

REPORT NUMBER: CAL-04-02

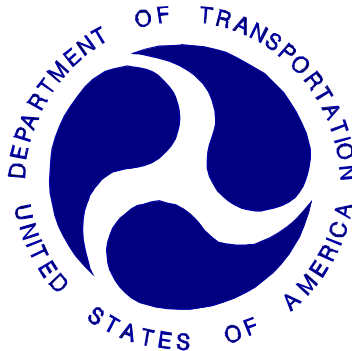
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

HYUNDAI MOTOR COMPANY
2004 HYUNDAI XG350
4-DOOR SEDAN

NHTSA NUMBER: M40503

GENERAL DYNAMICS TEST NUMBER: 8642-NCAP-38

GENERAL DYNAMICS
ADVANCED INFORMATION ENGINEERING SERVICES
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BUFFALO, NEW YORK 14225



December 19, 2003

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
Mail Code: NVS-111
400 Seventh Street, SW, Room No. 5313
Washington, DC 20590

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FINAL REPORT ACCEPTANCE BY OCS:

Manager, New Car Assessment Program (NCAP)
NHTSA, Office of Crashworthiness Standards

Date of Report Acceptance

COTR, New Car Assessment Program (NCAP)
NHTSA, Office of Crashworthiness Standards

Date of Report Acceptance

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. CAL-04-02		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of NEW CAR ASSESSMENT PROGRAM (NCAP) Testing of a 2004 Hyundai XG350 4-Door Sedan NHTSA No. M40503				5. Report Date December 19, 2003	
				6. Performing Organization Code CAL	
7. Author(s) David J. Travale, Program Manager Lawrence Q. Valvo, Project Engineer				8. Performing Organization Report No. 8642-NCAP-38	
9. Performing Organization Name and Address General Dynamics Advanced Information Engineering Services 4455 Genesee Street Buffalo, New York 14225				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-01-D-32005	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NVS-111 400 Seventh, SW, Room 5313 Washington, D.C. 20590				13. Type of Report and Period Covered Final Report December 19, 2003	
				14. Sponsoring Agency Code NVS-111	
15. Supplementary Notes					
16. Abstract A frontal load cell barrier test of a 2004 Hyundai XG350 4-Door Sedan was performed at General Dynamics crash test facility in Buffalo, New York, on December 19, 2003. The impact velocity was 56.81 kph and the temperature at the barrier face was 21.1 °C. The maximum post-test vehicle crush was 369 mm. The test vehicle was equipped with 3-point restraint systems, knee bolsters, and airbags at both the driver and right outboard passenger seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements.					
ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver (061)	371.2	44.3	-38.1	-4288.3	-5710.1
Passenger (064)	396.1	45.1	-32.3	-5395.3	-4947.6
17. Key Words 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)			18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5111 Washington, DC 20590		
19. Security Classif. (of this report) UNCLASSIFIED		20. Security Classif. (of this page) UNCLASSIFIED		21. No. of Pages 307	22. Price

Form DOT F1700.7 (8-69)

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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.81 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-D-32005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.81 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 56.81 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated December 1999. 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 testing and reporting of test results are described in the test procedures and are not repeated in this report.

One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with nine accelerometer array head, chest and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were installed on the driver's and passenger's lap belts to measure dummy pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No.064) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 194 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Appendix C contains the dummy calibration data and Appendix D contains the transducer calibration dates.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 36 load cells was impacted by a 2004 Hyundai XG350 4-Door Sedan at a velocity of 56.81 kph. The test was performed at General Dynamics on December 19, 2003. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The occupant data is summarized below.

	HIC	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)	Belt Stretch (mm/50 mm)
Driver ATD	371.2	44.3	-38.1	-4288.3	-5710.1	130	0
Passenger ATD	396.1	45.1	-32.3	-5395.3	-4947.6	No Data	0.5

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum vehicle static crush was 369 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: Face to center of airbag, back of head to inboard half of the head restraint, knees to knee bolster. The passenger's visible contact points were as follows: Face to center of airbag, back of head to inboard half of the head restraint, knees to glove compartment door.

The 2004 Hyundai XG350 4-Door Sedan did not exceed the requirements of FMVSS 208, FMVSS 212, FMVSS 219, and FMVSS 301. Data pertaining to these standards are presented in the data sheets.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No.:	M40503	Test Mode:	56.3 kph Frontal Barrier
Test Date:	December 19, 2003	Time:	12:26
		Temperature:	21.1 °C
Vehicle Make/Model/Body Style:	2004 Hyundai XG350 4-Door Sedan		
Vehicle Test Weight:	1900.5	kg	
Vehicle/Barrier Impact Angle:	0	°	
Impact Velocity:	56.81	kph	
Maximum Static Crush:	369	mm	
Vehicle Rebound:	460	mm	
<u>DUMMIES:</u>		<u>DRIVER</u>	<u>PASSENGER</u>
Type:		572E	572E
Restraint System:		Seatbelt, Airbag, Knee Bolster	Seatbelt, Airbag, Knee Bolster
Number of Data Channels:	194		
Number of Cameras:	1	Real Time	
	16	High Speed	
<u>DOOR OPENING DATA:</u>	Door remained closed and latched; Door opened without tools - Left Front		
	Door remained closed and latched; Door opened without tools - Right Front		
Front Seat(s) Data:		<u>DRIVER</u>	<u>PASSENGER</u>
Seat Track Failure: (mm of shift)		0	0
Seat Back Failure:		None	None
<u>VISIBLE DUMMY CONTACT POINTS:</u>		<u>DRIVER</u>	<u>PASSENGER</u>
Head:		Face to center of airbag; Back of head to inboard half of head restraint	Face to center of airbag; Back of head to inboard half of head restraint
Abdomen:		None	None
Chest:		Airbag	Airbag
Knees:		Left knee to knee bolster; Right knee to knee bolster	Left knee to left quarter of the glove compartment door; Right knee to the center of the glove compartment door

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2004 Hyundai XG350 4-Door Sedan

NHTSA No. : M40503 ; VIN: KMHFU45E64A311695 ; Color: gold

Engine Data: 6 cylinders; - CID; 3.5 Liters; - cc

Placement: - Longitudinal or In-Line; X Transverse or Lateral

Transmission Data: 5 Seeds; - Manual; X Automatic; X Overdrive

Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive

Safety Belt Features – Driver X Pretensioner (Shoulder); X Load Limiter; X Adj. Anchorage

Safety Belt Features - Passenger X Pretensioner (Shoulder); X Load Limiter; X Adj. Anchorage

Major Options: X A/C; X Pwr.Strg.; X Pwr. Brakes

X Pwr. Windows; X Pwr. Door Locks; X Tilt Wheel

Date Received: 12/04/03 ; Odometer Reading 50 km

Selling Dealer: Towne Hyundai

& Address: 3525 Southwestern Blvd., Orchard Park, NY 14127

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Hyundai Motor Company

Date of Manufacture SEP/16/03

GVWR: 2120 kg; GAWR: 1230 kg FRONT; 1095 kg REAR

DATA FROM TIRE PLACARD:

Recommended Tire Size: P205/60R16

* Recommended Cold Tire Pressure: 230 kpa FRONT; 210 kpa REAR

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P205/60R16 ; Manufacturer: Michelin

Tire Pressure with Maximum Capacity Vehicle Load: Front: 340 kPa; Rear: 340 kPa

Treadwear: 400 ; Traction: A ; Temperature: A

VEHICLE CAPACITY DATA:

Type of Front Seats: - Bench; X Bucket; - Split Bench

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 390.1 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 49.9 kg

*Tire pressure used for test

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

Right Front	=	<u>532.5</u>	kg	Right Rear	=	<u>310.0</u>	kg
Left Front	=	<u>530.5</u>	kg	Left Rear	=	<u>332.0</u>	kg
TOTAL FRONT	=	<u>1063.0</u>	kg	TOTAL REAR	=	<u>642.0</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>1705.0</u>	kg				
% of Total Front of Vehicle Weight	=	<u>62.3%</u>		% of Total Rear Weight	=	<u>37.7%</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW)	=	<u>1705.0</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>49.9</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152</u>	kg
TARGET TEST WEIGHT	=	<u>1906.9</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 43.5 KG OF CARGO WEIGHT:

Right Front	=	<u>576.0</u>	kg	Right Rear	=	<u>354.5</u>	kg
Left Front	=	<u>583.0</u>	kg	Left Rear	=	<u>387.0</u>	kg
TOTAL FRONT	=	<u>1159.0</u>	kg	TOTAL REAR	=	<u>741.5</u>	kg
TOTAL TEST WEIGHT	=	<u>1900.5</u>	kg				
% of Total Front Weight	=	<u>61.0%</u>	%	% of Total Rear Weight	=	<u>39.0%</u>	%
Weight of Ballast Secured in Vehicle Trunk Area	=	<u>0</u>	kg				
Vehicle Components Removed for Weight Reduction:	<u>Mirrors, rear bumper and cover, muffler, trunk trim, rear windows and window mechanisms, 14 gallons of stoddard fluid.</u>						

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>703</u>	LF	<u>694</u>	RR	<u>696</u>	LR	<u>685</u>
FULLY LOADED:	RF	<u>685</u>	LF	<u>677</u>	RR	<u>662</u>	LR	<u>650</u>
AS TESTED:	RF	<u>685</u>	LF	<u>678</u>	RR	<u>667</u>	LR	<u>660</u>
Vehicle's Wheel Base:		<u>2748</u>	mm					
Location of Vehicle's C.G.:		<u>0</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual	=	<u>70</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>70</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>64.4</u>	to <u>65.8</u> liters
ACTUAL TEST VOLUME	=	<u>11.4</u>	liters (with entire fuel system filled) *
Test Fluid Type:	<u>Stoddard Solution</u>	; Spec. Grav. =	<u>0.764</u>
Kinematic Viscosity	=	<u>0.96</u>	centistokes; Color = <u>Orange</u>
Type of Fuel Pump:	Electric- <u>X</u>	; Mechanical- <u>-</u>	
Does Electric Pump operate with ignition switch "ON" & engine "OFF"	Yes- <u>X</u>	No- <u>-</u>	
Details of Fuel System:	<u>The fuel tank is located on the vehicle underbody forward of the rear axle; The fuel filler is located on the left rear quarter panel rearward of the rear axle; The fuel lines are routed along the vehicle underbody inboard of the left body stiffener.</u>		

* Reduced stoddard volume was necessary to achieve target test weight.

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: December 19, 2003 Time: 12:26 Temperature: 21.1 °C
Vehicle NHTSA No.: M40503
Required Impact Velocity Range: 55.5 to 57.1 kph

BARRIER IMPACT VELOCITY: (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 56.81 kph; Trap No. 2 = 56.81 kph
Distance from vehicle to barrier: (1) entering trap = 813 mm
(2) exiting trap = 305 mm

VEHICLE STATIC CRUSH: (mm) (For frontal and rear impacts only.)

Vehicle Length:

Pre-Test	Left = <u>4808</u> ; C/L = <u>4877</u> ; Right = <u>4811</u>
Post-Test	Left = <u>4489</u> ; C/L = <u>4508</u> ; Right = <u>4487</u>
Crush	Left = <u>319</u> ; C/L = <u>369</u> ; Right = <u>324</u>
AVERAGE	= <u>337</u> mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

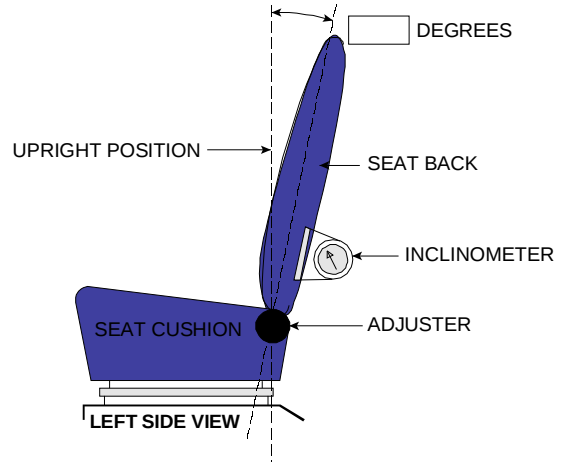
	Left = <u>482</u> ; C/L = <u>452</u> ; Right = <u>447</u>
AVERAGE	= <u>460</u> mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2004 Vehicle Model: Hyundai XG350 Body Style : 4-Door Sedan

1. Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Seat back angle for driver's seat: 26 degrees

Measurement instructions: Seat back angle is measured along the rear edge of the metal seatback frame from vertical. With the vehicle rocker panel level, set the seat back to 26 degrees from vertical.

Seat back angle for passenger's seat: 26 degrees

Measurement instructions: Seat back angle is measured along the rear edge of the metal seatback frame from vertical. With the vehicle rocker panel level, set the seat back to 26 degrees from vertical.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: Position the seat at the midway point of its fore/aft travel. Total travel is 226 mm, seat was positioned at 113 from full forward.

Positioning of the passenger's seat: Position the seat at the midway point of its fore/aft travel. Total travel is 226 mm, seat was positioned at 113 from full forward.

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 70 liters

B. "Usable Capacity" of the optional equipment fuel tank is - liters

C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = 70 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 11.4 liters

3.3 Is vehicle equipped with electric fuel pump? Yes- X ; No- -

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

The vehicle fuel pump operates briefly when the ignition is placed in the 'on' position and the engine is not started.

The vehicle fuel pump operates continuously while the engine is running.

DATA SHEET NO. 4 TEST VEHICLE INFORMATION (cont.)

4. STEERING COLUMN ADJUSTMENTS:

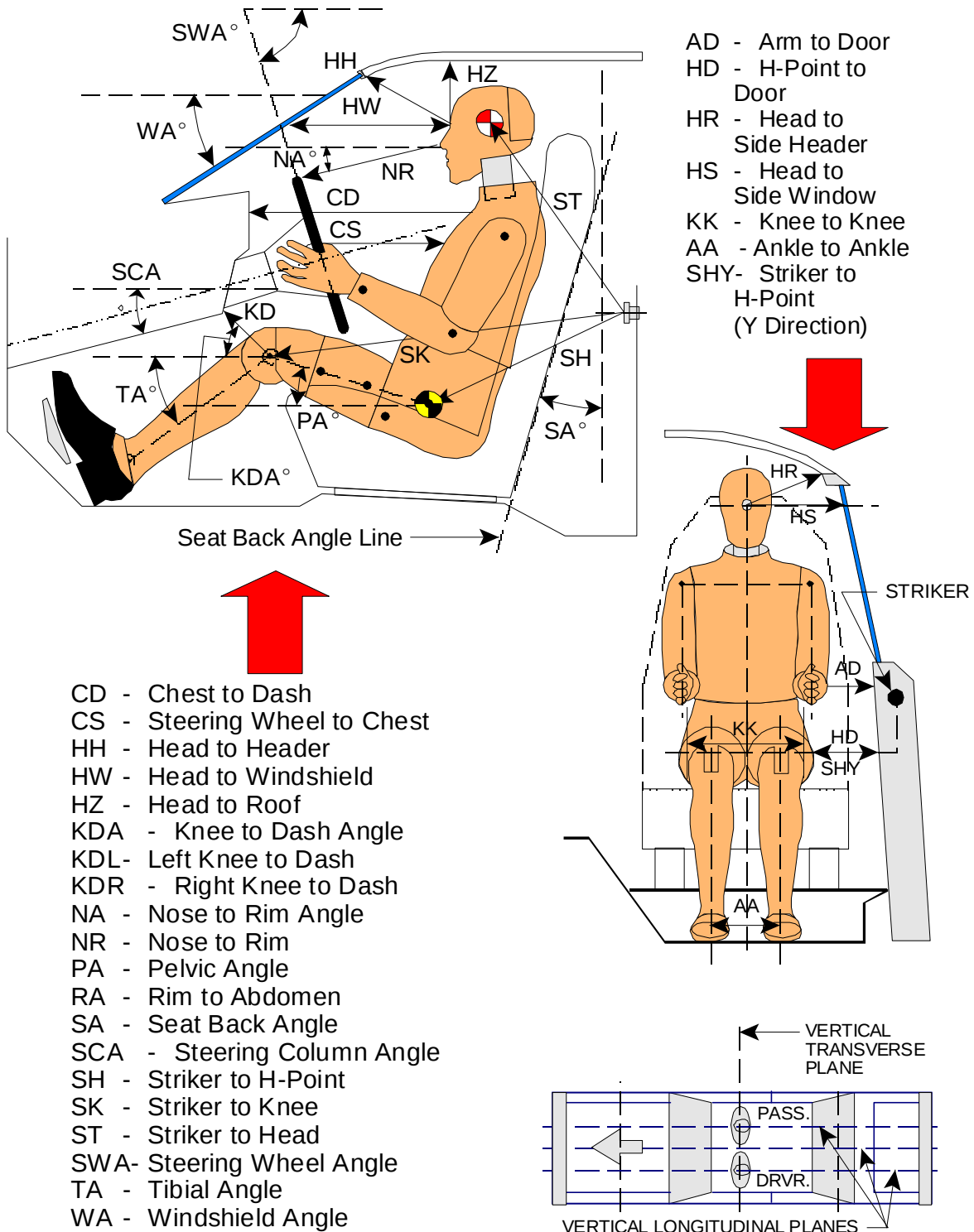
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions: The steering wheel was placed the 4th position from the upper-most position for a target steering wheel angle of 66.5 degrees. An actual steering wheel angle of 67.4 degrees was achieved.

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: The shoulder belt anchorage was positioned in the 2nd lock position, where the upper-most position was defined as the 1st lock position.

DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



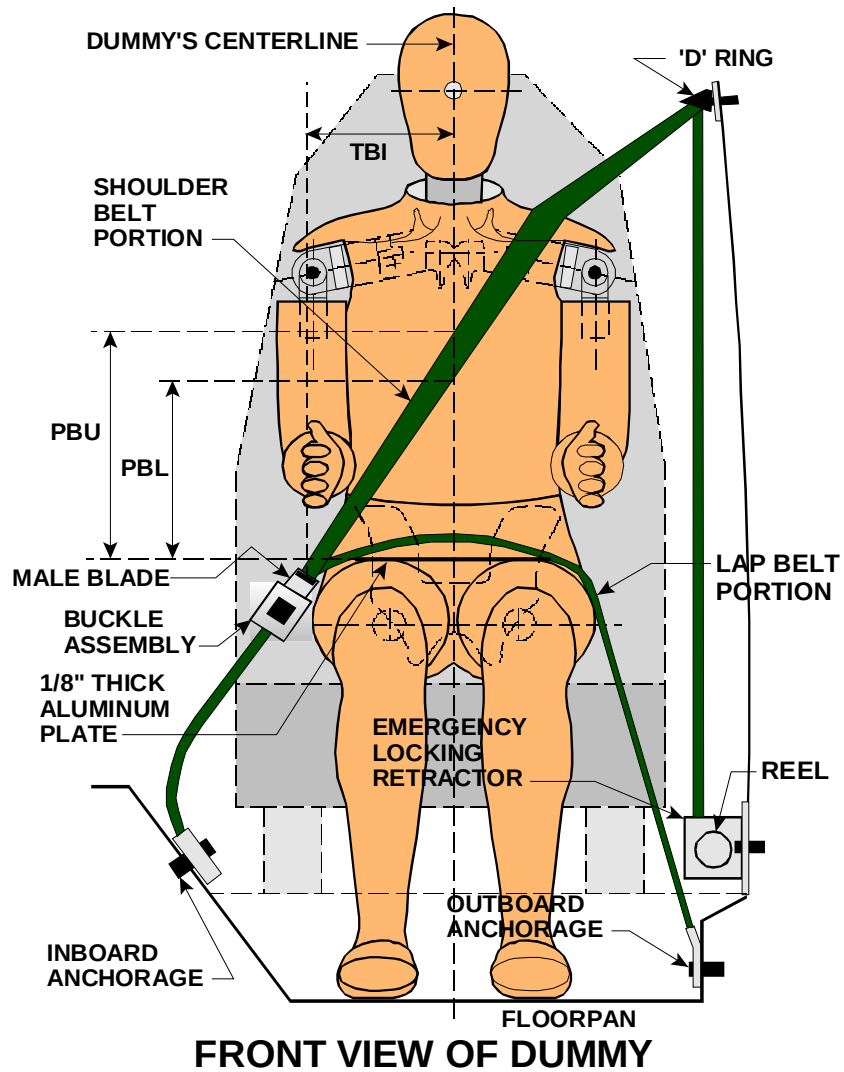
DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA ^o	28.5 deg.			N/A		
SWA ^o	67.4 deg.			N/A		
SCA ^o	22.6 deg.			N/A		
SA ^o	26 deg.			26 deg.		
HZ	188			177		
HH	323			315		
HW	635			598		
HR	183 (to side handle)			185 (to side handle)		
NR	425	Angle	12 deg.	N/A		
CD	549			572		
CS	313			N/A		
RA	198			N/A		
KDL	175	Angle (KDA)	28 deg.	170		
KDR	170			159	Angle (KDA)	27 deg.
PA ^o	24.5 deg.			24.5 deg.		
TA ^o	36.5 deg.			36.3 deg.		
KK	400			325		
AA	370			231		
ST	548	Angle	9 deg.	532	Angle	9 deg.
SK	615	Angle	91 deg.	624	Angle	91 deg.
SH	247	Angle	112 deg.	259	Angle	112 deg.
SHY	230			225		
HS	352			352		
HD	158			154		
AD	126			130		

Dimensions in millimeters

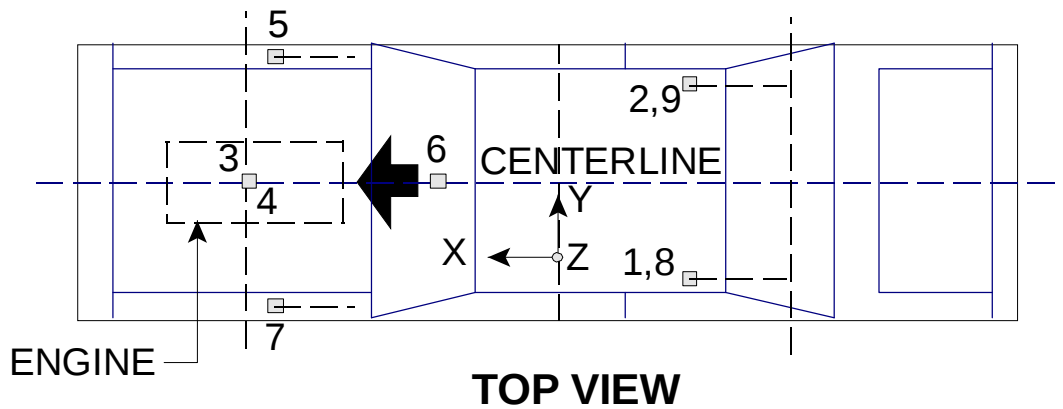
DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA

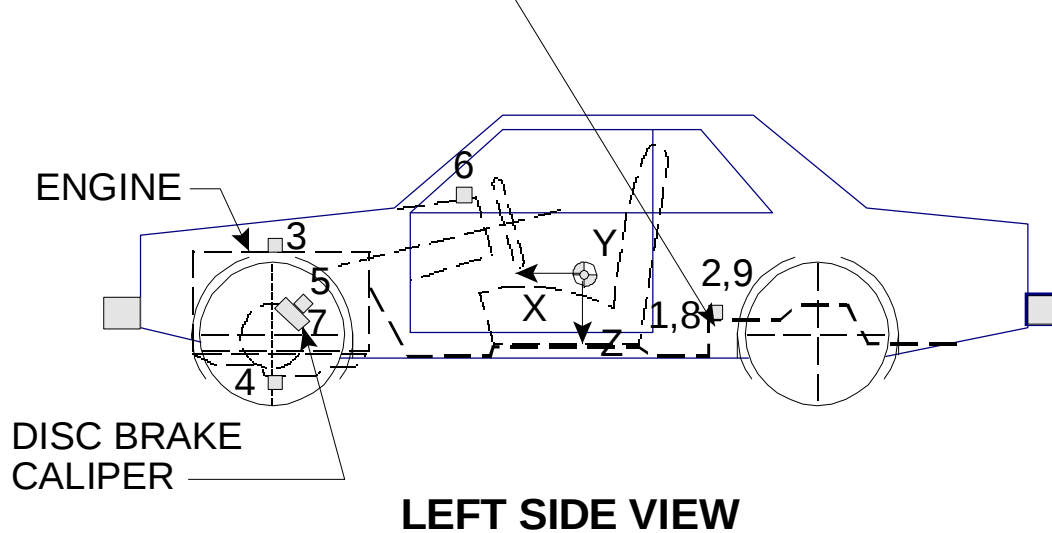


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	355	353
PBL-- Top surface of alum. plate to belt lower edge	270	268
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



Note: Vehicle accelerometer location and data summary shown in DATA SHEET NO. 7

DATA SHEET NO. 7 VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY (cont.)

LOCATION		PRE-TEST LENGTH (mm)		
		X	Y	Z
1	Left Rear Seat Cross Member X	2045	-509	-219
2	Right Rear Seat Cross Member X	2025	469	-250
3	Top of Engine Block	4154	-128	-649
4	Bottom of Engine	3696	-46	-122
5	Disc Brake Caliper @ Right Side	4033	848	-335
6	Instrument Panel	3144	-31	-843
7	Disc Brake Caliper @Left Side	4028	-836	-328
8	Left Rear Seat Cross Member Z	2045	-509	-219
9	Right Rear Seat Cross Member Z	2025	469	-250

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Left Rear Seat Cross Member X	2.0	114.7	-44.2	34.3
2	Right Rear Seat Cross Member X	1.6	102.5	-40.9	35.1
3	Top of Engine Block	6.1	47.6	-105.2	28.2
4	Bottom of Engine	23.3	34.8	-139.4	27.2
5	Disc Brake Caliper @ Right Side	40.4	68.2	-79.9	48.4
6	Instrument Panel	16.7	72.2	-69.4	42.5
7	Disc Brake Caliper @Left Side	37.0	63.4	-82.9	40.3
8	Left Rear Seat Cross Member Z	4.7	74.8	-7.7	40.8
9	Right Rear Seat Cross Member Z	7.7	49.8	-6.1	32.0

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2004 Hyundai XG350 4-Door Sedan

NHTSA Test No.: M40503 Test Date: December 19, 2003

DESCRIPTION	Unit	MAXIMUM VALUE							
		Driver				Passenger			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head 9 Array X Arm Y	g	2.5	191.4	-15.6	85.3	12.2	84.2	-1.4	176.4
Head 9 Array X Arm Z	g	33.6	50.3	-8.0	135.6	32.9	69.5	-8.7	132.4
Head 9 Array Y Arm X	g	3.4	295.2	-58.1	73.0	2.8	254.7	-54.4	79.0
Head 9 Array Y Arm Z	g	23.5	49.8	-8.5	94.7	24.7	80.5	-2.2	122.6
Head 9 Array Z Arm X	g	5.7	51.7	-57.7	72.6	4.2	239.4	-47.5	84.7
Head 9 Array Z Arm Y	g	3.0	145.4	-18.1	86.7	†	-	†	-
Head X	g	2.9	299.8	-54.5	74.7	2.4	248.7	††	-
Head Y	g	2.4	49.5	-17.4	91.2	15.4	75.6	-3.8	153.4
Head Z	g	23.1	59.2	-3.6	94.6	23.1	68.9	-2.0	132.5
Head Resultant	g	59.6	72.7	-	-	‡‡	-	-	-
Redundant Head X	g	2.9	299.7	-53.7	74.6	2.4	252.1	-50.1	77.2
Redundant Head Y	g	2.4	39.6	-17.7	92.4	10.4	95.0	*	-
Redundant Head Z	g	23.5	72.2	-3.4	94.6	23.3	68.5	-1.7	131.0
Redundant Head Resultant	g	59.1	73.3	-	-	53.5	80.8	-	-
Upper Neck Fx	N	489.0	65.0	-483.3	134.9	85.4	253.6	-696.8	70.7
Upper Neck Fy	N	166.8	65.1	-205.9	112.6	138.2	94.1	-83.8	142.5
Upper Neck Fz	N	1932.5	72.6	-69.7	139.8	1739.0	69.2	-88.1	131.4
Upper Neck F Resultant	N	1965.4	72.6	-	-	1855.5	69.2	-	-
Upper Neck Mx	N-m	7.4	146.1	-22.2	116.6	20.1	87.2	-7.4	147.7
Upper Neck My	N-m	53.7	64.1	-20.2	94.8	47.2	121.7	-59.6	71.6
Upper Neck Mz	N-m	24.2	95.5	-12.5	149.3	6.5	141.7	-15.5	96.7
Upper Neck M Resultant	N-m	55.1	64.2	-	-	59.8	71.5	-	-
Chest X	g	2.4	138.4	-46.4	79.9	1.7	141.5	-45.5	76.6
Chest Y	g	4.2	83.8	-6.9	56.0	5.4	79.2	-2.4	94.5
Chest Z	g	14.7	100.3	-8.6	48.6	7.2	46.3	-8.7	103.9
Chest Resultant	g	46.6	79.9	-	-	45.7	76.7	-	-

† Data questionable after 51ms

†† Data Spikes: 77, 81 ms

‡ Data Spikes: 76, 83 ms

‡‡ Data Spikes: 76-77, 81-83 ms

* Data Spikes: After 120 ms

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2004 Hyundai XG350 4-Door Sedan

NHTSA Test No.: M40503 Test Date: December 19, 2003

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Redundant Chest X	g	2.4	138.4	-46.5	79.9	†	-	†	-
Redundant Chest Y	g	4.9	77.8	-7.0	55.9	6.2	79.3	-2.4	100.7
Redundant Chest Z	g	14.9	101.8	-8.8	48.6	7.1	46.2	-8.8	103.9
Redundant Chest Resultant	g	46.7	79.9	-	-	†	-	-	-
Chest Displacement	mm	0.0	-6.9	-38.1	74.6	0.0	-40.3	-32.3	76.6
Pelvic X	g	2.5	127.5	-84.9	55.7	††	-	††	-
Pelvic Y	g	10.3	84.1	-13.1	46.6	††	-	††	-
Pelvic Z	g	2.4	239.9	-24.1	79.3	††	-	††	-
Pelvic Resultant	g	87.6	55.7	-	-	††	-	-	-
Left Femur	N	561.8	46.2	-4288.3	50.7	307.7	47.6	-5395.3	59.1
Right Femur	N	210.5	33.3	-5710.1	55.6	345.3	101.3	-4947.6	49.1
Left Upper Tibia Mx	N-m	35.8	61.3	-10.0	51.9	44.1	72.2	-21.6	55.8
Left Upper Tibia My	N-m	41.6	49.5	-100.5	64.5	135.3	49.6	-136.0	43.4
Left Lower Tibia Fz	N	*	-	-2124.3	30.9	268.1	49.9	-3363.9	72.2
Left Lower Tibia Mx	N-m	6.3	102.1	-14.0	65.3	11.6	85.4	-8.2	58.3
Left Lower Tibia My	N-m	39.0	90.7	-26.7	60.4	86.9	67.5	-57.1	43.9
Right Upper Tibia Mx	N-m	63.3	57.0	-46.7	44.6	9.8	264.4	-24.5	70.6
Right Upper Tibia My	N-m	21.3	136.0	-191.8	45.6	86.6	51.6	-108.3	70.3
Right Lower Tibia Fz	N	99.1	135.5	-8350.1	46.7	38.2	120.1	-3649.7	44.2
Right Lower Tibia Mx	N-m	88.4	47.0	-6.1	41.4	15.3	64.0	-22.8	79.7
Right Lower Tibia My	N-m	48.5	72.6	-15.0	49.2	50.9	52.3	-24.6	44.3
Left Foot Aft Ax	g	10.7	91.5	-44.6	50.3	111.0‡	63.0	-188.8	45.6
Left Foot Aft Az	g	4.4	191.7	-47.5	50.1	30.7‡†	196.7	-270.5‡†	113.1
Left Foot Fore Az	g	4.5	132.0	-64.9	50.2	97.3	65.7	-159.3	42.4
Right Foot Aft Ax	g	15.5	73.3	-133.2	47.6	32.4	63.8	-134.8	44.2
Right Foot Aft Az	g	19.1	54.7	-151.4	46.3	34.4	63.7	-68.9	47.2
Right Foot Fore Az	g	32.4	54.7	-202.7	47.3	83.9	63.7	-107.4	51.8
Lap Belt Load	N	7294.9	52.2	0.8	-28.5	6726.9	60.1	-23.8	150.7
Torso Belt	N	-	-	-	-	-	-	-	-

† Chest Ax redundant transducer failed

†† Data questionable after 59ms

‡ Data questionable after 52ms

‡† Data questionable after 56ms

* Data Spikes: 197-200 ms

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2004 Hyundai XG350 4-Door Sedan

NHTSA Test No.: M40503 Test Date: December 19, 2003

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	371.2	53.5	89.5	40.3
Position #2 - Passenger	396.1	65.1	101.1	41.4

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

CLIP SUMMARY*				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	44.3	78.2	81.2	484.8
Position #2 - Passenger	45.1	74.9	77.9	421.7

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
REDUNDANT DATA

Vehicle Year/Make/Model/Body Style: 2004 Hyundai XG350 4-Door Sedan

NHTSA Test No.: M40503 Test Date: December 19, 2003

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	358.5	53.7	89.7	39.7
Position #2 - Passenger	376.6	65.0	101.0	40.5

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

CLIP SUMMARY* REDUNDANT				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	44.2	78.2	81.2	481.5
Position #2 - Passenger	45.1†	74.9	77.9	421.6

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

† Chest Ax redundant transducer failed. The Chest Ax primary data was used for the CLIP calculation.

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

Belt length from trim panel exit
to bolt hole anchor point for
continuous webbing systems.

Driver

Passenger

2088

2100

Shoulder belt length as measured
on Part 572 Dummy.

860

880

Lap belt length as measured
on Part 572 Dummy.

868

860

SHOULDER BELT SPOOL-OFF DATA:

As determined mechanically.

130 mm

No Data †

BELT STRETCH DATA:

Measured mechanically.

0 mm/m

10 mm/m

† Device broke.

Dimensions in millimeters

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place and covered with a 20 mm molding.

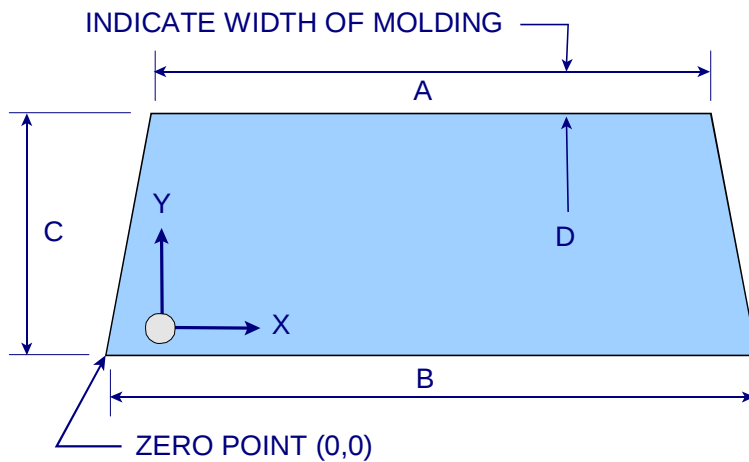
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants,

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2135	2135	100.0%
LEFT SIDE	2135	2135	100.0%
TOTAL	4270	4270	100.0%

AREA OF RETENTION FAILURE:



DIMENSIONS (mm)	
A	1160
B	1550
C	780
D	20

FRONT VIEW OF WINDSHIELD

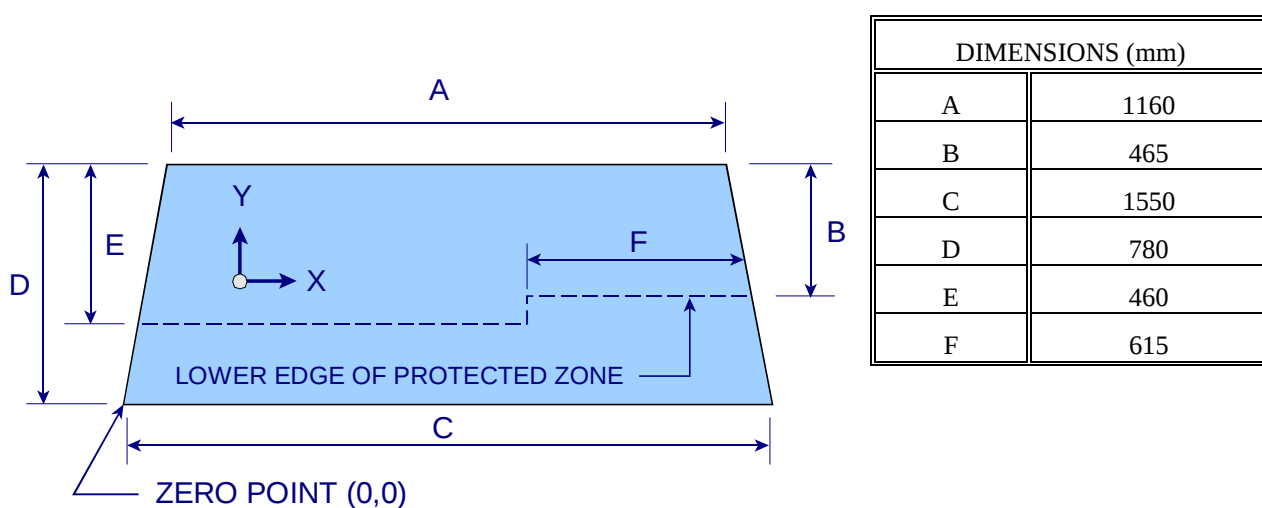
FAILURE DETAILS: None

DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 165 mm diameter rigid sphere weighing 6.8 kg in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points extend the locus line horizontally to the edges of the windshield, then draw a line on the inner surface of the windshield below and 13 mm distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA:



FRONT VIEW OF WINDSHIELD

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm: None

(Show location of penetration on the above sketch)

COORDINATES		
	X	Y
1.	-	-
2.	-	-
3.	-	-
4.	-	-

NHTSA TEST No.: M40503 TEST DATE: December 19, 2003

VEHICLE MAKE/MODEL: 2004 Hyundai XG350 4-Door Sedan

=====

TEST VEHICLE IMPACT TYPE:	
X	Frontal (56 kph)
	Oblique (48 kph) with _____ deg. barrier face first contacting _____
-	(driver/passenger) side
-	Rear Moving Barrier (48 kph)
-	Lateral Moving Barrier (32 kph)

1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

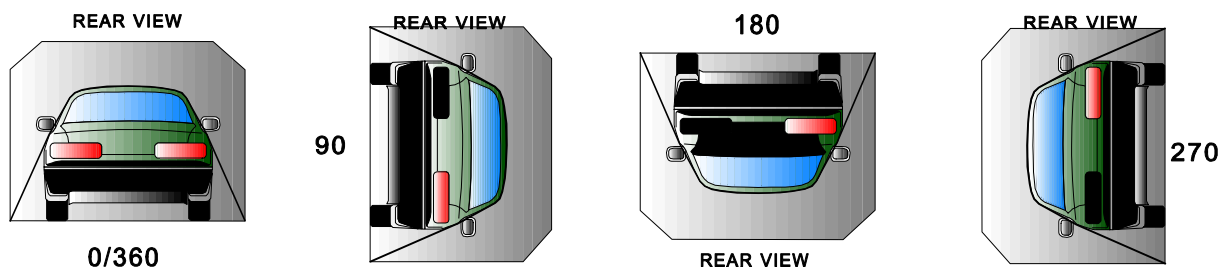
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

8642-NCAP-38

DATA SHEET NO. 13 - ROLLOVER DATA

Vehicle: 2004 Hyundai XG350 4-Door Sedan

NHTSA No.: M40503



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	minutes	8	seconds	5	minutes	6	minutes	8	seconds	7	minutes
90° - 180°	1	minutes	2	seconds	5	minutes	6	minutes	2	seconds	7	minutes
180°-270°	1	minutes	2	seconds	5	minutes	6	minutes	2	seconds	7	minutes
270°-360°	1	minutes	6	seconds	5	minutes	6	minutes	6	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

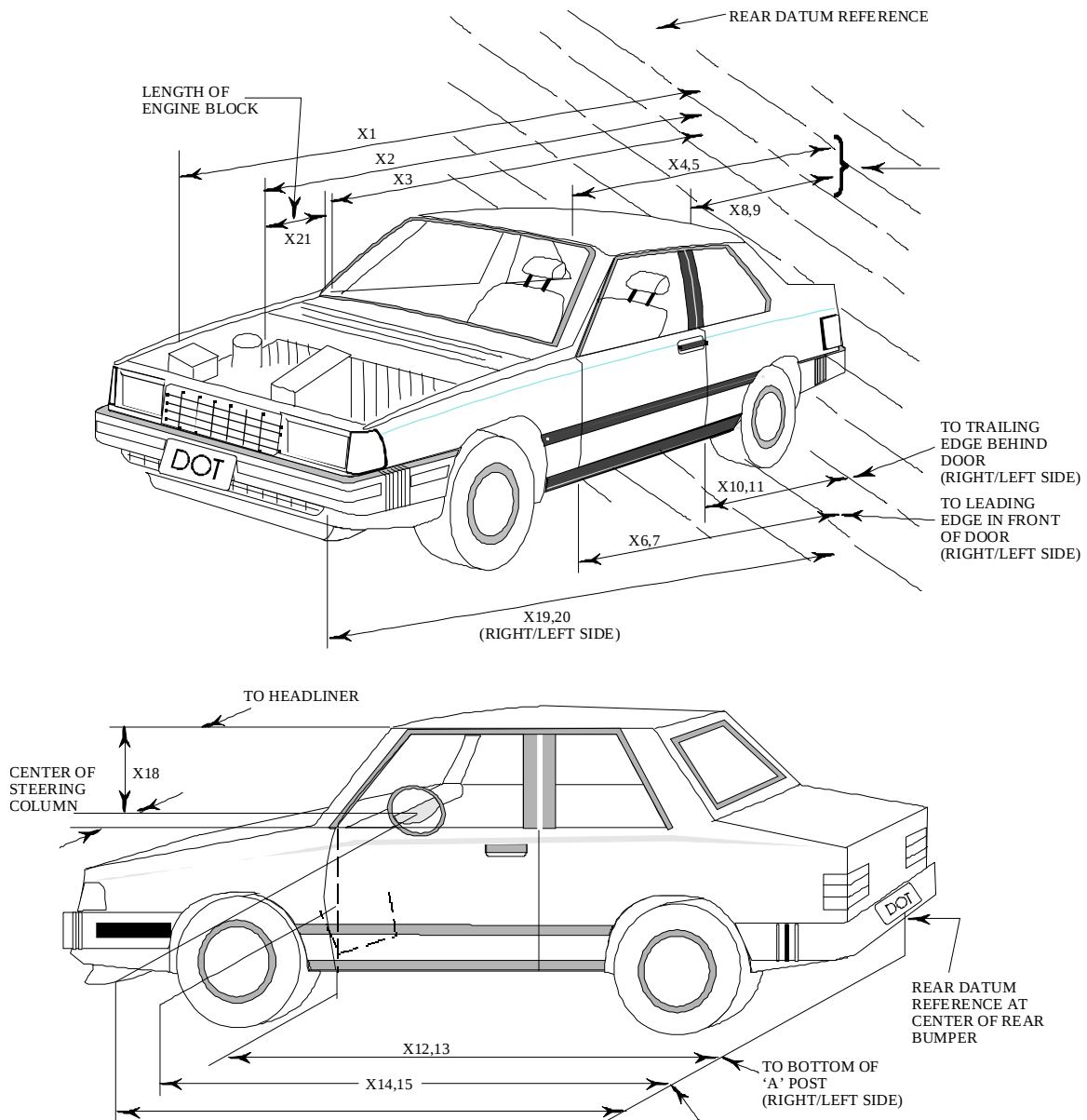
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

Rollover Stage	Spillage Location
0° - 90°	None
90° - 180°	None
180°-270°	None
270°-360°	None

DATA SHEET NO. 14 TEST VEHICLE MEASUREMENTS

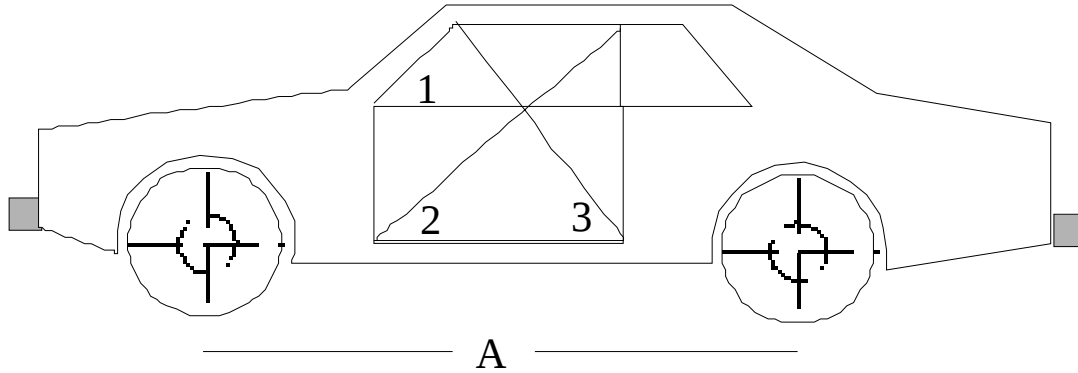


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4877	4508	369
X2	Rear Surface of Vehicle to Front of Engine	4389	4169	220
X3	Rear Surface of Vehicle to Firewall	3700	3551	149
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3354	3351	3
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3359	3344	15
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3333	3331	2
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3339	3323	16
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2260	2260	0
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2268	2256	12
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2268	2274	-6
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2275	2259	16
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3303	3293	10
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3302	3284	18
X14	Rear Surface of Vehicle to Firewall, Right Side	3662	3583	79
X15	Rear Surface of Vehicle to Firewall, Left Side	3659	3587	72
X16	Rear Surface of Vehicle to Steering Column	2907	2885	22
X17	Center of Steering Column to "A" Post	333	358	-25
X18	Center of Steering Column to Headliner	443	502	-59
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4811	4487	324
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4808	4489	319
X21	Length of Engine Block	562	561	1
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3083	3070	13
CD	Rear Surface of Vehicle to Center of Dash Panel	3157	3119	38
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3090	3060	30

All Dimensions in mm

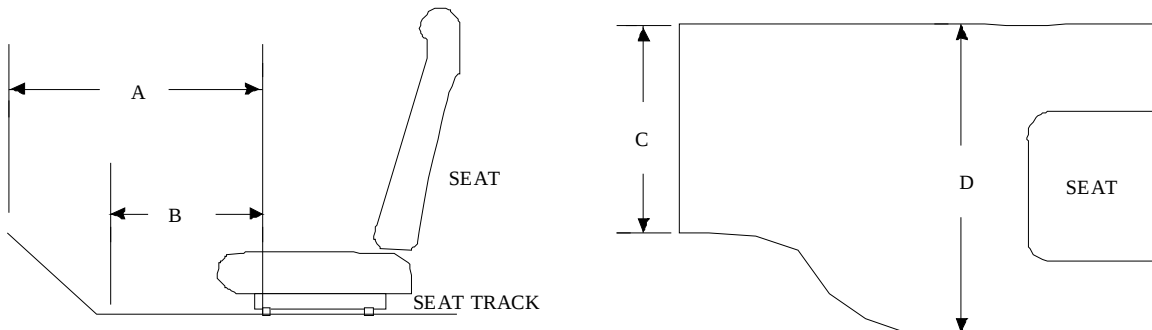
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	991	1433	973	990	1414	977
AFTER TEST	972	1430	984	979	1418	978
DIFFERENCE	19	3	-11	11	-4	-1

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2748	2748
AFTER TEST	2644	2689
DIFFERENCE	104	59

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 STATIC FOOTWELL DEFORMATION



DRIVER

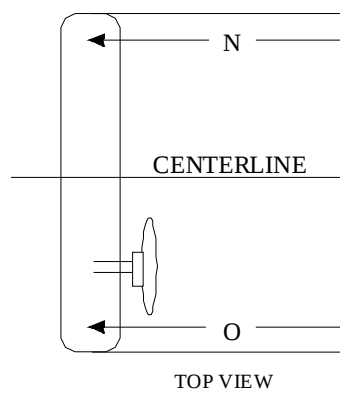
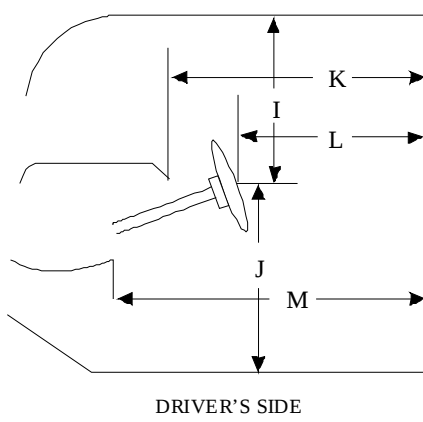
Measurement	Pre-Test	Post-Test	Difference
A	786	699	87
B	562	531	31
C	493	449	44
D	517	530	-13

PASSENGER

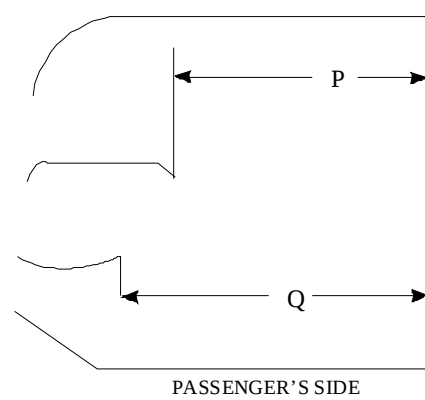
Measurement	Pre-Test	Post-Test	Difference
A	757	666	91
B	528	499	29
C	468	445	23
D	490	497	-7

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 STATIC PASSENGER COMPARTMENT INTRUSION



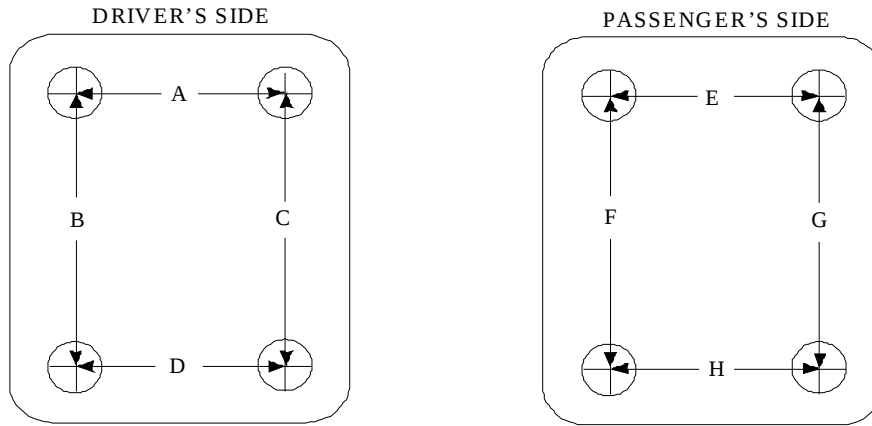
MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



Measurement	Pre-Test	Post-Test	Difference
I	443	502	-59
J	617	599	18
K	1945	1875	70
L	1721	1696	25
M	1945	1917	28
N	1911	1898	13
O	1905	1872	33
P = K (PASS.)	2031	2018	13
Q = M (PASS.)	1987	1967	20

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
FLOORBOARD DEFORMATION

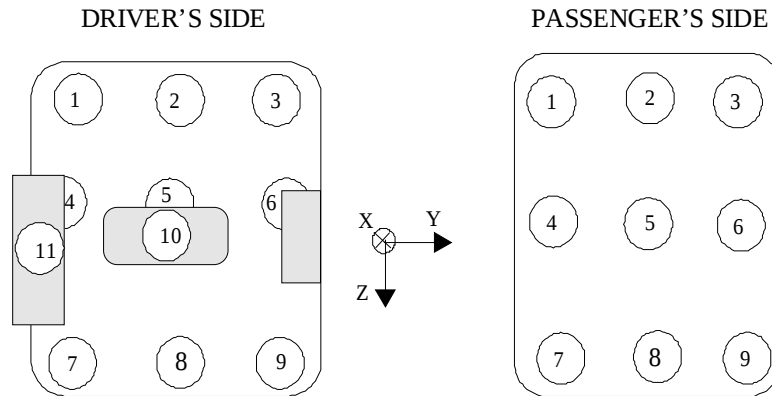


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	493	449	44
B	390	427	-37
C	405	347	58
D	517	530	-13
E	468	445	23
F	428	424	4
G	434	383	51
H	490	497	-7

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
TOE-PAN INTRUSION



Driver Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3607	3504	103	-478	-516	38
2	3609	3509	100	-474	-514	40
3	3602	3520	82	-463	-507	44
4	3541	3416	125	-343	-365	22
5	3519	3413	106	-330	-372	42
6	3532	3403	129	-335	-344	9
7	3389	3378	11	-251	-283	32
8	3385	3341	44	-248	-234	-14
9	3378	3278	100	-243	-223	-20
10	3393	3345	48	-422	-429	7
11	3424	3388	36	-343	-355	12

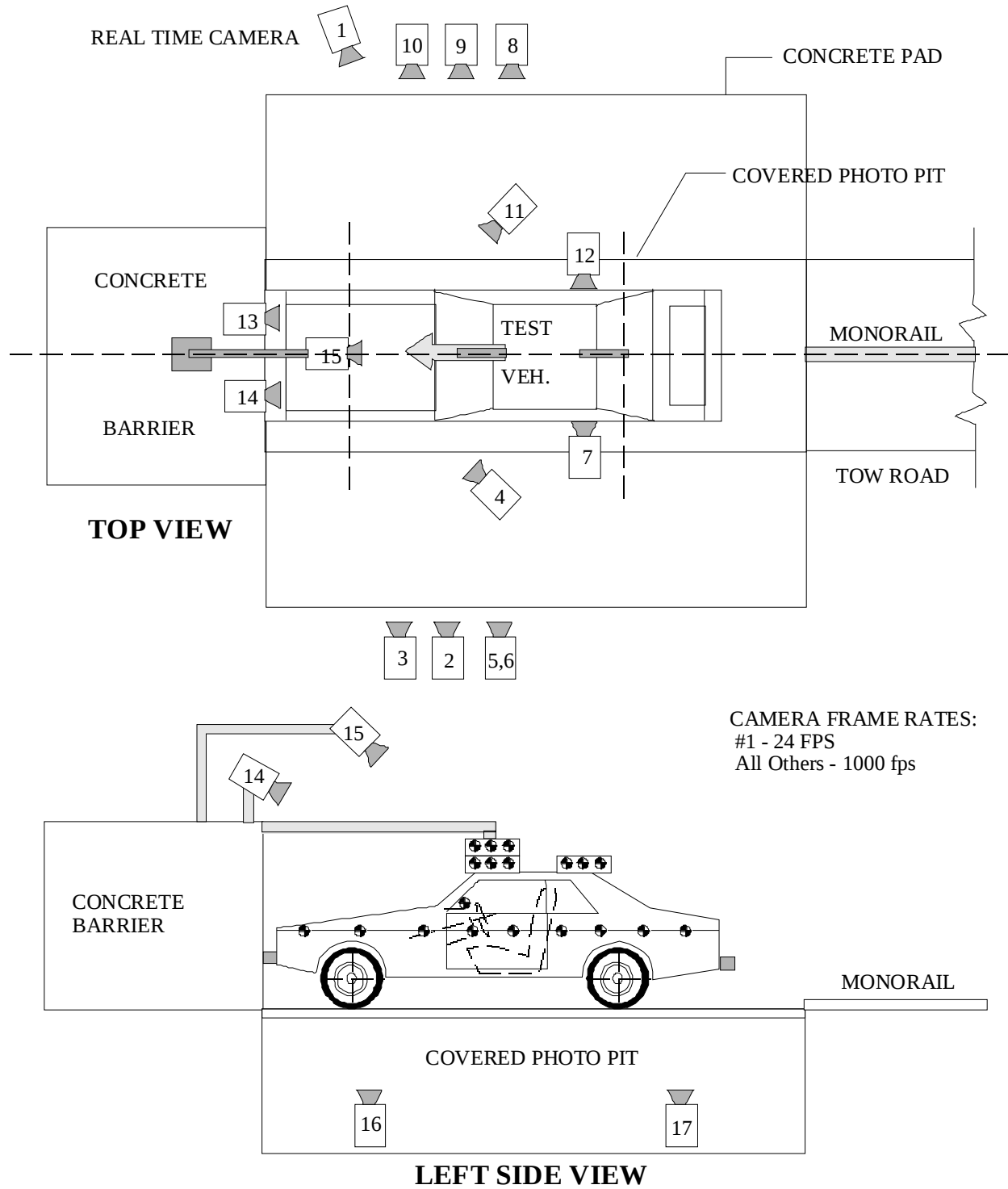
Passenger Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3552	3501	51	-448	-447	-1
2	3572	3495	77	-438	-441	3
3	3551	3506	45	-458	-479	21
4	3457	3311	146	-330	-324	-6
5	3455	3367	88	-331	-345	14
6	3461	3424	37	-335	-357	22
7	3346	3316	30	-261	-249	-12
8	3343	3327	16	-262	-228	-34
9	3346	3342	4	-268	-244	-24

Reference: SAE: X = Rear Bumper (Positive: forward); Z = Ground (Positive: down)

DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

NOTE: Camera information shown in DATA SHEET NO. 15.



DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS (cont.)

NHTSA Test No.: M40503 Vehicle: 2004 Hyundai XG350 4-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	6726	1735	1090	-3	6401	12.5	1015
3	Left Side View	7880	865	1110	-3	7555	25	1030
4	Driver and Interior View	7790	2815	2000	-10	-	25	1060
5	Steering Column (Bottom)	7620	2055	1170	-3	7295	25	1025
6	Steering Column (Top)	7620	2055	1775	-8	7295	25	1015
7	Left Lateral View	943	3095	1075	-6	-	13	1015†
8	Overall Right Side	6796	2035	1050	-3	7111	12.5	1010
9	Right Side View	8125	1510	1120	-3	8440	25	1000
10	Right Passenger View	8270	2070	1310	-3	8585	35	1010
11	Passenger and Interior View	7700	3165	1980	-9	-	25	955
12	Right Lateral View	943	3110	1060	-6	-	13	1015†
13	Passenger Front View	620	-92	1987	-36	-	13	960
14	Driver Front View	620	-92	1987	-37	-	13	1020
15	Windshield View	0	-530	3374	-50	-	13	1005
16	Pit View of Engine	0	615	-3048	90	-	13	1010
17	Pit View of Fuel Tank	0	3100	-3048	90	-	13	1010

*X = film plane to monorail centerline ** = referenced to horizontal plane

Y = film plane to impact location N.T. indicates No Timing

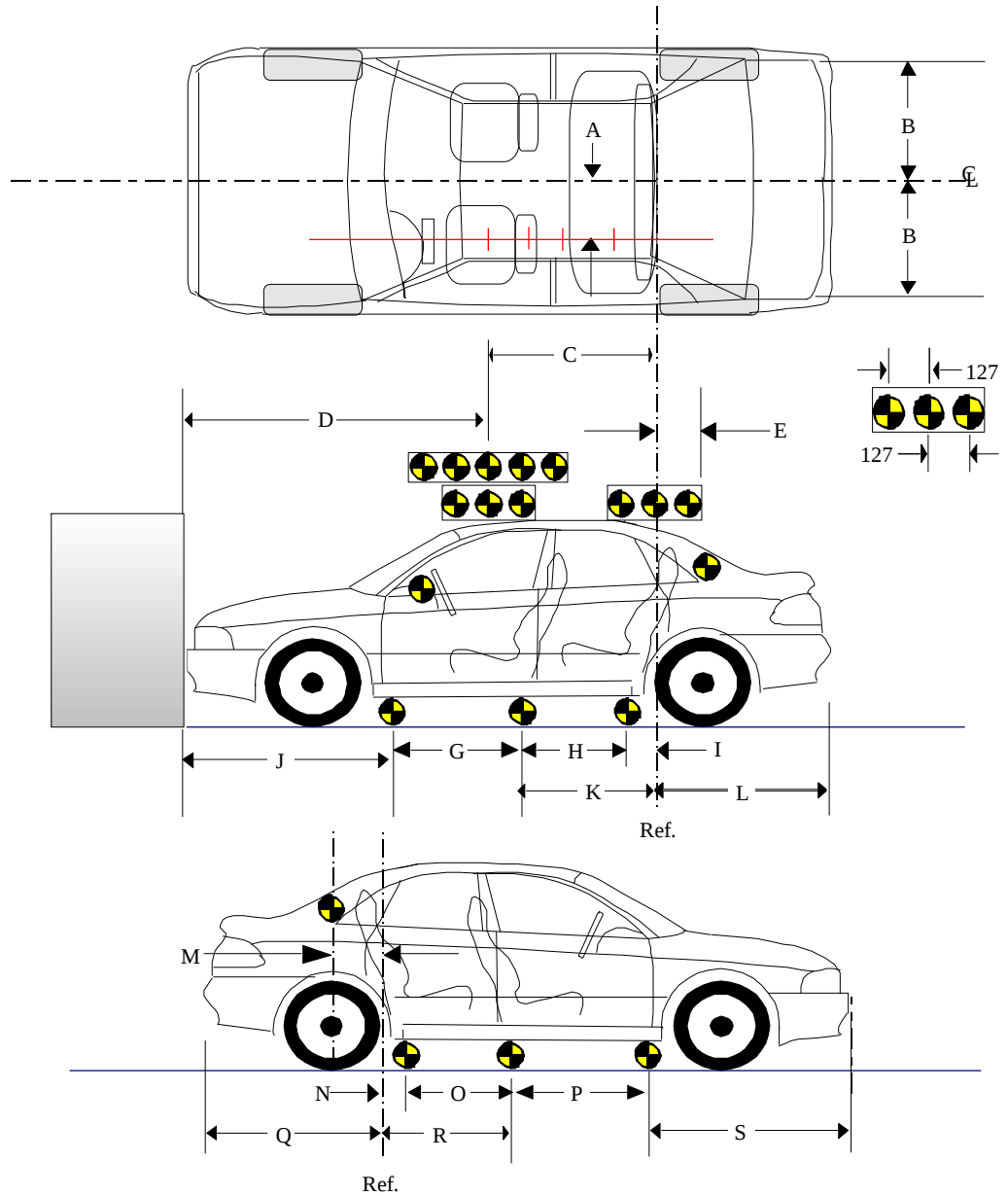
Z = film plane to ground

† Time-zero strobe lights mounted inside of the vehicle received an early trigger. These strobes flashed 28.5 milliseconds before vehicle bumper to barrier contact.

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

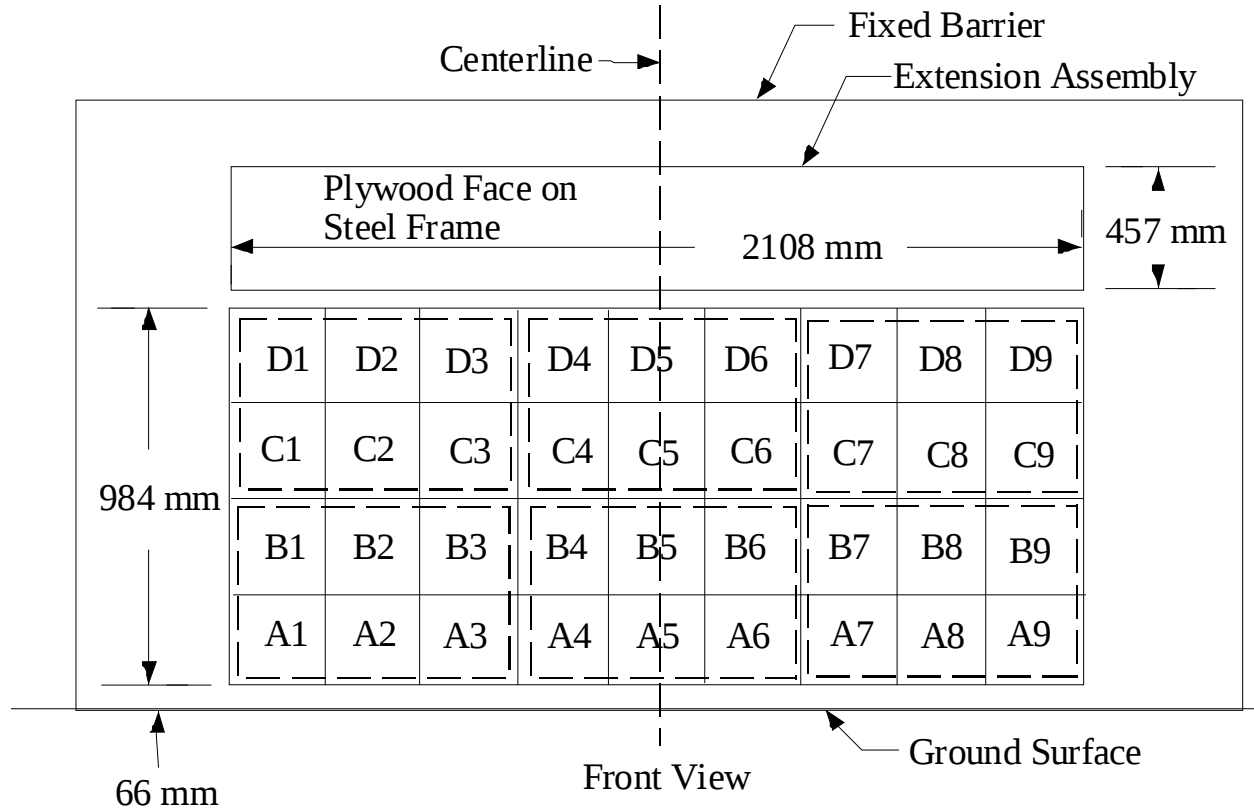
(Dimensions in millimeters)

A	391
B	640
C	1217
D	2187
E	287
F	1570
G	919
H	935
I	87
J	1468
K	1022
L	1469
M	306
N	22
O	918
P	927
Q	1532
R	940
S	1479



DATA SHEET NO. 17 LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
 4 Rows
 9 Columns
 6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

The following data is presented in Appendix B:

- (1)Data from 36 individual load cells
- (2)Total or Sum of 36 individual load cells
- (3)Data from 6 Groupings shown above (6 cells/group)

DATA SHEET NO. 18 POST TEST AIR BAG DATA

NHTSA No.: M40503; Test Date: December 19, 2003; Technician: Lawrence Q. Valvo

Vehicle Model Year/Make/Model: 2004 Hyundai XG350 4-Door Sedan

A. No. of vent holes: 2 -Driver 2 -Passenger

B. Size of vent holes: (mm²) 314 -Driver 2124 -Passenger

C. Total vent area: (mm²) 628 -Driver 4248 -Passenger

D. Deflated air bag length and width dimensions or, if round, diameter. (mm)

Driver: 600 -Height; 600 -Width; 240 -Depth

Passenger: 520 -Height; 480 -Width; 530 -Depth

E. Is the air bag tethered?

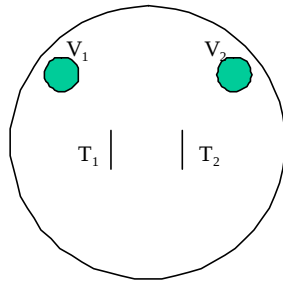
Driver: X -Yes; - -No; If yes, record length of tether- 280

Passenger: X -Yes; - -No; If yes, record length of tether- 220 (upper); 380 (lower)

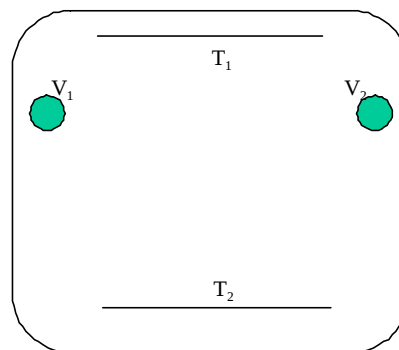
Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.

(Note: Not to scale; V_n = Vent hole_n, T_n = Tether_n).

Driver



Passenger



F. Record part numbers and manufacturer name of the air bag and gas generator.

Driver: Air bag: XG FL EEC AB3090220151 PA66

Generator: ACDS 3090220142

Passenger: Air bag: PT3090836083 PA66

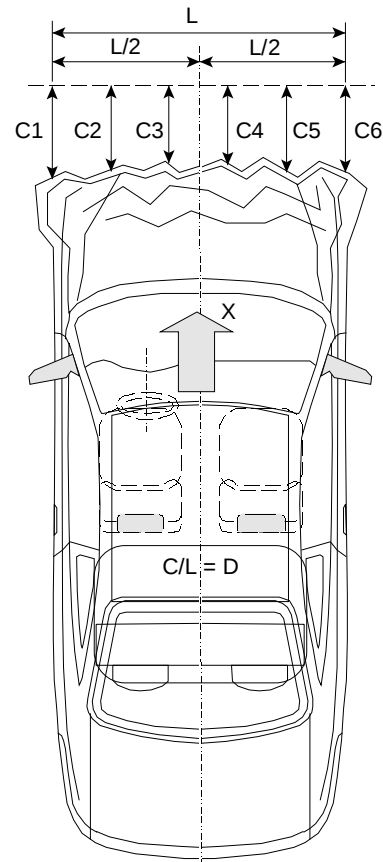
Generator: H2PS3090830061

DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA
FOR FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Hyundai XG350 4-Door Sedan
 NHTSA Test No.: M40503 VIN: KMHFU45E64A311695
 Model Year: 2004 Build Date: SEP/16/03 Test Date: December 19, 2003
 Vehicle Size Category: Passenger Car Test Weight: 1900.5 kg
 Vehicle Wheelbase: 2748 mm; Front Overhang: 993 mm; Overall Width: 1794 mm
 Collision Deformation Classification (CDC) Code: 12FDEW2

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4711	4458	253
C2 =	4822	4488	334
C3 =	4875	4506	369
C4 =	4870	4504	366
C5 =	4821	4487	334
C6 =	4690	4426	264



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region: L1= 1470 mm
 L2= 735 mm
 L5= 294 mm

APPENDIX A
PHOTOGRAPHS

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A-57	Post-Test Passenger Contact To Airbag	A-60
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Figure A-1 LOAD CELL LOCATIONS

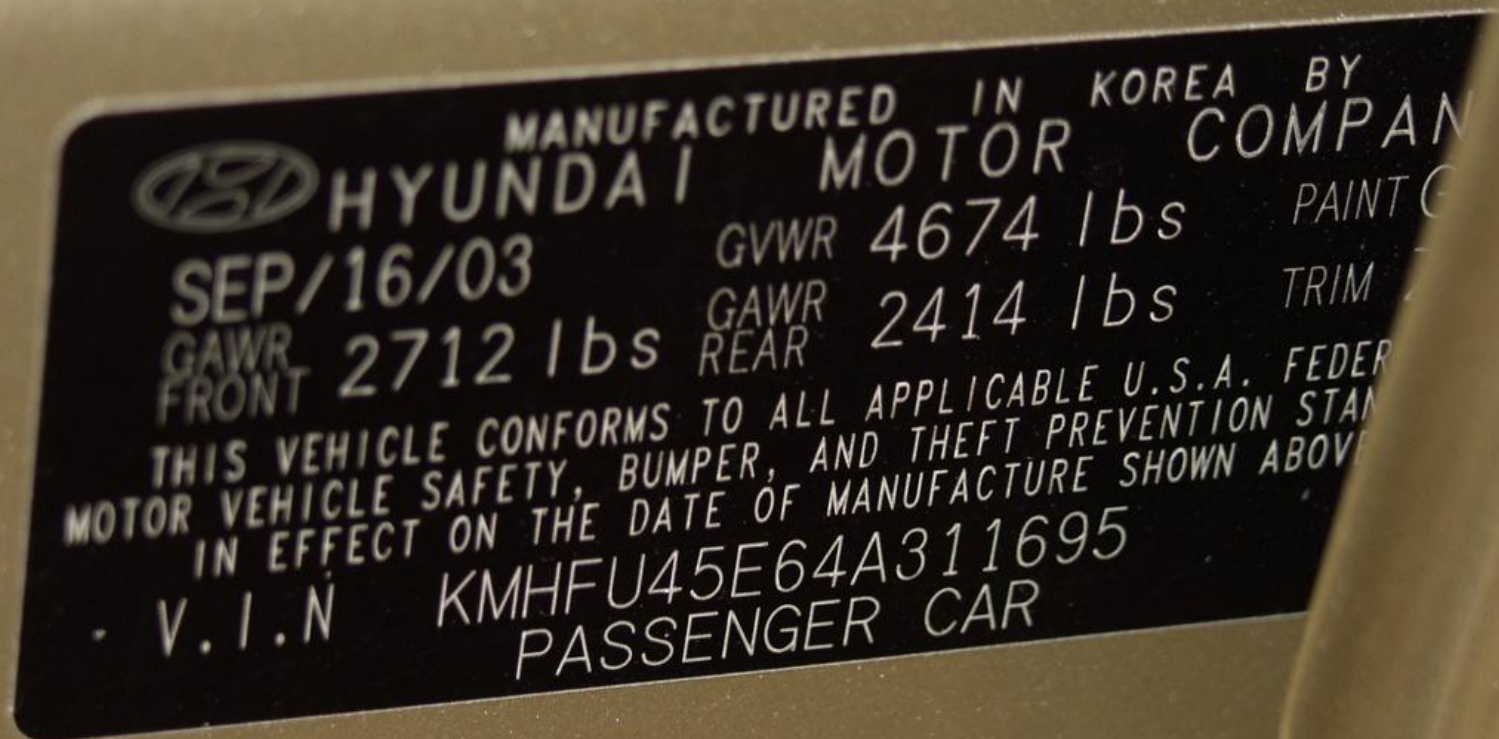


Figure A-2 VEHICLE CERTIFICATION PLACARD

0



TIRE INFORMATION

SEATING CAPACITY

TOTAL	5	FRONT	2	REAR	3
-------	---	-------	---	------	---

The combined weight of occupants and cargo should never exceed 860 pounds.

TIRE SIZE	COLD TIRE INFLATION PRESSURE	
	LOAD UP TO 4 PERSONS	FRONT REAR
P205/60R16 94H	MAX. VEHICLE WEIGHT LIMIT	FRONT REAR

**SEE OWNER'S
MANUAL FOR
ADDITIONAL
INFORMATION**

Figure A-3 VEHICLE TIRE PLACARD



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Figure A-4 RIGHT FRONT, AS RECEIVED



Figure A-5 LEFT REAR, AS RECEIVED



Figure A-6 PRE-TEST FRONT VIEW



Figure A-7 POST-TEST FRONT VIEW



Figure A-8 PRE-TEST LEFT SIDE VIEW



Figure A-9 POST-TEST LEFT SIDE VIEW



Figure A-10 PRE-TEST RIGHT SIDE VIEW



Figure A-11 POST-TEST RIGHT SIDE VIEW



Figure A-12 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-13 POST-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-14 PRE-TEST LEFT REAR THREE-QUARTER VIEW

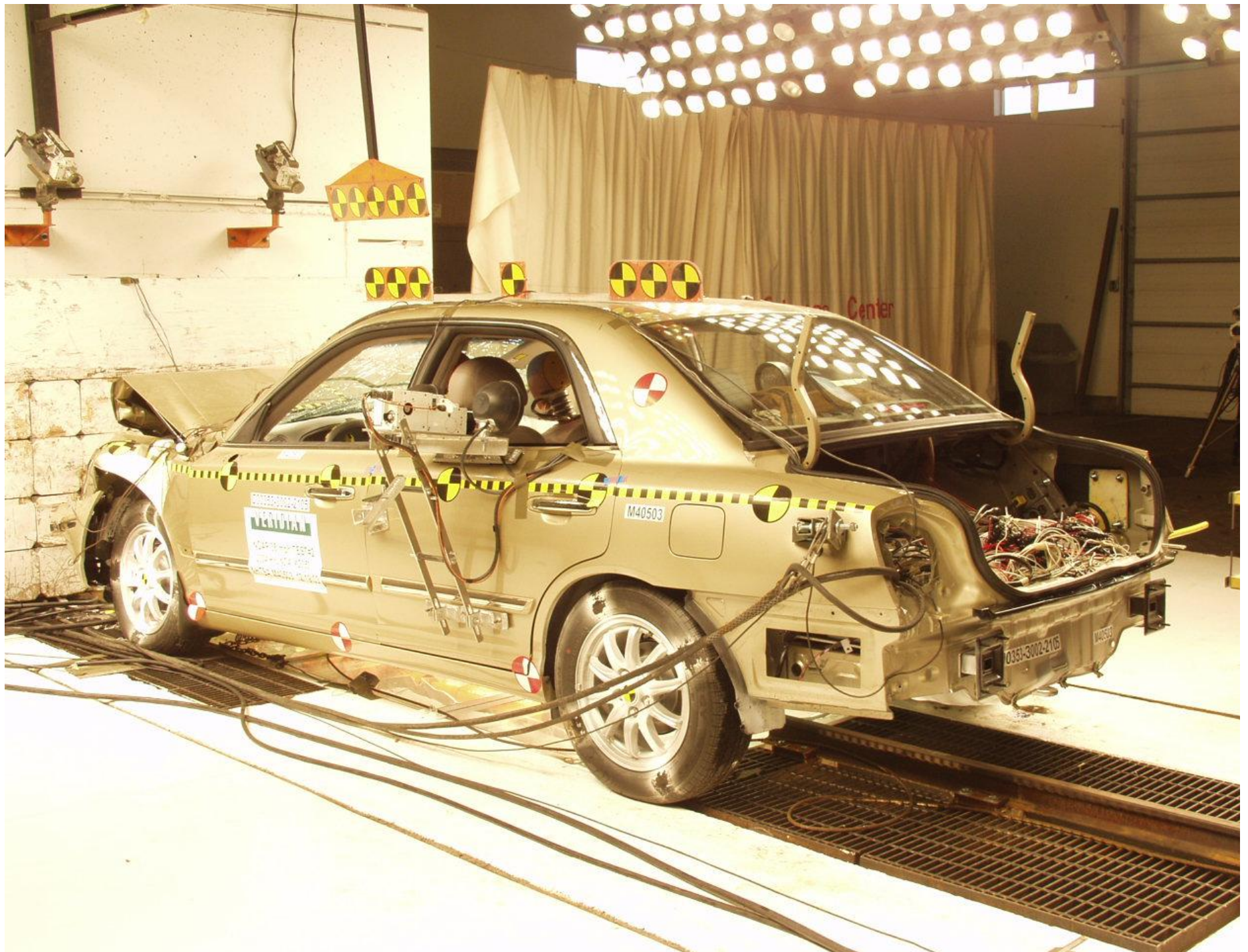


Figure A-15 POST-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-16 LEFT REAR THREE-QUARTER VIEW OF DOORS AFTER IMPACT



Figure A-17 RIGHT REAR THREE-QUARTER VIEW OF DOORS AFTER IMPACT



Figure A-18 PRE-TEST WINDSHIELD VIEW



Figure A-19 POST-TEST WINDSHIELDVIEW



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Figure A-20 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-21 POST-TEST ENGINE COMPARTMENT VIEW



Figure A-22 PRE-TEST FUEL CAP VIEW



Figure A-23 POST-TEST FUEL CAP VIEW



Figure A-24 PRE-TEST FRONT UNDERBODY VIEW



Figure A-25 POST-TEST FRONT UNDERBODY VIEW



Figure A-26 PRE-TEST MID UNDERBODY VIEW



Figure A-27 POST-TEST MID UNDERBODY VIEW

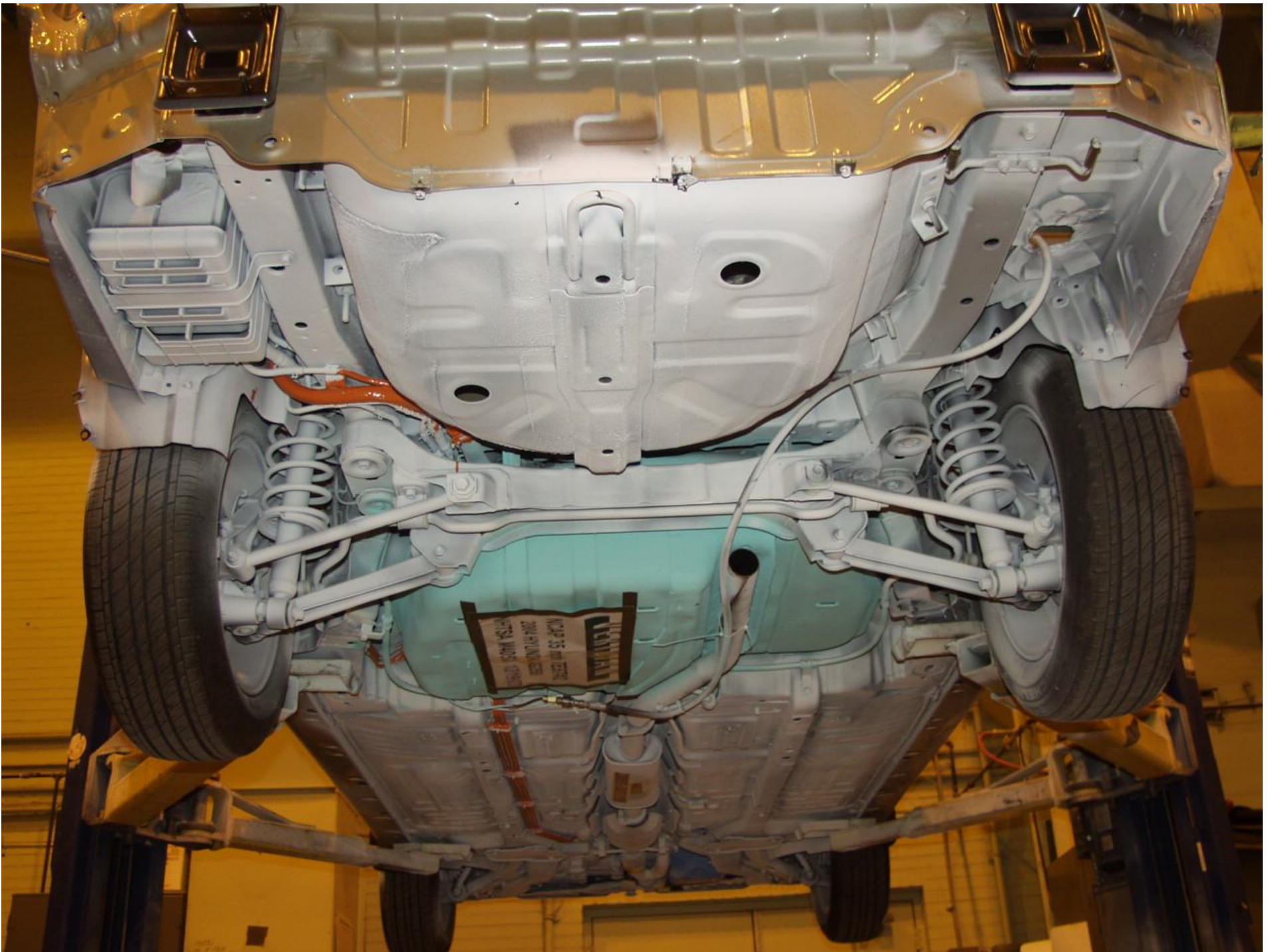


Figure A-28 PRE-TEST REAR UNDERBODY VIEW



Figure A-29 POST-TEST REAR UNDERBODY VIEW



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Figure A-30 PRE-TEST DRIVER HEAD LOCATION



Figure A-31 POST-TEST DRIVER HEAD LOCATION



Figure A-32 PRE-TEST DRIVER POSITION VIEW



Figure A-33 POST-TEST DRIVER POSITION VIEW



Figure A-34 PRE-TEST DRIVER AND INTERIOR VIEW



Figure A-35 POST-TEST DRIVER AND INTERIOR VIEW



Figure A-36 PRE-TEST DRIVER FEET VIEW



Figure A-37 POST-TEST DRIVER FEET VIEW



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Figure A-39 POST-TEST DRIVER KNEE BOLSTER VIEW



Figure A-40 PRE-TEST DRIVER FLOOR PAN VIEW



Figure A-41 POST-TEST DRIVER FLOOR PAN VIEW



Figure A-42 POST-TEST DRIVER HEAD VIEW



Figure A-43 POST-TEST DRIVER CONTACT TO AIRBAG



Figure A-44 PRE-TEST PASSENGER HEAD LOCATION



Figure A-45 POST-TEST PASSENGER HEAD LOCATION



Figure A-46 PRE-TEST PASSENGER POSITION VIEW



Figure A-47 POST-TEST PASSENGER POSITION VIEW



Figure A-48 PRE-TEST PASSENGER AND INTERIOR VIEW



Figure A-49 POST-TEST PASSENGER AND INTERIOR VIEW



Figure A-50 PRE- TEST PASSENGER FEET VIEW



Figure A-51 POST-TEST PASSENGER FEET VIEW



Figure A-52 PRE-TEST PASSENGER KNEE BOLSTER VIEW



Figure A-53 POST-TEST PASSENGER KNEE BOLSTER VIEW



Figure A-54 PRE-TEST PASSENGER FLOOR PAN VIEW



Figure A-55 POST-TEST PASSENGER FLOOR PAN VIEW



Figure A-56 POST-TEST PASSENGER HEAD VIEW



Figure A-57 POST-TEST PASSENGER CONTACT TO AIRBAG



Figure A-58 ROLLOVER VIEW



Figure A-59 IMPACT VIEW

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

**Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers**

Transducer	SAE Sign Convention (positive unless noted)	
Upper Neck Load Cell	Fx	Head rearward
	Fy	Head left
	Fz	Neck in tension
	Mx	Left ear to left shoulder
	My	Chin to chest (flexion)
	Mz	Chin to left shoulder (look left)
Chest Displacement Potentiometer	Compression is negative	
Pelvic Load Cell (Lower Lumbar)	Fx	Chest rearward
	Fy	Chest left
	Fz	Spine in tension
Femur Load Cell	Compression is negative	
Upper Tibia Load Cell (right and left leg)	Mx	Support tibia at ends, load left side center
	My	Support tibia at ends, load front (shin) center
Lower Tibia Load Cell (right and left leg)	Fz	Tibia in tension
	Mx	Support tibia at ends, load left side center
	My	Support tibia at ends, load front (shin) center

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO. M40503

DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	600
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle Displacement Integrations	180
Load Cell Barrier Forces	60

Table of Data Plots

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	V1P1 Head 9 Array X Arm Ay [g, CFC_1000]	B-8
2	V1P1 Head 9 Array X Arm Az [g, CFC_1000]	B-9
3	V1P1 Head 9 Array Y Arm Ax [g, CFC_1000]	B-10
4	V1P1 Head 9 Array Y Arm Az [g, CFC_1000]	B-11
5	V1P1 Head 9 Array Z Arm Ax [g, CFC_1000]	B-12
6	V1P1 Head 9 Array Z Arm Ay [g, CFC_1000]	B-13
7	V1P1 Head CG x [g, CFC_1000]	B-14
8	V1P1 Head CG y [g, CFC_1000]	B-15
9	V1P1 Head CG z [g, CFC_1000]	B-16
10	V1P1 Head CG Resultant [g, CFC_1000]	B-17
11	V1P1 Head CG Red x [g, CFC_1000]	B-18
12	V1P1 Head CG Red y [g, CFC_1000]	B-19
13	V1P1 Head CG Red z [g, CFC_1000]	B-20
14	V1P1 Head CG Red Resultant [g, CFC_1000]	B-21
15	V1P1 Upper Neck Fx [N, CFC_1000]	B-22
16	V1P1 Upper Neck Fy [N, CFC_1000]	B-23
17	V1P1 Upper Neck Fz [N, CFC_1000]	B-24
18	V1P1 Upper Neck F Resultant [N, CFC_1000]	B-25
19	V1P1 Upper Neck Mx [N-m, CFC_600]	B-26
20	V1P1 Upper Neck My [N-m, CFC_600]	B-27
21	V1P1 Upper Neck Mz [N-m, CFC_600]	B-28
22	V1P1 Upper Neck M Resultant [N-m, CFC_600]	B-29
23	V1P1 Chest x [g, CFC_180]	B-30
24	V1P1 Chest y [g, CFC_180]	B-31
25	V1P1 Chest z [g, CFC_180]	B-32
26	V1P1 Chest Resultant [g, CFC_180]	B-33
27	V1P1 Chest Red x [g, CFC_180]	B-34
28	V1P1 Chest Red y [g, CFC_180]	B-35
29	V1P1 Chest Red z [g, CFC_180]	B-36
30	V1P1 Chest Red Resultant [g, CFC_180]	B-37
31	V1P1 Chest Compression x [mm, CFC_600]	B-38
32	V1P1 Pelvic x [g, CFC_1000]	B-39
33	V1P1 Pelvic y [g, CFC_1000]	B-40
34	V1P1 Pelvic z [g, CFC_1000]	B-41
35	V1P1 Pelvic Resultant [g, CFC_1000]	B-42
36	V1P1 Left Femur z [N, CFC_600]	B-43
37	V1P1 Right Femur z [N, CFC_600]	B-44
38	V1P1 Left Upper Tibia Mx [N-m, CFC_600]	B-45
39	V1P1 Left Upper Tibia My [N-m, CFC_600]	B-46
40	V1P1 Left Lower Tibia Fz [N, CFC_600]	B-47
41	V1P1 Left Lower Tibia Mx [N-m, CFC_600]	B-48
42	V1P1 Left Lower Tibia My [N-m, CFC_600]	B-49
43	V1P1 Right Upper Tibia Mx [N-m, CFC_600]	B-50
44	V1P1 Right Upper Tibia My [N-m, CFC_600]	B-51
45	V1P1 Right Lower Tibia Fz [N, CFC_600]	B-52
46	V1P1 Right Lower Tibia Mx [N-m, CFC_600]	B-53

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PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
47	V1P1 Right Lower Tibia My [N-m, CFC_600]	B-54
48	V1P1 Left Foot Aft x [g, CFC_600]	B-55
49	V1P1 Left Foot Aft z [g, CFC_600]	B-56
50	V1P1 Left Foot Fore z [g, CFC_600]	B-57
51	V1P1 Right Foot Aft x [g, CFC_600]	B-58
52	V1P1 Right Foot Aft z [g, CFC_600]	B-59
53	V1P1 Right Foot Fore z [g, CFC_600]	B-60
54	V1 Driver Lap Belt [N, CFC_60]	B-61
55	V1P2 Head 9 Array X Arm Ay [g, CFC_1000]	B-62
56	V1P2 Head 9 Array X Arm Az [g, CFC_1000]	B-63
57	V1P2 Head 9 Array Y Arm Ax [g, CFC_1000]	B-64
58	V1P2 Head 9 Array Y Arm Az [g, CFC_1000]	B-65
59	V1P2 Head 9 Array Z Arm Ax [g, CFC_1000]	B-66
60	V1P2 Head 9 Array Z Arm Ay [g, CFC_1000]	B-67
61	V1P2 Head CG x [g, CFC_1000]	B-68
62	V1P2 Head CG y [g, CFC_1000]	B-69
63	V1P2 Head CG z [g, CFC_1000]	B-70
64	V1P2 Head CG Resultant [g, CFC_1000]	B-71
65	V1P2 Head CG Red x [g, CFC_1000]	B-72
66	V1P2 Head CG Red y [g, CFC_1000]	B-73
67	V1P2 Head CG Red z [g, CFC_1000]	B-74
68	V1P2 Head CG Red Resultant [g, CFC_1000]	B-75
69	V1P2 Upper Neck Fx [N, CFC_1000]	B-76
70	V1P2 Upper Neck Fy [N, CFC_1000]	B-77
71	V1P2 Upper Neck Fz [N, CFC_1000]	B-78
72	V1P2 Upper Neck F Resultant [N, CFC_1000]	B-79
73	V1P2 Upper Neck Mx [N-m, CFC_600]	B-80
74	V1P2 Upper Neck My [N-m, CFC_600]	B-81
75	V1P2 Upper Neck Mz [N-m, CFC_600]	B-82
76	V1P2 Upper Neck M Resultant [N-m, CFC_600]	B-83
77	V1P2 Chest x [g, CFC_180]	B-84
78	V1P2 Chest y [g, CFC_180]	B-85
79	V1P2 Chest z [g, CFC_180]	B-86
80	V1P2 Chest Resultant [g, CFC_180]	B-87
81	V1P2 Chest Red x [g, CFC_180]	B-88
82	V1P2 Chest Red y [g, CFC_180]	B-89
83	V1P2 Chest Red z [g, CFC_180]	B-90
84	V1P2 Chest Red Resultant [g, CFC_180]	B-91
85	V1P2 Chest Compression x [mm, CFC_600]	B-92
86	V1P2 Pelvic x [g, CFC_1000]	B-93
87	V1P2 Pelvic y [g, CFC_1000]	B-94
88	V1P2 Pelvic z [g, CFC_1000]	B-95
89	V1P2 Pelvic Resultant [g, CFC_1000]	B-96
90	V1P2 Left Femur z [N, CFC_600]	B-97
91	V1P2 Right Femur z [N, CFC_600]	B-98
92	V1P2 Left Upper Tibia Mx [N-m, CFC_600]	B-99

Table of Data Plots (Continued)

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
93	V1P2 Left Upper Tibia My [N-m, CFC_600]	B-100
94	V1P2 Left Lower Tibia Fz [N, CFC_600]	B-101
95	V1P2 Left Lower Tibia Mx [N-m, CFC_600]	B-102
96	V1P2 Left Lower Tibia My [N-m, CFC_600]	B-103
97	V1P2 Right Upper Tibia Mx [N-m, CFC_600]	B-104
98	V1P2 Right Upper Tibia My [N-m, CFC_600]	B-105
99	V1P2 Right Lower Tibia Fz [N, CFC_600]	B-106
100	V1P2 Right Lower Tibia Mx [N-m, CFC_600]	B-107
101	V1P2 Right Lower Tibia My [N-m, CFC_600]	B-108
102	V1P2 Left Foot Aft x [g, CFC_600]	B-109
103	V1P2 Left Foot Aft z [g, CFC_600]	B-110
104	V1P2 Left Foot Fore z [g, CFC_600]	B-111
105	V1P2 Right Foot Aft x [g, CFC_600]	B-112
106	V1P2 Right Foot Aft z [g, CFC_600]	B-113
107	V1P2 Right Foot Fore z [g, CFC_600]	B-114
108	V1 RFP Lap Belt [N, CFC_60]	B-115
109	V1 Left Rear #1x [g, CFC_60]	B-116
110	V1 Left Rear #1x Velocity [kph, CFC_180]	B-117
111	V1 Left Rear #1x Displacement [mm, CFC_180]	B-118
112	V1 Right Rear #2x [g, CFC_60]	B-119
113	V1 Right Rear #2x Velocity [kph, CFC_180]	B-120
114	V1 Right Rear #2x Displacement [mm, CFC_180]	B-121
115	V1 Engine Top #3x [g, CFC_60]	B-122
116	V1 Engine Top #3x Velocity [kph, CFC_180]	B-123
117	V1 Engine Top #3x Displacement [mm, CFC_180]	B-124
118	V1 Engine Bottom #4x [g, CFC_60]	B-125
119	V1 Engine Bottom #4x Velocity [kph, CFC_180]	B-126
120	V1 Engine Bottom #4x Displacement [mm, CFC_180]	B-127
121	V1 Right Caliper #5x [g, CFC_60]	B-128
122	V1 Right Caliper #5x Velocity [kph, CFC_180]	B-129
123	V1 Right Caliper #5x Displacement [mm, CFC_180]	B-130
124	V1 Instrument Panel #6x [g, CFC_60]	B-131
125	V1 Instrument Panel #6x Velocity [kph, CFC_180]	B-132
126	V1 Instrument Panel #6x Displacement [mm, CFC_180]	B-133
127	V1 Left Caliper #7x [g, CFC_60]	B-134
128	V1 Left Caliper #7x Velocity [kph, CFC_180]	B-135
129	V1 Left Caliper #7x Displacement [mm, CFC_180]	B-136
130	V1 Left Rear #8z [g, CFC_60]	B-137
131	V1 Left Rear #8z Velocity [kph, CFC_180]	B-138
132	V1 Left Rear #8z Displacement [mm, CFC_180]	B-139
133	V1 Right Rear #9z [g, CFC_60]	B-140
134	V1 Right Rear #9z Velocity [kph, CFC_180]	B-141
135	V1 Right Rear #9z Displacement [mm, CFC_180]	B-142
136	Barrier Load Cell A1 Fx [N, CFC_60]	B-143
137	Barrier Load Cell A2 Fx [N, CFC_60]	B-144
138	Barrier Load Cell A3 Fx [N, CFC_60]	B-145

Table of Data Plots (Continued)

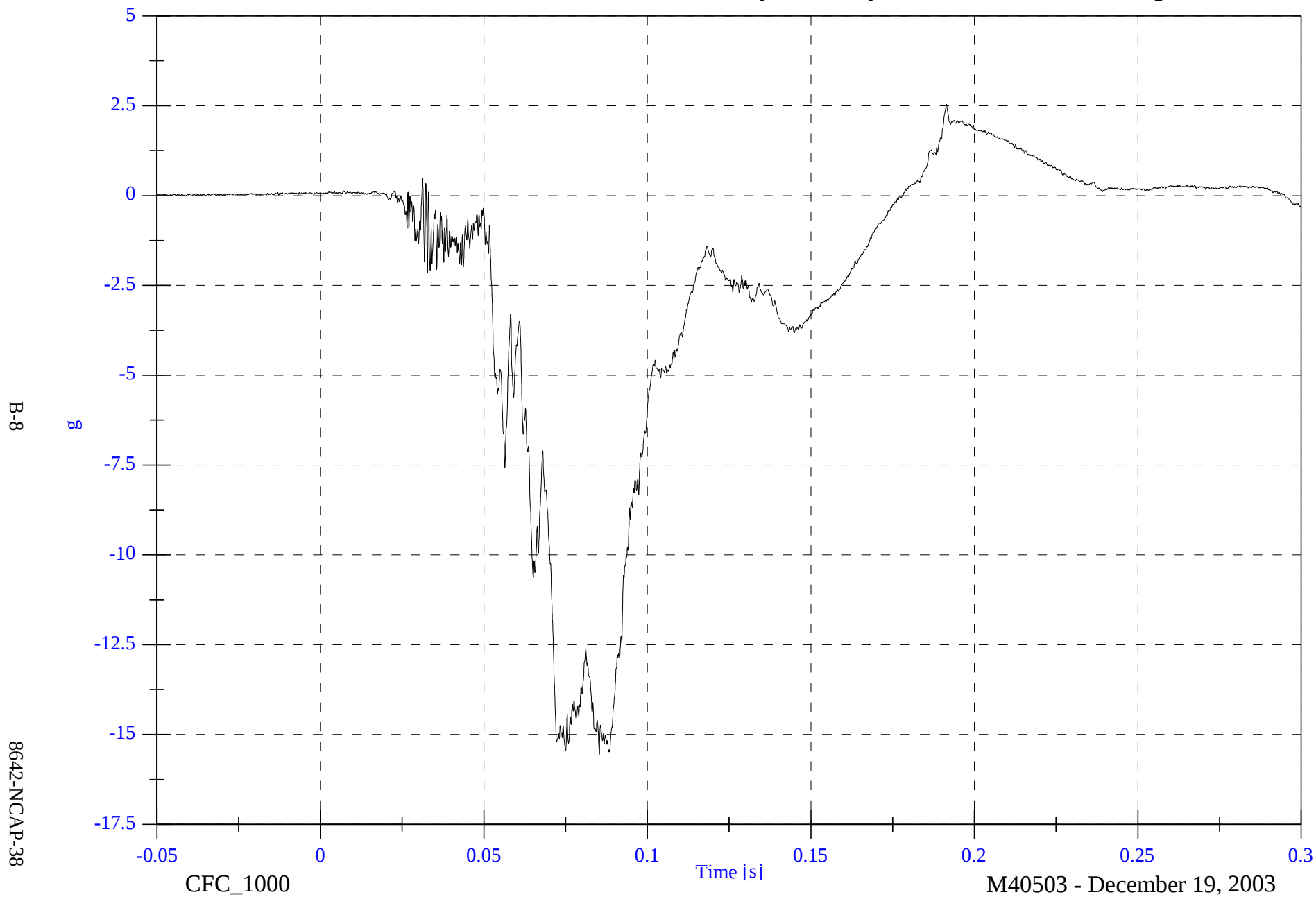
PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
139	Barrier Load Cell A4 Fx [N, CFC_60]	B-146
140	Barrier Load Cell A5 Fx [N, CFC_60]	B-147
141	Barrier Load Cell A6 Fx [N, CFC_60]	B-148
142	Barrier Load Cell A7 Fx [N, CFC_60]	B-149
143	Barrier Load Cell A8 Fx [N, CFC_60]	B-150
144	Barrier Load Cell A9 Fx [N, CFC_60]	B-151
145	Barrier Load Cell B1 Fx [N, CFC_60]	B-152
146	Barrier Load Cell B2 Fx [N, CFC_60]	B-153
147	Barrier Load Cell B3 Fx [N, CFC_60]	B-154
148	Barrier Load Cell B4 Fx [N, CFC_60]	B-155
149	Barrier Load Cell B5 Fx [N, CFC_60]	B-156
150	Barrier Load Cell B6 Fx [N, CFC_60]	B-157
151	Barrier Load Cell B7 Fx [N, CFC_60]	B-158
152	Barrier Load Cell B8 Fx [N, CFC_60]	B-159
153	Barrier Load Cell B9 Fx [N, CFC_60]	B-160
154	Barrier Load Cell C1 Fx [N, CFC_60]	B-161
155	Barrier Load Cell C2 Fx [N, CFC_60]	B-162
156	Barrier Load Cell C3 Fx [N, CFC_60]	B-163
157	Barrier Load Cell C4 Fx [N, CFC_60]	B-164
158	Barrier Load Cell C5 Fx [N, CFC_60]	B-165
159	Barrier Load Cell C6 Fx [N, CFC_60]	B-166
160	Barrier Load Cell C7 Fx [N, CFC_60]	B-167
161	Barrier Load Cell C8 Fx [N, CFC_60]	B-168
162	Barrier Load Cell C9 Fx [N, CFC_60]	B-169
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164	Barrier Load Cell D2 Fx [N, CFC_60]	B-171
165	Barrier Load Cell D3 Fx [N, CFC_60]	B-172
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167	Barrier Load Cell D5 Fx [N, CFC_60]	B-174
168	Barrier Load Cell D6 Fx [N, CFC_60]	B-175
169	Barrier Load Cell D7 Fx [N, CFC_60]	B-176
170	Barrier Load Cell D8 Fx [N, CFC_60]	B-177
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172	Group 1 Load Cell Sum (A1,A2,A3,B1,B2,B3)	B-179
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178	Total Load Cell Sum (All 6 Groups)	B-185

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head 9 Array X Arm Ay

Max: 2.5 [g] at 0.191 [s]

Min: -15.6 [g] at 0.085 [s]

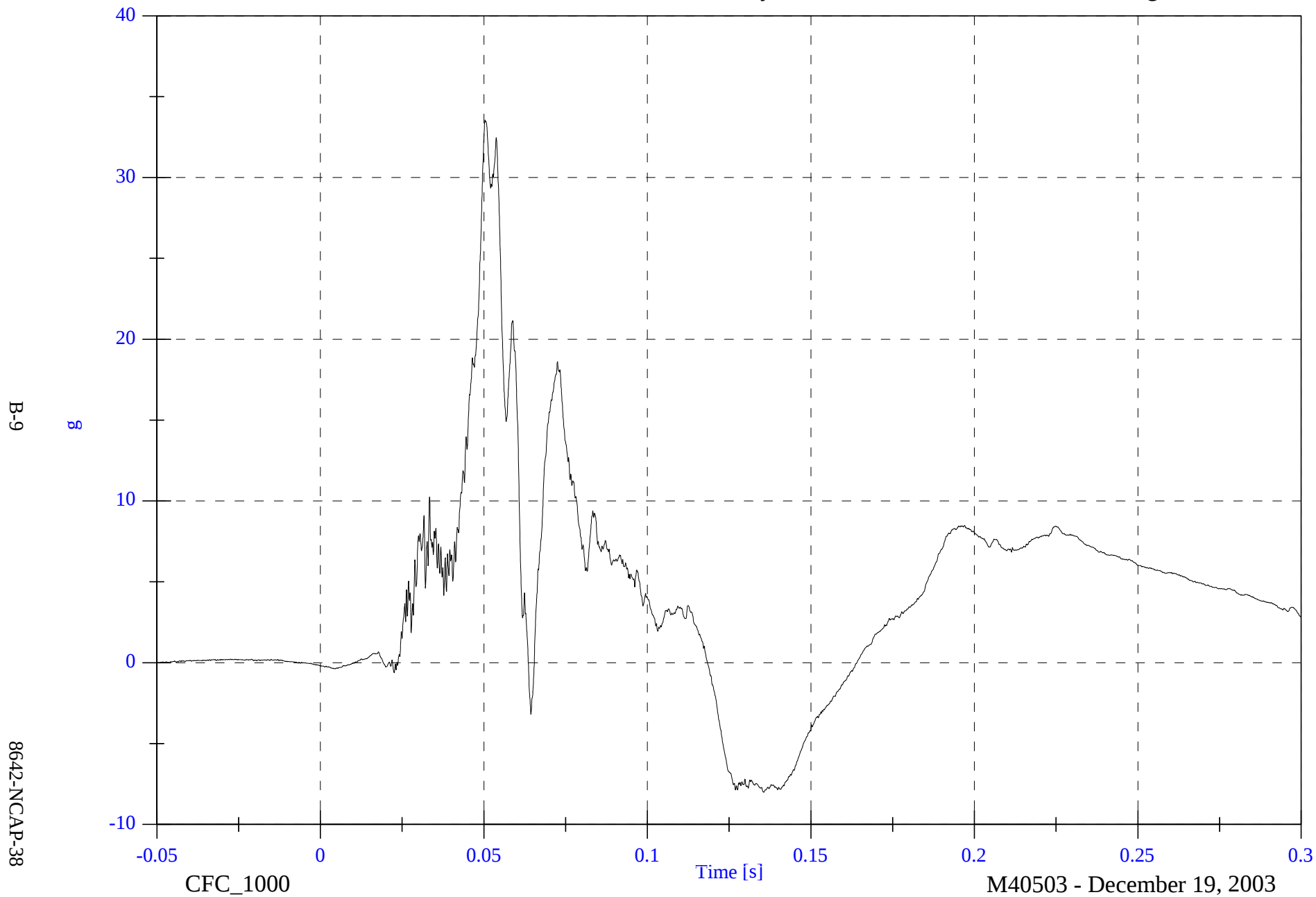


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head 9 Array X Arm Az

Max: 33.6 [g] at 0.050 [s]

Min: -8.0 [g] at 0.136 [s]

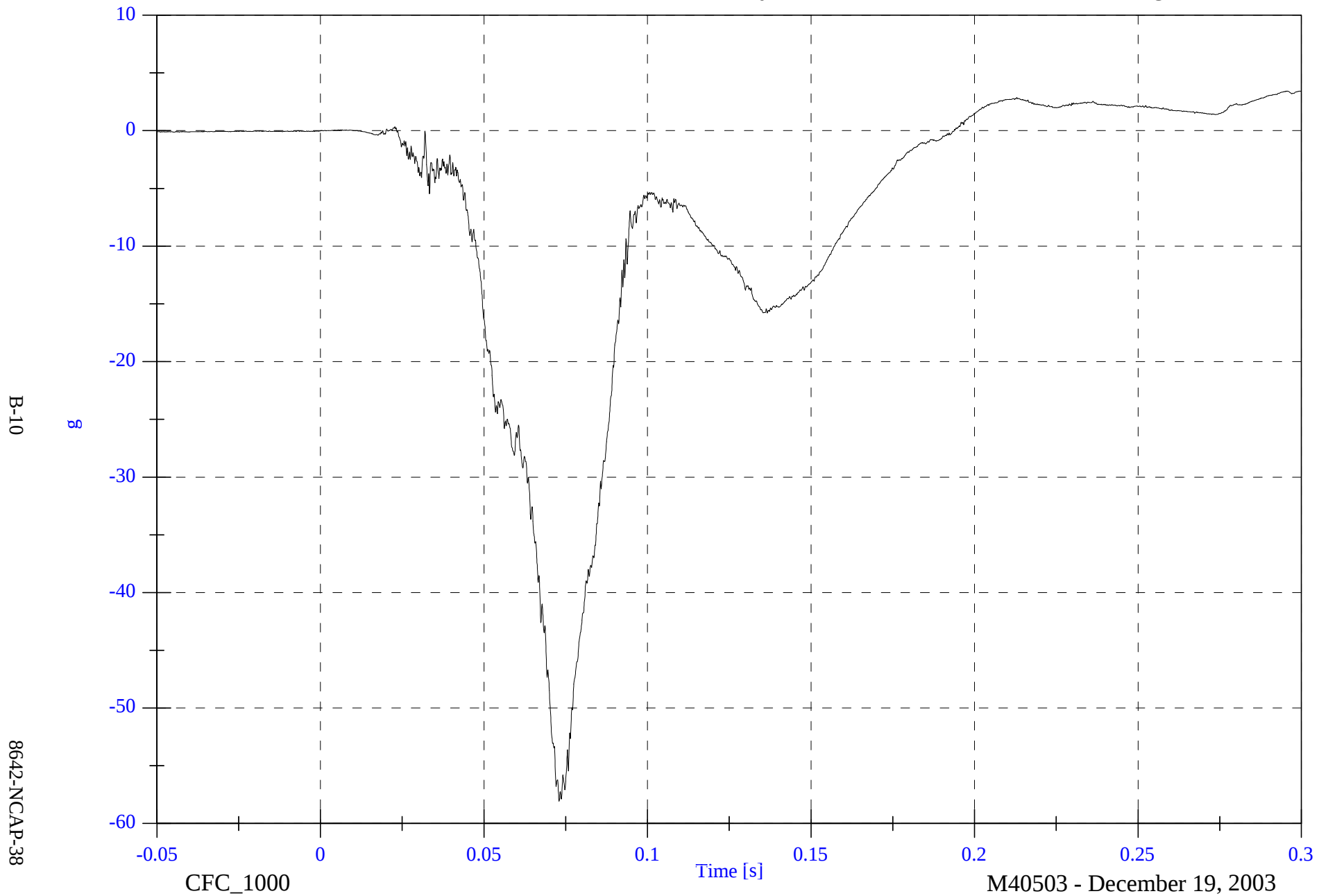


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head 9 Array Y Arm Ax

Max: 3.4 [g] at 0.295 [s]

Min: -58.1 [g] at 0.073 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

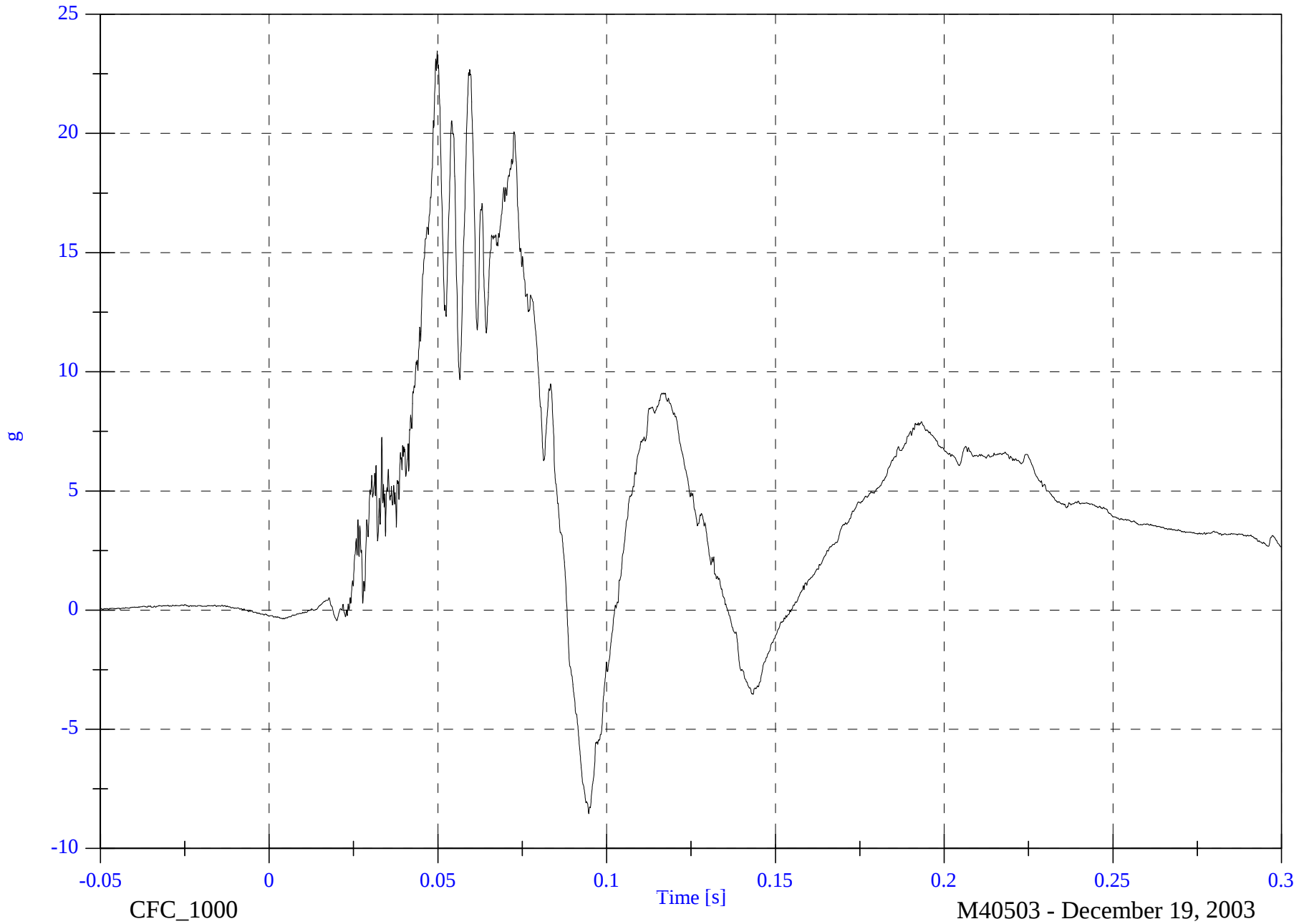
V1P1 Head 9 Array Y Arm Az

Max: 23.5 [g] at 0.050 [s]

Min: -8.5 [g] at 0.095 [s]

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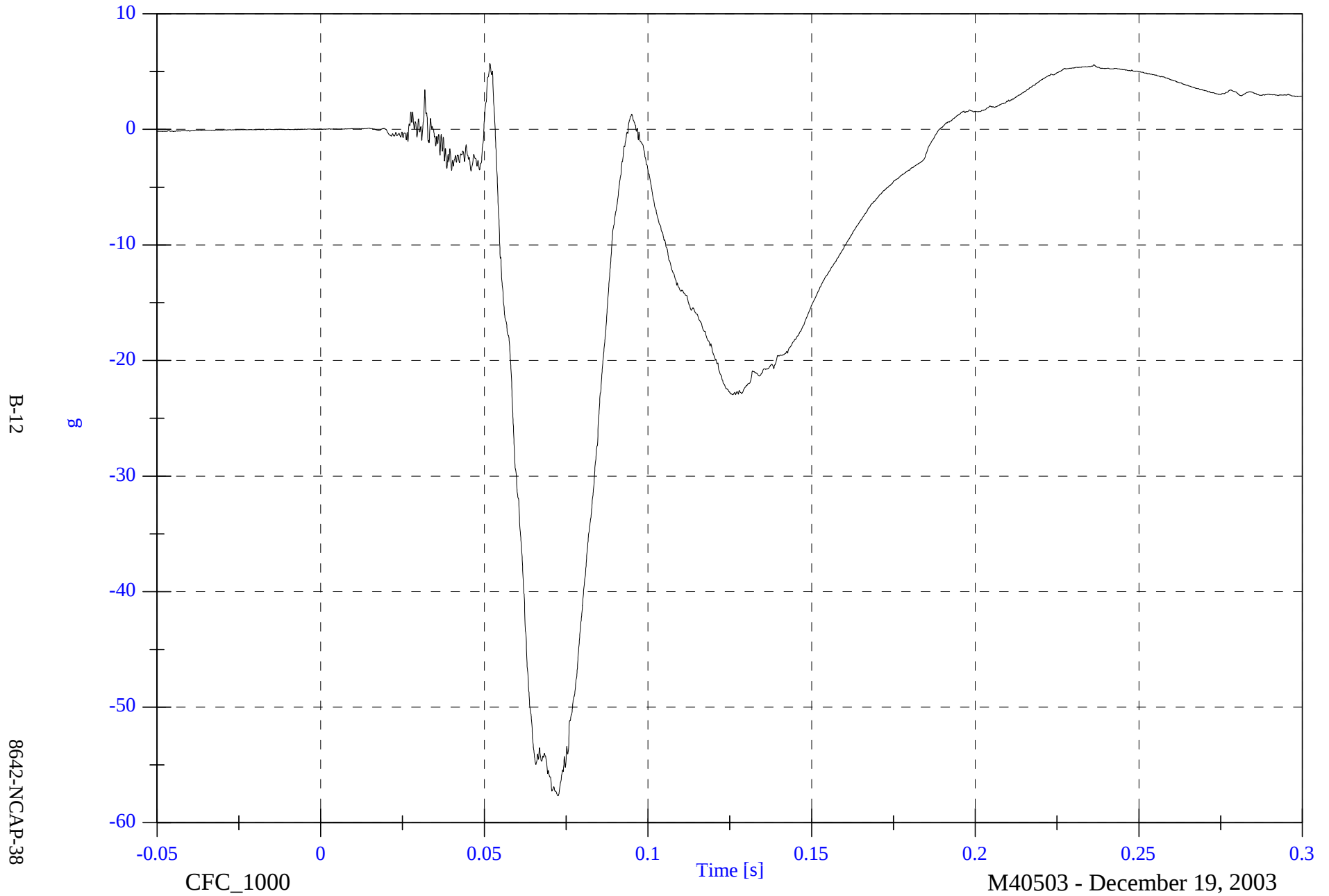


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head 9 Array Z Arm Ax

Max: 5.7 [g] at 0.052 [s]

Min: -57.7 [g] at 0.073 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

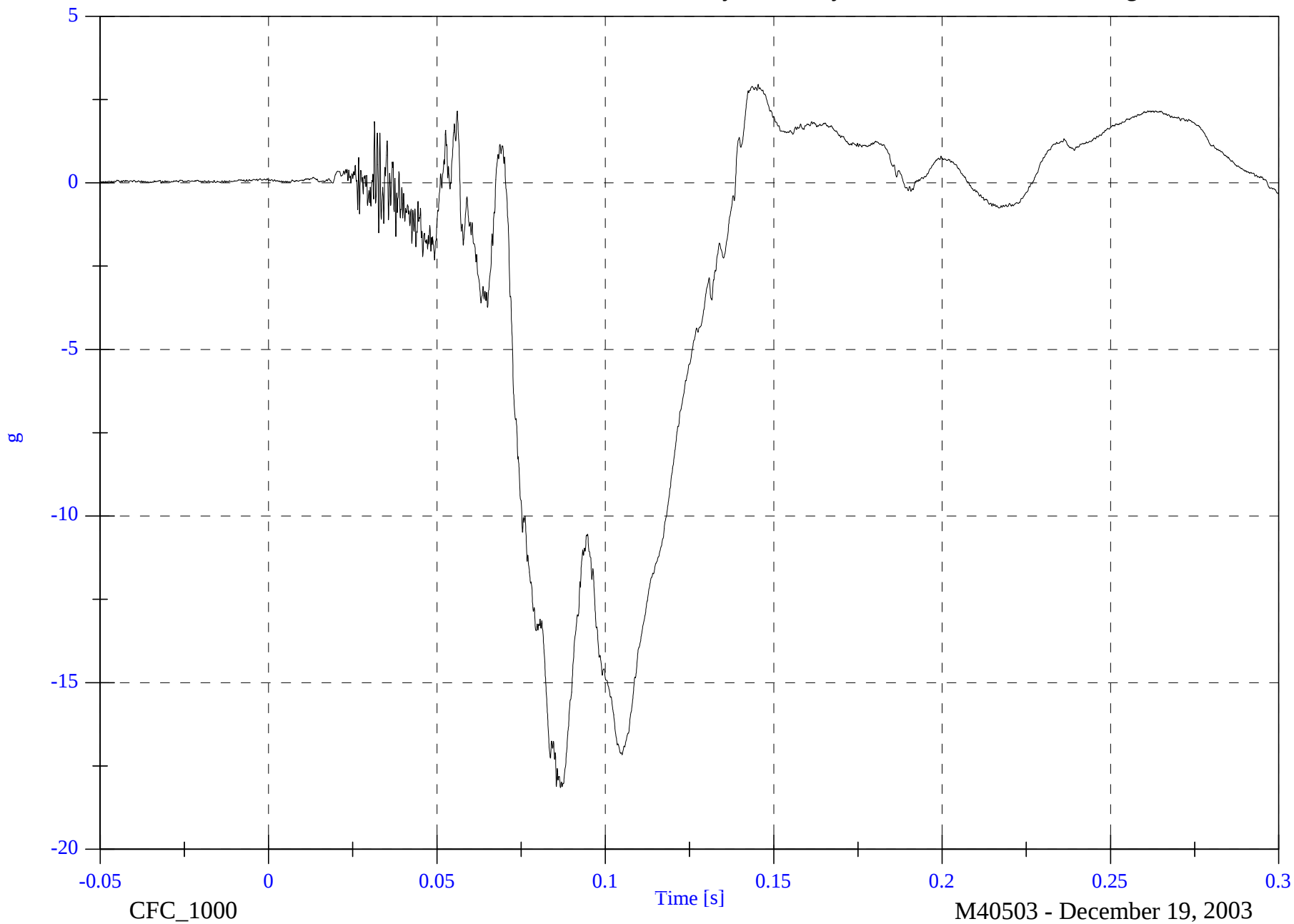
V1P1 Head 9 Array Z Arm Ay

Max: 3.0 [g] at 0.145 [s]

Min: -18.1 [g] at 0.087 [s]

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8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

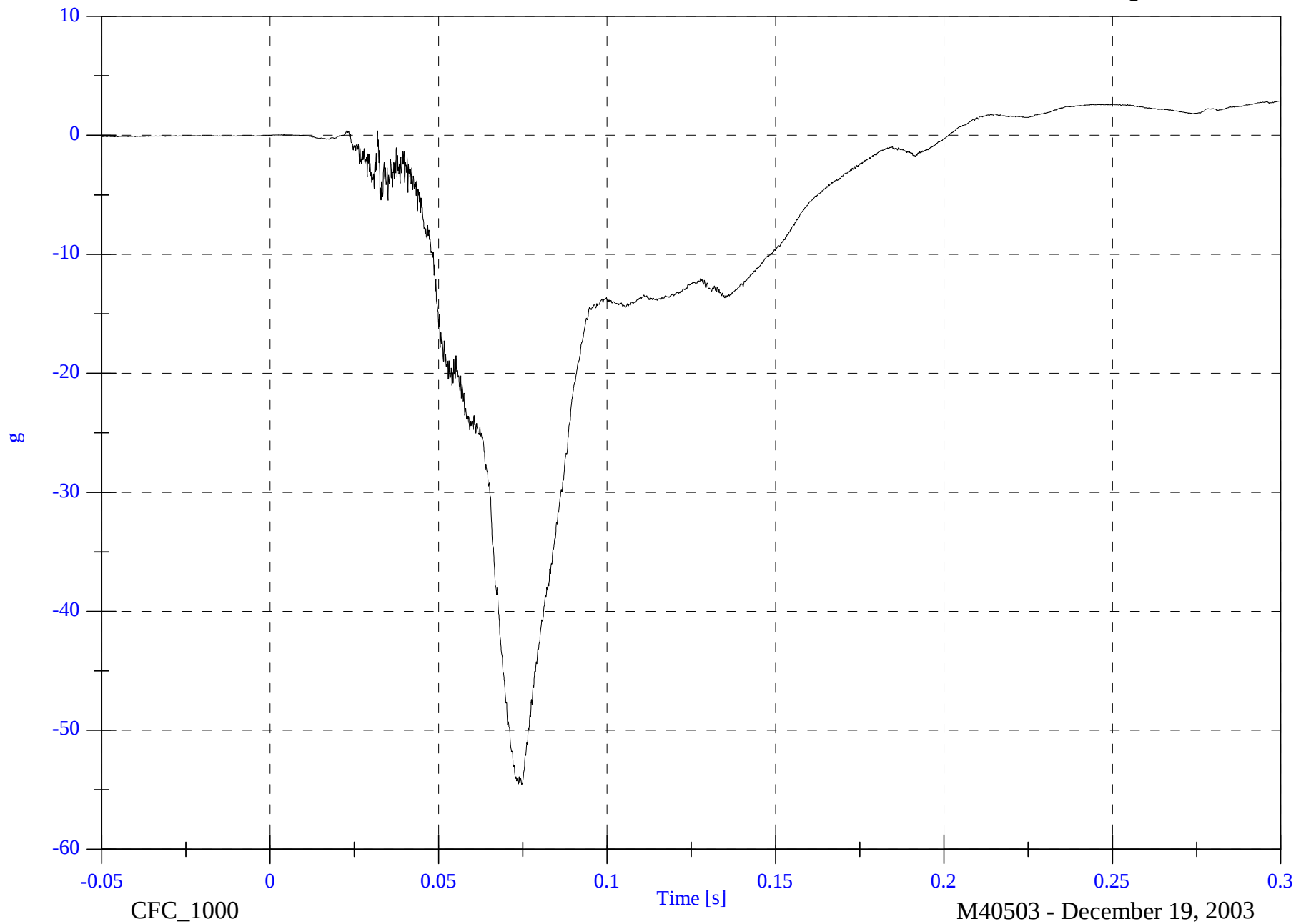
V1P1 Head CG x

Max: 2.9 [g] at 0.300 [s]

Min: -54.5 [g] at 0.075 [s]

B-14

8642-NCAP-38

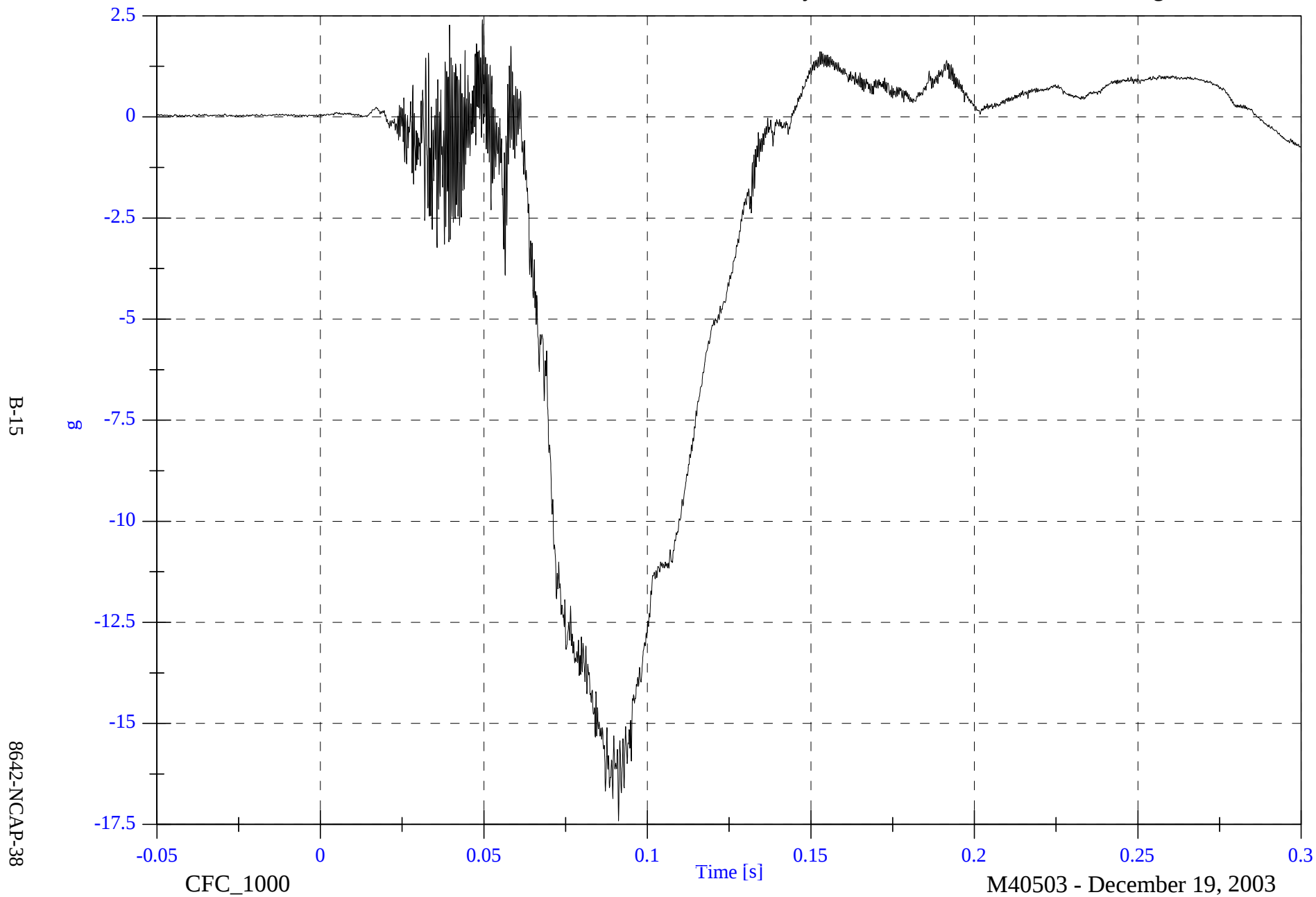


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head CG y

Max: 2.4 [g] at 0.050 [s]

Min: -17.4 [g] at 0.091 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

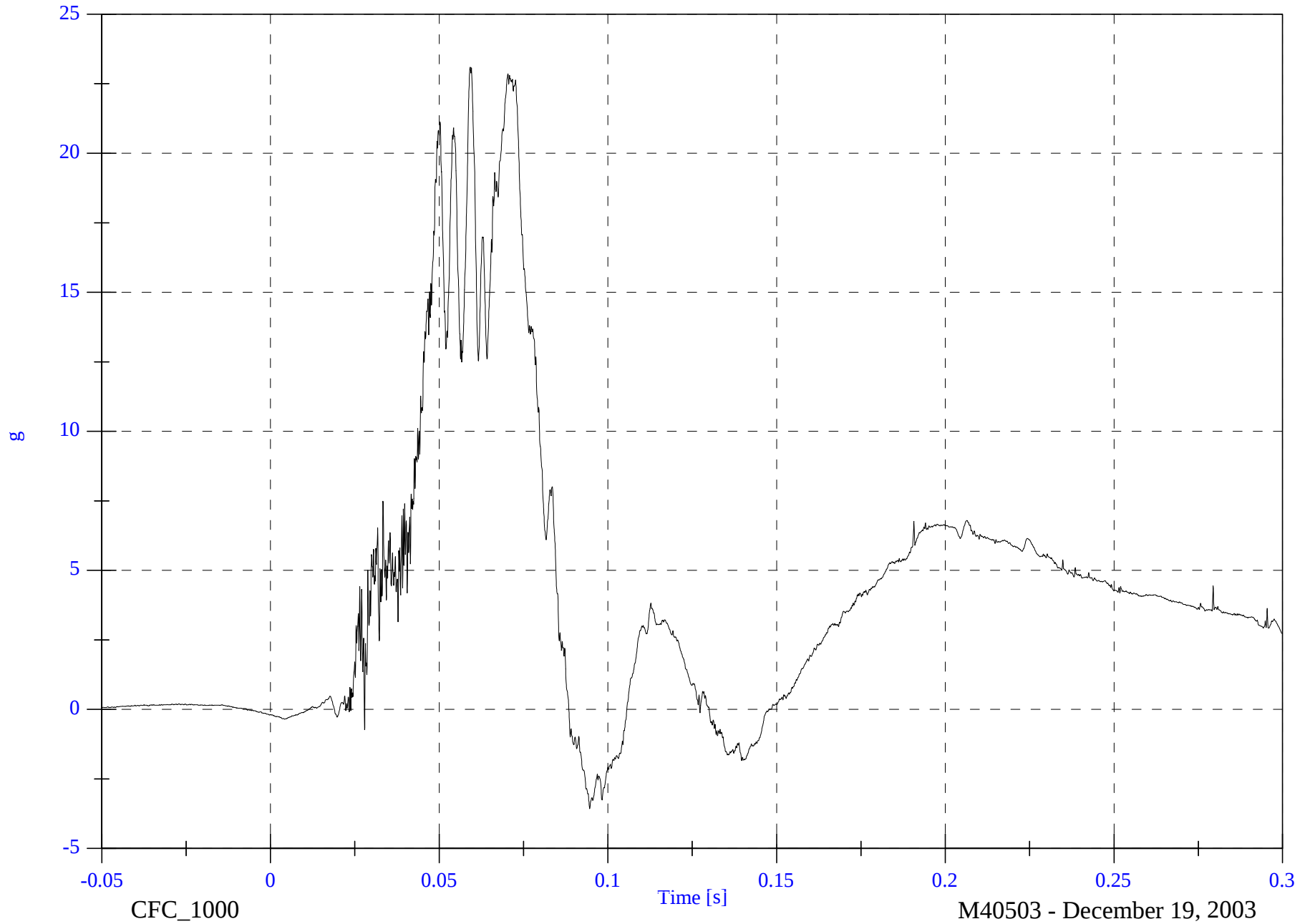
V1P1 Head CG z

Max: 23.1 [g] at 0.059 [s]

Min: -3.6 [g] at 0.095 [s]

B-16

8642-NCAP-38

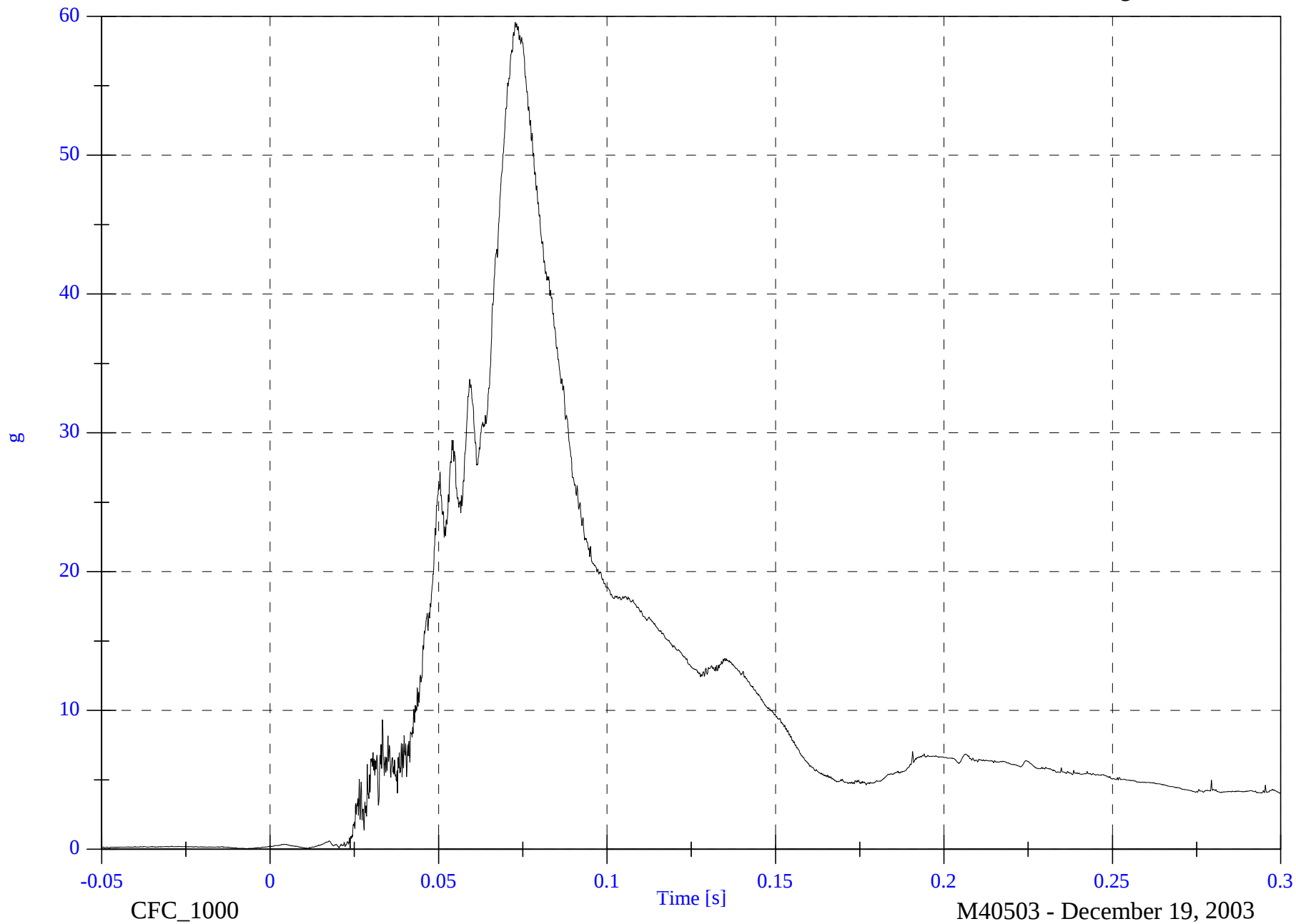


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head CG Resultant

Max: 59.6 [g] at 0.073 [s]

Min: 0.0 [g] at -0.007 [s]



B-17

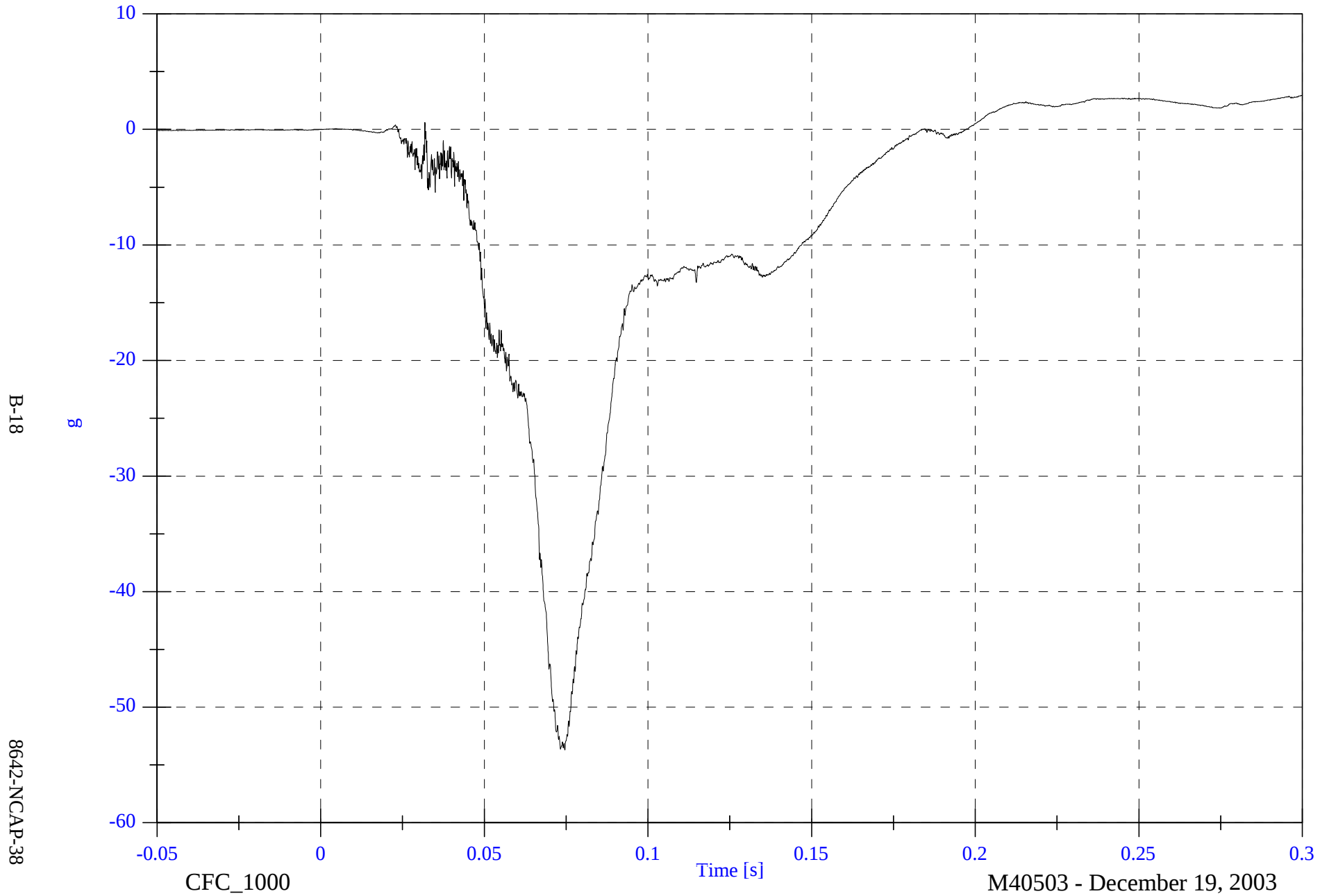
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head CG Red x

Max: 2.9 [g] at 0.300 [s]

Min: -53.7 [g] at 0.075 [s]

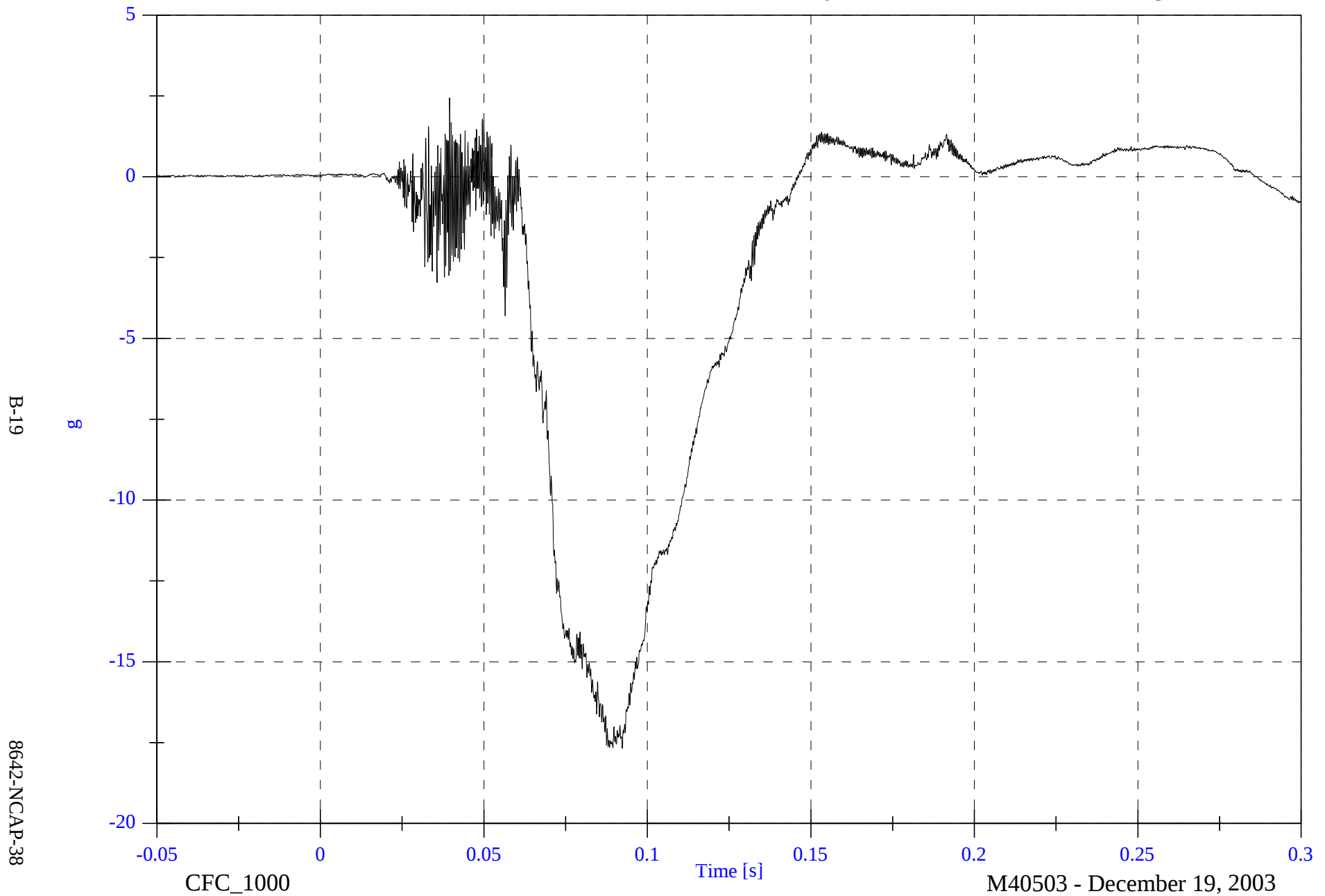


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head CG Red y

Max: 2.4 [g] at 0.040 [s]

Min: -17.7 [g] at 0.092 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

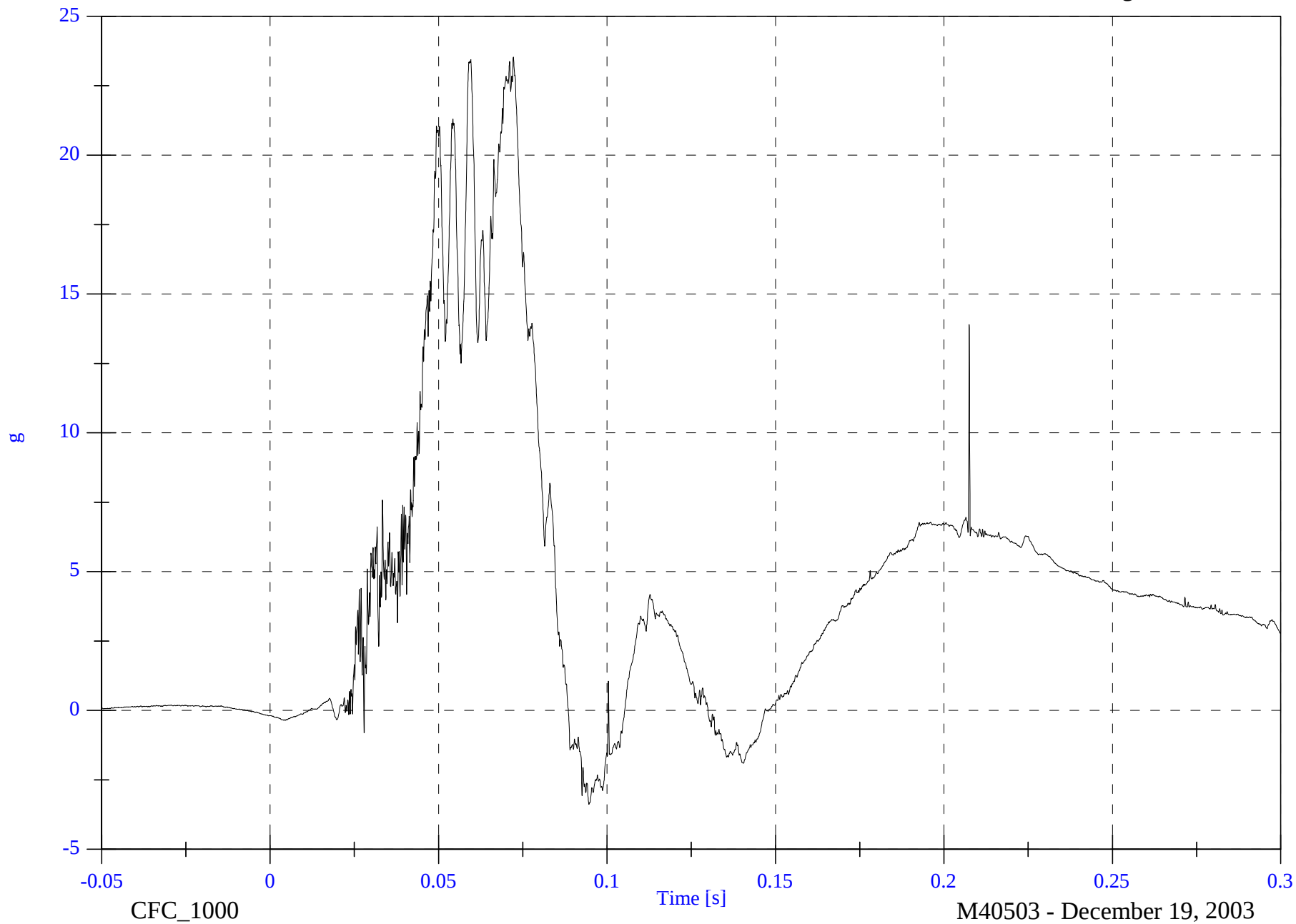
V1P1 Head CG Red z

Max: 23.5 [g] at 0.072 [s]

Min: -3.4 [g] at 0.095 [s]

B-20

8642-NCAP-38

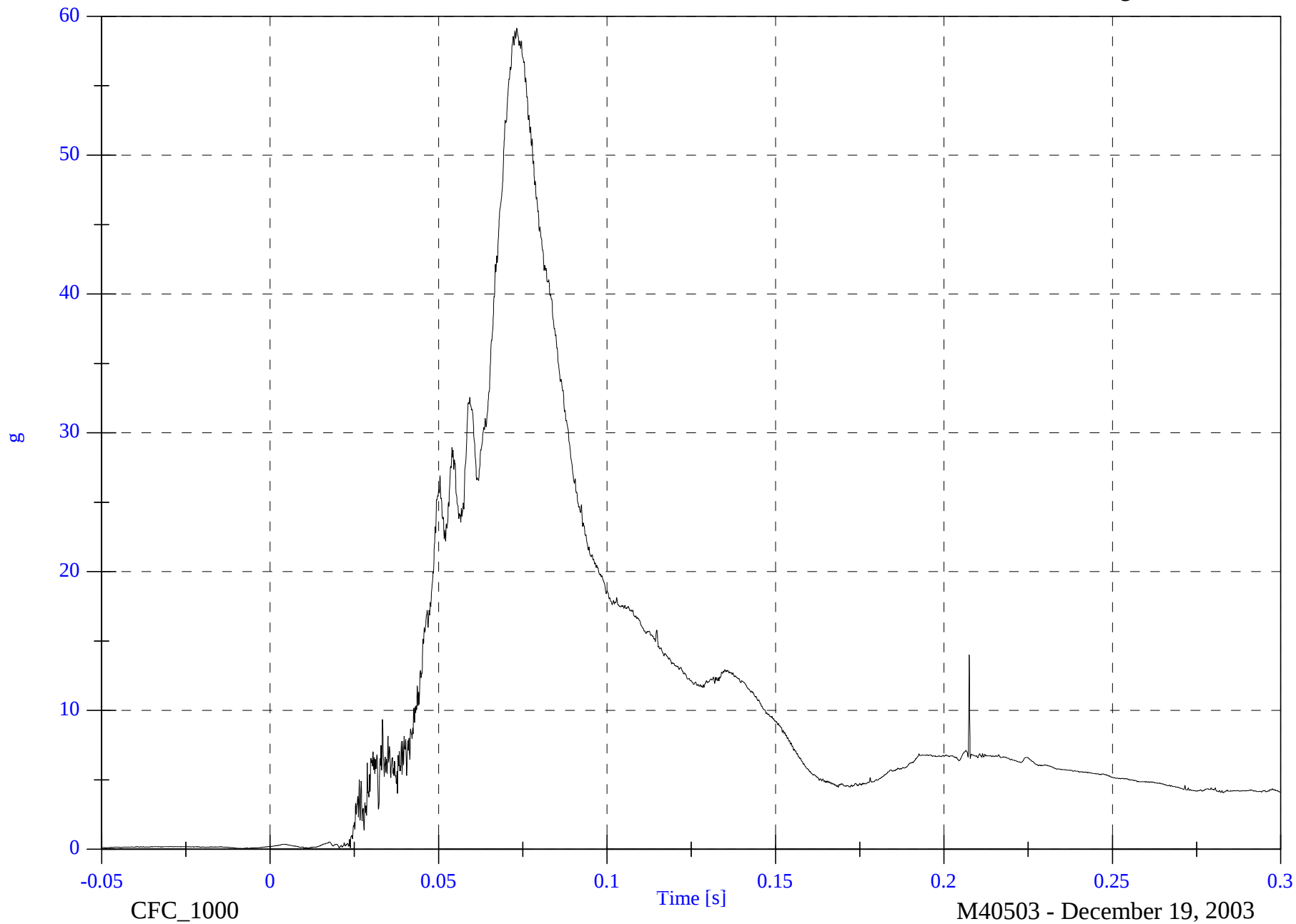


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Head CG Red Resultant

Max: 59.1 [g] at 0.073 [s]

Min: 0.0 [g] at -0.008 [s]



B-21

8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 489.0 [N] at 0.065 [s]

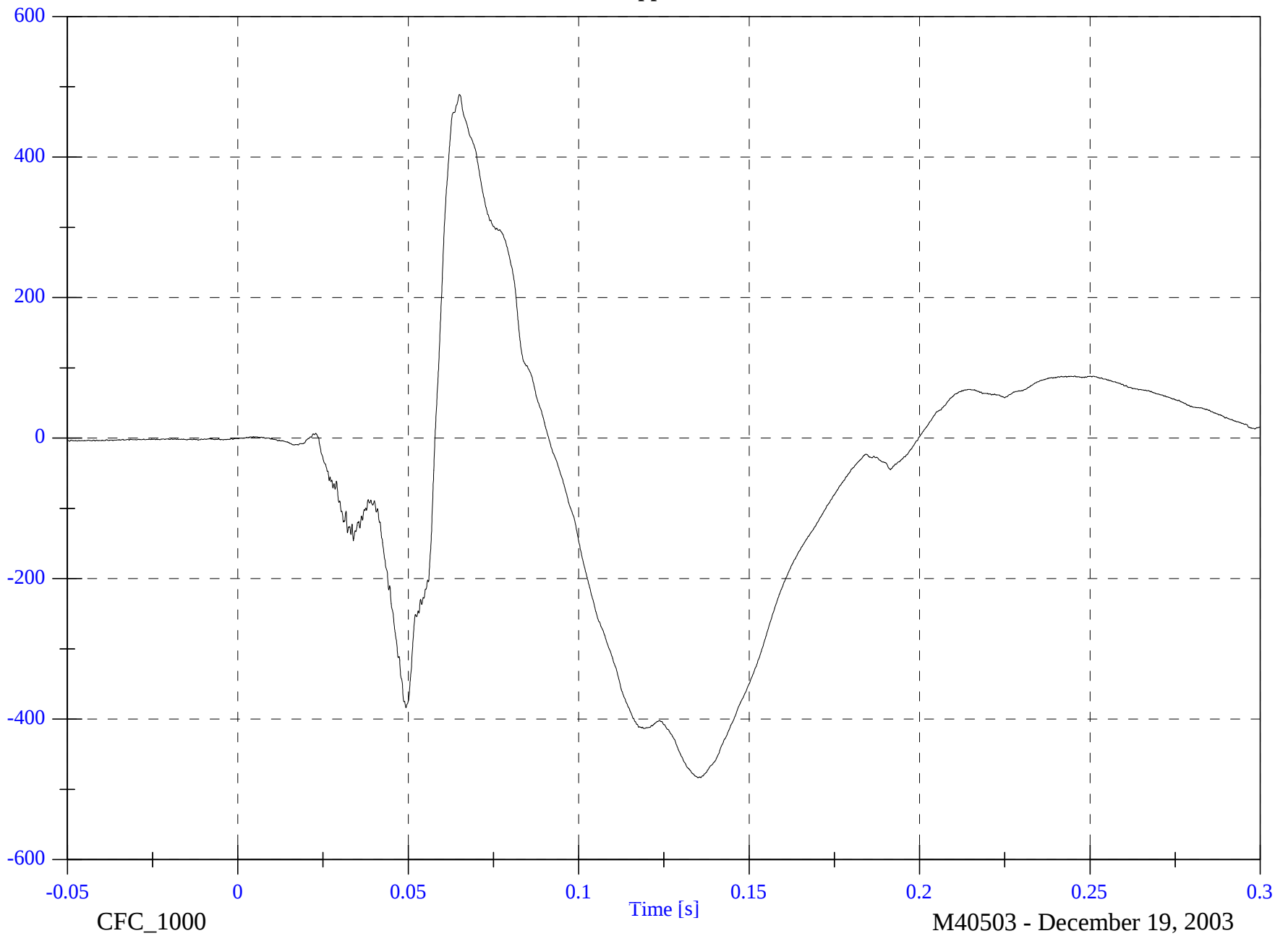
Min: -483.3 [N] at 0.135 [s]

V1P1 Upper Neck Fx

B-22

N

8642-NCAP-38

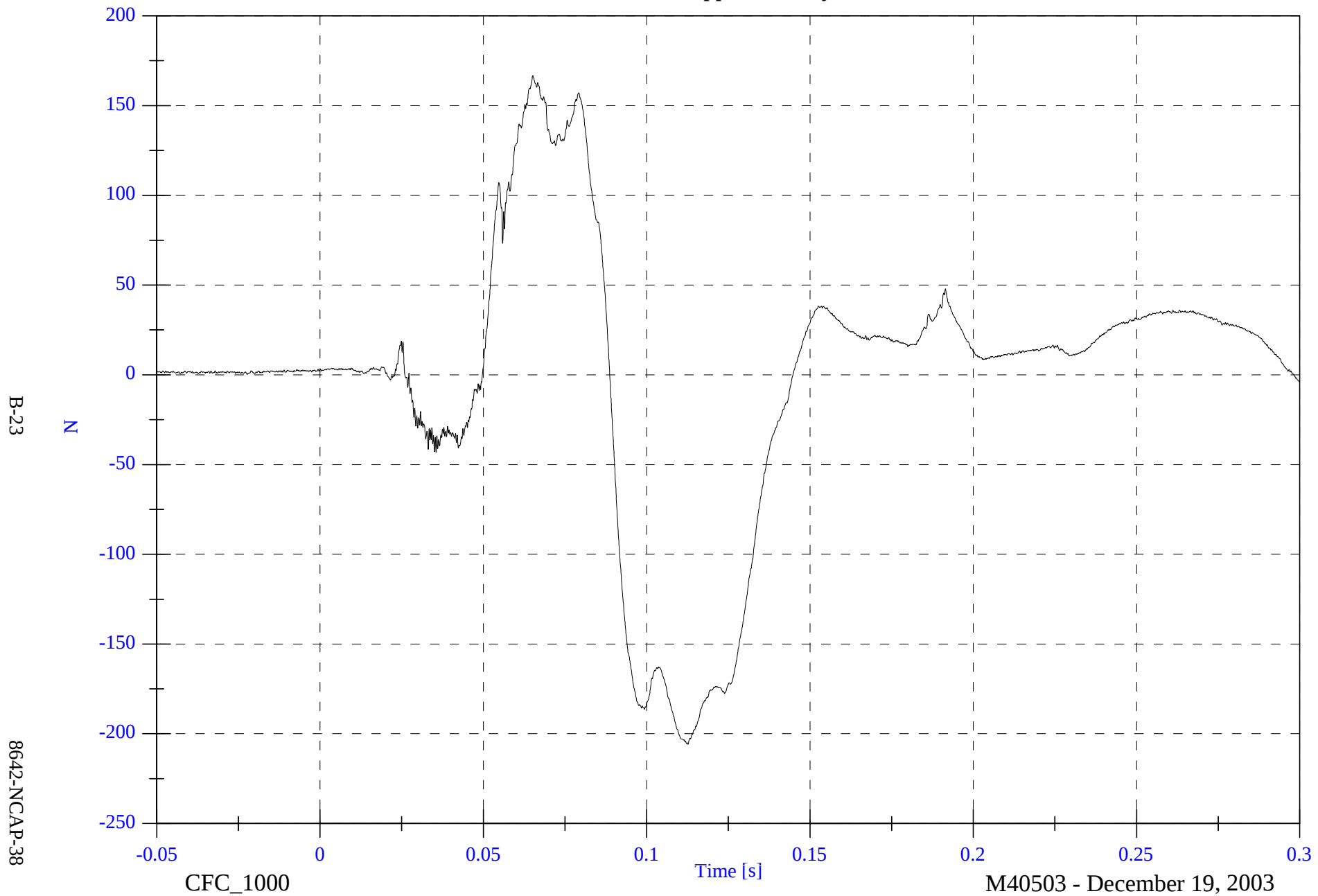


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Upper Neck Fy

Max: 166.8 [N] at 0.065 [s]

Min: -205.9 [N] at 0.113 [s]

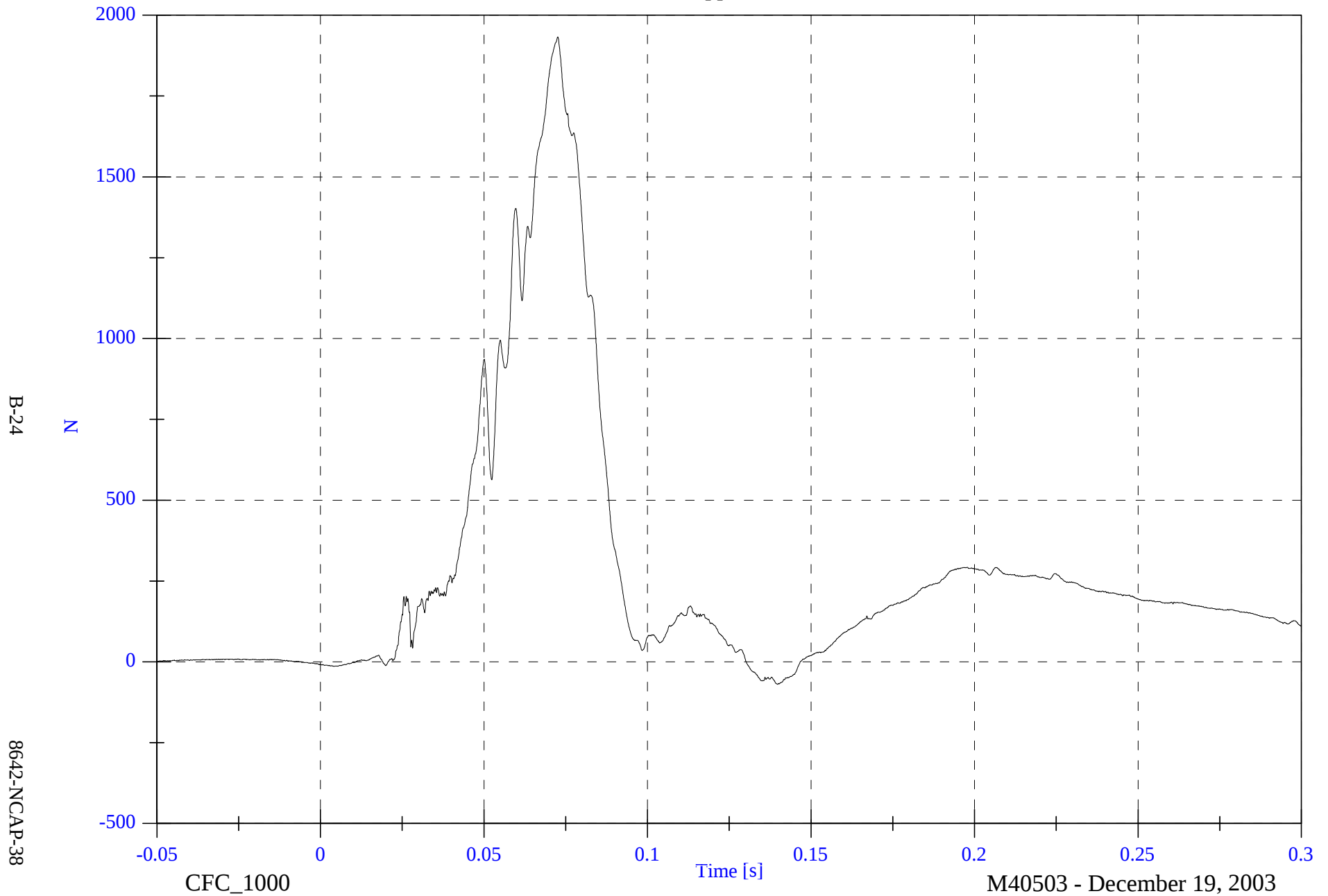


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 1932.5 [N] at 0.073 [s]

Min: -69.7 [N] at 0.140 [s]

V1P1 Upper Neck Fz



2004 NCAP Test 2 - 2004 Hyundai XG350

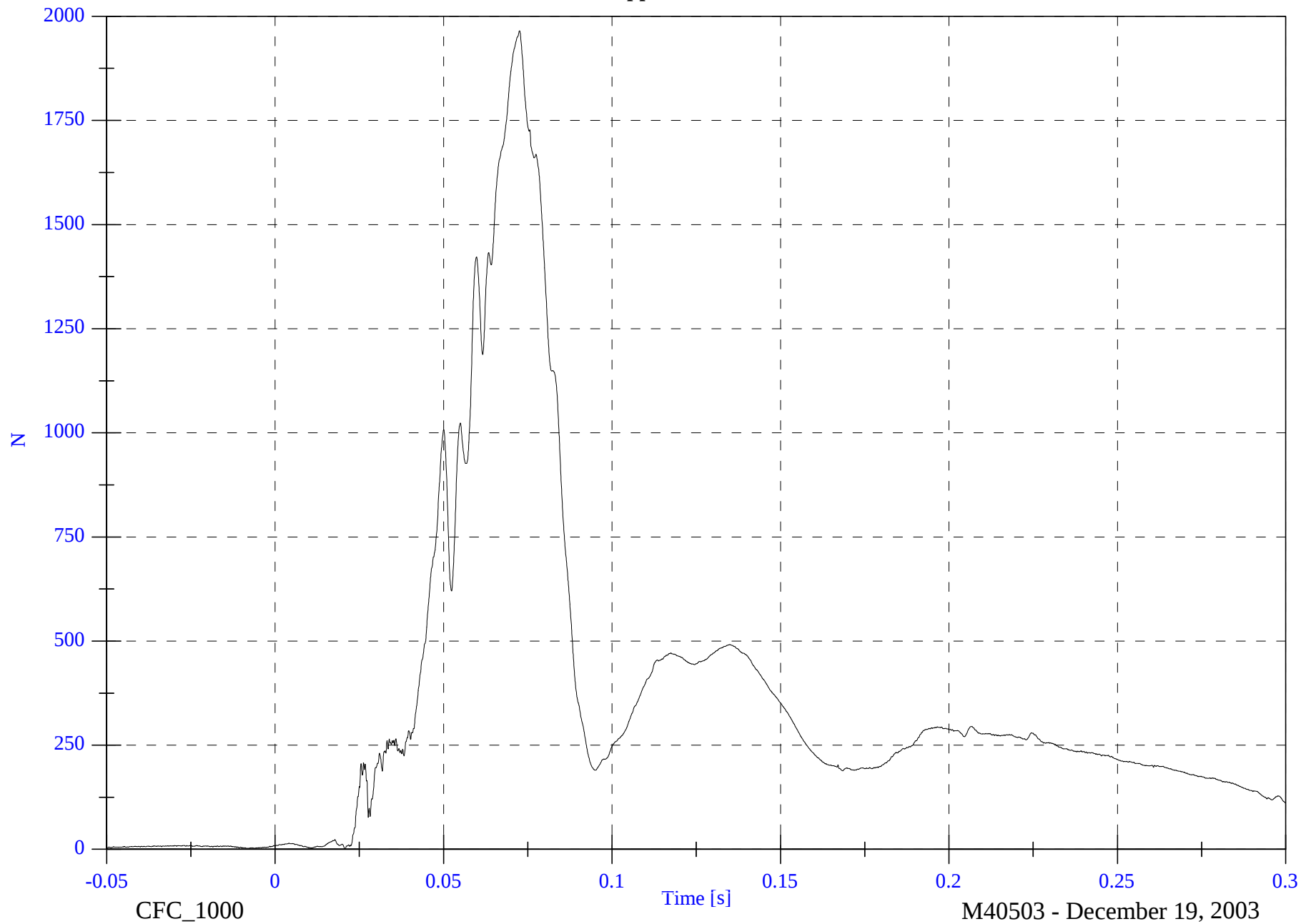
V1P1 Upper Neck F Resultant

Max: 1965.4 [N] at 0.073 [s]

Min: 0.9 [N] at 0.021 [s]

B-25

8642-NCAP-38

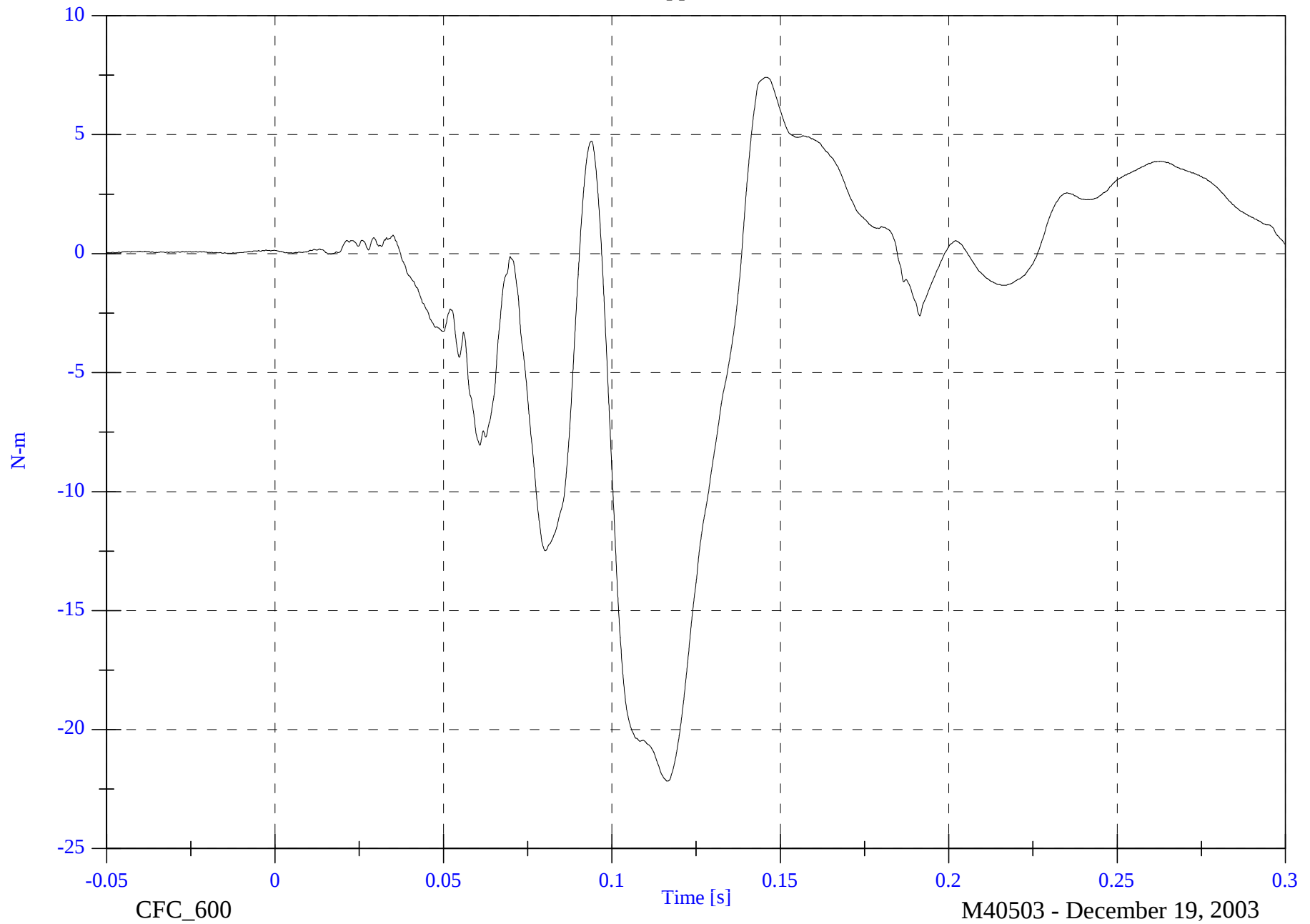


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Upper Neck Mx

Max: 7.4 [N-m] at 0.146 [s]

Min: -22.2 [N-m] at 0.117 [s]

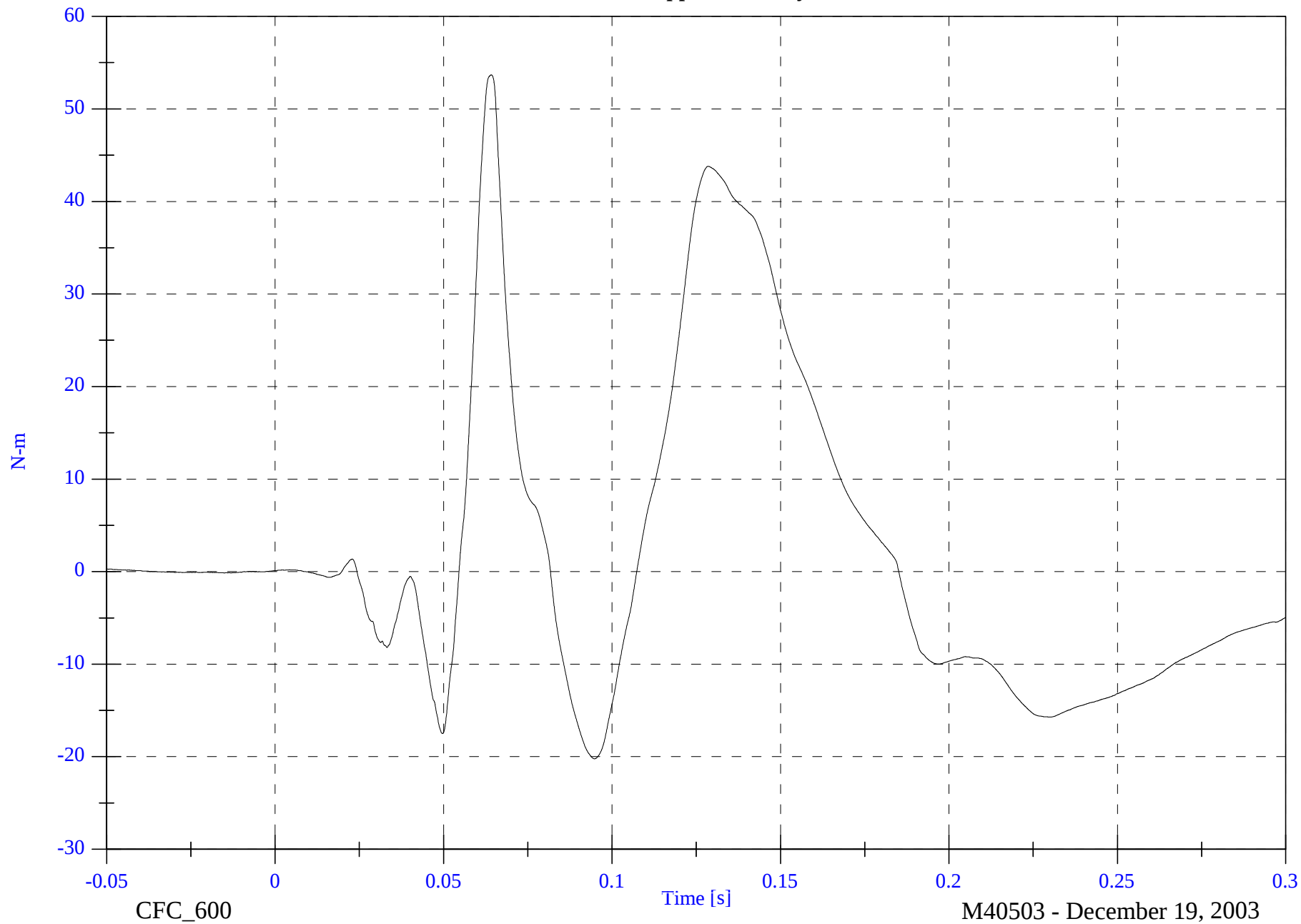


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Upper Neck My

Max: 53.7 [N-m] at 0.064 [s]

Min: -20.2 [N-m] at 0.095 [s]



B-27

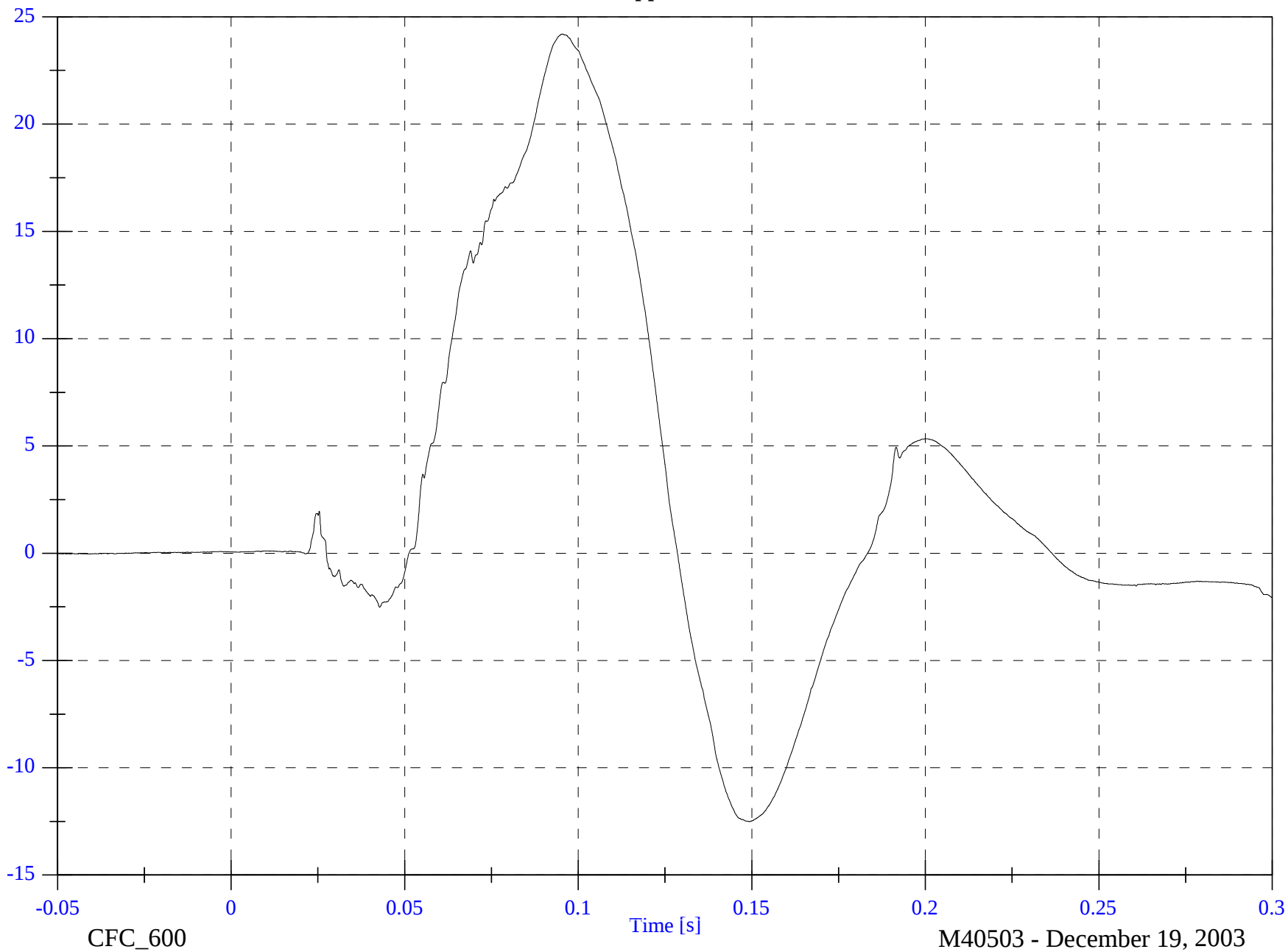
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Upper Neck Mz

Max: 24.2 [N-m] at 0.095 [s]

Min: -12.5 [N-m] at 0.149 [s]



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8642-NCAP-38

CFC_600

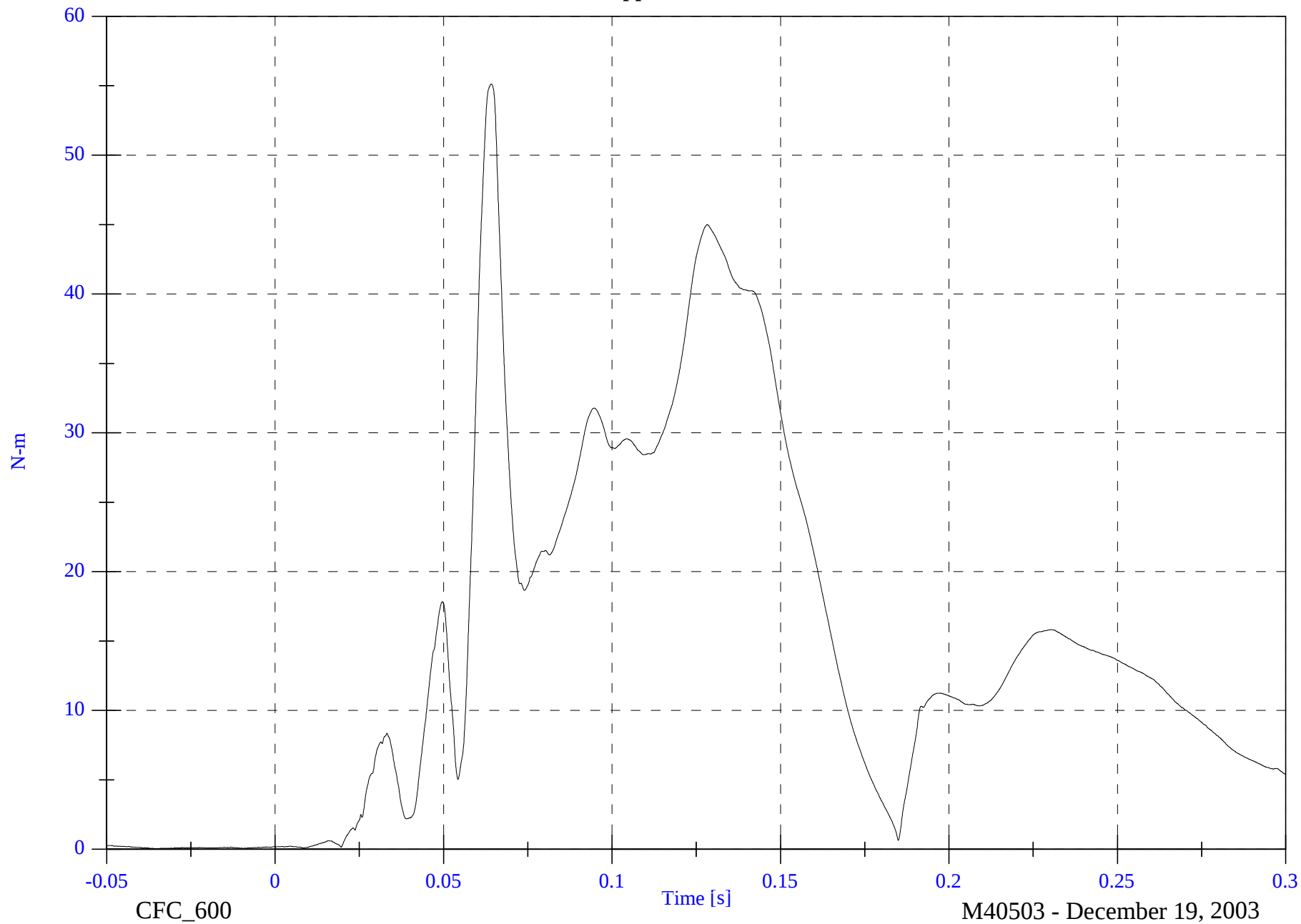
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Upper Neck M Resultant

Max: 55.1 [N-m] at 0.064 [s]

Min: 0.0 [N-m] at -0.036 [s]

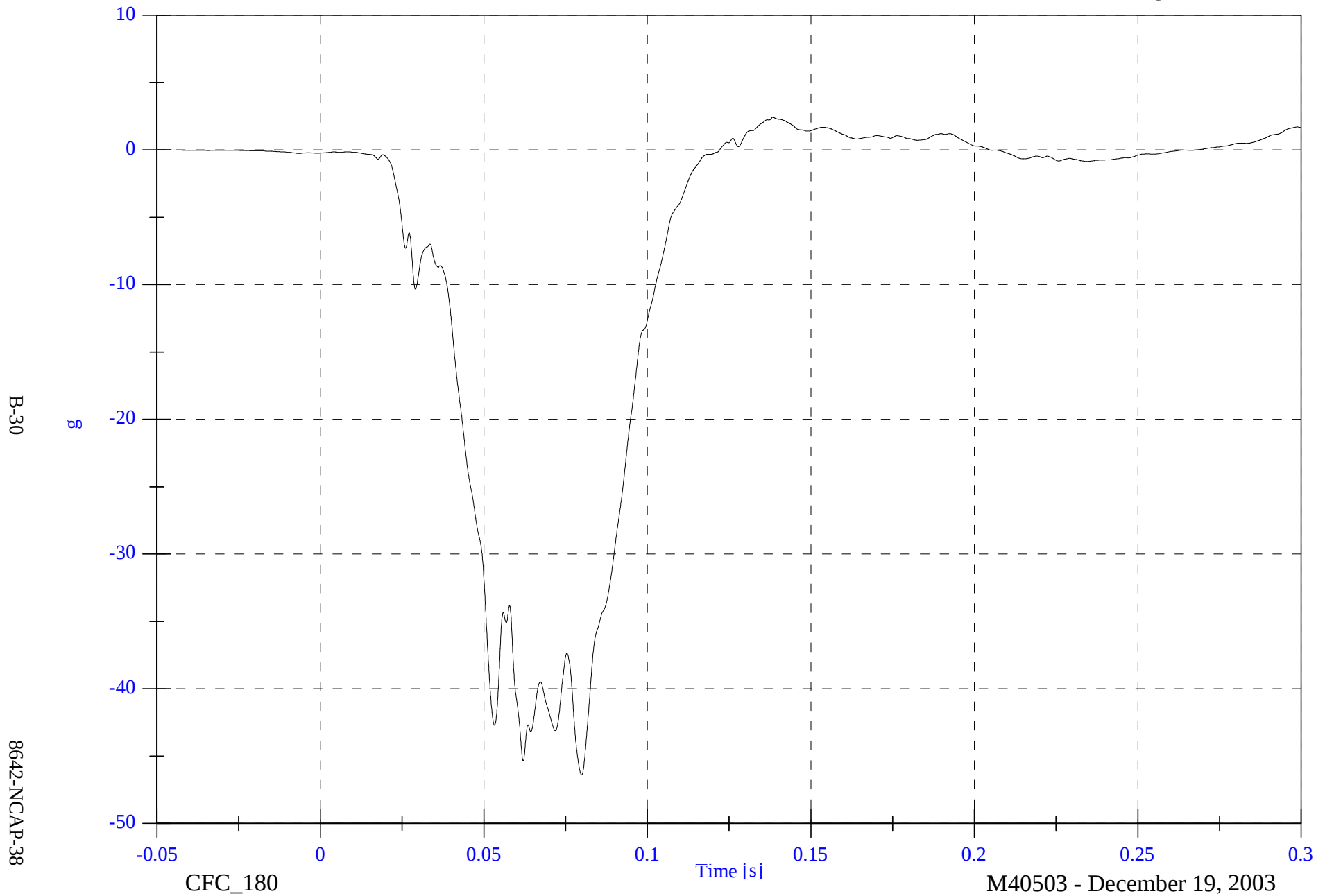


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Chest x

Max: 2.4 [g] at 0.138 [s]

Min: -46.4 [g] at 0.080 [s]

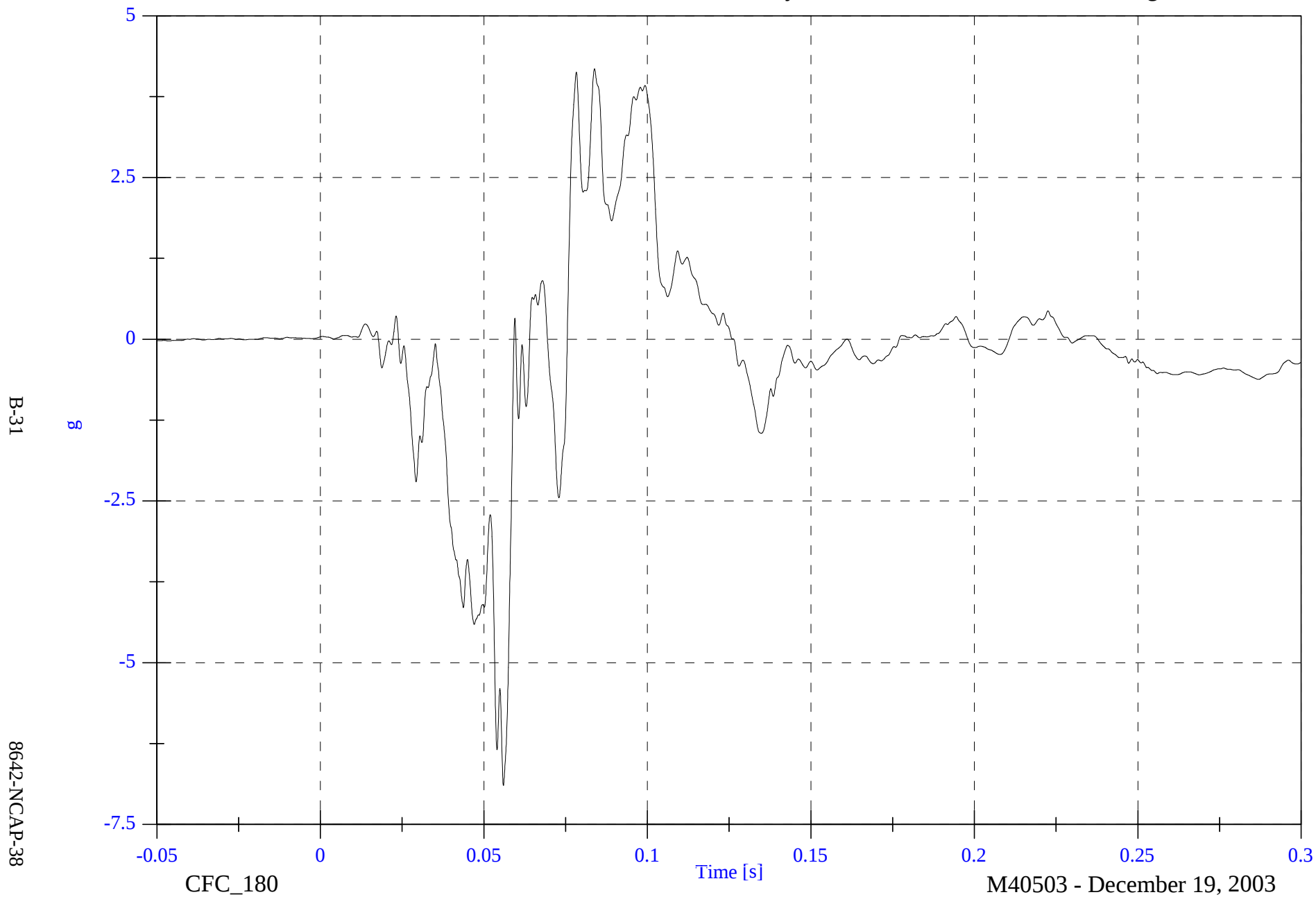


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 4.2 [g] at 0.084 [s]

Min: -6.9 [g] at 0.056 [s]

V1P1 Chest y

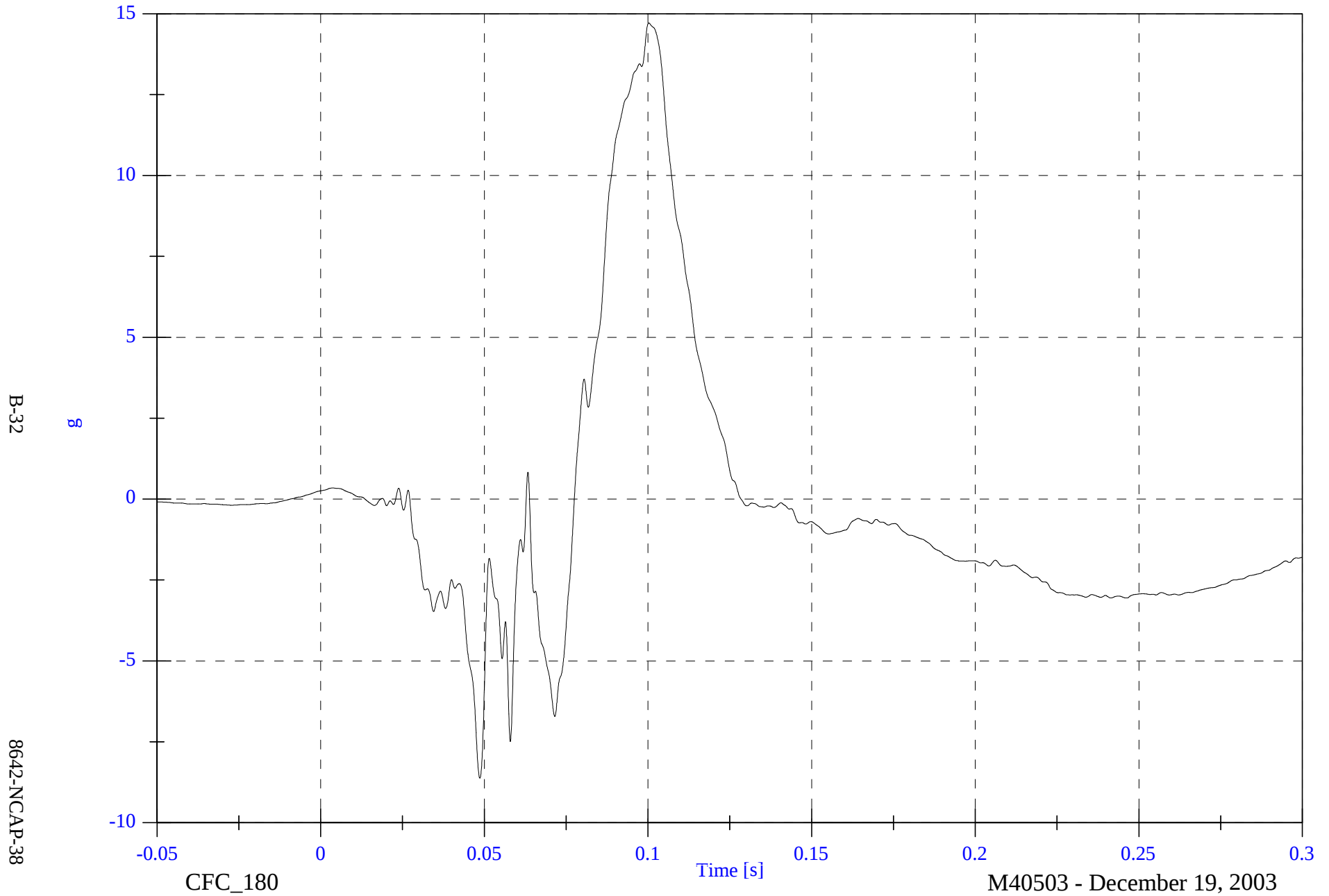


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 14.7 [g] at 0.100 [s]

Min: -8.6 [g] at 0.049 [s]

V1P1 Chest z



2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Chest Resultant

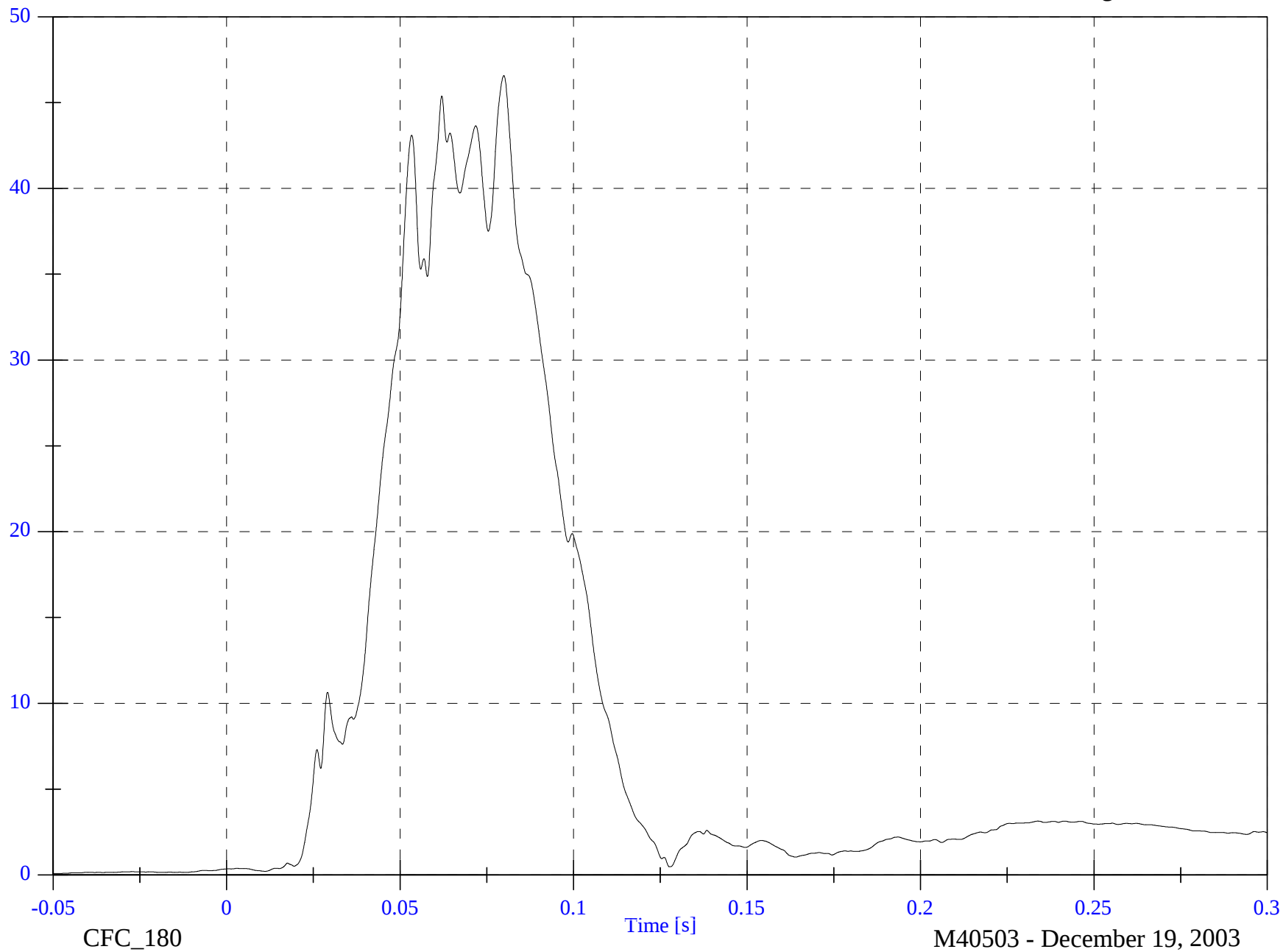
Max: 46.6 [g] at 0.080 [s]

Min: 0.1 [g] at -0.049 [s]

B-33

8642-NCAP-38

g



CFC_180

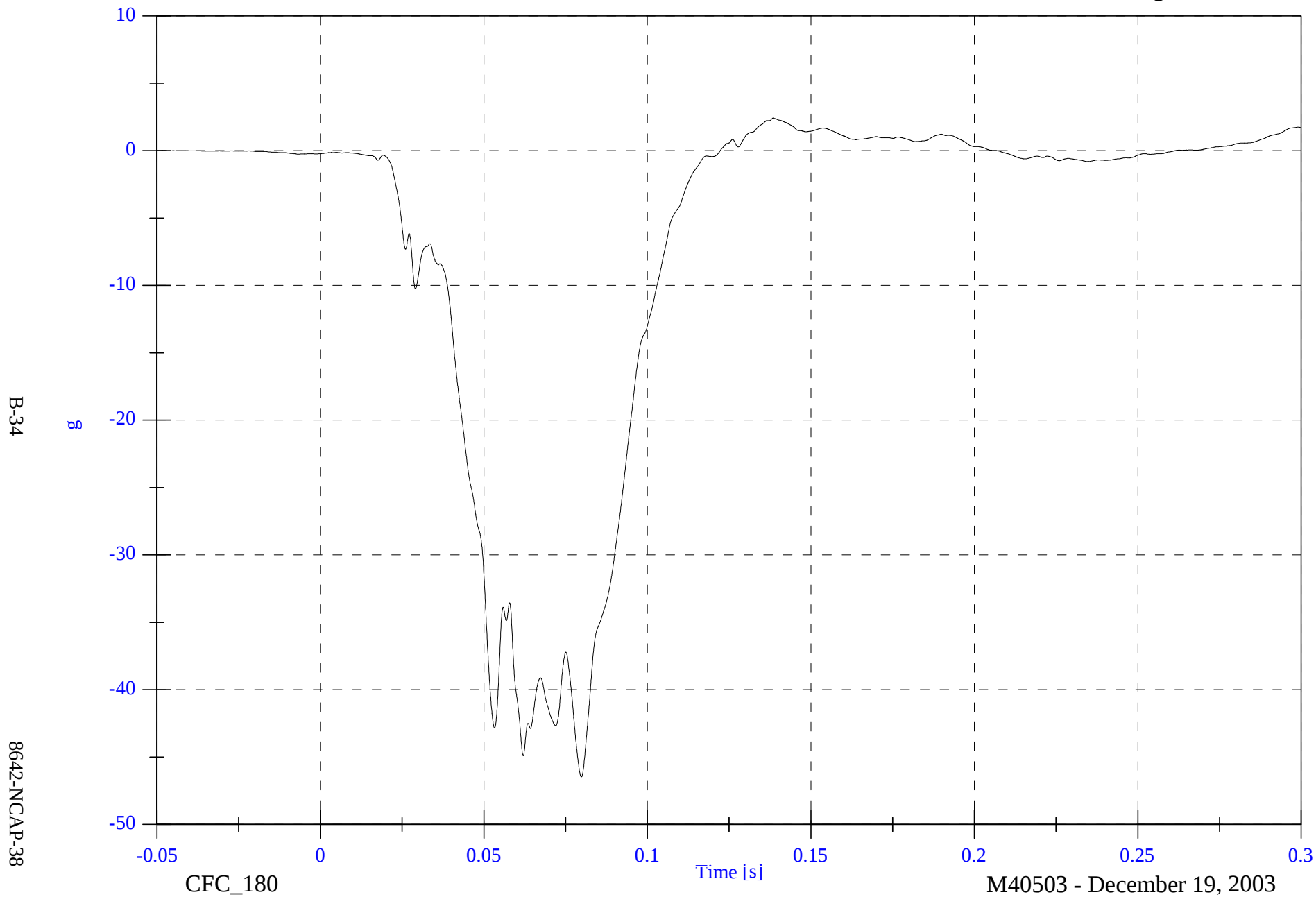
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Chest Red x

Max: 2.4 [g] at 0.138 [s]

Min: -46.5 [g] at 0.080 [s]

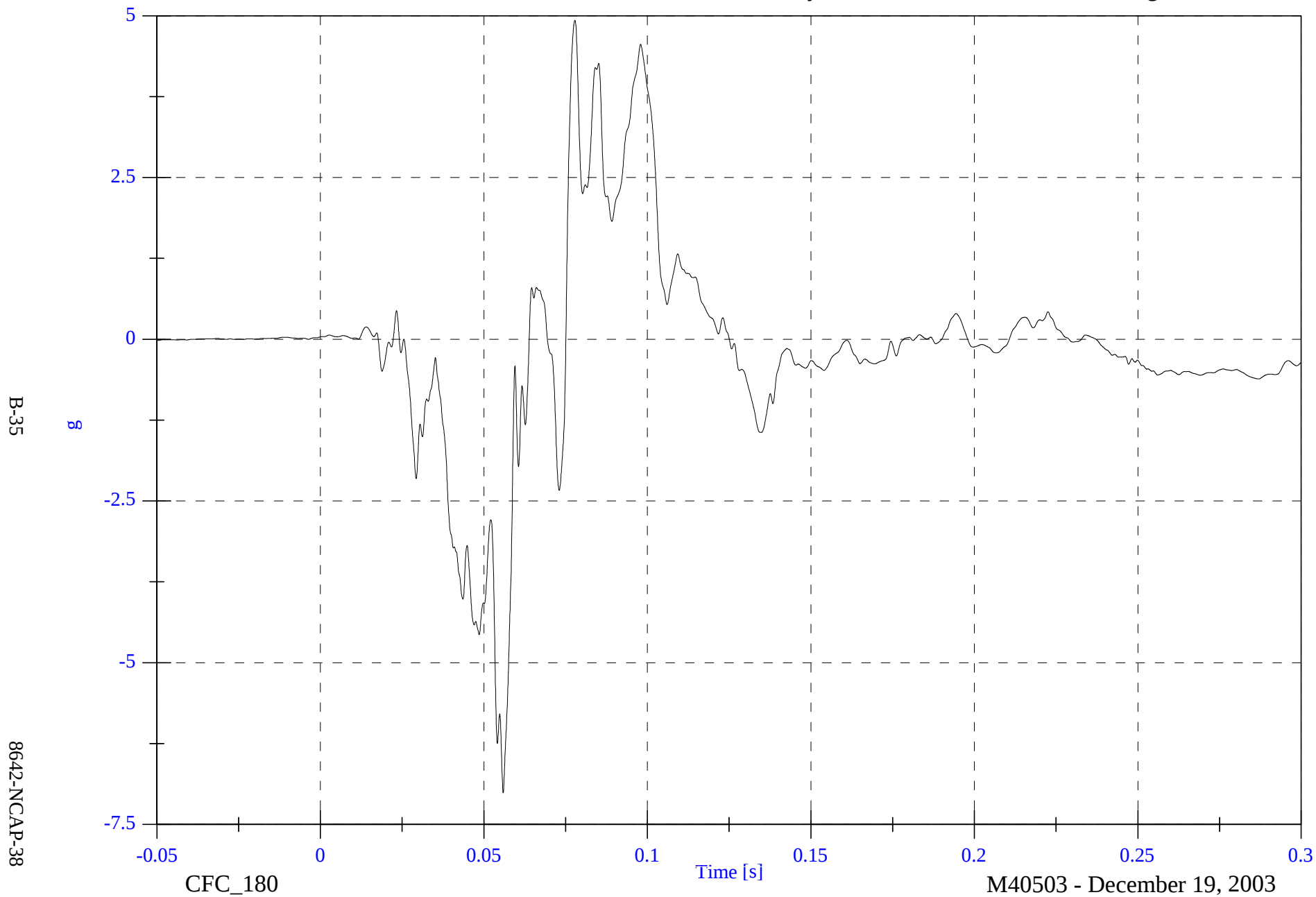


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 4.9 [g] at 0.078 [s]

Min: -7.0 [g] at 0.056 [s]

V1P1 Chest Red y



2004 NCAP Test 2 - 2004 Hyundai XG350

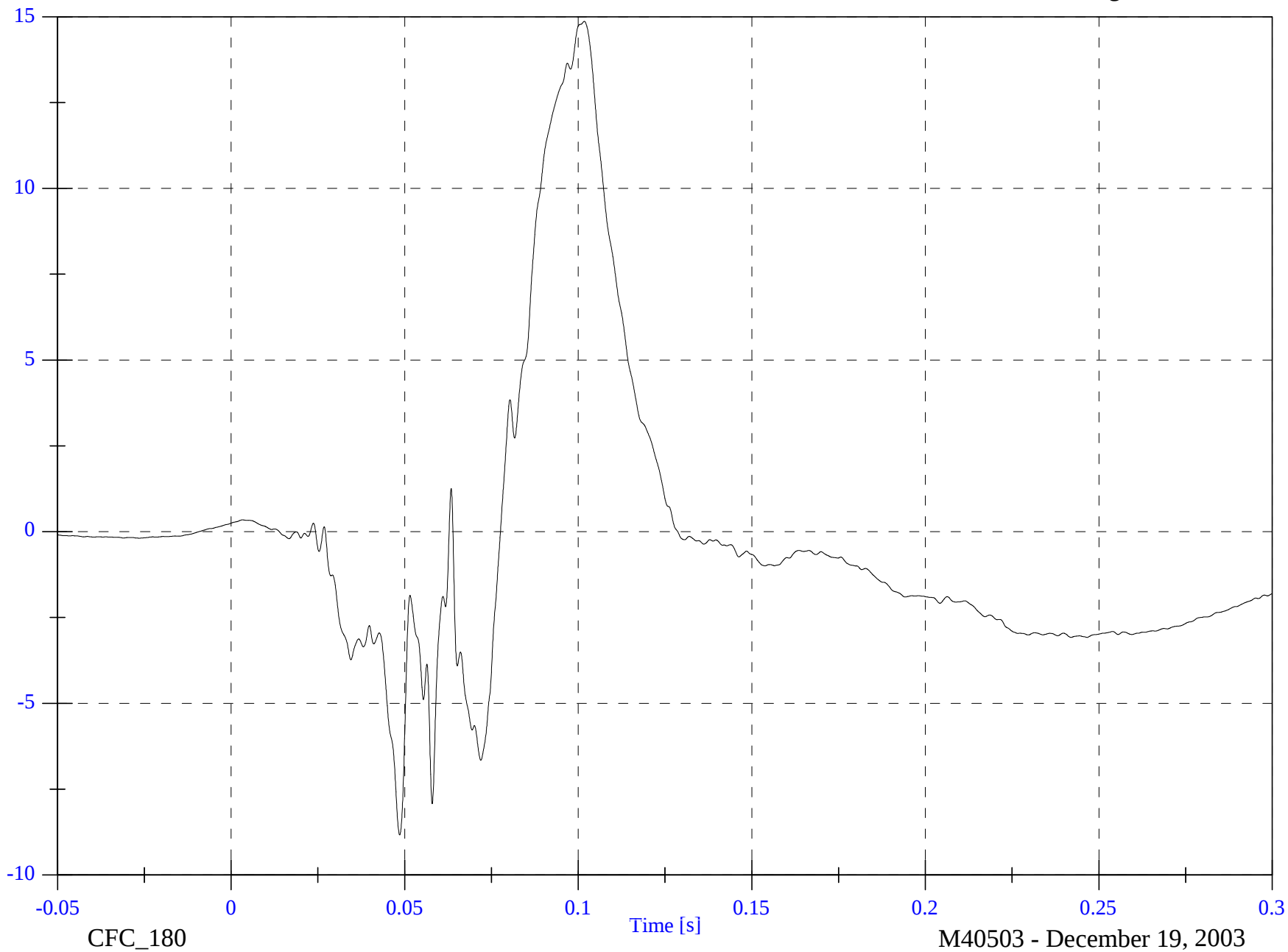
Max: 14.9 [g] at 0.102 [s]

Min: -8.8 [g] at 0.049 [s]

V1P1 Chest Red z

B-36

8642-NCAP-38

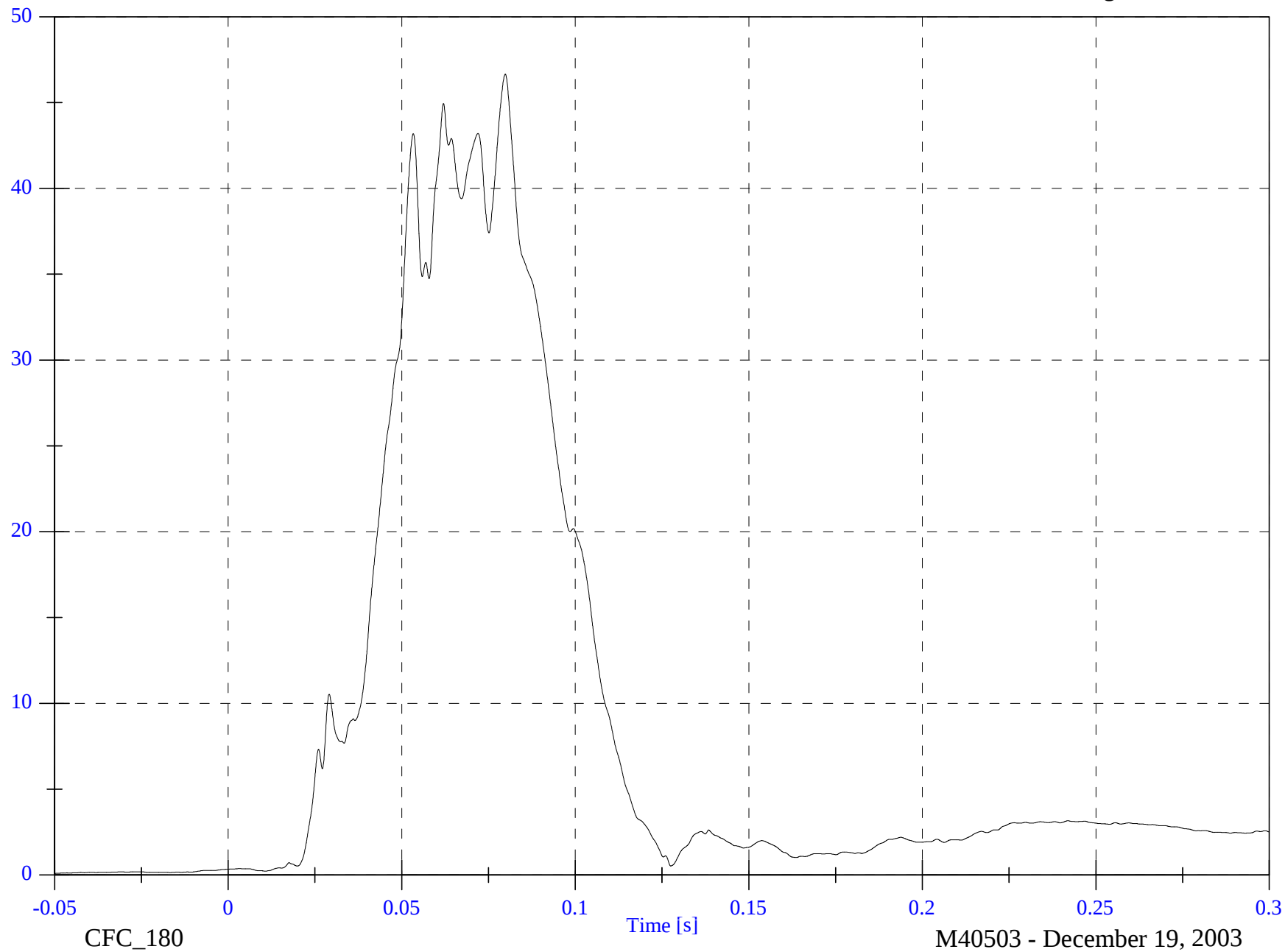


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Chest Red Resultant

Max: 46.7 [g] at 0.080 [s]

Min: 0.1 [g] at -0.050 [s]



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8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Chest Compression x

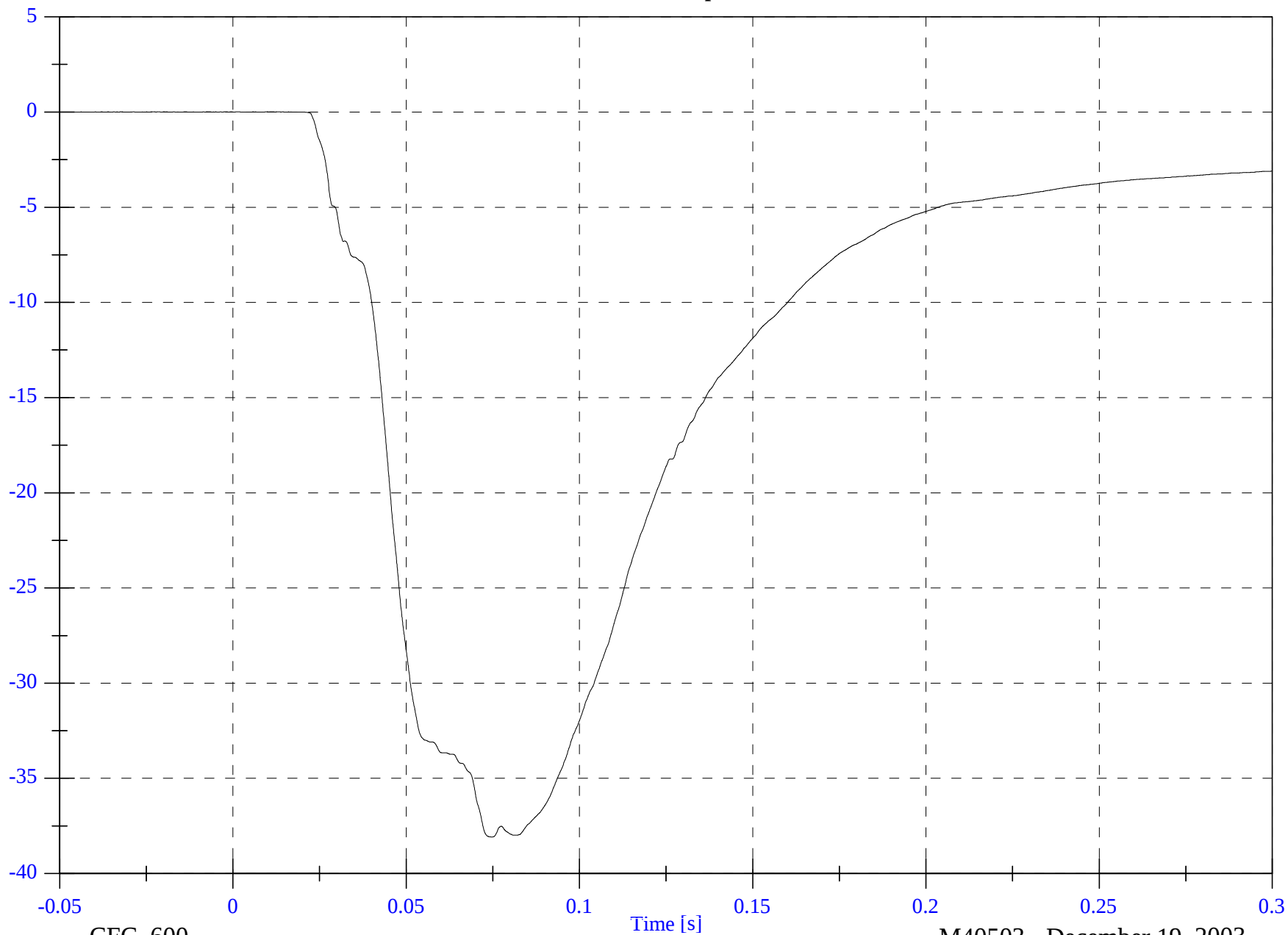
Max: 0.0 [mm] at -0.007 [s]

Min: -38.1 [mm] at 0.075 [s]

B-38

8642-NCAP-38

mm



CFC_600

M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

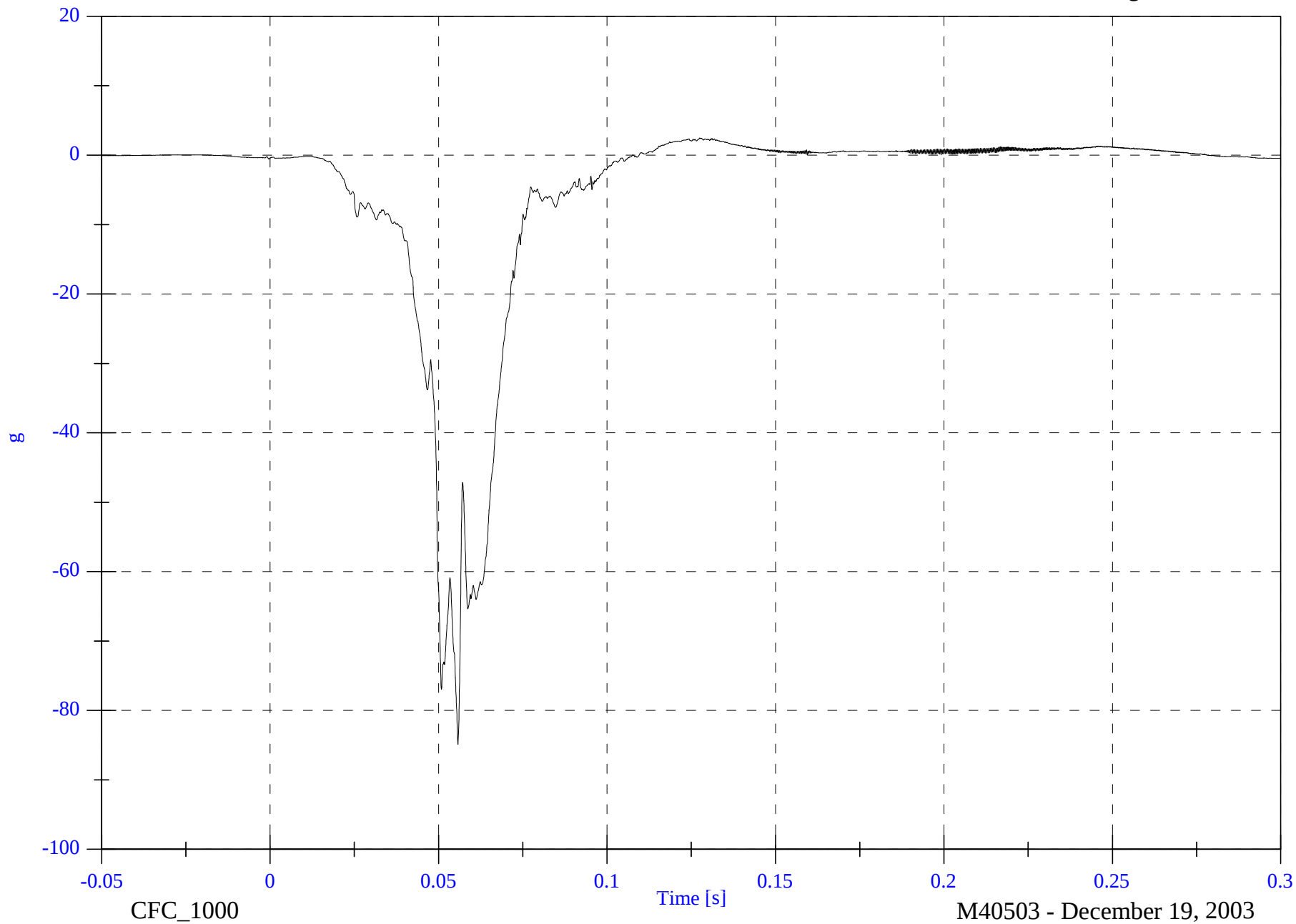
V1P1 Pelvic x

Max: 2.5 [g] at 0.127 [s]

Min: -84.9 [g] at 0.056 [s]

B-39

8642-NCAP-38

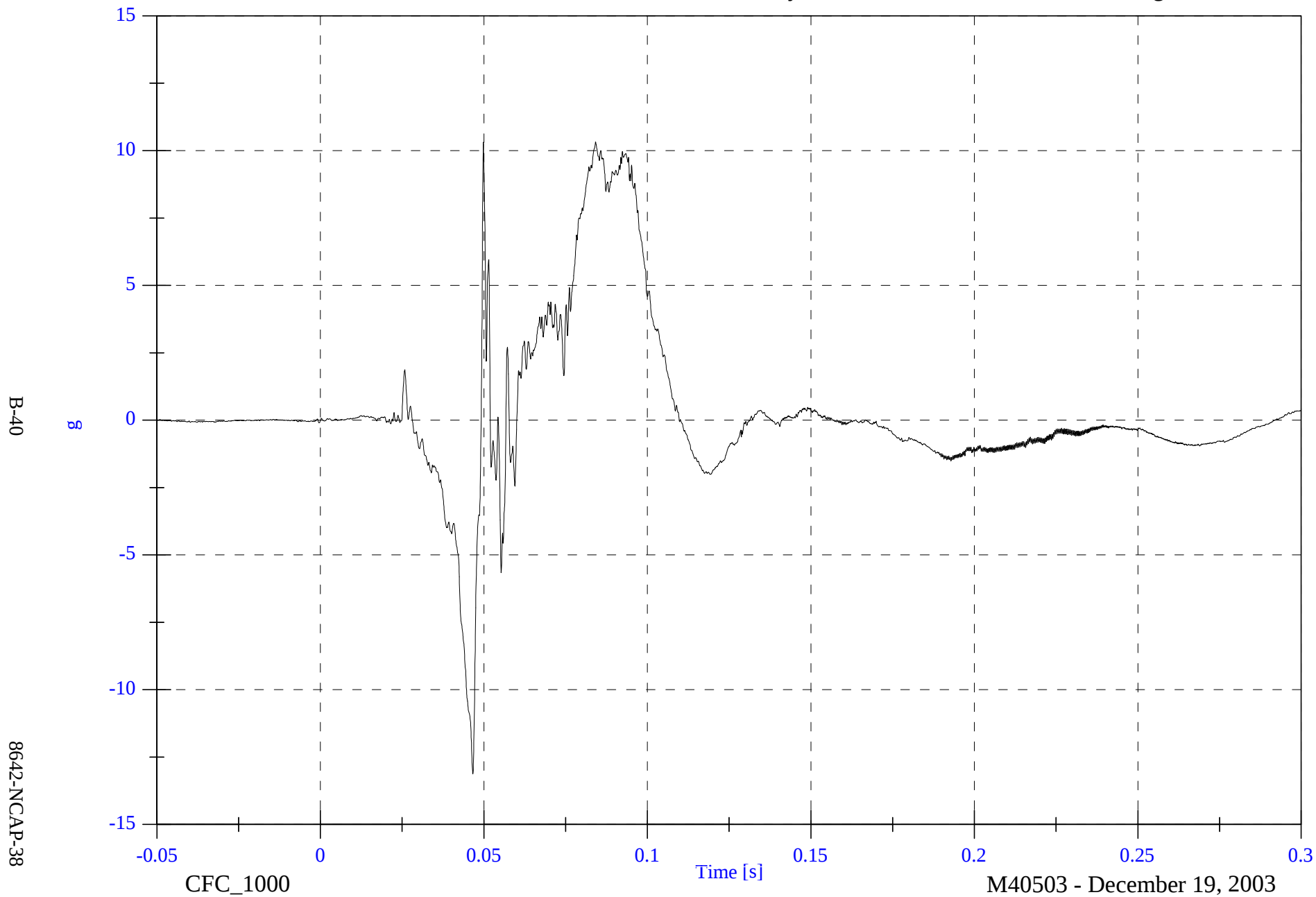


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Pelvic y

Max: 10.3 [g] at 0.084 [s]

Min: -13.1 [g] at 0.047 [s]

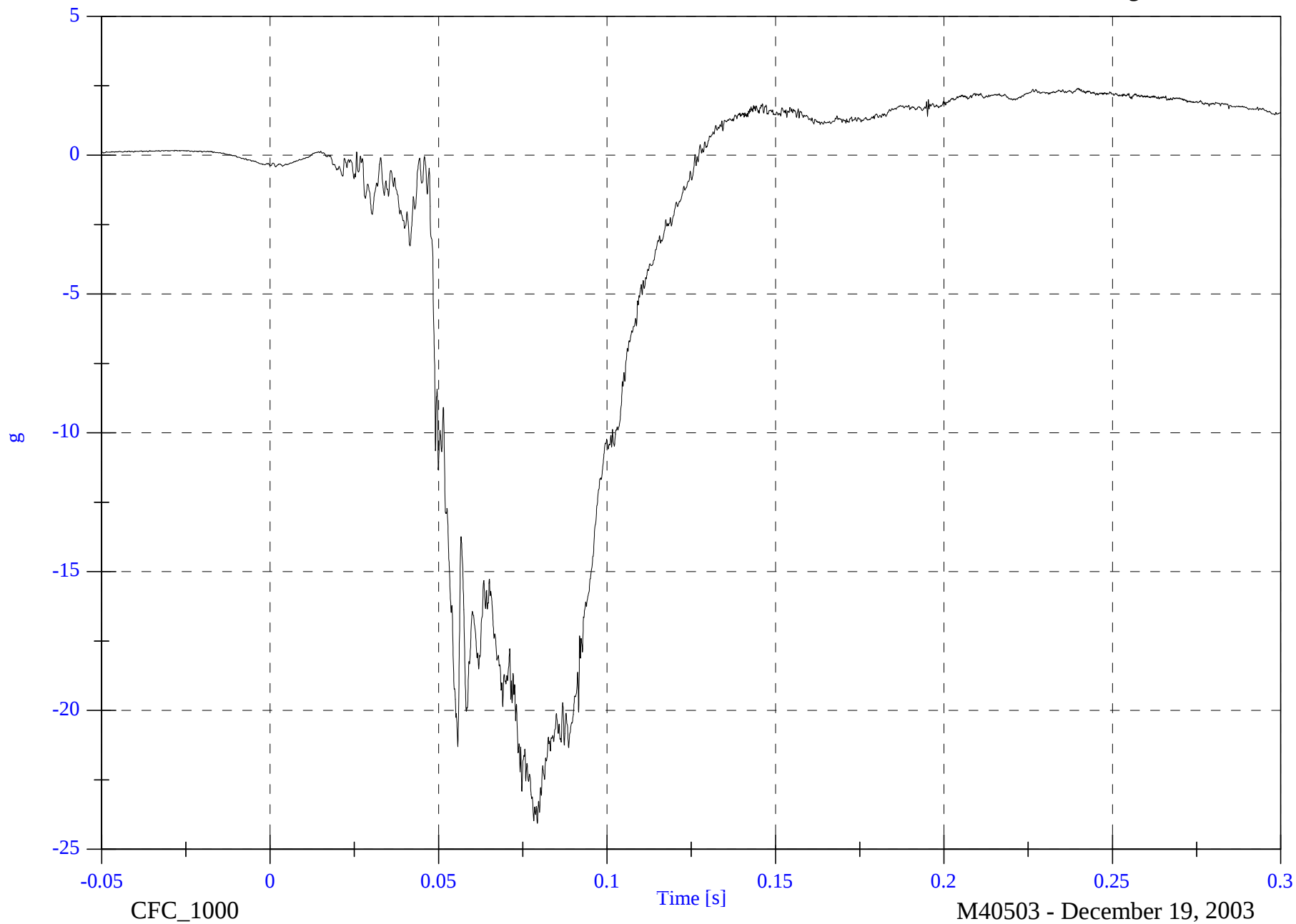


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Pelvic z

Max: 2.4 [g] at 0.240 [s]

Min: -24.1 [g] at 0.079 [s]



B-41

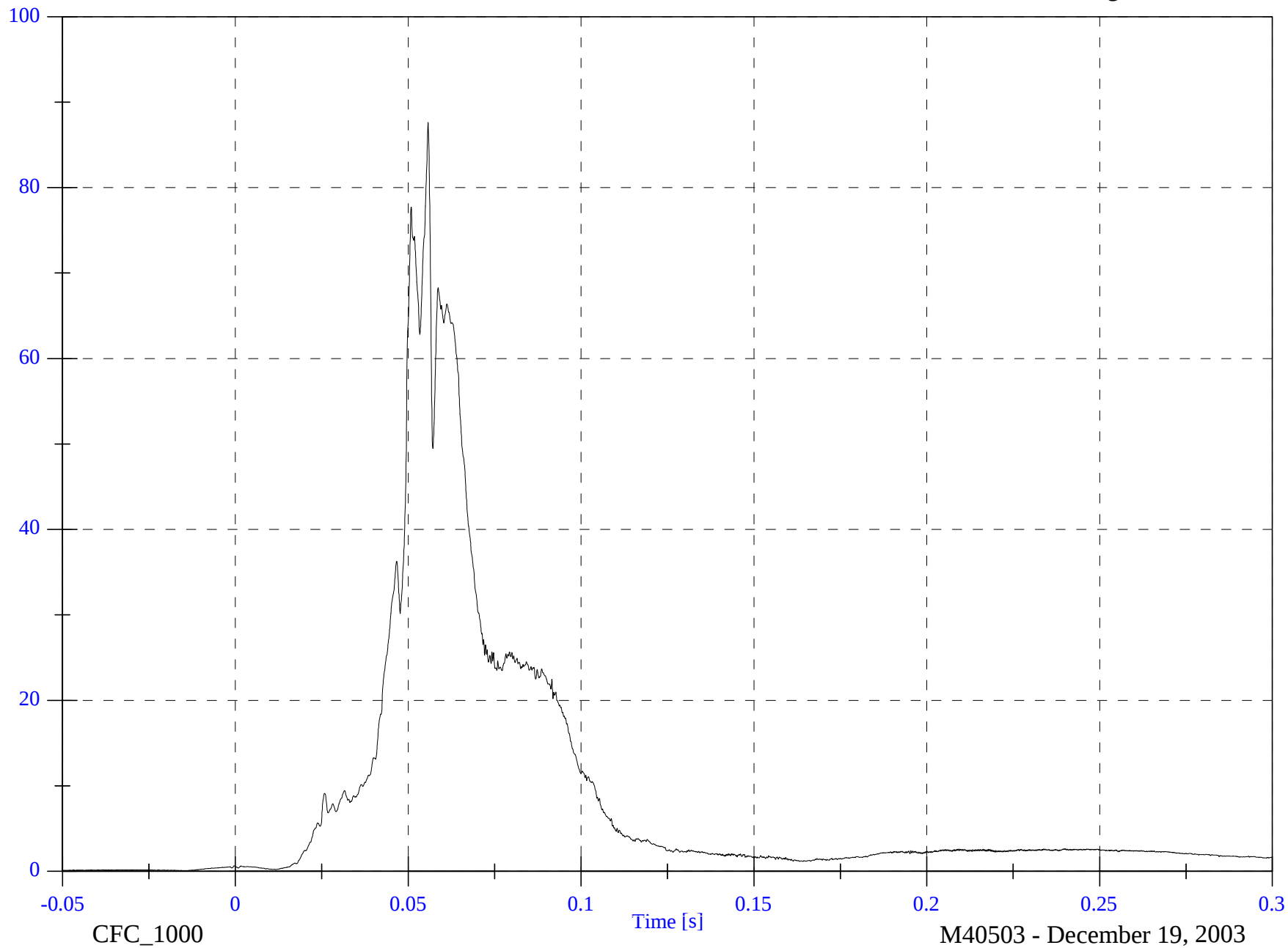
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Pelvic Resultant

Max: 87.6 [g] at 0.056 [s]

Min: 0.1 [g] at -0.015 [s]



B-42

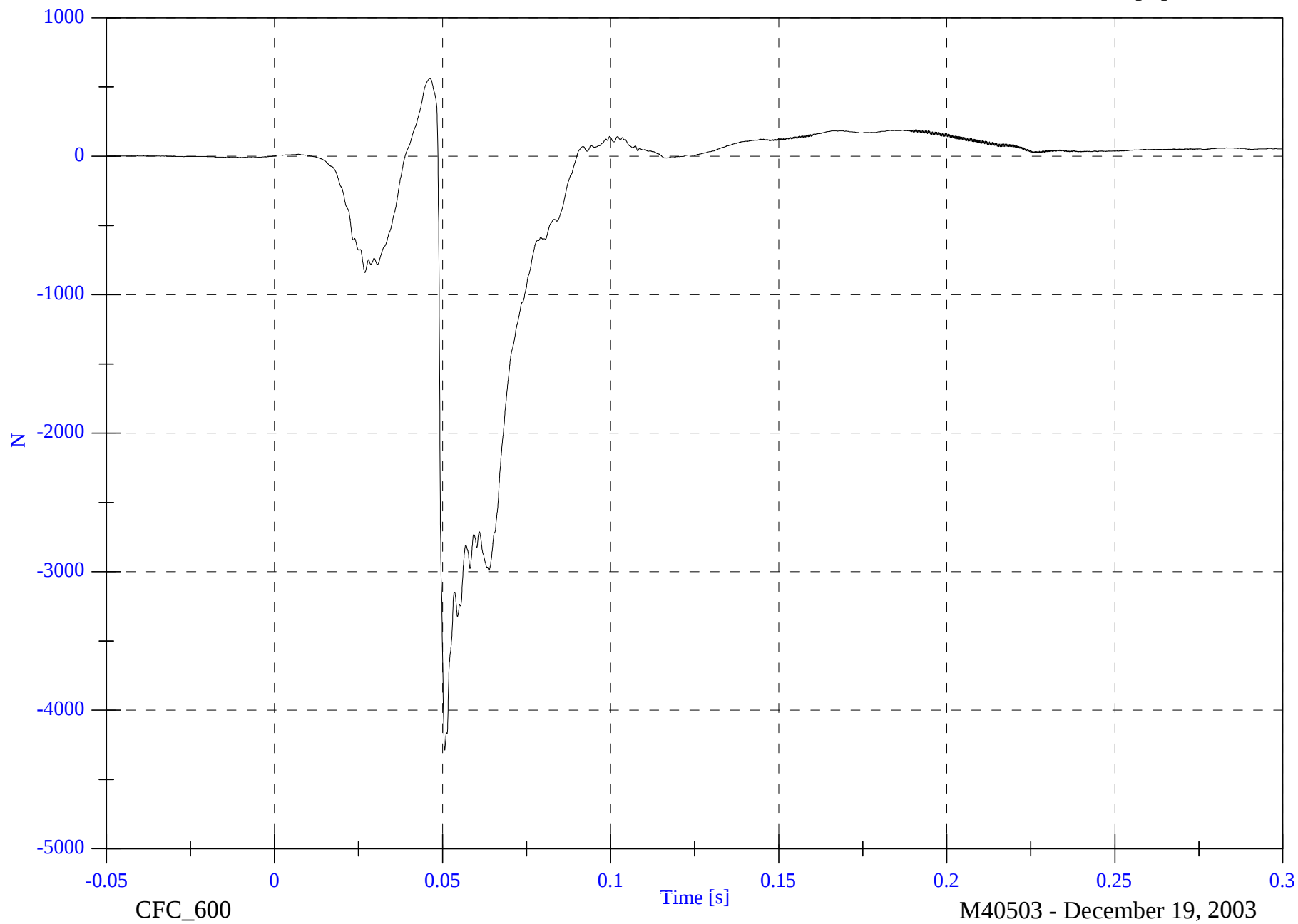
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 561.8 [N] at 0.046 [s]

Min: -4288.3 [N] at 0.051 [s]

V1P1 Left Femur z

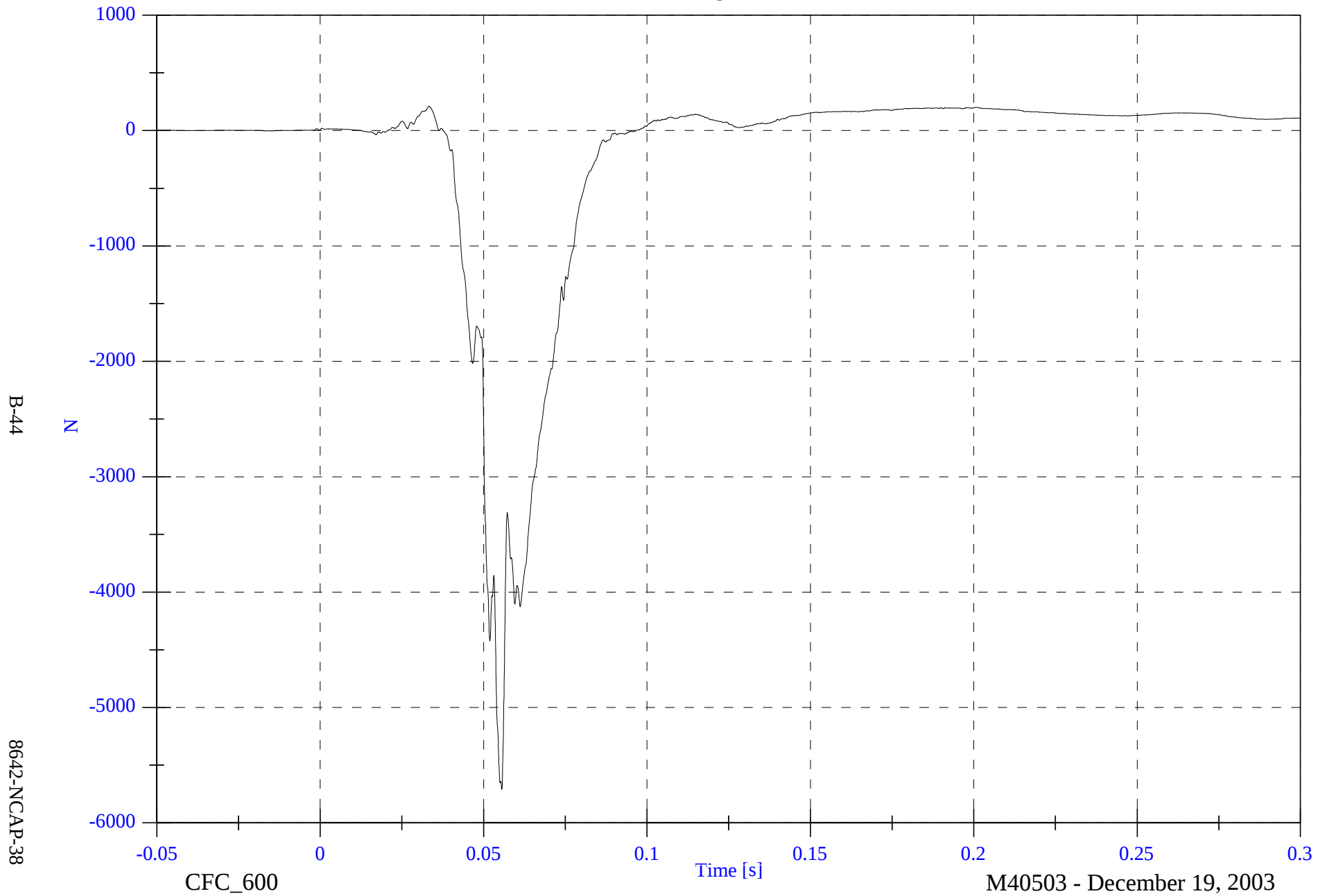


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 210.5 [N] at 0.033 [s]

Min: -5710.1 [N] at 0.056 [s]

V1P1 Right Femur z

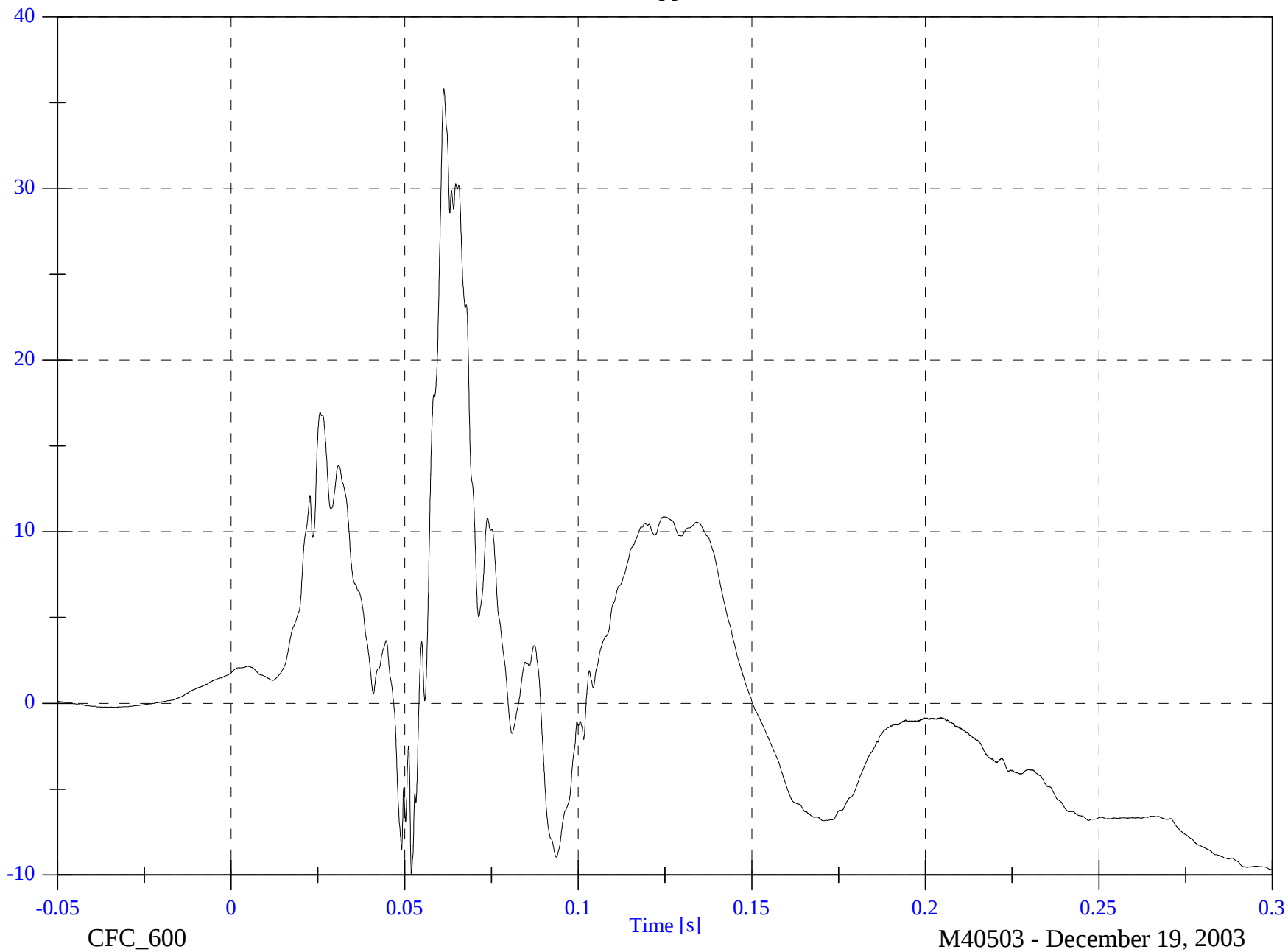


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Left Upper Tibia Mx

Max: 35.8 [N-m] at 0.061 [s]

Min: -10.0 [N-m] at 0.052 [s]



B-45

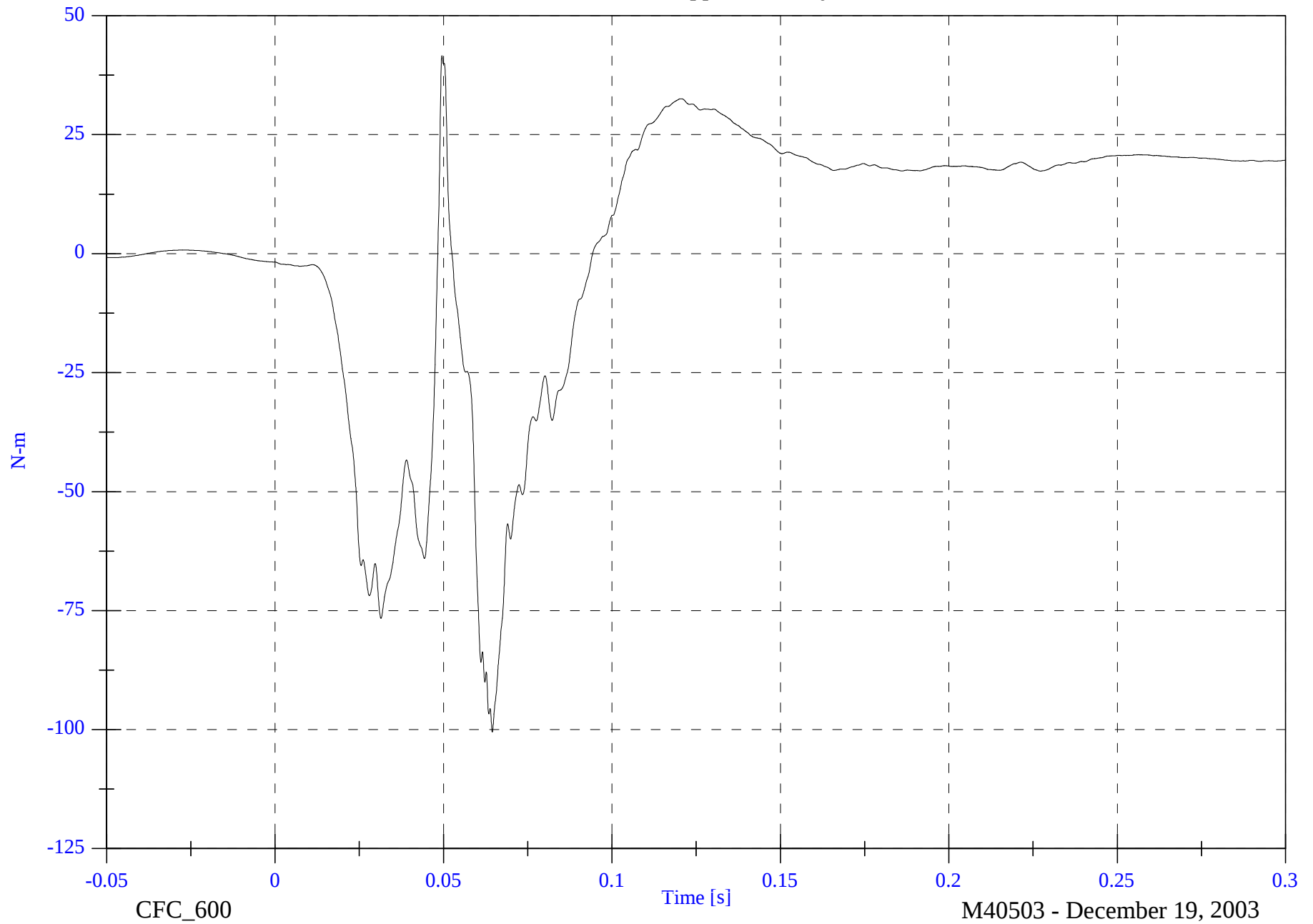
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Left Upper Tibia My

Max: 41.6 [N-m] at 0.050 [s]

Min: -100.5 [N-m] at 0.064 [s]



B-46

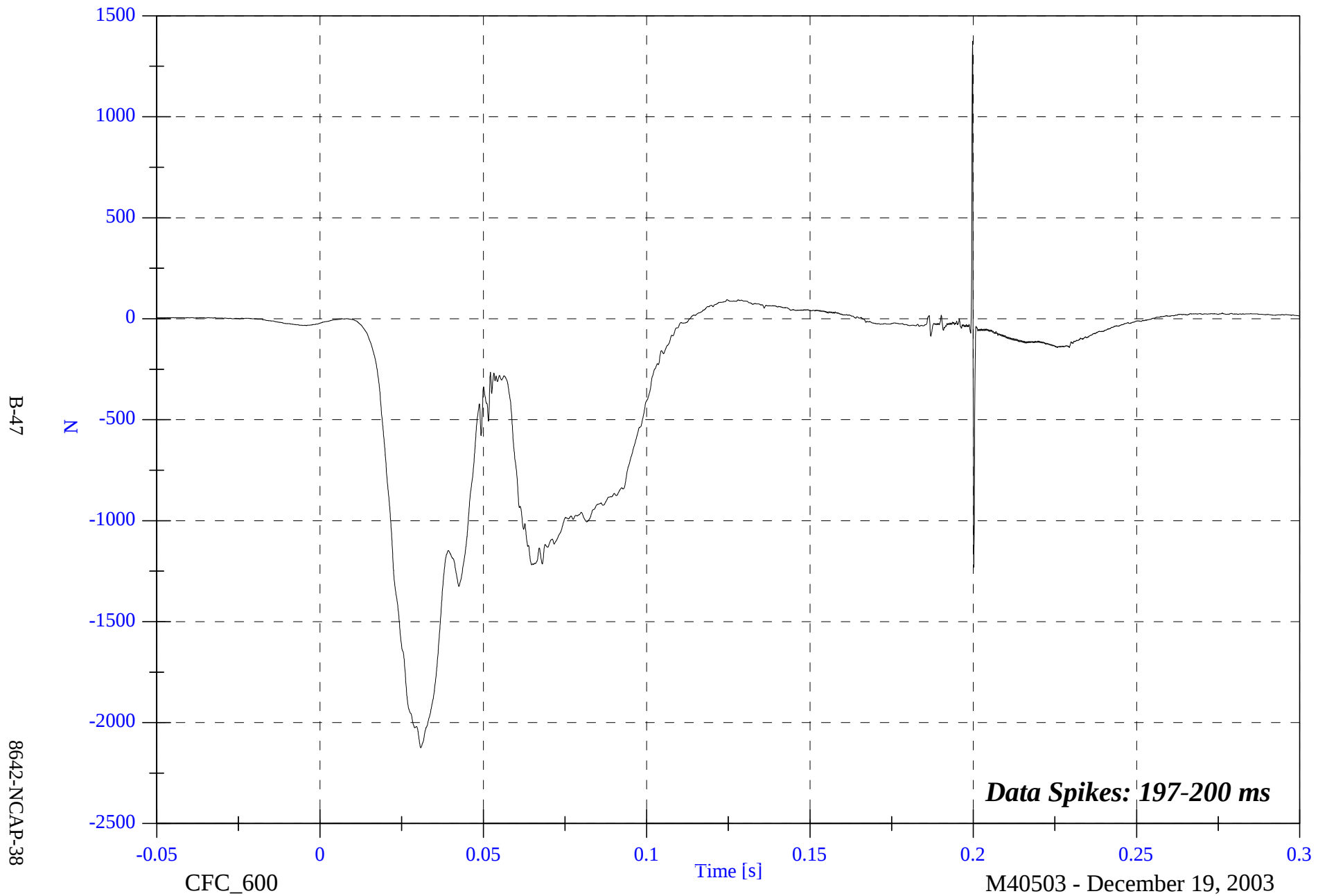
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Left Lower Tibia Fz

Max: 1374.0 [N] at 0.200 [s]

Min: -2124.3 [N] at 0.031 [s]

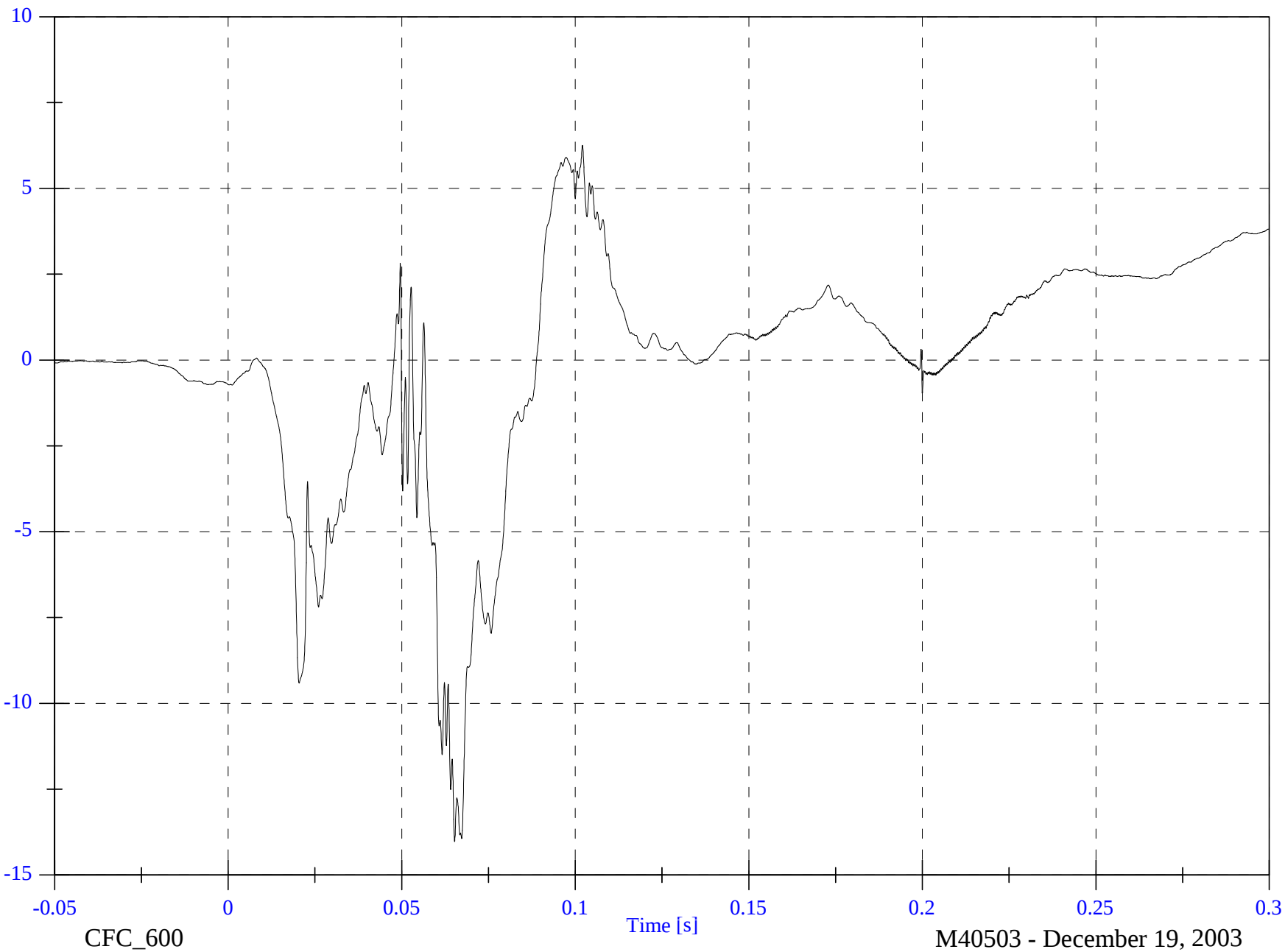


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Left Lower Tibia Mx

Max: 6.3 [N-m] at 0.102 [s]

Min: -14.0 [N-m] at 0.065 [s]



B-48

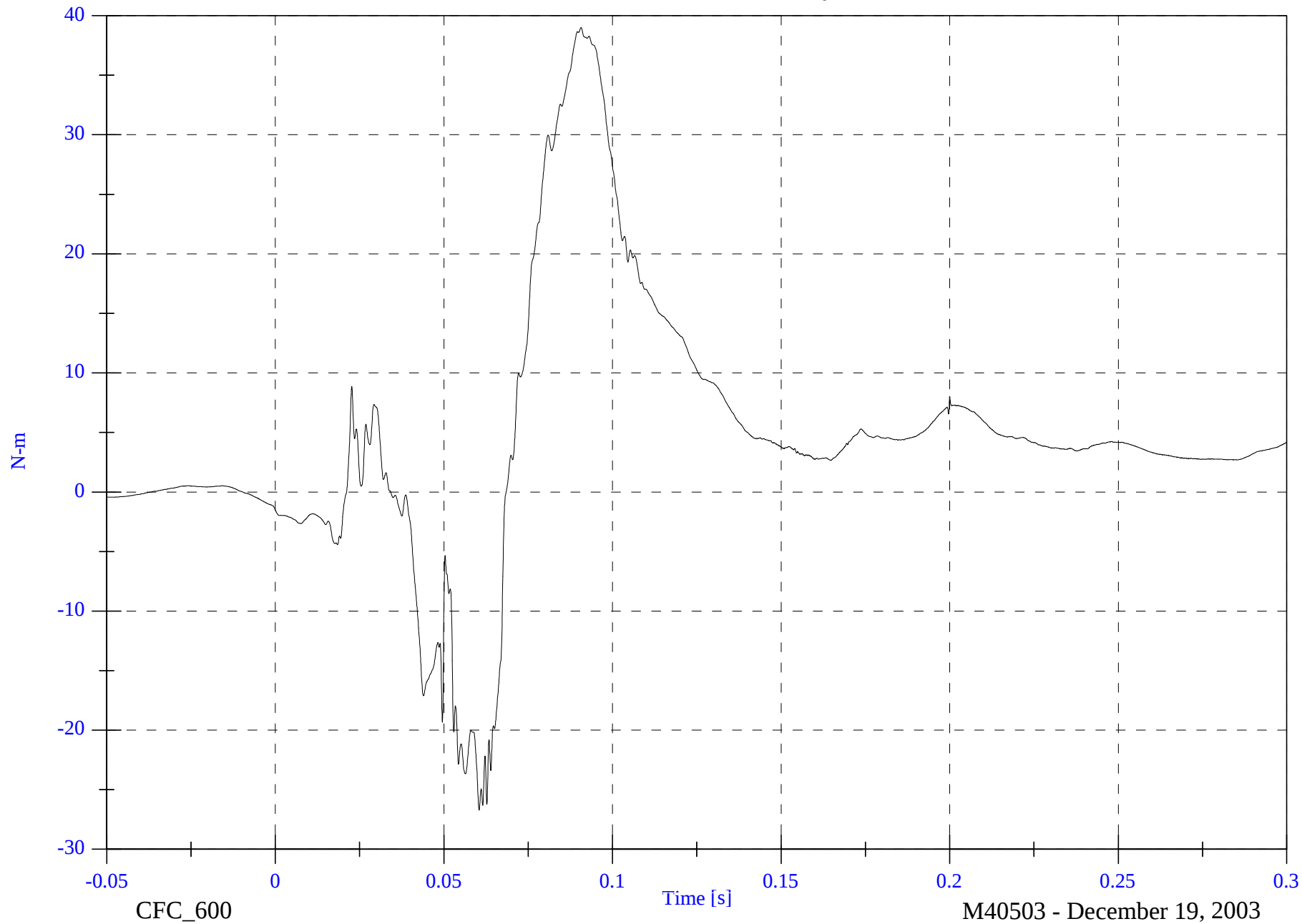
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Left Lower Tibia My

Max: 39.0 [N-m] at 0.091 [s]

Min: -26.7 [N-m] at 0.060 [s]



B-49

8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

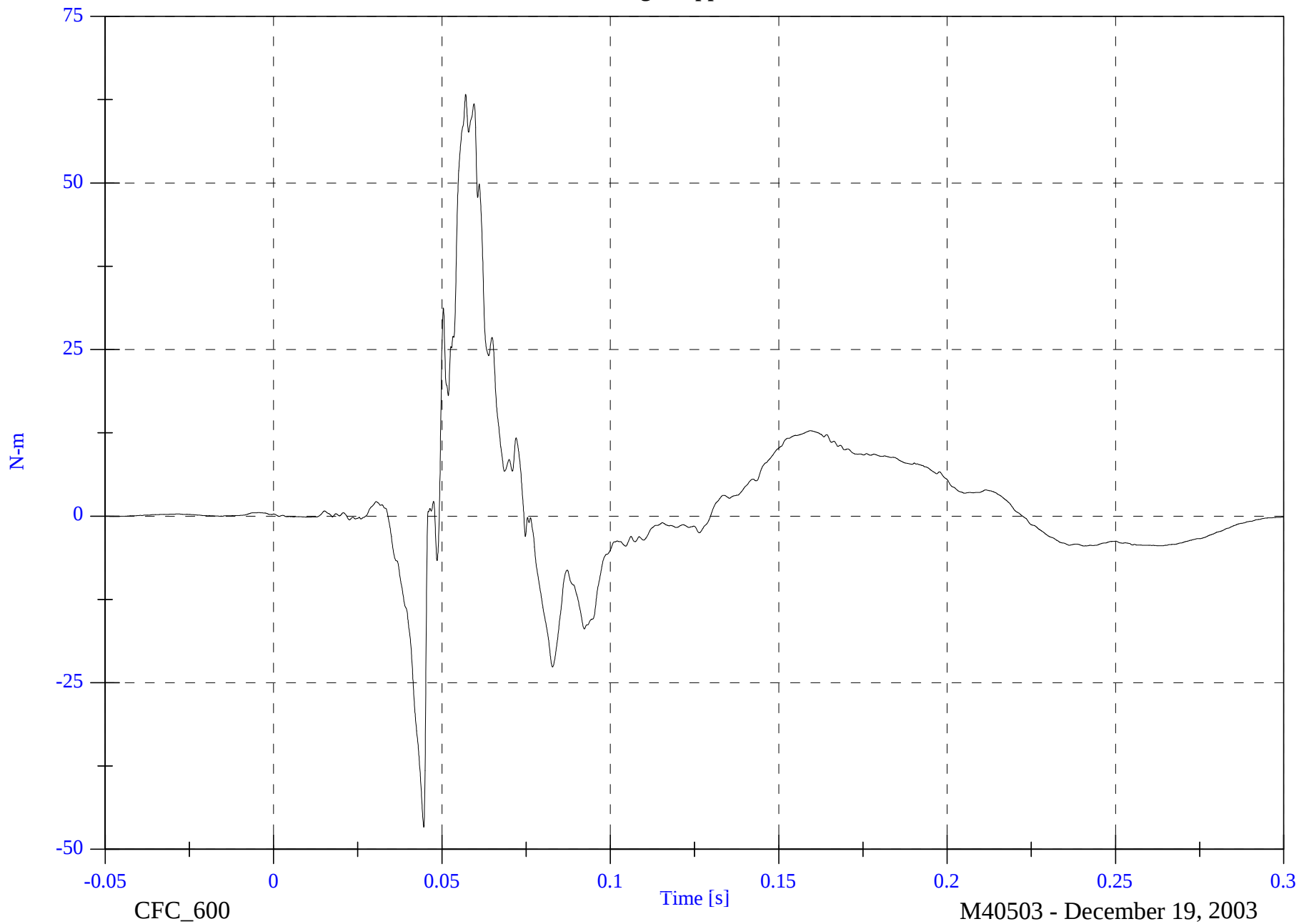
V1P1 Right Upper Tibia Mx

Max: 63.3 [N-m] at 0.057 [s]

Min: -46.7 [N-m] at 0.045 [s]

B-50

8642-NCAP-38

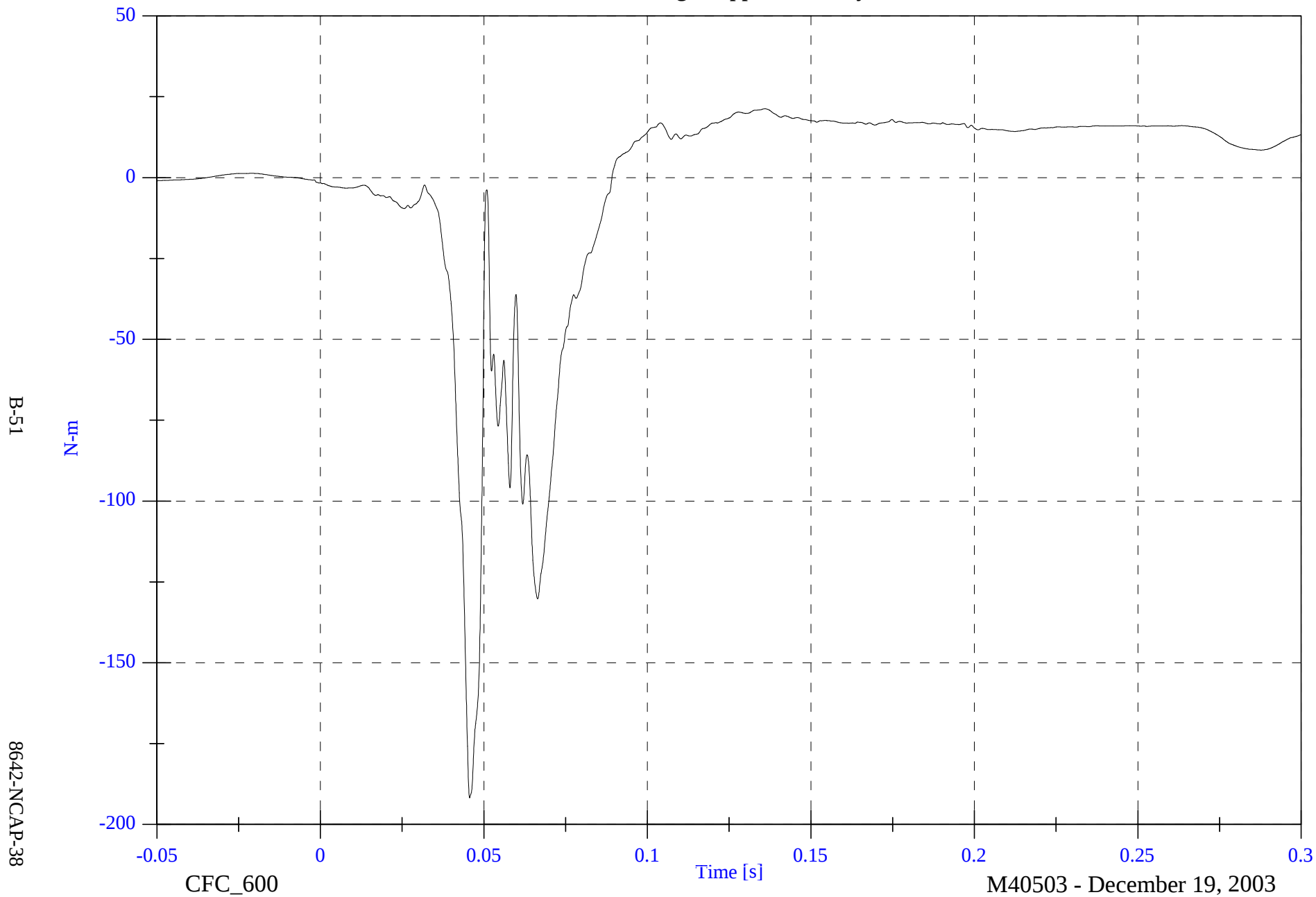


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Right Upper Tibia My

Max: 21.3 [N-m] at 0.136 [s]

Min: -191.8 [N-m] at 0.046 [s]

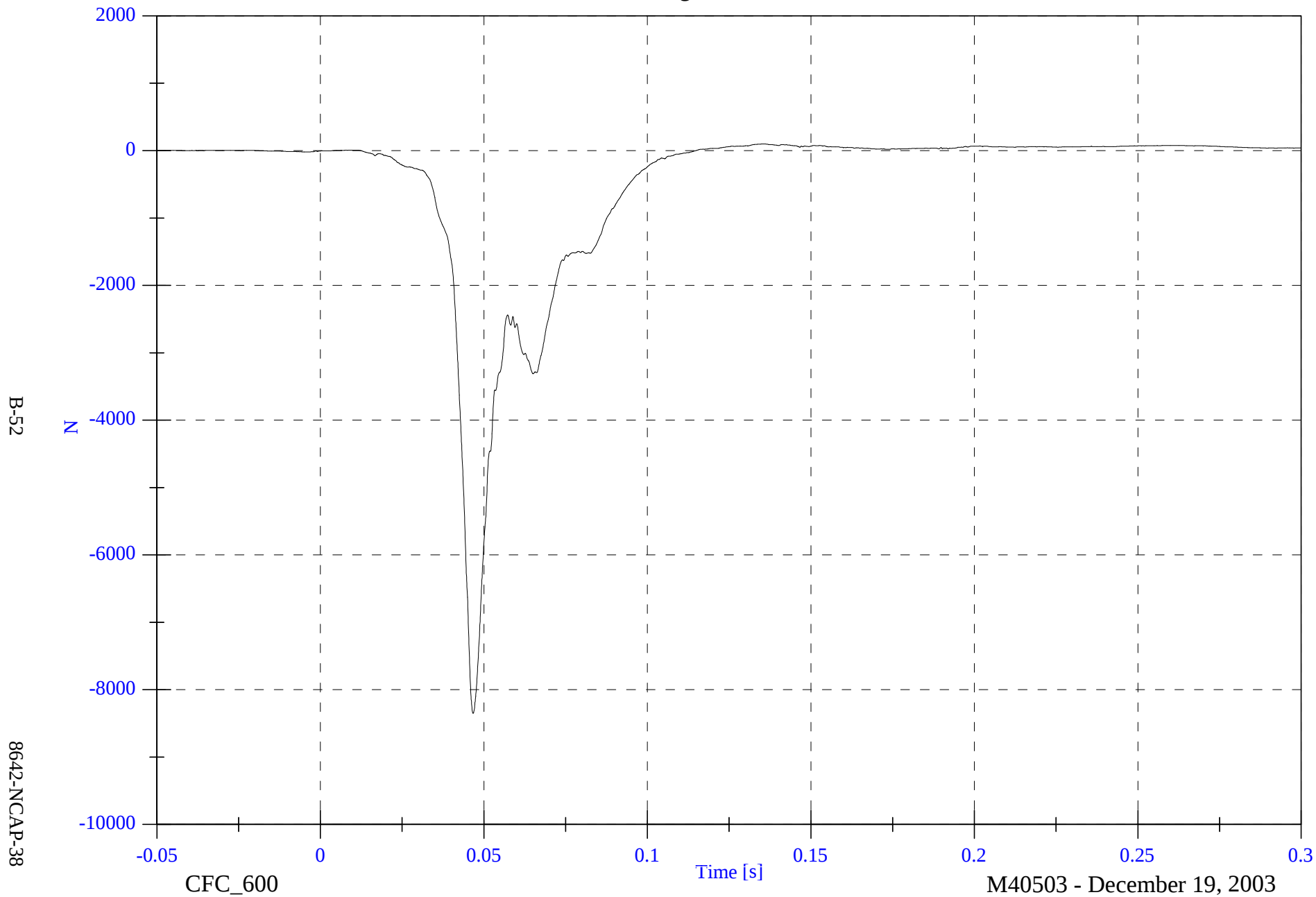


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Right Lower Tibia Fz

Max: 99.1 [N] at 0.136 [s]

Min: -8350.1 [N] at 0.047 [s]

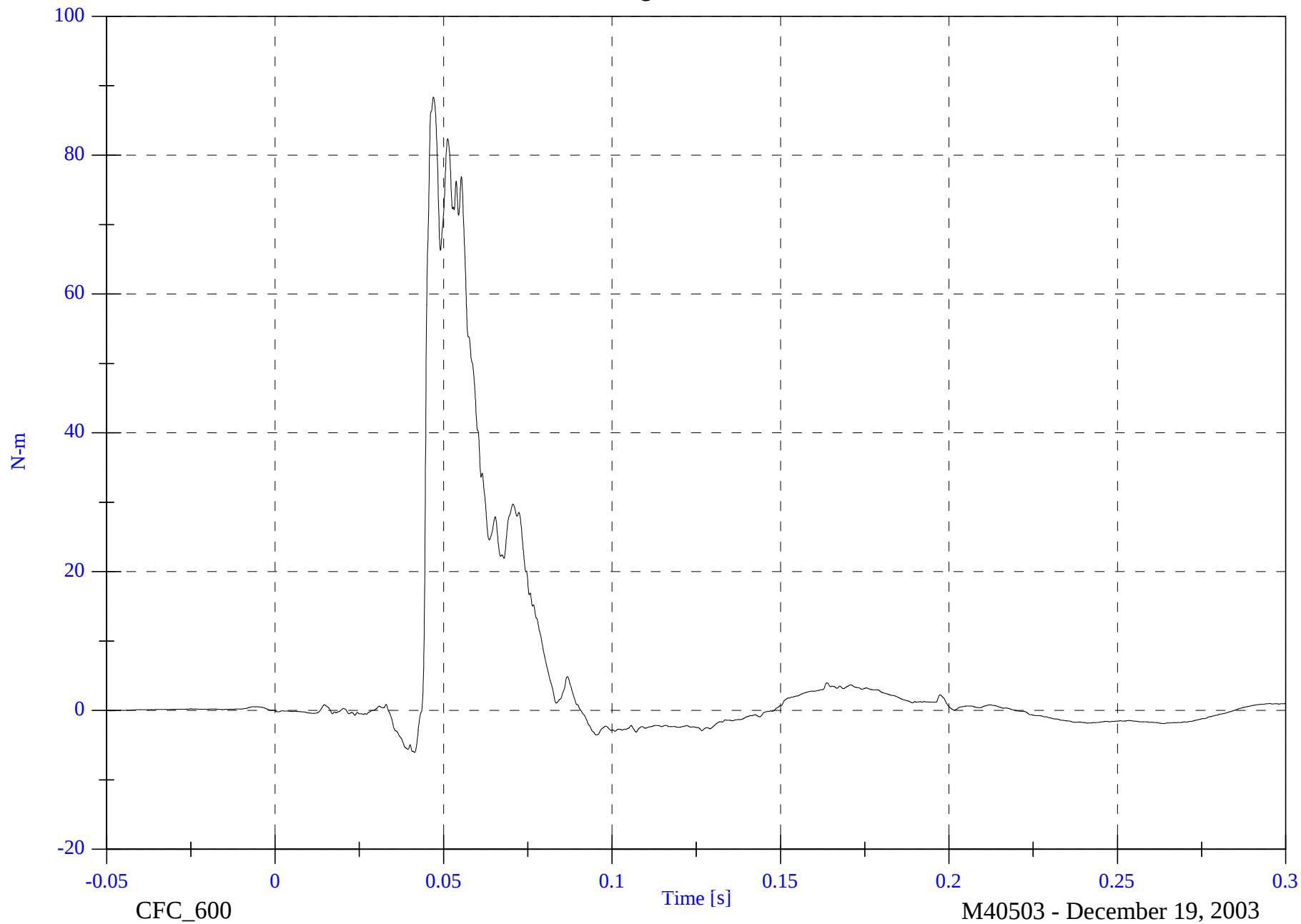


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Right Lower Tibia Mx

Max: 88.4 [N-m] at 0.047 [s]

Min: -6.1 [N-m] at 0.041 [s]



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8642-NCAP-38

CFC_600

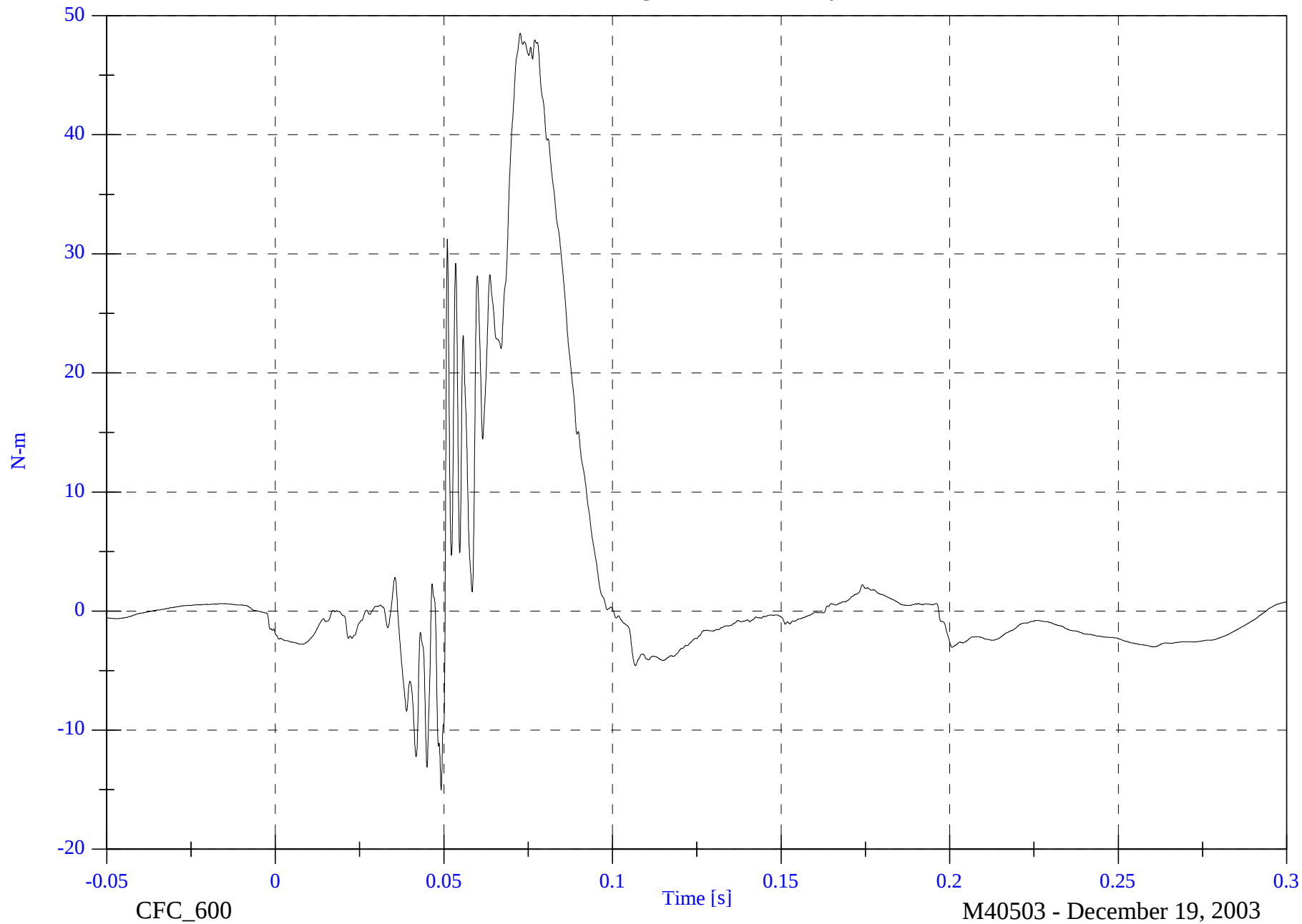
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Right Lower Tibia My

Max: 48.5 [N-m] at 0.073 [s]

Min: -15.0 [N-m] at 0.049 [s]



B-54

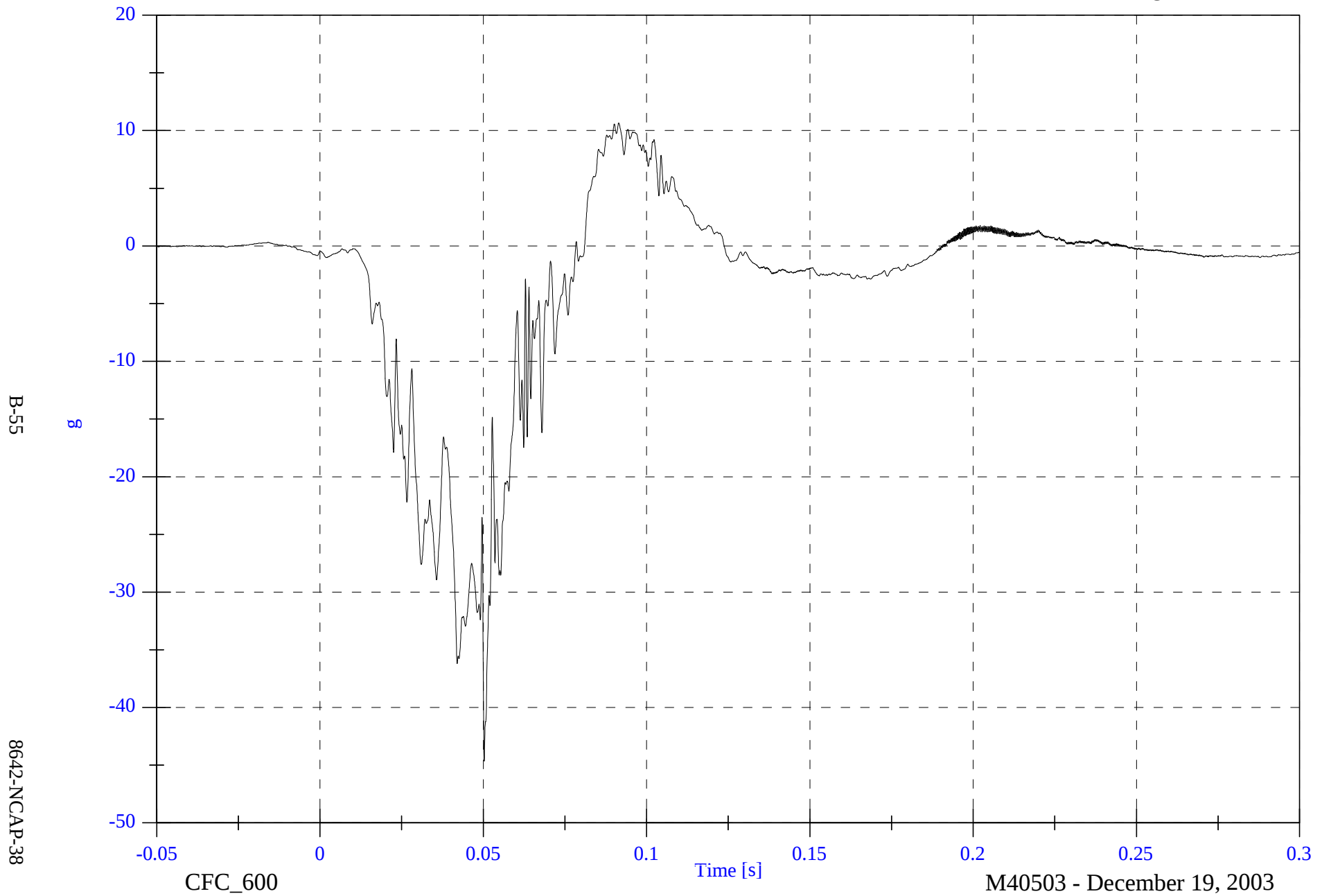
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Left Foot Aft x

Max: 10.7 [g] at 0.091 [s]

Min: -44.6 [g] at 0.050 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

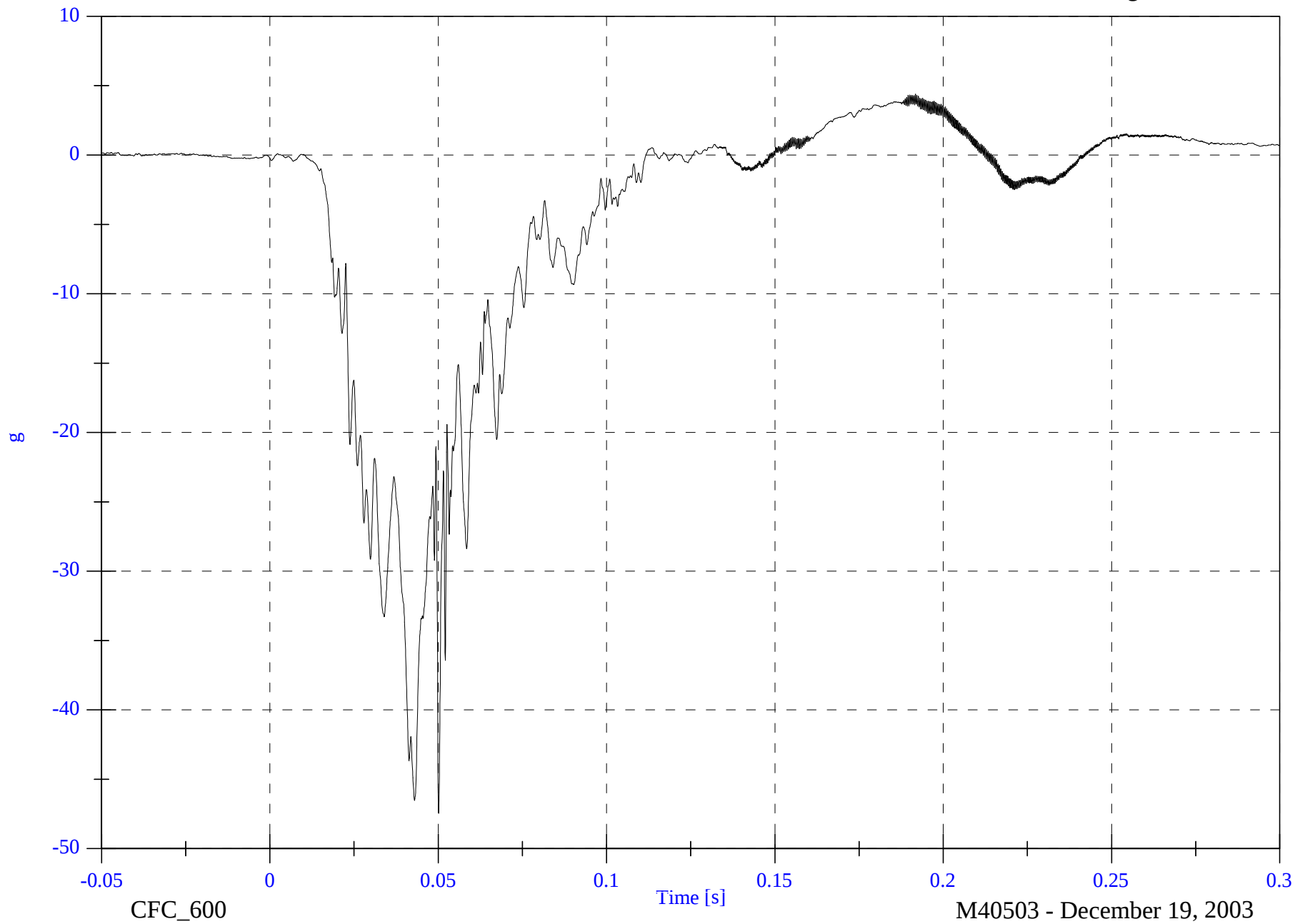
V1P1 Left Foot Aft z

Max: 4.4 [g] at 0.192 [s]

Min: -47.5 [g] at 0.050 [s]

B-56

8642-NCAP-38

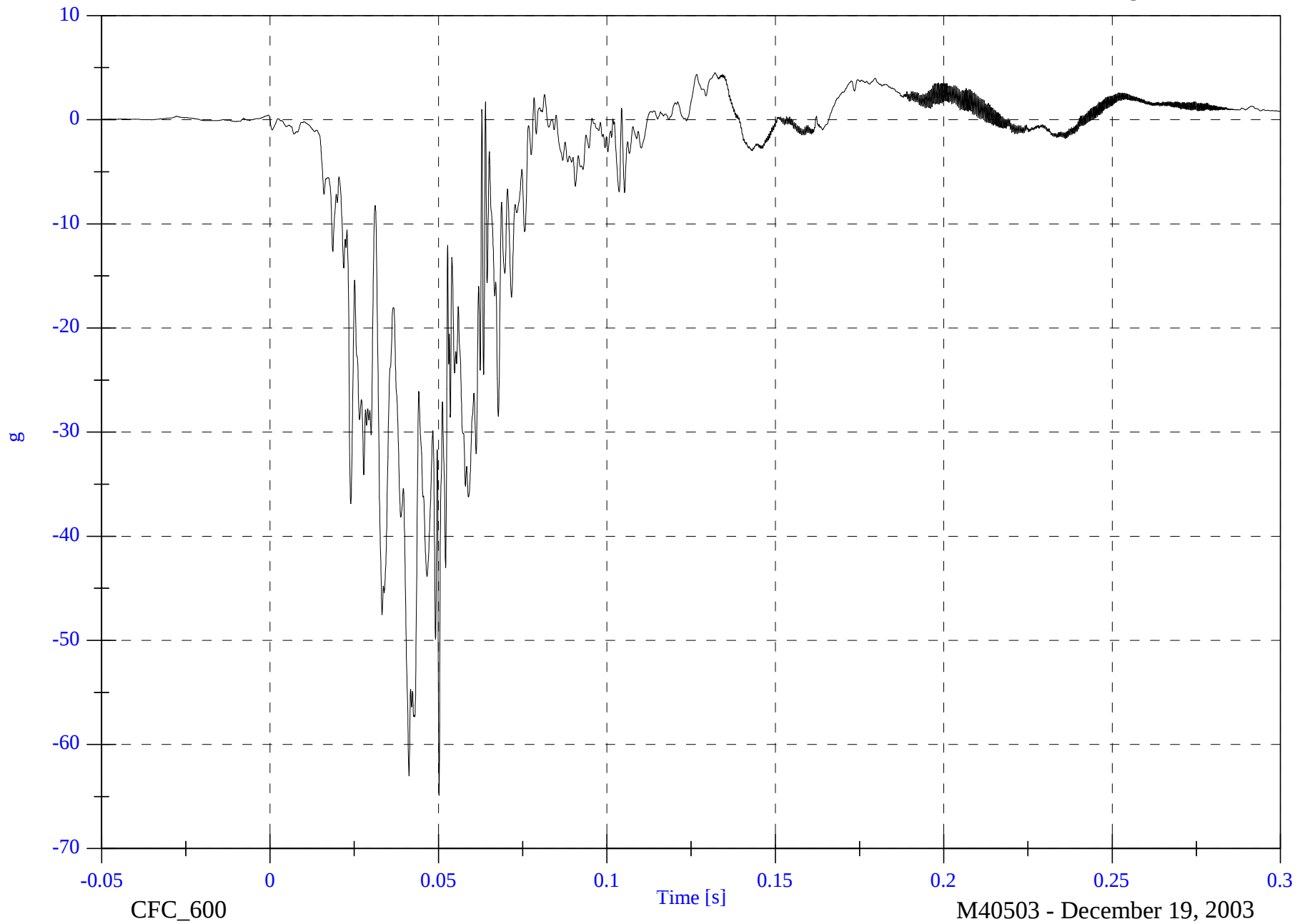


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Left Foot Fore z

Max: 4.5 [g] at 0.132 [s]

Min: -64.9 [g] at 0.050 [s]



B-57

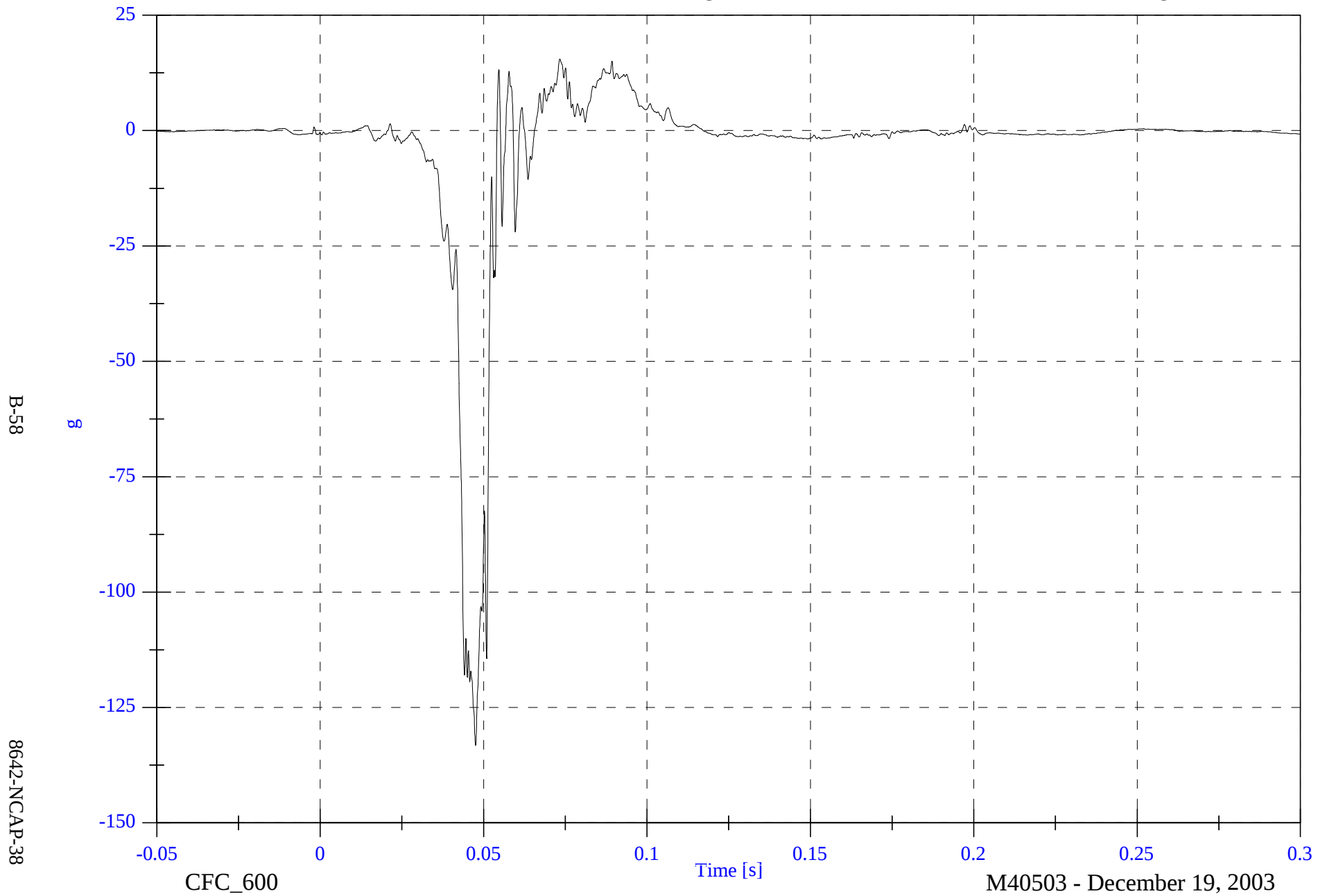
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Right Foot Aft x

Max: 15.5 [g] at 0.073 [s]

Min: -133.2 [g] at 0.048 [s]

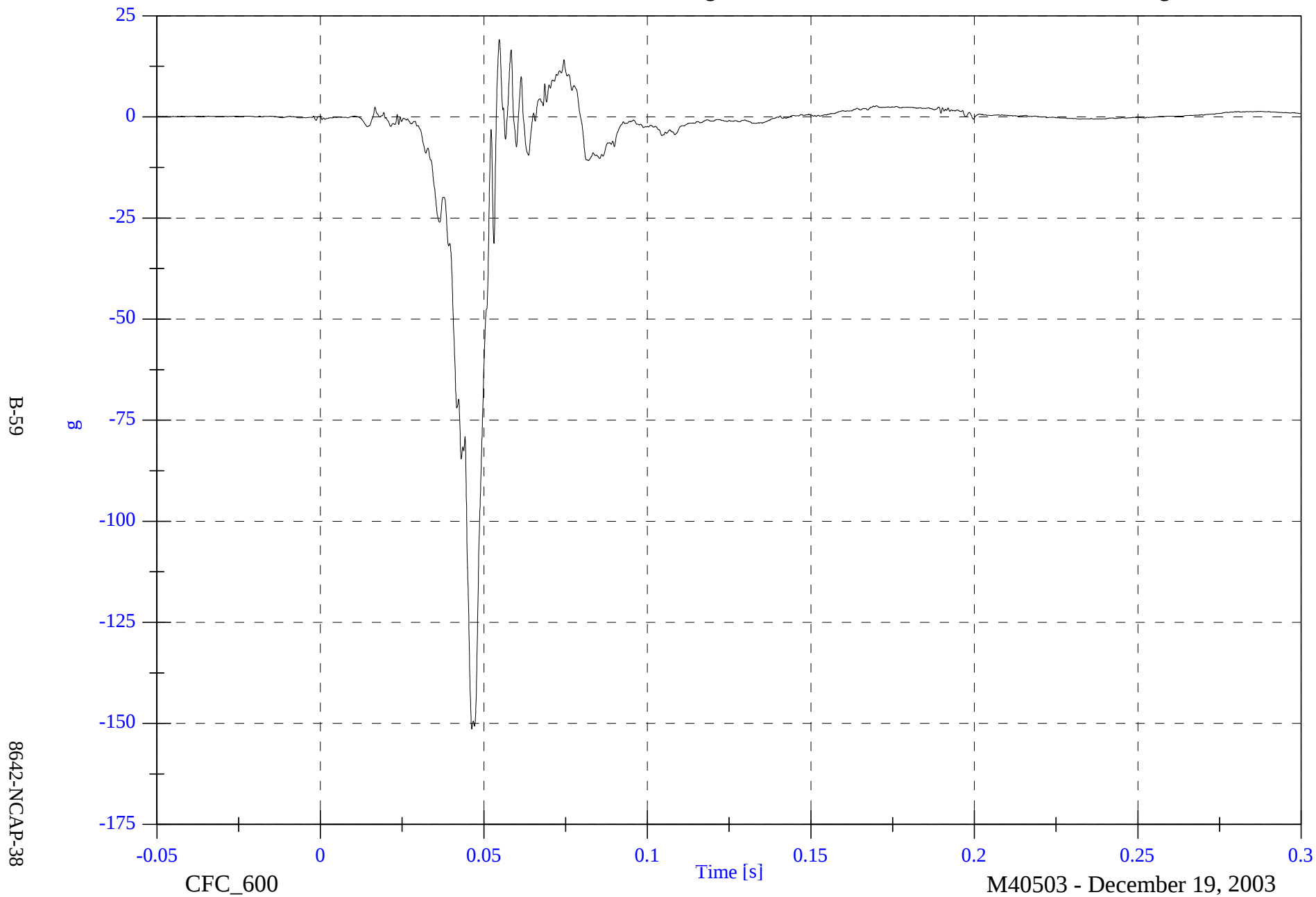


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Right Foot Aft z

Max: 19.1 [g] at 0.055 [s]

Min: -151.4 [g] at 0.046 [s]

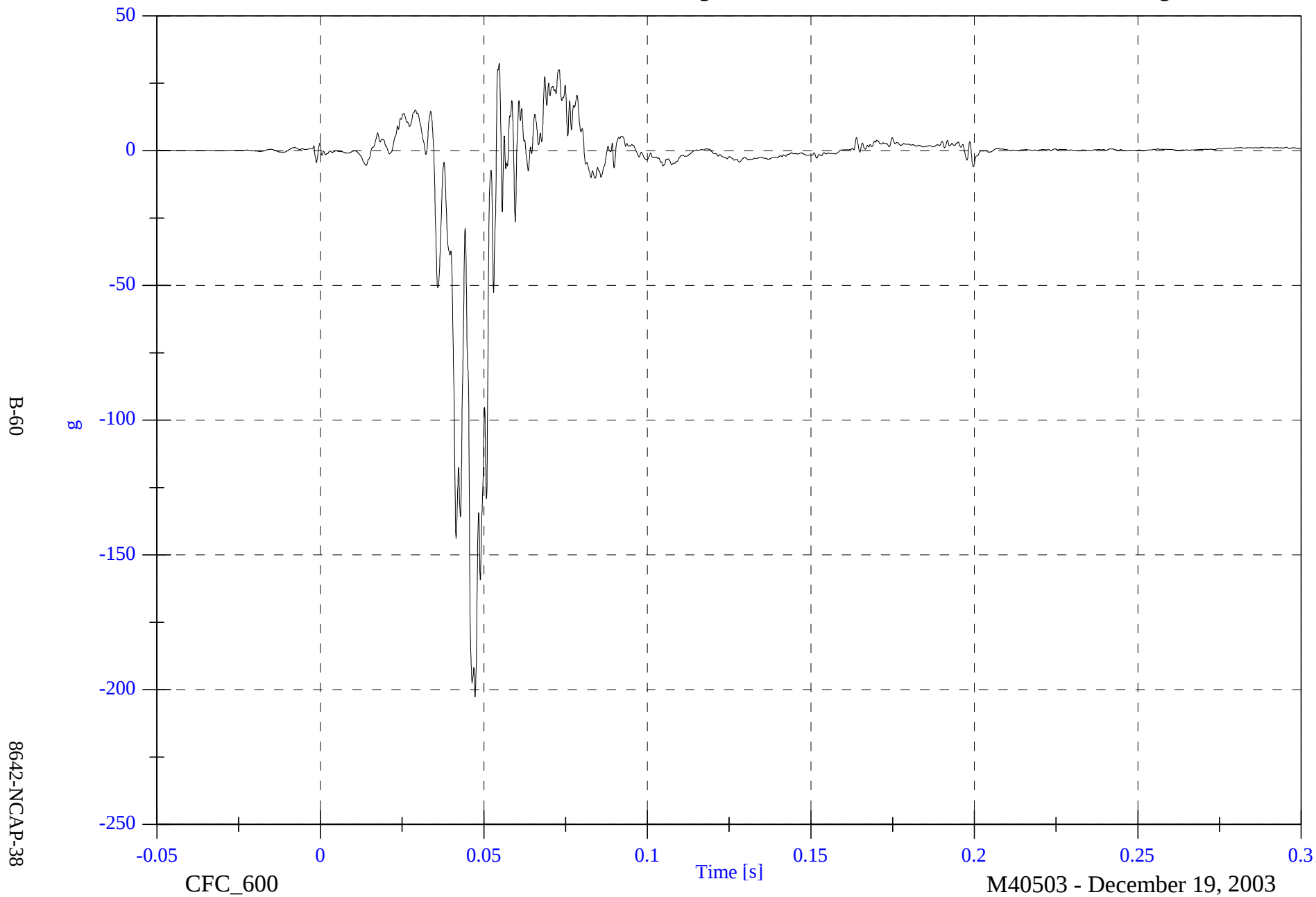


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P1 Right Foot Fore z

Max: 32.4 [g] at 0.055 [s]

Min: -202.7 [g] at 0.047 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

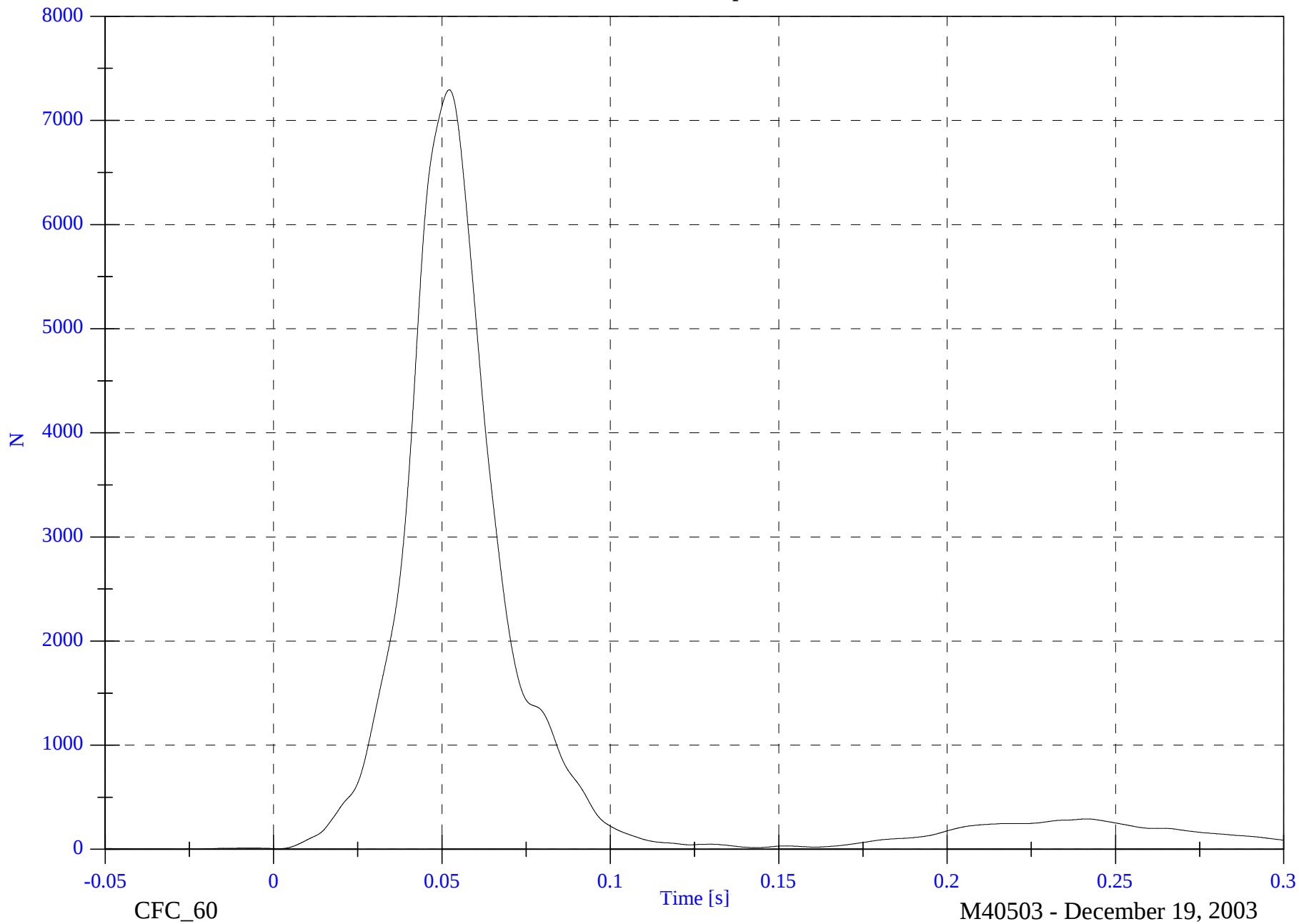
V1 Driver Lap Belt

Max: 7294.9 [N] at 0.052 [s]

Min: 0.8 [N] at -0.029 [s]

B-61

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2004 NCAP Test 2 - 2004 Hyundai XG350

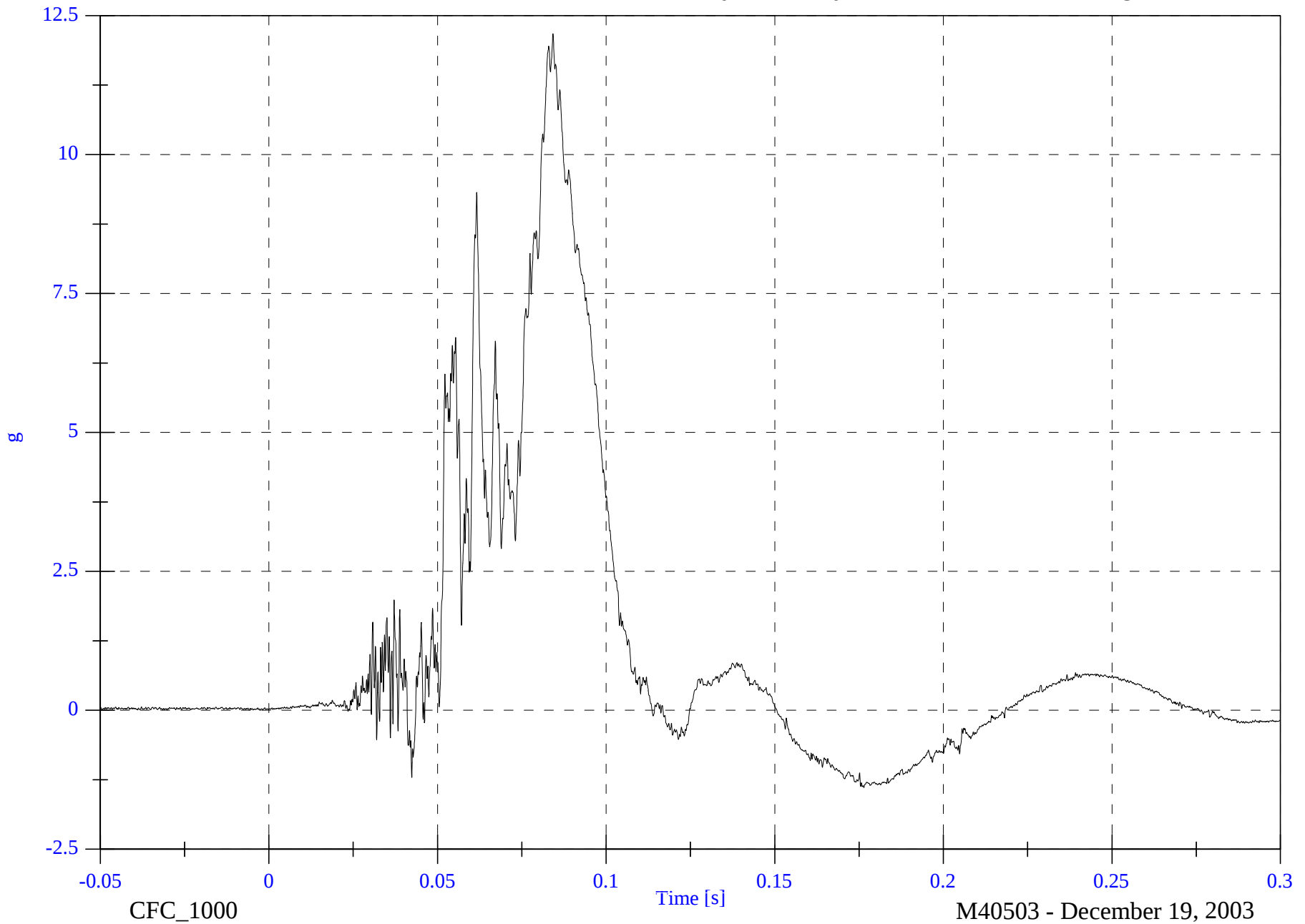
V1P2 Head 9 Array X Arm Ay

Max: 12.2 [g] at 0.084 [s]

Min: -1.4 [g] at 0.176 [s]

B-62

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

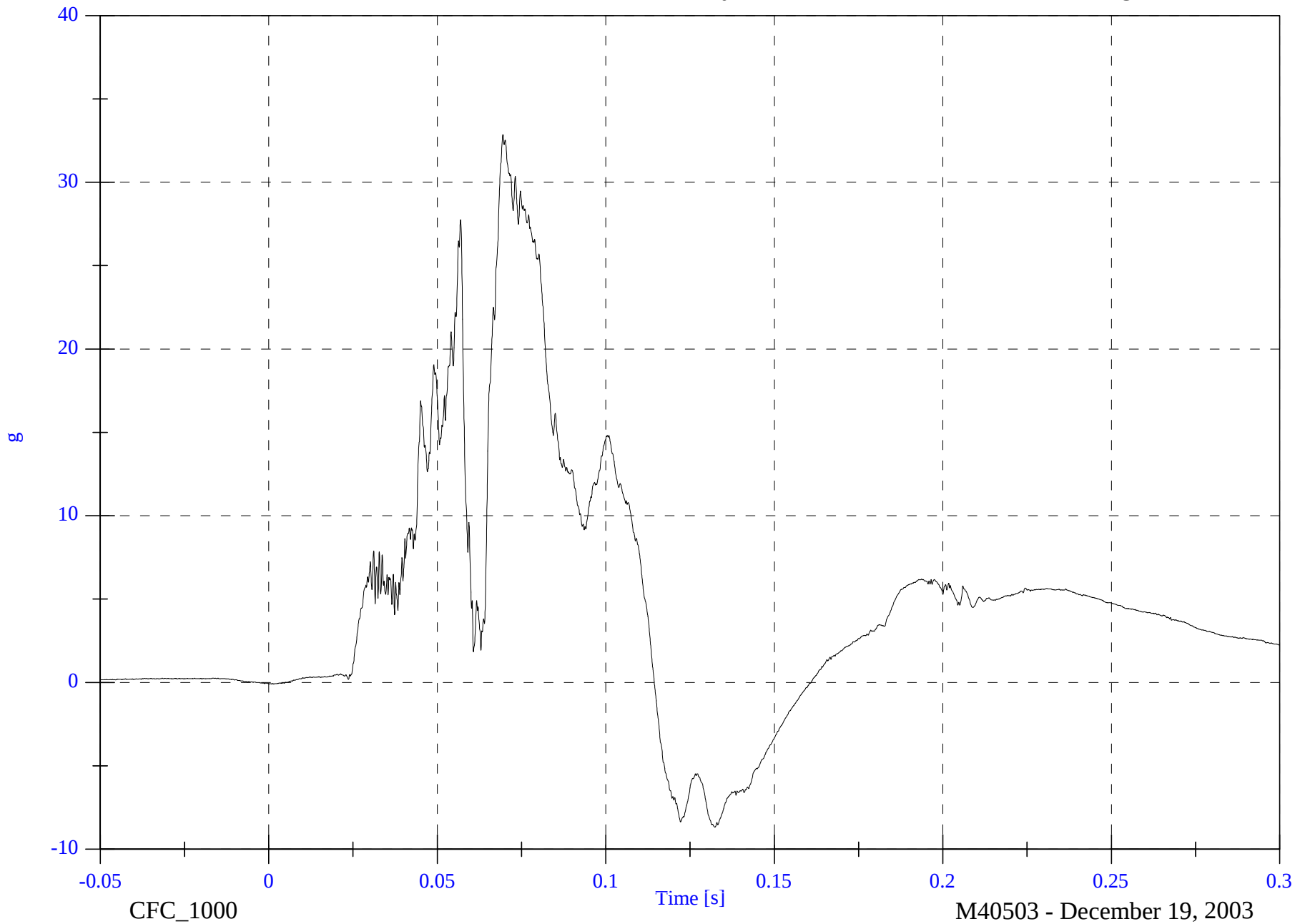
V1P2 Head 9 Array X Arm Az

Max: 32.9 [g] at 0.069 [s]

Min: -8.7 [g] at 0.132 [s]

B-63

8642-NCAP-38

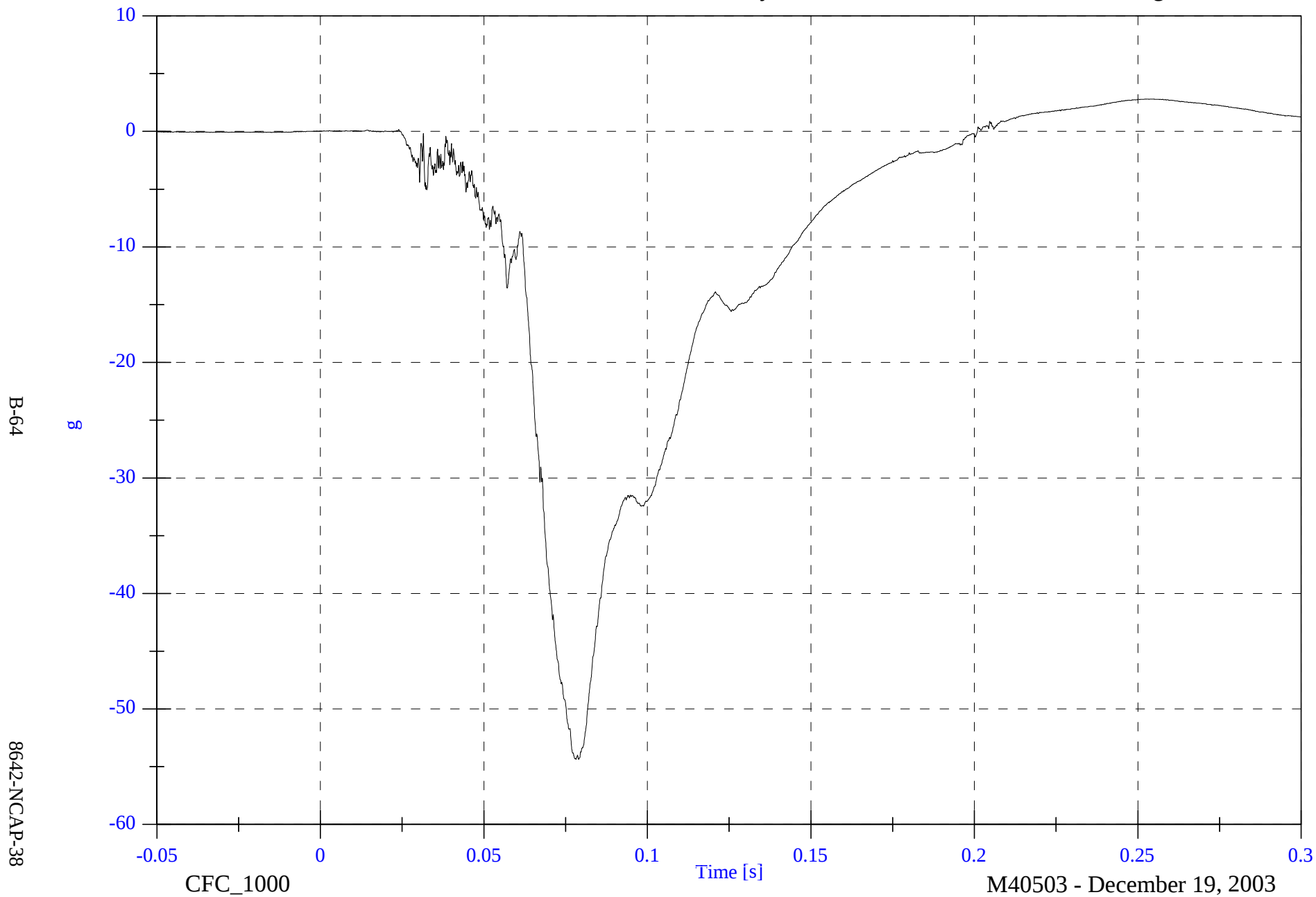


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Head 9 Array Y Arm Ax

Max: 2.8 [g] at 0.255 [s]

Min: -54.4 [g] at 0.079 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

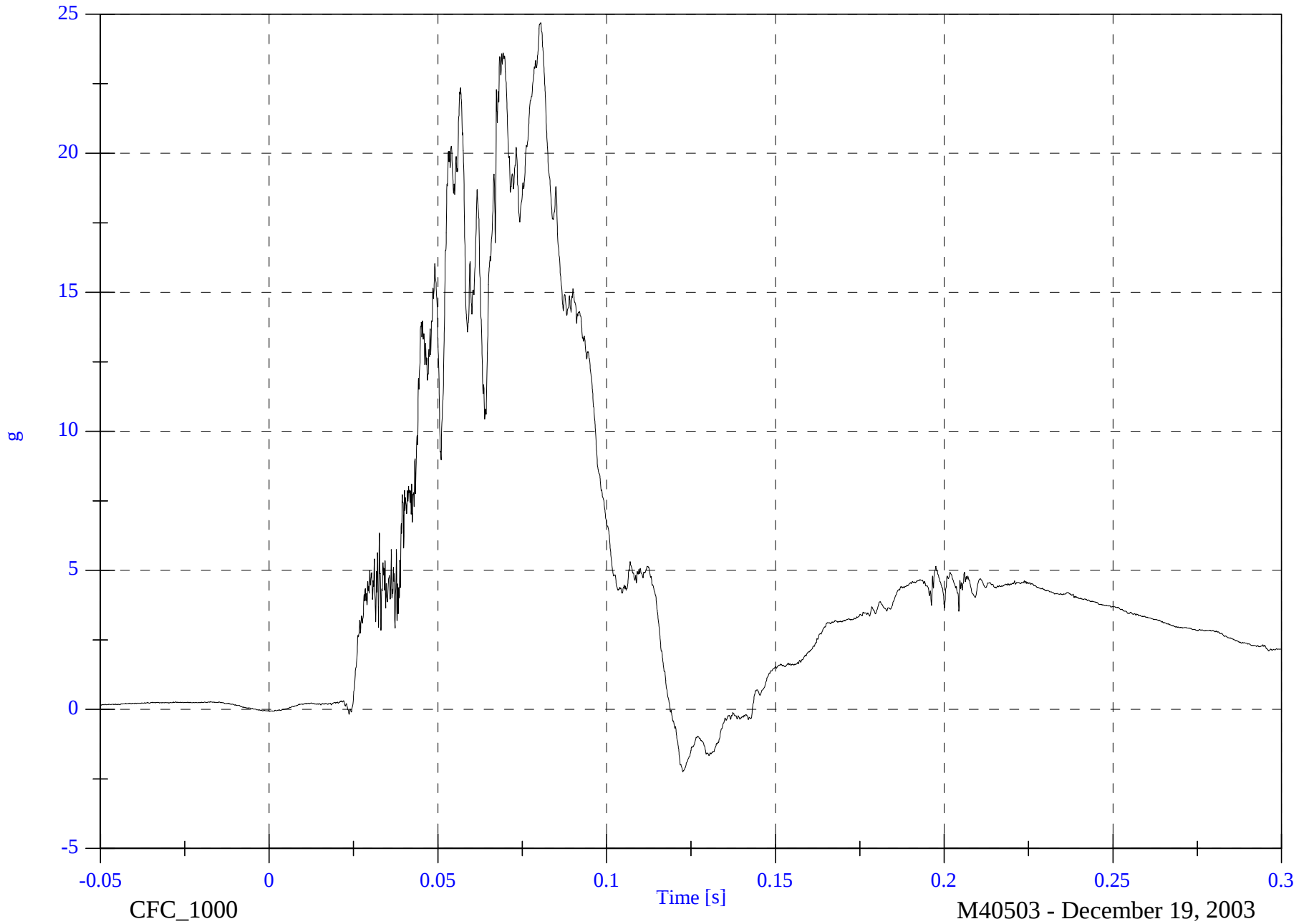
V1P2 Head 9 Array Y Arm Az

Max: 24.7 [g] at 0.080 [s]

Min: -2.2 [g] at 0.123 [s]

B-65

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

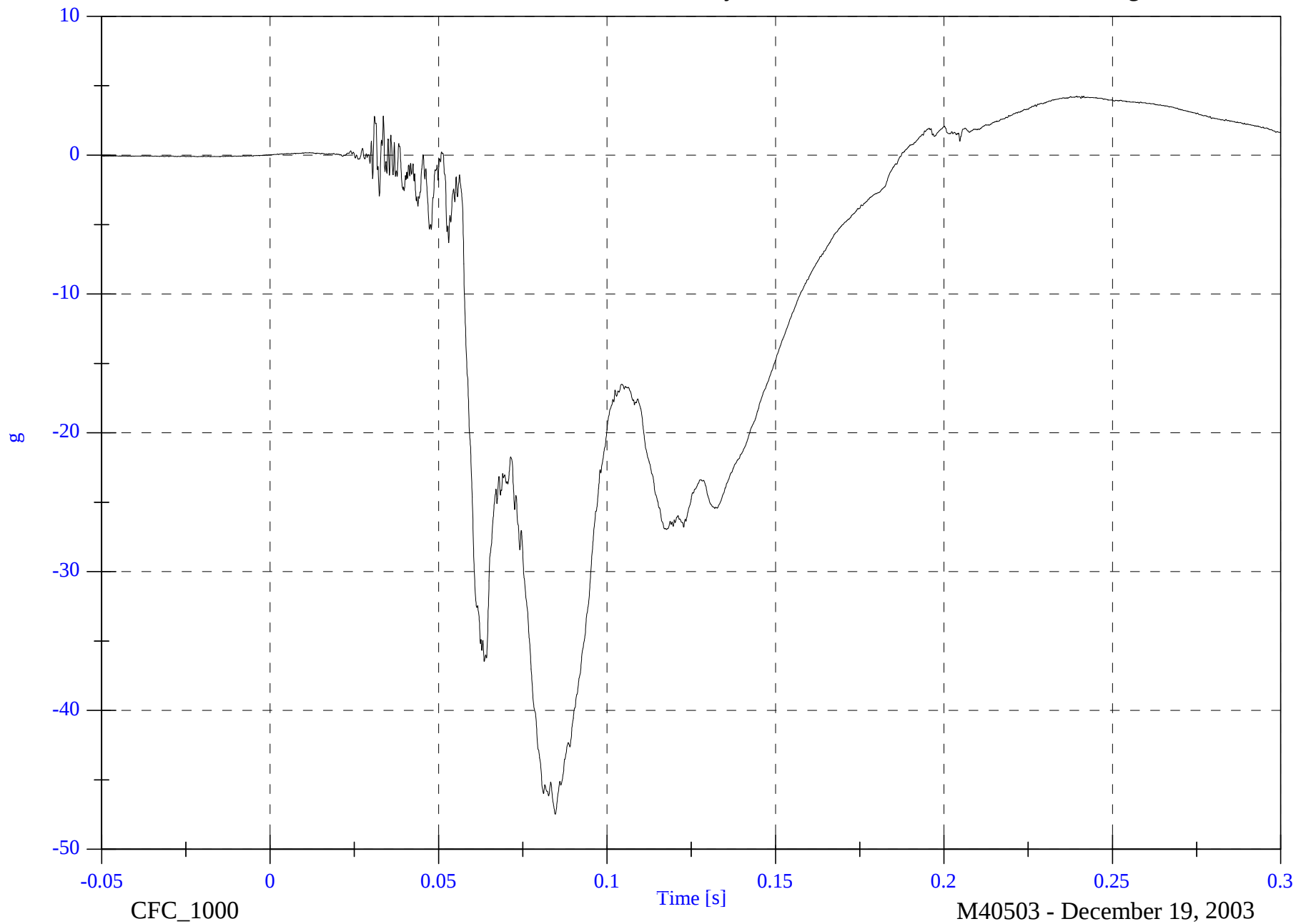
V1P2 Head 9 Array Z Arm Ax

Max: 4.2 [g] at 0.239 [s]

Min: -47.5 [g] at 0.085 [s]

B-66

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

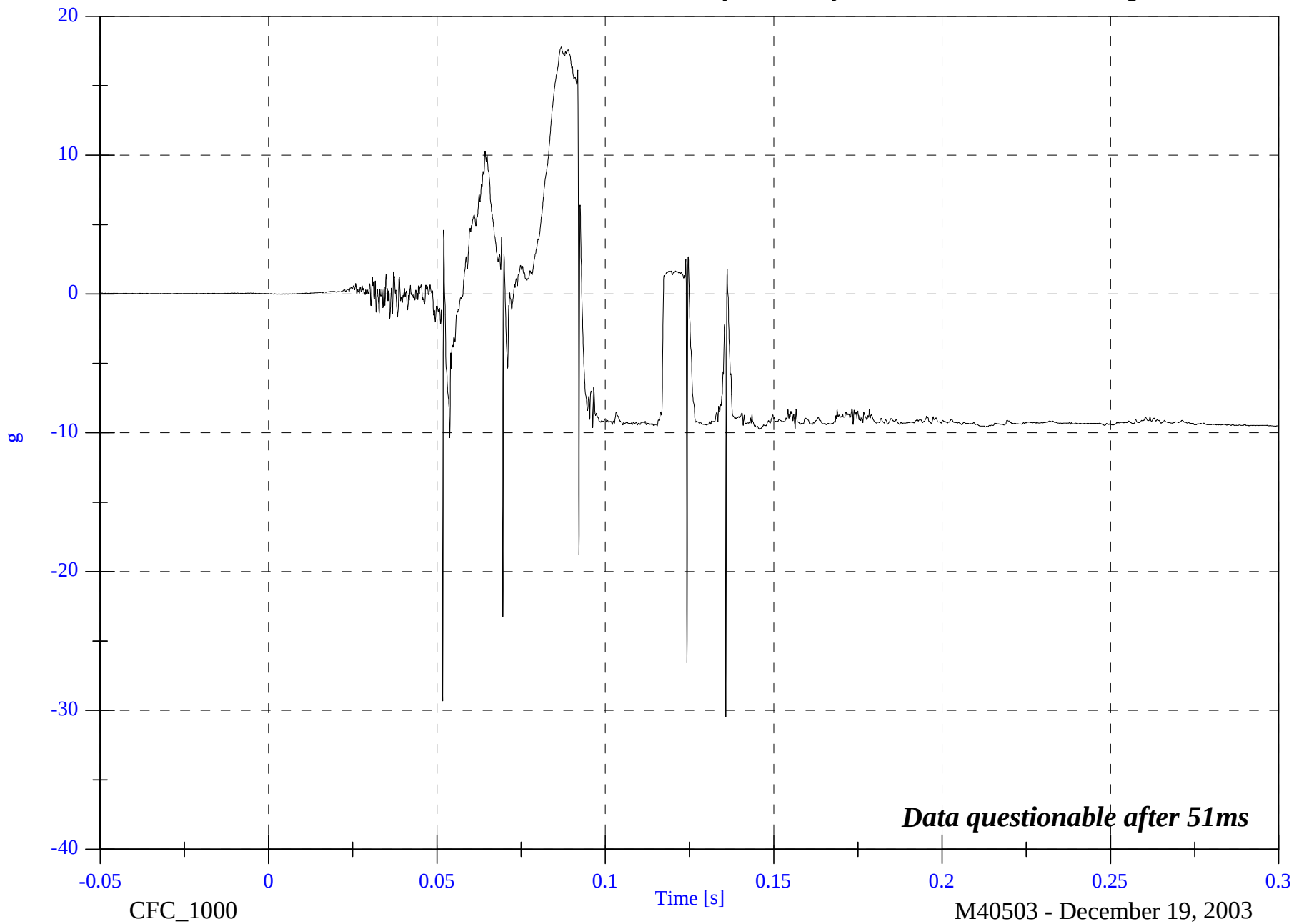
V1P2 Head 9 Array Z Arm Ay

Max: 17.8 [g] at 0.087 [s]

Min: -30.5 [g] at 0.136 [s]

B-67

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

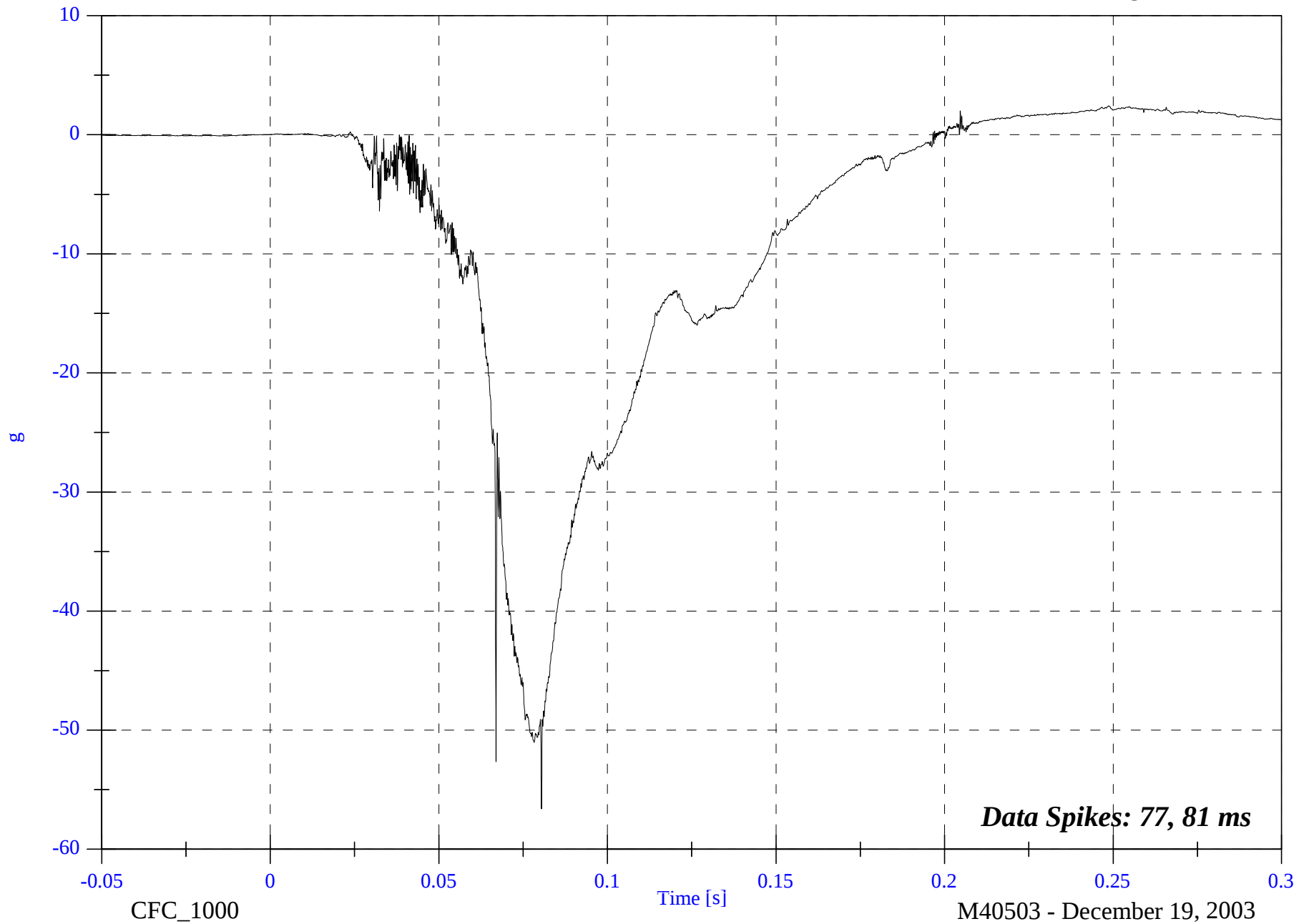
V1P2 Head CG x

Max: 2.4 [g] at 0.249 [s]

Min: -56.6 [g] at 0.080 [s]

B-68

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

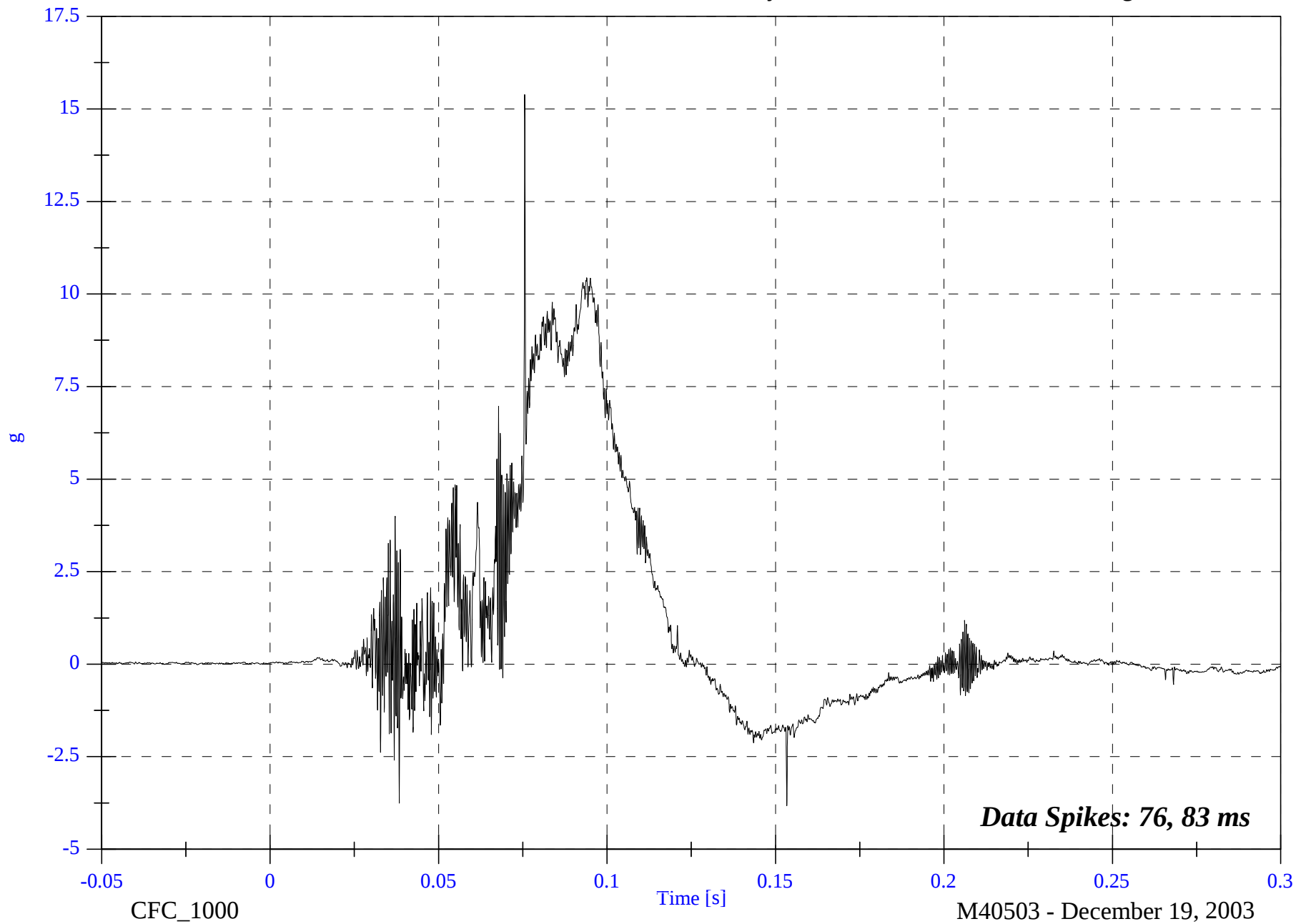
V1P2 Head CG y

Max: 15.4 [g] at 0.076 [s]

Min: -3.8 [g] at 0.153 [s]

B-69

8642-NCAP-38

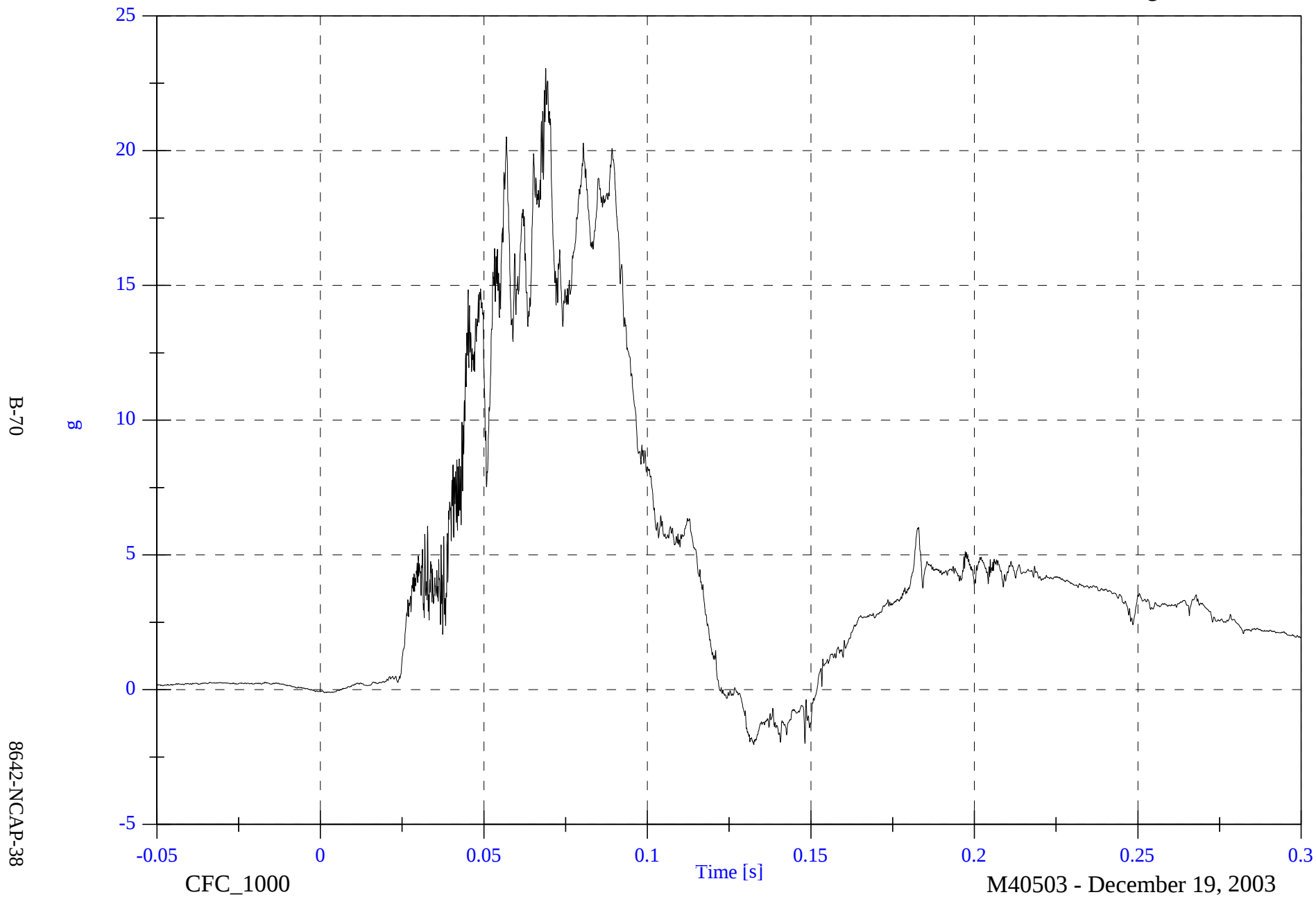


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Head CG z

Max: 23.1 [g] at 0.069 [s]

Min: -2.0 [g] at 0.133 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Head CG Resultant

Max: 60.7 [g] at 0.080 [s]

Min: 0.0 [g] at -0.003 [s]

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8642-NCAP-38

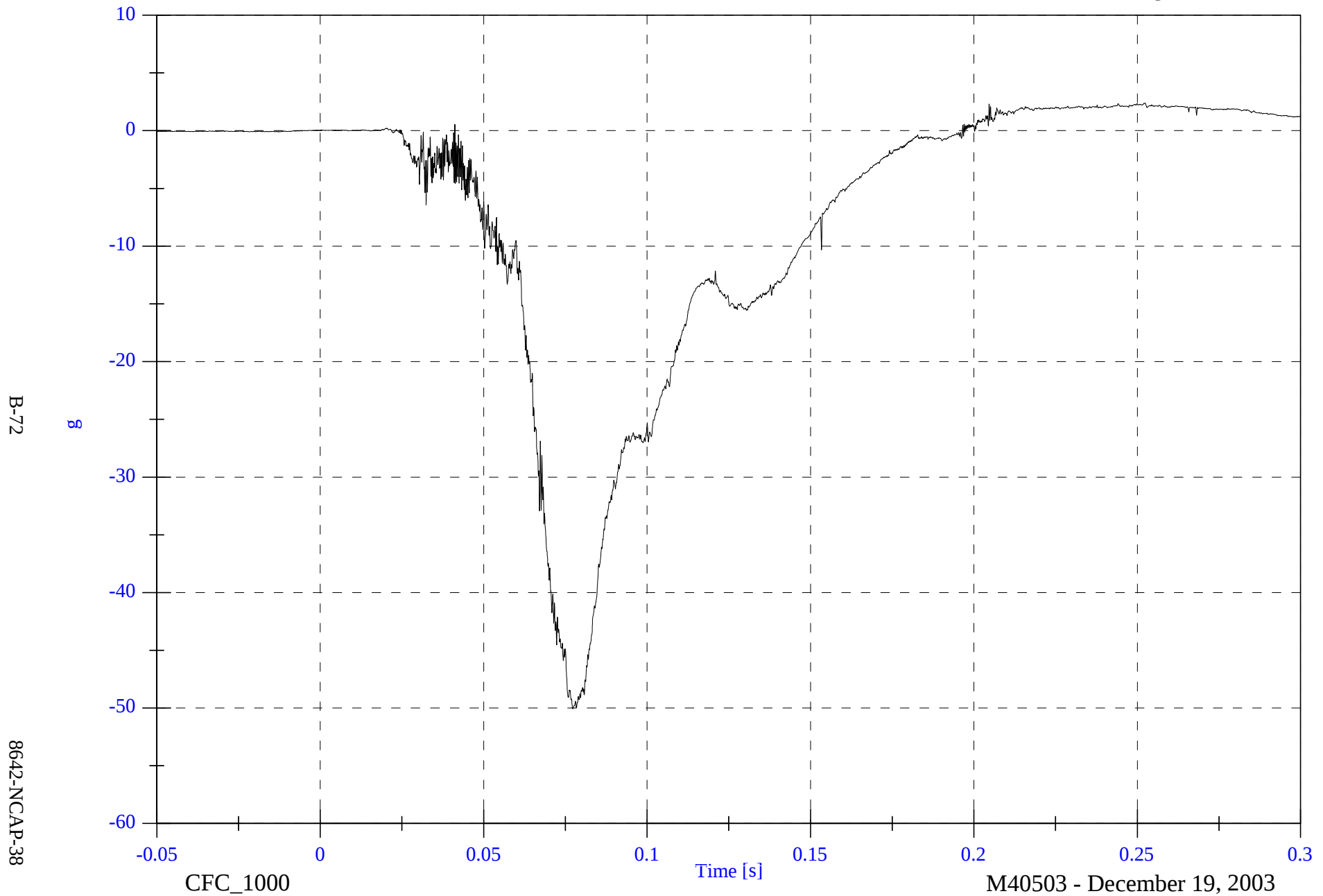


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Head CG Red x

Max: 2.4 [g] at 0.252 [s]

Min: -50.1 [g] at 0.077 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

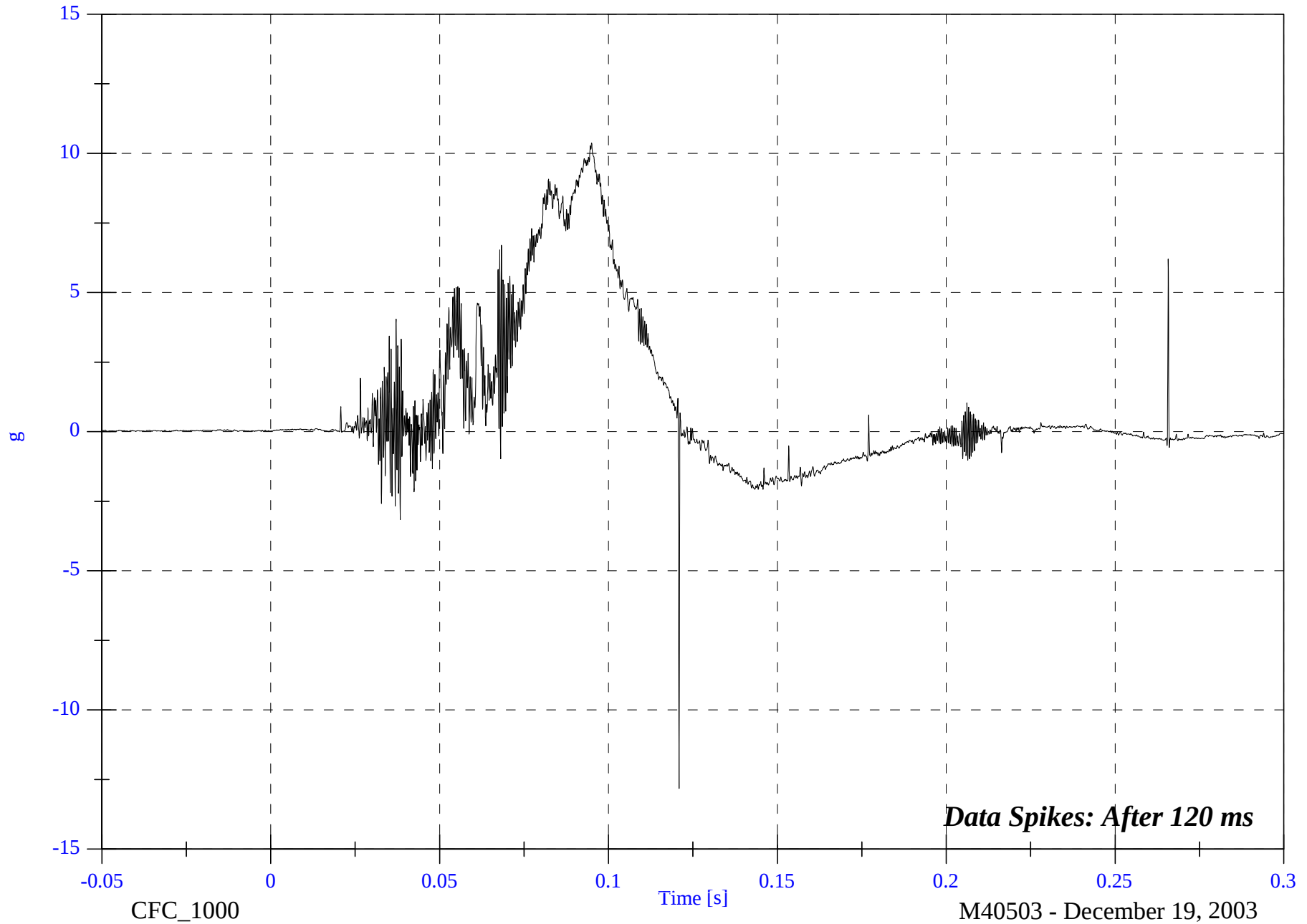
V1P2 Head CG Red y

Max: 10.4 [g] at 0.095 [s]

Min: -12.8 [g] at 0.121 [s]

B-73

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

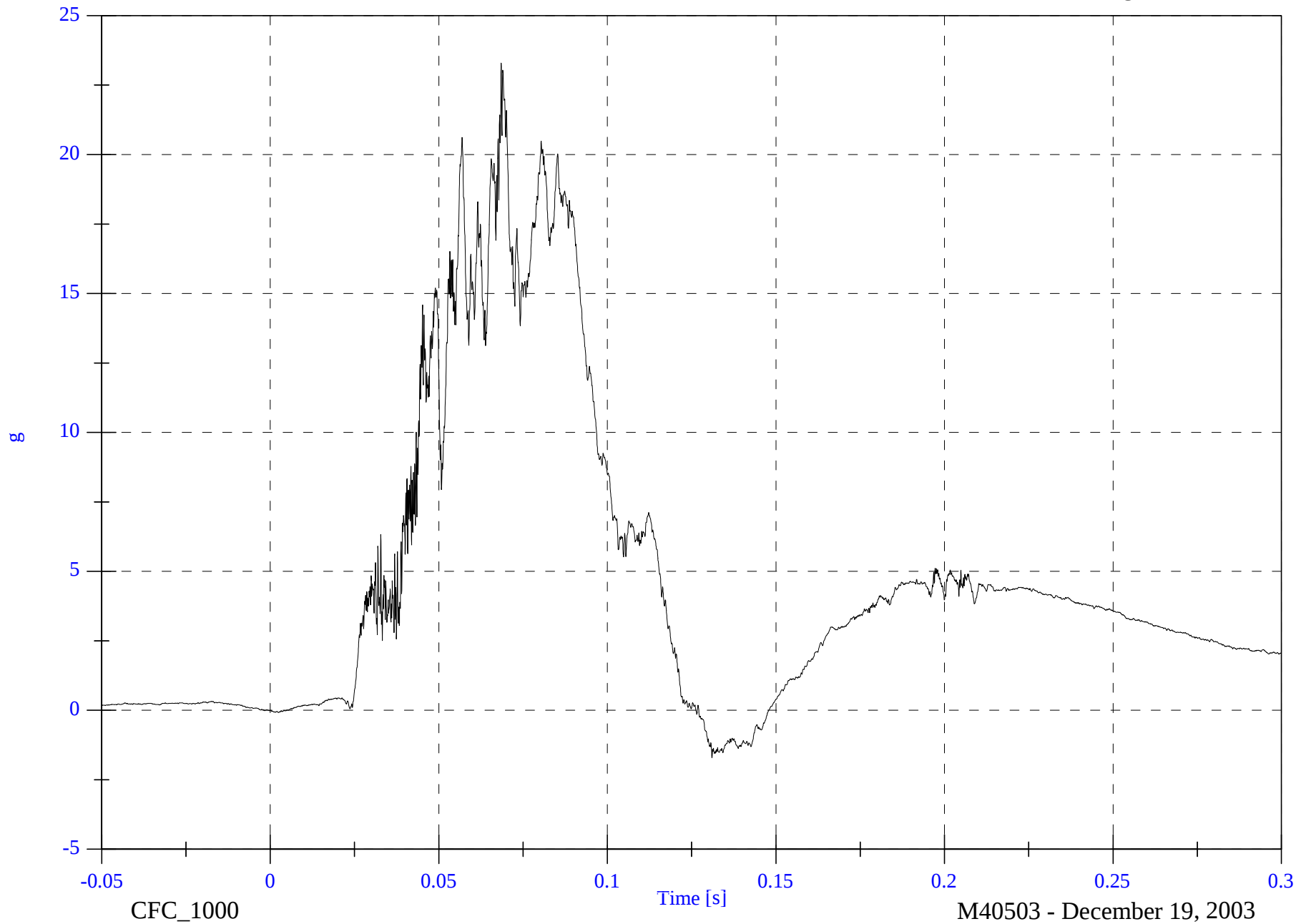
V1P2 Head CG Red z

Max: 23.3 [g] at 0.069 [s]

Min: -1.7 [g] at 0.131 [s]

B-74

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Head CG Red Resultant

Max: 53.5 [g] at 0.081 [s]

Min: 0.0 [g] at -0.000 [s]

B-75

8642-NCAP-38

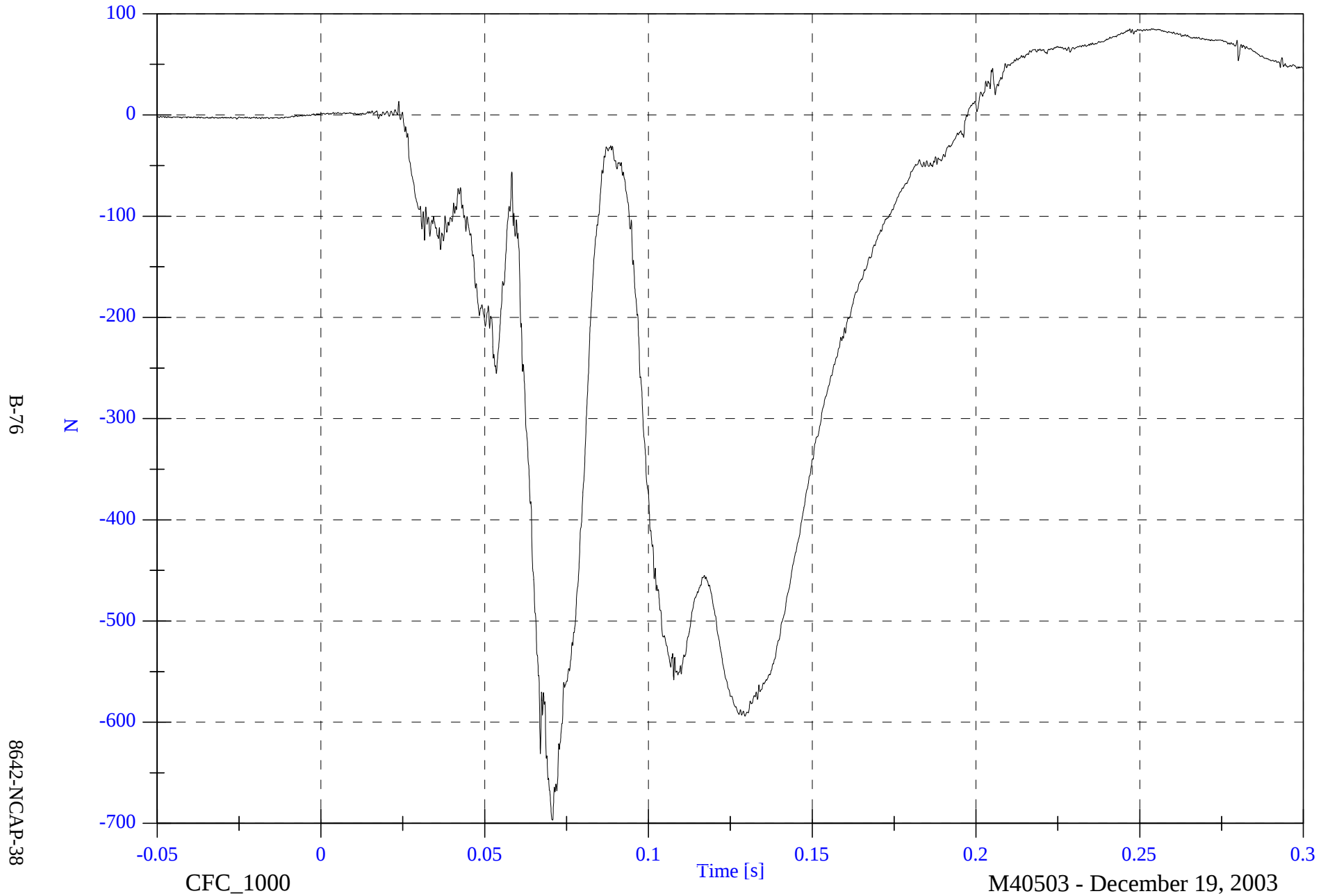


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Upper Neck Fx

Max: 85.4 [N] at 0.254 [s]

Min: -696.8 [N] at 0.071 [s]

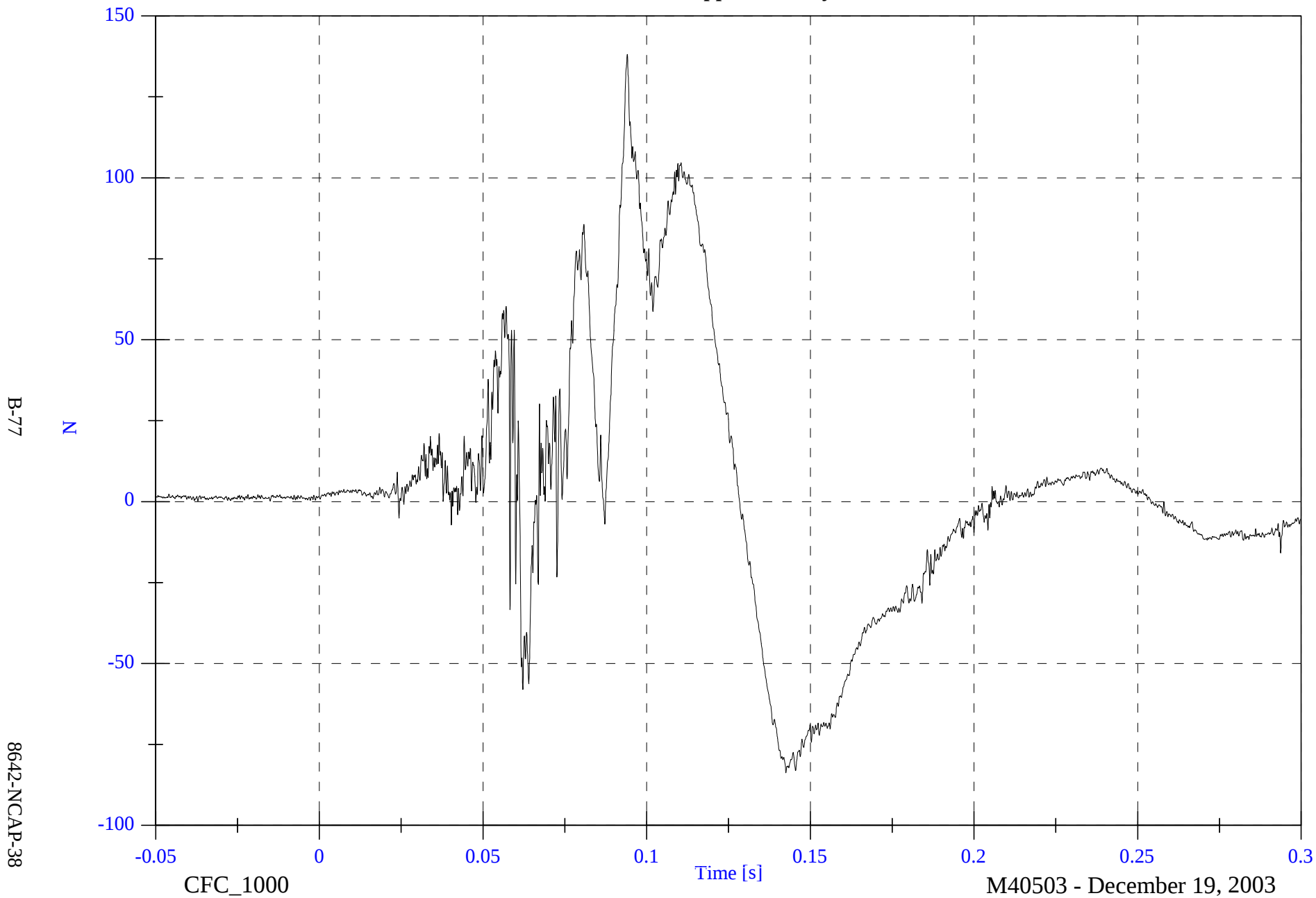


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 138.2 [N] at 0.094 [s]

Min: -83.8 [N] at 0.143 [s]

V1P2 Upper Neck Fy

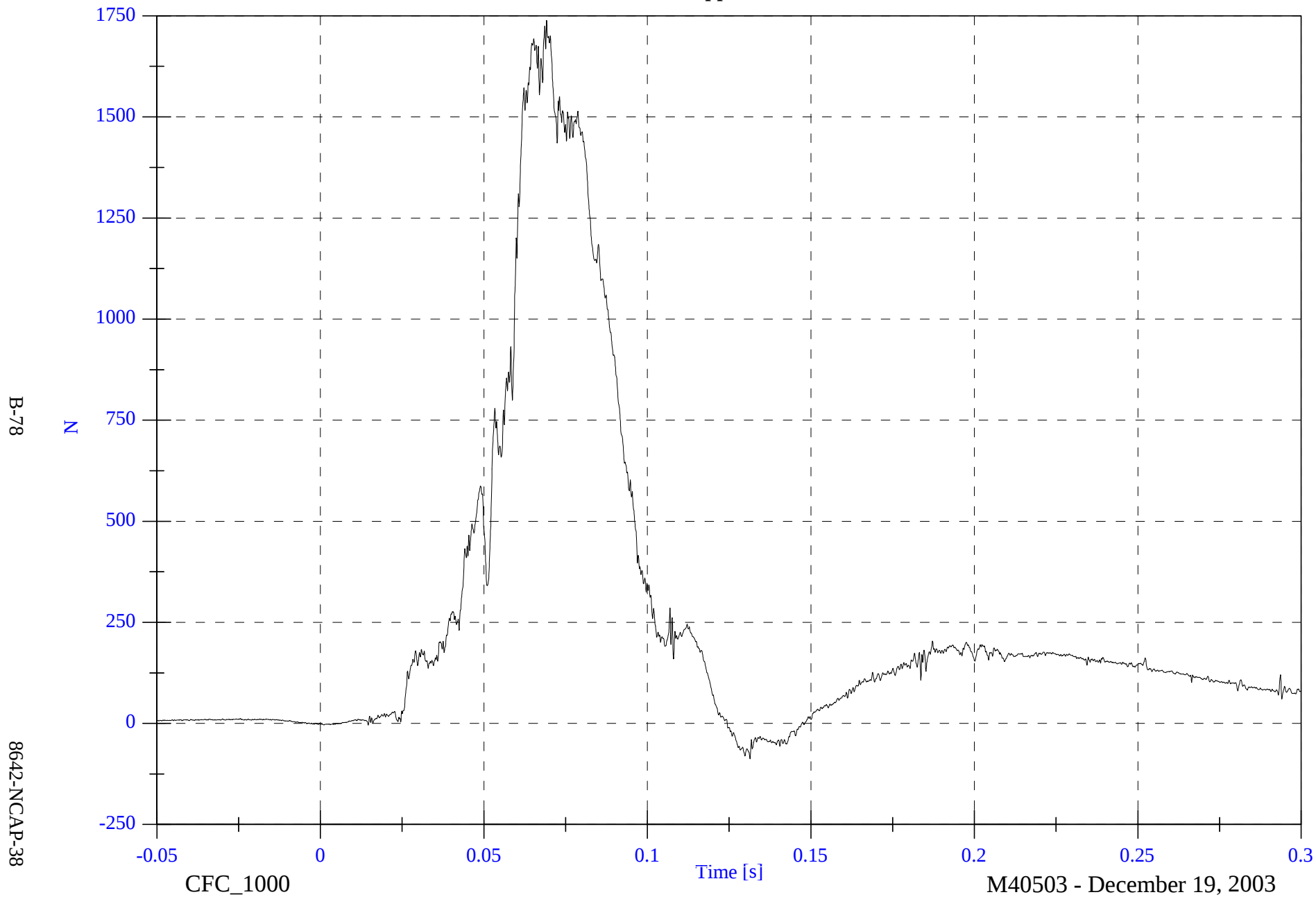


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 1739.0 [N] at 0.069 [s]

Min: -88.1 [N] at 0.131 [s]

V1P2 Upper Neck Fz

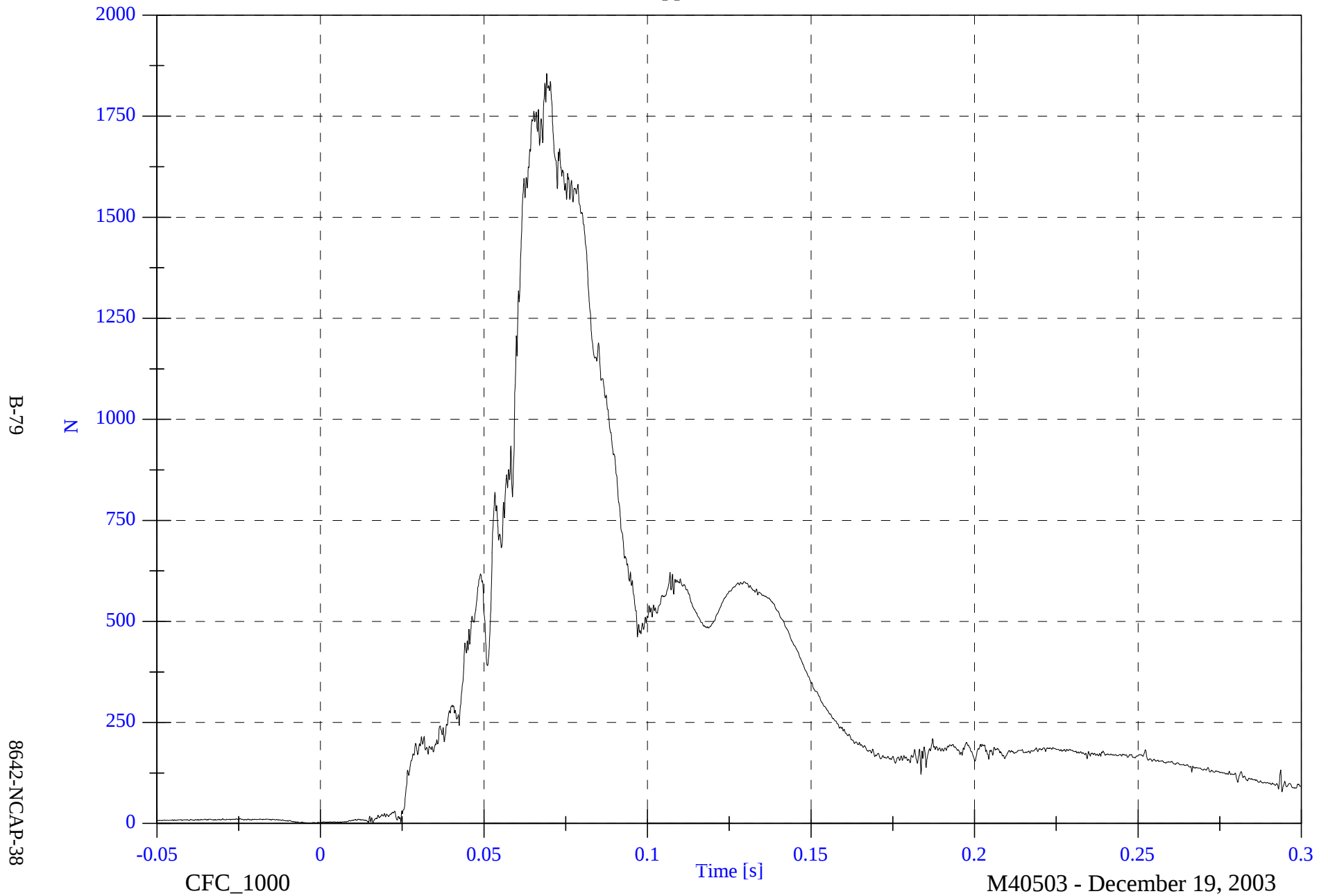


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Upper Neck F Resultant

Max: 1855.5 [N] at 0.069 [s]

Min: 0.6 [N] at -0.003 [s]

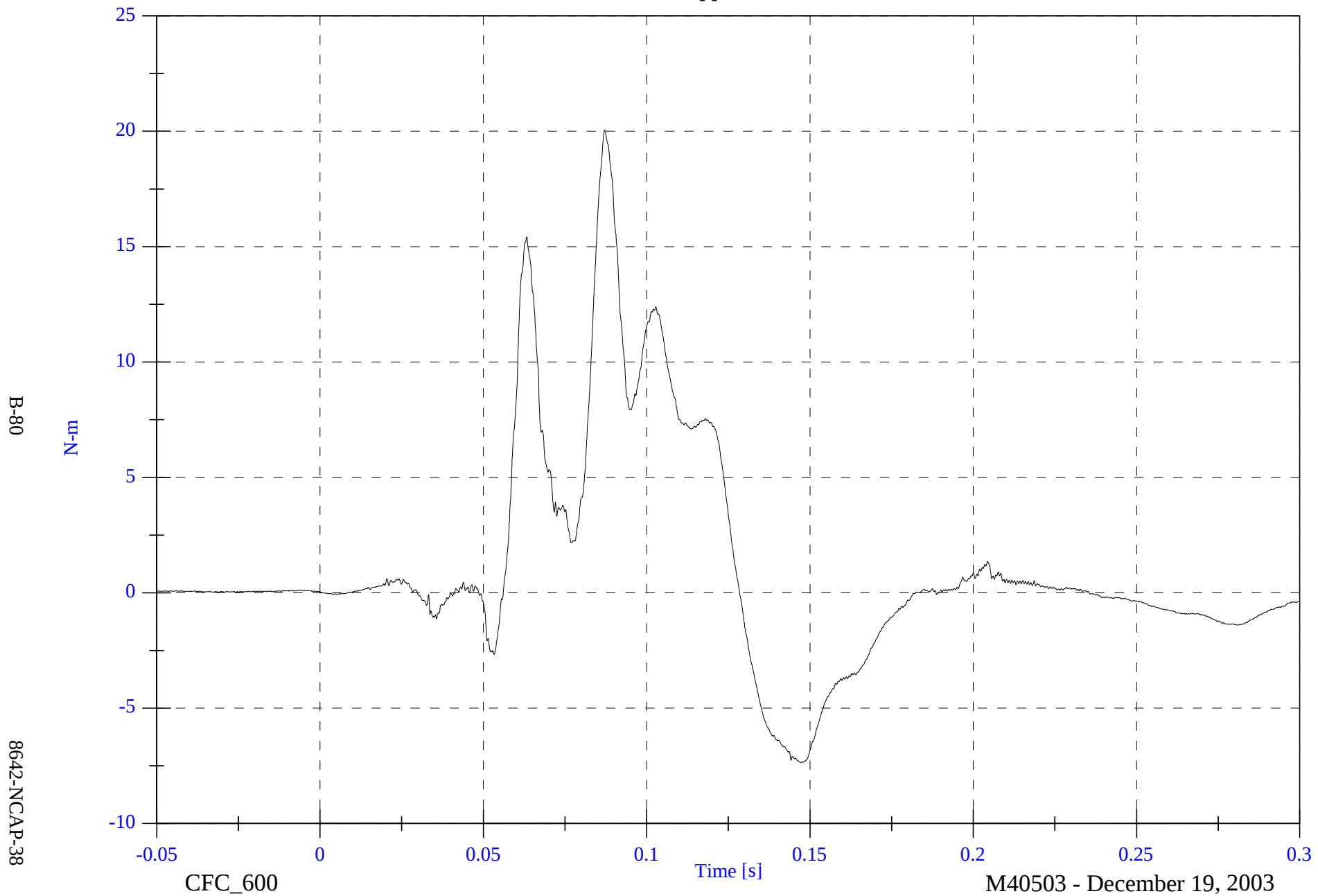


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Upper Neck Mx

Max: 20.1 [N-m] at 0.087 [s]

Min: -7.4 [N-m] at 0.148 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

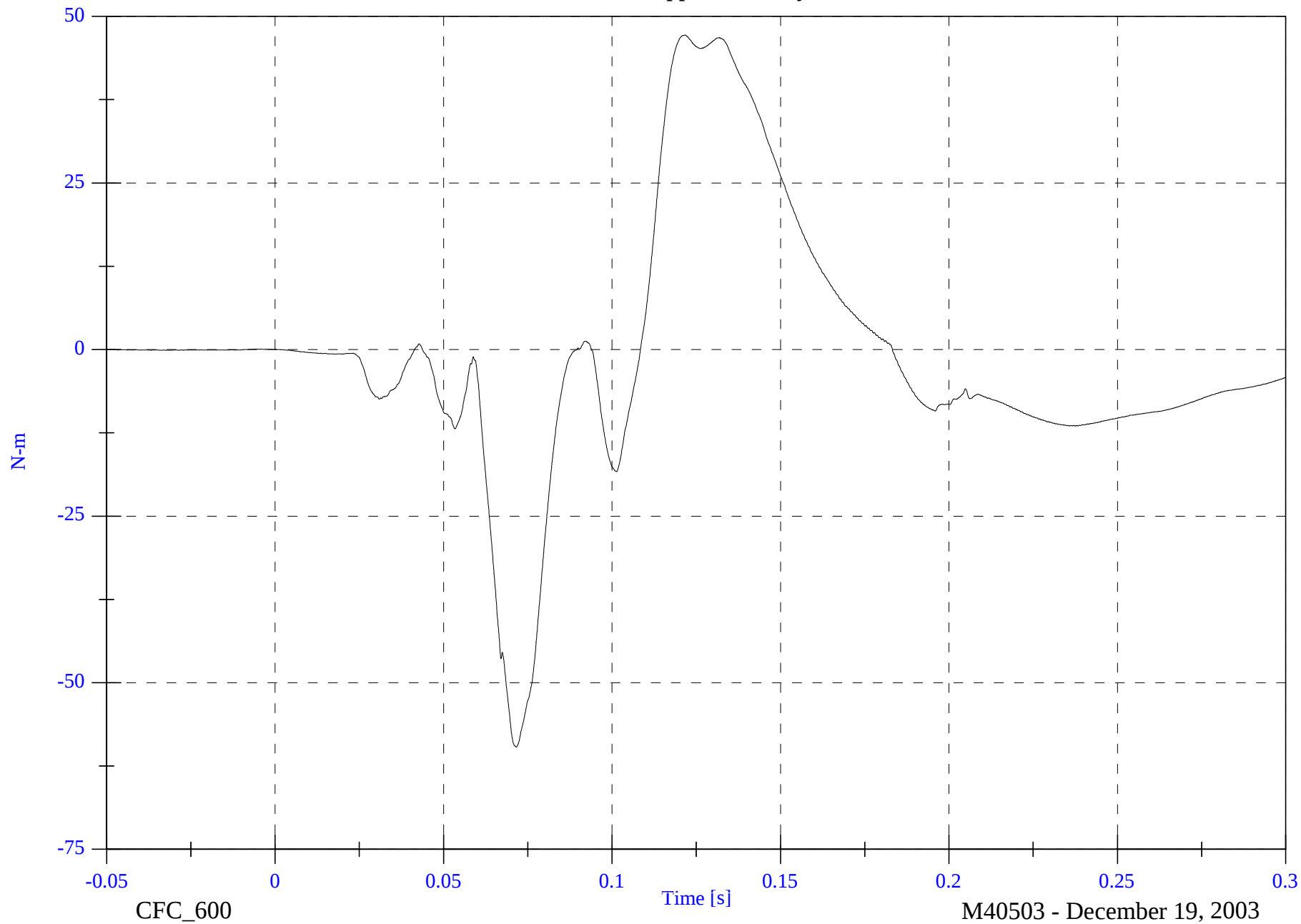
V1P2 Upper Neck My

Max: 47.2 [N-m] at 0.122 [s]

Min: -59.6 [N-m] at 0.072 [s]

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8642-NCAP-38

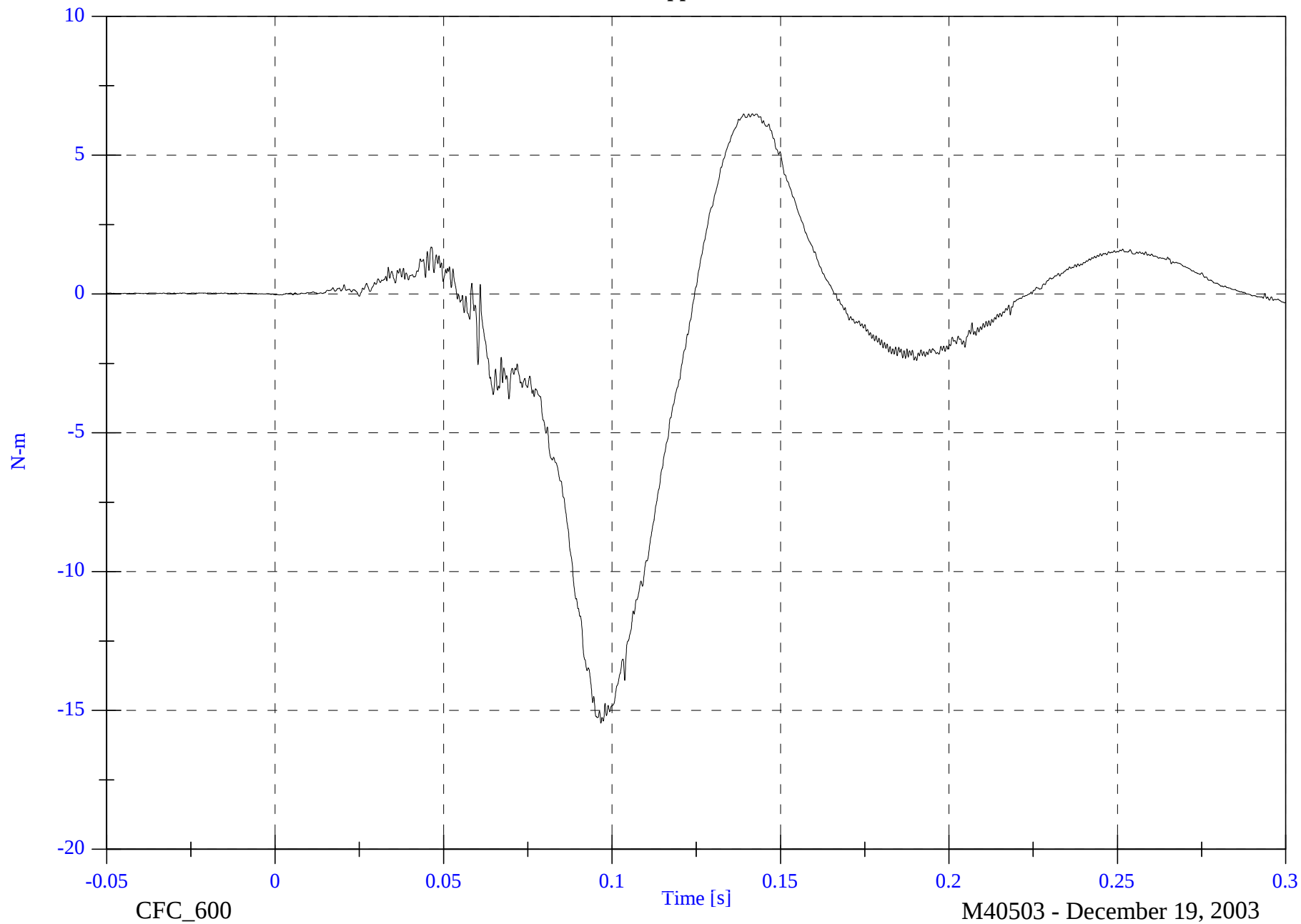


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Upper Neck Mz

Max: 6.5 [N-m] at 0.142 [s]

Min: -15.5 [N-m] at 0.097 [s]



B-82

8642-NCAP-38

CFC_600

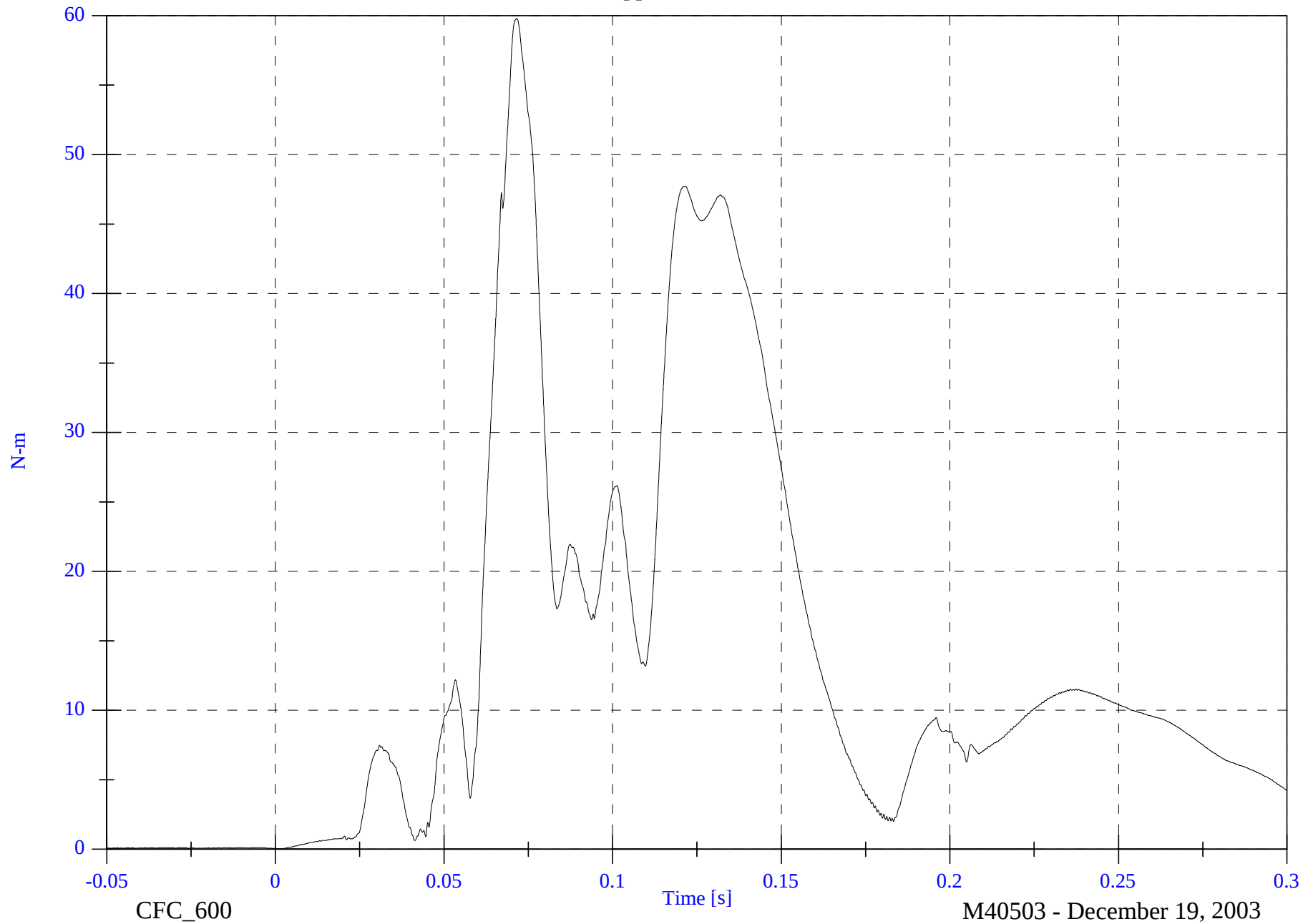
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Upper Neck M Resultant

Max: 59.8 [N-m] at 0.072 [s]

Min: 0.0 [N-m] at 0.001 [s]



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8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

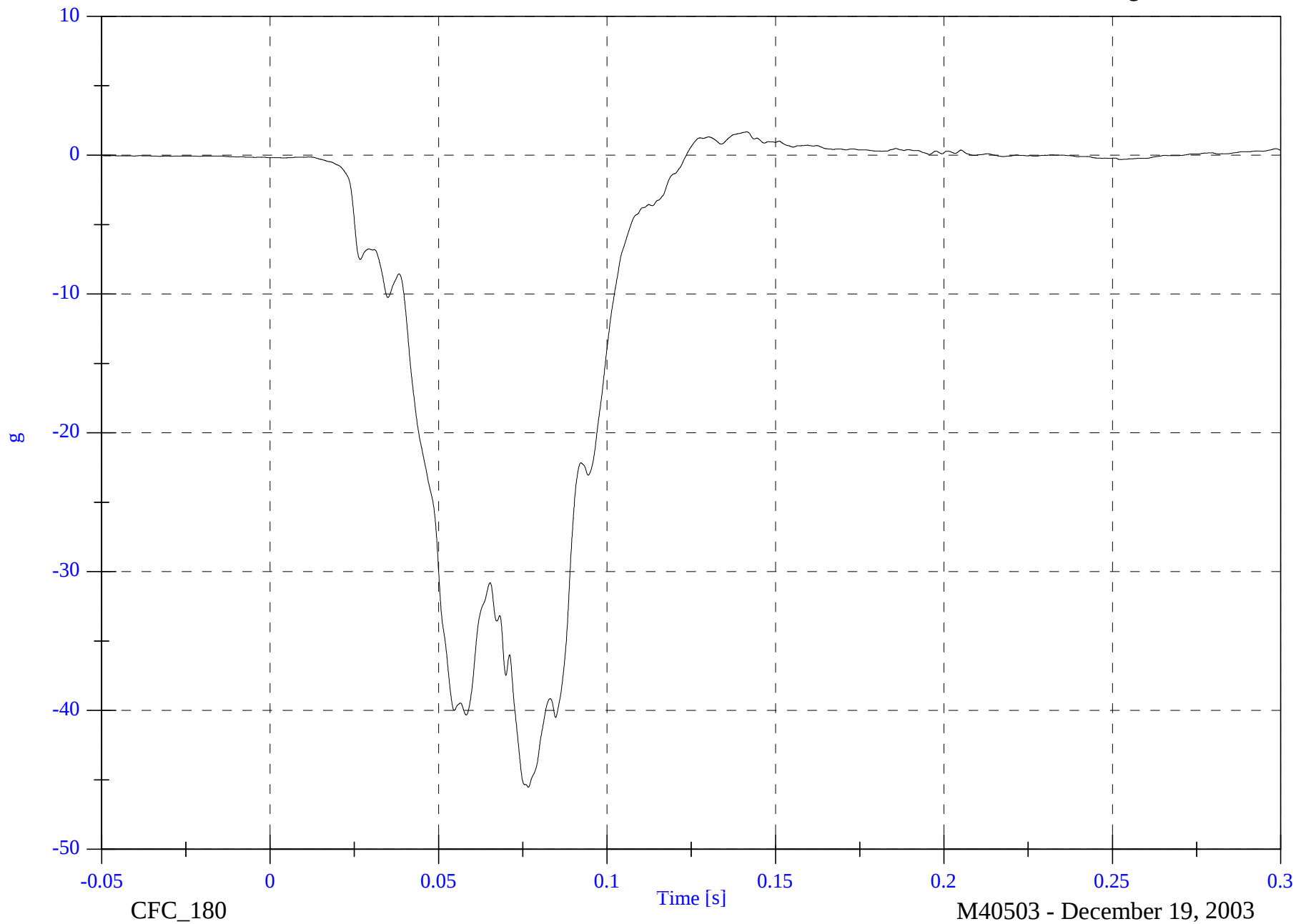
V1P2 Chest x

Max: 1.7 [g] at 0.142 [s]

Min: -45.5 [g] at 0.077 [s]

B-84

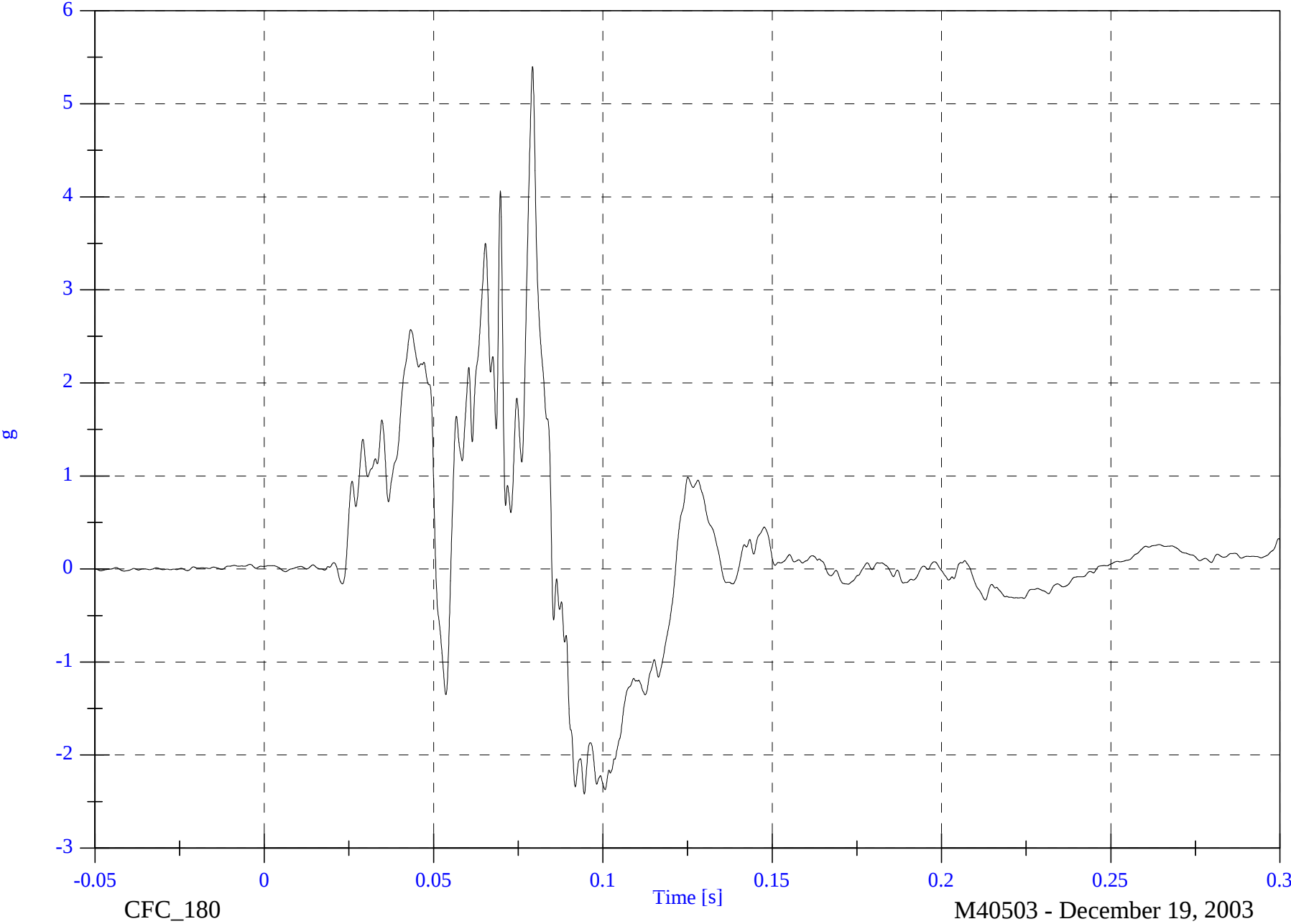
8642-NCAP-38



V1P2 Chest y

B-85

8642-NCAP-38

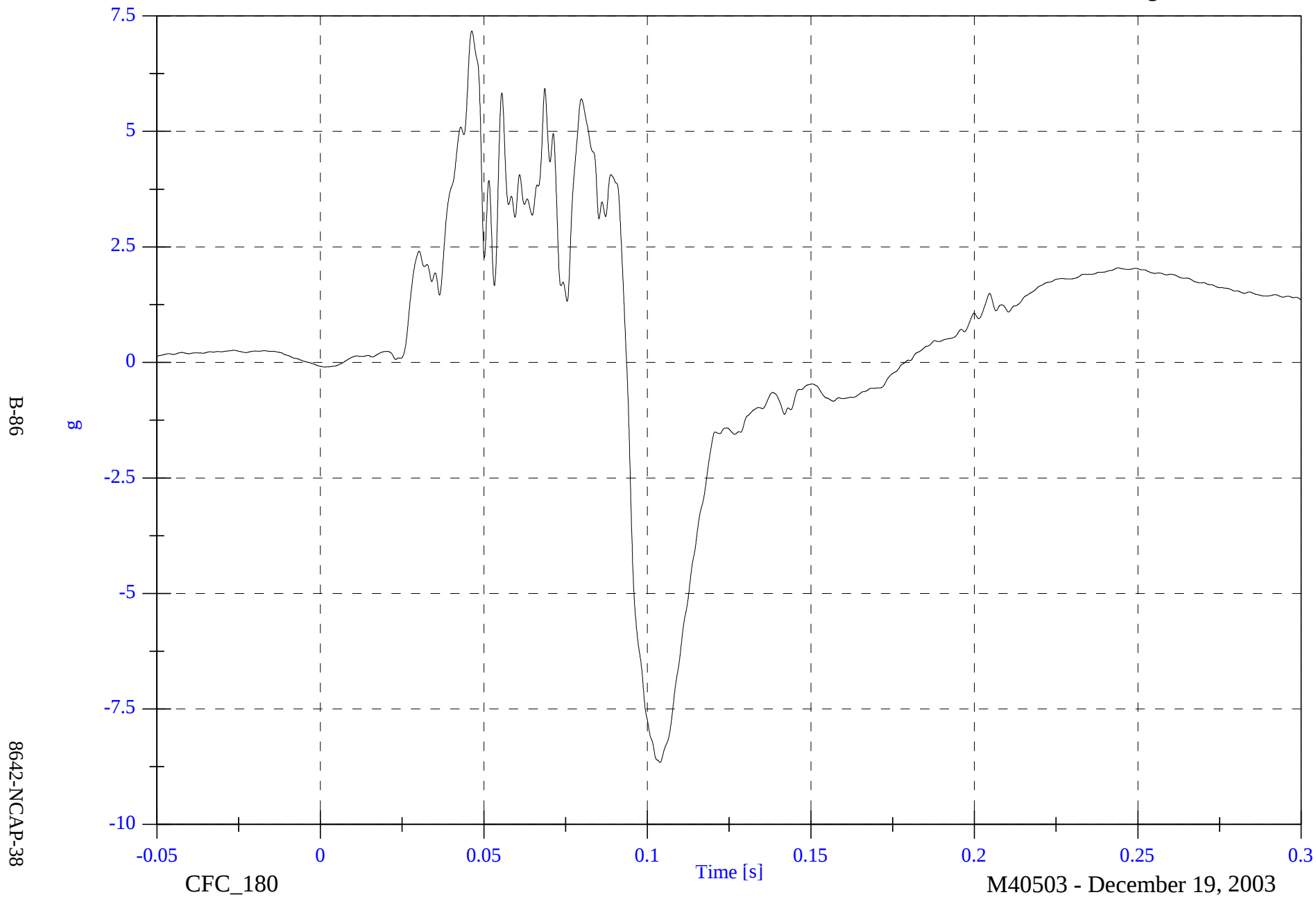


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Chest z

Max: 7.2 [g] at 0.046 [s]

Min: -8.7 [g] at 0.104 [s]

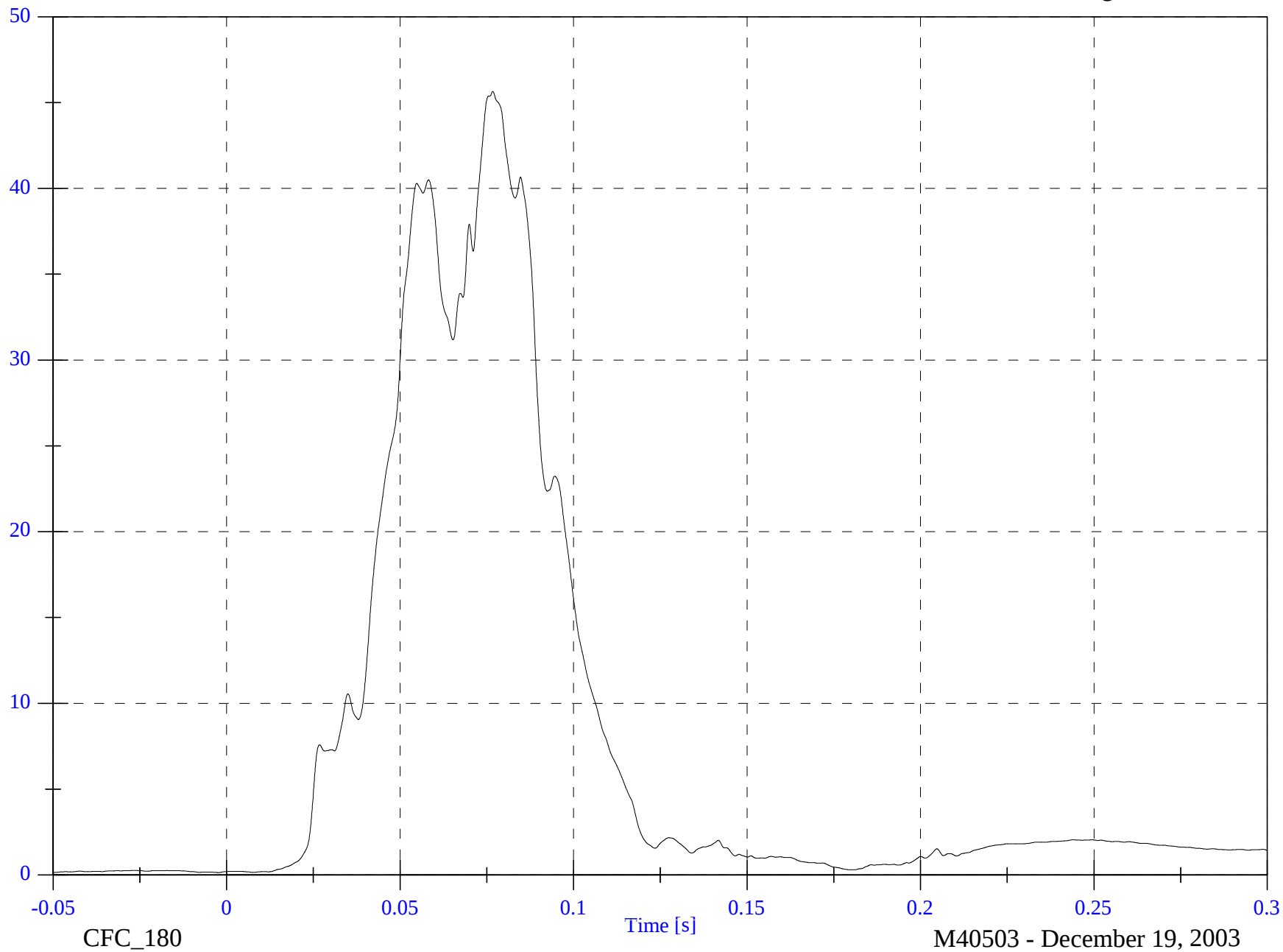


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Chest Resultant

Max: 45.7 [g] at 0.077 [s]

Min: 0.1 [g] at -0.050 [s]

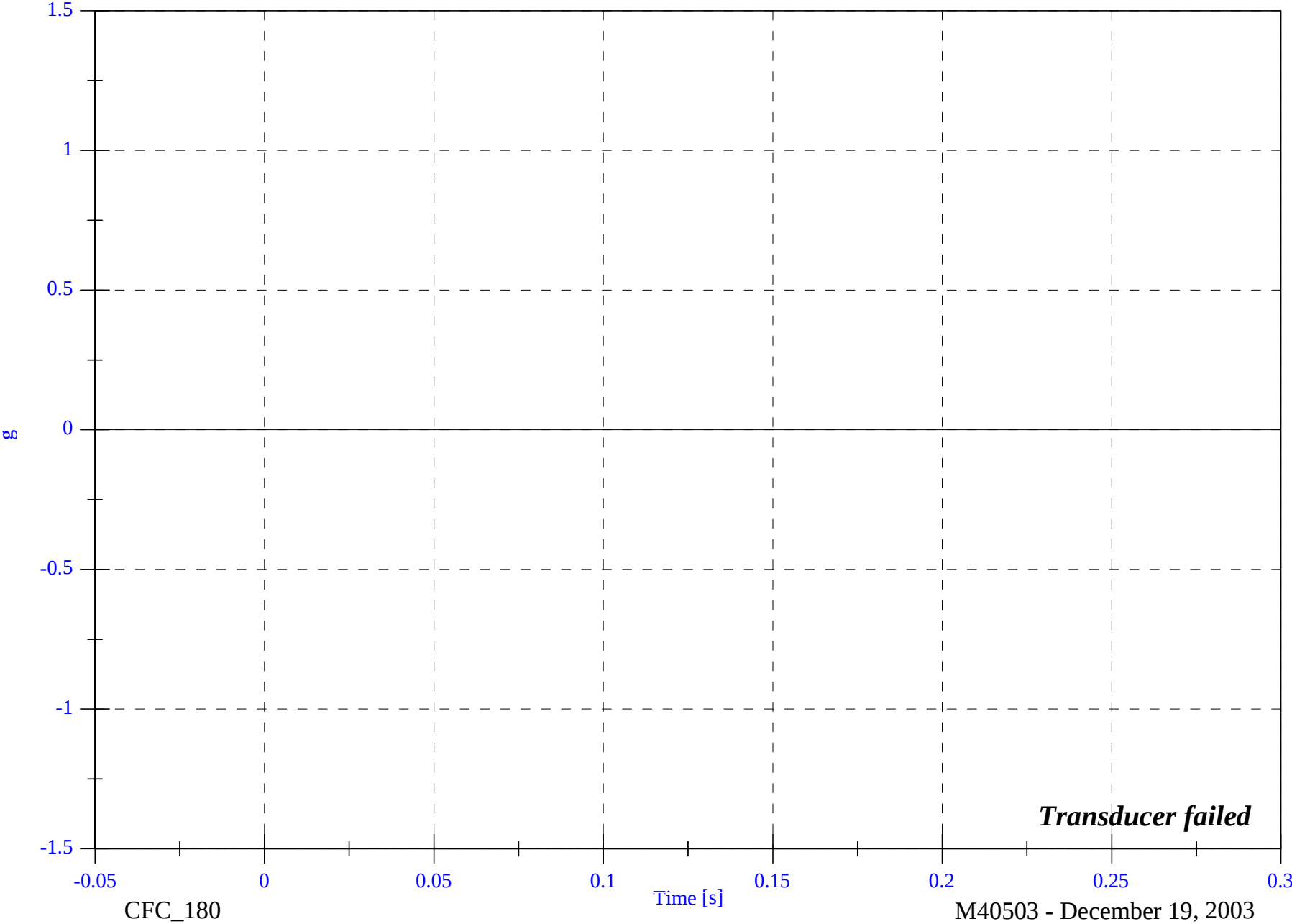


B-87

8642-NCAP-38

B-88

8642-NCAP-38

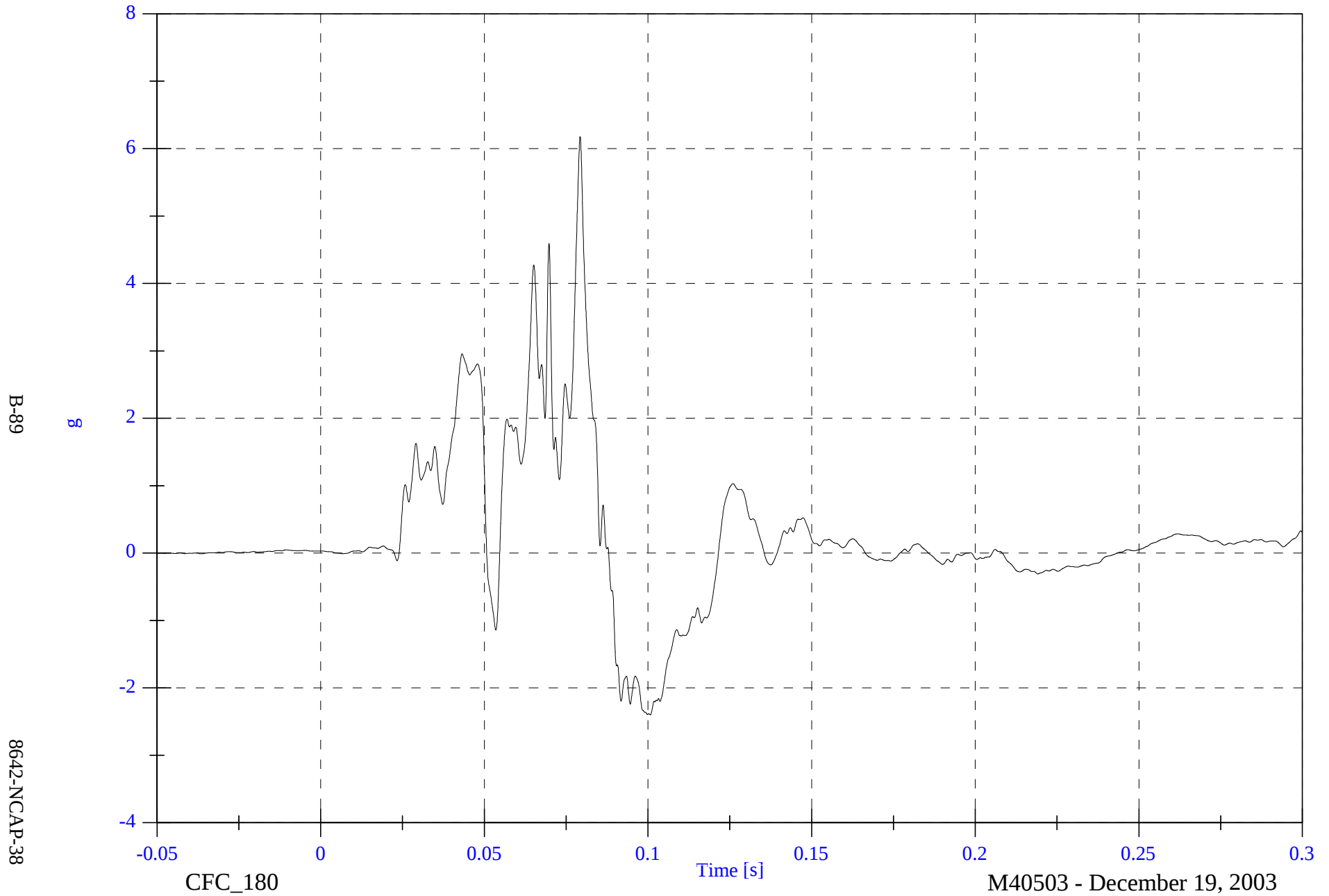


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Chest Red y

Max: 6.2 [g] at 0.079 [s]

Min: -2.4 [g] at 0.101 [s]

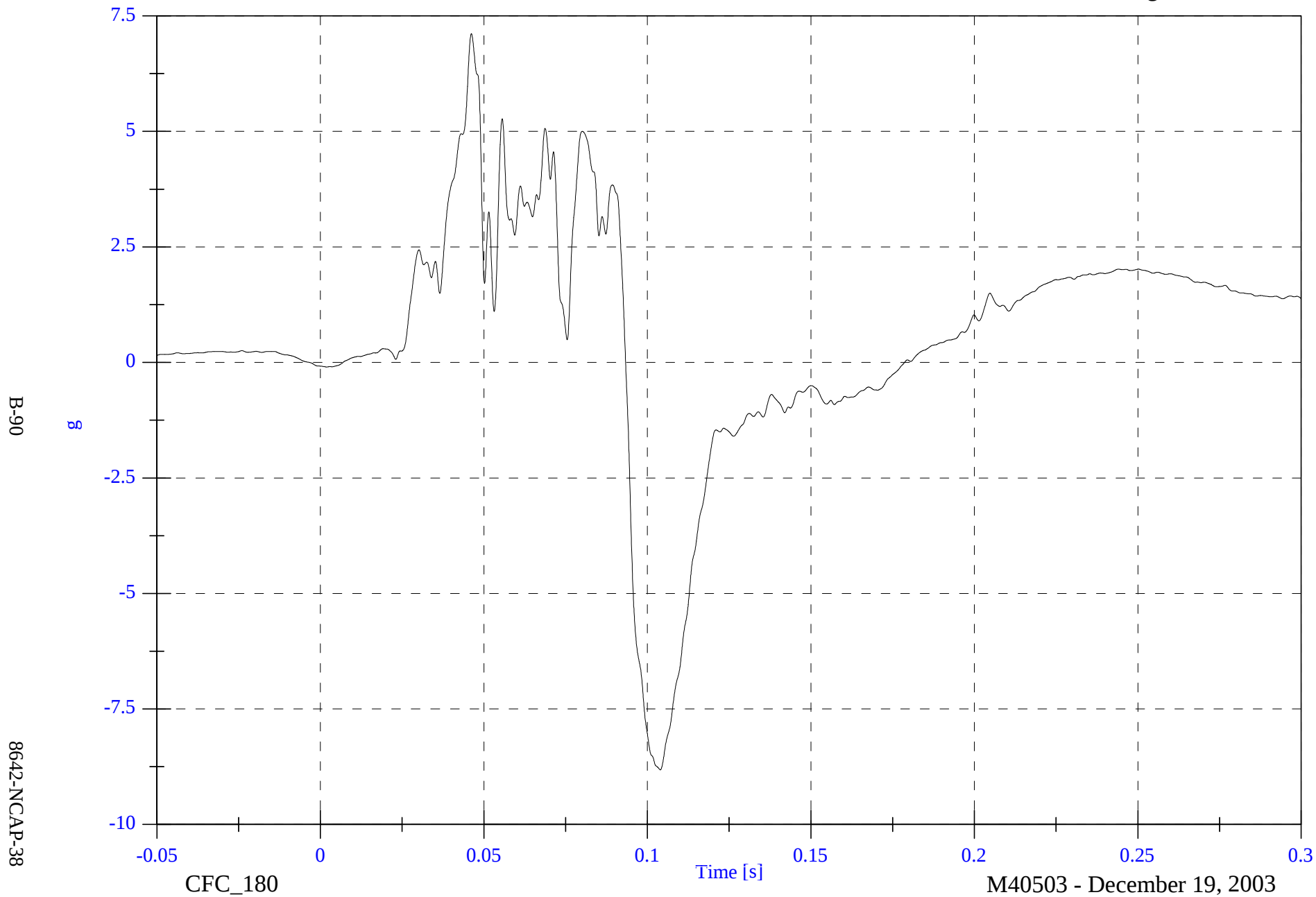


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Chest Red z

Max: 7.1 [g] at 0.046 [s]

Min: -8.8 [g] at 0.104 [s]

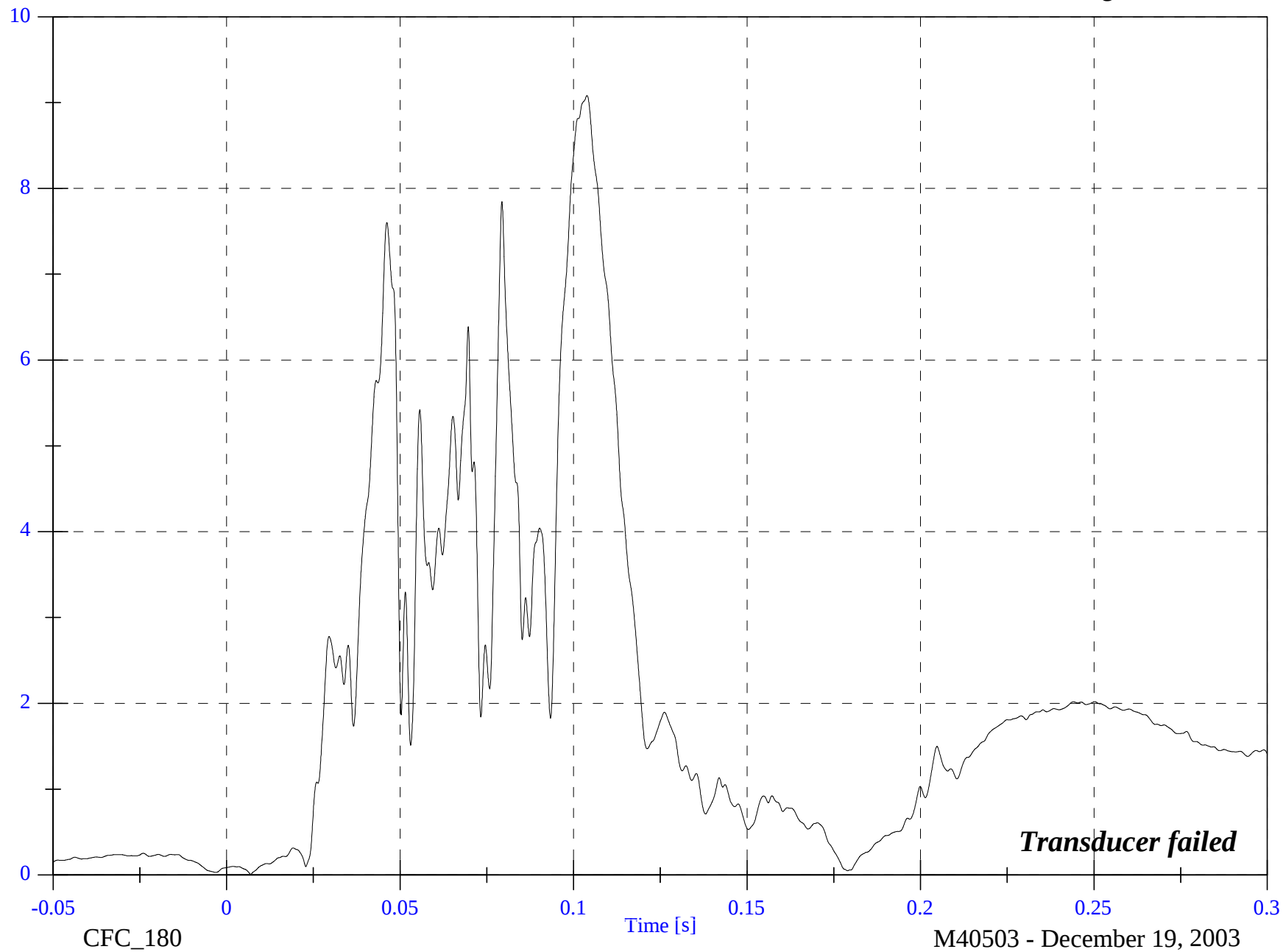


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Chest Red Resultant

Max: 9.1 [g] at 0.104 [s]

Min: 0.0 [g] at 0.007 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Chest Compression x

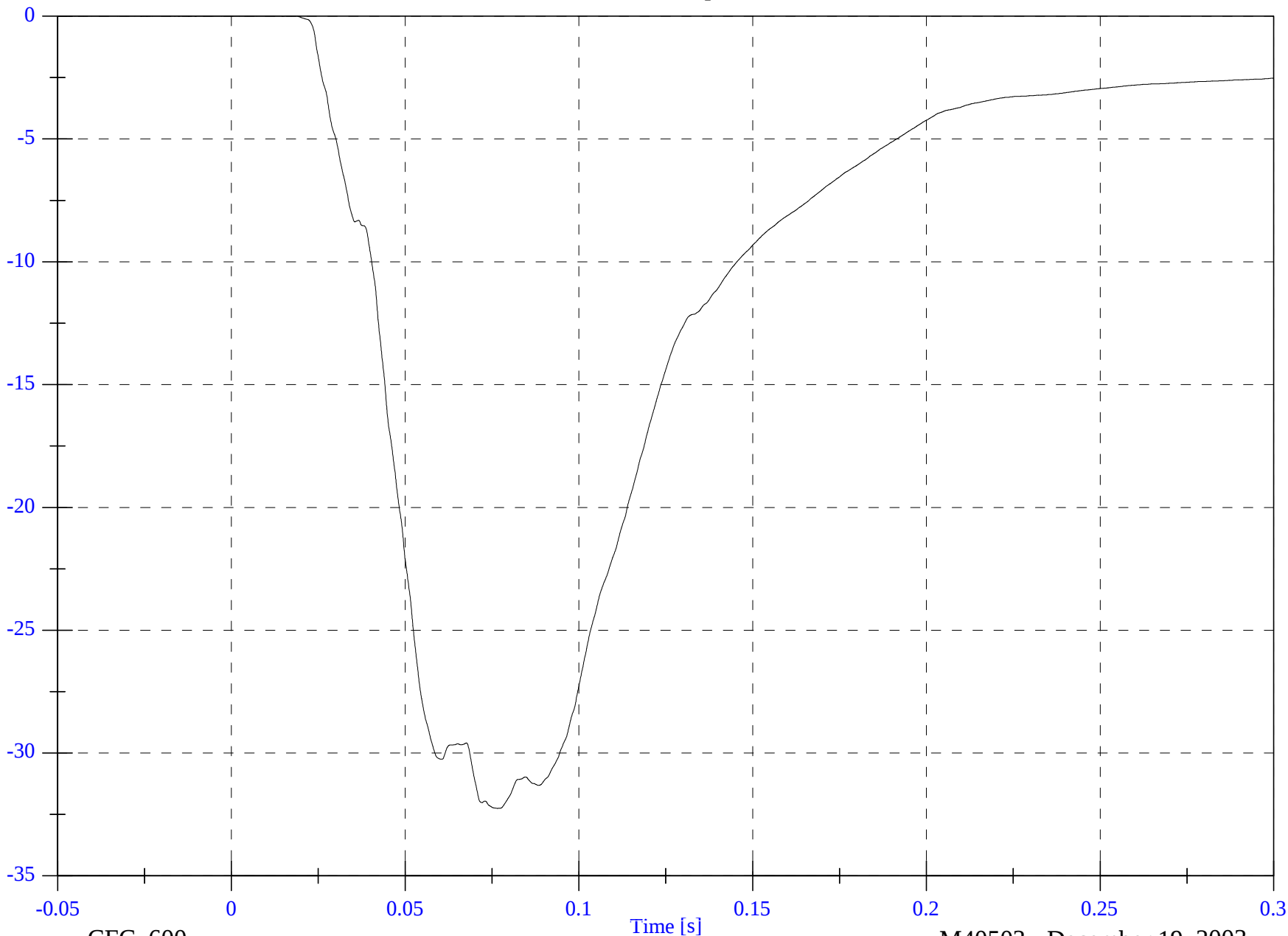
Max: 0.0 [mm] at -0.040 [s]

Min: -32.3 [mm] at 0.077 [s]

B-92

8642-NCAP-38

mm



CFC_600

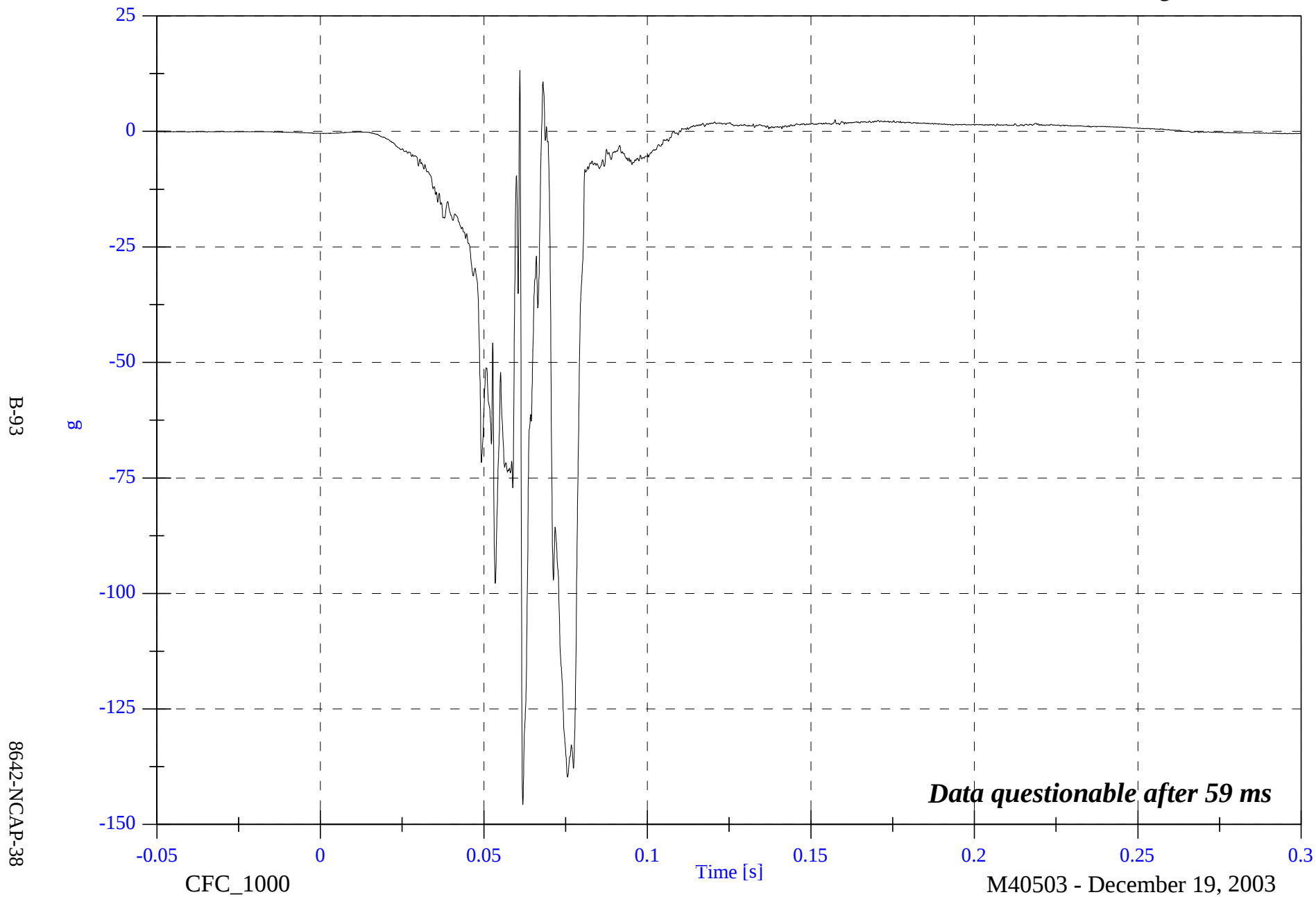
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Pelvic x

Max: 13.3 [g] at 0.061 [s]

Min: -145.7 [g] at 0.062 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

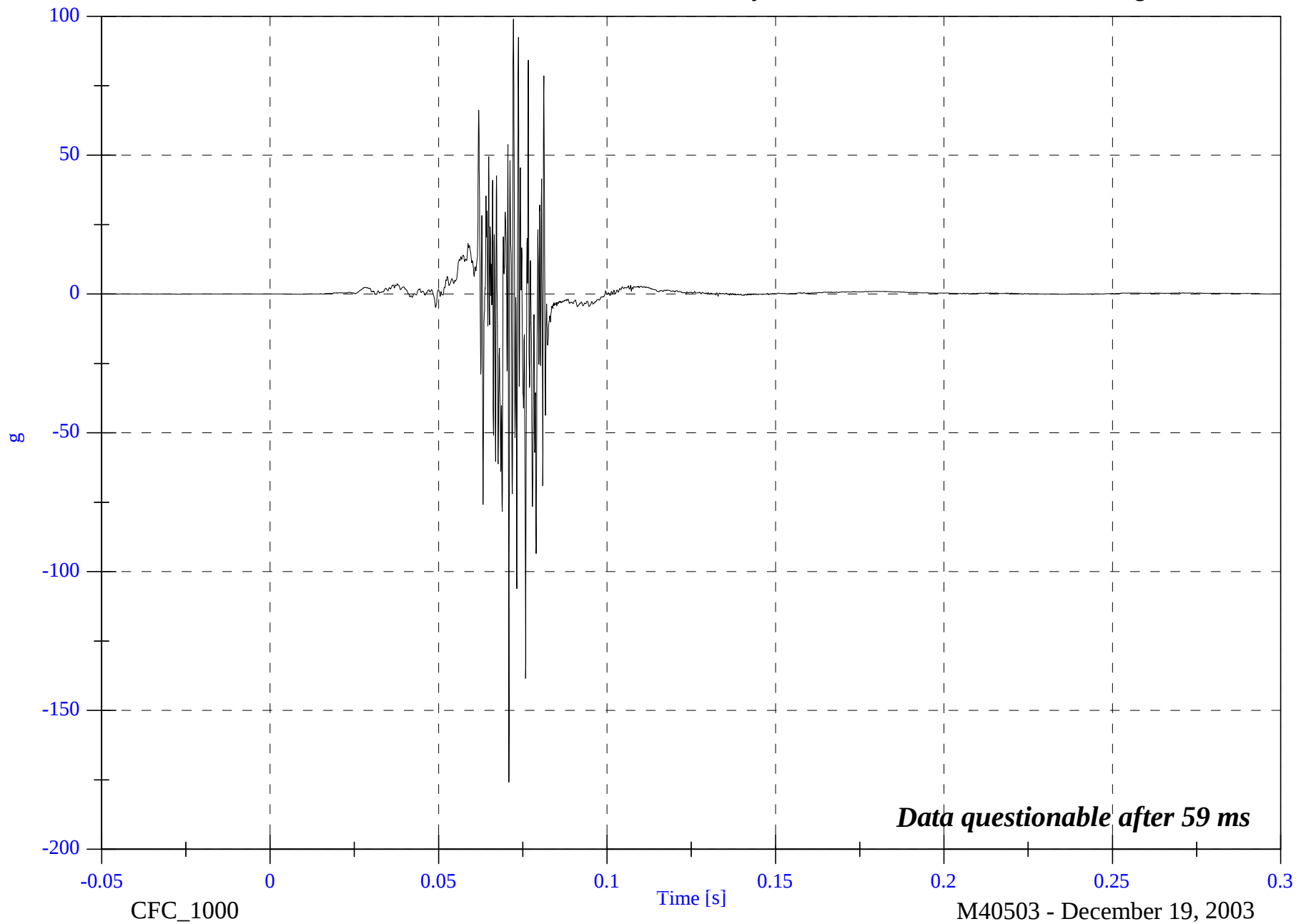
V1P2 Pelvic y

Max: 99.1 [g] at 0.072 [s]

Min: -175.8 [g] at 0.071 [s]

B-94

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

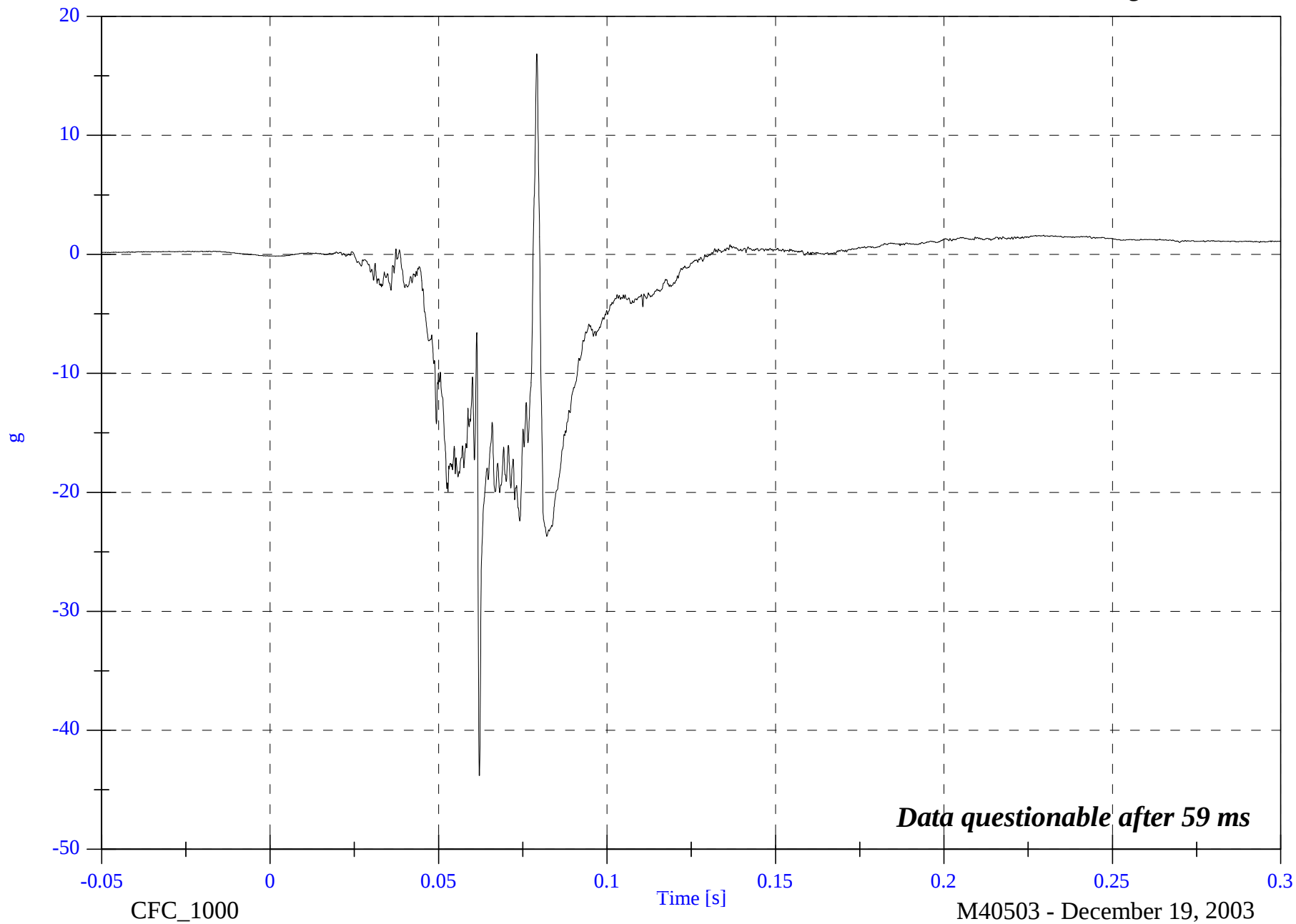
V1P2 Pelvic z

Max: 16.8 [g] at 0.079 [s]

Min: -43.8 [g] at 0.062 [s]

B-95

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2004 NCAP Test 2 - 2004 Hyundai XG350

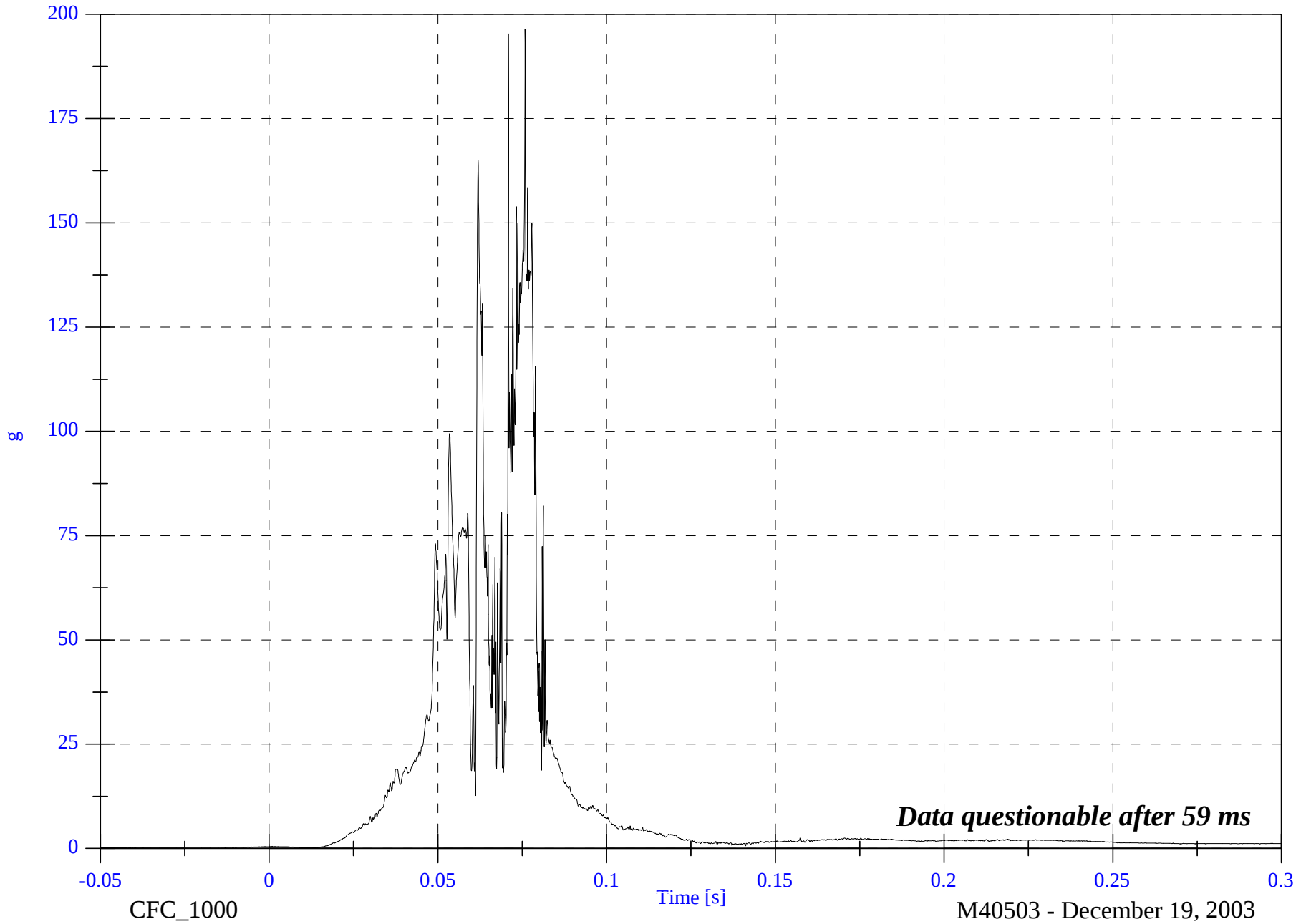
V1P2 Pelvic Resultant

Max: 196.5 [g] at 0.076 [s]

Min: 0.1 [g] at 0.012 [s]

B-96

8642-NCAP-38

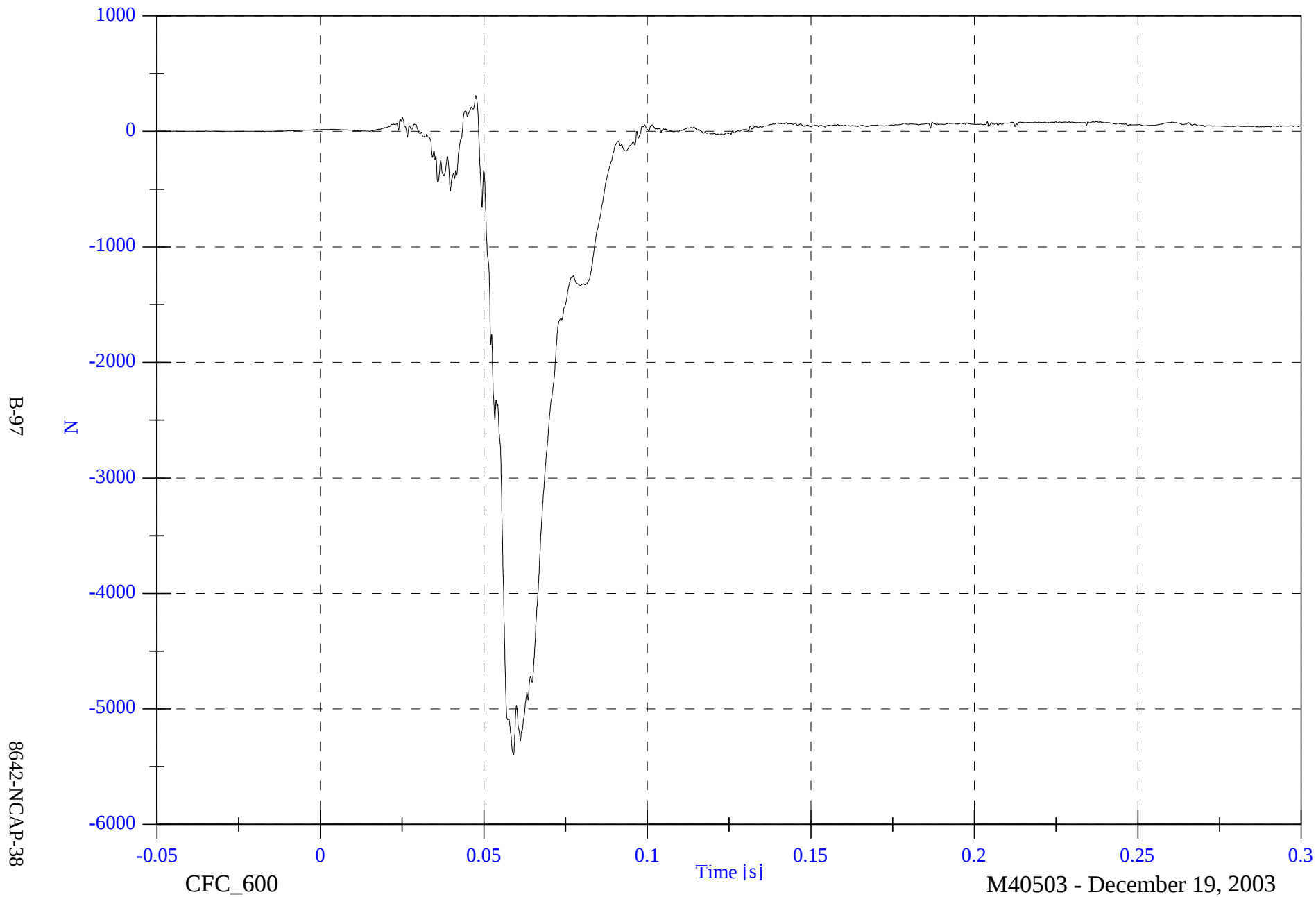


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Left Femur z

Max: 307.7 [N] at 0.048 [s]

Min: -5395.3 [N] at 0.059 [s]

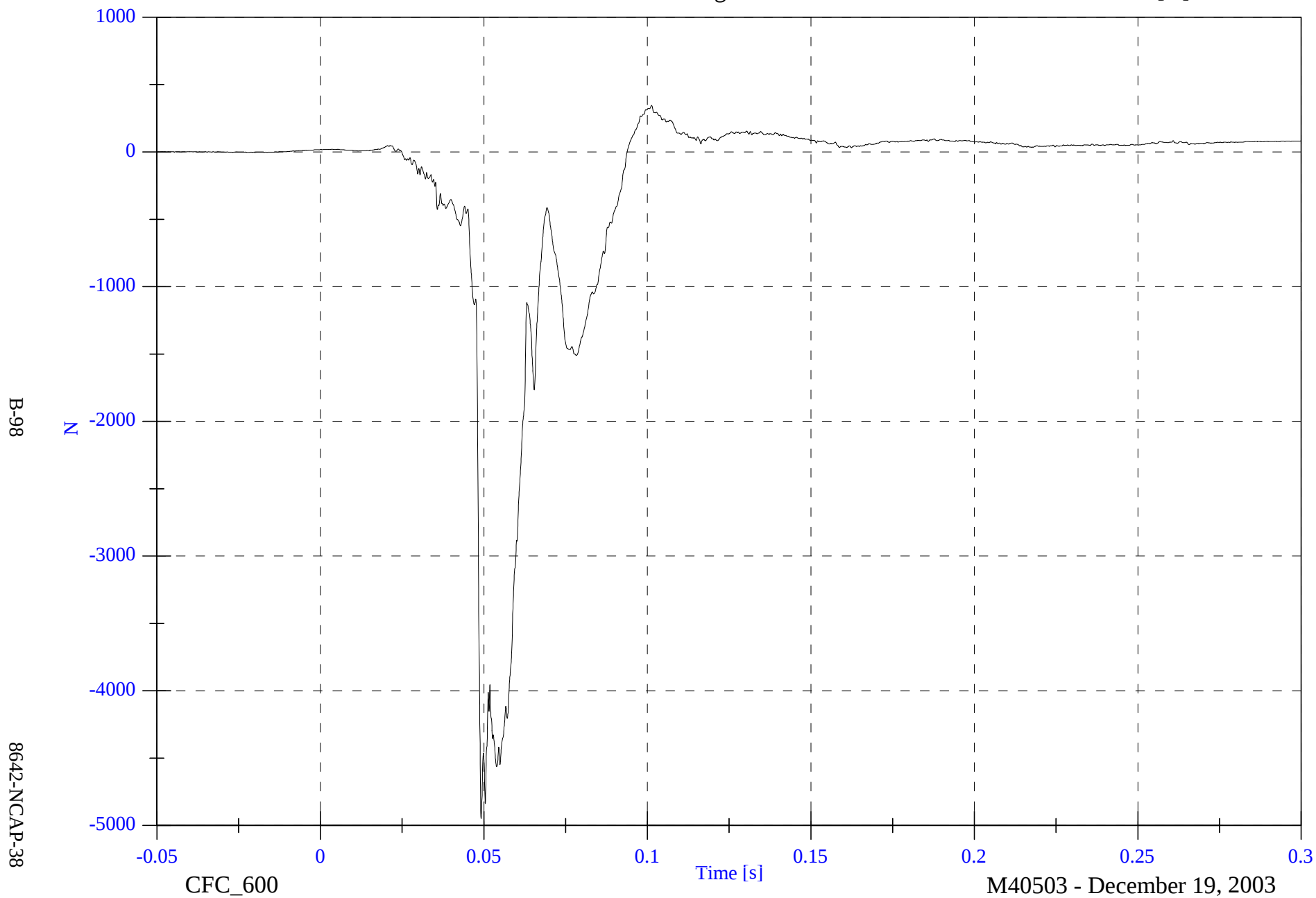


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 345.3 [N] at 0.101 [s]

Min: -4947.6 [N] at 0.049 [s]

V1P2 Right Femur z

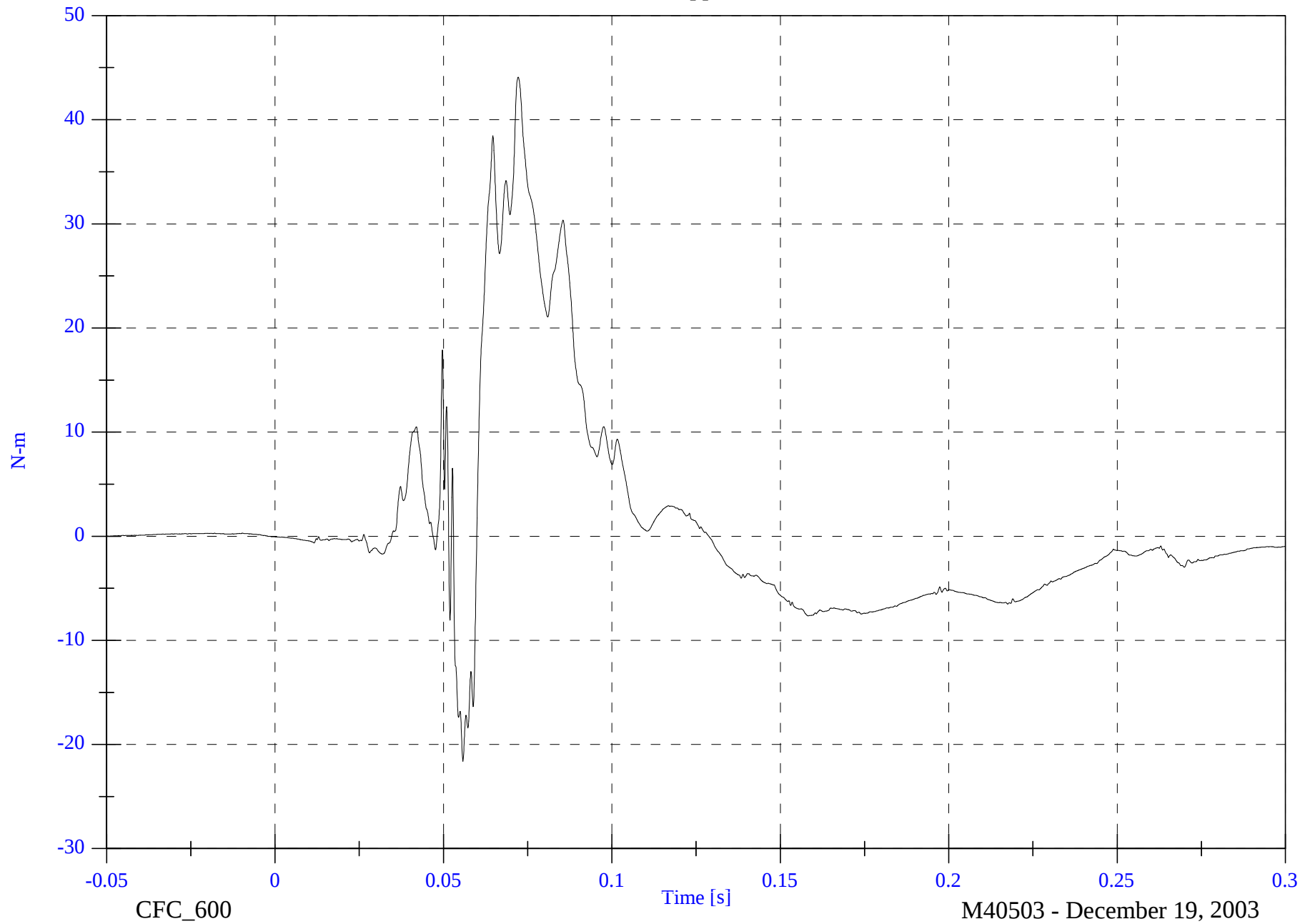


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Left Upper Tibia Mx

Max: 44.1 [N-m] at 0.072 [s]

Min: -21.6 [N-m] at 0.056 [s]

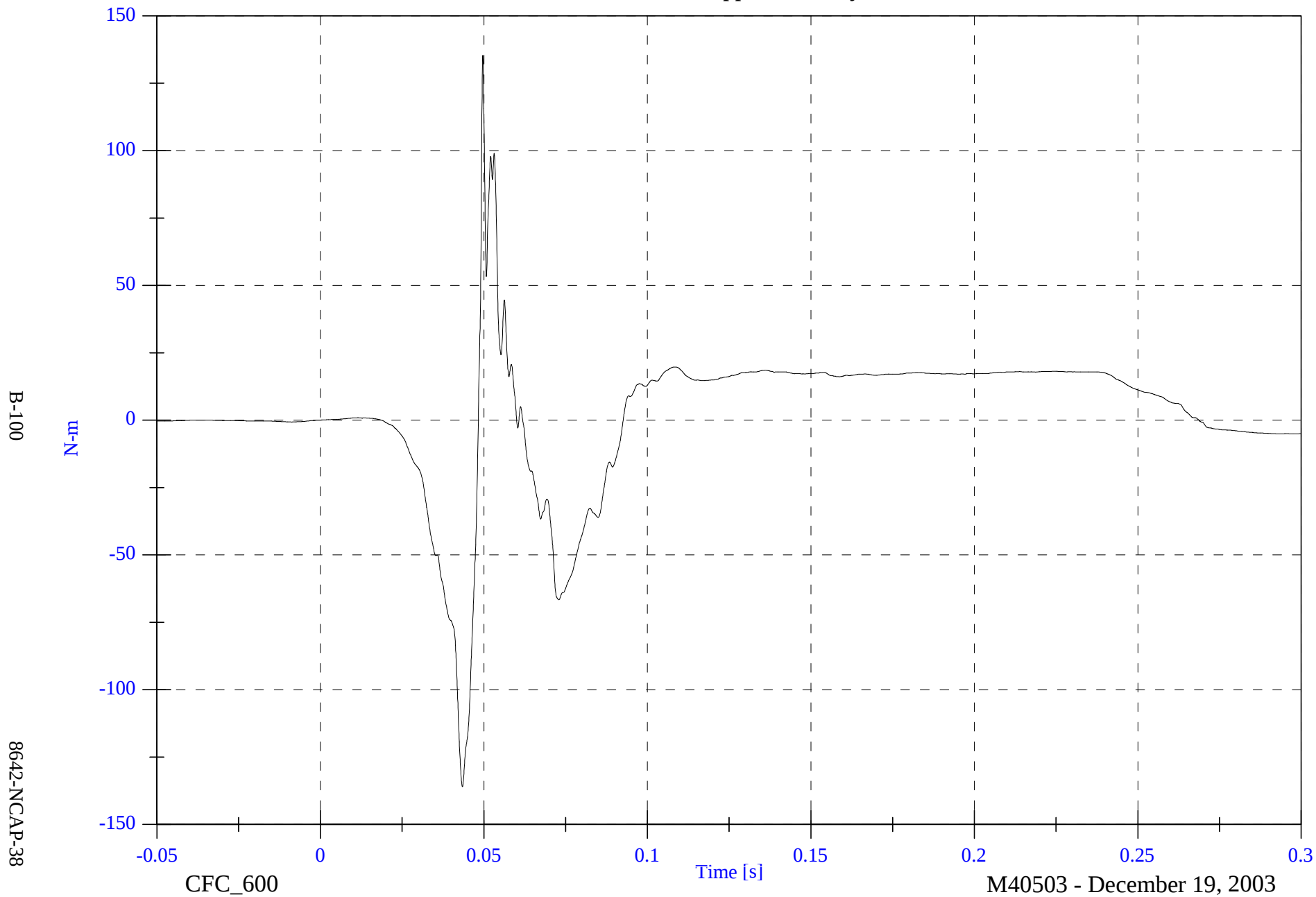


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Left Upper Tibia My

Max: 135.3 [N-m] at 0.050 [s]

Min: -136.0 [N-m] at 0.043 [s]

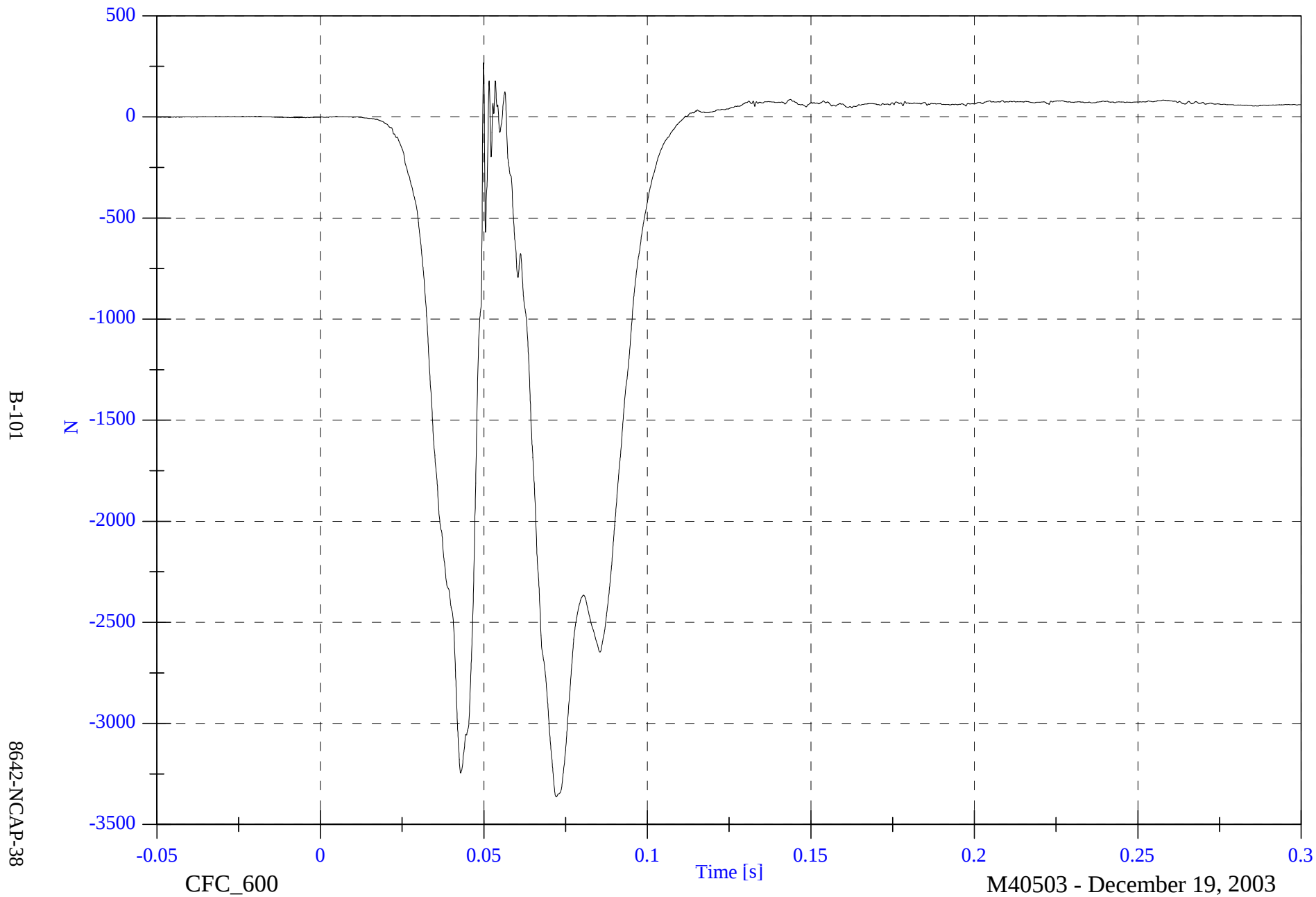


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Left Lower Tibia Fz

Max: 268.1 [N] at 0.050 [s]

Min: -3363.9 [N] at 0.072 [s]

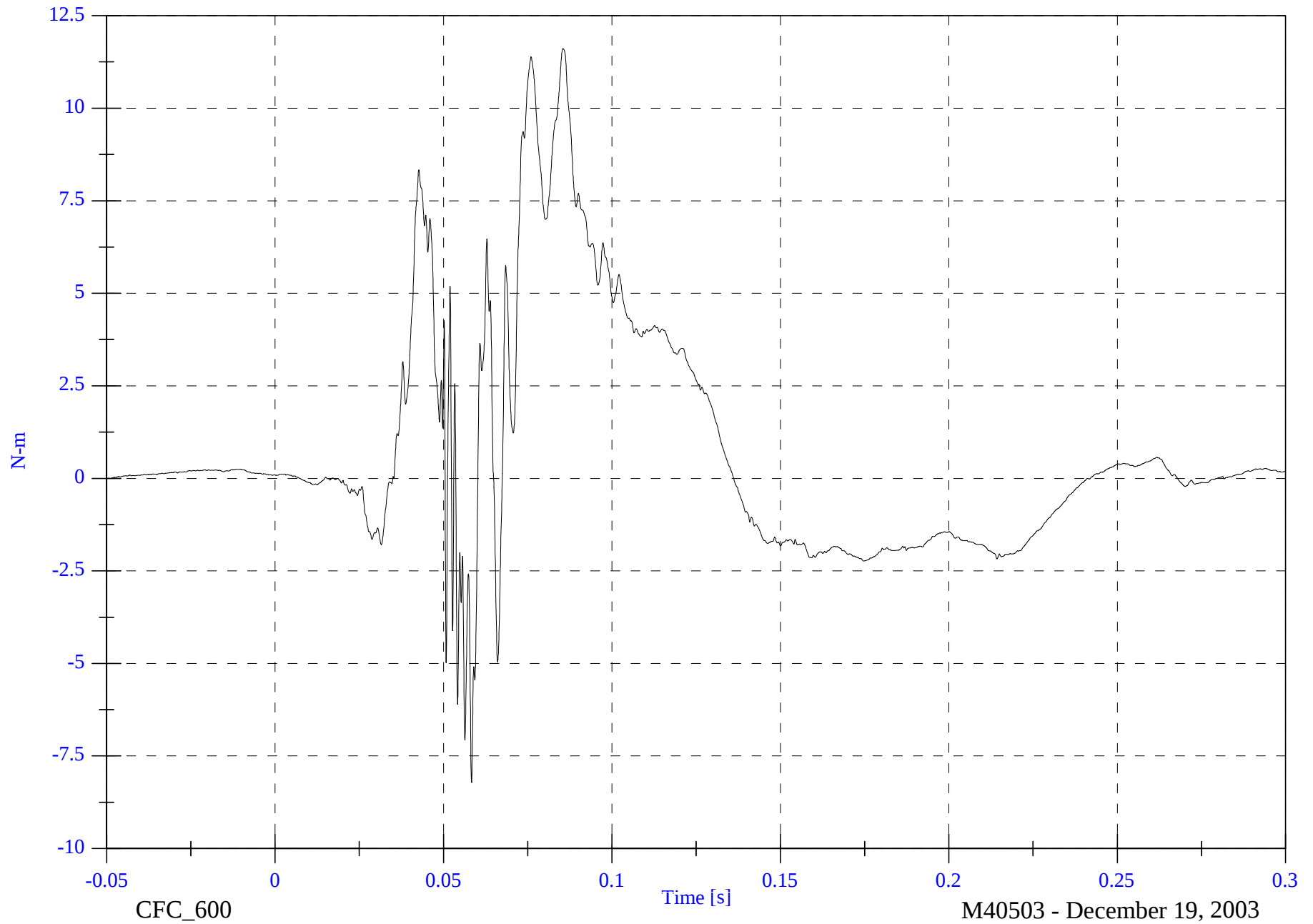


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Left Lower Tibia Mx

Max: 11.6 [N-m] at 0.085 [s]

Min: -8.2 [N-m] at 0.058 [s]

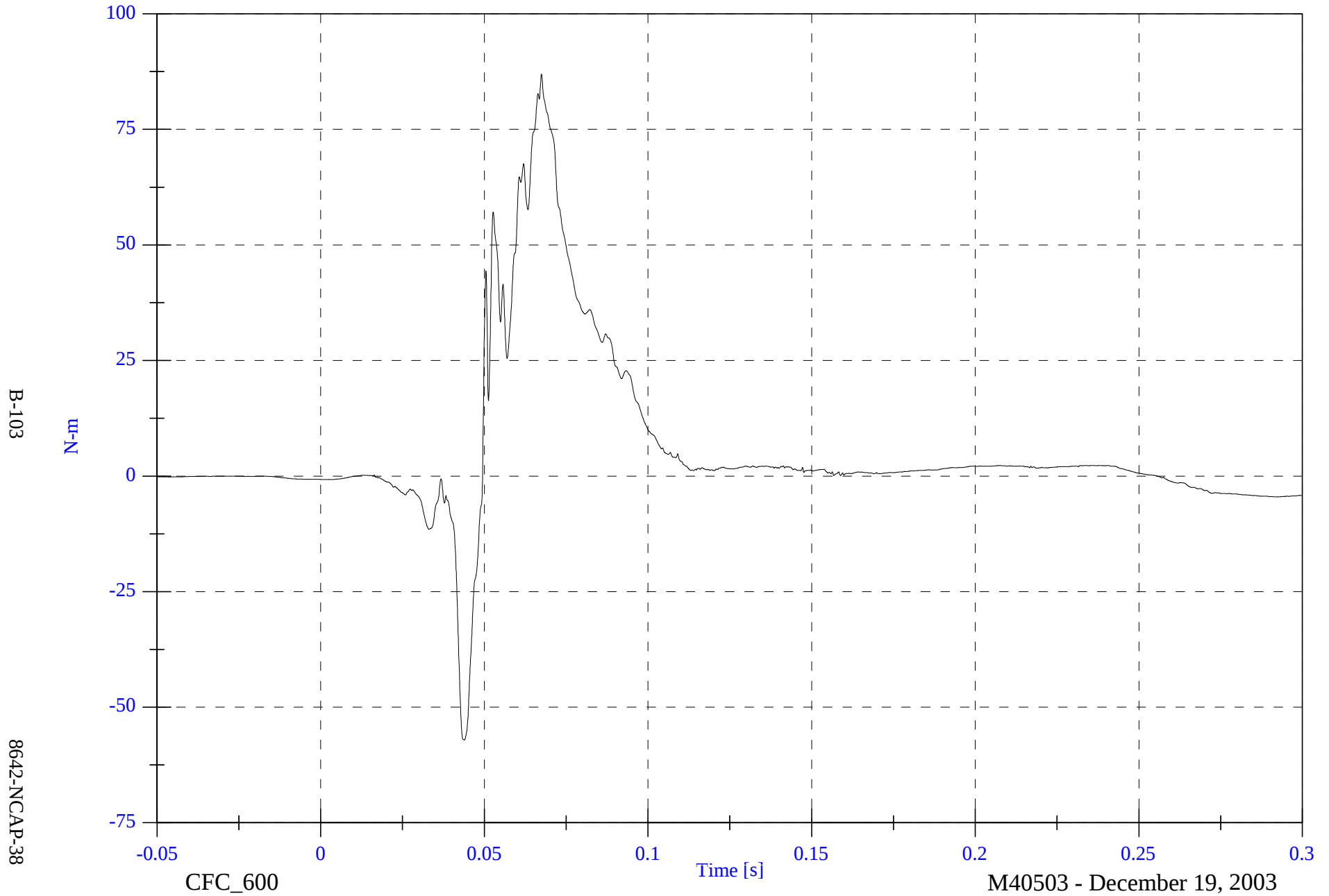


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Left Lower Tibia My

Max: 86.9 [N-m] at 0.068 [s]

Min: -57.1 [N-m] at 0.044 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

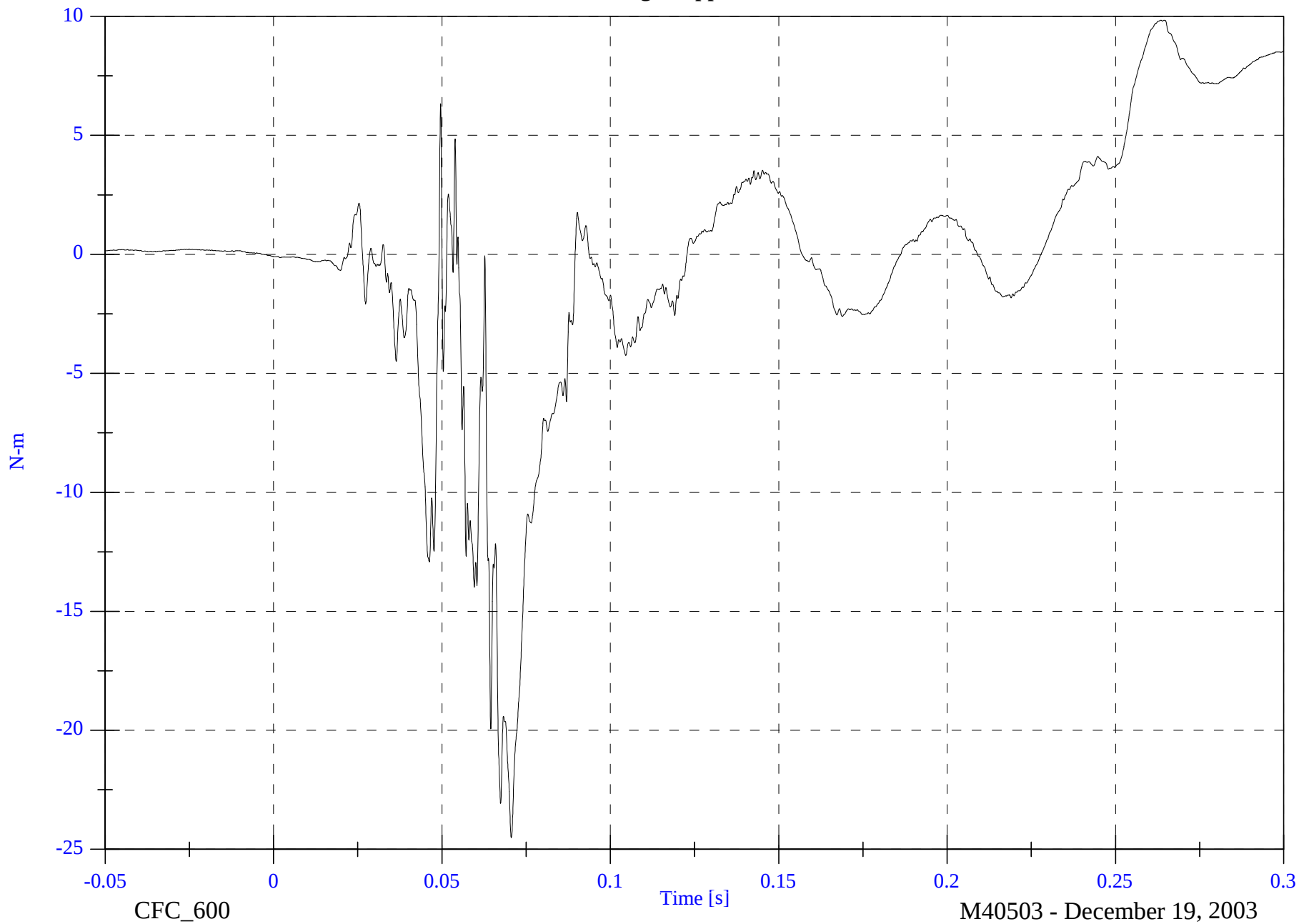
V1P2 Right Upper Tibia Mx

Max: 9.8 [N-m] at 0.264 [s]

Min: -24.5 [N-m] at 0.071 [s]

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8642-NCAP-38

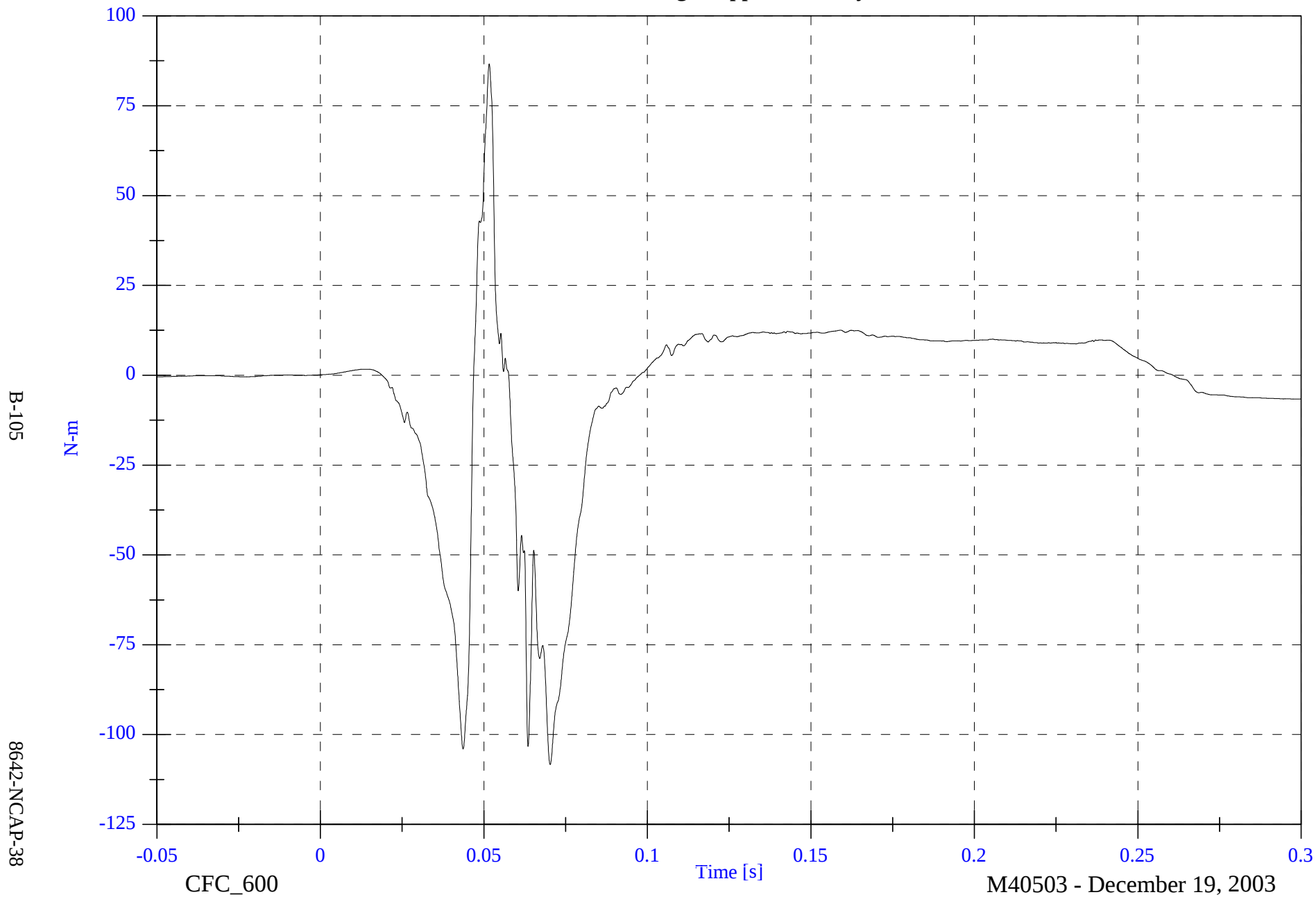


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Right Upper Tibia My

Max: 86.6 [N-m] at 0.052 [s]

Min: -108.3 [N-m] at 0.070 [s]

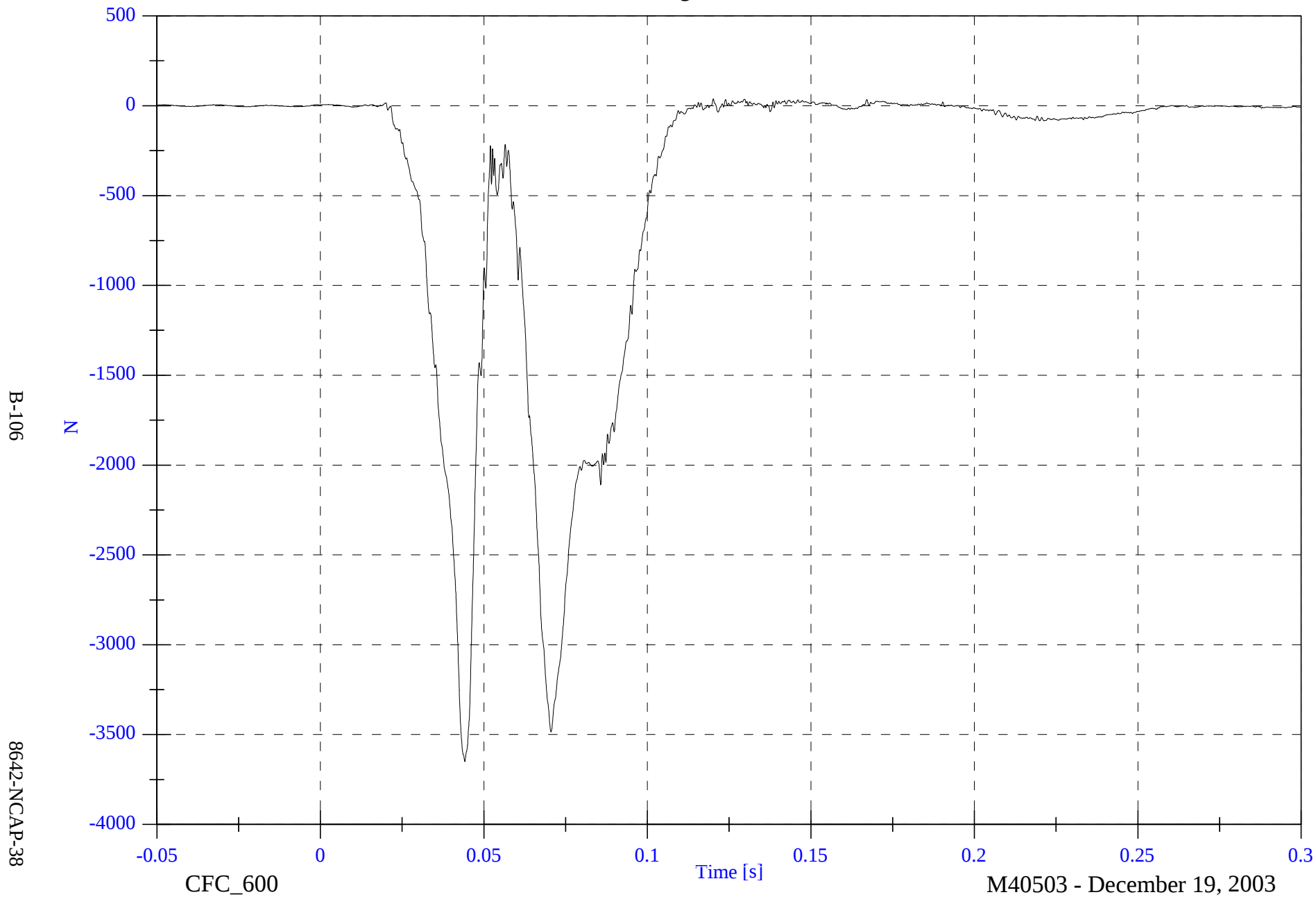


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Right Lower Tibia Fz

Max: 38.2 [N] at 0.120 [s]

Min: -3649.7 [N] at 0.044 [s]

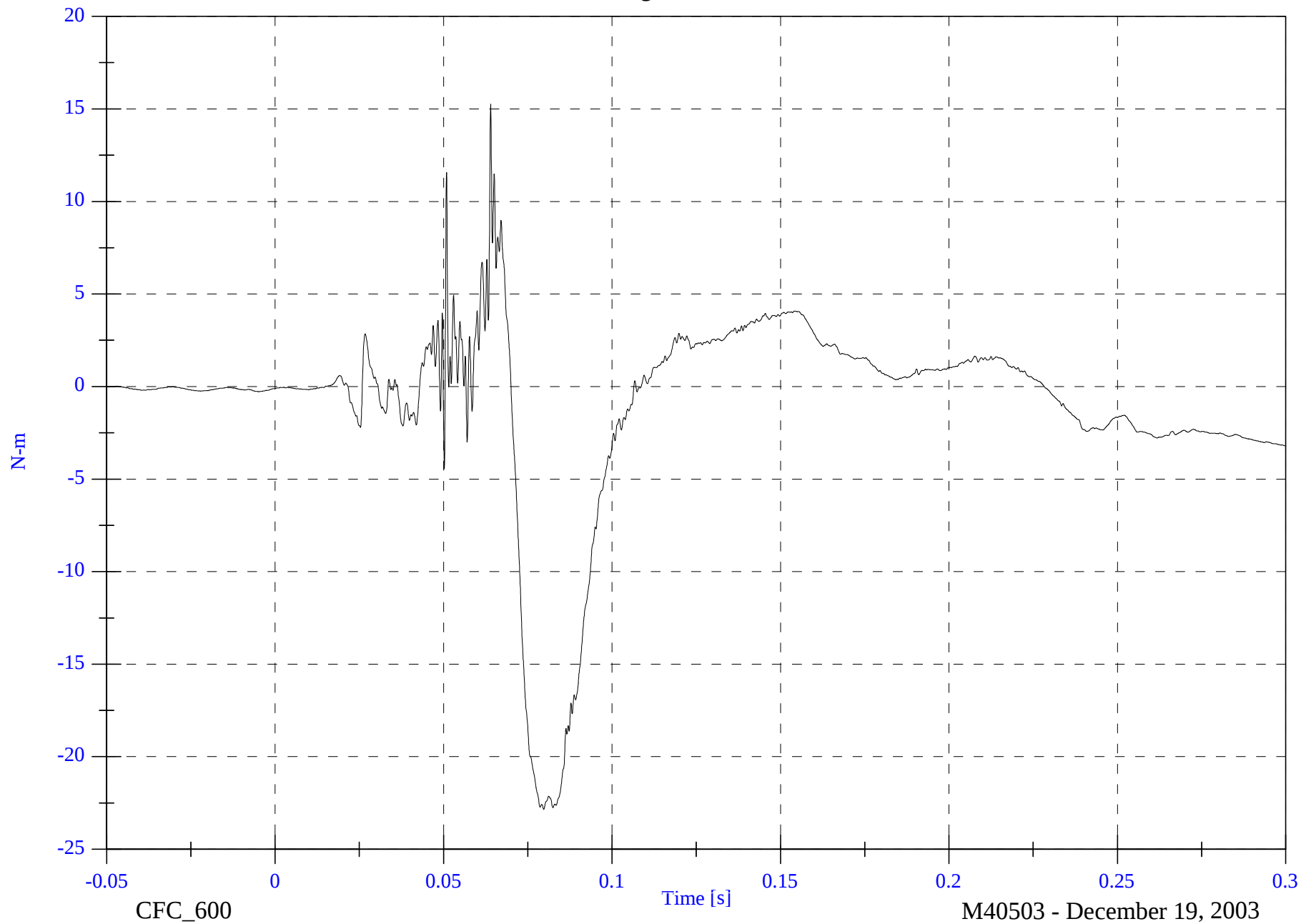


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Right Lower Tibia Mx

Max: 15.3 [N-m] at 0.064 [s]

Min: -22.8 [N-m] at 0.080 [s]



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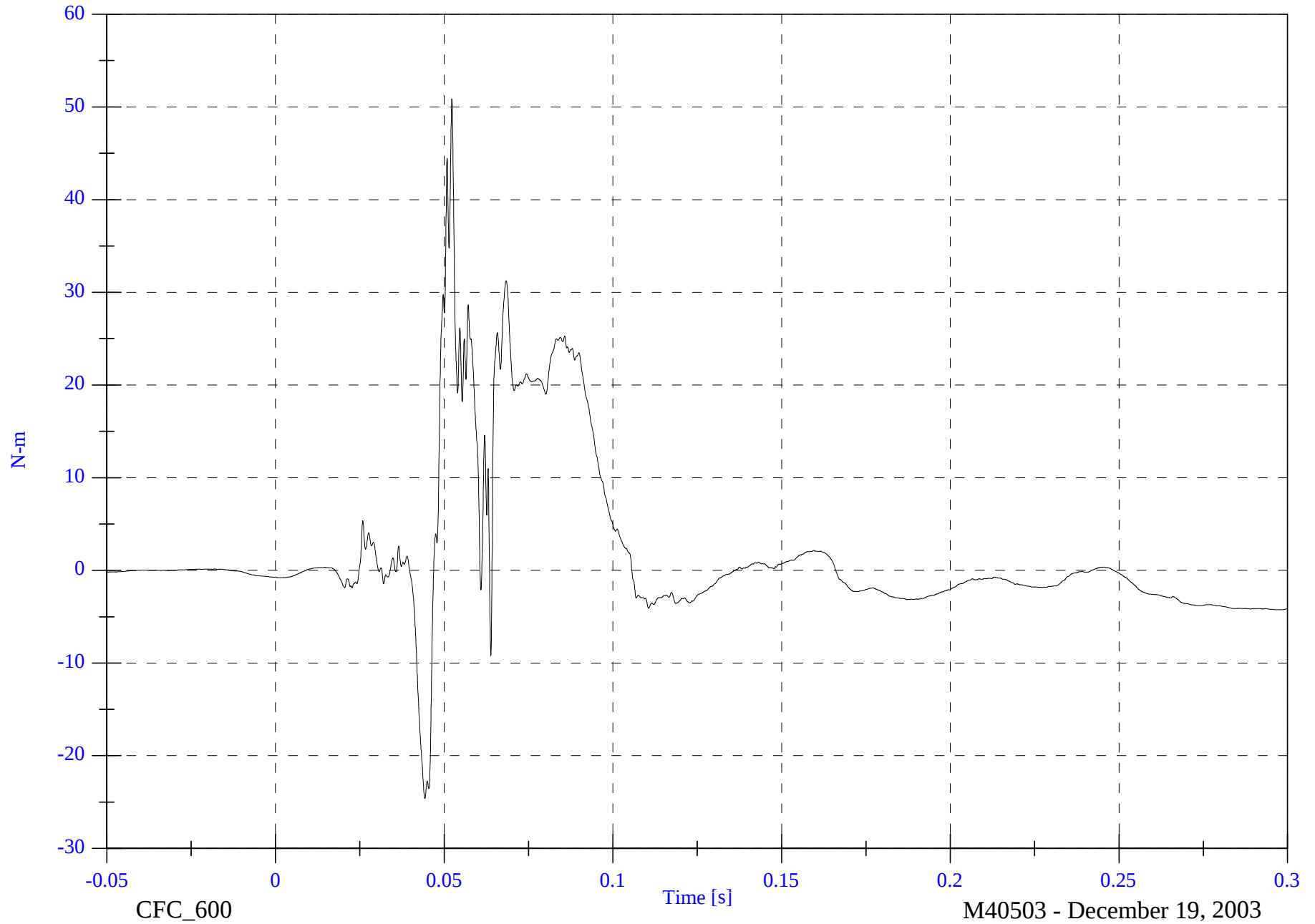
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Right Lower Tibia My

Max: 50.9 [N-m] at 0.052 [s]

Min: -24.6 [N-m] at 0.044 [s]

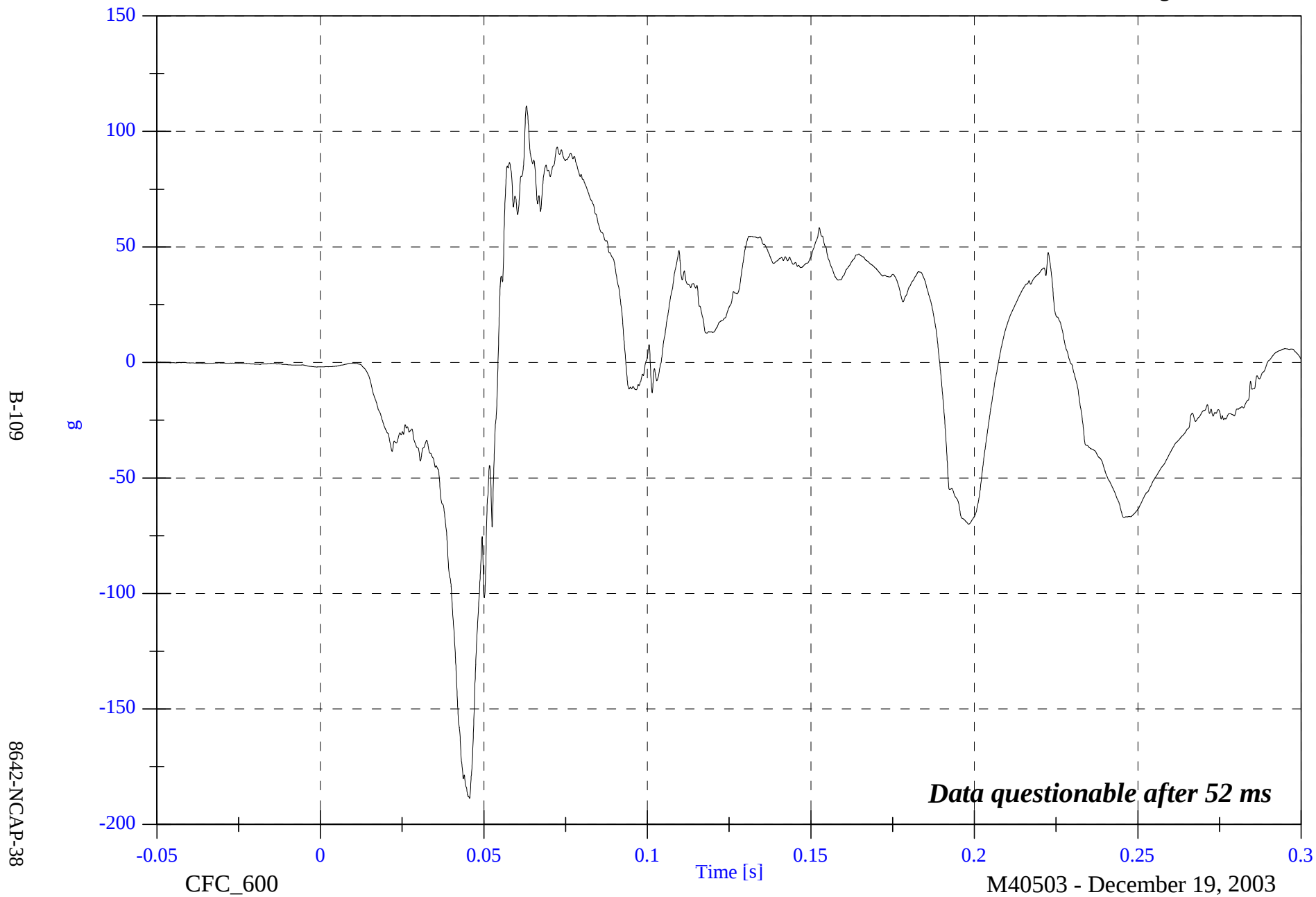


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 111.0 [g] at 0.063 [s]

Min: -188.8 [g] at 0.046 [s]

V1P2 Left Foot Aft x

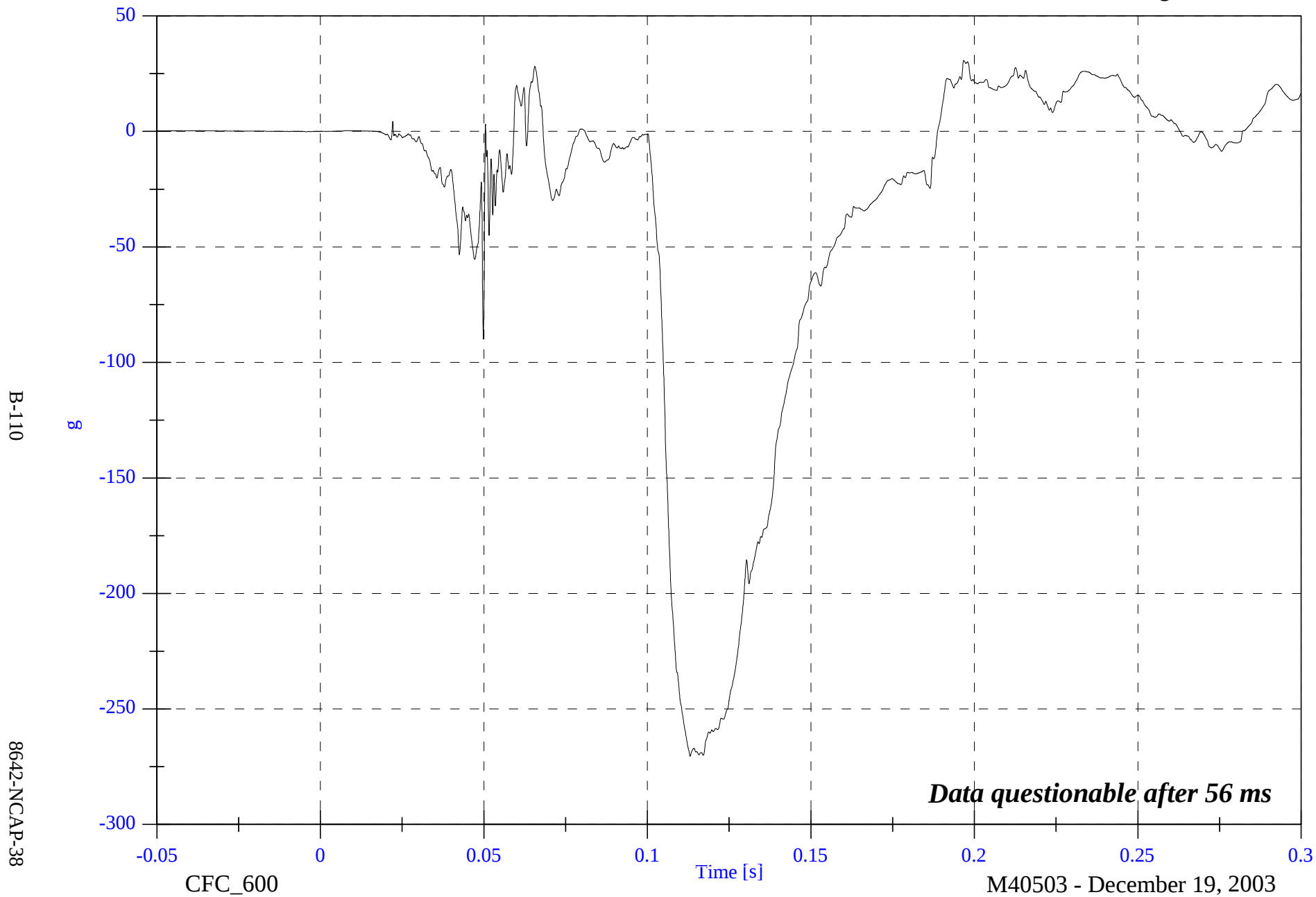


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Left Foot Aft z

Max: 30.7 [g] at 0.197 [s]

Min: -270.5 [g] at 0.113 [s]



2004 NCAP Test 2 - 2004 Hyundai XG350

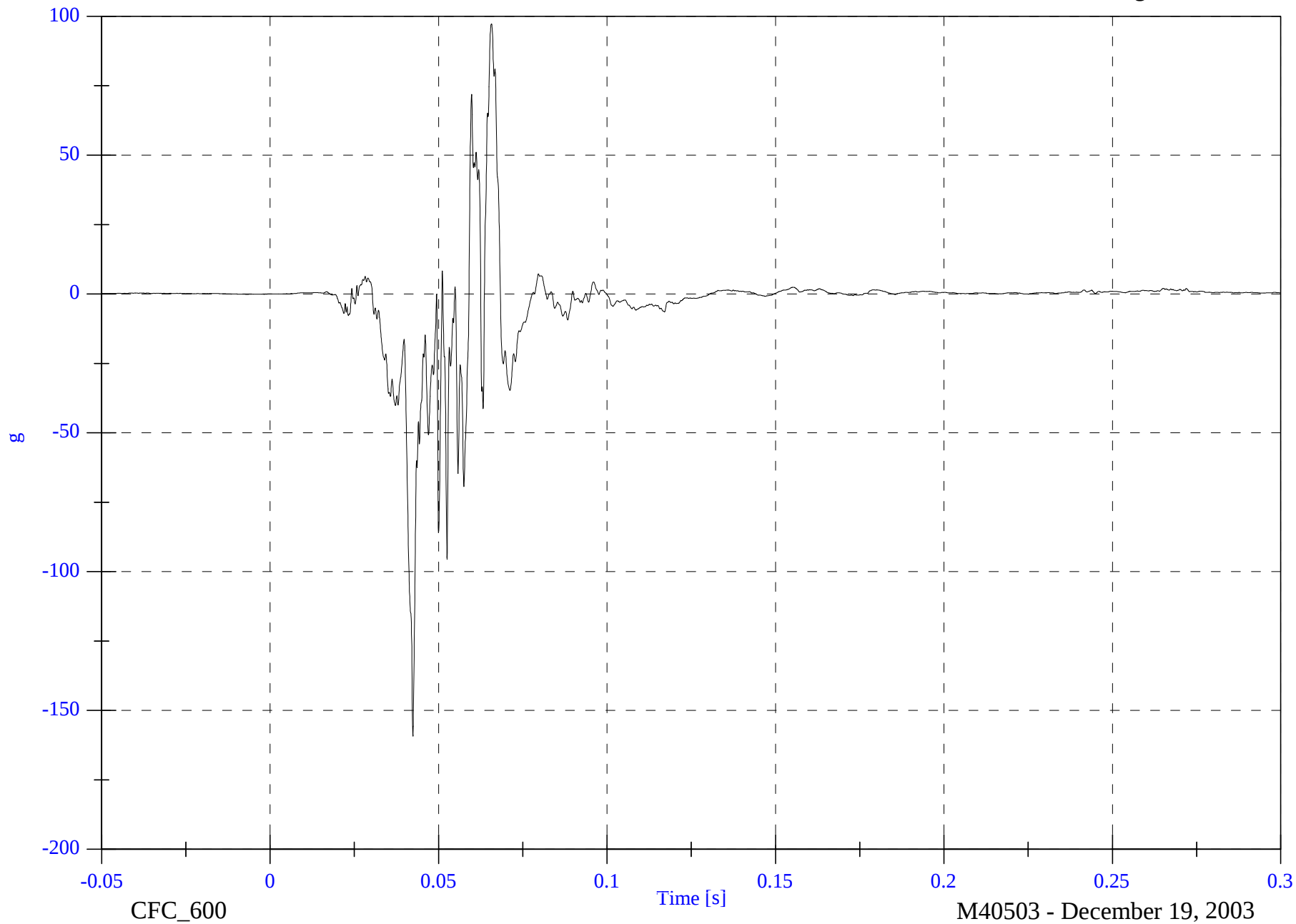
V1P2 Left Foot Fore z

Max: 97.3 [g] at 0.066 [s]

Min: -159.3 [g] at 0.042 [s]

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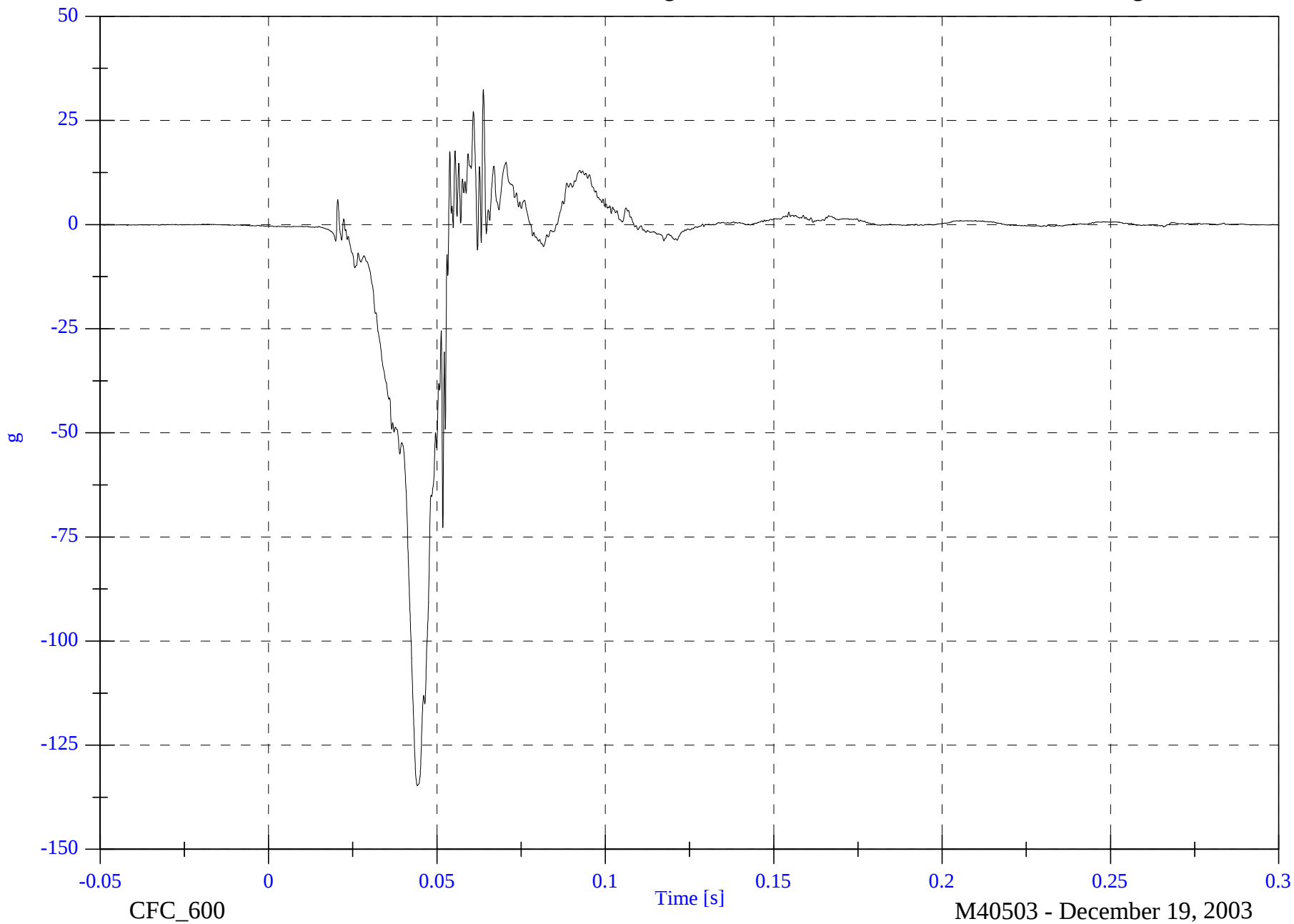


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Right Foot Aft x

Max: 32.4 [g] at 0.064 [s]

Min: -134.8 [g] at 0.044 [s]



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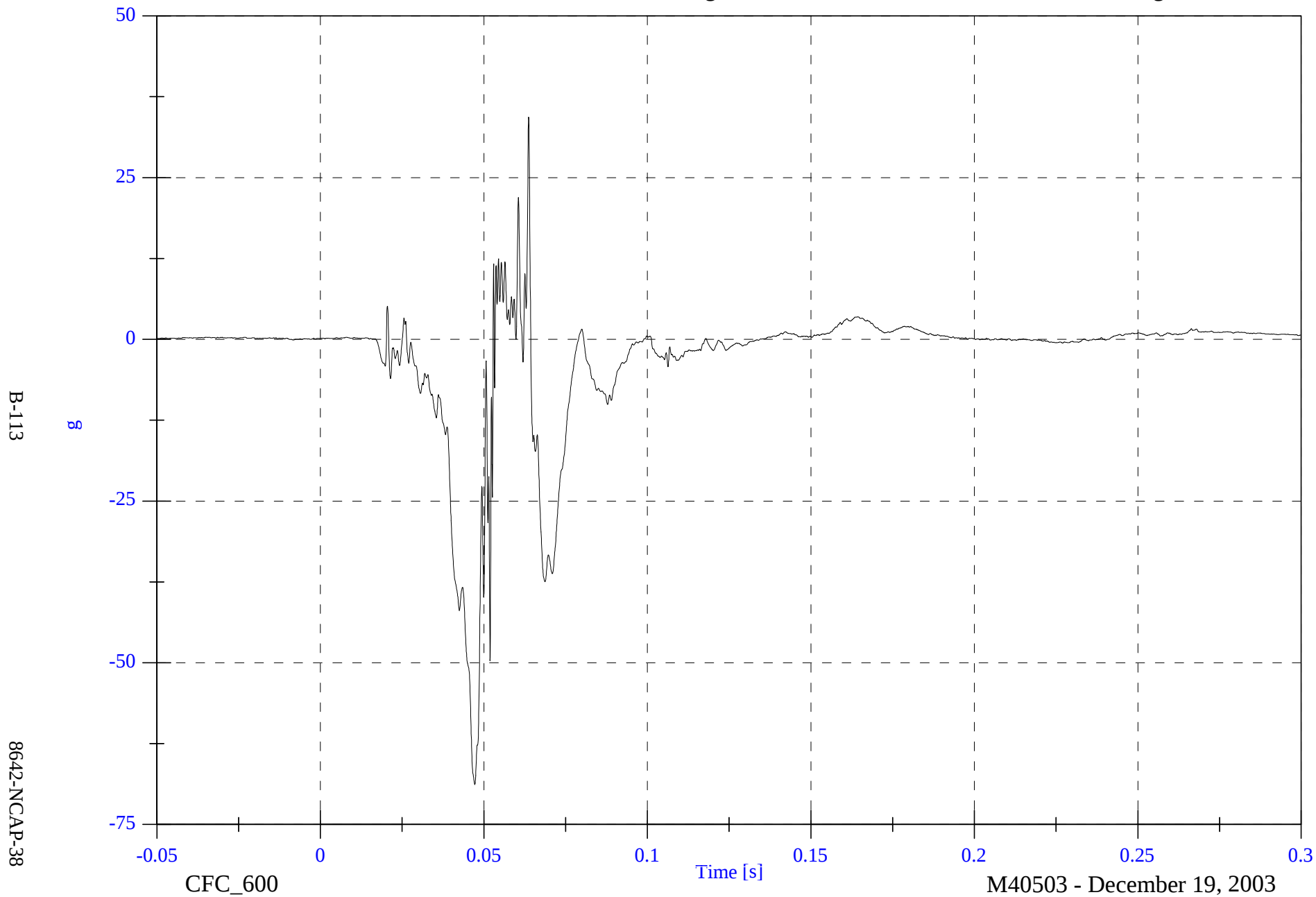
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2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Right Foot Aft z

Max: 34.4 [g] at 0.064 [s]

Min: -68.9 [g] at 0.047 [s]

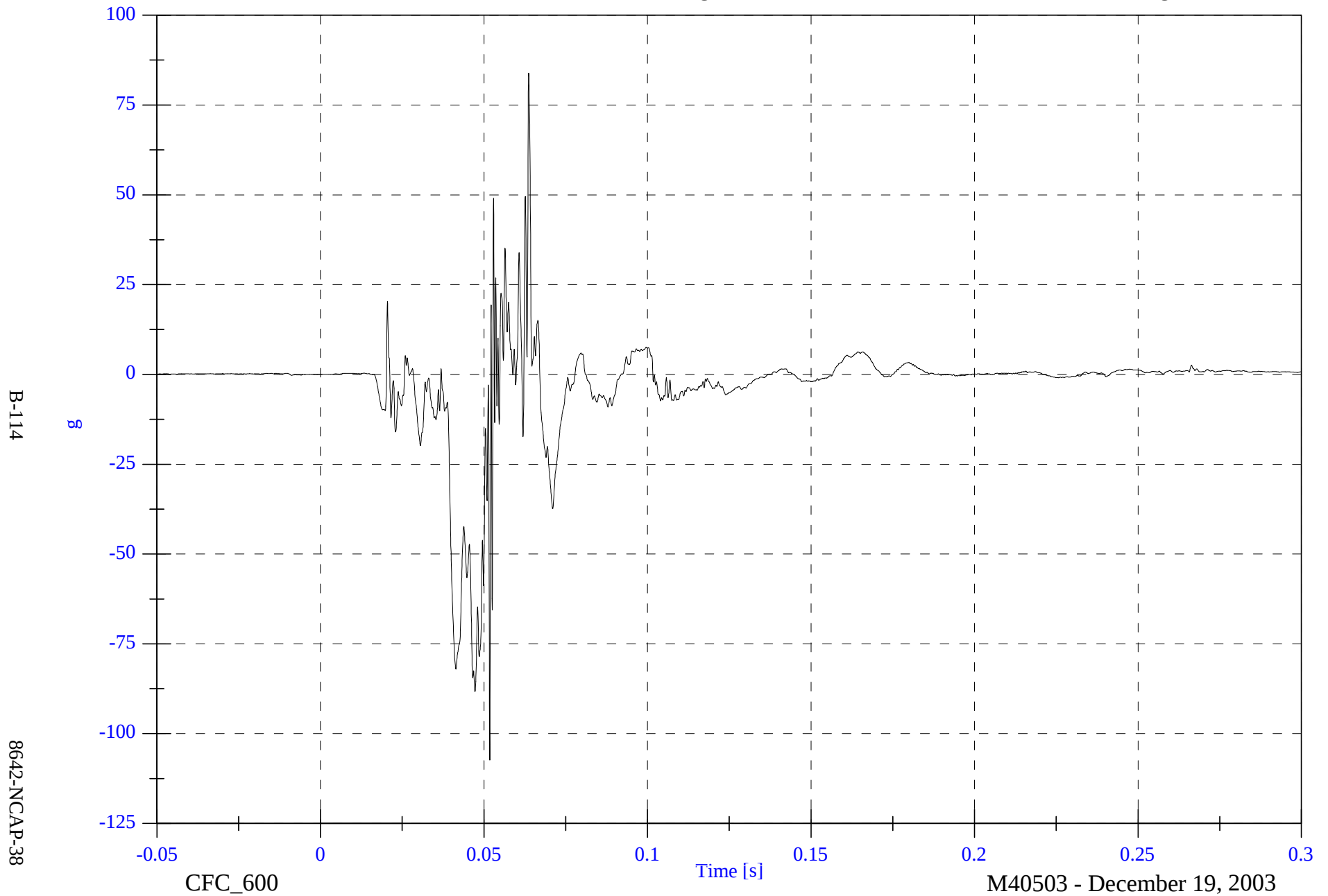


2004 NCAP Test 2 - 2004 Hyundai XG350

V1P2 Right Foot Fore z

Max: 83.9 [g] at 0.064 [s]

Min: -107.4 [g] at 0.052 [s]

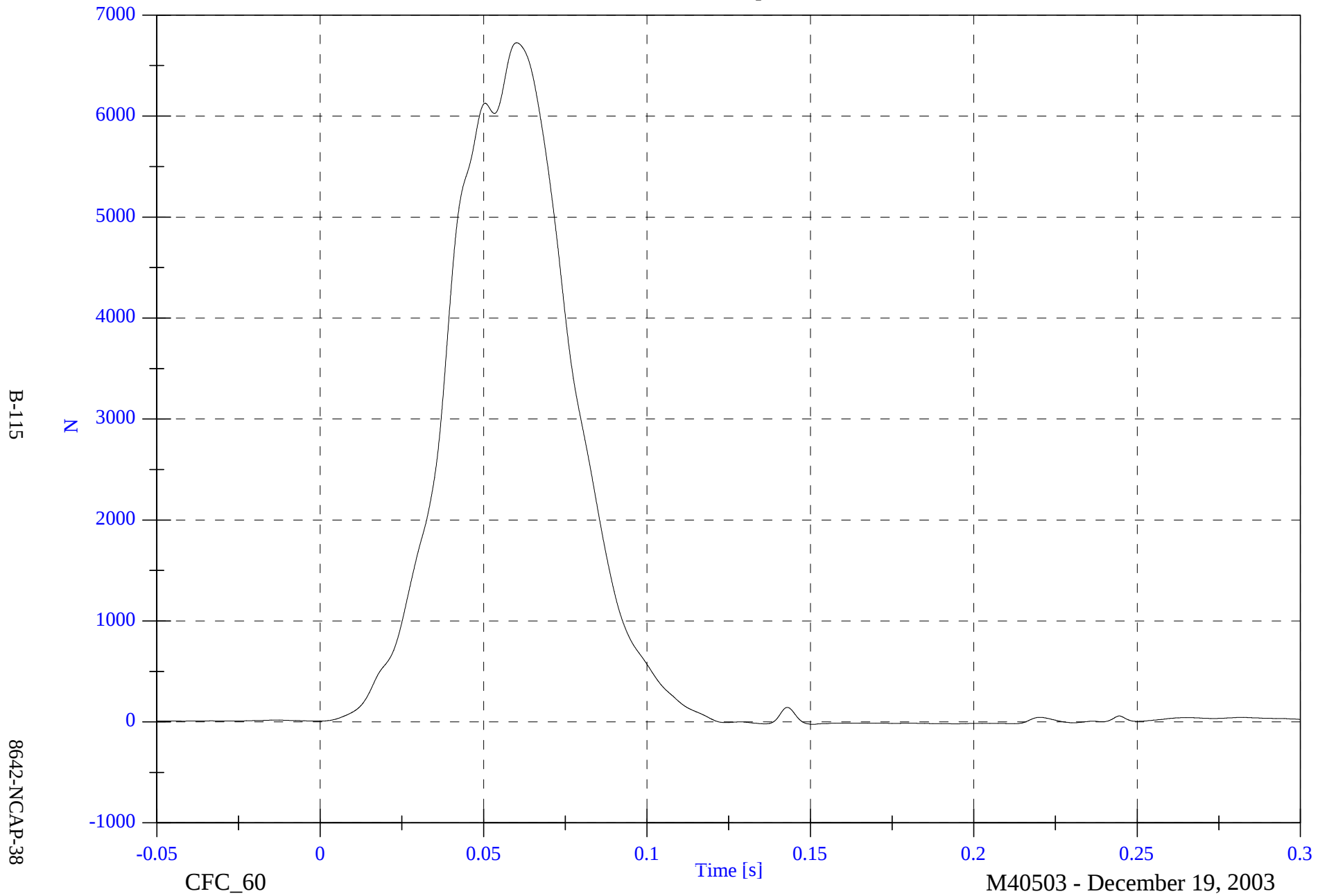


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 RFP Lap Belt

Max: 6726.9 [N] at 0.060 [s]

Min: -23.8 [N] at 0.151 [s]

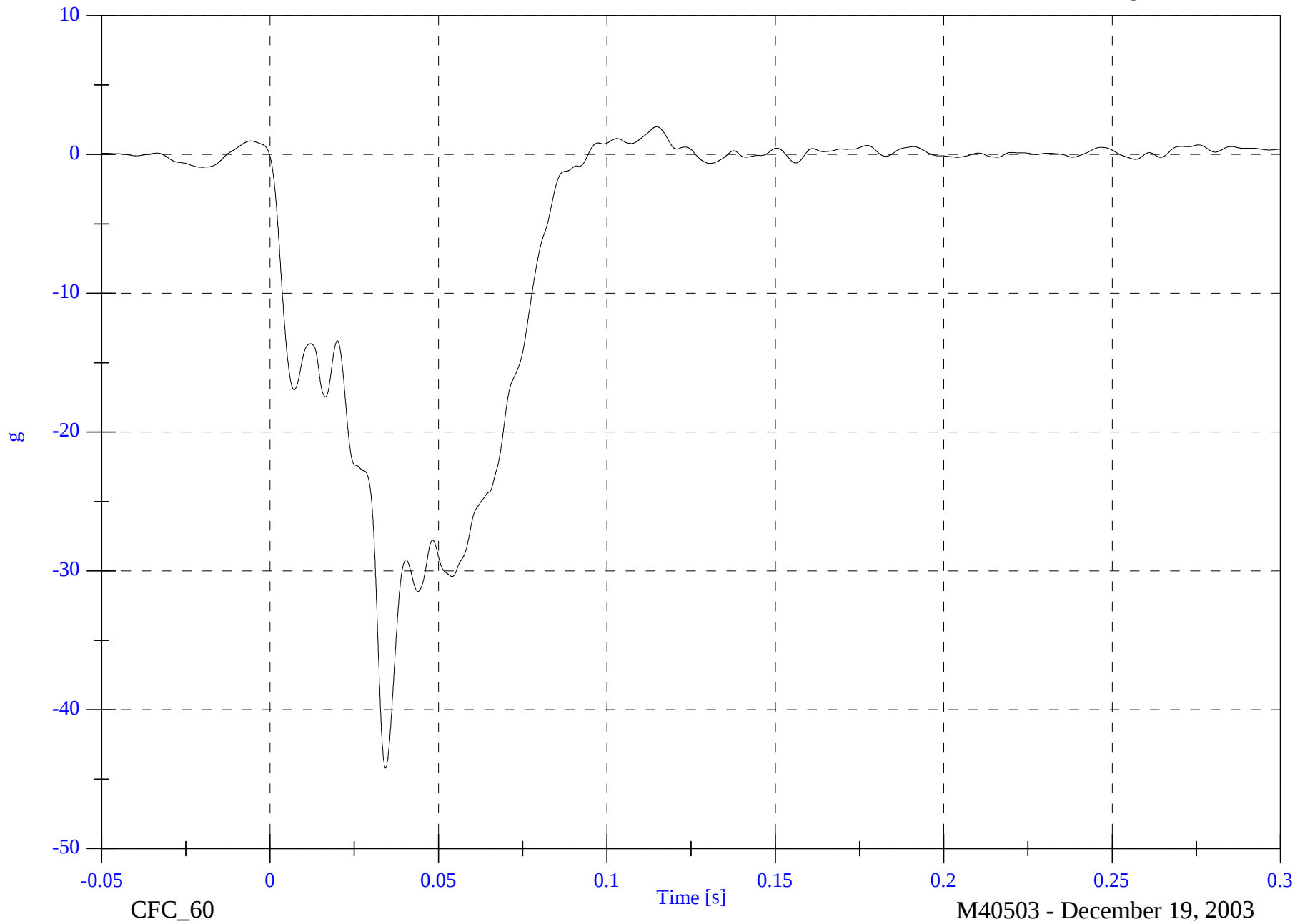


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Left Rear #1x

Max: 2.0 [g] at 0.115 [s]

Min: -44.2 [g] at 0.034 [s]



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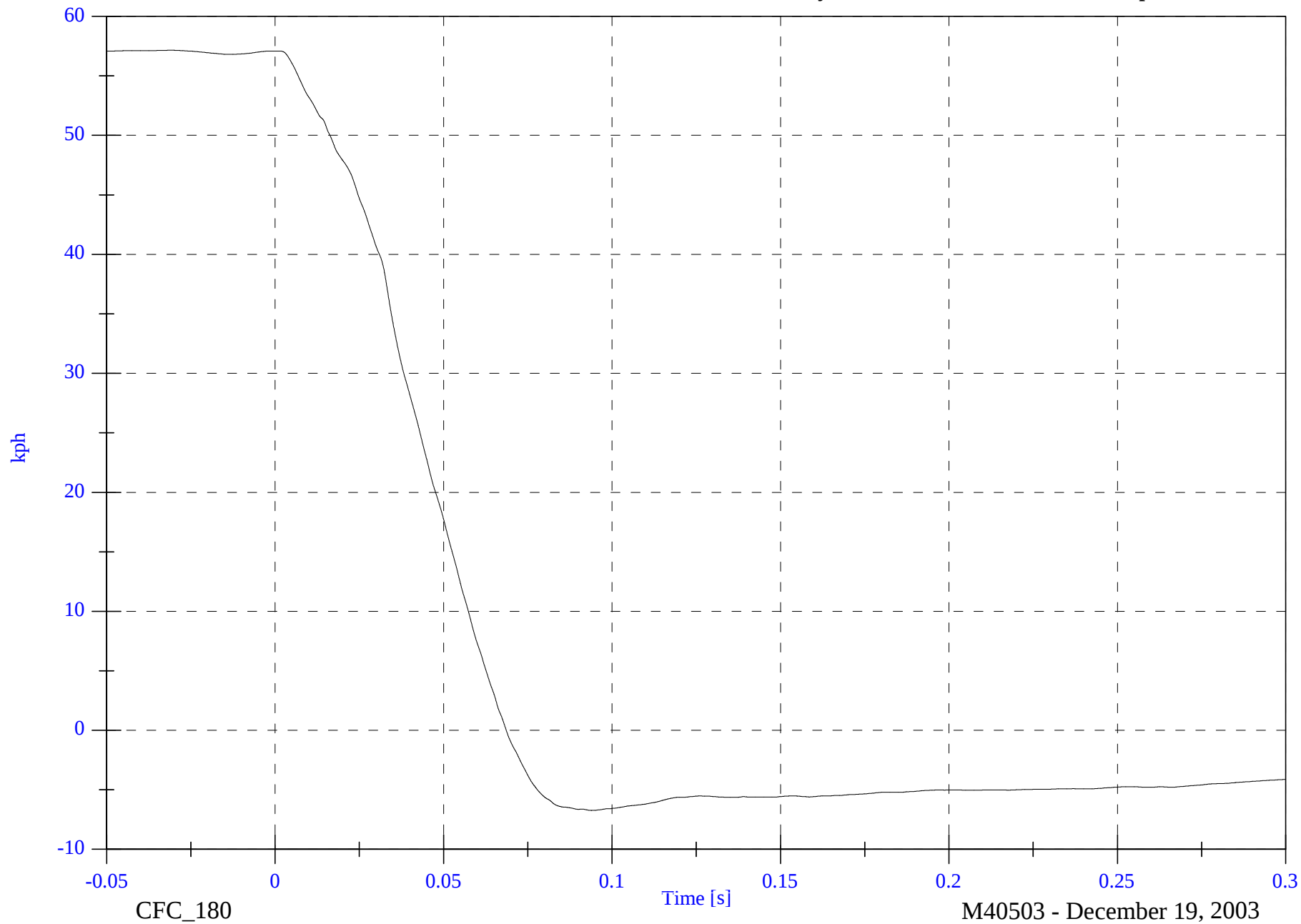
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2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 57.2 [kph] at -0.031 [s]

V1 Left Rear #1x Velocity

Min: -6.7 [kph] at 0.094 [s]



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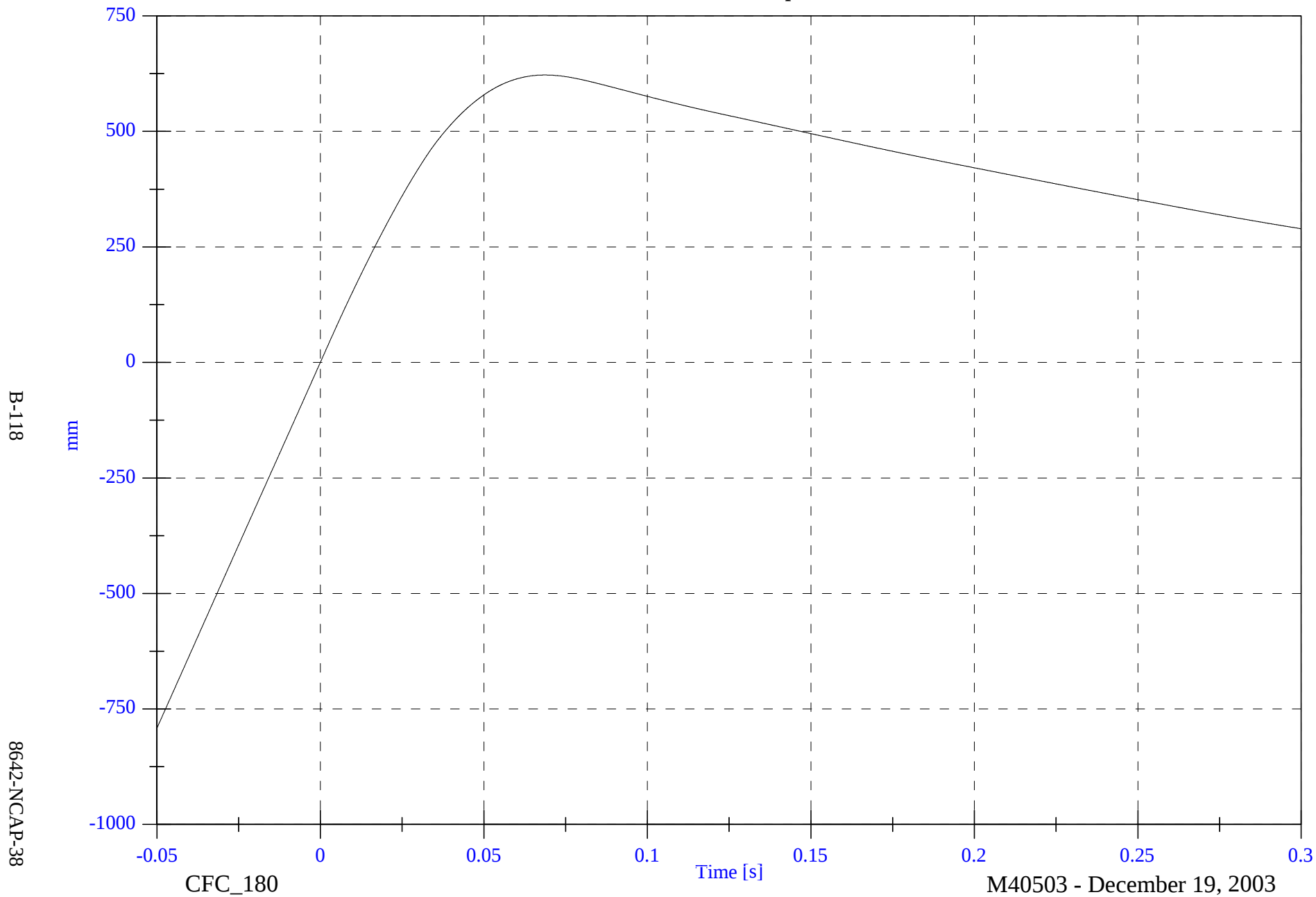
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2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Left Rear #1x Displacement

Max: 622.1 [mm] at 0.069 [s]

Min: -792.0 [mm] at -0.050 [s]

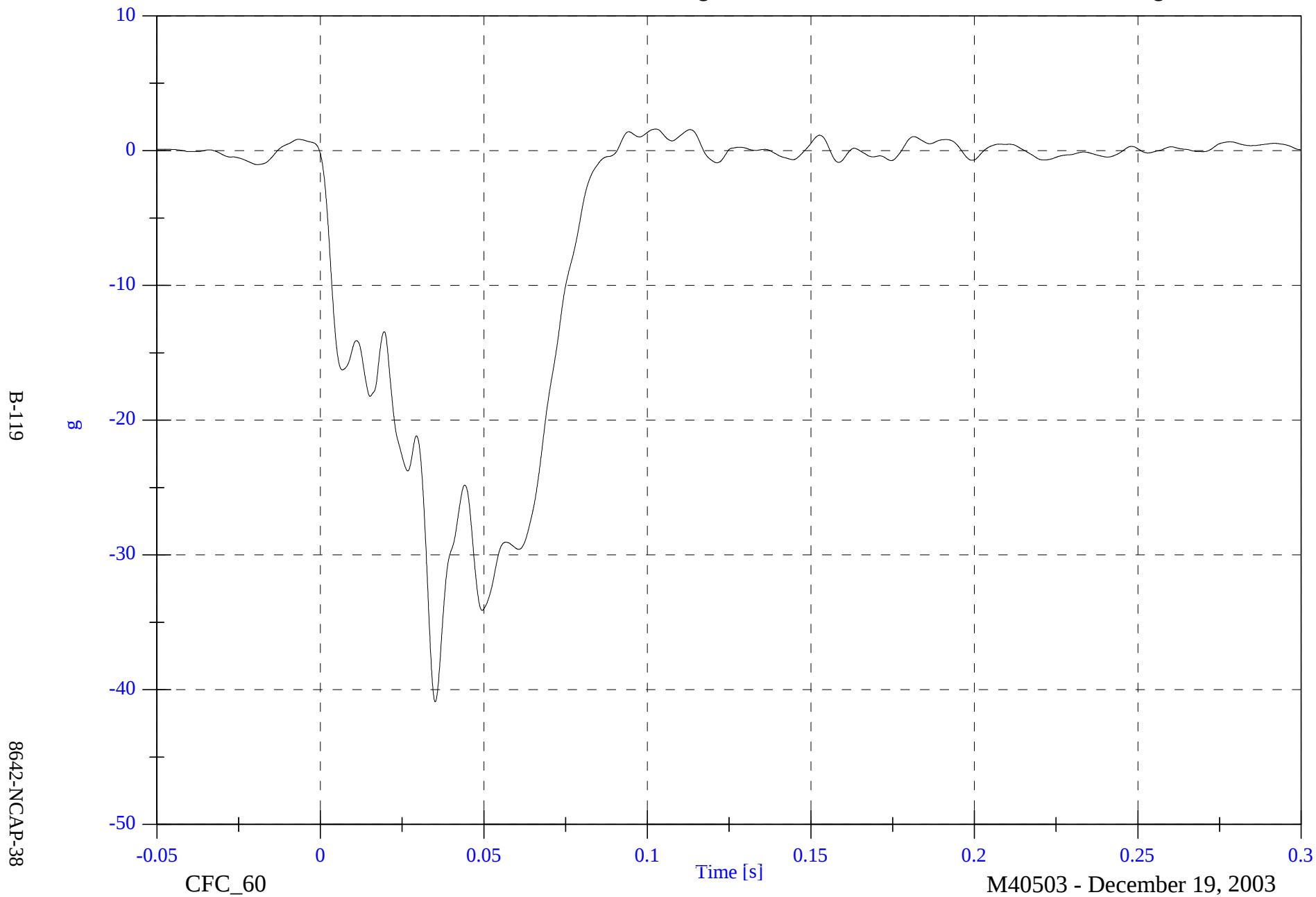


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Right Rear #2x

Max: 1.6 [g] at 0.103 [s]

Min: -40.9 [g] at 0.035 [s]

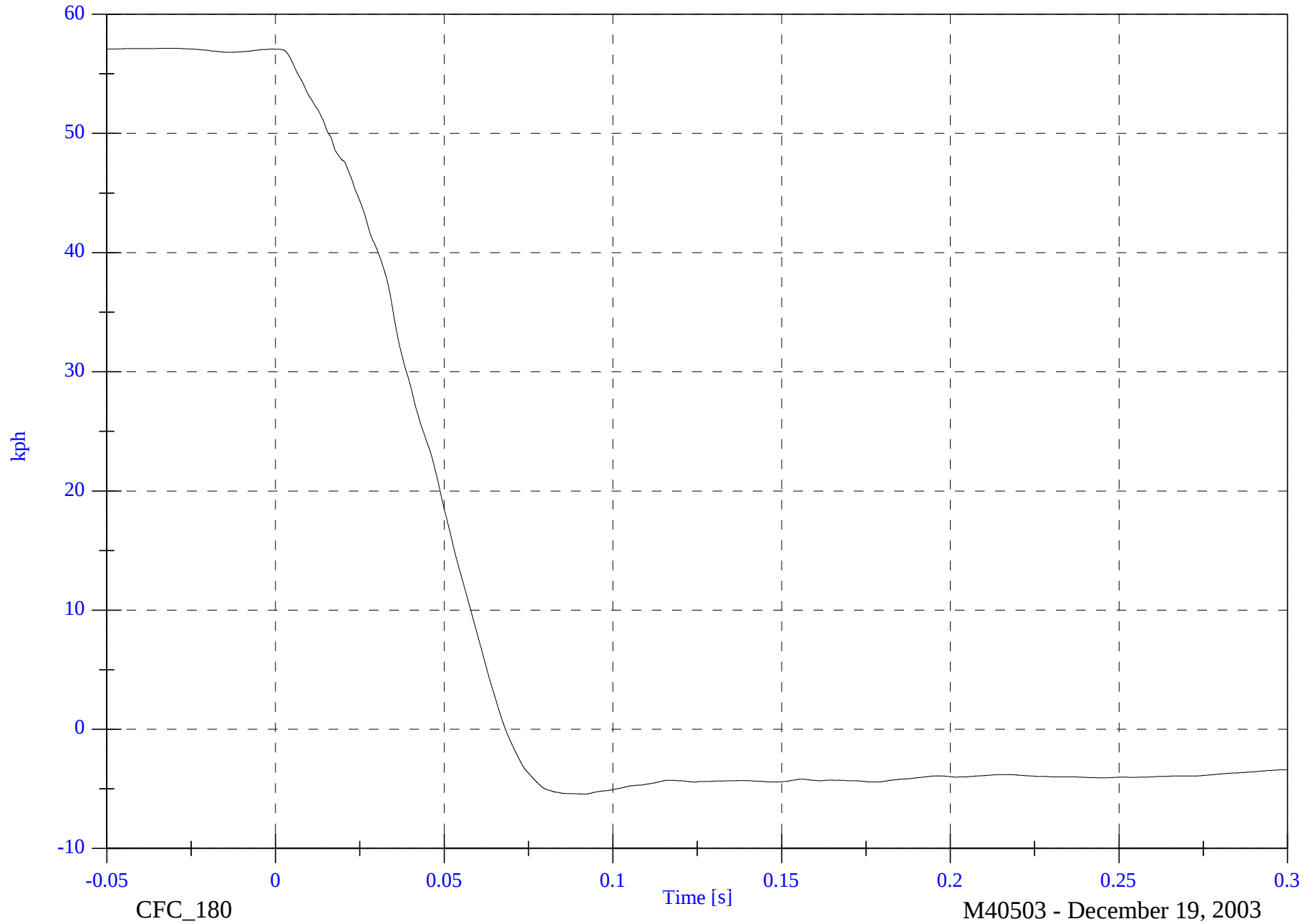


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Right Rear #2x Velocity

Max: 57.1 [kph] at -0.031 [s]

Min: -5.4 [kph] at 0.091 [s]



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2004 NCAP Test 2 - 2004 Hyundai XG350

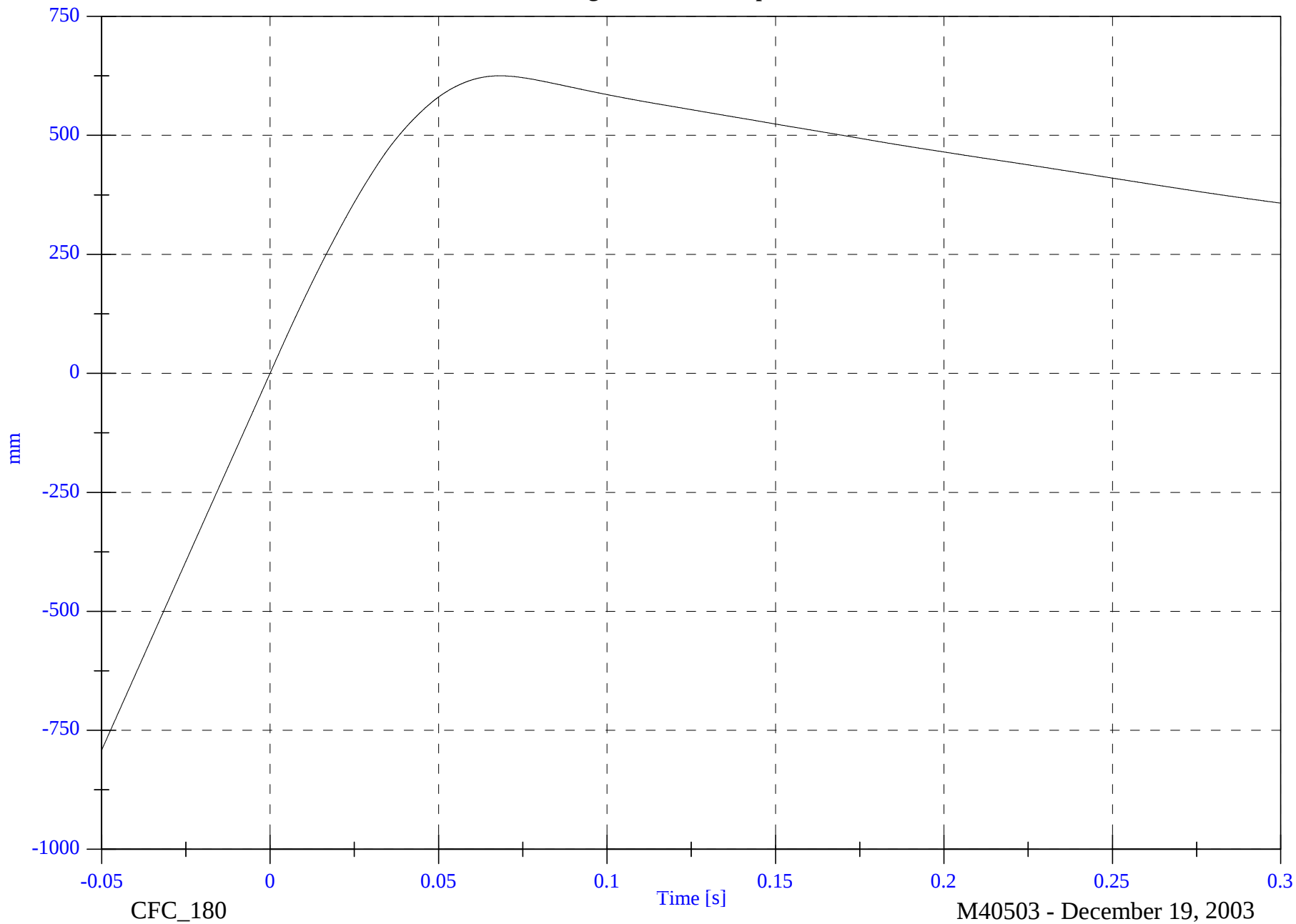
V1 Right Rear #2x Displacement

Max: 625.0 [mm] at 0.068 [s]

Min: -792.0 [mm] at -0.050 [s]

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2004 NCAP Test 2 - 2004 Hyundai XG350

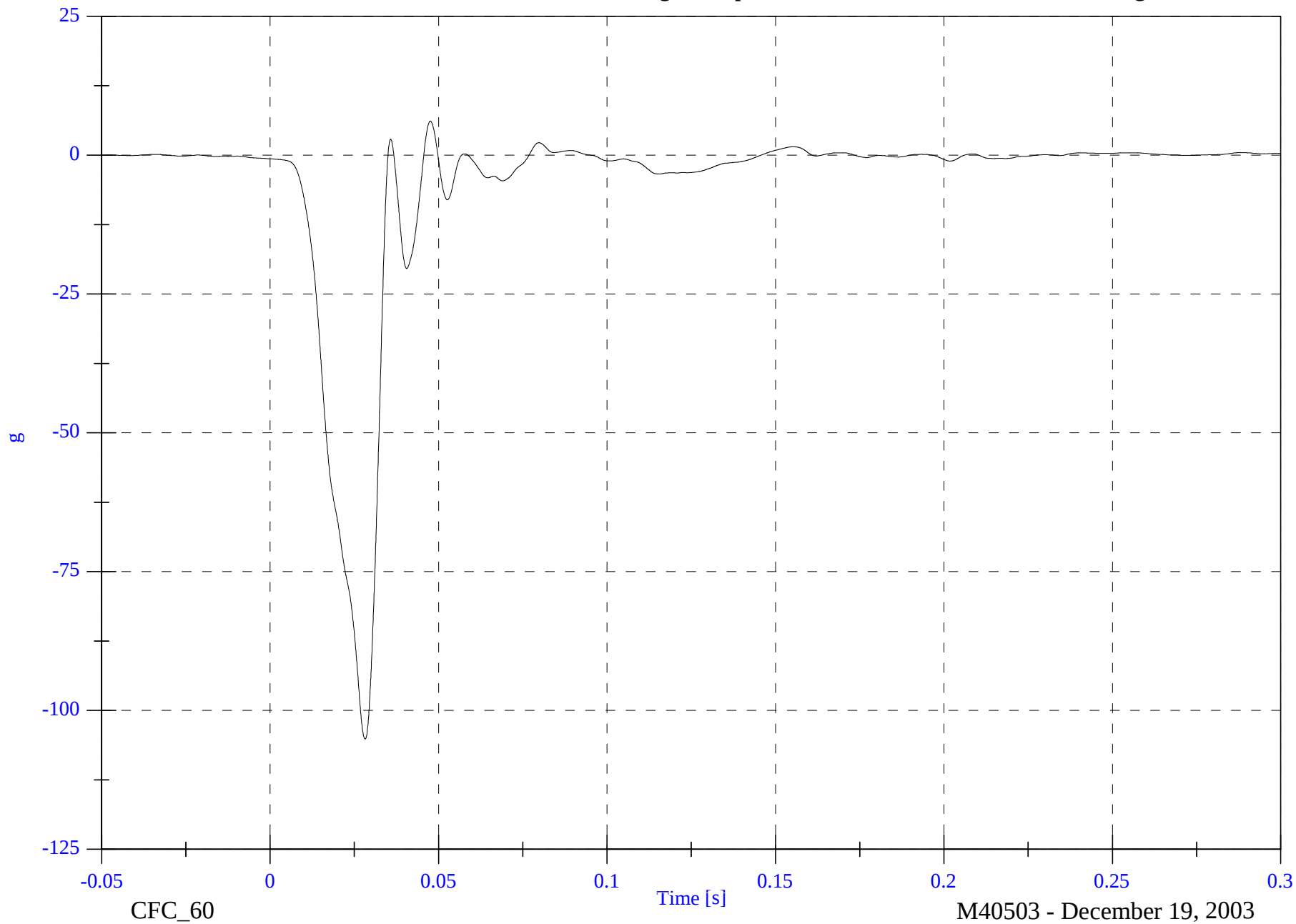
V1 Engine Top #3x

Max: 6.1 [g] at 0.048 [s]

Min: -105.2 [g] at 0.028 [s]

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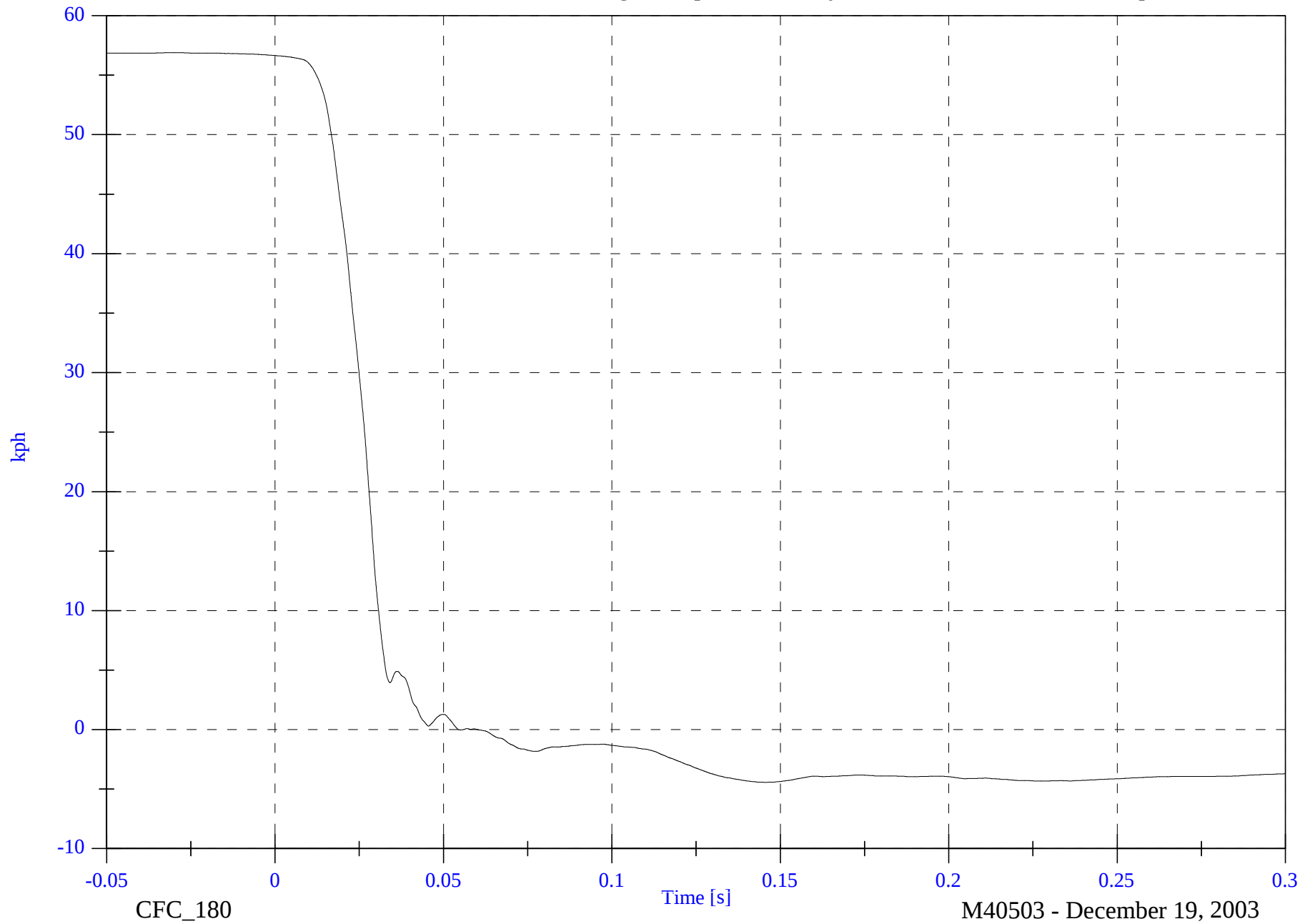


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Engine Top #3x Velocity

Max: 56.9 [kph] at -0.031 [s]

Min: -4.4 [kph] at 0.146 [s]

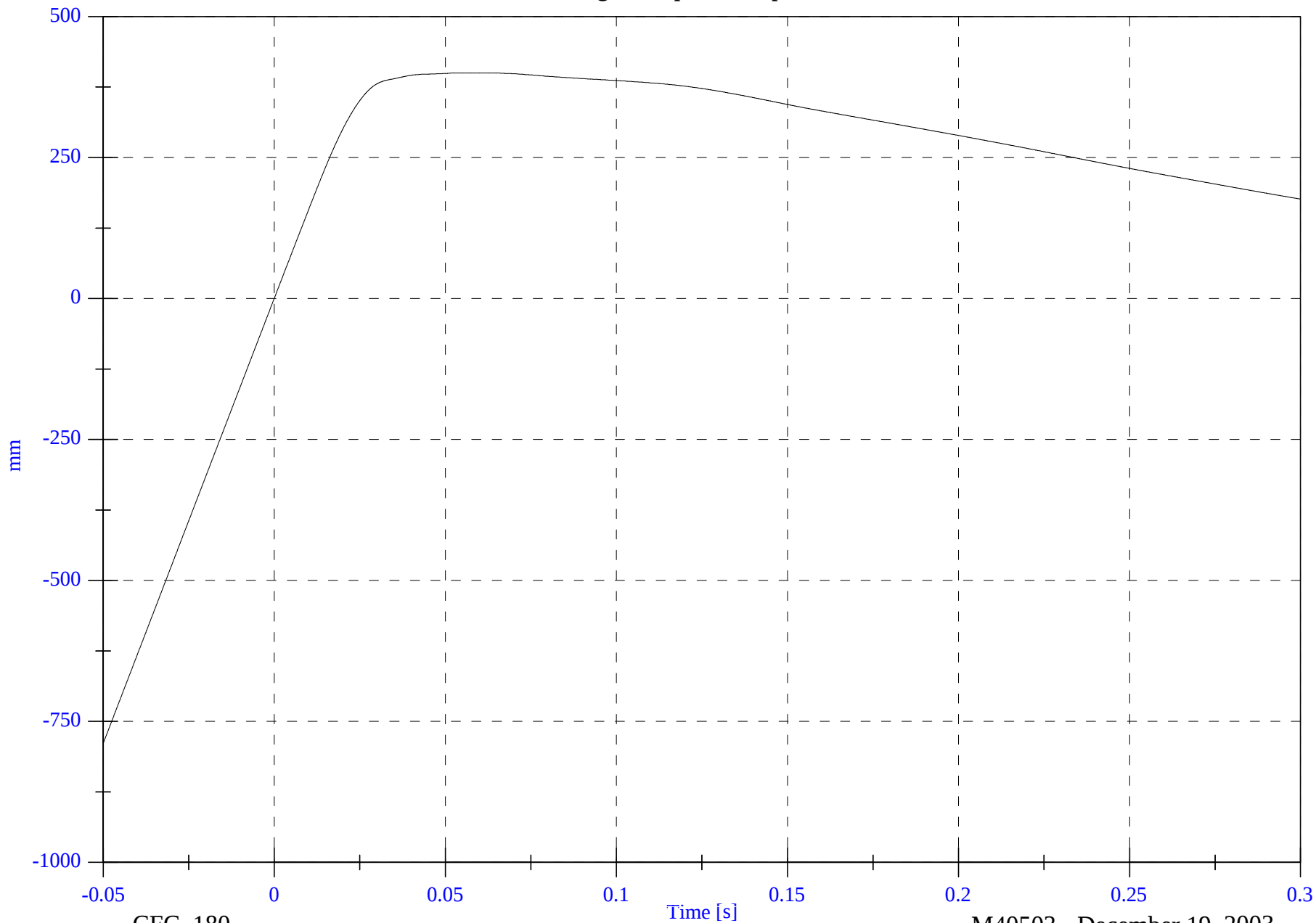


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Engine Top #3x Displacement

Max: 400.1 [mm] at 0.060 [s]

Min: -789.3 [mm] at -0.050 [s]



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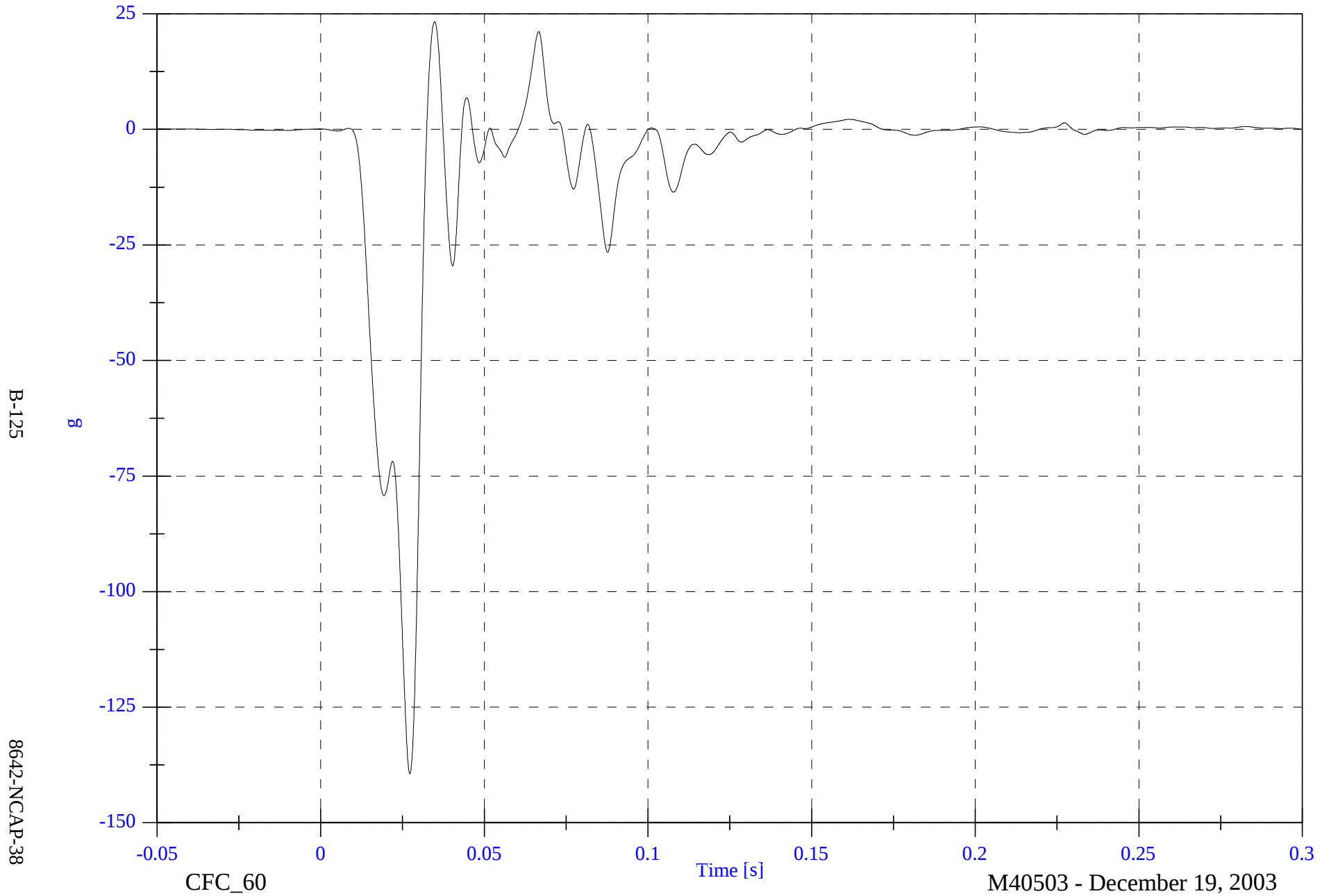
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2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Engine Bottom #4x

Max: 23.3 [g] at 0.035 [s]

Min: -139.4 [g] at 0.027 [s]

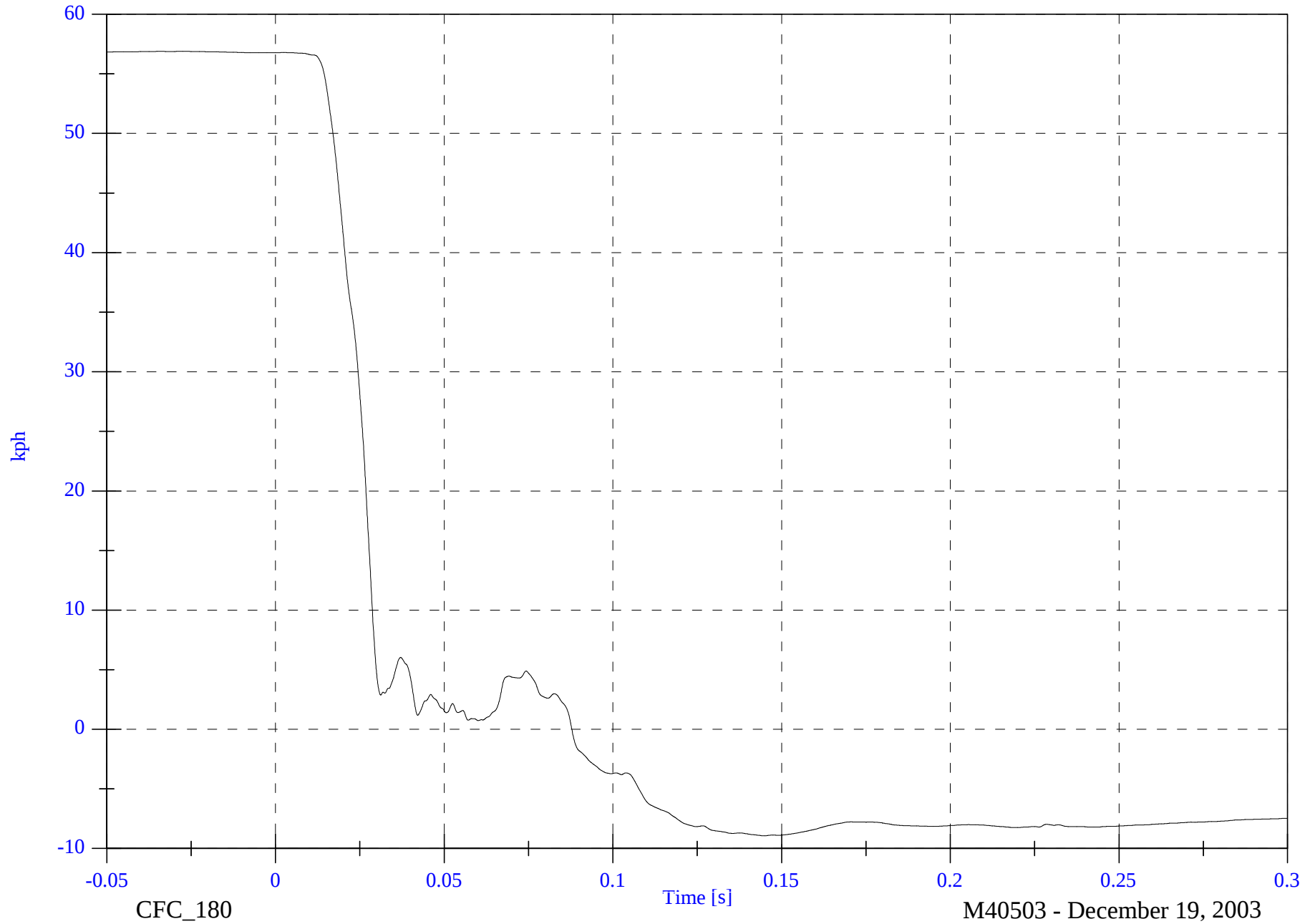


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Engine Bottom #4x Velocity

Max: 56.9 [kph] at -0.026 [s]

Min: -8.9 [kph] at 0.145 [s]



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2004 NCAP Test 2 - 2004 Hyundai XG350

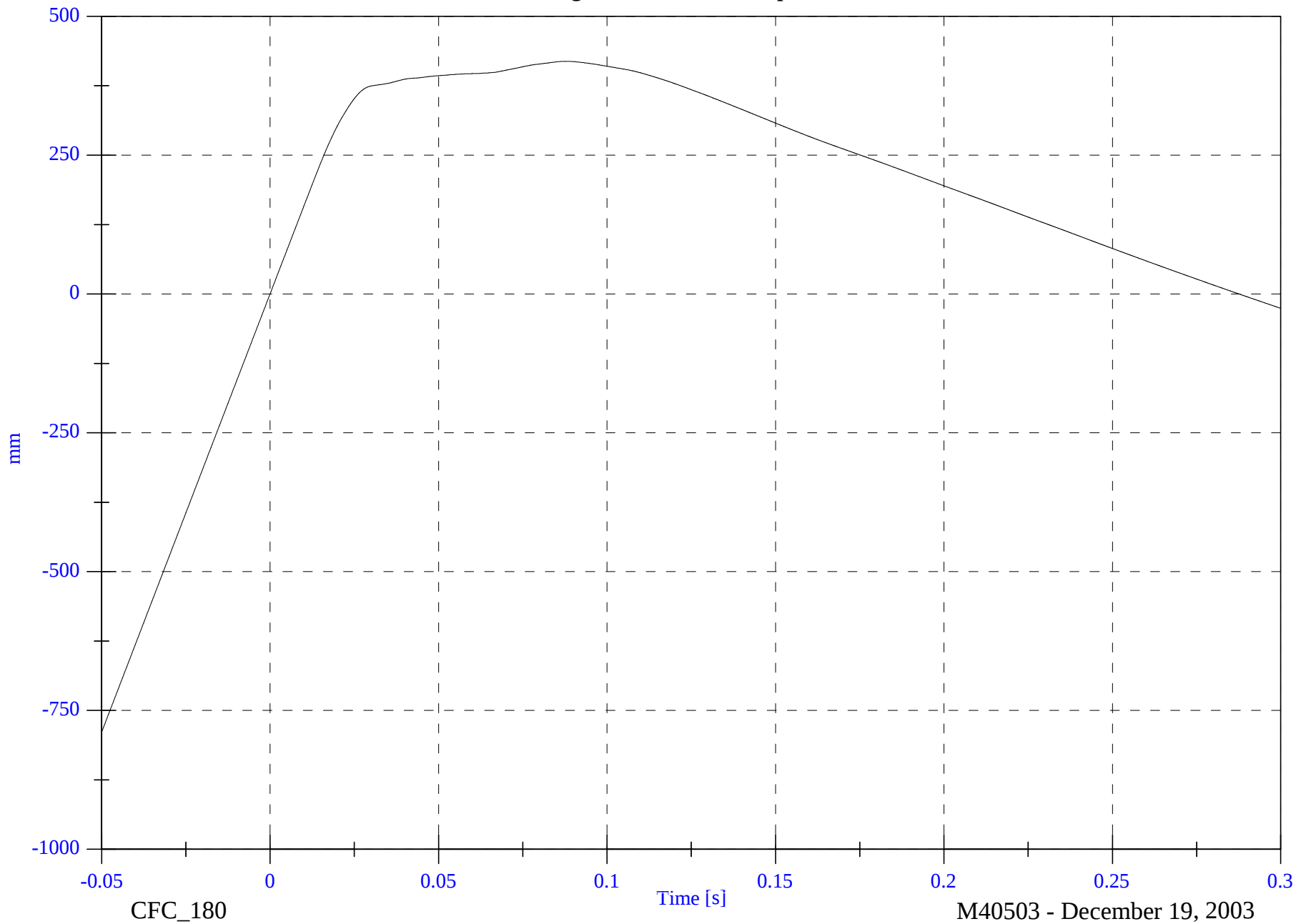
V1 Engine Bottom #4x Displacement

Max: 419.1 [mm] at 0.088 [s]

Min: -789.4 [mm] at -0.050 [s]

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2004 NCAP Test 2 - 2004 Hyundai XG350

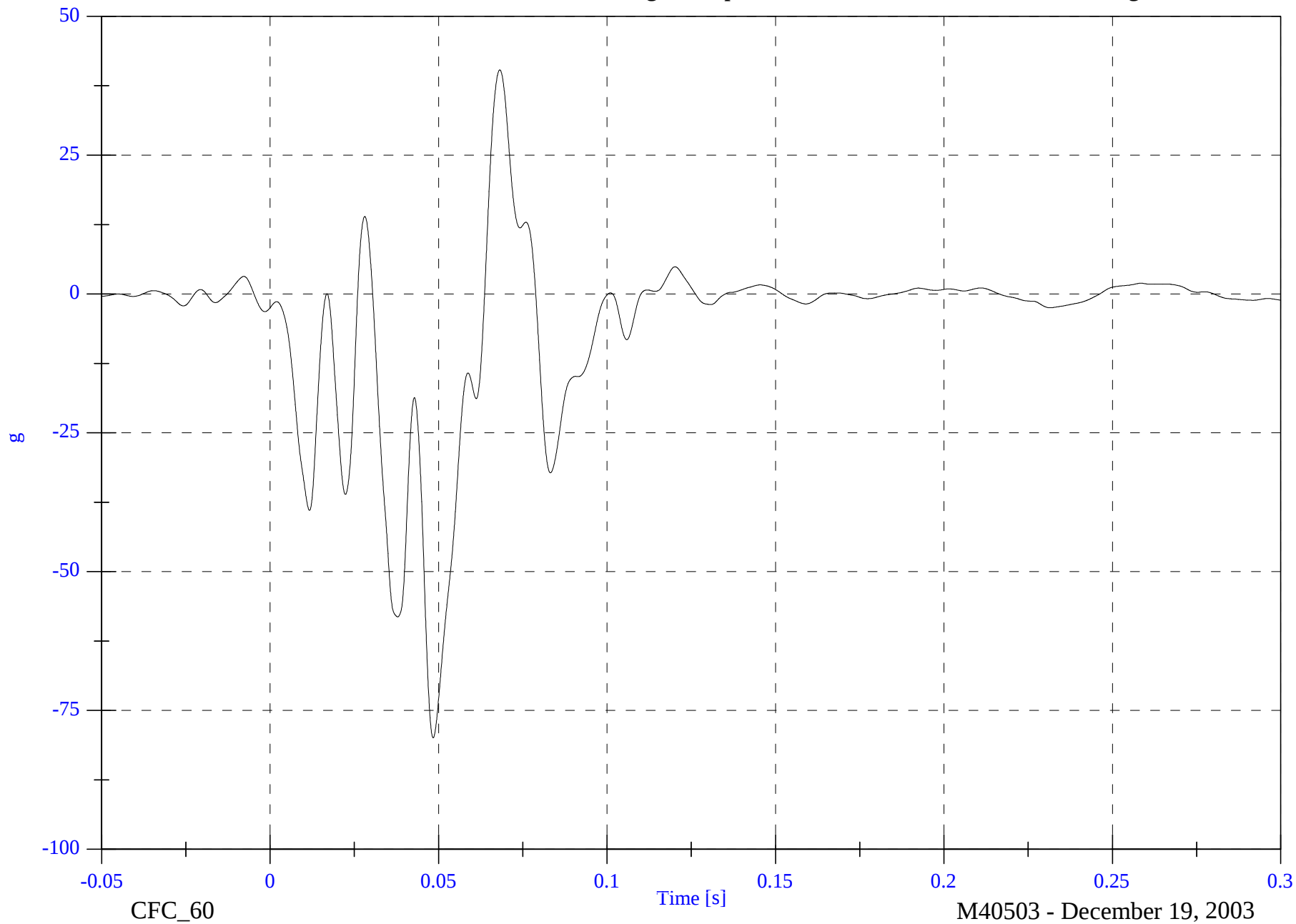
V1 Right Caliper #5x

Max: 40.4 [g] at 0.068 [s]

Min: -79.9 [g] at 0.048 [s]

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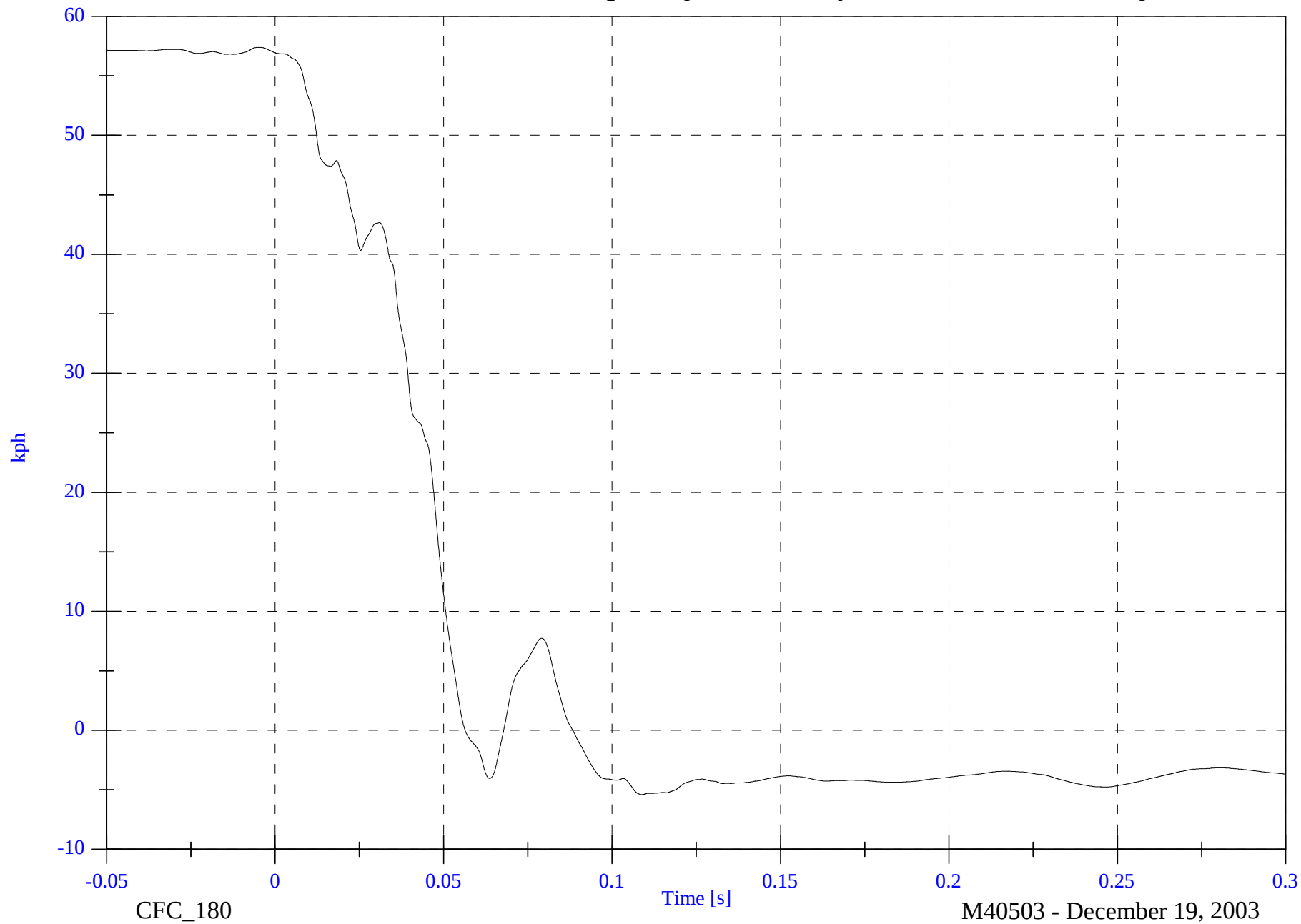


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Right Caliper #5x Velocity

Max: 57.4 [kph] at -0.005 [s]

Min: -5.4 [kph] at 0.109 [s]



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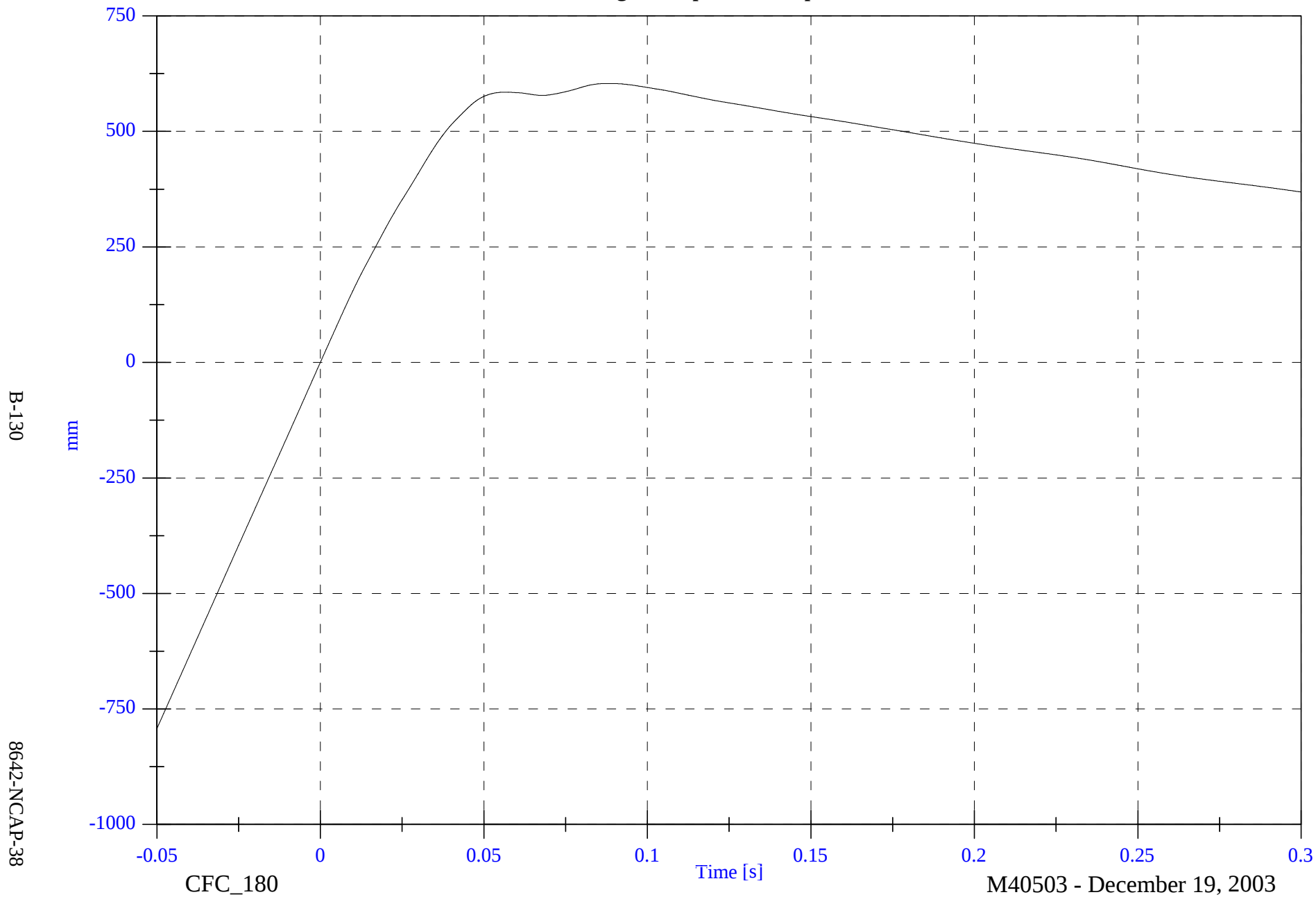
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2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Right Caliper #5x Displacement

Max: 603.8 [mm] at 0.088 [s]

Min: -792.8 [mm] at -0.050 [s]

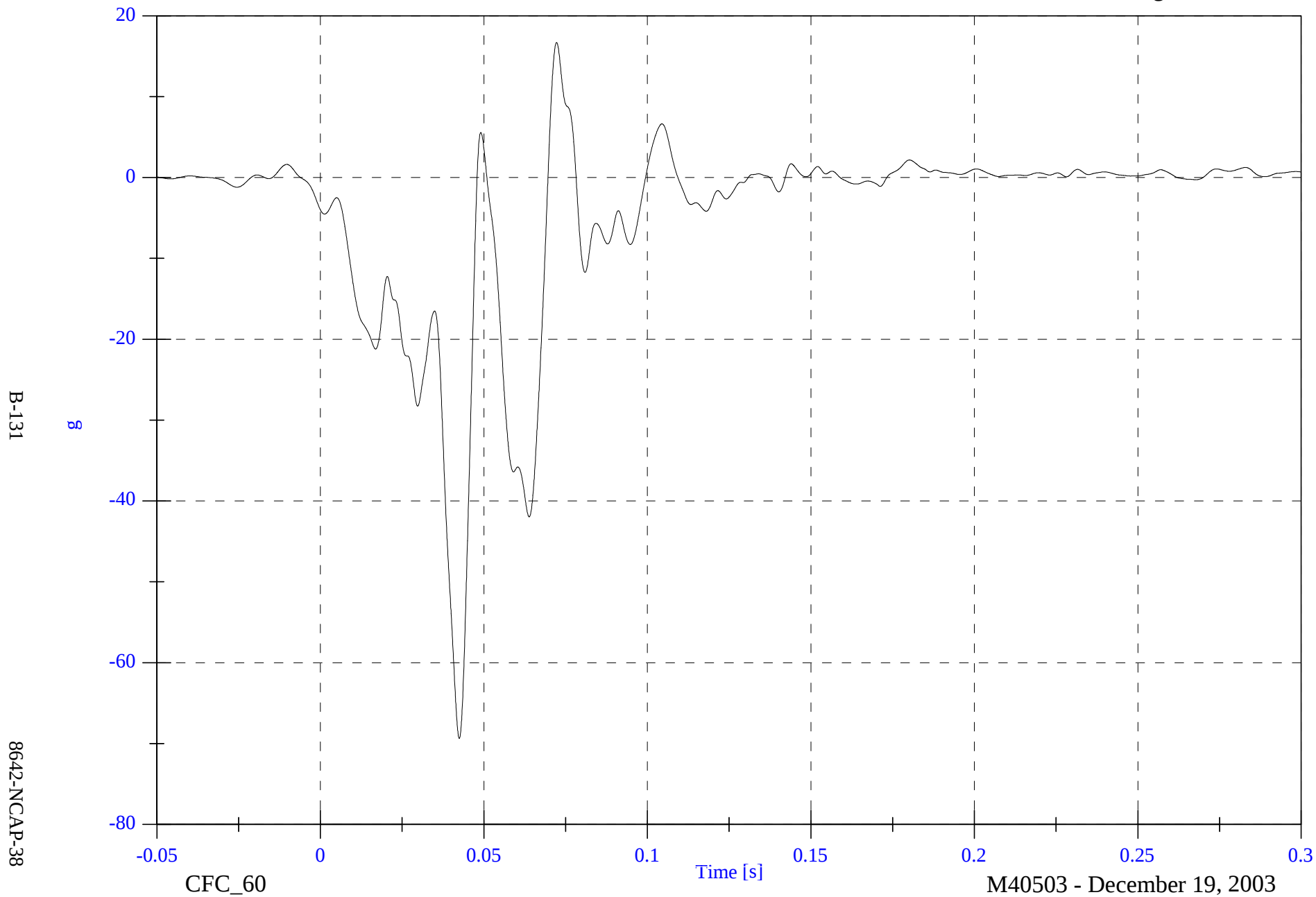


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Instrument Panel #6x

Max: 16.7 [g] at 0.072 [s]

Min: -69.4 [g] at 0.043 [s]

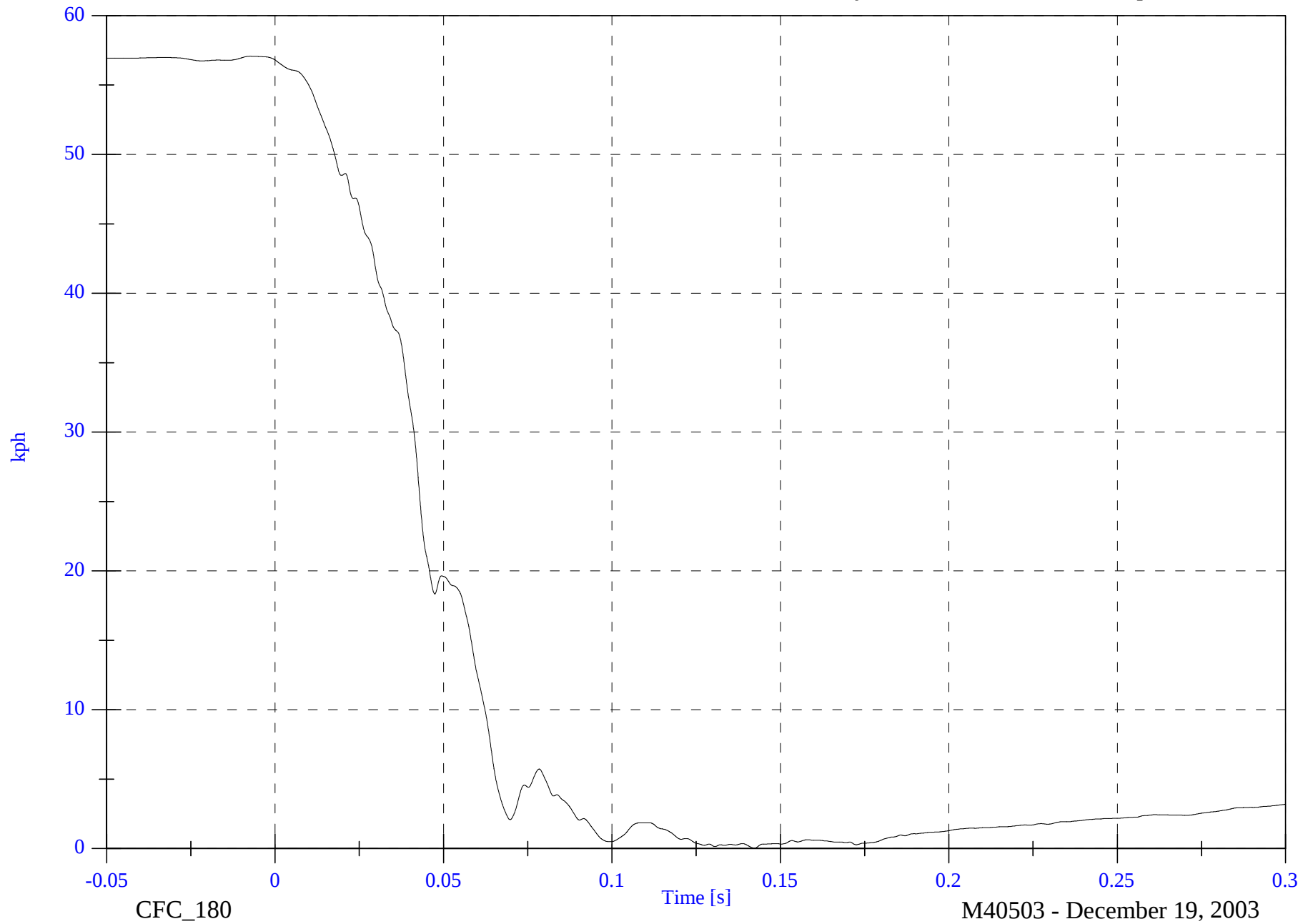


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Instrument Panel #6x Velocity

Max: 57.1 [kph] at -0.007 [s]

Min: 0.0 [kph] at 0.142 [s]



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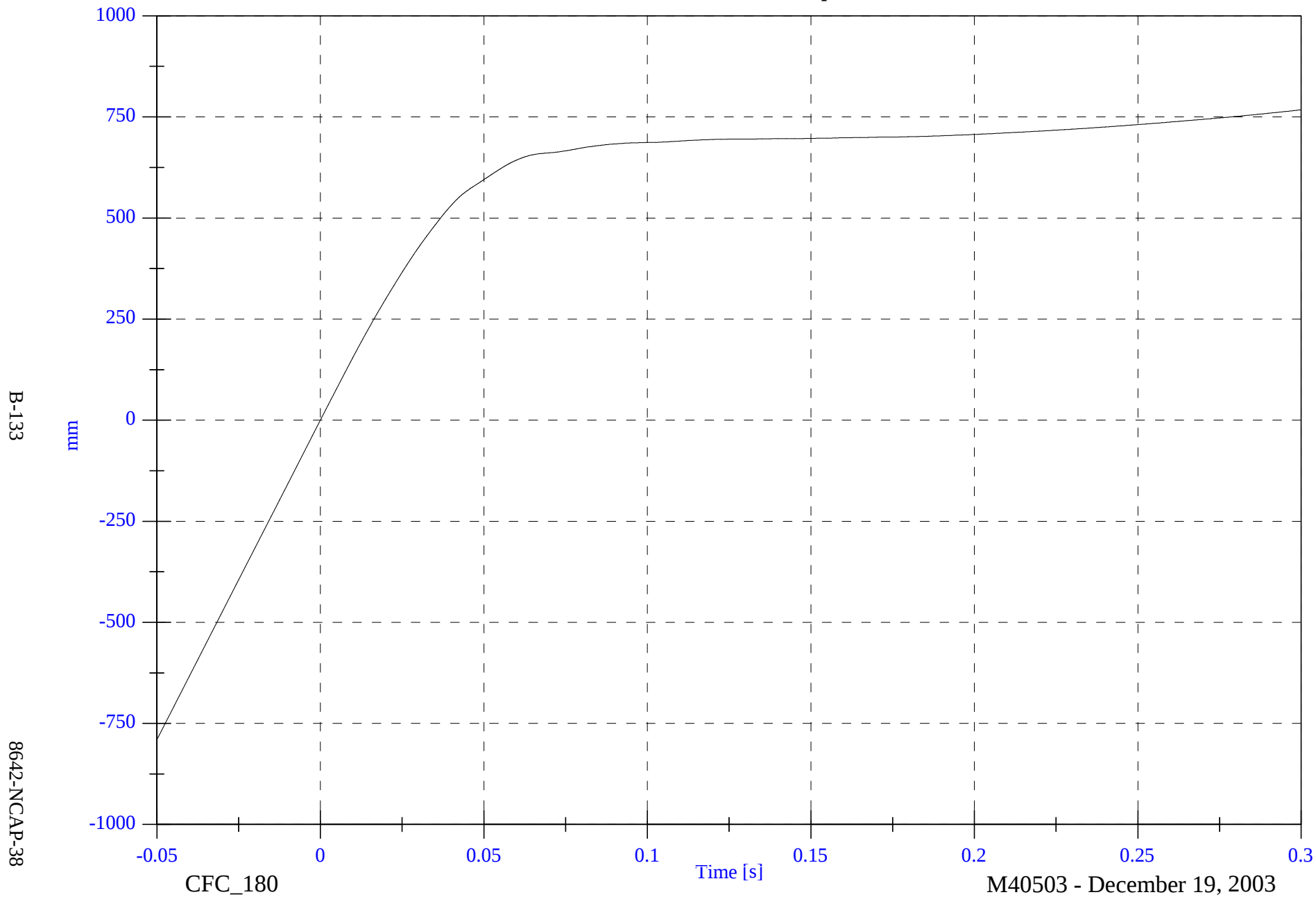
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2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Instrument Panel #6x Displacement

Max: 767.6 [mm] at 0.300 [s]

Min: -790.5 [mm] at -0.050 [s]

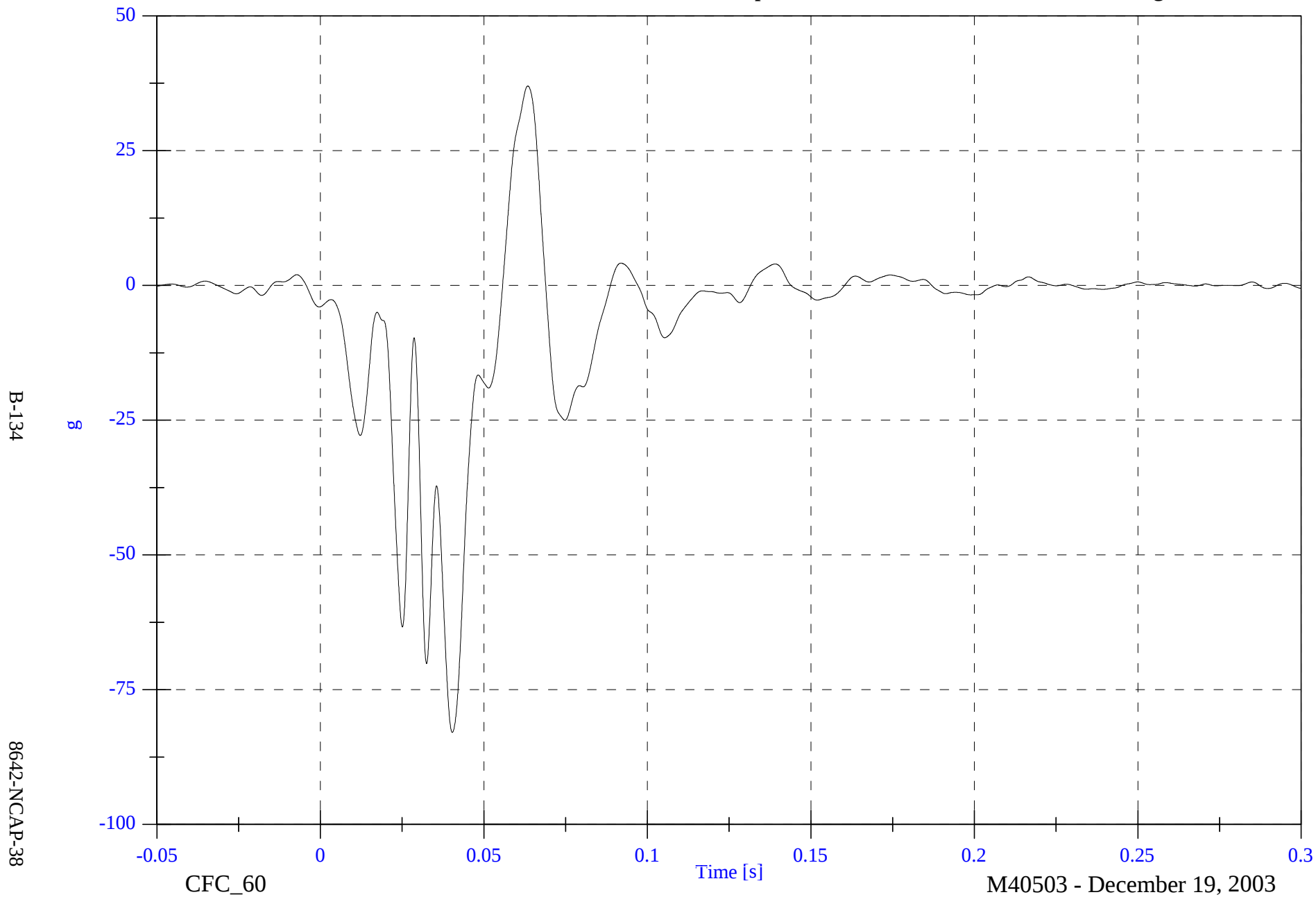


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Left Caliper #7x

Max: 37.0 [g] at 0.063 [s]

Min: -82.9 [g] at 0.040 [s]

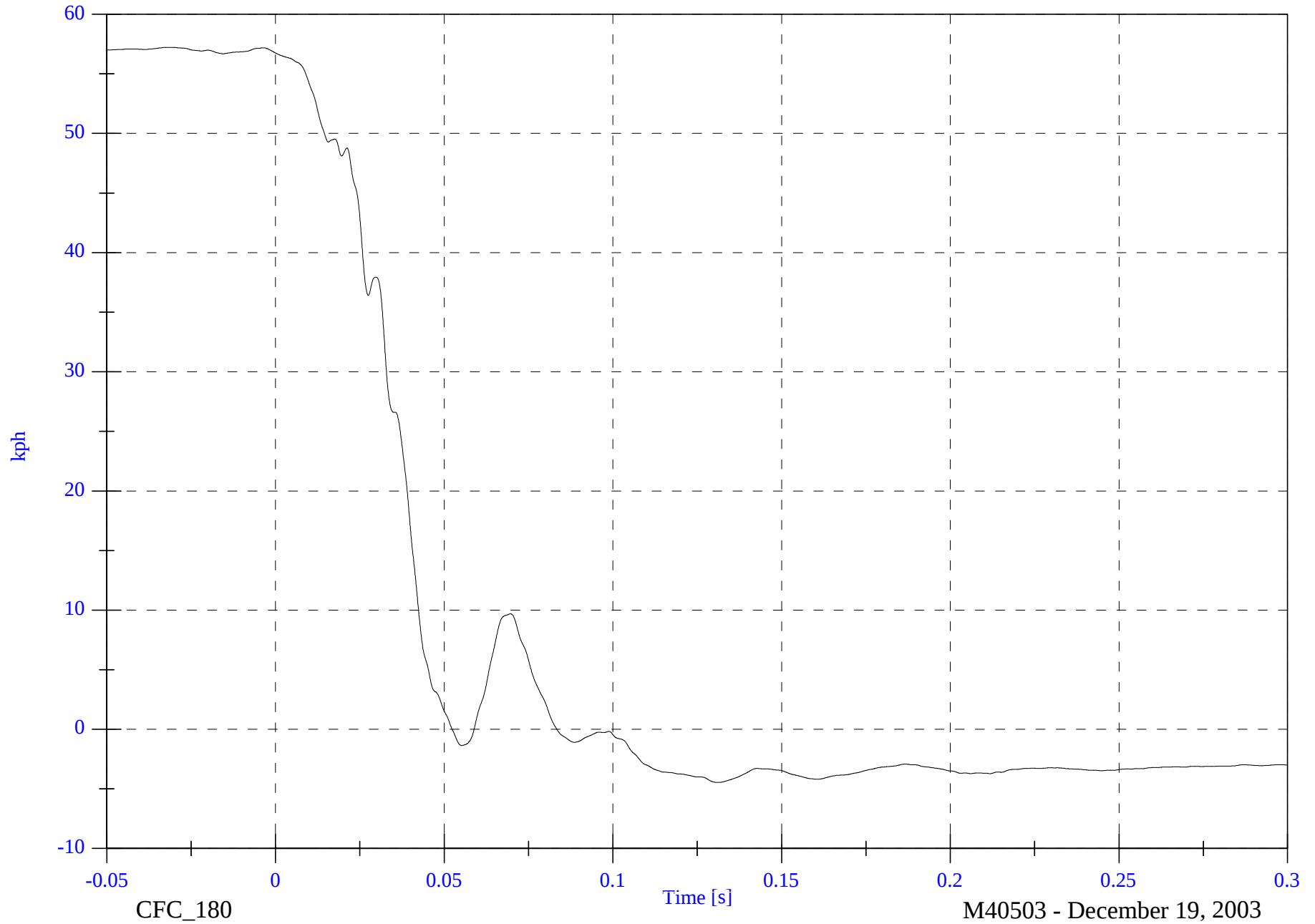


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Left Caliper #7x Velocity

Max: 57.2 [kph] at -0.031 [s]

Min: -4.5 [kph] at 0.131 [s]



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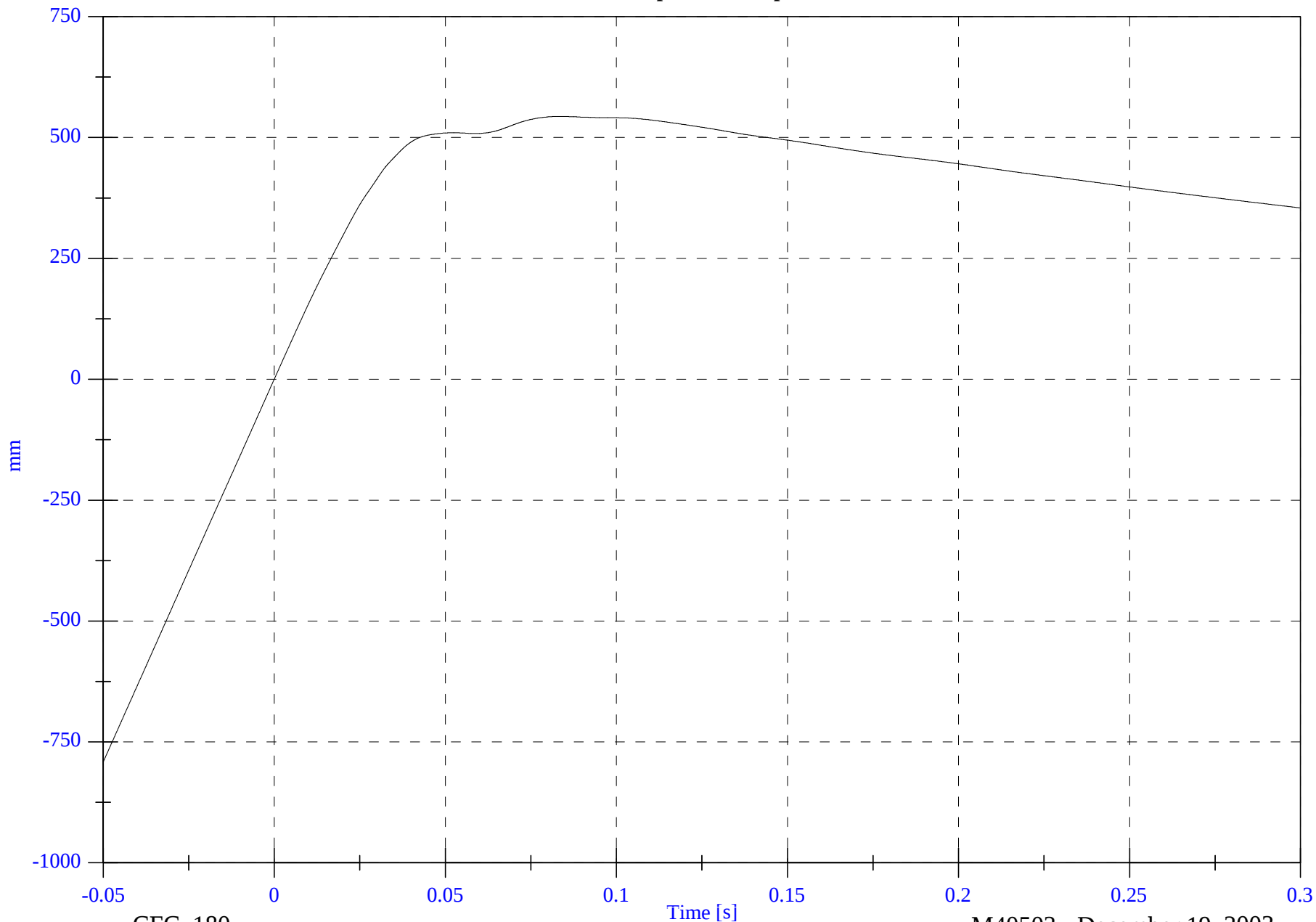
V1 Left Caliper #7x Displacement

Max: 543.5 [mm] at 0.083 [s]

Min: -791.8 [mm] at -0.050 [s]

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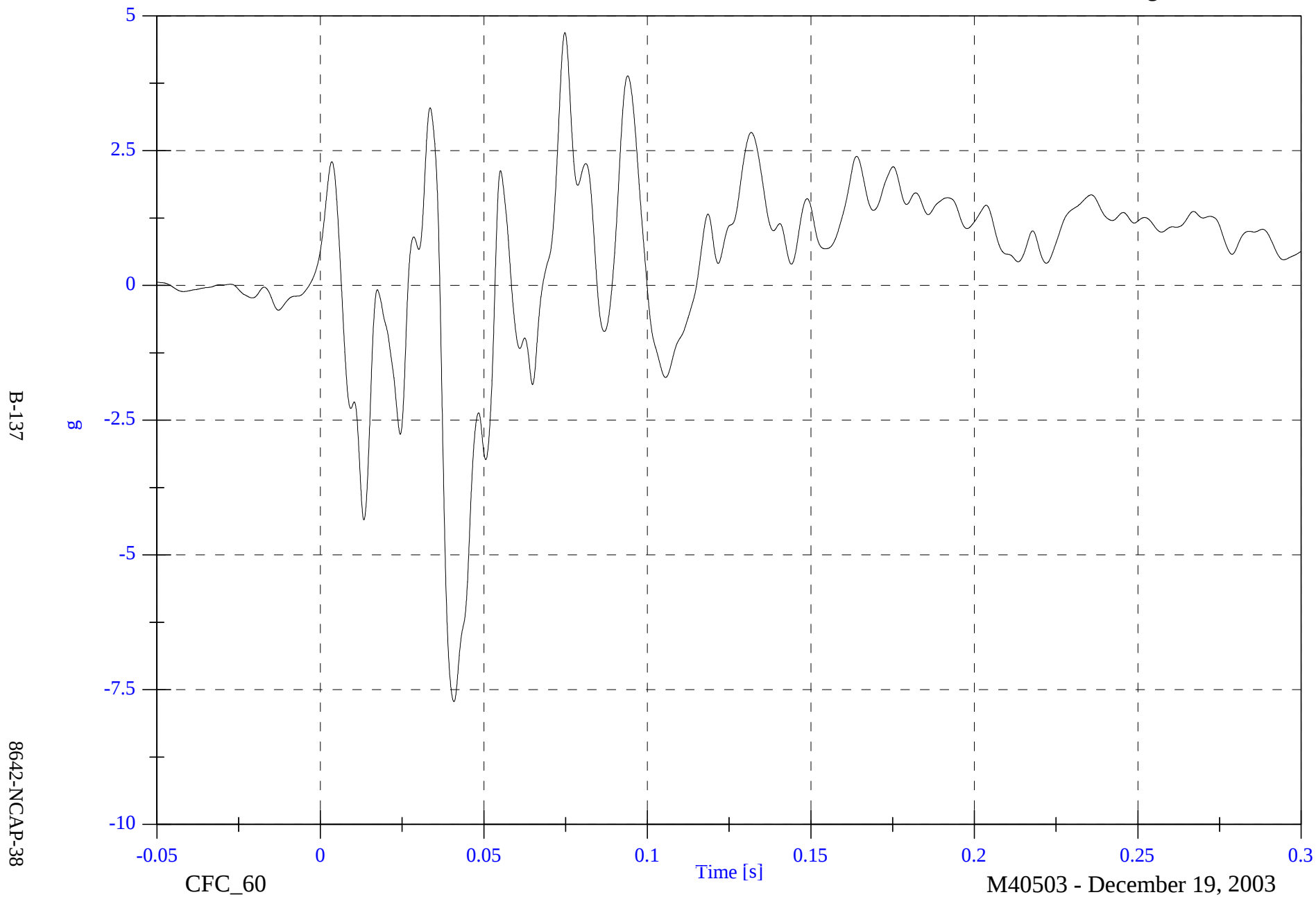
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2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Left Rear #8z

Max: 4.7 [g] at 0.075 [s]

Min: -7.7 [g] at 0.041 [s]



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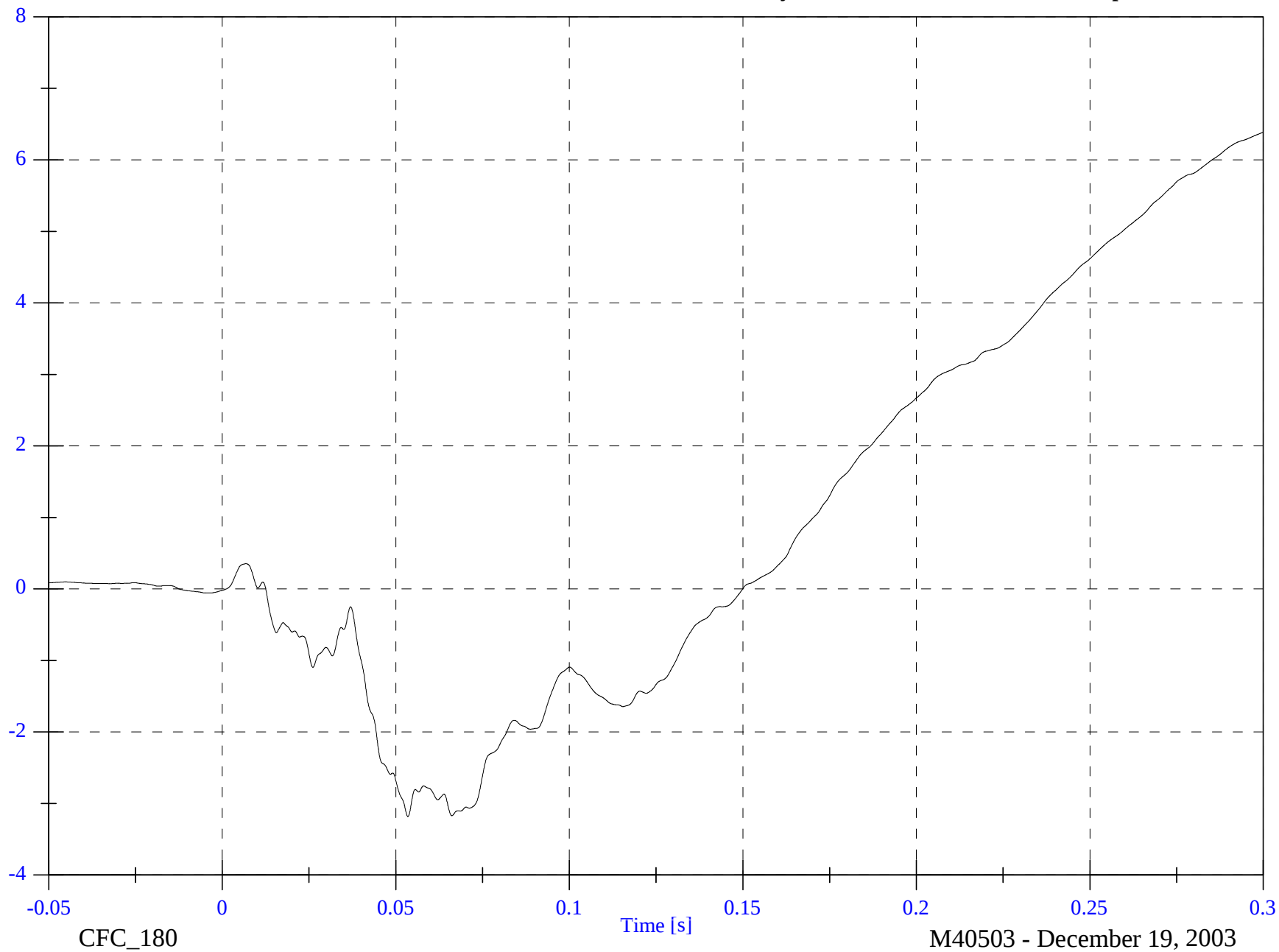
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Left Rear #8z Velocity

Max: 6.4 [kph] at 0.300 [s]

Min: -3.2 [kph] at 0.053 [s]



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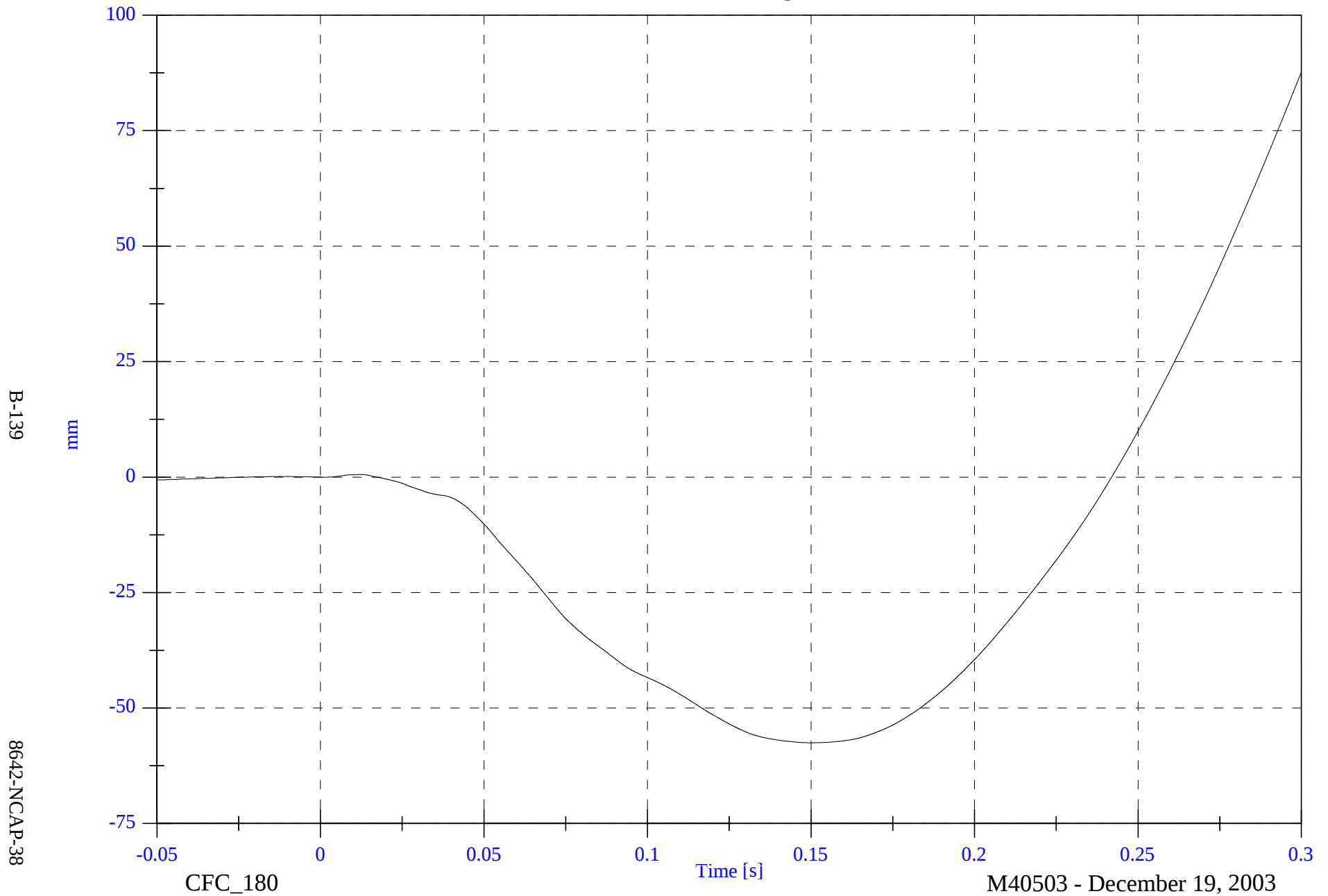
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Left Rear #8z Displacement

Max: 87.7 [mm] at 0.300 [s]

Min: -57.5 [mm] at 0.150 [s]

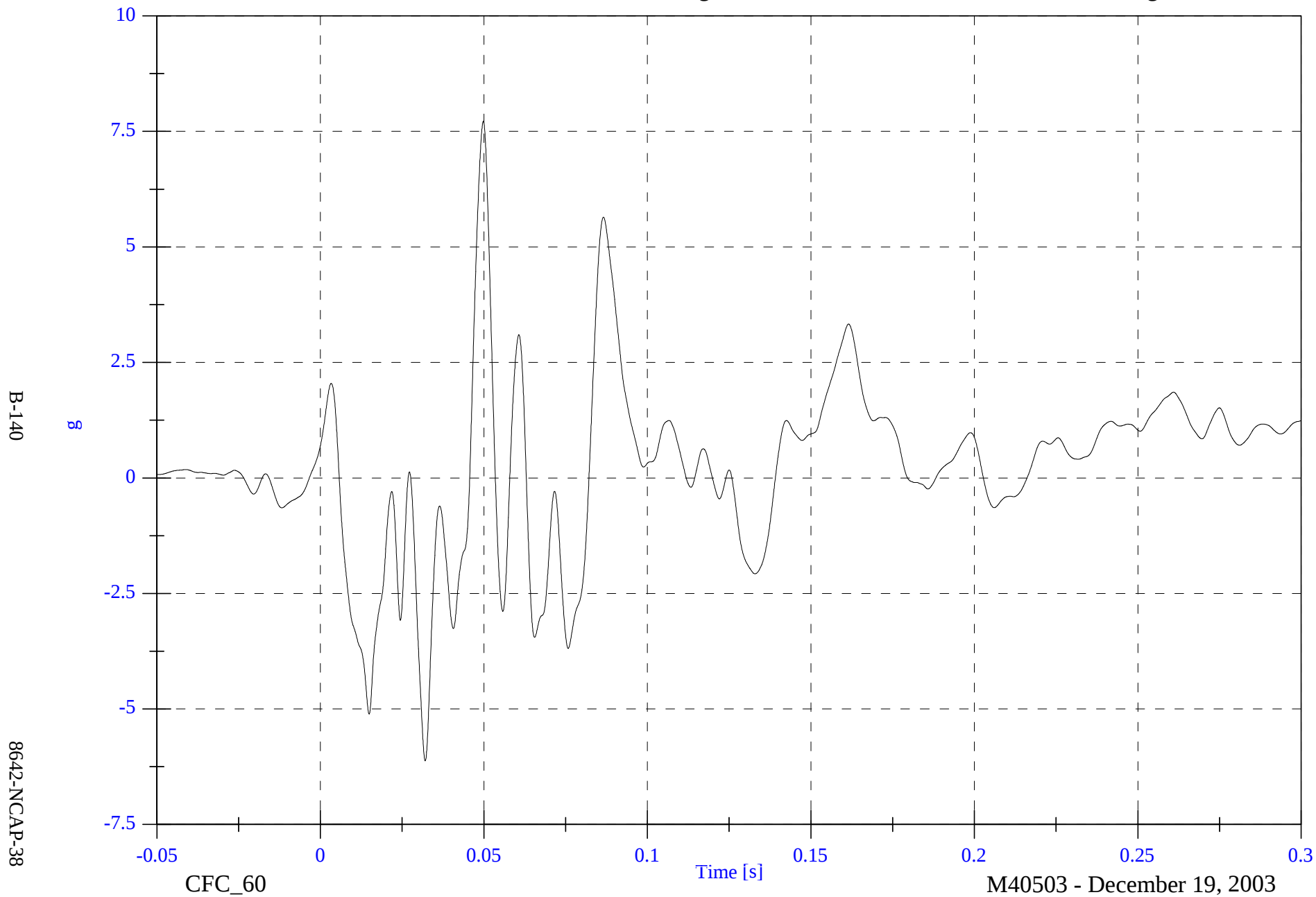


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Right Rear #9z

Max: 7.7 [g] at 0.050 [s]

Min: -6.1 [g] at 0.032 [s]

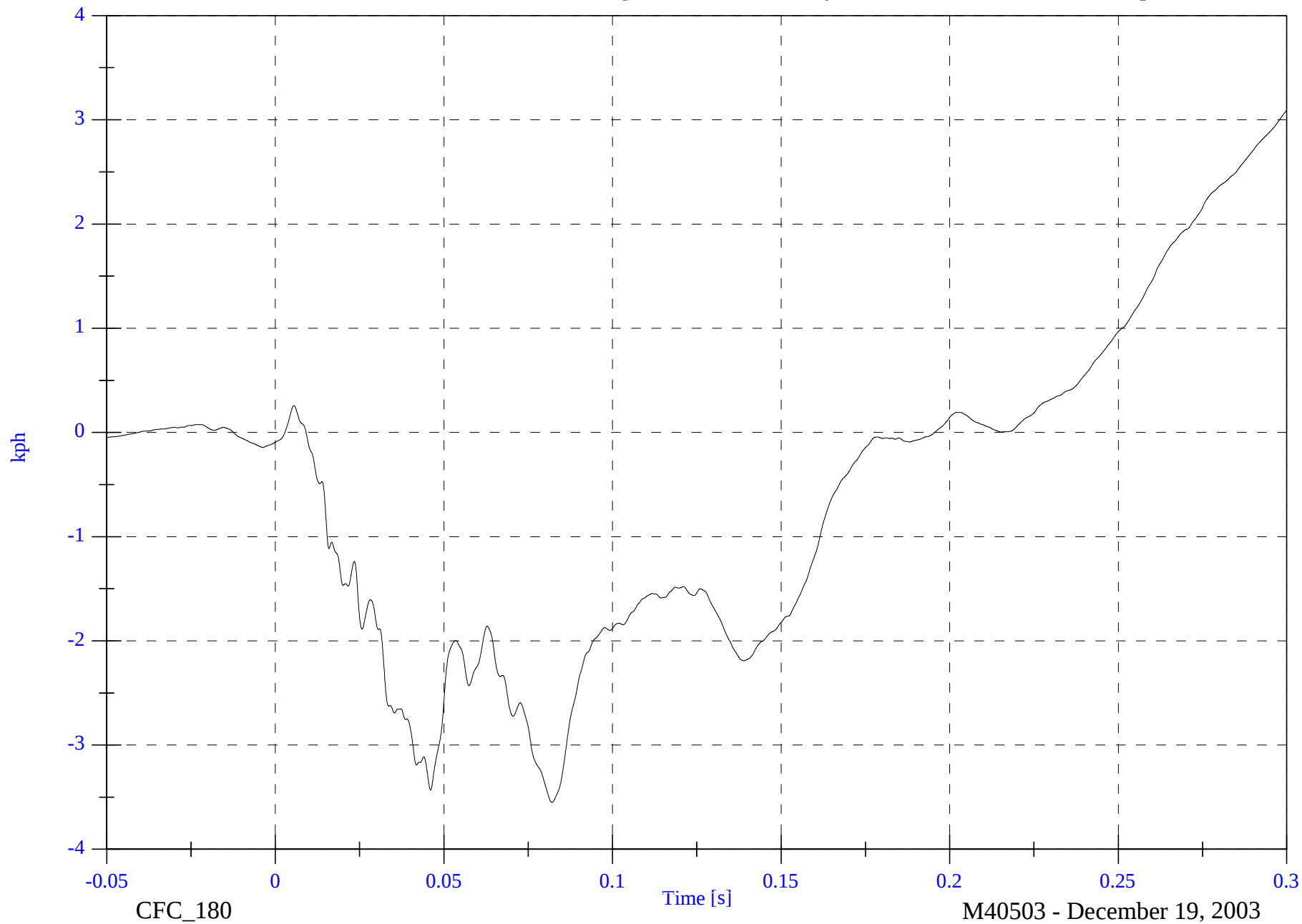


2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Right Rear #9z Velocity

Max: 3.1 [kph] at 0.300 [s]

Min: -3.6 [kph] at 0.082 [s]



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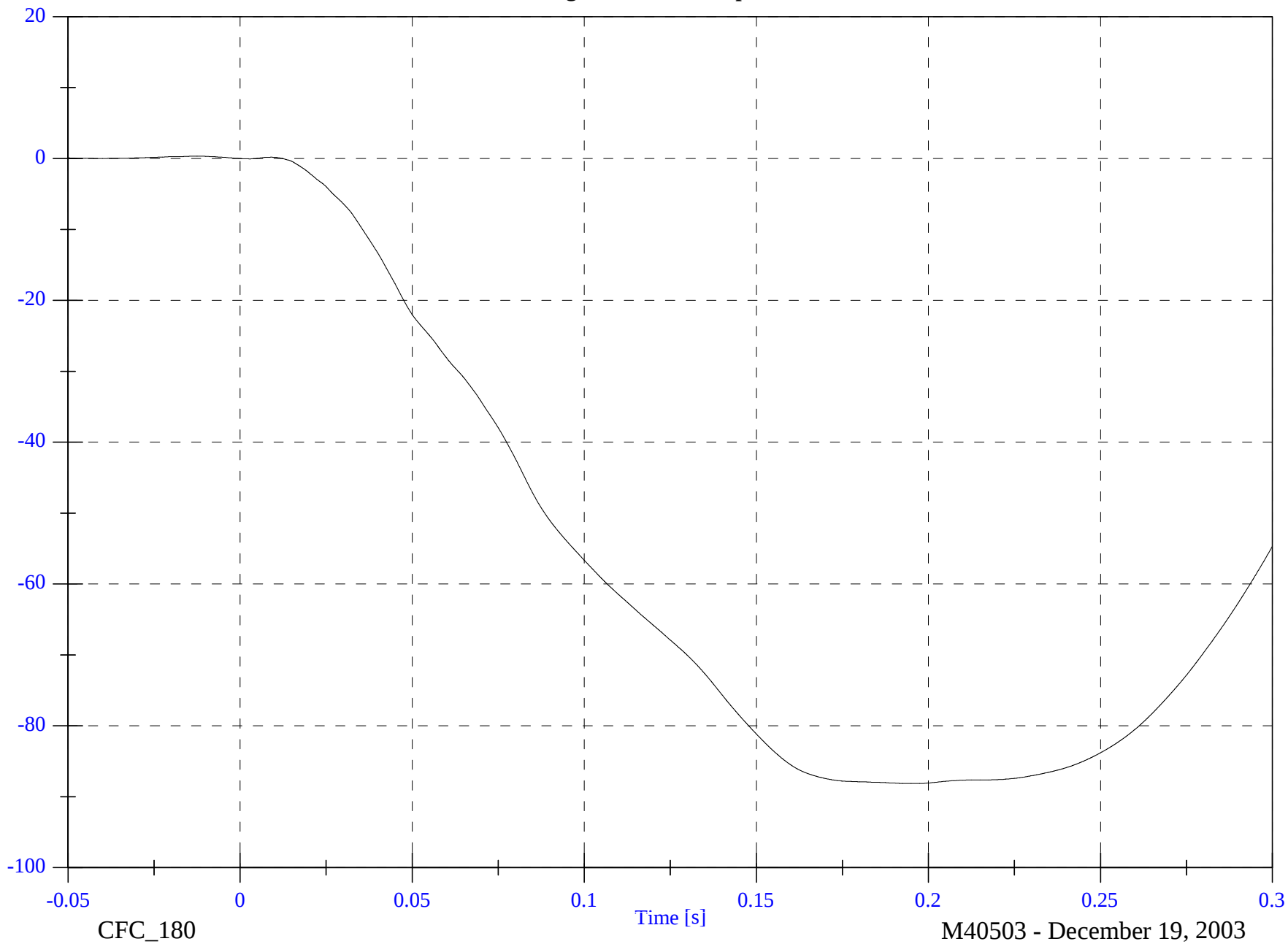
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

V1 Right Rear #9z Displacement

Max: 0.3 [mm] at -0.012 [s]

Min: -88.1 [mm] at 0.196 [s]



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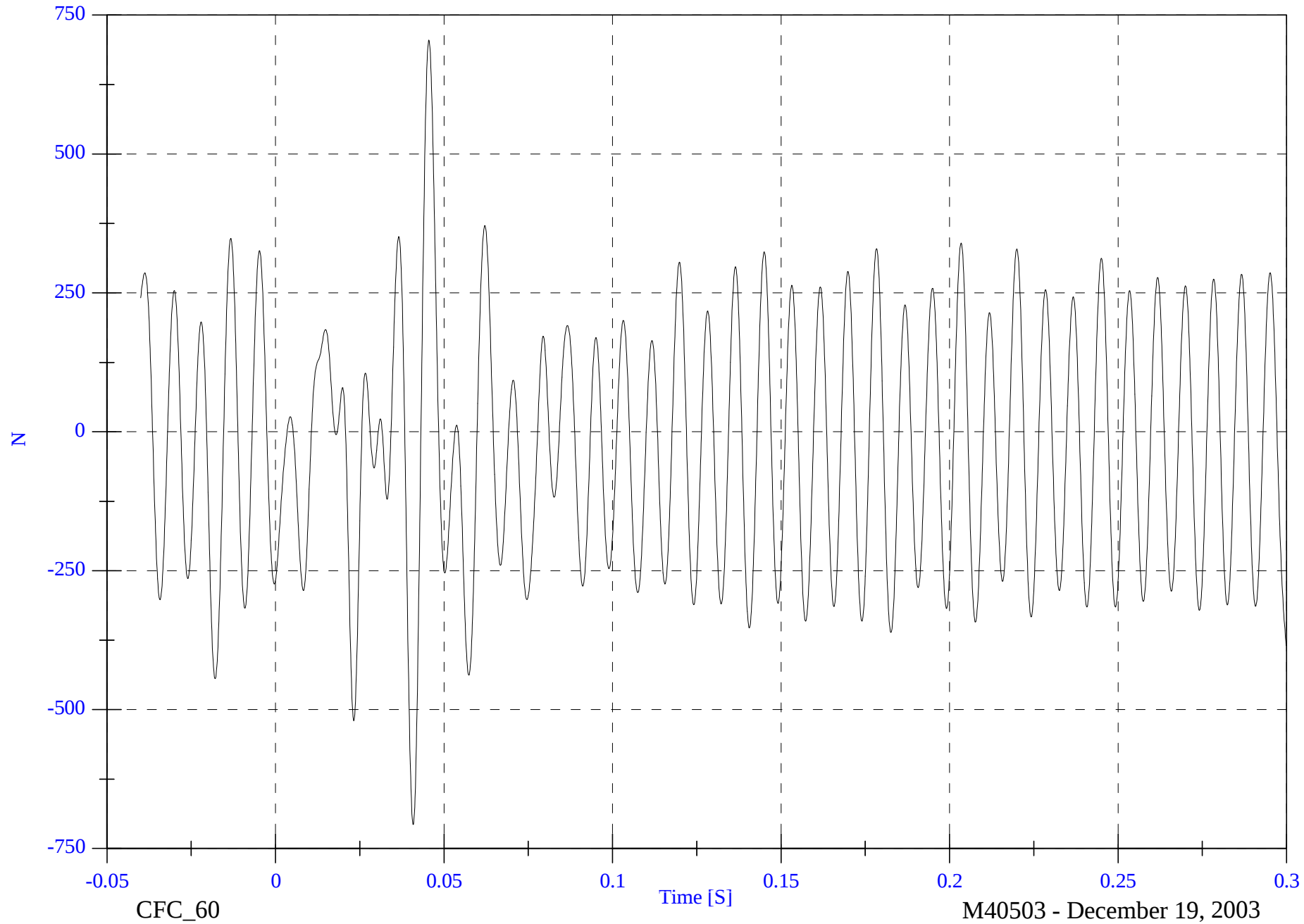
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCA1 Fx

Max: 705.5 [N] at 0.045 [S]

Min: -706.9 [N] at 0.041 [S]



2004 NCAP Test 2 - 2004 Hyundai XG350

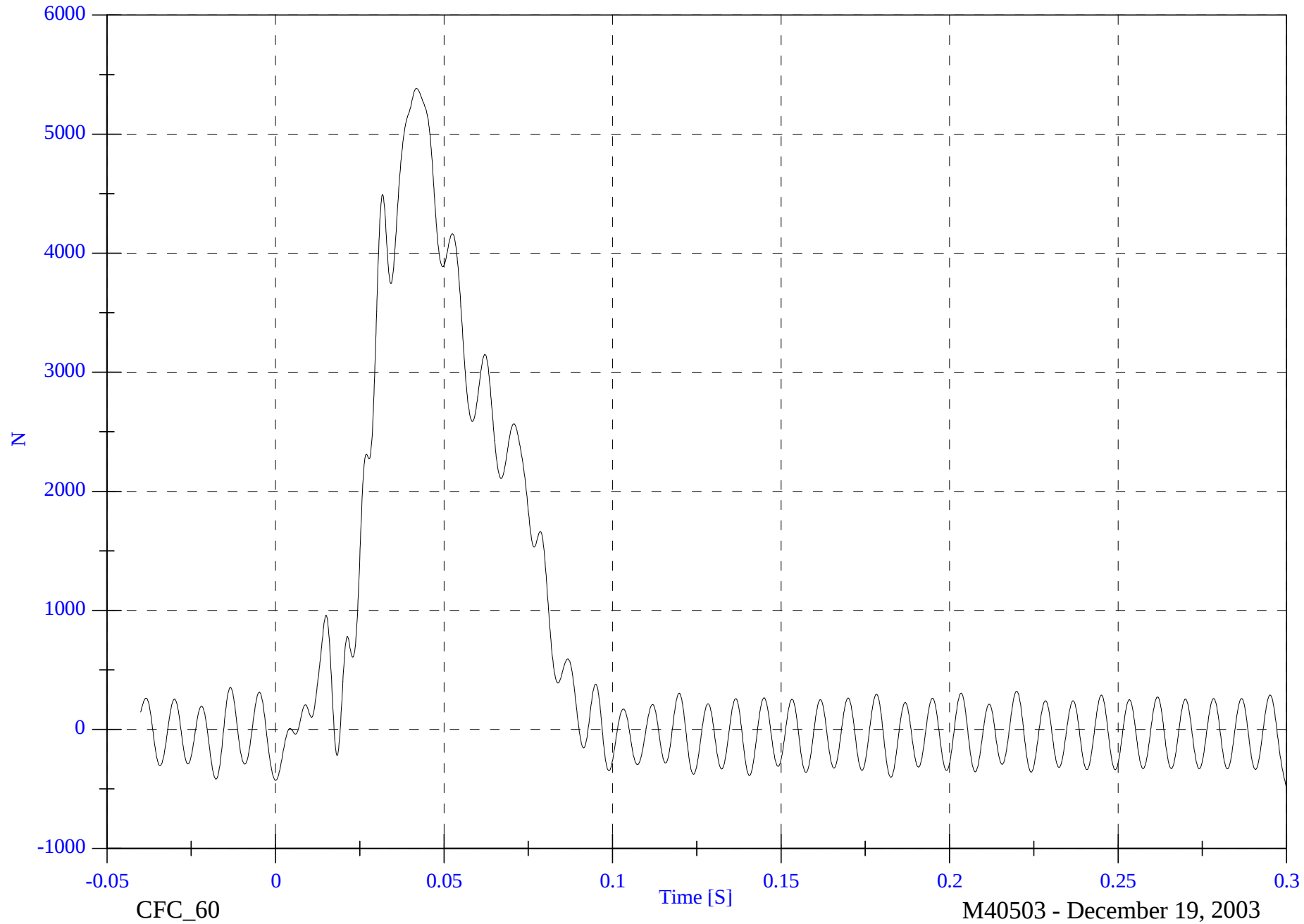
Max: 5384.9 [N] at 0.042 [S]

B1 LCA2 Fx

Min: -479.7 [N] at 0.300 [S]

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2004 NCAP Test 2 - 2004 Hyundai XG350

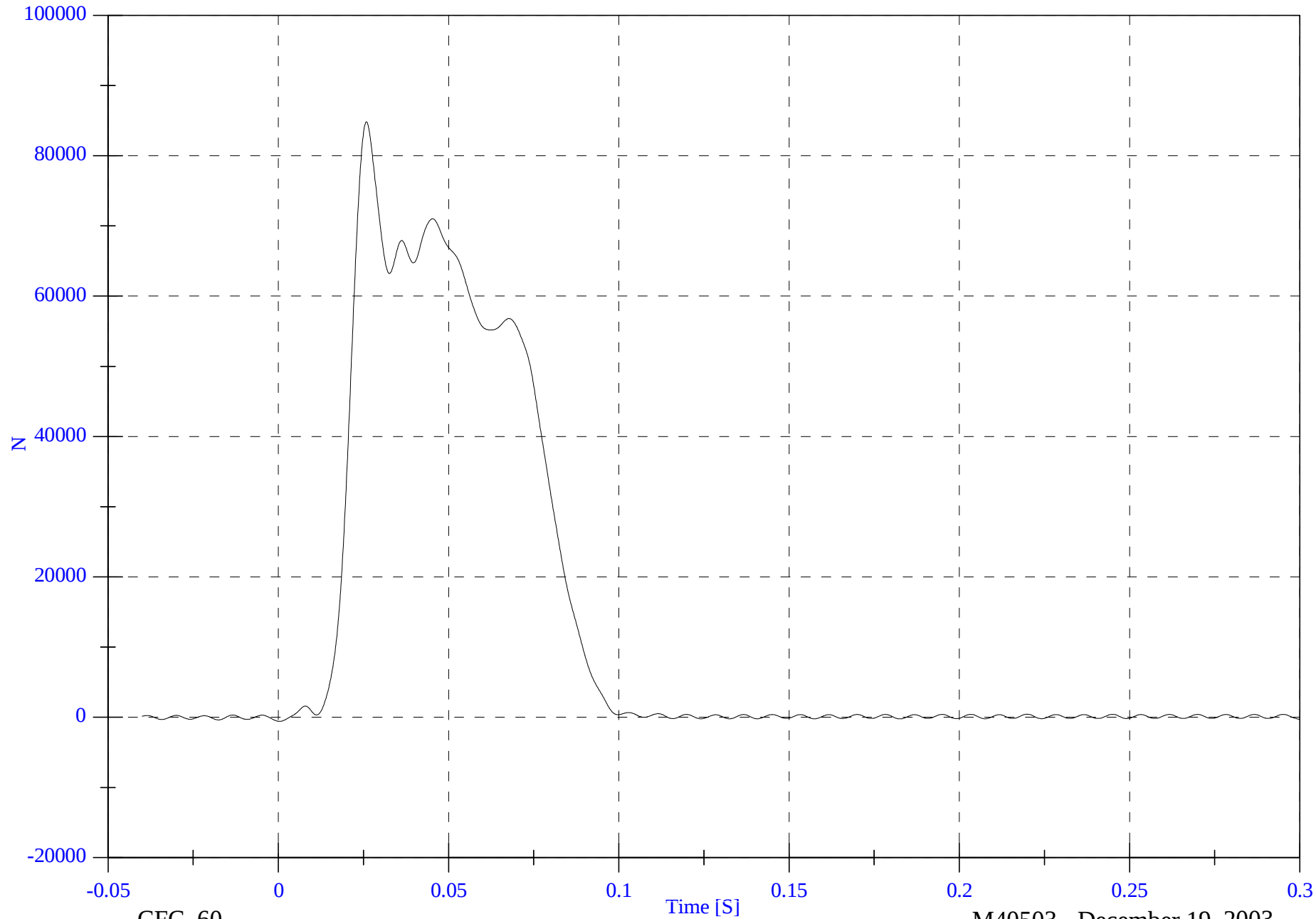
B1 LCA3 Fx

Max: 84826.4 [N] at 0.026 [S]

Min: -588.1 [N] at 0.000 [S]

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CFC_60

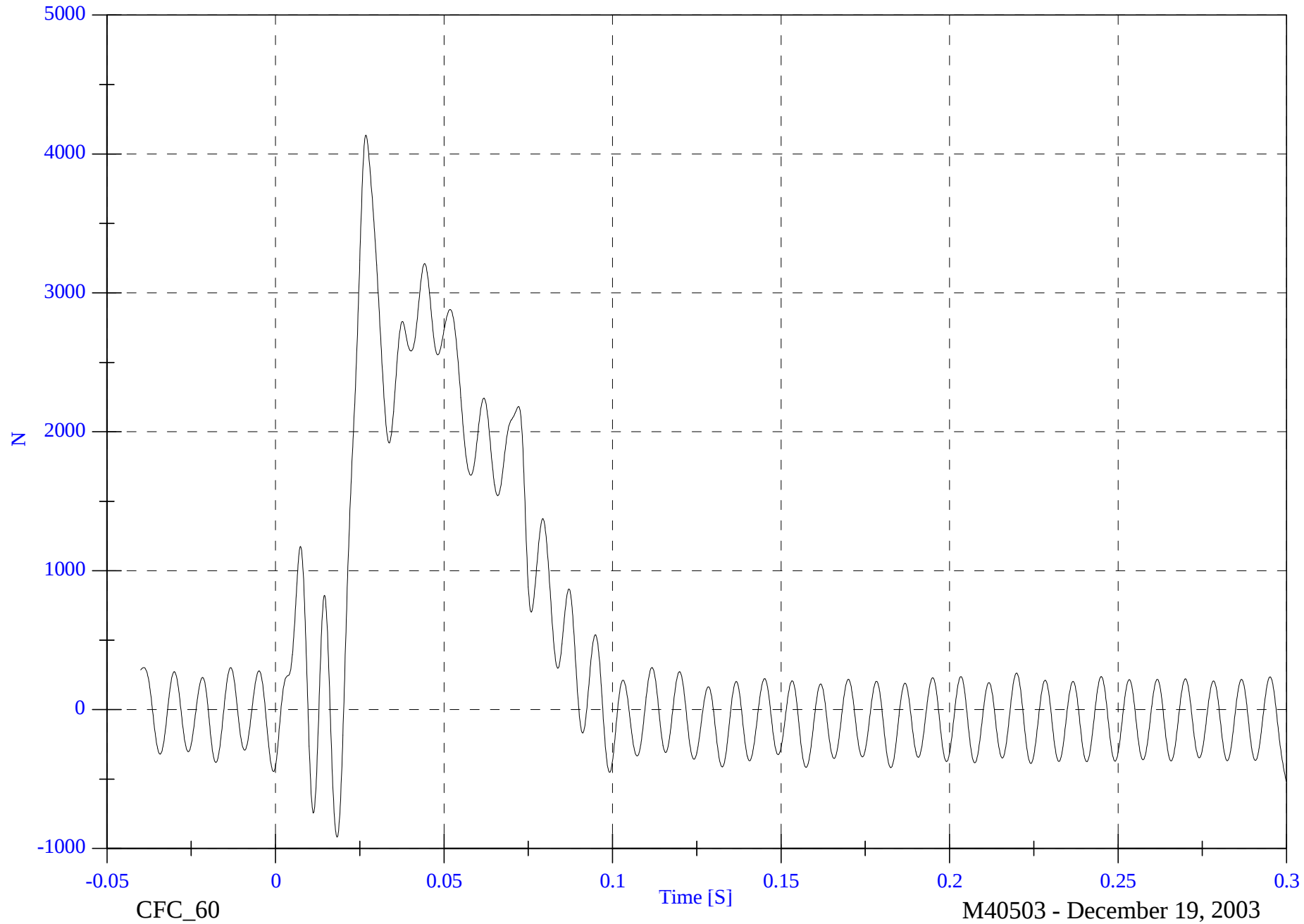
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2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCA4 Fx

Max: 4136.7 [N] at 0.027 [S]

Min: -917.5 [N] at 0.018 [S]



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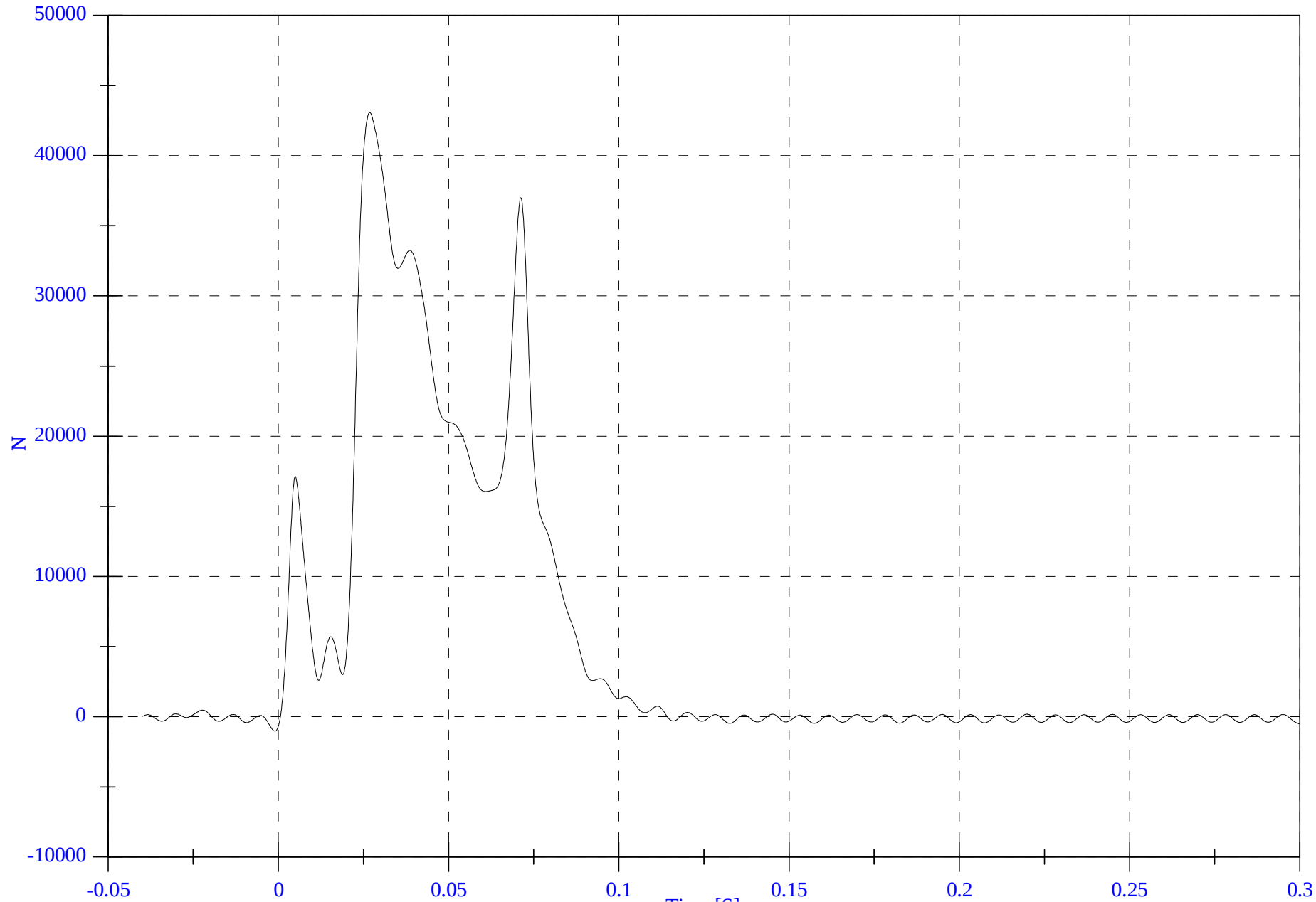
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCA5 Fx

Max: 43072.2 [N] at 0.027 [S]

Min: -1024.3 [N] at -0.001 [S]



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CFC_60

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2004 NCAP Test 2 - 2004 Hyundai XG350

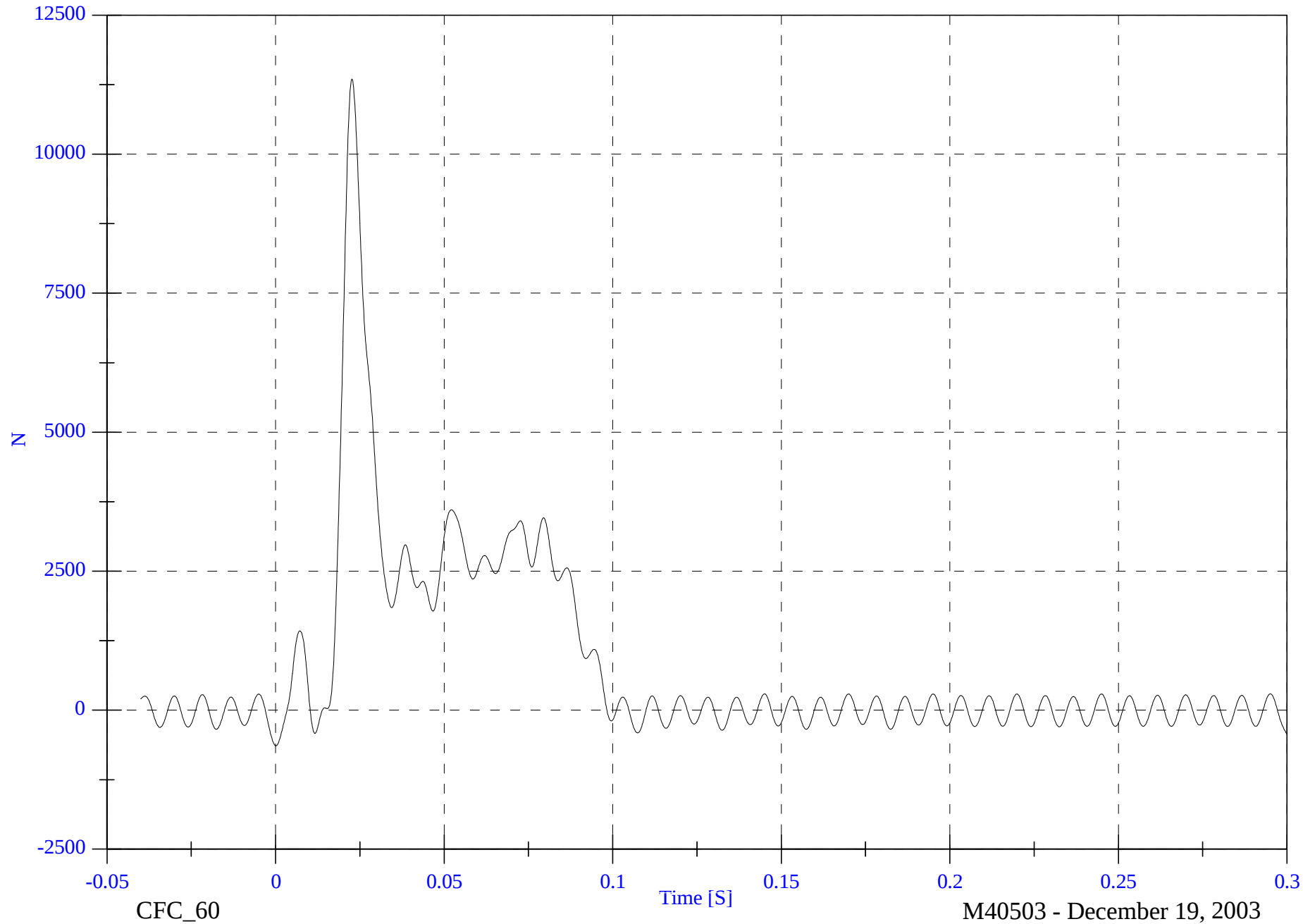
B1 LCA6 Fx

Max: 11351.8 [N] at 0.023 [S]

Min: -641.9 [N] at 0.000 [S]

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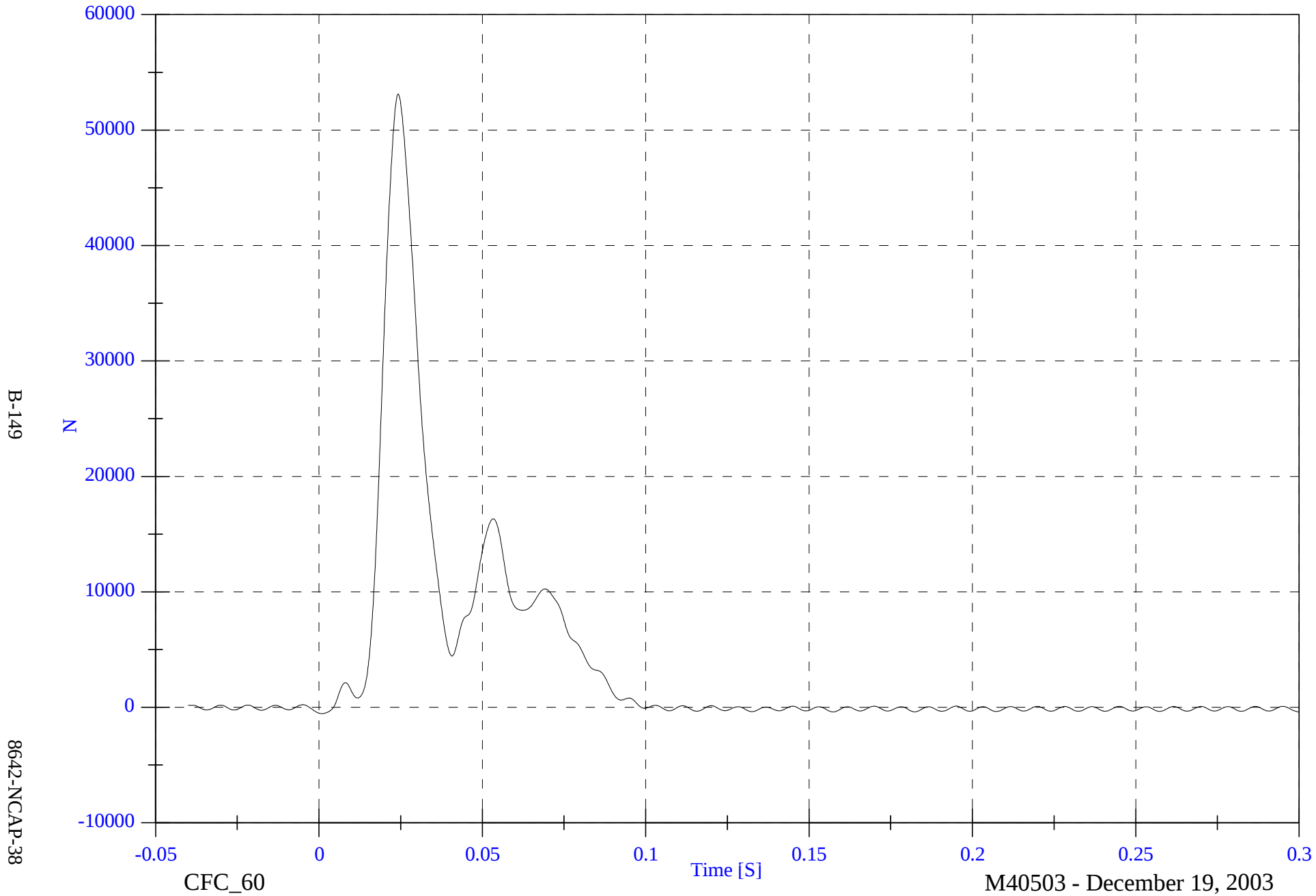


2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCA7 Fx

Max: 53118.9 [N] at 0.024 [S]

Min: -548.7 [N] at 0.001 [S]

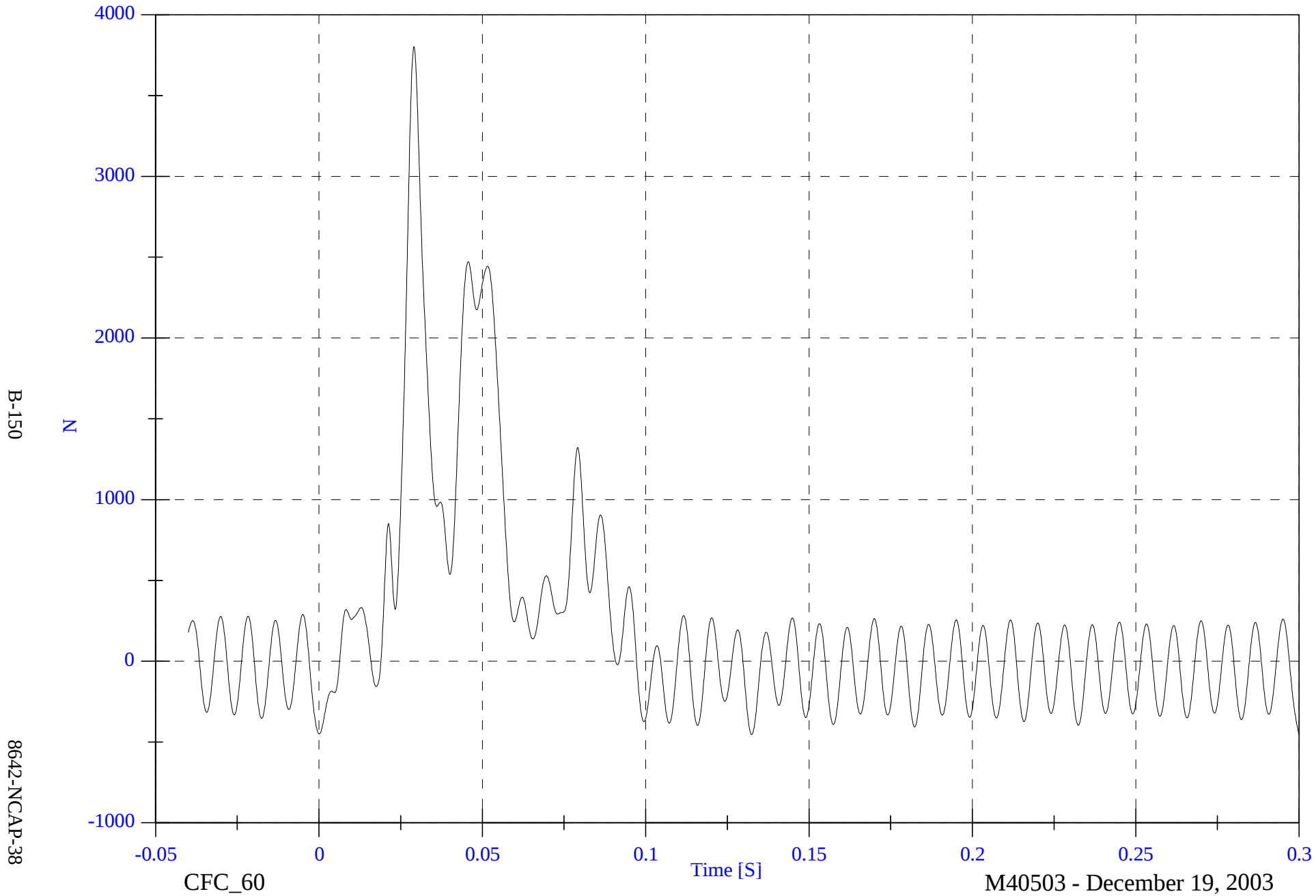


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 3801.9 [N] at 0.029 [S]

B1 LCA8 Fx

Min: -454.2 [N] at 0.132 [S]



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Max: 666.2 [N] at 0.036 [S]

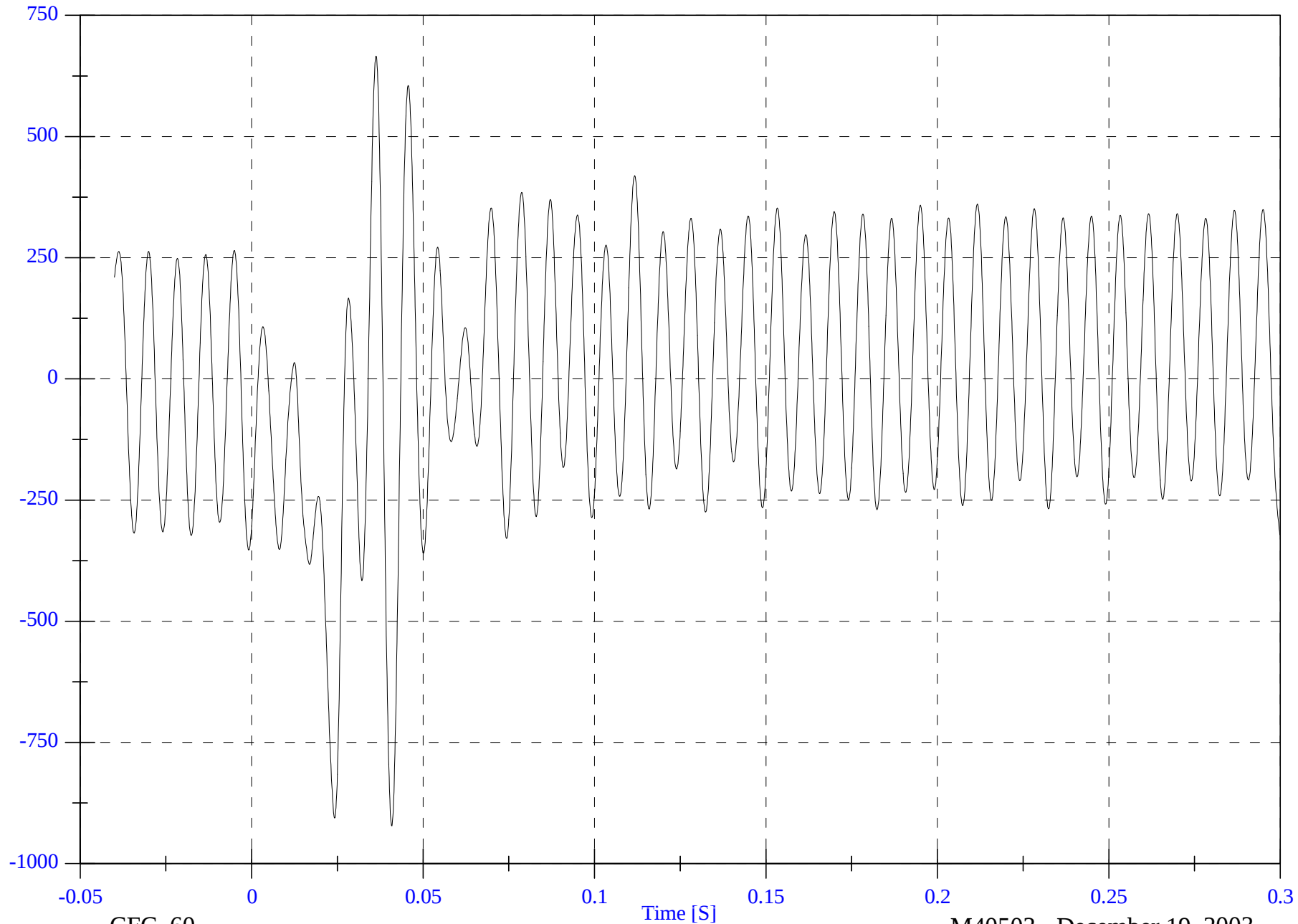
Min: -922.0 [N] at 0.041 [S]

B1 LCA9 Fx

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N



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2004 NCAP Test 2 - 2004 Hyundai XG350

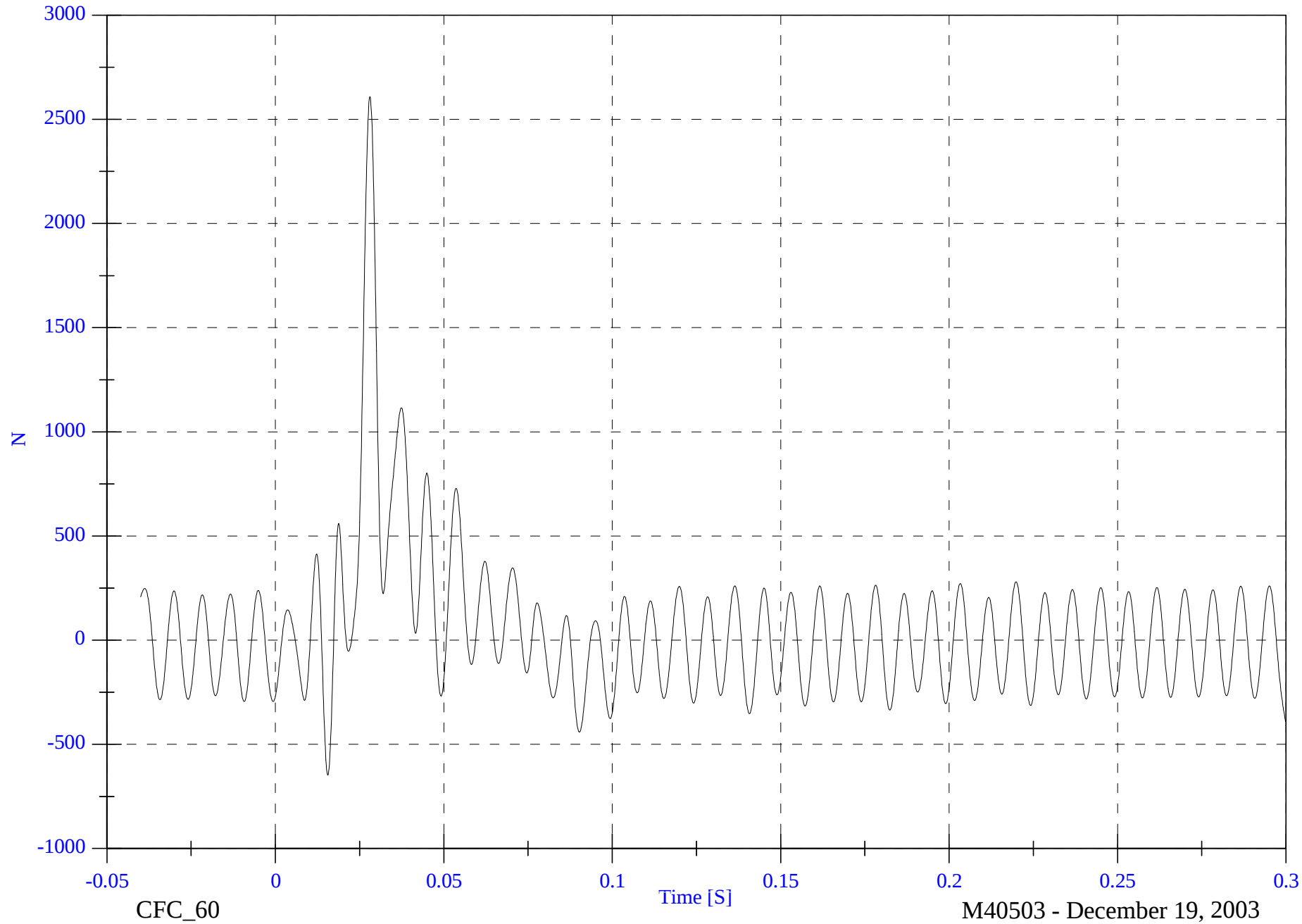
Max: 2609.1 [N] at 0.028 [S]

B1 LCB1 Fx

Min: -648.2 [N] at 0.016 [S]

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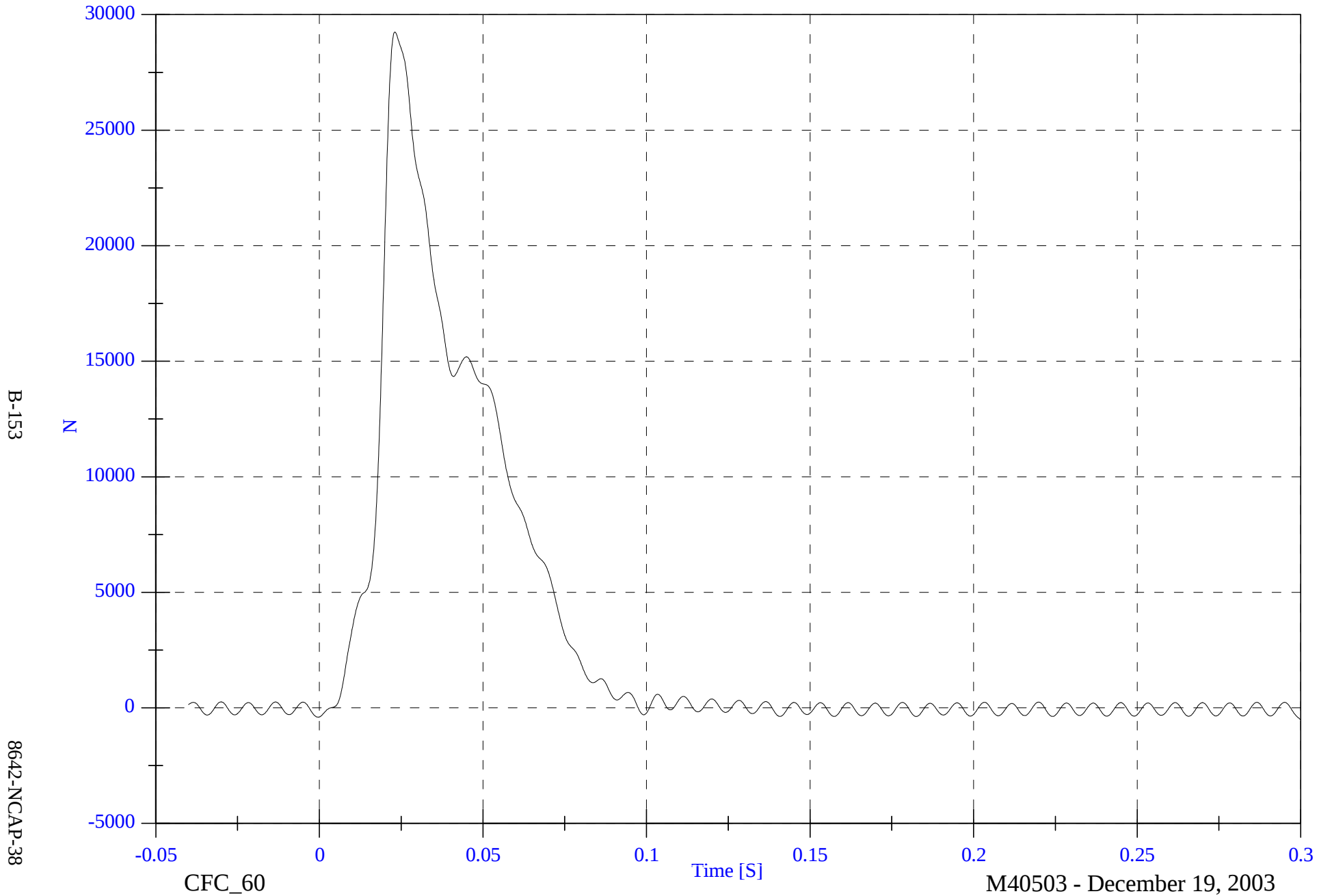


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 29252.8 [N] at 0.023 [S]

B1 LCB2 Fx

Min: -499.7 [N] at 0.300 [S]

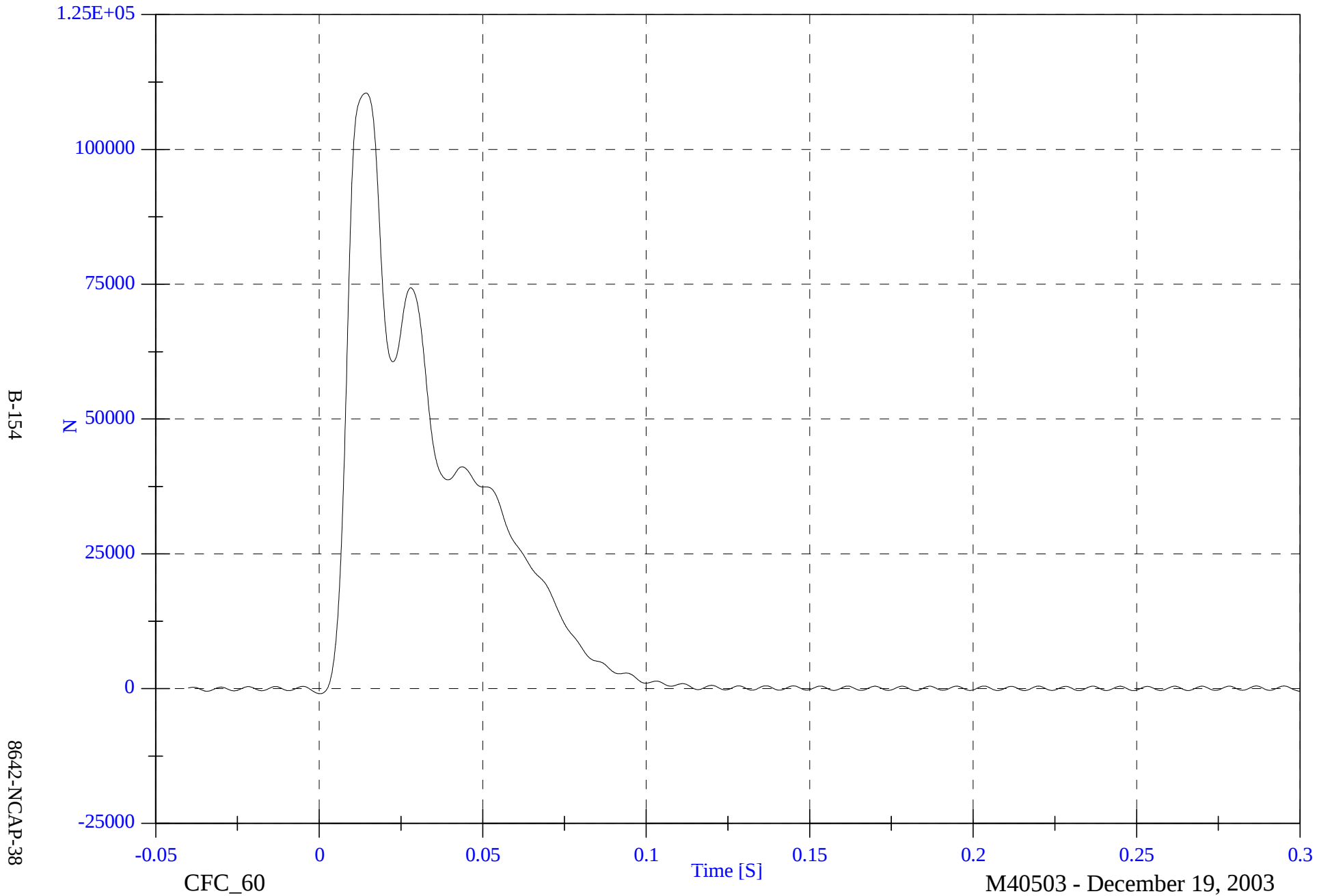


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 110469.0 [N] at 0.014 [S]

Min: -944.7 [N] at 0.000 [S]

B1 LCB3 Fx



2004 NCAP Test 2 - 2004 Hyundai XG350

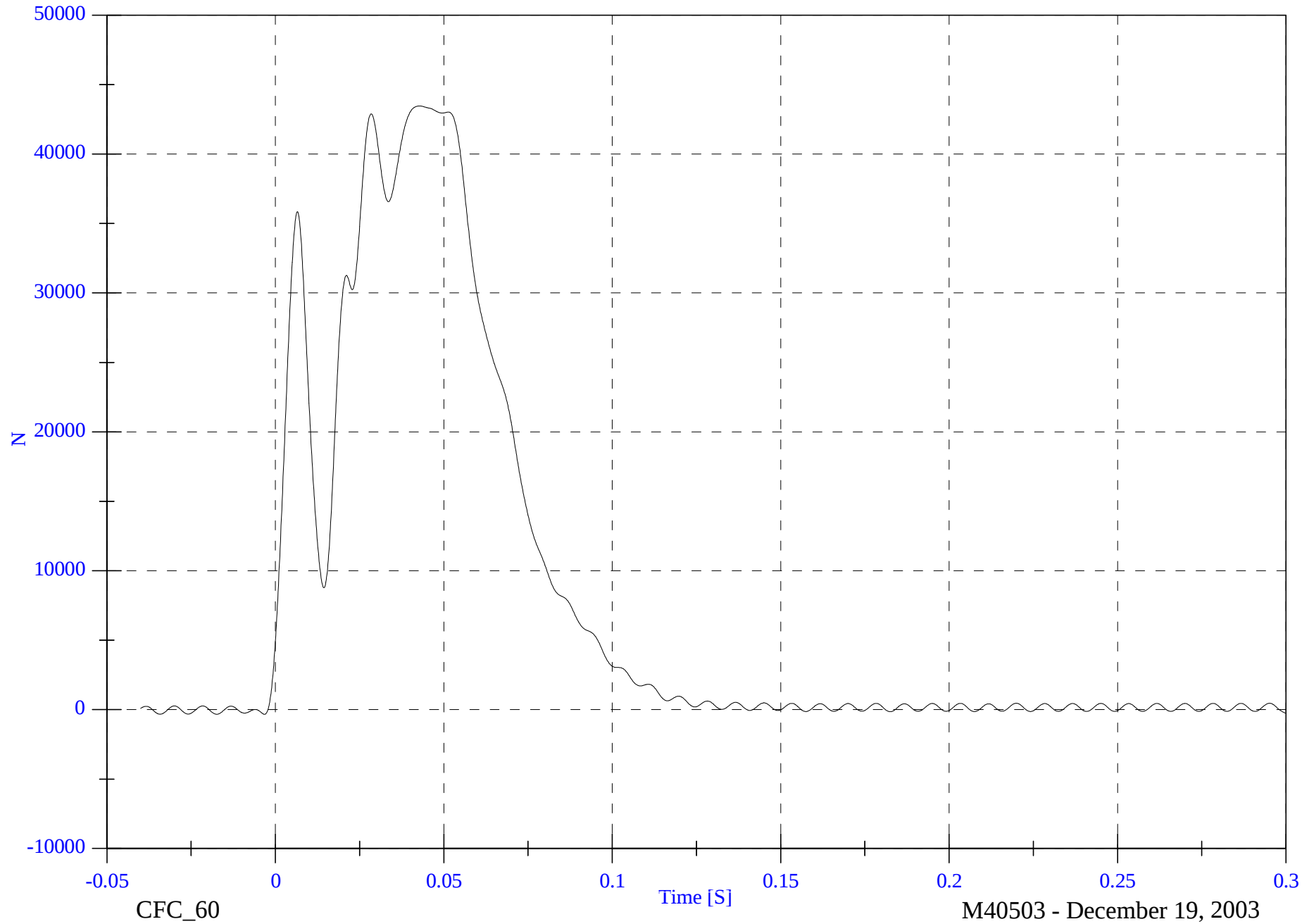
B1 LCB4 Fx

Max: 43459.4 [N] at 0.043 [S]

Min: -335.8 [N] at -0.003 [S]

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2004 NCAP Test 2 - 2004 Hyundai XG350

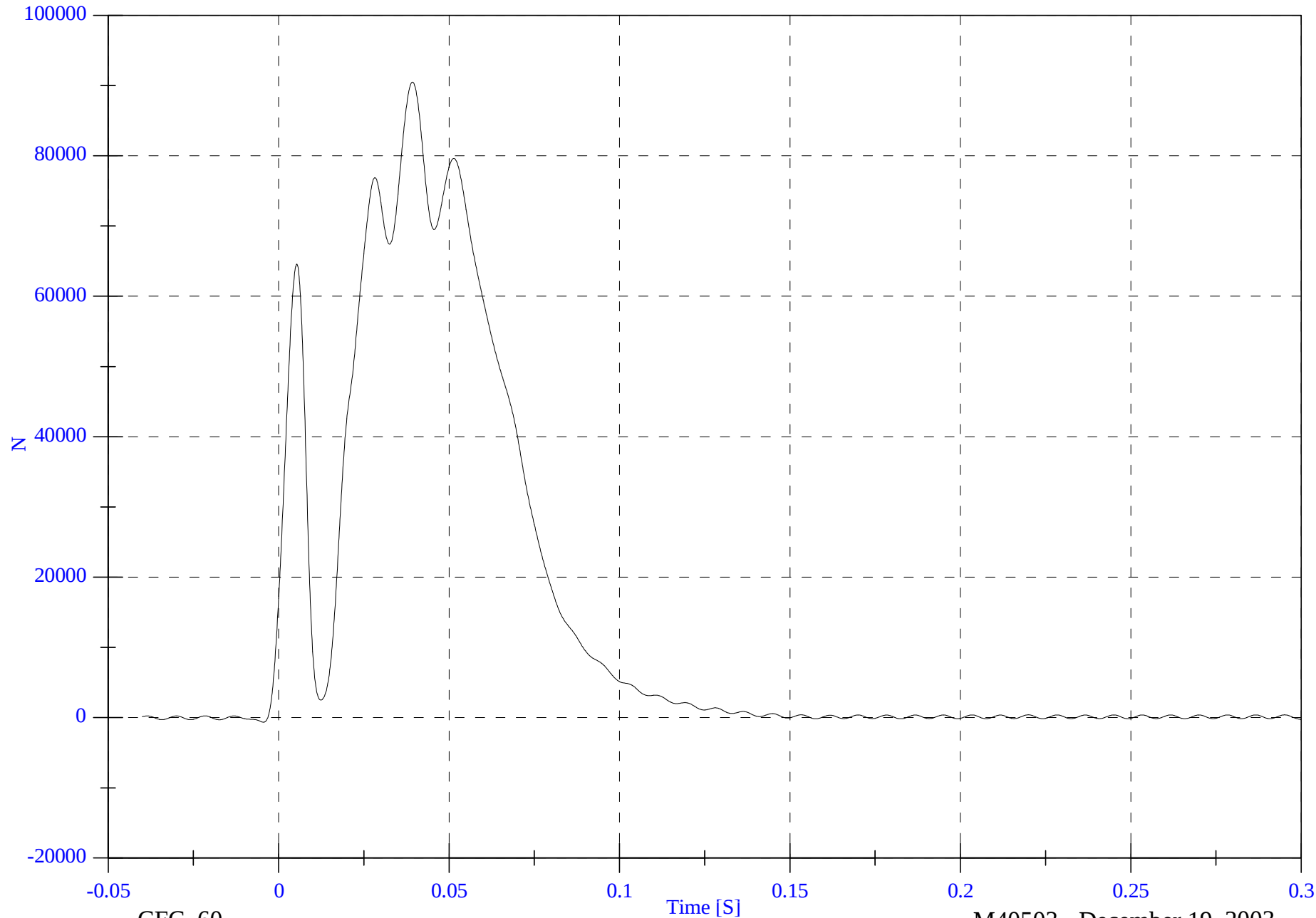
Max: 90495.4 [N] at 0.039 [S]

Min: -659.4 [N] at -0.005 [S]

B1 LCB5 Fx

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CFC_60

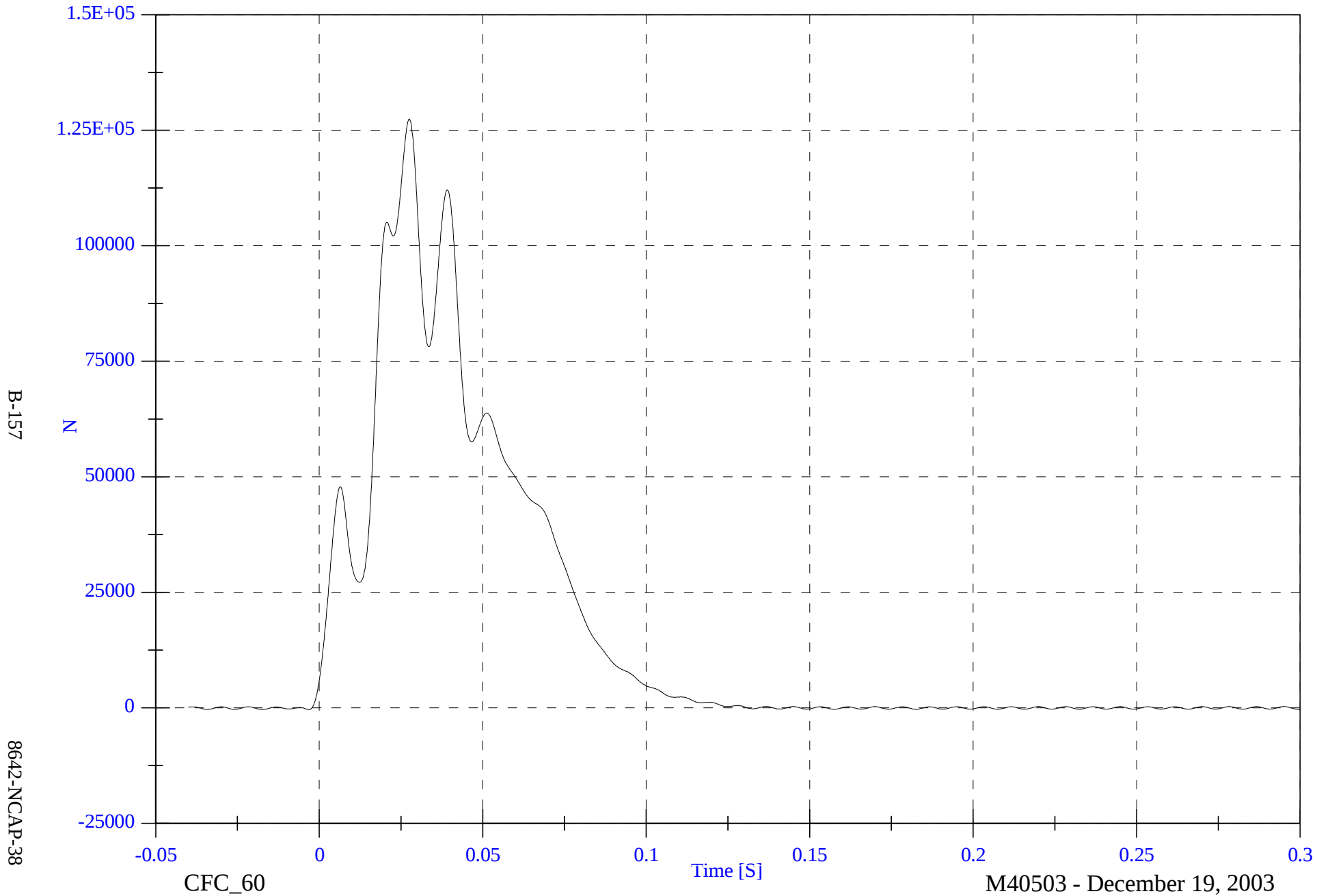
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2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCB6 Fx

Max: 127430.0 [N] at 0.027 [S]

Min: -374.7 [N] at 0.300 [S]

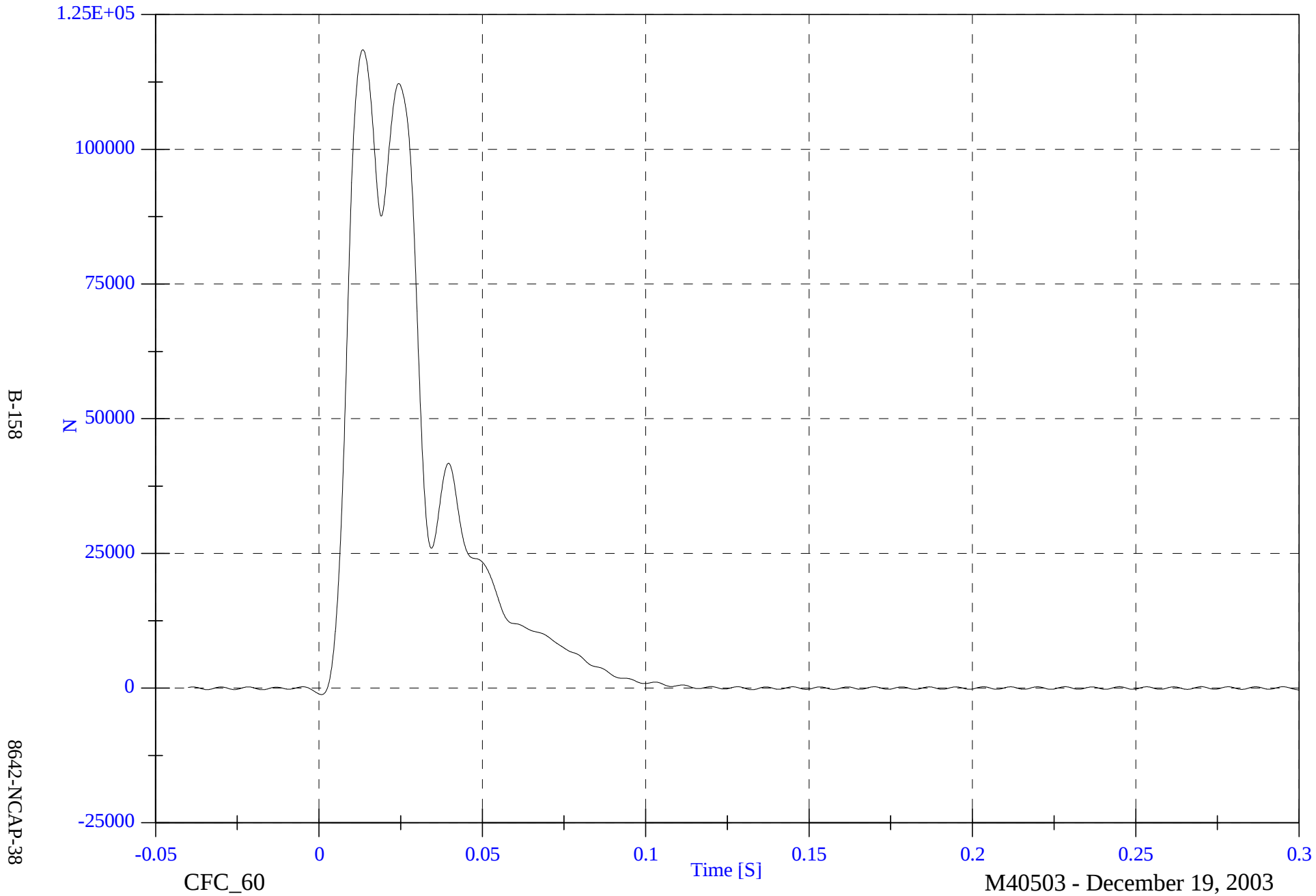


2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCB7 Fx

Max: 118490.9 [N] at 0.013 [S]

Min: -1197.4 [N] at 0.001 [S]

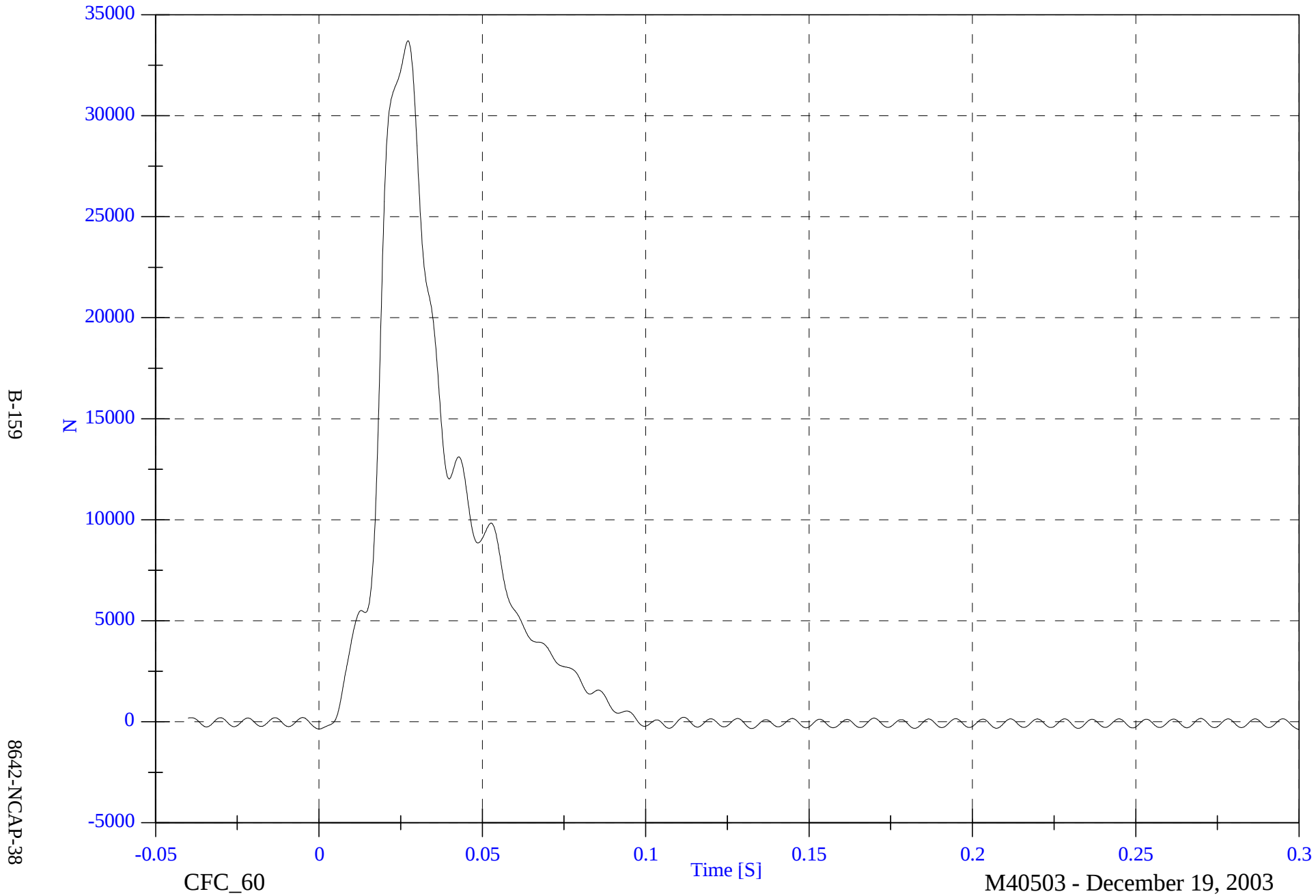


2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCB8 Fx

Max: 33708.9 [N] at 0.027 [S]

Min: -391.2 [N] at 0.300 [S]

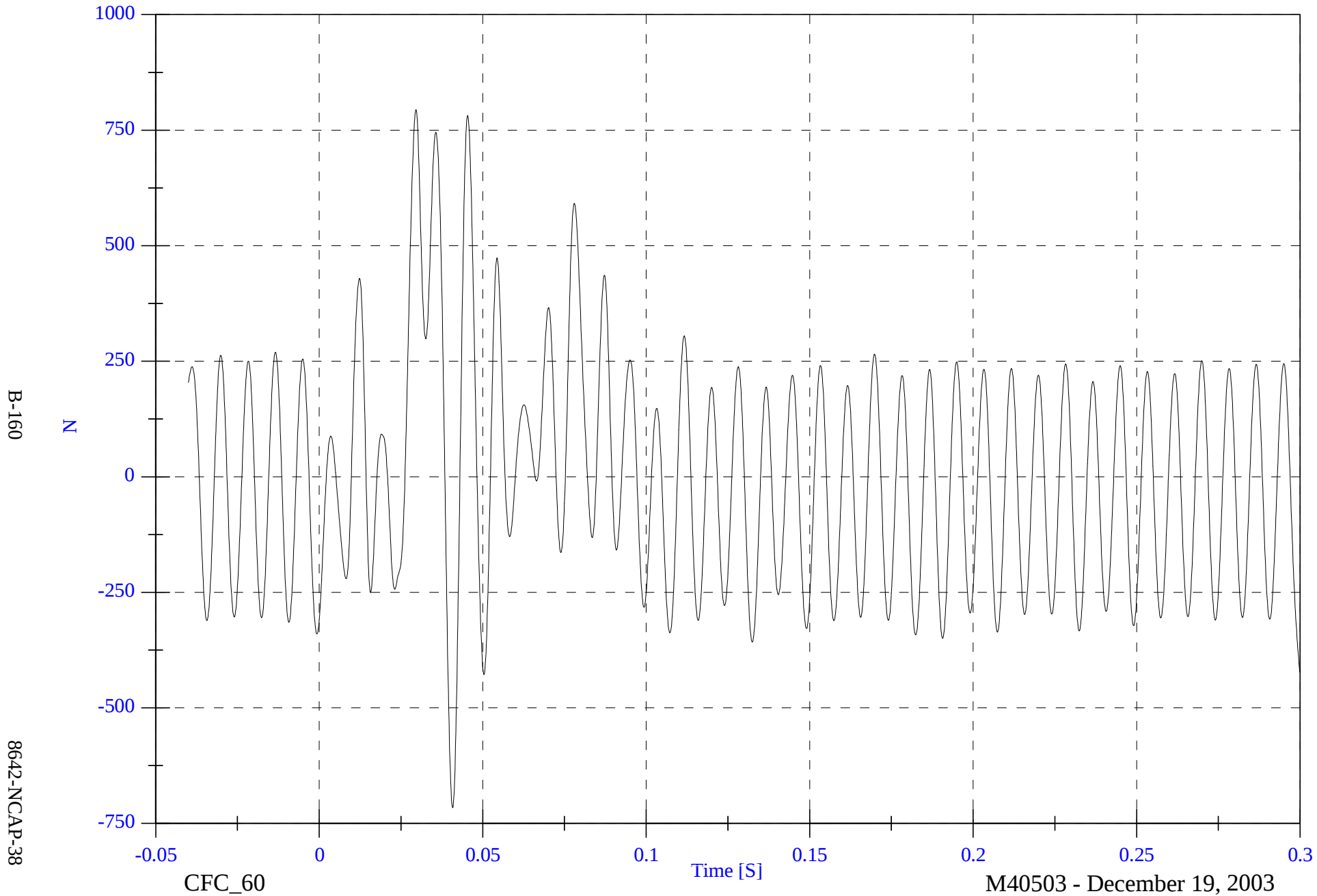


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 794.4 [N] at 0.030 [S]

Min: -716.2 [N] at 0.041 [S]

B1 LCB9 Fx



2004 NCAP Test 2 - 2004 Hyundai XG350

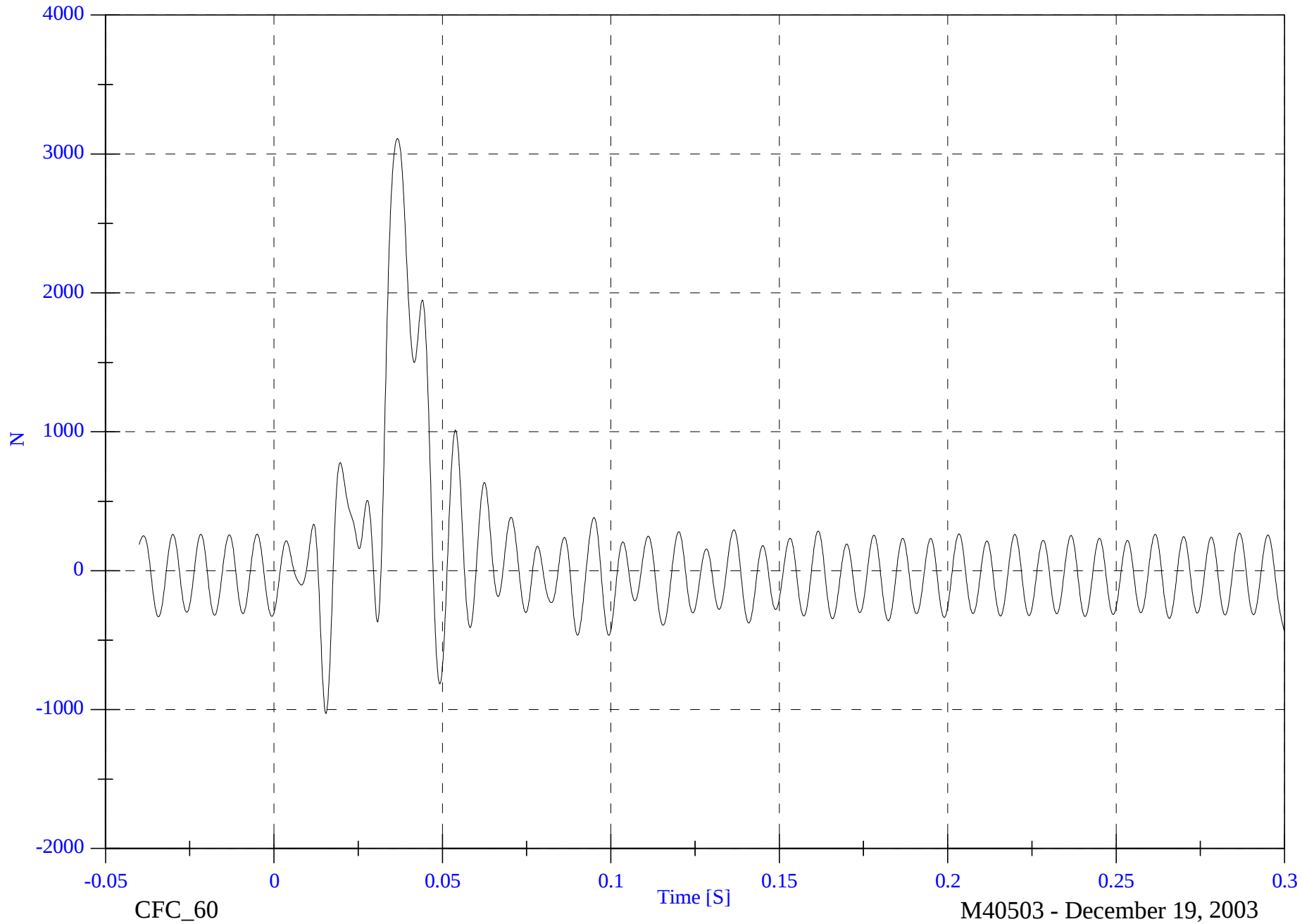
B1 LCC1 Fx

Max: 3111.9 [N] at 0.037 [S]

Min: -1028.0 [N] at 0.015 [S]

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8642-NCAP-38

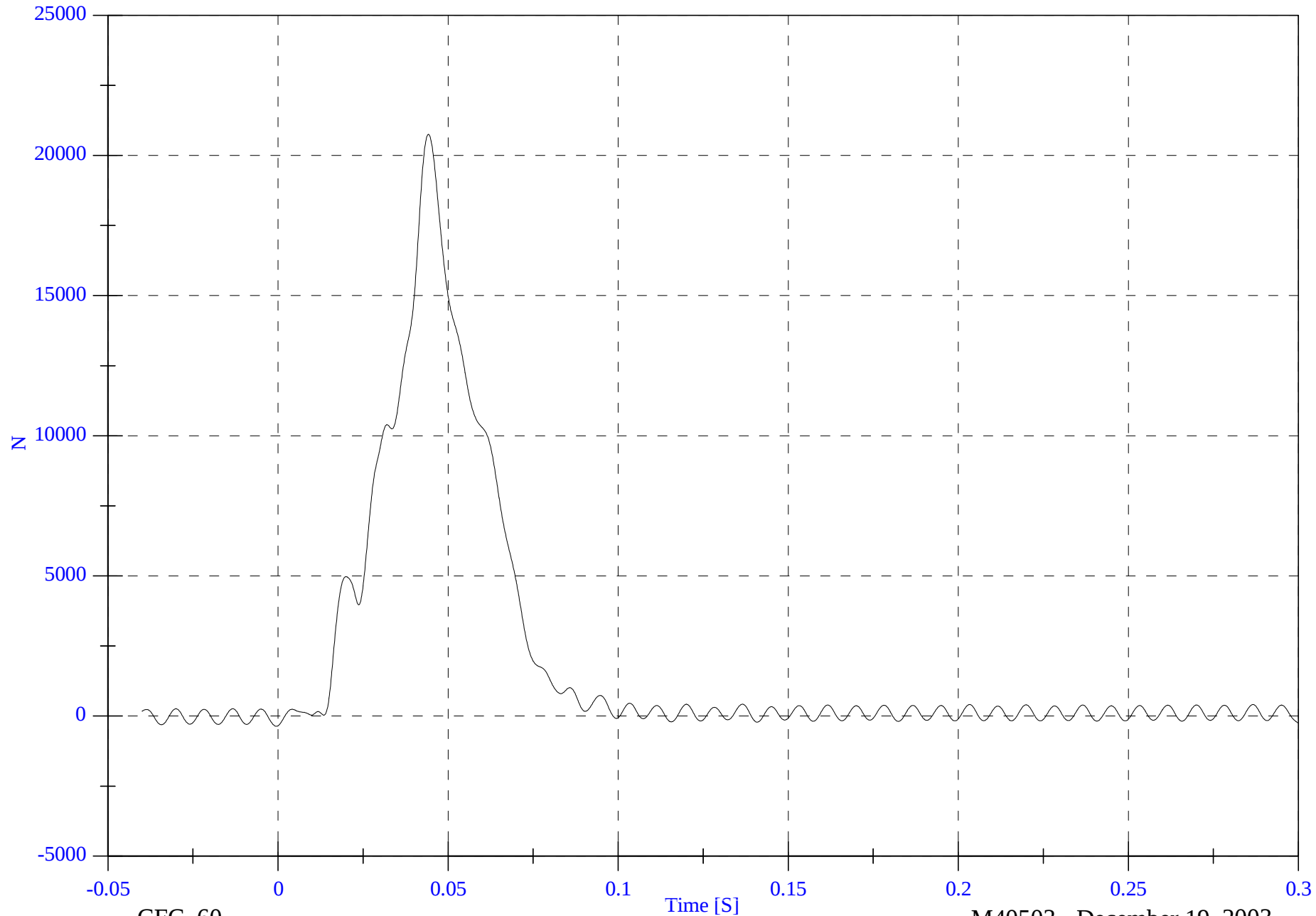


2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCC2 Fx

Max: 20755.7 [N] at 0.044 [S]

Min: -364.1 [N] at -0.001 [S]



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CFC_60

M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

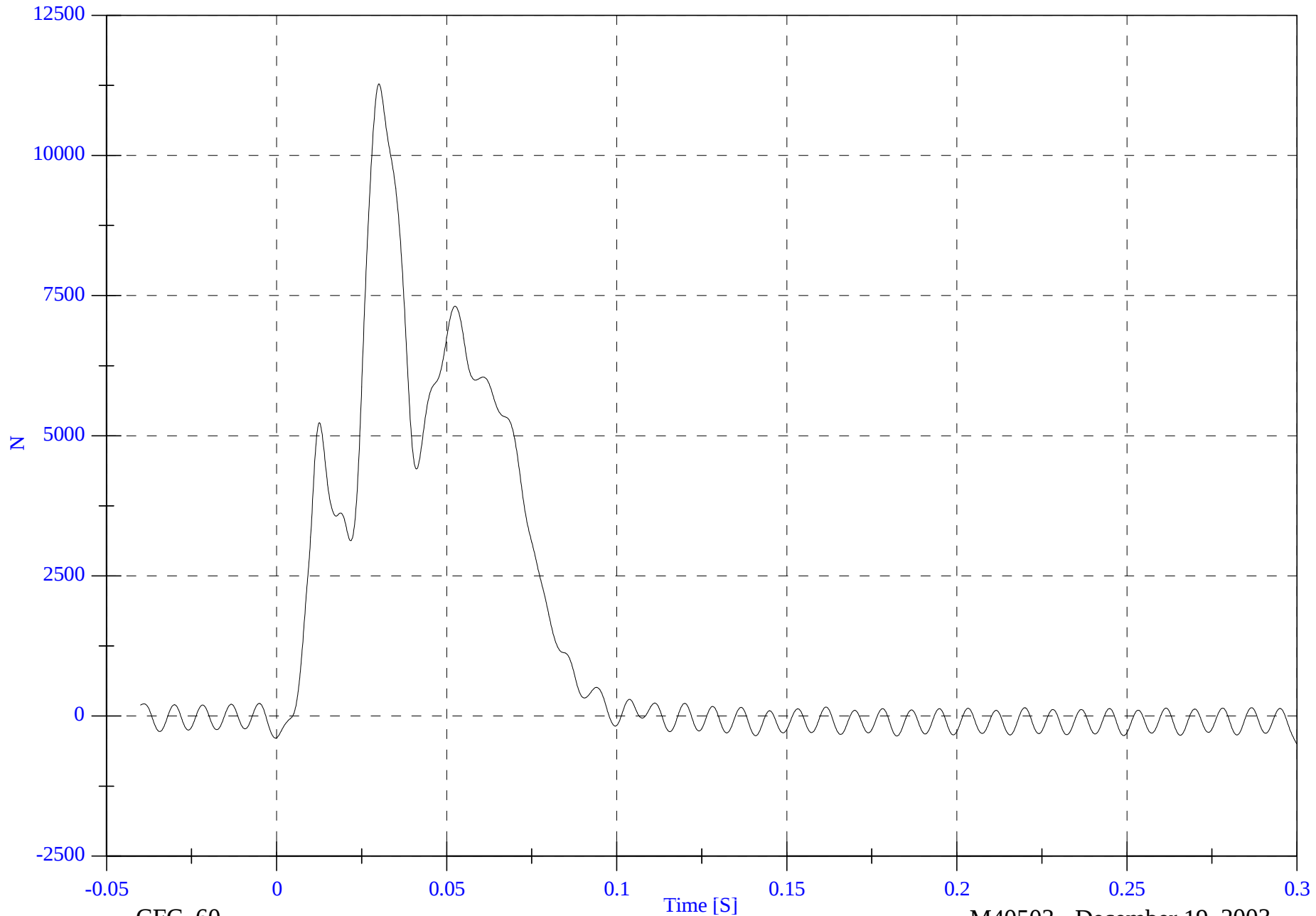
Max: 11276.0 [N] at 0.030 [S]

B1 LCC3 Fx

Min: -493.9 [N] at 0.300 [S]

B-163

8642-NCAP-38



CFC_60

M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

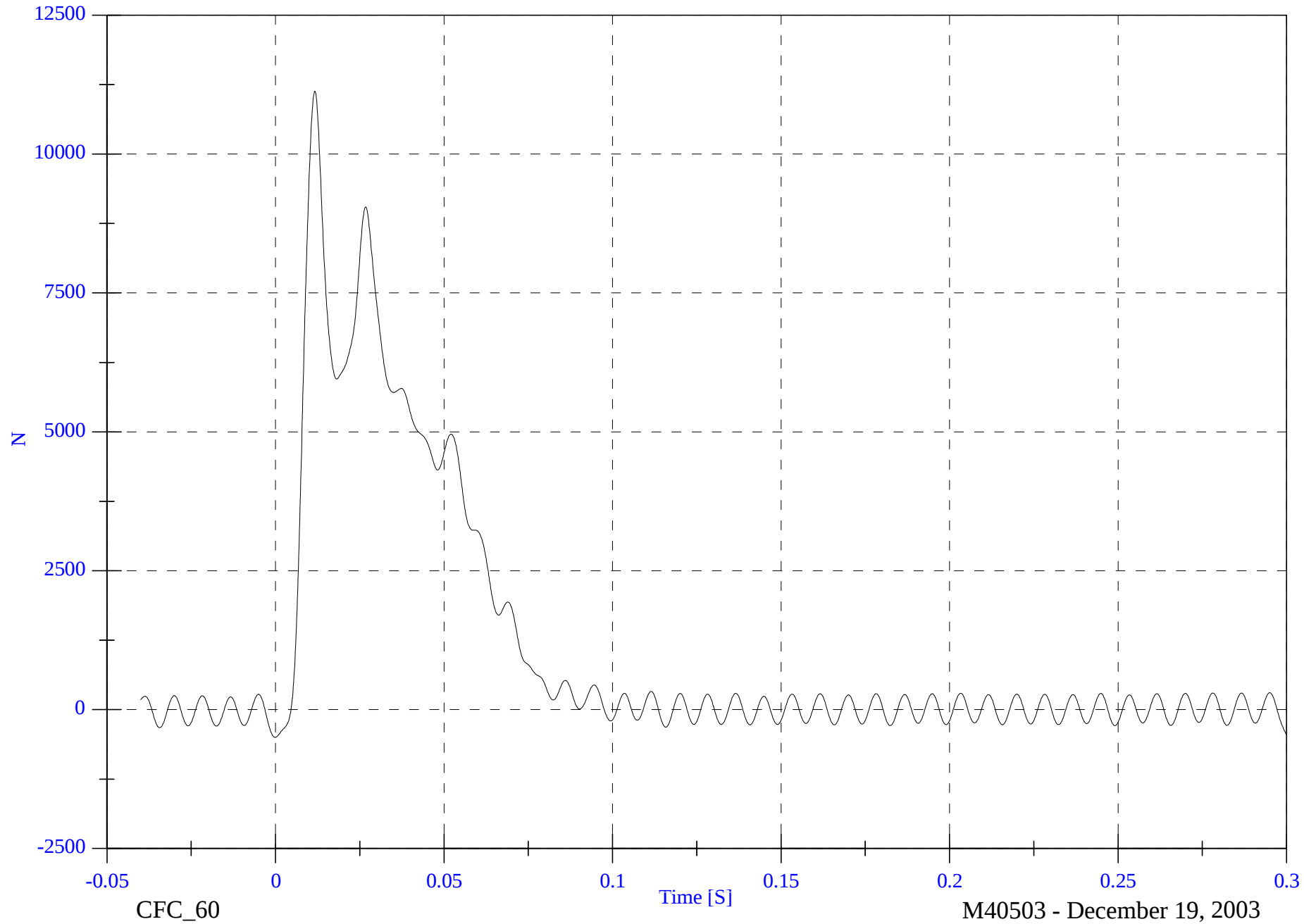
B1 LCC4 Fx

Max: 11132.5 [N] at 0.012 [S]

Min: -500.0 [N] at -0.000 [S]

B-164

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

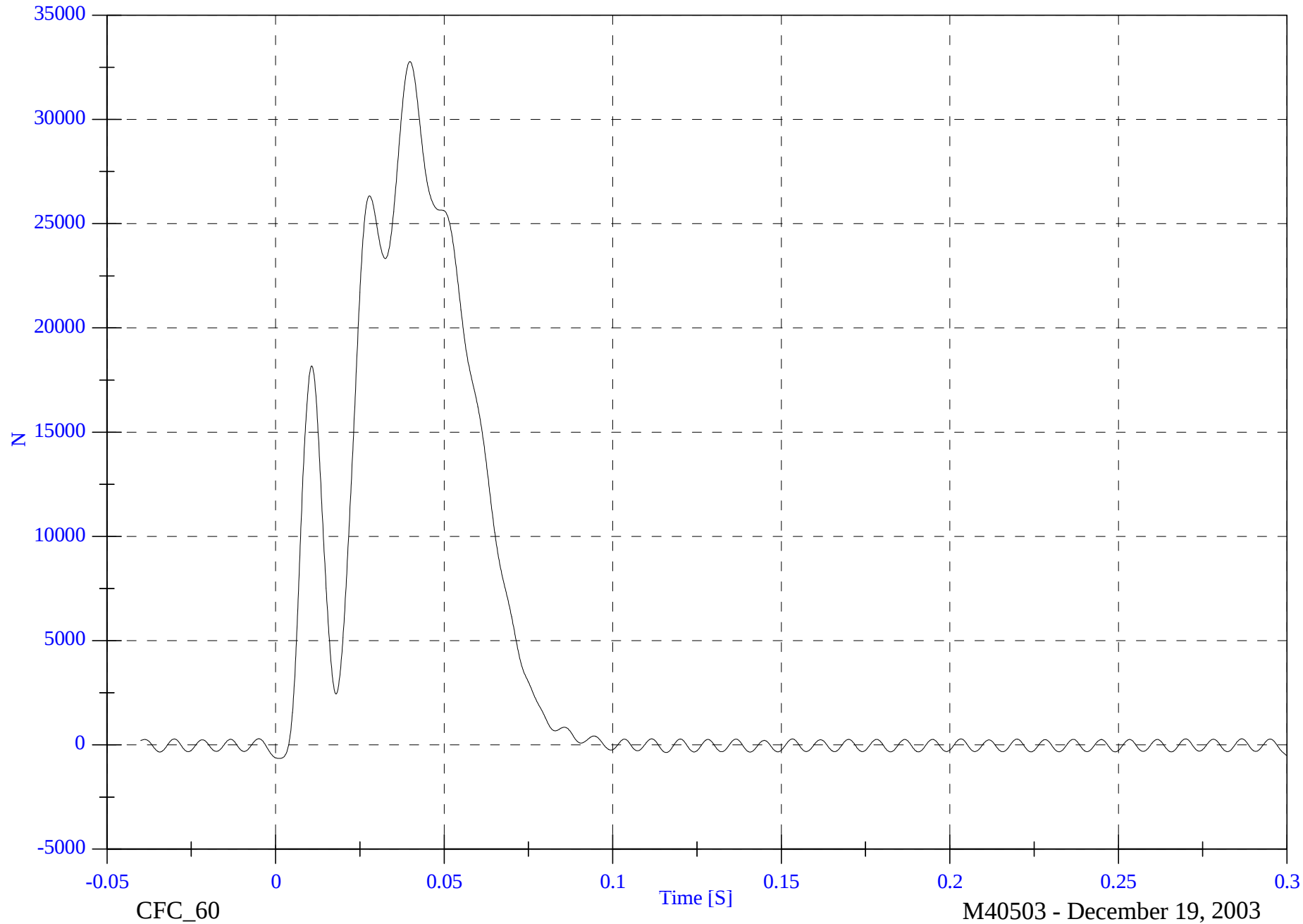
B1 LCC5 Fx

Max: 32769.7 [N] at 0.040 [S]

Min: -647.6 [N] at 0.001 [S]

B-165

8642-NCAP-38



2004 NCAP Test 2 - 2004 Hyundai XG350

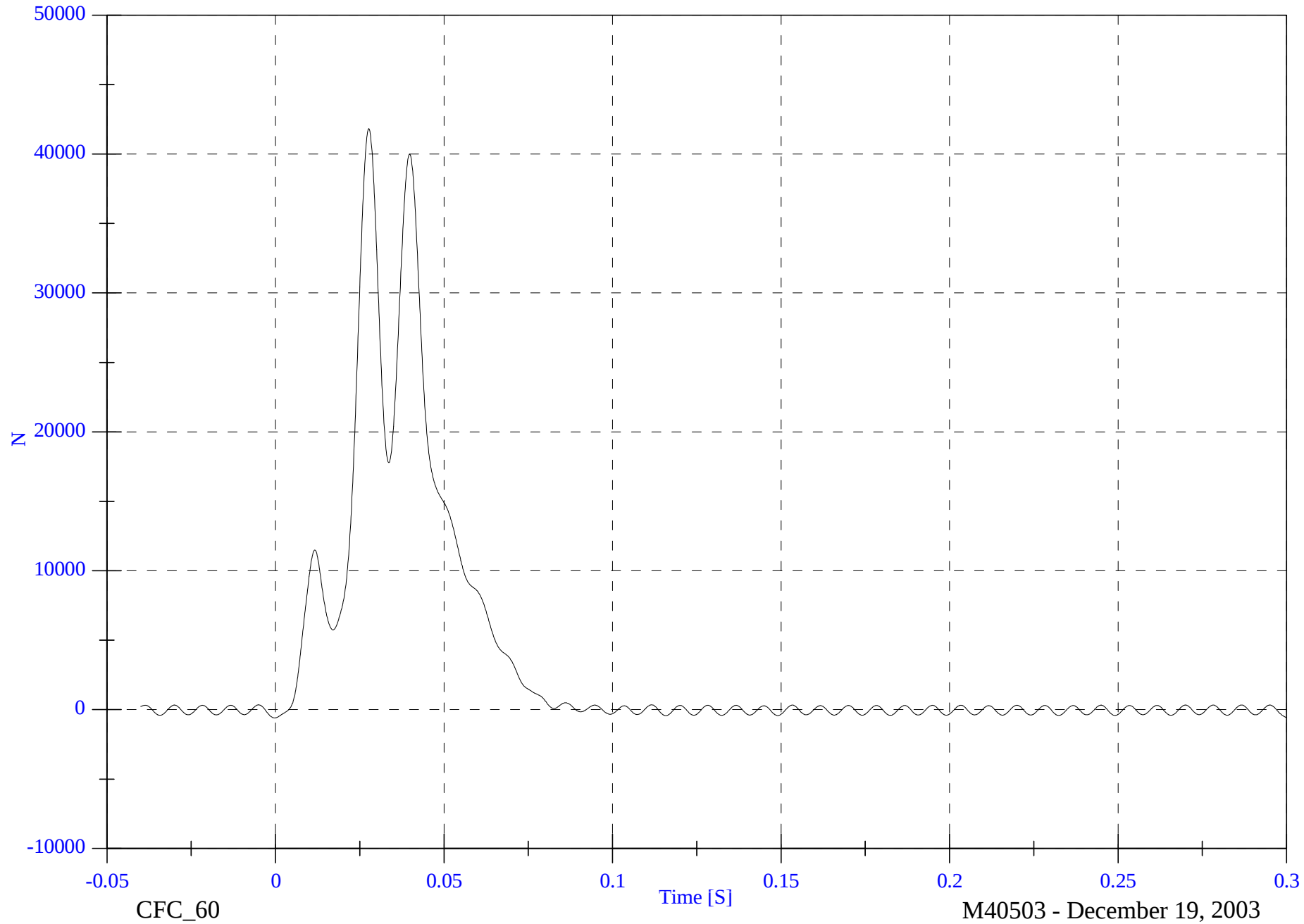
B1 LCC6 Fx

Max: 41836.3 [N] at 0.028 [S]

Min: -596.8 [N] at -0.000 [S]

B-166

8642-NCAP-38

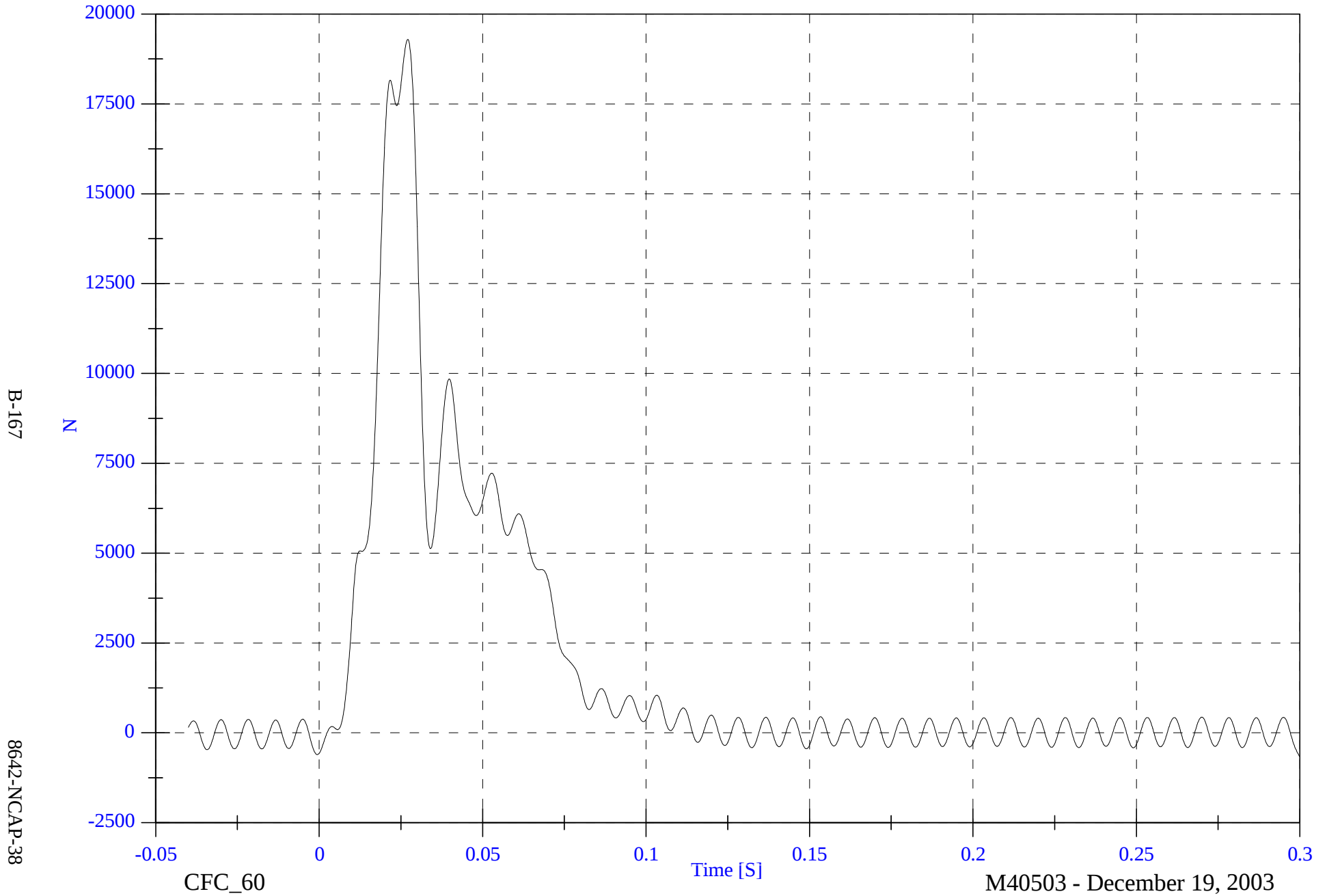


2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCC7 Fx

Max: 19293.9 [N] at 0.027 [S]

Min: -653.0 [N] at 0.300 [S]



2004 NCAP Test 2 - 2004 Hyundai XG350

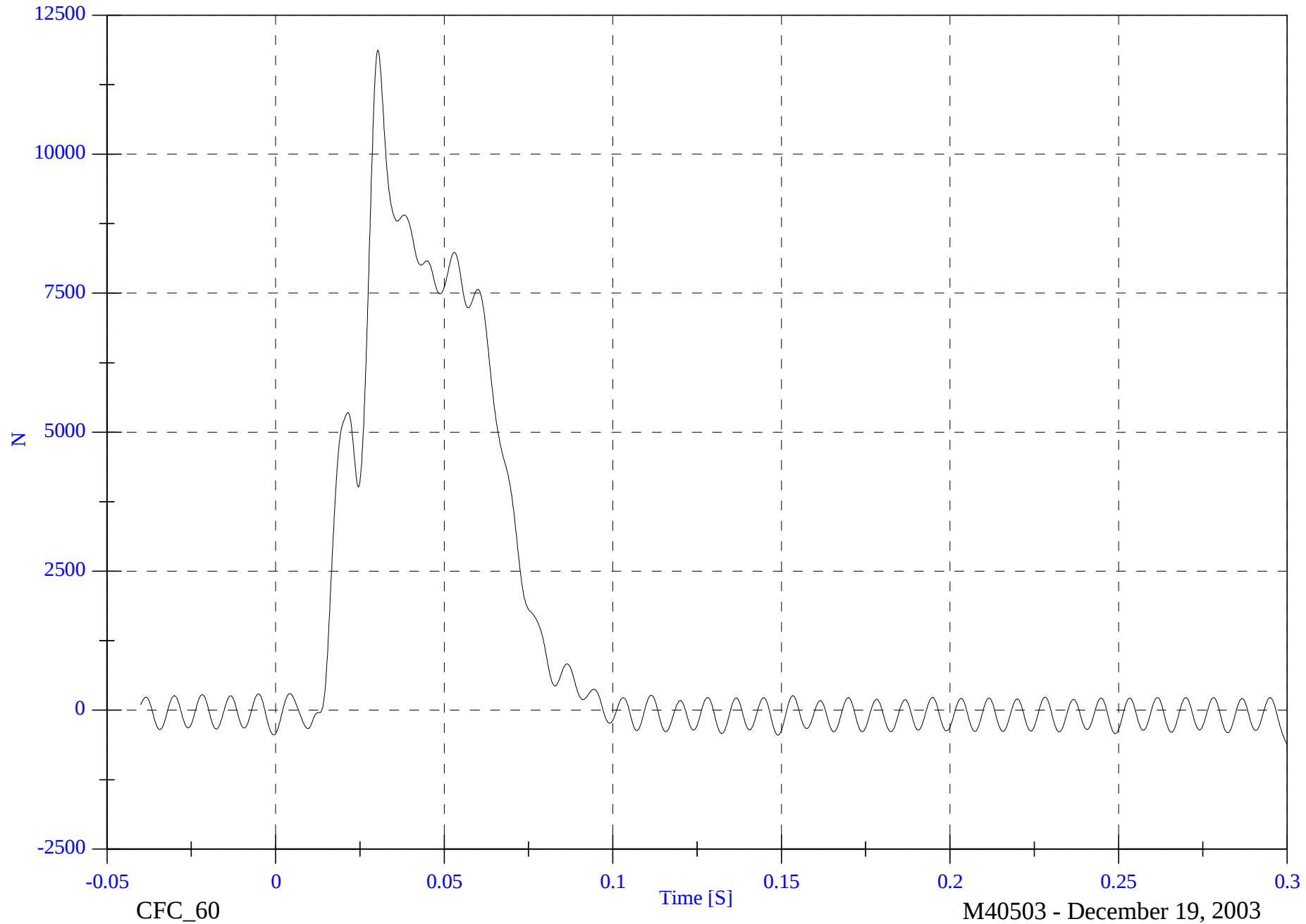
Max: 11871.8 [N] at 0.030 [S]

B1 LCC8 Fx

Min: -611.7 [N] at 0.300 [S]

B-168

8642-NCAP-38

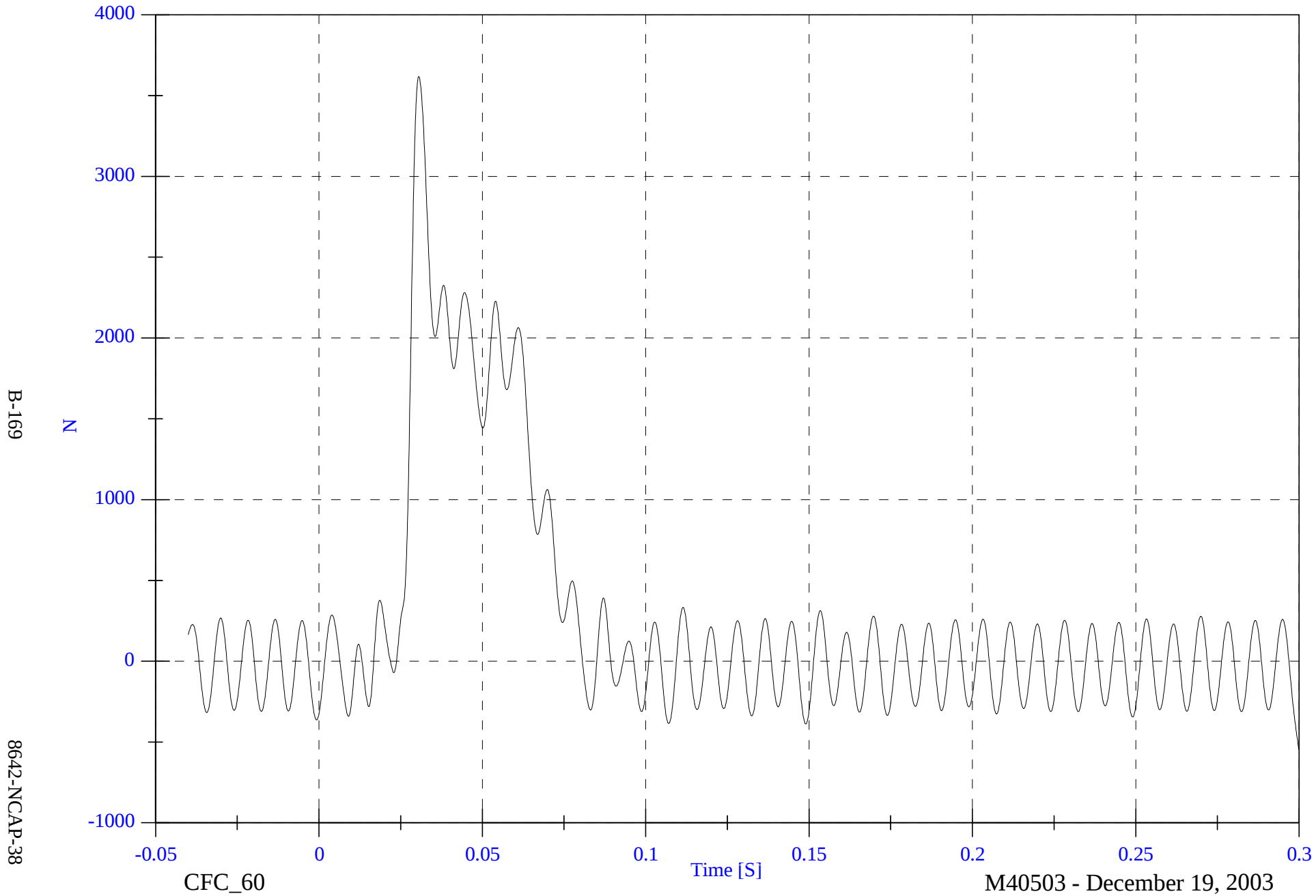


2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCC9 Fx

Max: 3617.5 [N] at 0.030 [S]

Min: -544.3 [N] at 0.300 [S]

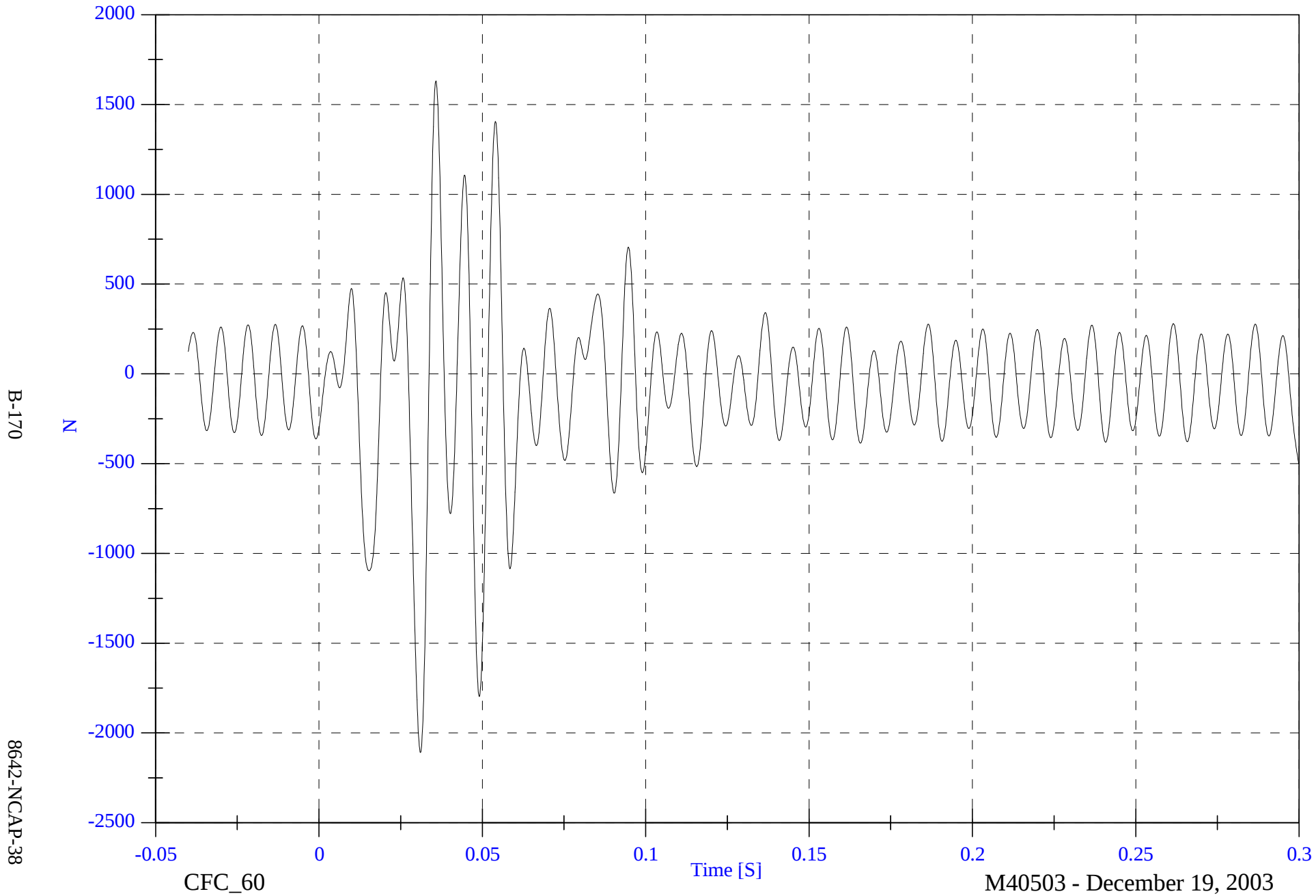


2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCD1 Fx

Max: 1631.1 [N] at 0.036 [S]

Min: -2108.1 [N] at 0.031 [S]

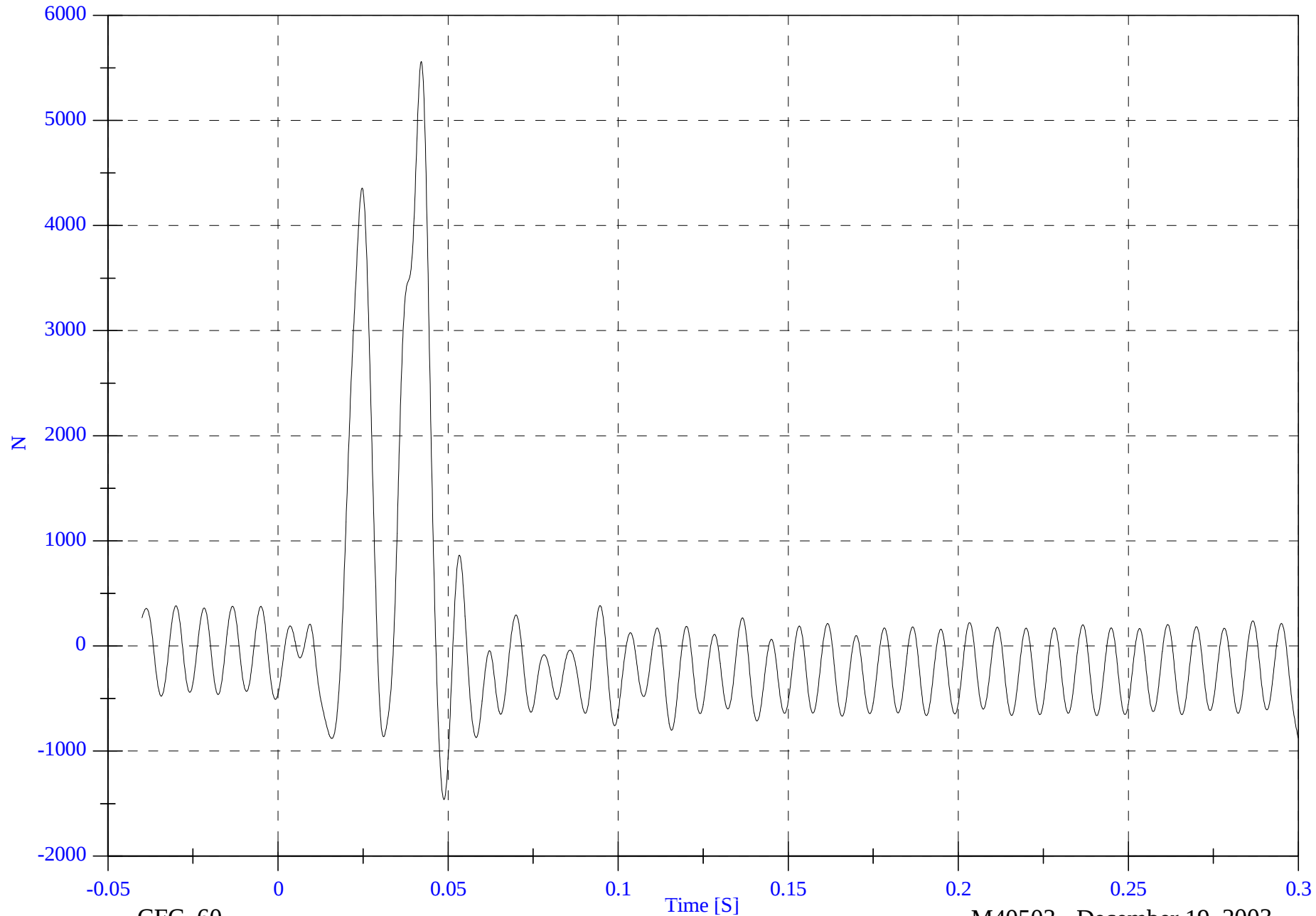


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 5561.0 [N] at 0.042 [S]

Min: -1460.7 [N] at 0.049 [S]

B1 LCD2 Fx



B-171

8642-NCAP-38

CFC_60

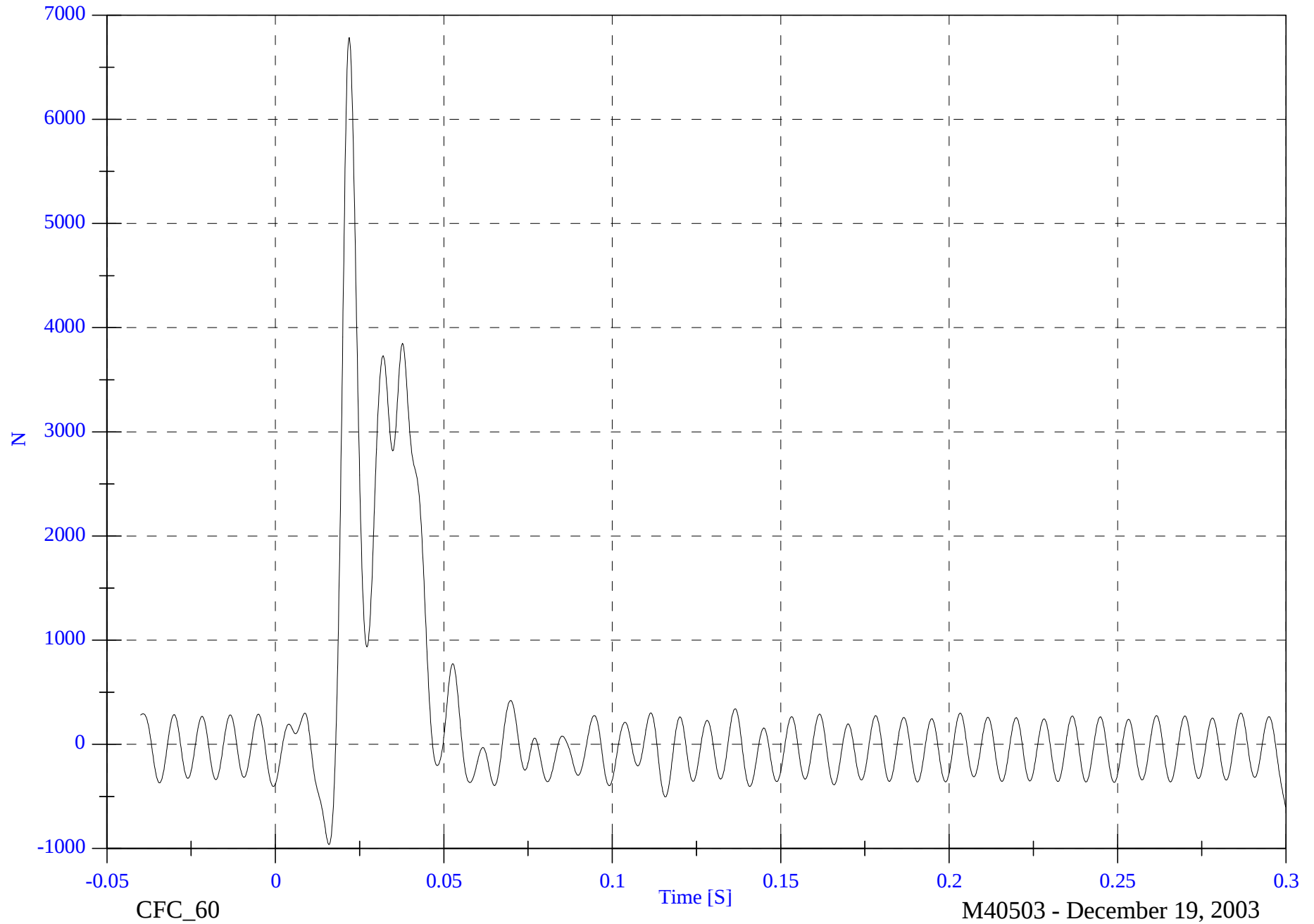
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 6785.2 [N] at 0.022 [S]

B1 LCD3 Fx

Min: -961.6 [N] at 0.016 [S]



B-172

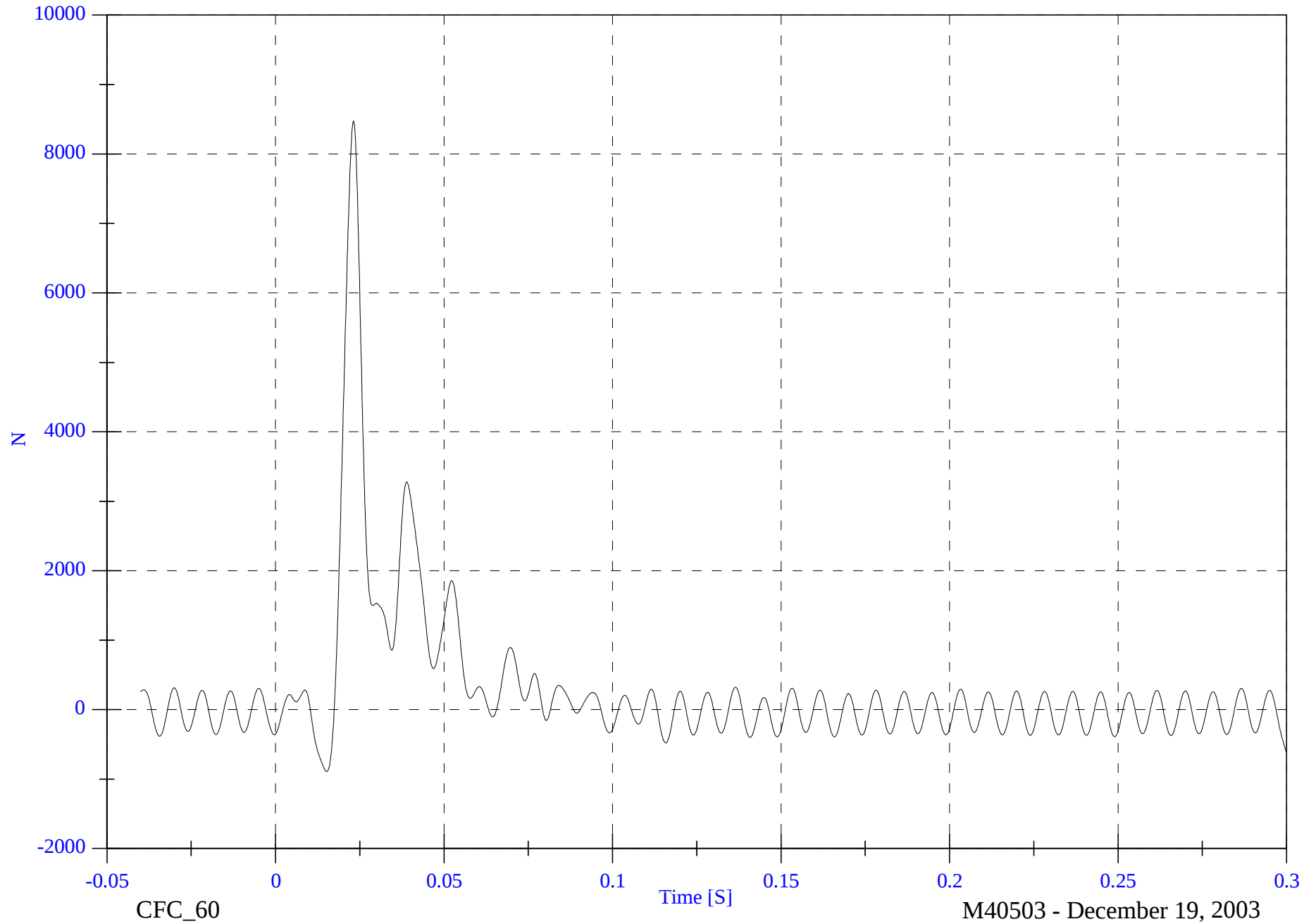
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCD4 Fx

Max: 8476.6 [N] at 0.023 [S]

Min: -890.6 [N] at 0.015 [S]

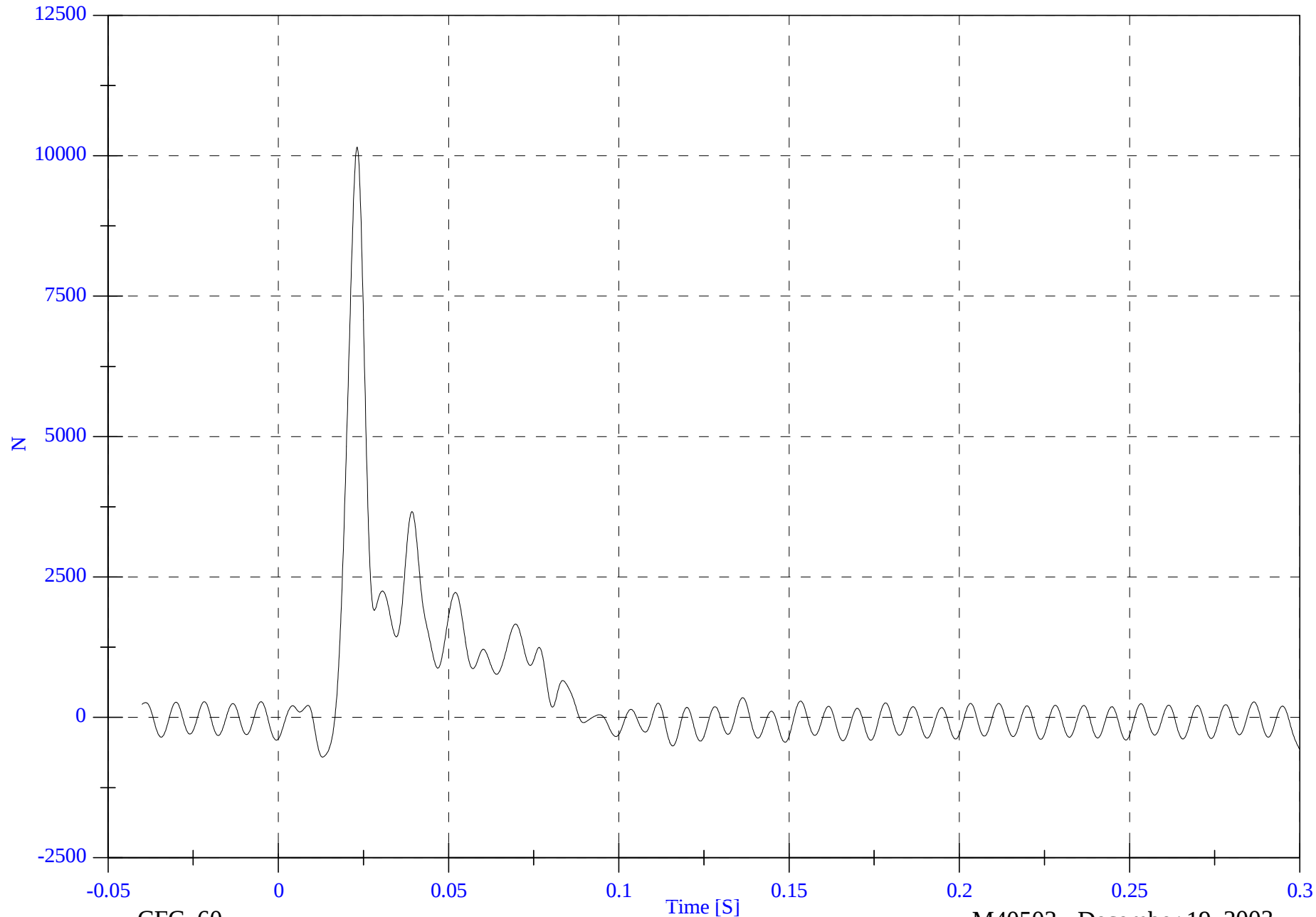


2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 10153.5 [N] at 0.023 [S]

B1 LCD5 Fx

Min: -707.0 [N] at 0.013 [S]



B-174

8642-NCAP-38

CFC_60

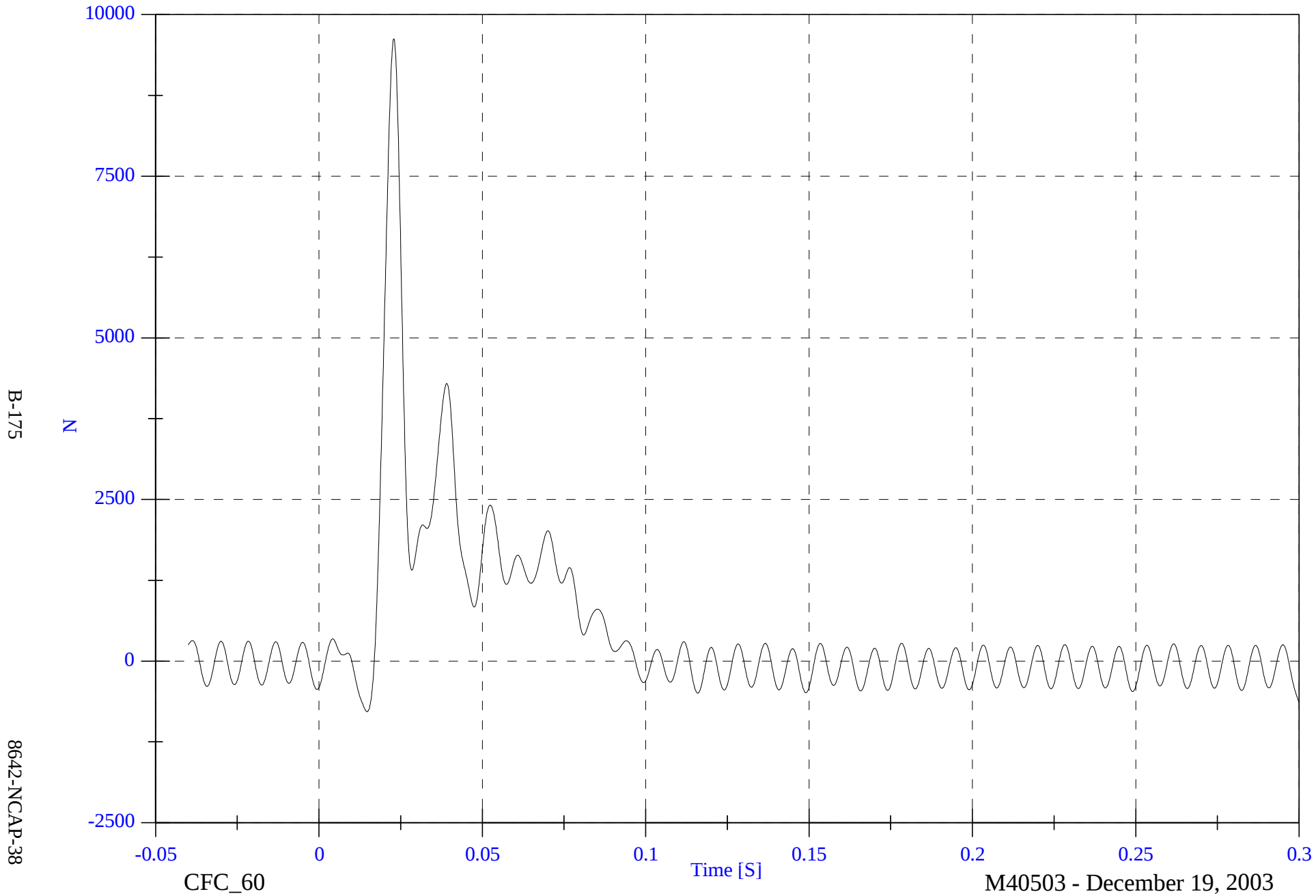
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 9629.0 [N] at 0.023 [S]

B1 LCD6 Fx

Min: -780.9 [N] at 0.015 [S]



2004 NCAP Test 2 - 2004 Hyundai XG350

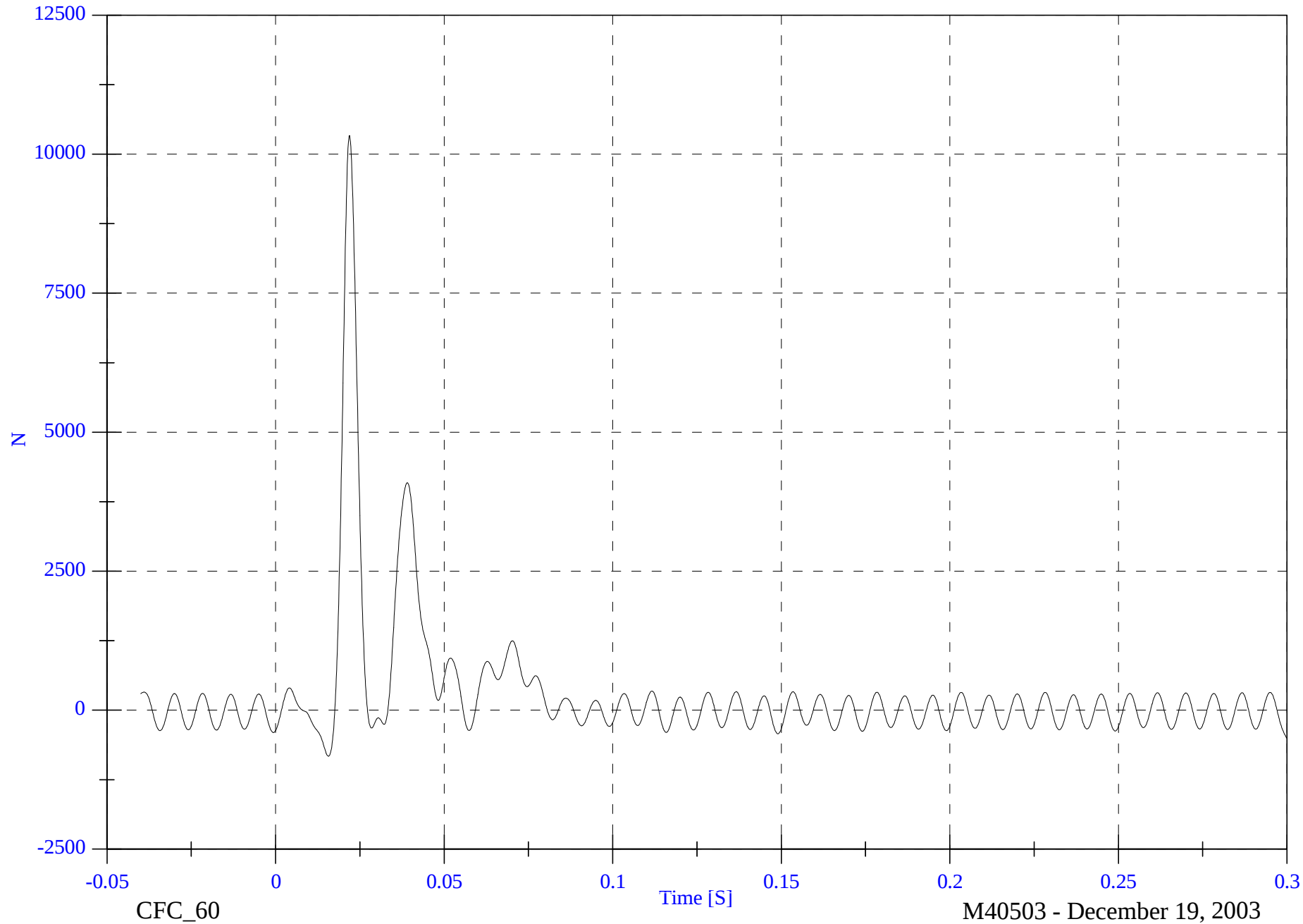
B1 LCD7 Fx

Max: 10336.6 [N] at 0.022 [S]

Min: -828.4 [N] at 0.016 [S]

B-176

8642-NCAP-38

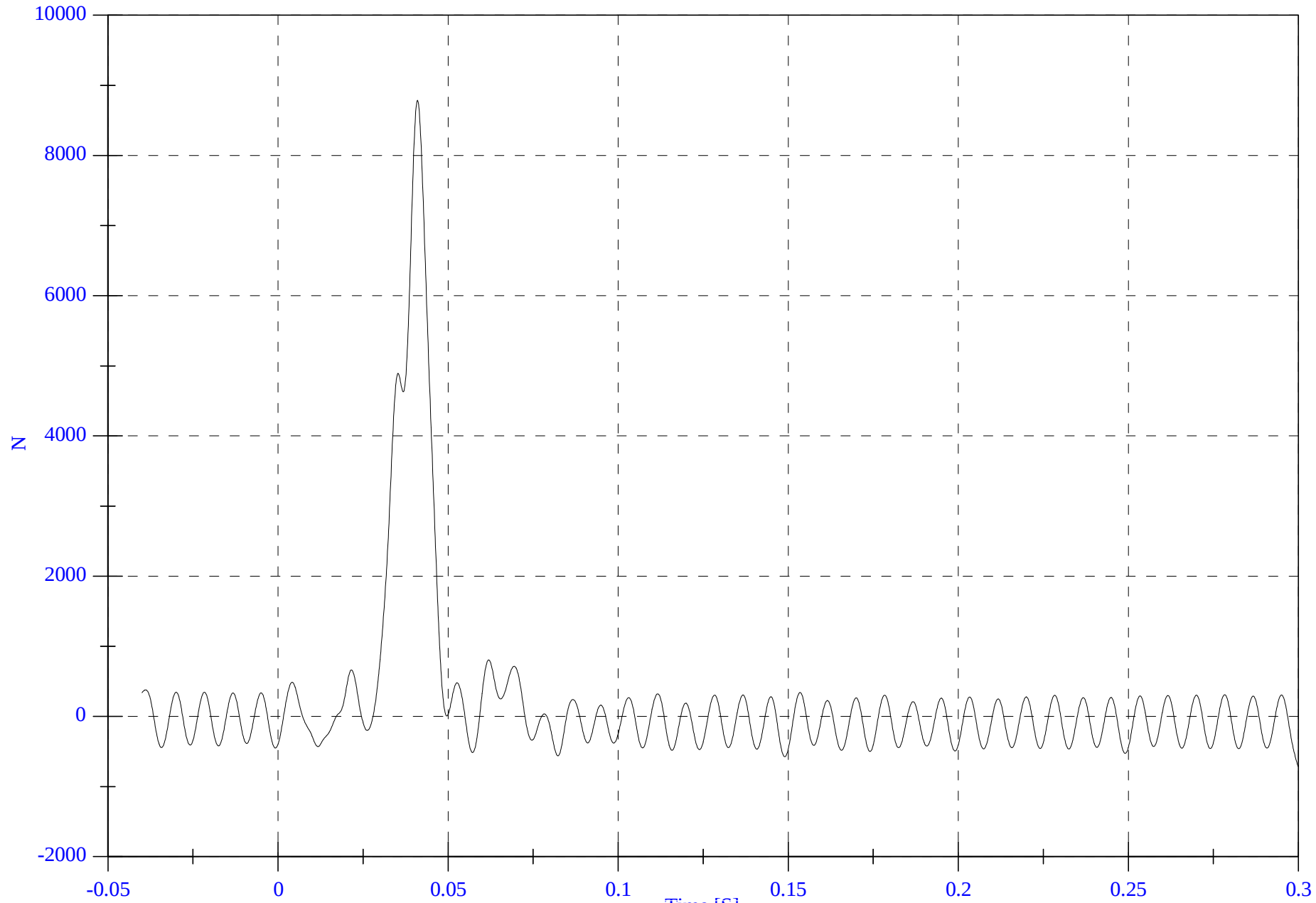


2004 NCAP Test 2 - 2004 Hyundai XG350

B1 LCD8 Fx

Max: 8788.5 [N] at 0.041 [S]

Min: -714.3 [N] at 0.300 [S]



B-177

8642-NCAP-38

CFC_60

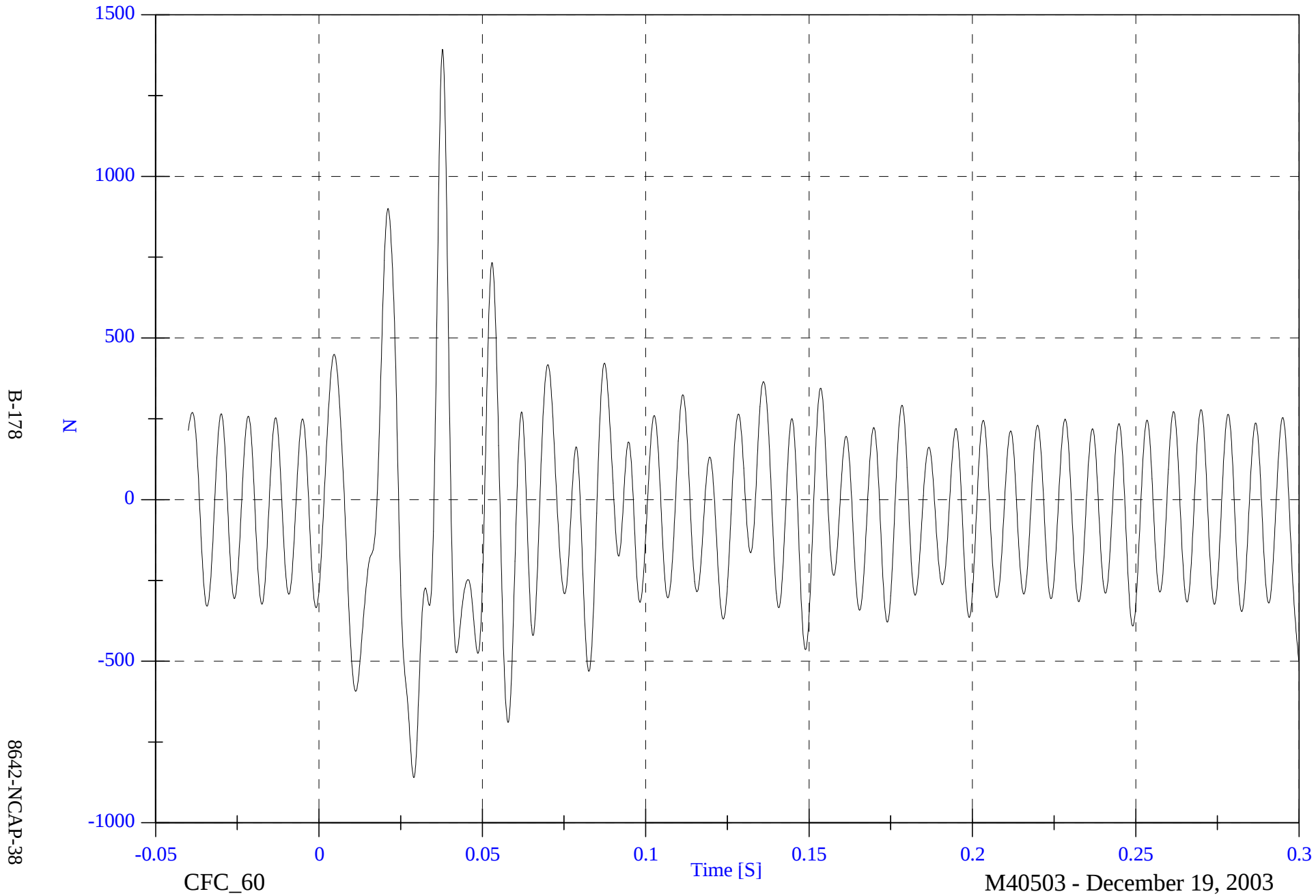
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 1392.9 [N] at 0.038 [S]

B1 LCD9 Fx

Min: -860.4 [N] at 0.029 [S]

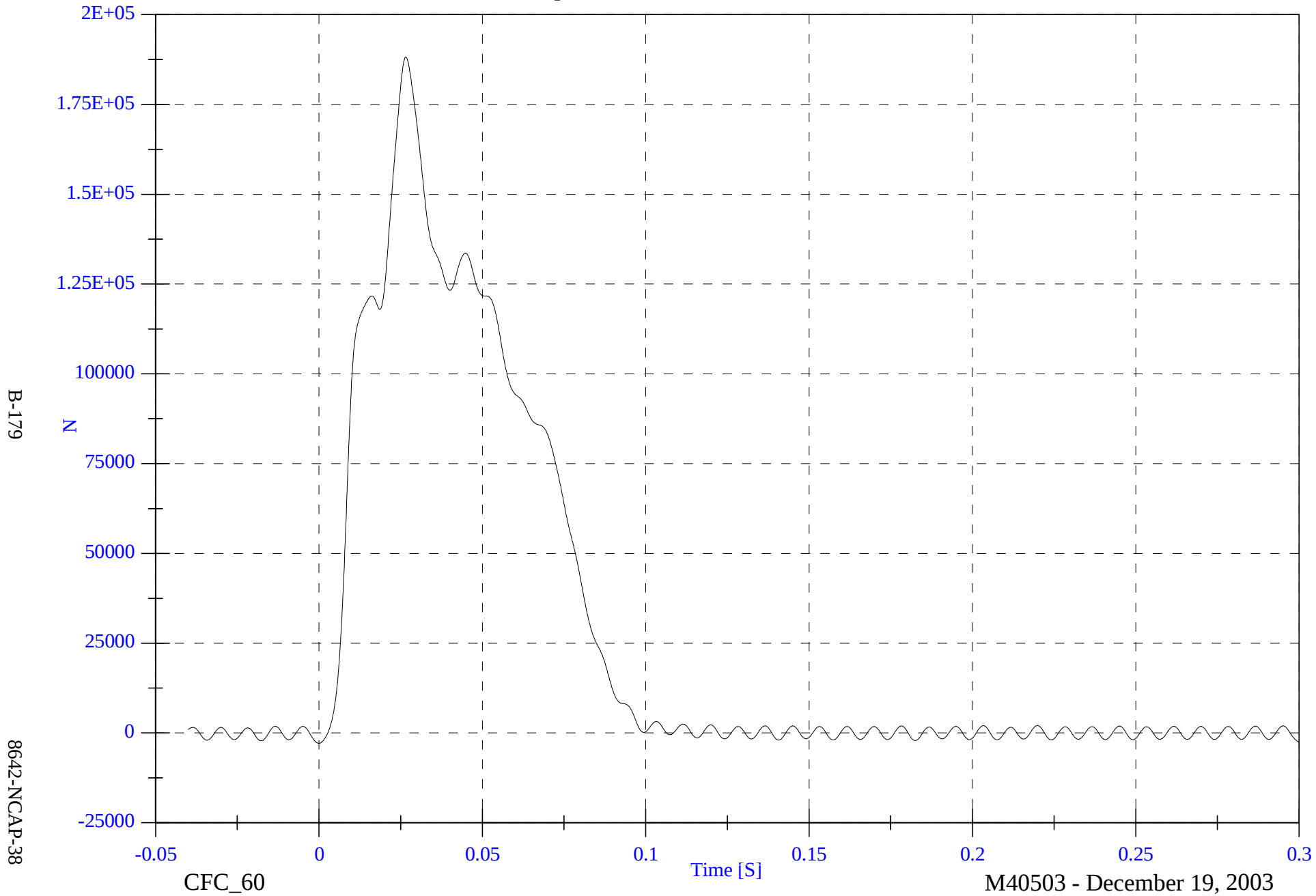


2004 NCAP Test 2 - 2004 Hyundai XG350

Group 1 Load Cell Sum (A1,A2,A3,B1,B2,B3)

Max: 188221.4 [N] at 0.027 [S]

Min: -2868.8 [N] at -0.000 [S]

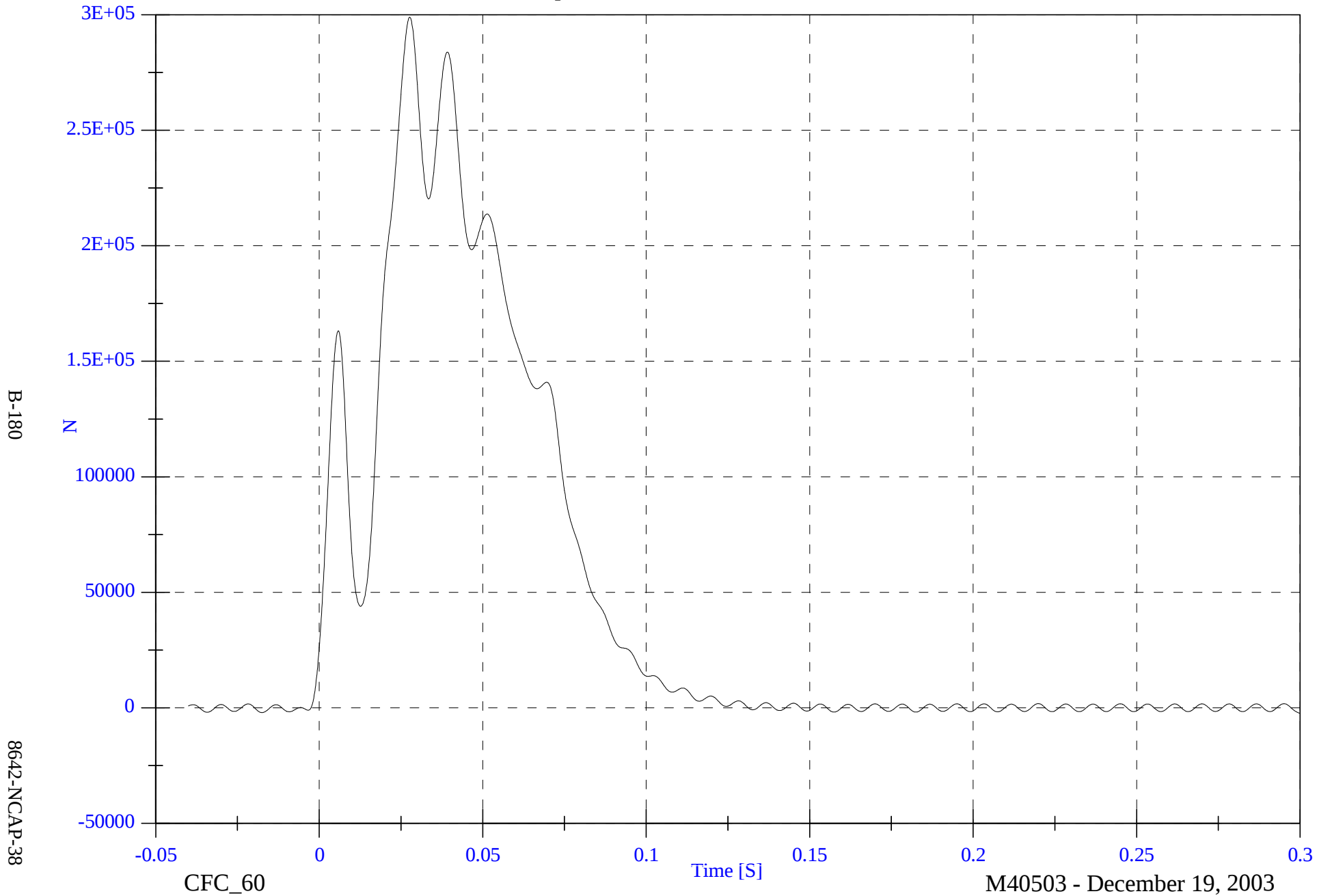


2004 NCAP Test 2 - 2004 Hyundai XG350

Group 2 Load Cell Sum (A4,A5,A6,B4,B5,B6)

Max: 298959.0 [N] at 0.028 [S]

Min: -2365.5 [N] at 0.300 [S]

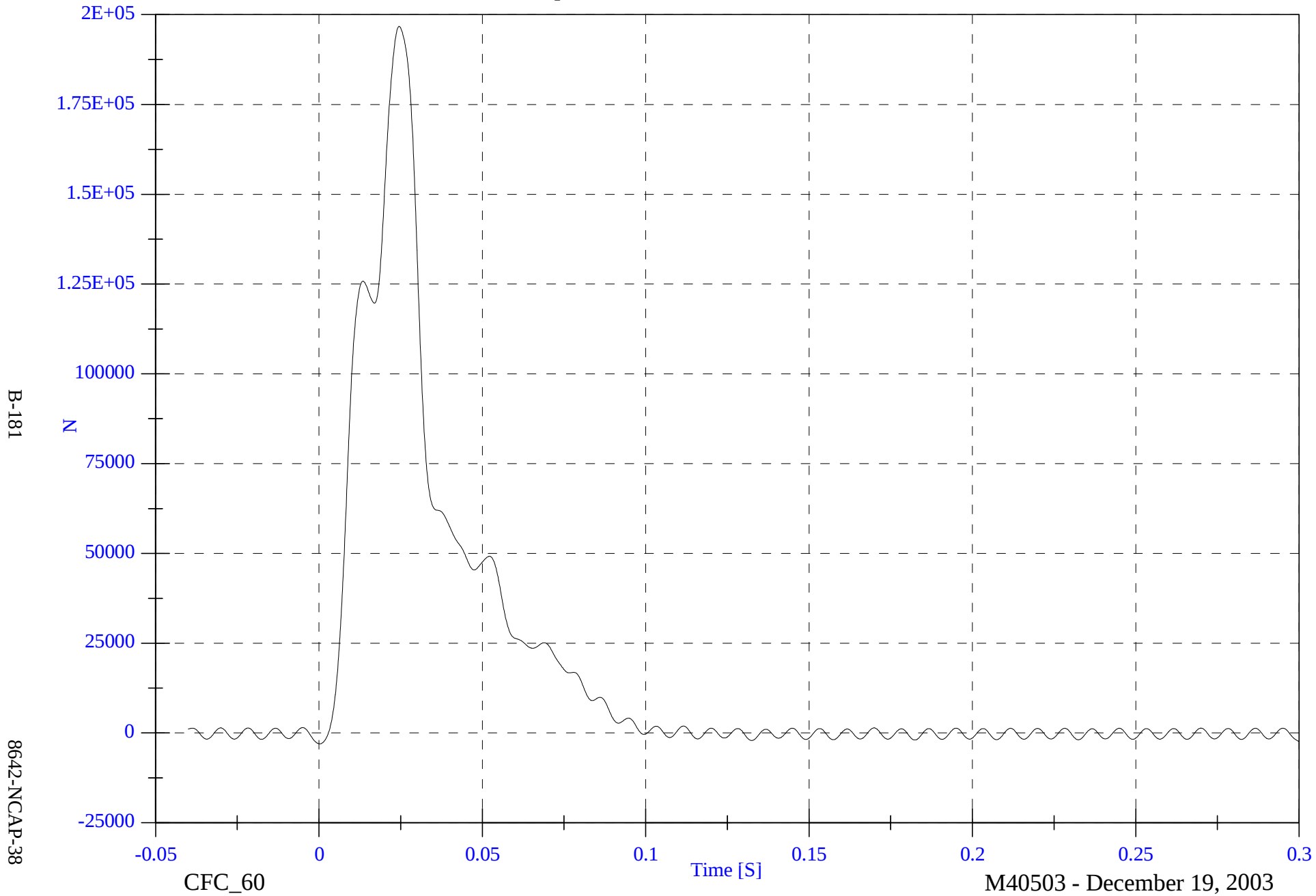


2004 NCAP Test 2 - 2004 Hyundai XG350

Group 3 Load Cell Sum (A7,A8,A9,B7,B8,B9)

Max: 196741.4 [N] at 0.024 [S]

Min: -3029.5 [N] at 0.000 [S]

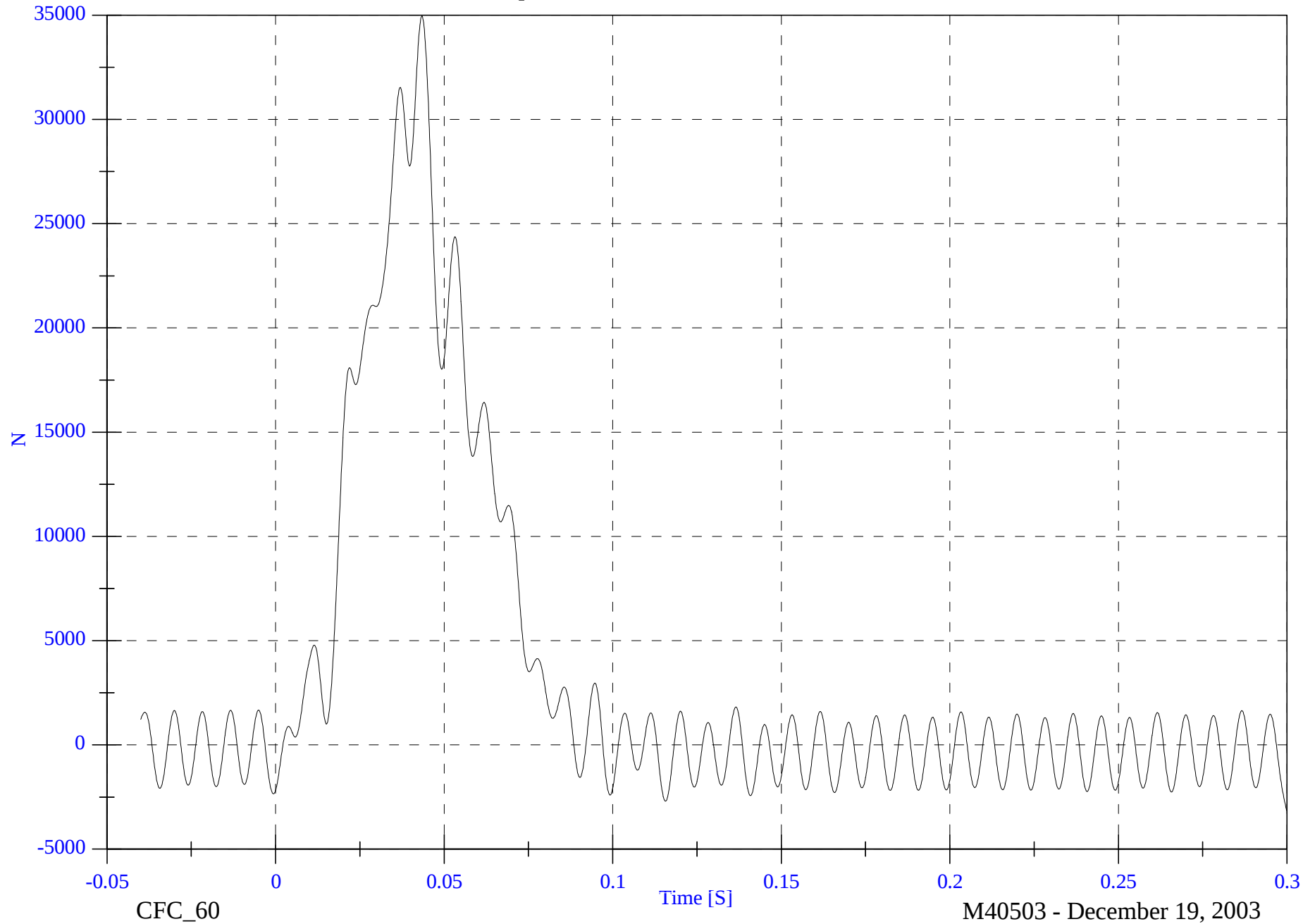


2004 NCAP Test 2 - 2004 Hyundai XG350

Group 4 Load Cell Sum (C1,C2,C3,D1,D2,D3)

Max: 34961.1 [N] at 0.043 [S]

Min: -3143.9 [N] at 0.300 [S]



B-182

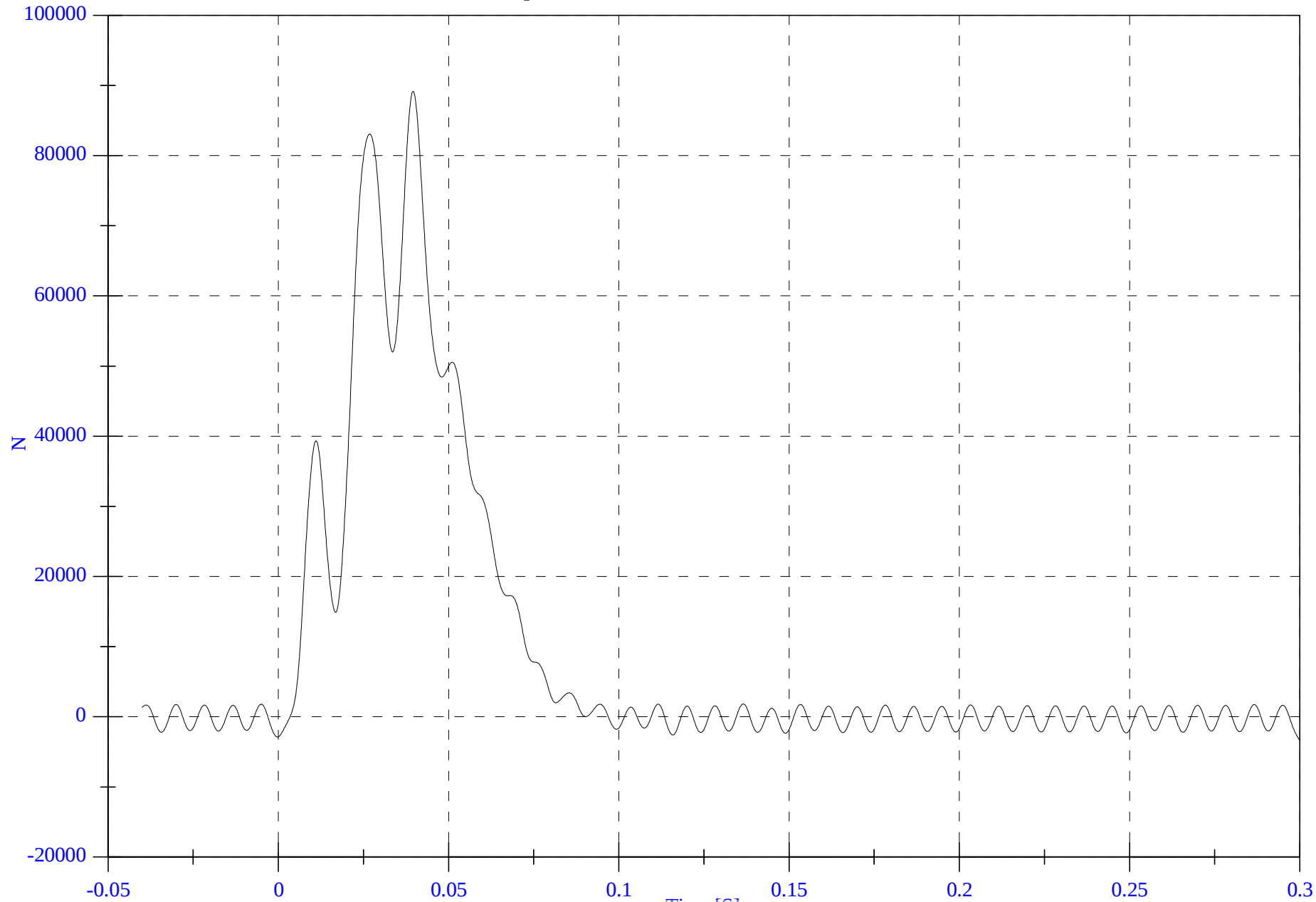
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

Group 5 Load Cell Sum (C4,C5,C6,D4,D5,D6)

Max: 89175.6 [N] at 0.040 [S]

Min: -3326.8 [N] at 0.300 [S]



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CFC_60

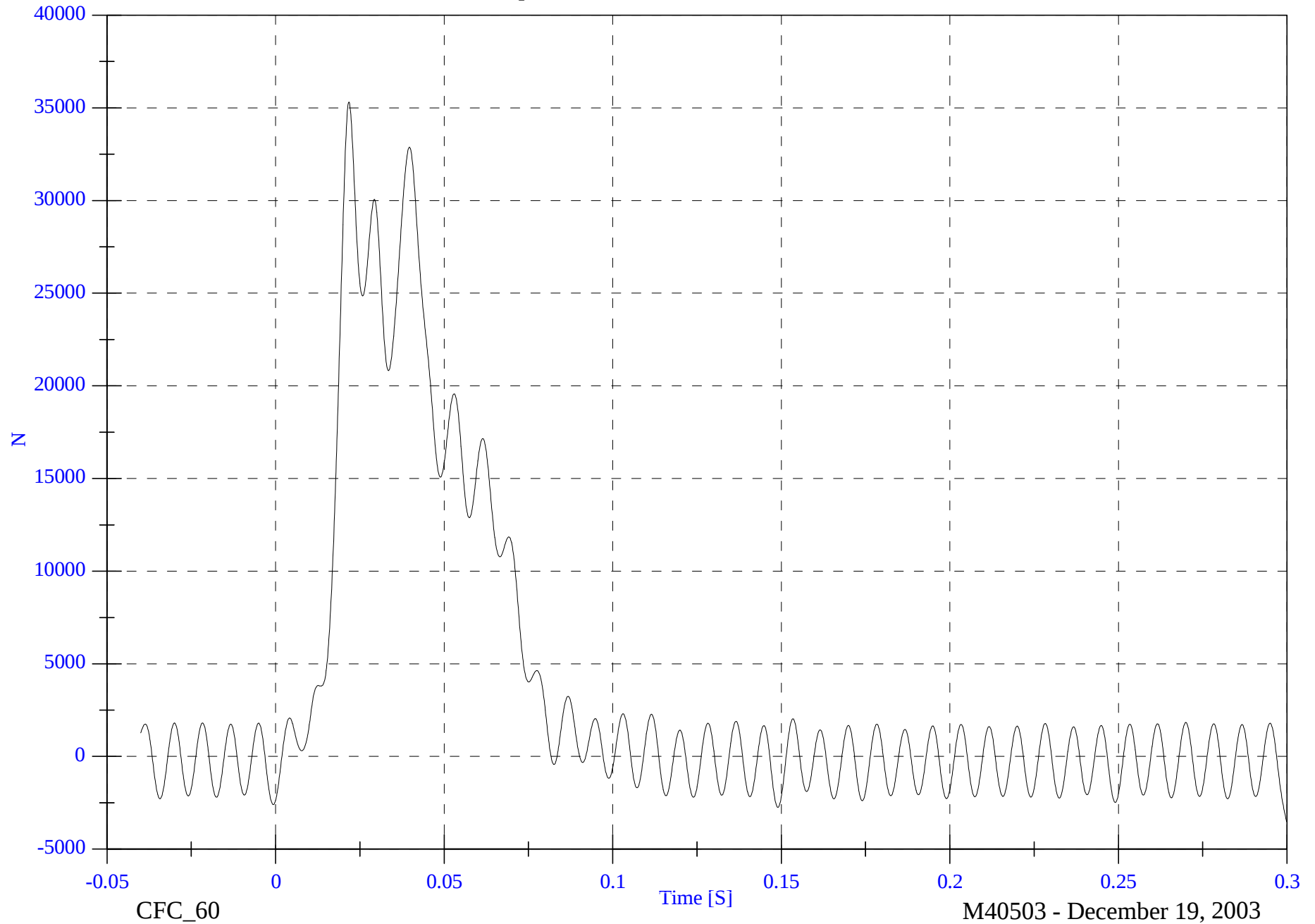
M40503 - December 19, 2003

2004 NCAP Test 2 - 2004 Hyundai XG350

Group 6 Load Cell Sum (C7,C8,C9,D7,D8,D9)

Max: 35314.4 [N] at 0.022 [S]

Min: -3523.0 [N] at 0.300 [S]



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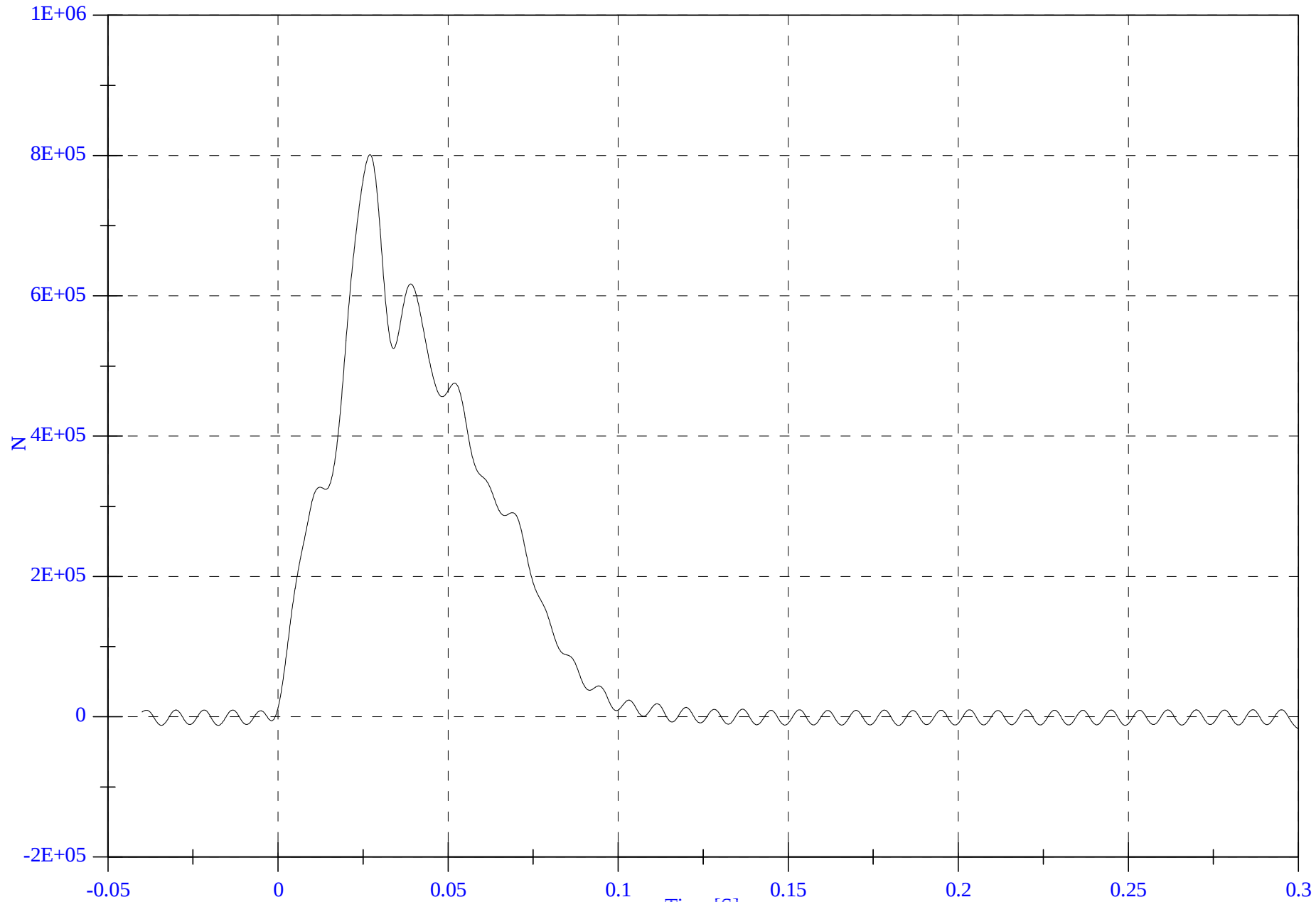
8642-NCAP-38

2004 NCAP Test 2 - 2004 Hyundai XG350

Max: 801270.8 [N] at 0.027 [S]

Total Load Cell Sum (All 6 Groups)

Min: -17262.2 [N] at 0.300 [S]



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CFC_60

M40503 - December 19, 2003

APPENDIX C

PART 572B/E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA SHEETS

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of General Dynamics . A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

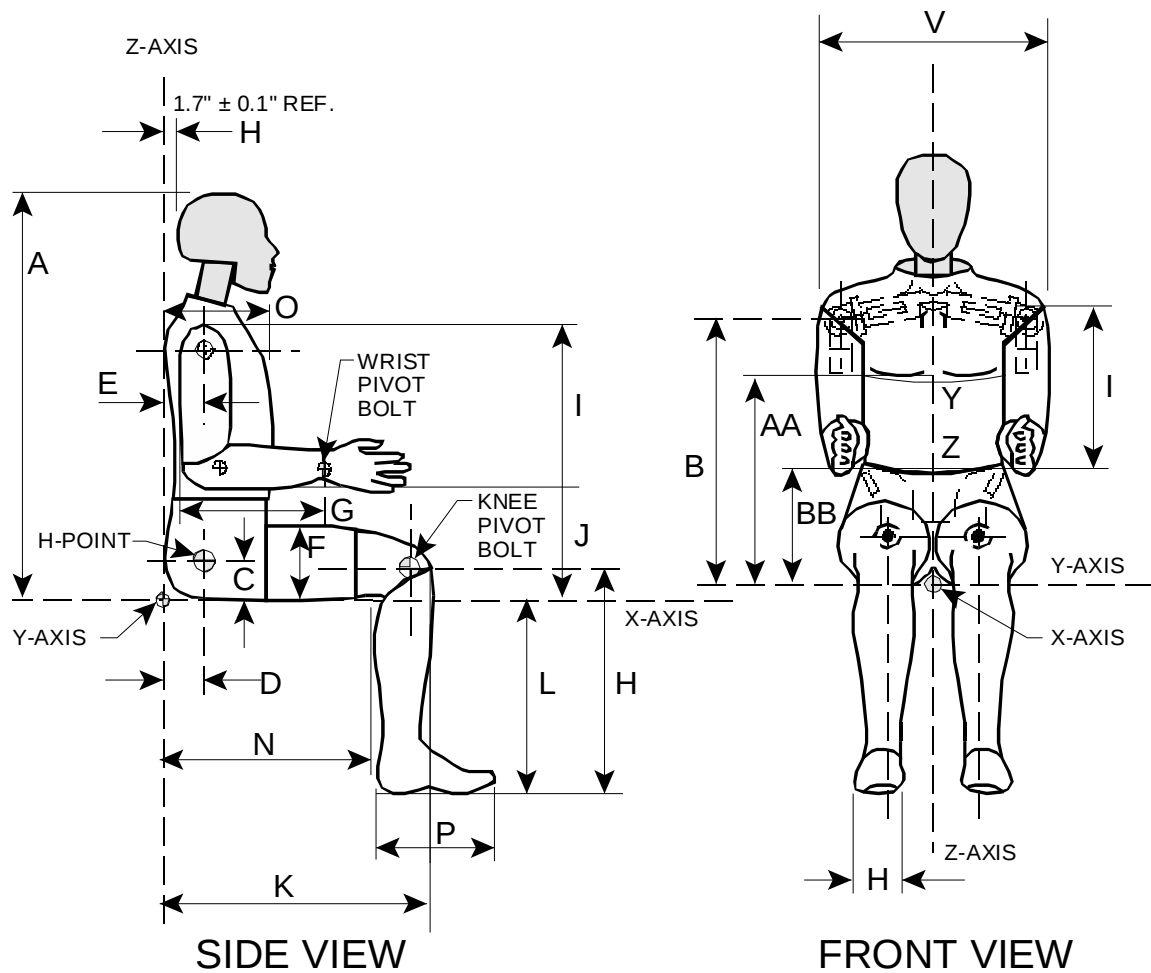
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	December 1, 2003
#2/Right Front Passenger	064	December 1, 2003

Electronic Test Equipment

The complement of signal conditioning, recording and display equipment, in conjunction with dummy certification testing, can be found in New Car Assessment and Standards Inducant Testing Final Report No. 6525-V-1.

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude.
(REF: S572.31(A)(6))

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 2
Date 11/24/2003
Workfile 061H 11-24-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	38.0
Peak Resultant Acceleration	225-275 G's	242.02
Peak Lateral Acceleration	15 G's Max	5.62
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	2	
Date	11/25/2003	6 Axis Neck Transducer
Workfile	061NF 11-25-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	37.00
Impact Velocity		22.60 - 23.40 Ft/s	23.06
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.67
	20 ms	17.60 - 22.60 G's	20.68
	30 ms	12.50 - 18.50 G's	16.12
Max Pendulum G's Above 30 ms		29 G's Max	16.12
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	39.90
D Plane Rotation	Max	64 - 78 Deg	65.29
	Time	57 - 64 ms	58.70
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	105.02
	Time	47 - 58 ms	51.70
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.10
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	98.40

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	2	
Date	11/25/2003	6 Axis Neck Transducer
Workfile	061NE 11-25-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.0
Relative Humidity		10% - 70%	37.0
Impact Velocity		19.50 - 20.30 Ft/s	19.85
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.44
	20 ms	14.00 - 19.00 G's	16.35
	30 ms	11.00 - 16.00 G's	11.64
Max Pendulum G's Above 30 ms		22 G's Max	11.64
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	45.00
D Plane Rotation	Max	81 - 106 Deg	89.88
	Time	72 - 82 ms	76.20
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-58.84
	Time	65 - 79 ms	69.60
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	156.30
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	139.40

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 2
Date 11/26/2003
Workfile 061T 11-26-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	27.00
Pendulum Velocity	21.6 - 22.4 Ft/s	23.35
Maximum Deflection	2.50 - 2.86 in	2.61
Maximum Resistive Force	1160 - 1325 Lbs	1279.80
Internal Hysteresis	69 - 85 %	76.53

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 2
Date 12/01/2003
Workfile 061LF 12-01-03/061RF 12-01-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	35.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1176.83
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	35.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1104.71

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 2
Date 12/01/2003

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70.0
Relative Humidity			35.0
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.5
Chest Depth	O	8.4 - 9.0 in	8.4
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.9
Thigh Clearance	F	5.5 - 6.1 in	6.1
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.8
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.5
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.1
Elbow Rest Height	J	7.5 - 8.3 in	7.7
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.4
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 064
Sequential Test Number 2
Date 11/24/2003
Workfile 064H 11-24-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	38.0
Peak Resultant Acceleration	225-275 G's	245.44
Peak Lateral Acceleration	15 G's Max	12.76
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	2	
Date	11/25/2003	6 Axis Neck Transducer
Workfile	064NF1 11-25-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	37.00
Impact Velocity		22.60 - 23.40 Ft/s	22.87
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.55
	20 ms	17.60 - 22.60 G's	20.53
	30 ms	12.50 - 18.50 G's	15.03
Max Pendulum G's Above 30 ms		29 G's Max	15.03
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	41.30
D Plane Rotation	Max	64 - 78 Deg	64.84
	Time	57 - 64 ms	58.00
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	76.84
	Time	47 - 58 ms	51.30
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.40
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.80

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	2	
Date	11/25/2003	6 Axis Neck Transducer
Workfile	064NE2 11-25-03	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	37.00
Impact Velocity		19.50 - 20.30 Ft/s	19.85
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.18
	20 ms	14.00 - 19.00 G's	16.95
	30 ms	11.00 - 16.00 G's	13.61
Max Pendulum G's Above 30 ms		22 G's Max	13.88
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	40.40
D Plane Rotation	Max	81 - 106 Deg	90.73
	Time	72 - 82 ms	75.10
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-50.39
	Time	65 - 79 ms	70.20
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	151.50
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	133.80

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 2
Date 11/26/2003
Workfile 064T1 11-26-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	27.00
Pendulum Velocity	21.6 - 22.4 Ft/s	22.33
Maximum Deflection	2.50 - 2.86 in	2.55
Maximum Resistive Force	1160 - 1325 Lbs	1311.25
Internal Hysteresis	69 - 85 %	74.96

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 2
Date 12/01/2003
Workfile 064LF 12-01-03/064RF 12-01-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	35.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1211.77
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	35.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1198.09

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 2
Date 12-01-03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70.0
Relative Humidity			35.0
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.6
Chest Depth	O	8.4 - 9.0 in	8.5
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.3
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.4
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.3
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician:

B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENDEVCO	AC-P21399	6-Nov-03	6-May-04
	X Arm Z	ENDEVCO	AC-P23282	11-Nov-03	11-May-04
	Y Arm X	ENDEVCO	AC-P23155	11-Nov-03	11-May-04
	Y Arm Z	ENDEVCO	AC-P23358	6-Nov-03	6-May-04
	Z Arm X	ENDEVCO	AC-P18731	11-Nov-03	11-May-04
	Z Arm Y	ENDEVCO	AC-P23885	11-Nov-03	11-May-04
Head	X	ENDEVCO	AC-P18516	11-Nov-03	11-May-04
	Y	ENDEVCO	AC-P19222	11-Nov-03	11-May-04
	Z	ENDEVCO	AC-P18785	11-Nov-03	11-May-04
Head	X (R)	ENDEVCO	AC-P18663	11-Nov-03	11-May-04
	Y (R)	ENDEVCO	AC-P18639	11-Nov-03	11-May-04
	Z (R)	ENDEVCO	AC-P18537	11-Nov-03	11-May-04
Neck Load Cell	X	DENTON	LC-076FX	24-Sep-03	24-Mar-04
	Y	DENTON	LC-076FY	24-Sep-03	24-Mar-04
	Z	DENTON	LC-076FZ	24-Sep-03	24-Mar-04
Neck Moment	X	DENTON	LC-076MX	24-Sep-03	24-Mar-04
	Y	DENTON	LC-076MY	24-Sep-03	24-Mar-04
	Z	DENTON	LC-076MZ	24-Sep-03	24-Mar-04
Chest	X	ENDEVCO	AC-P21373	30-Oct-03	29-Apr-04
	Y	ENDEVCO	AC-P22639	30-Oct-03	29-Apr-04
	Z	ENDEVCO	AC-P21297	30-Oct-03	29-Apr-04
Chest	X (R)	ENDEVCO	AC-P21171	30-Oct-03	29-Apr-04
	Y (R)	ENDEVCO	AC-P23136	30-Oct-03	29-Apr-04
	Z (R)	ENDEVCO	AC-P23128	30-Oct-03	29-Apr-04
Chest Deflection	X	SERVO	DS-061	11-Nov-03	11-May-04
Pelvic	X	ENDEVCO	AC-P18792	11-Nov-03	11-May-04
	Y	ENDEVCO	AC-P17535	11-Nov-03	11-May-04
	Z	ENDEVCO	AC-P23134	11-Nov-03	11-May-04

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	DENTON	LC-231	3-Dec-03	2-Jun-04
Right Femur Load Cell	Fz	DENTON	LC-232	3-Dec-03	2-Jun-04
Left Upper Tibia	Mx	DENTON	LC-038MX	26-Sep-03	26-Mar-04
	My	DENTON	LC-038MY	26-Sep-03	26-Mar-04
Left Lower Tibia	Fz	DENTON	LC-124FZ	26-Sep-03	26-Mar-04
	Mx	DENTON	LC-124MX	26-Sep-03	26-Mar-04
	My	DENTON	LC-124MY	26-Sep-03	26-Mar-04
Right Upper Tibia	Mx	DENTON	LC-023MX	26-Sep-03	26-Mar-04
	My	DENTON	LC-023MY	26-Sep-03	26-Mar-04
Right Lower Tibia	Fz	DENTON	LC-111FZ	26-Sep-03	26-Mar-04
	Mx	DENTON	LC-111MX	26-Sep-03	26-Mar-04
	My	DENTON	LC-111MY	26-Sep-03	26-Mar-04
Left Foot Rear	X	ENTRAN	AC-00L13-F04	14-Nov-03	14-May-04
	Z	ENTRAN	AC-01G18-F15	14-Nov-03	14-May-04
Left Foot Front	Z	ENTRAN	AC-01G18-F14	14-Nov-03	14-May-04
Right Foot Rear	X	ENTRAN	AC-01G18-F05	14-Nov-03	14-May-04
	Z	ENTRAN	AC-01G18-F03	14-Nov-03	14-May-04
Right Foot Front	Z	ENTRAN	AC-01J02-F09	14-Nov-03	14-May-04
Lap Belt Load Cell		LEBOW	LC-706	8-Oct-03	7-Apr-04

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENDEVCO	AC-P18532	20-Nov-03	20-May-04
	X Arm Z	ENDEVCO	AC-P17237	20-Nov-03	20-May-04
	Y Arm X	ENDEVCO	AC-P16662	20-Nov-03	20-May-04
	Y Arm Z	ENDEVCO	AC-P17299	20-Nov-03	20-May-04
	Z Arm X	ENDEVCO	AC-P21441	20-Nov-03	20-May-04
	Z Arm Y	ENDEVCO	AC-P21516	20-Nov-03	20-May-04
Head	X	ENDEVCO	AC-J32184	3-Nov-03	3-May-04
	Y	ENDEVCO	AC-J32185	30-Oct-03	29-Apr-04
	Z	ENDEVCO	AC-J31011	3-Nov-03	3-May-04
Head	X (R)	ENDEVCO	AC-J31020	3-Nov-03	3-May-04
	Y (R)	ENDEVCO	AC-J31101	3-Nov-03	3-May-04
	Z (R)	ENDEVCO	AC-J31059	3-Nov-03	3-May-04
Neck Load Cell	X	DENTON	LC-1634FX	18-Aug-03	16-Feb-04
	Y	DENTON	LC-1634FY	18-Aug-03	16-Feb-04
	Z	DENTON	LC-1634FZ	18-Aug-03	16-Feb-04
Neck Moment	X	DENTON	LC-1634MX	18-Aug-03	16-Feb-04
	Y	DENTON	LC-1634MY	18-Aug-03	16-Feb-04
	Z	DENTON	LC-1634MZ	18-Aug-03	16-Feb-04
Chest	X	ENDEVCO	AC-J31066	3-Nov-03	3-May-04
	Y	ENDEVCO	AC-J33018	3-Nov-03	3-May-04
	Z	ENDEVCO	AC-J32783	3-Nov-03	3-May-04
Chest	X (R)	ENDEVCO	AC-J34019	3-Nov-03	3-May-04
	Y (R)	ENDEVCO	AC-P16979	3-Nov-03	3-May-04
	Z (R)	ENDEVCO	AC-J31022	3-Nov-03	3-May-04
Chest Deflection	X	SERVO	DS-064	20-Nov-03	20-May-04
Pelvic	X	ENDEVCO	AC-P23174	30-Oct-03	29-Apr-04
	Y	ENDEVCO	AC-P23164	30-Oct-03	29-Apr-04
	Z	ENDEVCO	AC-P23137	30-Oct-03	29-Apr-04

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	GSE	LC-723	3-Dec-03	2-Jun-04
Right Femur Load Cell	Fz	GSE	LC-955	3-Dec-03	2-Jun-04
Left Upper Tibia	Mx	DENTON	LC-045MX	26-Sep-03	26-Mar-04
	My	DENTON	LC-045MY	26-Sep-03	26-Mar-04
Left Lower Tibia	Fz	DENTON	LC-125FZ	26-Sep-03	26-Mar-04
	Mx	DENTON	LC-125MX	26-Sep-03	26-Mar-04
	My	DENTON	LC-125MY	26-Sep-03	26-Mar-04
Right Upper Tibia	Mx	DENTON	LC-016MX	26-Sep-03	26-Mar-04
	My	DENTON	LC-016MY	26-Sep-03	26-Mar-04
Right Lower Tibia	Fz	DENTON	LC-123FZ	26-Sep-03	26-Mar-04
	Mx	DENTON	LC-123MX	26-Sep-03	26-Mar-04
	My	DENTON	LC-123MY	26-Sep-03	26-Mar-04
Left Foot Rear	X	ENDEVCO	AC-J18059	4-Dec-03	3-Jun-04
	Z	ENDEVCO	AC-J36176	4-Dec-03	3-Jun-04
Left Foot Front	Z	ENDEVCO	AC-J18662	4-Dec-03	3-Jun-04
Right Foot Rear	X	ENDEVCO	AC-AJ8C0	4-Dec-03	3-Jun-04
	Z	ENDEVCO	AC-J19868	4-Dec-03	3-Jun-04
Right Foot Front	Z	ENDEVCO	AC-J34378	4-Dec-03	3-Jun-04
Lap Belt Load Cell		LEBOW	LC-707	8-Oct-03	7-Apr-04

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	GS SENSORS	AC-9440-023	3-Dec-03	2-Jun-04
Right Rear Seat Crossmember X	GS SENSORS	AC-9444-038	3-Dec-03	2-Jun-04
Top of Engine	ICS	AC-8084-020	4-Dec-03	3-Jun-04
Bottom of Engine	ICS	AC-8062-003	11-Dec-03	10-Jun-04
Right Disc Brake Caliper	ICS	AC-8086-047	11-Dec-03	10-Jun-04
Instrument Panel	GS SENSORS	AC-9440-034	3-Dec-03	2-Jun-04
Left Disc Brake Caliper	ICS	AC-8084-023	11-Dec-03	10-Jun-04
Left Seat Rear Crossmember Z	GS SENSORS	AC-9440-046	3-Dec-03	2-Jun-04
Right Seat Rear Crossmember Z	GS SENSORS	AC-9440-029	3-Dec-03	2-Jun-04

REPORT NUMBER: CAL-04-02

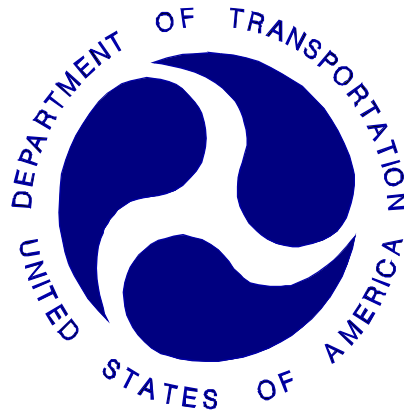
NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

EVENFLO VANGUARD 5 LATCH AND TOP TETHER
BRITAX ROUNDABOUT LATCH AND TOP TETHER

NHTSA NUMBER: M40503

GENERAL DYNAMICS REPORT NUMBER: 8642-NCAP-38

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December 19, 2003

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
Mail Code: NVS-111
400 Seventh Street, SW, Room No. 5313
Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-01-D-32005. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

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TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. CAL-04-02		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of Evenflo Vanguard 5 LATCH and top Tether Convertible and Britax Roundabout LATCH and top Tether Convertible NHTSA No.: M40503				5. Report Date December 19, 2003	
				6. Performing Organization Code CAL	
7. Author(s) Lawrence Q. Valvo, Project Engineer David J. Travale, Program Manager				8. Performing Organization Report No. 8642-NCAP-38	
9. Performing Organization Name and Address General Dynamics Advance Information Engineering Services Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-01-D-32005	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NVS-111 400 Seventh SW, Room 5313 Washington, D.C. 20590				13. Type of Report and Period Covered Final Report December 2003 – January 2004	
				14. Sponsoring Agency Code NVS-111	
15. Supplementary Notes					
16. Abstract This CRS test was performed in conjunction with a New Car Assessment Program (NCAP) load cell barrier test. An Evenflo Vanguard 5 forward facing convertible CRS was secured in Position 3 (P3) with the LATCH system and top tether. A Britax Roundabout forward facing convertible CRS was secured in Position 4 (P4) with the LATCH system and top tether. This test was conducted at the General Dynamics Crash Test Facility in Buffalo, New York, on December 19, 2003.					
ATD Position		HIC 15	HIC 36	Clip (3 ms)	
P3 (Right Rear) (044)		634.7	970.3	55.2	
P4 (Left Rear) (142)		777.4	976.2	64.4	
17. Key Words New Car Assessment Program (NCAP)				18. Distribution Statement	
				<u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Technical Reference Division Room 5111 (NAD-52) 400 Seventh St., S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946 ATTN: Robert Hornicle	
19. Security Classification of Report UNCLASSIFIED		20. Security Classification of Page UNCLASSIFIED		21. No. of Pages 147	
22. Price					

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SECTION 1

PURPOSE AND SUMMARY OF TEST M40503

The purpose of this test was to obtain CRS performance data in a frontal impact NCAP condition. The 56.81 kph NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

A forward facing convertible 5-point belt CRS and a 3 year old child dummy (serial no. 044) was secured in the right rear occupant position (Position 3 or P3). A forward facing convertible 5-point belt CRS and a 3 year old child dummy (serial no. 142) was secured in the left rear occupant position (Position 4 or P4). Both 3 Year Old Hybrid III (P572 P) child dummies were instrumented with head, head rear Z-direction, chest, and pelvic triaxial accelerometers, a chest displacement sensor, and upper and lower six axial neck load cells. The dummies were calibrated previous to this test and the certification information is found in section 5.

The right rear child dummy's HIC (15 ms) was 634.7, maximum chest deceleration over 3 ms was 55.2 g's. The left rear child dummy's HIC (15 ms) was 777.4, maximum chest deceleration over 3 ms was 64.4 g's.

SECTION 2
DATA SHEET NO. 1
CRASH TEST SUMMARY

TEST DUMMY INFORMATION:

DESCRIPTION	Position #3 CRS	Position #4 CRS
ATD Type/Serial No.	Hybrid III 3C/044	Hybrid III 3C /142
Restraint System:	Evenflo Vanguard 5 LATCH and top Tether	Britax Roundabout LATCH and top Tether

Number of Data Channels 55

Number of Cameras: 1 Real Time

2 High Speed

POST TEST DOOR OPENING

DESCRIPTION	FRONT	REAR
Left Side Doors	Closed, Latched and Operable without tools	Closed, Latched and Operable without tools
Right Side Doors	Closed, Latched and Operable without tools	Closed, Latched and Operable without tools
Hatch/Other Door	N/A	N/A

POST TEST SEAT DATA

LOCATION	SEAT MOVEMENT (mm)	SEAT BACK FAILURE
P1 (Left Front)	0	None
P2 (Right Front)	0	None
P3 (Right Rear)	0	None
P4 (Left Rear)	0	None

VISIBLE DUMMY CONTACT POINTS

	Position #3 CRS	Position #4 CRS
Head Contact:	The chin to the chest and the back of the head to the top of the child restraint seat back and the vehicle head restraint	The chin to the chest and the back of the head to the top of the child restraint seat back and the vehicle head restraint
Upper Torso Contact:	None	None
Lower Torso Contact:	None	None
Left Knee Contact:	No knee contact; Left foot to P2 seat back	No knee contact; Left foot to P1 seat back
Right Knee Contact:	No knee contact; Right foot to P2 seat back	No knee contact; Right foot to P1 seat back

DATA SHEET NO. 2

CRS PARAMETER DATA

CRS: Evenflo Vanguard 5 LATCH and top Tether/Britax Roundabout LATCH and top Tether

NHTSA No. M40503

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Delivered Weight of Vehicle with Maximum Fluids = 1705.0 kg (A)

AS TESTED WEIGHT OF VEHICLE

(2 P572E + 1 P572P w/ CRS + 1 P572P w/ CRS +CARGO + EQUIPMENT & INSTRUMENTATION):

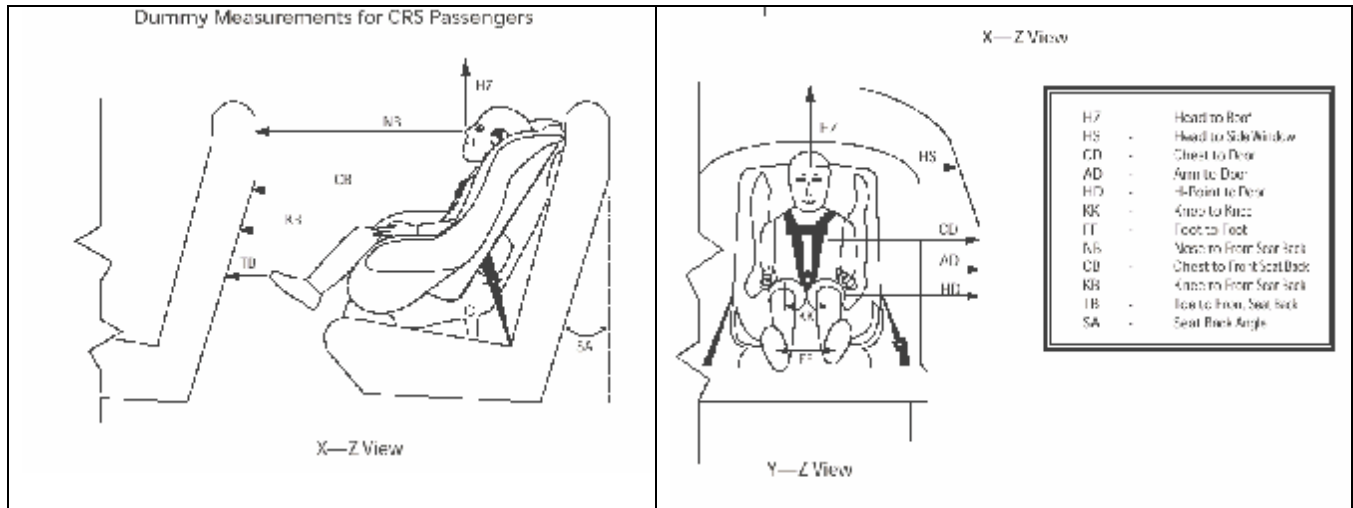
Left Front	=	<u>583.0</u>	kg	Left Rear	=	<u>387.0</u>	kg
Right Front	=	<u>576.0</u>	kg	Right Rear	=	<u>354.5</u>	kg
TOTAL FRONT	=	<u>1159.0</u>	kg	TOTAL REAR	=	<u>741.5</u>	kg
TOTAL TEST WEIGHT =		<u>1900.5</u>	kg				

DATA SHEET NO. 3

CHILD DUMMY POSITIONING IN VEHICLE

CRS: Evenflo Vanguard 5 LATCH and top Tether/Britax Roundabout LATCH and top Tether

NHTSA No. M40503



Measurement	P3 CRS (044)	P4 CRS (142)
SA	23.3	23.3
HS	420	405
CD	383	400
AD	262	275
HD	303	325
HZ	345	296
NB	600	579
CB	580	546
KK	166	179
FF	156	191
KB – LEFT	386	350
KB – RIGHT	385	343
TB – LEFT	107	118
TB – RIGHT	108	112

All dimensions in mm (unless noted)

P3 – Right Rear Passenger (CRS #1)

P4 – Left Rear Passenger (CRS #2)

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES

CRS: Evenflo Vanguard 5 LATCH and top Tether/Britax Roundabout LATCH and top Tether

NHTSA No. M40503

DESCRIPTION	Unit	MAXIMUM VALUE							
		Position #3				Position #4			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	59.7	201.5	-46.4	102.1	32.1	214.8	-32.9	100.3
Head Y	g	4.3	117.1	-22.1	102.0	8.9	99.9	-7.7	104.3
Head Z	g	72.1	79.2	-10.9	46.5	82.8	75.7	-18.8	45.9
Head Resultant	g	75.8	79.2	-	-	85.4	75.7	-	-
Head Rear Z	g	83.7	86.1	-17.2	46.6	123.4†	207.5	-65.4†	61.2
Upper Neck Fx	N	52.0	184.2	-710.5	102.5	44.9	260.3	-683.2	98.7
Upper Neck Fy	N	81.1	61.5	-36.0	214.4	68.3	106.3	-105.7	101.2
Upper Neck Fz	N	2039.3	80.5	-405.6	201.5	2170.3	77.2	-522.0	47.4
Upper Neck F Resultant	N	2107.7	80.6	-	-	2229.5	77.2	-	-
Upper Neck Mx	N-m	5.6	69.0	-5.2	105.9	5.1	102.2	-4.1	79.0
Upper Neck My	N-m	6.6	152.8	-16.4	205.8	10.0	162.5	-16.3	226.3
Upper Neck Mz	N-m	1.5	296.8	-1.6	100.8	1.4	107.4	-3.1	198.6
Upper Neck M Resultant	N-m	16.5	205.8	-	-	16.7	226.3	-	-
Lower Neck Fx	N	182.1	192.4	-859.8	76.0	187.0	210.2	-1564.3	78.3
Lower Neck Fy	N	103.5	65.8	-99.7	96.6	103.9	63.9	-105.3	84.7
Lower Neck Fz	N	1512.4	73.1	-344.7	41.3	1833.6	75.1	-682.1	47.4
Lower Neck F Resultant	N	1702.6	80.5	-	-	2372.7	77.8	-	-
Lower Neck Mx	N-m	17.2	73.2	-4.9	216.8	8.1	211.1	-15.0	85.8
Lower Neck My	N-m	92.8	81.6	-11.5	192.3	100.4	79.2	-15.4	210.6
Lower Neck Mz	N-m	5.9	67.3	-4.7	104.2	4.6	105.2	-4.4	237.4
Lower Neck M Resultant	N-m	93.8	81.5	-	-	101.5	79.2	-	-
Chest X	g	7.5	205.6	-44.1	74.1	6.8	225.9	-44.5	57.9
Chest Y	g	9.1	73.8	-2.1	172.6	2.8	101.8	-5.3	67.1
Chest Z	g	16.5	198.2	-40.8	57.7	31.4	80.9	-48.1	57.6
Chest Resultant	g	57.5	57.6	-	-	65.5	57.8	-	-
Chest Displacement	g	0.0	-10.5	-23.2	104.2	0.0	0.9	-24.0	99.7

† Transducer mount was loose, data is questionable.

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)

CRS: Evenflo Vanguard 5 LATCH and top Tether/Britax Roundabout LATCH and top Tether

NHTSA No. M40503

		MAXIMUM VALUE							
		Position #3				Position #4			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Pelvic X	g	20.1	121.5	-59.2	61.2	21.9	113.2	-56.1	61.1
Pelvic Y	g	11.3	66.5	-3.7	119.5	3.6	114.9	-11.4	62.5
Pelvic Z	g	18.0	203.9	-42.6	54.0	14.3	88.2	-51.9	59.8
Pelvic Resultant	g	70.4	59.1	-	-	76.7	59.9	-	-
Tether Belt Load	N	-	-	-	-	4896.4	62.9	-16.6	211.8
LATCH Belt Load	N	4716.1	67.9	-201.7	138.6	2429.9	64.6	-162.7	121.7

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)

CRS: Evenflo Vanguard 5 LATCH and top Tether/Britax Roundabout LATCH and top Tether

NHTSA No. M40503

HEAD INJURY CRITERIA (HIC)								
HIC15					HIC36			
HIC	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂		HIC	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #3 - Right	634.7	74.2	89.2	70.9	970.3	68.8	104.8	59.2
Position #4 - Left	777.4	69.7	84.7	76.9	976.2	62.4	90.7	65.3

CLIP SUMMARY*				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #3 - Right	55.2	56.2	59.2	547.8
Position #4 - Left	64.4	56.5	59.5	687.0

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

DATA SHEET NO. 5

CRS PERFORMANCE DATA

CRS: Evenflo Vanguard 5 LATCH and top Tether/Britax Roundabout LATCH and top Tether

NHTSA No. M40503

		MAXIMUM VALUE			
DESCRIPTION	Unit	Positive	Time (ms)	Negative	Time (ms)
P3 CRS X	g	12.8	191.8	-59.3	54.8
P3 CRS Y	g	7.1	63.4	-5.6	50.1
P3 CRS Z	g	21.2	118.6	-22.1	66.5
P3 CRS Resultant	g	59.6	66.3	-	-
P4 CRS X	g	13.4	131.6	-63.7	64.2
P4 CRS Y	g	3.6	197.8	-4.4	218.9
P4 CRS Z	g	16.4	89.9	-19.4	61.7
P4 CRS Resultant	g	66.1	64.0	-	-

DATA SHEET NO. 5**CRS PERFORMANCE DATA (CONTINUED)**CRS: Evenflo Vanguard 5 LATCH and top Tether/Britax Roundabout LATCH and top TetherNHTSA No. M40503**POSITION #3 CRS POST-TEST INSPECTION (Serial No. 3691261P1)**

LOCATION	DAMAGE	REMARKS
Upper Tether Strap	No	None
Upper Tether Buckle	No	None
Upper Tether Hook	No	None
Vehicle Upper Tether Anchor	No	None
Lower Anchor Strap	No	None
Lower Anchor Buckle	No	None
Lower Anchor Hooks	No	None
Vehicle Lower CRS Anchors	No	None
Five Point Harness Connections	No	None
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	No	None

POSITION #4 CRS POST-TEST INSPECTION (Serial No. E9L02163853)

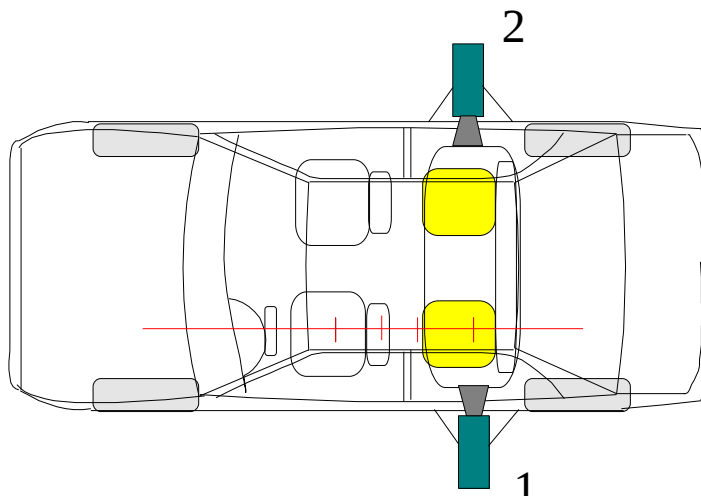
LOCATION	DAMAGE	REMARKS
Upper Tether Strap	No	None
Upper Tether Buckle	No	None
Upper Tether Hook	No	None
Vehicle Upper Tether Anchor	No	None
Lower Anchor Strap	No	None
Lower Anchor Buckle	No	None
Lower Anchor Hooks	No	None
Vehicle Lower CRS Anchors	No	None
Five Point Harness Connections	No	None
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	No	None

DATA SHEET NO. 6

CRS CAMERA DATA

CRS: Evenflo Vanguard 5 LATCH and top Tether/Britax Roundabout LATCH and top Tether

NHTSA No. M40503



Camera No.	View	Coordinates (millimeters)			Angle** (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left side CRS lateral view	943	3095	1075	-6	13	1015†
2	Right side CRS lateral view	943	3110	1060	-6	13	1015†

* Reference (from point of impact); all measurements accurate to within ± 6 mm

** = referenced to horizontal plane

X = film plane to monorail centerline

Y = film plane to impact location

Z = film plane to ground

† Time-zero strobe lights mounted inside of the vehicle received an early trigger. These strobes flashed 28.5 milliseconds before vehicle bumper to barrier contact.

SECTION 3

PHOTOGRAPHS

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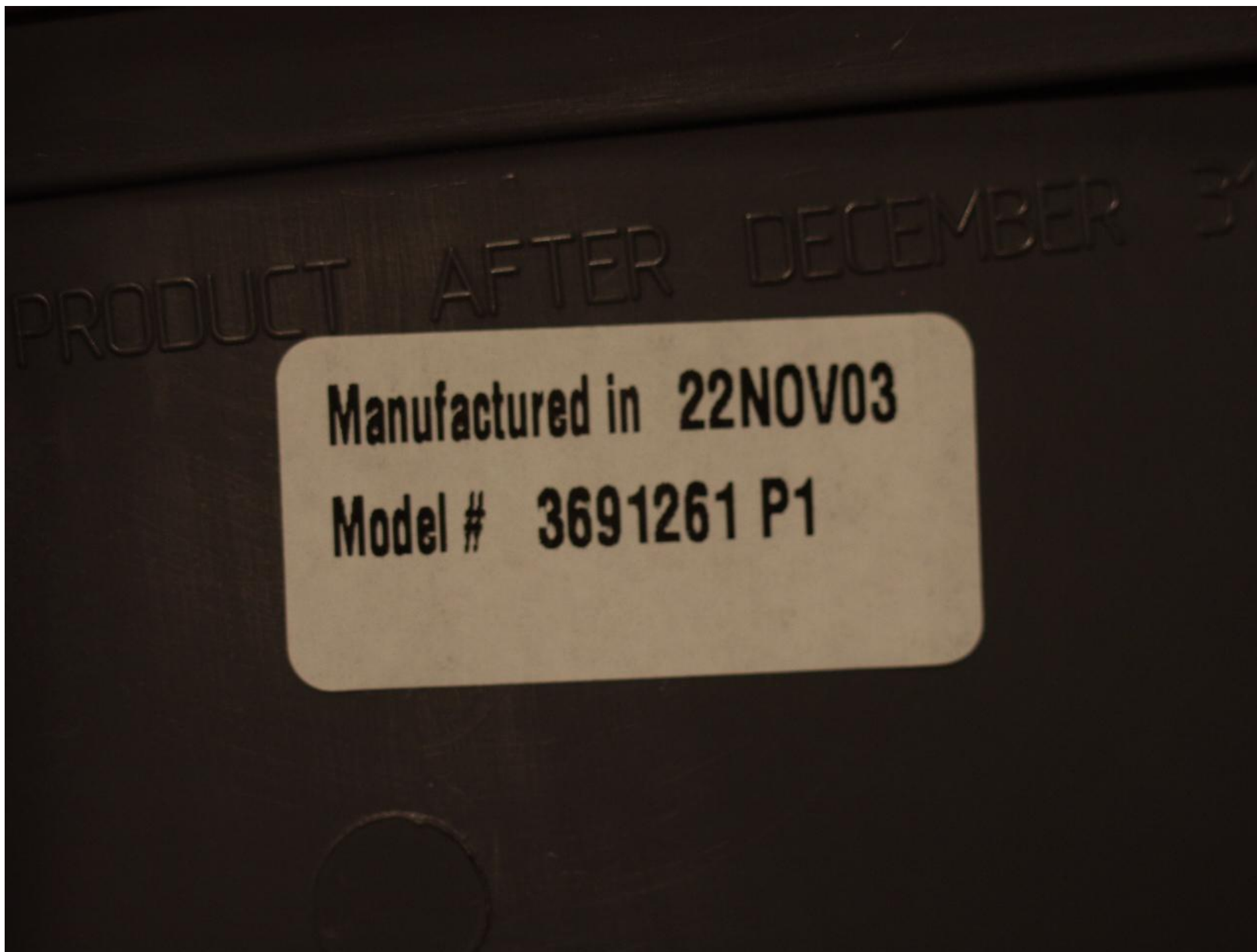


Figure 3-1 CLOSE-UP VIEW OF POSITION 3 CRS LABEL



Figure 3-2 PRE-TEST FRONTAL VIEW OF POSITION 3 CRS



Figure 3-3 POST-TEST FRONTAL VIEW OF POSITION 3 CRS



Figure 3-4 PRE-TEST REAR VIEW OF POSITION 3 CRS



Figure 3-5 POST-TEST REAR VIEW OF POSITION 3 CRS





Figure 3-7 POST-TEST LEFT SIDE VIEW OF POSITION 3 CRS



Figure 3-8 PRE-TEST RIGHT SIDE VIEW OF POSITION 3 CRS



Figure 3-9 POST-TEST RIGHT SIDE VIEW OF POSITION 3 CRS

our Name: _____
our Street Address: _____
City: _____ State: _____ Zip Code: _____
Britax **CHILD RESTRAINT REGISTRATION**

RESTRAINT MODEL: E9L0216
SERIAL NUMBER: E9L02163853
MANUFACTURED IN: Oct 02, 2002
BATCH NUMBER: 503126

Check

☐

I have been trained by the s
installation of this restraint.

4 04/01

Figure 3-10 CLOSE-UP VIEW OF POSITION 4 CRS LABEL



Figure 3-11 PRE-TEST FRONTAL VIEW OF POSITION 4 CRS



Figure 3-12 POST-TEST FRONTAL VIEW OF POSITION 4 CRS



Figure 3-13 PRE-TEST REAR VIEW OF POSITION 4 CRS



Figure 3-14 POST-TEST REAR VIEW OF POSITION 4 CRS



Figure 3-15 PRE-TEST LEFT SIDE VIEW OF POSITION 4 CRS



Figure 3-16 POST-TEST LEFT SIDE VIEW OF POSITION 4 CRS



Figure 3-17 PRE-TEST RIGHT SIDE VIEW OF POSITION 4 CRS



Figure 3-18 POST-TEST RIGHT SIDE VIEW OF POSITION 4 CRS



Figure 3-19 PRE-TEST POSITION 3 LEFT SIDE VIEW



Figure 3-20 POST-TEST POSITION 3 LEFT SIDE VIEW



Figure 3-21 PRE-TEST POSITION 4 LEFT SIDE VIEW



Figure 3-22 POST-TEST POSITION 4 LEFT SIDE VIEW



Figure 3-24 POST-TEST POSITION 3 RIGHT SIDE VIEW



Figure 3-25 PRE-TEST POSITION 4 RIGHT SIDE VIEW

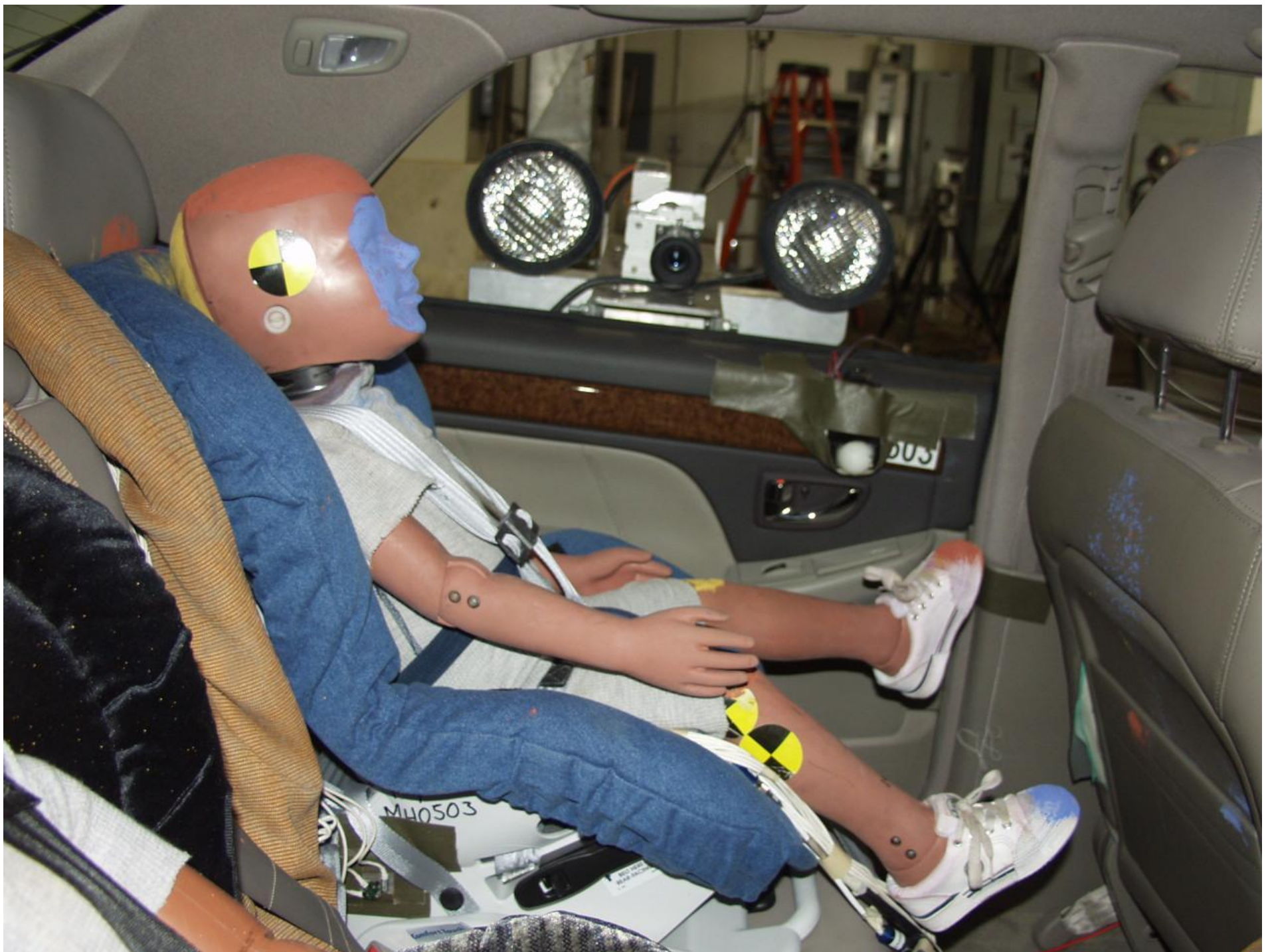


Figure 3-26 POST-TEST POSITION 4 RIGHT SIDE VIEW



Figure 3-27 PRE-TEST POSITION 3 FRONT VIEW



Figure 3-28 POST-TEST POSITION 3 FRONT VIEW

PHOTOGRAPH NOT AVAILABLE

Figure 3-29 PRE-TEST POSITION 4 FRONT VIEW



Figure 3-30 POST-TEST POSITION 4 FRONT VIEW

SECTION 4

CHILD DUMMY RESPONSE AND CRS DATA TRACES

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3	V1P3 Head z [g, CFC_1000]	4-6
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6	V1P3 Upper Neck Fx [N, CFC_1000]	4-9
7	V1P3 Upper Neck Fy [N, CFC_1000]	4-10
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9	V1P3 Upper Neck F Resultant [N, CFC_1000]	4-12
10	V1P3 Upper Neck Mx [N-m, CFC_600]	4-13
11	V1P3 Upper Neck My [N-m, CFC_600]	4-14
12	V1P3 Upper Neck Mz [N-m, CFC_600]	4-15
13	V1P3 Upper Neck M Resultant [N-m, CFC_600]	4-16
14	V1P3 Lower Neck Fx [N, CFC_1000]	4-17
15	V1P3 Lower Neck Fy [N, CFC_1000]	4-18
16	V1P3 Lower Neck Fz [N, CFC_1000]	4-19
17	V1P3 Lower Neck F Resultant [N, CFC_1000]	4-20
18	V1P3 Lower Neck Mx [N-m, CFC_600]	4-21
19	V1P3 Lower Neck My [N-m, CFC_600]	4-22
20	V1P3 Lower Neck Mz [N-m, CFC_600]	4-23
21	V1P3 Lower Neck M Resultant [N-m, CFC_600]	4-24
22	V1P3 Chest x [g, CFC_180]	4-25
23	V1P3 Chest y [g, CFC_180]	4-26
24	V1P3 Chest z [g, CFC_180]	4-27
25	V1P3 Chest Resultant [g, CFC_180]	4-28
26	V1P3 Chest Compression [mm, CFC_600]	4-29
27	V1P3 Pelvic x [g, CFC_1000]	4-30
28	V1P3 Pelvic y [g, CFC_1000]	4-31
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31	V1P3 Latch Belt [N, CFC_60]	4-34
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33	V1P3 Seat x Velocity [kph, CFC_180]	4-36
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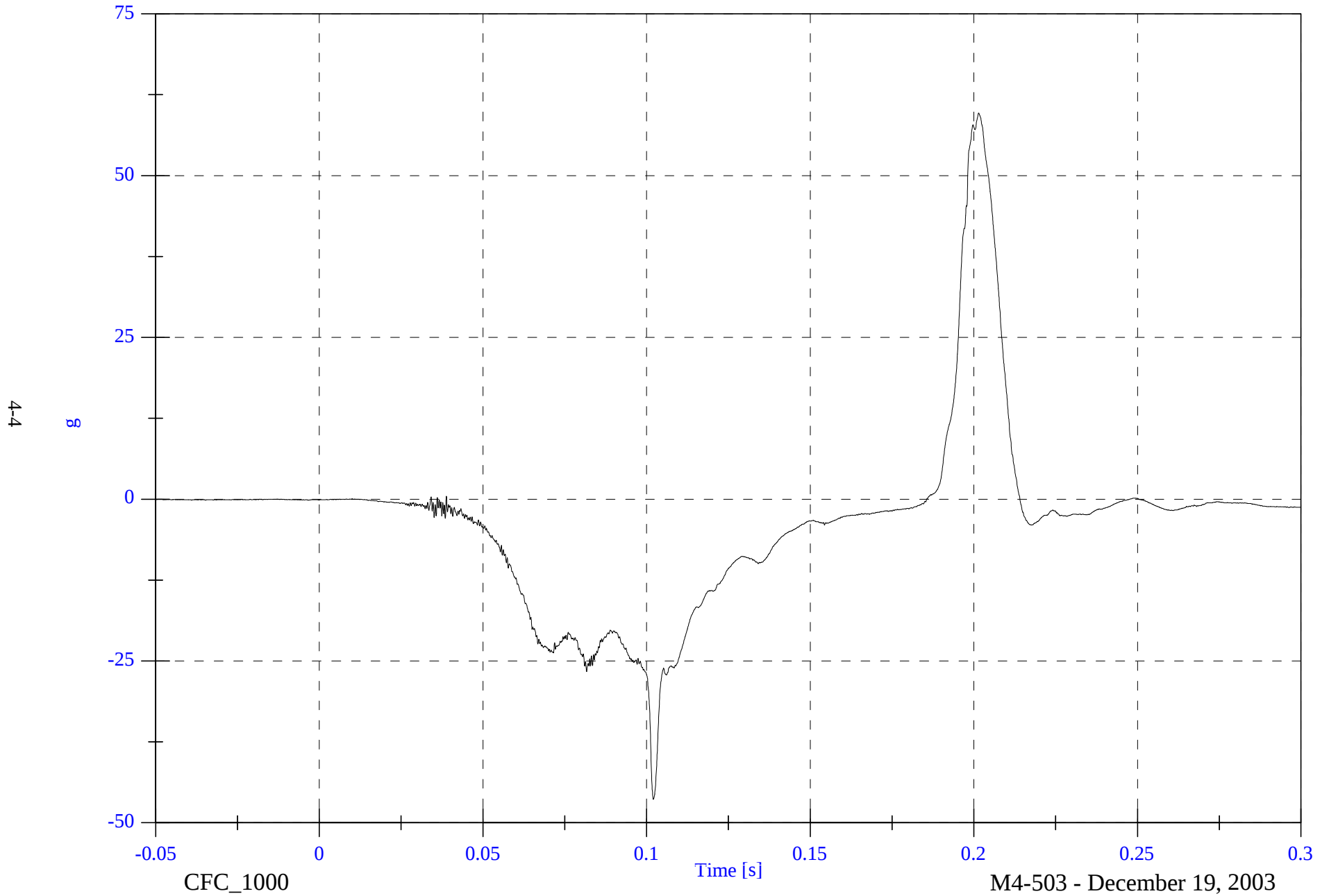
TABLE OF DATA PLOTS (Continued)

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
50	V1P4 Upper Neck F Resultant [N, CFC_1000]	4-53
51	V1P4 Upper Neck Mx [N-m, CFC_600]	4-54
52	V1P4 Upper Neck My [N-m, CFC_600]	4-55
53	V1P4 Upper Neck Mz [N-m, CFC_600]	4-56
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55	V1P4 Lower Neck Fx [N, CFC_1000]	4-58
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60	V1P4 Lower Neck My [N-m, CFC_600]	4-63
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65	V1P4 Chest z [g, CFC_180]	4-68
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75	V1P4 Seat x Velocity [kph, CFC_180]	4-78
76	V1P4 Seat x Displacement [mm, CFC_180]	4-79
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78	V1P4 Seat y Velocity [kph, CFC_180]	4-81
79	V1P4 Seat y Displacement [mm, CFC_180]	4-82
80	V1P4 Seat z [g, CFC_60]	4-83
81	V1P4 Seat z Velocity [kph, CFC_180]	4-84
82	V1P4 Seat z Displacement [mm, CFC_180]	4-85
83	V1P4 Seat Resultant [g, CFC_60]	4-86

2004 NCAP Test 2 2004 Hyundai XG350

Max: 59.7 [g] at 0.201 [s]
Min: -46.4 [g] at 0.102 [s]

V1P3 Head x

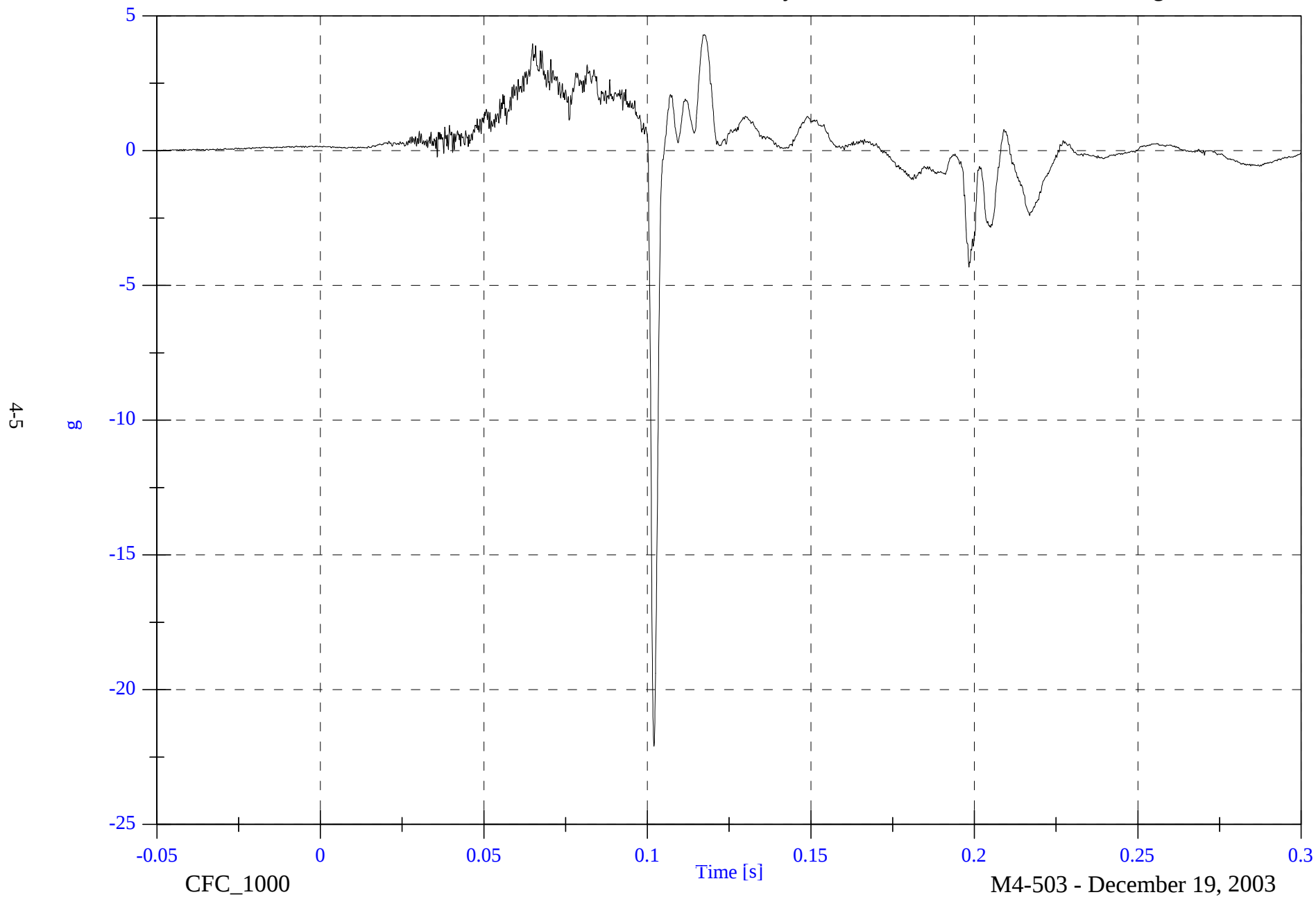


2004 NCAP Test 2 2004 Hyundai XG350

Max: 4.3 [g] at 0.117 [s]

Min: -22.1 [g] at 0.102 [s]

V1P3 Head y

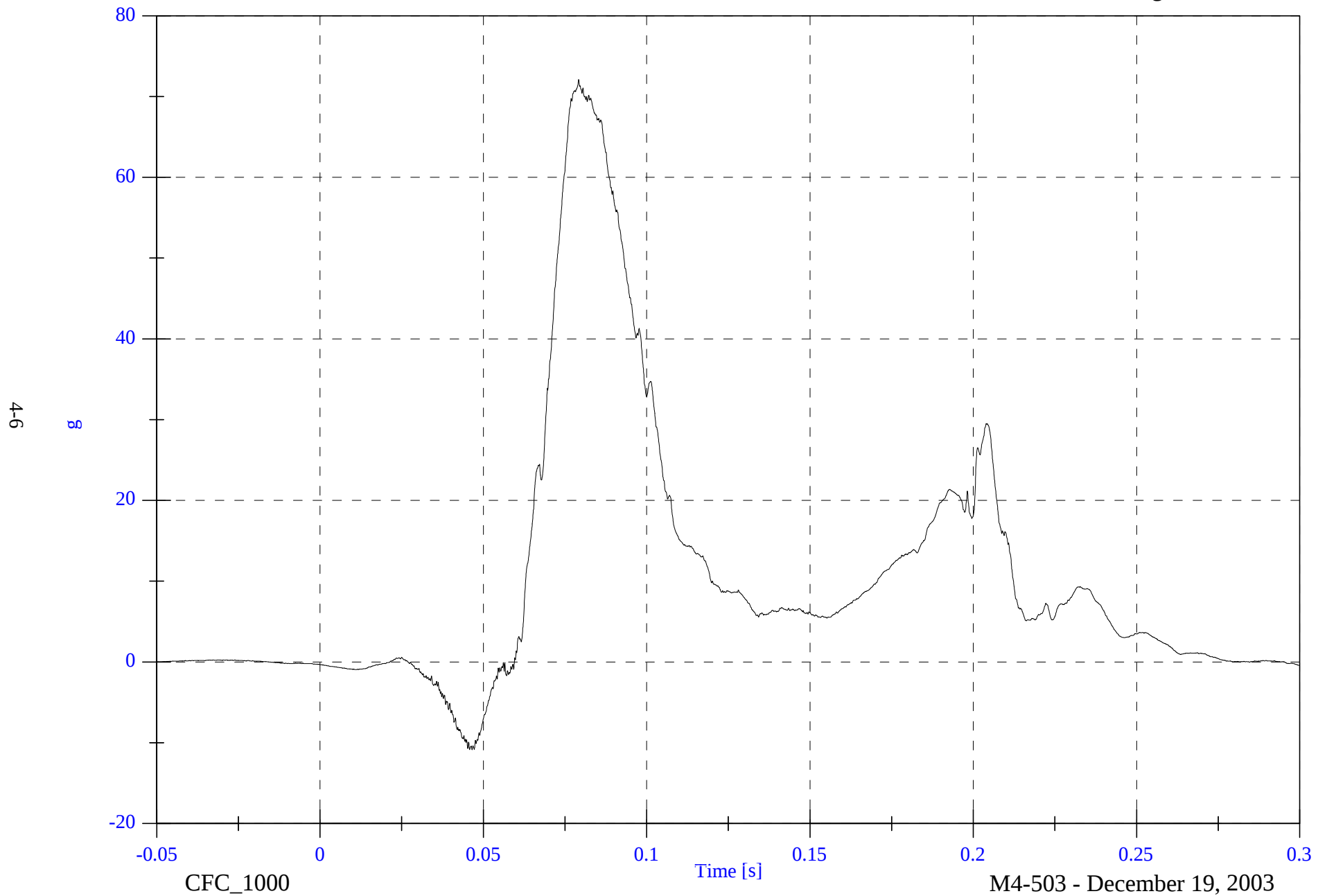


2004 NCAP Test 2 2004 Hyundai XG350

Max: 72.1 [g] at 0.079 [s]

Min: -10.9 [g] at 0.047 [s]

V1P3 Head z

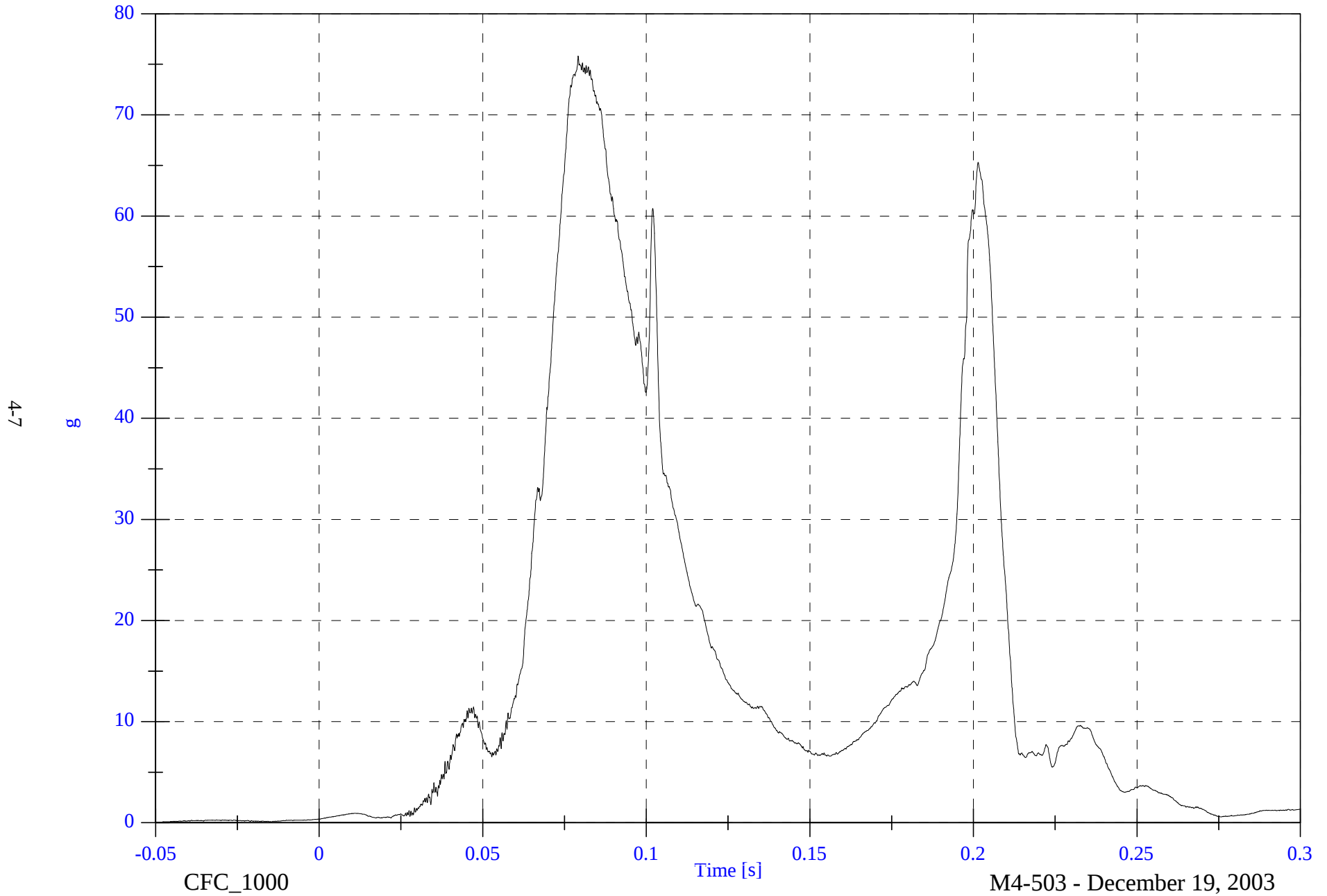


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Head Resultant

Max: 75.8 [g] at 0.079 [s]

Min: 0.0 [g] at -0.049 [s]

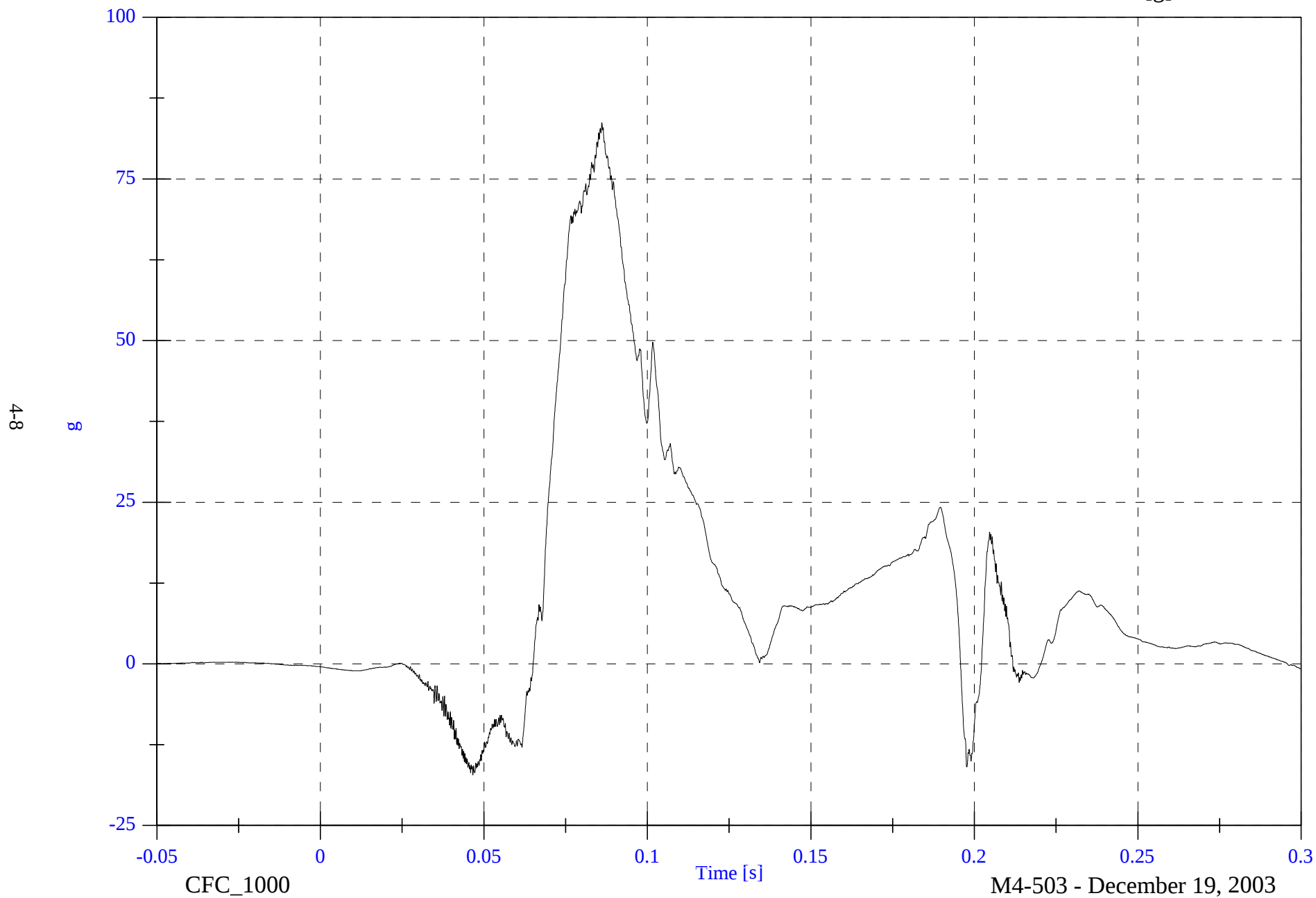


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Head Rear z

Max: 83.7 [g] at 0.086 [s]

Min: -17.2 [g] at 0.047 [s]

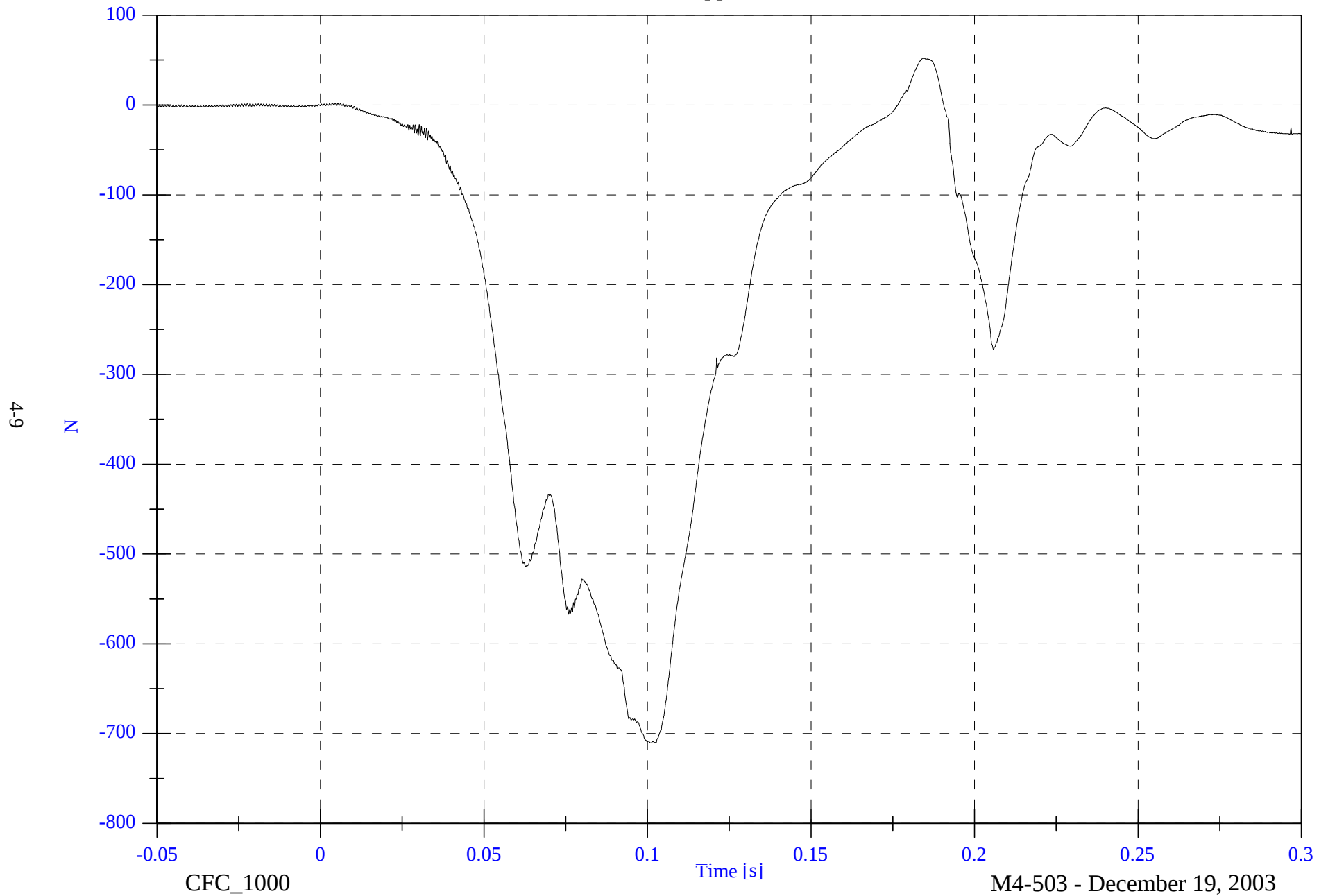


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Upper Neck Fx

Max: 52.0 [N] at 0.184 [s]

Min: -710.5 [N] at 0.103 [s]

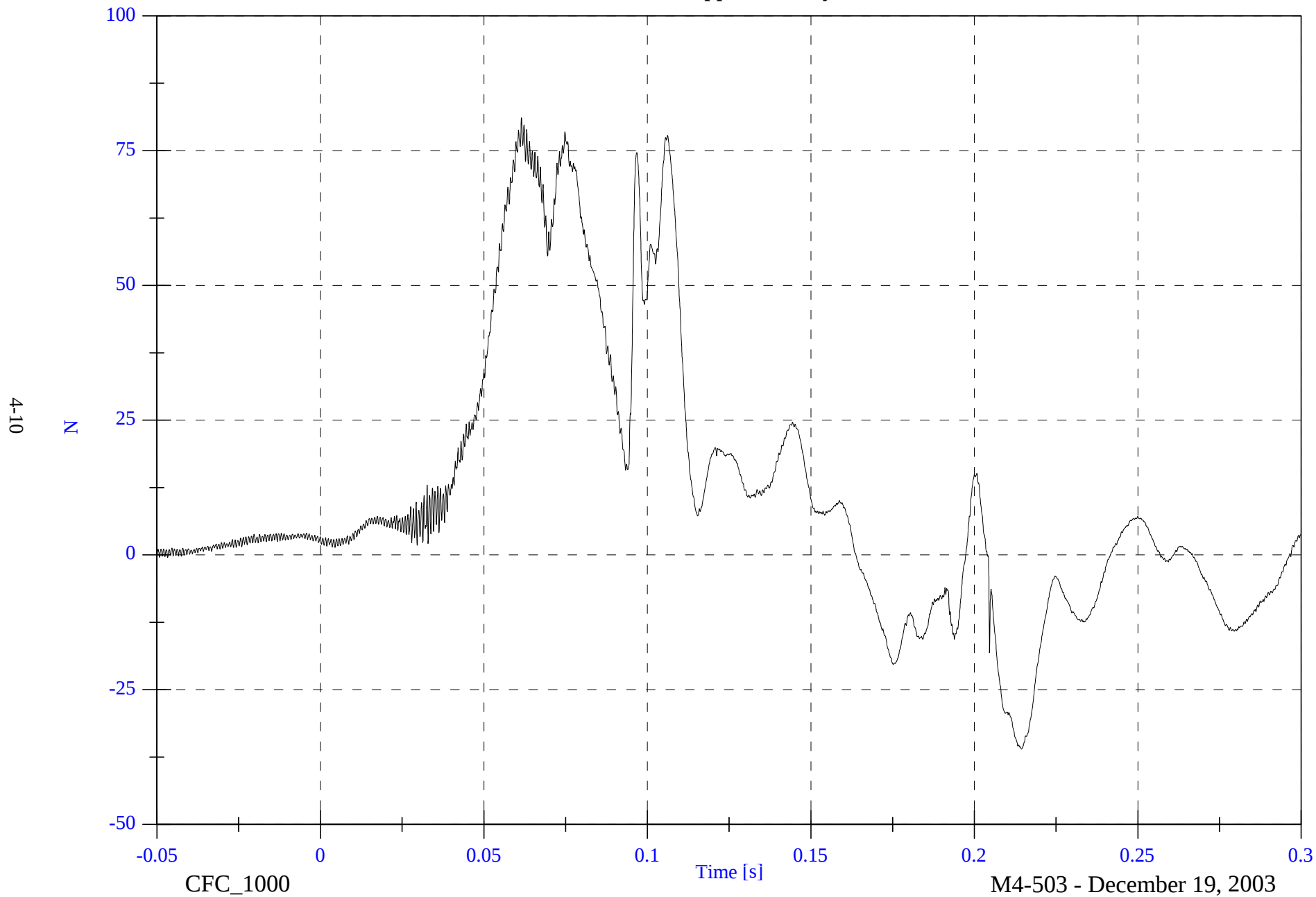


2004 NCAP Test 2 2004 Hyundai XG350

Max: 81.1 [N] at 0.061 [s]

Min: -36.0 [N] at 0.214 [s]

V1P3 Upper Neck Fy

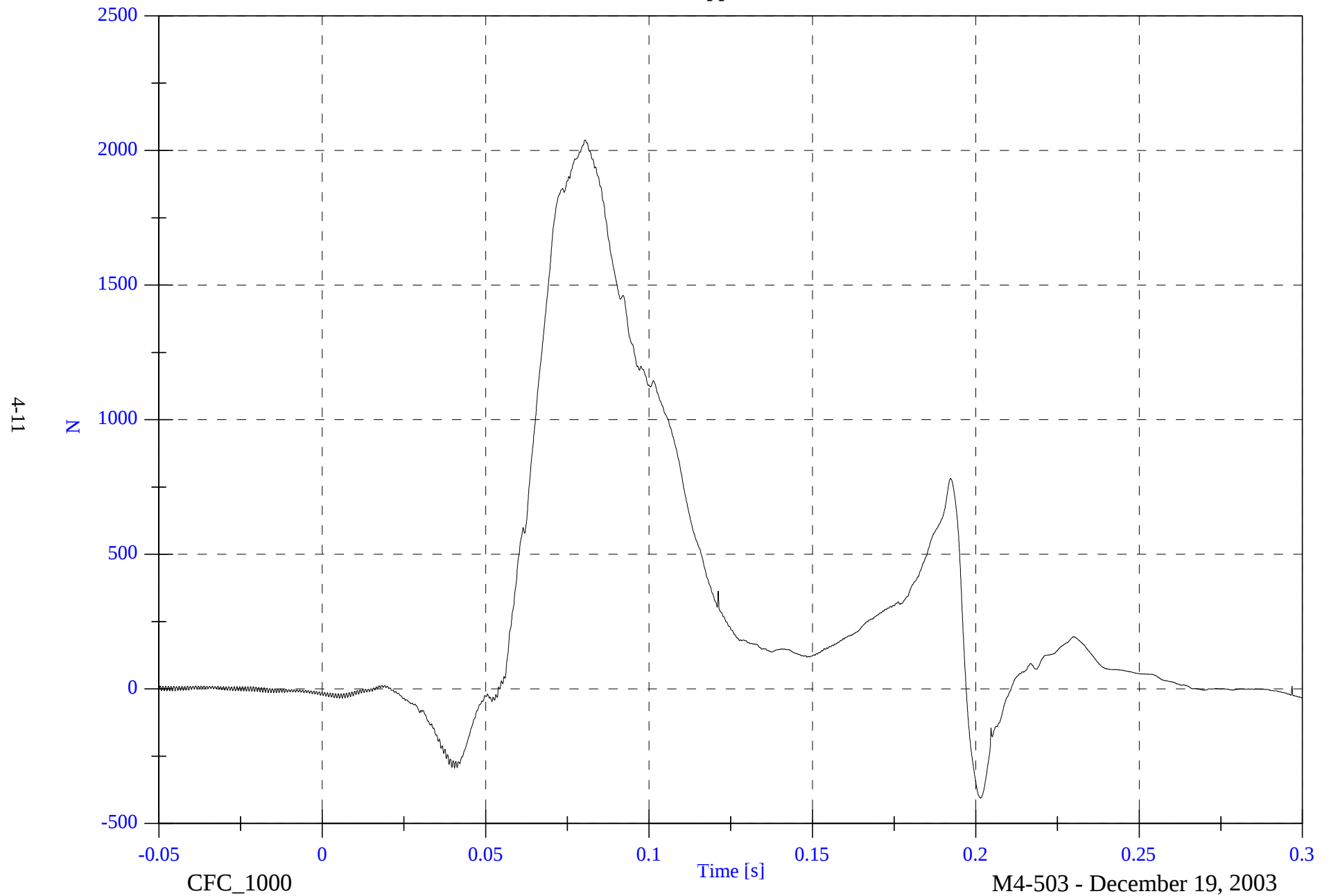


2004 NCAP Test 2 2004 Hyundai XG350

Max: 2039.3 [N] at 0.080 [s]

Min: -405.6 [N] at 0.202 [s]

V1P3 Upper Neck Fz

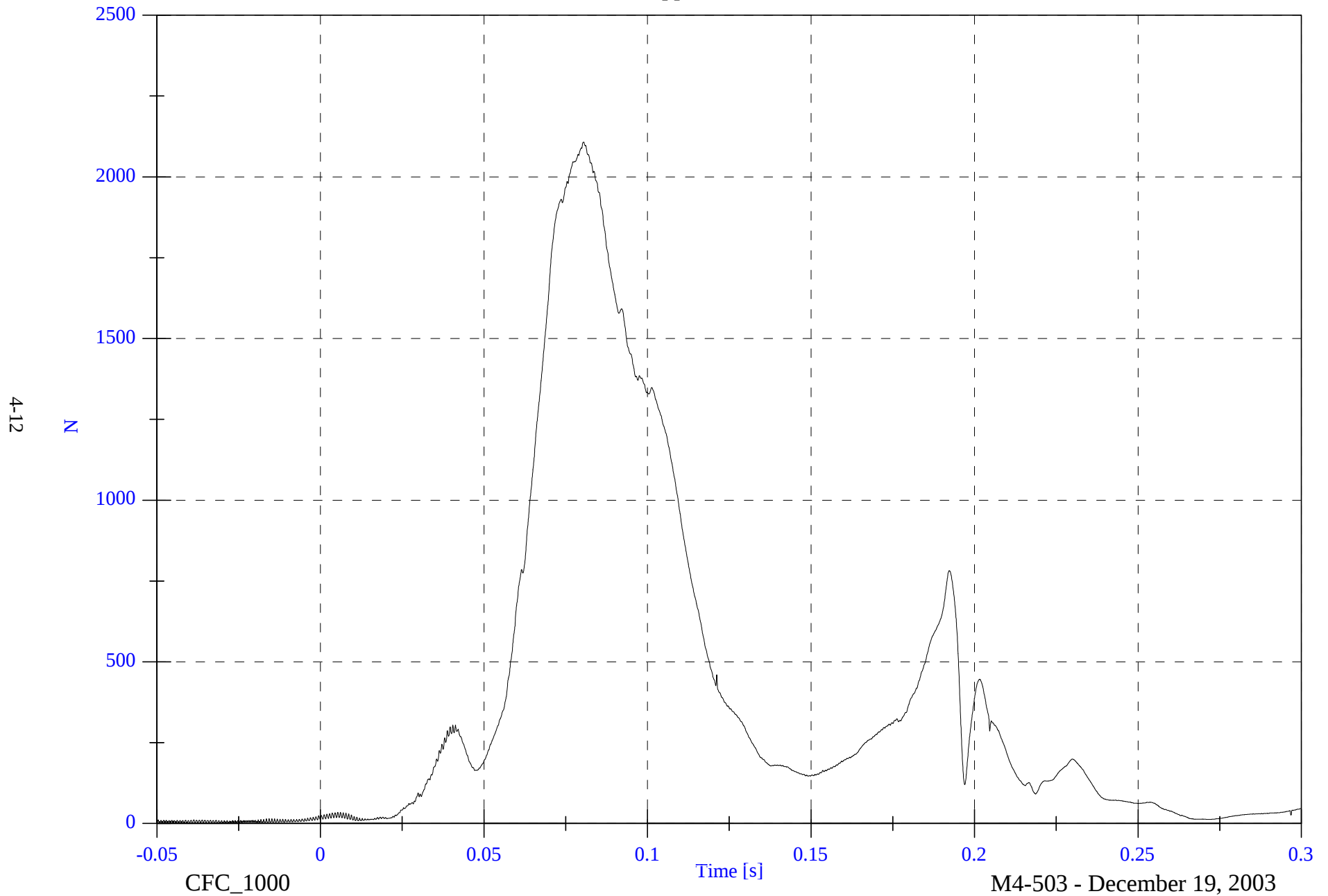


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Upper Neck F Resultant

Max: 2107.7 [N] at 0.081 [s]

Min: 0.7 [N] at -0.050 [s]

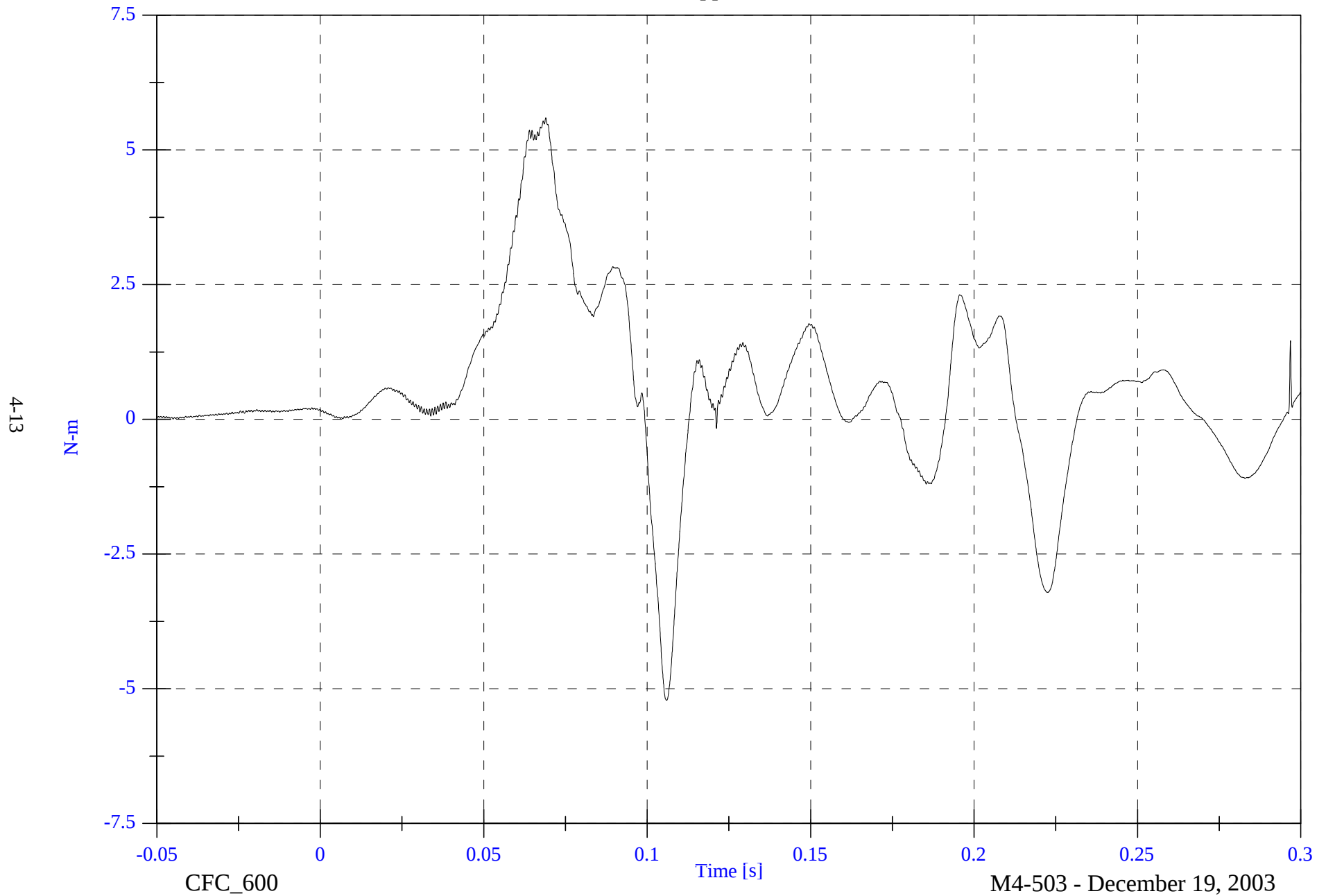


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Upper Neck Mx

Max: 5.6 [N-m] at 0.069 [s]

Min: -5.2 [N-m] at 0.106 [s]

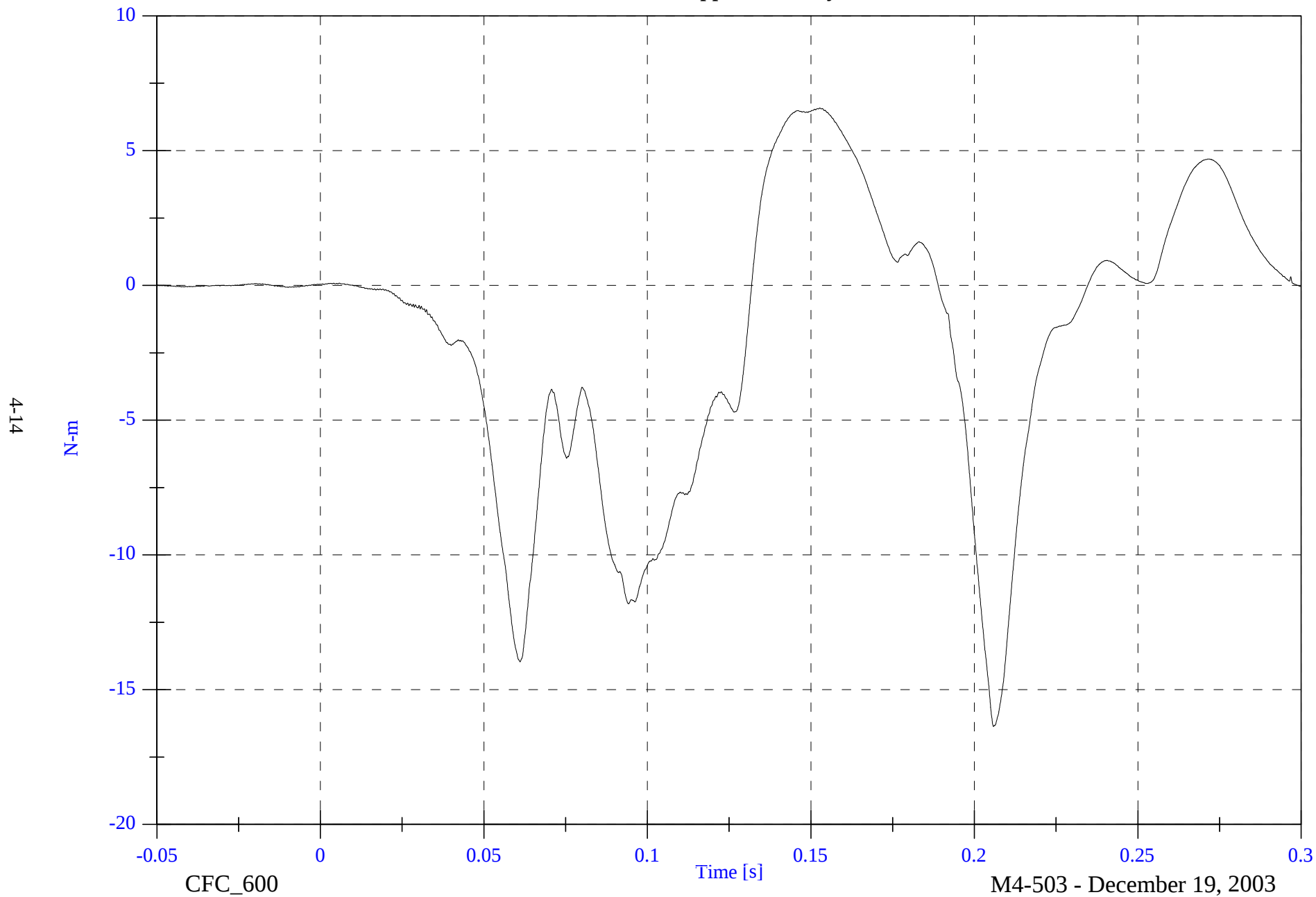


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Upper Neck My

Max: 6.6 [N-m] at 0.153 [s]

Min: -16.4 [N-m] at 0.206 [s]

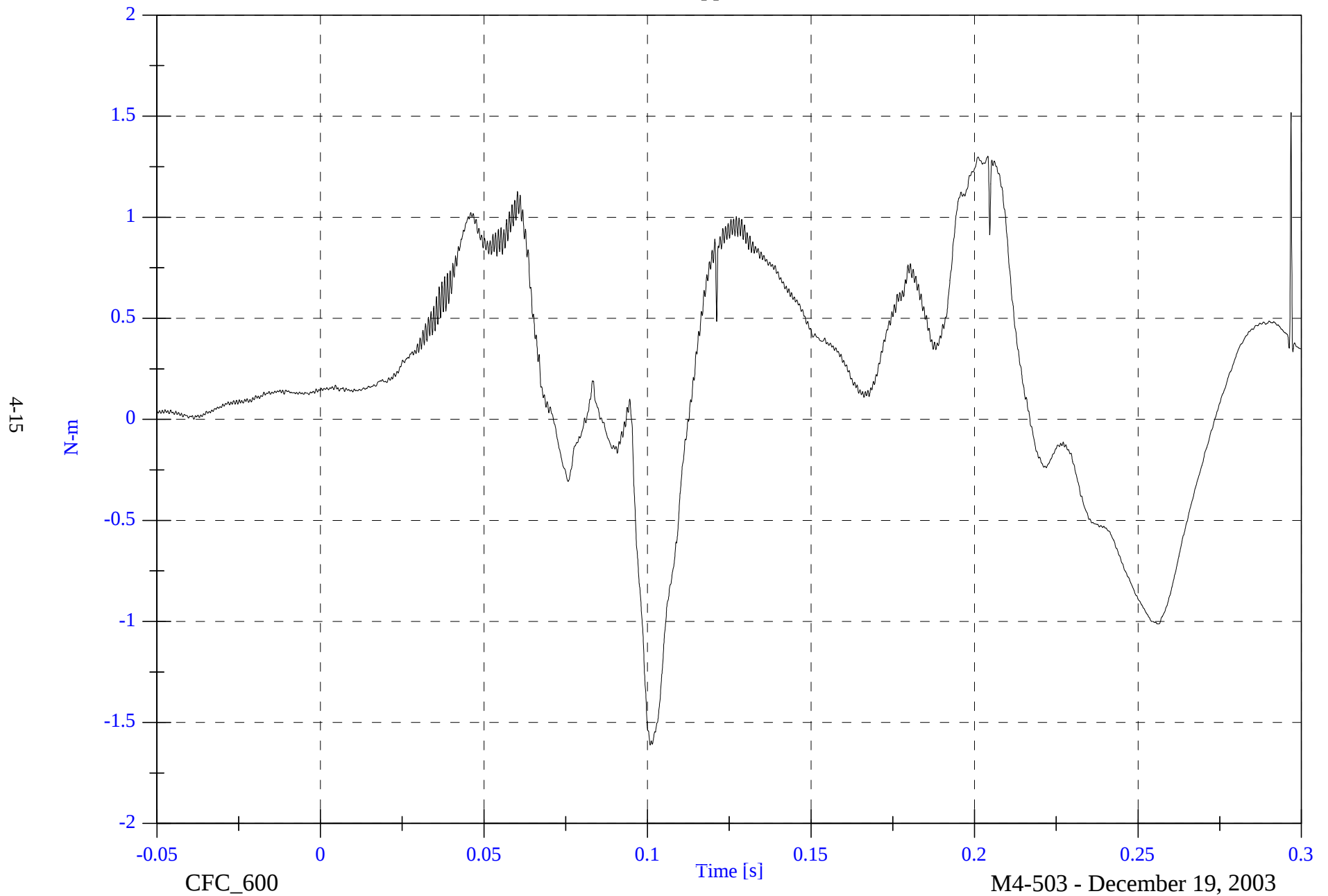


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Upper Neck Mz

Max: 1.5 [N-m] at 0.297 [s]

Min: -1.6 [N-m] at 0.101 [s]

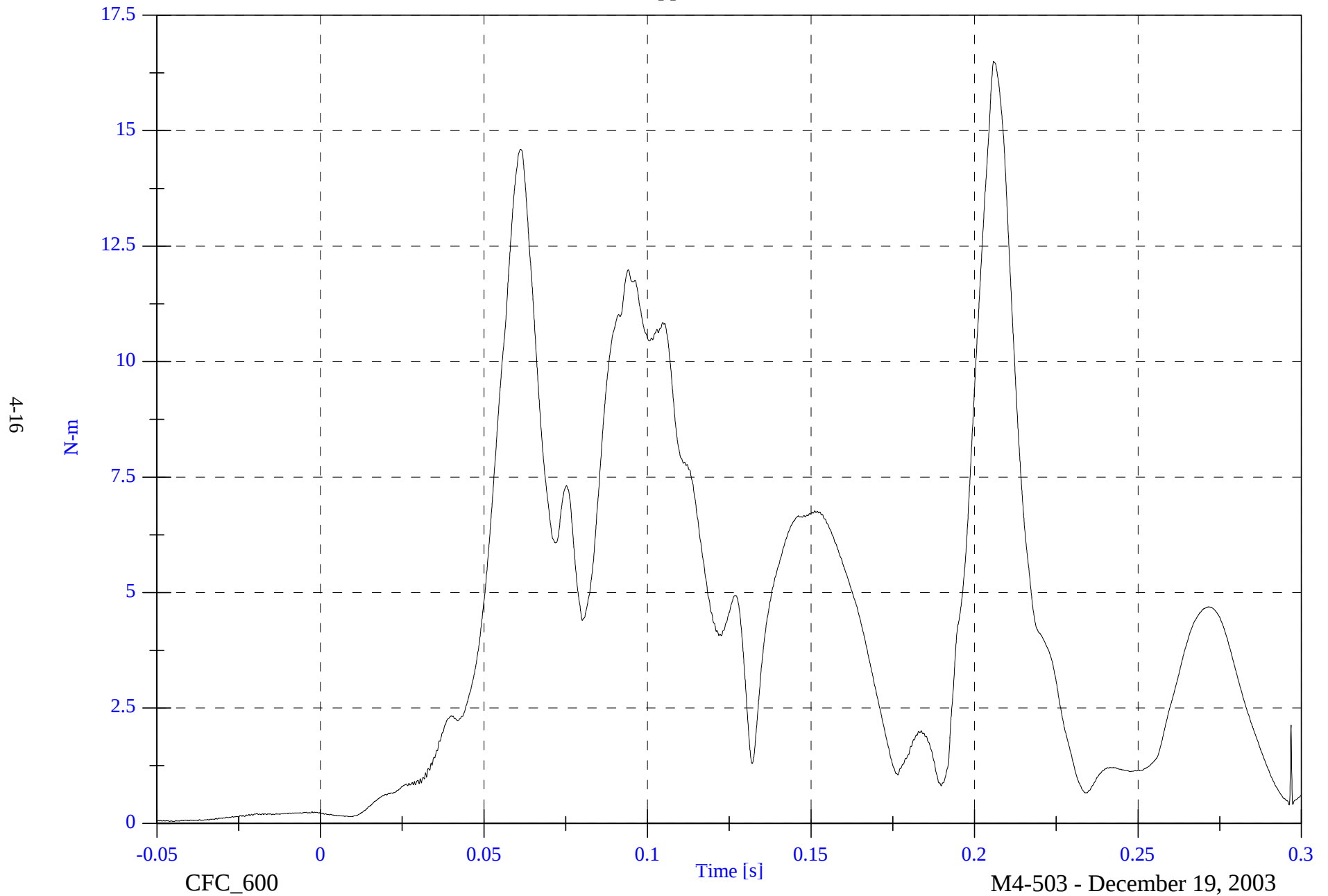


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Upper Neck M Resultant

Max: 16.5 [N-m] at 0.206 [s]

Min: 0.0 [N-m] at -0.045 [s]

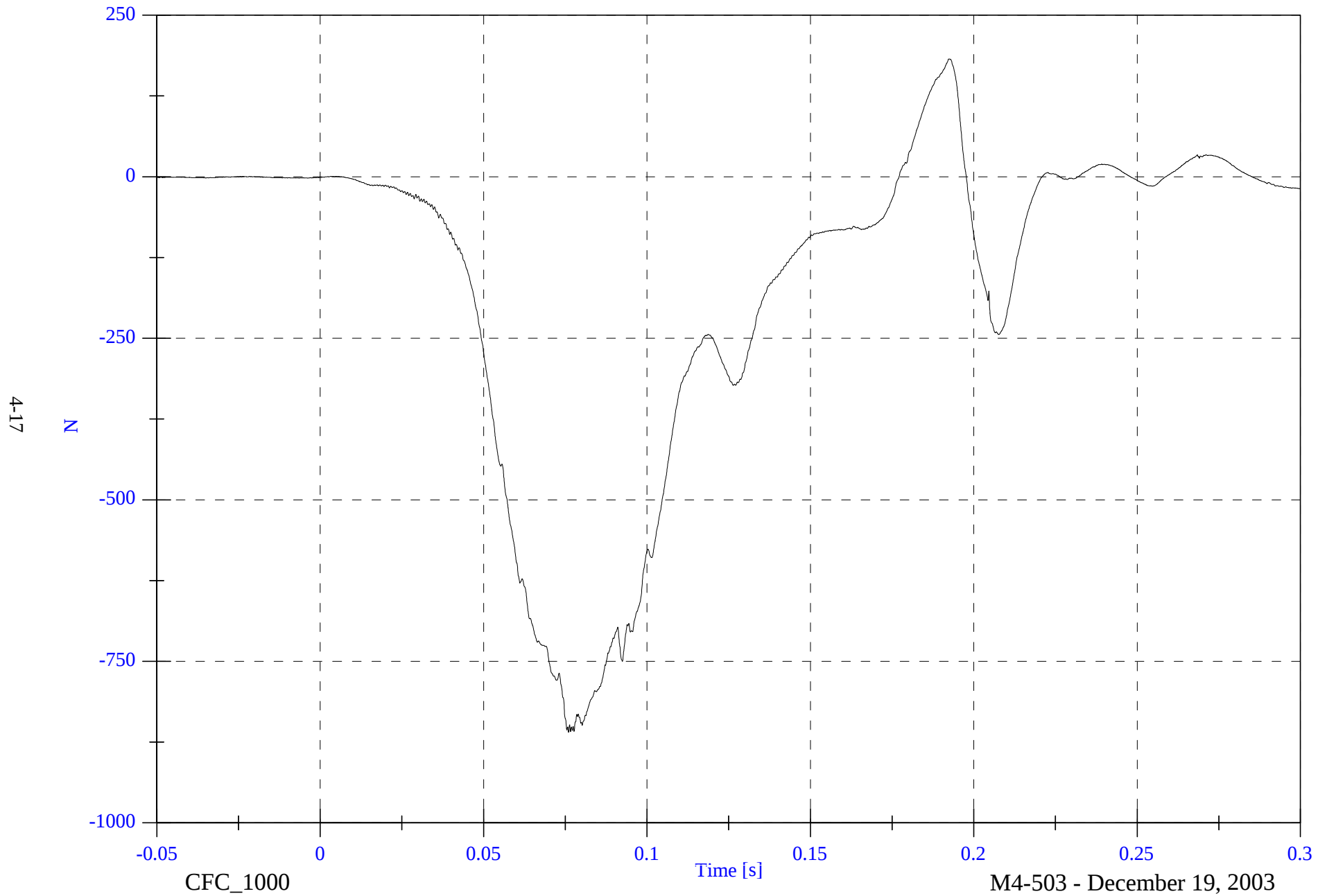


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Lower Neck Fx

Max: 182.1 [N] at 0.192 [s]

Min: -859.8 [N] at 0.076 [s]

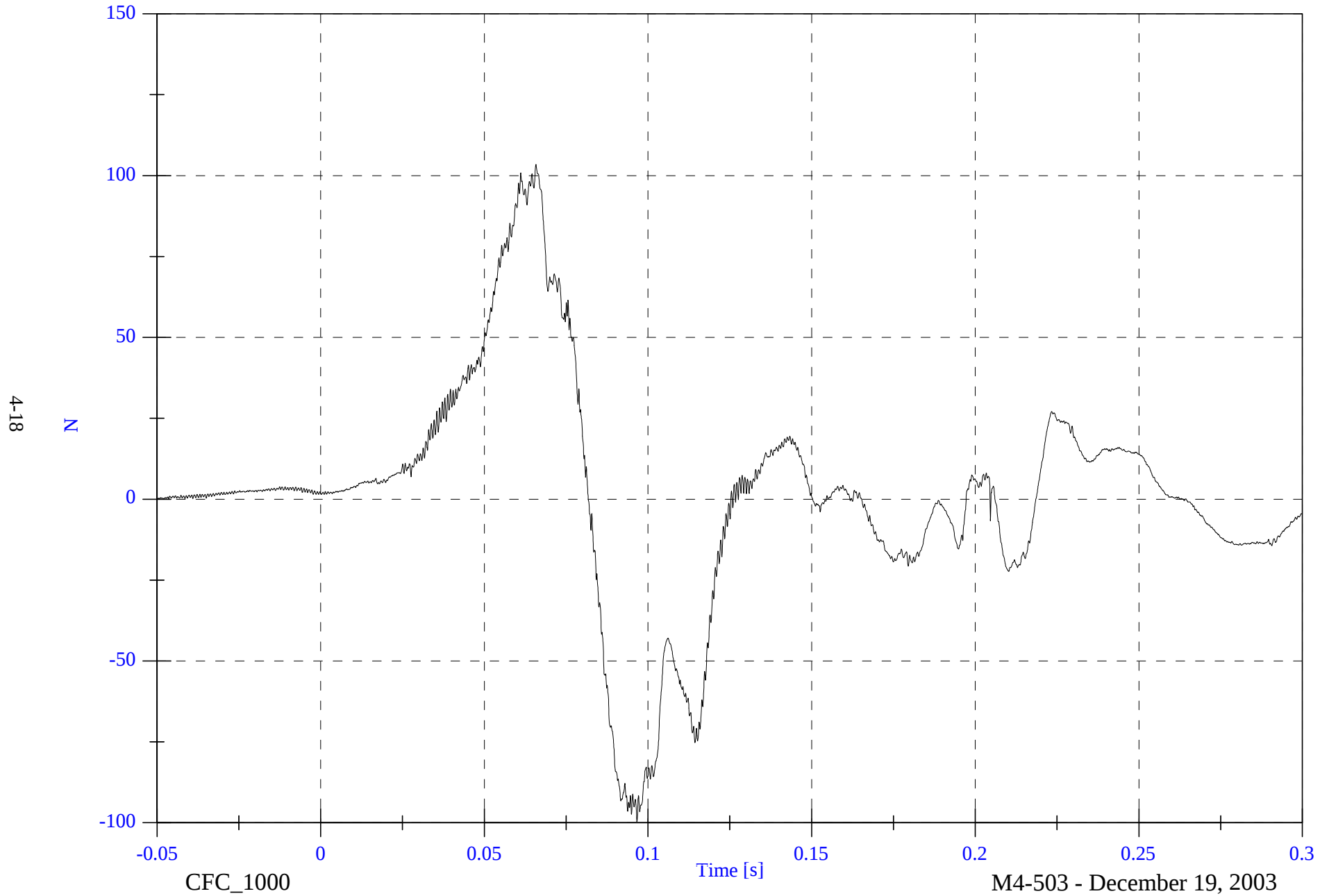


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Lower Neck Fy

Max: 103.5 [N] at 0.066 [s]

Min: -99.7 [N] at 0.097 [s]

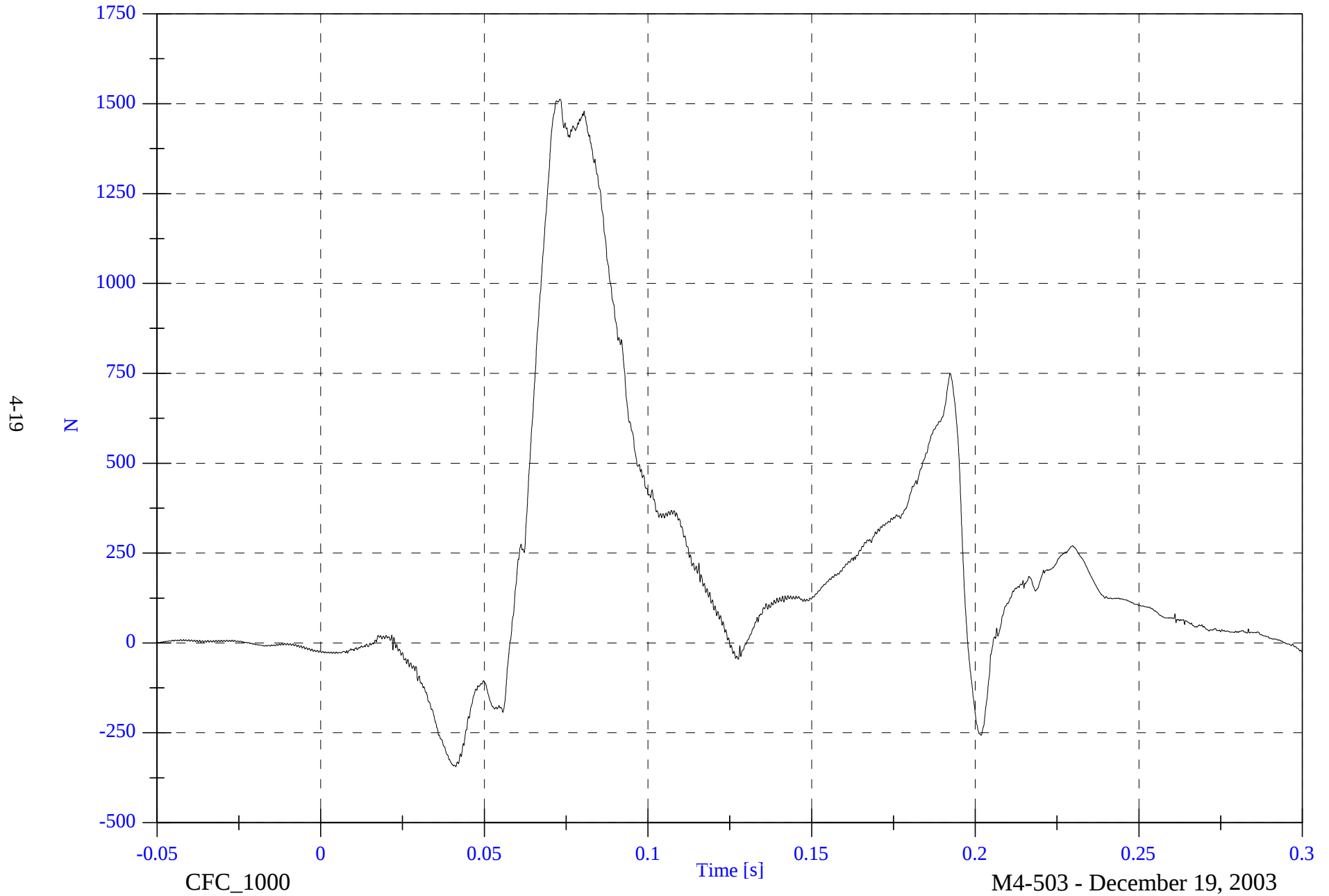


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Lower Neck Fz

Max: 1512.4 [N] at 0.073 [s]

Min: -344.7 [N] at 0.041 [s]

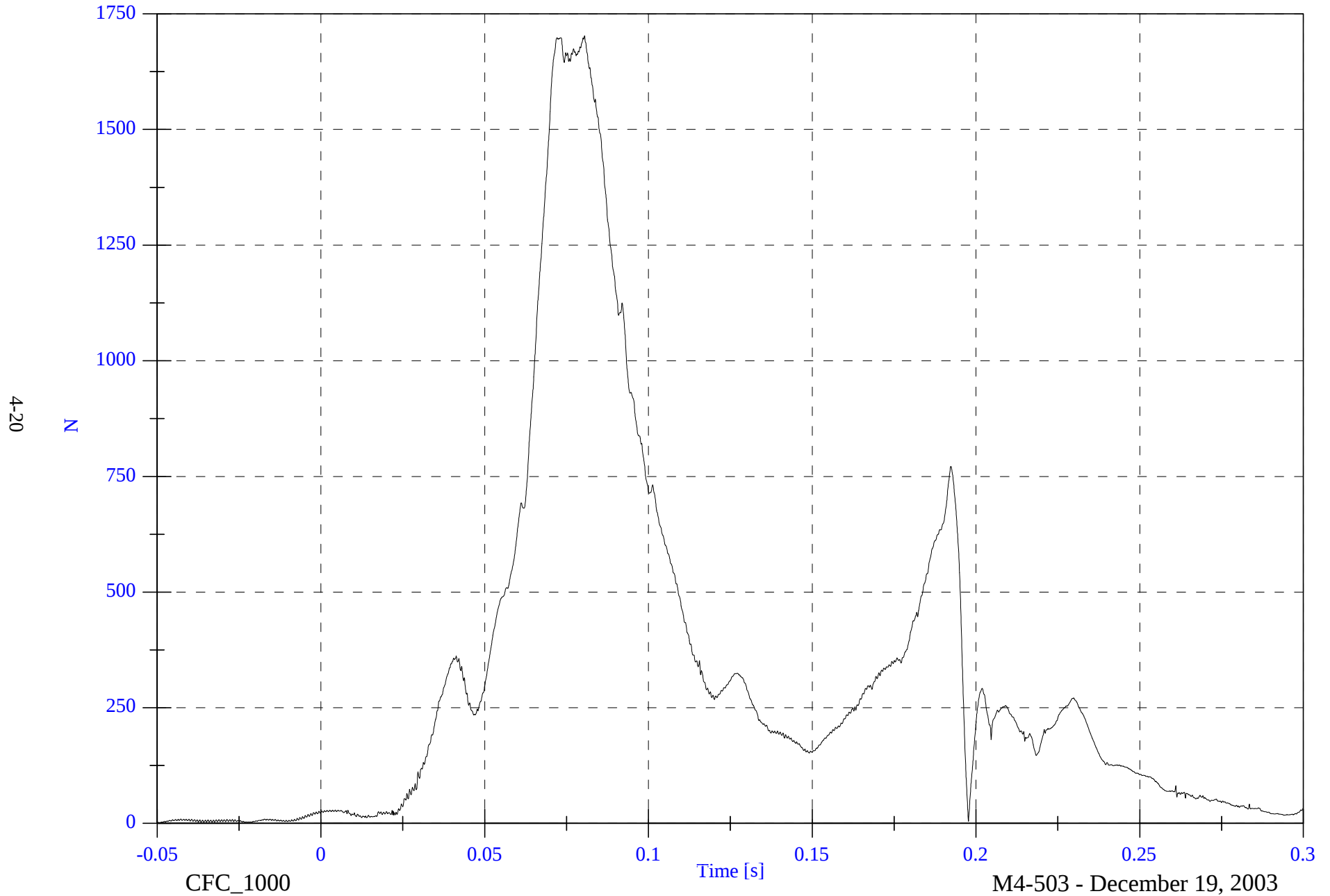


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Lower Neck F Resultant

Max: 1702.6 [N] at 0.080 [s]

Min: 1.2 [N] at -0.050 [s]

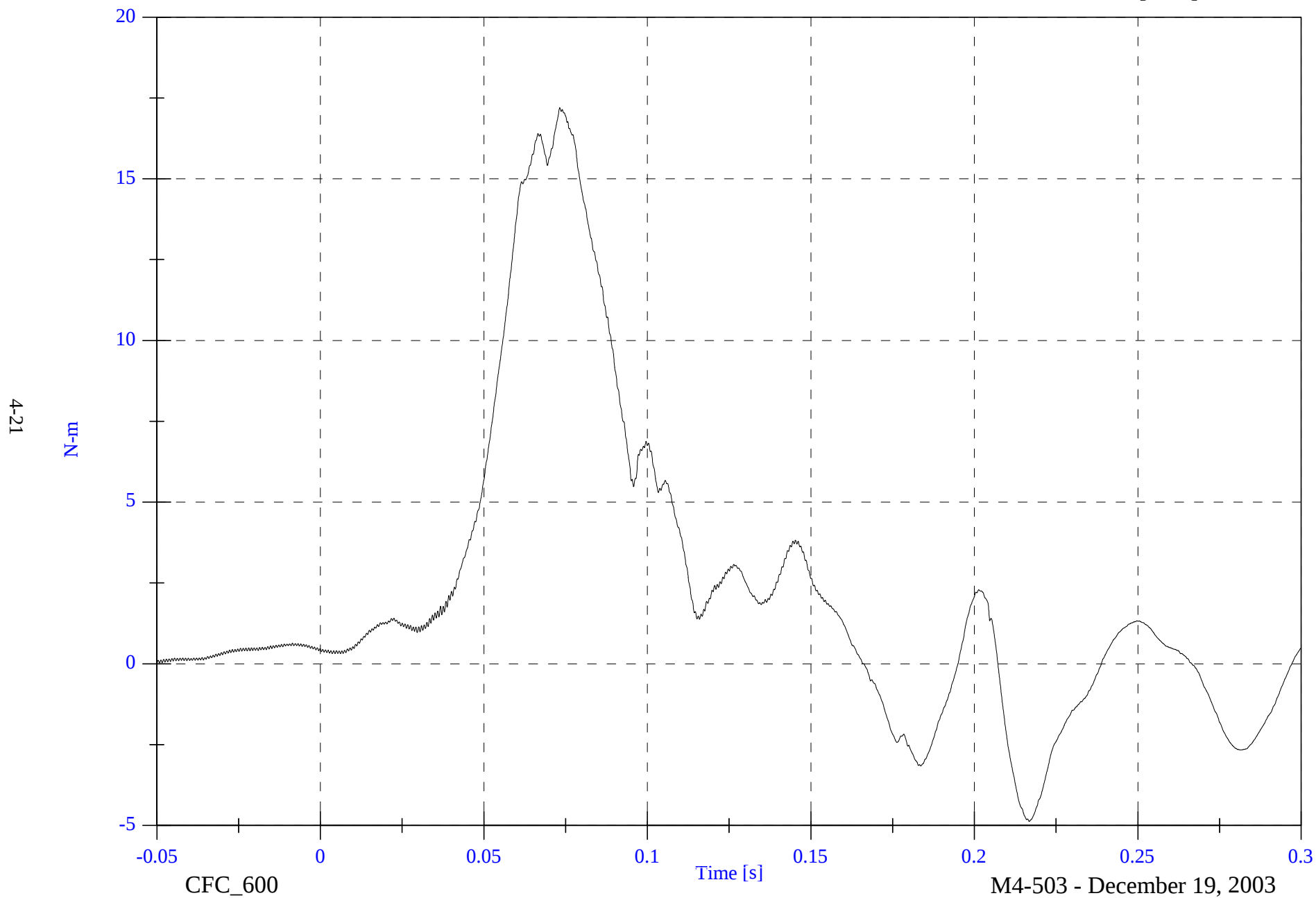


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Lower Neck Mx

Max: 17.2 [N-m] at 0.073 [s]

Min: -4.9 [N-m] at 0.217 [s]

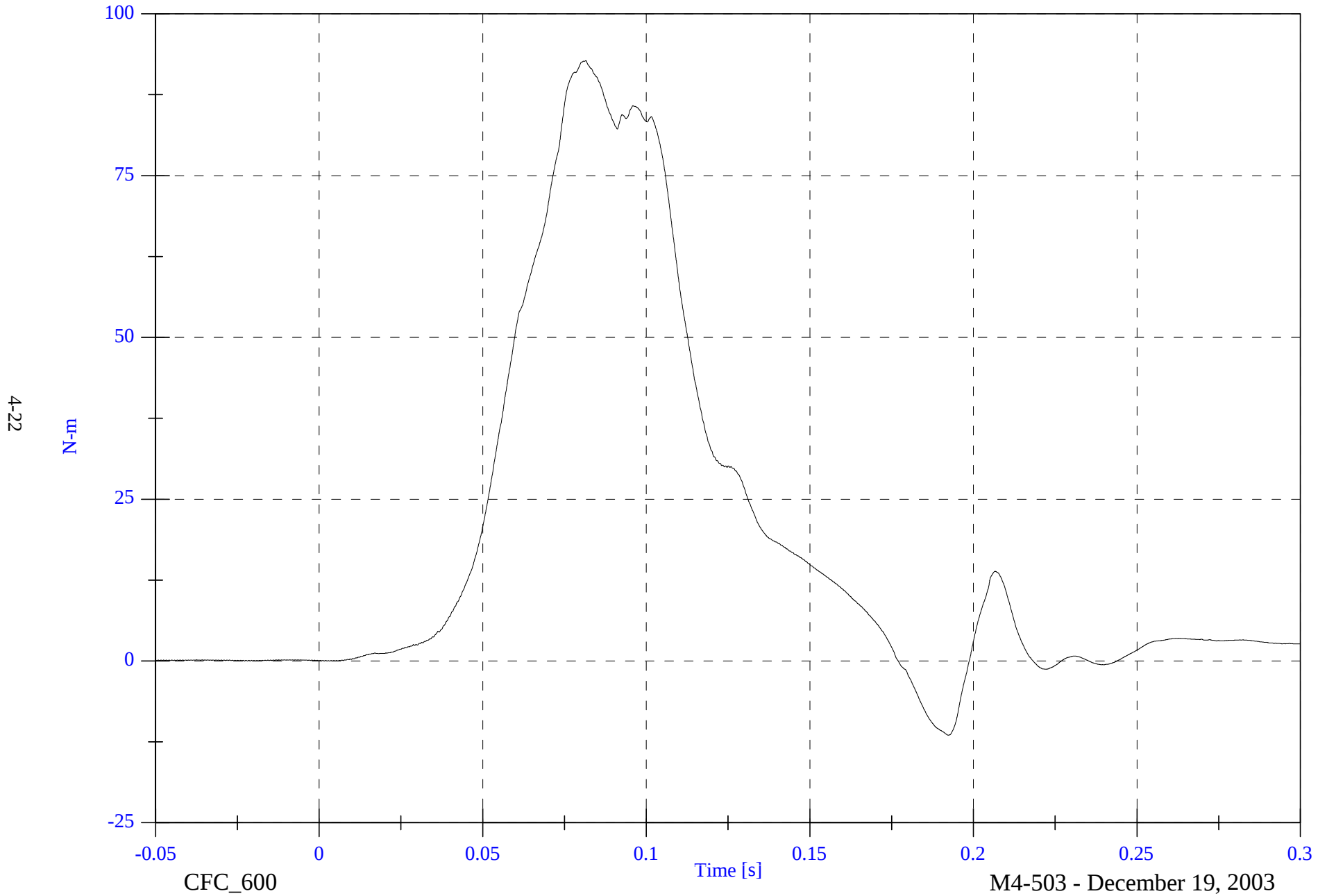


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Lower Neck My

Max: 92.8 [N-m] at 0.082 [s]

Min: -11.5 [N-m] at 0.192 [s]

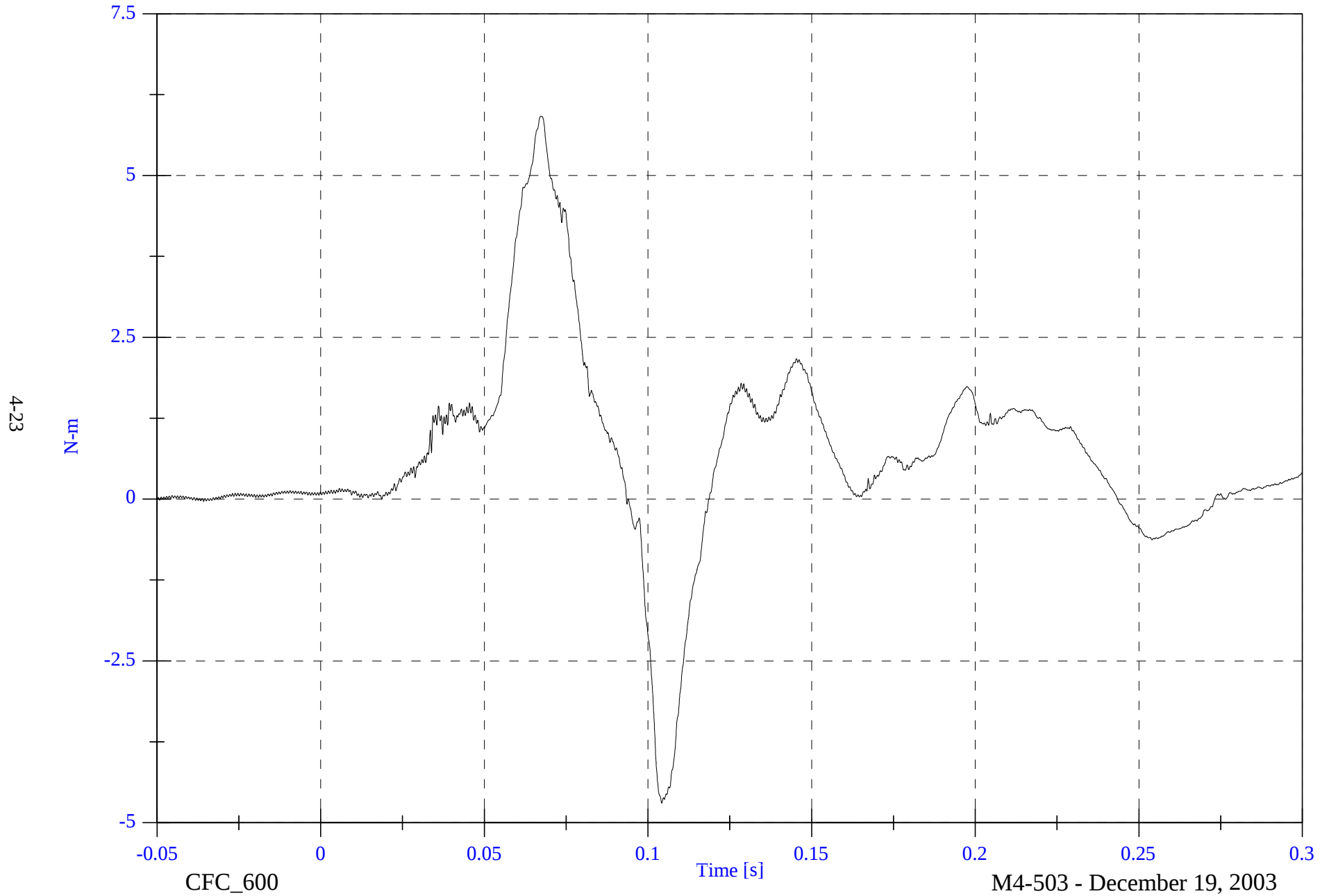


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Lower Neck Mz

Max: 5.9 [N-m] at 0.067 [s]

Min: -4.7 [N-m] at 0.104 [s]

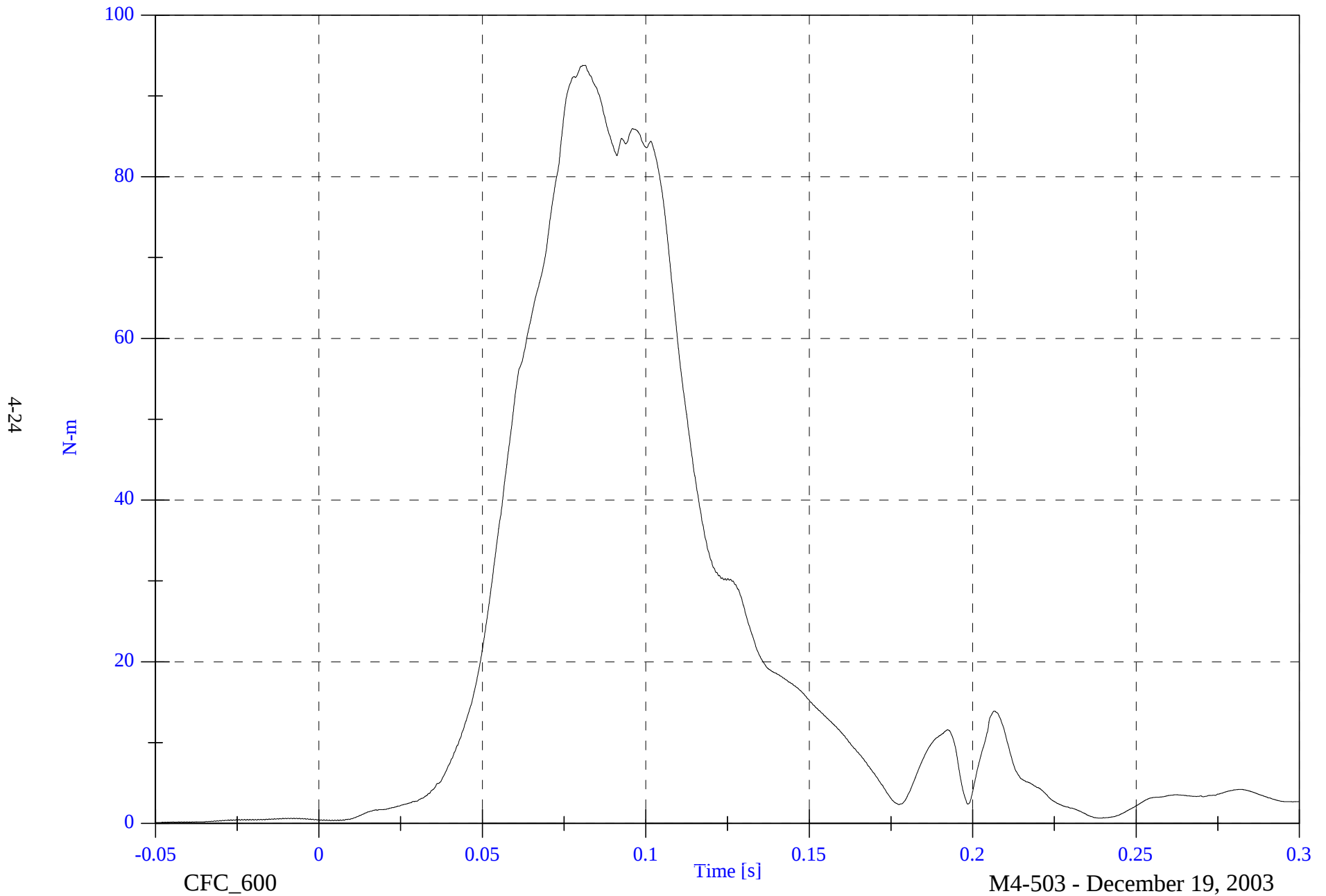


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Lower Neck M Resultant

Max: 93.8 [N-m] at 0.081 [s]

Min: 0.1 [N-m] at -0.050 [s]

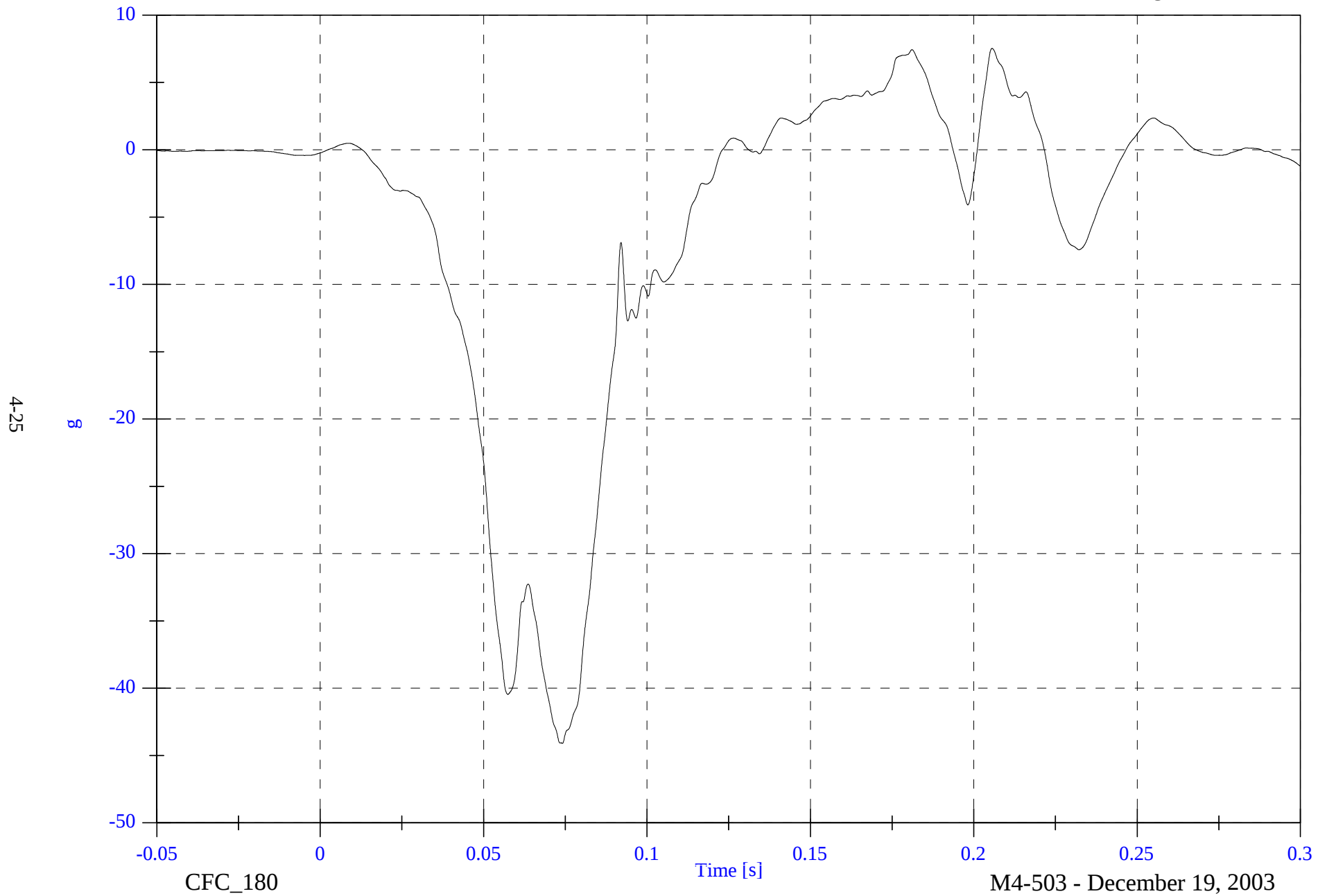


2004 NCAP Test 2 2004 Hyundai XG350

Max: 7.5 [g] at 0.206 [s]

Min: -44.1 [g] at 0.074 [s]

V1P3 Chest x

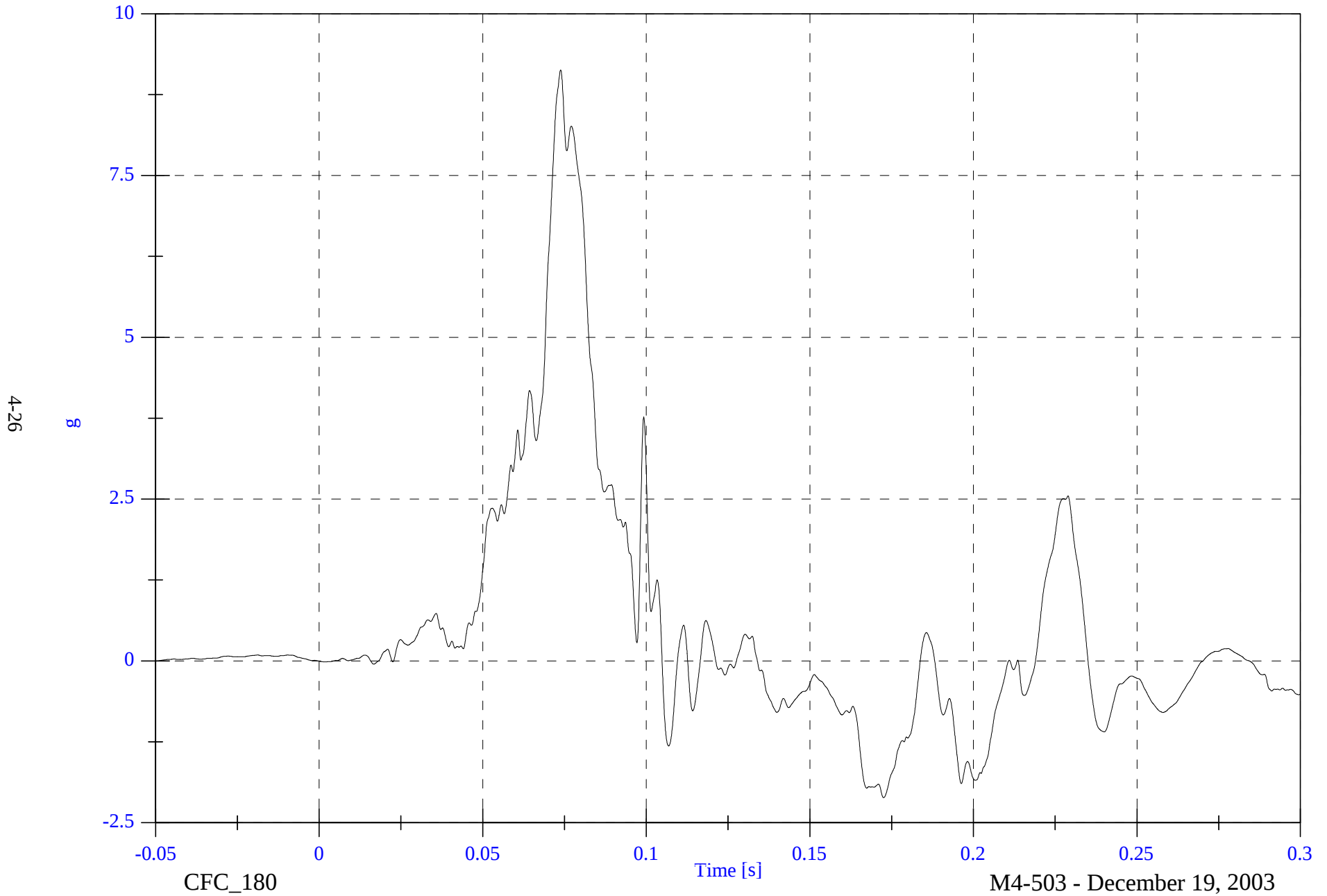


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Chest y

Max: 9.1 [g] at 0.074 [s]

Min: -2.1 [g] at 0.173 [s]

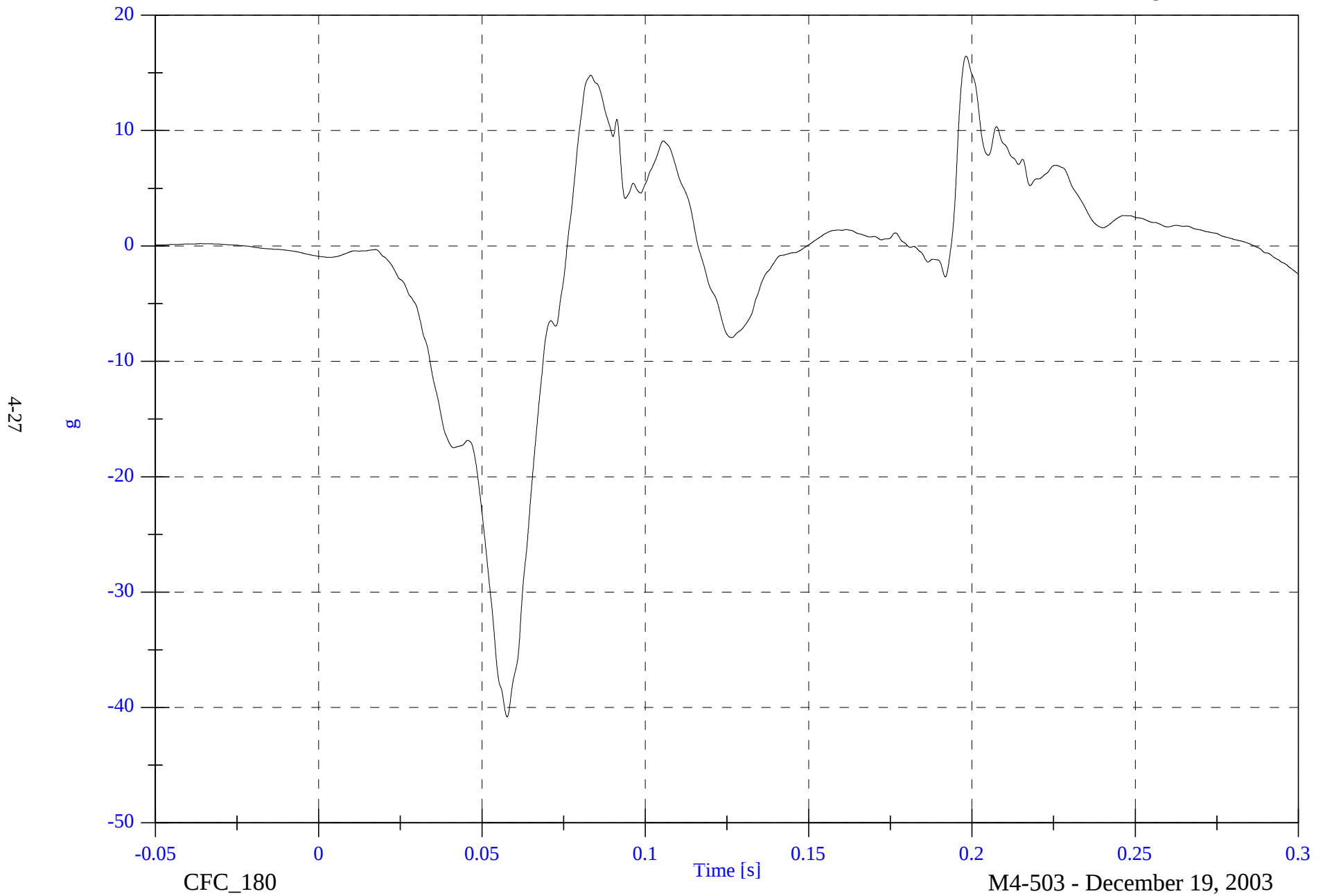


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Chest z

Max: 16.5 [g] at 0.198 [s]

Min: -40.8 [g] at 0.058 [s]



2004 NCAP Test 2 2004 Hyundai XG350

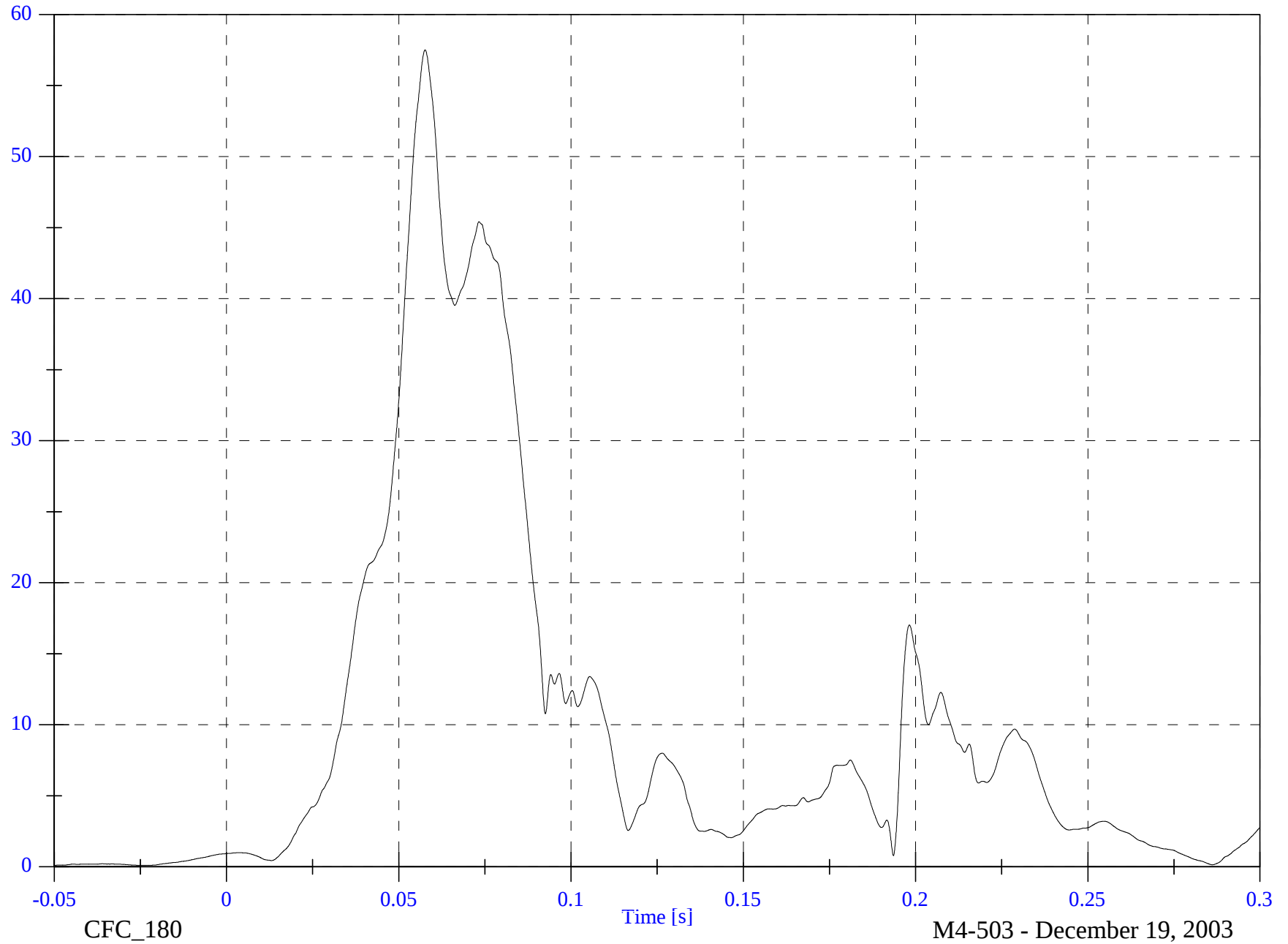
V1P3 Chest Resultant

Max: 57.5 [g] at 0.058 [s]

Min: 0.1 [g] at -0.023 [s]

4-28

g

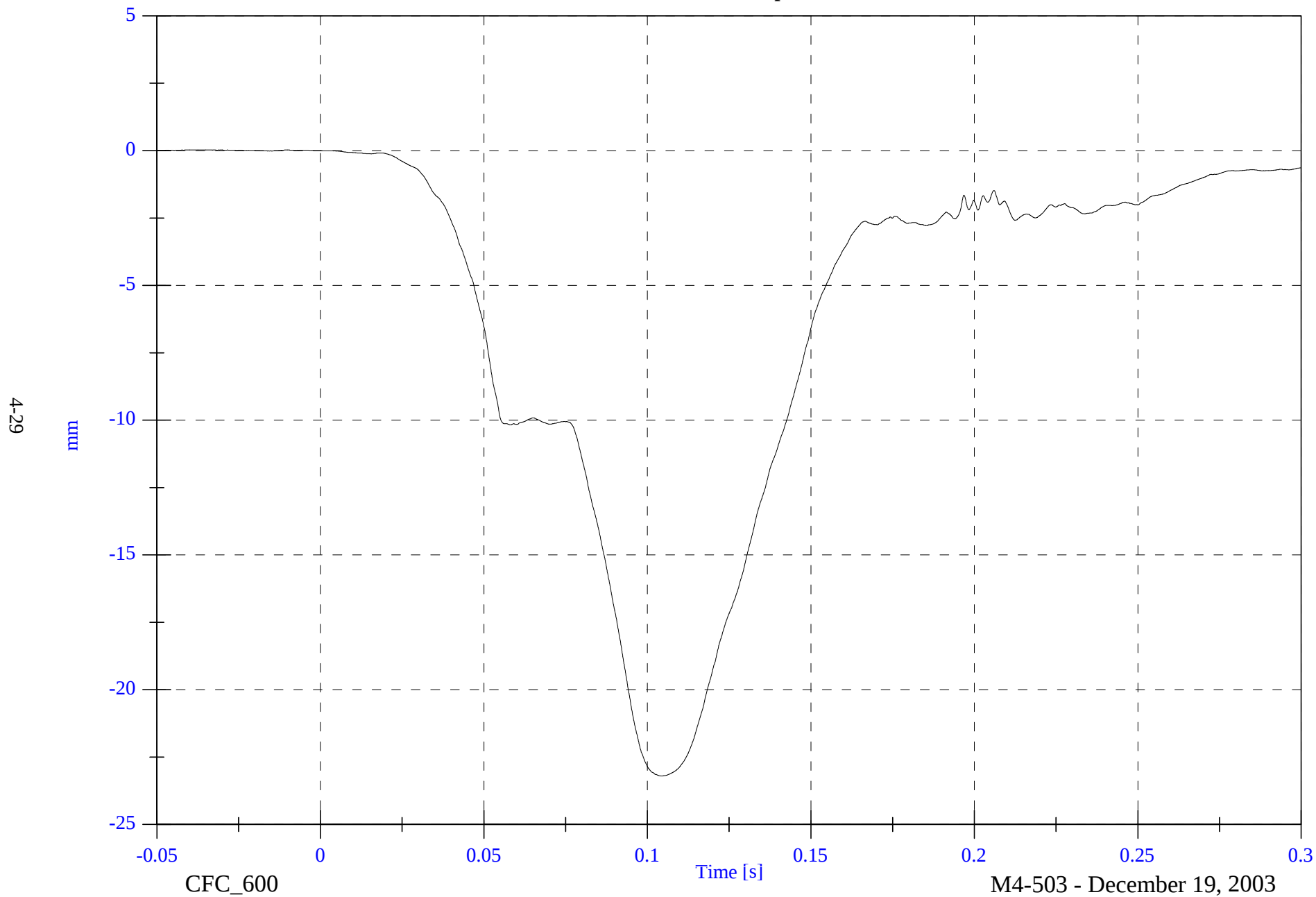


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Chest Compression

Max: 0.0 [mm] at -0.011 [s]

Min: -23.2 [mm] at 0.104 [s]



2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Pelvic x

Max: 20.1 [g] at 0.121 [s]

Min: -59.2 [g] at 0.061 [s]

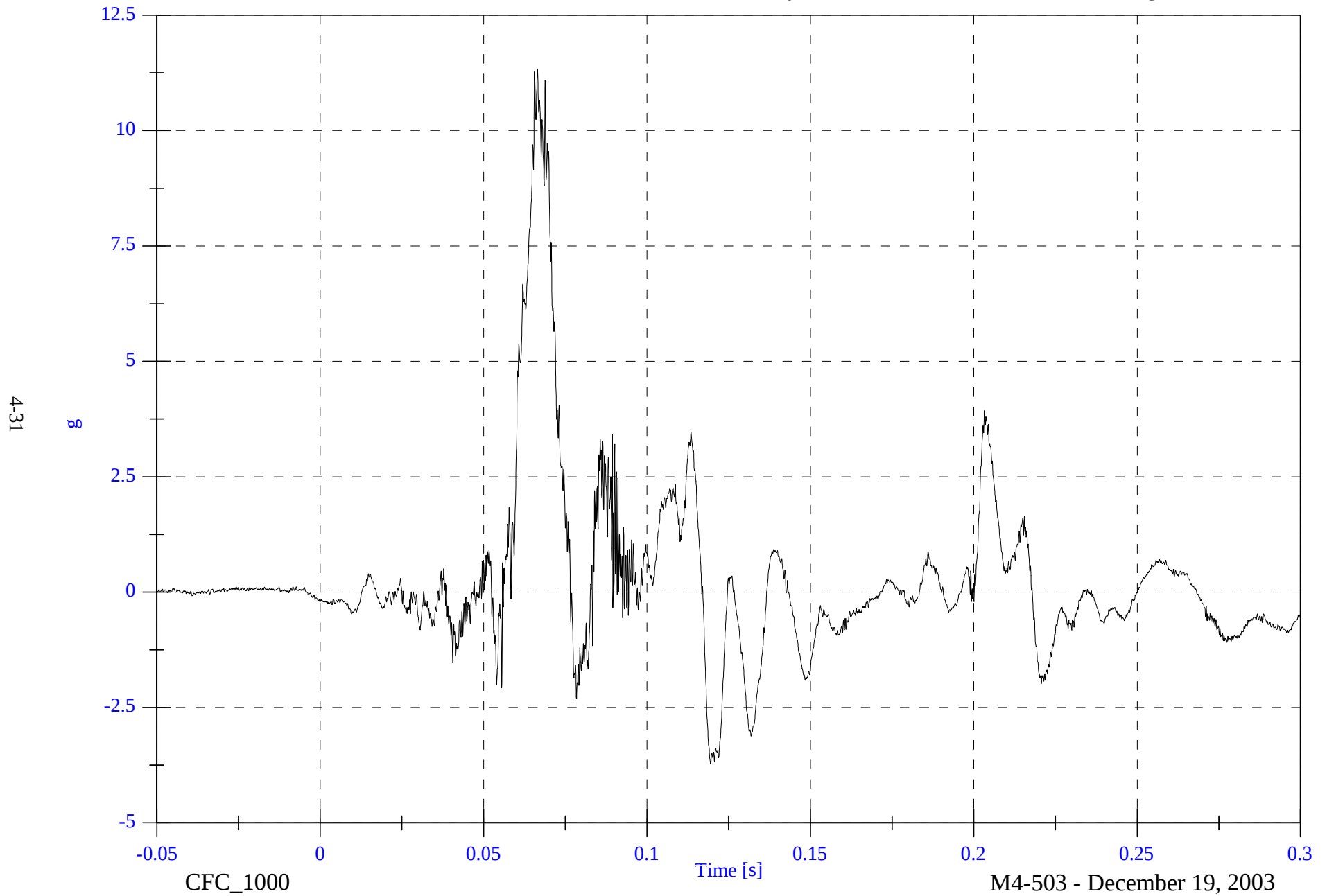


2004 NCAP Test 2 2004 Hyundai XG350

Max: 11.3 [g] at 0.066 [s]

Min: -3.7 [g] at 0.119 [s]

V1P3 Pelvic y

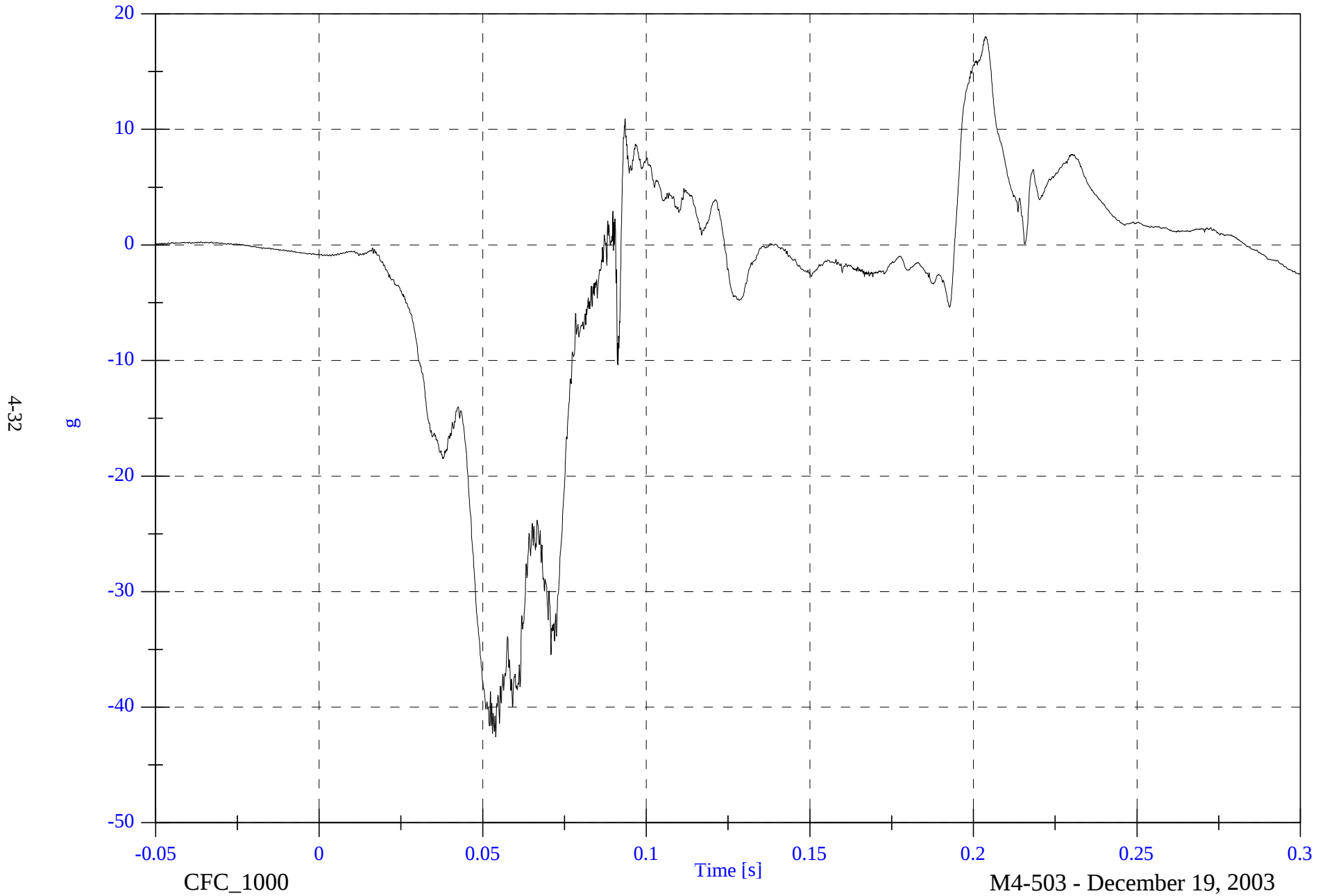


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Pelvic z

Max: 18.0 [g] at 0.204 [s]

Min: -42.6 [g] at 0.054 [s]



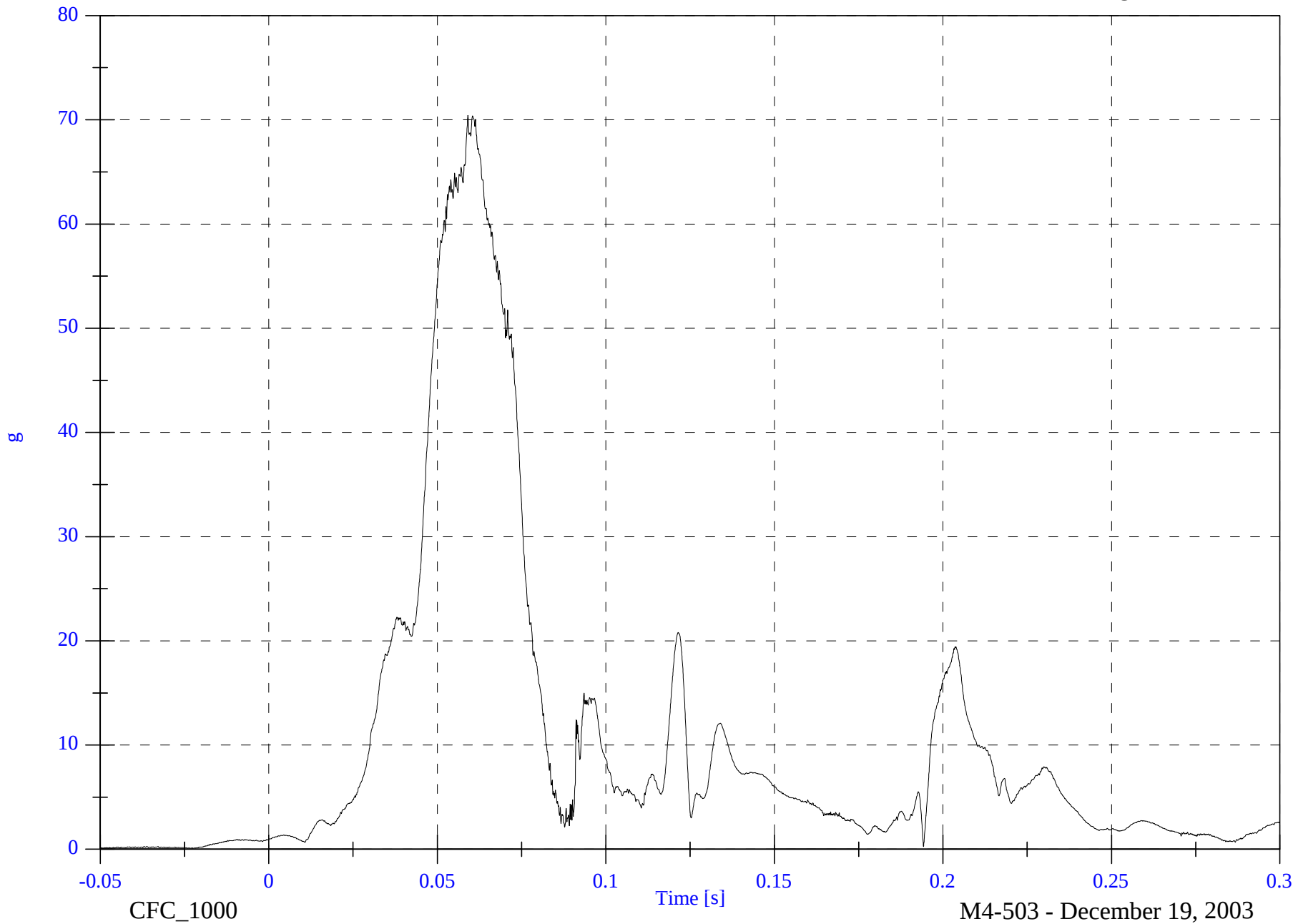
2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Pelvic Resultant

Max: 70.4 [g] at 0.059 [s]

Min: 0.1 [g] at -0.049 [s]

4-33

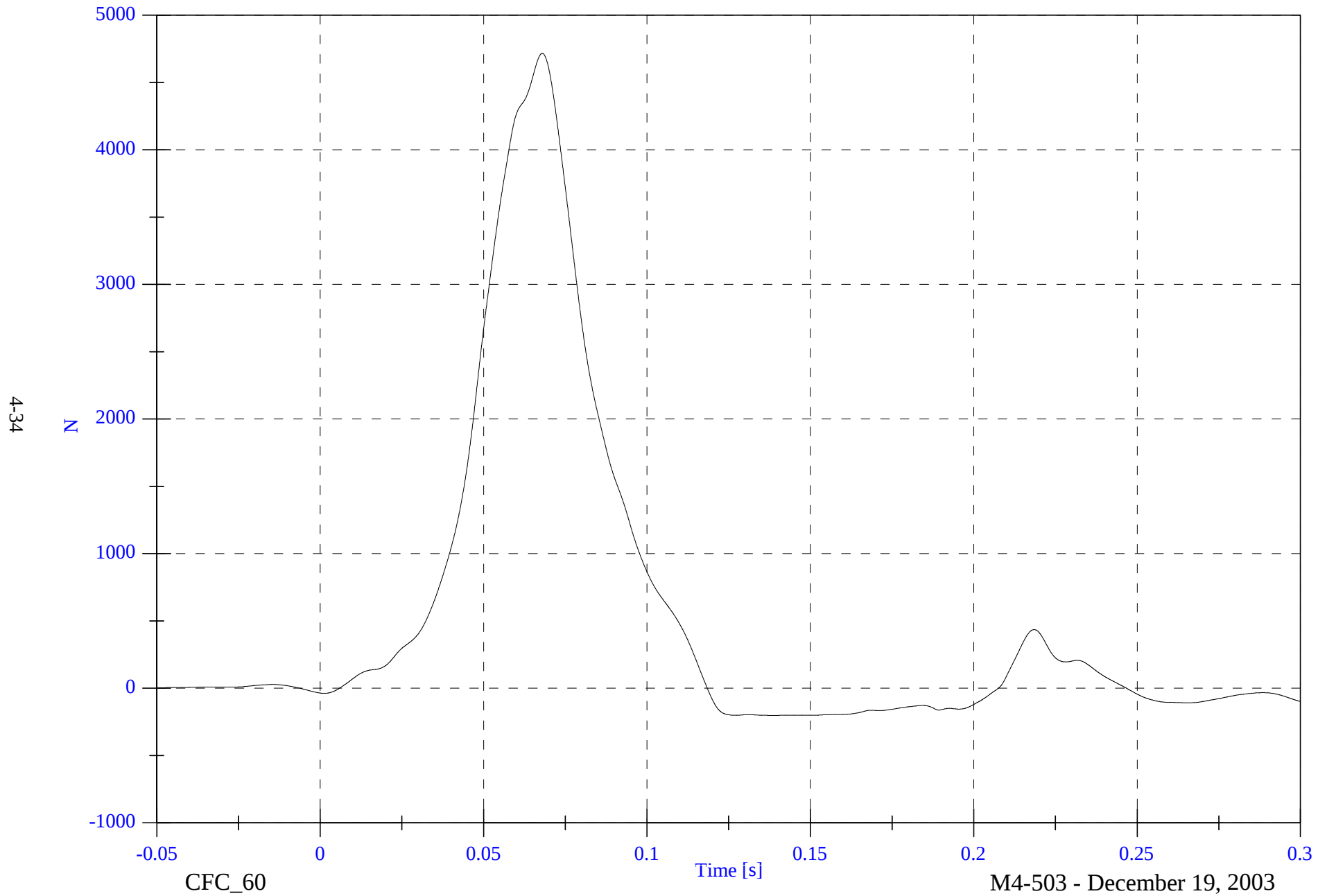


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 Latch Belt

Max: 4716.1 [N] at 0.068 [s]

Min: -201.7 [N] at 0.139 [s]

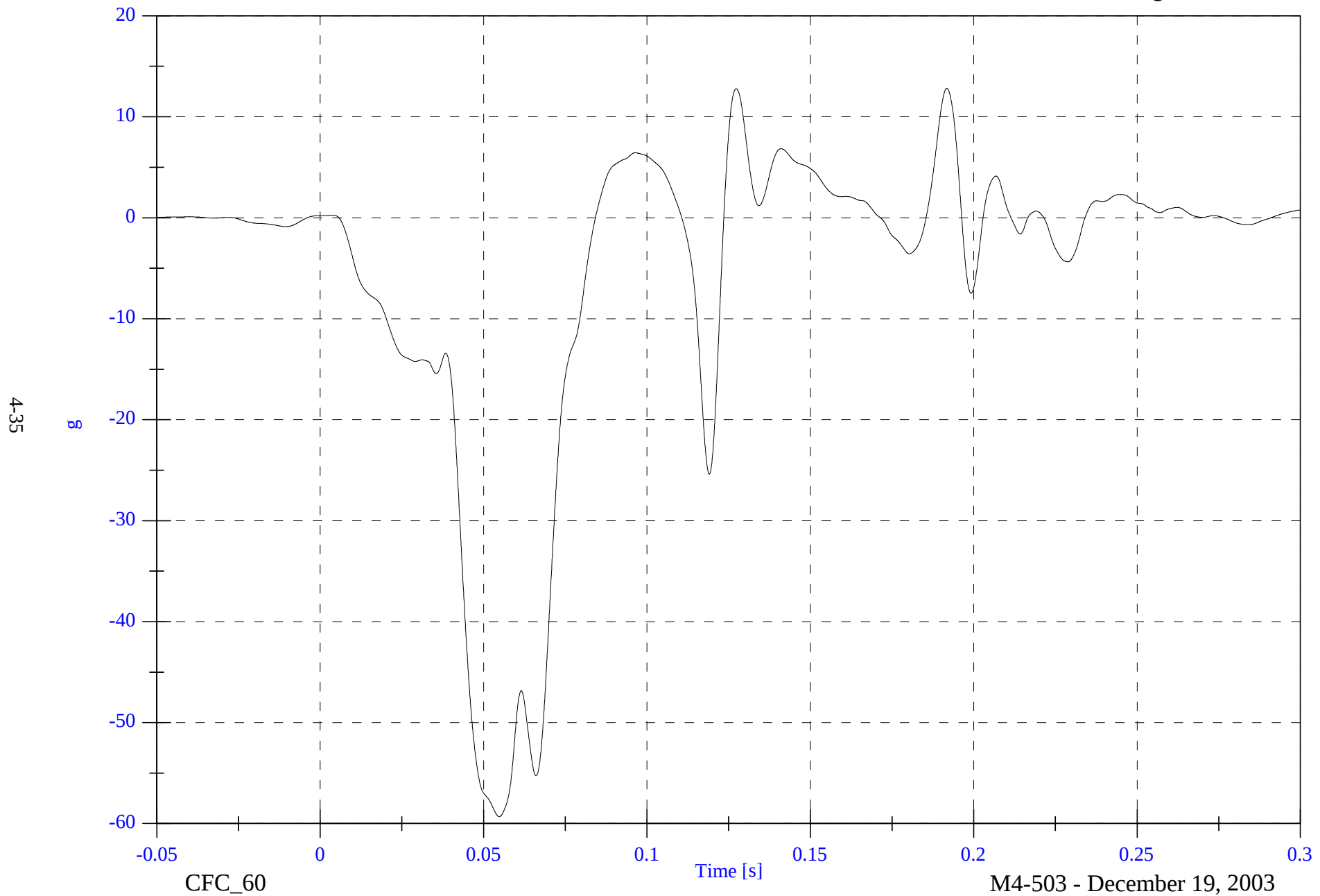


2004 NCAP Test 2 2004 Hyundai XG350

Max: 12.8 [g] at 0.192 [s]

Min: -59.3 [g] at 0.055 [s]

V1P3 CRS x



2004 NCAP Test 2 2004 Hyundai XG350

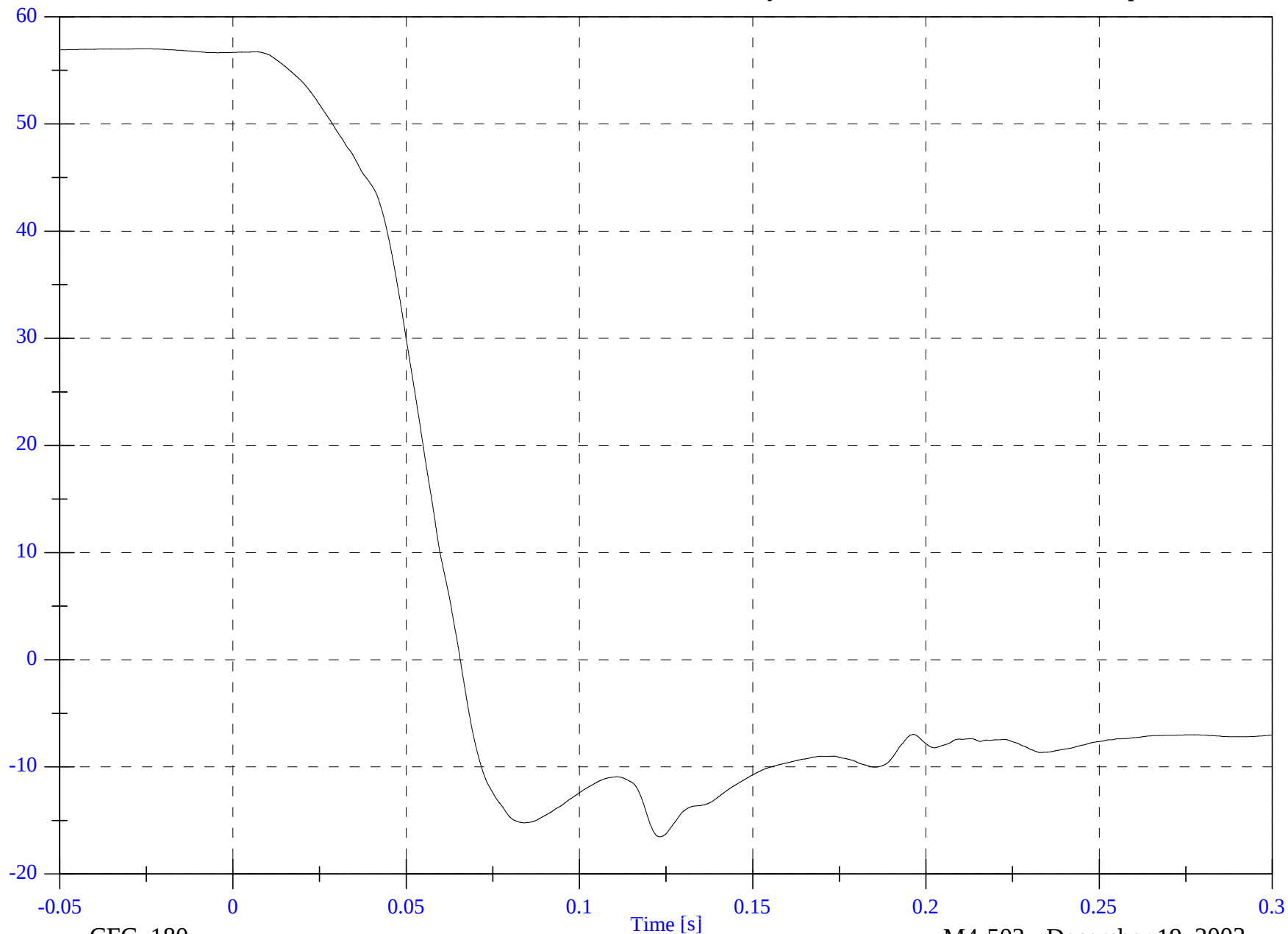
V1P3 CRS x Velocity

Max: 57.0 [kph] at -0.026 [s]

Min: -16.5 [kph] at 0.123 [s]

4-36

kph



CFC_180

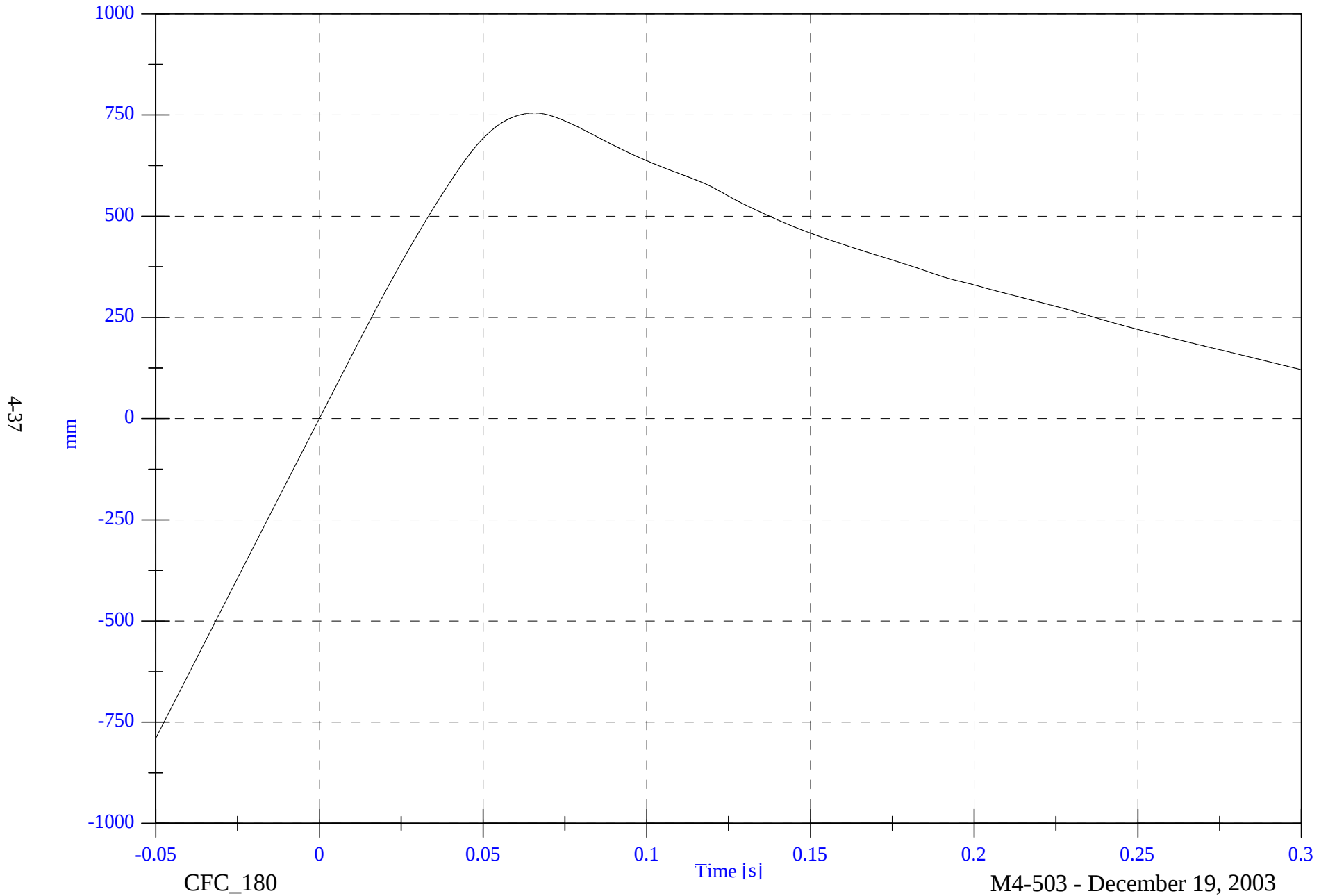
M4-503 - December 19, 2003

2004 NCAP Test 2 2004 Hyundai XG350

V1P3 CRS x Displacement

Max: 755.0 [mm] at 0.066 [s]

Min: -790.2 [mm] at -0.050 [s]

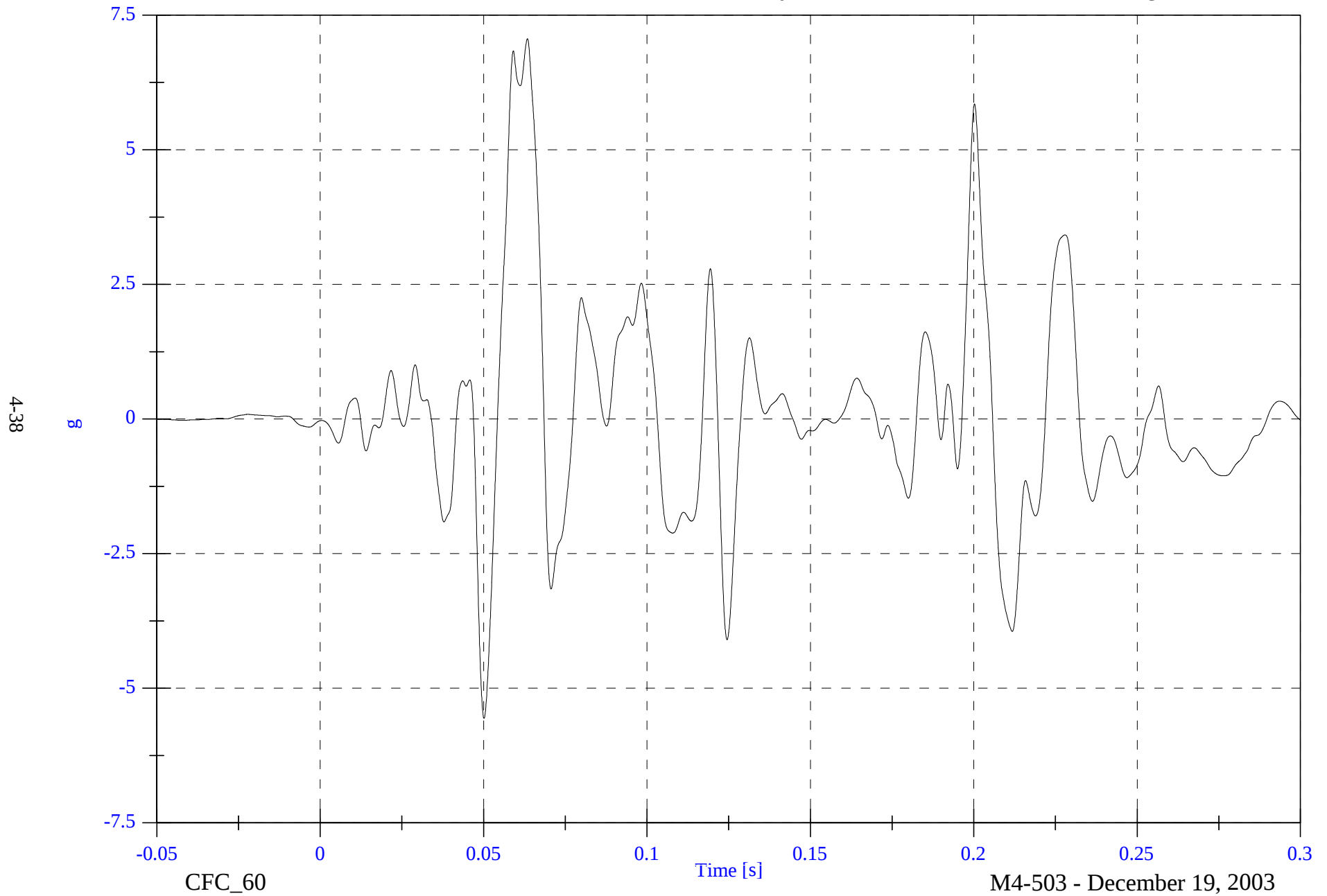


2004 NCAP Test 2 2004 Hyundai XG350

Max: 7.1 [g] at 0.063 [s]

Min: -5.6 [g] at 0.050 [s]

V1P3 CRS y

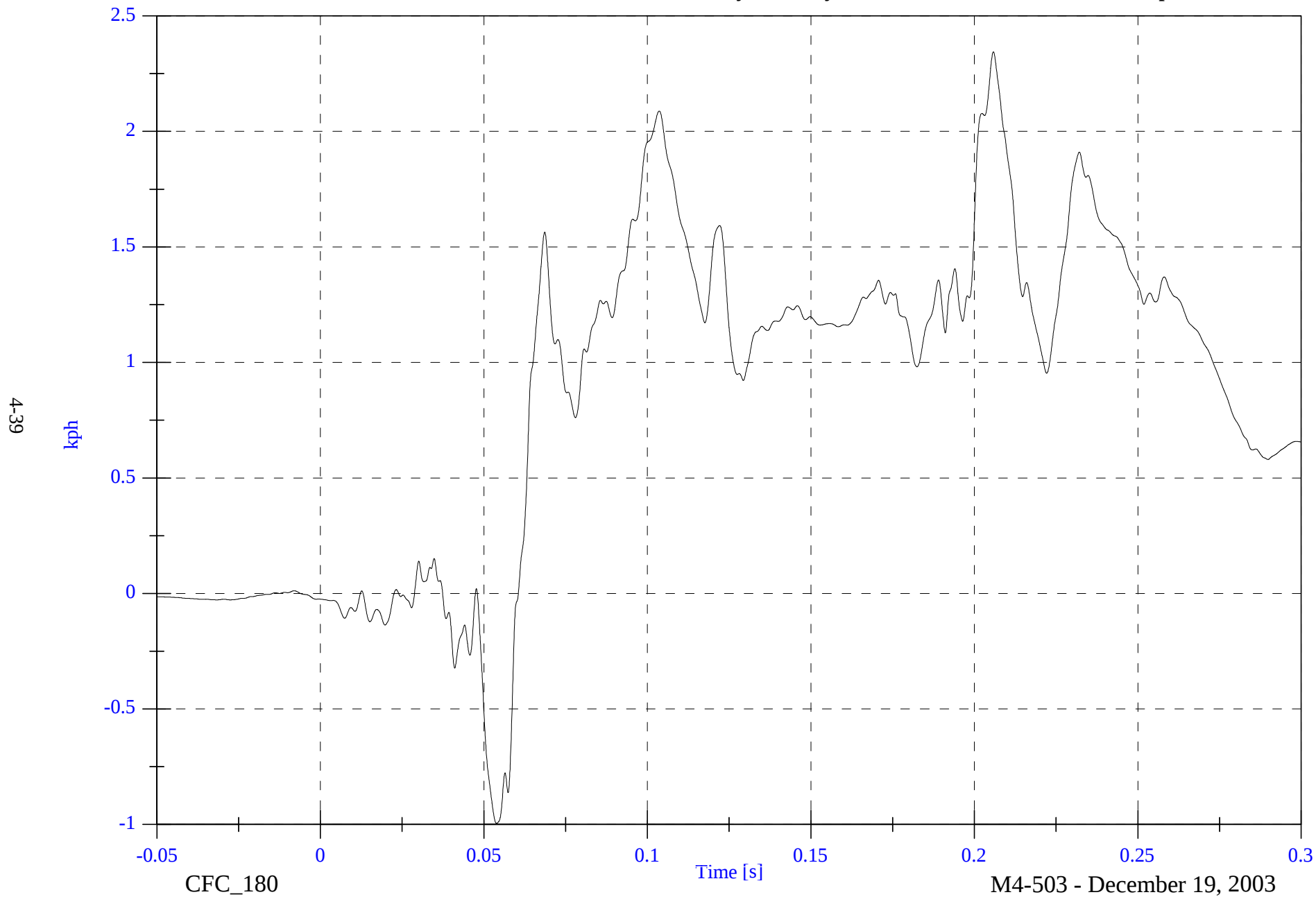


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 CRS y Velocity

Max: 2.3 [kph] at 0.206 [s]

Min: -1.0 [kph] at 0.054 [s]

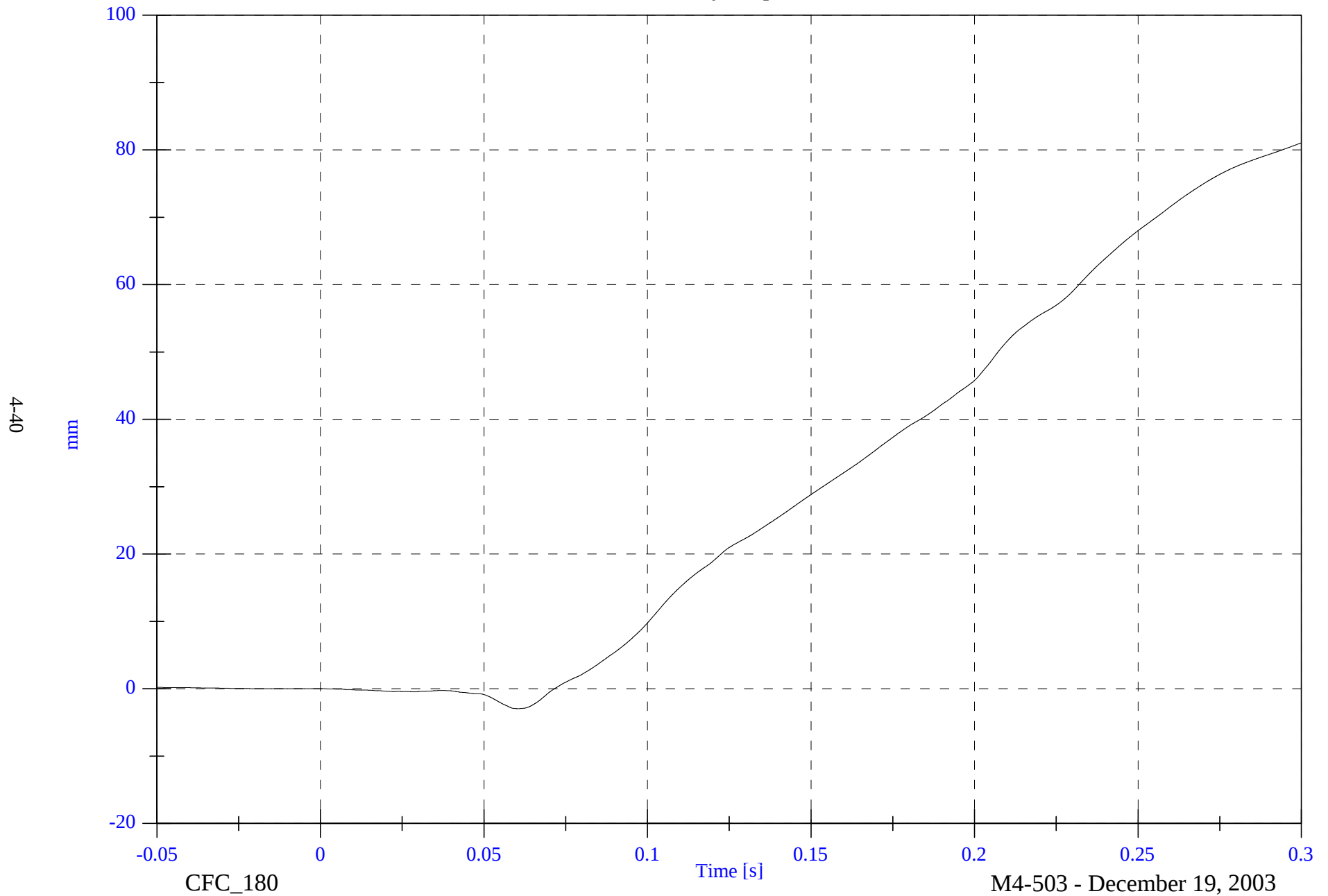


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 CRS y Displacement

Max: 81.0 [mm] at 0.300 [s]

Min: -3.0 [mm] at 0.061 [s]

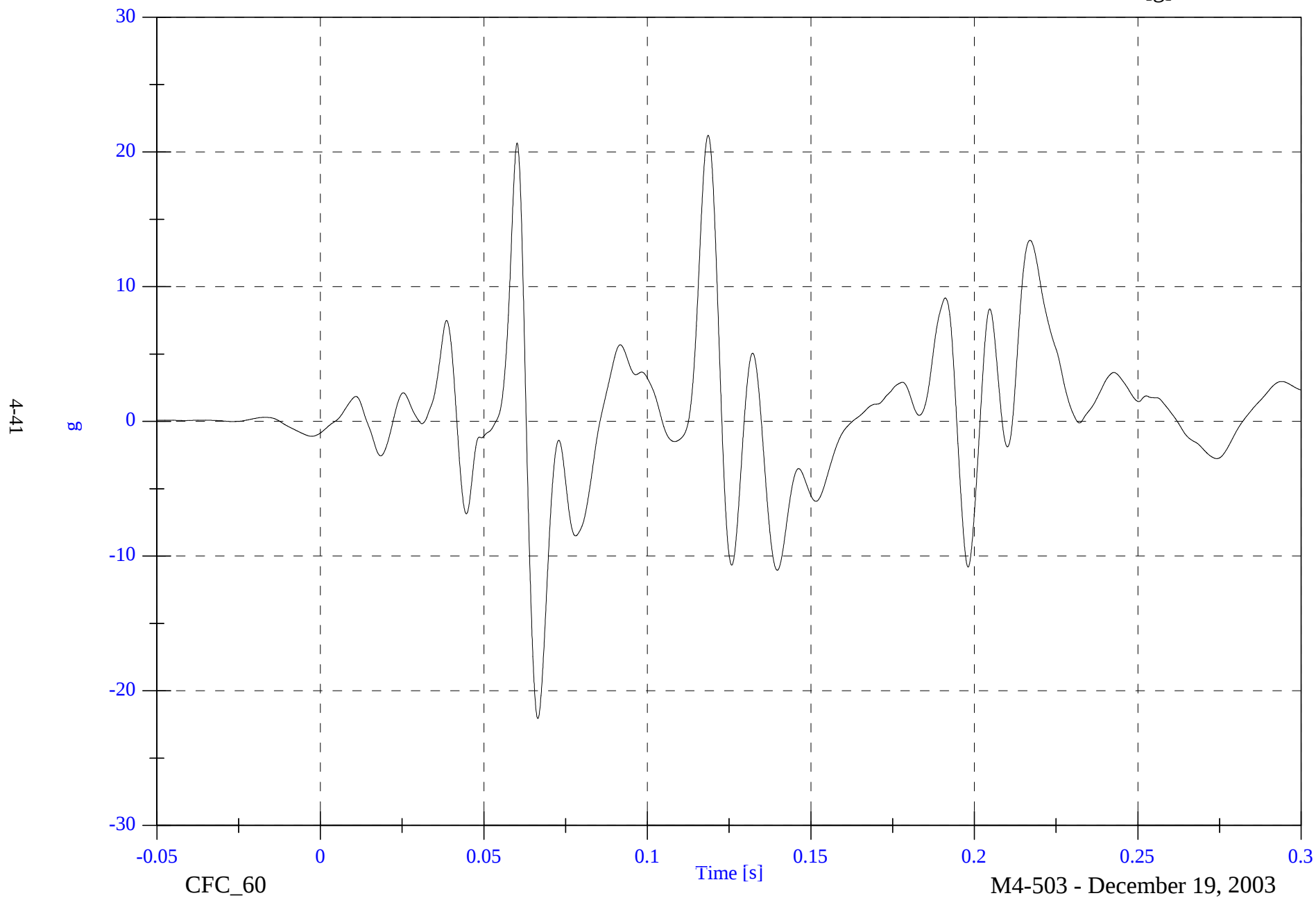


2004 NCAP Test 2 2004 Hyundai XG350

Max: 21.2 [g] at 0.119 [s]

Min: -22.1 [g] at 0.066 [s]

V1P3 CRS z

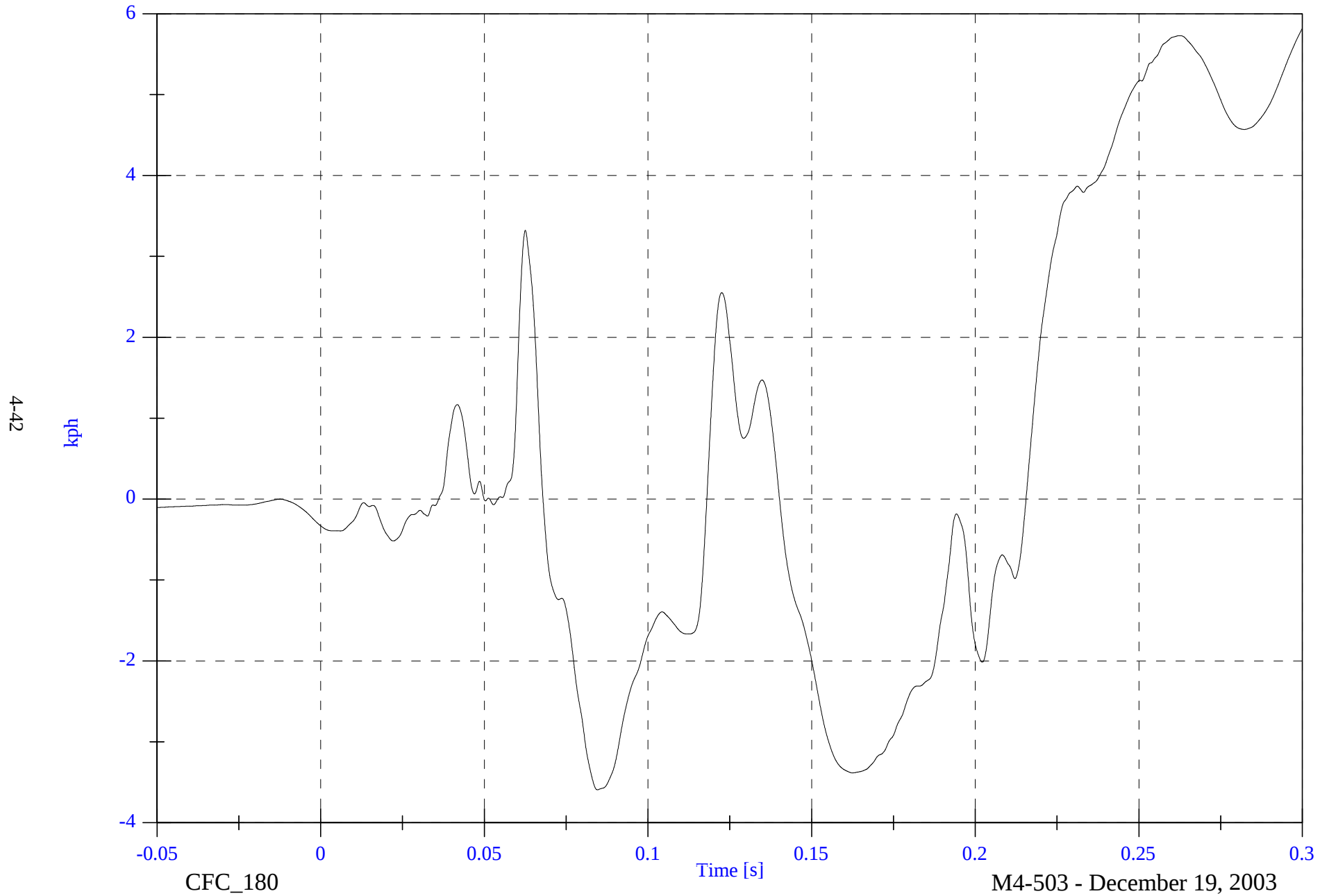


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 CRS z Velocity

Max: 5.8 [kph] at 0.300 [s]

Min: -3.6 [kph] at 0.085 [s]

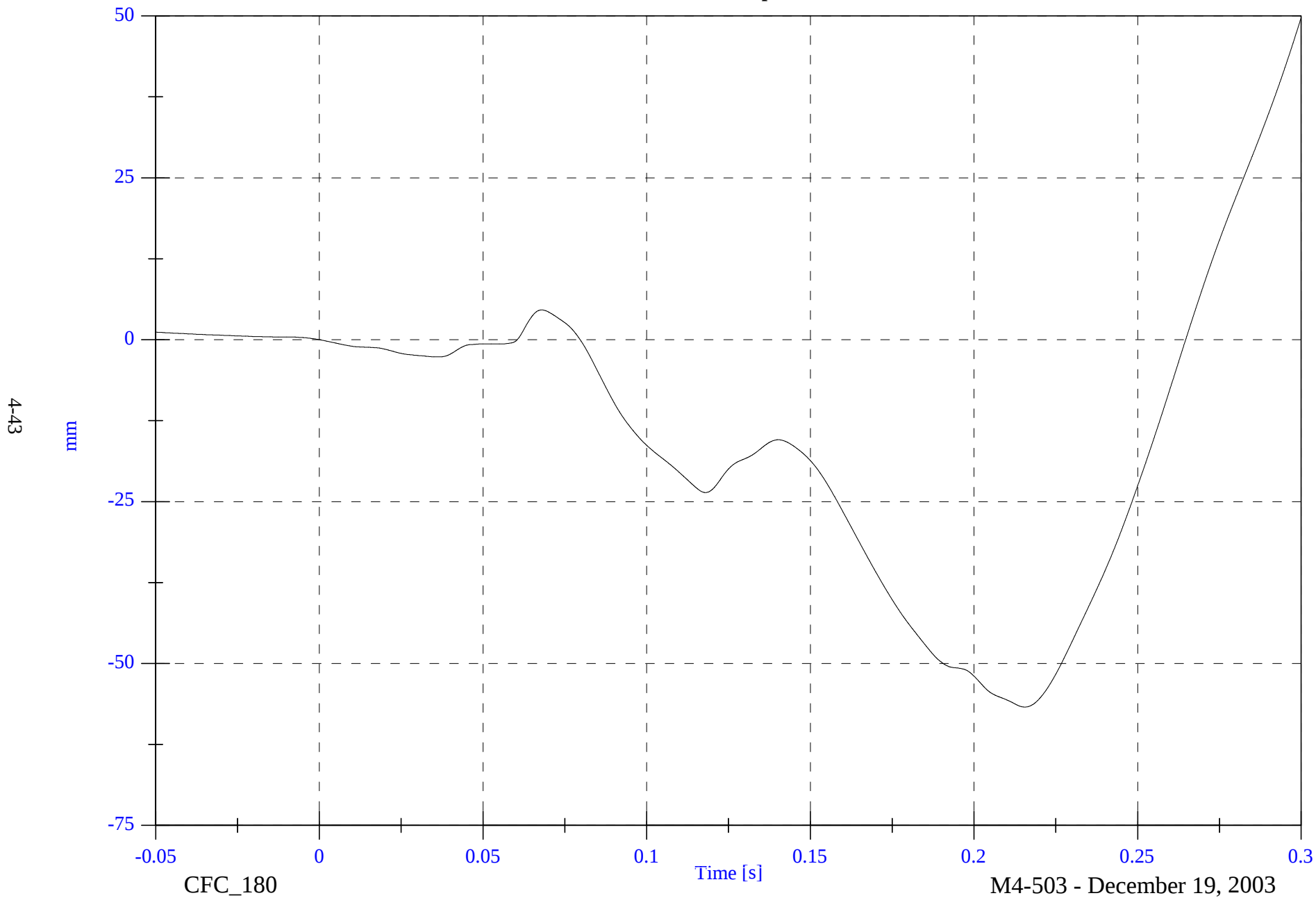


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 CRS z Displacement

Max: 49.7 [mm] at 0.300 [s]

Min: -56.7 [mm] at 0.216 [s]

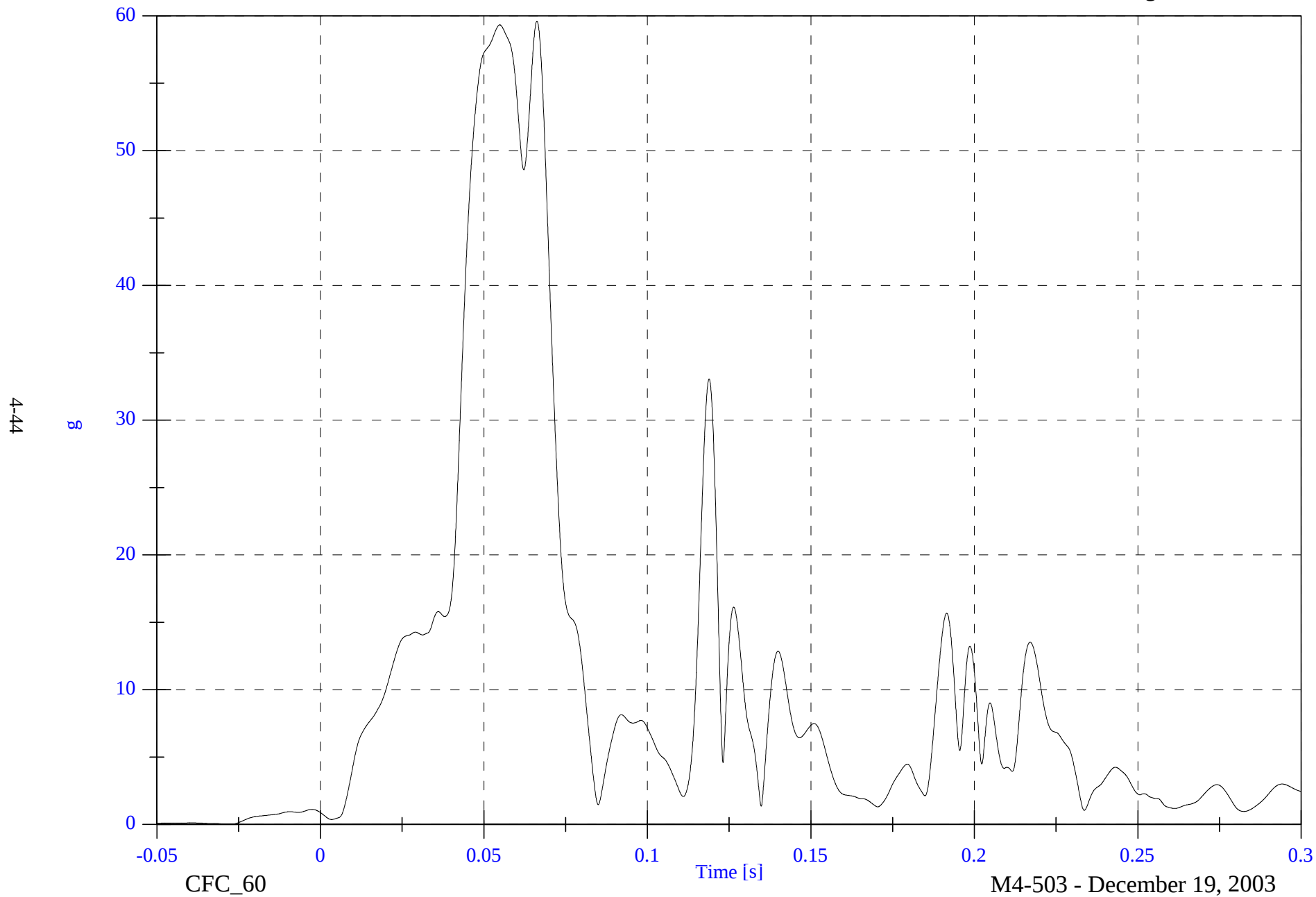


2004 NCAP Test 2 2004 Hyundai XG350

V1P3 CRS Resultant

Max: 59.6 [g] at 0.066 [s]

Min: 0.0 [g] at -0.029 [s]

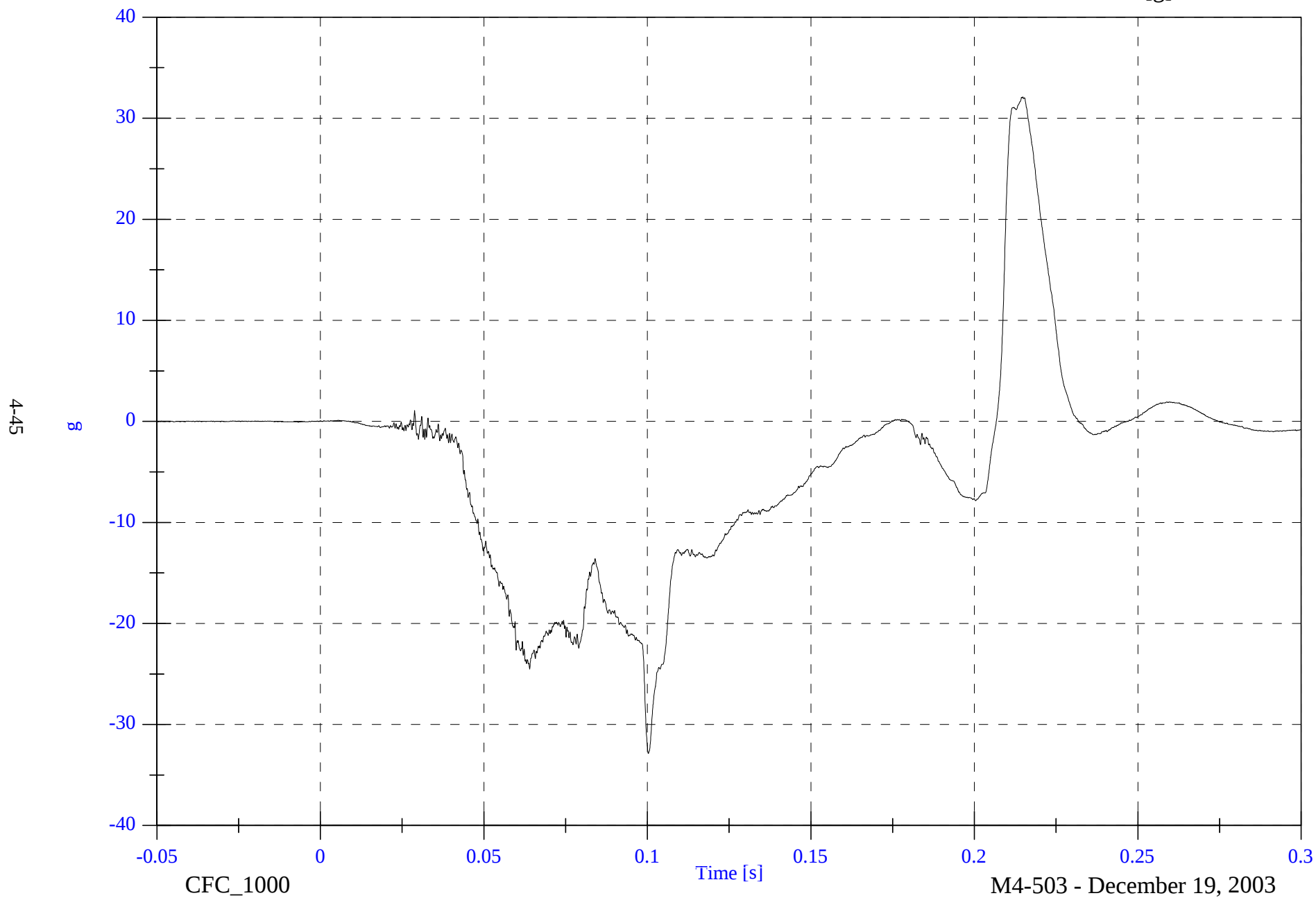


2004 NCAP Test 2 2004 Hyundai XG350

Max: 32.1 [g] at 0.215 [s]

Min: -32.9 [g] at 0.100 [s]

V1P4 Head x

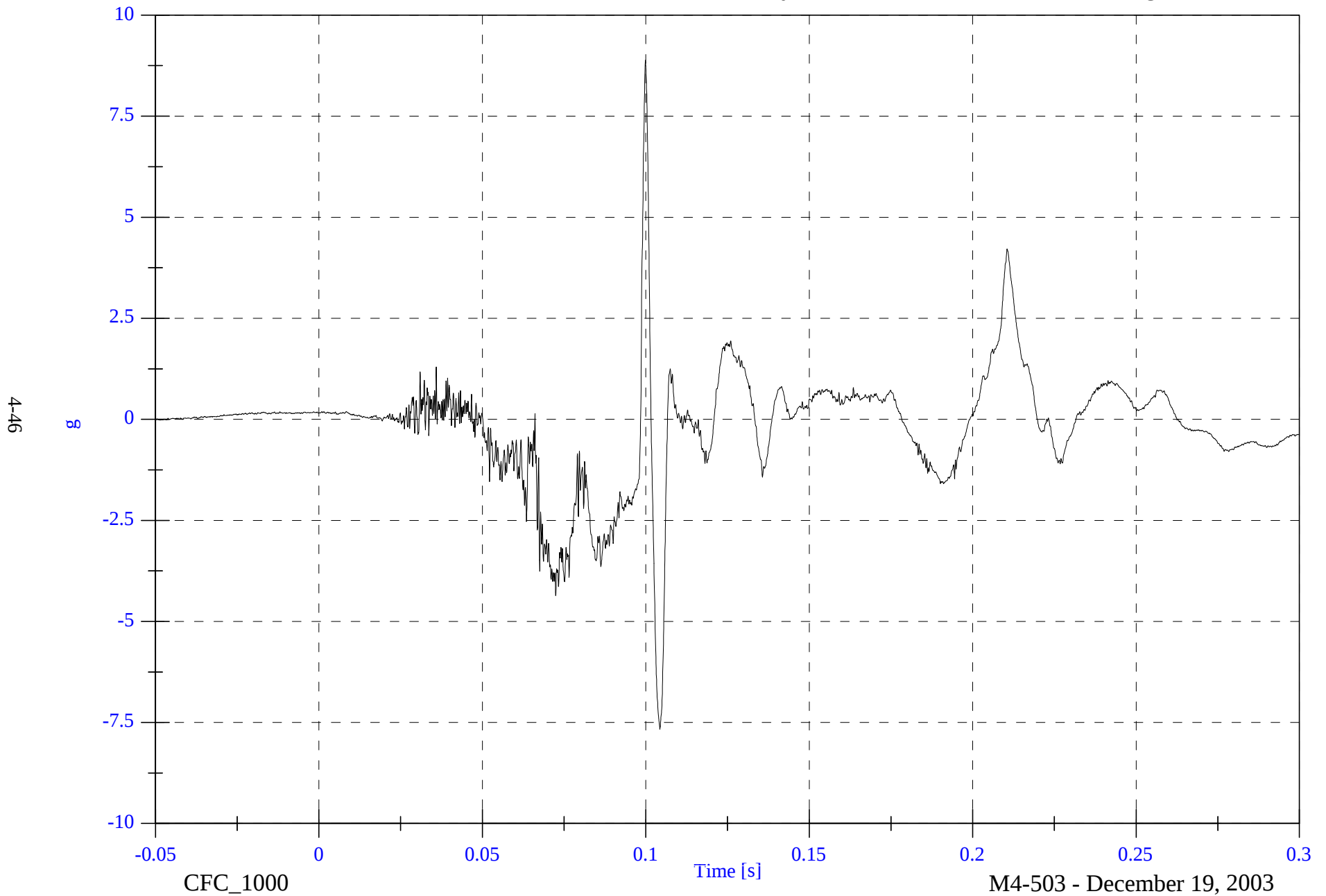


2004 NCAP Test 2 2004 Hyundai XG350

Max: 8.9 [g] at 0.100 [s]

Min: -7.7 [g] at 0.104 [s]

V1P4 Head y

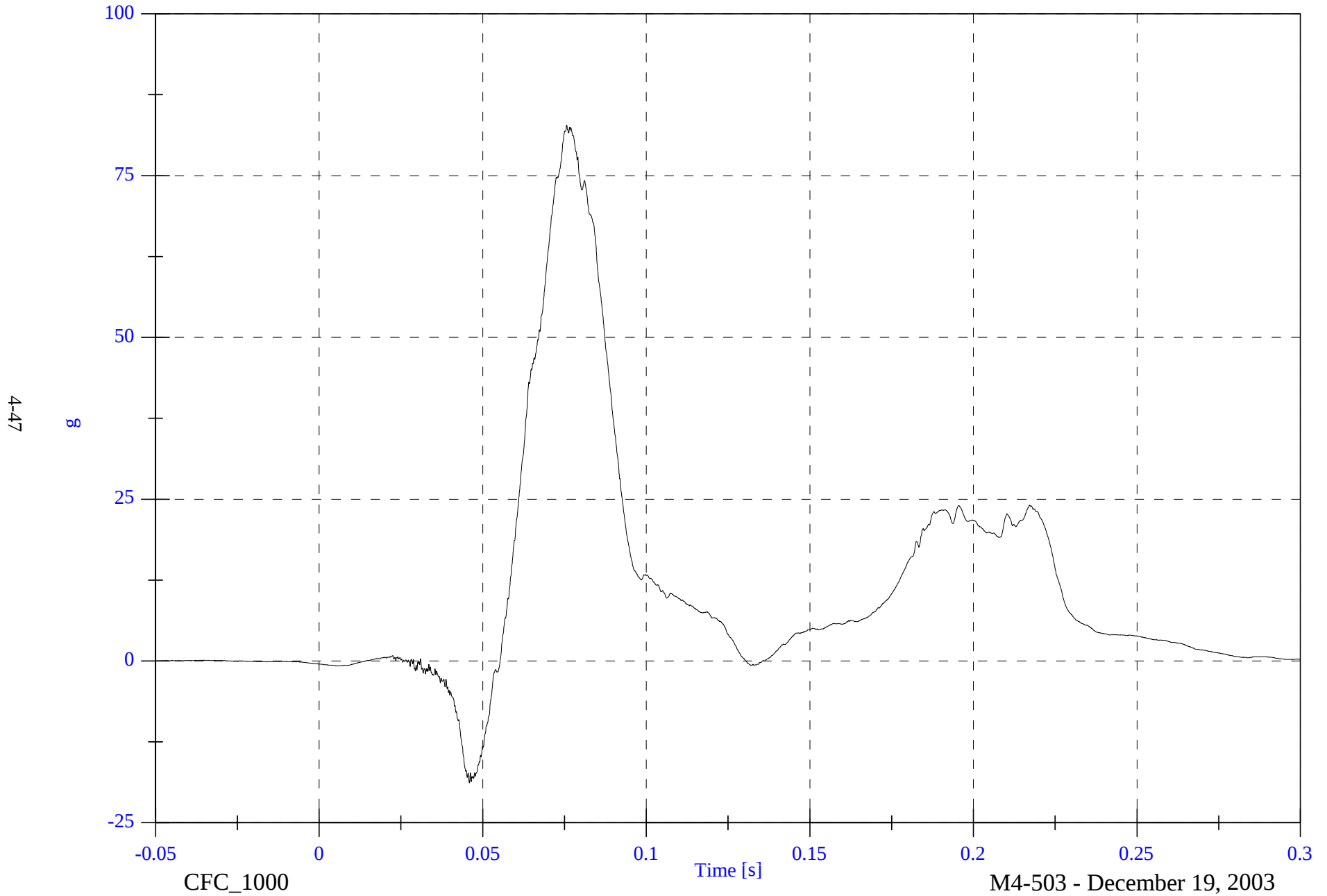


2004 NCAP Test 2 2004 Hyundai XG350

Max: 82.8 [g] at 0.076 [s]

Min: -18.8 [g] at 0.046 [s]

V1P4 Head z

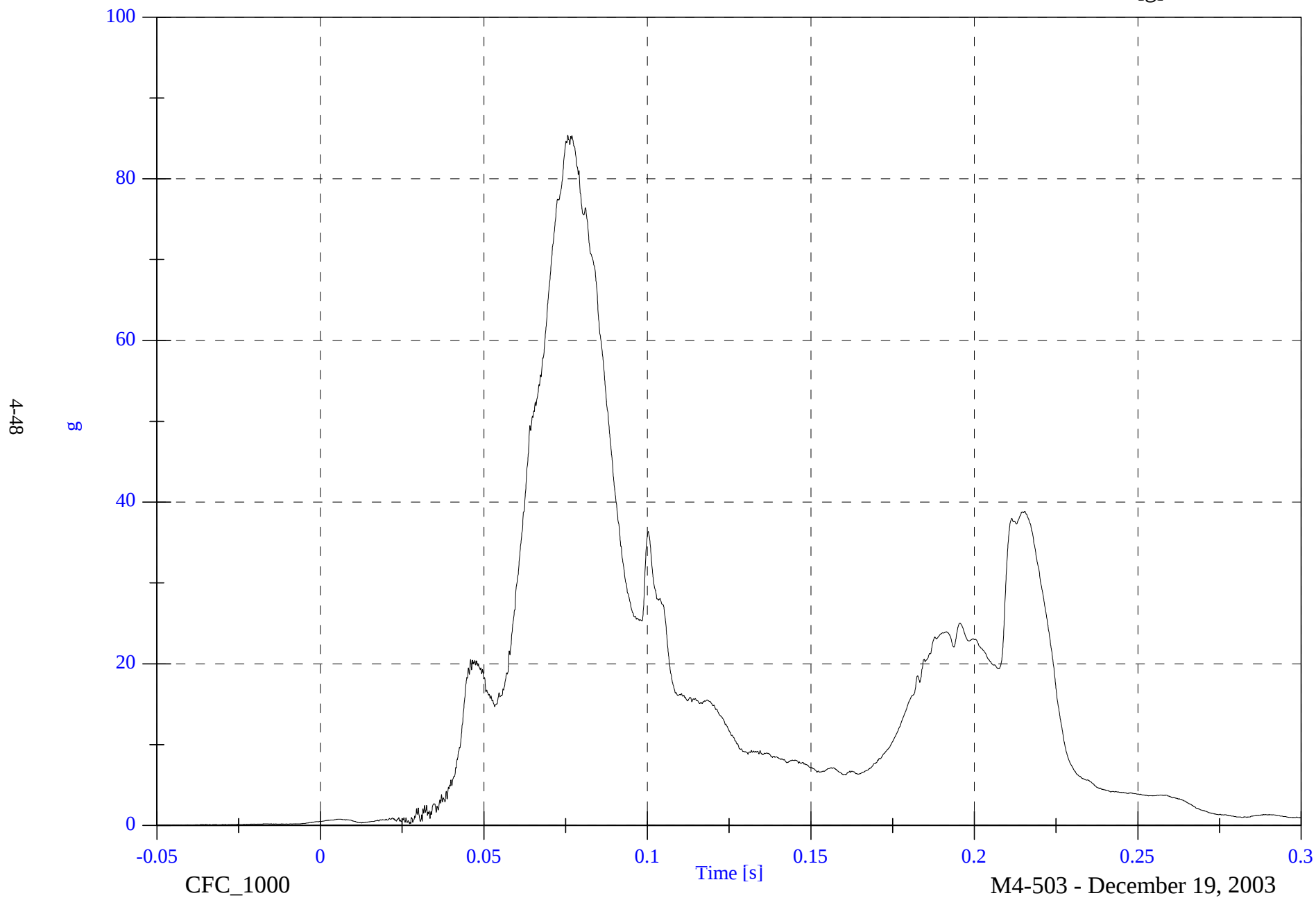


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Head Resultant

Max: 85.4 [g] at 0.076 [s]

Min: 0.0 [g] at -0.046 [s]



2004 NCAP Test 2 2004 Hyundai XG350

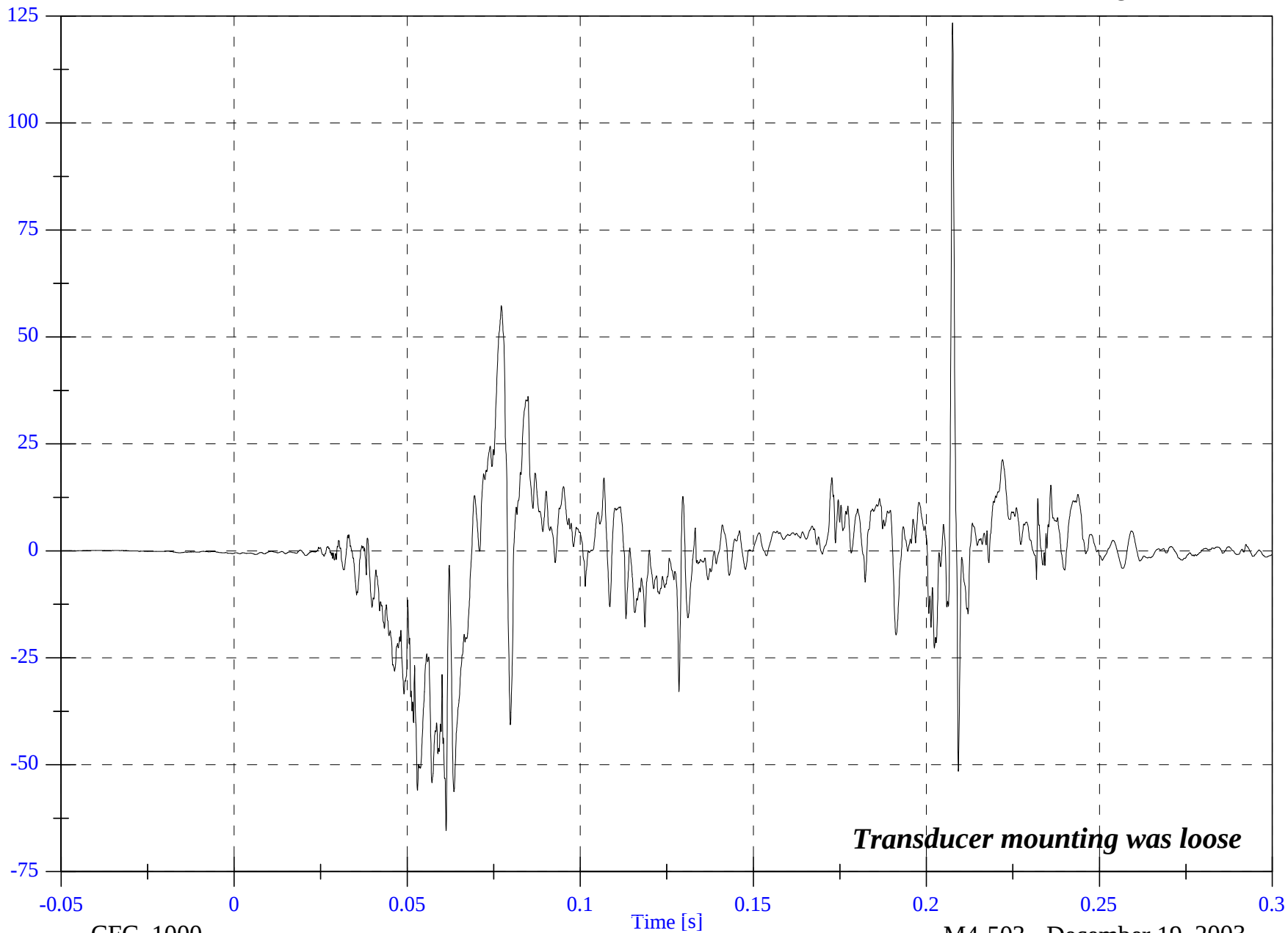
V1P4 Head Rear z

Max: 123.4 [g] at 0.208 [s]

Min: -65.4 [g] at 0.061 [s]

4-49

g



CFC_1000

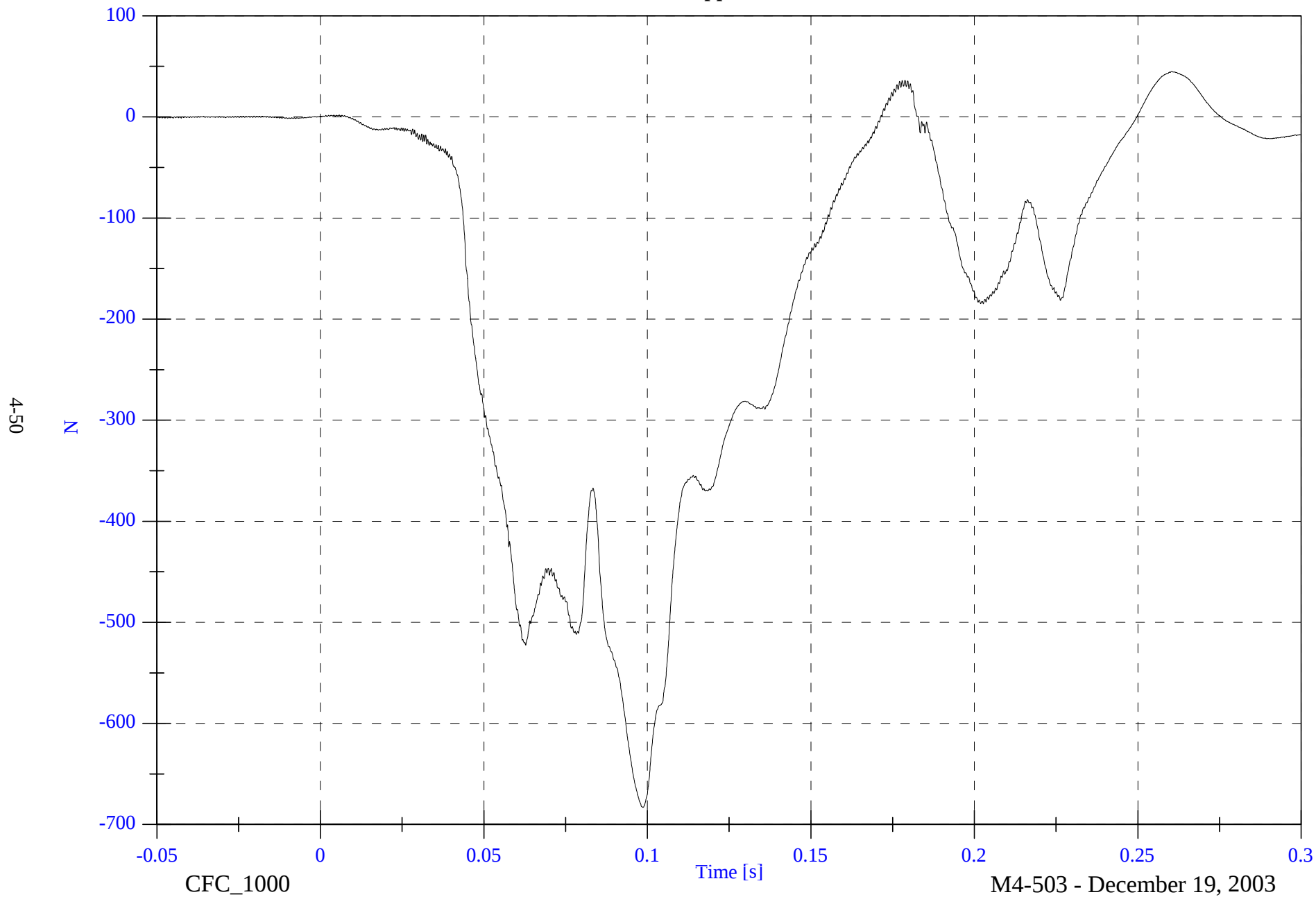
M4-503 - December 19, 2003

2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Upper Neck Fx

Max: 44.9 [N] at 0.260 [s]

Min: -683.2 [N] at 0.099 [s]

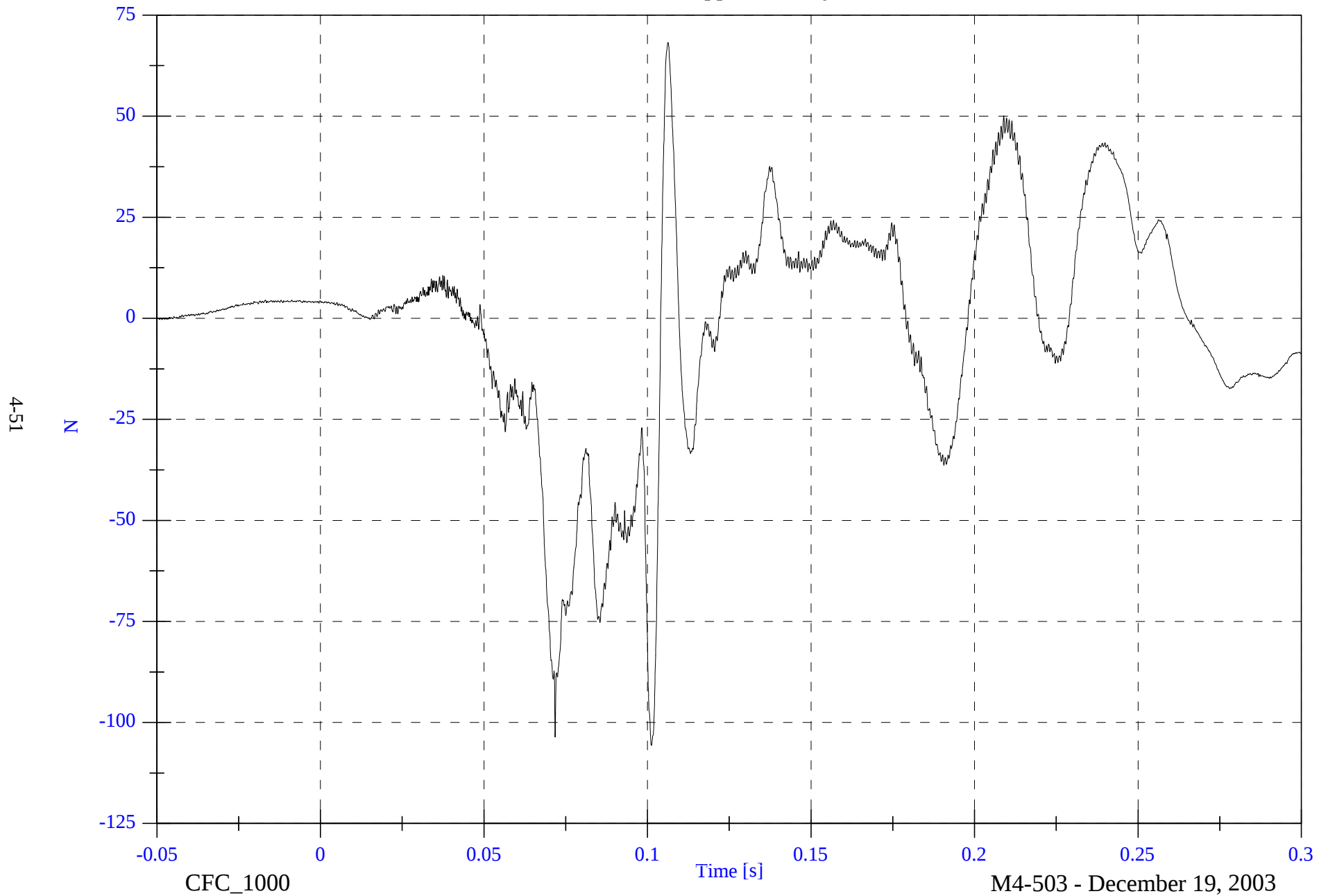


2004 NCAP Test 2 2004 Hyundai XG350

Max: 68.3 [N] at 0.106 [s]

Min: -105.7 [N] at 0.101 [s]

V1P4 Upper Neck Fy

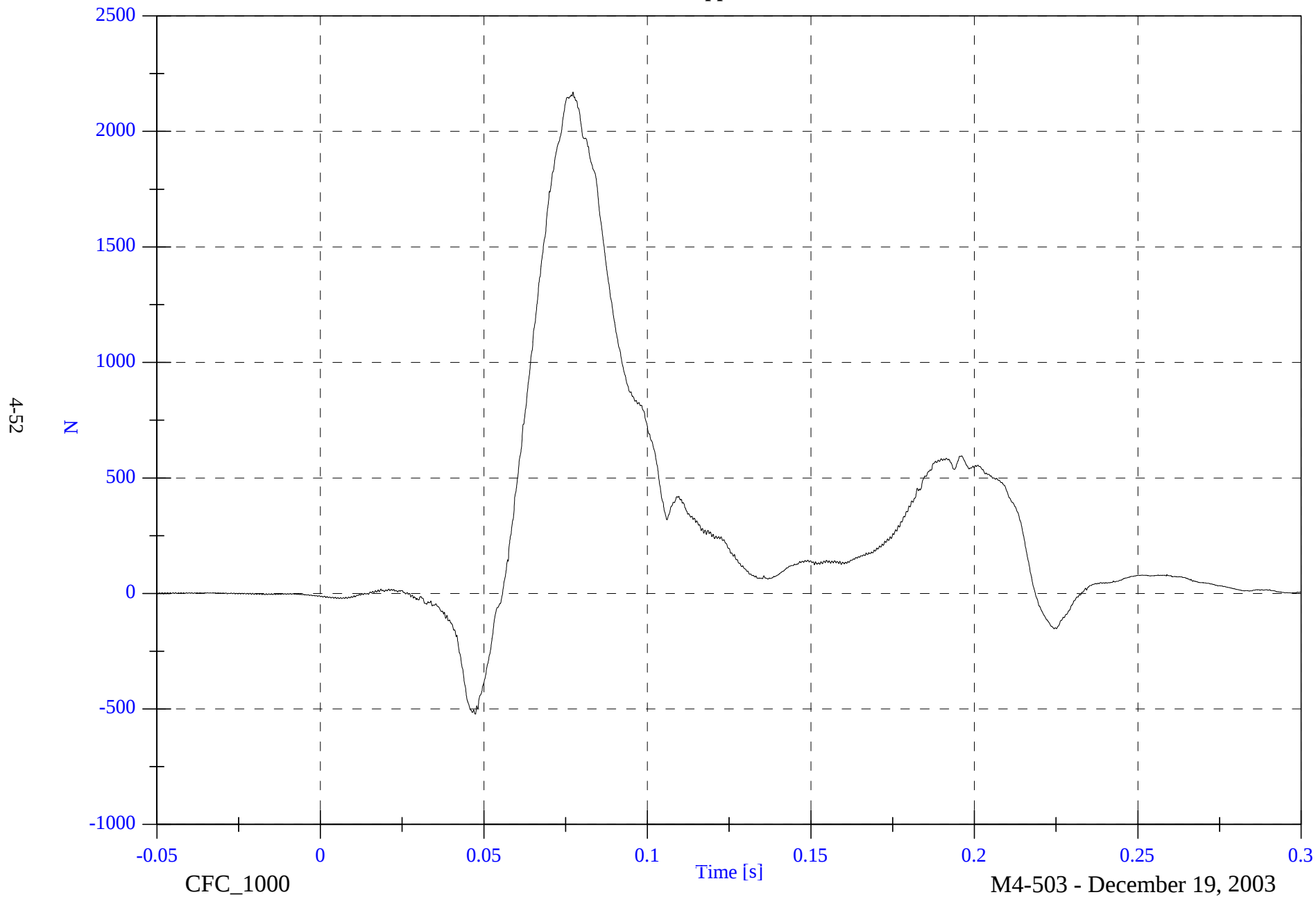


2004 NCAP Test 2 2004 Hyundai XG350

Max: 2170.3 [N] at 0.077 [s]

Min: -522.0 [N] at 0.047 [s]

V1P4 Upper Neck Fz

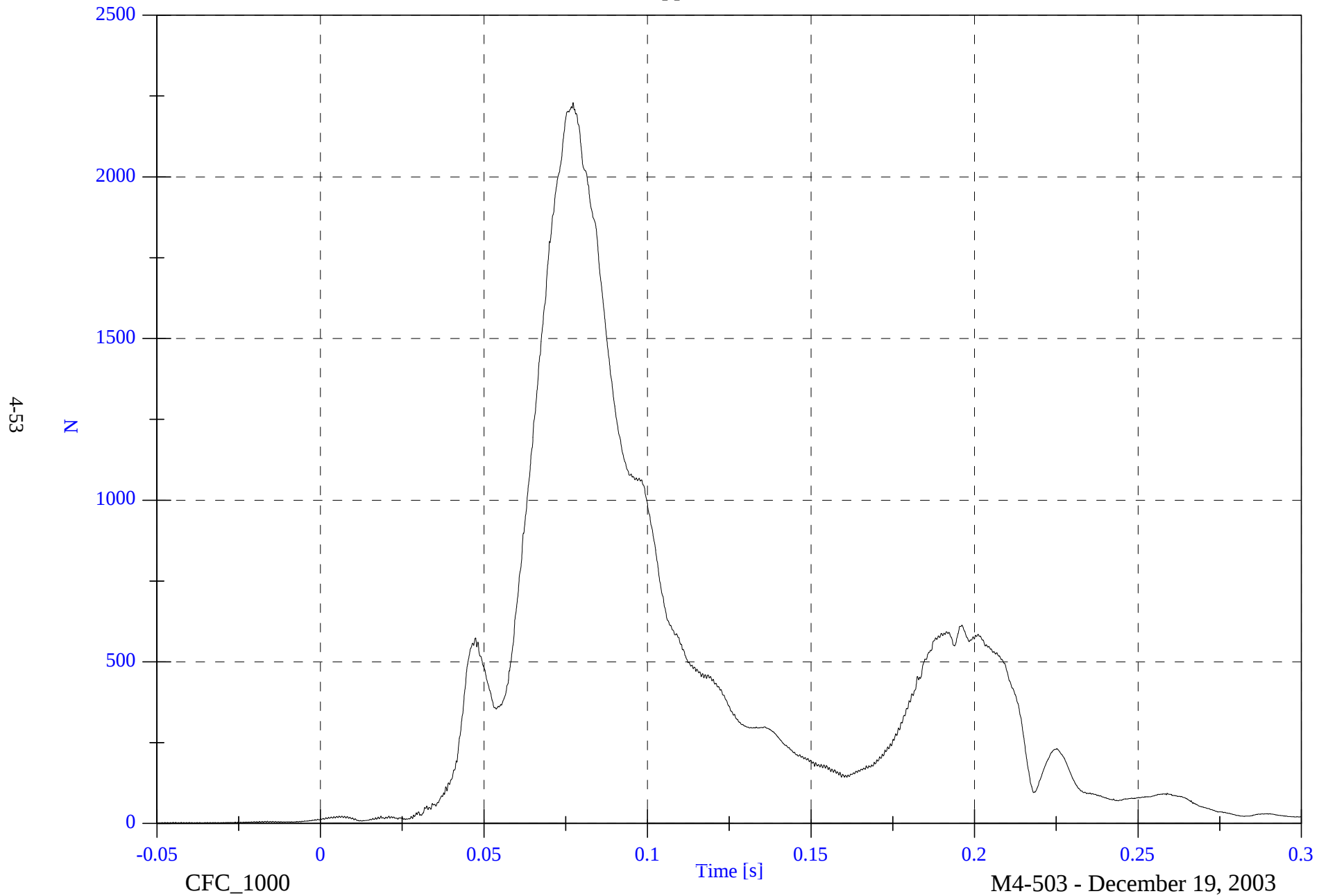


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Upper Neck F Resultant

Max: 2229.5 [N] at 0.077 [s]

Min: 0.2 [N] at -0.044 [s]

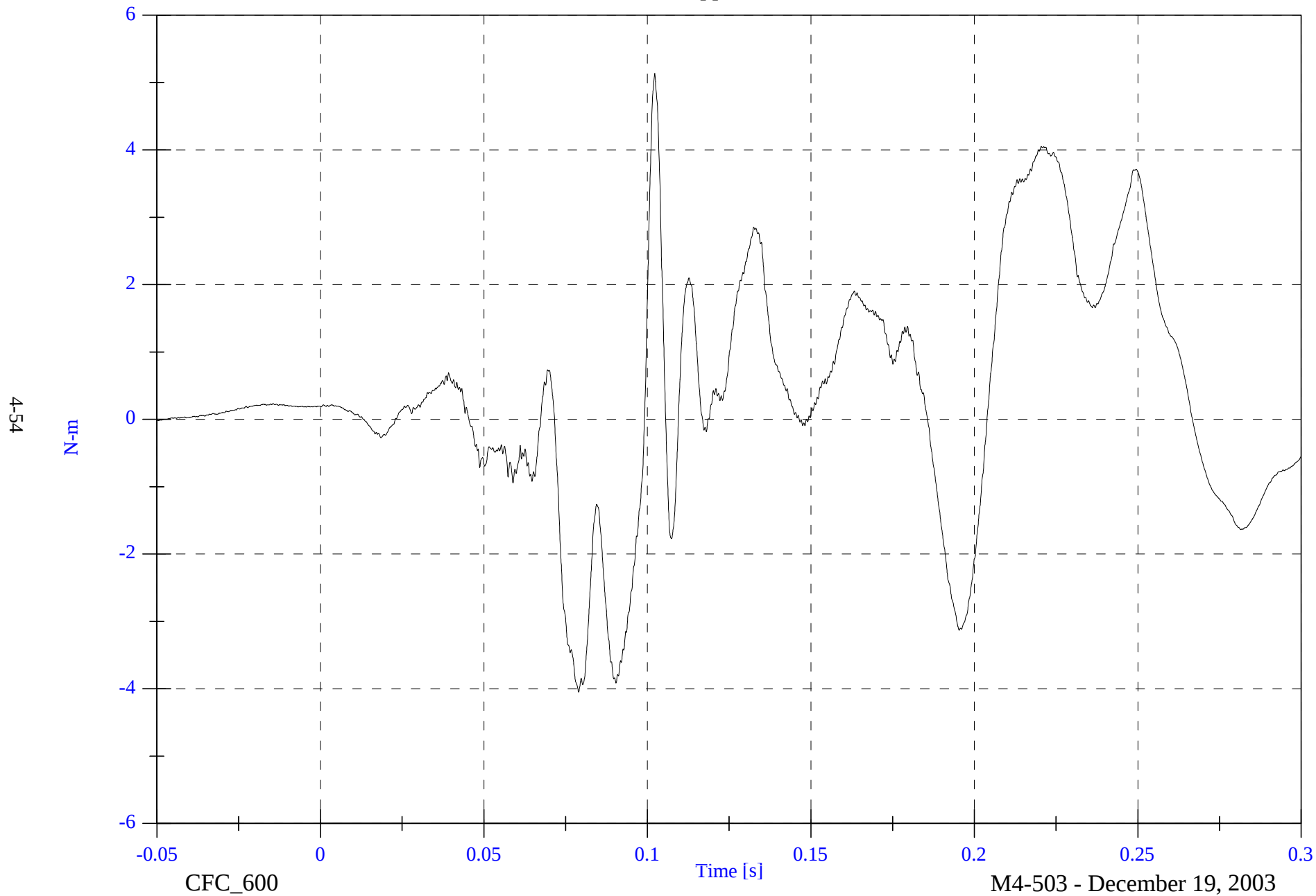


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Upper Neck Mx

Max: 5.1 [N-m] at 0.102 [s]

Min: -4.1 [N-m] at 0.079 [s]

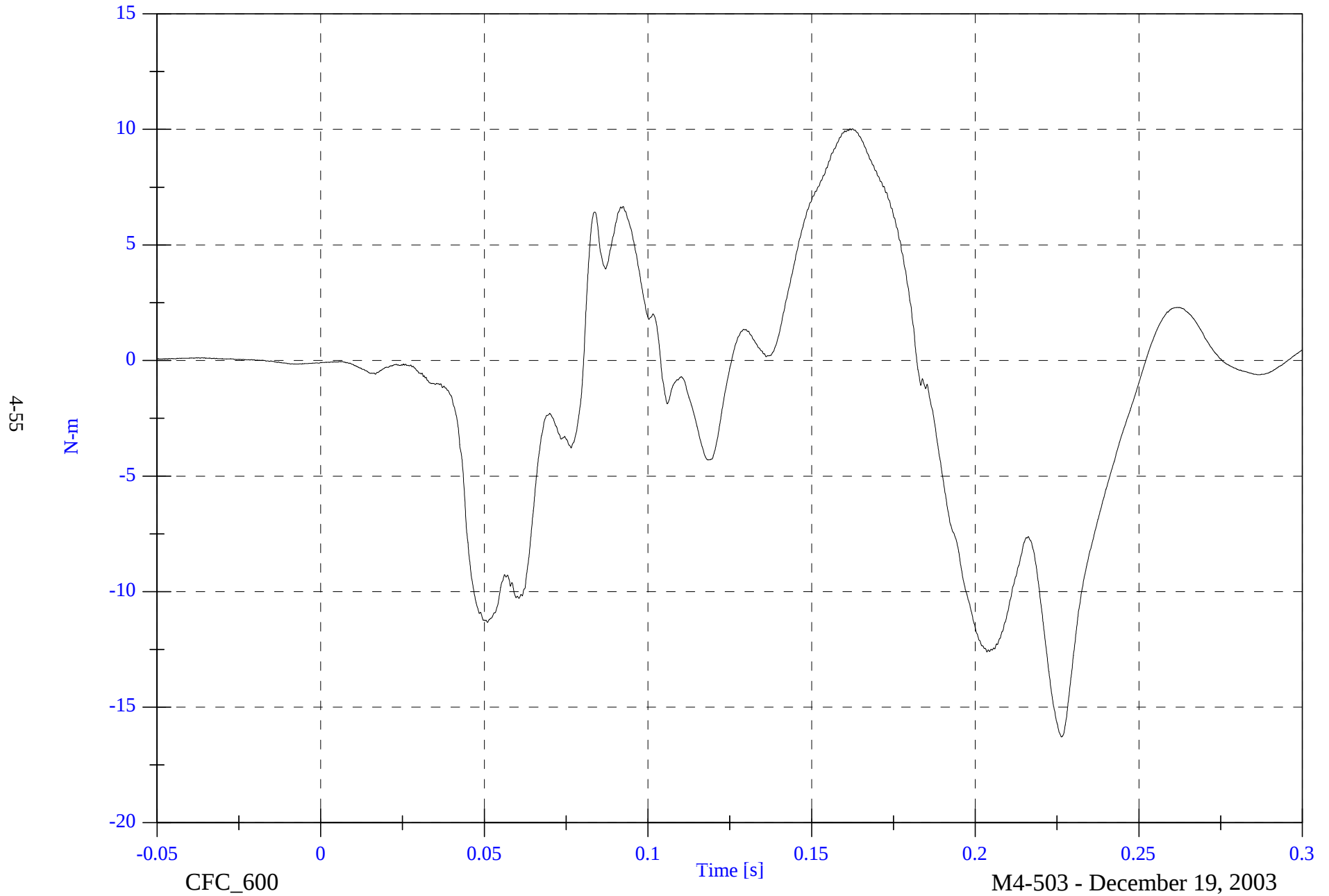


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Upper Neck My

Max: 10.0 [N-m] at 0.163 [s]

Min: -16.3 [N-m] at 0.226 [s]

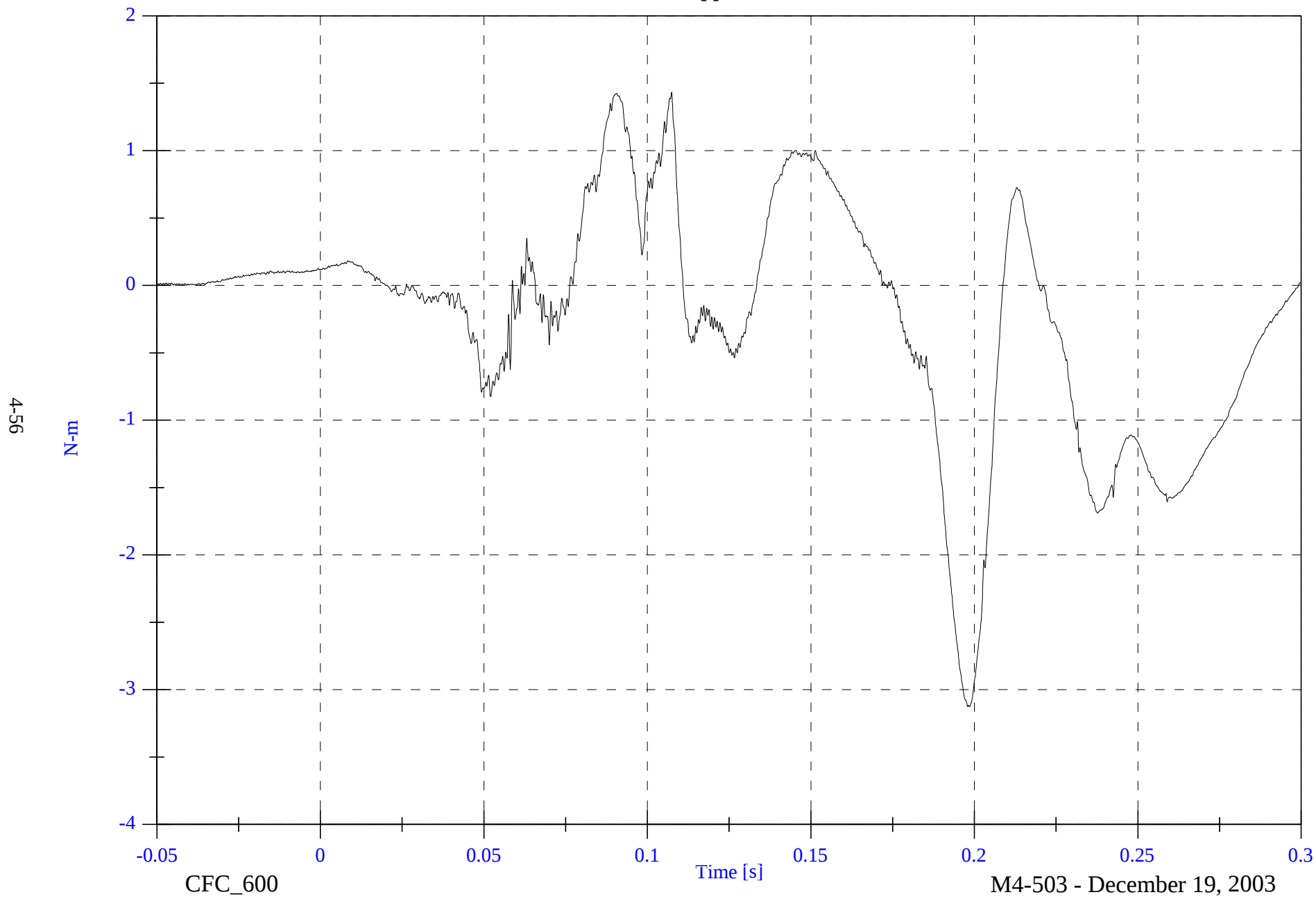


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Upper Neck Mz

Max: 1.4 [N-m] at 0.107 [s]

Min: -3.1 [N-m] at 0.199 [s]

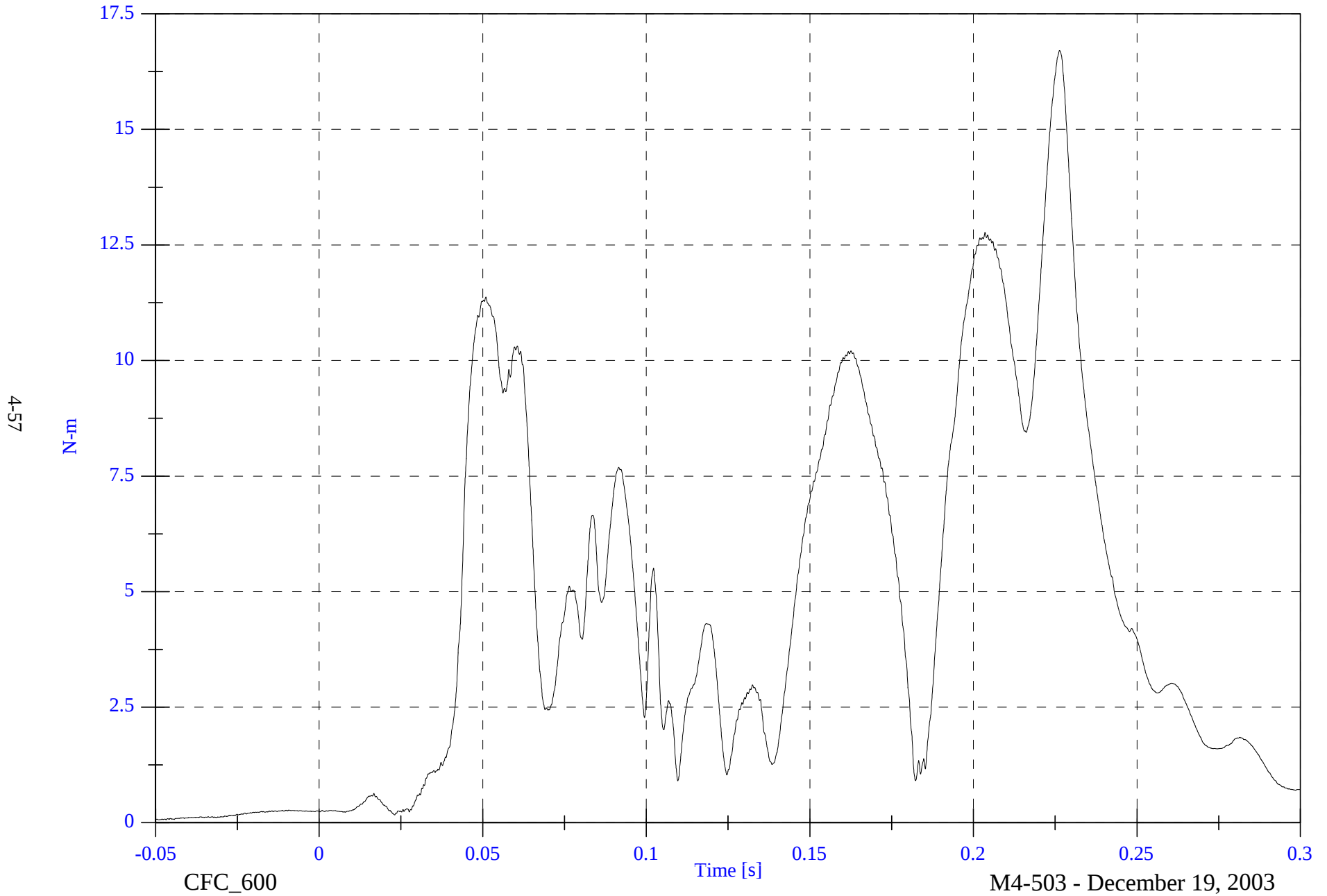


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Upper Neck M Resultant

Max: 16.7 [N-m] at 0.226 [s]

Min: 0.1 [N-m] at -0.049 [s]



2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Lower Neck Fx

Max: 187.0 [N] at 0.210 [s]

Min: -1564.3 [N] at 0.078 [s]

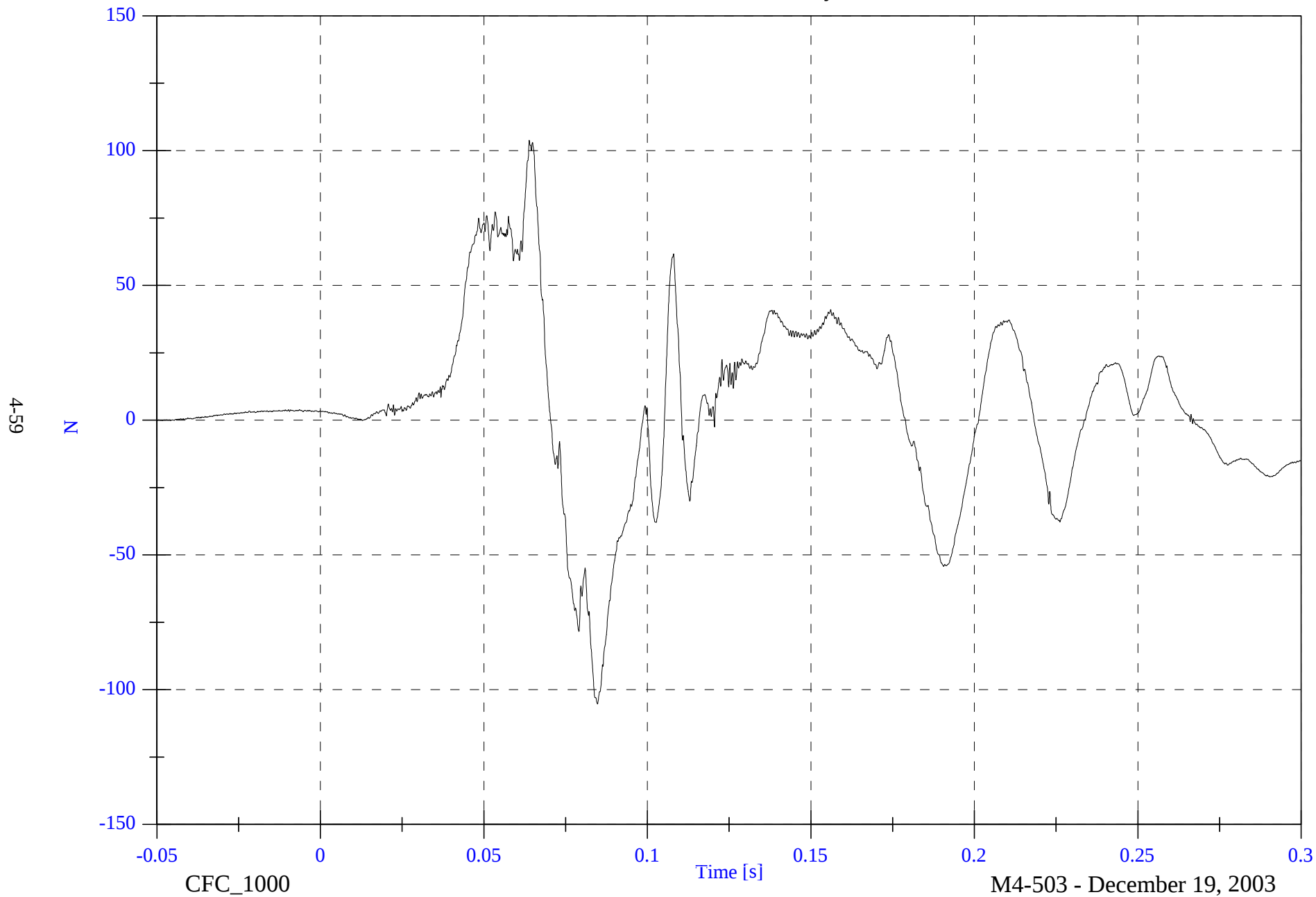


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Lower Neck Fy

Max: 103.9 [N] at 0.064 [s]

Min: -105.3 [N] at 0.085 [s]

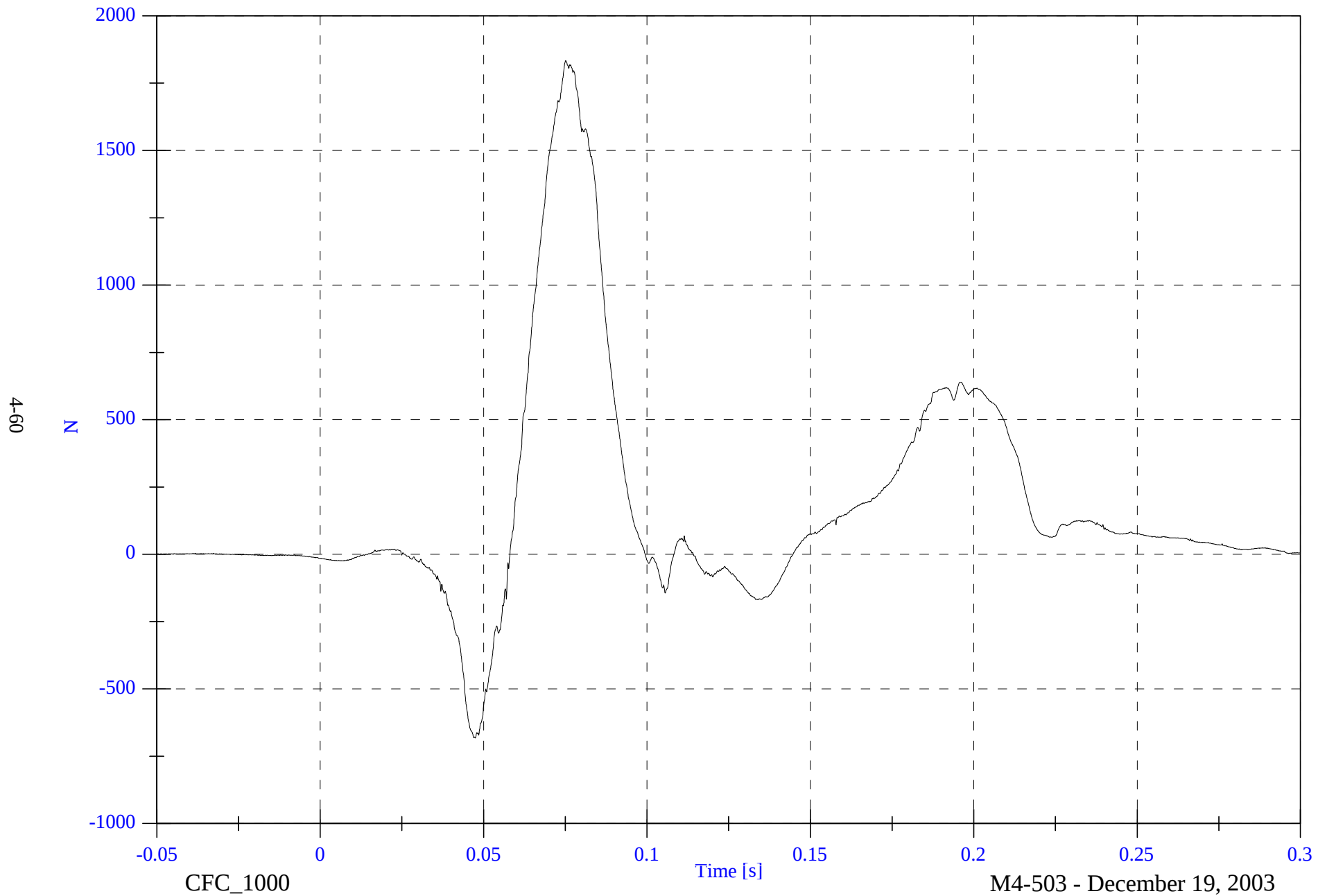


2004 NCAP Test 2 2004 Hyundai XG350

Max: 1833.6 [N] at 0.075 [s]

Min: -682.1 [N] at 0.047 [s]

V1P4 Lower Neck Fz

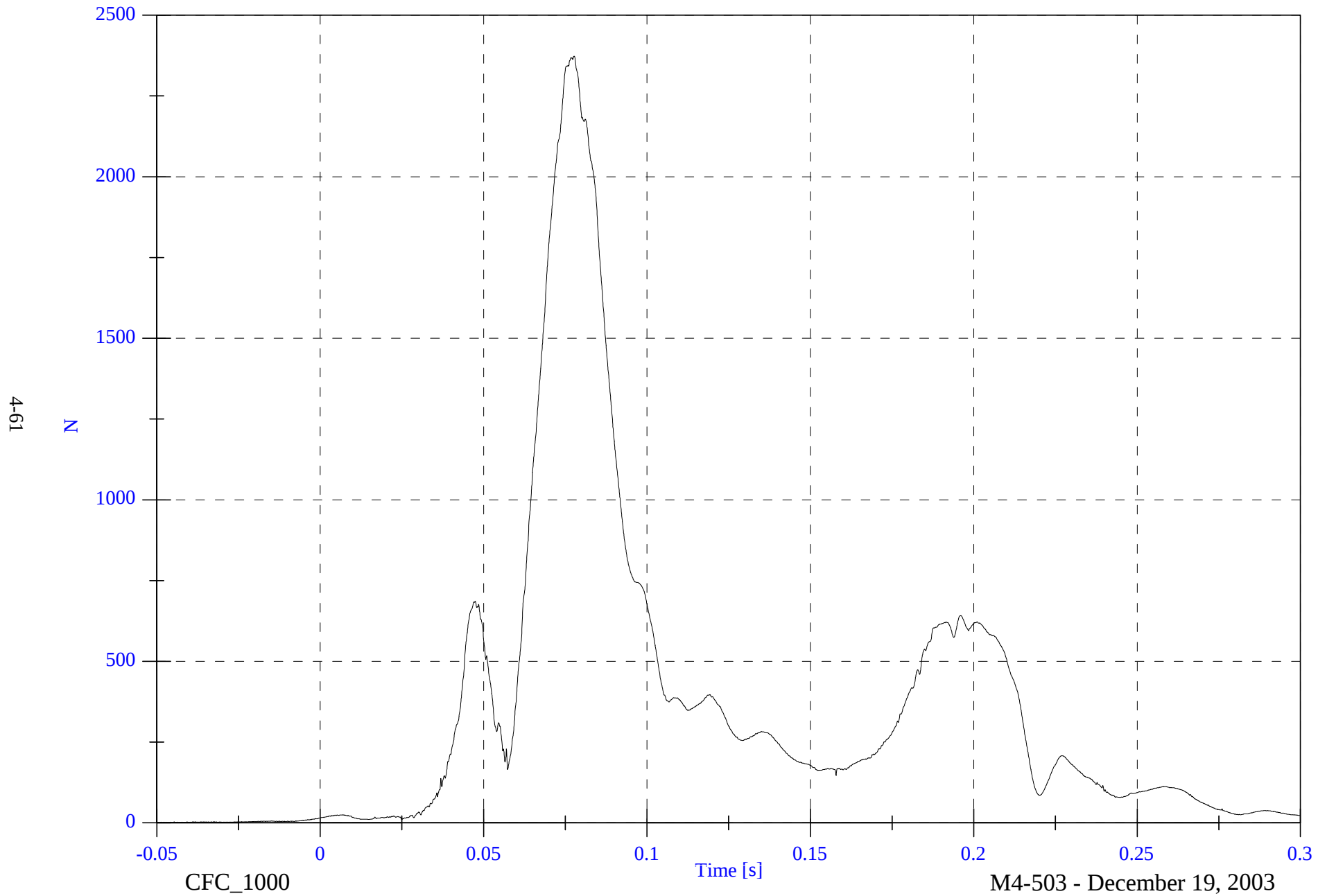


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Lower Neck F Resultant

Max: 2372.7 [N] at 0.078 [s]

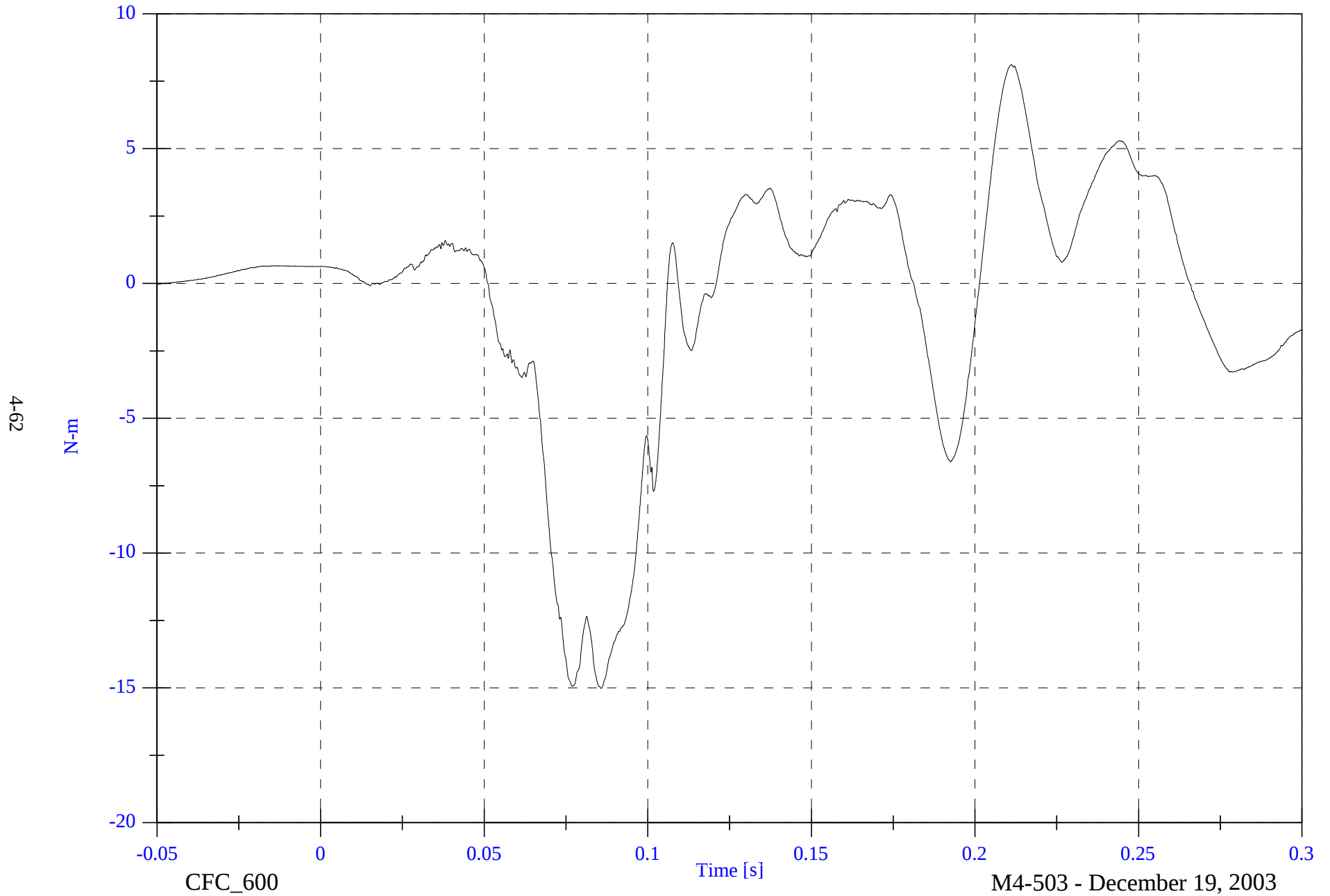
Min: 0.6 [N] at -0.045 [s]



2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Lower Neck Mx

Max: 8.1 [N-m] at 0.211 [s]
Min: -15.0 [N-m] at 0.086 [s]

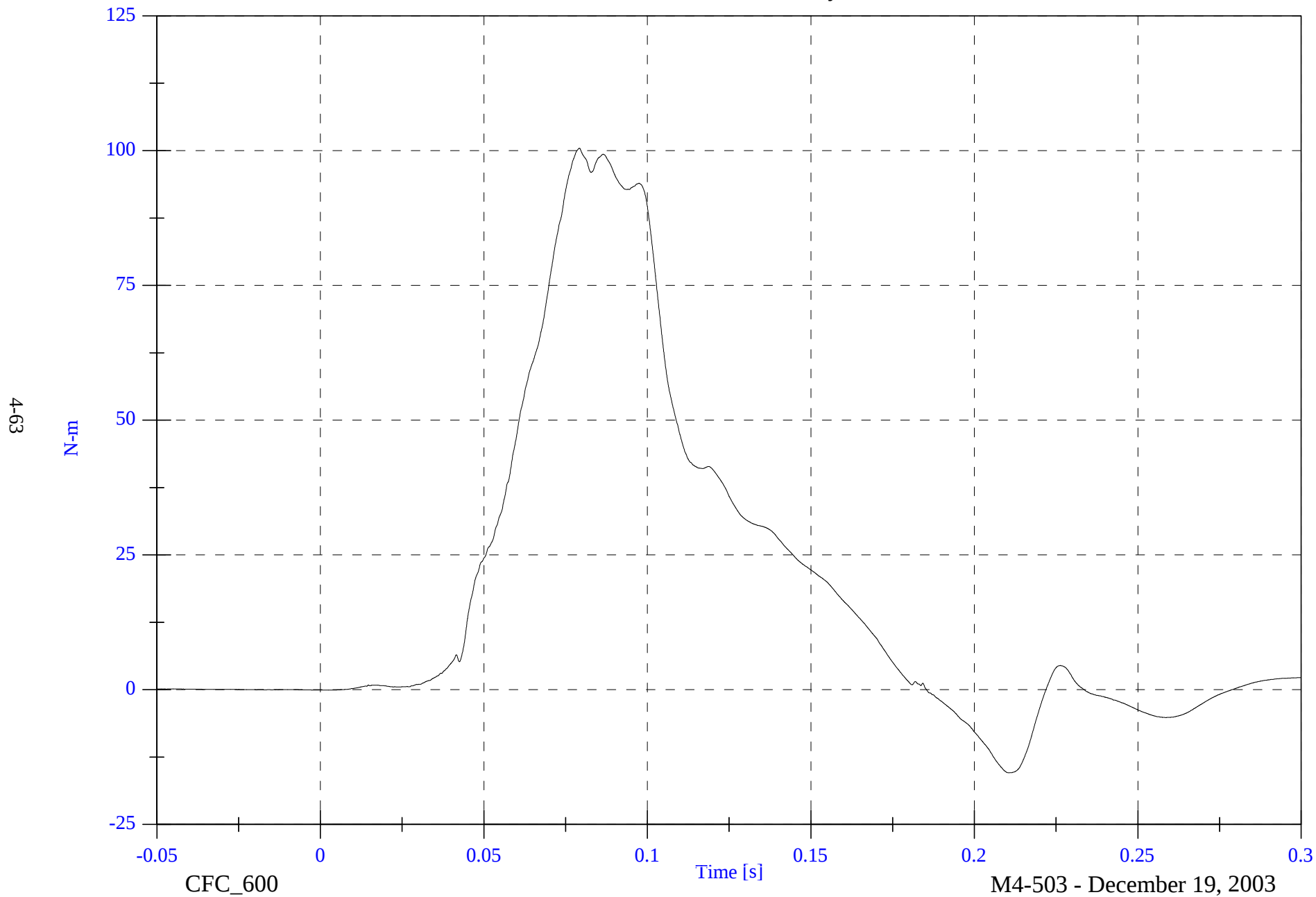


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Lower Neck My

Max: 100.4 [N-m] at 0.079 [s]

Min: -15.4 [N-m] at 0.211 [s]

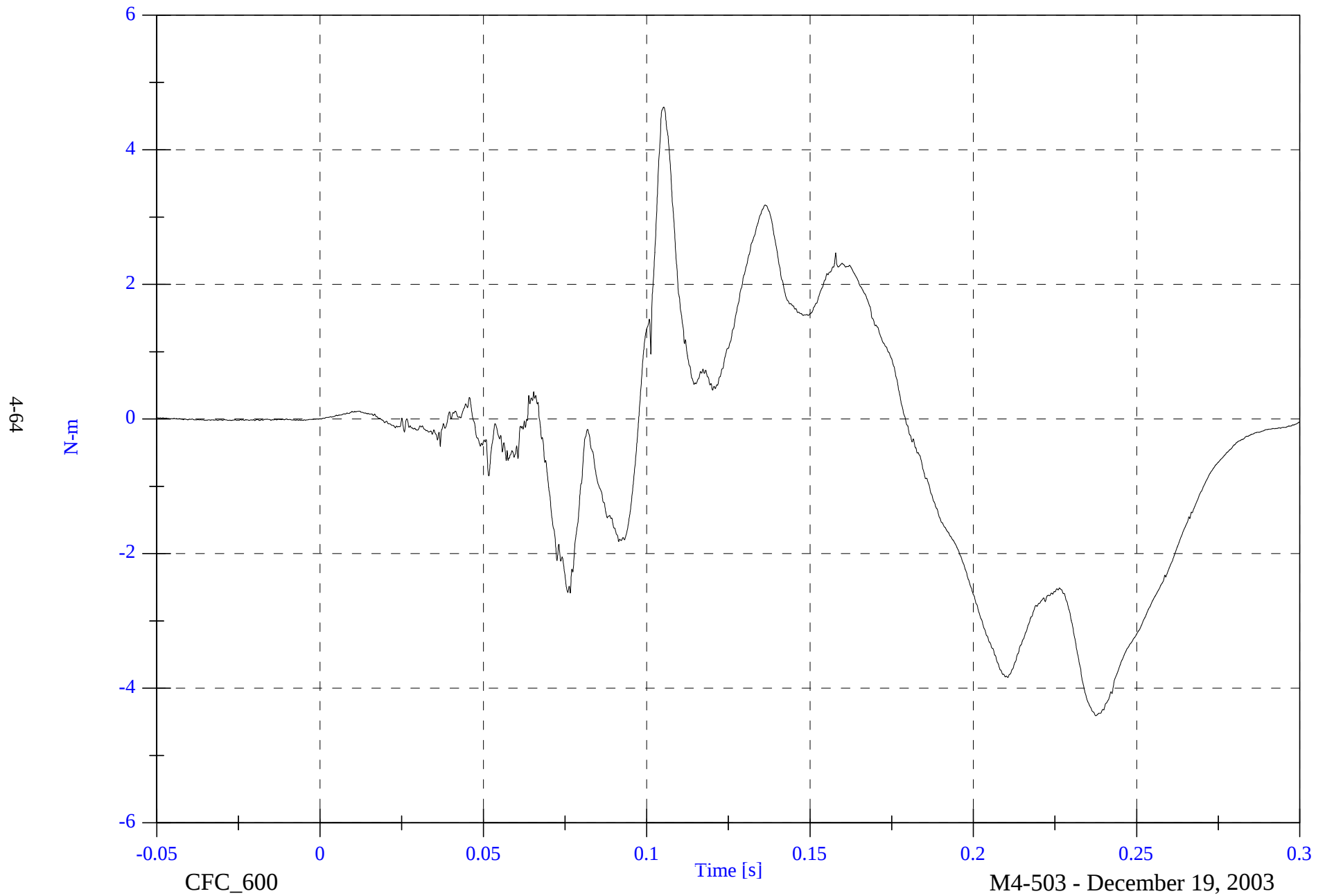


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Lower Neck Mz

Max: 4.6 [N-m] at 0.105 [s]

Min: -4.4 [N-m] at 0.237 [s]

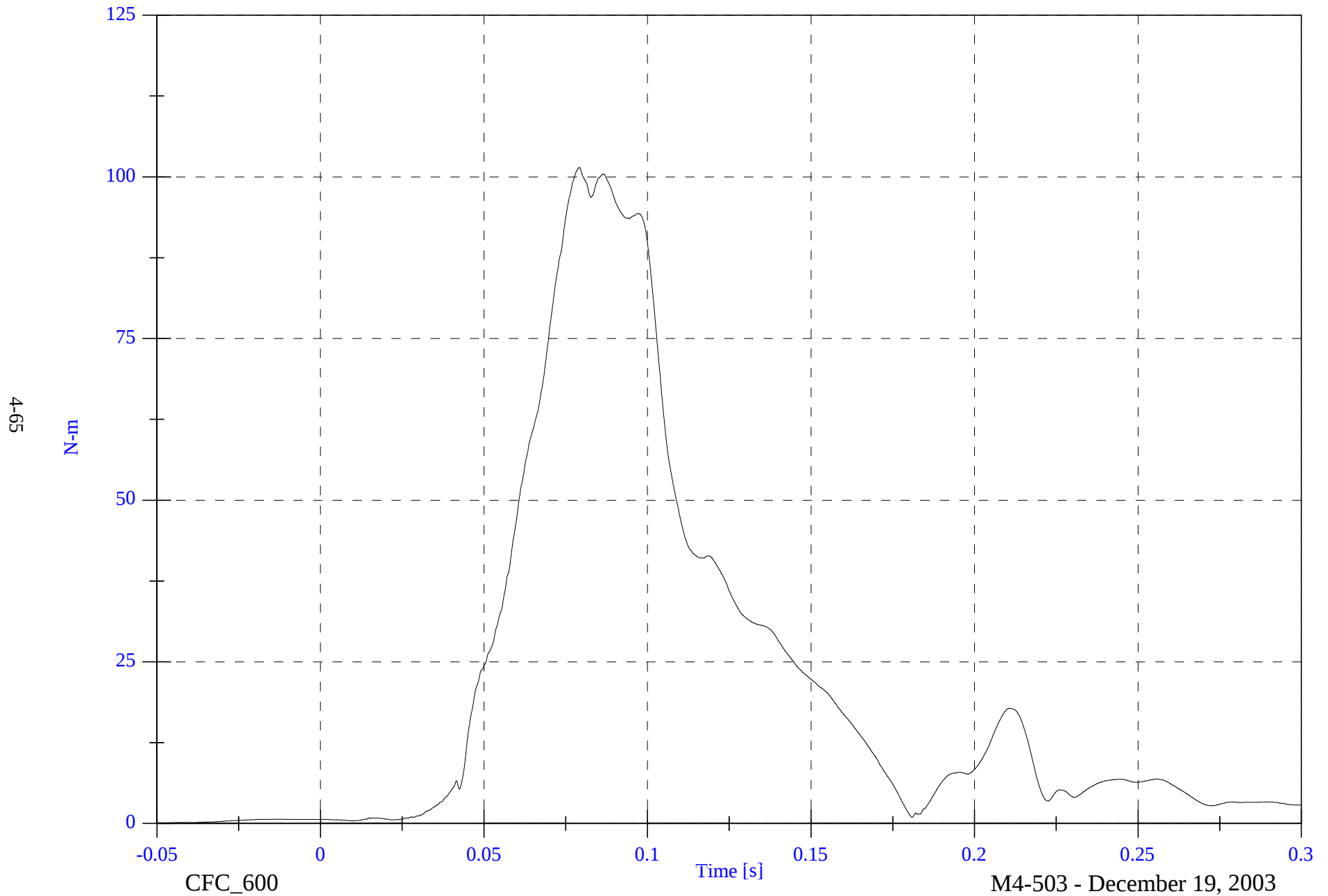


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Lower Neck M Resultant

Max: 101.5 [N-m] at 0.079 [s]

Min: 0.1 [N-m] at -0.047 [s]

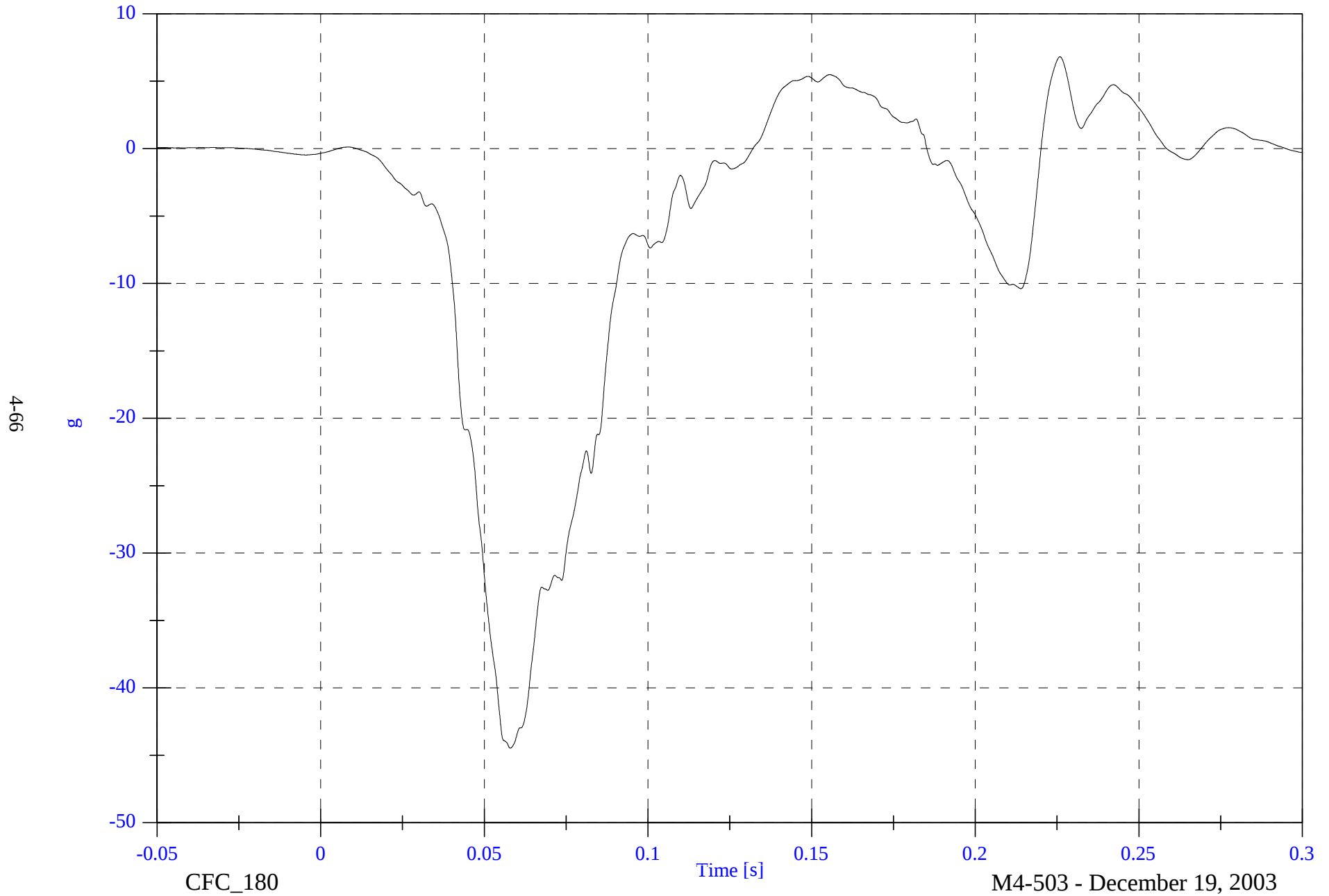


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Chest x

Max: 6.8 [g] at 0.226 [s]

Min: -44.5 [g] at 0.058 [s]

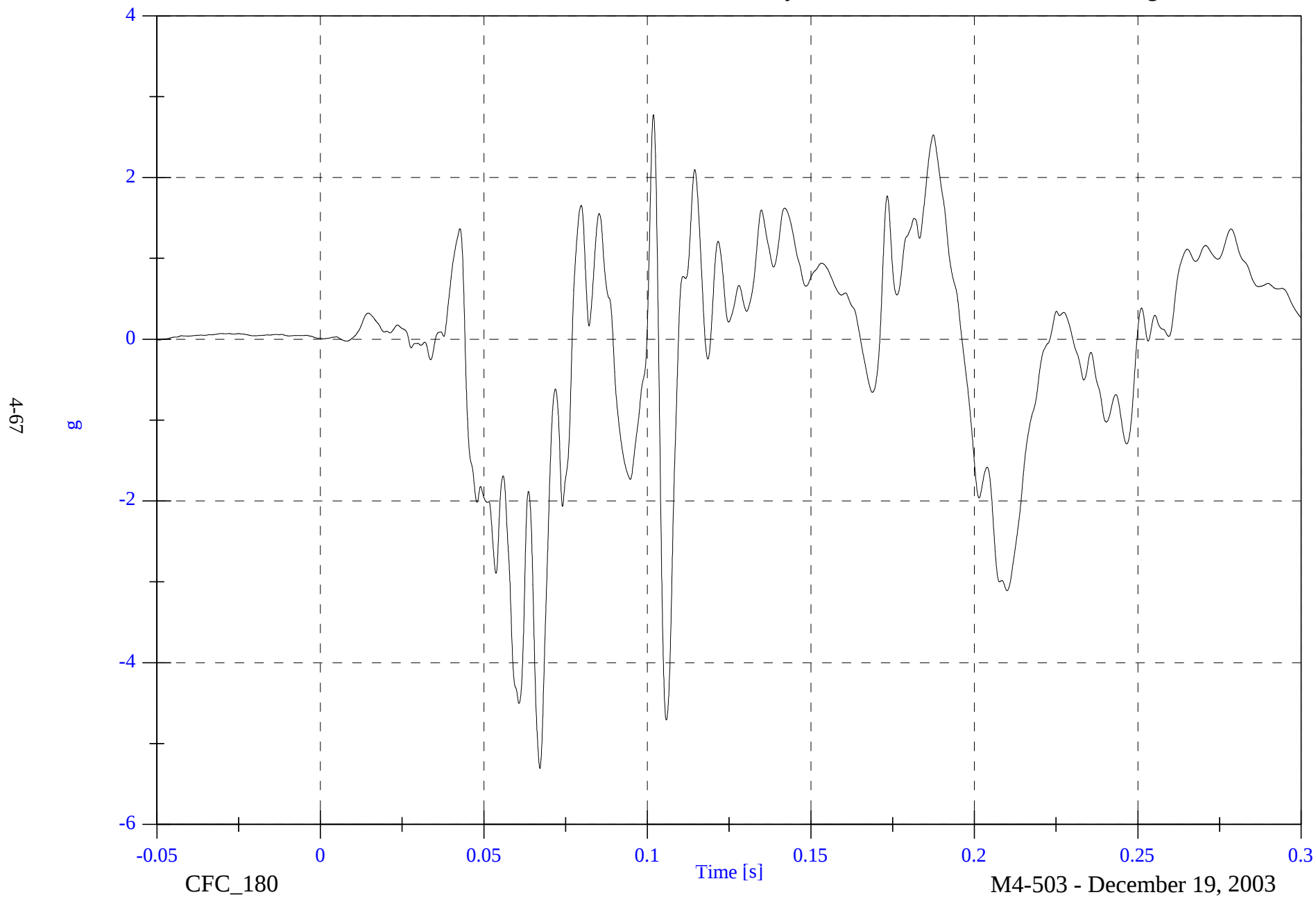


2004 NCAP Test 2 2004 Hyundai XG350

Max: 2.8 [g] at 0.102 [s]

Min: -5.3 [g] at 0.067 [s]

V1P4 Chest y

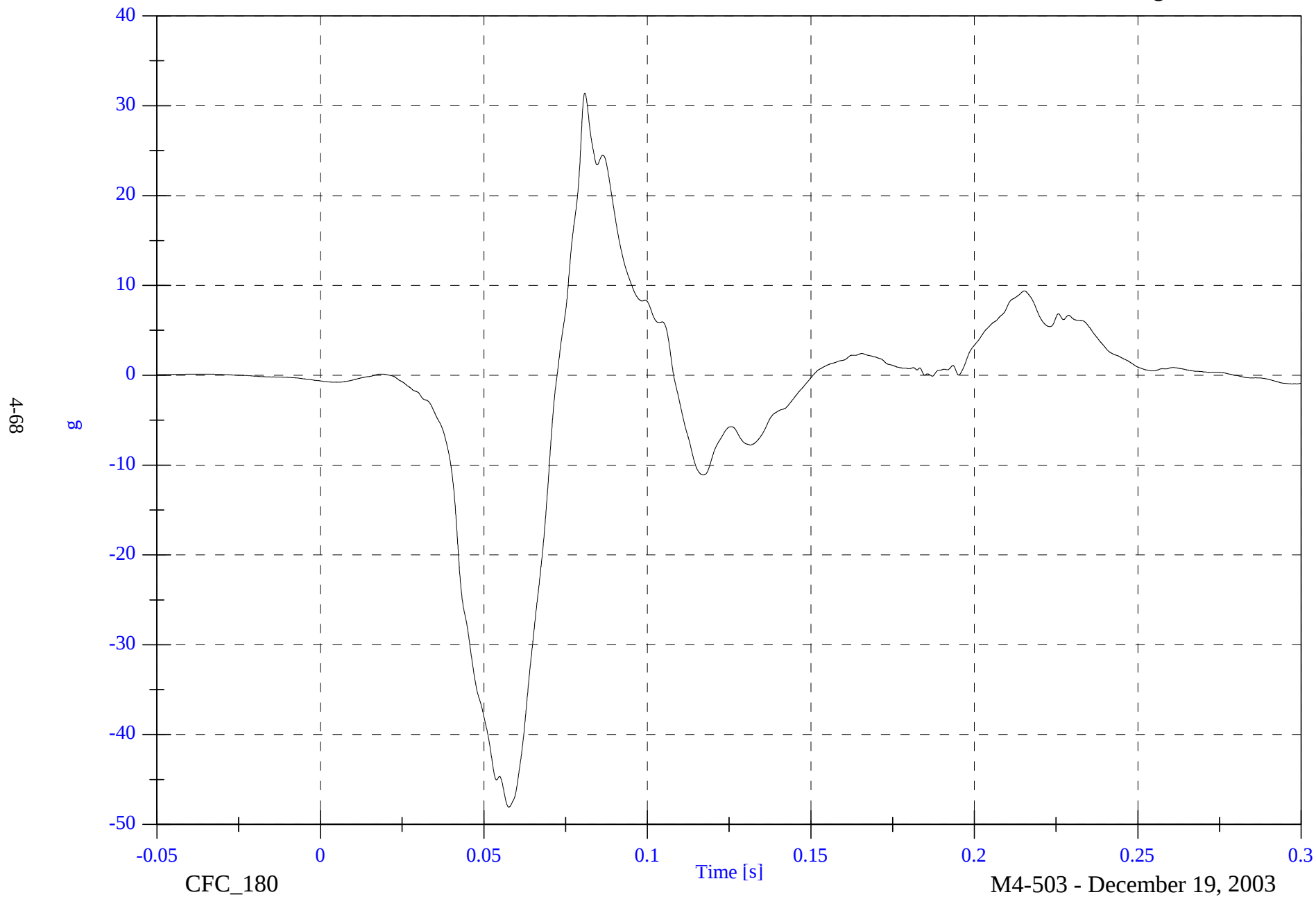


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Chest z

Max: 31.4 [g] at 0.081 [s]

Min: -48.1 [g] at 0.058 [s]

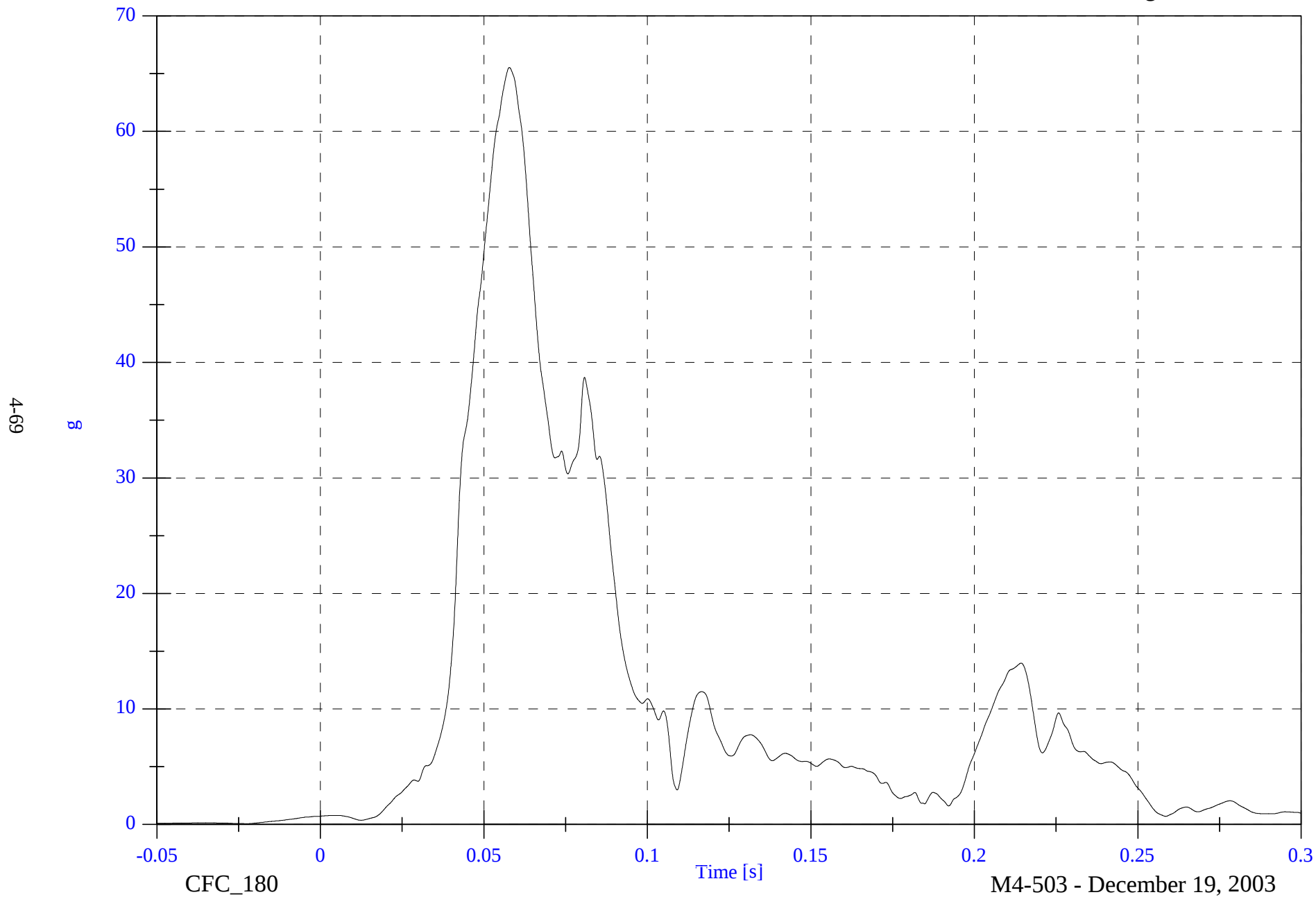


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Chest Resultant

Max: 65.5 [g] at 0.058 [s]

Min: 0.1 [g] at -0.022 [s]

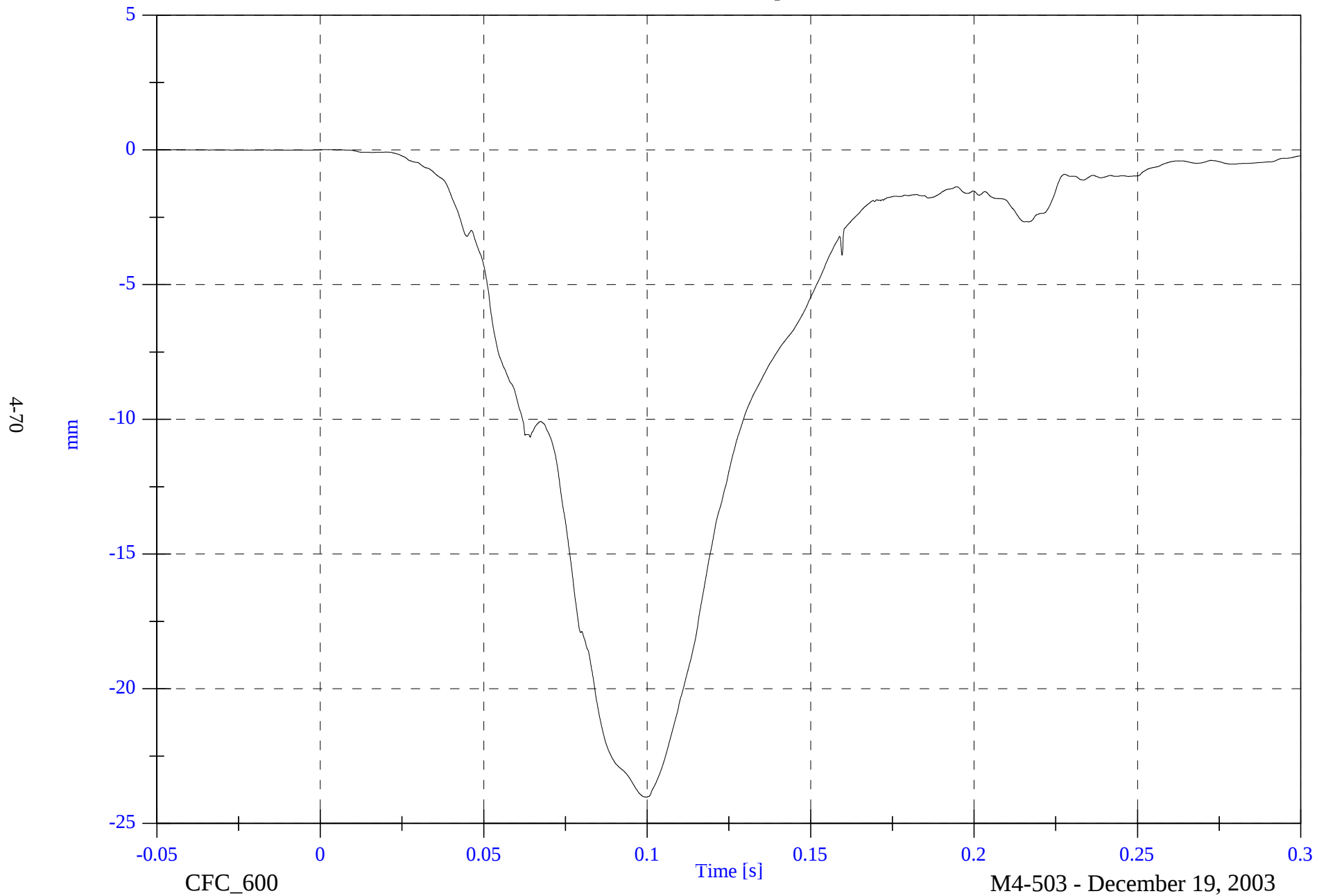


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Chest Compression

Max: 0.0 [mm] at 0.001 [s]

Min: -24.0 [mm] at 0.100 [s]

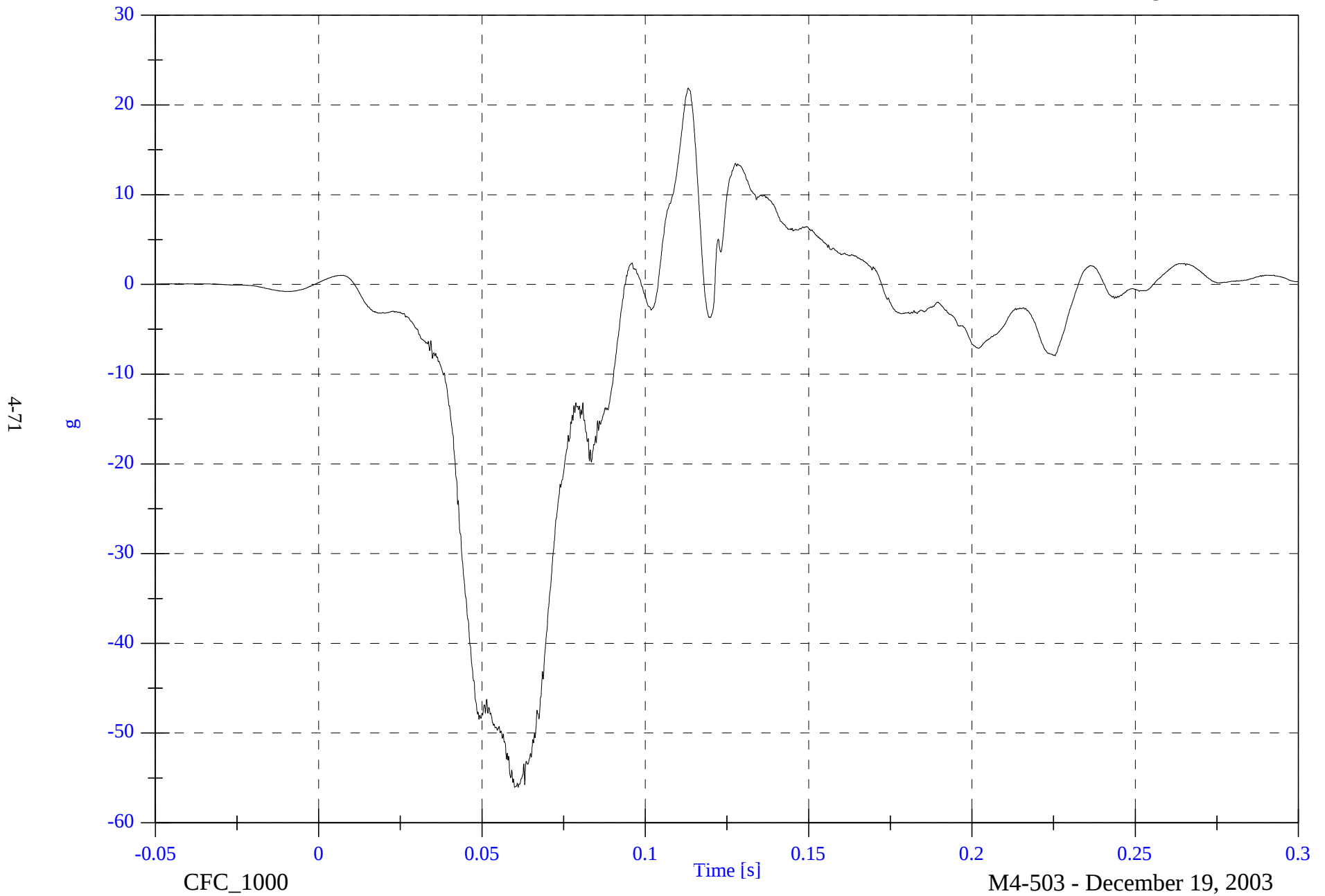


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Pelvic x

Max: 21.9 [g] at 0.113 [s]

Min: -56.1 [g] at 0.061 [s]

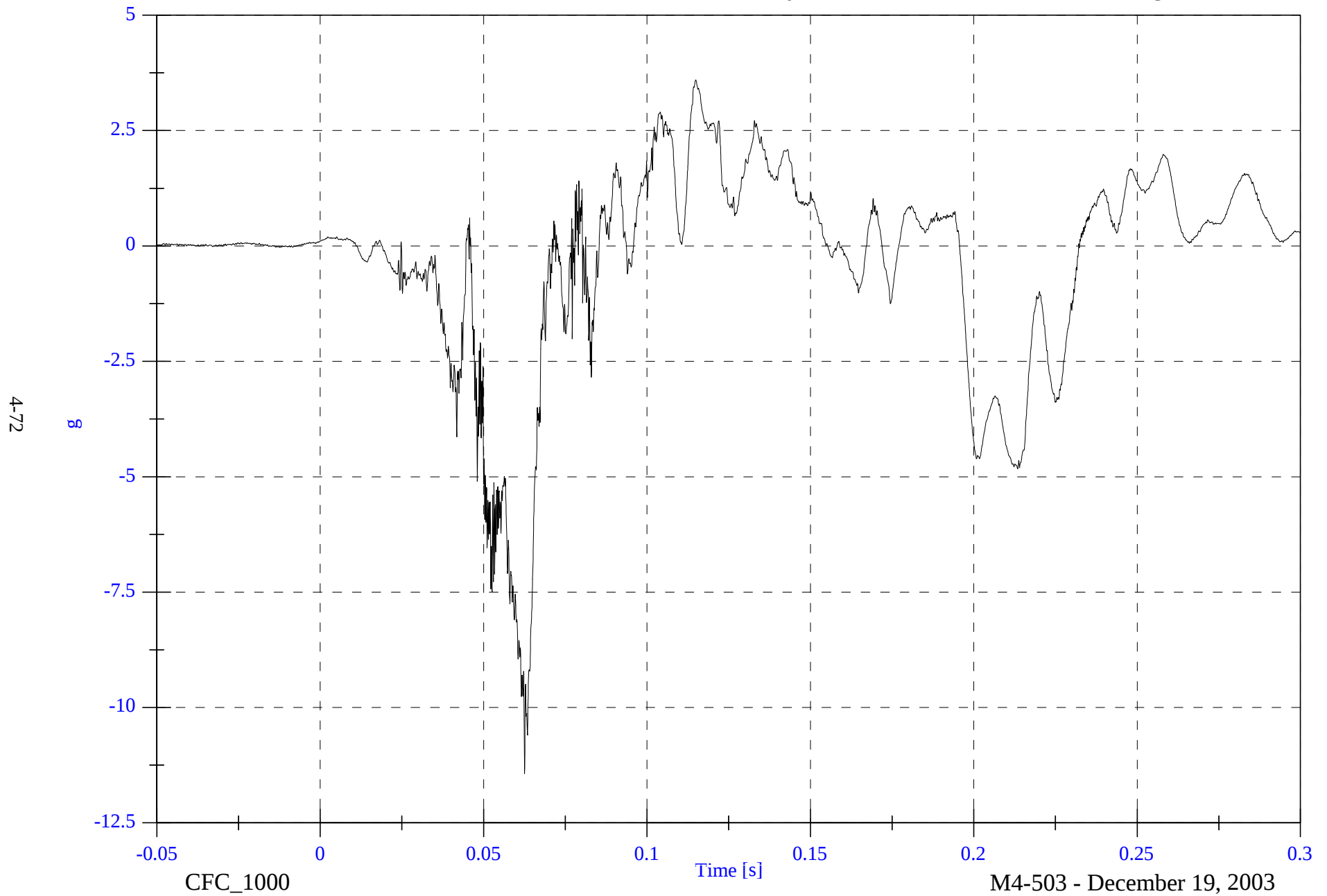


2004 NCAP Test 2 2004 Hyundai XG350

Max: 3.6 [g] at 0.115 [s]

Min: -11.4 [g] at 0.063 [s]

V1P4 Pelvic y

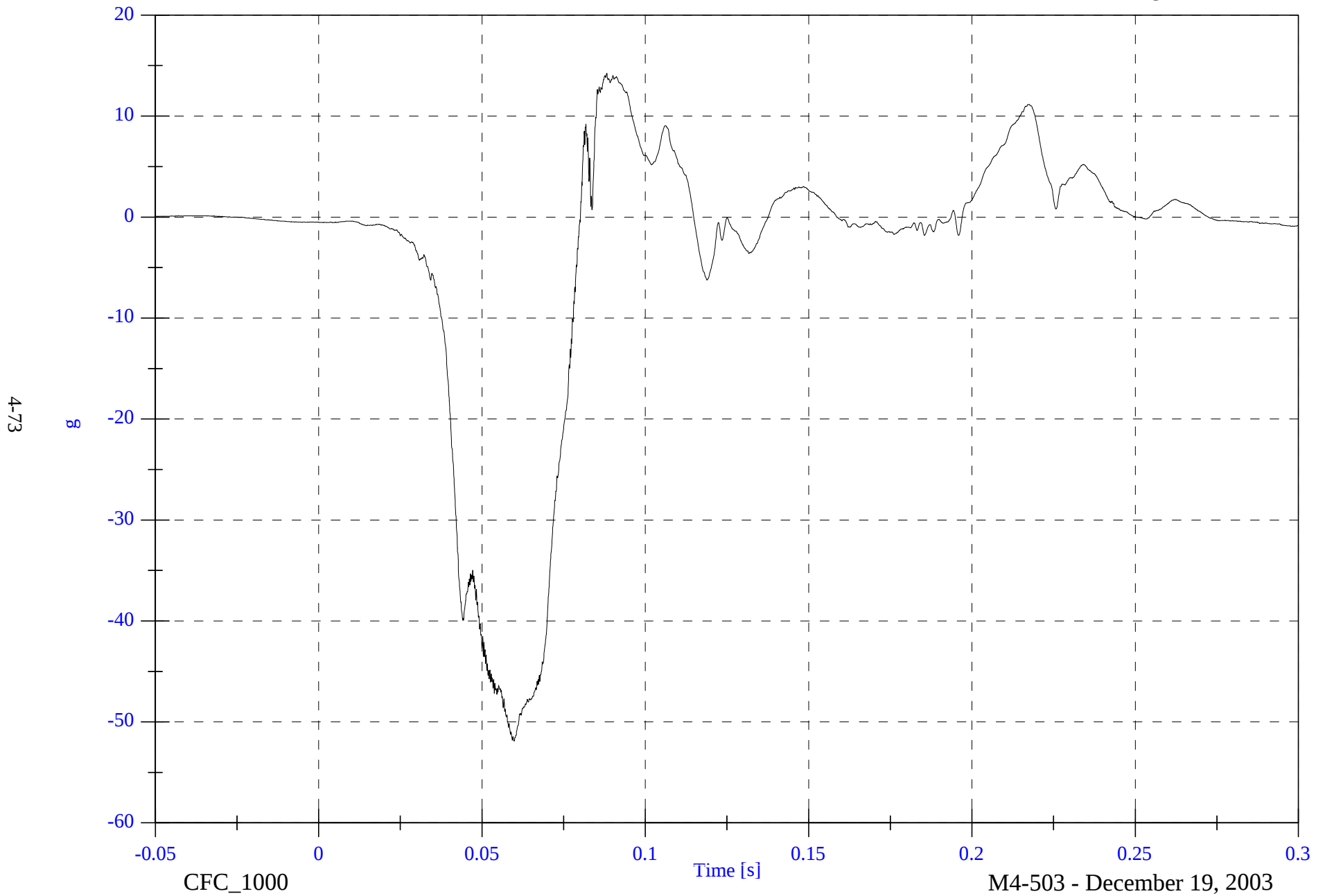


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Pelvic z

Max: 14.3 [g] at 0.088 [s]

Min: -51.9 [g] at 0.060 [s]

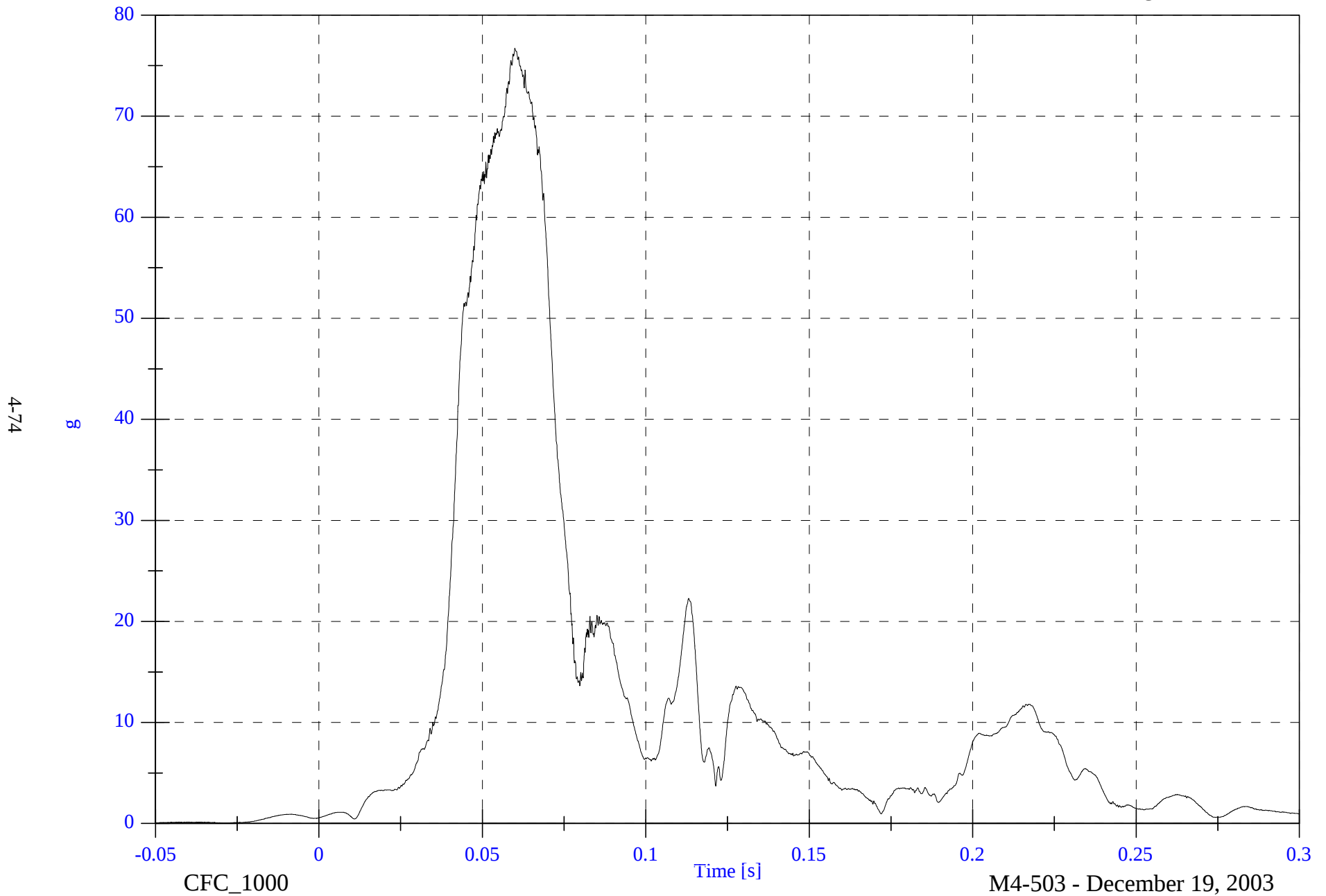


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Pelvic Resultant

Max: 76.7 [g] at 0.060 [s]

Min: 0.0 [g] at -0.029 [s]

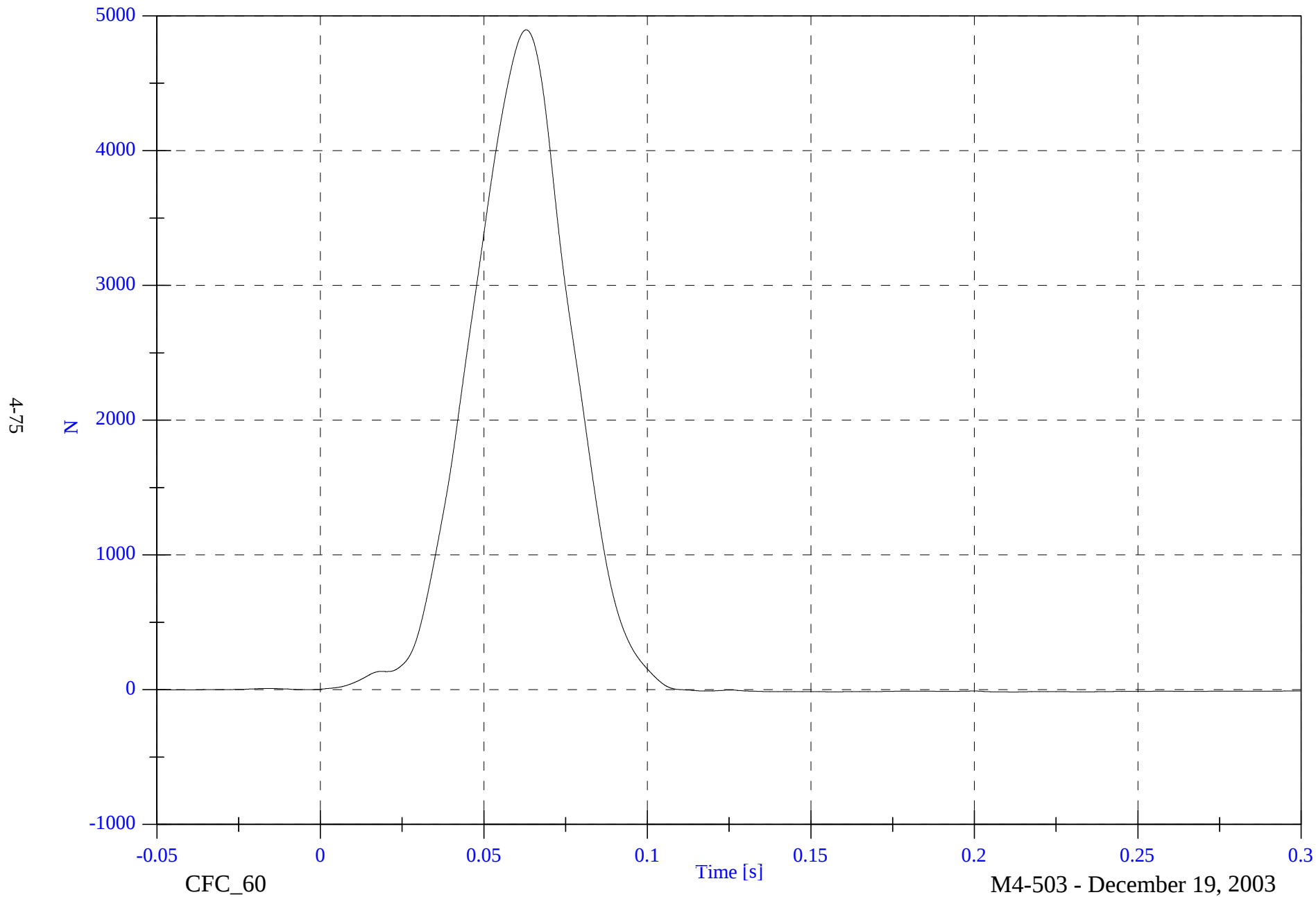


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Tether Belt

Max: 4896.4 [N] at 0.063 [s]

Min: -16.6 [N] at 0.212 [s]

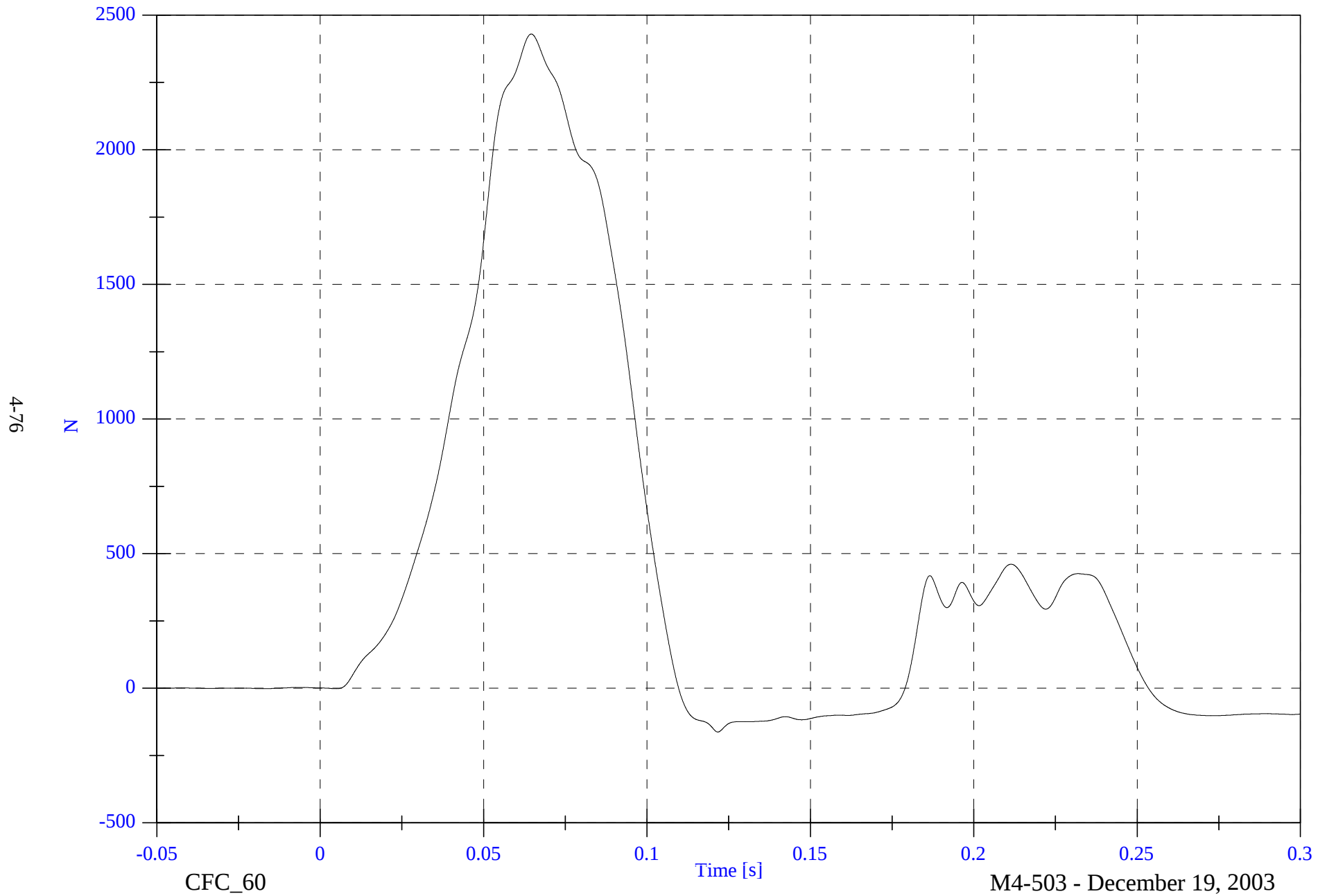


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 Latch Belt

Max: 2429.9 [N] at 0.065 [s]

Min: -162.7 [N] at 0.122 [s]

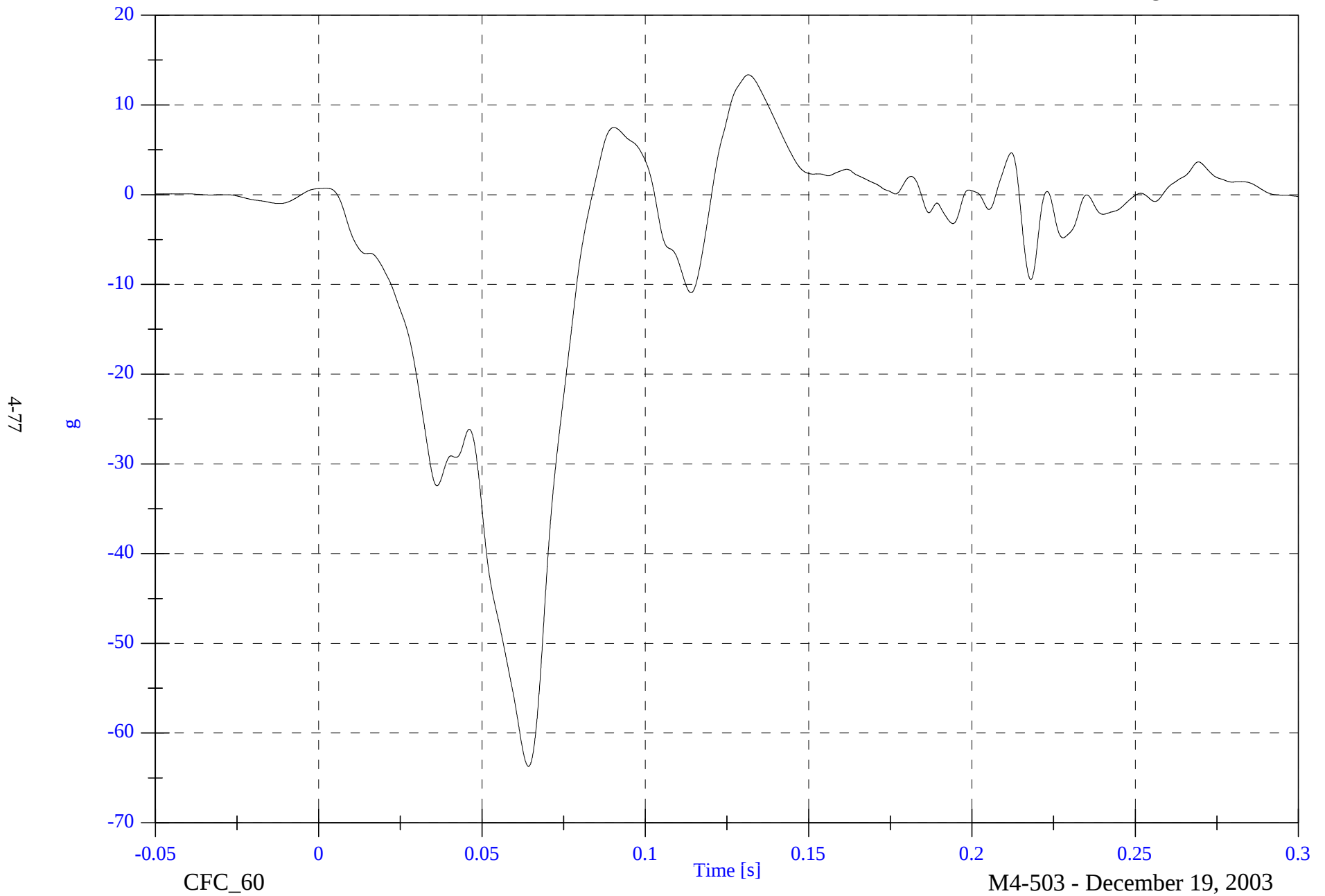


2004 NCAP Test 2 2004 Hyundai XG350

Max: 13.4 [g] at 0.132 [s]

Min: -63.7 [g] at 0.064 [s]

V1P4 CRS x

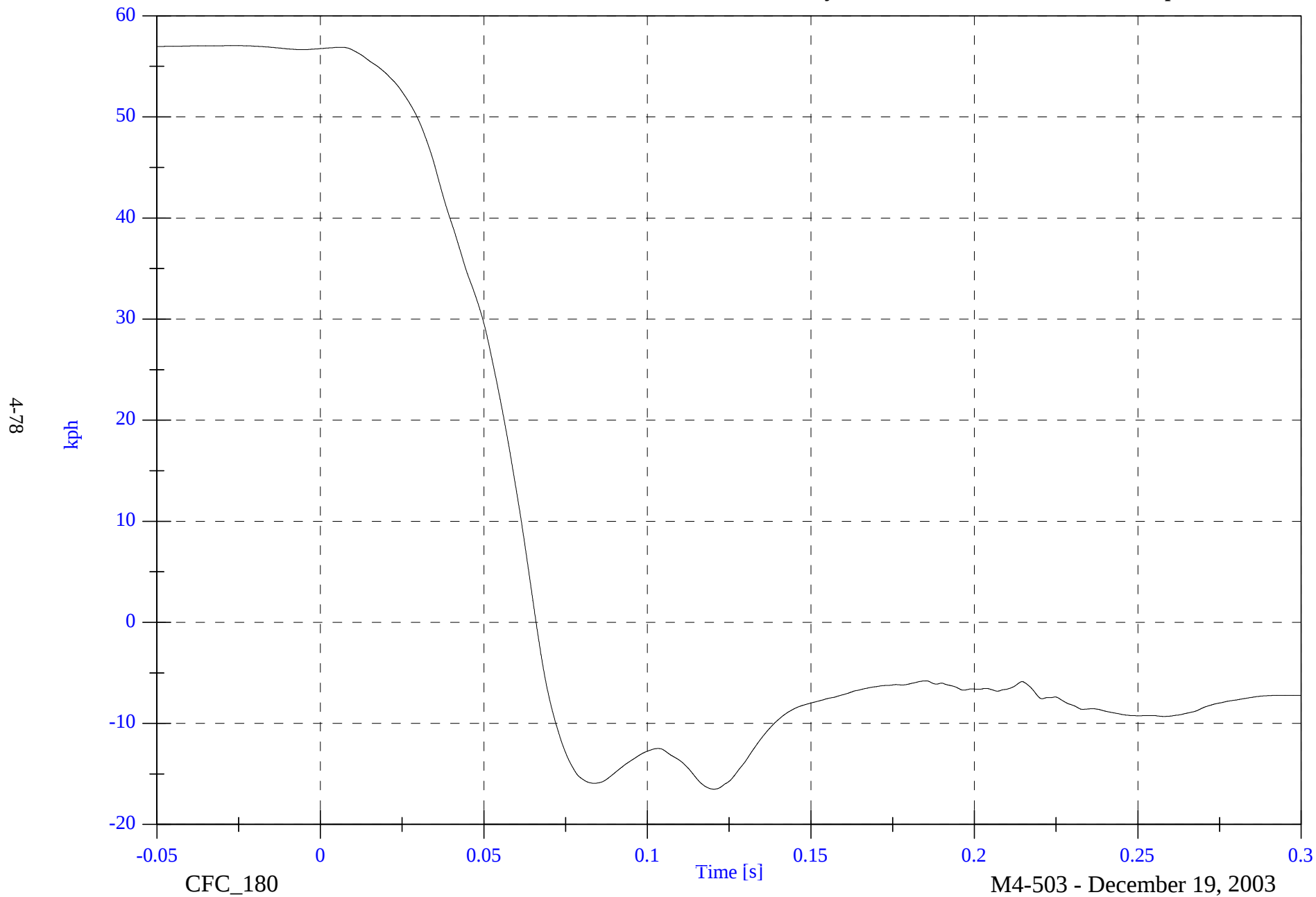


2004 NCAP Test 2 2004 Hyundai XG350

Max: 57.1 [kph] at -0.026 [s]

Min: -16.5 [kph] at 0.120 [s]

V1P4 CRS x Velocity

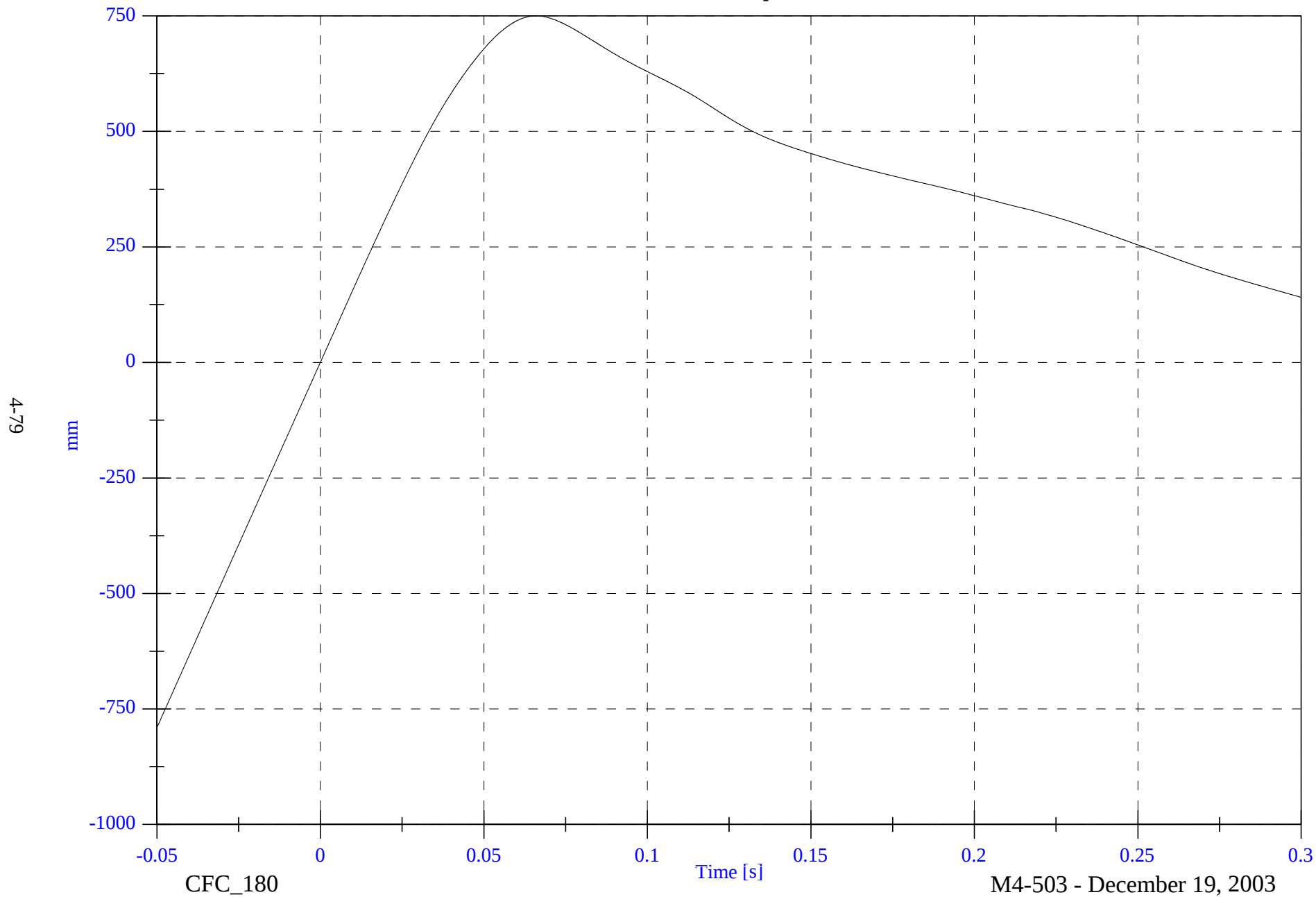


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 CRS x Displacement

Max: 750.1 [mm] at 0.066 [s]

Min: -790.7 [mm] at -0.050 [s]

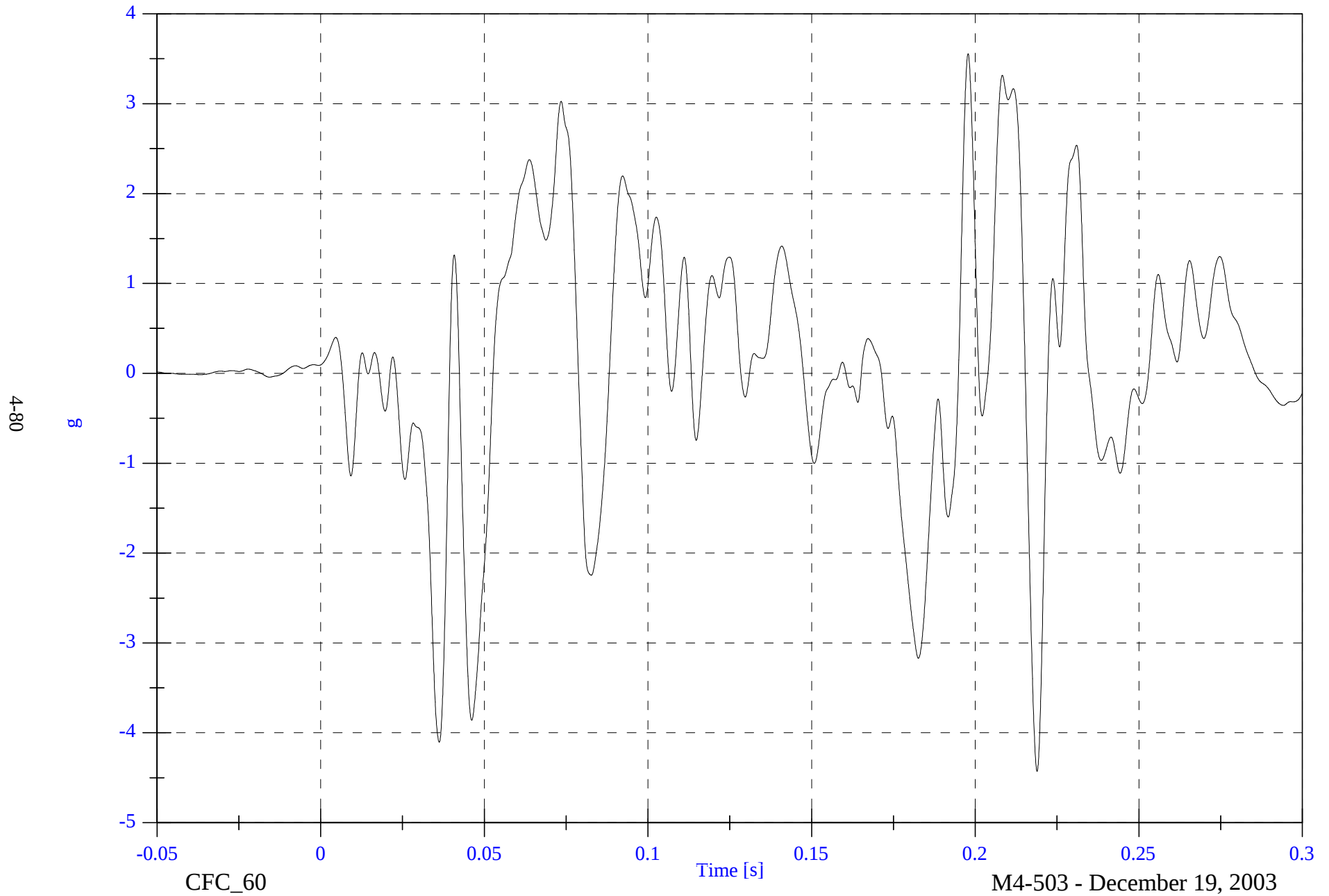


2004 NCAP Test 2 2004 Hyundai XG350

Max: 3.6 [g] at 0.198 [s]

Min: -4.4 [g] at 0.219 [s]

V1P4 CRS y



2004 NCAP Test 2 2004 Hyundai XG350

V1P4 CRS y Velocity

Max: 1.5 [kph] at 0.285 [s]

Min: -1.8 [kph] at 0.052 [s]

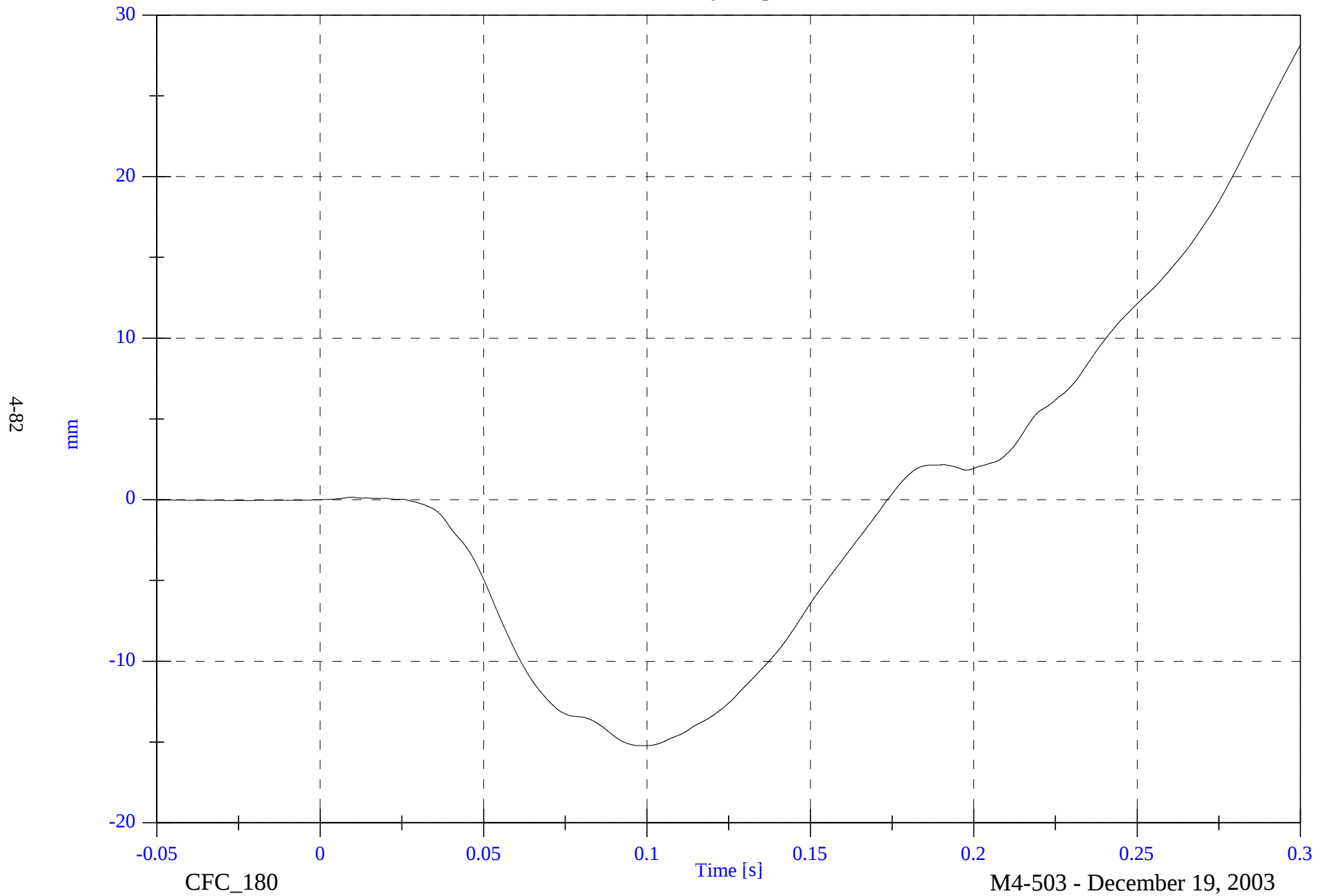


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 CRS y Displacement

Max: 28.1 [mm] at 0.300 [s]

Min: -15.2 [mm] at 0.098 [s]

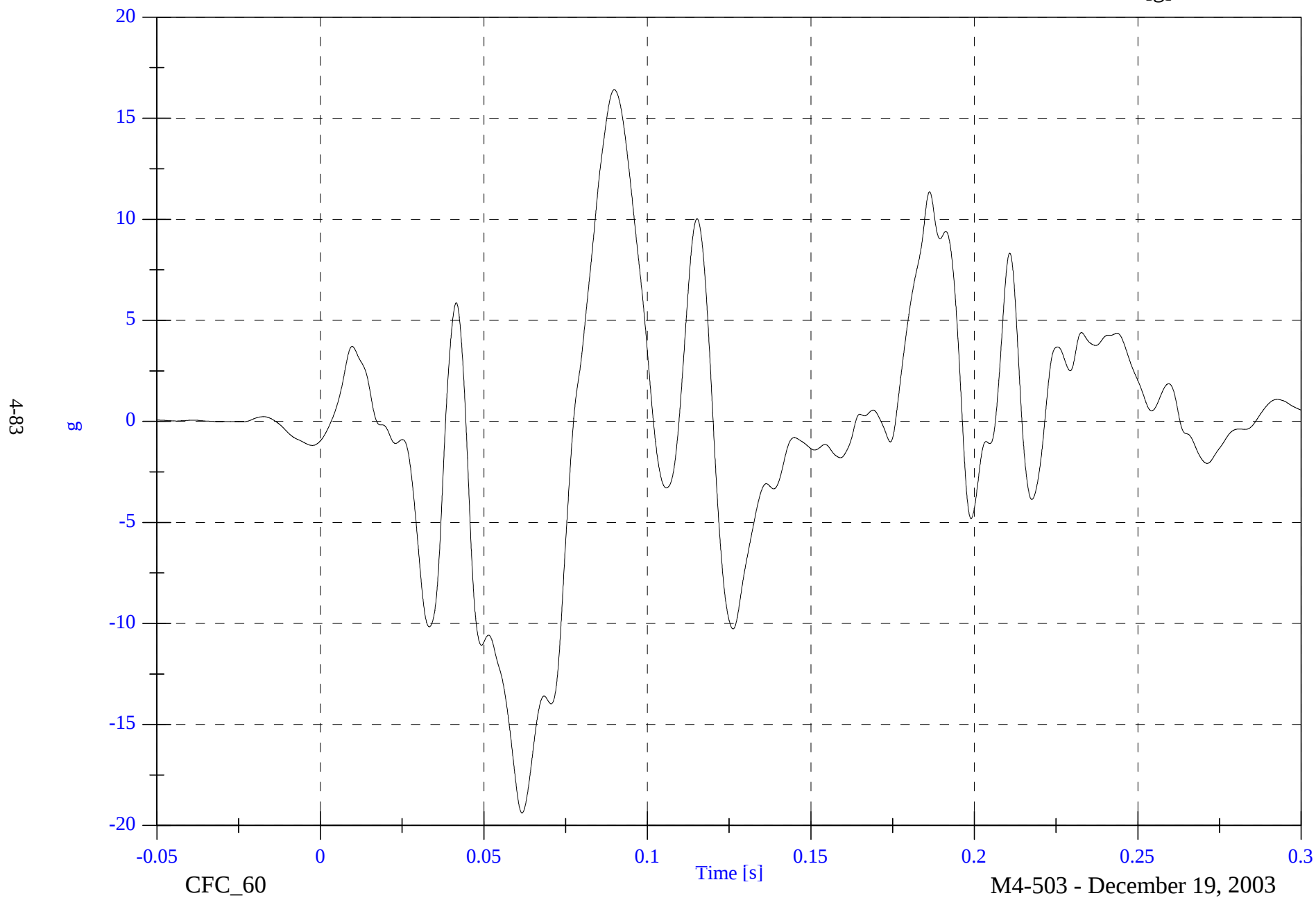


2004 NCAP Test 2 2004 Hyundai XG350

Max: 16.4 [g] at 0.090 [s]

Min: -19.4 [g] at 0.062 [s]

V1P4 CRS z

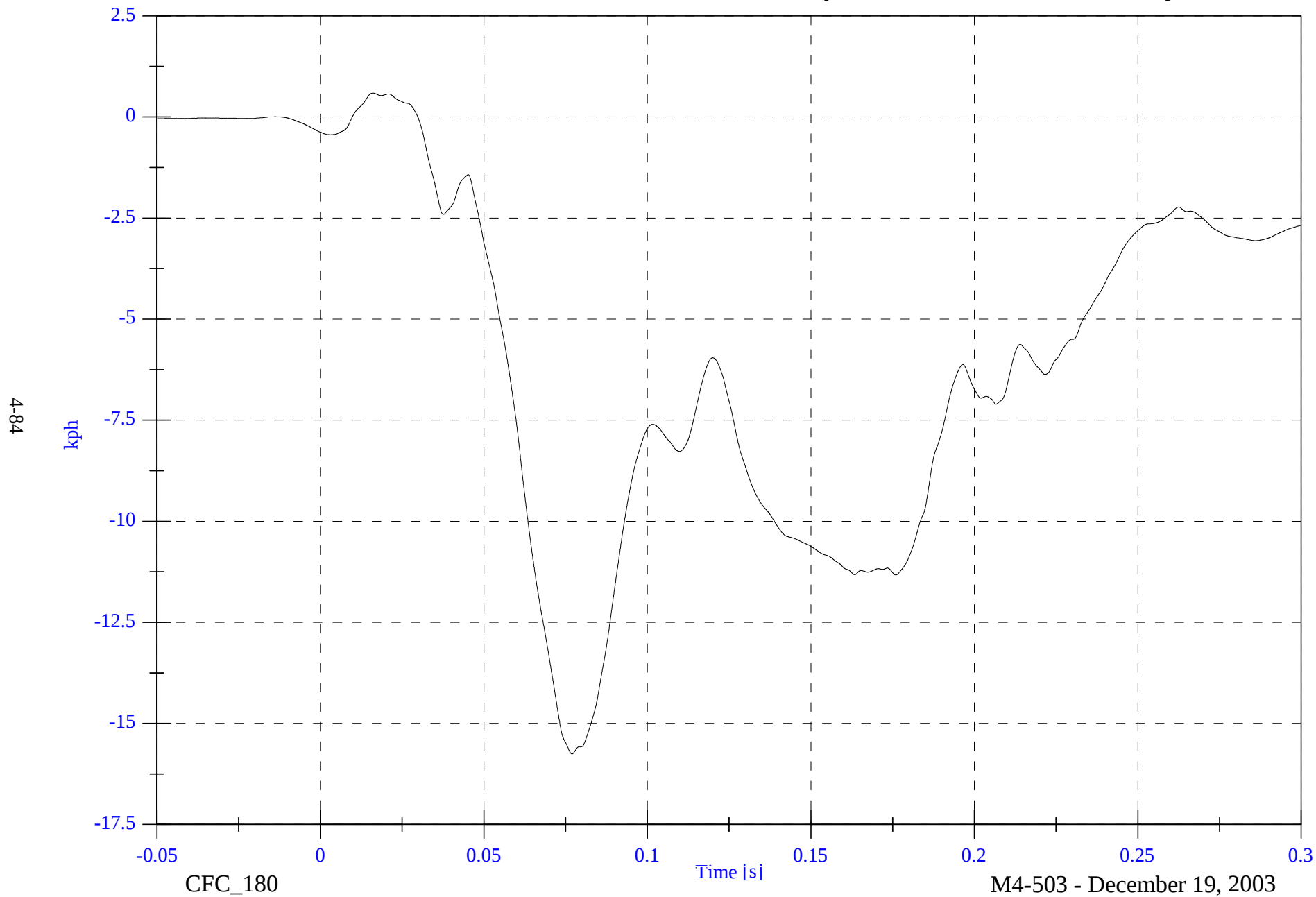


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 CRS z Velocity

Max: 0.6 [kph] at 0.016 [s]

Min: -15.8 [kph] at 0.077 [s]

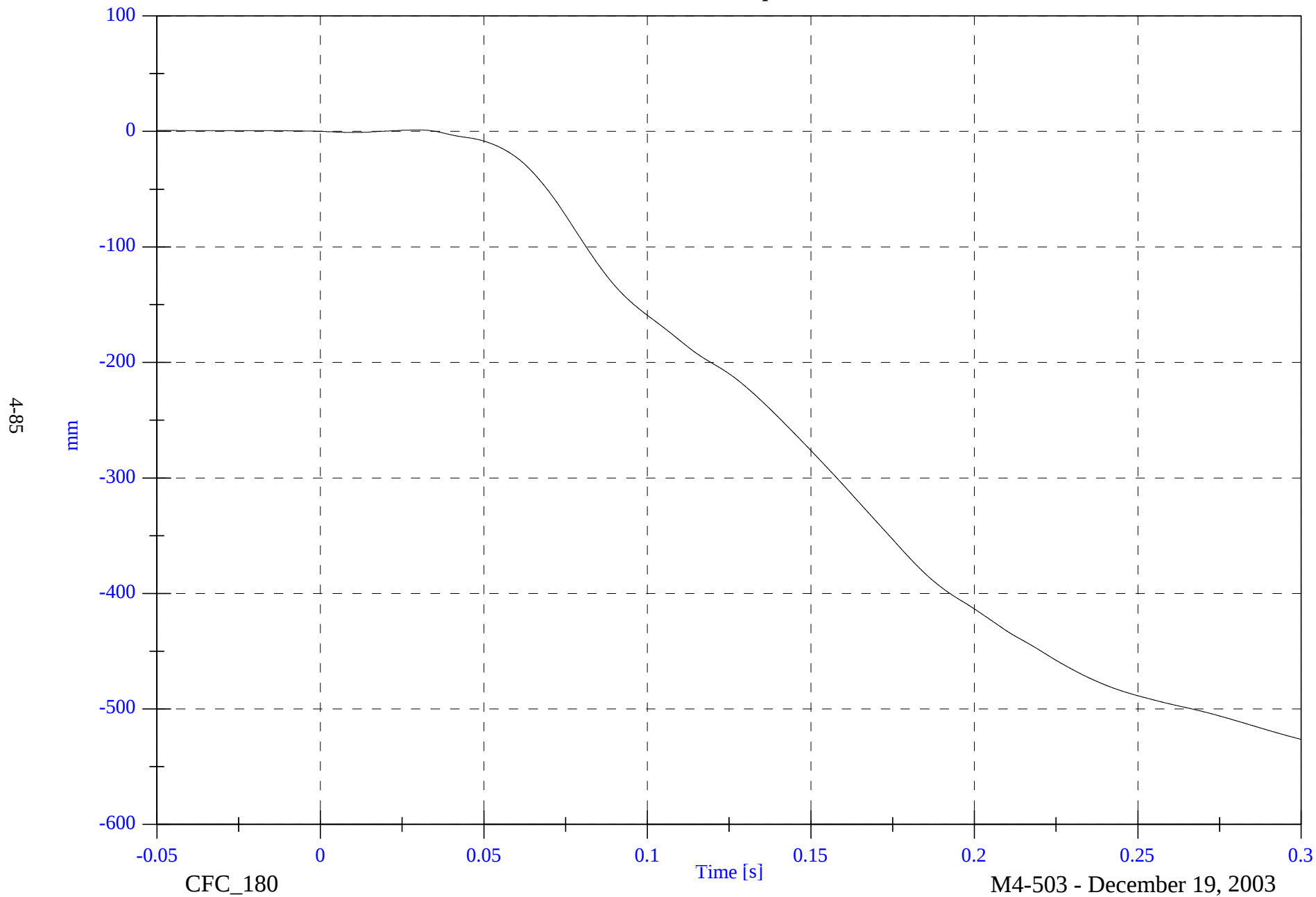


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 CRS z Displacement

Max: 1.2 [mm] at 0.030 [s]

Min: -526.3 [mm] at 0.300 [s]

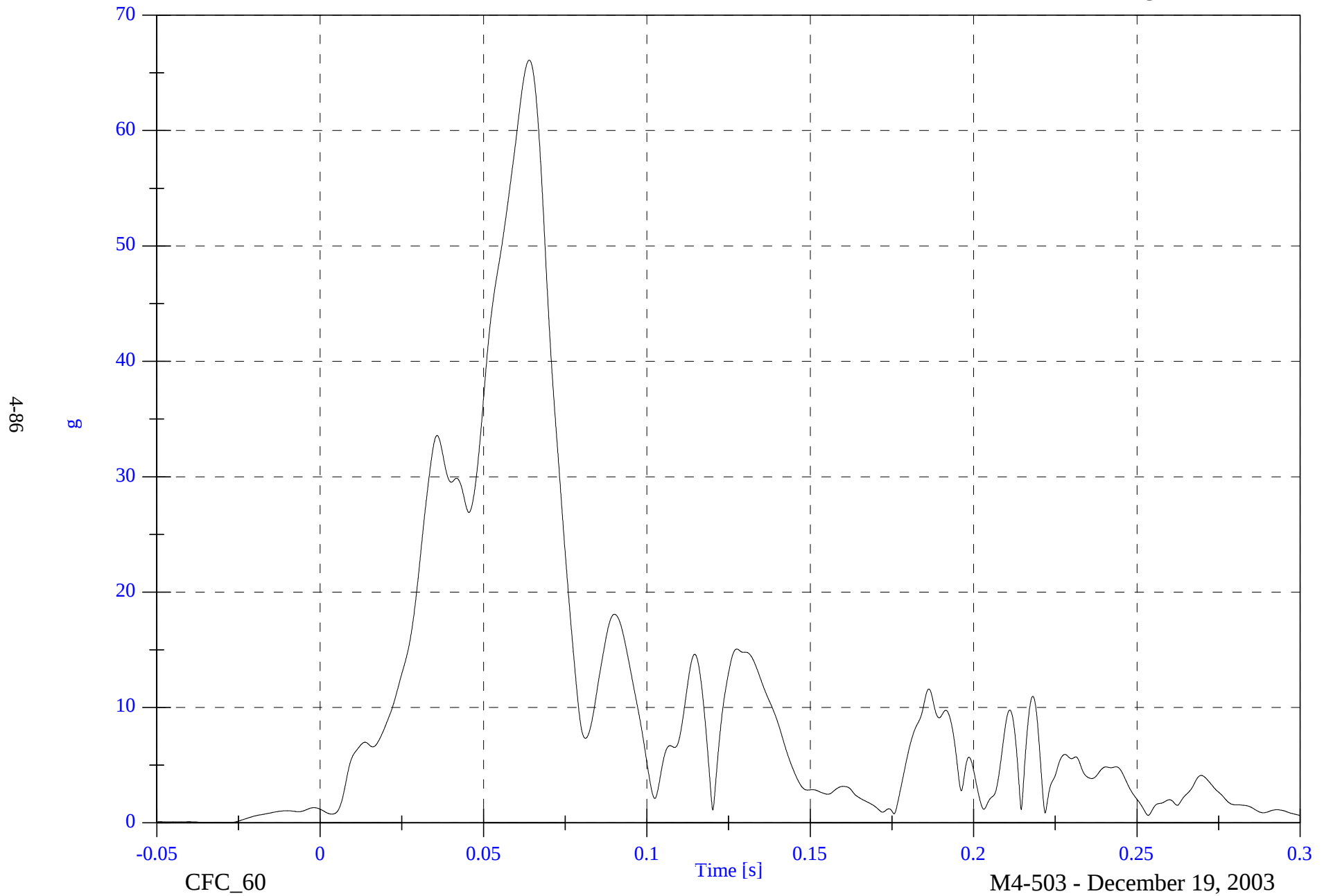


2004 NCAP Test 2 2004 Hyundai XG350

V1P4 CRS Resultant

Max: 66.1 [g] at 0.064 [s]

Min: 0.0 [g] at -0.035 [s]



SECTION 5

CHILD DUMMY CALIBRATION INFORMATION

PART 572P
HEAD DROP TEST

Dummy Serial Number 044
Sequential Test Number 1
Date 12/16/03
Workfile 044H 12-16-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	33.0
Peak Resultant Acceleration	250-280 G's	266.77
Peak Lateral Acceleration	15 G's Max	13.80
Is Acceleration Curve Unimodal?	<10%	4.79

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
NECK FLEXION TEST

Dummy Serial Number 044
Sequential Test Number 2
Date 10/22/2003
Workfile 044NF 10-22-03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.1
Relative Humidity		10% - 70%	38.0
Pendulum Speed		5.40-5.60 m/s	5.46
Pendulum Pulse	10 ms	2.00 – 2.70 m/s	2.14
	15 ms	3.00 – 4.00 m/s	3.13
	20 ms	4.00 – 5.10 m/s	4.30
D Plane Rotation	Max	70.0 – 82.0 Deg	75.72
Maximum Occipital Moment		42.00 - 53.00 N-m	52.40
Occipital Moment Decay		60.0 - 80.0 ms	74.60

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
NECK EXTENSION TEST

Dummy Serial Number 044
Sequential Test Number 2
Date 10/22/2003
Workfile 044NE2 10-22-03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.1
Relative Humidity		10% - 70%	38.0
Pendulum Speed		3.55 – 3.75 m/s	3.72
Pendulum Pulse	10 ms	1.00 – 1.40 m/s	1.05
	15 ms	1.90 – 2.50 m/s	1.98
	20 ms	2.80 – 3.50 m/s	2.82
D Plane Rotation	Max	83.0 – 93.0 Deg	85.02
Maximum Occipital Moment		-53.30 - -43.70 N-m	-45.28
Occipital Moment Decay		60.0 - 80.0 ms	67.60

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
THORAX IMPACT TEST

Dummy Serial Number 044
Sequential Test Number 2
Date 10/23/03
Workfile 044T 10-23-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	21.1
Relative Humidity	10% - 70%	37.0
Pendulum Velocity	19.40 – 20.00 Ft/s	19.98
Maximum Deflection	1.30 – 1.50 in	1.41
Maximum Resistive Force	152.90 – 182.10 Lbs	176.02
Internal Hysteresis	65 - 85 %	72.12
Sternum Force Criteria	193.30 lbf	188.61

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
EXTERNAL DIMENSIONS

Dummy Serial Number 044
Sequential Test Number 2
Date 10/23/03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Total Sitting Height	A	21.2 – 21.8 in	21.38
Shoulder Pivot Height	B	12.1 - 12.7 in	12.40
H-Point Height	C	1.35 – 1.75 in	1.57
H-Point from Backline	D	2.24 – 2.64 in	2.76
Shoulder Pivot from Backline	E	2.40 – 2.80 in	2.76
Thigh Clearance	F	3.19 – 3.59 in	3.27
Back of Elbow to Fingertip	G	9.74 – 10.34 in	10.04
Head back from Backline	H	1.9 – 2.3 in	2.17
Shoulder - Elbow Length	I	7.3 – 7.9 in	7.87
Elbow Rest Height	J	5.26 – 5.86 in	5.31
Buttock to Knee Length	K	11.21 – 11.81 in	11.42
Popliteal Height	L	8.60 – 9.20 in	8.86
Knee Pivot Height	M	9.51 – 10.11 in	9.84
Buttock Popliteal Length	N	8.58 - 9.18 in	8.86
Chest Depth with Jacket	O	5.45 - 6.05 in	5.98
Foot Length	P	5.42 – 5.82 in	5.47
Stature	Q	36.7 – 37.7 in	37.00
Buttock to Knee Pivot Length	R	9.9 - 10.3 in	10.04
Head Breadth	S	5.15 – 5.55 in	5.16
Head Depth	T	6.59 -7.19 in	6.81
Hip Breadth	U	7.9 – 8.5 in	8.14
Shoulder Breadth	V	9.31 – 9.91in	9.49
Foot Breadth	W	2.11 – 2.51 in	2.32
Head Circumference	X	19.7 – 20.3 in	20.00
Chest Circumference (With Jacket)	Y	20.75 – 21.75 in	21.65
Waist Circumference	Z	20.75 – 21.75 in	21.69
Location for Chest Circumference	AA	9.8 – 10.2 in	10.04
Location for Waist Circumference	BB	6.3 – 6.7 in	6.50

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
HEAD DROP TEST

Dummy Serial Number 142
Sequential Test Number 2
Date 12-10-03
Workfile 142H 12-10-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	38.0
Peak Resultant Acceleration	250-280 G's	272.76
Peak Lateral Acceleration	15 G's Max	6.00
Is Acceleration Curve Unimodal?	<10%	4.31

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
NECK FLEXION TEST

Dummy Serial Number 142
Sequential Test Number 2
Date 12-11-03
Workfile 142nf 12-11-03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	27.0
Pendulum Speed		5.40-5.60 m/s	5.55
Pendulum Pulse	10 ms	2.00 – 2.70 m/s	2.05
	15 ms	3.00 – 4.00 m/s	3.03
	20 ms	4.00 – 5.10 m/s	4.13
D Plane Rotation	Max	70.0 – 82.0 Deg	80.64
Maximum Occipital Moment		42.00 - 53.00 N-m	42.46
Occipital Moment Decay		60.0 - 80.0 ms	69.60

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
NECK EXTENSION TEST

Dummy Serial Number 142
Sequential Test Number 2
Date 12-11-03
Workfile 142ne2 12-11-03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		20.6 – 22.2 Deg C	21.11
Relative Humidity		10% - 70%	27.00
Pendulum Speed		3.55 – 3.75 m/s	3.60
Pendulum Pulse	10 ms	1.00 – 1.40 m/s	1.10
	15 ms	1.90 – 2.50 m/s	2.02
	20 ms	2.80 – 3.50 m/s	2.85
D Plane Rotation	Max	83.0 – 93.0 Deg	83.64
Maximum Occipital Moment		-53.30 - -43.70 N-m	-52.76
Occipital Moment Decay		60.0 - 80.0 ms	72.40

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
THORAX IMPACT TEST

Dummy Serial Number 142
Sequential Test Number 2
Date 12-12-03
Workfile 142T 12-12-03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	35.0
Pendulum Velocity	19.40 – 20.00 Ft/s	19.70
Maximum Deflection	1.30 – 1.50 in	1.30
Maximum Resistive Force	152.90 – 182.10 Lbs	167.53
Internal Hysteresis	65 - 85 %	76.46
Sternum Force Criteria	193.30 lbf	179.91

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572P
EXTERNAL DIMENSIONS

Dummy Serial Number 142
Sequential Test Number 2
Date 12-11-03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Total Sitting Height	A	21.2 – 21.8 in	21.2
Shoulder Pivot Height	B	12.1 - 12.7 in	12.4
H-Point Height	C	1.35 – 1.75 in	1.55
H-Point from Backline	D	2.24 – 2.64 in	2.5
Shoulder Pivot from Backline	E	2.40 – 2.80 in	2.6
Thigh Clearance	F	3.19 – 3.59 in	3.5
Back of Elbow to Fingertip	G	9.74 – 10.34 in	10.1
Head back from Backline	H	1.9 – 2.3 in	2.1
Shoulder - Elbow Length	I	7.3 – 7.9 in	7.7
Elbow Rest Height	J	5.26 – 5.86 in	5.5
Buttock to Knee Length	K	11.21 – 11.81 in	11.5
Popliteal Height	L	8.60 – 9.20 in	8.9
Knee Pivot Height	M	9.51 – 10.11 in	9.75
Buttock Popliteal Length	N	8.58 - 9.18 in	9.0
Chest Depth with Jacket	O	5.45 - 6.05 in	5.8
Foot Length	P	5.42 – 5.82 in	5.8
Stature	Q	36.7 – 37.7 in	37.0
Buttock to Knee Pivot Length	R	9.9 - 10.3 in	10.25
Head Breadth	S	5.15 – 5.55 in	5.4
Head Depth	T	6.59 -7.19 in	6.9
Hip Breadth	U	7.9 – 8.5 in	8.1
Shoulder Breadth	V	9.31 – 9.91in	9.9
Foot Breadth	W	2.11 – 2.51 in	2.3
Head Circumference	X	19.7 – 20.3 in	20.3
Chest Circumference (With Jacket)	Y	20.75 – 21.75 in	21.4
Waist Circumference	Z	20.75 – 21.75 in	21.4
Location for Chest Circumference	AA	9.8 – 10.2 in	10.00
Location for Waist Circumference	BB	6.3 – 6.7 in	6.50

Remarks:

Laboratory Technician:

B. Swiecicki

SECTION 6

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

HYBRID III INSTRUMENTATION

	POSITION #3 (RIGHT) SERIAL NO.: 044		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	ENDEVCO	AC-P17912	21-Oct-03
HEAD AY	ENDEVCO	AC-P17743	21-Oct-03
HEAD AZ	ENDEVCO	AC-P15319	21-Oct-03
HEAD REAR AZ	ENTRAN	AC-02I02I10-N06	8-Dec-03
UPPER NECK FX	DENTON	LC-248-FX	1-Oct-03
UPPER NECK FY	DENTON	LC-248-FY	1-Oct-03
UPPER NECK FZ	DENTON	LC-248-FZ	1-Oct-03
UPPER NECK MX	DENTON	LC-248-MX	1-Oct-03
UPPER NECK MY	DENTON	LC-248-MY	1-Oct-03
UPPER NECK MZ	DENTON	LC-248-MZ	1-Oct-03
LOWER NECK FX	DENTON	LC-249FX	1-Oct-03
LOWER NECK FY	DENTON	LC-249FY	1-Oct-03
LOWER NECK FZ	DENTON	LC-249FZ	1-Oct-03
LOWER NECK MX	DENTON	LC-249MX	1-Oct-03
LOWER NECK MY	DENTON	LC-249MY	1-Oct-03
LOWER NECK MZ	DENTON	LC-249MZ	1-Oct-03
CHEST AX	ENDEVCO	AC-P15334	21-Oct-03
CHEST AY	ENDEVCO	AC-P15321	21-Oct-03
CHEST AZ	ENDEVCO	AC-P17758	21-Oct-03
CHEST DISPLACEMENT X	SERVO	DS-044	22-Jul-03
PELVIS AX	ENDEVCO	AC-P16755	21-Oct-03
PELVIS AY	ENDEVCO	AC-P15591	21-Oct-03
PELVIS AZ	ENDEVCO	AC-P16155	21-Oct-03
TETHER BELT LOAD	-	-	-
LATCH BELT LOAD	FIRST TECHNOLOGY	LC-173	10-Oct-03

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

HYBRID III INSTRUMENTATION

	POSITION #4 (LEFT) SERIAL NO.: 142		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	ENDEVCO	AC-P23804	18-Sep-03
HEAD AY	ENTRAN	AC-99102-F12	18-Aug-03
HEAD AZ	ENDEVCO	AC-00L13-F03	18-Aug-03
HEAD REAR AZ	ENTRAN	AC-99108-F29	18-Aug-03
UPPER NECK FX	DENTON	LC-213FX	1-Oct-03
UPPER NECK FY	DENTON	LC-213FY	1-Oct-03
UPPER NECK FZ	DENTON	LC-213FZ	1-Oct-03
UPPER NECK MX	DENTON	LC-213MX	1-Oct-03
UPPER NECK MY	DENTON	LC-213MY	1-Oct-03
UPPER NECK MZ	DENTON	LC-213MZ	1-Oct-03
LOWER NECK FX	DENTON	LC-214FX	1-Oct-03
LOWER NECK FY	DENTON	LC-214FY	1-Oct-03
LOWER NECK FZ	DENTON	LC-214FZ	1-Oct-03
LOWER NECK MX	DENTON	LC-214MX	1-Oct-03
LOWER NECK MY	DENTON	LC-214MY	1-Oct-03
LOWER NECK MZ	DENTON	LC-214MZ	1-Oct-03
CHEST AX	ENTRAN	AC-99108-F30	18-Aug-03
CHEST AY	ENTRAN	AC-99108-F28	18-Aug-03
CHEST AZ	ENTRAN	AC-99H30-Z04	18-Aug-03
CHEST DISPLACEMENT X	SERVO	DS-142	18-Aug-03
PELVIS AX	ENTRAN	AC-99102-F06	18-Aug-03
PELVIS AY	ENTRAN	AC-99102-F15	18-Aug-03
PELVIS AZ	ENTRAN	AC-99G29-Q13	18-Aug-03
TETHER BELT LOAD	FIRST TECHNOLOGY	LC-155	16-Sep-03
LATCH BELT LOAD	FIRST TECHNOLOGY	LC-156	16-Sep-03

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

CRS INSTRUMENTATION

	CRS ACCELEROMETERS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
P3 CRS AX	ENDEVCO	AC-P16585	24-Sep-03
P3 CRS AY	ENDEVCO	AC-P14438	24-Sep-03
P3 CRS AZ	ENDEVCO	AC-P15747	24-Sep-03
P4 CRS AX	ENDEVCO	AC-P23926	10-Sep-03
P4 CRS AY	ENDEVCO	AC-P23854	10-Sep-03
P4 CRS AZ	ENDEVCO	AC-P23864	10-Sep-03