

REPORT NUMBER: 8717-01

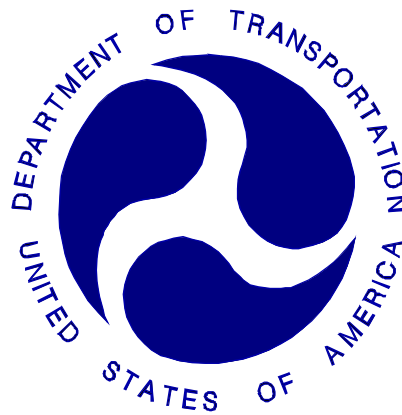
**NEW CAR ASSESSMENT PROGRAM  
SIDE IMPACT TEST**

BAYERISCHE MOTORENWERKE AG  
2003 BMW Z4  
2-DOOR CONVERTIBLE

NHTSA NUMBER: BM30500

VERIDIAN ENGINEERING TEST NUMBER: C42125-1001-2075

VERIDIAN ENGINEERING  
TRANSPORTATION SCIENCES CENTER  
P.O. BOX 400  
BUFFALO, NEW YORK 14225



July 17, 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. DTNH22-98-D-02001. 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.

Prepared By:

\_\_\_\_\_  
James A. Czarnecki, Project Engineer

Approved By:

\_\_\_\_\_  
David J. Travale, Program Manager  
Transportation Sciences Center

Approval Date:

\_\_\_\_\_

FINAL REPORT ACCEPTANCE BY:

Accepted By:

\_\_\_\_\_

Acceptance Date:

\_\_\_\_\_

**TECHNICAL REPORT STANDARD TITLE PAGE**

1. Report No. 8717-01		2. Government Accession No.		3. Recipient's Catalog No.																															
4. Title and Subtitle Final Report of new Car Assessment Program Side Impact Testing of a 2003 BMW Z4 2-Door Convertible NHTSA No.: BM30500				5. Report Date July 17, 2003																															
				6. Performing Organization Code CAL																															
7. Author(s) James A. Czarnecki, Project Engineer David J. Travale, Program Manager				8. Performing Organization Report No. 8717-01																															
9. Performing Organization Name and Address Veridian Engineering Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225				10. Work Unit No.																															
				11. Contract or Grant No. DTNH22-98-D-02001																															
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, July, 2003																															
				14. Sponsoring Agency Code NVS-111																															
15. Supplementary Notes																																			
16. Abstract A 55/28 kph 90 <sup>0</sup> Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2003 BMW Z4 2-Door Convertible in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted at the Veridian Engineering Crash Test Facility in Buffalo, New York, on July 17, 2003. The impact velocity of the Moving Deformable Barrier (MDB) was 61.8 kph, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.1 <sup>0</sup> C. The target vehicle post-test maximum crush was 197 mm at level 3. The test or target vehicle's performance is given below: <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Front SID H3</u></th> <th style="width: 10%;"></th> <th style="width: 25%; text-align: center;"><u>Rear SID H3</u></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td style="text-align: center;">80</td> <td style="text-align: right;">g's</td> <td style="text-align: center;">-</td> <td style="text-align: right;">g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td style="text-align: center;">59</td> <td style="text-align: right;">g's</td> <td style="text-align: center;">-</td> <td style="text-align: right;">g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td style="text-align: center;">70</td> <td style="text-align: right;">g's</td> <td style="text-align: center;">-</td> <td style="text-align: right;">g's</td> </tr> <tr> <td>Thoracic Trauma Index (TTI):</td> <td style="text-align: center;">75</td> <td style="text-align: right;">g's</td> <td style="text-align: center;">-</td> <td style="text-align: right;">g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td style="text-align: center;">59</td> <td style="text-align: right;">g's</td> <td style="text-align: center;">-</td> <td style="text-align: right;">g's</td> </tr> </tbody> </table> <p>The door on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite door did not open during the side impact event.</p>							<u>Front SID H3</u>		<u>Rear SID H3</u>		Left Upper Rib Acceleration:	80	g's	-	g's	Left Lower Rib Acceleration:	59	g's	-	g's	Lower Spine Acceleration:	70	g's	-	g's	Thoracic Trauma Index (TTI):	75	g's	-	g's	Pelvis Acceleration (PEV):	59	g's	-	g's
	<u>Front SID H3</u>		<u>Rear SID H3</u>																																
Left Upper Rib Acceleration:	80	g's	-	g's																															
Left Lower Rib Acceleration:	59	g's	-	g's																															
Lower Spine Acceleration:	70	g's	-	g's																															
Thoracic Trauma Index (TTI):	75	g's	-	g's																															
Pelvis Acceleration (PEV):	59	g's	-	g's																															
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB Side Impact Dummy (SID H3)			18. Distribution Statement <u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Technical Reference Division Room 5108 (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 231	22. Price																														

## TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	PURPOSE AND TEST PROCEDURE	1-1
2	SUMMARY OF SIDE IMPACT TEST	2-1
3	VEHICLE TEST DATA	3-1
	Data Sheet 1 - General Vehicle Test Parameter Data	3-2
	Data Sheet 2 - Test Vehicle Summary of Results	3-5
	Data Sheet 3 - Moving Deformable Barrier (MDB) Summary	3-6
	Data Sheet 4 - Post Test Observations	3-7
4	OCCUPANT AND VEHICLE INFORMATION	4-1
	Data Sheet 5 – SID HYBRID III Instrumentation Data	4-2
	Data Sheet 6 - Vehicle Pre- And Post Test Measurements	4-3
	Data Sheet 7 – SID HYBRID III Longitudinal Clearance Dimensions	4-4
	Data Sheet 8 – SID HYBRID III Lateral Clearance Dimensions	4-5
	Data Sheet 9 - Vehicle Side Measurements	4-6
	Data Sheet 10 - Vehicle Exterior Crush Profiles - All Levels	4-7
	Data Sheet 11 - Vehicle Damage Profile Distances	4-8
	Data Sheet 12 - Exterior Static Crush For Impactor Face	4-9
	Data Sheet 13 - Test Vehicle Accelerometer Locations And Data Summary	4-10
	Data Sheet 14 - MDB Accelerometer Locations and Data Summary	4-13
	Data Sheet 15 - High Speed Camera Locations and Data	4-14
5	VEHICLE FUEL SYSTEM INTEGRITY	5-1
	Data Sheet 16 - FMVSS 301 Fuel System Integrity Data	5-2
	Data Sheet 17 - FMVSS 301 Rollover Data	5-3
6	STRUCTURAL SURVEY MEASUREMENTS	6-1
	Data Sheet 18 - Target Vehicle Structural Measurements	6-2
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	VEHICLE, MDB AND SID HYBRID III RESPONSE DATA	B-1
APPENDIX C	SID HYBRID III CONFIGURATION AND PERFORMANCE VERIFICATION DATA	C-1
APPENDIX D	TEST EQUIPMENT LIST AND CALIBRATION INFORMATION	D-1

## **SECTION 1**

### **PURPOSE AND TEST PROCEDURE**

This side impact test is part of the FY2003 New Car Assessment Program Side Impact Protection sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-98-D-02001. The purpose of this test was to generate comparative side impact performance in a 2003 BMW Z4 2-Door Convertible. The test was conducted in accordance with the Office of Crashworthiness Standards' Laboratory Test Procedure dated July 1997.

## SECTION 2

### SUMMARY OF SIDE IMPACT TEST

A 2003 BMW Z4 2-Door Convertible was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 61.8 kph (38.4 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Veridian Engineering Transportation Sciences Center in Buffalo, New York on July 17, 2003. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the Side Impact Hybrid III Dummy (SID H3) are included in Appendix A.

One restrained Side Impact Hybrid III Dummy (SID H3) was placed in the driver (Pos. #1) according to the instructions specified in the OCWS Side Impact Laboratory Test Procedure which is dated July, 1997. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SID H3 was instrumented with the following transducers:

1. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
3. Lower Thoracic Spine (T<sub>12</sub>) uniaxial and redundant accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)
5. Head triaxial accelerometers (X-, Y- and Z-direction)
6. Upper Neck triaxial loadcell (X-, Y- and Z-direction)

A summary of the Side Impact Hybrid III Dummy (SID H3) configuration and verification test data can be found in Appendix C. A total of 41 channels of data were recorded. Appendix B contains the vehicle, MDB and dummy response data traces.

The following table summarizes the results of the test.

Injury Criteria	Front SID H3	Rear SID H3
TTI (g)	75	-
PEV (g)	59	-

### AIR BAG DEPLOYMENT STATUS

	DRIVER	FRONT PASSENGER	REAR PASSENGER
Front Air Bag	No	No	-
Knee Bolster Bag	No	No	-
Side Air Bag	Yes	No	-
Side Curtain Bag	-	-	-

**SECTION 3**

**SUMMARY OF TEST RESULTS**

# DATA SHEET 1

## GENERAL TEST AND VEHICLE PARAMETER DATA

### TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2003 BMW Z4 2-Door Convertible

Vehicle Body Color: Silver VIN: 4USBT33443LR65408

Vehicle NHTSA No.: BM30500 Month & Year of Manufacture: 06/03

Engine Data: 6 Cylinders; - CID; 2.5 Liters; - cc

Engine Placement: X Longitudinal; or - Lateral

Transmission: 5 Speed; X Manual; - Automatic; - Overdrive

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

Odometer Reading 5 km

Supplemental Airbag Restraints:

Front Occupant: X Frontal; - Knee; - Side; - Curtain

Rear Occupant: - Frontal; - Knee; - Side; - Curtain

Options: X A/C; X Power Steering; X Power Brakes; X Power Windows

### DATA FROM TIRE PLACARD

Recommended Tire Size: P225/50R16 92V

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

### DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P225/50R16 92V RSC; Manufacturer: Bridgestone

Tire Pressure with Maximum Capacity Vehicle Load: Front: 350 kPa; Rear: 350 kPa

Treadwear: 140; Traction: A; Temperature: A

### VEHICLE CAPACITY DATA:

Number of Occupants: 2 Front; 0 Rear; 0 3rd Seat; 2 Total

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

Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob

Vehicle Max Capacity Loading = 250 kg (A)

No. of Occupants x 68.04 kg. = 136.08 kg (B)

Vehicle Cargo Capacity = 113.92 kg (A-B) \*\*

### TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front = 338.0 kg Left Rear = 332.0 kg

Right Front = 343.0 kg Right Rear = 338.0 kg

TOTAL FRONT = 681.0 kg TOTAL REAR = 670.0 kg

% of Total Weight = 50.4% % % of Total Weight = 49.6 %

TOTAL WEIGHT = 1351.0 kg

\* Tire pressure used in test.

\*\* Maximum value of 136.1 kg used for target weight calculation.

**DATA SHEET 1 (continued)**

**GENERAL TEST VEHICLE PARAMETER DATA**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Max. Fluids = 1351.0 kg (A)  
Maximum Cargo Carrying Capacity of Test Vehicle = 113.92 kg (B)  
Weight of instrumented Side Impact Dummies ( 1 X 81.2 kg) = 81.2 kg (C)  
TEST VEHICLE TARGET WEIGHT: = 1546.12 kg (A+B+C)

FULLY LOADED TEST VEHICLE (UDVW + 1 or 2 SID H3(s) + CARGO):

Left Front = 354.0 kg      Left Rear = 437.0 kg  
Right Front = 342.0 kg      Right Rear = 416.0 kg  
TOTAL FRONT = 696.0 kg      TOTAL REAR = 853.0 kg  
% of Total Weight = 44.6 %      % of Total Weight = 55.2 %  
TOTAL TEST WEIGHT = 1549.0 kg

AS TESTED WEIGHT OF TEST VEHICLE (1 OR 2 SID H3(s) + CARGO + EQUIPMENT & INSTRUMENTATION):

Left Front = 359.0 kg      Left Rear = 424.0 kg  
Right Front = 354.0 kg      Right Rear = 407.0 kg  
TOTAL FRONT = 713.0 kg      TOTAL REAR = 831.0 kg  
% of Total Weight = 45.6 %      % of Total Weight = 53.2 %  
TOTAL TEST WEIGHT = 1544 kg

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

AS DELIVERED:

Left Front 682      Right Front 679      Left Rear 692      Right Rear 694

FULLY LOADED:

Left Front 671      Right Front 671      Left Rear 656      Right Rear 662

READY FOR TEST:

Left Front 671      Right Front 671      Left Rear 661      Right Rear 663

Test Vehicle Wheelbase: 2495 millimeters

C.G. = 1343 millimeters rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 3940 millimeters  
Left Side = 3940 millimeters  
Centerline = 4090 millimeters

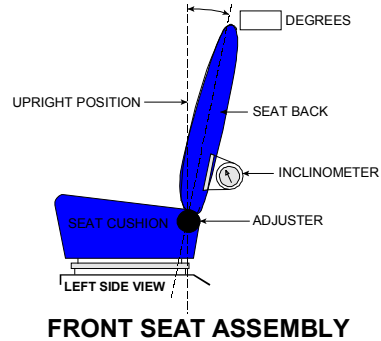
**DATA SHEET 1 (continued)**

**GENERAL TEST VEHICLE PARAMETER DATA**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500

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.



FRONT SEAT CUSHION PLACEMENT: Full down, midpoint of fore/aft travel.

Total Length of Adjustment Travel: 206 millimeters

Total Number of Adjustment Positions or Detents: Infinite – power adjuster

FRONT SEAT BACK ADJUSTMENT POSITION: Set seat back angle to obtain a 25° back pan angle on H-point machine

Seat Back Torso Angle: 10° degrees

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: - millimeters

Seat Back Adjustment Position: -

ADJUSTABLE STEERING COLUMN POSITION: Mid-position

WINDOW POSITIONS: Left Front: Closed Left Rear: -  
Right Front: Open Right Rear: -

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

56 liters (Fuel Tank Usable Capacity)

51.9 liters used for test (92%-94% of Fuel Tank Usable Capacity)

LOCATION OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:

Wheelbase = 2495 millimeters

Impact Point is 307.5 millimeters rearward of front axle centerline  
(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 307.5 millimeters rearward of front axle centerline

**DATA SHEET 2**

**TEST VEHICLE SUMMARY OF RESULTS**

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 2003 BMW Z4

Body Style: 2-Door Convertible

VIN: 4USBT33443LR65408

NHTSA No.: BM30500

Test Date: July 17, 2003

Overall Length = 4090 millimeters; Overall Width = 1730 millimeters

VEHICLE TEST WEIGHT (Pre-Test):

Left Front = 359.0 kg      Left Rear = 424.0 kg

Right Front = 354.0 kg      Right Rear = 407.0 kg

TOTAL FRONT = 713.0 kg      TOTAL REAR = 831.0 kg

TOTAL VEHICLE WEIGHT 1544.0 kg

Wheelbase = 2495 millimeters

Longitudinal C.G. from Center of Front Axle = 1343 millimeters

Impact Angle with Respect to Impactor = 90 degrees

ACTUAL IMPACT POINT

Actual Impact Point is 0 mm rearward of nominal impact ref. line (Lateral)

Actual Impact Point is 7 mm below nominal impact point (Vertical)

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 ( 234 mm above ground) = 40 millimeters

2. LEVEL 2 ( 366 mm above ground) = 139 millimeters

3. LEVEL 3 ( 551 mm above ground) = 197 millimeters

4. LEVEL 4 ( 760 mm above ground) = 165 millimeters

5. LEVEL 5 ( 1141 mm above ground) = 32 millimeters

Maximum Post-Test Intrusion = 197 millimeters

OCCUPANTS:

Front Passenger:

Rear Passenger:

Dummy Identification SID H3/270 -

Restraints Used Door mounted side airbag and 3-point active seat belt -

INSTRUMENTATION:

Number of Vehicle Data Channels: = 19

Number of Cameras:      Onboard = 2

                                 Offboard = 8

                                 TOTAL = 10

**DATA SHEET 3**

**MOVING DEFORMABLE BARRIER (MDB) SUMMARY**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500

MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore: 119B0303-4; 033A0303

---

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

Overall Width of Framework Carriage	=	<u>1250</u>	millimeters
Overall Length of MDB (incl. honeycomb impact face)	=	<u>4120</u>	millimeters
Wheelbase of Framework Carriage	=	<u>2590</u>	millimeters
Tread of Framework Carriage (Front & Rear)	=	<u>1875</u>	millimeters
C.G. Location Rearward of Front Axle	=	<u>1104</u>	millimeters

MDB WEIGHT:

Left Front	=	<u>409.5</u>	kg	Left Rear	=	<u>281.5</u>	kg
Right Front	=	<u>372.5</u>	kg	Right Rear	=	<u>299.0</u>	kg
TOTAL FRONT	=	<u>782.0</u>	kg	TOTAL REAR	=	<u>580.5</u>	kg
TOTAL MDB WEIGHT	=	<u>1362.5</u>	kg				
Impact Angle (MDB C/L to Target Vehicle C/L)	=	<u>90</u>	degrees				
Impact Speed	=	<u>61.8</u>	kph				

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A at Center of Bumper Level	=	<u>283</u>	millimeters
2. Row B at Top of Bumper Level	=	<u>214</u>	millimeters
3. Row C at Mid Level	=	<u>161</u>	millimeters
4. Row D at Top of Stack Level	=	<u>111</u>	millimeters

INSTRUMENTATION:

Number of MDB Data Channels	=	<u>5</u>
-----------------------------	---	----------

**DATA SHEET 4**

**POST-TEST OBSERVATIONS**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500

TEST DUMMY INFORMATION AND CONTACT POINTS:

DESCRIPTION	FRONT SEAT	REAR SEAT
ATD Type/Serial No.	SID H3/270	SID H3/-
Head Contact:	Top of head to left roof header and side rail	-
Upper Torso Contact:	Shoulder to top of door; Left arm to side airbag	-
Lower Torso Contact:	Hip to door trim below armrest	-
Left Knee Contact:	Left knee to door trim below switch cluster	-
Right Knee Contact:	Right knee to left knee	-

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

DESCRIPTION	FRONT	REAR
Left Side Doors	Closed, Latched and Inoperable	-
Right Side Doors	Closed, Latched and Operable	-
Hatch/Other Door	-	-
Seat Movement (mm)	0 mm	-
Seat Back Failure	None	-

POST TEST STRUCTURAL OBSERVATIONS

CRITICAL AREAS OF PERFORMANCE	
Pillar Performance	No visible tears or separations
Sill Separation	None
Windshield Damage	Windshield cracked at the driver side lower edge
Window Damage	Left door window shattered at impact
Other Notable Effects	None

AIR BAG DEPLOYMENT STATUS:

	DRIVER	FRONT PASSENGER	REAR PASSENGER
Front Air Bag	No	No	-
Knee Bolster Bag	No	No	-
Side Air Bag	Yes	No	-
Side Curtain Bag	-	-	-

MDB LEFT EDGE IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	± 50 mm	0 mm
Vertical Offset	mm	± 20 mm	7 mm

**SECTION 4**

**OCCUPANT AND VEHICLE INFORMATION**

**DATA SHEET 5**

**SID H3 INSTRUMENTATION DATA**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500

		Front Dummy ID# 270				Rear Dummy ID# -			
		Pos. Direction		Neg. Direction		Pos. Direction		Neg. Direction	
		Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
<b>HEAD ACCELERATIONS:</b>									
Longitudinal	X	2.4	193.3	-31.5	41.8	-	-	-	-
Lateral	Y	91.1	41.6	-6.1	194.5	-	-	-	-
Vertical	Z	30.3	36	-7.3	46.0	-	-	-	-
Resultant	R	97.5	41.6	0.0	-12.7	-	-	-	-
HIC		421.2				-			
<b>NECK FORCES:</b>									
Longitudinal	X	52.8	199.9	-612.7	78.1	-	-	-	-
Lateral	Y	1036.1	42.9	-236.6	197.2	-	-	-	-
Vertical	Z	817.6	34.5	-593.5	37.8	-	-	-	-
Resultant	R	1165.7	43.3	0.1	-1.7	-	-	-	-
<b>NECK MOMENTS:</b>									
X		33.2	59.3	-134.4	43.3	-	-	-	-
Y		18.7	87.9	-25.3	46.9	-	-	-	-
Z*		0.7	69.8	-1.4	36.9	-	-	-	-
Resultant	R	136.3	43.4	0.0	-8.2	-	-	-	-
<b>RIB ACCELERATIONS:</b>									
Upper Rib Lateral	Y	80.2	30.7	-7.5	80.0	-	-	-	-
Upper Rib Lateral	Y(R)	79.0	30.6	-7.5	80.0	-	-	-	-
Lower Rib Lateral	Y	59.3	40.0	-9.3	170.6	-	-	-	-
Lower Rib Lateral	Y(R)	60.3	40.0	-10.6	165.0	-	-	-	-
<b>SPINE ACCELERATIONS:</b>									
Lower Lateral	Y	69.8	33.8	-7.4	60.6	-	-	-	-
Lower Lateral	Y(R)	68.3	33.8	-7.0	60.6	-	-	-	-
<b>PELVIC ACCELERATIONS:</b>									
Lateral	Y	58.9	39.4	-9.5	60.0	-	-	-	-
Lateral	Y(R)	57.9	39.4	-9.5	60.0	-	-	-	-

\* Data is questionable

REFERENCE: Positive Direction: Longitudinal (X) = forward; Lateral (Y) = to right; Vertical (Z) = down

Note: Rib, Spine and Pelvis data has been FIR filtered, Y(R) denotes redundant Y direction accelerometer.

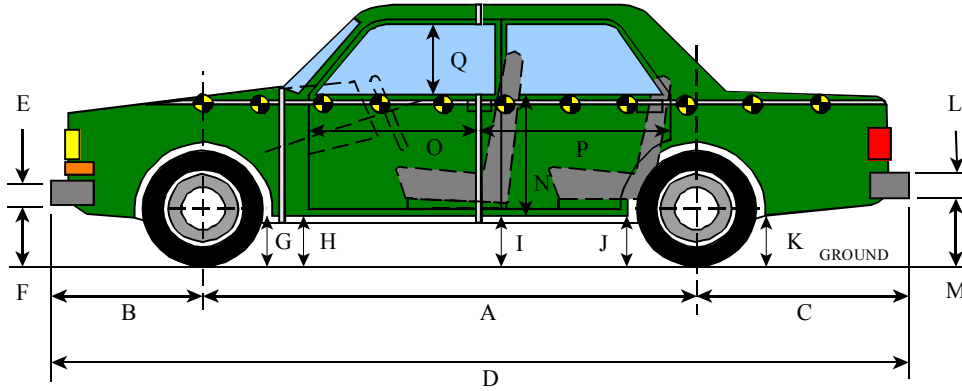
Head Accelerations and Neck Forces are filtered at SAE Class 1000, Neck Moments are filtered at SAE Class 600.

## DATA SHEET 6

### VEHICLE SIDE MEASUREMENTS

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



#### LEFT SIDE VIEW

NOTE: all dimensions are in millimeters with tolerance of  $\pm 3$  mm

	PRE-TEST (as delivered)	PRE-TEST (as tested)	POST-TEST (as tested)	$\Delta$ CHANGE
A	2495	2495	2473	-22
B	825	-	840	15
C	770	-	764	764
D	4090	-	4077	-13
E	393	-	393	0
F	298	301	308	7
G	154	140	183	43
H	160	134	174	40
I	165	141	147	6
J1	166	141	147	6
J2	166	141	147	6
K	224	185	206	21
L	335	-	335	0
M	243	208	235	27
N	573	-	534	-39
O	230	-	177	-53
P	892	-	913	21
Q	318	-	319	1
R	3940	-	3936	-4
S	3940	-	3920	-20
T	1730	-	1701	-29

D = Length at Centerline

E&L = Bumper Thickness

R = Right Side Length

S = Left Side Length

T = Width at B-Pillar

J1 = To Pinch Weld

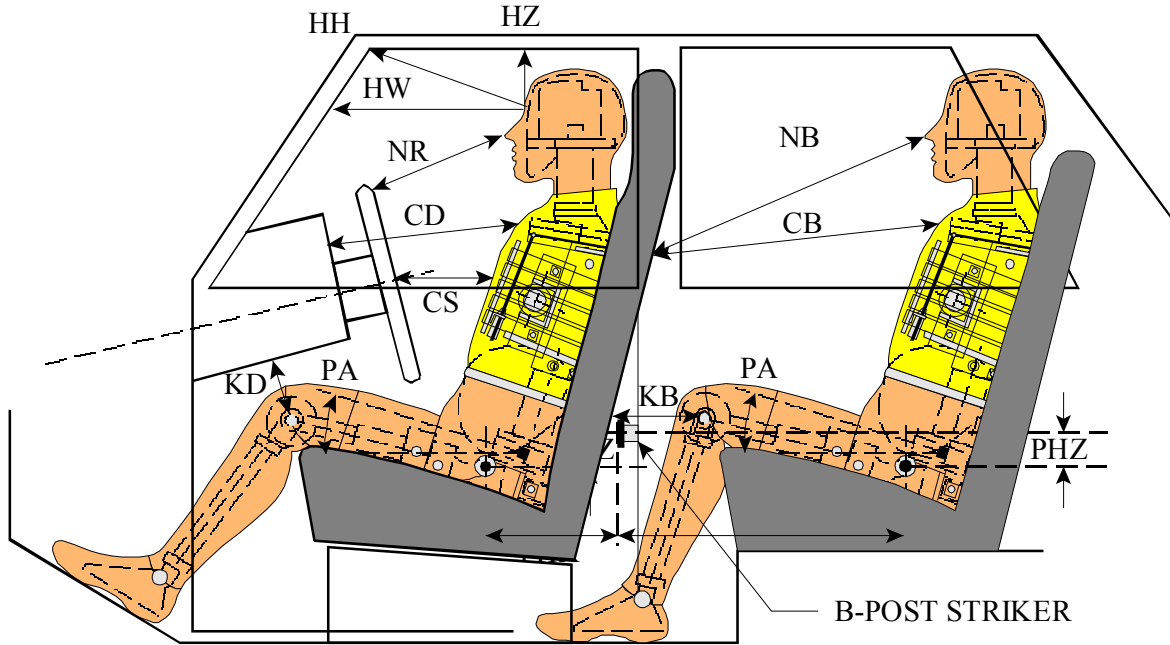
J2 = To Sill

DATA SHEET 7

SID H3 LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



**LEFT SIDE VIEW**

NOTE: 2-DOOR VEHICLE SHOWN.  
REAR DUMMY PHX & PHZ  
MEASUREMENTS FOR A 4-DOOR  
VEHICLE WOULD USE THE C-POST  
STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm

	DRIVER ID# 270	LEFT REAR PASS. ID# -
HH	394	N/A
HW	612	N/A
HZ	151	-
NR/NB	416	-
CD/CB	527	-
CS	313	N/A
KDL(KDA°)/KBL(KBA°)	209 / ( 49 °)	- / ( - °)
KDR(KBA°)/KBR(KBA°)	185 / ( 58 °)	- / ( - °)
PA°	23.3 °	- °
PHX	294	-
PHZ	230	-

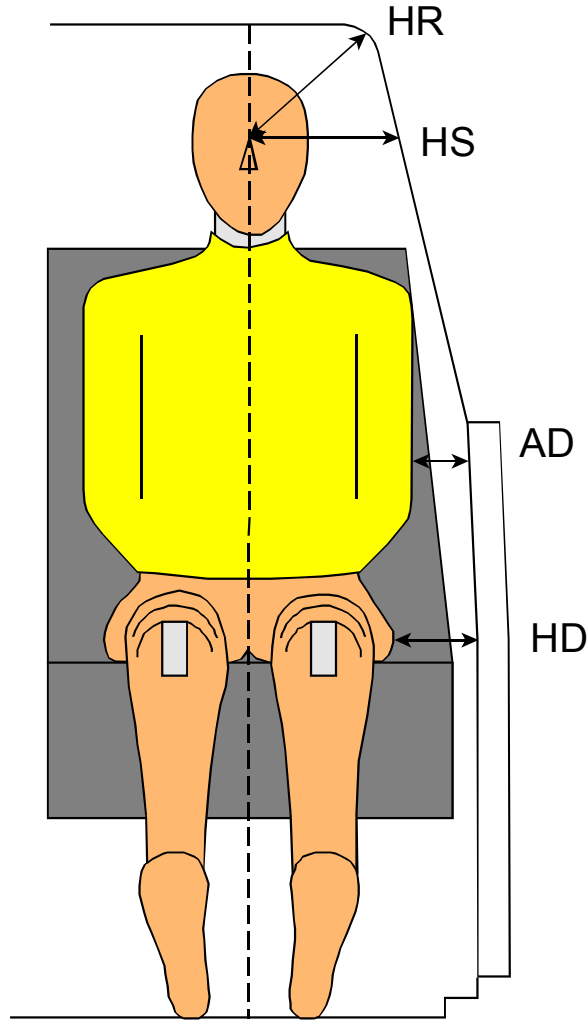
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

DATA SHEET 8

SID H3 LATERAL CLEARANCE DIMENSIONS

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm

	DRIVER ID # 270		LEFT REAR PASS. ID # -	
HR	212		-	
HS	292		-	
AD*	LOWER: 89	UPPER: 66	LOWER: -	UPPER: -
HD	143			

\* Lower measurement is taken laterally at the center of the lower rib accelerometer height from the SID H3 arm to the closest part of the vehicle side.

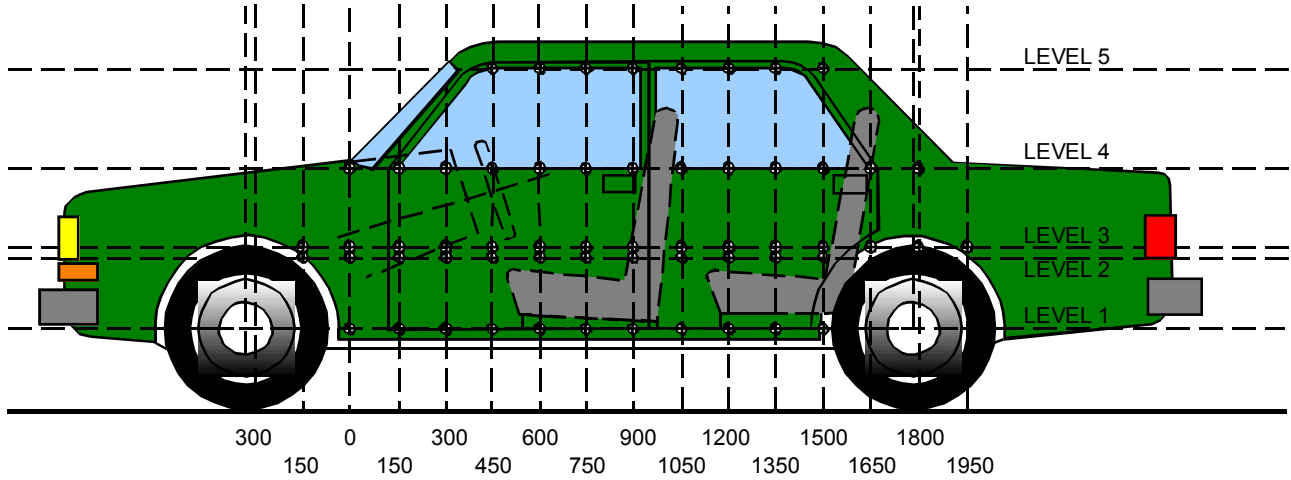
Upper measurement is taken laterally at the center of the upper rib accelerometer height from the SID H3 arm to the closest part of the vehicle side.

**DATA SHEET 9**

**VEHICLE SIDE MEASUREMENTS**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



**LEFT SIDE VIEW**

**NOTE: All measurements are in millimeters (mm)**

- LEVEL 5 - WINDOW TOP
- LEVEL 4 - WINDOW SILL
- LEVEL 3 - MID-DOOR
- LEVEL 2 - OCCUPANT H-POINT
- LEVEL 1 - AXLE CENTERLINE HEIGHT OR SILL TOP HEIGHT

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION.

Measurements Along the Vertical 750 mm Line Shown Above:

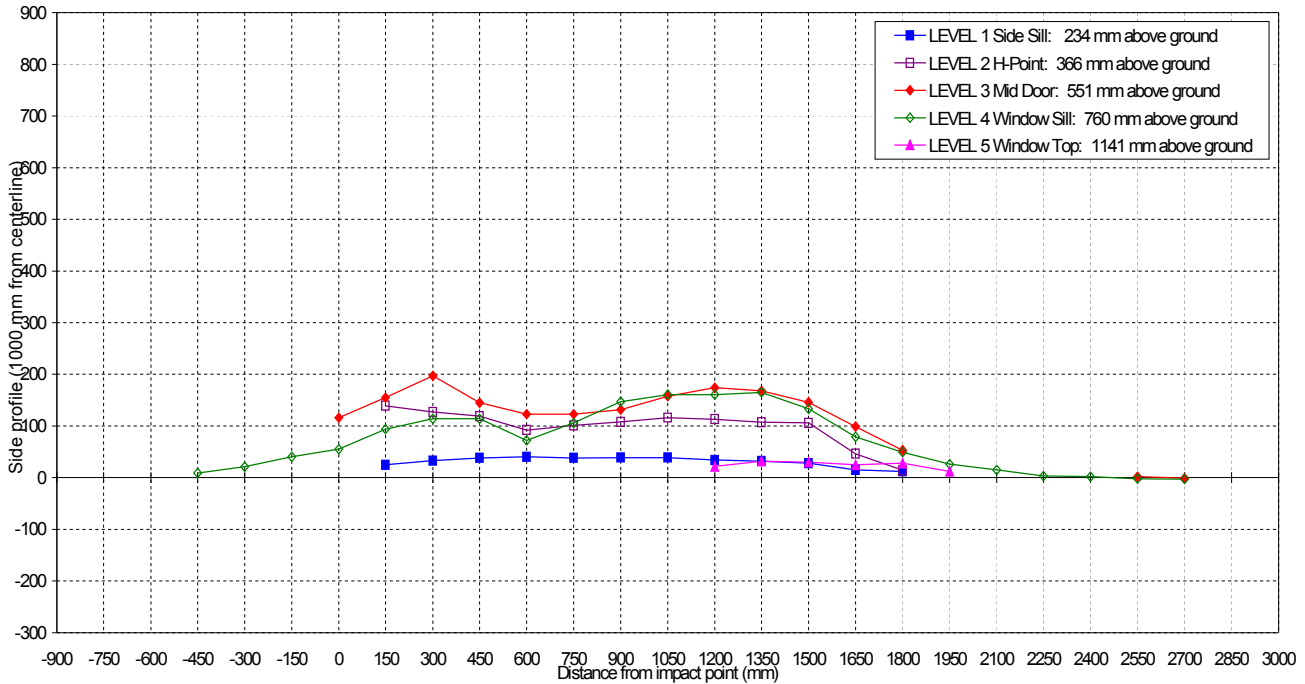
Level 5 @ Window Top	=	<u>1141</u>	millimeters
Level 4 @ Window Sill	=	<u>760</u>	millimeters
Level 3 @ Mid Door	=	<u>551</u>	millimeters
Level 2 @ Occupant H-Point	=	<u>366</u>	millimeters
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>234</u>	millimeters

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



NOTE: All dimensions are in millimeters with a tolerance of ±3 mm

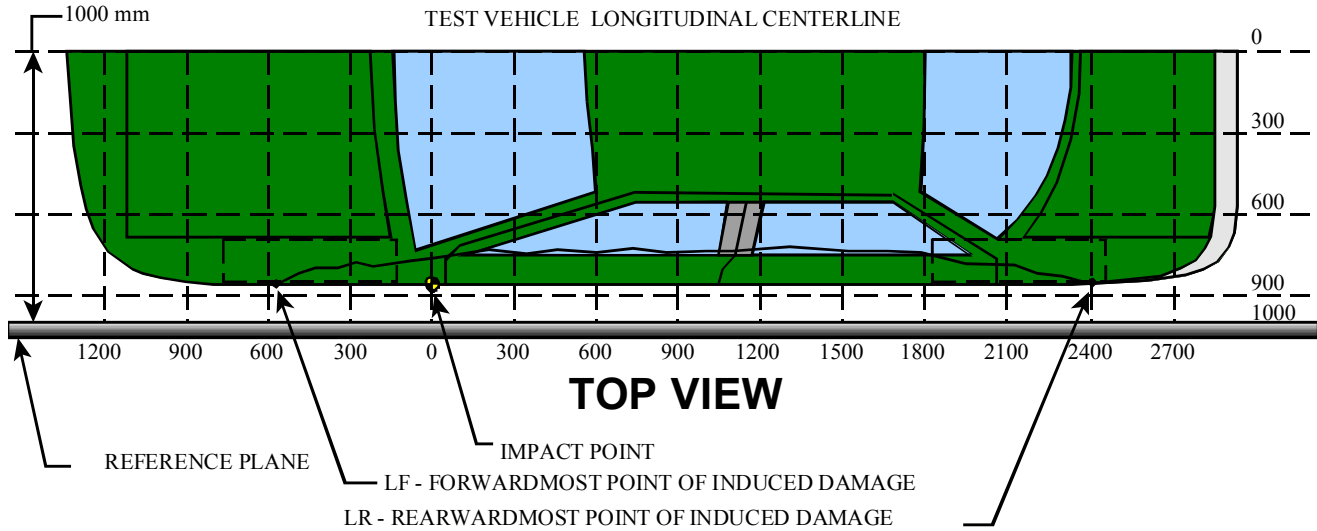
LEVEL	HEIGHT (mm)		DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT																											
			-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	
LEVEL 1 SIDE SILL	234	PRE	-	-	-	-	-	-	153	138	129	127	127	132	136	148	155	164	161	146	-	-	-	-	-	-	-	-	-	
		POST	-	-	-	-	-	-	178	171	167	167	165	171	175	182	187	192	176	158	-	-	-	-	-	-	-	-	-	
		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	25	33	38	40	38	39	39	34	32	28	15	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
LEVEL 2 H POINT	366	PRE	-	-	-	-	-	-	130	135	136	135	138	143	145	150	153	152	145	129	-	-	-	-	-	-	-	-	-	
		POST	-	-	-	-	-	-	269	262	255	227	239	251	261	263	260	258	191	143	-	-	-	-	-	-	-	-	-	
		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	139	127	119	92	101	108	116	113	107	106	46	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
LEVEL 3 MID DOOR	551	PRE	-	-	-	-	-	123	117	115	117	116	117	119	122	128	138	143	146	128	-	-	-	-	151	226	-	-		
		POST	-	-	-	-	-	239	272	312	262	239	240	251	280	302	306	289	245	181	-	-	-	-	153	225	-	-		
		CRUSH	N/A	N/A	N/A	N/A	N/A	116	155	197	145	123	123	132	158	174	168	146	99	53	N/A	N/A	N/A	N/A	2	-1	N/A	N/A		
LEVEL 4 WINDOW SILL	760	PRE	-	-	-	230	182	163	156	151	150	150	152	152	153	159	174	181	193	201	194	165	154	163	193	248	327	-	-	
		POST	-	-	-	239	203	203	211	245	264	264	224	258	300	320	335	346	326	280	243	191	169	166	195	246	324	-	-	
		CRUSH	N/A	N/A	N/A	9	21	40	55	94	114	114	72	106	147	161	161	165	133	79	49	26	15	3	2	-2	-3	N/A	N/A	
LEVEL 5 WINDOW TOP	1141	PRE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	399	388	393	411	467	498	-	-	-	-	-	-		
		POST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	421	420	423	436	495	510	-	-	-	-	-	-	
		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22	32	30	25	28	12	N/A	N/A	N/A	N/A	N/A	N/A	

**DATA SHEET 11**

**VEHICLE DAMAGE PROFILE DISTANCES**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



MEASUREMENT CONVENTIONS:  
 Forward of the impact point (towards front of vehicle) is considered negative (—).  
 Rearward of the impact point (toward rearend of vehicle) is considered positive (+).

NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm.

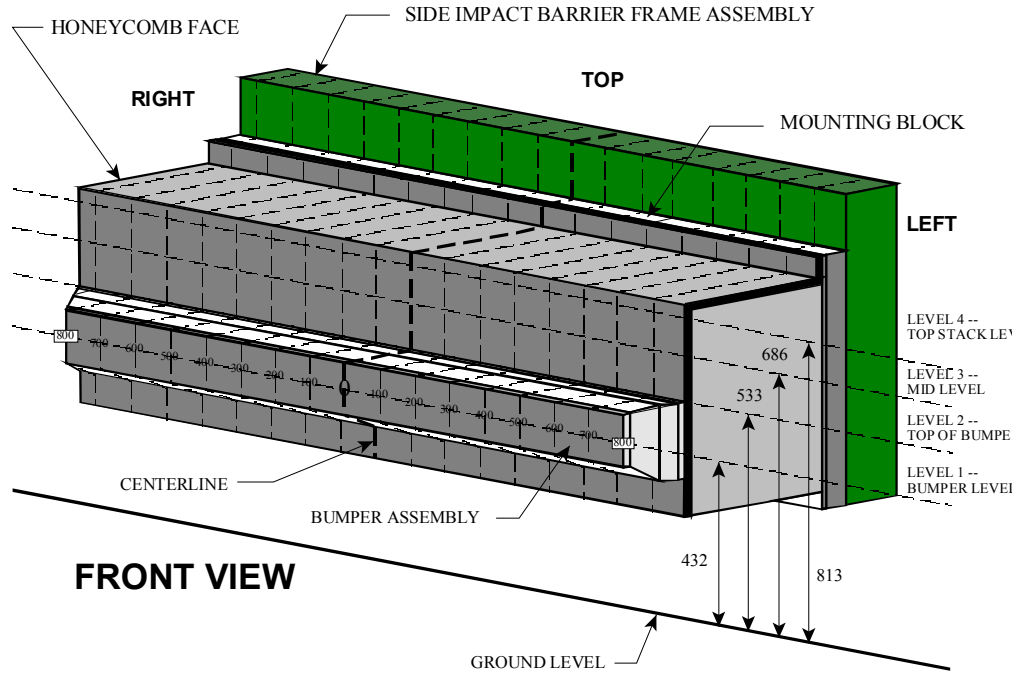
DPD MEASUREMENTS	POST TEST (mm)	PRETEST (mm)	STATIC CRUSH (mm)
1 (LR = 2475mm)	221	221	0
2 1890	212	177	35
3 1305	305	135	170
4 720	240	117	123
5 135	269	118	151
6 (LF = -450mm)	239	230	9

DATA SHEET 12

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



NOTE: Dimensions are shown in millimeters, mm

NOTE: All dimensions are in millimeters with a tolerance of  $\pm 3$  mm

LEVEL	HEIGHT AT CL (mm)*		DISTANCE RIGHT OF CENTER (mm)									DISTANCE LEFT OF CENTER (mm)								
			800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800	
LEVEL 4 TOP STACK	813	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	
		POST	722	672	632	618	619	625	636	647	662	673	720	730	723	693	692	707	721	
		CRUSH	103	53	13	-1	0	6	17	28	43	54	101	111	104	74	73	88	102	
LEVEL 3 MID LEVEL	686	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	
		POST	780	737	689	658	650	645	643	647	654	678	719	710	695	687	683	694	708	
		CRUSH	161	118	70	39	31	26	24	28	35	59	100	91	76	68	64	75	89	
LEVEL 2 TOP BUMPER	533	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	
		POST	833	792	763	752	749	749	748	749	749	748	753	752	744	737	729	723	717	
		CRUSH	214	173	144	133	130	130	129	130	130	129	134	133	125	118	110	104	98	
LEVEL 1 MID BUMPER	432	PRE	535	519	518	518	518	518	518	518	518	518	518	518	518	518	518	519	535	
		POST	818	777	740	719	712	710	710	711	710	712	730	730	704	699	686	677	679	
		CRUSH	283	258	222	201	194	192	192	193	192	194	212	212	186	181	168	158	144	

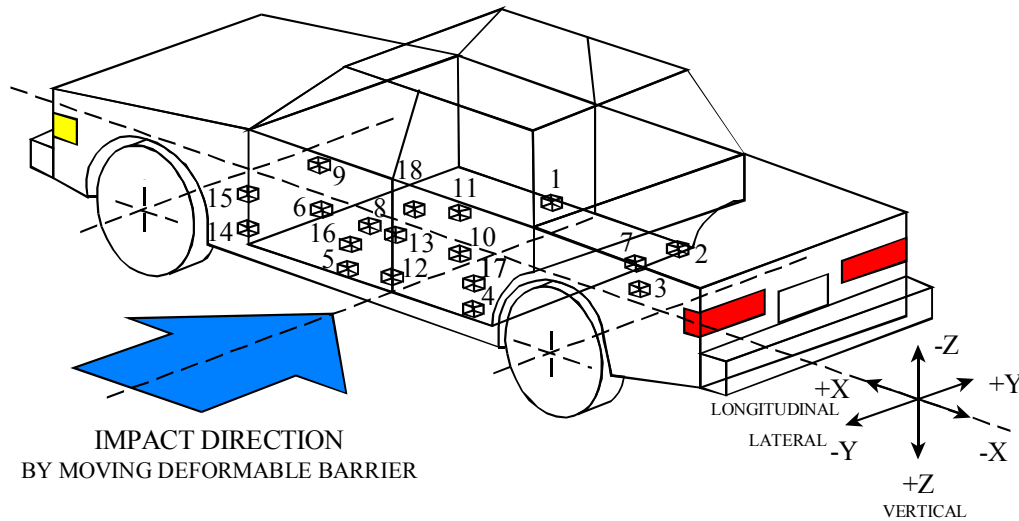
\*Heights measured above ground level.

**DATA SHEET 13**

**TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1-Right Side Sill @ Front Seat     | 10-Midrear of Left Rear Door       |
| 2-Right Side Sill @ Rear Seat      | 11-Left Rear Door Upper Centerline |
| 3-Rear Floorpan Above Axle         | 12-Left Lower B-Pillar             |
| 4-Left Side Sill @ Rear Seat       | 13-Left Middle B-Pillar            |
| 5-Left Side Sill @ Front Seat      | 14-Left Lower A-Pillar             |
| 6-Left Front Door on Centerline    | 15-Left Middle A-Pillar            |
| 7-Right Rear Occupant Compartment  | 16-Front Seat Track                |
| 8-Midrear of Left Front Door       | 17-Rear Seat Track                 |
| 9-Left Front Door Upper Centerline | 18-Vehicle CG                      |

**DATA SHEET 13 (continued)**

**VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500

Accel. No.	Location	Coordinates (mm)±3 mm				Long. (x)		Lat. (y)		Vert. (z)		Resultant	
		X*	Y*	Z*		Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
						pos.	neg.	pos.	neg.	pos.	neg.	pos.	neg.
1	Right Side Sill at Front Seat	2201	649	-201	pos.	5.3	53.0	29.6	6.5	5.7	30.5	31.1	6.5
					neg.	-7.9	10.9	-2.1	74.0	-7.5	6.7	-	-
2	Right Side Sill at Rear	1426	670	-214	pos.	6.4	51.8	26.1	6.1	8.2	33.0	26.4	6.1
					neg.	-6.2	10.8	-2.8	74.8	-6.5	12.3	-	-
3	Rear Floorpan Above Axle	805	-4	-420	pos.	3.2	51.6	23.8	5.1	19.9	22.0	27.4	22.0
					neg.	-8.8	3.8	-2.7	76.6	-16.3	25.5	-	-
4	Left Side Sill at Rear	1488	-664	-245	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
5	Left Side Sill at Front Seat	2178	-655	-225	pos.	-	-	83.3	2.9	-	-	-	-
					neg.	-	-	-17.2	7.0	-	-	-	-
6**	Left Front Door on Centerline	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
7†	Right Rear Occupant Compartment	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
8**	Midrear of Left Front Door	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
9**	Left Front Door Upper Centerline	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
10†	Midrear of Left Rear Door	-	-	-	Pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
11†	Left Rear Door Upper Centerline	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-

\*Reference: X - Rear Bumper (+ Forward) Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Down)

\*\*Accelerometer was deleted due to the door mounted side airbag.

† Accelerometer was deleted, vehicle did not have rear seating positions.

4-11

8717-01

**DATA SHEET 13 (continued)**

**VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500

Accel. No.	Location	Coordinates (mm)±3 mm				Long. (x)		Lat. (y)		Vert. (z)		Resultant	
		X*	Y*	Z*		Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
12	Left Lower B-Pillar	1408	-640	-215	pos.	-	-	52.4	25.6	-	-	-	-
					neg.	-	-	-9.9	28.2	-	-	-	-
13	Left Middle B-Pillar	1170	-626	-649	pos.	-	-	58.2	14.4	-	-	-	-
					neg.	-	-	-14.4	20.7	-	-	-	-
14	Left Lower A-Pillar	2385	-684	-290	pos.	-	-	109.6	3.2	-	-	-	-
					neg.	-	-	-43.7	11.1	-	-	-	-
15	Left Middle A-Pillar	2233	-641	-870	pos.	-	-	60.5	10.7	-	-	-	-
					neg.	-	-	-8.5	175.3	-	-	-	-
16	Front Seat Track	1638	-645	-182	pos.	-	-	32.1	3.9	-	-	-	-
					neg.	-	-	-2.6	79.0	-	-	-	-
17†	Rear Seat Track	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
18	Vehicle CG	1869	8	-400	pos.	3.3	55.0	26.4	6.1	7.6	13.0	26.9	6.1
					neg.	-12.4	9.5	-1.8	92.0	-4.8	4.7	-	-

\*Reference: X - Rear Bumper (+ Forward) Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Down)

† Accelerometer was deleted, vehicle did not have rear seating positions.

4-12

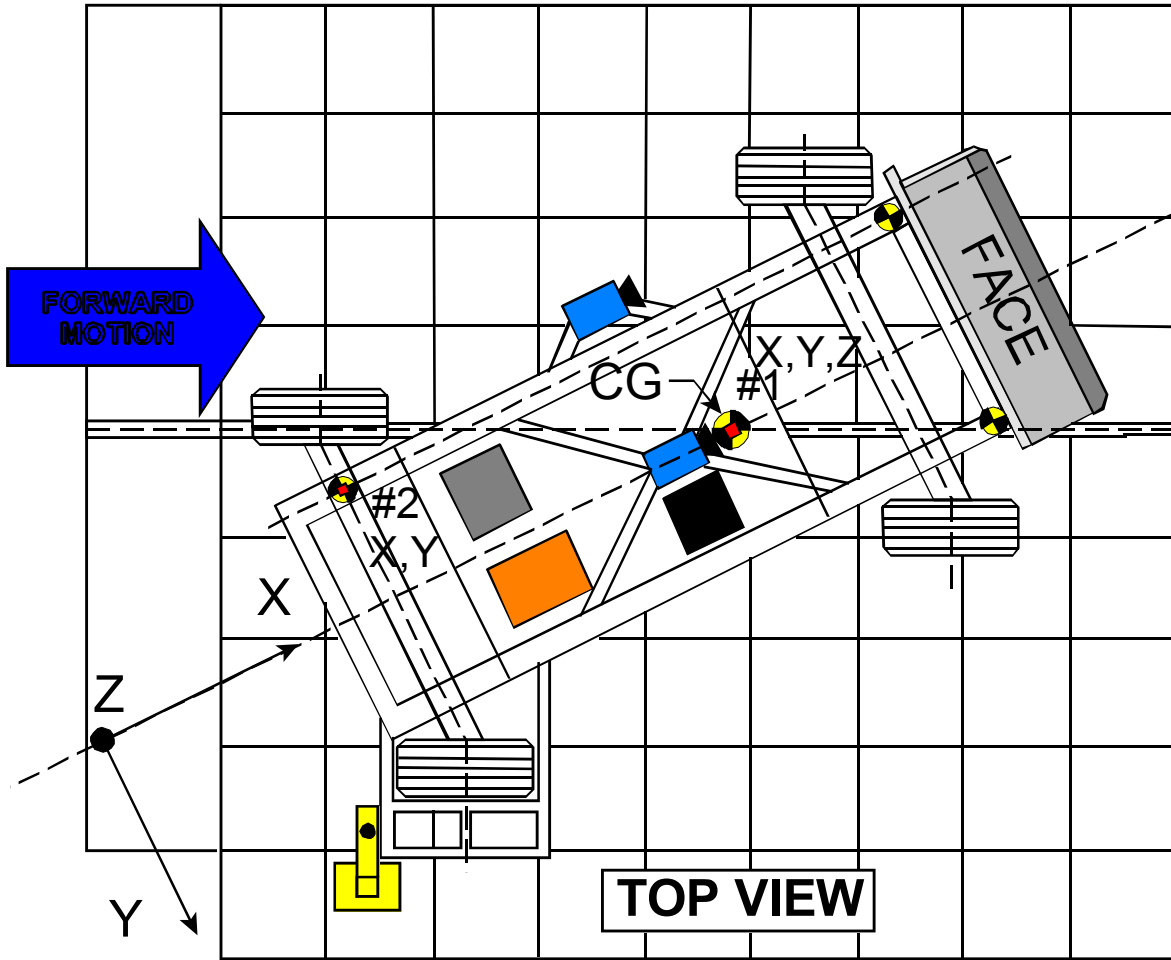
8717-01

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



Accel. No.	Location	Coordinates (millimeters)			Pos. Direct.		Neg. Direct.	
		X*	Y*	Z*	Max (g)	Time (msec)	Max (g)	Time (msec)
1	MDB Center of Gravity							
	Longitudinal... X	1859	0	-330	1.0	75.4	-23.7	38.8
	Lateral..... Y				2.7	58.7	-8.4	17.6
	Vertical..... Z				16.4	94.0	-24	49.6
	Resultant..... R				28.1	49.5	-	-
2	Rear Frame Member							
	Longitudinal... X	386	-660	-660	2.3	93.6	-26.7	32.2
	Lateral..... Y				4.1	17.4	-2.4	77.4

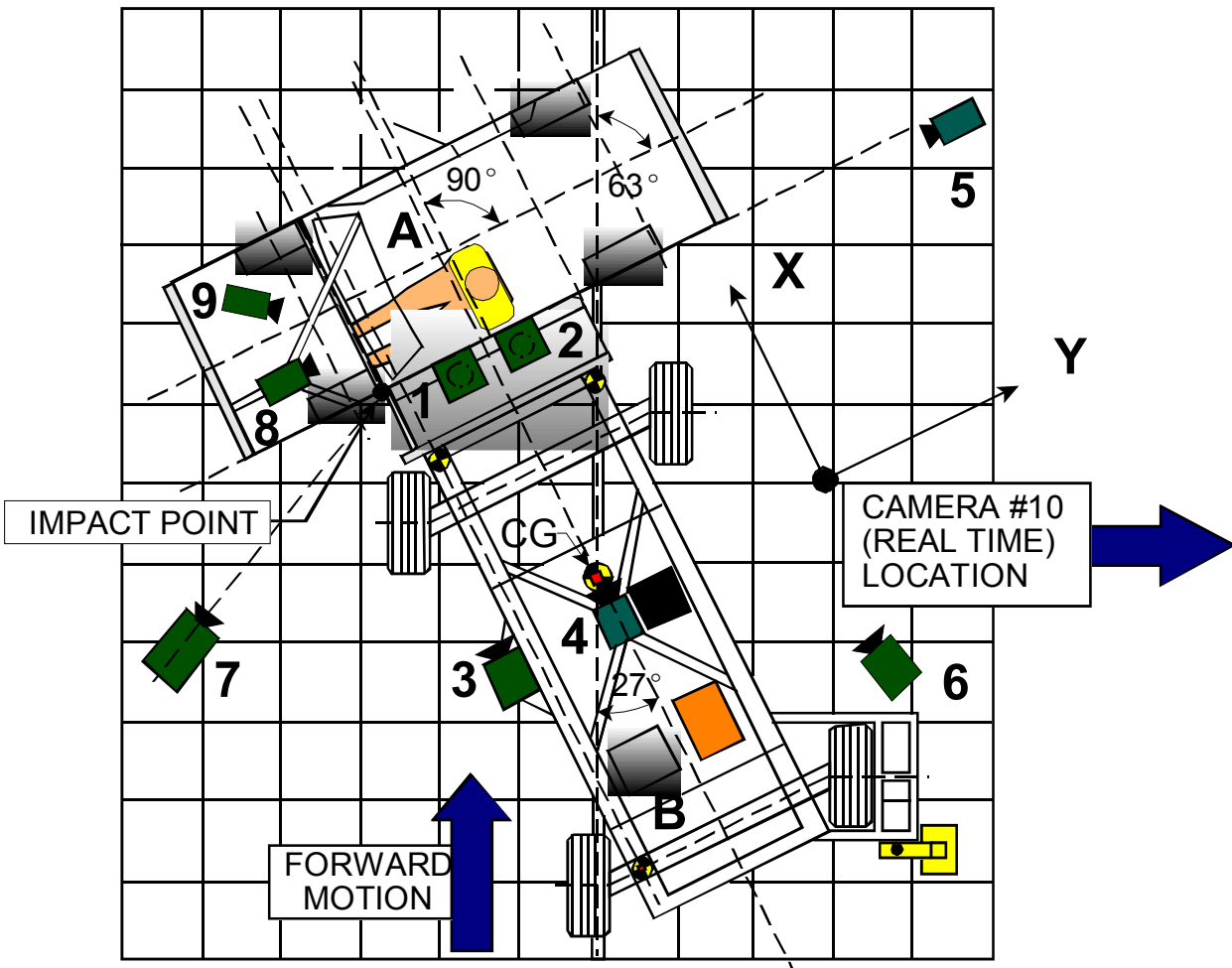
\*Reference: X = Rear Bumper (+ Forward)  
 Y = Vehicle Centerline (+ To Right)  
 Z = Ground Level (+ Down)  
 All measurements accurate to within ±3 mm.

DATA SHEET 15

HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No. BM30500



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead view of test vehicle	350	830	-4880	-90	8	1000
2	Overhead closeup view of impact plane	205	768	-4880	-90	12.5	1000
3	MDB onboard closeup view of impact point	-1470	0	-847	0	13	1000
4	MDB onboard view of driver dummy	-1140	838	-1586	-17	7.5	1000
5	Right side ground level overall view	0	9187	-1051	-3.5	25	980
6	Secondary impact point view	4023	3576	-1050	-3.2	25	1000
7	Left side ground level overall view	2023	-1698	-1047	-7.6	13	1015
8	Test vehicle onboard driver front view	459	0	-1247	-9.6	13	1000
9	Test vehicle onboard driver quarter view	1796	1291	-957	-9.9	13	1000
10	Real time film coverage of test	-	-	-	-	-	24

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

X = (Impact Point) + Forward  
 Y = (Impact Point) + To Right  
 Z = (Ground Level) + Down

**SECTION 5**

**FUEL SYSTEM INTEGRITY**

**DATA SHEET 16**

**FMVSS 301 FUEL SYSTEM INTEGRITY DATA**

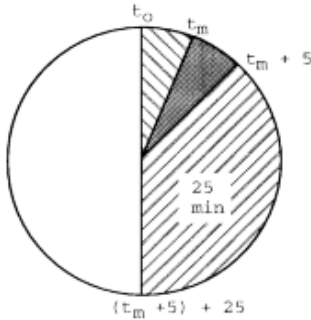
NHTSA No.: BM30500 TEST DATE: July 17, 2003  
 Vehicle Mfgr./Make/Model: Bayerische Motorenwerke AG 2003 BMW Z4 2-Door Convertible

\*\*\*\*\*

TEST VEHICLE IMPACT TYPE:

- Frontal (48.28 kph)
- Oblique (48.28 kph) with      ° barrier face first  
 contacting the      side  
 (driver/passenger)
- Rear Moving Barrier (48.28 kph)
- Lateral Moving Barrier (32.19 kph)
- X - Side Impact Moving Deformable Barrier (62.0 kph)  
 contacting the      driver      side  
 (driver/passenger)

FUEL SPILLAGE MEASUREMENT:



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

ACTUAL	MAX ALLOWED
0 g	28 g
0 g	142 g
0 g	28 g/1 min.

SOLVENT SPILLAGE DETAILS:

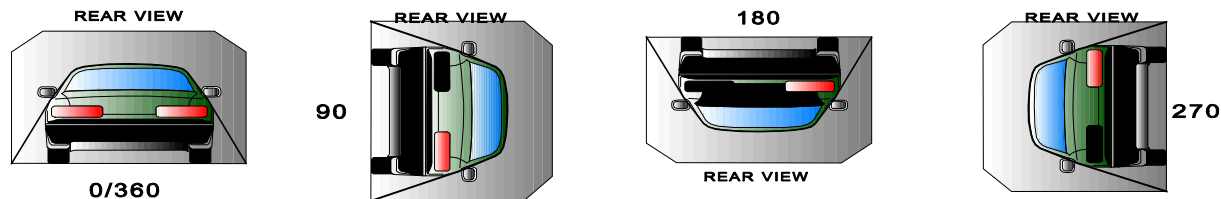
None

**DATA SHEET 17**

**ROLLOVER DATA**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No.: BM30500



**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	
	1	minutes	8	seconds	5	minutes	6	minutes	8	seconds	7	minutes
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	1	seconds	5	minutes	6	minutes	1	seconds	7	minutes
270°-360°	1	minutes	7	seconds	5	minutes	6	minutes	7	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	-
90° - 180°	0	0	0	-
180°-270°	0	0	0	-
270°-360°	0	0	0	-

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

**IV. SOLVENT SPILLAGE LOCATION(S):**

Rollover Stage	Spillage Location
0° - 90°	-
90° - 180°	-
180°-270°	-
270°-360°	-

**SECTION 6**

**STRUCTURAL SURVEY MEASUREMENTS**

**DATA SHEET 18**

**TARGET VEHICLE STRUCTURAL MEASUREMENTS**

Vehicle: 2003 BMW Z4 2-Door Convertible

NHTSA No.: BM30500

	Elements	Pre-Test (mm)
1	Total length	4090
2	Total Width	1730
3	Bumper Top Height	691
4	Bumper Bottom Height	298
5	Longitudinal Member Top Height	465
6	Distance Between Longitudinal Members	835
7	Longitudinal Member Width	55
8	Engine top height	790
9	Engine bottom height	530
10	Engine and gearbox width	460
11	Front bumper-engine distance	500
12	Front shock absorber fixing height	780
13	Bonnet leading edge height	700
14	Front shock absorber fixing width	1040
15	Front bumper – front axle distance	800
16	Front axle – a pillar distance	994
17	A-pillar – B pillar distance	1011
18	B-pillar – rear axle distance	509
19	B-pillar – C Pillar distance	-
20	Roof sill bottom height	1125
21	Roof sill top height	1235
22	Floor sill bottom height	155
23	Floor sill top height	334

**APPENDIX A**

**PHOTOGRAPHS**

**TABLE OF PHOTOGRAPHS**

<u>Figure</u>	<u>Photograph Title</u>	<u>Page</u>
Figure A- 1	PRE-TEST FRONTAL VIEW OF TEST VEHICLE	A- 3
Figure A- 2	POST-TEST FRONTAL VIEW OF TEST VEHICLE	A- 4
Figure A- 3	PRE-TEST REAR VIEW OF TEST VEHICLE	A- 5
Figure A- 4	POST-TEST REAR VIEW OF TEST VEHICLE	A- 6
Figure A- 5	PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE	A- 7
Figure A- 6	POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE	A- 8
Figure A- 7	PRE-TEST LEFT FRONT VIEW OF TEST VEHICLE	A- 9
Figure A- 8	POST-TEST LEFT FRONT VIEW OF TEST VEHICLE	A- 10
Figure A- 9	PRE-TEST LEFT REAR VIEW OF TEST VEHICLE	A- 11
Figure A- 10	POST-TEST LEFT REAR VIEW OF TEST VEHICLE	A- 12
Figure A- 11	PRE-TEST RIGHT FRONT VIEW OF TEST VEHICLE	A- 13
Figure A- 12	POST-TEST RIGHT FRONT VIEW OF TEST VEHICLE	A- 14
Figure A- 13	PRE-TEST RIGHT REAR VIEW OF TEST VEHICLE	A- 15
Figure A- 14	POST-TEST RIGHT REAR VIEW OF TEST VEHICLE	A- 16
Figure A- 15	PRE-TEST FRONTAL VIEW OF IMPACTOR FACE	A- 17
Figure A- 16	POST-TEST FRONTAL VIEW OF IMPACTOR FACE	A- 18
Figure A- 17	PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE	A- 19
Figure A- 18	POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE	A- 20
Figure A- 19	PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE	A- 21
Figure A- 20	POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE	A- 22
Figure A- 21	PRE-TEST TOP VIEW OF IMPACTOR FACE	A- 23
Figure A- 22	POST-TEST TOP VIEW OF IMPACTOR FACE	A- 24
Figure A- 23	PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE	A- 25
Figure A- 24	POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE	A- 26
Figure A- 25	PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A- 27
Figure A- 26	POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A- 28
Figure A- 27	PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A- 29
Figure A- 28	POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A- 30
Figure A- 29	PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A- 31
Figure A- 30	POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A- 32
Figure A- 31	PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A- 33
Figure A- 32	POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A- 34
Figure A- 33	PRE-TEST INTERIOR OF FRONT DOOR	A- 35
Figure A- 34	POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS	A- 36
Figure A- 35	PRE-TEST INTERIOR OF REAR DOOR	A- 37
Figure A- 36	POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS	A- 38
Figure A- 37	PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION	A- 39
Figure A- 38	PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION	A- 40
Figure A- 39	POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET	A- 41
Figure A- 40	CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL	A- 42
Figure A- 41	CLOSE-UP VIEW OF VEHICLE'S TIRE PLACARD LABEL	A- 43
Figure A- 42	IMPACT PHOTO	A- 44
Figure A- 43	ROLLOVER 90 DEGREES	A- 45
Figure A- 44	ROLLOVER 180 DEGREES	A- 46
Figure A- 45	ROLLOVER 270 DEGREES	A- 47
Figure A- 46	ROLLOVER 360 DEGREES	A- 48



Figure A-1 PRE-TEST FRONTAL VIEW OF TEST VEHICLE



A-4

8717-01

Figure A-2 POST-TEST FRONTAL VIEW OF TEST VEHICLE



A-5

8717-01

Figure A-3 PRE-TEST REAR VIEW OF TEST VEHICLE



Figure A-4 POST-TEST REAR VIEW OF TEST VEHICLE



Figure A-5 PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE



Figure A-6 POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE



A-9

8717-01

Figure A-7 PRE-TEST LEFT FRONT VIEW OF TEST VEHICLE



Figure A-8 POST-TEST LEFT FRONT VIEW OF TEST VEHICLE



A-11

8717-01

Figure A-9 PRE-TEST LEFT REAR VIEW OF TEST VEHICLE



A-12

8717-01

Figure A-10 POST-TEST LEFT REAR VIEW OF TEST VEHICLE



A-13

8717-01

Figure A-11 PRE-TEST RIGHT FRONT VIEW OF TEST VEHICLE



A-14

8717-01

Figure A-12 POST-TEST RIGHT FRONT VIEW OF TEST VEHICLE



A-15

8717-01

Figure A-13 PRE-TEST RIGHT REAR VIEW OF TEST VEHICLE



A-16

8717-01

Figure A-14 POST-TEST RIGHT REAR VIEW OF TEST VEHICLE



Figure A-15 PRE-TEST FRONTAL VIEW OF IMPACTOR FACE



Figure A-16 POST-TEST FRONTAL VIEW OF IMPACTOR FACE

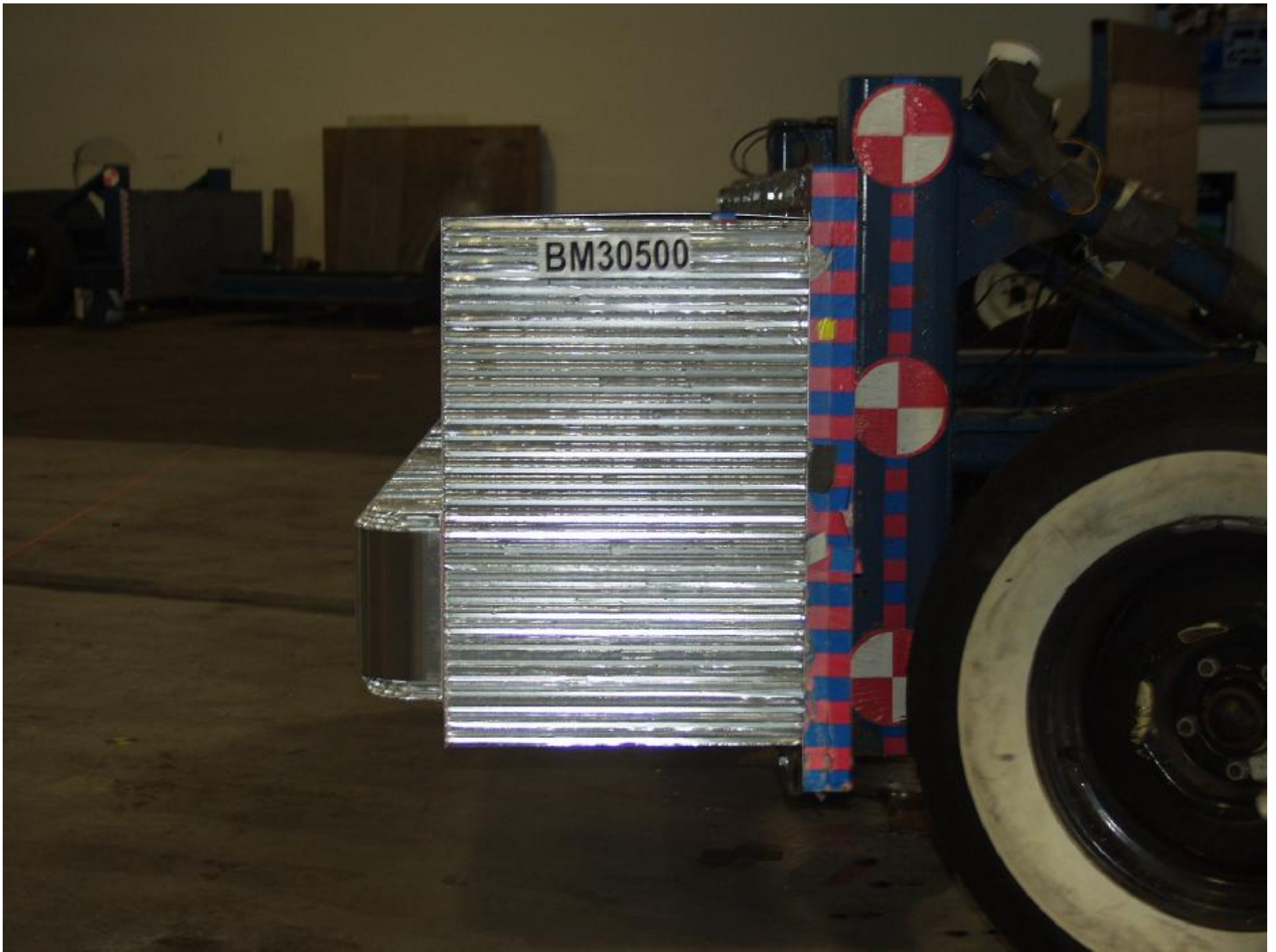


Figure A-17 PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-18 POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE

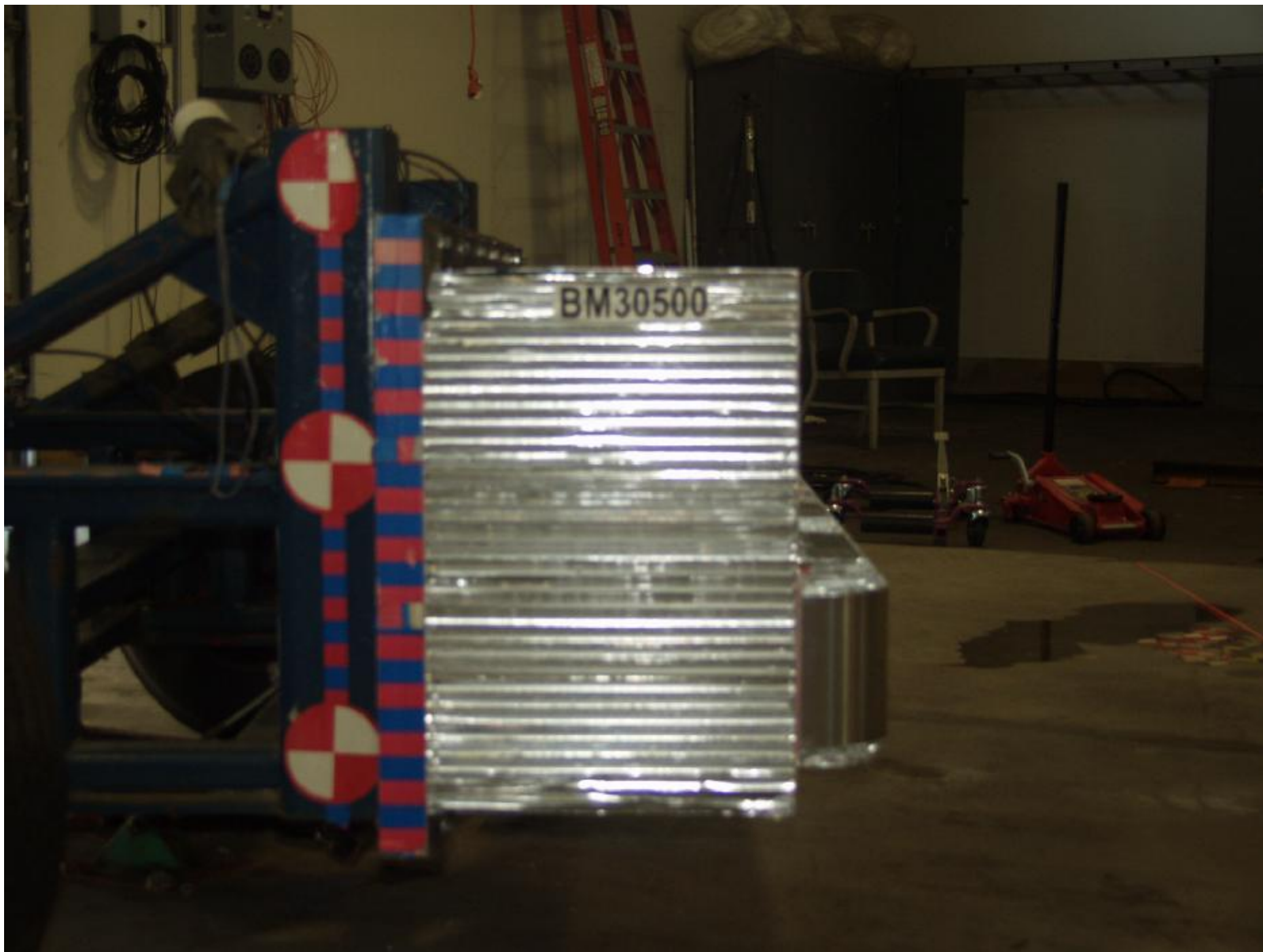


Figure A-19 PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-20 POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE

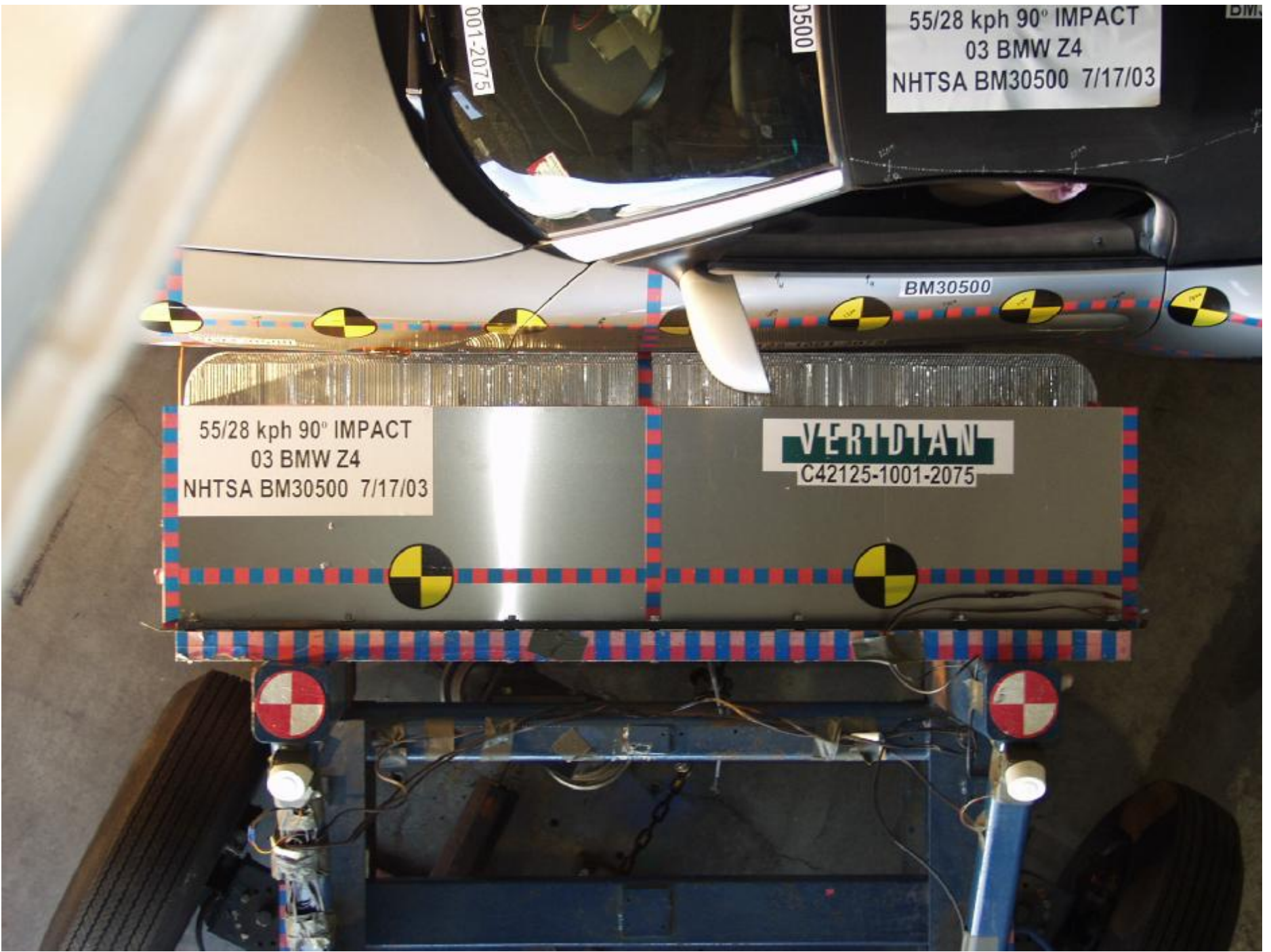


Figure A-21 PRE-TEST TOP VIEW OF IMPACTOR FACE



A-24

8717-01

Figure A-22 POST-TEST TOP VIEW OF IMPACTOR FACE



Figure A-23 PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE

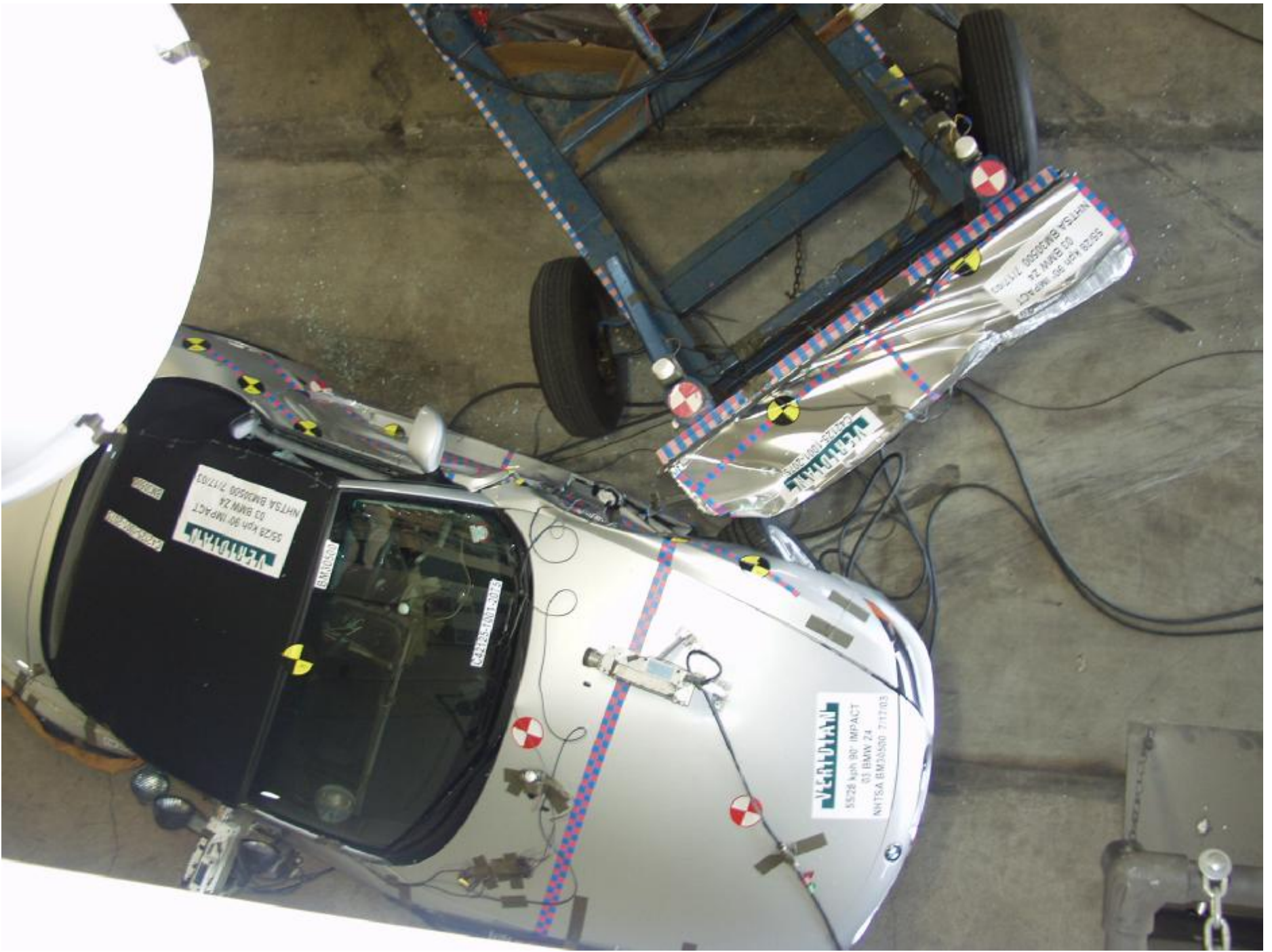


Figure A-24 POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE



A-27

8717-01

Figure A-25 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-26 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3

NOT AVAILABLE

Figure A-27 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3

NOT AVAILABLE

A-30

8717-01

Figure A-28 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



A-31

8717-01

Figure A-29 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



A-32

8717-01

Figure A-30 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID

NOT AVAILABLE

A-33

8717-01

Figure A-31 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3

NOT AVAILABLE

A-34

8717-01

Figure A-32 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



A-35

8717-01

Figure A-33 PRE-TEST INTERIOR OF FRONT DOOR



Figure A-34 POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS

NOT AVAILABLE

A-37

8717-01

Figure A-35 PRE-TEST INTERIOR OF REAR DOOR

NOT AVAILABLE

Figure A-36 POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS



Figure A-37 PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



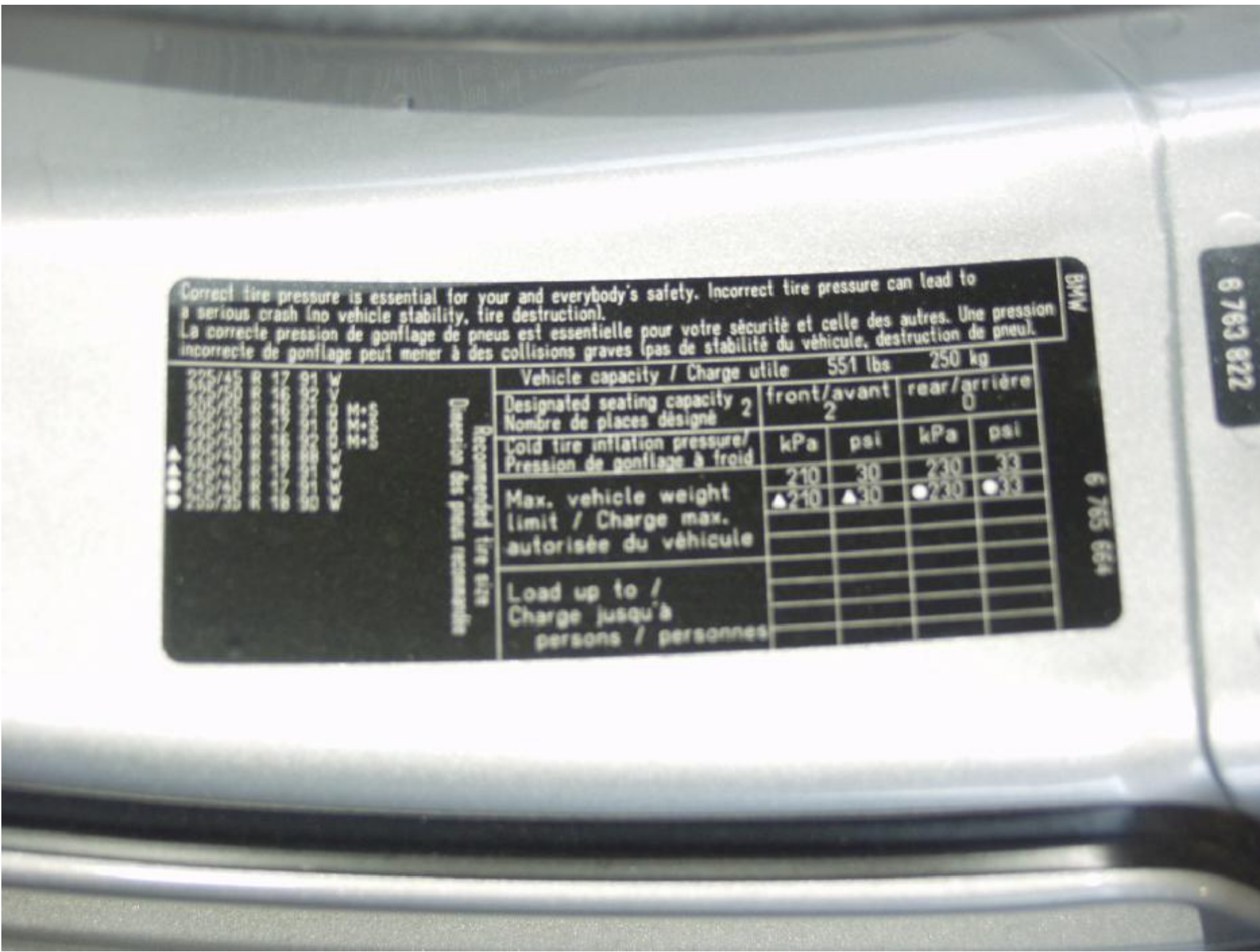
Figure A-38 PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



Figure A-39 POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET



Figure A-40 CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL



Correct tire pressure is essential for your and everybody's safety. Incorrect tire pressure can lead to a serious crash (no vehicle stability, tire destruction).  
 La correcte pression de gonflage de pneus est essentielle pour votre sécurité et celle des autres. Une pression incorrecte de gonflage peut mener à des collisions graves (pas de stabilité du véhicule, destruction de pneu).

225/745 505/750 505/750 505/745 505/750 505/740 505/740 505/740 505/735	R R R R R R R R R	17 17 17 17 17 17 17 17 17	60 60 60 60 60 60 60 60 60	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Vehicle capacity / Charge utile 551 lbs 250 kg		Designated seating capacity 2 Nombre de places désigné 2		front/avant 2		rear/arrière 0	
					Cold tire inflation pressure/ Pression de gonflage à froid		kPa	psi	kPa	psi		
					210	30	230	33				
					▲210	▲30	●230	●33				
Max. vehicle weight limit / Charge max. autorisée du véhicule												
Load up to / Charge jusqu'à persons / personnes												

BMW

6 765 664

6 763 822

Figure A-41 CLOSE-UP VIEW OF VEHICLE'S TIRE PLACARD LABEL

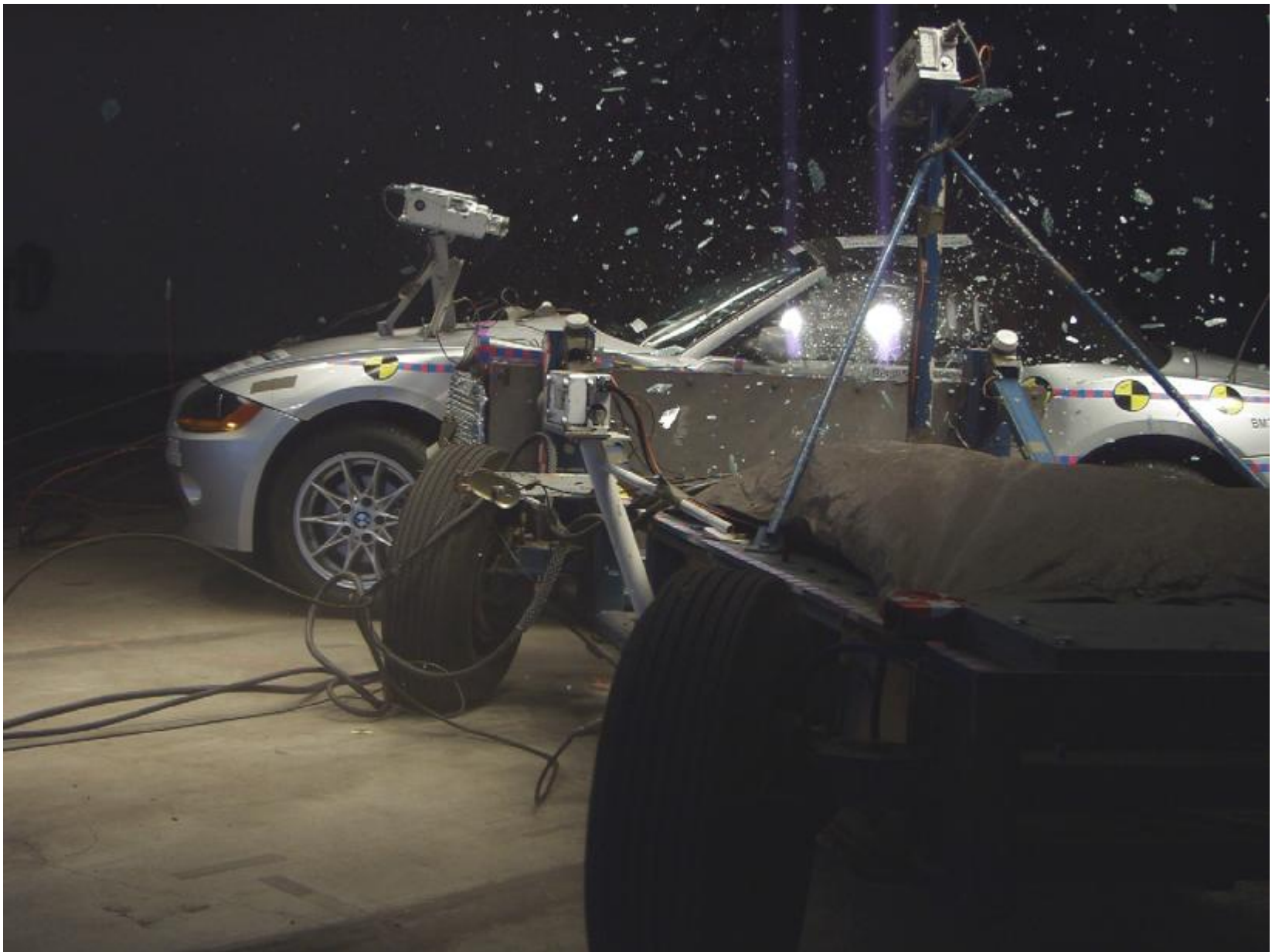


Figure A-42 IMPACT PHOTO

A-45

8717-01



Figure A-43 ROLLOVER 90 DEGREES



Figure A-44 ROLLOVER 180 DEGREES



Figure A-45 ROLLOVER 270 DEGREES



Figure A-46 ROLLOVER 360 DEGREES

**APPENDIX B**

**VEHICLE, MDB AND SID H3 RESPONSE DATA**

## TABLE OF DATA PLOTS

**DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS**  
ACCELERATION DATA - FILTER CLASS 1000, LOWER SPINE - FILTER CLASS 180  
INTEGRATION DATA - FILTER CLASS 180  
FORCE DATA – FILTER CLASS 1000  
MOMENT DATA – FILTER CLASS 600

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
1	DRIVER HEAD (X) ACCELERATION VS TIME	B- 6
2	DRIVER HEAD (X) VELOCITY VS TIME	B- 7
3	DRIVER HEAD (Y) ACCELERATION VS TIME	B- 8
4	DRIVER HEAD (Y) VELOCITY VS TIME	B- 9
5	DRIVER HEAD (Z) ACCELERATION VS TIME	B- 10
6	DRIVER HEAD (Z) VELOCITY VS TIME	B- 11
7	DRIVER HEAD RESULTANT ACCELERATION VS TIME	B- 12
8	DRIVER UPPER NECK (X) FORCE VS TIME	B- 13
9	DRIVER UPPER NECK (Y) FORCE VS TIME	B- 14
10	DRIVER UPPER NECK (Z) FORCE VS TIME	B- 15
11	DRIVER UPPER NECK RESULTANT FORCE VS TIME	B- 16
12	DRIVER UPPER NECK (X) MOMENT VS TIME	B- 17
13	DRIVER UPPER NECK (Y) MOMENT VS TIME	B- 18
14	DRIVER UPPER NECK (Z) MOMENT VS TIME	B- 19
15	DRIVER UPPER NECK RESULTANT MOMENT VS TIME	B- 20
16	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 21
17	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B- 22
18	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 23
19	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B- 24
20	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 25
21	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B- 26
22	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 27
23	DRIVER PELVIC (Y) VELOCITY VS TIME	B- 28

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS**  
ACCELERATION DATA - FIR FILTERED

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
24	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 29
25	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 30
26	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 31
27	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 32

**TEST VEHICLE INSTRUMENTATION PLOTS**  
 ACCELERATION DATA - FILTER CLASS 60  
 INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
28	RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME	B- 33
29	RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY VS TIME	B- 34
30	RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 35
31	RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 36
32	RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME	B- 37
33	RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY VS TIME	B- 38
34	RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION VS TIME	B- 39
35	RIGHT SIDE SILL AT REAR (X) ACCELERATION VS TIME	B- 40
36	RIGHT SIDE SILL AT REAR (X) VELOCITY VS TIME	B- 41
37	RIGHT SIDE SILL AT REAR (Y) ACCELERATION VS TIME	B- 42
38	RIGHT SIDE SILL AT REAR (Y) VELOCITY VS TIME	B- 43
39	RIGHT SIDE SILL AT REAR (Z) ACCELERATION VS TIME	B- 44
40	RIGHT SIDE SILL AT REAR (Z) VELOCITY VS TIME	B- 45
41	RIGHT SIDE SILL AT REAR RESULTANT ACCELERATION VS TIME	B- 46
42	REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME	B- 47
43	REAR FLOORPAN ABOVE AXLE (X) VELOCITY VS TIME	B- 48
44	REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME	B- 49
45	REAR FLOORPAN ABOVE AXLE (Y) VELOCITY VS TIME	B- 50
46	REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME	B- 51
47	REAR FLOORPAN ABOVE AXLE (Z) VELOCITY VS TIME	B- 52
48	REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION VS TIME	B- 53
49	LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 54
50	LEFT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 55
51	LOWER B-POST (Y) ACCELERATION VS TIME	B- 56
52	LOWER B-POST (Y) VELOCITY VS TIME	B- 57
53	UPPER B-POST (Y) ACCELERATION VS TIME	B- 58
54	UPPER B-POST (Y) VELOCITY VS TIME	B- 59
55	LOWER A-POST (Y) ACCELERATION VS TIME	B- 60
56	LOWER A-POST (Y) VELOCITY VS TIME	B- 61
57	UPPER A-POST (Y) ACCELERATION VS TIME	B- 62
58	UPPER A-POST (Y) VELOCITY VS TIME	B- 63
59	FRONT SEAT TRACK (Y) ACCELERATION VS TIME	B- 64
60	FRONT SEAT TRACK (Y) VELOCITY VS TIME	B- 65
61	VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME	B- 66
62	VEHICLE CENTER OF GRAVITY (X) VELOCITY VS TIME	B- 67
63	VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B- 68
64	VEHICLE CENTER OF GRAVITY (Y) VELOCITY ACCELERATION VS TIME	B- 69
65	VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B- 70
66	VEHICLE CENTER OF GRAVITY (Z) VELOCITY VS TIME	B- 71
67	VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B- 72

**MDB INSTRUMENTATION PLOTS**  
ACCELERATION DATA - FILTER CLASS 60  
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
68	MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME	B- 73
69	MDB CENTER OF GRAVITY (X) VELOCITY VS TIME	B- 74
70	MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B- 75
71	MDB CENTER OF GRAVITY (Y) VELOCITY VS TIME	B- 76
72	MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B- 77
73	MDB CENTER OF GRAVITY (Z) VELOCITY VS TIME	B- 78
74	MDB CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B- 79
75	MDB REAR (X) ACCELERATION VS TIME	B- 80
76	MDB REAR (X) VELOCITY VS TIME	B- 81
77	MDB REAR (Y) ACCELERATION VS TIME	B- 82
78	MDB REAR (Y) VELOCITY VS TIME	B- 83

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)**  
ACCELERATION DATA - FILTER CLASS 1000, LOWER SPINE - FILTER CLASS 180  
INTEGRATION DATA - FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
79	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 84
80	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B- 85
81	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 86
82	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B- 87
83	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 88
84	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B- 89
85	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 90
86	DRIVER PELVIC (Y) VELOCITY VS TIME	B- 91

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)**  
ACCELERATION DATA - FIR FILTERED

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
87	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 92
88	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 93
89	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 94
90	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 95

2003 SNCAP Test 1 2003 BMW Z4

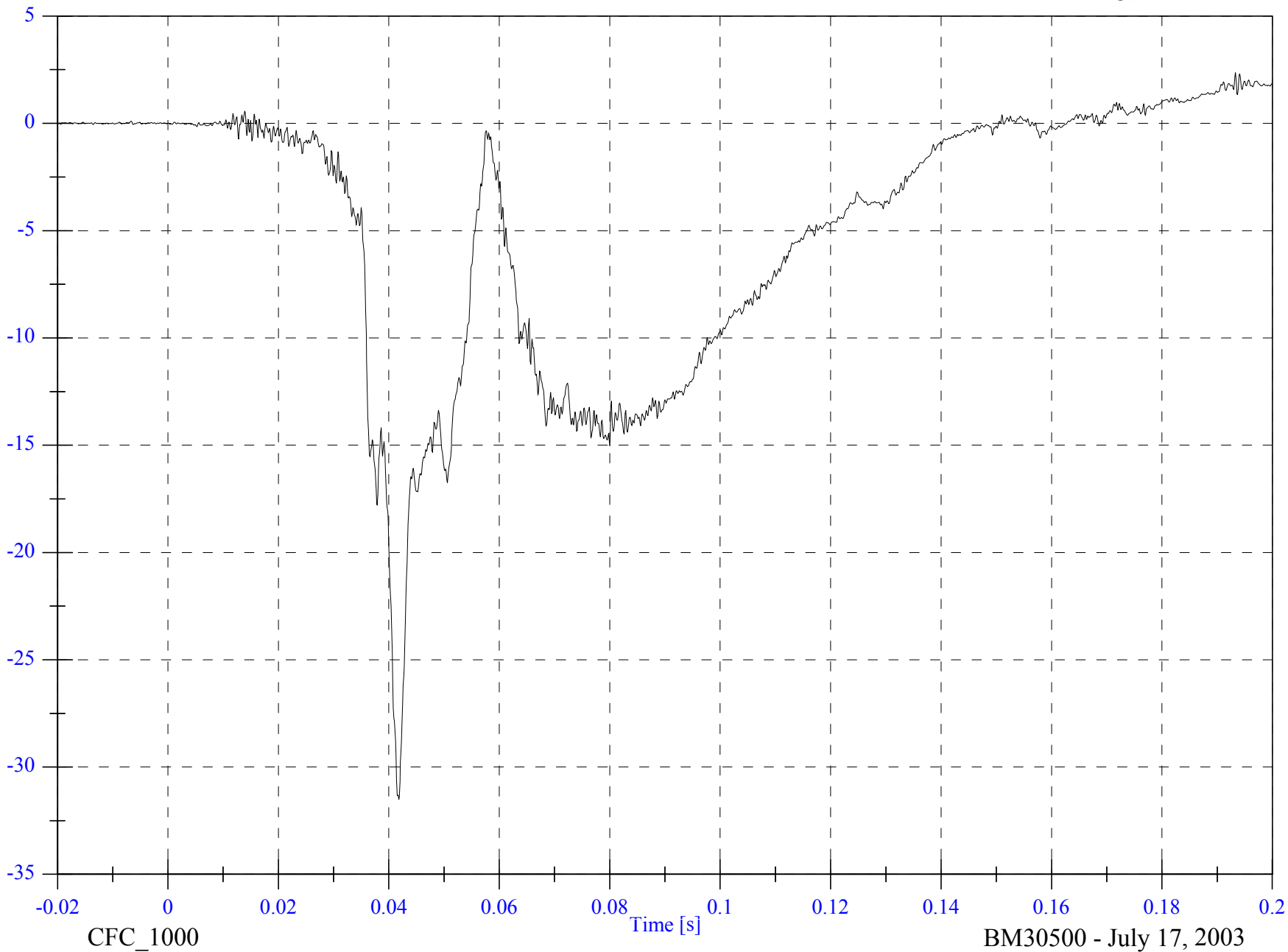
V2P1 Head x

Max: 2.4 [g] at 0.193 [s]

Min: -31.5 [g] at 0.042 [s]

B-6

g



8717-01

CFC\_1000

Time [s]

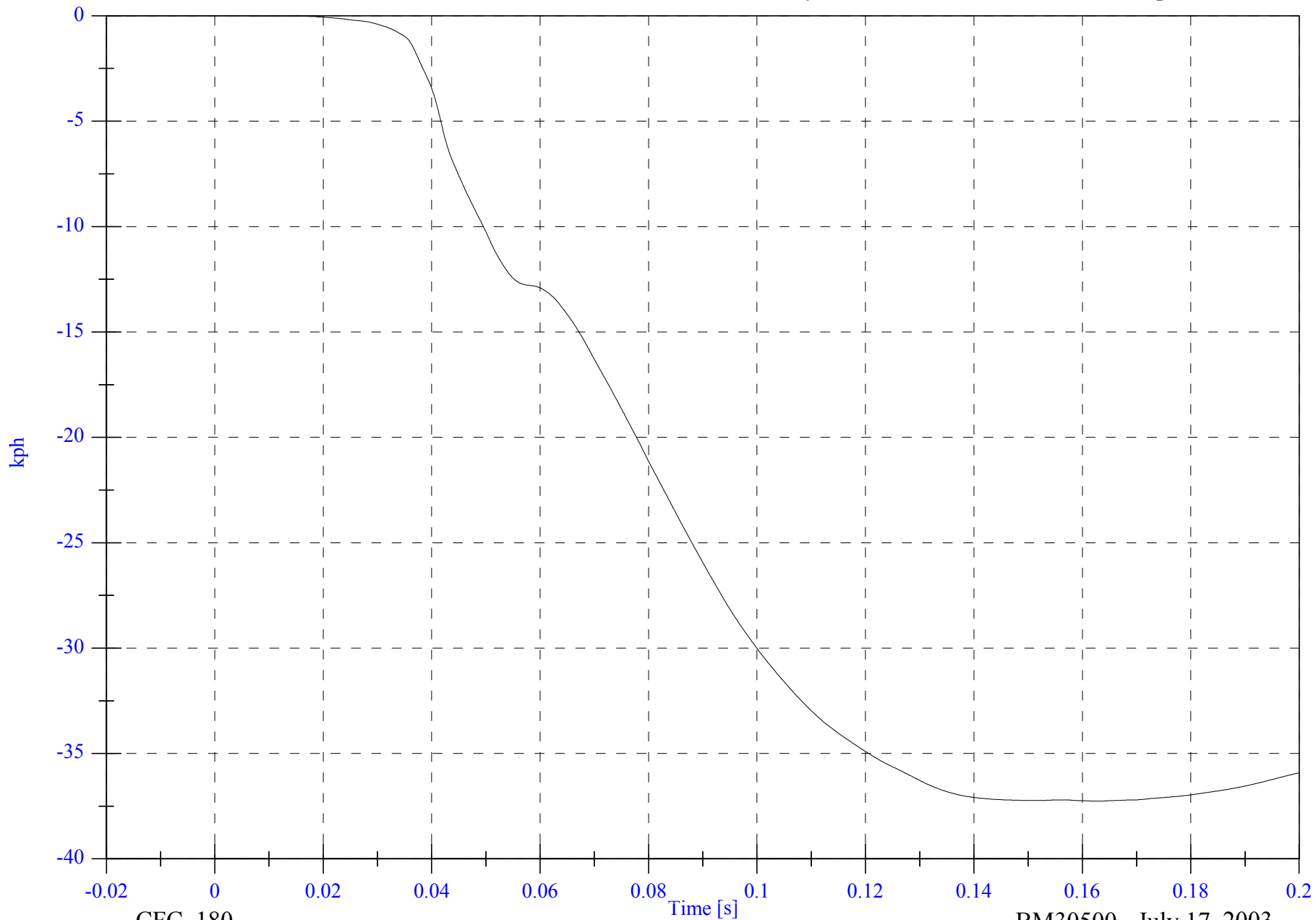
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

Max: 0.0 [kph] at -0.001 [s]

Min: -37.3 [kph] at 0.163 [s]

### V2P1 Head x Velocity



B-7

8717-01

CFC\_180

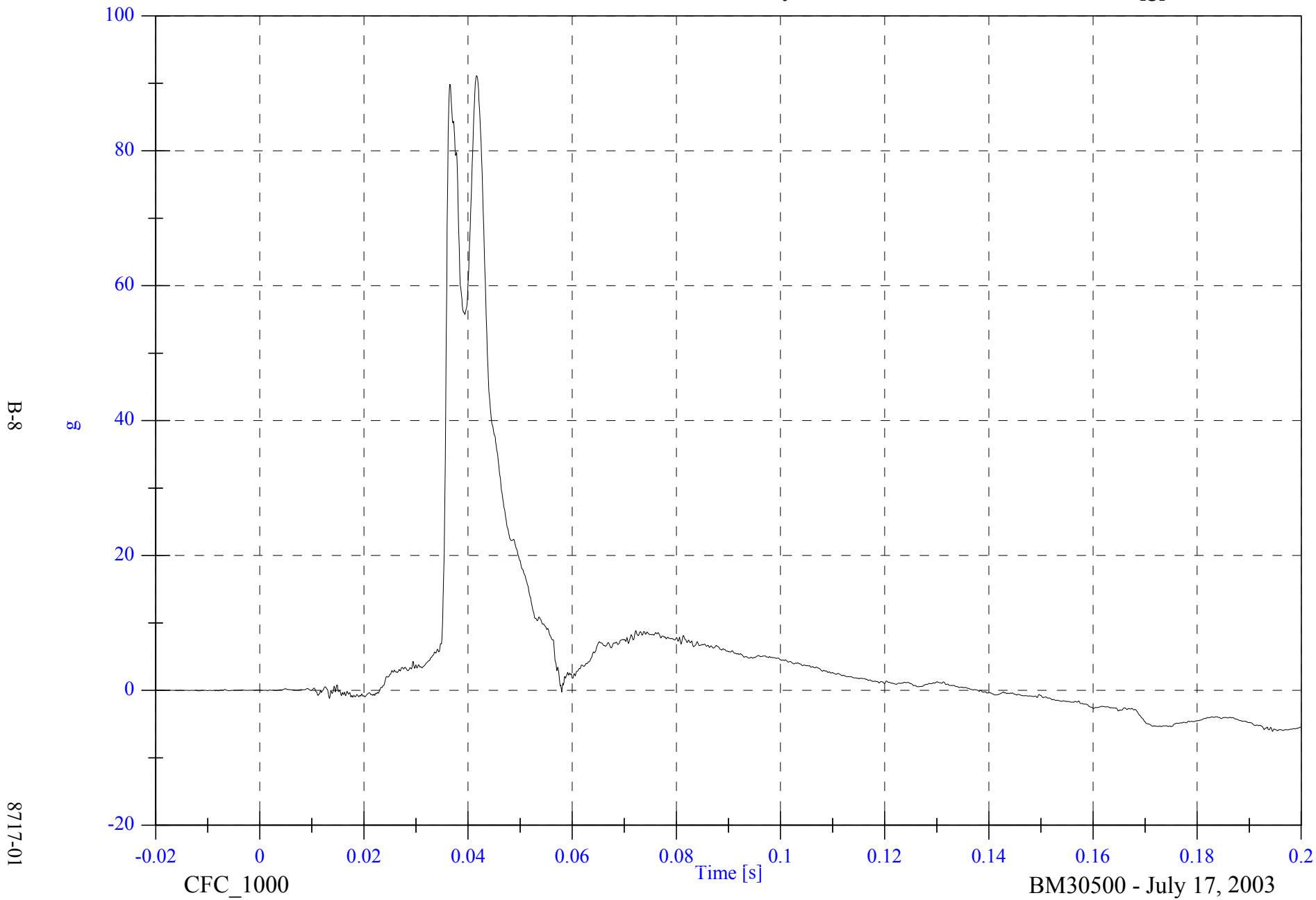
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Head y

Max: 91.1 [g] at 0.042 [s]

Min: -6.1 [g] at 0.194 [s]



B-8

8717-01

CFC\_1000

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

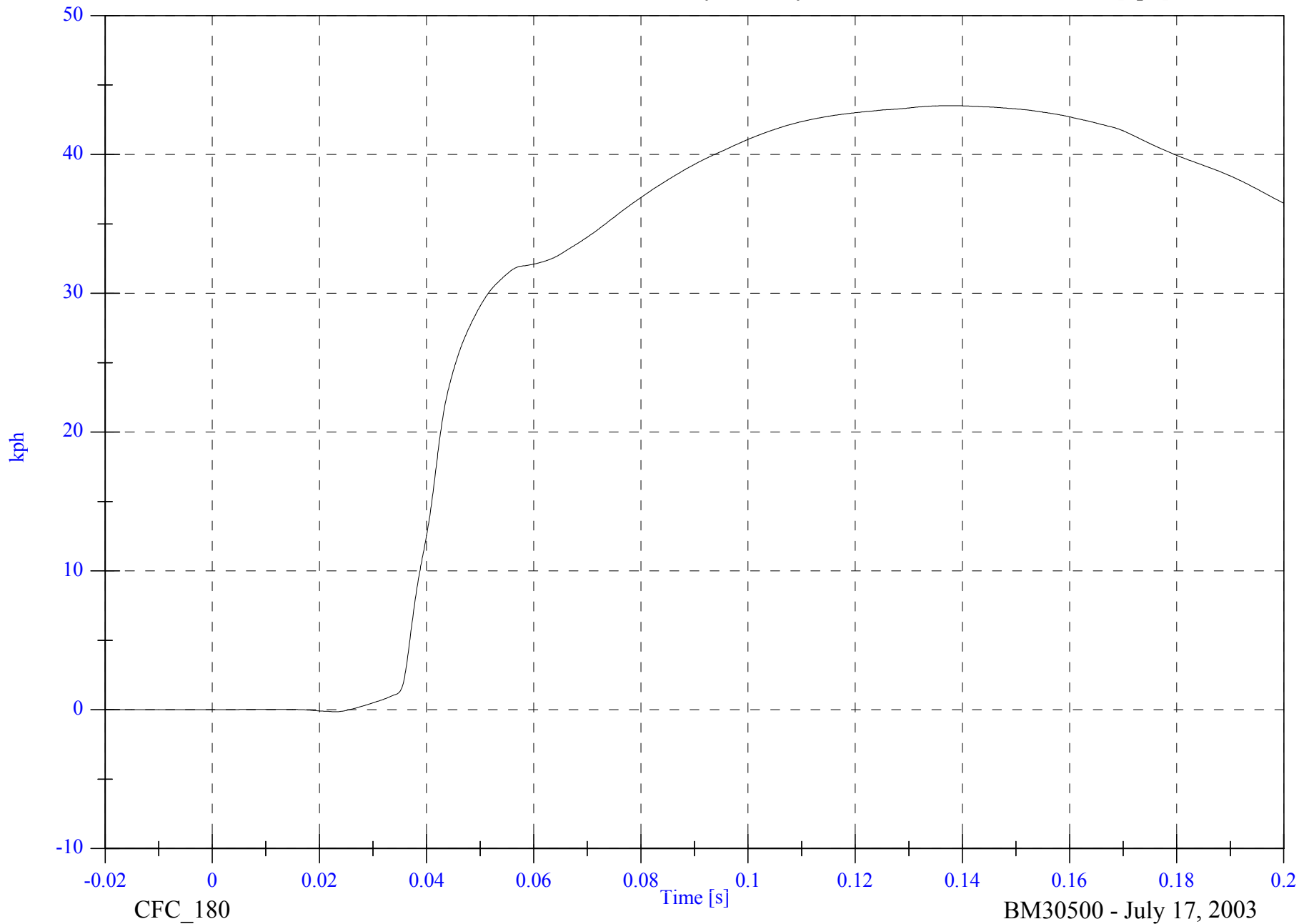
### V2P1 Head y Velocity

Max: 43.5 [kph] at 0.138 [s]

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

B-9

8717-01



CFC\_180

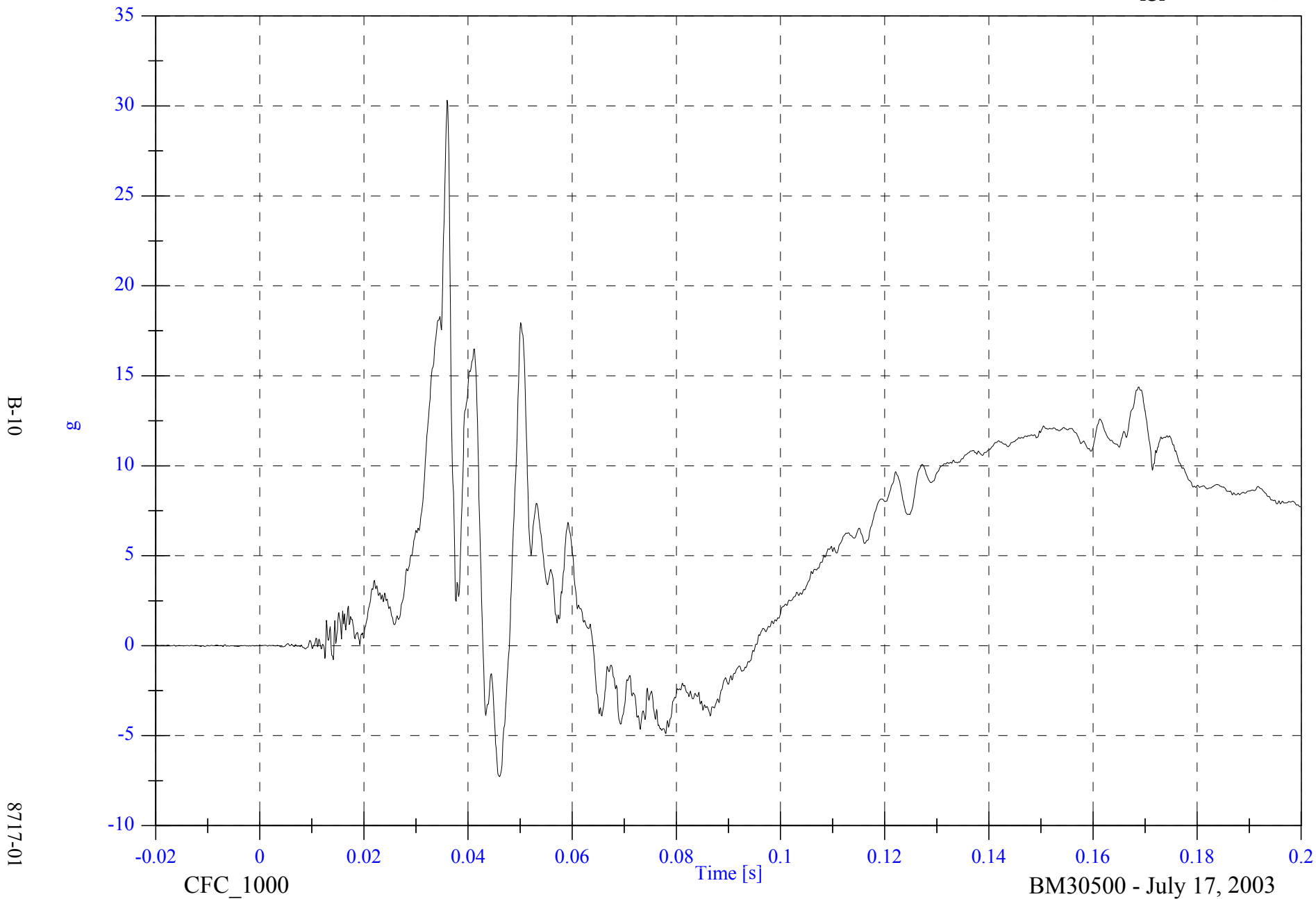
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Head z

Max: 30.3 [g] at 0.036 [s]

Min: -7.3 [g] at 0.046 [s]



B-10

g

8717-01

CFC\_1000

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

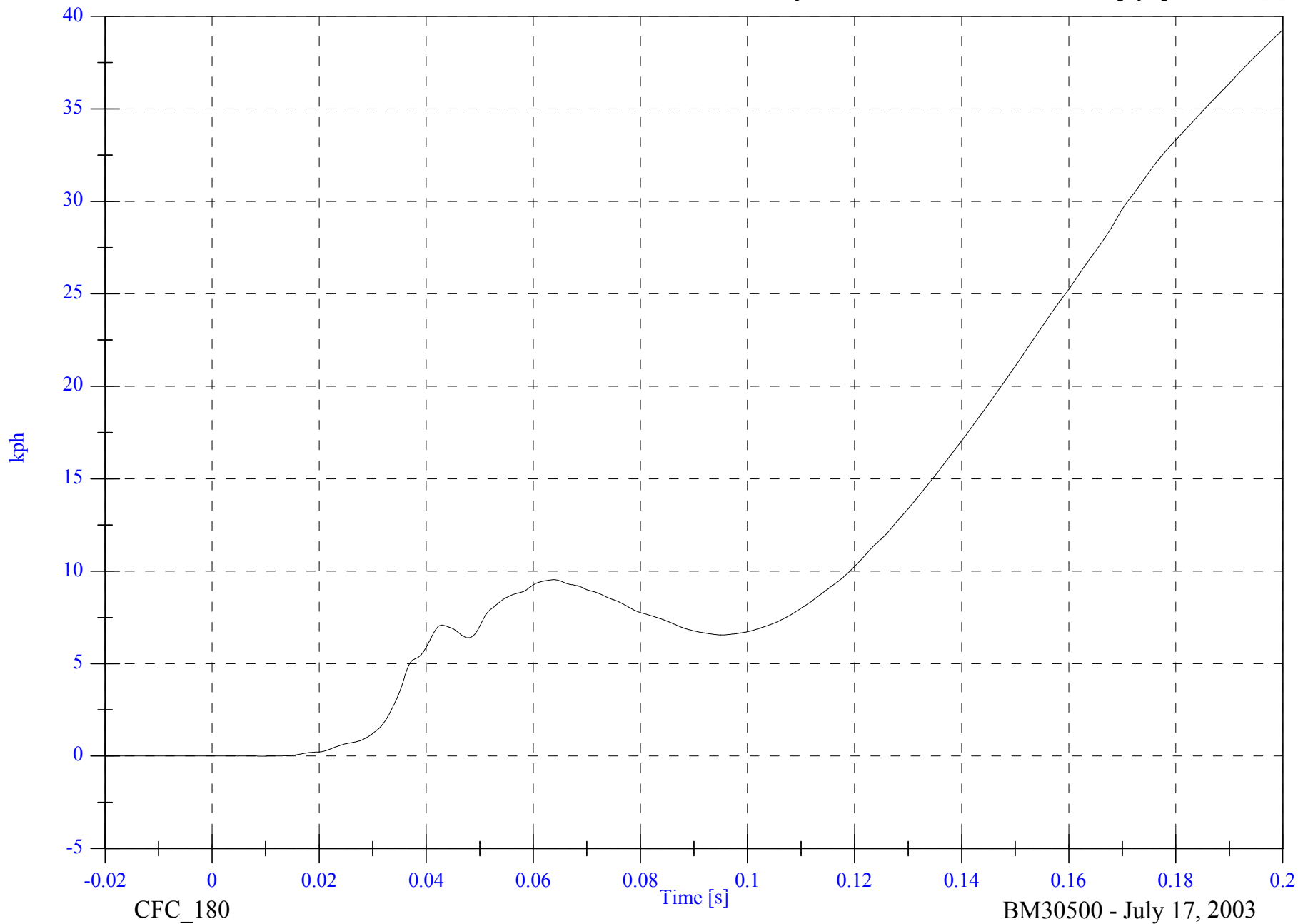
V2P1 Head z Velocity

Max: 39.2 [kph] at 0.200 [s]

Min: -0.0 [kph] at 0.009 [s]

B-11

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

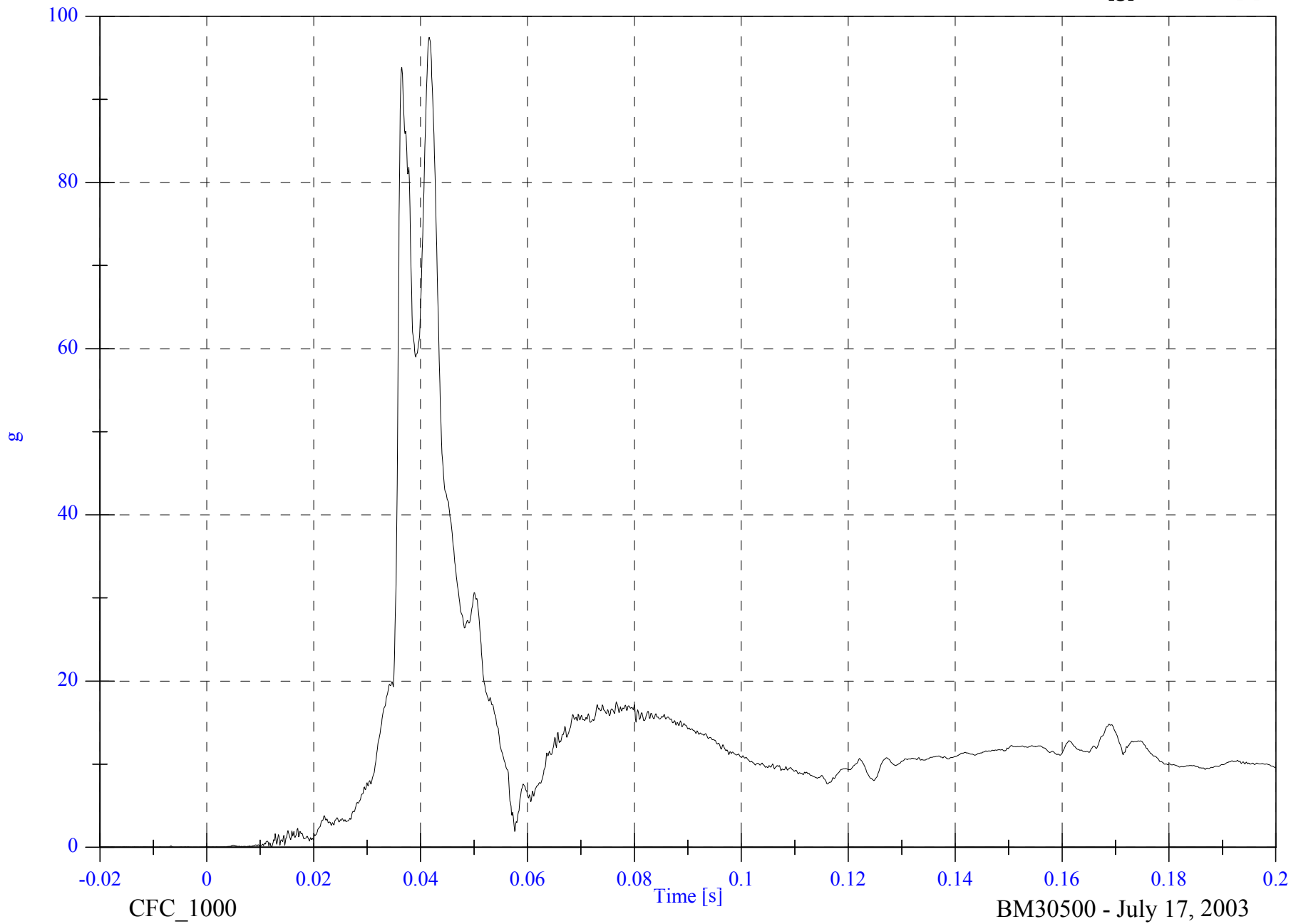
V2P1 Head Resultant

Max: 97.5 [g] at 0.042 [s]

Min: 0.0 [g] at -0.013 [s]

B-12

8717-01



CFC\_1000

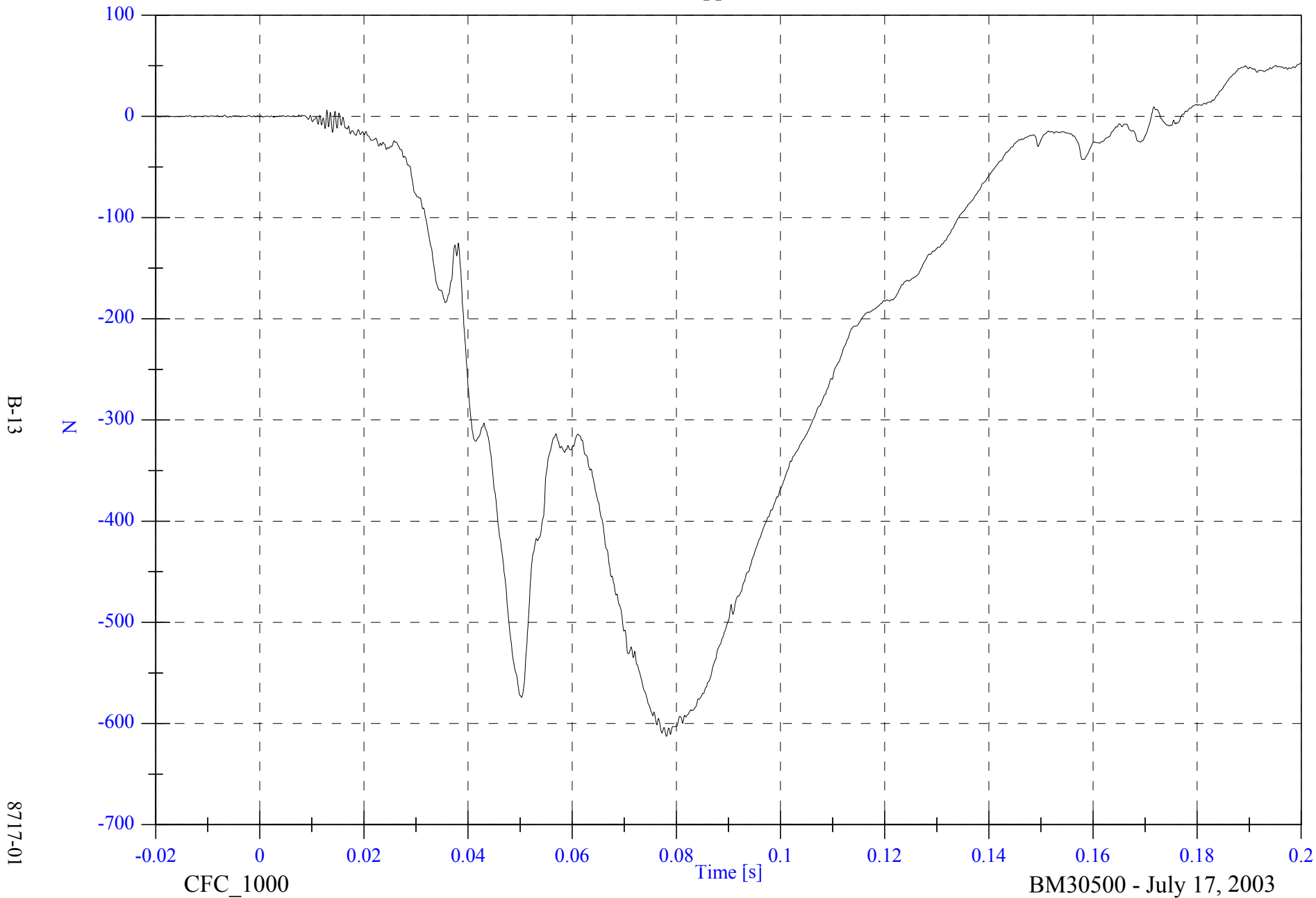
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Upper Neck Fx

Max: 52.8 [N] at 0.200 [s]

Min: -612.7 [N] at 0.078 [s]



B-13

N

8717-01

CFC\_1000

Time [s]

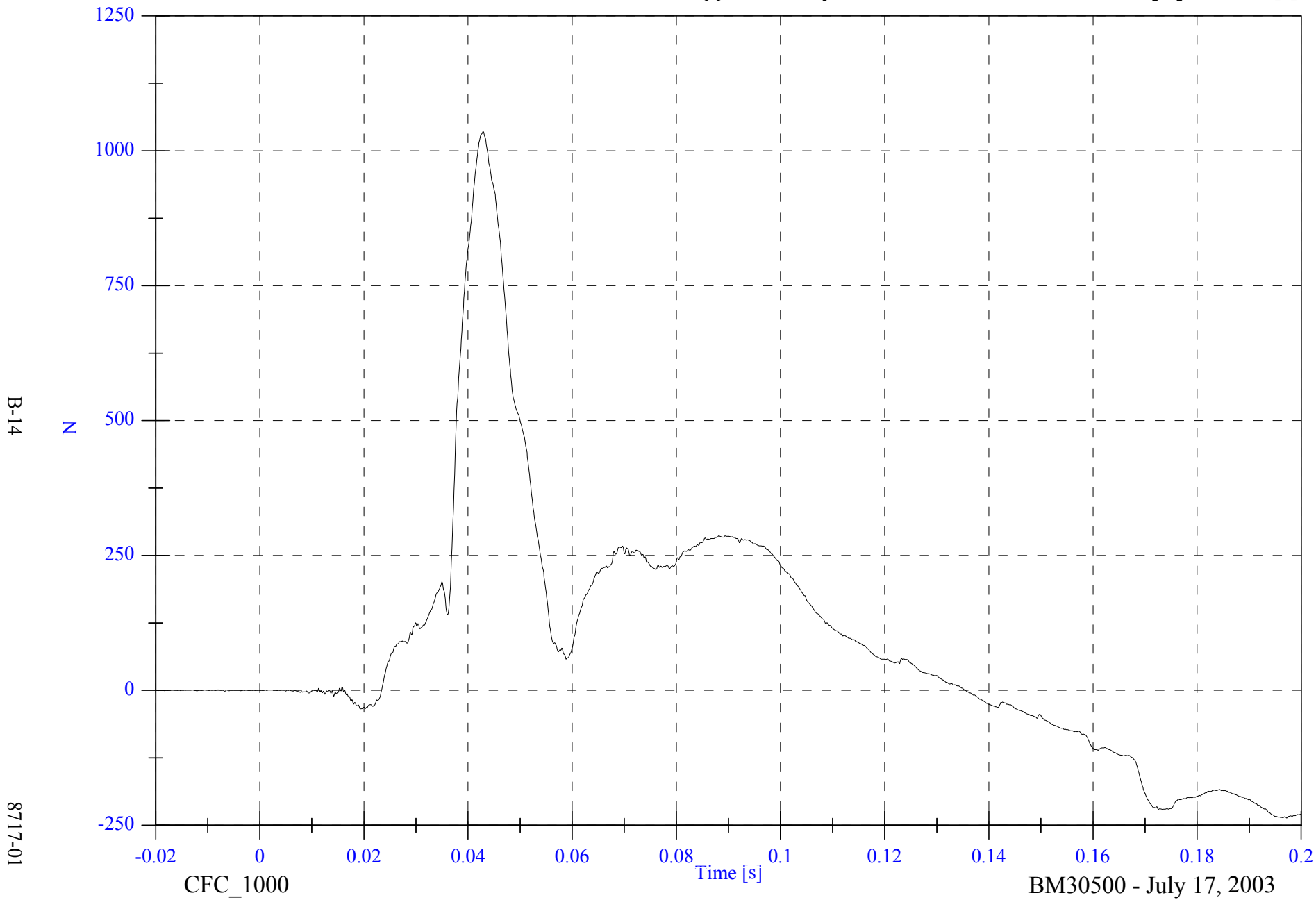
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Upper Neck Fy

Max: 1036.1 [N] at 0.043 [s]

Min: -236.6 [N] at 0.197 [s]



B-14

8717-01

CFC\_1000

Time [s]

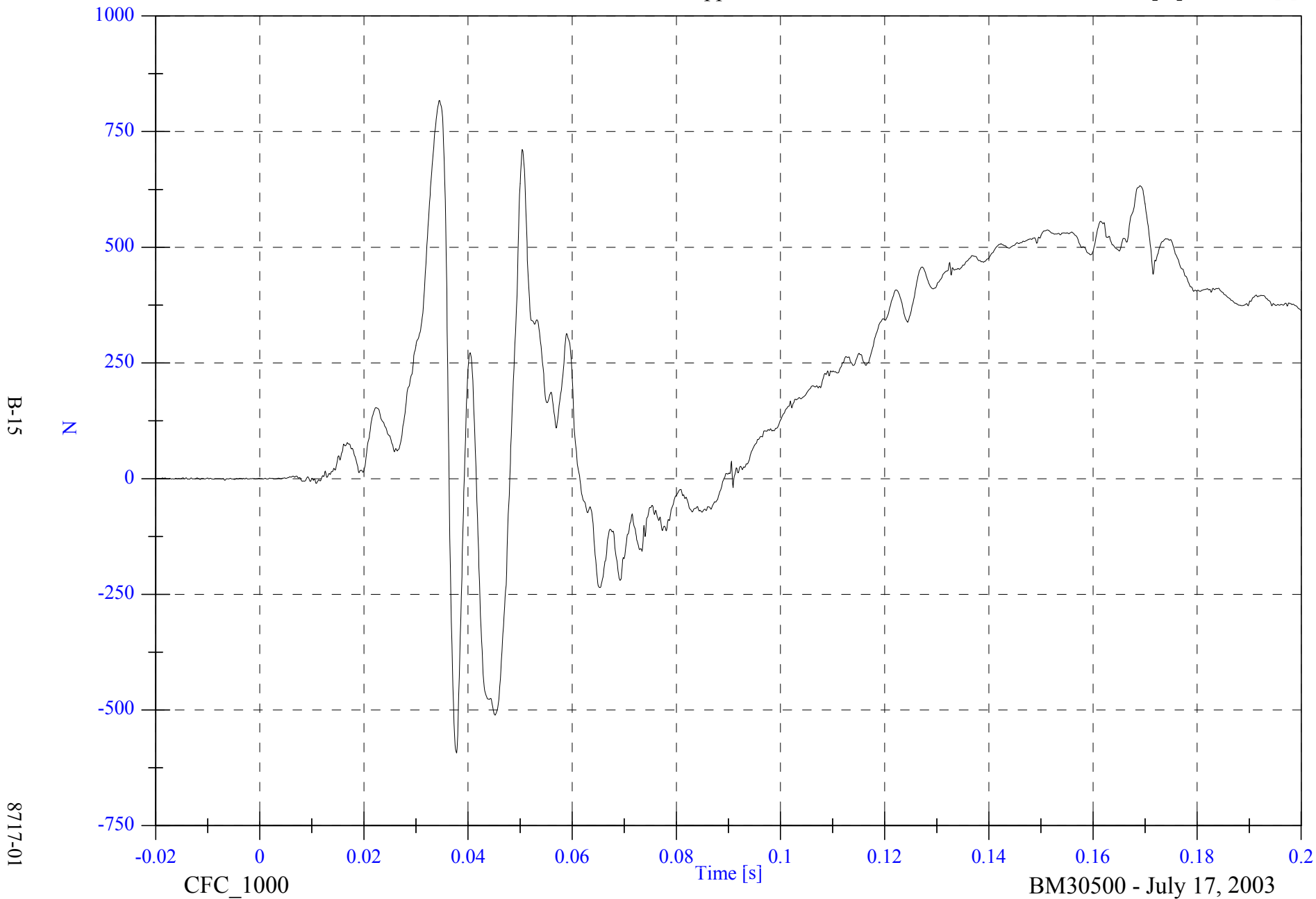
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Upper Neck Fz

Max: 817.6 [N] at 0.034 [s]

Min: -593.5 [N] at 0.038 [s]



B-15

N

8717-01

CFC\_1000

Time [s]

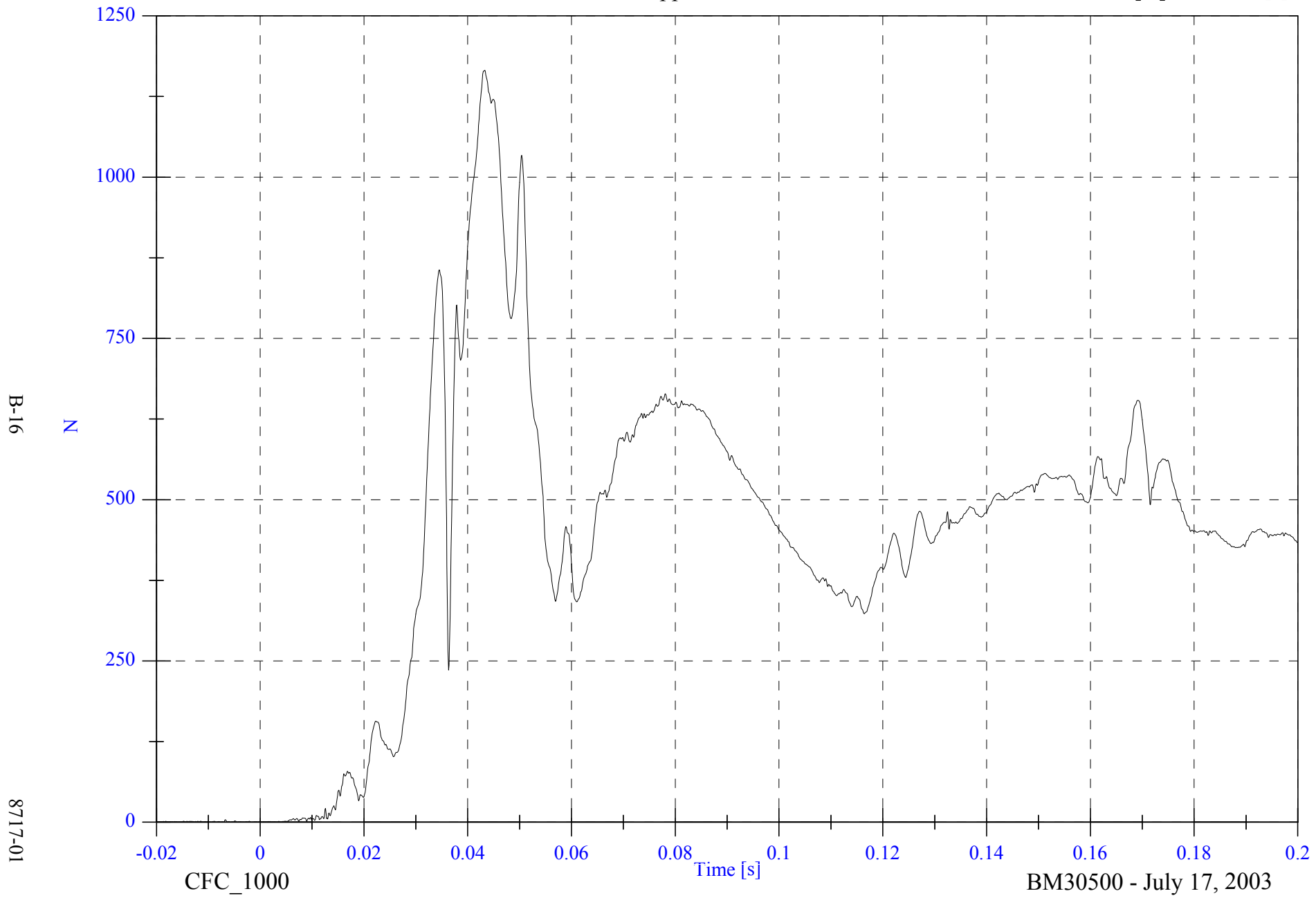
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Upper Neck F Resultant

Max: 1165.7 [N] at 0.043 [s]

Min: 0.1 [N] at -0.002 [s]



B-16

8717-01

CFC\_1000

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

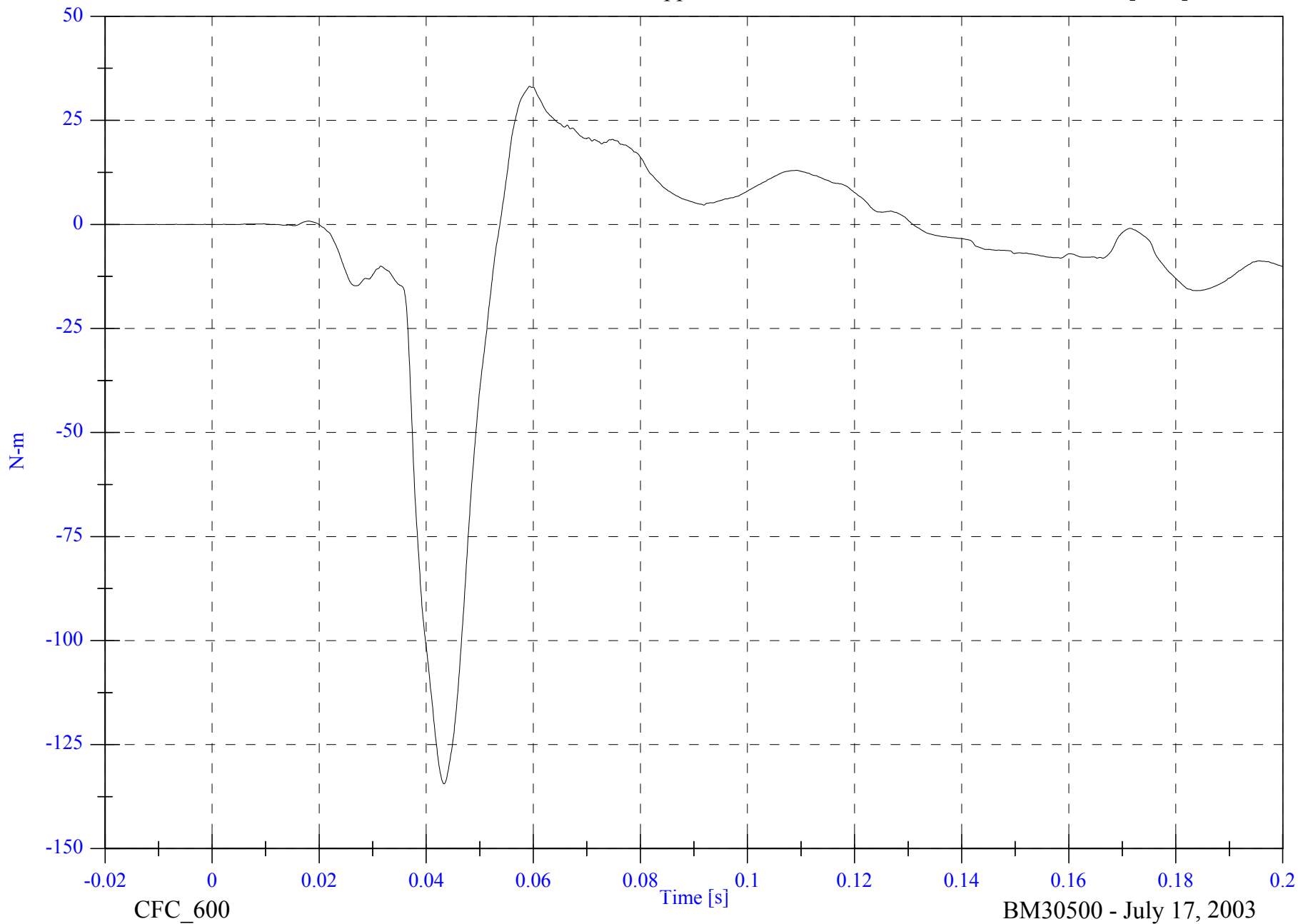
V2P1 Upper Neck Mx

Max: 33.2 [N-m] at 0.059 [s]

Min: -134.4 [N-m] at 0.043 [s]

B-17

8717-01



CFC\_600

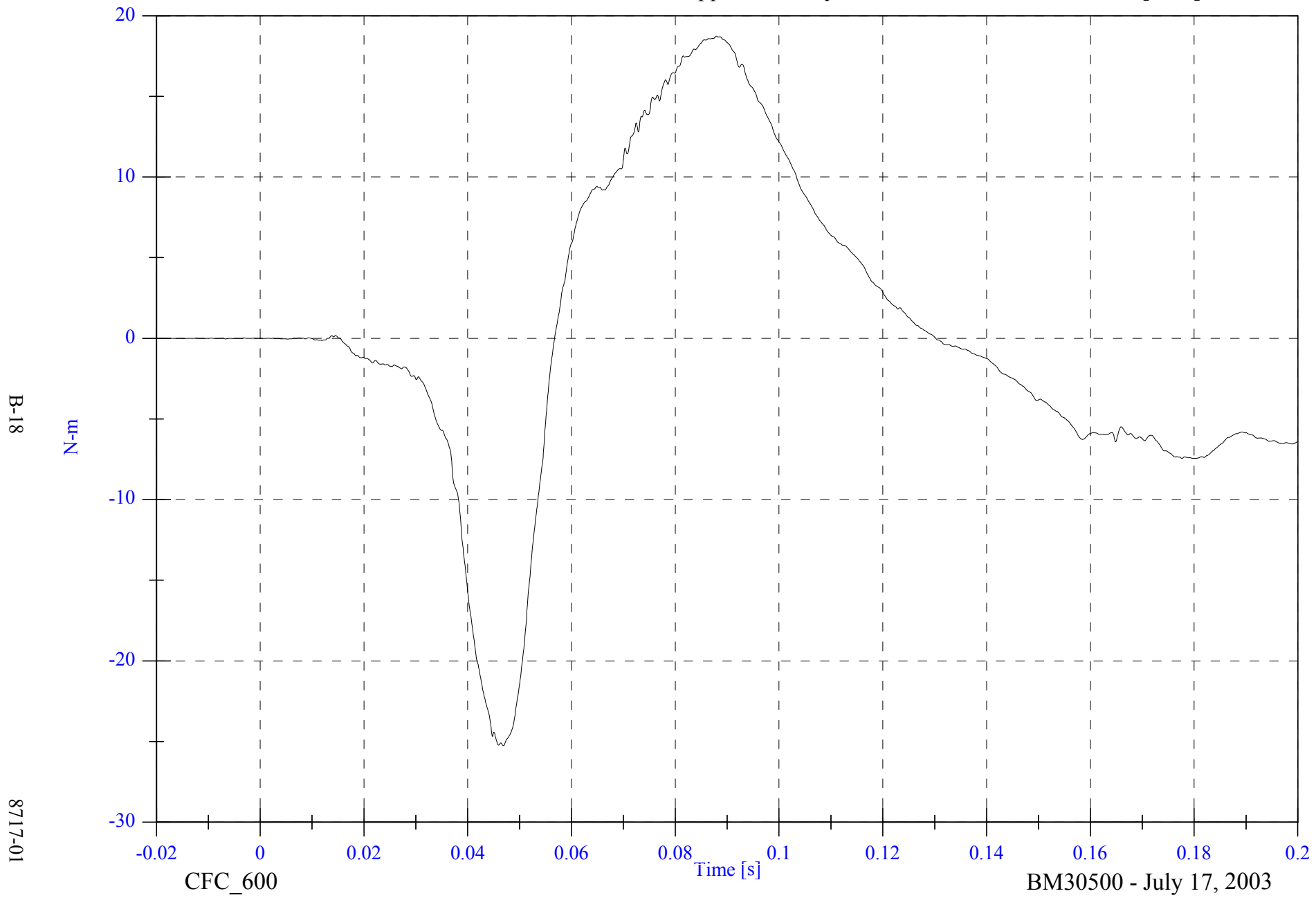
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

Max: 18.7 [N-m] at 0.088 [s]

Min: -25.3 [N-m] at 0.047 [s]

V2P1 Upper Neck My



B-18

N-m

8717-01

CFC\_600

Time [s]

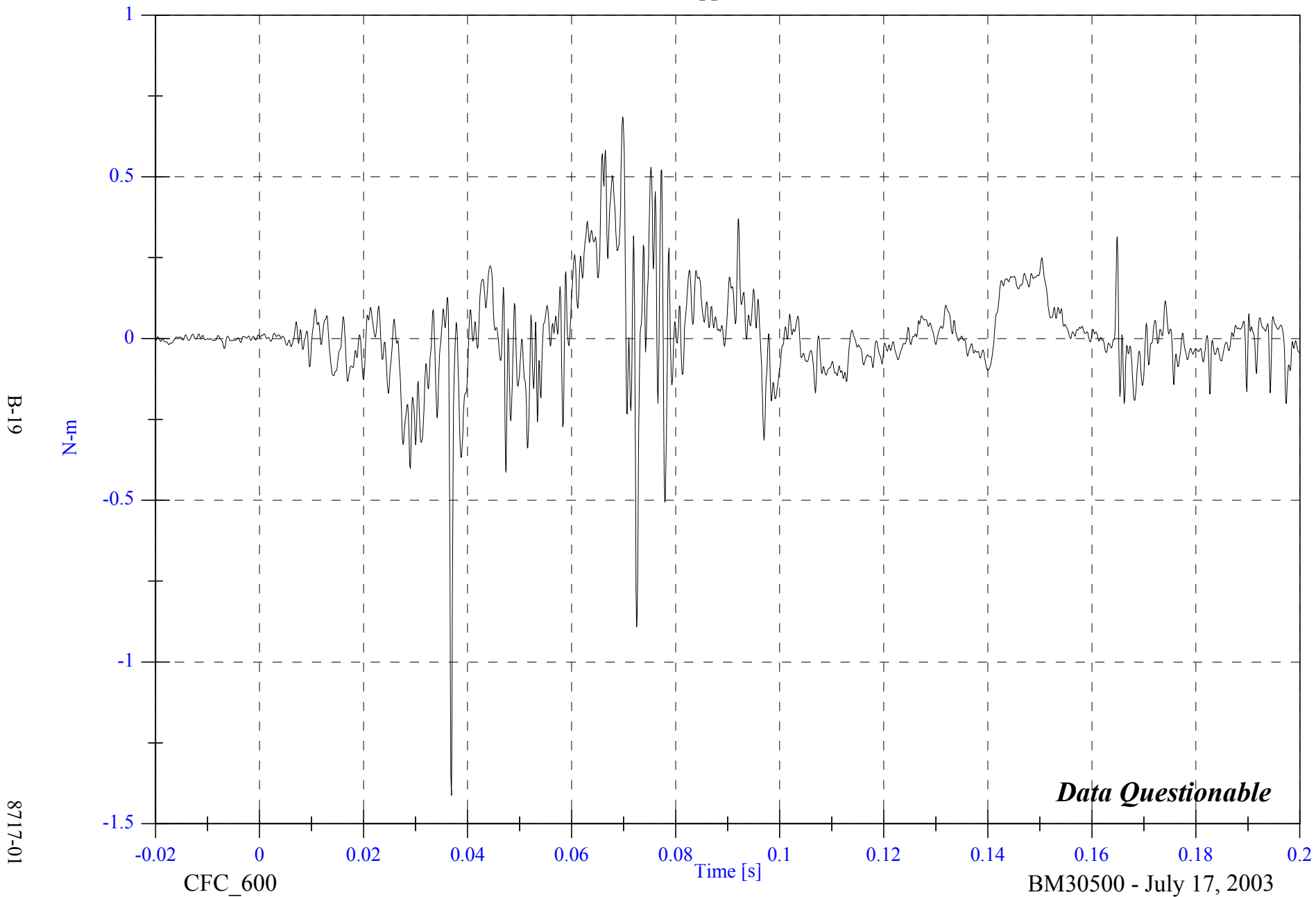
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Upper Neck Mz

Max: 0.7 [N-m] at 0.070 [s]

Min: -1.4 [N-m] at 0.037 [s]



B-19

8717-01

CFC\_600

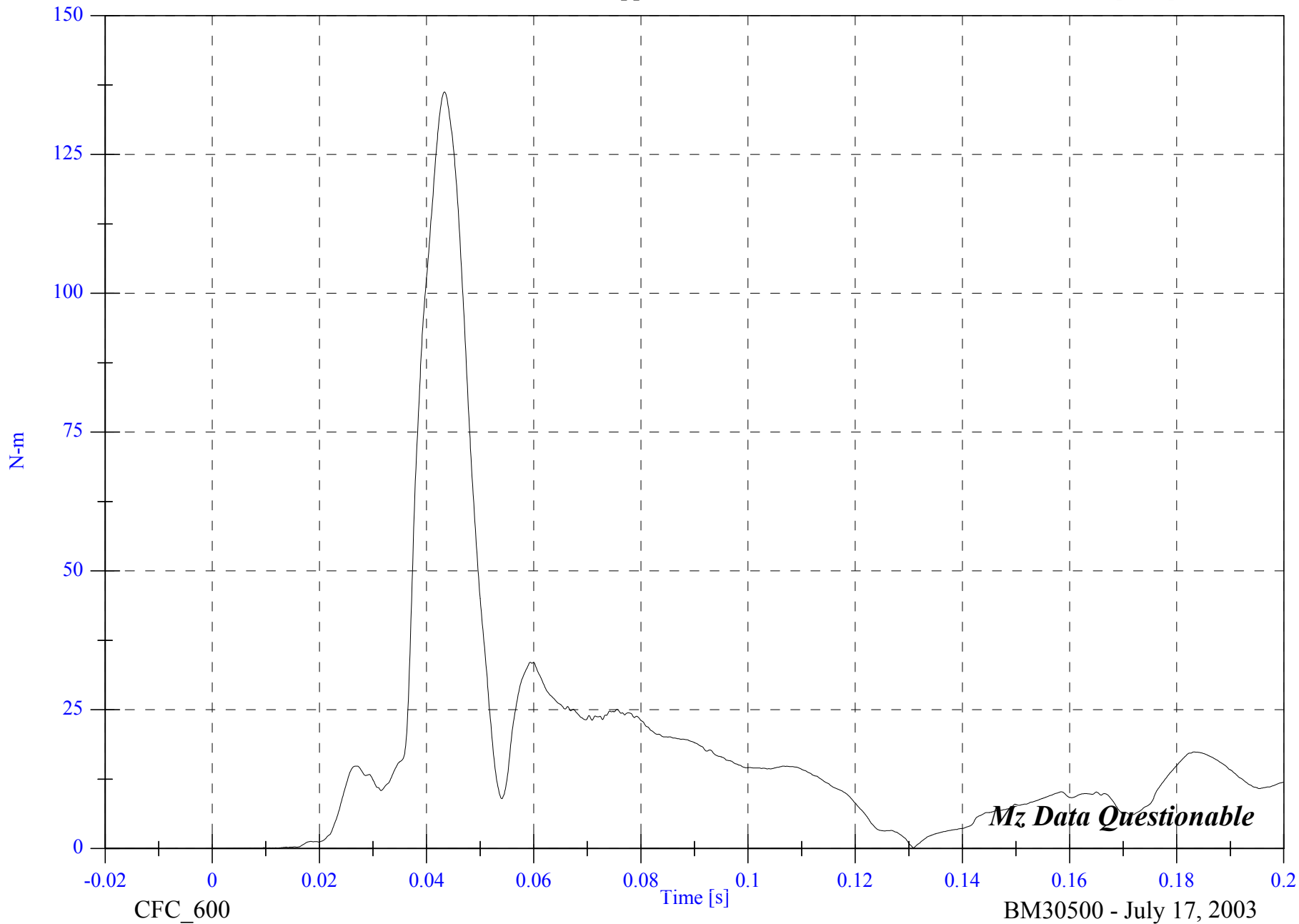
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Upper Neck M Resultant

Max: 136.3 [N-m] at 0.043 [s]

Min: 0.0 [N-m] at -0.008 [s]



B-20

8717-01

*Mz Data Questionable*

CFC\_600

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

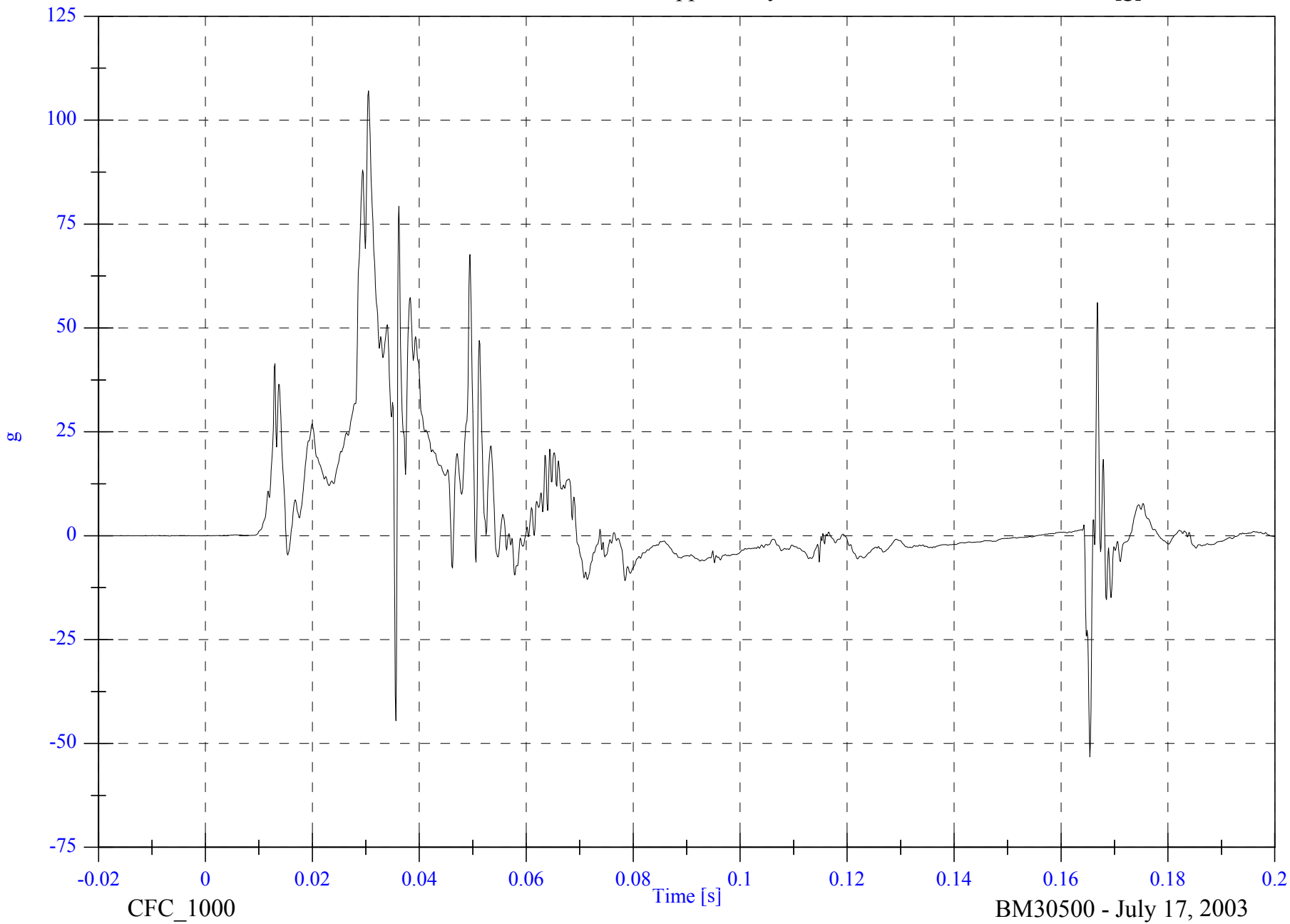
V2P1 Upper Rib y

Max: 107.0 [g] at 0.030 [s]

Min: -53.2 [g] at 0.165 [s]

B-21

8717-01

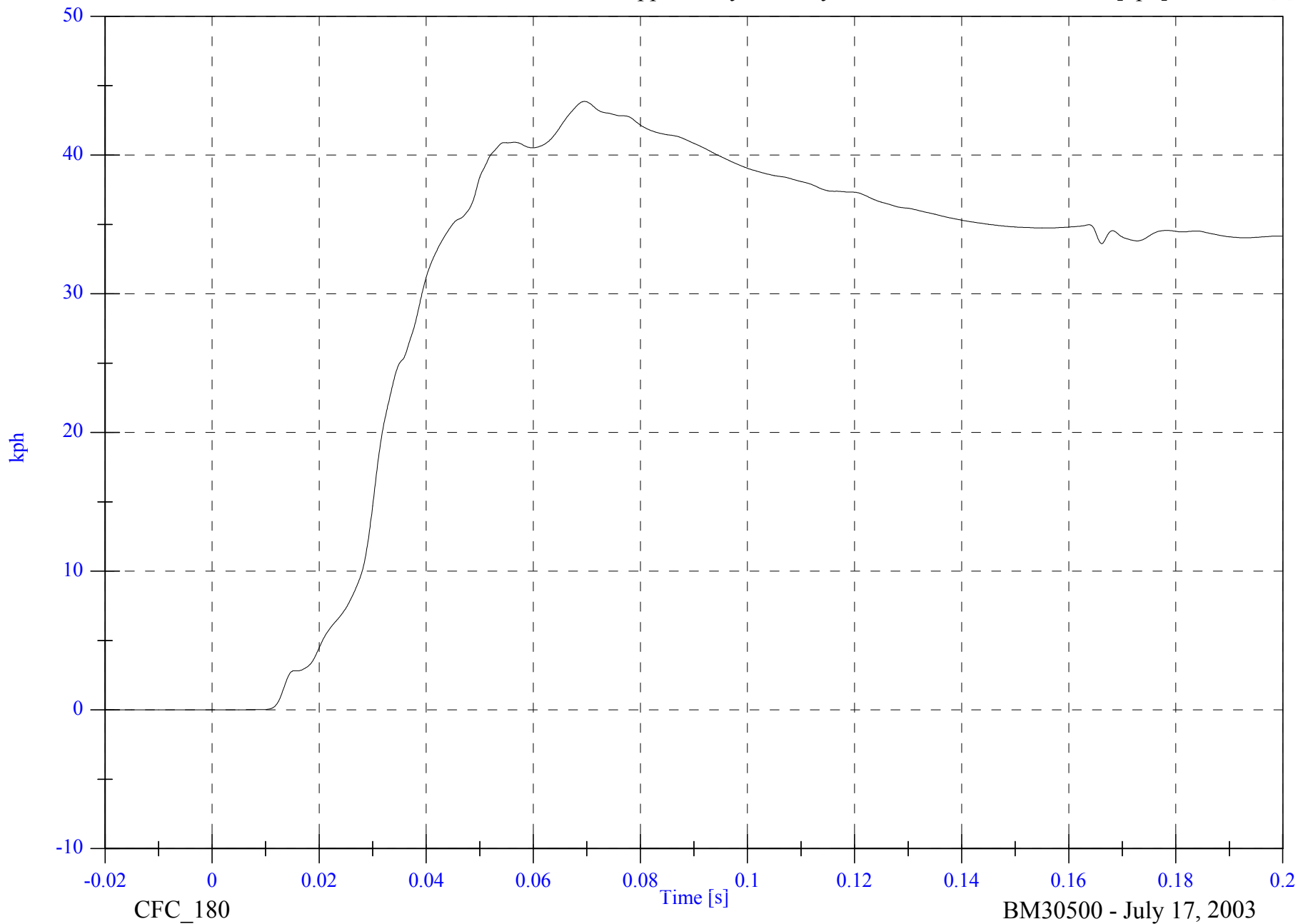


2003 SNCAP Test 1 2003 BMW Z4

Max: 43.9 [kph] at 0.070 [s]

Min: -0.0 [kph] at -0.013 [s]

### V2P1 Upper Rib y Velocity



B-22

8717-01

CFC\_180

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

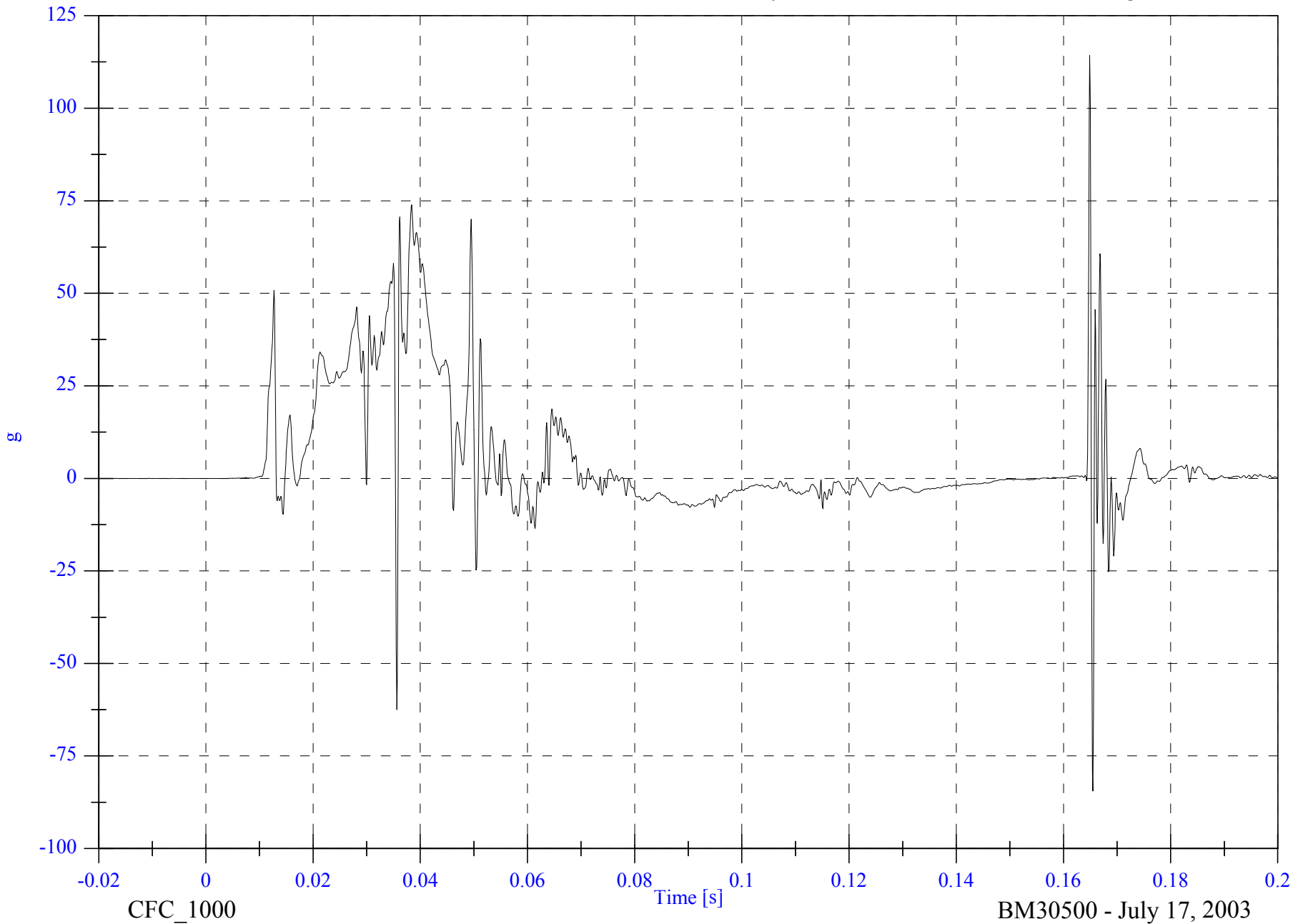
V2P1 Lower Rib y

Max: 114.2 [g] at 0.165 [s]

Min: -84.5 [g] at 0.166 [s]

B-23

8717-01



CFC\_1000

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

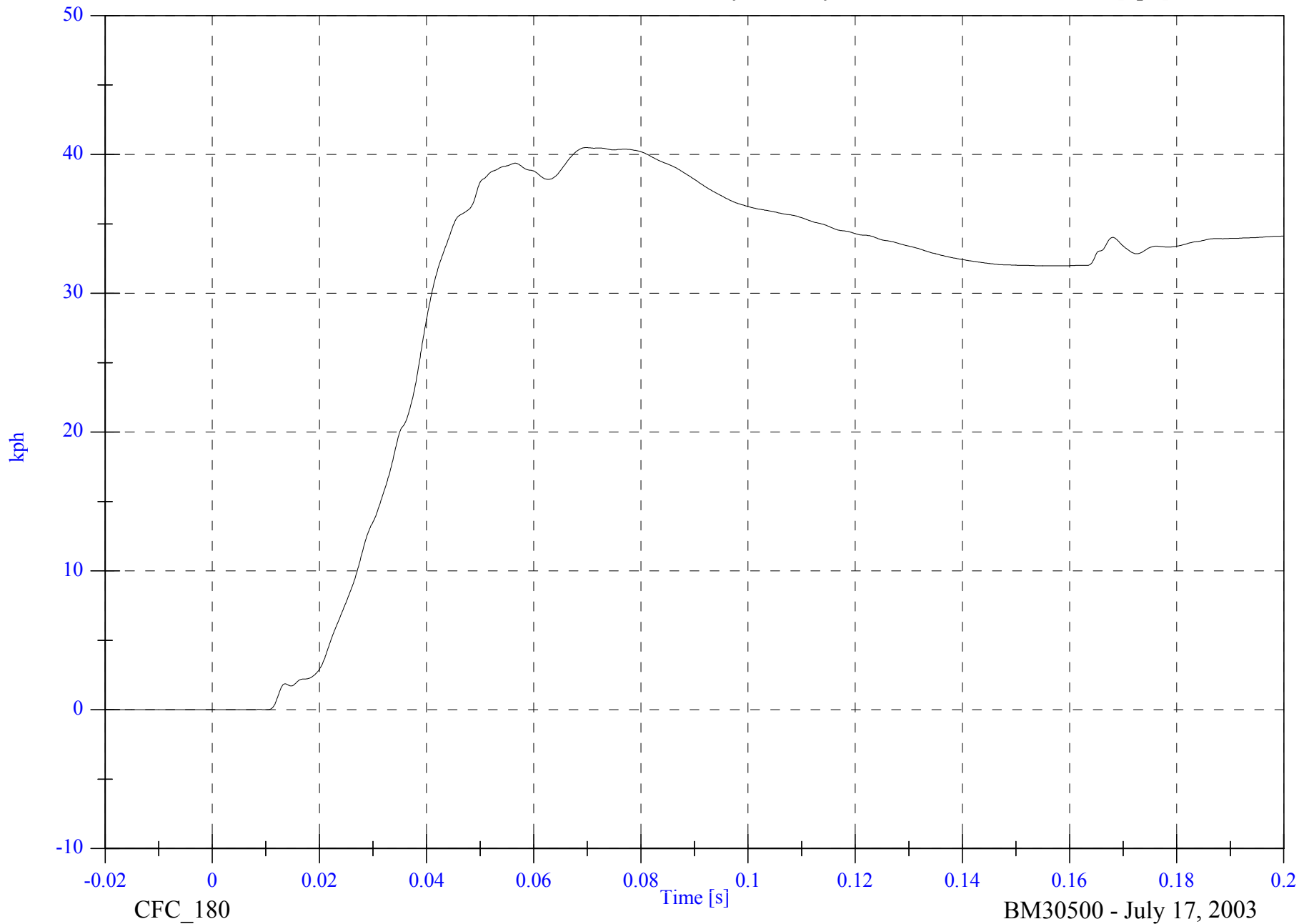
V2P1 Lower Rib y Velocity

Max: 40.5 [kph] at 0.070 [s]

Min: -0.0 [kph] at -0.018 [s]

B-24

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

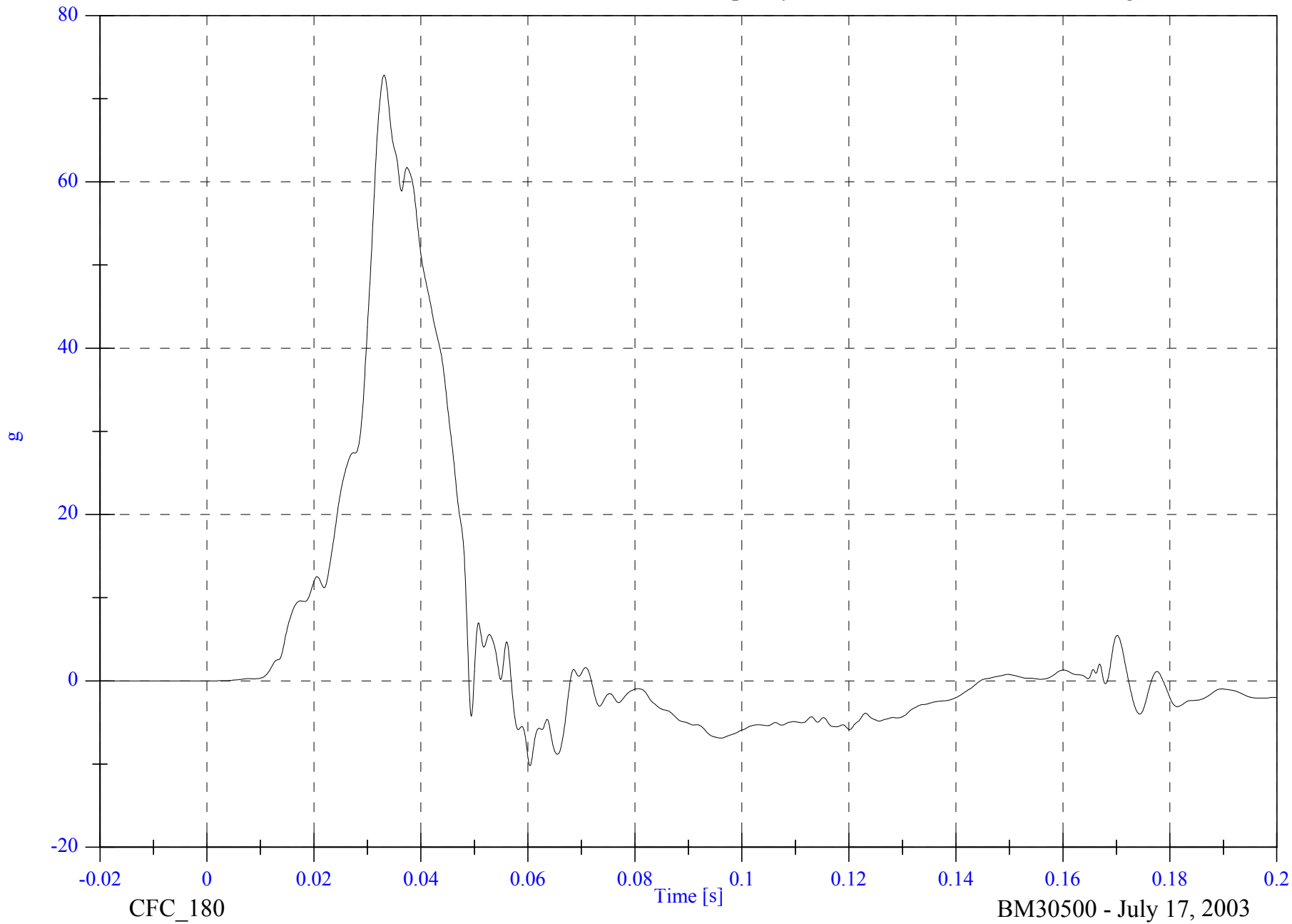
V2P1 Lower Spine y

Max: 72.9 [g] at 0.033 [s]

Min: -10.2 [g] at 0.060 [s]

B-25

8717-01

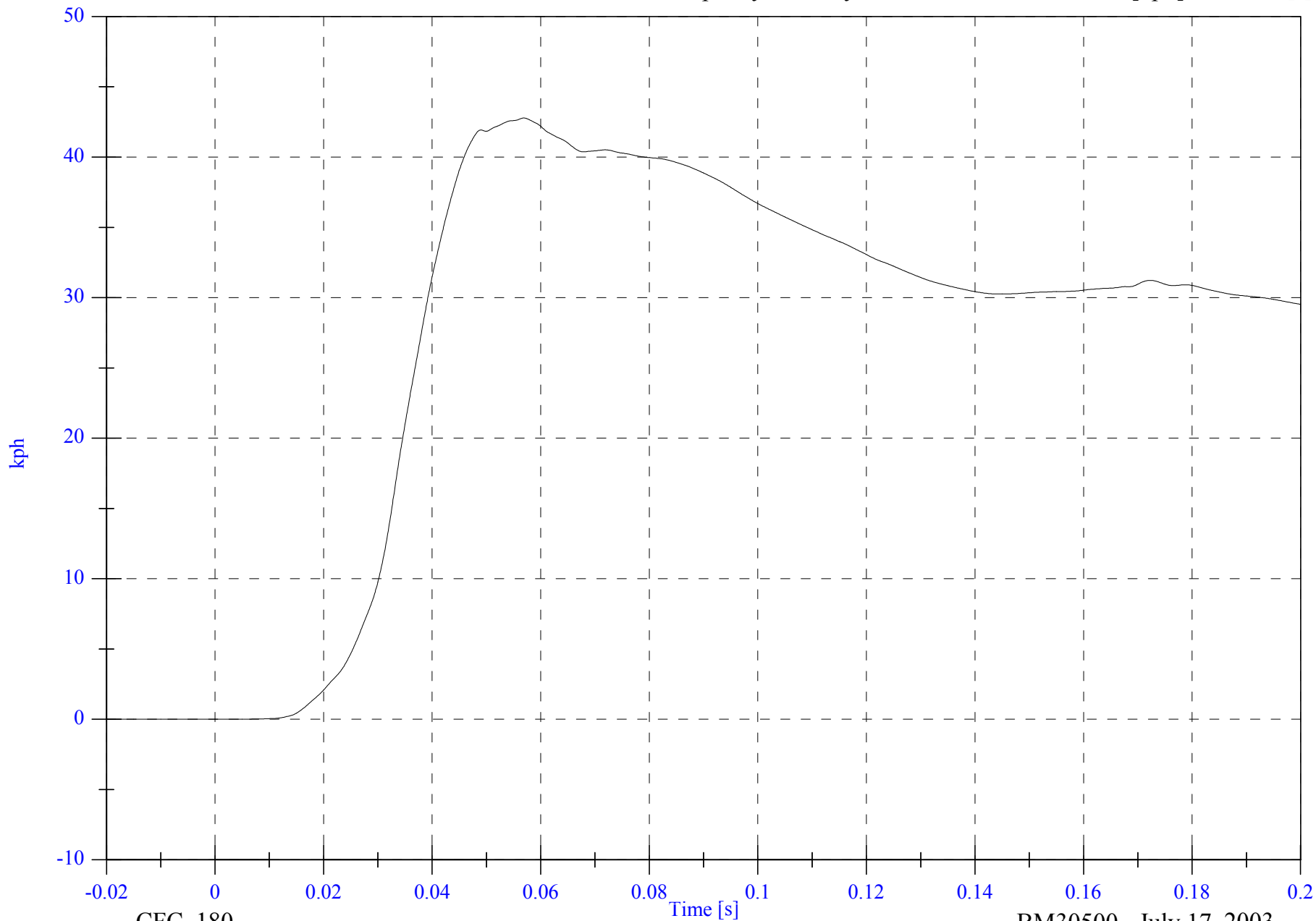


2003 SNCAP Test 1 2003 BMW Z4

Max: 42.8 [kph] at 0.057 [s]

Min: -0.0 [kph] at -0.014 [s]

### V2P1 Lower Spine y Velocity



B-26

8717-01

CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Pelvic y

Max: 59.6 [g] at 0.039 [s]

Min: -10.8 [g] at 0.059 [s]

B-27

8717-01

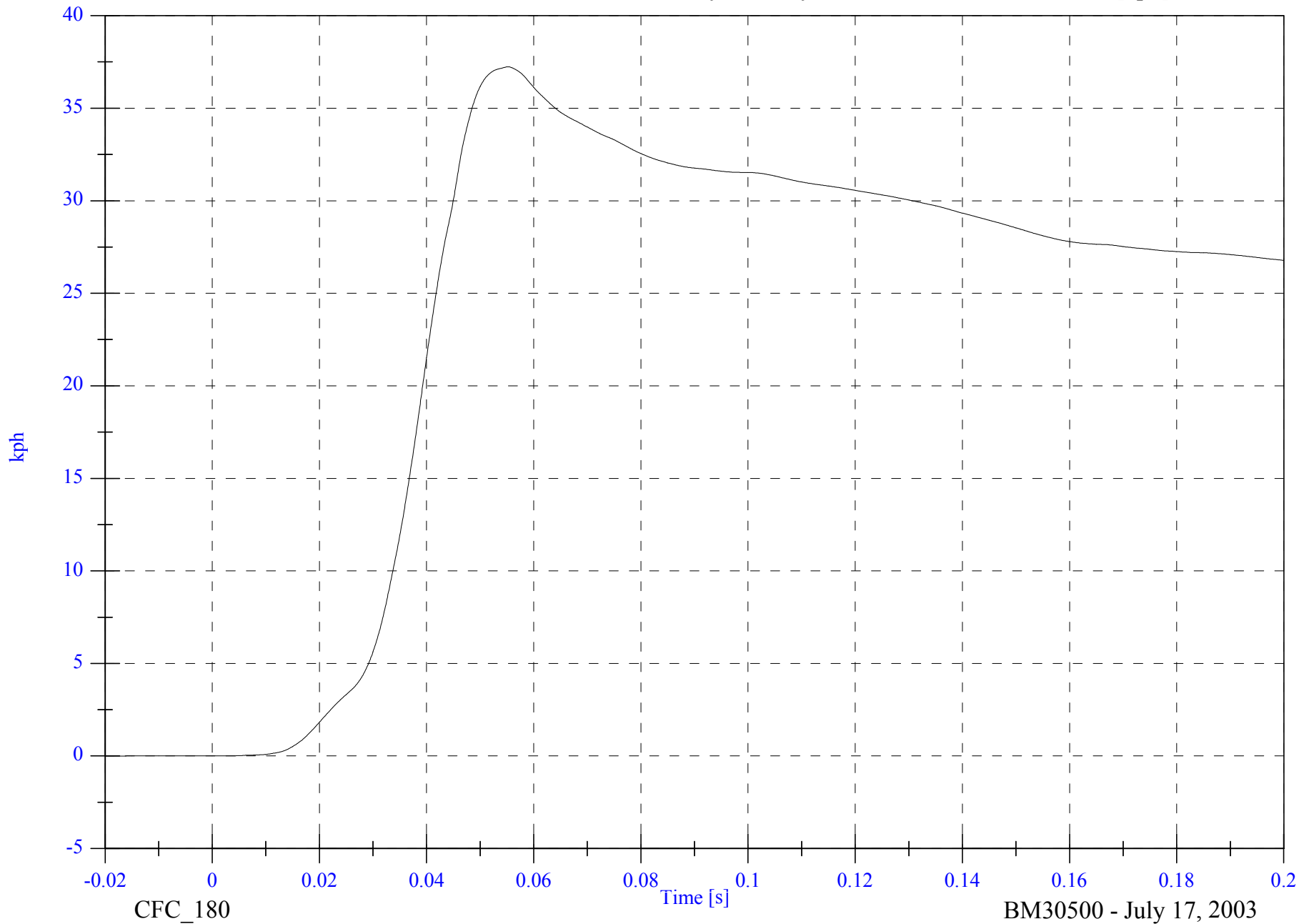


2003 SNCAP Test 1 2003 BMW Z4

V2P1 Pelvic y Velocity

Max: 37.2 [kph] at 0.055 [s]

Min: -0.0 [kph] at -0.020 [s]



B-28

8717-01

CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Upper Rib y

Max: 80.2 [g] at 0.031 [s]

Min: -7.5 [g] at 0.080 [s]



B-29

8717-01

FIR\_100

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

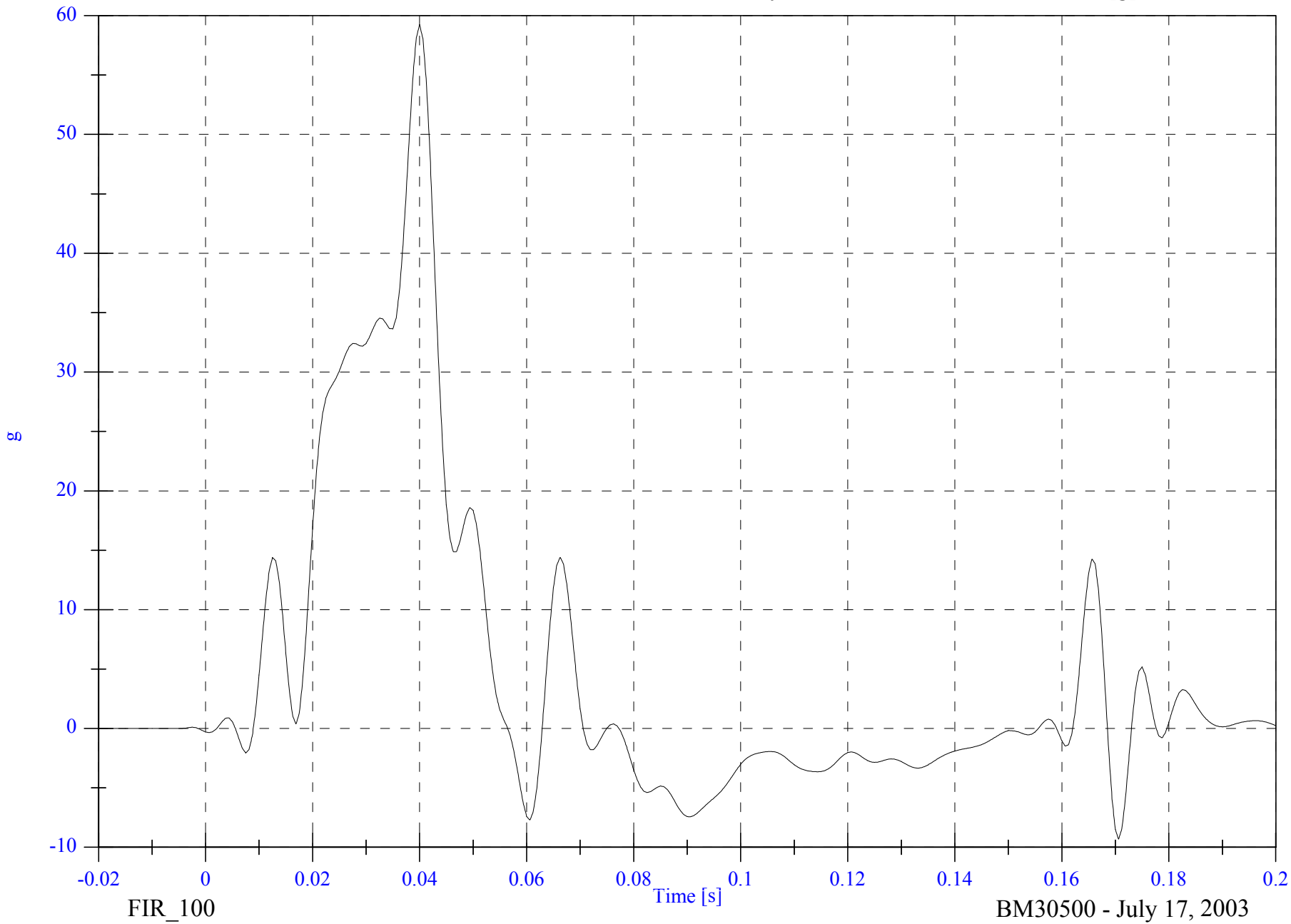
V2P1 Lower Rib y

Max: 59.3 [g] at 0.040 [s]

Min: -9.3 [g] at 0.171 [s]

B-30

8717-01



FIR\_100

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

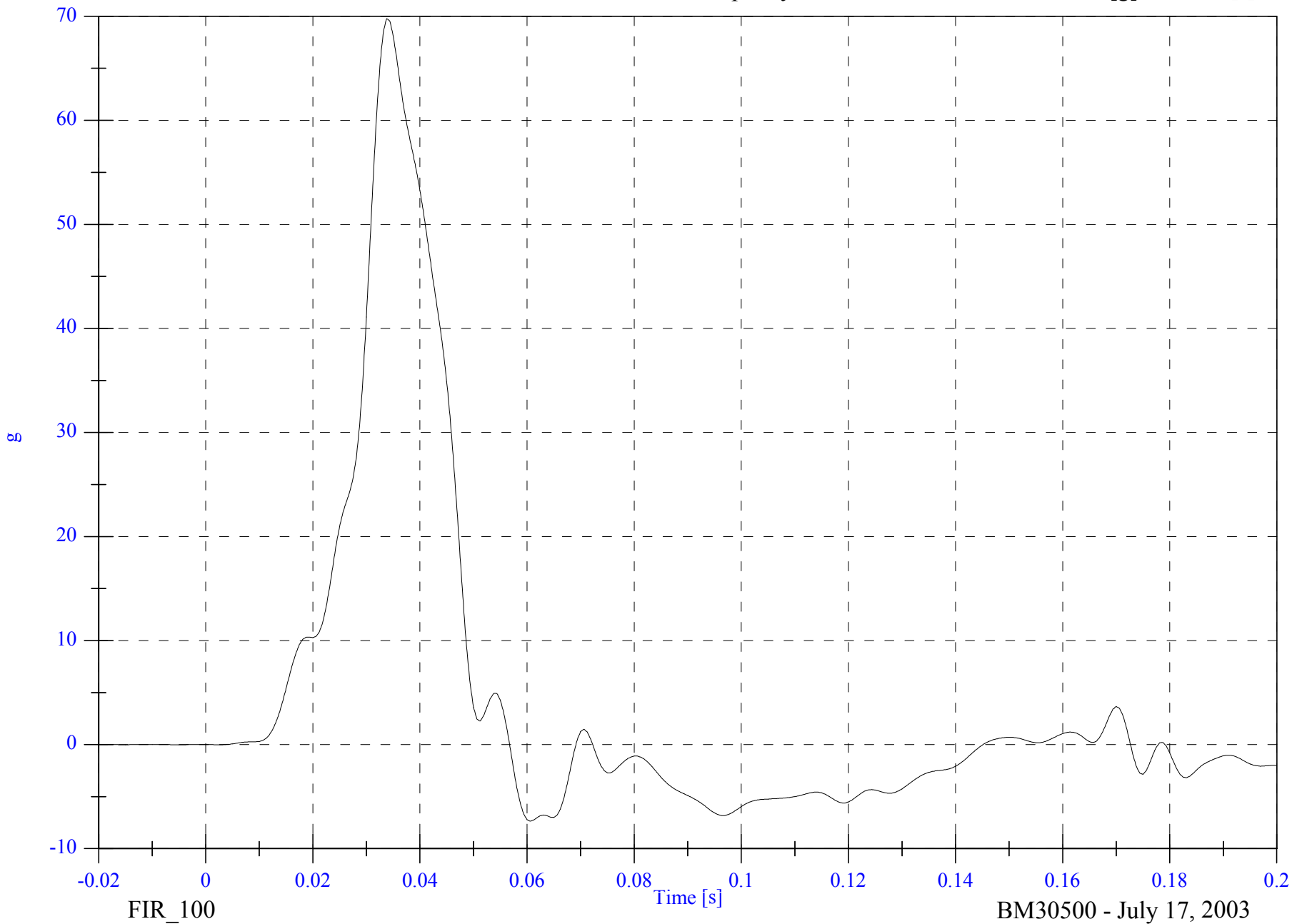
V2P1 Lower Spine y

Max: 69.8 [g] at 0.034 [s]

Min: -7.4 [g] at 0.061 [s]

B-31

8717-01



FIR\_100

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

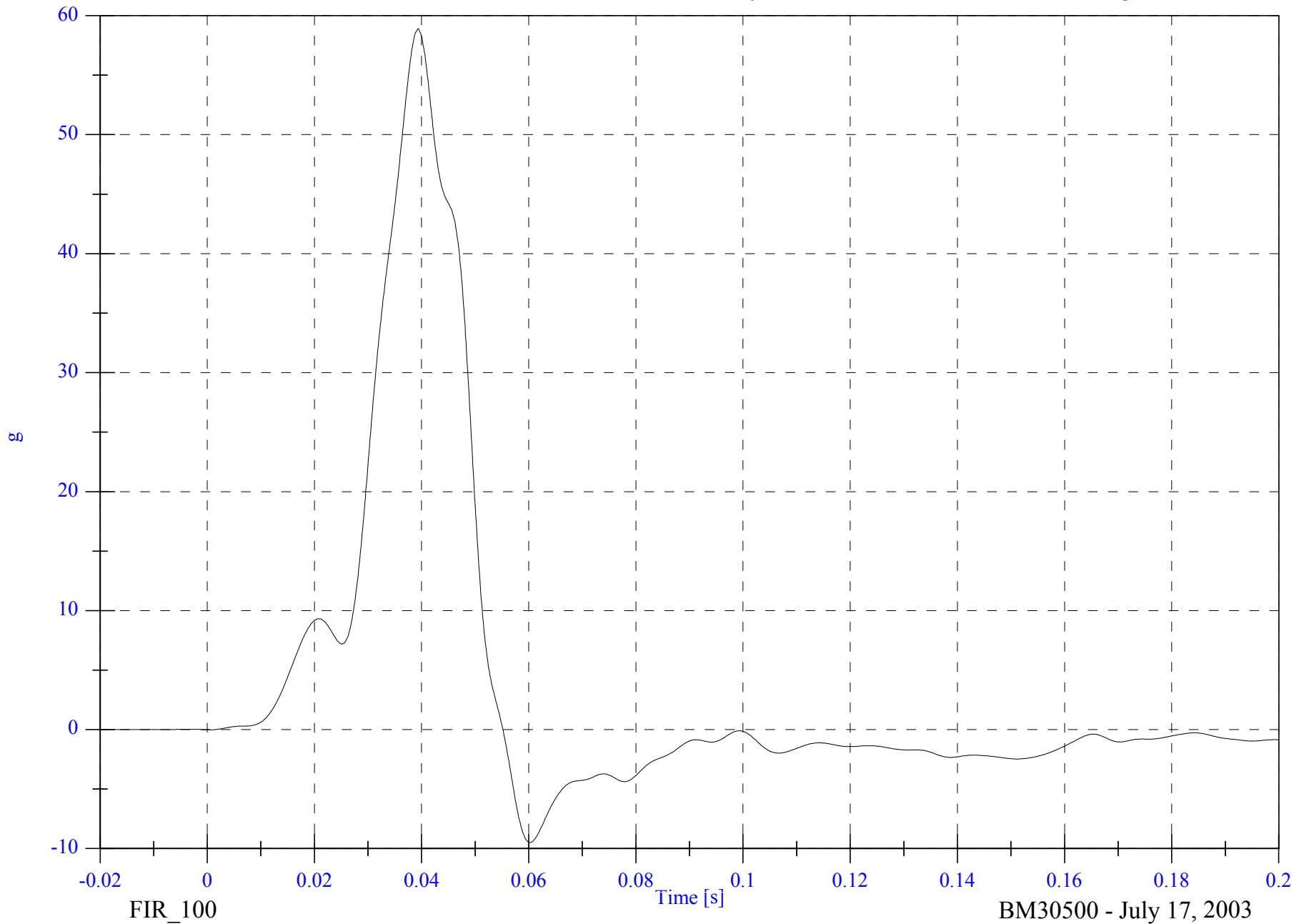
V2P1 Pelvic y

Max: 58.9 [g] at 0.039 [s]

Min: -9.5 [g] at 0.060 [s]

B-32

8717-01



FIR\_100

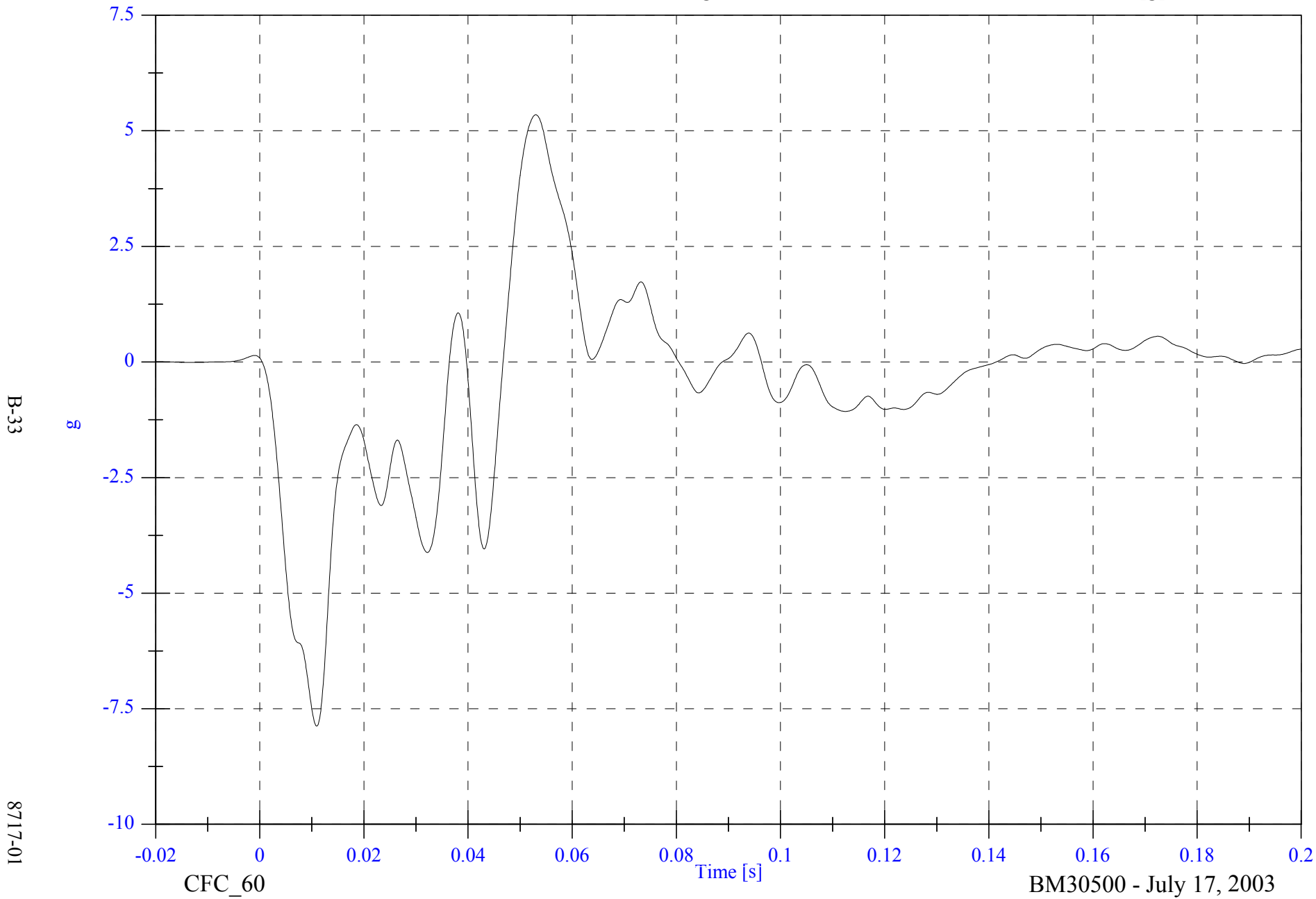
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A1 Right Front Sill X

Max: 5.3 [g] at 0.053 [s]

Min: -7.9 [g] at 0.011 [s]



B-33

8717-01

CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

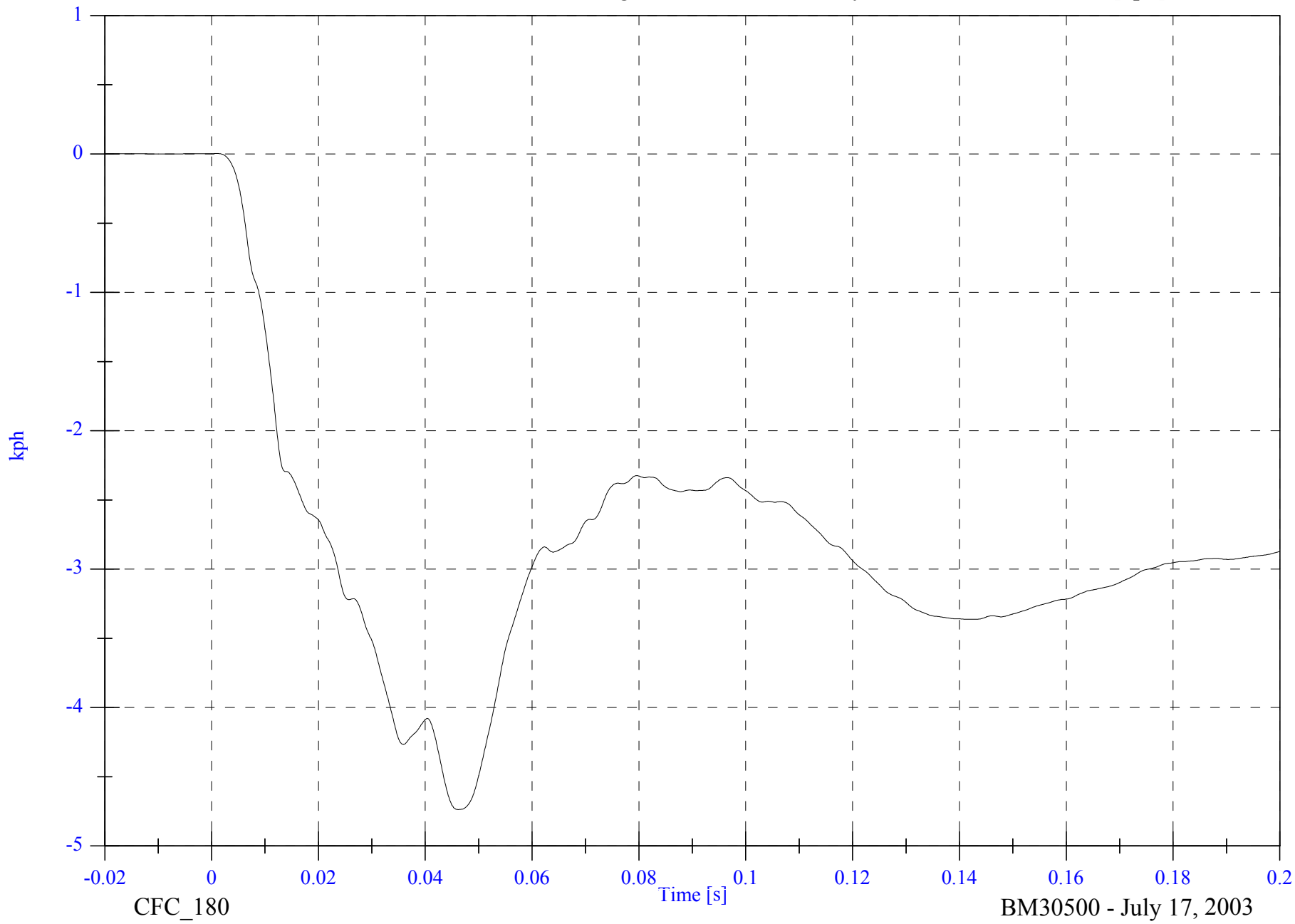
V2 A1 Right Front Sill X Velocity

Max: 0.0 [kph] at 0.001 [s]

Min: -4.7 [kph] at 0.046 [s]

B-34

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

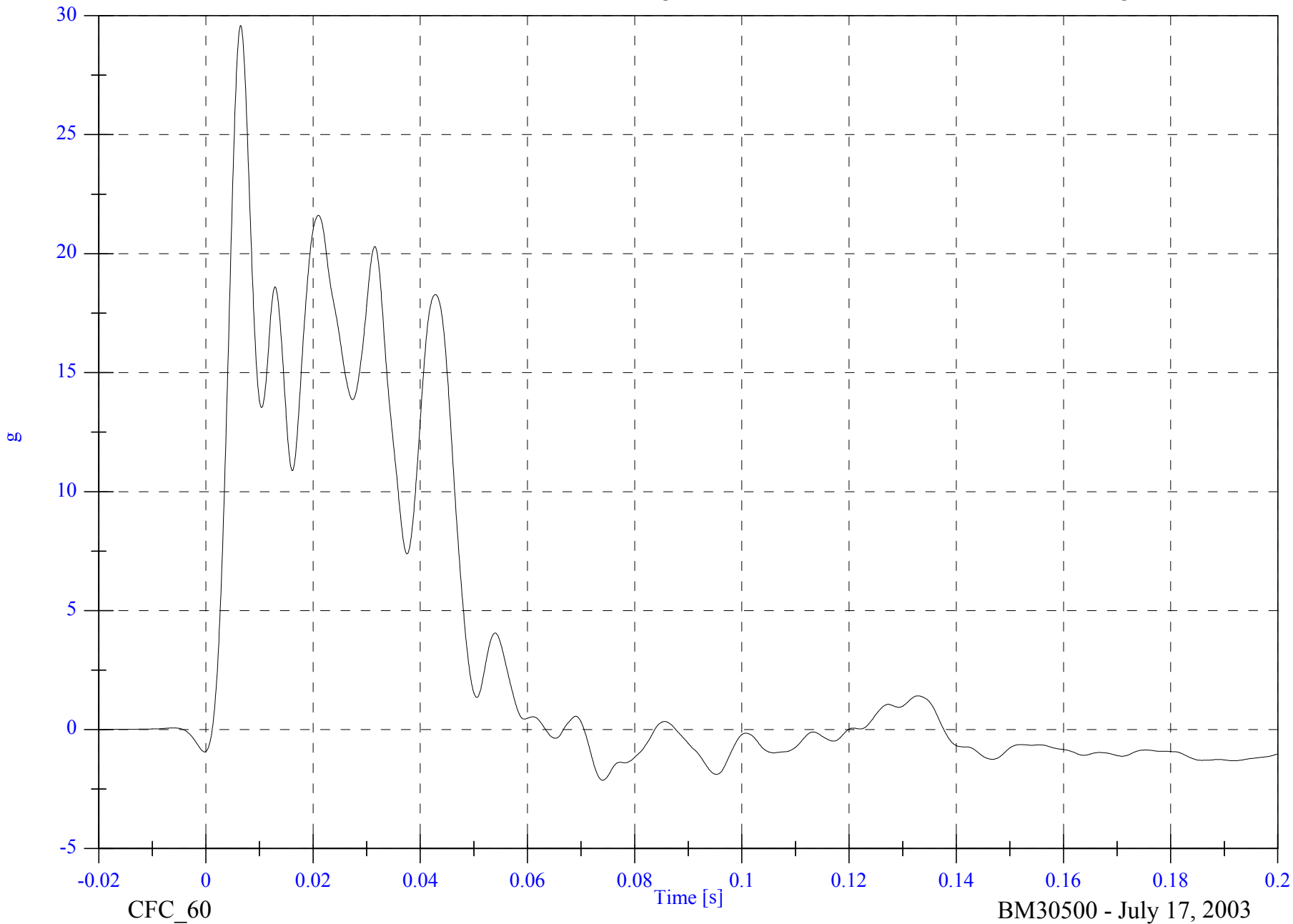
V2 A1 Right Front Sill Y

Max: 29.6 [g] at 0.006 [s]

Min: -2.1 [g] at 0.074 [s]

B-35

8717-01

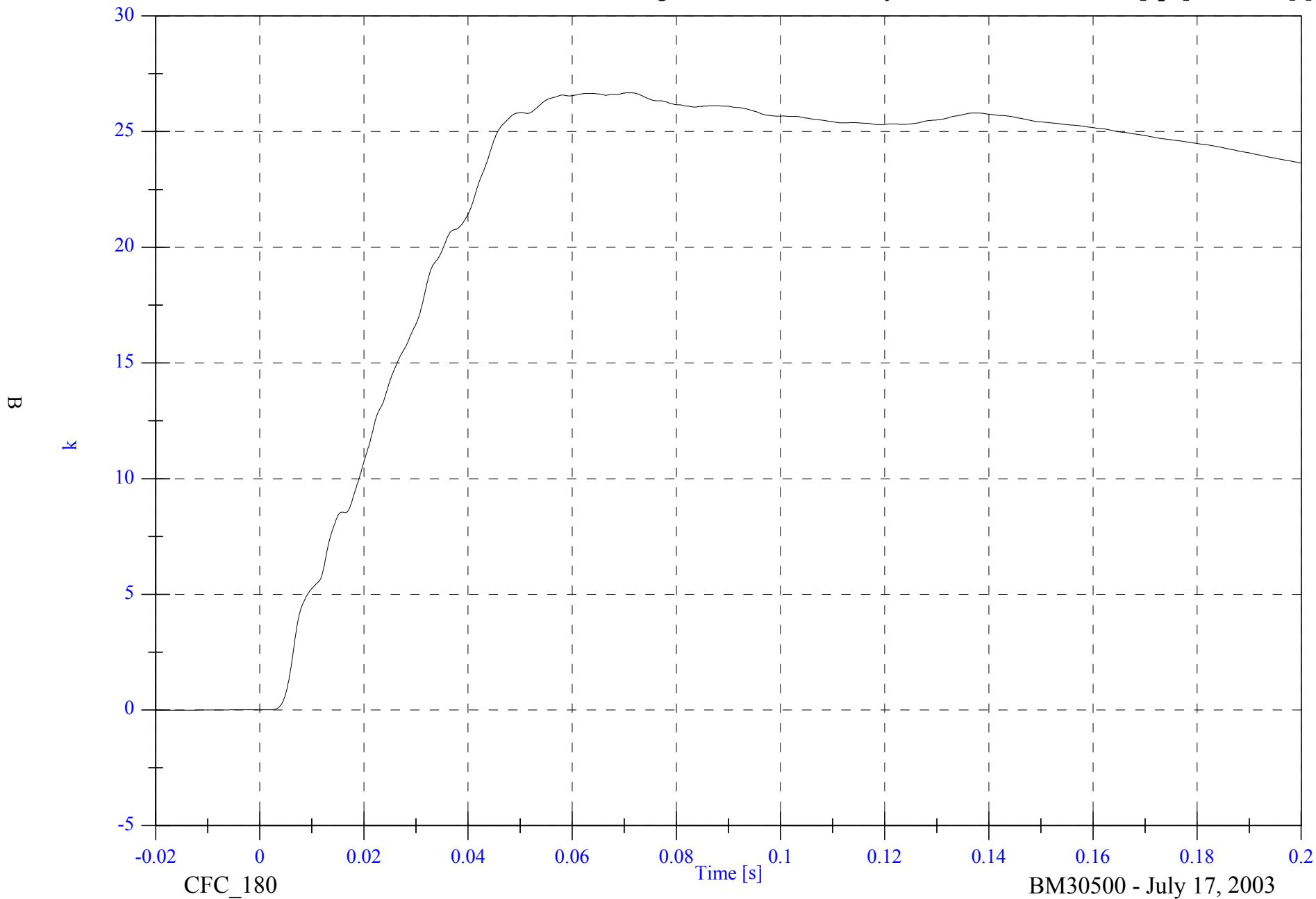


2003 SNCAP Test 1 2003 BMW Z4

V2 A1 Right Front Sill Y Velocity

Max: 26.7 [kph] at 0.071 [s]

Min: -0.0 [kph] at -0.019 [s]



CFC\_180

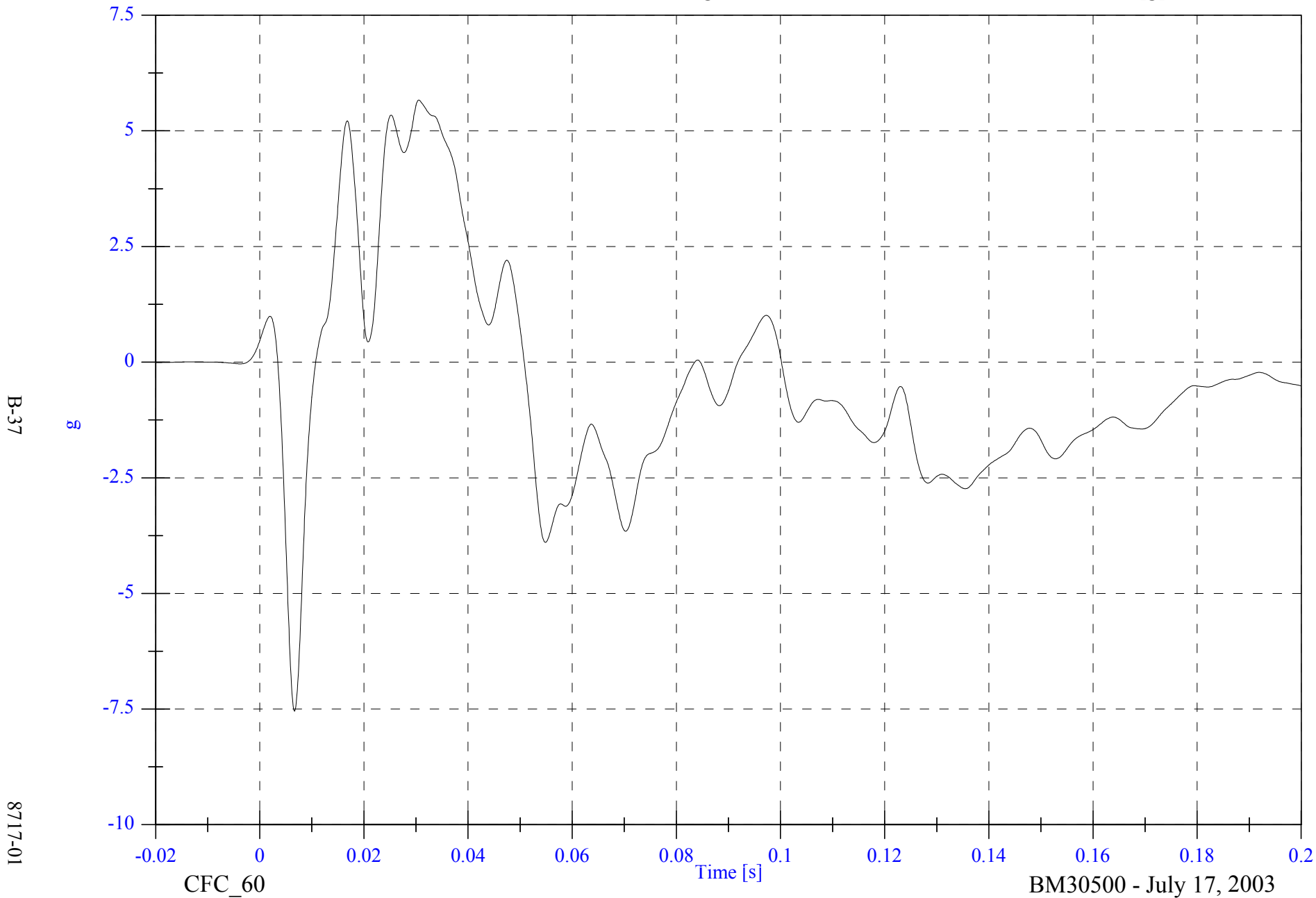
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A1 Right Front Sill Z

Max: 5.7 [g] at 0.030 [s]

Min: -7.5 [g] at 0.007 [s]



B-37

8717-01

CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

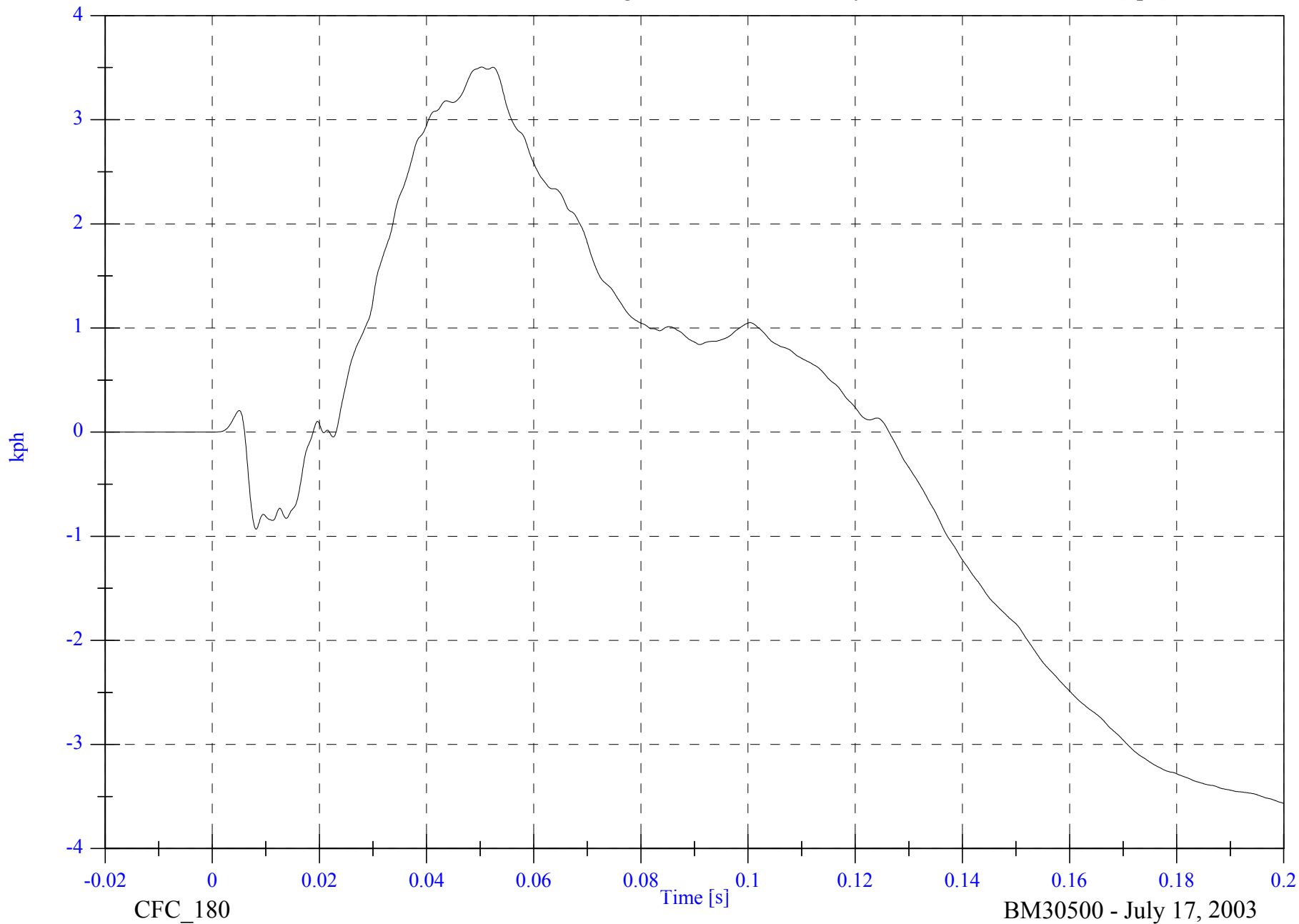
V2 A1 Right Front Sill Z Velocity

Max: 3.5 [kph] at 0.050 [s]

Min: -3.6 [kph] at 0.200 [s]

B-38

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

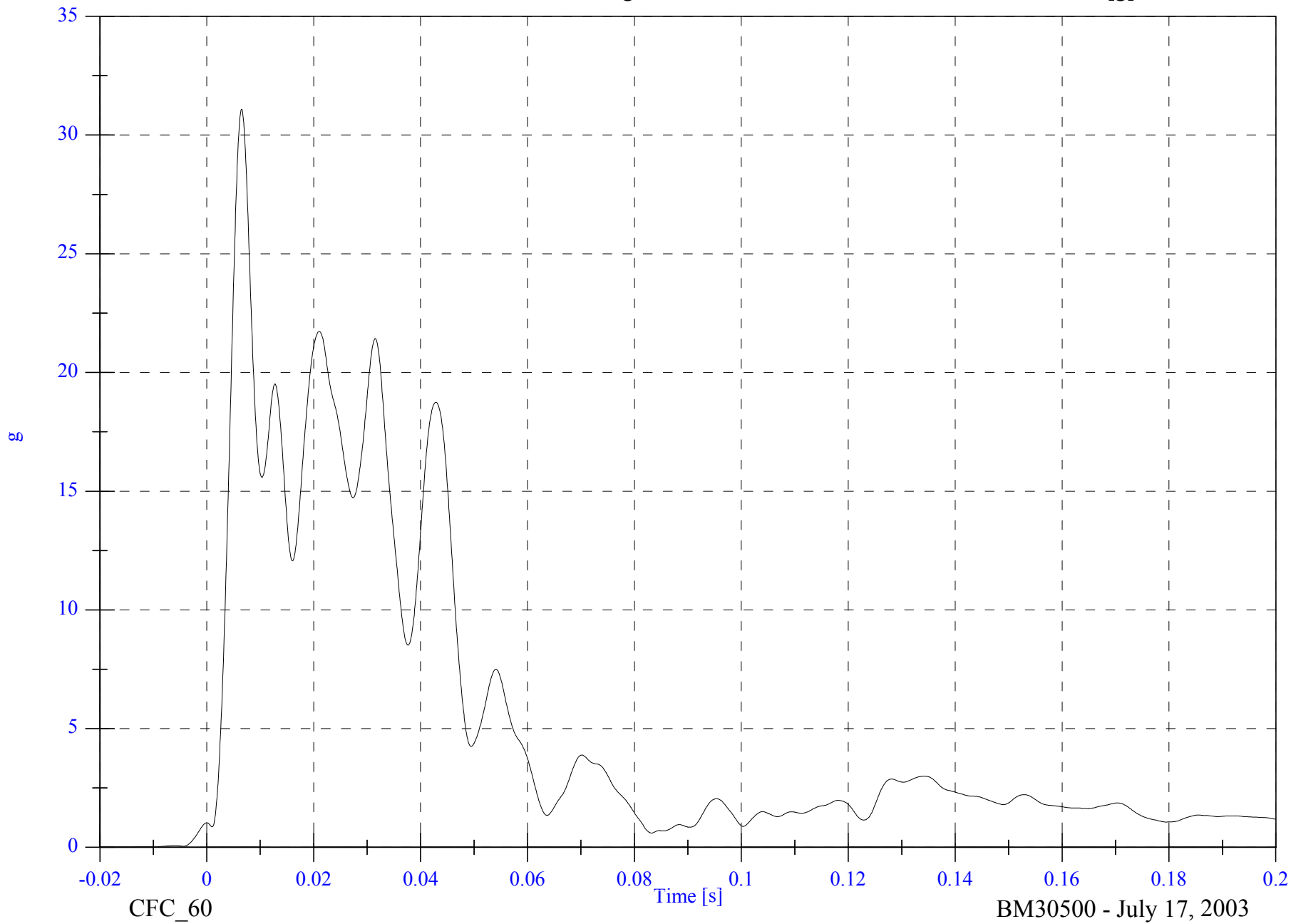
V2 A1 Right Front Sill Resultant

Max: 31.1 [g] at 0.006 [s]

Min: 0.0 [g] at -0.019 [s]

B-39

8717-01



CFC\_60

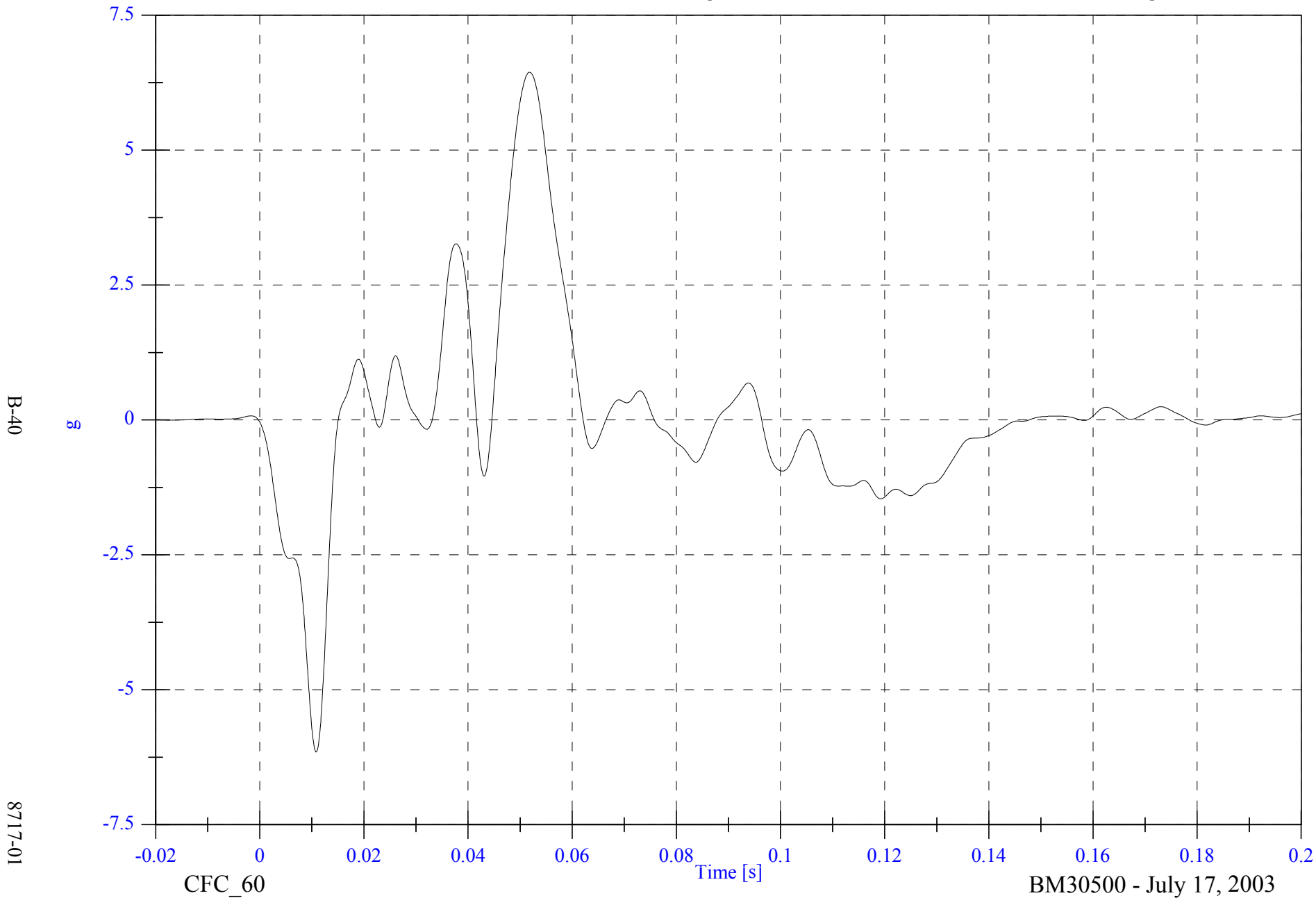
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A2 Right Rear Sill X

Max: 6.4 [g] at 0.052 [s]

Min: -6.2 [g] at 0.011 [s]



B-40

8717-01

CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

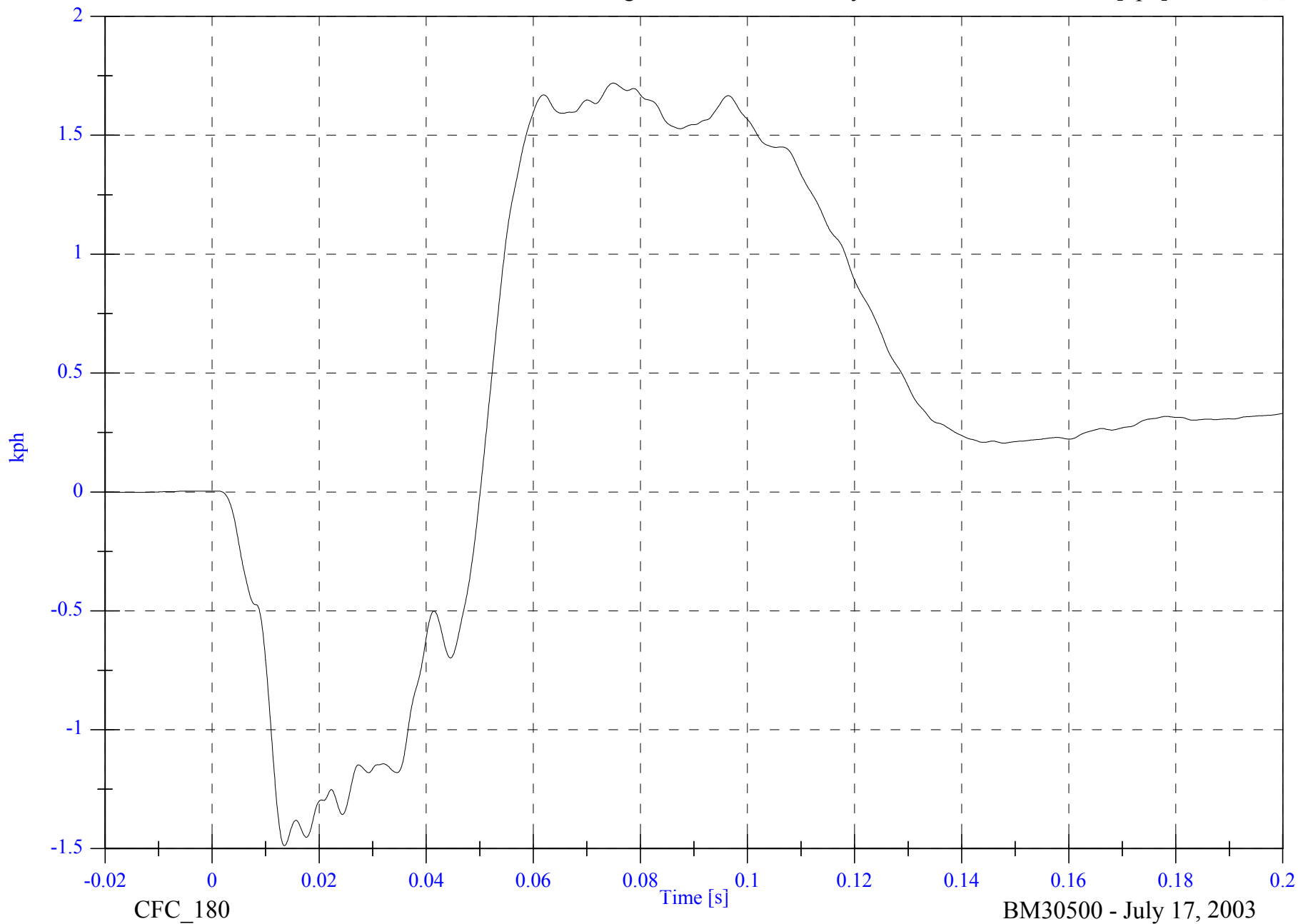
V2 A2 Right Rear Sill X Velocity

Max: 1.7 [kph] at 0.075 [s]

Min: -1.5 [kph] at 0.013 [s]

B-41

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

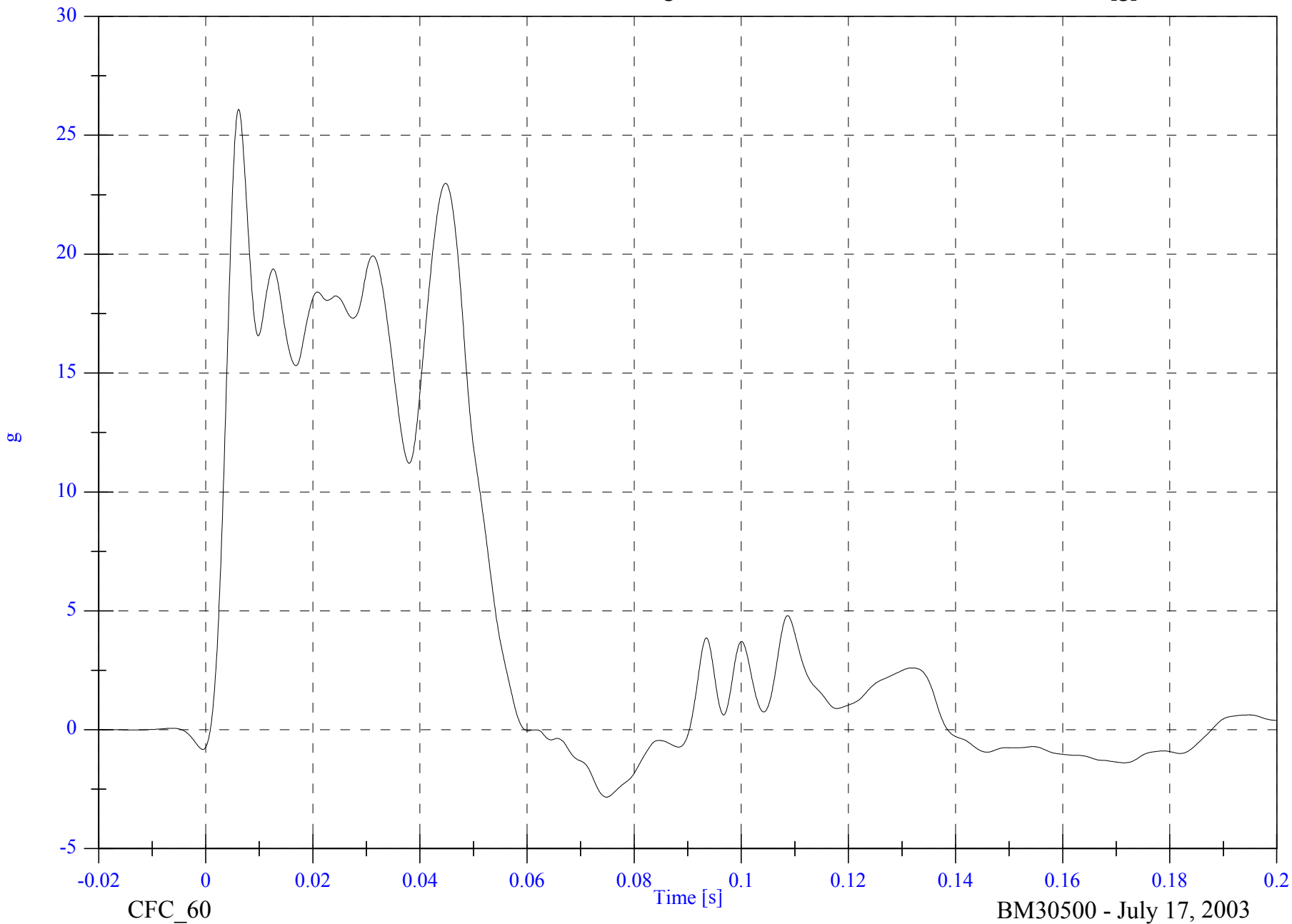
V2 A2 Right Rear Sill Y

Max: 26.1 [g] at 0.006 [s]

Min: -2.8 [g] at 0.075 [s]

B-42

8717-01



CFC\_60

Time [s]

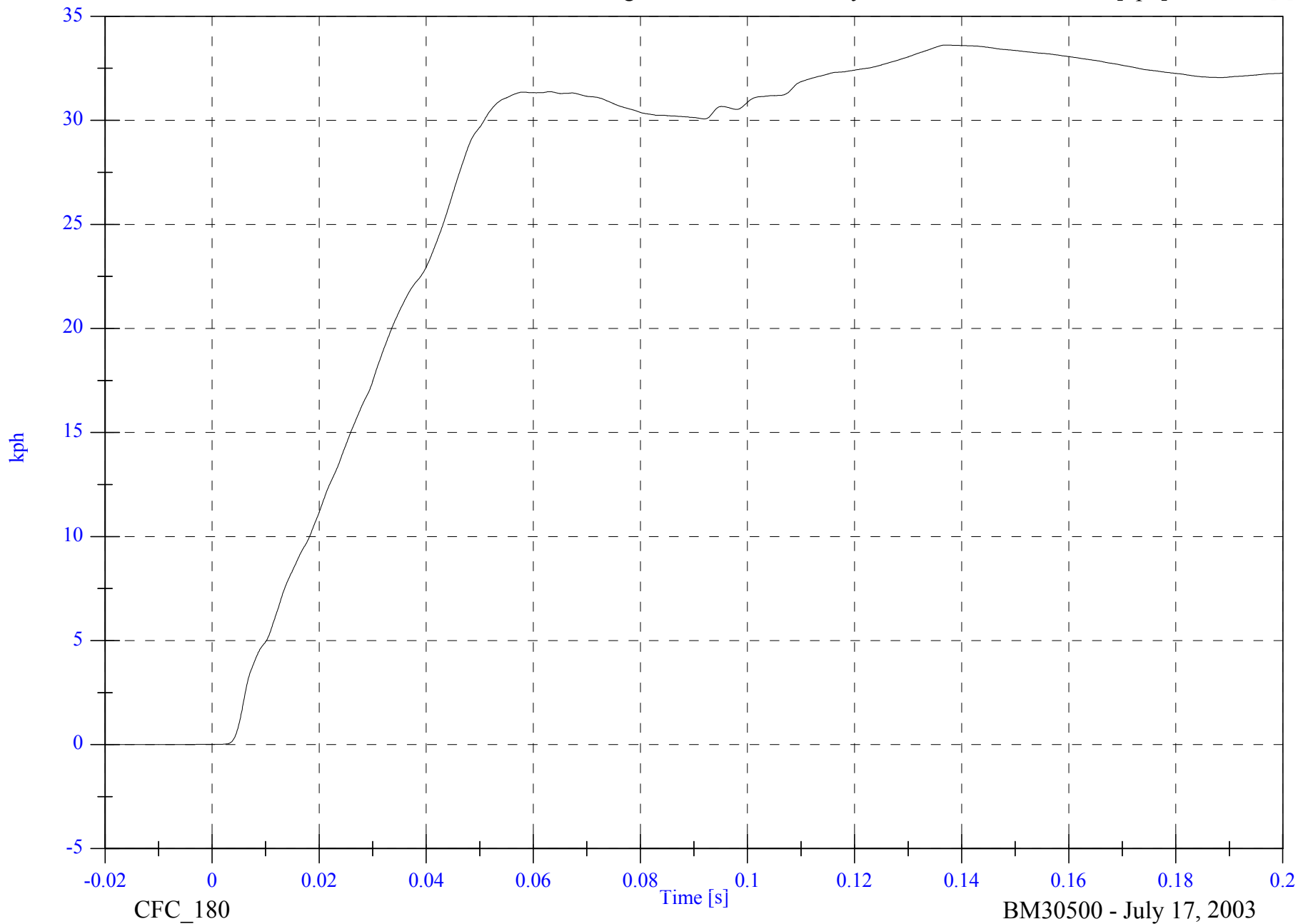
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A2 Right Rear Sill Y Velocity

Max: 33.6 [kph] at 0.137 [s]

Min: -0.0 [kph] at -0.011 [s]



B-43

8717-01

CFC\_180

Time [s]

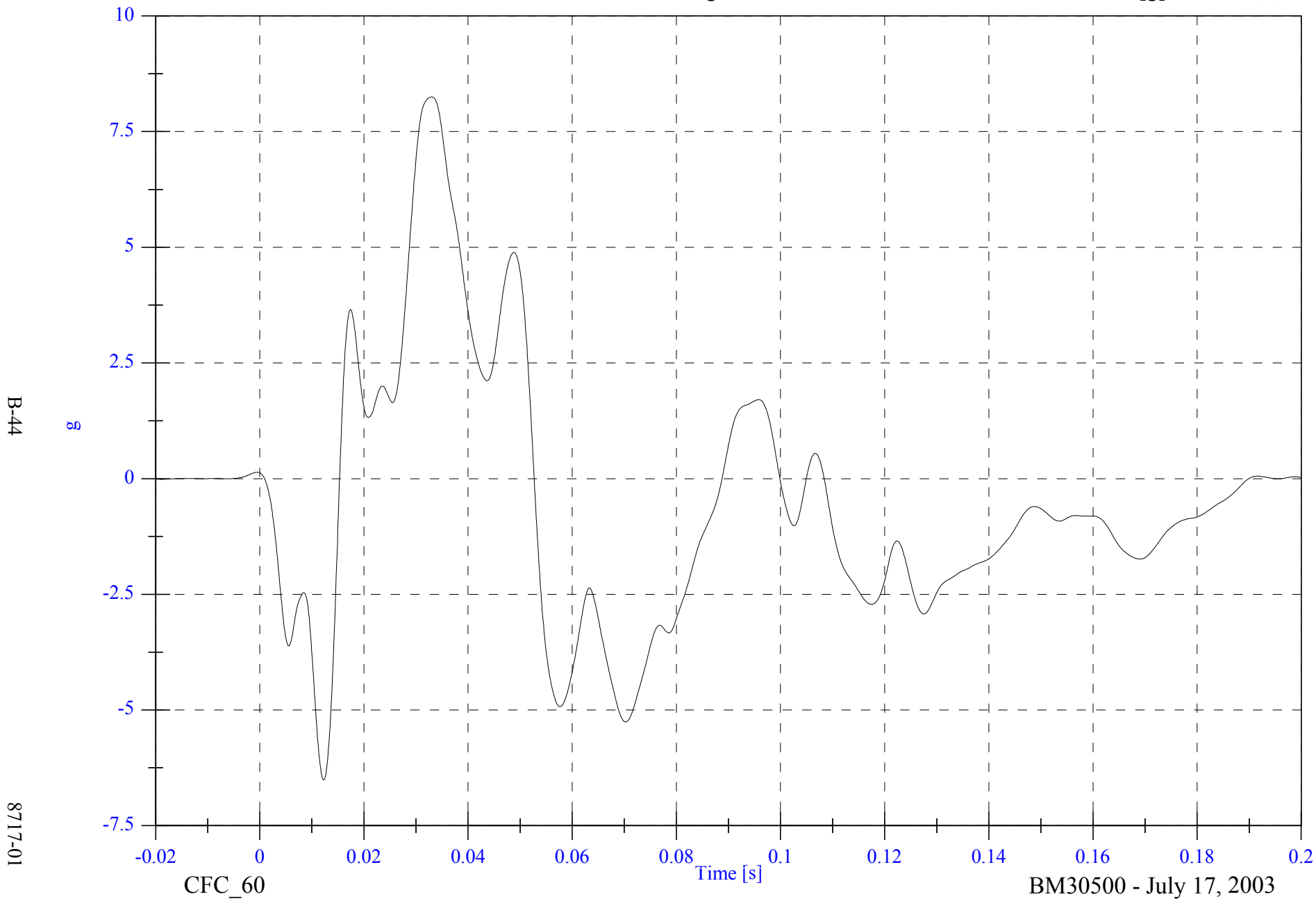
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A2 Right Rear Sill Z

Max: 8.2 [g] at 0.033 [s]

Min: -6.5 [g] at 0.012 [s]



B-44

8717-01

CFC\_60

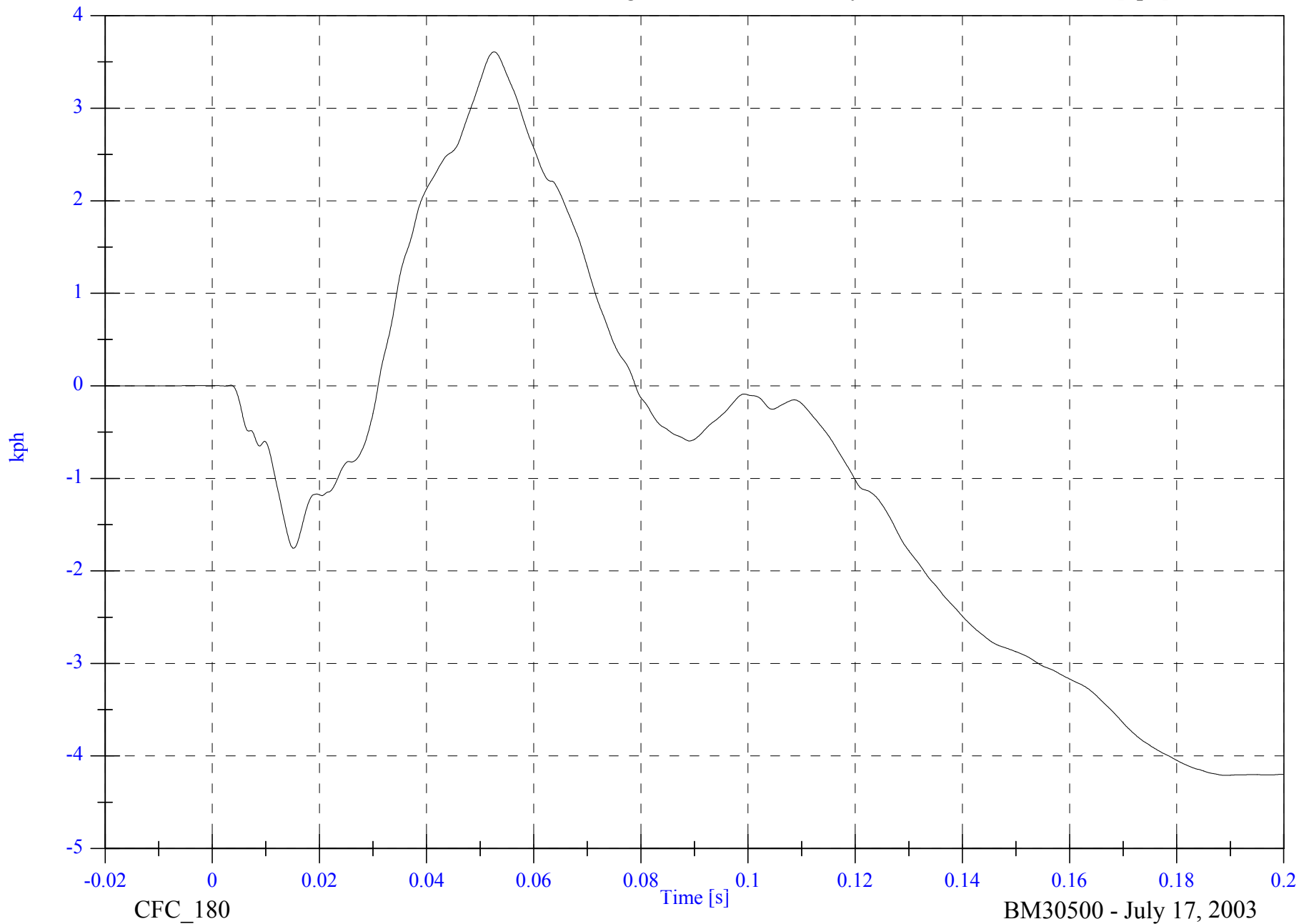
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

Max: 3.6 [kph] at 0.053 [s]

Min: -4.2 [kph] at 0.189 [s]

V2 A2 Right Rear Sill Z Velocity



B-45

8717-01

CFC\_180

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

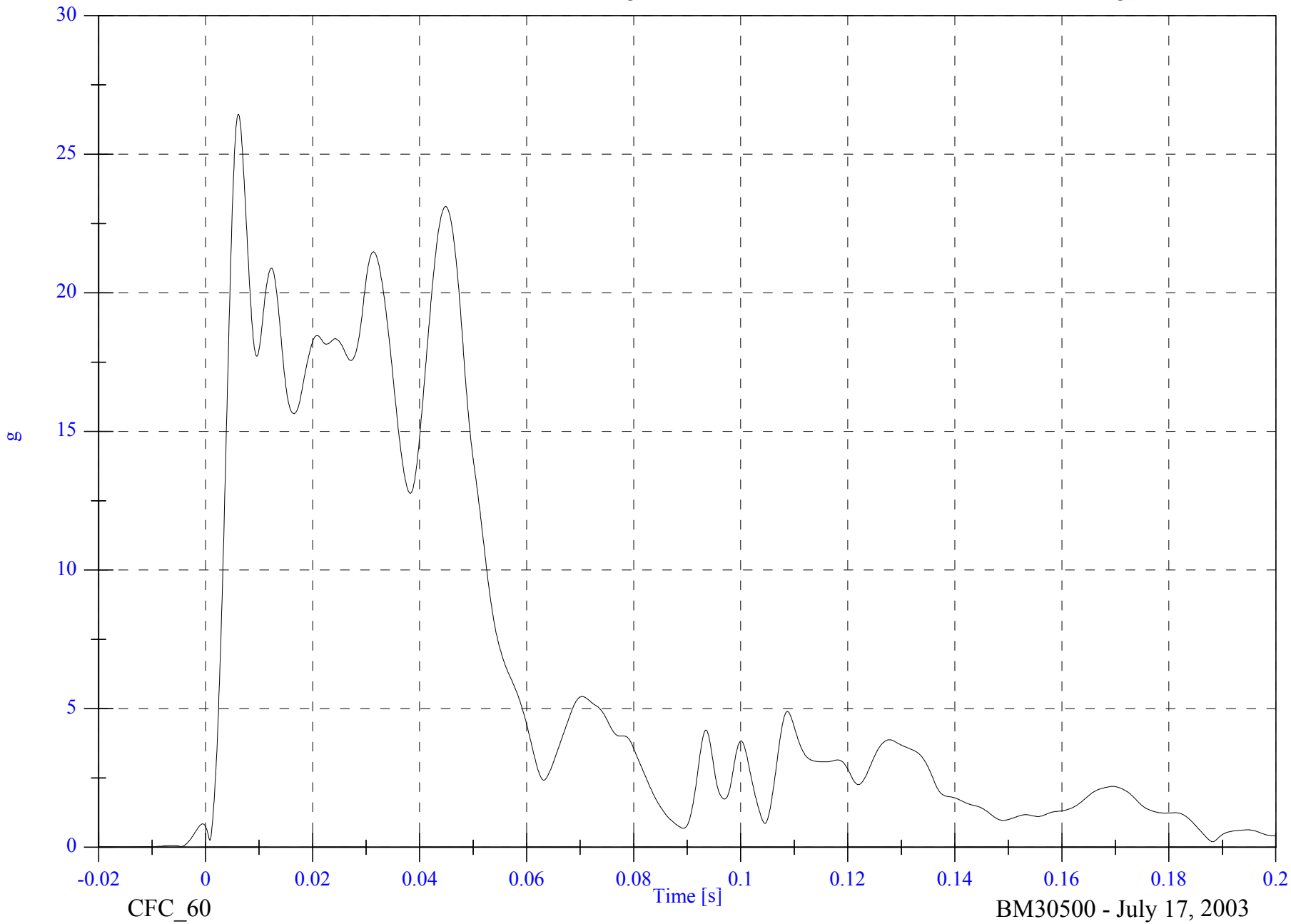
V2 A2 Right Rear Sill Resultant

Max: 26.4 [g] at 0.006 [s]

Min: 0.0 [g] at -0.016 [s]

B-46

8717-01

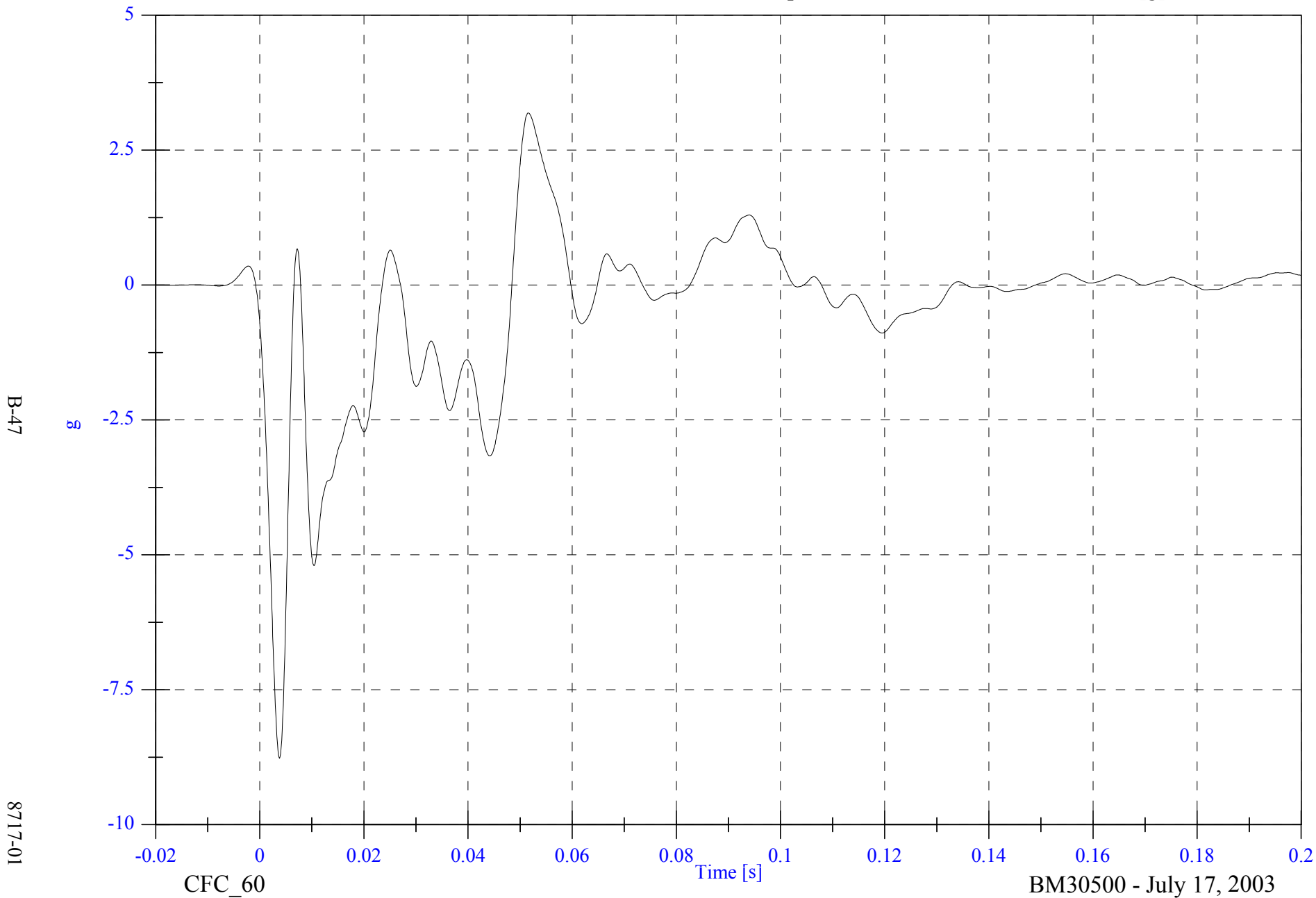


2003 SNCAP Test 1 2003 BMW Z4

V2 A3 Rear Floorpan X

Max: 3.2 [g] at 0.052 [s]

Min: -8.8 [g] at 0.004 [s]



B-47

8717-01

CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

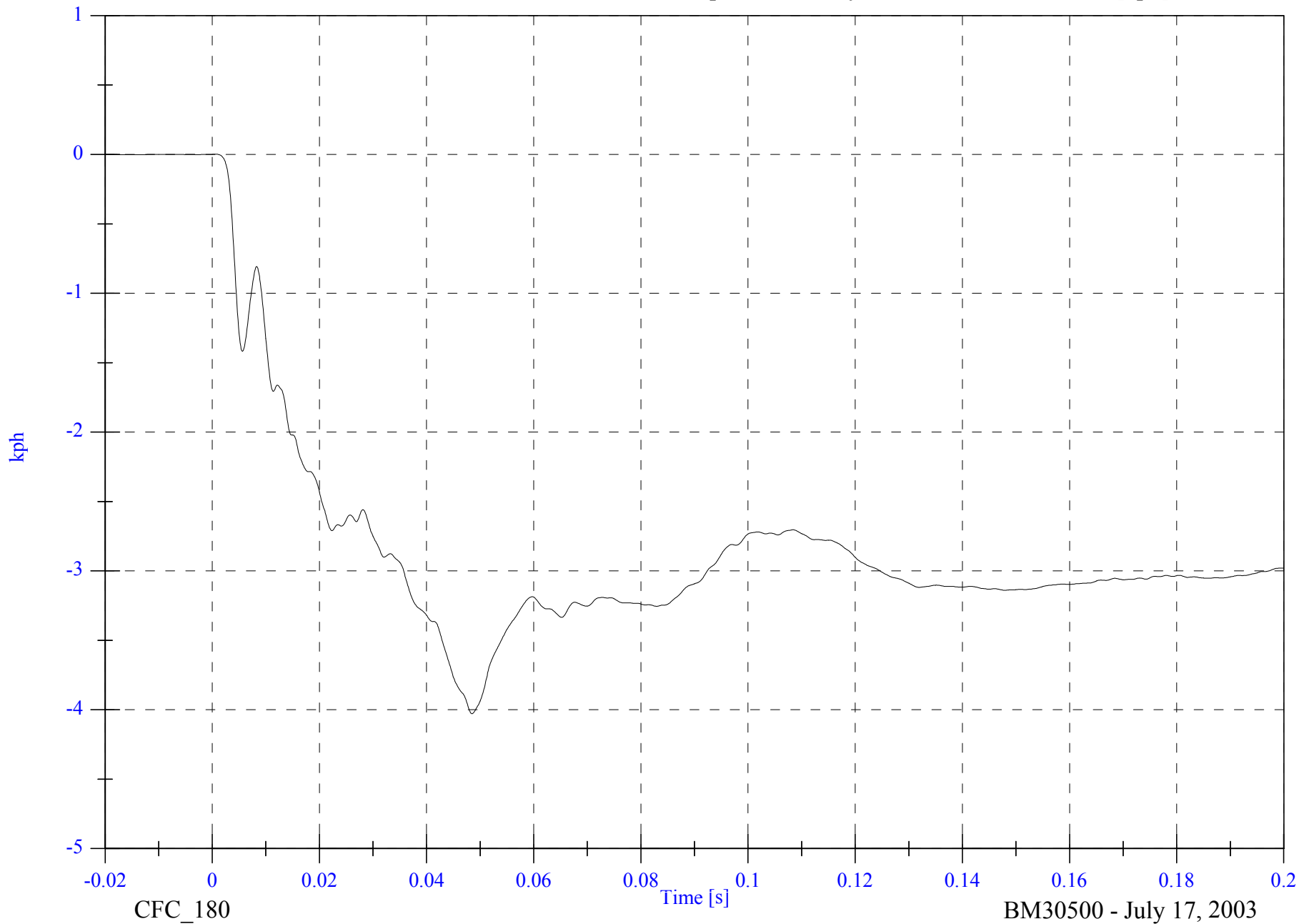
V2 A3 Rear Floorpan X Velocity

Max: 0.0 [kph] at 0.001 [s]

Min: -4.0 [kph] at 0.048 [s]

B-48

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

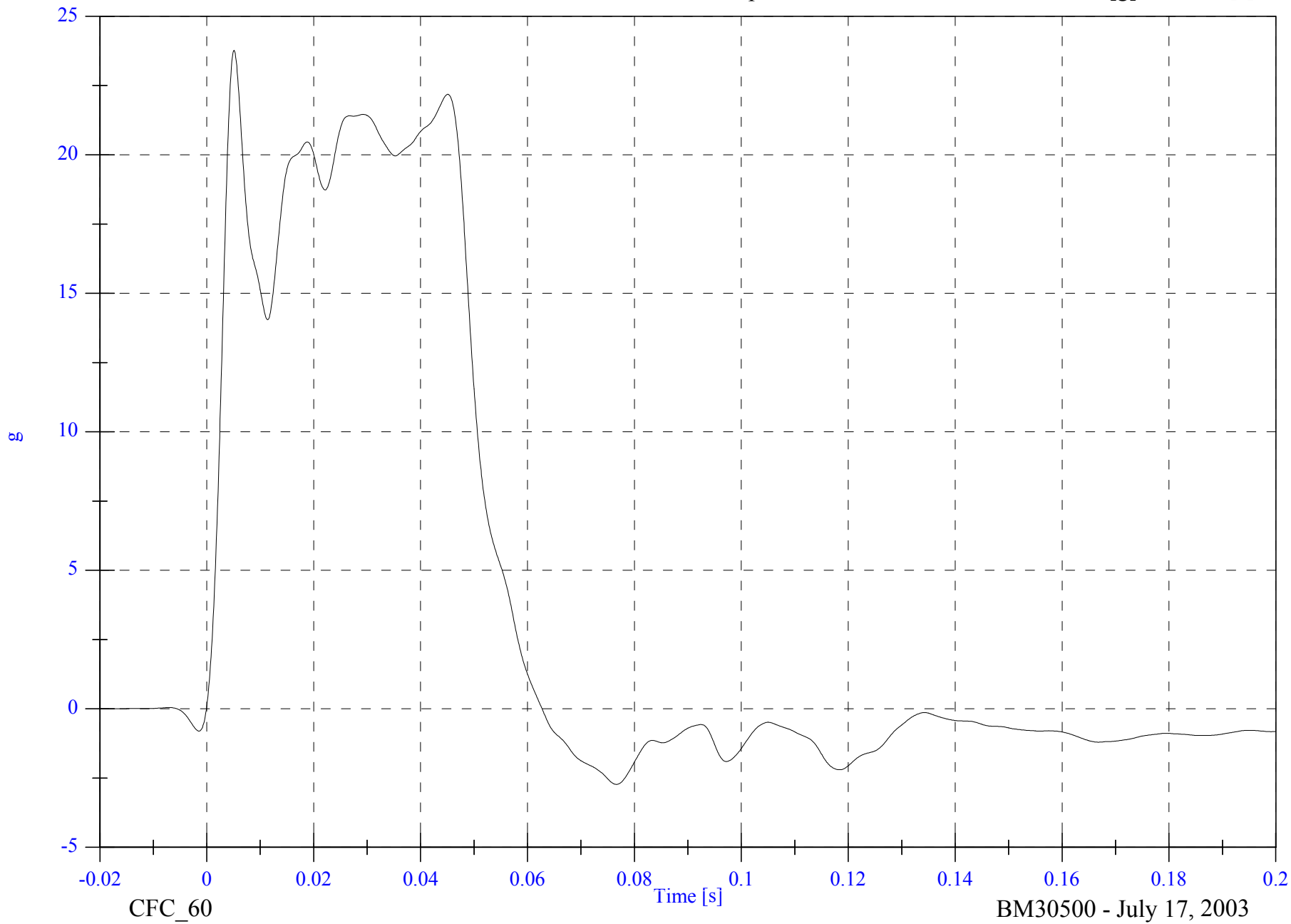
V2 A3 Rear Floorpan Y

Max: 23.8 [g] at 0.005 [s]

Min: -2.7 [g] at 0.077 [s]

B-49

8717-01



CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

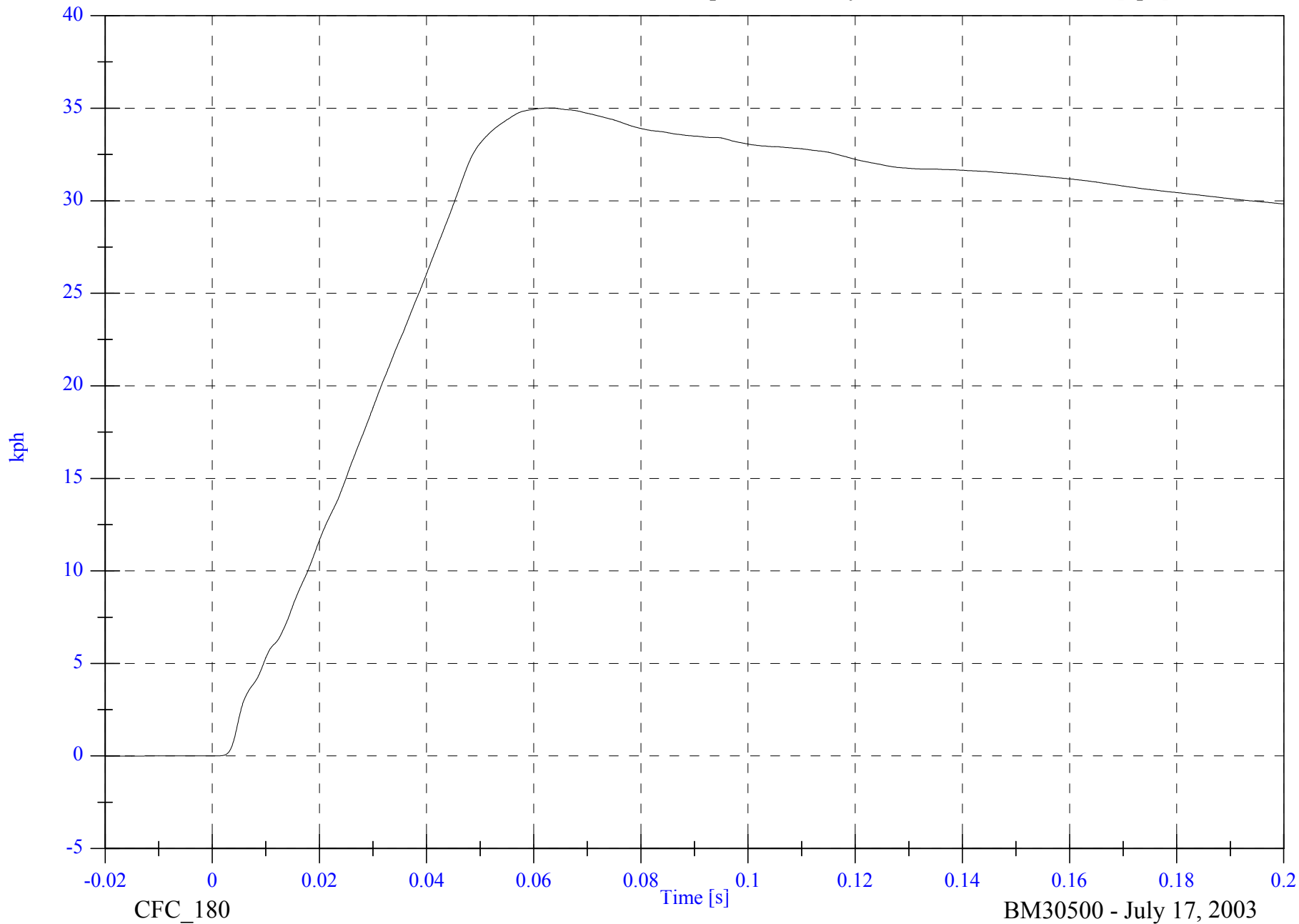
V2 A3 Rear Floorpan Y Velocity

Max: 35.0 [kph] at 0.063 [s]

Min: -0.0 [kph] at -0.017 [s]

B-50

8717-01



CFC\_180

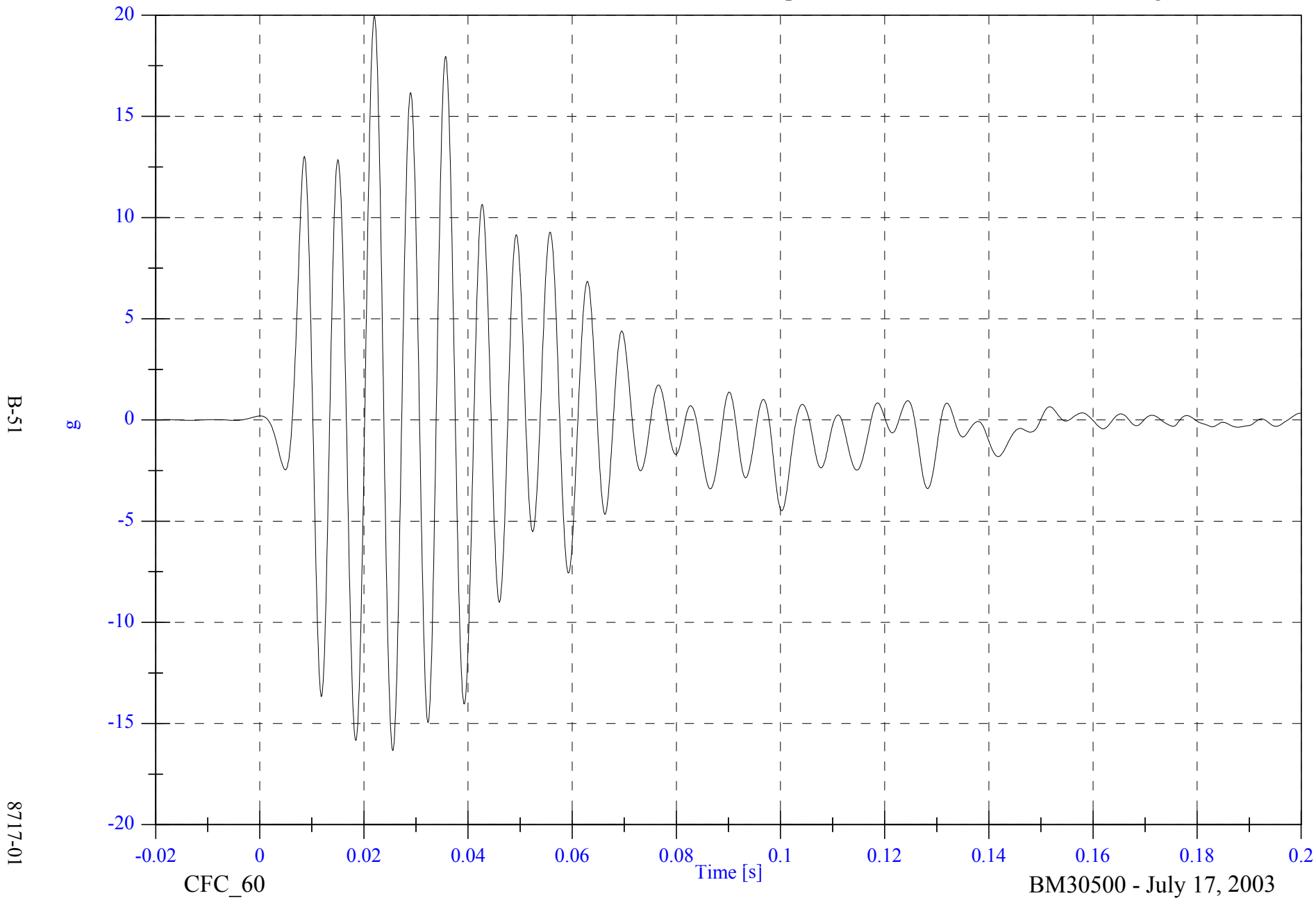
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A3 Rear Floorplan Z

Max: 19.9 [g] at 0.022 [s]

Min: -16.3 [g] at 0.025 [s]



2003 SNCAP Test 1 2003 BMW Z4

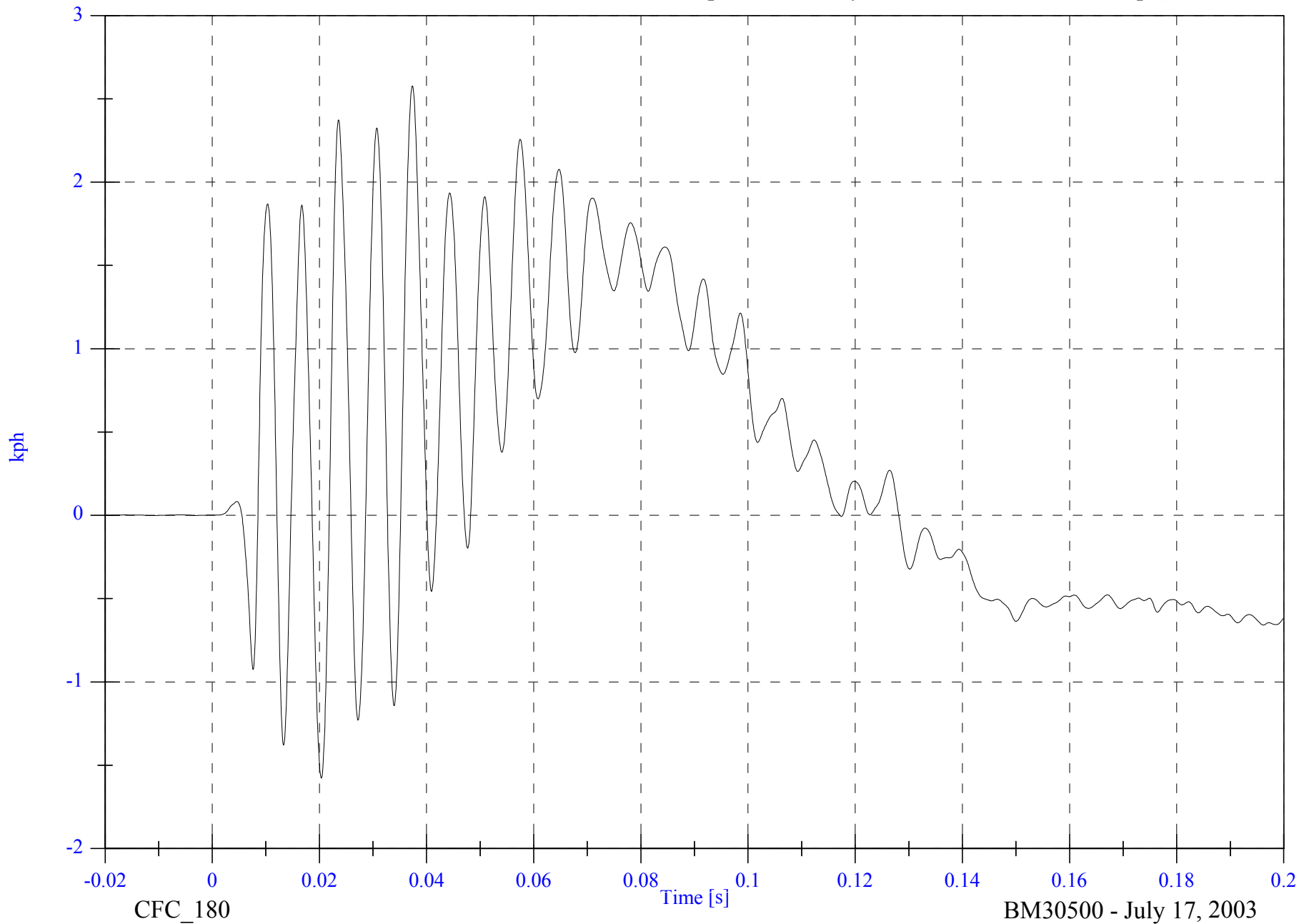
V2 A3 Rear Floorplan Z Velocity

Max: 2.6 [kph] at 0.037 [s]

Min: -1.6 [kph] at 0.020 [s]

B-52

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

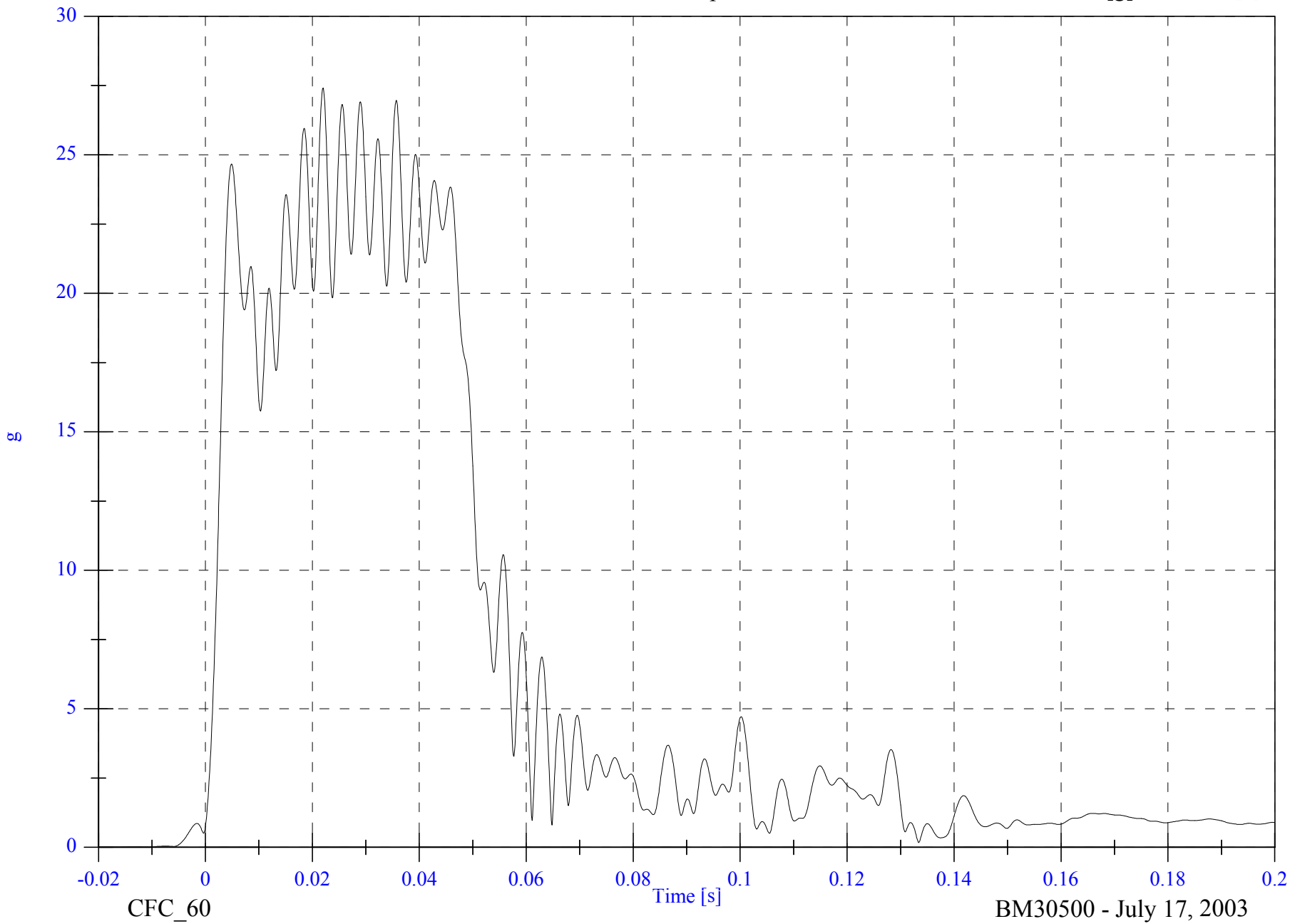
V2 A3 Rear Floorpan Resultant

Max: 27.4 [g] at 0.022 [s]

Min: 0.0 [g] at -0.016 [s]

B-53

8717-01



CFC\_60

Time [s]

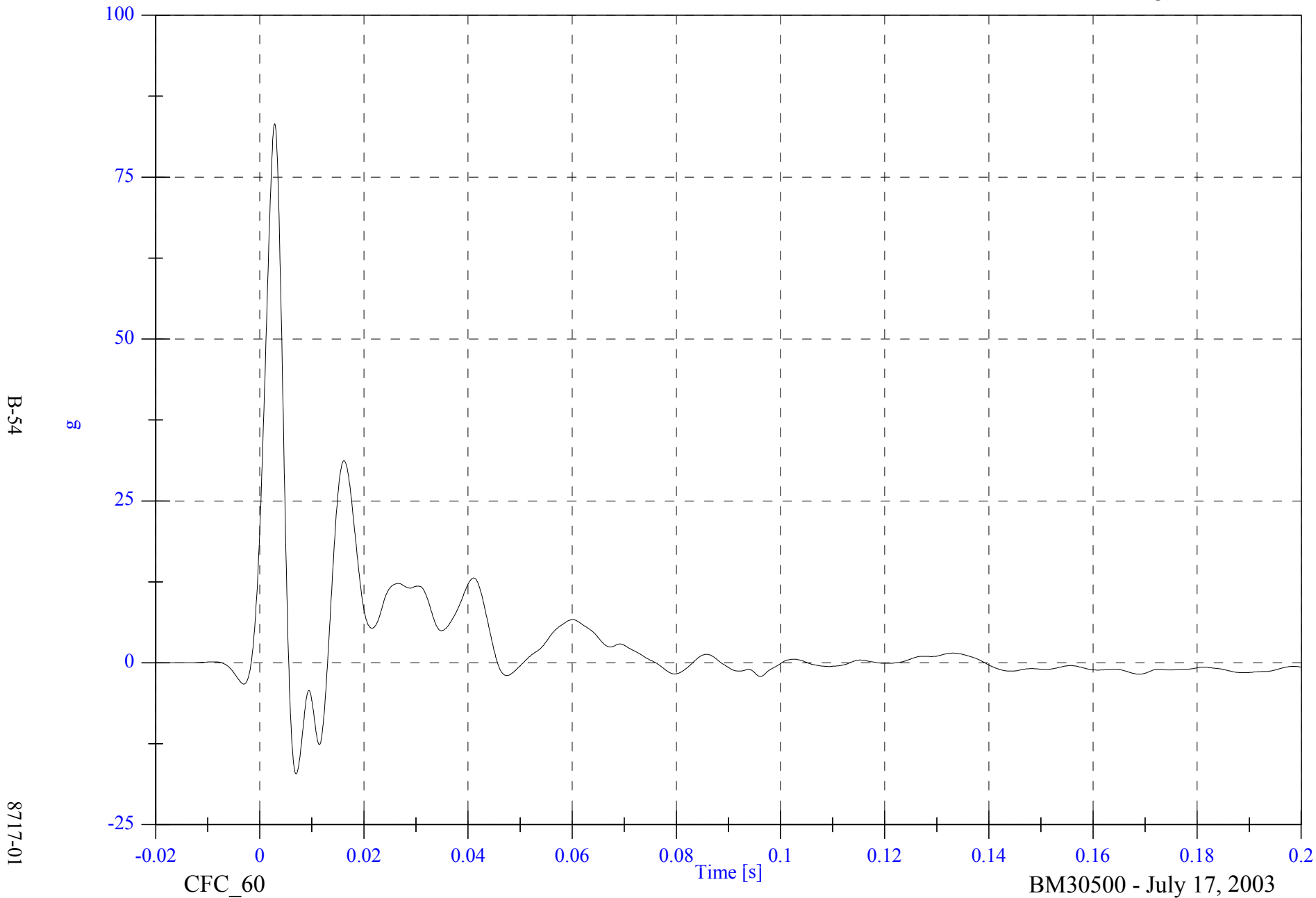
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A5 Left Front Sill Y

Max: 83.3 [g] at 0.003 [s]

Min: -17.2 [g] at 0.007 [s]



B-54

8717-01

CFC\_60

Time [s]

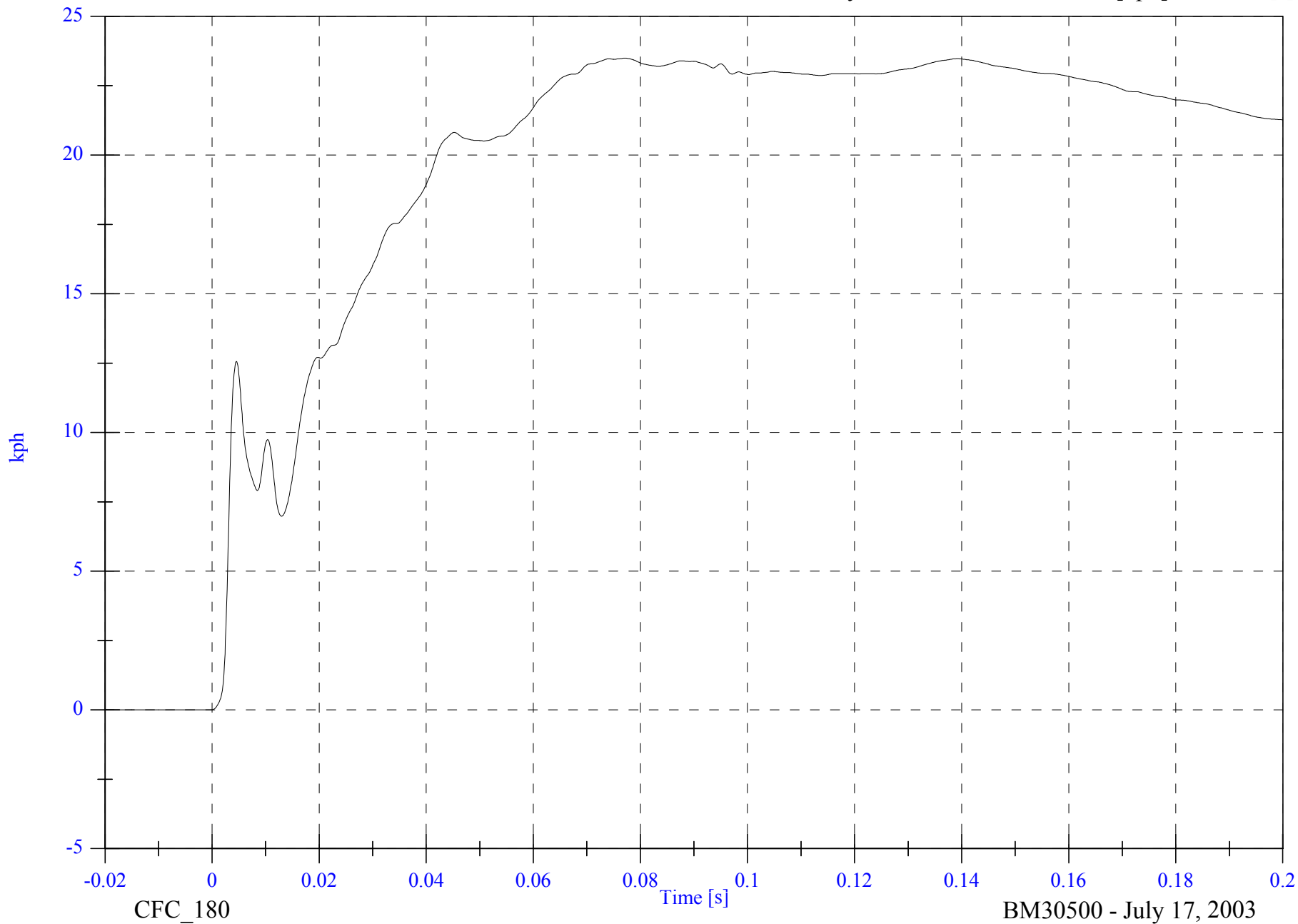
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A5 Left Front Sill Y Velocity

Max: 23.5 [kph] at 0.077 [s]

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



B-55

8717-01

CFC\_180

Time [s]

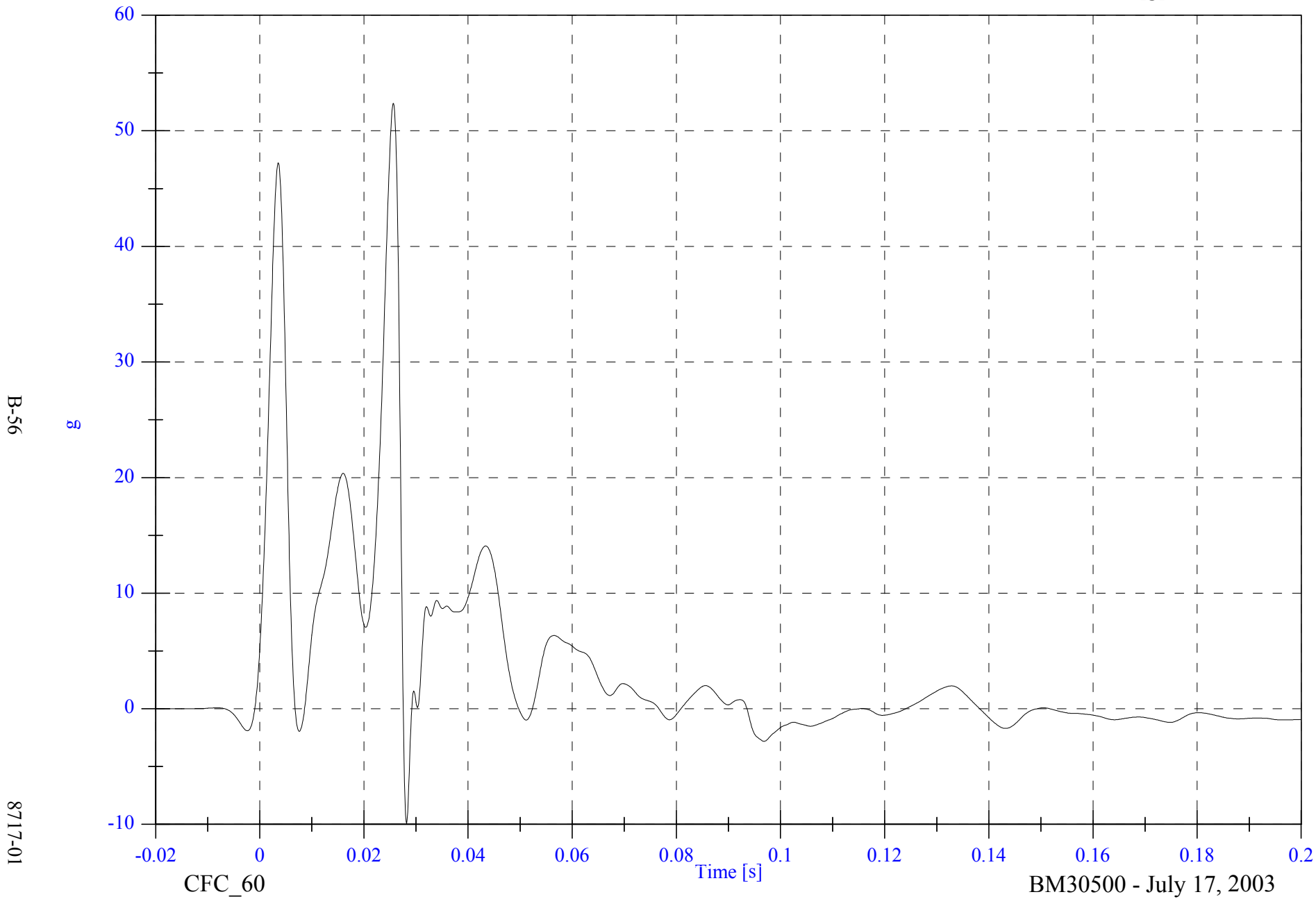
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A12 Left Lower B Post Y

Max: 52.4 [g] at 0.026 [s]

Min: -9.9 [g] at 0.028 [s]



2003 SNCAP Test 1 2003 BMW Z4

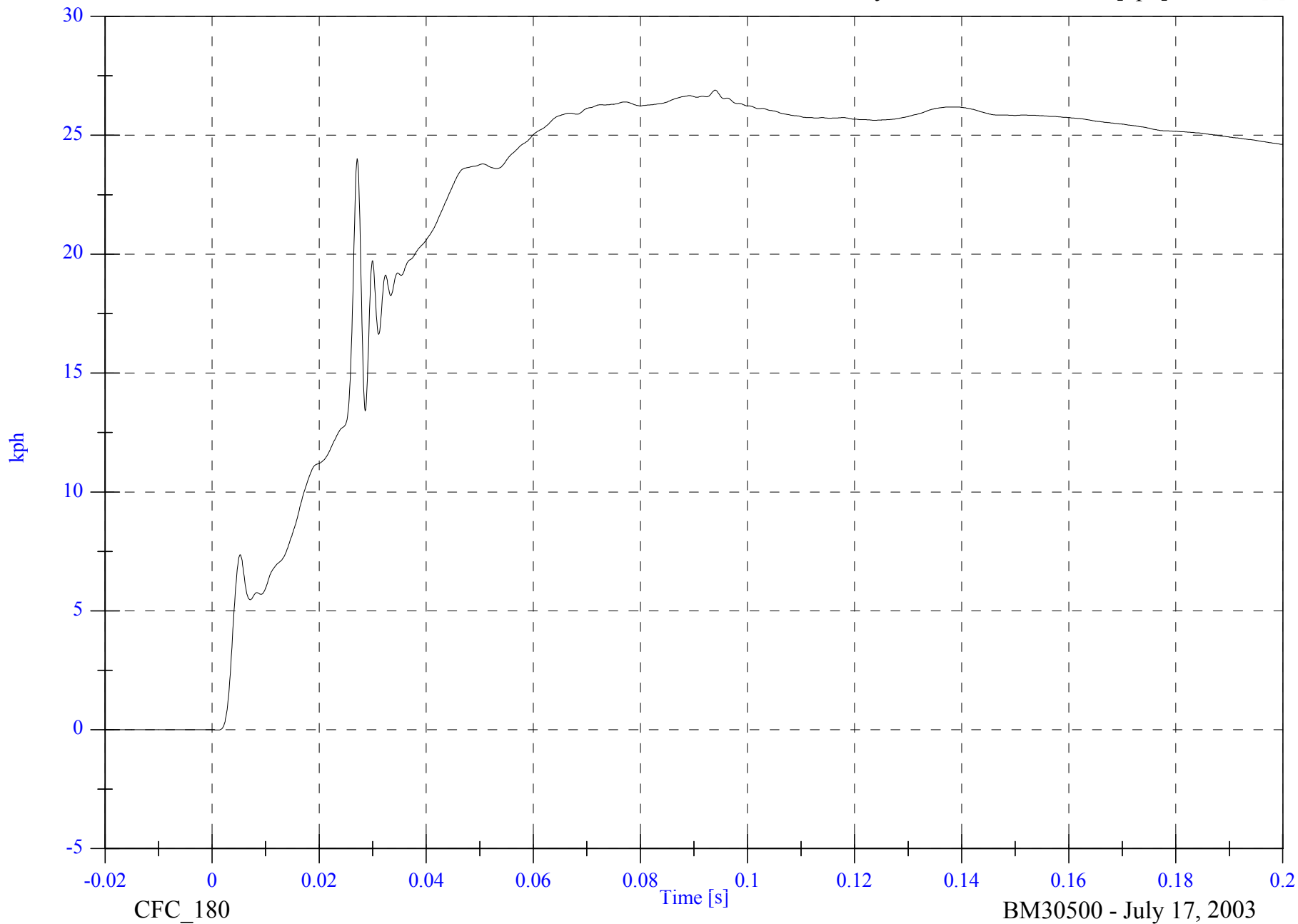
V2 A12 Left Lower B Post Y Velocity

Max: 26.9 [kph] at 0.094 [s]

Min: -0.0 [kph] at 0.001 [s]

B-57

8717-01



CFC\_180

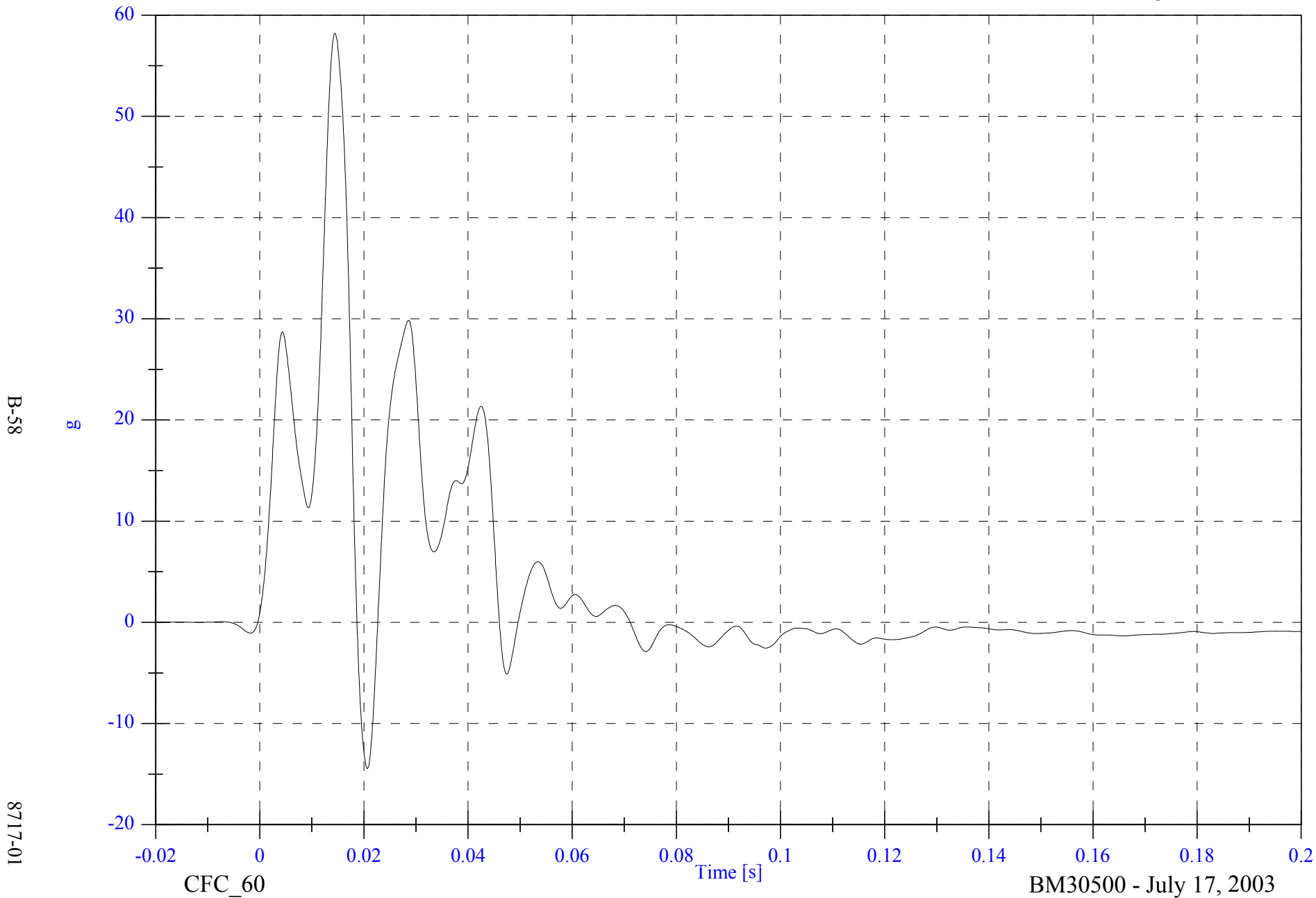
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A13 Left Mid B Post Y

Max: 58.2 [g] at 0.014 [s]

Min: -14.4 [g] at 0.021 [s]



B-58

g

8717-01

CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

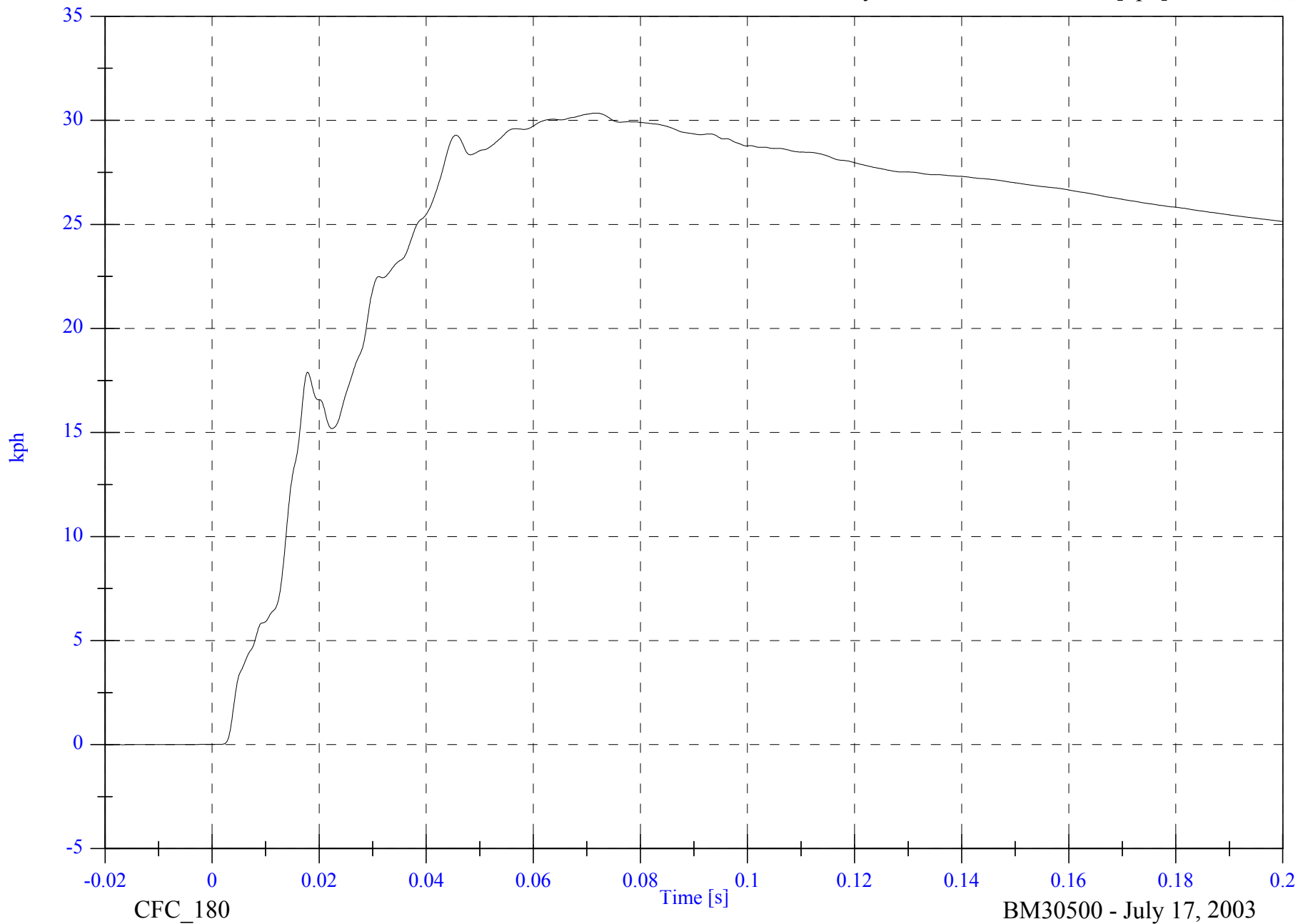
V2 A13 Left Mid B Post Y Velocity

Max: 30.3 [kph] at 0.072 [s]

Min: -0.0 [kph] at -0.020 [s]

B-59

8717-01



CFC\_180

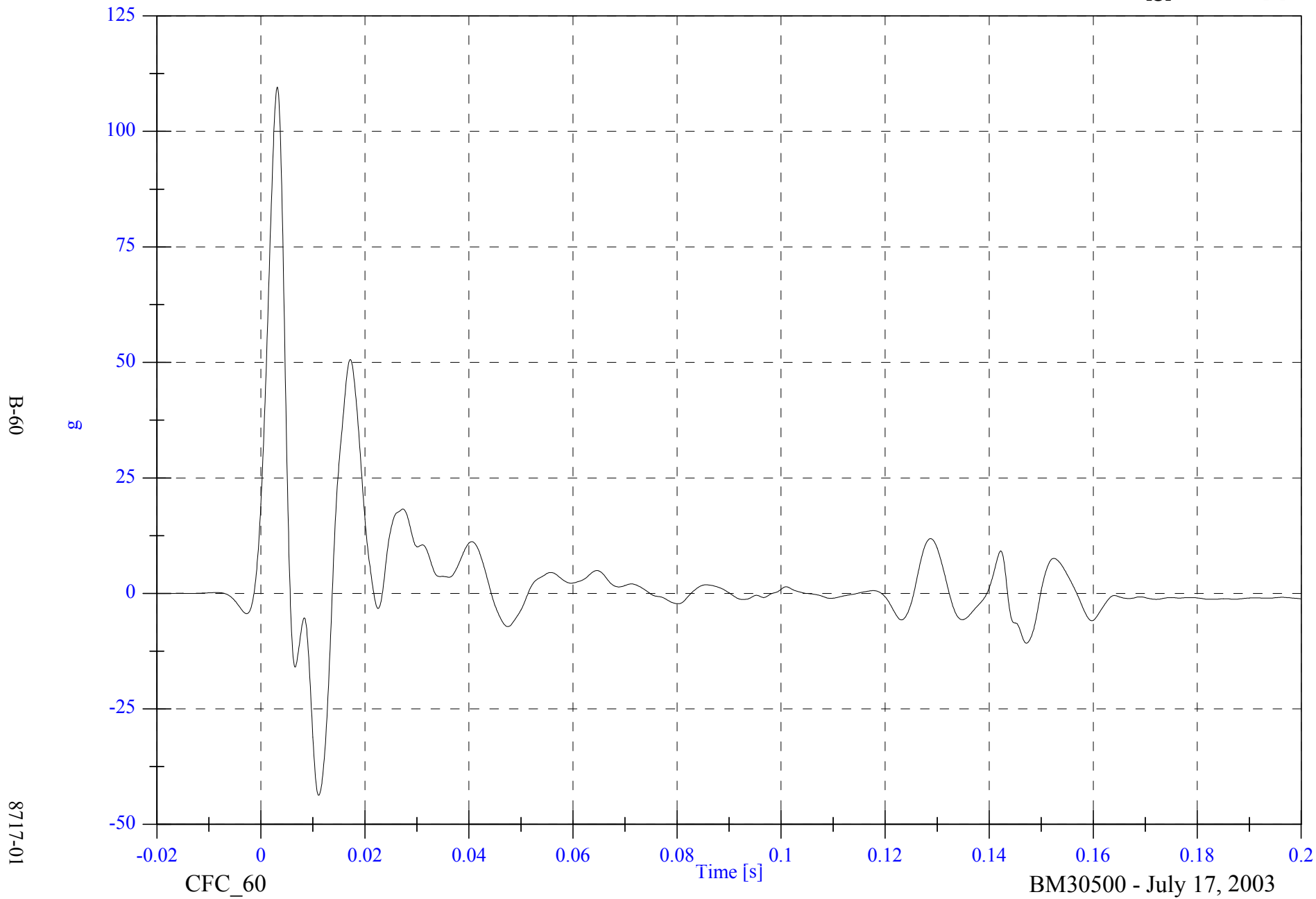
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A14 Left Lower A Post Y

Max: 109.6 [g] at 0.003 [s]

Min: -43.7 [g] at 0.011 [s]

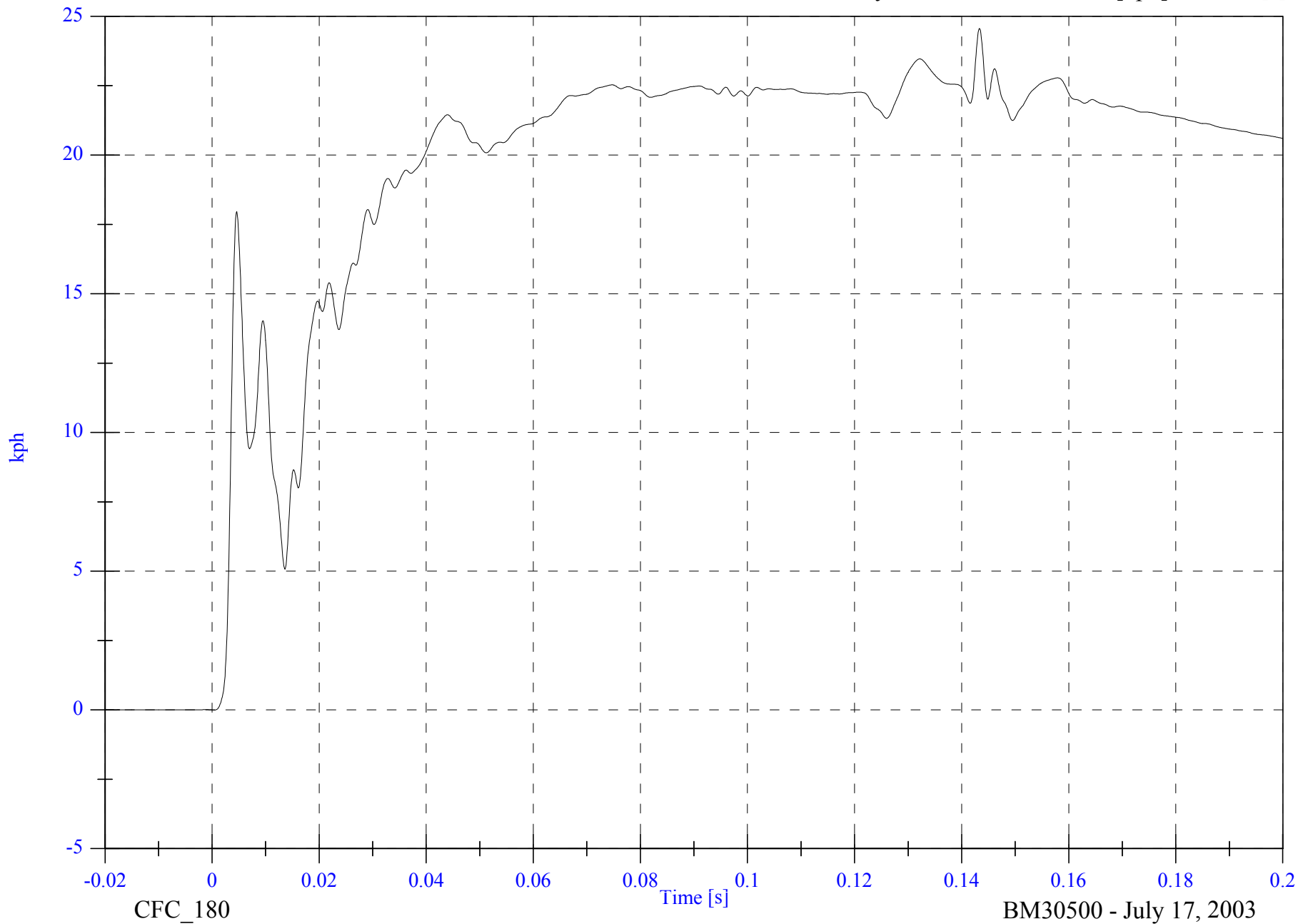


2003 SNCAP Test 1 2003 BMW Z4

V2 A14 Left Lower A Post Y Velocity

Max: 24.6 [kph] at 0.143 [s]

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



B-61

8717-01

CFC\_180

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

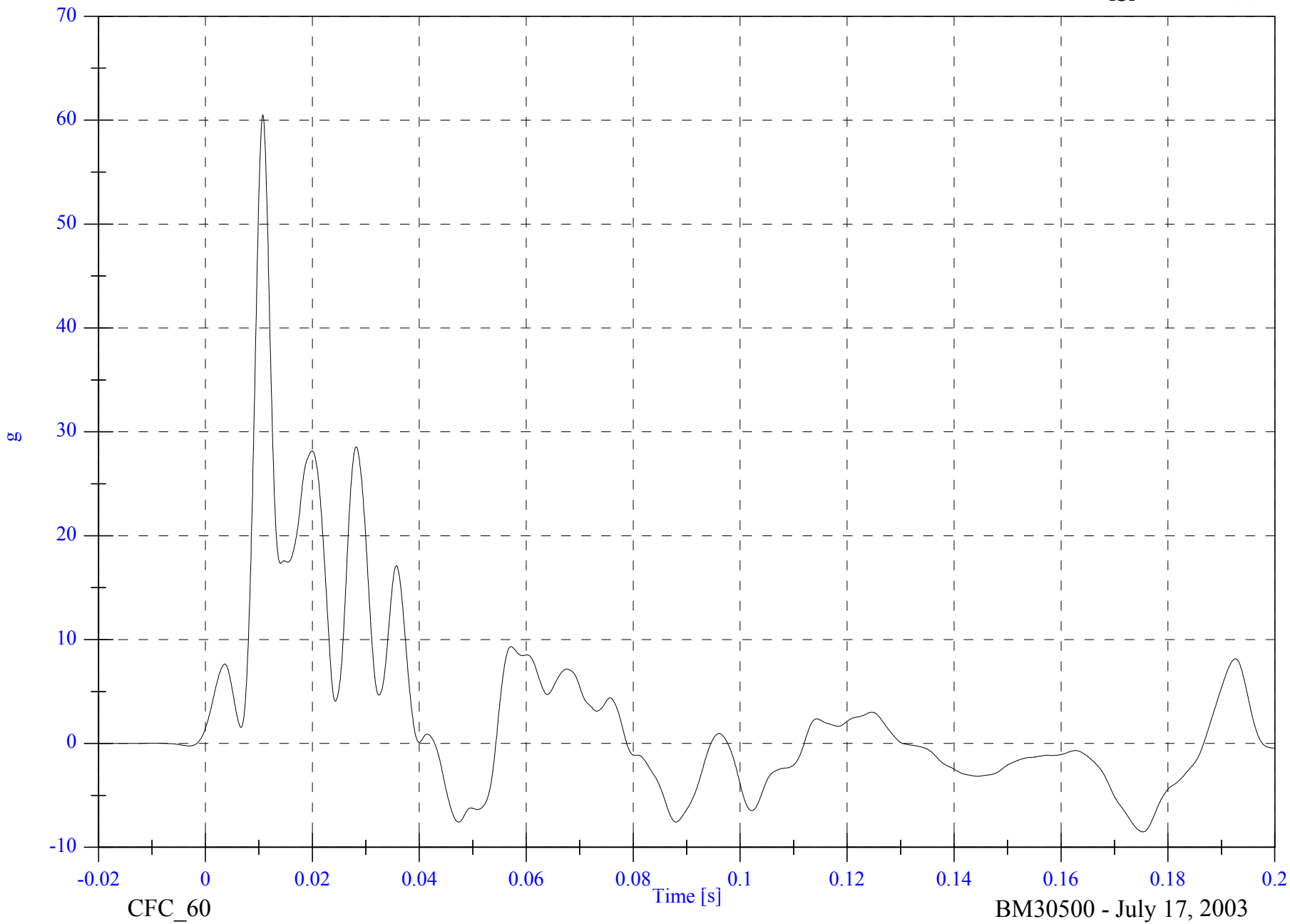
V2 A15 Left Mid A Post Y

Max: 60.5 [g] at 0.011 [s]

Min: -8.5 [g] at 0.175 [s]

B-62

8717-01



2003 SNCAP Test 1 2003 BMW Z4

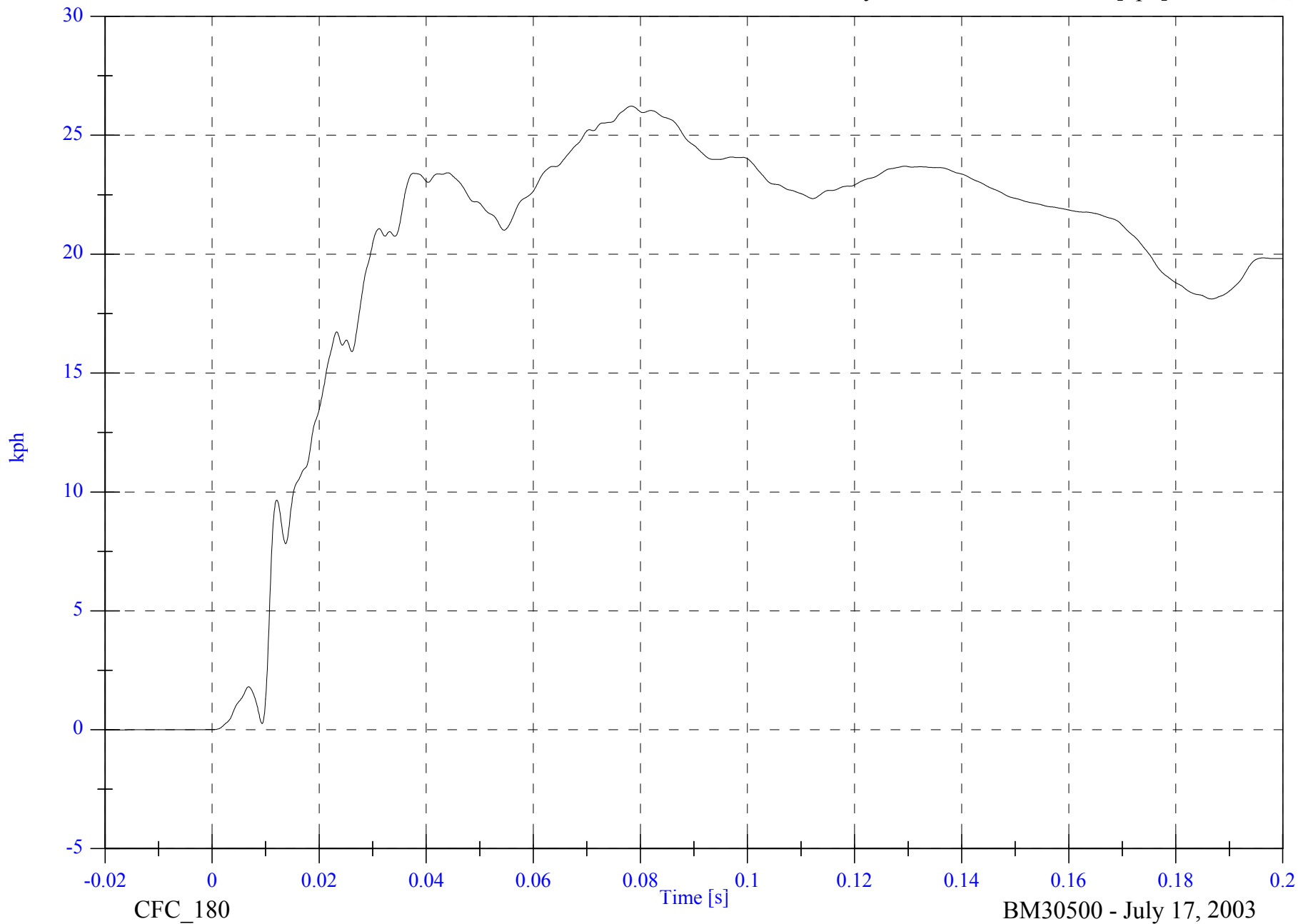
V2 A15 Left Mid A Post Y Velocity

Max: 26.2 [kph] at 0.078 [s]

Min: -0.0 [kph] at -0.017 [s]

B-63

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

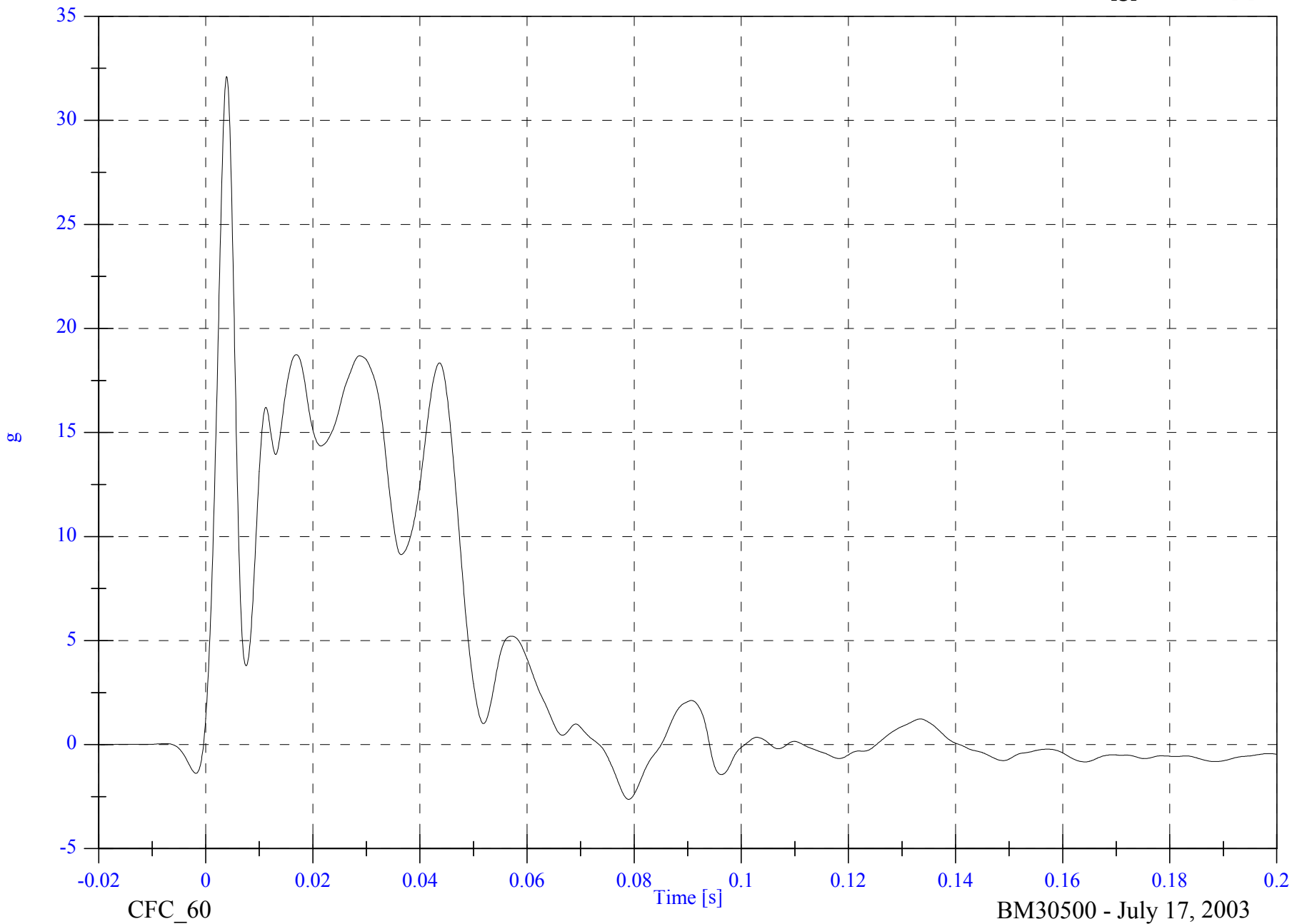
V2 A16 Front Seat Track Y

Max: 32.1 [g] at 0.004 [s]

Min: -2.6 [g] at 0.079 [s]

B-64

8717-01



CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

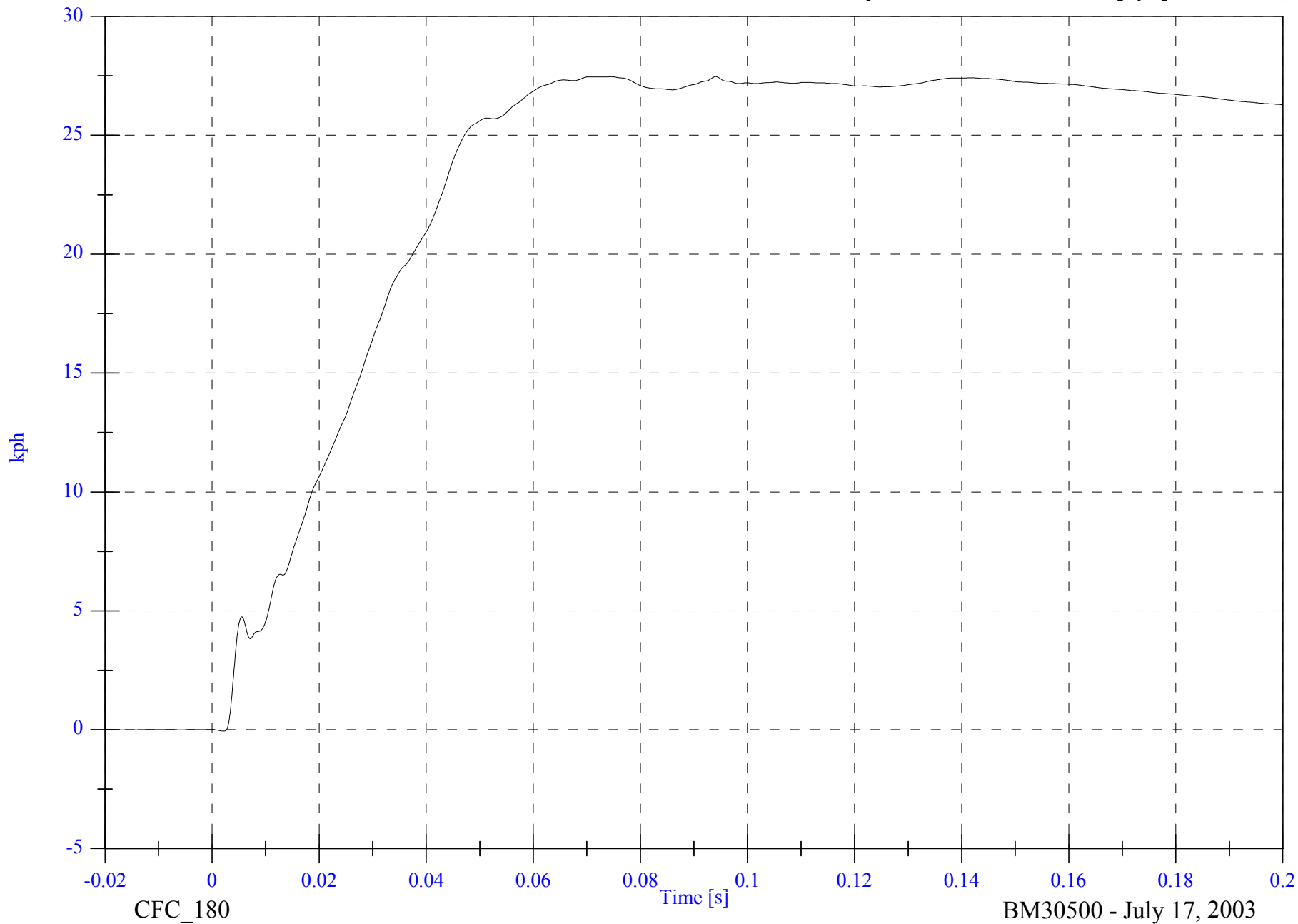
V2 A16 Front Seat Track Y Velocity

Max: 27.5 [kph] at 0.094 [s]

Min: -0.1 [kph] at 0.002 [s]

B-65

8717-01



CFC\_180

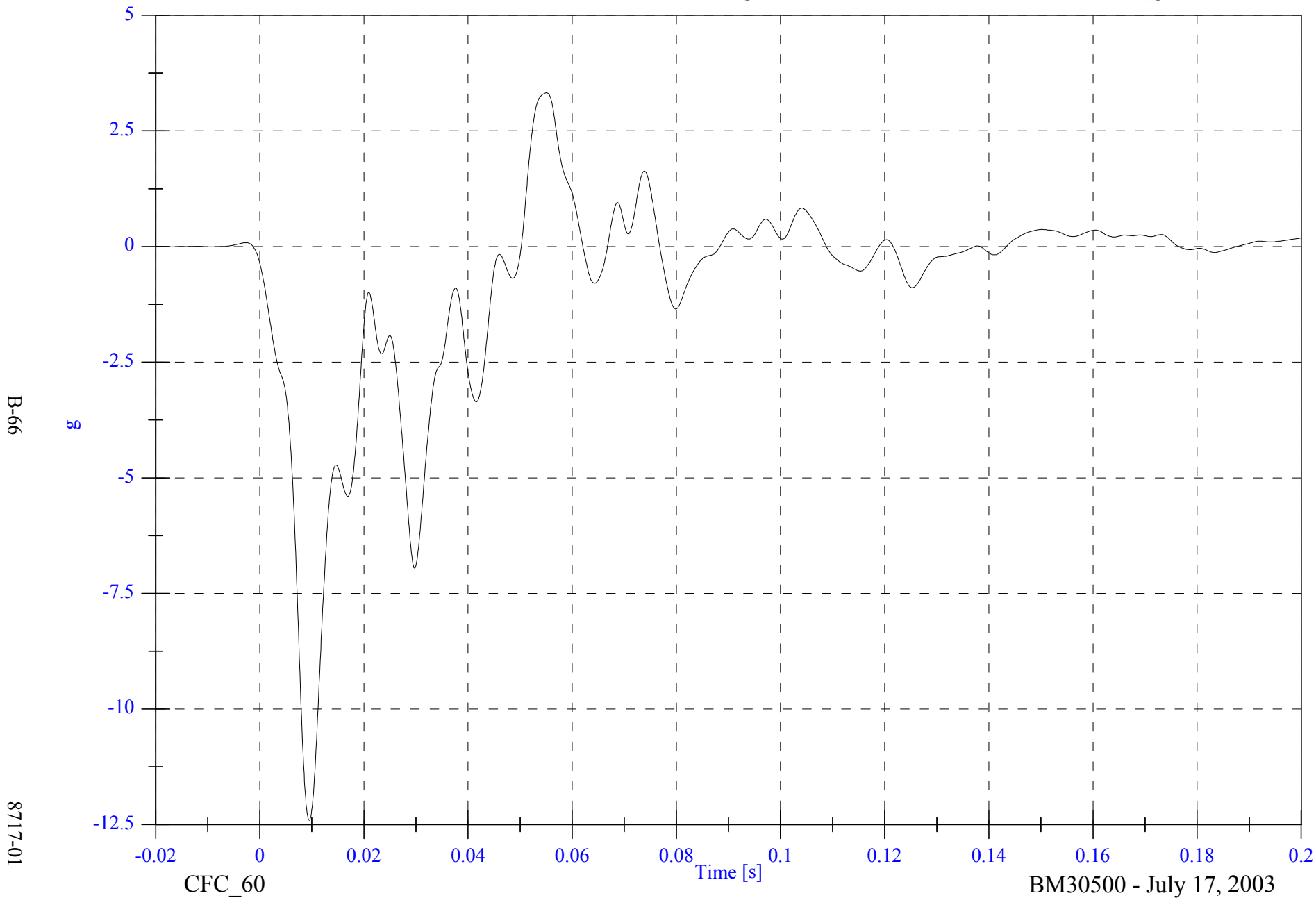
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A18 Target CG X

Max: 3.3 [g] at 0.055 [s]

Min: -12.4 [g] at 0.010 [s]



B-66

8717-01

CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

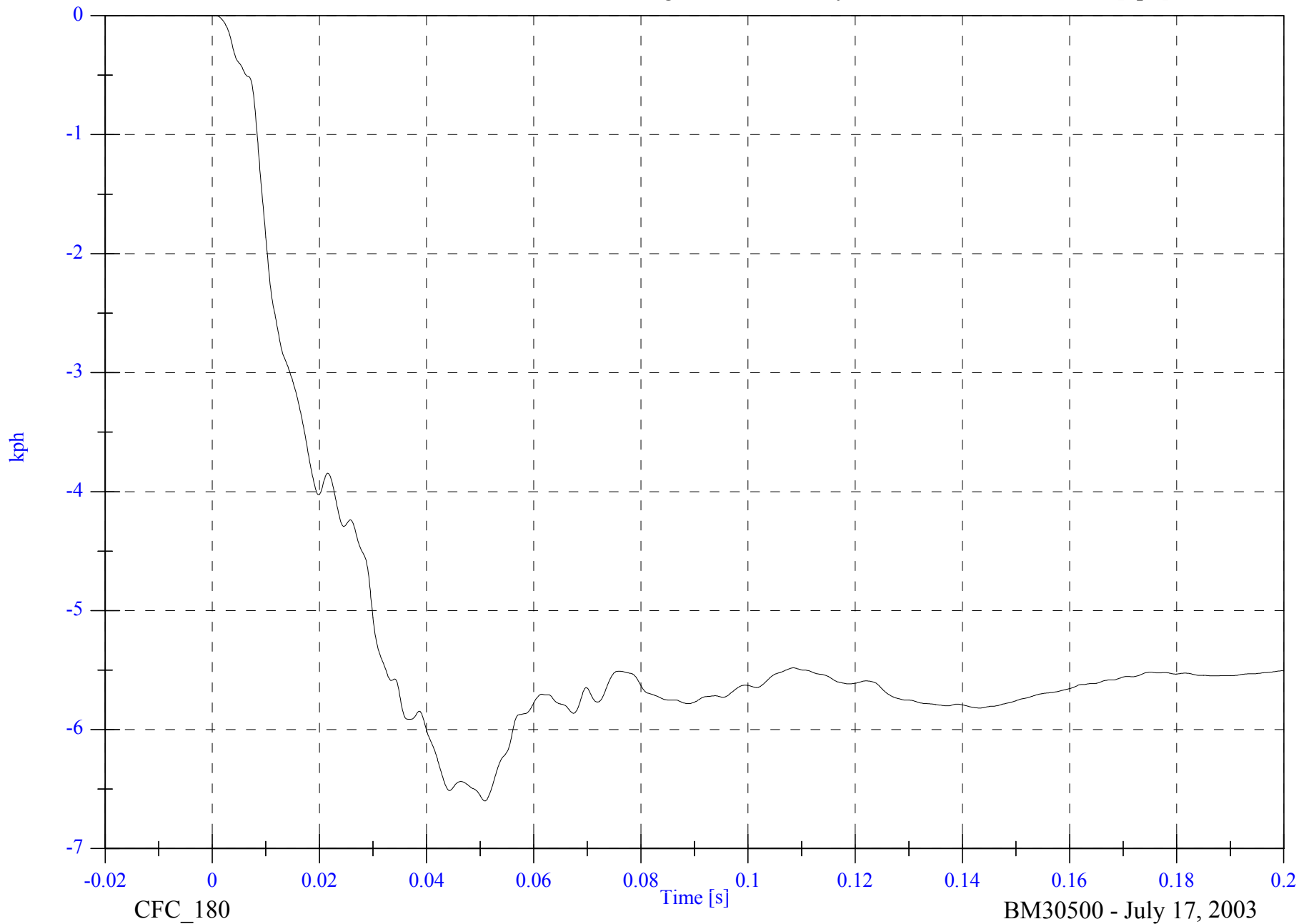
V2 A18 Target CG X Velocity

Max: 0.0 [kph] at -0.018 [s]

Min: -6.6 [kph] at 0.051 [s]

B-67

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

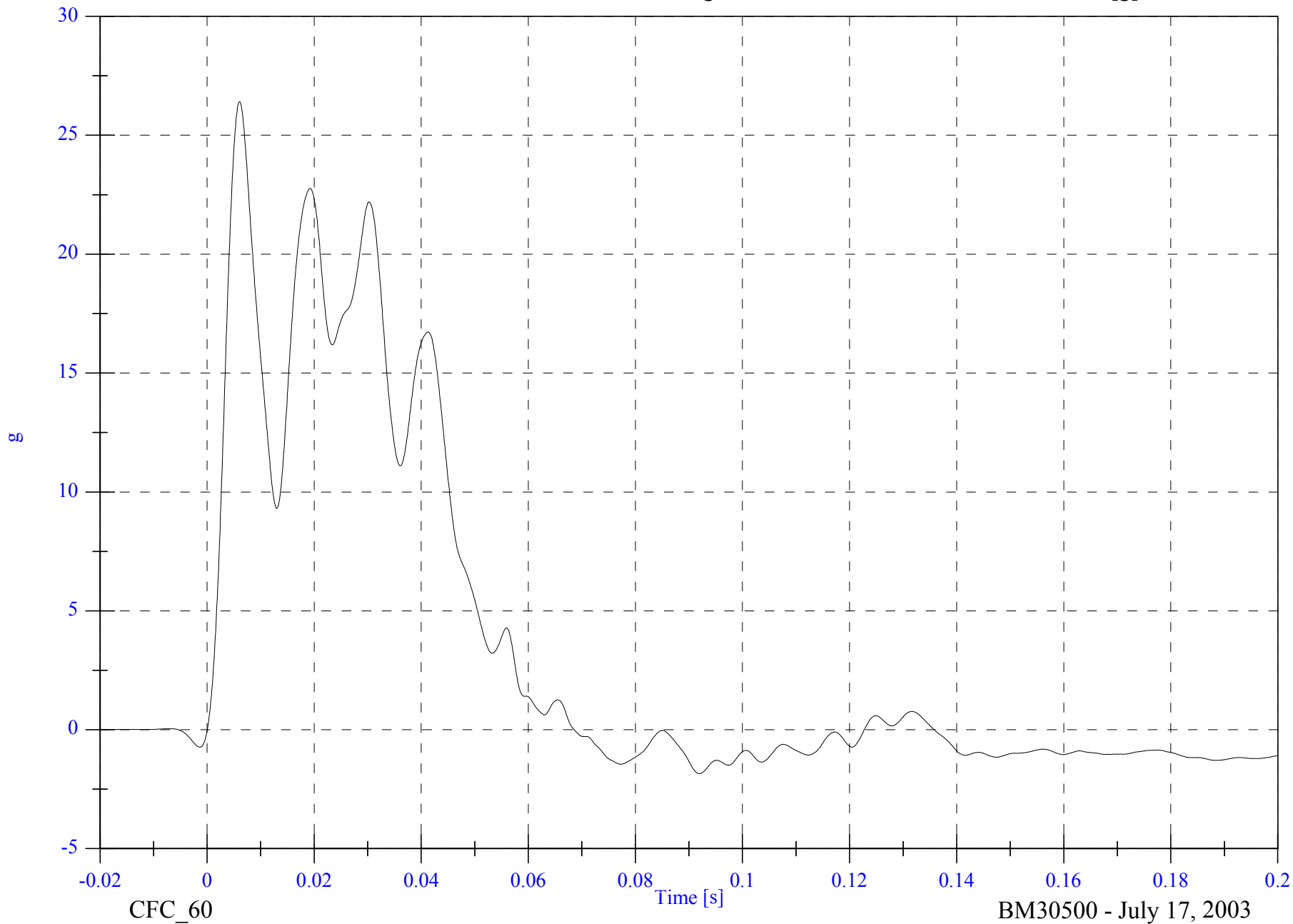
V2 A18 Target CG Y

Max: 26.4 [g] at 0.006 [s]

Min: -1.8 [g] at 0.092 [s]

B-68

8717-01



CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

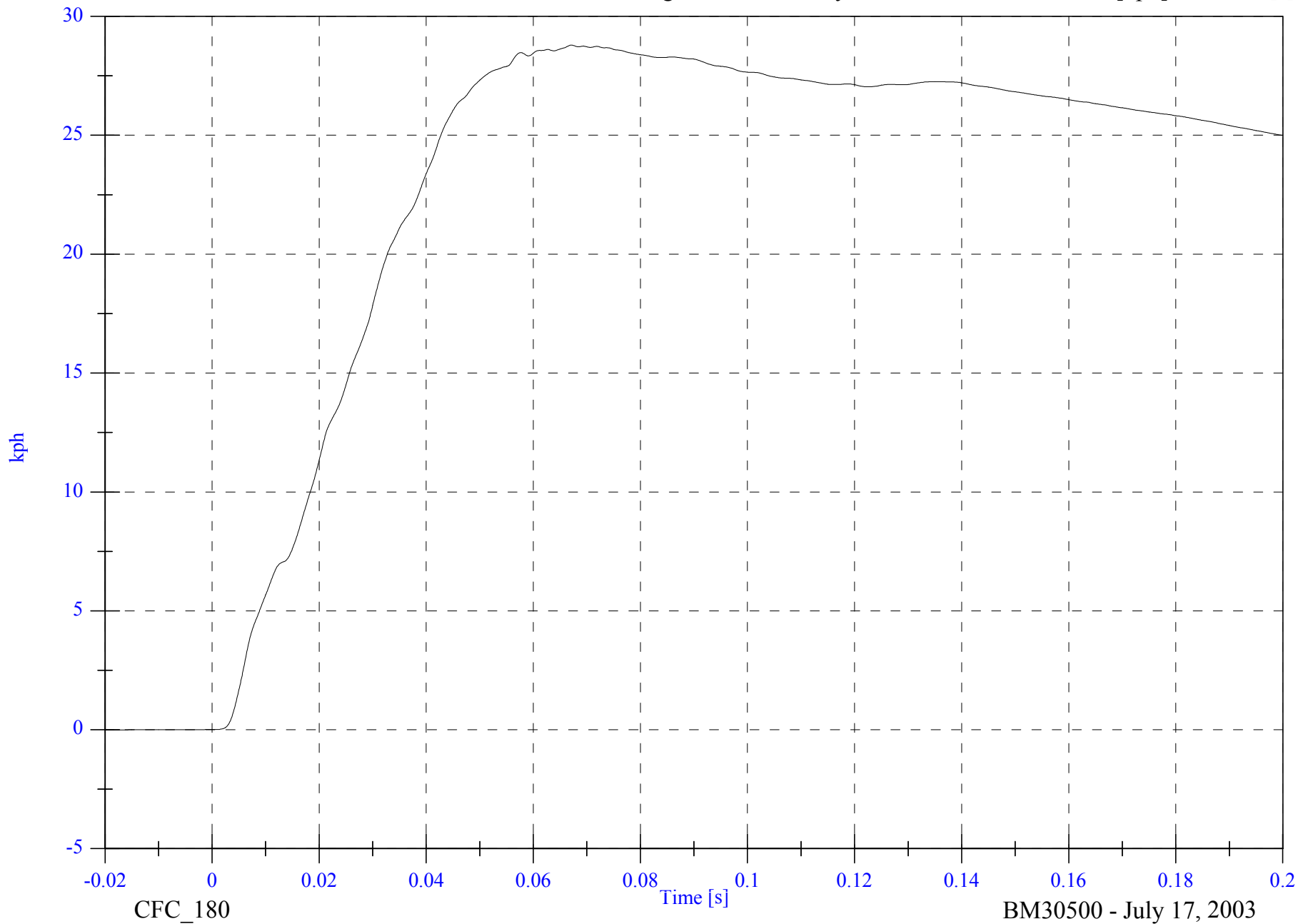
V2 A18 Target CG Y Velocity

Max: 28.8 [kph] at 0.067 [s]

Min: -0.0 [kph] at -0.020 [s]

B-69

8717-01



CFC\_180

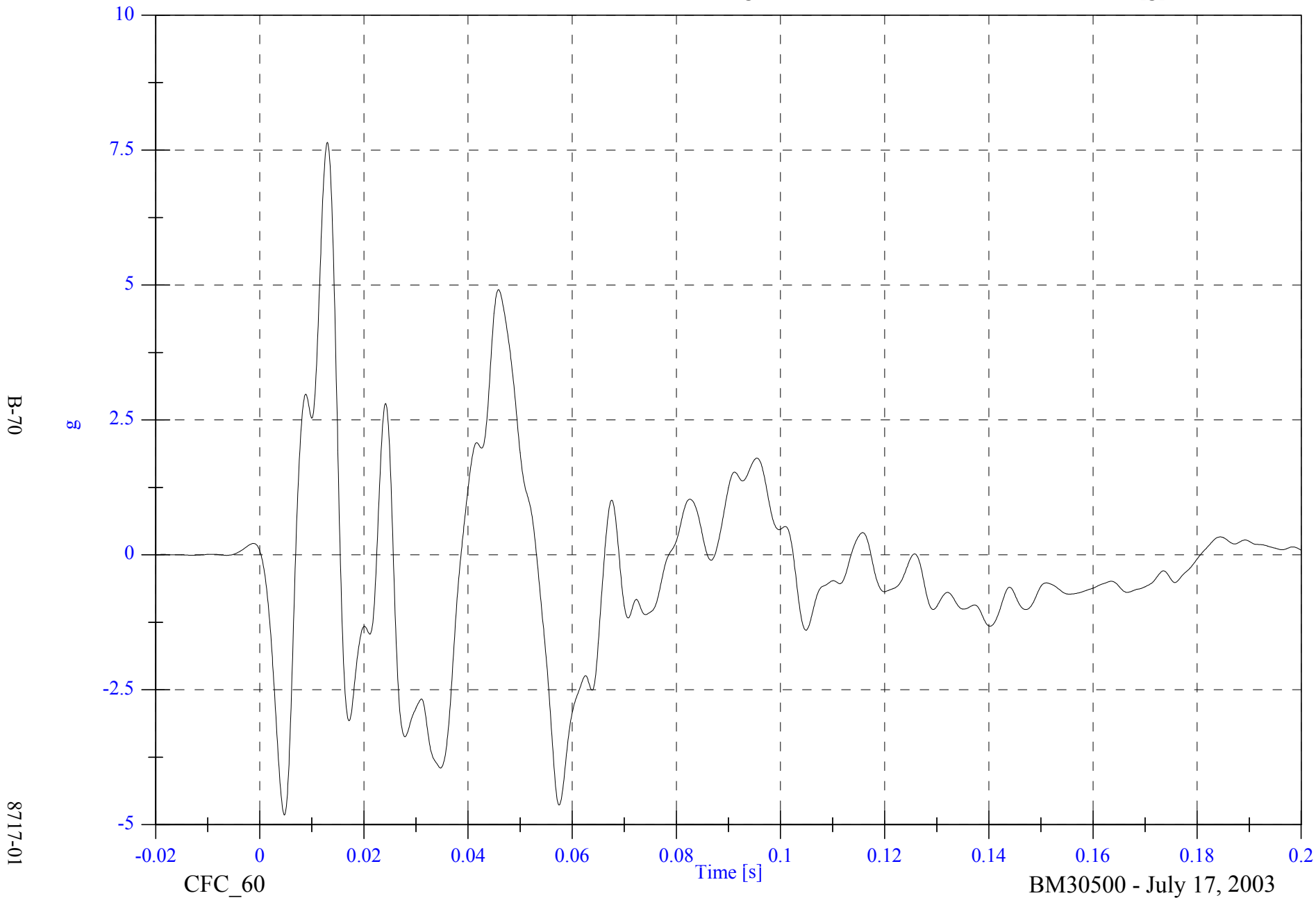
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A18 Target CG Z

Max: 7.6 [g] at 0.013 [s]

Min: -4.8 [g] at 0.005 [s]



B-70

8717-01

CFC\_60

Time [s]

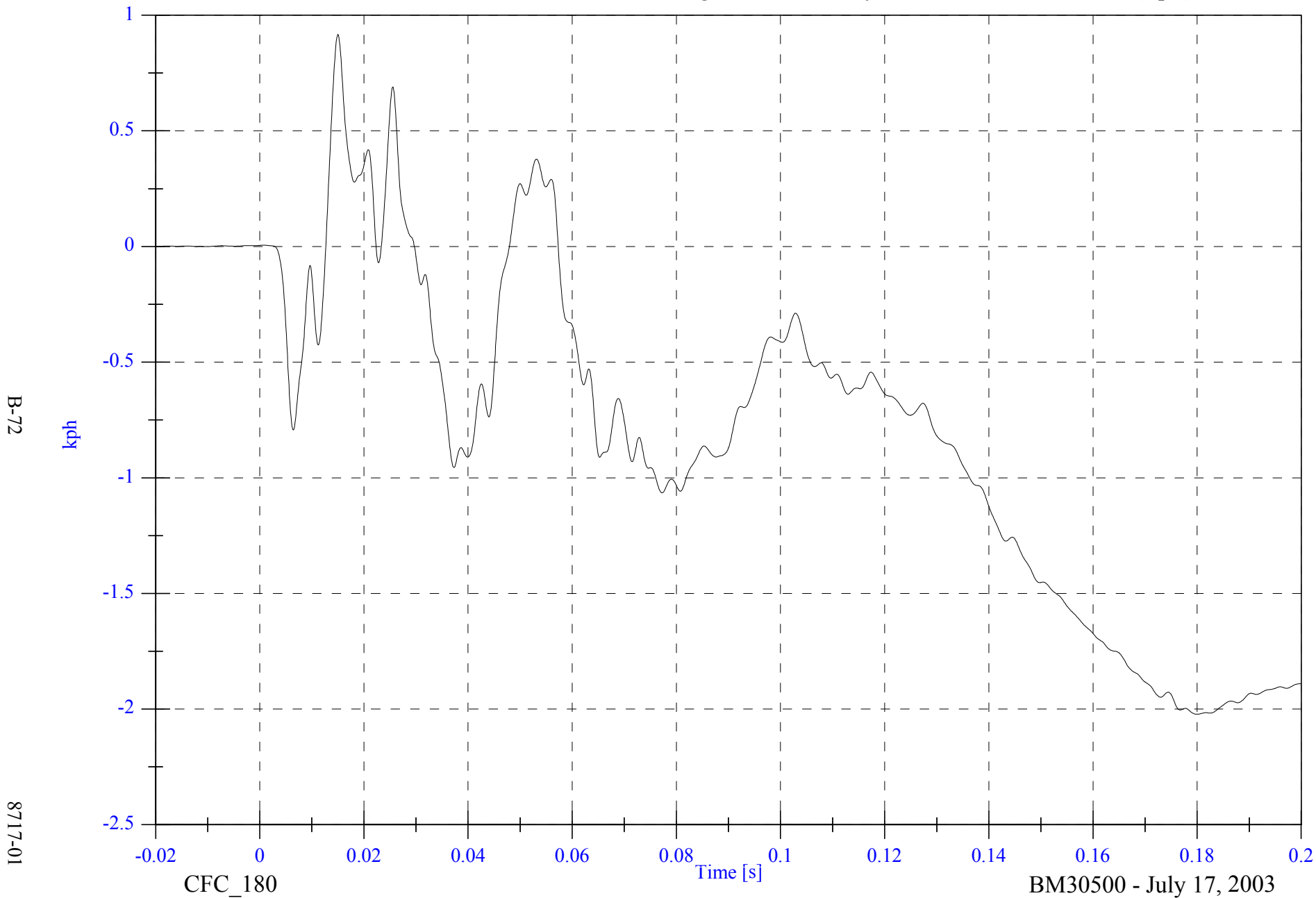
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A18 Target CG Z Velocity

Max: 0.9 [kph] at 0.015 [s]

Min: -2.0 [kph] at 0.180 [s]



B-72

8717-01

CFC\_180

Time [s]

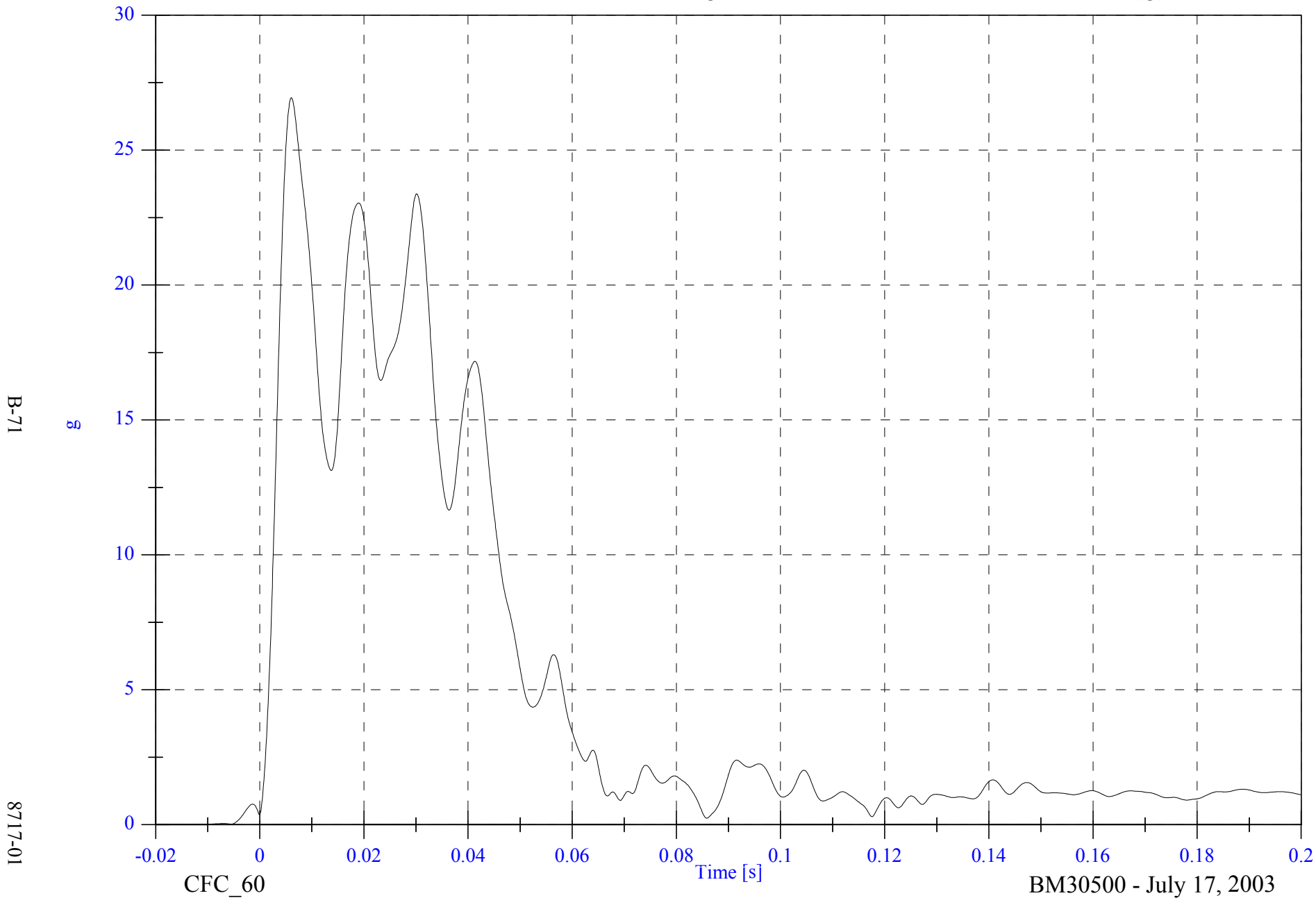
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2 A18 Target CG Resultant

Max: 26.9 [g] at 0.006 [s]

Min: 0.0 [g] at -0.020 [s]



B-71

8717-01

CFC\_60

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

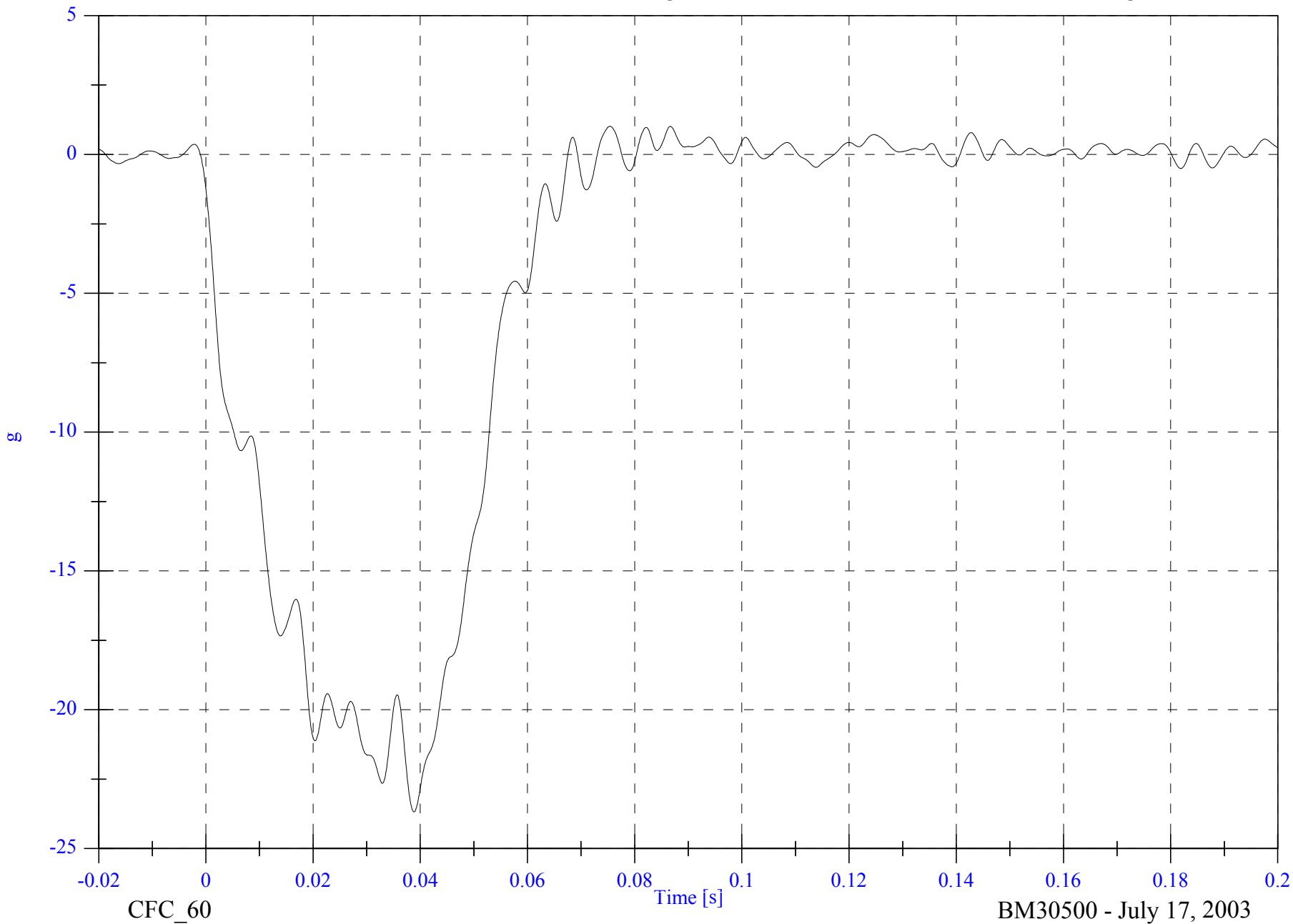
V1 Moving Barrier CG X

Max: 1.0 [g] at 0.075 [s]

Min: -23.7 [g] at 0.039 [s]

B-73

8717-01



CFC\_60

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

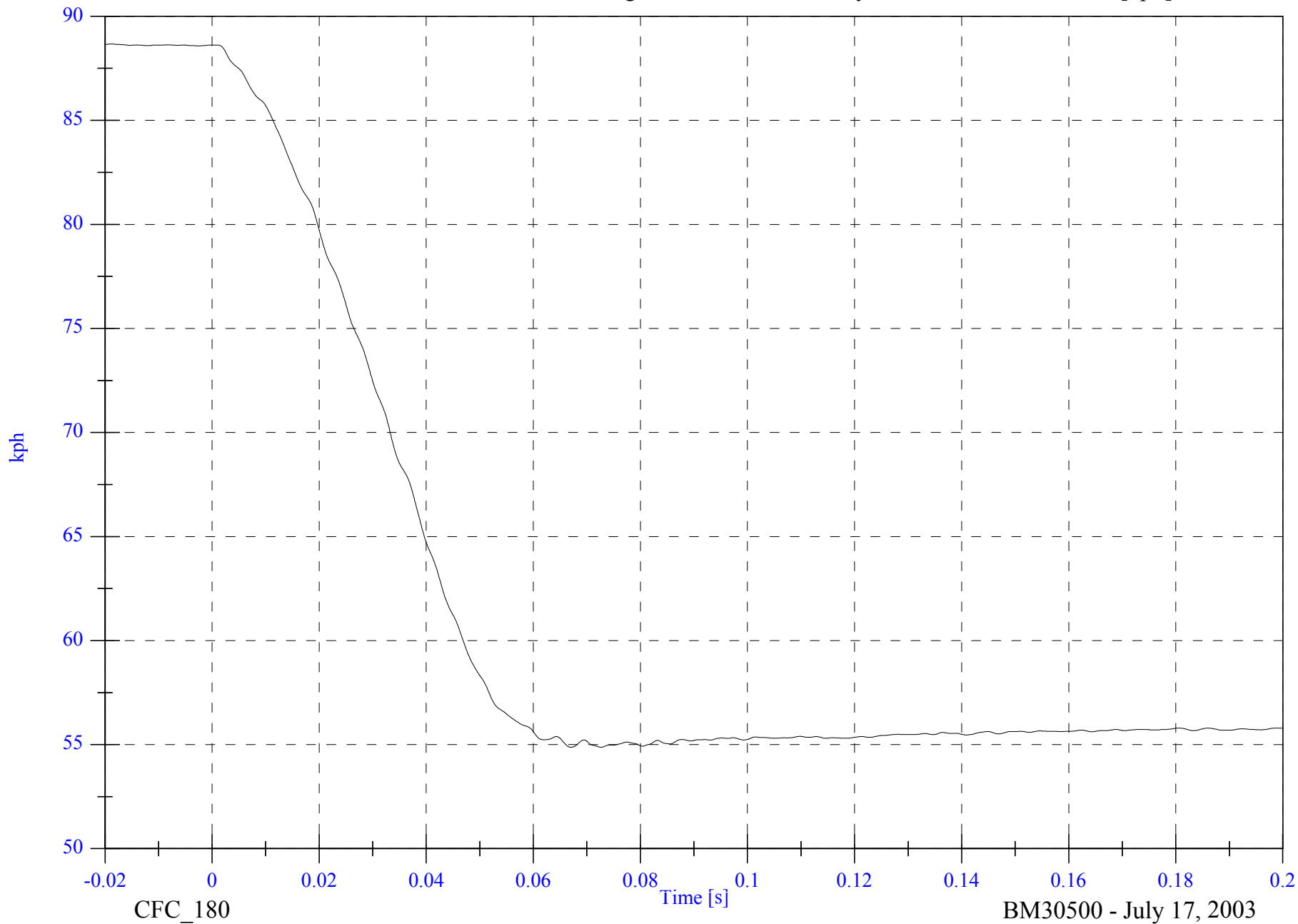
Max: 88.7 [kph] at -0.019 [s]

V1 Moving Barrier CG X Velocity

Min: 54.9 [kph] at 0.073 [s]

B-74

8717-01



CFC\_180

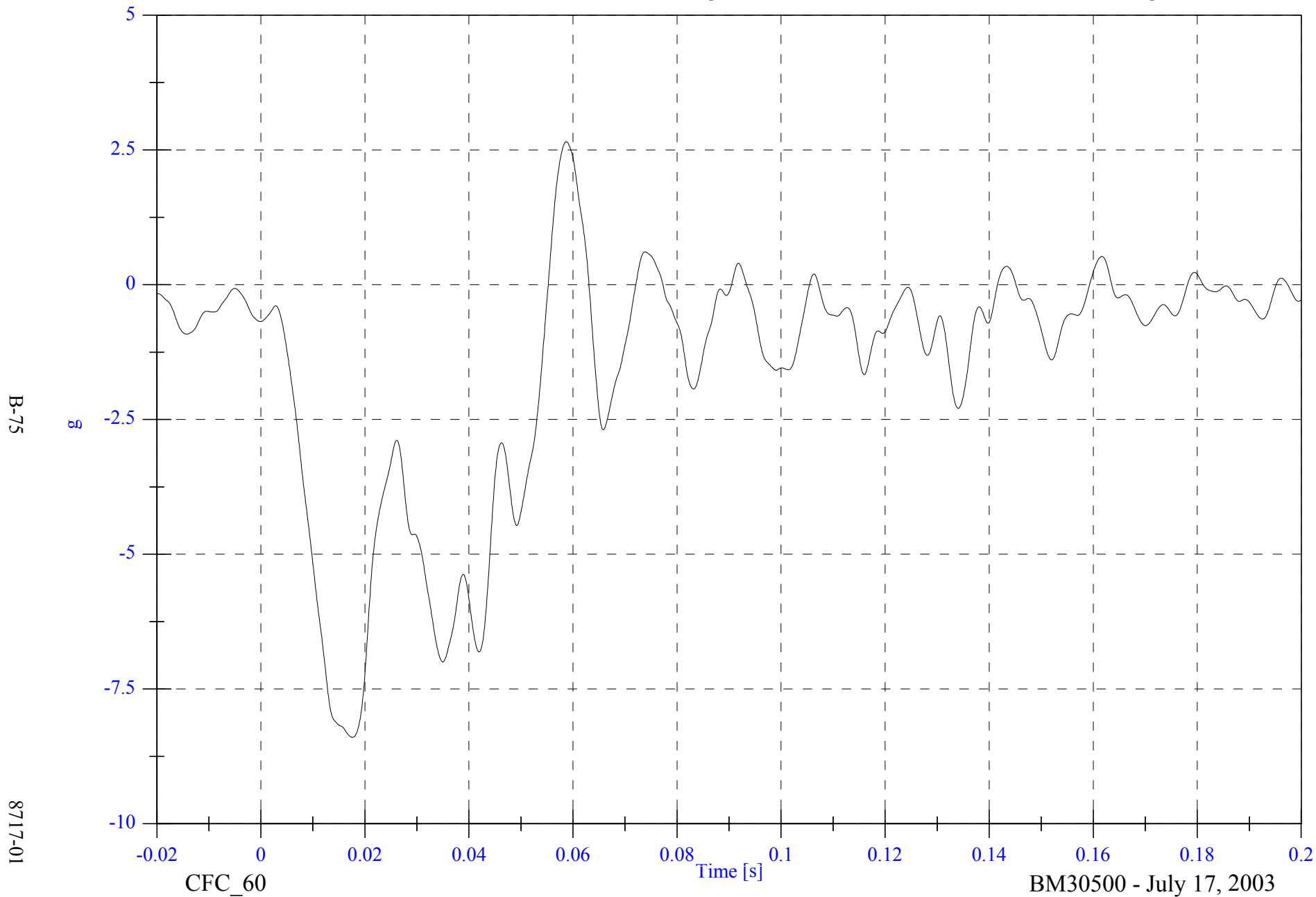
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V1 Moving Barrier CG Y

Max: 2.7 [g] at 0.059 [s]

Min: -8.4 [g] at 0.018 [s]



B-75

8717-01

CFC\_60

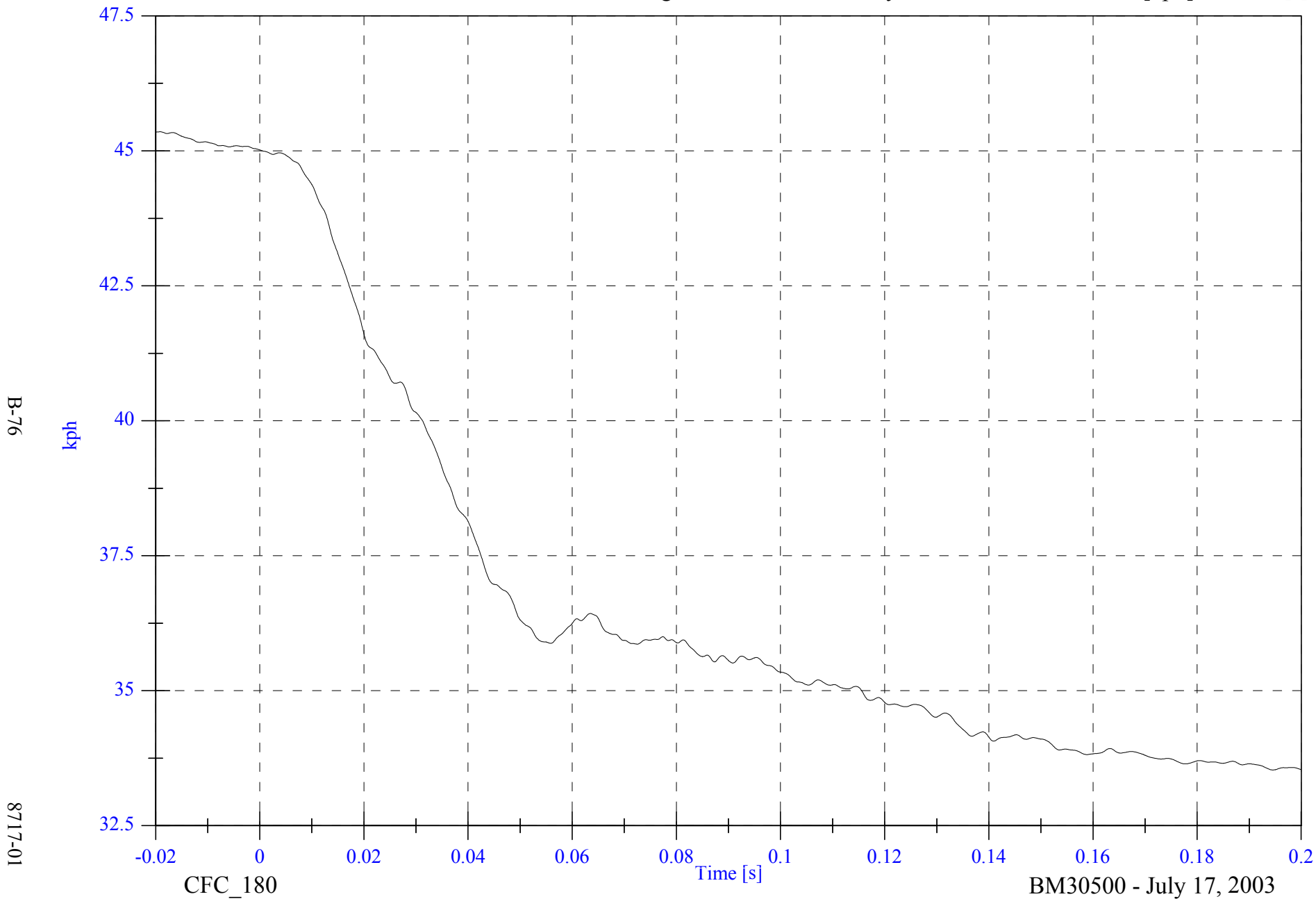
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

Max: 45.4 [kph] at -0.019 [s]

V1 Moving Barrier CG Y Velocity

Min: 33.5 [kph] at 0.195 [s]



B-76

8717-01

CFC\_180

Time [s]

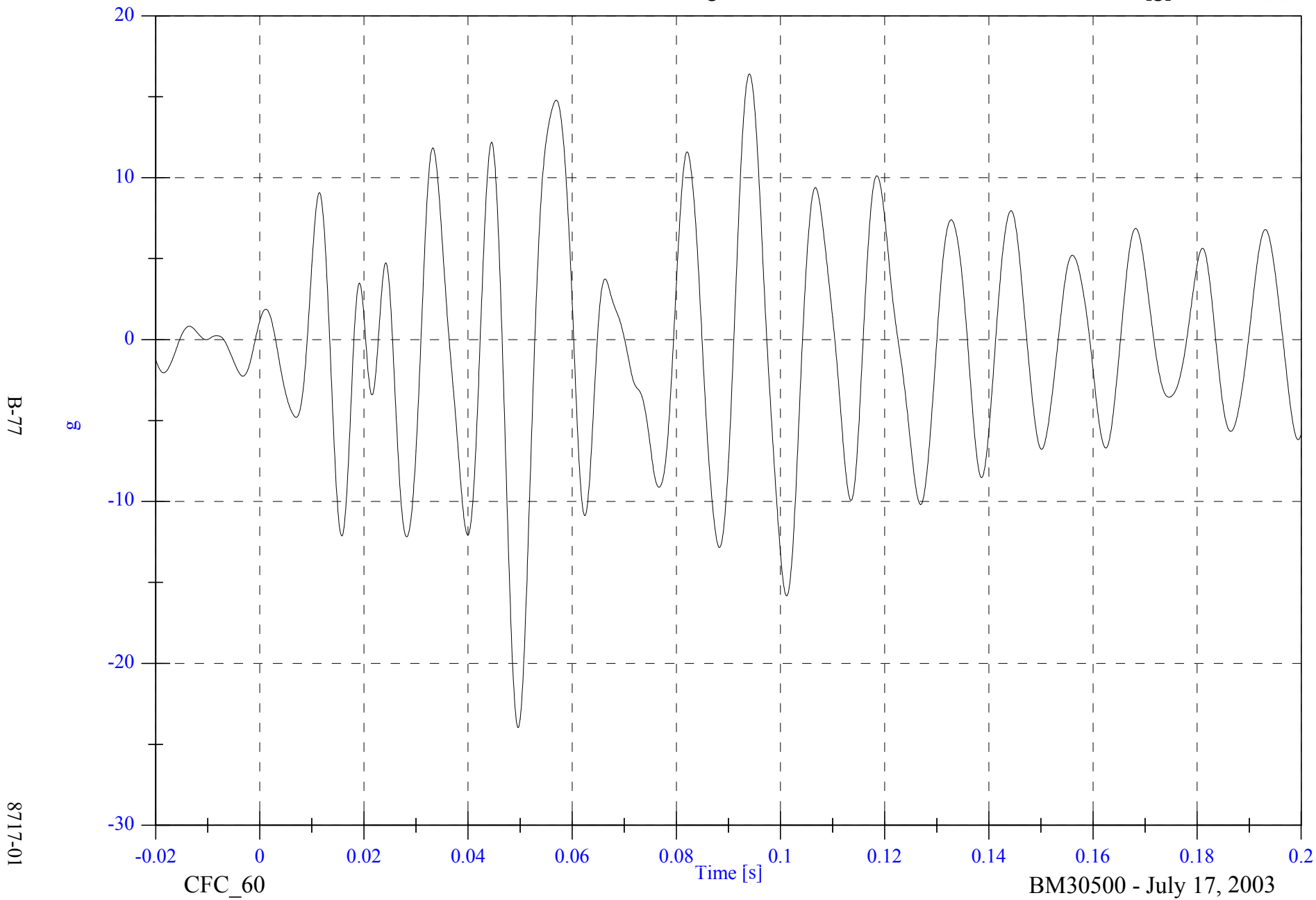
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V1 Moving Barrier CG Z

Max: 16.4 [g] at 0.094 [s]

Min: -24.0 [g] at 0.050 [s]



2003 SNCAP Test 1 2003 BMW Z4

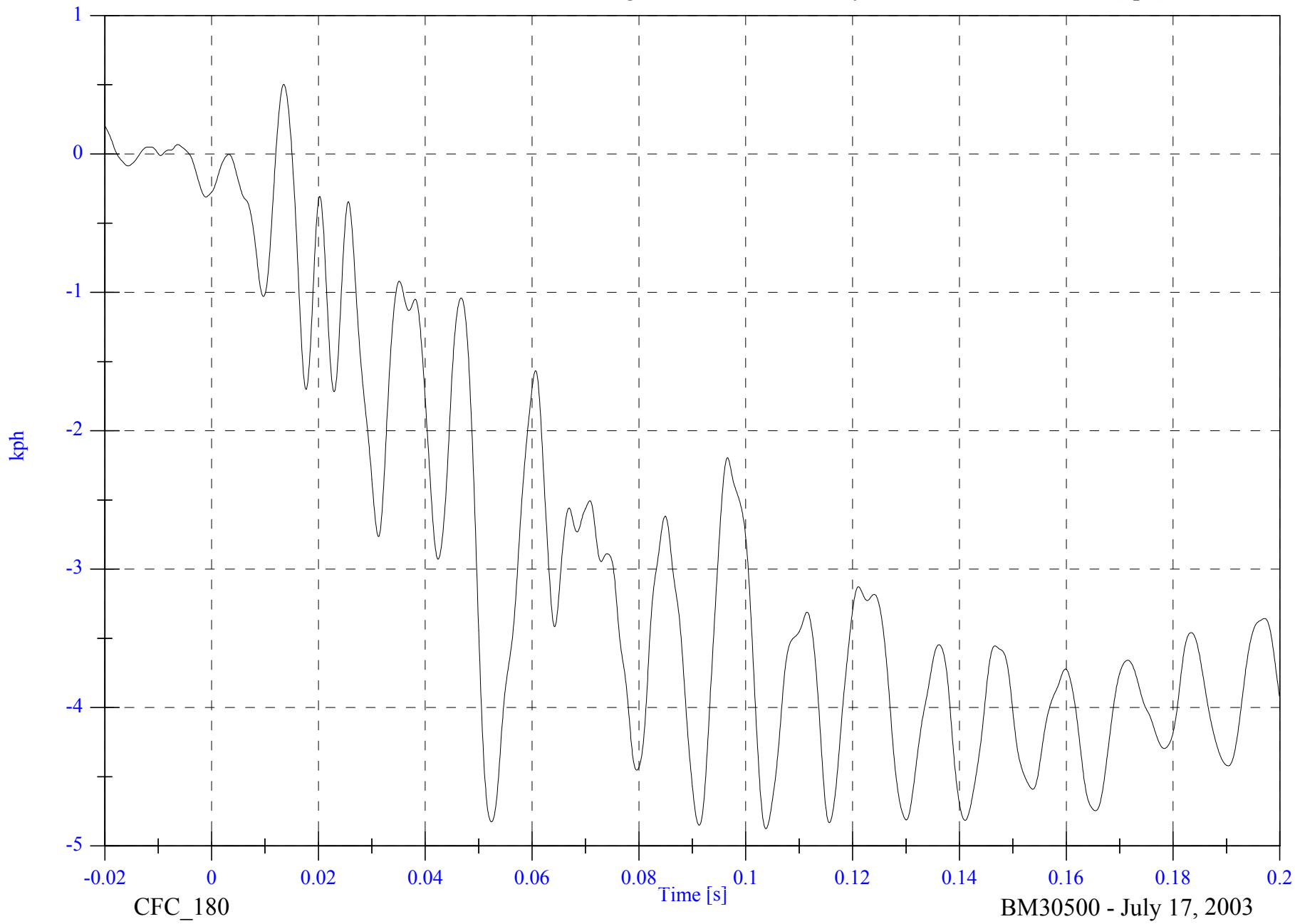
Max: 0.5 [kph] at 0.013 [s]

V1 Moving Barrier CG Z Velocity

Min: -4.9 [kph] at 0.104 [s]

B-78

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

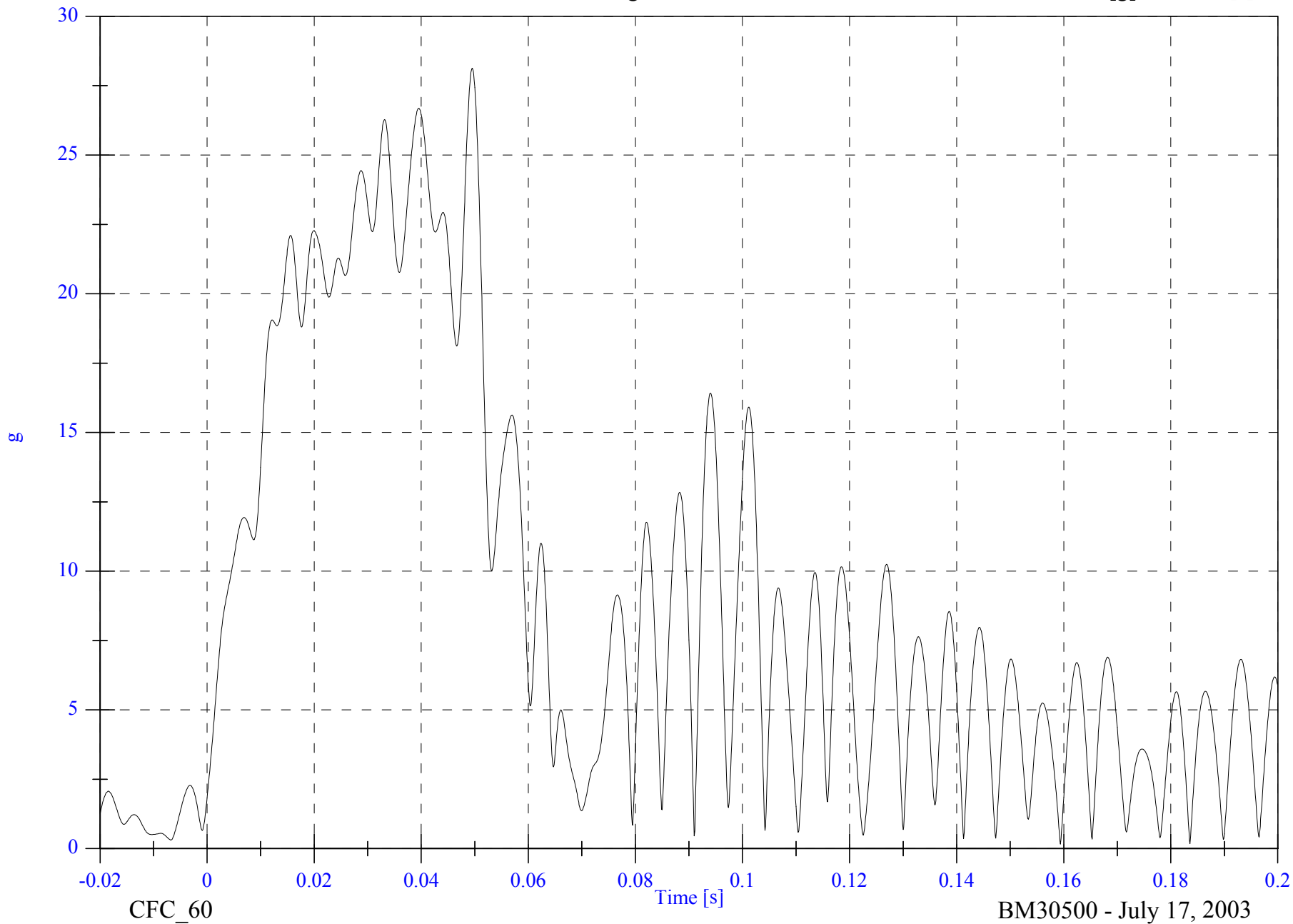
V1 Moving Barrier CG Resultant

Max: 28.1 [g] at 0.049 [s]

Min: 0.2 [g] at 0.159 [s]

B-79

8717-01



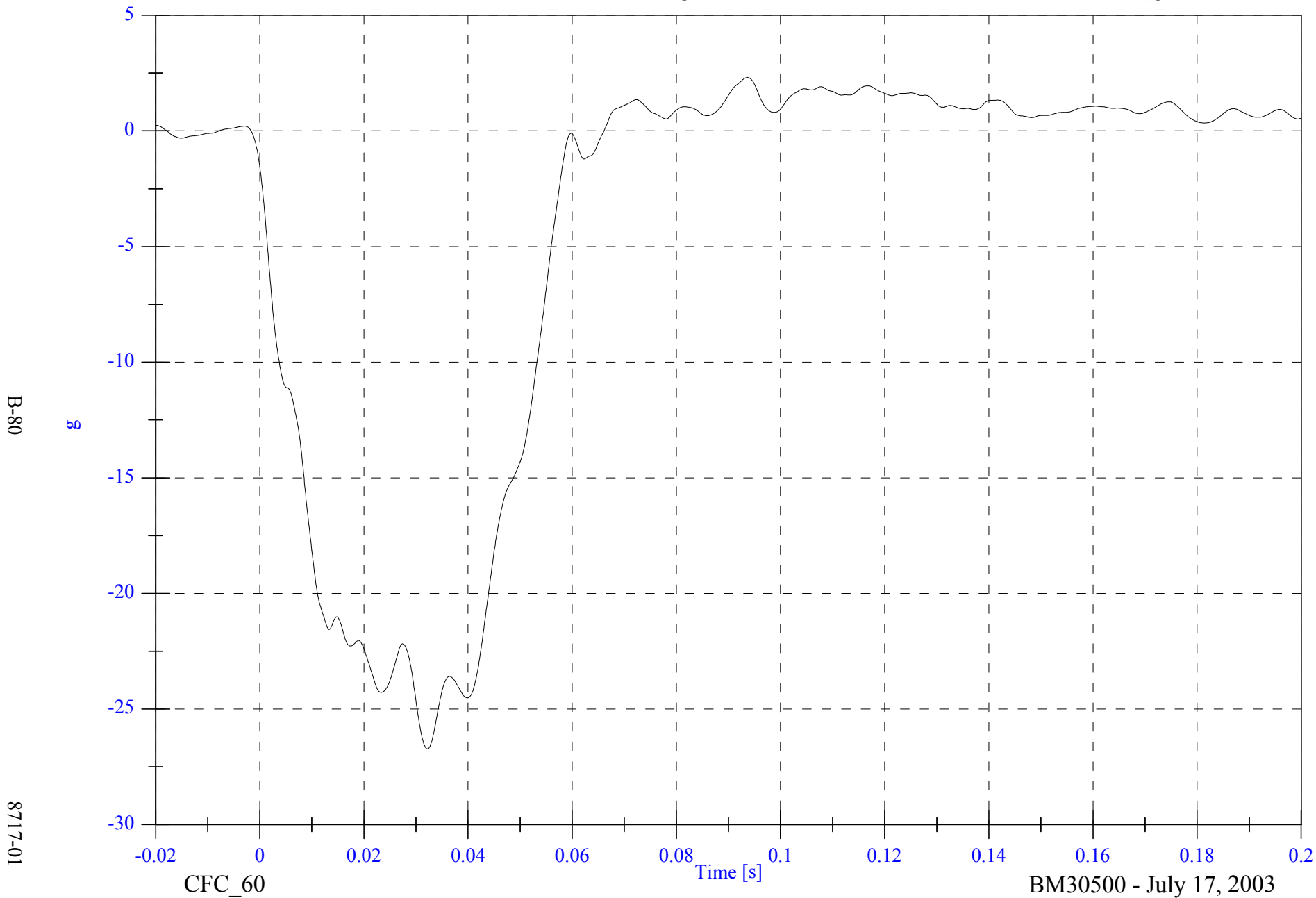
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V1 Moving Barrier Left Rail X

Max: 2.3 [g] at 0.094 [s]

Min: -26.7 [g] at 0.032 [s]



2003 SNCAP Test 1 2003 BMW Z4

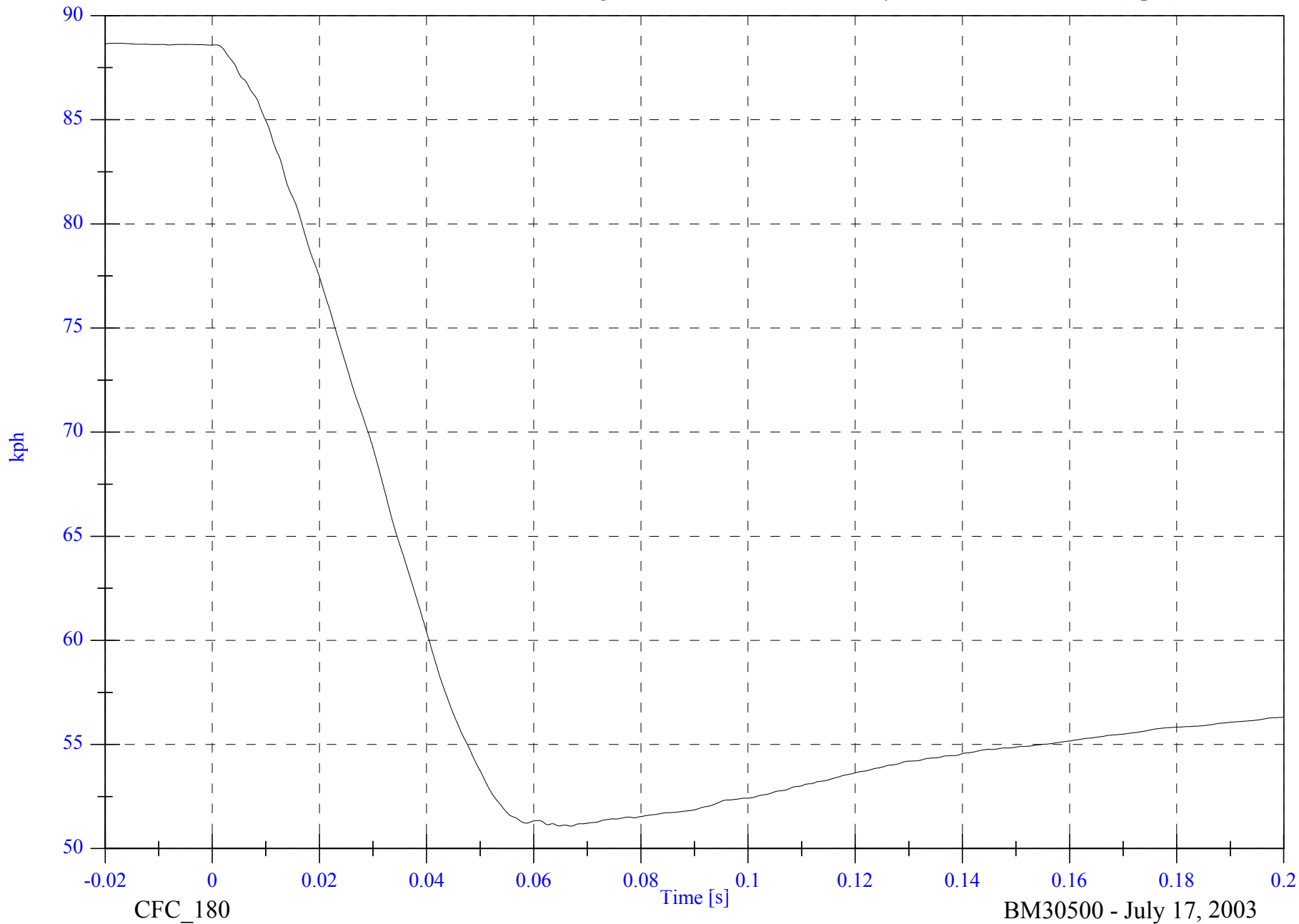
Max: 88.7 [kph] at -0.018 [s]

V1 Moving Barrier Left Rail X Velocity

Min: 51.1 [kph] at 0.067 [s]

B-81

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

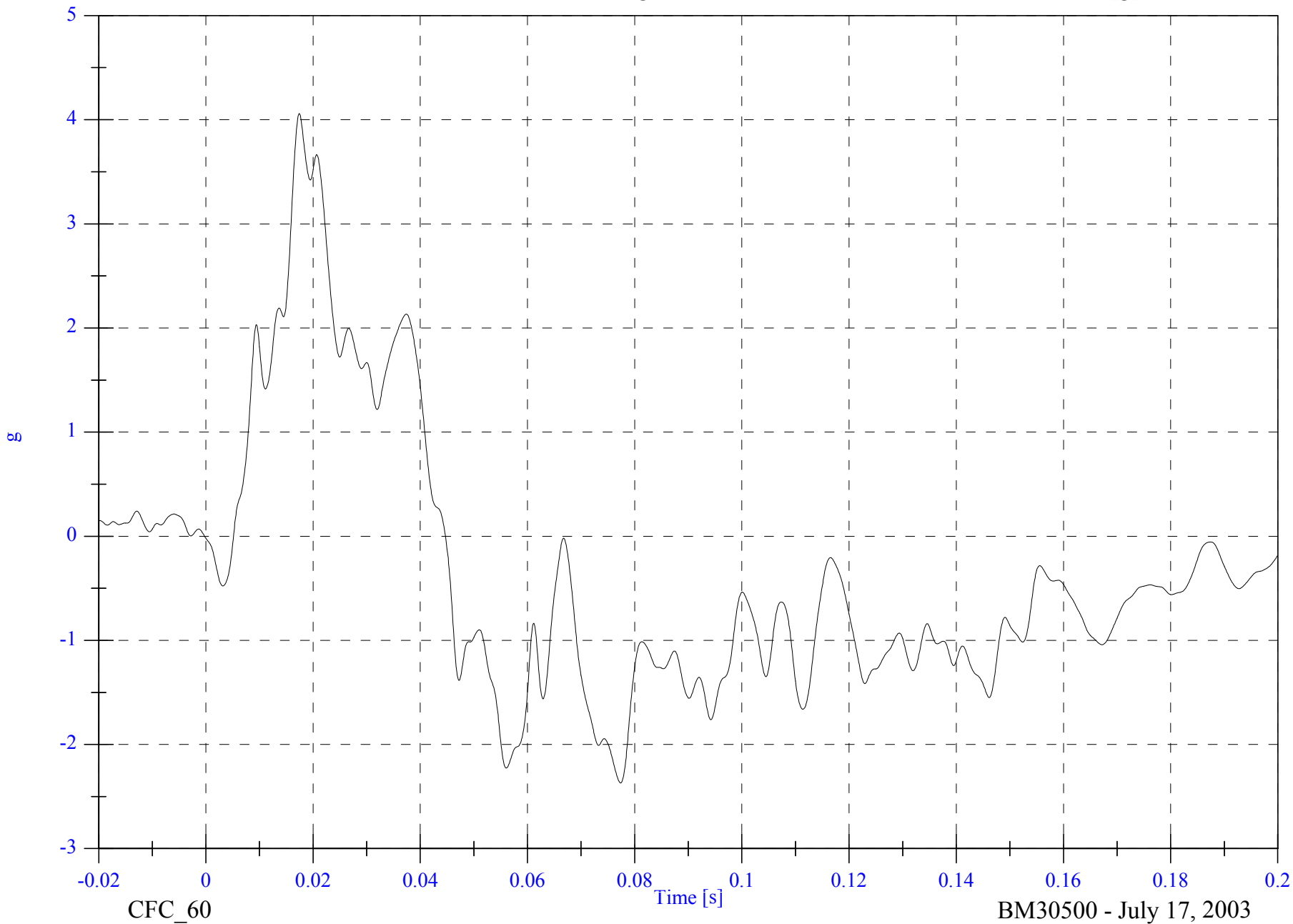
V1 Moving Barrier Left Rail Y

Max: 4.1 [g] at 0.017 [s]

Min: -2.4 [g] at 0.077 [s]

B-82

8717-01



2003 SNCAP Test 1 2003 BMW Z4

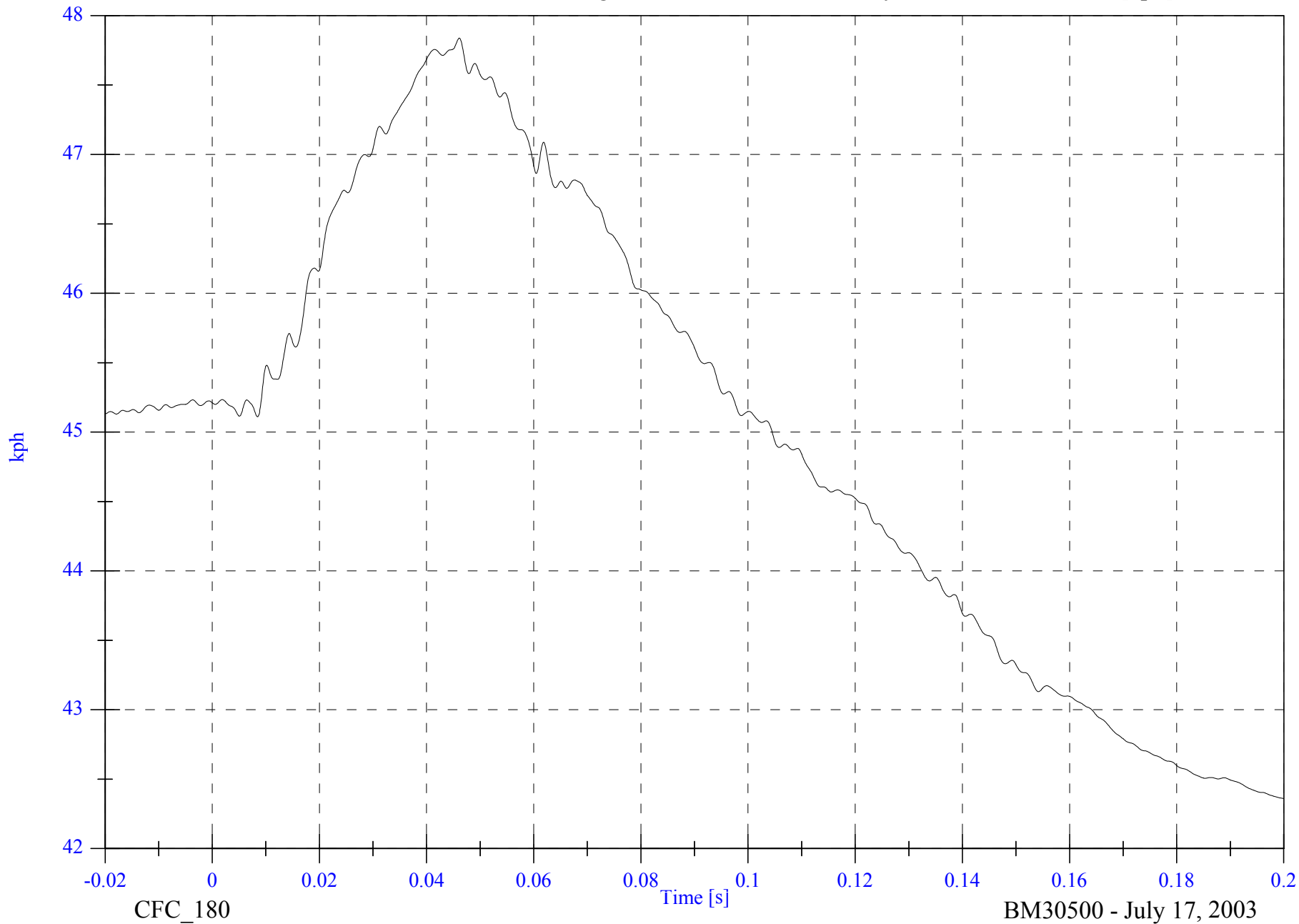
Max: 47.8 [kph] at 0.046 [s]

V1 Moving Barrier Left Rail Y Velocity

Min: 42.4 [kph] at 0.200 [s]

B-83

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

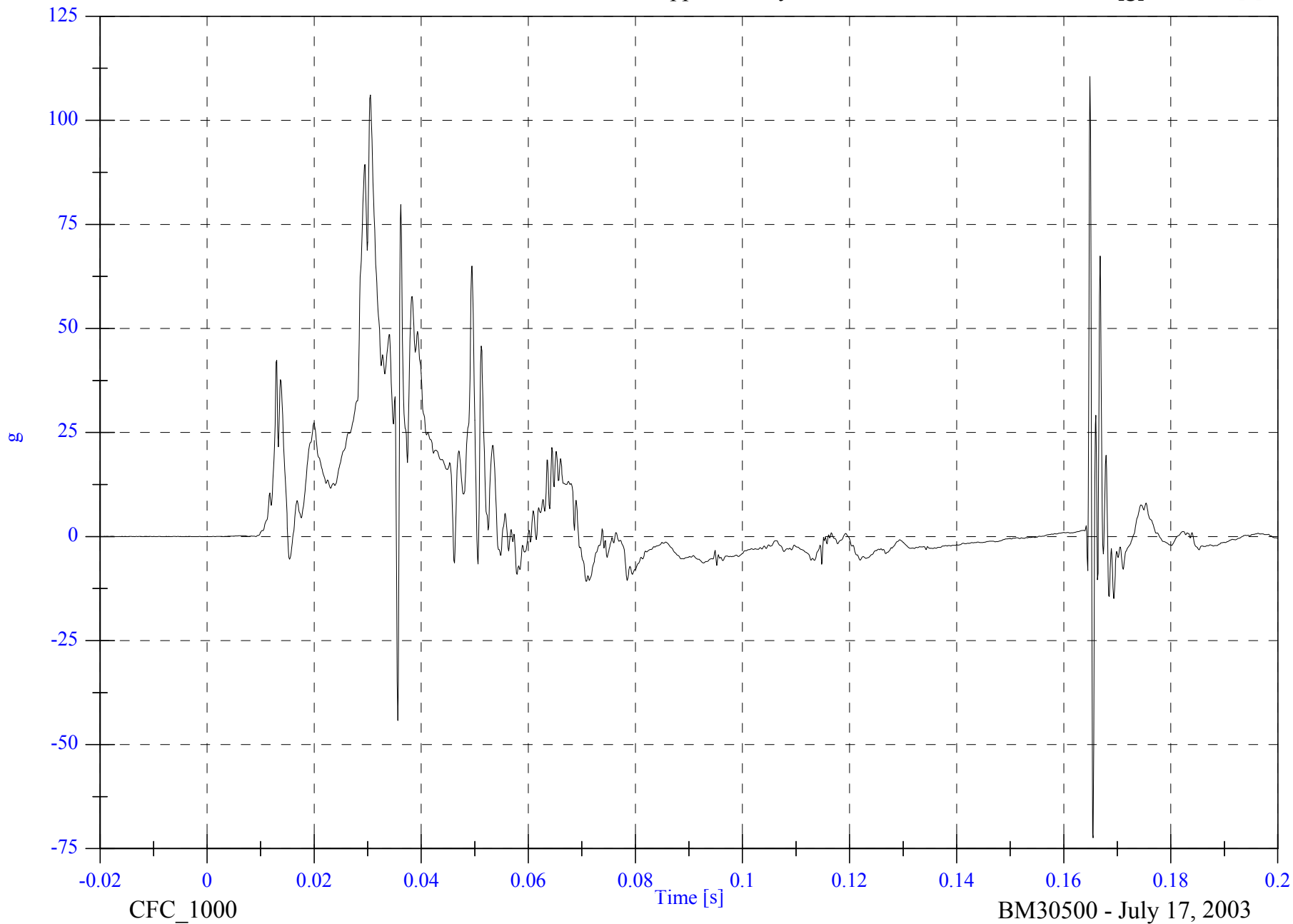
V2P1 Upper Rib Ry

Max: 110.5 [g] at 0.165 [s]

Min: -72.4 [g] at 0.166 [s]

B-84

8717-01



CFC\_1000

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

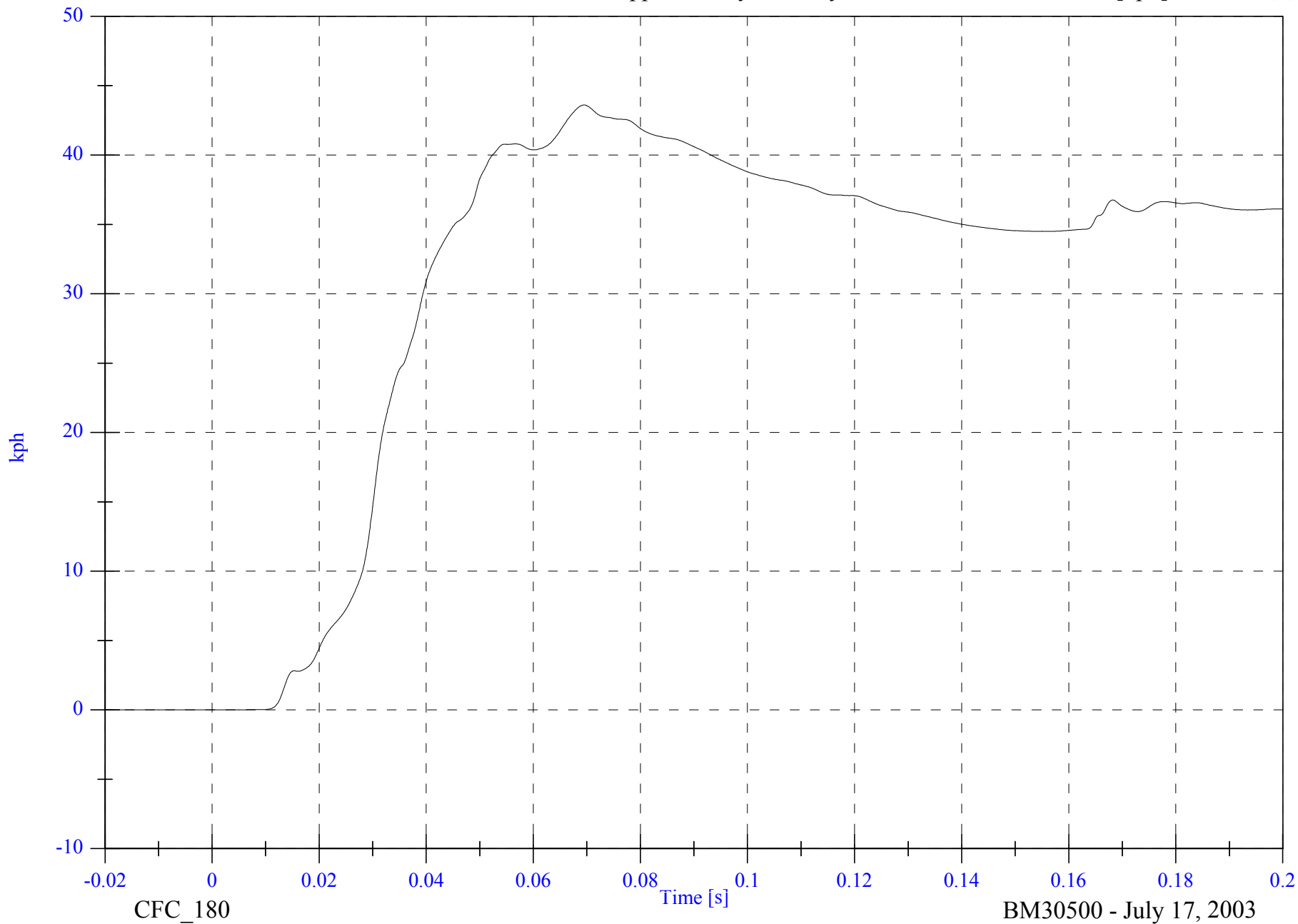
V2P1 Upper Rib Ry Velocity

Max: 43.6 [kph] at 0.069 [s]

Min: -0.0 [kph] at -0.019 [s]

B-85

8717-01



CFC\_180

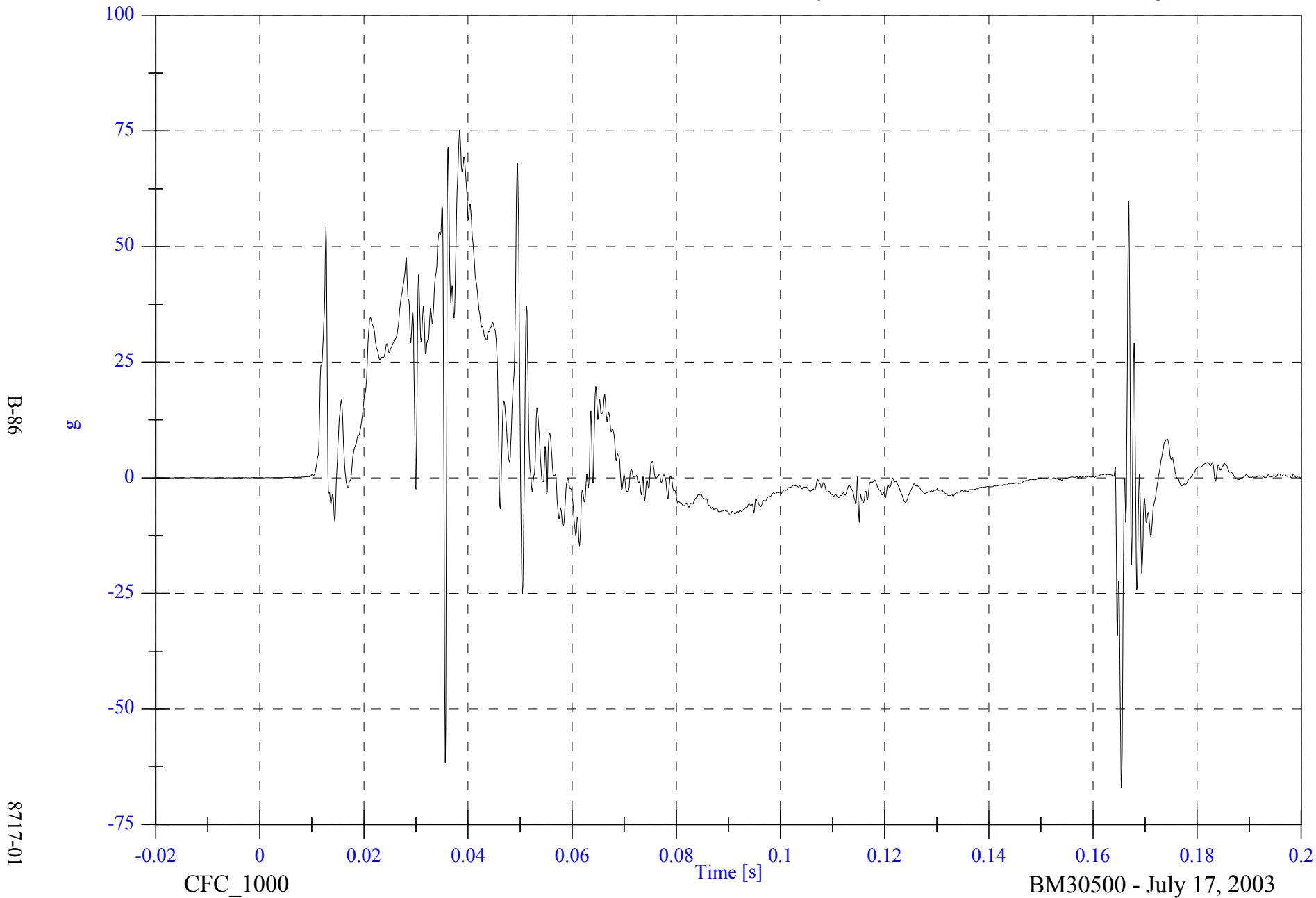
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Lower Rib Ry

Max: 75.2 [g] at 0.038 [s]

Min: -67.0 [g] at 0.166 [s]



B-86

8717-01

2003 SNCAP Test 1 2003 BMW Z4

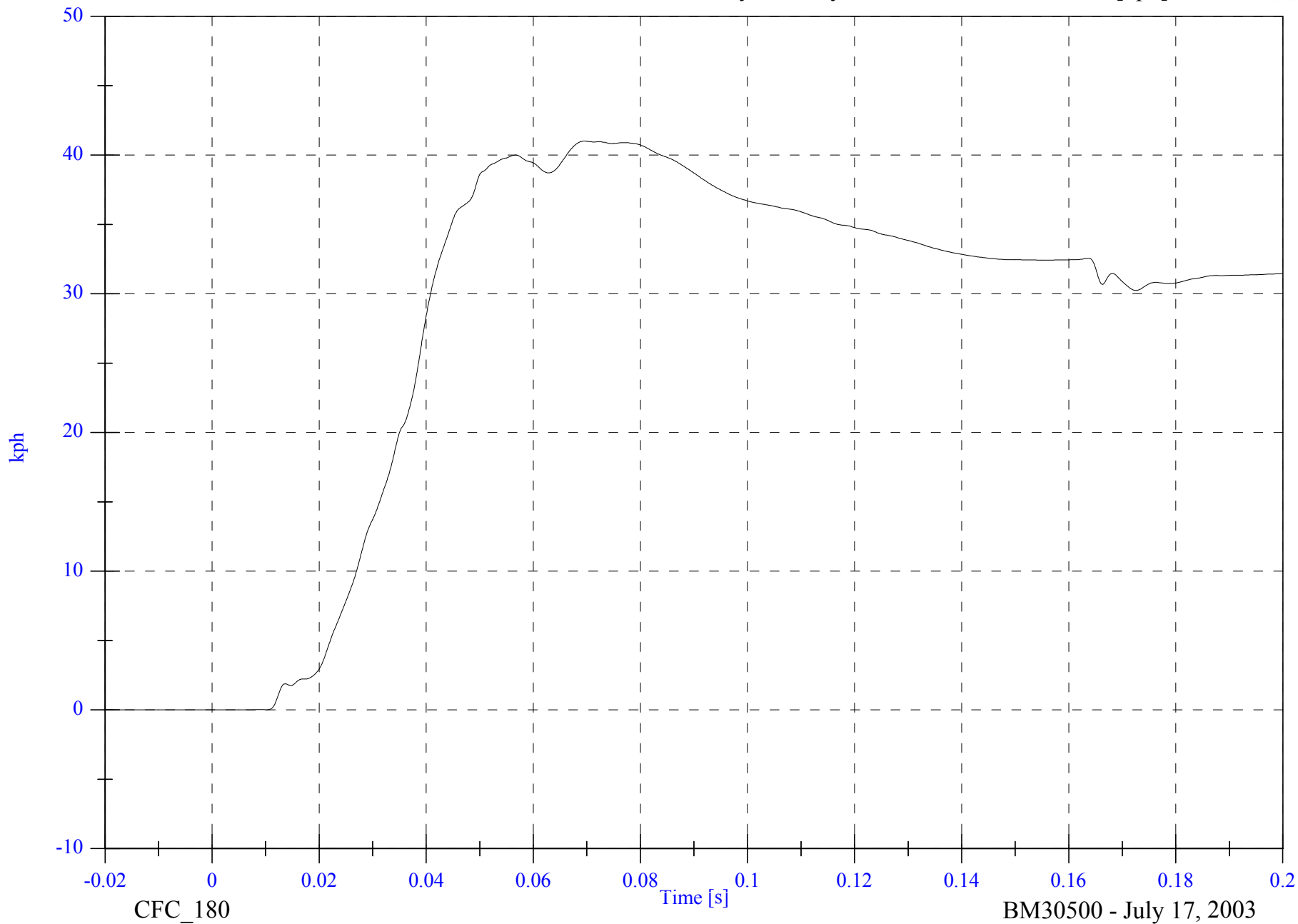
V2P1 Lower Rib Ry Velocity

Max: 41.0 [kph] at 0.069 [s]

Min: -0.0 [kph] at -0.017 [s]

B-87

8717-01



CFC\_180

Time [s]

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

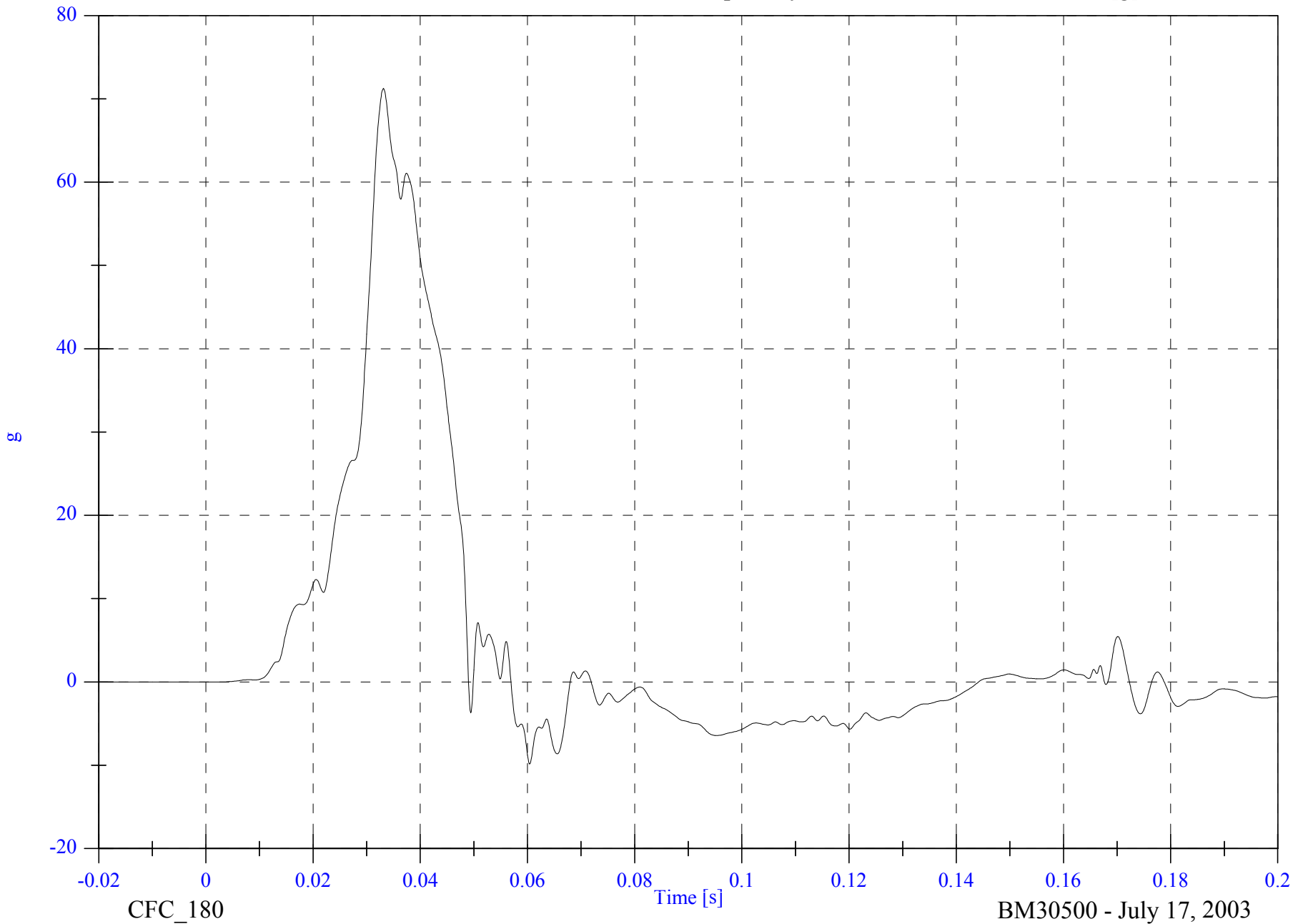
V2P1 Lower Spine Ry

Max: 71.3 [g] at 0.033 [s]

Min: -9.8 [g] at 0.060 [s]

B-88

8717-01



2003 SNCAP Test 1 2003 BMW Z4

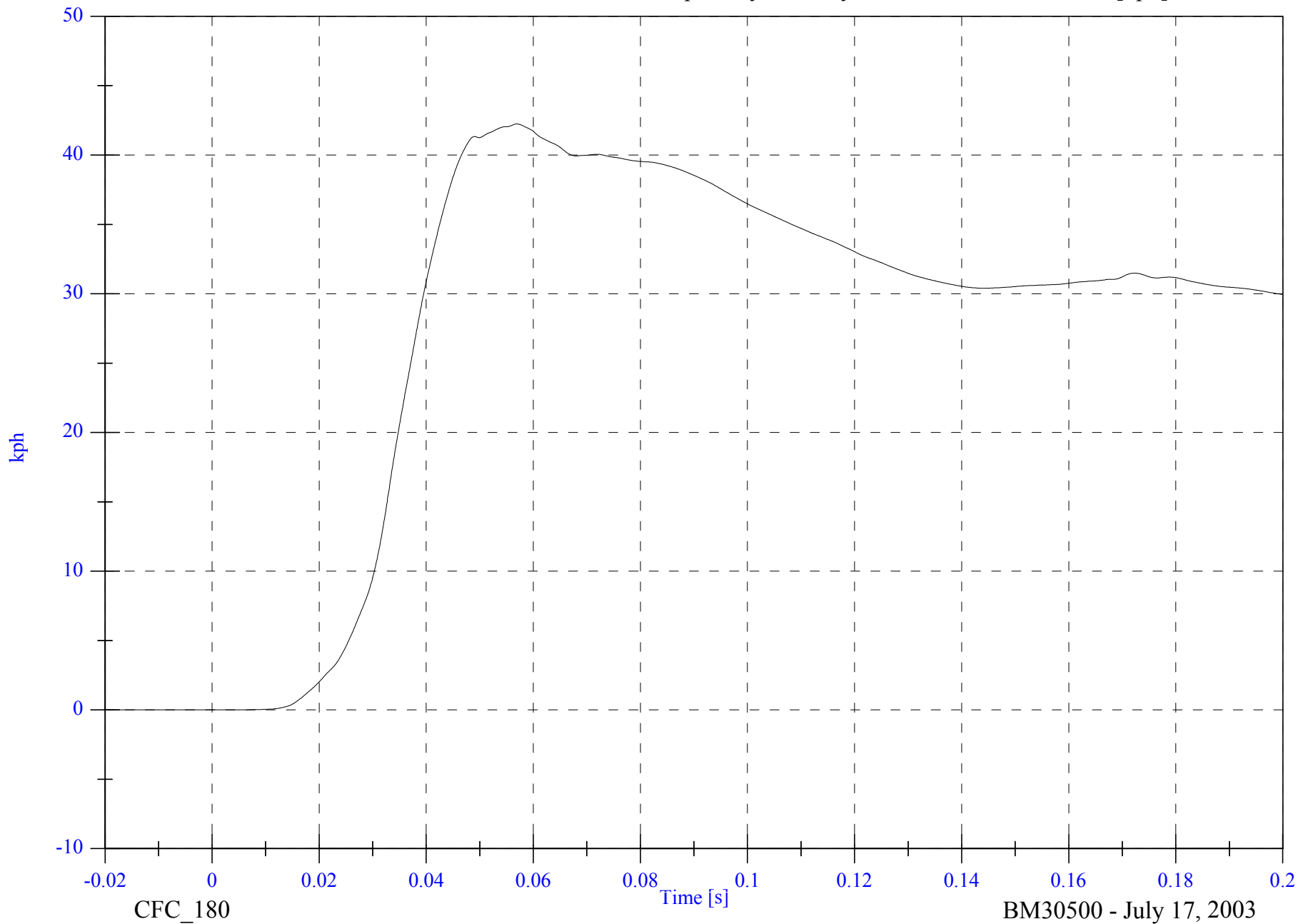
V2P1 Lower Spine Ry Velocity

Max: 42.2 [kph] at 0.057 [s]

Min: -0.0 [kph] at -0.006 [s]

B-89

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

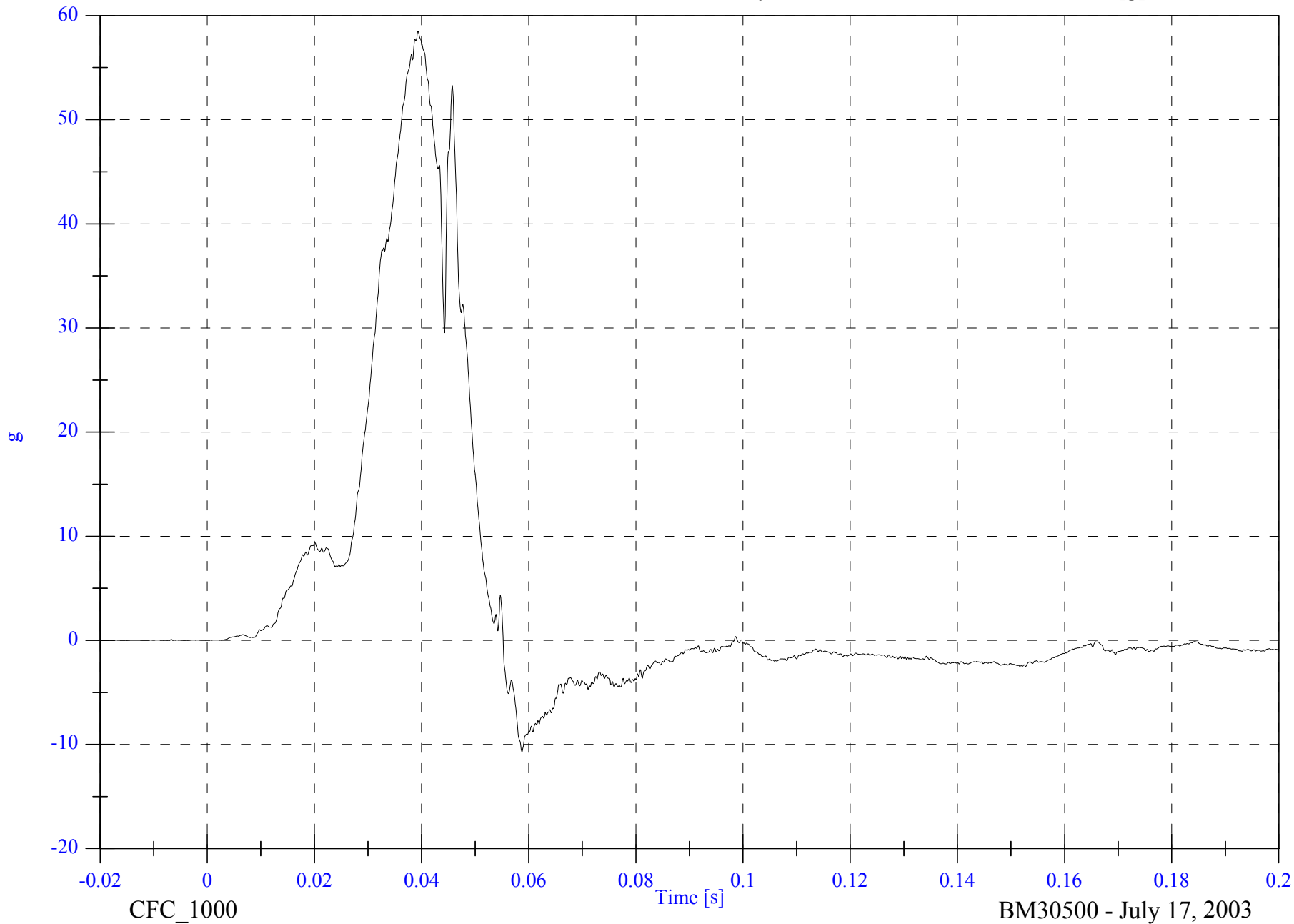
V2P1 Pelvic Ry

Max: 58.5 [g] at 0.039 [s]

Min: -10.7 [g] at 0.059 [s]

B-90

8717-01



CFC\_1000

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

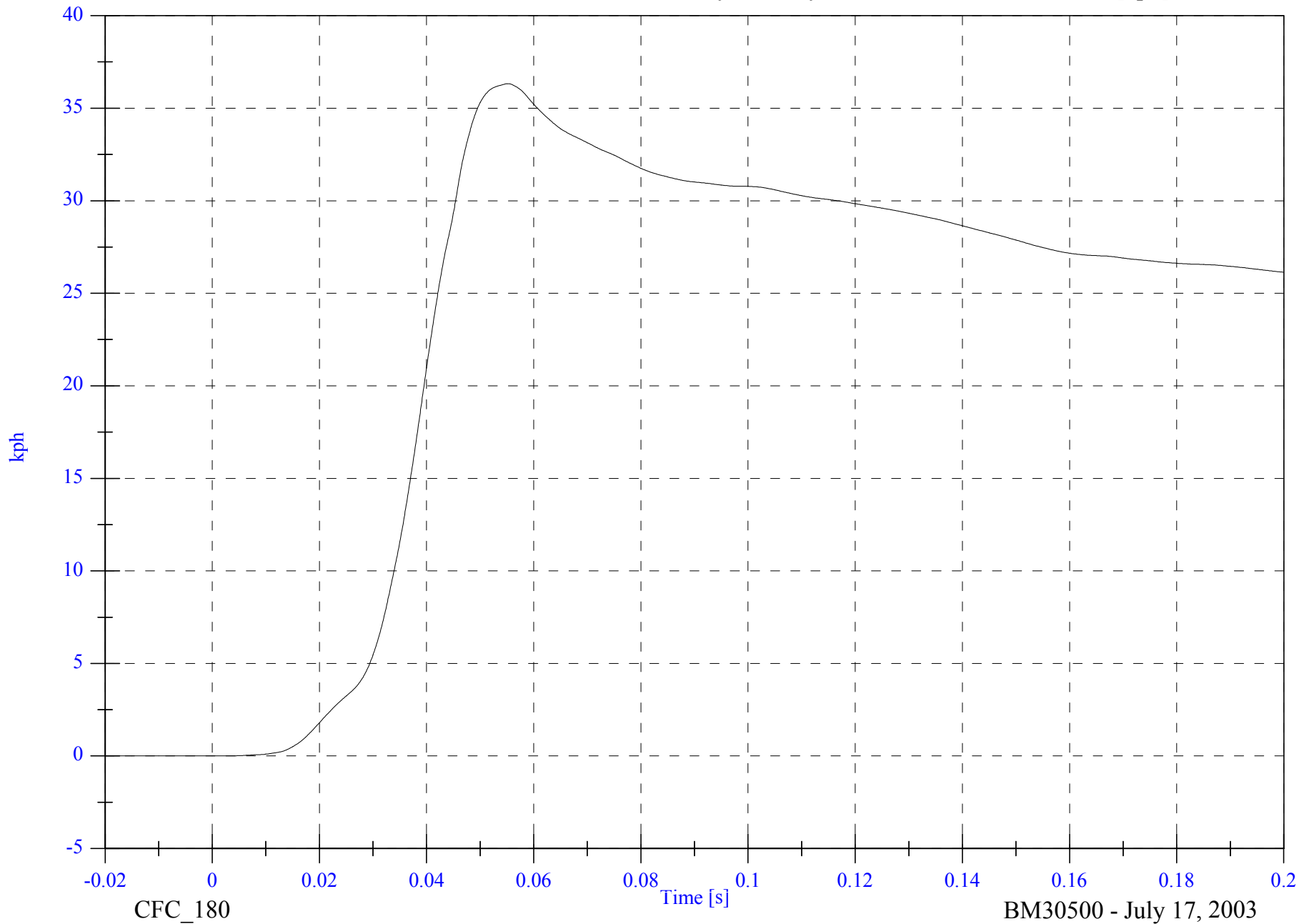
V2P1 Pelvic Ry Velocity

Max: 36.3 [kph] at 0.055 [s]

Min: -0.0 [kph] at -0.012 [s]

B-91

8717-01



CFC\_180

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

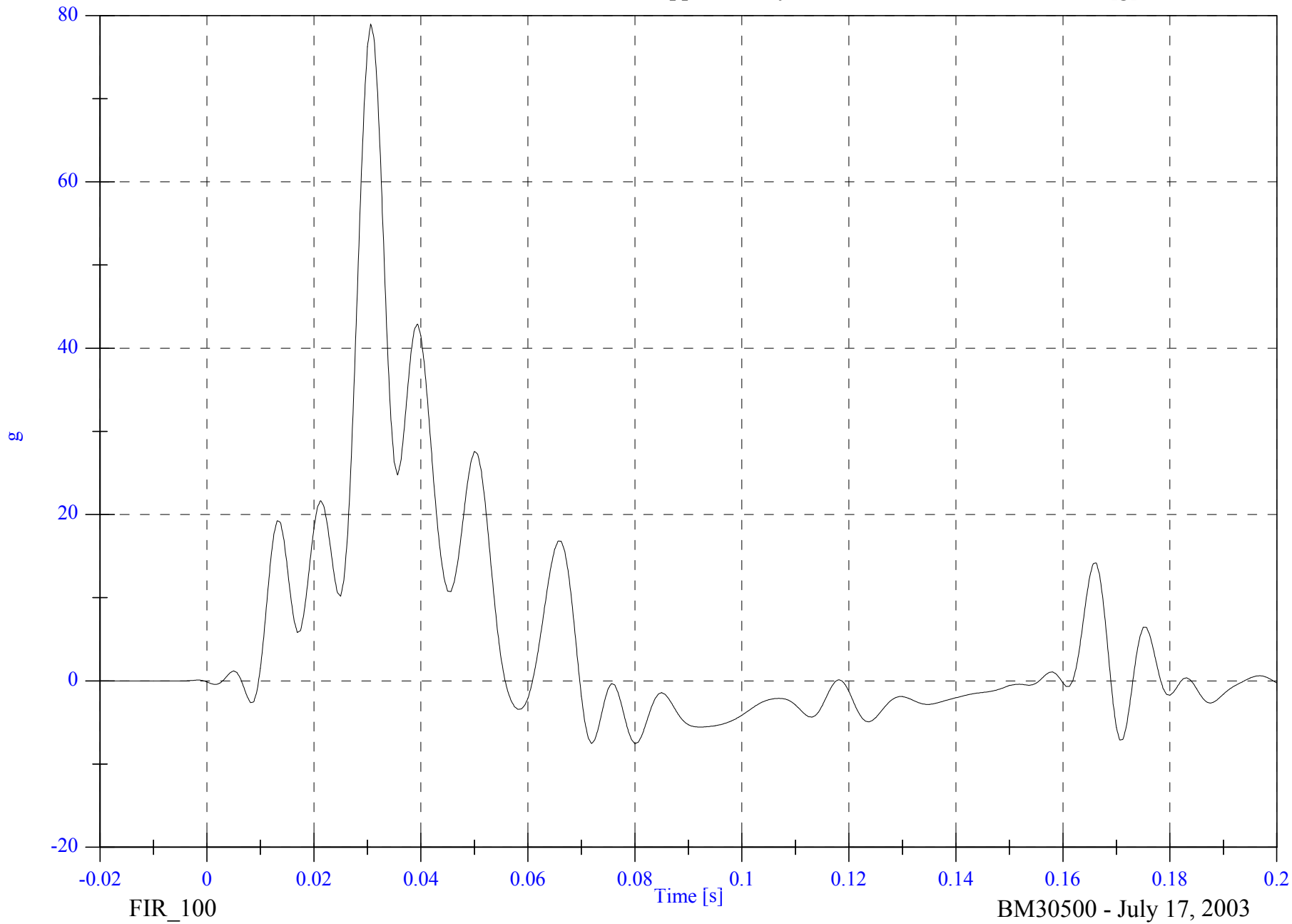
V2P1 Upper Rib Ry

Max: 79.0 [g] at 0.031 [s]

Min: -7.5 [g] at 0.080 [s]

B-92

8717-01



FIR\_100

BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Lower Rib Ry

Max: 60.3 [g] at 0.040 [s]

Min: -10.6 [g] at 0.165 [s]

B-93

8717-01



2003 SNCAP Test 1 2003 BMW Z4

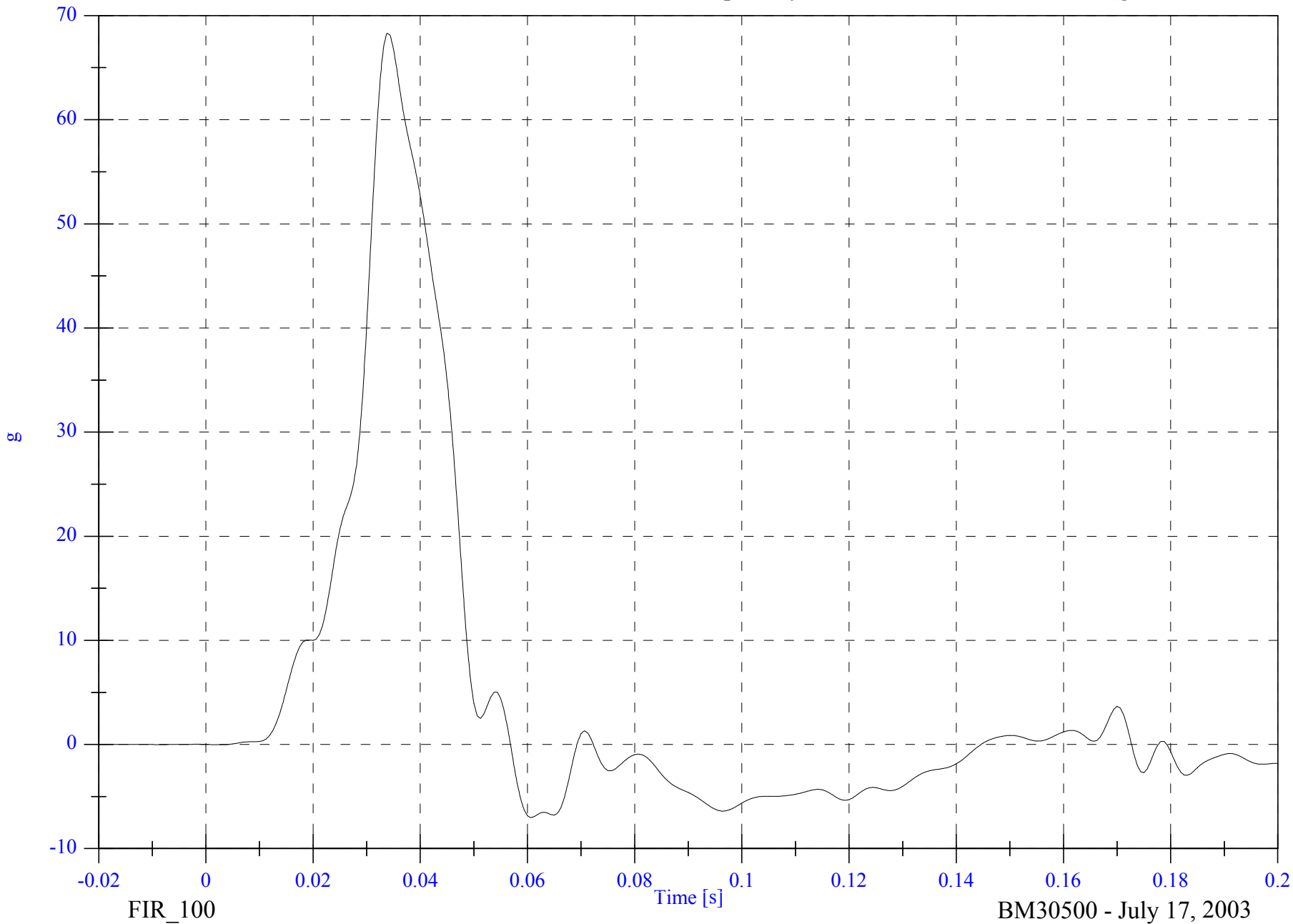
V2P1 Lower Spine Ry

Max: 68.3 [g] at 0.034 [s]

Min: -7.0 [g] at 0.061 [s]

B-94

8717-01



FIR\_100

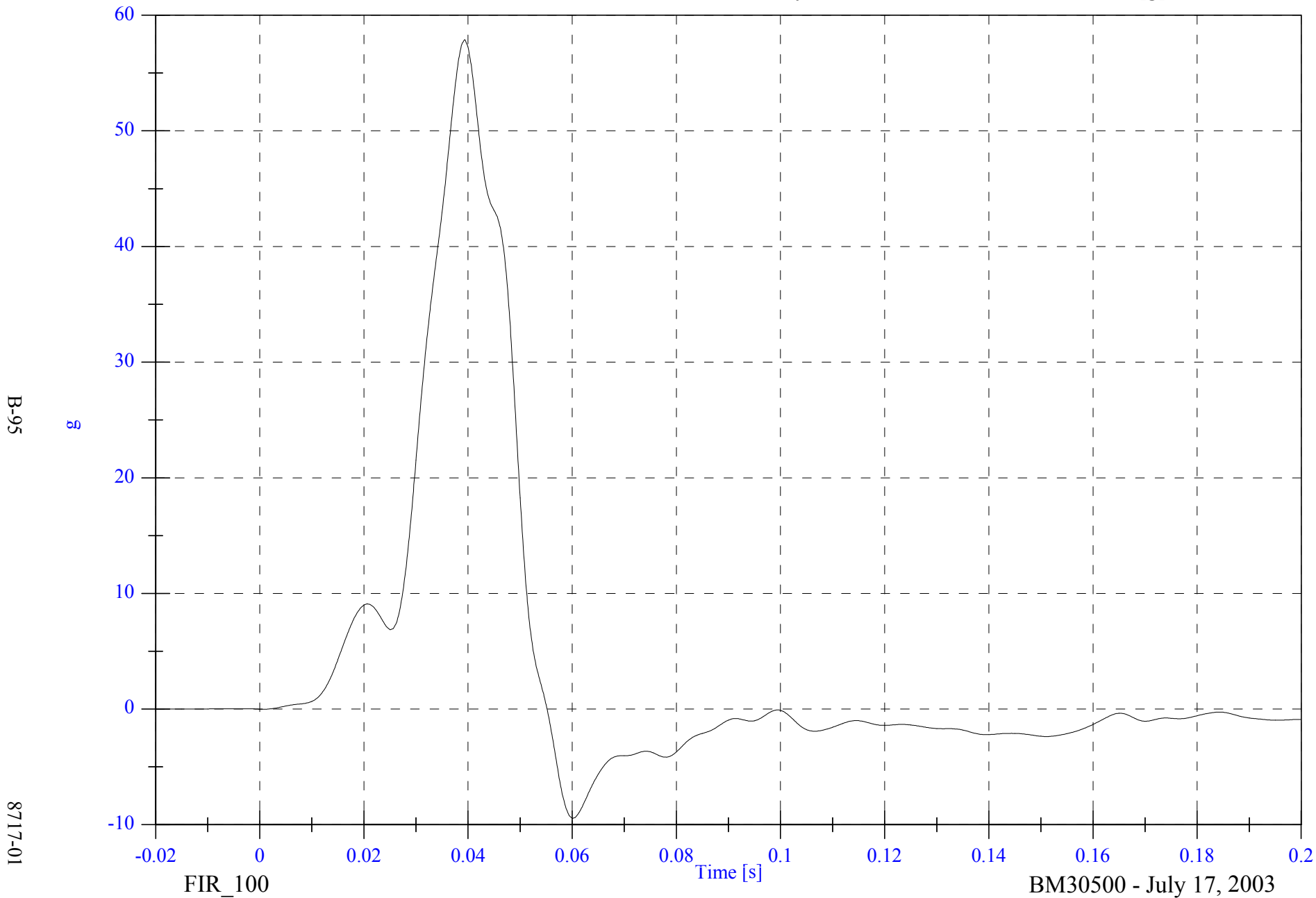
BM30500 - July 17, 2003

2003 SNCAP Test 1 2003 BMW Z4

V2P1 Pelvic Ry

Max: 57.9 [g] at 0.039 [s]

Min: -9.5 [g] at 0.060 [s]



B-95

8717-01

FIR\_100

Time [s]

BM30500 - July 17, 2003

**APPENDIX C**

**SID H3 CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

**SUMMARY**  
**SID H3 PRE & POST TEST CALIBRATION**  
**CONFIGURED FOR LEFT SIDE IMPACT**

Date: November 27, 2002

Sequential Test Number:

1.2

Laboratory Technician:

B. Swiecicki

TEST PARAMETER	SPECIFICATION	SID H3 270		SID H3 -	
		PRE TEST	POST TEST	PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	902	902	-	-
RH- Rib Height (mm)	501 - 521	506	506	-	-
HP- Hip Pivot Height (mm)	99 ref.	99	99	-	-
RD- Rib from Back Line (mm)	229 - 241	234	234	-	-
KV- Knee Pivot from Back Line (mm)	511 - 526	515	515	-	-
SW- Knee Pivot to Floor (mm)	490 - 505	495	495	-	-
HW- Hip Width (mm)	356 - 391	373	373	-	-
<b>THORAX IMPACTS</b>					
TEMPERATURE (°C)	18.9 - 25.5	21.1	21.1	-	-
RELATIVE HUMIDITY (%)	10 - 70	27	48	-	-
PROBE SPEED (m/s)	4.27 - 4.33	4.31	4.32	-	-
UPPER RIB (g's)	37 - 46	40.46	44.52	-	-
LOWER RIB (g's)	37 - 46	40.87	41.40	-	-
LOWER SPINE (g's)	15 - 22	20.17	20.43	-	-
<b>PELVIS IMPACT</b>					
TEMPERATURE (°C)	18.9 - 25.5	21.1	21.1	-	-
RELATIVE HUMIDITY (%)	10 - 70	27	48	-	-
PROBE SPEED (m/s)	4.27 - 4.33	4.27	4.32	-	-
PELVIS (g's)	40 - 60	55.98	44.49	-	-

**REMARKS:** None

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**SID H3 NO.: 270**

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: July 15, 2003 Laboratory Technician: B. Swiecicki

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
THORACIC SHOCK ABSORBER TEST	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

\* Test not required for SID certification.

**REMARKS:** None

**EXTERNAL DIMENSIONS  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: July 15, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 – 909	902
RH- Rib Height (mm)	502 – 520	506
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 – 241	234
KH- Knee Pivot from Back Line (mm)	511 – 526	515
KV- Knee Pivot to Floor (mm)	490 – 505	495
HW- Hip Width (mm)	356 - 391	373

**REMARKS:** None

**THORACIC SHOCK ABSORBER TESTS  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
 Date: July 15, 2003 Laboratory Technician: B. Swiecicki

DAMPER IDENTIFICATION: 5

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)		18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)		10 - 70	27
VELOCITY 3.05 m/s	FORCE (N)	836 - 1125	1084.44
	DISPLACEMENT (mm)	30 - 35	30.58
VELOCITY 4.27 m/s	FORCE (N)	1730 - 2099	1839.24
	DISPLACEMENT (mm)	32 - 37	32.36
VELOCITY 6.10 m/s	FORCE (N)	3741 - 4448	4336.39
	DISPLACEMENT (mm)	33 - 40	37.86

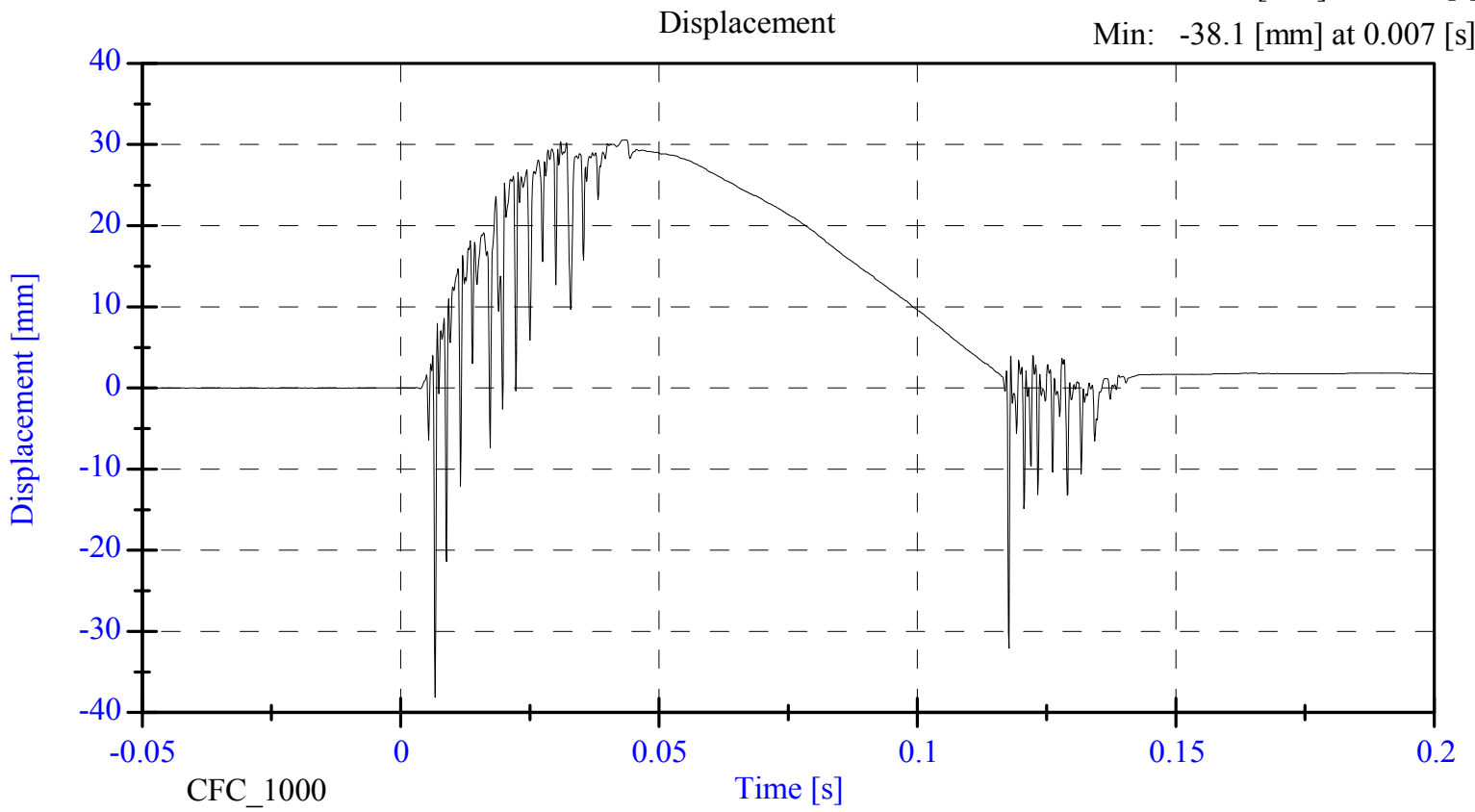
DAMPER SETTING: 5

**REMARKS:** None

SID SHOCK LOW PLOTS

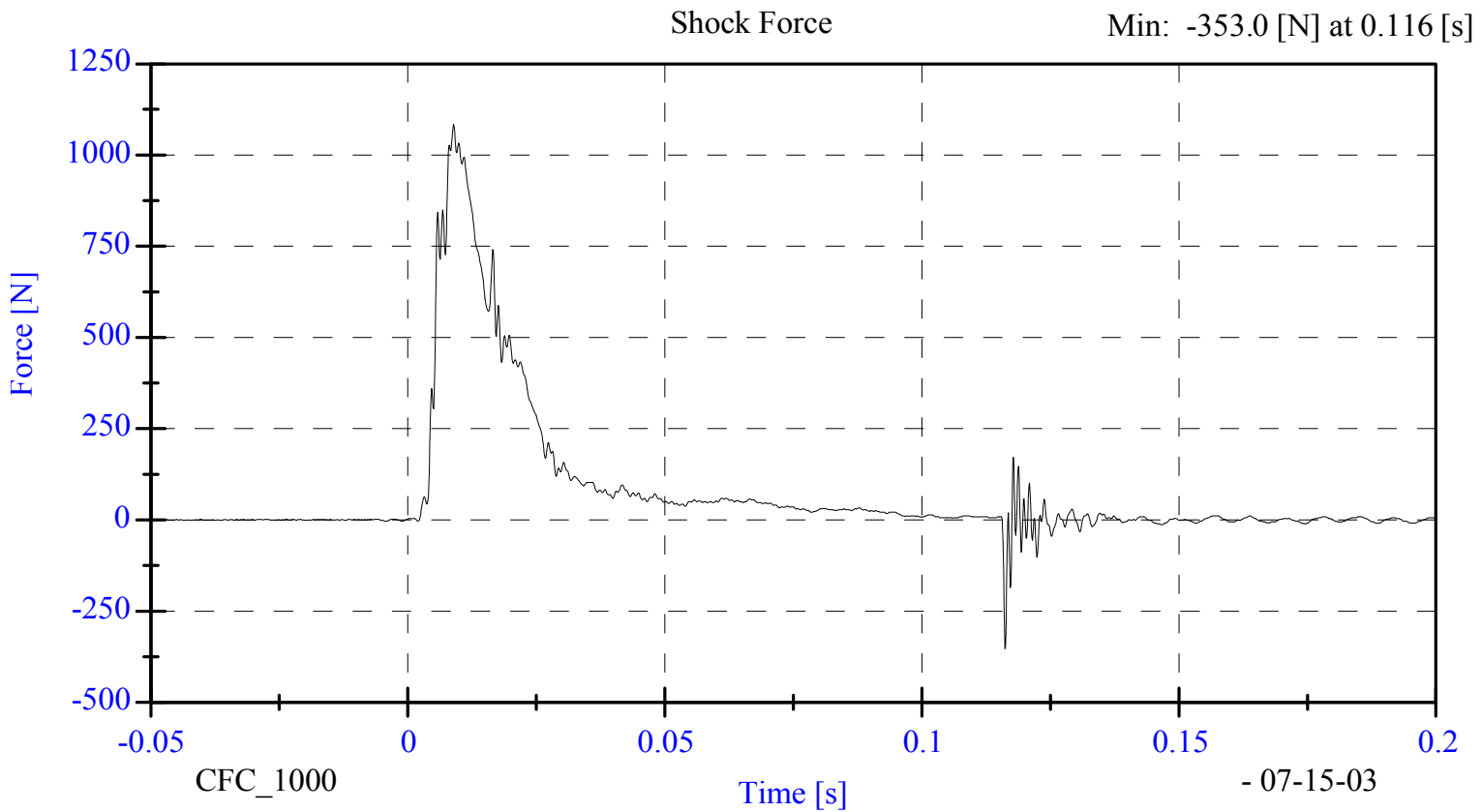
Max: 30.6 [mm] at 0.044 [s]

Min: -38.1 [mm] at 0.007 [s]



Max: 1084.4 [N] at 0.009 [s]

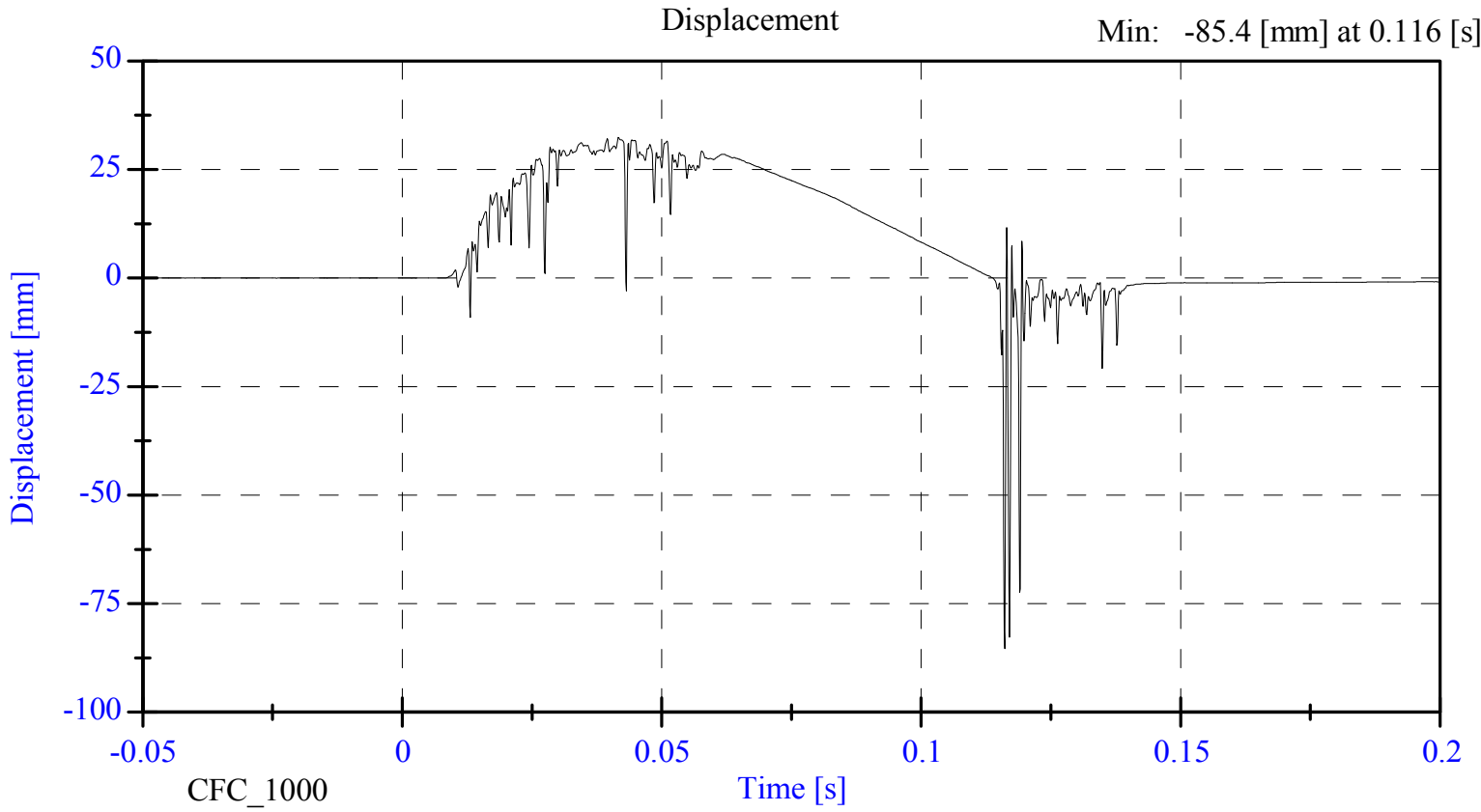
Min: -353.0 [N] at 0.116 [s]



- 07-15-03

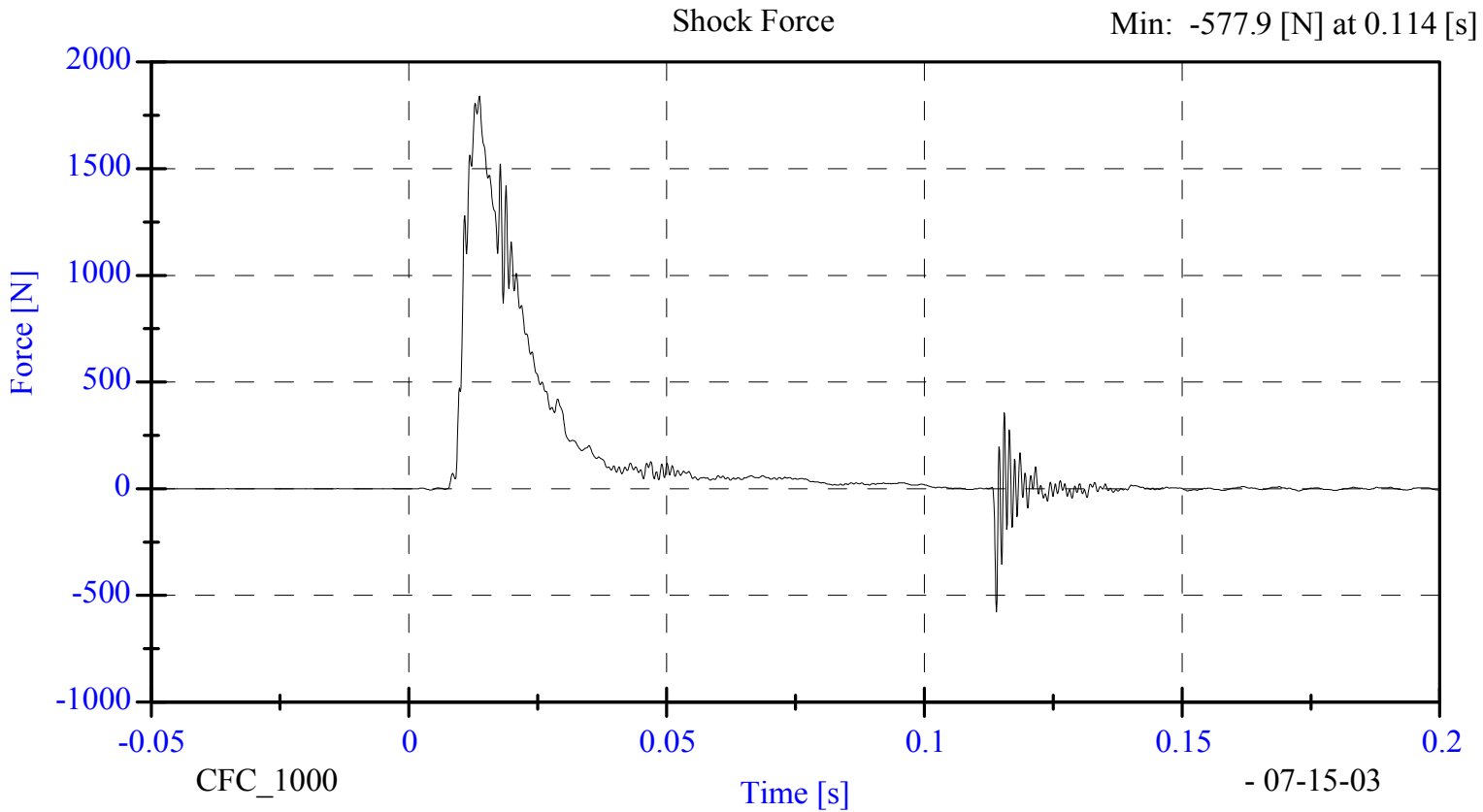
Max: 32.4 [mm] at 0.042 [s]

Min: -85.4 [mm] at 0.116 [s]



Max: 1839.2 [N] at 0.014 [s]

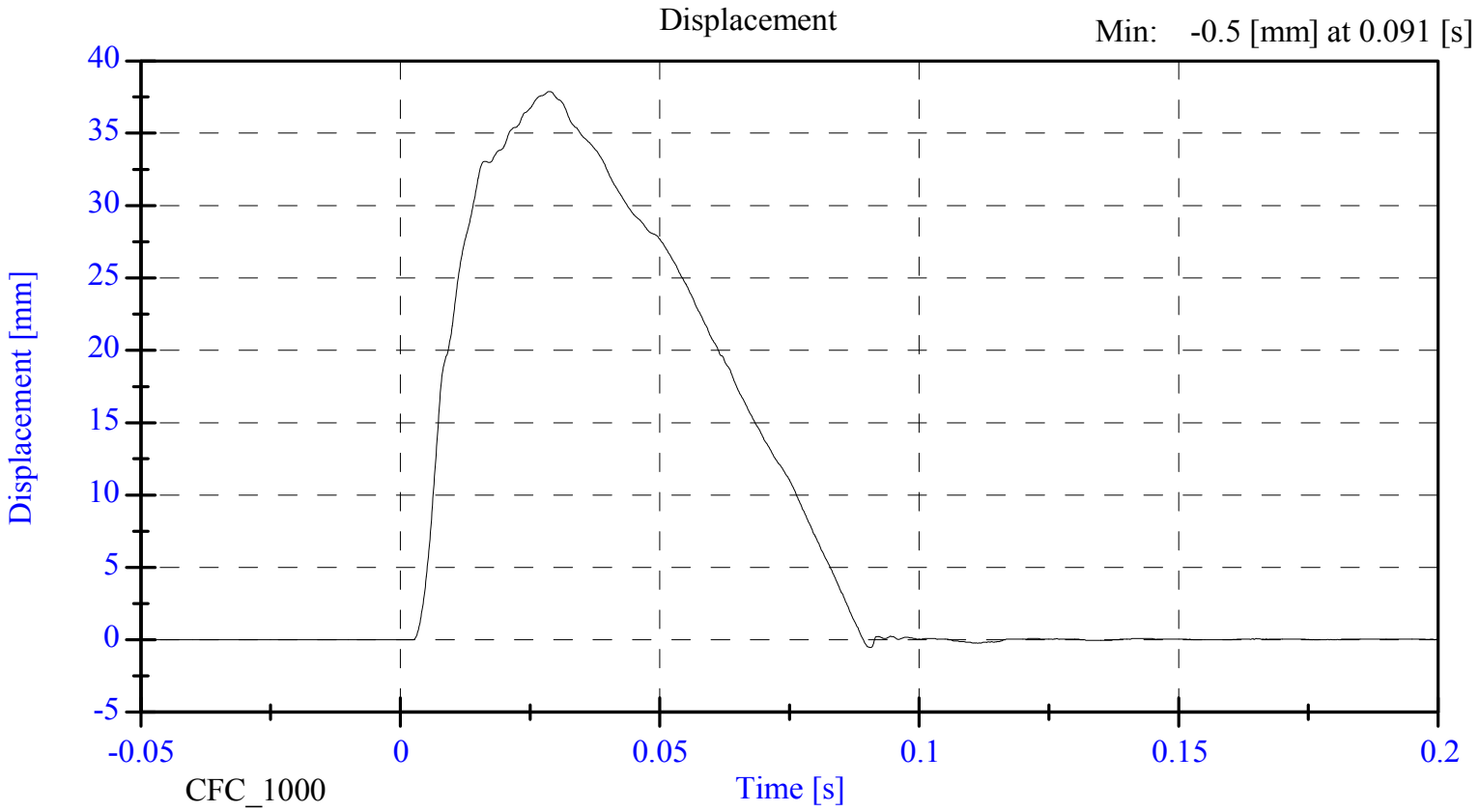
Min: -577.9 [N] at 0.114 [s]



- 07-15-03

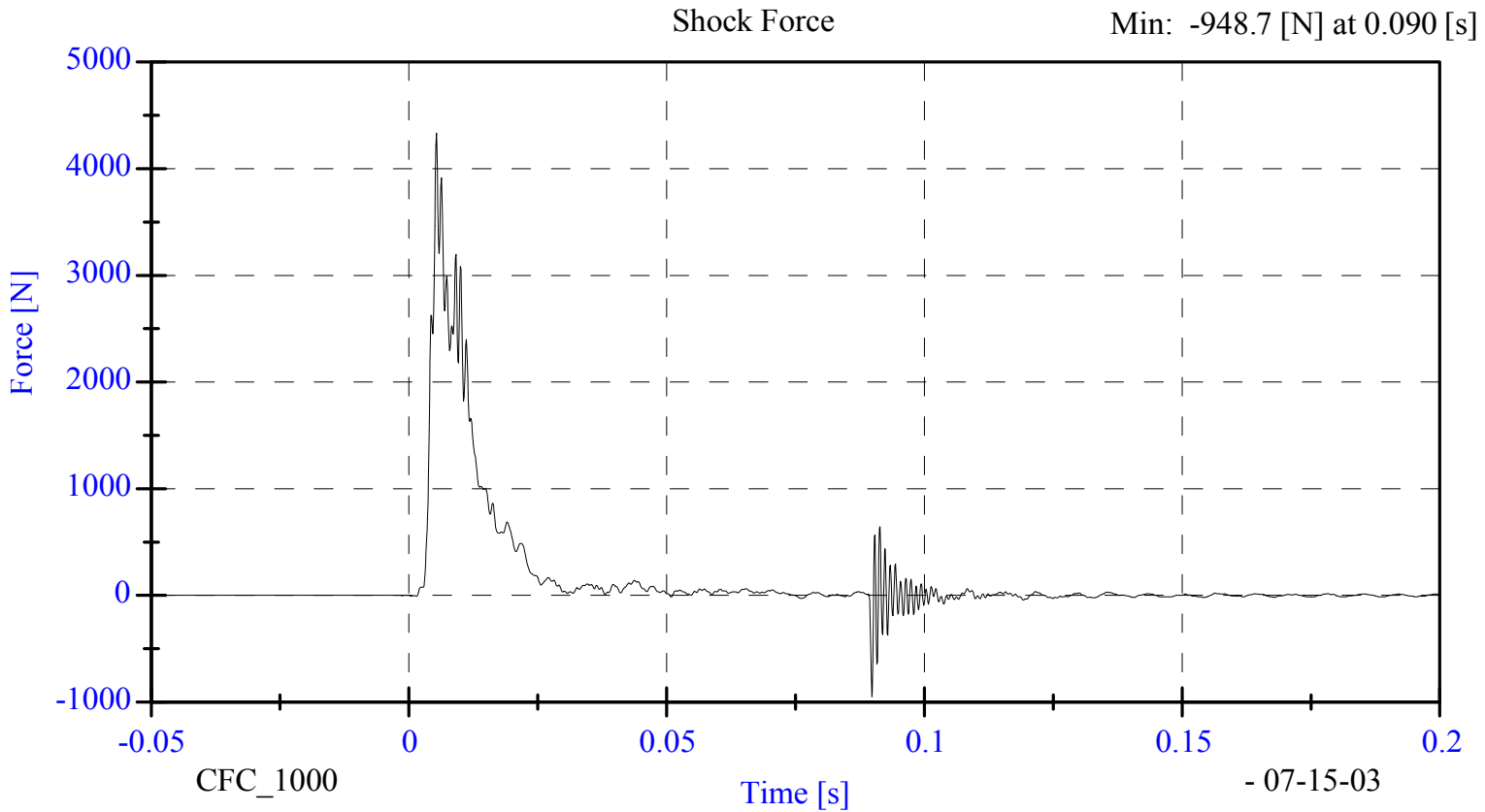
Max: 37.9 [mm] at 0.029 [s]

Min: -0.5 [mm] at 0.091 [s]



Max: 4336.4 [N] at 0.005 [s]

Min: -948.7 [N] at 0.090 [s]



- 07-15-03

**LATERAL THORAX IMPACT TEST  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: July 15, 2003 Laboratory Technician: B. Swiecicki

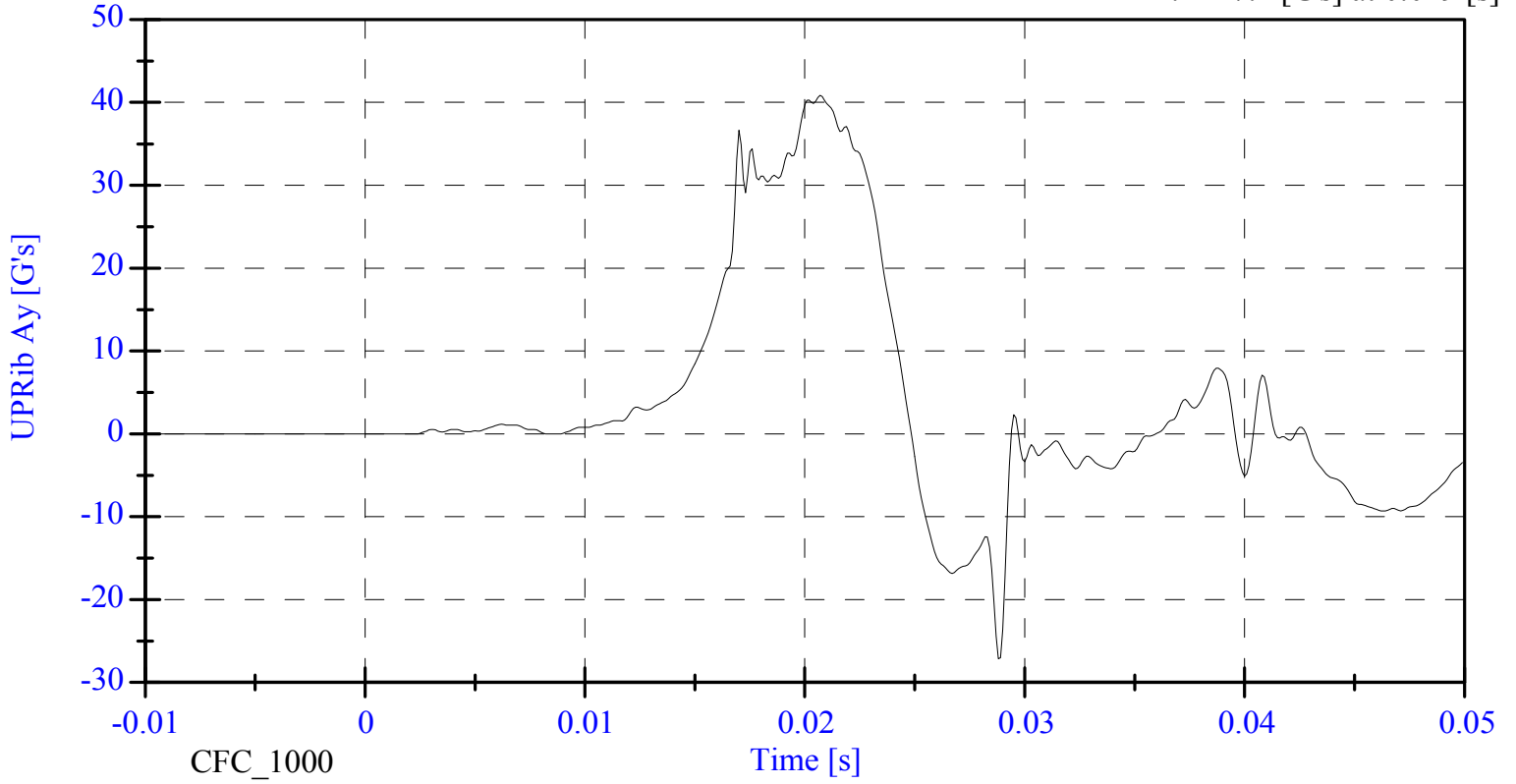
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	27
PROBE SPEED (m/s)	4.27 - 4.33	4.31
UPPER RIB (g's)	37 - 46	40.46
LOWER RIB (g's)	37 - 46	40.87
LOWER SPINE (g's)	15 - 22	20.17

**REMARKS:** None

Max: 40.9 [G's] at 0.021 [s]

Min: -27.1 [G's] at 0.029 [s]

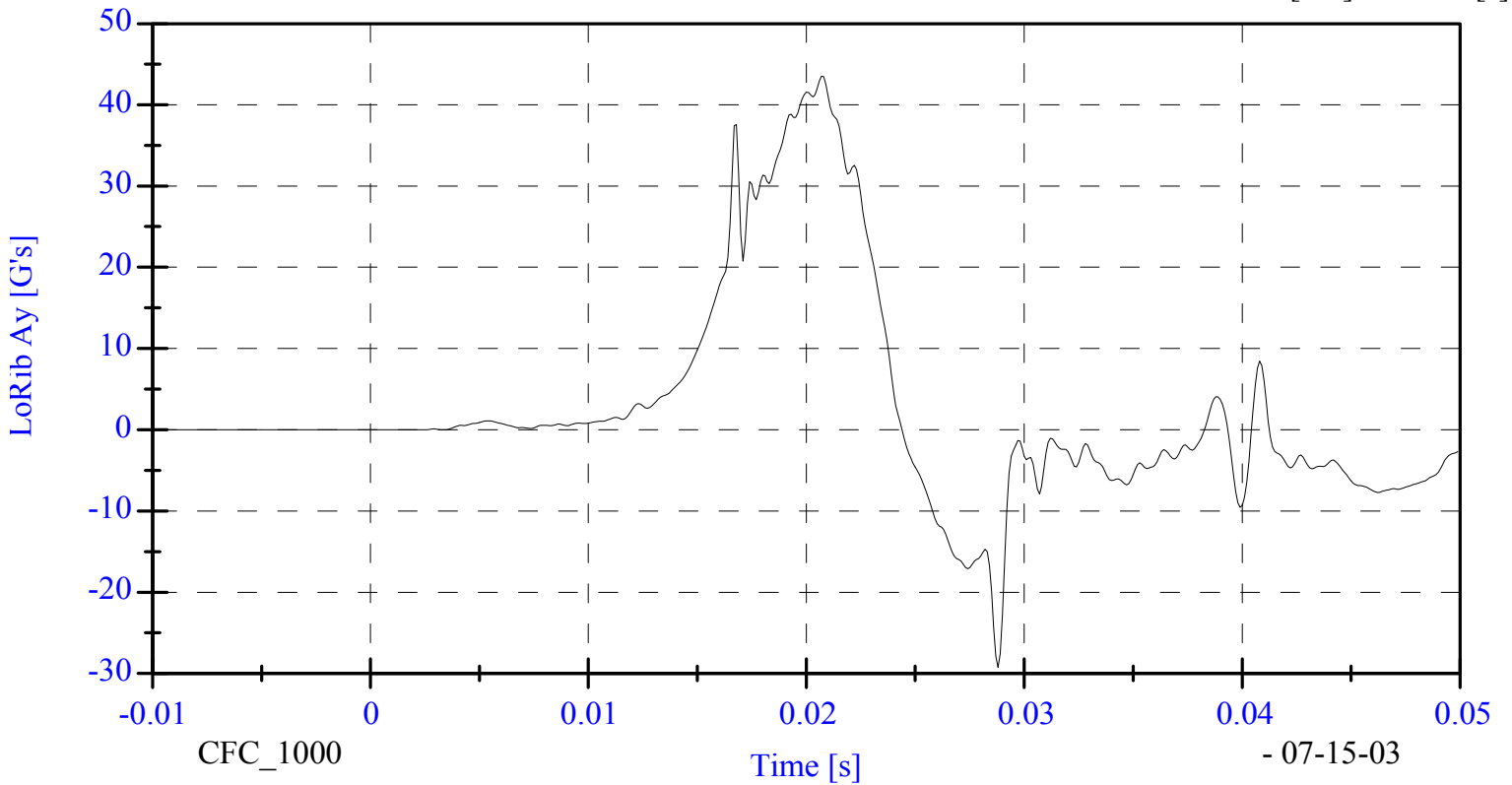
Upper Rib Y Acceleration



Max: 43.5 [G's] at 0.021 [s]

Min: -29.3 [G's] at 0.029 [s]

Lower Rib Y Acceleration

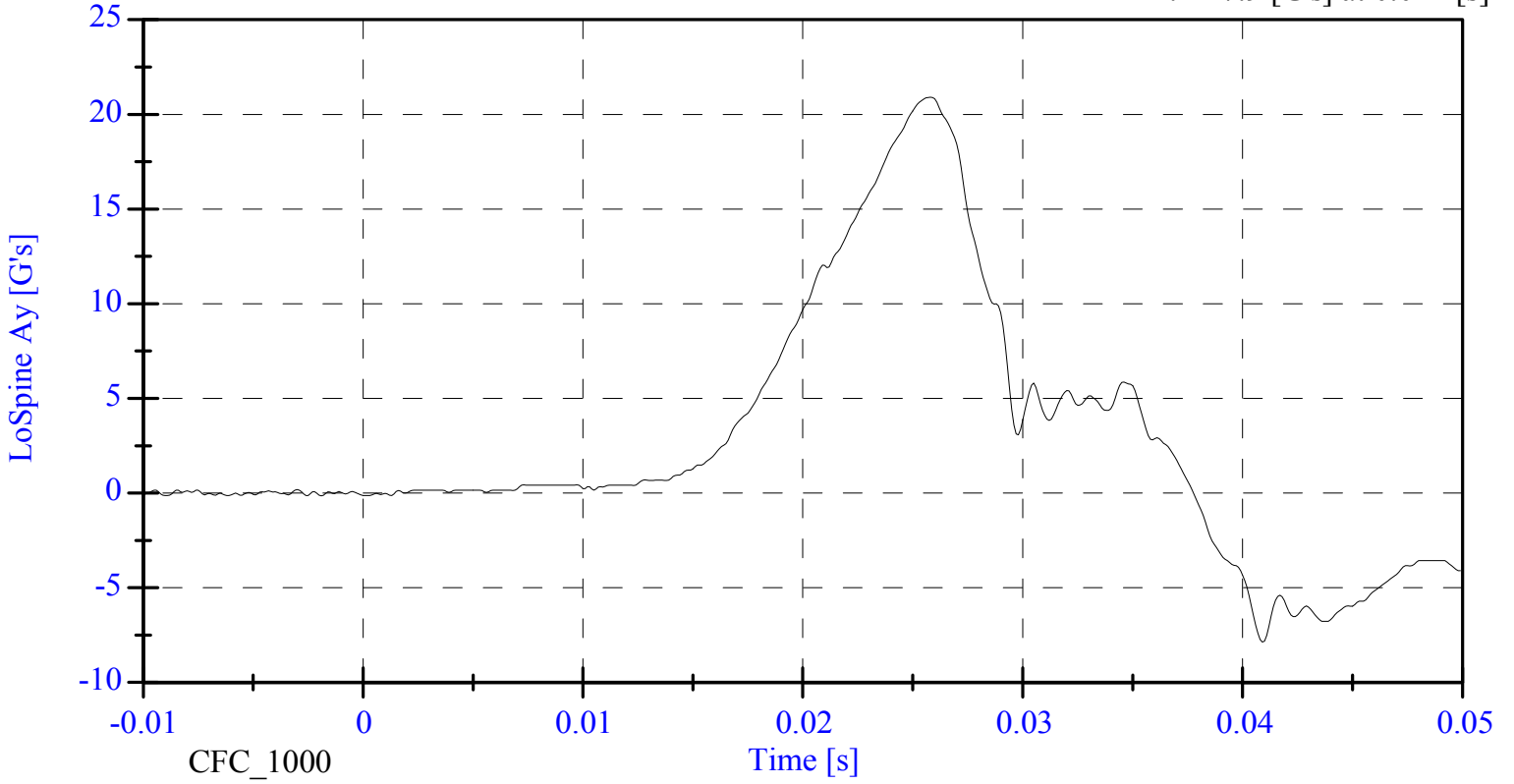


- 07-15-03

Lower Spine Y Acceleration

Max: 20.9 [G's] at 0.026 [s]

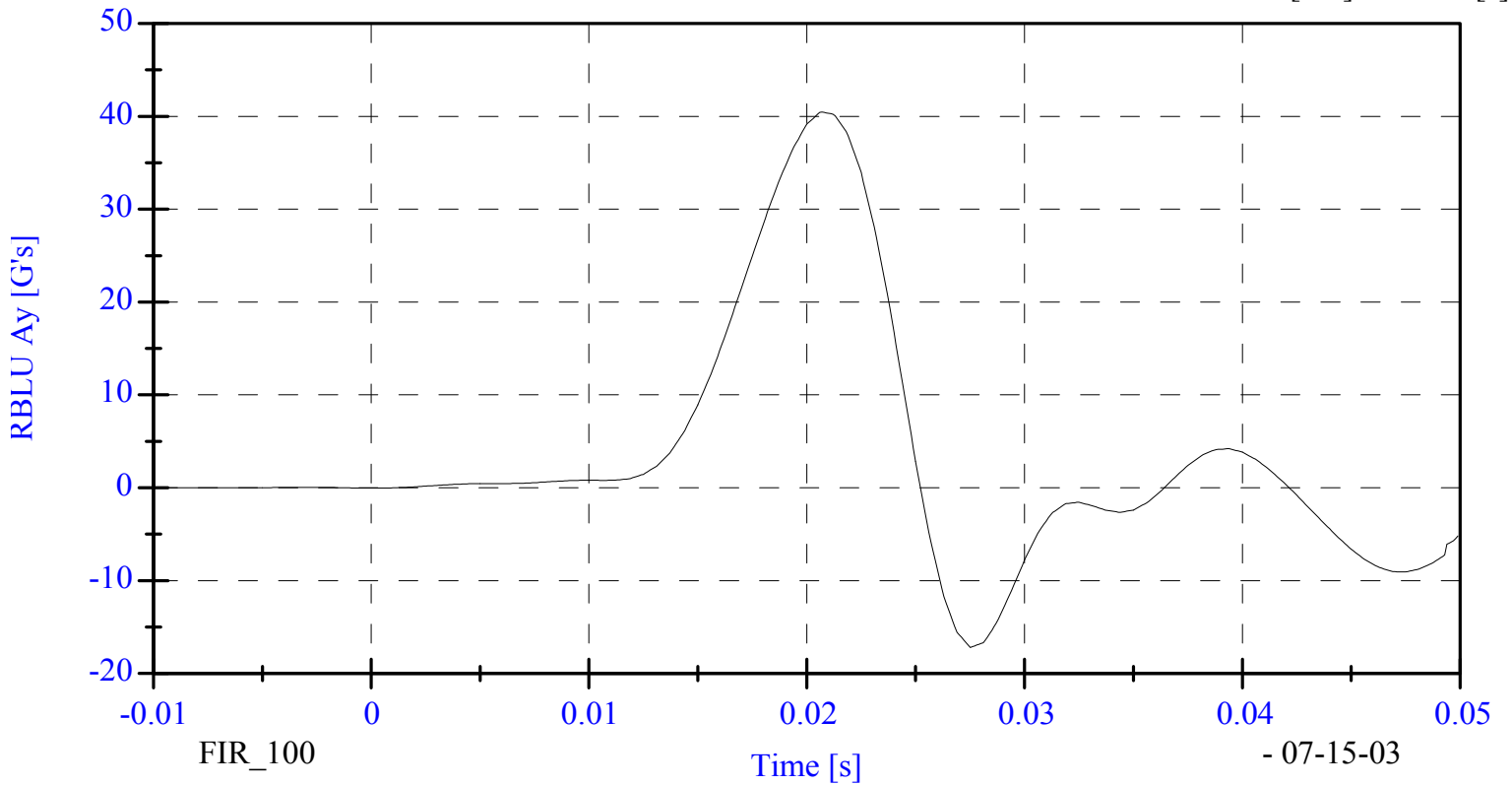
Min: -7.9 [G's] at 0.041 [s]



Upper Rib Y Acceleration

Max: 40.5 [G's] at 0.021 [s]

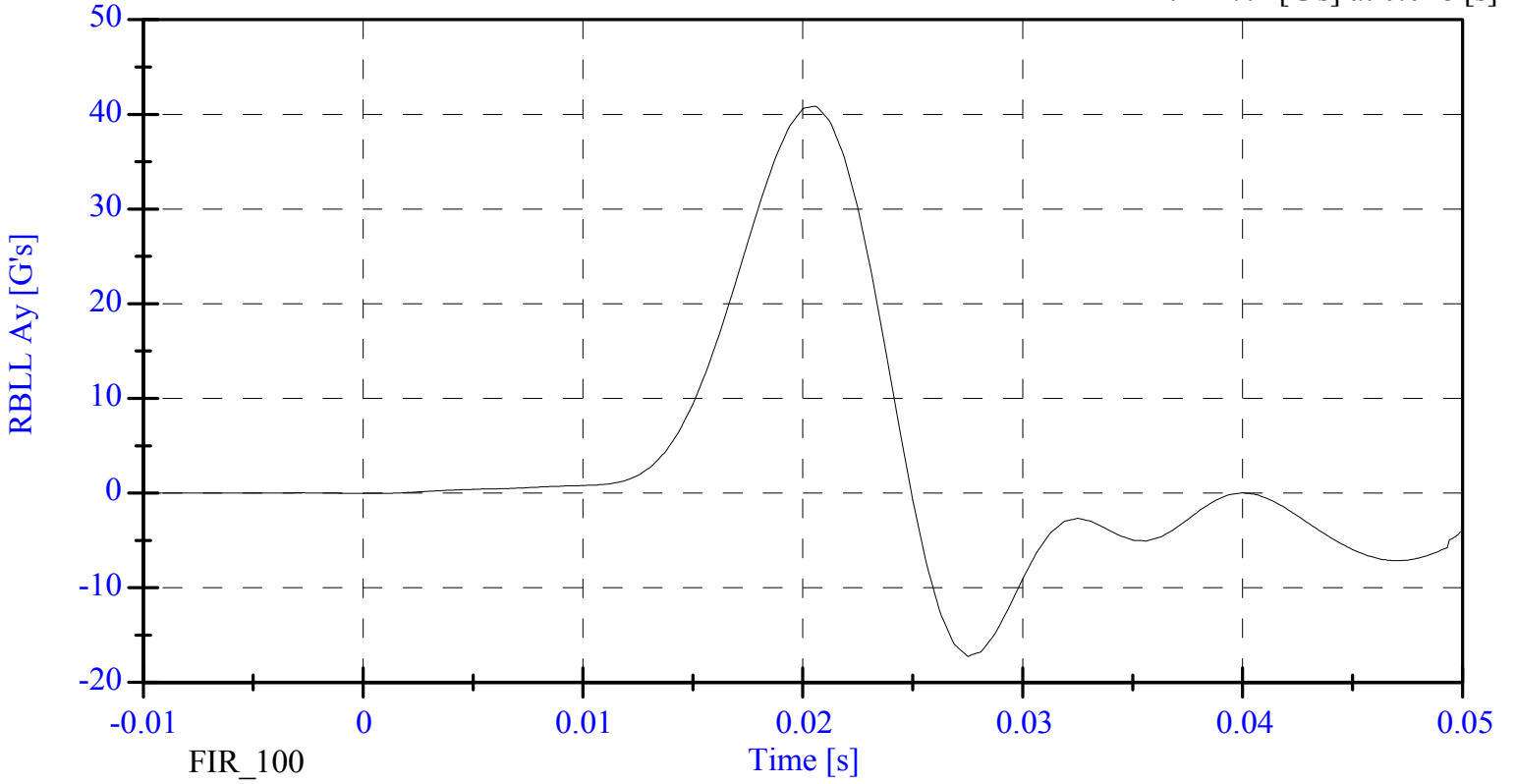
Min: -17.2 [G's] at 0.028 [s]



Lower Rib Y Acceleration

Max: 40.9 [G's] at 0.021 [s]

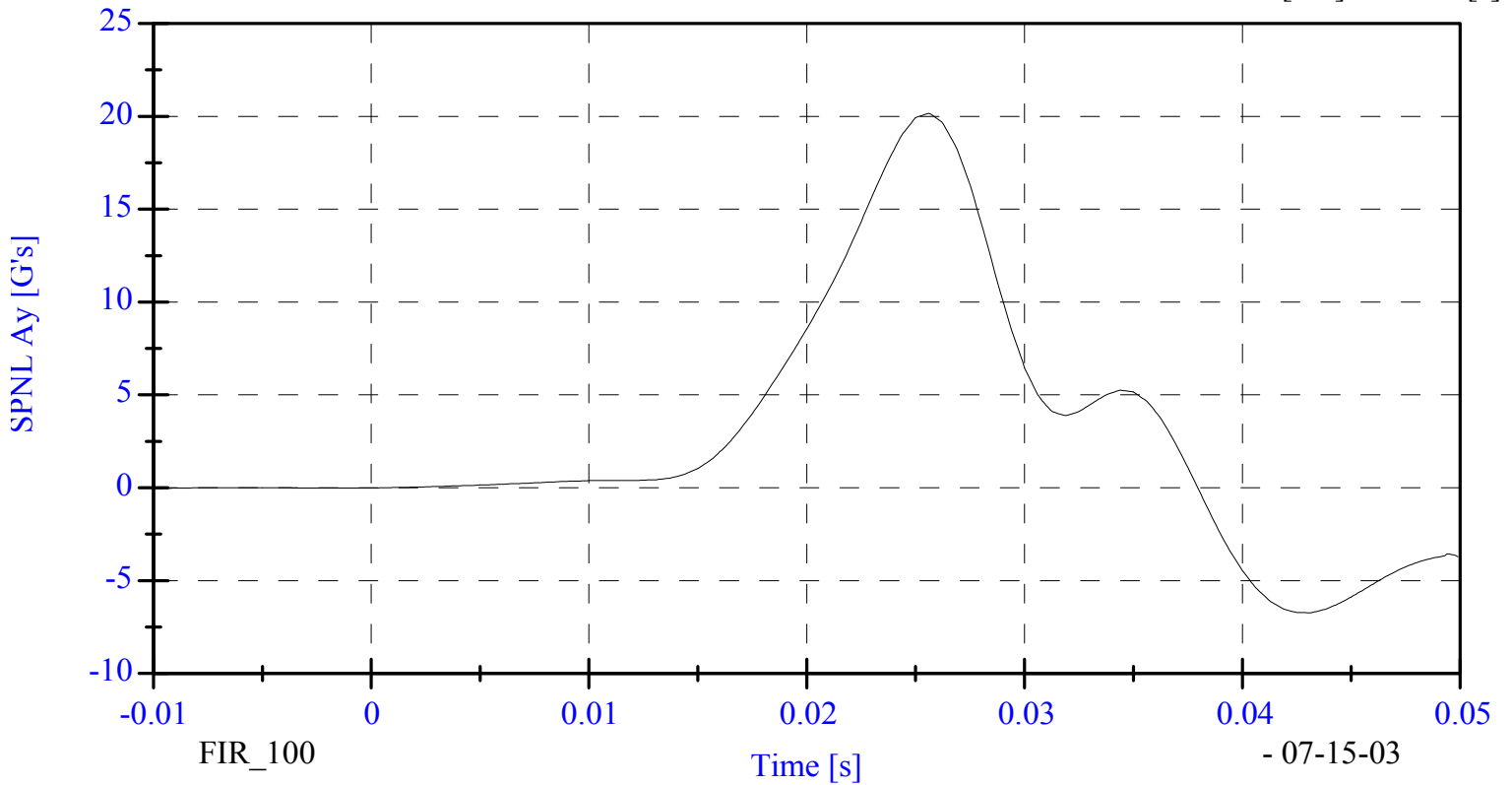
Min: -17.2 [G's] at 0.028 [s]



Lower Spine Y Acceleration

Max: 20.2 [G's] at 0.026 [s]

Min: -6.7 [G's] at 0.043 [s]



**LATERAL PELVIS IMPACT TEST  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

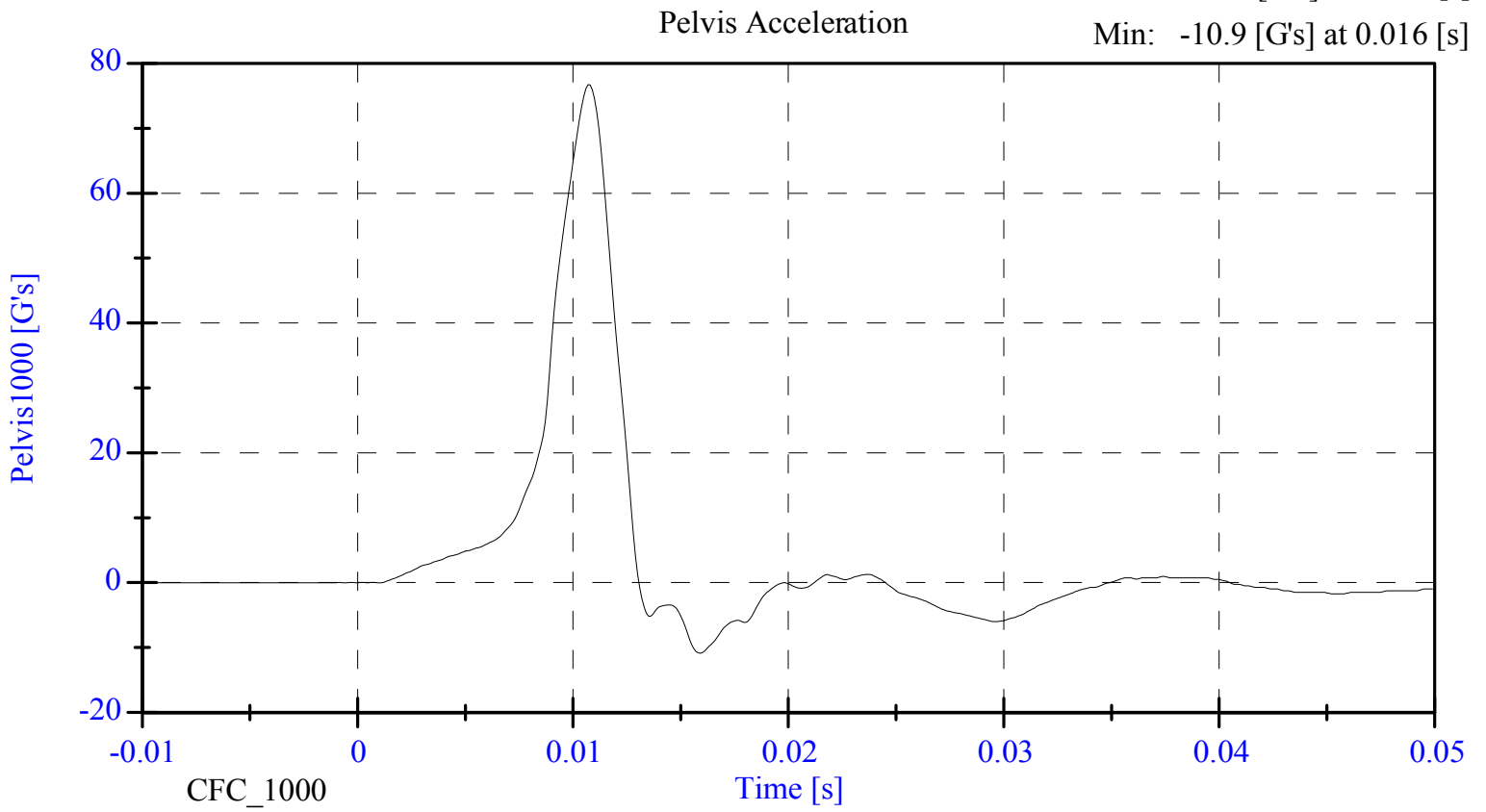
SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: July 15, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	27
PROBE SPEED (m/s)	4.27 - 4.33	4.27
PELVIS ACCELERATION (g's)	40 - 60	55.98

**REMARKS:** None

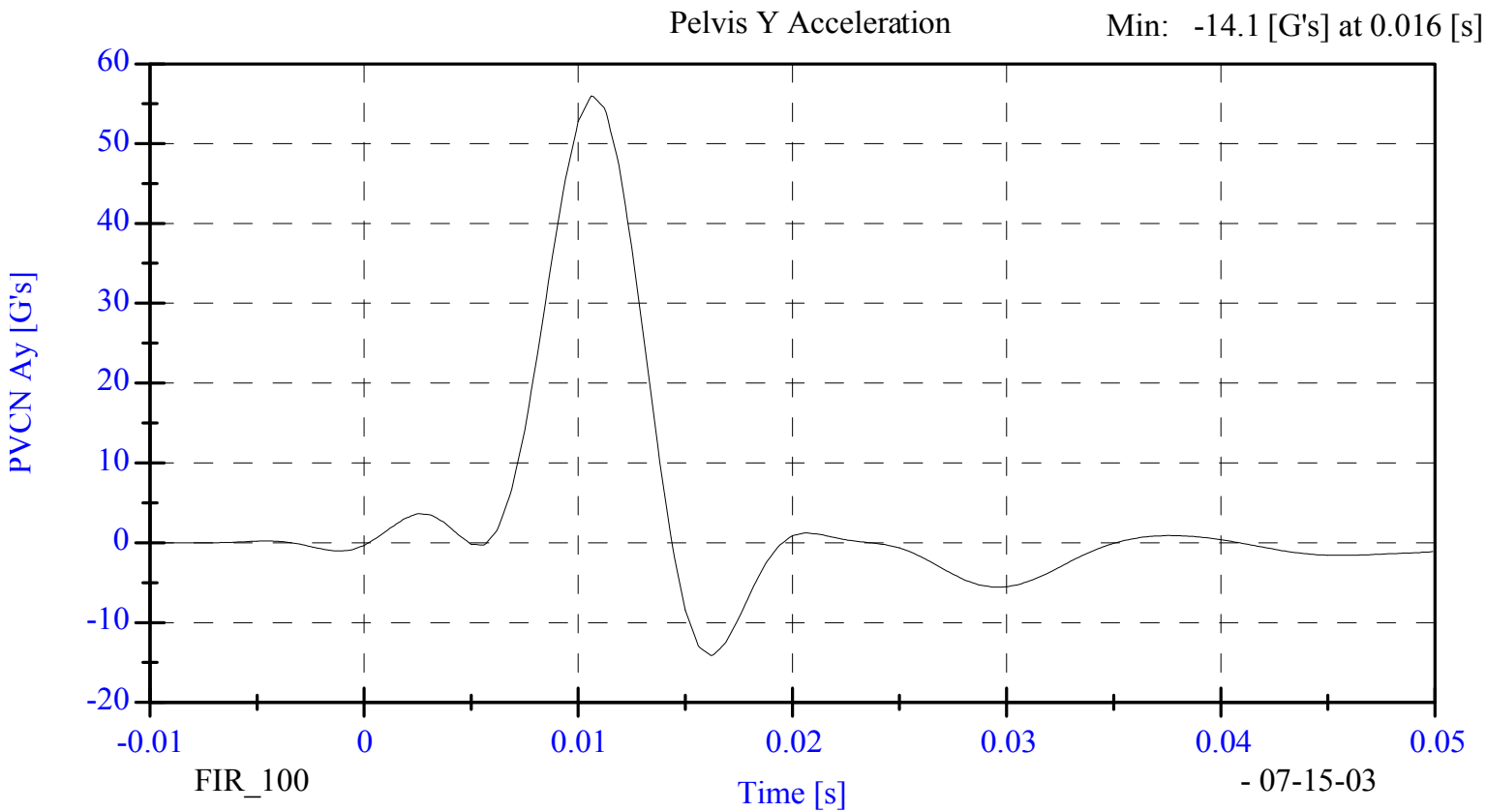
Max: 76.7 [G's] at 0.011 [s]

Min: -10.9 [G's] at 0.016 [s]



Max: 56.0 [G's] at 0.011 [s]

Min: -14.1 [G's] at 0.016 [s]



**HEAD DROP TEST  
PRE-TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

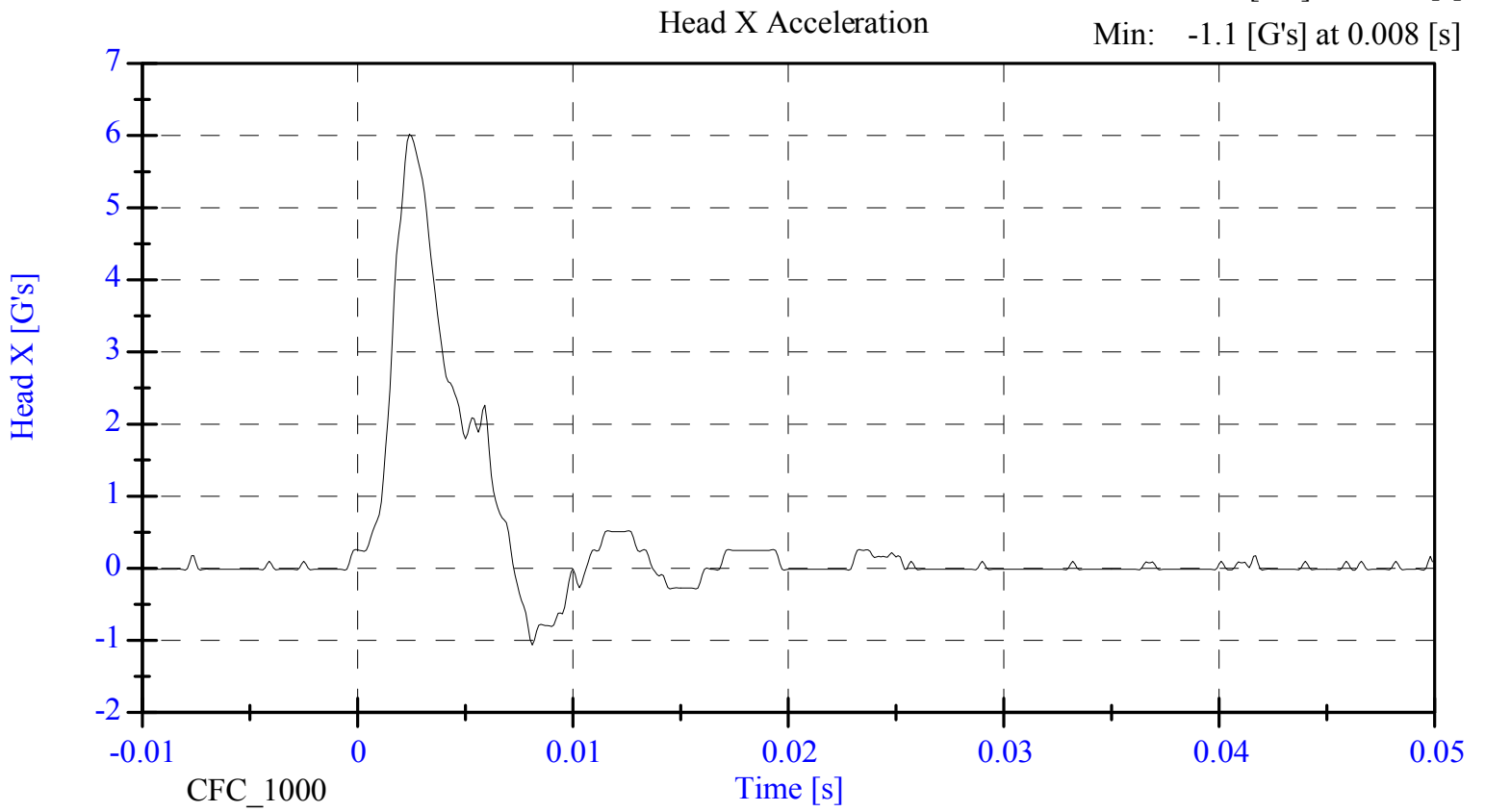
SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: July 14, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 – 22.2	20.6
RELATIVE HUMIDITY (%)	10 – 70	38
PEAK RESULTANT ACCELERATION (Gs)	120 – 150	134.44
PEAK LATERAL ACCELERATION (Gs)	Not to Exceed 15	6.02
CURVE PERCENT NONMODAL (%)	< 15	1.03

**REMARKS:** None

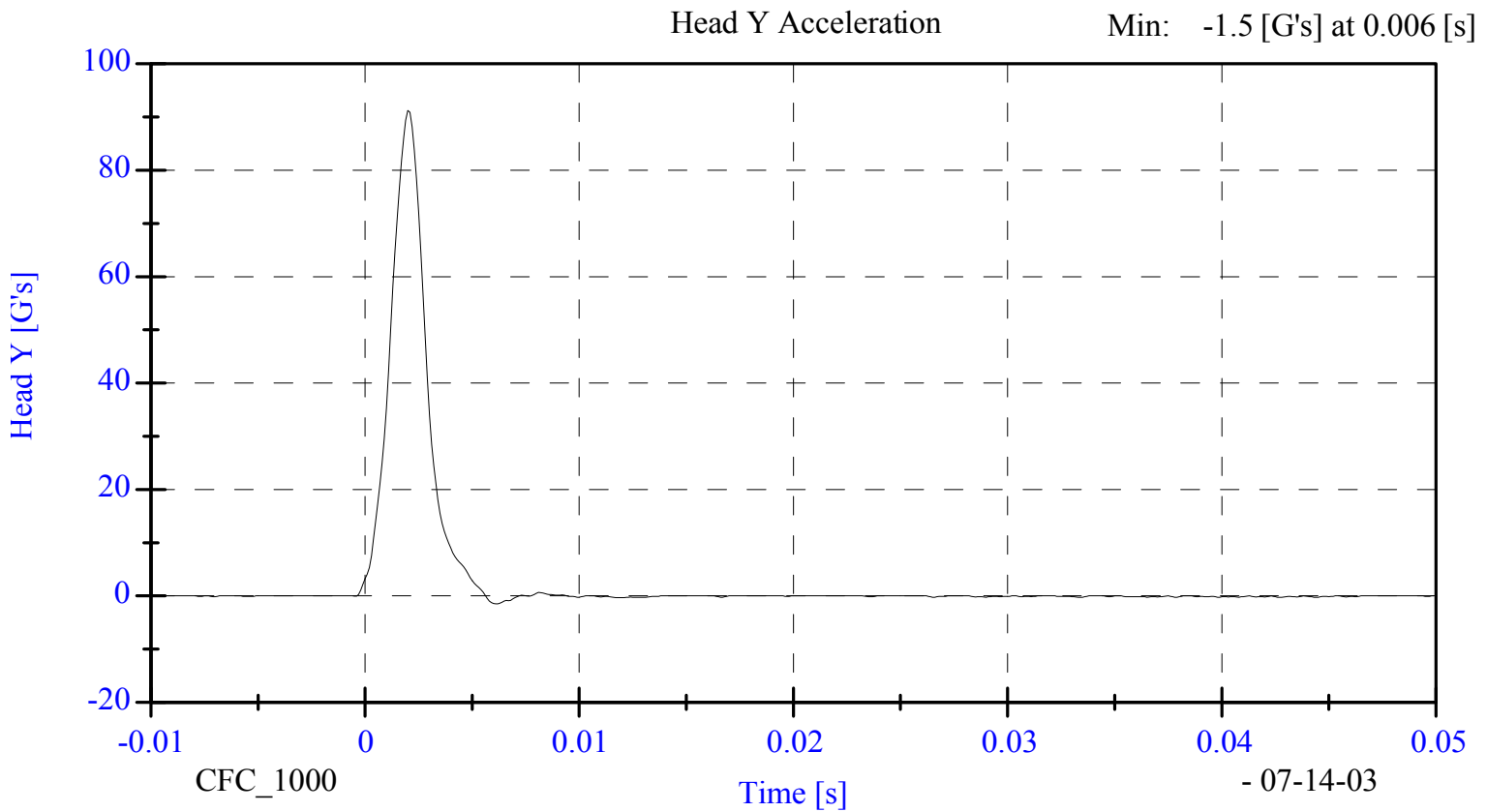
Max: 6.0 [G's] at 0.002 [s]

Min: -1.1 [G's] at 0.008 [s]



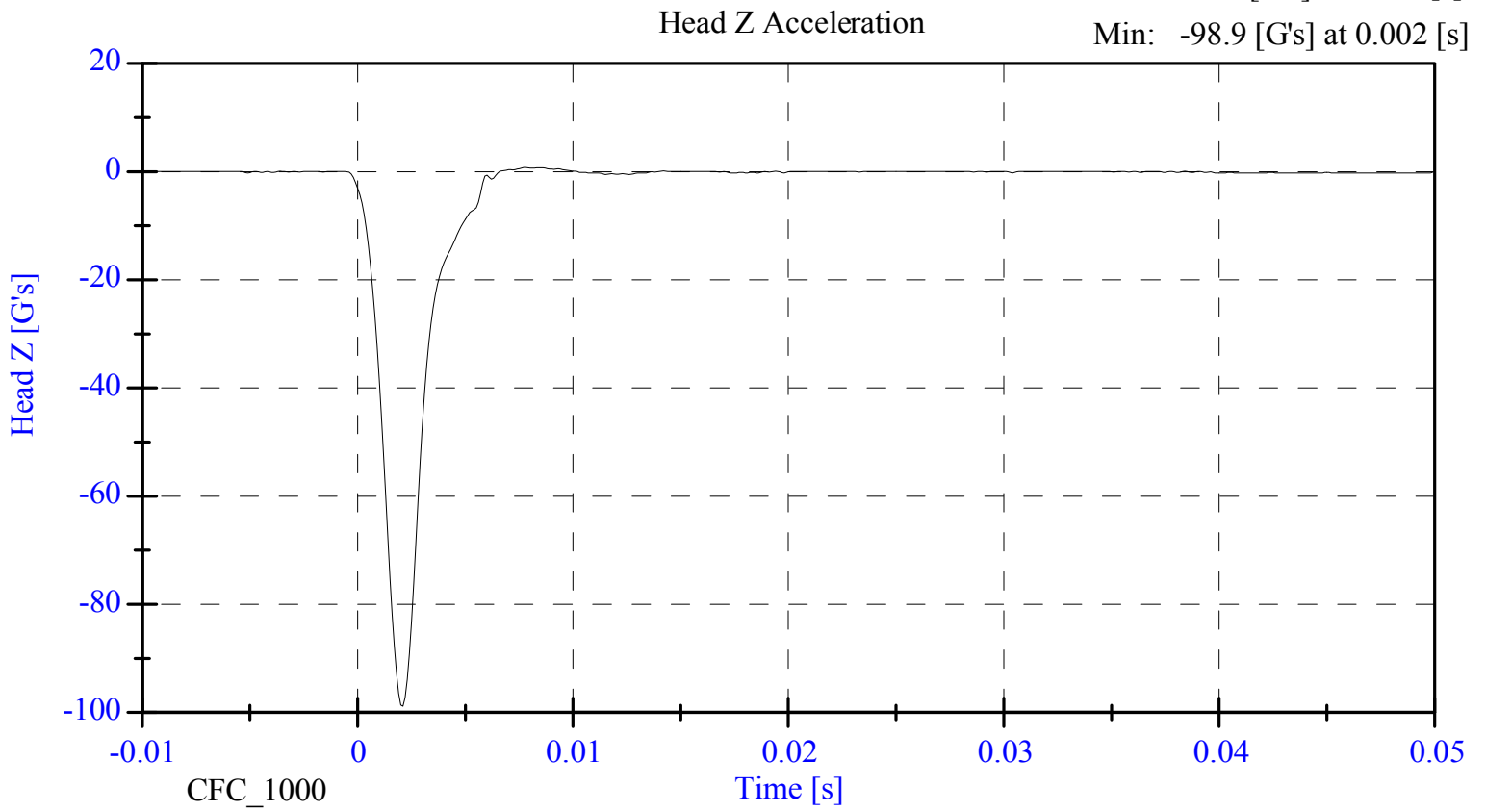
Max: 91.2 [G's] at 0.002 [s]

Min: -1.5 [G's] at 0.006 [s]



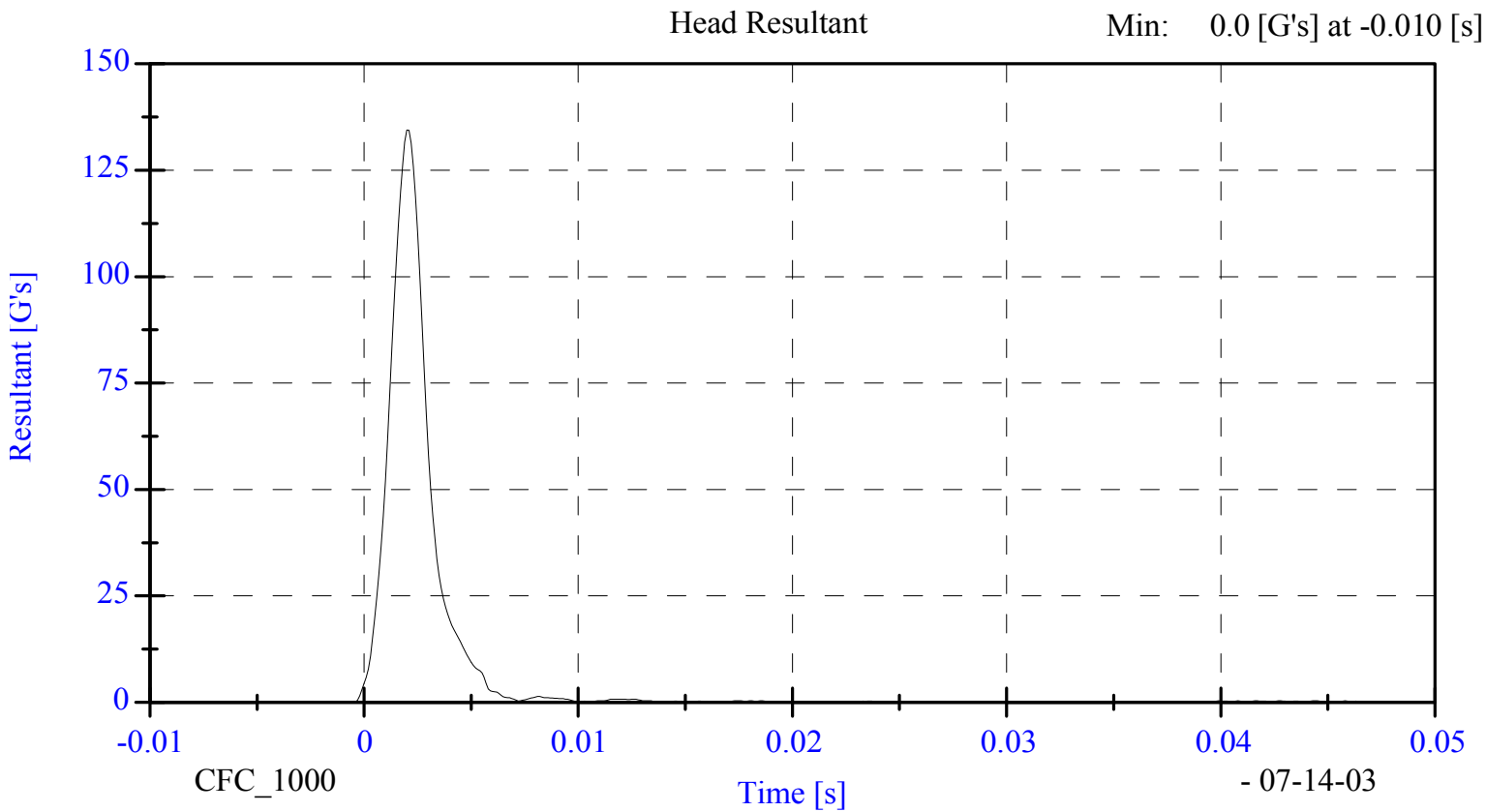
Max: 0.8 [G's] at 0.008 [s]

Min: -98.9 [G's] at 0.002 [s]



Max: 134.4 [G's] at 0.002 [s]

Min: 0.0 [G's] at -0.010 [s]



- 07-14-03

**LATERAL NECK BENDING TEST  
PRE-TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
 Date: July 14, 2003 Laboratory Technician: B. Swiecicki

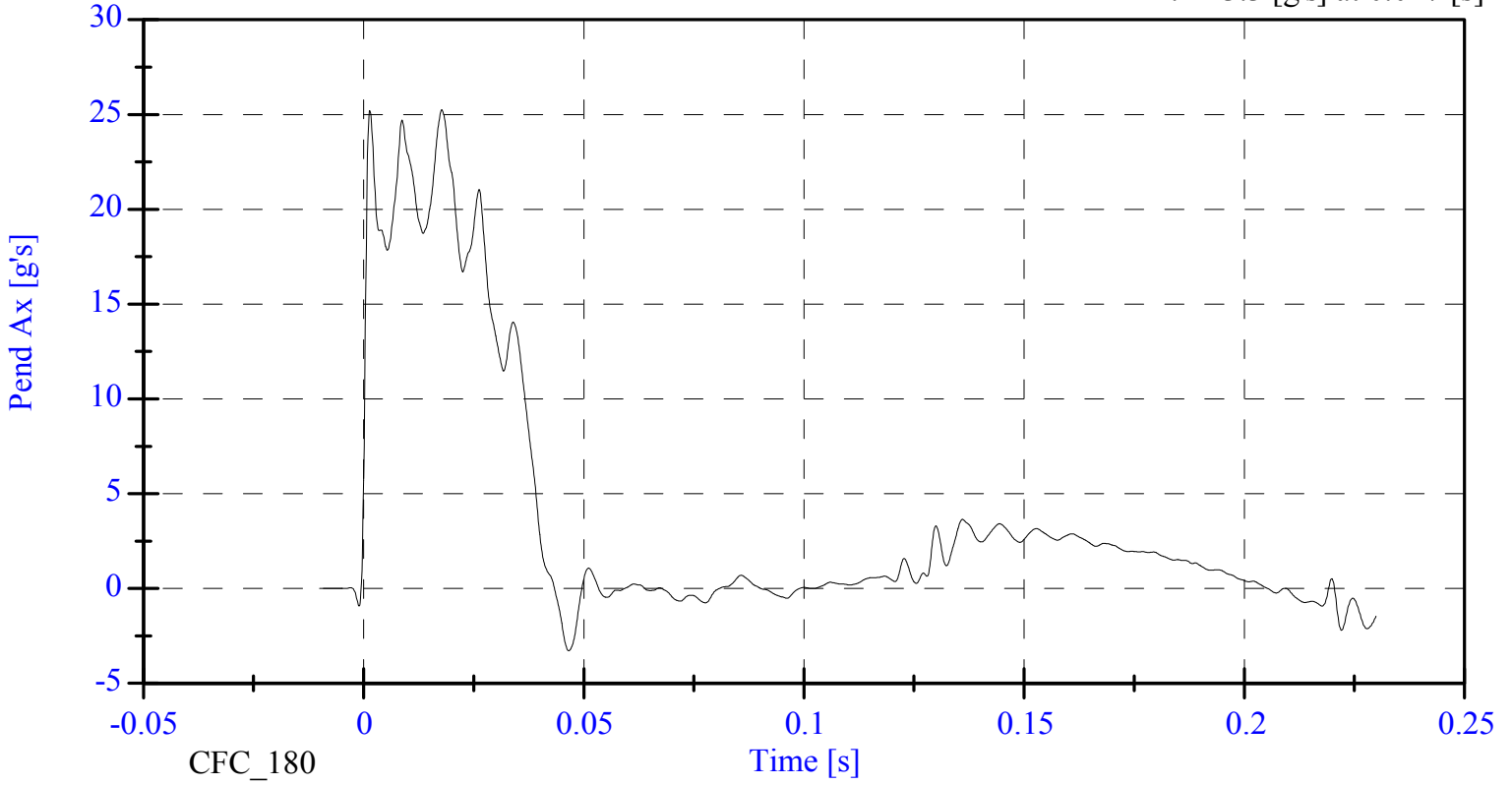
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 - 22.2	21.1
RELATIVE HUMIDITY (%)	10 - 70	38
IMPACT VELOCITY (m/s)	6.89 – 7.13	7.02
PENDULUM DELTA V		
DELTA V @ 10 ms (m/s)	1.96 – 2.55	2.02
DELTA V @ 20 ms (m/s)	4.12 – 5.10	4.16
DELTA V @ 30 ms (m/s)	5.73 – 7.01	5.92
DELTA V @ 40-70 ms (m/s)	6.27 – 7.64	6.99
D PLANE ROTATION		
MAXIMUM ROTATION (deg)	64 – 78	76.80
ROT. ANGLE TIME to ZERO (ms)	50 – 70	62.90
MOMENT ABOUT THE OCCIPITAL CONDYLE		
MAX OCCIPITAL MOMENT (Nm)	88 – 108	89.00
OCCIPITAL MOMENT DECAY (ms)	40.0 – 60.0	56.50
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT		
ROTATION wrt MOMENT (ms)	0 – 20	8.90

**REMARKS:** None

Max: 25.3 [g's] at 0.018 [s]

Min: -3.3 [g's] at 0.047 [s]

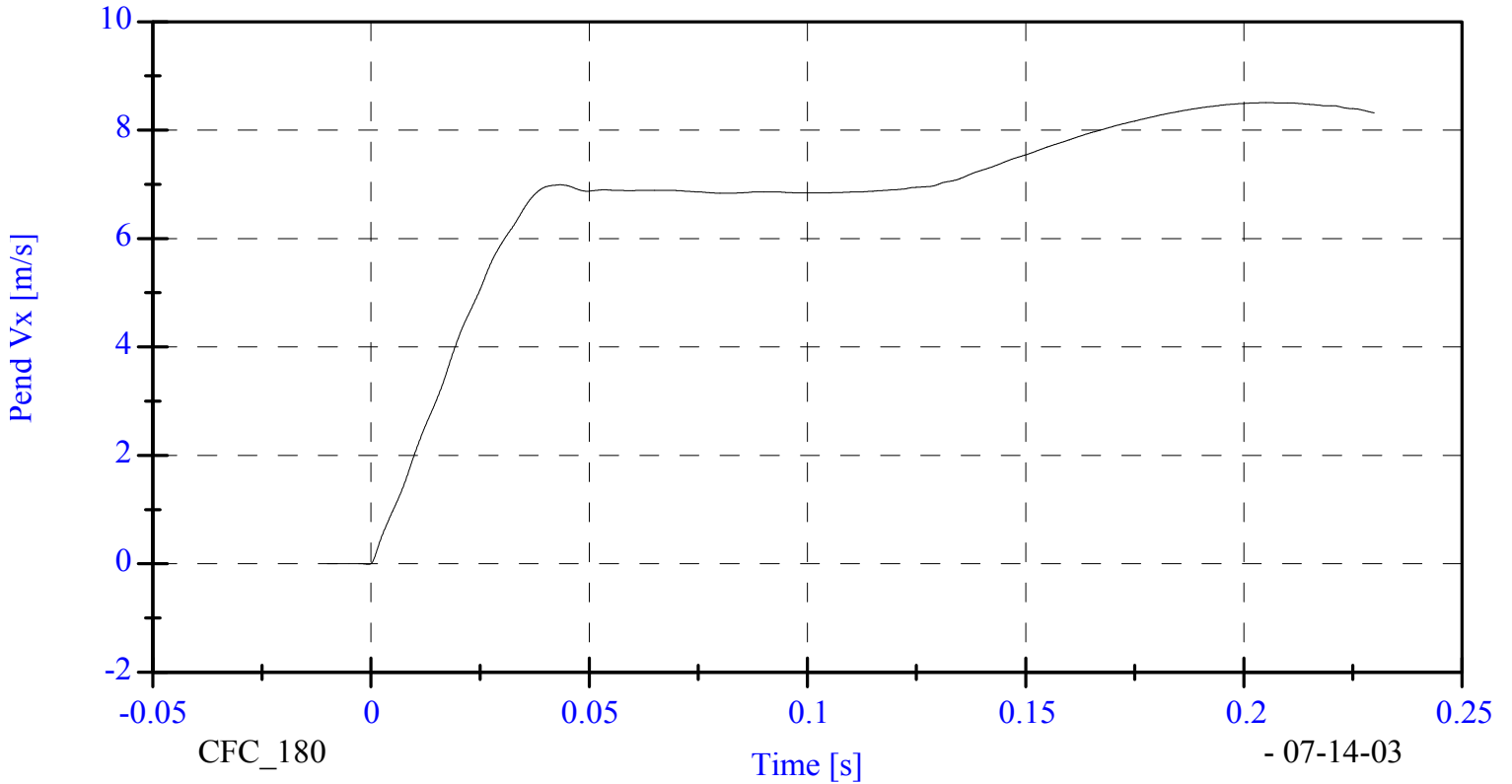
Pendulum Acceleration



Max: 8.5 [m/s] at 0.205 [s]

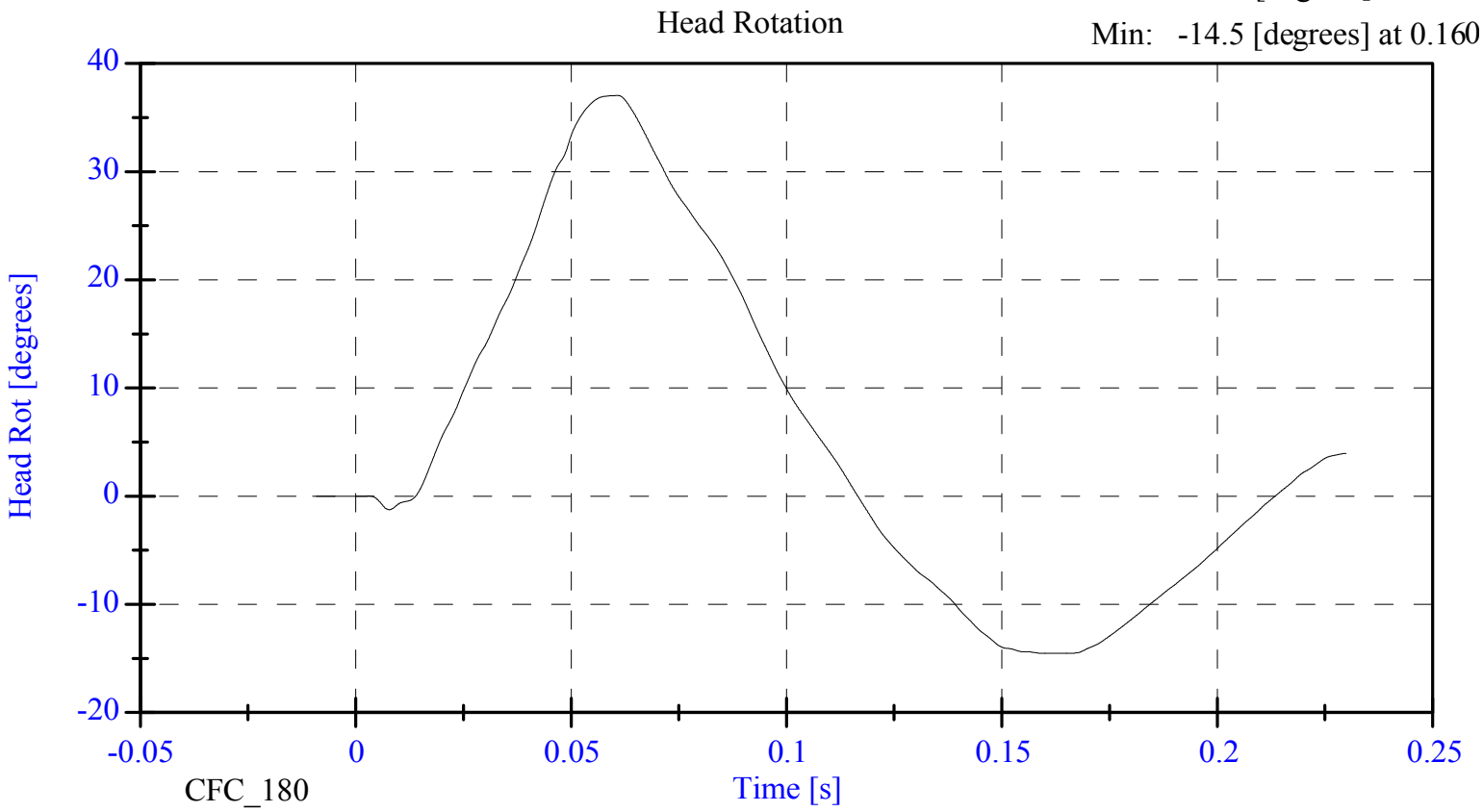
Min: -0.0 [m/s] at -0.001 [s]

Pendulum Velocity



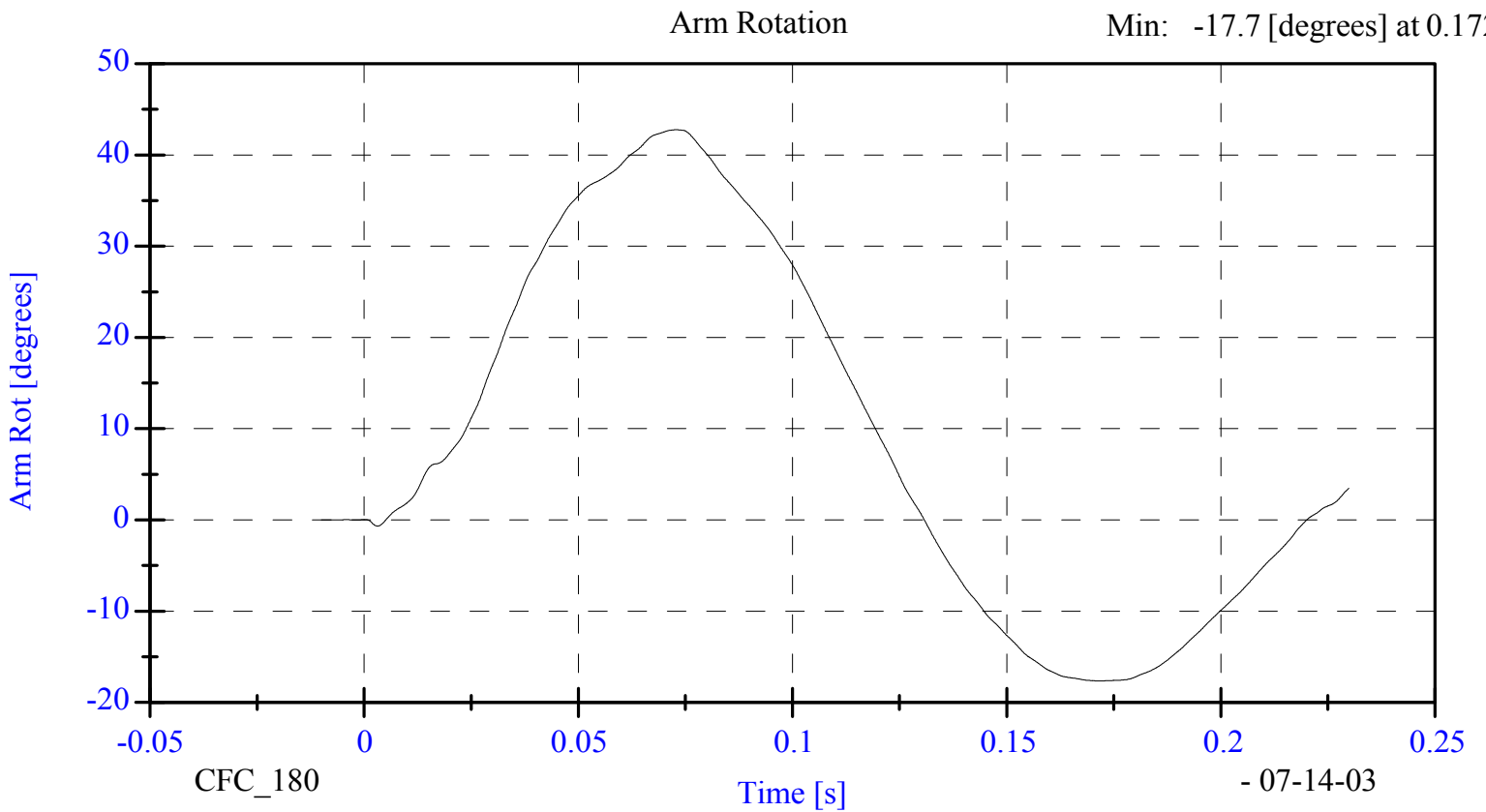
Max: 37.0 [degrees] at 0.061

Min: -14.5 [degrees] at 0.160



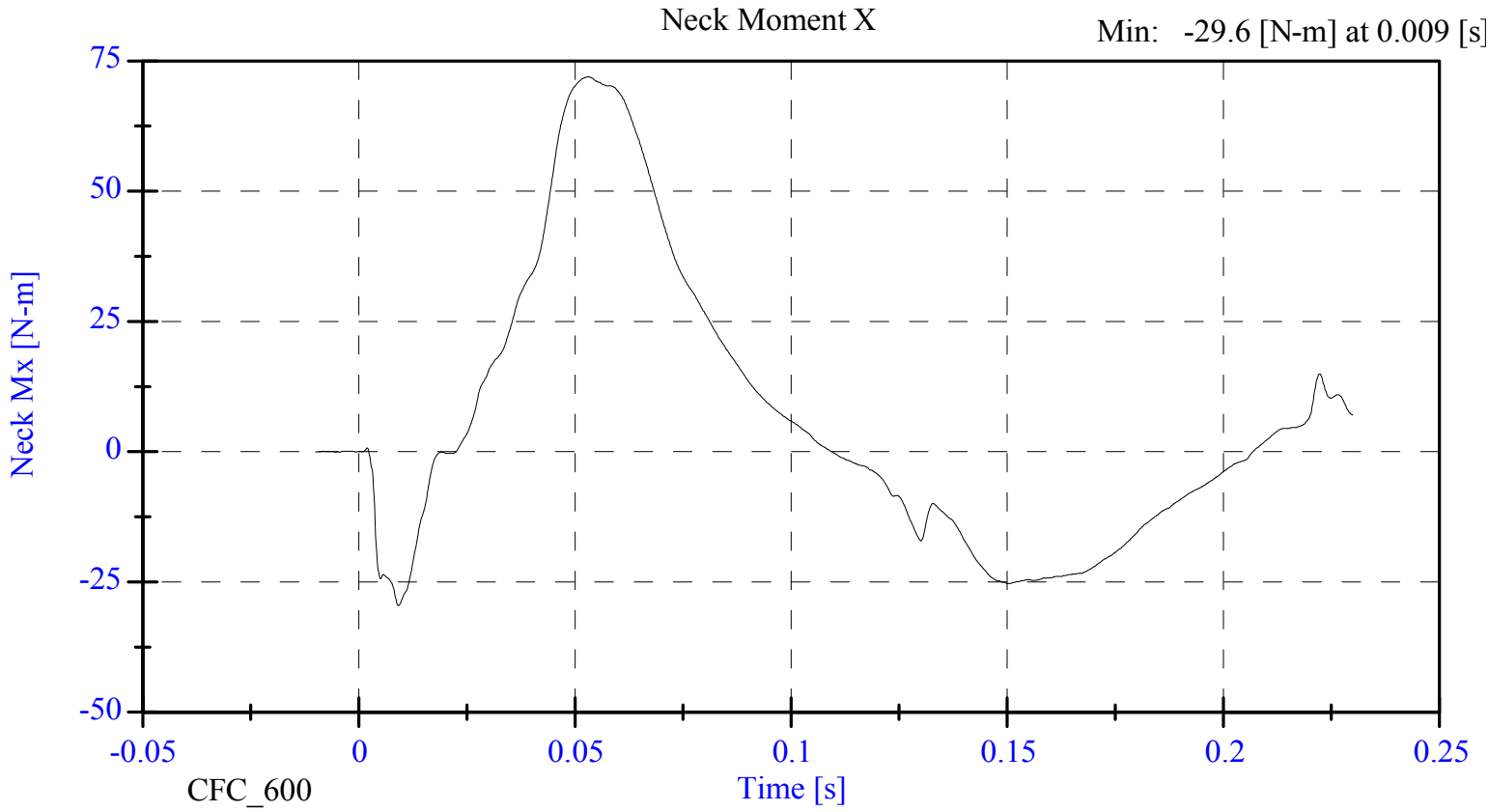
Max: 42.8 [degrees] at 0.073

Min: -17.7 [degrees] at 0.172



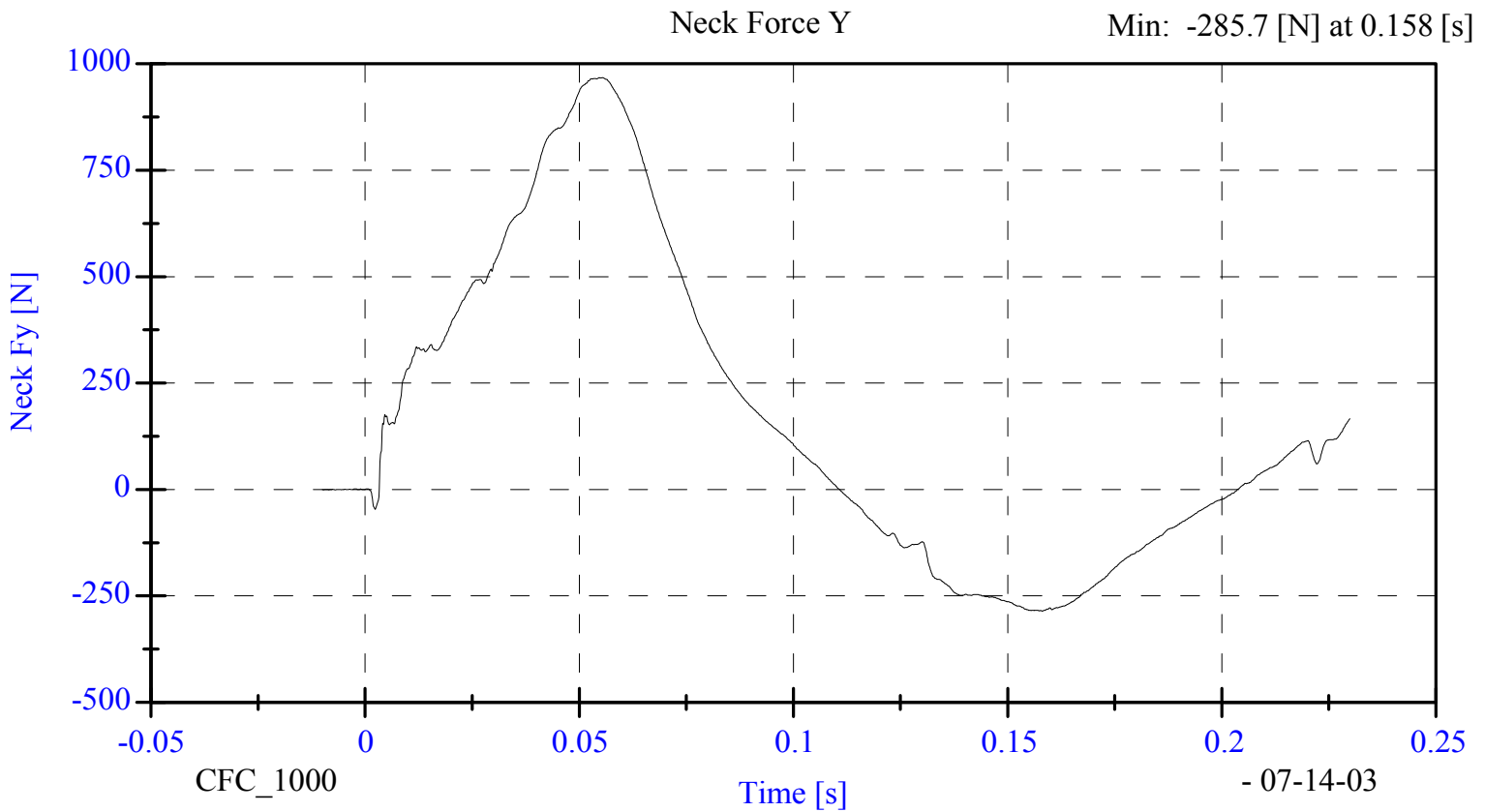
Max: 71.9 [N-m] at 0.053 [s]

Min: -29.6 [N-m] at 0.009 [s]



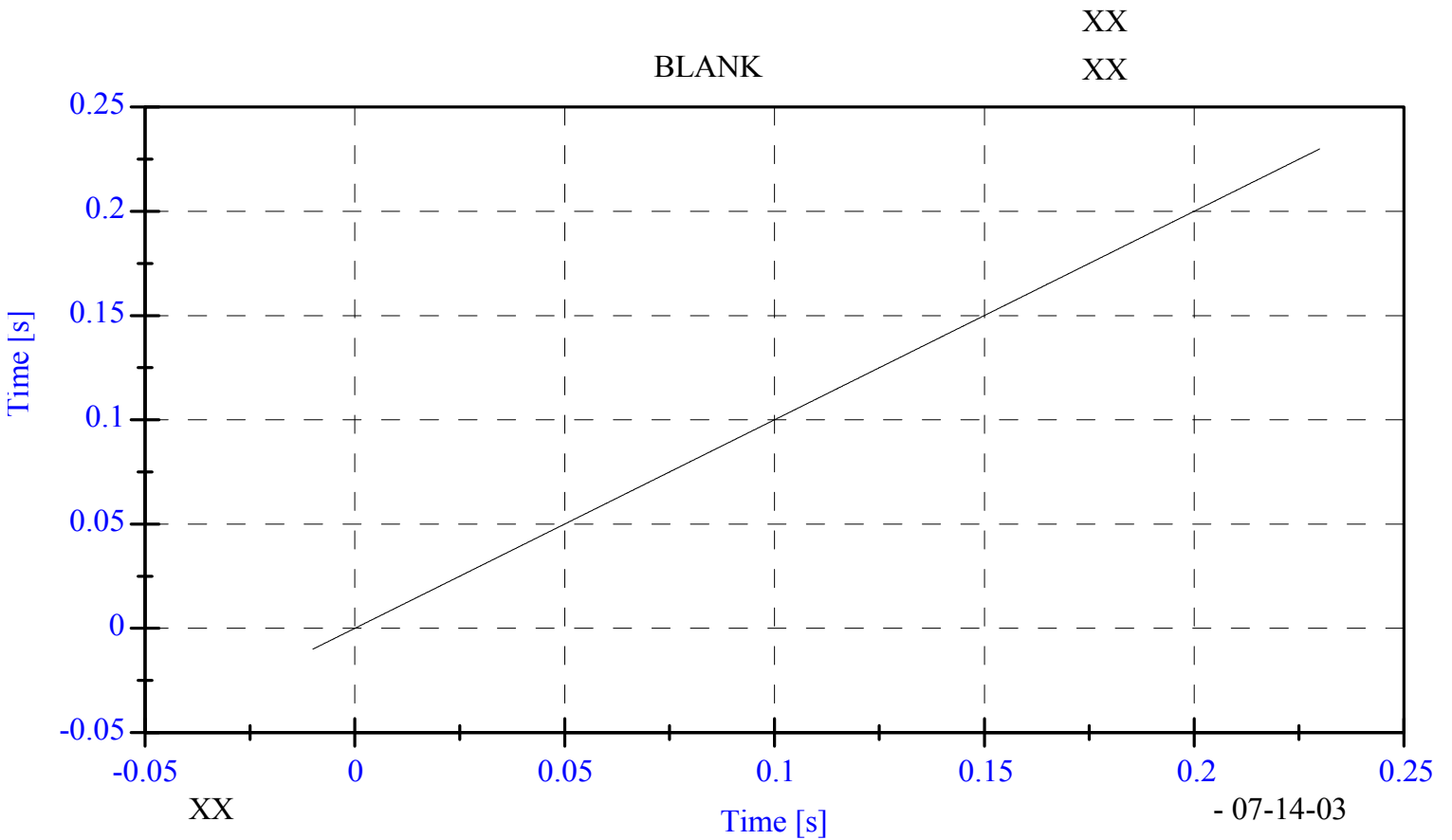
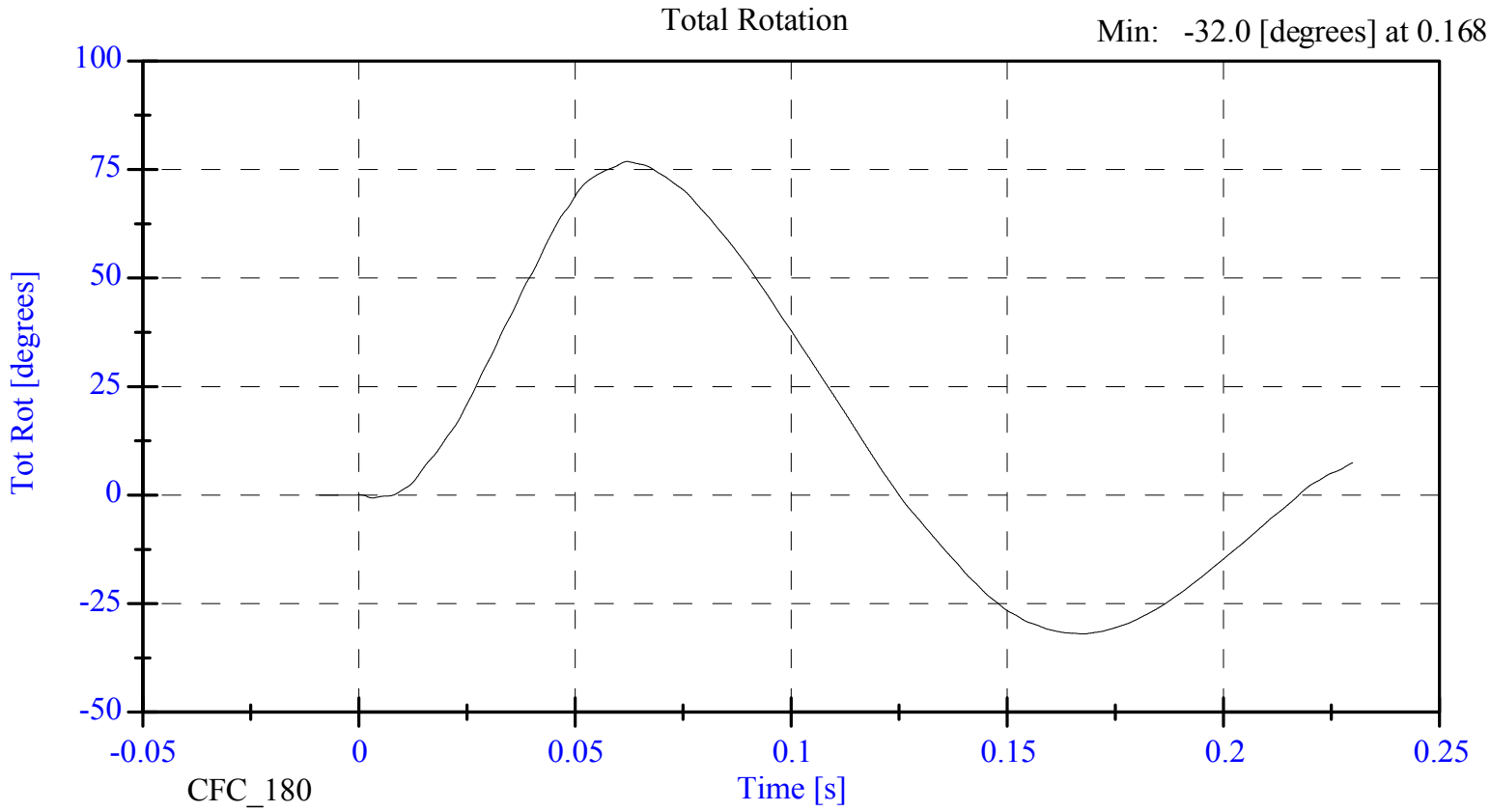
Max: 967.4 [N] at 0.055 [s]

Min: -285.7 [N] at 0.158 [s]



Max: 76.8 [degrees] at 0.062

Min: -32.0 [degrees] at 0.168



**ABDOMINAL COMPRESSION TEST  
PRE-TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

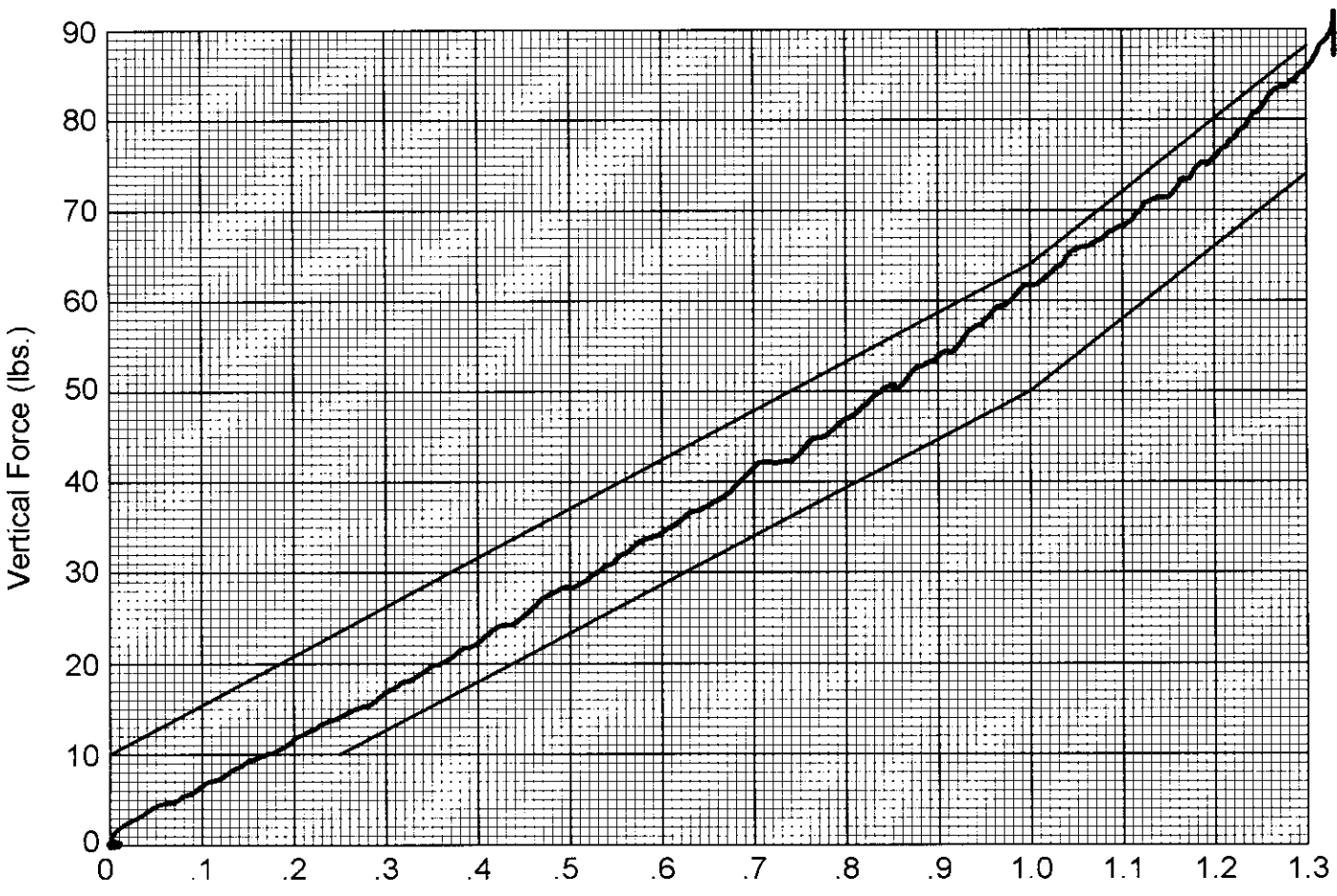
SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: July 15, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	29
FORCE @ 13 mm (N)	104 - 162	125
FORCE @ 19 mm (N)	163 - 221	191
FORCE @ 25 mm (N)	222 - 280	276
FORCE @ 33 mm (N)	325 - 391	347

**REMARKS:** None

**ORIGINAL**

Dummy S/N 270  
W/A \_\_\_\_\_  
Date 07-15-03  
Performed By [Signature]  
Temp. 70°  
Humidity 59%



Hybrid II  
Abdomen Static Press

**LUMBAR FLEXION TEST  
PRE-TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: July 15, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	29
FORCE @ 0° (N)	0 - 26.7	26
FORCE @ 20° (N)	97.8 - 151.2	111
FORCE @ 30° (N)	151.2 - 204.6	138
FORCE @ 40° (N)	204.6 - 258	222
RETURN ANGLE	12° max.	5

**REMARKS:** None

Dummy S/N 270

W/A

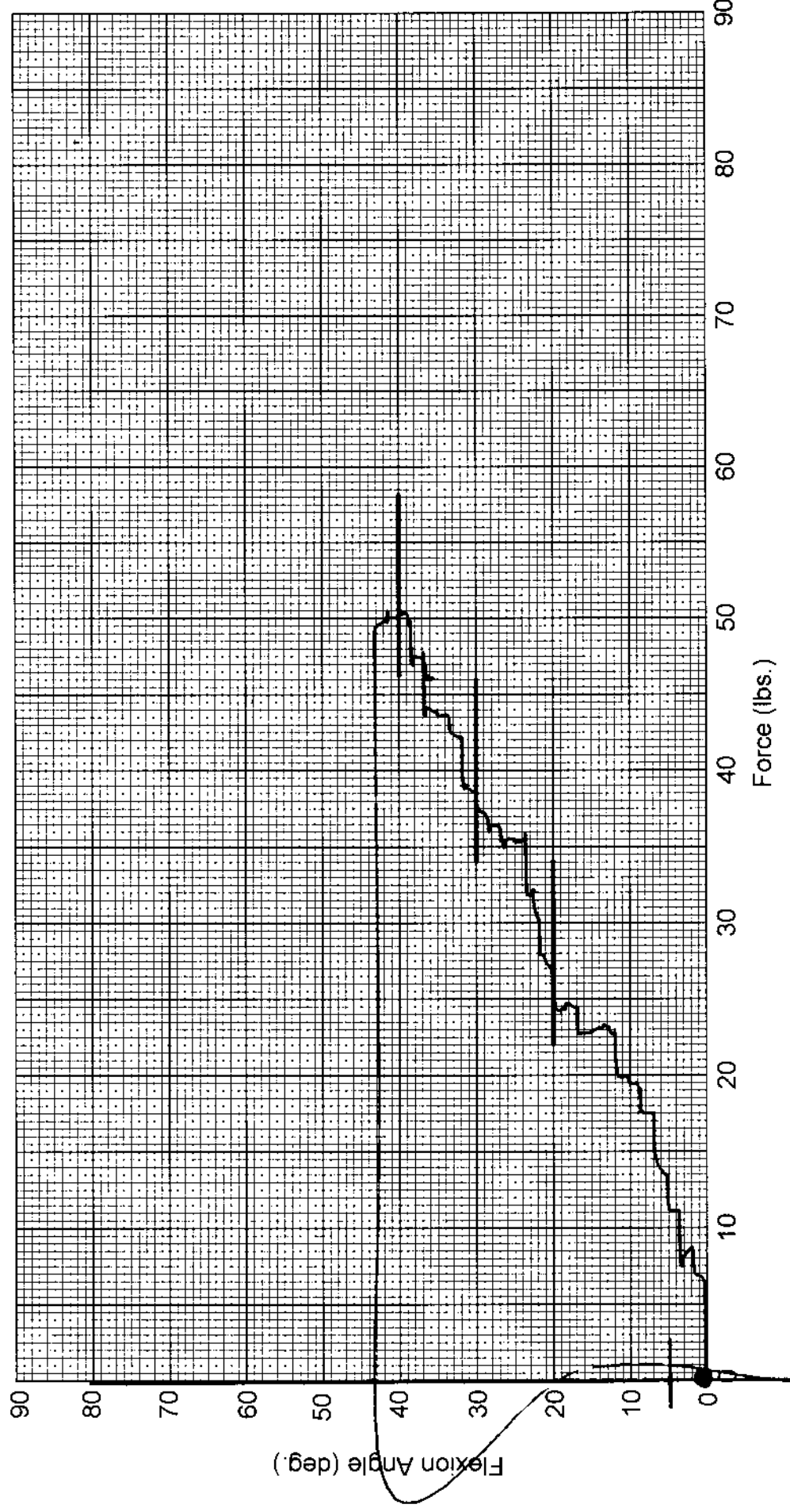
Date 07-15-03

Performed By [Signature]

Temp. 70°

Humidity 29%

ORIGINAL



Hybrid II Lumbar Spine Flexion Test

**PRE-TEST DUMMY INSPECTION LIST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
 Date: July 15, 2003 Laboratory Technician: B. Swiecicki

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

**REMARKS:** None

**CALIBRATION TEST RESULTS**

**POST TEST**

**SID H3 NO.: 270**

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 2  
Date: August 11, 2003 Laboratory Technician: B. Swiecicki

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

\* Test not required for SID certification.

**REMARKS:** None

**EXTERNAL DIMENSIONS  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 2  
Date: August 11, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	506
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	234
KH- Knee Pivot from Back Line (mm)	511 - 526	515
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	373

**REMARKS:** None

**LATERAL THORAX IMPACT TEST  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 2  
Date: August 8, 2003 Laboratory Technician: B. Swiecicki

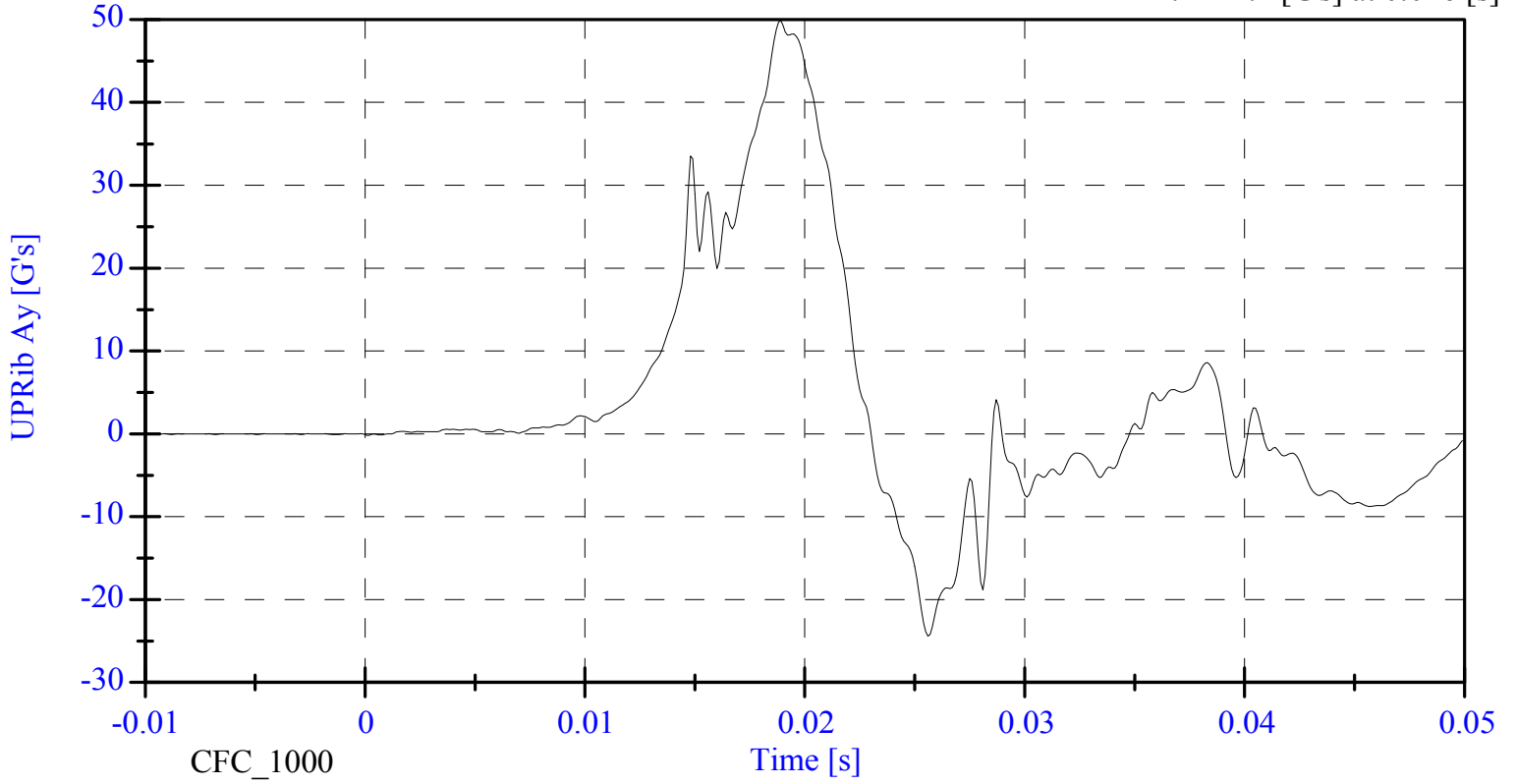
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	48
PROBE SPEED (m/s)	4.27 - 4.33	4.32
UPPER RIB (g's)	37 - 46	44.52
LOWER RIB (g's)	37 - 46	41.40
LOWER SPINE (g's)	15 - 22	20.43

**REMARKS:** None

Max: 49.9 [G's] at 0.019 [s]

Min: -24.4 [G's] at 0.026 [s]

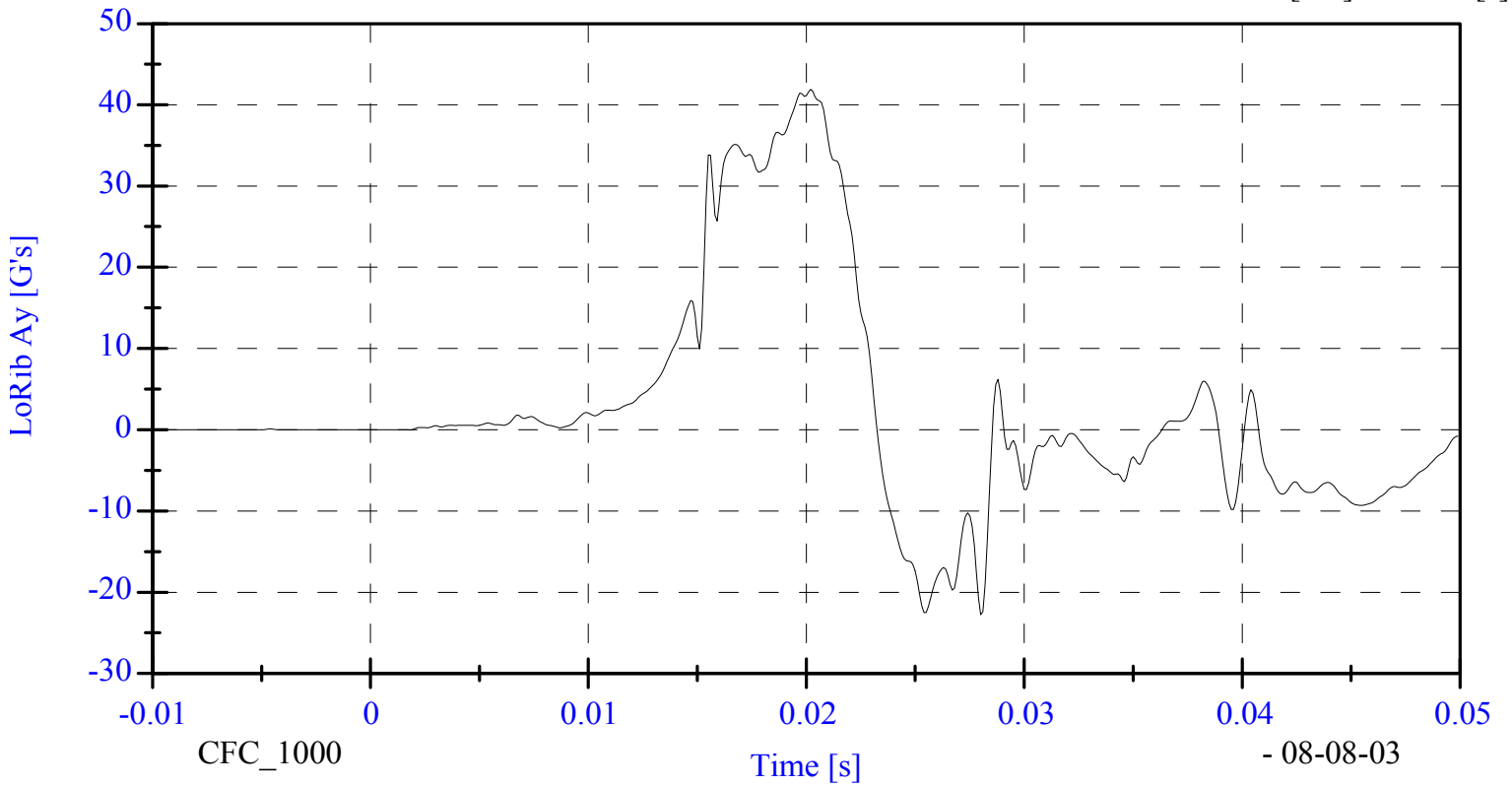
Upper Rib Y Acceleration



Max: 41.9 [G's] at 0.020 [s]

Min: -22.8 [G's] at 0.028 [s]

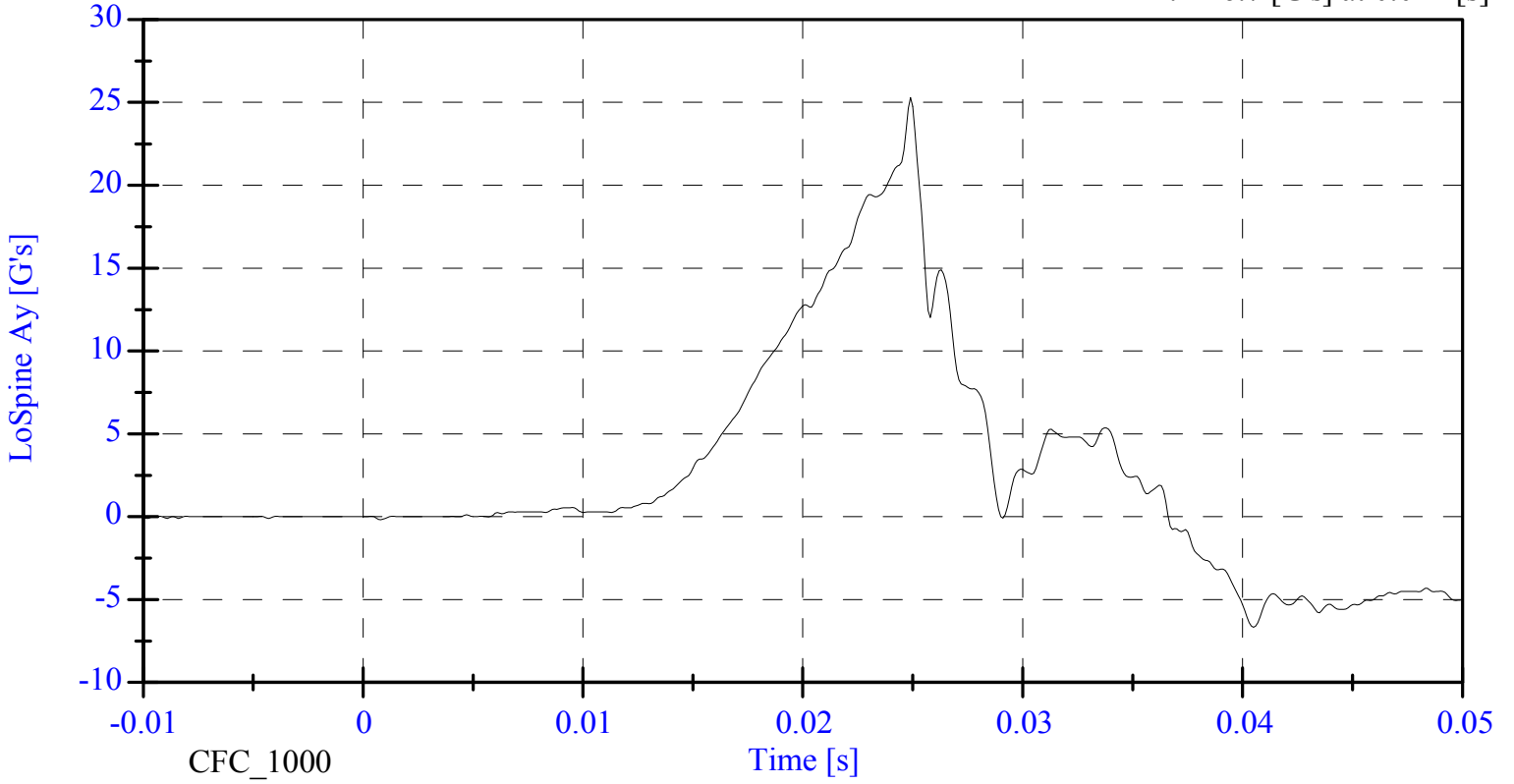
Lower Rib Y Acceleration



Lower Spine Y Acceleration

Max: 25.3 [G's] at 0.025 [s]

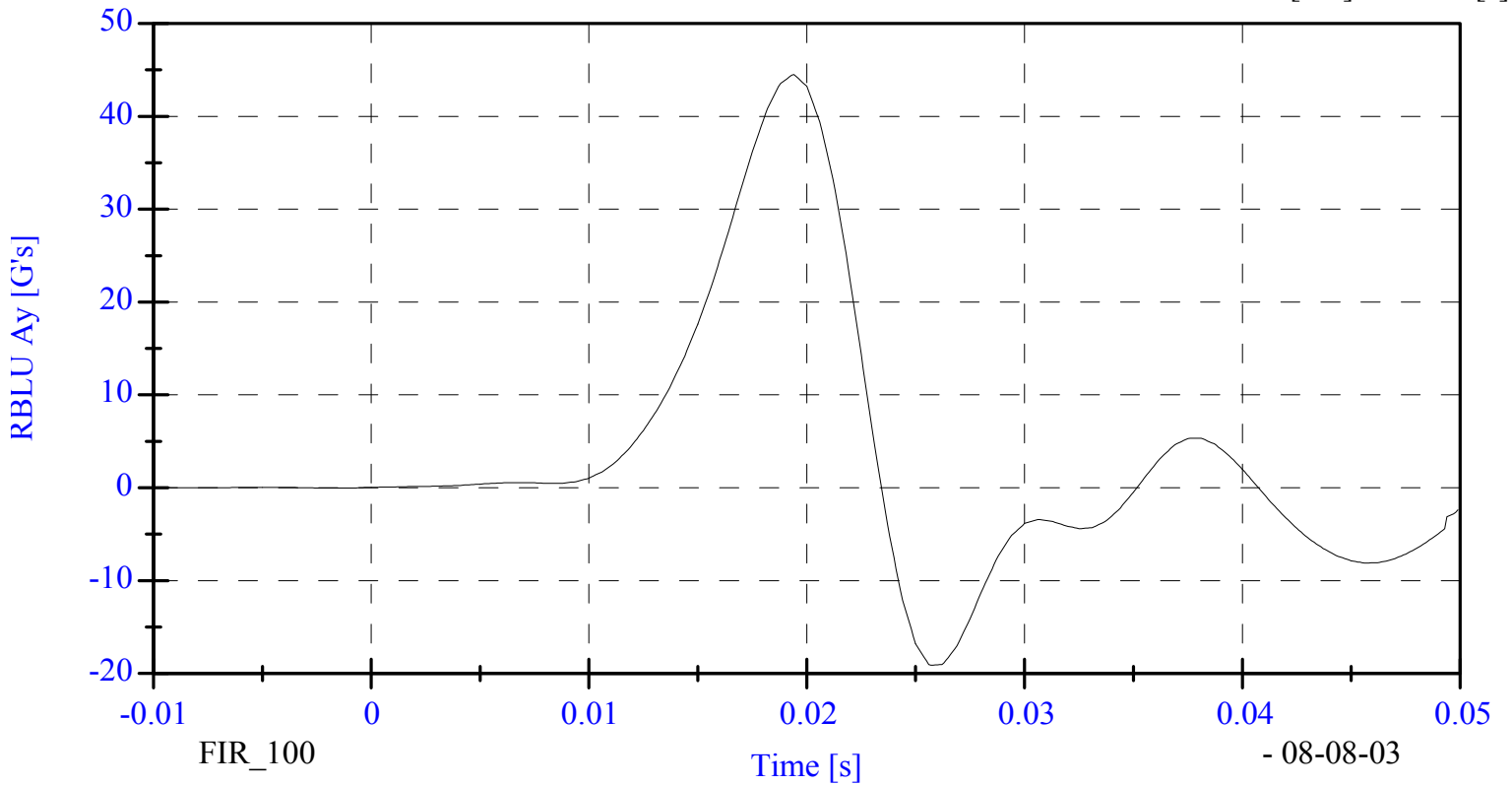
Min: -6.7 [G's] at 0.041 [s]



Upper Rib Y Acceleration

Max: 44.5 [G's] at 0.019 [s]

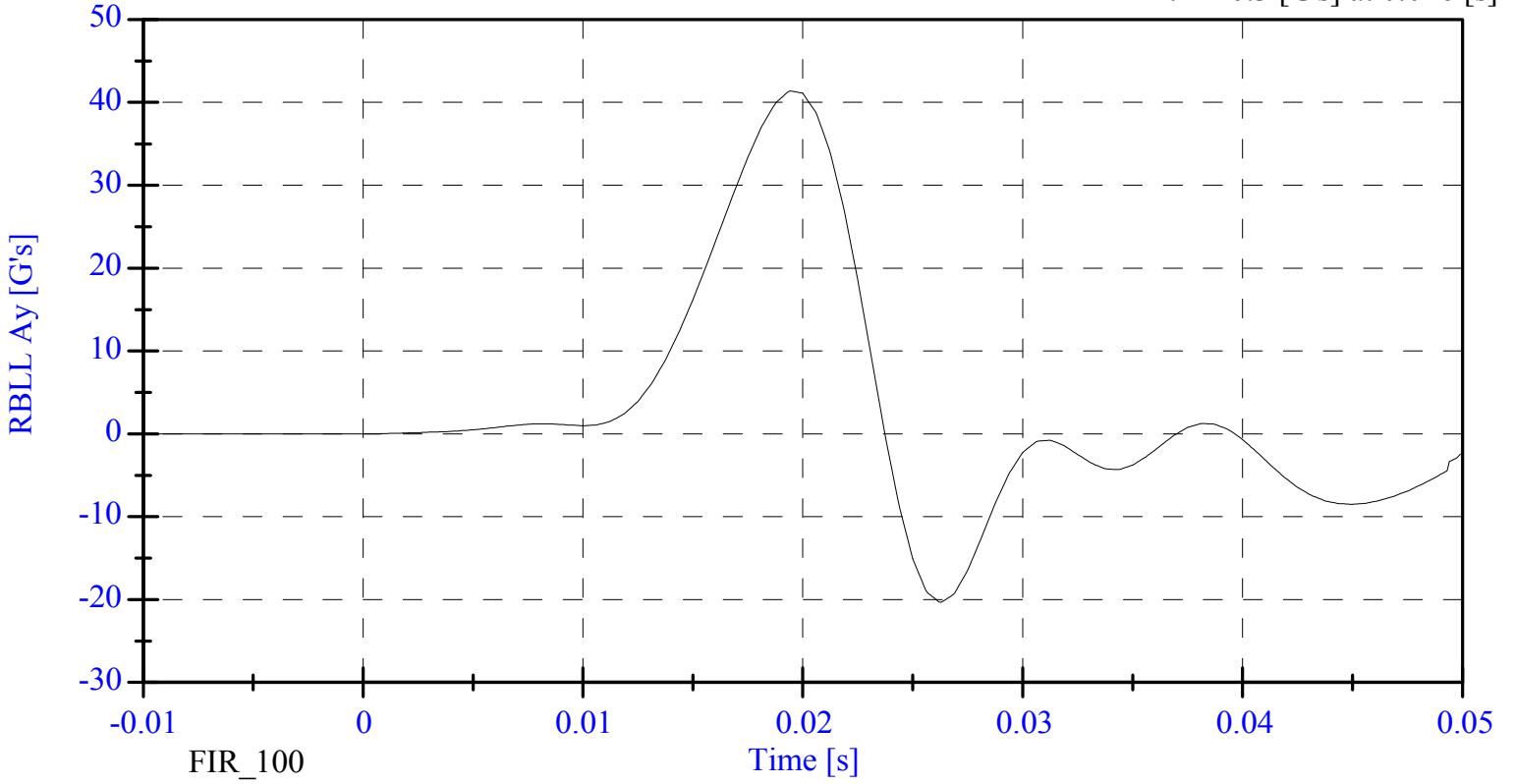
Min: -19.1 [G's] at 0.026 [s]



Max: 41.4 [G's] at 0.019 [s]

Min: -20.3 [G's] at 0.026 [s]

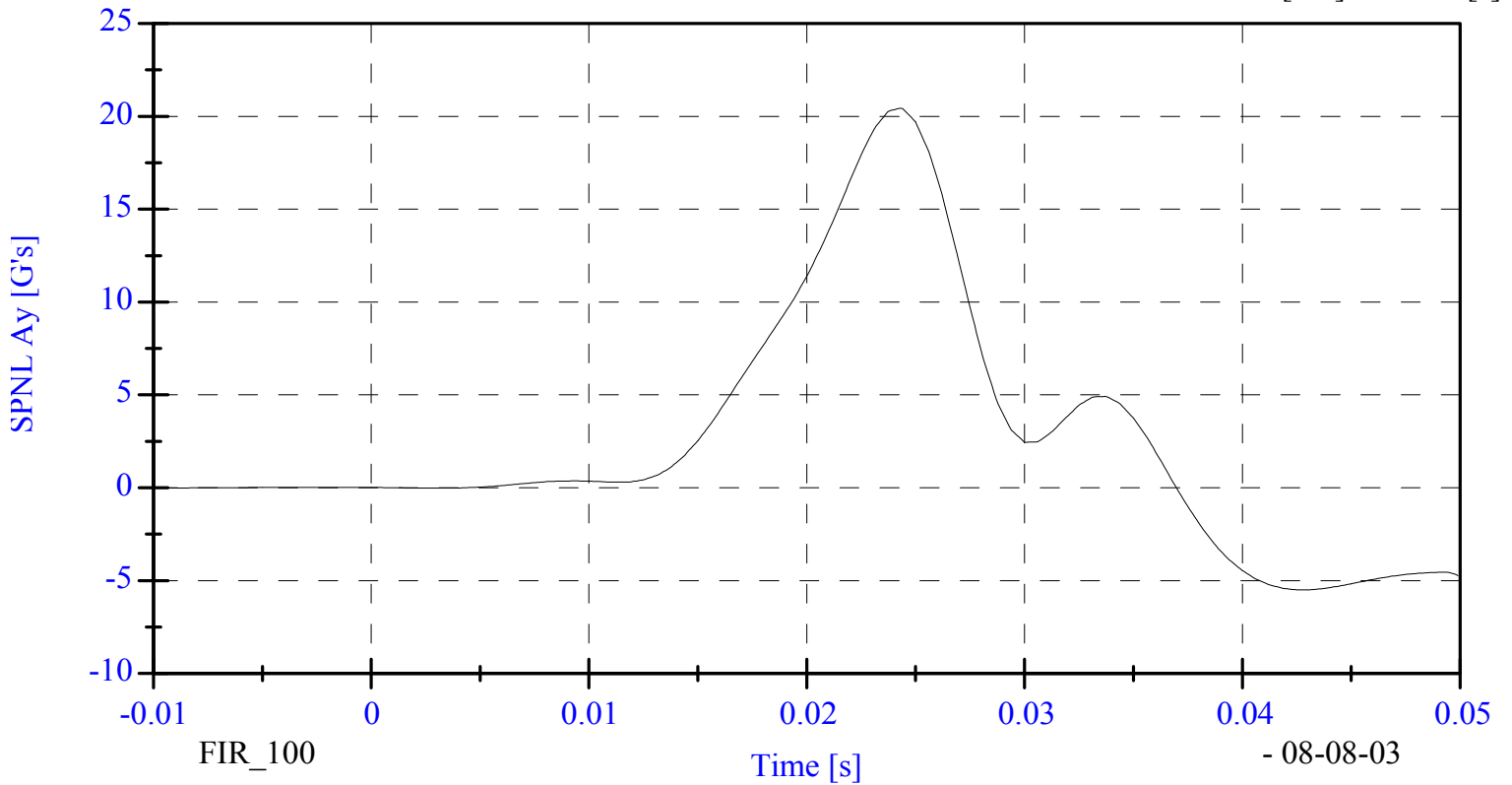
Lower Rib Y Acceleration



Max: 20.4 [G's] at 0.024 [s]

Min: -5.5 [G's] at 0.043 [s]

Lower Spine Y Acceleration



- 08-08-03

**LATERAL PELVIS IMPACT TEST  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

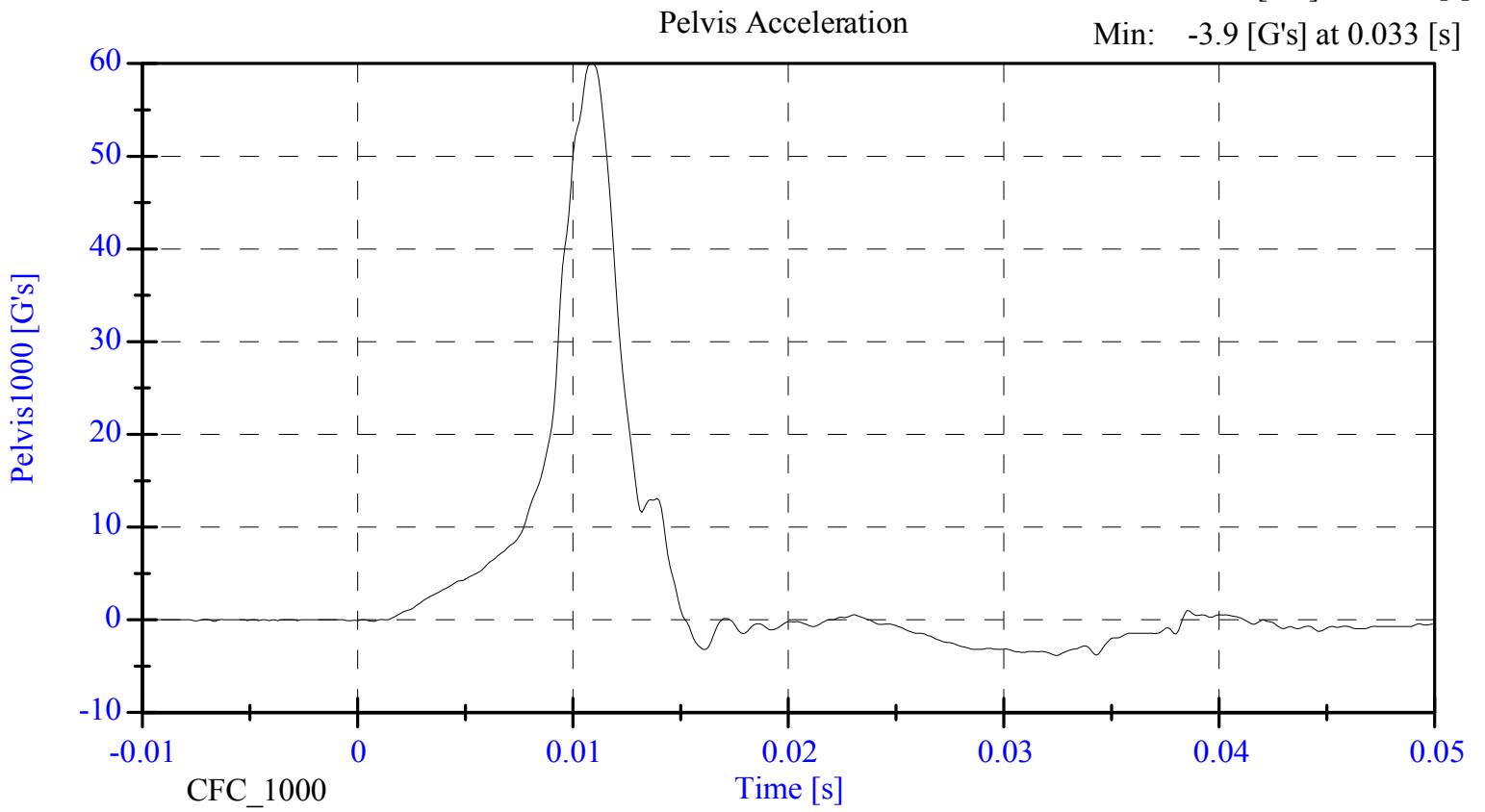
SID H3 Serial No.: 270 Sequential Test Number: 2  
Date: August 8, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	48
PROBE SPEED (m/s)	4.27 - 4.33	4.32
PELVIS ACCELERATION (g's)	40 - 60	44.49

**REMARKS:** None

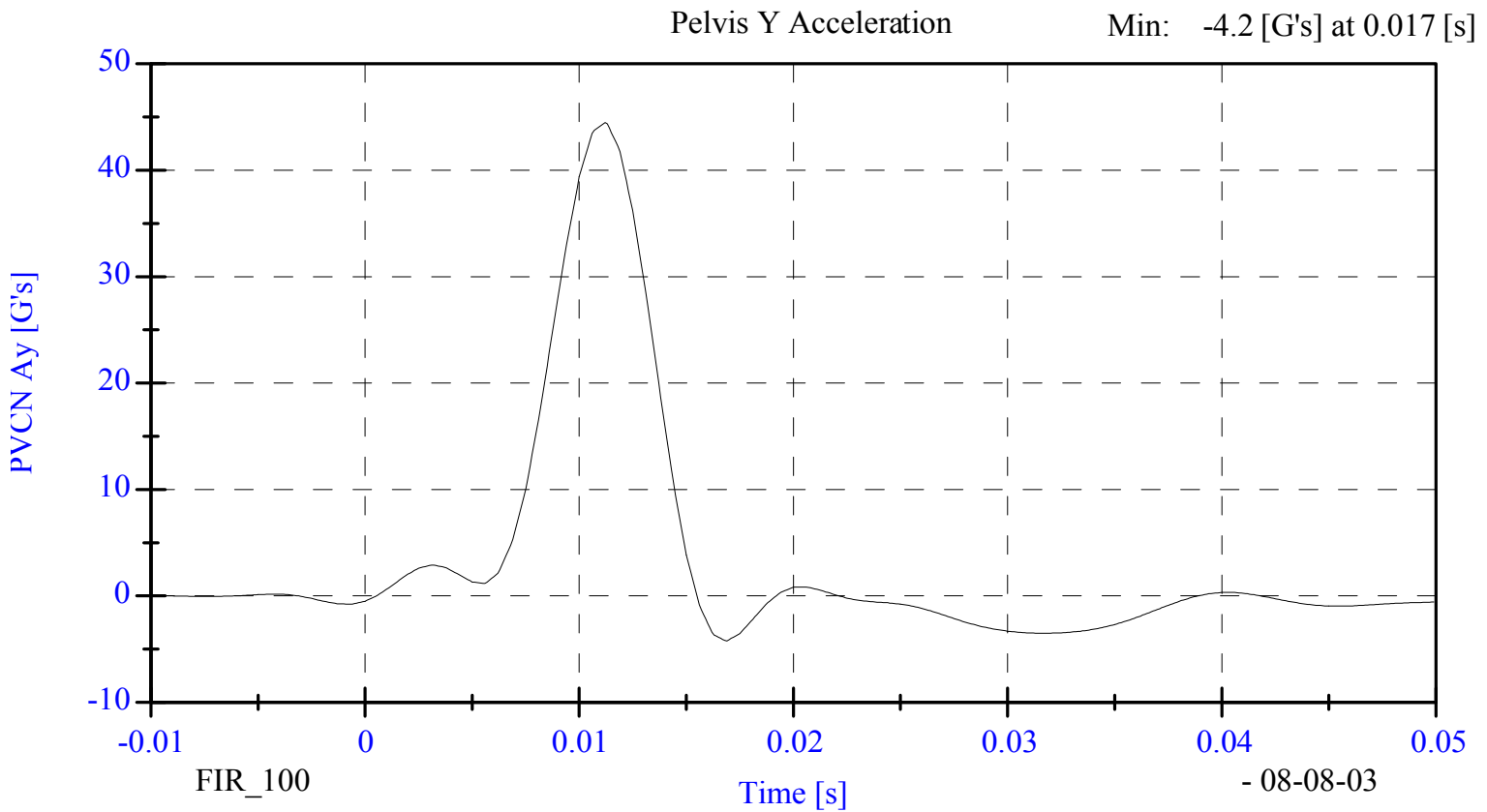
Max: 60.0 [G's] at 0.011 [s]

Min: -3.9 [G's] at 0.033 [s]



Max: 44.5 [G's] at 0.011 [s]

Min: -4.2 [G's] at 0.017 [s]



**HEAD DROP TEST  
POST-TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

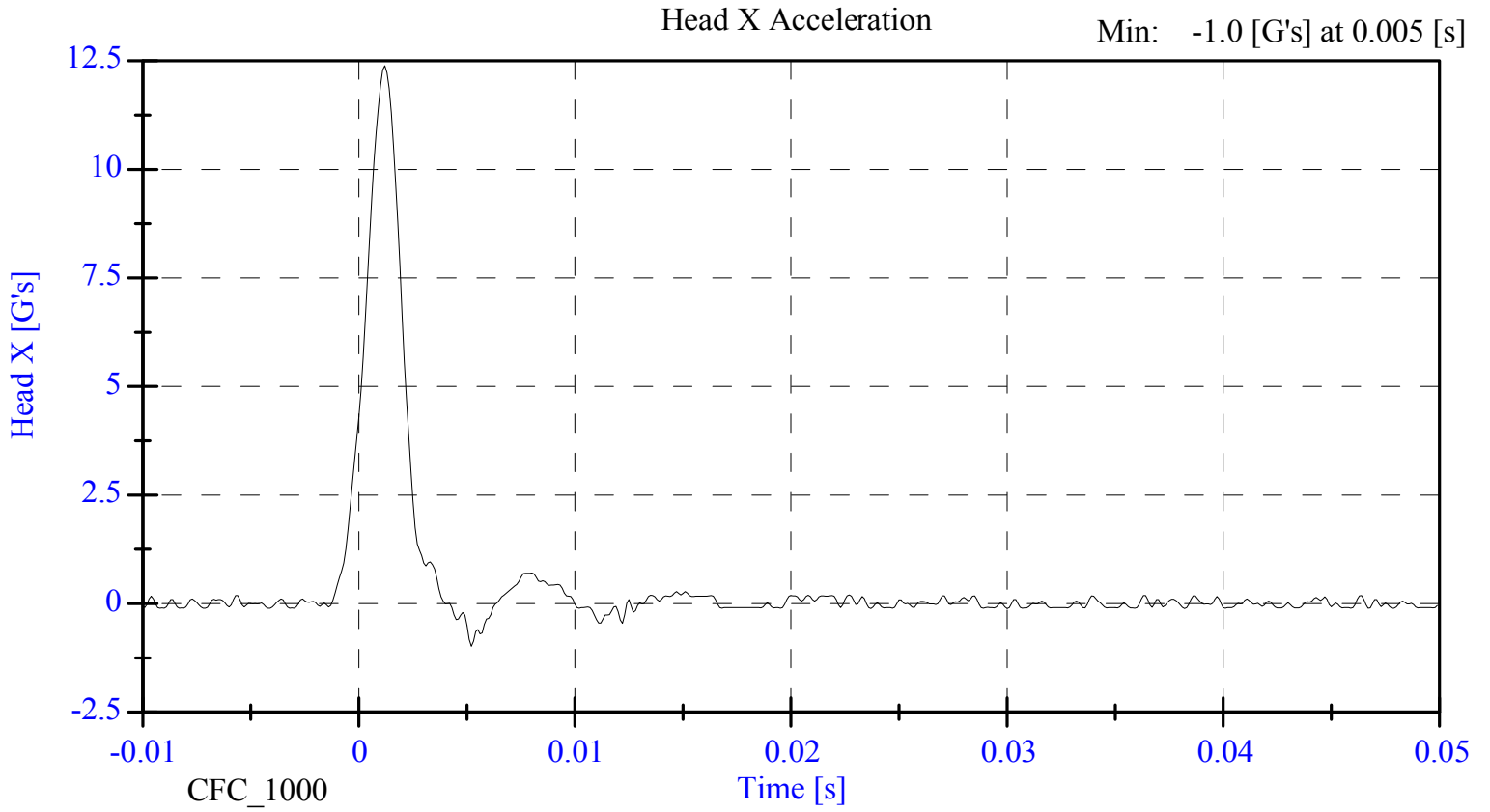
SID H3 Serial No.: 270 Sequential Test Number: 2  
Date: August 6, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 – 22.2	21.1
RELATIVE HUMIDITY (%)	10 – 70	45
PEAK RESULTANT ACCELERATION (Gs)	120 – 150	124.54
PEAK LATERAL ACCELERATION (Gs)	Not to Exceed 15	12.38
CURVE PERCENT NONMODAL (%)	< 15	1.96

**REMARKS:** None

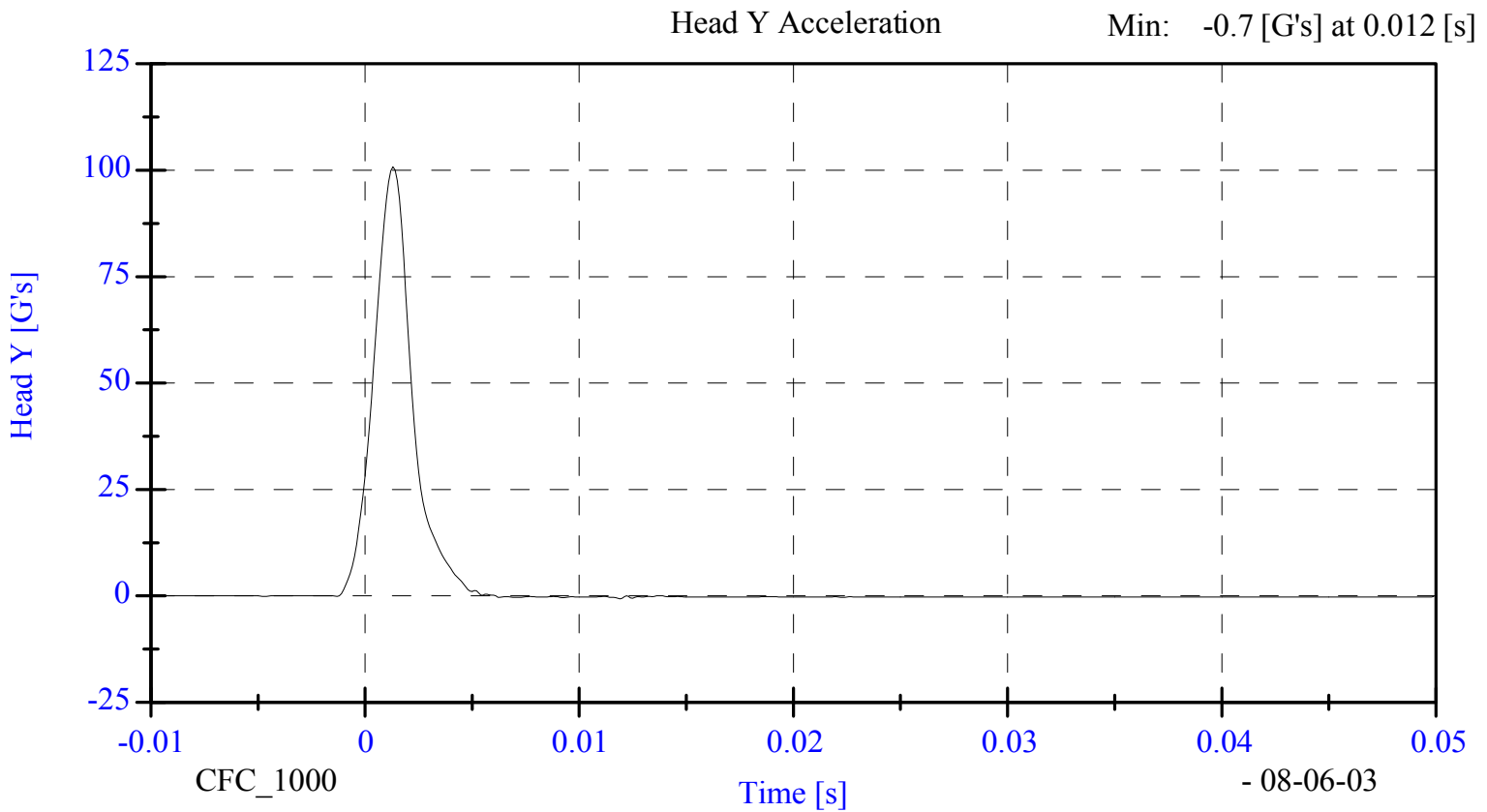
Max: 12.4 [G's] at 0.001 [s]

Min: -1.0 [G's] at 0.005 [s]



Max: 100.8 [G's] at 0.001 [s]

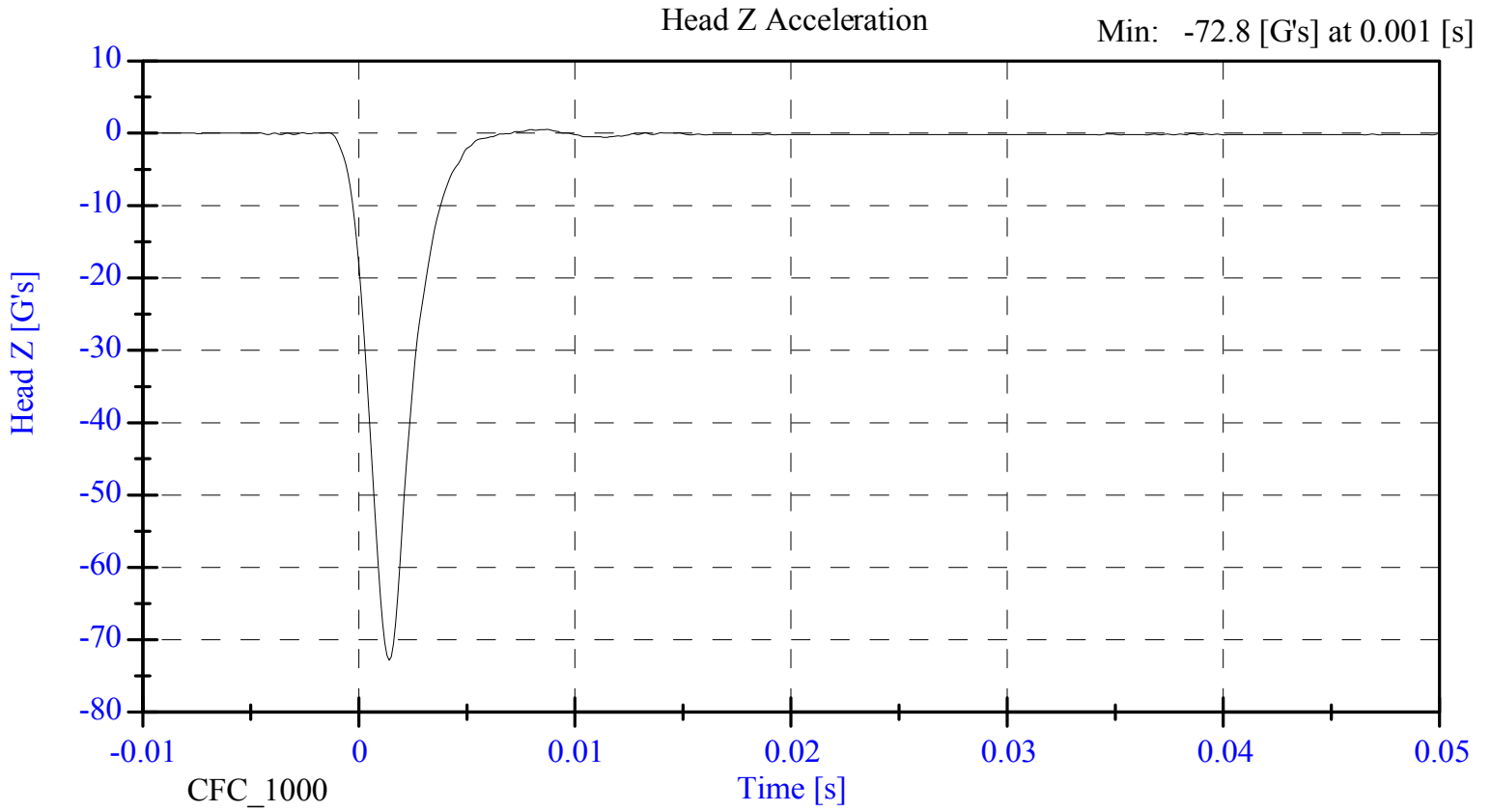
Min: -0.7 [G's] at 0.012 [s]



- 08-06-03

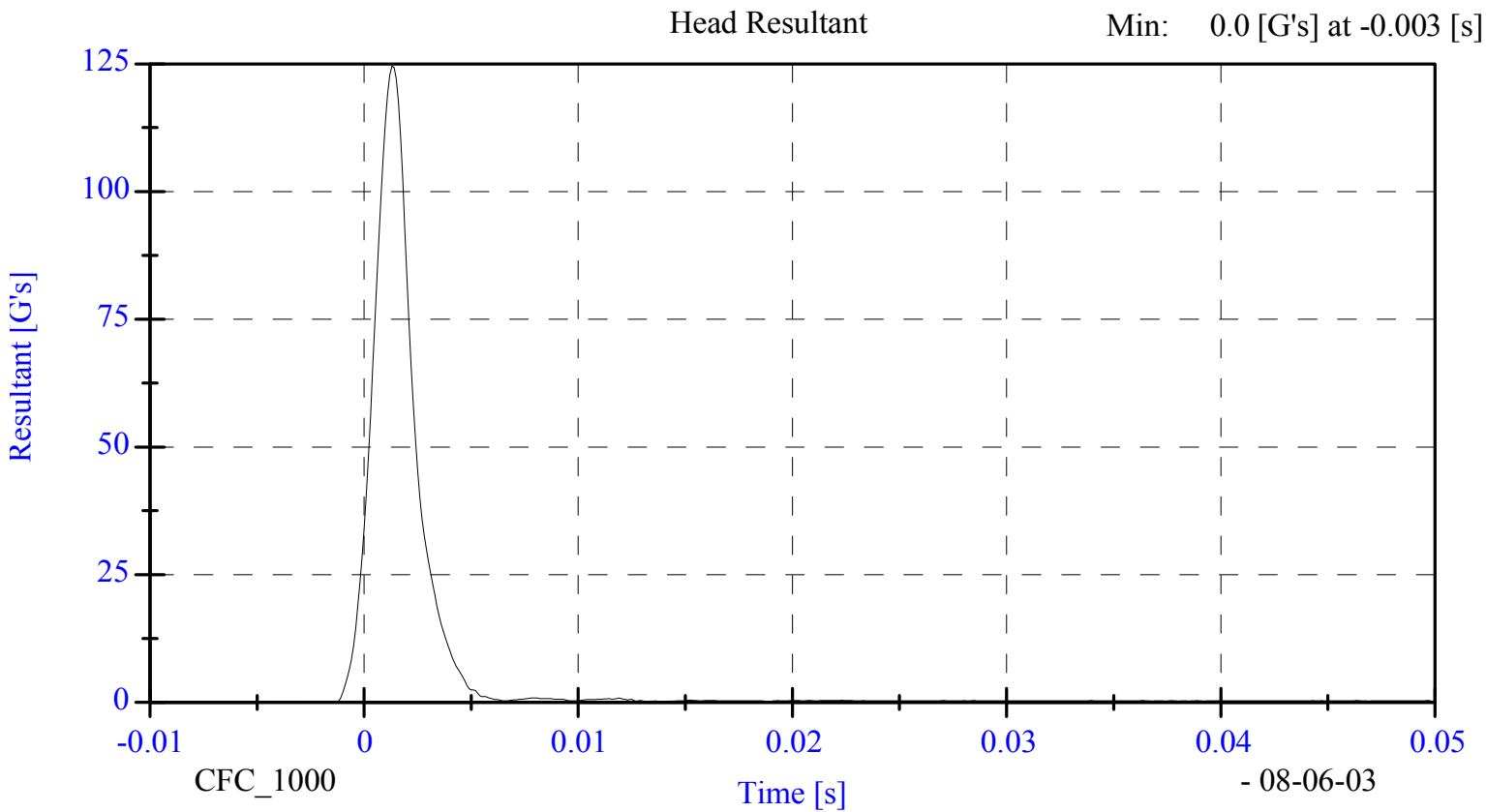
Max: 0.5 [G's] at 0.009 [s]

Min: -72.8 [G's] at 0.001 [s]



Max: 124.5 [G's] at 0.001 [s]

Min: 0.0 [G's] at -0.003 [s]



**LATERAL NECK BENDING TEST  
POST-TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 2  
 Date: August 7, 2003 Laboratory Technician: B. Swiecicki

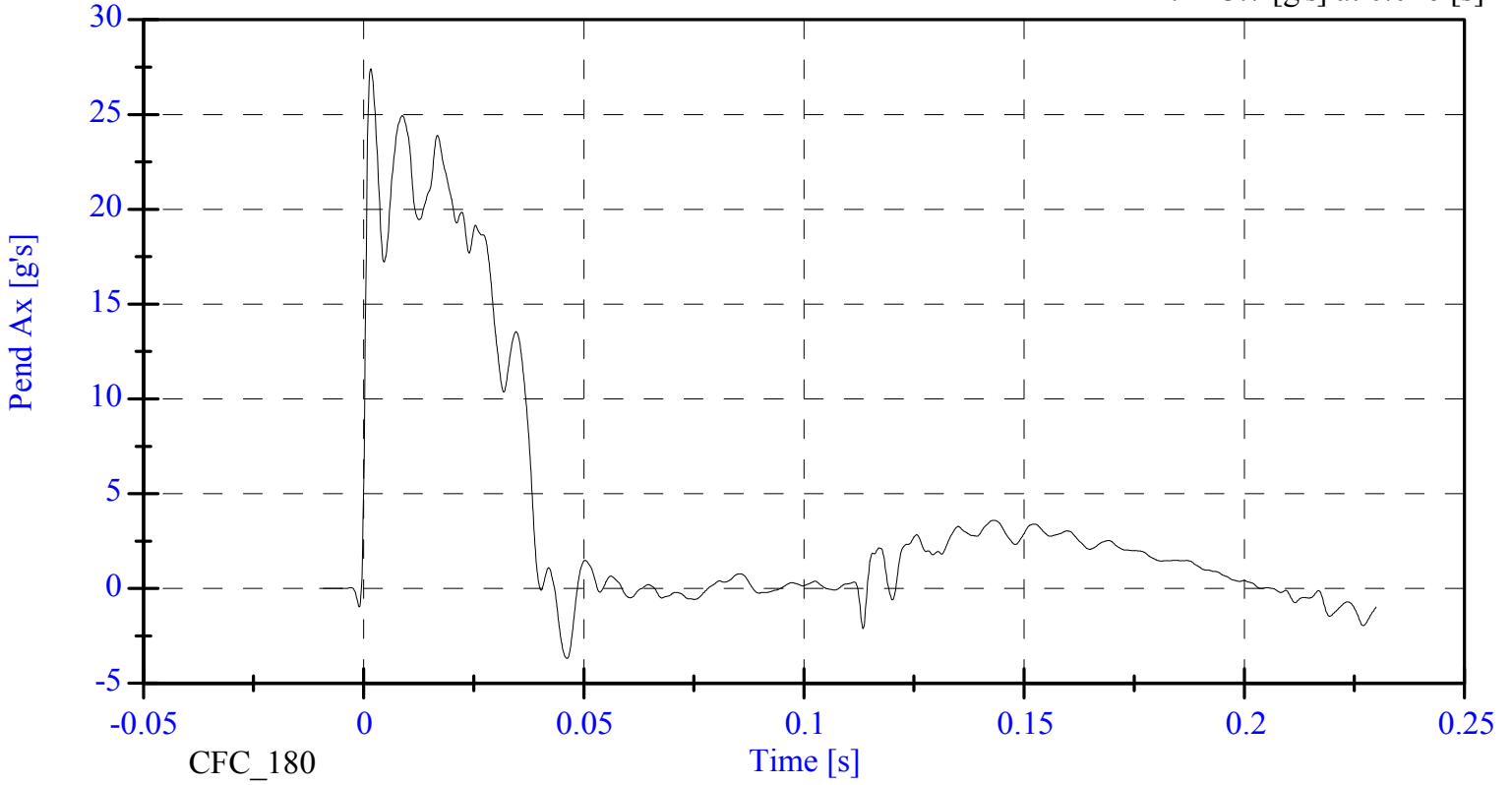
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 - 22.2	21.1
RELATIVE HUMIDITY (%)	10 - 70	38
IMPACT VELOCITY (m/s)	6.89 – 7.13	6.91
PENDULUM DELTA V		
DELTA V @ 10 ms (m/s)	1.96 – 2.55	2.16
DELTA V @ 20 ms (m/s)	4.12 – 5.10	4.27
DELTA V @ 30 ms (m/s)	5.73 – 7.01	6.07
DELTA V @ 40-70 ms (m/s)	6.27 – 7.64	7.03
D PLANE ROTATION		
MAXIMUM ROTATION (deg)	64 – 78	75.51
ROT. ANGLE TIME to ZERO (ms)	50 – 70	63.80
MOMENT ABOUT THE OCCIPITAL CONDYLE		
MAX OCCIPITAL MOMENT (Nm)	88 – 108	89.00
OCCIPITAL MOMENT DECAY (ms)	40.0 – 60.0	54.50
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT		
ROTATION wrt MOMENT (ms)	0 – 20	8.40

**REMARKS:** None

Pendulum Acceleration

Max: 27.4 [g's] at 0.002 [s]

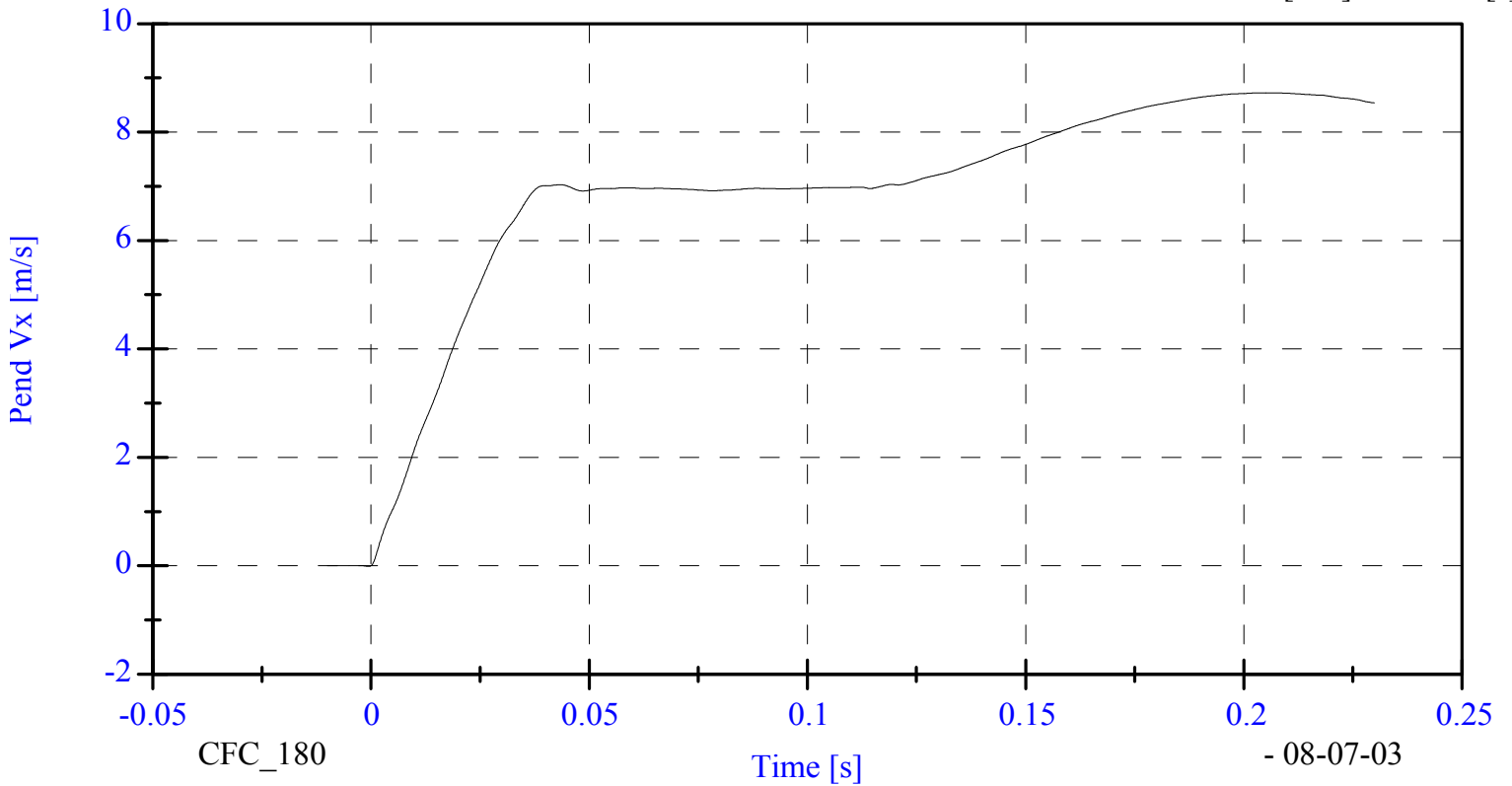
Min: -3.7 [g's] at 0.046 [s]



Pendulum Velocity

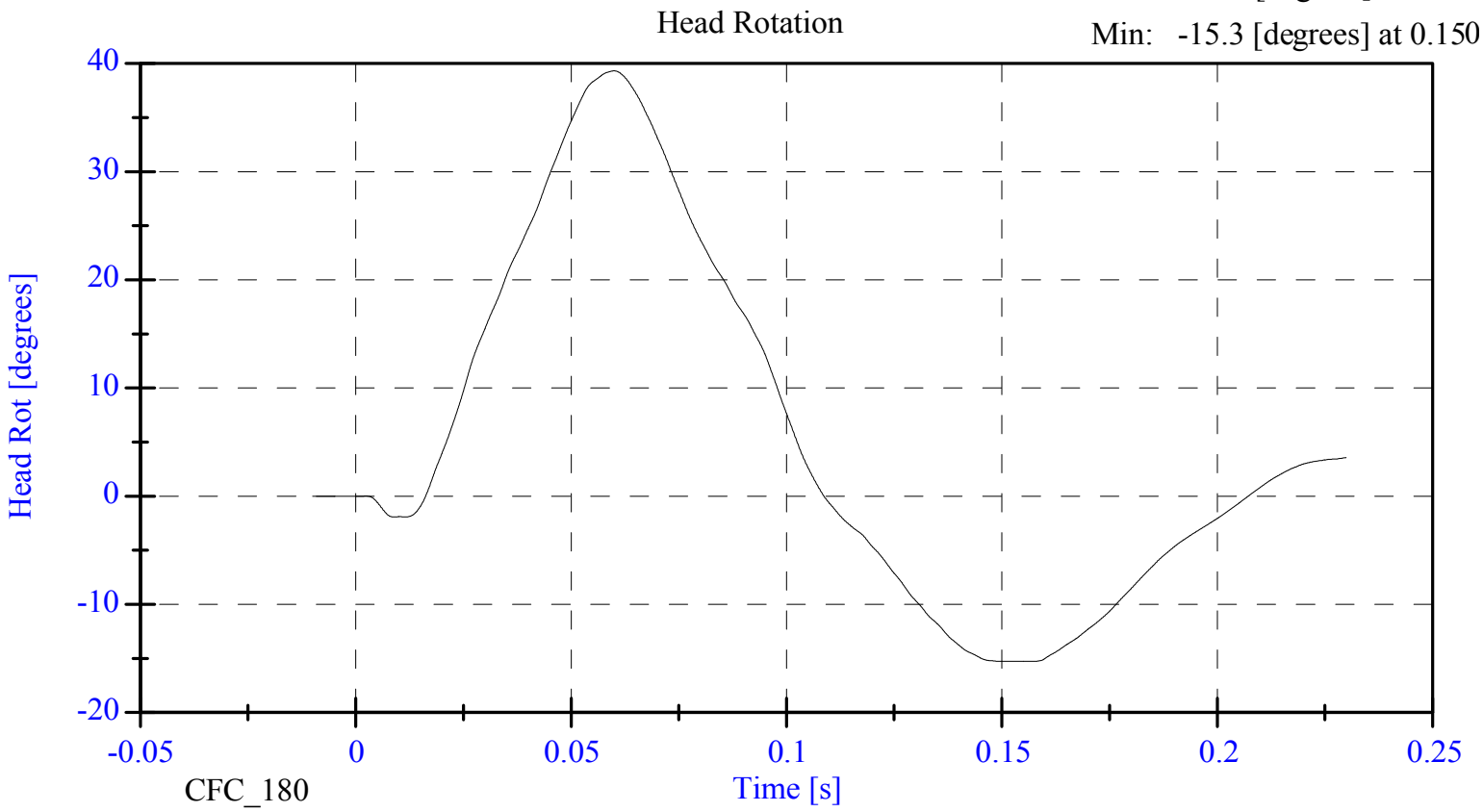
Max: 8.7 [m/s] at 0.206 [s]

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



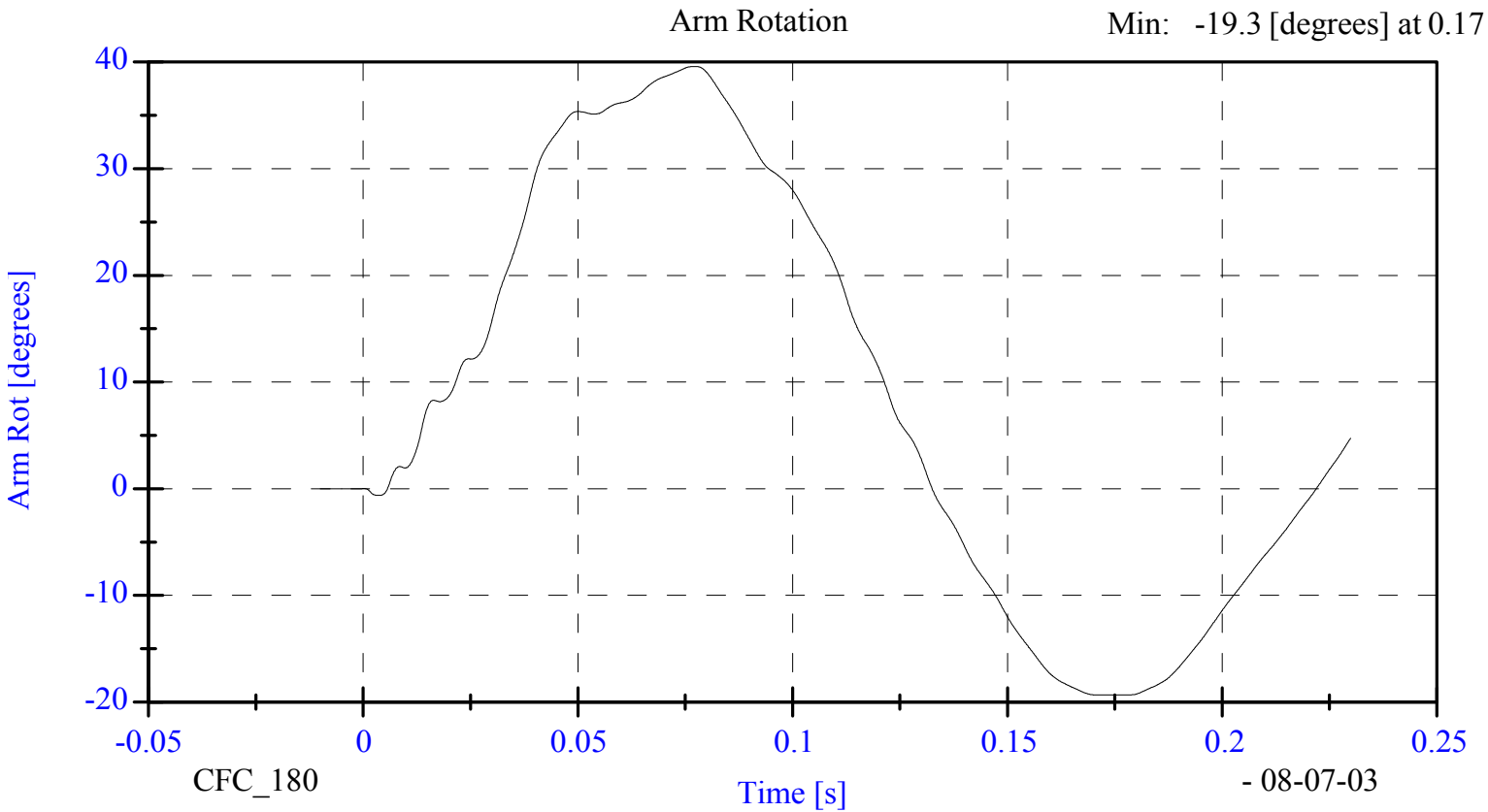
Max: 39.3 [degrees] at 0.060

Min: -15.3 [degrees] at 0.150



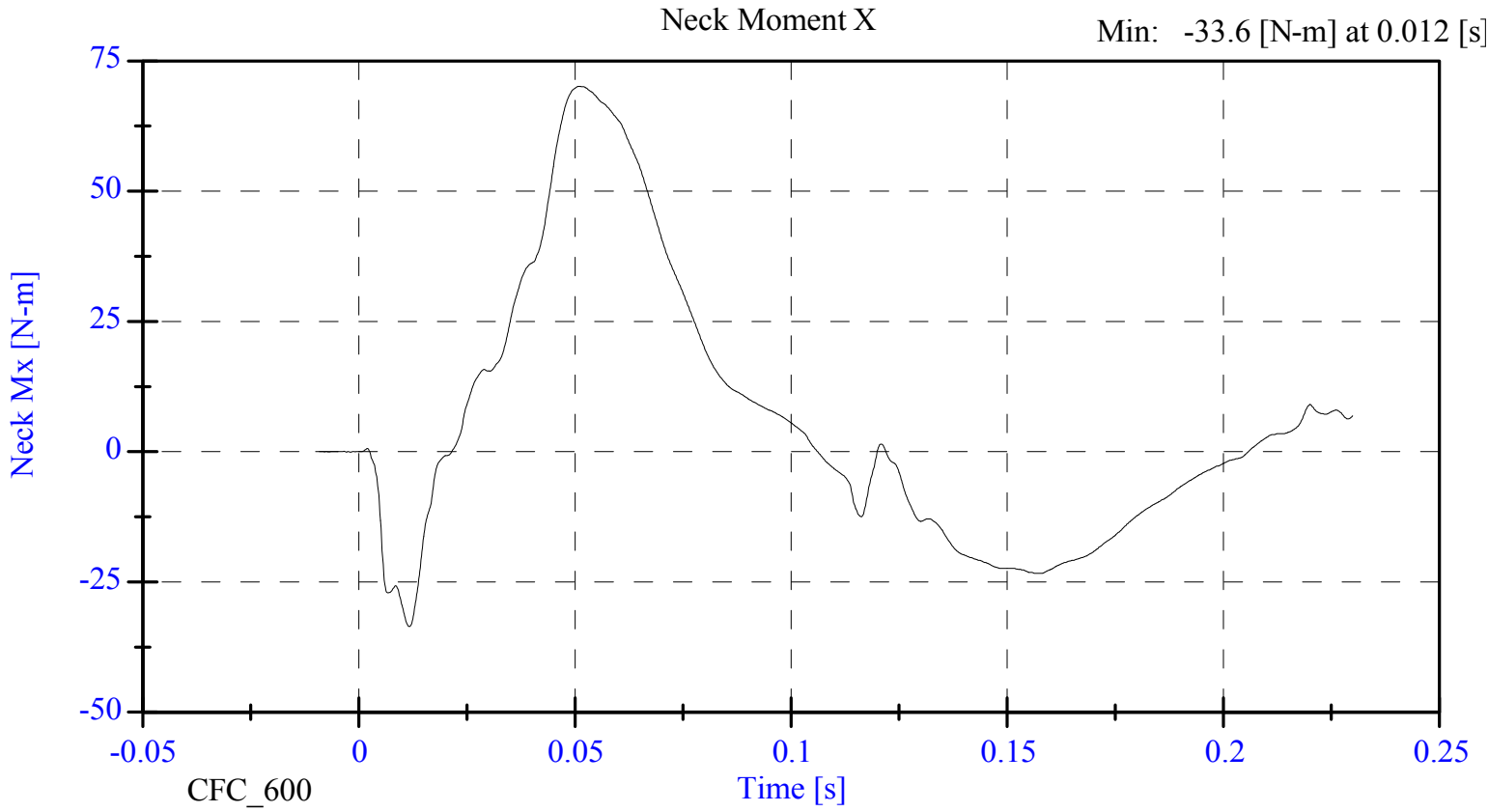
Max: 39.6 [degrees] at 0.077

Min: -19.3 [degrees] at 0.171



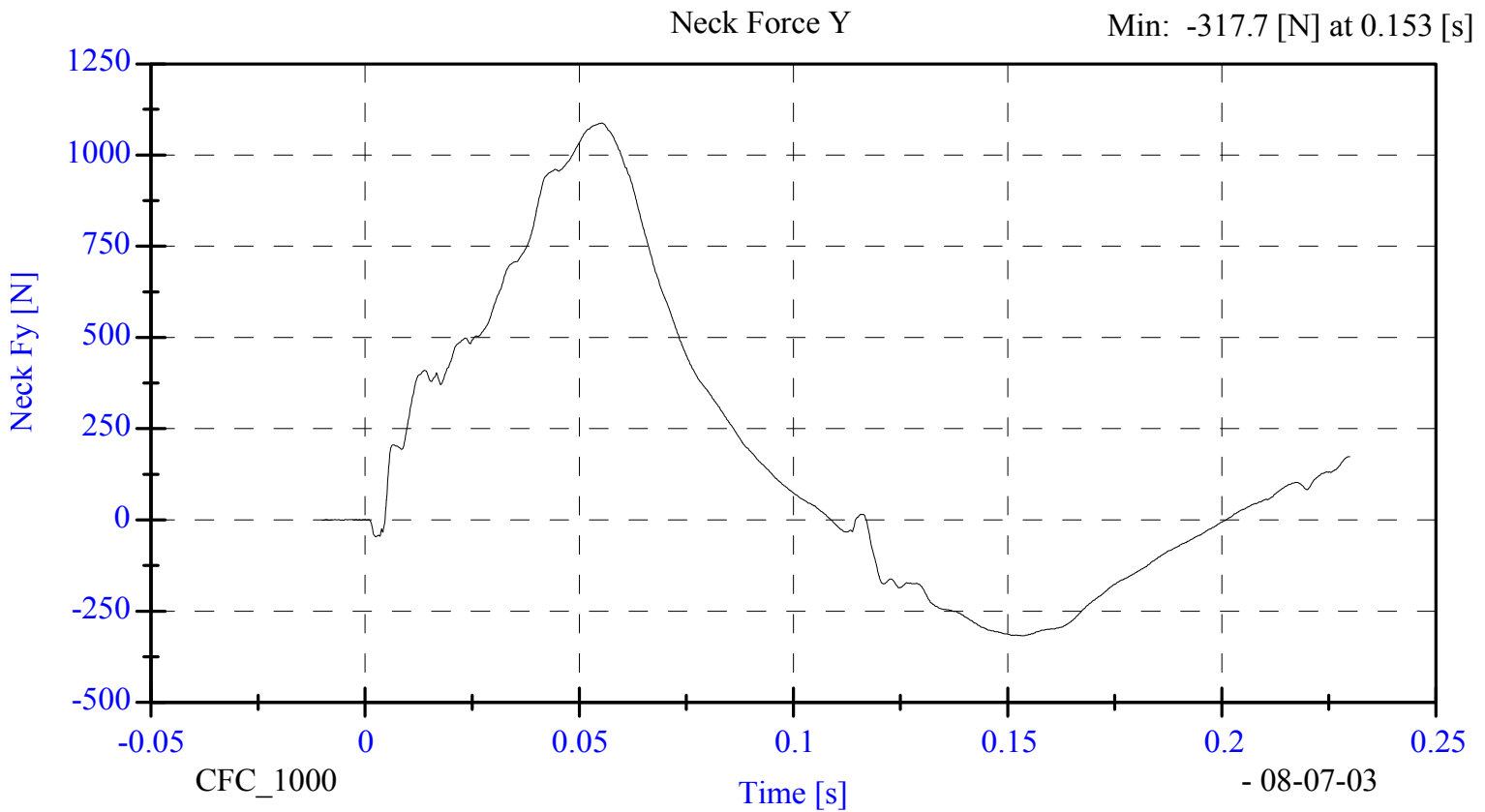
Max: 70.1 [N-m] at 0.051 [s]

Min: -33.6 [N-m] at 0.012 [s]



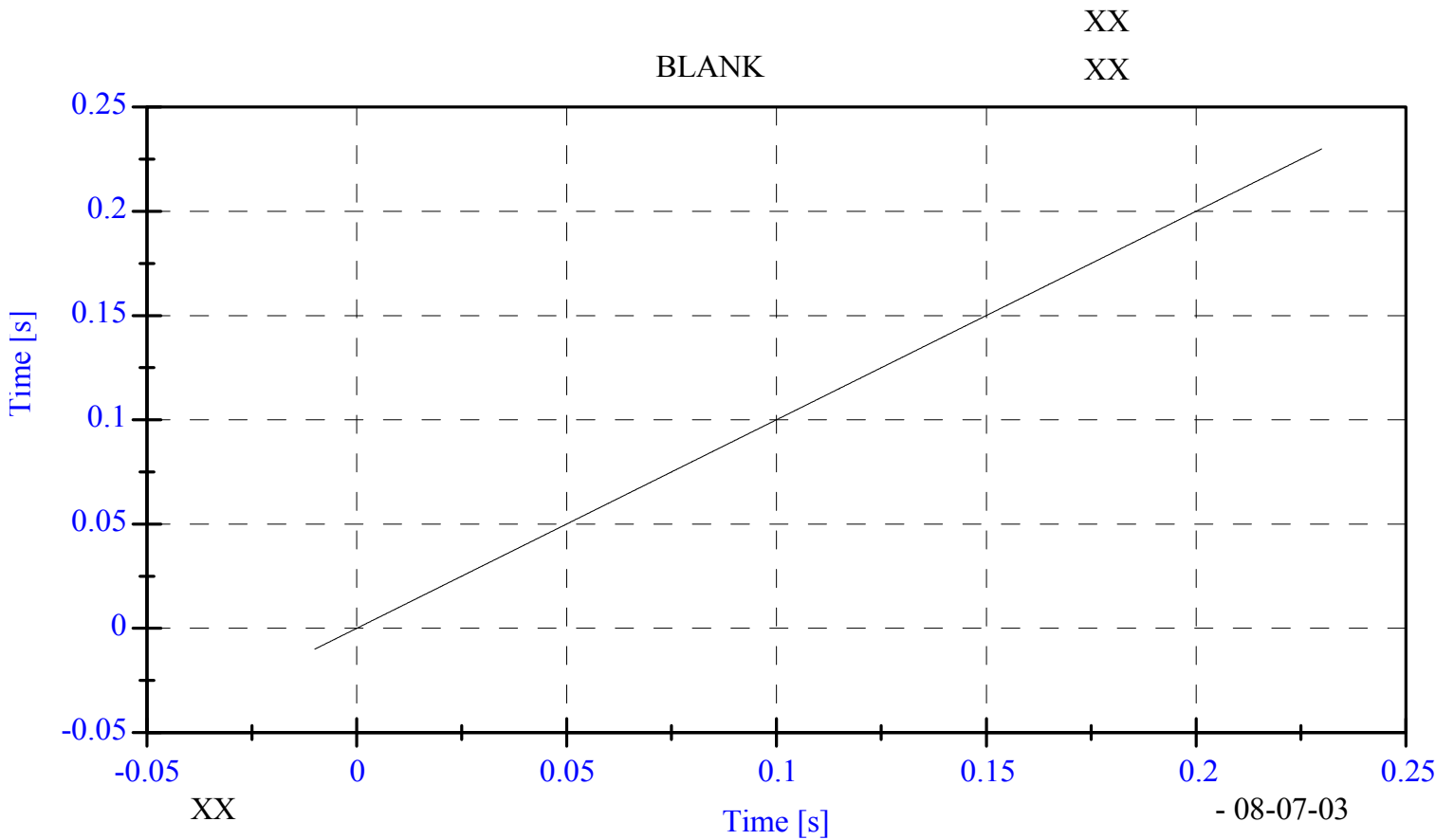
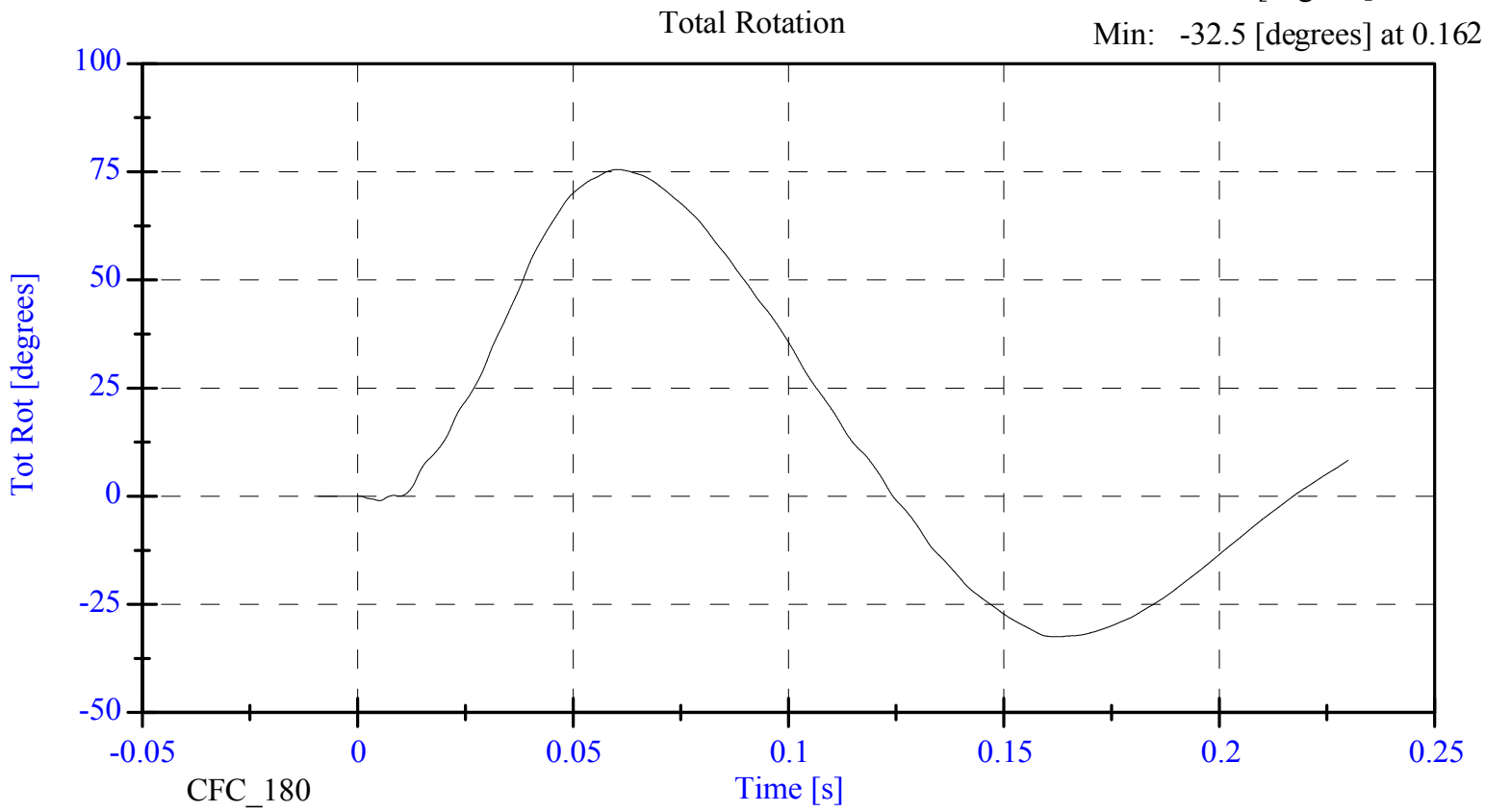
Max: 1087.8 [N] at 0.055 [s]

Min: -317.7 [N] at 0.153 [s]



Max: 75.5 [degrees] at 0.060

Min: -32.5 [degrees] at 0.162



**ABDOMINAL COMPRESSION TEST  
POST TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 2  
Date: August 8, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	48
FORCE @ 13 mm (N)	104 - 162	111.2
FORCE @ 19 mm (N)	163 - 221	182.4
FORCE @ 25 mm (N)	222 - 280	262.4
FORCE @ 33 mm (N)	325 - 391	351.4

**REMARKS:** None

**ORIGINAL**

Dummy S/N 270

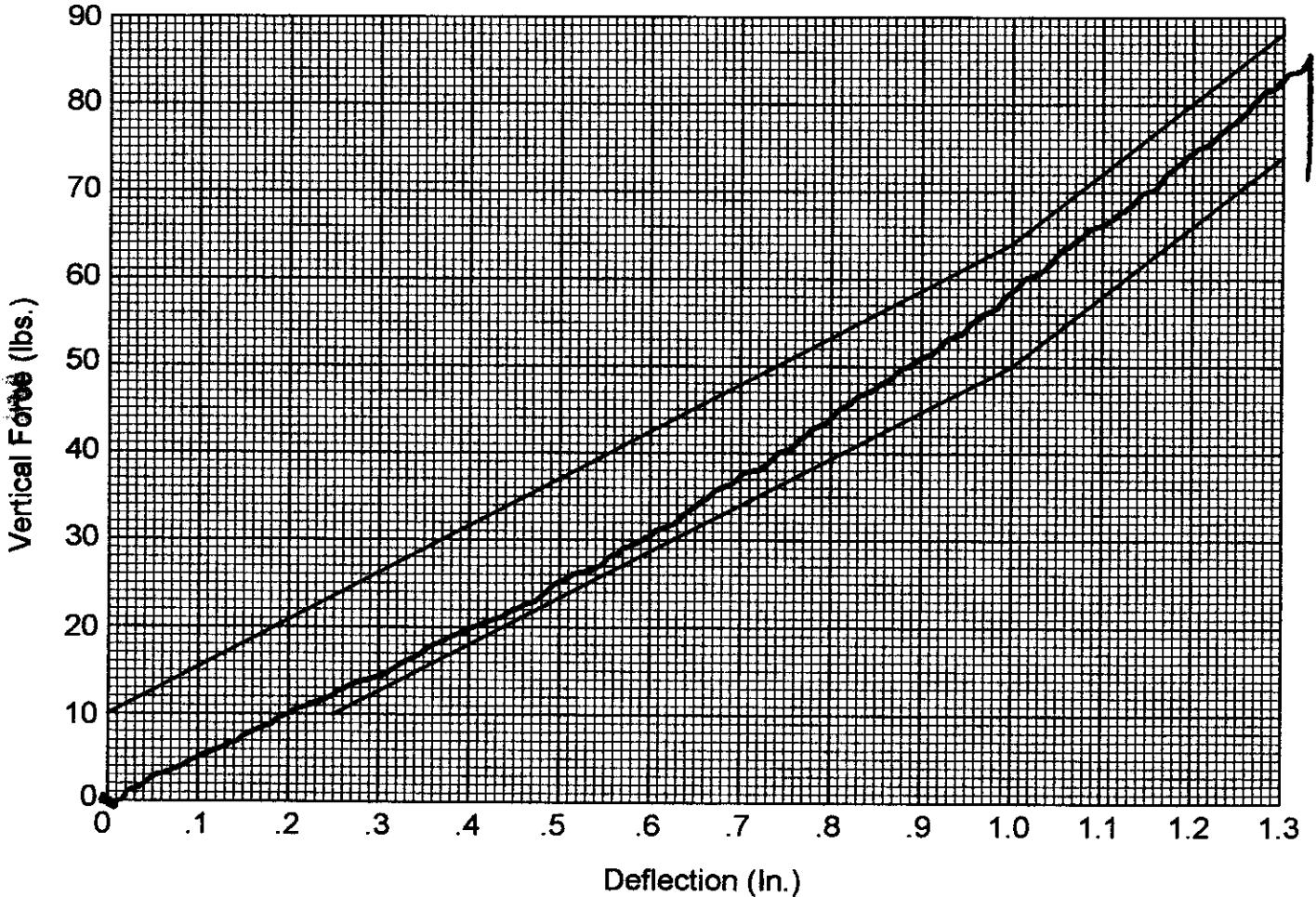
W/A \_\_\_\_\_

Date 8-8-03

Performed By [Signature]

Temp. 70°

Humidity 48%



**Hybrid II  
Abdomen Static Press**

**LUMBAR FLEXION TEST  
POST TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

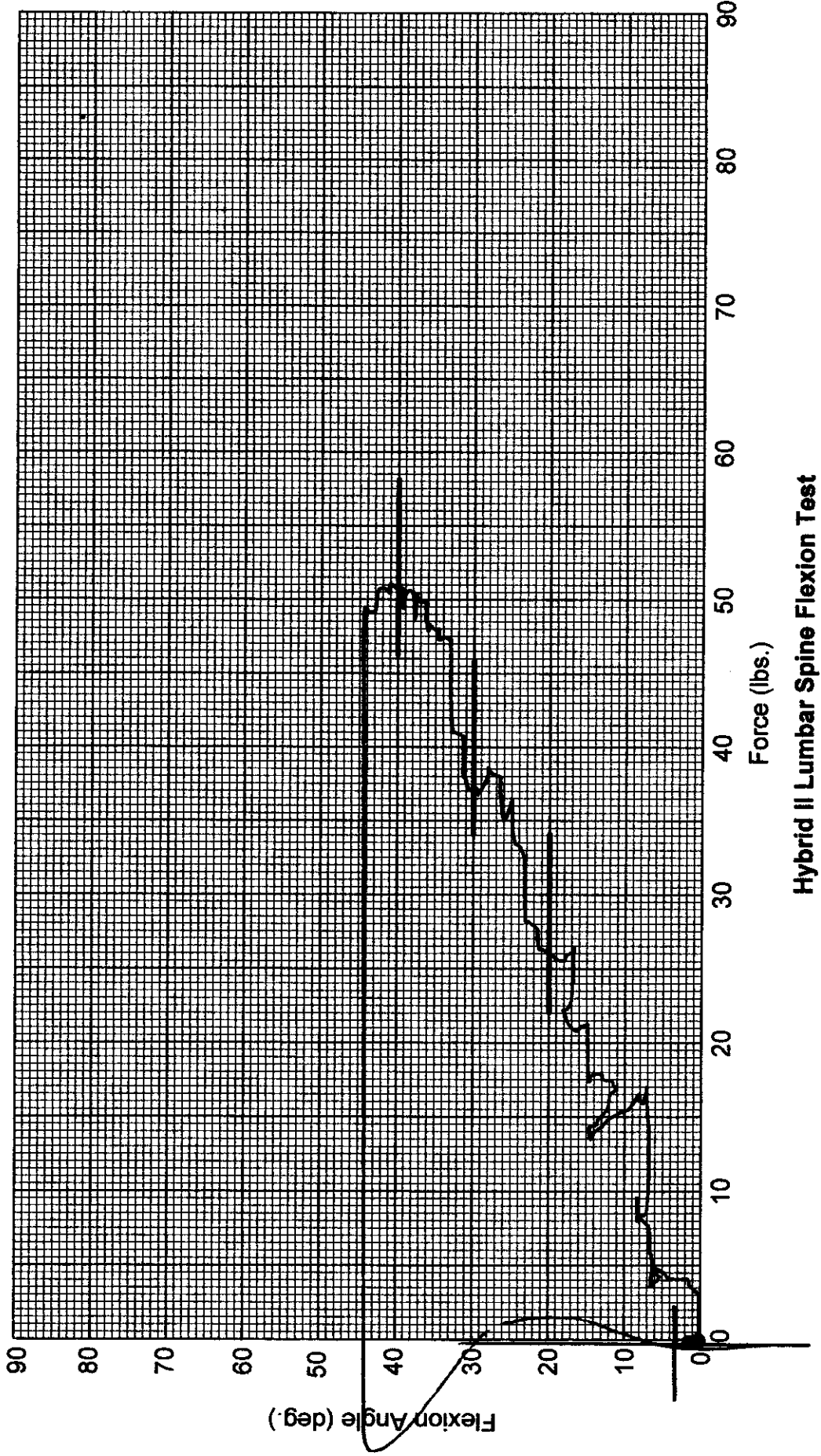
SID H3 Serial No.: 270 Sequential Test Number: 2  
Date: August 8, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	48
FORCE @ 0° (N)	0 - 26.7	17.8
FORCE @ 20° (N)	97.8 - 151.2	115.7
FORCE @ 30° (N)	151.2 - 204.6	164.6
FORCE @ 40° (N)	204.6 - 258	226.9
RETURN ANGLE	12° max.	4

**REMARKS:** None

**ORIGINAL**

Dummy S/N 270  
W/A \_\_\_\_\_  
Date 8-8-03  
Performed By [Signature]  
Temp. -70°  
Humidity 48%



Hybrid II Lumbar Spine Flexion Test

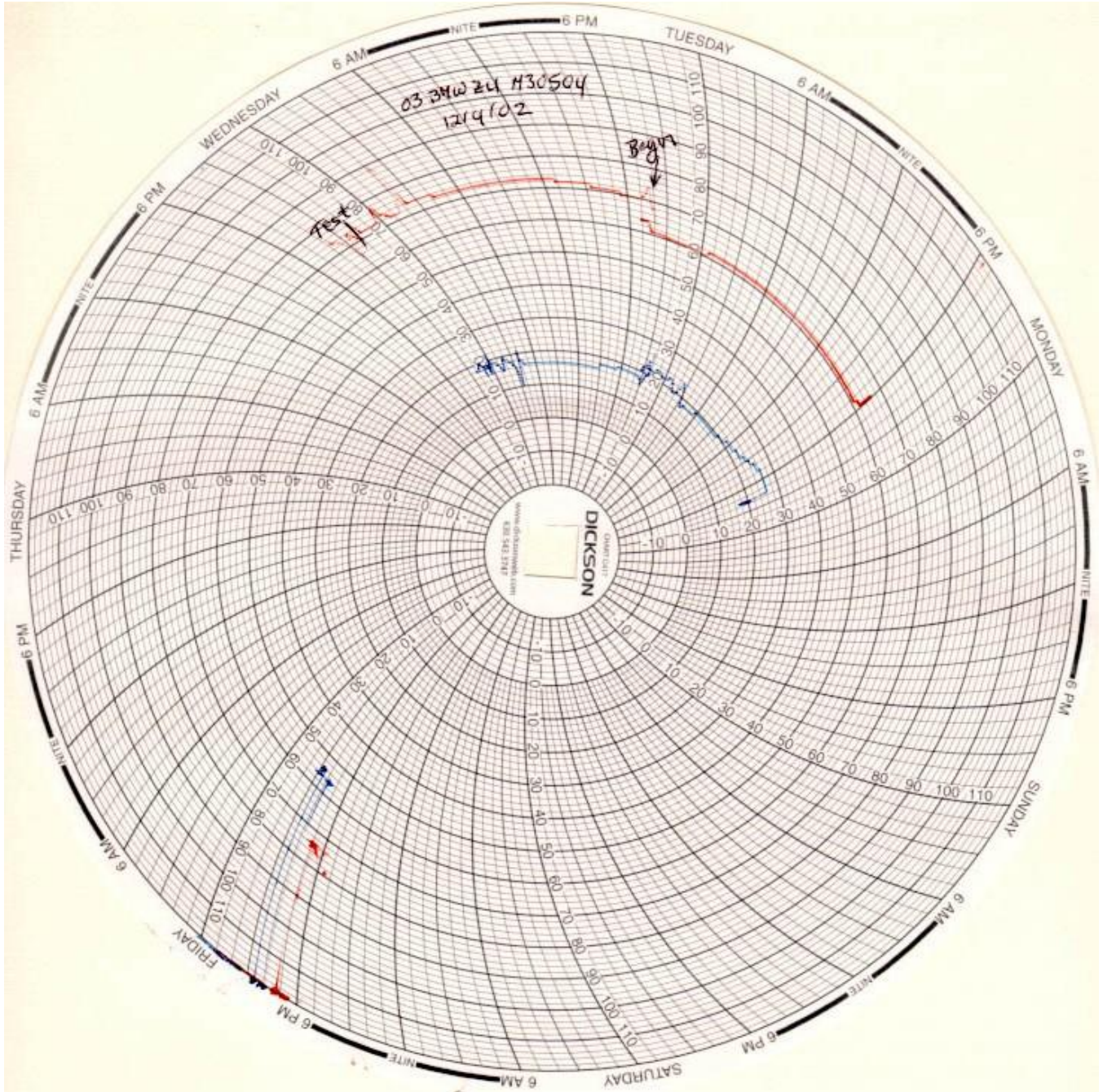
**POST TEST DUMMY INSPECTION LIST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 2  
 Date: August 11, 2003 Laboratory Technician: B. Swiecicki

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

**REMARKS:** None

# TEMPERATURE TRACE



**APPENDIX D**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**SID H3 INSTRUMENTATION**

	FRONT SID NO.: 270		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	P23960	ENDEVCO	12/10/2002
HEAD AY	P23940	ENDEVCO	12/9/2002
HEAD AZ	P23899	ENDEVCO	12/10/2002
UPPER NECK	205	DENTON	6/18/2003
UPPER RIB	P18524	ENDEVCO	2/17/2003
LOWER RIB	P18533	ENDEVCO	2/17/2003
LOWER SPINE	P18514	ENDEVCO	2/17/2003
PELVIS	P18519	ENDEVCO	2/17/2003
UPPER RIB REDUNDANT	P18528	ENDEVCO	2/17/2003
LOWER RIB REDUNDANT	P18518	ENDEVCO	2/17/2003
LOWER SPINE REDUNDANT	P18688	ENDEVCO	2/17/2003
PELVIS REDUNDANT	P18531	ENDEVCO	2/17/2003

	REAR SID NO.: -		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	-	-	-
HEAD AY	-	-	-
HEAD AZ	-	-	-
UPPER NECK	-	-	-
UPPER RIB	-	-	-
LOWER RIB	-	-	-
LOWER SPINE	-	-	-
PELVIS	-	-	-
UPPER RIB REDUNDANT	-	-	-
LOWER RIB REDUNDANT	-	-	-
LOWER SPINE REDUNDANT	-	-	-
PELVIS REDUNDANT	-	-	-

**REMARKS:** None

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**VEHICLE AND MDB INSTRUMENTATION**

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT FRONT SILL (X)	J32383	ENDEVCO	1/21/2003
RIGHT FRONT SILL (Y)	J25745	ENDEVCO	1/21/2003
RIGHT FRONT SILL (Z)	J29805	ENDEVCO	1/21/2003
RIGHT REAR SILL (X)	J32832	ENDEVCO	4/16/2003
RIGHT REAR SILL (Y)	J31095	ENDEVCO	4/14/2003
RIGHT REAR SILL (Z)	J33376	ENDEVCO	4/16/2003
REAR FLOORPAN ABOVE AXLE (X)	B11408	ENDEVCO	2/10/2003
REAR FLOORPAN ABOVE AXLE (Y)	B10827	ENDEVCO	2/10/2003
REAR FLOORPAN ABOVE AXLE (Z)	A13513	ENDEVCO	2/10/2003
LEFT REAR SILL (Y)	-	-	-
LEFT FRONT SILL (Y)	6917-012	ENDEVCO	5/23/2003
LEFT FRONT DOOR CENTERLINE (Y)	-	-	-
RIGHT REAR SEAT OCCUPANT COMP. (Y)	-	-	-
MID REAR OF LEFT FRONT DOOR (Y)	-	-	-
LEFT FRONT DOOR UPPER C\L (Y)	-	-	-
MID REAR OF LEFT REAR DOOR (Y)	-	-	-
LEFT REAR DOOR UPPER C\L (Y)	-	-	-
LOWER LEFT B- PILLAR (Y)	6917-020	ENDEVCO	5/23/2003
MIDDLE LEFT B-PILLAR (Y)	8083-032	ENDEVCO	5/23/2003
LOWER LEFT A-PILLAR (Y)	8084-041	ENDEVCO	5/27/2003
UPPER LEFT A-PILLAR (Y)	8084-010	ENDEVCO	5/27/2003
FRONT SEAT TRACK (Y)	8084-018	ENDEVCO	5/23/2003
REAR SEAT TRACK (Y)	-	-	-
VEHICLE CG (X)	P21392	ENDEVCO	2/10/2003
VEHICLE CG (Y)	P19253	ENDEVCO	2/10/2003
VEHICLE CG (Z)	P23138	ENDEVCO	2/10/2003
MDB CG (X)	C16433	ENDEVCO	4/17/2003
MDB CG (Y)	C16416	ENDEVCO	4/17/2003
MDB CG (Z)	C16499	ENDEVCO	4/17/2003
MDB REAR FRAME MEMBER (X)	C14948	ENDEVCO	4/17/2003
MDB REAR FRAME MEMBER (Y)	C16680	ENDEVCO	4/15/2003

**REMARKS:** None