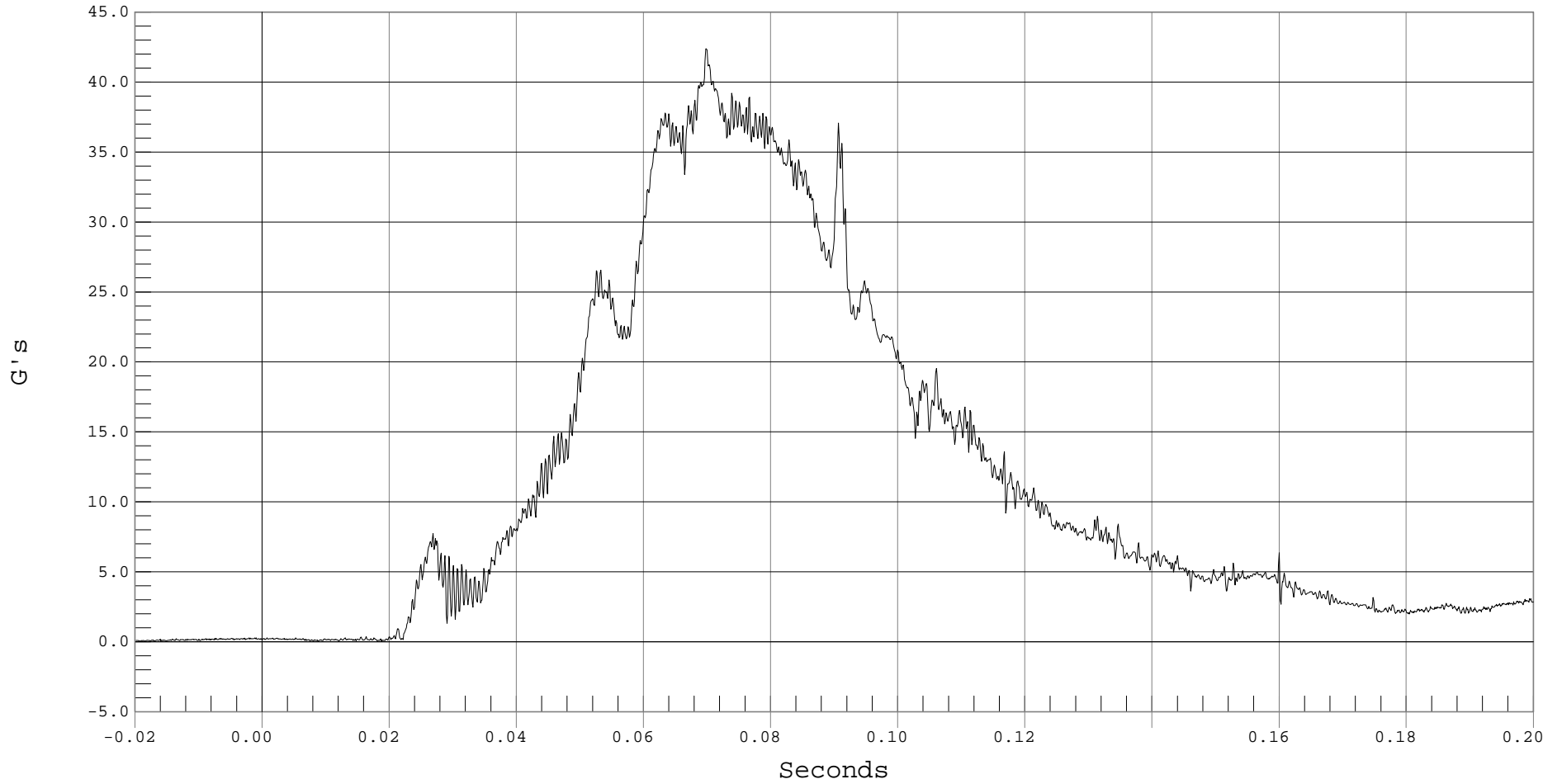
DRIVER HEAD REDUNDANT RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD REDUNDANT RESULTANT ACCELERATION, B01025AV.A33

Ymin = .02 G's @ 0.0187 Seconds, Ymax = 42.39 G's @ 0.0698 Seconds



B-9



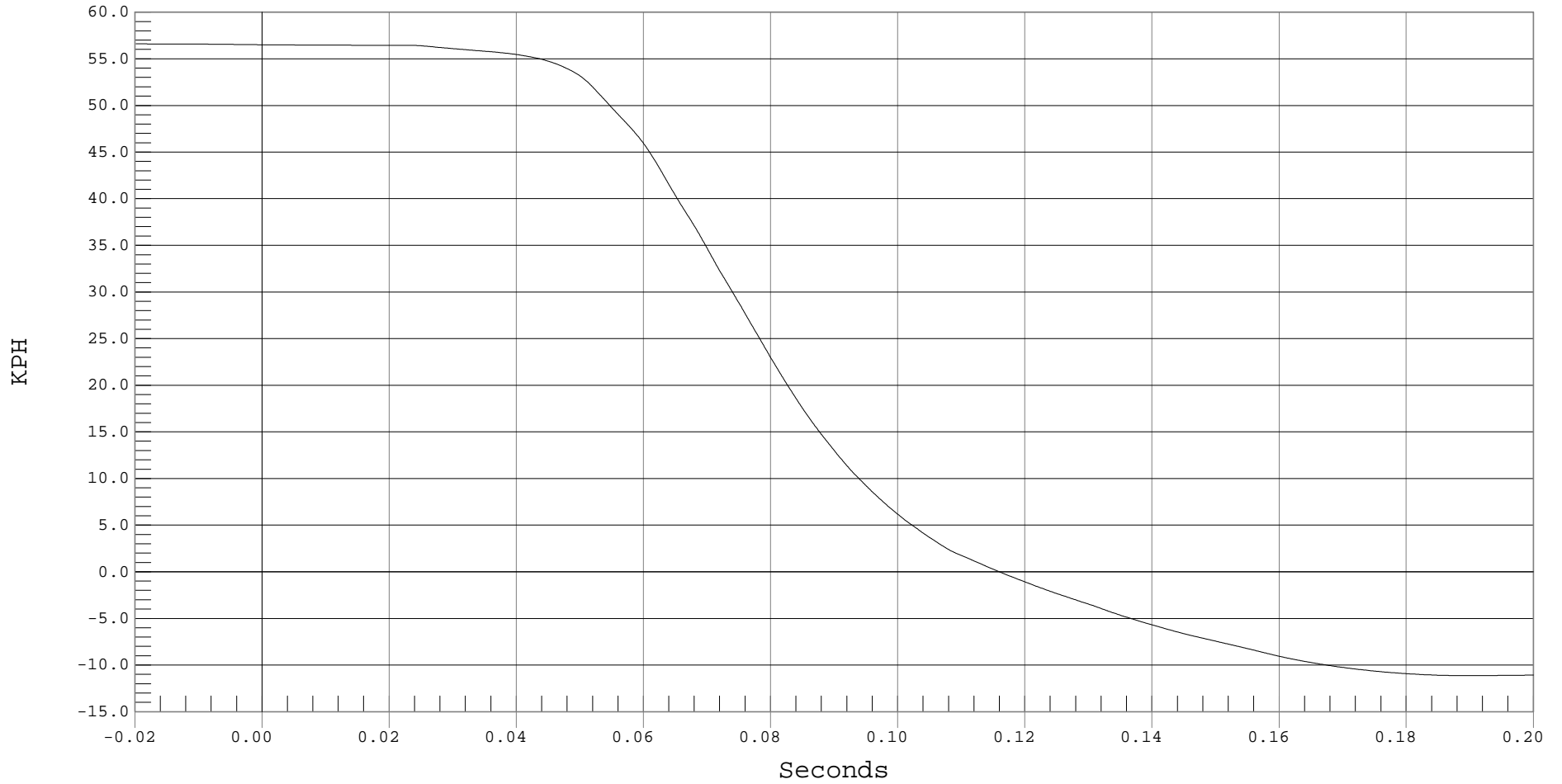
DRIVER HEAD REDUNDANT X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER HEAD REDUNDANT X VELOCITY, B01025AI.V33

Ymin = -11.14 KPH @ 0.1905 Seconds, Ymax = 56.6 KPH @ -0.0199 Seconds



B-10



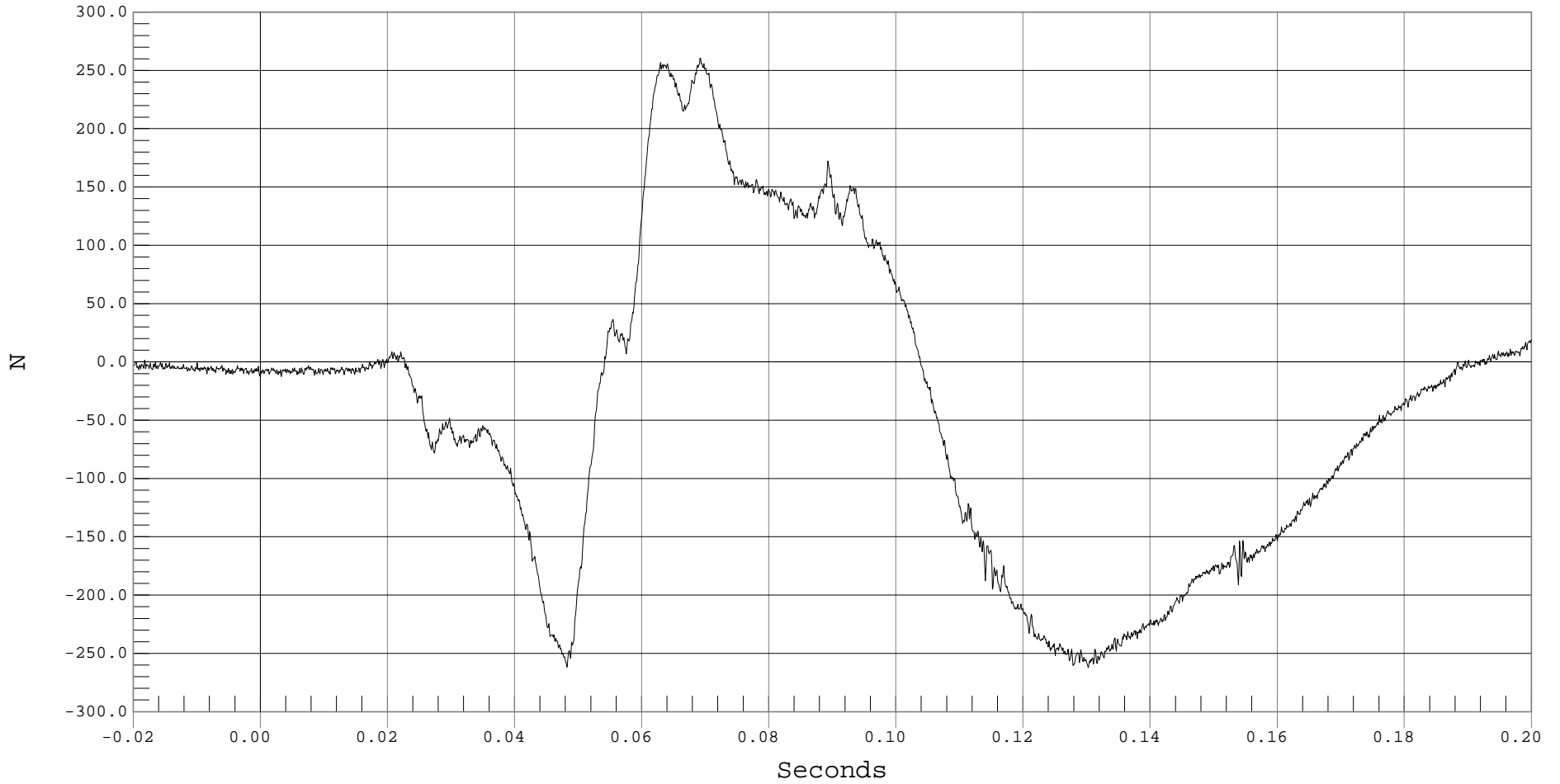
DRIVER NECK FORCE X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER NECK FX, B01025FT.F04

Ymin = -262.26 N @ 0.1302 Seconds, Ymax = 260.69 N @ 0.0692 Seconds



B-11



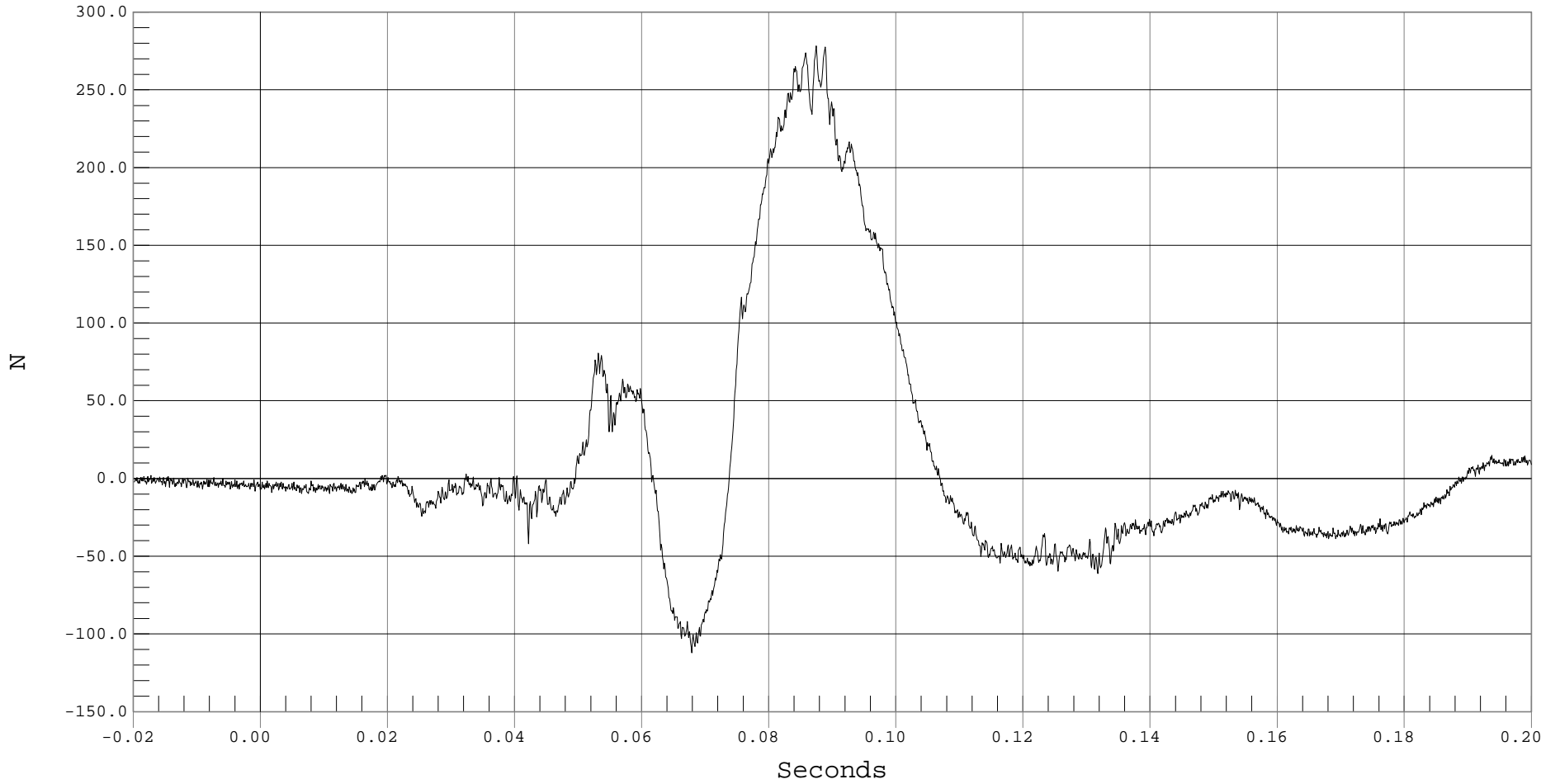
DRIVER NECK FORCE Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER NECK FY, B01025FT.F05

Ymin = -112.18 N @ 0.0678 Seconds, Ymax = 278.33 N @ 0.0874 Seconds



B-12



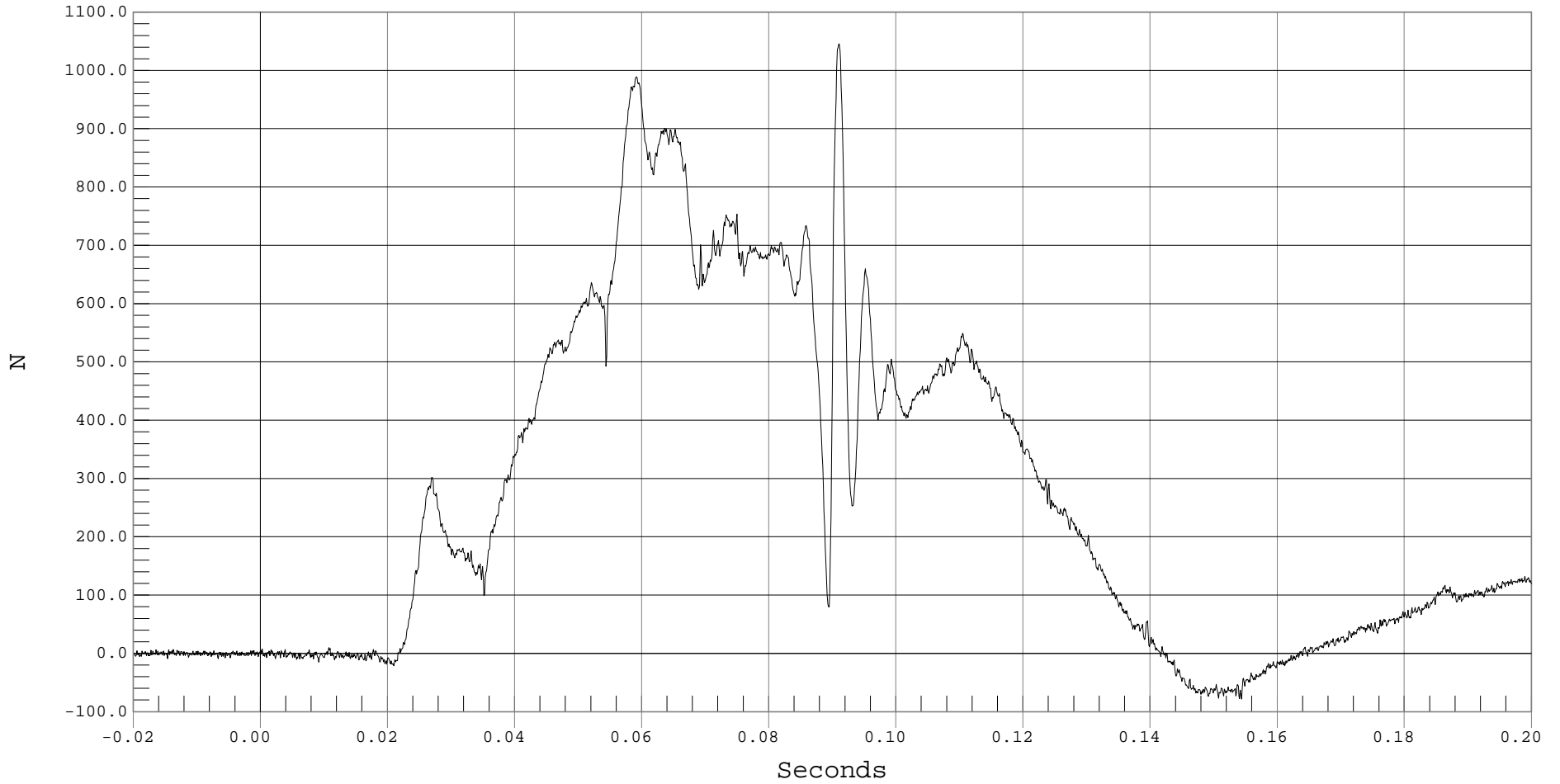
DRIVER NECK FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER NECK FZ, B01025FT.F06

Ymin = -78.21 N @ 0.1543 Seconds, Ymax = 1045.93 N @ 0.0910 Seconds



B-13



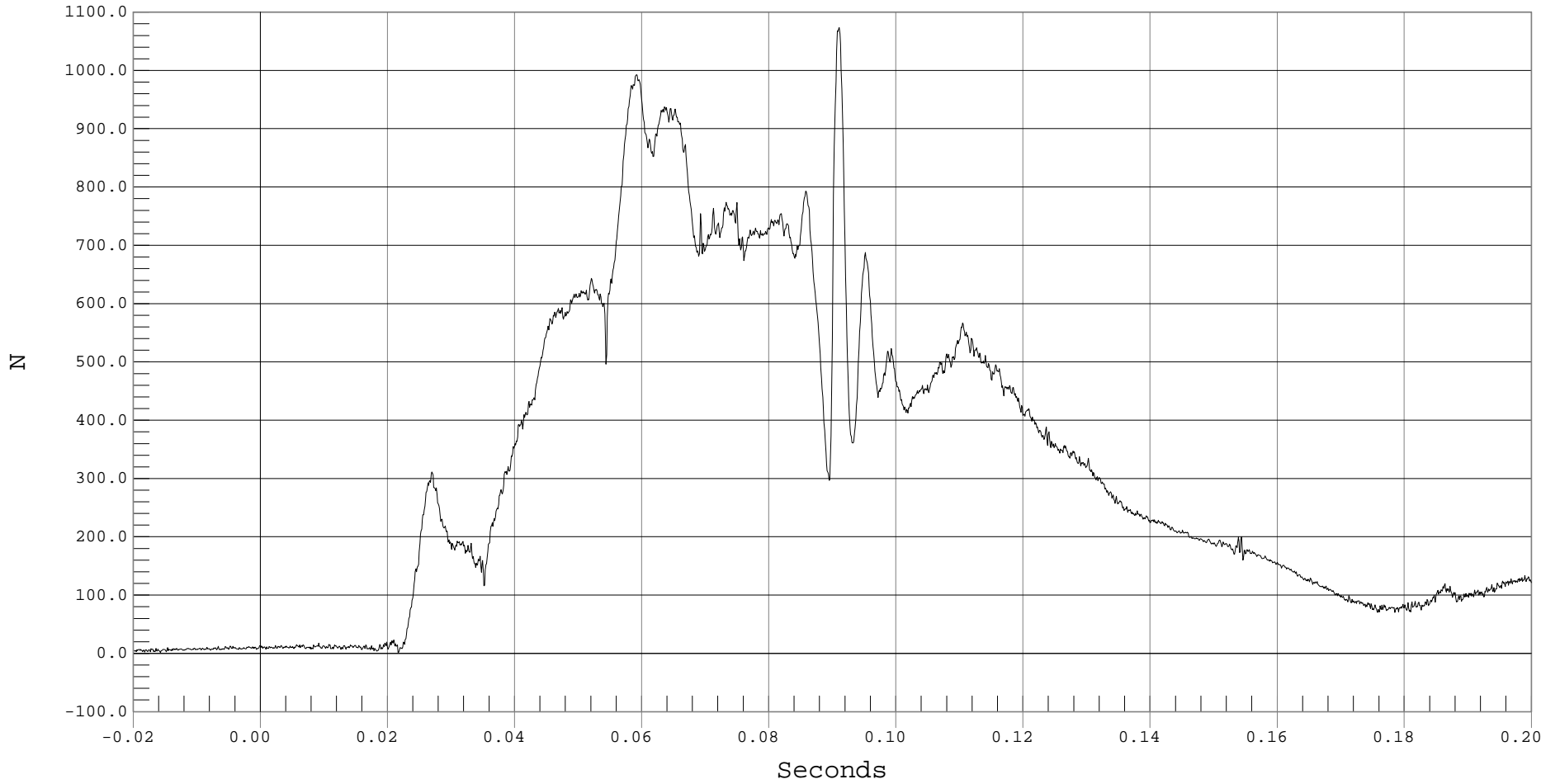
DRIVER NECK FORCE RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER NECK FORCE RESULTANT, B01025FV.F04

Ymin = 1.33 N @ -0.0158 Seconds, Ymax = 1073.35 N @ 0.0910 Seconds





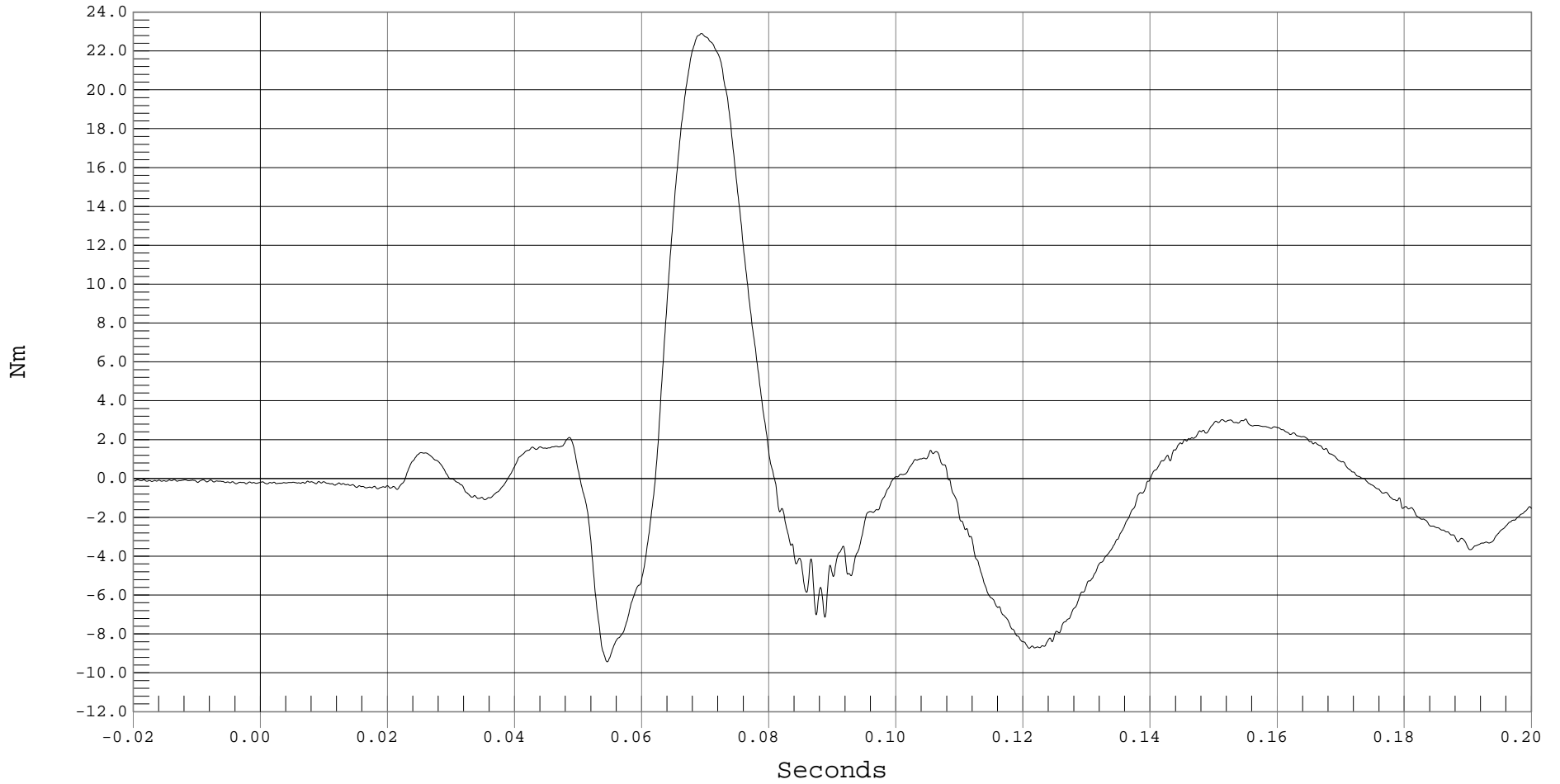
DRIVER NECK MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER NECK MX, B01025MF.M07

Ymin = -9.43 Nm @ 0.0545 Seconds, Ymax = 22.9 Nm @ 0.0693 Seconds





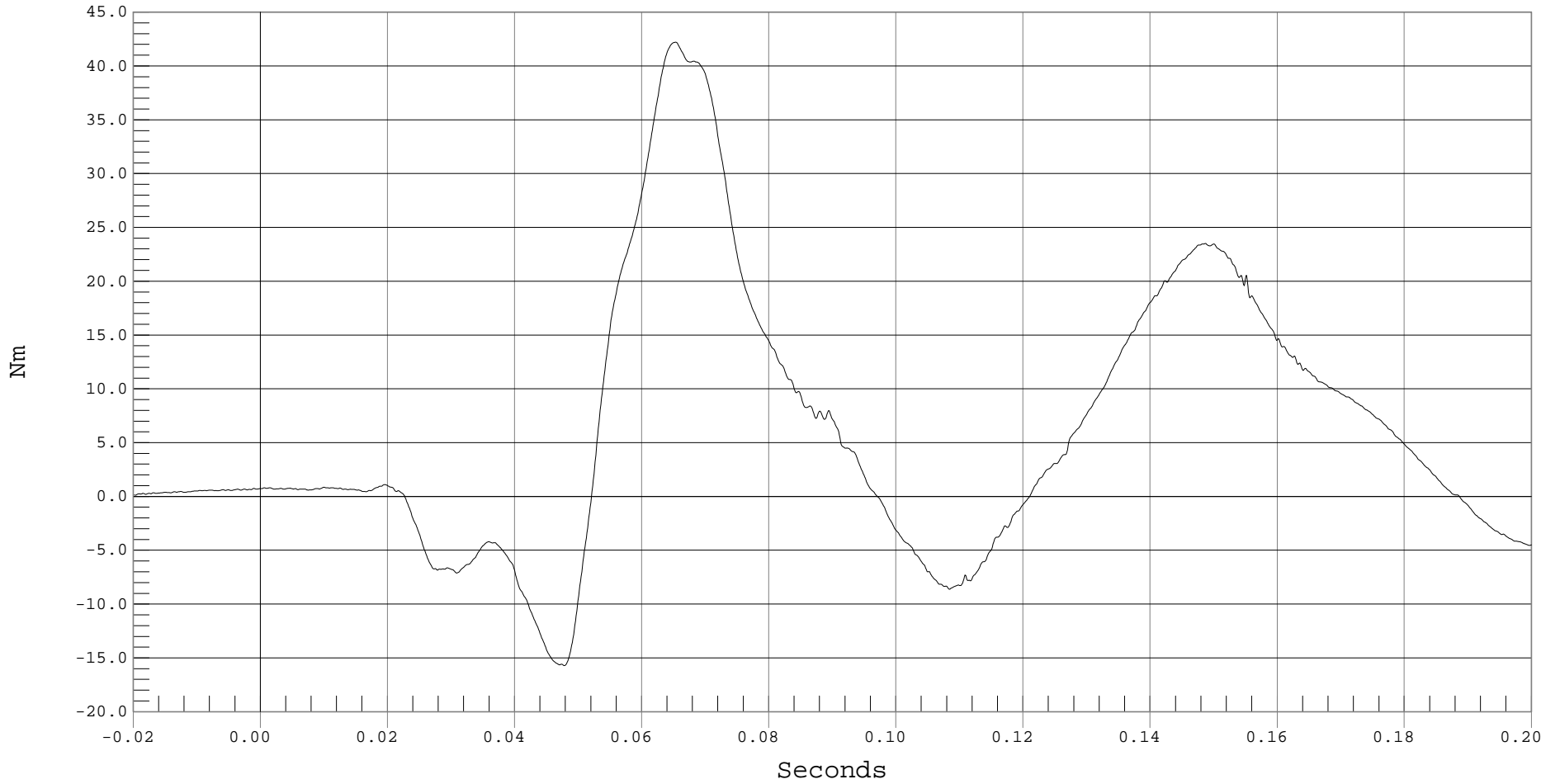
DRIVER NECK MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER NECK MY, B01025MF.M08

Ymin = -15.71 Nm @ 0.0478 Seconds, Ymax = 42.2 Nm @ 0.0652 Seconds



B-16



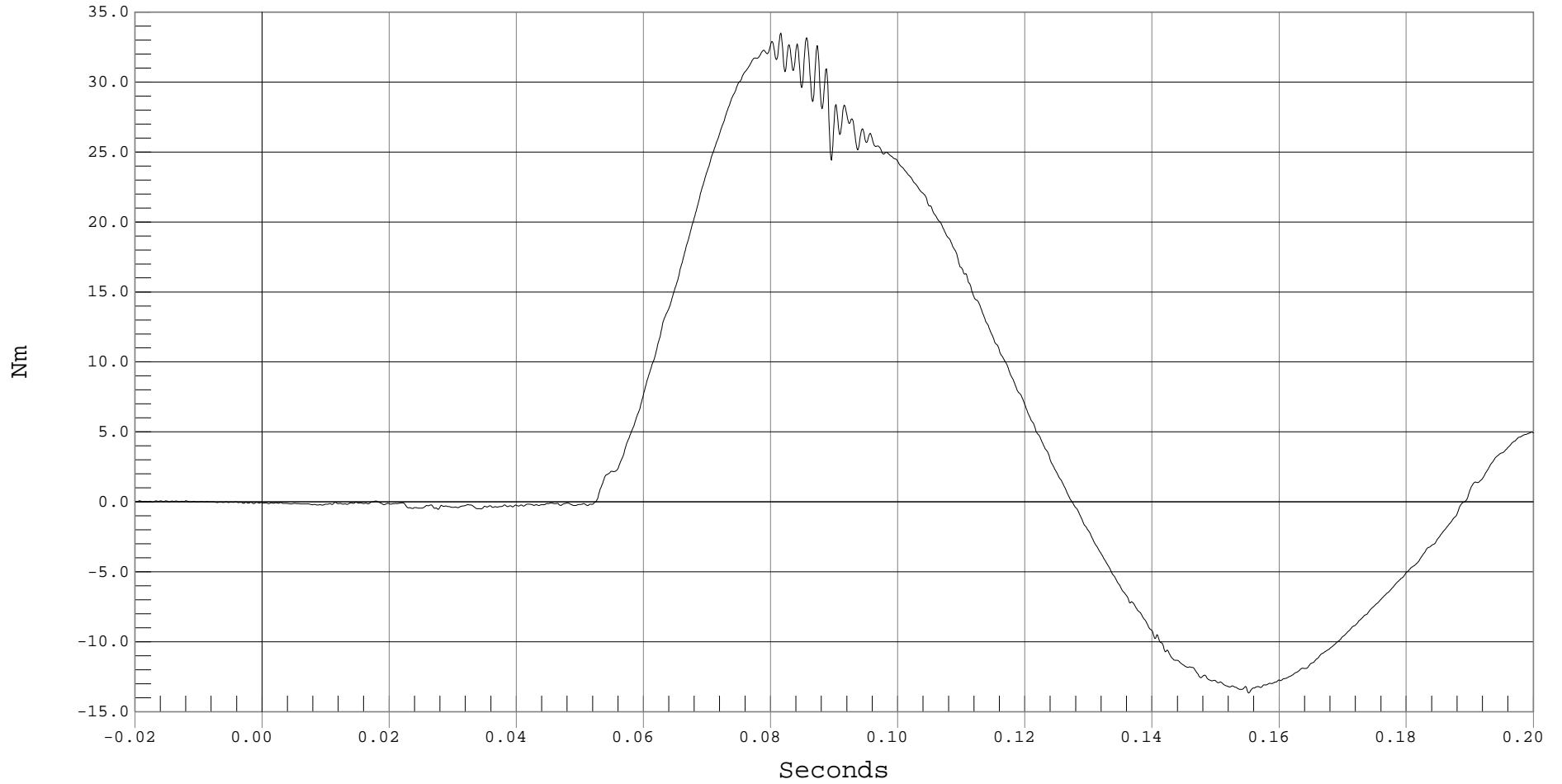
DRIVER NECK MOMENT Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER NECK MZ, B01025MF.M09

Ymin = -13.67 Nm @ 0.1551 Seconds, Ymax = 33.5 Nm @ 0.0815 Seconds





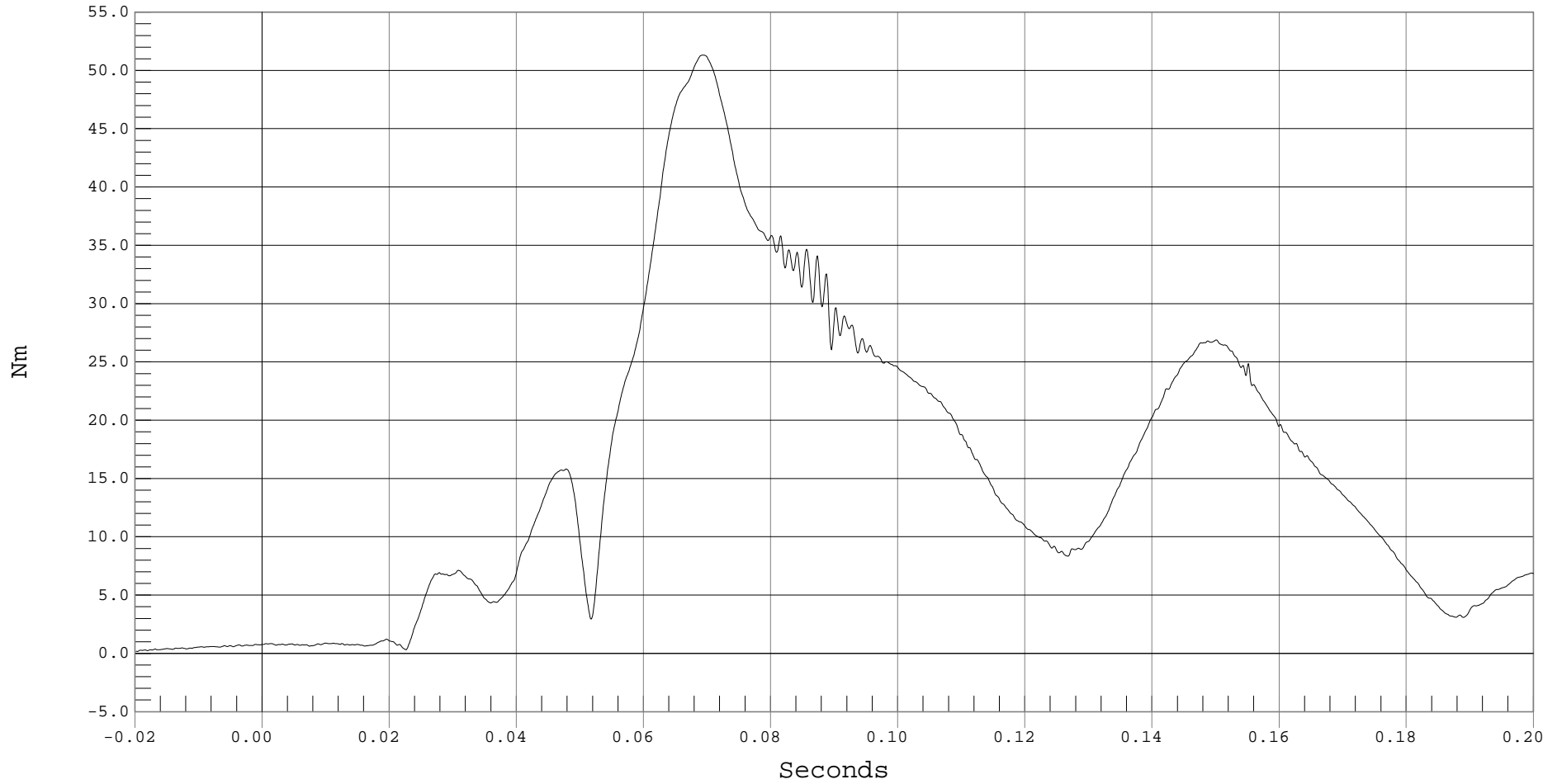
DRIVER NECK MOMENT RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER NECK MOMENT RESULTANT, B01025MV.M07

Ymin = .16 Nm @ -0.0197 Seconds, Ymax = 51.32 Nm @ 0.0692 Seconds





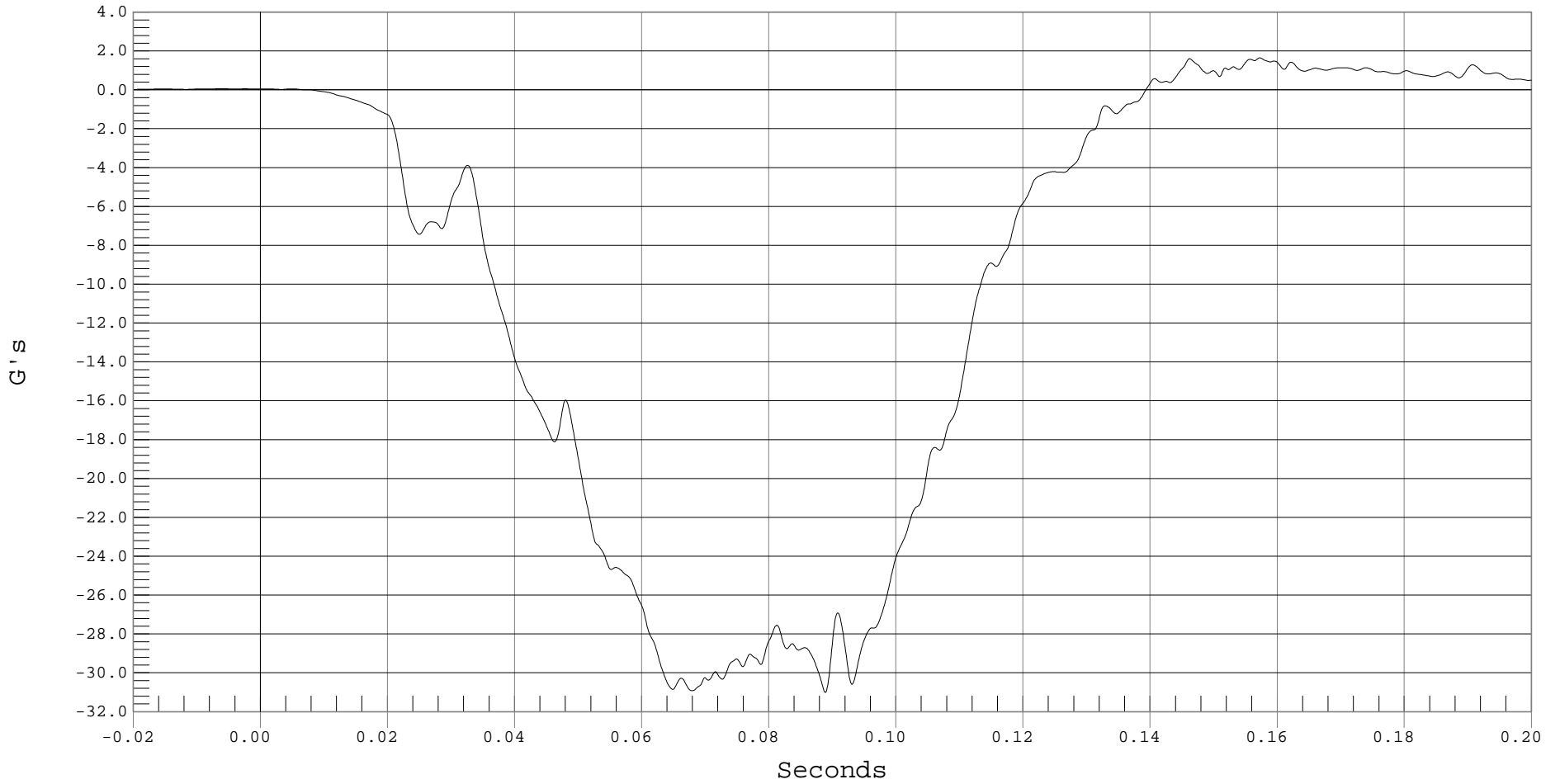
DRIVER CHEST X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST X, B01025AF.A10

Ymin = -31.01 G's @ 0.0888 Seconds, Ymax = 1.65 G's @ 0.1572 Seconds



B-19



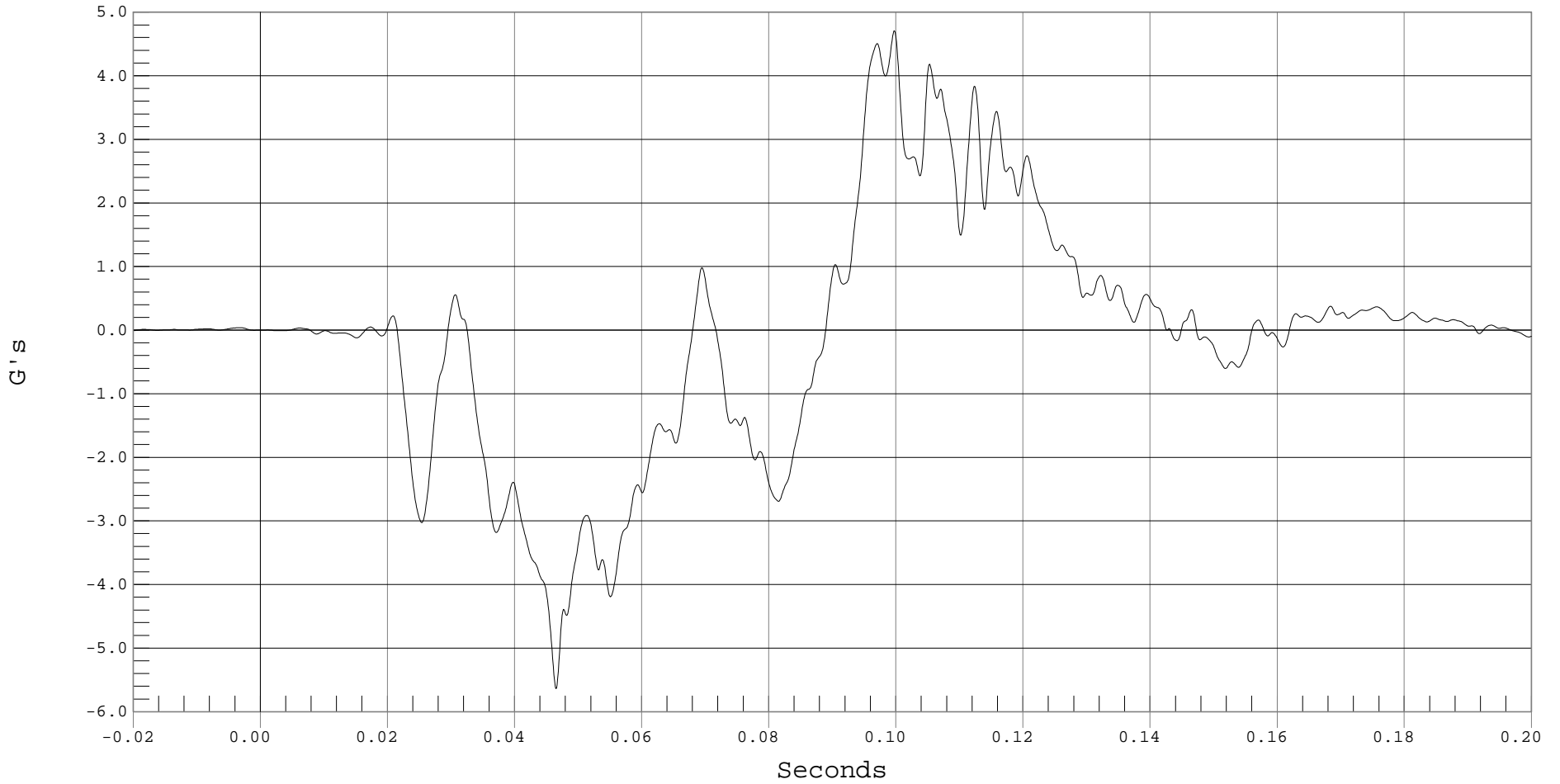
DRIVER CHEST Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST Y, B01025AF.A11

Ymin = -5.64 G's @ 0.0464 Seconds, Ymax = 4.71 G's @ 0.0997 Seconds



B-20



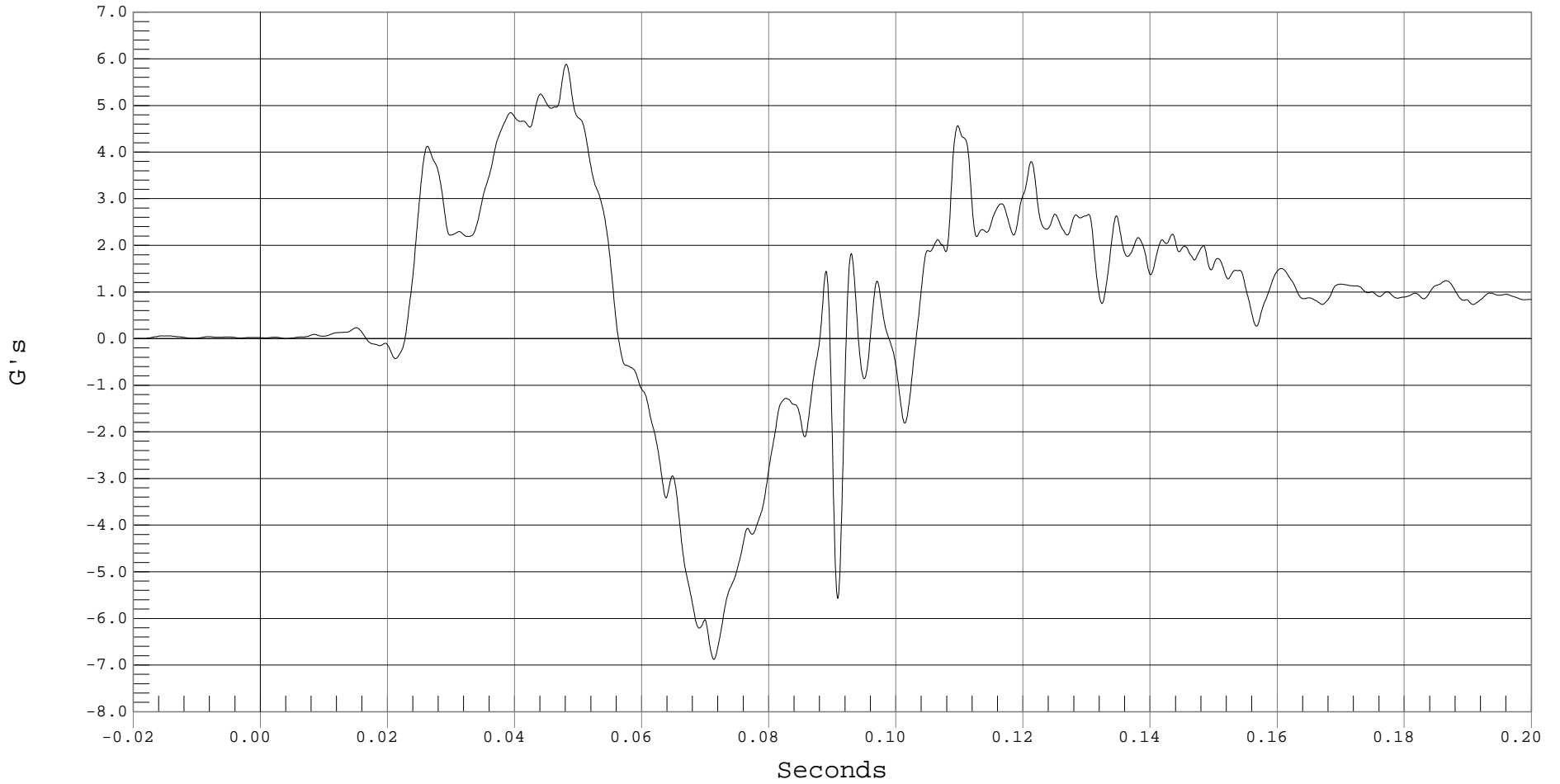
DRIVER CHEST Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST Z, B01025AF.A12

Ymin = -6.88 G's @ 0.0713 Seconds, Ymax = 5.88 G's @ 0.0480 Seconds



B-21



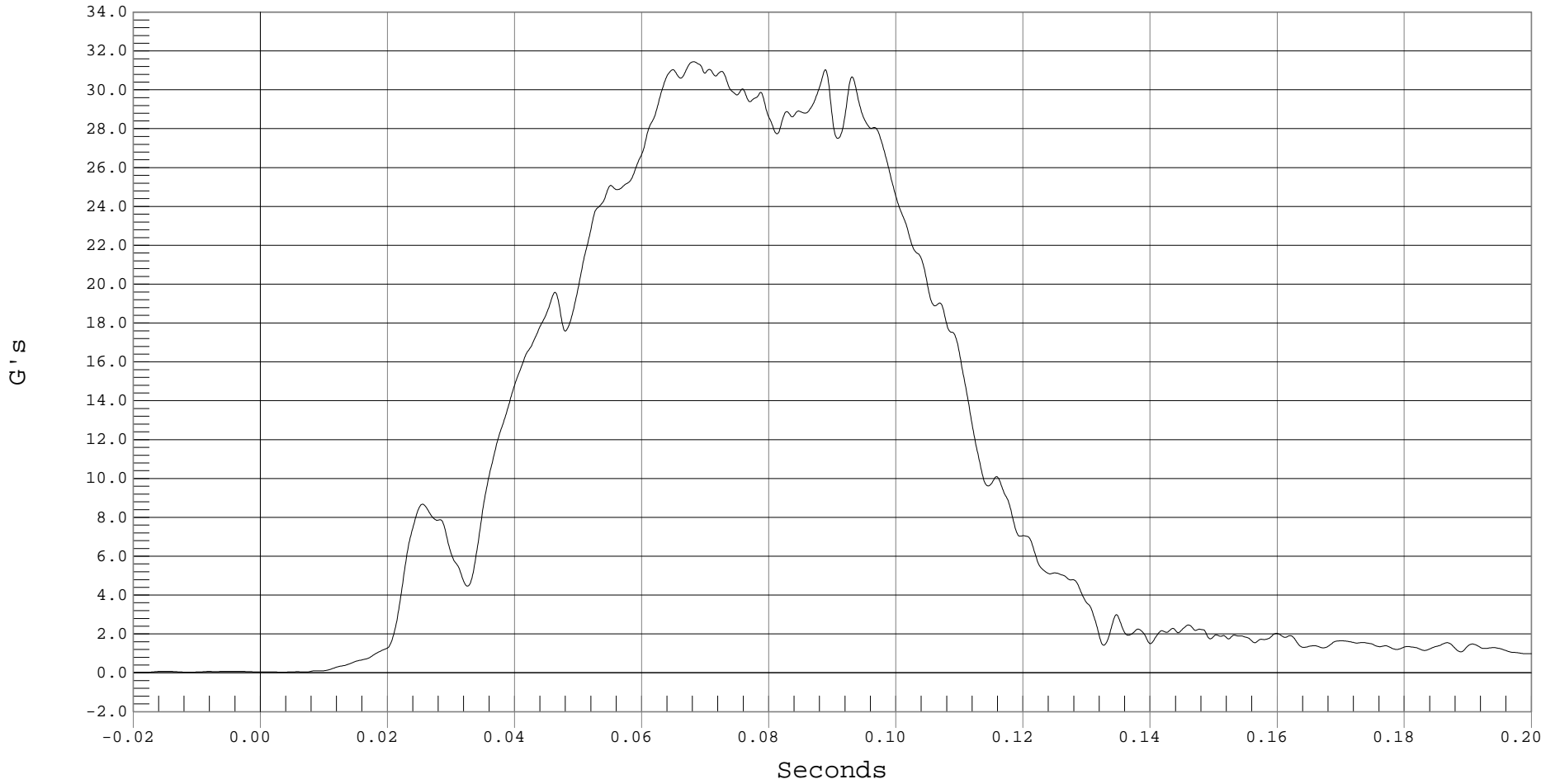
DRIVER CHEST RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST RESULTANT ACCELERATION, B01025AV.A10

Ymin = .02 G's @ -0.0199 Seconds, Ymax = 31.45 G's @ 0.0681 Seconds



B-22



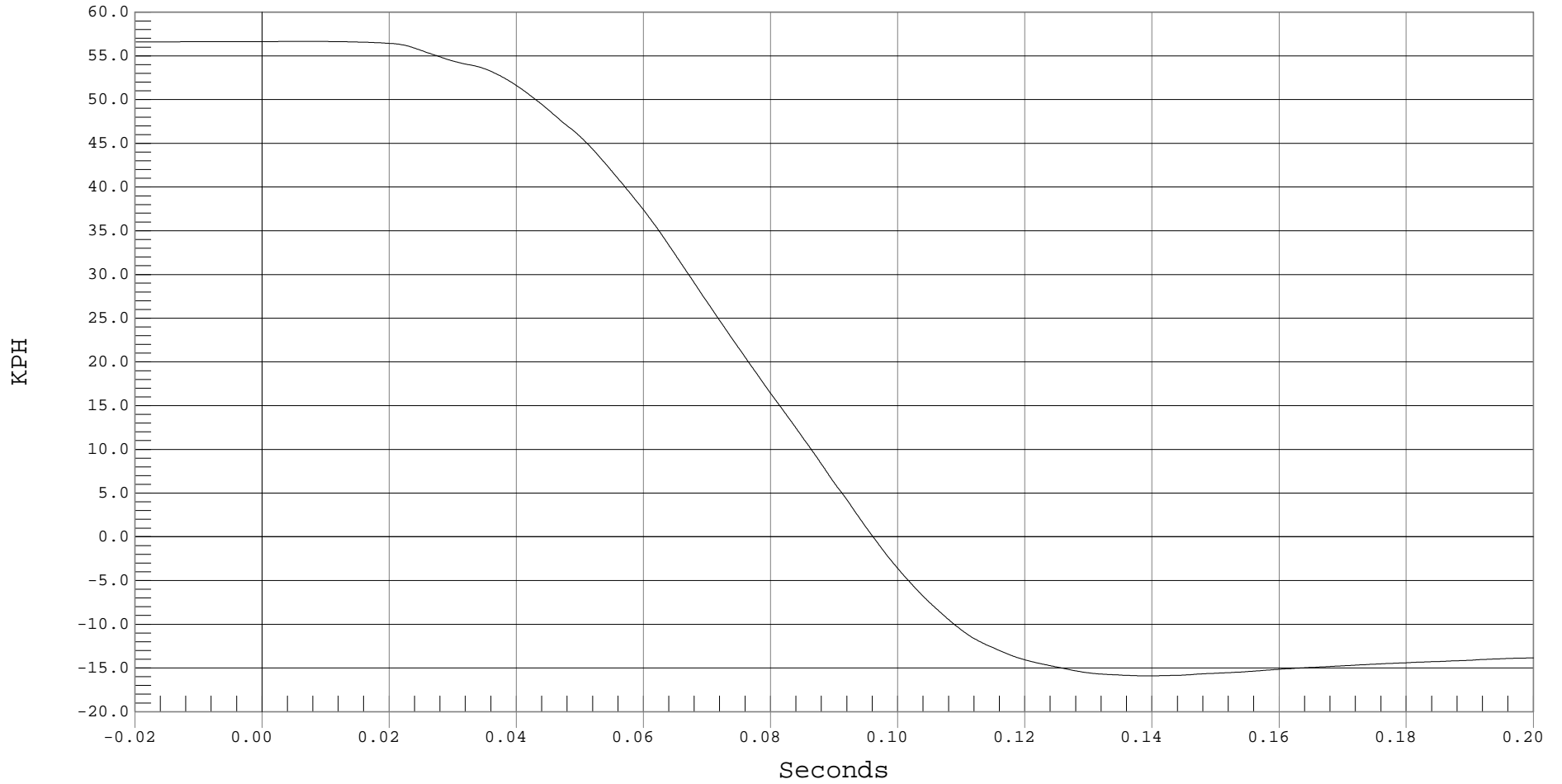
DRIVER CHEST X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST X VELOCITY, B01025AI.V10

Ymin = -15.91 KPH @ 0.1392 Seconds, Ymax = 56.64 KPH @ 0.0078 Seconds



B-23



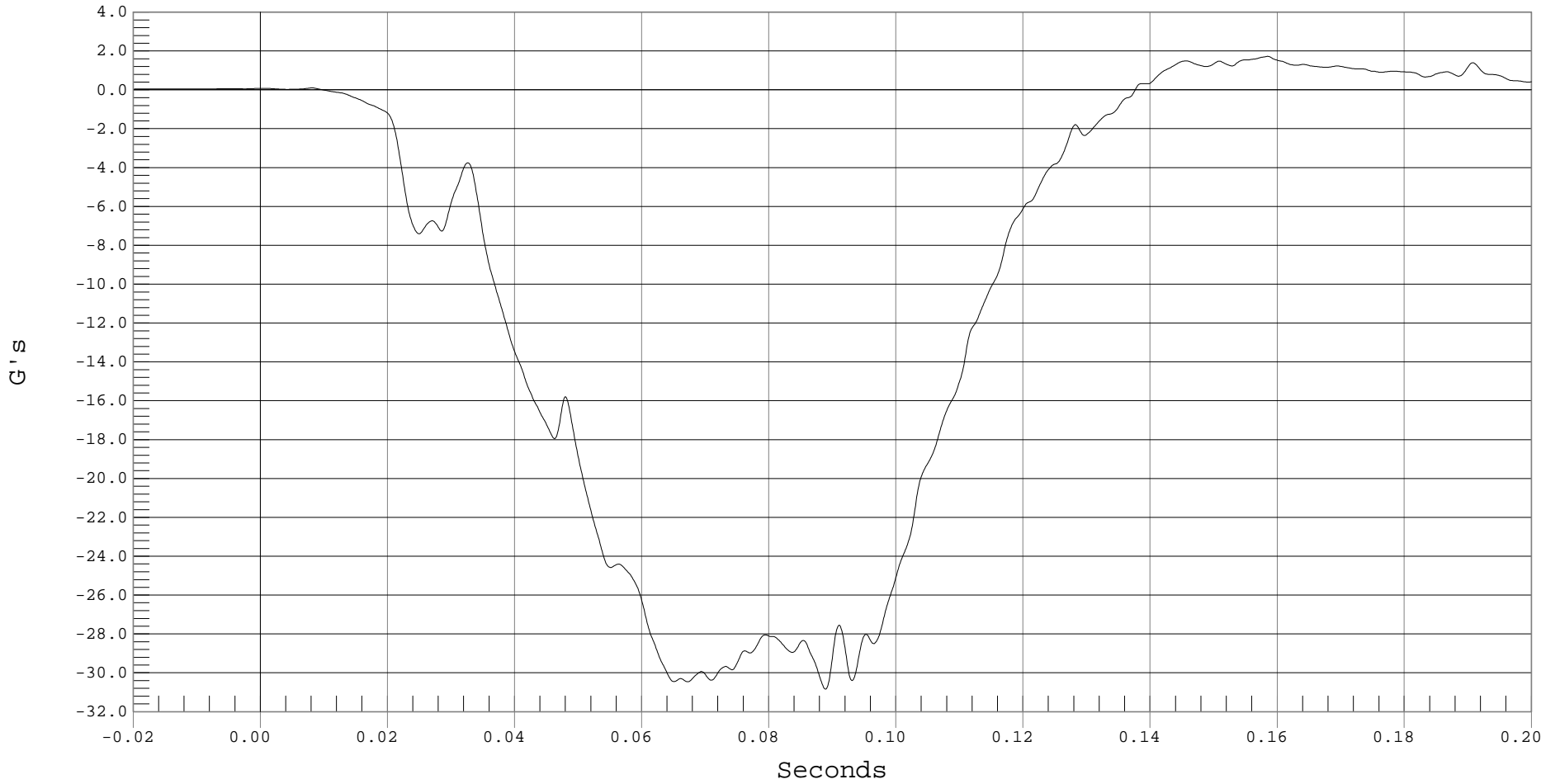
DRIVER CHEST REDUNDANT X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST Xr, B01025AF.A36

Ymin = -30.84 G's @ 0.0888 Seconds, Ymax = 1.73 G's @ 0.1584 Seconds



B-24



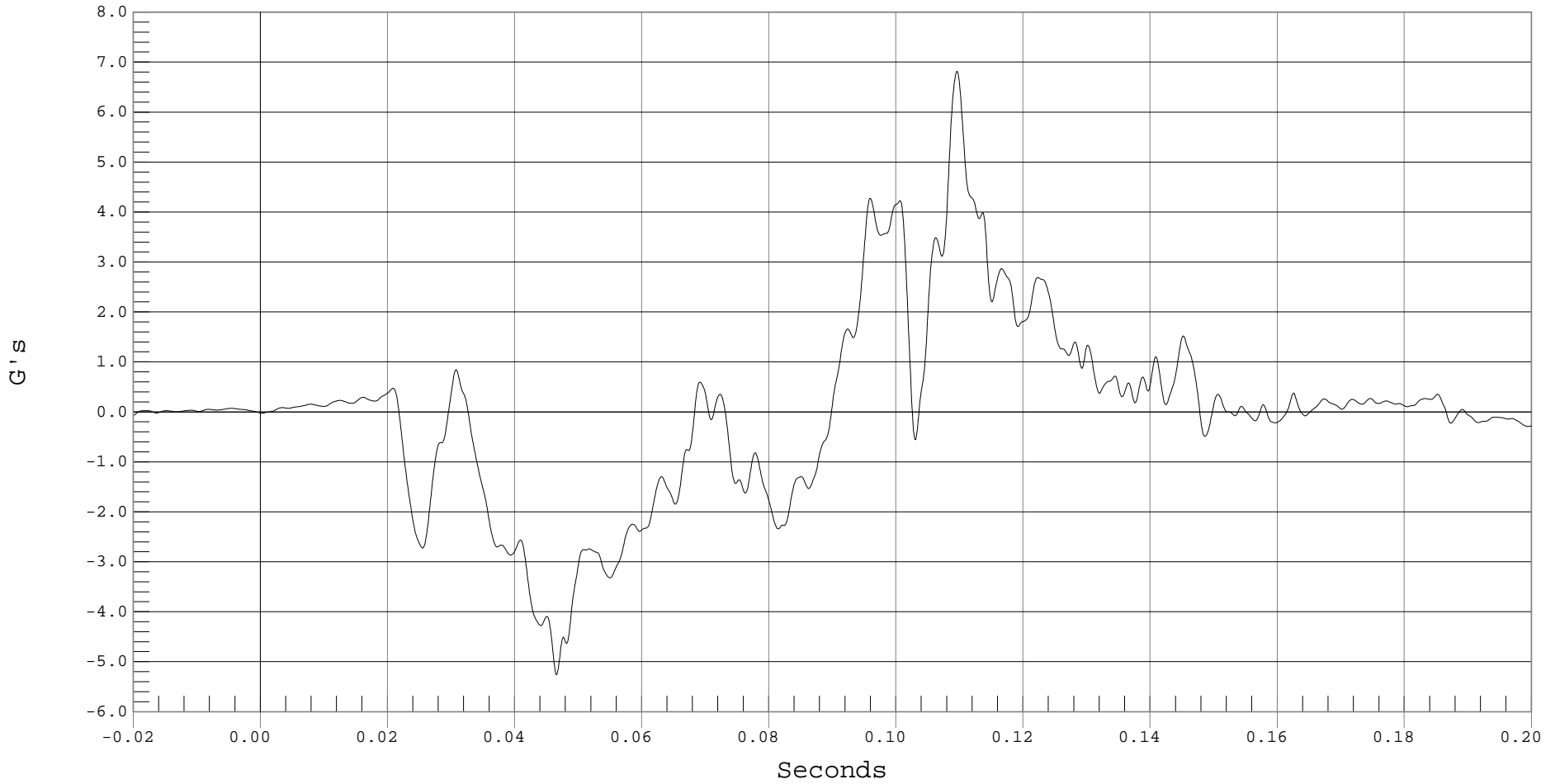
DRIVER CHEST REDUNDANT Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST Yr, B01025AF.A37

Ymin = -5.26 G's @ 0.0465 Seconds, Ymax = 6.82 G's @ 0.1095 Seconds



B-25



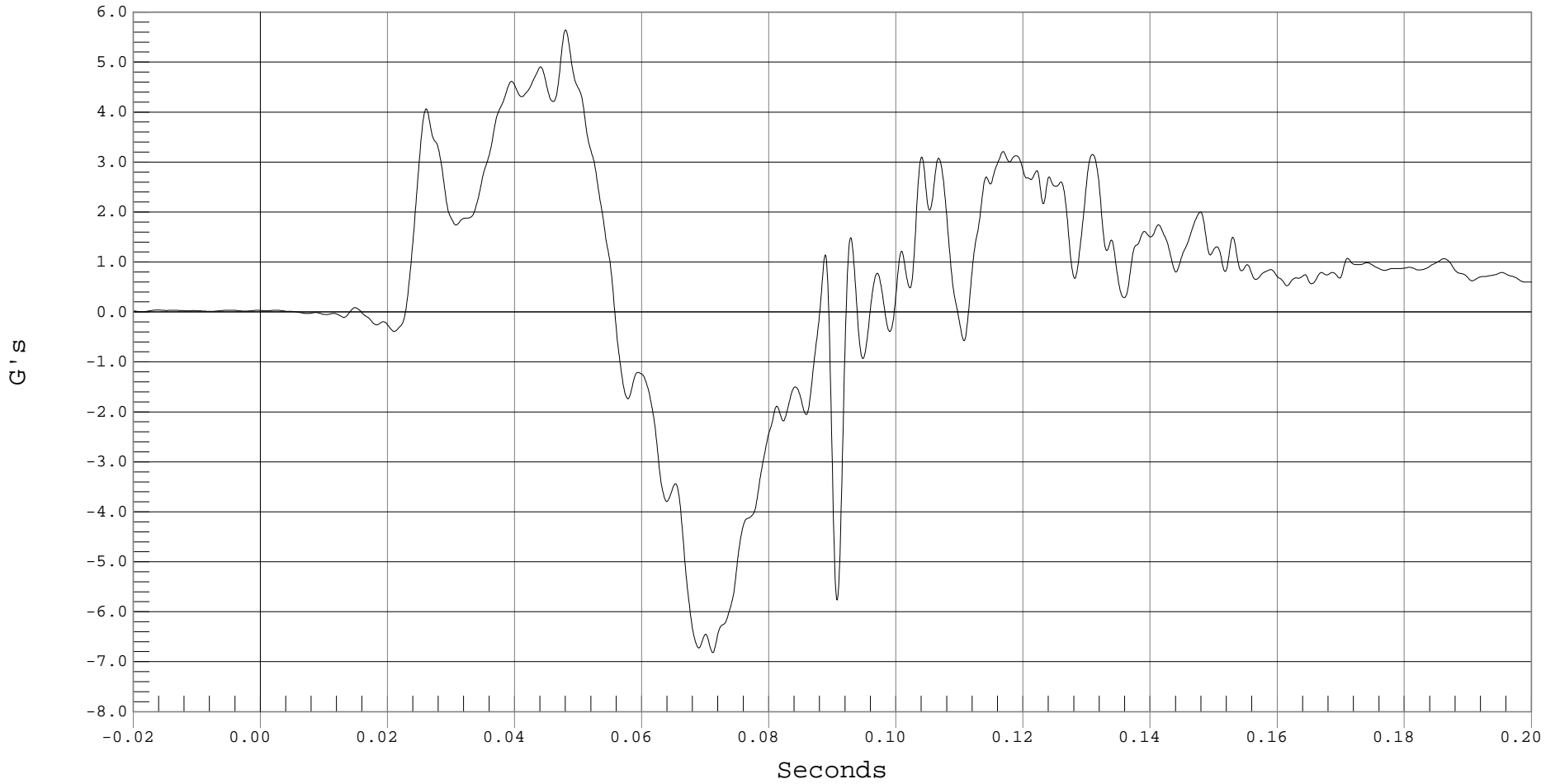
DRIVER CHEST REDUNDANT Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST Zr, B01025AF.A38

Ymin = -6.82 G's @ 0.0711 Seconds, Ymax = 5.64 G's @ 0.0479 Seconds





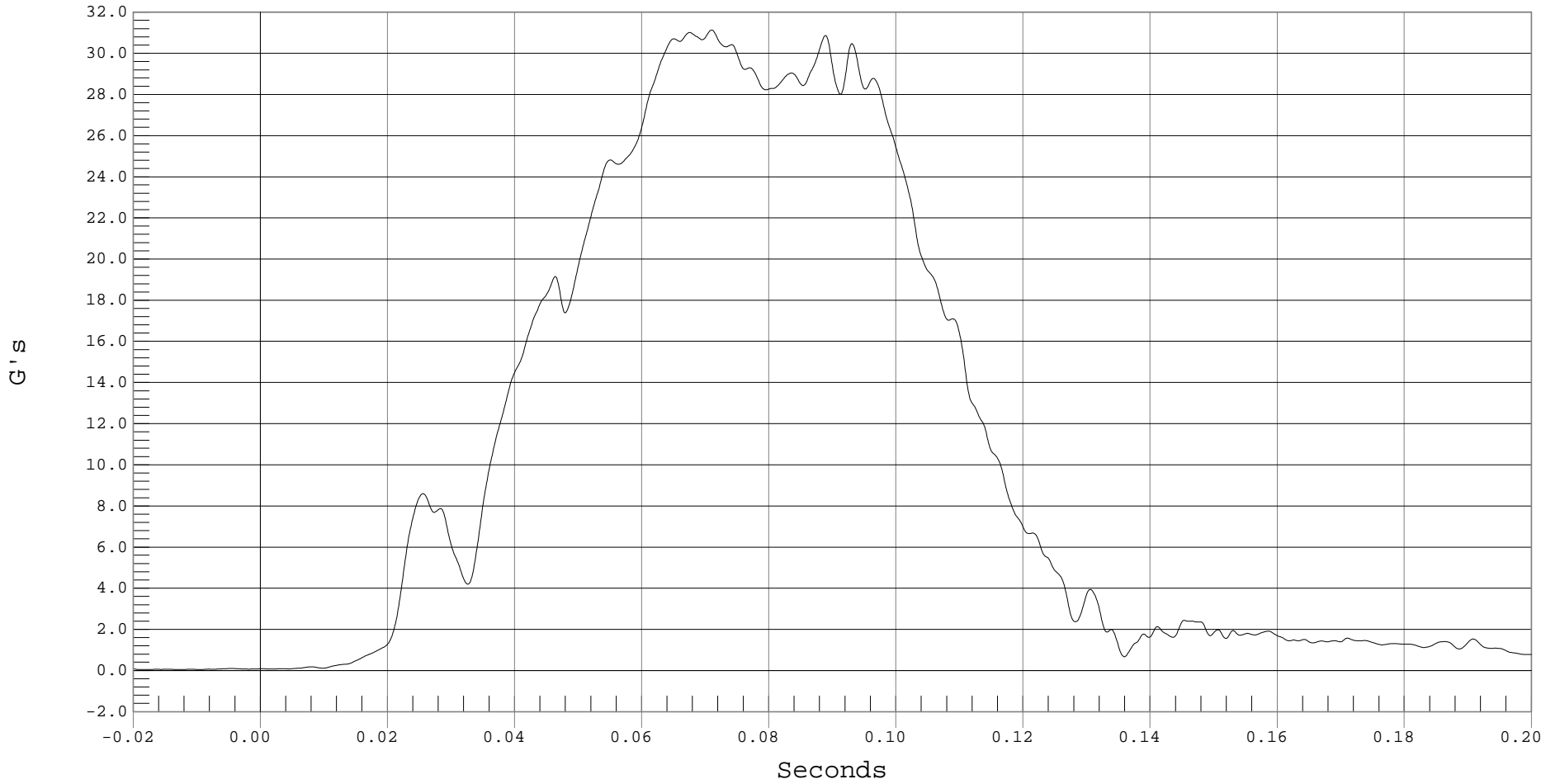
DRIVER CHEST REDUNDANT RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST REDUNDANT RESULTANT ACCELERATION, B01025AV.A36

Ymin = .05 G's @ -0.0193 Seconds, Ymax = 31.13 G's @ 0.0709 Seconds



B-27



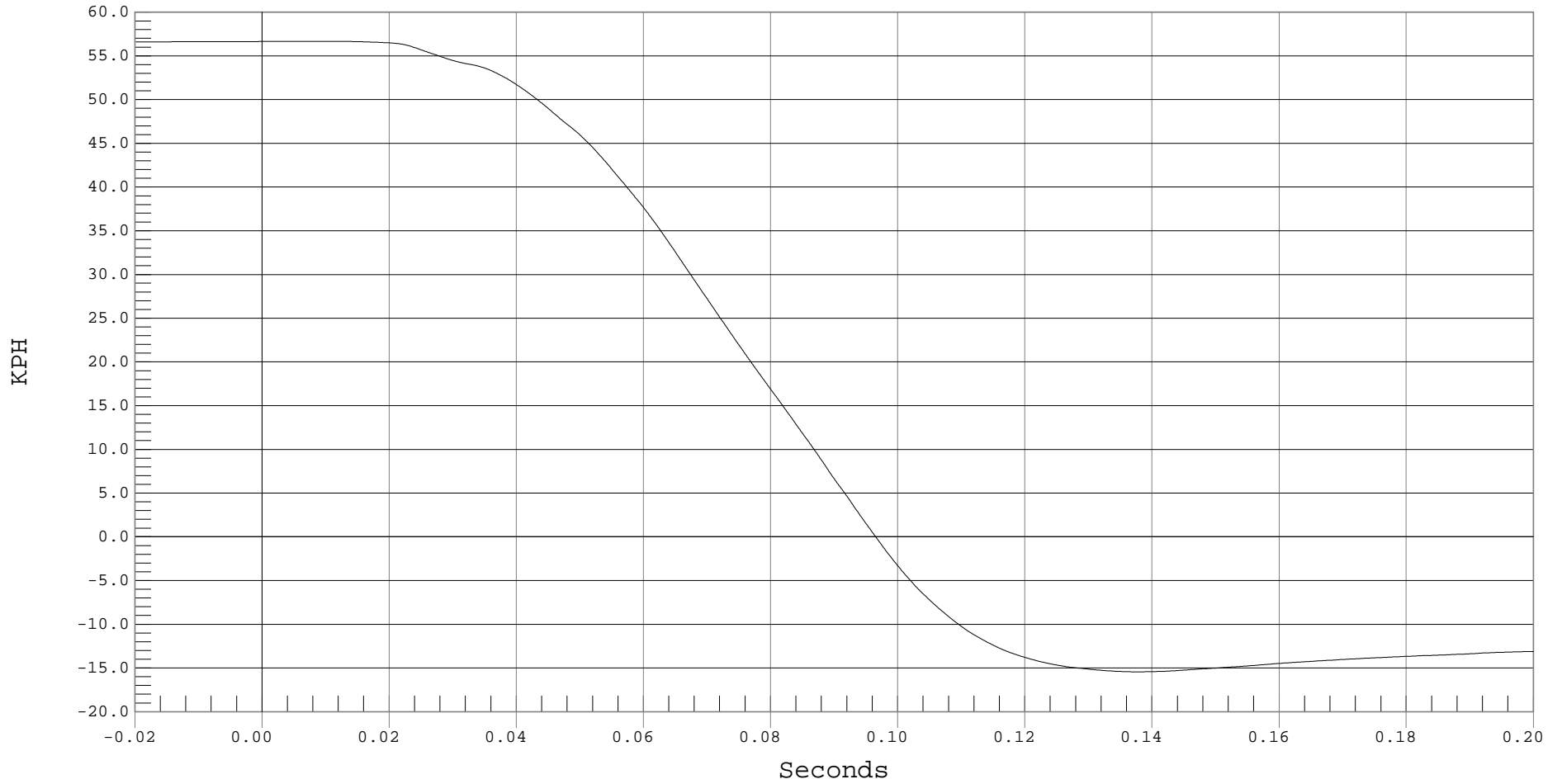
DRIVER CHEST REDUNDANT X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER CHEST REDUNDANT X VELOCITY, B01025AI.V36

Ymin = -15.44 KPH @ 0.1376 Seconds, Ymax = 56.65 KPH @ 0.0098 Seconds



B-28



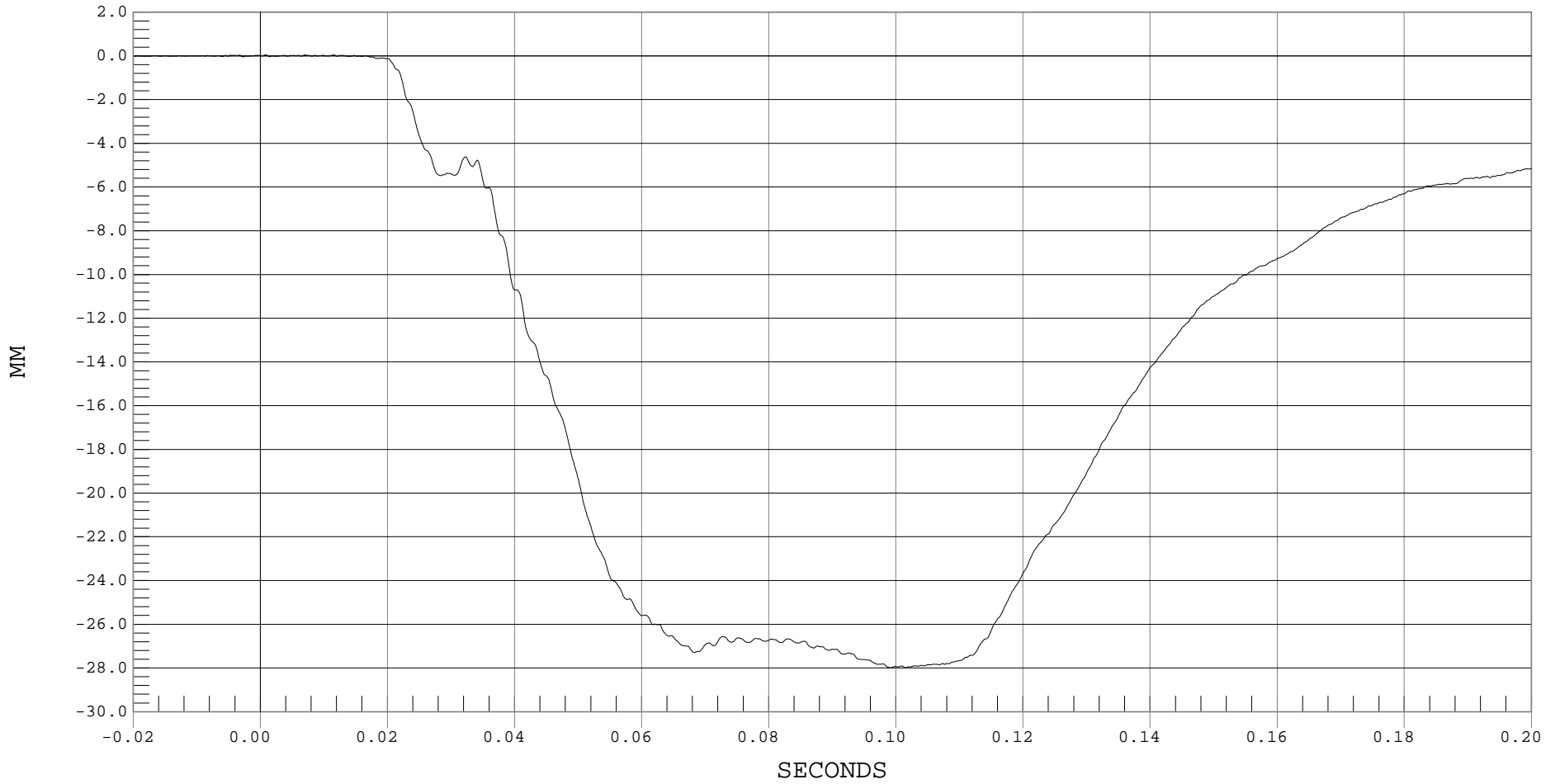
DRIVER CHEST COMPRESSION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER CHEST DISPLACEMENT, B01025DF.D13

Ymin = -27.99 MM @ 0.0991 SECONDS, Ymax = .05 MM @ 0.0069 SECONDS



B-29



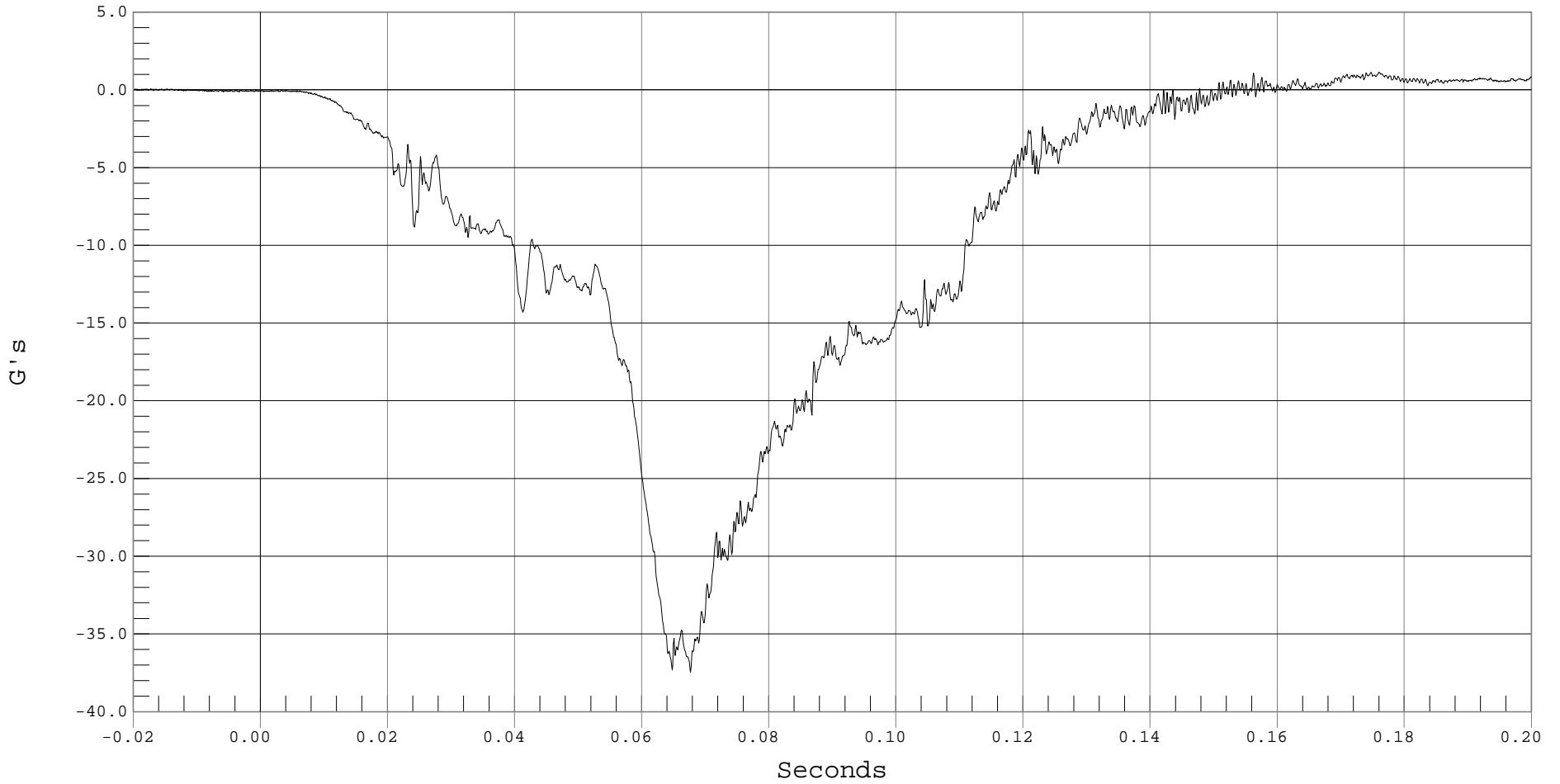
DRIVER PELVIS X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER PELVIS X, B01025AT.A14

Ymin = -37.45 G's @ 0.0676 Seconds, Ymax = 1.15 G's @ 0.1759 Seconds



B-30



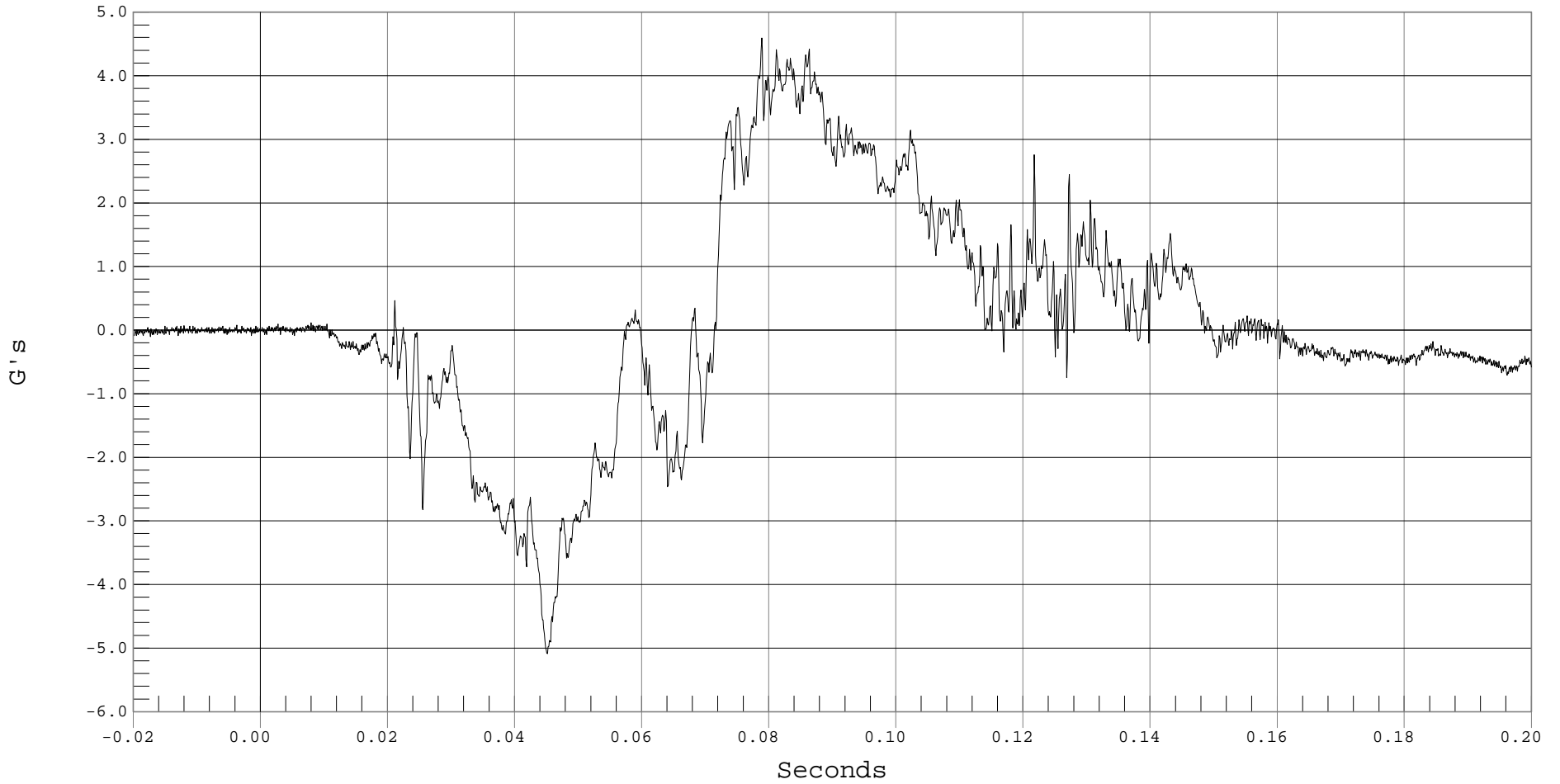
DRIVER PELVIS Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Y, B01025AT.A15

Ymin = -5.09 G's @ 0.0451 Seconds, Ymax = 4.59 G's @ 0.0788 Seconds



B-31



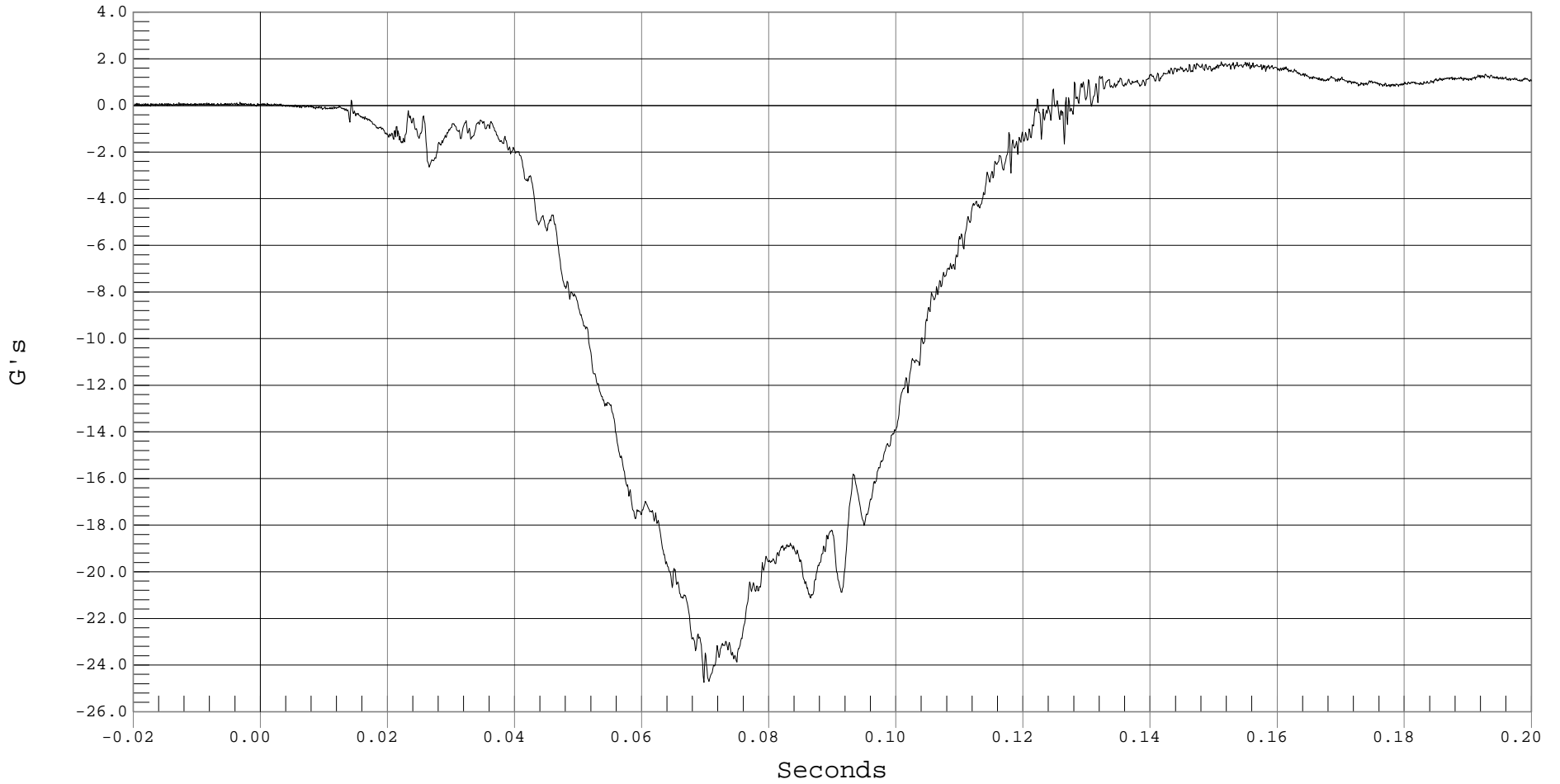
DRIVER PELVIS Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Z, B01025AT.A16

Ymin = -24.75 G's @ 0.0697 Seconds, Ymax = 1.88 G's @ 0.1511 Seconds



B-32



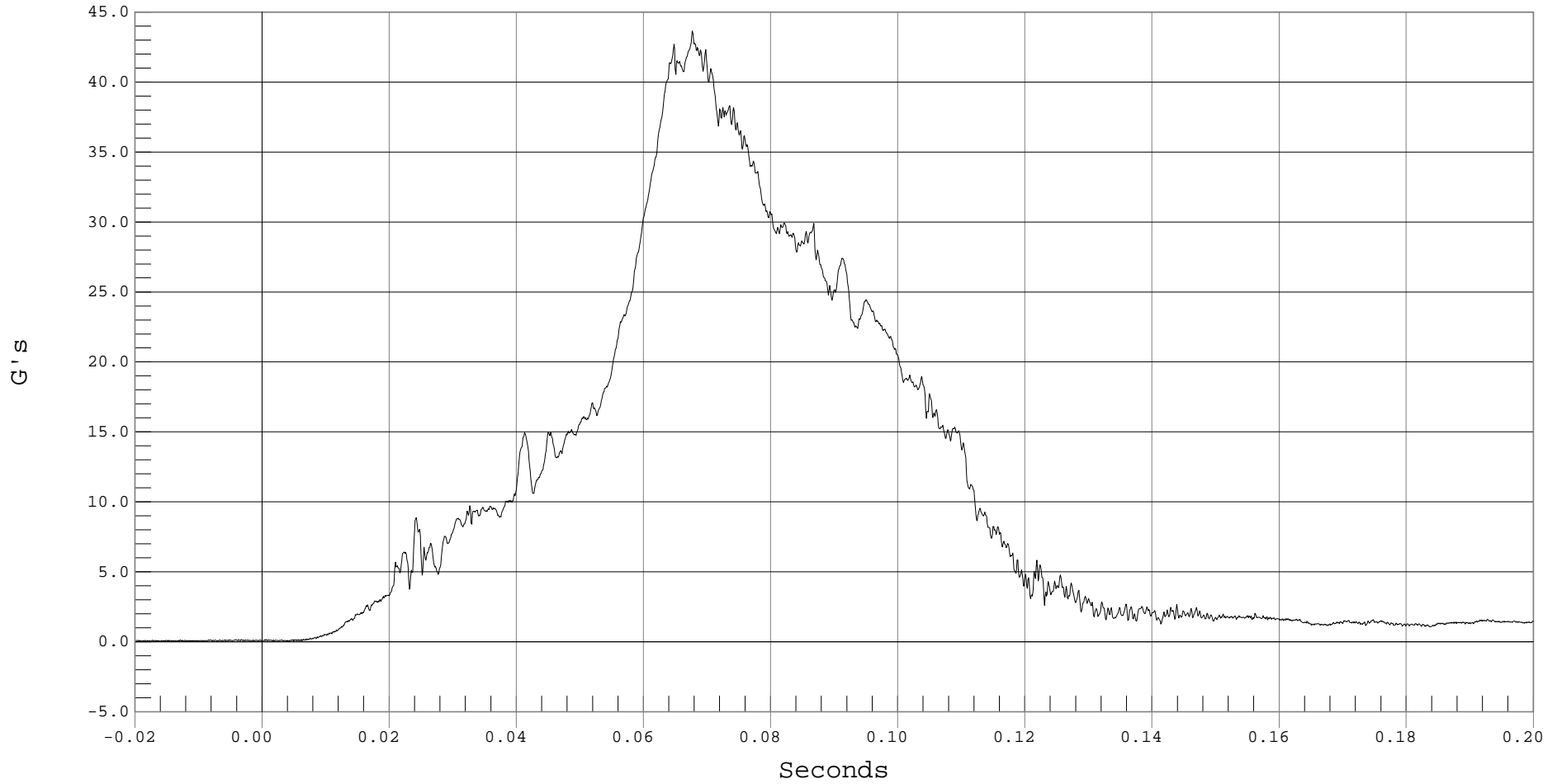
DRIVER PELVIS RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 DRIVER PELVIS RESULTANT ACCELERATION, B01025AV.A14

Ymin = .02 G's @ -0.0139 Seconds, Ymax = 43.66 G's @ 0.0676 Seconds



B-33



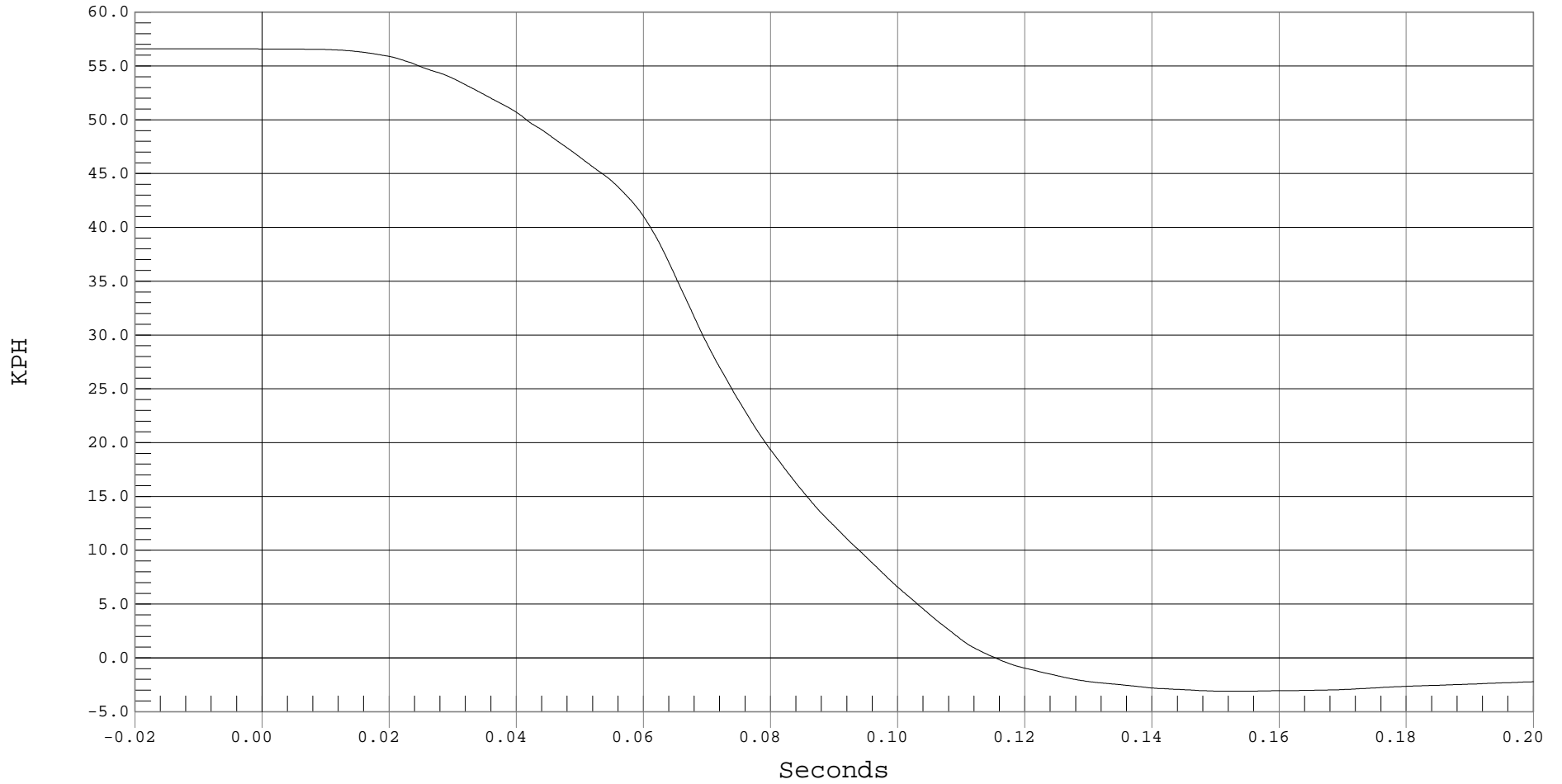
DRIVER PELVIS X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER PELVIS X VELOCITY, B01025AI.V14

Ymin = -3.1 KPH @ 0.1517 Seconds, Ymax = 56.6 KPH @ -0.0132 Seconds





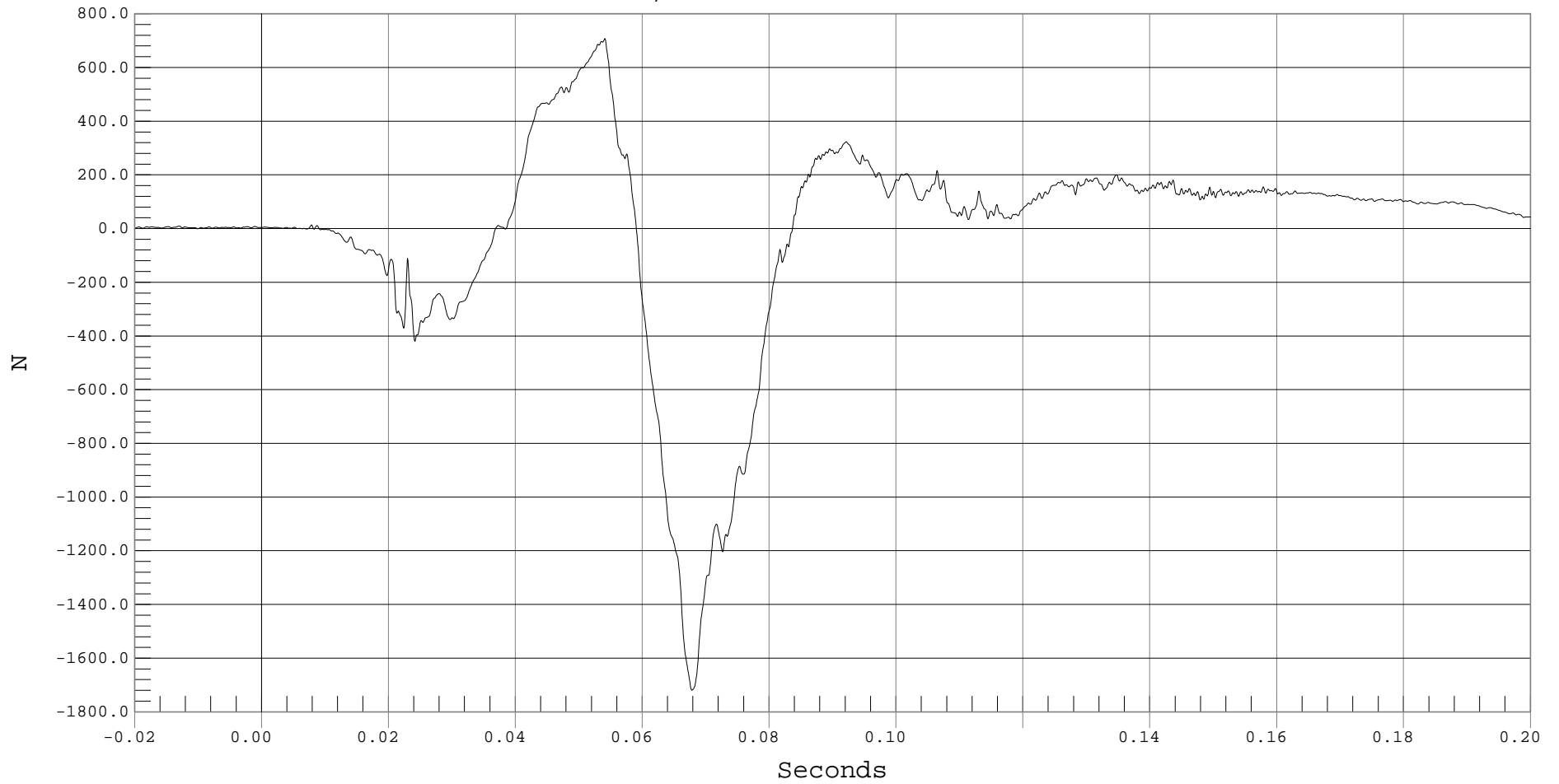
DRIVER LEFT FEMUR FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR X, B01025FF.F18

Ymin = -1719.72 N @ 0.0677 Seconds, Ymax = 707.46 N @ 0.0540 Seconds



B-35



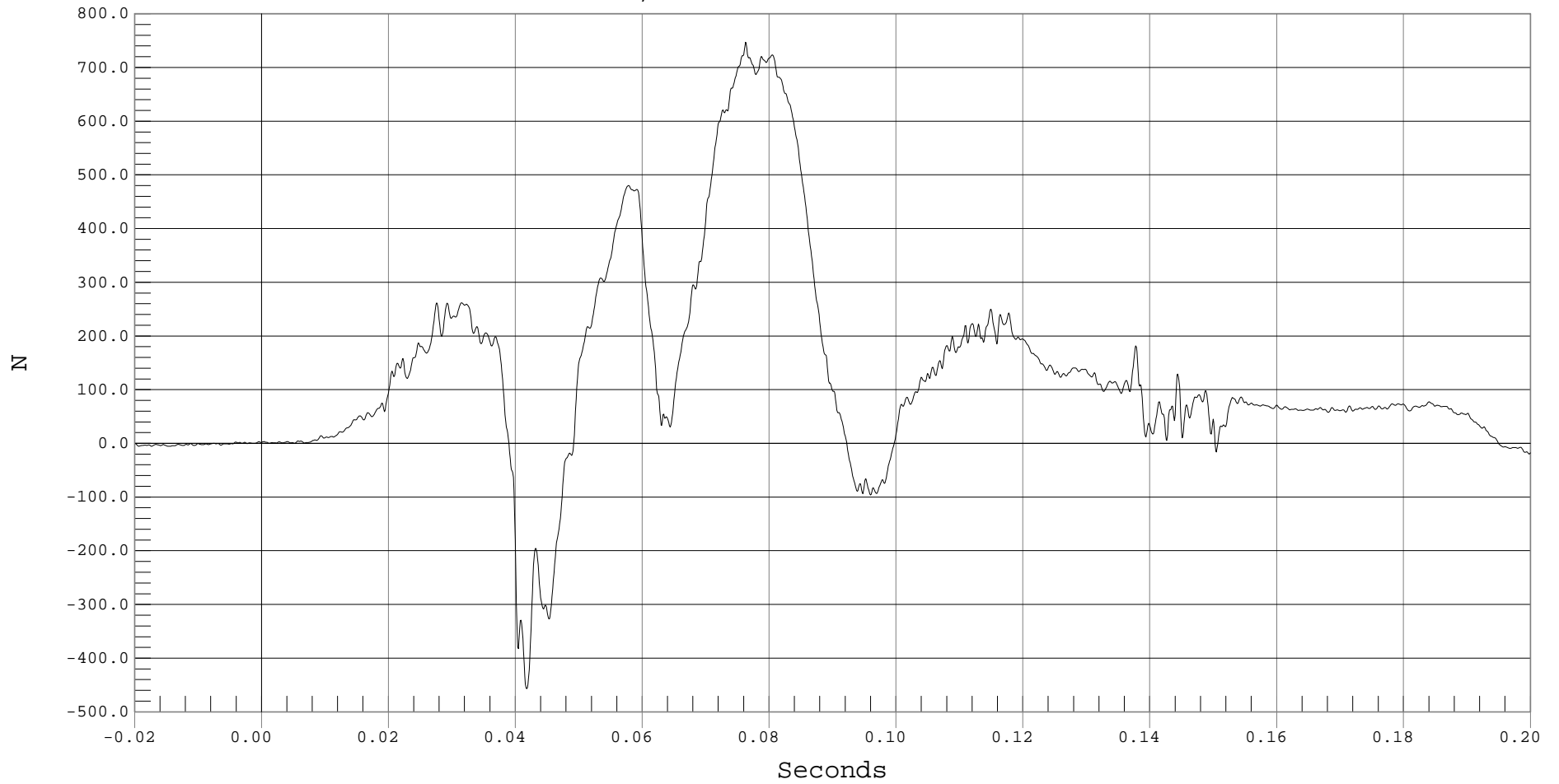
DRIVER RIGHT FEMUR FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR X, B01025FF.F17

Ymin = -457.28 N @ 0.0417 Seconds, Ymax = 747.32 N @ 0.0762 Seconds





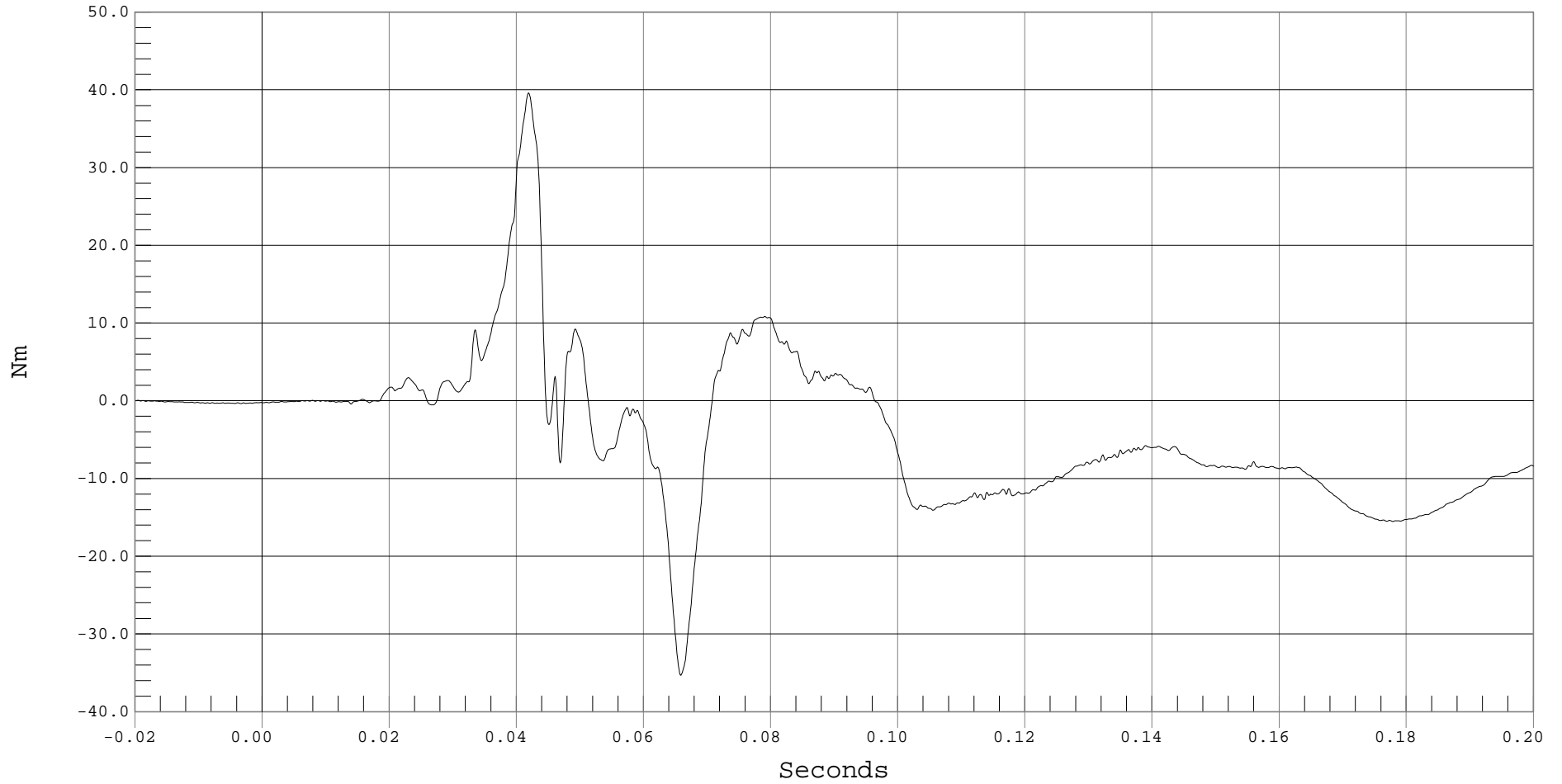
DRIVER LEFT UPPER TIBIA MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER LEFT UPPER TIBIA MX, B01025MF.M75

Ymin = -35.3 Nm @ 0.0658 Seconds, Ymax = 39.61 Nm @ 0.0418 Seconds





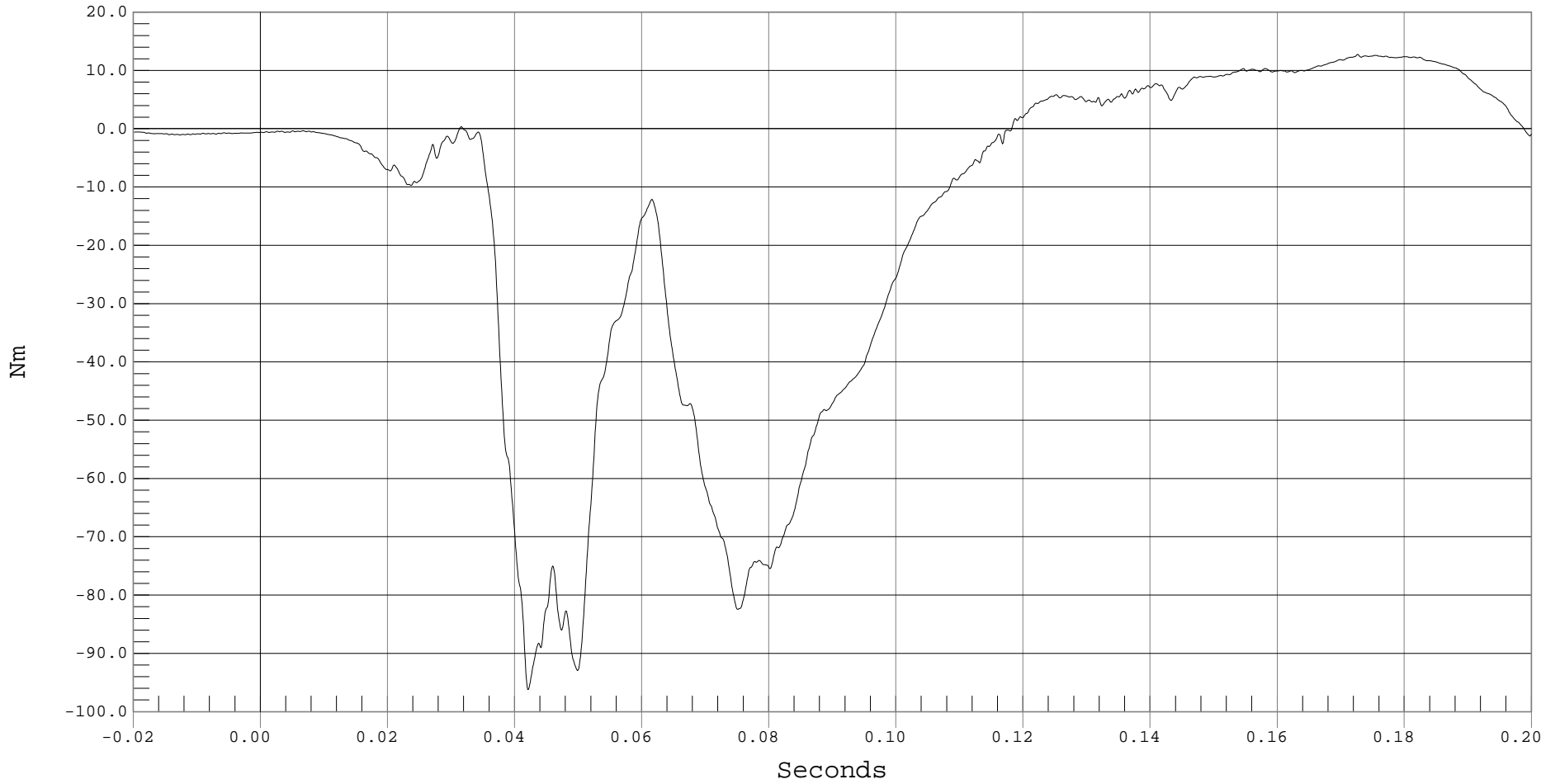
DRIVER LEFT UPPER TIBIA MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER LEFT UPPER TIBIA MY, B01025MF.M76

Ymin = -96.2 Nm @ 0.0420 Seconds, Ymax = 12.75 Nm @ 0.1726 Seconds





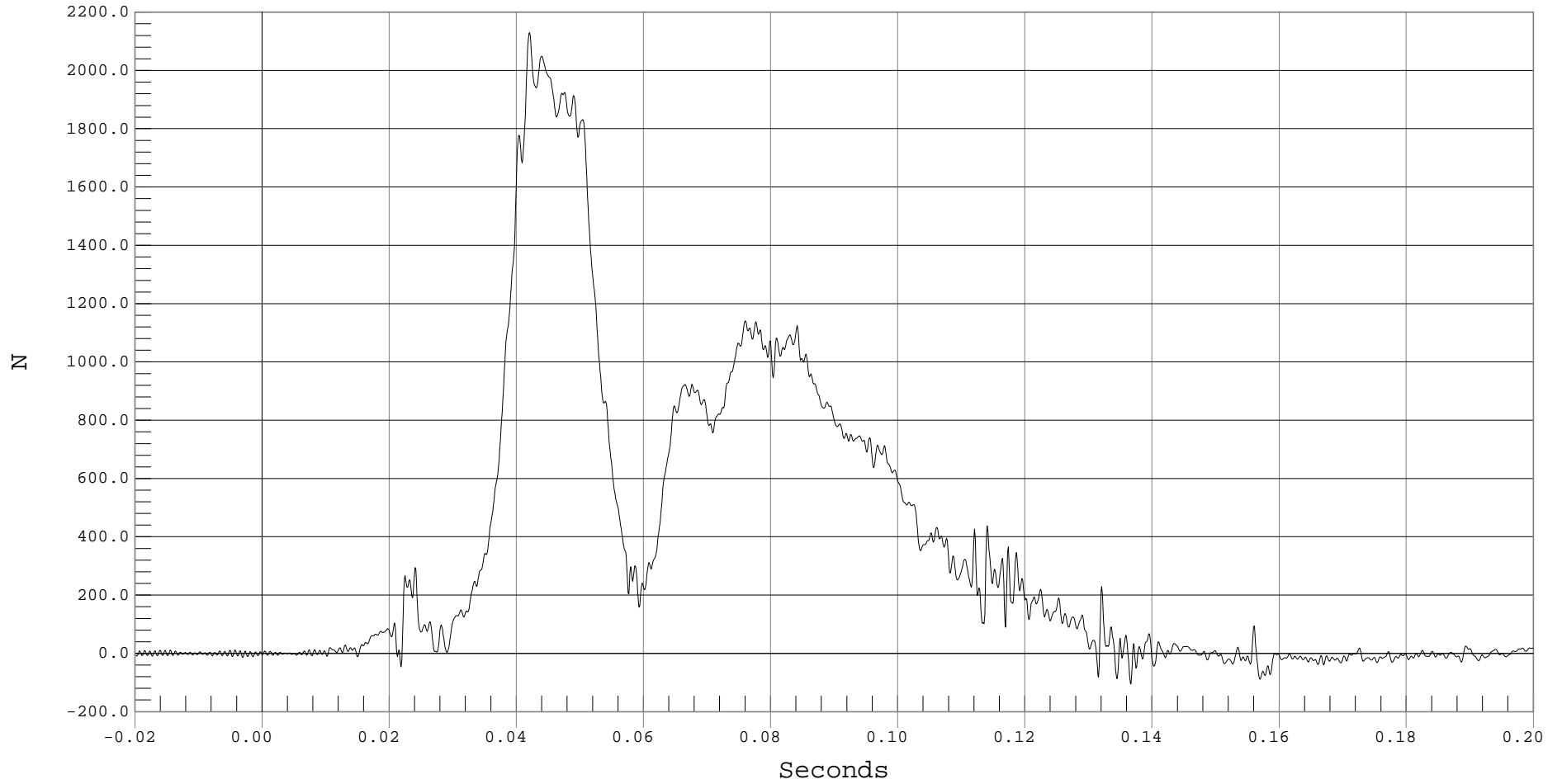
DRIVER LEFT UPPER TIBIA FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER LEFT UPPER TIBIA FZ, B01025FF.F77

Ymin = -105.15 N @ 0.1366 Seconds, Ymax = 2129.87 N @ 0.0420 Seconds





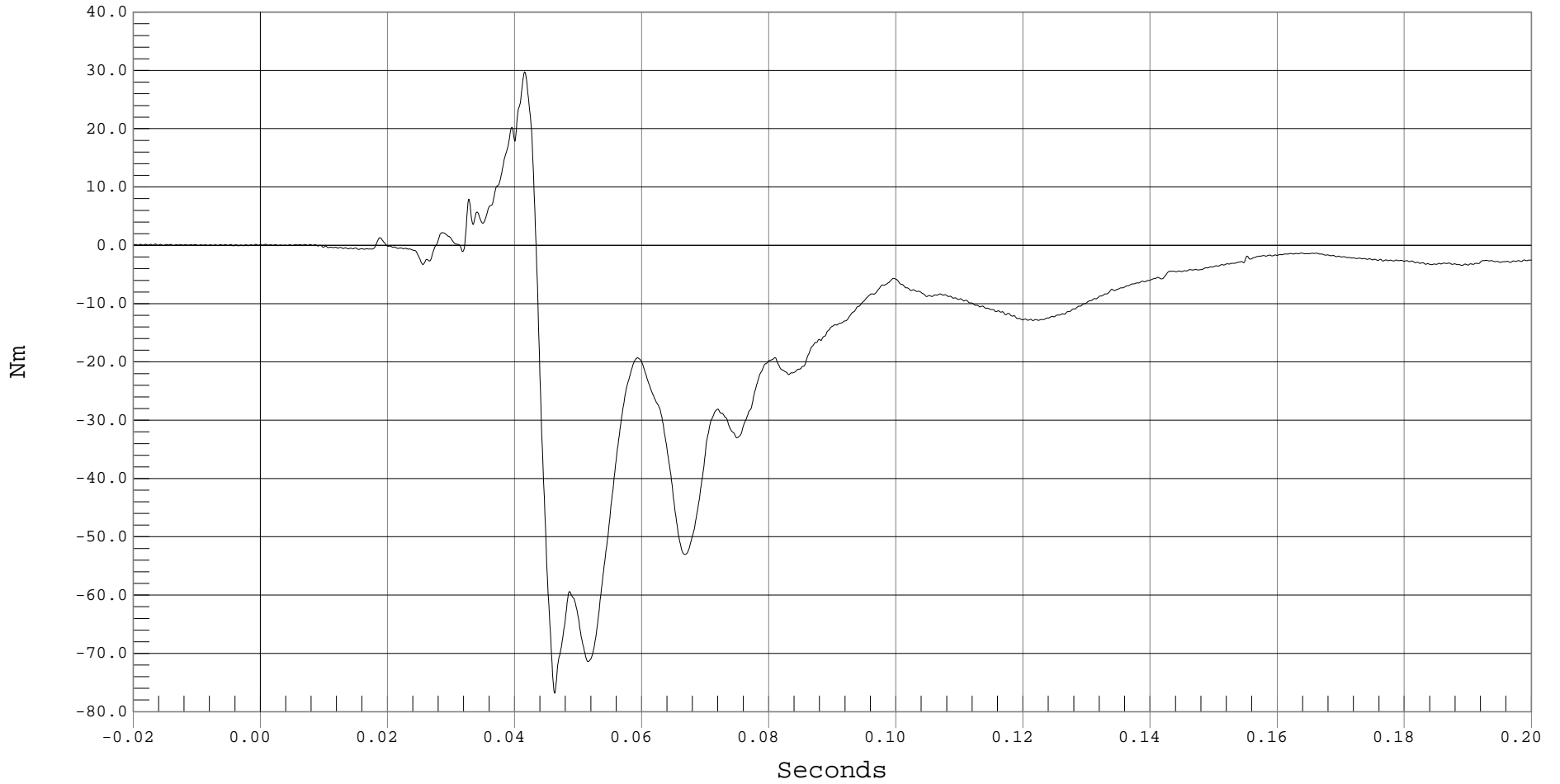
DRIVER LEFT LOWER TIBIA MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER LEFT LOWER TIBIA MX, B01025MF.M78

Ymin = -76.86 Nm @ 0.0462 Seconds, Ymax = 29.76 Nm @ 0.0415 Seconds



B-40



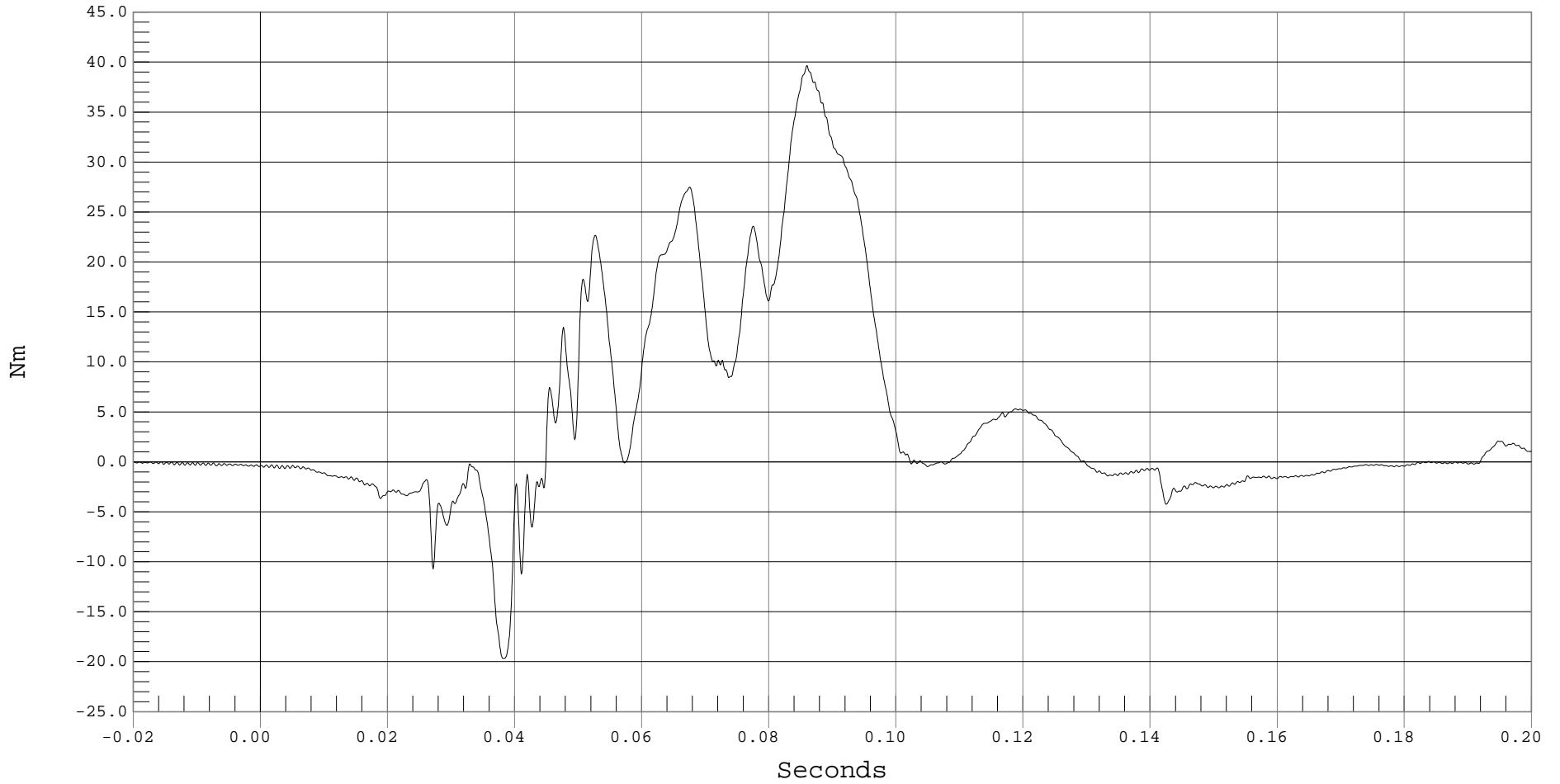
DRIVER LEFT LOWER TIBIA MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER LEFT LOWER TIBIA MY, B01025MF.M79

Ymin = -19.68 Nm @ 0.0381 Seconds, Ymax = 39.67 Nm @ 0.0859 Seconds



B-41



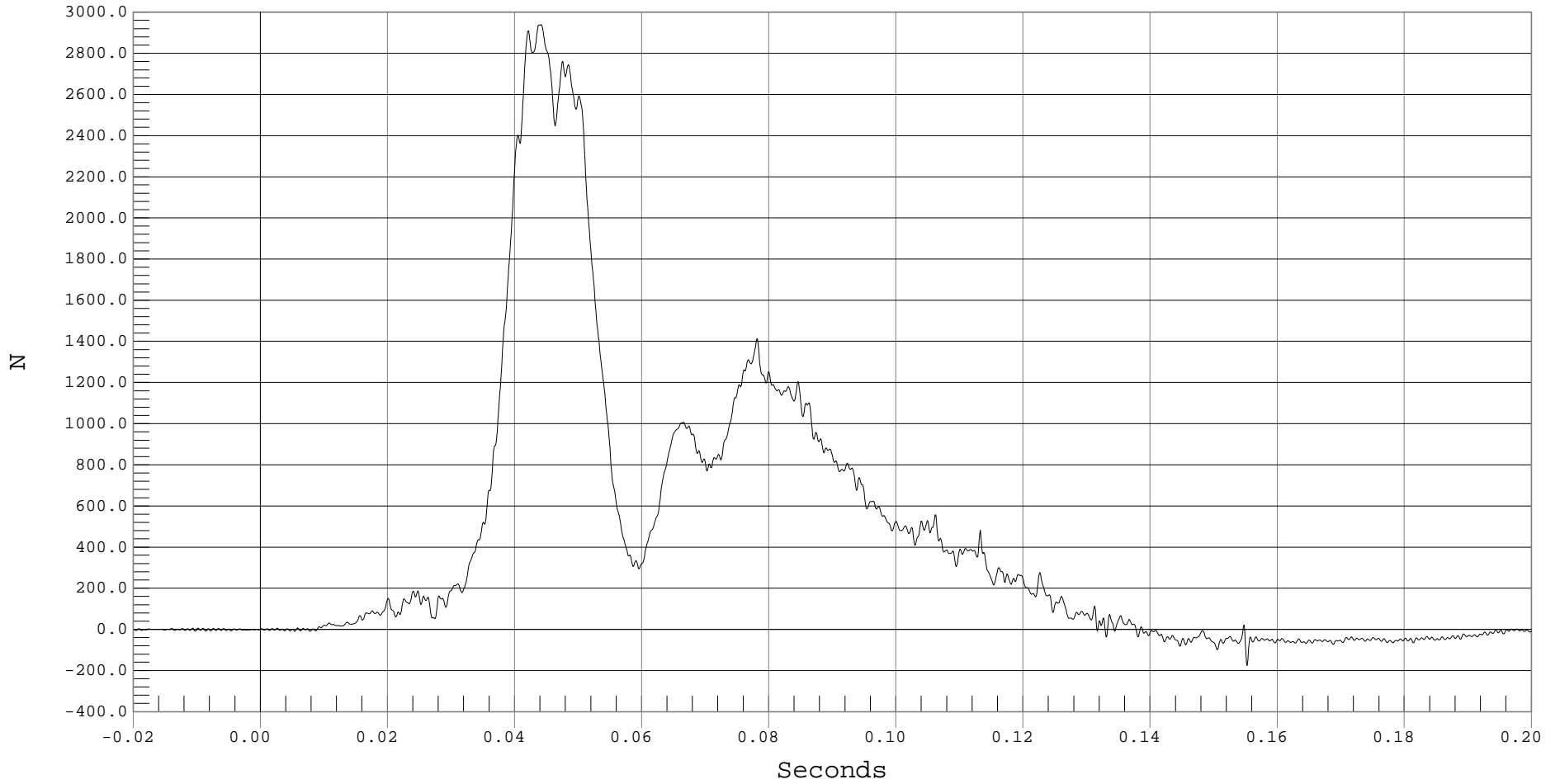
DRIVER LEFT LOWER TIBIA FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER LEFT LOWER TIBIA FZ, B01025FF.F80

Ymin = -176.17 N @ 0.1552 Seconds, Ymax = 2939.55 N @ 0.0441 Seconds



B-42



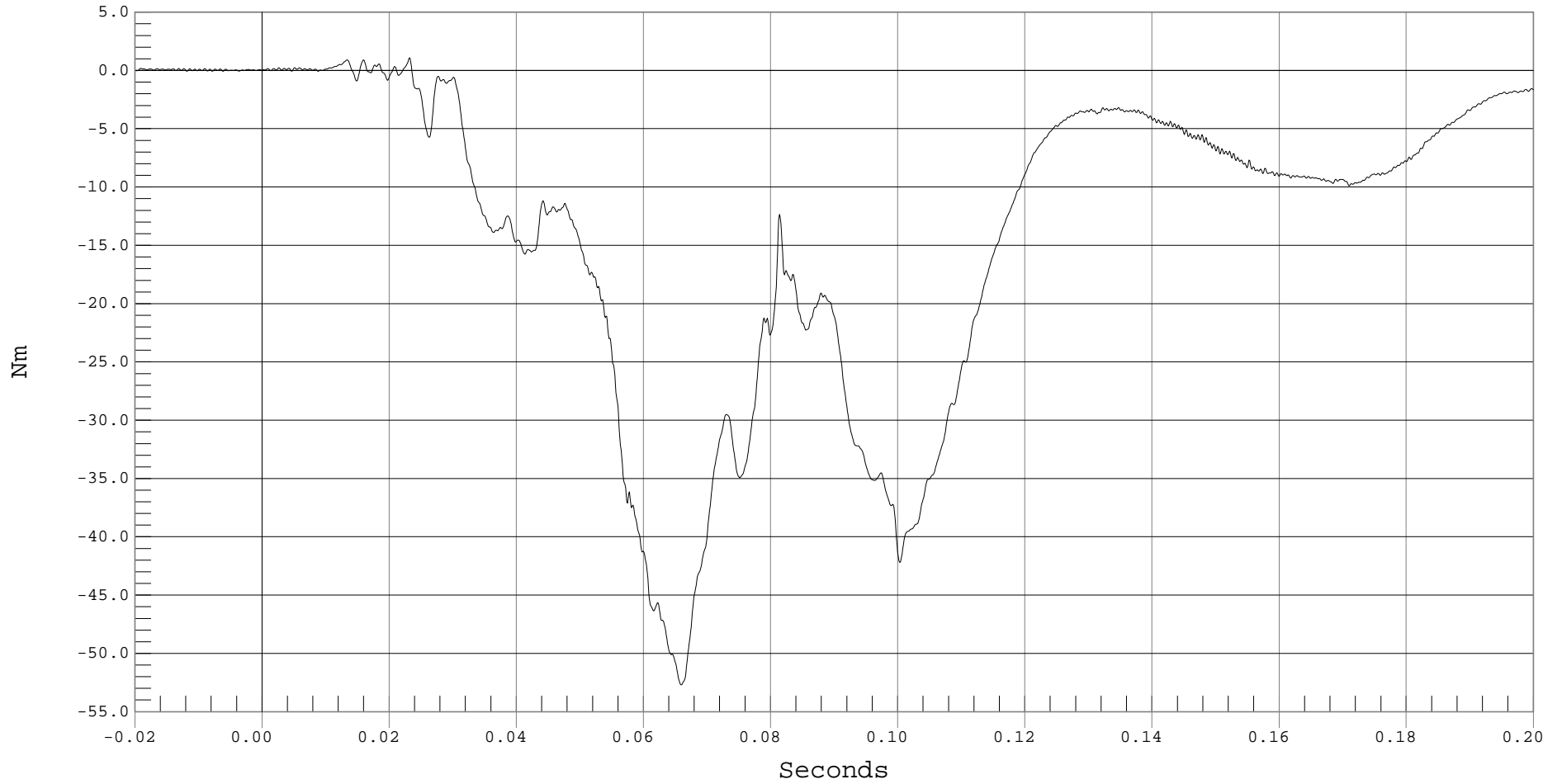
DRIVER RIGHT UPPER TIBIA MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT UPPER TIBIA MX, B01025MF.M69

Ymin = -52.7 Nm @ 0.0659 Seconds, Ymax = 1.09 Nm @ 0.0231 Seconds





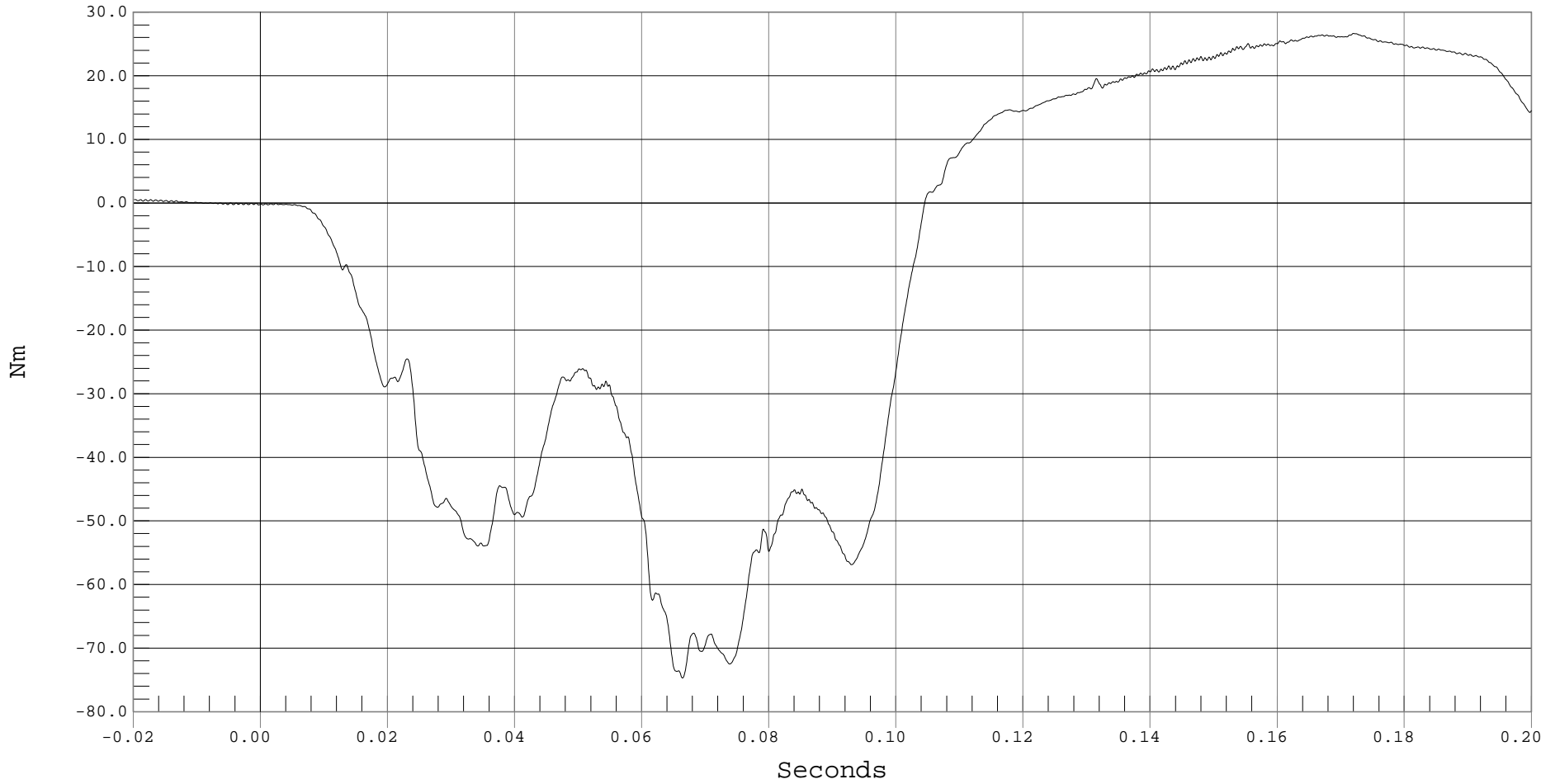
DRIVER RIGHT UPPER TIBIA MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT UPPER TIBIA MY, B01025MF.M70

Ymin = -74.73 Nm @ 0.0663 Seconds, Ymax = 26.66 Nm @ 0.1719 Seconds





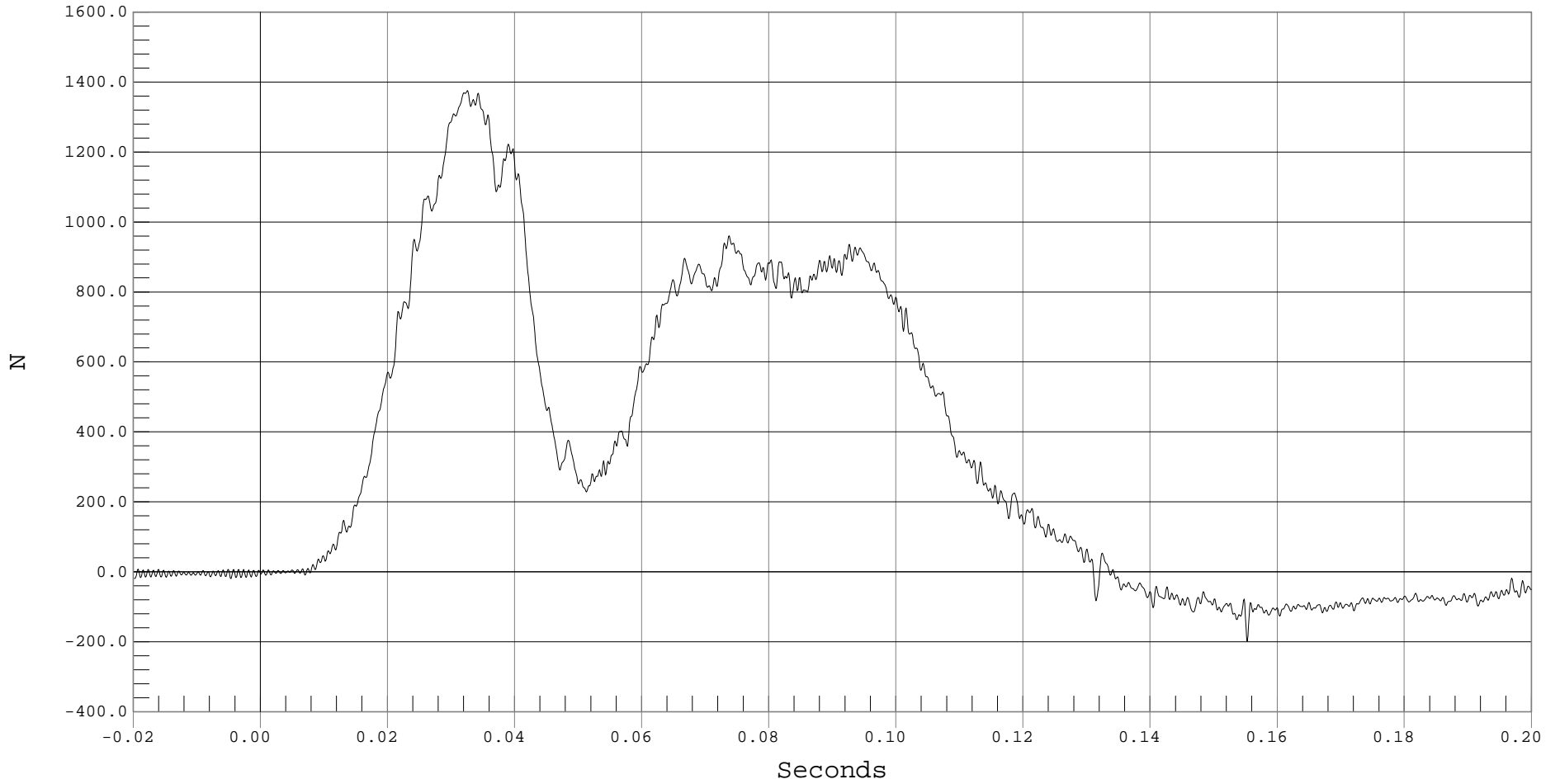
DRIVER RIGHT UPPER TIBIA FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT UPPER TIBIA FZ, B01025FF.F71

Ymin = -198.85 N @ 0.1552 Seconds, Ymax = 1375.54 N @ 0.0325 Seconds



B-45



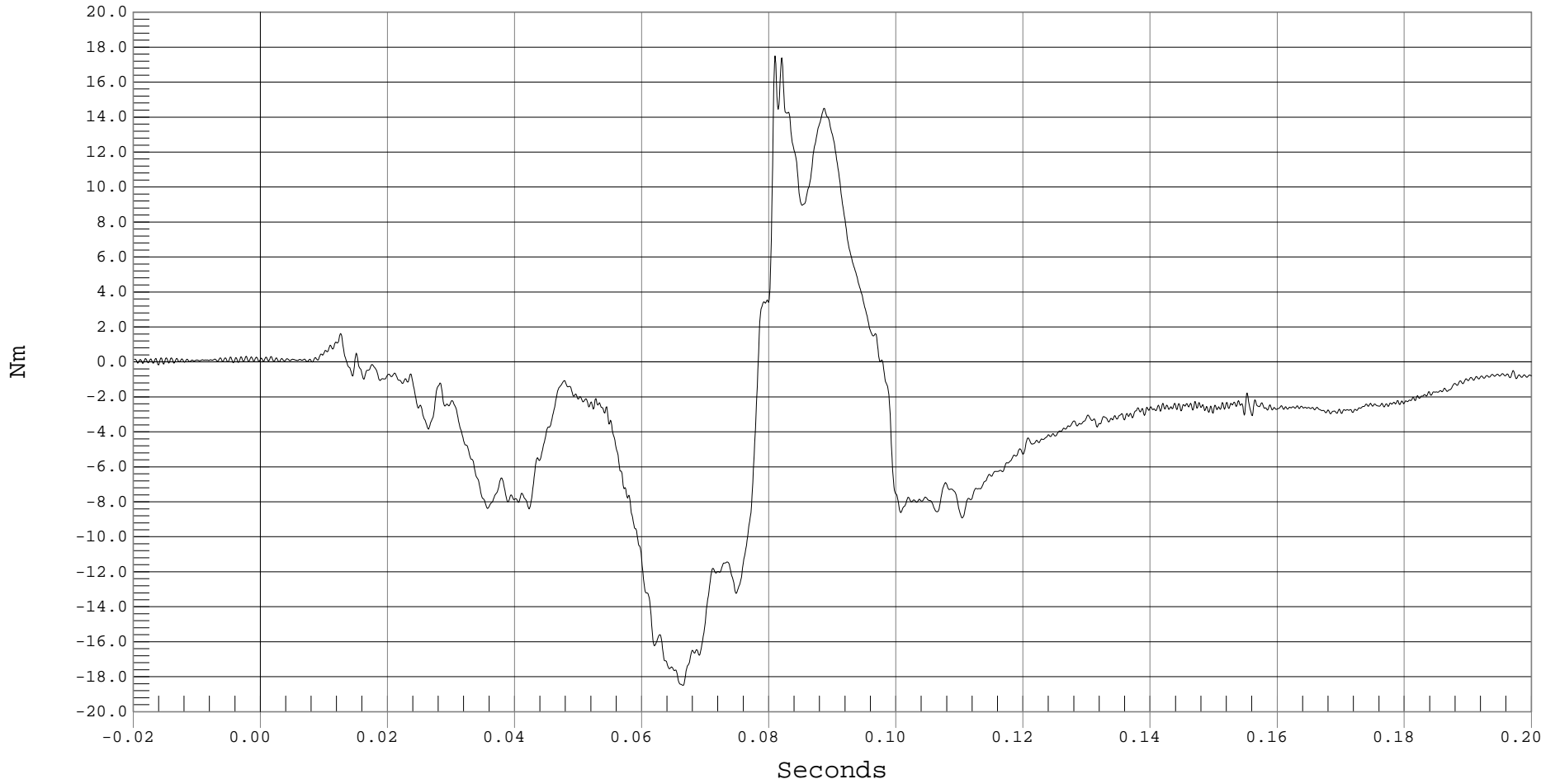
DRIVER RIGHT LOWER TIBIA MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT LOWER TIBIA MX, B01025MF.M72

Ymin = -18.5 Nm @ 0.0664 Seconds, Ymax = 17.49 Nm @ 0.0809 Seconds





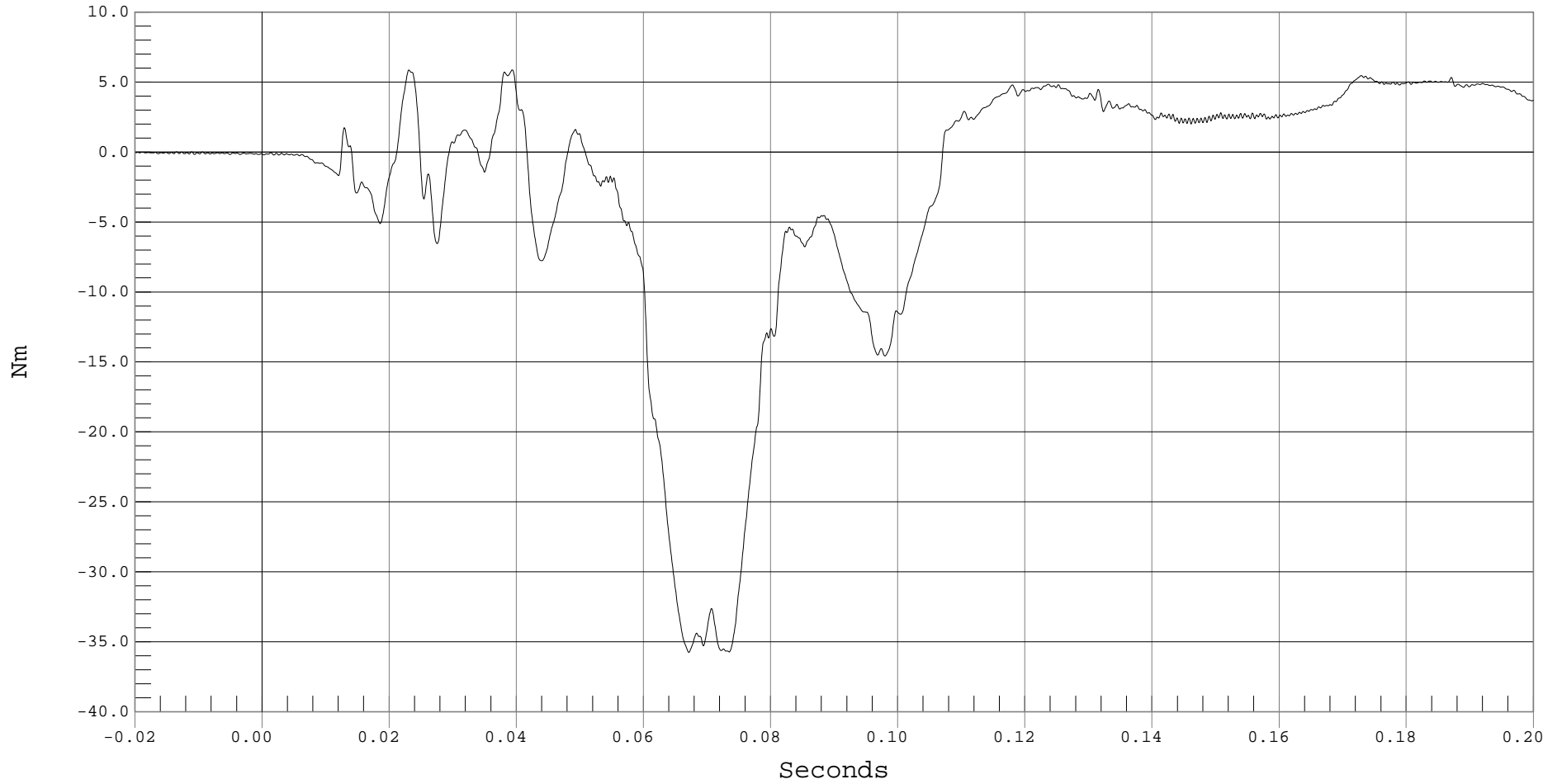
DRIVER RIGHT LOWER TIBIA MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT LOWER TIBIA MY, B01025MF.M73

Ymin = -35.75 Nm @ 0.0670 Seconds, Ymax = 5.88 Nm @ 0.0393 Seconds





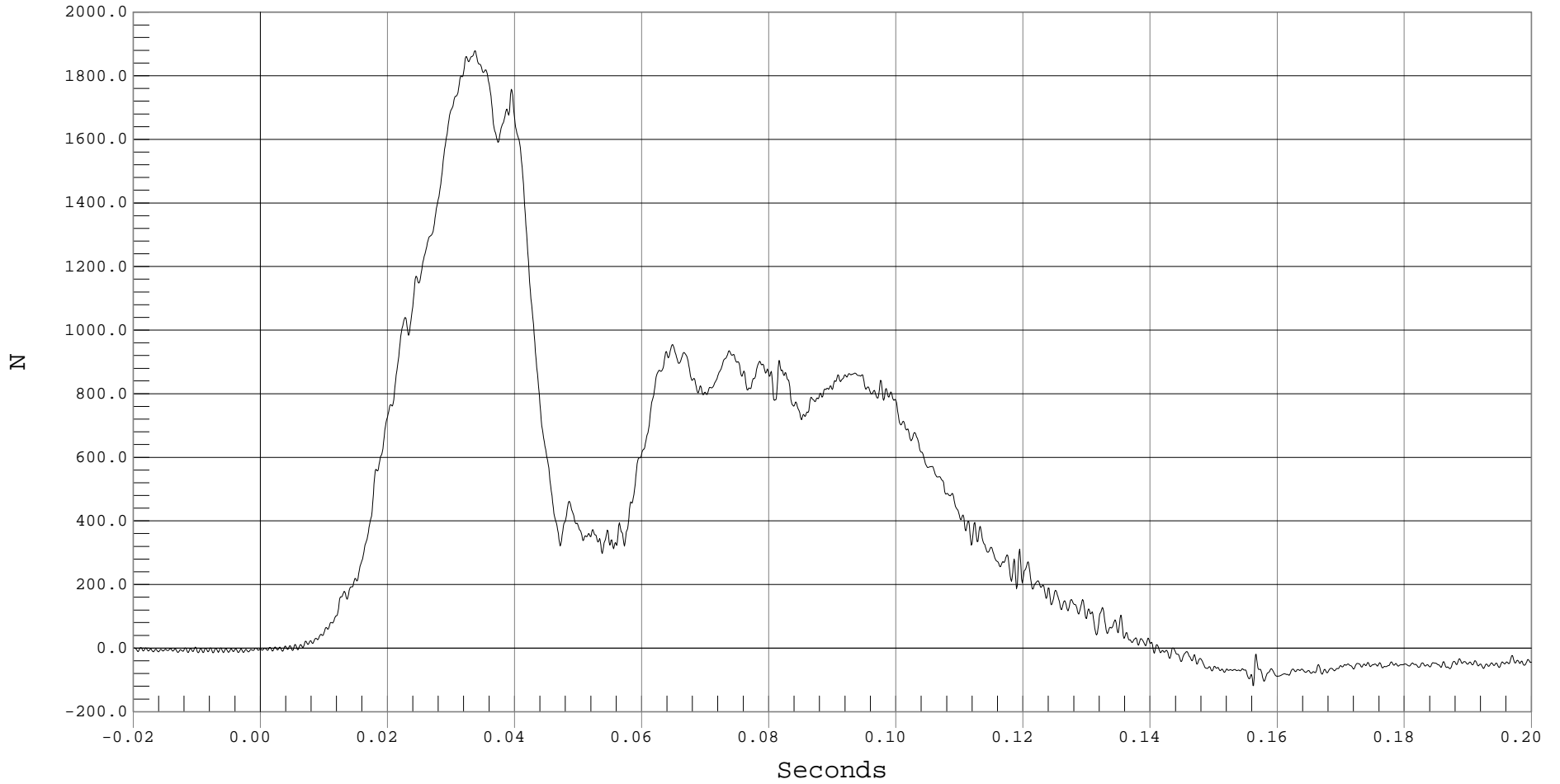
DRIVER RIGHT LOWER TIBIA FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT LOWER TIBIA FZ, B01025FF.F74

Ymin = -118.19 N @ 0.1562 Seconds, Ymax = 1878.61 N @ 0.0337 Seconds



B-48



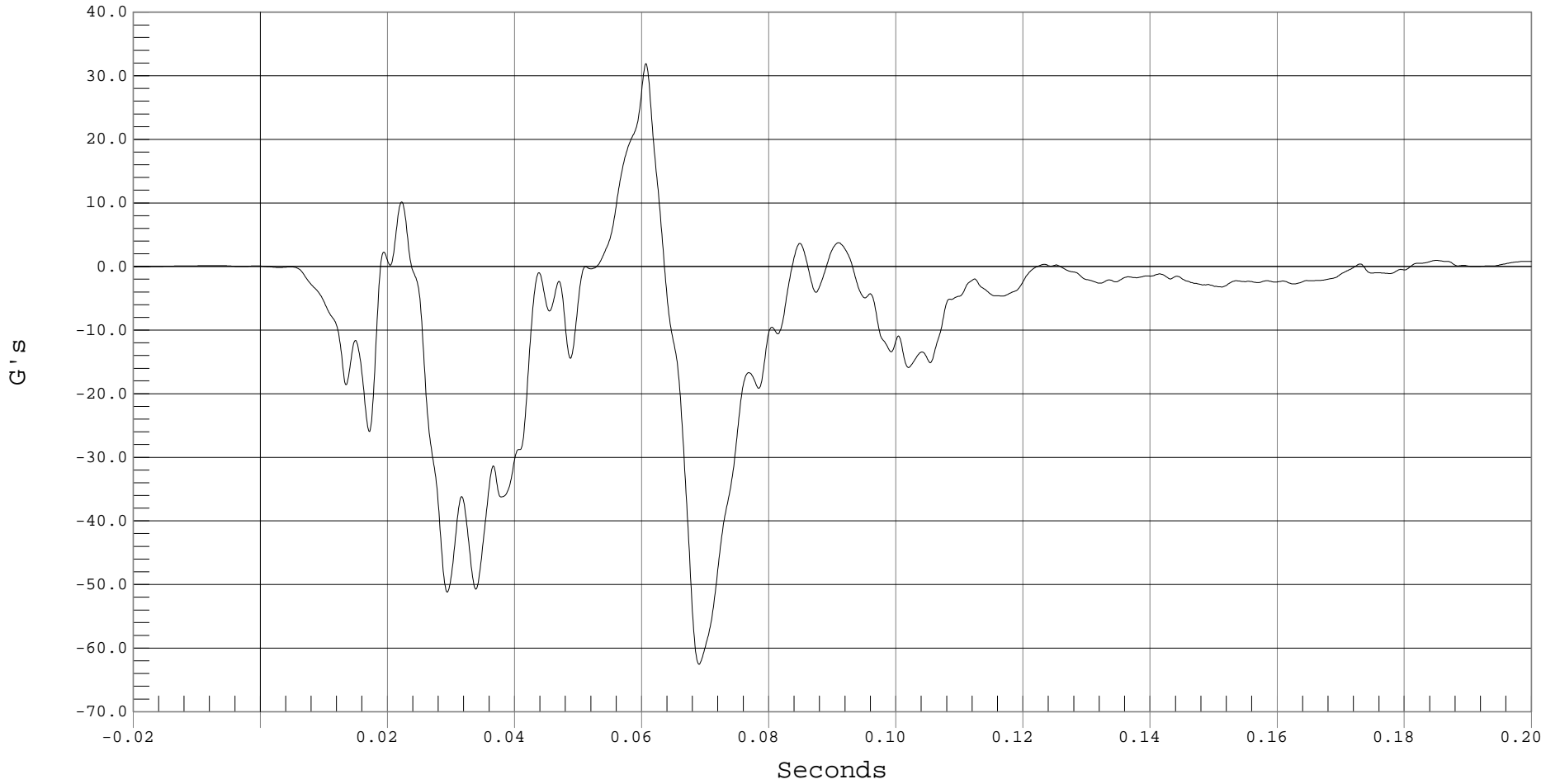
DRIVER LEFT FOOT @ BALL Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER LEFT FOOT @ BALL Z, B01025AF.A12

Ymin = -62.55 G's @ 0.0689 Seconds, Ymax = 31.91 G's @ 0.0606 Seconds





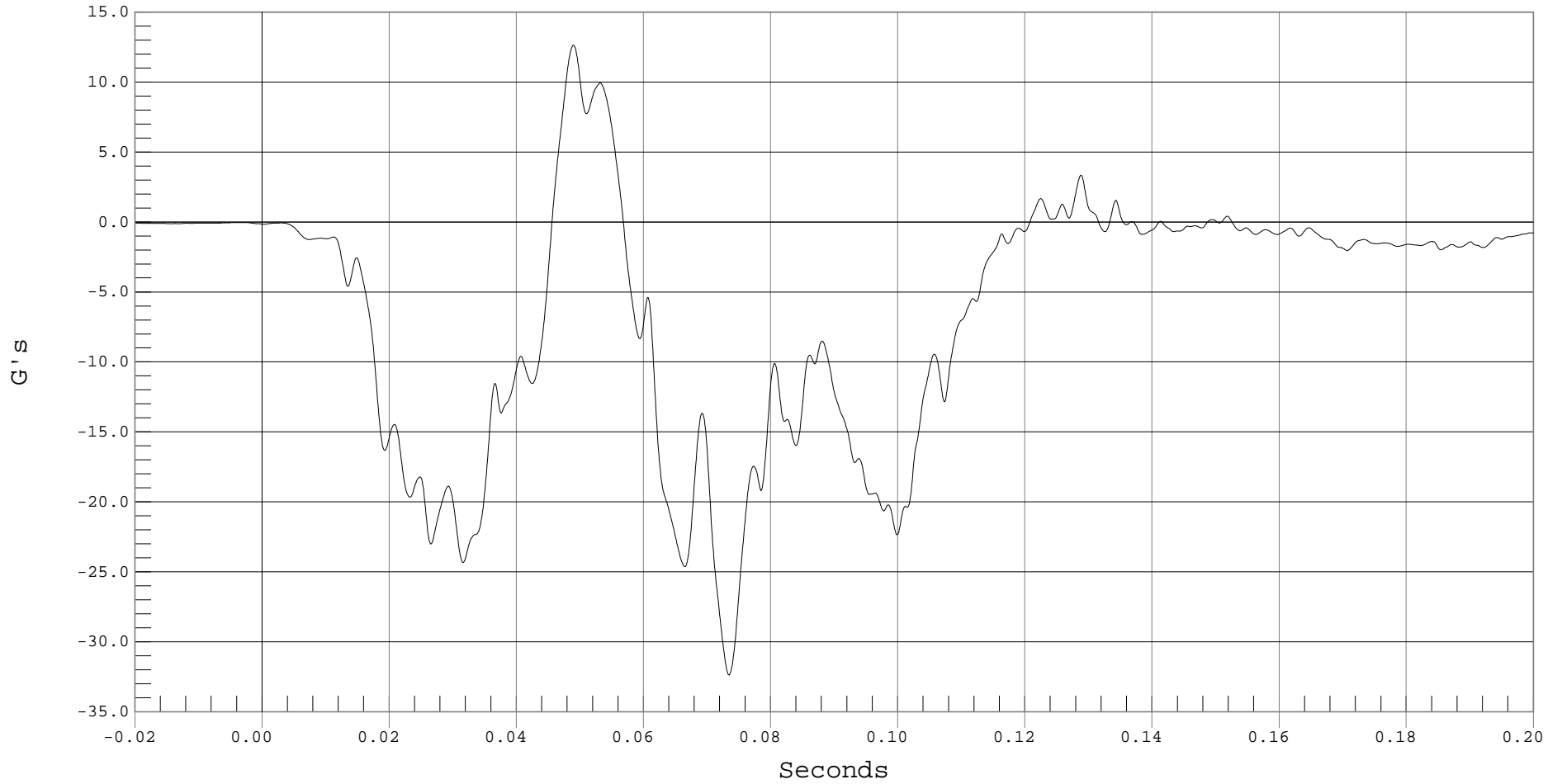
DRIVER LEFT FOOT @ HEEL X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER LEFT FOOT @ HEEL X, B01025AF.A10

Ymin = -32.38 G's @ 0.0734 Seconds, Ymax = 12.64 G's @ 0.0489 Seconds



B-50



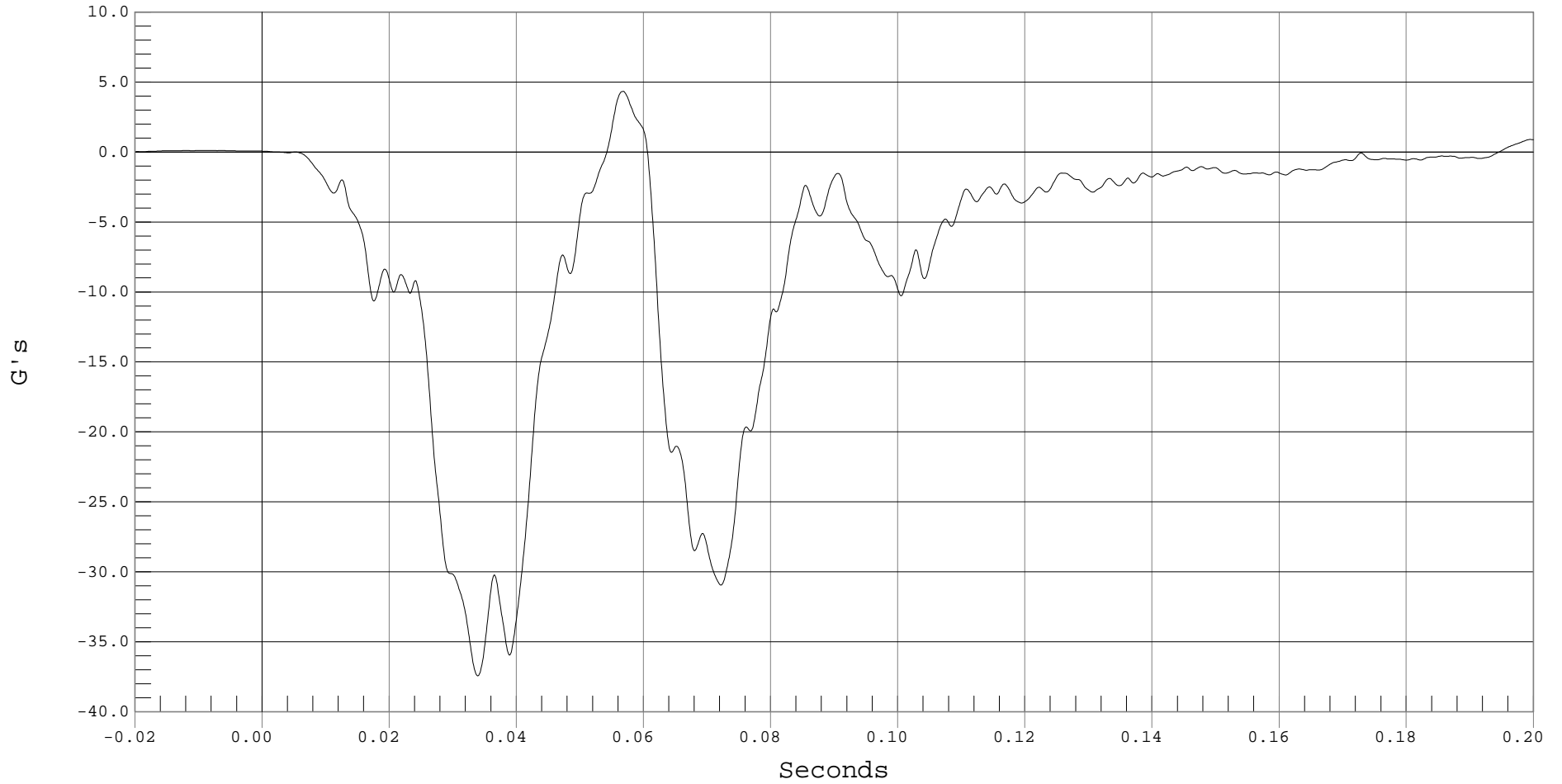
DRIVER LEFT FOOT @ HEEL Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER LEFT FOOT @ HEEL Z, B01025AF.A11

Ymin = -37.43 G's @ 0.0338 Seconds, Ymax = 4.34 G's @ 0.0567 Seconds



B-51



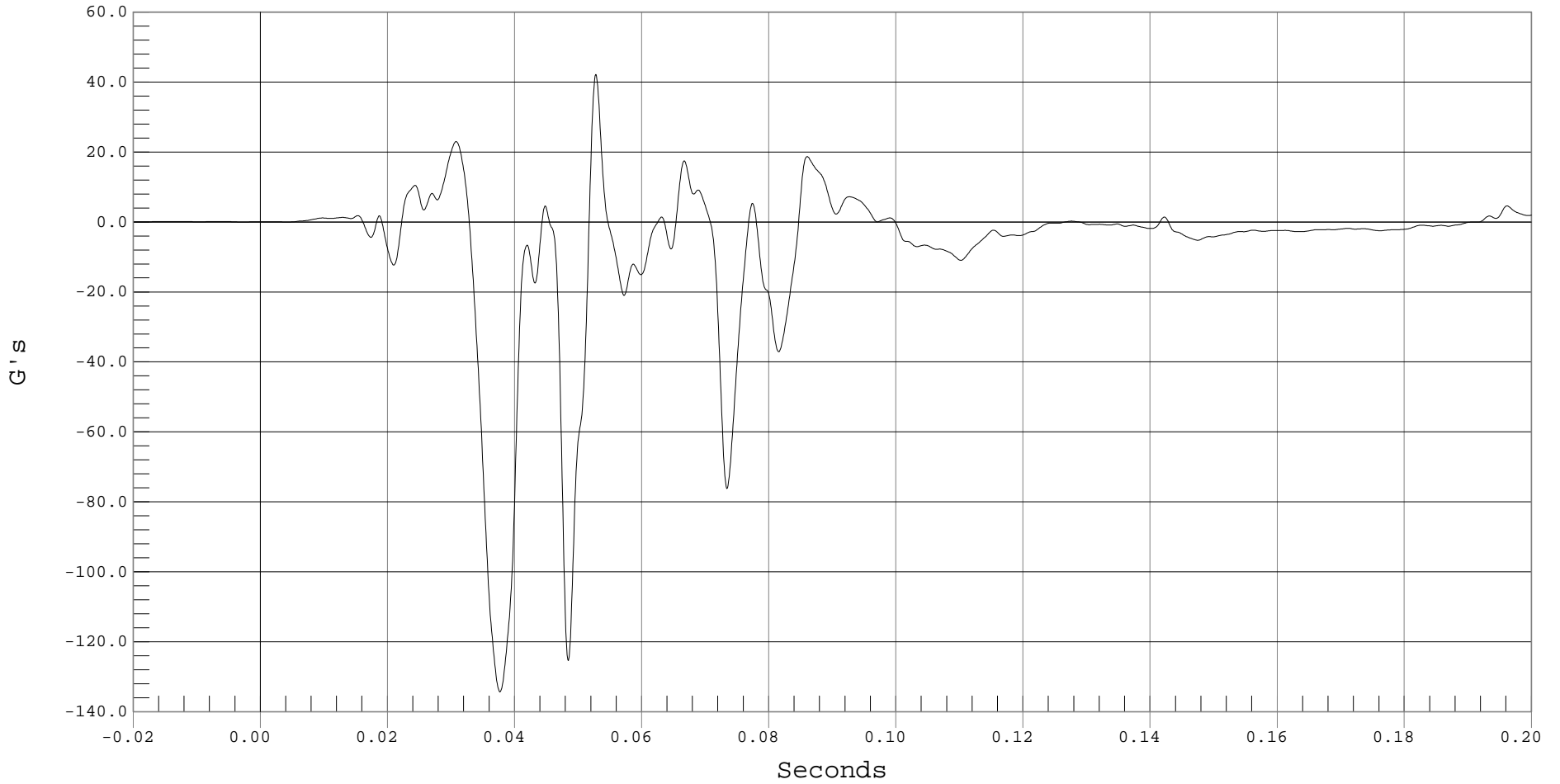
DRIVER RIGHT FOOT @ BALL Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER RIGHT FOOT @ BALL Z, B01025AF.A95

Ymin = -134.33 G's @ 0.0376 Seconds, Ymax = 42.23 G's @ 0.0527 Seconds



B-52



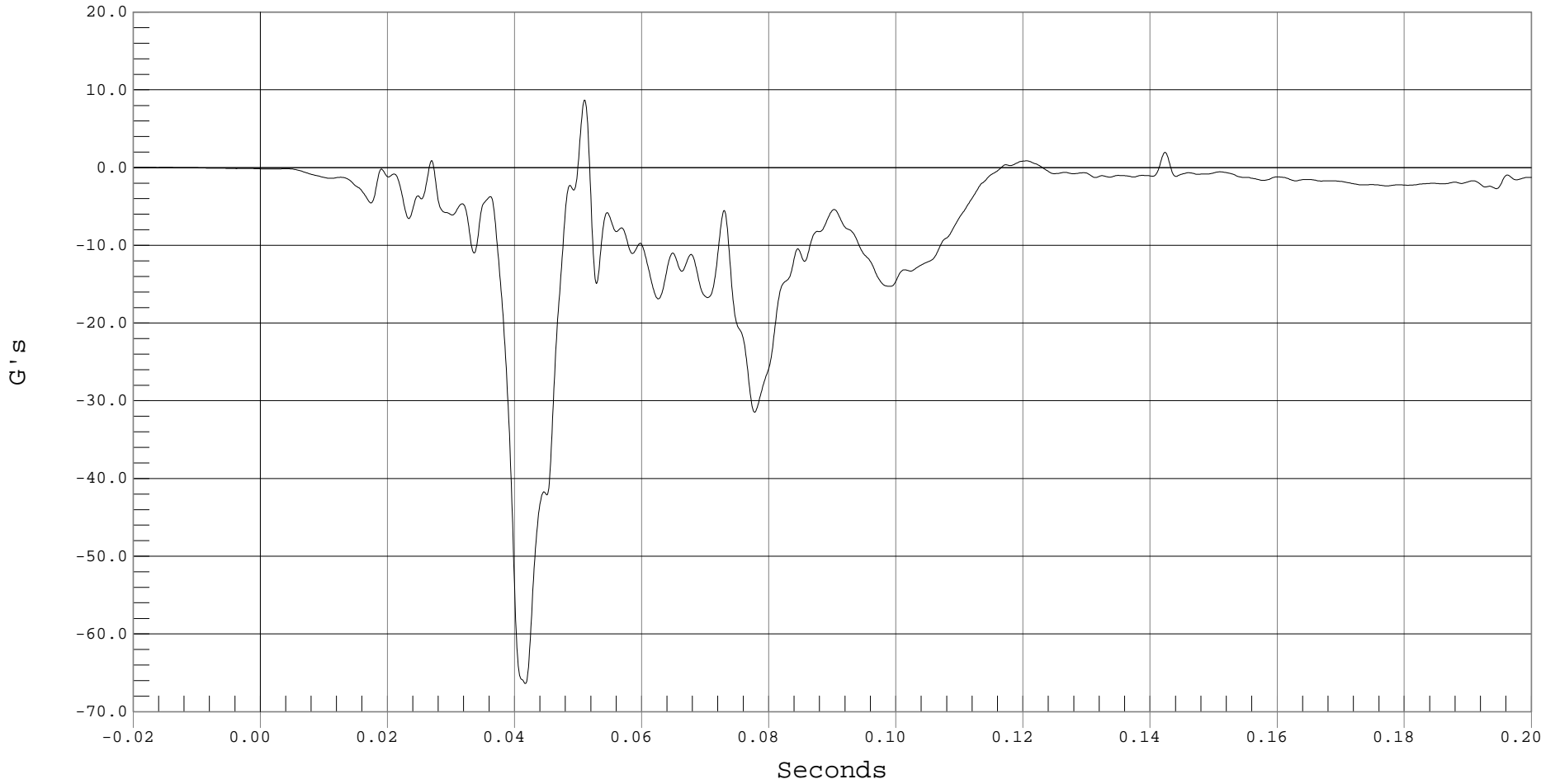
DRIVER RIGHT FOOT @ HEEL X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER RIGHT FOOT @ HEEL X, B01025AF.A93

Ymin = -66.39 G's @ 0.0416 Seconds, Ymax = 8.7 G's @ 0.0509 Seconds



B-53



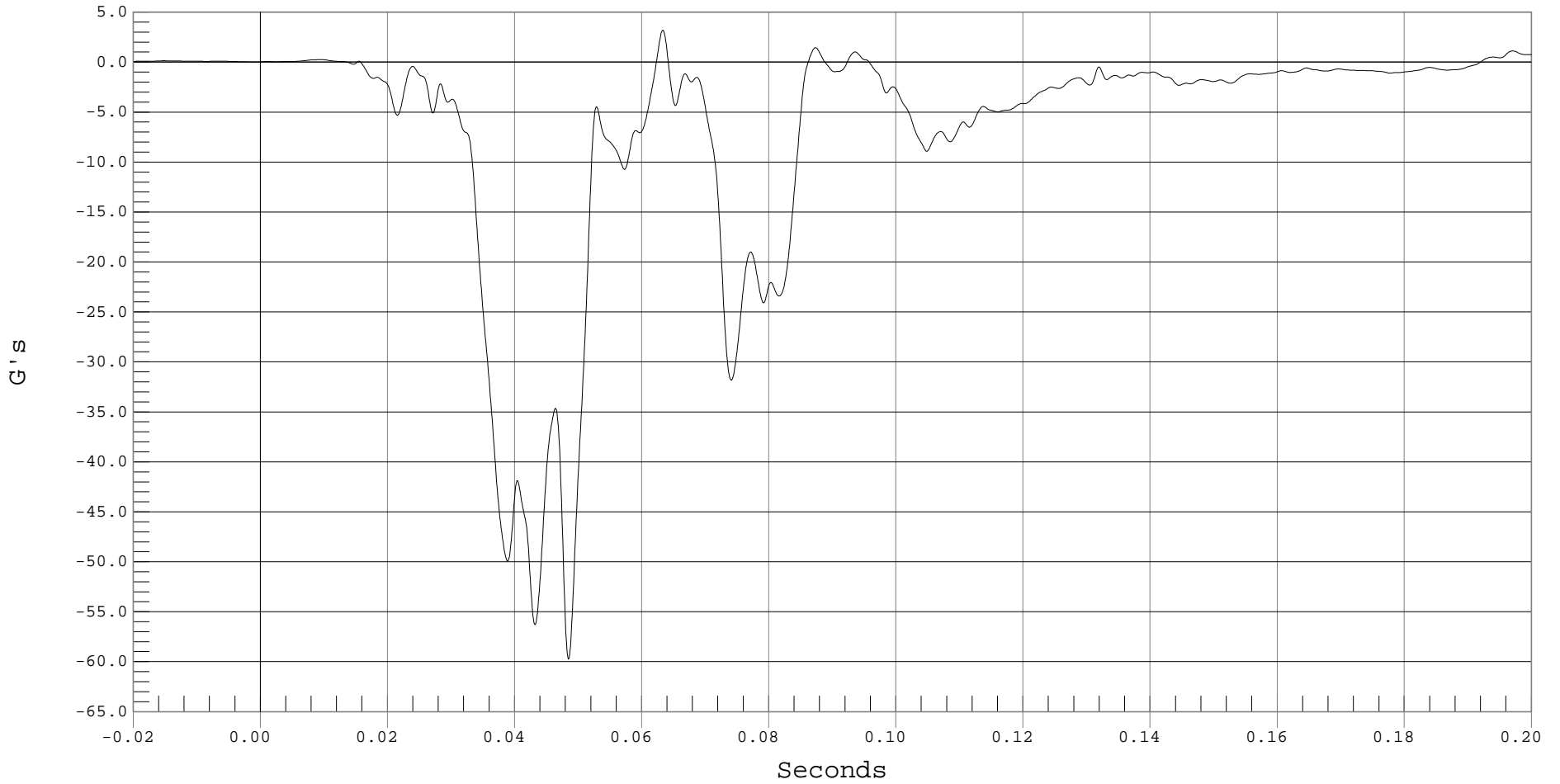
DRIVER RIGHT FOOT @ HEEL Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 DRIVER RIGHT FOOT @ HEEL Z, B01025AF.A94

Ymin = -59.74 G's @ 0.0484 Seconds, Ymax = 3.18 G's @ 0.0632 Seconds



B-54



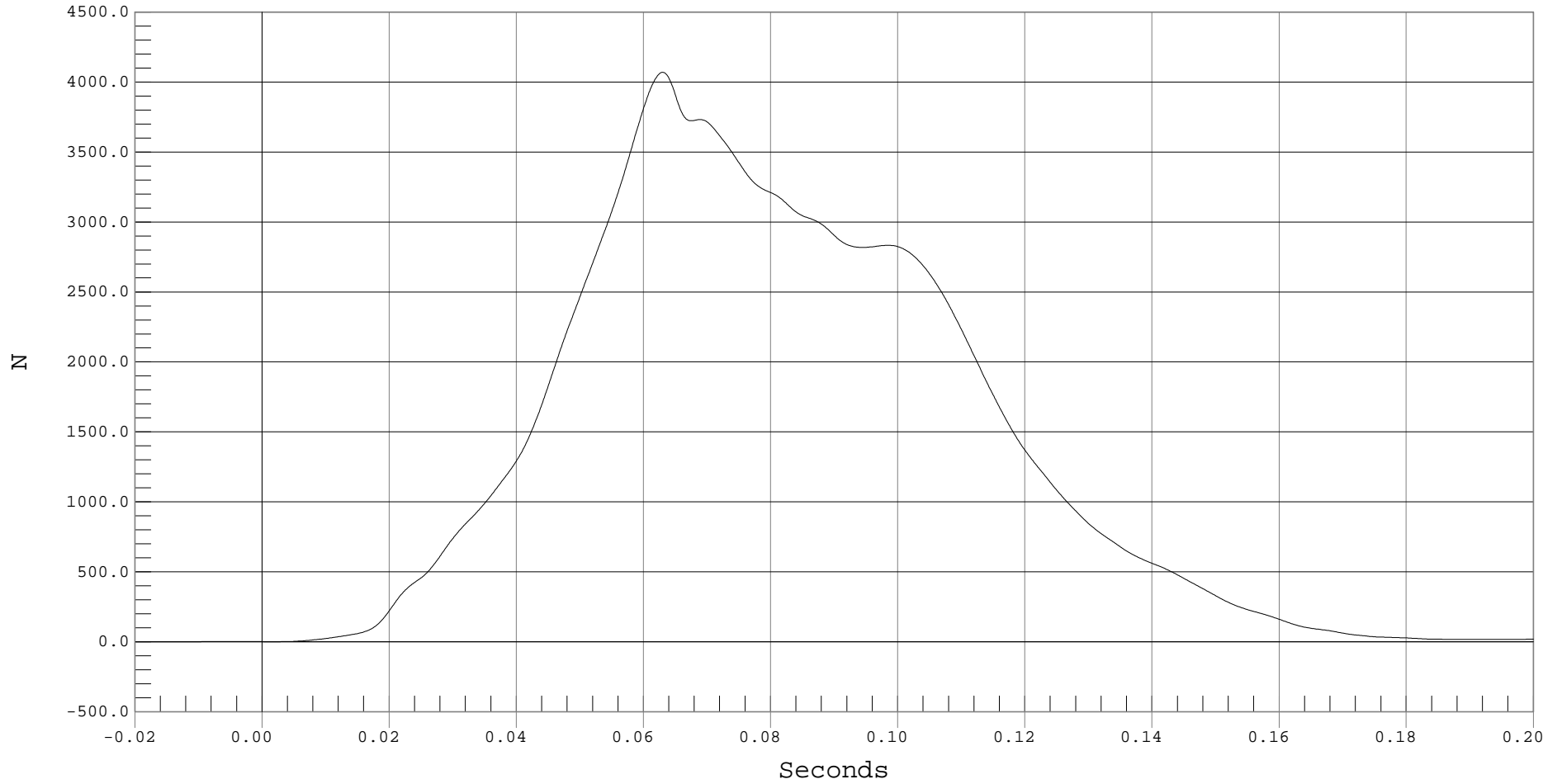
DRIVER LAP BELT FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 DRIVER LAP BELT, B01025FF.F66

Ymin = -0.56 N @ -0.0199 Seconds, Ymax = 4070.29 N @ 0.0629 Seconds



B-55



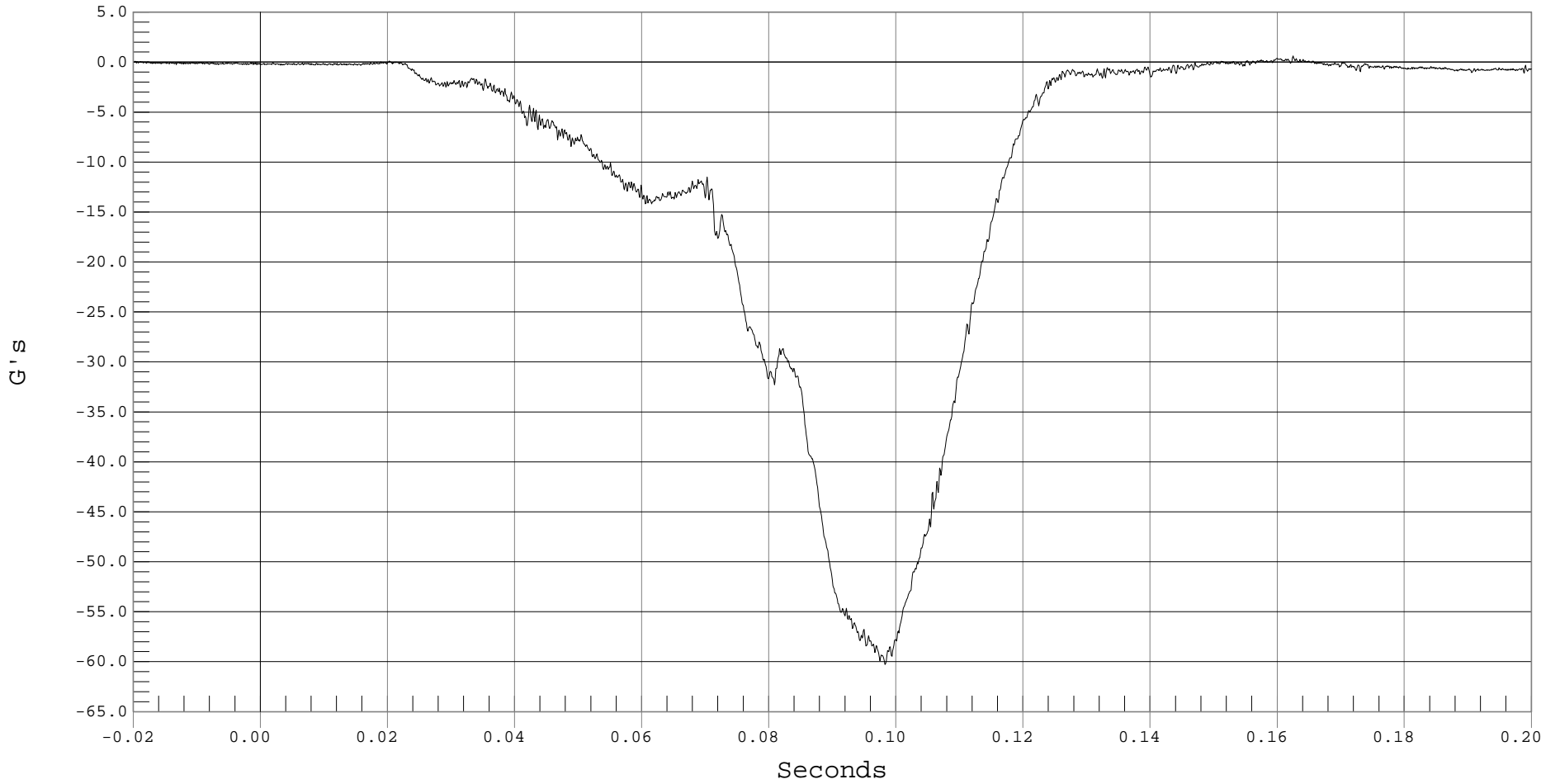
PASSENGER HEAD X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD X, B01025AT.A19

Ymin = -60.28 G's @ 0.0982 Seconds, Ymax = .63 G's @ 0.1624 Seconds



B-56



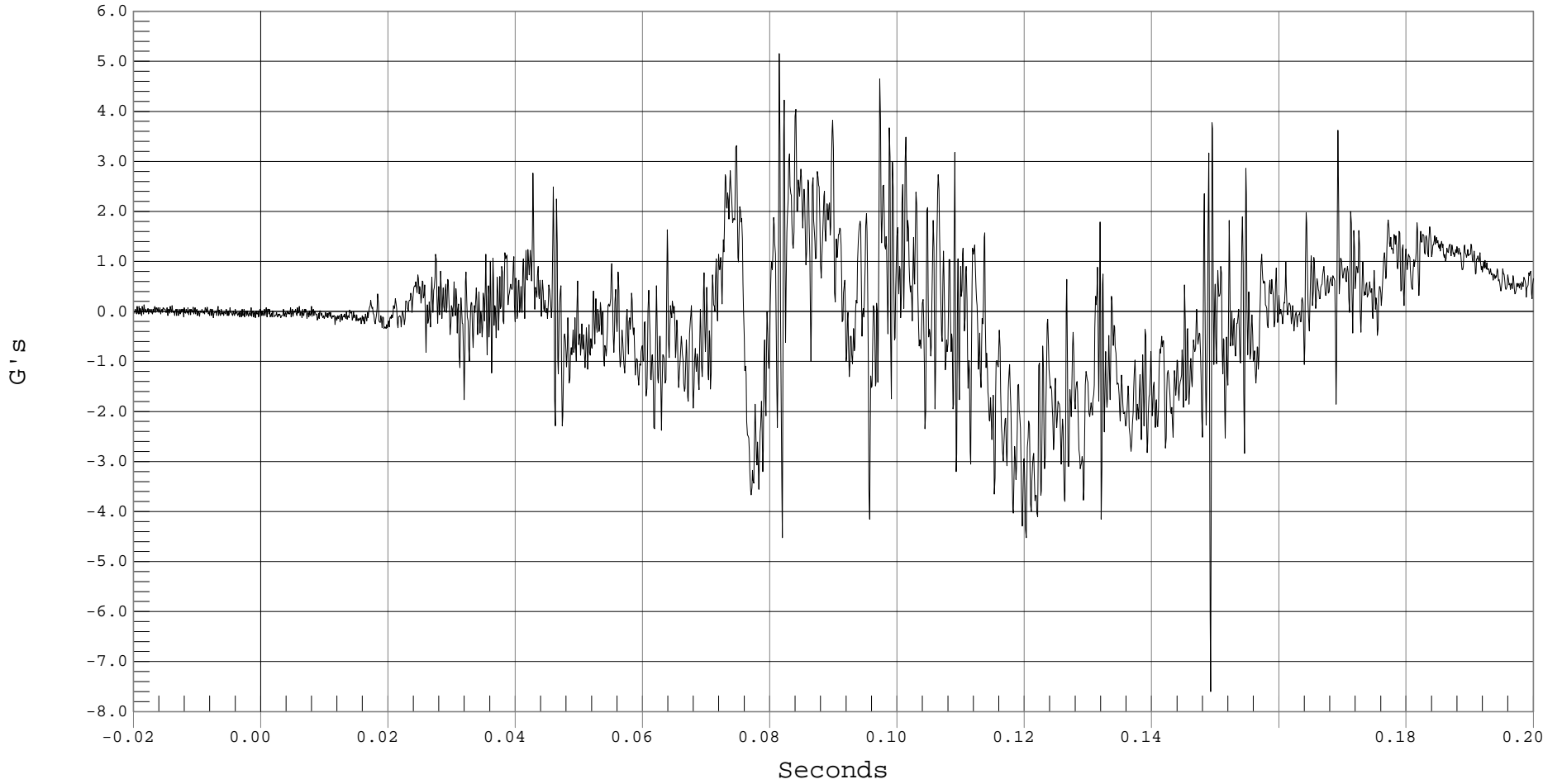
PASSENGER HEAD Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Y, B01025AT.A20

Ymin = -7.6 G's @ 0.1492 Seconds, Ymax = 5.16 G's @ 0.0814 Seconds



B-57



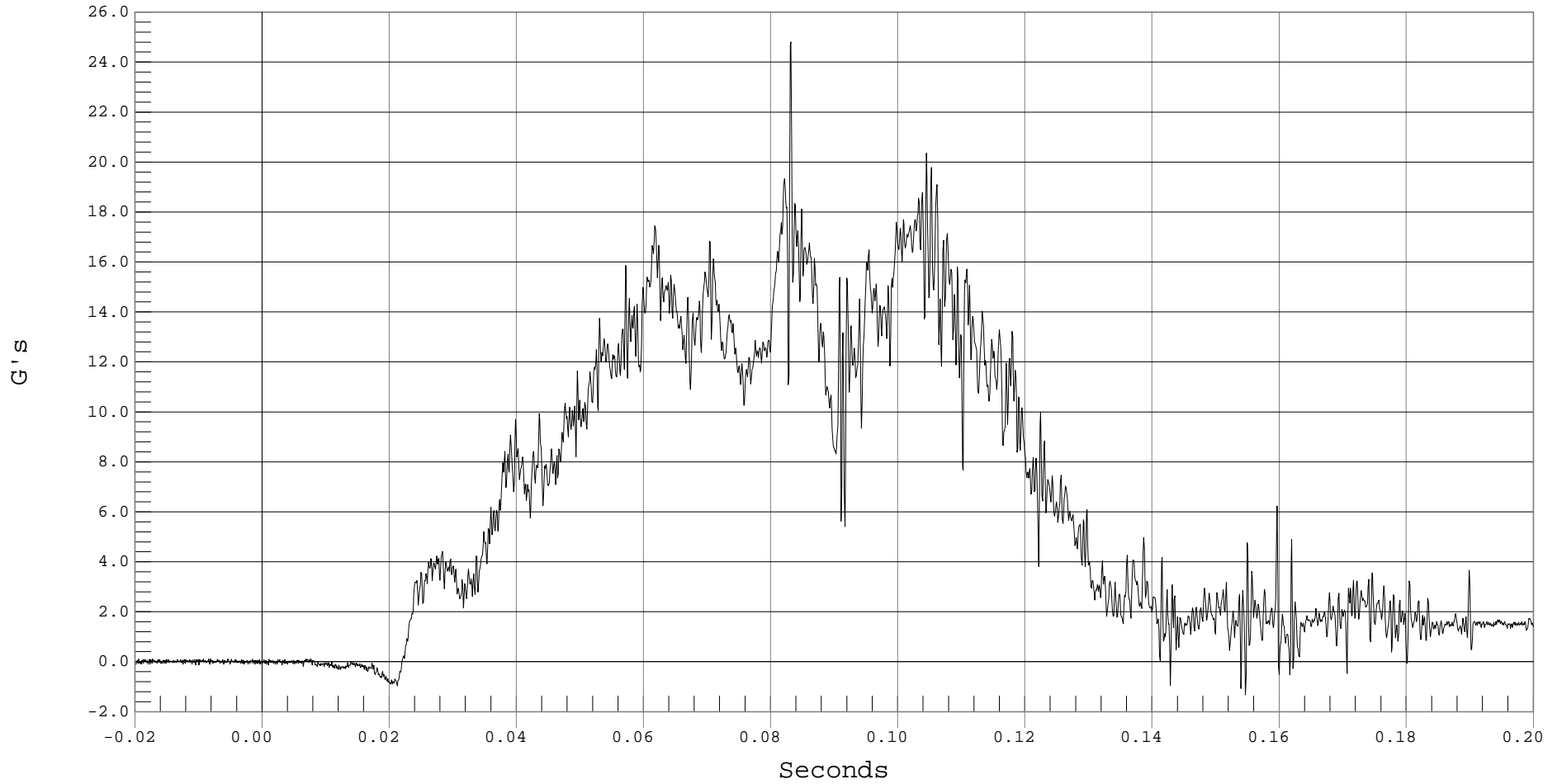
PASSENGER HEAD Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Z, B01025AT.A21

Ymin = -1.32 G's @ 0.1546 Seconds, Ymax = 24.81 G's @ 0.0831 Seconds



B-58



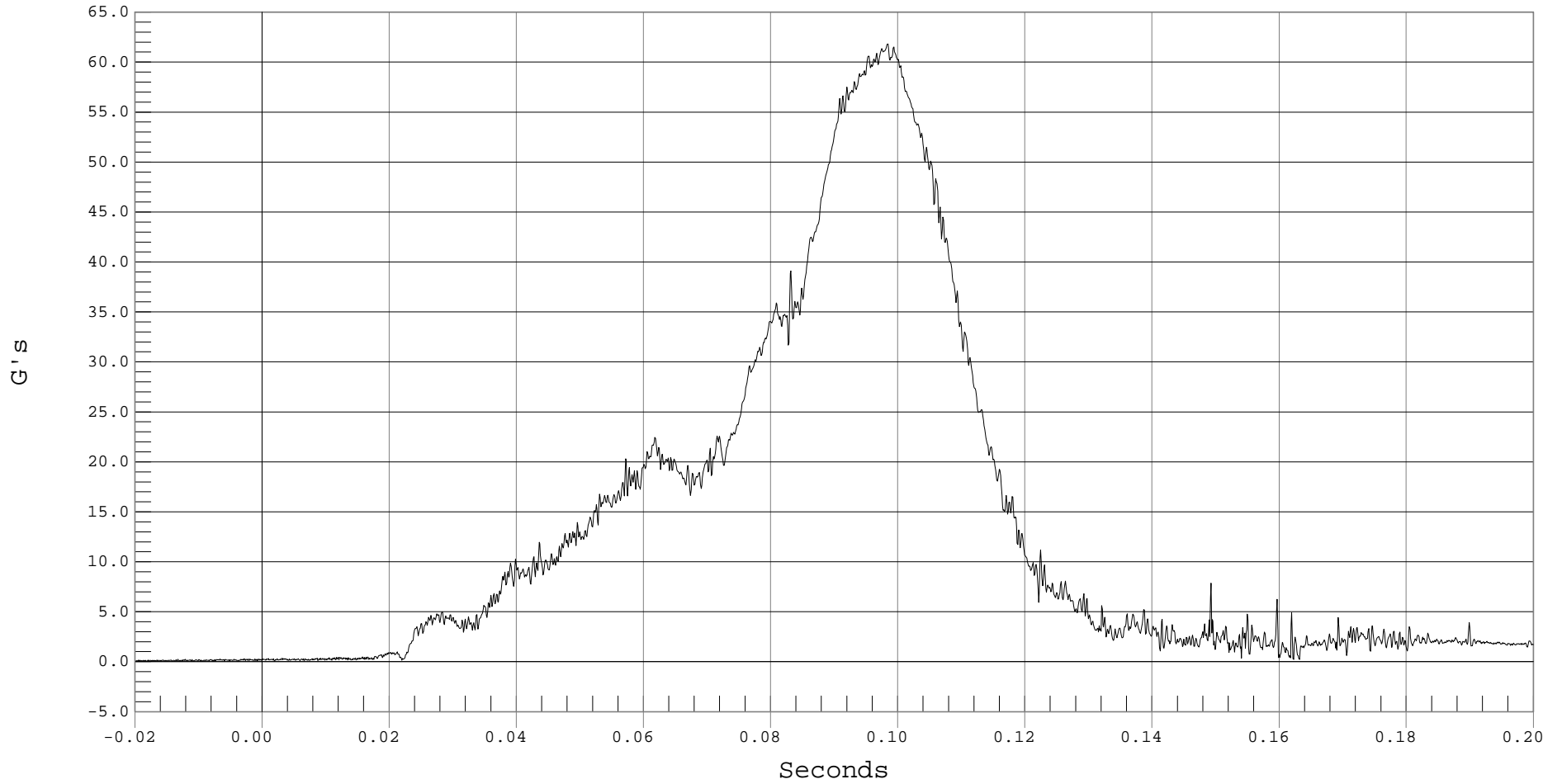
PASSENGER HEAD RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD RESULTANT ACCELERATION, B01025AV.A19

Ymin = .04 G's @ -0.0183 Seconds, Ymax = 61.81 G's @ 0.0984 Seconds



B-59



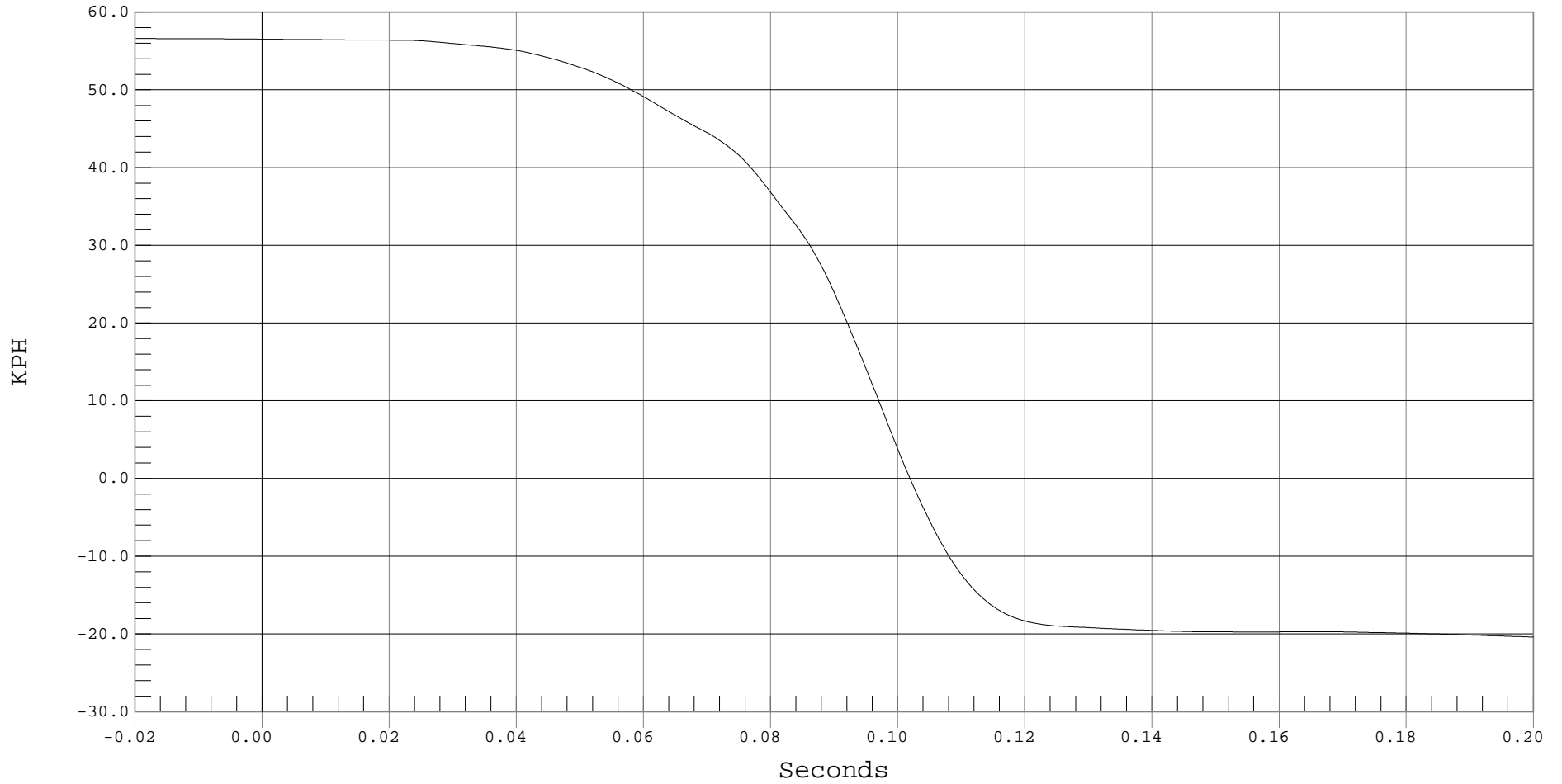
PASSENGER HEAD X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER HEAD X VELOCITY, B01025AI.V19

Ymin = -20.4 KPH @ 0.2000 Seconds, Ymax = 56.6 KPH @ -0.0194 Seconds



B-60



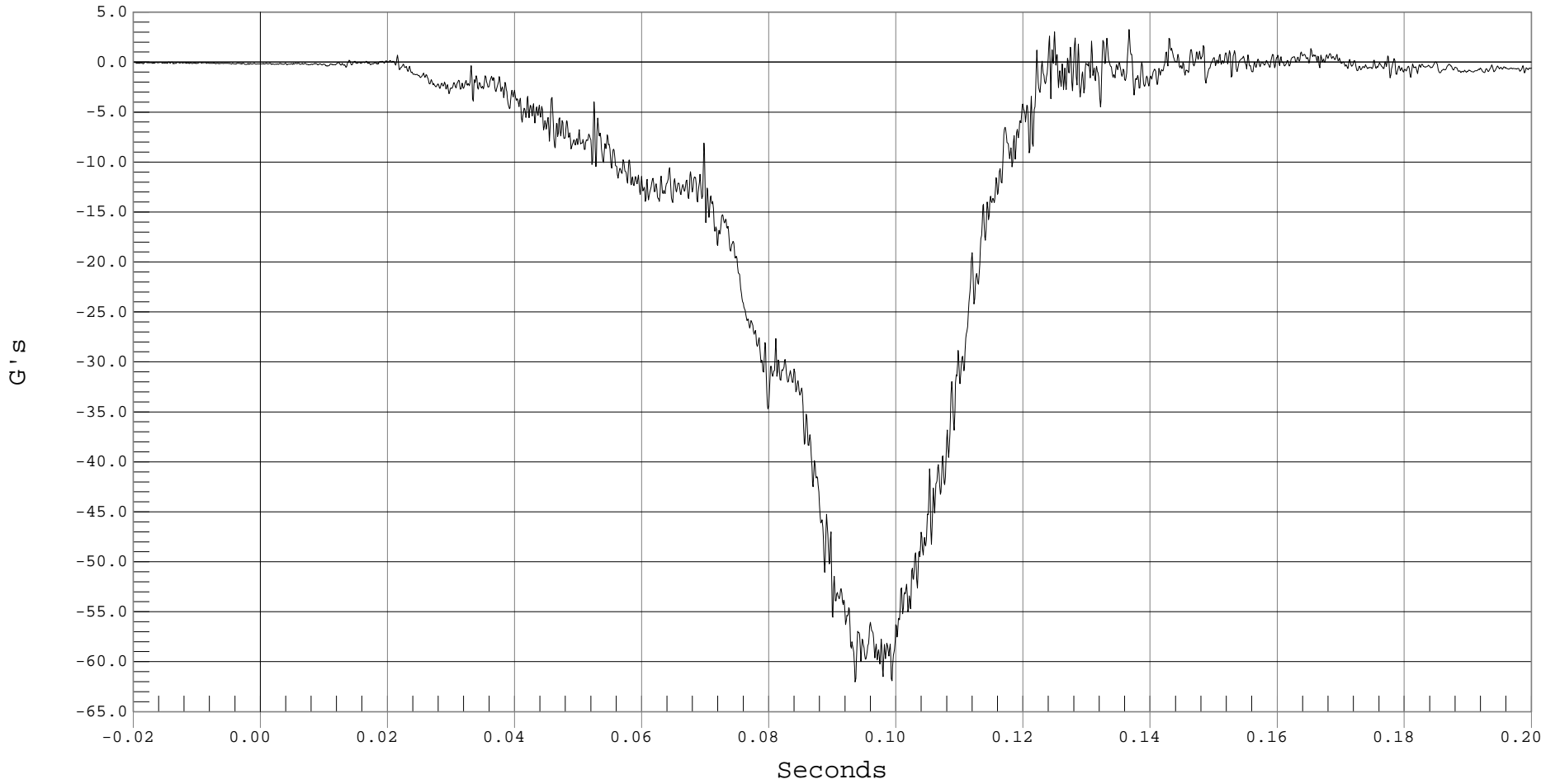
PASSENGER HEAD REDUNDANT X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Xr, B01025AT.A41

Ymin = -62.02 G's @ 0.0935 Seconds, Ymax = 3.26 G's @ 0.1366 Seconds



B-61



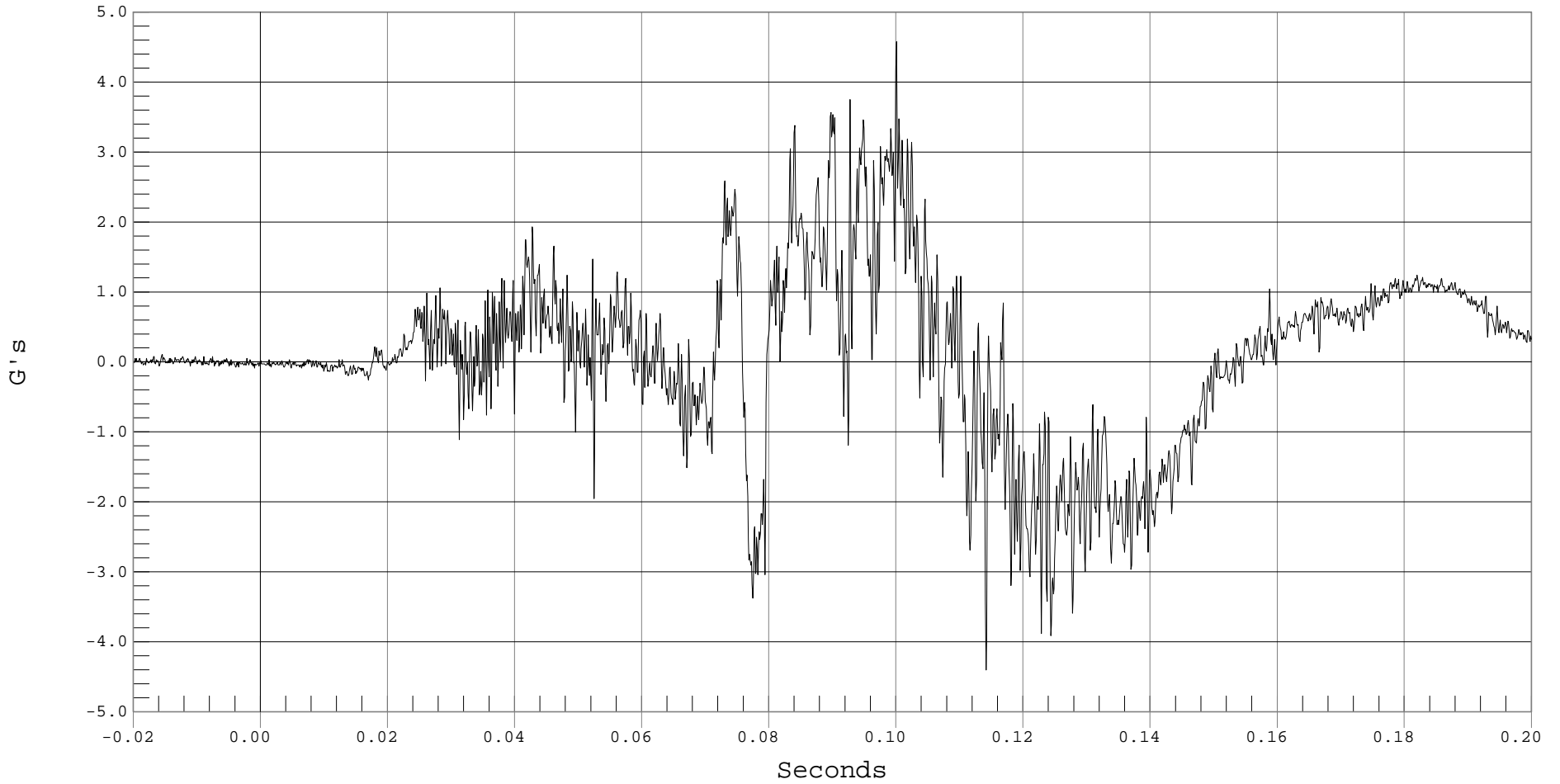
PASSENGER HEAD REDUNDANT Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Yr, B01025AT.A42

Ymin = -4.4 G's @ 0.1141 Seconds, Ymax = 4.58 G's @ 0.1000 Seconds



B-62



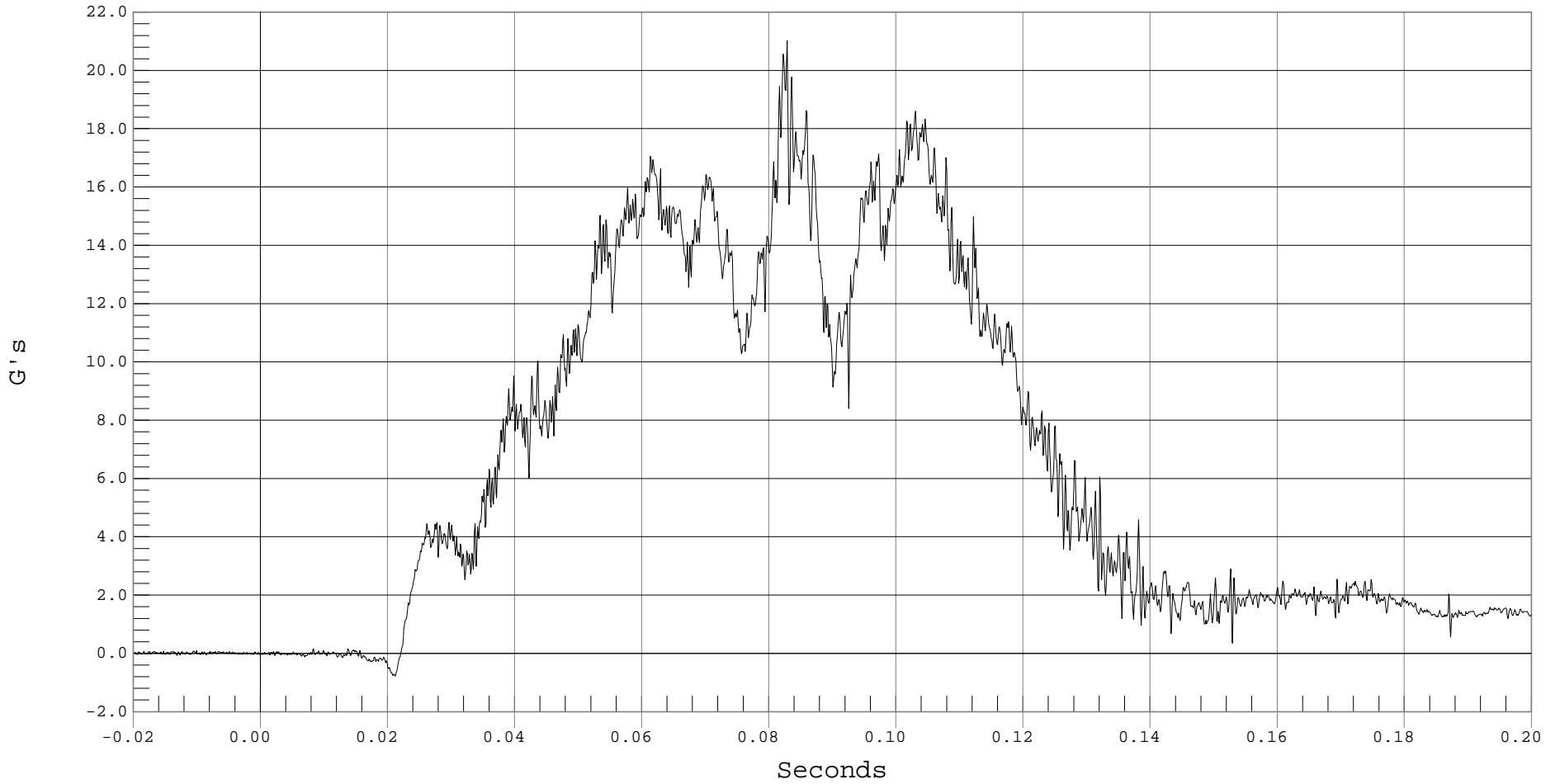
PASSENGER HEAD REDUNDANT Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD Zr, B01025AT.A43

Ymin = -.77 G's @ 0.0211 Seconds, Ymax = 21.02 G's @ 0.0828 Seconds



B-63



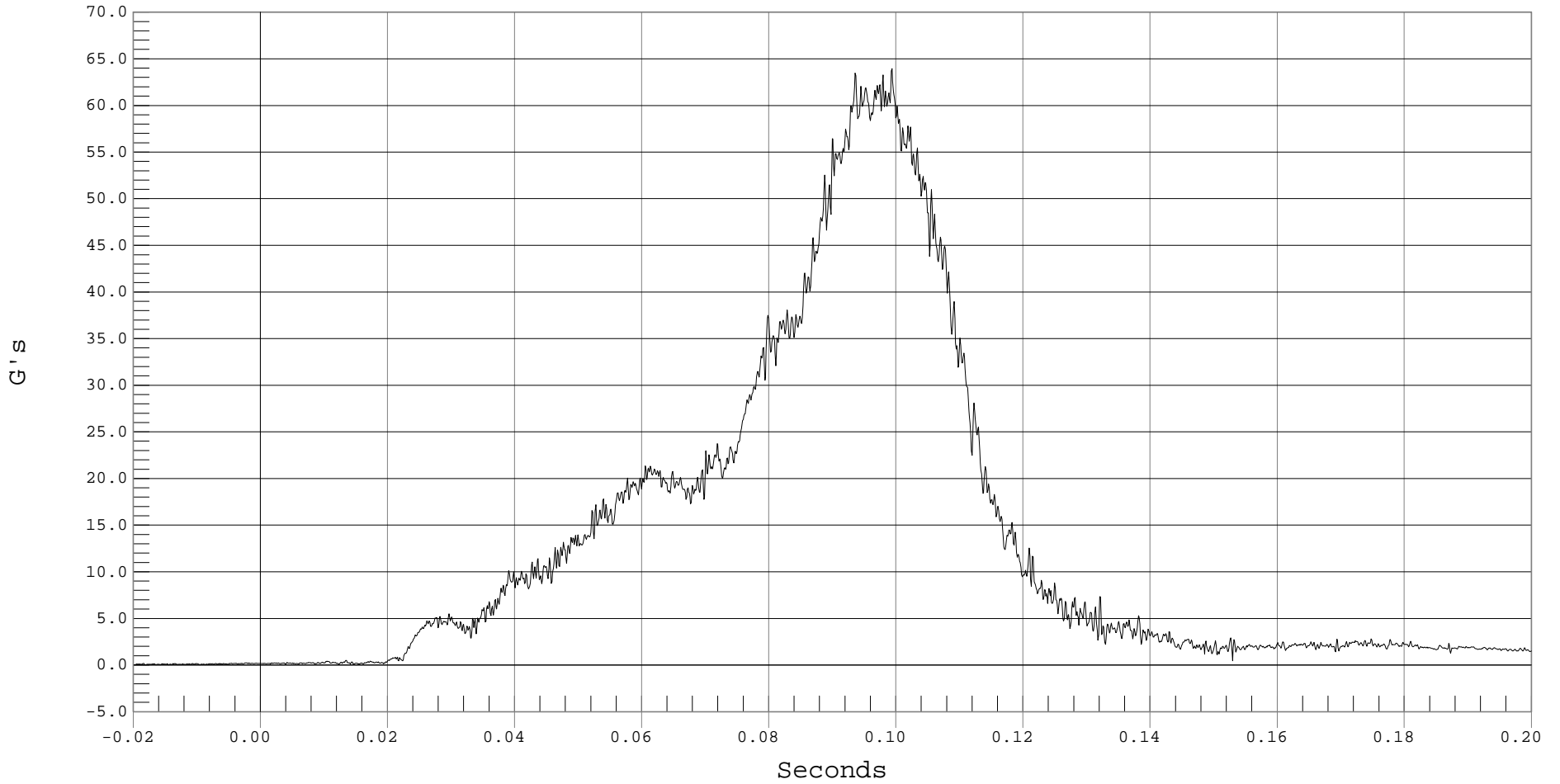
PASSENGER HEAD REDUNDANT RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD REDUNDANT RESULTANT ACCELERATION, B01025AV.A41

Ymin = .02 G's @ -0.0145 Seconds, Ymax = 63.94 G's @ 0.0993 Seconds



B-64



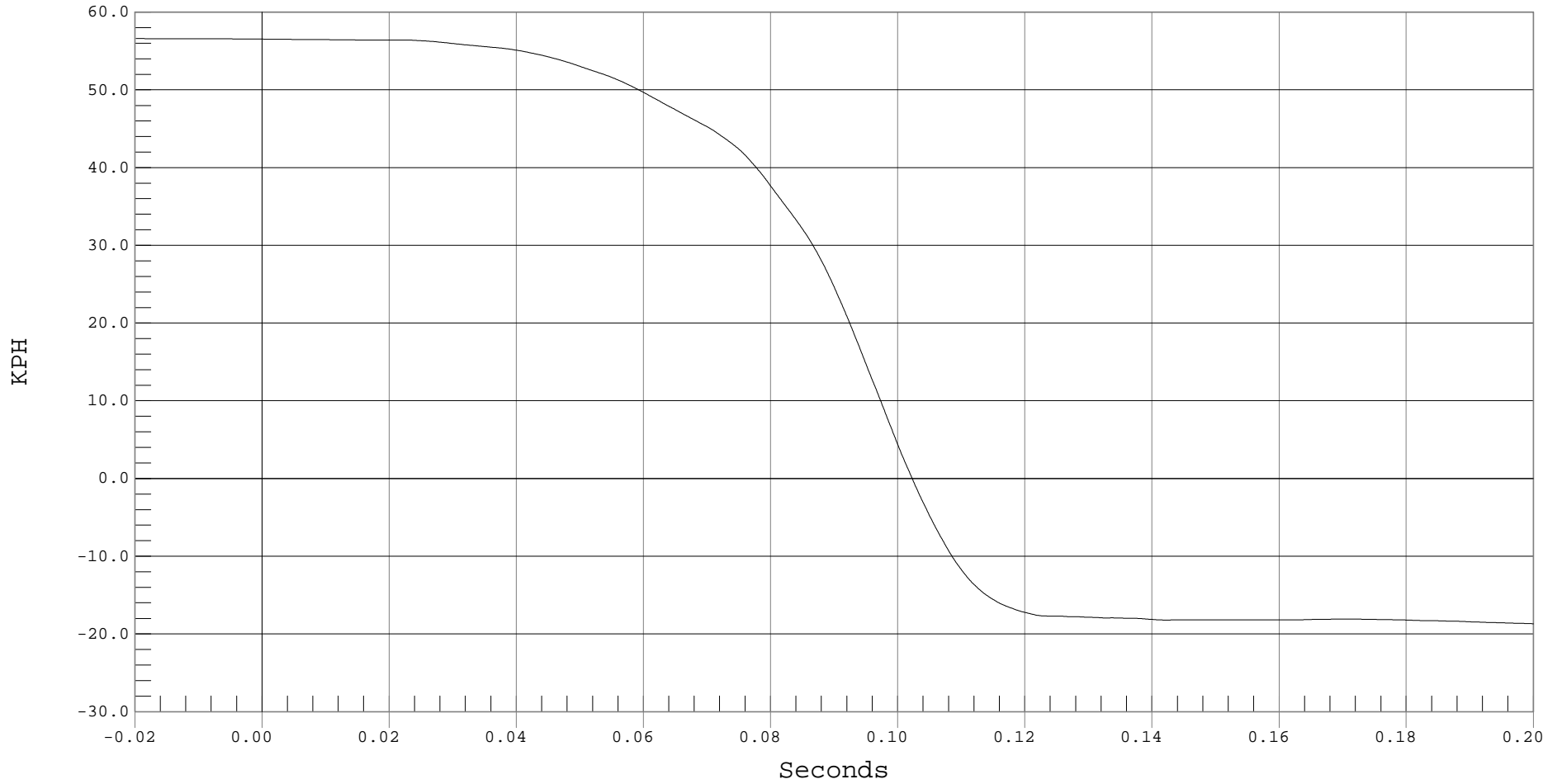
PASSENGER HEAD REDUNDANT X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER HEAD REDUNDANT X VELOCITY, B01025AI.V41

Ymin = -18.69 KPH @ 0.2000 Seconds, Ymax = 56.6 KPH @ -0.0199 Seconds



B-65



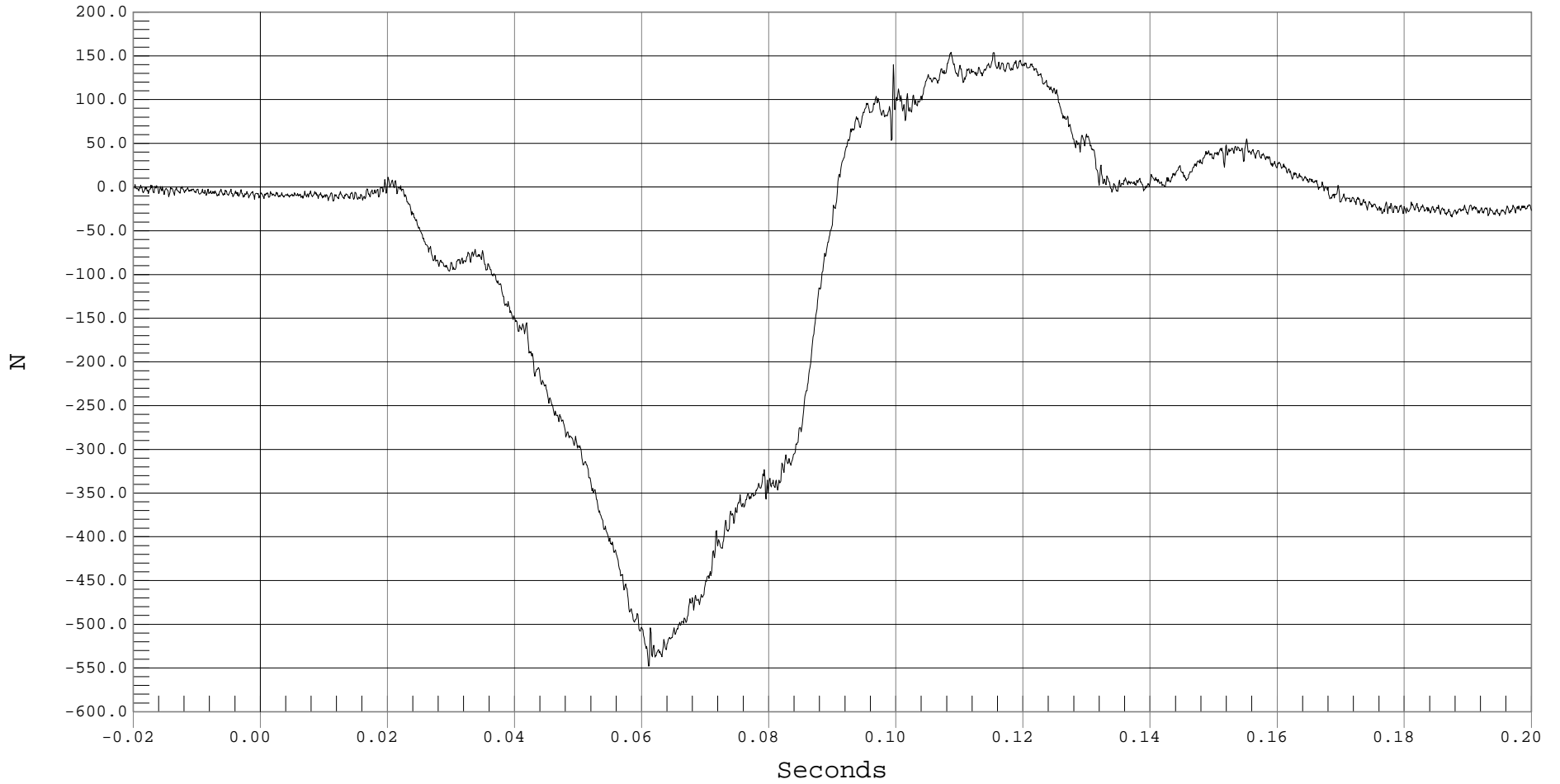
PASSENGER NECK FORCE X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER NECK FX, B01025FT.F44

Ymin = -547.94 N @ 0.0610 Seconds, Ymax = 154.24 N @ 0.1086 Seconds



B-66



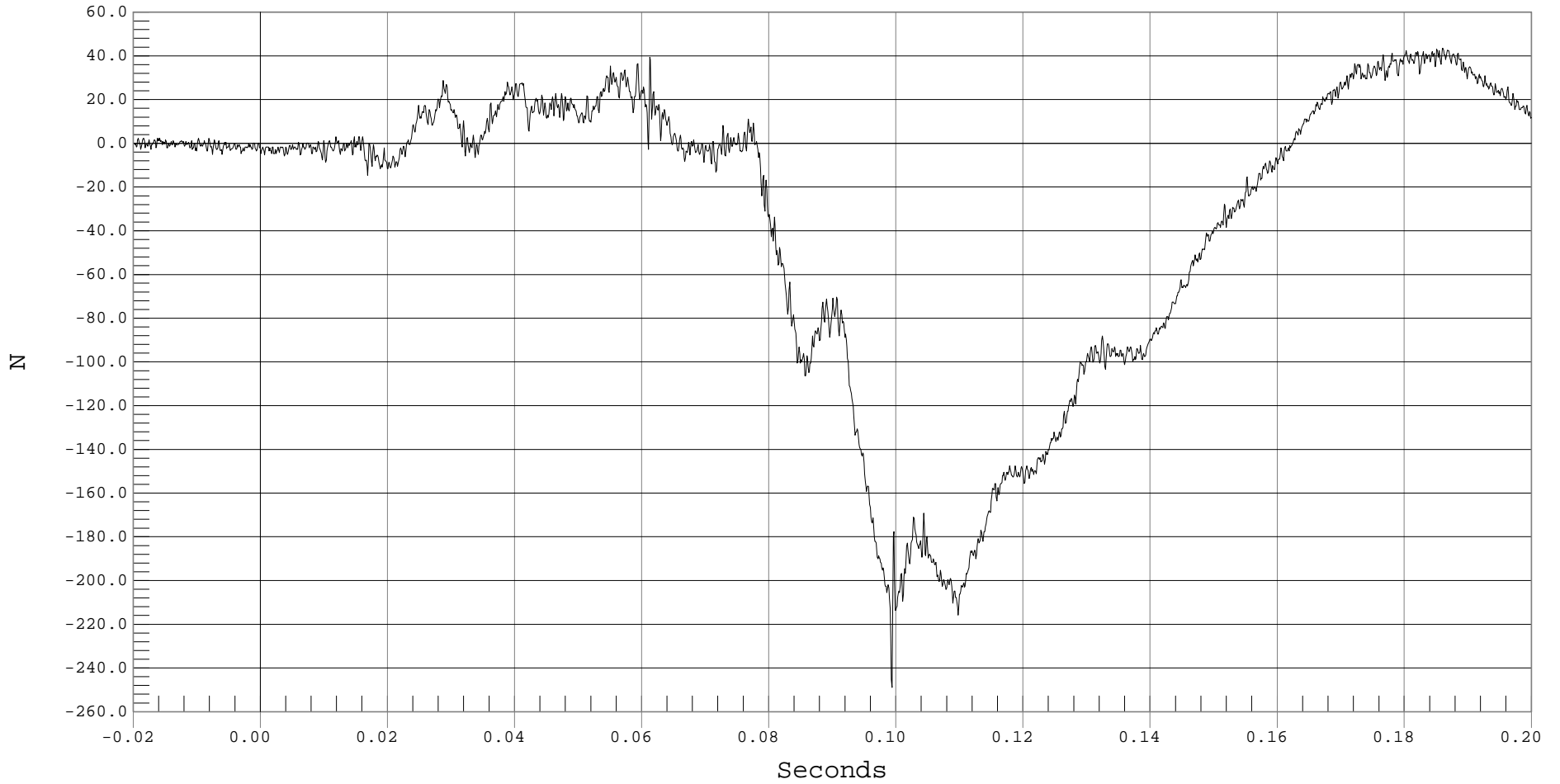
PASSENGER NECK FORCE Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER NECK FY, B01025FT.F45

Ymin = -248.9 N @ 0.0993 Seconds, Ymax = 43.43 N @ 0.1859 Seconds



B-67



PASSENGER NECK FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER NECK FZ, B01025FT.F46

Ymin = -48.81 N @ 0.0206 Seconds, Ymax = 773.54 N @ 0.0763 Seconds



B-68



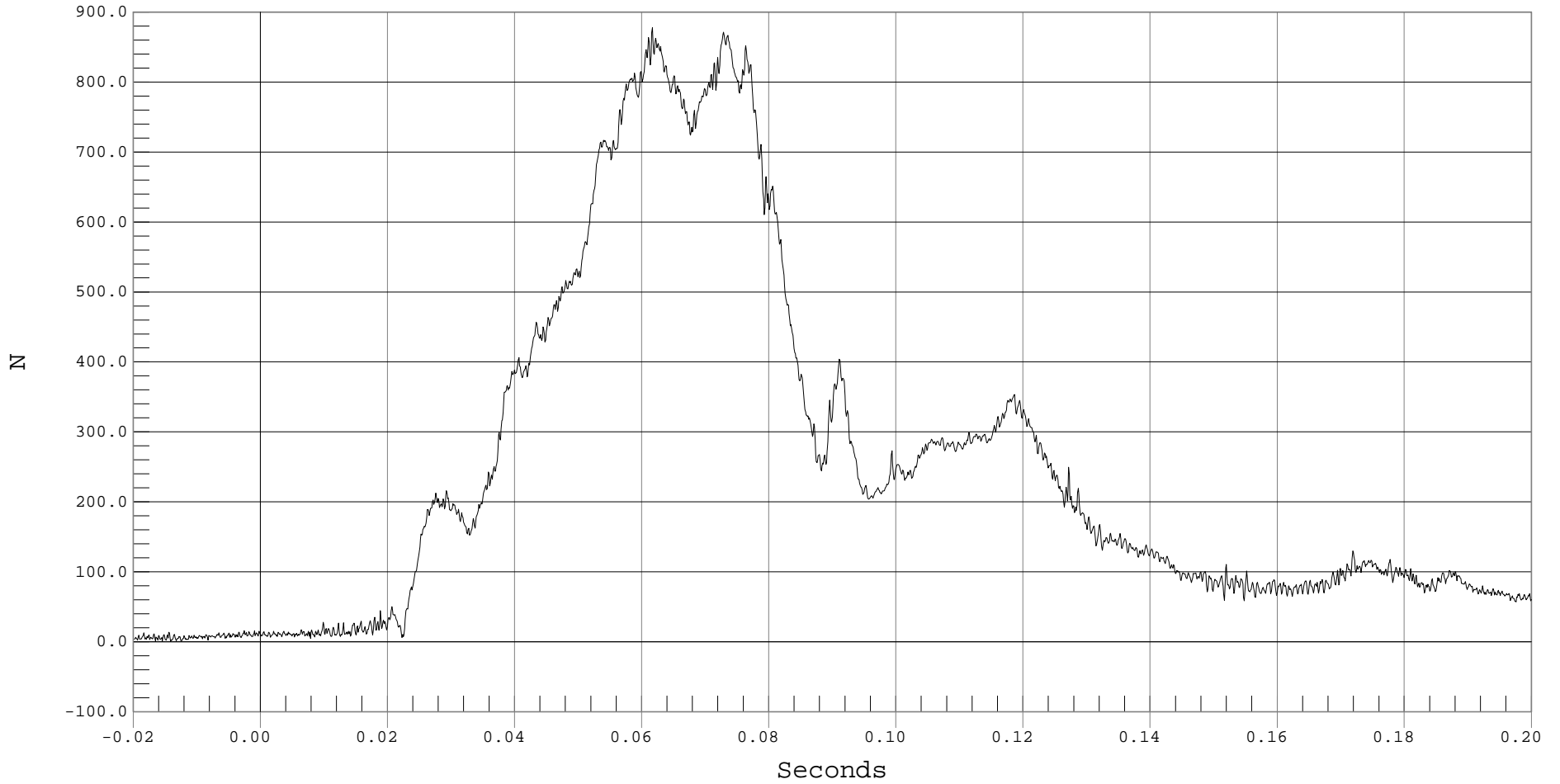
PASSENGER NECK FORCE RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER NECK FORCE RESULTANT, B01025FV.F44

Ymin = .3 N @ -0.0142 Seconds, Ymax = 877.83 N @ 0.0616 Seconds



B-69



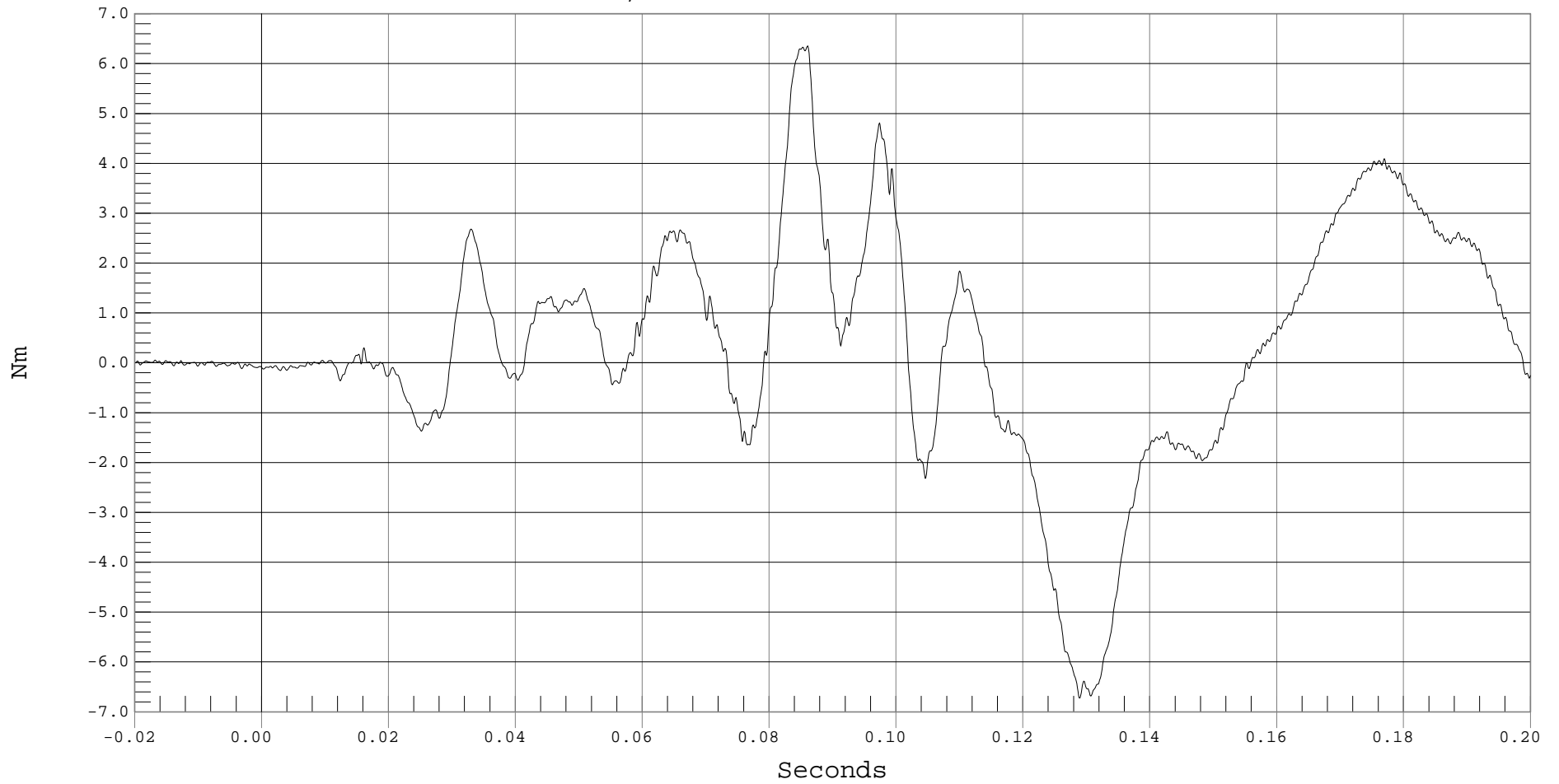
PASSENGER NECK MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER NECK MX, B01025MF.M47

Ymin = -6.72 Nm @ 0.1288 Seconds, Ymax = 6.35 Nm @ 0.0860 Seconds



B-70



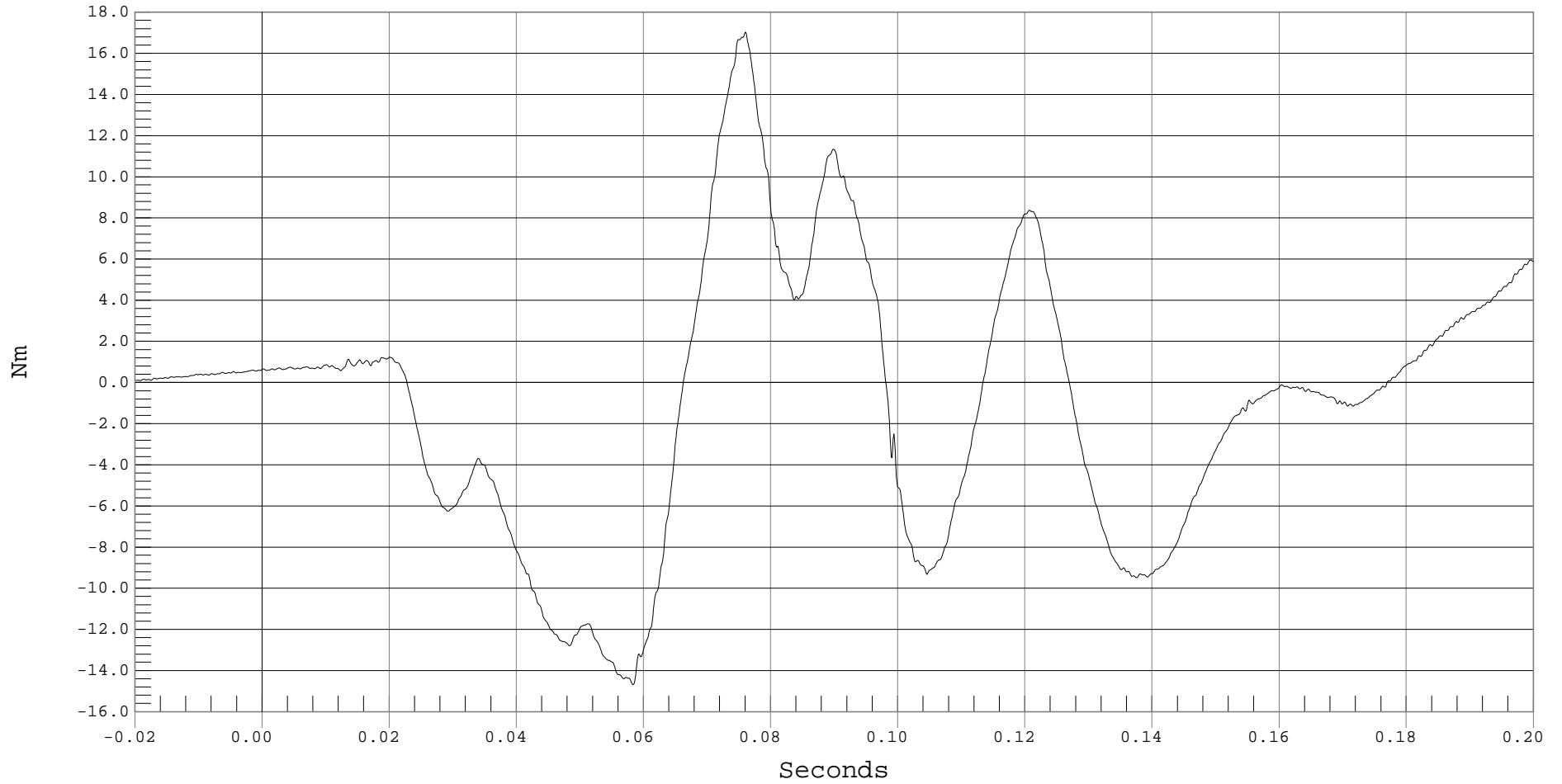
PASSENGER NECK MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER NECK MY, B01025MF.M48

Ymin = -14.69 Nm @ 0.0583 Seconds, Ymax = 17.02 Nm @ 0.0760 Seconds



B-71



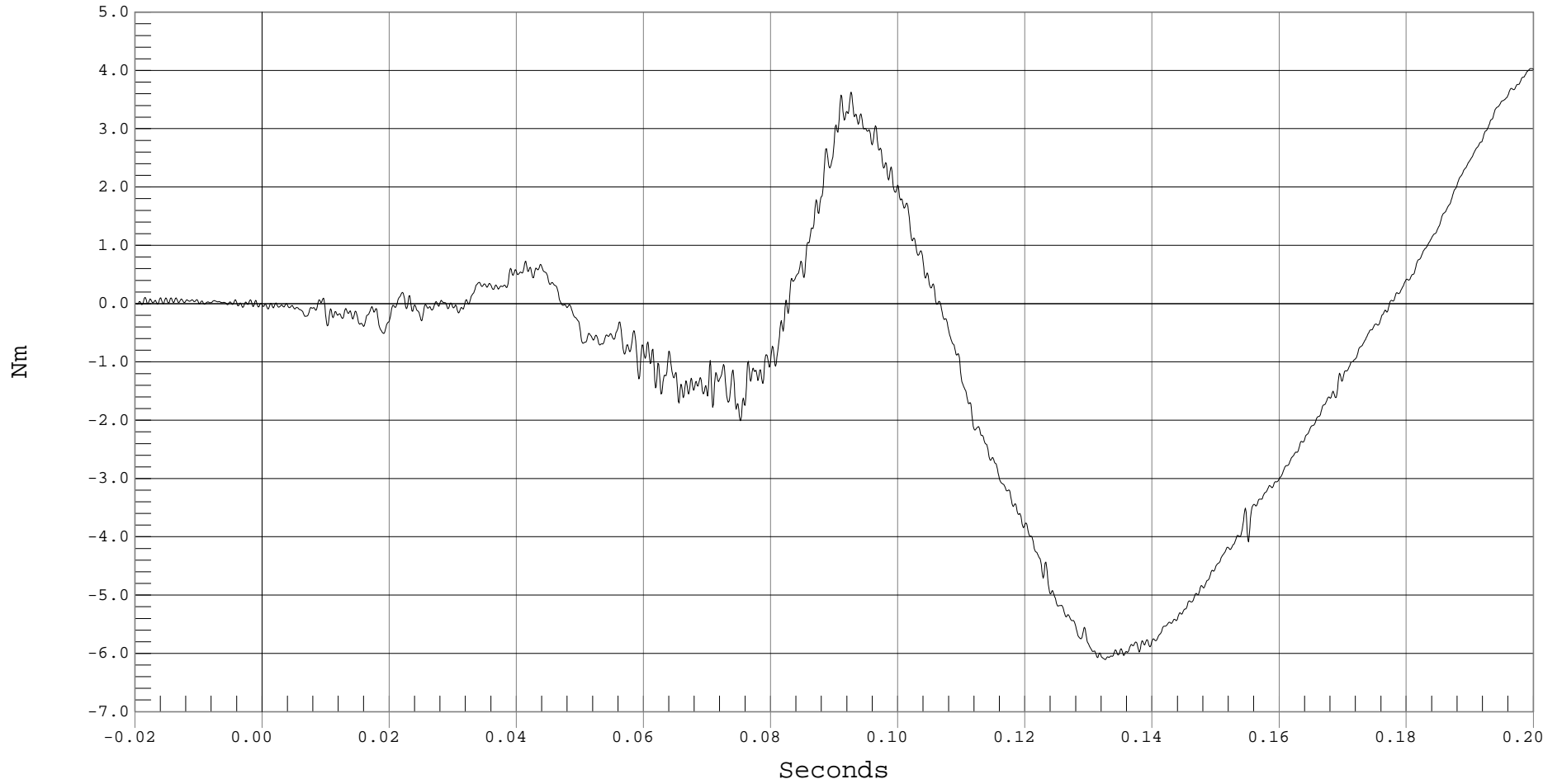
PASSENGER NECK MOMENT Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER NECK MZ, B01025MF.M49

Ymin = -6.1 Nm @ 0.1326 Seconds, Ymax = 4.03 Nm @ 0.1996 Seconds



B-72



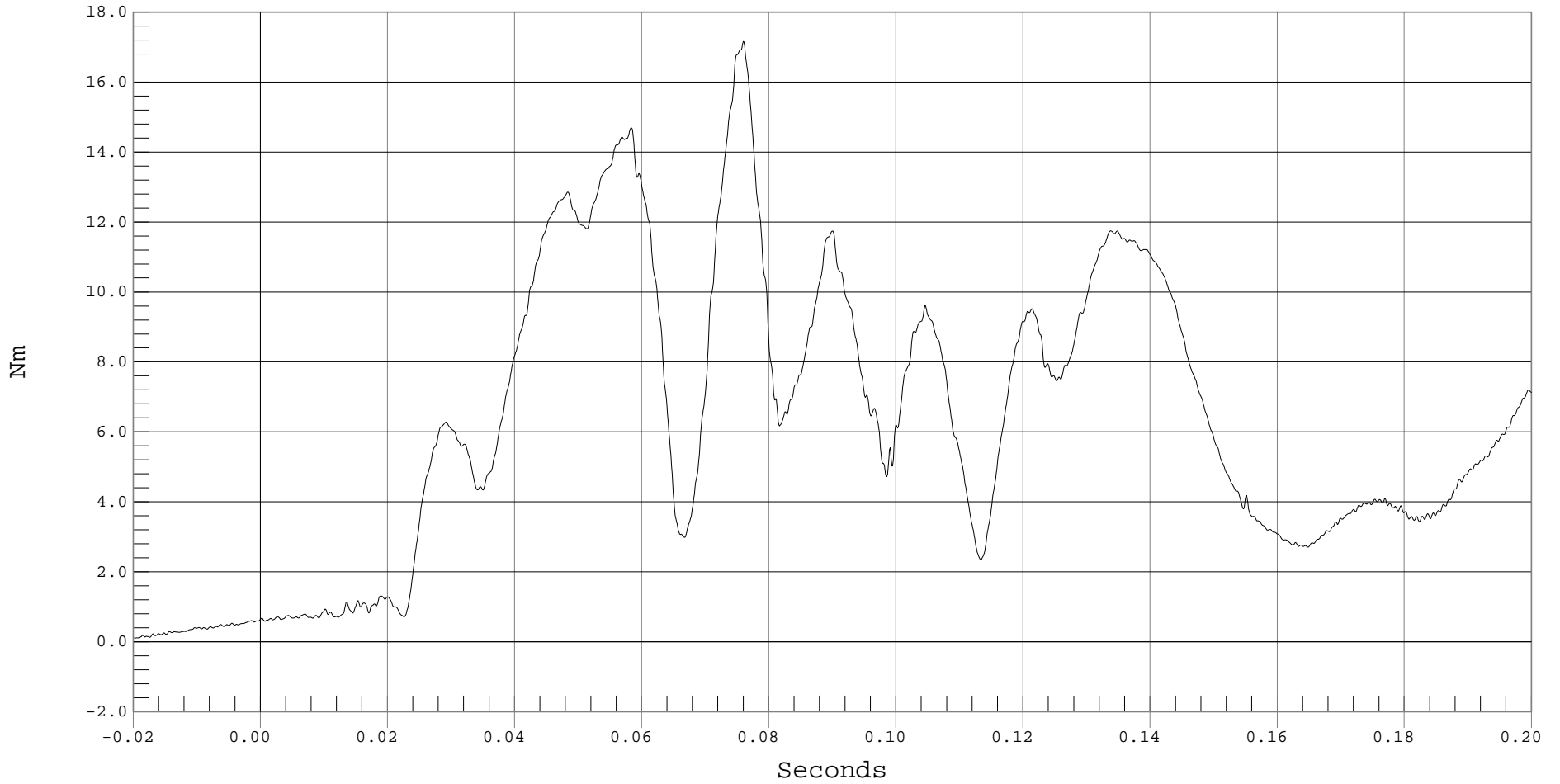
PASSENGER NECK MOMENT RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER NECK MOMENT RESULTANT, B01025MV.M47

Ymin = .1 Nm @ -0.0198 Seconds, Ymax = 17.16 Nm @ 0.0759 Seconds



B-73



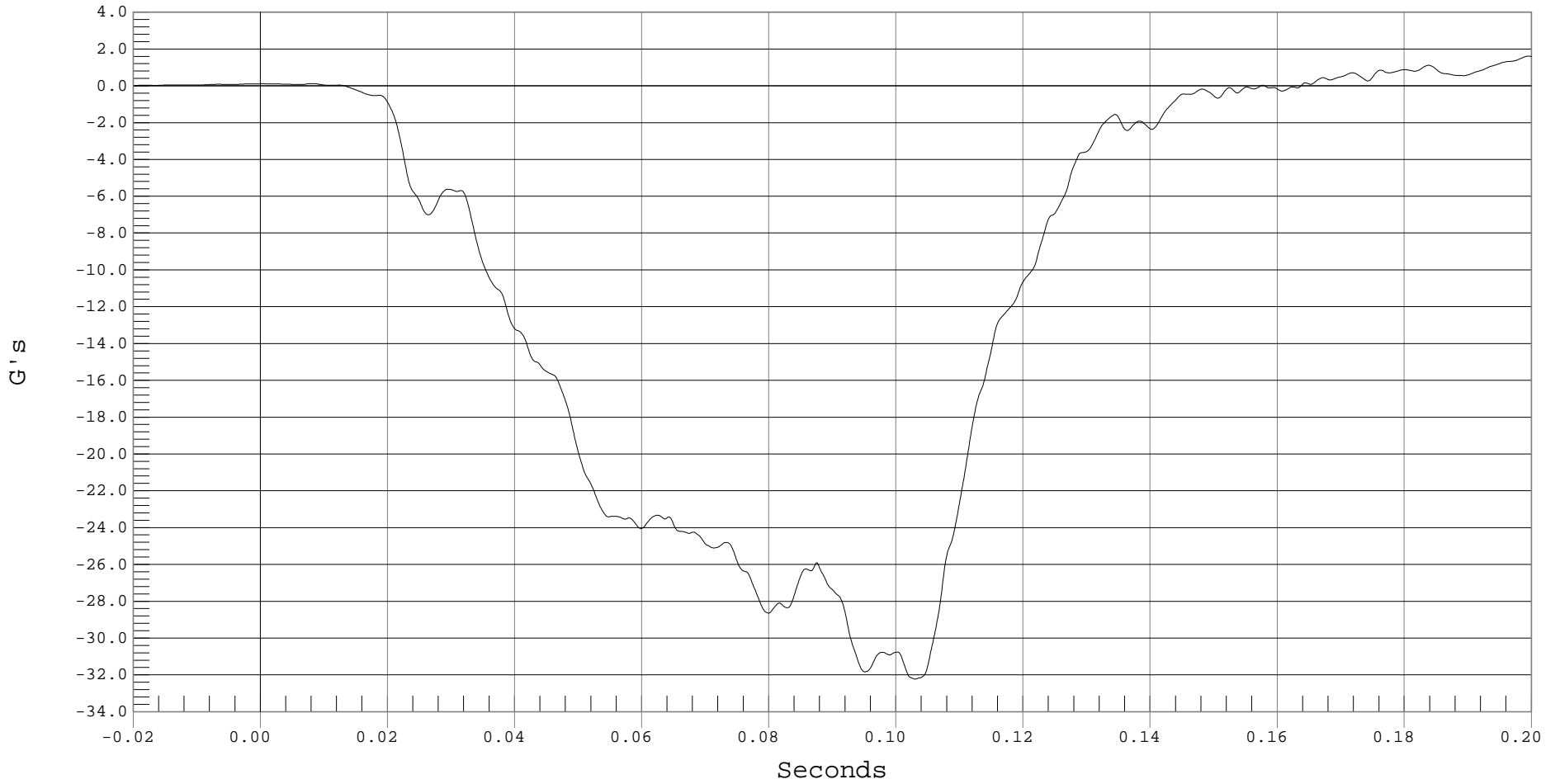
PASSENGER CHEST X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST X, B01025AF.A22

Ymin = -32.23 G's @ 0.1029 Seconds, Ymax = 1.61 G's @ 0.1994 Seconds



B-74



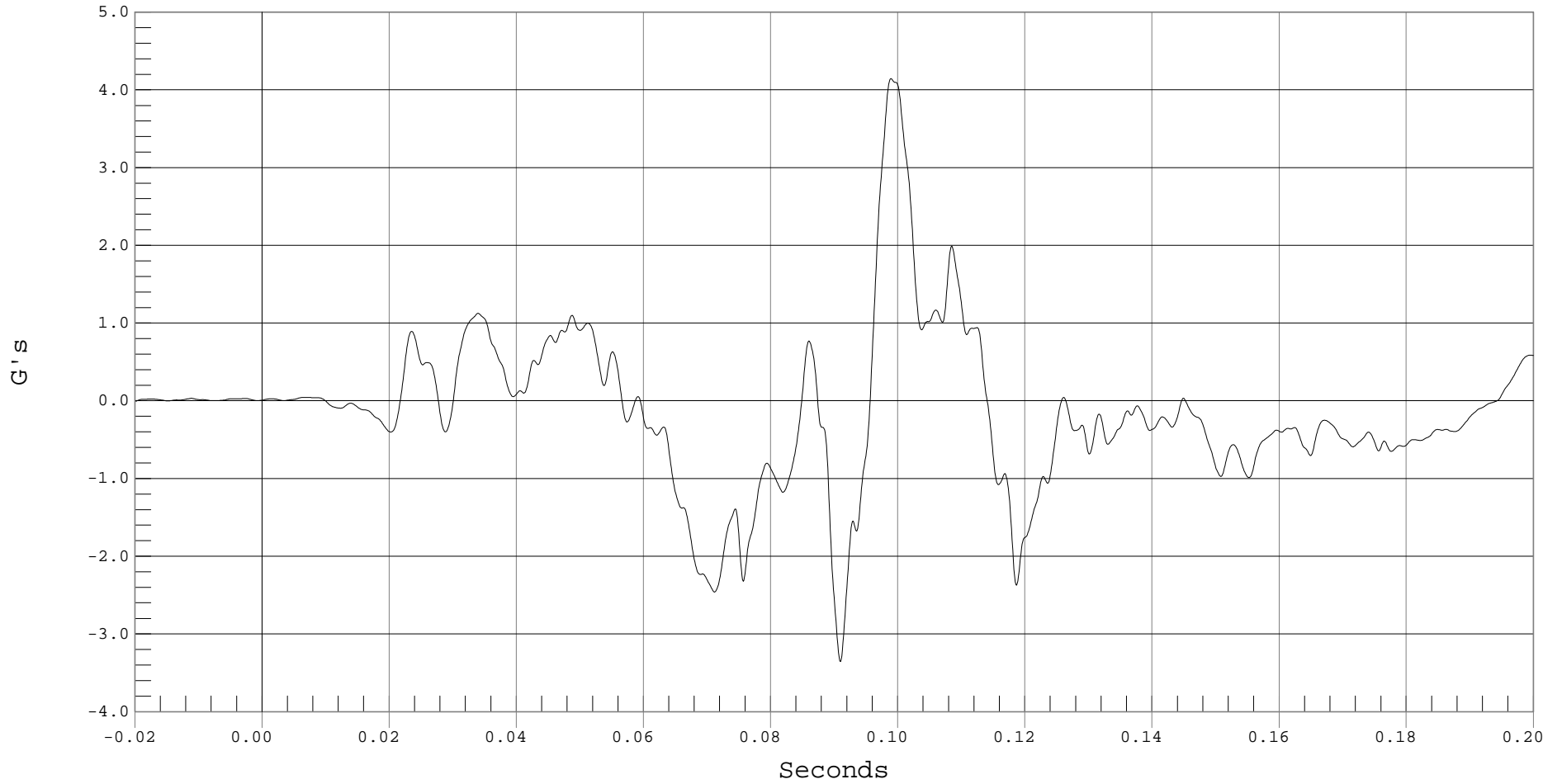
PASSENGER CHEST Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST Y, B01025AF.A23

Ymin = -3.36 G's @ 0.0909 Seconds, Ymax = 4.14 G's @ 0.0988 Seconds



B-75



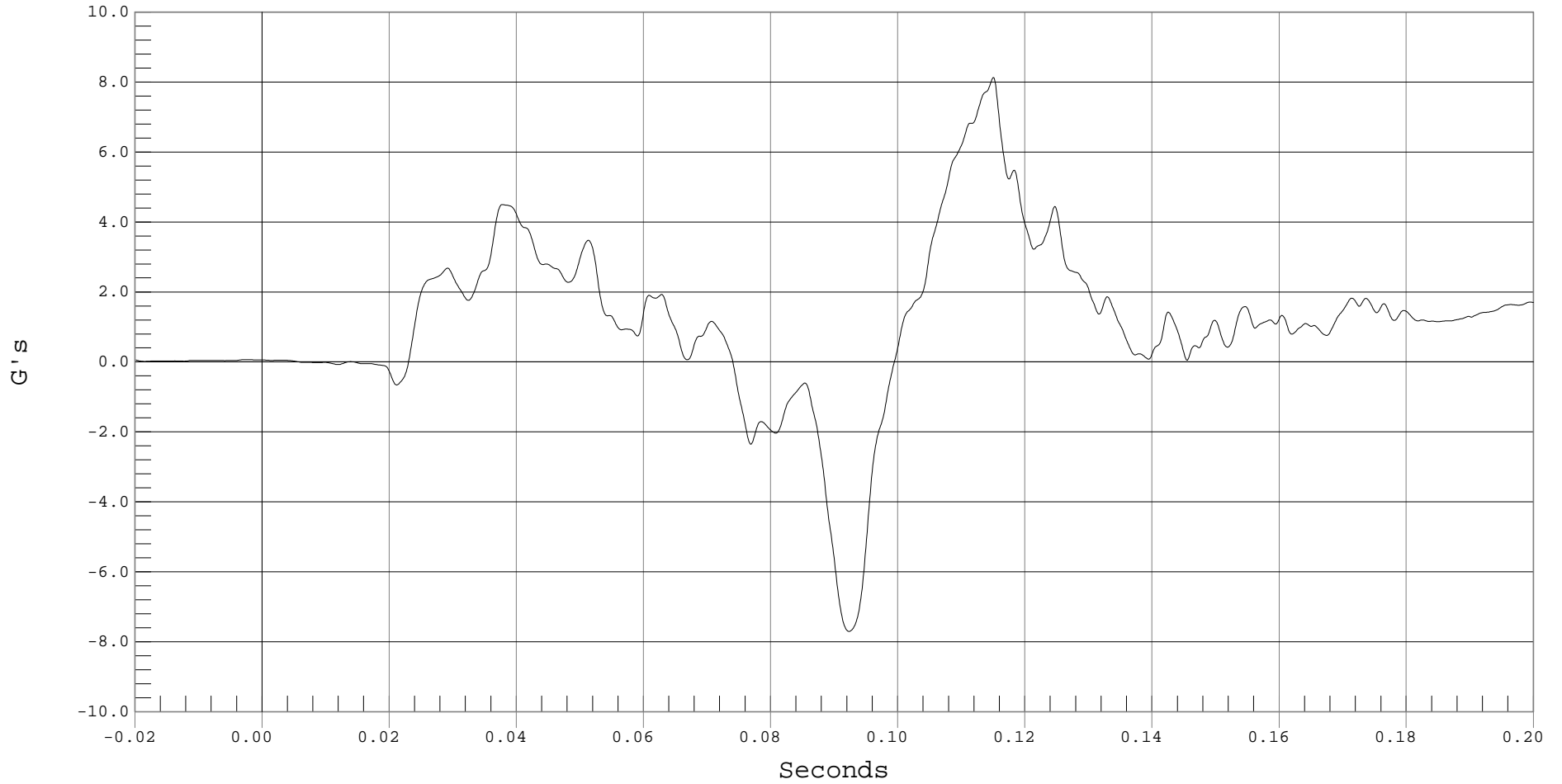
PASSENGER CHEST Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST Z, B01025AF.A24

Ymin = -7.7 G's @ 0.0922 Seconds, Ymax = 8.13 G's @ 0.1150 Seconds



B-76



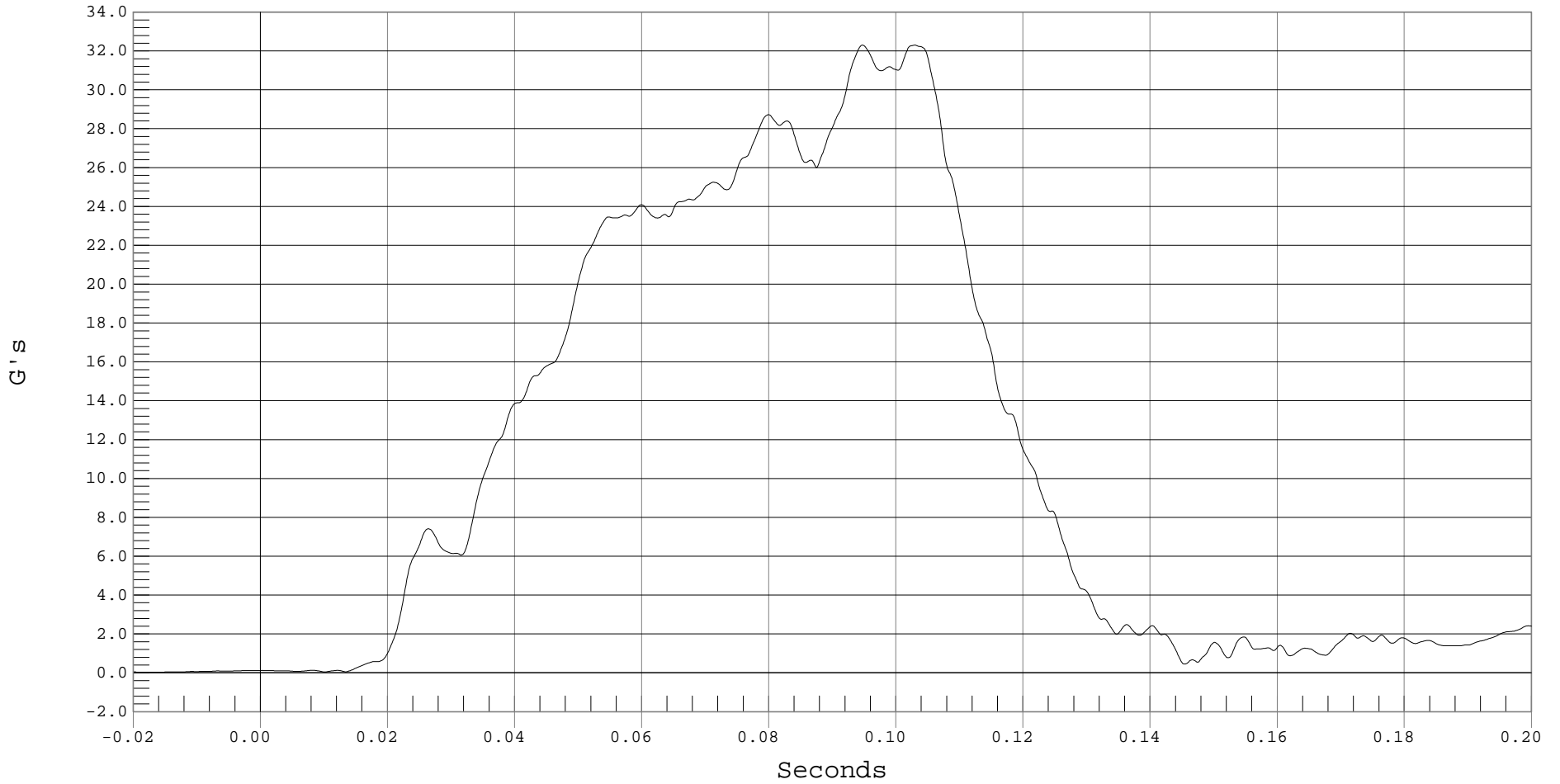
PASSENGER CHEST RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST RESULTANT ACCELERATION, B01025AV.A22

Ymin = .04 G's @ -0.0193 Seconds, Ymax = 32.31 G's @ 0.0947 Seconds





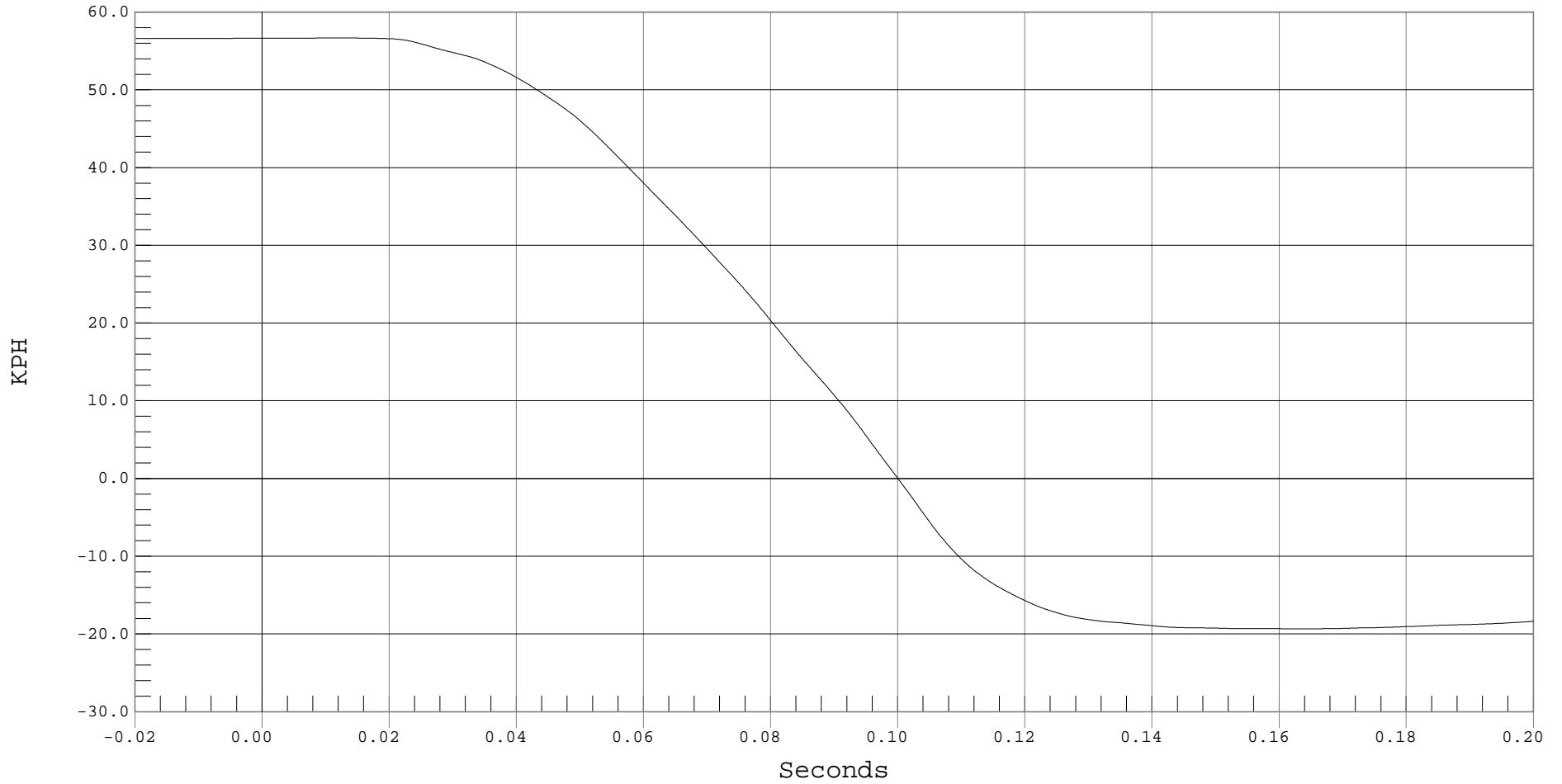
PASSENGER CHEST X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST X VELOCITY, B01025AI.V22

Ymin = -19.35 KPH @ 0.1637 Seconds, Ymax = 56.67 KPH @ 0.0131 Seconds



B-78



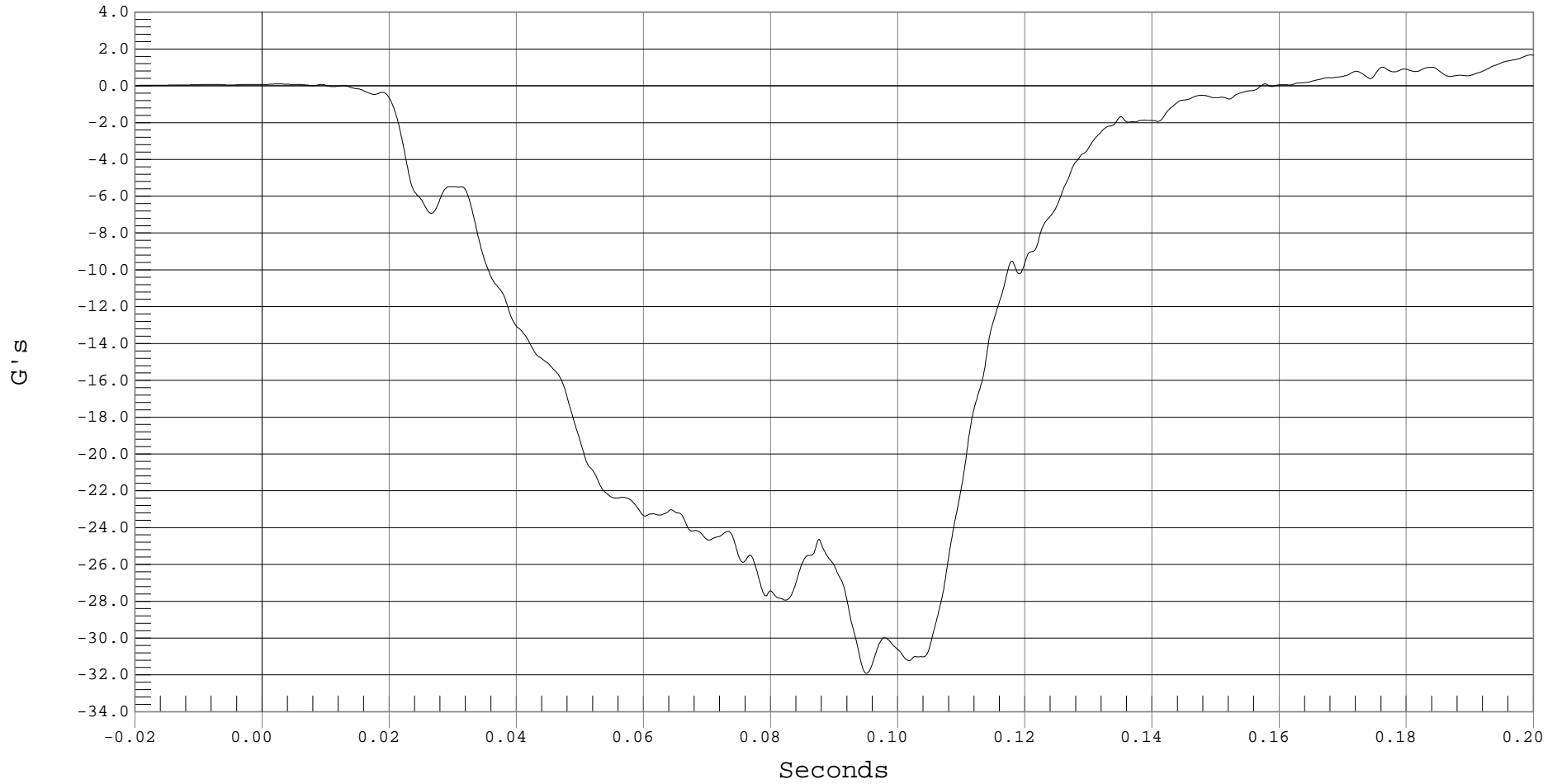
PASSENGER CHEST REDUNDANT X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST Xr, B01025AF.A50

Ymin = -31.92 G's @ 0.0950 Seconds, Ymax = 1.68 G's @ 0.1994 Seconds



B-79



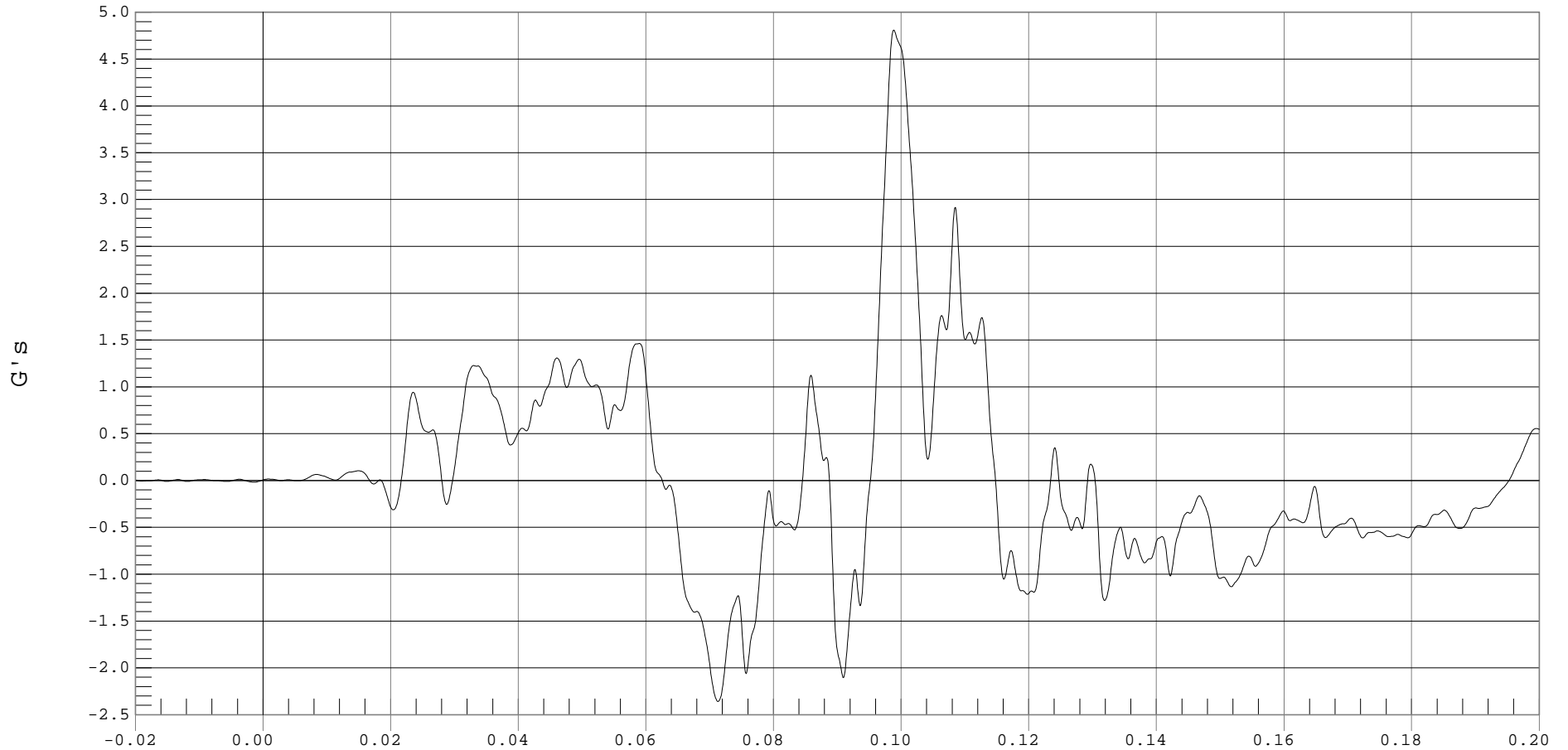
PASSENGER CHEST REDUNDANT Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST Yr, B01025AF.A51

Ymin = -2.36 G's @ 0.0712 Seconds, Ymax = 4.81 G's @ 0.0987 Seconds





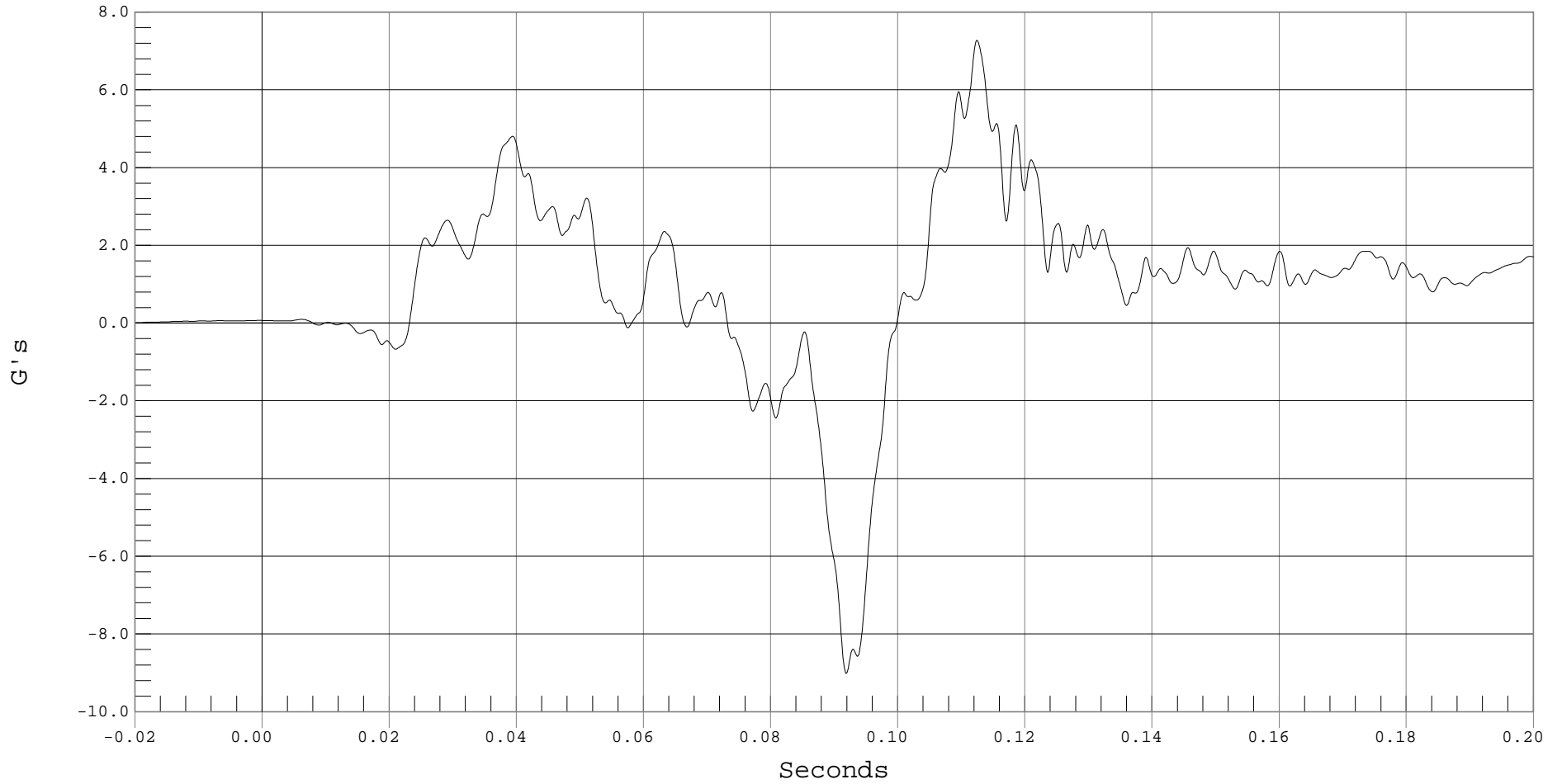
PASSENGER CHEST REDUNDANT Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST Zr, B01025AF.A52

Ymin = -9.01 G's @ 0.0918 Seconds, Ymax = 7.28 G's @ 0.1124 Seconds



B-81



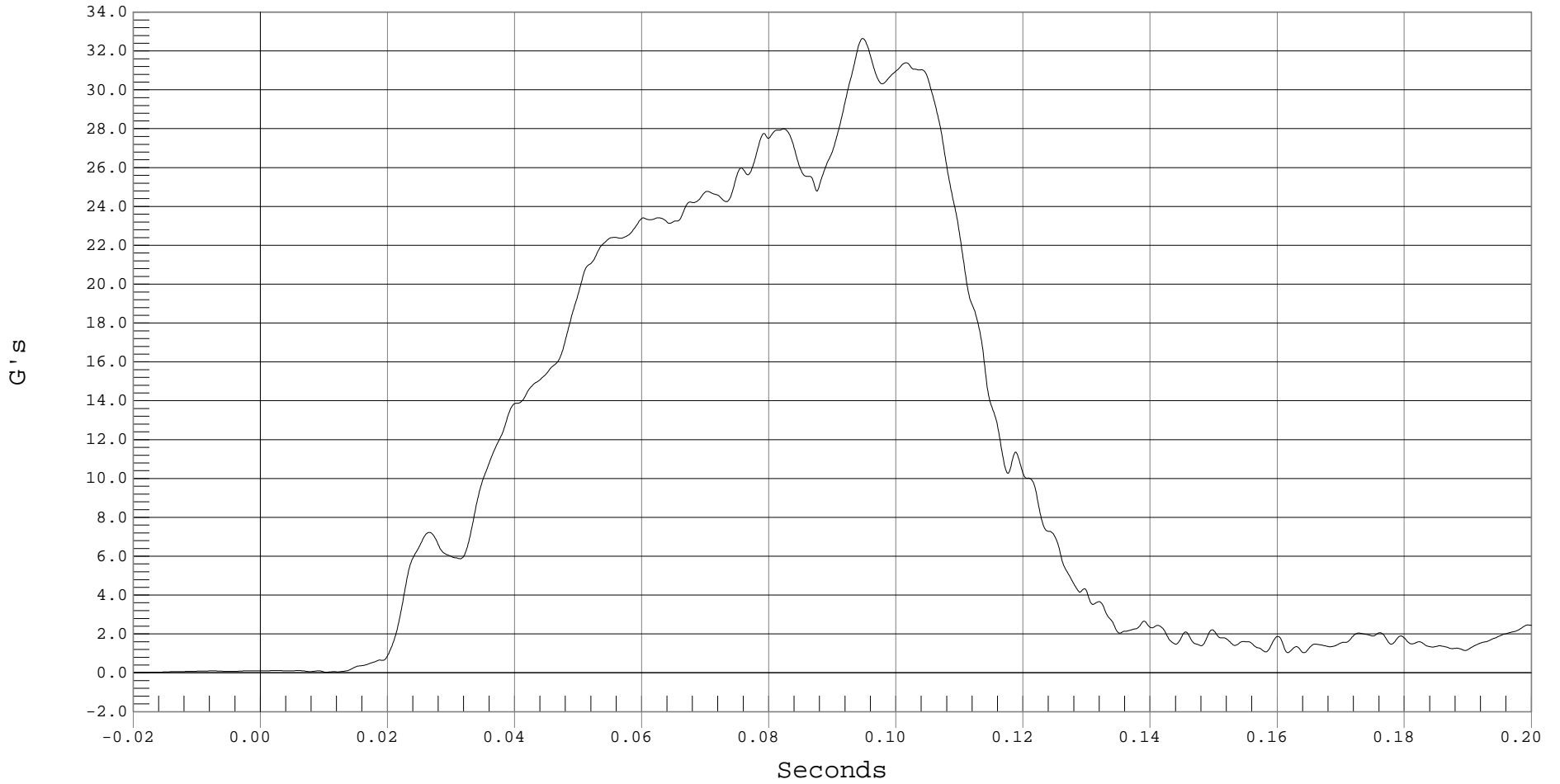
PASSENGER CHEST REDUNDANT RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST REDUNDANT RESULTANT ACCELERATION, B01025AV.A50

Ymin = .02 G's @ -0.0199 Seconds, Ymax = 32.65 G's @ 0.0947 Seconds



B-82



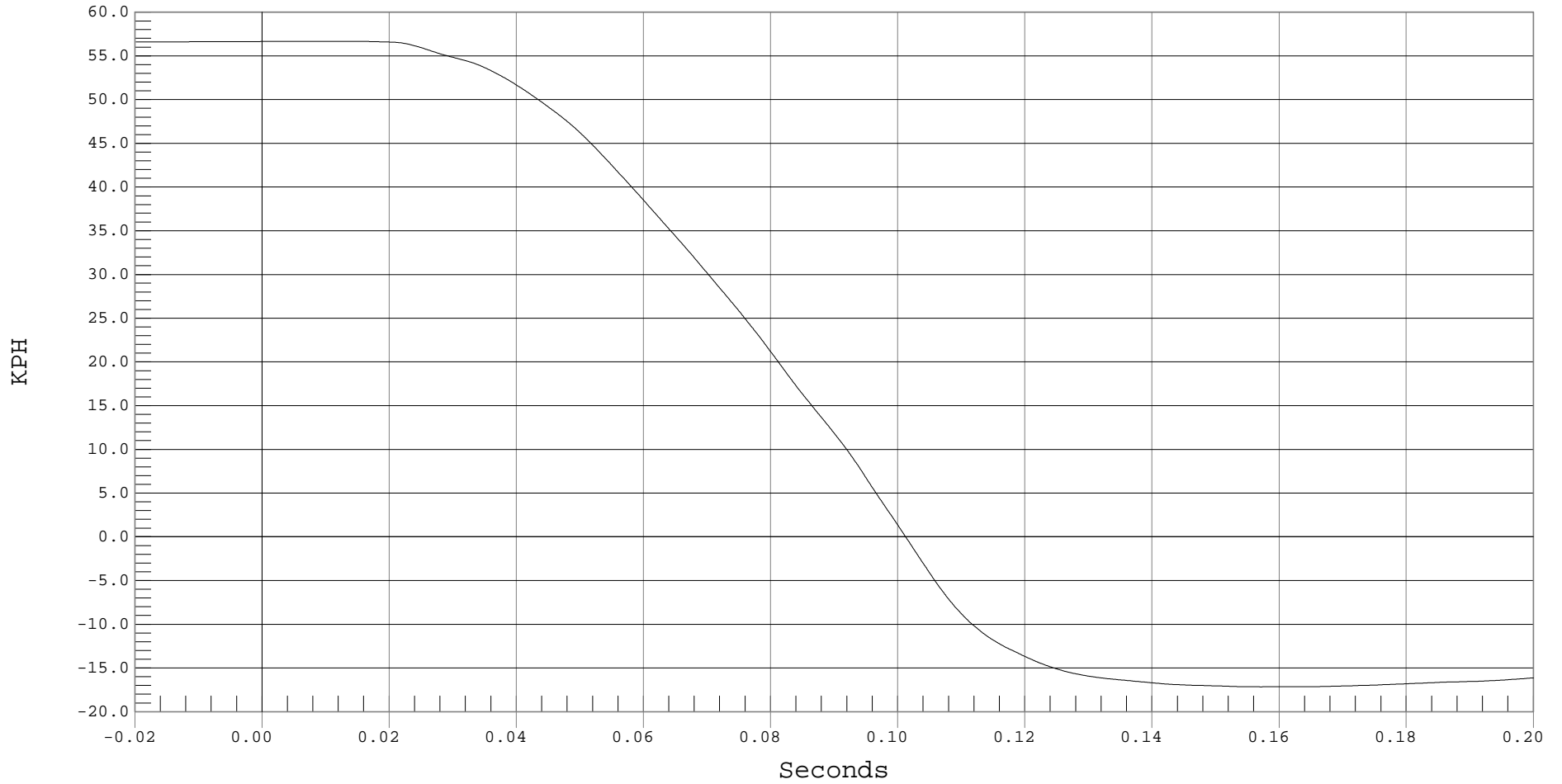
PASSENGER CHEST REDUNDANT X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER CHEST REDUNDANT X VELOCITY, B01025AI.V50

Ymin = -17.16 KPH @ 0.1571 Seconds, Ymax = 56.66 KPH @ 0.0102 Seconds



B-83



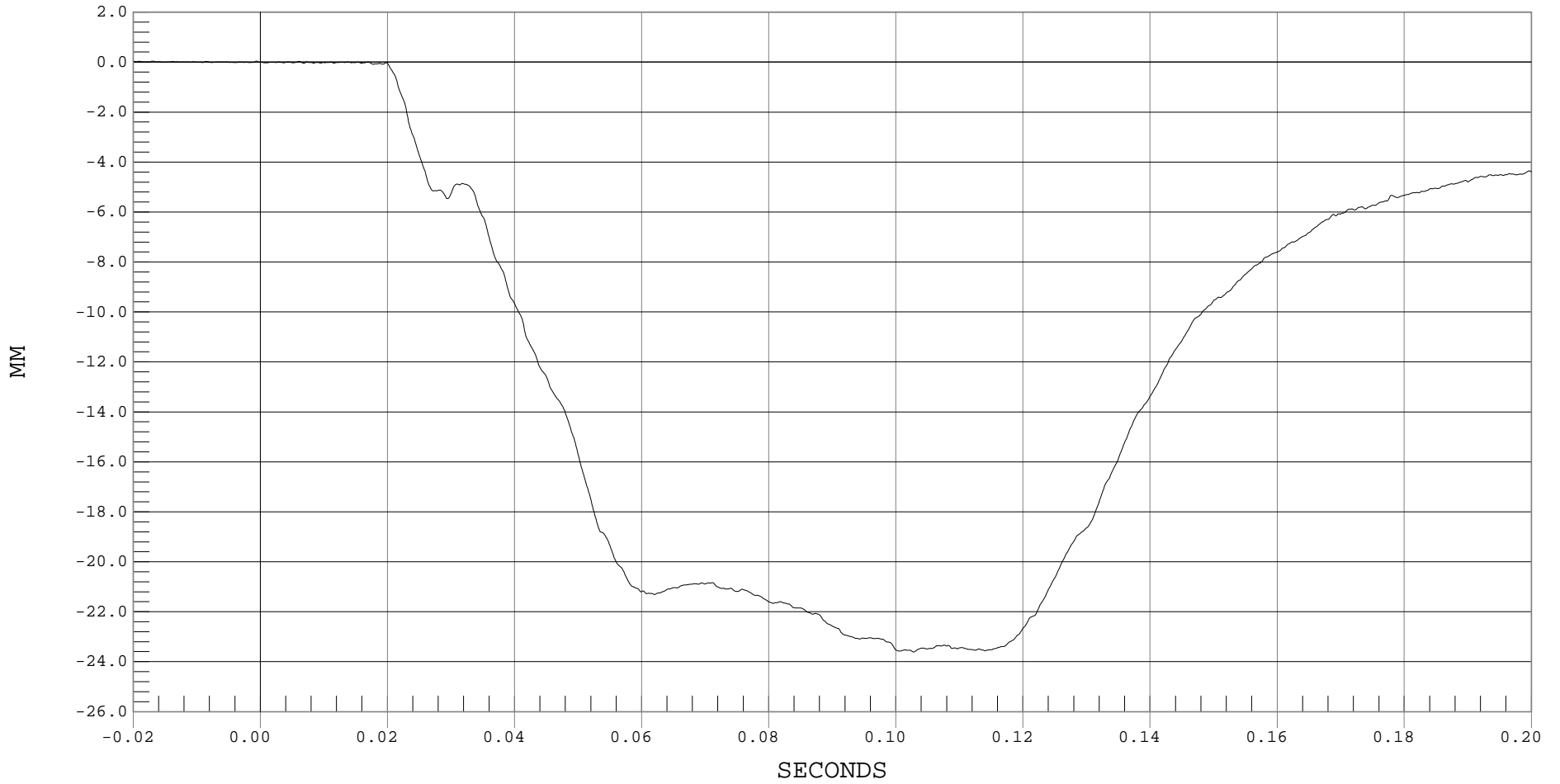
PASSENGER CHEST COMPRESSION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER CHEST DISP, B01025DF.D25

Ymin = -23.61 MM @ 0.1027 SECONDS, Ymax = .04 MM @ -0.0199 SECONDS



B-84



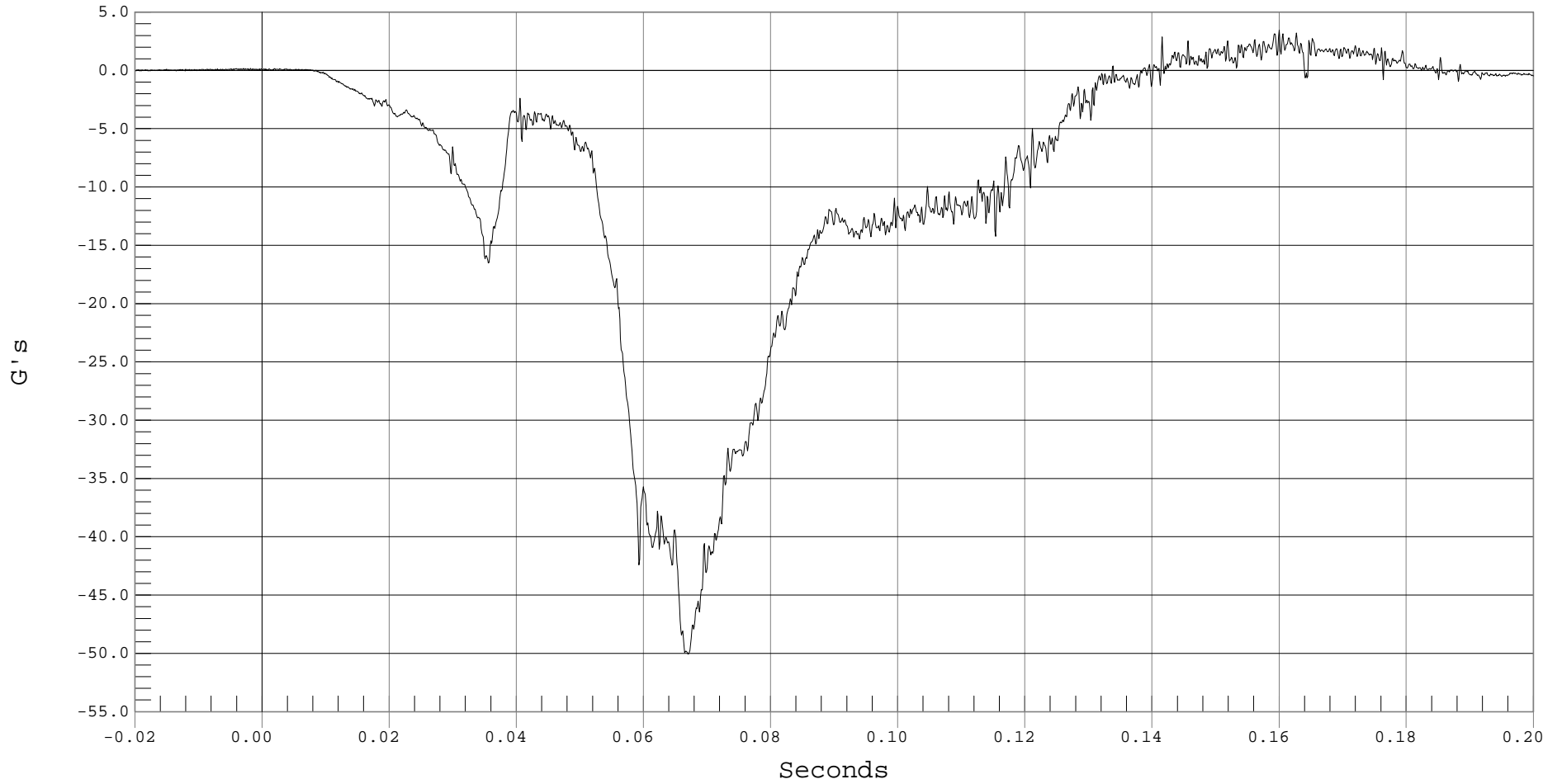
PASSENGER PELVIS X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS X, B01025AT.A26

Ymin = -50.05 G's @ 0.0669 Seconds, Ymax = 3.47 G's @ 0.1599 Seconds



B-85



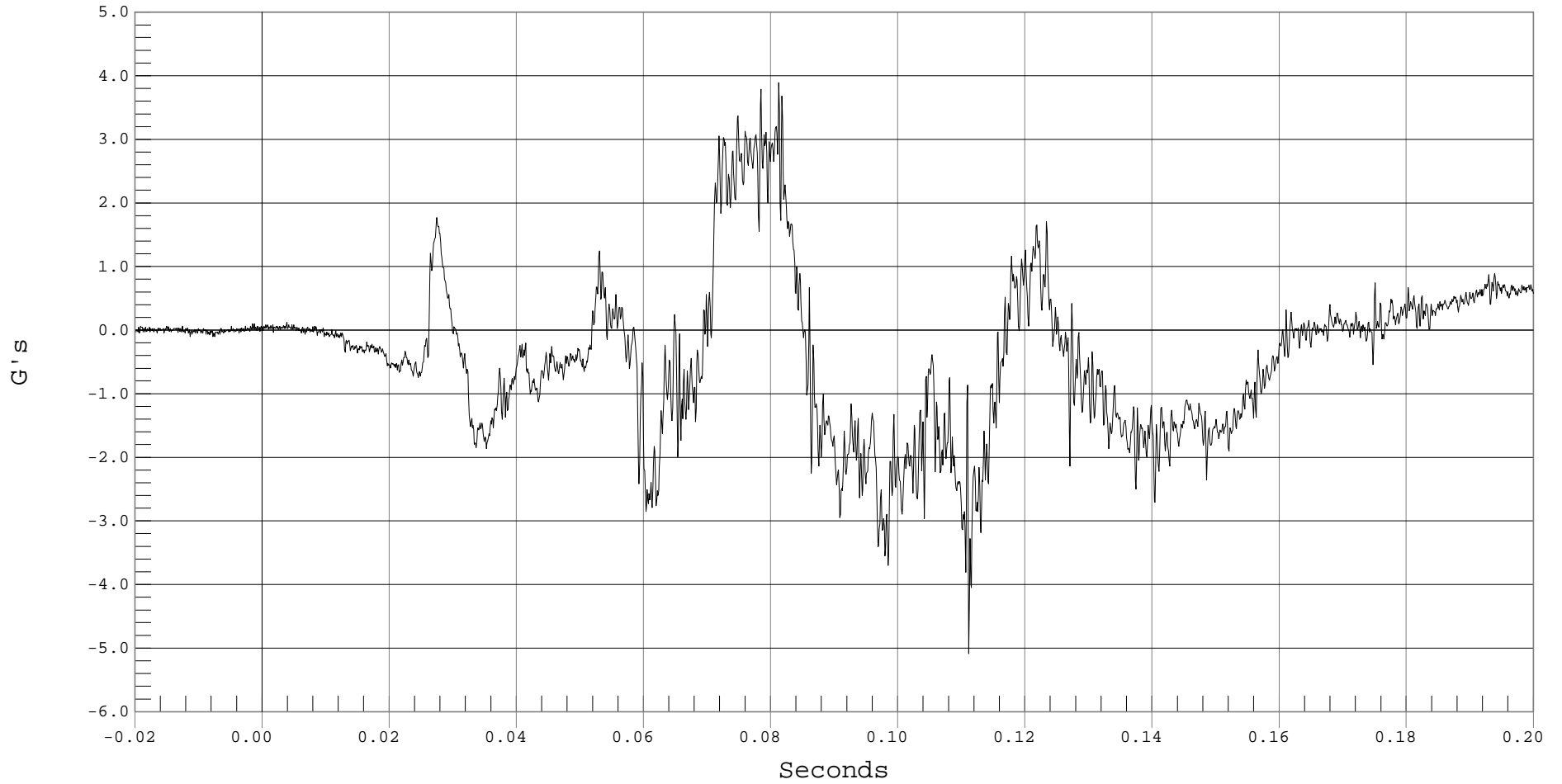
PASSENGER PELVIS Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS Y, B01025AT.A27

Ymin = -5.09 G's @ 0.1111 Seconds, Ymax = 3.89 G's @ 0.0812 Seconds





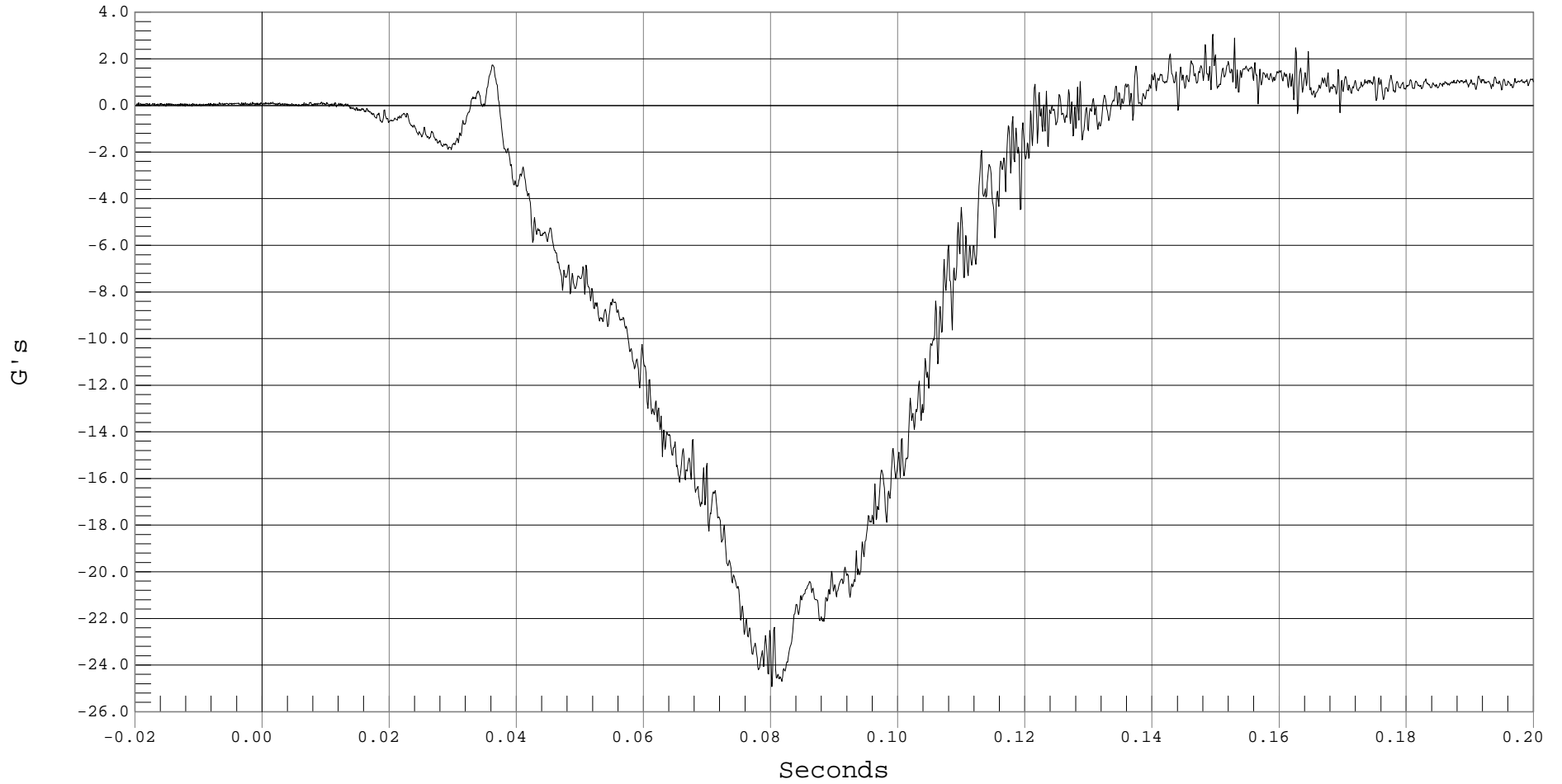
PASSENGER PELVIS Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS Z, B01025AT.A28

Ymin = -24.93 G's @ 0.0801 Seconds, Ymax = 3.05 G's @ 0.1495 Seconds



B-87



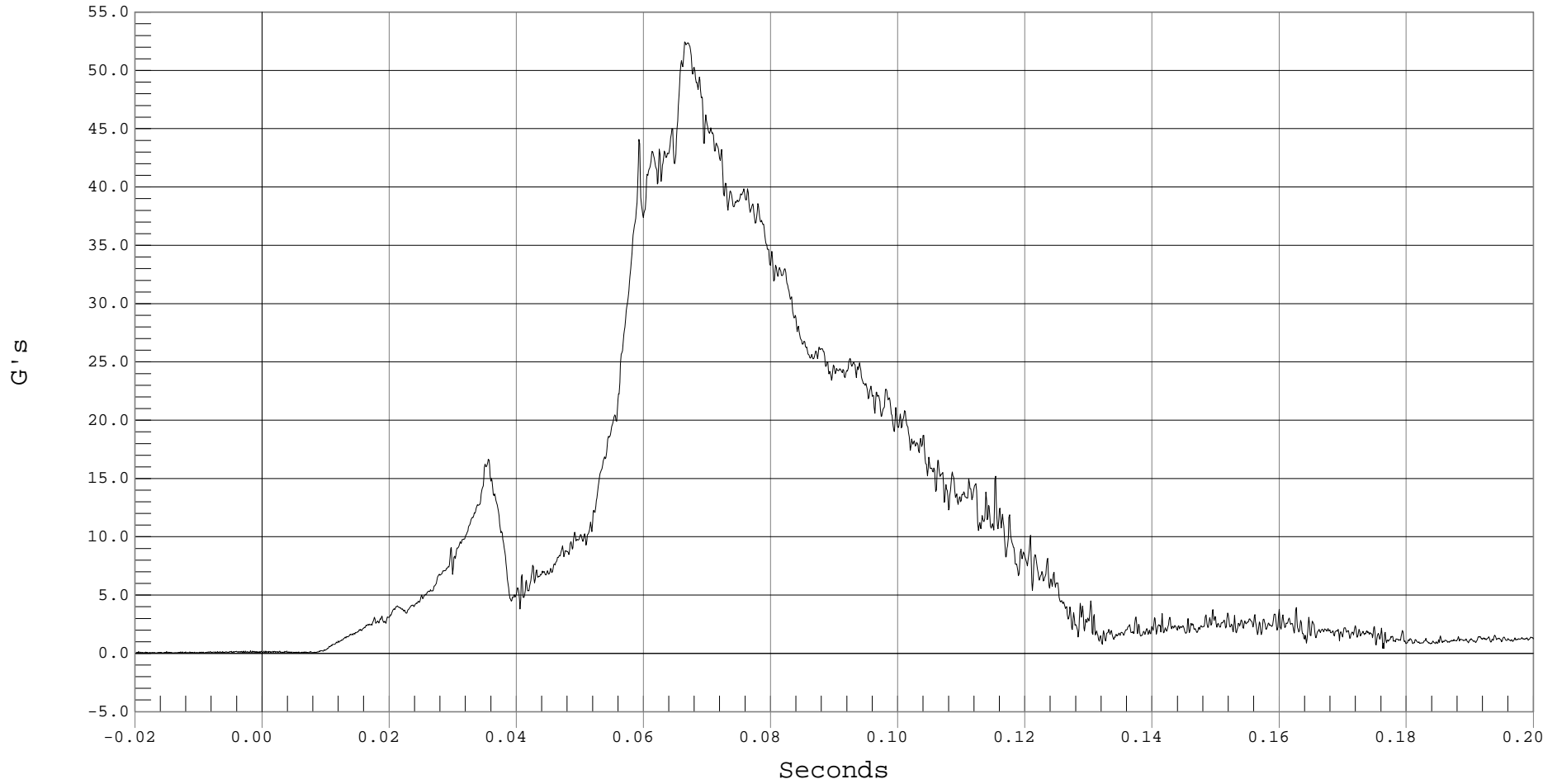
PASSENGER PELVIS RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS RESULTANT ACCELERATION, B01025AV.A26

Ymin = .01 G's @ 0.0072 Seconds, Ymax = 52.44 G's @ 0.0664 Seconds





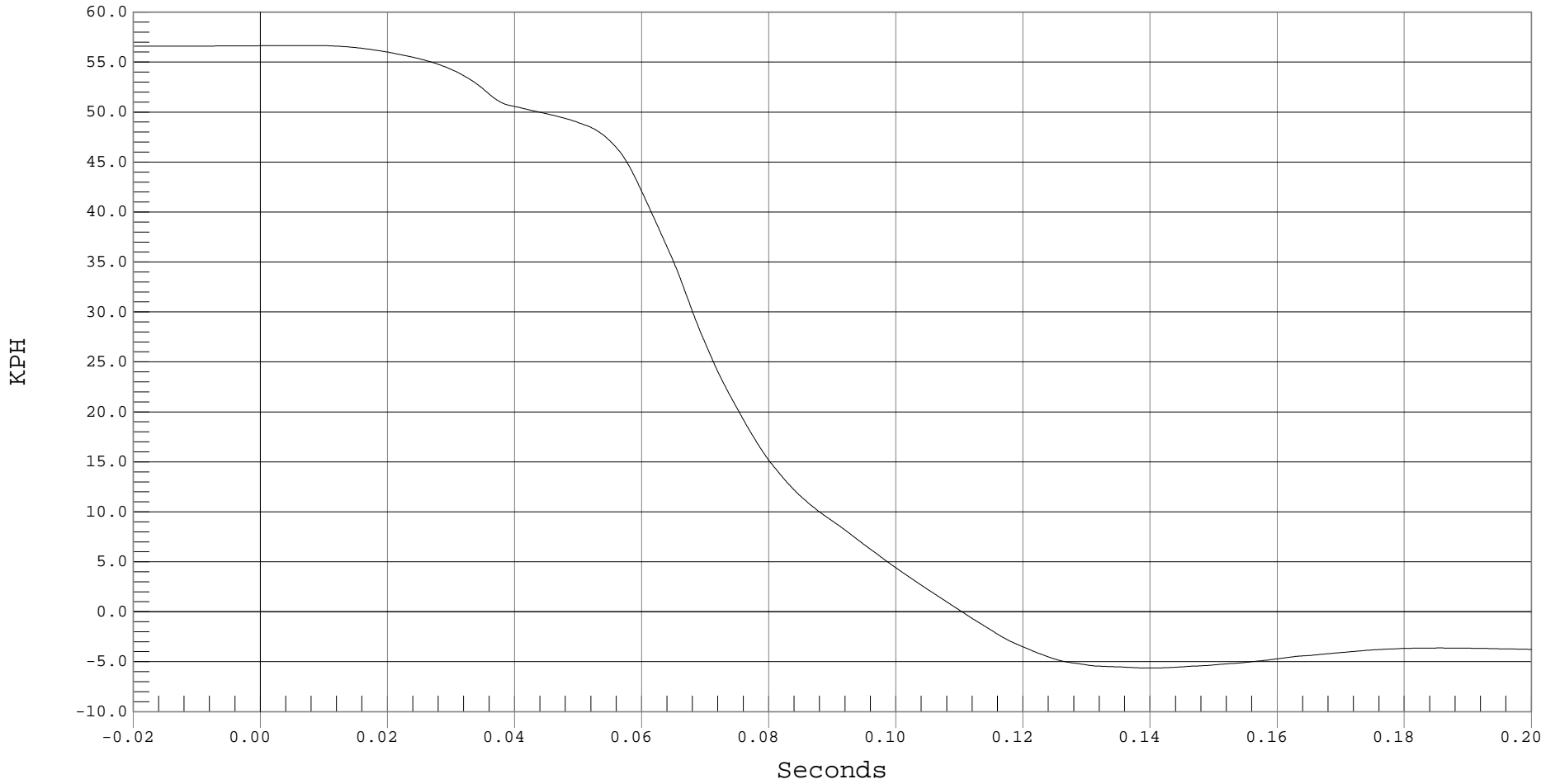
PASSENGER PELVIS X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER PELVIS X VELOCITY, B01025AI.V26

Ymin = -5.62 KPH @ 0.1404 Seconds, Ymax = 56.66 KPH @ 0.0079 Seconds





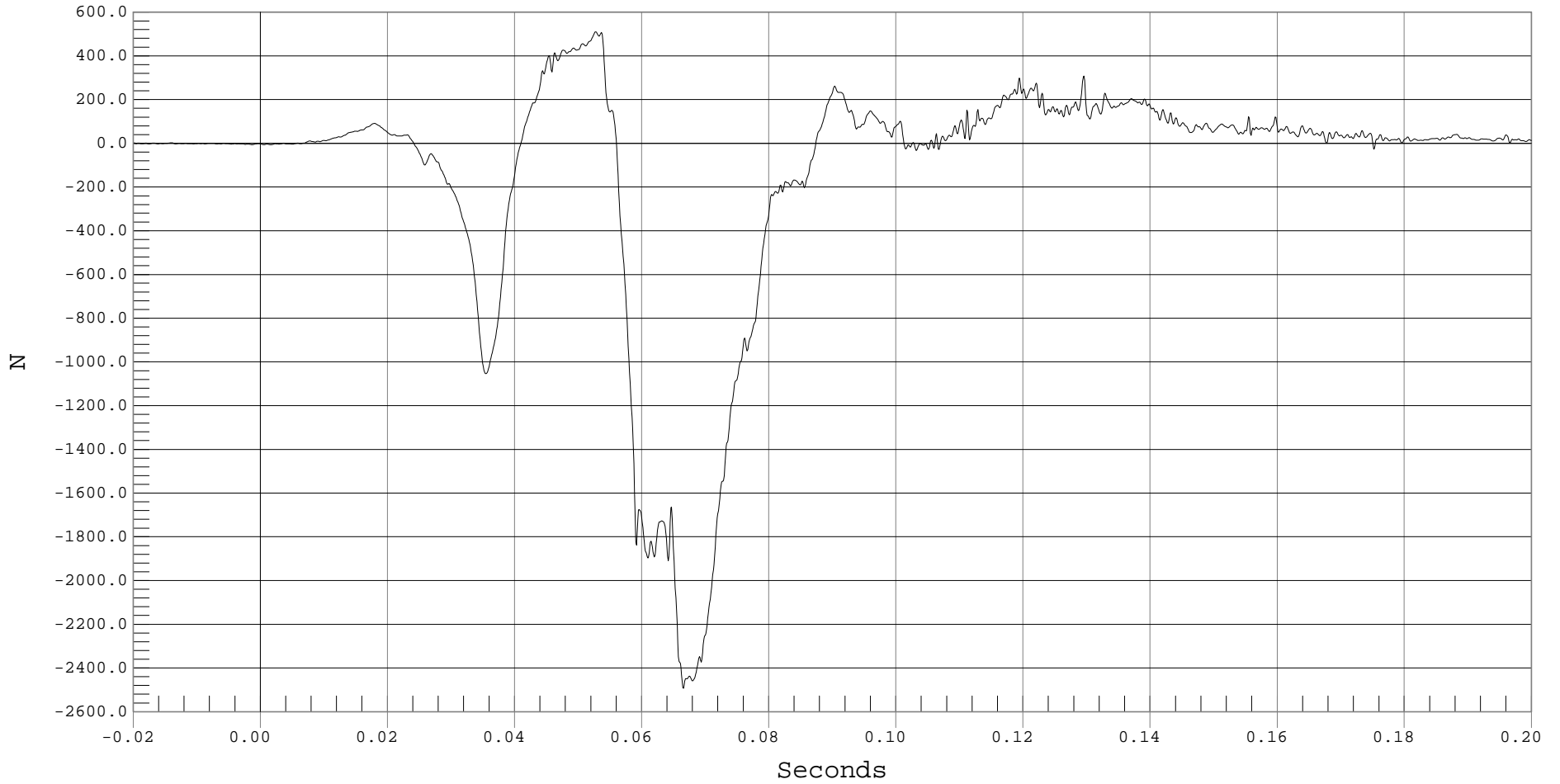
PASSENGER LEFT FEMUR FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT FEMUR, B01025FF.F30

Ymin = -2492.78 N @ 0.0665 Seconds, Ymax = 510.05 N @ 0.0527 Seconds



B-90



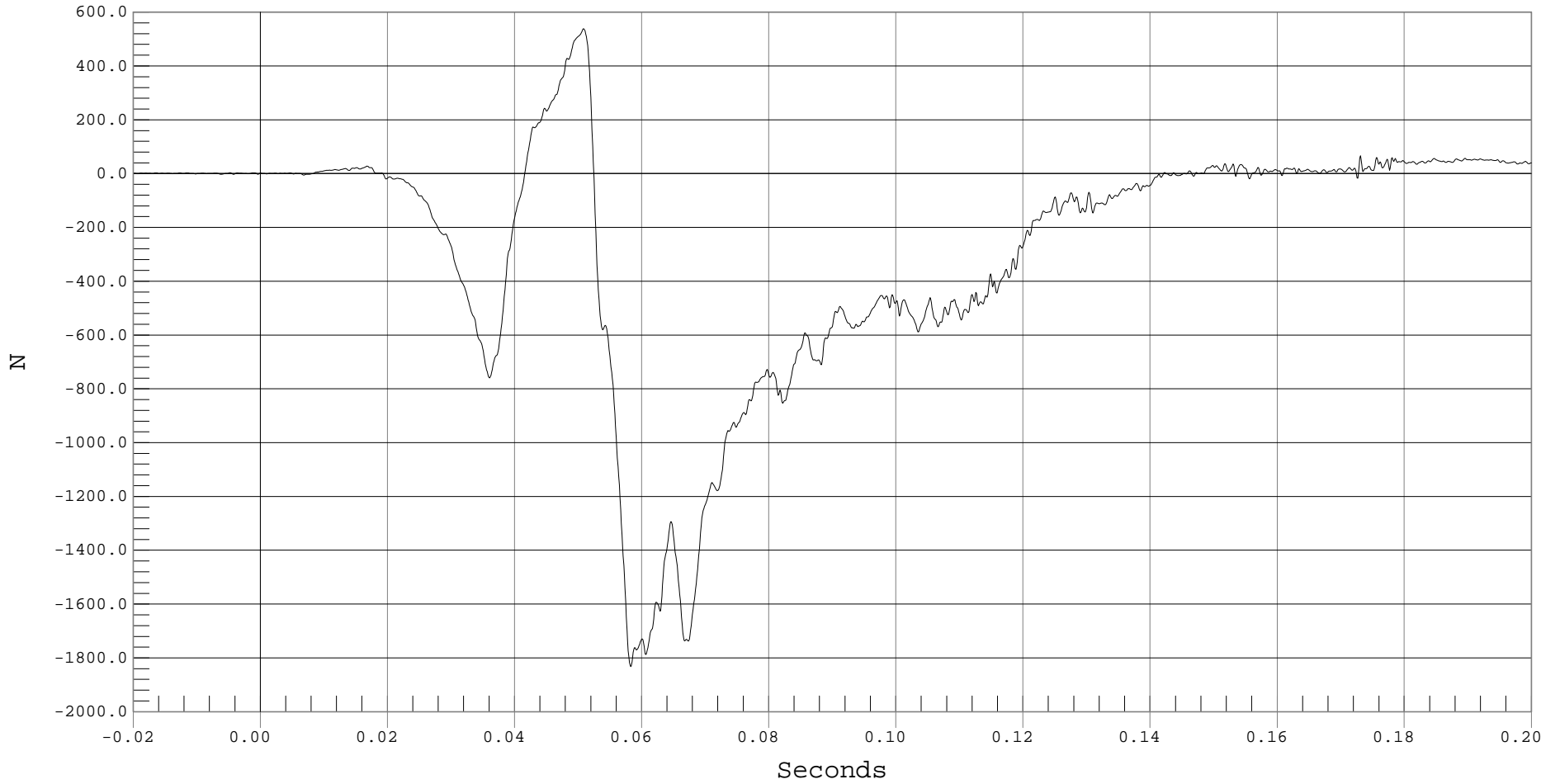
PASSENGER RIGHT FEMUR FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT FEMUR, B01025FF.F29

Ymin = -1832.57 N @ 0.0582 Seconds, Ymax = 538.13 N @ 0.0508 Seconds



B-91



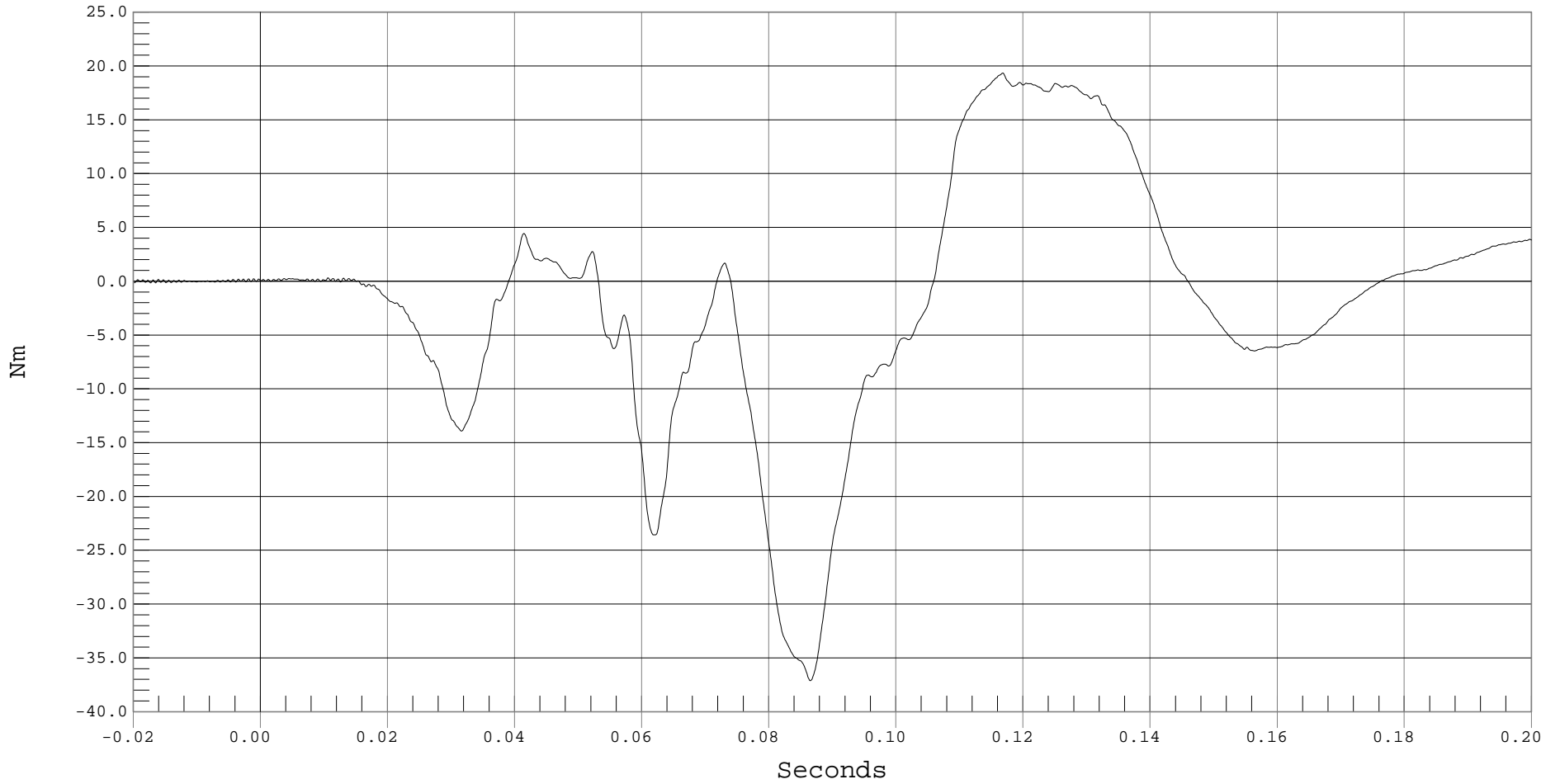
PASSENGER LEFT UPPER TIBIA MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT UPPER TIBIA MX, B01025MF.M87

Ymin = -37.12 Nm @ 0.0865 Seconds, Ymax = 19.35 Nm @ 0.1167 Seconds



B-92



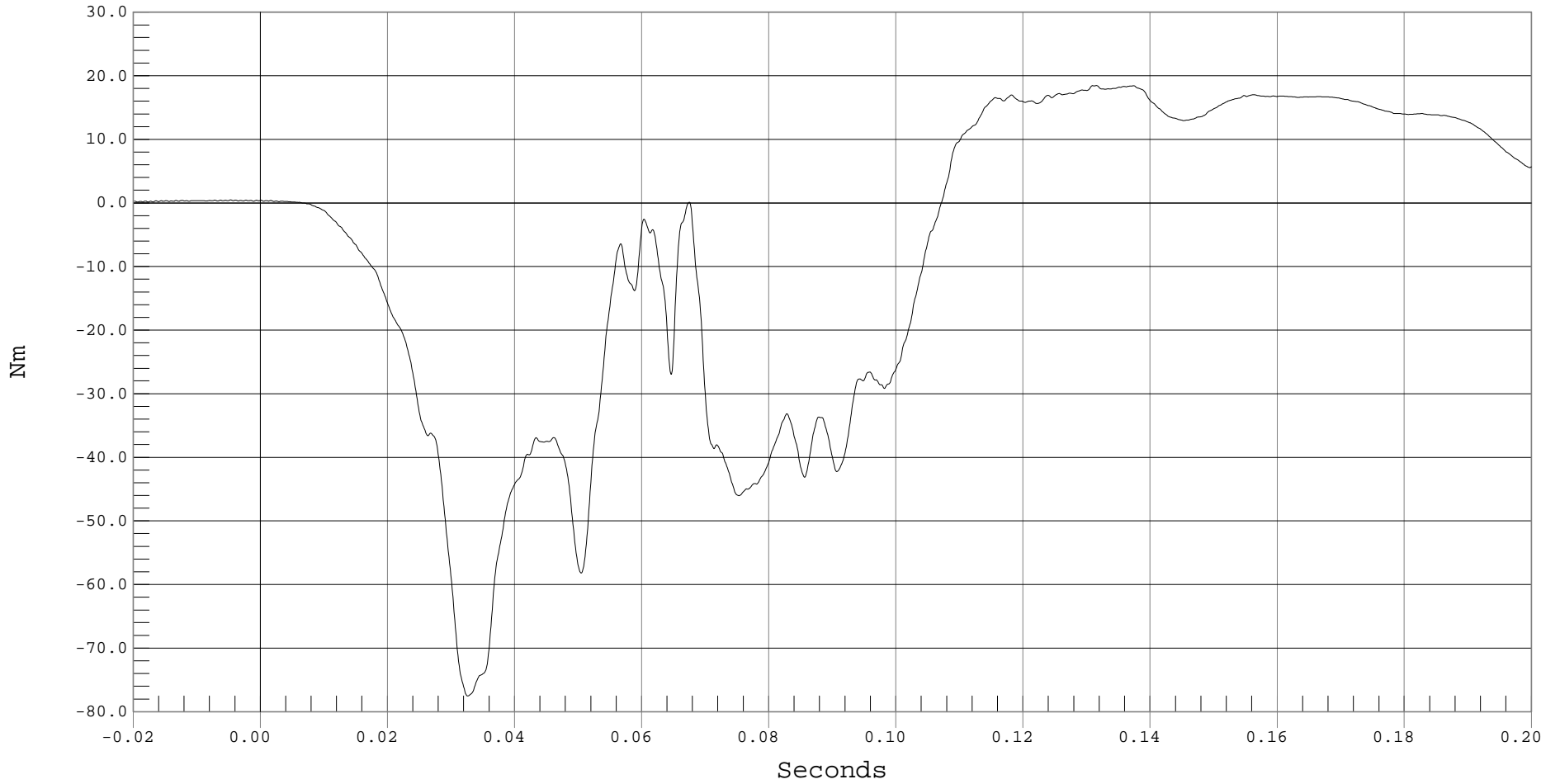
PASSENGER LEFT UPPER TIBIA MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT UPPER TIBIA MY, B01025MF.M88

Ymin = -77.54 Nm @ 0.0325 Seconds, Ymax = 18.47 Nm @ 0.1315 Seconds



B-93



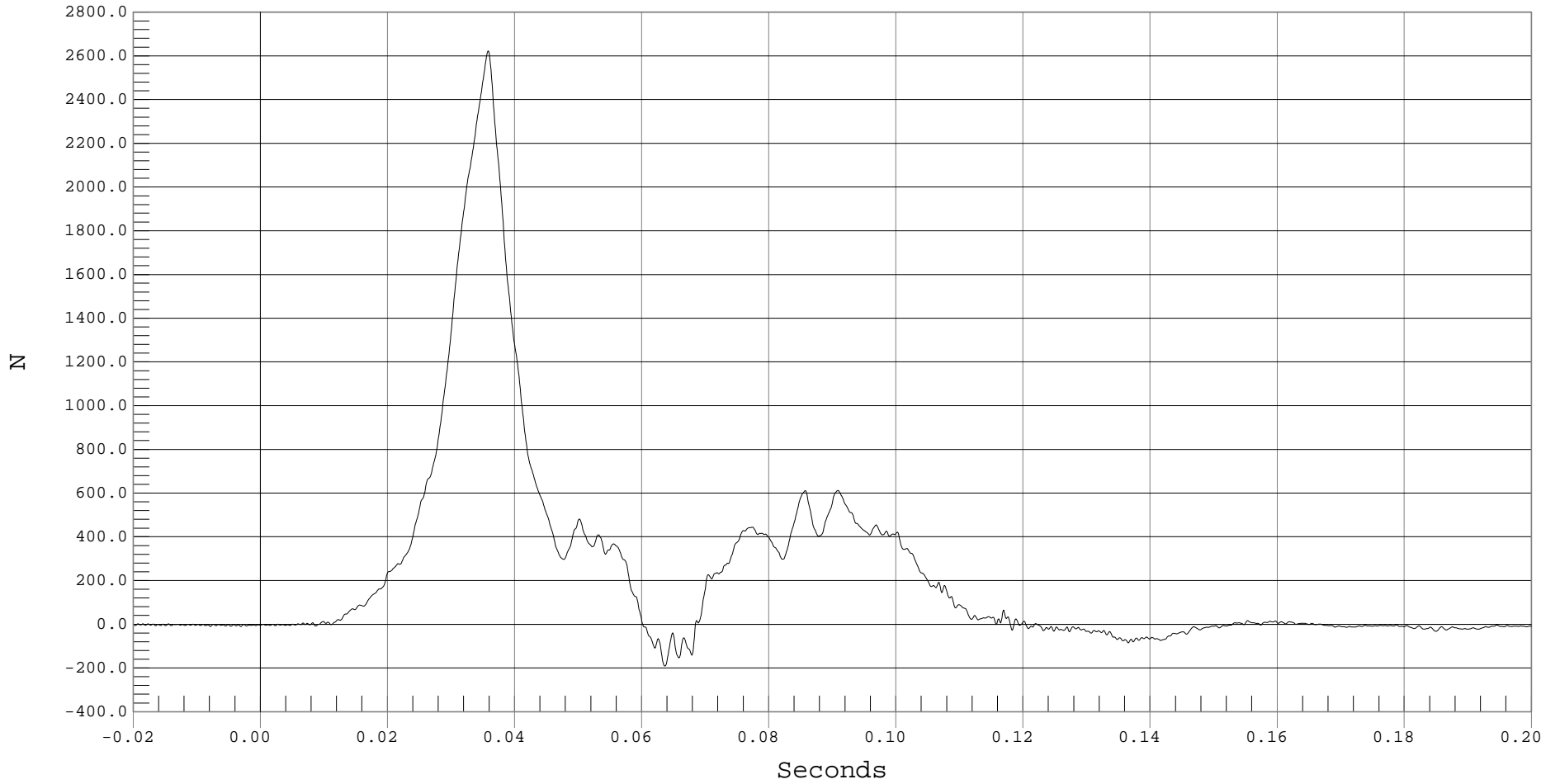
PASSENGER LEFT UPPER TIBIA FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT UPPER TIBIA FZ, B01025FF.F89

Ymin = -191.96 N @ 0.0636 Seconds, Ymax = 2622.13 N @ 0.0358 Seconds



B-94



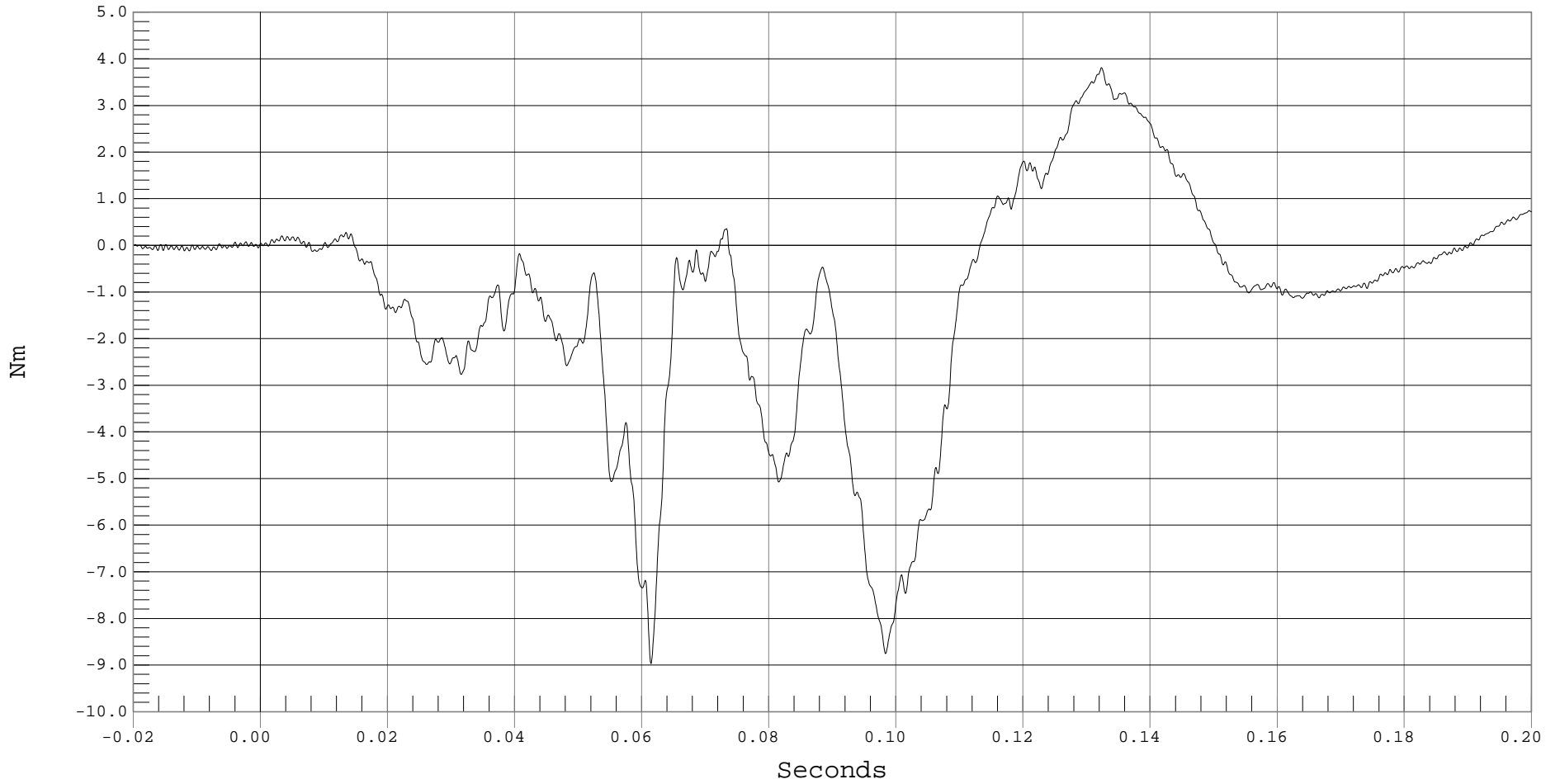
PASSENGER LEFT LOWER TIBIA MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT LOWER TIBIA MX, B01025MF.M90

Ymin = -8.97 Nm @ 0.0614 Seconds, Ymax = 3.81 Nm @ 0.1323 Seconds



B-95



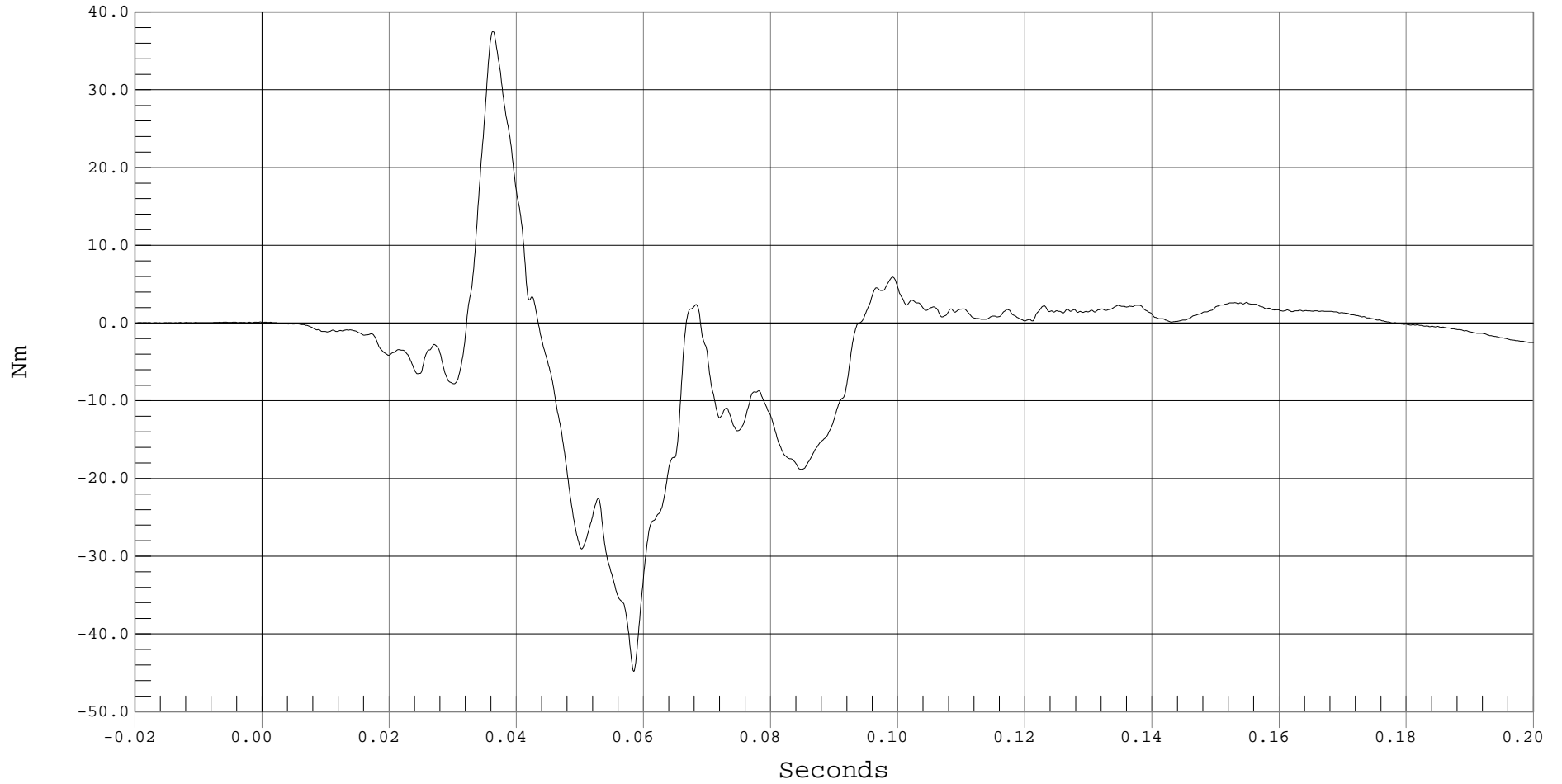
PASSENGER LEFT LOWER TIBIA MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT LOWER TIBIA MY, B01025MF.M91

Ymin = -44.83 Nm @ 0.0584 Seconds, Ymax = 37.55 Nm @ 0.0362 Seconds



B-96



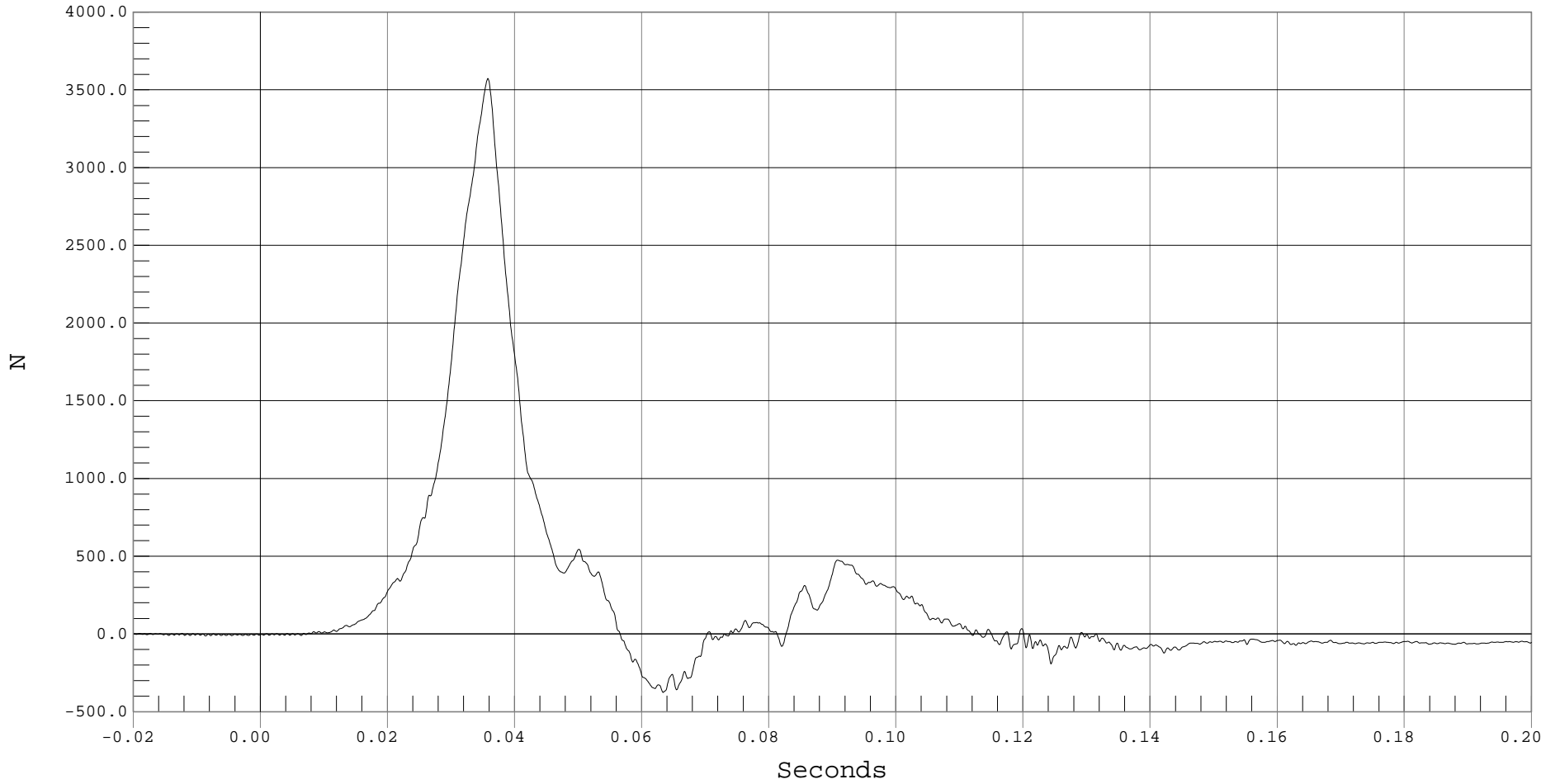
PASSENGER LEFT LOWER TIBIA FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT LOWER TIBIA FZ, B01025FF.F92

Ymin = -376.09 N @ 0.0633 Seconds, Ymax = 3573.93 N @ 0.0357 Seconds



B-97



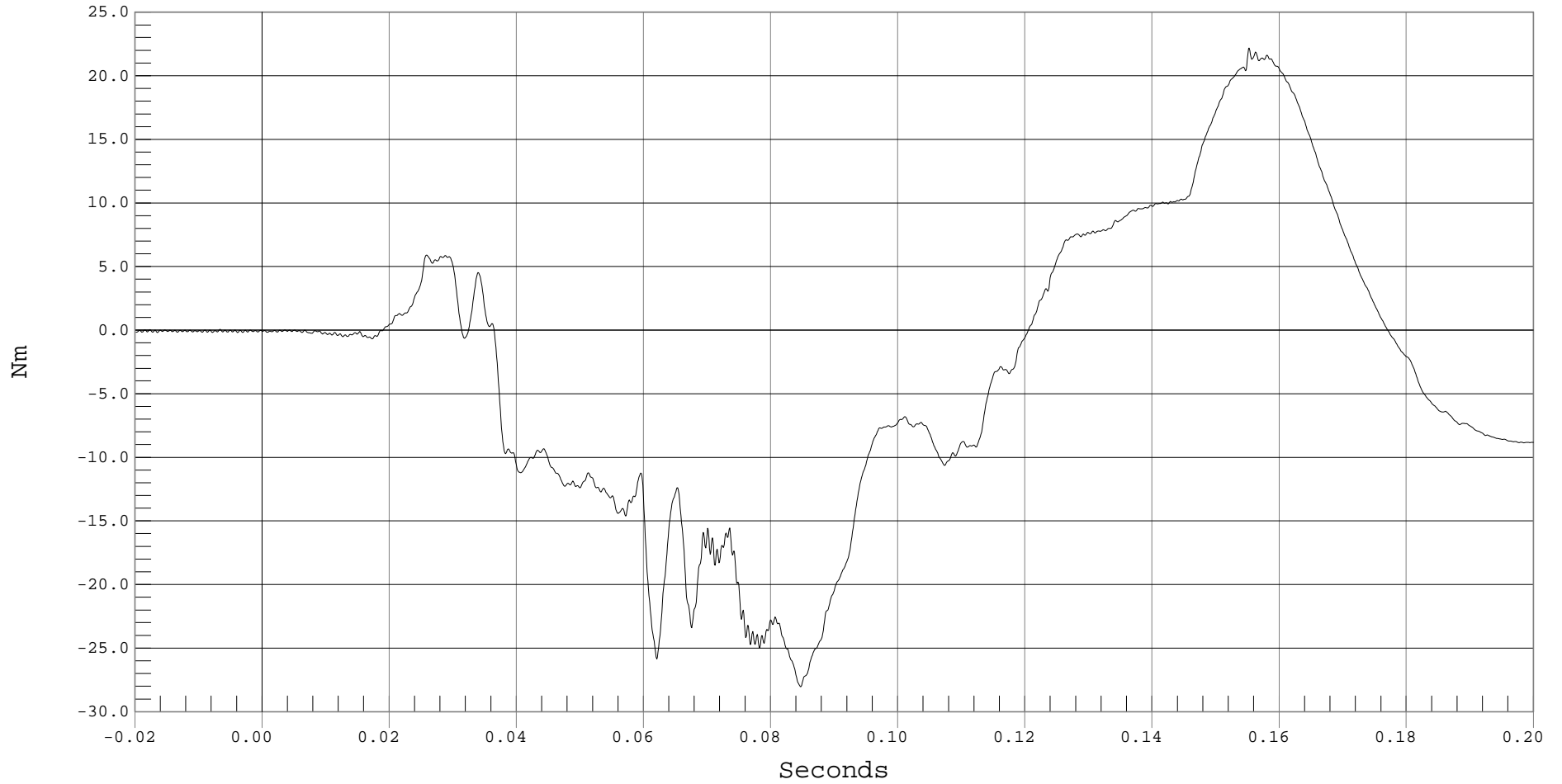
PASSENGER RIGHT UPPER TIBIA MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT UPPER TIBIA MX, B01025MF.M81

Ymin = -28.04 Nm @ 0.0847 Seconds, Ymax = 22.18 Nm @ 0.1552 Seconds



B-98



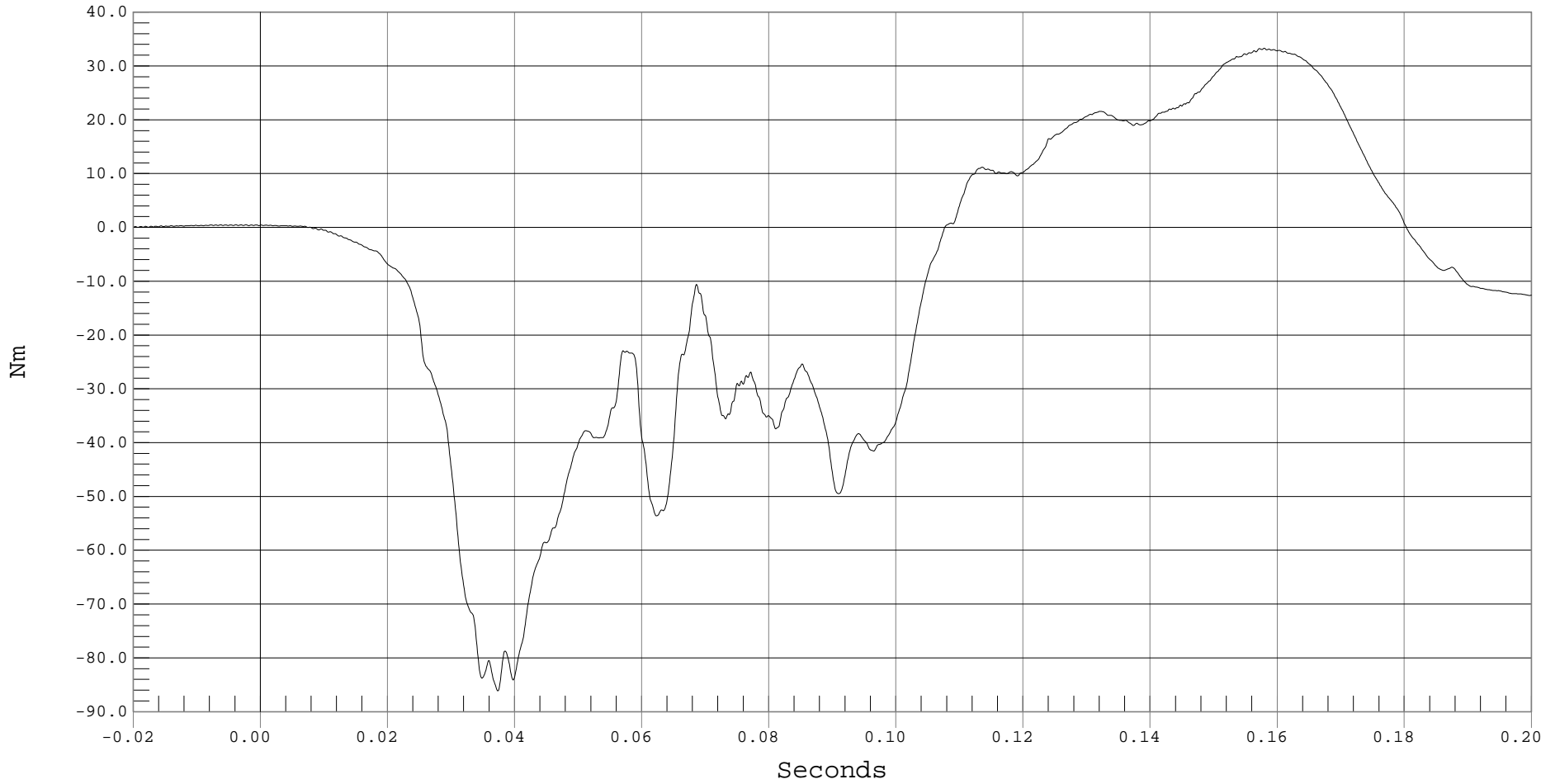
PASSENGER RIGHT UPPER TIBIA MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT UPPER TIBIA MY, B01025MF.M82

Ymin = -86.15 Nm @ 0.0373 Seconds, Ymax = 33.3 Nm @ 0.1579 Seconds



B-99



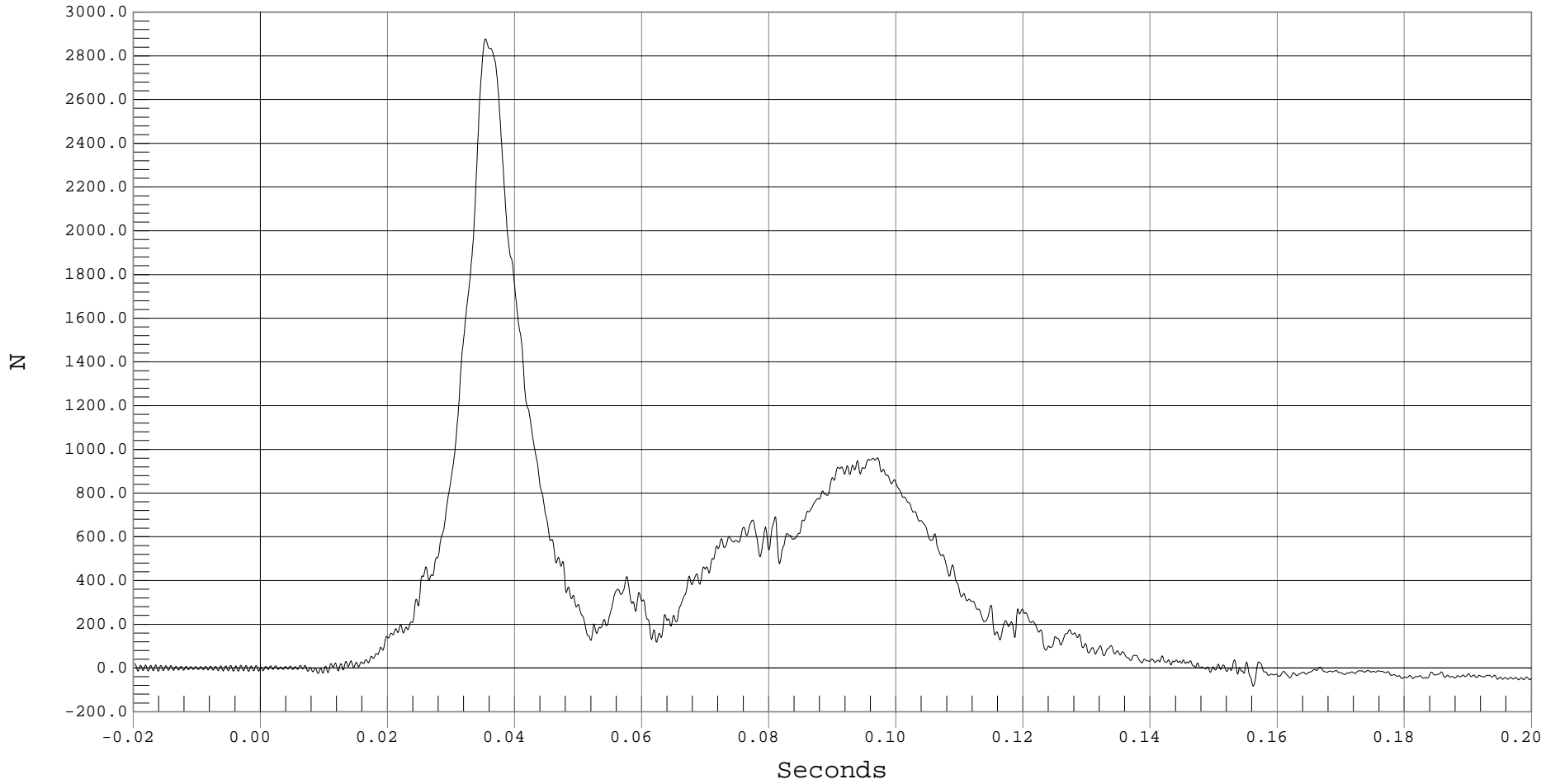
PASSENGER RIGHT UPPER TIBIA FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT UPPER TIBIA FZ, B01025FF.F83

Ymin = -83.69 N @ 0.1561 Seconds, Ymax = 2878.2 N @ 0.0353 Seconds



B-100



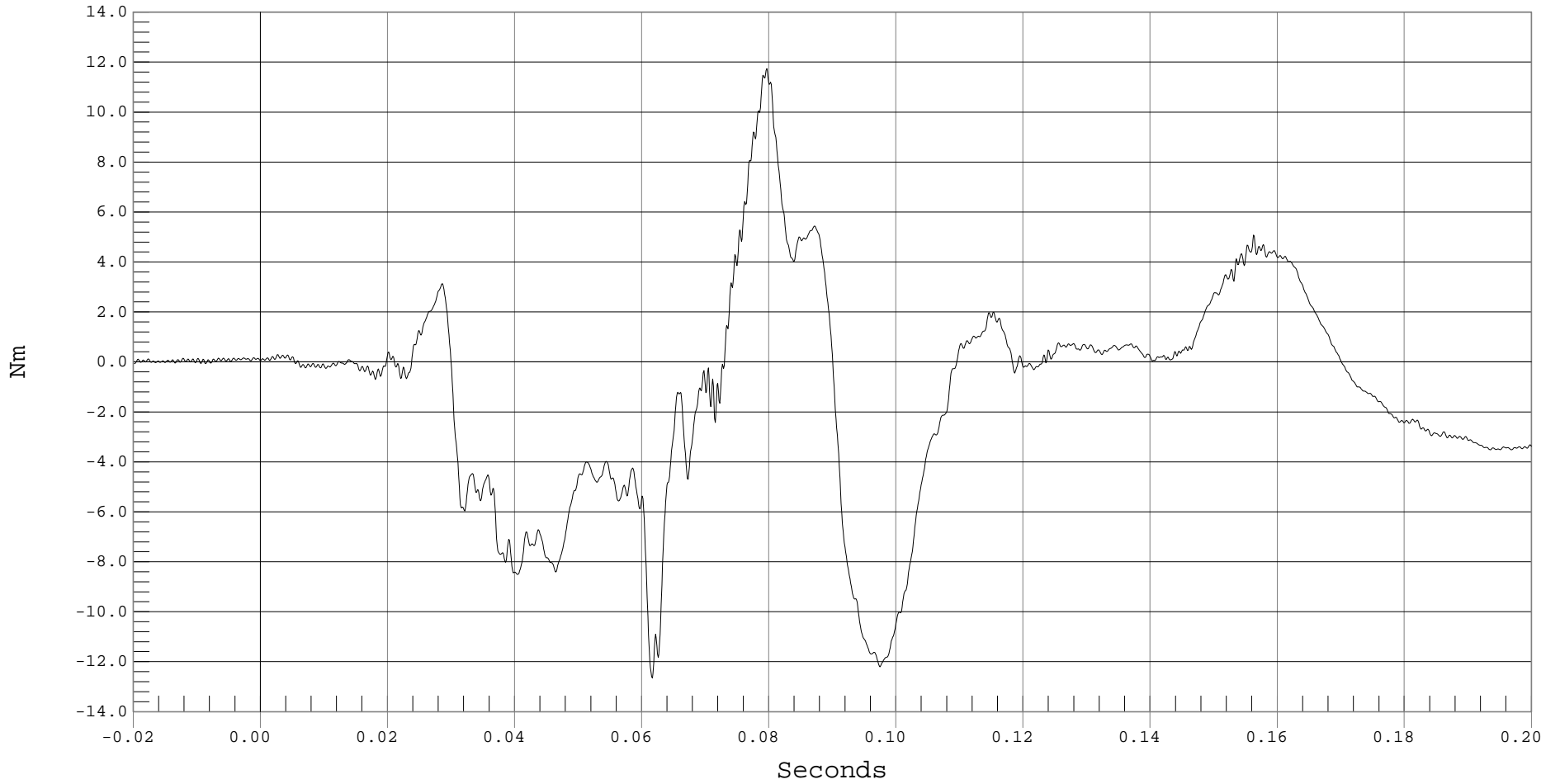
PASSENGER RIGHT LOWER TIBIA MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT LOWER TIBIA MX, B01025MF.M84

Ymin = -12.66 Nm @ 0.0616 Seconds, Ymax = 11.74 Nm @ 0.0796 Seconds



B-101



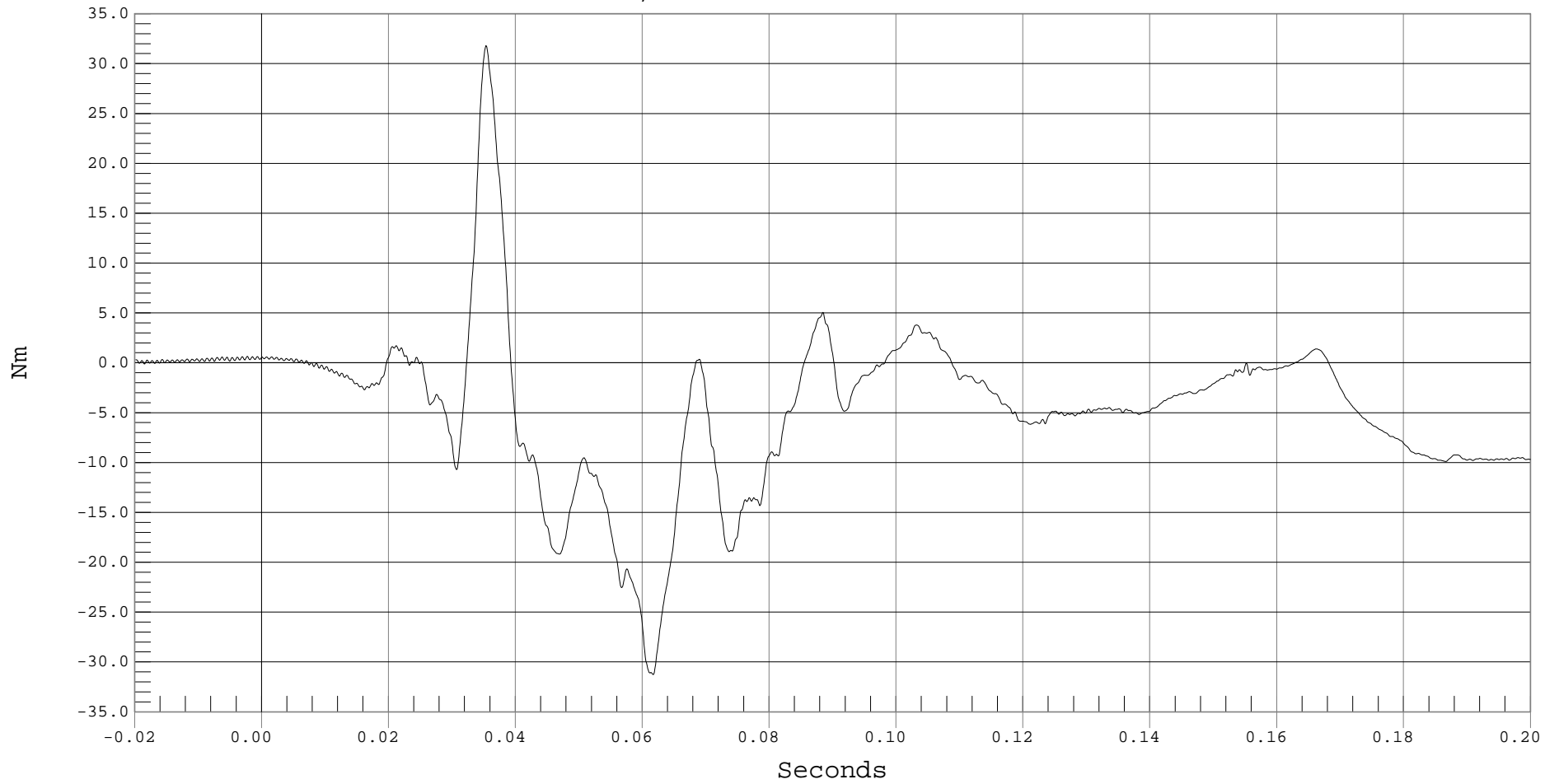
PASSENGER RIGHT LOWER TIBIA MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT LOWER TIBIA MY, B01025MF.M85

Ymin = -31.27 Nm @ 0.0616 Seconds, Ymax = 31.8 Nm @ 0.0353 Seconds



B-102



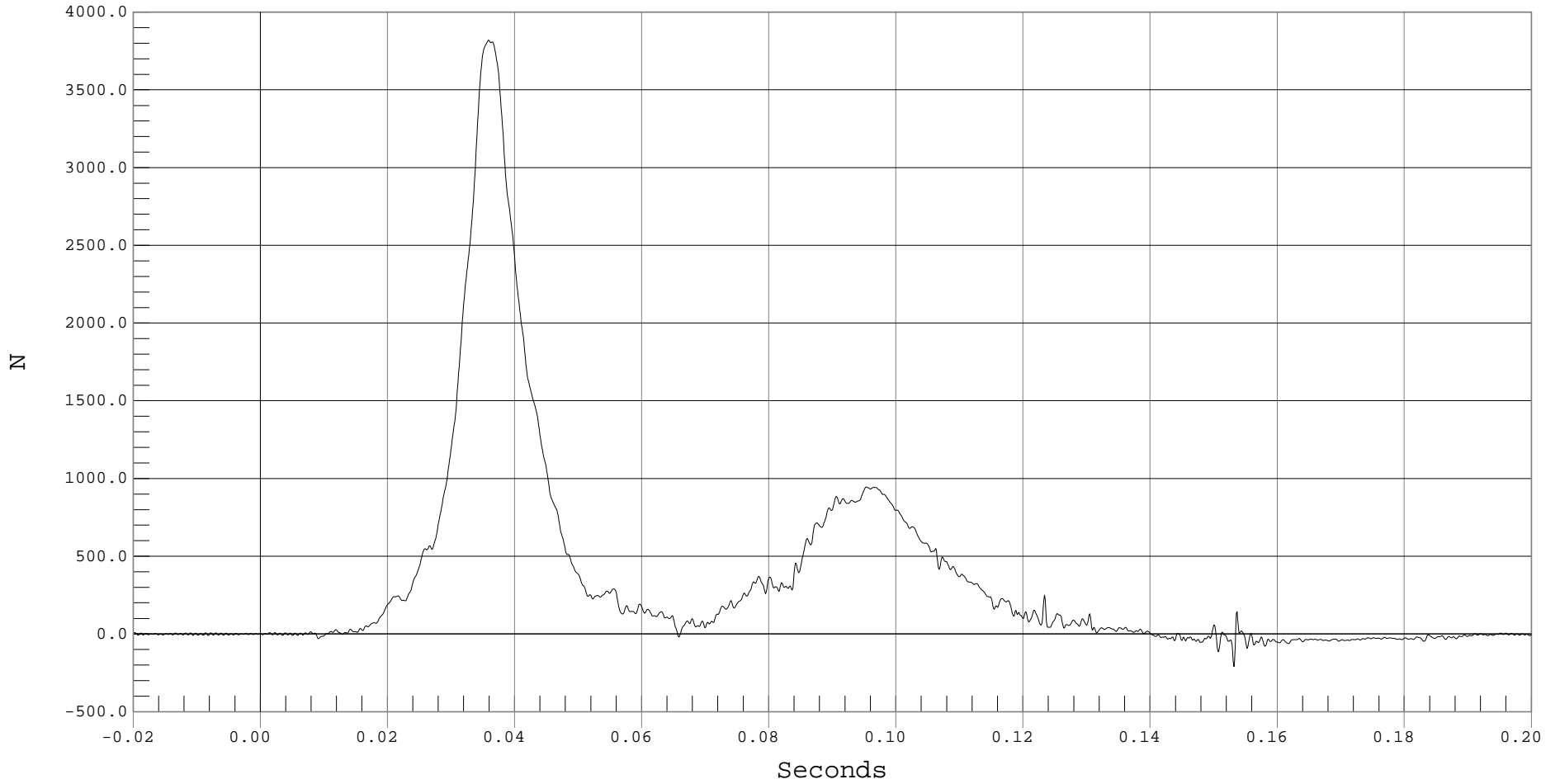
PASSENGER RIGHT LOWER TIBIA FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT LOWER TIBIA FZ, B01025FF.F86

Ymin = -209.9 N @ 0.1531 Seconds, Ymax = 3819.86 N @ 0.0358 Seconds



B-103



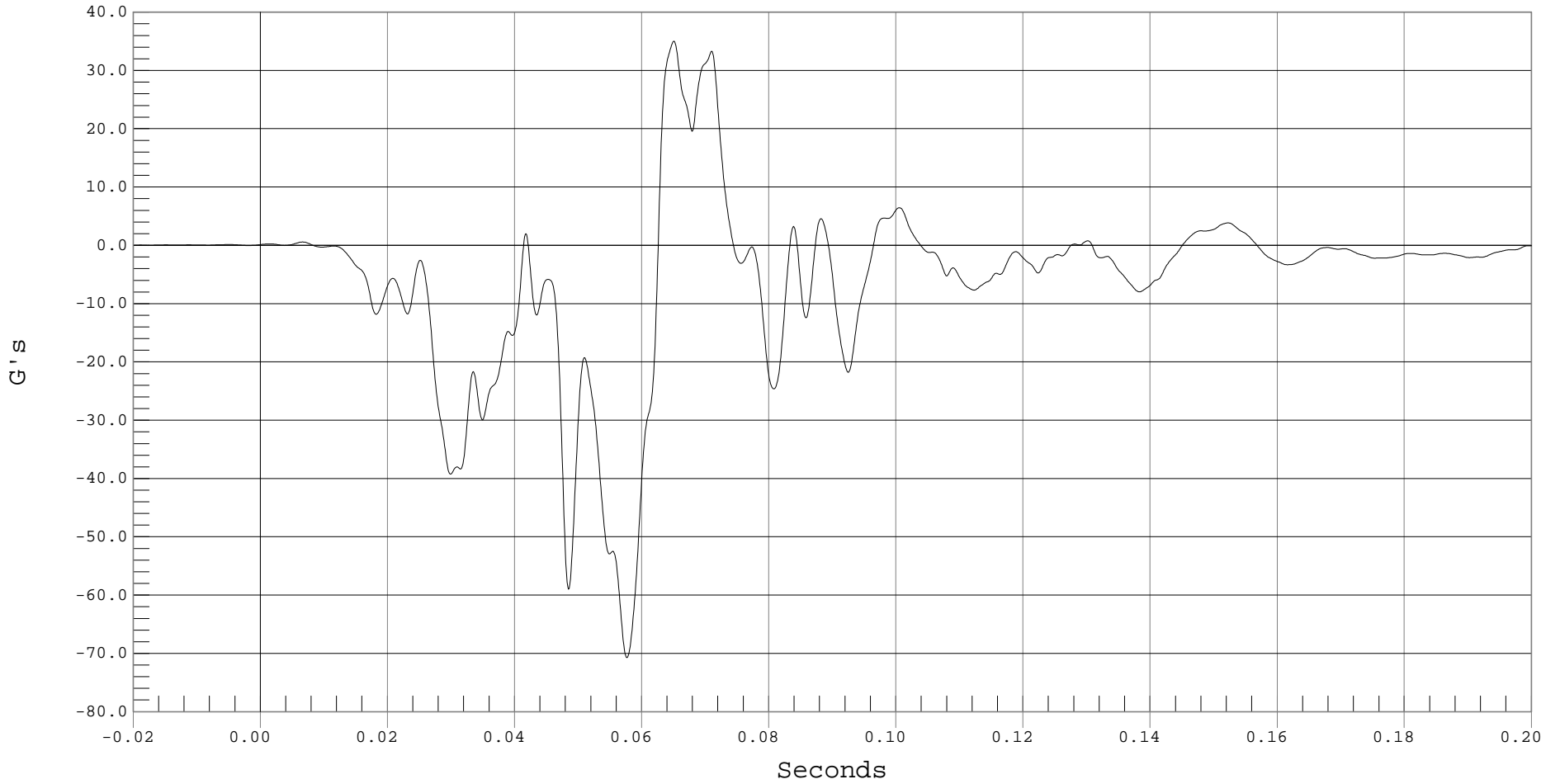
PASSENGER LEFT FOOT @ BALL Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER LEFT FOOT @ BALL Z, B01025AF.A09

Ymin = -70.75 G's @ 0.0576 Seconds, Ymax = 35.03 G's @ 0.0650 Seconds



B-104



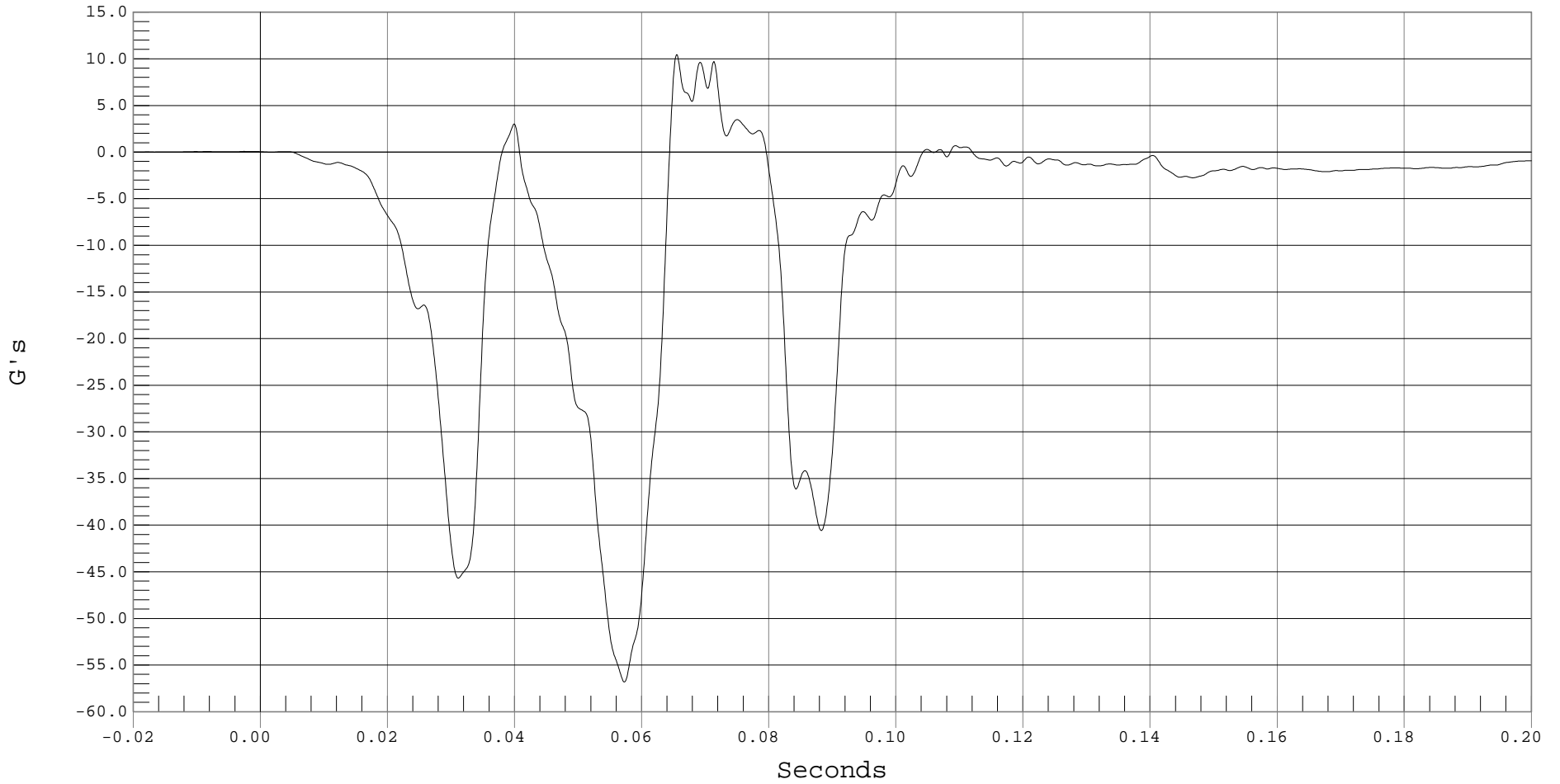
PASSENGER LEFT FOOT @ HEEL X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER LEFT FOOT @ HEEL X, B01025AF.A07

Ymin = -56.83 G's @ 0.0572 Seconds, Ymax = 10.45 G's @ 0.0654 Seconds



B-105



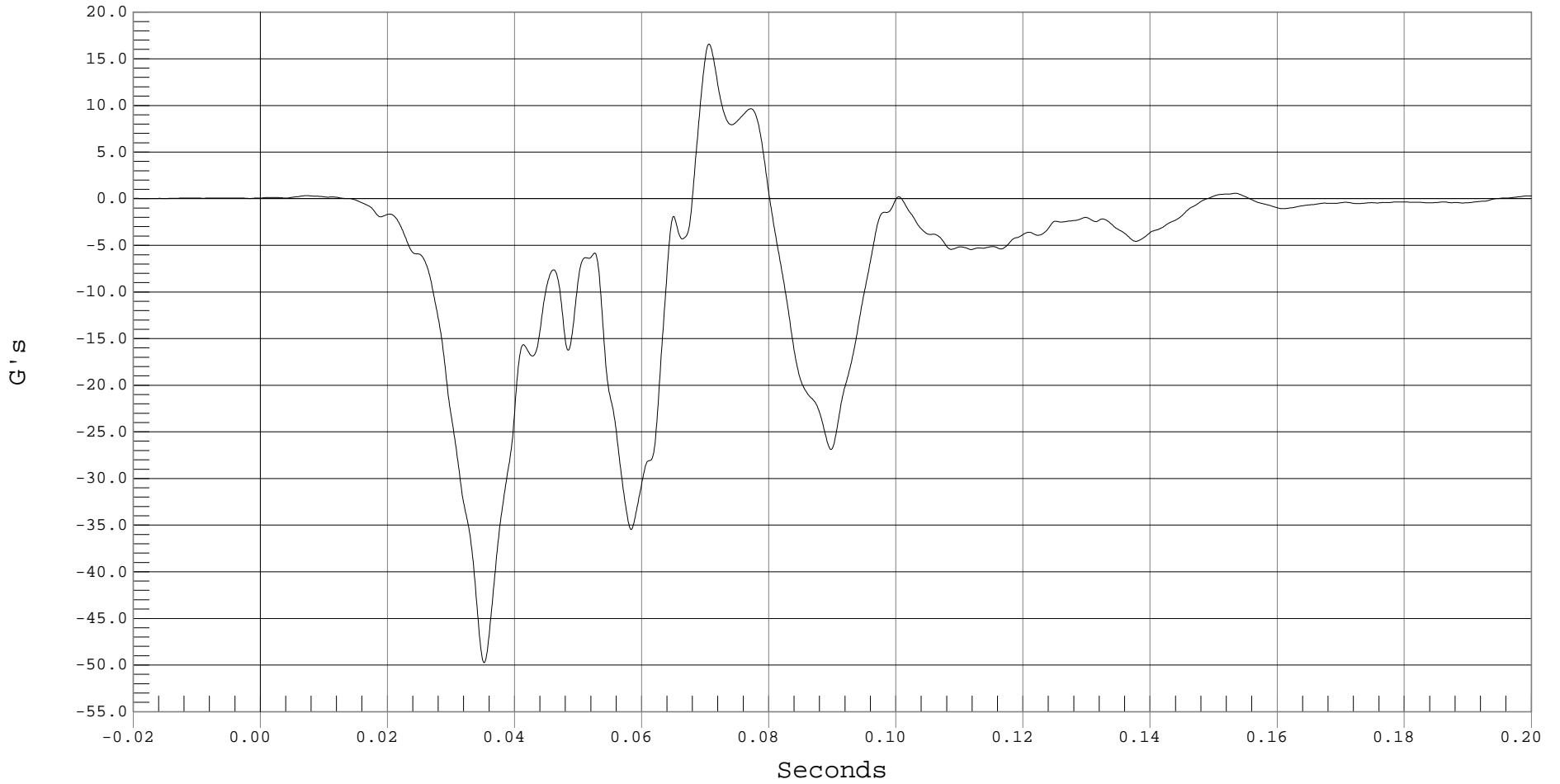
PASSENGER LEFT FOOT @ HEEL Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER LEFT FOOT @ HEEL Z, B01025AF.A08

Ymin = -49.74 G's @ 0.0351 Seconds, Ymax = 16.59 G's @ 0.0705 Seconds



B-106



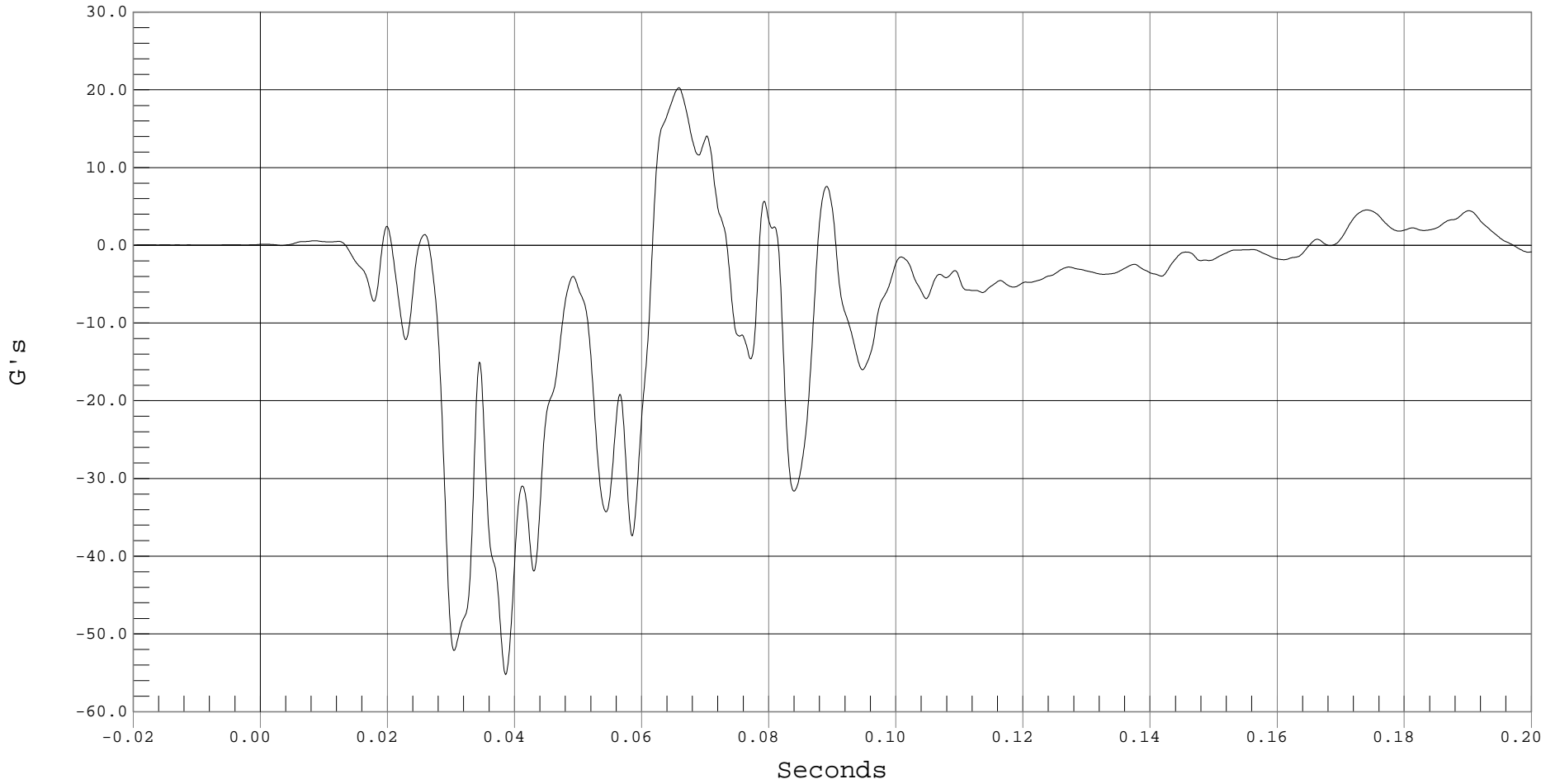
PASSENGER RIGHT FOOT @ BALL Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER RIGHT FOOT @ BALL Z, B01025AF.A06

Ymin = -55.22 G's @ 0.0385 Seconds, Ymax = 20.28 G's @ 0.0658 Seconds



B-107



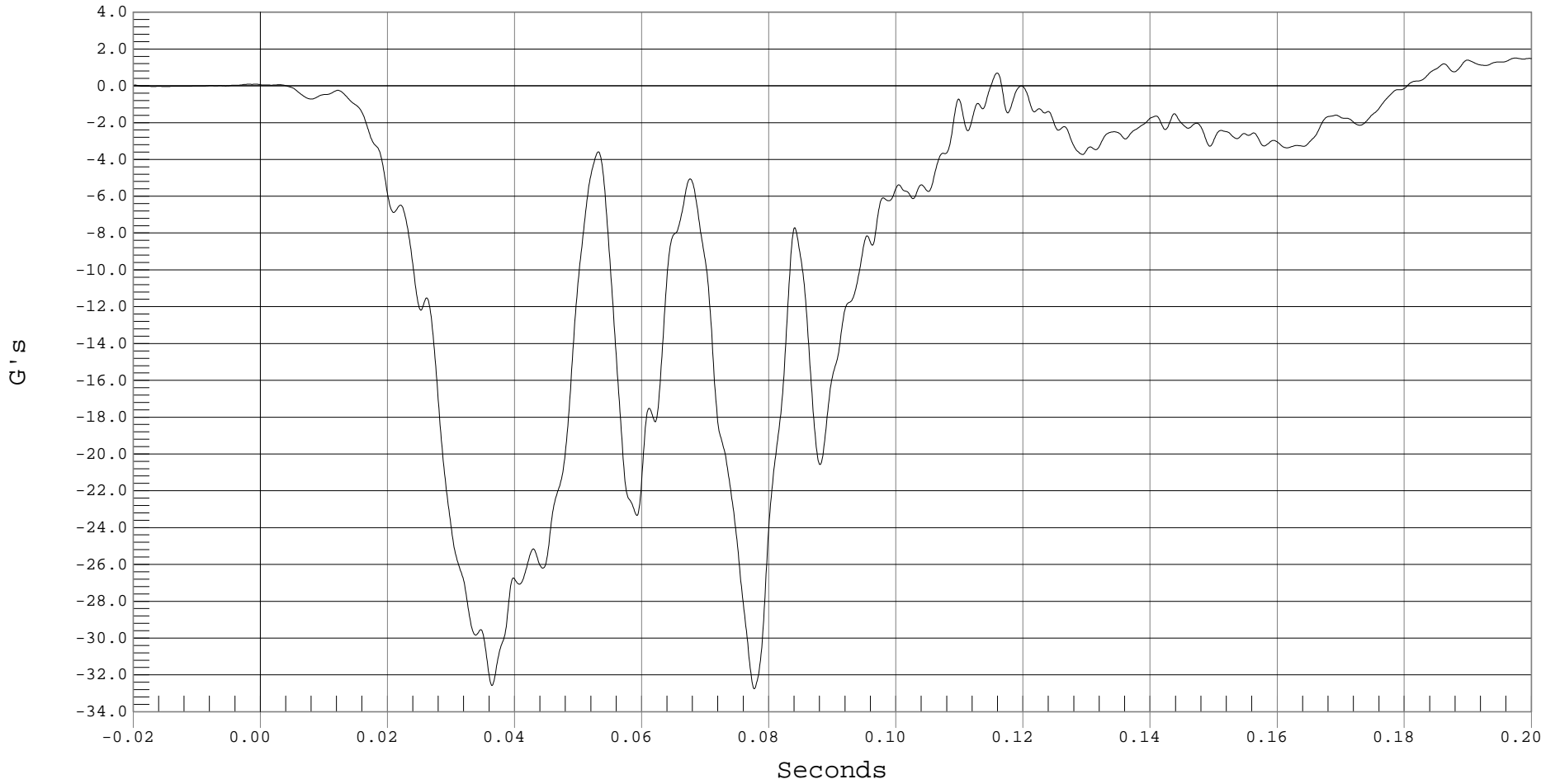
PASSENGER RIGHT FOOT @ HEEL X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER RIGHT FOOT @ HEEL X, B01025AF.A04

Ymin = -32.76 G's @ 0.0776 Seconds, Ymax = 1.5 G's @ 0.1974 Seconds



B-108



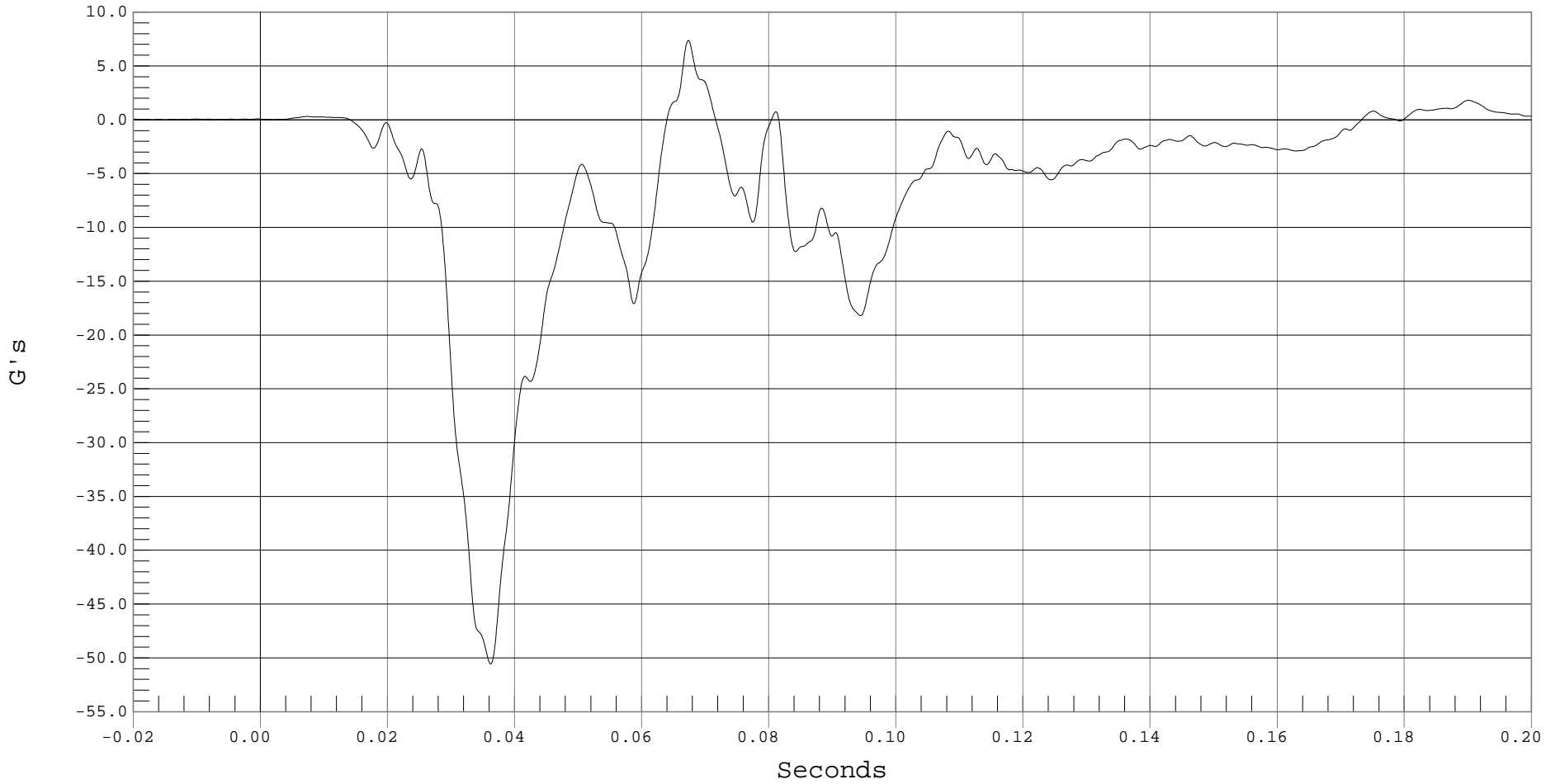
PASSENGER RIGHT FOOT @ HEEL Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 PASSENGER RIGHT FOOT @ HEEL Z, B01025AF.A05

Ymin = -50.56 G's @ 0.0362 Seconds, Ymax = 7.37 G's @ 0.0672 Seconds



B-109



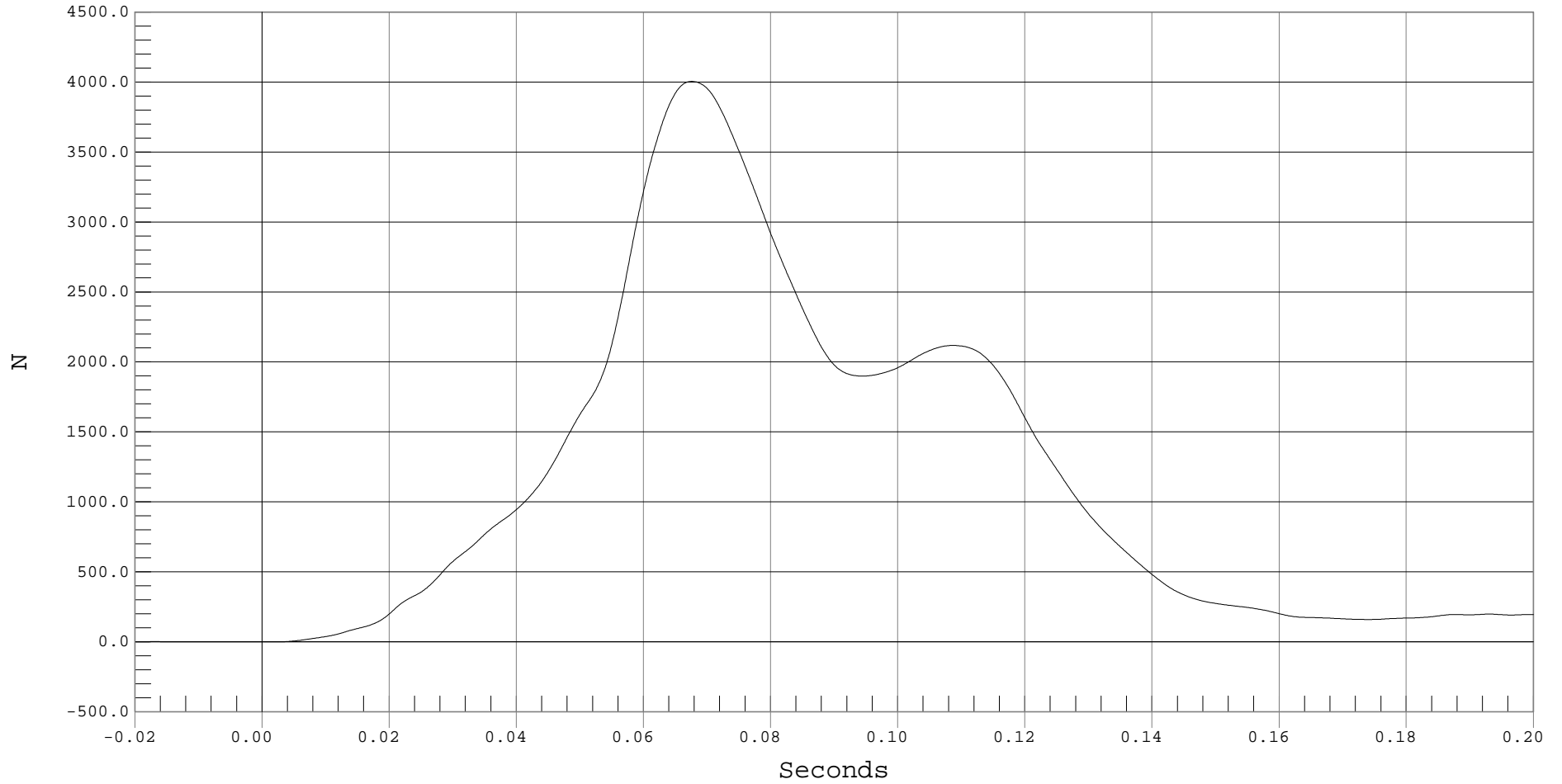
PASSENGER LAP BELT FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 PASSENGER LAP BELT, B01025FF.F68

Ymin = -1.07 N @ 0.0001 Seconds, Ymax = 4005.13 N @ 0.0675 Seconds



B-110



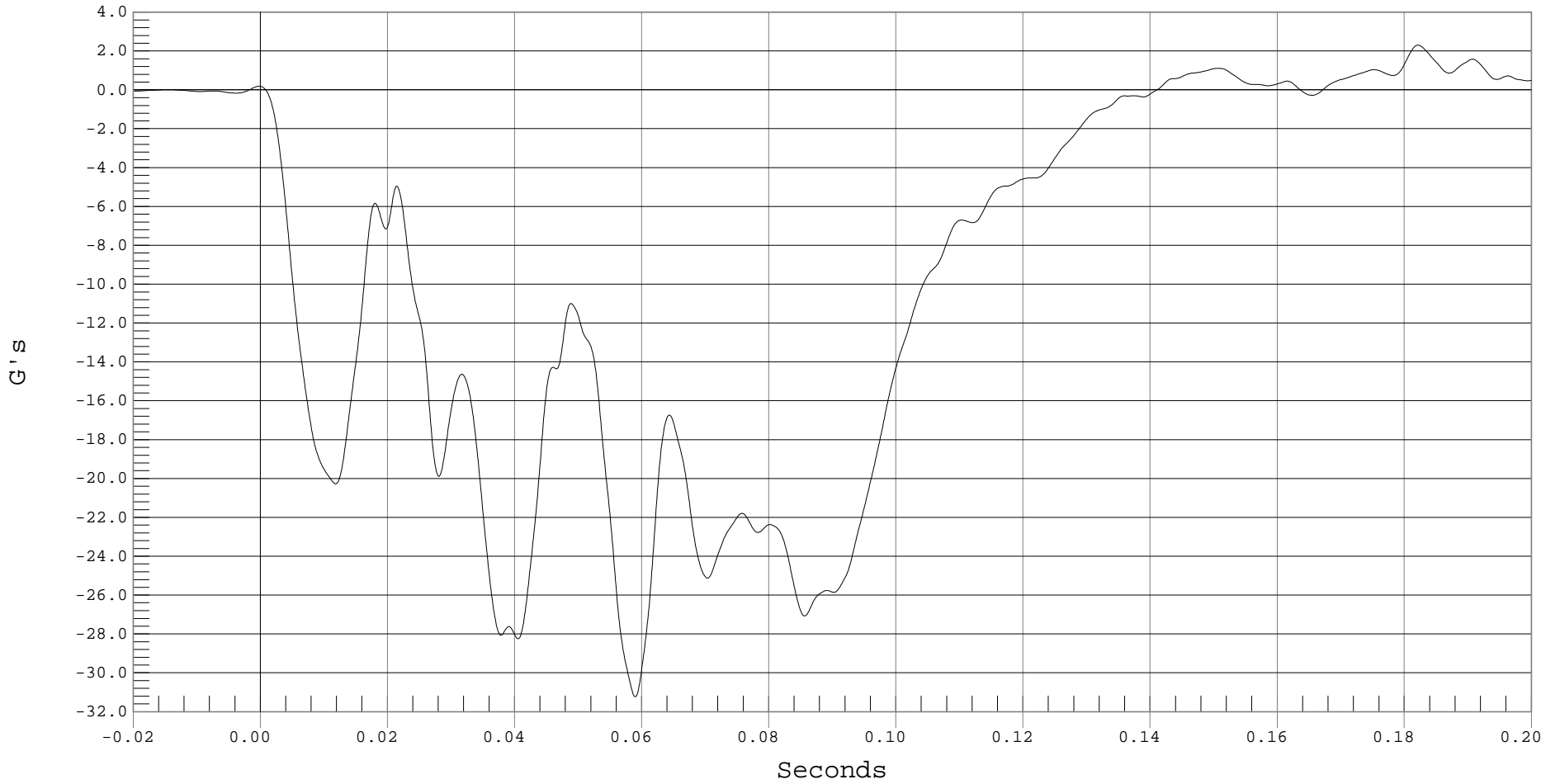
LEFT REAR SEAT CROSSMEMBER X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 LEFT REAR SEAT CROSSMEMBER X, B01025AF.A59

Ymin = -31.24 G's @ 0.0589 Seconds, Ymax = 2.3 G's @ 0.1821 Seconds



B-111



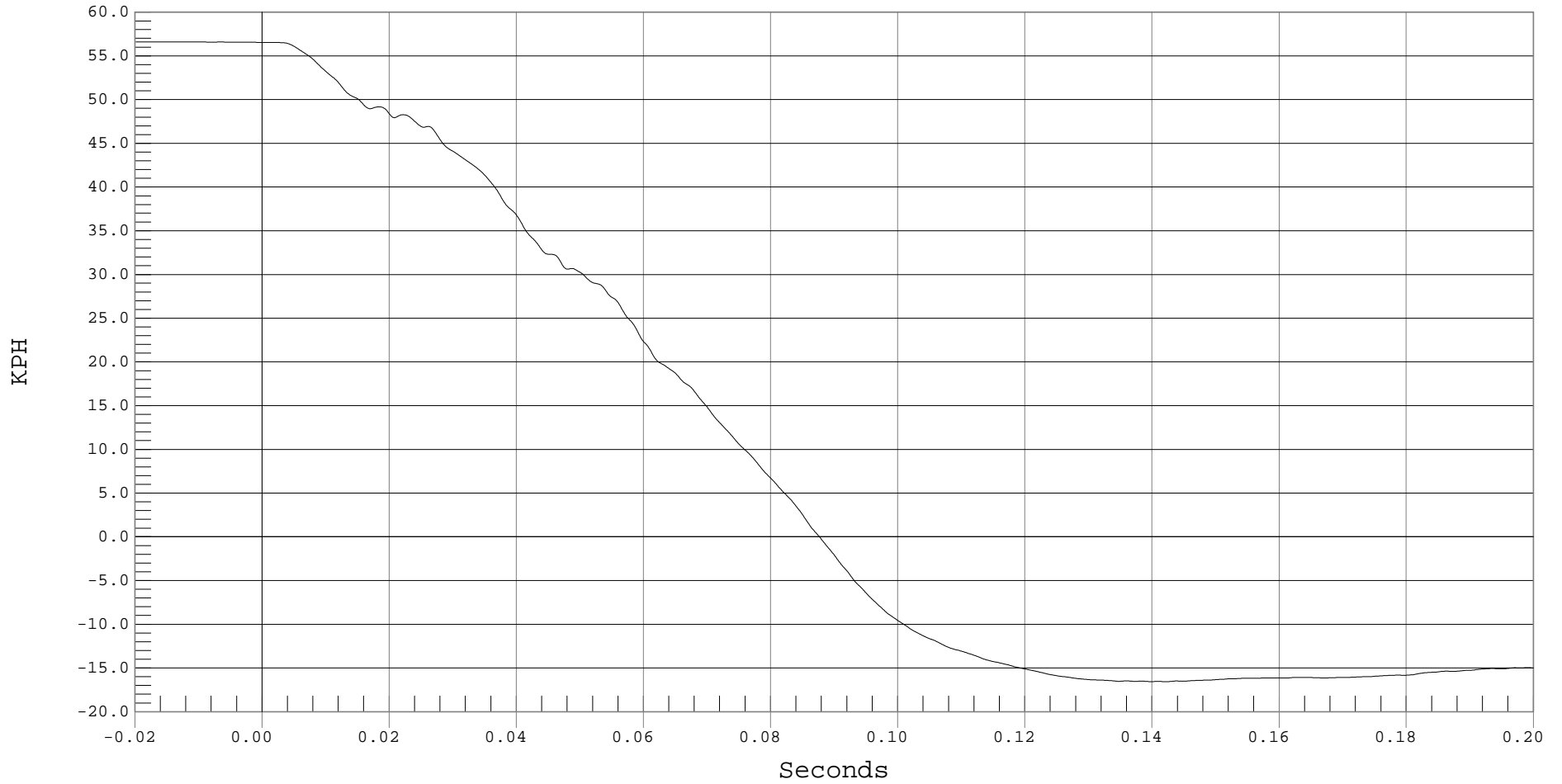
LEFT REAR SEAT CROSSMEMBER X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LEFT REAR SEAT CROSSMEMBER X VELOCITY, B01025AI.V59

Ymin = -16.58 KPH @ 0.1421 Seconds, Ymax = 56.6 KPH @ -0.0199 Seconds



B-112



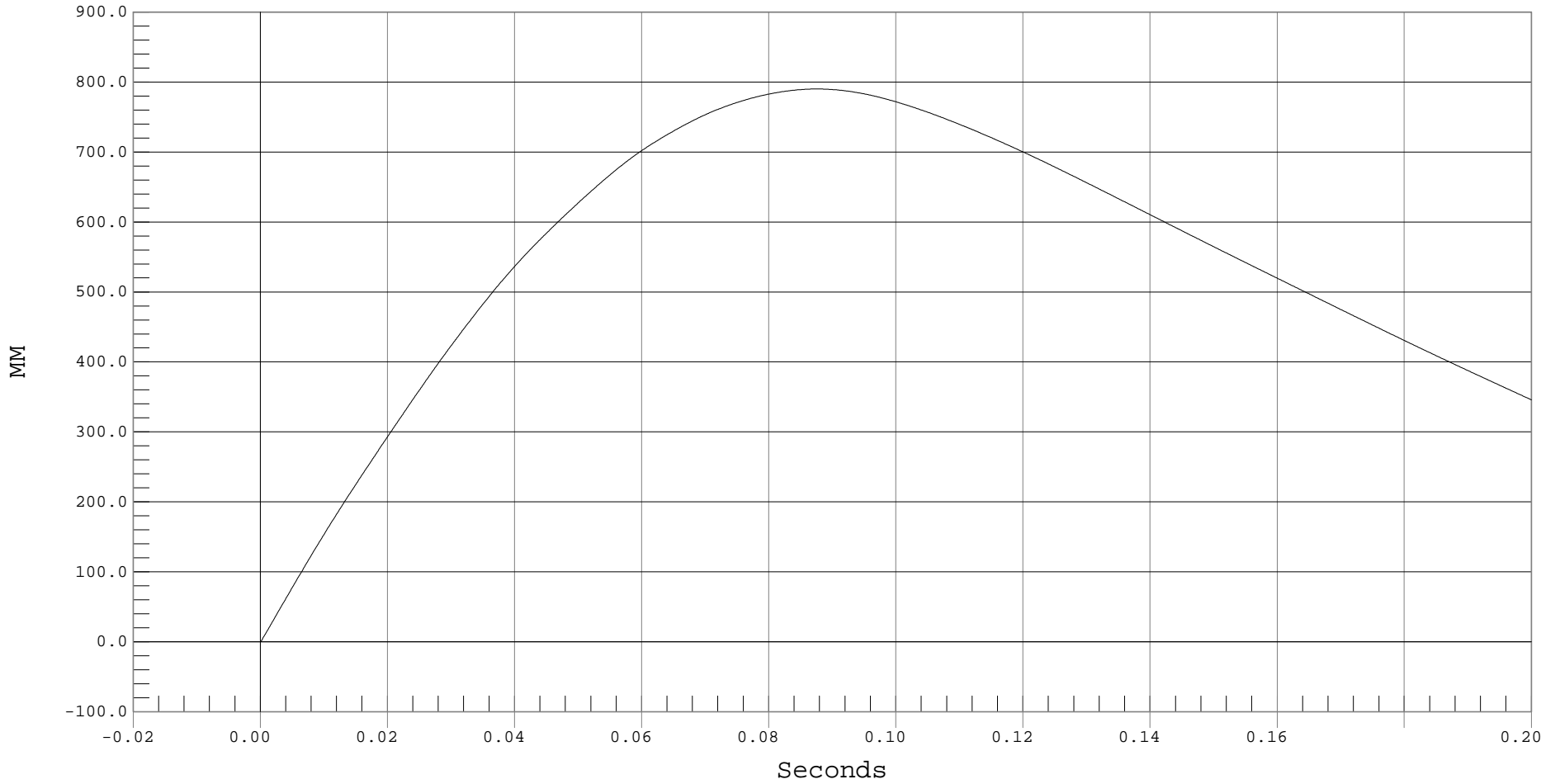
LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT, B01025AI.D59

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 790.08 MM @ 0.0875 Seconds



B-113



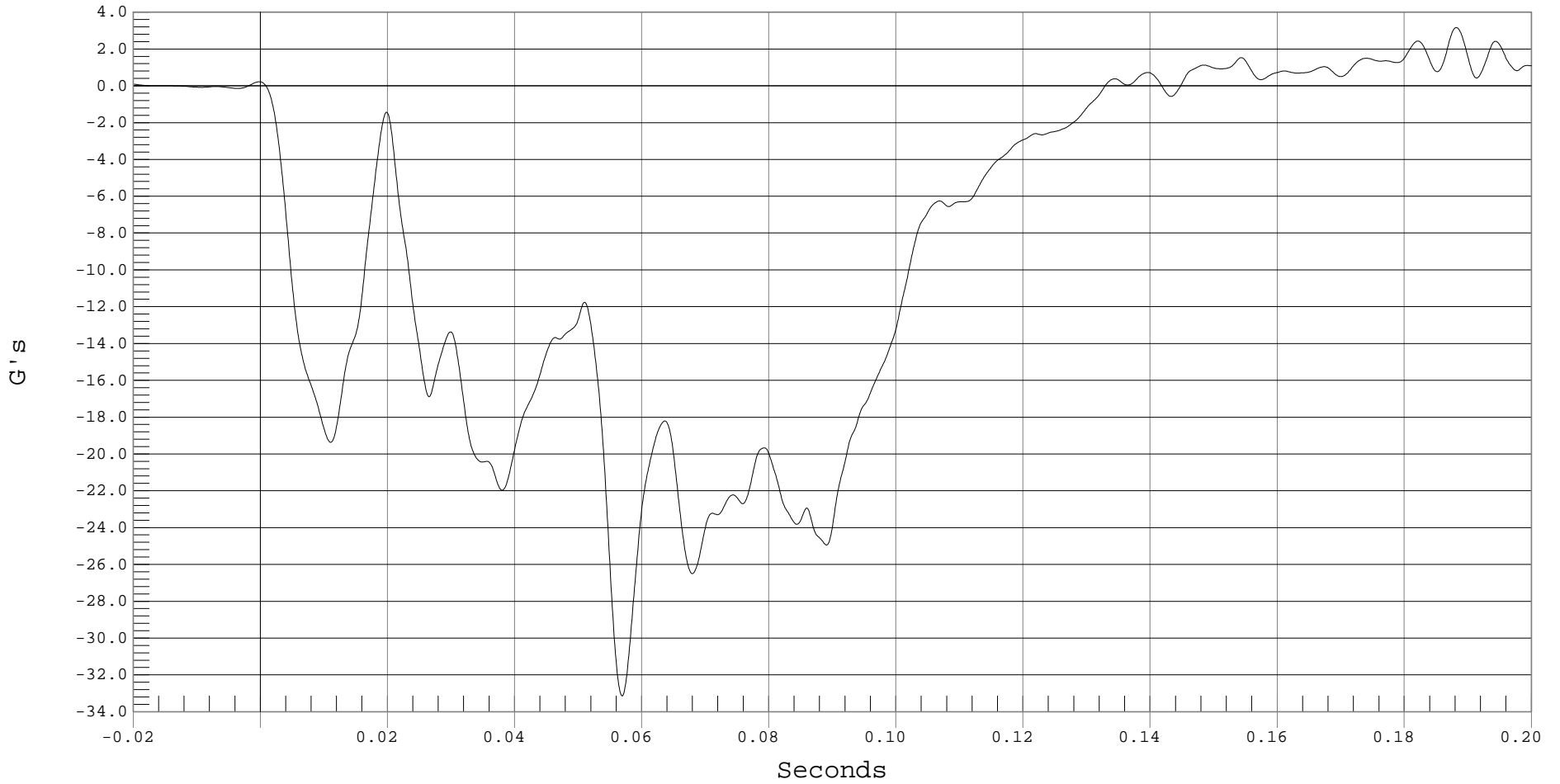
RIGHT REAR SEAT CROSSMEMBER X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 RIGHT REAR SEAT CROSSMEMBER X, B01025AF.A58

Ymin = -33.15 G's @ 0.0568 Seconds, Ymax = 3.17 G's @ 0.1881 Seconds



B-114



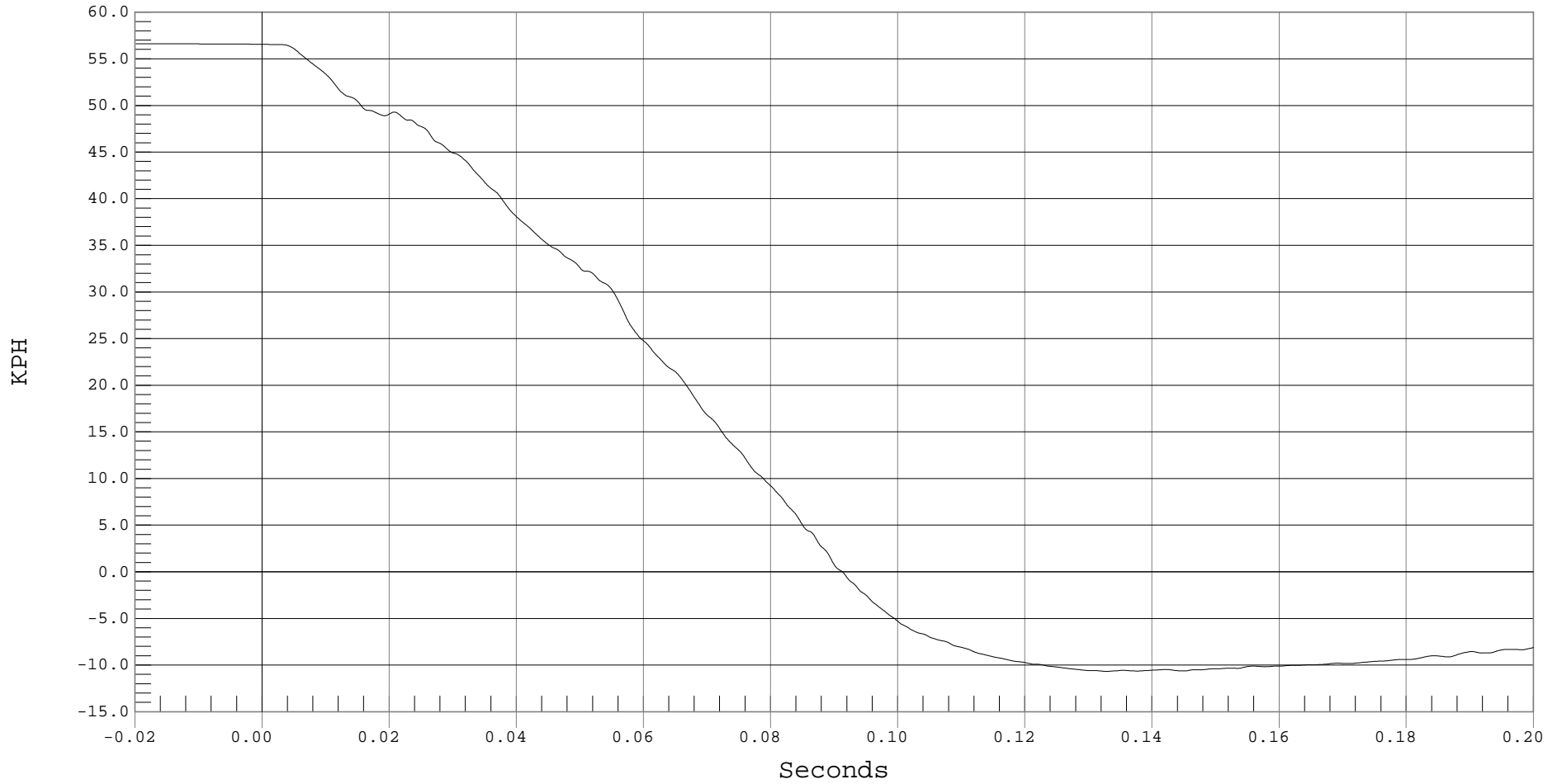
RIGHT REAR SEAT CROSSMEMBER X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RIGHT REAR SEAT CROSSMEMBER X VELOCITY, B01025AI.V58

Ymin = -10.68 KPH @ 0.1327 Seconds, Ymax = 56.6 KPH @ -0.0192 Seconds



B-115



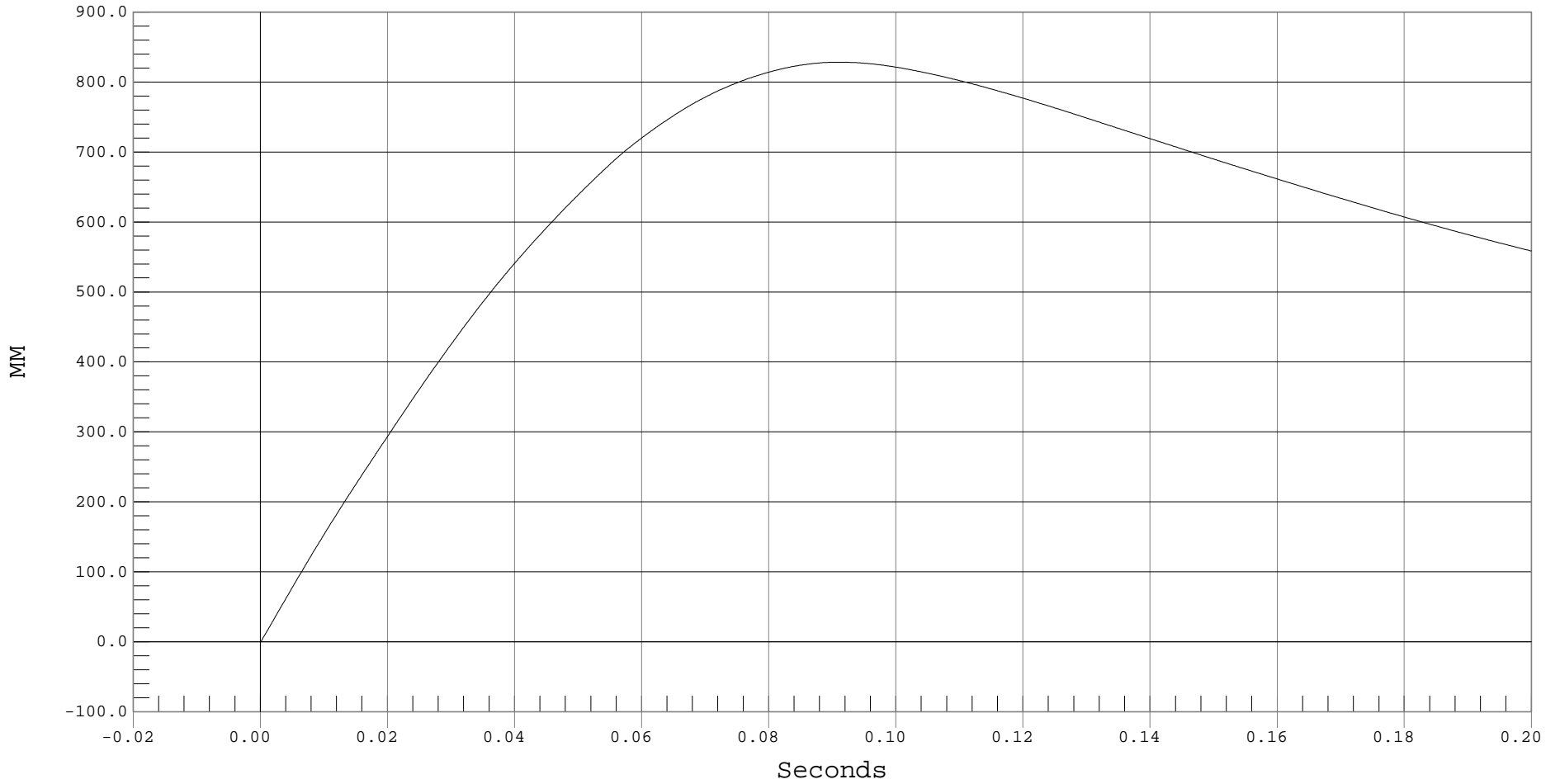
RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT, B01025AI.D58

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 828.48 MM @ 0.0911 Seconds



B-116



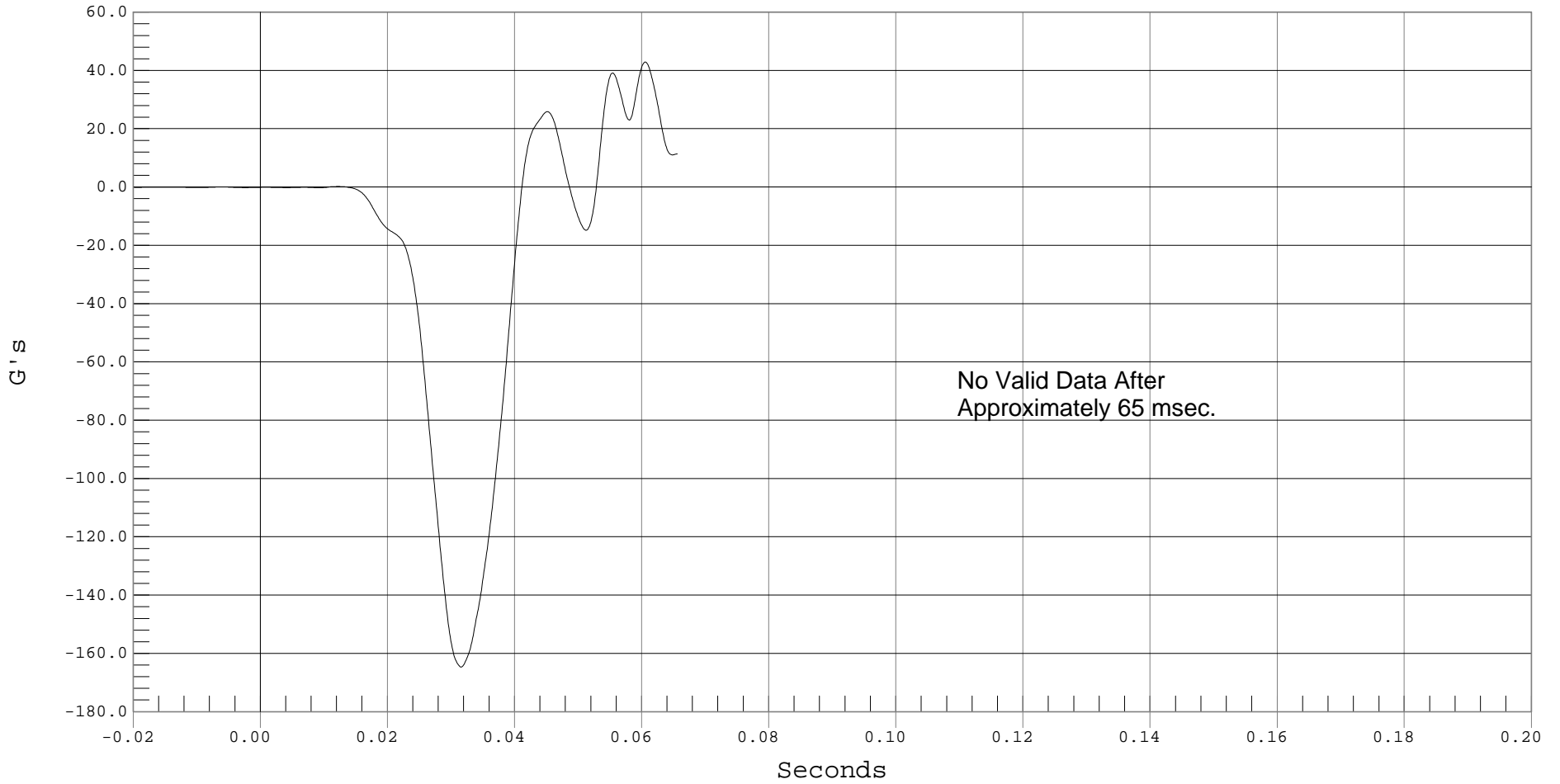
UPPER ENGINE X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 ENGINE UPPER X, B01025AF.A55

Ymin = -164.69 G's @ 0.0315 Seconds, Ymax = 42.9 G's @ 0.0605 Seconds



B-117



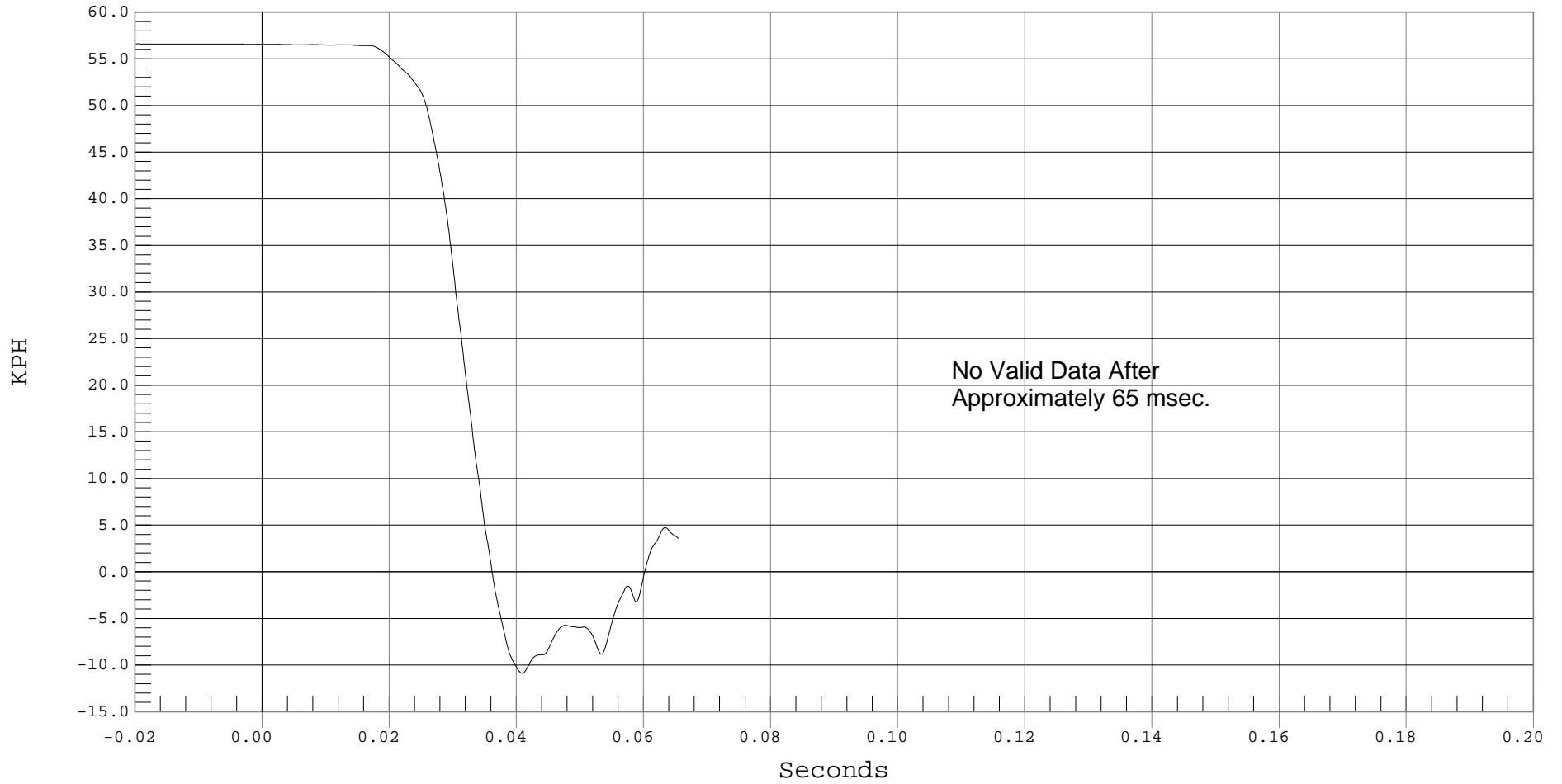
UPPER ENGINE X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 TOP OF ENGINE BLOCK X VELOCITY, B01025AI.V55

Ymin = -10.88 KPH @ 0.0408 Seconds, Ymax = 56.6 KPH @ -0.0199 Seconds



B-118



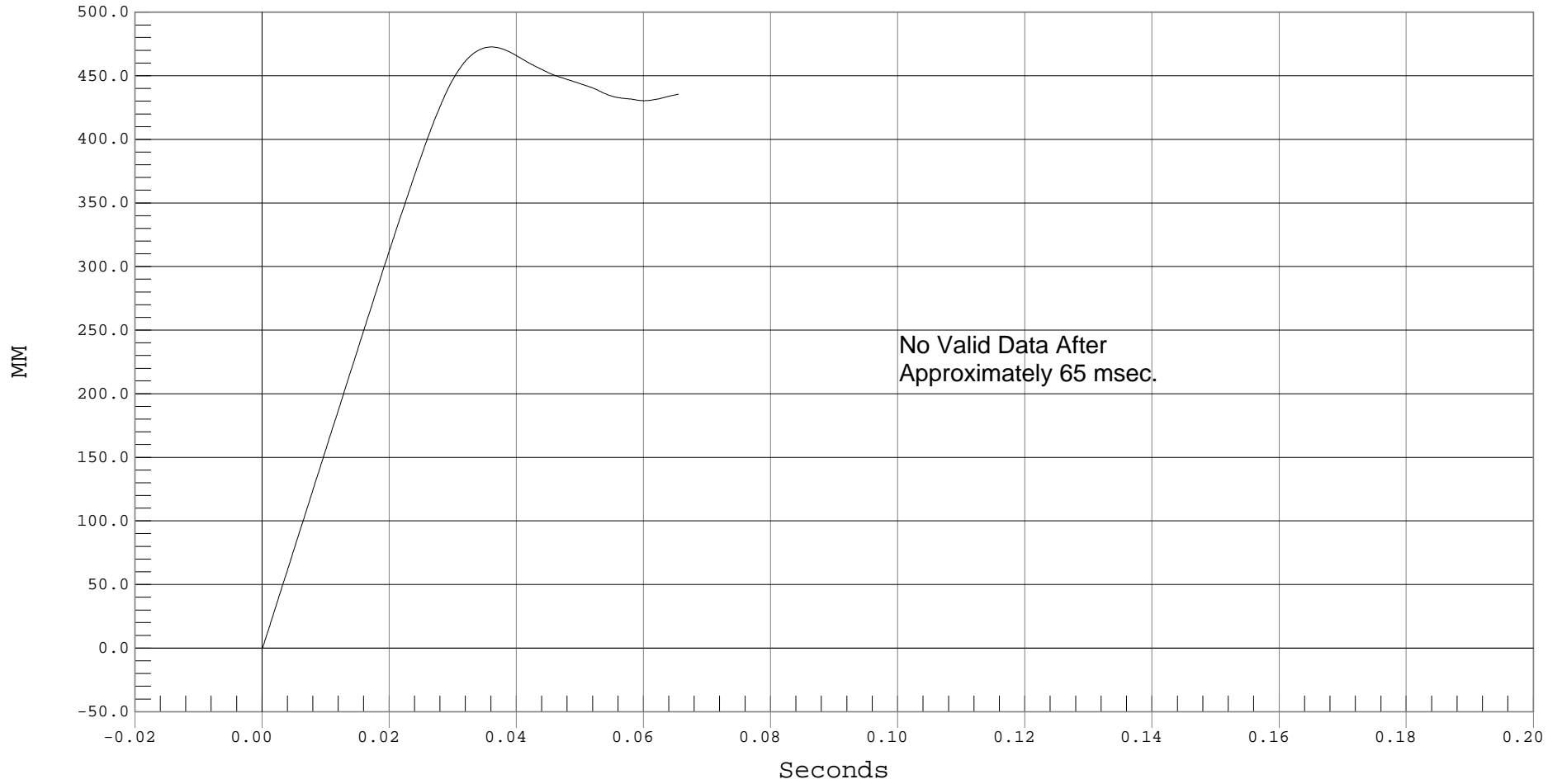
UPPER ENGINE X DISPLACEMENT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 TOP OF ENGINE BLOCK X DISPLACEMENT, B01025AI.D55

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 472.62 MM @ 0.0360 Seconds



B-119

LOWER ENGINE X ACCELERATION VS. TIME
NO VALID DATA COLLECTED



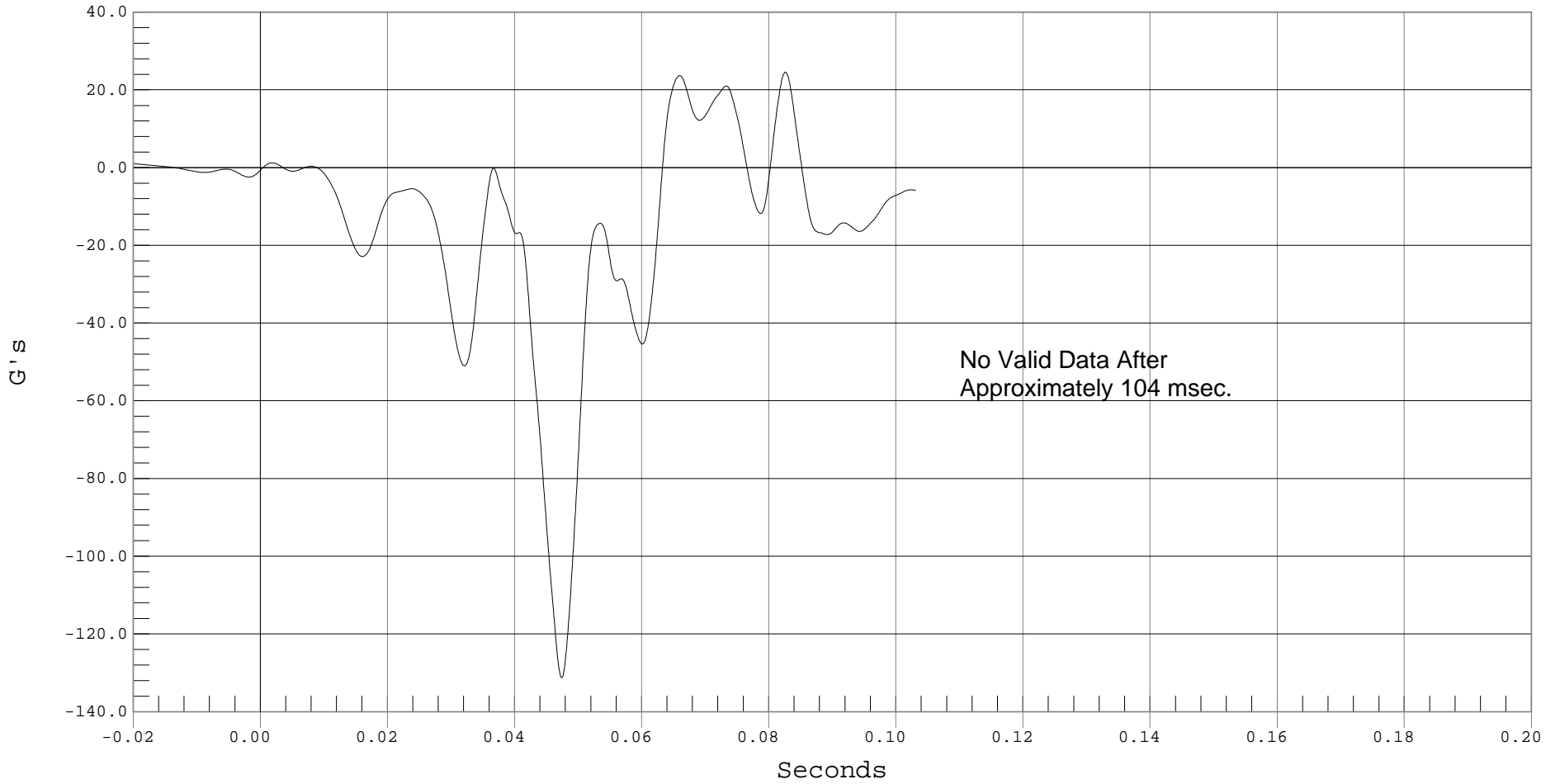
LEFT BRAKE CALIPER X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 LEFT BRAKE CALIPER X, B01025AF.A61

Ymin = -131.26 G's @ 0.0473 Seconds, Ymax = 24.57 G's @ 0.0825 Seconds



B-121



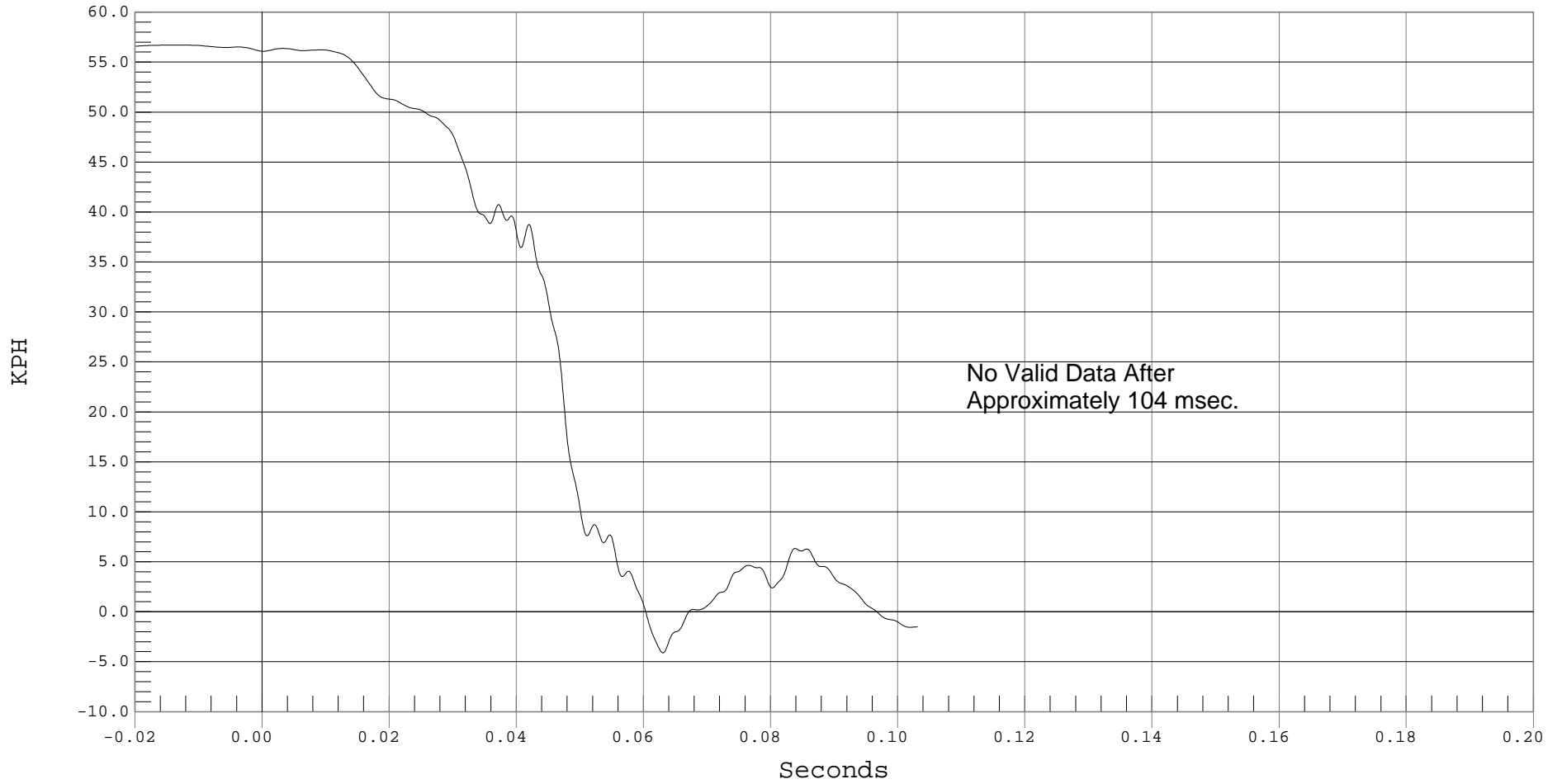
LEFT BRAKE CALIPER X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LEFT BRAKE CALIPER X VELOCITY, B01025AI.V61

Ymin = -4.11 KPH @ 0.0630 Seconds, Ymax = 56.71 KPH @ -0.0133 Seconds



B-122



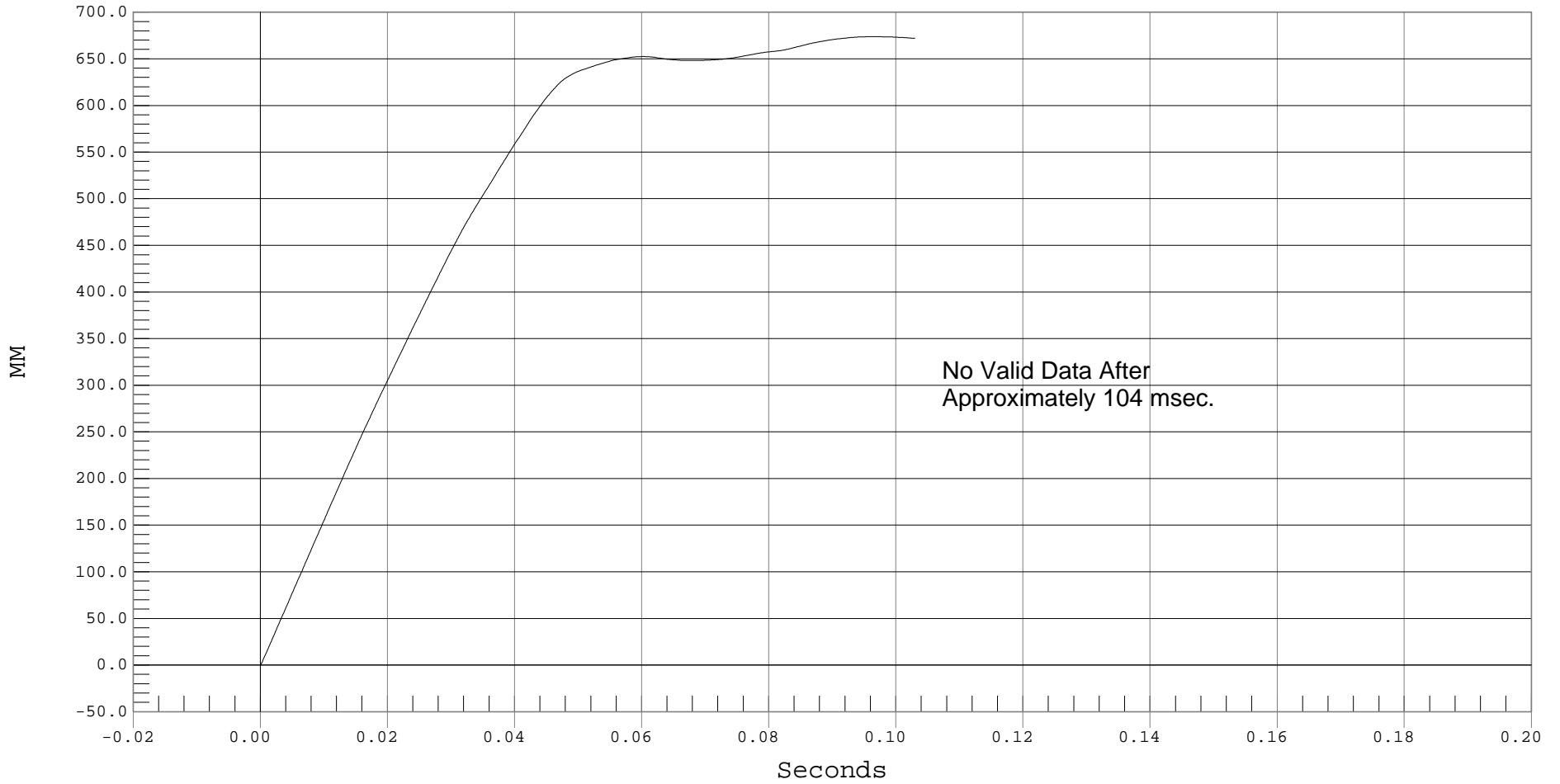
LEFT BRAKE CALIPER X DISPLACEMENT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LEFT BRAKE CALIPER X DISPLACEMENT, B01025AI.D61

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 673.76 MM @ 0.0965 Seconds



B-123



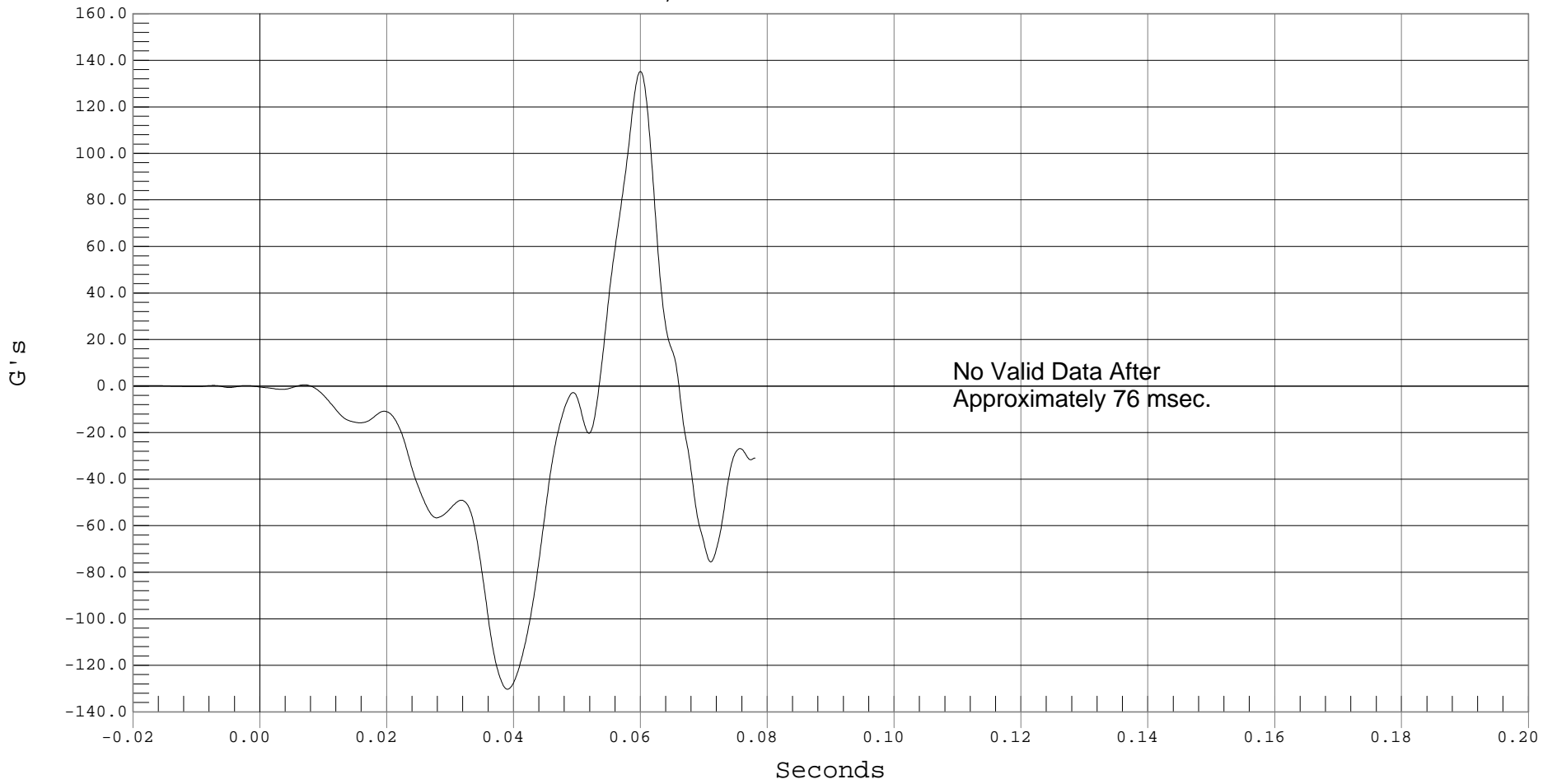
RIGHT BRAKE CALIPER X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 RIGHT BRAKE CALIPER X, B01025AF.A60

Ymin = -130.28 G's @ 0.0389 Seconds, Ymax = 135.27 G's @ 0.0599 Seconds



B-124



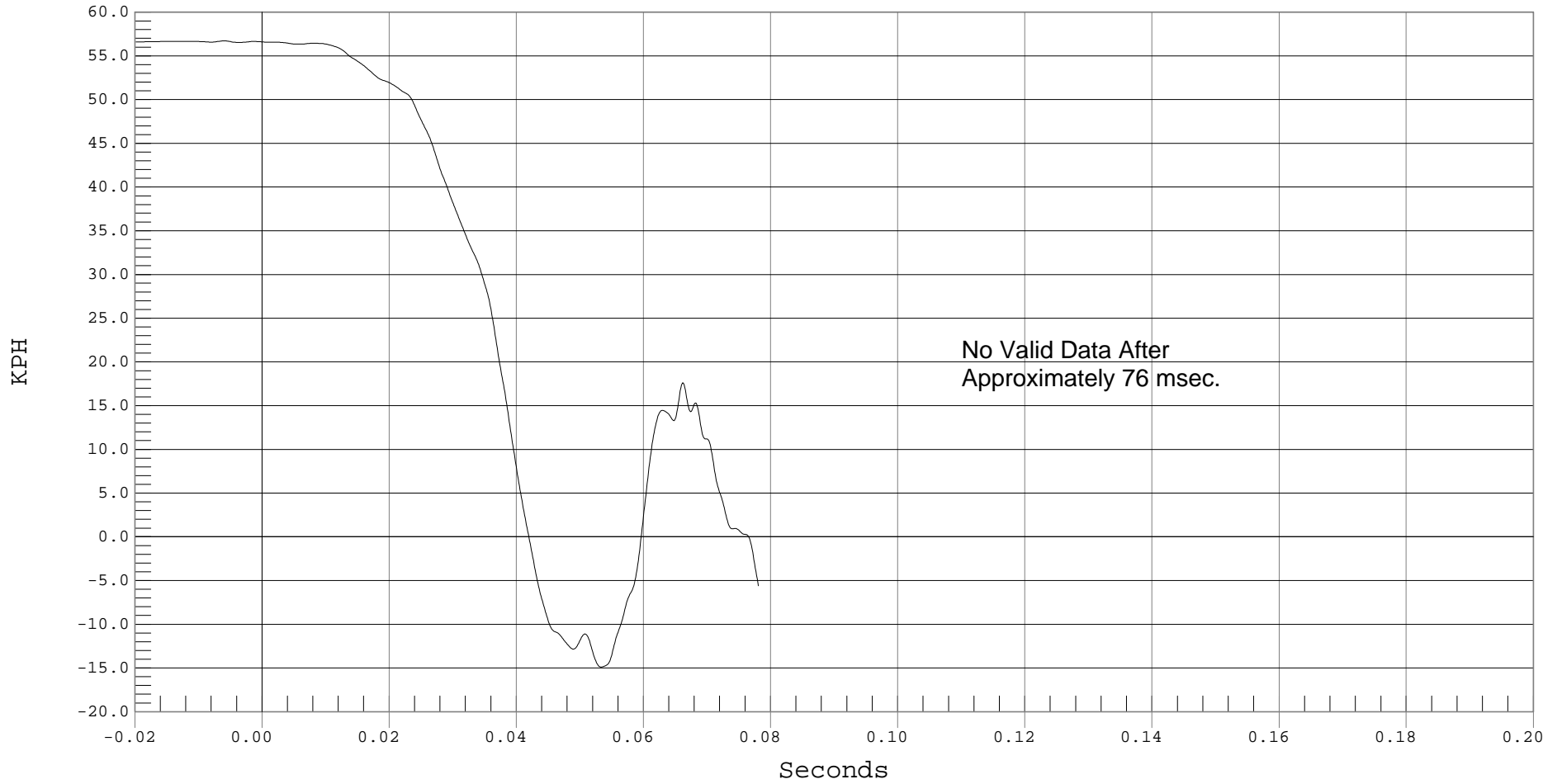
RIGHT BRAKE CALIPER X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RIGHT BRAKE CALIPER X VELOCITY, B01025AI.V60

Ymin = -14.9 KPH @ 0.0533 Seconds, Ymax = 56.72 KPH @ -0.0060 Seconds



B-125



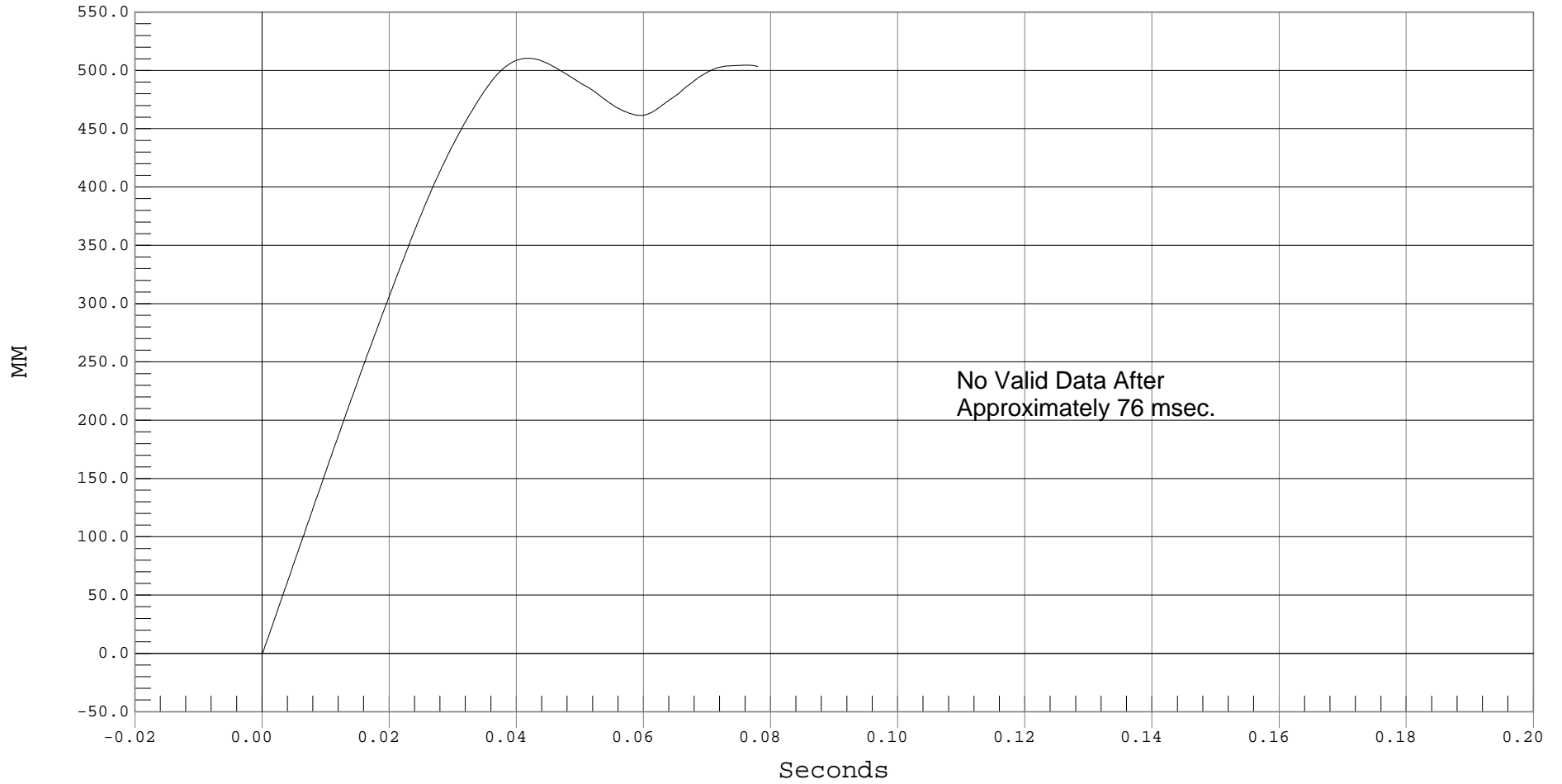
RIGHT BRAKE CALIPER X DISPLACEMENT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RIGHT BRAKE CALIPER X DISPLACEMENT, B01025AI.D60

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 510.45 MM @ 0.0418 Seconds





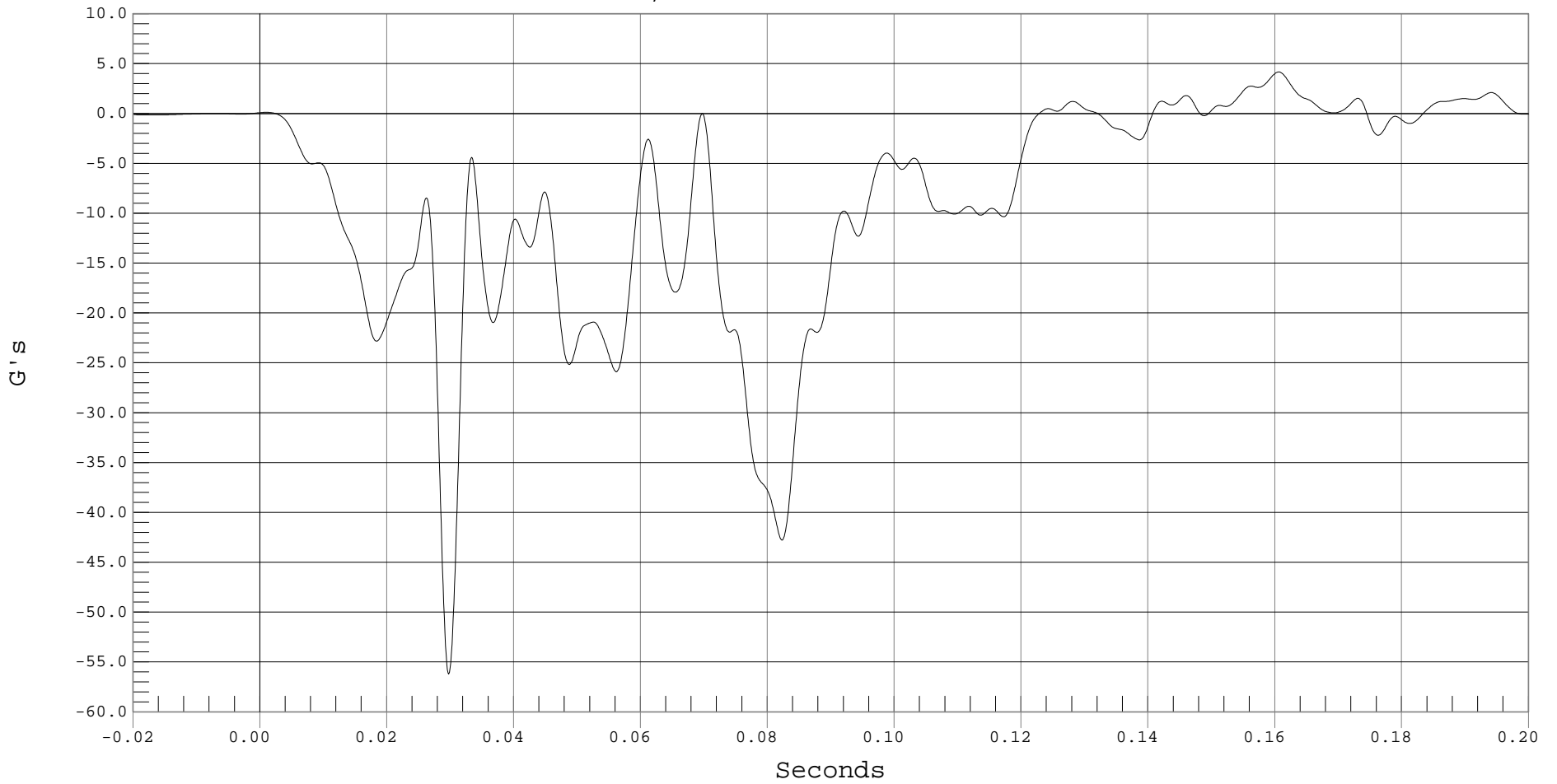
INSTRUMENT PANEL X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 INSTRUMENT PANEL X, B01025AF.A57

Ymin = -56.21 G's @ 0.0297 Seconds, Ymax = 4.16 G's @ 0.1605 Seconds



B-127



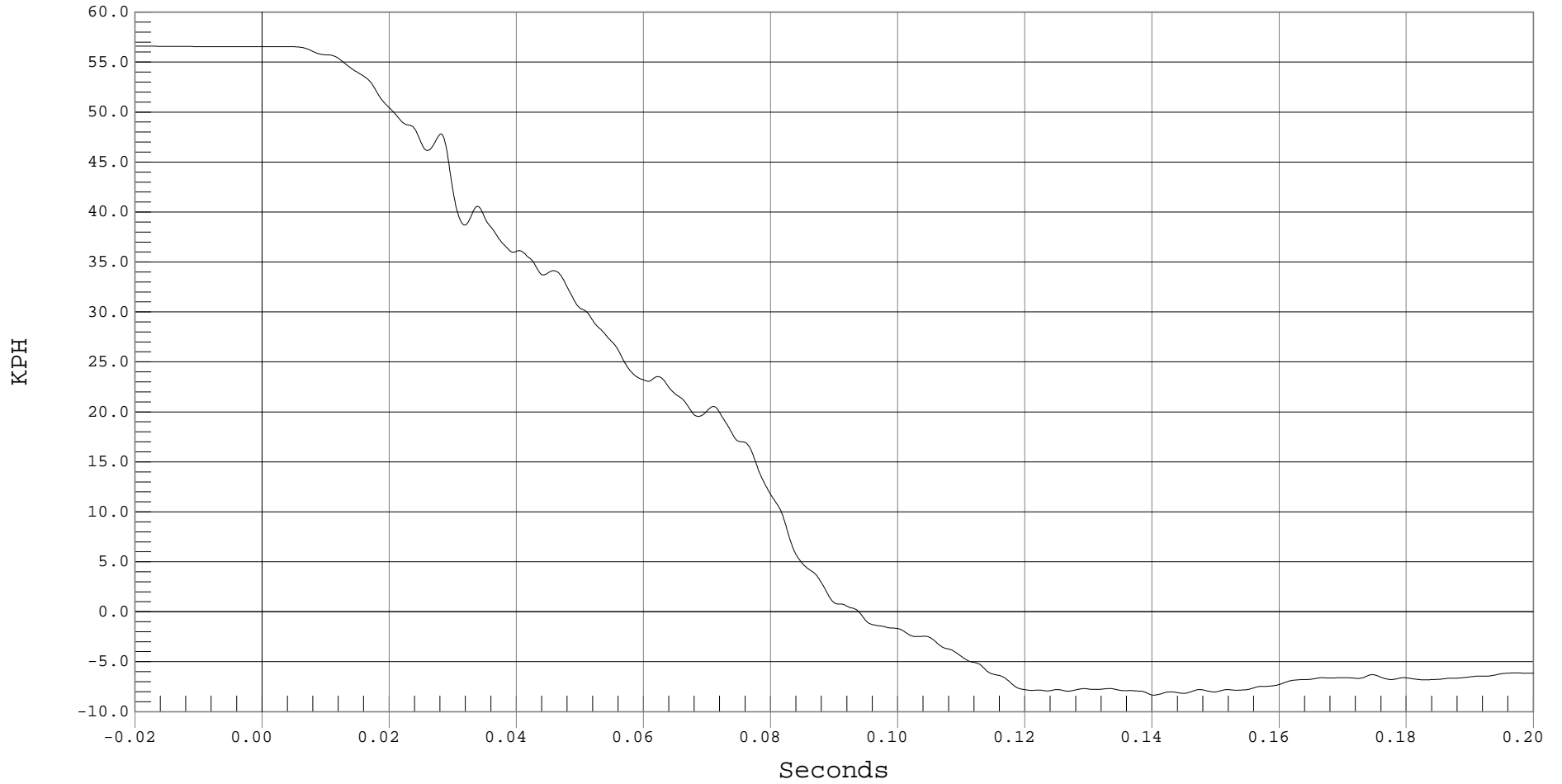
INSTRUMENT PANEL X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 INSTRUMENT PANEL X VELOCITY, B01025AI.V57

Ymin = -8.34 KPH @ 0.1402 Seconds, Ymax = 56.6 KPH @ -0.0199 Seconds





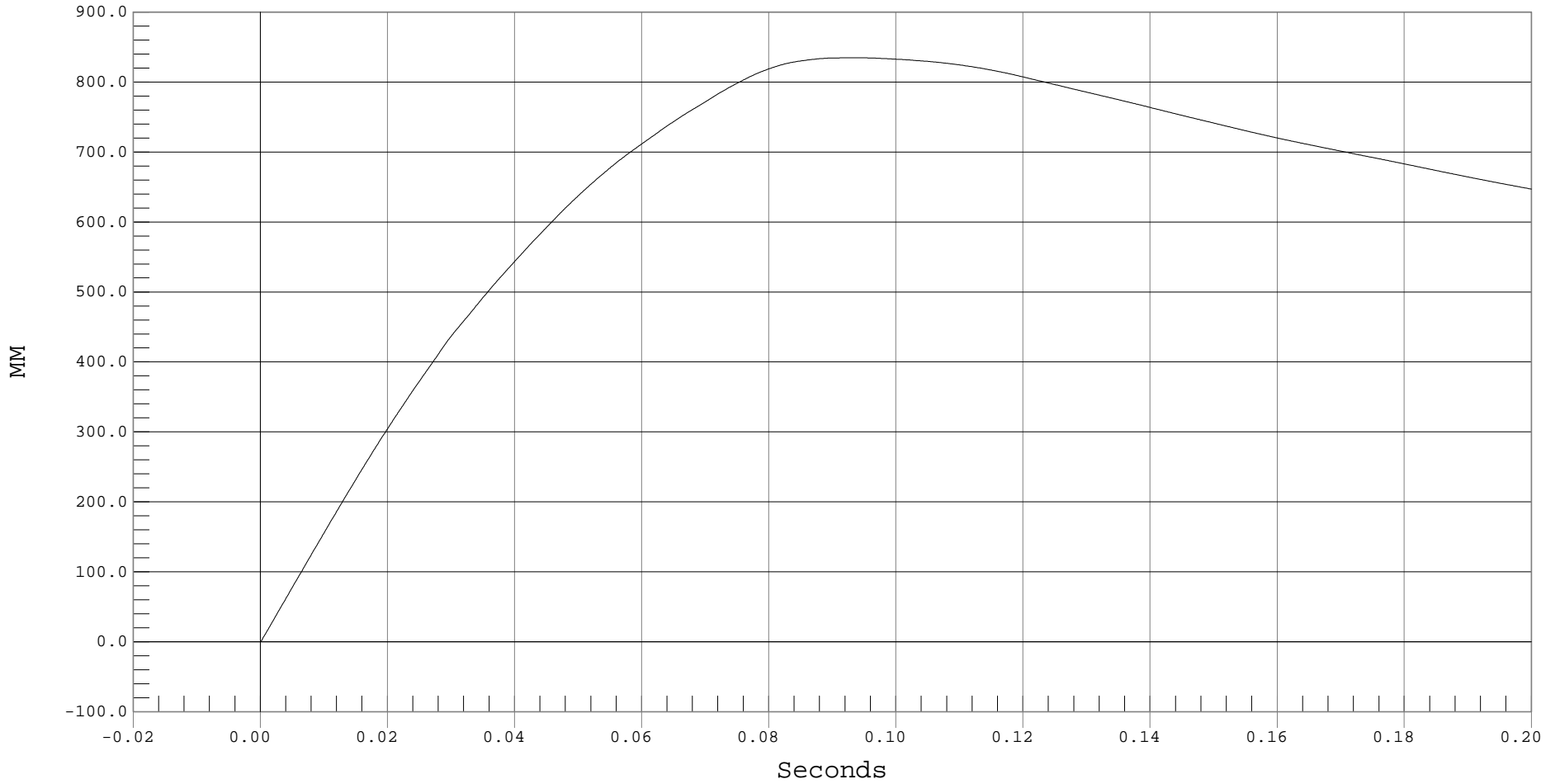
INSTRUMENT PANEL X DISPLACEMENT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 INSTRUMENT PANEL X DISPLACEMENT, B01025AI.D57

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 834.96 MM @ 0.0937 Seconds





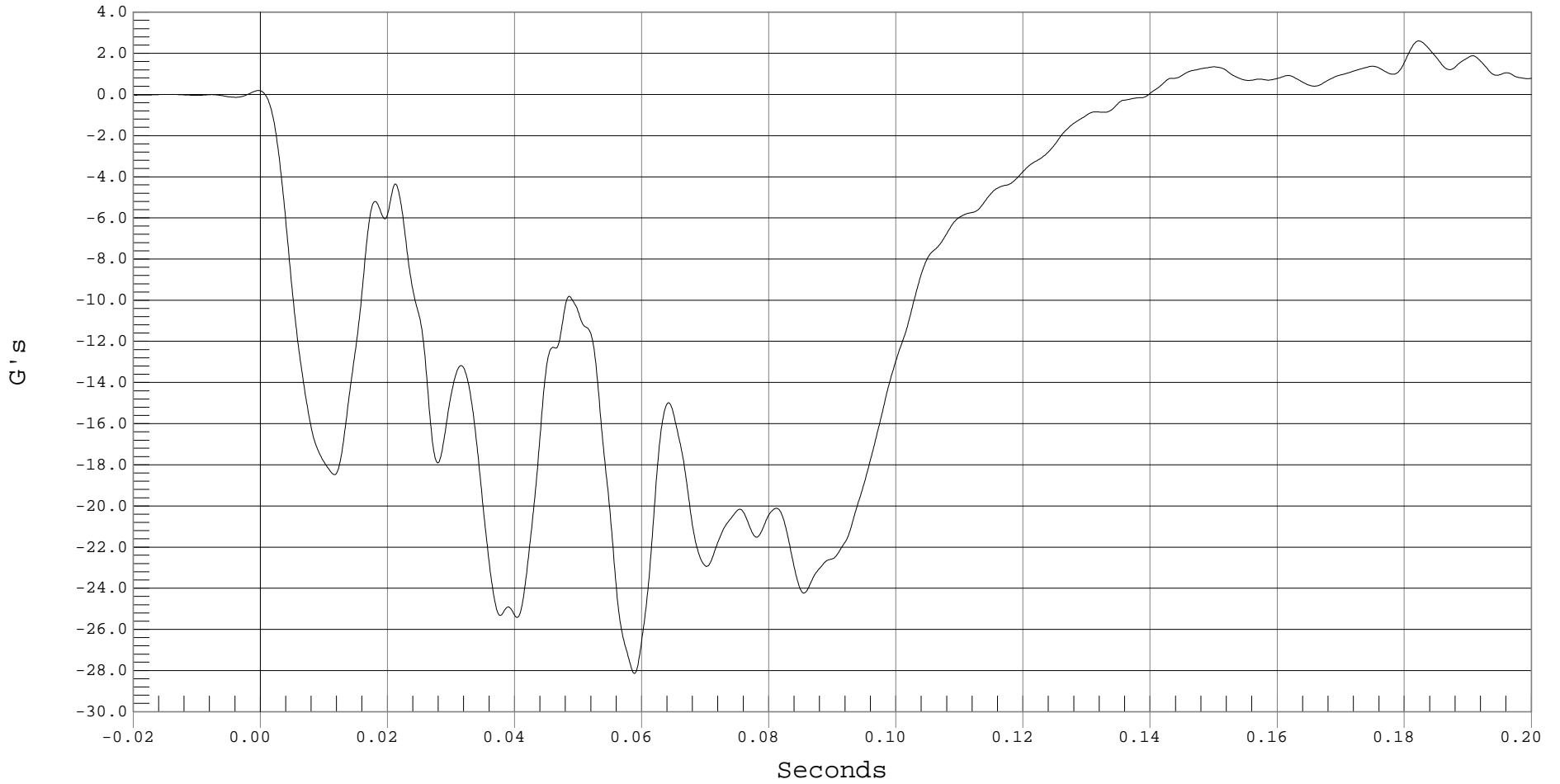
LEFT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 LEFT REAR SEAT X-MEMBER Xr, B01025AF.A03

Ymin = -28.14 G's @ 0.0588 Seconds, Ymax = 2.6 G's @ 0.1822 Seconds



B-130



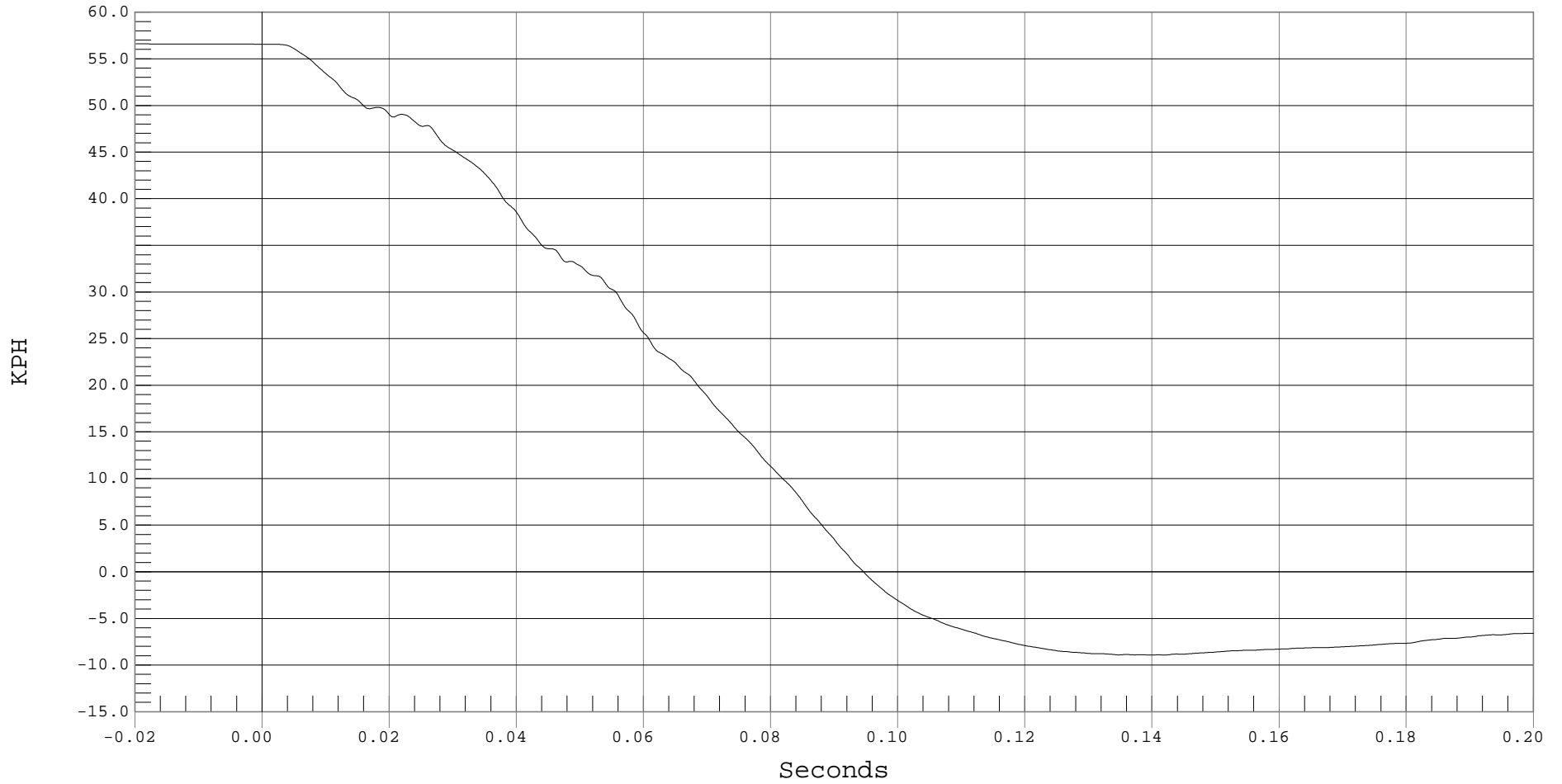
LEFT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LEFT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY, B01025AI.V03

Ymin = -8.93 KPH @ 0.1397 Seconds, Ymax = 56.6 KPH @ -0.0199 Seconds



B-131



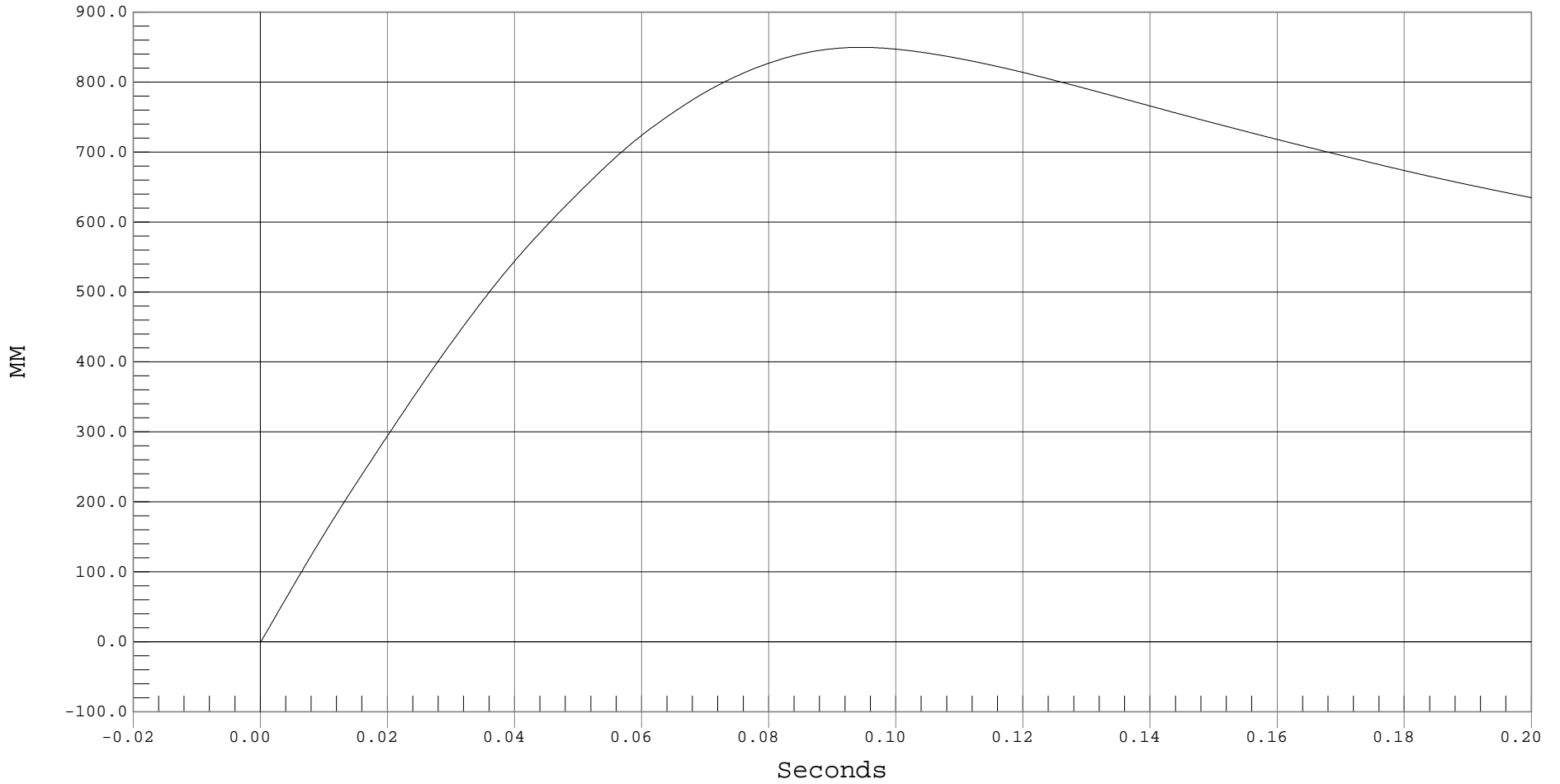
LEFT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LEFT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT, B01025AI.D03

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 849.67 MM @ 0.0944 Seconds



B-132



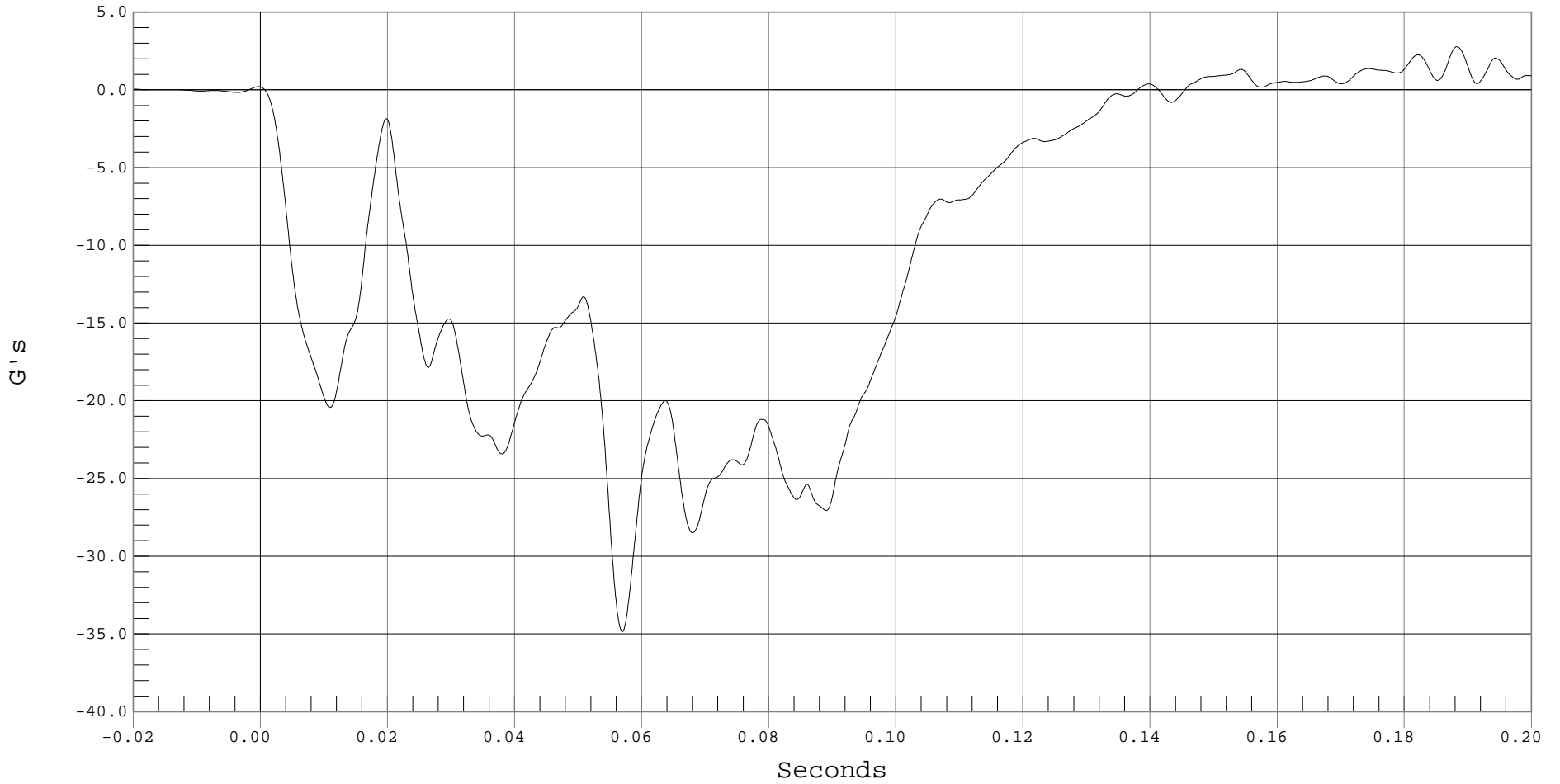
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 RIGHT REAR SEAT X-MEMBER Xr, B01025AF.A02

Ymin = -34.85 G's @ 0.0569 Seconds, Ymax = 2.77 G's @ 0.1882 Seconds



B-133



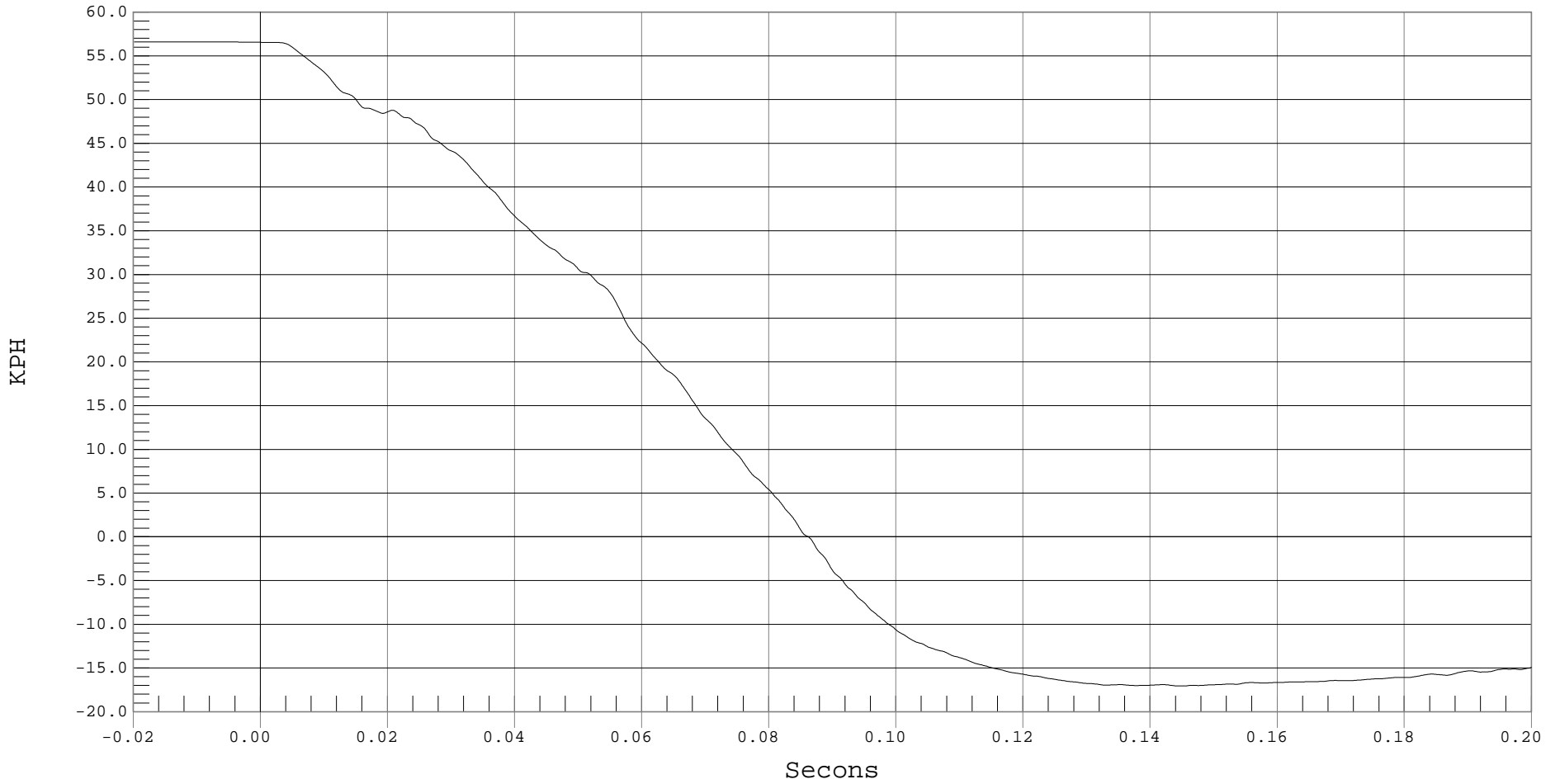
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RIGHT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY, B01025AI.V02

Ymin = -17.06 KPH @ 0.1453 Secons, Ymax = 56.6 KPH @ -0.0112 Secons



B-134



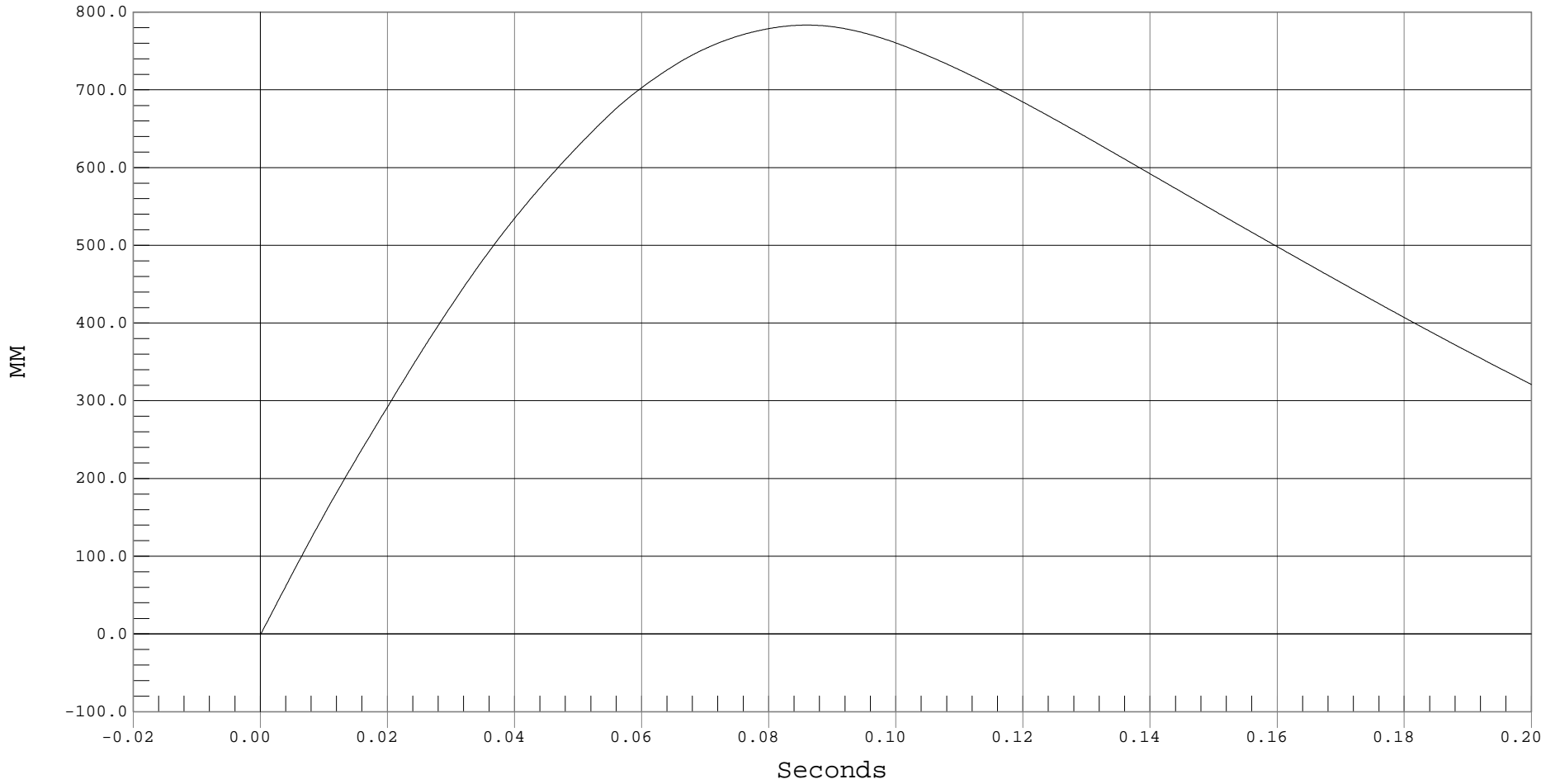
RIGHT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RIGHT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT, B01025AI.D02

Ymin = 0 MM @ 0.0000 Seconds, Ymax = 783.28 MM @ 0.0860 Seconds



B-135



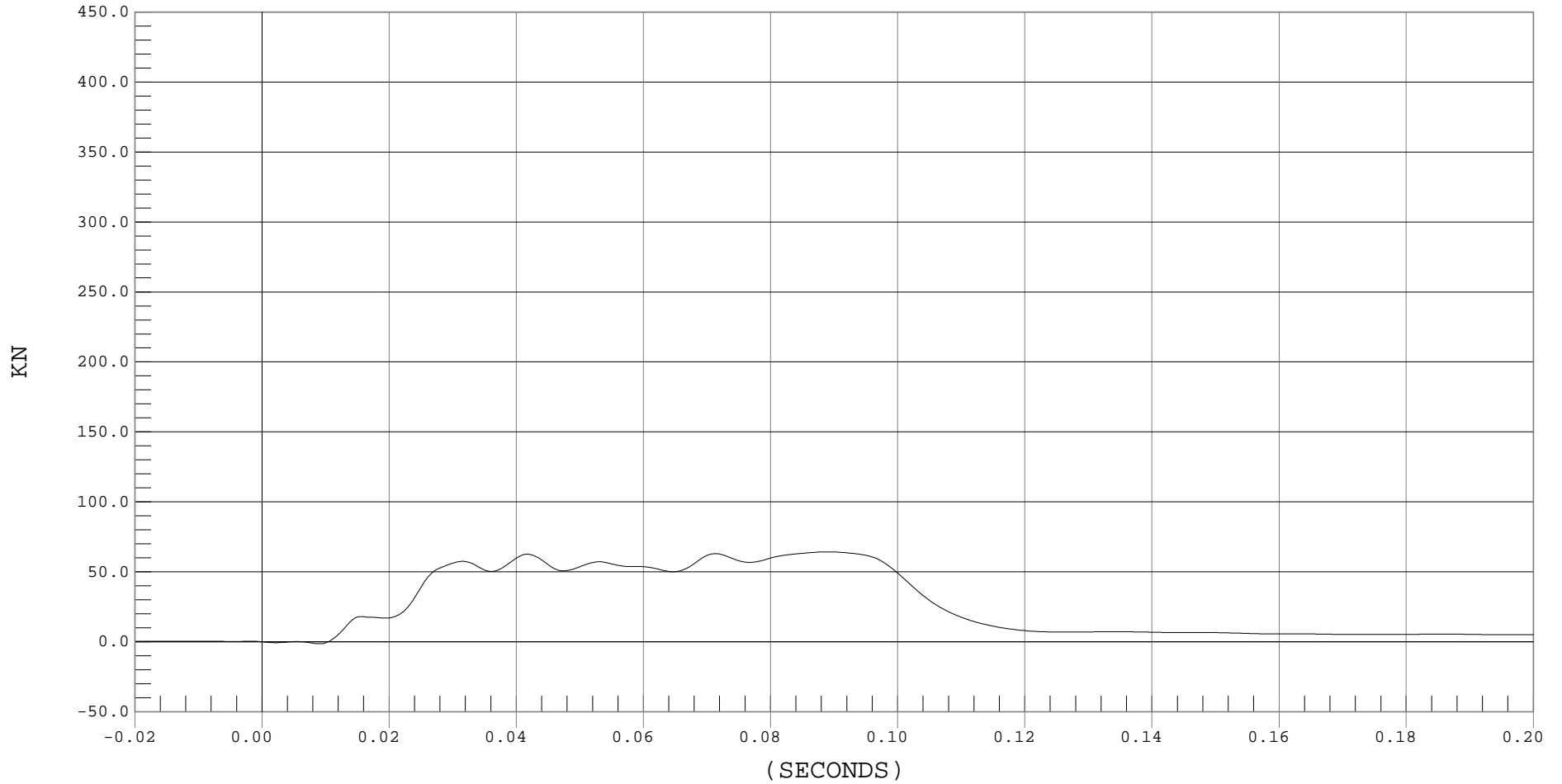
UPPER LEFT BARRIER FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 BARRIER UPPER LEFT, B01025FF.F02

Ymin = -1.46 KN @ 0.0090 SECONDS, Ymax = 64.27 KN @ 0.0889 SECONDS





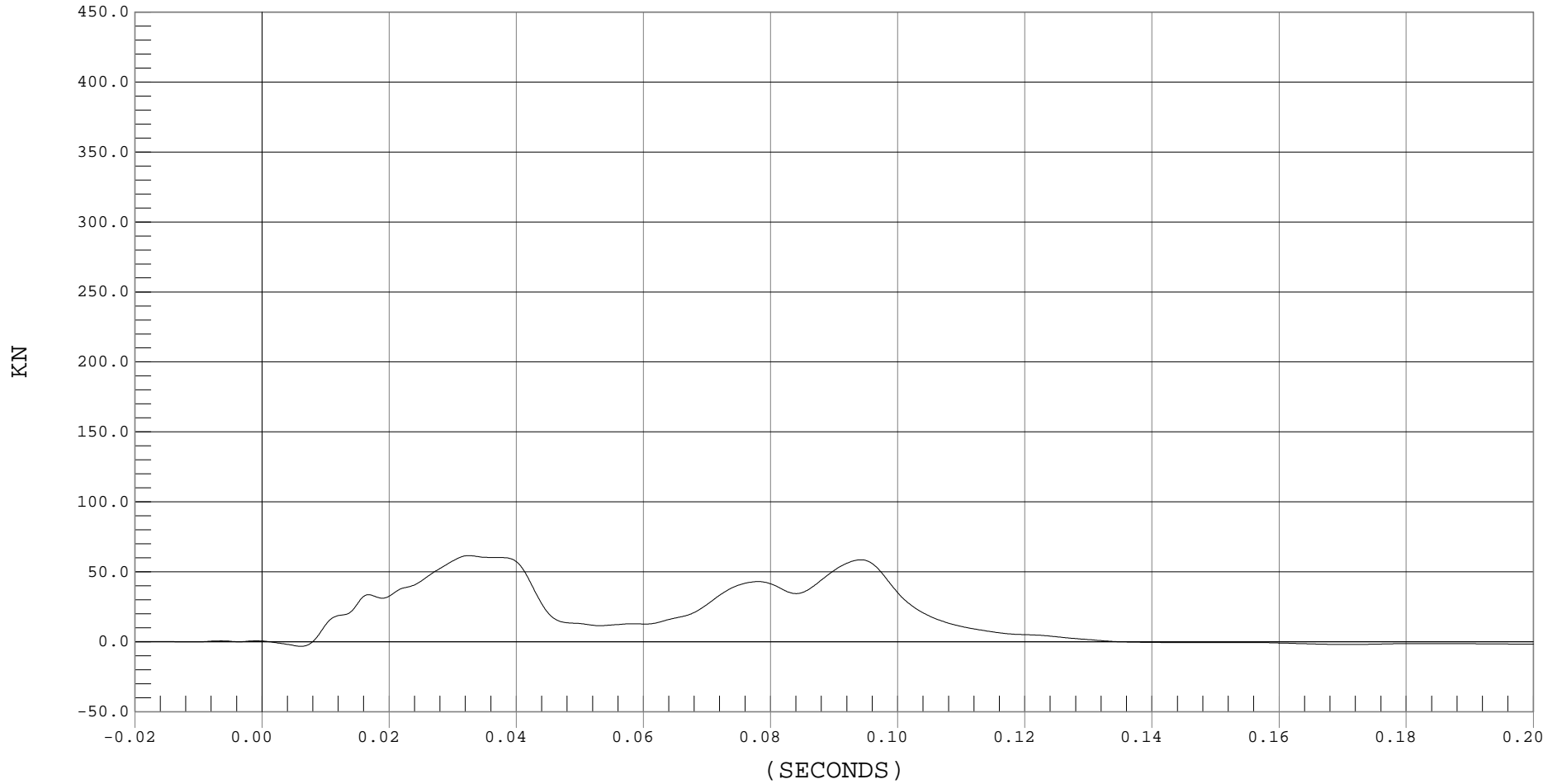
UPPER CENTER BARRIER FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 BARRIER UPPER CENTER, B01025FF.F03

Ymin = -3.29 KN @ 0.0060 SECONDS, Ymax = 61.58 KN @ 0.0324 SECONDS





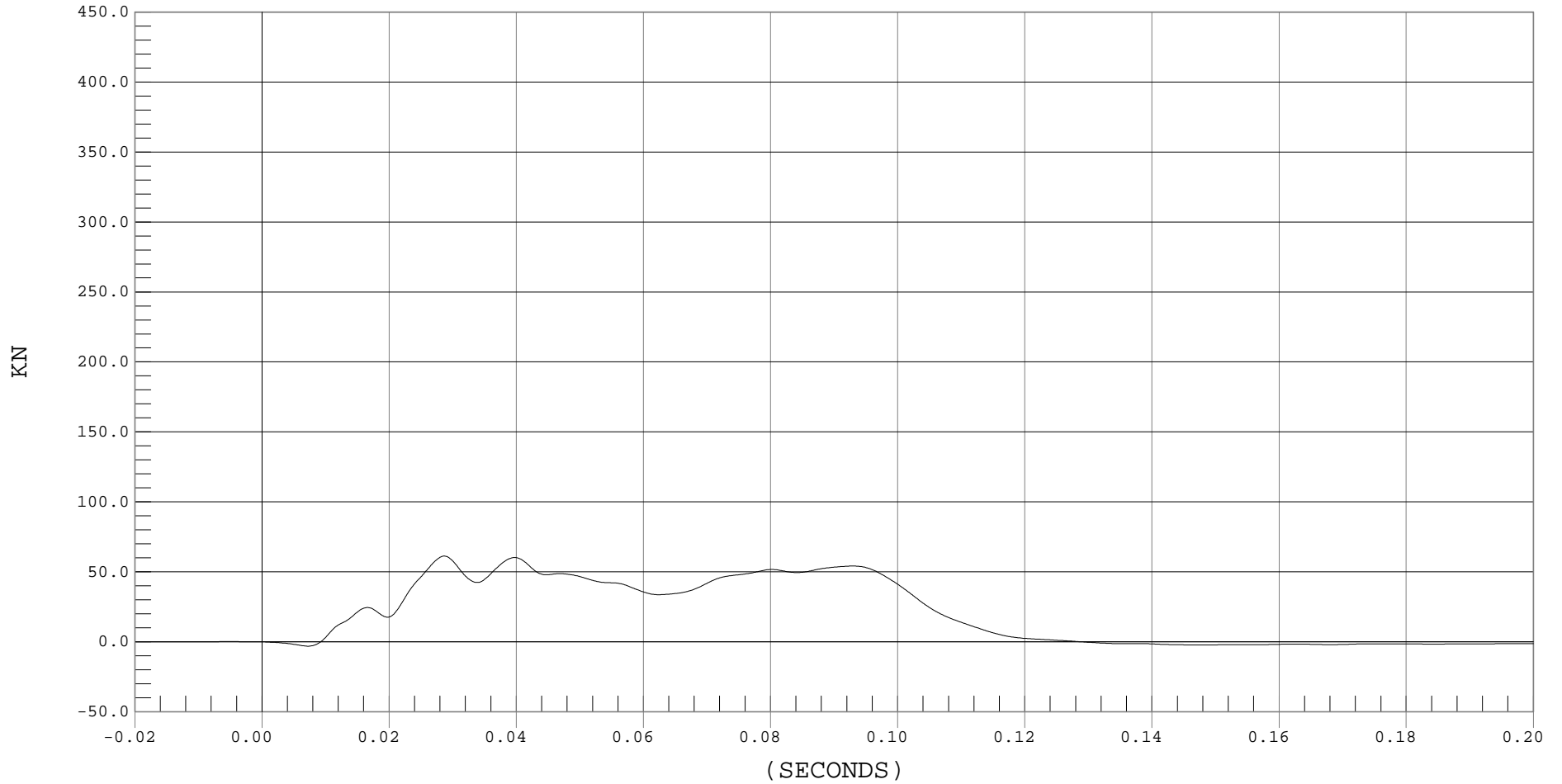
UPPER RIGHT BARRIER FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 BARRIER UPPER RIGHT, B01025FF.F04

Ymin = -3.16 KN @ 0.0071 SECONDS, Ymax = 61.23 KN @ 0.0286 SECONDS





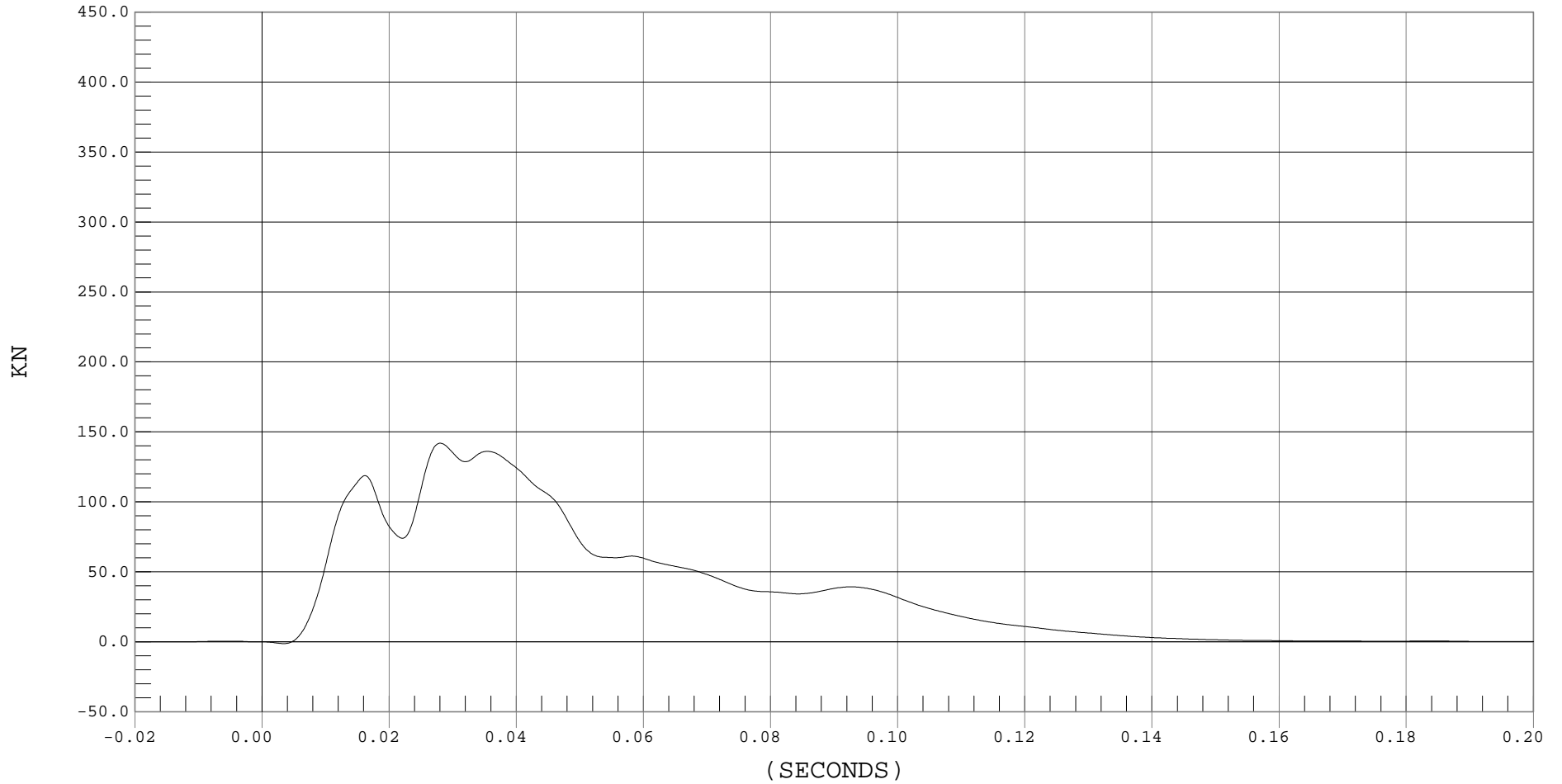
LOWER LEFT BARRIER FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 BARRIER LOWER LEFT, B01025FF.F05

Ymin = -1.31 KN @ 0.0033 SECONDS, Ymax = 141.91 KN @ 0.0279 SECONDS





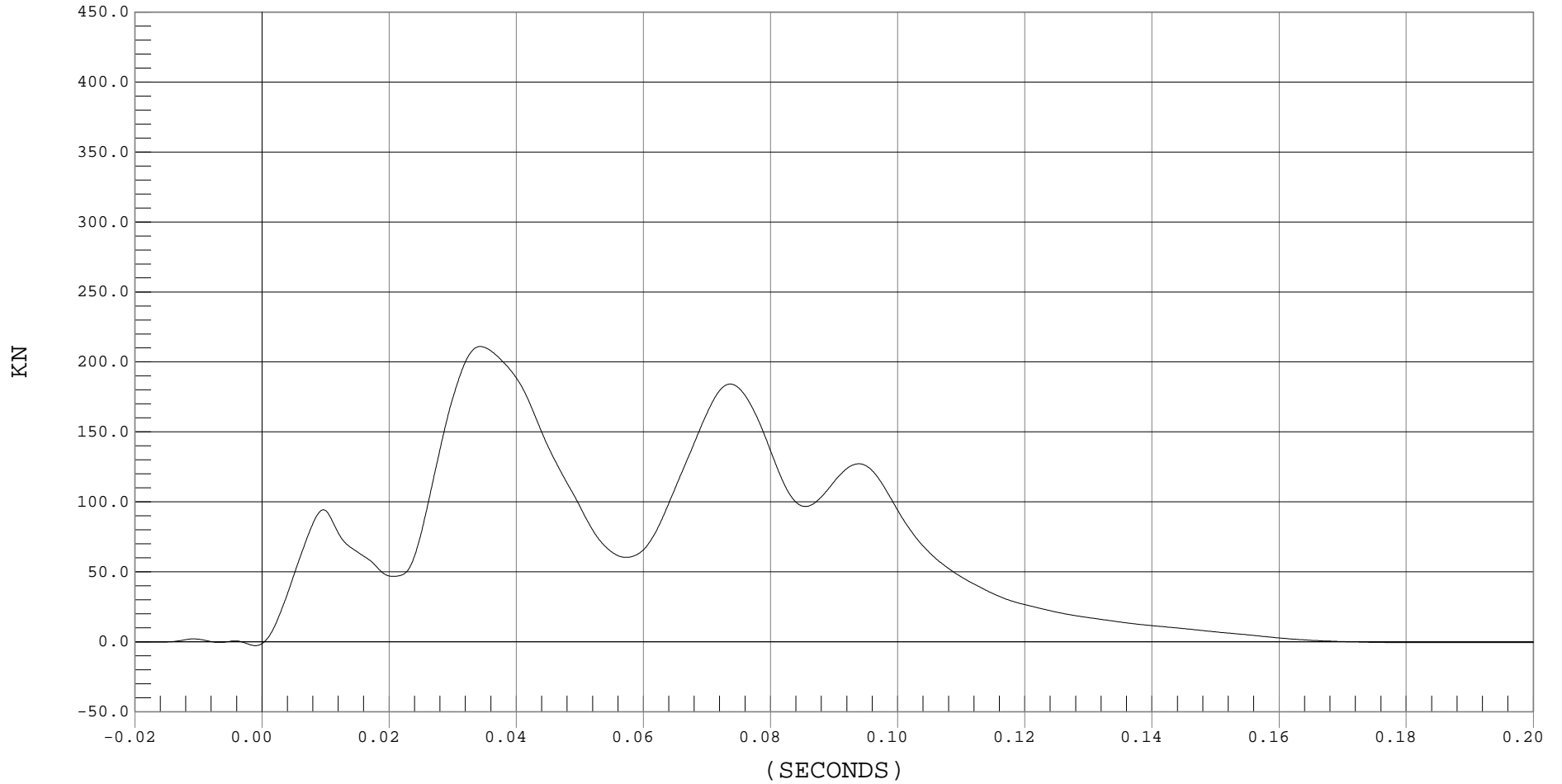
LOWER CENTER BARRIER FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 BARRIER LOWER CENTER, B01025FF.F06

Ymin = -2.8 KN @ -0.0011 SECONDS, Ymax = 210.99 KN @ 0.0342 SECONDS



B-140



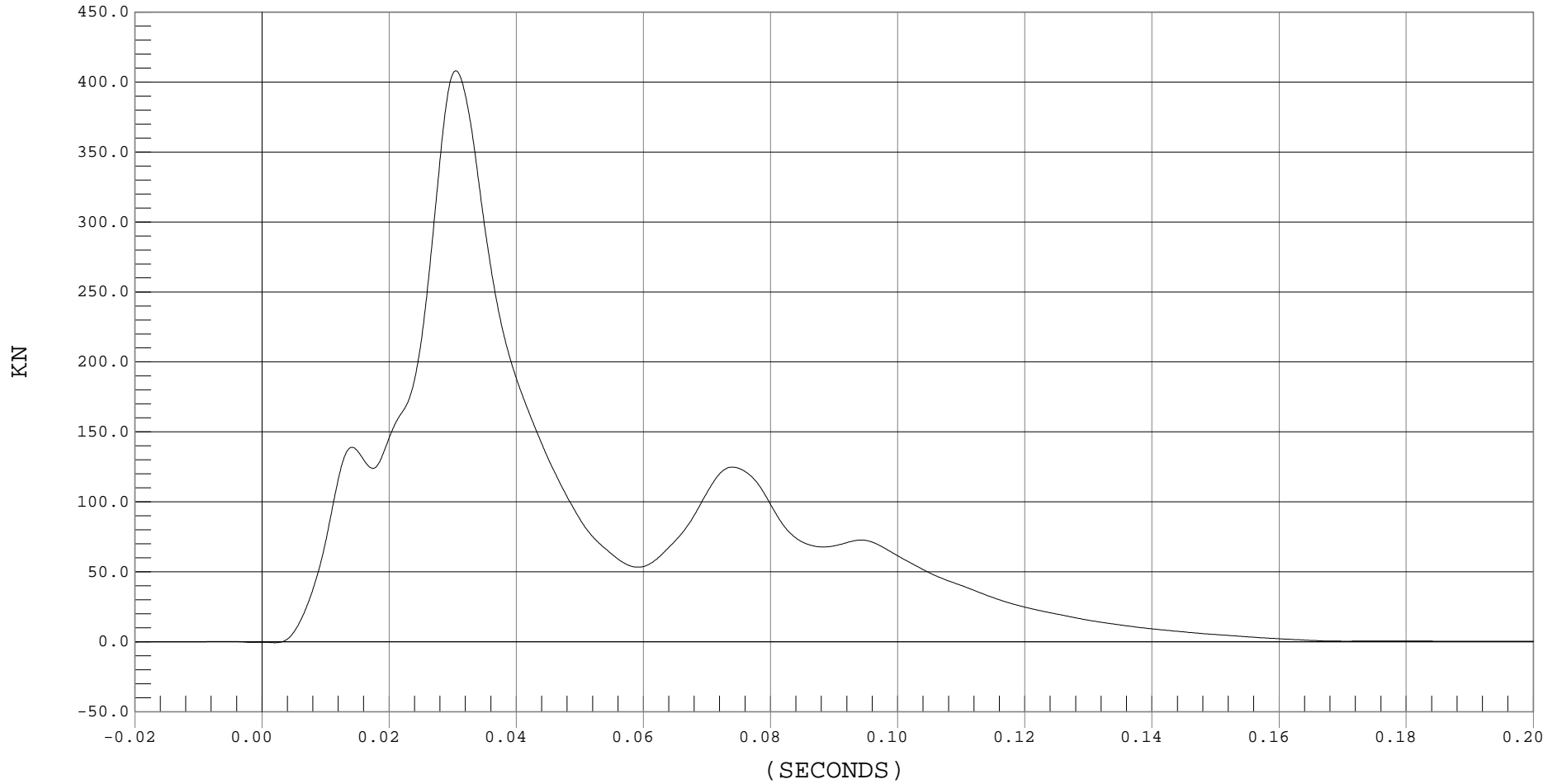
LOWER RIGHT BARRIER FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 BARRIER LOWER RIGHT, B01025FF.F07

Ymin = -.71 KN @ 0.0019 SECONDS, Ymax = 408.09 KN @ 0.0304 SECONDS



B-141



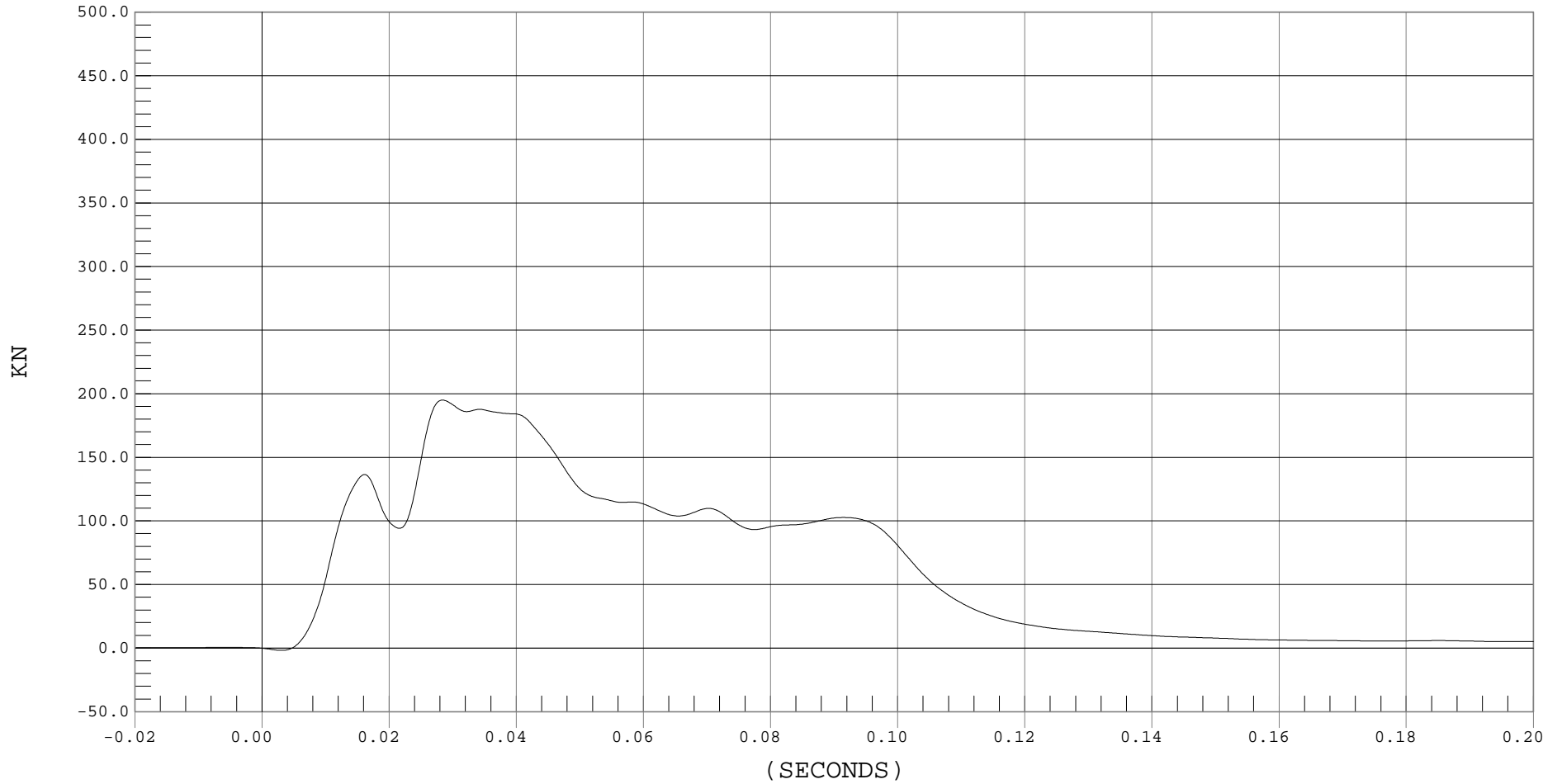
SUM OF LEFT BARRIER FORCES

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 SUM OF LEFT BARRIER FORCES, B01025FU.F02

Ymin = -1.83 KN @ 0.0030 SECONDS, Ymax = 194.98 KN @ 0.0283 SECONDS





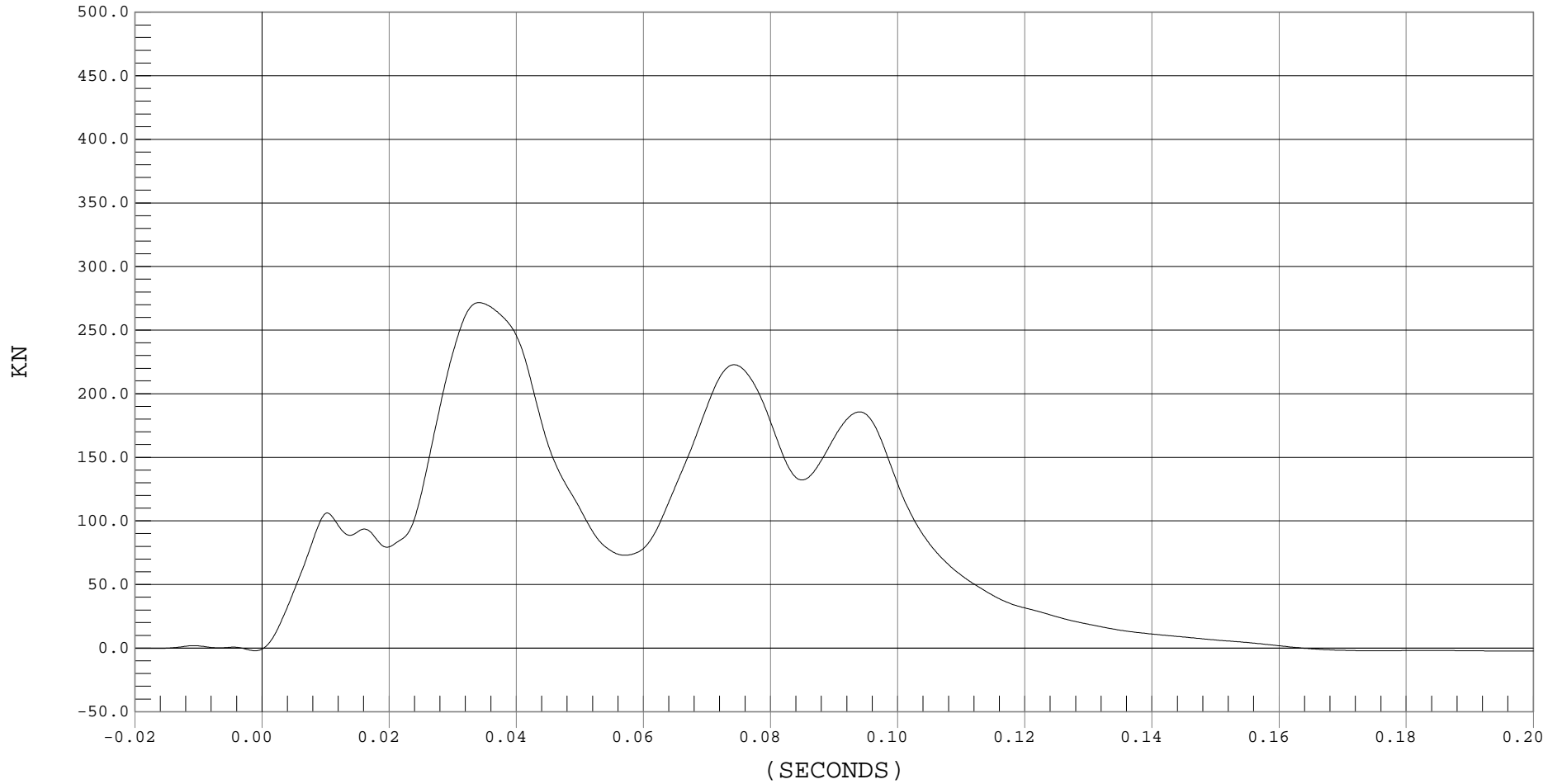
SUM OF CENTER BARRIER FORCES

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 SUM OF CENTER BARRIER FORCES, B01025FU.F03

Ymin = -2.29 KN @ 0.1992 SECONDS, Ymax = 271.66 KN @ 0.0340 SECONDS





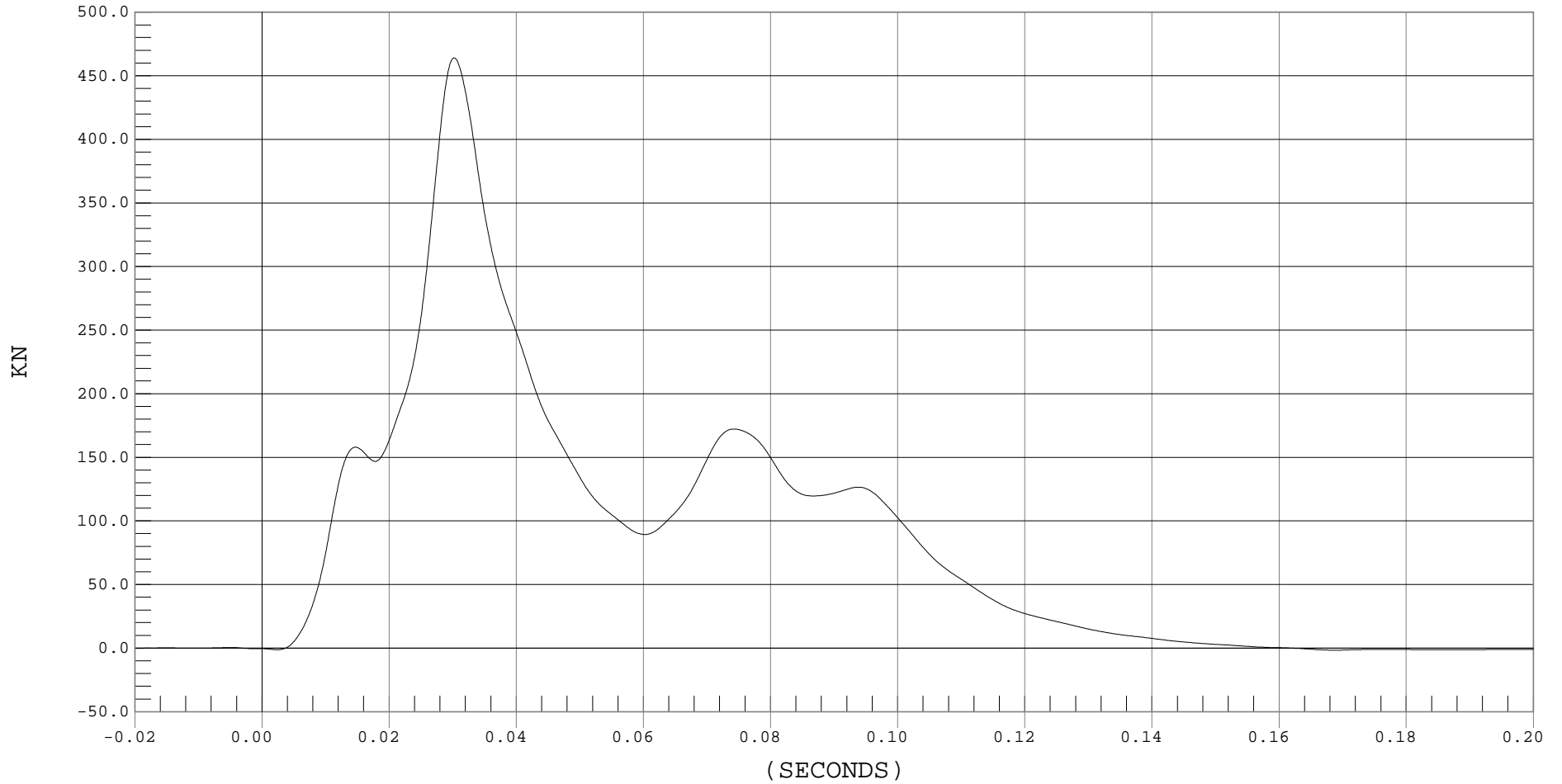
SUM OF RIGHT BARRIER FORCES

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 SUM OF RIGHT BARRIER FORCES, B01025FU.F04

Ymin = -1.64 KN @ 0.1687 SECONDS, Ymax = 464.08 KN @ 0.0301 SECONDS



B-144



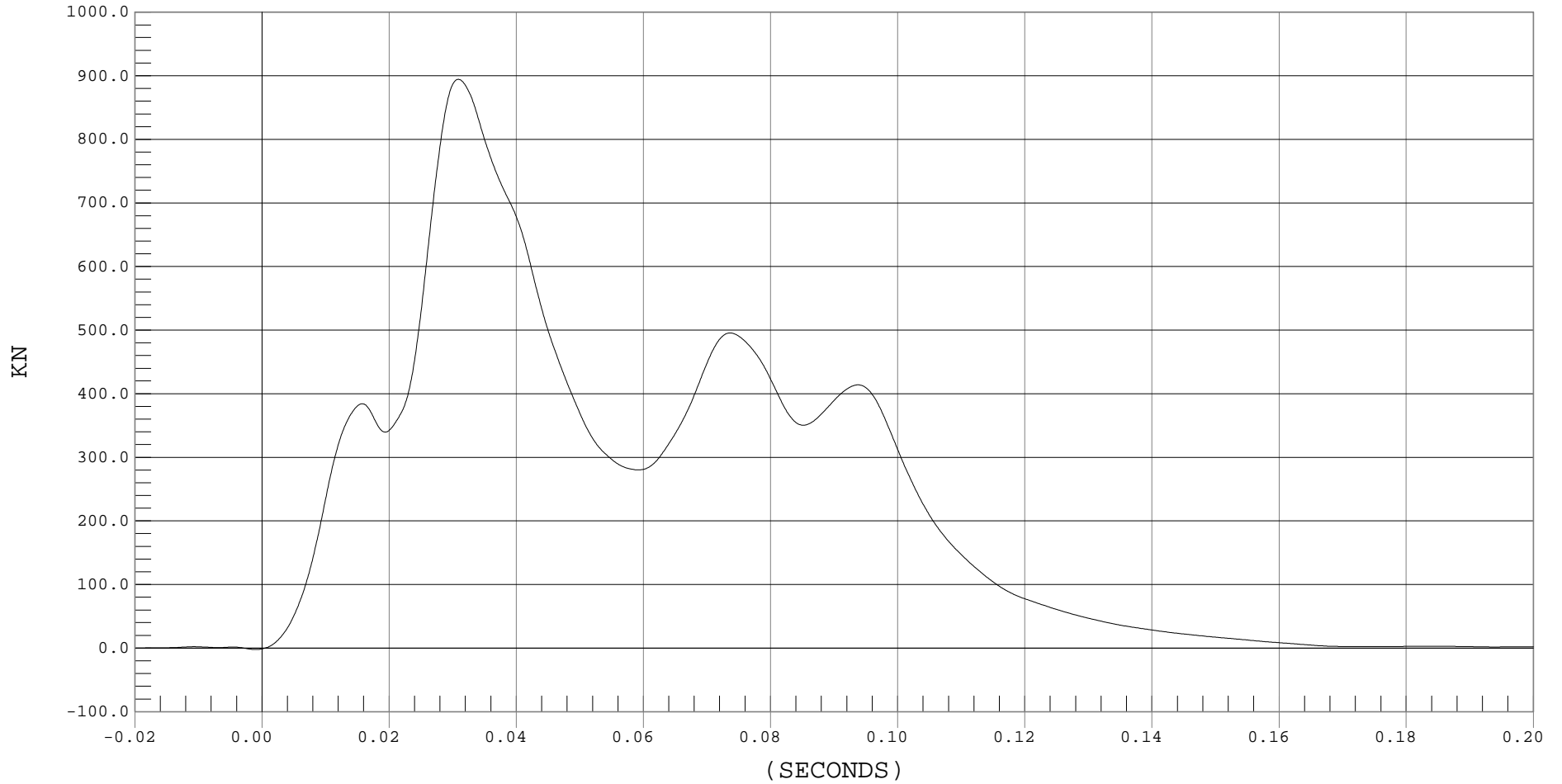
SUM OF BARRIER FORCES

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 SUM OF BARRIER FORCES, B01025FU.F01

Ymin = -2.28 KN @ -0.0011 SECONDS, Ymax = 894.39 KN @ 0.0308 SECONDS



B-145

APPENDIX C

DUMMY CALIBRATION DATA TRACES AND TABLES

Hybrid III Calibration Data Sheet
50th Percentile Male
Left Knee Impact Test

ATD Serial No.: 142

Test I.D.: D01186

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	PASS
Laboratory Relative Humidity	%	10 to 70	28	PASS
Probe Velocity	m/s	2.07 to 2.13	2.11	PASS
Peak Probe Force	Newtons	4715 to 5782	5278	PASS
Overall Test Results				PASS

 Laboratory Technician

 2/8/01
 Test Date

 Approved By



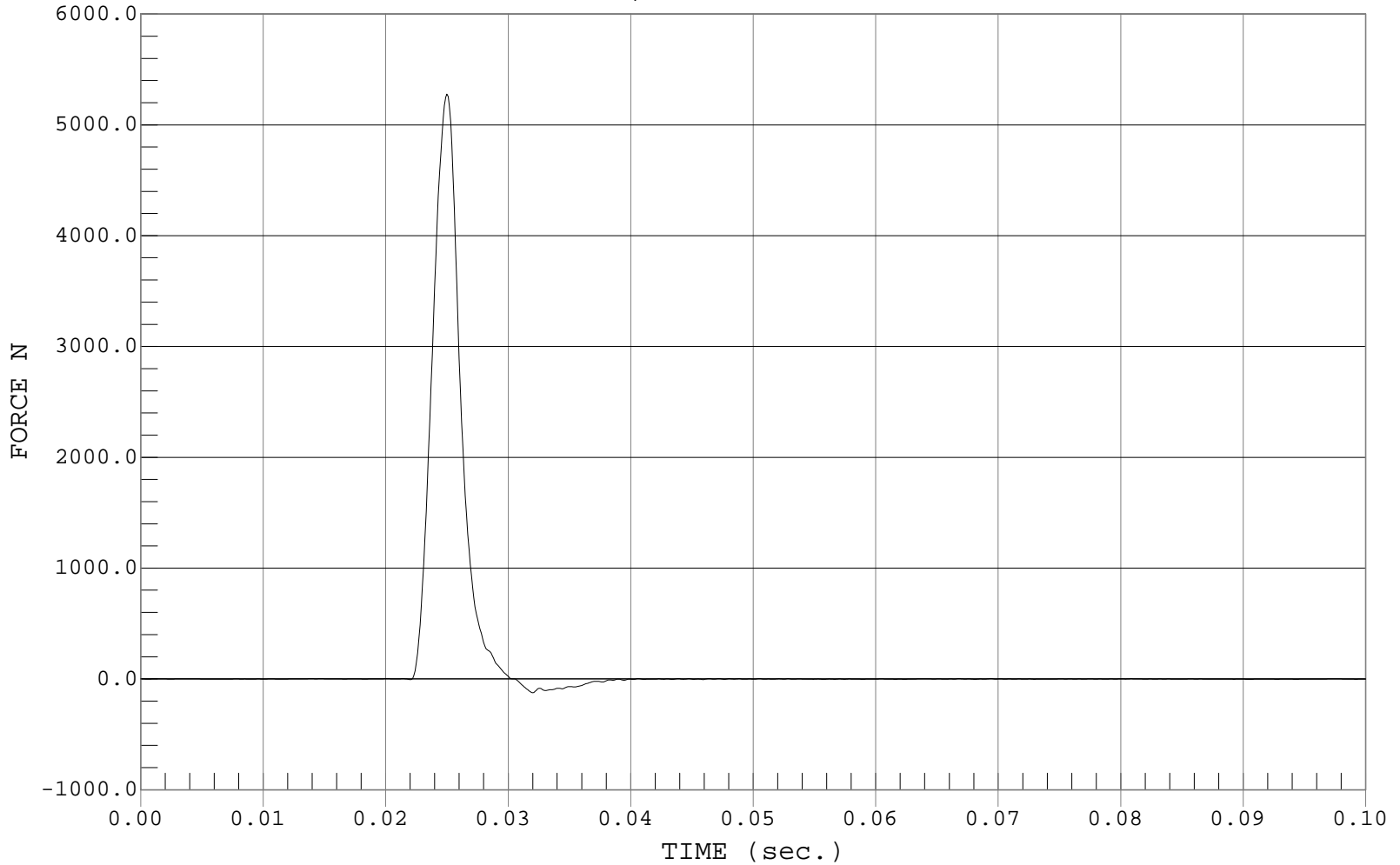
LEFT KNEE IMPACT

Test Desc.: Dummy Calibration - Left Knee Impact
Component: Dummy #142

Test Date: 02-08-01
Speed: 6.91 FT/SEC, 2.11 M/SEC

— 1 FORCE, D01186FF.F09

Ymin = -123.99 N @ 0.0320 sec., Ymax = 5278.44 N @ 0.0250 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Right Knee Impact Test

ATD Serial No.: 142

Test I.D.: D01185

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	PASS
Laboratory Relative Humidity	%	10 to 70	28	PASS
Probe Velocity	m/s	2.07 to 2.13	2.10	PASS
Peak Probe Force	Newtons	4715 to 5782	5449	PASS
Overall Test Results				PASS

 Laboratory Technician

 2/8/01
 Test Date

 Approved By



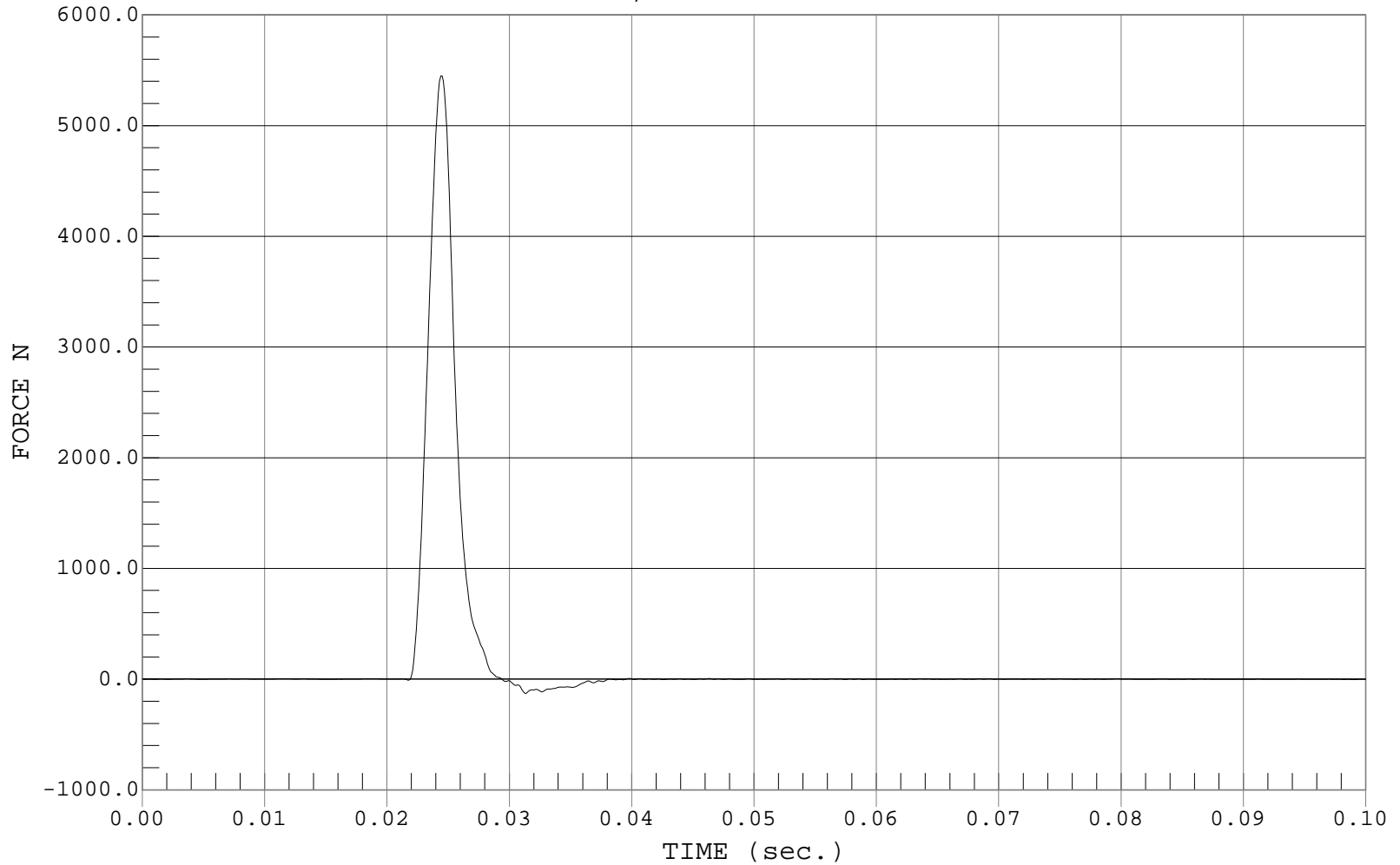
RIGHT KNEE IMPACT

Test Desc.: Dummy Calibration - Right Knee Impact
Component: Dummy #142

Test Date: 02-08-01
Speed: 6.89 FT/SEC, 2.10 M/SEC

— 1 FORCE, D01185FF.F09

Ymin = -129.35 N @ 0.0313 sec., Ymax = 5448.66 N @ 0.0245 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Head Drop Calibration

ATD Serial No.: 142

Test I.D.: D01181

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.5	PASS
Laboratory Relative Humidity	%	10 to 70	33	PASS
Peak Resultant Acceleration	G's	225.0 to 275.0	246.9	PASS
Peak Lateral Acceleration	G's	≤ ±15.0	11.5	PASS
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	PASS
Overall Test Results				PASS

 Laboratory Technician

 2/9/01
 Test Date

 Approved By



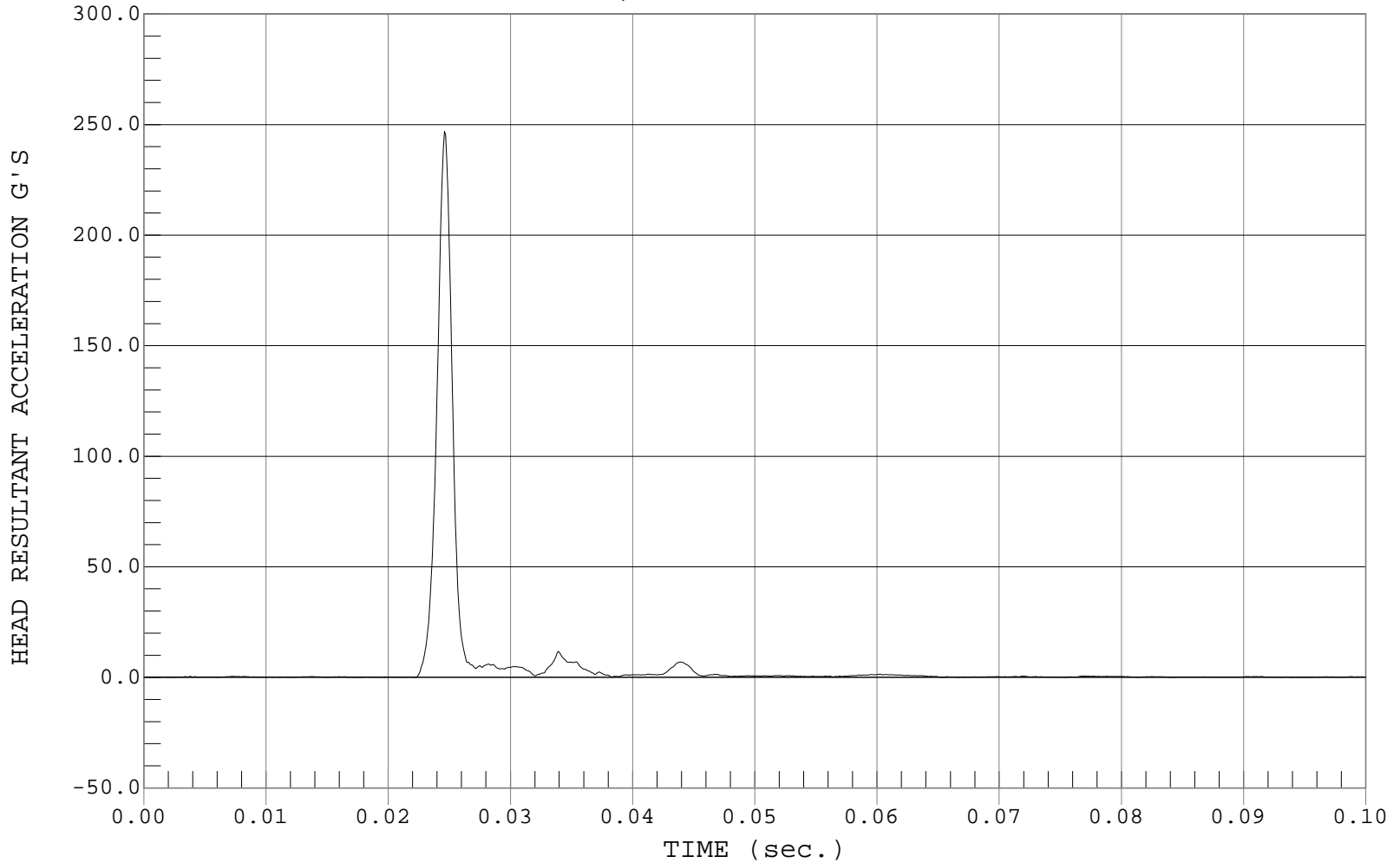
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #142

Test Date: 02-09-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01181AV.A01

Ymin = .06 G'S @ 0.0008 sec., Ymax = 246.91 G'S @ 0.0246 sec.





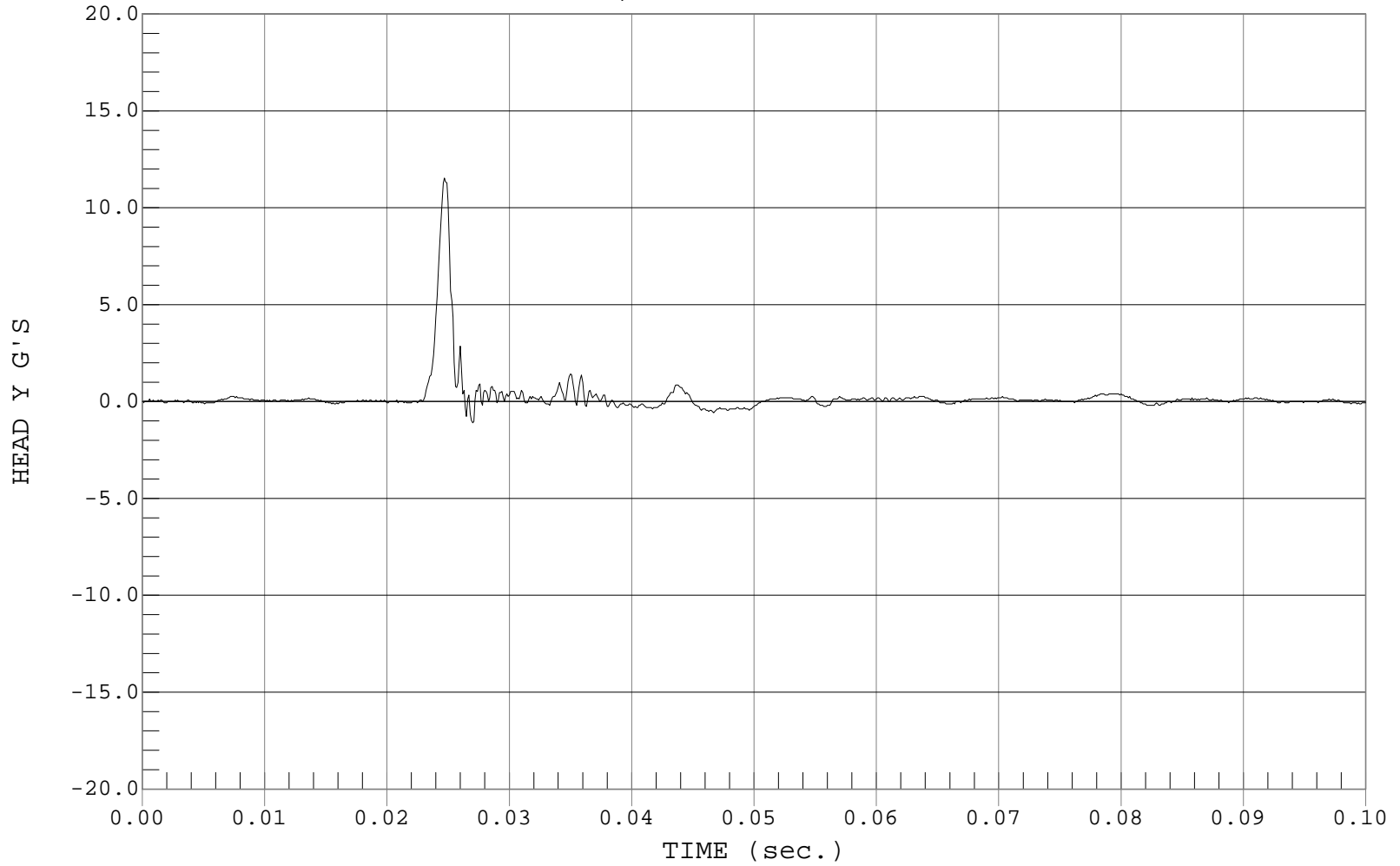
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #142

Test Date: 02-09-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01181AR.A02

Ymin = -1.1 G'S @ 0.0270 sec., Ymax = 11.54 G'S @ 0.0247 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Thorax Impact Test

ATD Serial No.: 142

Test I.D.: D01184

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.6	PASS
Laboratory Relative Humidity	%	10 to 70	21	PASS
Probe Velocity	m/s	6.58 to 6.82	6.66	PASS
Peak Probe Force	Newtons	5159 to 5893	5676	PASS
Peak Sternum Displacement	CM	6.35 to 7.26	6.38	PASS
Internal Hysteresis	%	69 to 85	77	PASS
Overall Test Results				PASS

 Laboratory Technician

 2/6/01
 Test Date

 Approved By



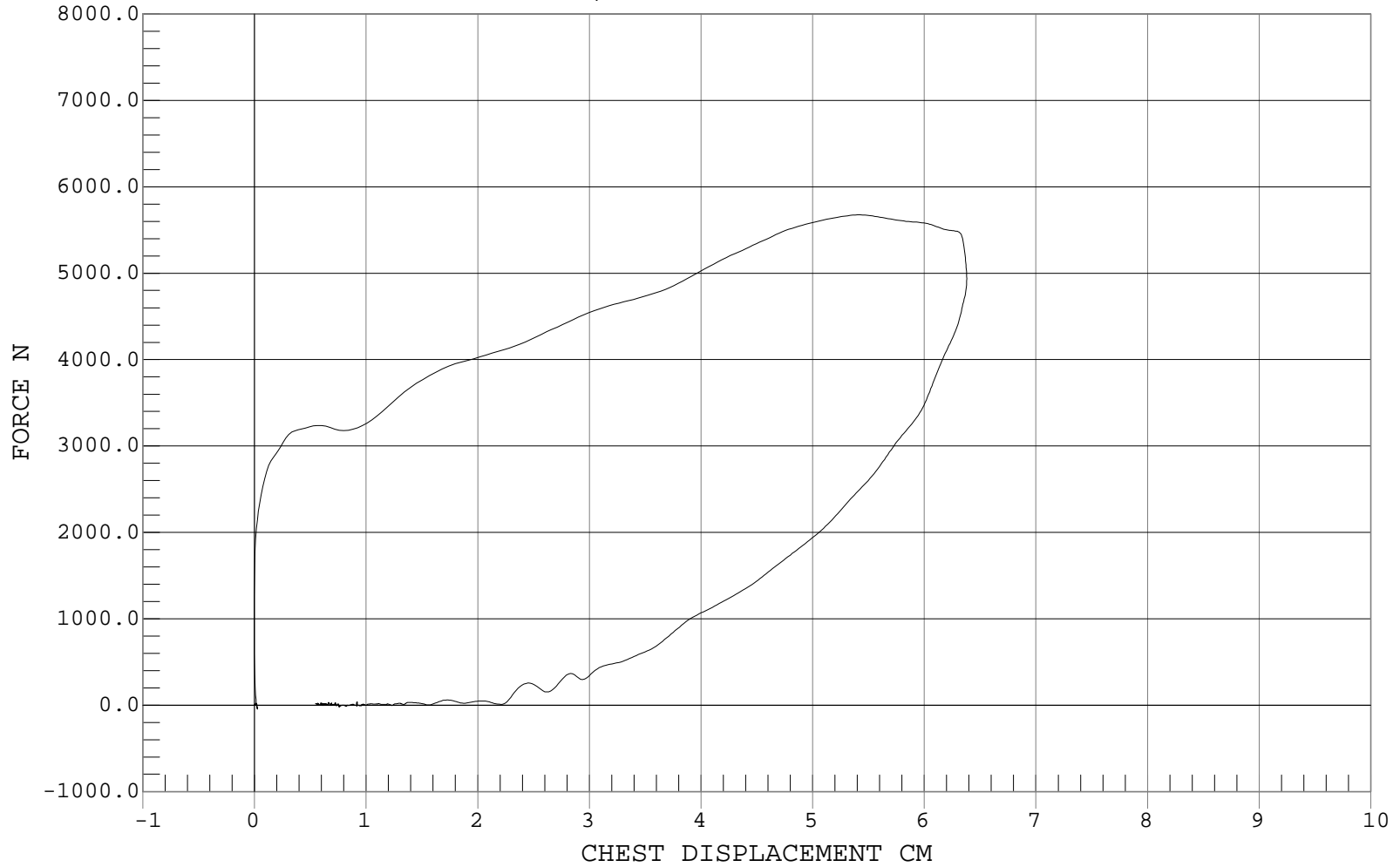
THORAX IMPACT

Test Desc.: Dummy Calibration - Chest Impact
Component: Dummy #142

Test Date: 02-06-01
Speed: 21.84 FT/SEC, 6.66 M/SEC

— 1 FORCE, D01184CH.FVD

Ymin = -45.43 N @ 0.0268 CM, Ymax = 5675.9 N @ 5.4030 CM



Hybrid III Calibration Data Sheet
50th Percentile Male
Neck Flexion Test

ATD Serial No.: 142

Test I.D.: D01182

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	PASS
Laboratory Relative Humidity		%	10 to 70	25	PASS
Pendulum Velocity		m/s	6.89 to 7.13	7.08	PASS
Pendulum Deceleration	10 Msec.	G's	22.50 to 27.50	22.54	PASS
	20 Msec.	G's	17.60 to 22.60	19.56	PASS
	30 Msec.	G's	12.50 to 18.50	16.24	PASS
Peak Pendulum Decel. After 30 Msec.		G's	≤29.0	16.2	PASS
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	39.0	PASS
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	70.2	PASS
	Time	Msec.	57.0 to 64.0	59.8	PASS
"D" Plane Rotation Decay Time To Zero Crossing		Msec.	113.0 to 128.0	116.4	PASS
Moment About Occipital Condyle	Maximum	Nm	84.1 to 108.5	90.9	PASS
	Time	Msec.	47.0 to 58.0	52.0	PASS
Positive Moment Decay Time To Zero Crossing		Msec.	97.0 to 107.0	97.6	PASS
				Overall Test Results	PASS

Laboratory Technician

2/8/01
Test Date

Approved By



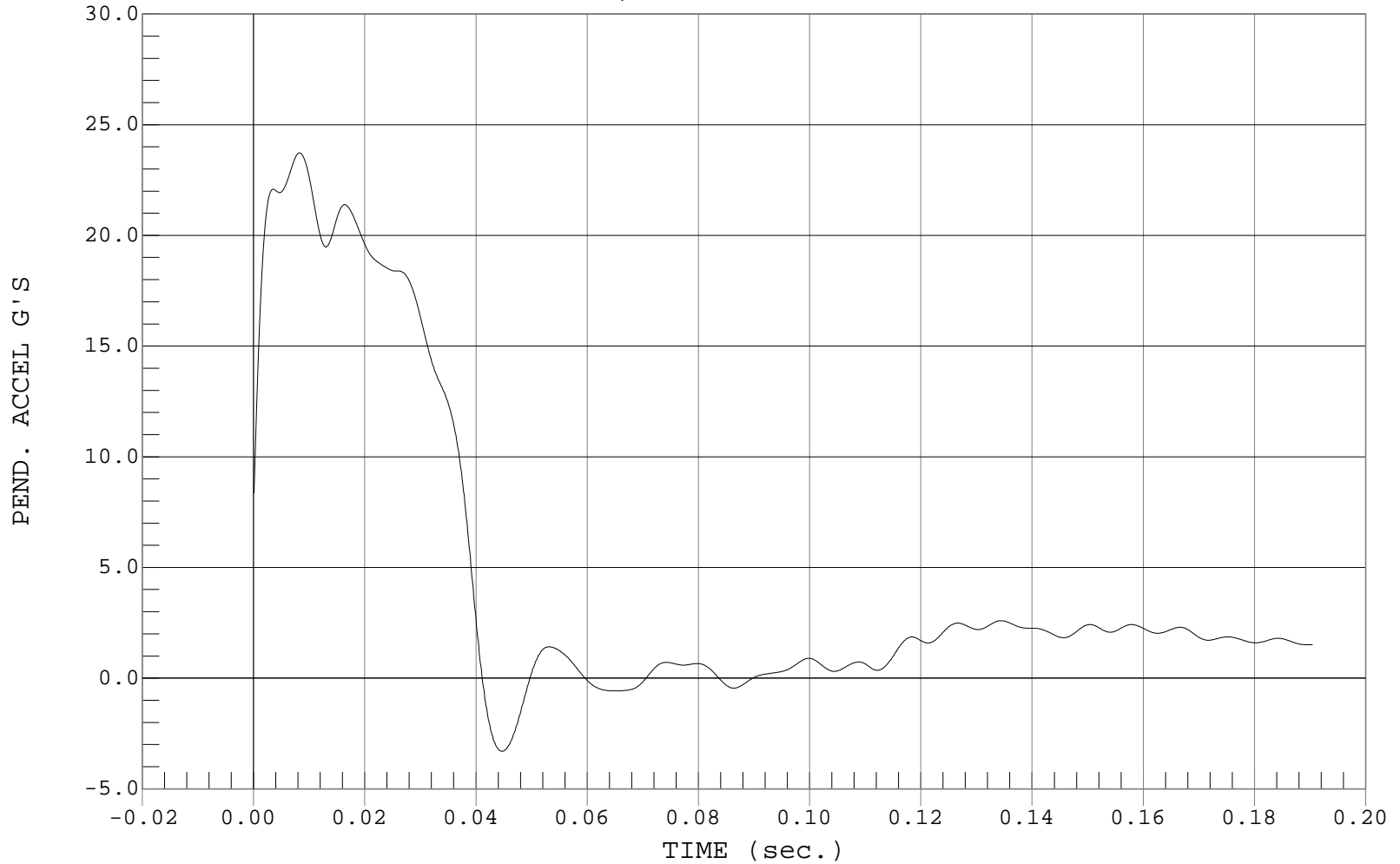
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #142

Test Date: 02-08-01
Speed: 23.24 FT/SEC, 7.08 M/SEC

— 1 PEND. ACCEL, D01182AF.A04

Ymin = -3.3 G'S @ 0.0447 sec., Ymax = 23.73 G'S @ 0.0083 sec.





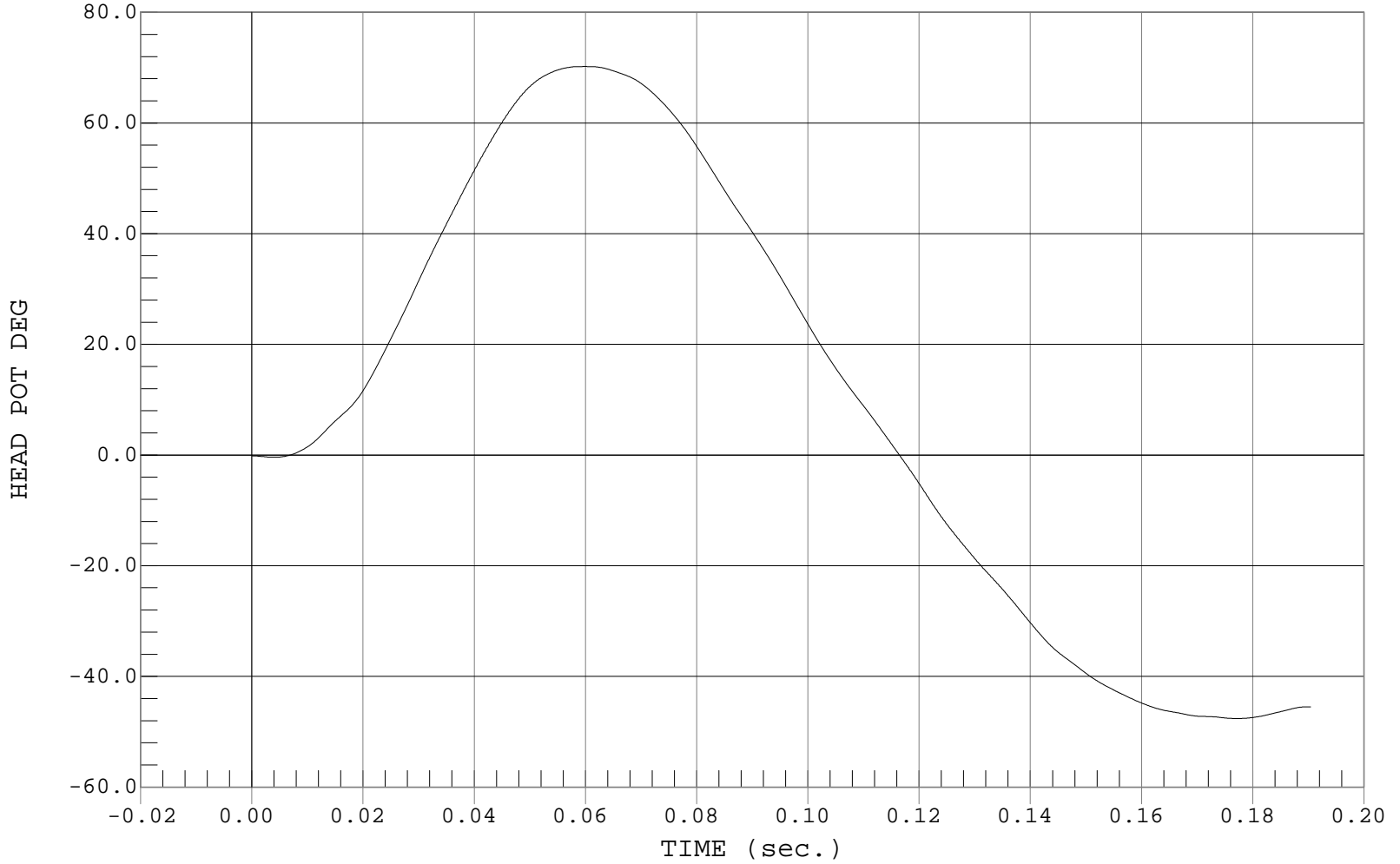
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #142

Test Date: 02-08-01
Speed: 23.24 FT/SEC, 7.08 M/SEC

— 1 HEAD POT, D01182DU.D05

Ymin = -47.62 DEG @ 0.1772 sec., Ymax = 70.2 DEG @ 0.0598 sec.





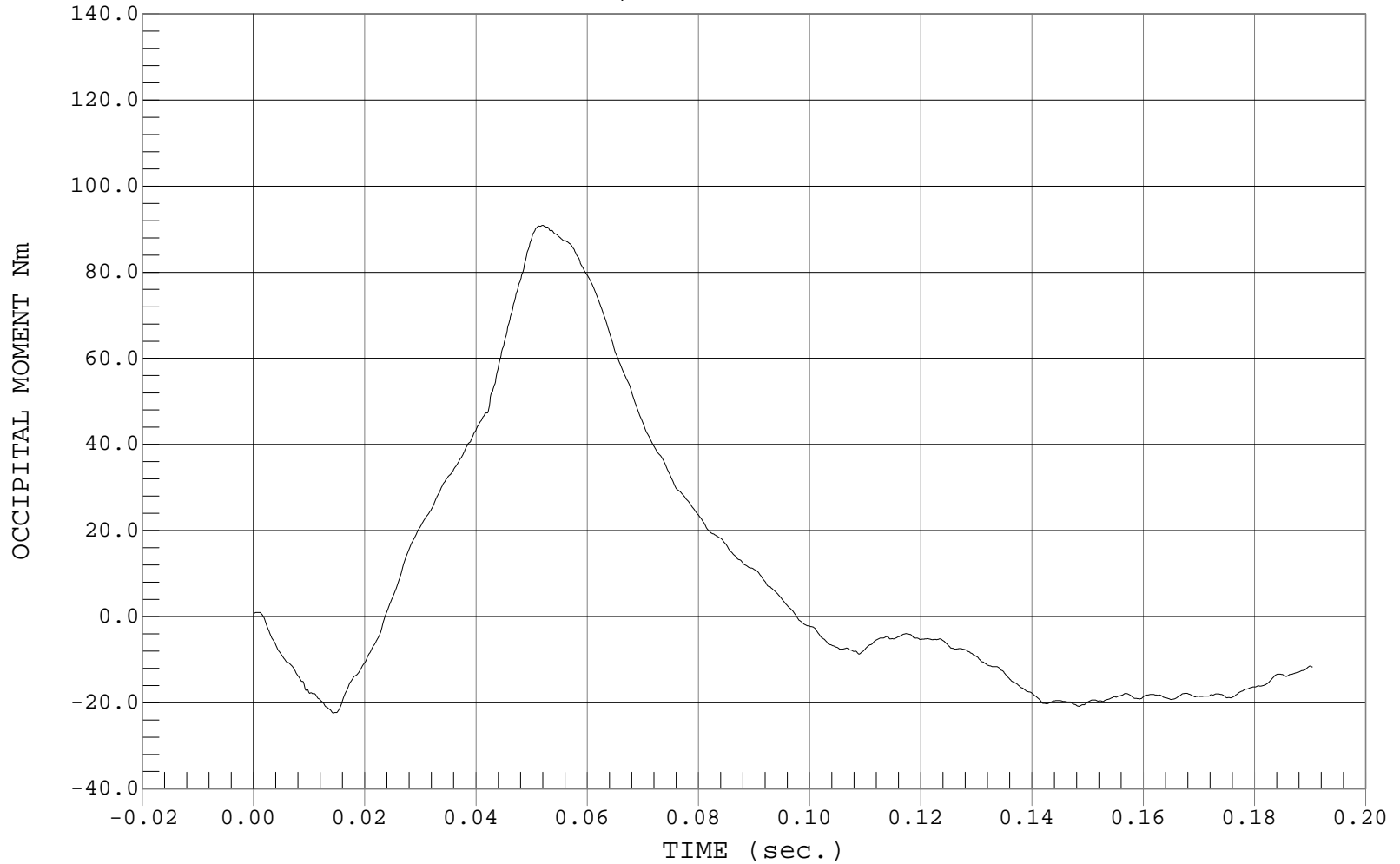
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #142

Test Date: 02-08-01
Speed: 23.24 FT/SEC, 7.08 M/SEC

— 1 OCCIPITAL MOMENT, D01182NK.MNT

Ymin = -22.4 Nm @ 0.0144 sec., Ymax = 90.92 Nm @ 0.0520 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Neck Extension Test

ATD Serial No.: 142

Test I.D.: D01183

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	PASS
Laboratory Relative Humidity		%	10 to 70	25	PASS
Pendulum Velocity		m/s	5.95 to 6.19	6.15	PASS
Pendulum Deceleration	10 Msec.	G's	17.20 to 21.20	18.39	PASS
	20 Msec.	G's	14.00 to 19.00	16.57	PASS
	30 Msec.	G's	11.00 to 16.00	12.89	PASS
Peak Pendulum Deceleration After 30 Msec.		G's	≤22.0	13.2	PASS
Deceleration Decay Time to Cross 5 G's		Msec.	38.0 to 46.0	40.0	PASS
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.7	PASS
	Time	Msec.	72.0 to 82.0	74.7	PASS
"D" Plane Rotation Decay Time To Zero Crossing		Msec.	147.0 to 174.0	150.9	PASS
Moment About Occipital Condyle	Minimum	Nm	-52.9 to -79.9	-66.1	PASS
	Time	Msec.	65.0 to 79.0	71.9	PASS
Negative Moment Decay Time To Zero Crossing		Msec.	120.0 to 148.0	135.6	PASS
Overall Test Results					PASS

Laboratory Technician

2/8/01

Test Date

Approved By



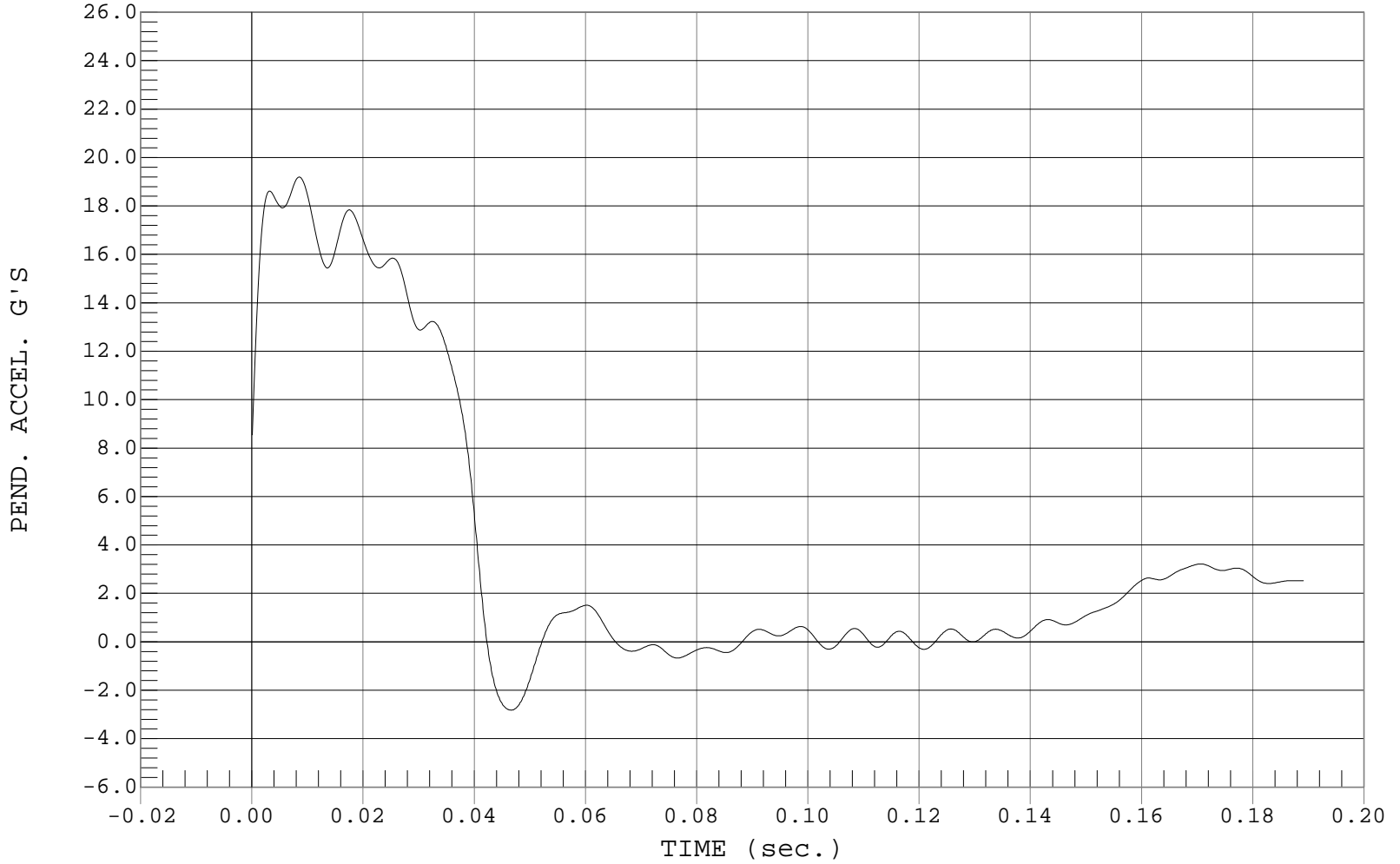
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #142

Test Date: 02-08-01
Speed: 20.17 FT/SEC, 6.15 M/SEC

— 1 PEND. ACCEL., D01183AF.A04

Ymin = -2.82 G'S @ 0.0466 sec., Ymax = 19.2 G'S @ 0.0085 sec.





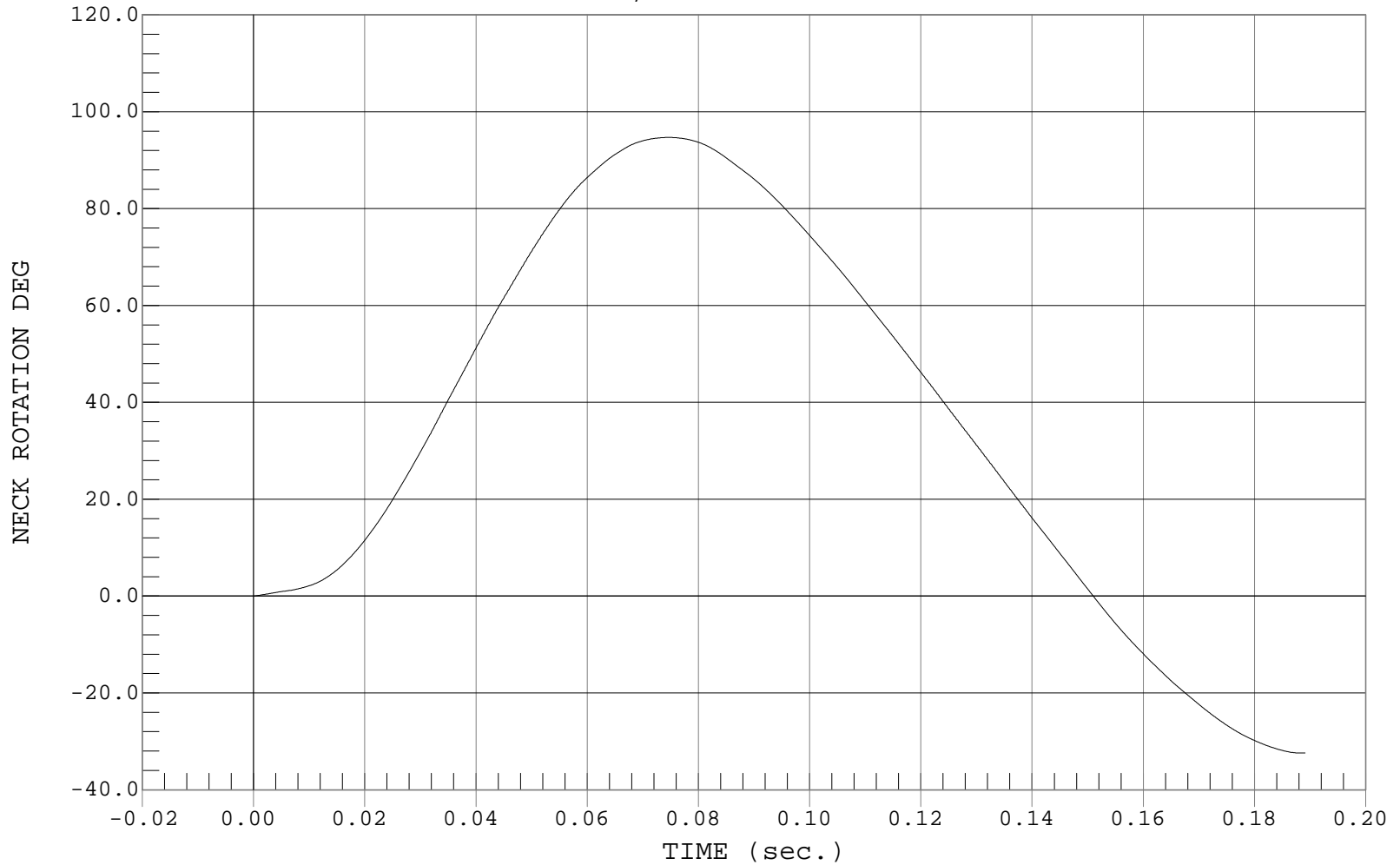
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #142

Test Date: 02-08-01
Speed: 20.17 FT/SEC, 6.15 M/SEC

— 1 NECK ROTATION, D01183DU.D05

Ymin = -32.4 DEG @ 0.1883 sec., Ymax = 94.68 DEG @ 0.0747 sec.





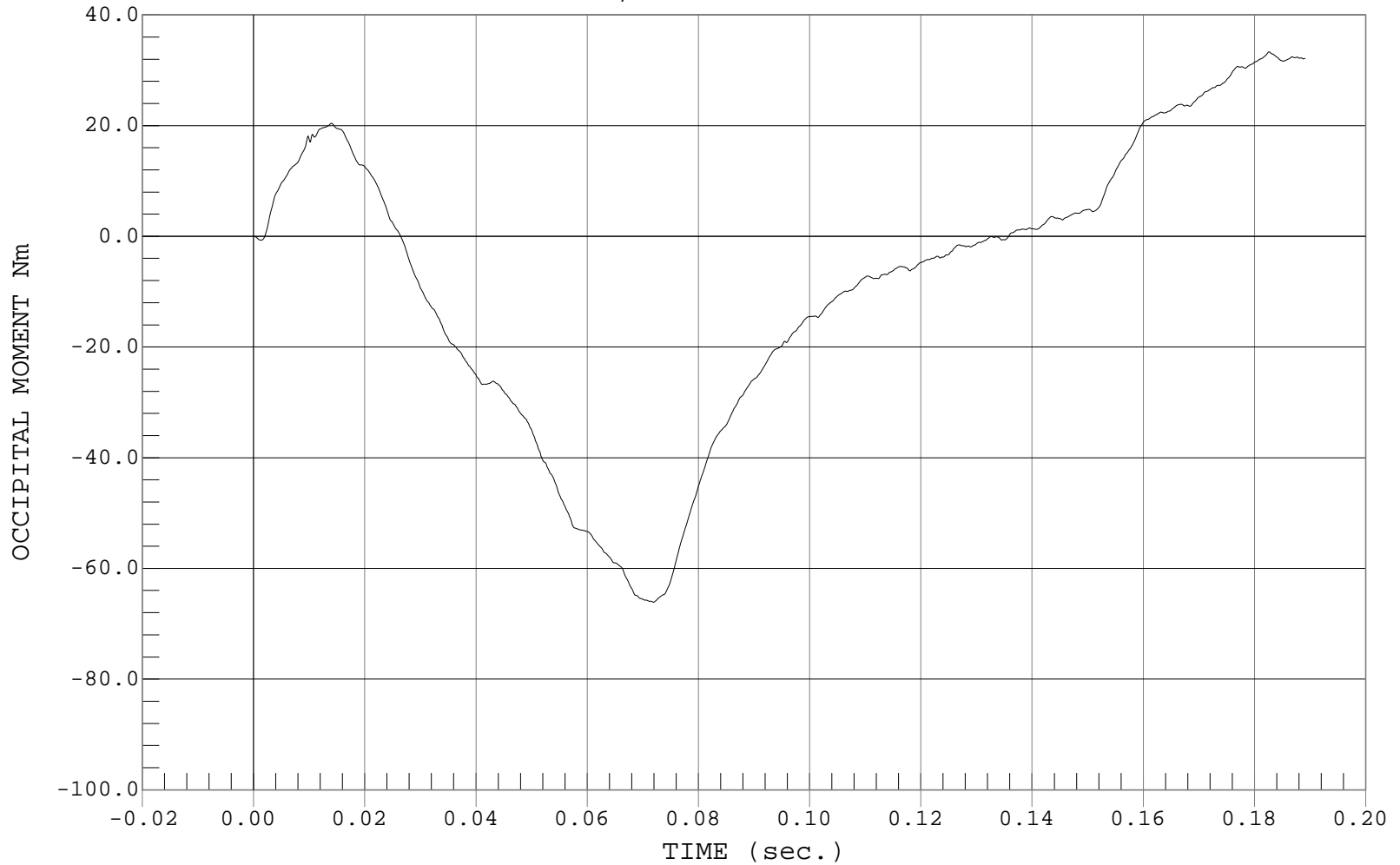
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #142

Test Date: 02-08-01
Speed: 20.17 FT/SEC, 6.15 M/SEC

— 1 OCCIPITAL MOMENT, D01183NK.MNT

Ymin = -66.1 Nm @ 0.0719 sec., Ymax = 33.34 Nm @ 0.1826 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Hip-Femur Flexion Test

ATD Serial No.: 142

Test I.D.: D01189/0

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Temperature	°C	18.9 to 25.6	21.8	21.8	PASS
Relative Humidity	%	10 to 70	33	33	PASS
Rotation Rate	deg/sec	5 – 10	Yes	Yes	PASS
30 Degrees	Nm	94.9 Nm Max.	68.5	82.3	PASS
150 ft-lbf / 203.4 Nm	Deg	40 – 50 Degree Max. rotation	45	43	PASS
Overall Test Results					PASS

Laboratory Technician

2/9/01
Test Date

Approved By



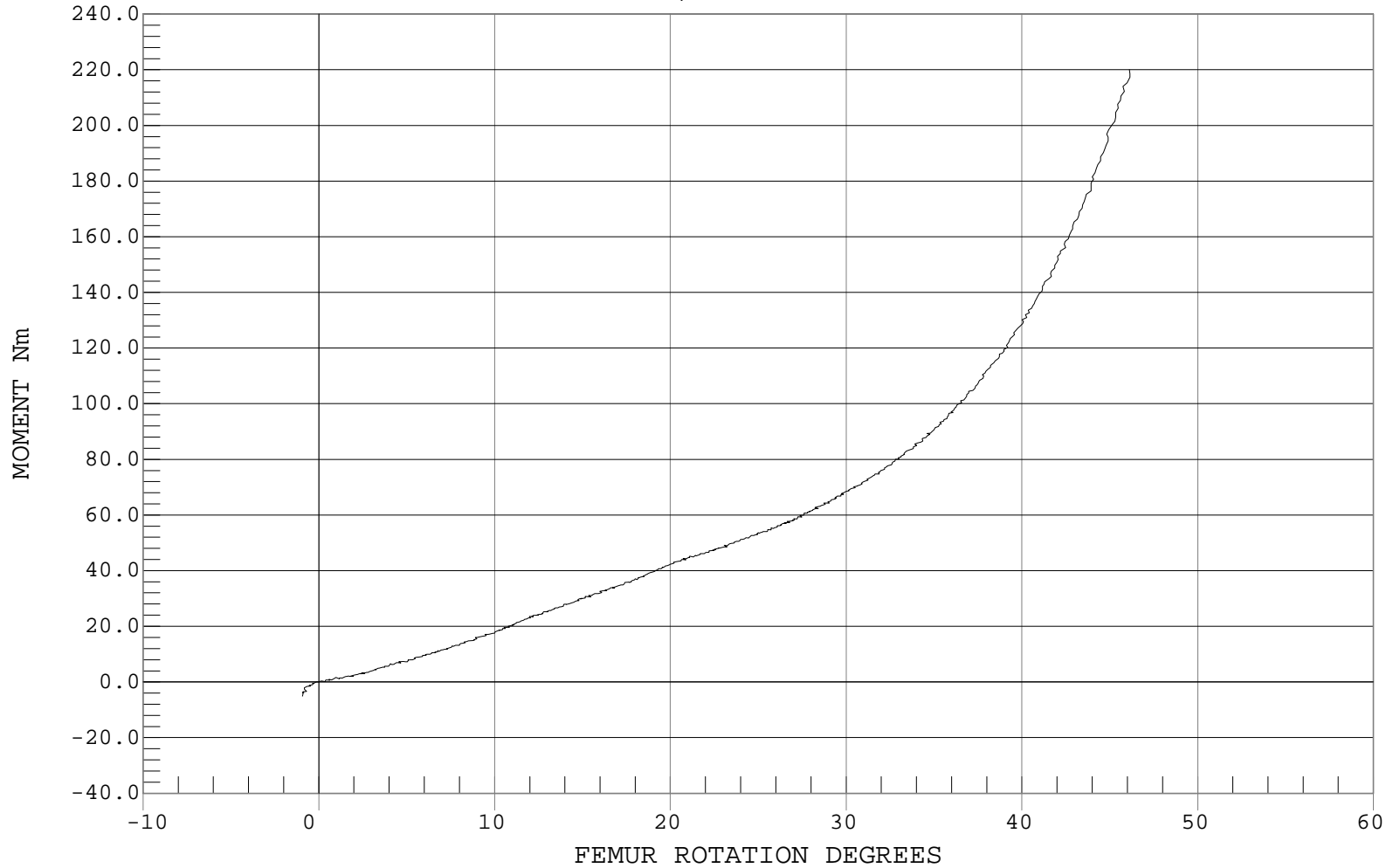
HIP-FEMUR FLEXION

Test Desc.: DUMMY CALIBRATION - HIP-FEMUR FLEXION
Component: DUMMY # 142 RIGHT FEMUR

Test Date: 02-09-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 MOMENT, D01189FC.F14

Ymin = -5.07 Nm @ -0.9330 DEGREES, Ymax = 220.05 Nm @ 46.1081 DEGREES





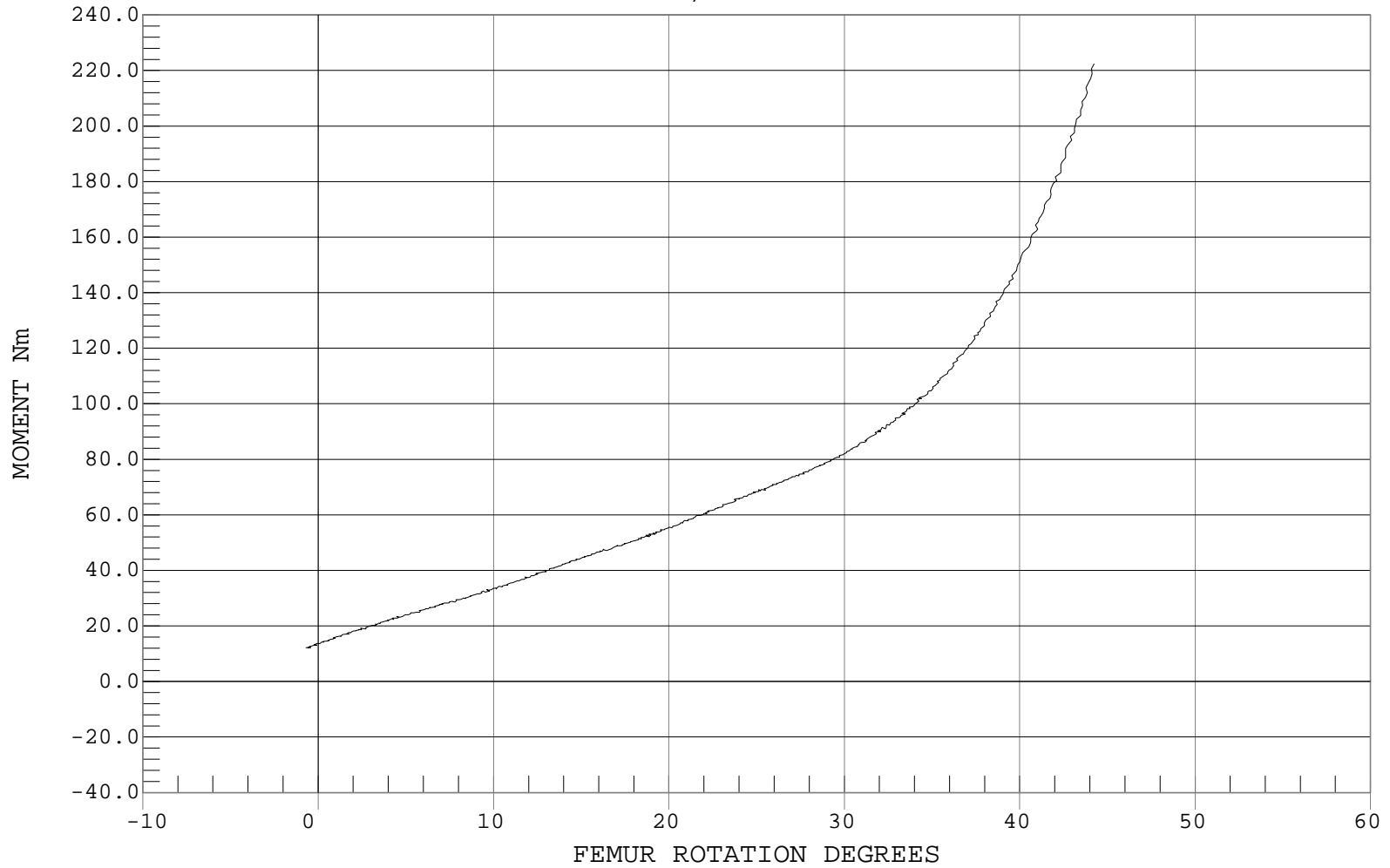
HIP-FEMUR FLEXION

Test Desc.: DUMMY CALIBRATION - HIP-FEMUR FLEXION
Component: DUMMY # 142 LEFT FEMUR

Test Date: 02-09-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 MOMENT, D01180FC.F14

Ymin = 12.15 Nm @ -0.6958 DEGREES, Ymax = 222.29 Nm @ 44.2460 DEGREES



Hybrid III Calibration Data Sheet
50th Percentile Male
Right Knee Slider

ATD Serial No.: 142

Test I.D.: D01187

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	°C	18.9 to 25.6	21.7	PASS
Relative Humidity	%	10 to 70	30	PASS
Velocity	m/s	2.7 – 2.8	2.8	PASS
Impact Force @ 10 mm	kN	-1.72 to -1.26	-1.33	PASS
Impact Force @ 18 mm	kN	-3.10 to -2.27	-2.40	PASS
Overall Test Results				PASS

 Laboratory Technician

2/8/01

 Test Date

 Approved By



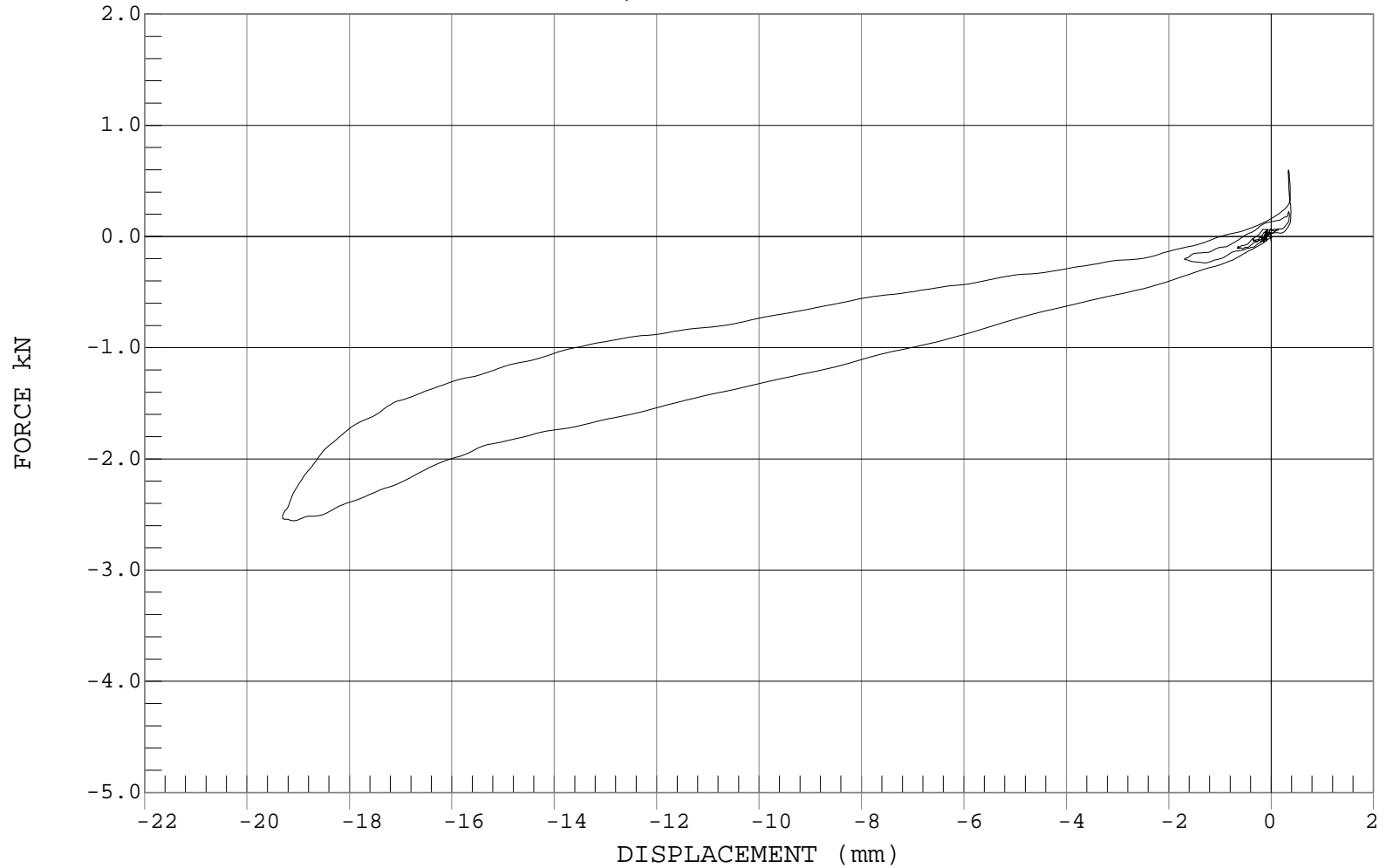
RIGHT KNEE SLIDER

Test Desc.: Dummy Calibration - Right Knee Slider
Component: Dummy #142

Test Date: 02-08-01
Speed: 9.13 FT/SEC, 2.78 M/SEC

— 1 FORCE, D01187FC.F05

Ymin = -2.56 kN @ -19.0900 mm, Ymax = .6 kN @ 0.3410 mm



Hybrid III Calibration Data Sheet
50th Percentile Male
Left Knee Slider

ATD Serial No.: 142

Test I.D.: D01188

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	°C	18.9 to 25.6	21.8	PASS
Relative Humidity	%	10 to 70	30	PASS
Velocity	m/s	2.7 – 2.8	2.8	PASS
Impact Force @ 10 mm	kN	-1.72 to -1.26	-1.38	PASS
Impact Force @ 18 mm	kN	-3.10 to -2.27	-2.27	PASS
Overall Test Results				PASS

 Laboratory Technician

2/9/01
 Test Date

 Approved By



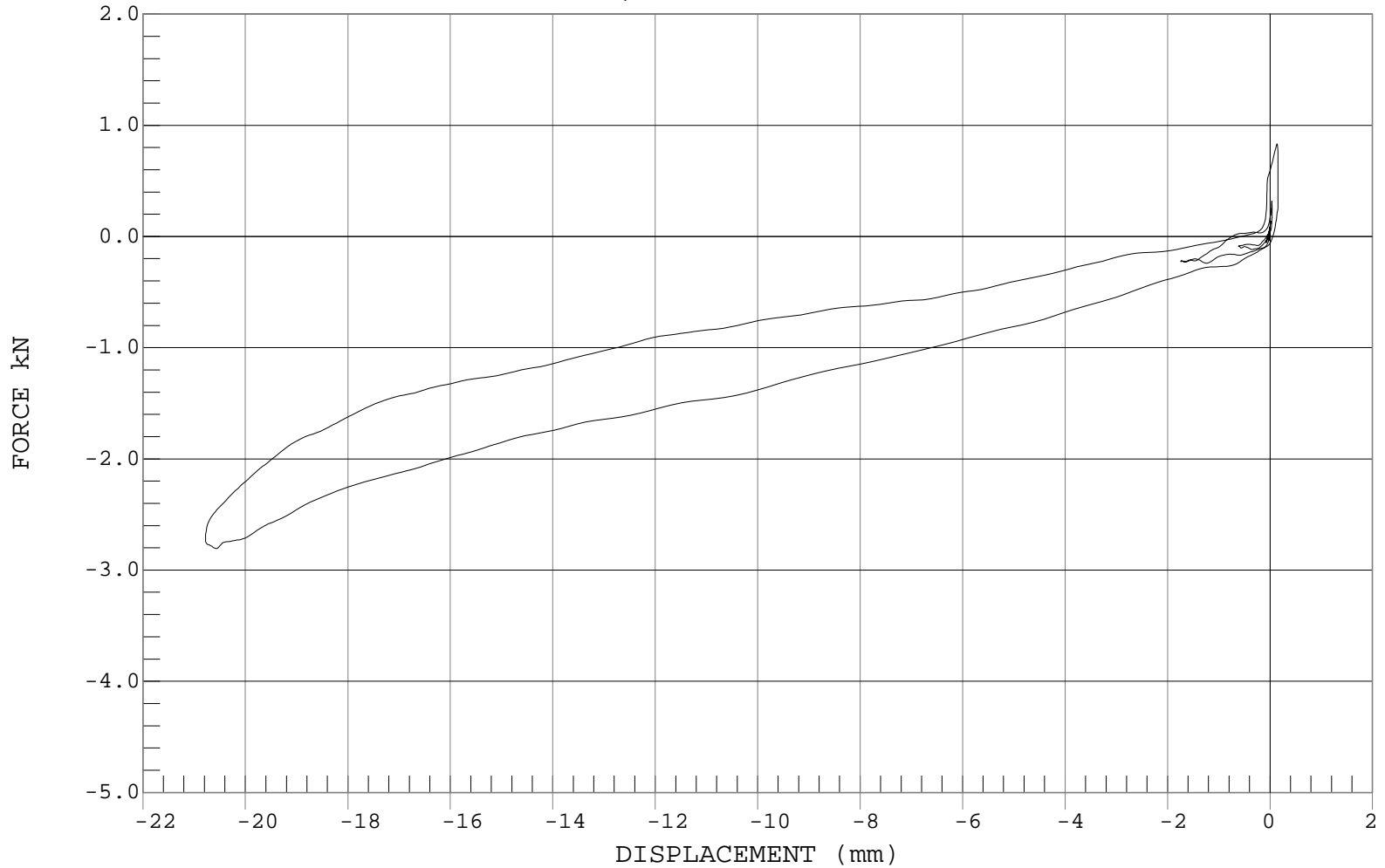
LEFT KNEE SLIDER

Test Desc.: Dummy Calibration - Left Knee Slider
Component: Dummy #142

Test Date: 02-09-01
Speed: 9.14 FT/SEC, 2.79 M/SEC

— 1 FORCE, D01188FC.F05

Ymin = -2.81 kN @ -20.5666 mm, Ymax = .83 kN @ 0.1411 mm



Hybrid III Calibration Data Sheet

50th Percentile Male

External Measurements

ATD Serial No.: 142

Test I.D.: D0118

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.4 to 22.1	21.8	PASS
Laboratory Relative Humidity	%	10 to 70	33	PASS
A – Total sitting height	mm	879 to 889	884	PASS
B – Shoulder pivot height	mm	506 to 521	514	PASS
C – “H” point height	mm	84 to 89	86	PASS
D – “H” point from seat back	mm	135 to 140	138	PASS
E – Shoulder pivot from back	mm	84 to 94	88	PASS
F – Thigh clearance	mm	140 to 155	144	PASS
G – Elbow back to wrist pivot	mm	290 to 305	296	PASS
H – Skull cap to back line	mm	41 to 46	44	PASS
I – Shoulder to elbow length	mm	330 to 345	339	PASS
J – Elbow rest height	mm	191 to 211	198	PASS
K – Buttock to knee length	mm	579 to 605	585	PASS
L – Popliteal length	mm	429 to 455	444	PASS
M – Knee pivot height	mm	485 to 500	492	PASS
N – Buttock popliteal length	mm	452 to 478	462	PASS
O – Chest depth	mm	213 to 229	219	PASS
P – Foot length	mm	252 to 267	261	PASS
V – Shoulder breadth	mm	422 to 437	432	PASS
W – Foot breadth	mm	91 to 107	102	PASS
Y – Chest circumference	mm	970 to 1001	990	PASS
Z – Waist circumference	mm	836 to 866	852	PASS
AA – Location for chest circumference	mm	429 to 434	432	PASS
BB – Location for waist circumference	mm	226 to 231	229	PASS
Overall Test Results				PASS

Laboratory Technician

2/8/01
Test Date

Approved By

Hybrid III Calibration Data Sheet
50th Percentile Male
Left Knee Impact Test

ATD Serial No.: 192

Test I.D.: D01196

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	PASS
Laboratory Relative Humidity	%	10 to 70	28	PASS
Probe Velocity	m/s	2.07 to 2.13	2.10	PASS
Peak Probe Force	Newtons	4715 to 5782	5405	PASS
Overall Test Results				PASS

 Laboratory Technician

2/8/01
 Test Date

 Approved By



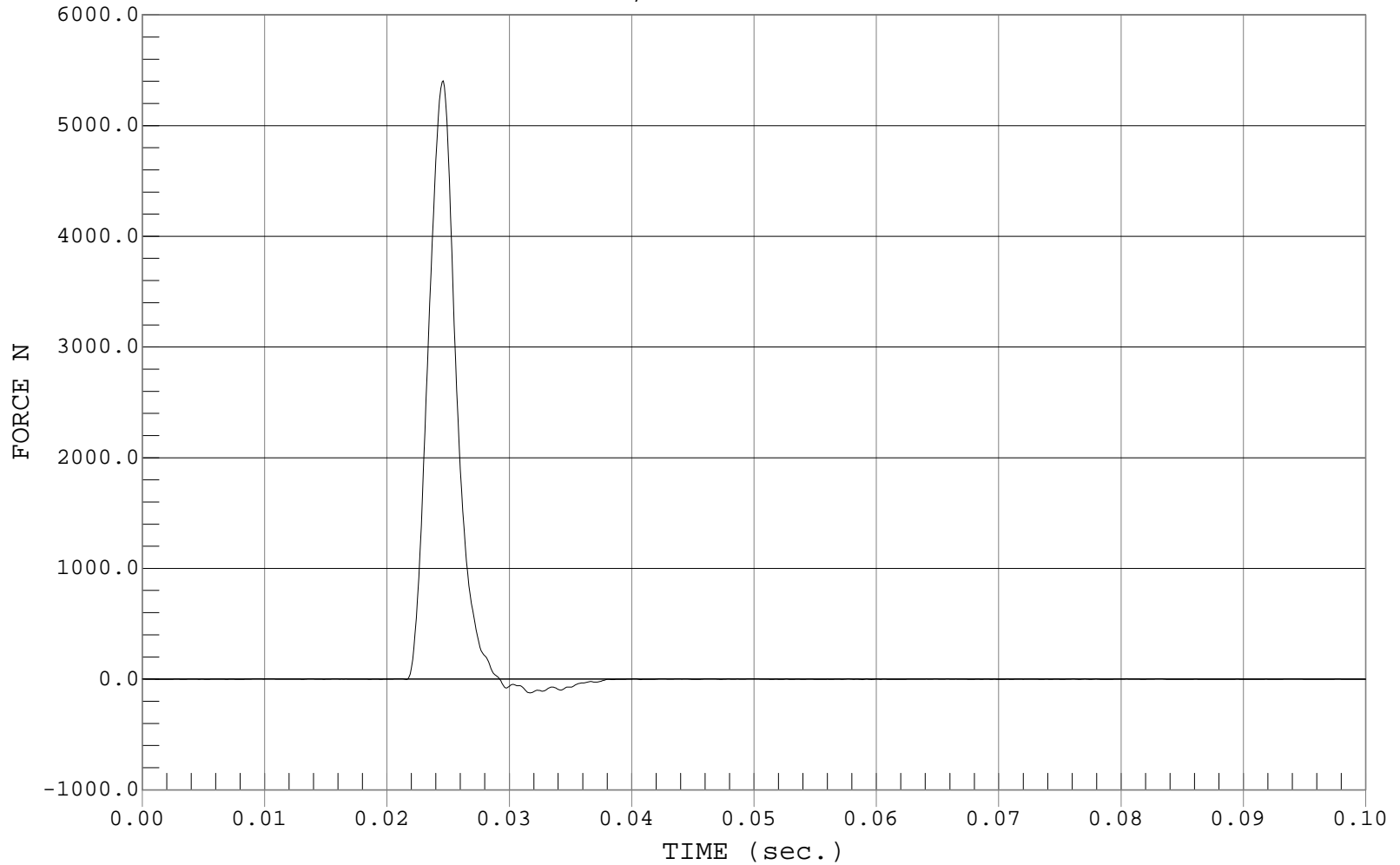
LEFT KNEE IMPACT

Test Desc.: Dummy Calibration - Left Knee Impact
Component: Dummy #192

Test Date: 02-08-01
Speed: 6.90 FT/SEC, 2.10 M/SEC

— 1 FORCE, D01196FF.F09

Ymin = -124.21 N @ 0.0317 sec., Ymax = 5404.68 N @ 0.0246 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Right Knee Impact Test

ATD Serial No.: 192

Test I.D.: D01196

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.7	PASS
Laboratory Relative Humidity	%	10 to 70	28	PASS
Probe Velocity	m/s	2.07 to 2.13	2.12	PASS
Peak Probe Force	Newtons	4715 to 5782	5514	PASS
Overall Test Results				PASS

 Laboratory Technician

 2/8/01
 Test Date

 Approved By



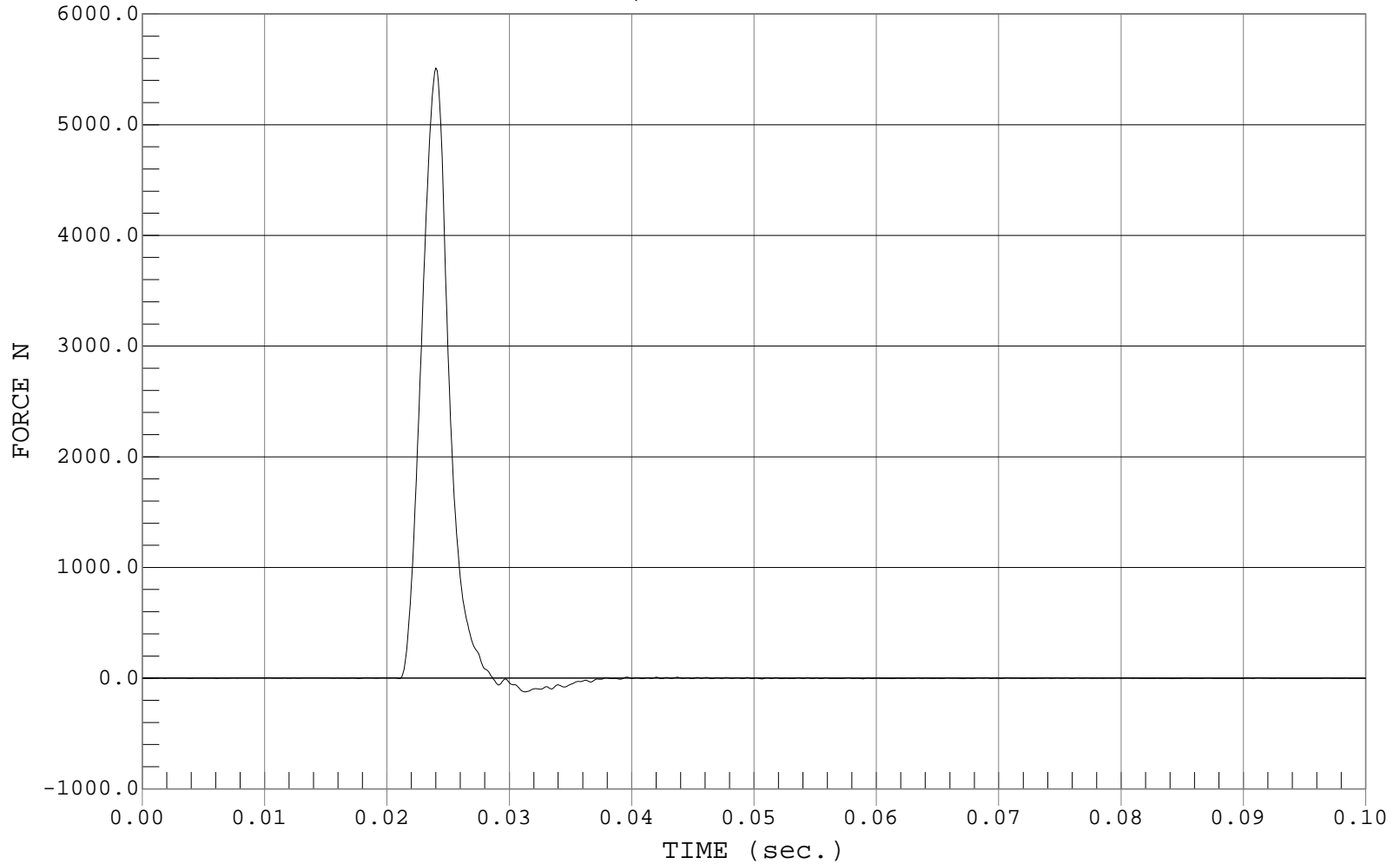
RIGHT KNEE IMPACT

Test Desc.: Dummy Calibration - Right Knee Impact
Component: Dummy #192

Test Date: 02-08-01
Speed: 6.96 FT/SEC, 2.12 M/SEC

— 1 FORCE, D01195FF.F09

Ymin = -124.07 N @ 0.0313 sec., Ymax = 5513.95 N @ 0.0240 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Head Drop Calibration

ATD Serial No.: 192

Test I.D.: D01191

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.5	PASS
Laboratory Relative Humidity	%	10 to 70	33	PASS
Peak Resultant Acceleration	G's	225.0 to 275.0	263.3	PASS
Peak Lateral Acceleration	G's	≤ ±15.0	6.1	PASS
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	PASS
Overall Test Results				PASS

 Laboratory Technician

 2/9/01
 Test Date

 Approved By



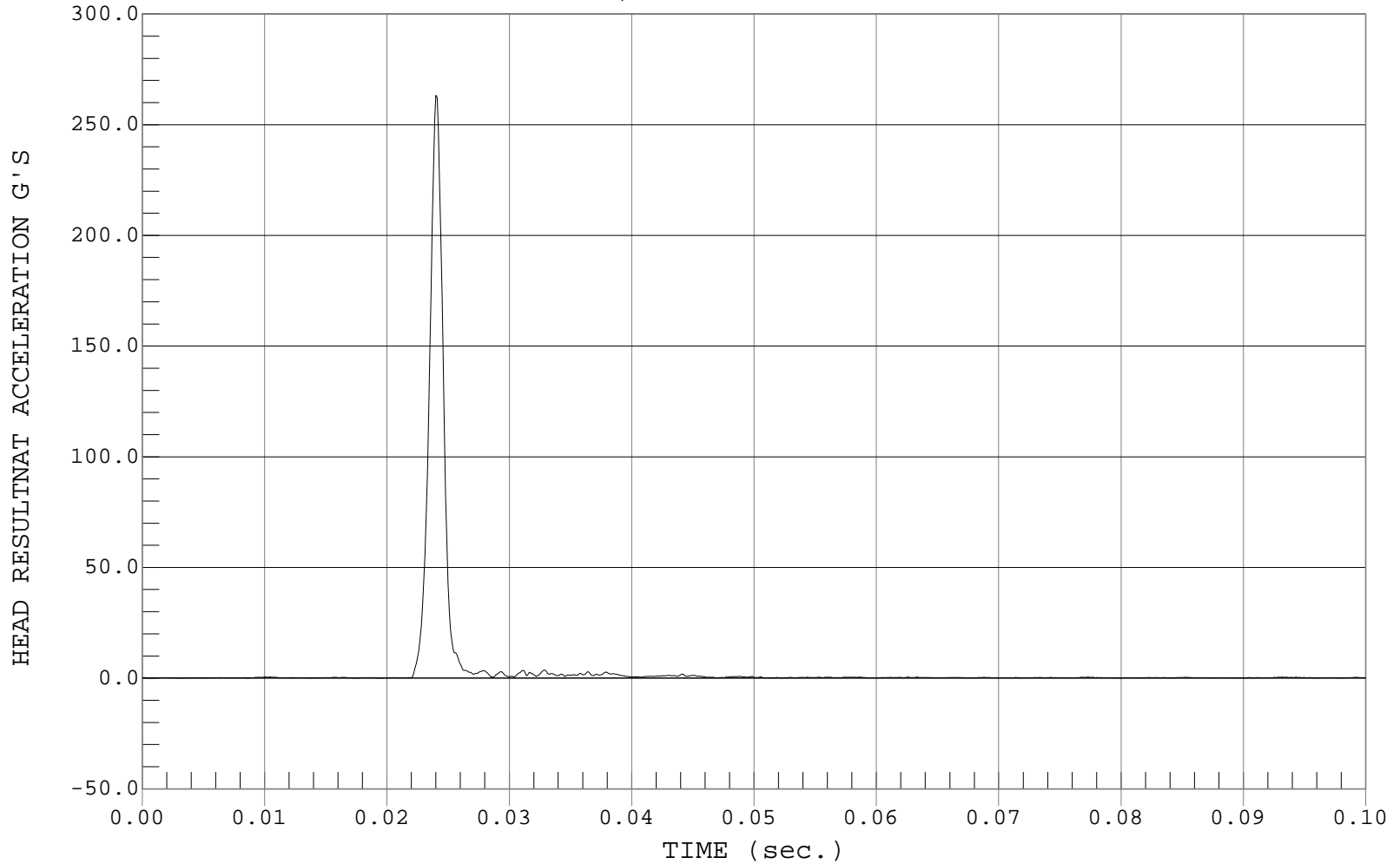
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #192

Test Date: 02-09-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01191AV.A01

Ymin = .03 G'S @ 0.0005 sec., Ymax = 263.28 G'S @ 0.0240 sec.





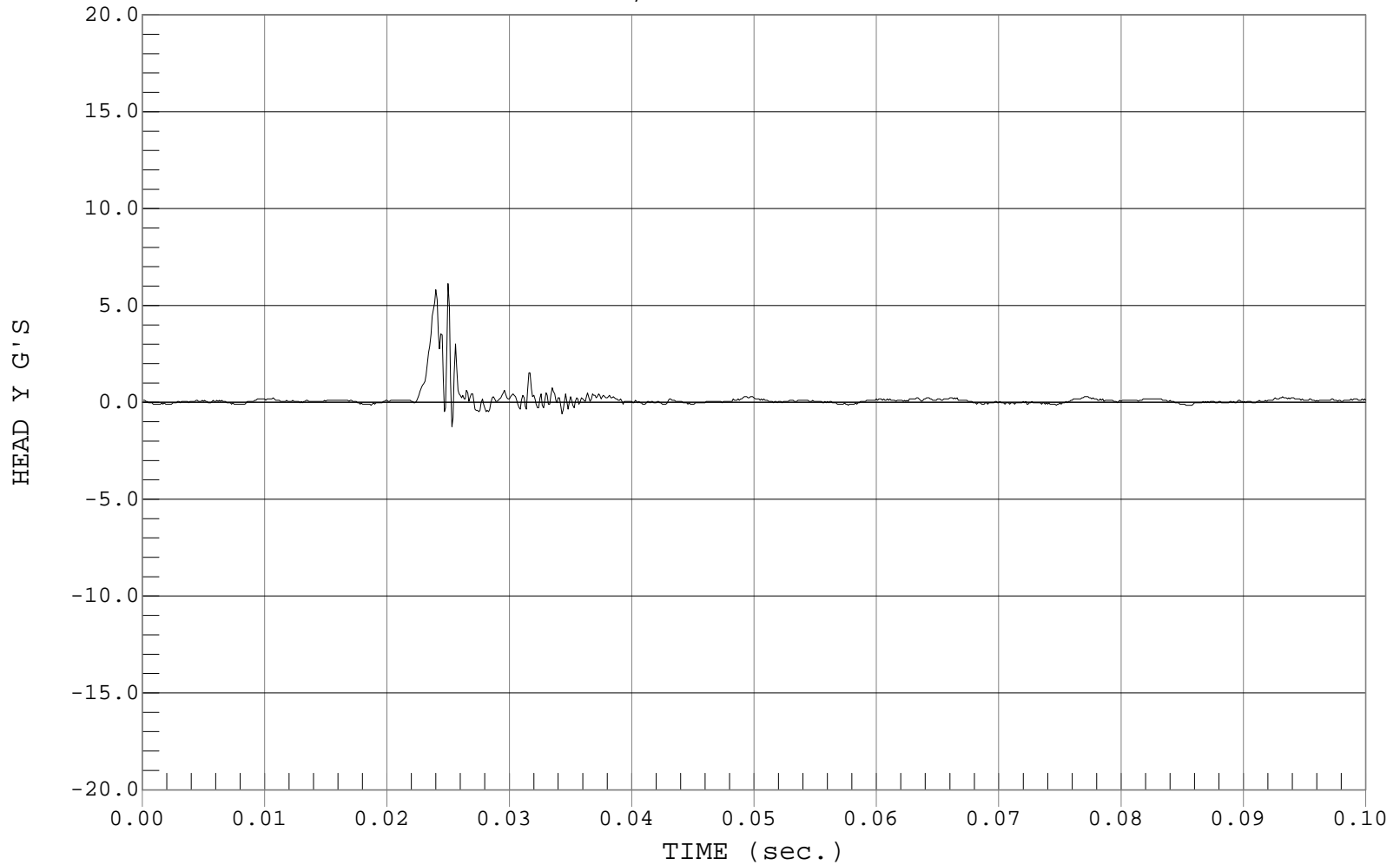
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #192

Test Date: 02-09-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01191AR.A02

Ymin = -1.25 G'S @ 0.0253 sec., Ymax = 6.13 G'S @ 0.0250 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Thorax Impact Test

ATD Serial No.: 192

Test I.D.: D01194

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.5	PASS
Laboratory Relative Humidity	%	10 to 70	21	PASS
Probe Velocity	m/s	6.58 to 6.82	6.69	PASS
Peak Probe Force	Newtons	5159 to 5893	5685	PASS
Peak Sternum Displacement	CM	6.35 to 7.26	6.72	PASS
Internal Hysteresis	%	69 to 85	75	PASS
Overall Test Results				PASS

 Laboratory Technician

 2/6/01
 Test Date

 Approved By



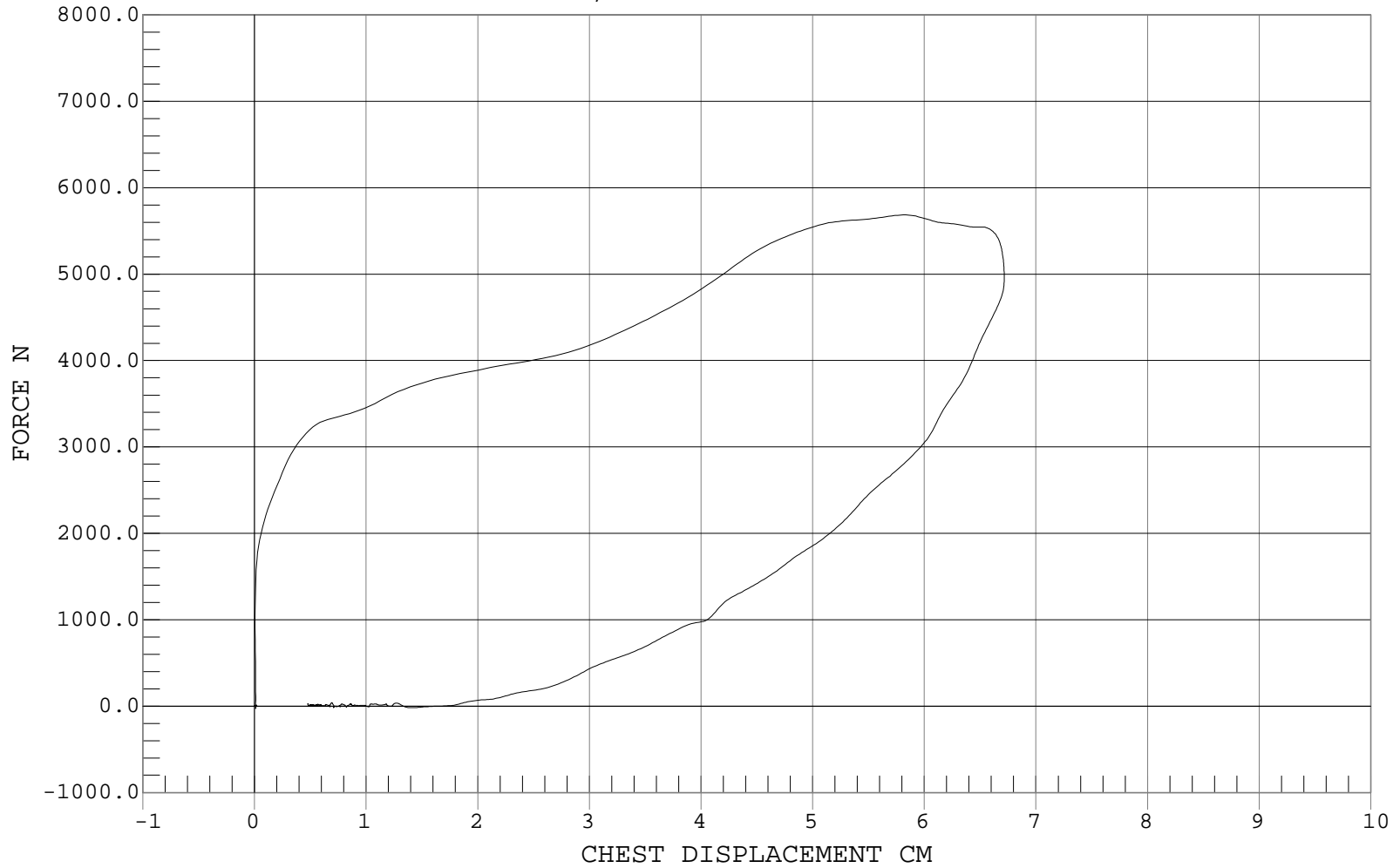
THORAX IMPACT

Test Desc.: Dummy Calibration - Chest Impact
Component: Dummy #192

Test Date: 02-06-01
Speed: 21.93 FT/SEC, 6.69 M/SEC

— 1 FORCE, D01194CH.FVD

Ymin = -26.01 N @ 0.0103 CM, Ymax = 5685.31 N @ 5.8112 CM



C-34

Hybrid III Calibration Data Sheet
50th Percentile Male
Neck Flexion Test

ATD Serial No.: 192

Test I.D.: D01192

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	PASS
Laboratory Relative Humidity		%	10 to 70	25	PASS
Pendulum Velocity		m/s	6.89 to 7.13	7.02	PASS
Pendulum Deceleration	10 Msec.	G's	22.50 to 27.50	23.03	PASS
	20 Msec.	G's	17.60 to 22.60	19.82	PASS
	30 Msec.	G's	12.50 to 18.50	13.33	PASS
Peak Pendulum Deceleration After 30 Msec.		G's	≤29.0	13.3	PASS
Deceleration Decay Time to Cross 5 G's		Msec.	34.0 to 42.0	39.3	PASS
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	72.4	PASS
	Time	Msec.	57.0 to 64.0	57.4	PASS
"D" Plane Rotation Decay Time To Zero Crossing		Msec.	113.0 to 128.0	114.2	PASS
Moment About Occipital Condyle	Maximum	Nm	84.1 to 108.5	89.9	PASS
	Time	Msec.	47.0 to 58.0	52.5	PASS
Positive Moment Decay Time To Zero Crossing		Msec.	97.0 to 107.0	97.1	PASS
Overall Test Results					PASS

Laboratory Technician

2/8/01

Test Date

Approved By



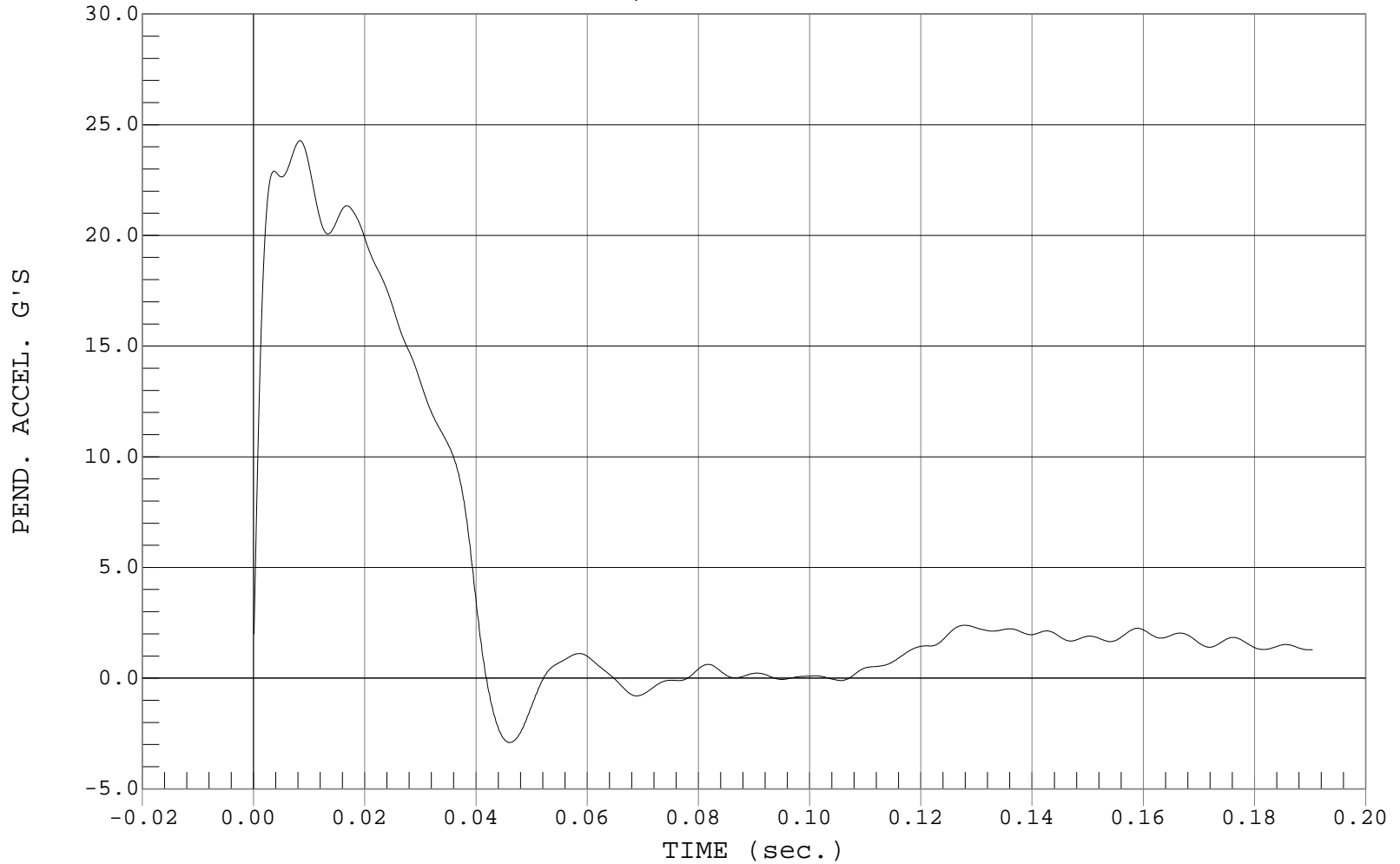
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #192

Test Date: 02-08-01
Speed: 23.02 FT/SEC, 7.02 M/SEC

— 1 PEND. ACCEL., D01192AF.A04

Ymin = -2.91 G'S @ 0.0461 sec., Ymax = 24.28 G'S @ 0.0084 sec.





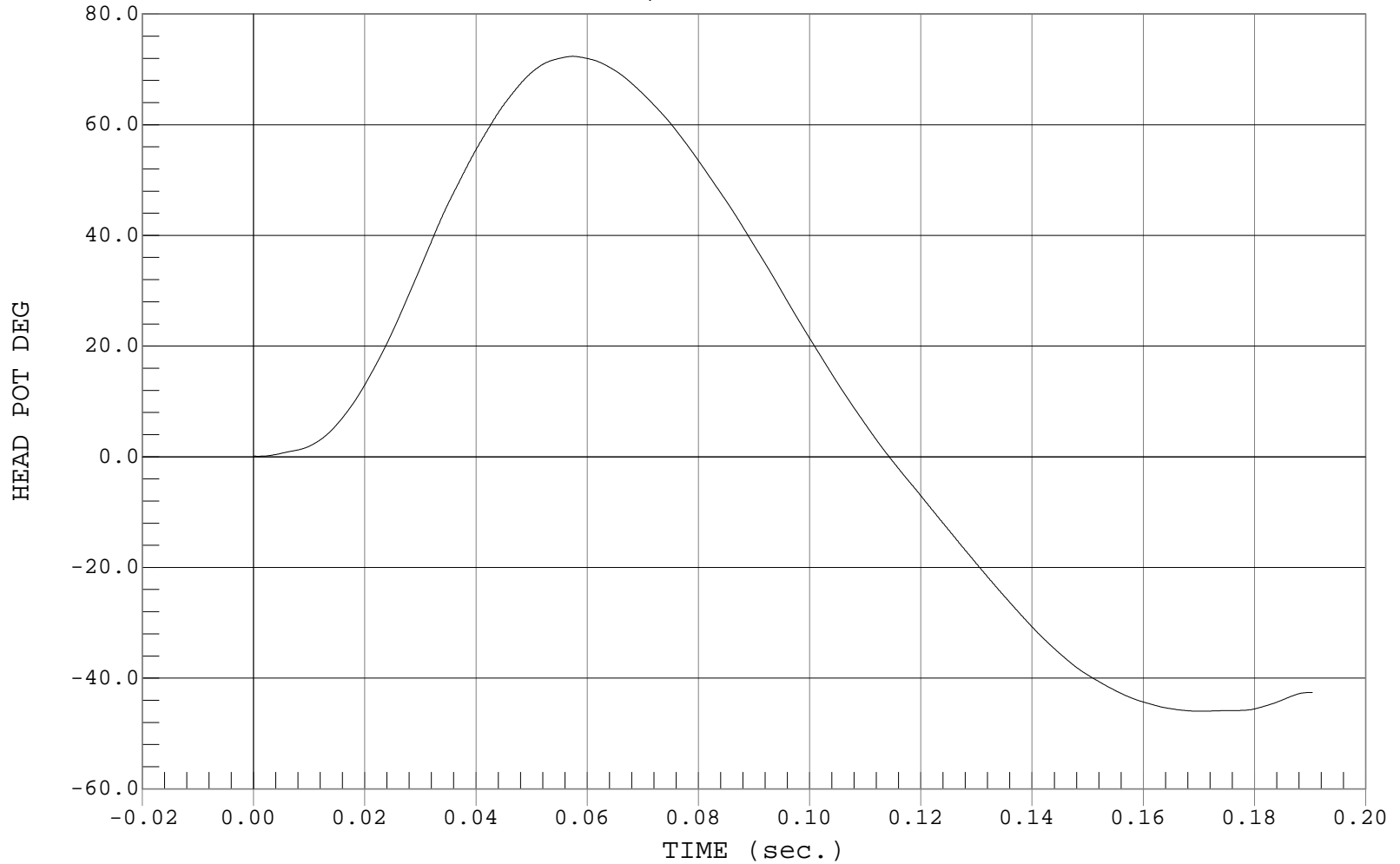
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #192

Test Date: 02-08-01
Speed: 23.02 FT/SEC, 7.02 M/SEC

— 1 HEAD POT, D01192DU.D05

Ymin = -45.96 DEG @ 0.1702 sec., Ymax = 72.36 DEG @ 0.0574 sec.





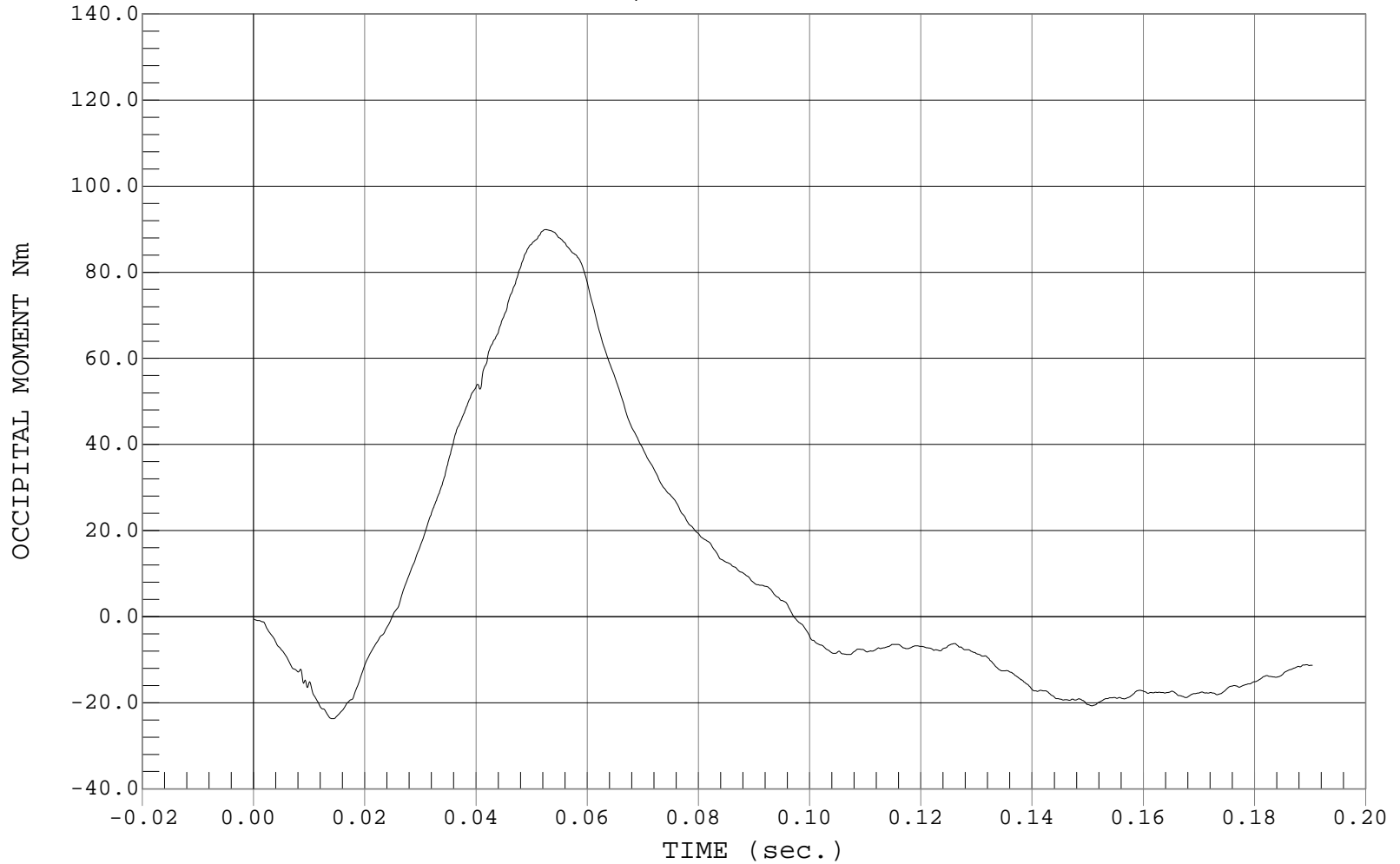
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #192

Test Date: 02-08-01
Speed: 23.02 FT/SEC, 7.02 M/SEC

— 1 OCCIPITAL MOMENT, D01192NK.MNT

Ymin = -23.69 Nm @ 0.0143 sec., Ymax = 89.93 Nm @ 0.0525 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Neck Extension Test

ATD Serial No.: 192

Test I.D.: D01193

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	PASS
Laboratory Relative Humidity		%	10 to 70	25	PASS
Pendulum Velocity		m/s	5.95 to 6.19	6.16	PASS
Pendulum Deceleration	10 Msec.	G's	17.20 to 21.20	18.27	PASS
	20 Msec.	G's	14.00 to 19.00	15.79	PASS
	30 Msec.	G's	11.00 to 16.00	11.55	PASS
Peak Pendulum Deceleration After 30 Msec.		G's	≤22.0	12.0	PASS
Deceleration Decay Time to Cross 5 G's		Msec.	38.0 to 46.0	43.2	PASS
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.4	PASS
	Time	Msec.	72.0 to 82.0	78.0	PASS
"D" Plane Rotation Decay Time To Zero Crossing		Msec.	147.0 to 174.0	156.7	PASS
Moment About Occipital Condyle	Minimum	Nm	-52.9 to -79.9	-57.1	PASS
	Time	Msec.	65.0 to 79.0	73.9	PASS
Negative Moment Decay Time To Zero Crossing		Msec.	120.0 to 148.0	136.4	PASS
Overall Test Results					PASS

Laboratory Technician

2/8/01

Test Date

Approved By



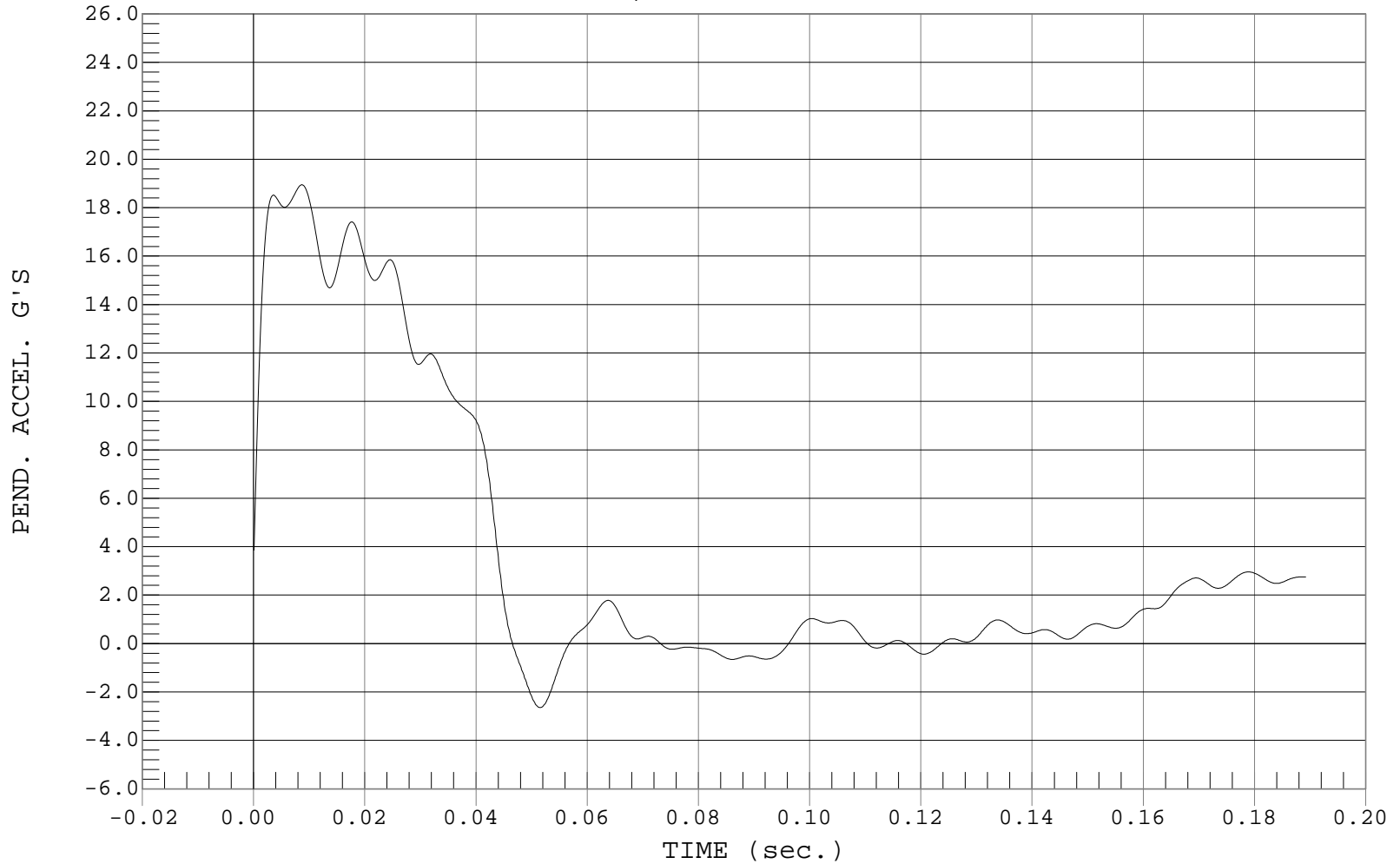
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #192

Test Date: 02-08-01
Speed: 20.20 FT/SEC, 6.16 M/SEC

— 1 PEND. ACCEL., D01193AF.A04

Ymin = -2.64 G'S @ 0.0515 sec., Ymax = 18.95 G'S @ 0.0087 sec.





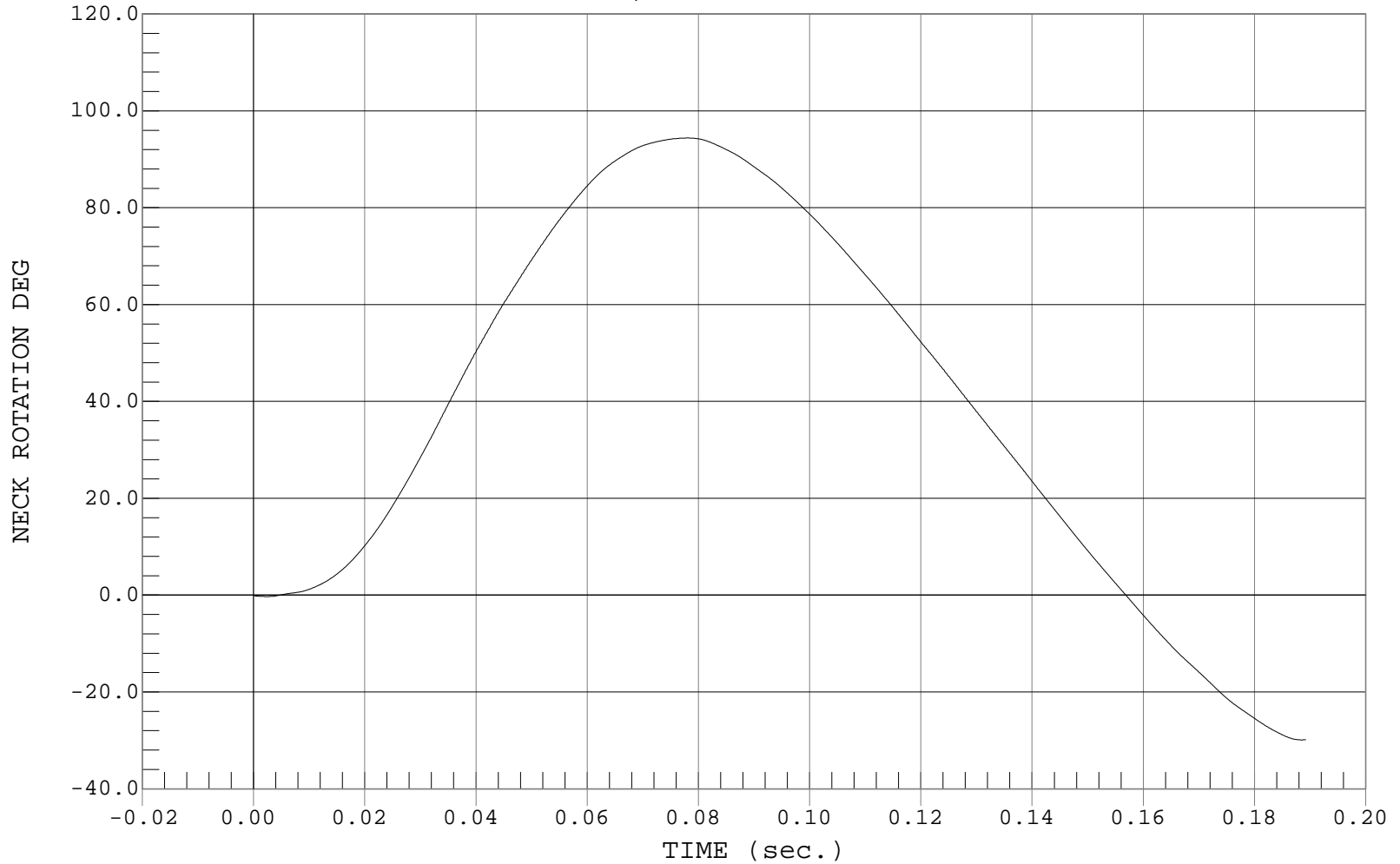
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #192

Test Date: 02-08-01
Speed: 20.20 FT/SEC, 6.16 M/SEC

— 1 NECK ROTATION, D01193DU.D05

Ymin = -29.9 DEG @ 0.1884 sec., Ymax = 94.39 DEG @ 0.0780 sec.





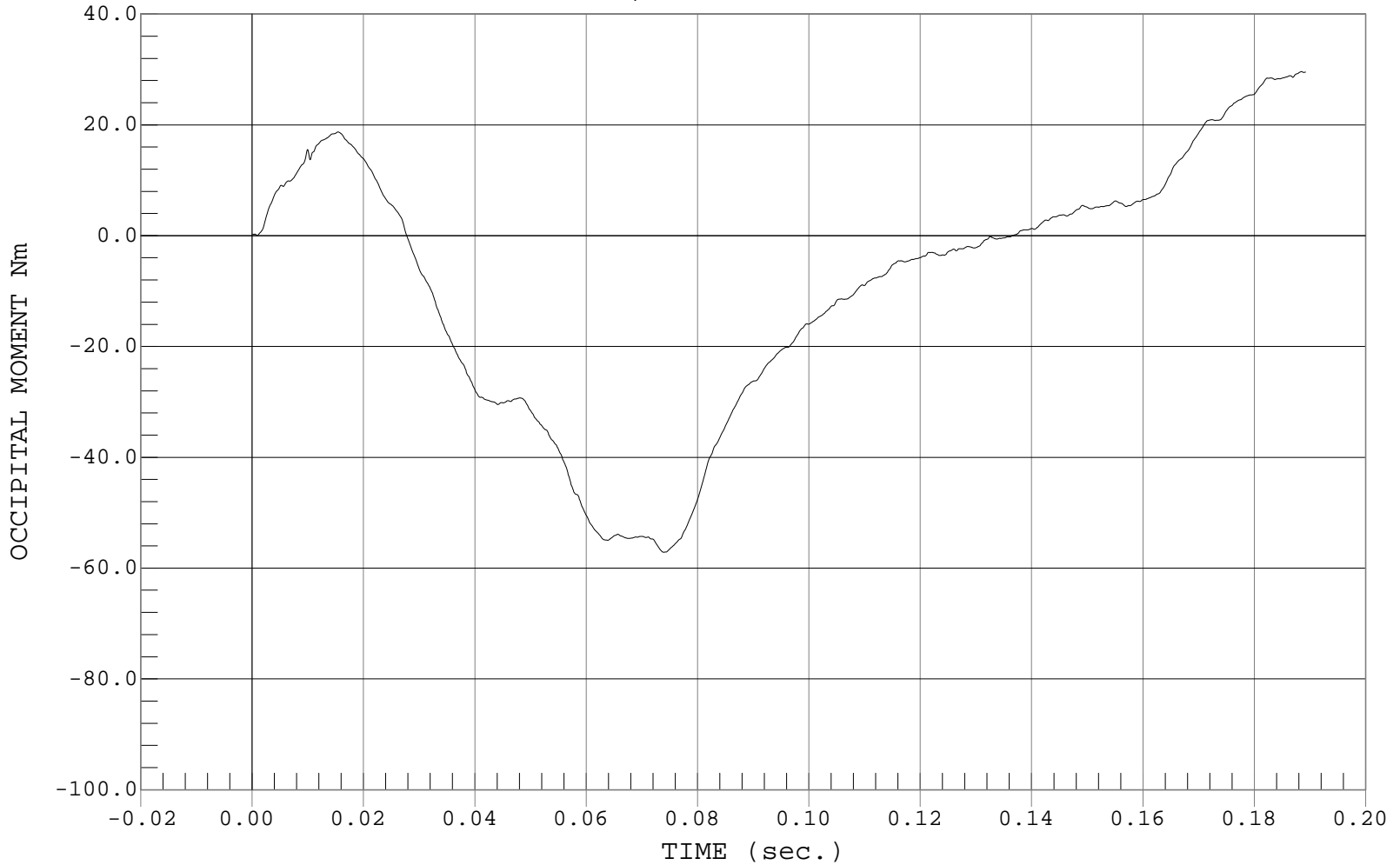
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #192

Test Date: 02-08-01
Speed: 20.20 FT/SEC, 6.16 M/SEC

— 1 OCCIPITAL MOMENT, D01193NK.MNT

Ymin = -57.14 Nm @ 0.0739 sec., Ymax = 29.61 Nm @ 0.1885 sec.



Hybrid III Calibration Data Sheet
50th Percentile Male
Hip-Femur Flexion Test

ATD Serial No.: 192

Test I.D.: D01199/0

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Temperature	°C	18.9 to 25.6	21.8	21.8	PASS
Relative Humidity	%	10 to 70	33	33	PASS
Rotation Rate	deg/sec	5 – 10	Yes	Yes	PASS
30 Degrees	Nm	94.9 Nm Max.	94.1	80.0	PASS
150 ft-lbf / 203.4 Nm	Deg	40 – 50 Degree Max. rotation	44	42	PASS
Overall Test Results					PASS

Laboratory Technician

2/9/01
Test Date

Approved By



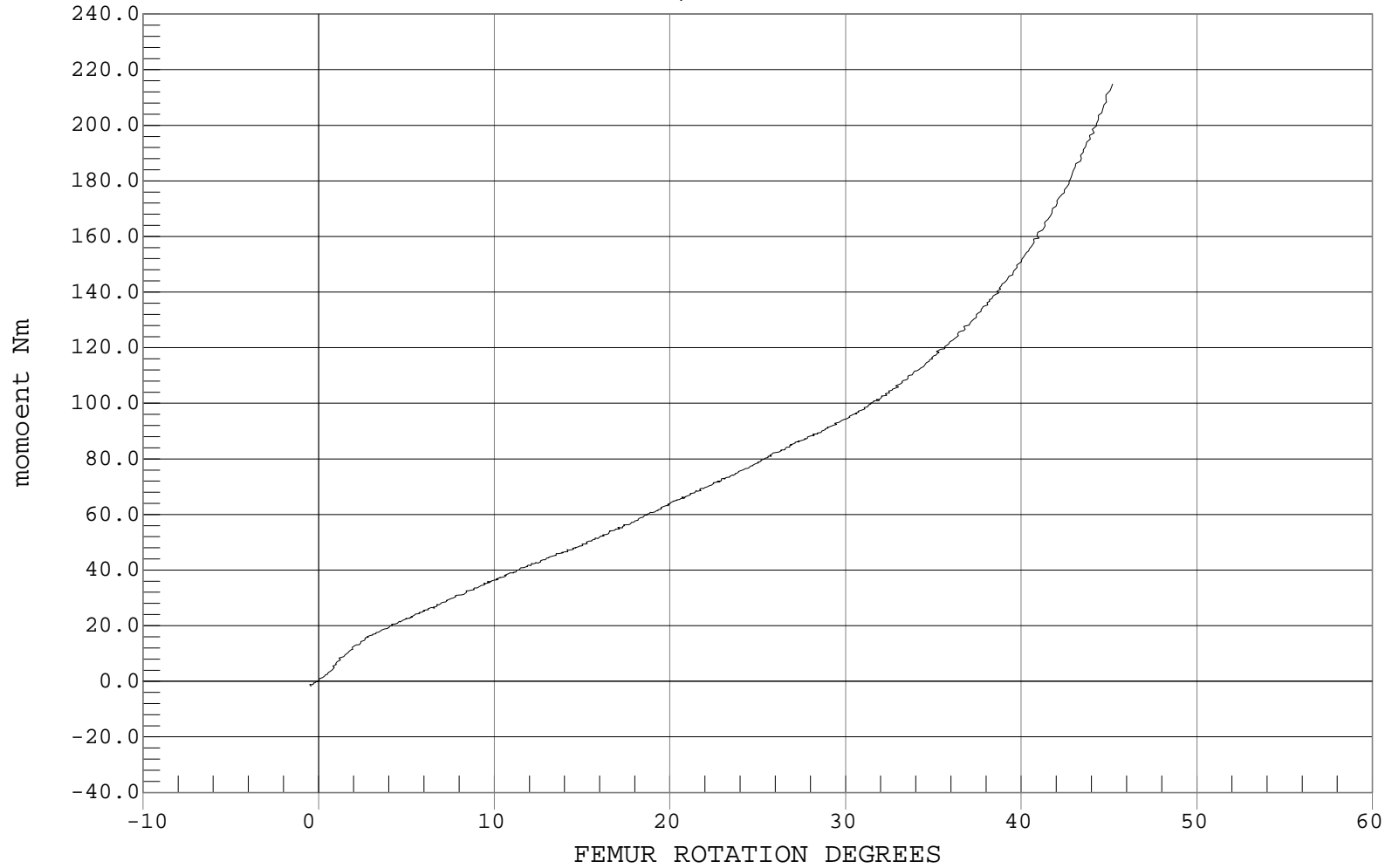
HIP-FEMUR FLEXION

Test Desc.: DUMMY CALIBRATION - HIP-FEMUR FLEXION
Component: DUMMY # 192 RIGHT FEMUR

Test Date: 02-09-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 momoent, D01199FC.F14

Ymin = -1.77 Nm @ -0.4276 DEGREES, Ymax = 214.88 Nm @ 45.2139 DEGREES





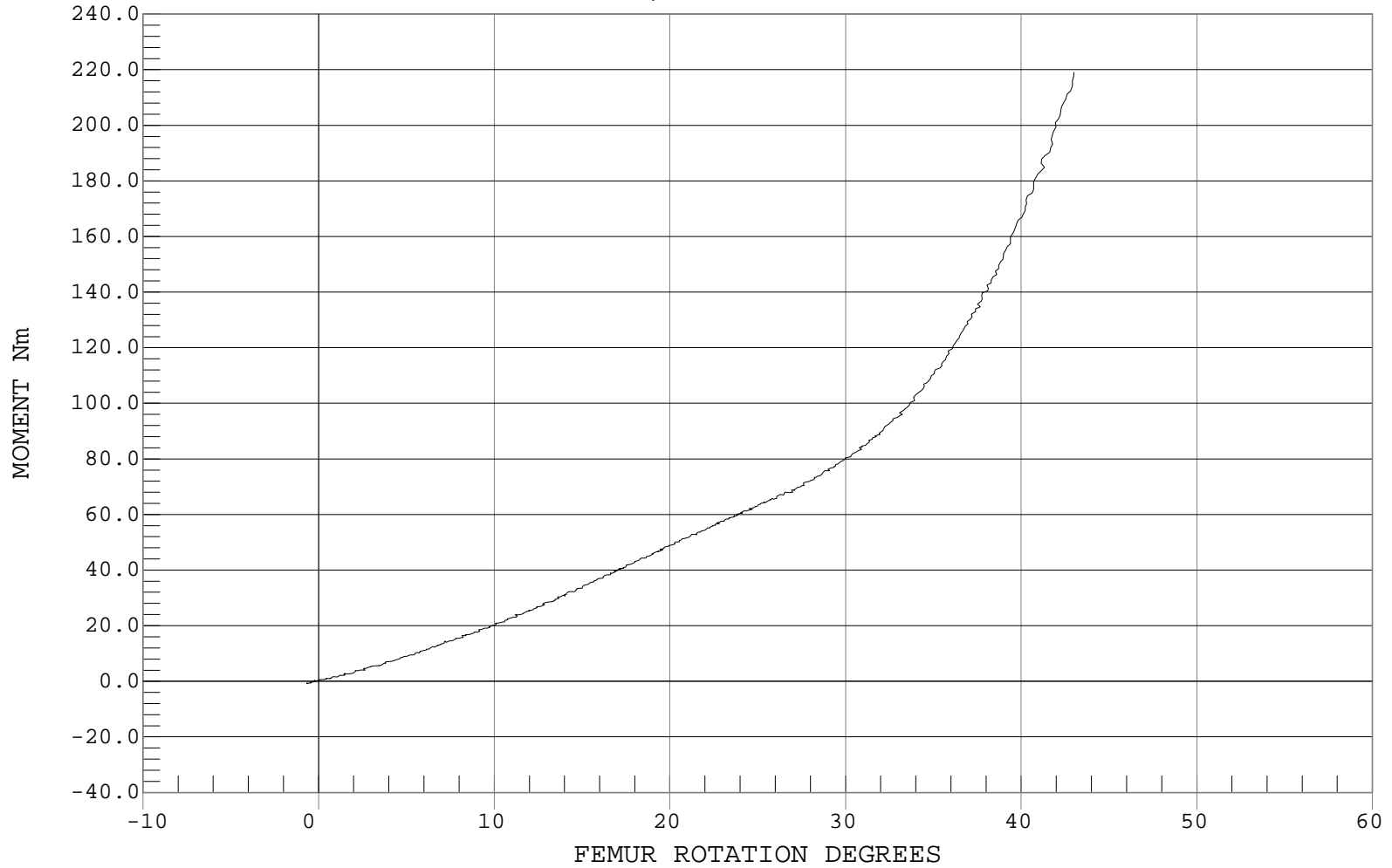
HIP-FEMUR FLEXION

Test Desc.: DUMMY CALIBRATION - HIP-FEMUR FLEXION
Component: DUMMY # 192 LEFT FEMUR

Test Date: 02-09-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 MOMENT, D01190FC.F14

Ymin = -0.9 Nm @ -0.6220 DEGREES, Ymax = 219.02 Nm @ 42.9979 DEGREES



Hybrid III Calibration Data Sheet
50th Percentile Male
Right Knee Slider

ATD Serial No.: 192

Test I.D.: D01197

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	°C	18.9 to 25.6	21.7	PASS
Relative Humidity	%	10 to 70	34	PASS
Velocity	m/s	2.7 – 2.8	2.8	PASS
Impact Force @ 10 mm	kN	-1.72 to -1.26	-1.34	PASS
Impact Force @ 18 mm	KN	-3.10 to -2.27	-2.32	PASS
Overall Test Results				PASS

 Laboratory Technician

2/9/01

 Test Date

 Approved By



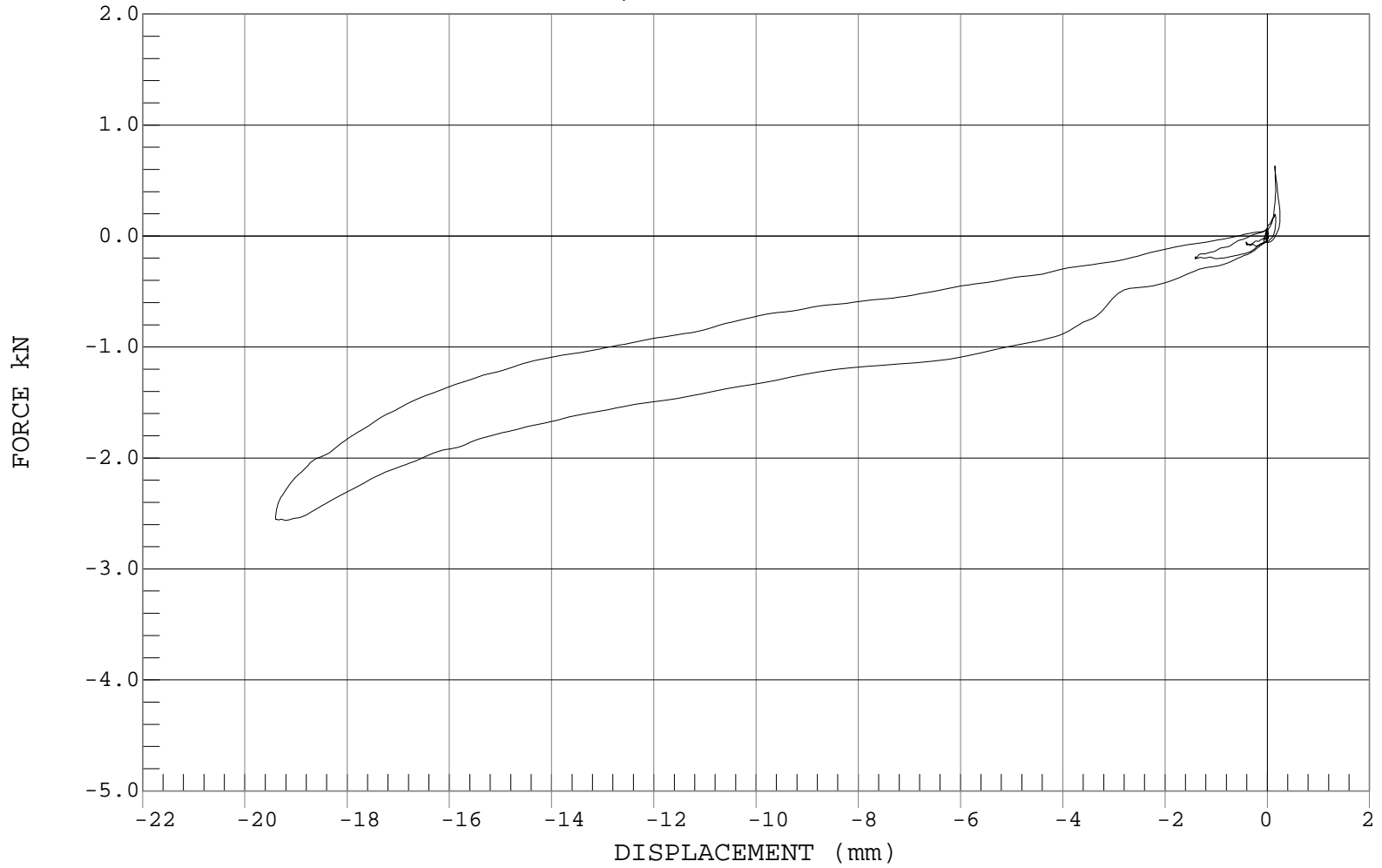
RIGHT KNEE SLIDER

Test Desc.: Dummy Calibration - Right Knee Slider
Component: Dummy #192

Test Date: 02-09-01
Speed: 9.13 FT/SEC, 2.78 M/SEC

— 1 FORCE, D01197FC.F05

Ymin = -2.56 kN @ -19.1967 mm, Ymax = .63 kN @ 0.1485 mm



Hybrid III Calibration Data Sheet
50th Percentile Male
Left Knee Slider

ATD Serial No.: 192

Test I.D.: D01198

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	°C	18.9 to 25.6	21.7	PASS
Relative Humidity	%	10 to 70	34	PASS
Velocity	m/s	2.7 – 2.8	2.8	PASS
Impact Force @ 10 mm	kN	-1.72 to -1.26	-1.27	PASS
Impact Force @ 18 mm	kN	-3.10 to -2.27	-2.30	PASS
Overall Test Results				PASS

 Laboratory Technician

2/9/01

 Test Date

 Approved By



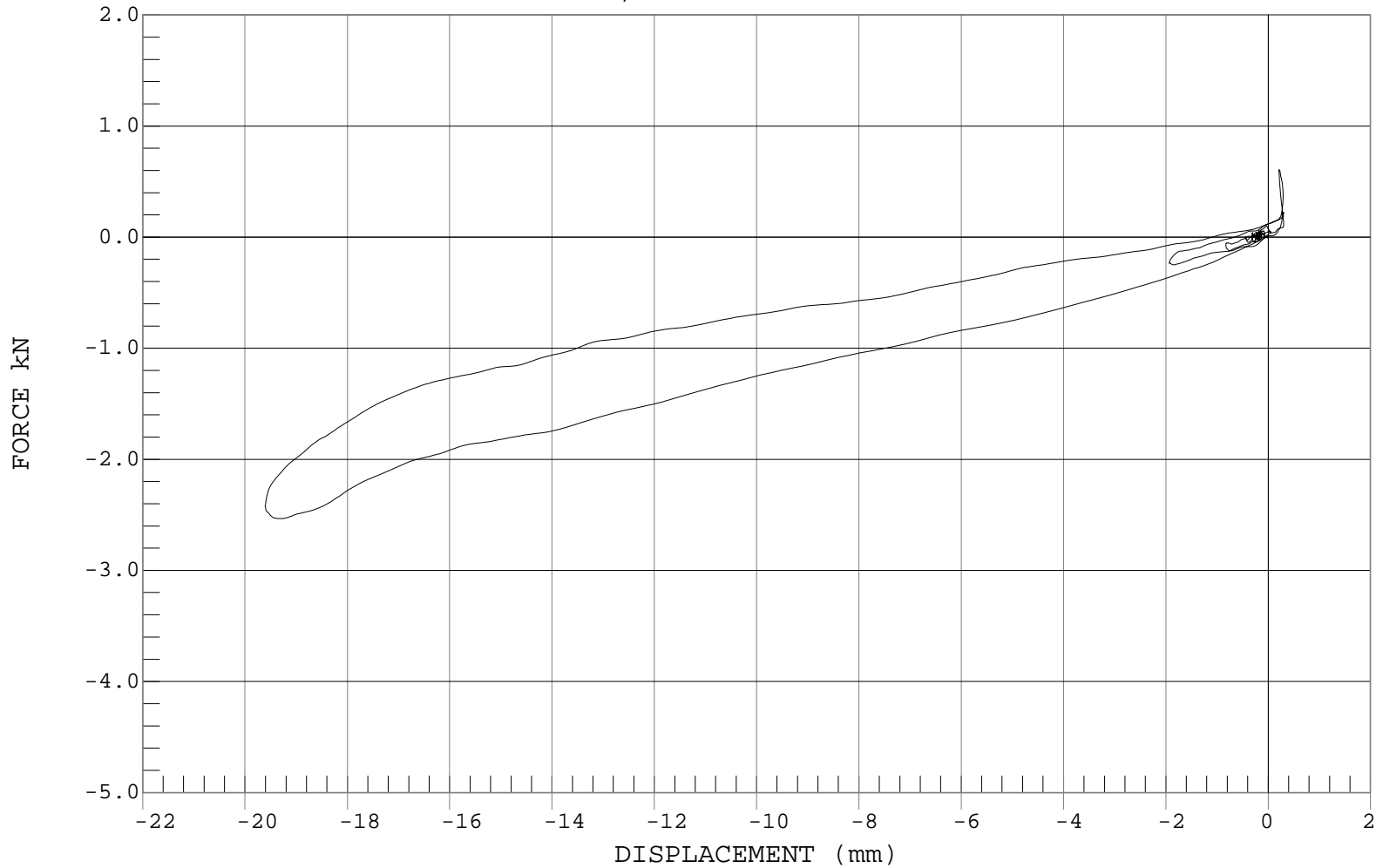
LEFT KNEE SLIDER

Test Desc.: Dummy Calibration - Left Knee Slider
Component: Dummy #192

Test Date: 02-09-01
Speed: 9.13 FT/SEC, 2.78 M/SEC

— 1 FORCE, D01198FC.F05

Ymin = -2.53 kN @ -19.3099 mm, Ymax = .61 kN @ 0.2173 mm



Hybrid III Calibration Data Sheet

50th Percentile Male

External Measurements

ATD Serial No.: 192

Test I.D.: D0119

External Measurement Data				
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.4 to 22.1	21.8	PASS
Laboratory Relative Humidity	%	10 to 70	33	PASS
A – Total sitting height	mm	879 to 889	885	PASS
B – Shoulder pivot height	mm	506 to 521	512	PASS
C – “H” point height	mm	84 to 89	87	PASS
D – “H” point from seat back	mm	135 to 140	138	PASS
E – Shoulder pivot from back	mm	84 to 94	90	PASS
F – Thigh clearance	mm	140 to 156	146	PASS
G – Elbow back to wrist pivot	mm	290 to 305	298	PASS
H – Skull cap to back line	mm	41 to 46	44	PASS
I – Shoulder to elbow length	mm	330 to 345	338	PASS
J – Elbow rest height	mm	191 to 211	201	PASS
K – Buttock to knee length	mm	579 to 605	591	PASS
L – Popliteal length	mm	429 to 455	439	PASS
M – Knee pivot height	mm	485 to 500	492	PASS
N – Buttock popliteal length	mm	452 to 478	463	PASS
O – Chest depth	mm	213 to 229	220	PASS
P – Foot length	mm	252 to 267	264	PASS
V – Shoulder breadth	mm	422 to 437	428	PASS
W – Foot breadth	mm	91 to 107	102	PASS
Y – Chest circumference	mm	970 to 1001	988	PASS
Z – Waist circumference	mm	836 to 866	850	PASS
AA – Location for chest circumference	mm	429 to 434	432	PASS
BB – Location for waist circumference	mm	226 to 231	229	PASS
Overall Test Results				PASS

Laboratory Technician

2/8/01
Test Date

Approved By

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

DUMMY, VEHICLE, AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 142

INSTRUMENTS FOR DRIVER DUMMY NO. 142			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	J27523	Endevco	11/15/00
Head Y	J29023	Endevco	11/15/00
Head Z	J29006	Endevco	11/15/00
Head X Redundant	J35562	Endevco	11/15/00
Head Y Redundant	J27461	Endevco	11/15/00
Head Z Redundant	J27457	Endevco	11/15/00
Chest X	J27466	Endevco	11/15/00
Chest Y	J17470	Endevco	11/15/00
Chest Z	J17509	Endevco	11/15/00
Chest X Redundant	AAL32	Endevco	11/15/00
Chest Y Redundant	AGY82	Endevco	11/15/00
Chest Z Redundant	AGR67	Endevco	11/15/00
Right Femur Load Cell	F257FZ	Denton	9/20/00
Left Femur Load Cell	F258FZ	Denton	9/20/00
Pelvis X	AAKA1	Endevco	11/15/00
Pelvis Y	AF9Y5	Endevco	11/15/00
Pelvis Z	AAKA2	Endevco	11/15/00
Neck Force X	N442FX	Denton	1/3/01
Neck Force Y	N442FY	Denton	1/3/01
Neck Force Z	N442FZ	Denton	1/3/01
Neck Moment X	N442MX	Denton	1/3/01
Neck Moment Y	N442MY	Denton	1/3/01
Neck Moment Z	N442MZ	Denton	1/3/01
Chest Deflection Gauge	142	Servo	11/10/00
Lap Belt Load Cell	192	Denton	10/6//00
Shoulder Belt Load Cell	191	Denton	10/6/00

DUMMY, VEHICLE, AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 142

INSTRUMENTS FOR DRIVER DUMMY NO. 142			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	T107MX	Denton	9/21/00
Upper Right Tibia Moment Y	T107MY	Denton	9/21/00
Upper Right Tibia Force Z	T107FZ	Denton	9/21/00
Lower Right Tibia Moment X	A136MX	Denton	9/21/00
Lower Right Tibia Moment Y	A136MY	Denton	9/21/00
Lower Right Tibia Force Z	A136MZ	Denton	9/21/00
Upper Left Tibia Moment X	T108MX	Denton	9/21/00
Upper Left Tibia Moment Y	T108MY	Denton	9/21/00
Upper Left Tibia Force Z	T108FZ	Denton	9/21/00
Lower Left Tibia Moment X	A137MX	Denton	9/21/00
Lower Left Tibia Moment Y	A137MY	Denton	9/21/00
Lower Left Tibia Force Z	A137FZ	Denton	9/21/00
Left Foot Ball Z Acceleration	J35564	Endevco	11/16/00
Left Heel X Acceleration	AJ507	Endevco	11/16/00
Left Heel Z Acceleration	J19925	Endevco	11/16/00
Right Foot Ball Z Acceleration	J17988	Endevco	11/16/00
Right Heel X Acceleration	J14232	Endevco	11/16/00
Right Heel Z Acceleration	AJ4R3	Endevco	11/16/00

DUMMY, VEHICLE, AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 192

INSTRUMENTS FOR PASSENGER DUMMY NO. 192			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AFW91	Endevco	11/16/00
Head Y	AAKB3	Endevco	11/16/00
Head Z	AGRP4	Endevco	11/16/00
Head X Redundant	AGRY2	Endevco	11/16/00
Head Y Redundant	ACCO9	Endevco	11/16/00
Head Z Redundant	AGMY3	Endevco	11/16/00
Chest X	AAKE2	Endevco	11/16/00
Chest Y	AGAG0	Endevco	11/16/00
Chest Z	AAJY4	Endevco	11/16/00
Chest X Redundant	AF9Y3	Endevco	11/16/00
Chest Y Redundant	AF973	Endevco	11/16/00
Chest Z Redundant	AGN47	Endevco	11/16/00
Right Femur Load Cell	F263FZ	Denton	9/20/00
Left Femur Load Cell	F264FZ	Denton	9/20/00
Pelvis X	AALG2	Endevco	11/15/00
Pelvis Y	AGN47	Endevco	11/15/00
Pelvis Z	AC9P8	Endevco	11/15/00
Neck Force X	N443FX	Denton	11/11/00
Neck Force Y	N443FY	Denton	11/11/00
Neck Force Z	N443FZ	Denton	11/11/00
Neck Moment X	N443MZ	Denton	11/11/00
Neck Moment Y	N443MY	Denton	11/11/00
Neck Moment Z	N443MZ	Denton	11/11/00
Chest Deflection Gauge	192	Servo	11/10/00
Lap Belt Load Cell	196	Denton	10/6/00
Shoulder Belt Load Cell	193	Denton	10/6/00

DUMMY, VEHICLE, AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 192

INSTRUMENTS FOR PASSENGER DUMMY NO. 192			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	T111MX	Denton	9/20/00
Upper Right Tibia Moment Y	T111MY	Denton	9/20/00
Upper Right Tibia Force Z	T111FZ	Denton	9/20/00
Lower Right Tibia Moment X	A142MX	Denton	9/20/00
Lower Right Tibia Moment Y	A142MY	Denton	9/20/00
Lower Right Tibia Force Z	A142FZ	Denton	9/20/00
Upper Left Tibia Moment X	T110MX	Denton	9/20/00
Upper Left Tibia Moment Y	T110MY	Denton	9/20/00
Upper Left Tibia Force Z	T110FZ	Denton	9/20/00
Lower Left Tibia Moment X	A139MX	Denton	9/21/00
Lower Left Tibia Moment Y	A139MY	Denton	9/21/00
Lower Left Tibia Force Z	A139FZ	Denton	9/21/00
Left Foot Ball Z Acceleration	J23772	Endevco	11/15/00
Left Heel X Acceleration	J19873	Endevco	11/15/00
Left Heel Z Acceleration	J19236	Endevco	11/15/00
Right Foot Ball Z Acceleration	FJ66J	Endevco	11/15/00
Right Heel X Acceleration	J23918	Endevco	11/15/00
Right Heel Z Acceleration	EH75J	Endevco	11/15/00

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	MGA045	Entran	9/14/00
Right Rear Seat Crossmember X	I25-F12	Entran	11/15/00
Top of Engine Block X	A08-A05	Entran	2/8/01
Bottom of Engine X	H07-A04	Entran	12/14/00
Left Brake Caliper X	K19-A15	Entran	1/11/01
Right Brake Caliper X	F18-G08	Entran	2/15/01
Instrument Panel X	I14-D18	Entran	11/17/00
Redundant Left Rear Seat Crossmember X	I18-E05	Entran	12/13/00
Redundant Right Rear Seat Crossmember X	E13-D06	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

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

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.

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.

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.

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.

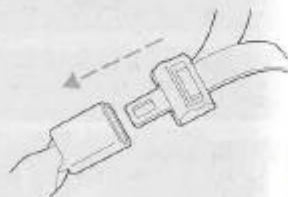
⚠ In a rollover crash, an unbelted person is significantly more likely to die than a person wearing a seat belt.

⚠ 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

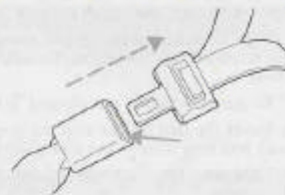
1. Insert the belt tongue into the proper buckle (the buckle closest to the direction the tongue is coming from) until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.



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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

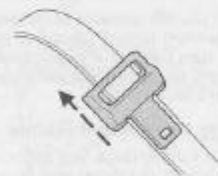
The locking cinch tongue will slide up and down the belt webbing when the belt is in the stowed position or while putting seat belts on. When the locking cinch tongue of the lap/shoulder combination seat belt is latched into the buckle, the cinch tongue will allow the lap portion to become shorter, but 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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Seating and safety restraints

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.

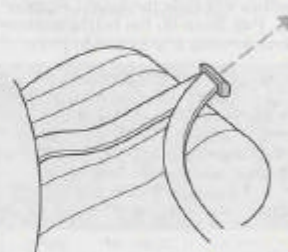
Lap belts

Adjusting the center lap belt

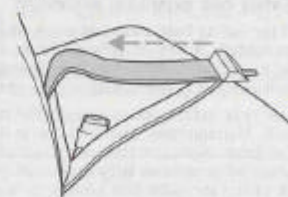
The lap belt does not adjust automatically.

⚠ 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 adjusters 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 611C22). 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.

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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.

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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.

1. Turn the ignition switch to the RUN (or ON) position. (DO NOT START THE ENGINE)
2. 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.

3. 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.

4. Turn on the parklamps/headlamps, turn off the parklamps/headlamps.

5. 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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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.

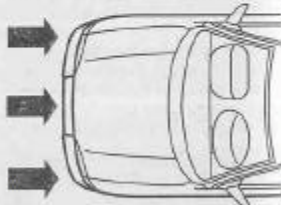


If any of these things happen, even intermittently, have the supplemental restraint system serviced at your dealership or by a qualified technician immediately. Unless serviced, the system may not function properly in the event of a collision.

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.



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.

- 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.

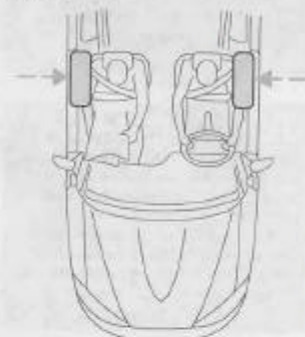
! Do not attempt to service, repair, or modify the air bag Supplemental Restraint System, its fuses or the seat cover on a seat containing an air bag. See your Ford or Lincoln Mercury dealer.

! All occupants of the vehicle including the driver should always wear their safety belts even when an air bag SRS is provided.

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.

Seating and safety restraints

⚠ 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 seats.

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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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Seating and safety restraints

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 the 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.

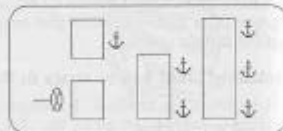
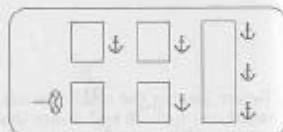
6. Before placing the child into the child seat, forcibly tilt the child seat from side to side and in forward direction to make sure that the seat is held securely in place. If the child seat moves excessively, repeat steps 5 through 6, or properly install the child seat in a different position.

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.



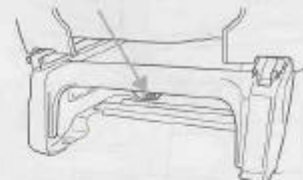
The tether can be attached directly to the rear of all passenger seating except the front passenger seat equipped with power adjustment. The front passenger seat with manual adjustment does have a tether anchor.

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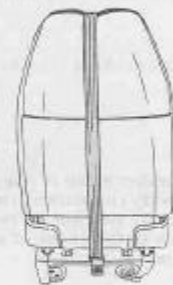
Seating and safety restraints

Front passenger seating position (manual adjusting seats only)

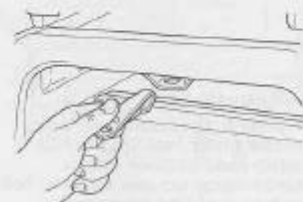
1. Position the child safety seat on the passenger seat cushion.



2. Route the child safety seat tether strap over the back of the seat.



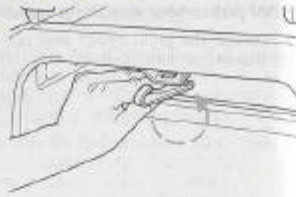
3. Grasp the tether strap and position it to the seat frame.



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Seating and safety restraints

4. Rotate the tether strap.



5. Clip the tether strap to the seat frame.

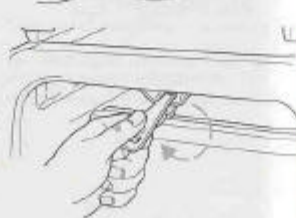


If the tether strap is clipped incorrectly (as shown) the child safety seat may not be retained properly in the event of a collision.



6. Rotate the tether strap clip.

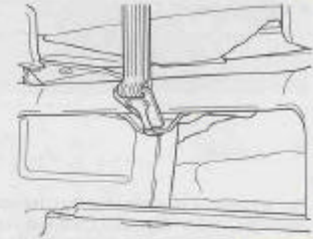
7. Refer to the instructions in this section under *Installing child safety seats in crotch tongue combination lap and shoulder belt seating positions* to secure the child safety seat.



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Seating and safety restraints

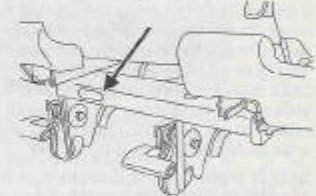
5. Tighten the child safety seat tether strap according to the manufacturer's instructions.



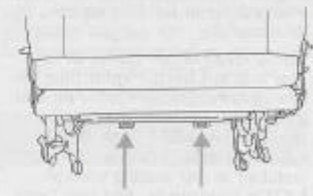
Rear seating positions

Follow steps 1-8 as described above for the following available seats:

- 2nd row bucket



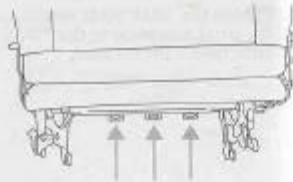
- 2nd row bench



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Seating and safety restraints

- 3rd row bench



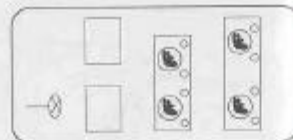
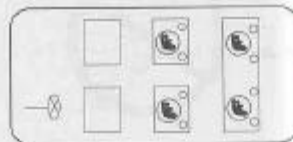
For additional important safety information on the proper use of seatbelts, child seats and infant seats, please read the entire *Seating and safety restraints* chapter in this owner's guide.

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.



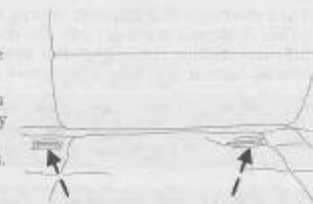
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Seating and safety restraints

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.

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APPENDIX F

CHILD SEAT

POST-TEST OBSERVATIONS

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

	Left Rear Passenger	Right Rear Passenger
Child Seat	Fisher Price Safe Embrace II Belted	Fisher Price Safe Embrace II Latch
Child Seat Mass (kg)	6.8	6.8
Belt Fraying	None	None
Stress Marks	around belt tightening at upper belt mechanism	through hole and around harness tightening mechanism
Cracks	None	None
Buckle Stress	None	None
Latch Hooks	No deformation	No deformation
Contact	feet to seatback	feet to seatback

HYBRID III 3 YEAR OLD ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 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	27.1	209	33.9	95	29.1	193	29.8	113
Head CG	Y	G's	5.6	151	7.6	89	7.3	66	7.9	197
Head CG	Z	G's	50.9	85	5.4	45	55.5	90	5.2	47
Head CG Resultant	N/A	G's	57.3	87			60.5	90		

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	6.9	249	35.7	92	8.3	232	37.3	91
Chest CG	Y	G's	2.1	246	8.5	72	3.3	98	2.1	65
Chest CG	Z	G's	9.8	216	23.2	74	16.1	198	21.2	72
Chest CG Resultant	N/A	G's	38.9	74			38.3	91		

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					1346	82		

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)	606	49.0	74.4	110.4	653	50.5	78.0	114.0
Head CG Primary (15 msec)	342	55.4	82.6	97.6	371	57.2	83.6	98.6

CHEST CLIP (3 MSEC)

Location	Left Rear Passenger			Right Rear Passenger		
	Avg G's	T ¹	T ²	Avg G's	T ¹	T ²
Chest CG Primary	37.8	71.7	74.8	37.6	89.4	92.5

HYBRID III 3 YEAR OLD ATD INJURY CRITERIA AND SENSOR DATA...(continued)

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 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	6.3	181	34.5	80	13.9	200	39.1	82
Pelvis	Y	G's	5.4	114	10.0	60	4.9	86	6.8	76
Pelvis	Z	G's	10.1	216	25.1	72	20.3	198	25.1	69

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	2	27	83	96	97	236	706	96
Neck Force	Y	Newtons	64	145	114	89	**	**	**	**
Neck Force	Z	Newtons	1889	94	159	44	**	**	**	**
Neck Moment	X	N"m	6.5	135	8.2	95	3.9	198	2.4	38
Neck Moment	Y	N"m	14.1	218	7.7	89	5.7	235	9.6	195
Neck Moment	Z	N"m	2.3	92	3.7	229	3.8	215	1.7	116

** No valid data collected.

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	**	**	**	**	315	197	1264	95
Neck Force	Y	Newtons	124	155	127	84	27	65	74	193
Neck Force	Z	Newtons	797	84	196	44	1037	196	172	50
Neck Moment	X	N"m	7.8	143	26.9	93	4.8	114	5.4	193
Neck Moment	Y	N"m	9.4	202	139.3	95	15.2	196	126.9	94
Neck Moment	Z	N"m	5.4	132	8.4	92	3.7	113	1.0	120

** No valid data collected.

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Left Rear Passenger				Right Rear Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	mm			14.7	101			18.3	107

** No valid data collected.

DUMMY DIMENSIONS

Test Vehicle: 2001/Ford/Windstar SE Sport

NHTSA No.: M10200

Test Program: NCAP

Test Date: March 5, 2001

Measurement Description	Left Rear Passenger	Right Rear Passenger
	Length (mm)	Length (mm)
Head to Roof (Z)	437	431
Head to Seatback (X)	627	633
Chest to Door (Y)	566	431
Left Foot to Seatback	177	219
Right Foot to Seatback	178	220

CHILD SEAT PHOTOGRAPHS

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Photo 1 - Pre-Test LRS 3 Year Old Left Side View



Photo 2 - Pre-Test LRS 3 Year Old Left Side View (Door Open)



Photo 3 - Post-Test LRS 3 Year Old Left Side View (Door Open)



Photo 4 - Post-Test LRS 3 Year Old Foot Contact View



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Photo 5 - Pre-Test RRS 3 Year Old Right Side View



Photo 6 - Post-Test RRS 3 Year Old Right Side View

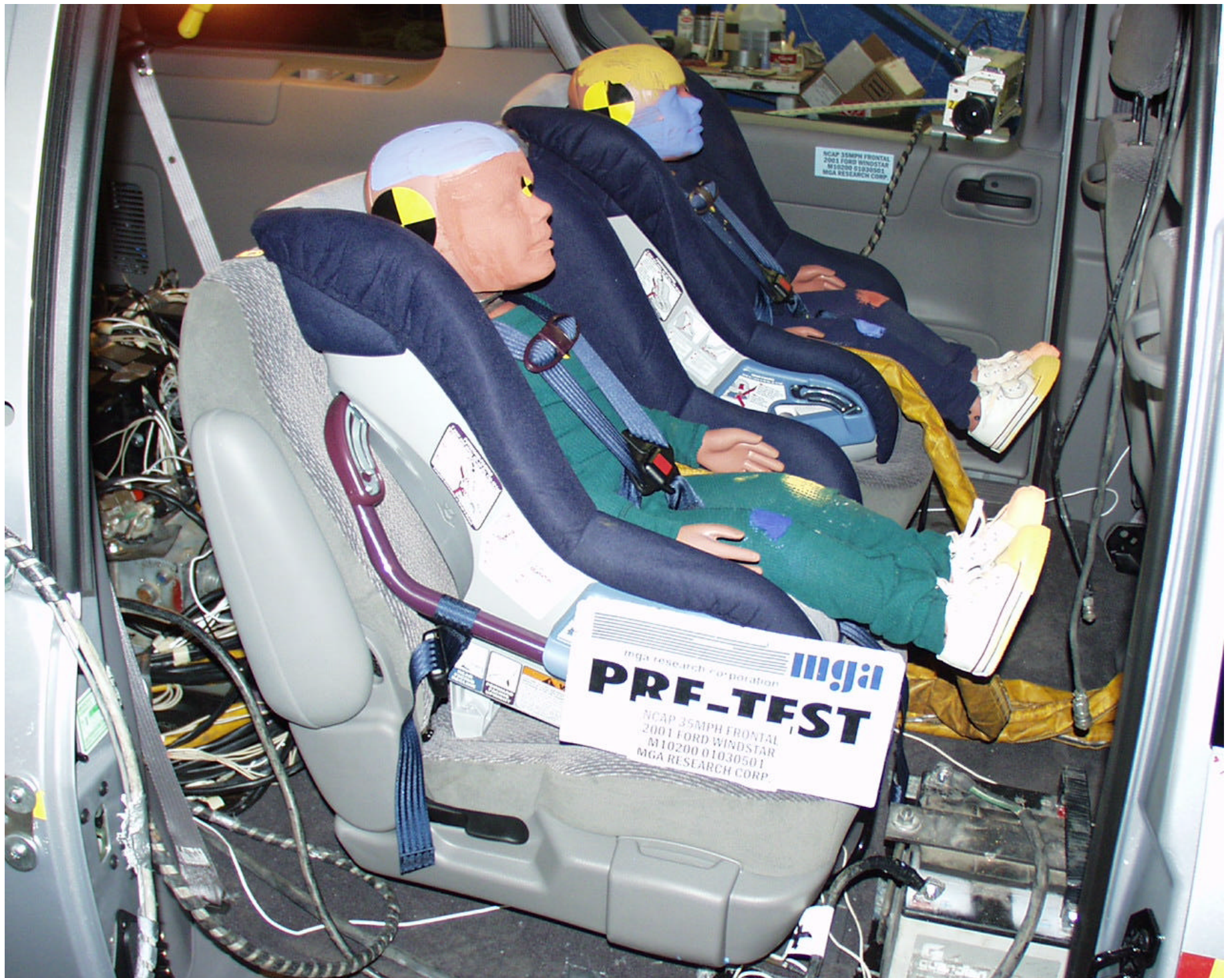


Photo 7 - Pre-Test RRS 3 Year Old Right Side View (Door Open)



Photo 8 - Post-Test RRS 3 Year Old Right Side View (Door Open)



Photo 9 - Post-Test RRS 3 Year Old Foot Contact View

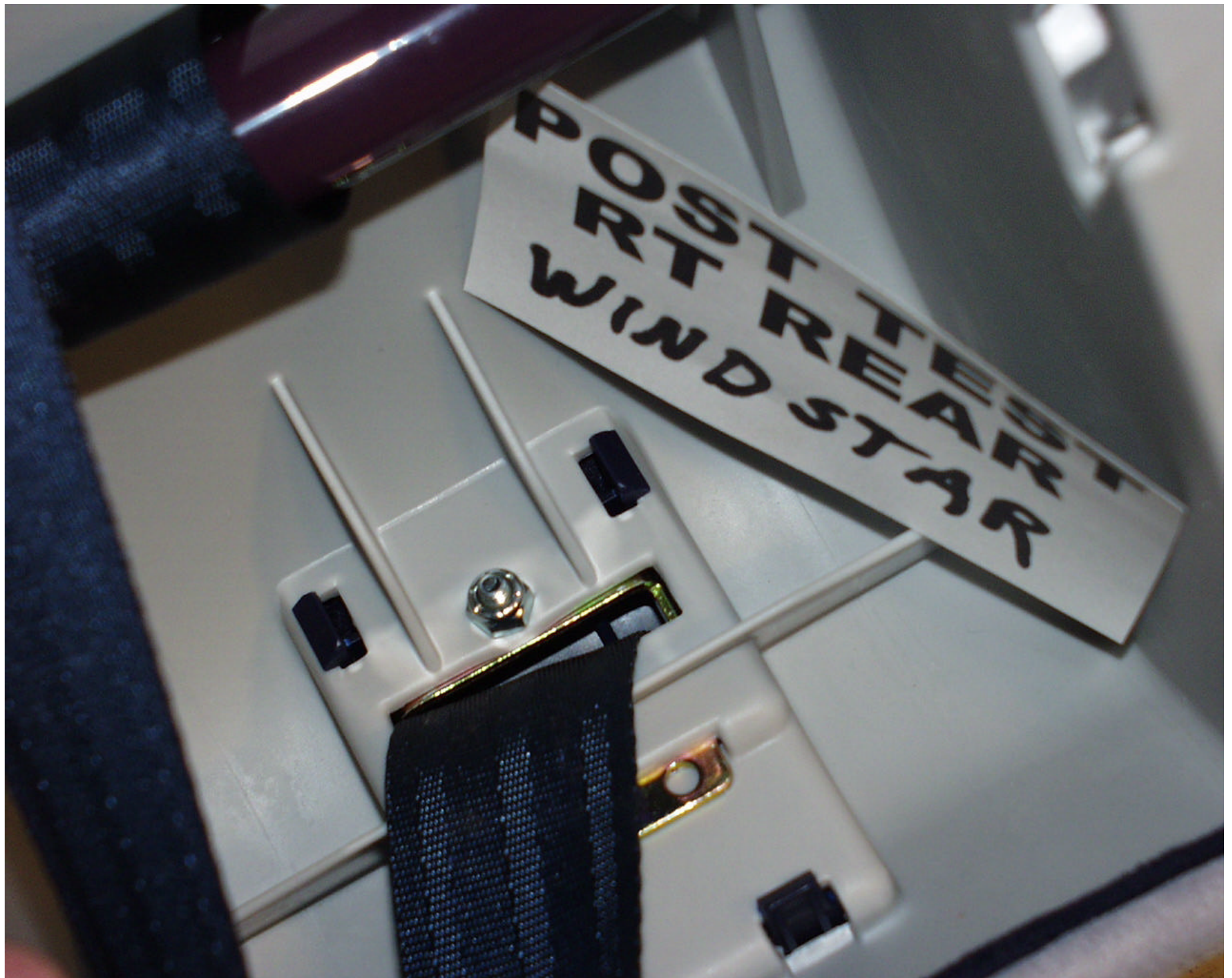


Photo 10 - Post-Test Right Child Seat Back Side View



Photo 11 - Post-Test Left Child Seat Back Side View

CHILD DATA PLOTS

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* No valid data collected.

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* No valid data collected.



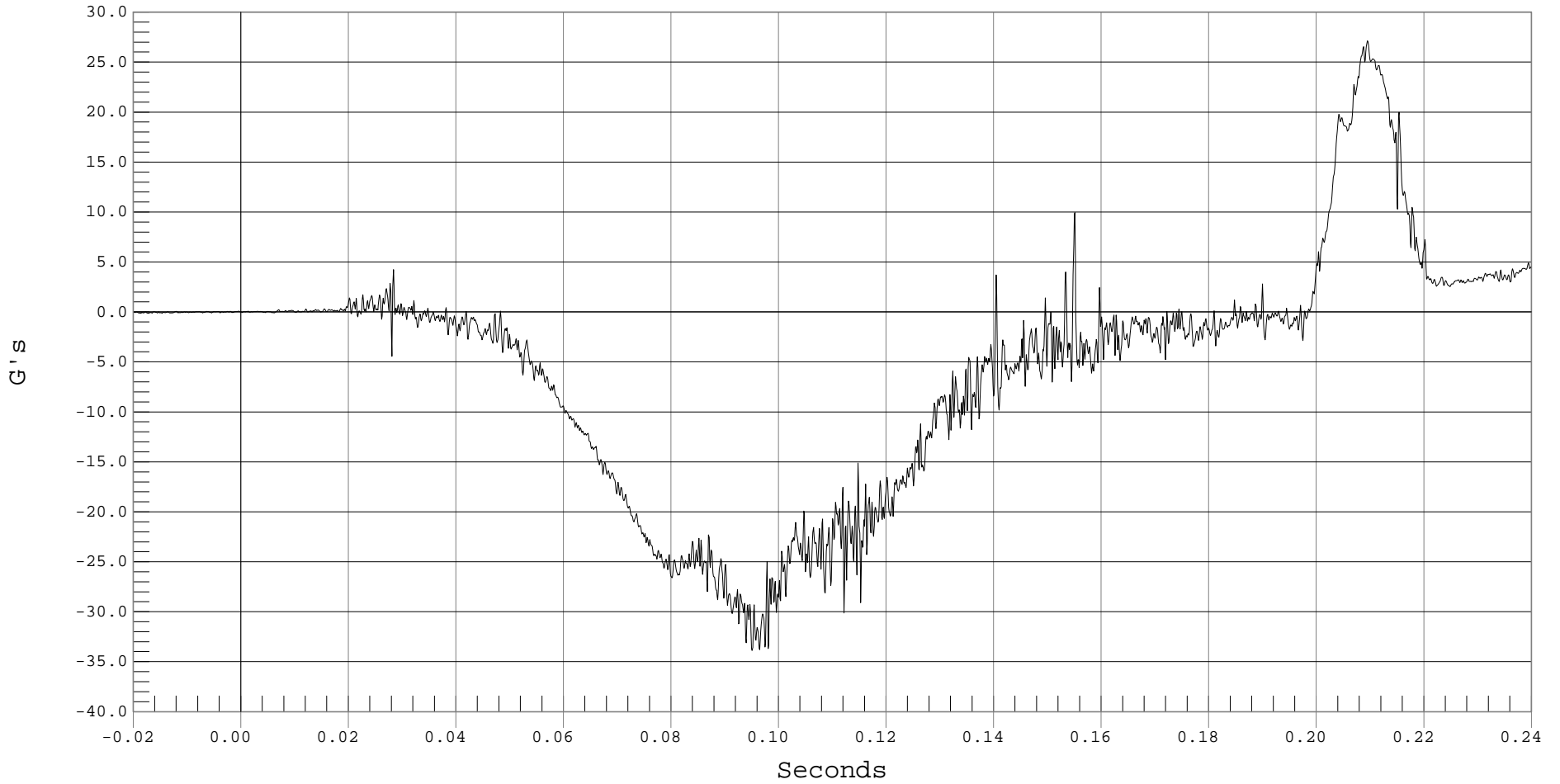
LRS 3 YR OLD HEAD X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD HEAD X, B01025AT.A13

Ymin = -33.88 G's @ 0.0950 Seconds, Ymax = 27.12 G's @ 0.2094 Seconds



F-21



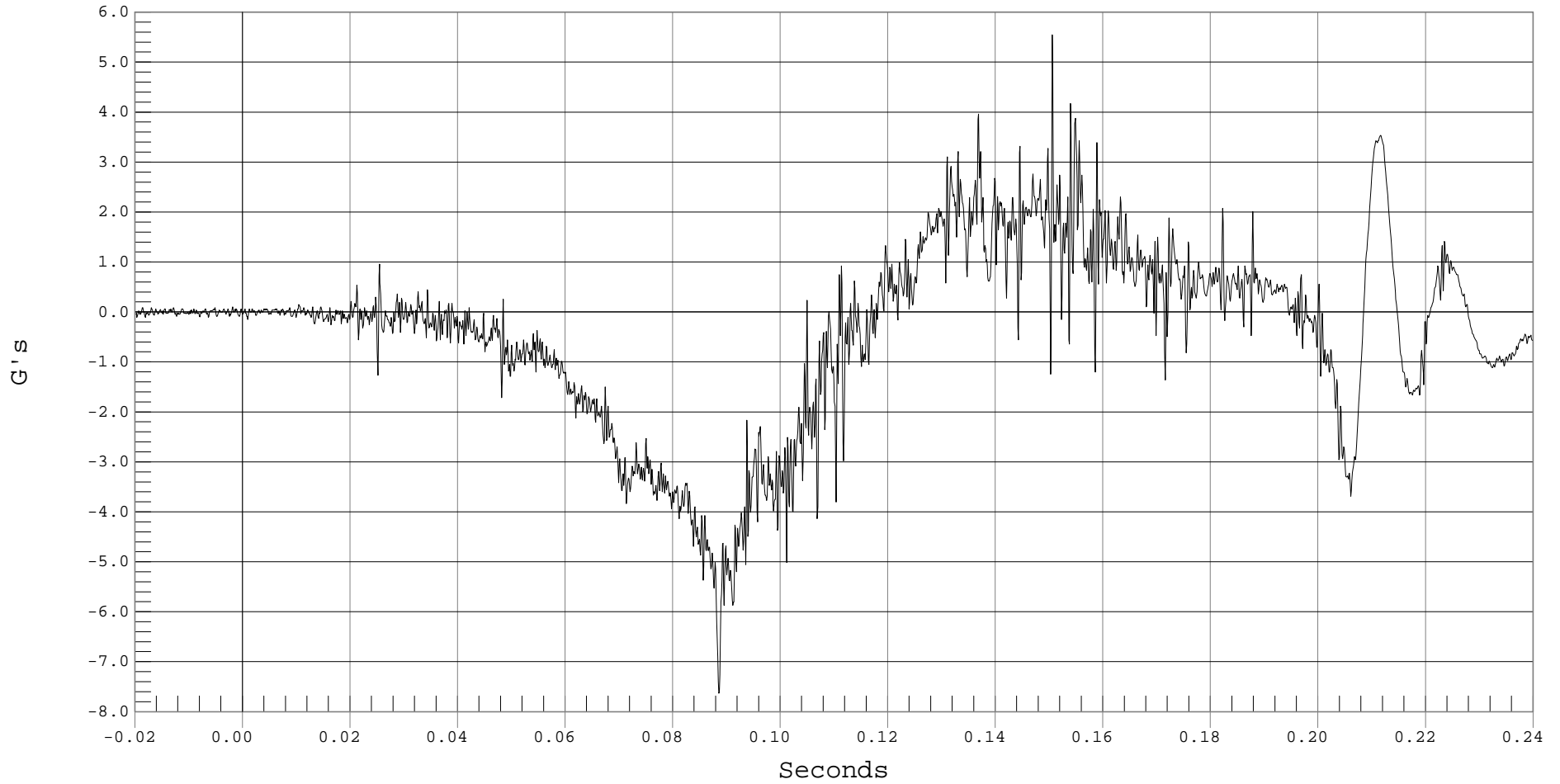
LRS 3 YR OLD HEAD Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD HEAD Y, B01025AT.A14

Ymin = -7.63 G's @ 0.0885 Seconds, Ymax = 5.55 G's @ 0.1505 Seconds





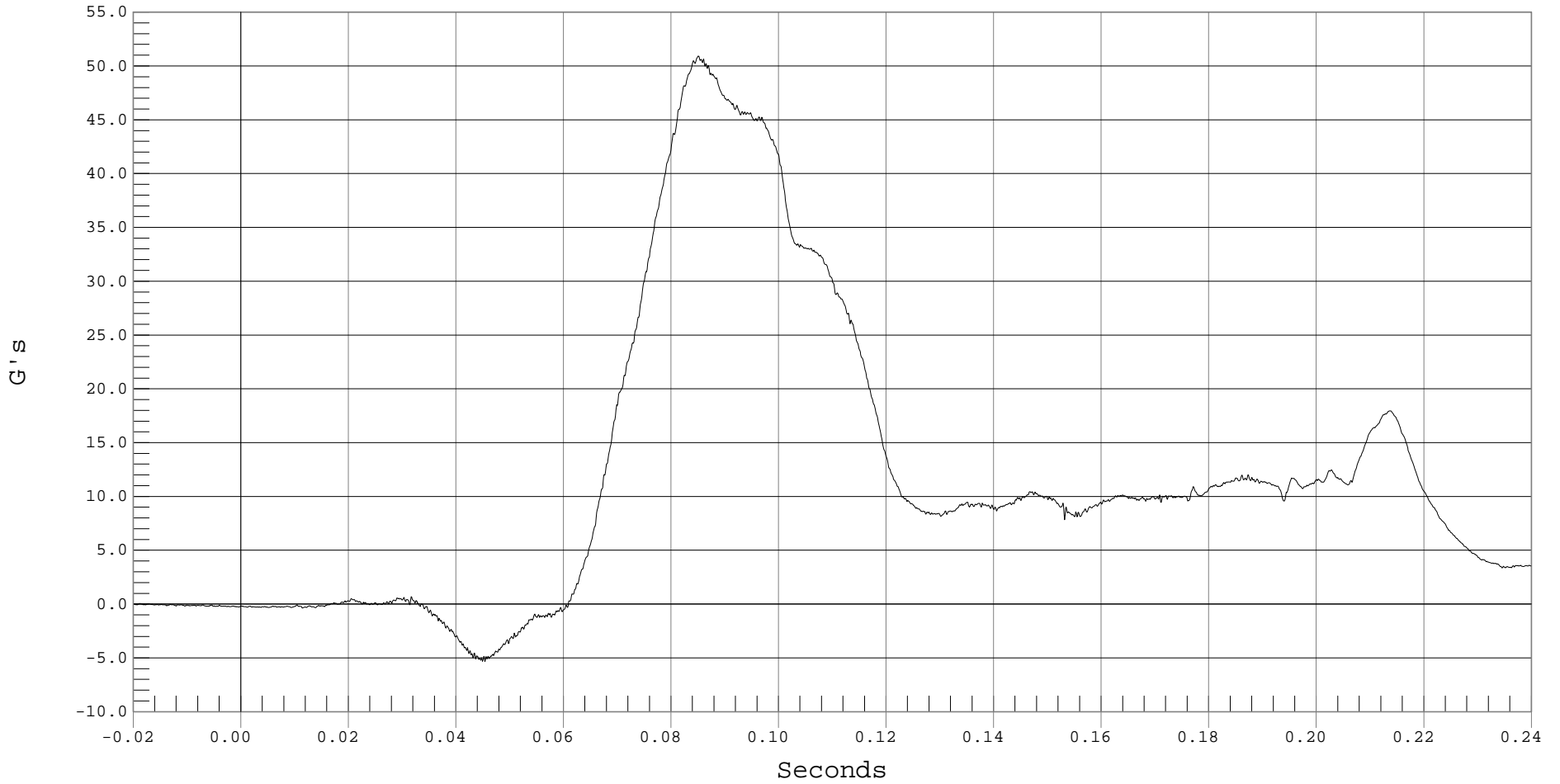
LRS 3 YR OLD HEAD Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD HEAD Z, B01025AT.A15

Ymin = -5.35 G's @ 0.0453 Seconds, Ymax = 50.91 G's @ 0.0850 Seconds





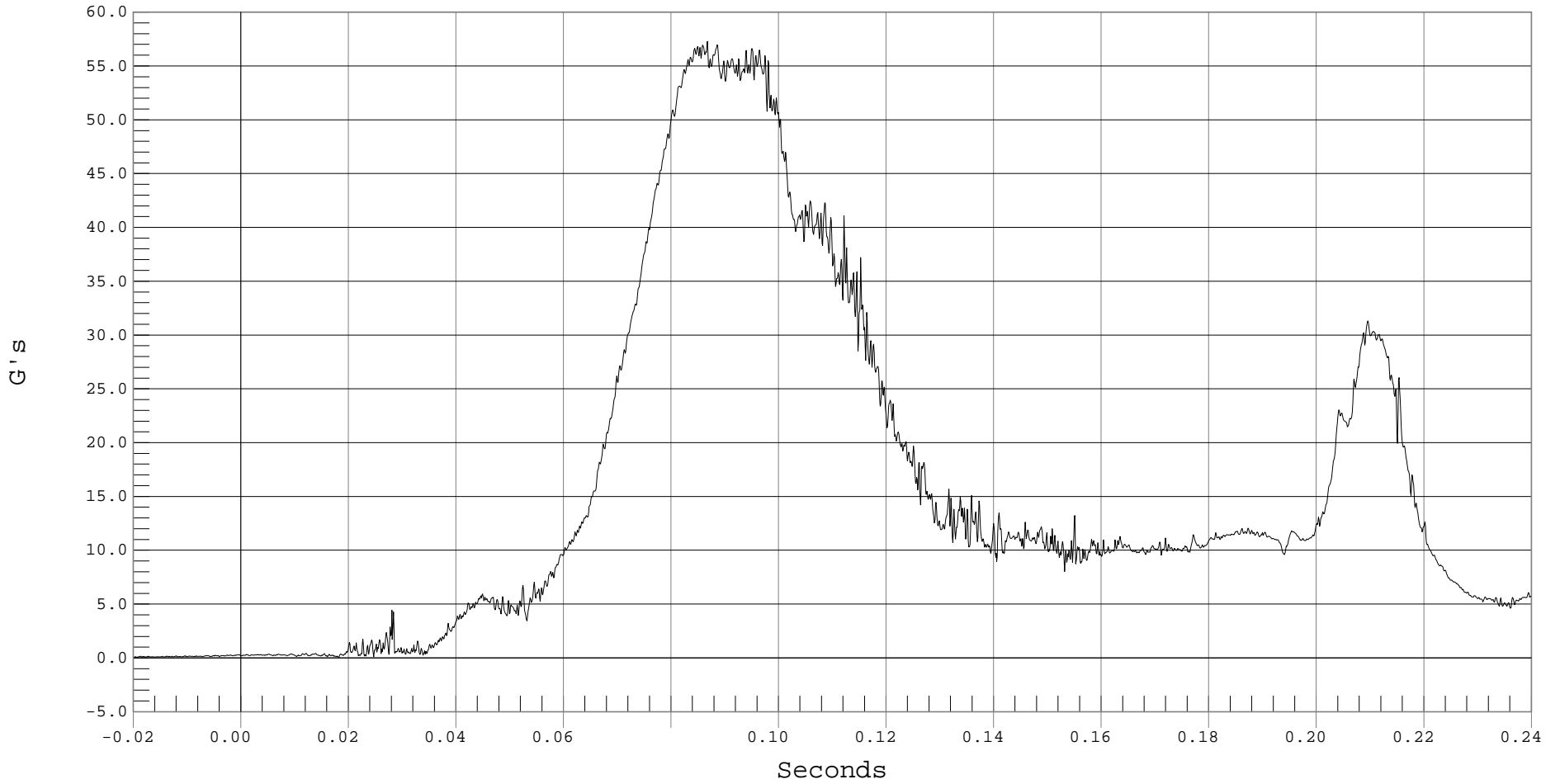
LRS 3 YR OLD HEAD RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS 3 YR OLD HEAD RESULTANT ACCELERATION, B01025AV.A13

Ymin = .05 G's @ 0.0181 Seconds, Ymax = 57.29 G's @ 0.0867 Seconds





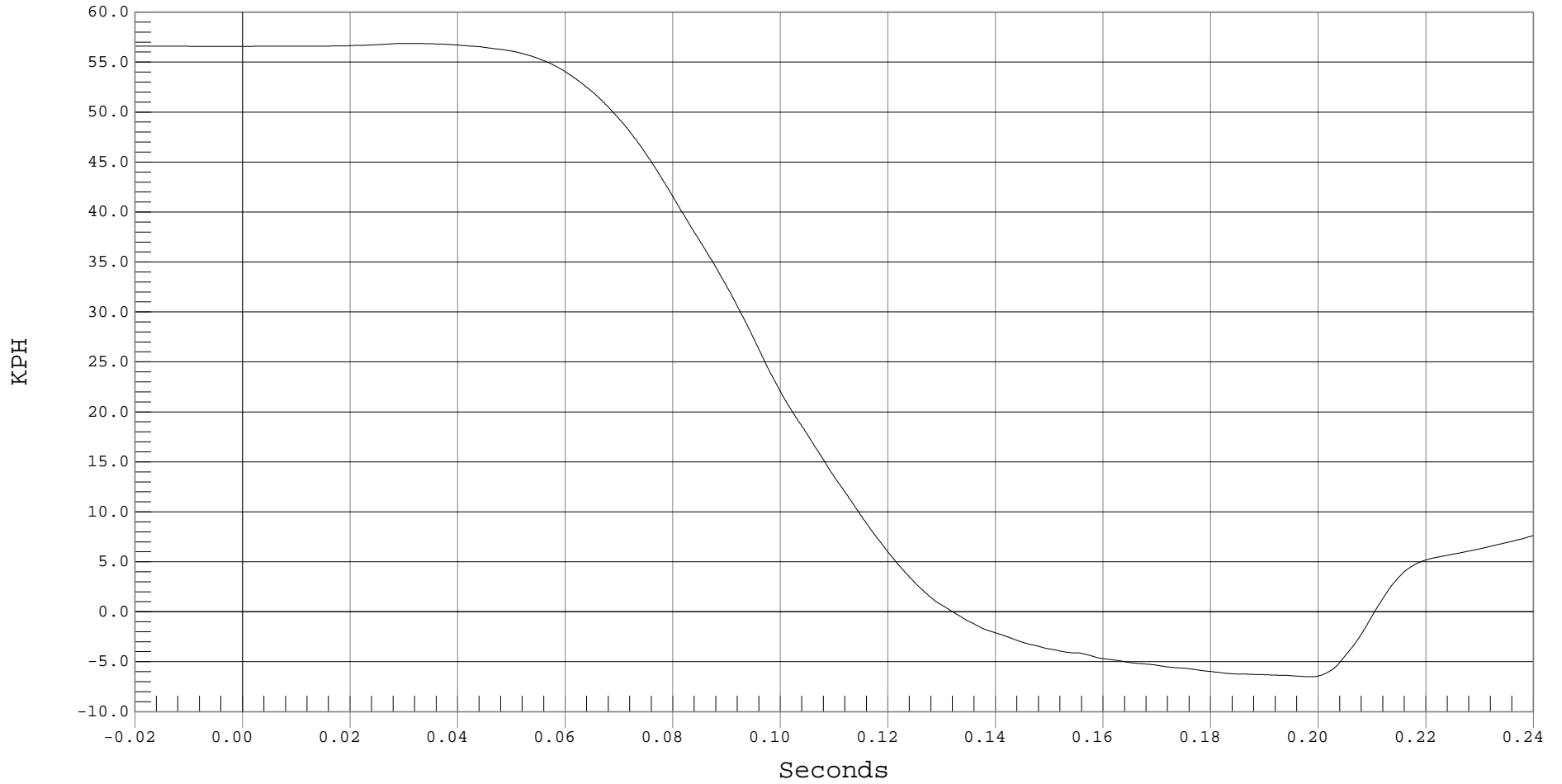
LRS 3 YR OLD HEAD X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LRS 3 YR OLD HEAD X VELOCITY, B01025AI.V13

Ymin = -6.51 KPH @ 0.1985 Seconds, Ymax = 56.88 KPH @ 0.0320 Seconds





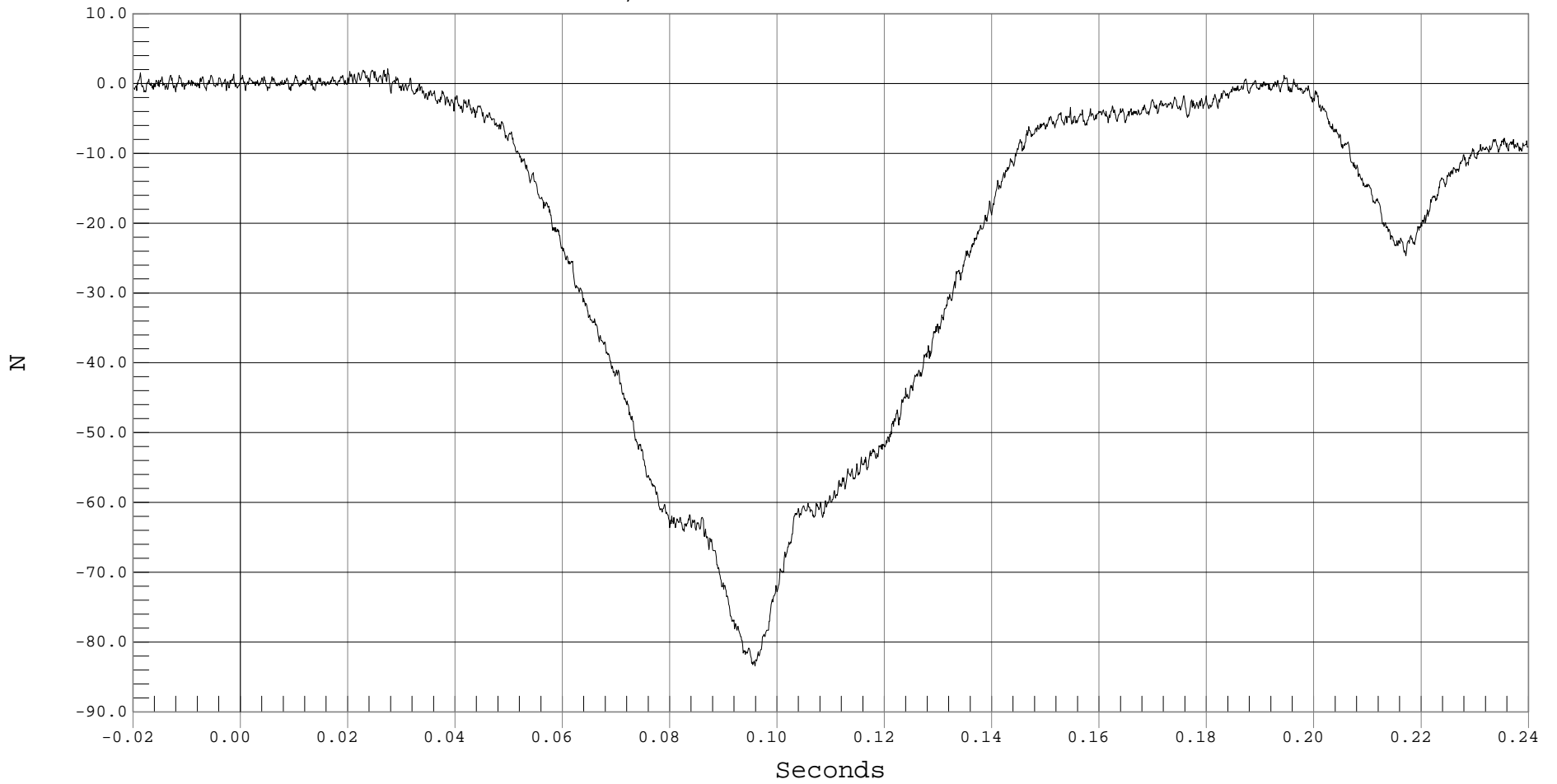
LRS 3 YR OLD UPPER NECK FORCE X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD UPPER NECK FORCE X, B01025FT.F16

Ymin = -83.44 N @ 0.0958 Seconds, Ymax = 2.1 N @ 0.0274 Seconds



F-26



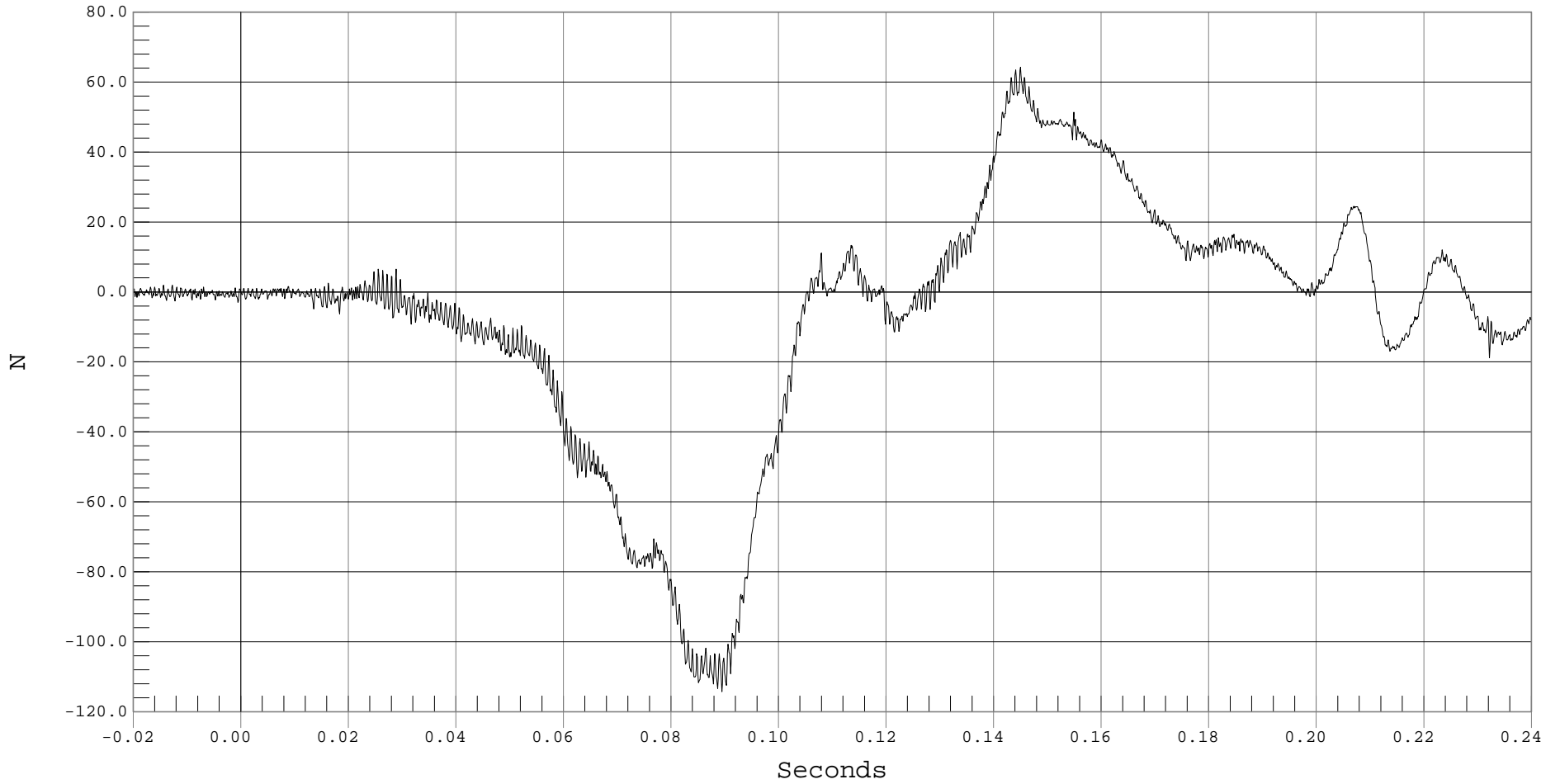
LRS 3 YR OLD UPPER NECK FORCE Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD UPPER NECK FORCE Y, B01025FT.F17

Ymin = -114.29 N @ 0.0894 Seconds, Ymax = 64.21 N @ 0.1449 Seconds



F-27



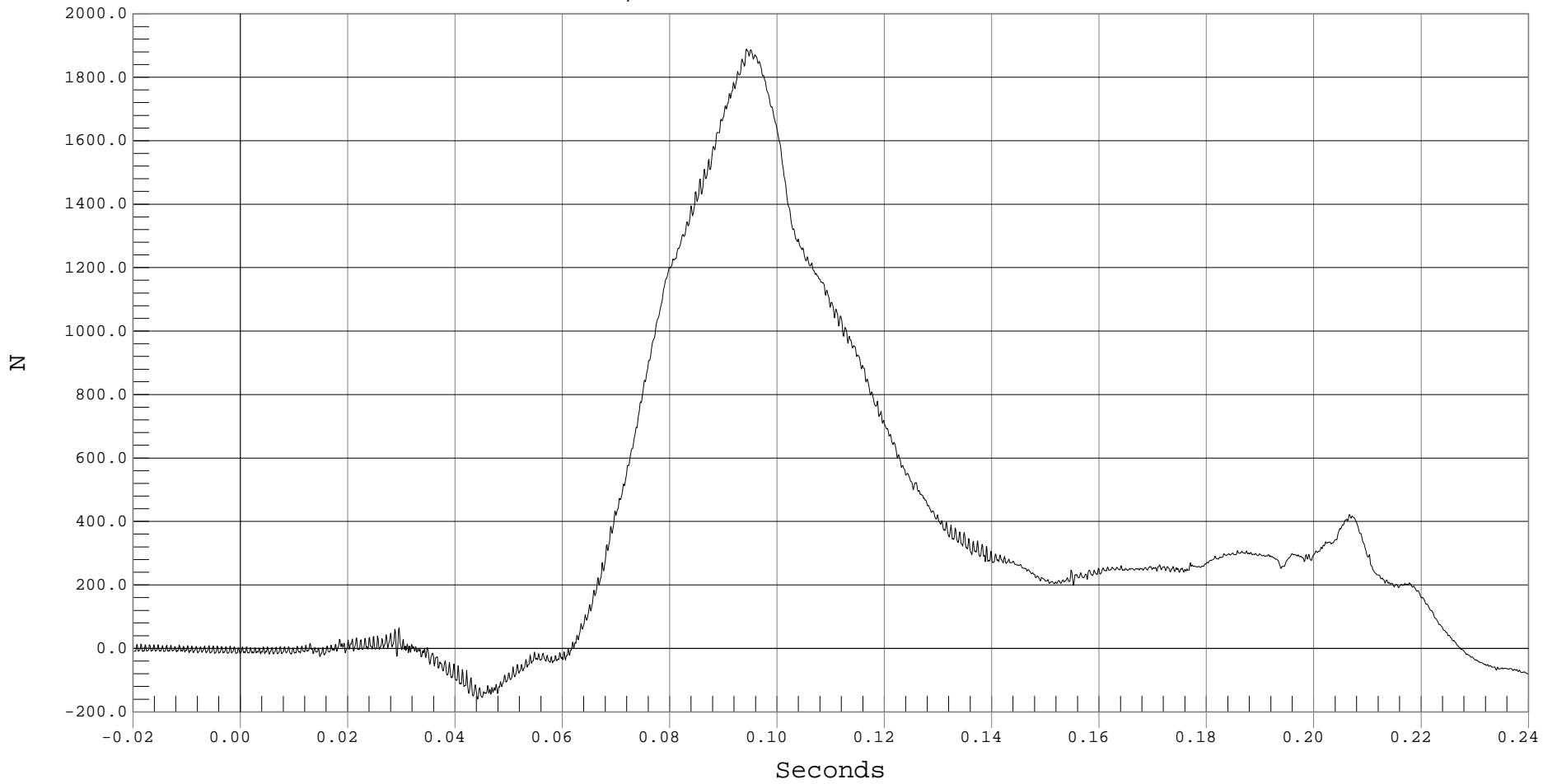
LRS 3 YR OLD UPPER NECK FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD UPPER NECK FORCE Z, B01025FT.F18

Ymin = -159.4 N @ 0.0441 Seconds, Ymax = 1889.03 N @ 0.0942 Seconds





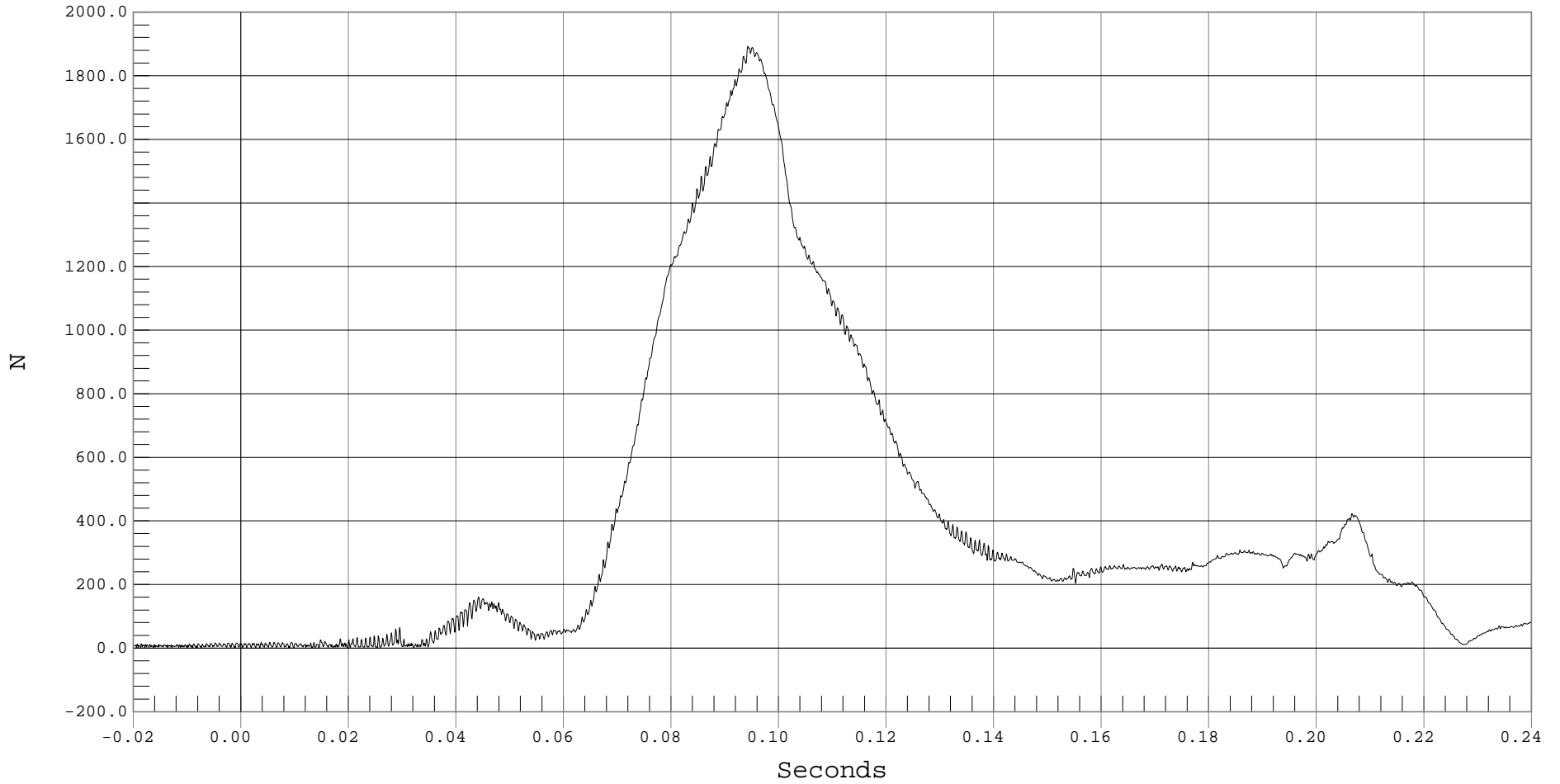
LRS 3 YR OLD UPPER NECK FORCE RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS 3 YR OLD UPPER NECK FORCE RESULTANT, B01025FV.F16

Ymin = .48 N @ 0.0098 Seconds, Ymax = 1892.51 N @ 0.0942 Seconds



F-29



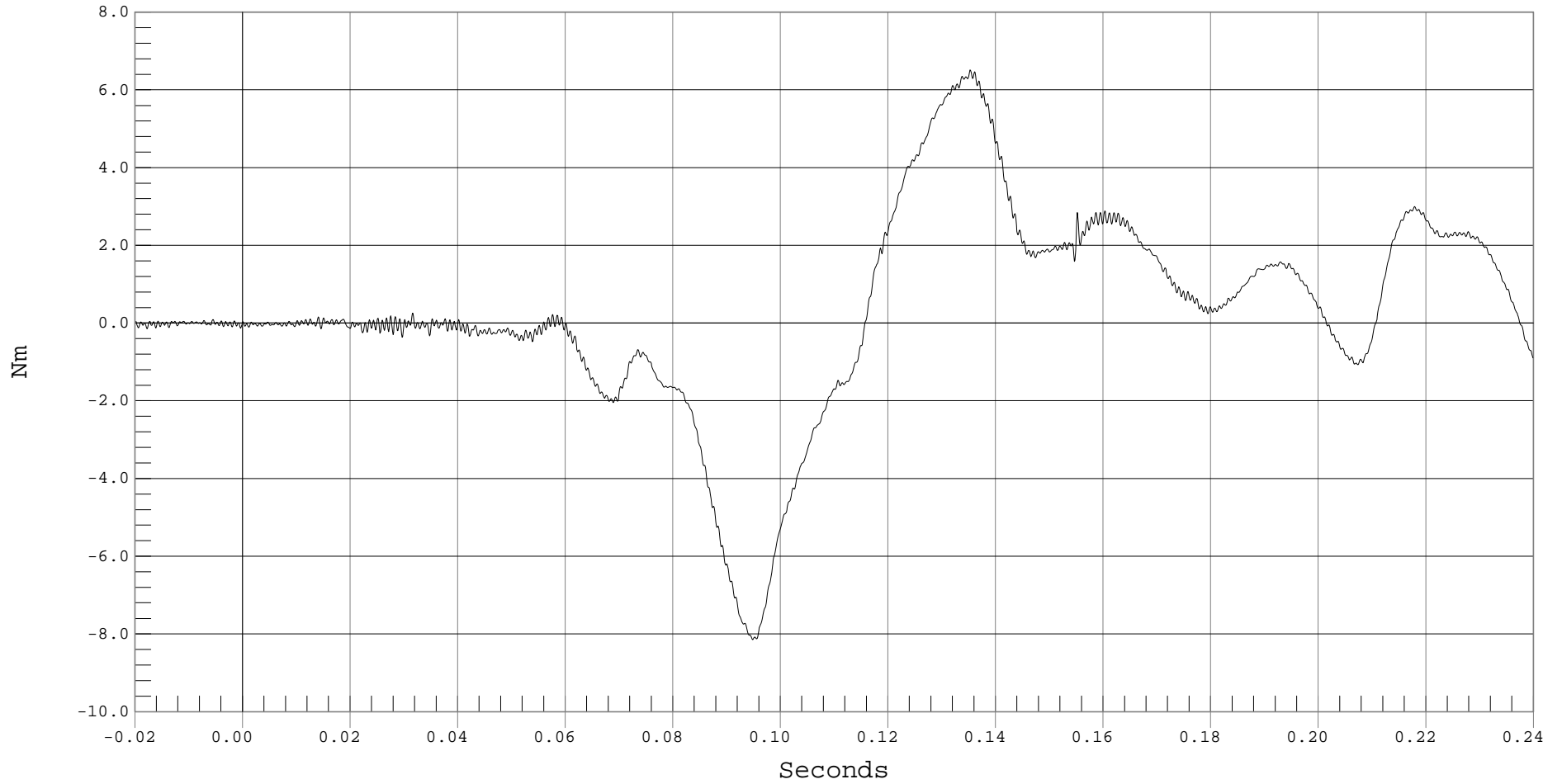
LRS 3 YR OLD UPPER NECK MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 LRS CHILD UPPER NECK MOMENT X, B01025MF.M19

Ymin = -8.15 Nm @ 0.0948 Seconds, Ymax = 6.51 Nm @ 0.1352 Seconds



F-30



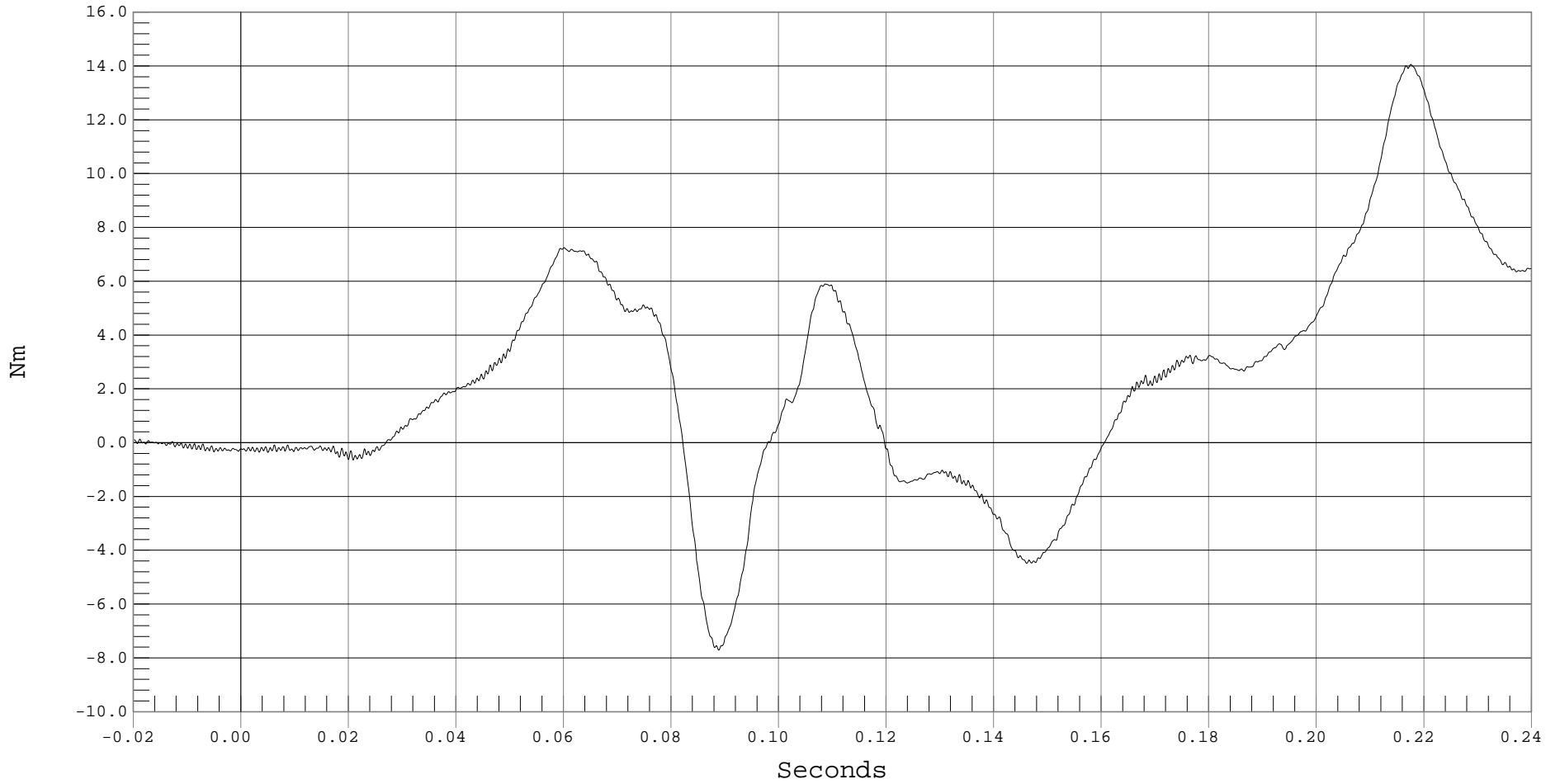
LRS 3 YR OLD UPPER NECK MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 LRS CHILD UPPER NECK MOMENT Y, B01025MF.M20

Ymin = -7.72 Nm @ 0.0888 Seconds, Ymax = 14.06 Nm @ 0.2175 Seconds



F-31



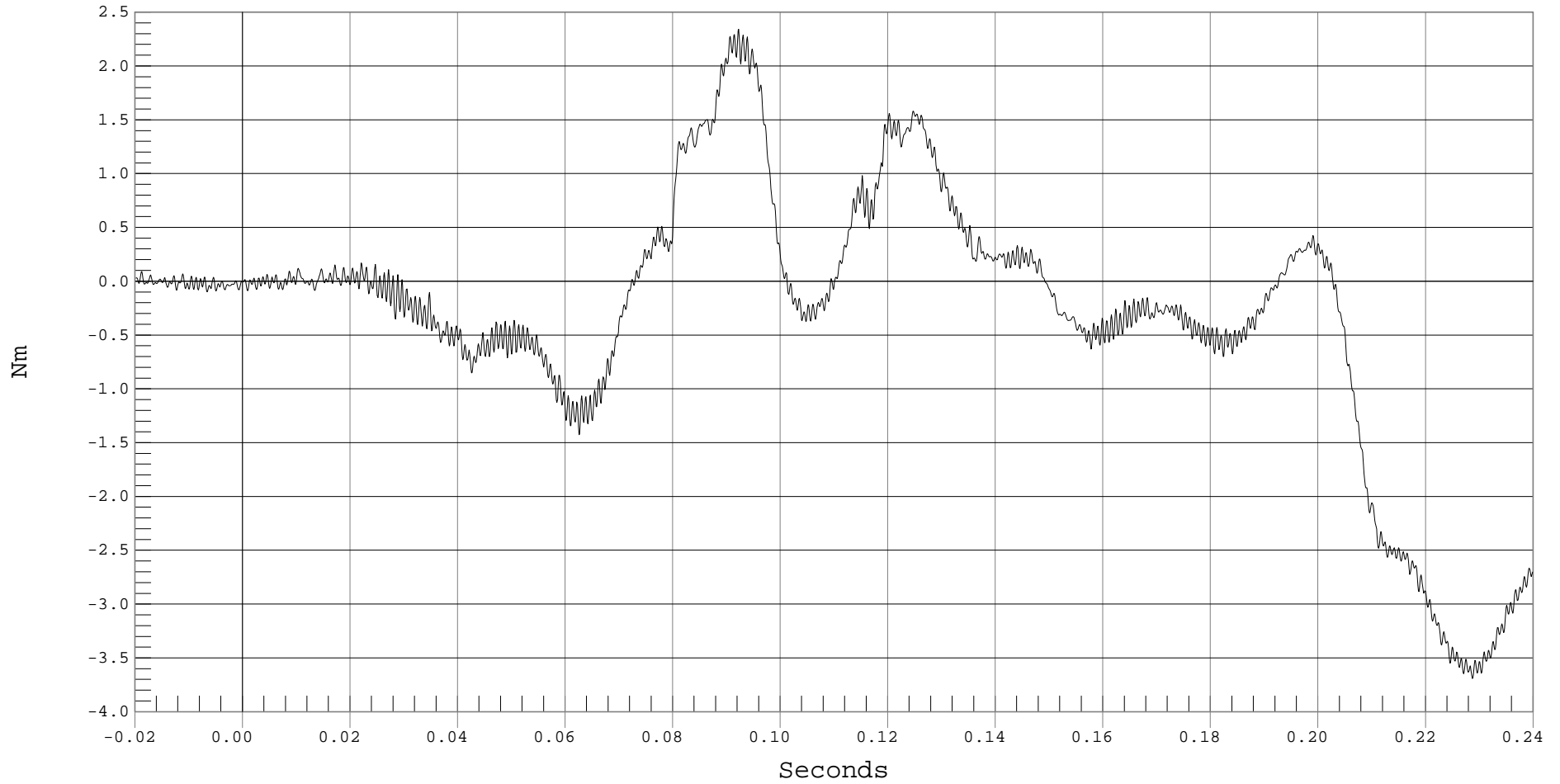
LRS 3 YR OLD UPPER NECK MOMENT Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 LRS CHILD UPPER NECK MOMENT Z, B01025MF.M21

Ymin = -3.69 Nm @ 0.2286 Seconds, Ymax = 2.34 Nm @ 0.0922 Seconds





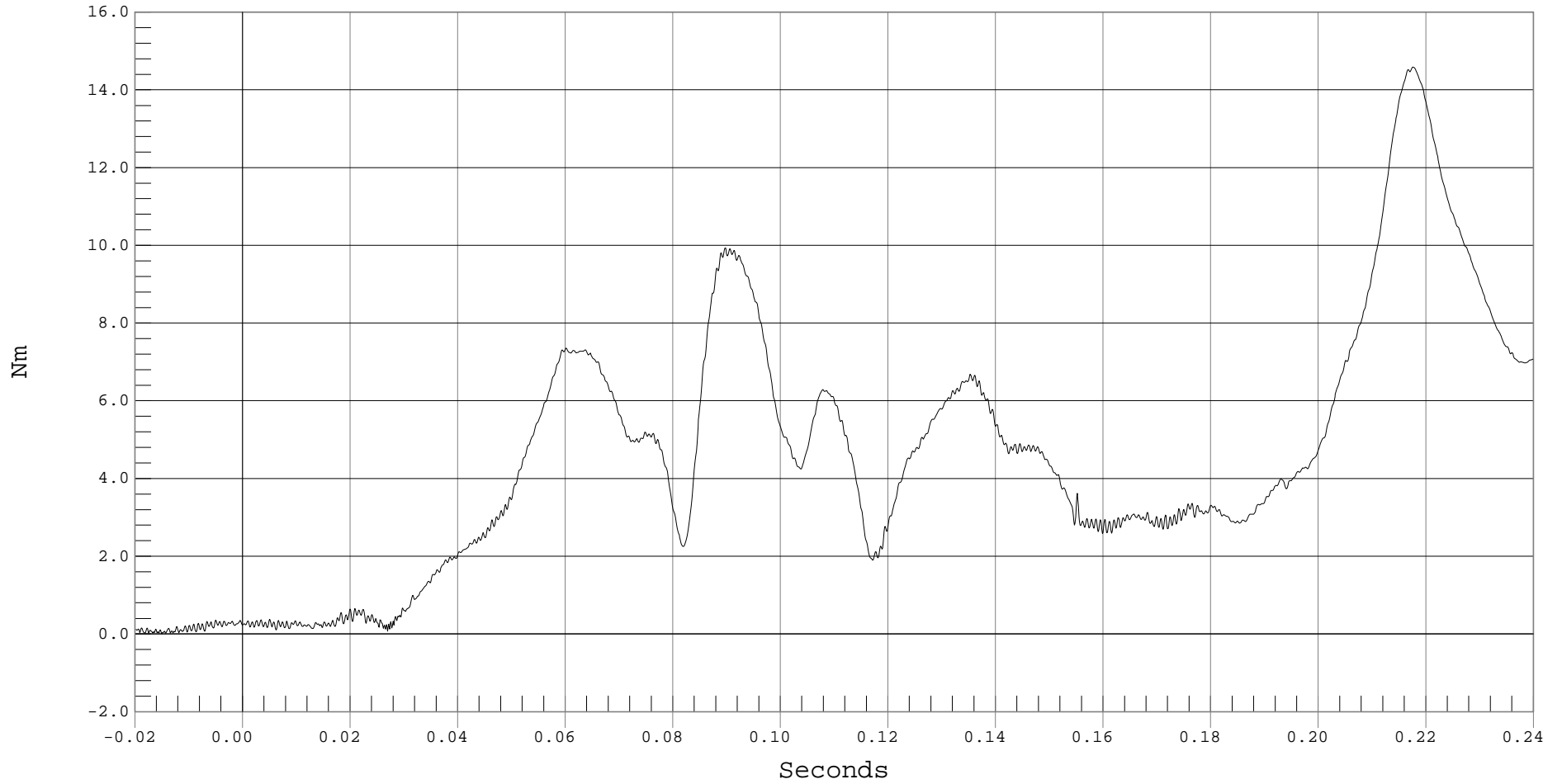
LRS 3 YR OLD UPPER NECK MOMENT RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 LRS 3 YR OLD UPPER NECK MOMENT RESULTANT, B01025MV.M19

Ymin = 0 Nm @ -0.0151 Seconds, Ymax = 14.59 Nm @ 0.2175 Seconds



LRS 3 YEAR OLD LOWER NECK FORCE X VS. TIME
NO VALID DATA COLLECTED



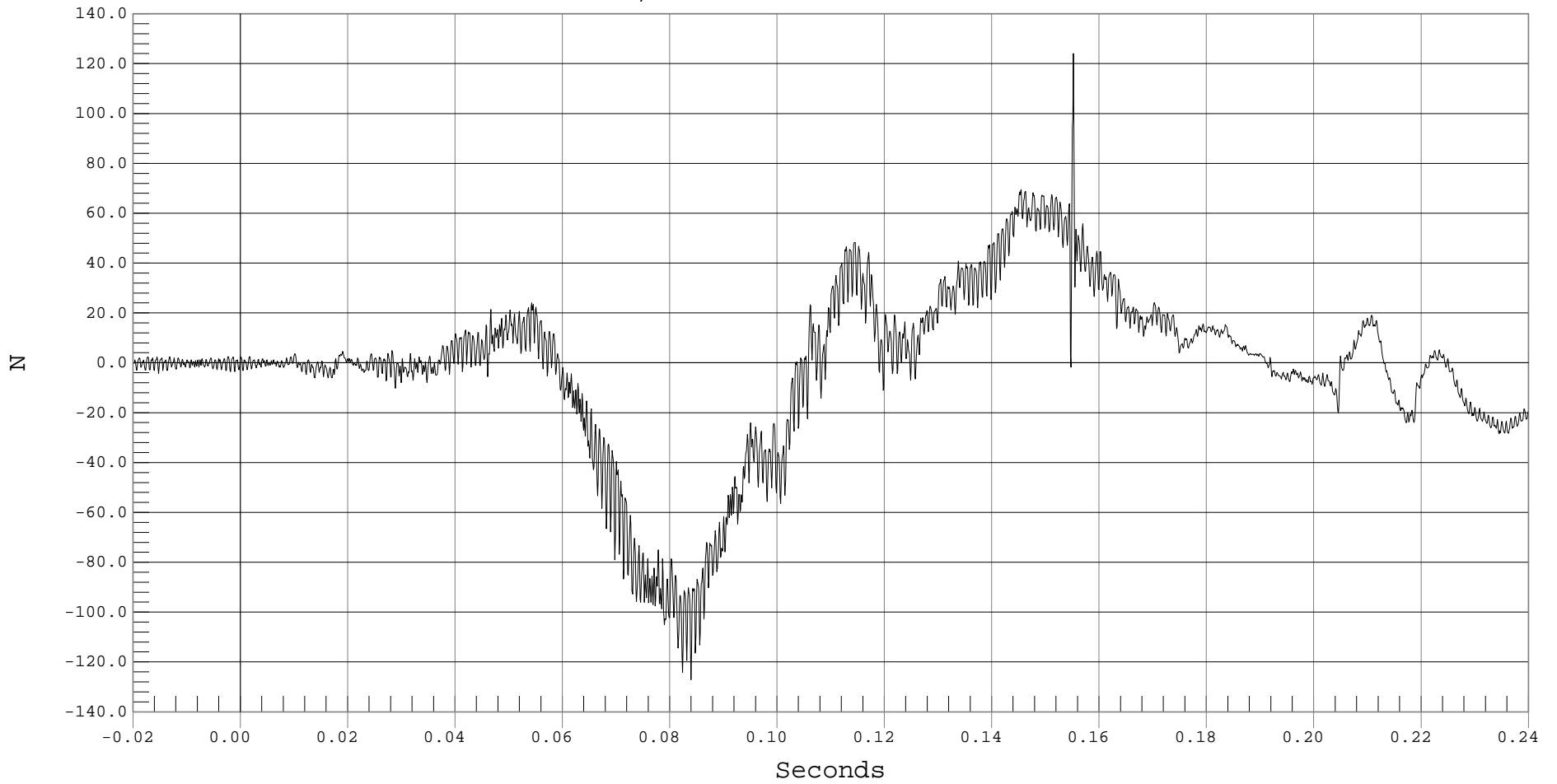
LRS 3 YR OLD LOWER NECK FORCE Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD LOWER NECK FORCE Y, B01025FT.F23

Ymin = -127.11 N @ 0.0839 Seconds, Ymax = 124.06 N @ 0.1551 Seconds





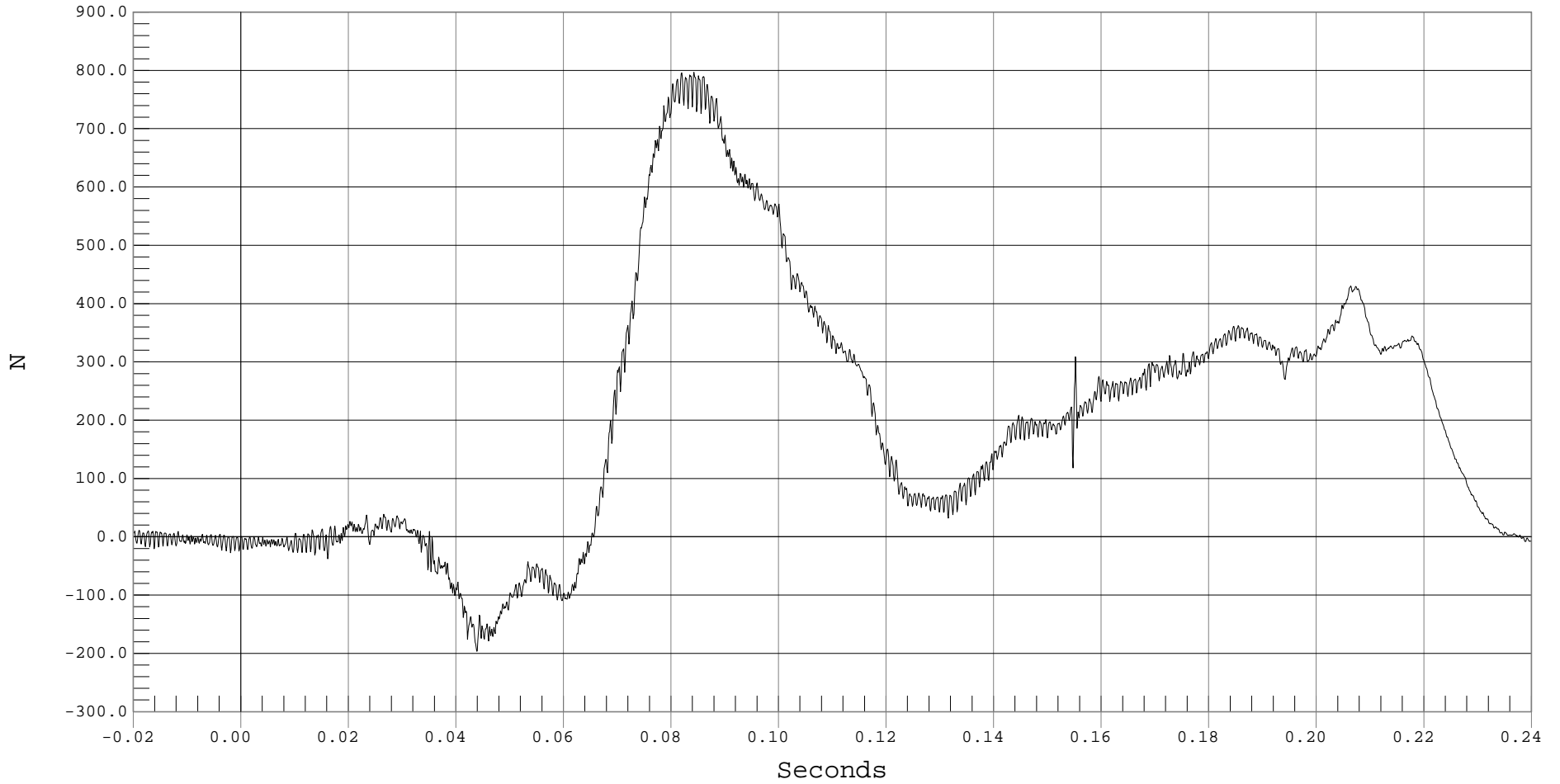
LRS 3 YR OLD LOWER NECK FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD LOWER NECK FORCE Z, B01025FT.F24

Ymin = -196.42 N @ 0.0438 Seconds, Ymax = 796.79 N @ 0.0842 Seconds





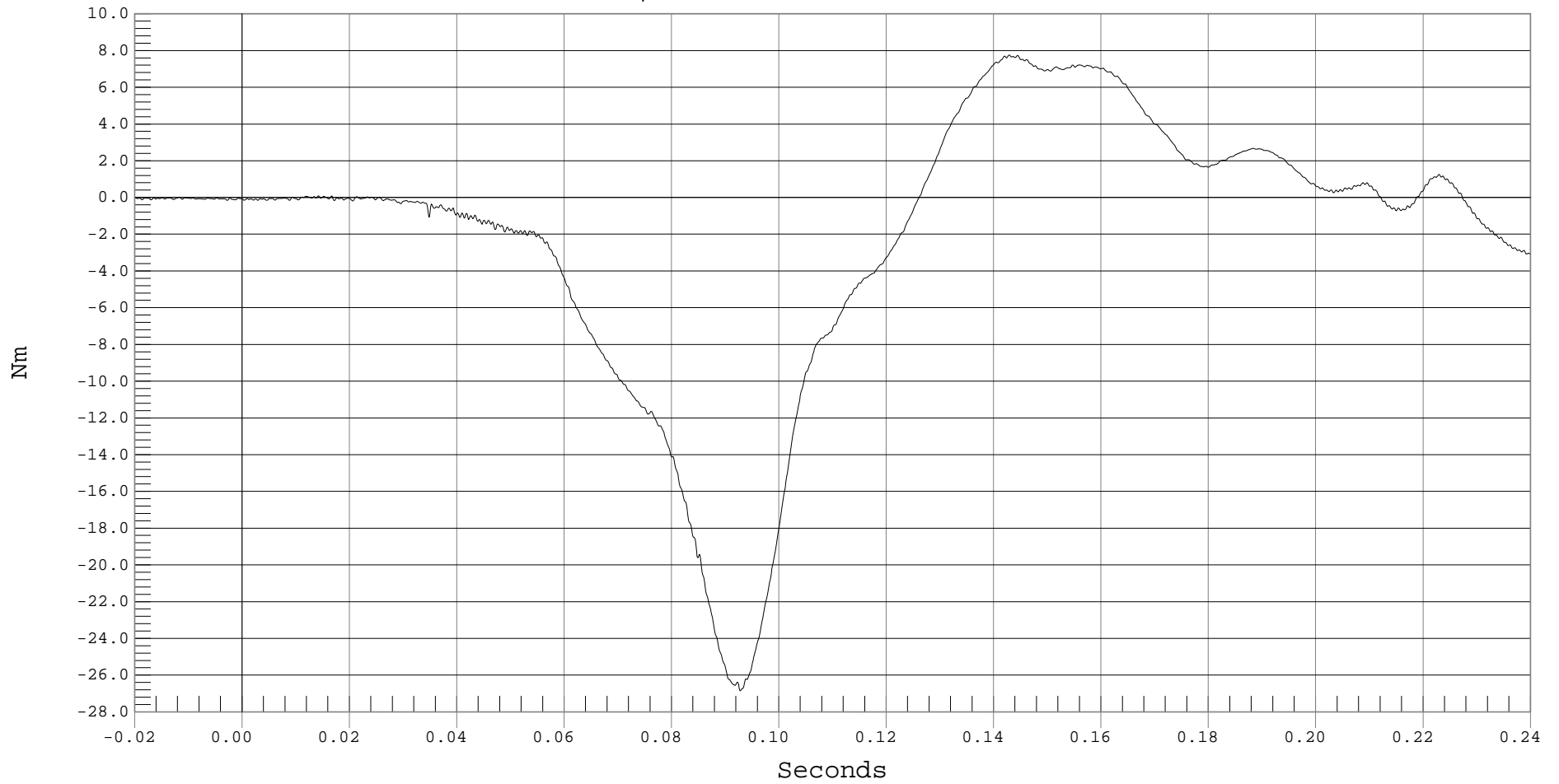
LRS 3 YR OLD LOWER NECK MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 LRS CHILD LOWER NECK MOMENT X, B01025MF.M25

Ymin = -26.86 Nm @ 0.0927 Seconds, Ymax = 7.75 Nm @ 0.1428 Seconds





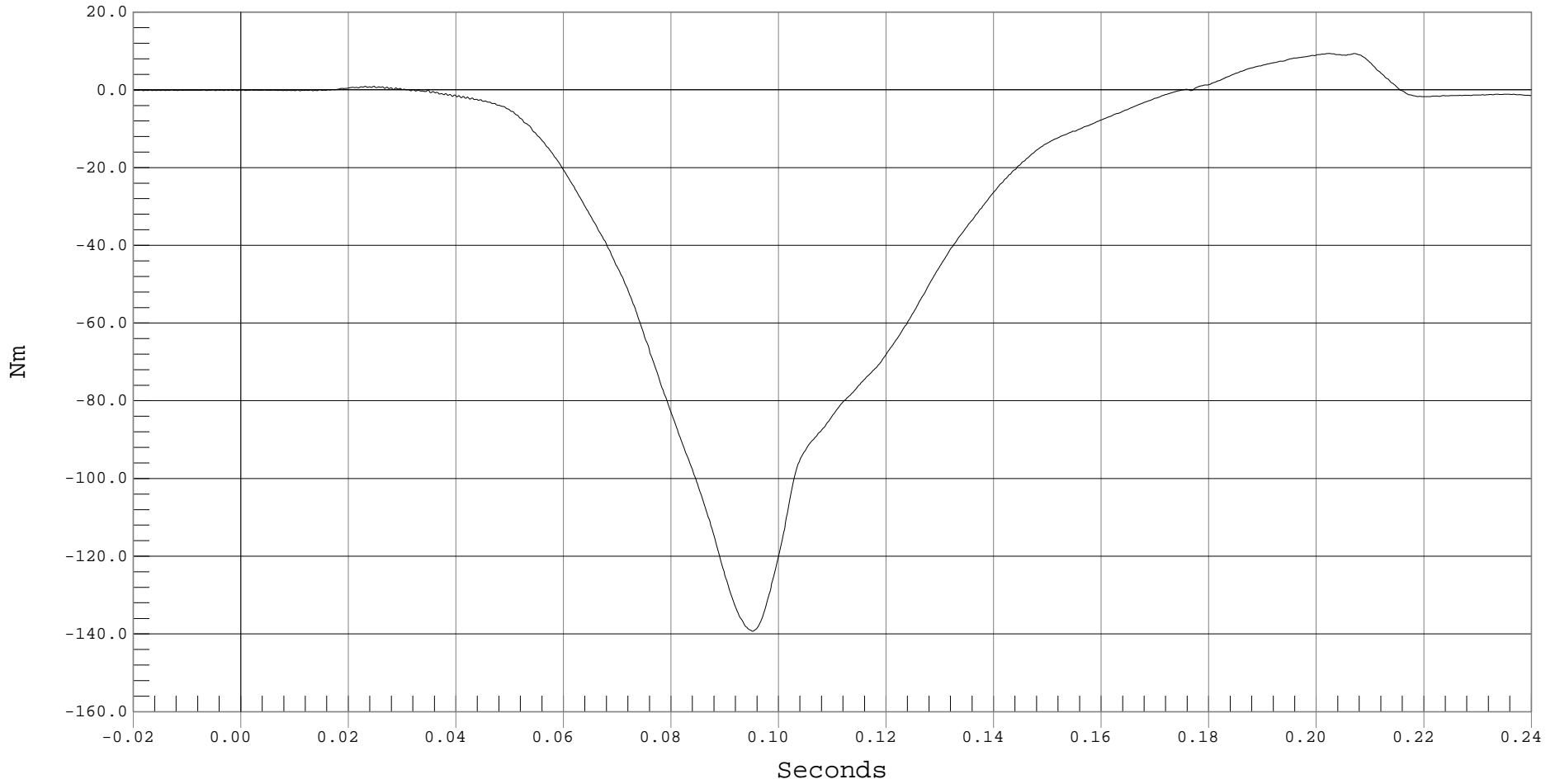
LRS 3 YR OLD LOWER NECK MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 LRS CHILD LOWER NECK MOMENT Y, B01025MF.M26

Ymin = -139.3 Nm @ 0.0951 Seconds, Ymax = 9.37 Nm @ 0.2023 Seconds





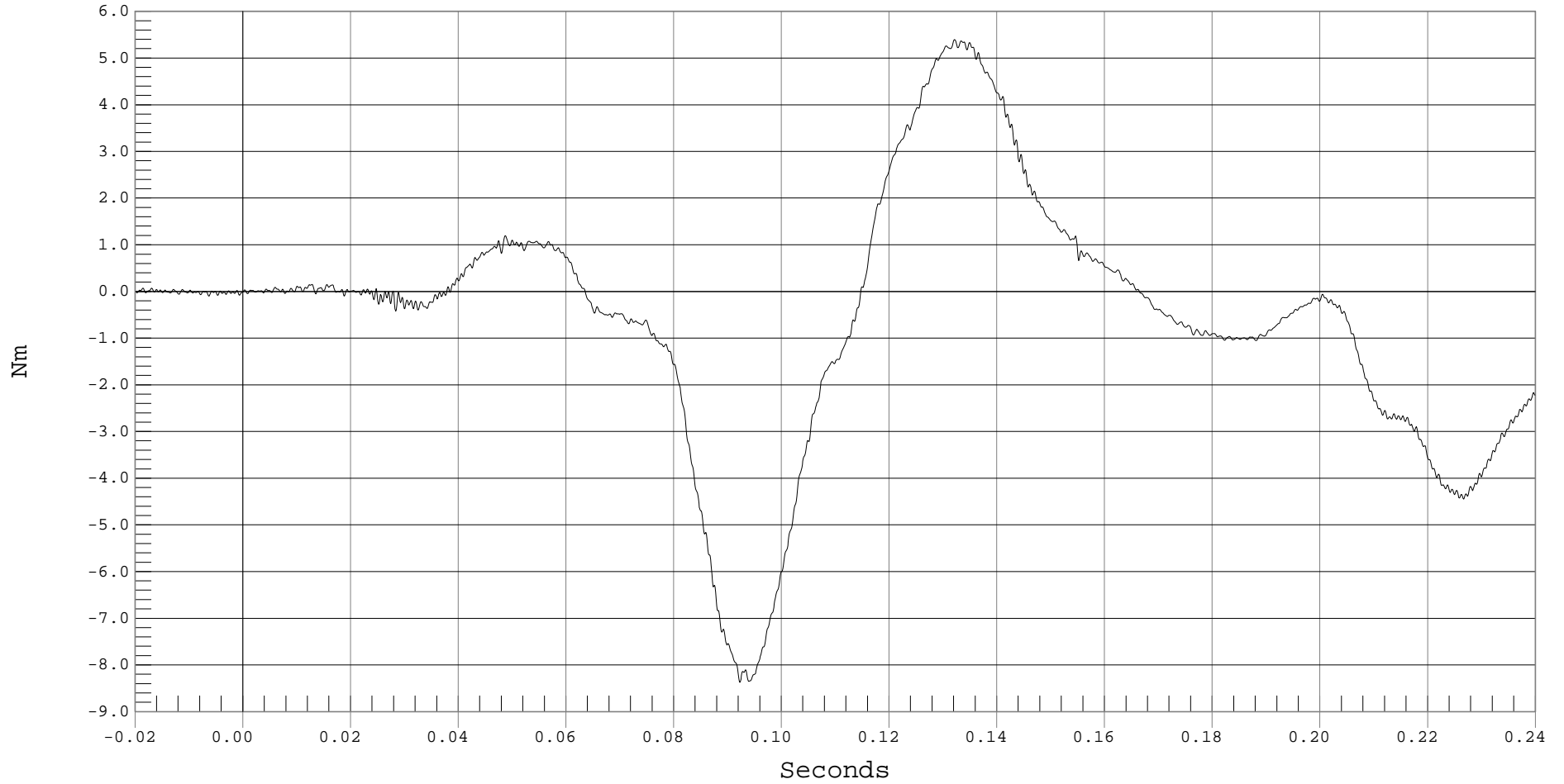
LRS 3 YR OLD LOWER NECK MOMENT Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 LRS CHILD LOWER NECK MOMENT Z, B01025MF.M27

Ymin = -8.37 Nm @ 0.0922 Seconds, Ymax = 5.39 Nm @ 0.1321 Seconds



F-39



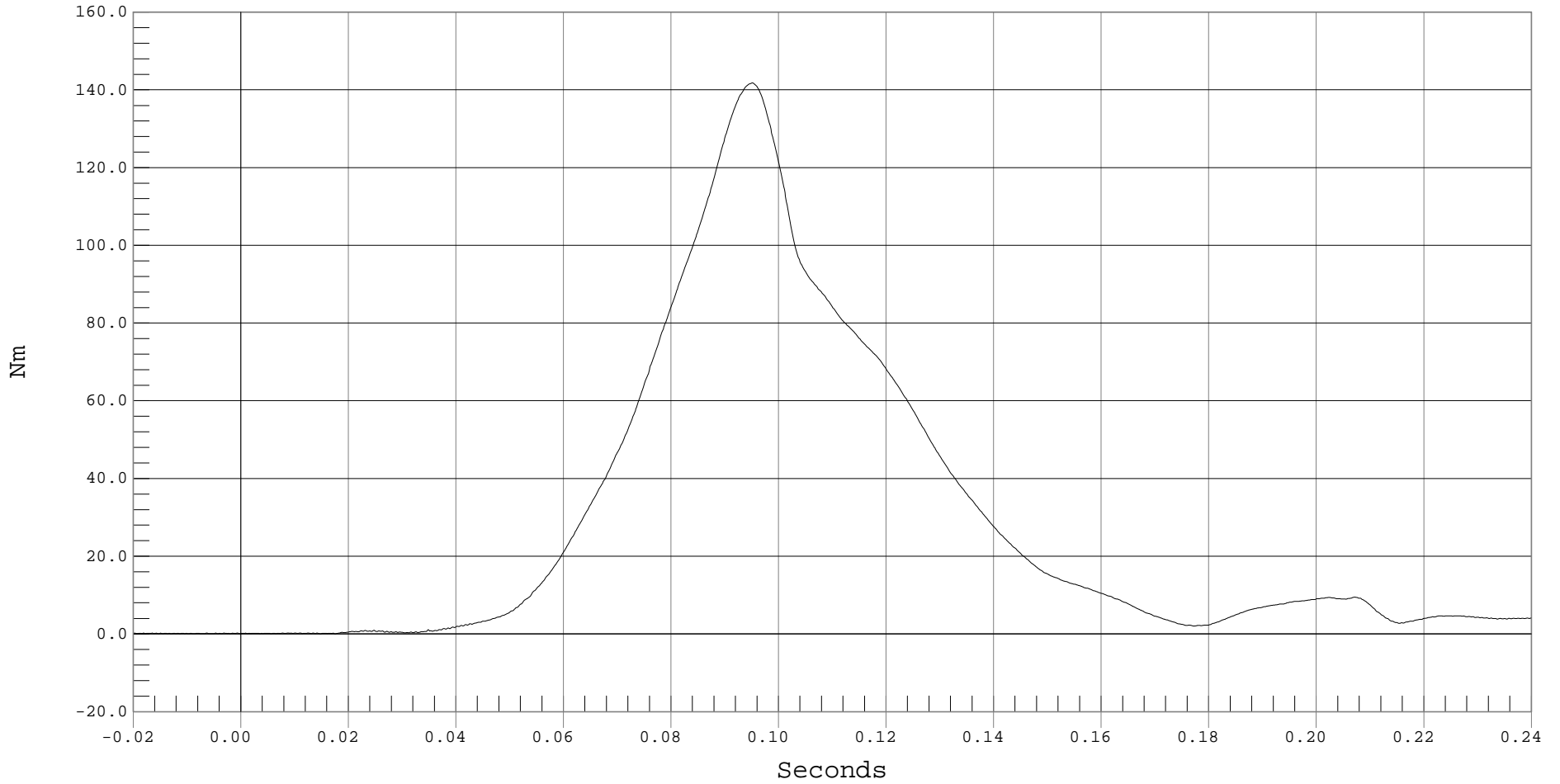
LRS 3 YR OLD LOWER NECK MOMENT RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 LRS 3 YR OLD LOWER NECK MOMENT RESULTANT, B01025MV.M25

Ymin = .05 Nm @ 0.0147 Seconds, Ymax = 141.8 Nm @ 0.0951 Seconds



F-40



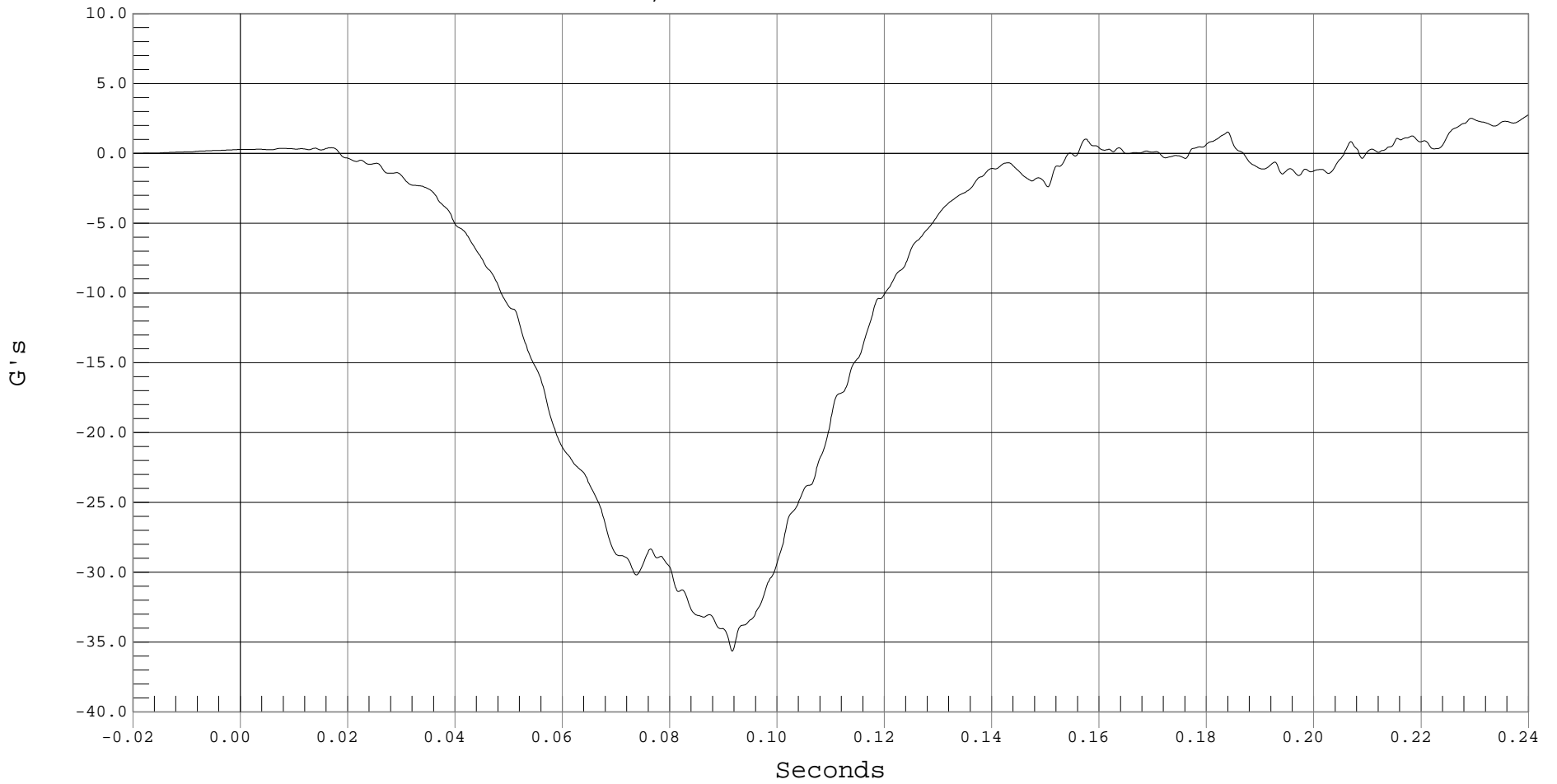
LRS 3 YR OLD CHEST X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LRS CHILD CHEST X, B01025AF.A28

Ymin = -35.65 G's @ 0.0916 Seconds, Ymax = 6.91 G's @ 0.2494 Seconds



F-41



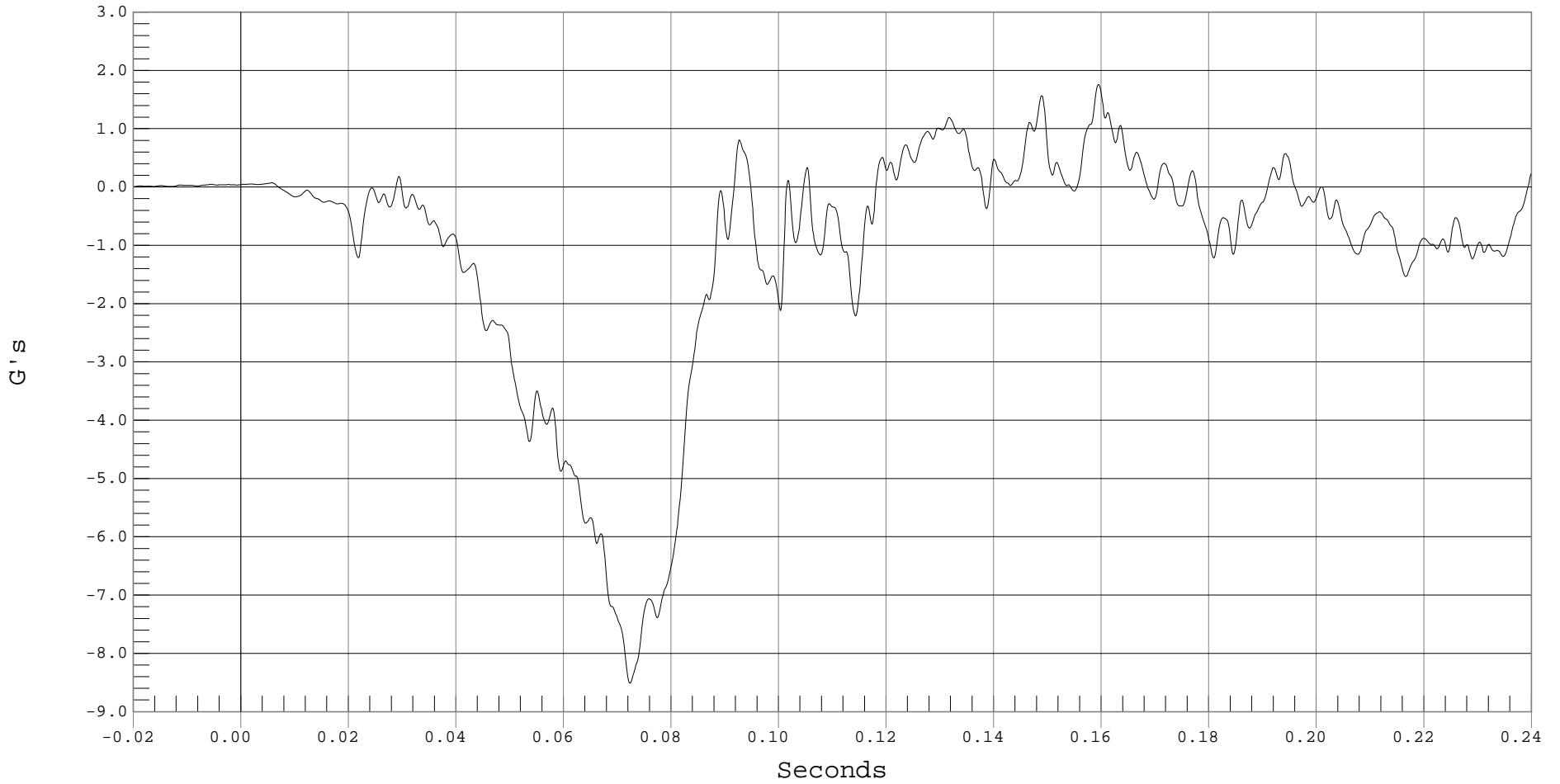
LRS 3 YR OLD CHEST Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LRS CHILD CHEST Y, B01025AF.A29

Ymin = -8.51 G's @ 0.0723 Seconds, Ymax = 2.08 G's @ 0.2456 Seconds



F-42



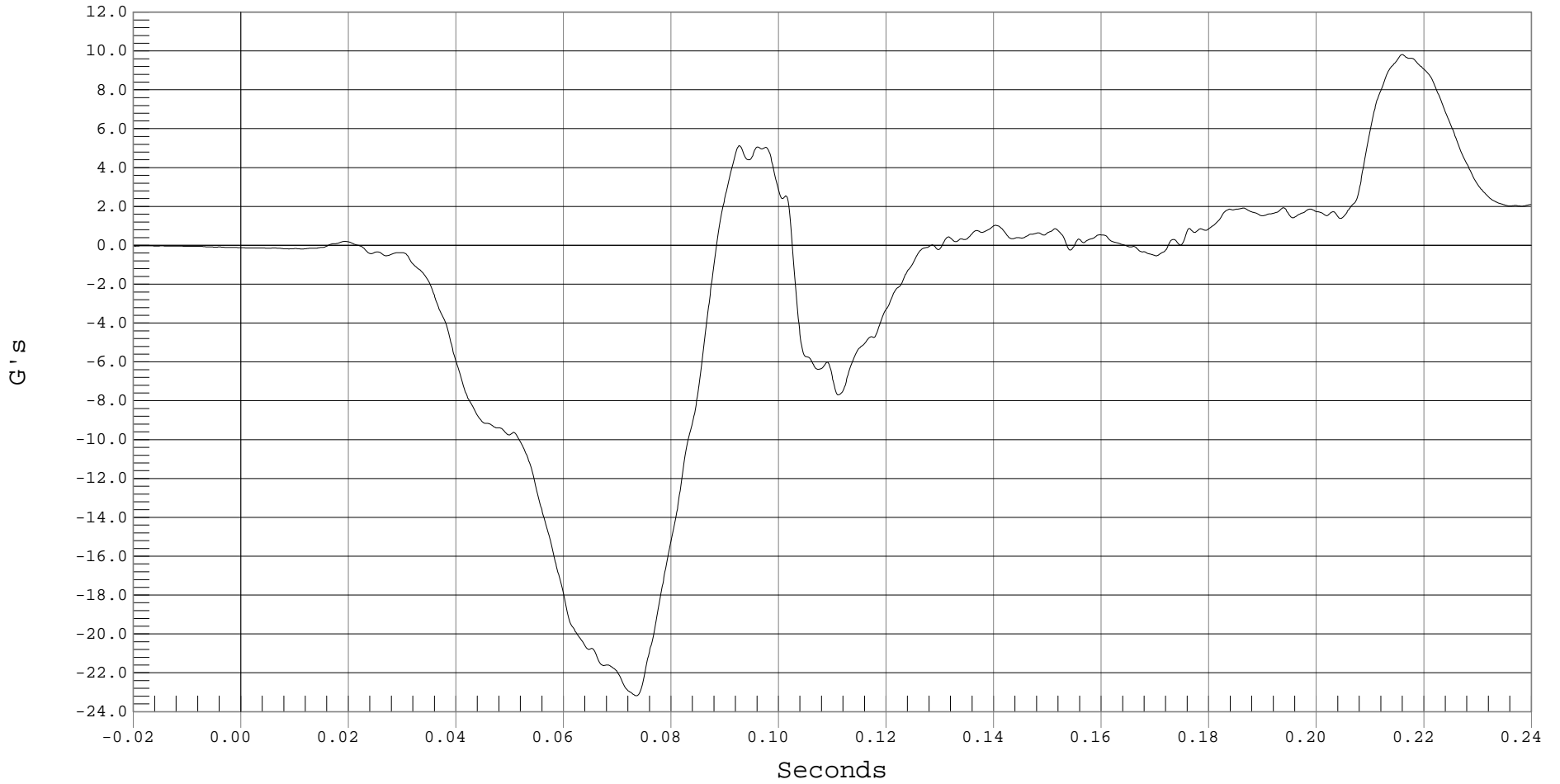
LRS 3 YR OLD CHEST Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LRS CHILD CHEST Z, B01025AF.A30

Ymin = -23.18 G's @ 0.0735 Seconds, Ymax = 9.82 G's @ 0.2159 Seconds



F-43



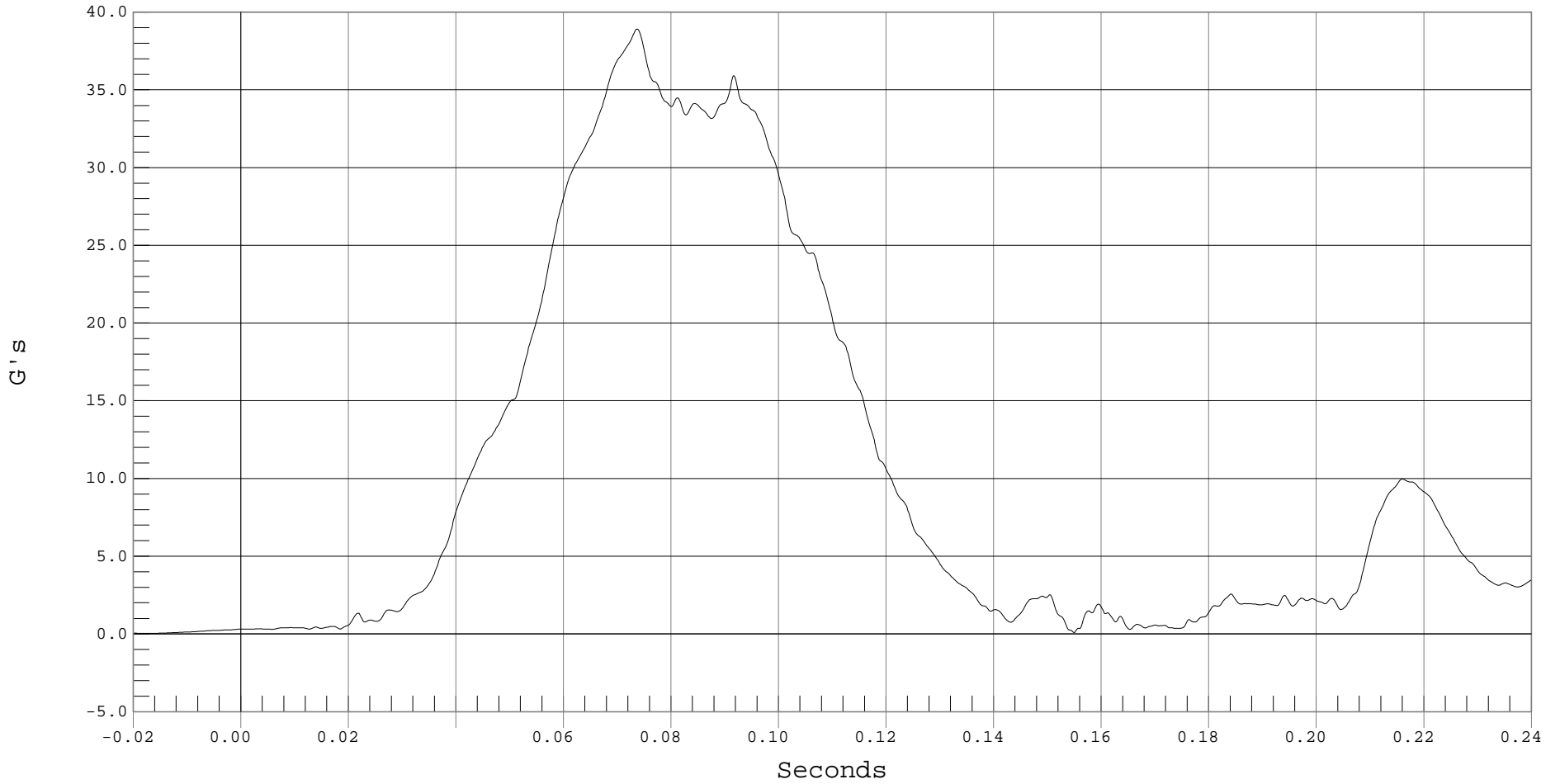
LRS 3 YR OLD CHEST RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LRS 3 YR OLD CHEST RESULTANT ACCELERATION, B01025AV.A28

Ymin = .03 G's @ -0.0171 Seconds, Ymax = 38.91 G's @ 0.0736 Seconds



F-44



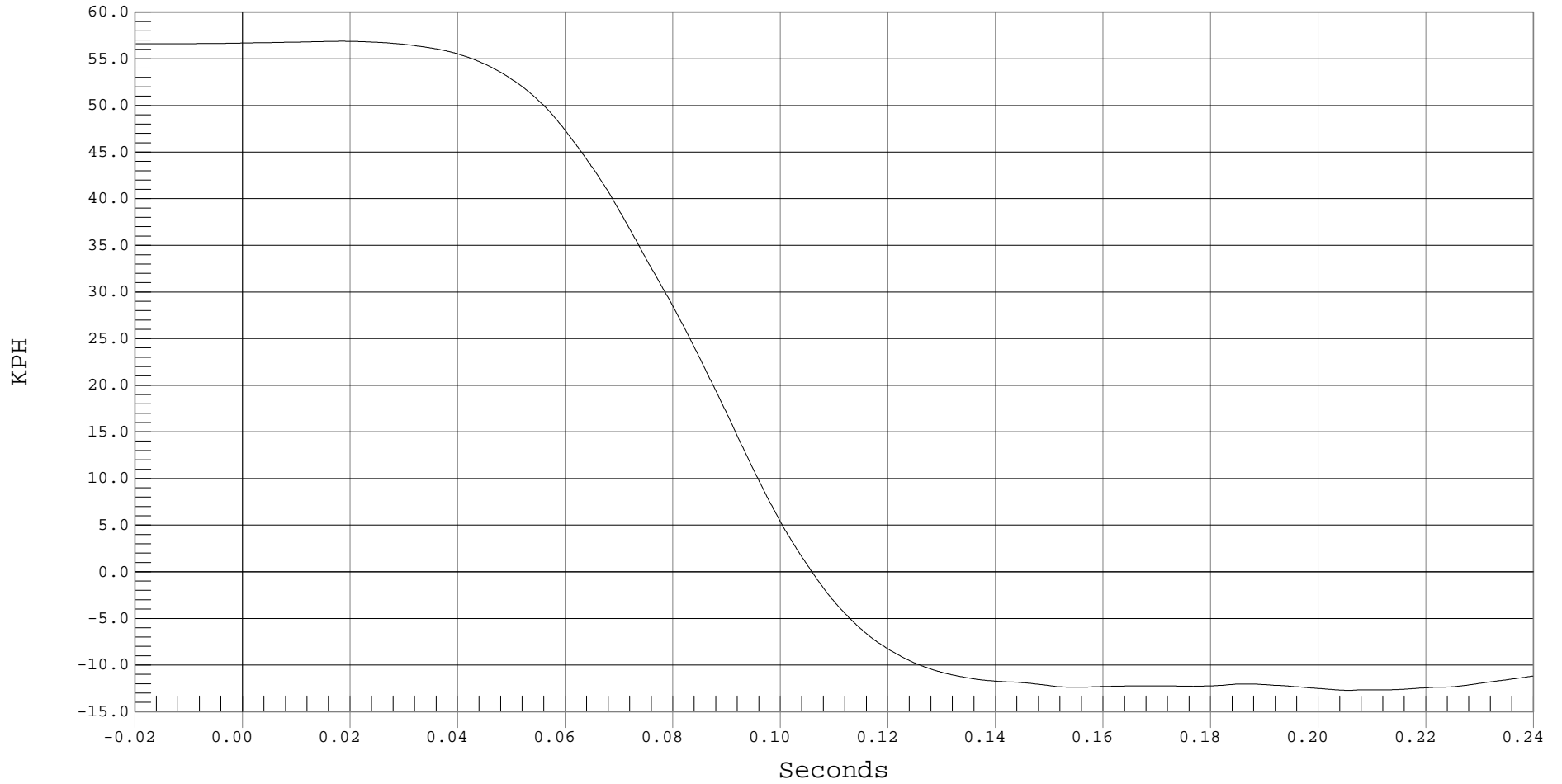
LRS 3 YR OLD CHEST X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 LRS 3 YR OLD CHEST X VELOCITY, B01025AI.V28

Ymin = -12.71 KPH @ 0.2056 Seconds, Ymax = 56.88 KPH @ 0.0184 Seconds



F-45



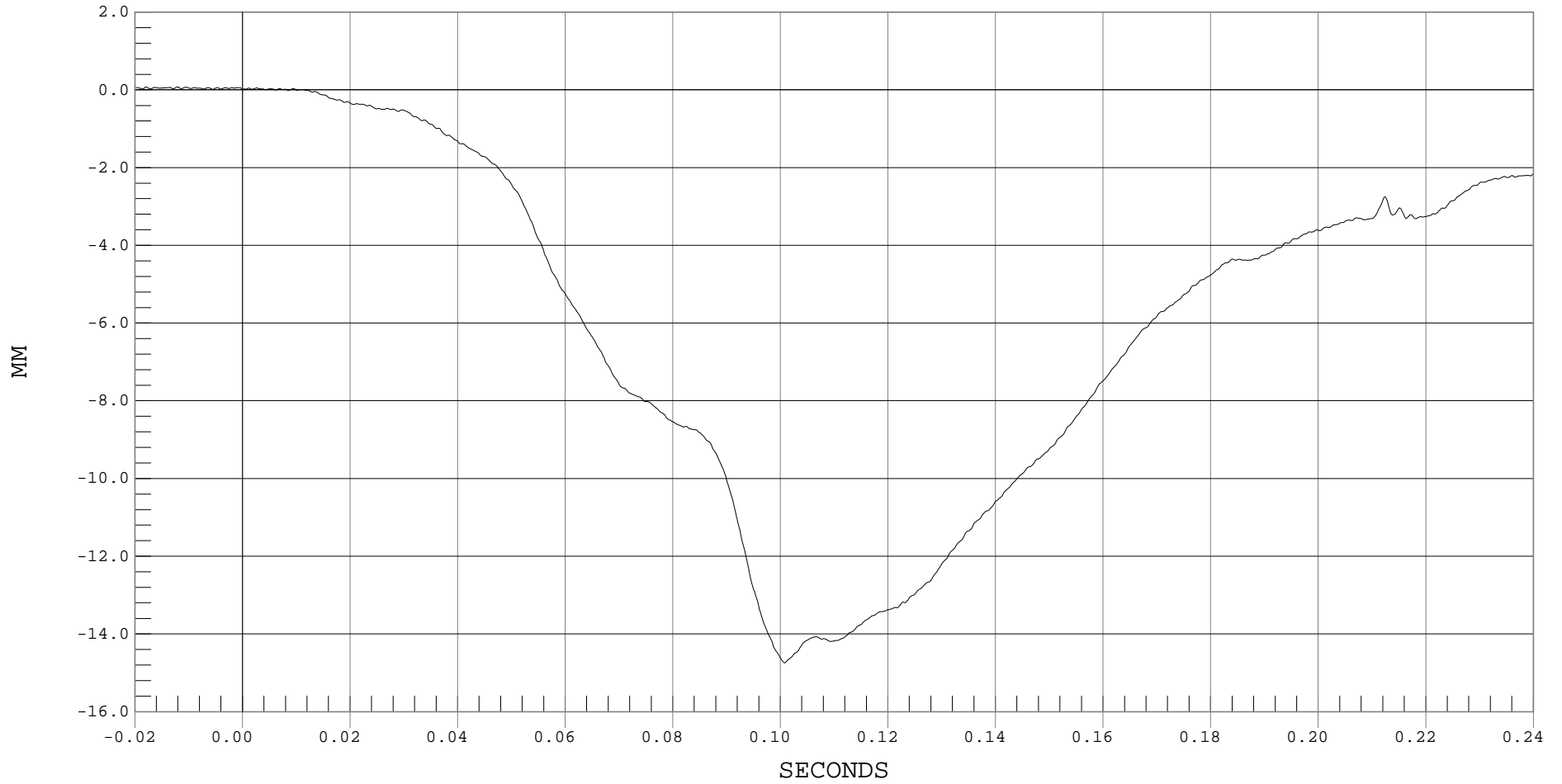
LRS 3 YR OLD CHEST COMPRESSION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DISPLACEMENT, B01025DF.D31

Ymin = -14.74 MM @ 0.1007 SECONDS, Ymax = .08 MM @ -0.0122 SECONDS



F-46



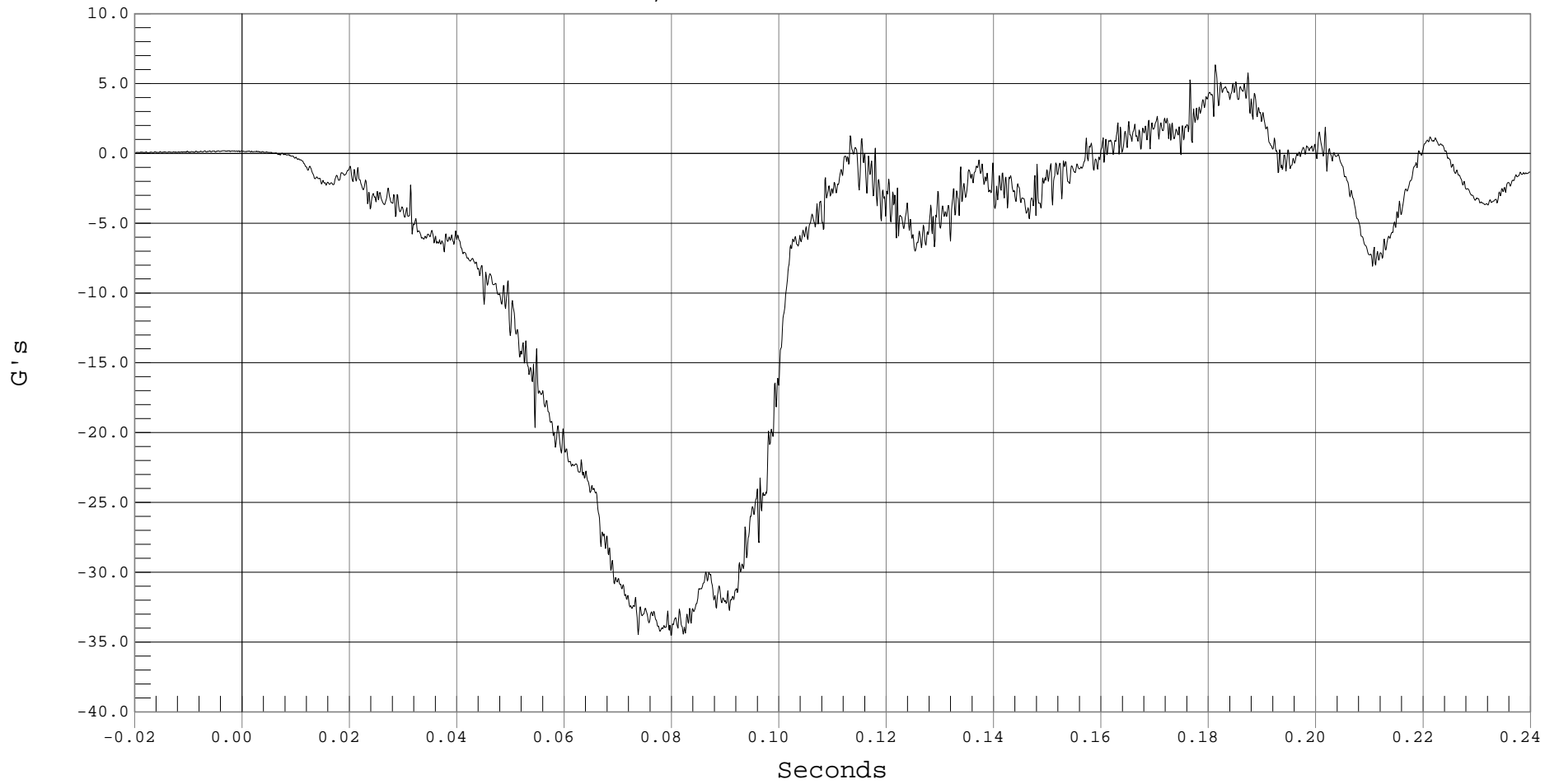
LRS 3 YR OLD PELVIS X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD PELVIS X, B01025AT.A34

Ymin = -34.51 G's @ 0.0799 Seconds, Ymax = 6.34 G's @ 0.1812 Seconds



F-47



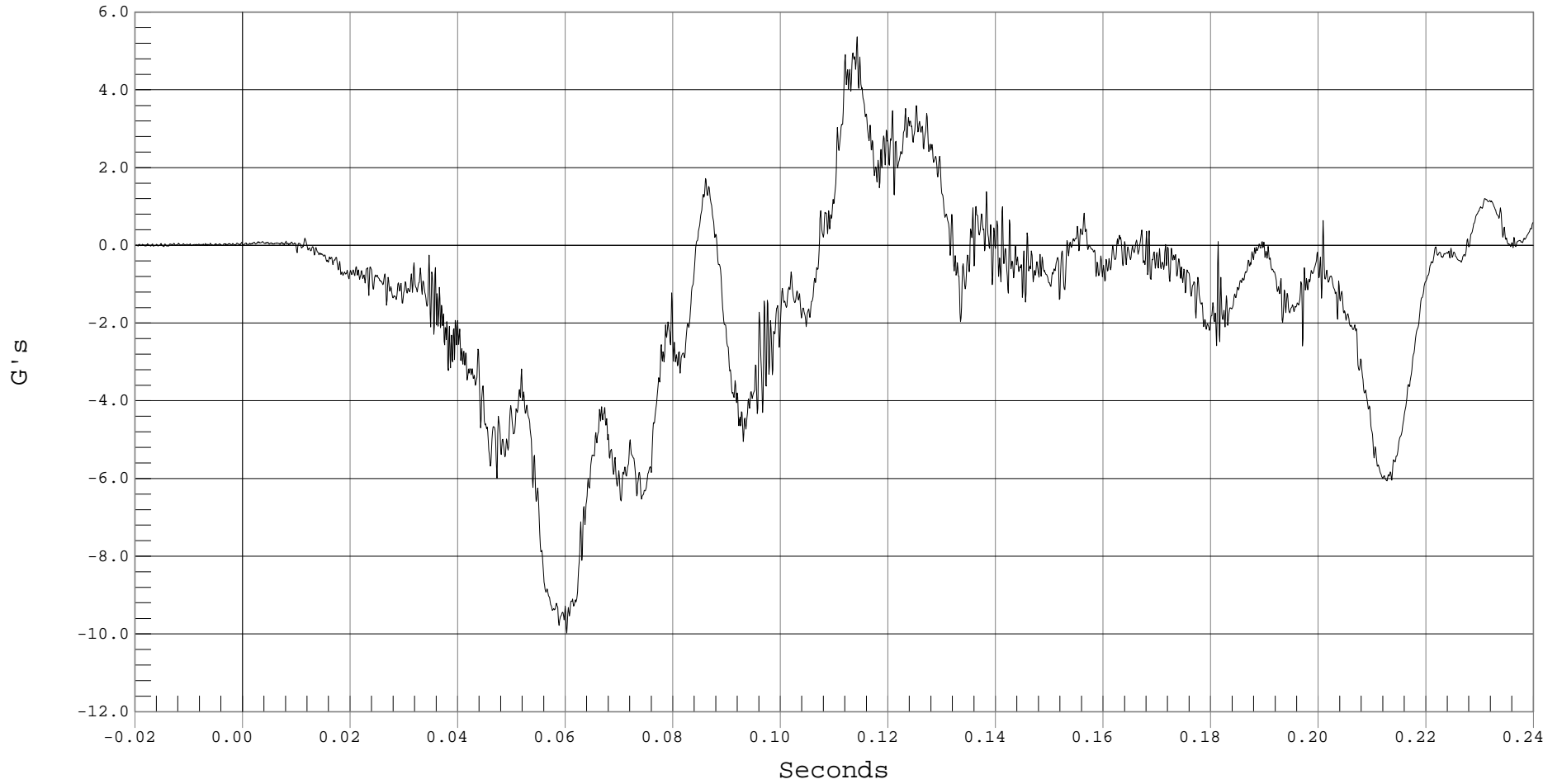
LRS 3 YR OLD PELVIS Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD PELVIS Y, B01025AT.A35

Ymin = -9.98 G's @ 0.0602 Seconds, Ymax = 5.36 G's @ 0.1142 Seconds



F-48



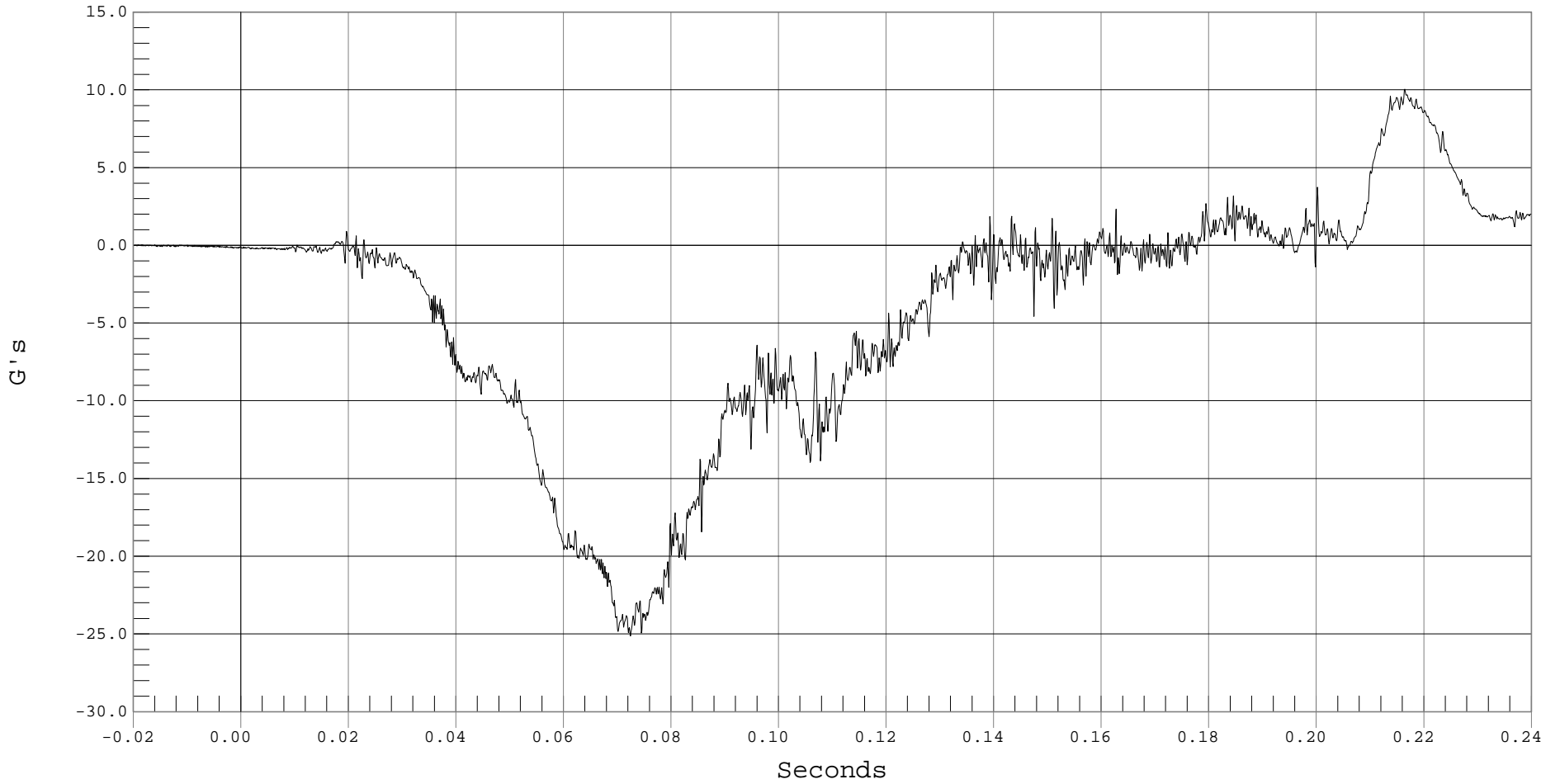
LRS 3 YR OLD PELVIS Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS CHILD PELVIS Z, B01025AT.A36

Ymin = -25.14 G's @ 0.0724 Seconds, Ymax = 10.05 G's @ 0.2164 Seconds



F-49



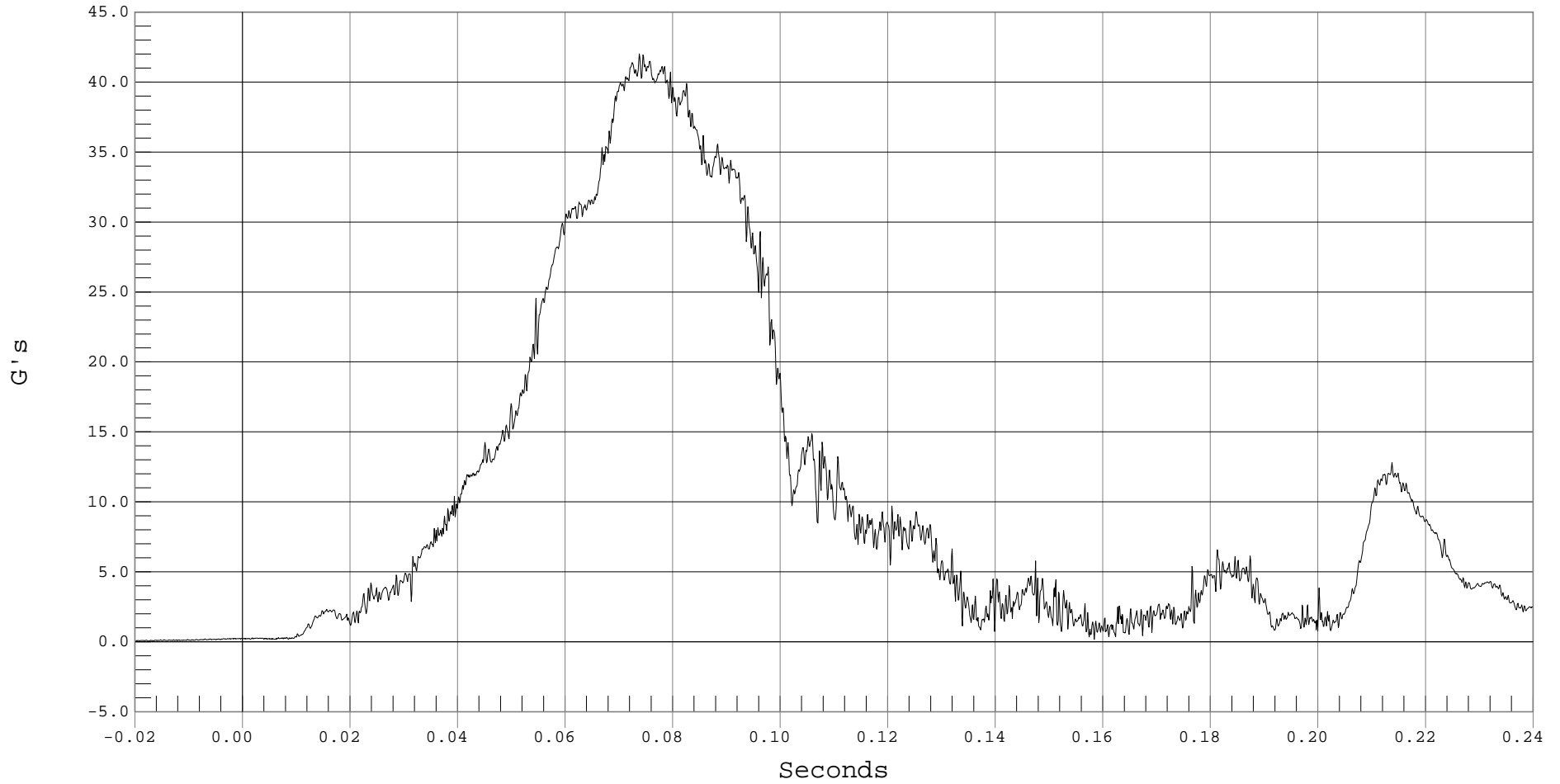
LRS 3 YR OLD PELVIS RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 LRS 3 YR OLD PELVIS RESULTANT ACCELERATION, B01025AV.A34

Ymin = .06 G's @ -0.0174 Seconds, Ymax = 42.03 G's @ 0.0737 Seconds



F-50



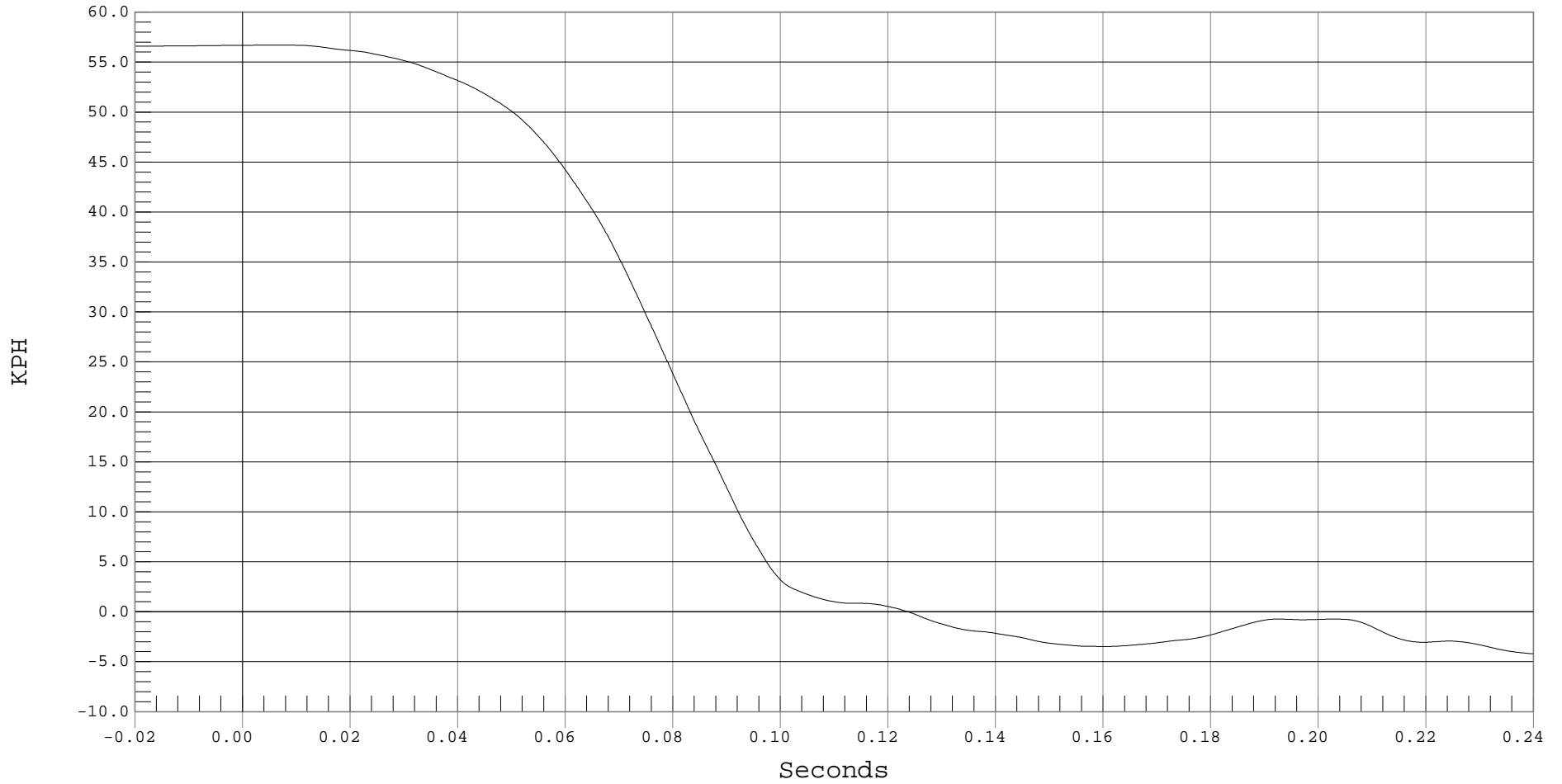
LRS 3 YR OLD PELVIS X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 3 YR OLD PELVIS X VELOCITY, B01025AI.V34

Ymin = -5.07 KPH @ 0.2500 Seconds, Ymax = 56.7 KPH @ 0.0061 Seconds



F-51



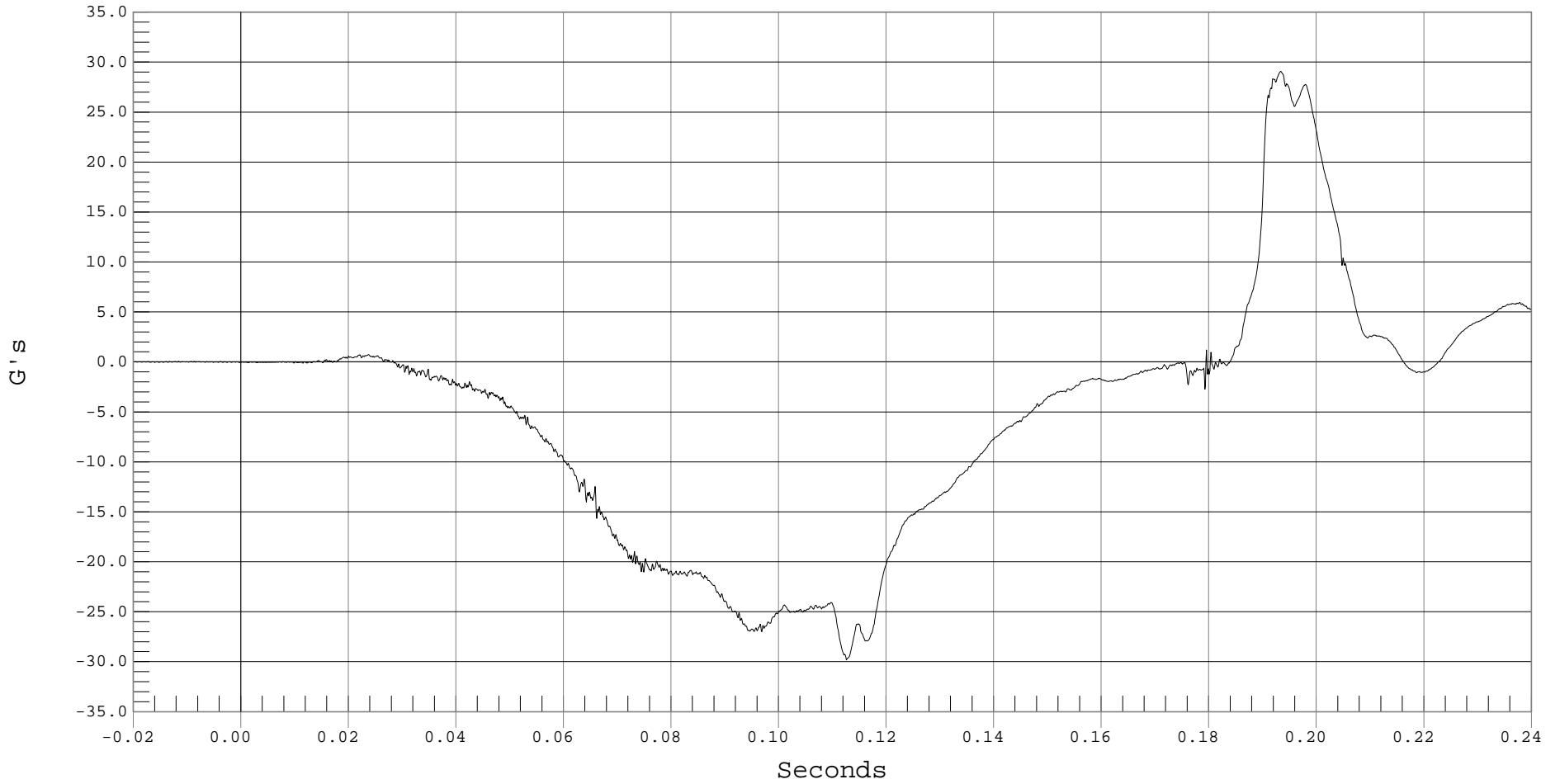
RRS 3 YR OLD HEAD X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD HEAD X, B01025AT.A37

Ymin = -29.81 G's @ 0.1125 Seconds, Ymax = 29.08 G's @ 0.1933 Seconds





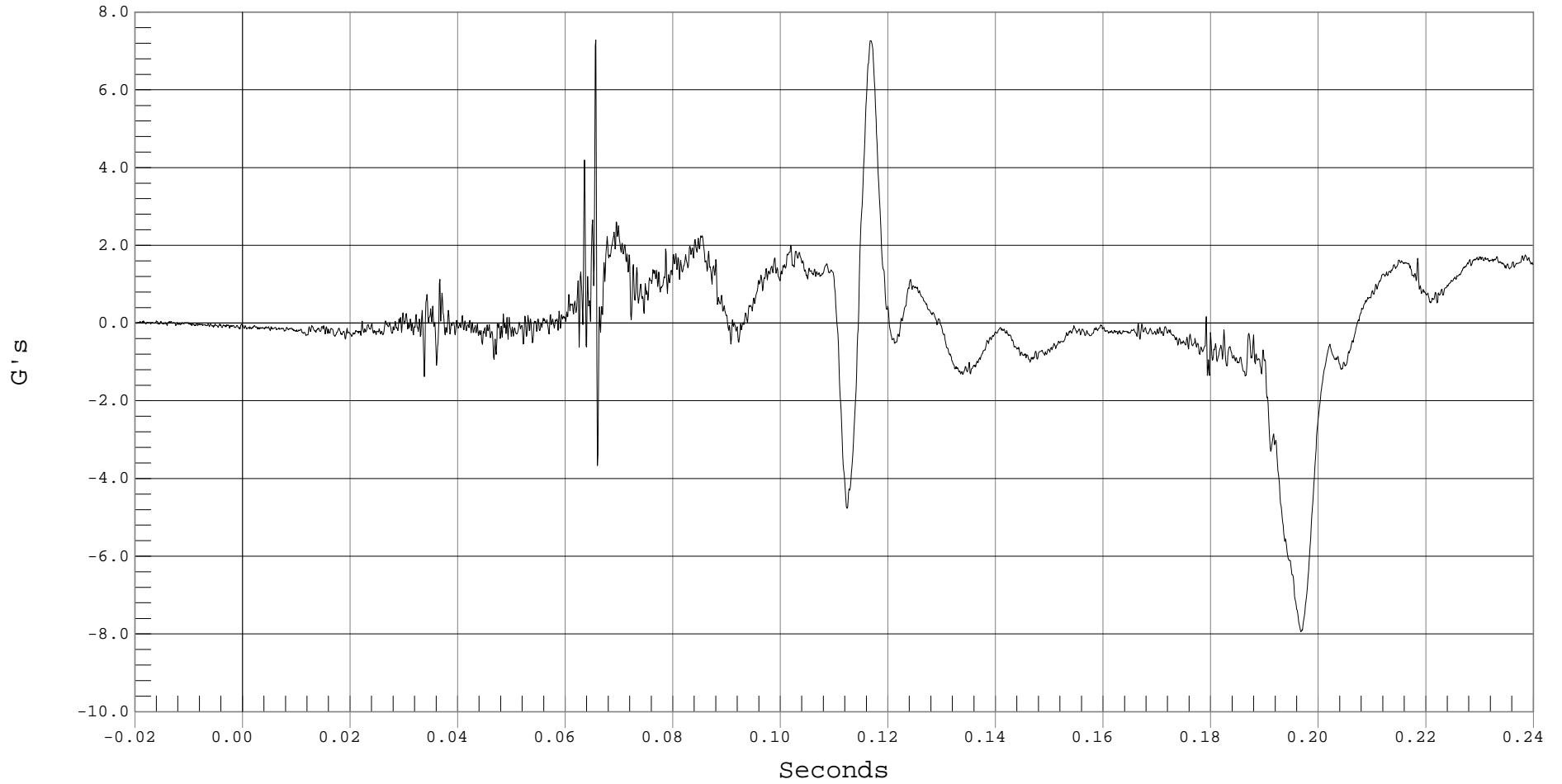
RRS 3 YR OLD HEAD Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD HEAD Y, B01025AT.A38

Ymin = -7.94 G's @ 0.1967 Seconds, Ymax = 7.28 G's @ 0.0656 Seconds





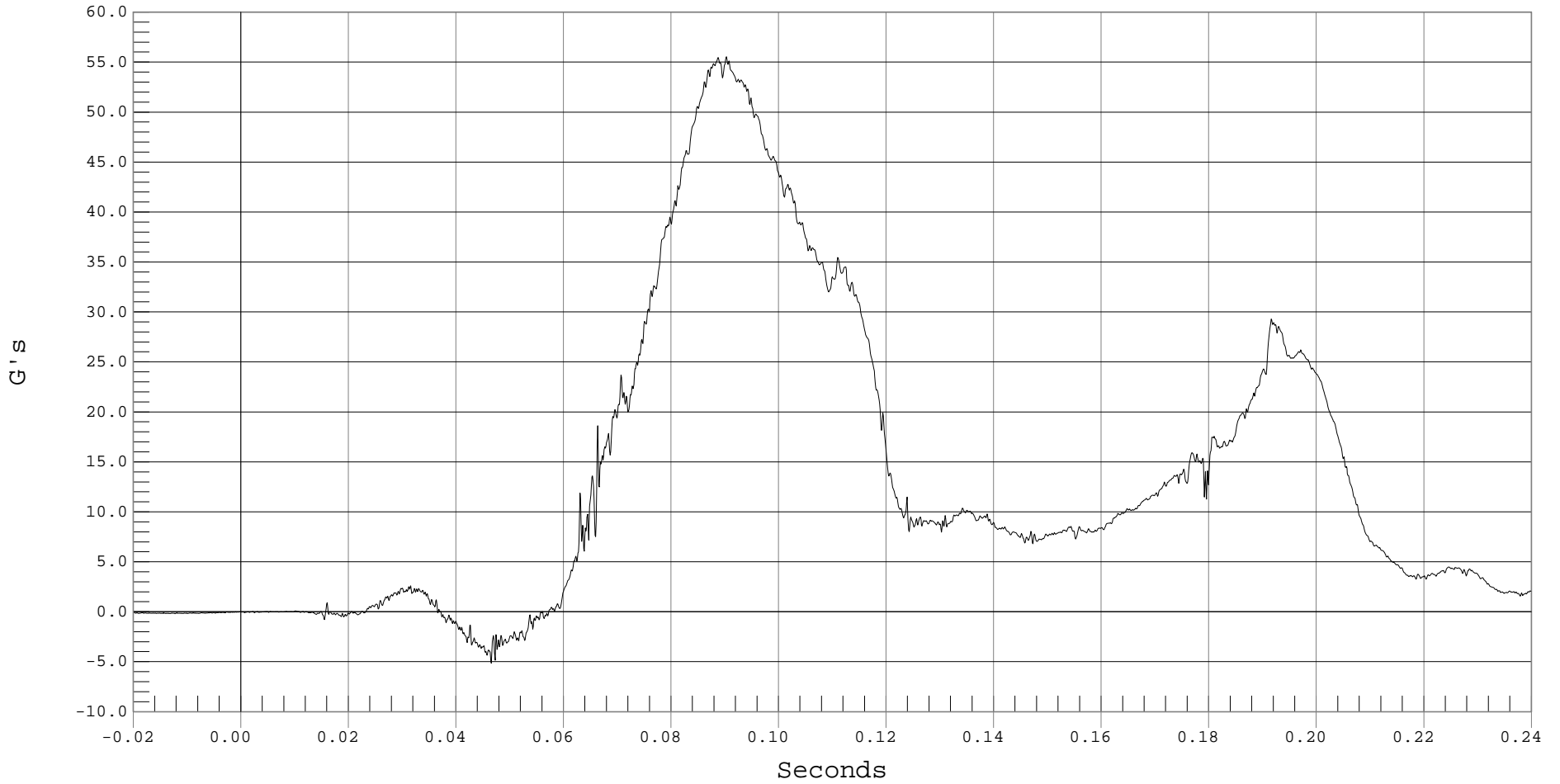
RRS 3 YR OLD HEAD Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD HEAD Z, B01025AT.A39

Ymin = -5.15 G's @ 0.0465 Seconds, Ymax = 55.53 G's @ 0.0902 Seconds





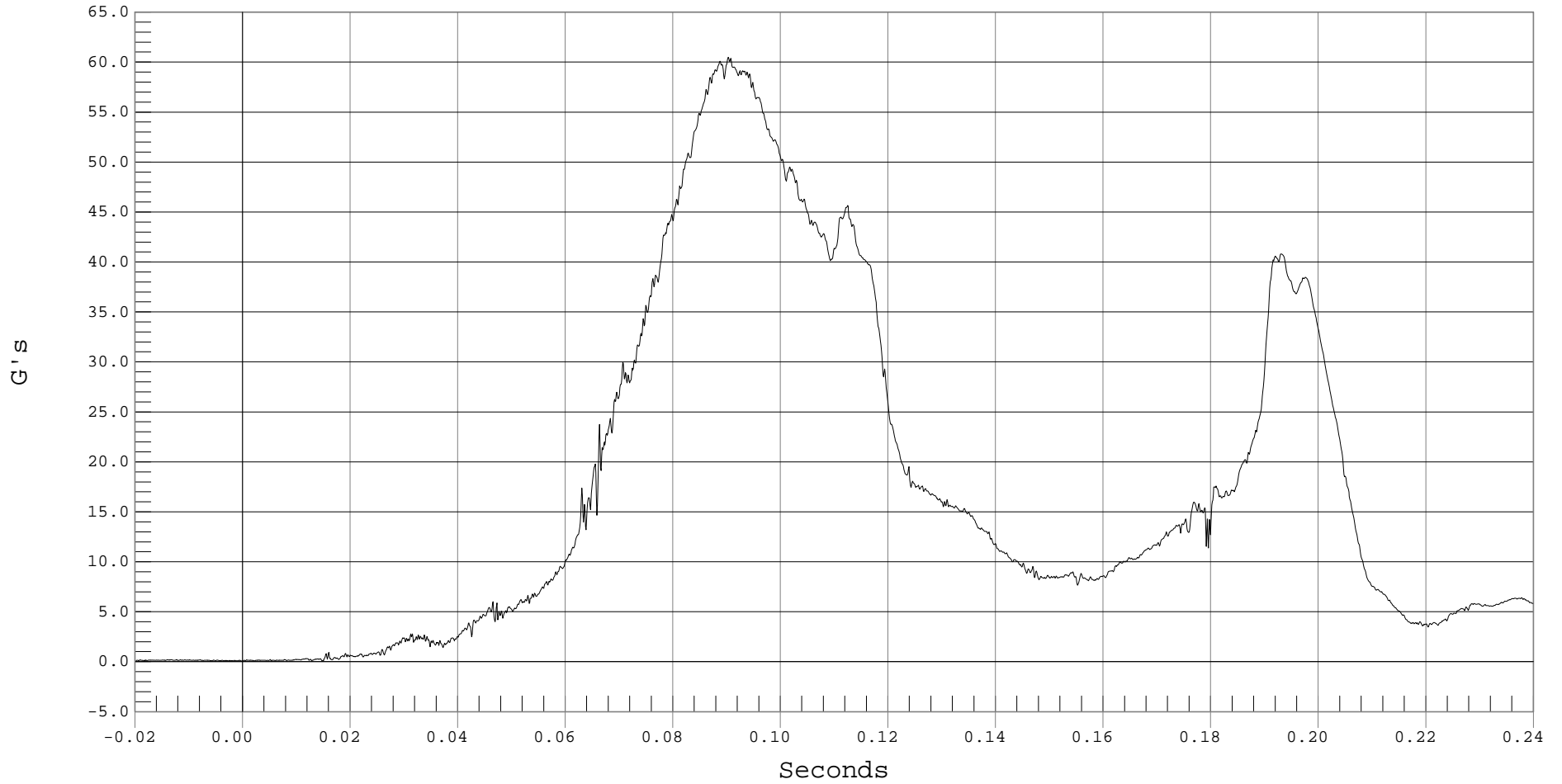
RRS 3 YR OLD HEAD RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS 3 YR OLD HEAD RESULTANT ACCELERATION, B01025AV.A37

Ymin = .06 G's @ -0.0003 Seconds, Ymax = 60.5 G's @ 0.0902 Seconds



F-55



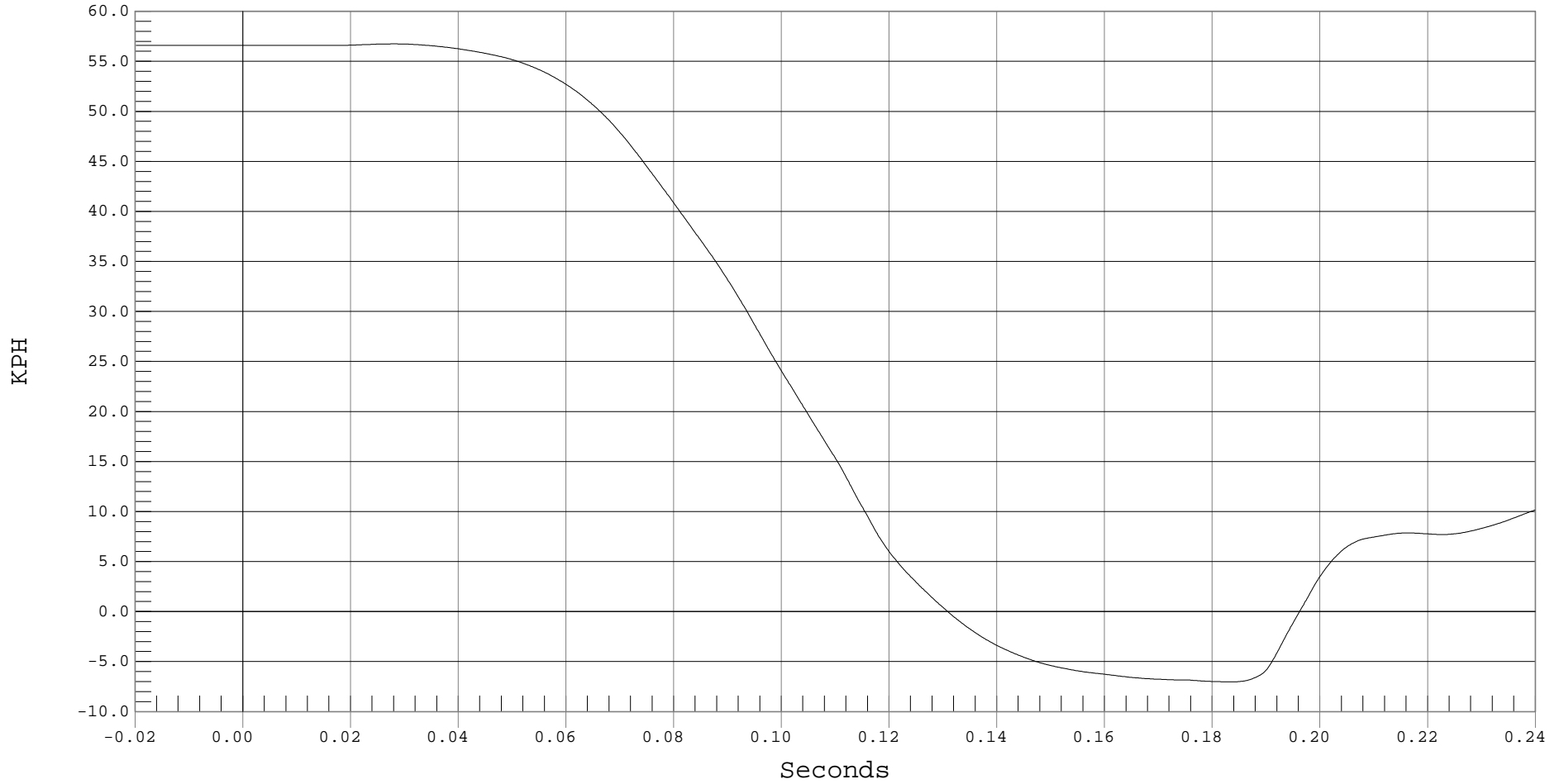
RRS 3 YR OLD HEAD X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RRS 3 YR OLD HEAD X VELOCITY, B01025AI.V37

Ymin = -7.02 KPH @ 0.1837 Seconds, Ymax = 56.75 KPH @ 0.0280 Seconds





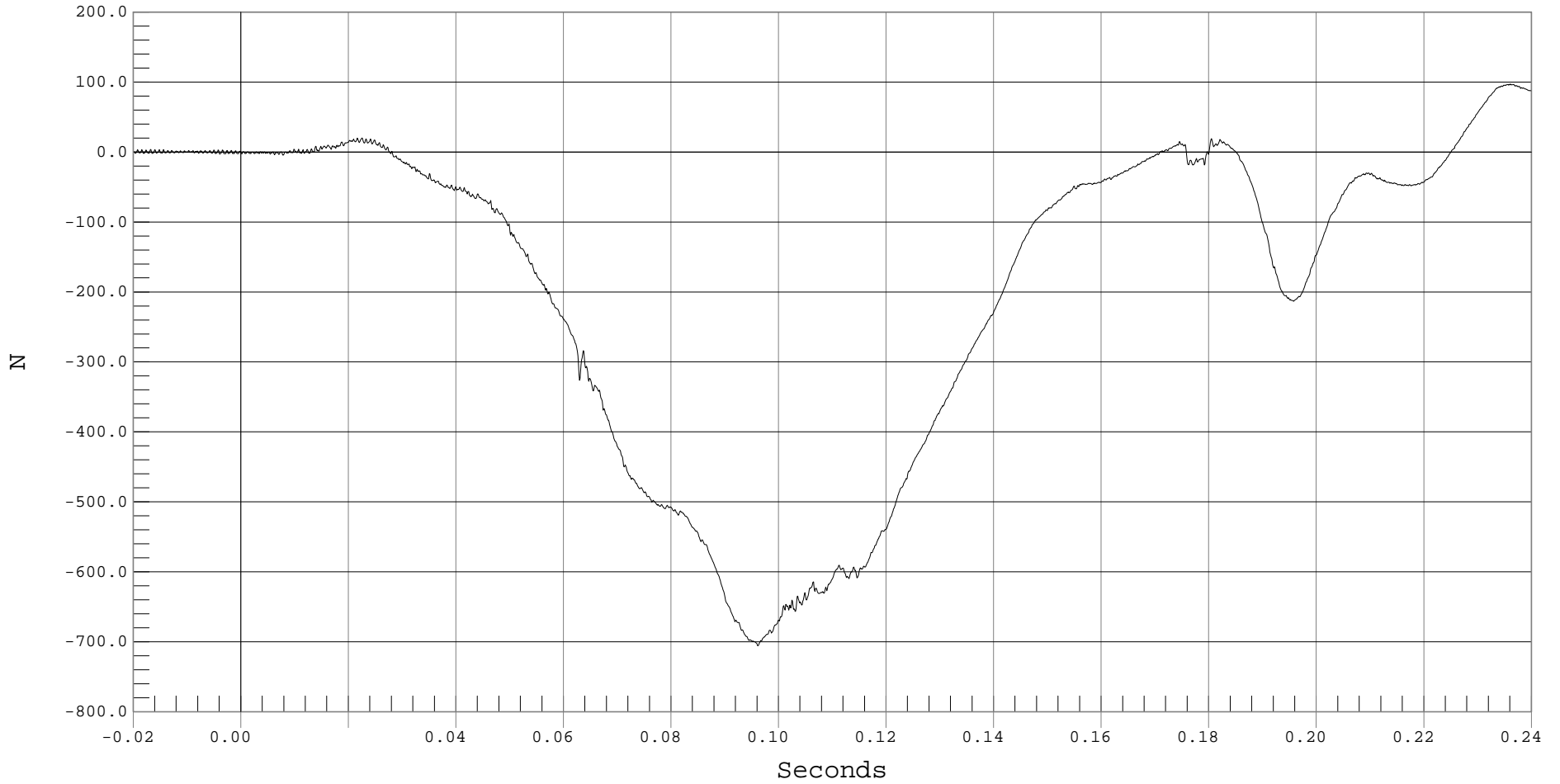
RRS 3 YR OLD UPPER NECK FORCE X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD UPPER NECK FORCE X, B01025FT.F40

Ymin = -705.79 N @ 0.0961 Seconds, Ymax = 97.39 N @ 0.2360 Seconds



F-57

RRS 3 YEAR OLD UPPER NECK FORCE Y VS. TIME
NO VALID DATA COLLECTED

RRS 3 YEAR OLD UPPER NECK FORCE Z VS. TIME
NO VALID DATA COLLECTED



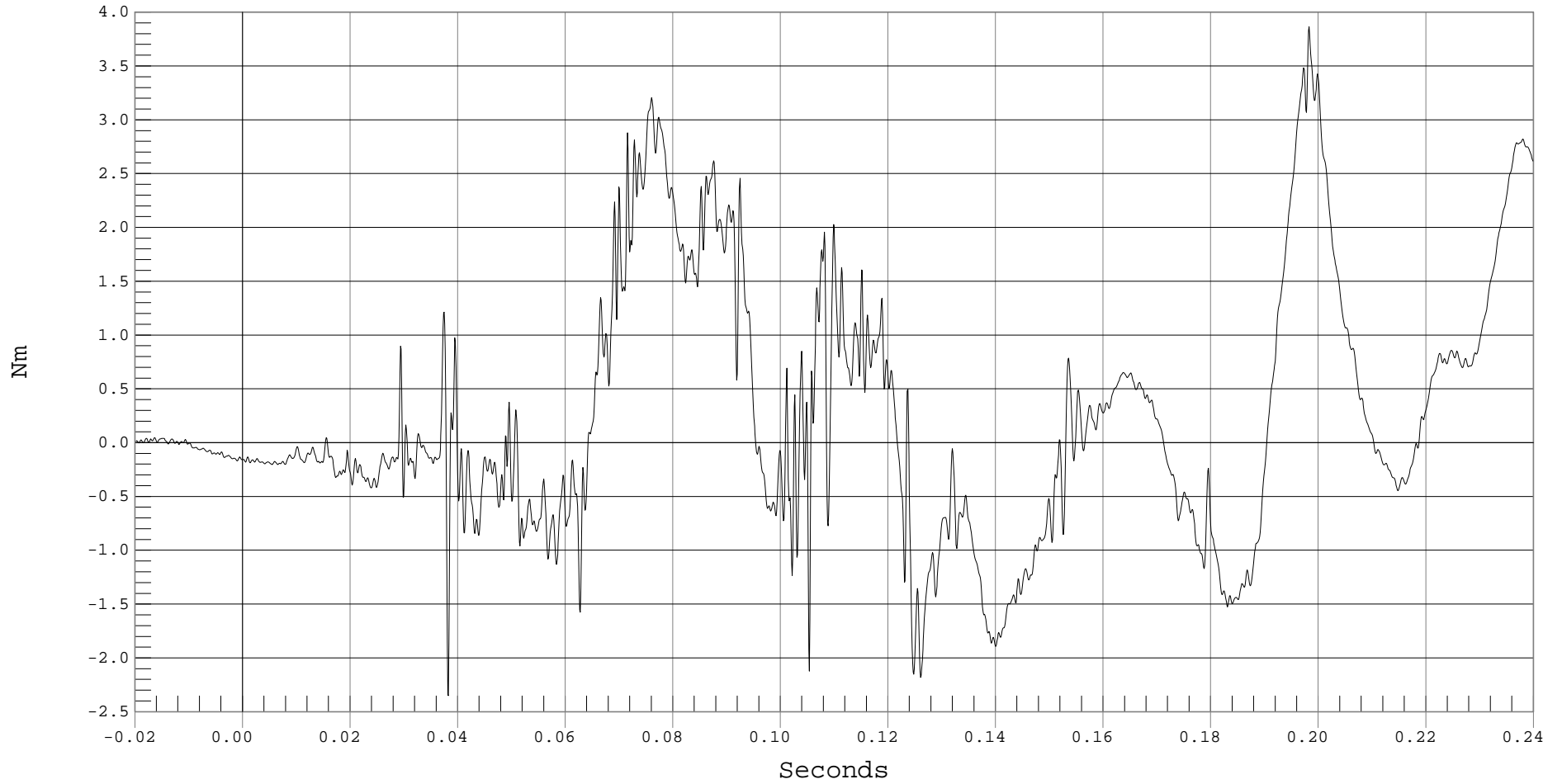
RRS 3 YR OLD UPPER NECK MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 RRS CHILD UPPER NECK MOMENT X, B01025MF.M43

Ymin = -2.35 Nm @ 0.0382 Seconds, Ymax = 3.86 Nm @ 0.1982 Seconds



F-60



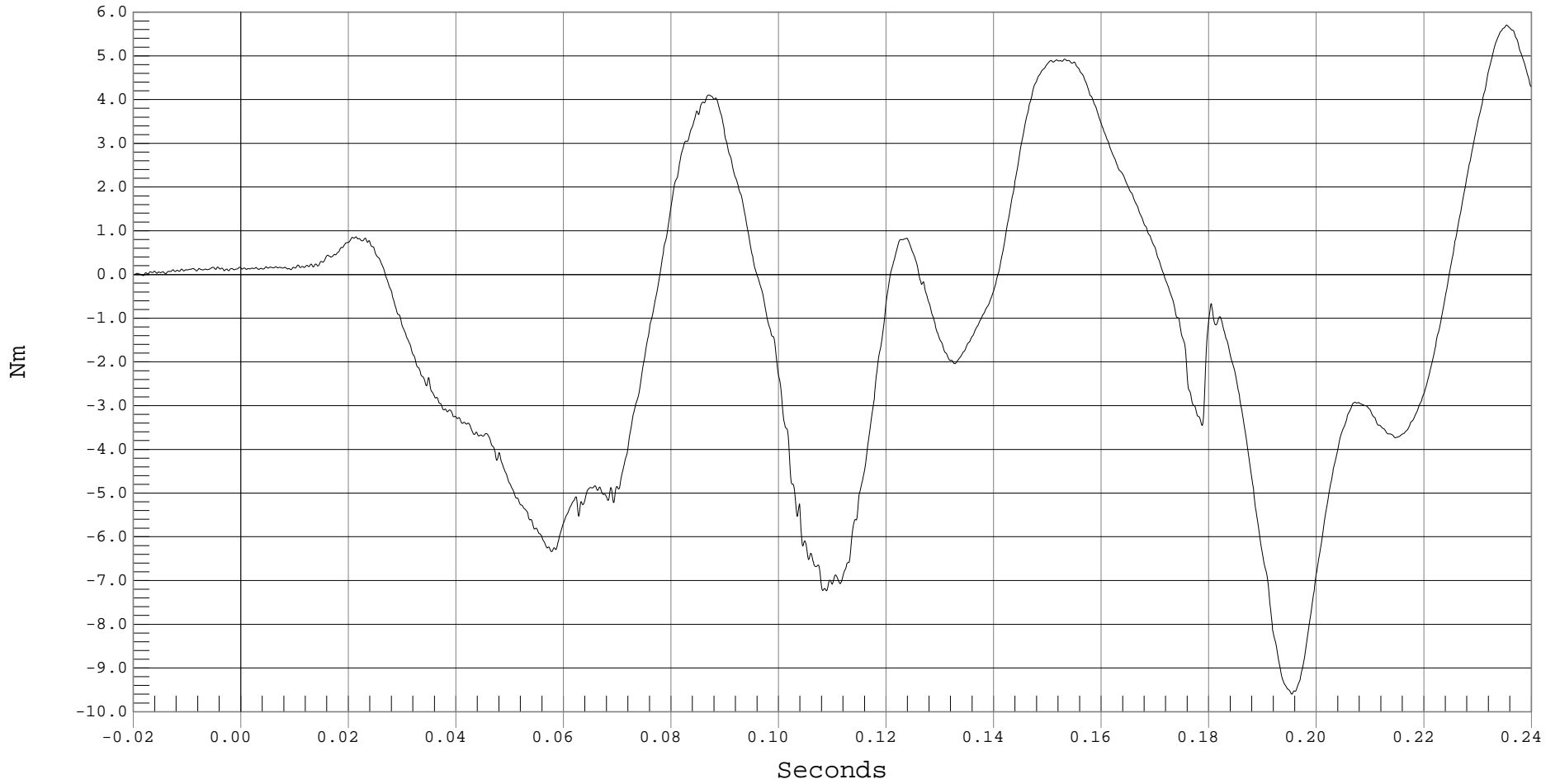
RRS 3 YR OLD UPPER NECK MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 RRS CHILD UPPER NECK MOMENT Y, B01025MF.M44

Ymin = -9.6 Nm @ 0.1953 Seconds, Ymax = 5.7 Nm @ 0.2353 Seconds



F-61



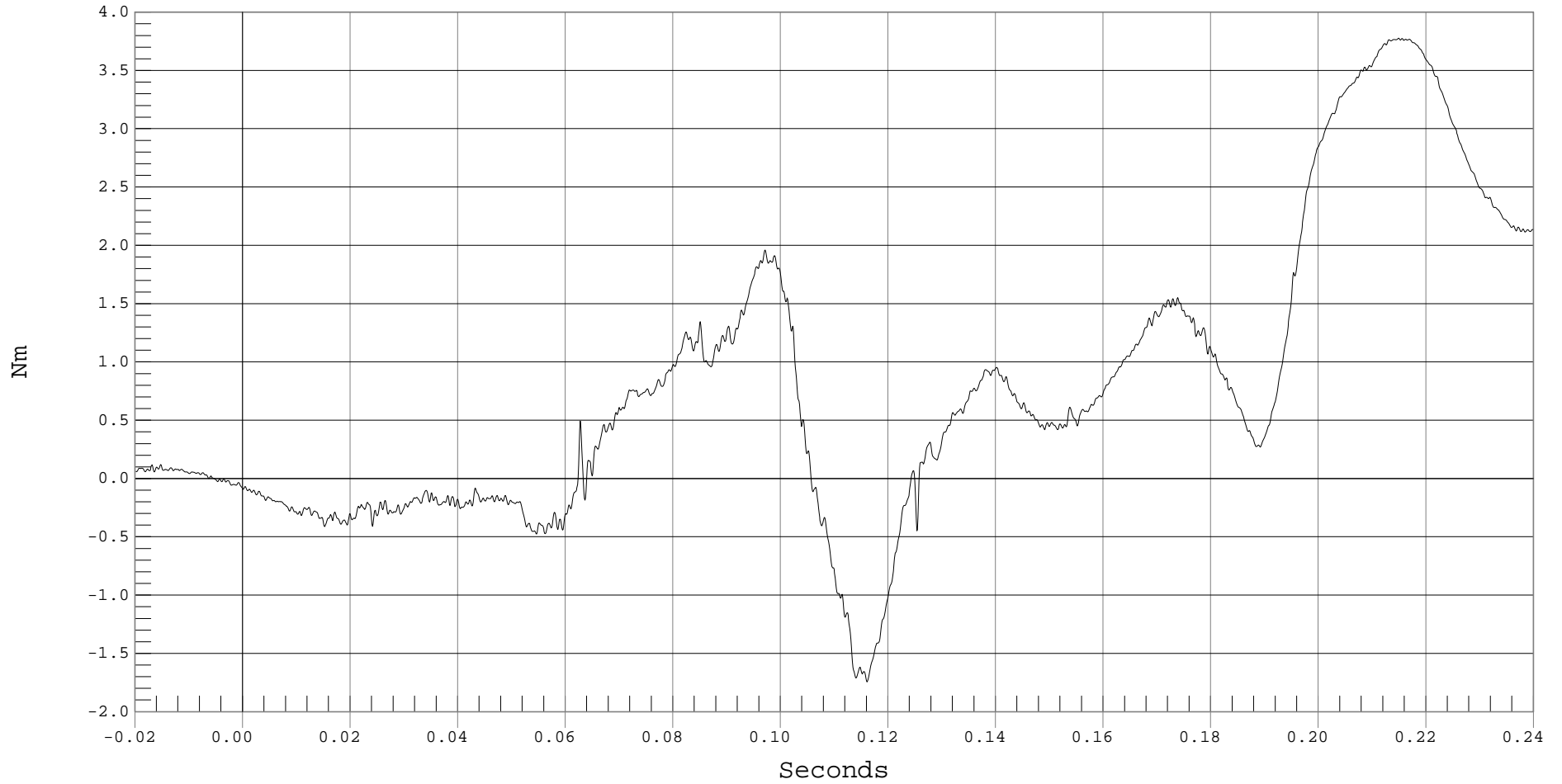
RRS 3 YR OLD UPPER NECK MOMENT Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 RRS CHILD UPPER NECK MOMENT Z, B01025MF.M63

Ymin = -1.74 Nm @ 0.1160 Seconds, Ymax = 3.78 Nm @ 0.2148 Seconds



F-62



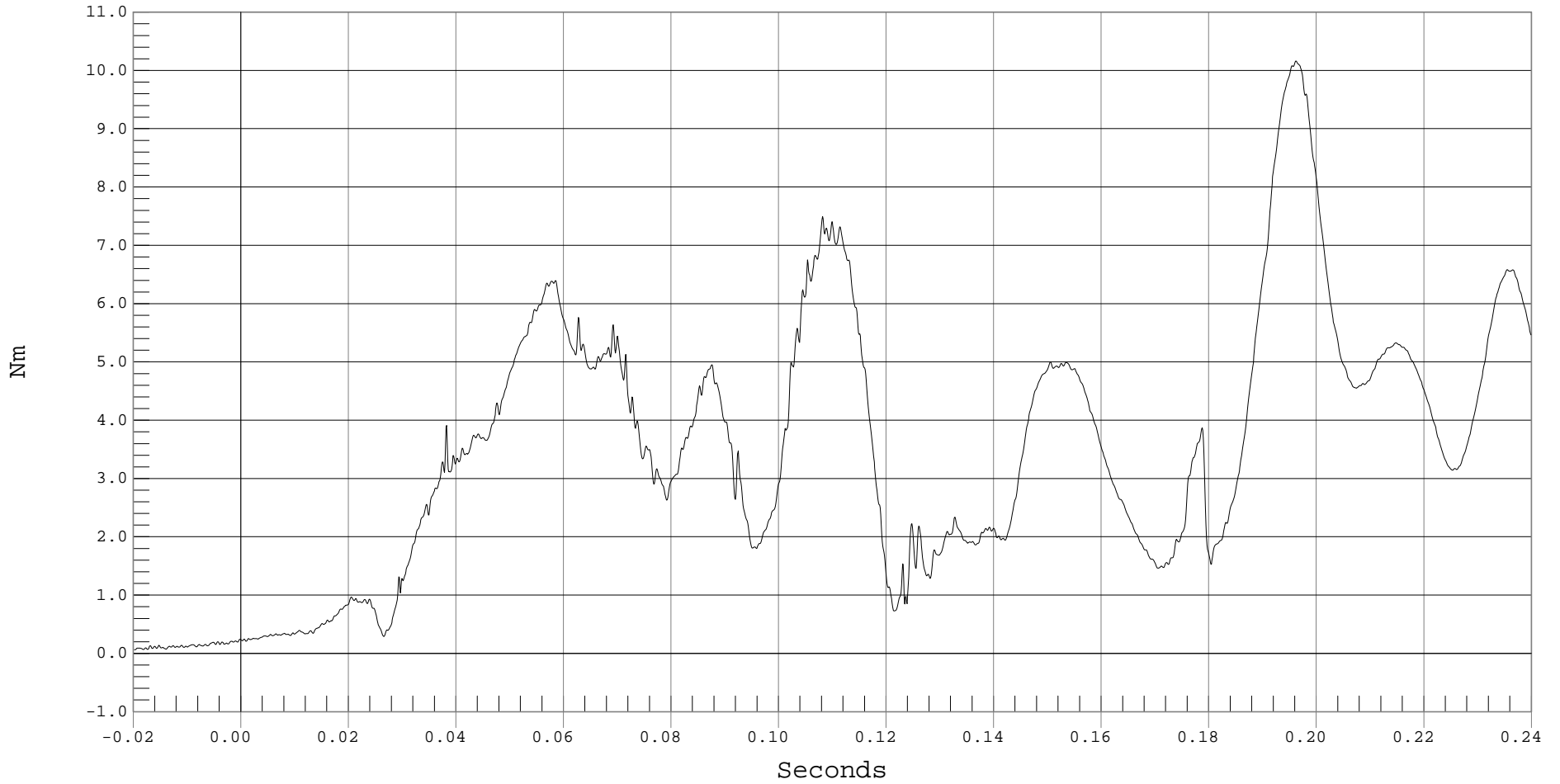
RRS 3 YR OLD UPPER NECK MOMENT RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 RRS 3 YR OLD UPPER NECK MOMENT RESULTANT, B01025MV.M43

Ymin = .06 Nm @ -0.0198 Seconds, Ymax = 10.16 Nm @ 0.1961 Seconds



F-63



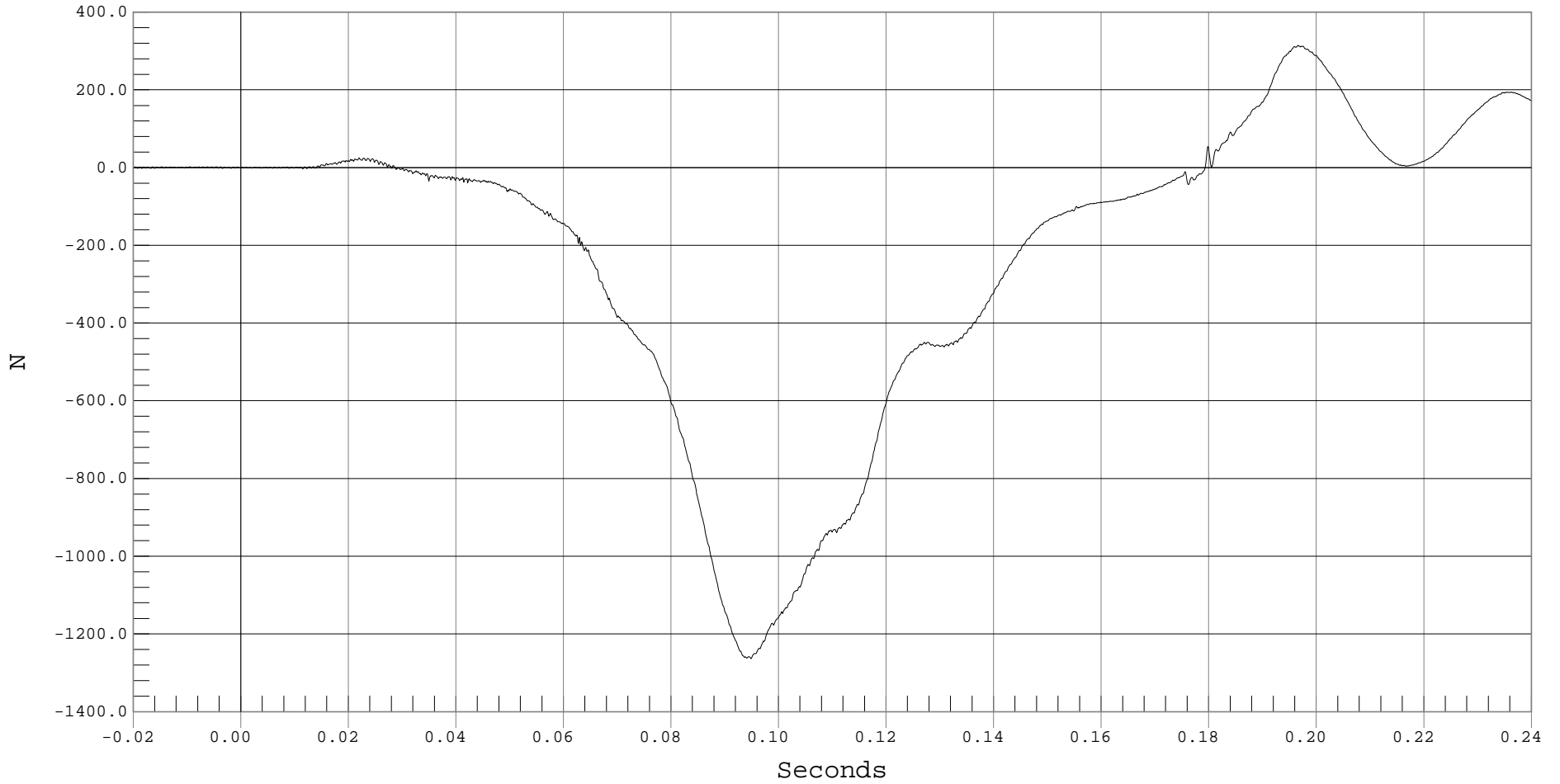
RRS 3 YR OLD LOWER NECK FORCE X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD LOWER NECK FORCE X, B01025FT.F46

Ymin = -1263.68 N @ 0.0948 Seconds, Ymax = 314.52 N @ 0.1965 Seconds



F-64



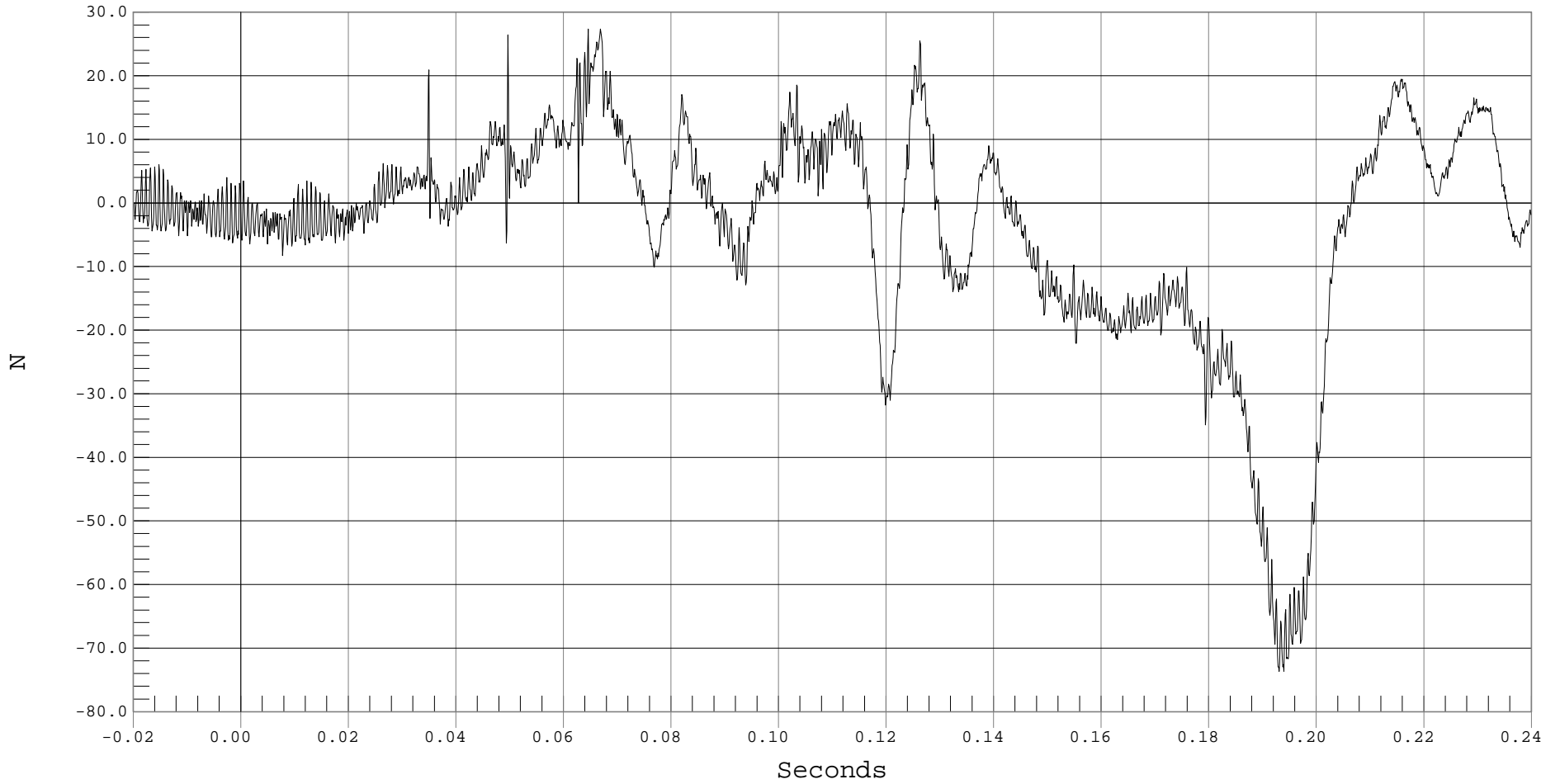
RRS 3 YR OLD LOWER NECK FORCE Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD LOWER NECK FORCE Y, B01025FT.F47

Ymin = -73.67 N @ 0.1930 Seconds, Ymax = 27.34 N @ 0.0645 Seconds



F-65



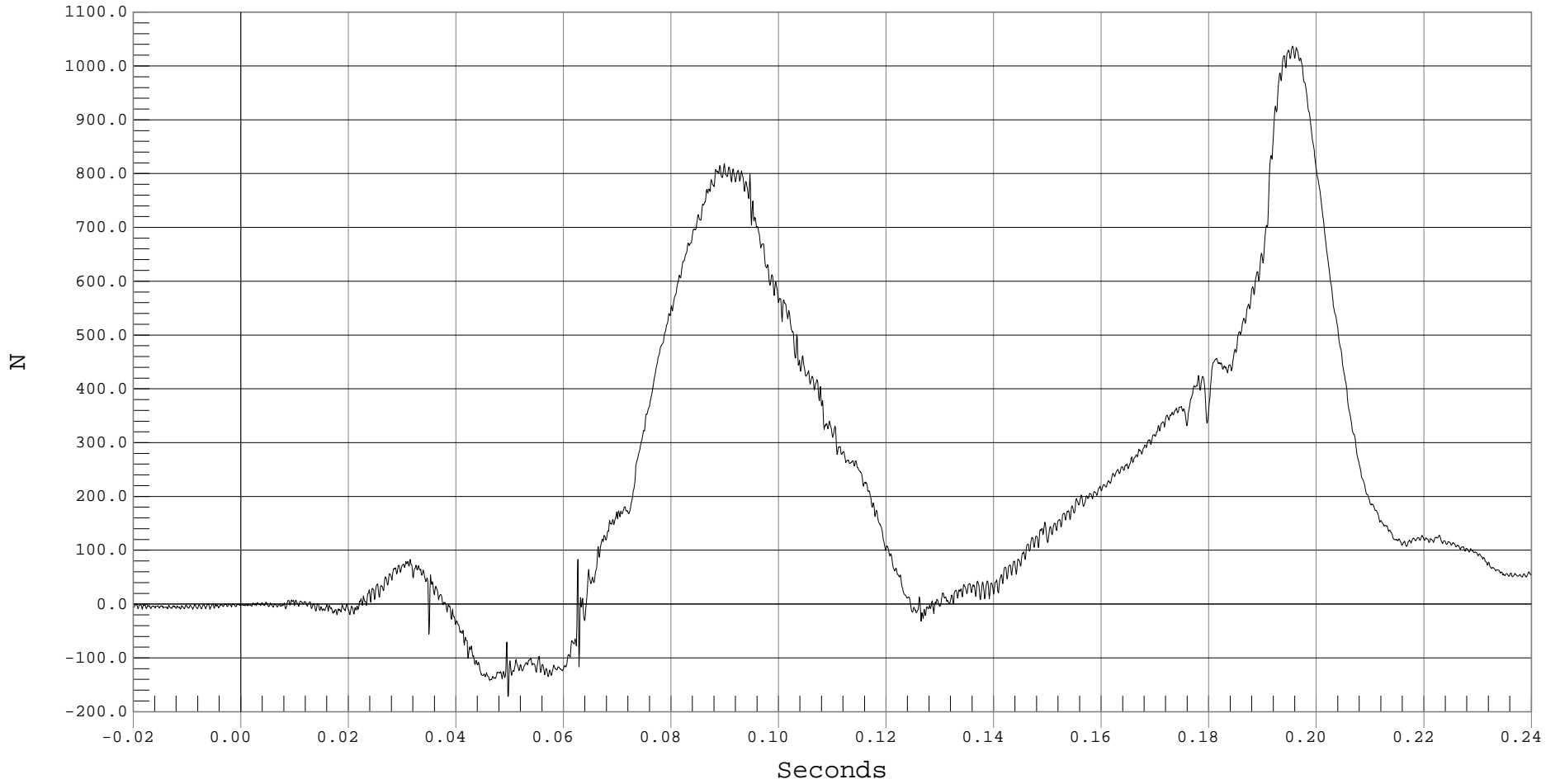
RRS 3 YR OLD LOWER NECK FORCE Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD LOWER NECK FORCE Z, B01025FT.F48

Ymin = -171.93 N @ 0.0496 Seconds, Ymax = 1036.59 N @ 0.1955 Seconds



F-66



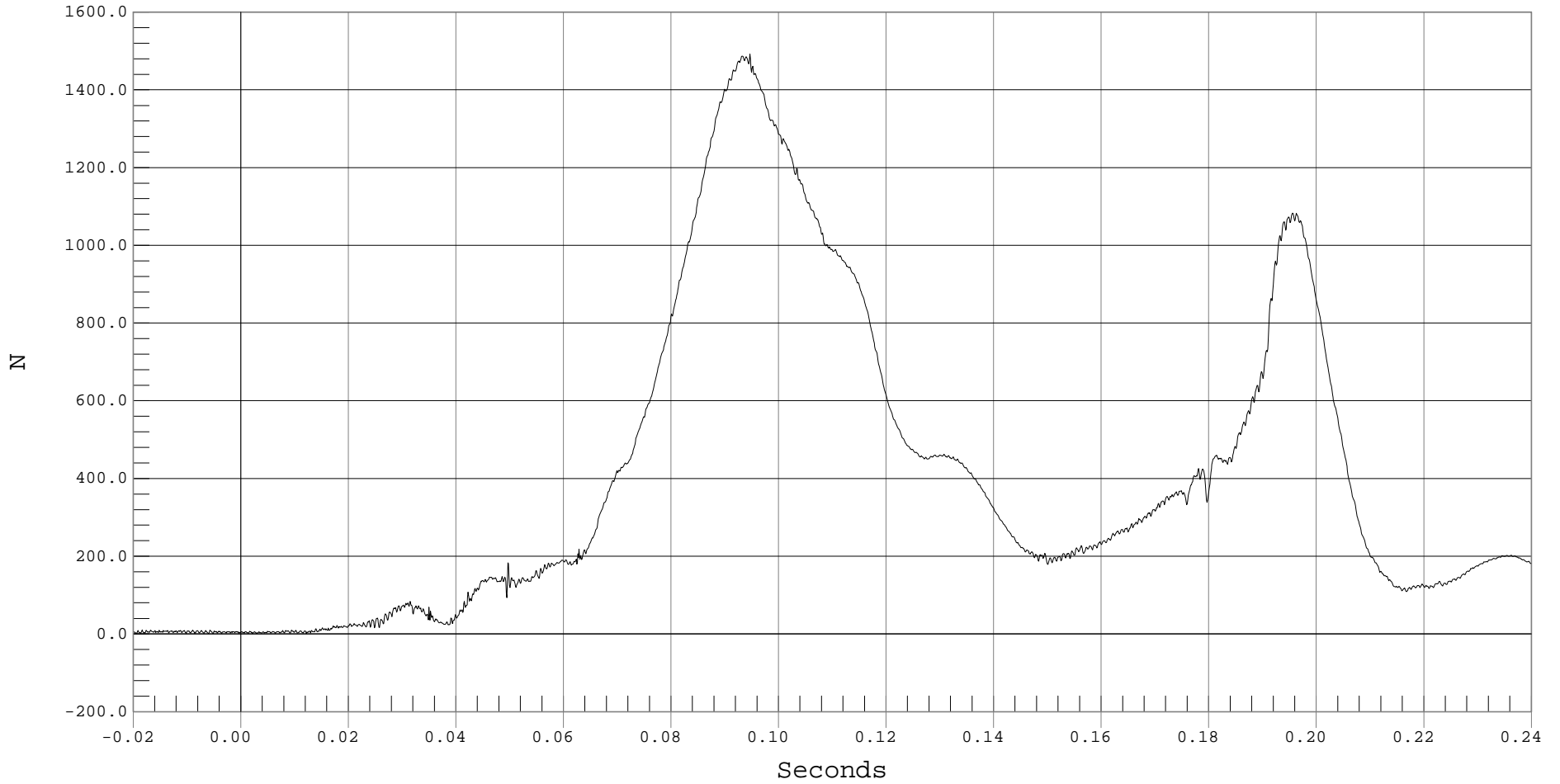
RRS 3 YR OLD LOWER NECK FORCE RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS 3 YR OLD LOWER NECK FORCE RESULTANT, B01025FV.F46

Ymin = .72 N @ 0.0021 Seconds, Ymax = 1492.54 N @ 0.0946 Seconds



F-67



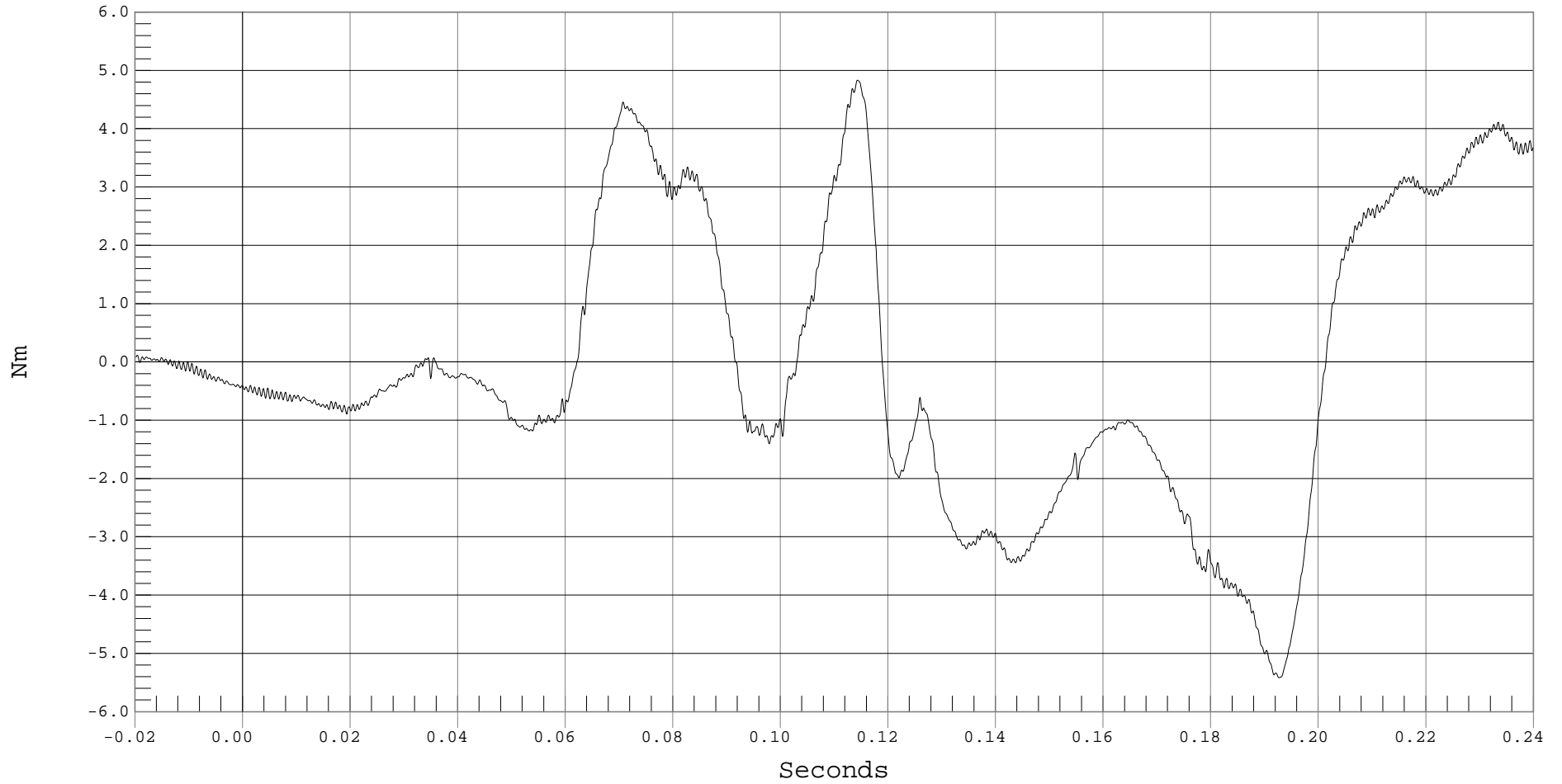
RRS 3 YR OLD LOWER NECK MOMENT X

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 RRS CHILD LOWER NECK MOMENT X, B01025MF.M49

Ymin = -5.42 Nm @ 0.1926 Seconds, Ymax = 4.83 Nm @ 0.1142 Seconds





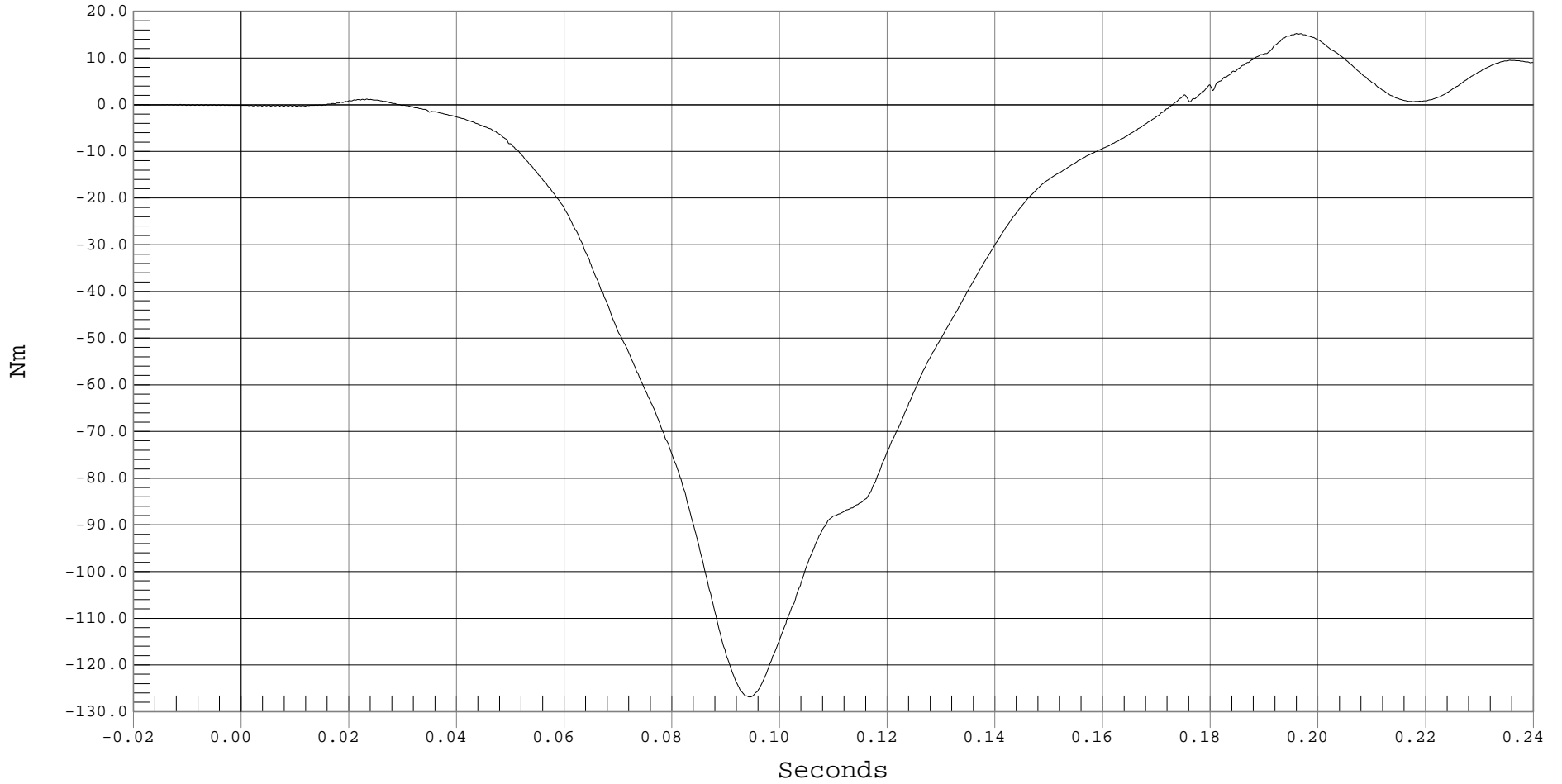
RRS 3 YR OLD LOWER NECK MOMENT Y

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 RRS CHILD LOWER NECK MOMENT Y, B01025MF.M50

Ymin = -126.87 Nm @ 0.0944 Seconds, Ymax = 15.23 Nm @ 0.1959 Seconds



F-69



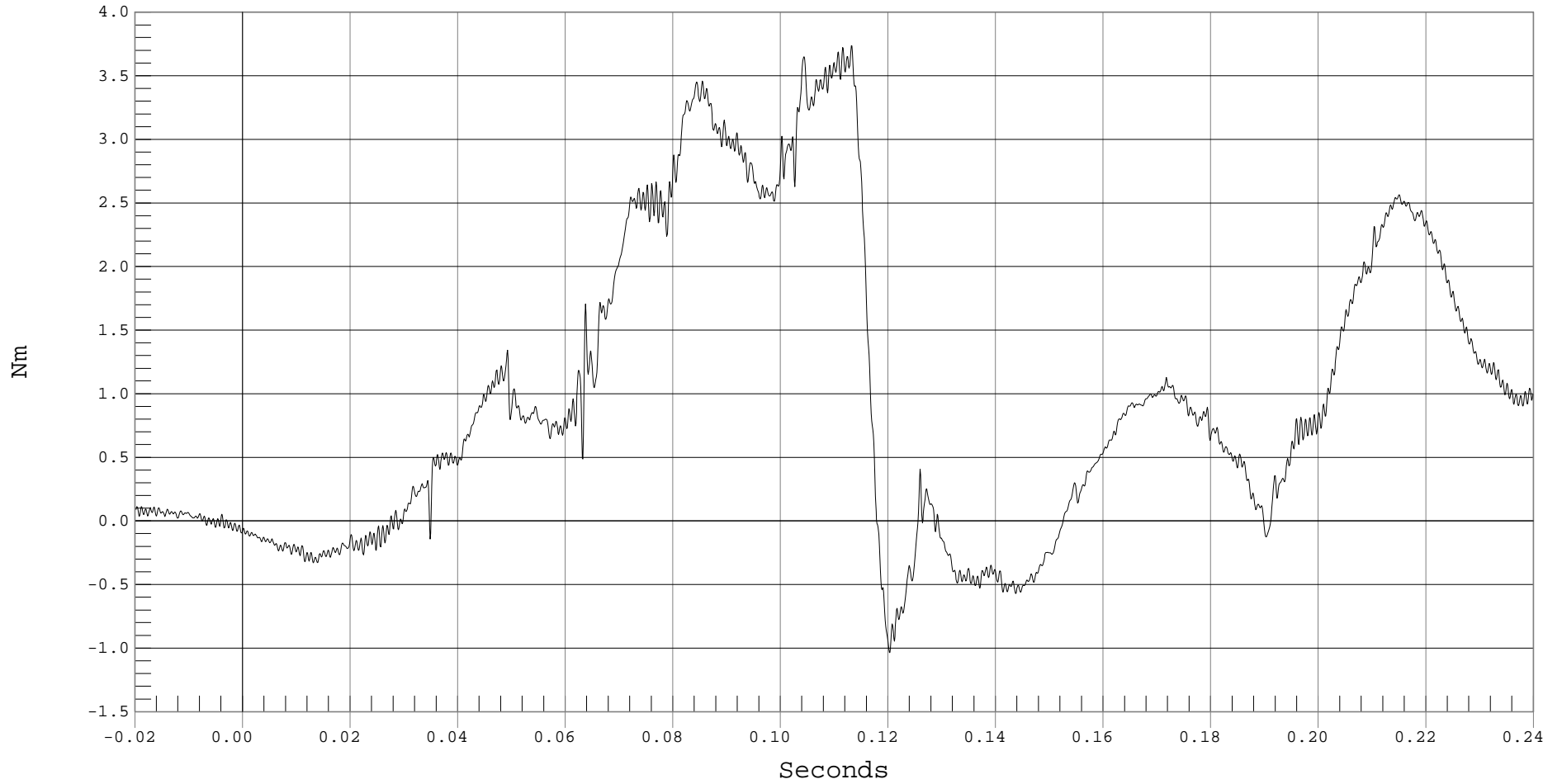
RRS 3 YR OLD LOWER NECK MOMENT Z

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 RRS CHILD LOWER NECK MOMENT Z, B01025MF.M51

Ymin = -1.03 Nm @ 0.1202 Seconds, Ymax = 3.74 Nm @ 0.1131 Seconds



F-70



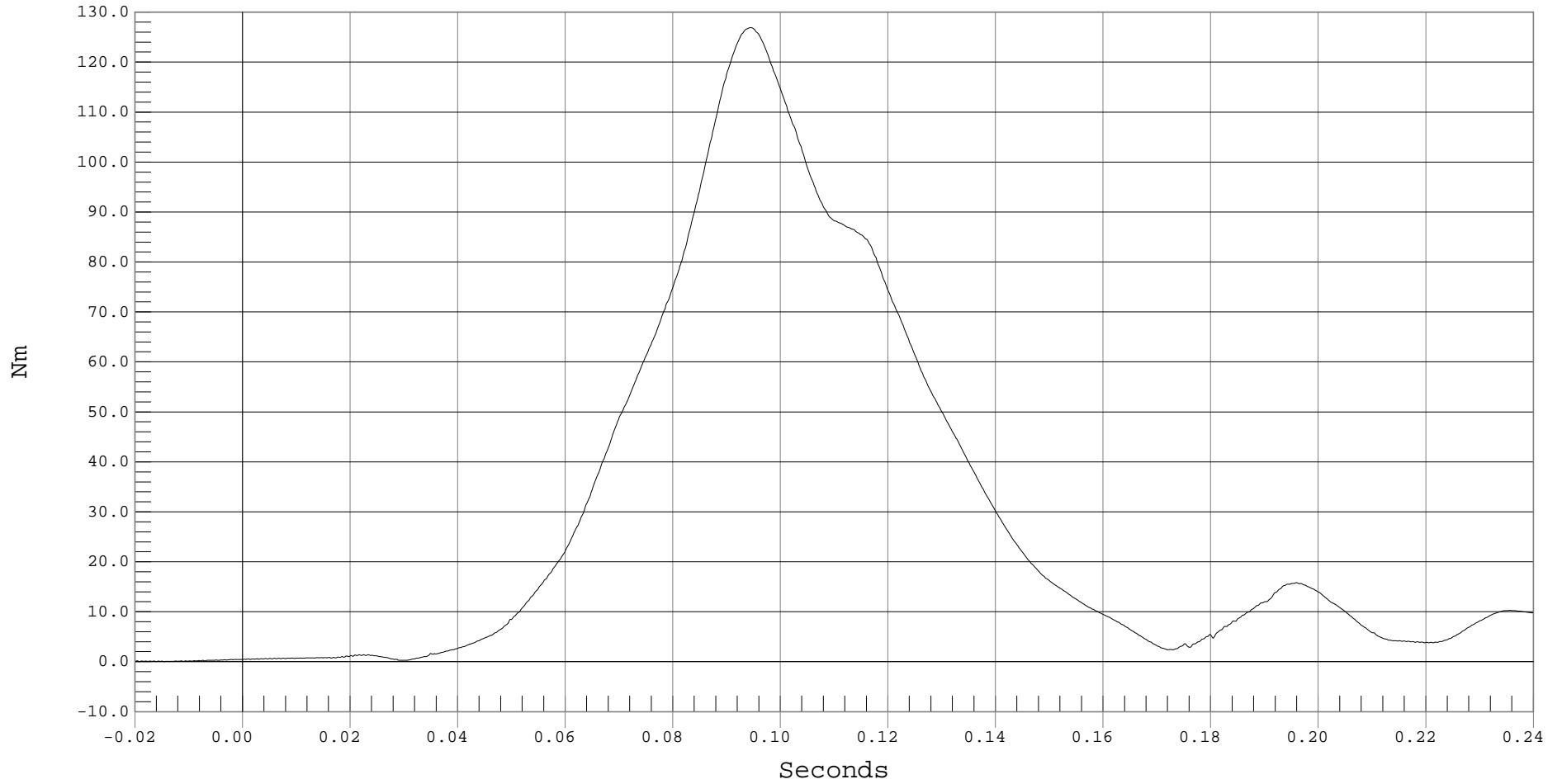
RRS 3 YR OLD LOWER NECK MOMENT RESULTANT

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 RRS 3 YR OLD LOWER NECK MOMENT RESULTANT, B01025MV.M49

Ymin = .05 Nm @ -0.0193 Seconds, Ymax = 126.9 Nm @ 0.0944 Seconds



F-71



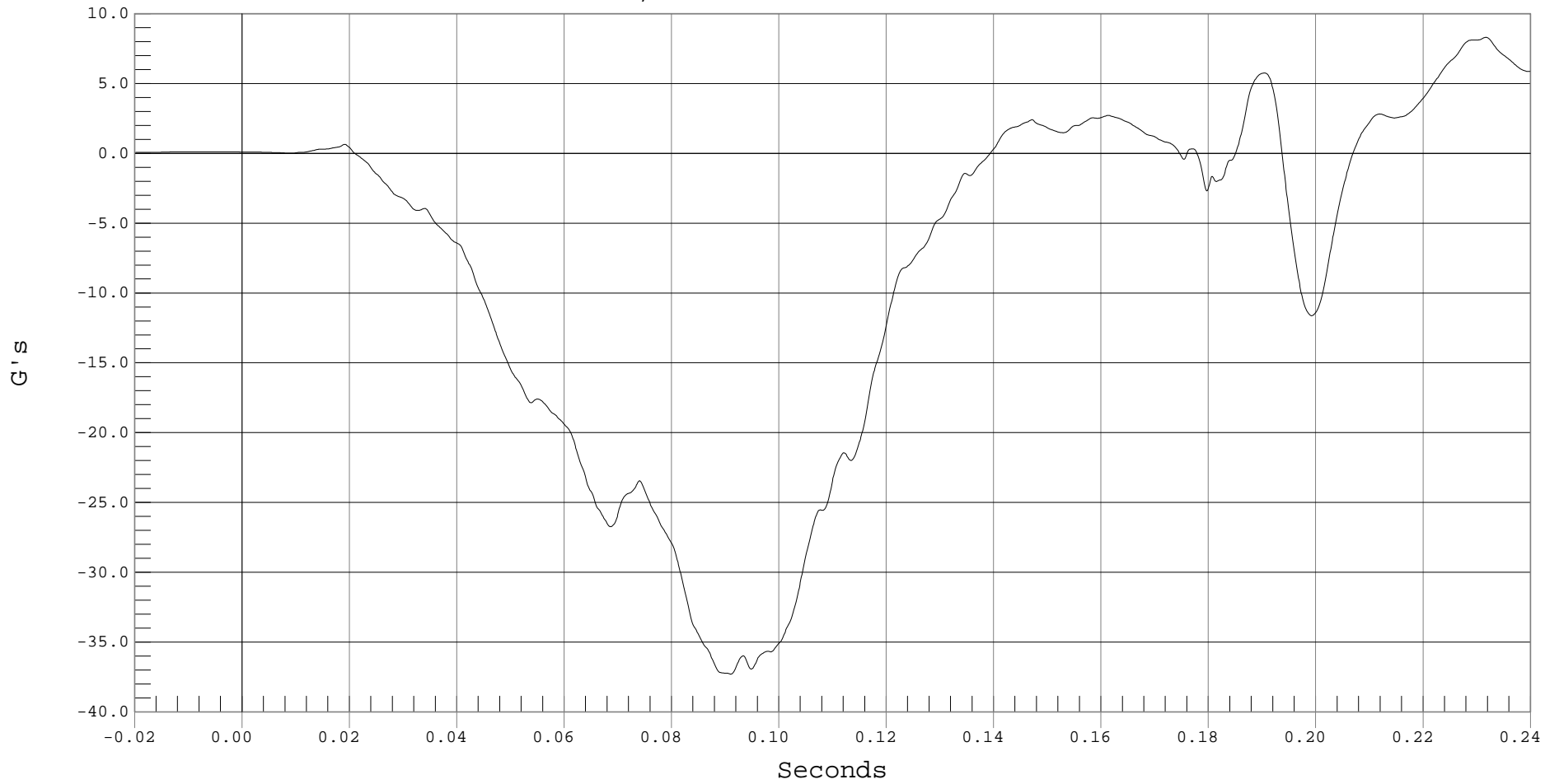
RRS 3 YR OLD CHEST X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RRS CHILD CHEST X, B01025AF.A52

Ymin = -37.3 G's @ 0.0909 Seconds, Ymax = 8.31 G's @ 0.2316 Seconds



F-72



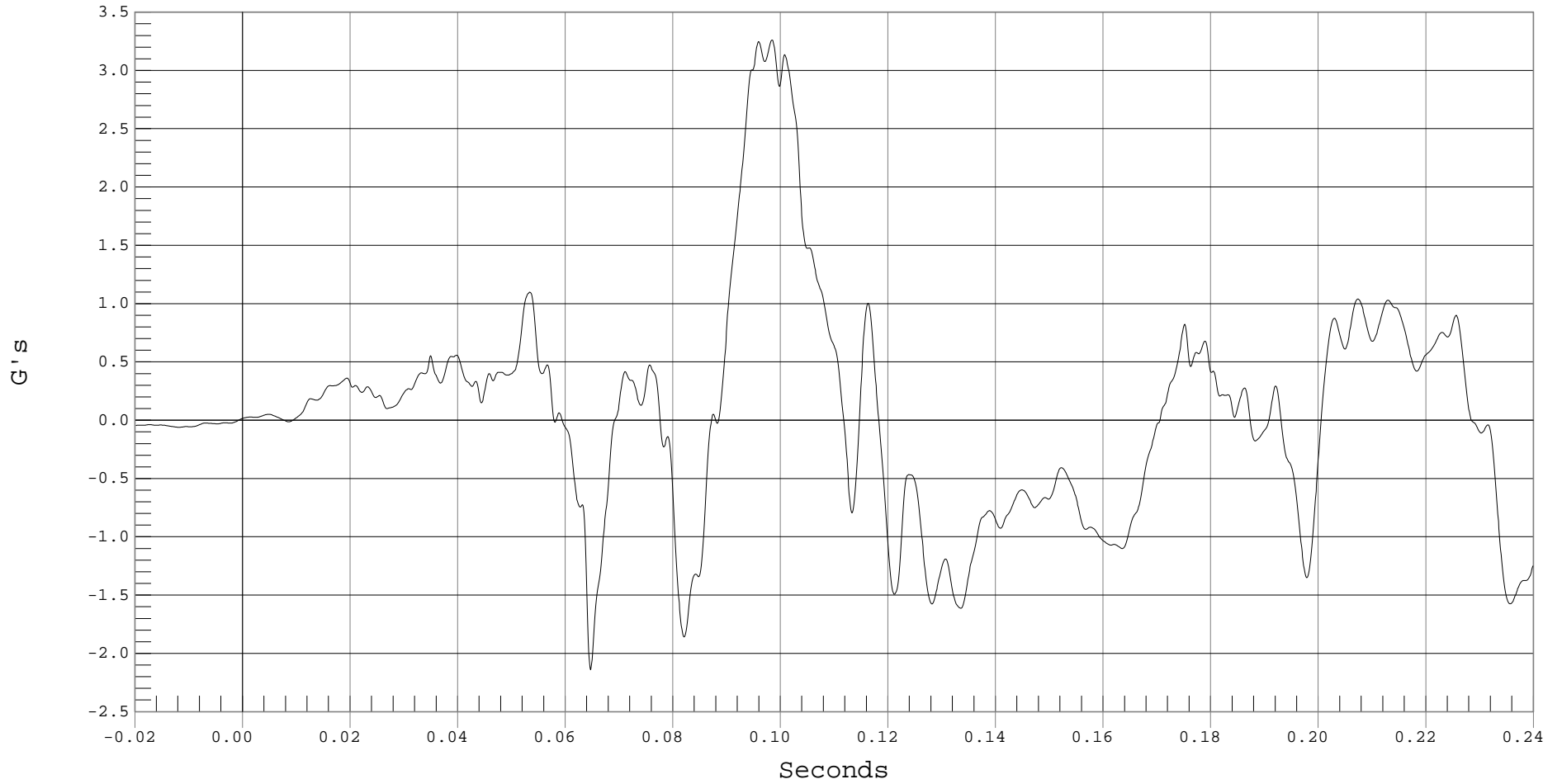
RRS 3 YR OLD CHEST Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RRS CHILD CHEST Y, B01025AF.A53

Ymin = -2.14 G's @ 0.0646 Seconds, Ymax = 3.26 G's @ 0.0984 Seconds



F-73



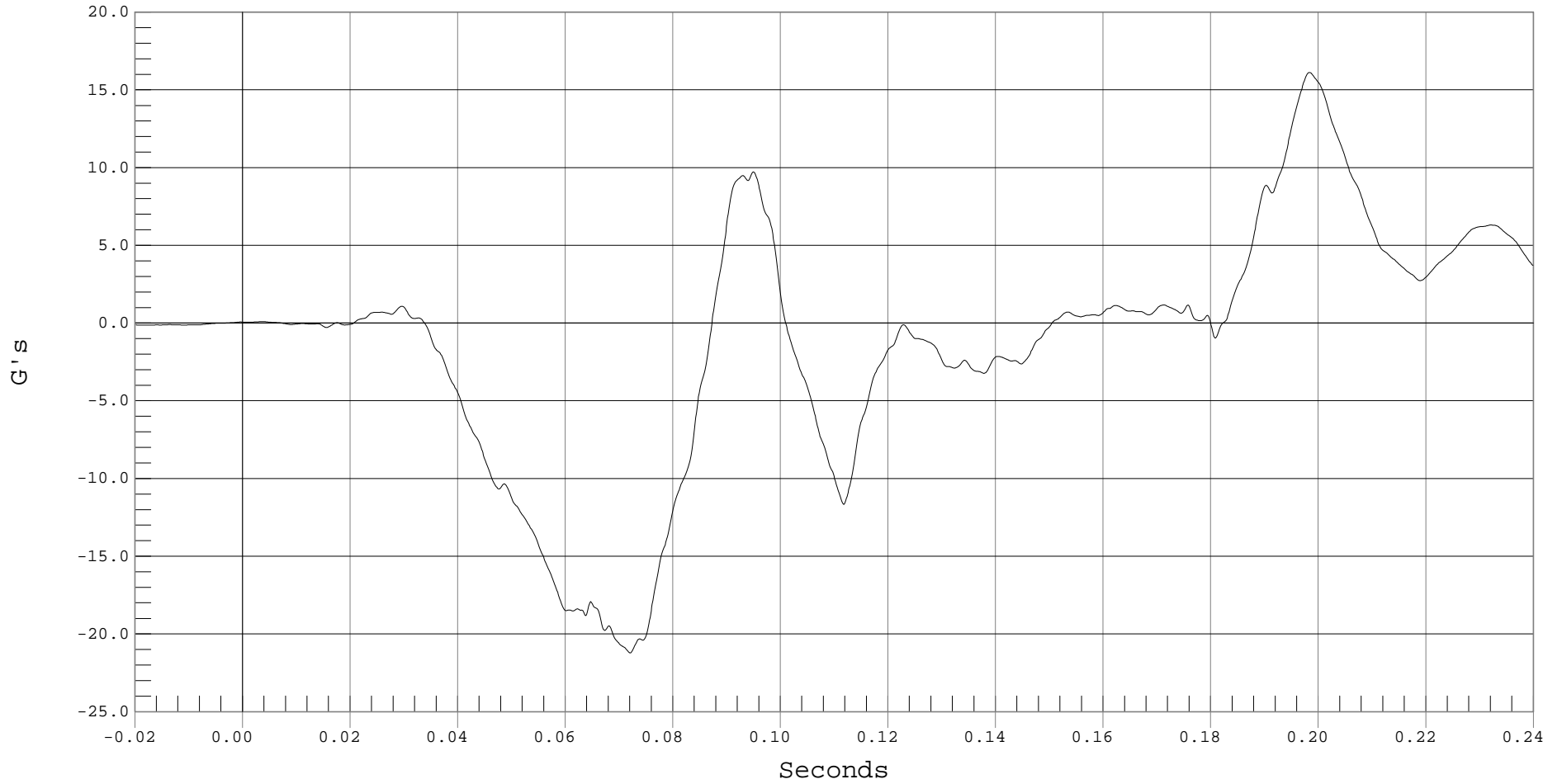
RRS 3 YR OLD CHEST Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RRS CHILD CHEST Z, B01025AF.A54

Ymin = -21.22 G's @ 0.0720 Seconds, Ymax = 16.12 G's @ 0.1983 Seconds





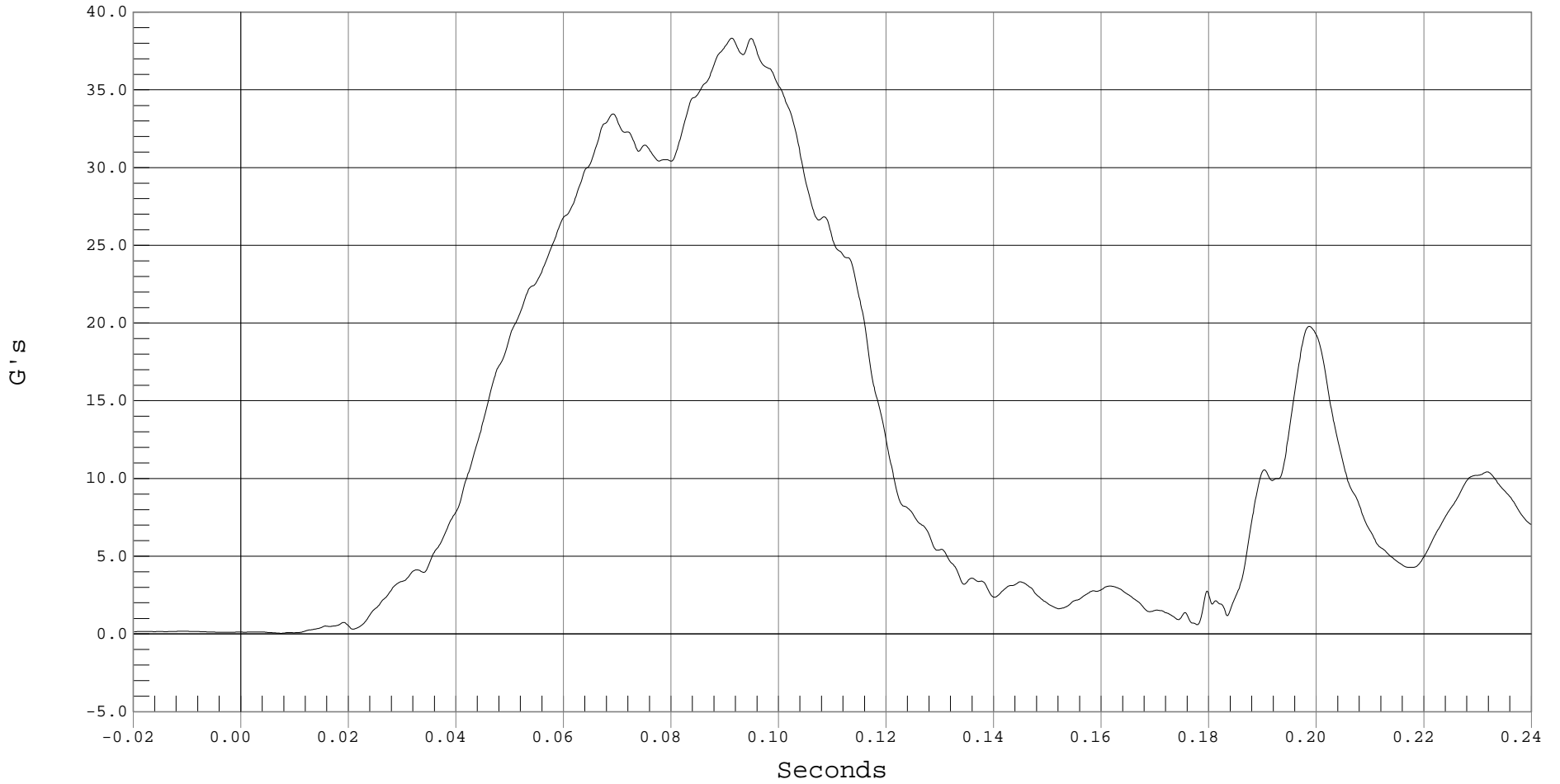
RRS 3 YR OLD CHEST RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RRS 3 YR OLD CHEST RESULTANT ACCELERATION, B01025AV.A52

Ymin = .04 G's @ 0.0074 Seconds, Ymax = 38.33 G's @ 0.0912 Seconds



F-75



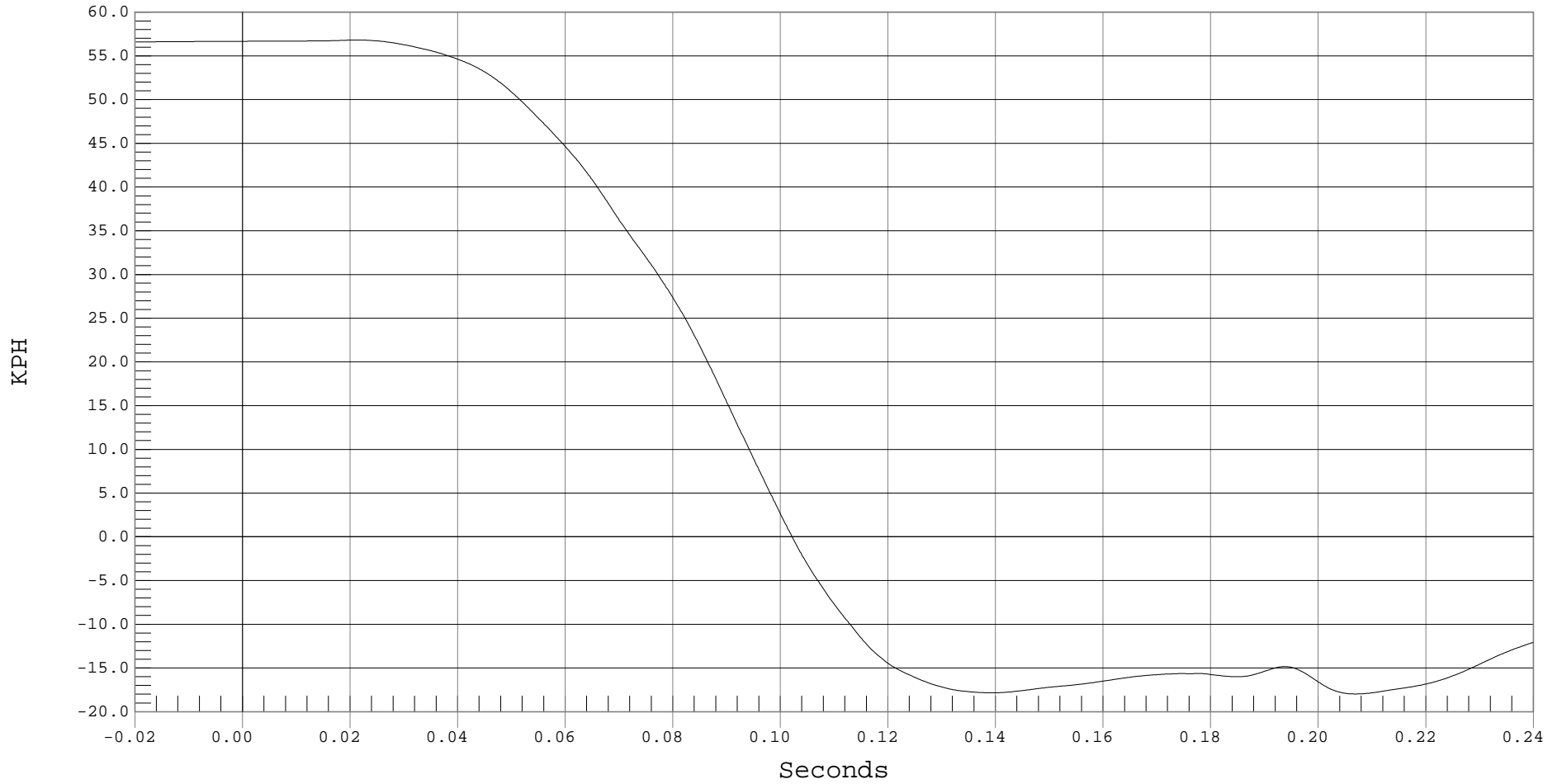
RRS 3 YR OLD CHEST X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RRS 3 YR OLD CHEST X VELOCITY, B01025AI.V52

Ymin = -17.98 KPH @ 0.2068 Seconds, Ymax = 56.81 KPH @ 0.0209 Seconds





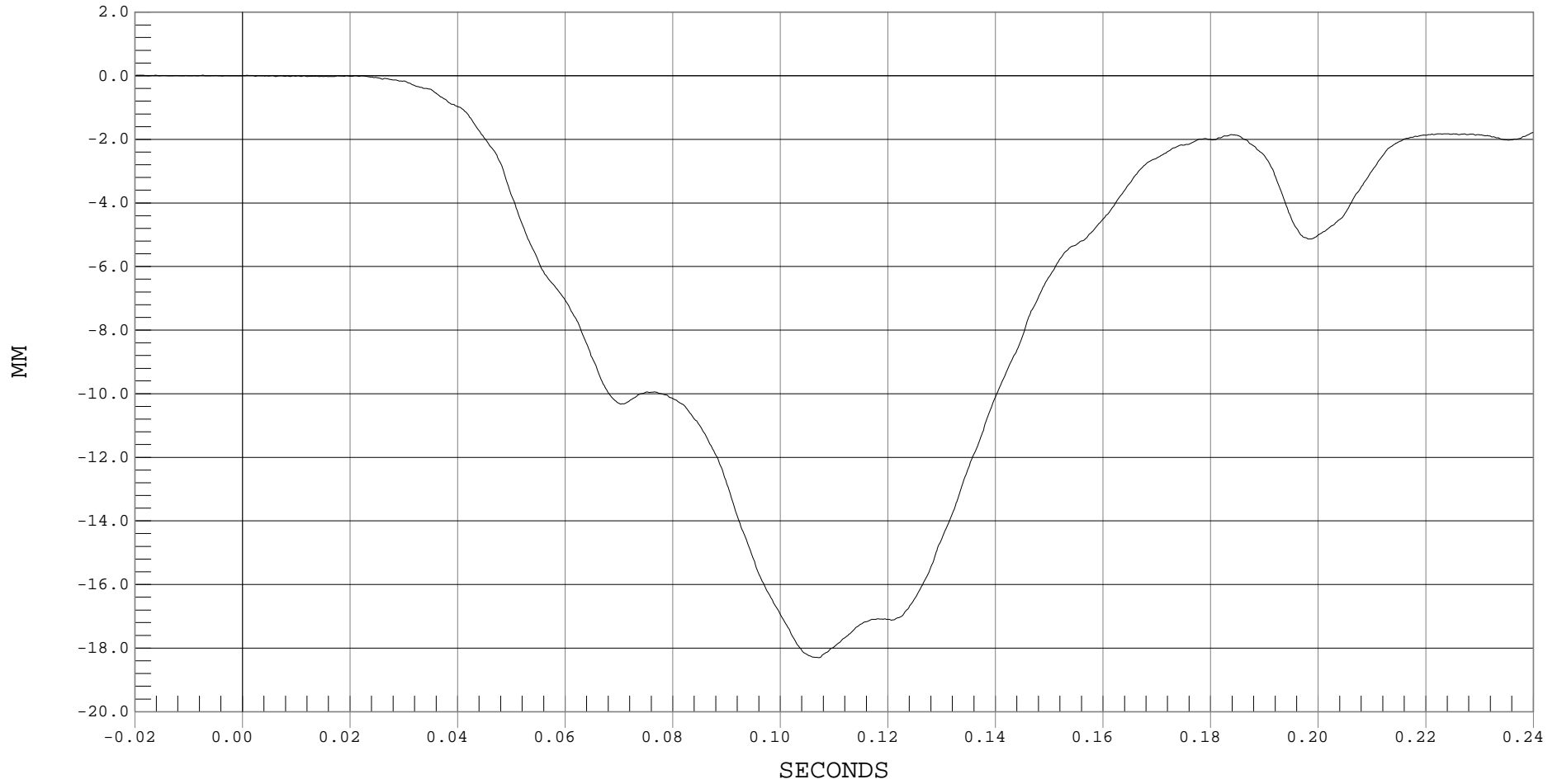
RRS 3 YR OLD CHEST COMPRESSION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 600

— 1 DISPLACEMENT, B01025DF.D55

Ymin = -18.3 MM @ 0.1071 SECONDS, Ymax = .02 MM @ -0.0187 SECONDS



F-77



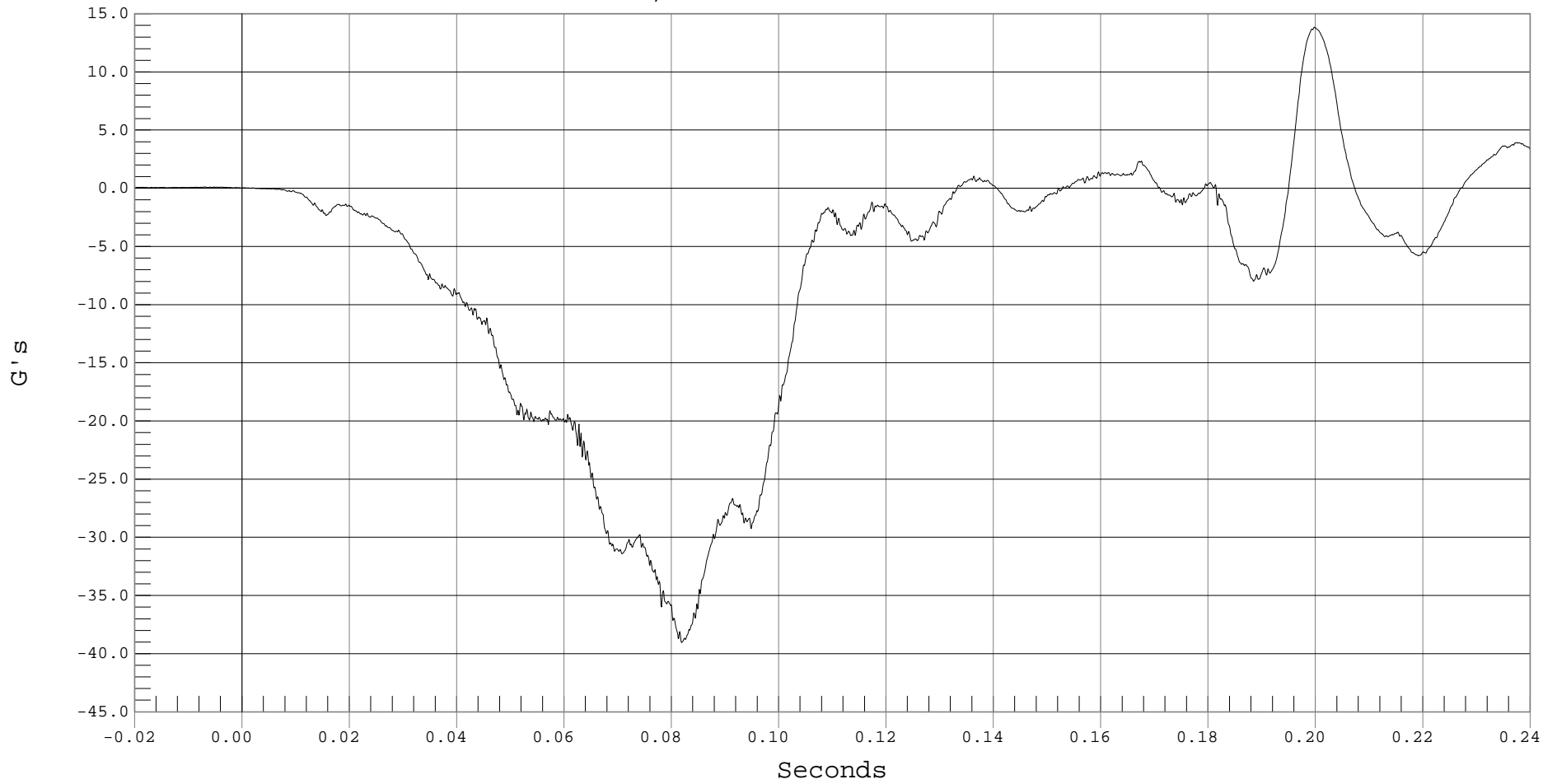
RRS 3 YR OLD PELVIS X ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD PELVIS X, B01025AT.A56

Ymin = -39.05 G's @ 0.0818 Seconds, Ymax = 13.85 G's @ 0.1997 Seconds



F-78



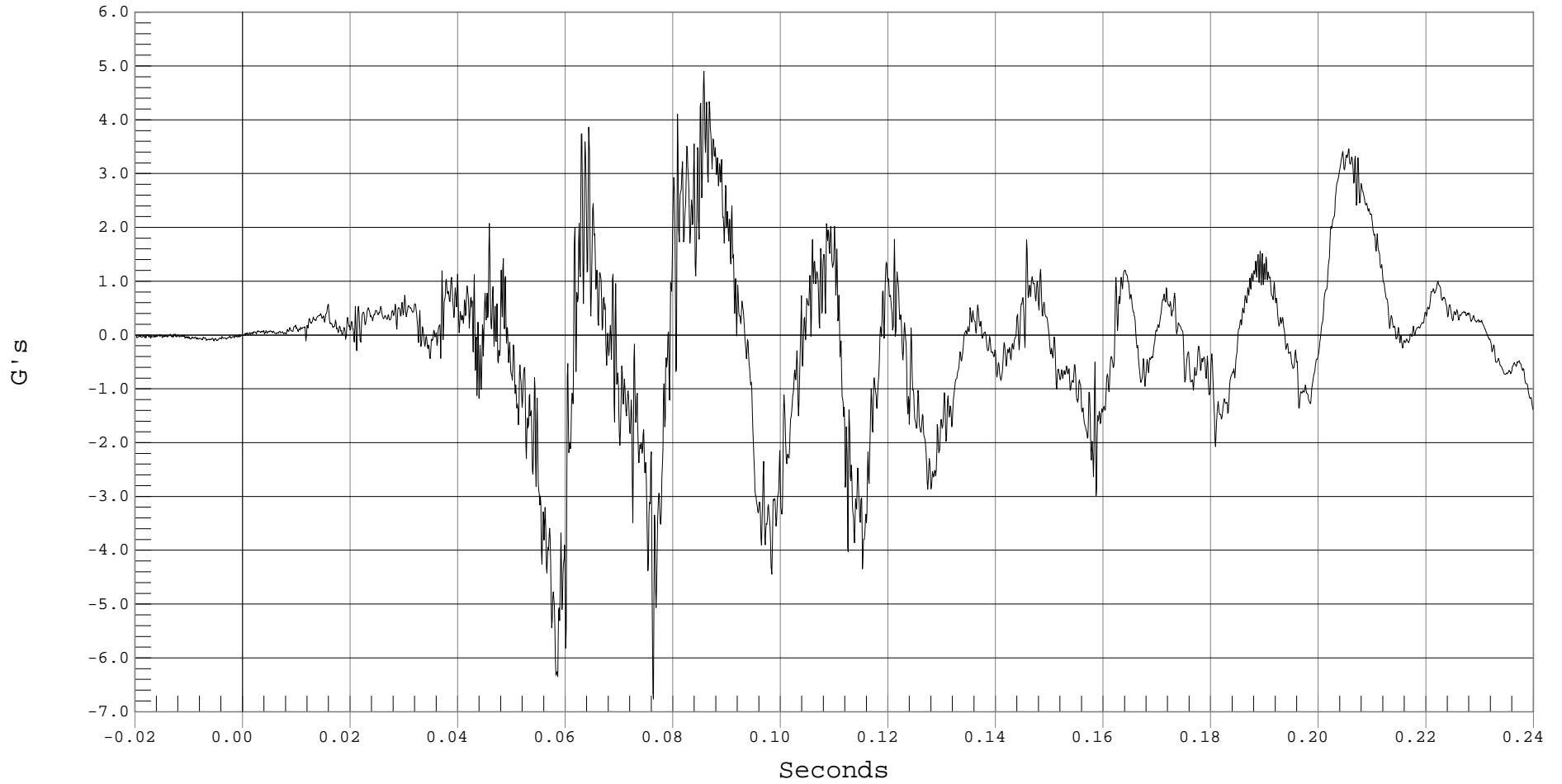
RRS 3 YR OLD PELVIS Y ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD PELVIS Y, B01025AT.A57

Ymin = -6.77 G's @ 0.0763 Seconds, Ymax = 4.9 G's @ 0.0857 Seconds



F-79



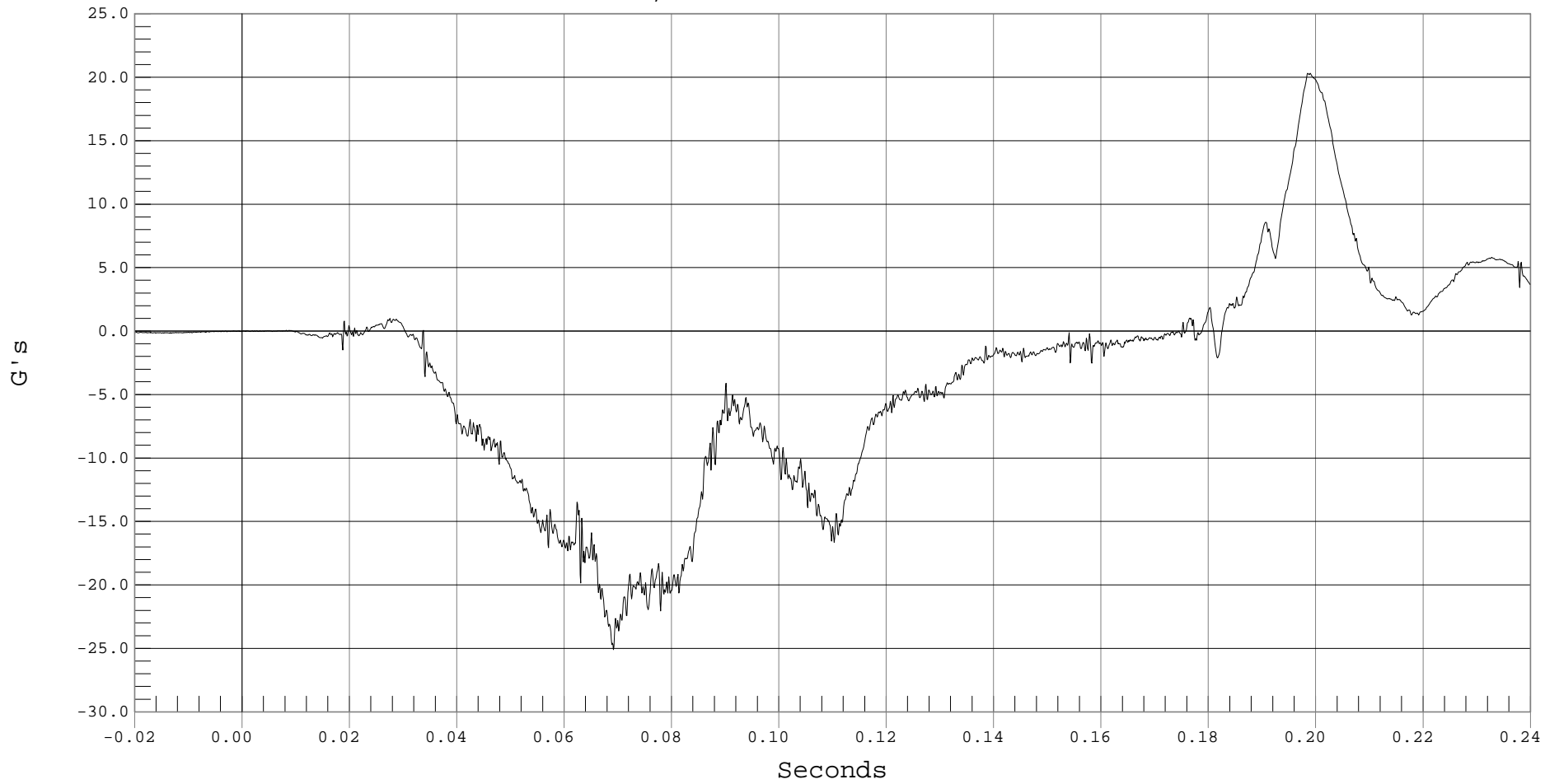
RRS 3 YR OLD PELVIS Z ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS CHILD PELVIS Z, B01025AT.A58

Ymin = -25.11 G's @ 0.0691 Seconds, Ymax = 20.31 G's @ 0.1984 Seconds



F-80



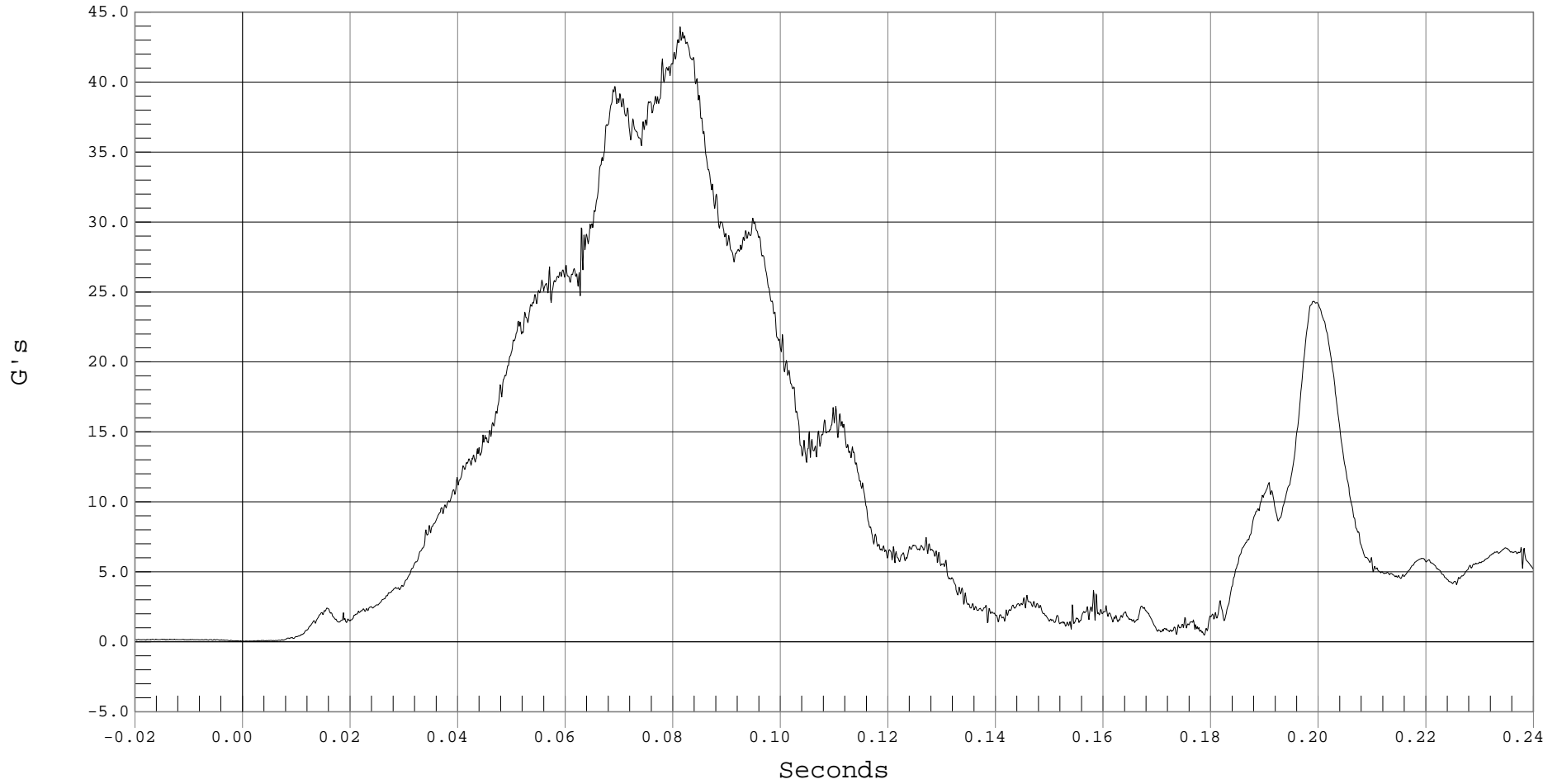
RRS 3 YR OLD PELVIS RESULTANT ACCELERATION

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 1000

— 1 RRS 3 YR OLD PELVIS RESULTANT ACCELERATION, B01025AV.A56

Ymin = .02 G's @ 0.0003 Seconds, Ymax = 43.95 G's @ 0.0813 Seconds



F-81



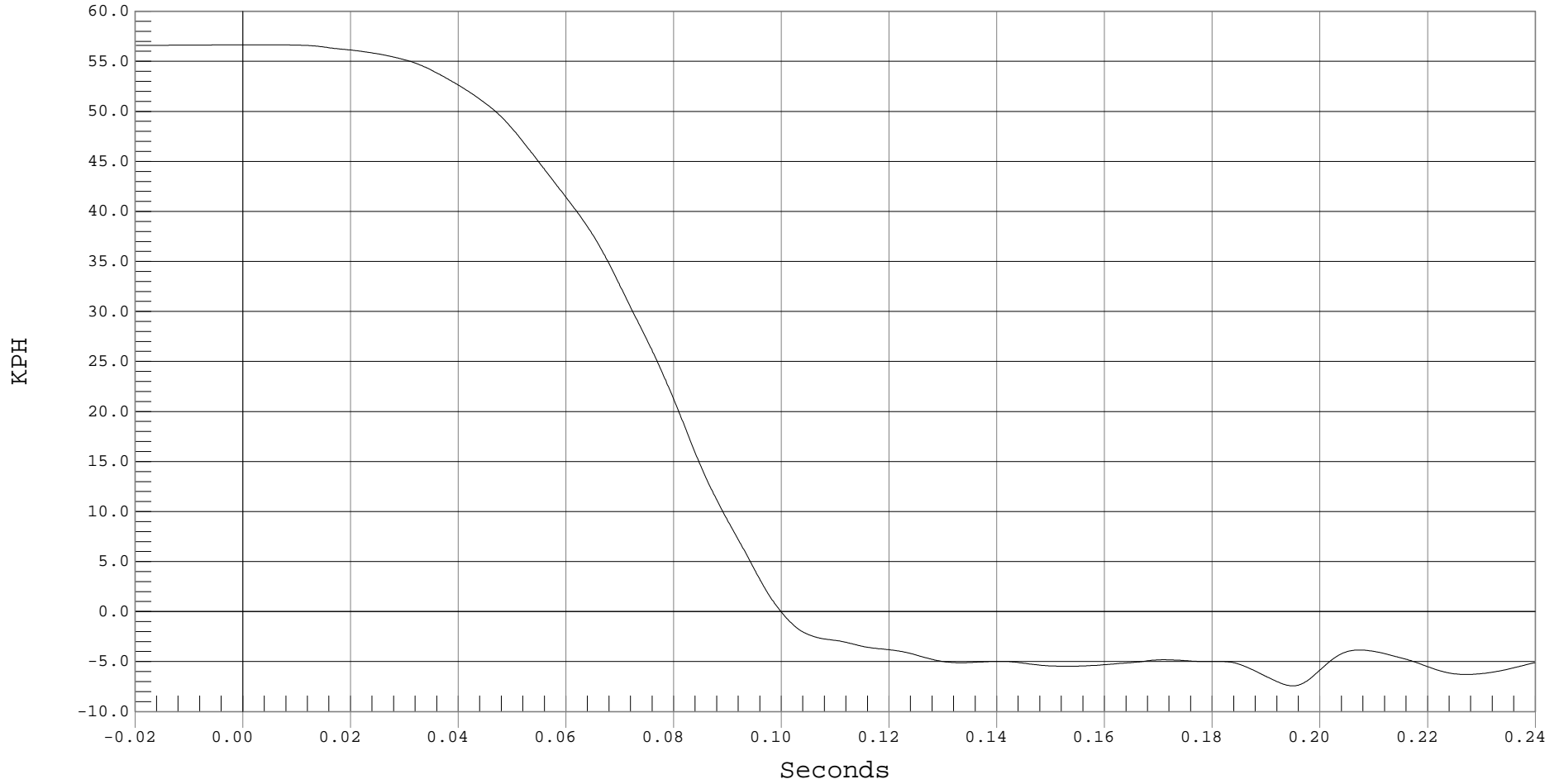
RRS 3 YR OLD PELVIS X VELOCITY

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 180

— 1 RRS 3 YR OLD PELVIS X VELOCITY, B01025AI.V56

Ymin = -7.43 KPH @ 0.1949 Seconds, Ymax = 56.65 KPH @ 0.0024 Seconds



F-82



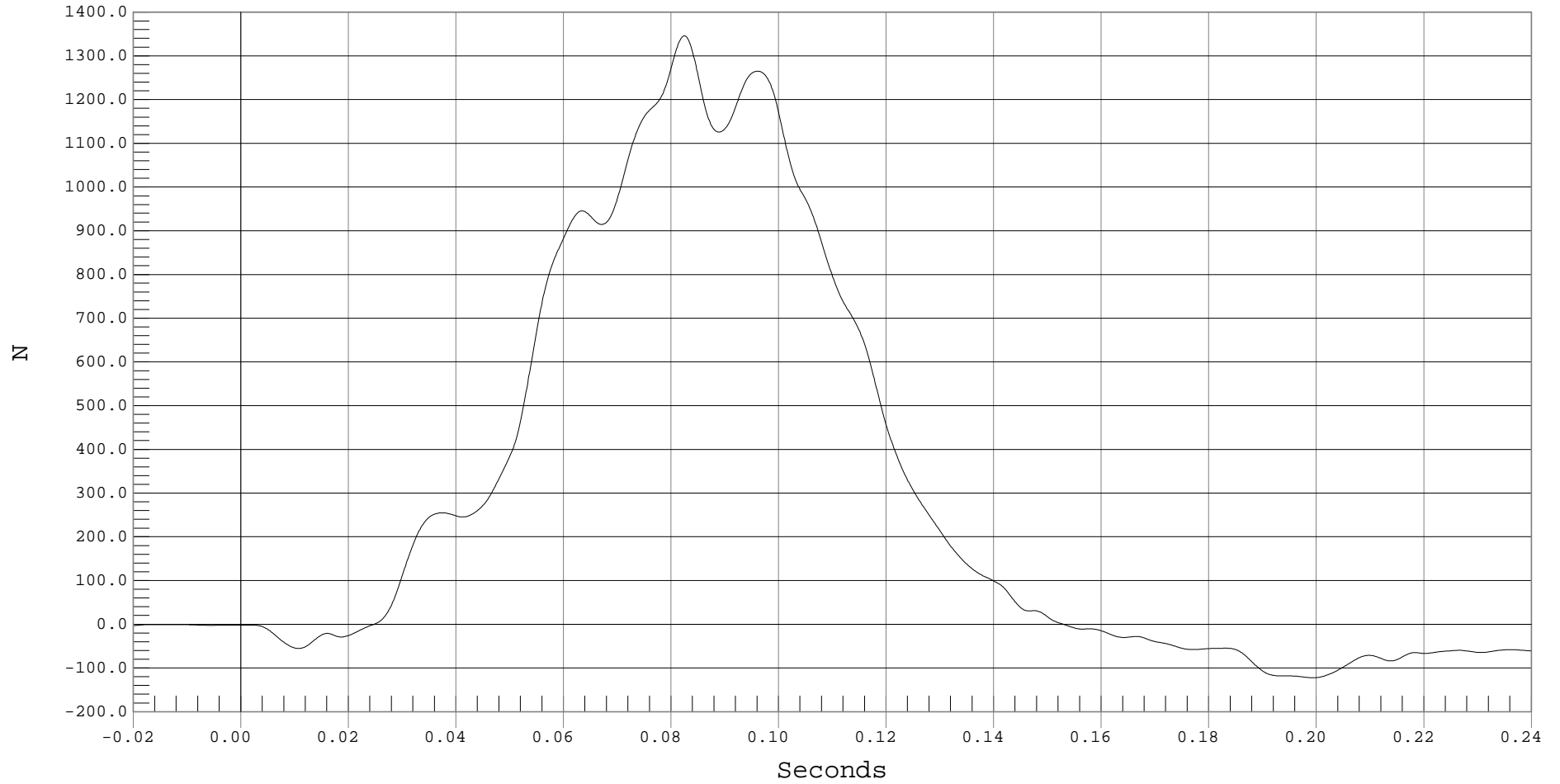
RRS TETHER FORCE

Test Desc.: NCAP FRONTAL IMPACT
Component: 2001 FORD WINDSTAR (M10200)
Other Info:

Test Date: 03-05-01
Speed: 35.2 MPH, 56.6 KPH
Filter Class: 60

— 1 RRS TETHER FORCE, B01025FF.F64

Ymin = -122.44 N @ 0.1993 Seconds, Ymax = 1345.97 N @ 0.0824 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

 1/11/00
 Test Date

 Approved By



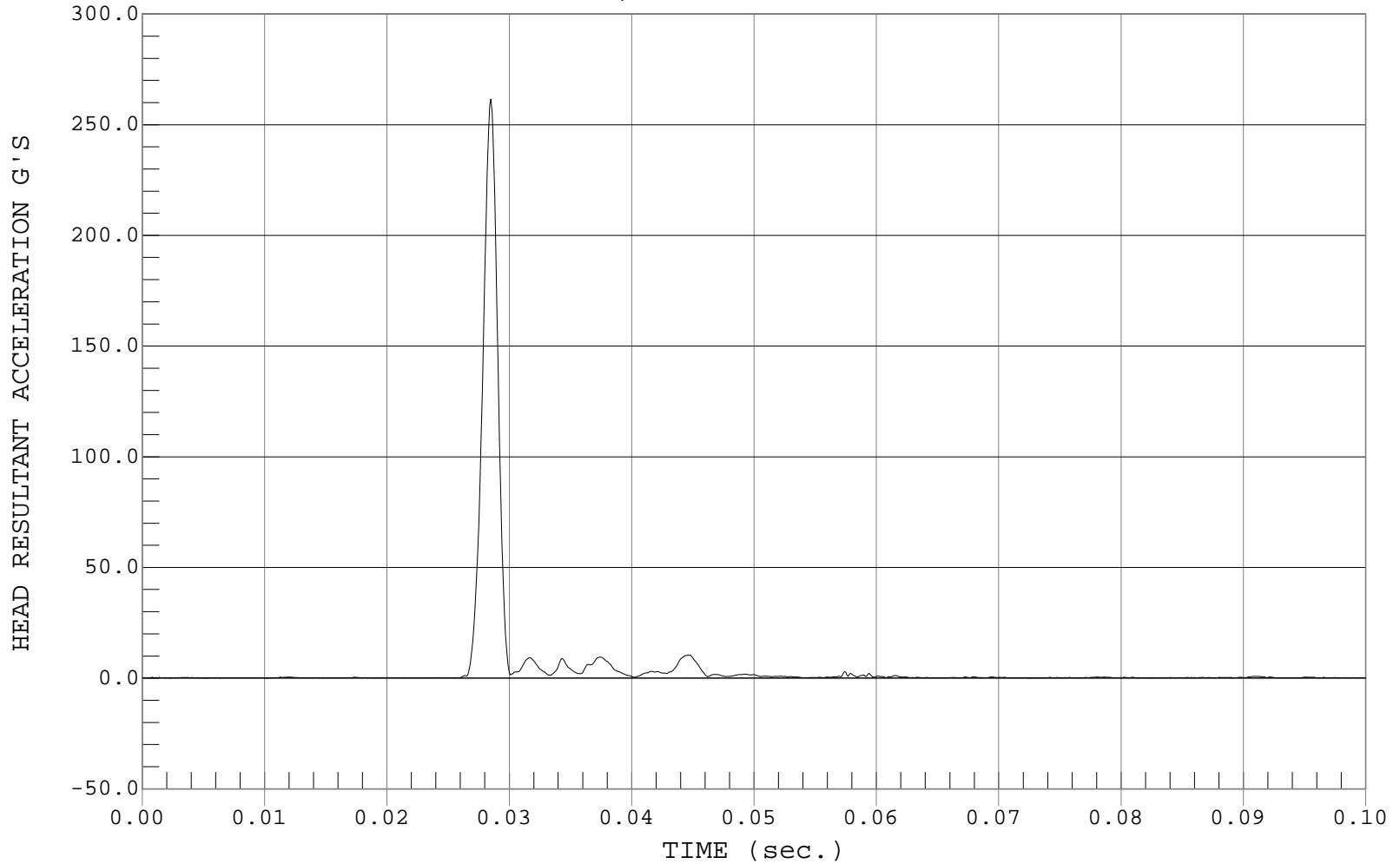
PEAK RESULTANT ACCELERATION

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 ACCELERATION, D01061AV.A01

Ymin = .07 G'S @ 0.0022 sec., Ymax = 261.67 G'S @ 0.0285 sec.





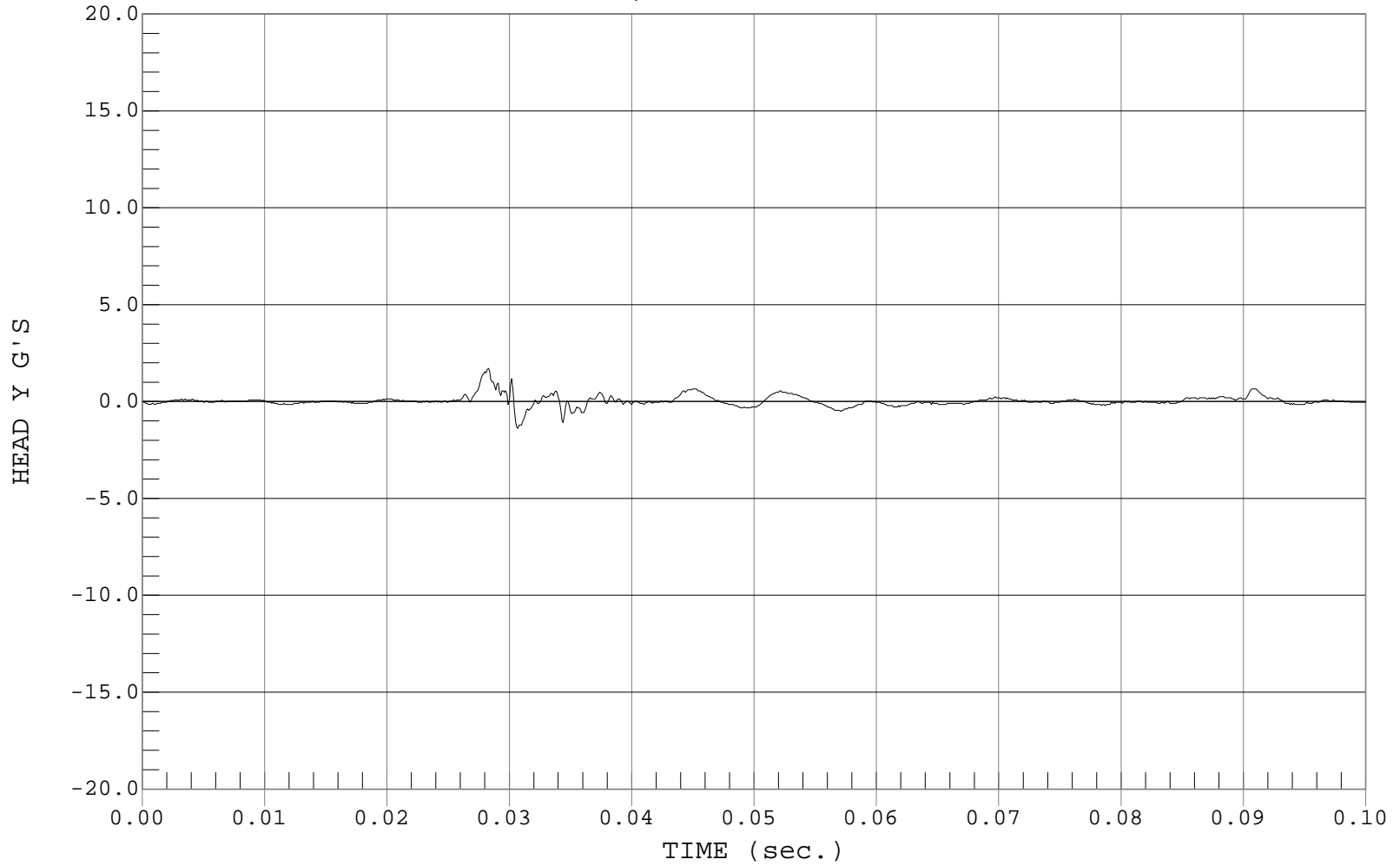
PEAK LATERAL ACCELARATION

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



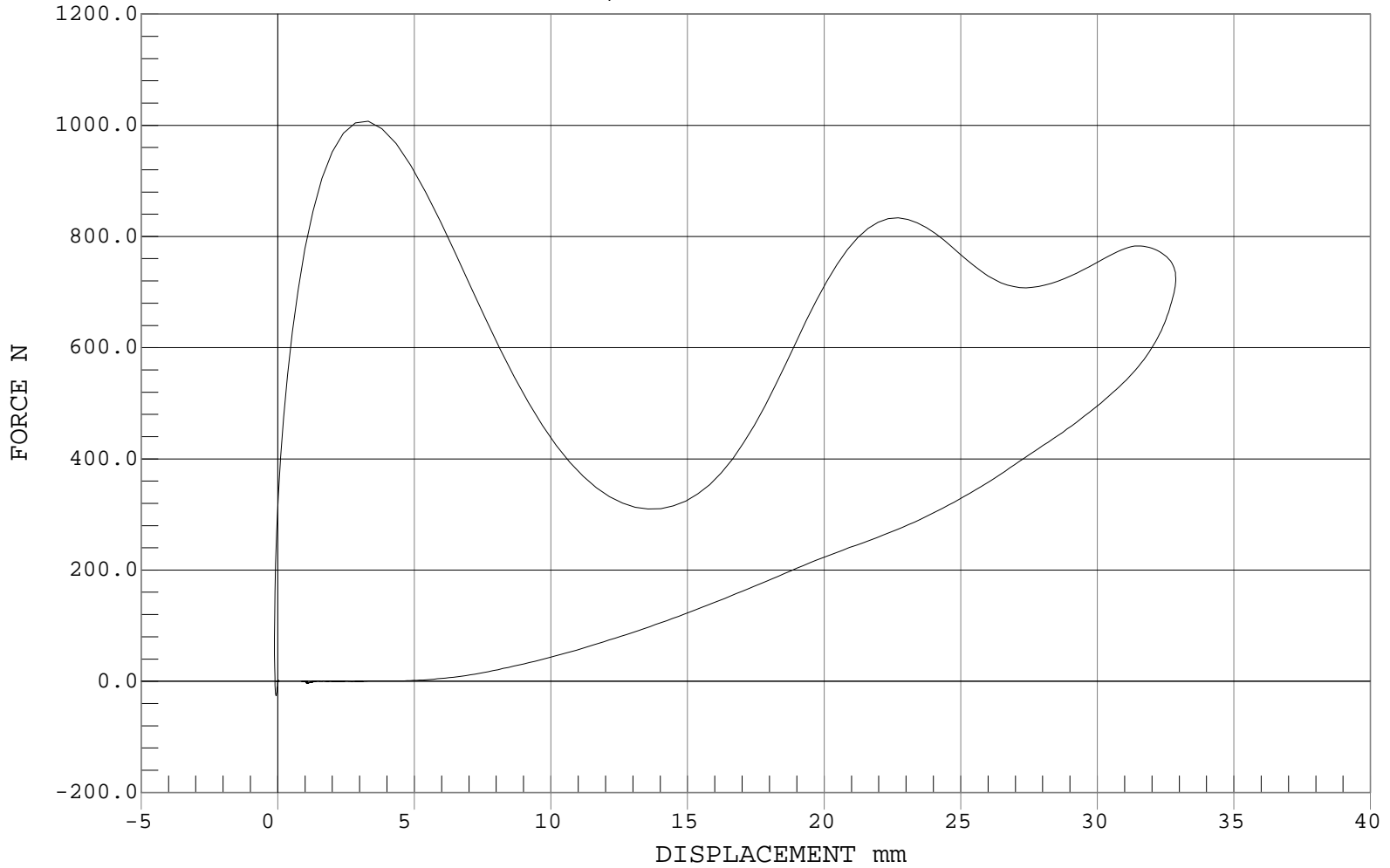
THORAX IMPACT

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

1/12/01
Test Date

Approved By



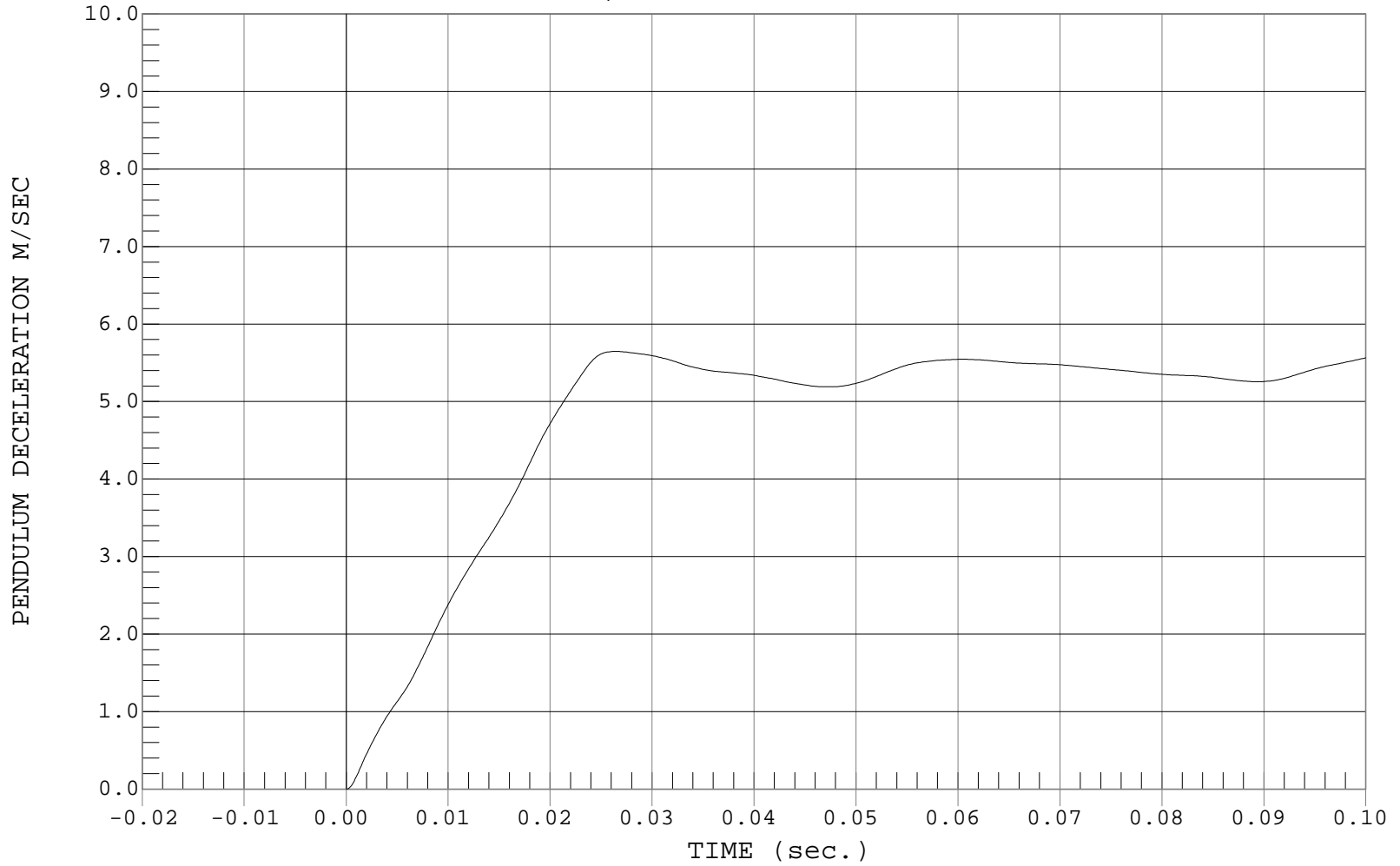
PENDULUM DECELERATION

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





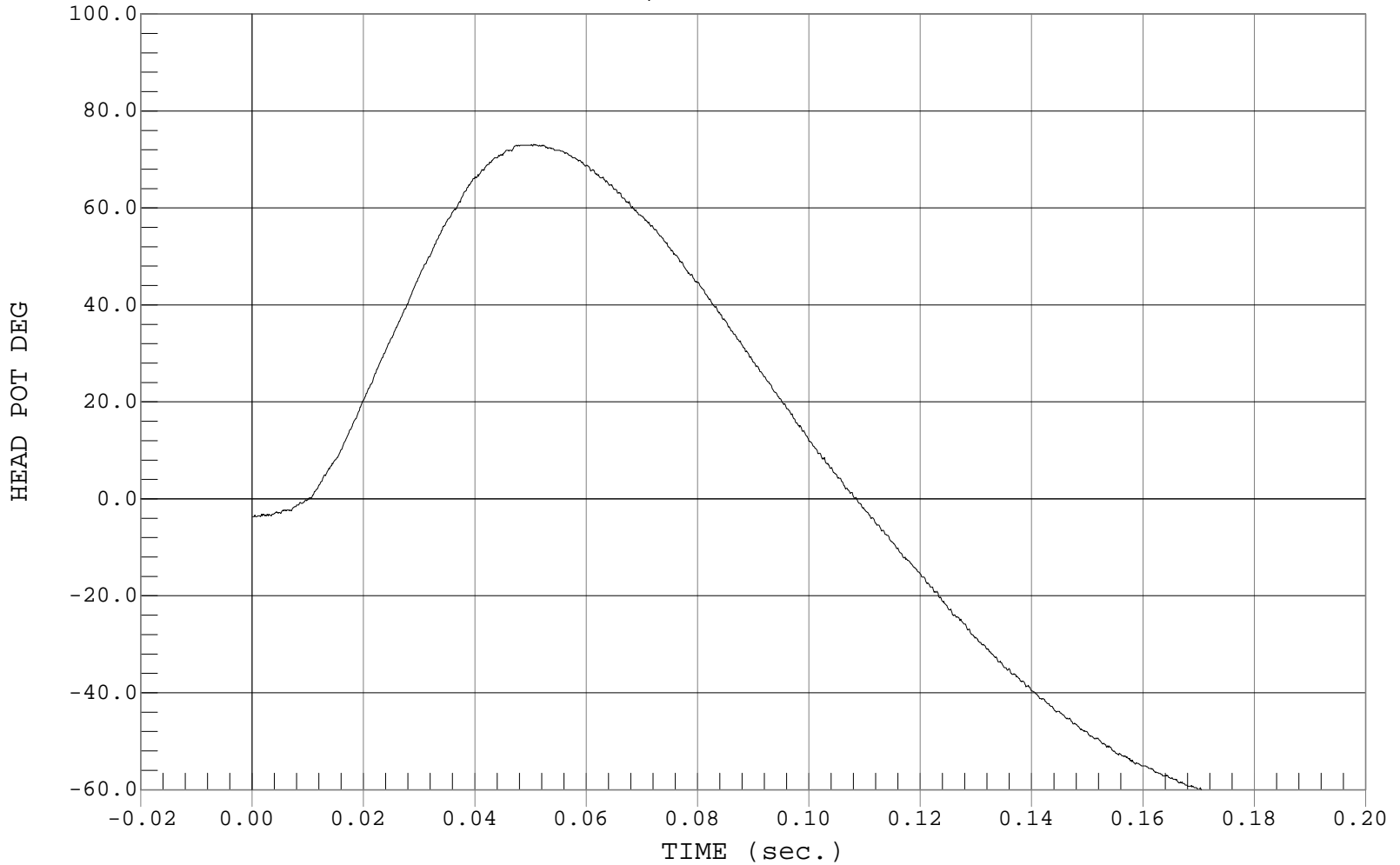
NECK ROTATION

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.





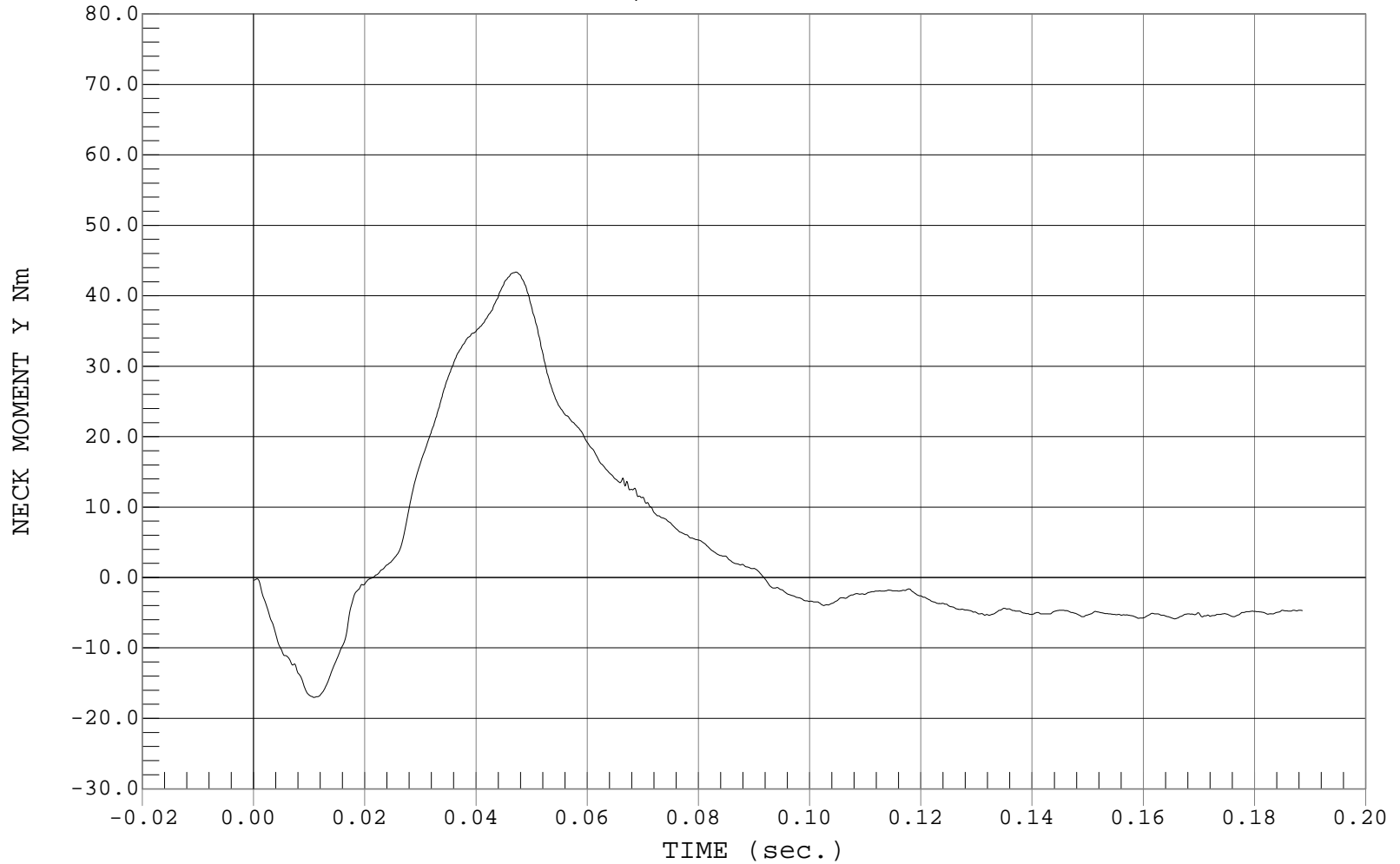
OCCIPITAL MOMENT

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

Ymin = -17.02 Nm @ 0.0109 sec., Ymax = 43.36 Nm @ 0.0472 sec.



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



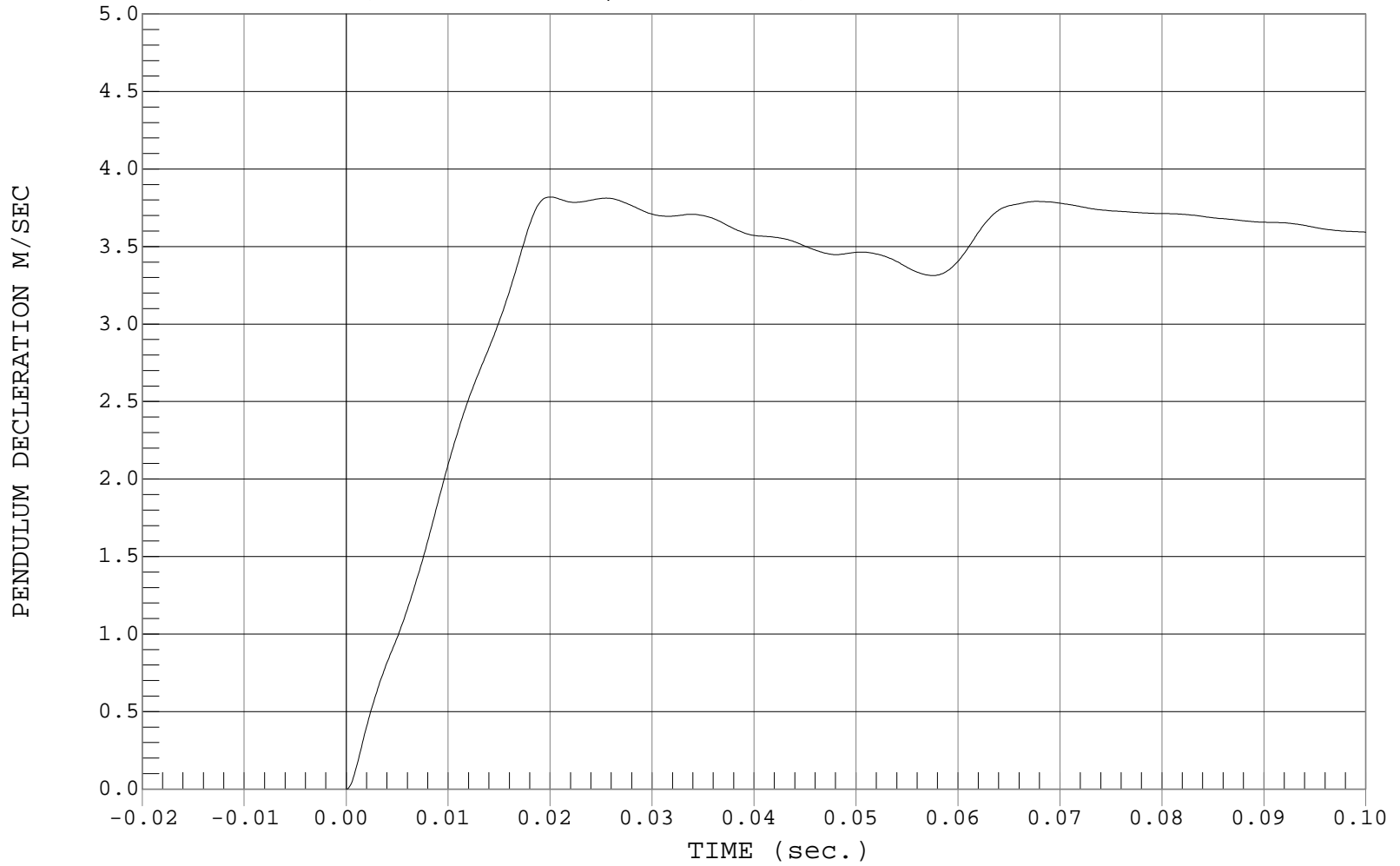
PENDULUM DECELERATION

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





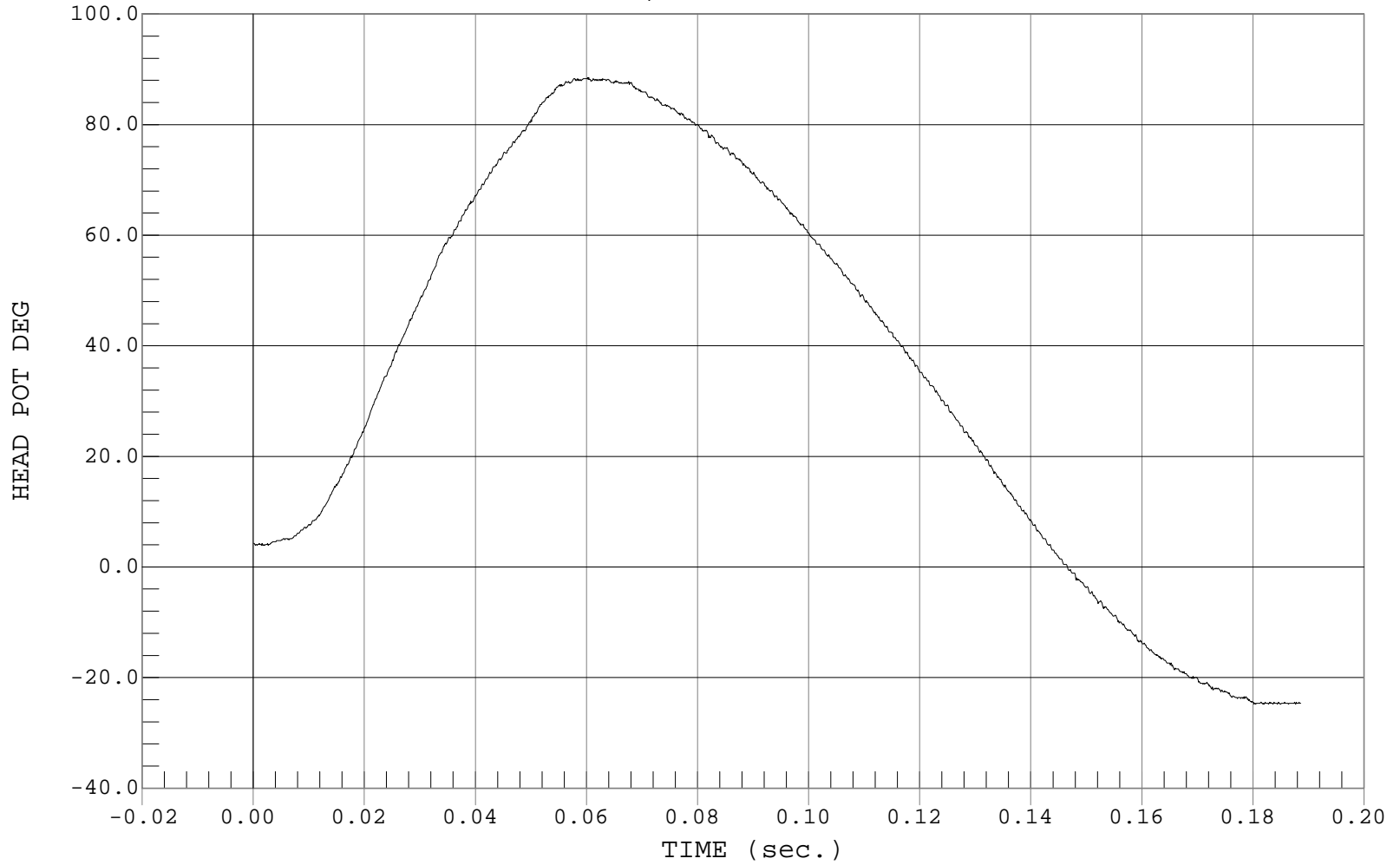
NECK ROTATION

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.





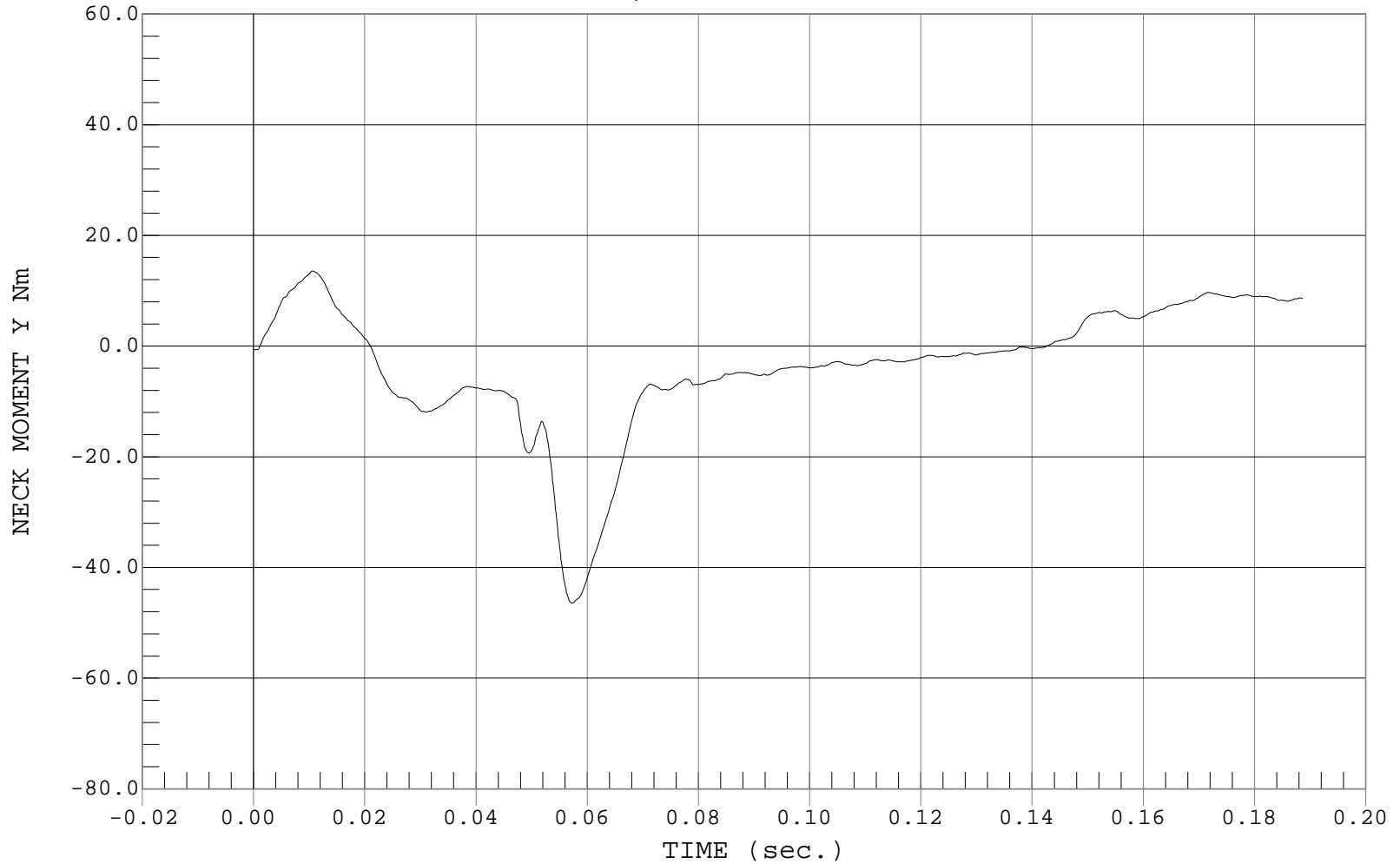
OCCIPITAL MOMENT

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	≤±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



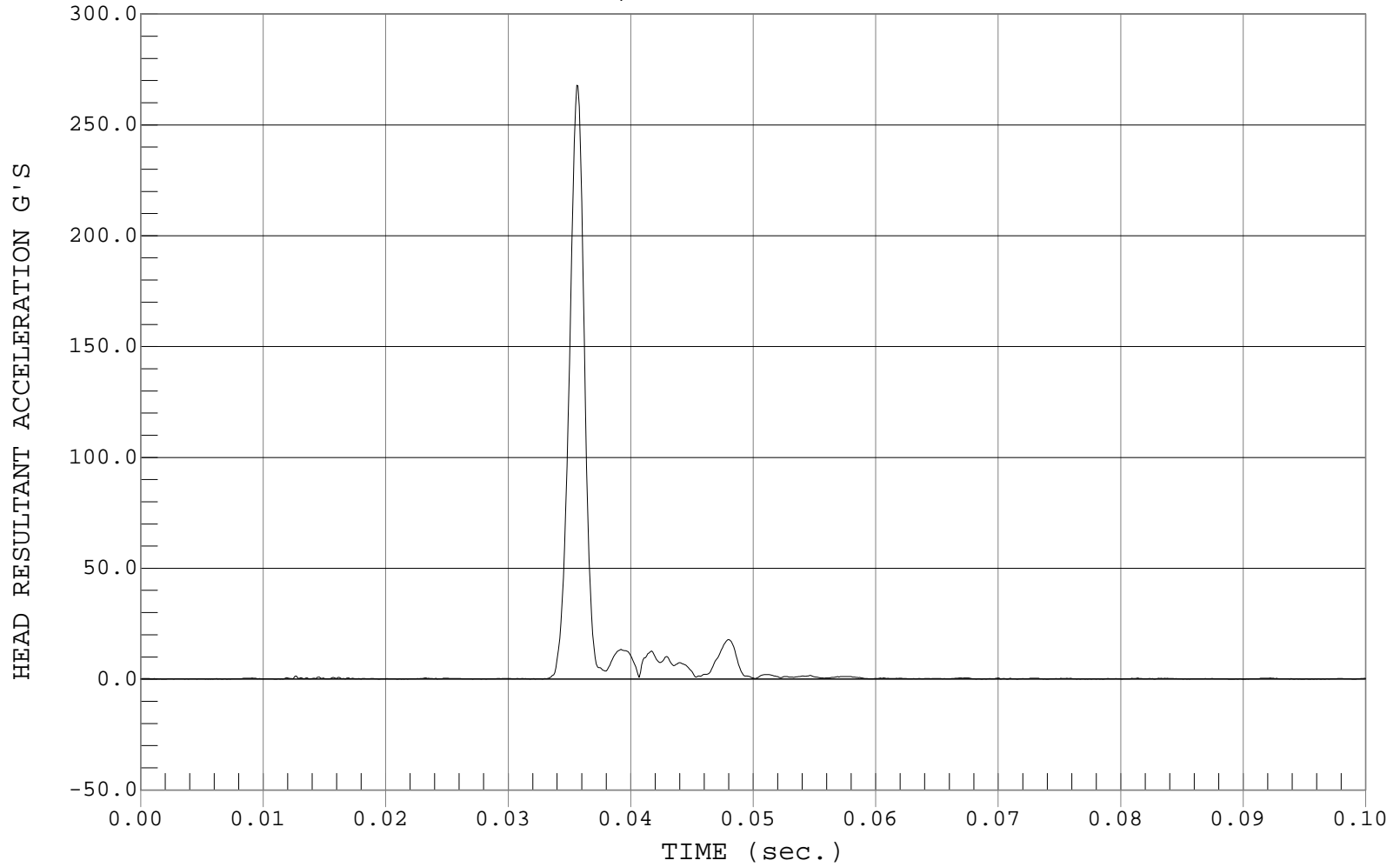
PEAK RESULTANT ACCELERATION

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 ACCELERATION, D01071AV.A01

Ymin = .07 G'S @ 0.0015 sec., Ymax = 267.89 G'S @ 0.0356 sec.





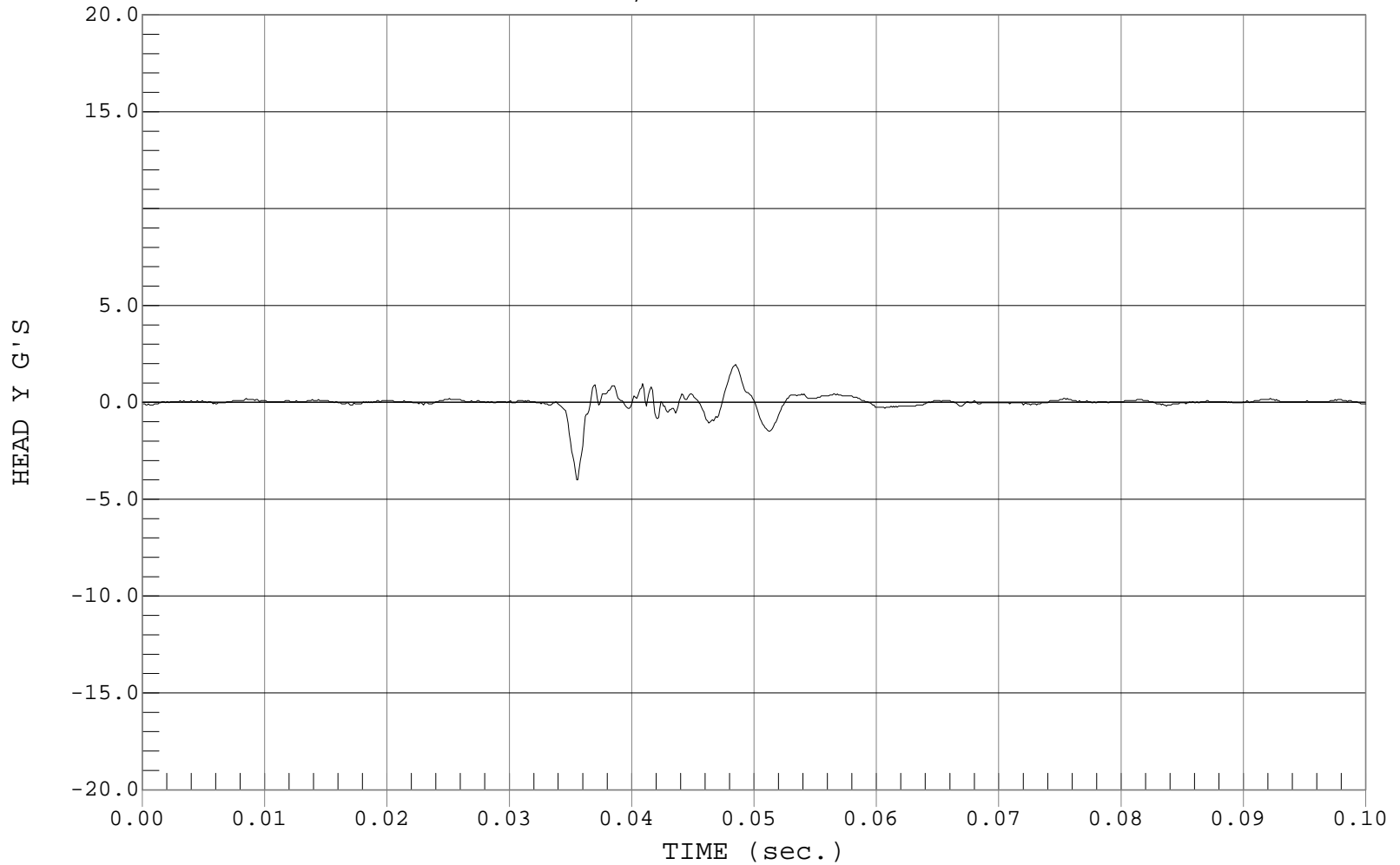
PEAK LATERAL ACCELARATION

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 Deflection	mm	32 to 38	33	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 – 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



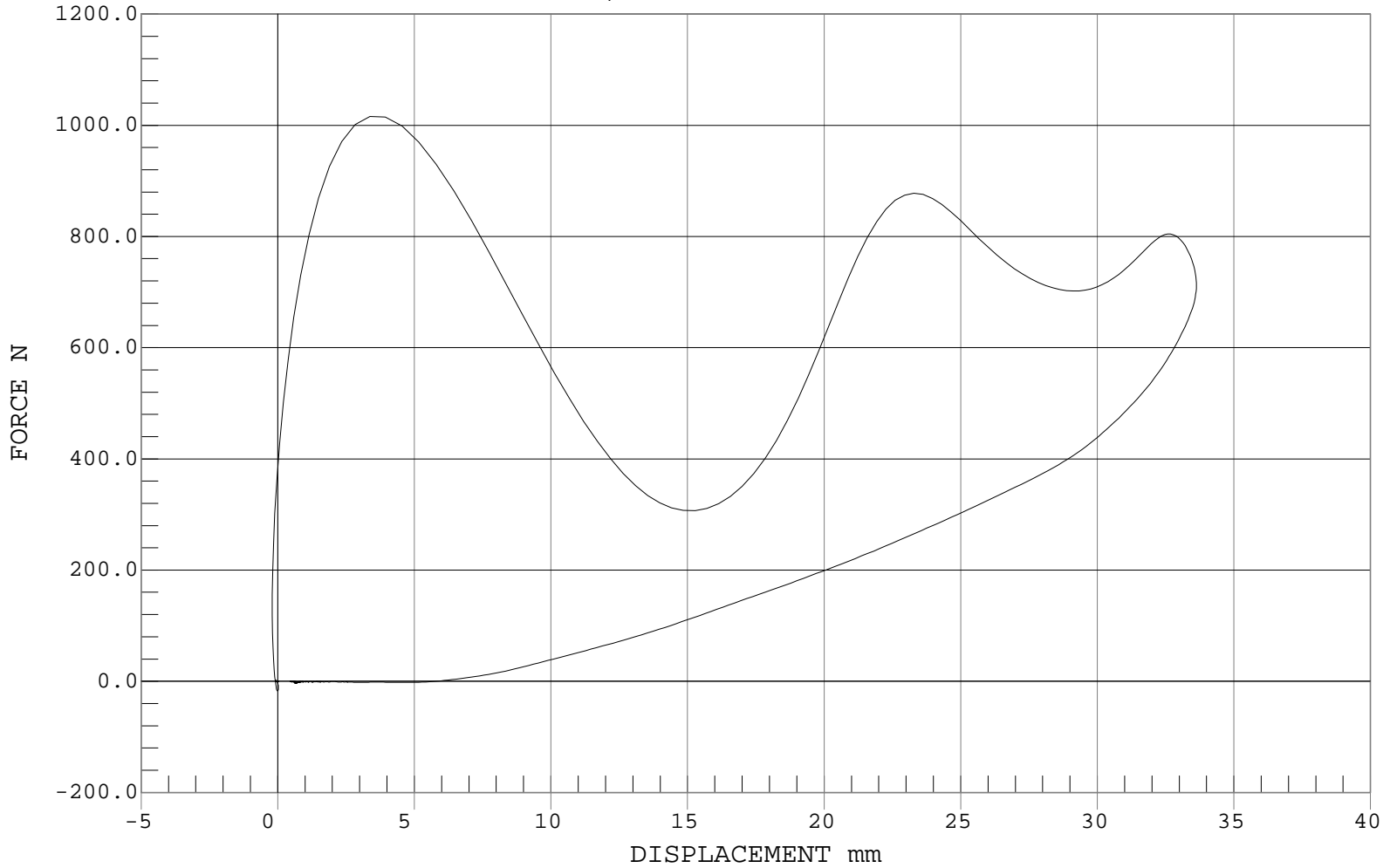
THORAX IMPACT

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



F-103

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



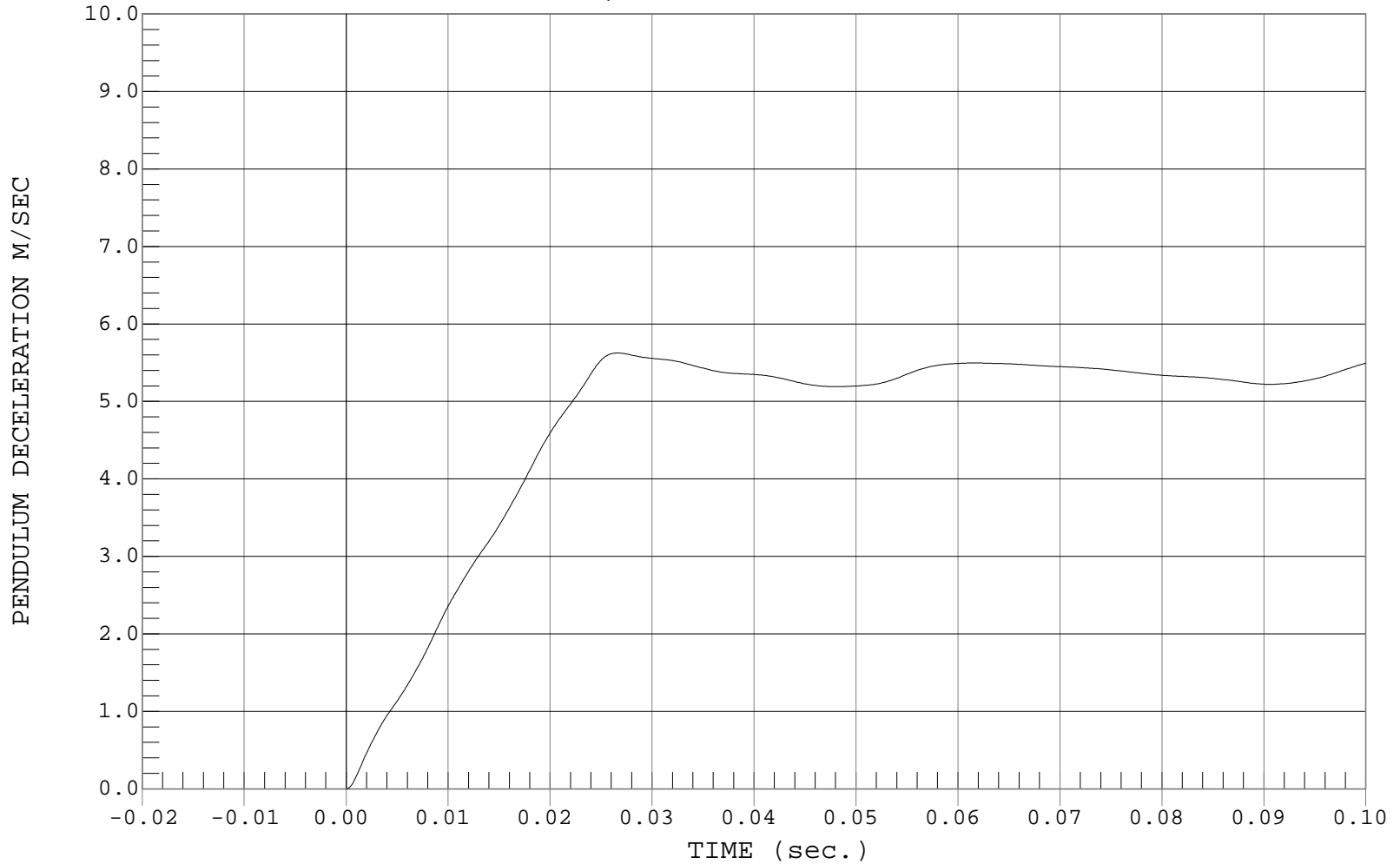
PENDULUM DECELERATION

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





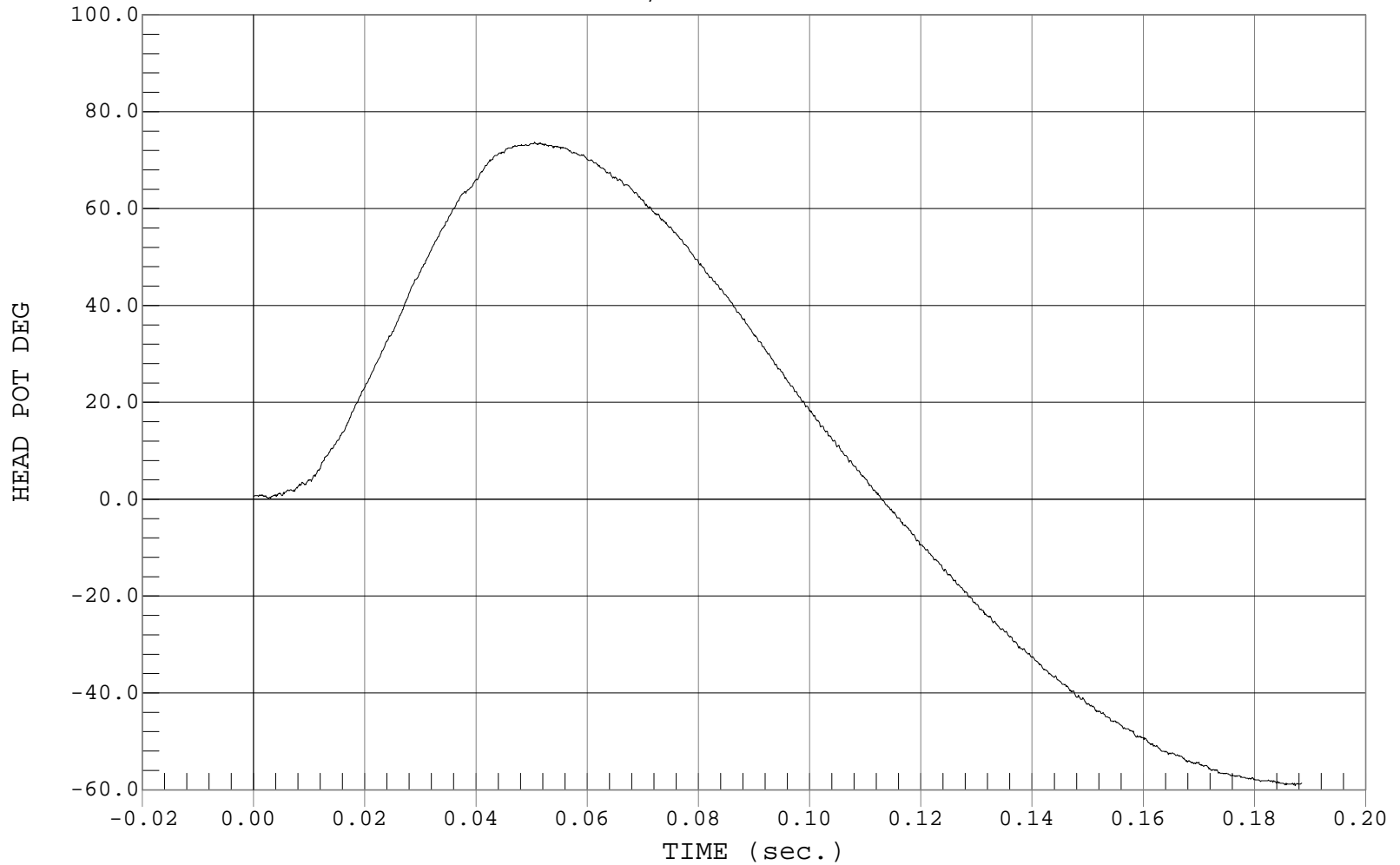
NECK ROTATION

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.





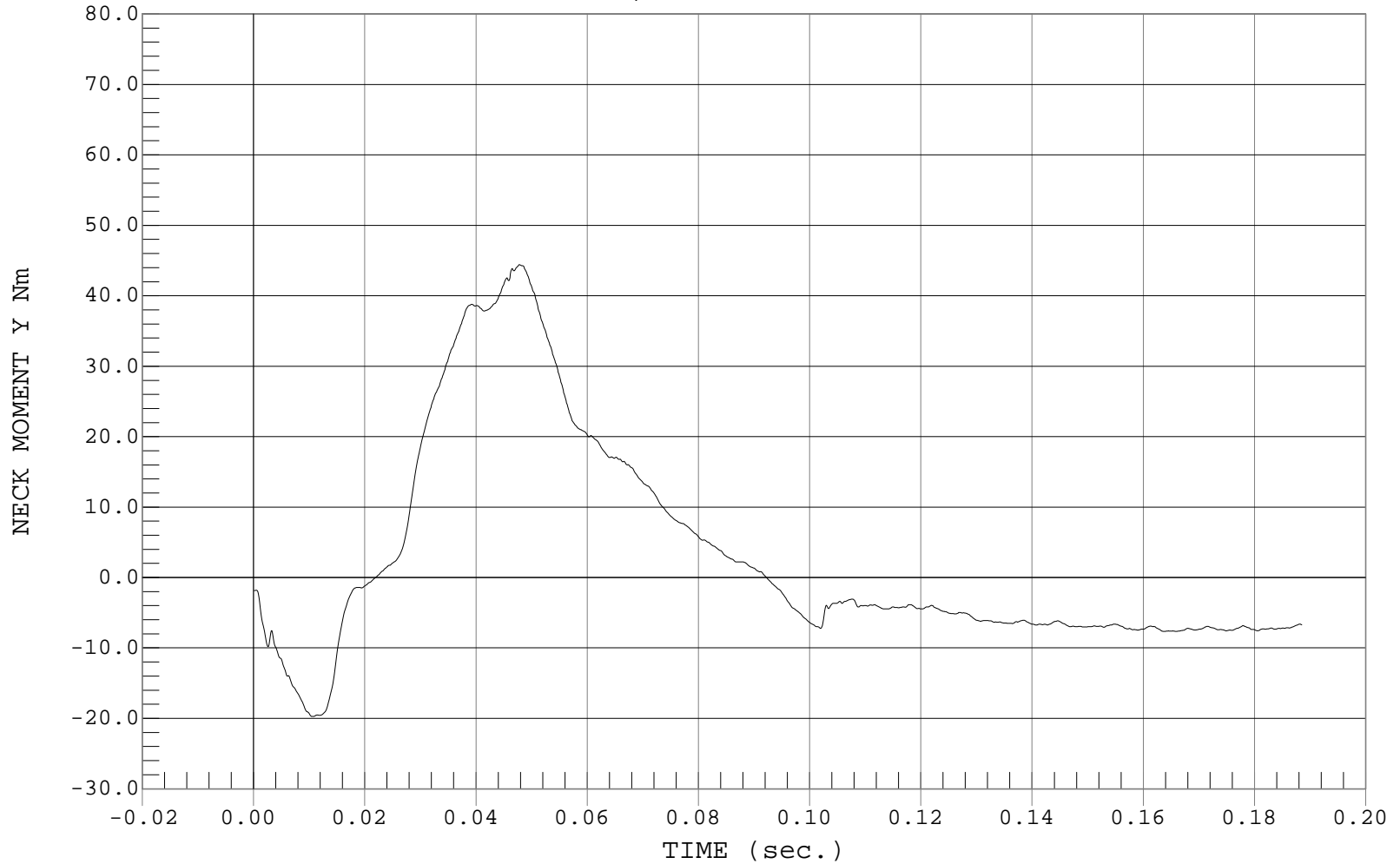
OCCIPITAL MOMENT

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



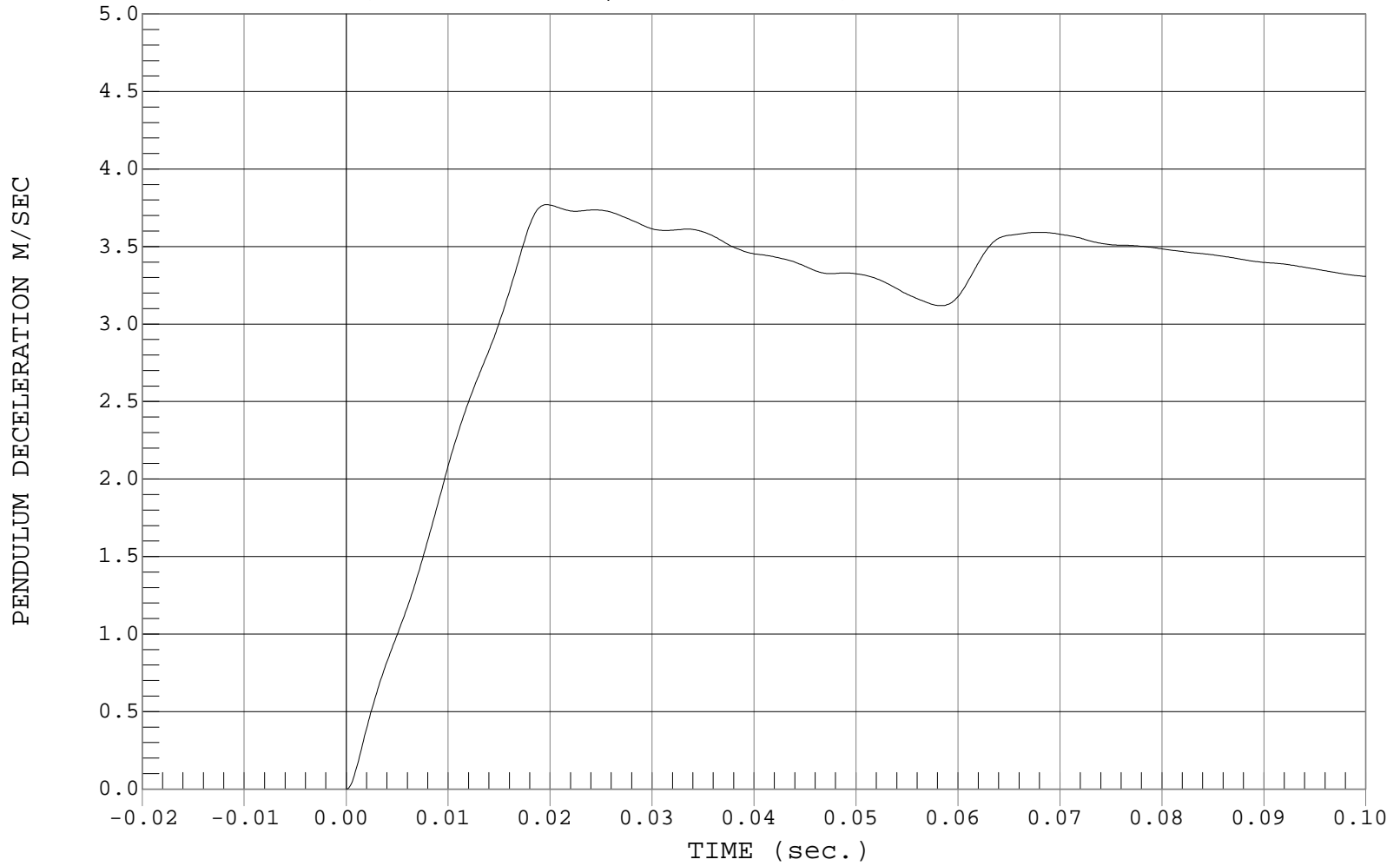
PENDULUM DECELERATION

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





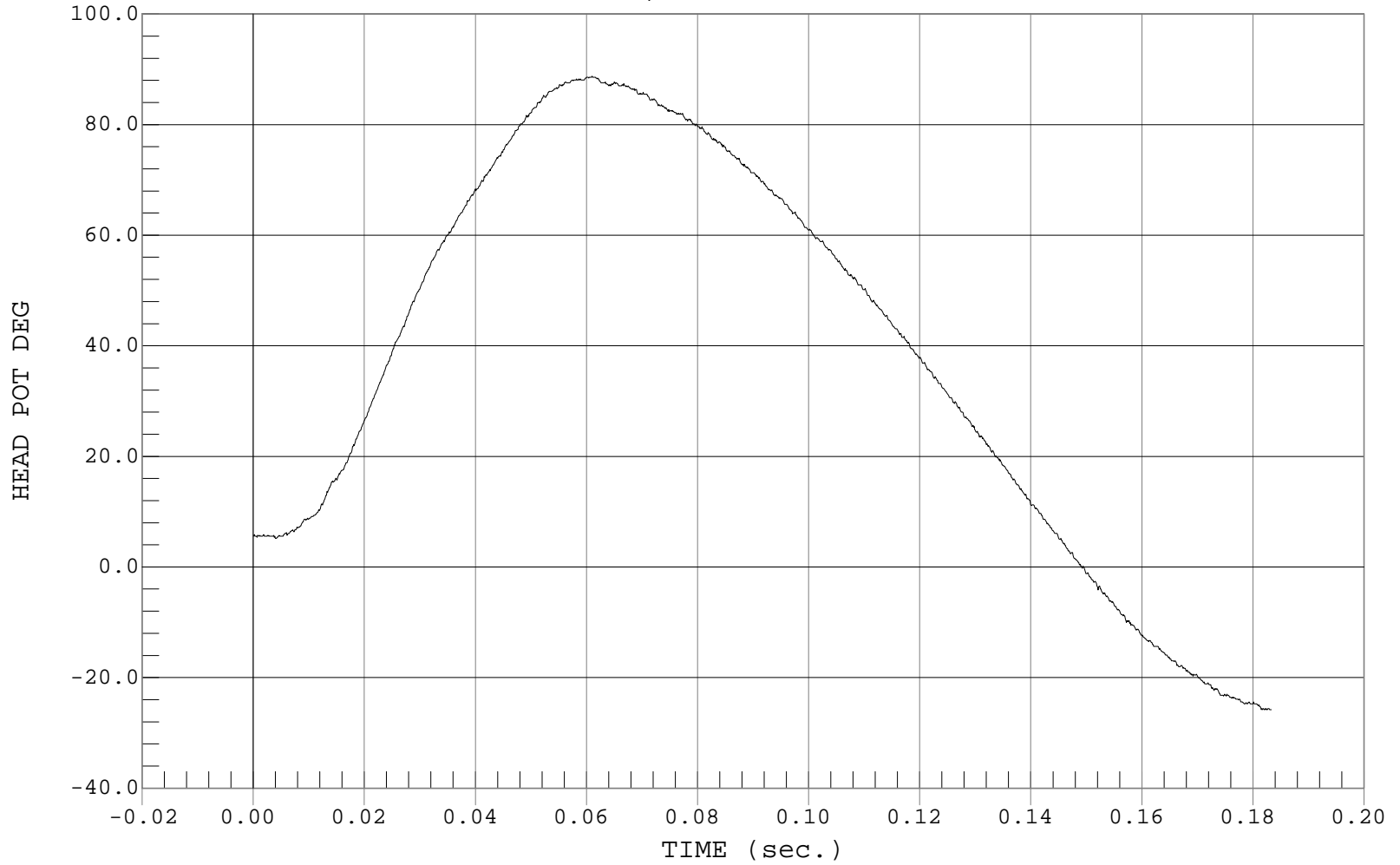
NECK ROTATION

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.





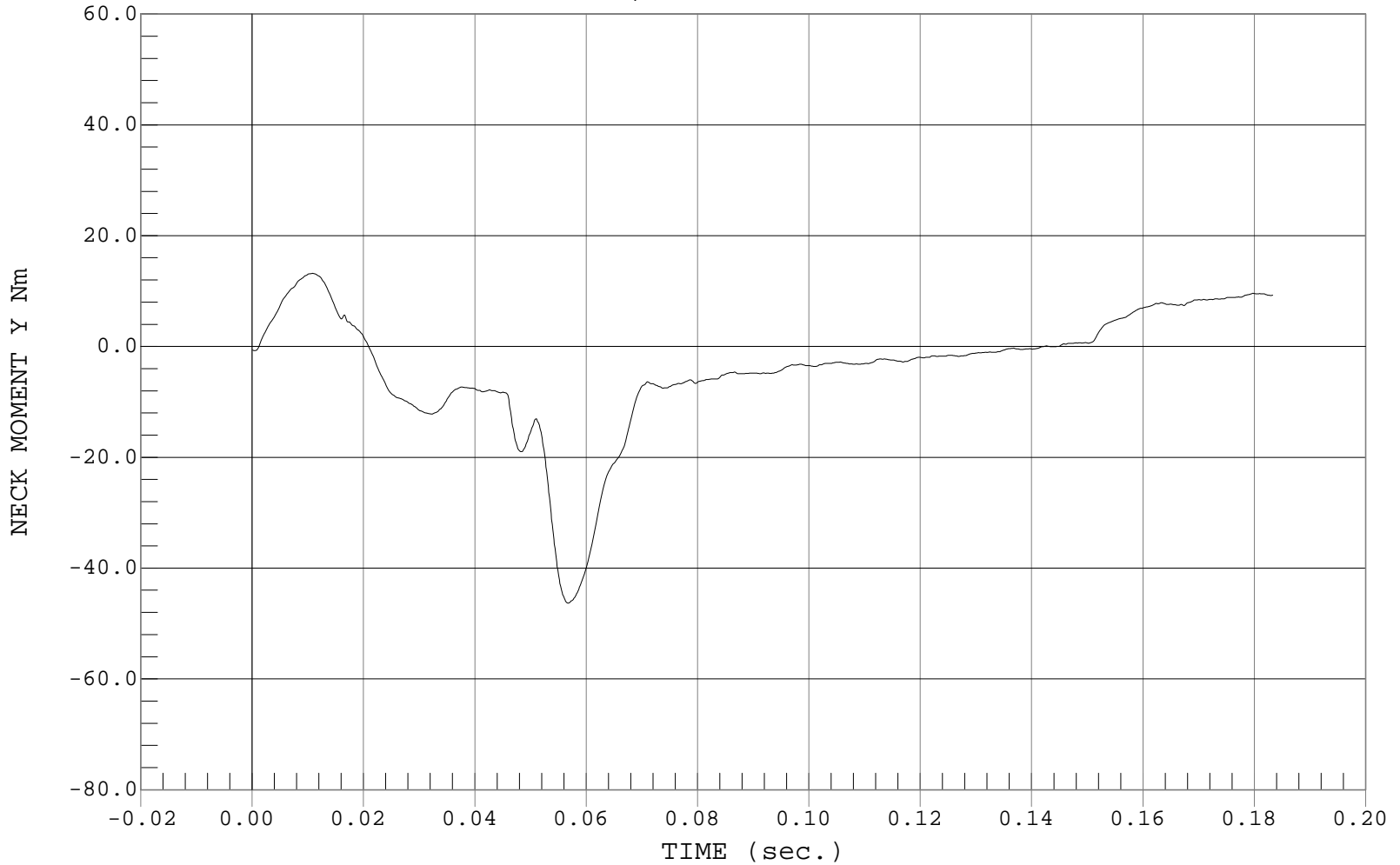
OCCIPITAL MOMENT

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

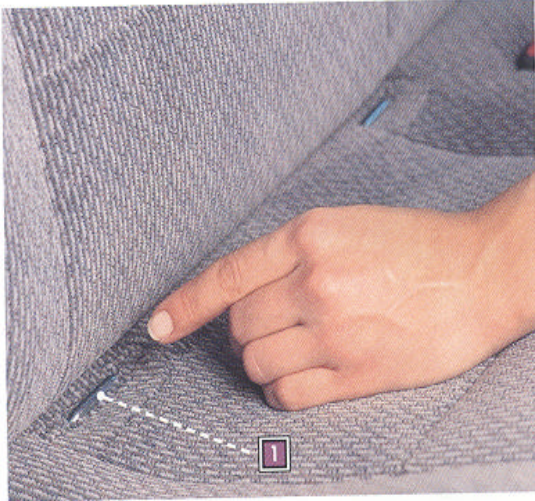
	INSTRUMENTS FOR DUMMY NO. 139		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AJ7F6	Endevco	1/4/01
Head Y	J19843	Endevco	1/4/01
Head Z	J19244	Endevco	1/4/01
Chest X	AJ7F7	Endevco	1/4/01
Chest Y	AJ454	Endevco	1/4/01
Chest Z	J23757	Endevco	1/4/01
Pelvis X	AJ8C0	Endevco	1/4/01
Pelvis Y	J14189	Endevco	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. 142C		
	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	142C	Servo	1/12/01

CHILD SEAT OWNER'S MANUAL RESTRAINT INSTRUCTIONS

Installing Your Car Seat in a Vehicle Using the Easy & Secure LATCH System



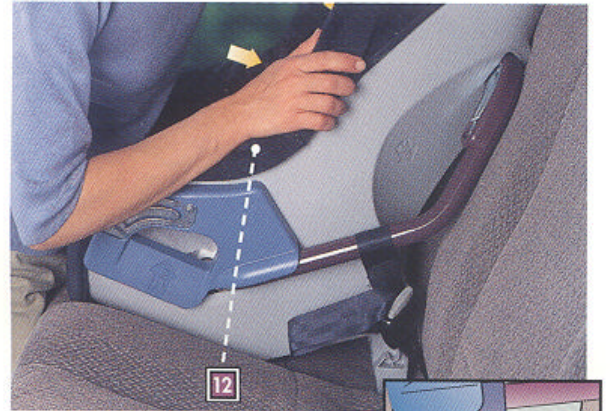
- 1 Once you have selected an acceptable seating location for the car seat (see car seat Owner's Manual), locate the special anchor points in your vehicle.

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FORWARD-FACING POSITION 1 YEAR AND UP (22 - 40 LBS.)

FORWARD-FACING POSITION 1 YEAR AND UP (22 - 40 LBS.)

Installing Your Car Seat in a Vehicle Using the Easy & Secure LATCH System



- 12 **To remove the car seat from the vehicle:**

While pushing down on the car seat armrest, press the release button on the Easy & Secure LATCH System buckle to loosen the strap.

With the strap loose, unfasten the Easy & Secure LATCH System hook from the vehicle special anchor point.

Repeat this procedure to loosen and unfasten the other strap.

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Installing Your Car Seat in a Vehicle



WARNING



ALWAYS secure this car seat with your vehicle belt system exactly as described in this manual. Refer also to your vehicle owner's manual for specific information on your vehicle belt system and specific instructions on how to install a car seat in your vehicle.



ALWAYS use the tether strap in the forward-facing position. Your child's safety is significantly enhanced in the event of a crash if the tether strap is used. The tether strap significantly reduces forward motion of your child's head during a crash, greatly reducing the likelihood of head injury.

IMPORTANT!

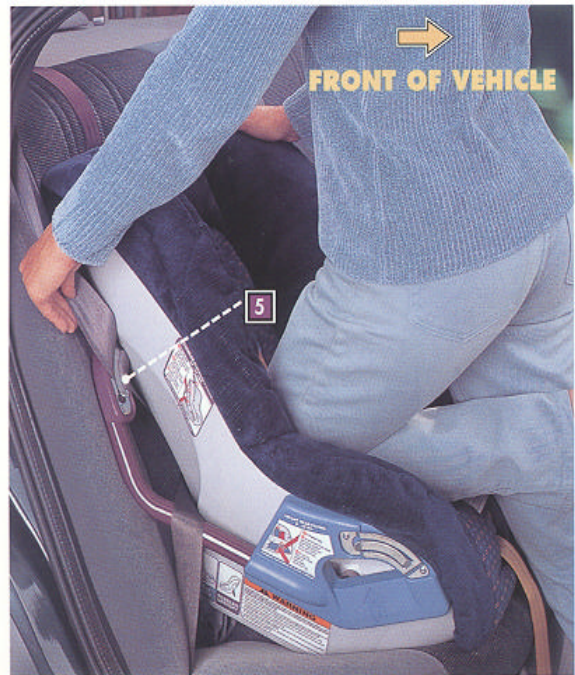
When installing this car seat in your vehicle, only use the front seat when no acceptable rear seating location is available. If the front seating location is equipped with an airbag but must be used to install this car seat in the forward-facing position, adjust the vehicle seat as far back from the dashboard as possible. Consult your vehicle owner's manual regarding front seat, forward-facing child restraint use.

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FORWARD-FACING POSITION 1 YEAR AND UP (22 - 40 LBS.)

FORWARD-FACING POSITION 1 YEAR AND UP (22 - 40 LBS.)

Installing Your Car Seat in a Vehicle



- 5** If you are using a vehicle seating location equipped with a shoulder belt, you must use **only one** forward-facing position locking clip on the car seat to prevent the vehicle belt system from loosening during use. With the vehicle belt system tight, fit the **shoulder belt** into the forward-facing position locking clip on the burgundy tube.

IMPORTANT!

Your car seat is equipped with two forward-facing position locking clips (one on each side of the seat). Use **only one** forward-facing position locking clip to install the car seat. Use the forward-facing position locking clip closest to where the vehicle shoulder belt is attached to the vehicle.

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