

REPORT NUMBER: 214-CAL-03-07

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

KIA MOTORS CORP.  
2003 KIA SORENTO  
MPV

NHTSA NUMBER: C30511

VERIDIAN ENGINEERING TEST NUMBER: 8675-F214-07

VERIDIAN ENGINEERING  
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April 29, 2003

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Safety Assurance  
Office of Vehicle Safety Compliance  
400 Seventh Street, SW  
Room 6111 (NVS-220)  
Washington, DC 20590

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16. Abstract <p>A 55/28 kph 90<sup>0</sup> Side Impact (Moving Deformable Barrier) Indicant Test was conducted on the subject Kia Sorento MPV. This test was performed at the New Car Assessment Program (NCAP) target test velocity of 62.0 kph, which is 8 kph faster than the target velocity required by the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 26, 2001). This test was conducted at the Veridian Engineering Crash Test Facility in Buffalo, New York, on April 29, 2003.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 61.64 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 271 mm at level 2.</p> <p>The test or target vehicle's performance is given below:</p> <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: 25%;"></th> <th style="width: 25%; text-align: center;"><u>Rear SID H3</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td style="text-align: center;">33</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td style="text-align: center;">32</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">24</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td style="text-align: center;">44</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">23</td> </tr> <tr> <td>Thoracic Trauma Index (TTI):</td> <td style="text-align: center;">38</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">24</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td style="text-align: center;">45</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">31</td> </tr> </tbody> </table> <p>The driver door on the struck side of the vehicle did not separate from the body at the hinges or latches and the doors opposite the struck side remained closed and latched during the side impact event. The passenger door on the struck side of the vehicle unlatched from the striker but remained jammed closed due to deformation. The driver and passenger frontal airbags deployed and the right rear tire deflated during the event.</p>					<u>Front SID H3</u>		<u>Rear SID H3</u>	Left Upper Rib Acceleration:	33	g's	25	Left Lower Rib Acceleration:	32	g's	24	Lower Spine Acceleration:	44	g's	23	Thoracic Trauma Index (TTI):	38	g's	24	Pelvis Acceleration (PEV):	45	g's	31
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## **SECTION 1**

### **PURPOSE AND TEST PROCEDURE**

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-02-D-01114. The purpose of this indicant test was to evaluate side impact protection in a 2003 Kia Sorento MPV when tested at the New Car Assessment Program (NCAP) target test velocity of 62.0 kph, which is 8 kph faster than the target velocity required by the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 26, 2001).

## SECTION 2

### SUMMARY OF SIDE IMPACT TEST

This Side Impact Protection Indicant Test was performed at the New Car Assessment Program (NCAP) target test velocity of 62.0 kph, which is 8 kph faster than the target velocity required by the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 26, 2001).

A 2003 Kia Sorento MPV 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 61.64 kph (38.3 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 April 29, 2003. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the Side Impact Hybrid III Dummies (SID H3s) are included in Appendix A.

Two restrained Side Impact Hybrid III Dummies (SID H3s) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions 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 H3s were instrumented with the following accelerometers:

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. Nine Axis Array Heads (NAAH)
6. Head triaxial accelerometers (X-, Y- and Z-direction)
7. Upper neck force and moment (X-, Y and Z-direction) load cells

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 72 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)	38	24
PEV (g)	45	31

### AIR BAG DEPLOYMENT STATUS

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

**SECTION 3**

**SUMMARY OF TEST RESULTS**

**DATA SHEET 1**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

**TEST VEHICLE INFORMATION:**

Year/Make/Model/Body Style: 2003 Kia Sorento MPV

Vehicle Body Color: Blue/Gray VIN: KNDJC733X35094874

Vehicle NHTSA No.: C30511 Month & Year of Manufacture: 12/27/02

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

Engine Placement: X Longitudinal; or - Lateral

Transmission: 4 Speed; - Manual; X Automatic; X Overdrive

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

Odometer Reading 420 km

Supplemental Airbag Restraints:

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

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

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

**DATA FROM TIRE PLACARD**

Recommended Tire Size: P245/70R16

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

**DATA FROM TIRE SIDEWALL:**

Size of Tires on Test Vehicle: P245/70R16 ; Manufacturer: Kumho

Tire Pressure with Maximum Capacity Vehicle Load: Front: 300 kPa; Rear: 300 kPa

Treadwear: 400 ; Traction: A ; Temperature: A

**VEHICLE CAPACITY DATA:**

Number of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 Total

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

Type of Rear Seats: - Bucket; - Bench; X Split Bench; Contoured

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

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

Vehicle Max Capacity Loading = 559.5 kg (A)

No. of Occupants x 68.04 kg. = 340.2 kg (B)

Vehicle Cargo Capacity = 219.3 kg (A-B) \*\*

**TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:**

Left Front = 558.5 kg Left Rear = 443.5 kg

Right Front = 559.0 kg Right Rear = 439.5 kg

TOTAL FRONT = 1117.5 kg TOTAL REAR = 883.0 kg

% of Total Weight = 55.9% % % of Total Weight = 44.1 %

TOTAL WEIGHT = 2000.5 kg

\* Tire pressure used in test.

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

**DATA SHEET 1 (continued)**

**GENERAL TEST VEHICLE PARAMETER DATA**

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Max. Fluids	=	<u>2000.5</u>	kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>136.1</u>	kg (B)
Weight of instrumented SID H3 Dummies ( 2 X 81.2 kg)	=	<u>162.4</u>	kg (C)
TEST VEHICLE TARGET WEIGHT:	=	<u>2299</u>	kg (A+B+C)

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

Left Front	=	<u>598.5</u>	kg	Left Rear	=	<u>600.0</u>	kg
Right Front	=	<u>552.5</u>	kg	Right Rear	=	<u>552.0</u>	kg
TOTAL FRONT	=	<u>1151.0</u>	kg	TOTAL REAR	=	<u>1152.0</u>	kg
% of Total Weight	=	<u>50.0%</u>	%	% of Total Weight	=	<u>50.0%</u>	%
TOTAL TEST WEIGHT =		<u>2303.0</u>	kg				

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

Left Front	=	<u>625.5</u>	kg	Left Rear	=	<u>564.0</u>	kg
Right Front	=	<u>581.0</u>	kg	Right Rear	=	<u>522.0</u>	kg
TOTAL FRONT	=	<u>1206.5</u>	kg	TOTAL REAR	=	<u>1086.0</u>	kg
% of Total Weight	=	<u>52.6%</u>	%	% of Total Weight	=	<u>47.4%</u>	%
TOTAL TEST WEIGHT =		<u>2292.5</u>	kg				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

AS DELIVERED:

Left Front	<u>833</u>	Right Front	<u>836</u>	Left Rear	<u>872</u>	Right Rear	<u>874</u>
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FULLY LOADED:

Left Front	<u>823</u>	Right Front	<u>834</u>	Left Rear	<u>810</u>	Right Rear	<u>825</u>
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READY FOR TEST:

Left Front	<u>823</u>	Right Front	<u>836</u>	Left Rear	<u>824</u>	Right Rear	<u>838</u>
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Test Vehicle Wheelbase: 2709 millimeters

C.G. = 1283.3 millimeters rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side	=	<u>4388</u>	millimeters
Left Side	=	<u>4388</u>	millimeters
Centerline	=	<u>4565</u>	millimeters

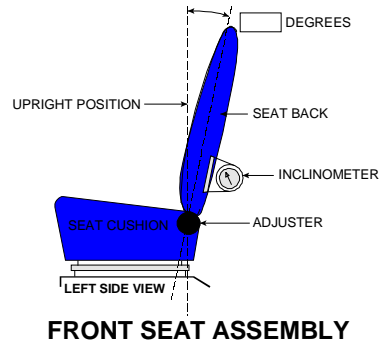
DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511

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: Where the forward-most detent is defined as detent 0, the seat was placed in detent 9.

Total Length of Adjustment Travel: 215 millimeters

Total Number of Adjustment Positions or Detents: 19

FRONT SEAT BACK ADJUSTMENT POSITION: Where the forward-most position is defined as detent 0, the seat back was placed in detent 5.

Seat Back Torso Angle: 20 degrees

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: 0 millimeters

Seat Back Adjustment Position: Fixed

ADJUSTABLE STEERING COLUMN POSITION: Where the top position is defined as detent 0, the column was placed in detent 2 (mid-position)

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

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:

79.9 liters (Fuel Tank Usable Capacity)

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

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

Wheelbase = 2709 millimeters

Impact Point is 415 millimeters rearward of front axle centerline  
(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 410 millimeters rearward of front axle centerline

**DATA SHEET 2**

**TEST VEHICLE SUMMARY OF RESULTS**

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 2003 Kia Sorento

Body Style: MPV

VIN: KNDJC733X35094874

NHTSA No.: C30511

Test Date: April 29, 2003

Overall Length = 4565 millimeters; Overall Width = 1816 millimeters

VEHICLE TEST WEIGHT (Pre-Test):

Left Front = 625.5 kg      Left Rear = 564.0 kg

Right Front = 581.0 kg      Right Rear = 522.0 kg

TOTAL FRONT = 1206.5 kg      TOTAL REAR = 1086.0 kg

TOTAL VEHICLE WEIGHT 2292.5 kg

Wheelbase = 2709 millimeters

Longitudinal C.G. from Center of Front Axle = 1283.3 millimeters

Impact Angle with Respect to Impactor = 90 degrees

ACTUAL IMPACT POINT

Actual Impact Point is 5 mm forward of nominal impact ref. line (Lateral)

Actual Impact Point is 9 mm below nominal impact point (Vertical)

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 ( 377 mm above ground) = 260 millimeters

2. LEVEL 2 ( 756 mm above ground) = 271 millimeters

3. LEVEL 3 ( 843 mm above ground) = 229 millimeters

4. LEVEL 4 ( 1073 mm above ground) = 128 millimeters

5. LEVEL 5 ( 1624 mm above ground) = 6 millimeters

Maximum Post-Test Intrusion = 271 millimeters

OCCUPANTS:

Front Passenger:

Rear Passenger:

Dummy Identification SID H3/015      SID H3/016

Restraints Used 3-point seat belt and side curtain airbag      3-point seat belt and side curtain airbag

INSTRUMENTATION:

Number of Vehicle Data Channels: = 21

Number of Cameras:      Onboard = 3

                                 Offboard = 7

                                 TOTAL = 10

### DATA SHEET 3

#### MOVING DEFORMABLE BARRIER (MDB) SUMMARY

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511

#### MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore: 36C1202-1; 23B1102

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#### 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>61.64</u>	kph				

#### MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A at Center of Bumper Level	=	<u>161</u>	millimeters
2. Row B at Top of Bumper Level	=	<u>140</u>	millimeters
3. Row C at Mid Level	=	<u>144</u>	millimeters
4. Row D at Top of Stack Level	=	<u>209</u>	millimeters

#### INSTRUMENTATION:

Number of MDB Data Channels	=	<u>5</u>
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**DATA SHEET 4**

**POST-TEST OBSERVATIONS**

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511

TEST DUMMY INFORMATION AND CONTACT POINTS:

DESCRIPTION	FRONT SEAT	REAR SEAT
ATD Type/Serial No.	SID H3/015	SID H3/016
Head Contact:	Side of head to side curtain airbag	Side of head to side curtain airbag
Upper Torso Contact:	Left arm to rear portion of door trim and arm rest	Left arm to middle C-pillar trim, rear portion of door trim and arm rest
Lower Torso Contact:	Pelvis to lower C-pillar trim	Pelvis to lower rear portion of door trim
Left Knee Contact:	Left knee to door trim above speaker cover	Left knee to door trim between arm rest and speaker cover
Right Knee Contact:	Right knee to left knee	Right knee to left knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

CRITICAL AREAS OF PERFORMANCE	
Pillar Performance	No visible tears or separations
Sill Separation	None
Windshield Damage	Windshield cracked above right front passenger's airbag cover due to airbag deployment
Window Damage	None
Other Notable Effects	The P1 and P2 frontal airbags deployed, the right rear tire deflated, and the externally mounted spare tire separated from its hanger during the event. The P4 door unlatched but remained closed during the event. The P4 outer door skin to vehicle body dimension was 45 mm at striker height.

AIR BAG DEPLOYMENT STATUS:

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

MDB LEFT EDGE IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	± 50 mm	5 mm forward of target
Vertical Offset	mm	± 20 mm	9 mm below target

**SECTION 4**

**OCCUPANT AND VEHICLE INFORMATION**

**DATA SHEET 5**

**SID H3 INSTRUMENTATION DATA**

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511

	Front Dummy ID# 015				Rear Dummy ID# 016			
	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>								
NAAH X Arm Y	27.5	69.5	-5.3	35.3	68.7	66.5	-5.2	43.6
NAAH X Arm Z	11.7	43.4	-4.8	116.9	9.0	68.0	-11.6	73.6
NAAH Y Arm X	1.8	186.0	-12.6	46.2	7.9	73.9	-27.6	61.7
NAAH Y Arm Z	13.1	43.2	-4.7	126.8	10.3	44.4	-25.8	61.8
NAAH Z Arm X	4.6	48.8	-18.5	75.1	16.1	68.9	-31.3	61.6
NAAH Z Arm Y	26.7	64.7	-6.8	34.5	95.9	61.7	-12.8	82.9
CG Longitudinal X	2.3	26.1	-16.8	74.8	7.0	70.2	-17.0	62.0
CG Lateral Y	23.5	63.3	-5.5	25.2	74.7	67.1	-5.2	41.7
CG Vertical Z	10.4	42.6	-3.1	114.2	8.6	44.5	-12.5	73.7
CG Resultant R	26.6	64.8	-	-	74.7	67.1	-	-
HIC	71.4				327.5			
<b>NECK FORCES:</b>								
Longitudinal X	31.3	198.4	-378.4	69.6	505.4	74.0	-69.2	44.2
Lateral Y	46.7	133.9	-348.3	48.6	52.1	171.0	-1534.8	72.8
Vertical Z	587.2	68.7	-124.4	114.8	357.6	44.8	-1824.6	71.1
Resultant R	699.4	69.1	-	-	2409.3	71.7	-	-
<b>NECK MOMENTS:</b>								
X	7.4	128.5	-23.0	57.1	11.5	75.7	-28.2	66.6
Y	17.2	87.7	-27.5	69.2	31.8	74.1	-6.3	199.9
Z	28.9	75.3	-8.2	130.1	2.1	199.9	-14.8	74.4
Resultant R	39.6	69.5	-	-	36.5	74.3	-	-
<b>RIB ACCELERATIONS:</b>								
Upper Rib Lateral Y	32.8	57.5	-4.5	18.1	24.9	55.6	-3.0	184.4
Upper Rib Lateral Y(R)	33.1	57.5	-4.6	18.1	24.9	55.6	-3.0	184.4
Lower Rib Lateral Y	31.7	35.0	-7.7	20.7	24.4	54.4	-4.1	76.2
Lower Rib Lateral Y(R)	32.8	35.0	-7.5	20.7	24.4	54.4	-3.8	187.5
<b>SPINE ACCELERATIONS:</b>								
Lower Lateral Y	43.6	36.9	-12.9	68.7	22.9	43.7	-14.9	75.6
Lower Lateral Y(R)	44.6	37.5	†	-	22.7	43.7	-14.5	75.6
<b>PELVIC ACCELERATIONS:</b>								
Lateral Y	45.4	39.4	-11.2	63.1	30.9	25.6	-7.5	66.9
Lateral Y(R)	46.3	39.4	-11.5	62.5	30.5	25.6	-7.3	66.8

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.

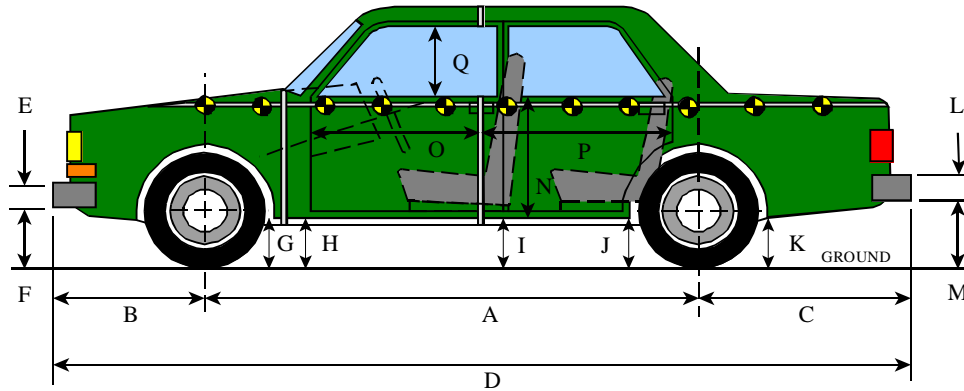
† Data invalid after 47 ms

## DATA SHEET 6

### VEHICLE SIDE MEASUREMENTS

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



#### 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	2712	2709	2702	-7
B	822	823	843	20
C	1031	1033	1011	-22
D	4565	4565	4556	-9
E	340	-	343	3
F	362	364	377	13
G	326	309	317	8
H	326	307	311	4
I	348	306	278	-28
J1	327	278	285	7
J2	349	299	304	5
K	425	366	353	-13
L	284	-	281	-3
M	462	404	353	-51
N	752	-	742	-10
O	707	-	698	-9
P	1414	-	1371	-43
Q	540	-	583	43
R	4388	-	4398	10
S	4388	-	4358	-30
T	1816	-	1595	-221

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

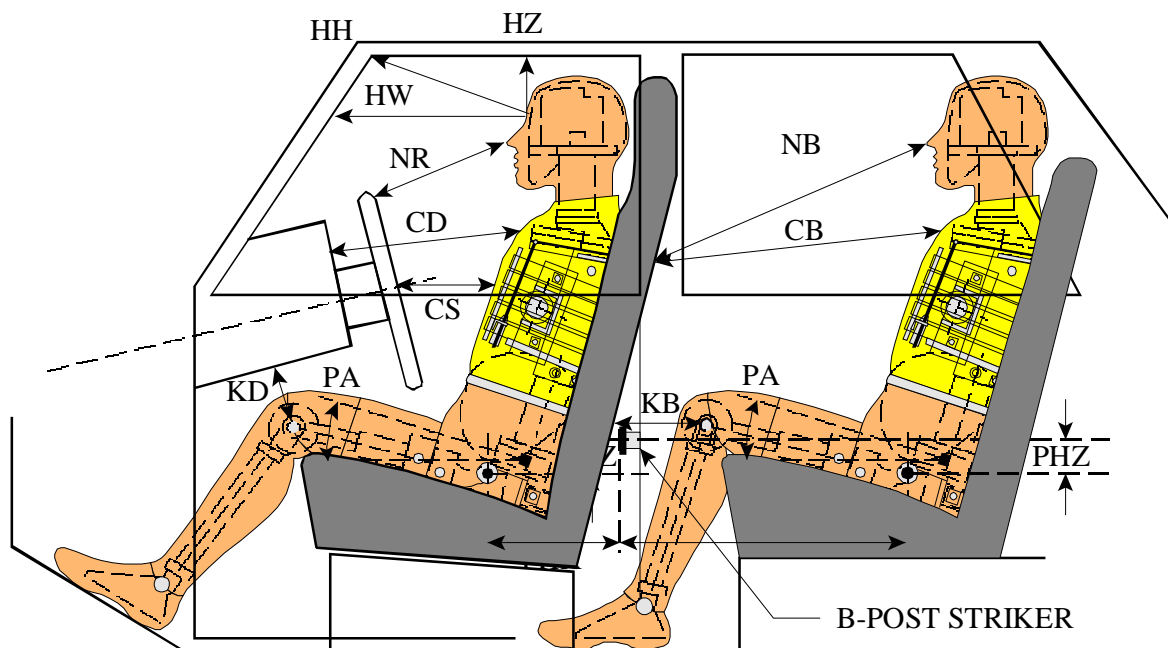
J2 = To Sill

## DATA SHEET 7

### SID H3 LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



### 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# 015	LEFT REAR PASS. ID# 016
HH	405	N/A
HW	655	N/A
HZ	172	204
NR/NB	467	633
CD/CB	552	567
CS	302	N/A
KDL(KDA°)/KBL(KDA°)	193 / ( 31 °)	220 / ( 33 °)
KDR(KBA°)/KBR(KBA°)	173 / ( 32 °)	218 / ( 33 °)
PA°	24.0 °	23.8 °
PHX	180	294
PHZ	42	256

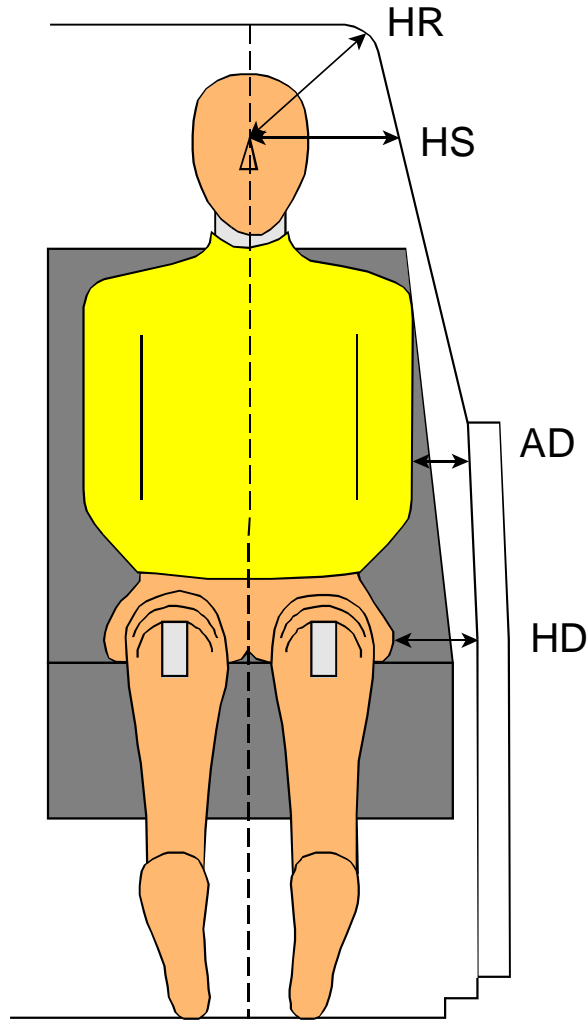
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

**DATA SHEET 8**

**SID H3 LATERAL CLEARANCE DIMENSIONS**

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



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

	DRIVER ID # 015		LEFT REAR PASS. ID # 016	
HR	192		200	
HS	300		232	
AD*	LOWER: 121	UPPER: 102	LOWER: 131	UPPER: 111
HD	198		164	

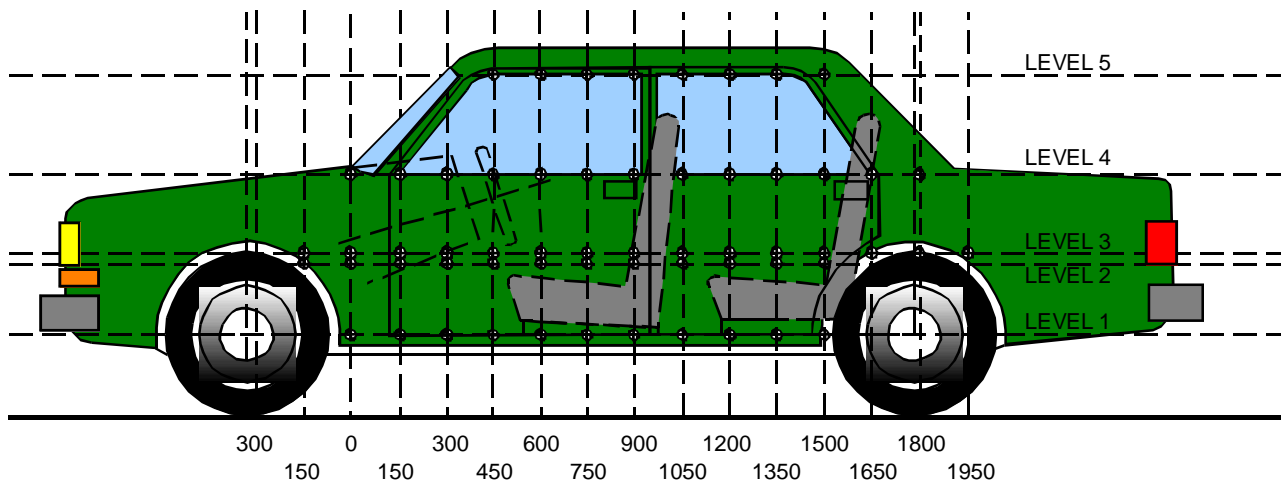
\* Lower measurement is taken laterally at the center of the lower rib accelerometer height from the SID H3 arm segment to the closest part of the vehicle side.  
 Upper measurement is taken laterally at the center of the upper rib accelerometer height from the SID H3 arm segment to the closest part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

**DATA SHEET 9**

**VEHICLE SIDE MEASUREMENTS**

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



**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:

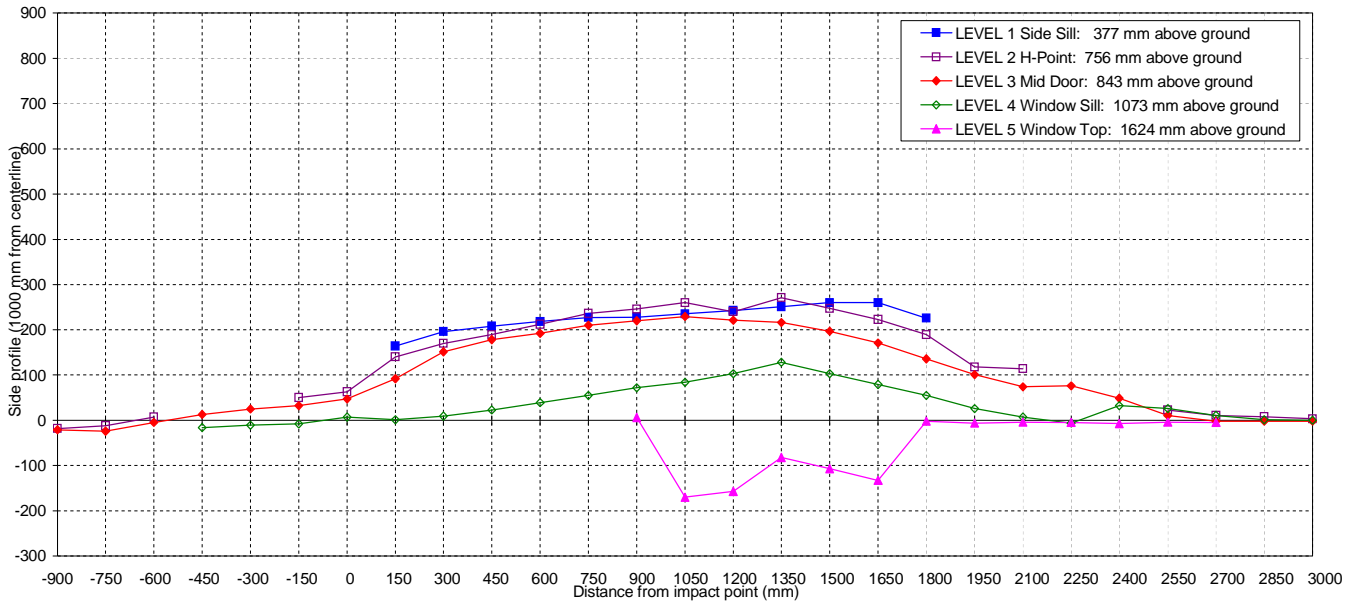
Level 5 @ Window Top	=	<u>1624</u>	millimeters
Level 4 @ Window Sill	=	<u>1073</u>	millimeters
Level 3 @ Mid Door	=	<u>843</u>	millimeters
Level 2 @ Occupant H-Point	=	<u>756</u>	millimeters
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>377</u>	millimeters

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



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

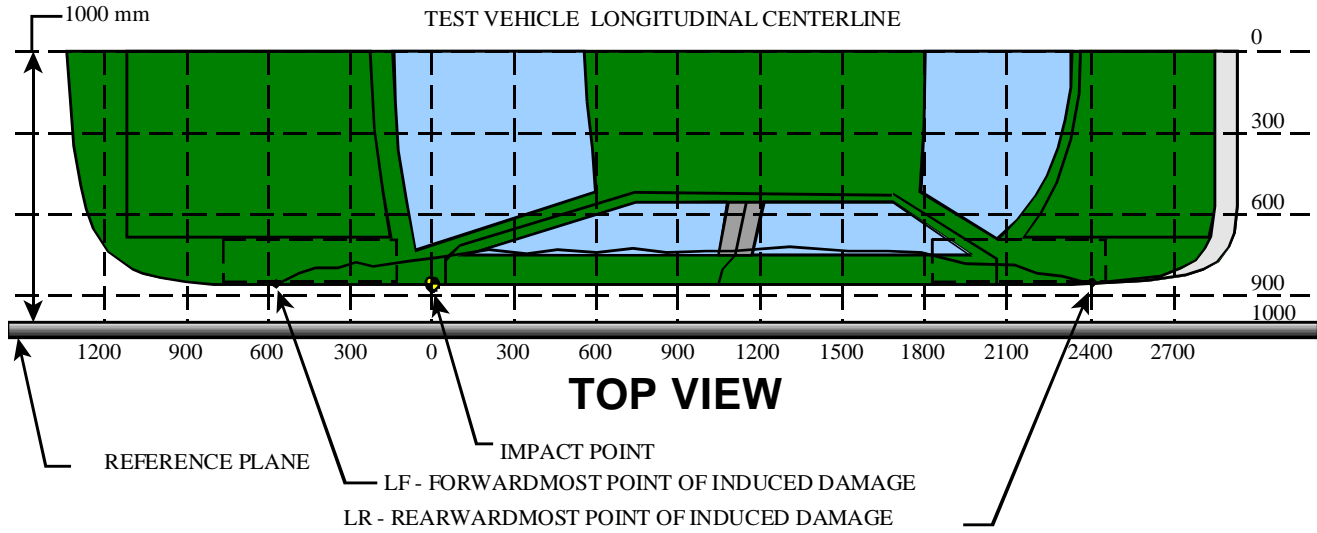
			DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT																											
LEVEL	HEIGHT (mm)		-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	
LEVEL 1 SIDE SILL	377	PRE	--	--	--	--	--	--	--	150	150	150	149	149	152	150	150	150	150	153	155	--	--	--	--	--	--	--	--	
		POST	--	--	--	--	--	--	--	314	346	358	367	376	380	385	393	401	410	413	381	--	--	--	--	--	--	--	--	
		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	164	196	208	218	227	228	235	243	251	260	260	226	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
LEVEL 2 H POINT	756	PRE	188	120	93	--	--	91	102	104	103	102	103	102	109	104	106	105	106	106	109	104	91	--	--	101	139	154	188	
		POST	170	108	100	--	--	141	165	244	273	291	315	338	355	364	346	376	353	329	298	222	205	--	--	124	150	162	19	
		CRUSH	-18	-12	7	N/A	N/A	50	63	140	170	189	212	236	246	260	240	271	247	223	189	118	114	N/A	N/A	23	11	8	3	
LEVEL 3 MID DOOR	843	PRE	207	137	113	97	96	107	102	104	101	100	103	100	101	99	100	101	102	104	106	108	101	95	101	126	138	155	19	
		POST	186	113	108	110	121	139	149	196	252	278	295	310	321	328	321	317	299	275	242	209	175	171	150	137	136	153	188	
		CRUSH	-21	-24	-5	13	25	32	47	92	151	178	192	210	220	229	221	216	197	171	136	101	74	76	49	11	-2	-2	-2	
LEVEL 4 WINDOW SILL	1073	PRE	--	--	--	315	261	218	185	165	157	145	138	132	126	123	118	119	120	121	121	126	129	134	139	147	157	177	203	
		POST	--	--	--	299	250	210	192	166	166	168	177	187	198	207	221	247	223	200	176	152	136	128	171	173	168	178	203	
		CRUSH	N/A	N/A	N/A	-16	-11	-8	7	1	9	23	39	55	72	84	103	128	103	79	55	26	7	-6	32	26	11	1	0	
LEVEL 5 WINDOW TOP	1624	PRE	--	--	--	--	--	--	--	--	--	--	--	--	362	351	350	348	350	353	355	360	366	375	391	408	450	--	--	
		POST	--	--	--	--	--	--	--	--	--	--	--	--	--	368	181	193	266	243	220	353	354	362	370	384	404	445	--	--
		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	6	-170	-157	-82	-107	-133	-2	-6	-4	-5	-7	-4	-5	N/A	N/A

**DATA SHEET 11**

**VEHICLE DAMAGE PROFILE DISTANCES**

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



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

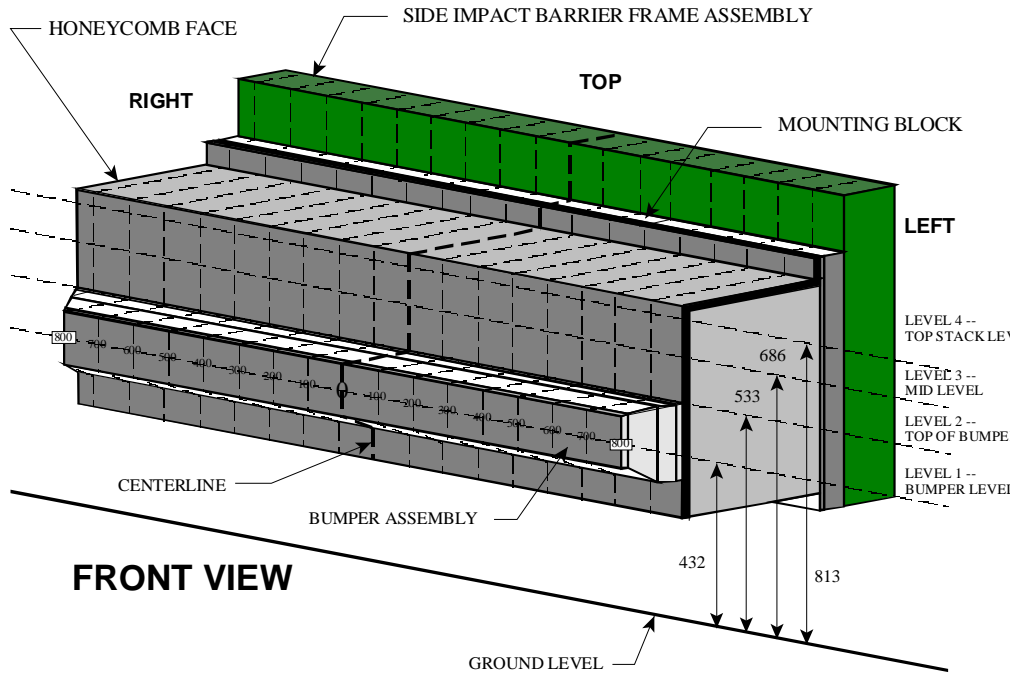
DPD MEASUREMENTS	POST TEST (mm)	PRETEST (mm)	STATIC CRUSH (mm)
1 (LR = 2875mm)	167	160	7
2 2188	173	97	76
3 1501	410	150	260
4 814	345	105	240
5 127	232	104	128
6 (LF = -560mm)	109	109	0

DATA SHEET 12

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



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	734	716	699	687	681	701	699	675	672	678	689	704	722	732	754	781	828
		CRUSH	115	97	80	68	62	82	80	56	53	59	70	85	103	113	135	162	209
LEVEL 3 MID LEVEL	686	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619
		POST	705	672	664	667	681	697	679	665	663	659	659	662	668	680	705	732	763
		CRUSH	86	53	45	48	62	78	60	46	44	40	40	43	49	61	86	113	144
LEVEL 2 TOP BUMPER	533	PRE	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619
		POST	751	743	740	738	736	734	734	734	732	730	733	733	735	736	739	749	759
		CRUSH	132	124	121	119	117	115	115	115	113	111	114	114	116	117	120	130	140
LEVEL 1 MID BUMPER	432	PRE	535	519	518	518	518	518	518	518	518	518	518	518	518	518	518	519	535
		POST	670	654	649	648	649	649	650	651	650	647	647	650	651	652	660	674	696
		CRUSH	135	135	131	130	131	131	132	133	132	129	129	132	133	134	142	155	161

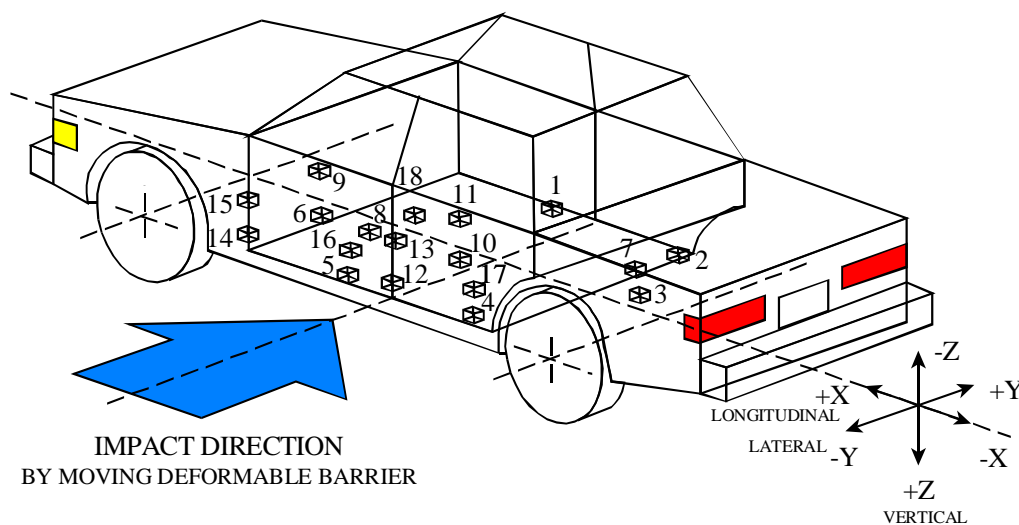
\*Heights measured above ground level.

## DATA SHEET 13

### TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



- |                                    |                                    |
|------------------------------------|------------------------------------|
| 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 Kia Sorento MPV

NHTSA No. C30511

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	2757	599	-430	pos.	8.3	18.2	18.3	9.8	14.1	28.4	26.8	23.9
					neg.	-8.1	7.7	-2.9	70.8	-23.3	23.9	-	-
2	Right Side Sill at Rear Seat	1833	610	-469	pos.	8.1	17.8	29.5	6.3	8.5	32.5	31.3	6.4
					neg.	-5.7	8.5	-2.5	100.8	-12.3	25.6	-	-
3	Rear Floorpan Above Axle	1168	62	-720	pos.	4.6	75.7	31.5	6.2	8.2	81.0	31.8	6.3
					neg.	-5.9	44.9	-3.5	17.4	-7.8	68.9	-	-
4	Left Side Sill at Rear Seat	1699	-633	-440	pos.	-	-	77.6	5.3	-	-	-	-
					neg.	-	-	-18.1	18.3	-	-	-	-
5	Left Side Sill at Front Seat	2721	-616	-422	pos.	-	-	68.7	5.5	-	-	-	-
					neg.	-	-	-35.0	18.8	-	-	-	-
6**	Left Front Door on Centerline	-	-	-	pos.	-	-	-	-	-	-	-	-
					neg.	-	-	-	-	-	-	-	-
7	Right Rear Occupant Compartment	1827	406	-487	pos.	-	-	30.6	6.2	-	-	-	-
					neg.	-	-	-2.0	102.6	-	-	-	-
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 not requested by COTR.

4-11

8675-F214-07

**DATA SHEET 13 (continued)**

**VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511

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	2098	-680	-641	pos.	-	-	260.9	4.4	-	-	-	-
					neg.	-	-	-70.8	13.4	-	-	-	-
13	Left Middle B-Pillar	2069	-698	-936	pos.	-	-	125.4	4.4	-	-	-	-
					neg.	-	-	-69.8	14.1	-	-	-	-
14	Left Lower A-Pillar	3130	-685	-710	pos.	-	-	162.8	4.8	-	-	-	-
					neg.	-	-	-78.7	84.1	-	-	-	-
15	Left Middle A-Pillar	3087	-688	-1204	pos.	-	-	68.8	28.6	-	-	-	-
					neg.	-	-	-34.6	32.0	-	-	-	-
16	Front Seat Track	2224	-609	-513	pos.	-	-	73.6	9.2	-	-	-	-
					neg.	-	-	-26.0	58.2	-	-	-	-
17	Rear Seat Track	1171	-352	-703	pos.	-	-	29.3	6.5	-	-	-	-
					neg.	-	-	-3.2	17.3	-	-	-	-
18	Vehicle CG	2560	16	-727	pos.	14.5	23.0	40.7	26.4	45.0	29.0	57.0	36.6
					neg.	-17.4	9.8	-19.5	41.1	-50.3	36.7	-	-

\*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Down)

4-12

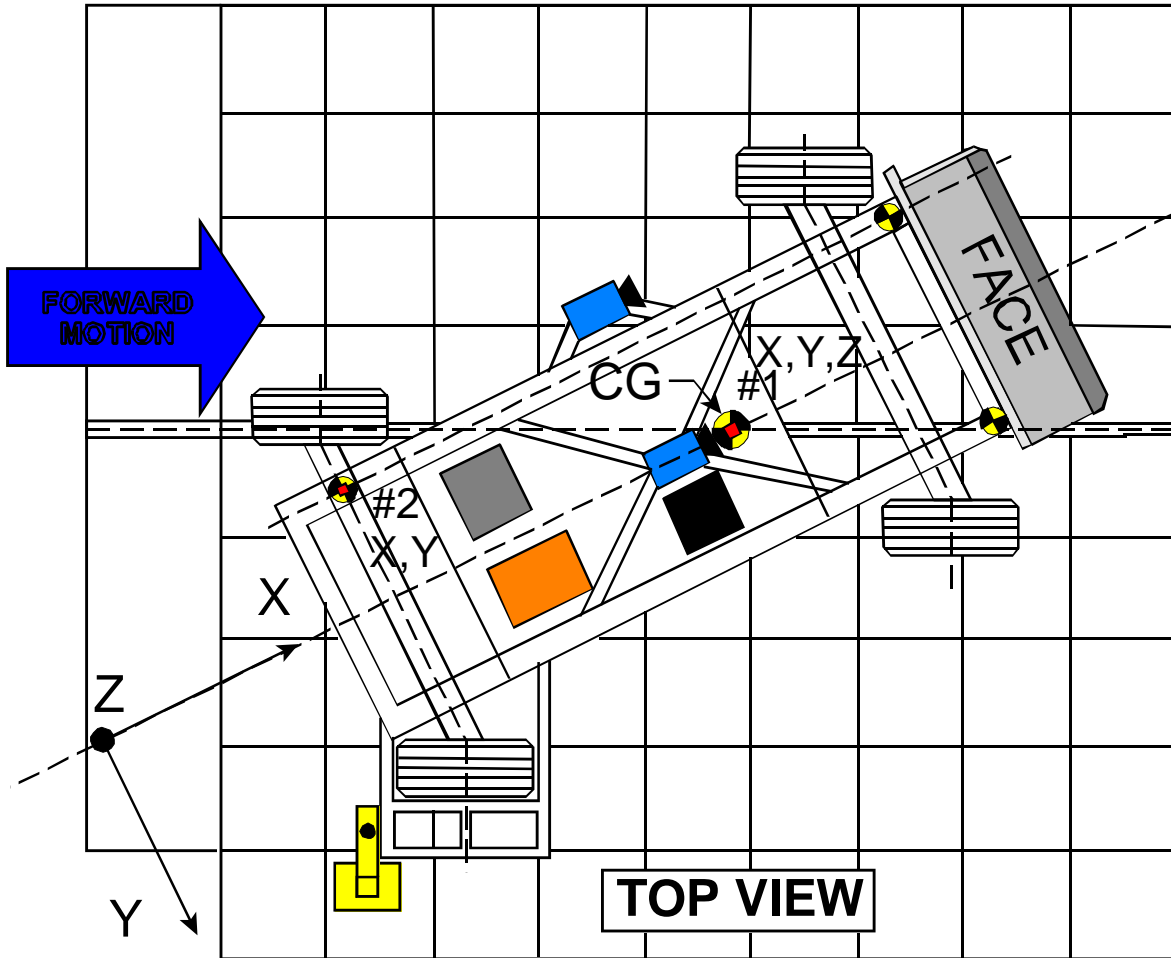
8675-F214-07

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



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	133.8	-20.2	40.9
	Lateral..... Y				0.1	187.7	-5.9	47.4
	Vertical..... Z				10.0	62.7	-12.5	93.5
	Resultant..... R				21.4	49.9	-	-
2	Rear Frame Member							
	Longitudinal... X	386	-660	-660	2.0	125.0	-22.4	43.4
	Lateral..... Y				2.9	31.1	-3.1	67.0

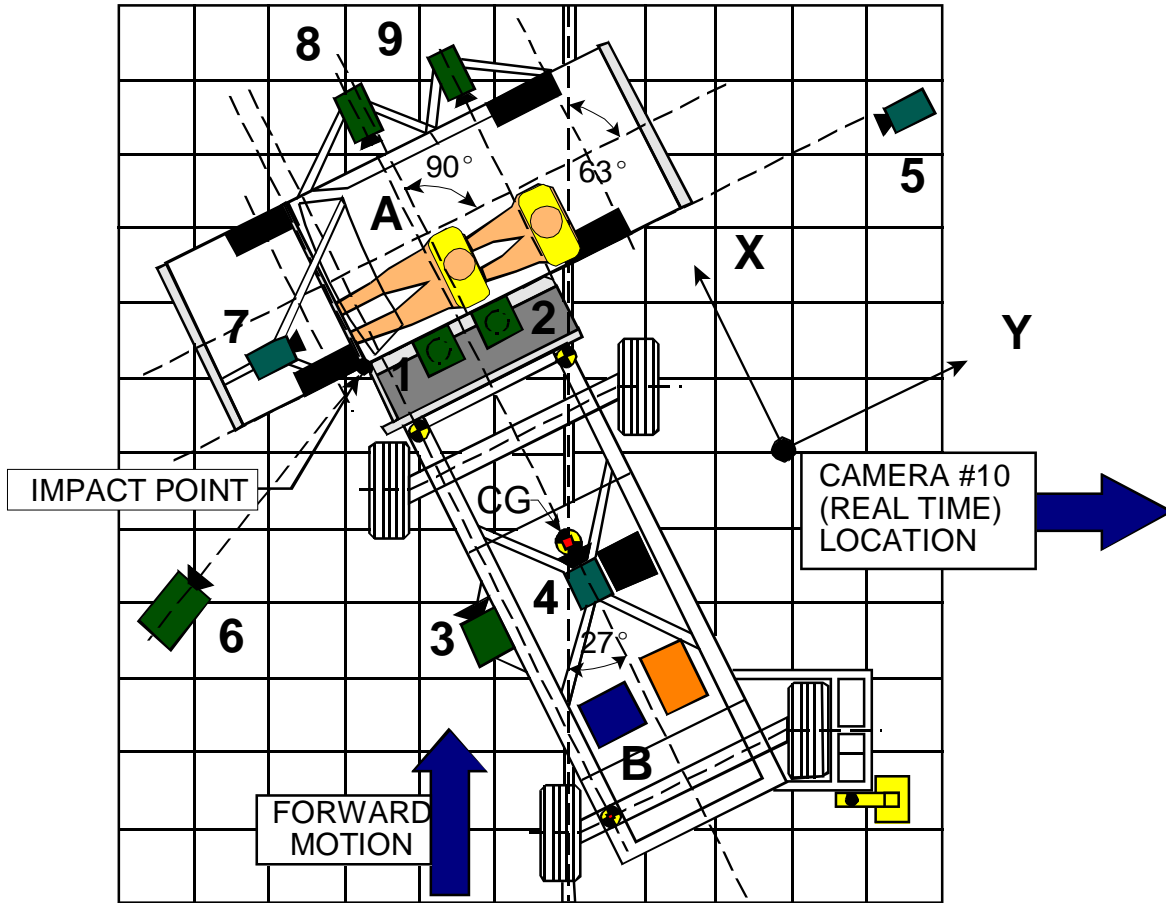
\*Reference: X = Rear Bumper (+ Forward)  
 Y = Vehicle Centerline (+ To Right)  
 Z = Ground Level (+ Down)  
 All measurements accurate to within ±3 mm.

DATA SHEET 15

HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead view of test vehicle	103	824	-4880	-90	8	1005
2	Overhead closeup view of impact plane	230	875	-4880	-90	12.5	1005
3	MDB onboard closeup view of impact point	-1470	0	-847	0	13	†
4	MDB onboard view of driver dummy	-1140	838	-1586	-17	7.5	1010
5	Right side ground level overall view	0	9173	-1080	-1	25	1010
6	Left side ground level overall view	-1559	-1898	-1070	-3	13	1000
7	Test vehicle onboard driver front view	492	-355	-1466	-6	13	870
8	Test vehicle onboard driver side view	1843	856	-1225	-5	8	1015
9	Test vehicle onboard passenger side view	1919	1706	-1295	-9	8	1020
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

† No timing. Timing circuit failed.

## **SECTION 5**

### **FUEL SYSTEM INTEGRITY**

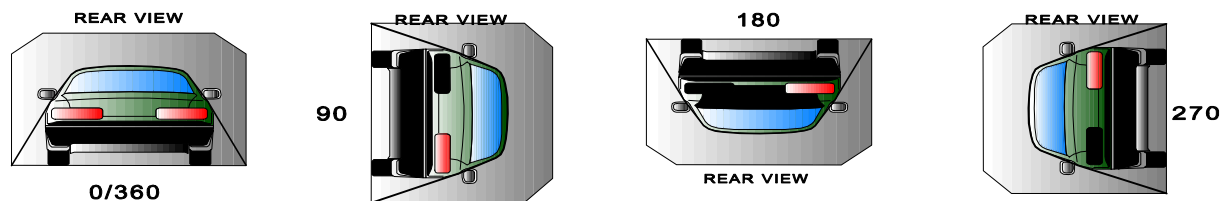


## DATA SHEET 17

### ROLLOVER DATA

Vehicle: 2003 Kia Sorento MPV

NHTSA No.: C30511



#### 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	5	seconds	5	minutes	6	minutes	5	seconds	7	minutes
180°-270°	1	minutes	3	seconds	5	minutes	6	minutes	3	seconds	7	minutes
270°-360°	1	minutes	5	seconds	5	minutes	6	minutes	5	seconds	7	minutes

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

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

#### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

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

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

**APPENDIX A**

**PHOTOGRAPHS**

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



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



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



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



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



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



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



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



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



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



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



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



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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

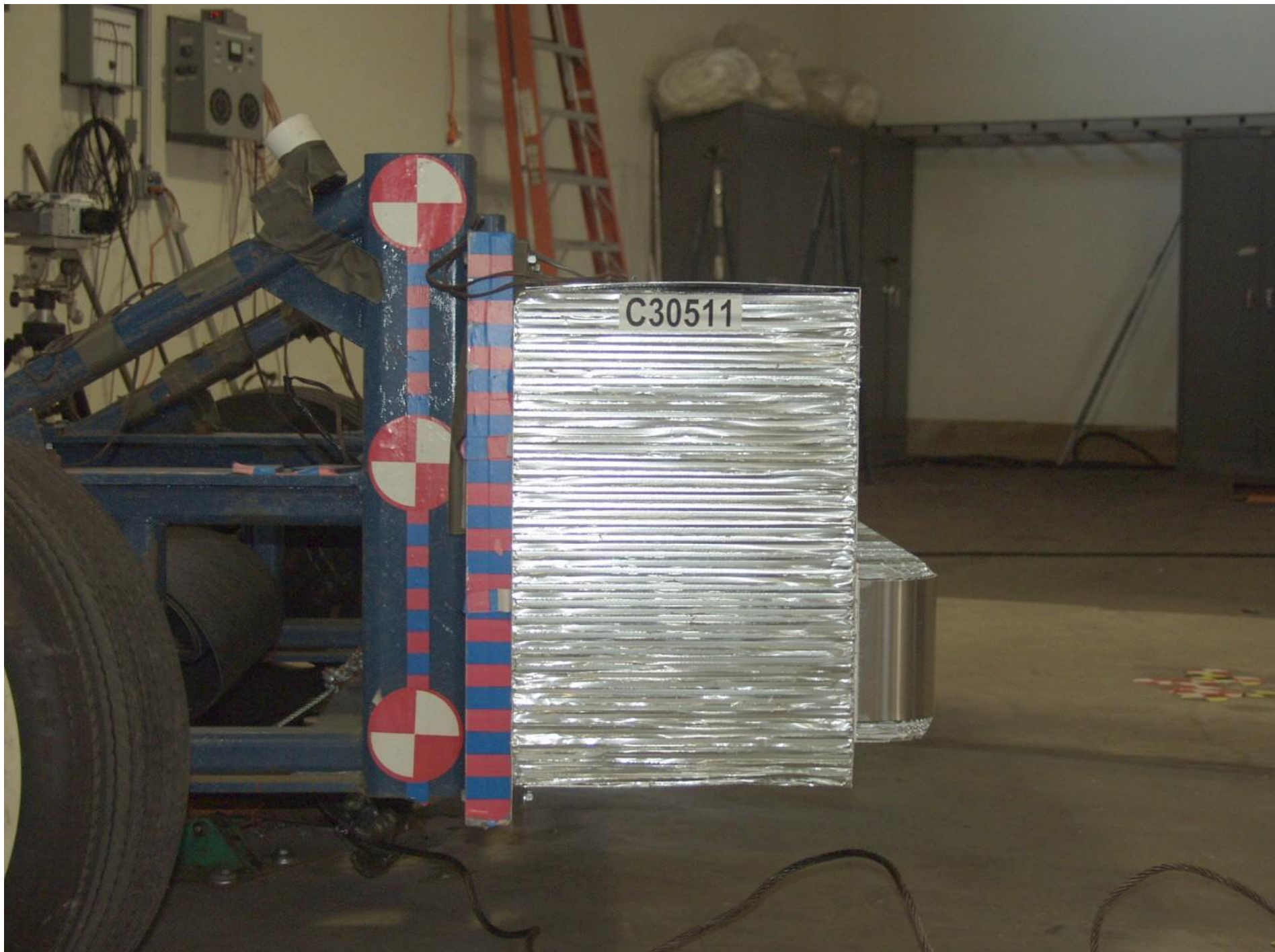


Figure A-19 PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



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



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



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



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



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



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



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



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



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



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



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



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Figure A-33 PRE-TEST INTERIOR OF FRONT DOOR



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



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Figure A-35 PRE-TEST INTERIOR OF REAR DOOR



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



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



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

MFD. BY KIA MOTORS CORP.

DATE: 12/27/02  
GVWR 5644 LB GAWR FRT 2822 LB GAWR RR 3307 LB  
PNBV 2560 KG PNBE FRT 1280 KG PNBE RR 1500 KG

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

VIN KNDJC733X35094874

TYPE M. P. V

L4

EXTERIOR PAINT COLORS

BODY

W

VR

MLDG.

INT. TRIM

GW

TAPE

R

S

AX

TR

DSO

E

U

MADE IN KOREA

FOR FURTHER INFORMATION,  
SEE OWNER'S MANUAL

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

<b>SORENTO</b>	2WD	GVWR 2480KG(5467LB)	MANUFACTURED BY <b>KIA</b> KIA MOTORS
	4WD	GVWR 2560KG(5644LB)	
GAWR(FRONT) : 1280KG(2822LB) USING P245/70R16 TIRES ON 16X7JJ RIMS, INFLATE TO : 210KPA (30PSI) COLD			
GAWR(REAR) : 1500KG(3307LB) USING P245/70R16 TIRES ON 16X7JJ RIMS, INFLATE TO : 210KPA (30PSI) COLD			
SPARE(FULL SIZE) : P245/70R16 TIRES ON 16X7JJ RIM, INFLATE TO : 210KPA (30PSI) COLD			

Handwritten markings on the placard label, including a circular symbol and the text "X=O" and "W=11".

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



Figure A-42 IMPACT PHOTO



Figure A-43 ROLLOVER 90 DEGREES

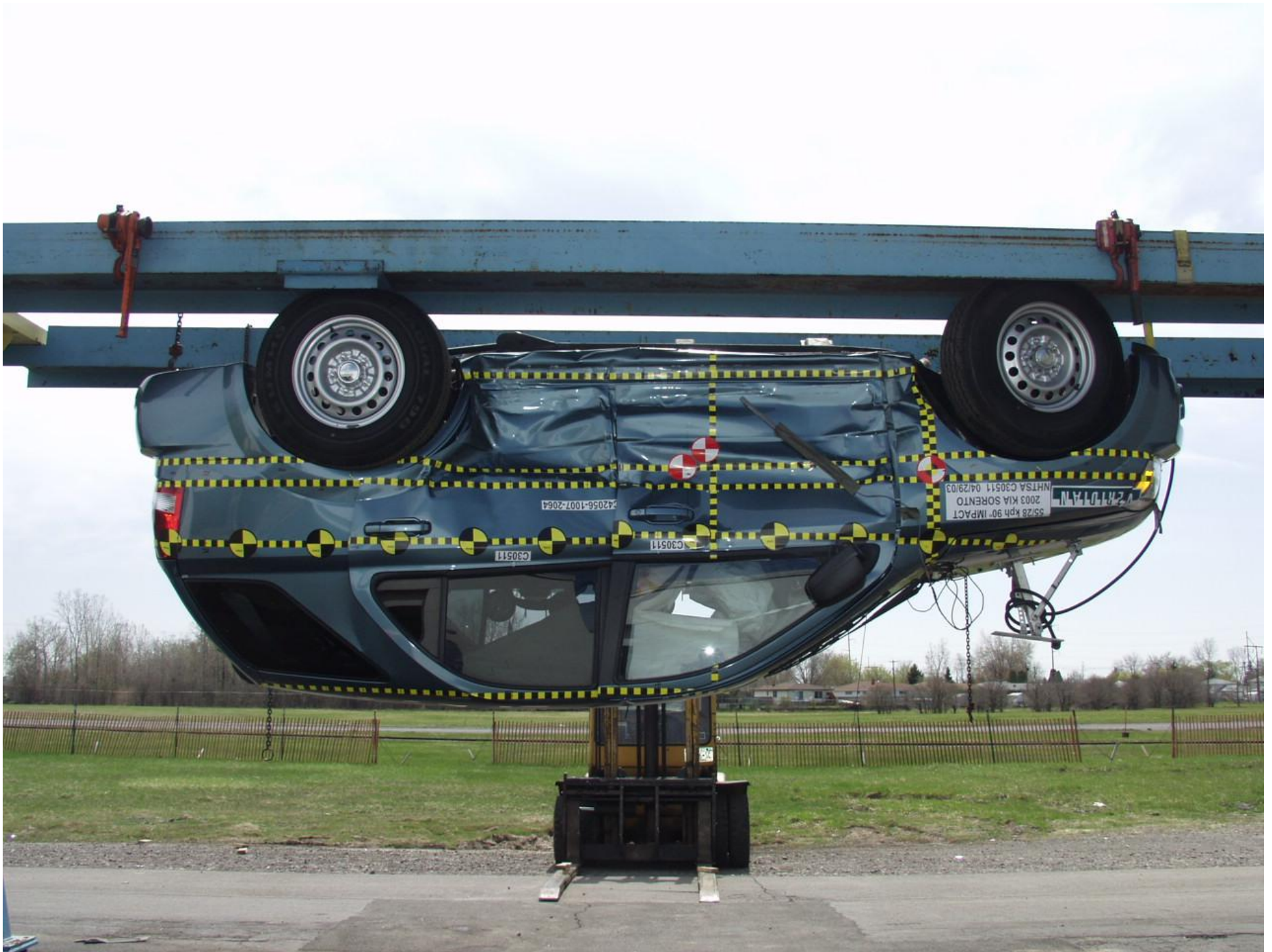


Figure A-44 ROLLOVER 180 DEGREES

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Figure A-45 ROLLOVER 270 DEGREES

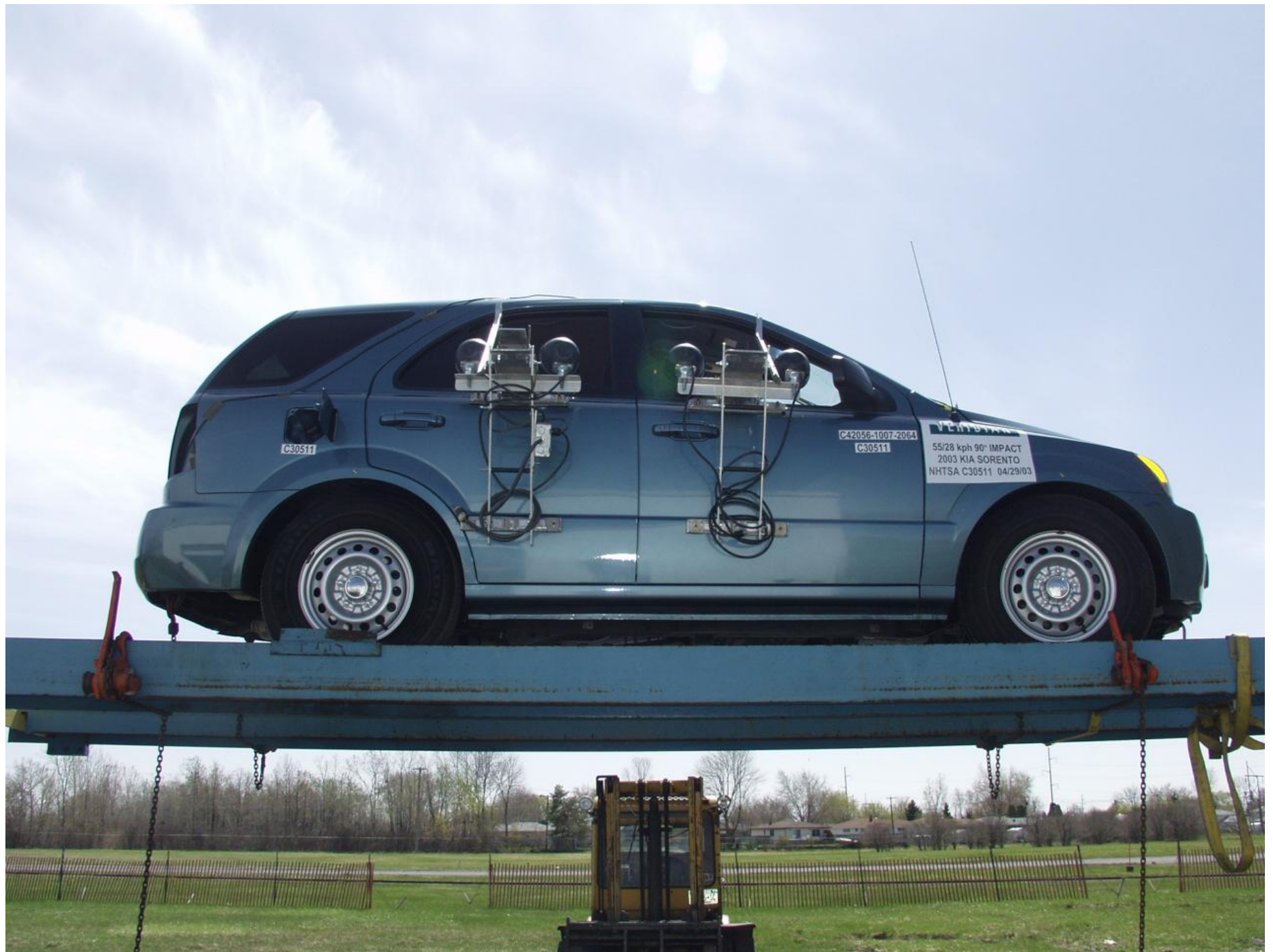


Figure A-46 ROLLOVER 360 DEGREES



Figure A-47 POST TEST P4 DOOR LATCH/STRIKER



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Figure A-48 POST TEST P4 DOOR TO BODY MEASUREMENT AT STRIKER HEIGHT

**APPENDIX B**

**VEHICLE, MDB AND SID HYBRID III RESPONSE DATA**

## TABLE OF DATA PLOTS

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

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2	DRIVER HEAD 9 ARRAY X ARM (Y) VELOCITY VS TIME	B- 8
3	DRIVER HEAD 9 ARRAY X ARM (Z) ACCELERATION VS TIME	B- 9
4	DRIVER HEAD 9 ARRAY X ARM (Z) VELOCITY VS TIME	B- 10
5	DRIVER HEAD 9 ARRAY Y ARM (X) ACCELERATION VS TIME	B- 11
6	DRIVER HEAD 9 ARRAY Y ARM (X) VELOCITY VS TIME	B- 12
7	DRIVER HEAD 9 ARRAY Y ARM (Z) ACCELERATION VS TIME	B- 13
8	DRIVER HEAD 9 ARRAY Y ARM (Z) VELOCITY VS TIME	B- 14
9	DRIVER HEAD 9 ARRAY Z ARM (X) ACCELERATION VS TIME	B- 15
10	DRIVER HEAD 9 ARRAY Z ARM (X) VELOCITY VS TIME	B- 16
11	DRIVER HEAD 9 ARRAY Z ARM (Y) ACCELERATION VS TIME	B- 17
12	DRIVER HEAD 9 ARRAY Z ARM (Y) VELOCITY VS TIME	B- 18
13	DRIVER HEAD (X) ACCELERATION VS TIME	B- 19
14	DRIVER HEAD (X) VELOCITY VS TIME	B- 20
15	DRIVER HEAD (Y) ACCELERATION VS TIME	B- 21
16	DRIVER HEAD (Y) VELOCITY VS TIME	B- 22
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18	DRIVER HEAD (Z) VELOCITY VS TIME	B- 24
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21	DRIVER UPPER NECK (Y) FORCE VS TIME	B- 27
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32	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 38
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**DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS**  
 ACCELERATION, FORCE AND MOMENT 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>
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39	PASSENGER HEAD 9 ARRAY X ARM (Z) VELOCITY VS TIME	B- 45
40	PASSENGER HEAD 9 ARRAY Y ARM (X) ACCELERATION VS TIME	B- 46
41	PASSENGER HEAD 9 ARRAY Y ARM (X) VELOCITY VS TIME	B- 47
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51	PASSENGER HEAD (Y) VELOCITY VS TIME	B- 57
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53	PASSENGER HEAD (Z) VELOCITY VS TIME	B- 59
54	PASSENGER HEAD RESULTANT ACCELERATION VS TIME	B- 60
55	DRIVER UPPER NECK (X) FORCE VS TIME	B- 61
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57	DRIVER UPPER NECK (Z) FORCE VS TIME	B- 63
58	DRIVER UPPER NECK RESULTANT FORCE VS TIME	B- 64
59	DRIVER UPPER NECK (X) MOMENT VS TIME	B- 65
60	DRIVER UPPER NECK (Y) MOMENT VS TIME	B- 66
61	DRIVER UPPER NECK (Z) MOMENT VS TIME	B- 67
62	DRIVER UPPER NECK RESULTANT MOMENT VS TIME	B- 68
63	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 69
64	PASSENGER UPPER RIB (Y) VELOCITY VS TIME	B- 70
65	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 71
66	PASSENGER LOWER RIB (Y) VELOCITY VS TIME	B- 72
67	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 73
68	PASSENGER LOWER SPINE (Y) VELOCITY VS TIME	B- 74
69	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 75
70	PASSENGER PELVIC (Y) VELOCITY VS TIME	B- 76

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

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
71	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 77
72	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 78
73	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 79
74	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 80
75	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 81
76	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 82
77	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 83
78	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 84

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

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80	RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY VS TIME	B- 86
81	RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 87
82	RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 88
83	RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME	B- 89
84	RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY VS TIME	B- 90
85	RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION VS TIME	B- 91
86	RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME	B- 92
87	RIGHT SIDE SILL AT REAR SEAT (X) VELOCITY VS TIME	B- 93
88	RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	B- 94
89	RIGHT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME	B- 95
90	RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME	B- 96
91	RIGHT SIDE SILL AT REAR SEAT (Z) VELOCITY VS TIME	B- 97
92	RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION VS TIME	B- 98
93	REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME	B- 99
94	REAR FLOORPAN ABOVE AXLE (X) VELOCITY VS TIME	B- 100
95	REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME	B- 101
96	REAR FLOORPAN ABOVE AXLE (Y) VELOCITY VS TIME	B- 102
97	REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME	B- 103
98	REAR FLOORPAN ABOVE AXLE (Z) VELOCITY VS TIME	B- 104
99	REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION VS TIME	B- 105
100	LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	B- 106
101	LEFT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME	B- 107
102	LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME	B- 108
103	LEFT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME	B- 109
104	RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME	B- 110
105	RIGHT REAR OCCUPANT COMPARTMENT (Y) VELOCITY VS TIME	B- 111
106	LOWER B-POST (Y) ACCELERATION VS TIME	B- 112
107	LOWER B-POST (Y) VELOCITY VS TIME	B- 113
108	UPPER B-POST (Y) ACCELERATION VS TIME	B- 114
109	UPPER B-POST (Y) VELOCITY VS TIME	B- 115
110	LOWER A-POST (Y) ACCELERATION VS TIME	B- 116
111	LOWER A-POST (Y) VELOCITY VS TIME	B- 117
112	UPPER A-POST (Y) ACCELERATION VS TIME	B- 118
113	UPPER A-POST (Y) VELOCITY VS TIME	B- 119
114	FRONT SEAT TRACK (Y) ACCELERATION VS TIME	B- 120
115	FRONT SEAT TRACK (Y) VELOCITY VS TIME	B- 121
116	REAR SEAT TRACK (Y) ACCELERATION VS TIME	B- 122
117	REAR SEAT TRACK (Y) VELOCITY VS TIME	B- 123

**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>
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120	VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B- 126
121	VEHICLE CENTER OF GRAVITY (Y) VELOCITY ACCELERATION VS TIME	B- 127
122	VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B- 128
123	VEHICLE CENTER OF GRAVITY (Z) VELOCITY VS TIME	B- 129
124	VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B- 130

**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>
125	MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME	B- 131
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127	MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME	B- 133
128	MDB CENTER OF GRAVITY (Y) VELOCITY VS TIME	B- 134
129	MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME	B- 135
130	MDB CENTER OF GRAVITY (Z) VELOCITY VS TIME	B- 136
131	MDB CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME	B- 137
132	MDB REAR (X) ACCELERATION VS TIME	B- 138
133	MDB REAR (X) VELOCITY VS TIME	B- 139
134	MDB REAR (Y) ACCELERATION VS TIME	B- 140
135	MDB REAR (Y) VELOCITY VS TIME	B- 141

**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>
136	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 142
137	DRIVER UPPER RIB (Y) VELOCITY VS TIME	B- 143
138	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 144
139	DRIVER LOWER RIB (Y) VELOCITY VS TIME	B- 145
140	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 146
141	DRIVER LOWER SPINE (Y) VELOCITY VS TIME	B- 147
142	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 148
143	DRIVER PELVIC (Y) VELOCITY VS TIME	B- 149
144	PASSENGER UPPER RIB (Y) ACCELERATION VS TIME	B- 150
145	PASSENGER UPPER RIB (Y) VELOCITY VS TIME	B- 151
146	PASSENGER LOWER RIB (Y) ACCELERATION VS TIME	B- 152
147	PASSENGER LOWER RIB (Y) VELOCITY VS TIME	B- 153
148	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 154
149	PASSENGER LOWER SPINE (Y) VELOCITY VS TIME	B- 155
150	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 156
151	PASSENGER PELVIC (Y) VELOCITY VS TIME	B- 157

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

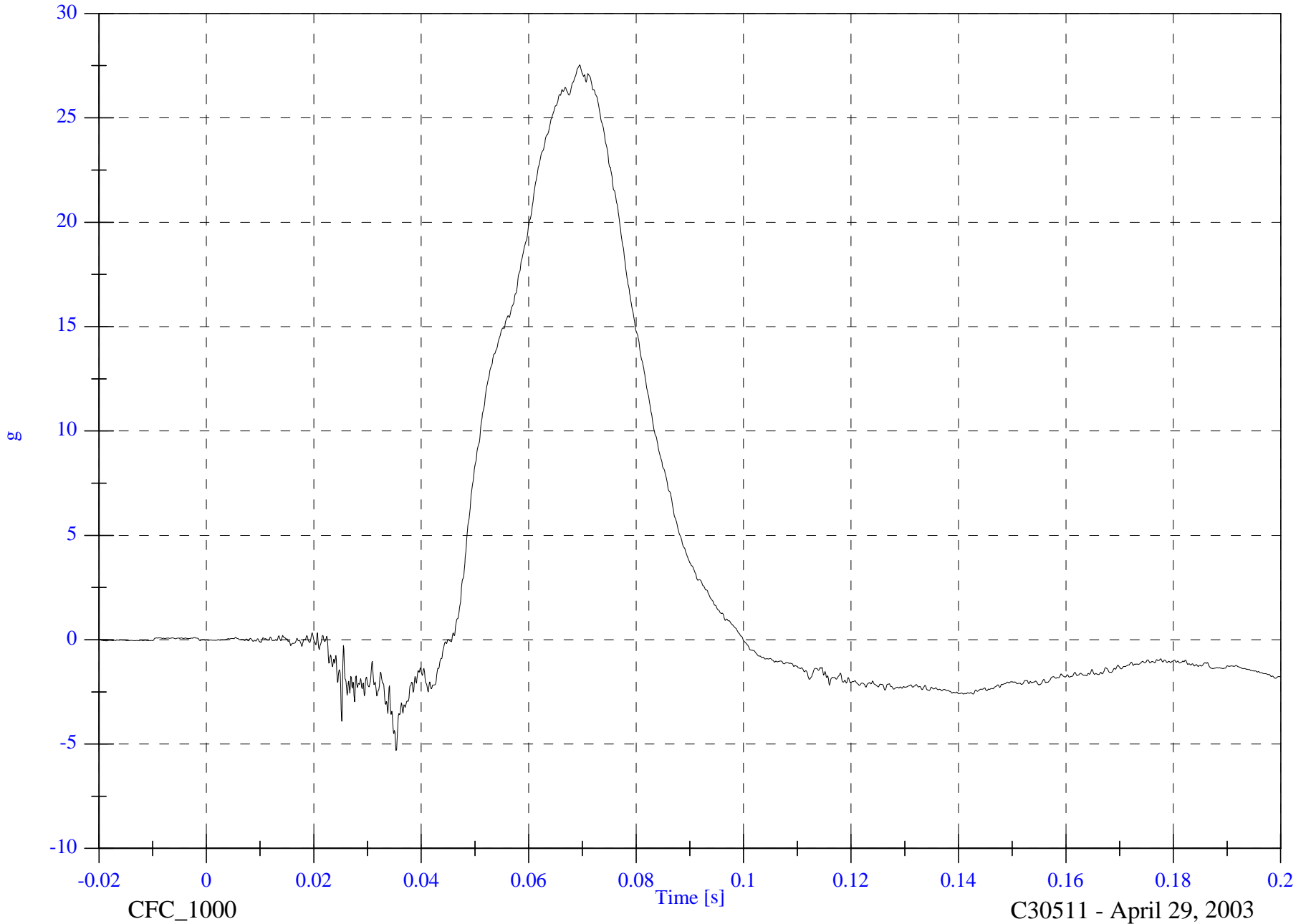
<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
152	DRIVER UPPER RIB (Y) ACCELERATION VS TIME	B- 158
153	DRIVER LOWER RIB (Y) ACCELERATION VS TIME	B- 159
154	DRIVER LOWER SPINE (Y) ACCELERATION VS TIME	B- 160
155	DRIVER PELVIC (Y) ACCELERATION VS TIME	B- 161
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158	PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME	B- 164
159	PASSENGER PELVIC (Y) ACCELERATION VS TIME	B- 165

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head 9 Array X Arm Ay

Max: 27.5 [g] at 0.069 [s]

Min: -5.3 [g] at 0.035 [s]



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C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

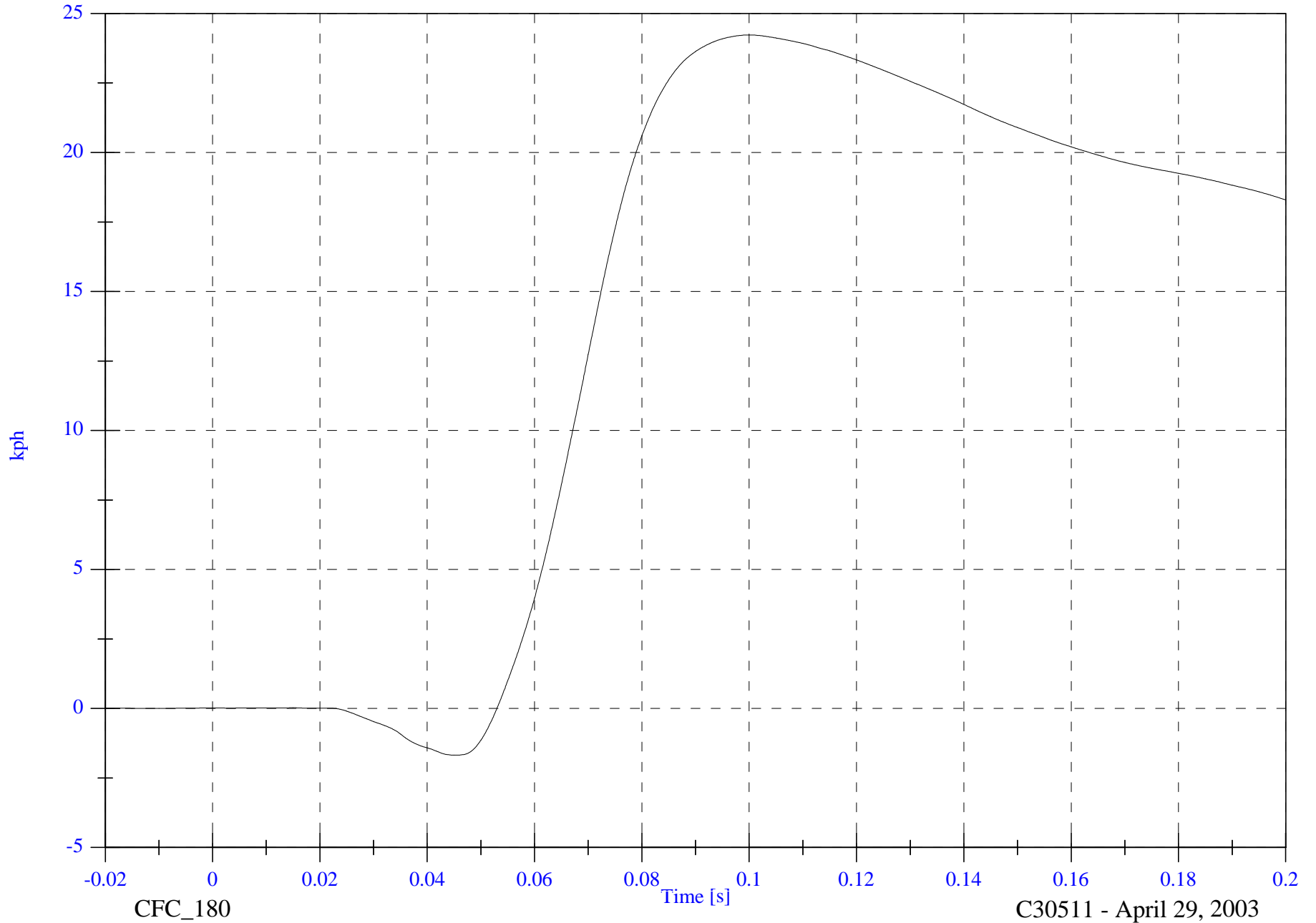
V2P1 Head 9 Array X Arm Ay Velocity

Max: 24.2 [kph] at 0.100 [s]

Min: -1.7 [kph] at 0.045 [s]

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8675-F214-07



CFC\_180

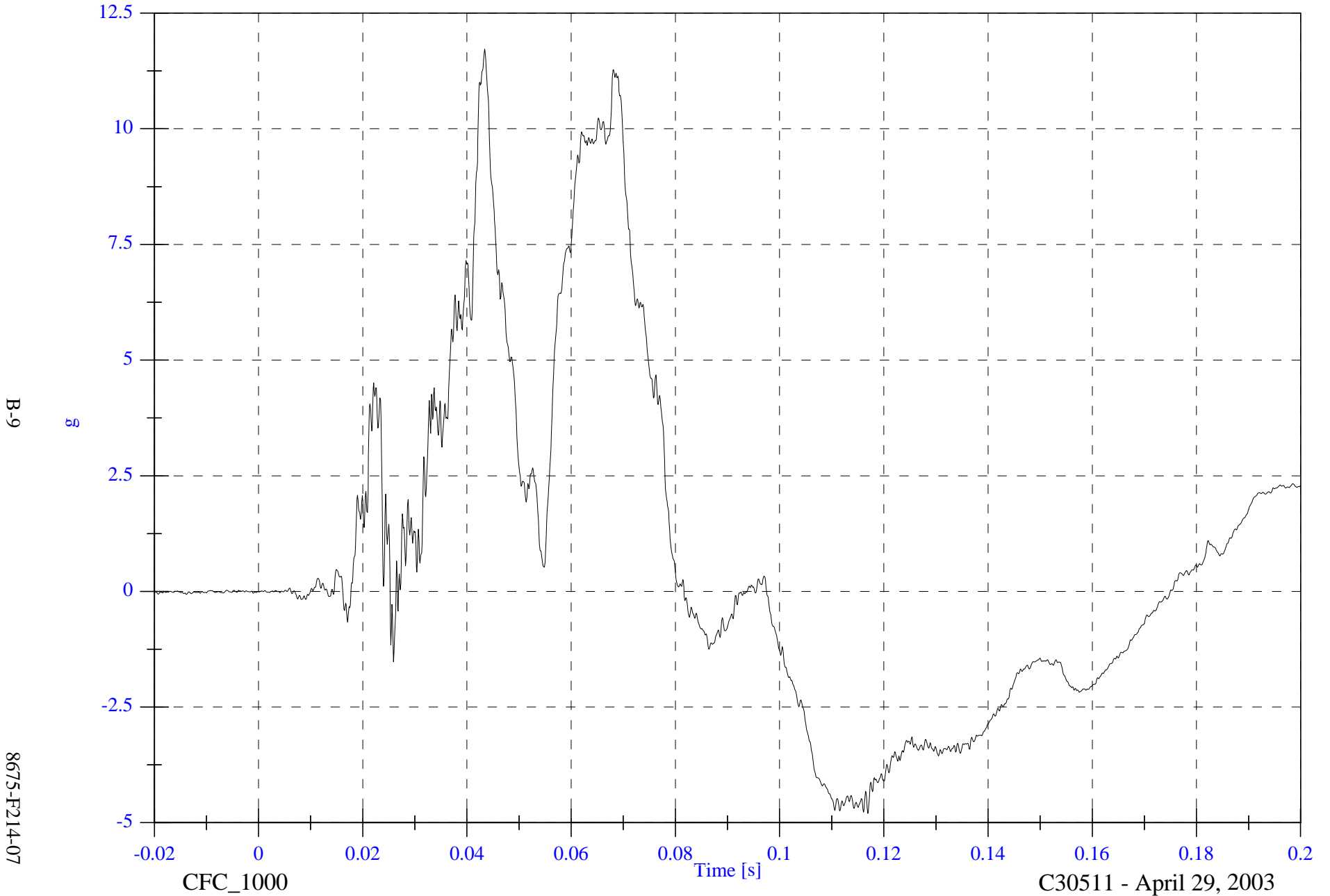
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head 9 Array X Arm Az

Max: 11.7 [g] at 0.043 [s]

Min: -4.8 [g] at 0.117 [s]



B-9

8675-F214-07

CFC\_1000

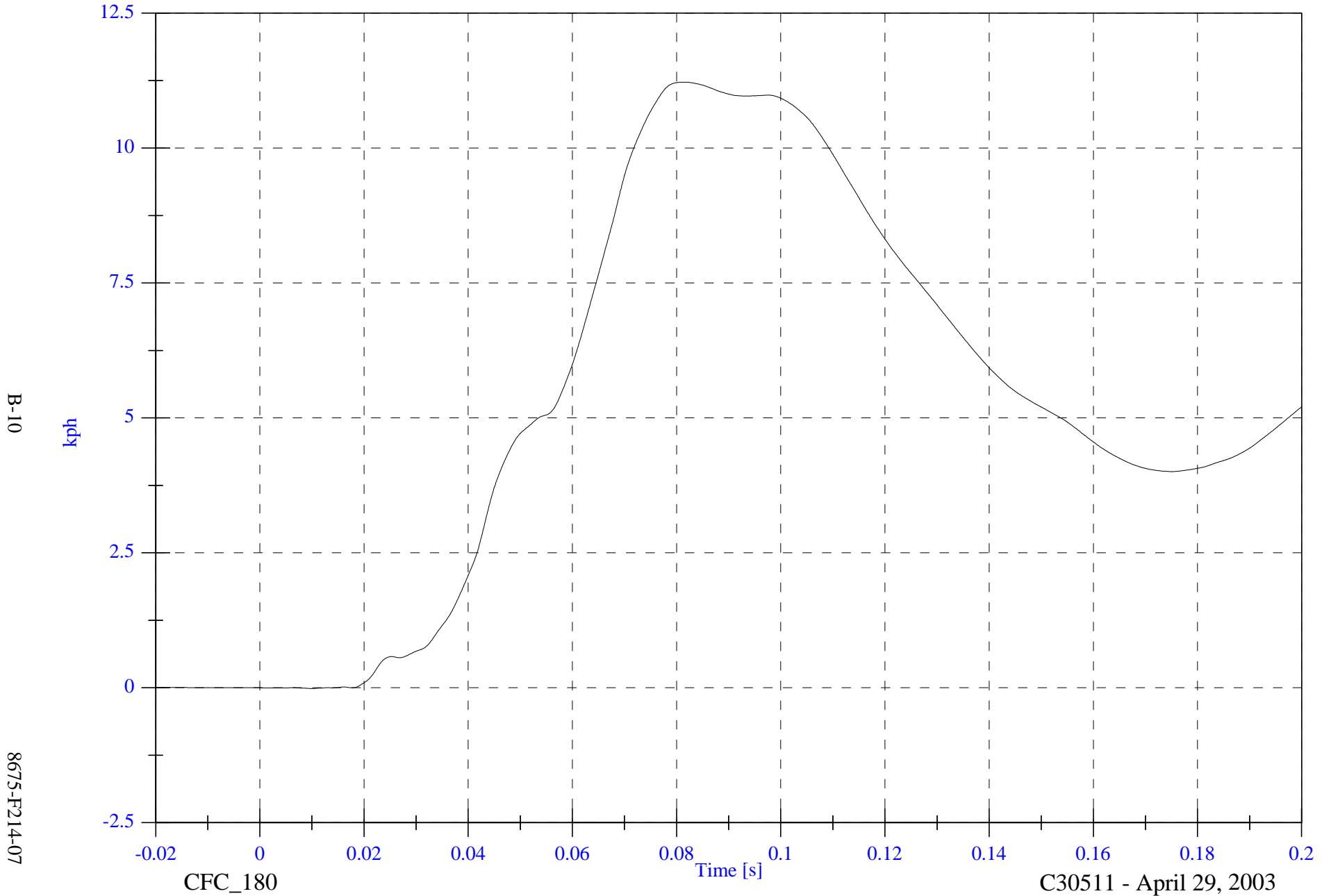
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head 9 Array X Arm Az Velocity

Max: 11.2 [kph] at 0.081 [s]

Min: -0.0 [kph] at 0.010 [s]



B-10

8675-F214-07

CFC\_180

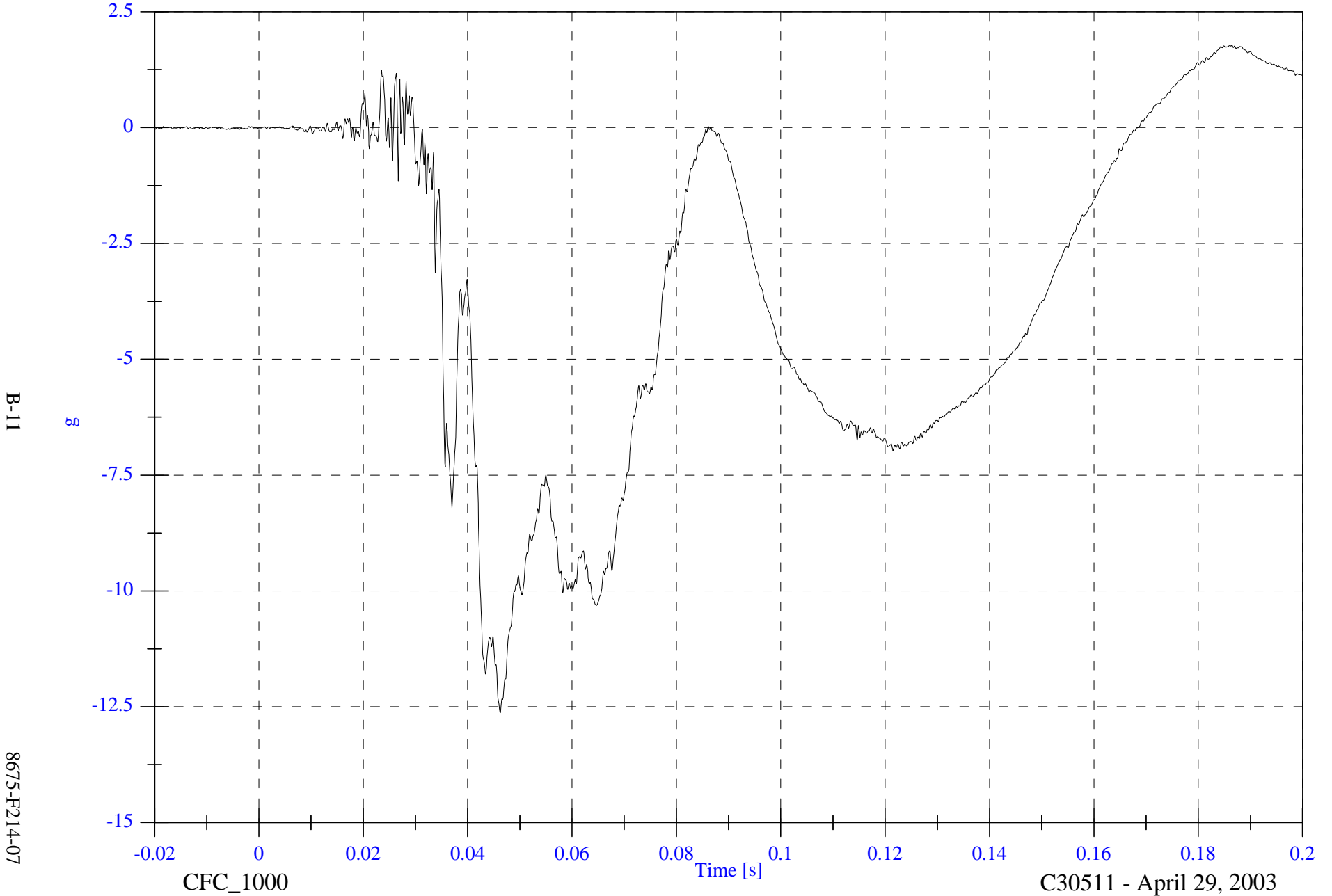
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head 9 Array Y Arm Ax

Max: 1.8 [g] at 0.186 [s]

Min: -12.6 [g] at 0.046 [s]

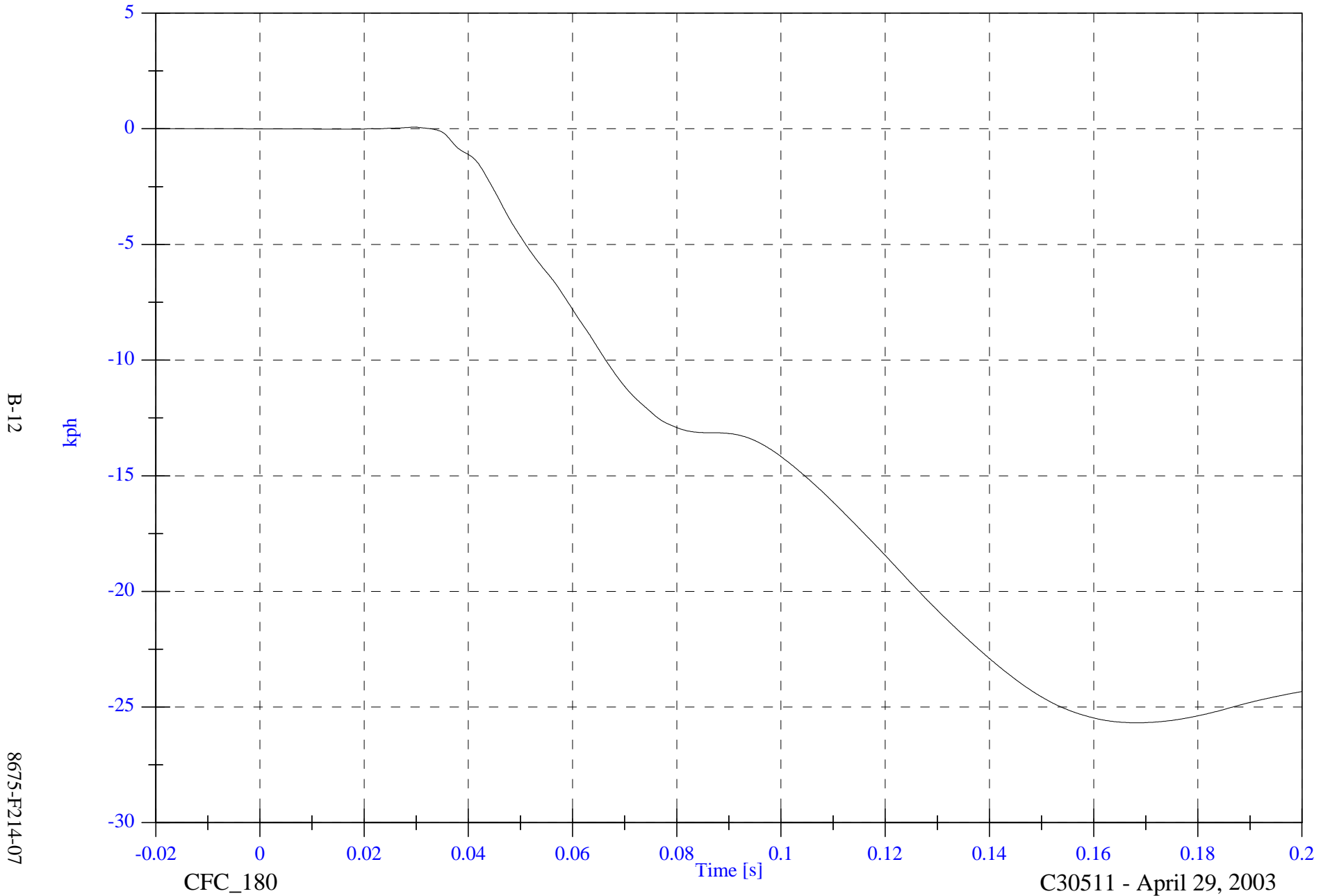


FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head 9 Array Y Arm Ax Velocity

Max: 0.1 [kph] at 0.030 [s]

Min: -25.7 [kph] at 0.168 [s]



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8675-F214-07

CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

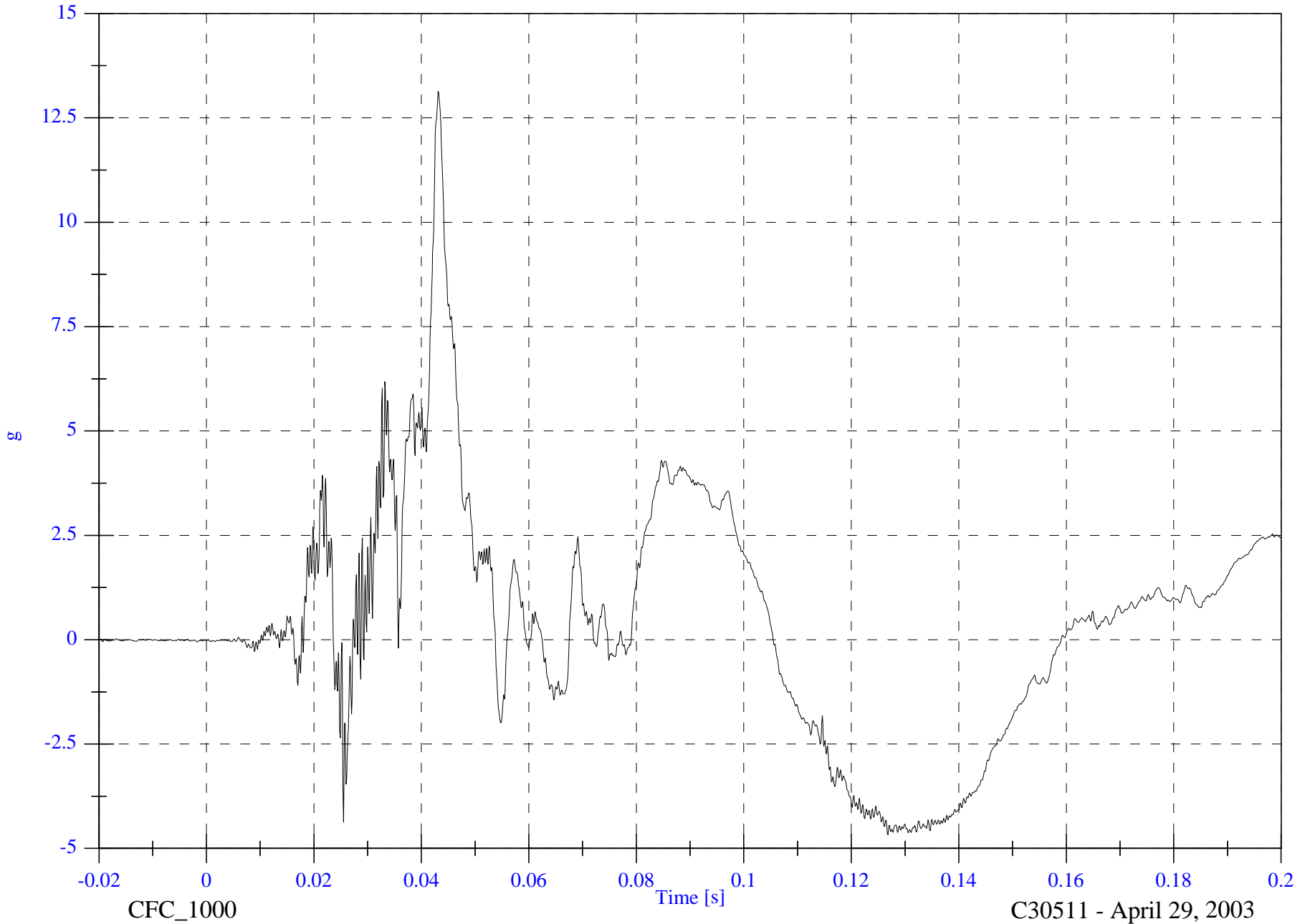
V2P1 Head 9 Array Y Arm Az

Max: 13.1 [g] at 0.043 [s]

Min: -4.7 [g] at 0.127 [s]

B-13

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FMVSS 214D Indicant - 2003 Kia Sorento

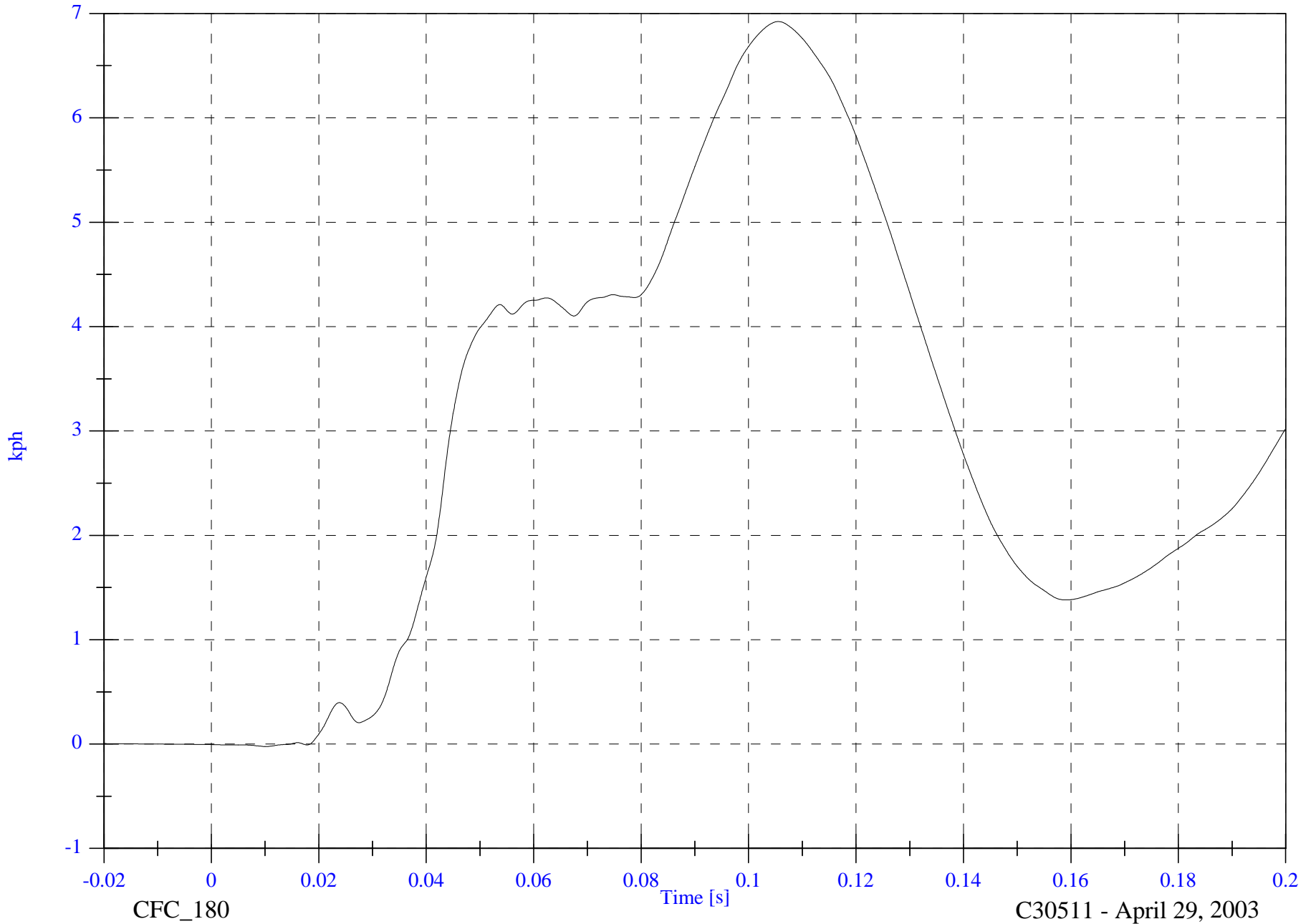
V2P1 Head 9 Array Y Arm Az Velocity

Max: 6.9 [kph] at 0.105 [s]

Min: -0.0 [kph] at 0.010 [s]

B-14

8675-F214-07



CFC\_180

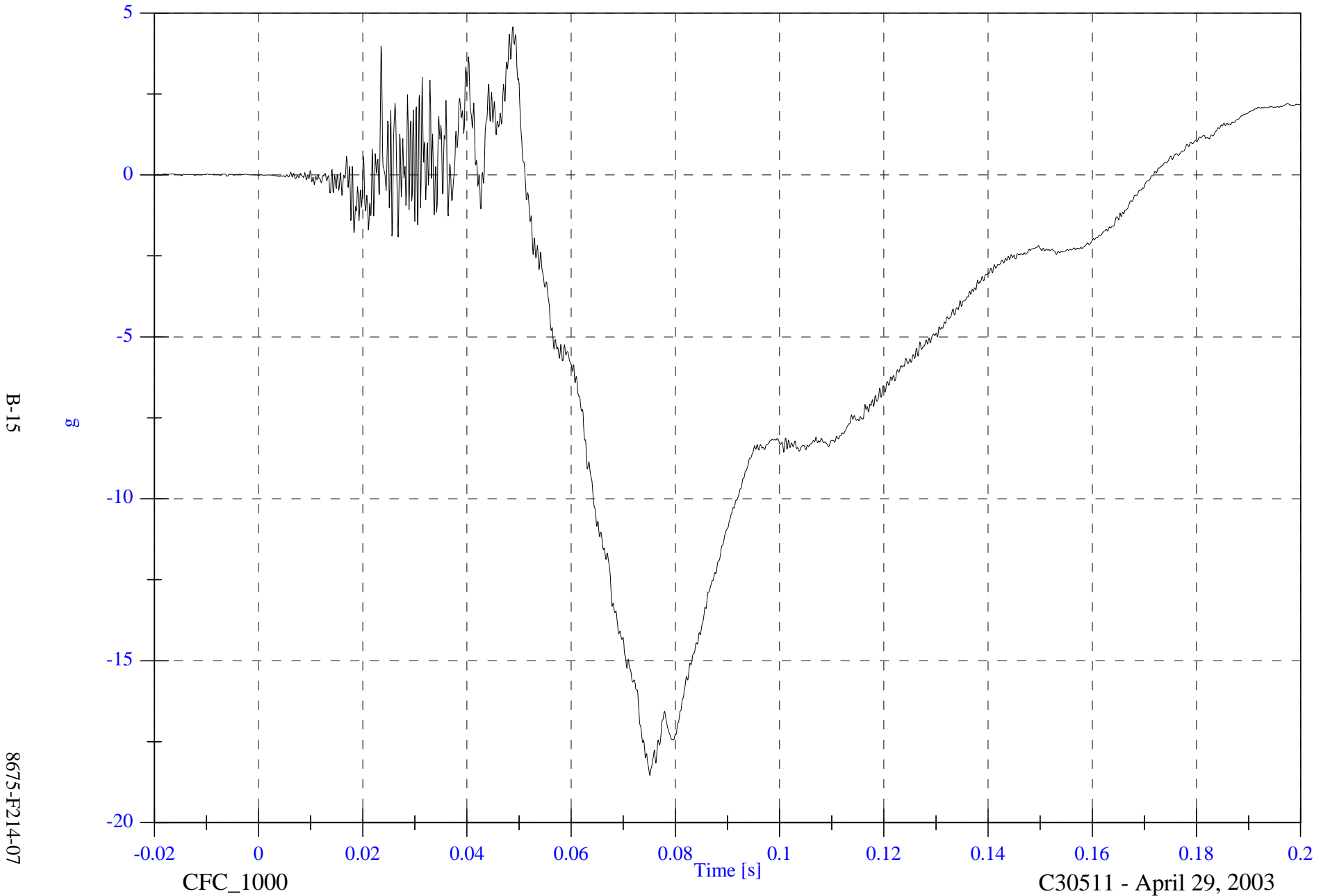
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head 9 Array Z Arm Ax

Max: 4.6 [g] at 0.049 [s]

Min: -18.5 [g] at 0.075 [s]

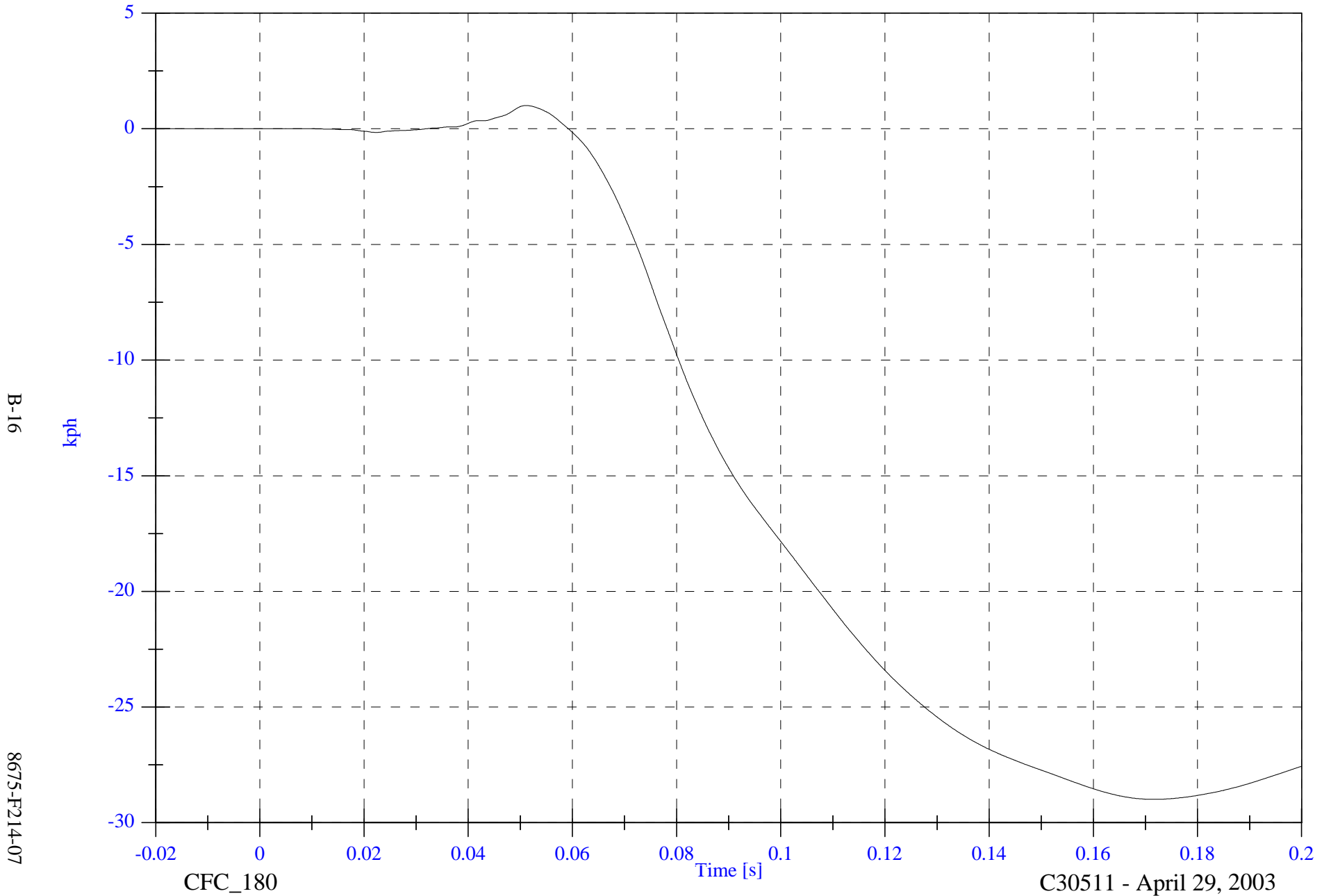


FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head 9 Array Z Arm Ax Velocity

Max: 1.0 [kph] at 0.051 [s]

Min: -29.0 [kph] at 0.172 [s]



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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

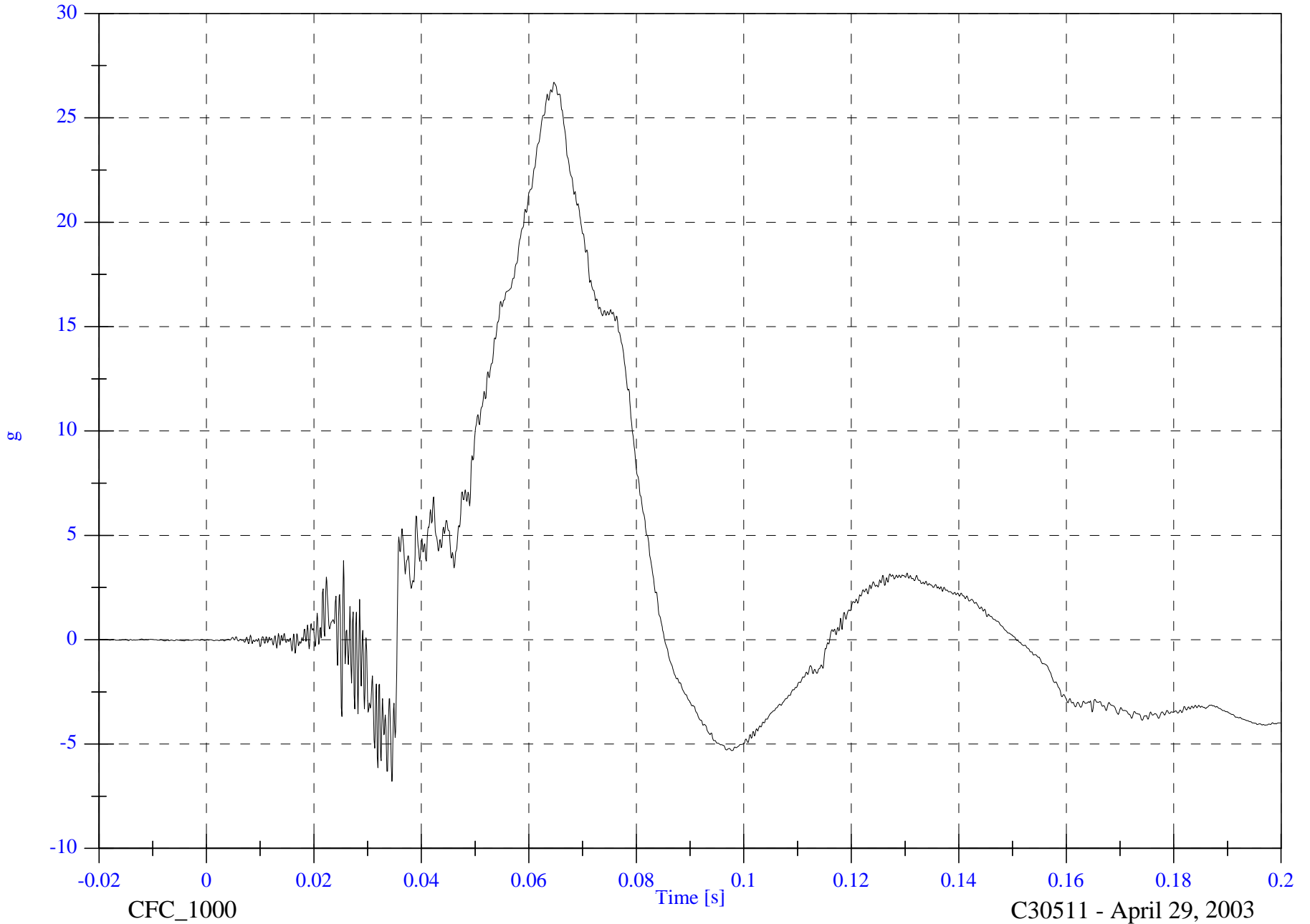
V2P1 Head 9 Array Z Arm Ay

Max: 26.7 [g] at 0.065 [s]

Min: -6.8 [g] at 0.034 [s]

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FMVSS 214D Indicant - 2003 Kia Sorento

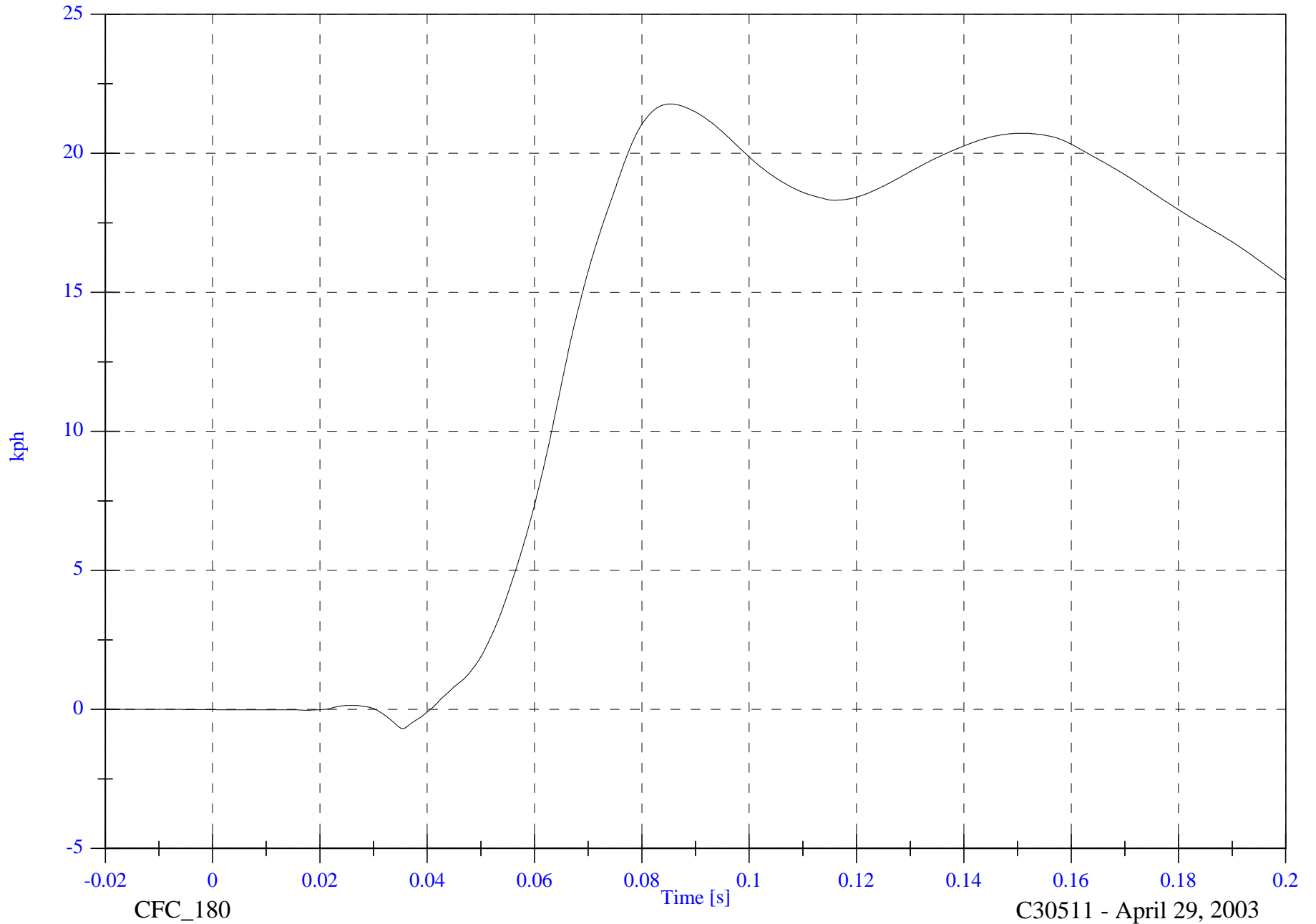
V2P1 Head 9 Array Z Arm Ay Velocity

Max: 21.8 [kph] at 0.085 [s]

Min: -0.7 [kph] at 0.035 [s]

B-18

8675-F214-07



CFC\_180

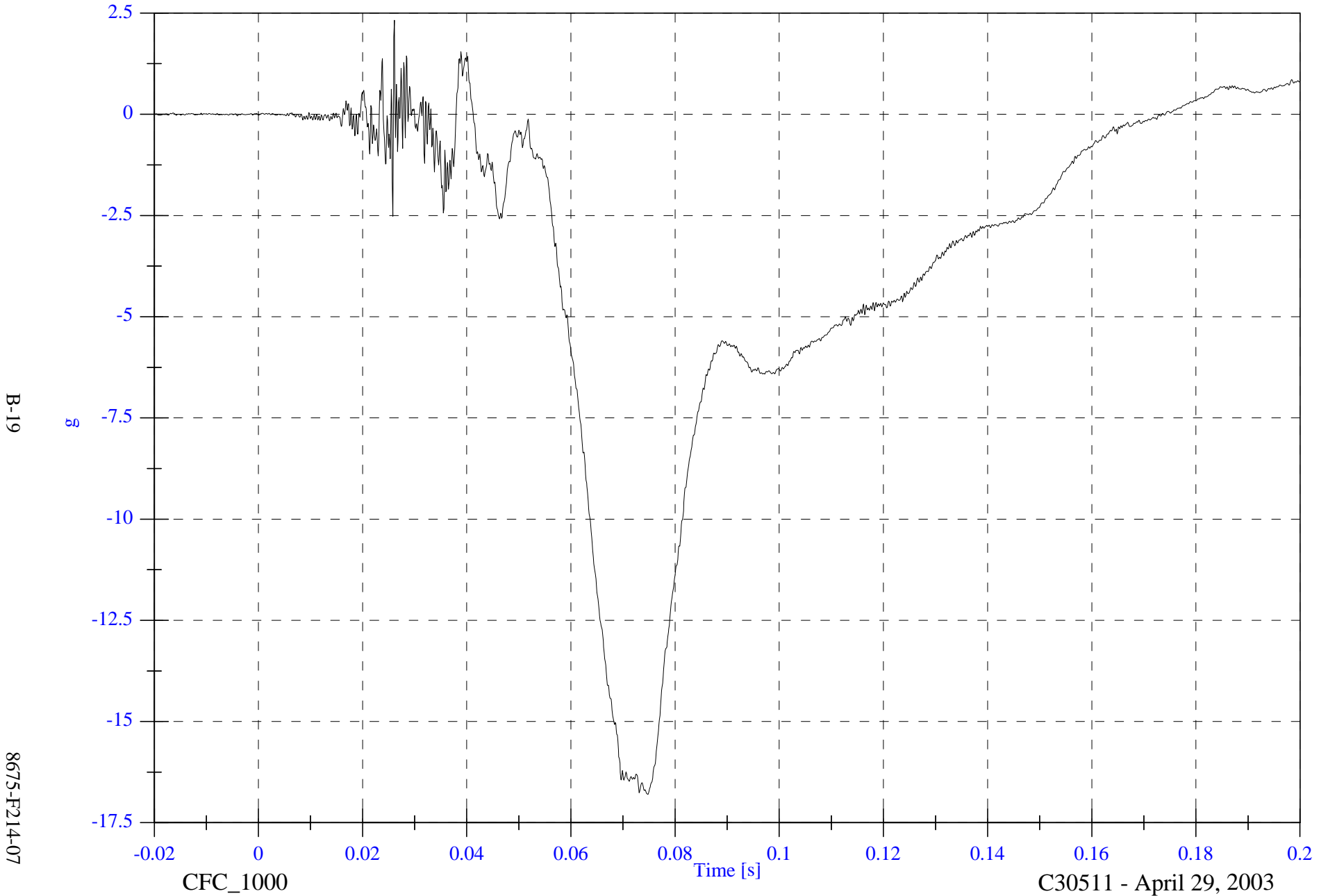
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head x

Max: 2.3 [g] at 0.026 [s]

Min: -16.8 [g] at 0.075 [s]



FMVSS 214D Indicant - 2003 Kia Sorento

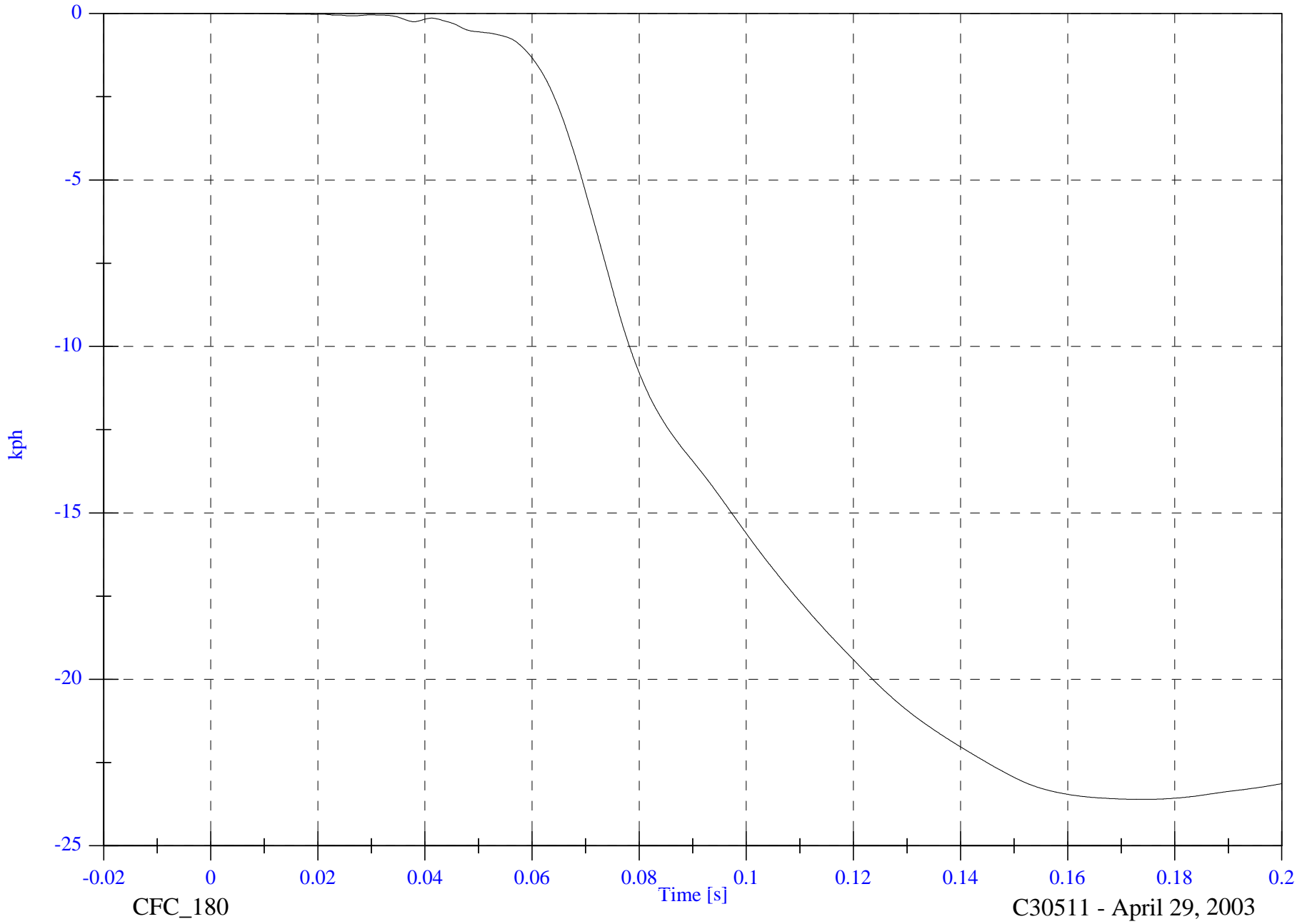
V2P1 Head x Velocity

Max: 0.0 [kph] at 0.003 [s]

Min: -23.6 [kph] at 0.174 [s]

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

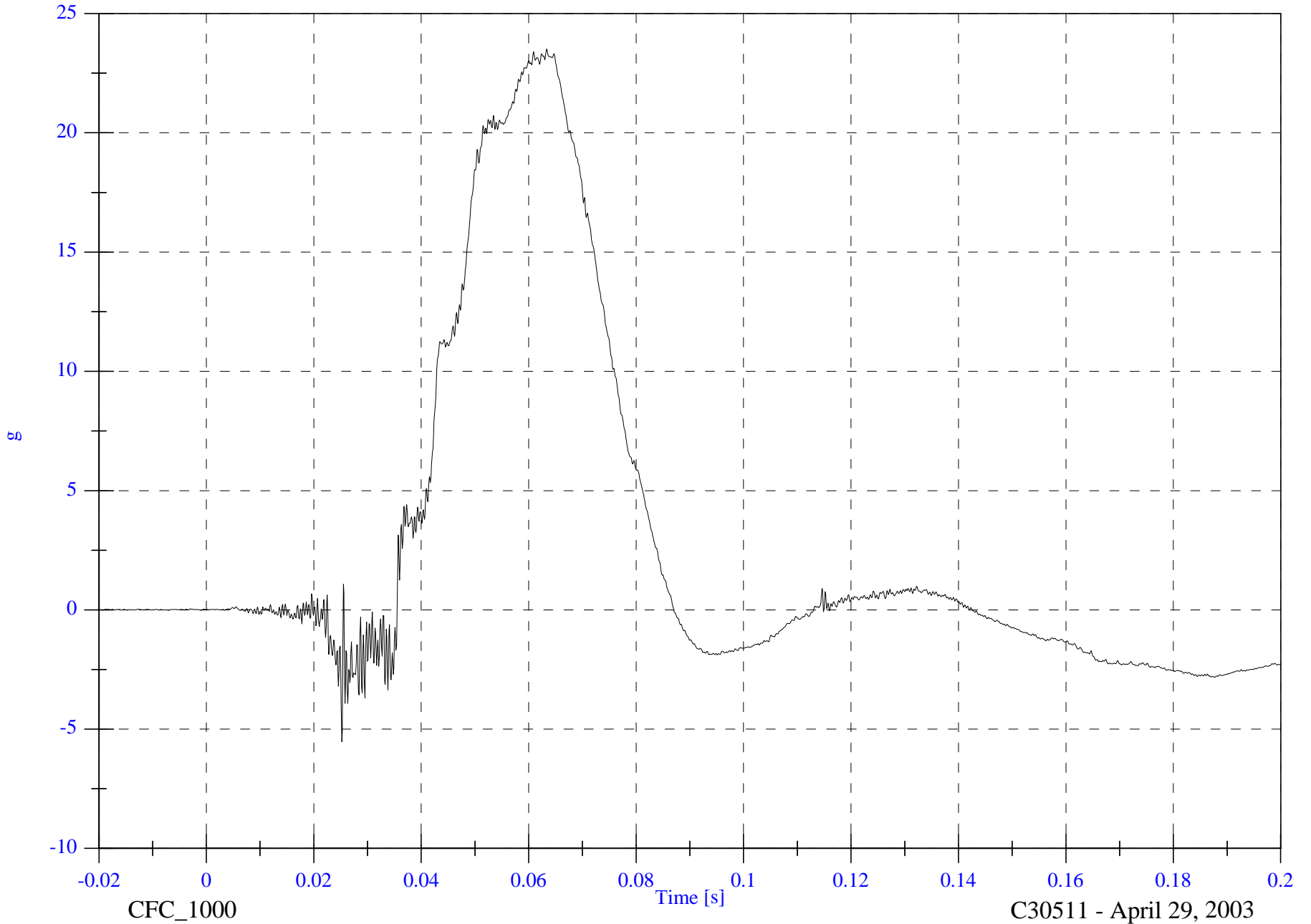
V2P1 Head y

Max: 23.5 [g] at 0.063 [s]

Min: -5.5 [g] at 0.025 [s]

B-21

8675-F214-07



CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

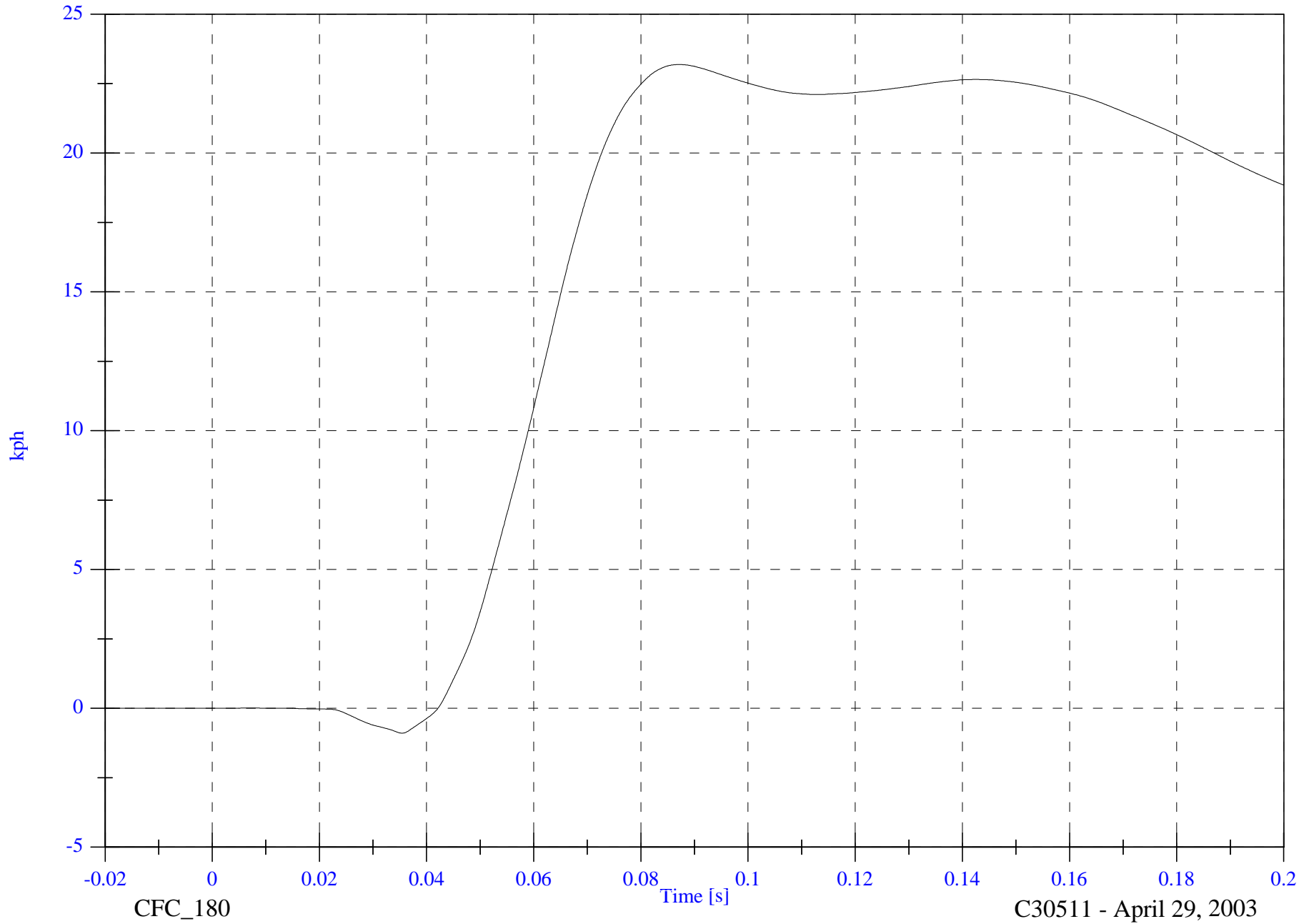
V2P1 Head y Velocity

Max: 23.2 [kph] at 0.087 [s]

Min: -0.9 [kph] at 0.035 [s]

B-22

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

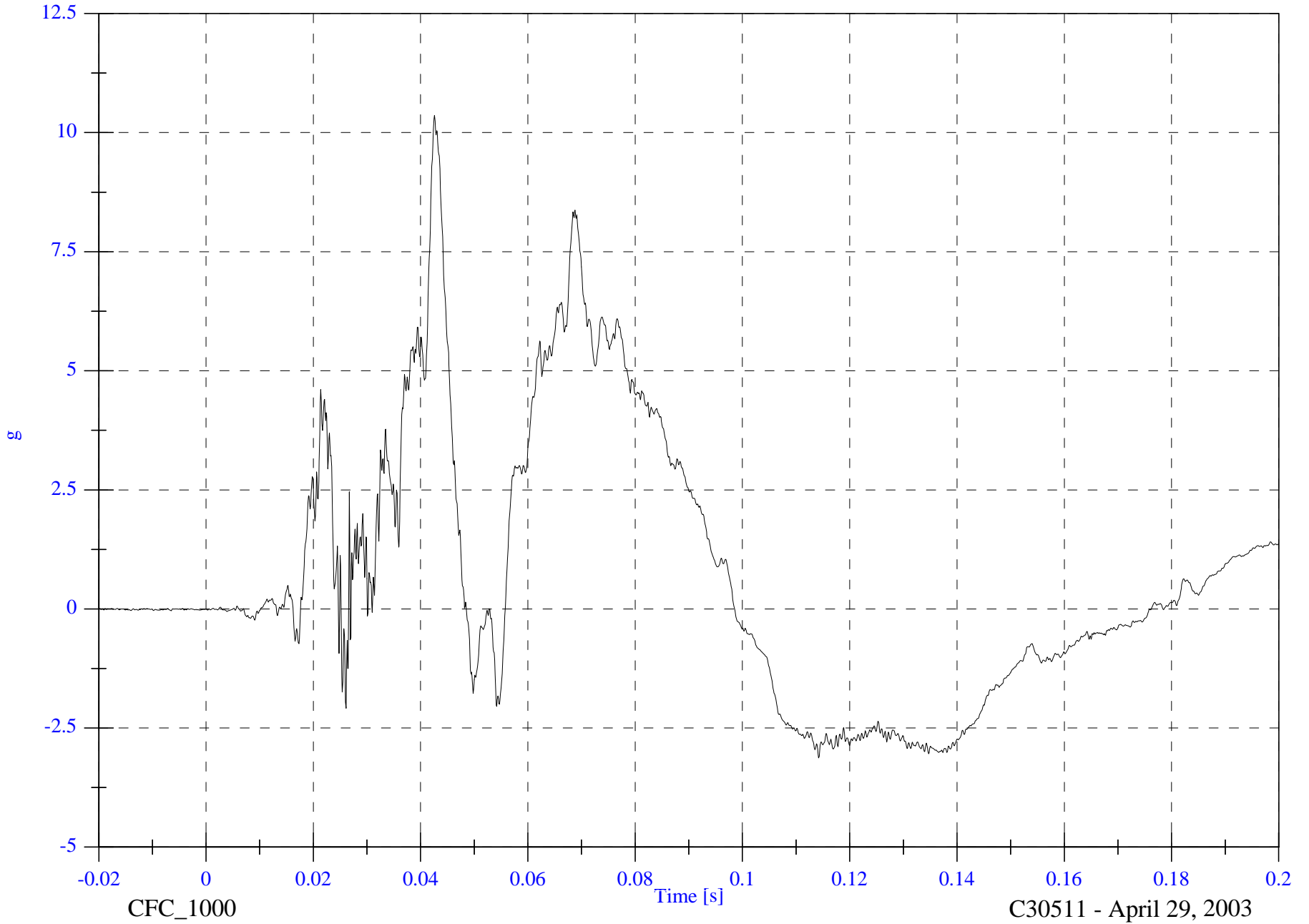
V2P1 Head z

Max: 10.4 [g] at 0.043 [s]

Min: -3.1 [g] at 0.114 [s]

B-23

8675-F214-07



CFC\_1000

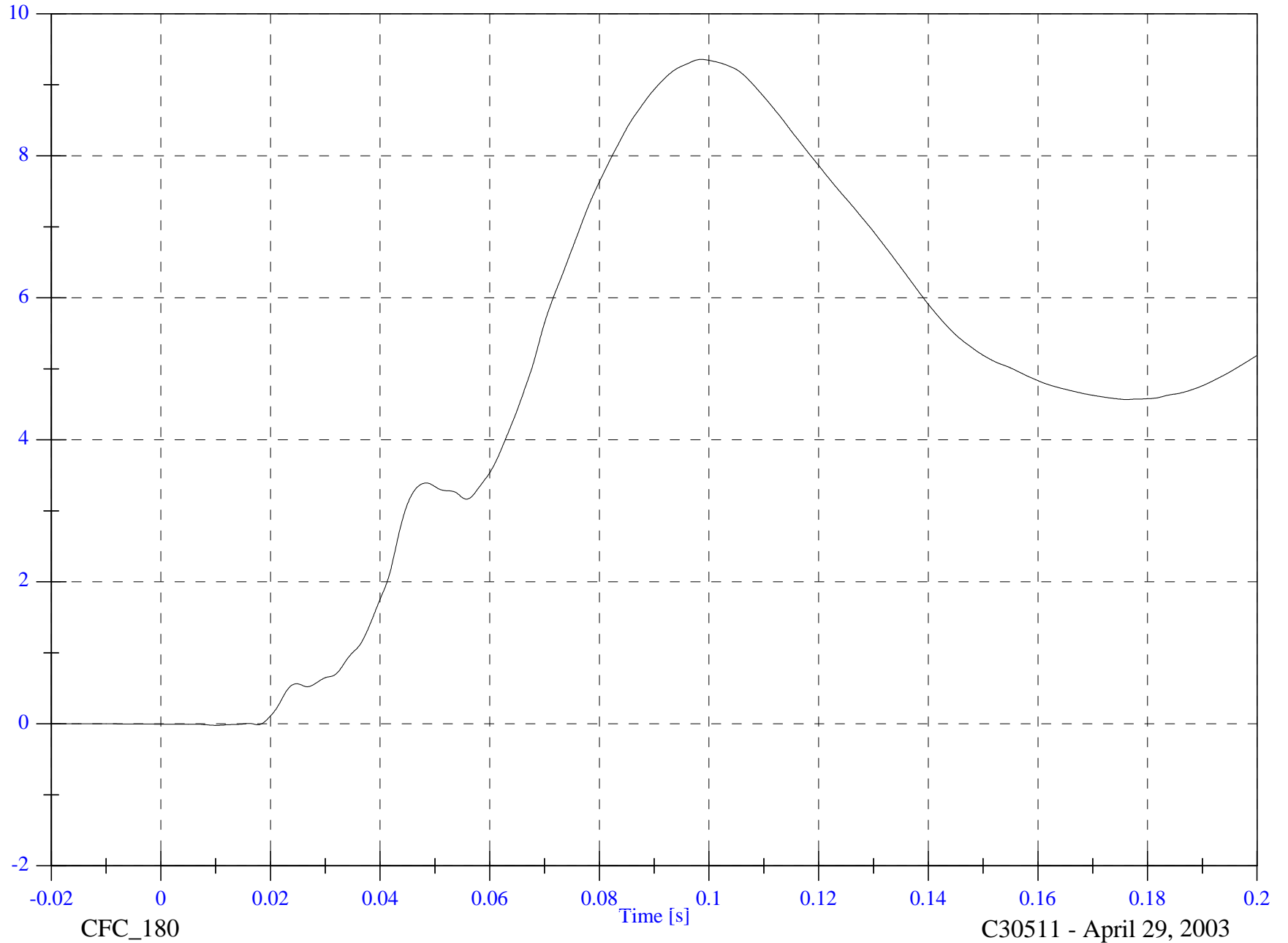
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head z Velocity

Max: 9.4 [kph] at 0.099 [s]

Min: -0.0 [kph] at 0.010 [s]



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8675-F214-07

CFC\_180

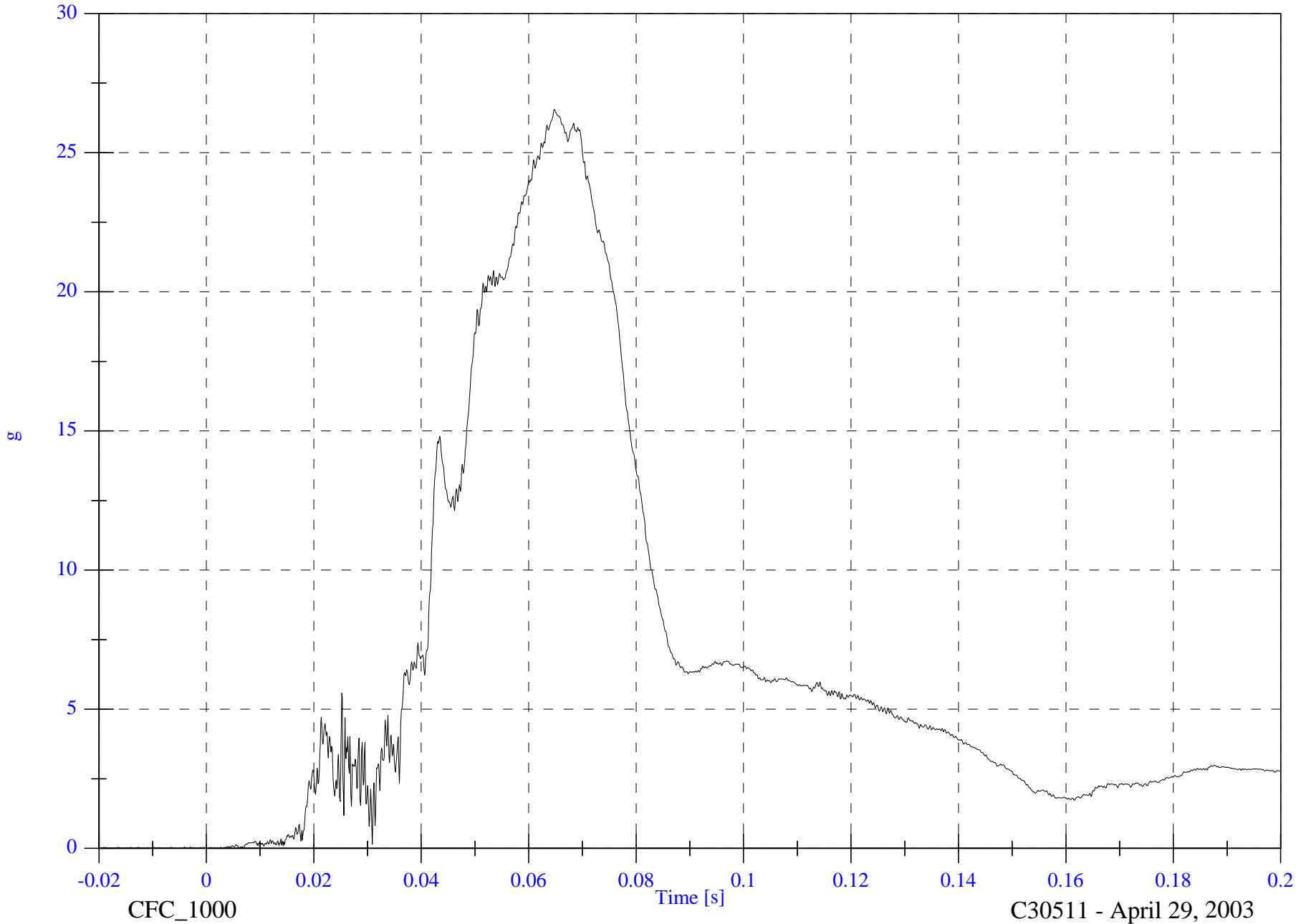
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Head Resultant

Max: 26.6 [g] at 0.065 [s]

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



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8675-F214-07

CFC\_1000

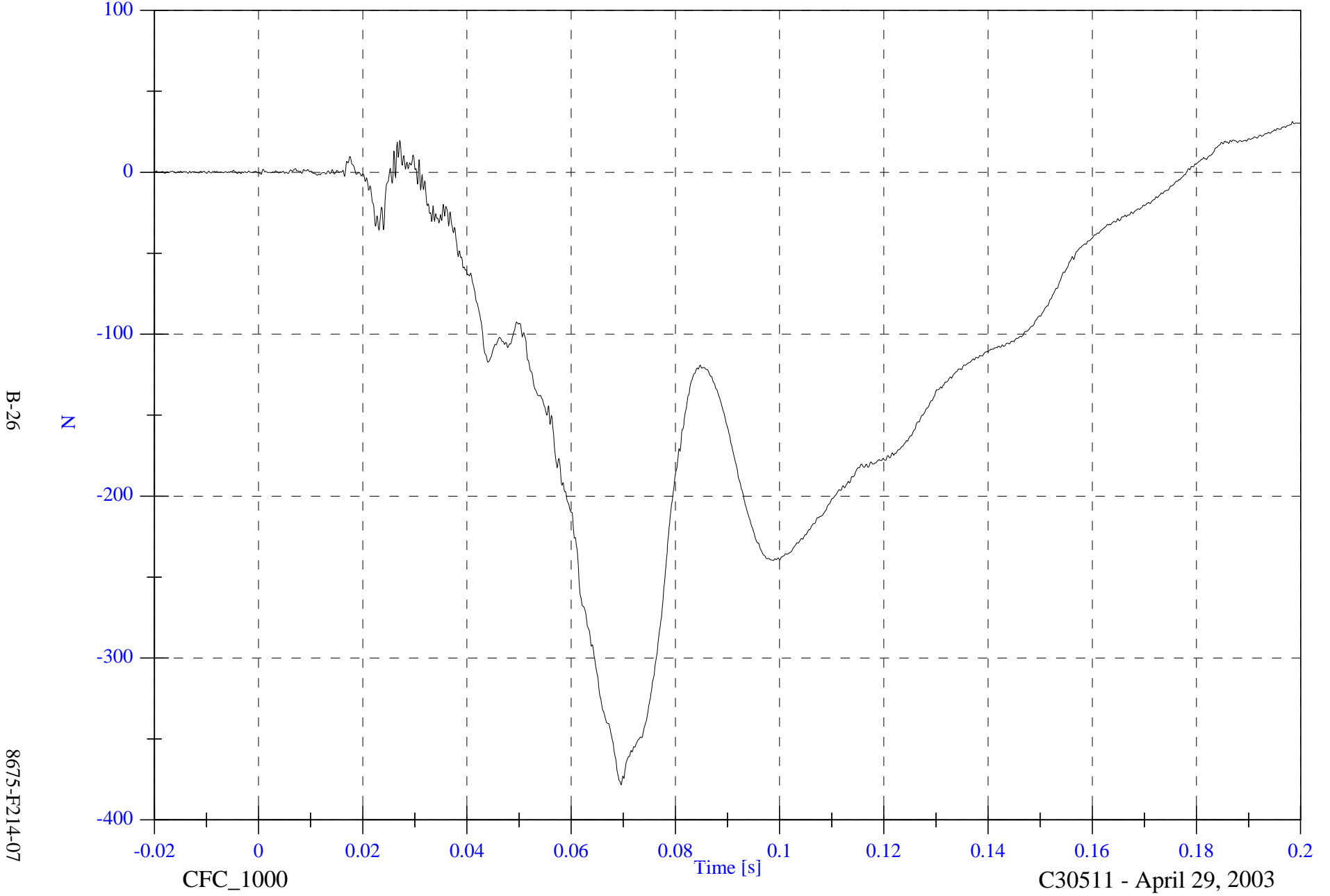
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Upper Neck Fx

Max: 31.3 [N] at 0.198 [s]

Min: -378.4 [N] at 0.070 [s]



B-26

8675-F214-07

CFC\_1000

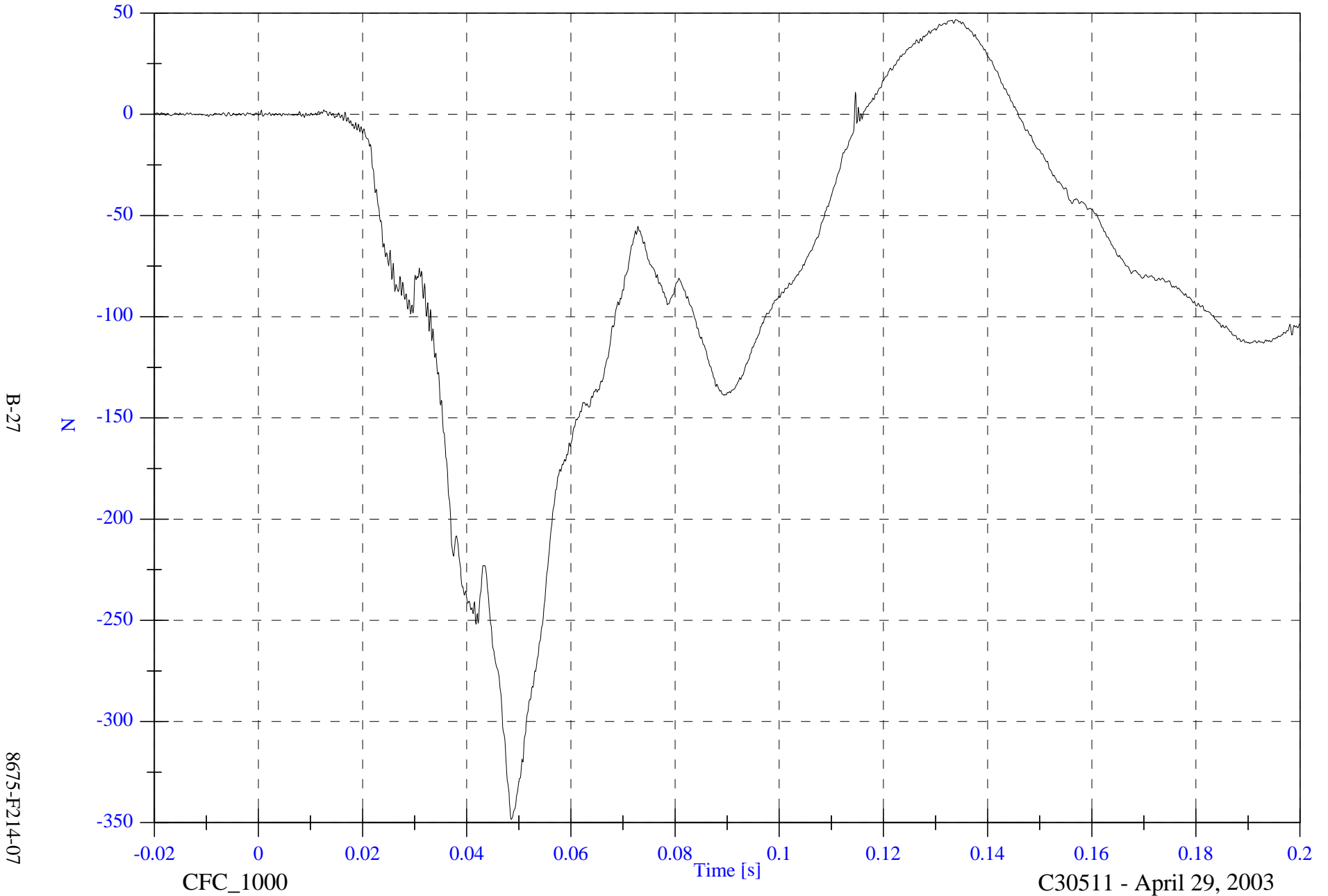
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Upper Neck Fy

Max: 46.7 [N] at 0.134 [s]

Min: -348.3 [N] at 0.049 [s]



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CFC\_1000

Time [s]

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

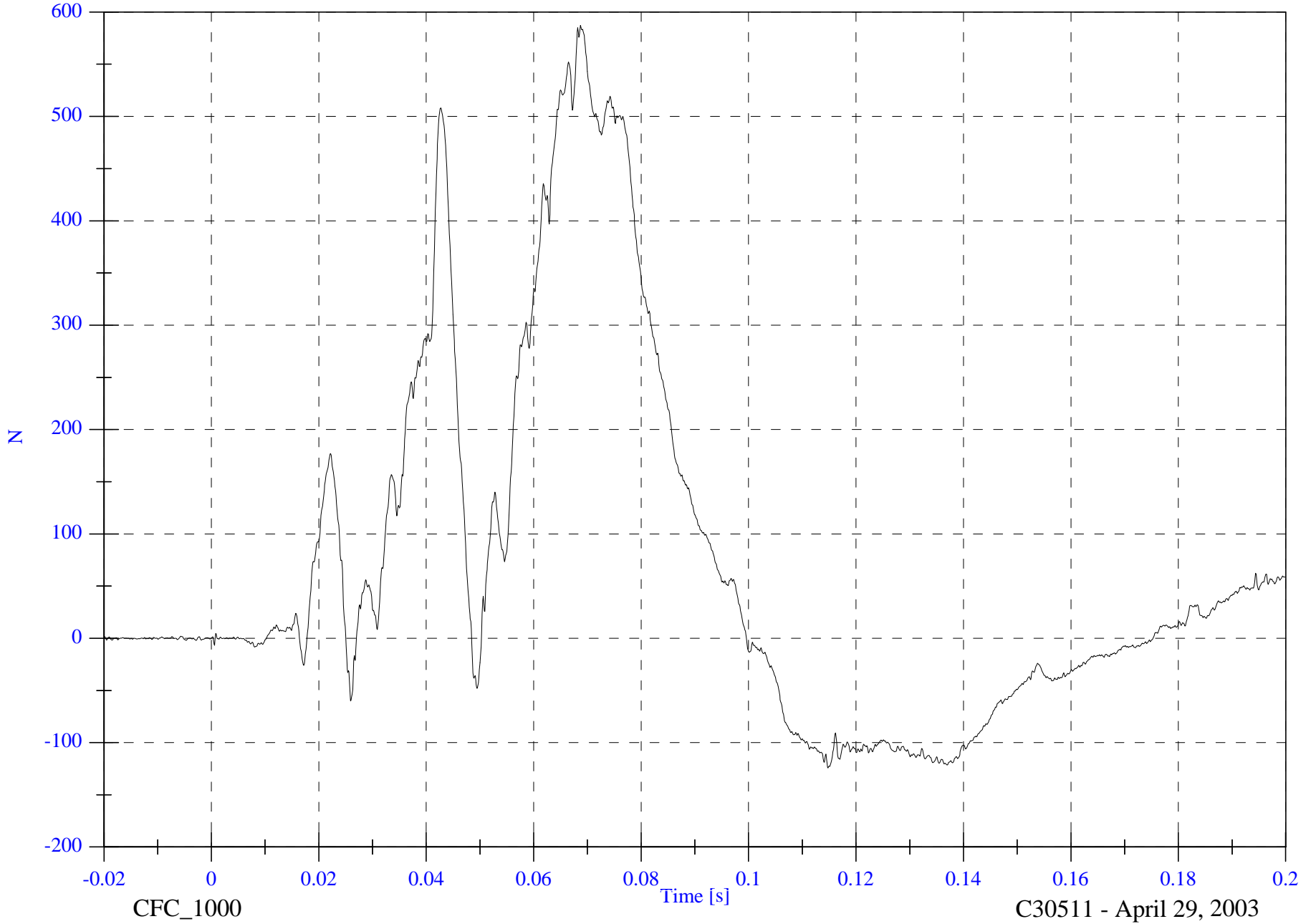
Max: 587.2 [N] at 0.069 [s]

V2P1 Upper Neck Fz

Min: -124.4 [N] at 0.115 [s]

B-28

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CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

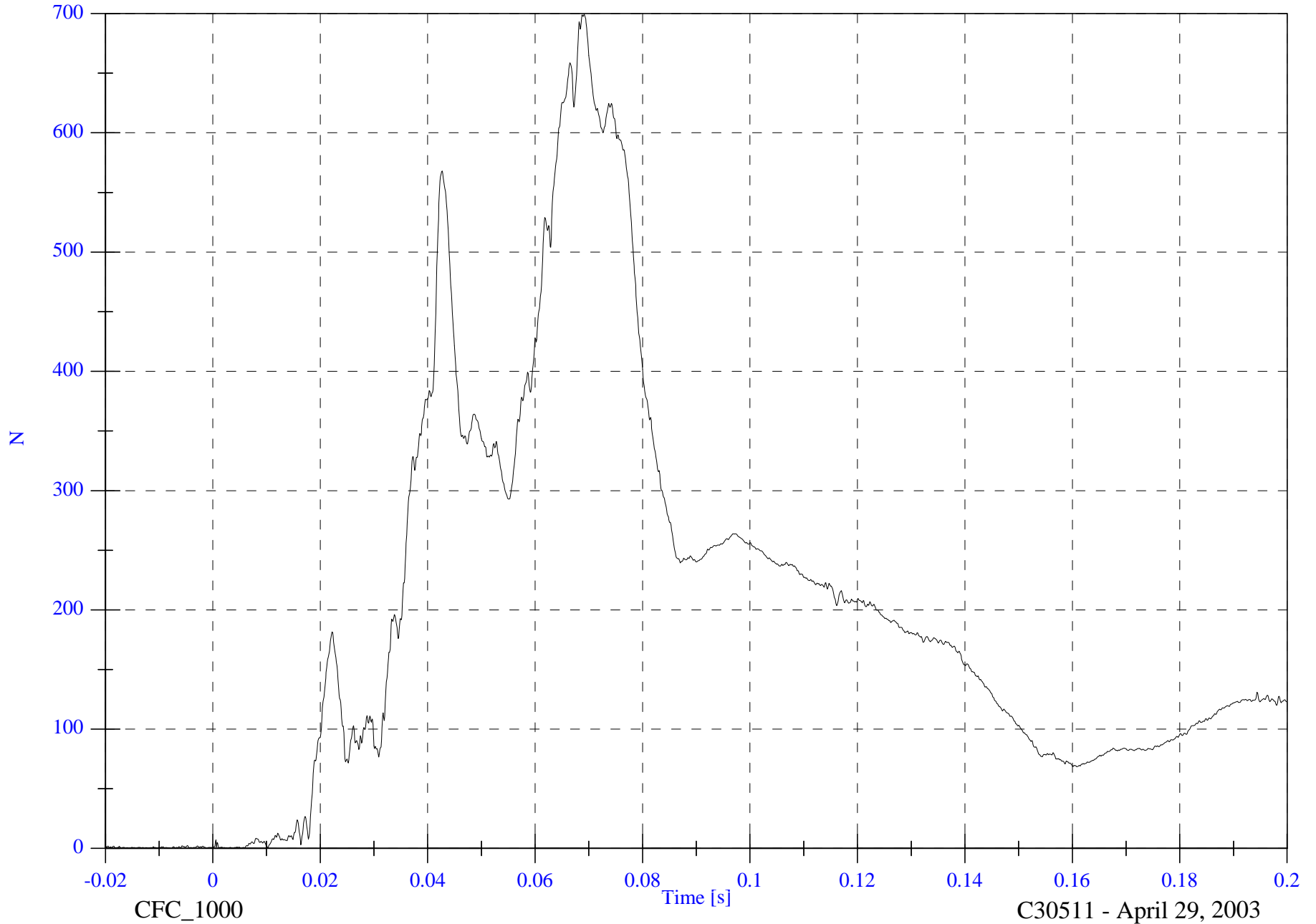
V2P1 Upper Neck F Resultant

Max: 699.4 [N] at 0.069 [s]

Min: 0.1 [N] at -0.008 [s]

B-29

8675-F214-07



CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

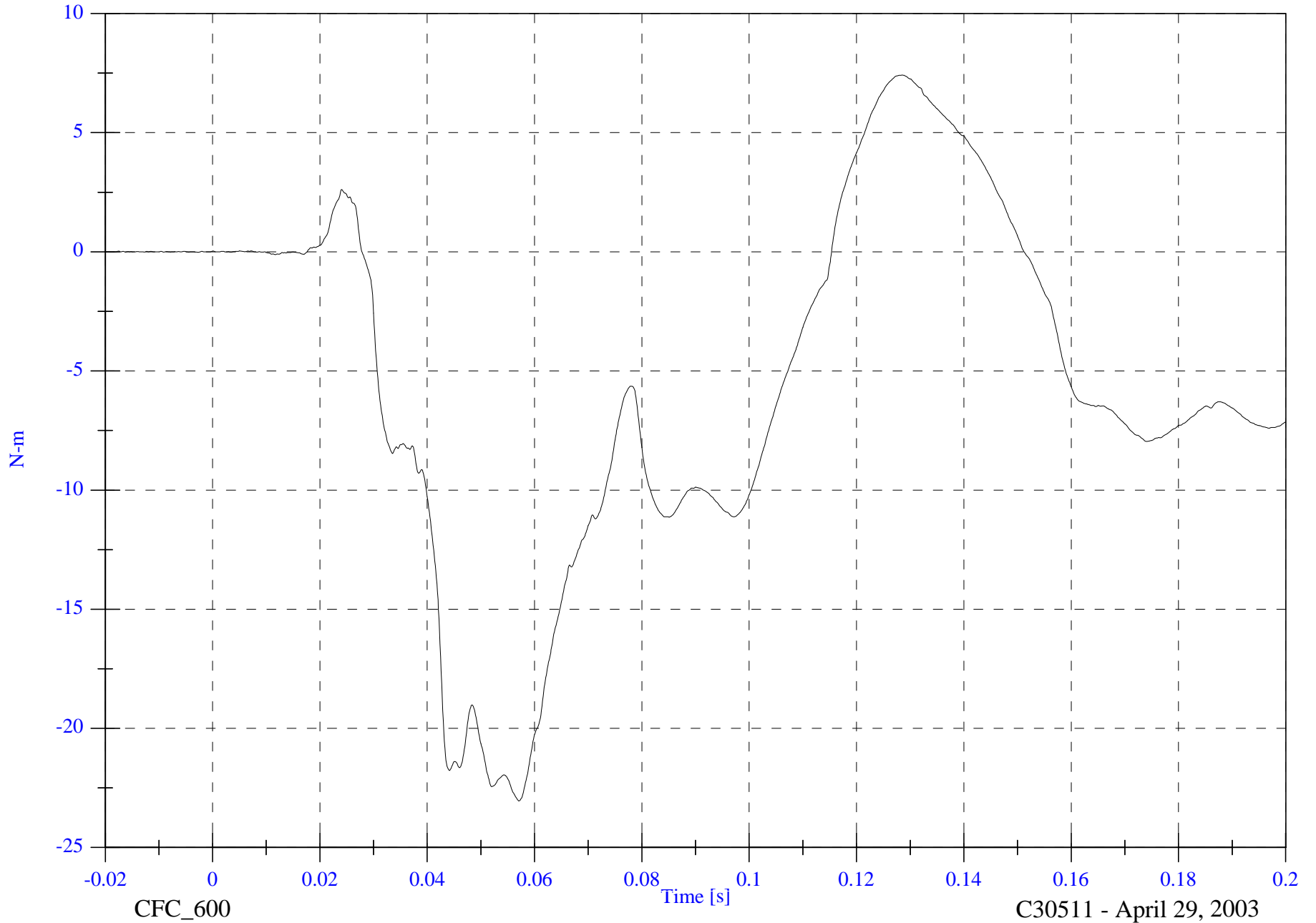
V2P1 Upper Neck Mx

Max: 7.4 [N-m] at 0.128 [s]

Min: -23.0 [N-m] at 0.057 [s]

B-30

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CFC\_600

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

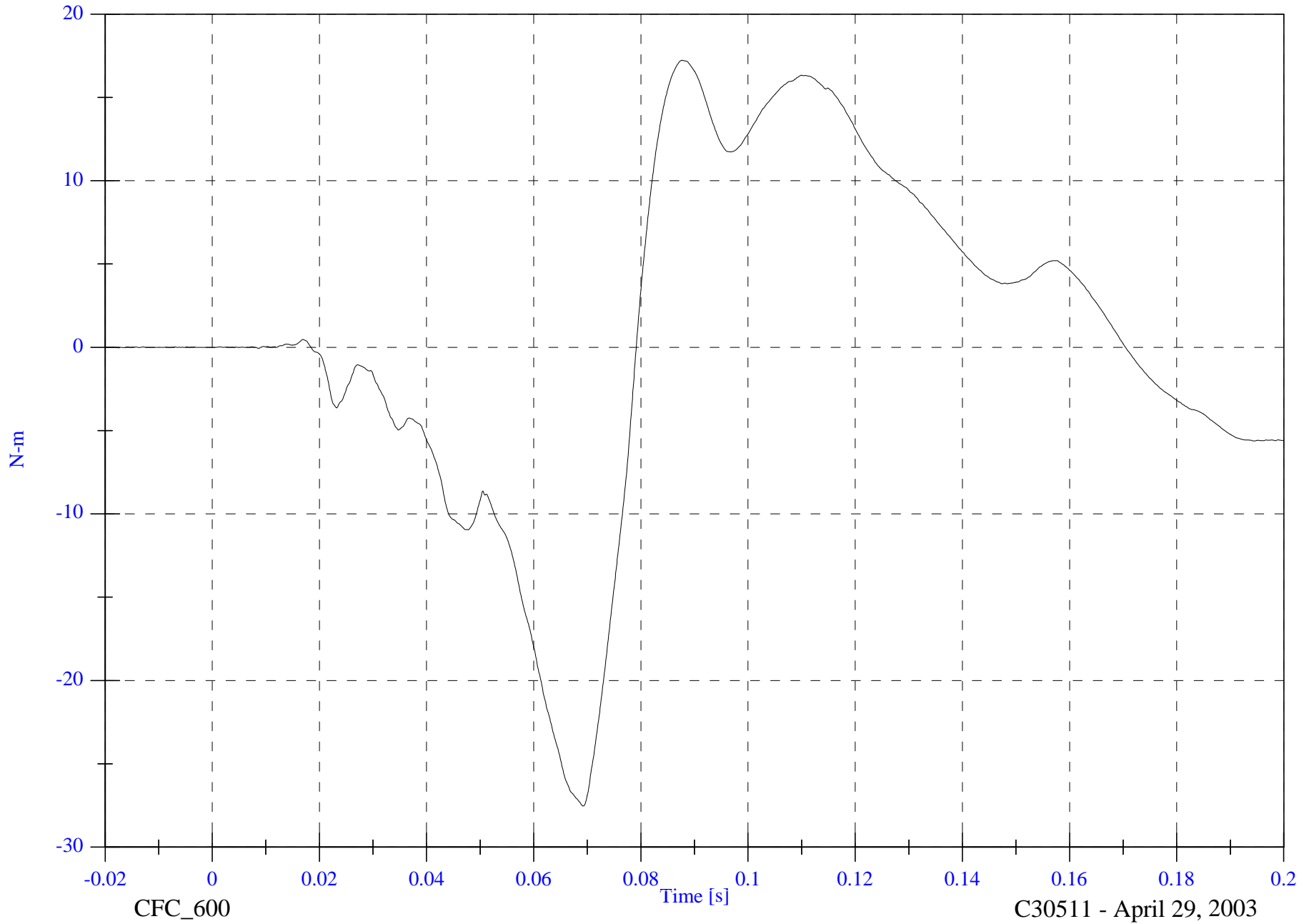
V2P1 Upper Neck My

Max: 17.2 [N-m] at 0.088 [s]

Min: -27.5 [N-m] at 0.069 [s]

B-31

8675-F214-07



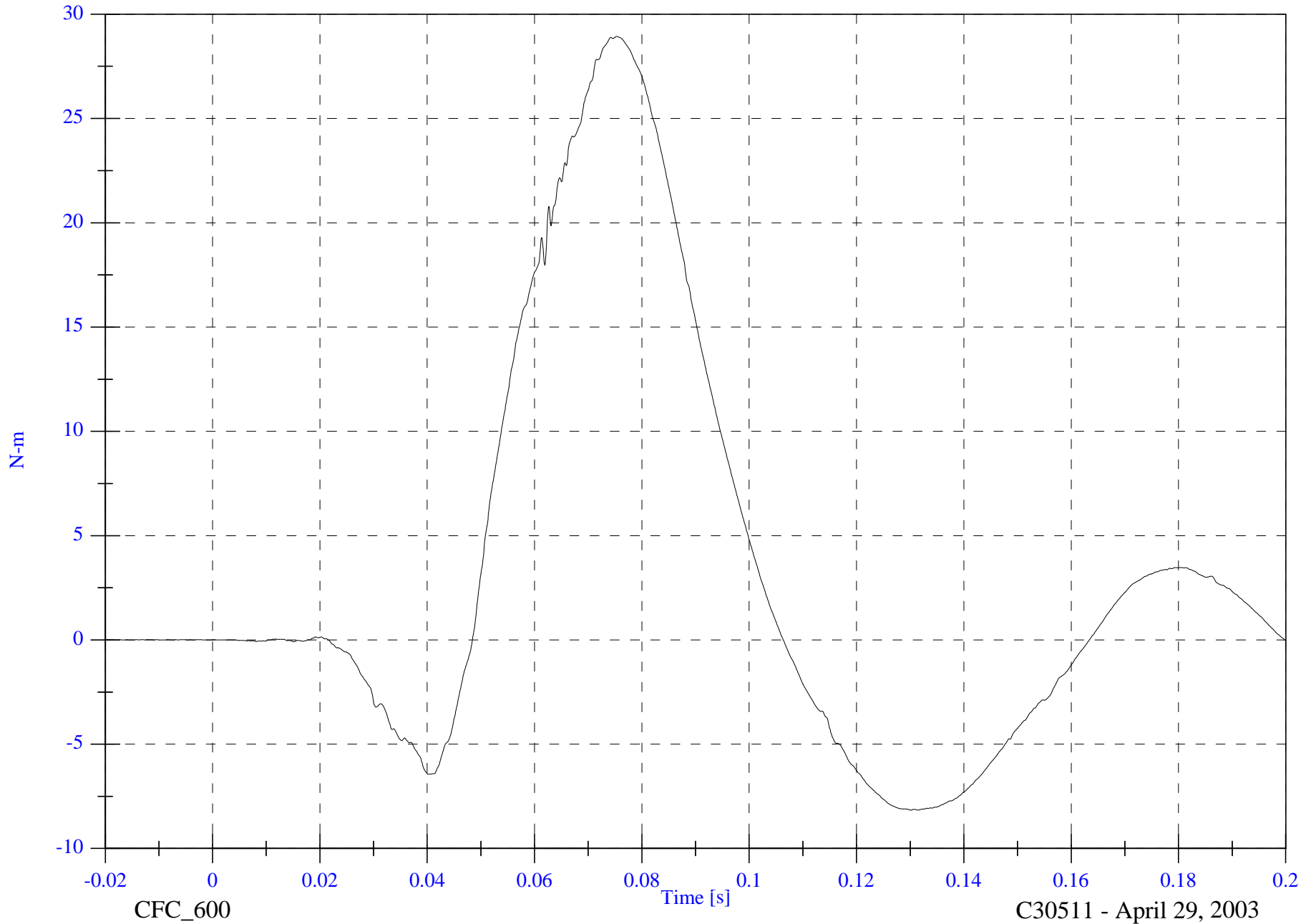
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 28.9 [N-m] at 0.075 [s]

V2P1 Upper Neck Mz

Min: -8.2 [N-m] at 0.130 [s]



B-32

8675-F214-07

CFC\_600

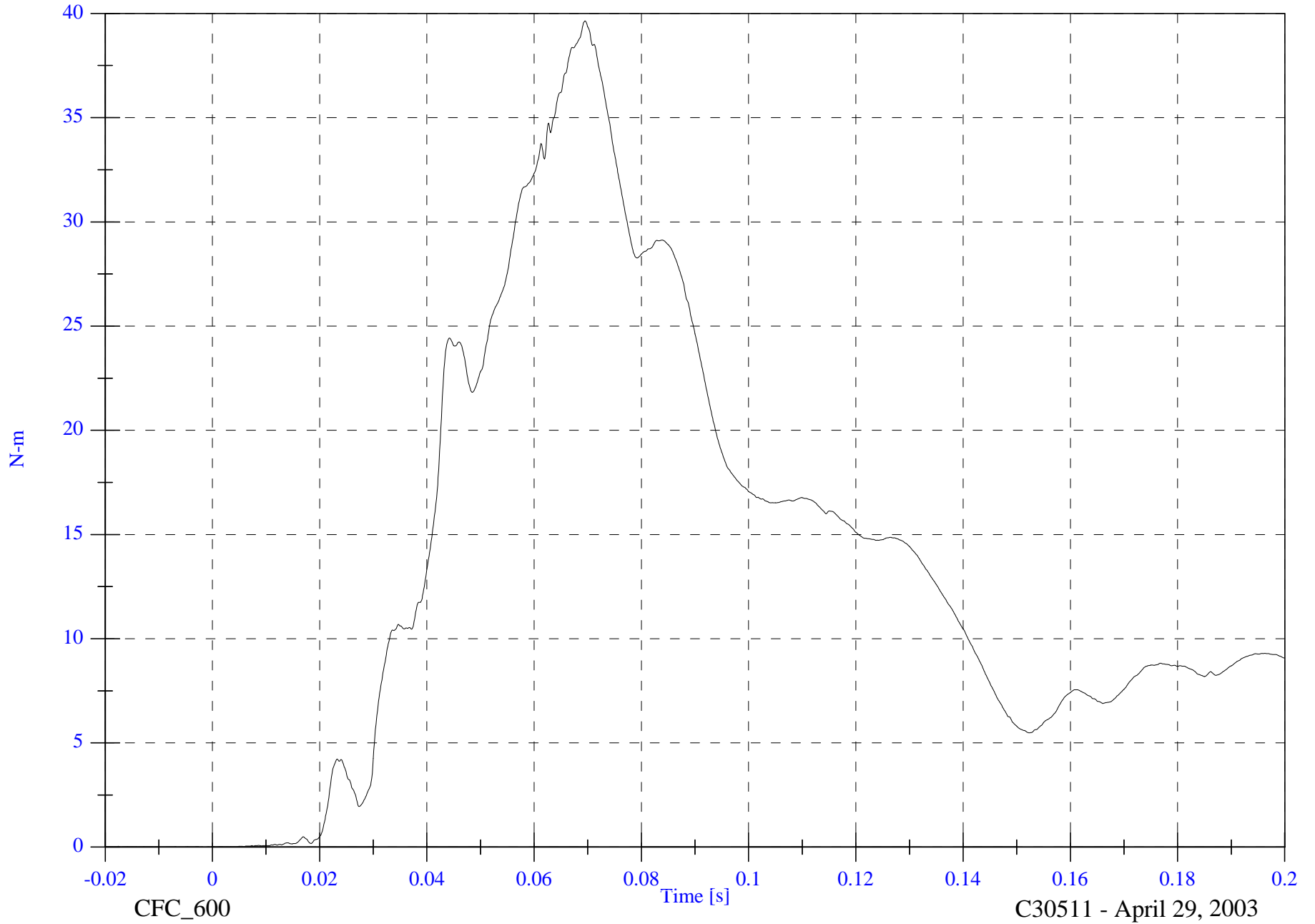
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Upper Neck M Resultant

Max: 39.6 [N-m] at 0.069 [s]

Min: 0.0 [N-m] at -0.011 [s]



B-33

8675-F214-07

CFC\_600

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

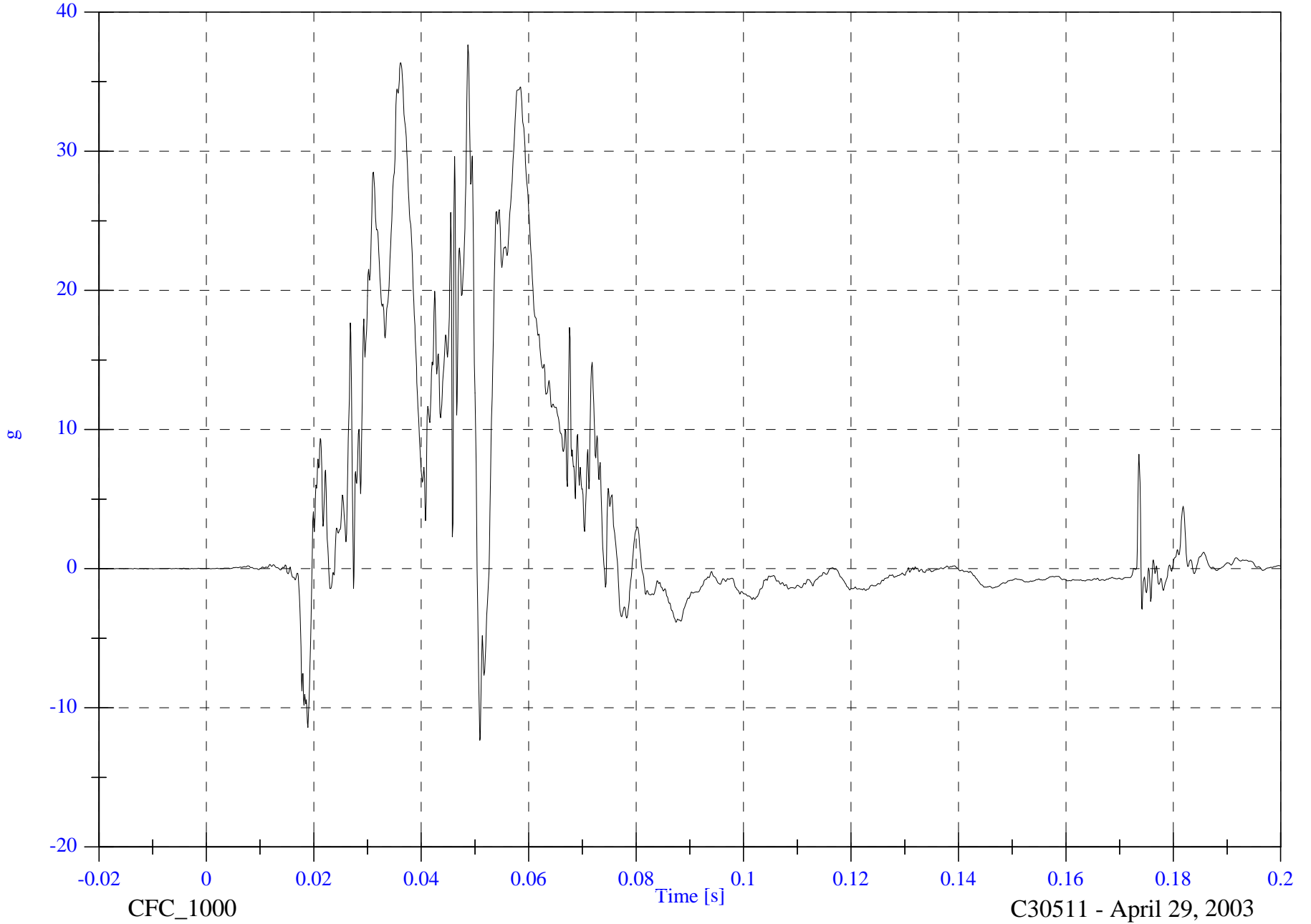
V2P1 Upper Rib y

Max: 37.6 [g] at 0.049 [s]

Min: -12.3 [g] at 0.051 [s]

B-34

8675-F214-07



FMVSS 214D Indicant - 2003 Kia Sorento

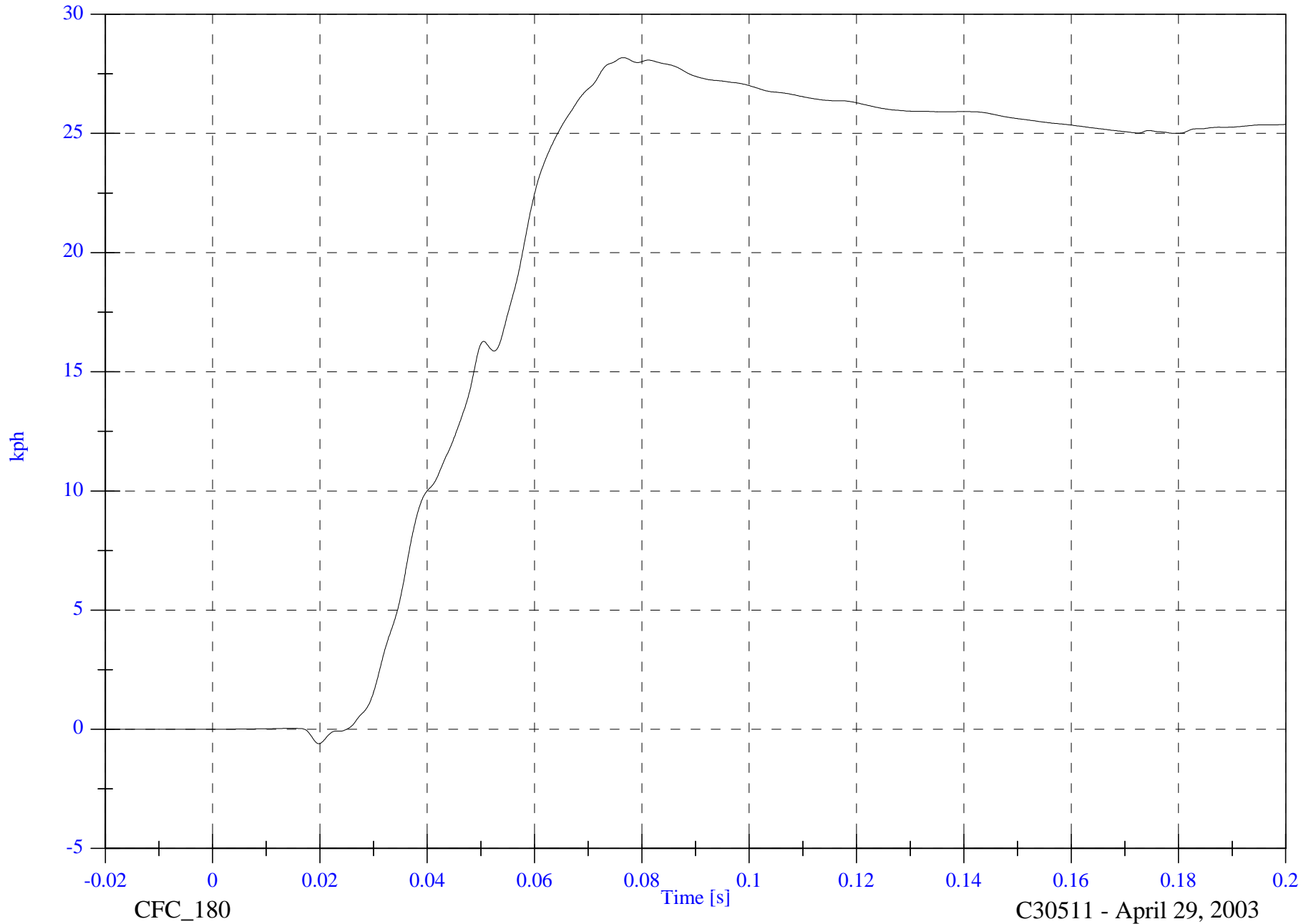
V2P1 Upper Rib y Velocity

Max: 28.2 [kph] at 0.076 [s]

Min: -0.6 [kph] at 0.020 [s]

B-35

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

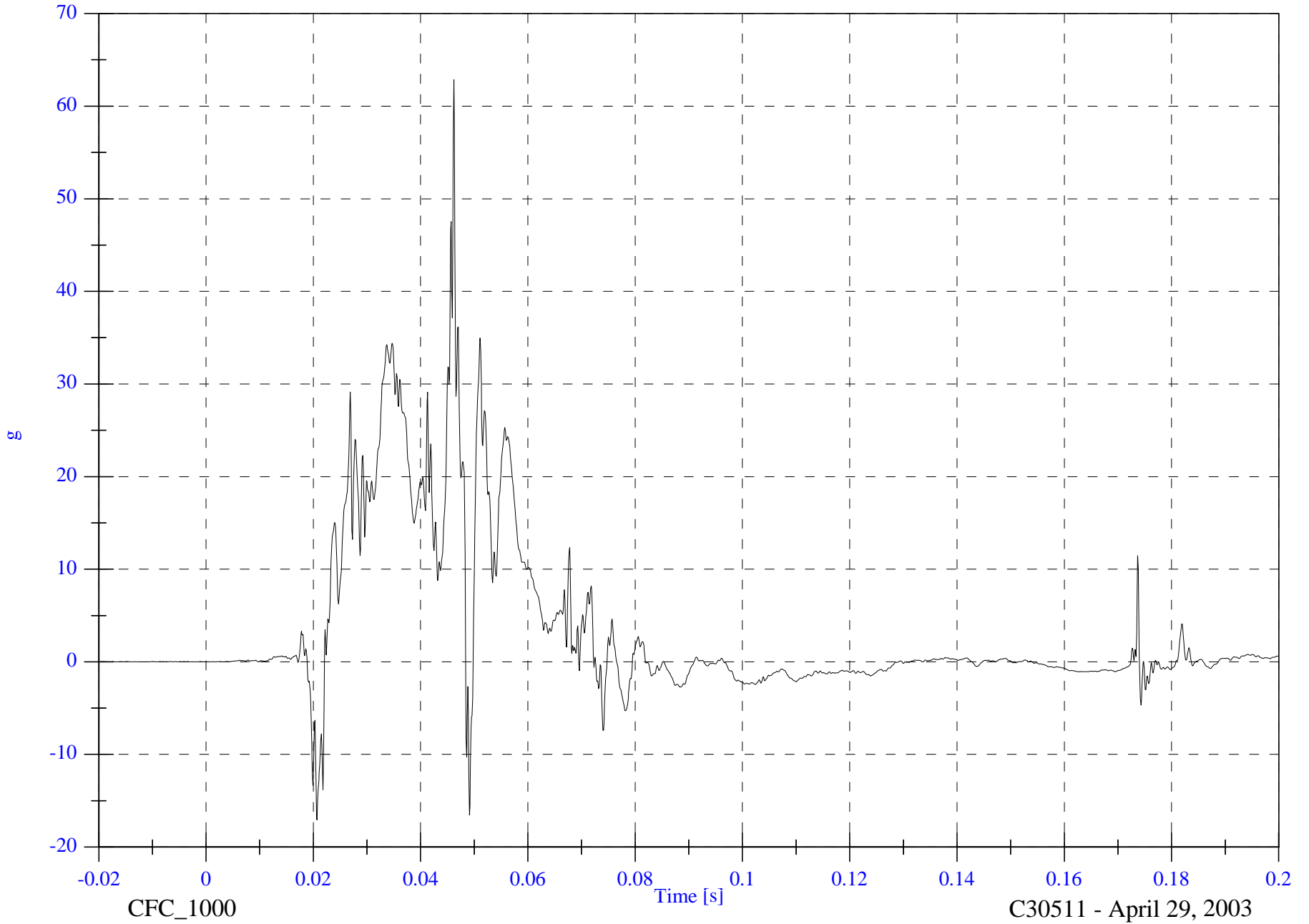
V2P1 Lower Rib y

Max: 62.9 [g] at 0.046 [s]

Min: -17.1 [g] at 0.021 [s]

B-36

8675-F214-07



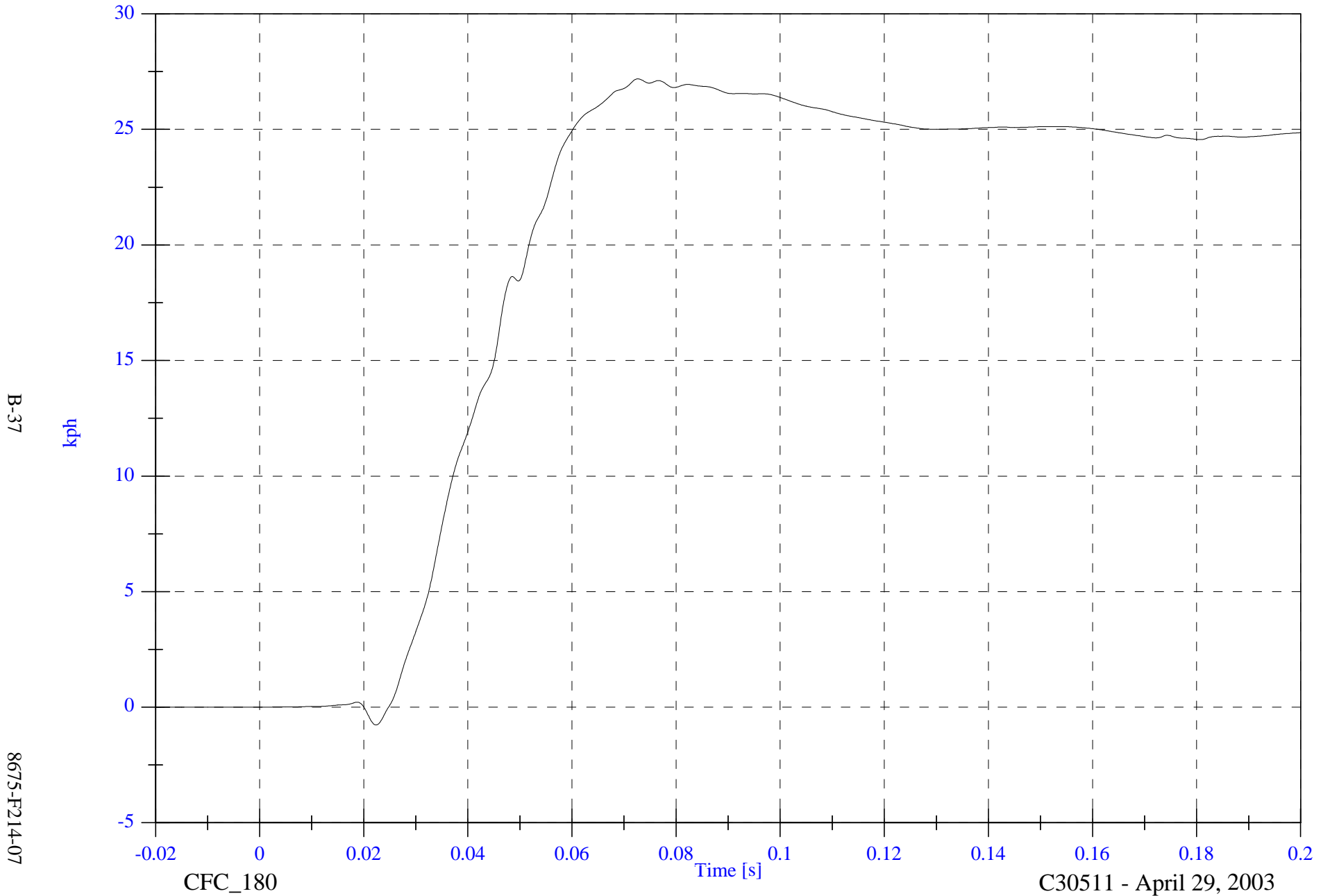
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Lower Rib y Velocity

Max: 27.2 [kph] at 0.073 [s]

Min: -0.8 [kph] at 0.022 [s]



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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

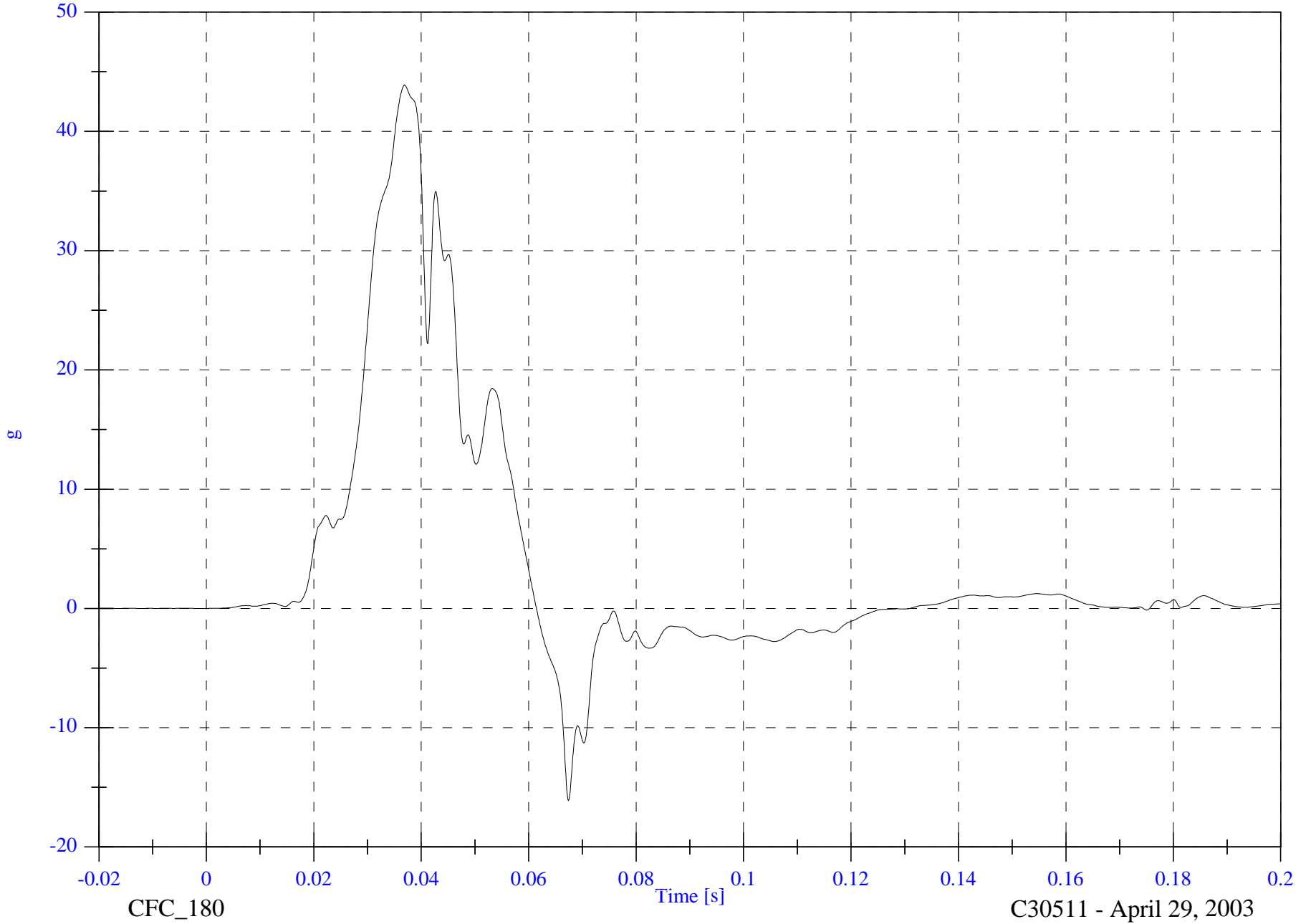
V2P1 Lower Spine y

Max: 43.9 [g] at 0.037 [s]

Min: -16.1 [g] at 0.067 [s]

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

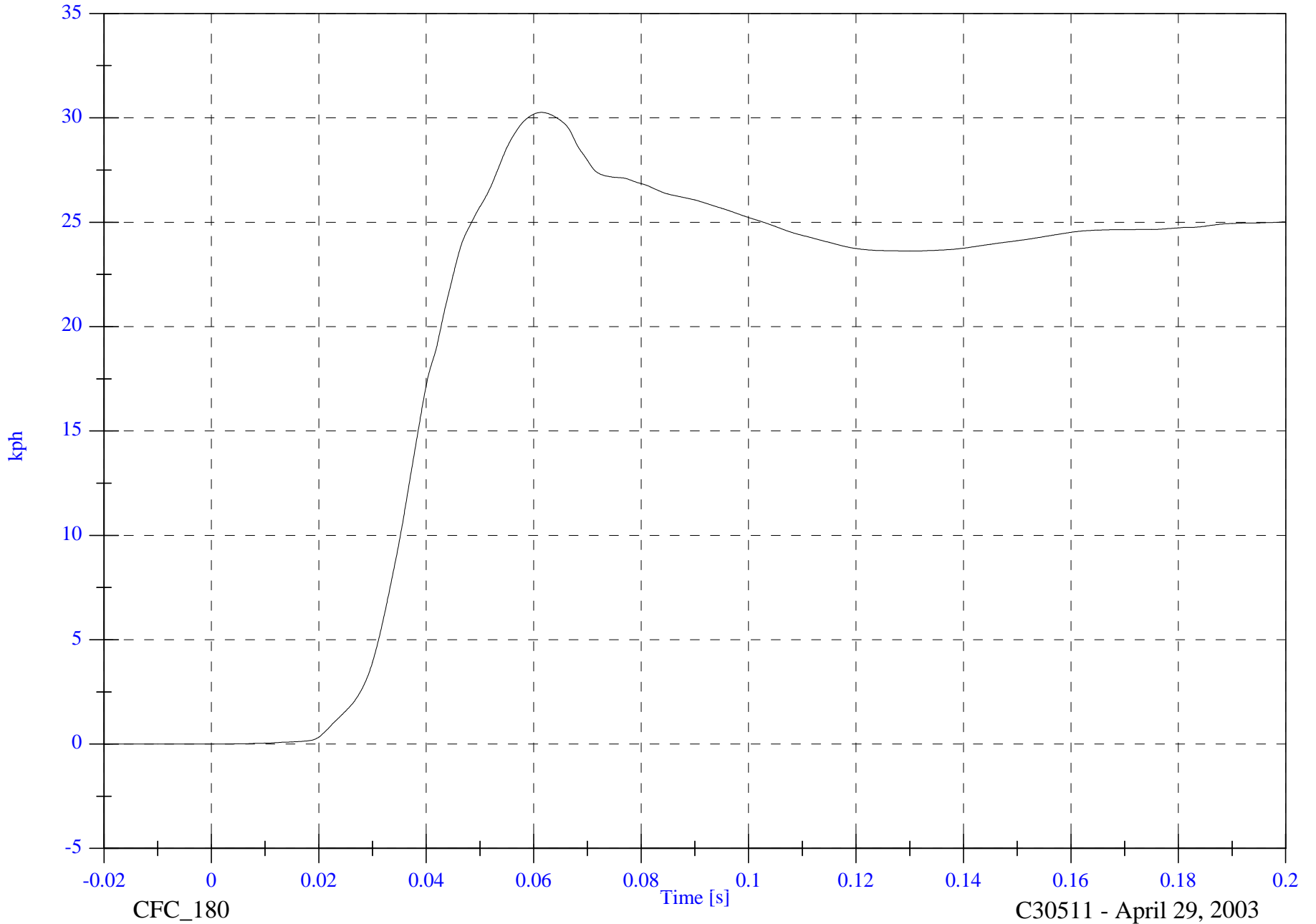
V2P1 Lower Spine y Velocity

Max: 30.3 [kph] at 0.061 [s]

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

B-39

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CFC\_180

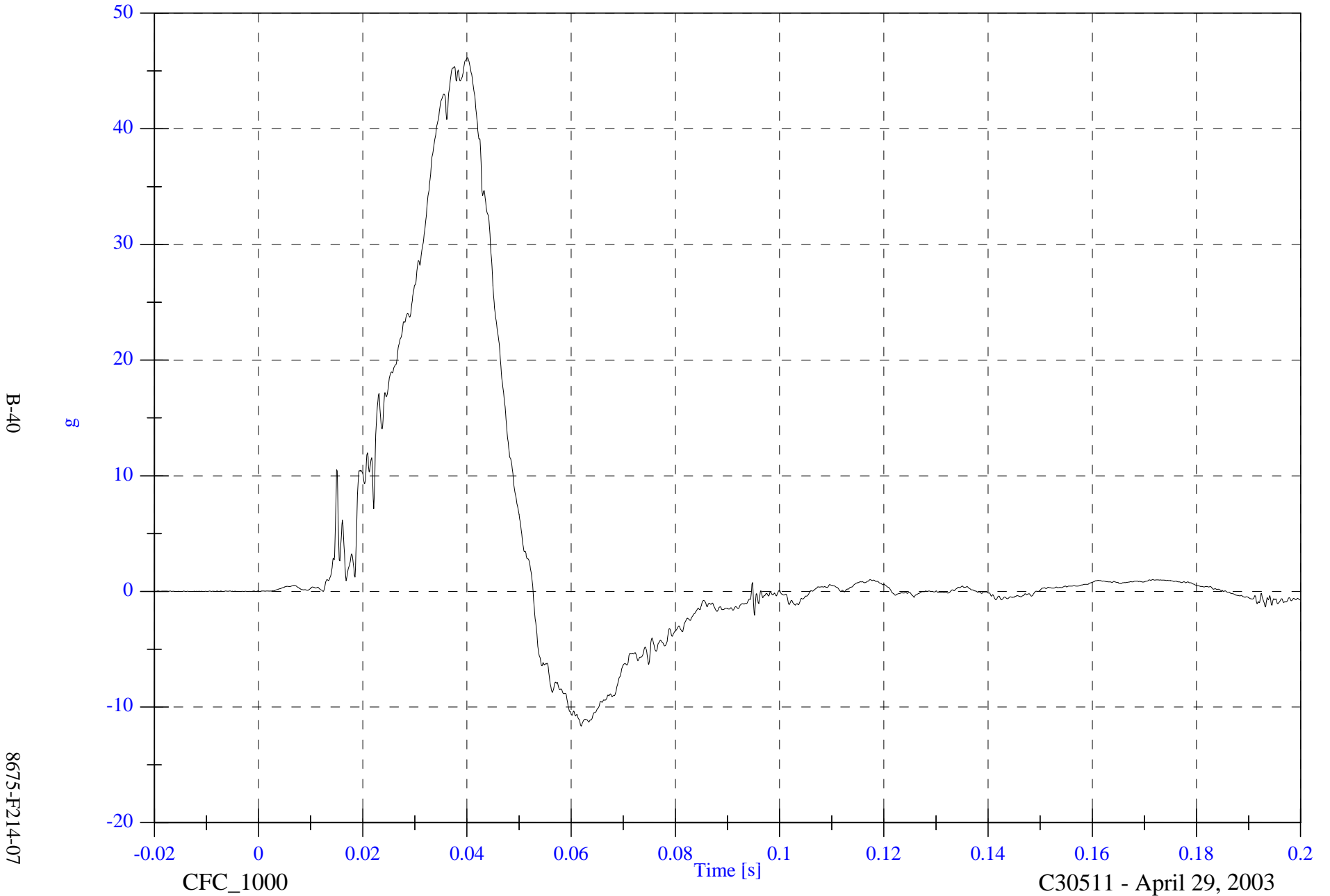
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Pelvic y

Max: 46.1 [g] at 0.040 [s]

Min: -11.6 [g] at 0.062 [s]



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C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

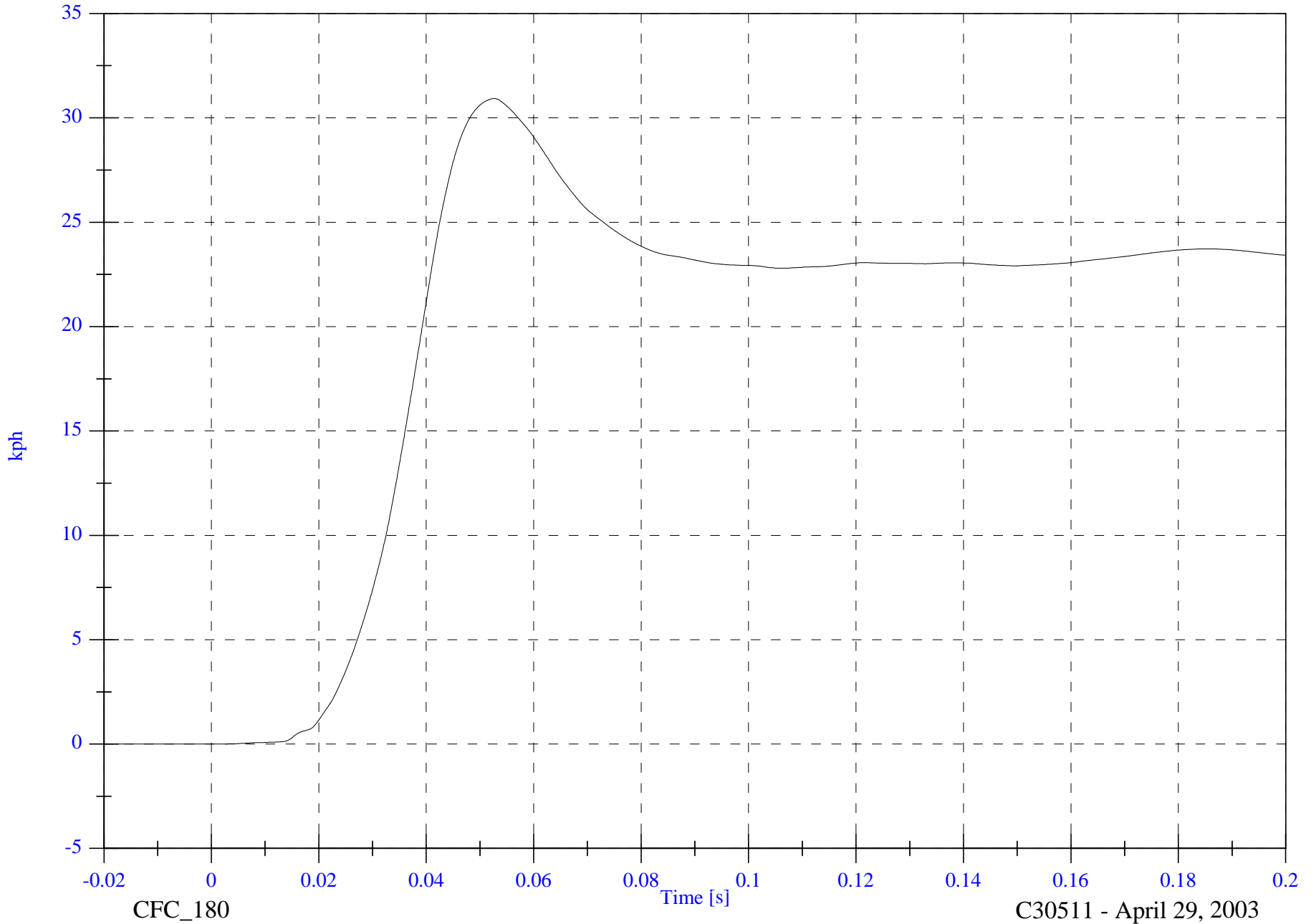
V2P1 Pelvic y Velocity

Max: 30.9 [kph] at 0.053 [s]

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

B-41

8675-F214-07

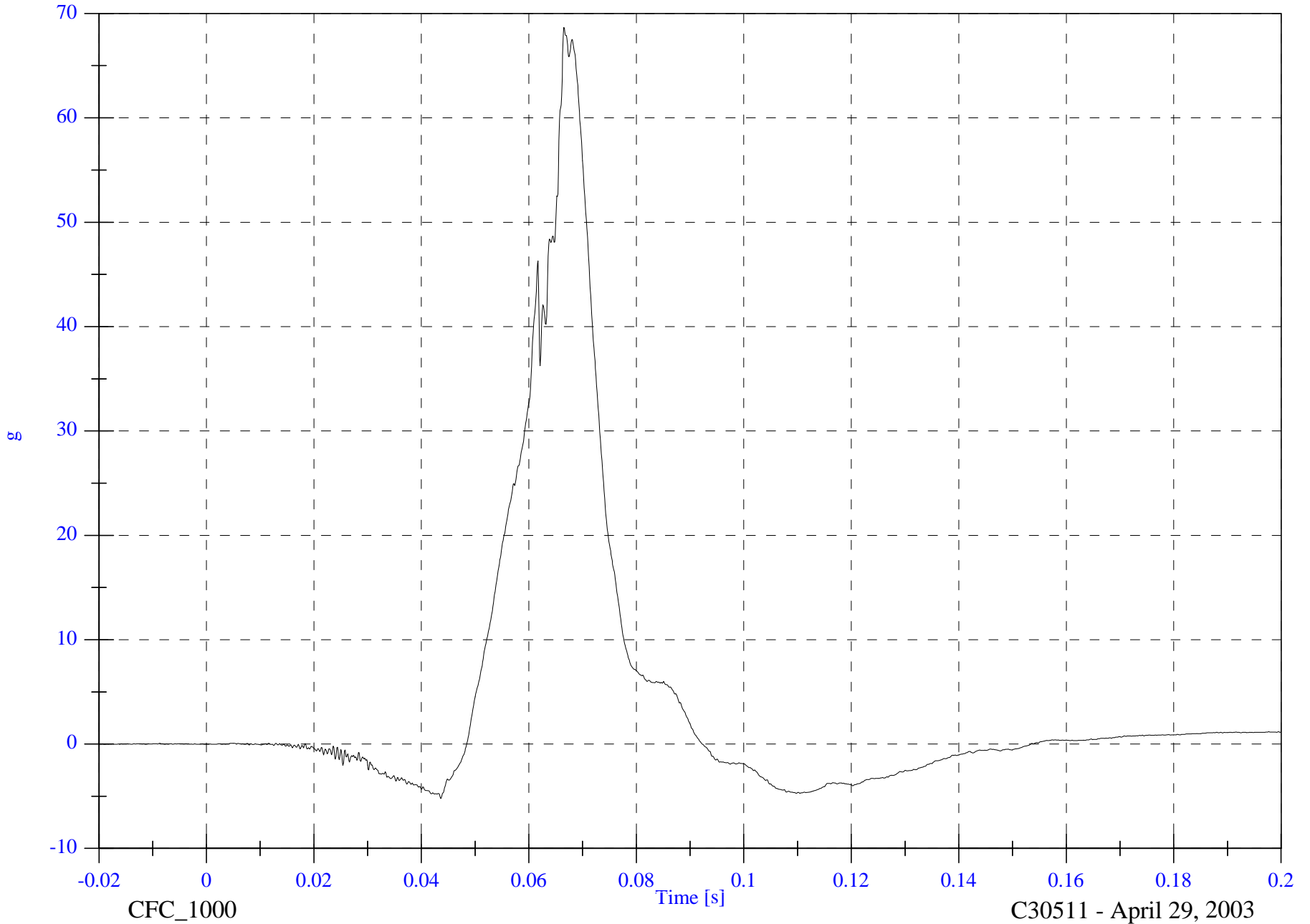


FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head 9 Array X Arm Ay

Max: 68.7 [g] at 0.067 [s]

Min: -5.2 [g] at 0.044 [s]



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CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

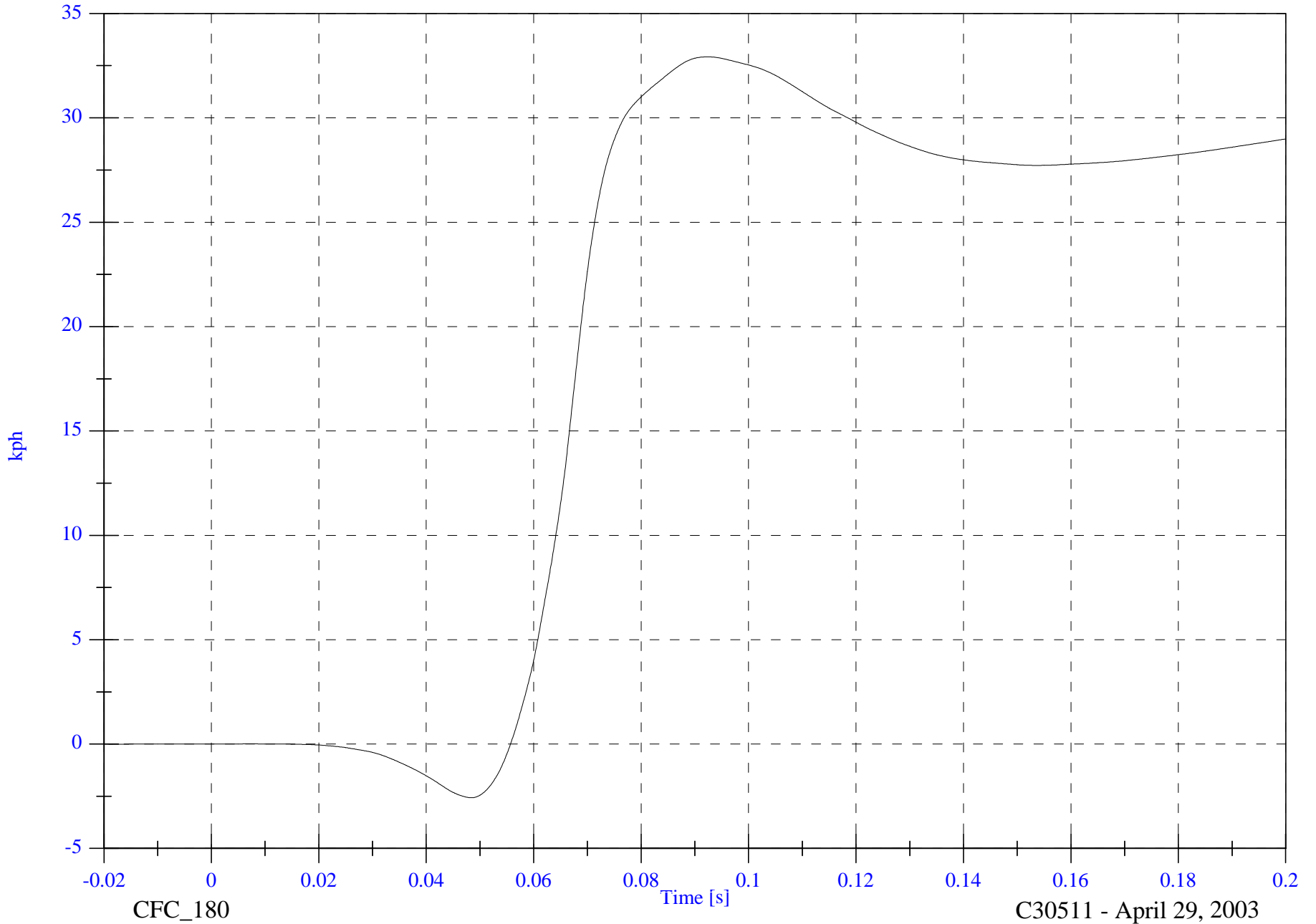
V2P4 Head 9 Array X Arm Ay Velocity

Max: 32.9 [kph] at 0.092 [s]

Min: -2.6 [kph] at 0.048 [s]

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

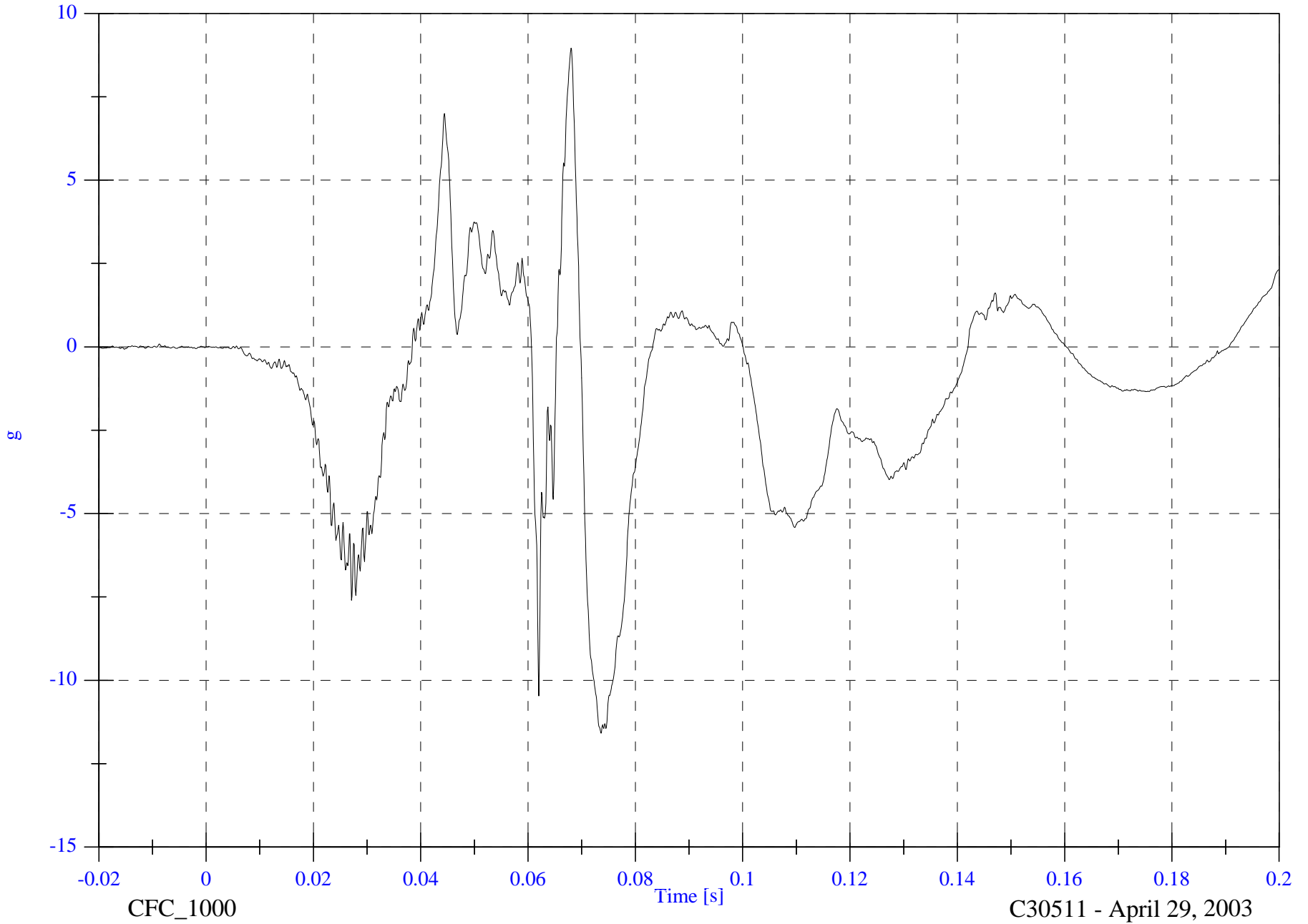
V2P4 Head 9 Array X Arm Az

Max: 9.0 [g] at 0.068 [s]

Min: -11.6 [g] at 0.074 [s]

B-44

8675-F214-07



CFC\_1000

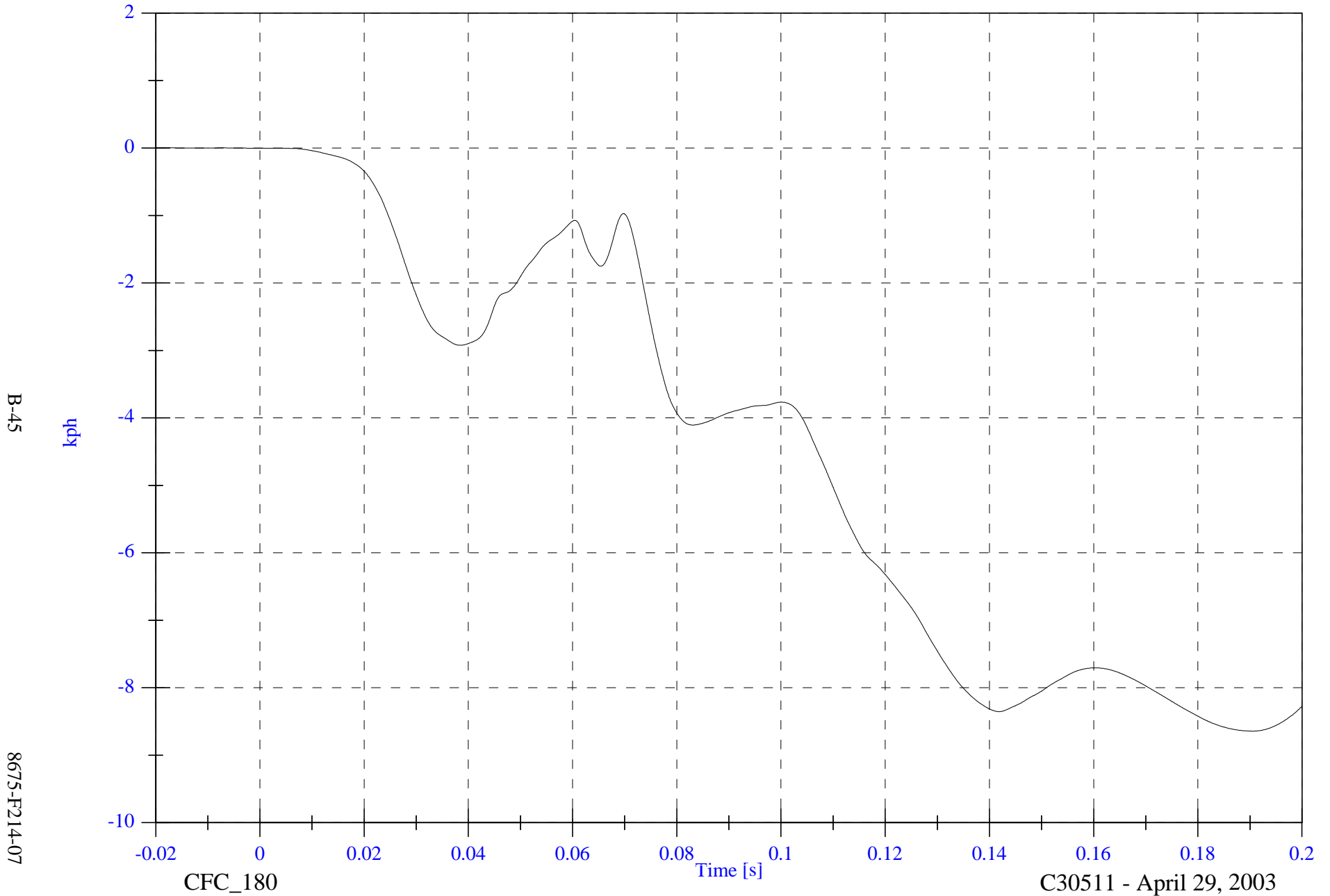
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head 9 Array X Arm Az Velocity

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

Min: -8.6 [kph] at 0.190 [s]



B-45

8675-F214-07

CFC\_180

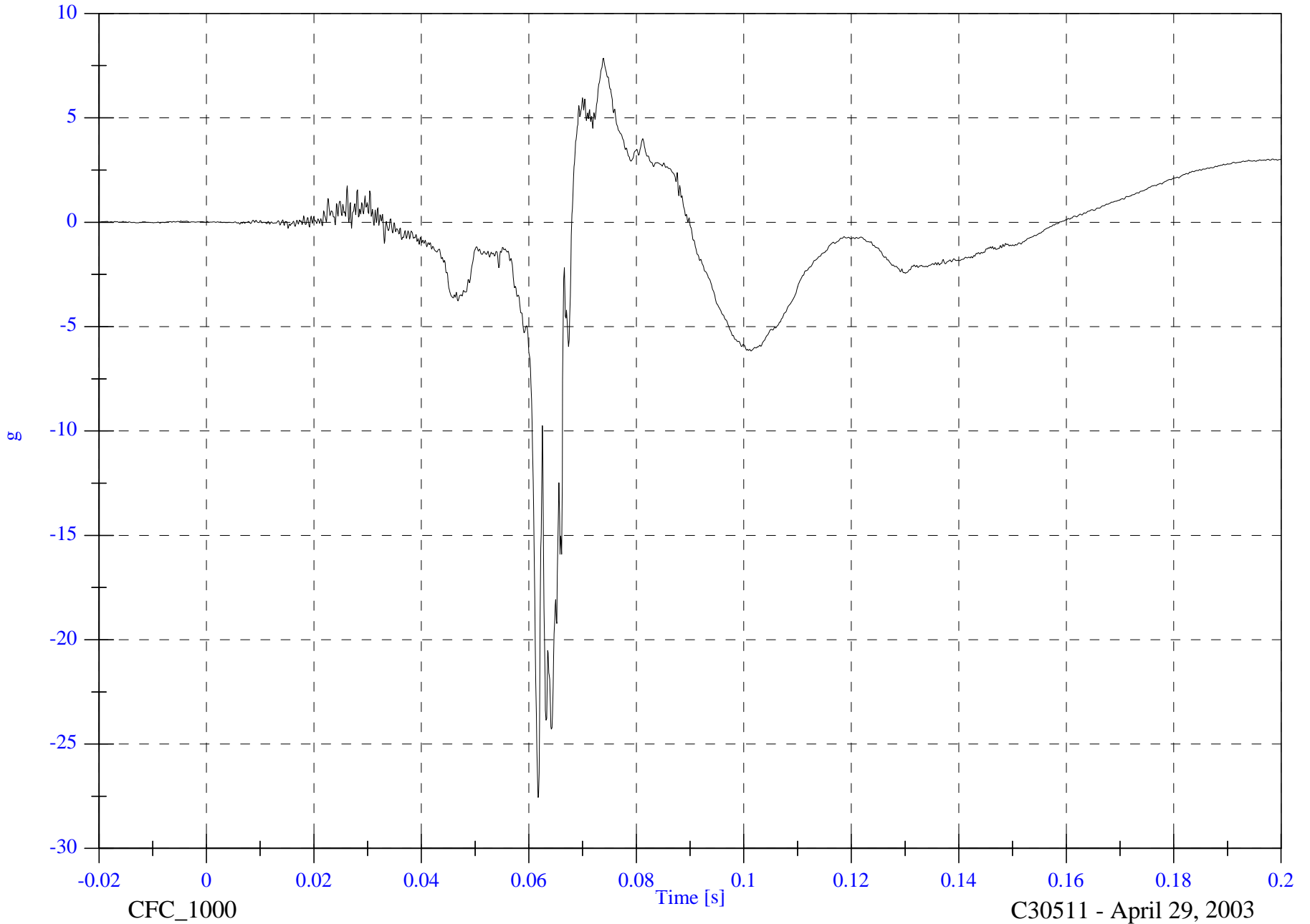
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head 9 Array Y Arm Ax

Max: 7.9 [g] at 0.074 [s]

Min: -27.6 [g] at 0.062 [s]



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CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

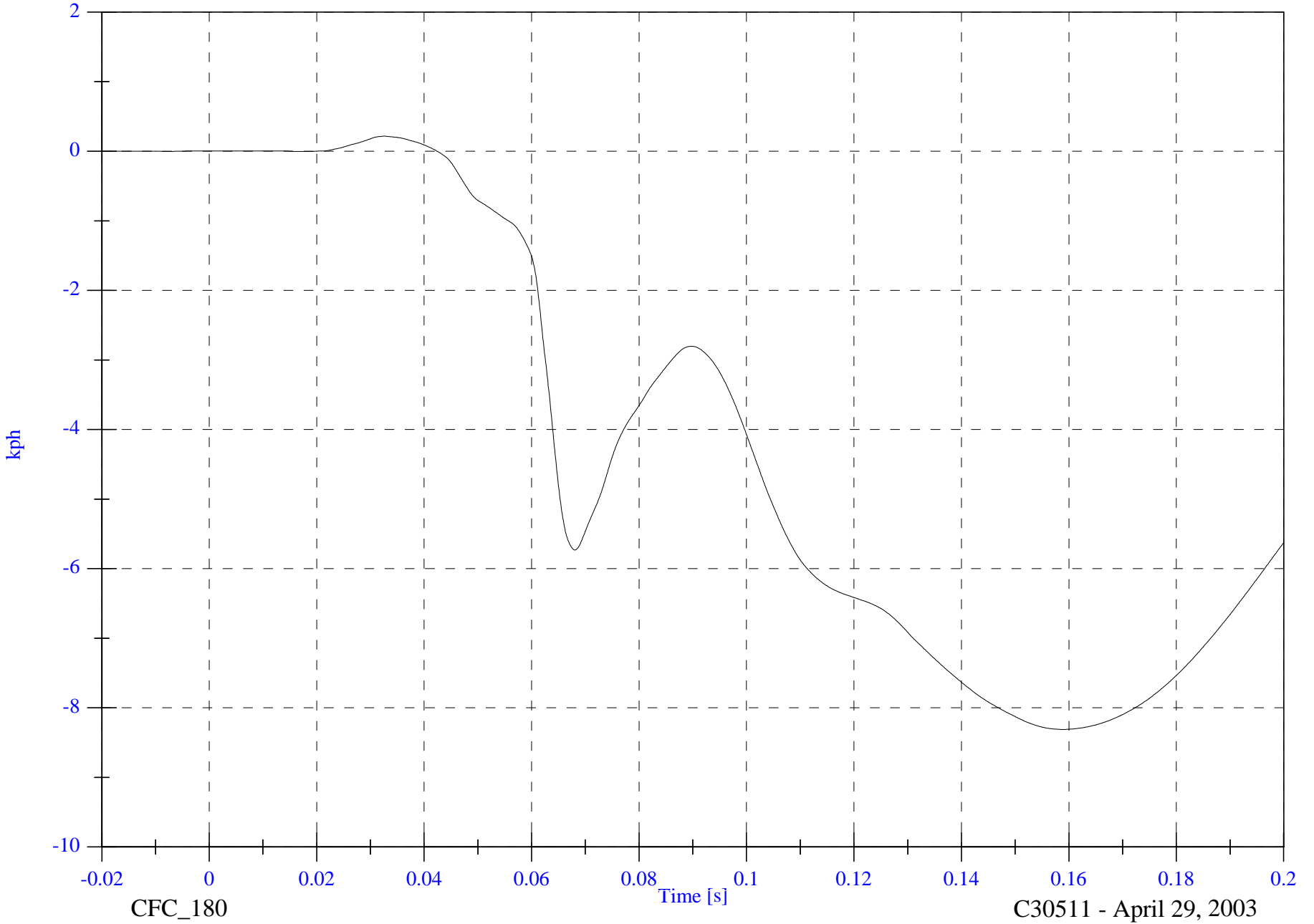
V2P4 Head 9 Array Y Arm Ax Velocity

Max: 0.2 [kph] at 0.033 [s]

Min: -8.3 [kph] at 0.159 [s]

B-47

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

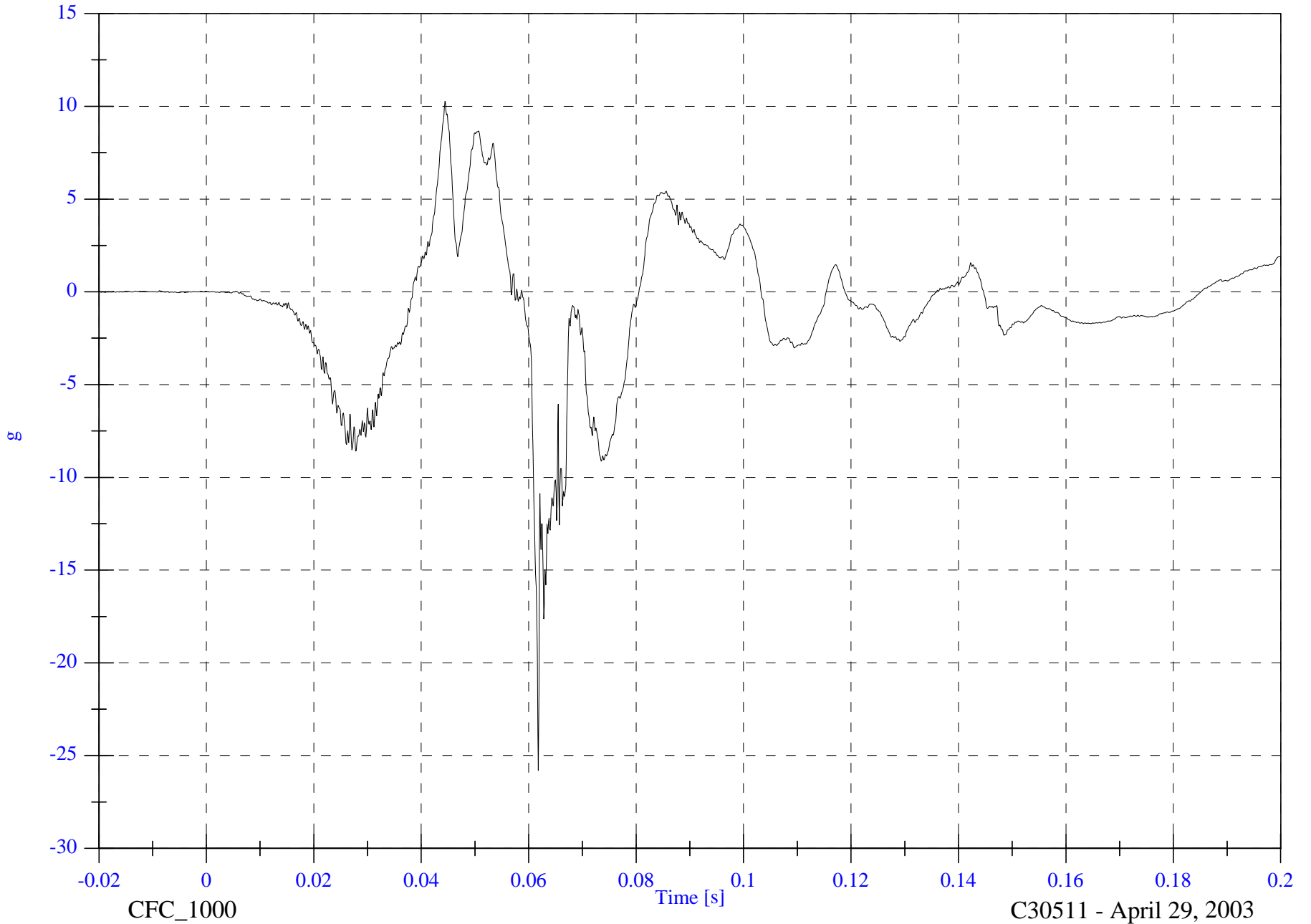
V2P4 Head 9 Array Y Arm Az

Max: 10.3 [g] at 0.044 [s]

Min: -25.8 [g] at 0.062 [s]

B-48

8675-F214-07



C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

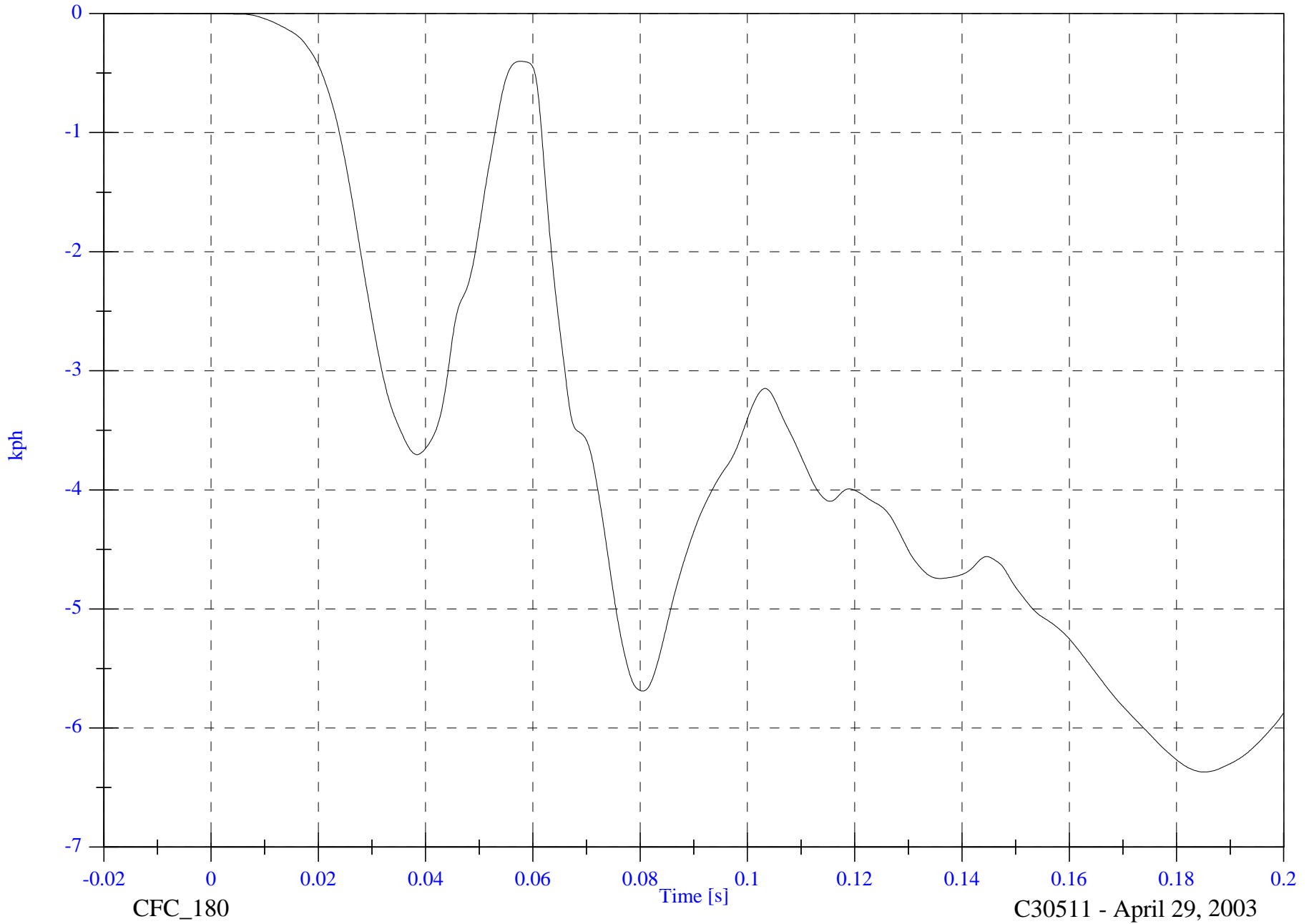
V2P4 Head 9 Array Y Arm Az Velocity

Max: 0.0 [kph] at -0.008 [s]

Min: -6.4 [kph] at 0.185 [s]

B-49

8675-F214-07



CFC\_180

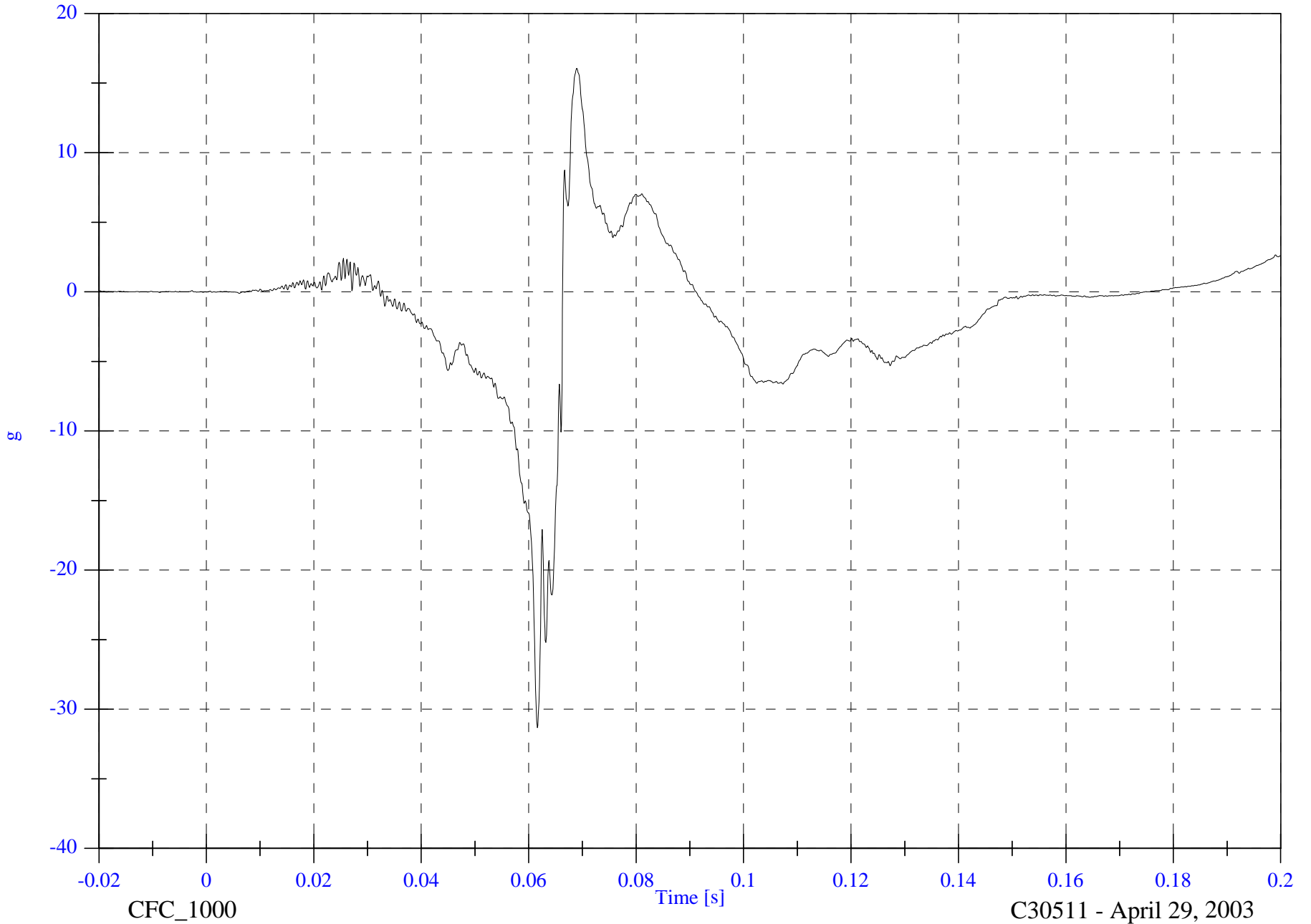
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head 9 Array Z Arm Ax

Max: 16.1 [g] at 0.069 [s]

Min: -31.3 [g] at 0.062 [s]



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8675-F214-07

CFC\_1000

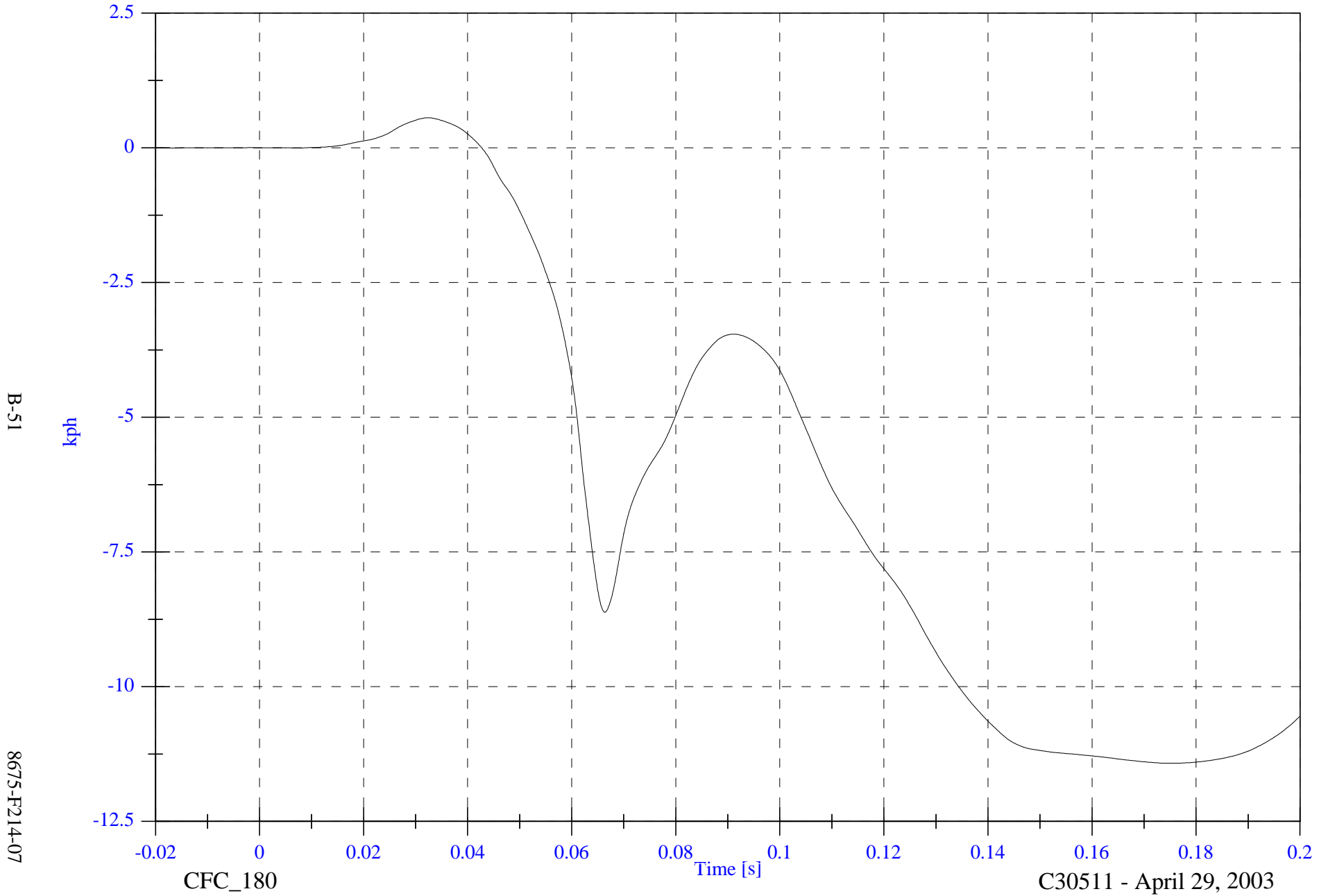
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head 9 Array Z Arm Ax Velocity

Max: 0.6 [kph] at 0.032 [s]

Min: -11.4 [kph] at 0.175 [s]



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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

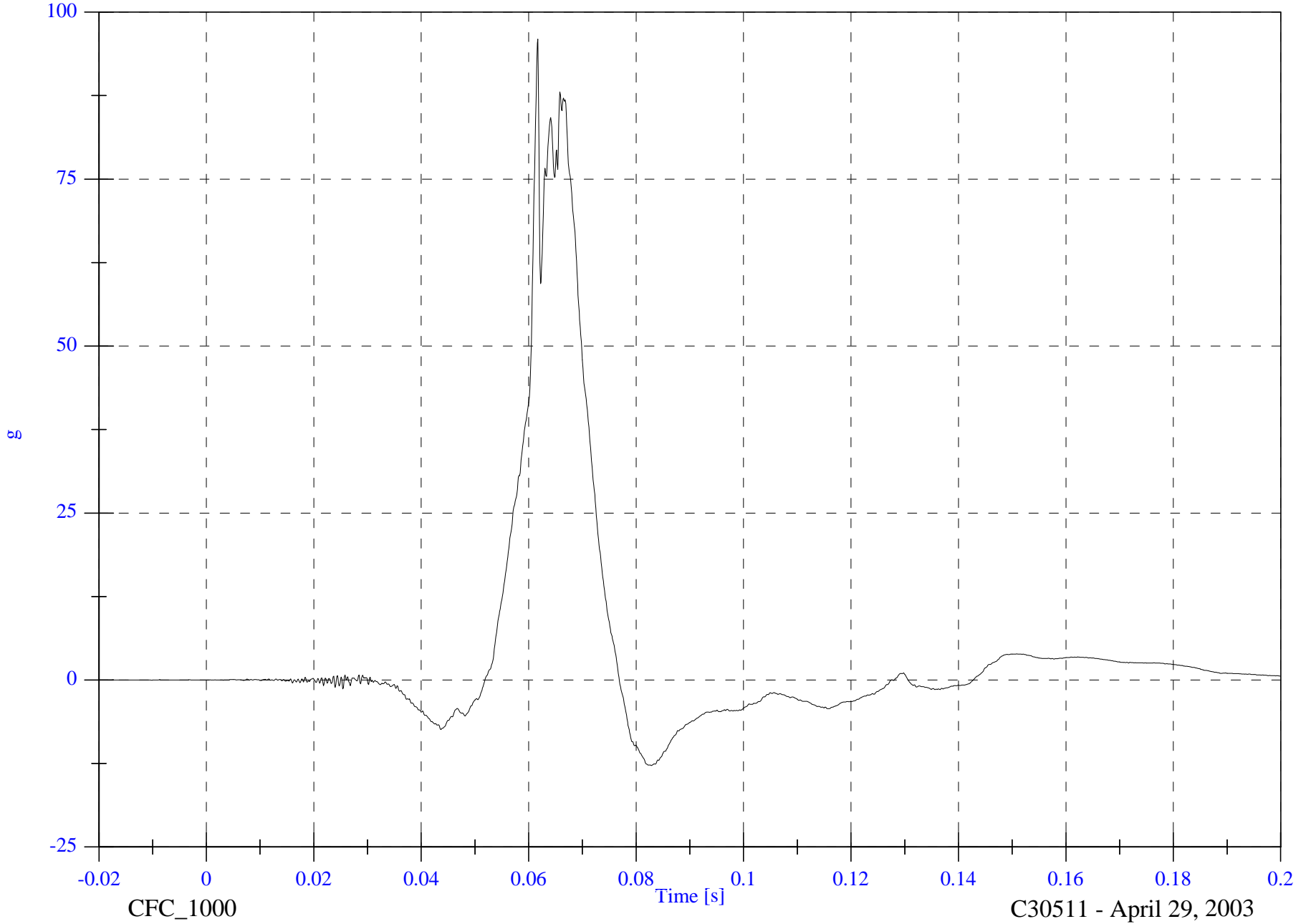
V2P4 Head 9 Array Z Arm Ay

Max: 95.9 [g] at 0.062 [s]

Min: -12.8 [g] at 0.083 [s]

B-52

8675-F214-07



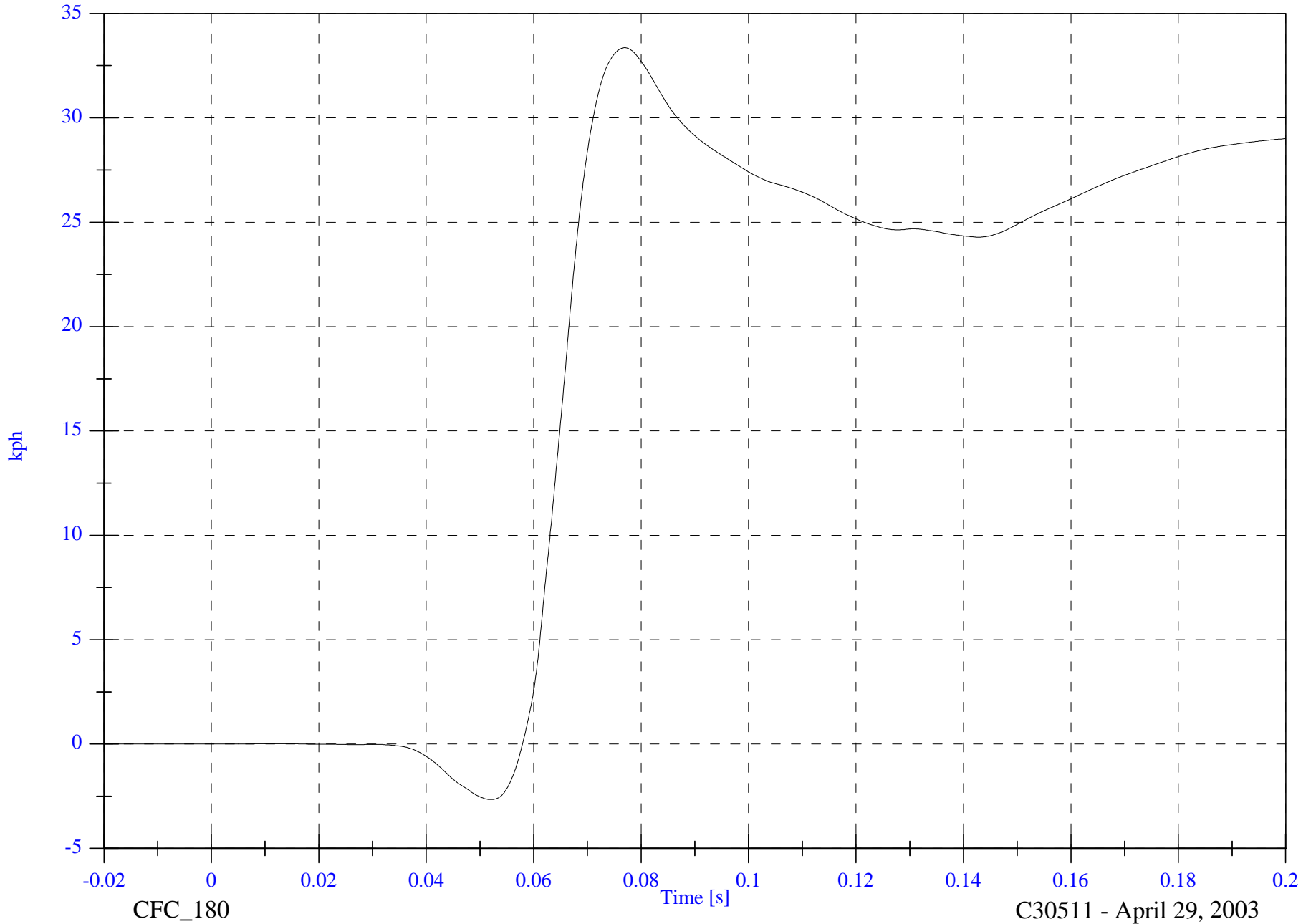
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head 9 Array Z Arm Ay Velocity

Max: 33.4 [kph] at 0.077 [s]

Min: -2.7 [kph] at 0.052 [s]



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8675-F214-07

CFC\_180

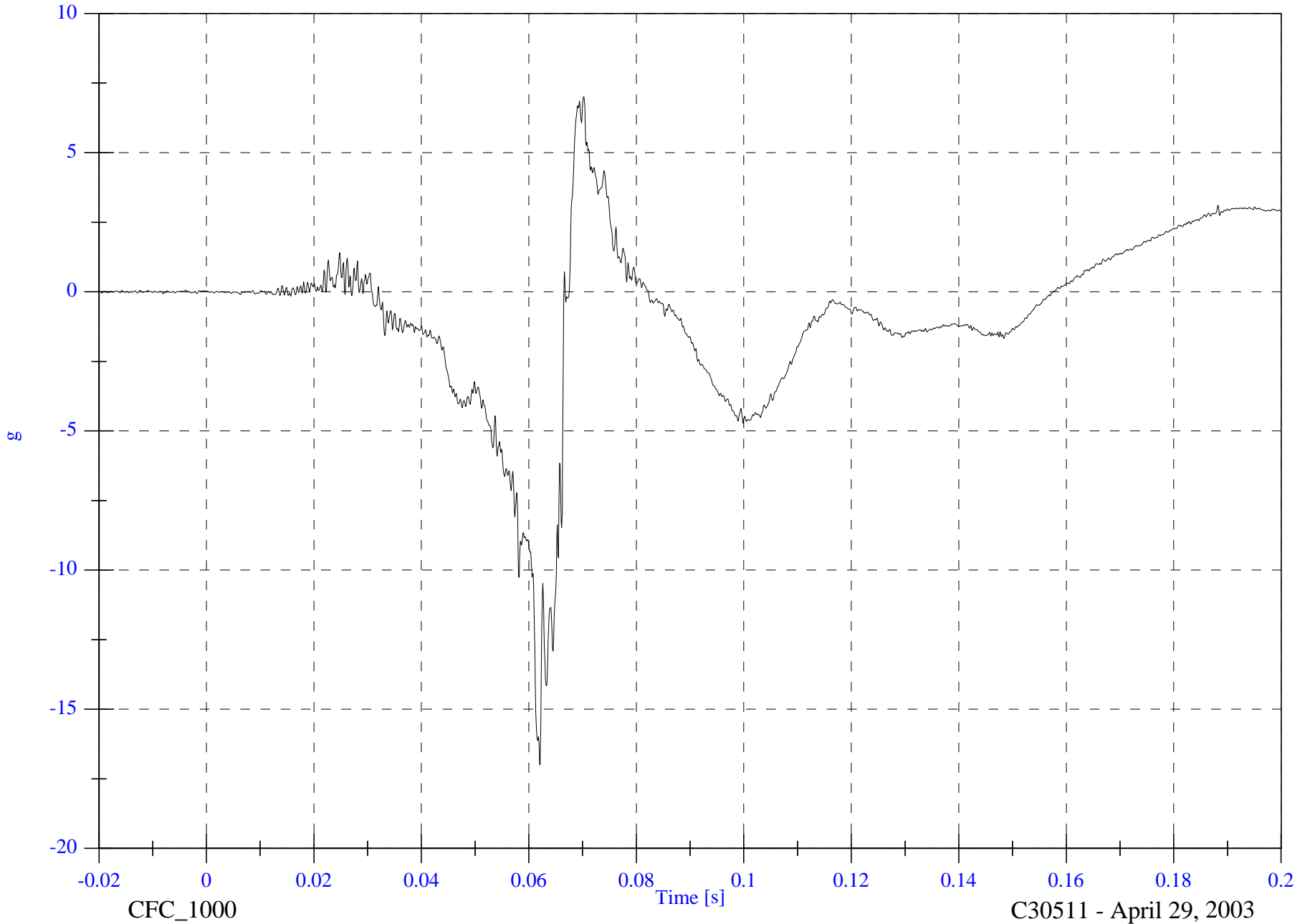
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head x

Max: 7.0 [g] at 0.070 [s]

Min: -17.0 [g] at 0.062 [s]



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CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

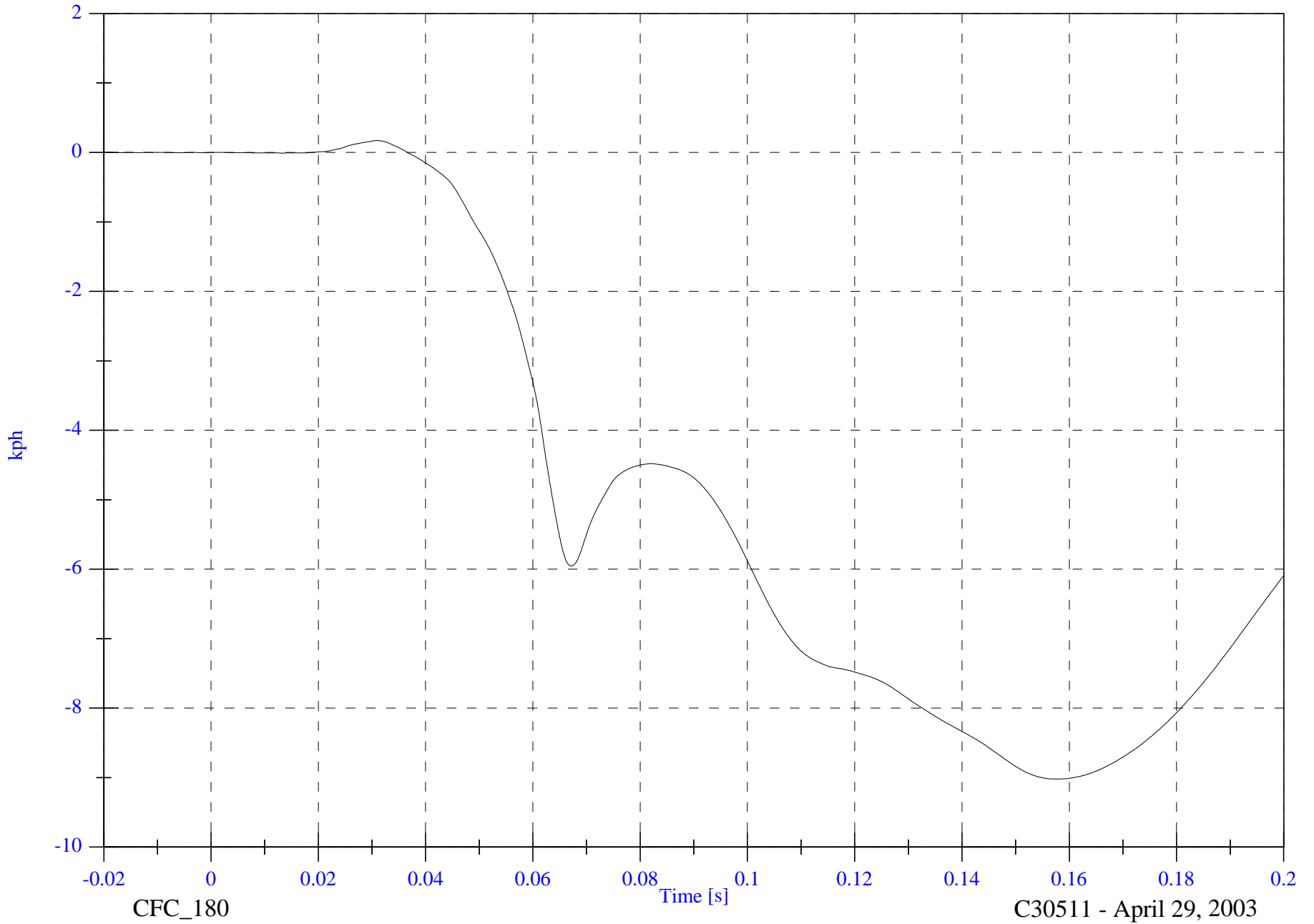
V2P4 Head x Velocity

Max: 0.2 [kph] at 0.031 [s]

Min: -9.0 [kph] at 0.158 [s]

B-55

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

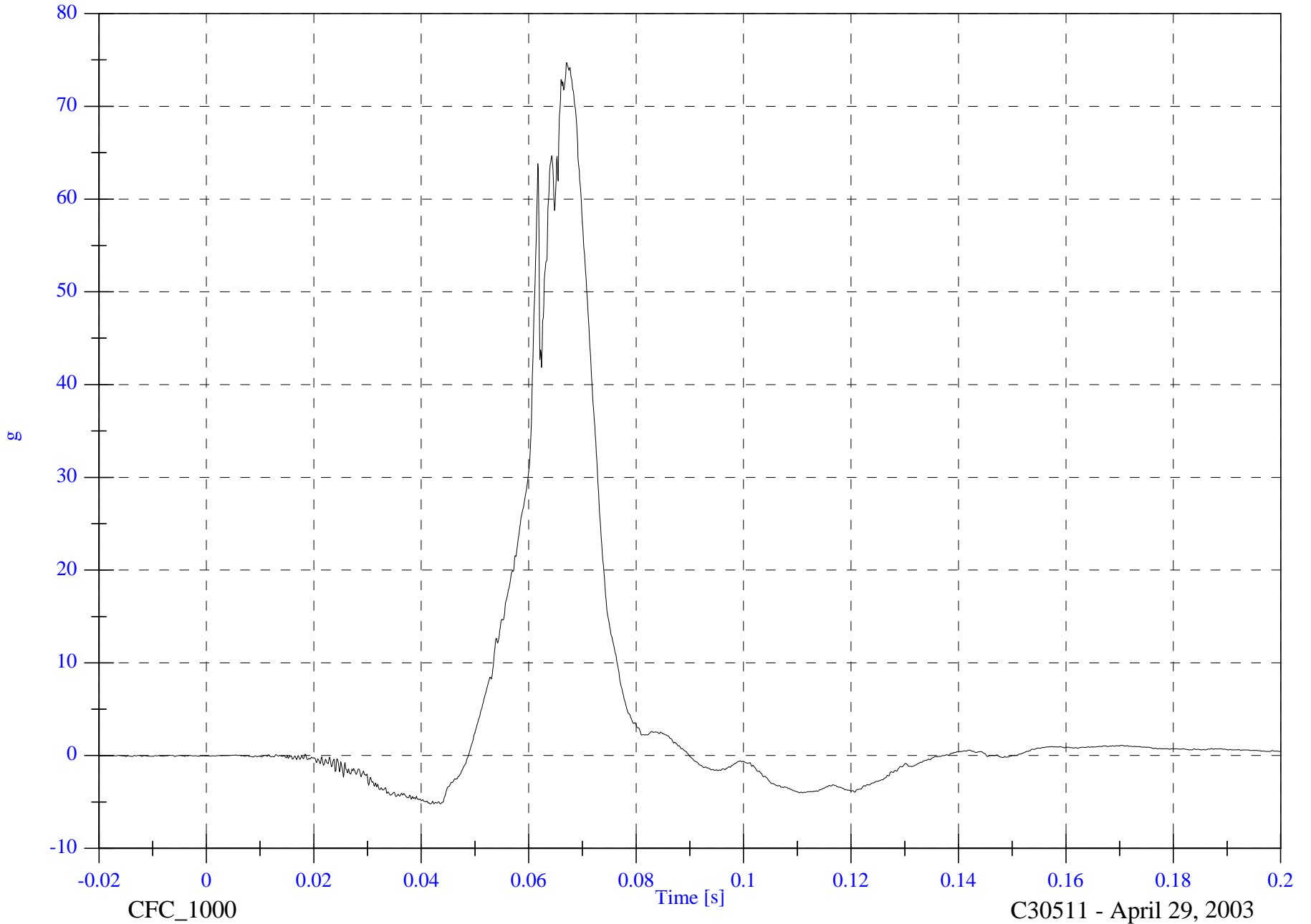
V2P4 Head y

Max: 74.7 [g] at 0.067 [s]

Min: -5.2 [g] at 0.042 [s]

B-56

8675-F214-07



C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

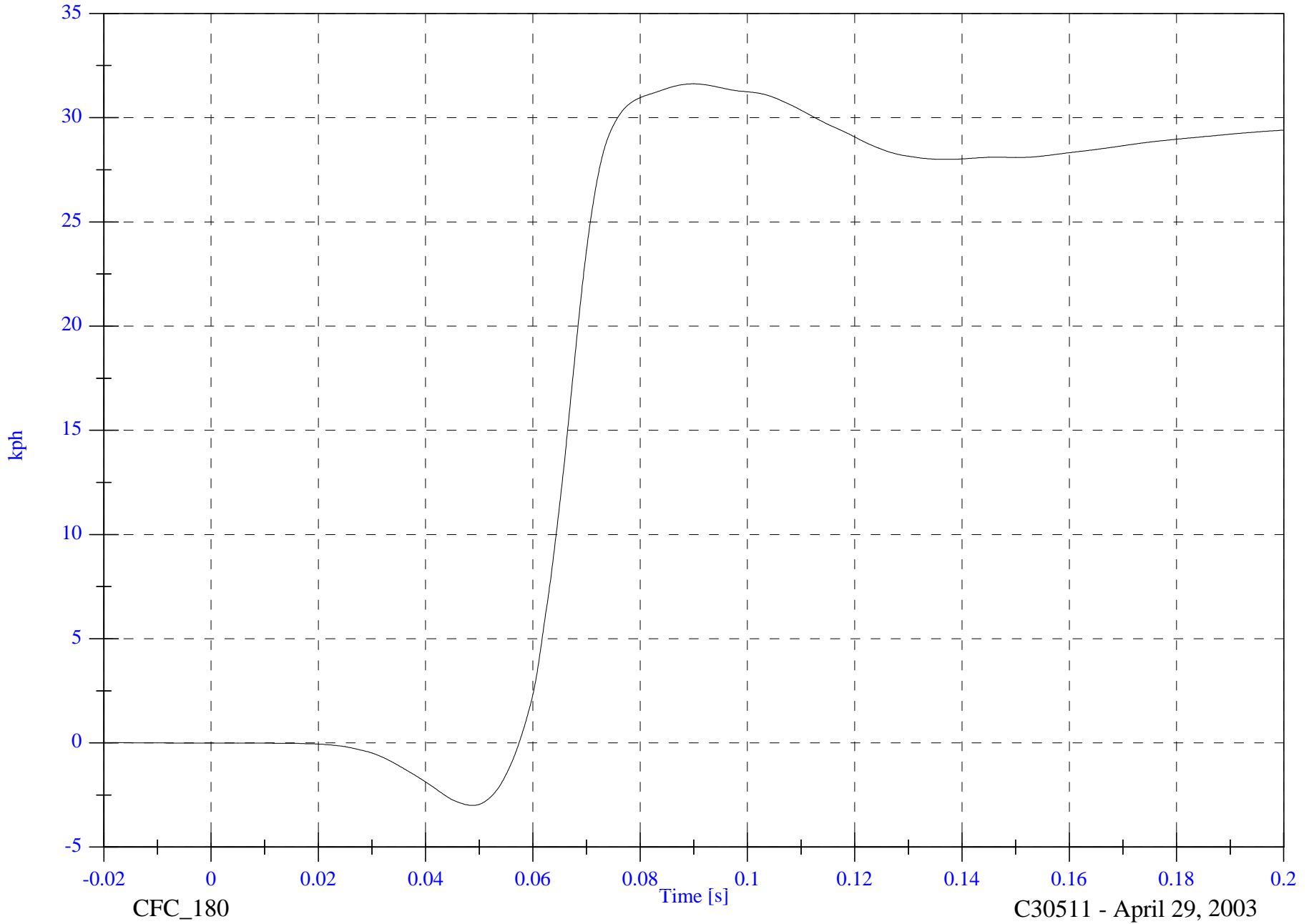
V2P4 Head y Velocity

Max: 31.6 [kph] at 0.090 [s]

Min: -3.0 [kph] at 0.049 [s]

B-57

8675-F214-07



CFC\_180

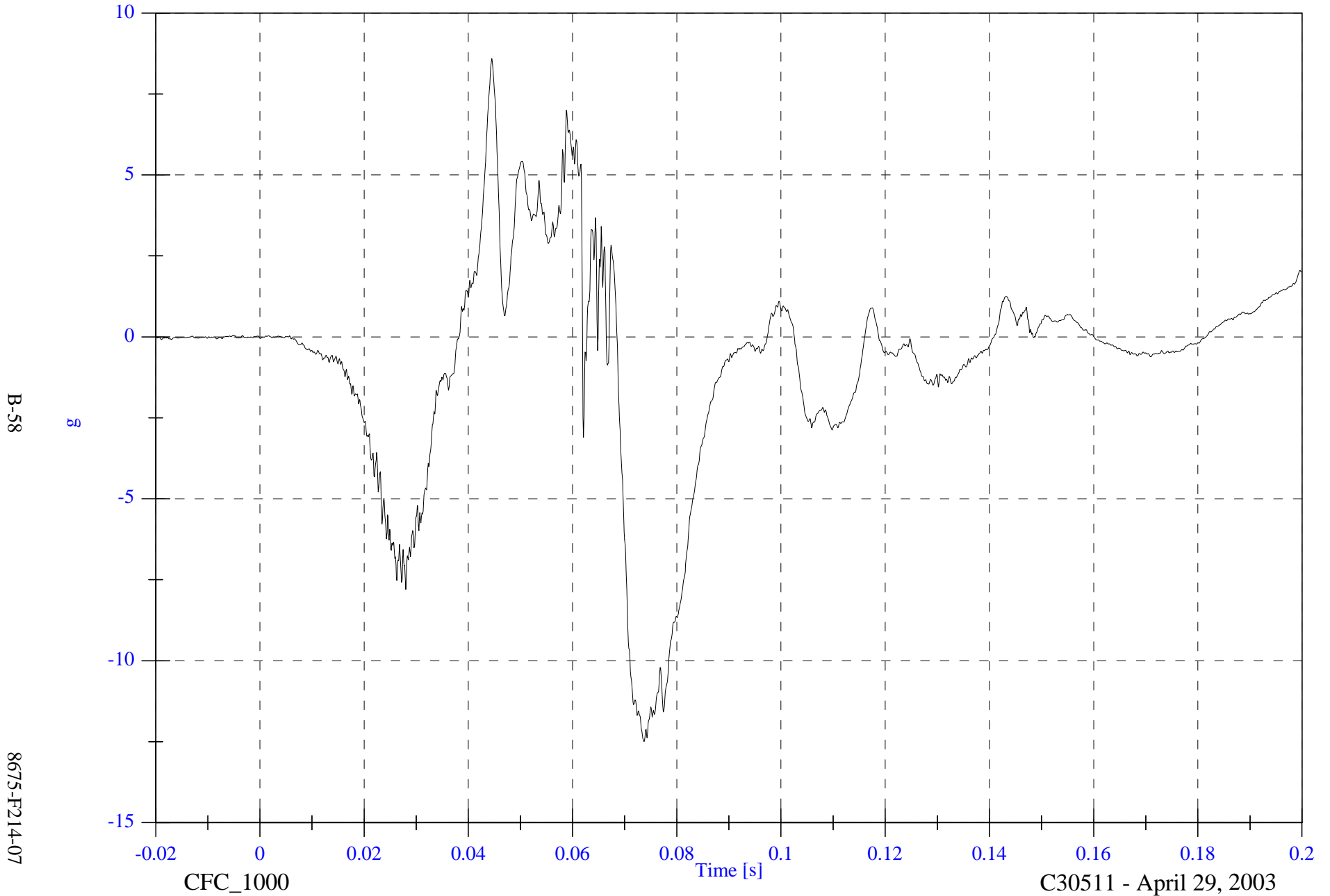
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head z

Max: 8.6 [g] at 0.044 [s]

Min: -12.5 [g] at 0.074 [s]



FMVSS 214D Indicant - 2003 Kia Sorento

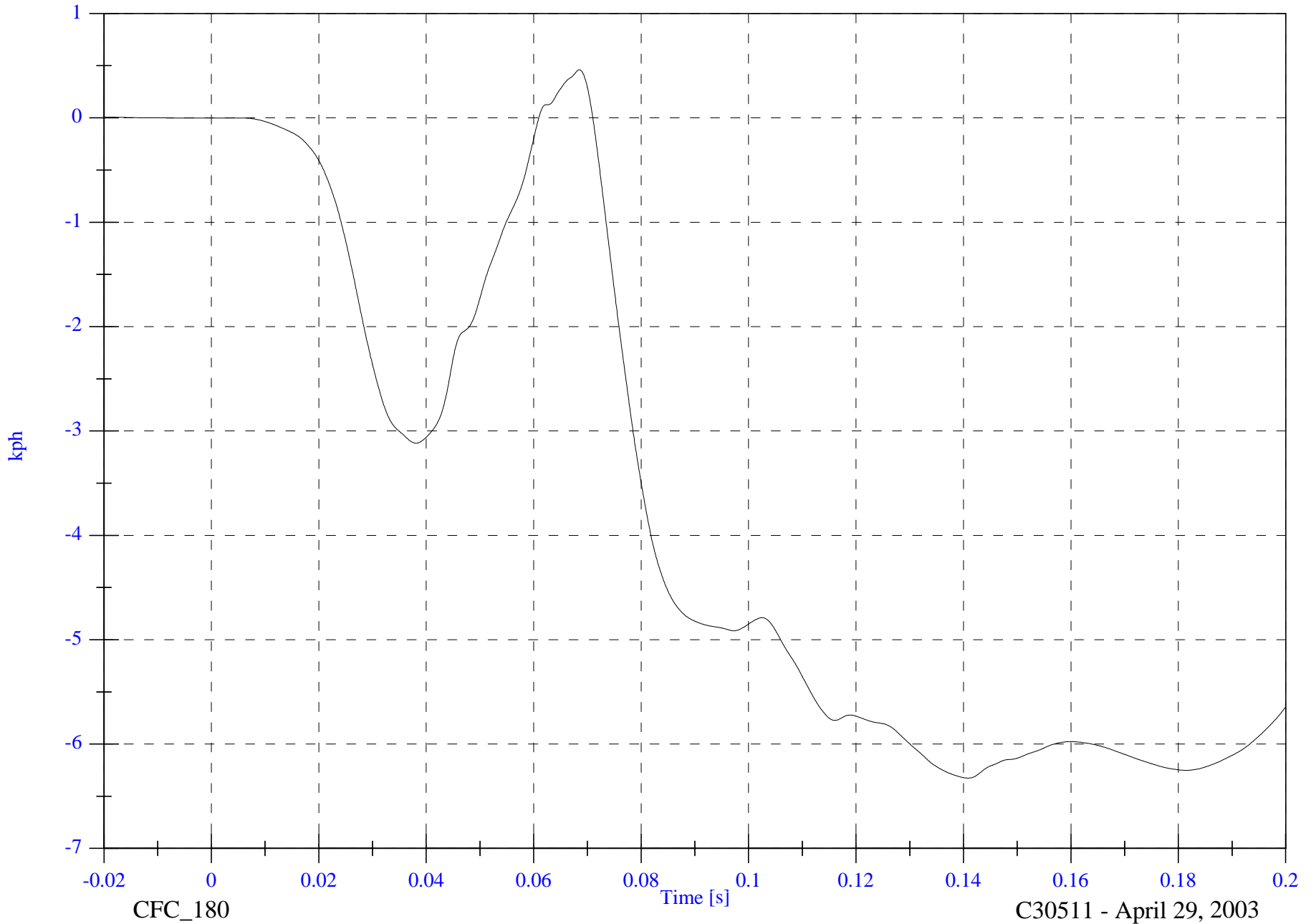
V2P4 Head z Velocity

Max: 0.5 [kph] at 0.068 [s]

Min: -6.3 [kph] at 0.141 [s]

B-59

8675-F214-07



CFC\_180

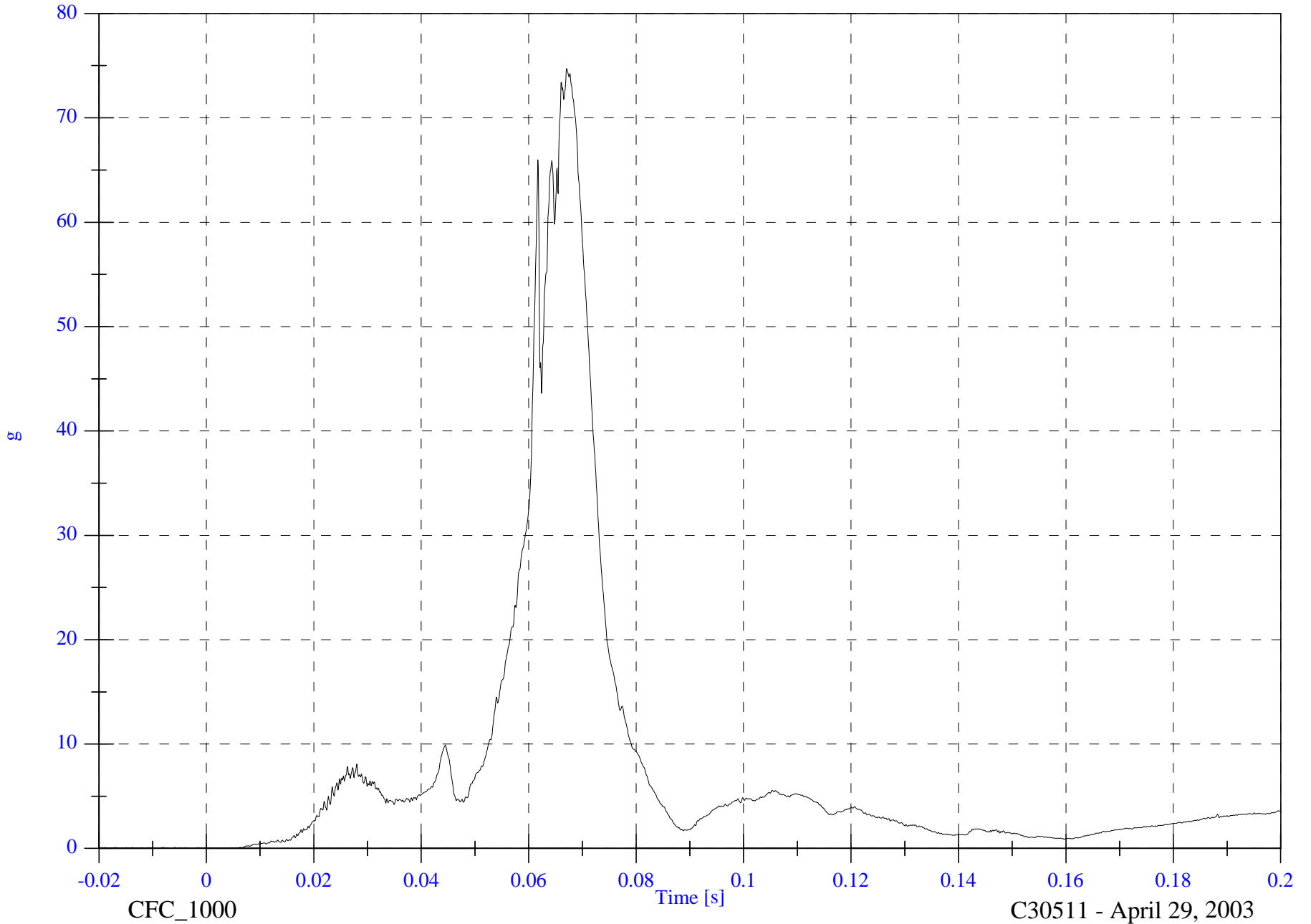
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head Resultant

Max: 74.7 [g] at 0.067 [s]

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



B-60

8675-F214-07

CFC\_1000

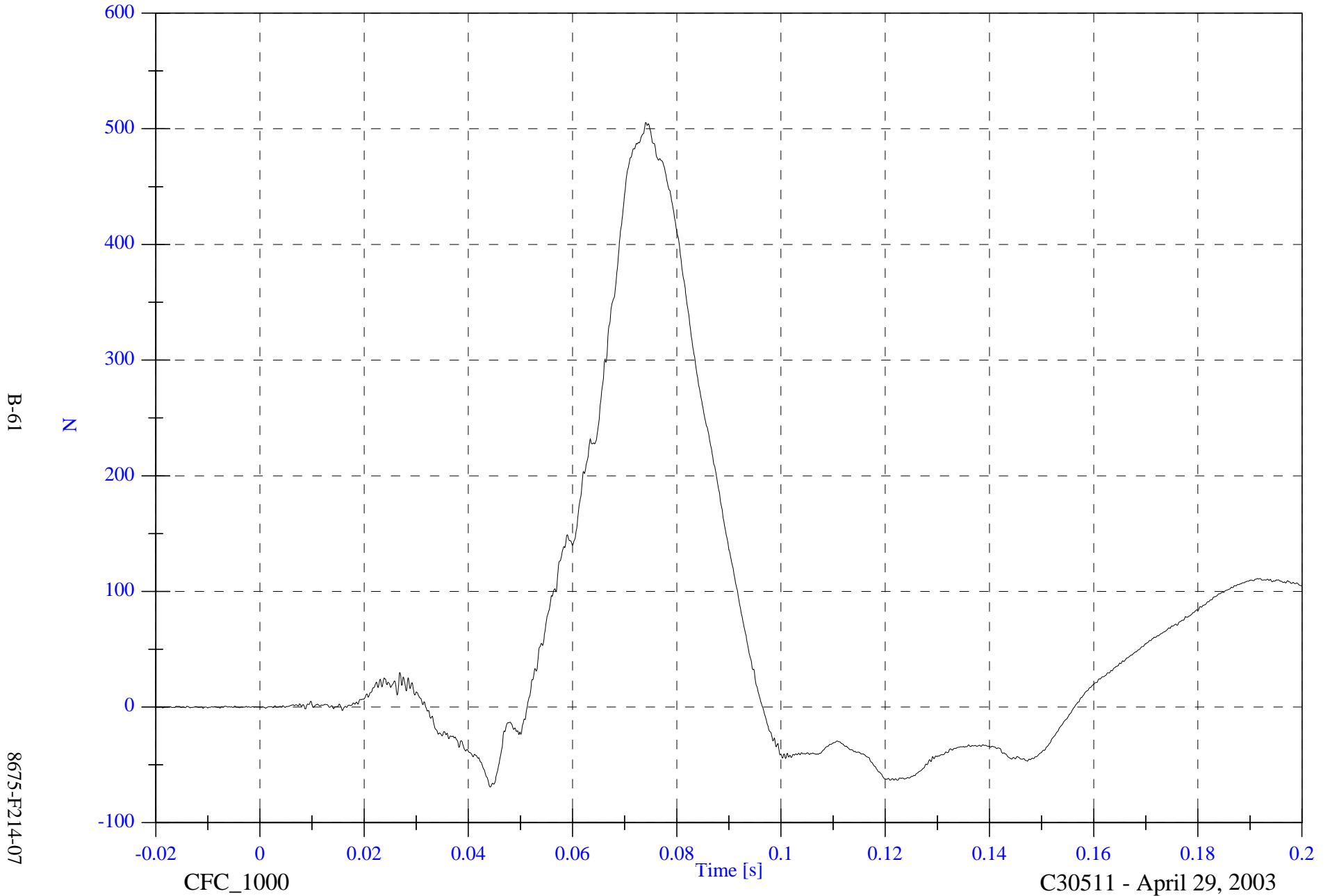
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Upper Neck Fx

Max: 505.4 [N] at 0.074 [s]

Min: -69.2 [N] at 0.044 [s]



B-61

8675-F214-07

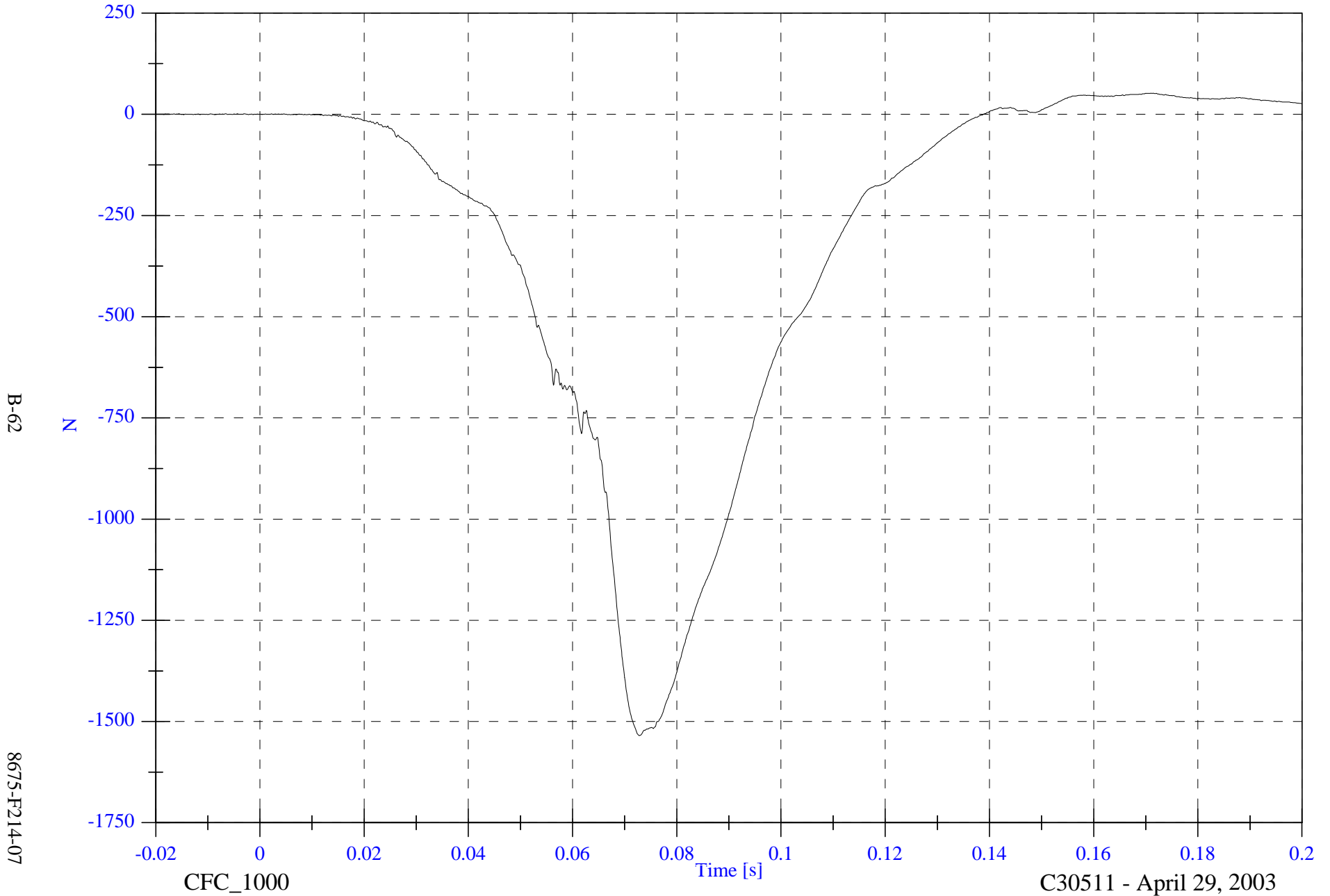
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Upper Neck Fy

Max: 52.1 [N] at 0.171 [s]

Min: -1534.8 [N] at 0.073 [s]



B-62

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CFC\_1000

Time [s]

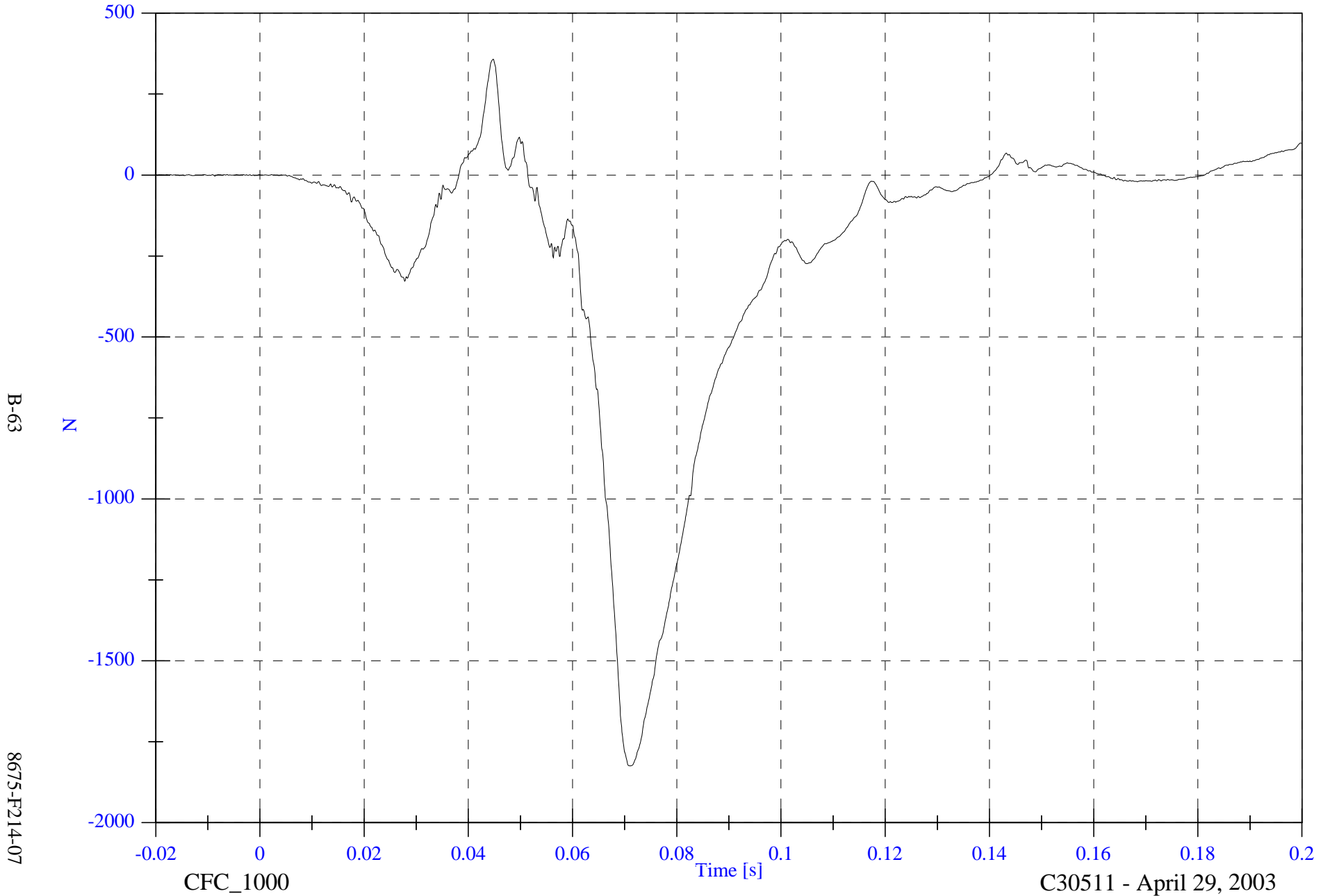
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Upper Neck Fz

Max: 357.6 [N] at 0.045 [s]

Min: -1824.6 [N] at 0.071 [s]



B-63

8675-F214-07

CFC\_1000

Time [s]

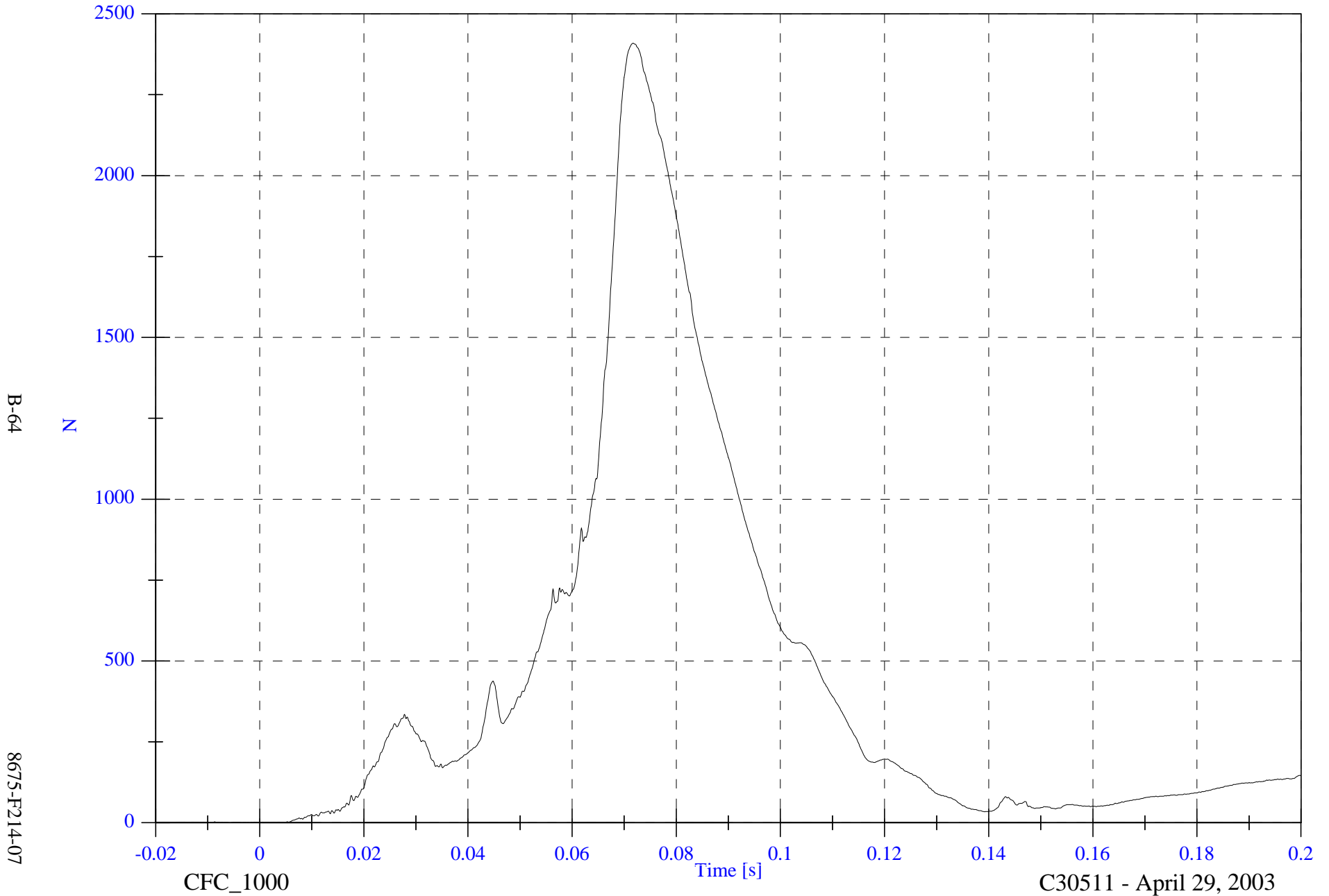
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Upper Neck F Resultant

Max: 2409.3 [N] at 0.072 [s]

Min: 0.1 [N] at -0.003 [s]



B-64

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CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

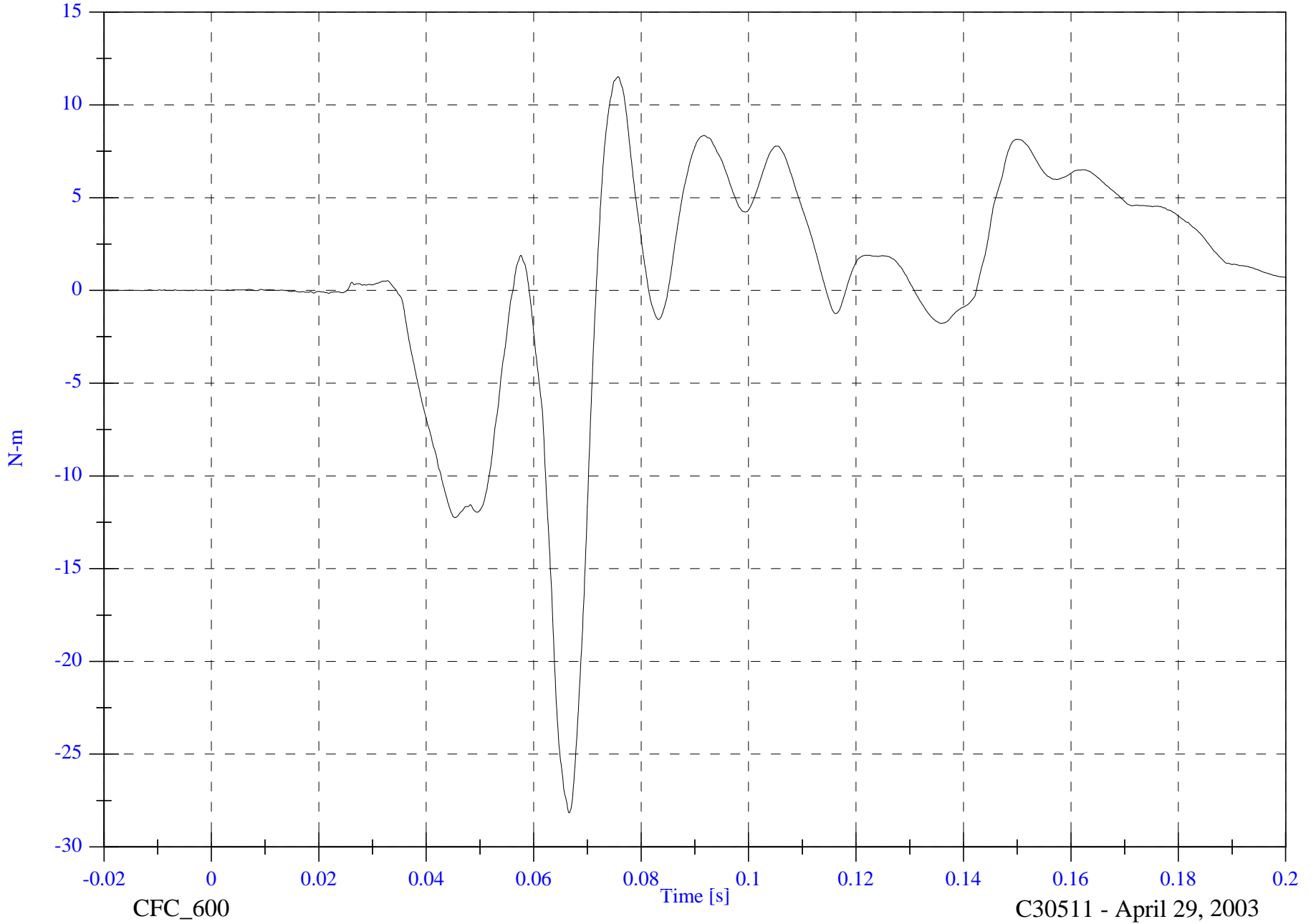
V2P4 Upper Neck Mx

Max: 11.5 [N-m] at 0.076 [s]

Min: -28.2 [N-m] at 0.067 [s]

B-65

8675-F214-07



CFC\_600

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

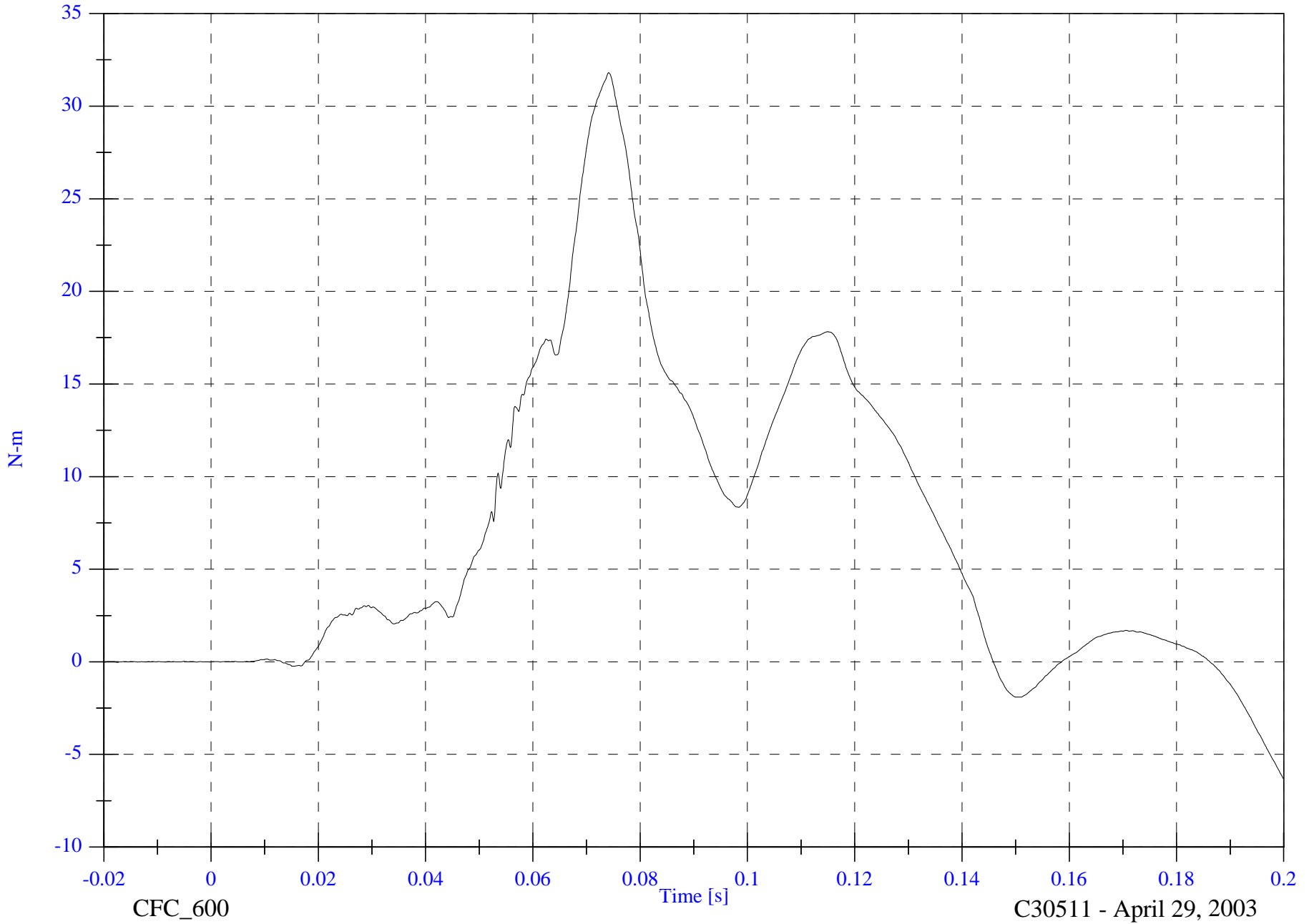
V2P4 Upper Neck My

Max: 31.8 [N-m] at 0.074 [s]

Min: -6.3 [N-m] at 0.200 [s]

B-66

8675-F214-07



CFC\_600

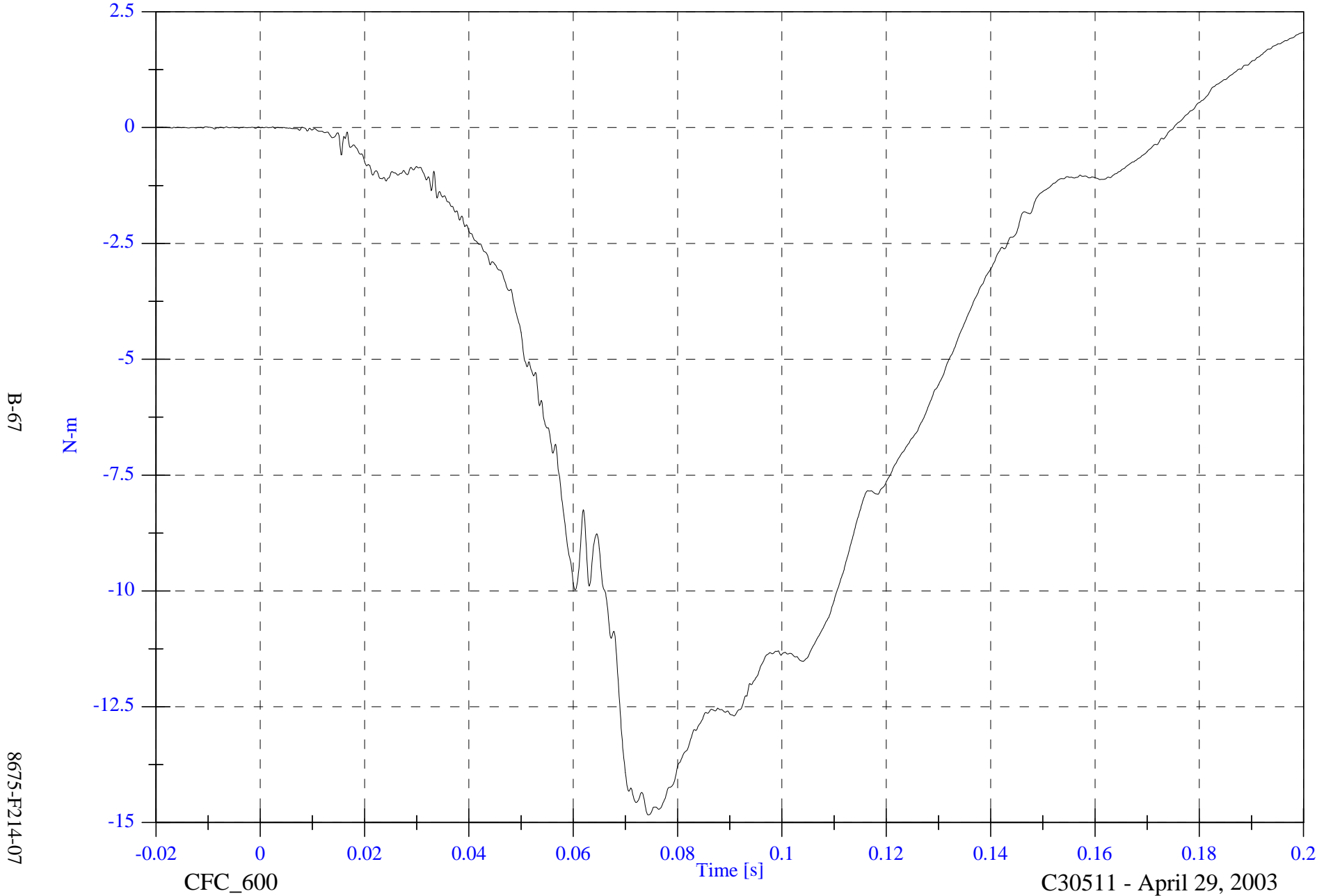
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Upper Neck Mz

Max: 2.1 [N-m] at 0.200 [s]

Min: -14.8 [N-m] at 0.074 [s]



B-67

8675-F214-07

CFC\_600

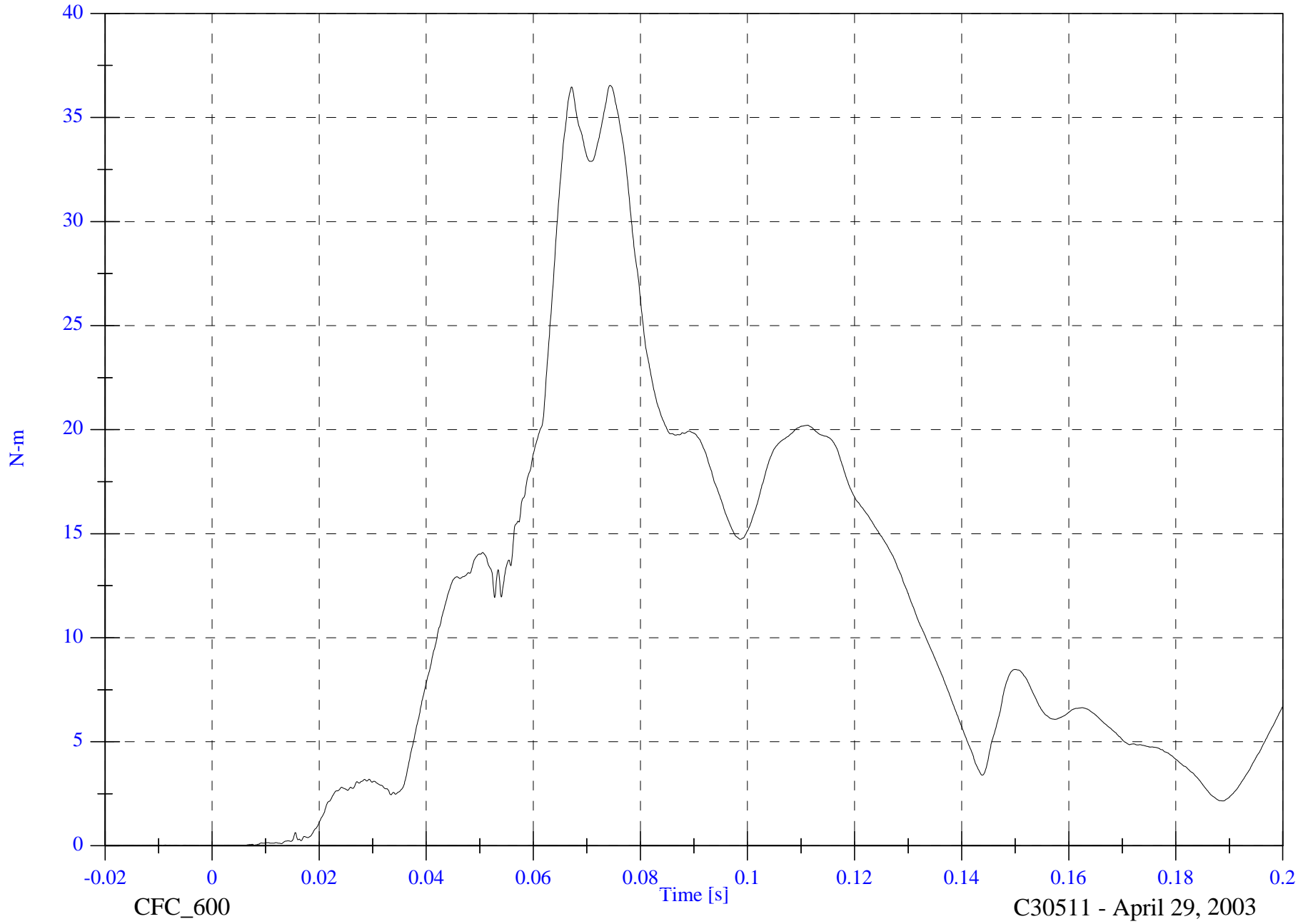
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Upper Neck M Resultant

Max: 36.5 [N-m] at 0.074 [s]

Min: 0.0 [N-m] at -0.006 [s]



B-68

8675-F214-07

CFC\_600

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

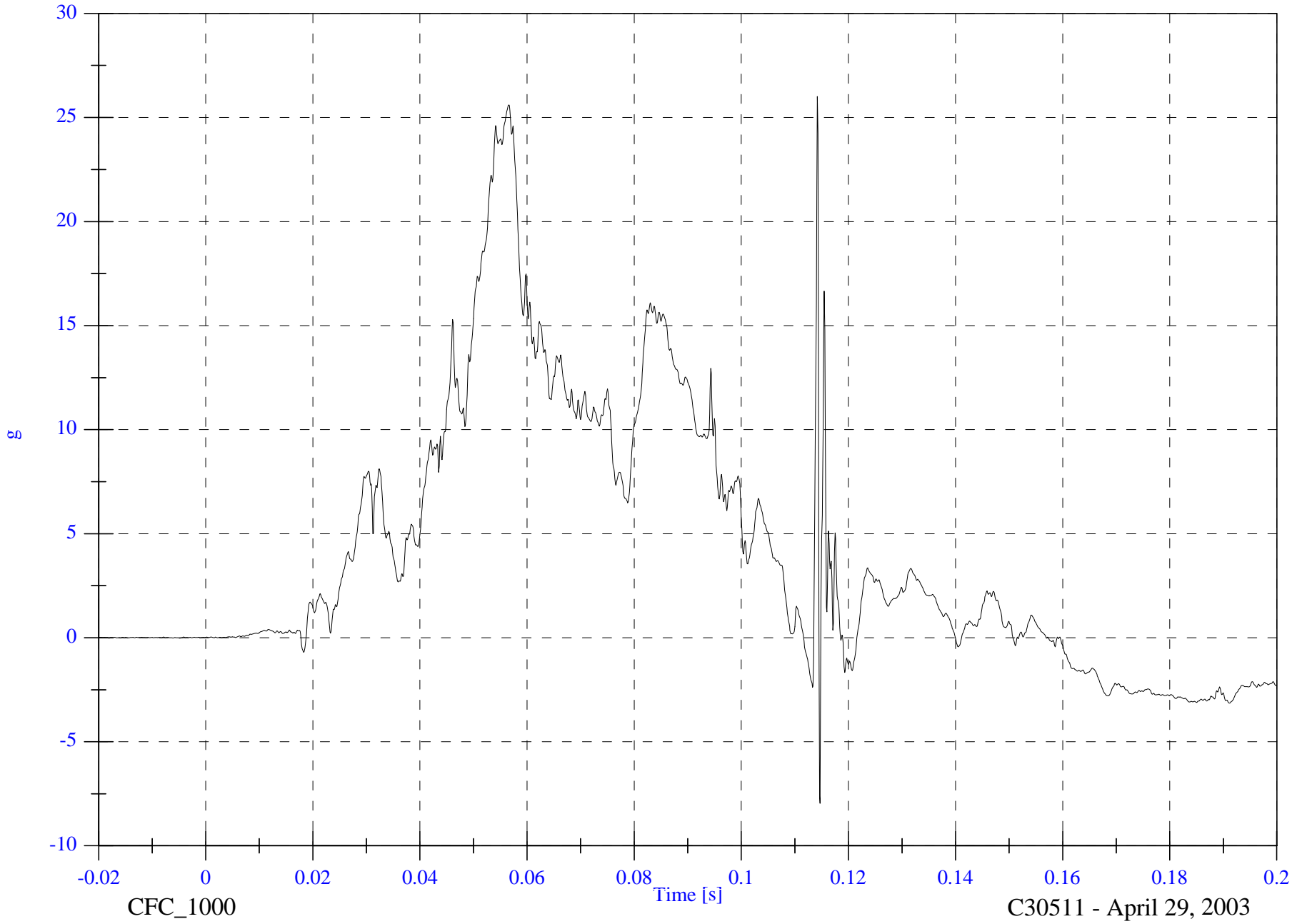
V2P4 Upper Rib y

Max: 26.0 [g] at 0.114 [s]

Min: -8.0 [g] at 0.115 [s]

B-69

8675-F214-07



CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

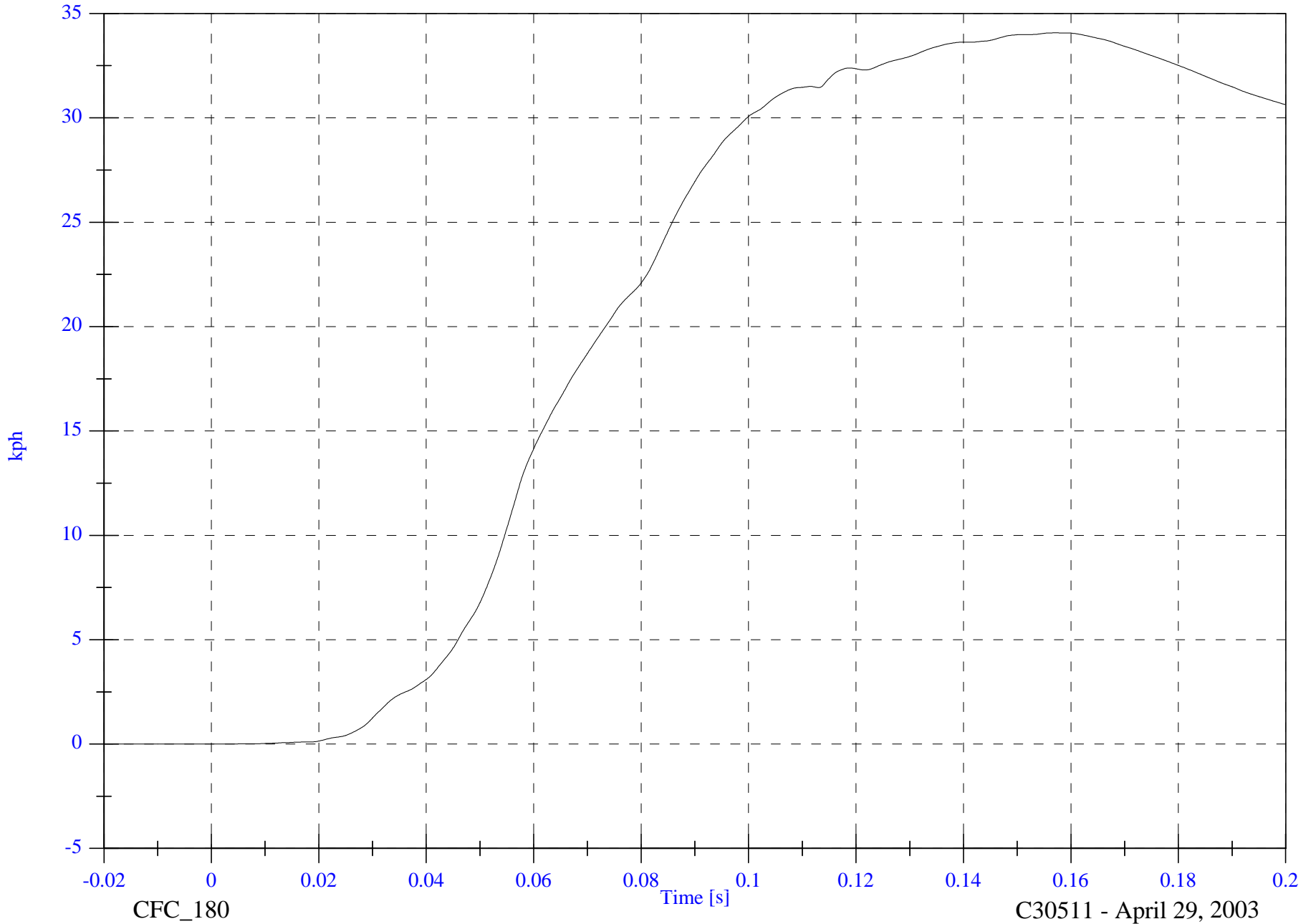
V2P4 Upper Rib y Velocity

Max: 34.1 [kph] at 0.157 [s]

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

B-70

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

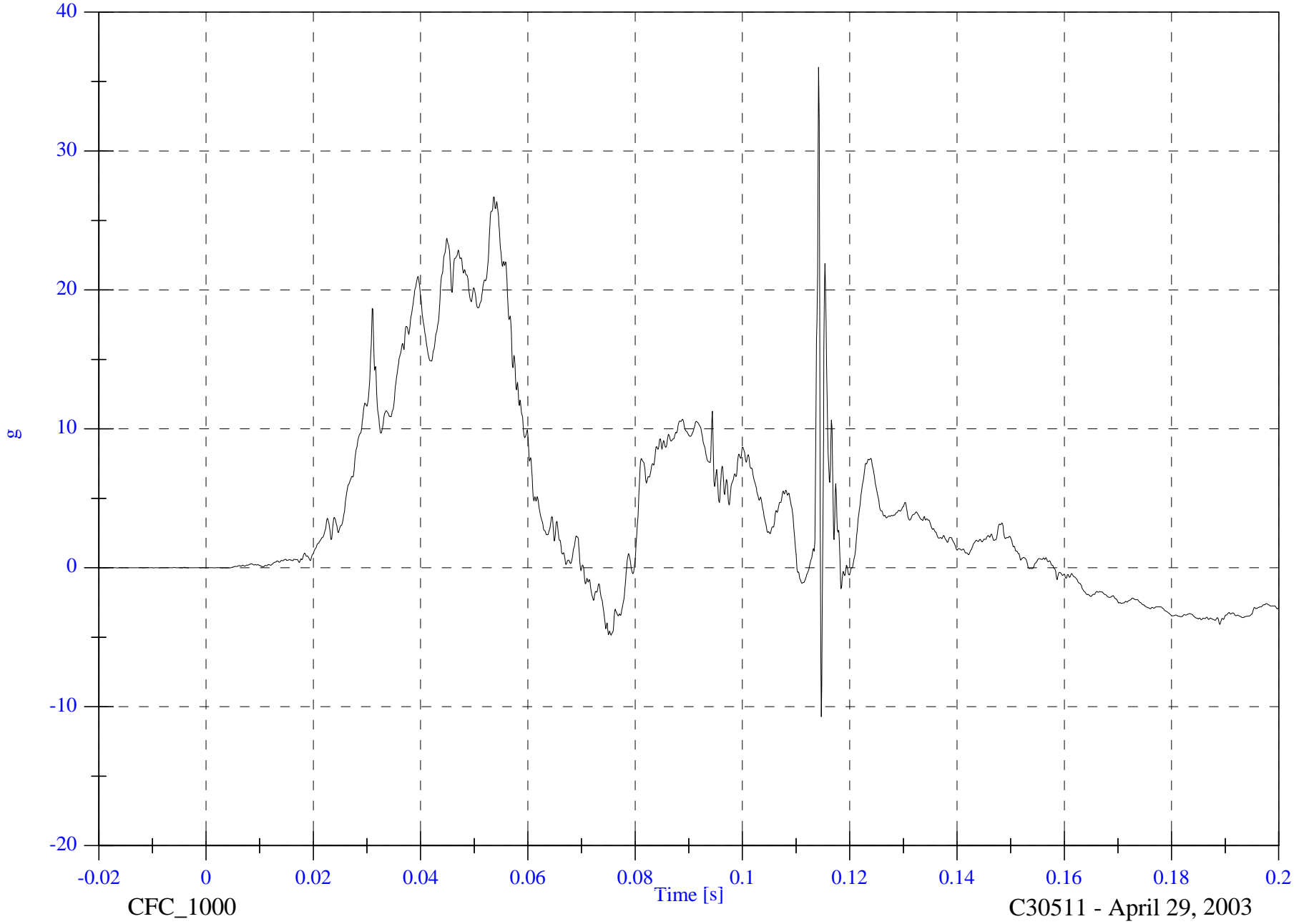
V2P4 Lower Rib y

Max: 36.0 [g] at 0.114 [s]

Min: -10.7 [g] at 0.115 [s]

B-71

8675-F214-07



C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

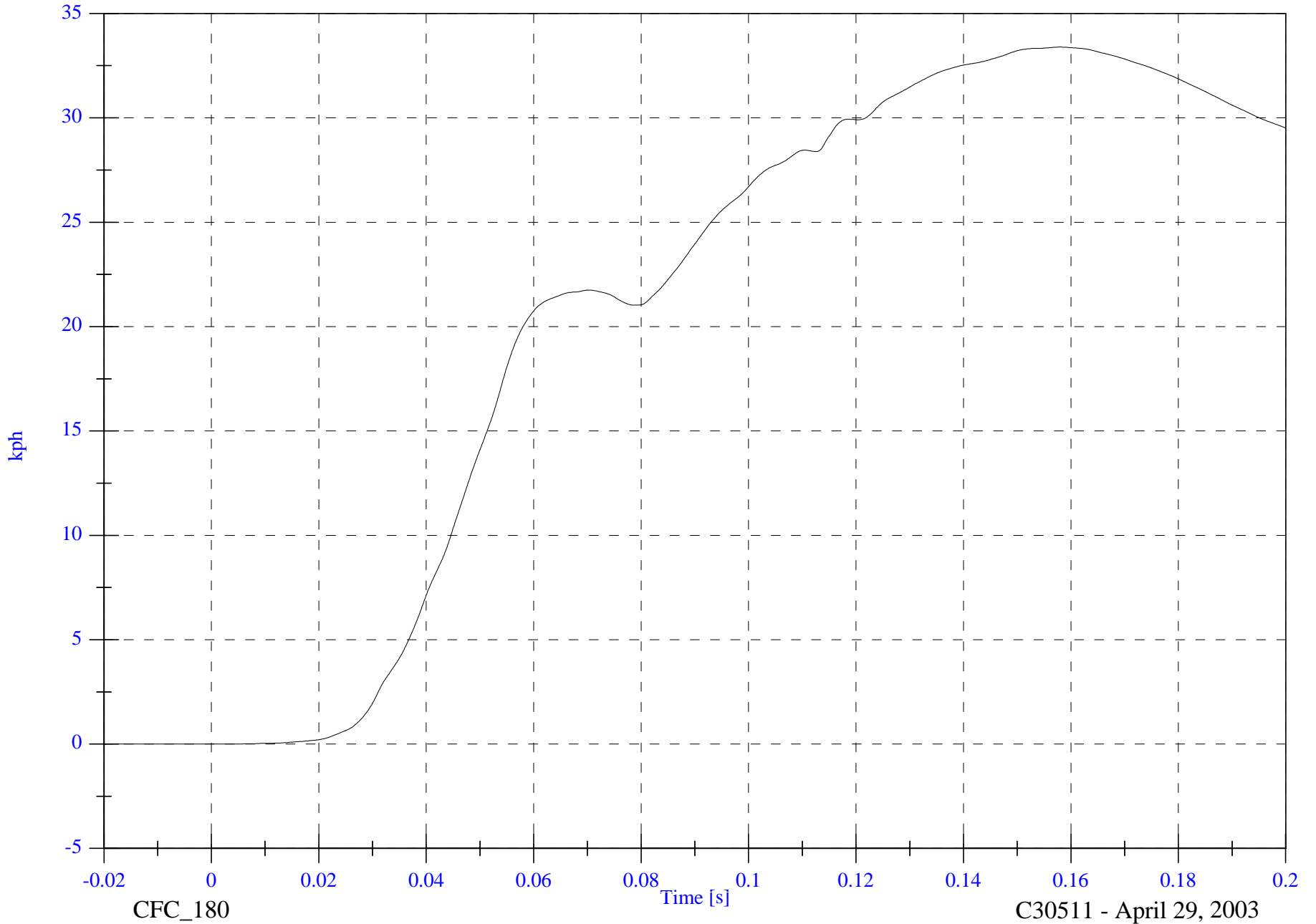
V2P4 Lower Rib y Velocity

Max: 33.4 [kph] at 0.158 [s]

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

B-72

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

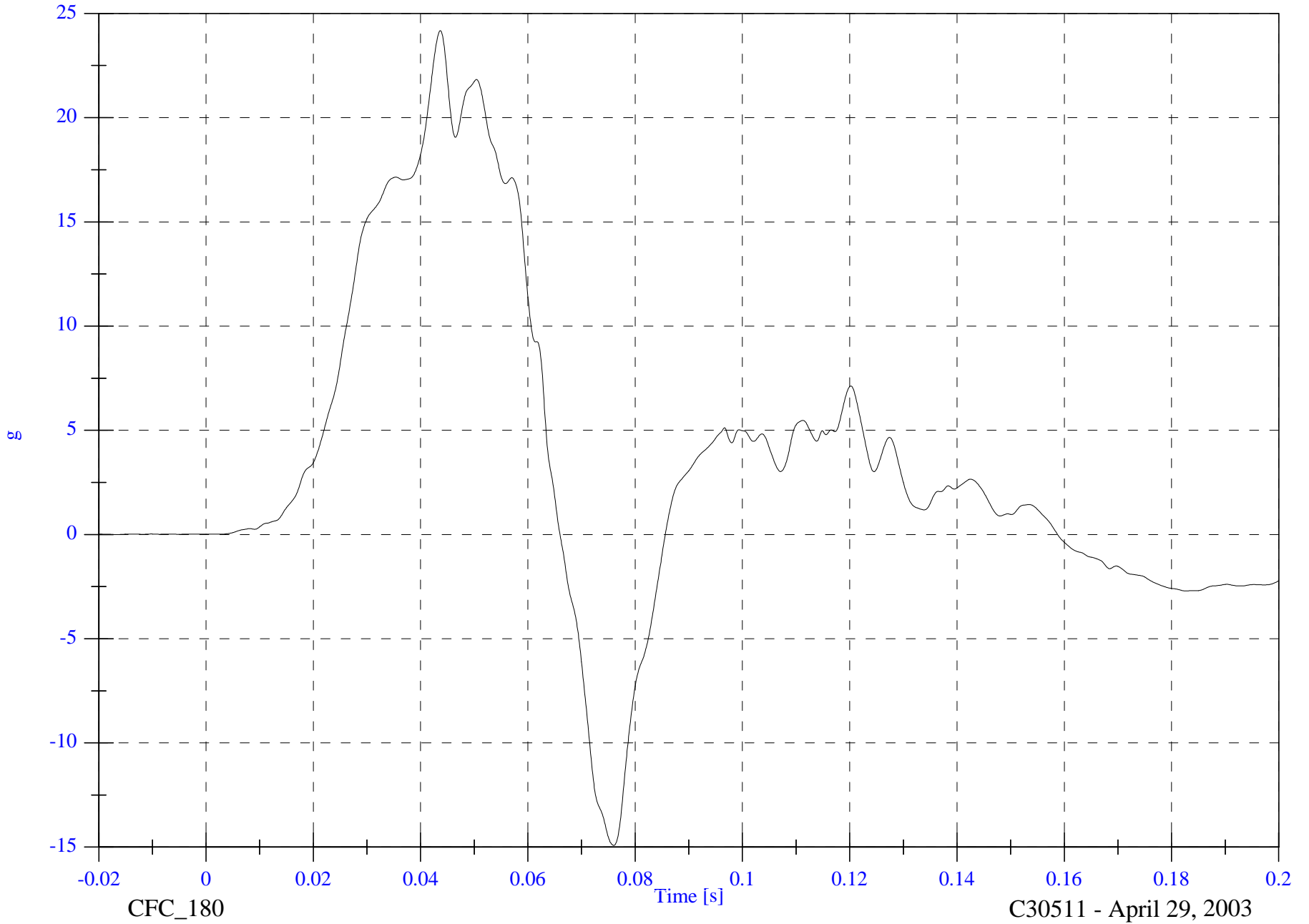
V2P4 Lower Spine y

Max: 24.2 [g] at 0.044 [s]

Min: -14.9 [g] at 0.076 [s]

B-73

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

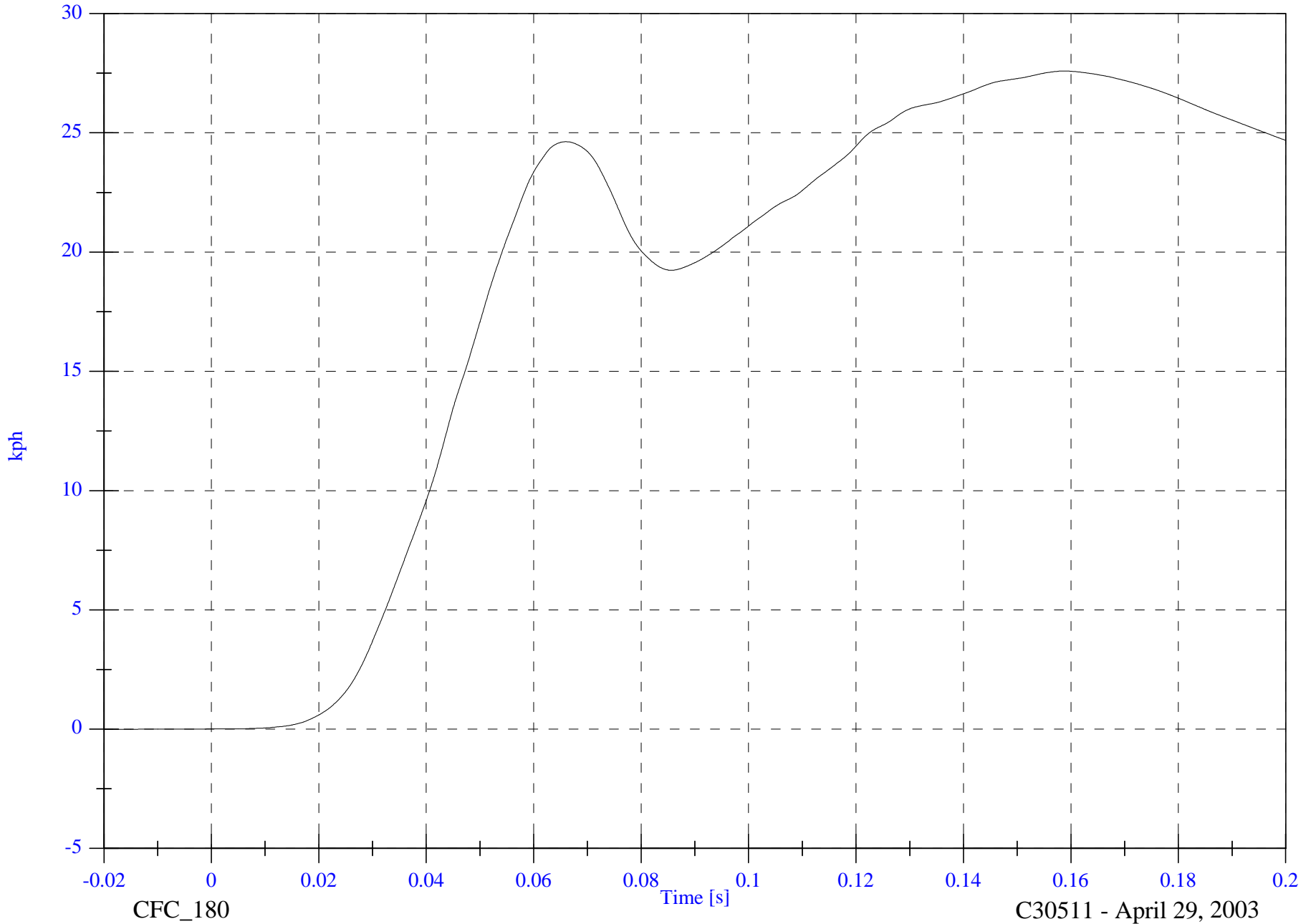
V2P4 Lower Spine y Velocity

Max: 27.6 [kph] at 0.159 [s]

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

B-74

8675-F214-07



CFC\_180

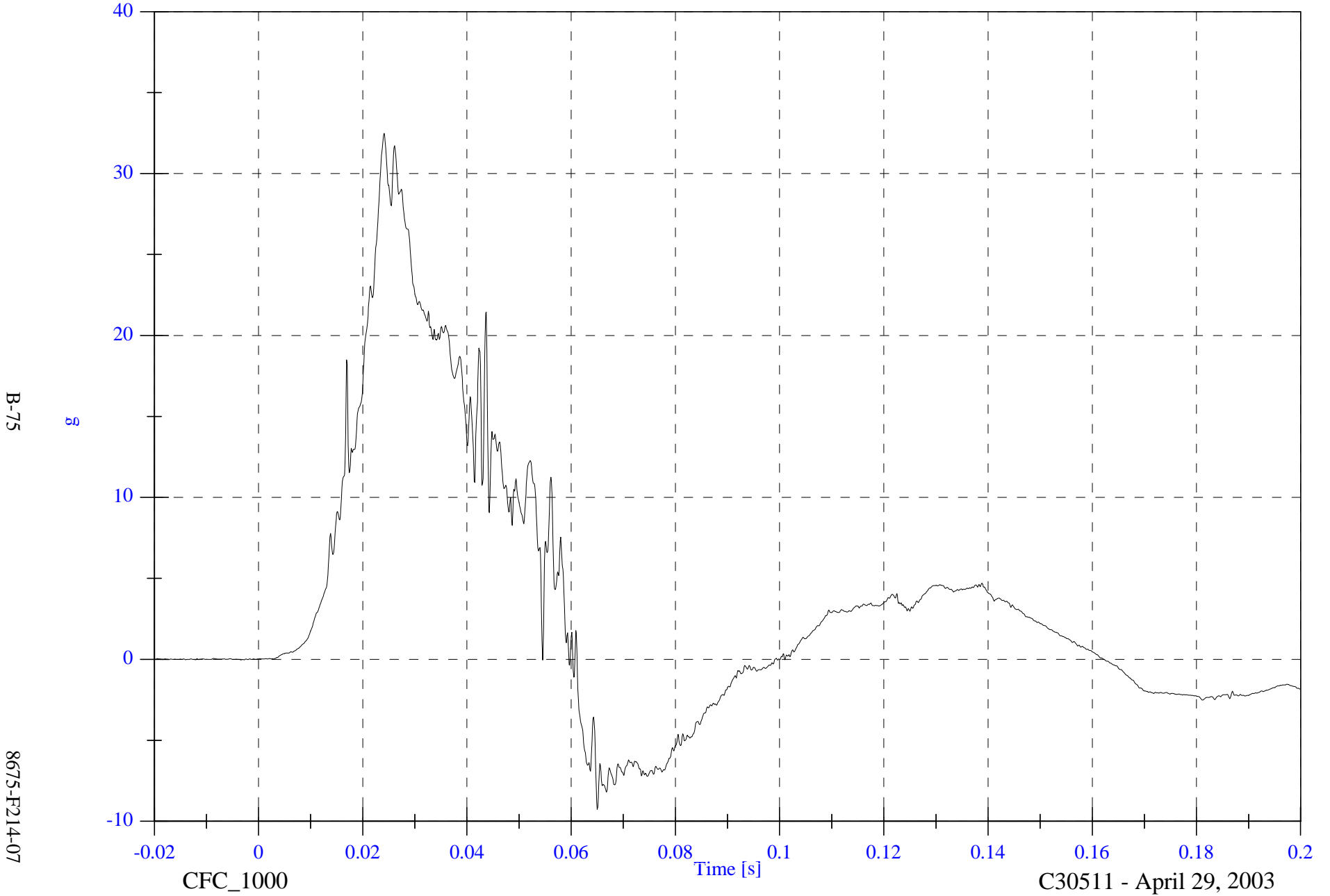
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Pelvic y

Max: 32.5 [g] at 0.024 [s]

Min: -9.3 [g] at 0.065 [s]



B-75

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FMVSS 214D Indicant - 2003 Kia Sorento

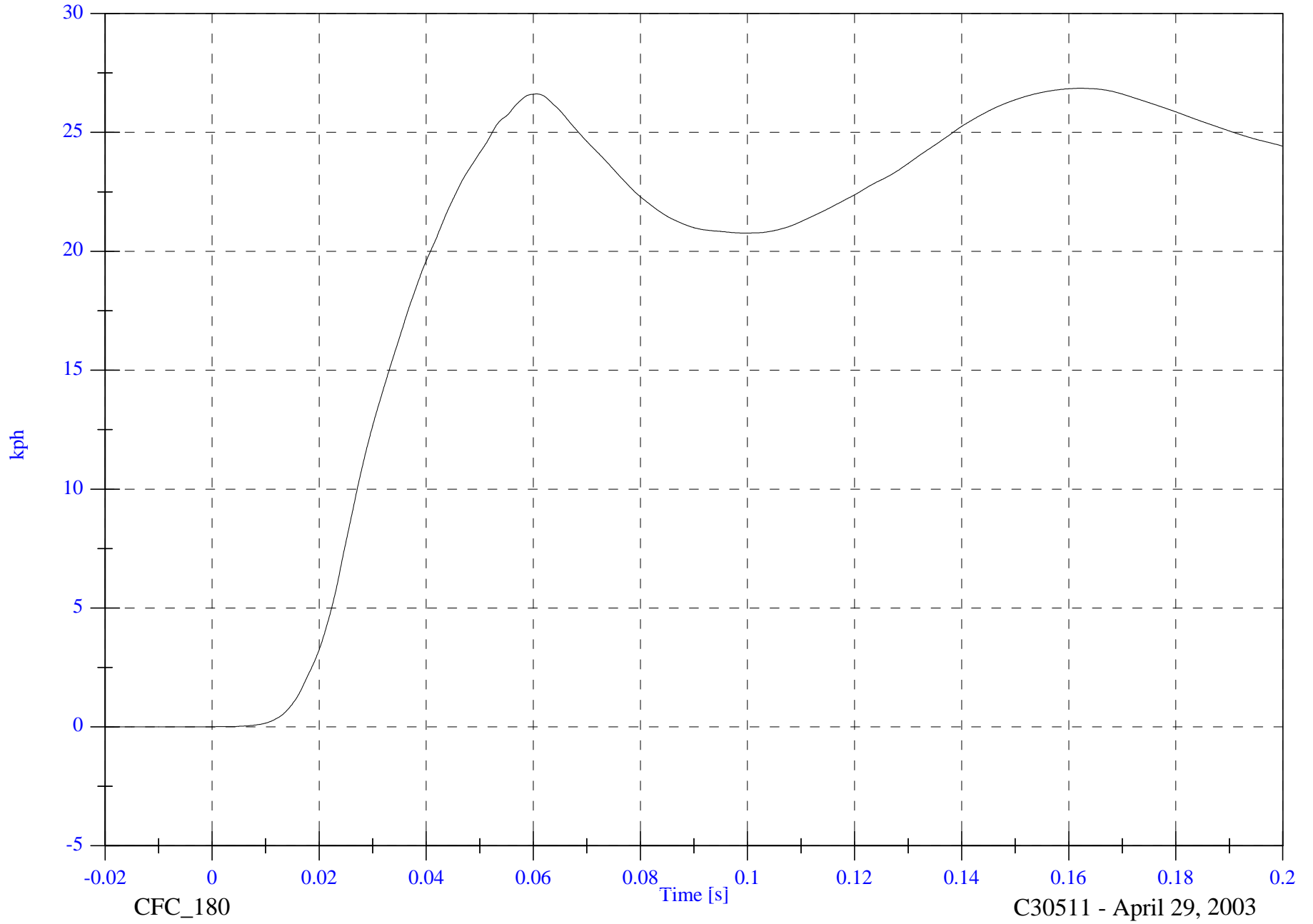
V2P4 Pelvic y Velocity

Max: 26.9 [kph] at 0.162 [s]

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

B-76

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

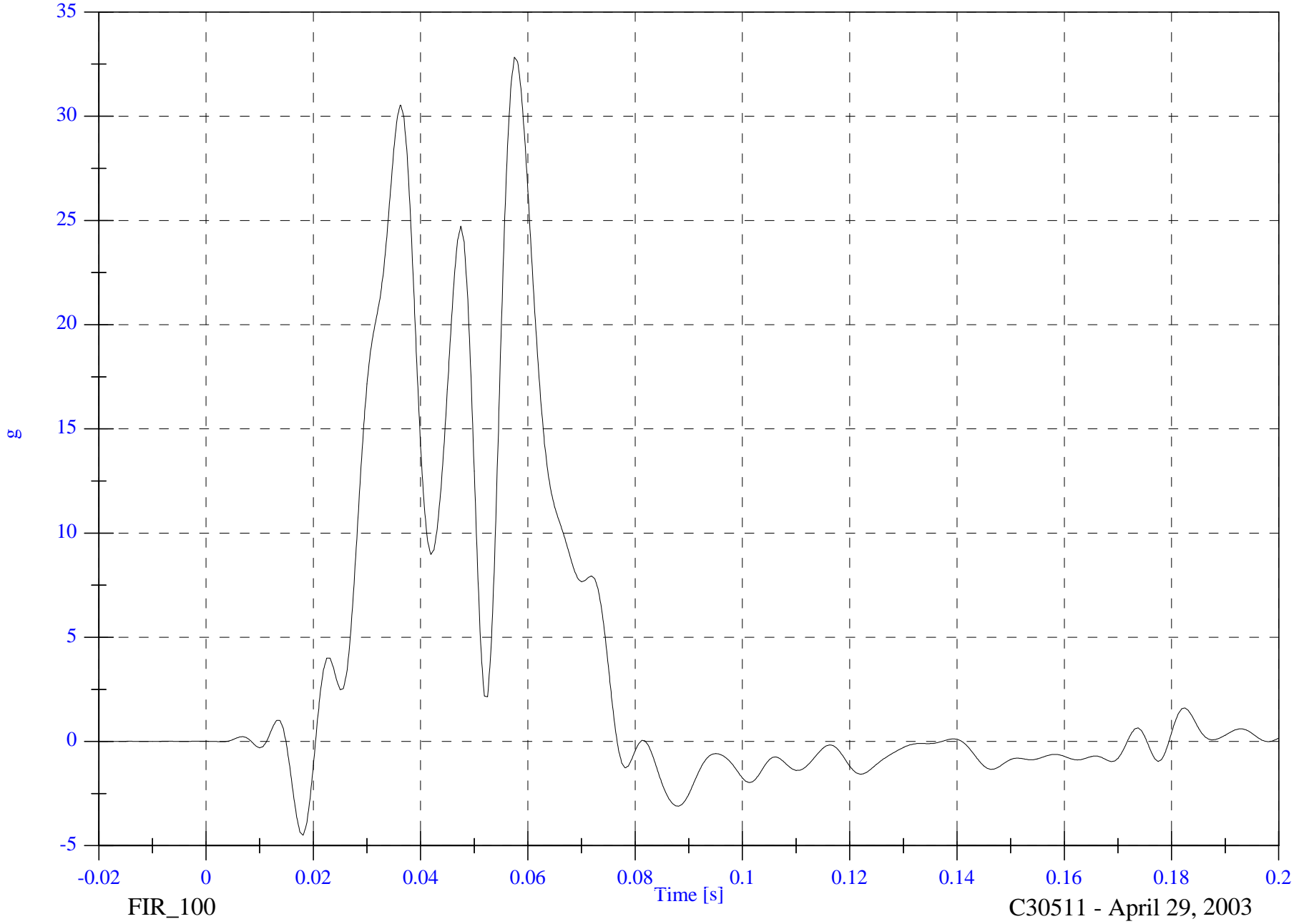
V2P1 Upper Rib y

Max: 32.8 [g] at 0.057 [s]

Min: -4.5 [g] at 0.018 [s]

B-77

8675-F214-07



FIR\_100

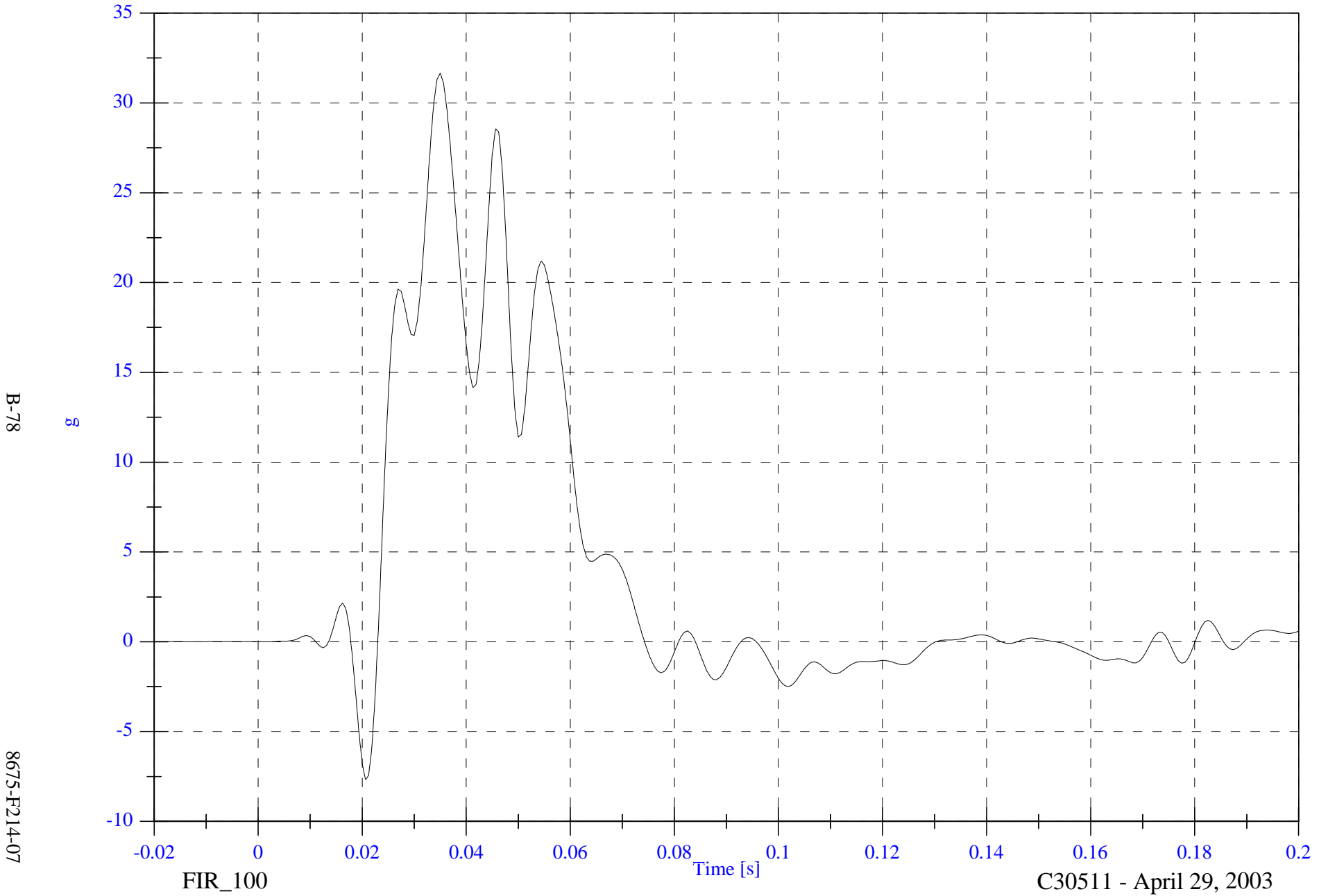
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Lower Rib y

Max: 31.7 [g] at 0.035 [s]

Min: -7.7 [g] at 0.021 [s]

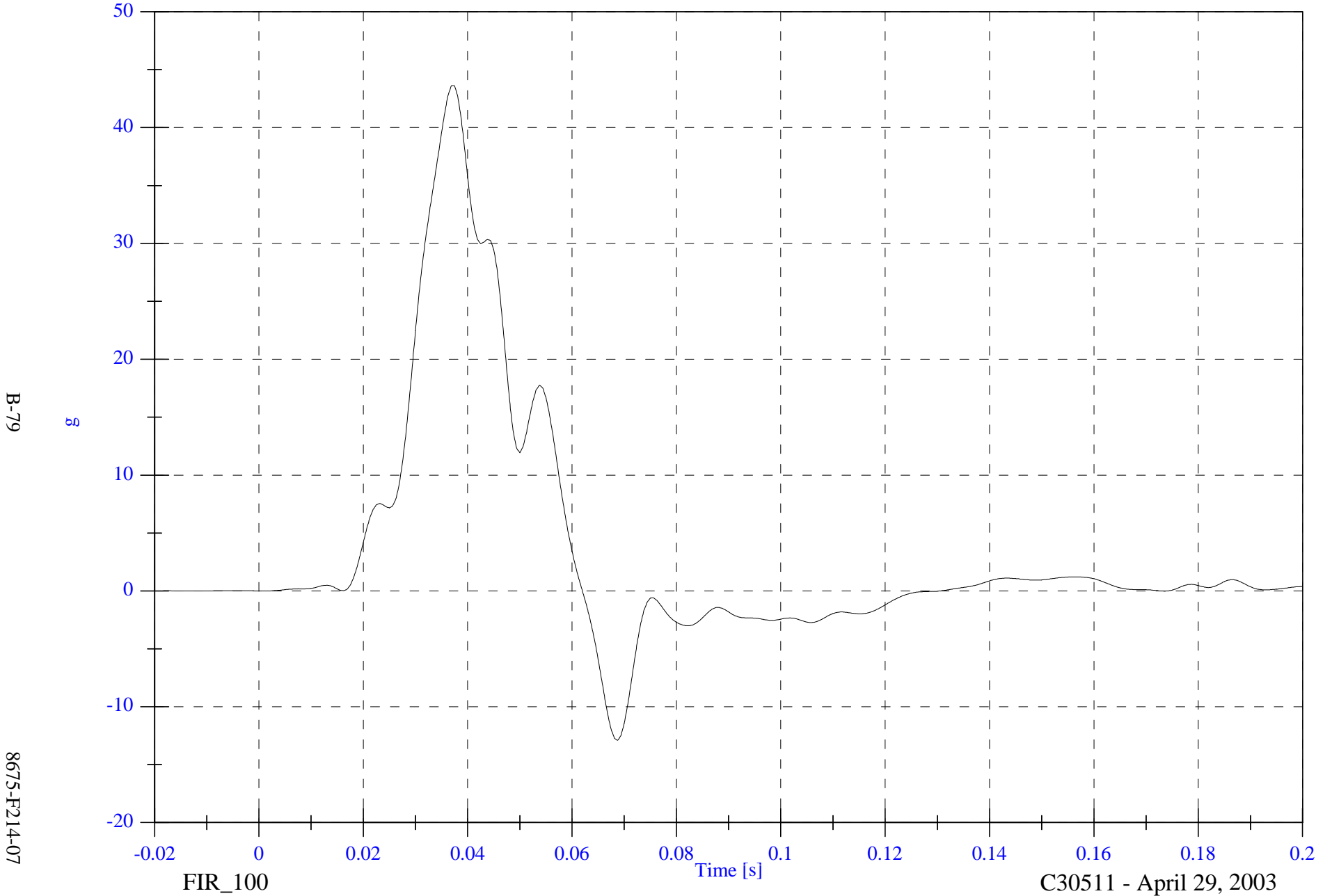


FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Lower Spine y

Max: 43.6 [g] at 0.037 [s]

Min: -12.9 [g] at 0.069 [s]



B-79

8675-F214-07

FIR\_100

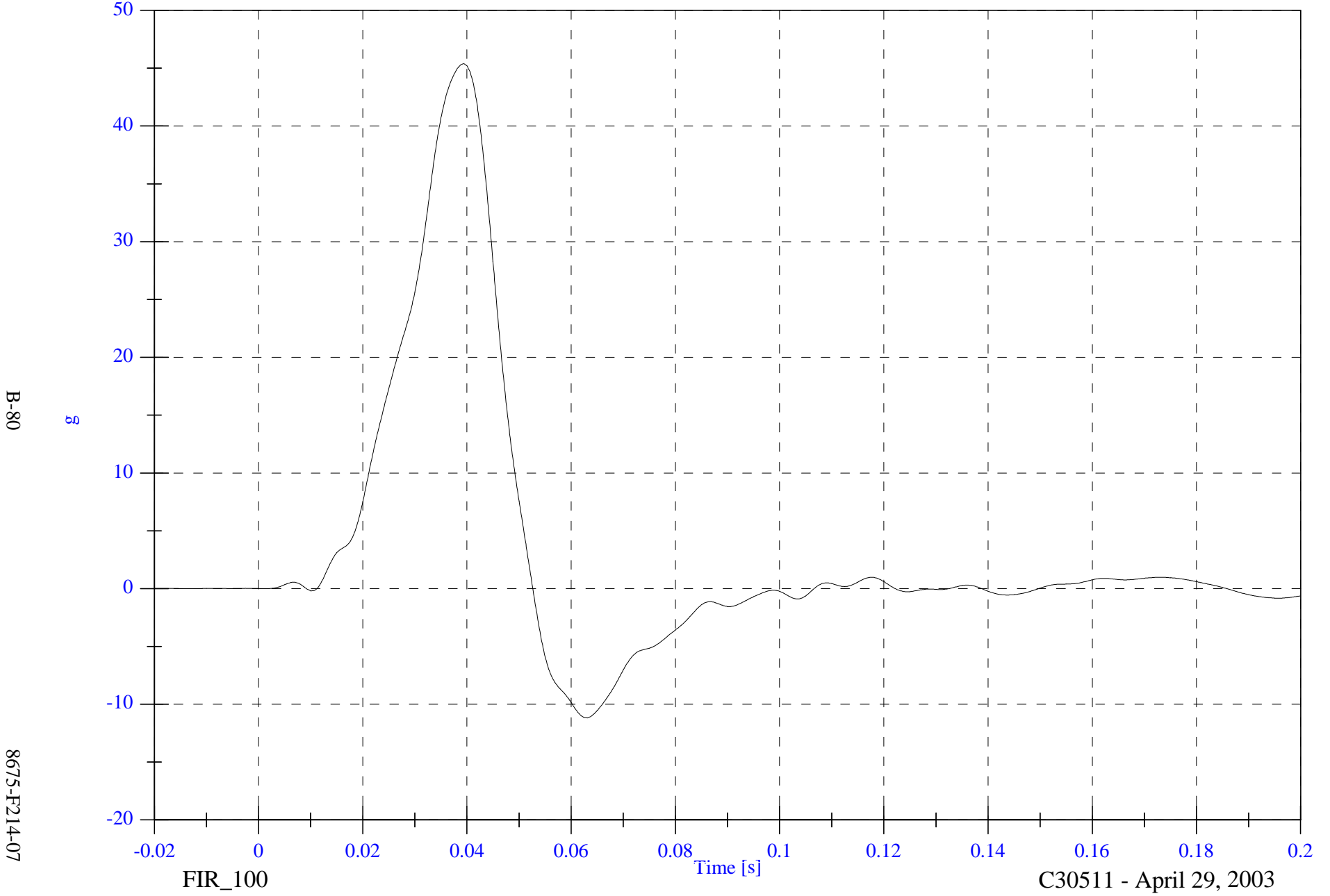
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Pelvic y

Max: 45.4 [g] at 0.039 [s]

Min: -11.2 [g] at 0.063 [s]



B-80

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FIR\_100

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FMVSS 214D Indicant - 2003 Kia Sorento

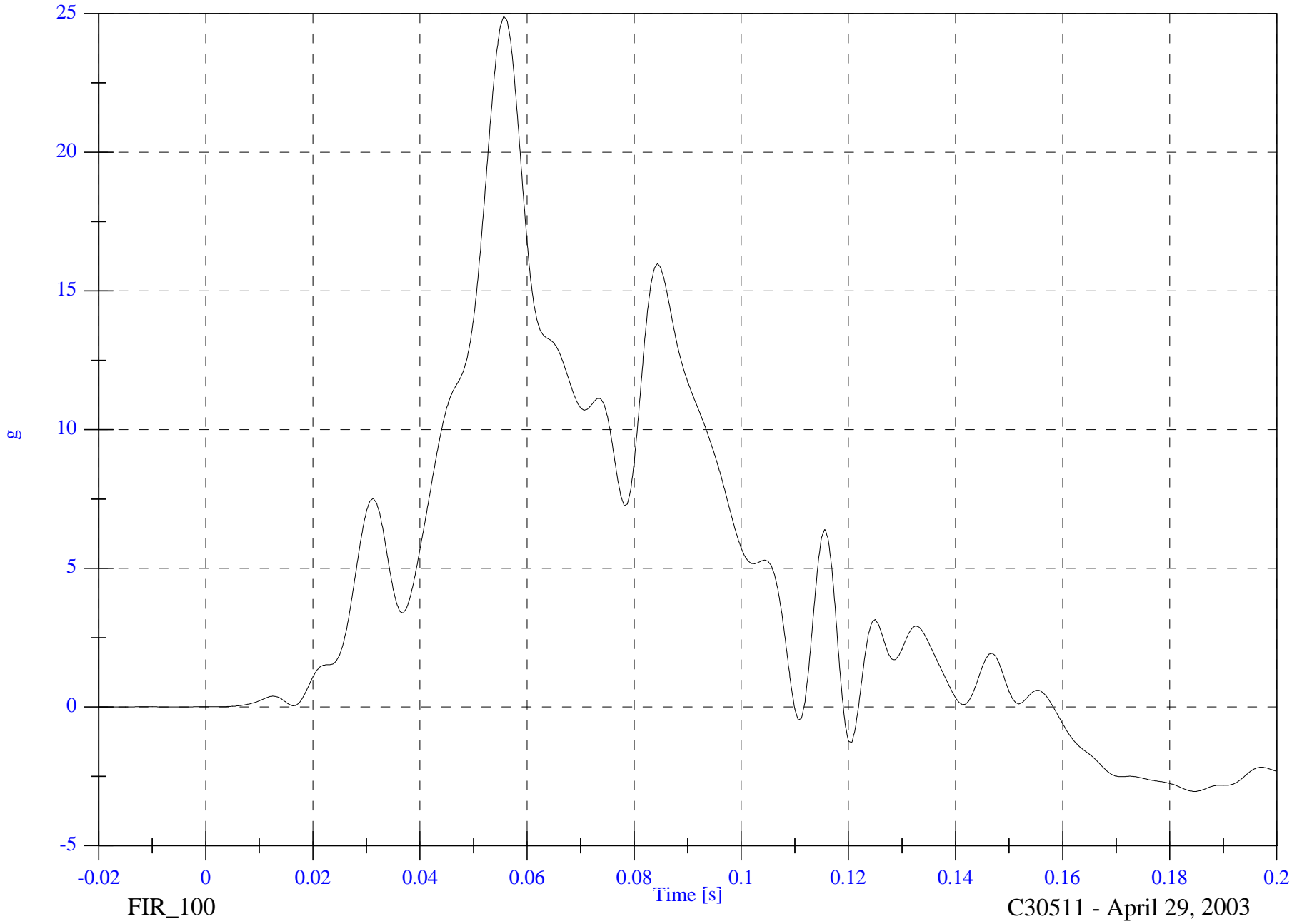
V2P4 Upper Rib y

Max: 24.9 [g] at 0.056 [s]

Min: -3.0 [g] at 0.184 [s]

B-81

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FMVSS 214D Indicant - 2003 Kia Sorento

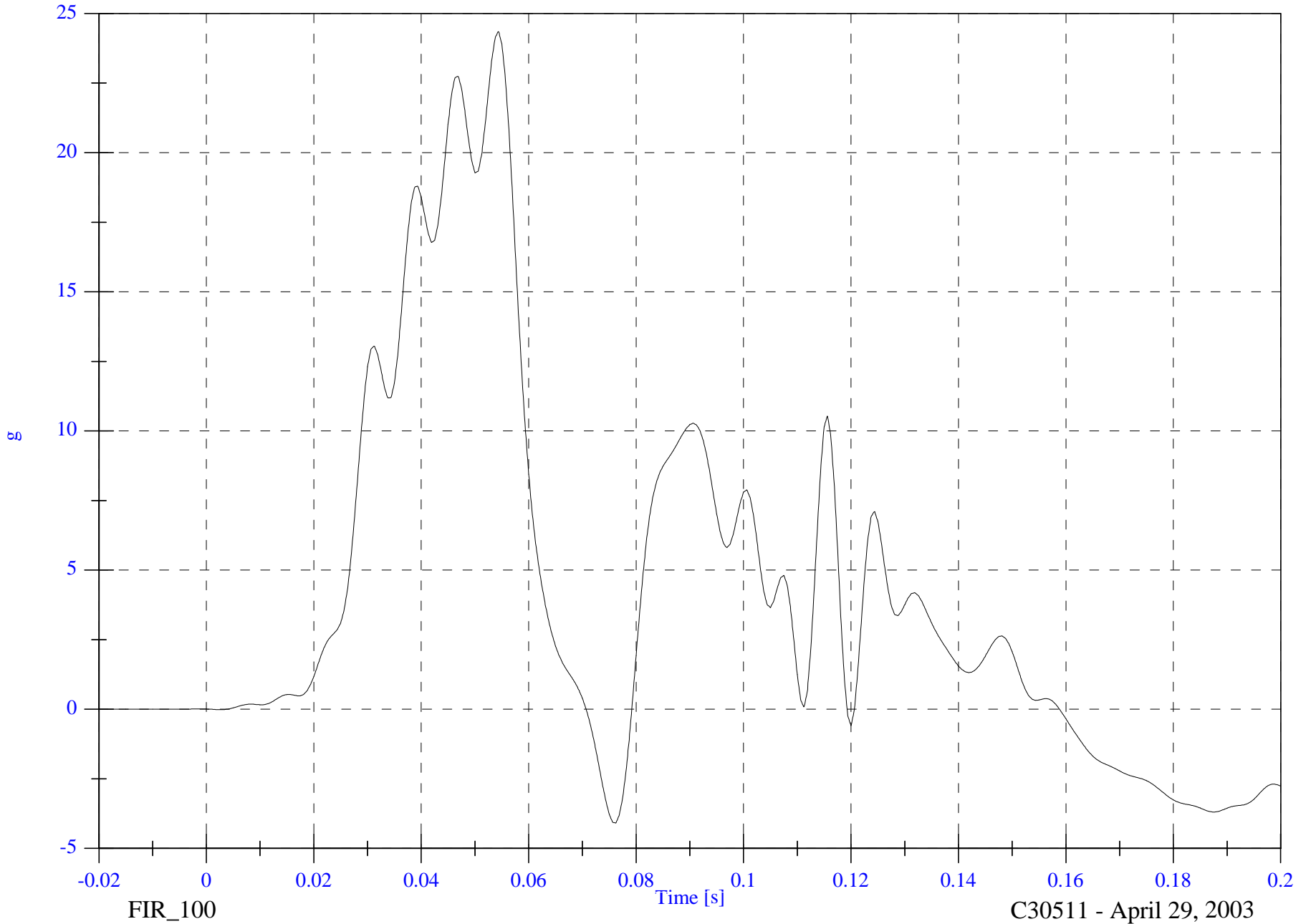
V2P4 Lower Rib y

Max: 24.4 [g] at 0.054 [s]

Min: -4.1 [g] at 0.076 [s]

B-82

8675-F214-07

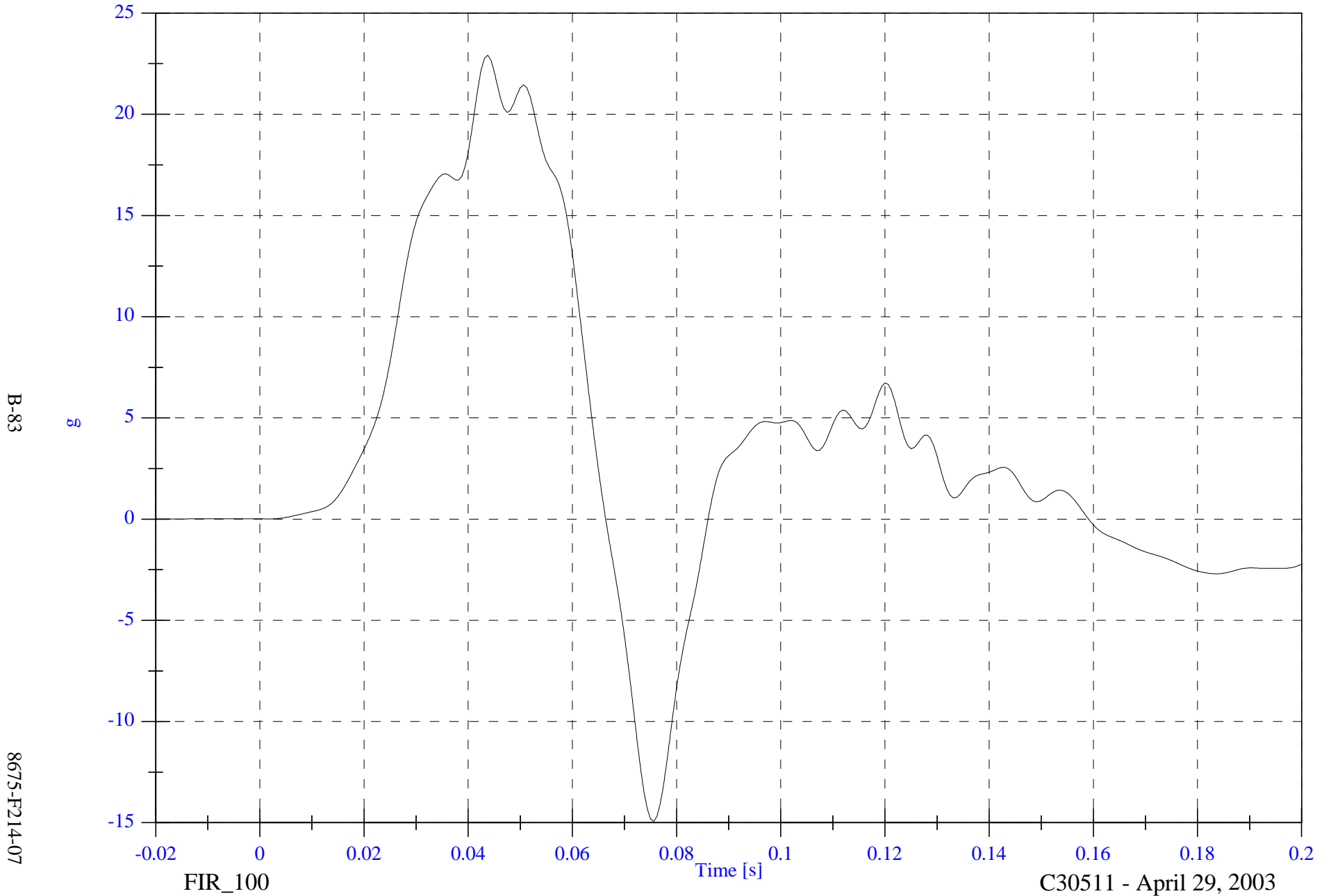


FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Lower Spine y

Max: 22.9 [g] at 0.044 [s]

Min: -14.9 [g] at 0.076 [s]



B-83

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FIR\_100

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FMVSS 214D Indicant - 2003 Kia Sorento

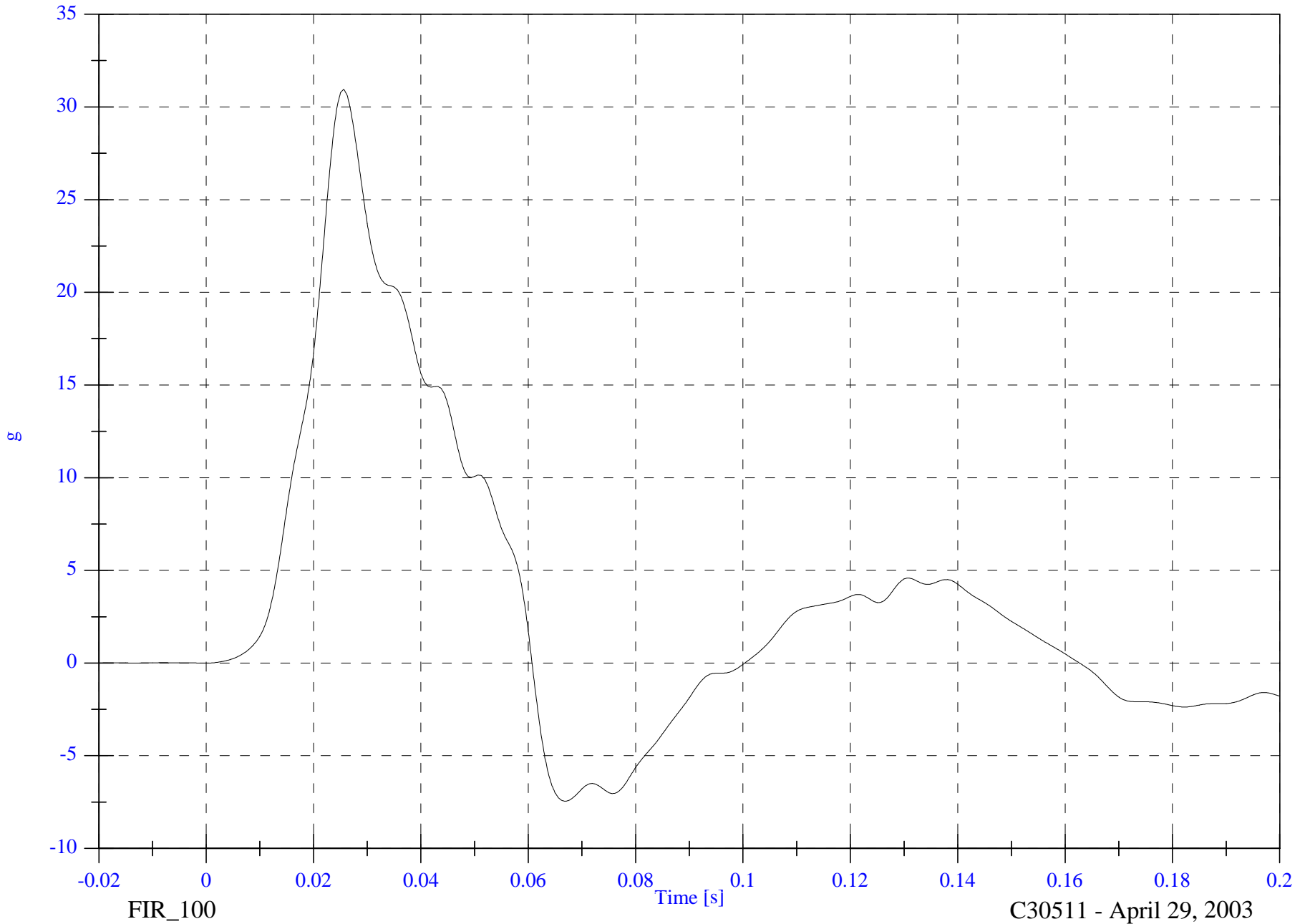
V2P4 Pelvic y

Max: 30.9 [g] at 0.026 [s]

Min: -7.5 [g] at 0.067 [s]

B-84

8675-F214-07

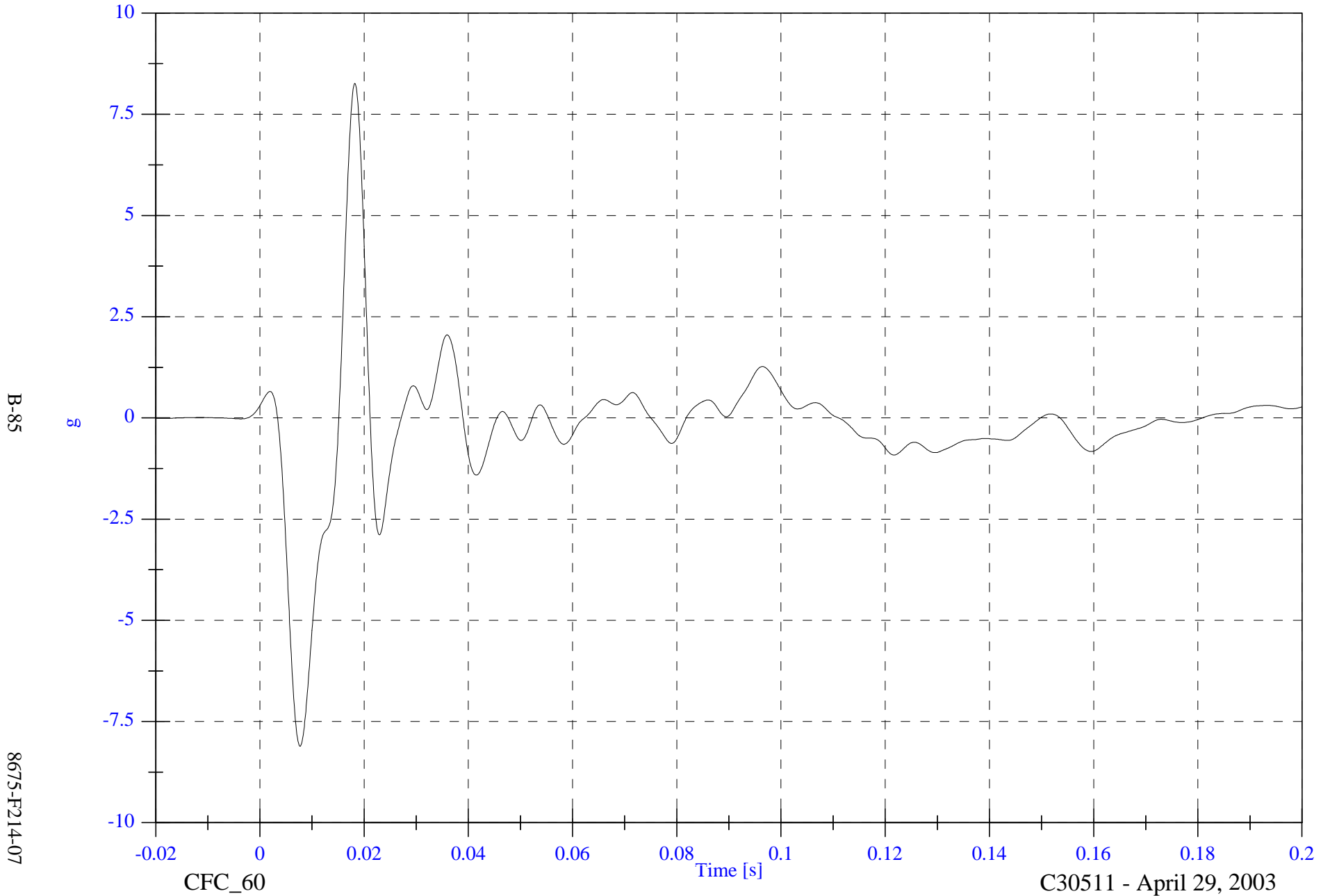


FMVSS 214D Indicant - 2003 Kia Sorento

V2 A1 Right Front Sill x

Max: 8.3 [g] at 0.018 [s]

Min: -8.1 [g] at 0.008 [s]



B-85

8675-F214-07

CFC\_60

Time [s]

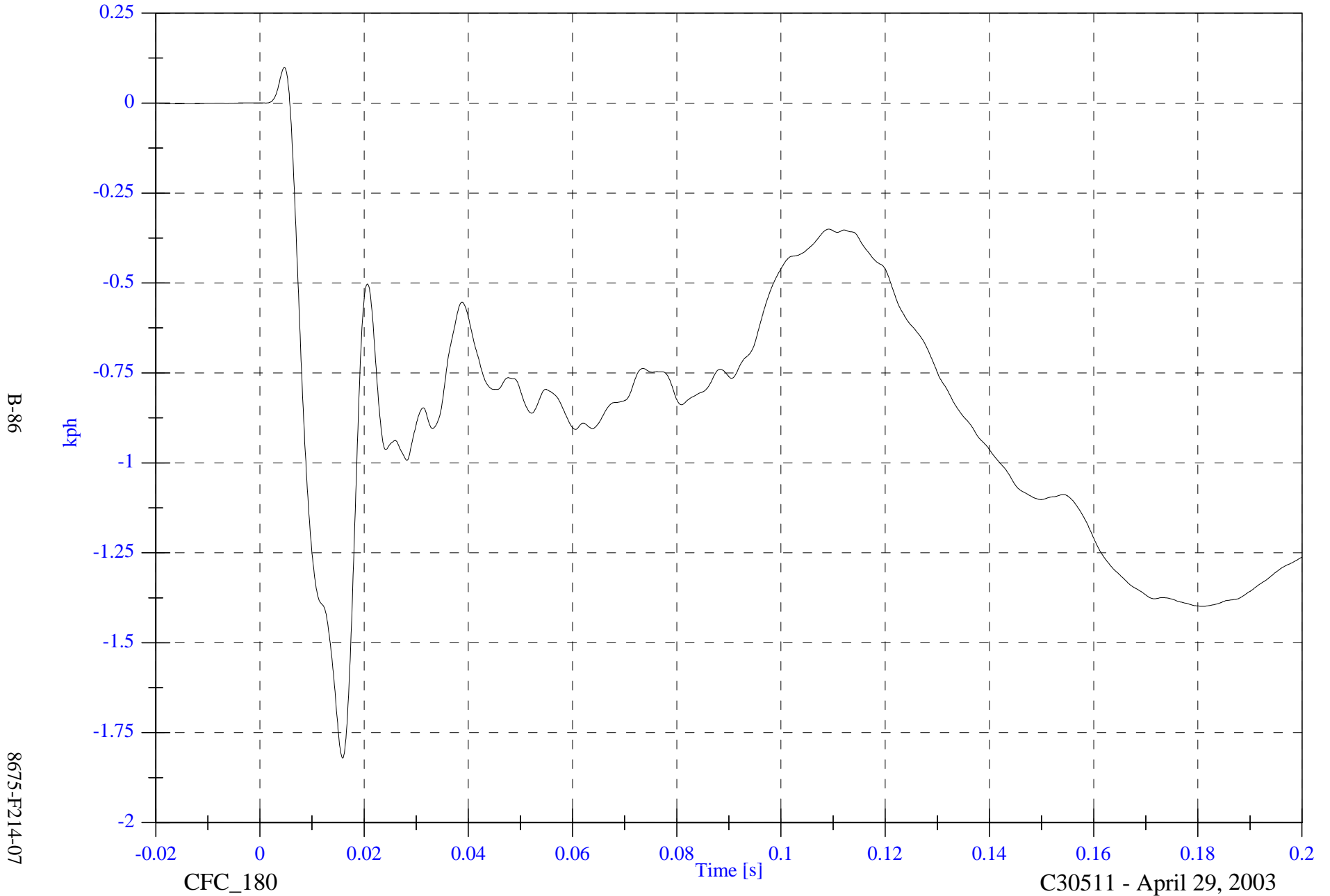
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2 A1 Right Front Sill x Velocity

Max: 0.1 [kph] at 0.005 [s]

Min: -1.8 [kph] at 0.016 [s]



B-86

8675-F214-07

CFC\_180

Time [s]

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

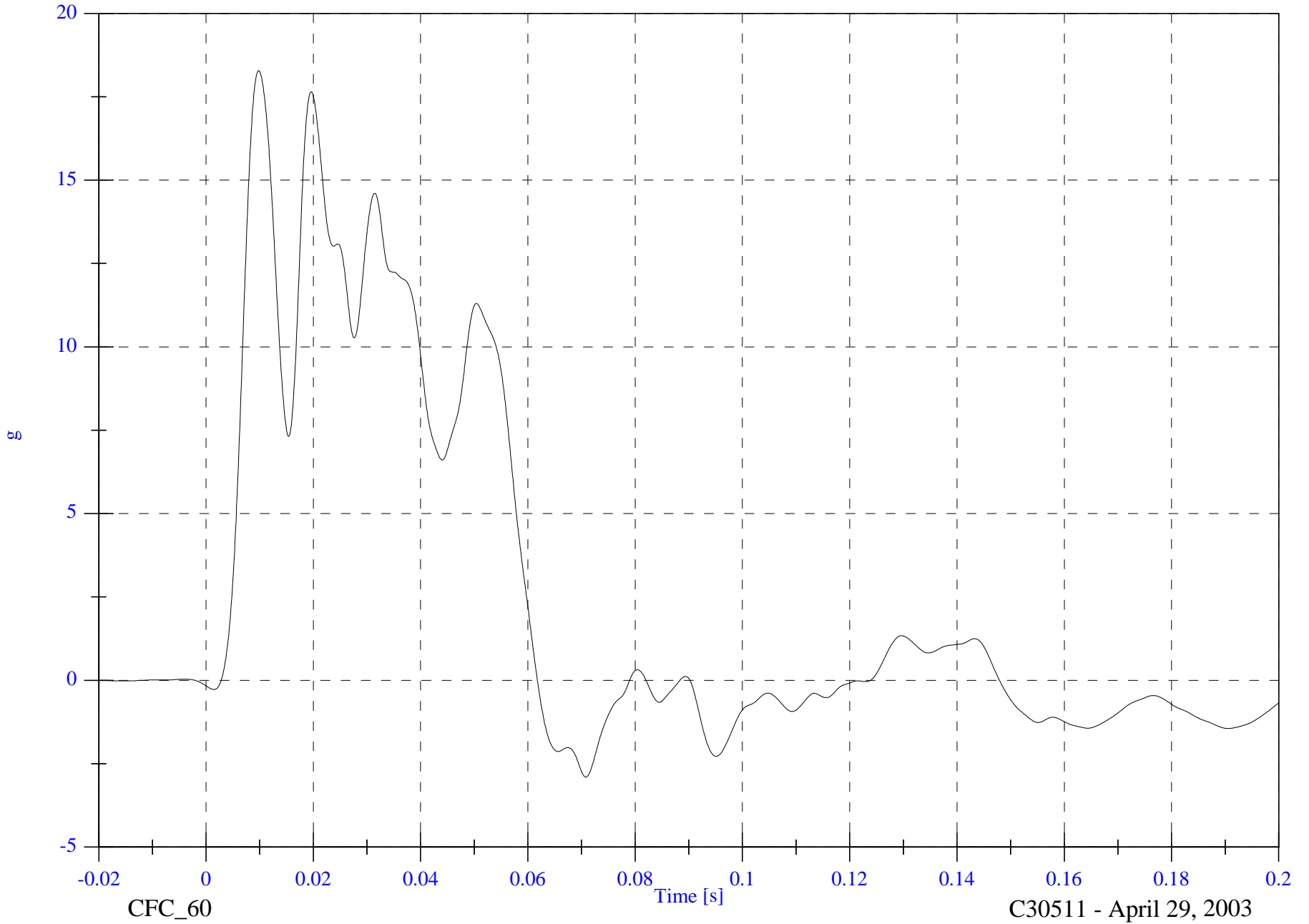
V2 A1 Right Front Sill y

Max: 18.3 [g] at 0.010 [s]

Min: -2.9 [g] at 0.071 [s]

B-87

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CFC\_60

Time [s]

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

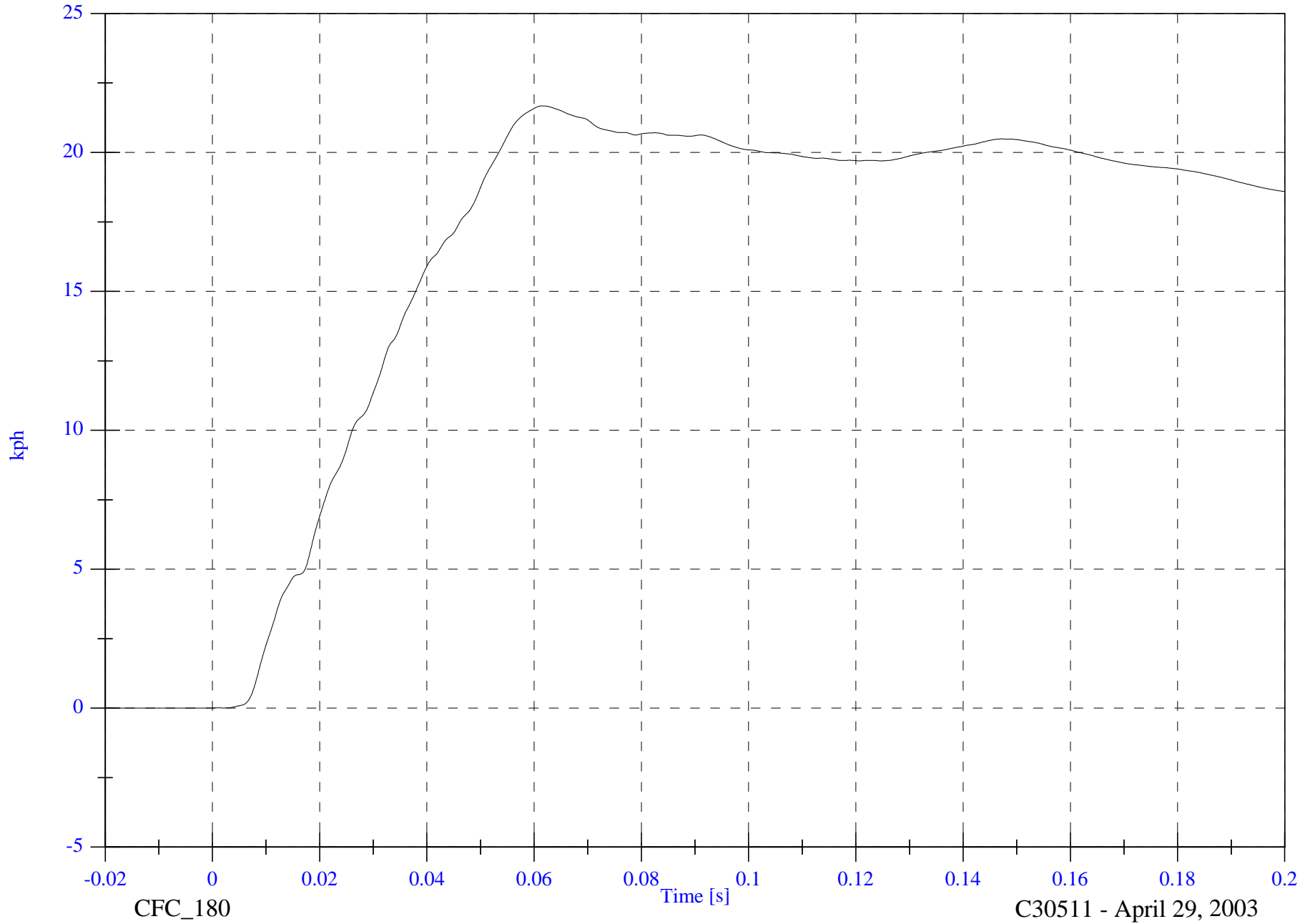
V2 A1 Right Front Sill y Velocity

Max: 21.7 [kph] at 0.062 [s]

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

B-88

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FMVSS 214D Indicant - 2003 Kia Sorento

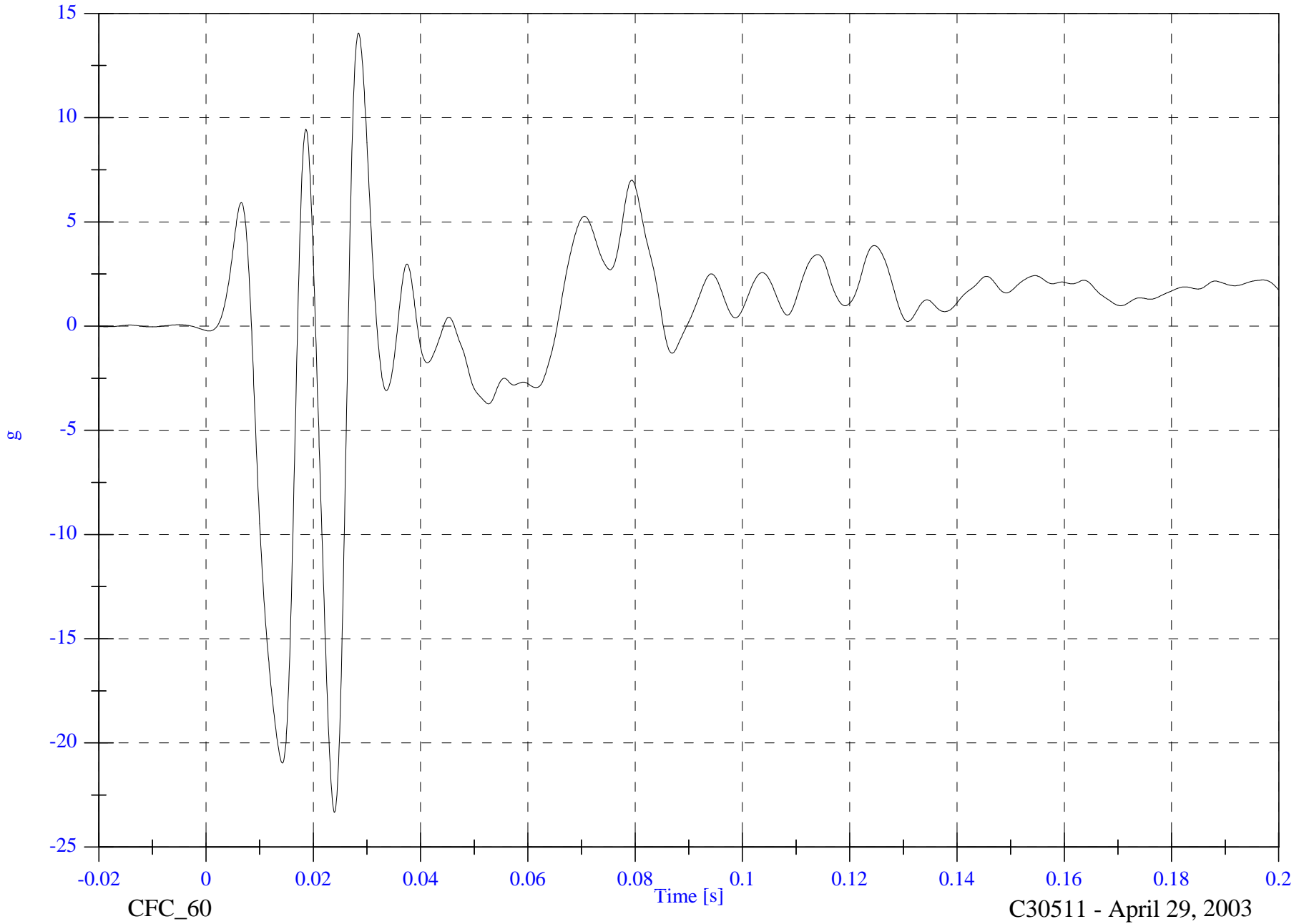
V2 A1 Right Front Sill z

Max: 14.1 [g] at 0.028 [s]

Min: -23.3 [g] at 0.024 [s]

B-89

8675-F214-07



CFC\_60

Time [s]

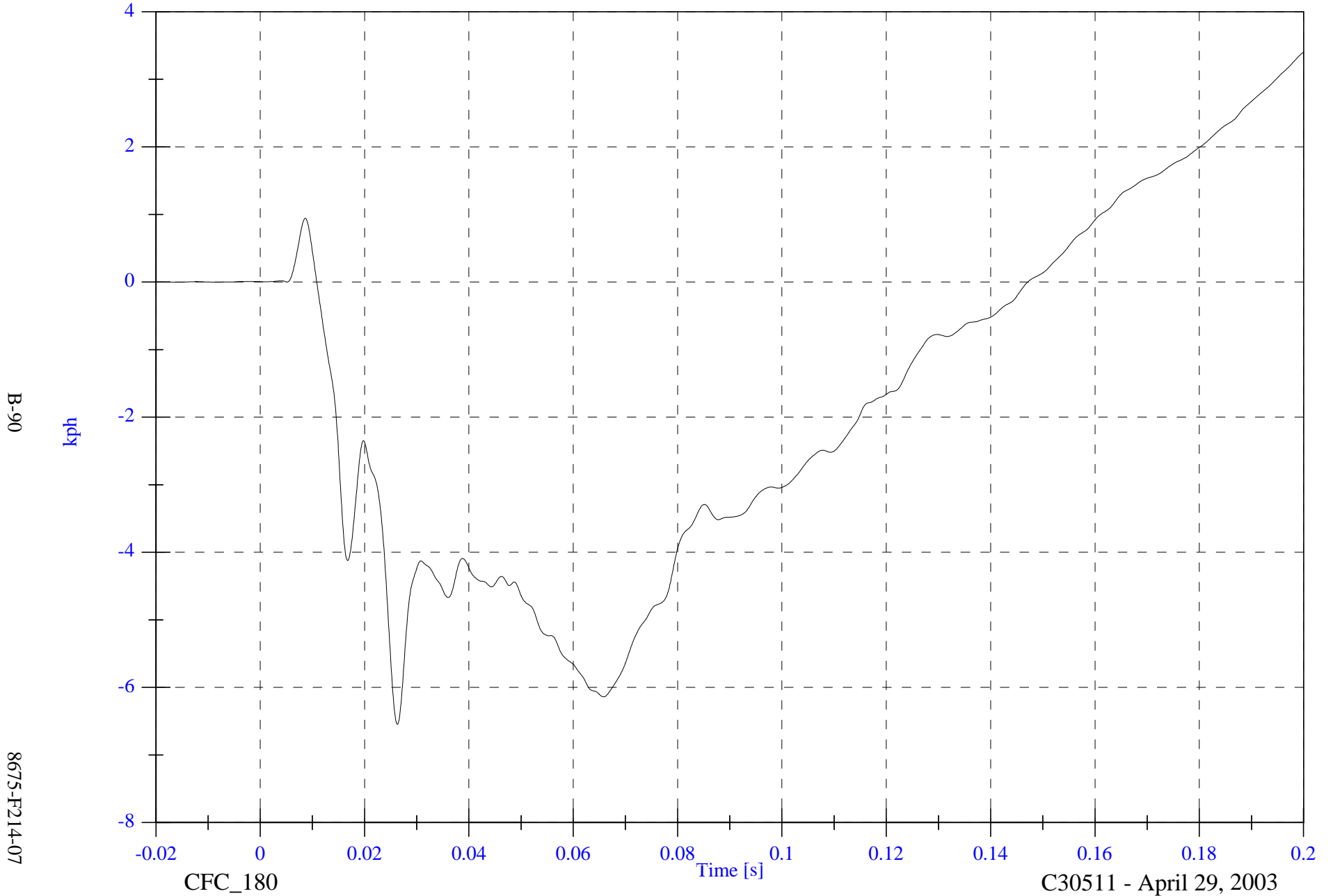
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2 A1 Right Front Sill z Velocity

Max: 3.4 [kph] at 0.200 [s]

Min: -6.5 [kph] at 0.026 [s]



B-90

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

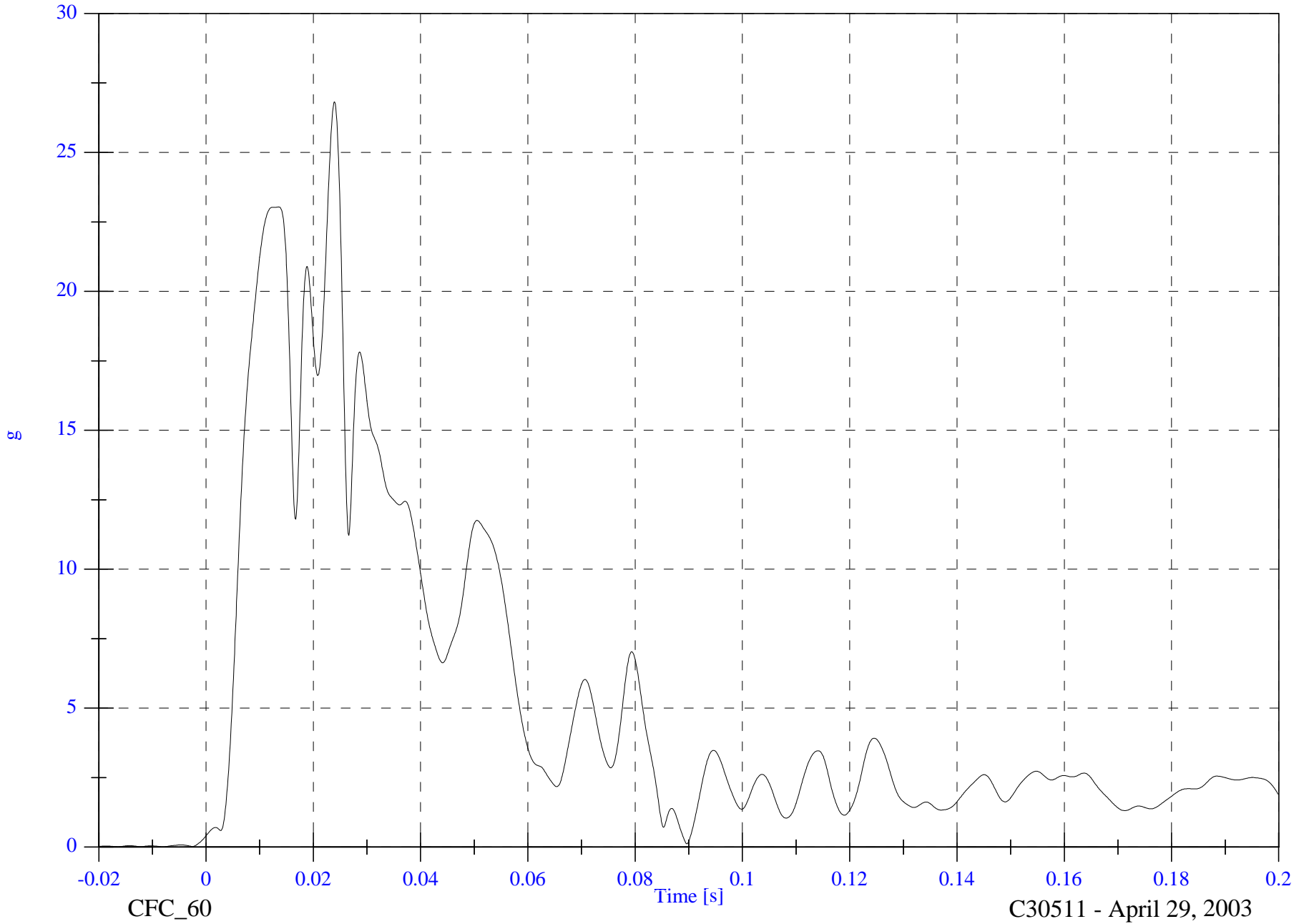
V2 A1 Right Front Sill Resultant

Max: 26.8 [g] at 0.024 [s]

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

B-91

8675-F214-07



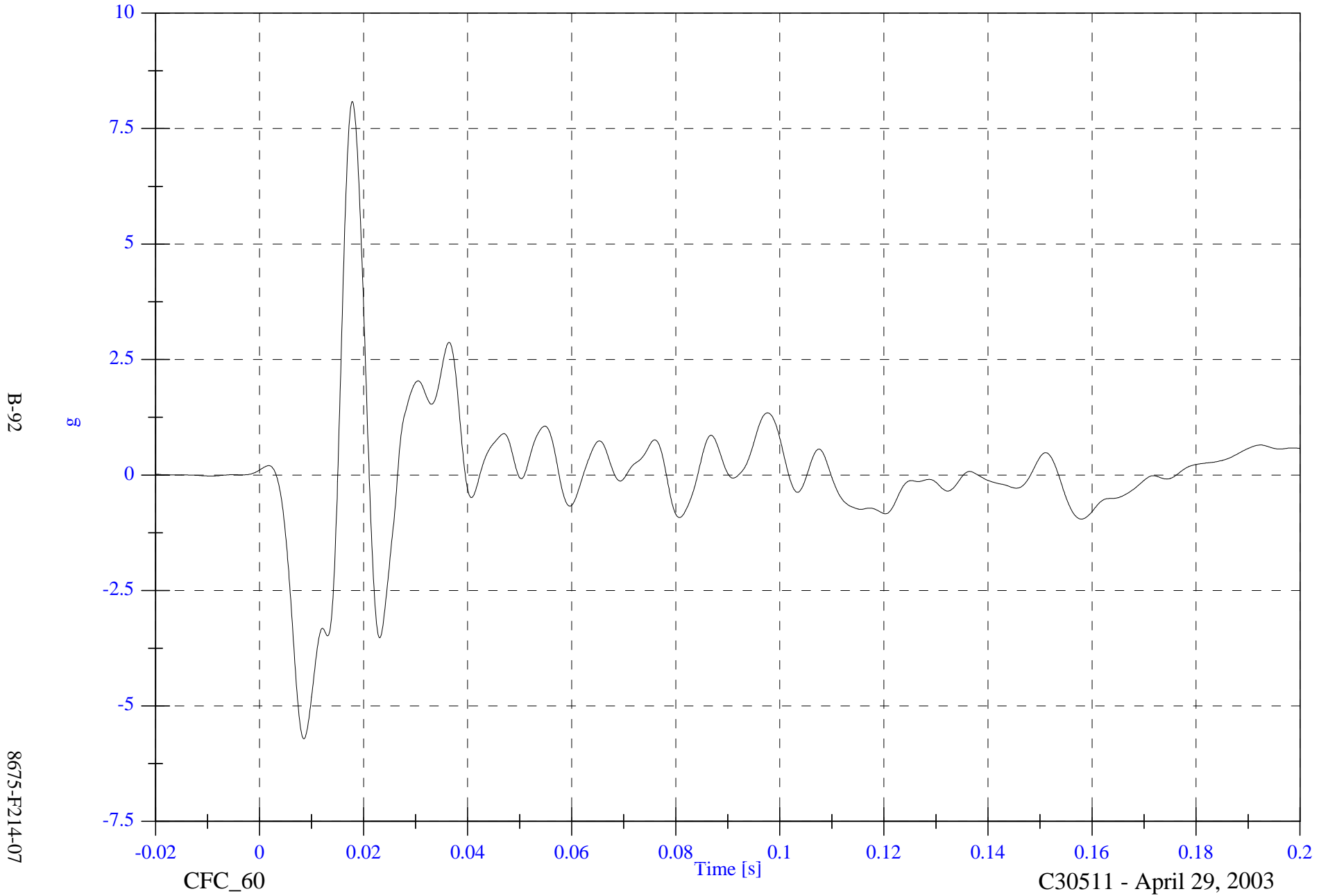
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2 A2 Right Rear Sill x

Max: 8.1 [g] at 0.018 [s]

Min: -5.7 [g] at 0.008 [s]



FMVSS 214D Indicant - 2003 Kia Sorento

V2 A2 Right Rear Sill x Velocity

Max: 0.8 [kph] at 0.109 [s]

Min: -1.5 [kph] at 0.015 [s]

B-93

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

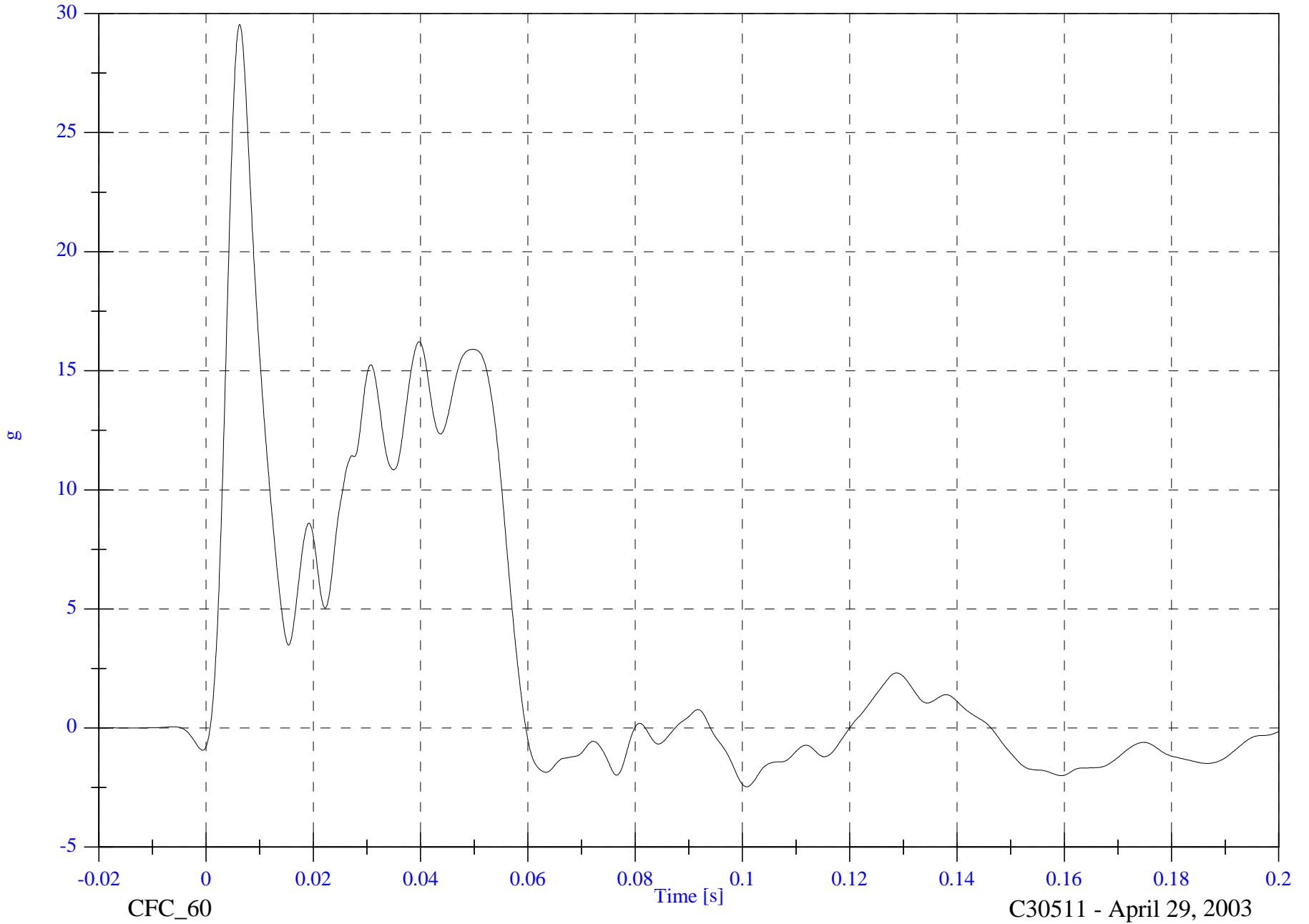
V2 A2 Right Rear Sill y

Max: 29.5 [g] at 0.006 [s]

Min: -2.5 [g] at 0.101 [s]

B-94

8675-F214-07

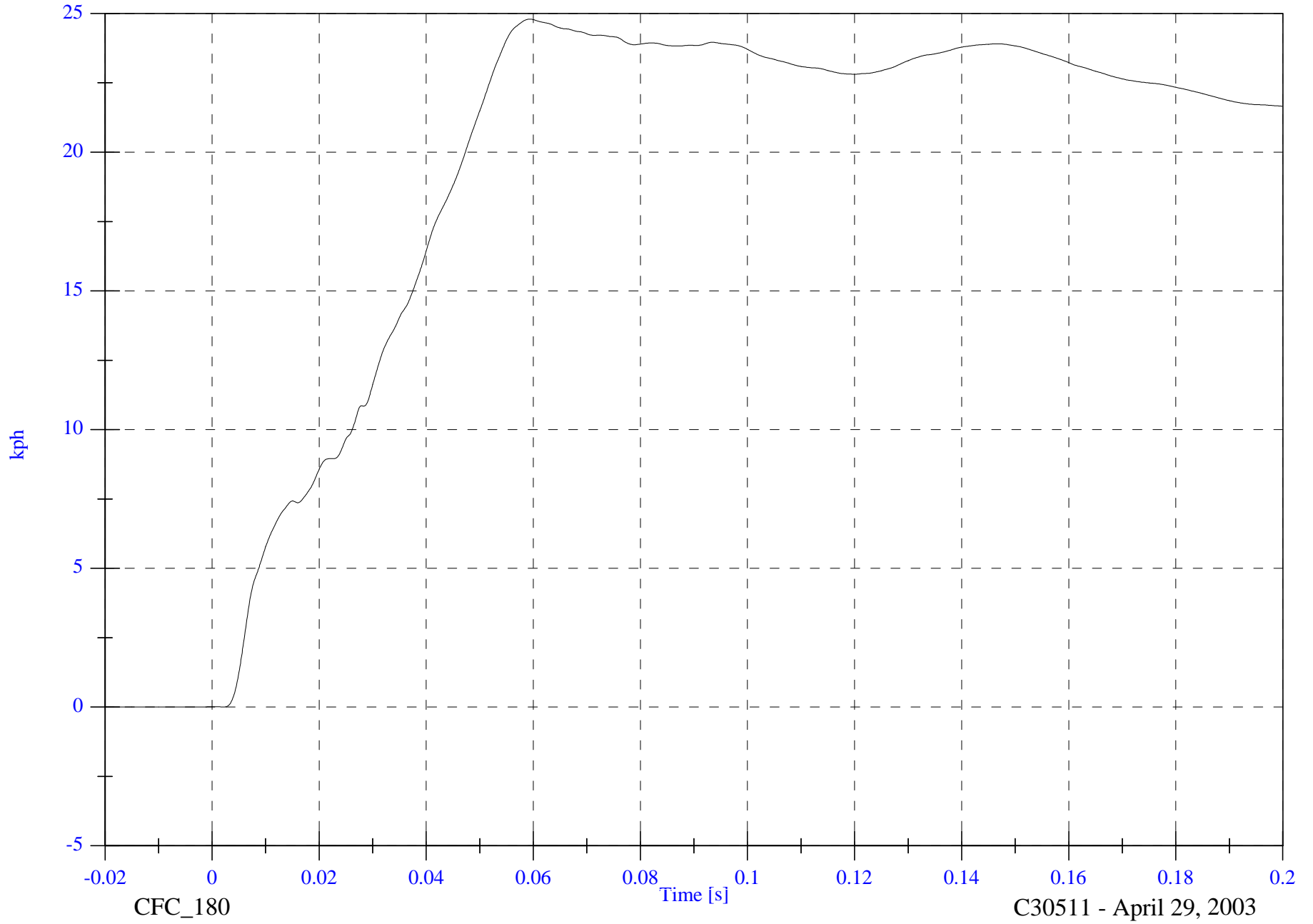


FMVSS 214D Indicant - 2003 Kia Sorento

Max: 24.8 [kph] at 0.059 [s]

V2 A2 Right Rear Sill y Velocity

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



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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

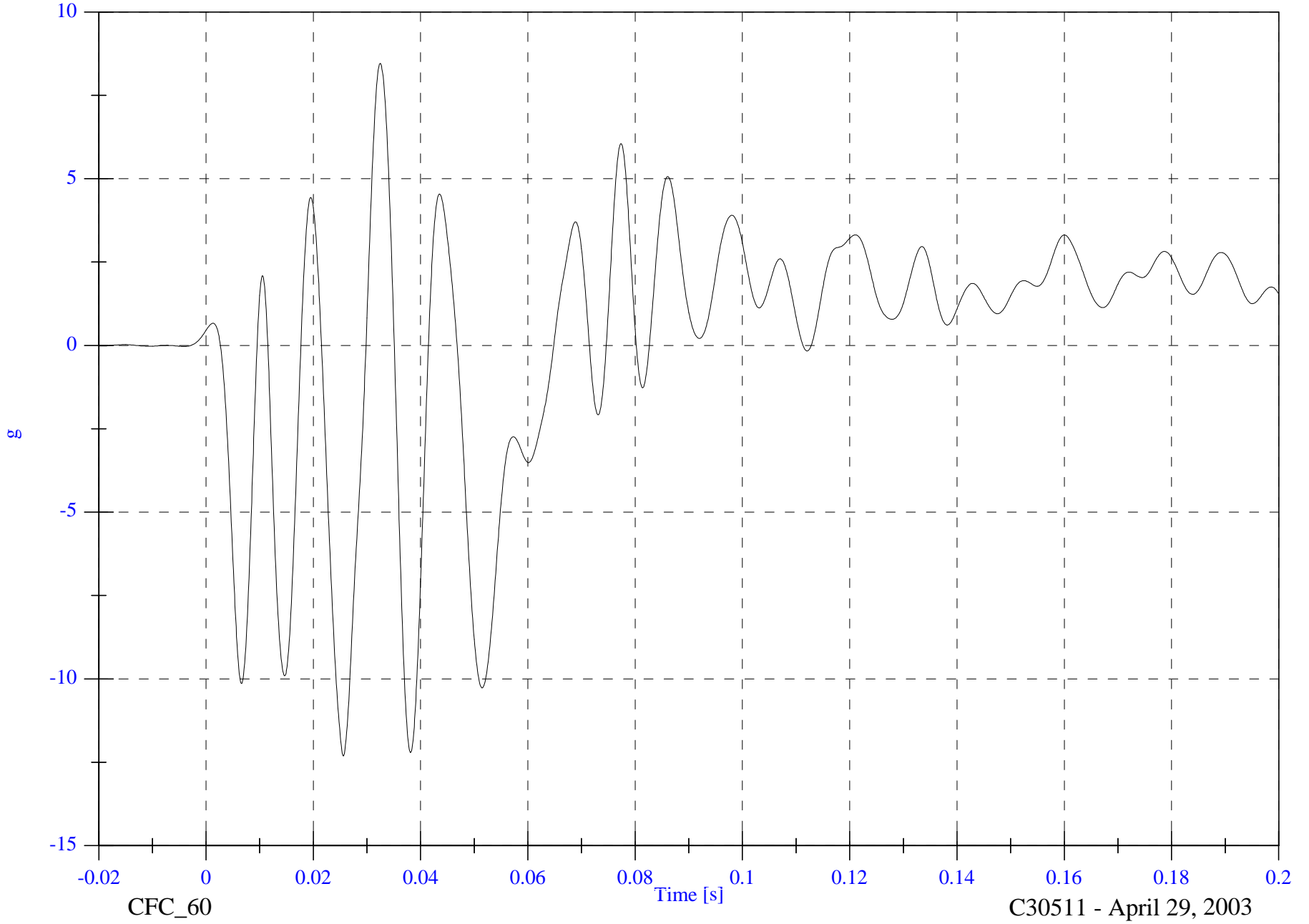
V2 A2 Right Rear Sill z

Max: 8.5 [g] at 0.032 [s]

Min: -12.3 [g] at 0.026 [s]

B-96

8675-F214-07



CFC\_60

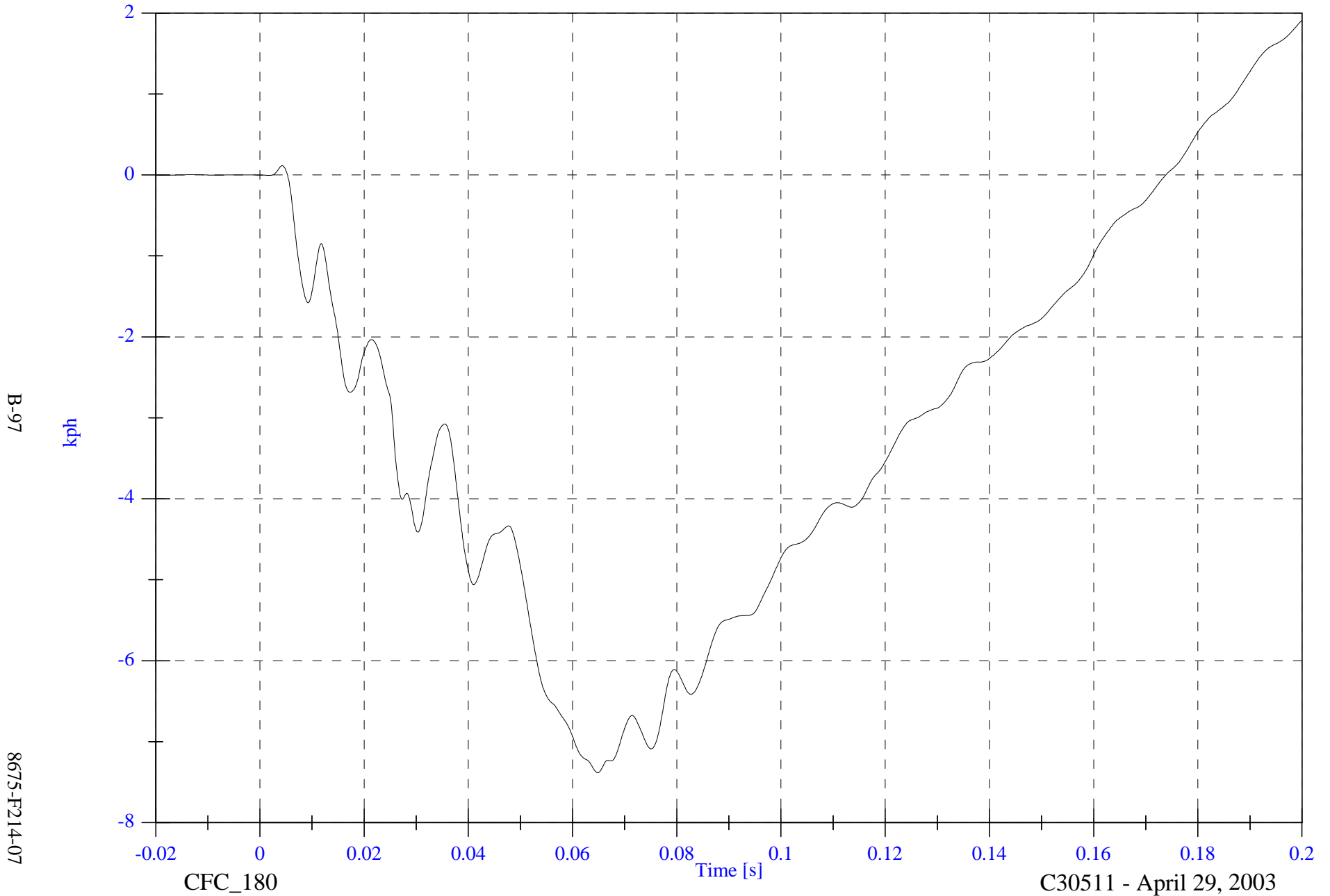
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2 A2 Right Rear Sill z Velocity

Max: 1.9 [kph] at 0.200 [s]

Min: -7.4 [kph] at 0.065 [s]



B-97

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

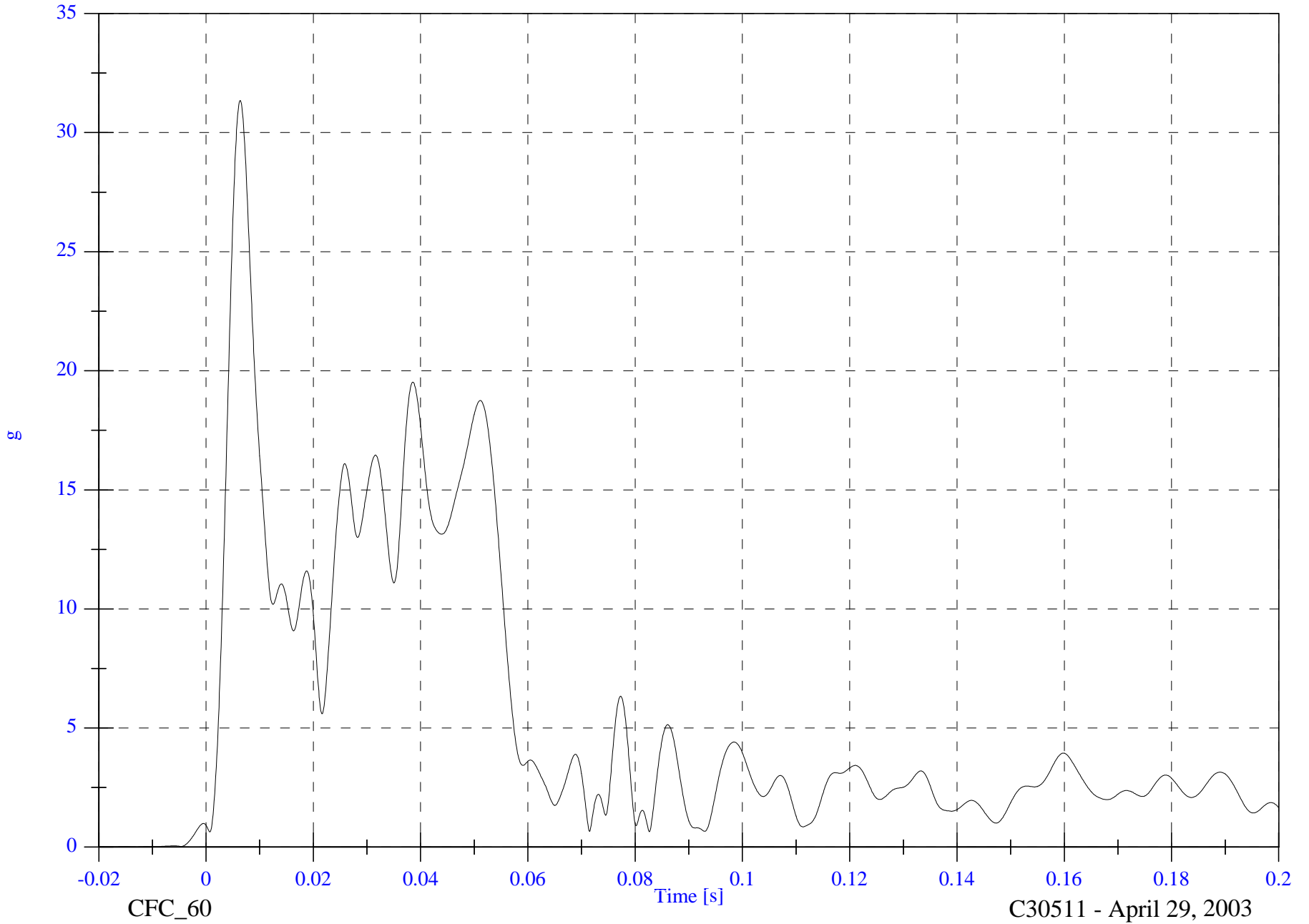
V2 A2 Right Rear Sill Resultant

Max: 31.3 [g] at 0.006 [s]

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

B-98

8675-F214-07



CFC\_60

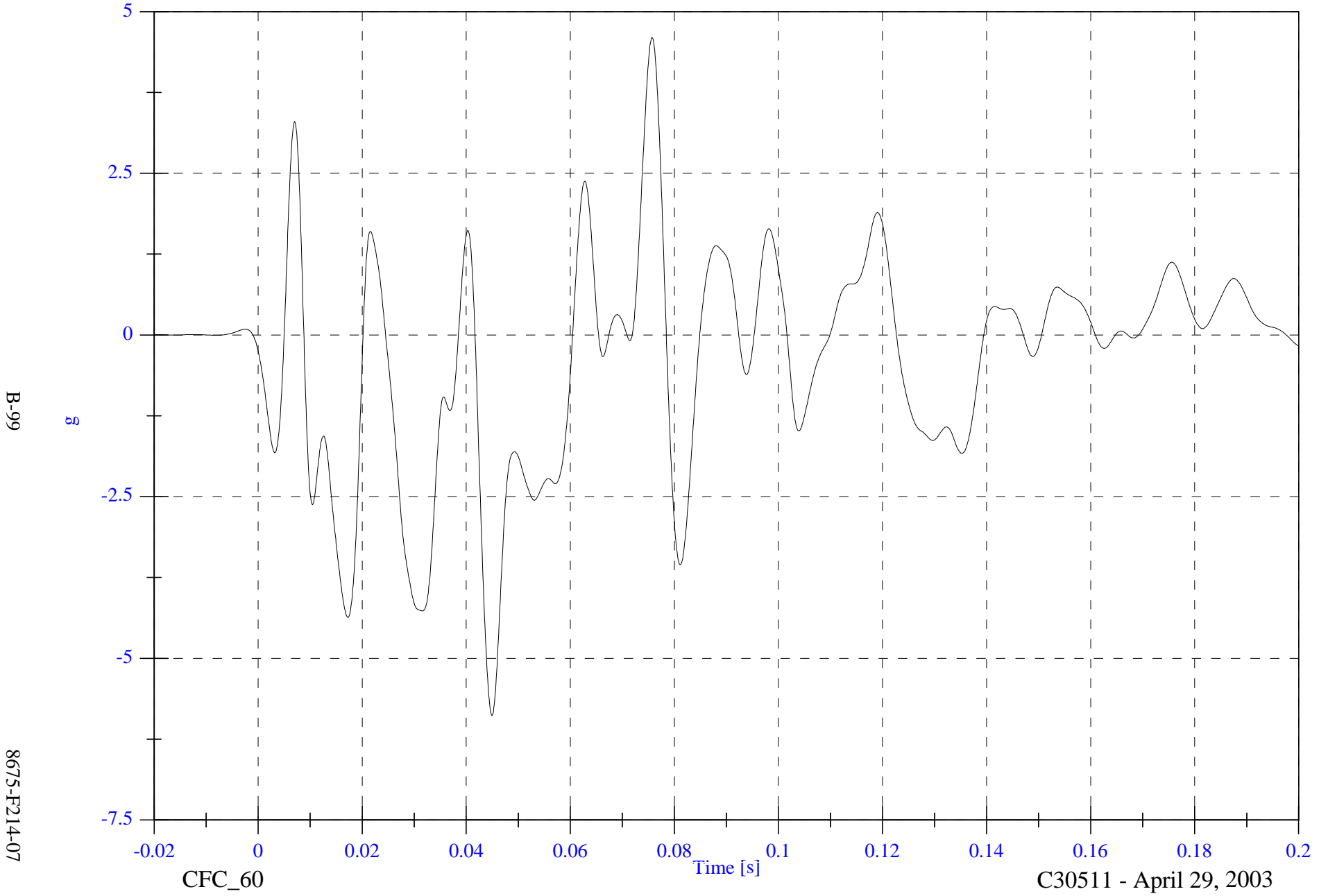
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2 A3 Rear Floorpan x

Max: 4.6 [g] at 0.076 [s]

Min: -5.9 [g] at 0.045 [s]



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CFC\_60

Time [s]

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

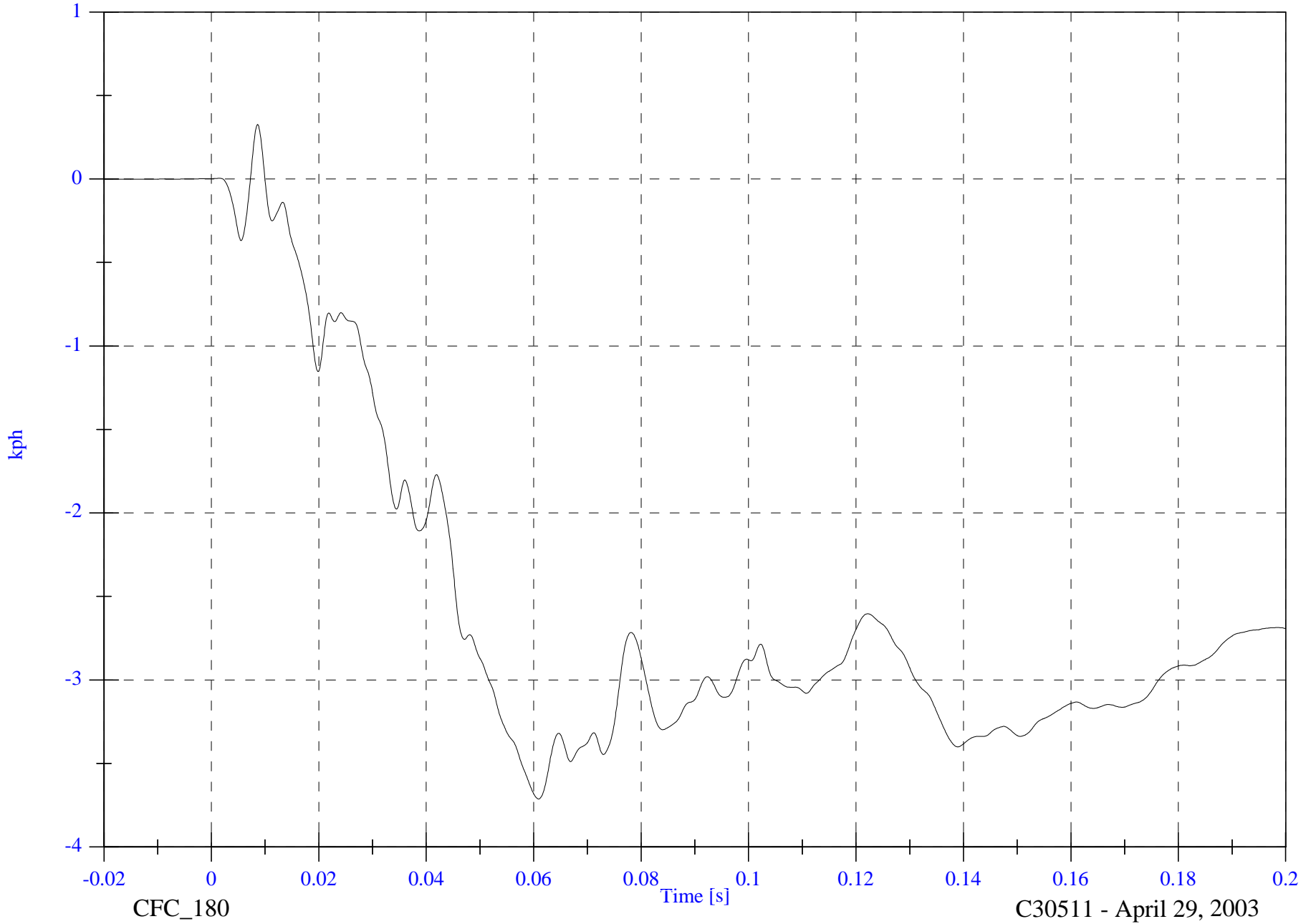
V2 A3 Rear Floorpan x Velocity

Max: 0.3 [kph] at 0.009 [s]

Min: -3.7 [kph] at 0.061 [s]

B-100

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

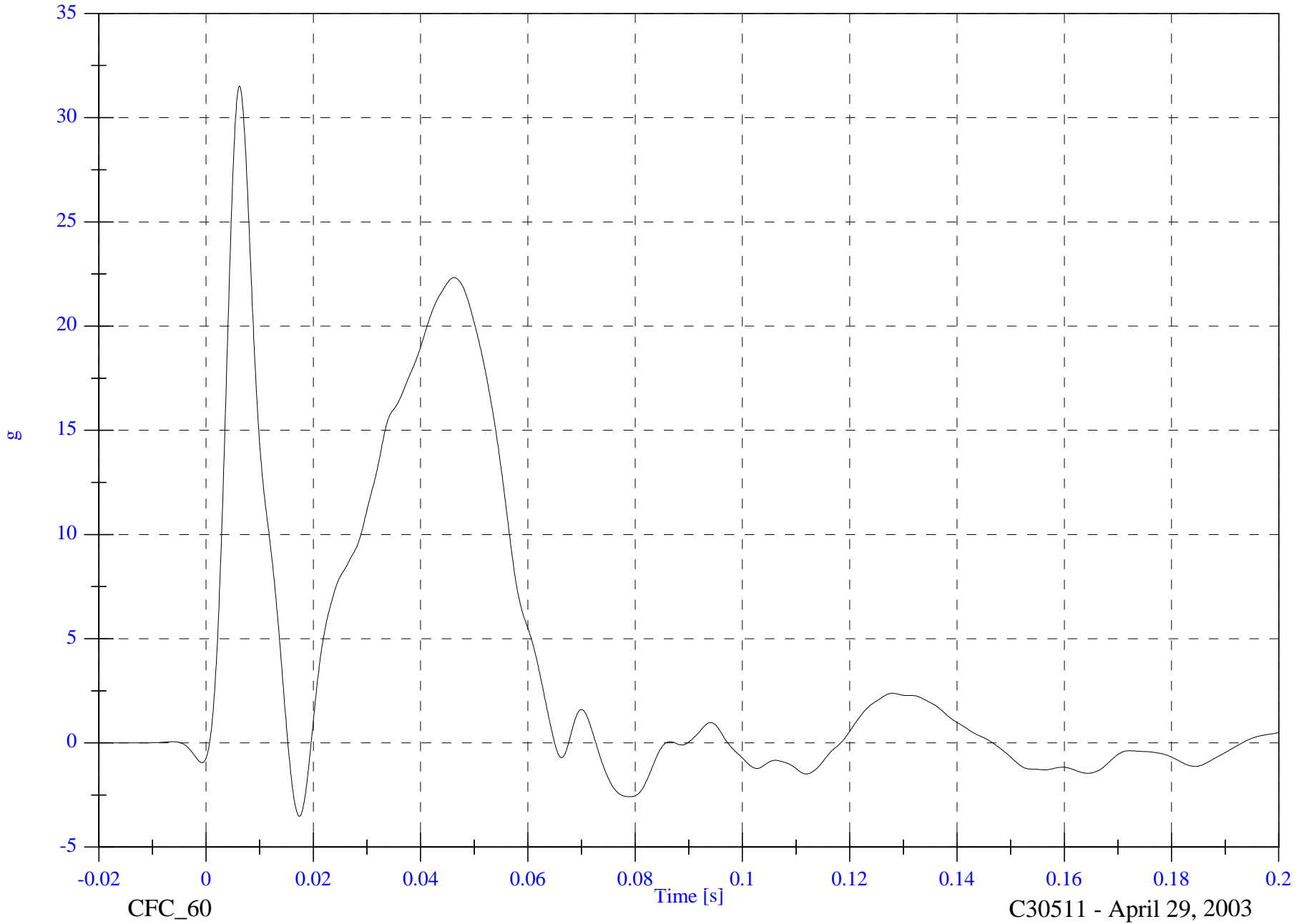
V2 A3 Rear Floorpan y

Max: 31.5 [g] at 0.006 [s]

Min: -3.5 [g] at 0.017 [s]

B-101

8675-F214-07



FMVSS 214D Indicant - 2003 Kia Sorento

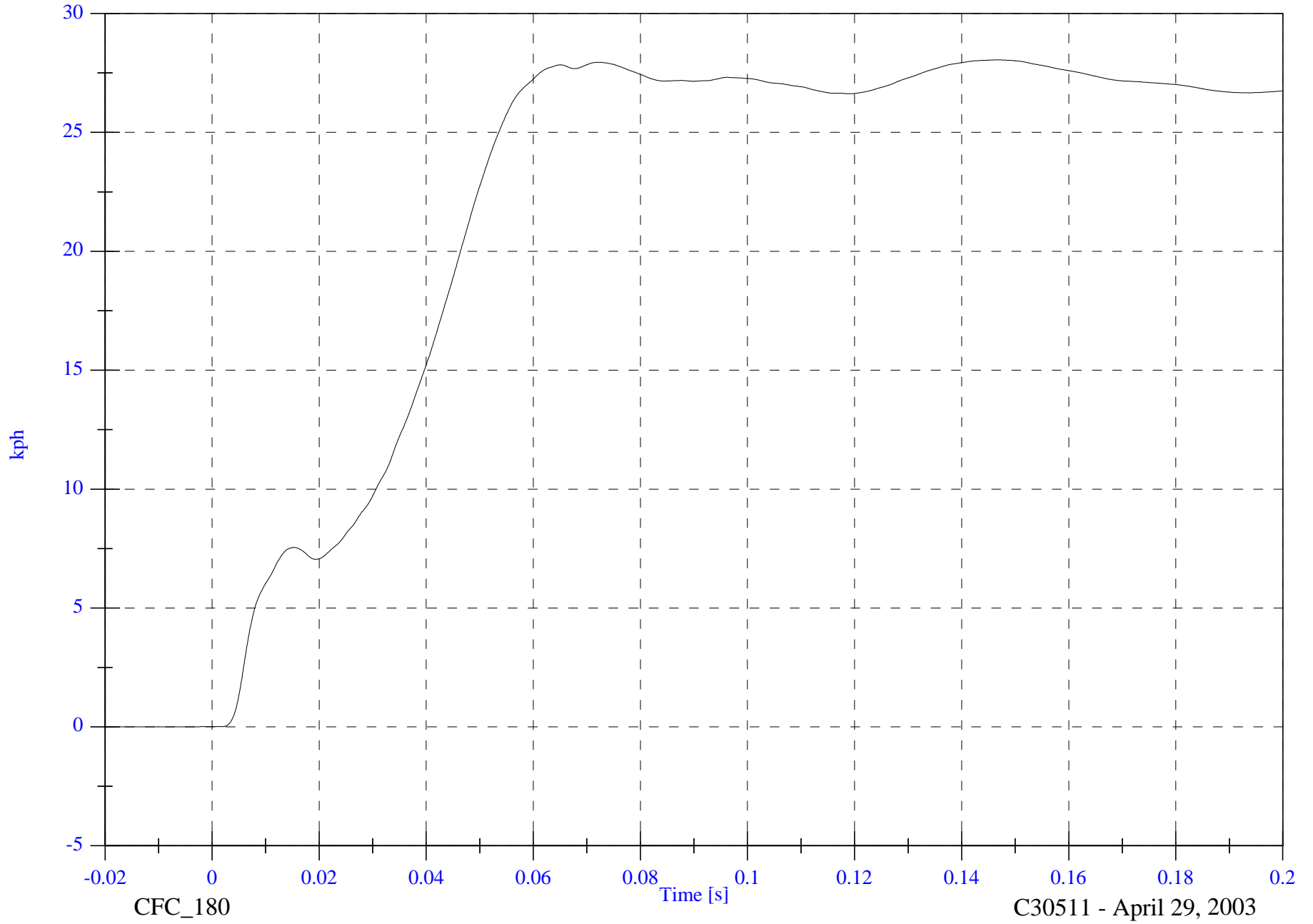
V2 A3 Rear Floorpan y Velocity

Max: 28.0 [kph] at 0.147 [s]

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

B-102

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CFC\_180

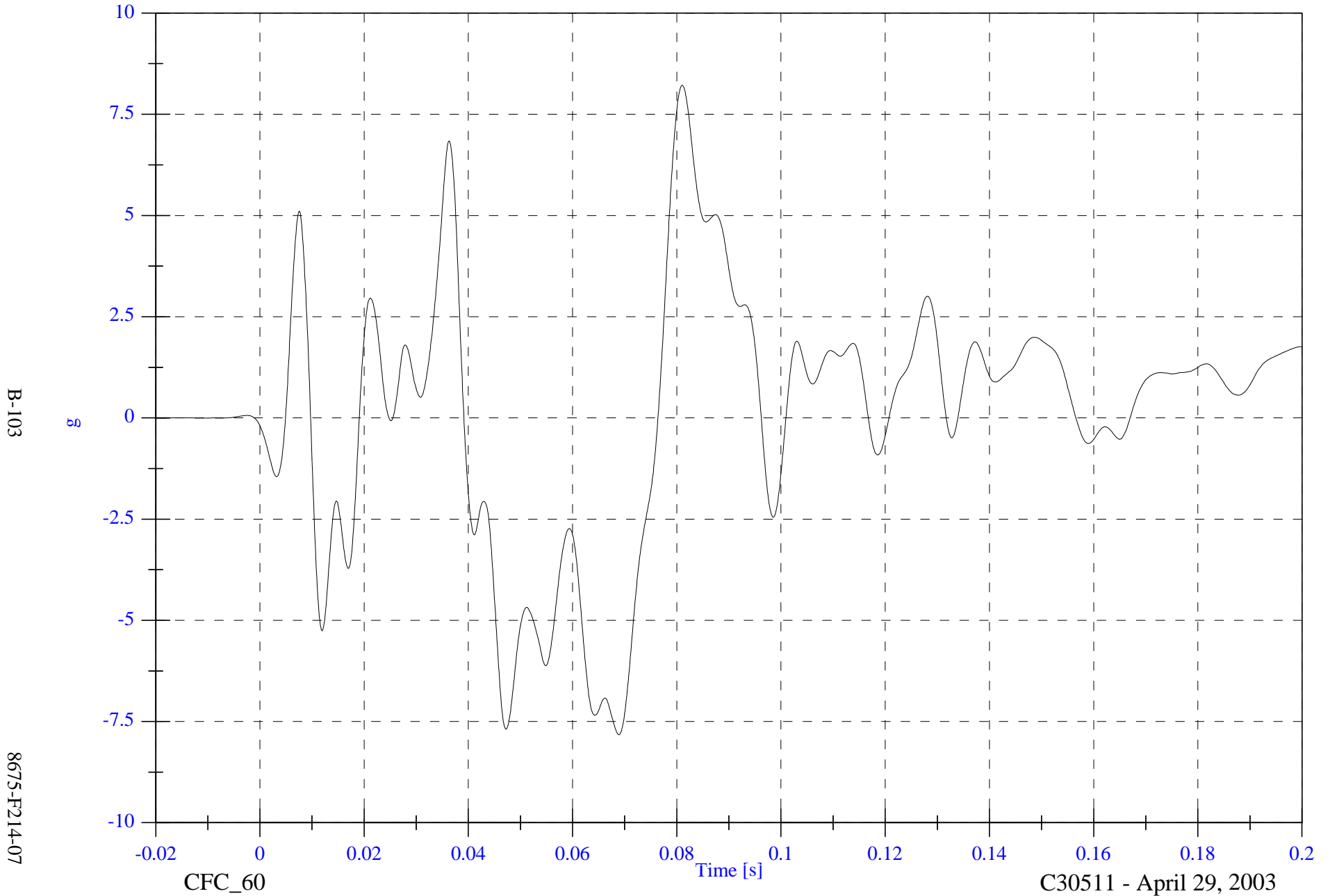
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FMVSS 214D Indicant - 2003 Kia Sorento

V2 A3 Rear Floorpan z

Max: 8.2 [g] at 0.081 [s]

Min: -7.8 [g] at 0.069 [s]



FMVSS 214D Indicant - 2003 Kia Sorento

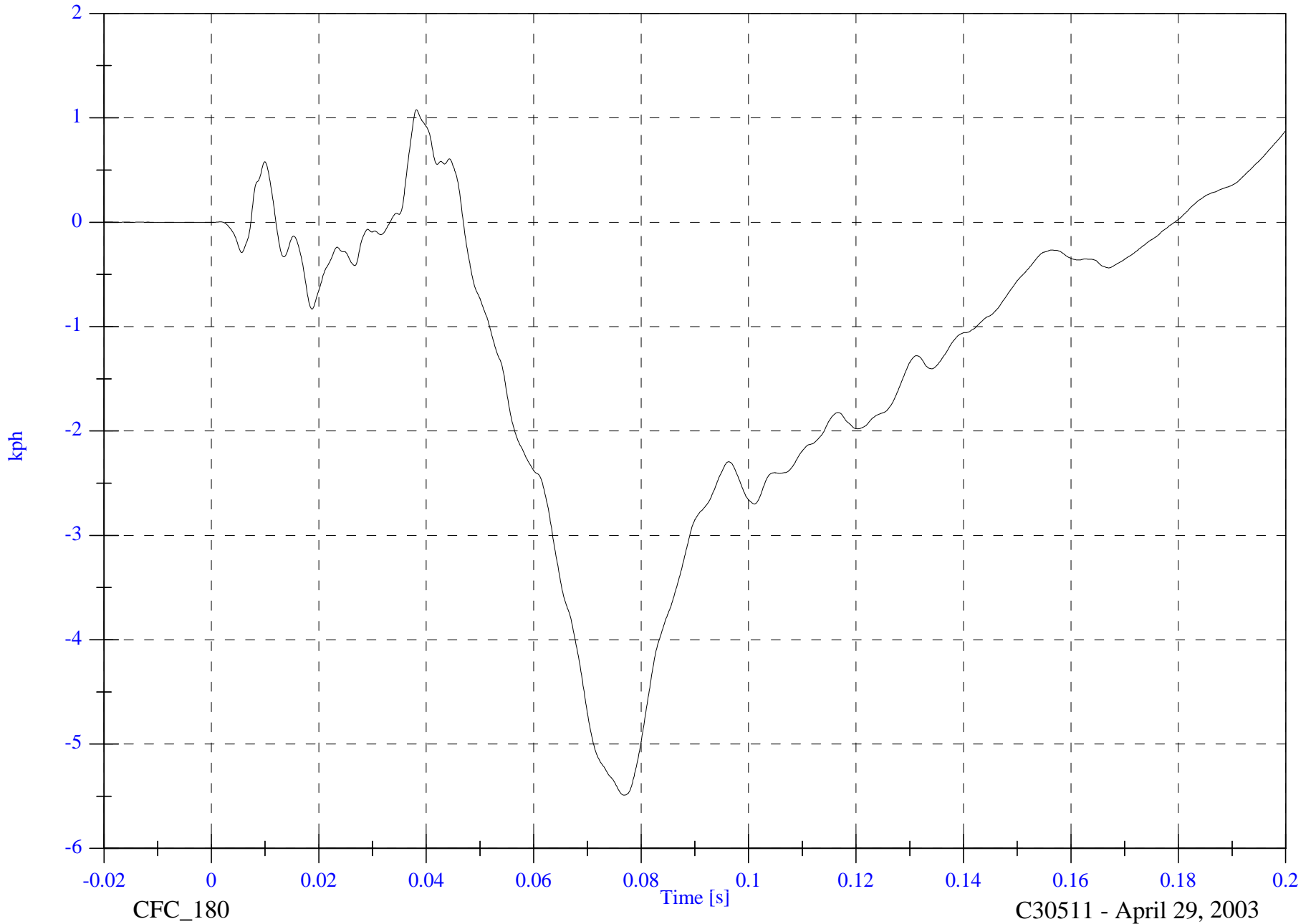
V2 A3 Rear Floorpan z Velocity

Max: 1.1 [kph] at 0.038 [s]

Min: -5.5 [kph] at 0.077 [s]

B-104

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CFC\_180

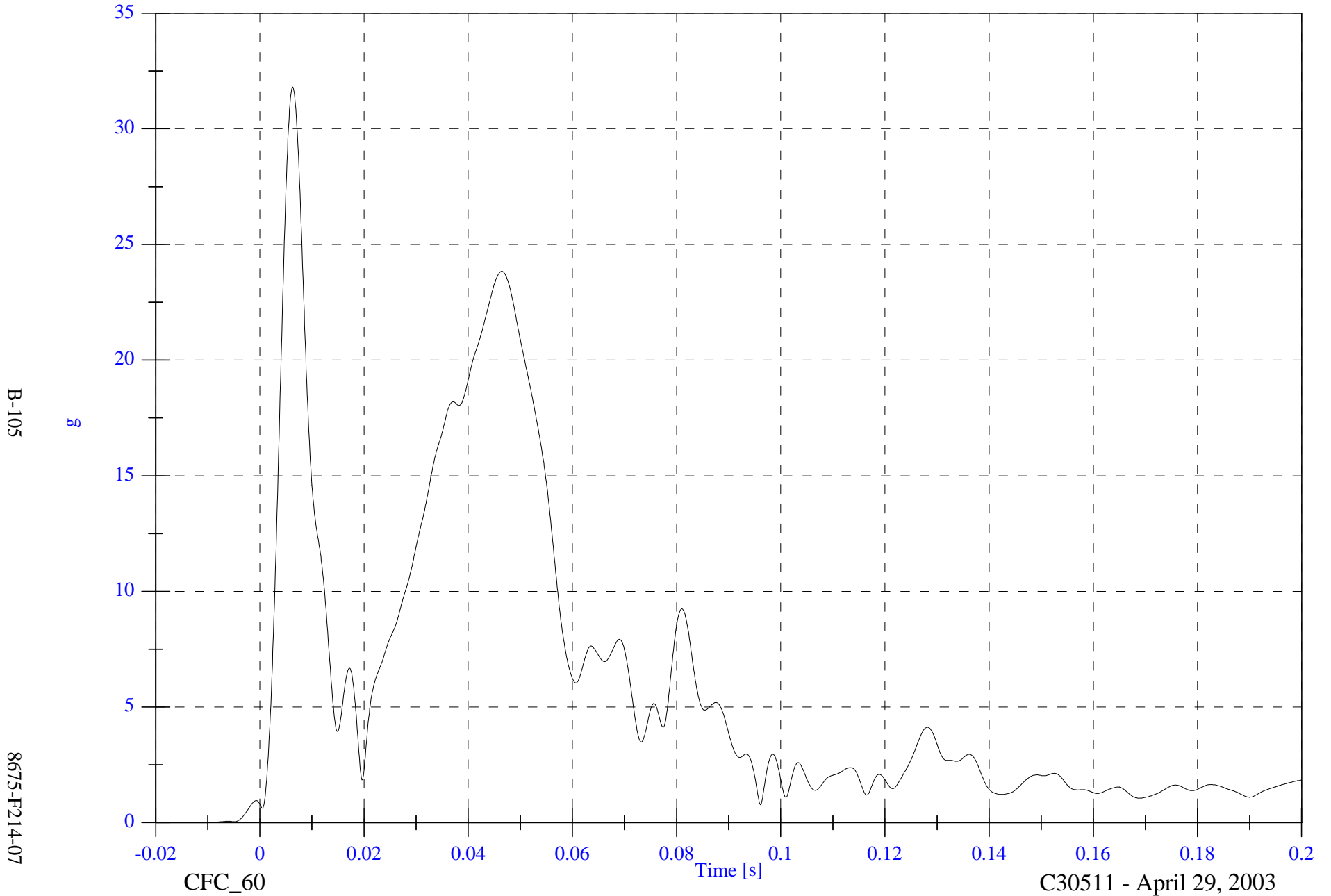
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FMVSS 214D Indicant - 2003 Kia Sorento

V2 A3 Rear Floorpan Resultant

Max: 31.8 [g] at 0.006 [s]

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



B-105

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CFC\_60

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

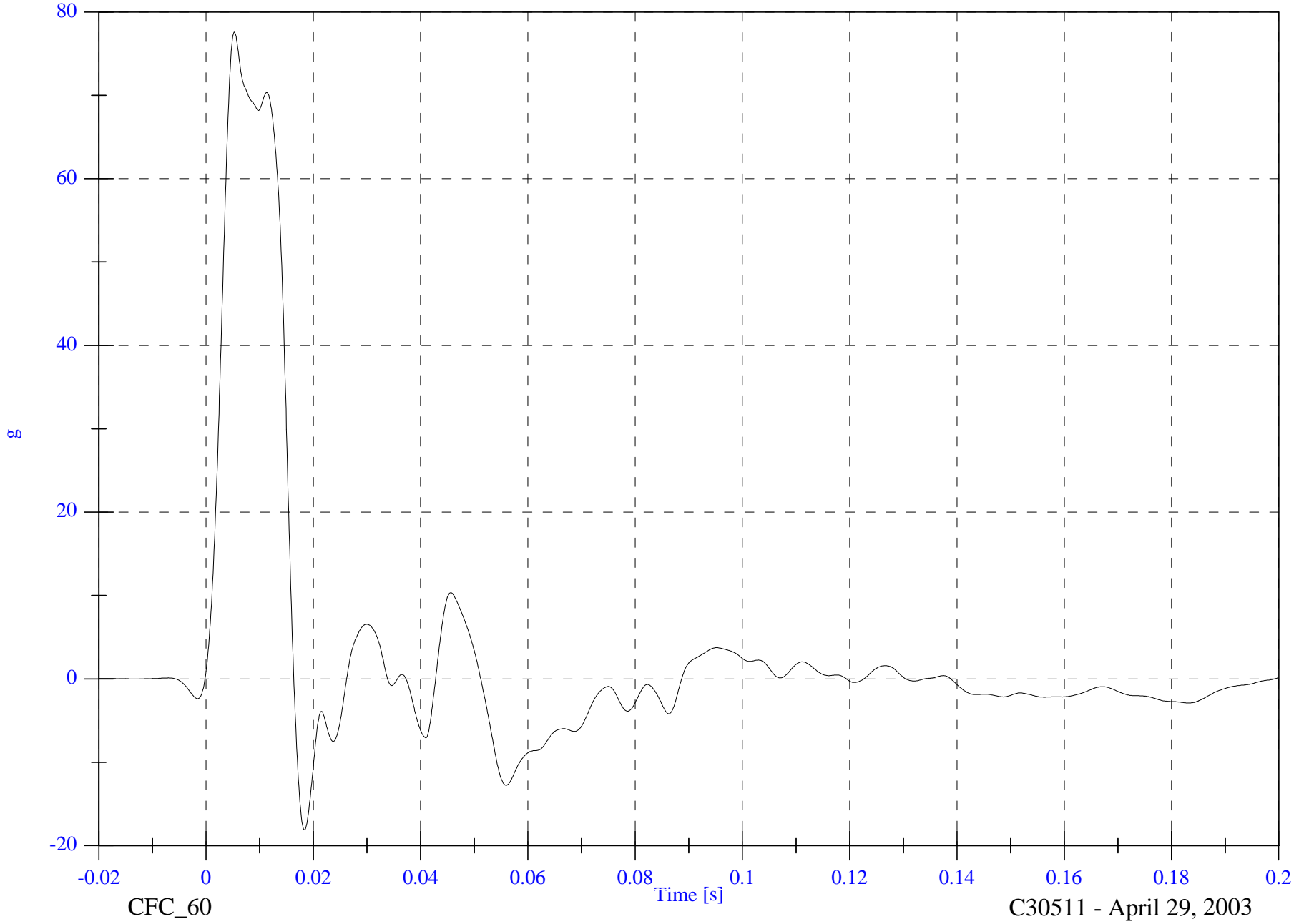
V2 A4 Left Rear Sill y

Max: 77.6 [g] at 0.005 [s]

Min: -18.1 [g] at 0.018 [s]

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FMVSS 214D Indicant - 2003 Kia Sorento

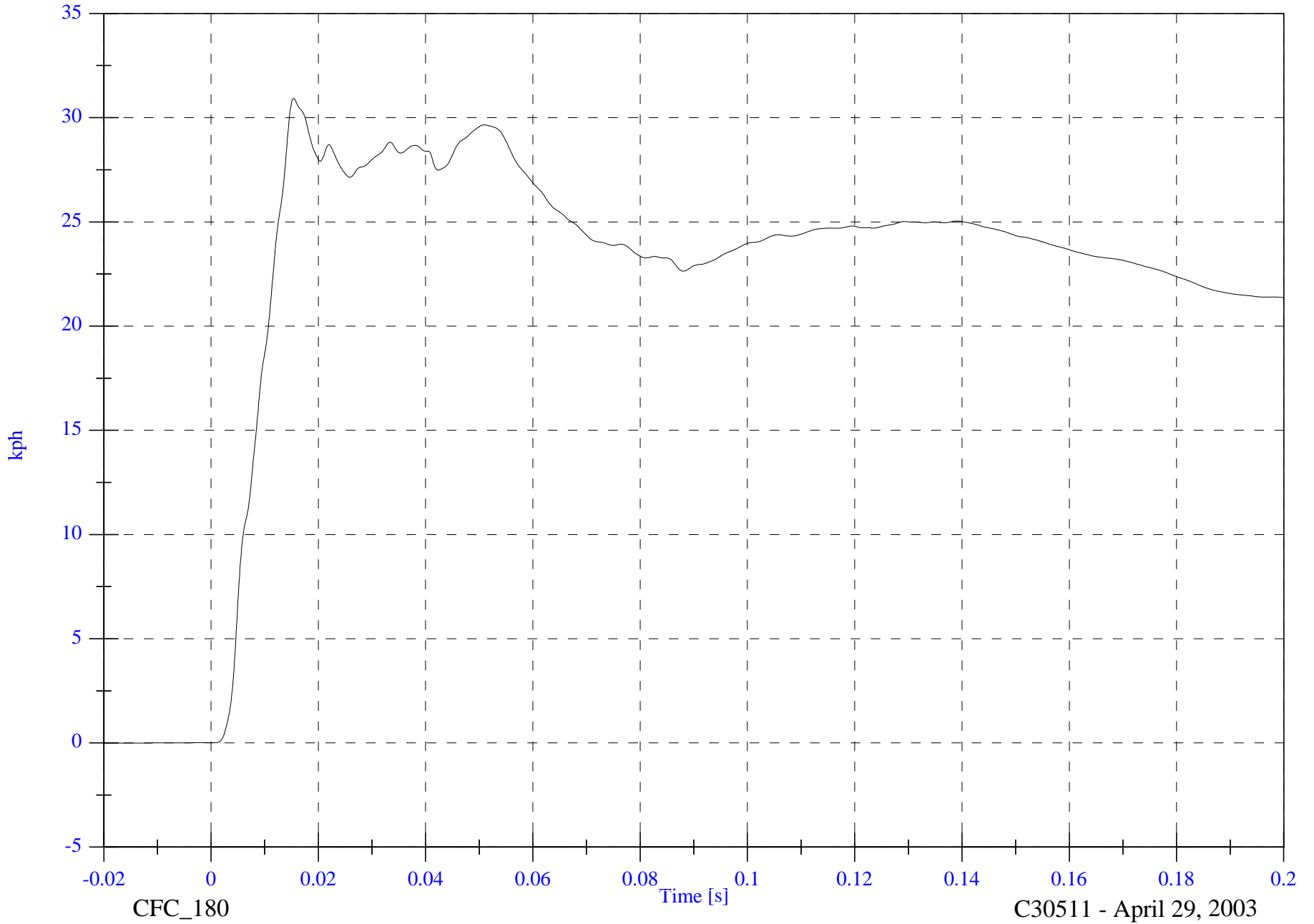
V2 A4 Left Rear Sill y Velocity

Max: 30.9 [kph] at 0.015 [s]

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

B-107

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CFC\_180

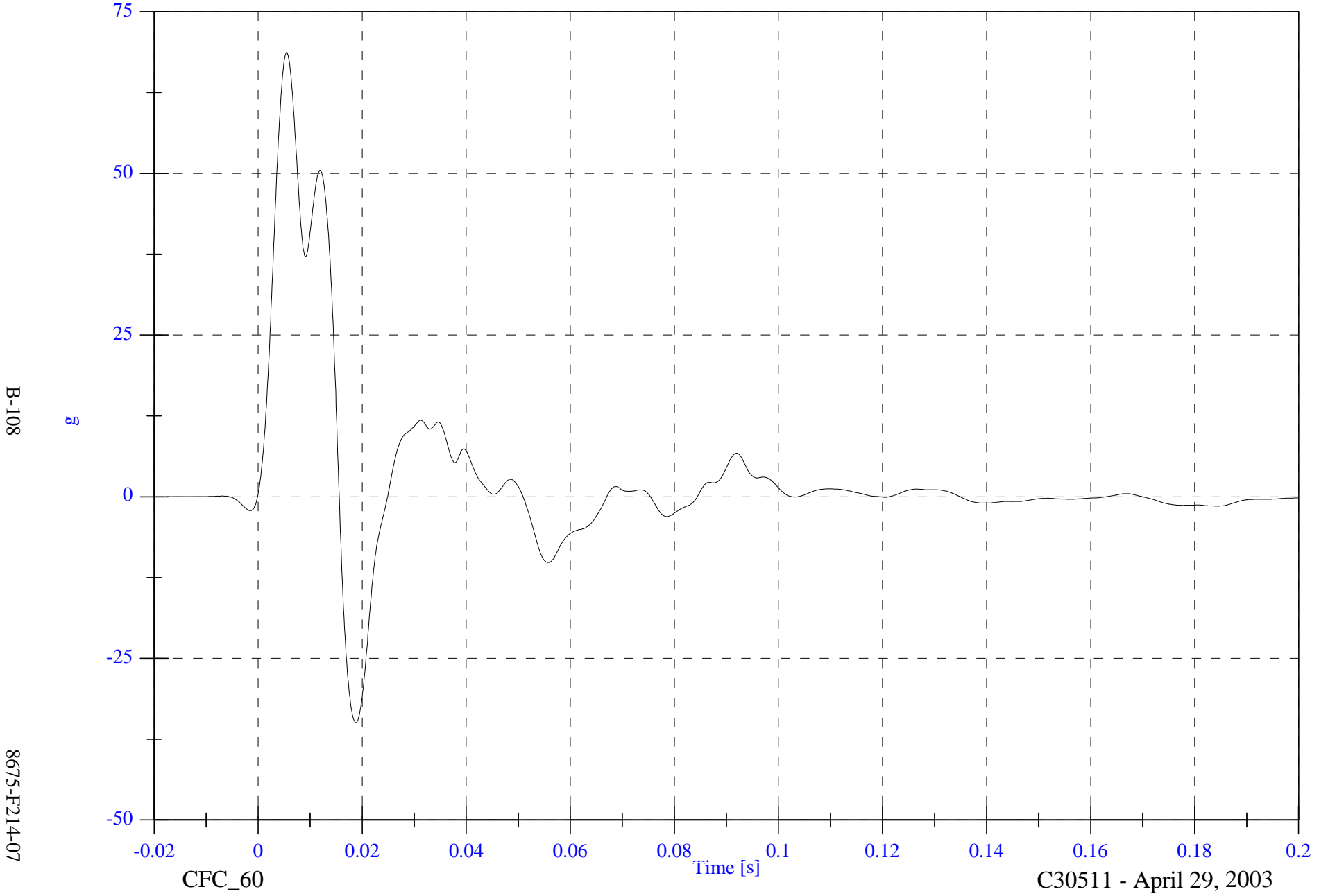
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V2 A5 Left Front Sill y

Max: 68.7 [g] at 0.006 [s]

Min: -35.0 [g] at 0.019 [s]



FMVSS 214D Indicant - 2003 Kia Sorento

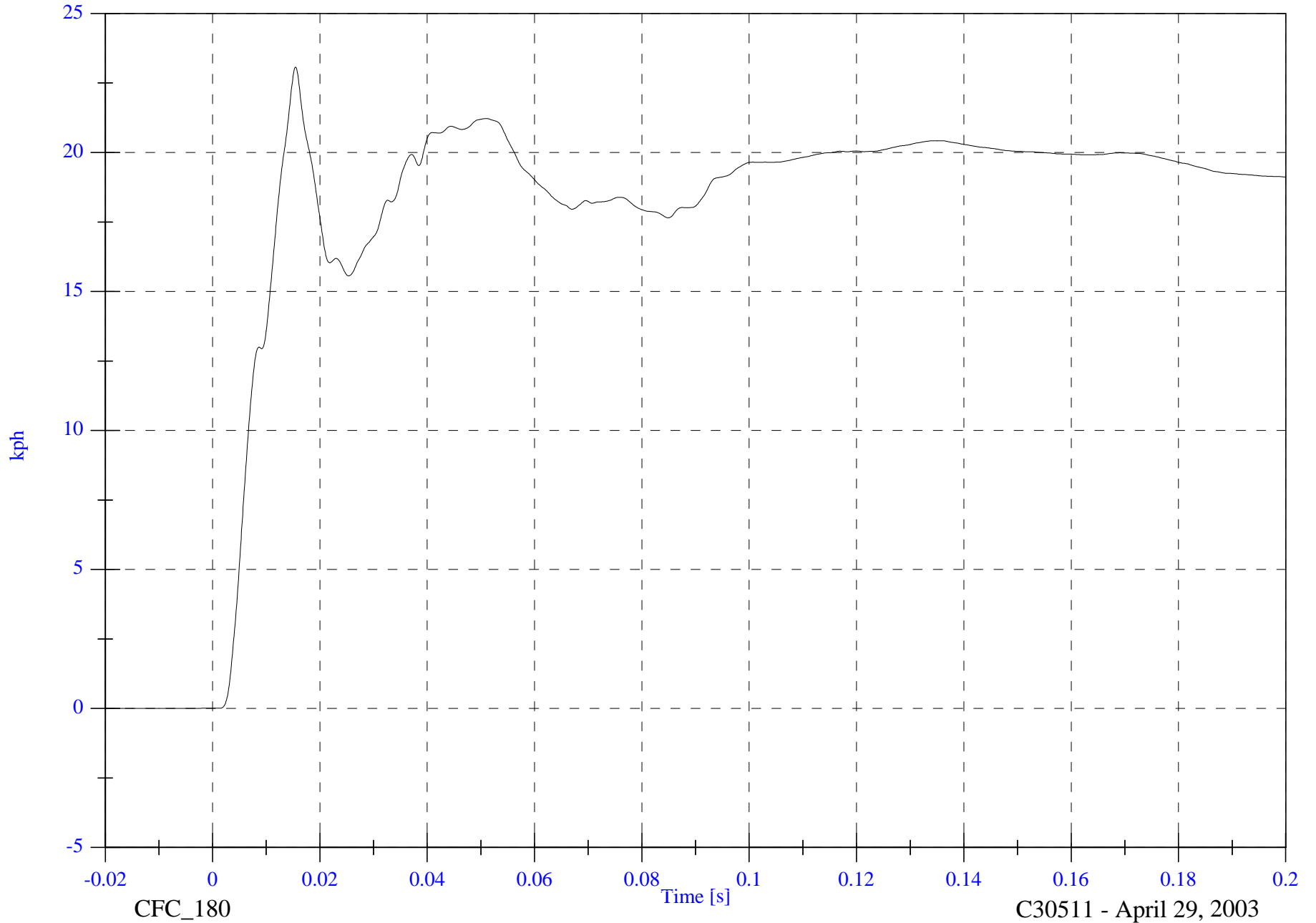
V2 A5 Left Front Sill y Velocity

Max: 23.1 [kph] at 0.015 [s]

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

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

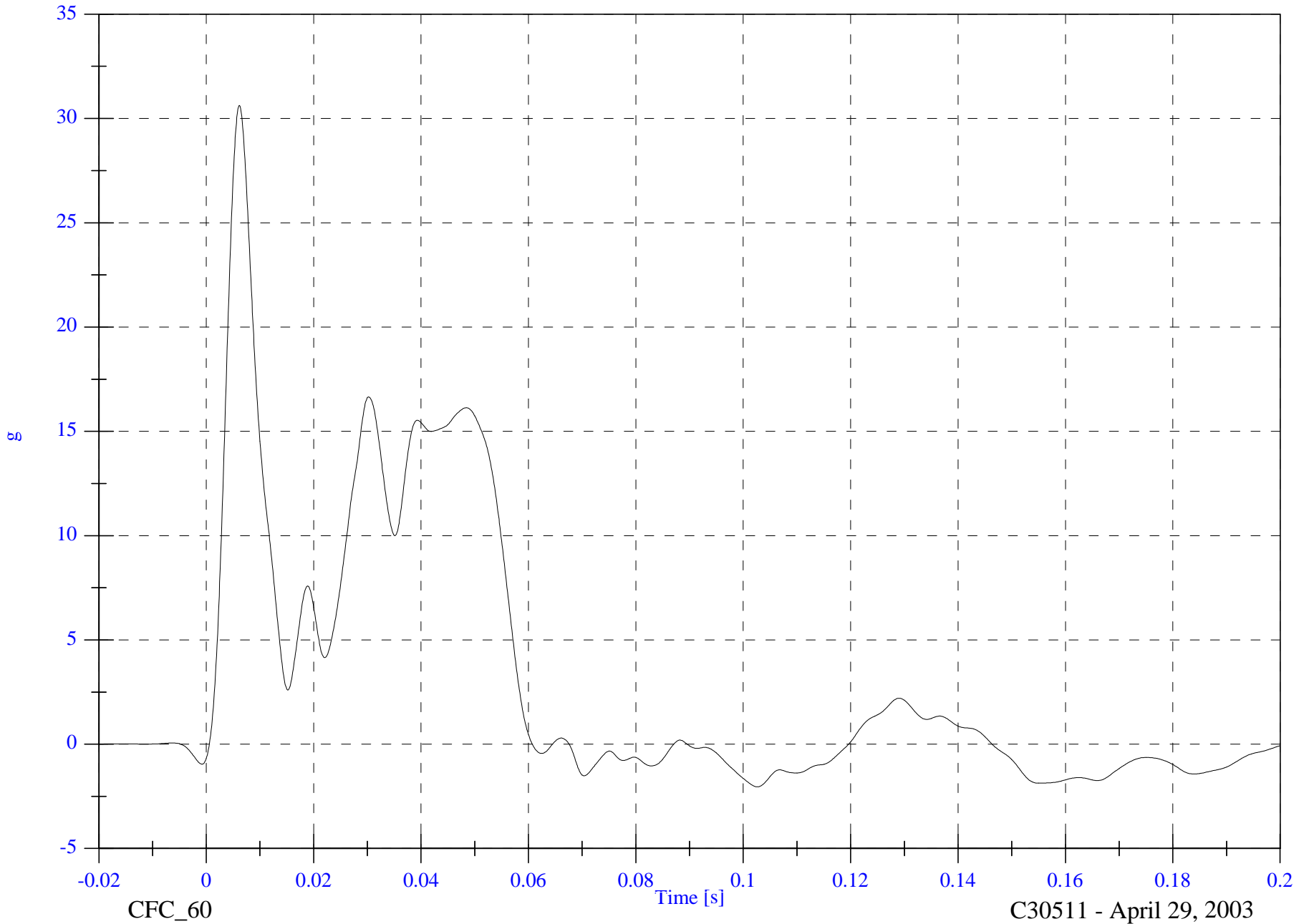
V2 A7 Right Rear Compartment y

Max: 30.6 [g] at 0.006 [s]

Min: -2.0 [g] at 0.103 [s]

B-110

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CFC\_60

Time [s]

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

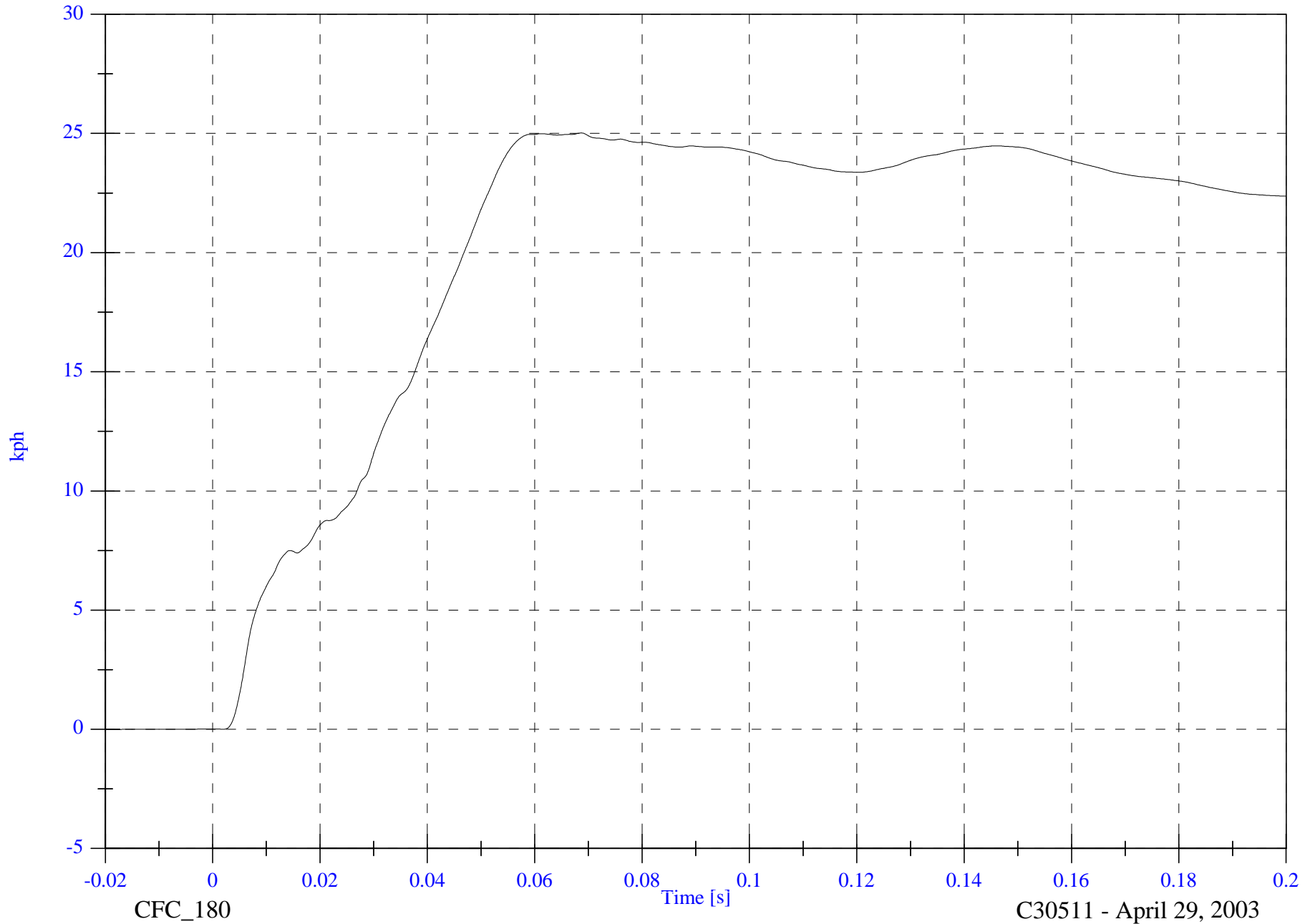
V2 A7 Right Rear Compartment y Velocity

Max: 25.0 [kph] at 0.069 [s]

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

B-111

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

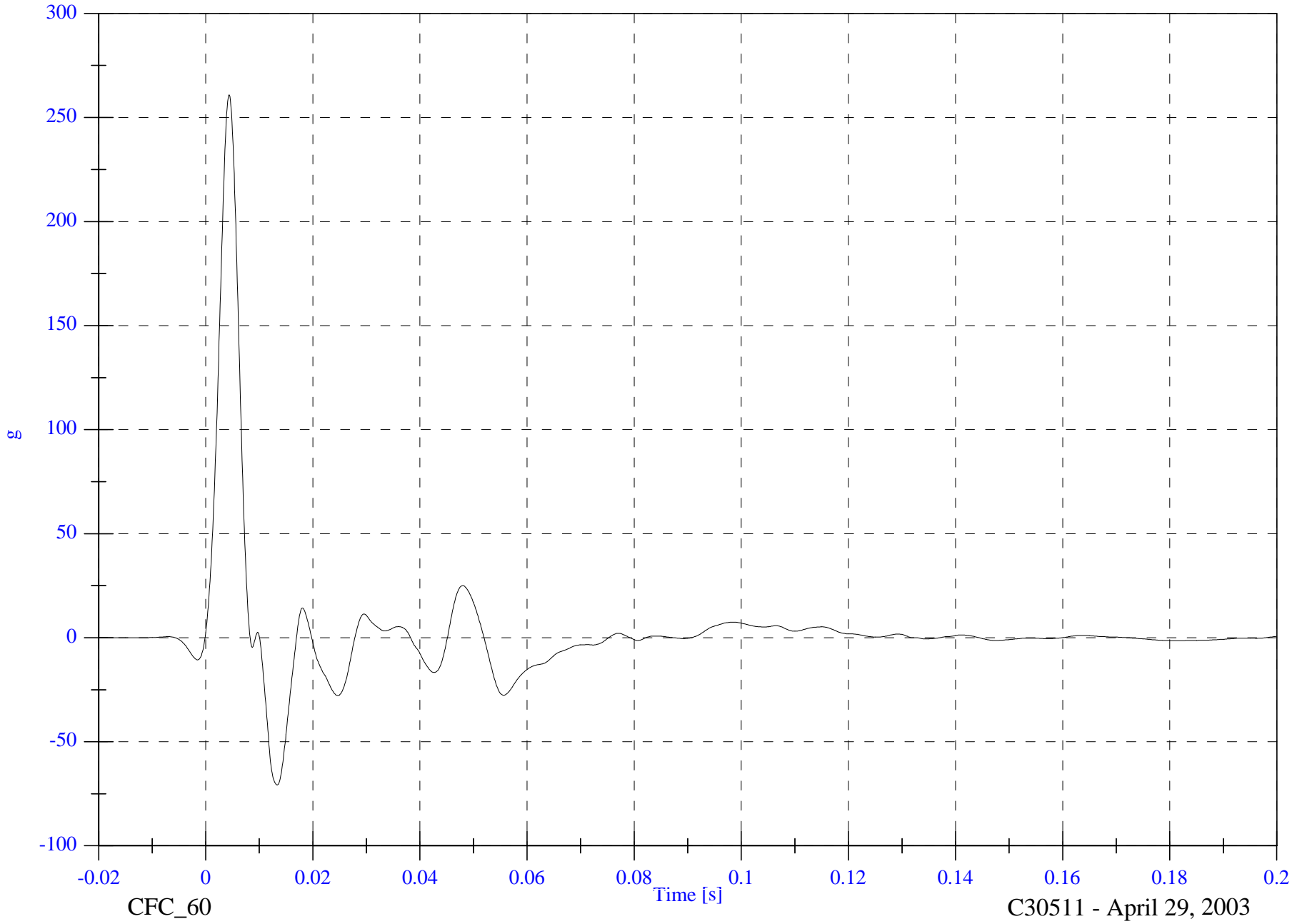
V2 A12 Left Lower B Post y

Max: 260.9 [g] at 0.004 [s]

Min: -70.8 [g] at 0.013 [s]

B-112

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FMVSS 214D Indicant - 2003 Kia Sorento

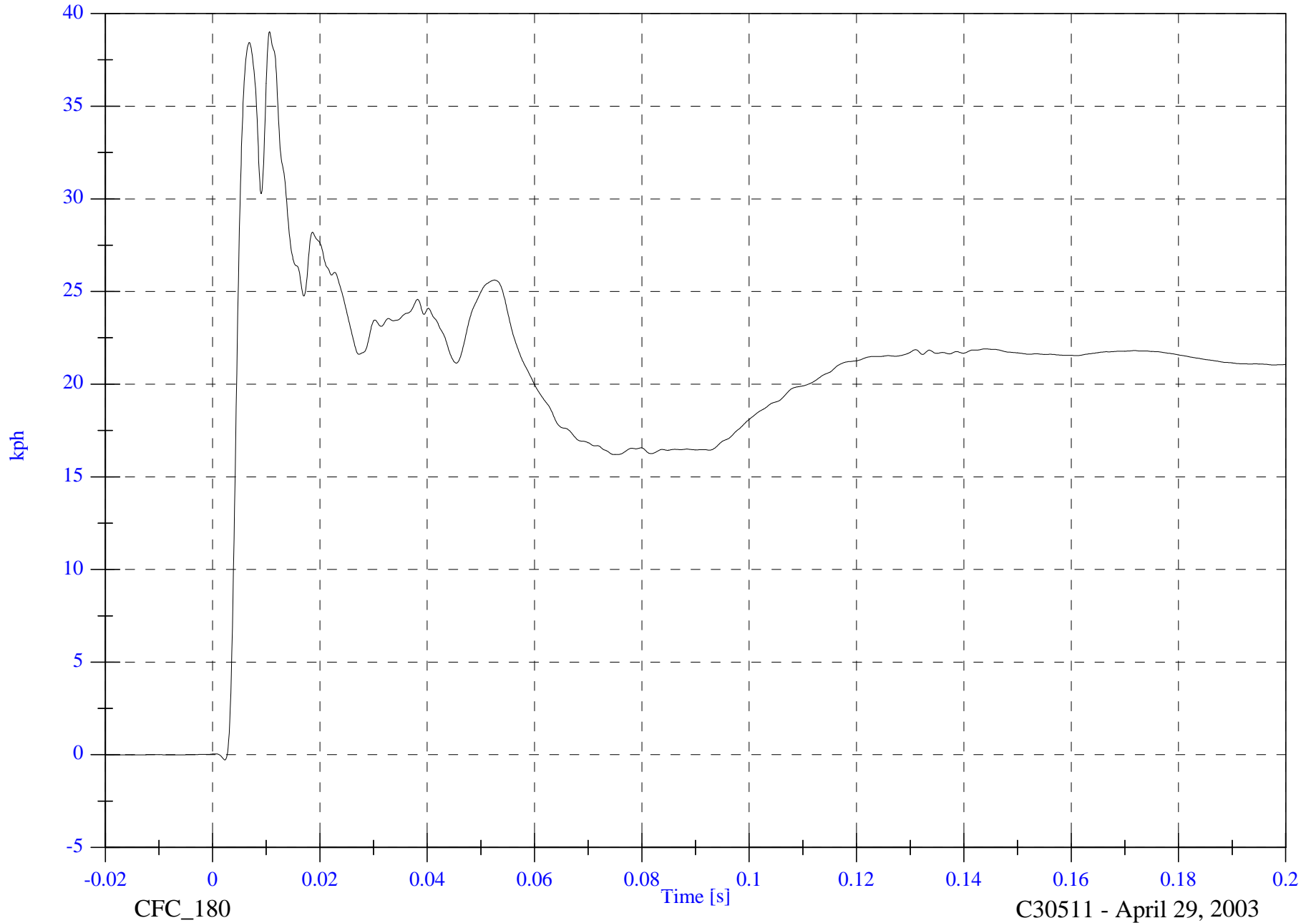
V2 A12 Left Lower B Post y Velocity

Max: 39.0 [kph] at 0.011 [s]

Min: -0.3 [kph] at 0.002 [s]

B-113

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CFC\_180

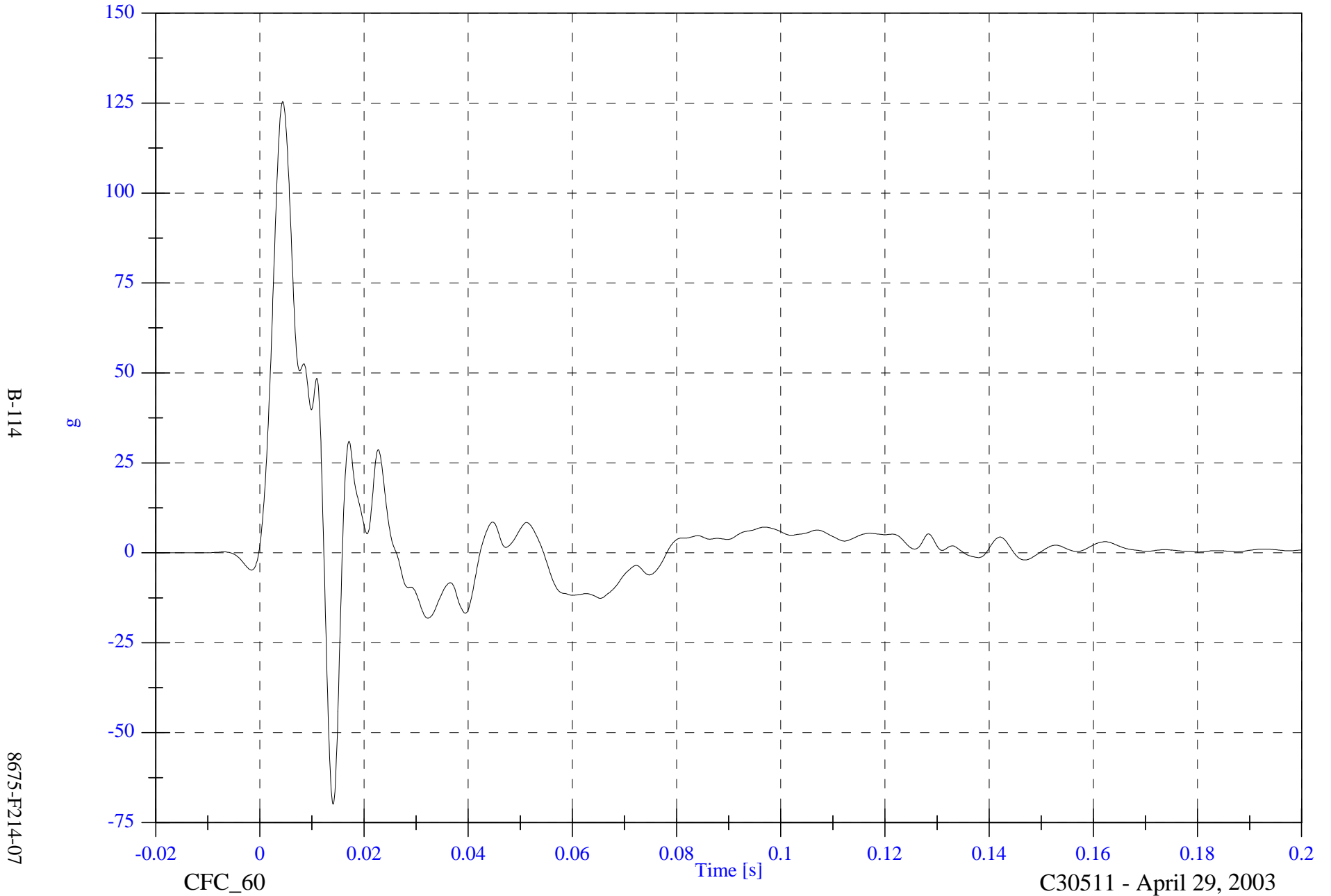
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FMVSS 214D Indicant - 2003 Kia Sorento

V2 A13 Left Middle B Post y

Max: 125.4 [g] at 0.004 [s]

Min: -69.8 [g] at 0.014 [s]



FMVSS 214D Indicant - 2003 Kia Sorento

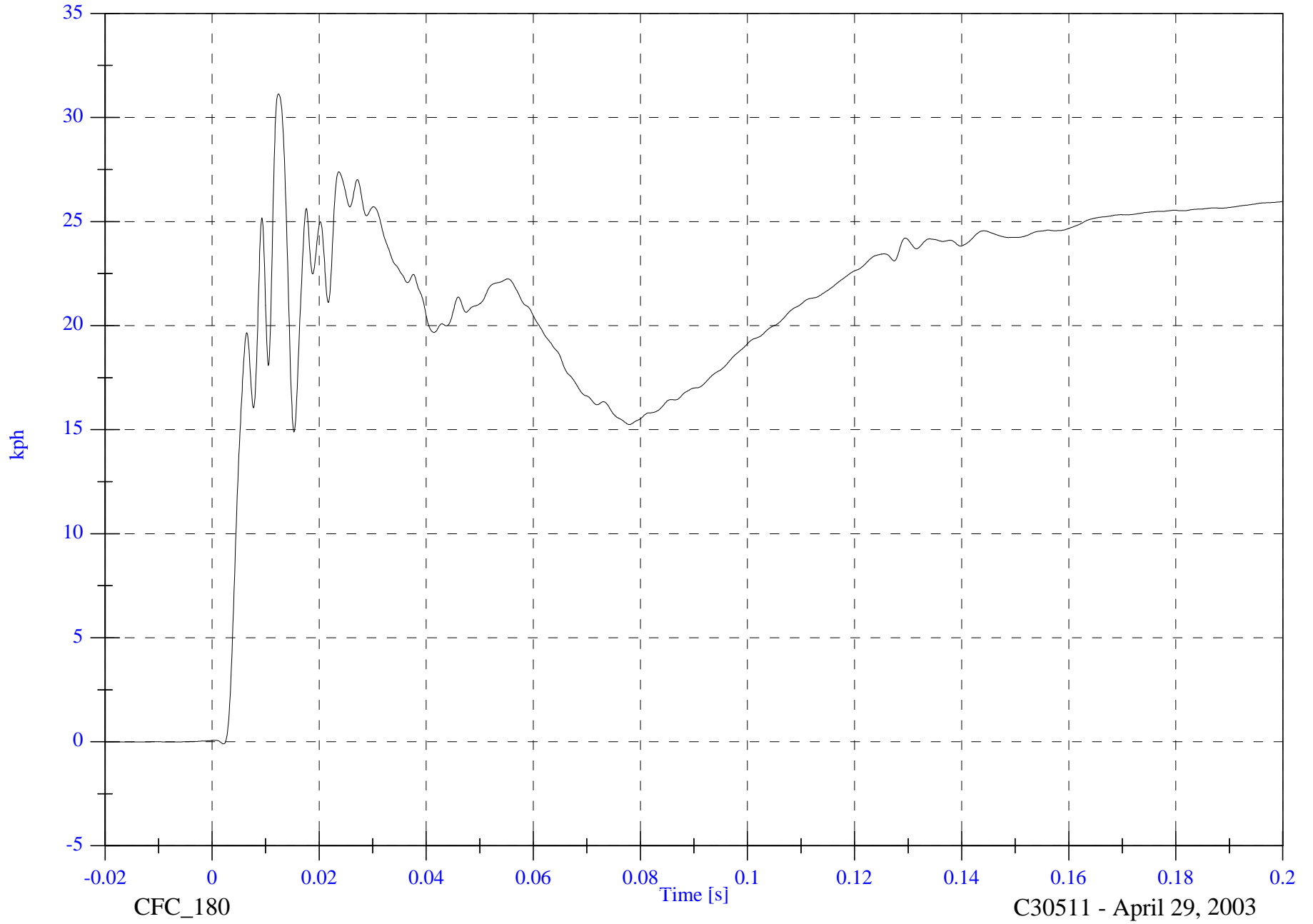
V2 A13 Left Middle B Post y Velocity

Max: 31.1 [kph] at 0.012 [s]

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

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

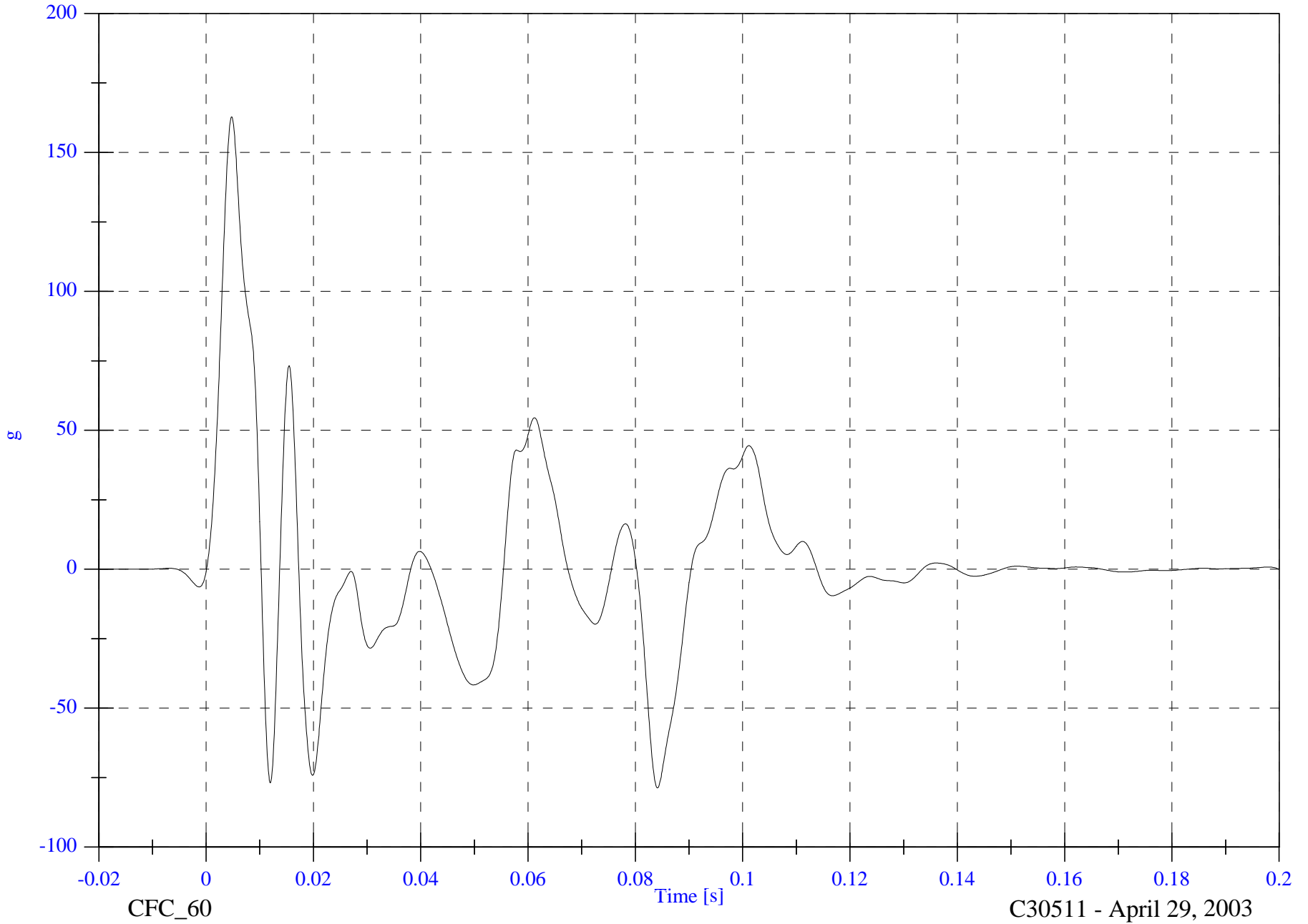
V2 A14 Left Lower A Post y

Max: 162.8 [g] at 0.005 [s]

Min: -78.7 [g] at 0.084 [s]

B-116

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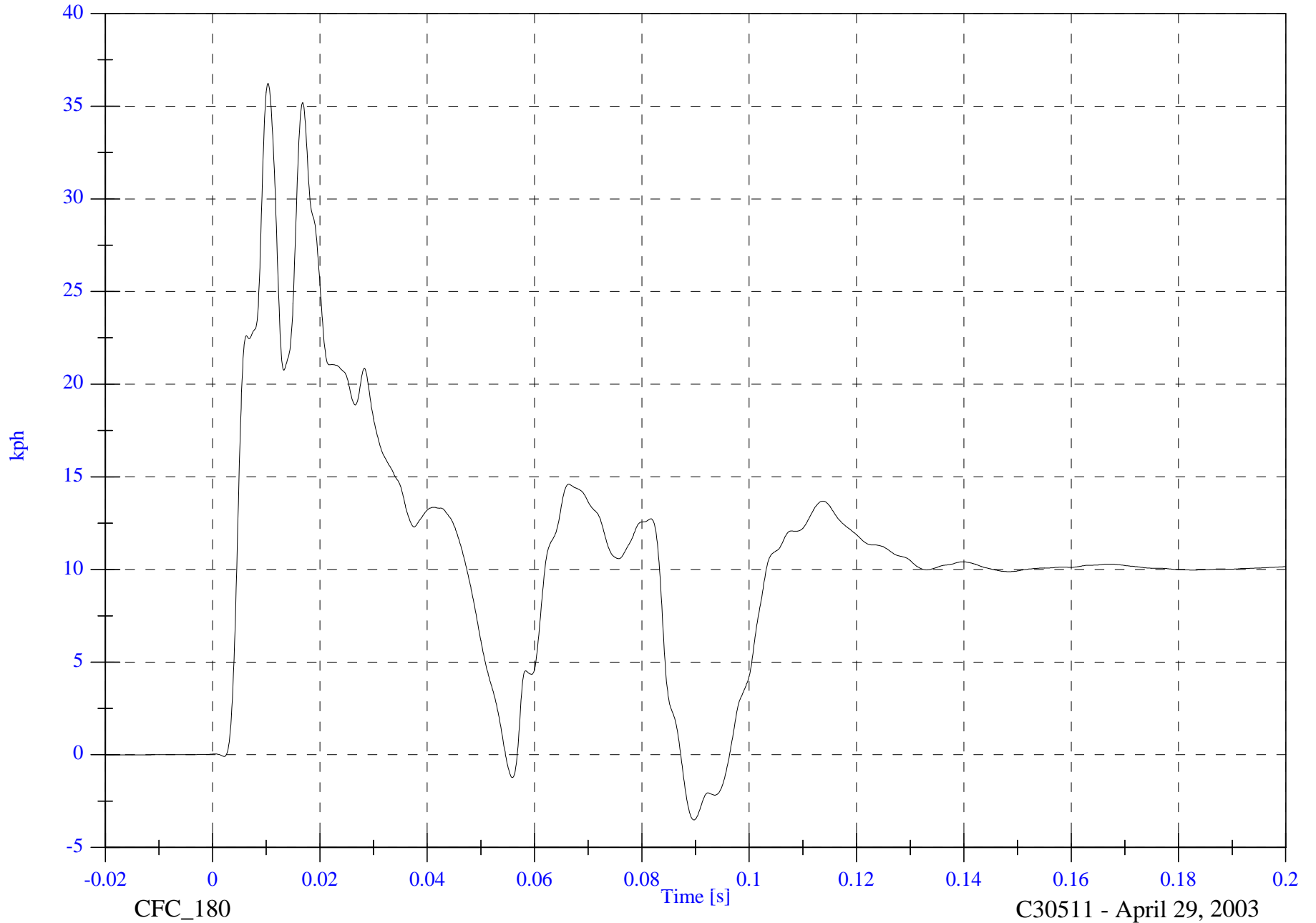
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FMVSS 214D Indicant - 2003 Kia Sorento

V2 A14 Left Lower A Post y Velocity

Max: 36.2 [kph] at 0.010 [s]

Min: -3.5 [kph] at 0.090 [s]



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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

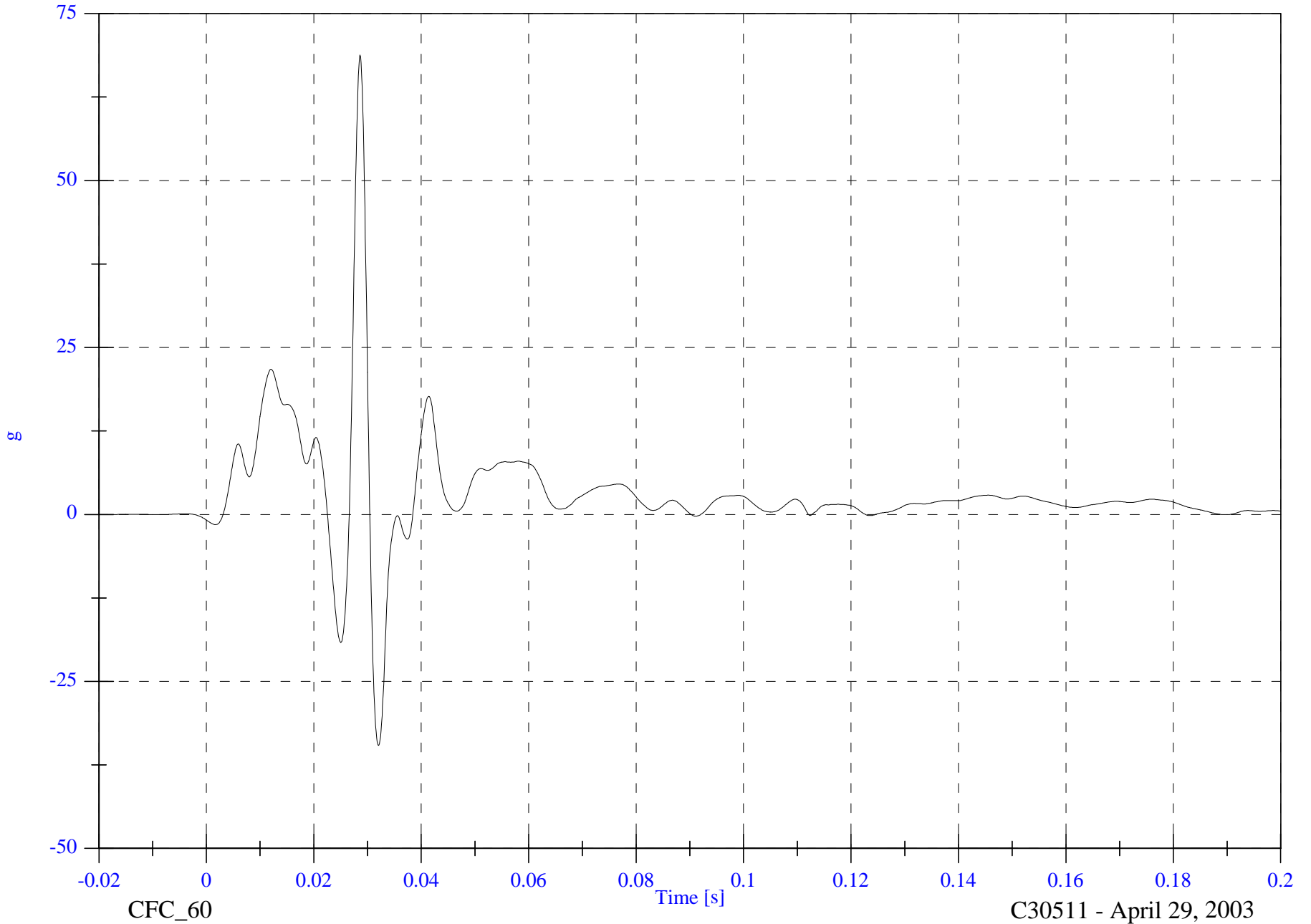
V2 A15 Left Mid A Post y

Max: 68.8 [g] at 0.029 [s]

Min: -34.6 [g] at 0.032 [s]

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FMVSS 214D Indicant - 2003 Kia Sorento

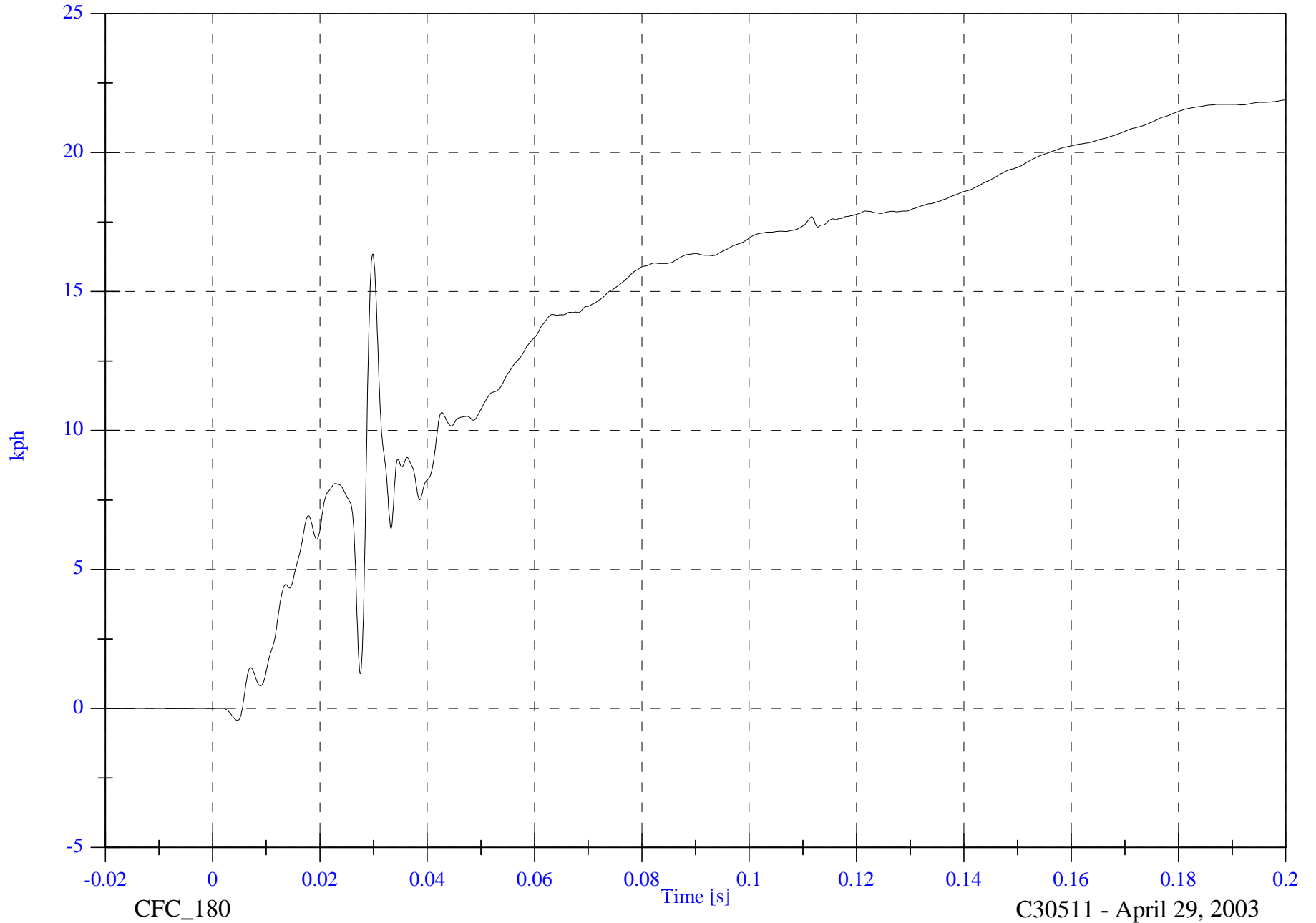
V2 A15 Left Mid A Post y Velocity

Max: 21.9 [kph] at 0.200 [s]

Min: -0.4 [kph] at 0.005 [s]

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CFC\_180

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FMVSS 214D Indicant - 2003 Kia Sorento

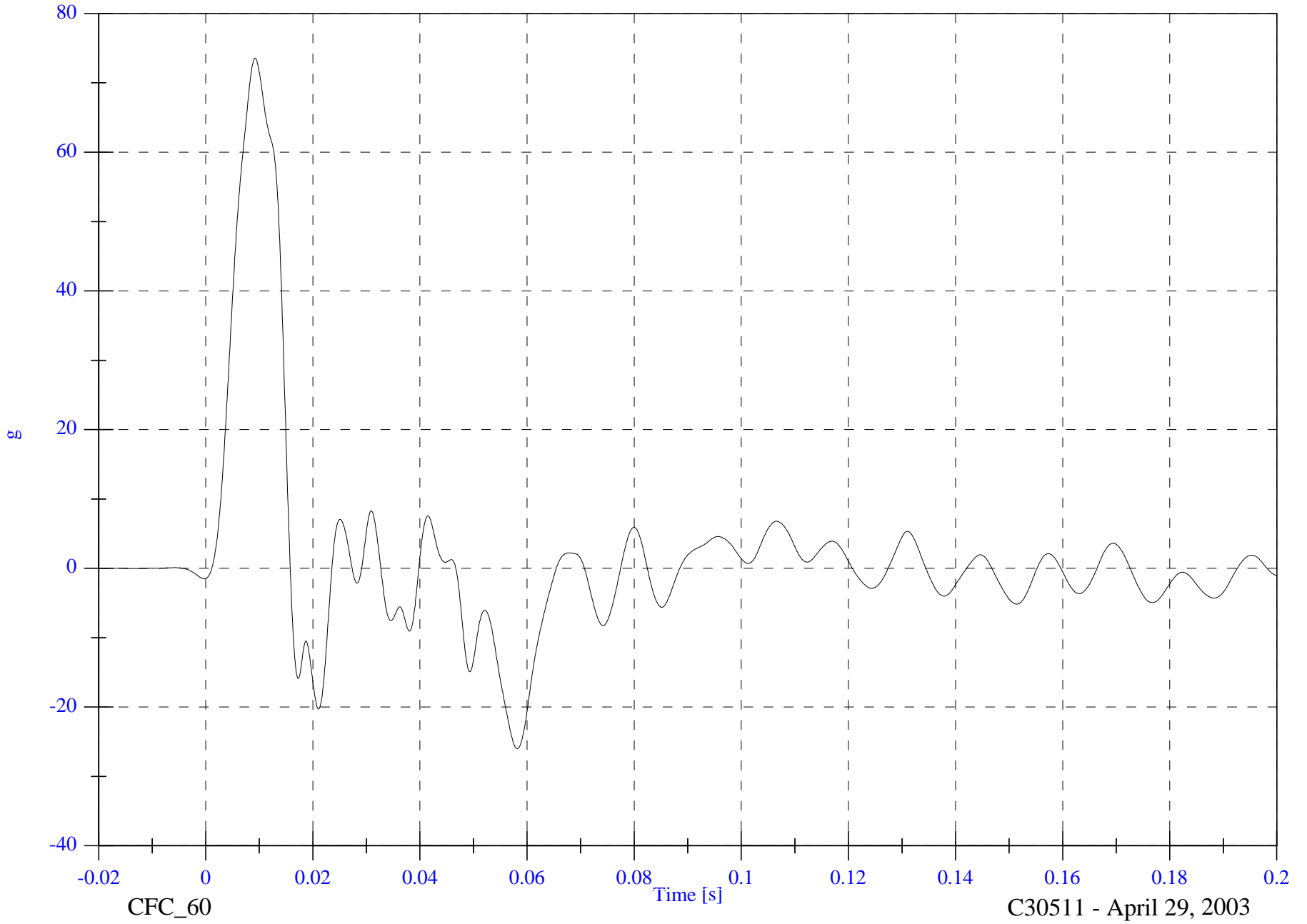
V2 A16 Front Seat Track y

Max: 73.6 [g] at 0.009 [s]

Min: -26.0 [g] at 0.058 [s]

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CFC\_60

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

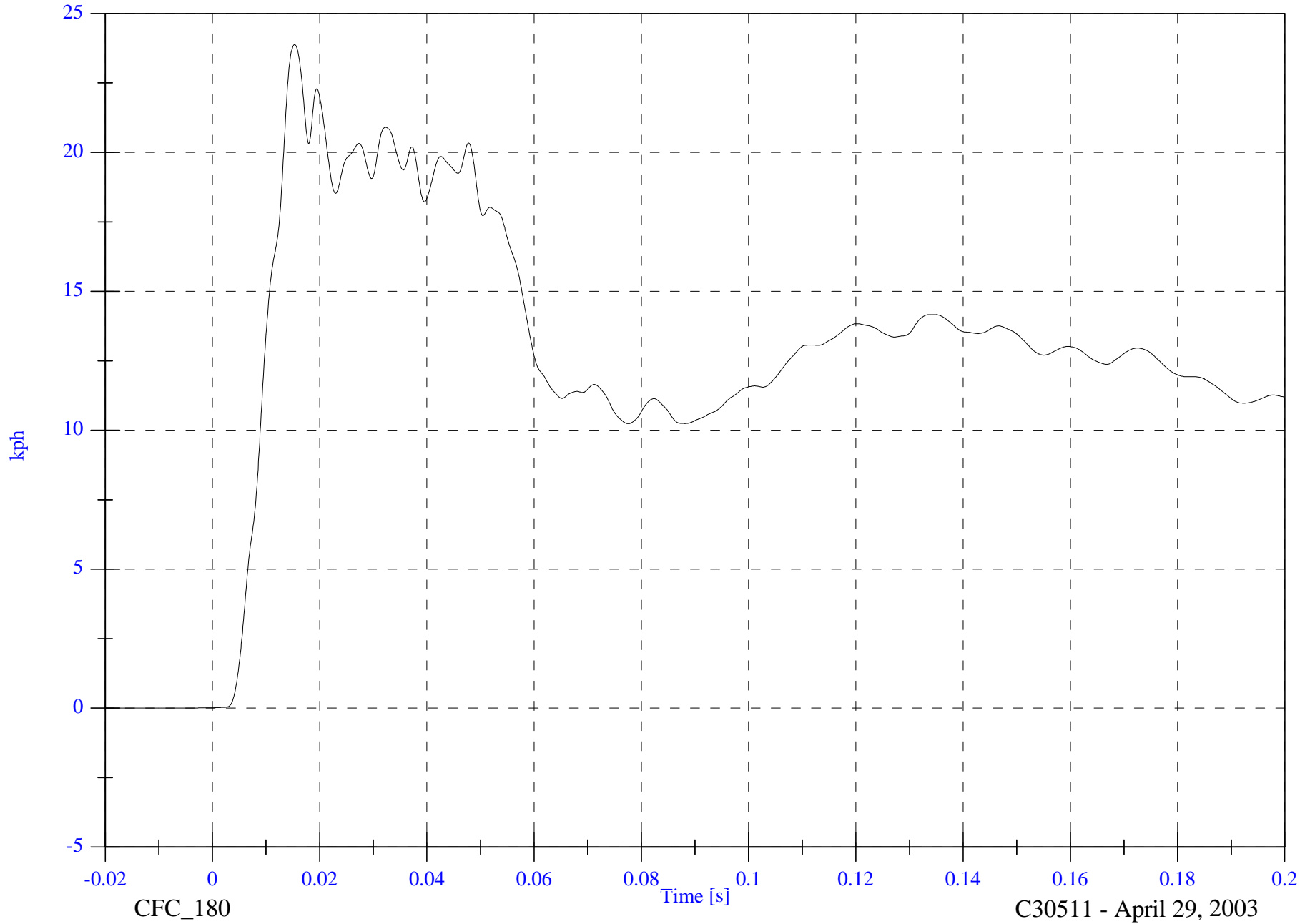
V2 A16 Front Seat Track y Velocity

Max: 23.9 [kph] at 0.015 [s]

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

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

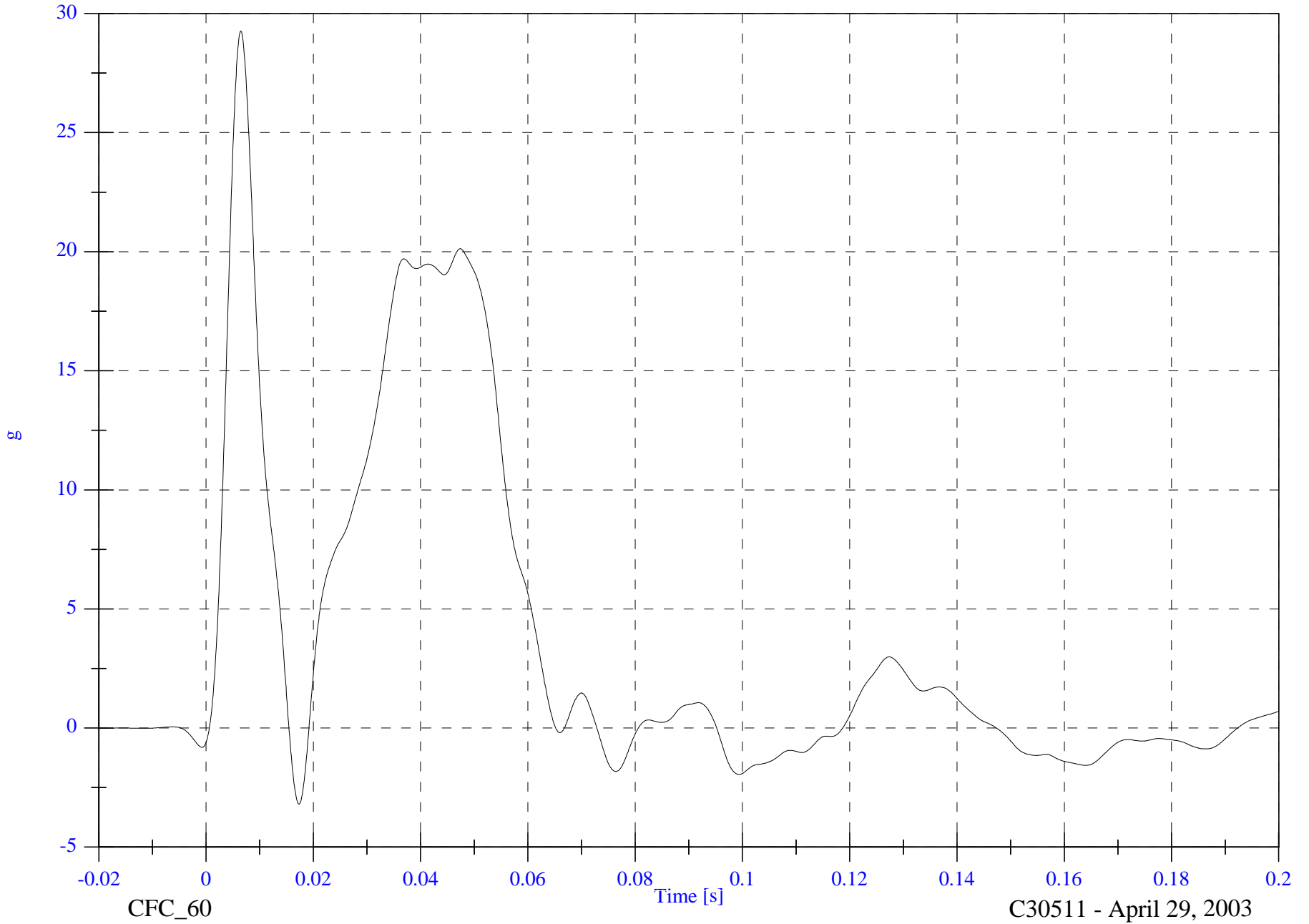
V2 A17 Rear Seat Track y

Max: 29.3 [g] at 0.006 [s]

Min: -3.2 [g] at 0.017 [s]

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FMVSS 214D Indicant - 2003 Kia Sorento

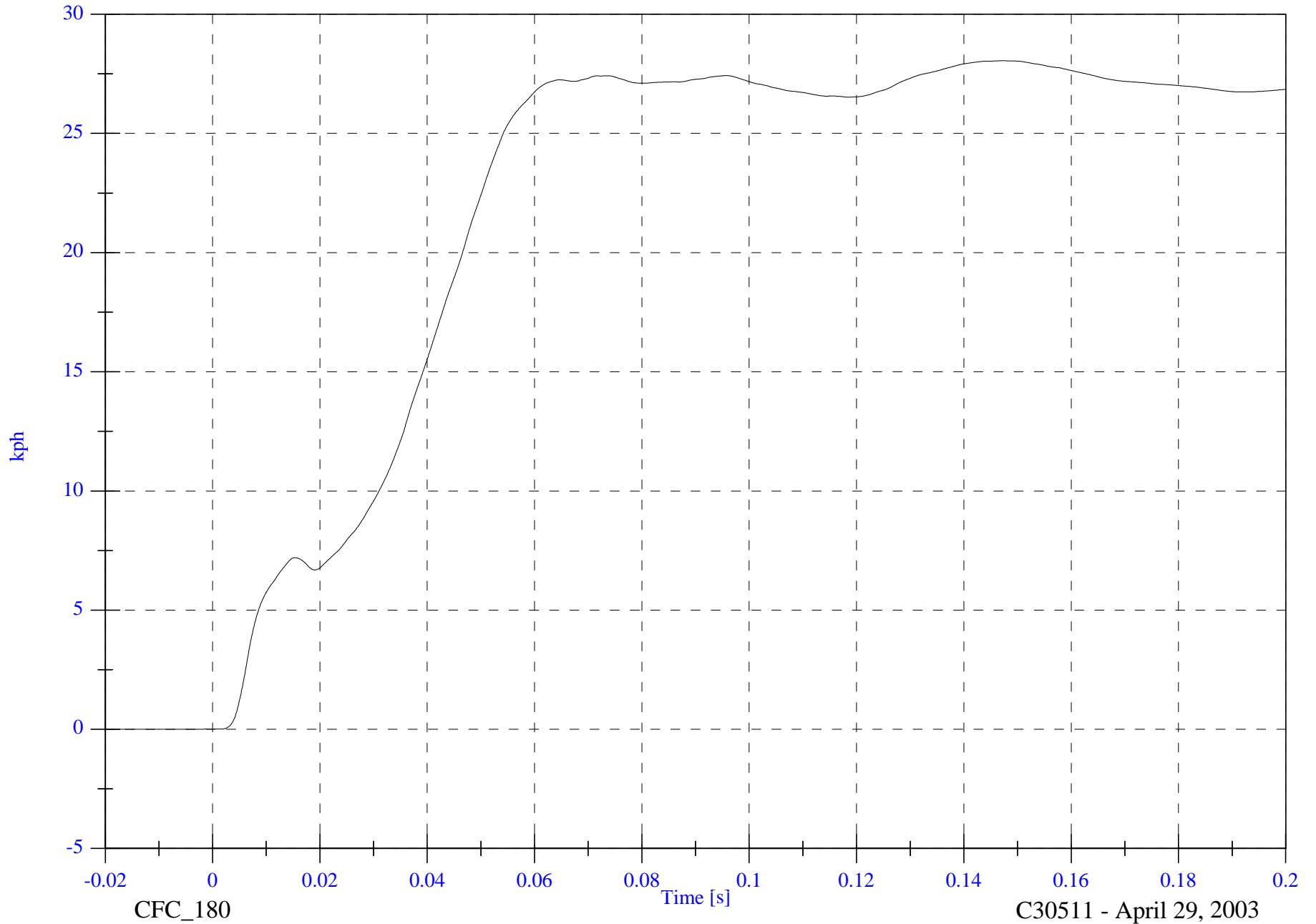
V2 A17 Rear Seat Track y Velocity

Max: 28.0 [kph] at 0.147 [s]

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

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

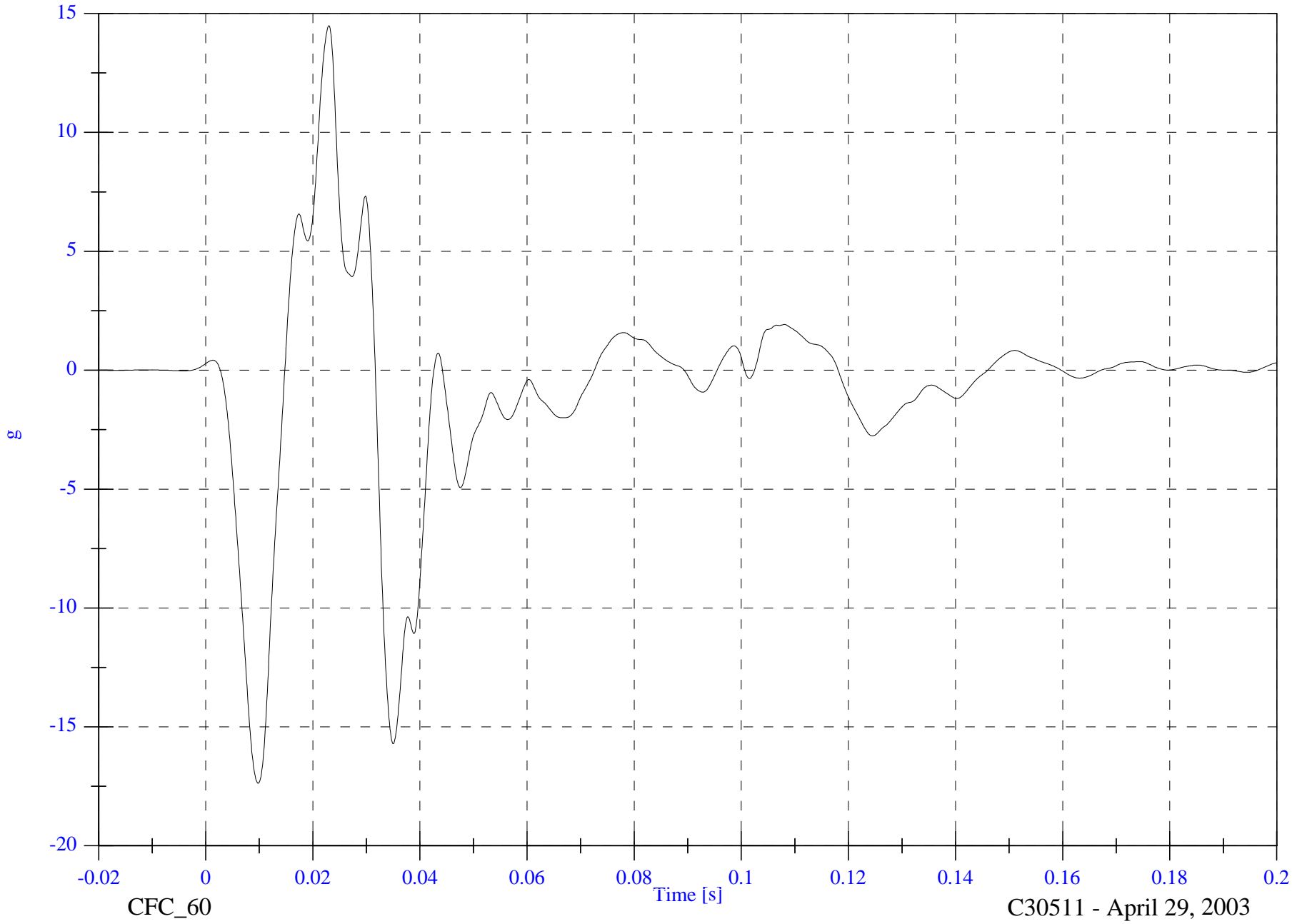
V2 A18 Target CG x

Max: 14.5 [g] at 0.023 [s]

Min: -17.4 [g] at 0.010 [s]

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FMVSS 214D Indicant - 2003 Kia Sorento

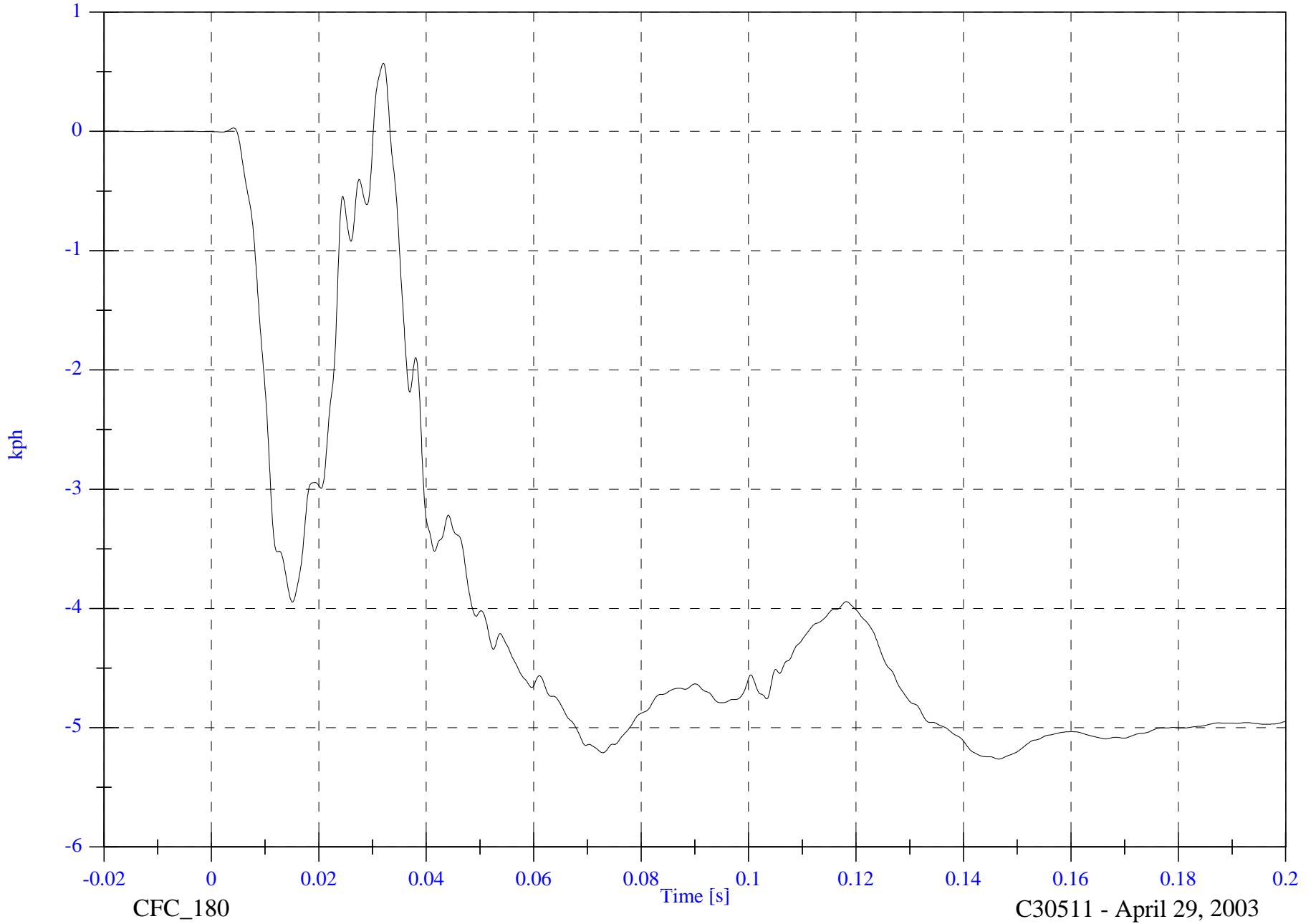
V2 A18 Target CG x Velocity

Max: 0.6 [kph] at 0.032 [s]

Min: -5.3 [kph] at 0.147 [s]

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CFC\_180

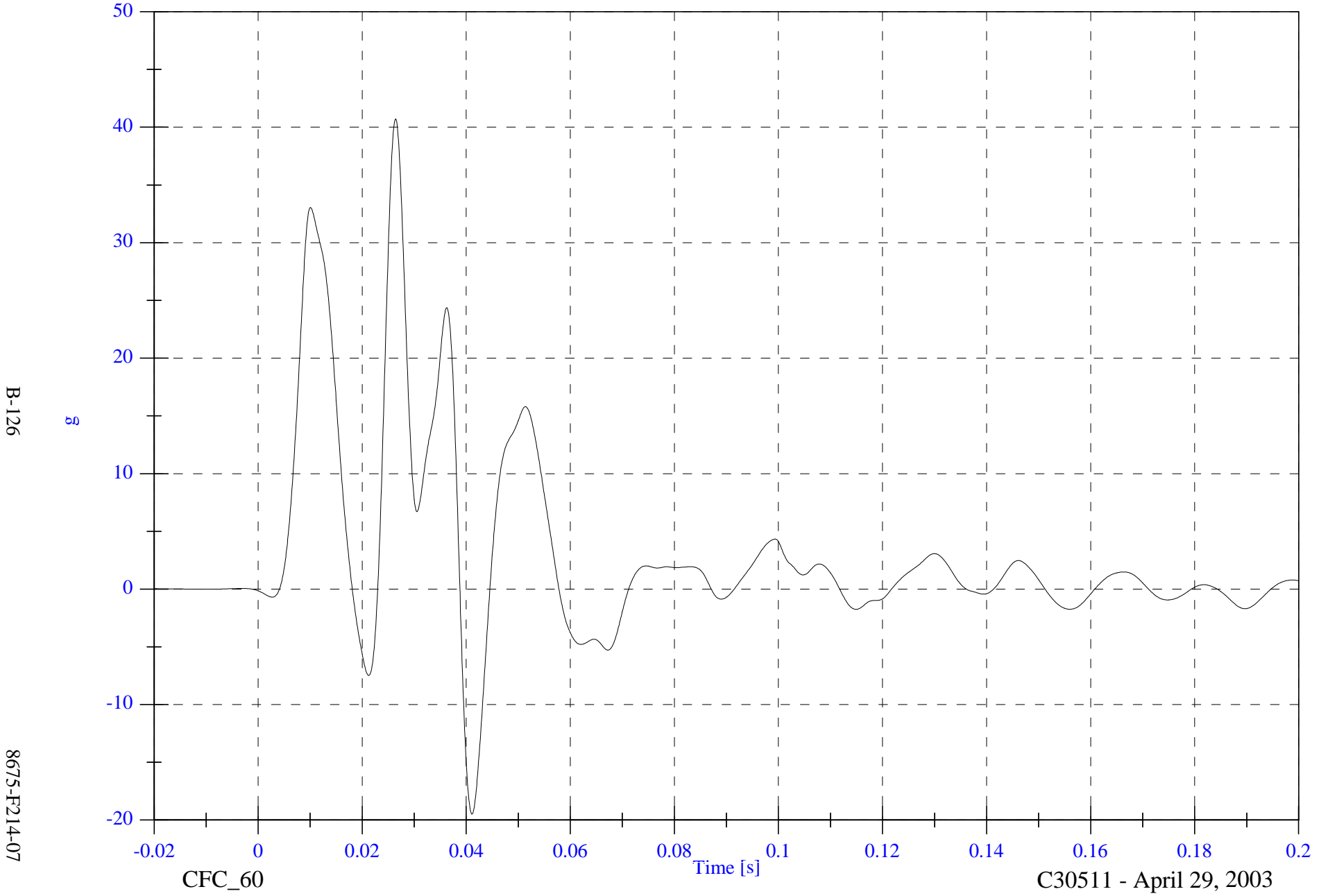
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FMVSS 214D Indicant - 2003 Kia Sorento

V2 A18 Target CG y

Max: 40.7 [g] at 0.026 [s]

Min: -19.5 [g] at 0.041 [s]



FMVSS 214D Indicant - 2003 Kia Sorento

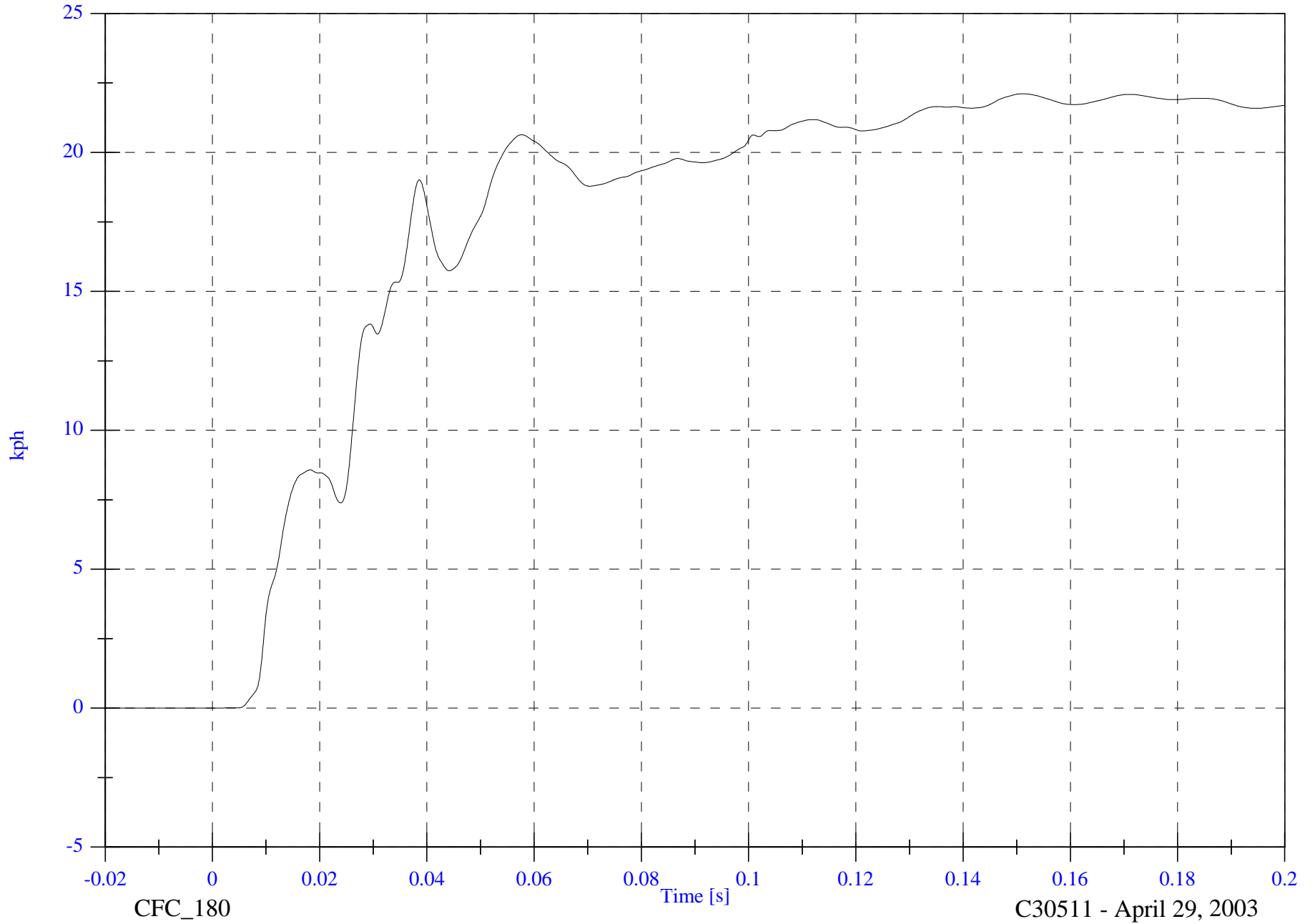
V2 A18 Target CG y Velocity

Max: 22.1 [kph] at 0.151 [s]

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

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

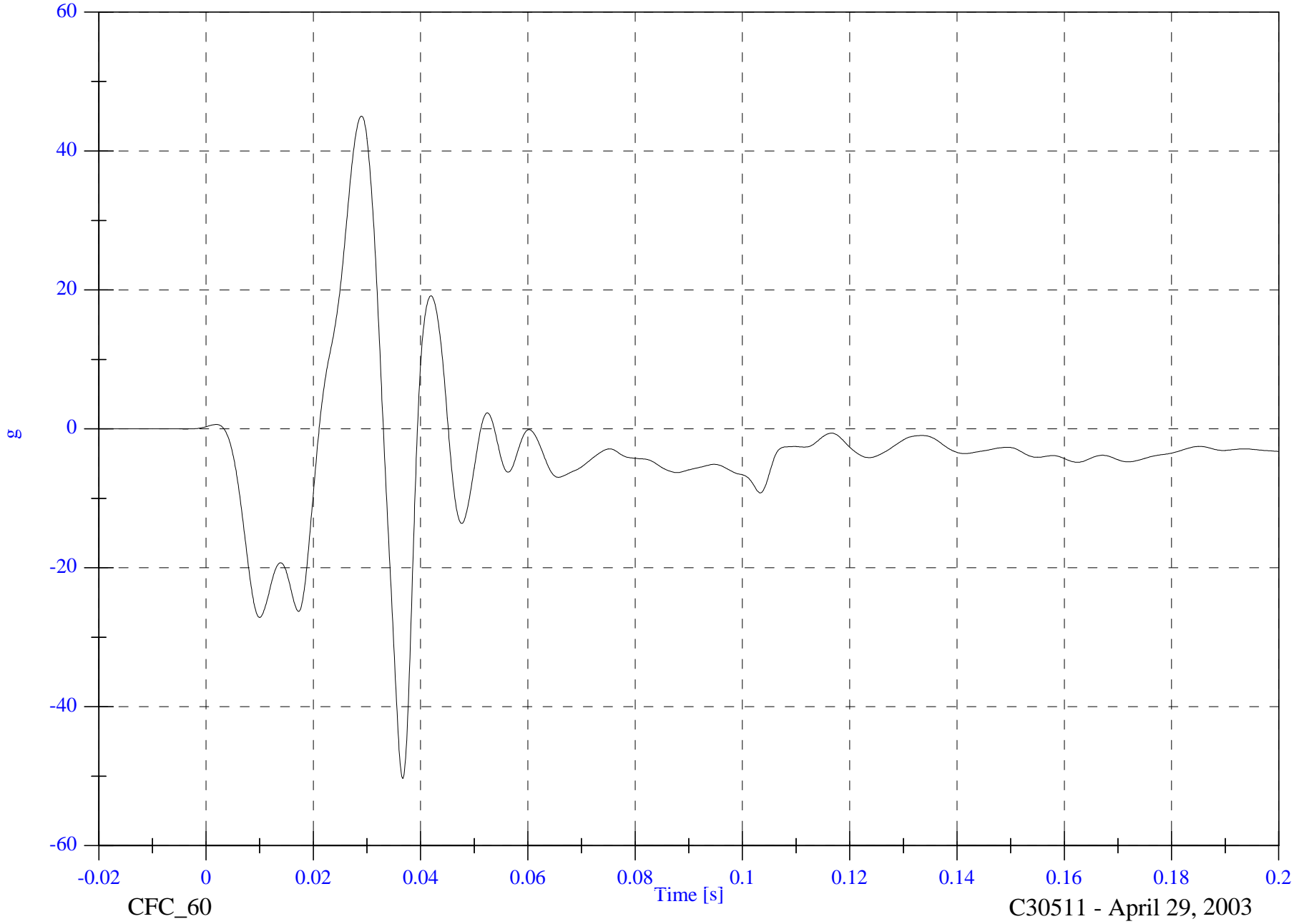
V2 A18 Target CG z

Max: 45.0 [g] at 0.029 [s]

Min: -50.3 [g] at 0.037 [s]

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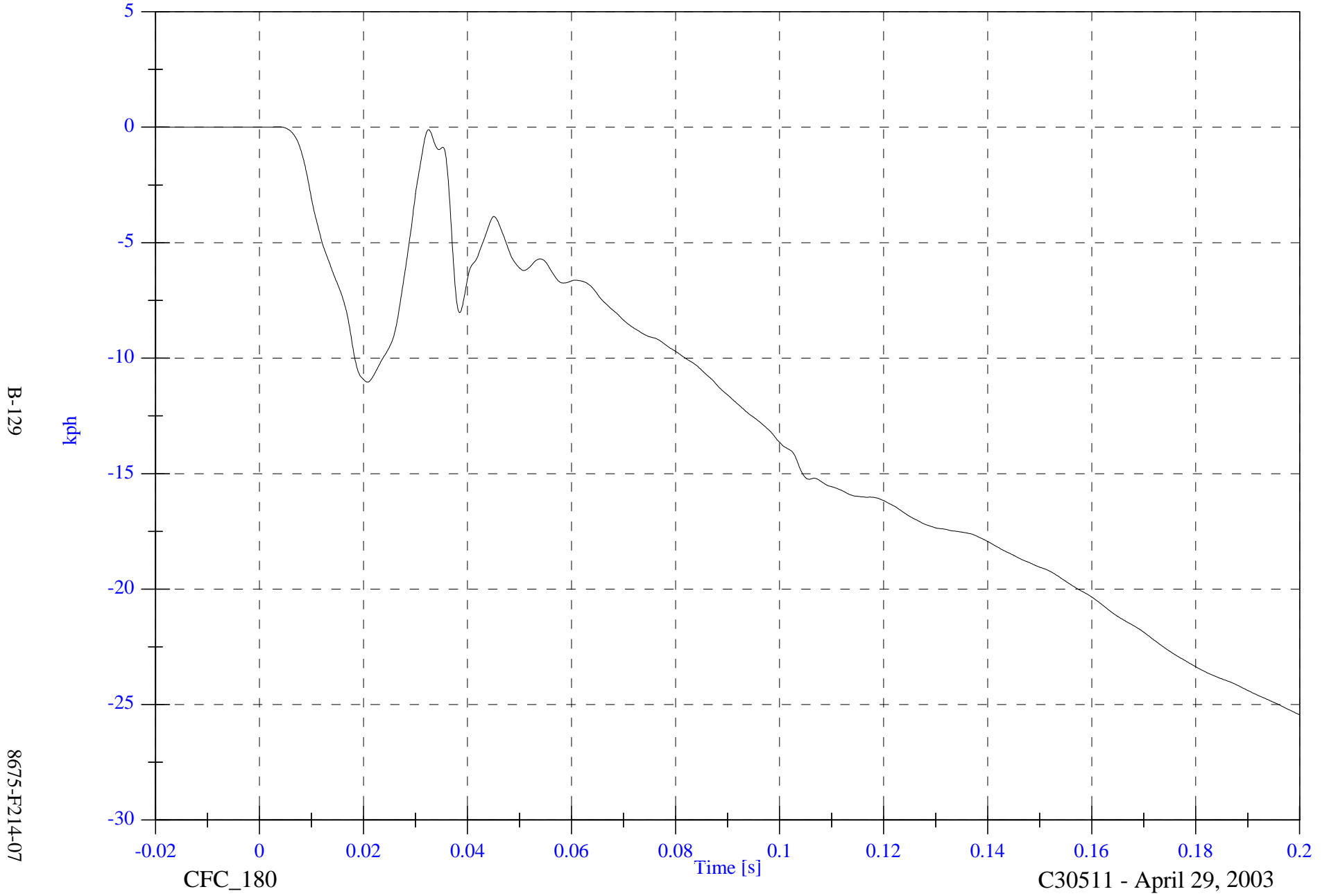
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FMVSS 214D Indicant - 2003 Kia Sorento

V2 A18 Target CG z Velocity

Max: 0.0 [kph] at 0.004 [s]

Min: -25.4 [kph] at 0.200 [s]



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CFC\_180

Time [s]

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

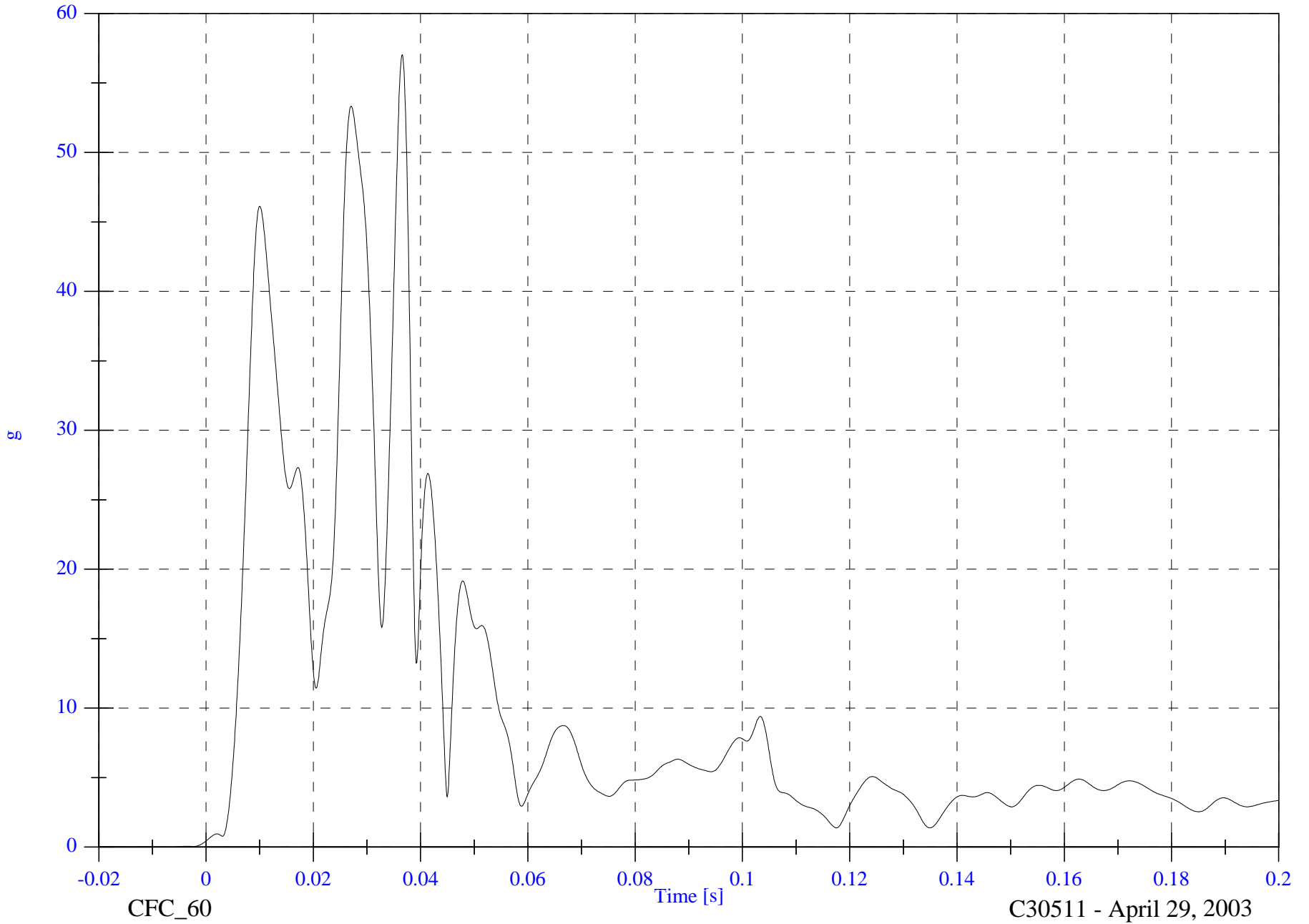
V2 A18 Target CG Resultant

Max: 57.0 [g] at 0.037 [s]

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

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FMVSS 214D Indicant - 2003 Kia Sorento

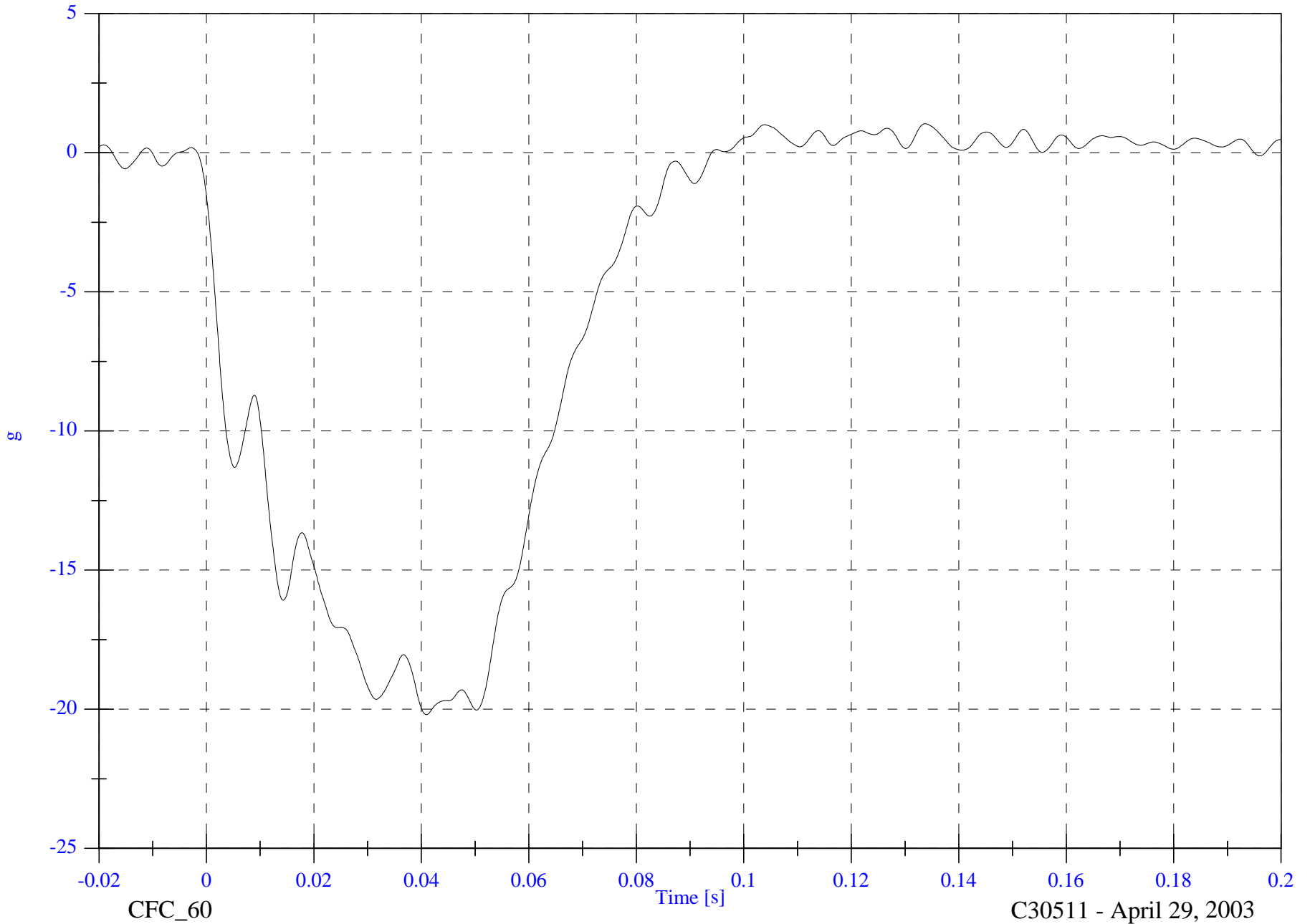
V1 Moving Barrier CG X

Max: 1.0 [g] at 0.134 [s]

Min: -20.2 [g] at 0.041 [s]

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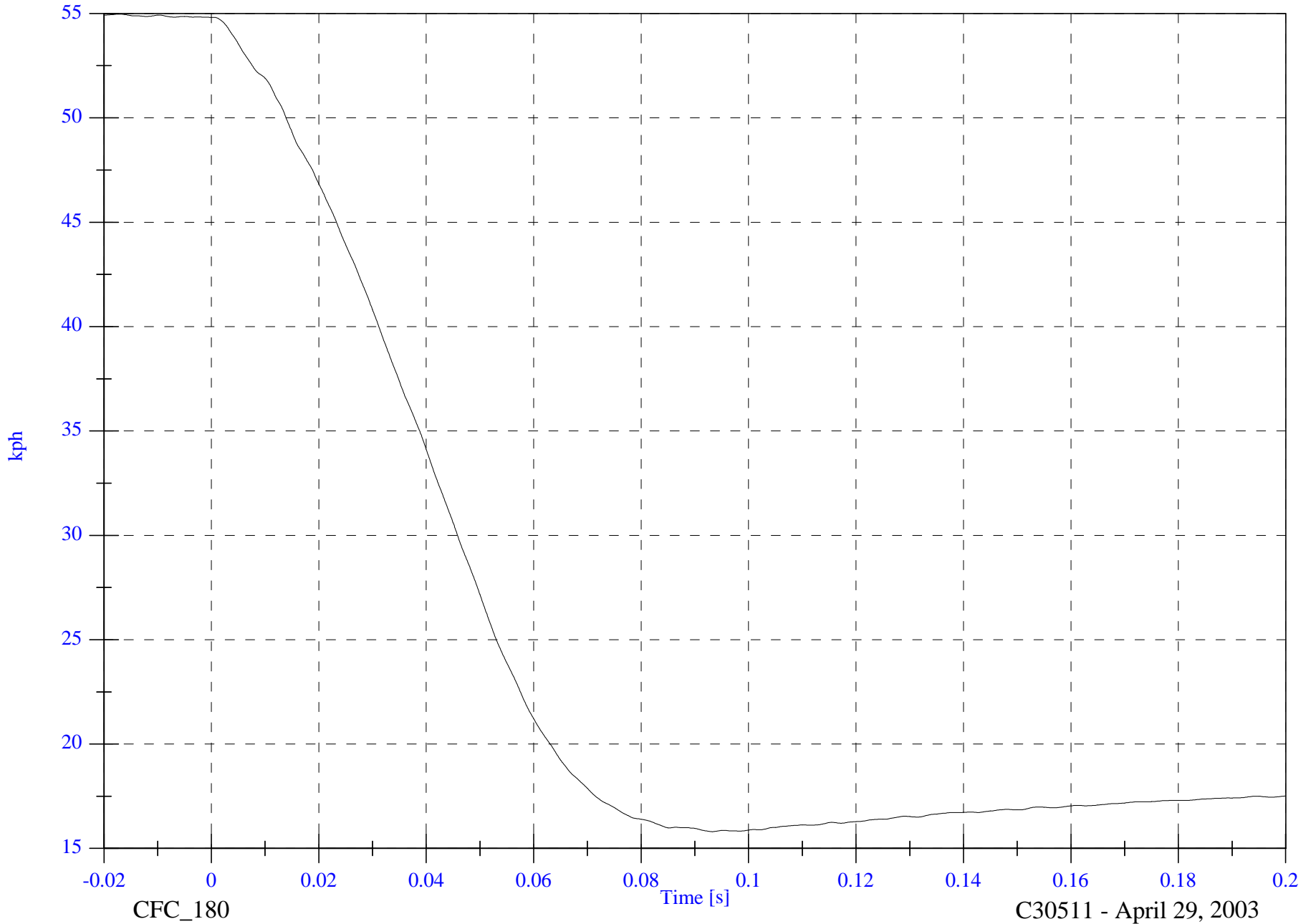


FMVSS 214D Indicant - 2003 Kia Sorento

Max: 55.0 [kph] at -0.017 [s]

V1 Moving Barrier CG X Velocity

Min: 15.8 [kph] at 0.093 [s]



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FMVSS 214D Indicant - 2003 Kia Sorento

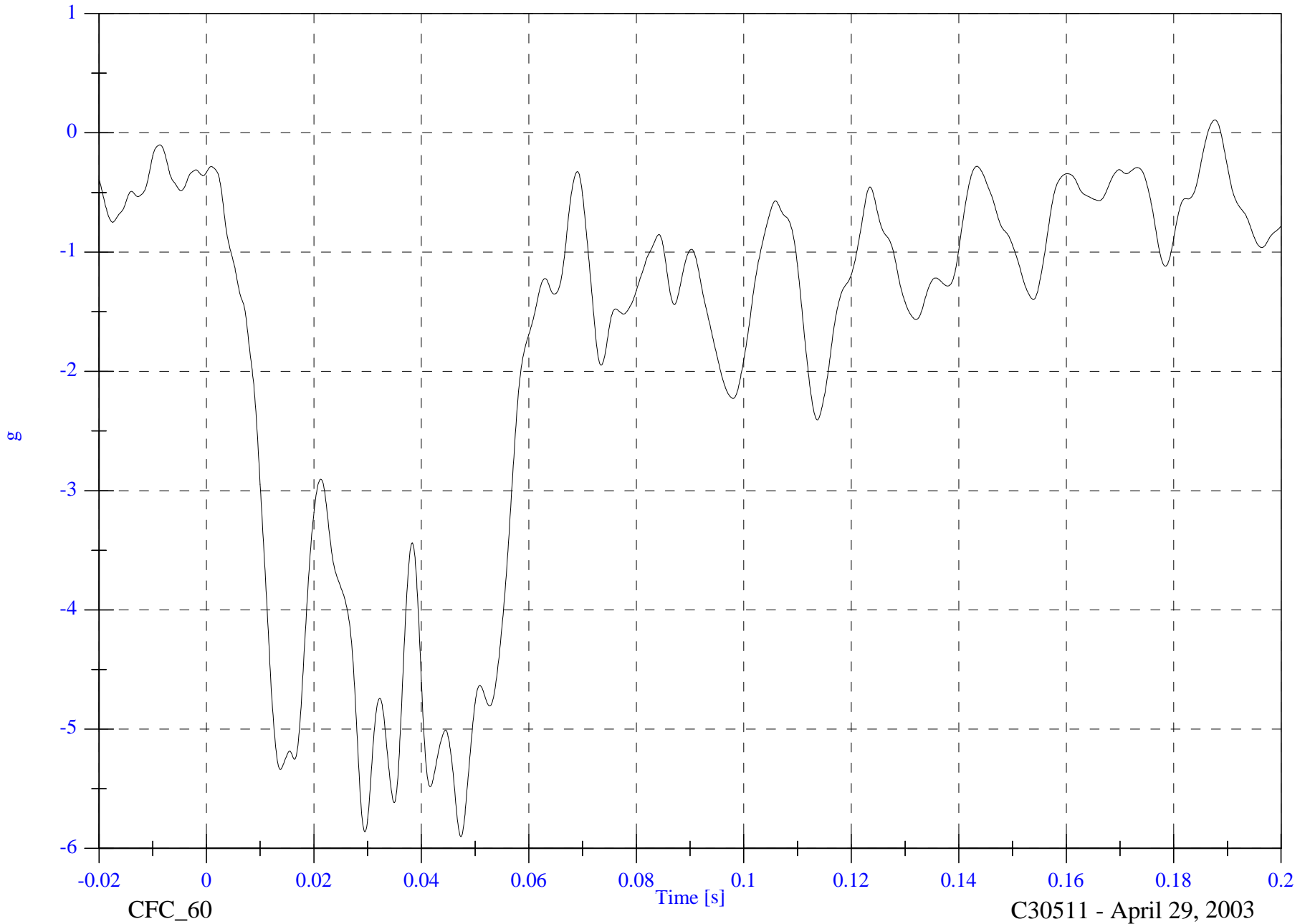
V1 Moving Barrier CG Y

Max: 0.1 [g] at 0.188 [s]

Min: -5.9 [g] at 0.047 [s]

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FMVSS 214D Indicant - 2003 Kia Sorento

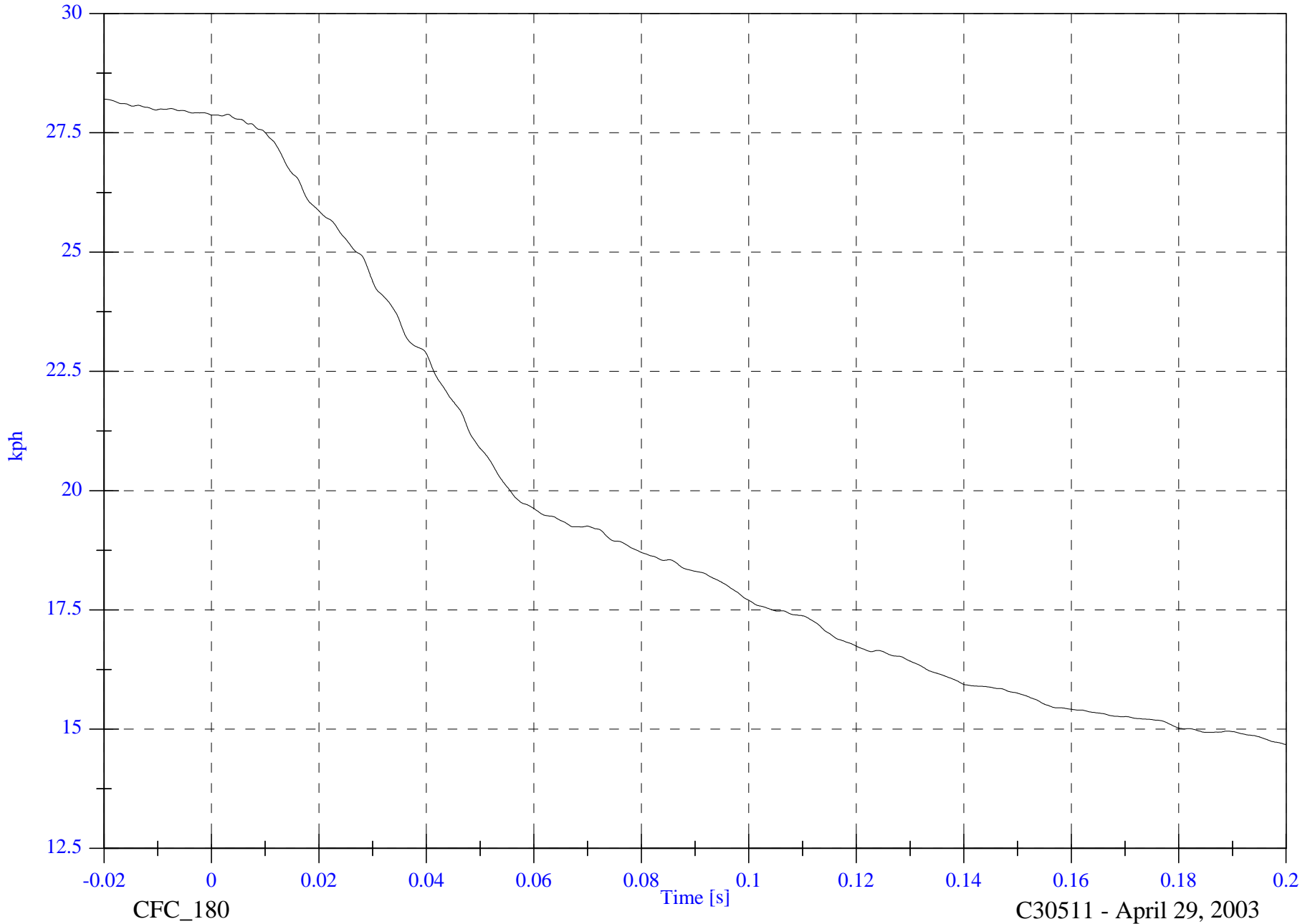
V1 Moving Barrier CG Y Velocity

Max: 28.2 [kph] at -0.020 [s]

Min: 14.7 [kph] at 0.200 [s]

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CFC\_180

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FMVSS 214D Indicant - 2003 Kia Sorento

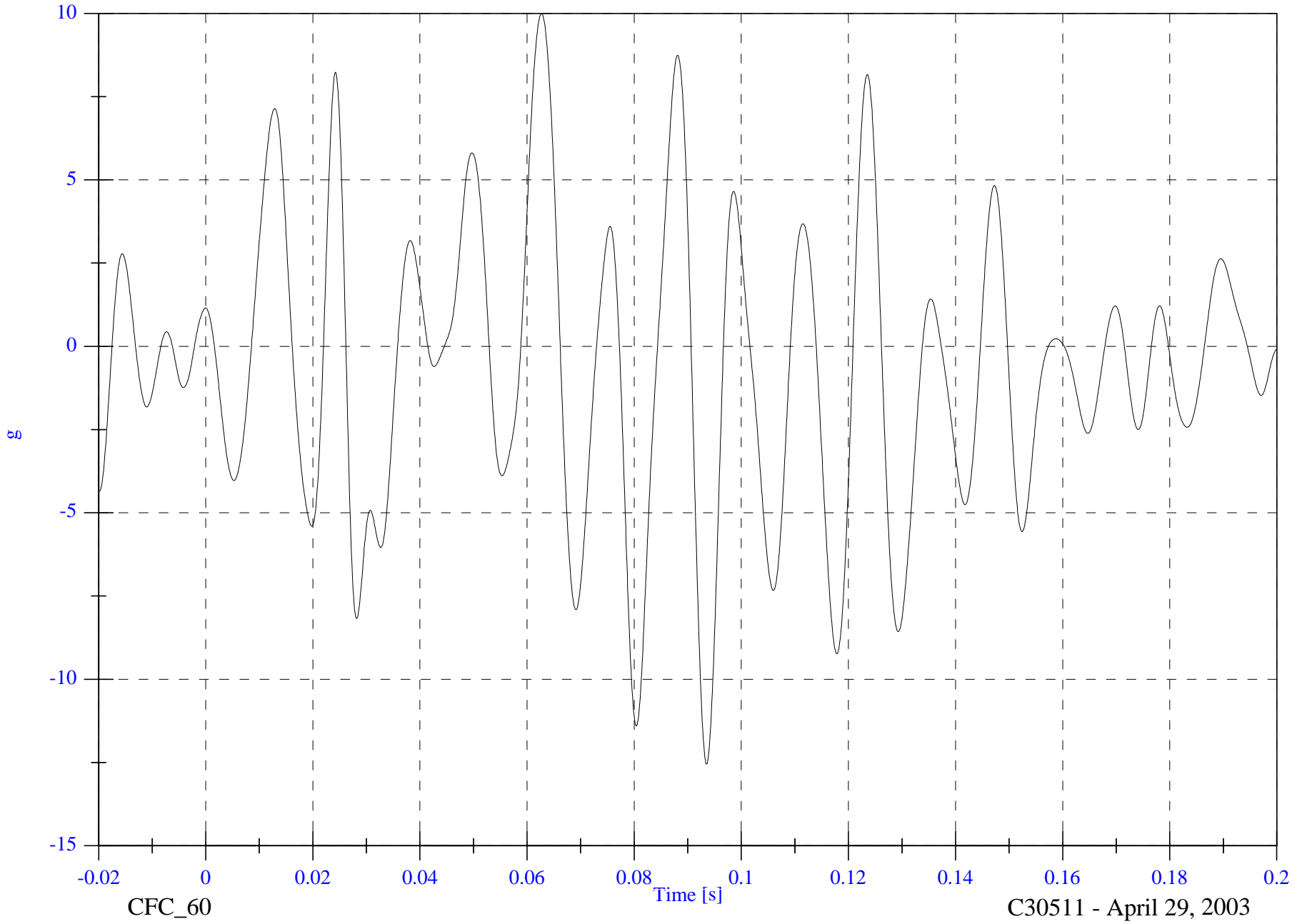
V1 Moving Barrier CG Z

Max: 10.0 [g] at 0.063 [s]

Min: -12.5 [g] at 0.093 [s]

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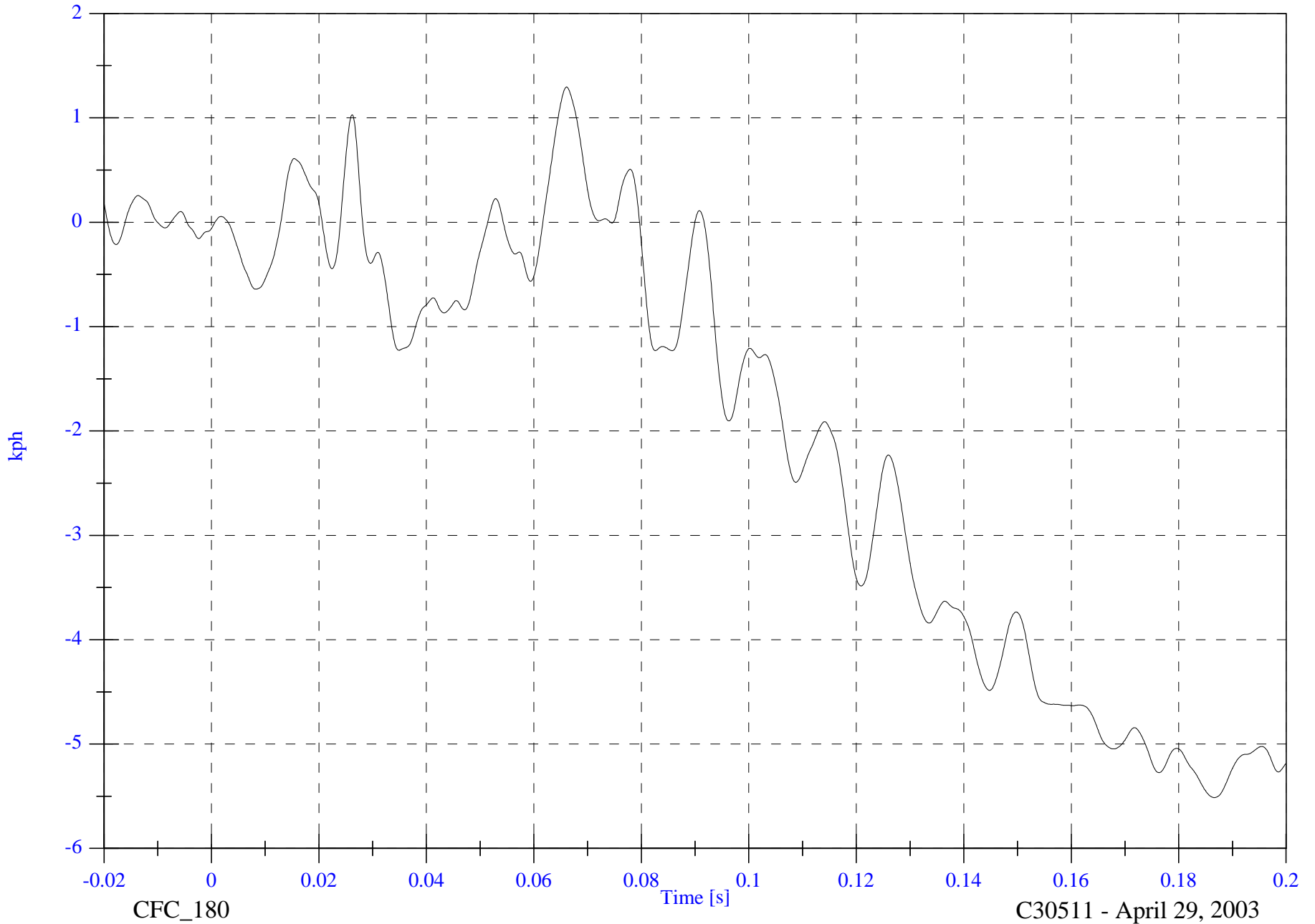


FMVSS 214D Indicant - 2003 Kia Sorento

Max: 1.3 [kph] at 0.066 [s]

V1 Moving Barrier CG Z Velocity

Min: -5.5 [kph] at 0.187 [s]



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CFC\_180

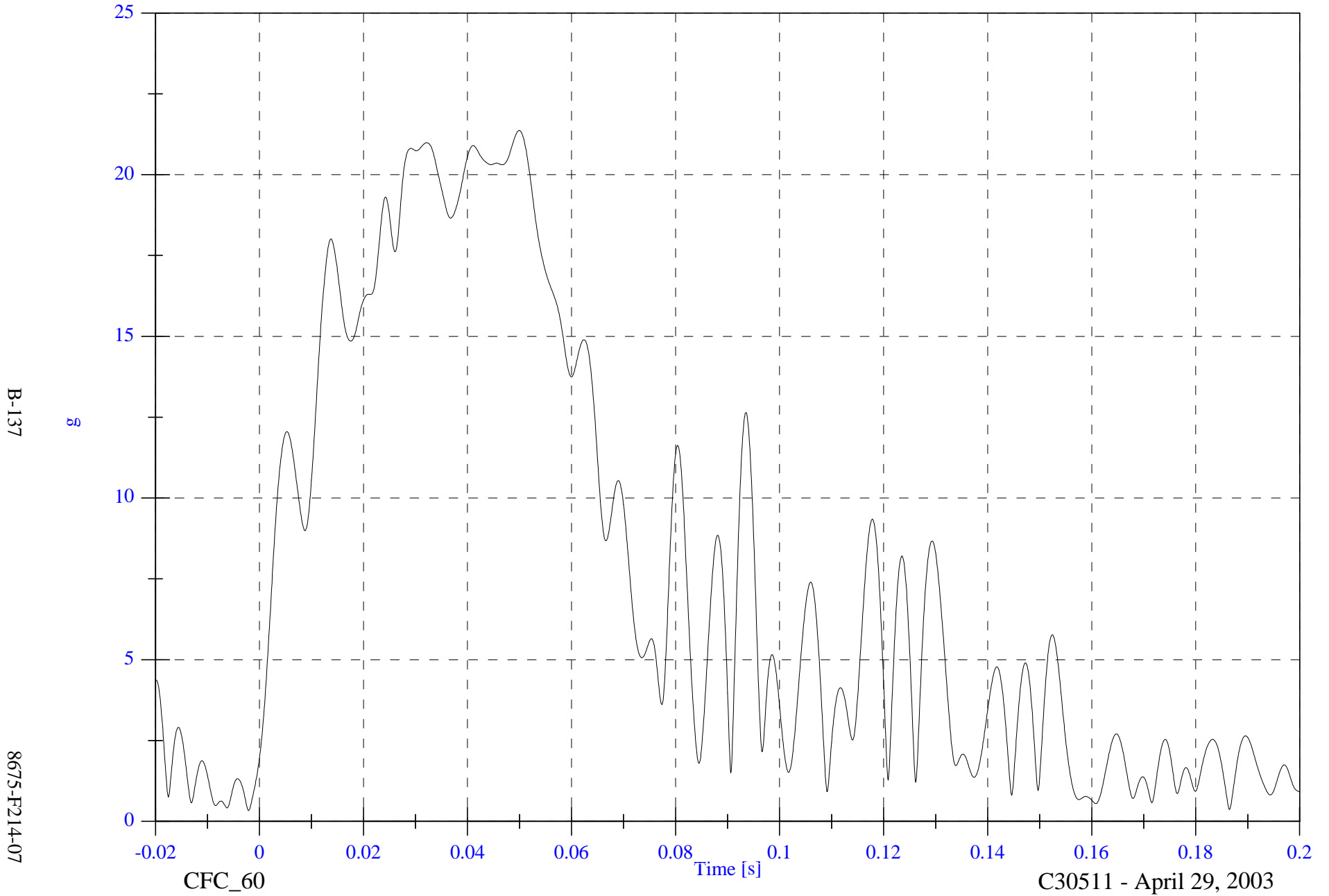
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V1 Moving Barrier CG Resultant

Max: 21.4 [g] at 0.050 [s]

Min: 0.3 [g] at -0.002 [s]



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CFC\_60

Time [s]

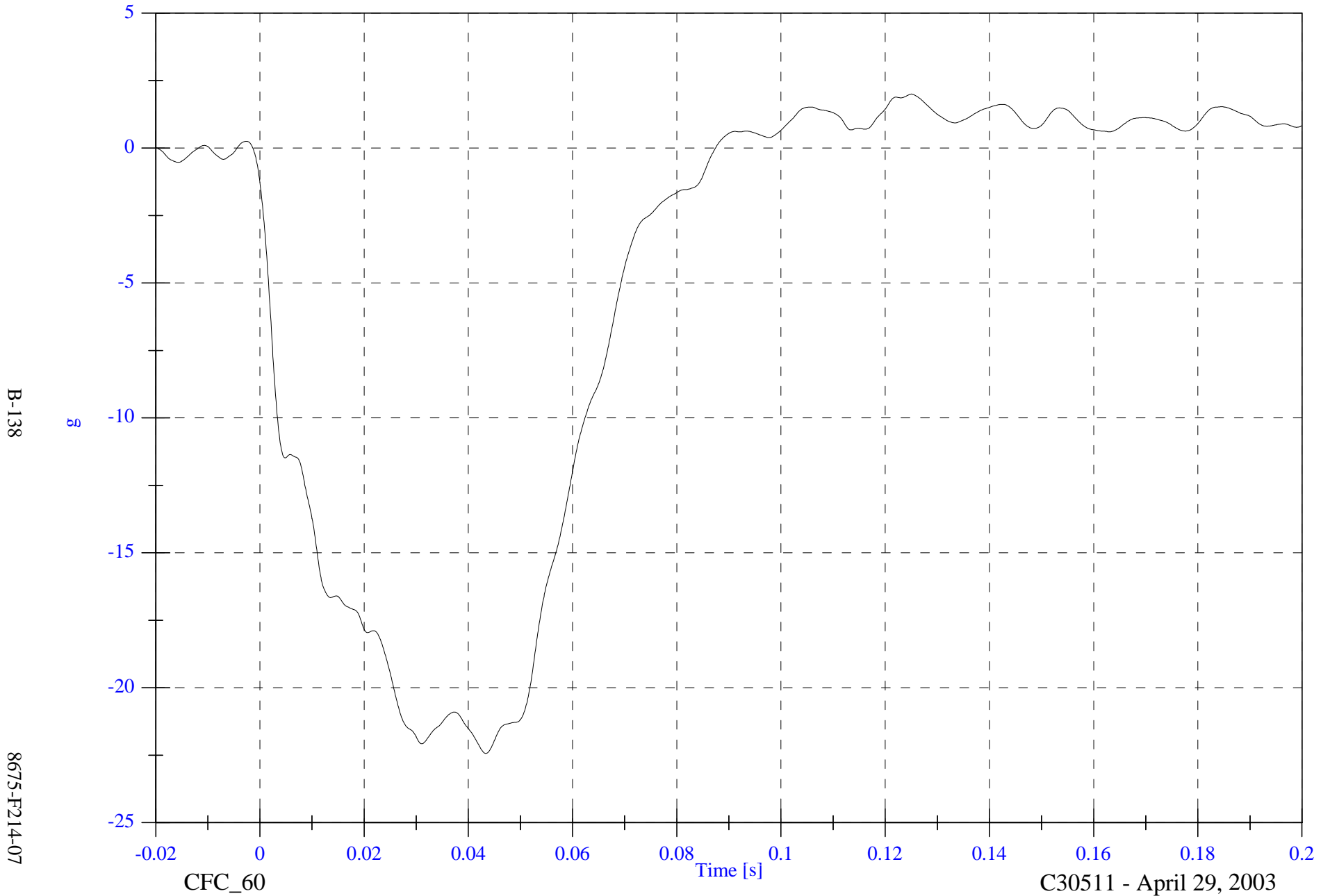
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FMVSS 214D Indicant - 2003 Kia Sorento

V1 Moving Barrier Left Rail X

Max: 2.0 [g] at 0.125 [s]

Min: -22.4 [g] at 0.043 [s]



FMVSS 214D Indicant - 2003 Kia Sorento

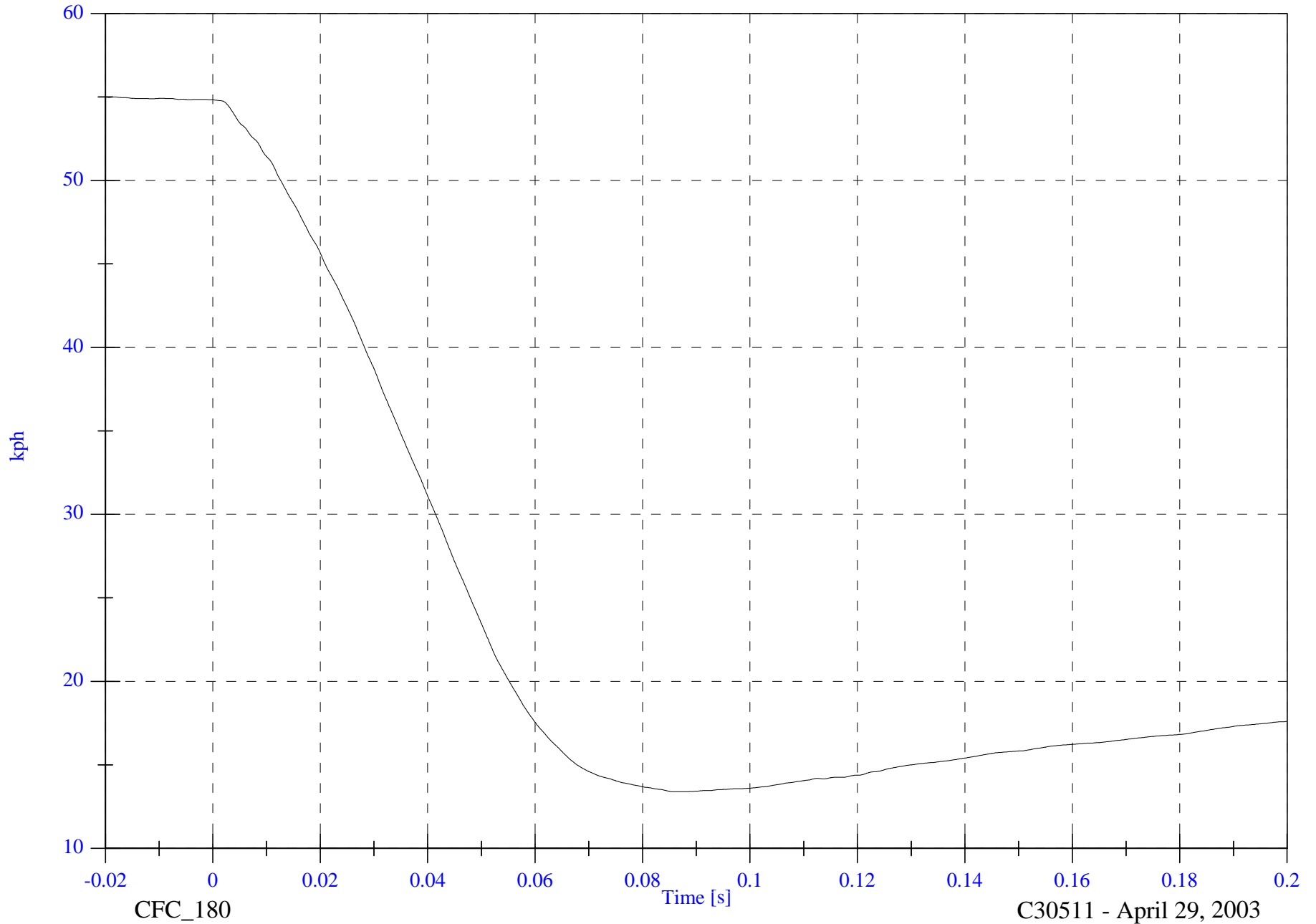
V1 Moving Barrier Left Rail X Velocity

Max: 55.0 [kph] at -0.018 [s]

Min: 13.4 [kph] at 0.086 [s]

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CFC\_180

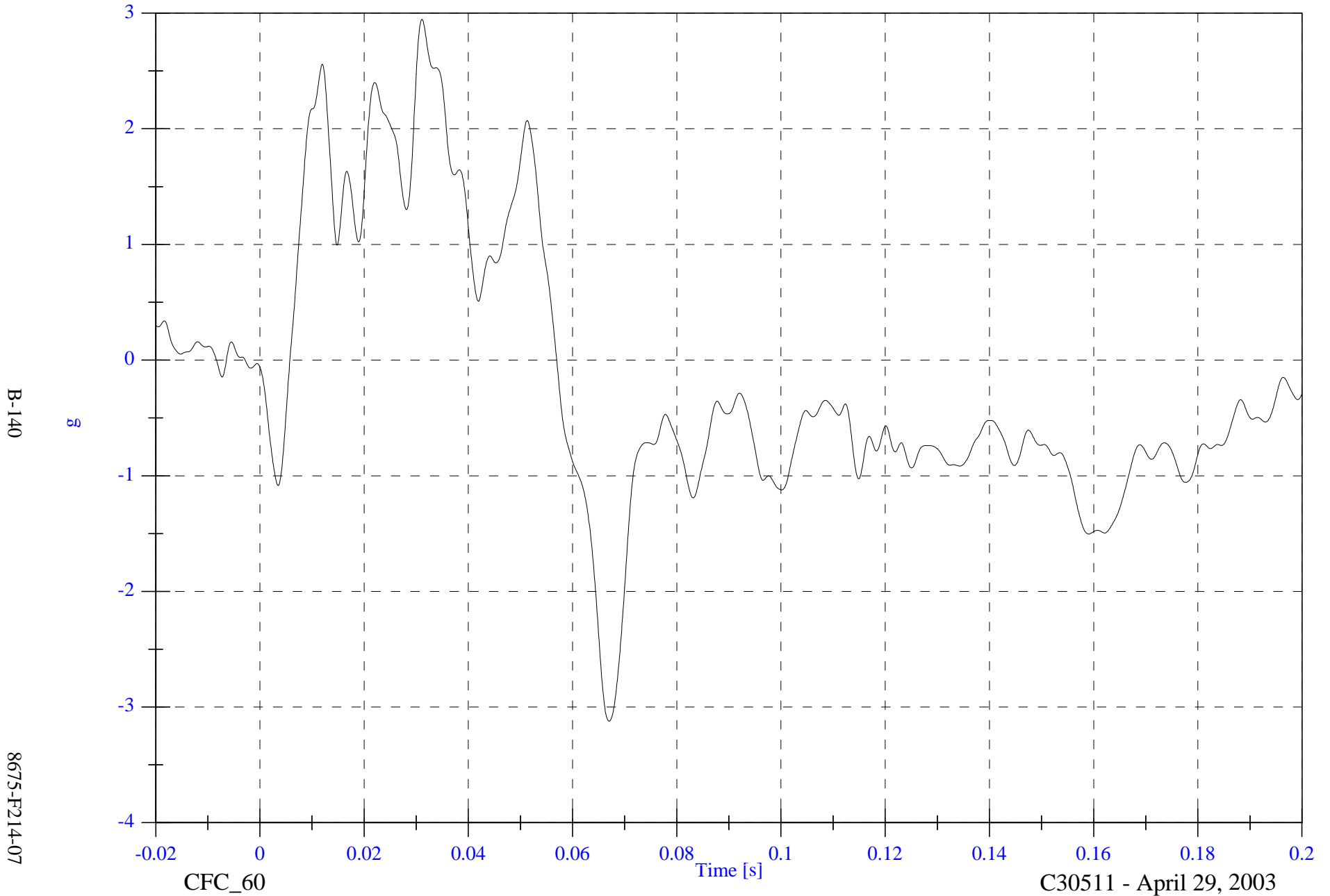
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V1 Moving Barrier Left Rail Y

Max: 2.9 [g] at 0.031 [s]

Min: -3.1 [g] at 0.067 [s]

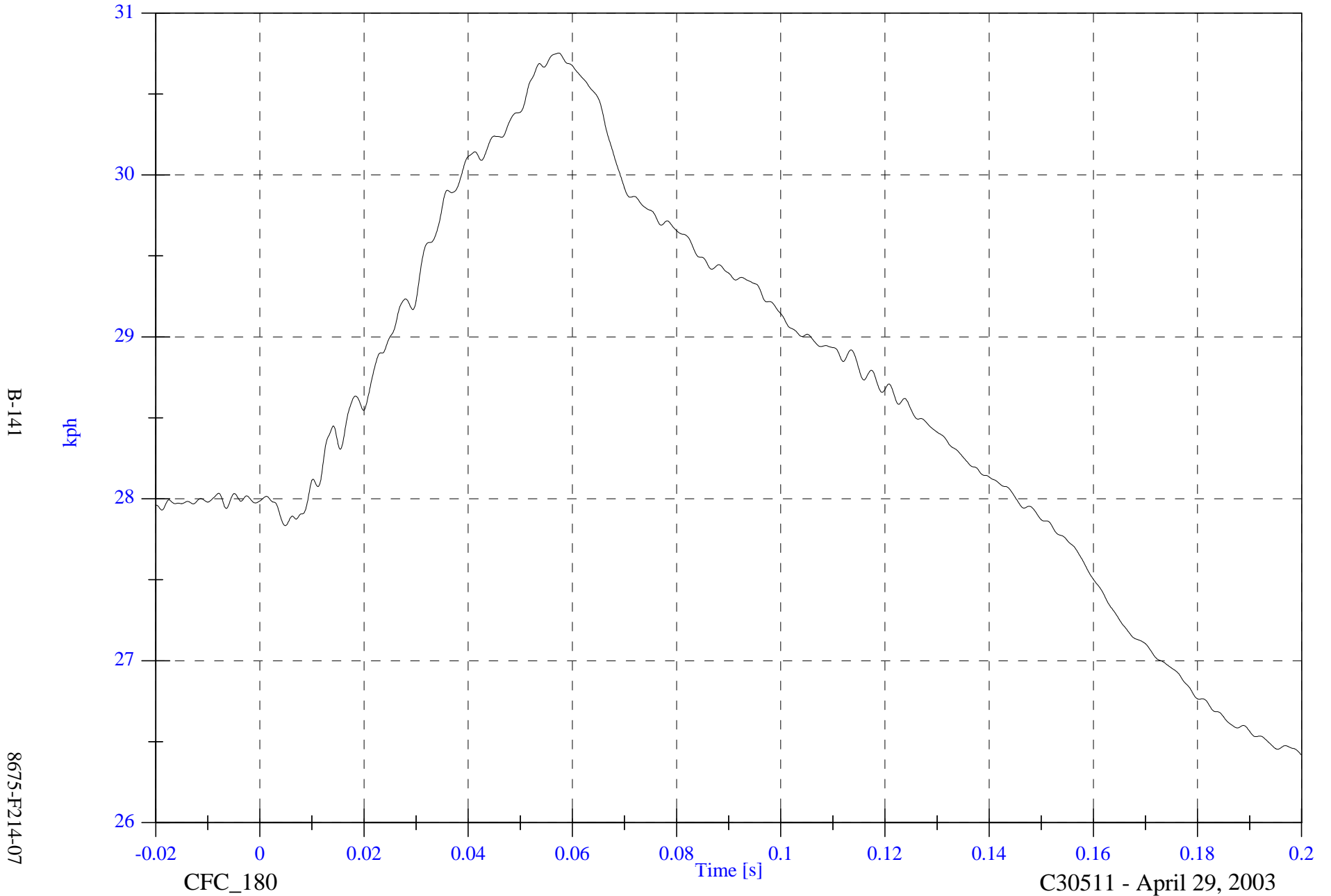


FMVSS 214D Indicant - 2003 Kia Sorento

Max: 30.8 [kph] at 0.057 [s]

V1 Moving Barrier Left Rail Y Velocity

Min: 26.4 [kph] at 0.200 [s]



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CFC\_180

Time [s]

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FMVSS 214D Indicant - 2003 Kia Sorento

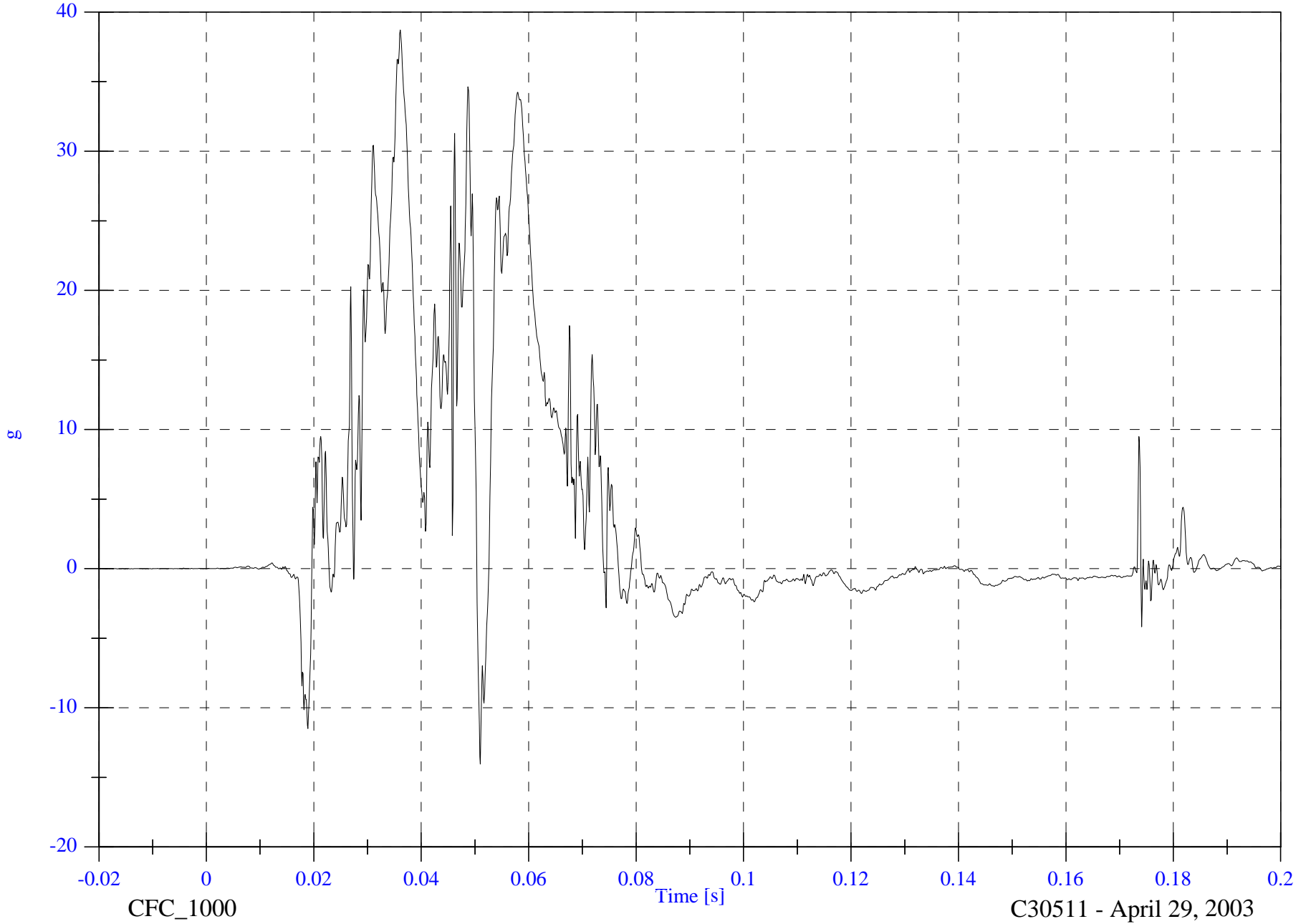
V2P1 Upper Rib Ry

Max: 38.7 [g] at 0.036 [s]

Min: -14.0 [g] at 0.051 [s]

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C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

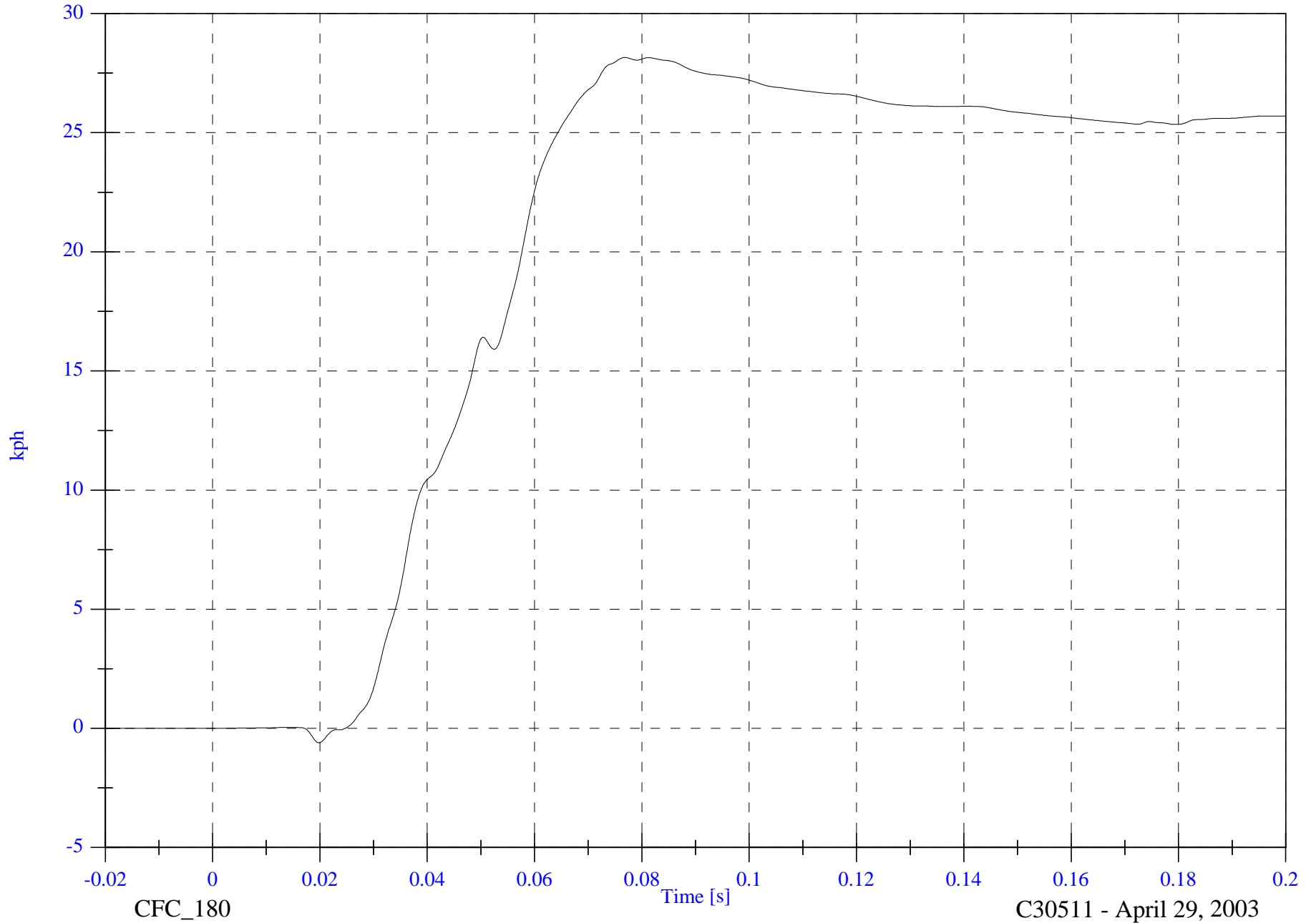
V2P1 Upper Rib Ry Velocity

Max: 28.2 [kph] at 0.077 [s]

Min: -0.6 [kph] at 0.020 [s]

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CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

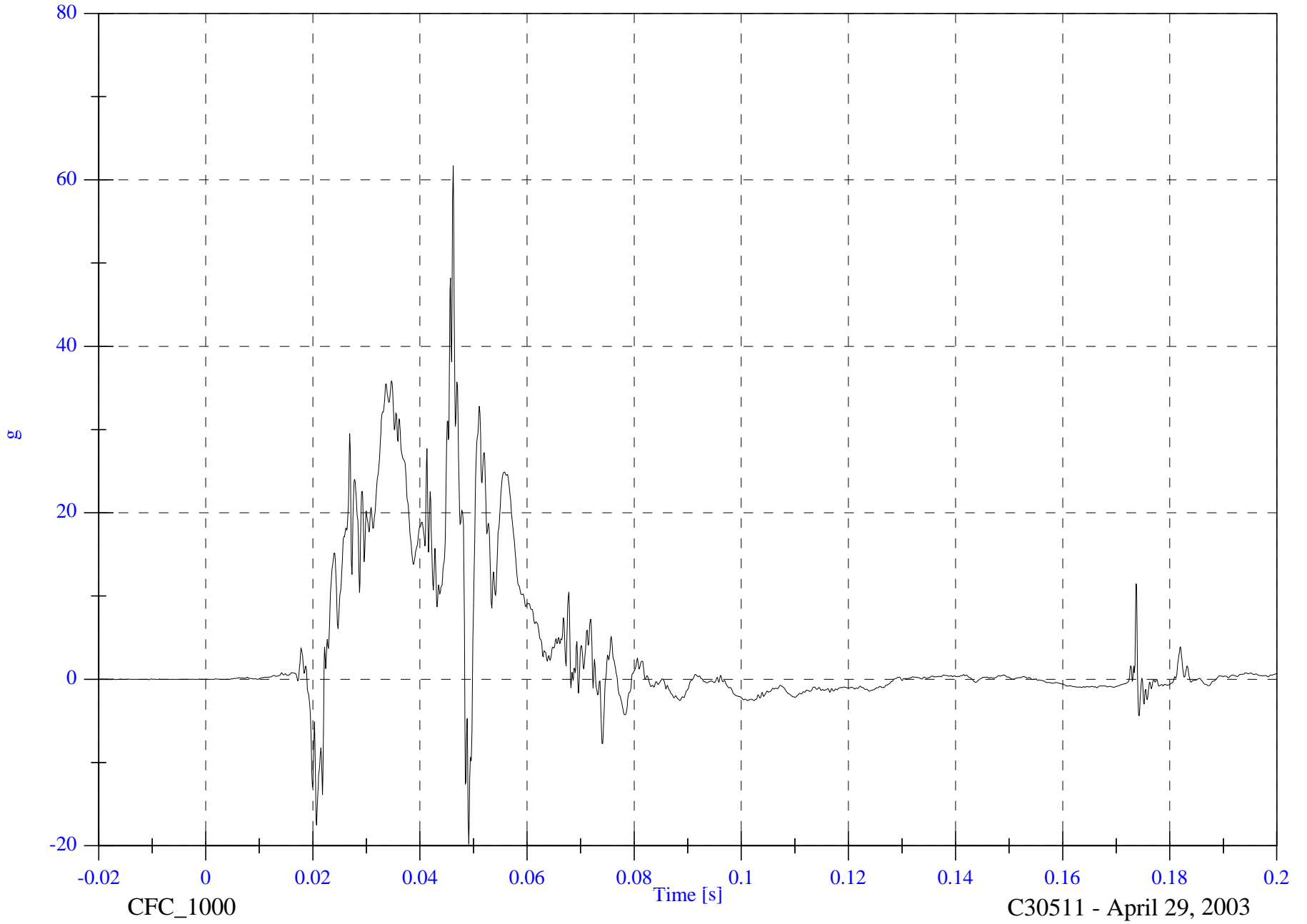
V2P1 Lower Rib Ry

Max: 61.7 [g] at 0.046 [s]

Min: -19.8 [g] at 0.049 [s]

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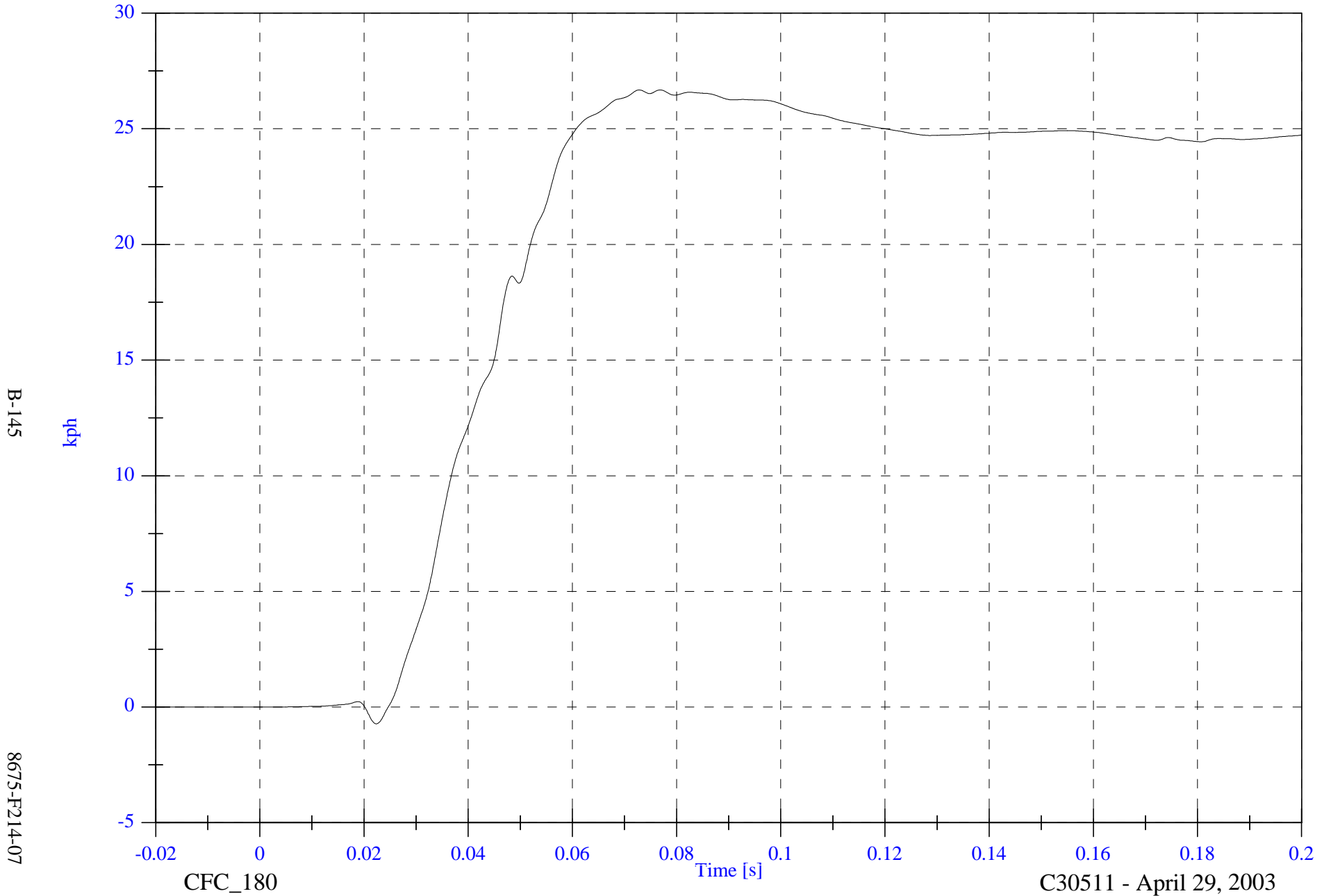


FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Lower Rib Ry Velocity

Max: 26.7 [kph] at 0.073 [s]

Min: -0.7 [kph] at 0.022 [s]



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CFC\_180

Time [s]

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

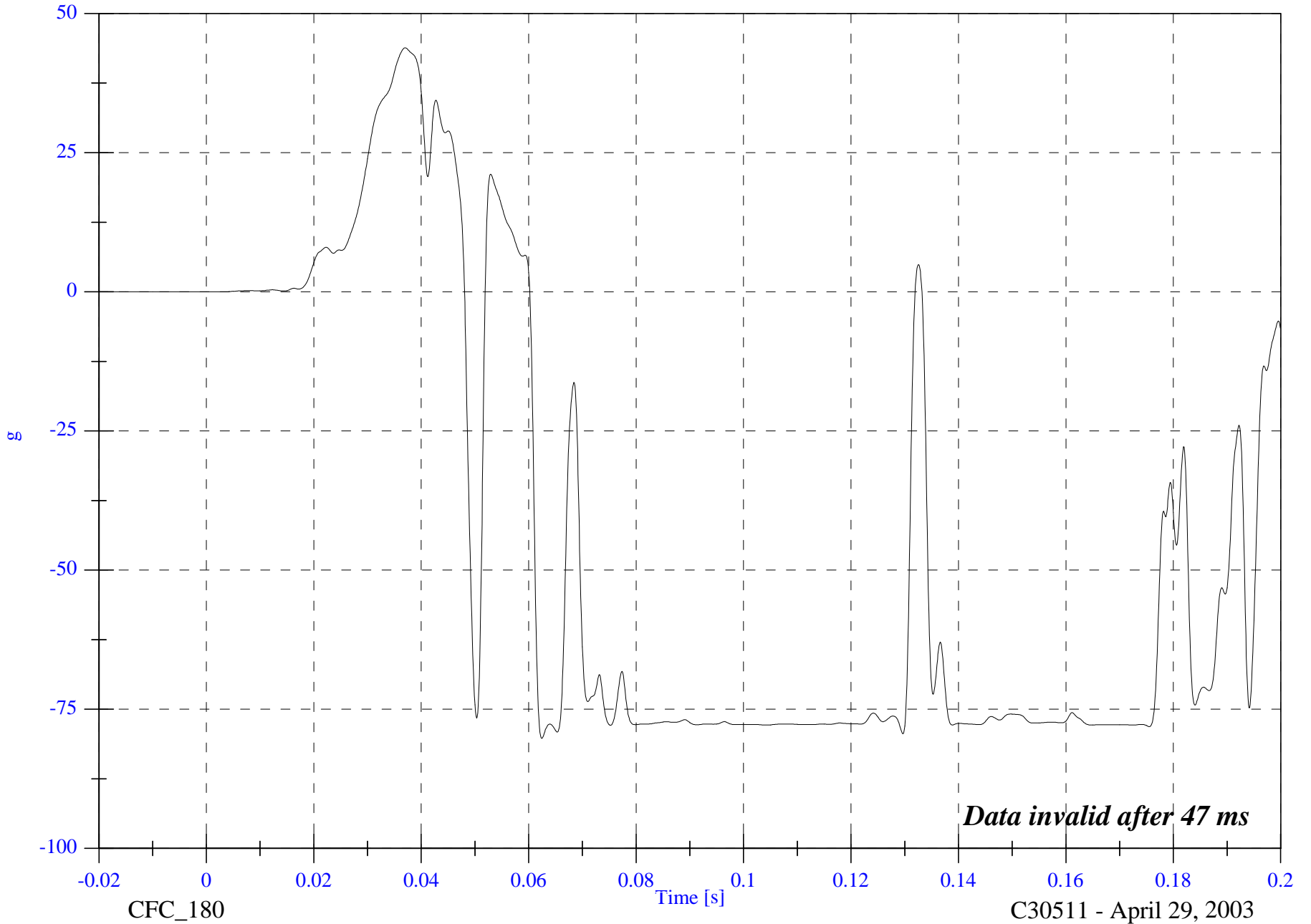
V2P1 Lower Spine Ry

Max: 43.8 [g] at 0.037 [s]

Min: -80.2 [g] at 0.062 [s]

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FMVSS 214D Indicant - 2003 Kia Sorento

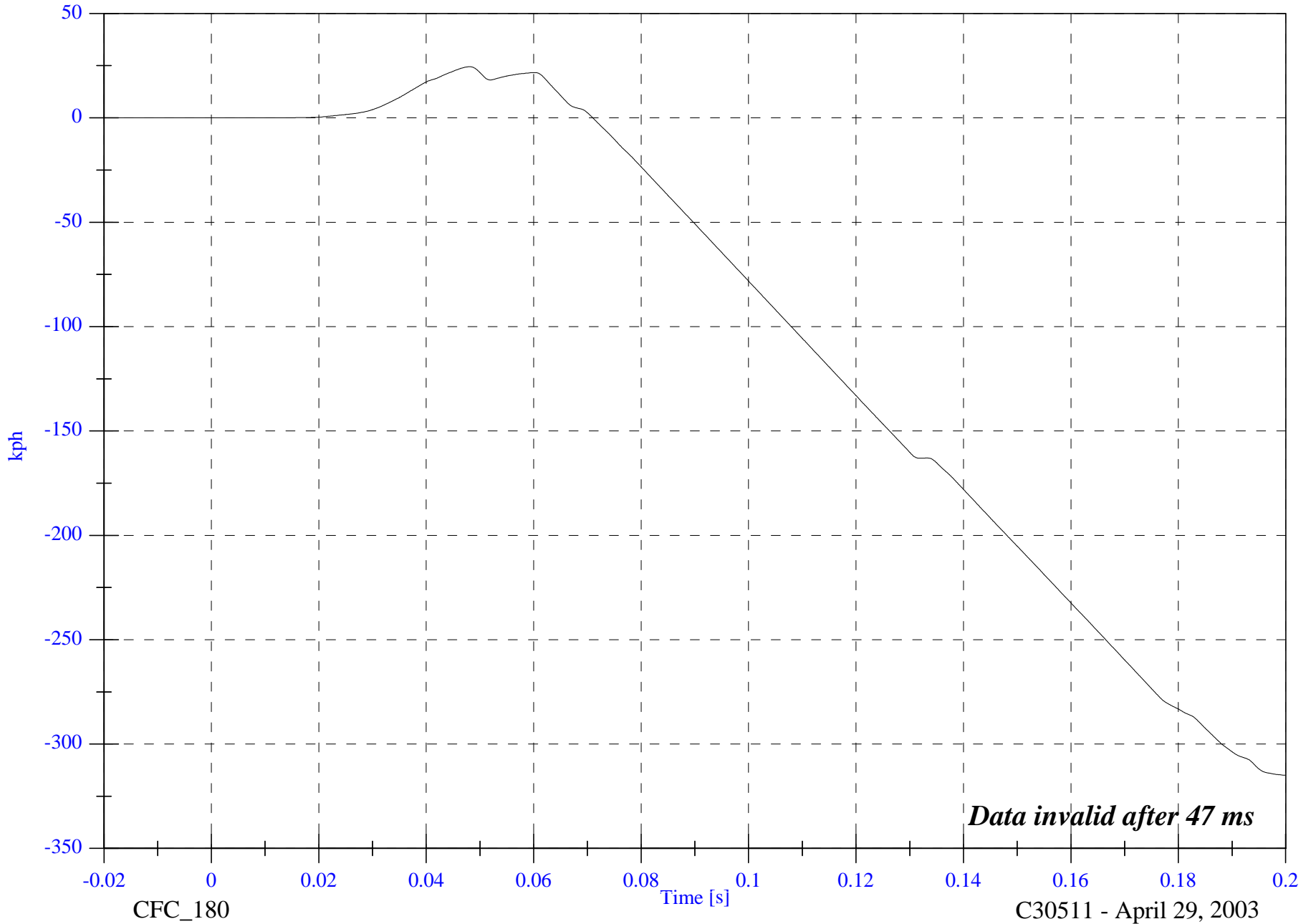
V2P1 Lower Spine Ry Velocity

Max: 24.5 [kph] at 0.048 [s]

Min: -315.0 [kph] at 0.200 [s]

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*Data invalid after 47 ms*

CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

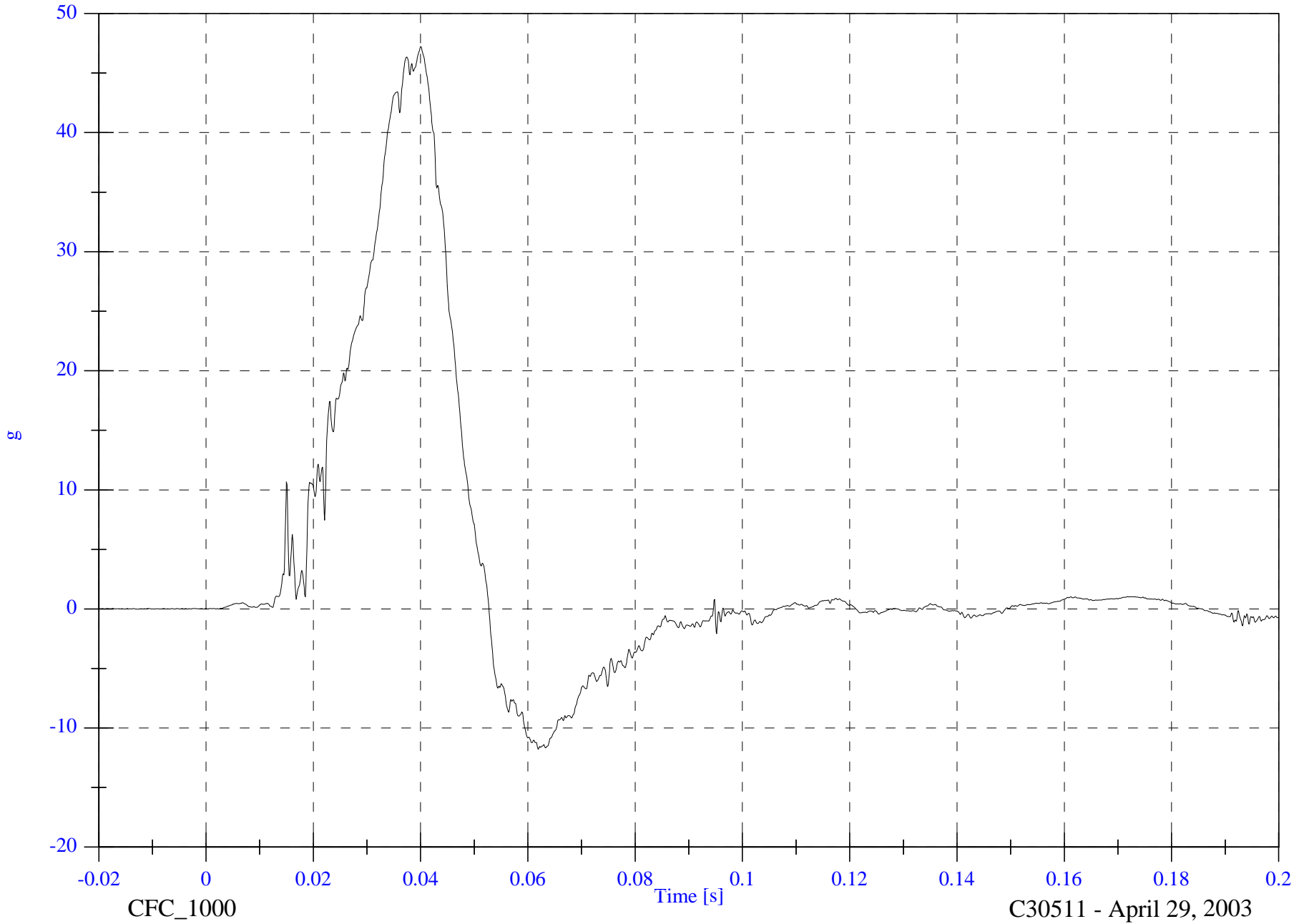
V2P1 Pelvic Ry

Max: 47.2 [g] at 0.040 [s]

Min: -11.8 [g] at 0.062 [s]

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8675-F214-07



FMVSS 214D Indicant - 2003 Kia Sorento

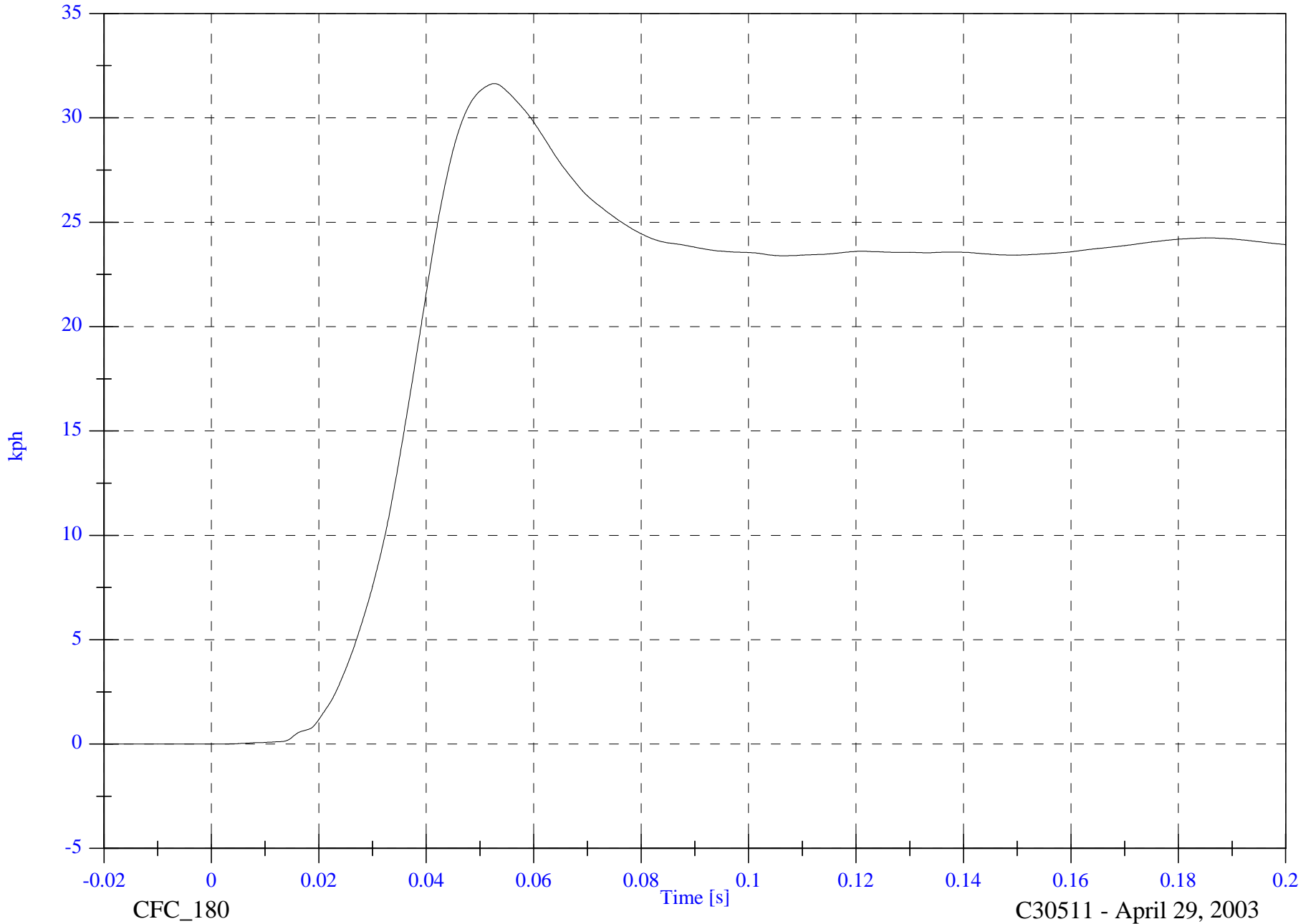
V2P1 Pelvic Ry Velocity

Max: 31.6 [kph] at 0.053 [s]

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

B-149

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

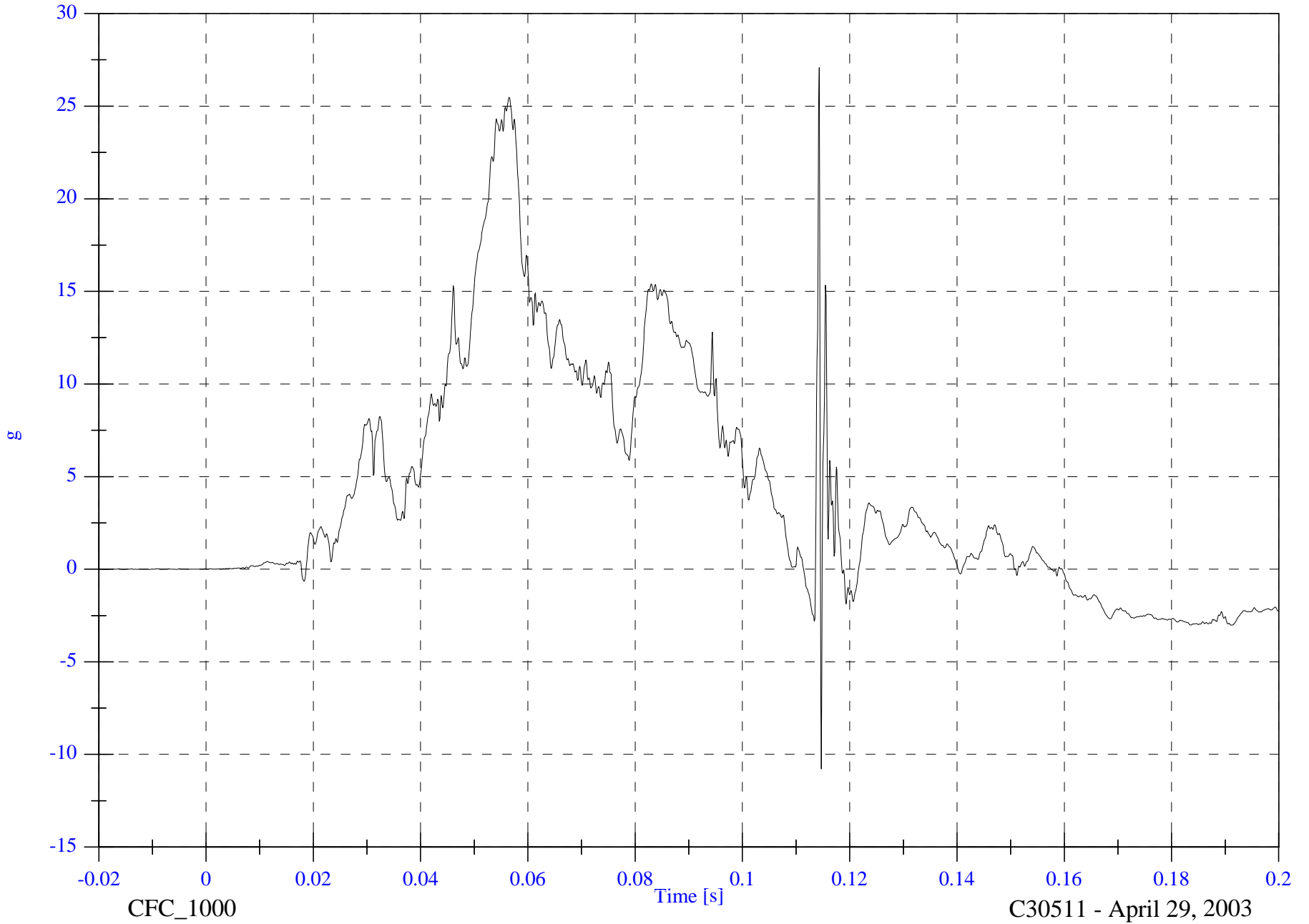
V2P4 Upper Rib Ry

Max: 27.1 [g] at 0.114 [s]

Min: -10.8 [g] at 0.115 [s]

B-150

8675-F214-07



CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

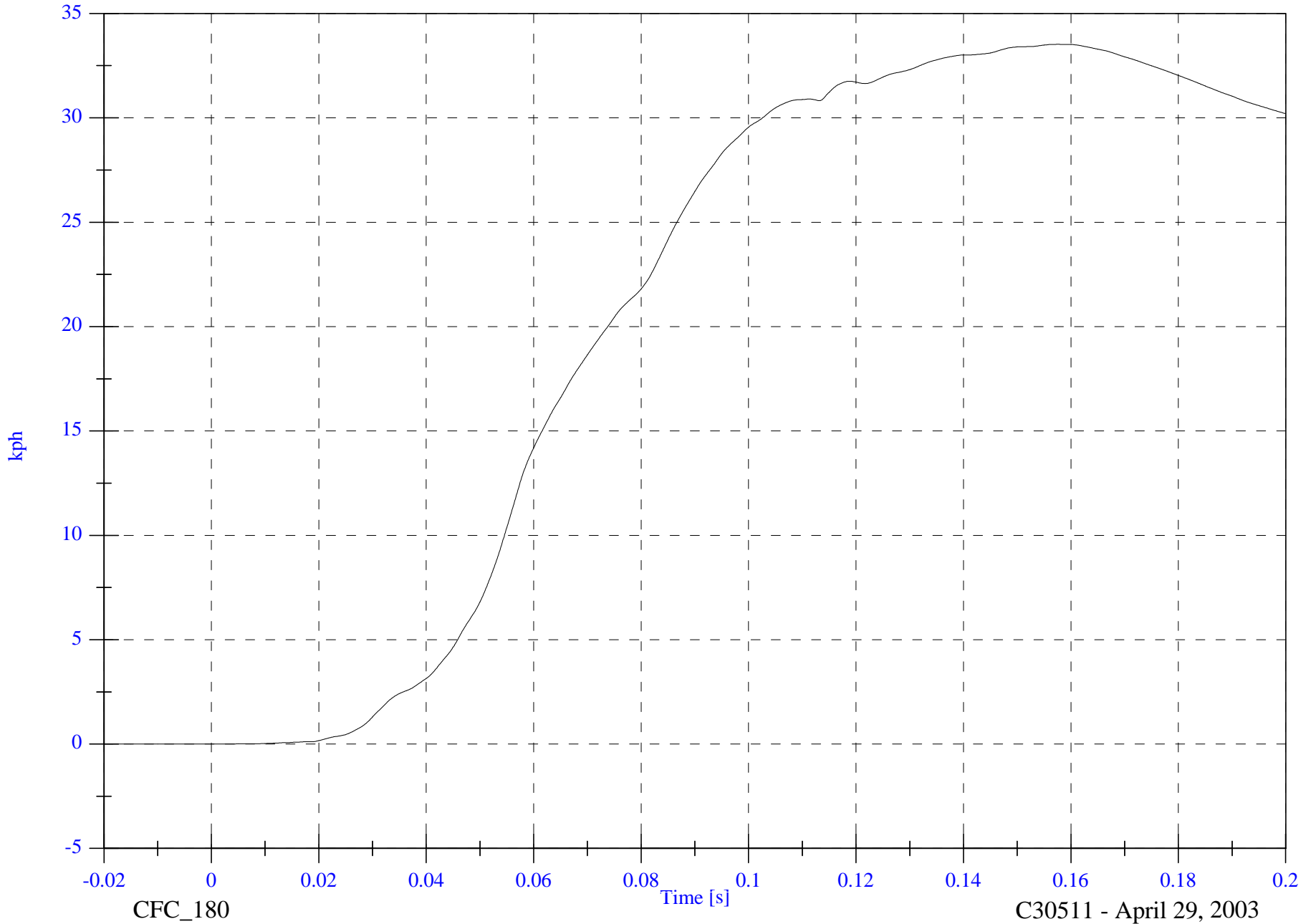
V2P4 Upper Rib Ry Velocity

Max: 33.5 [kph] at 0.158 [s]

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

B-151

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

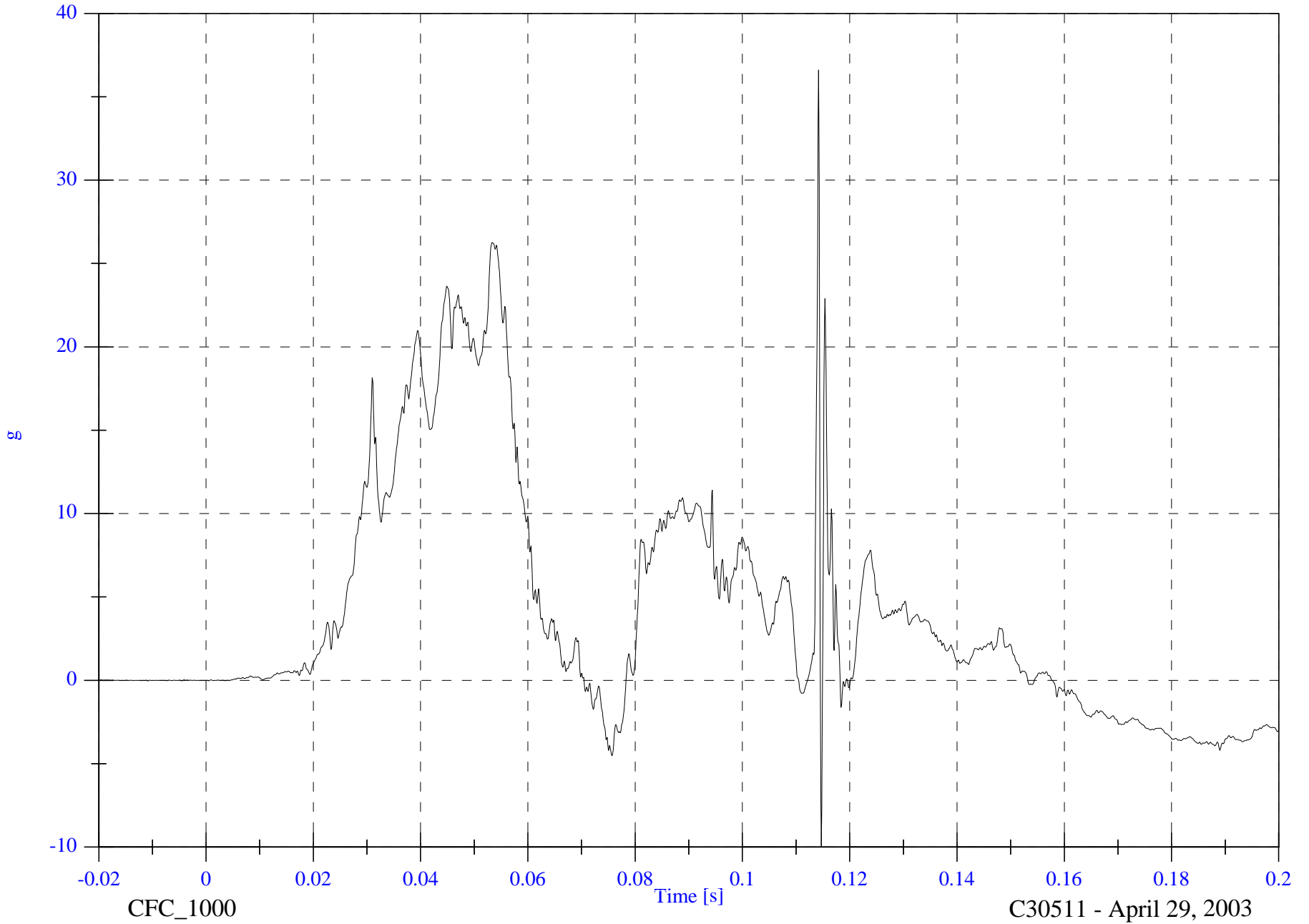
V2P4 Lower Rib Ry

Max: 36.6 [g] at 0.114 [s]

Min: -10.0 [g] at 0.115 [s]

B-152

8675-F214-07



FMVSS 214D Indicant - 2003 Kia Sorento

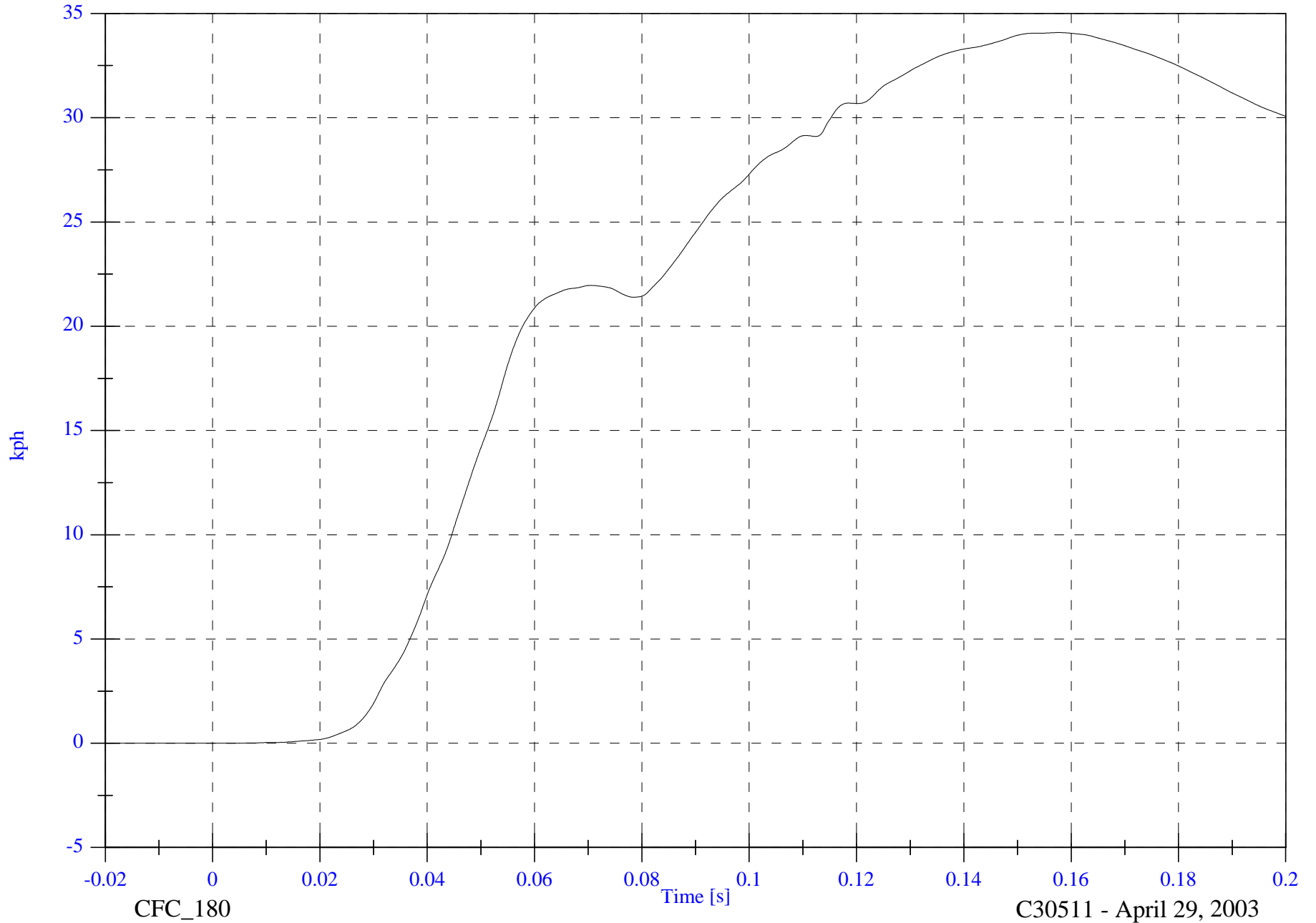
V2P4 Lower Rib Ry Velocity

Max: 34.1 [kph] at 0.158 [s]

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

B-153

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

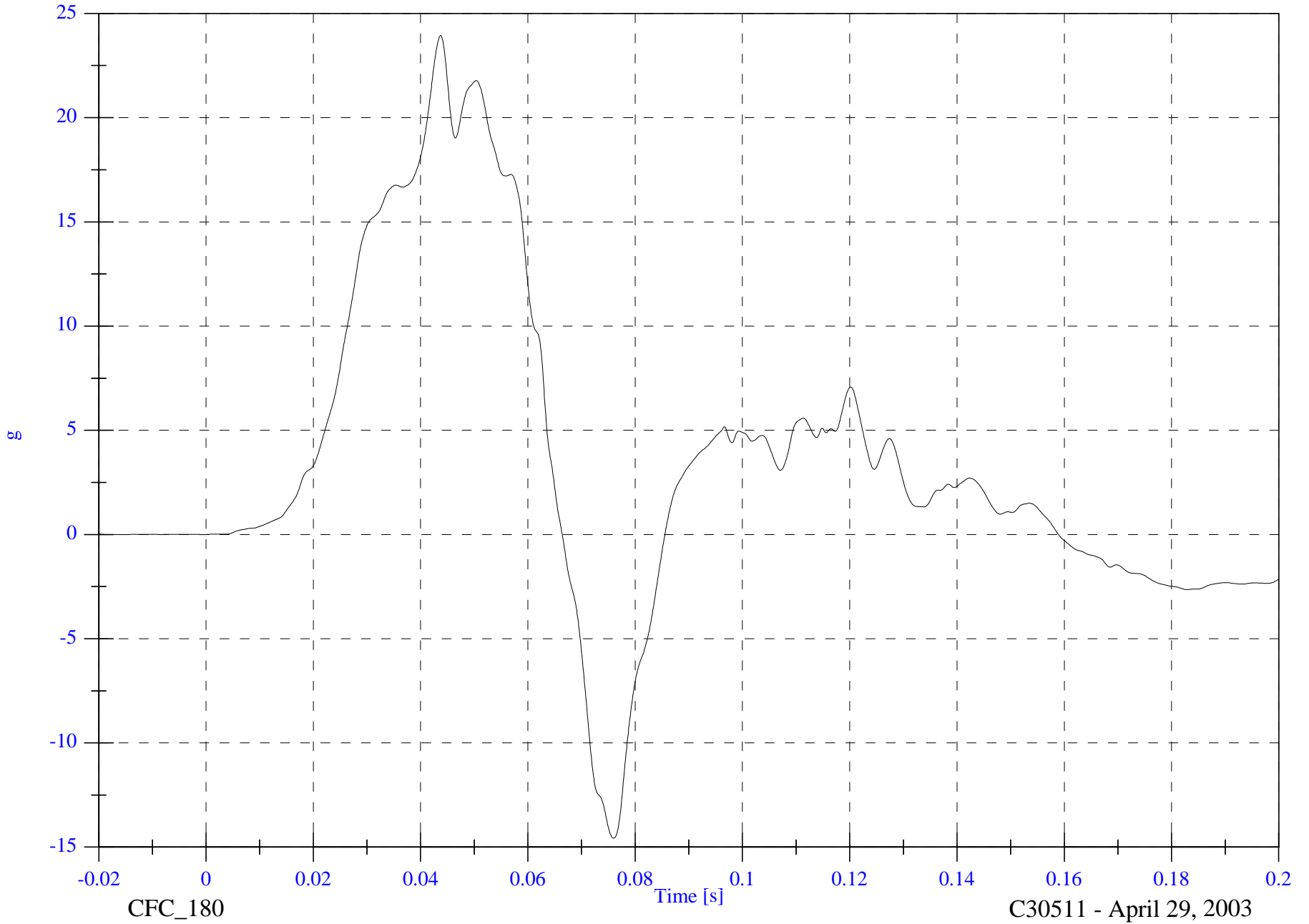
V2P4 Lower Spine Ry

Max: 23.9 [g] at 0.044 [s]

Min: -14.6 [g] at 0.076 [s]

B-154

8675-F214-07



FMVSS 214D Indicant - 2003 Kia Sorento

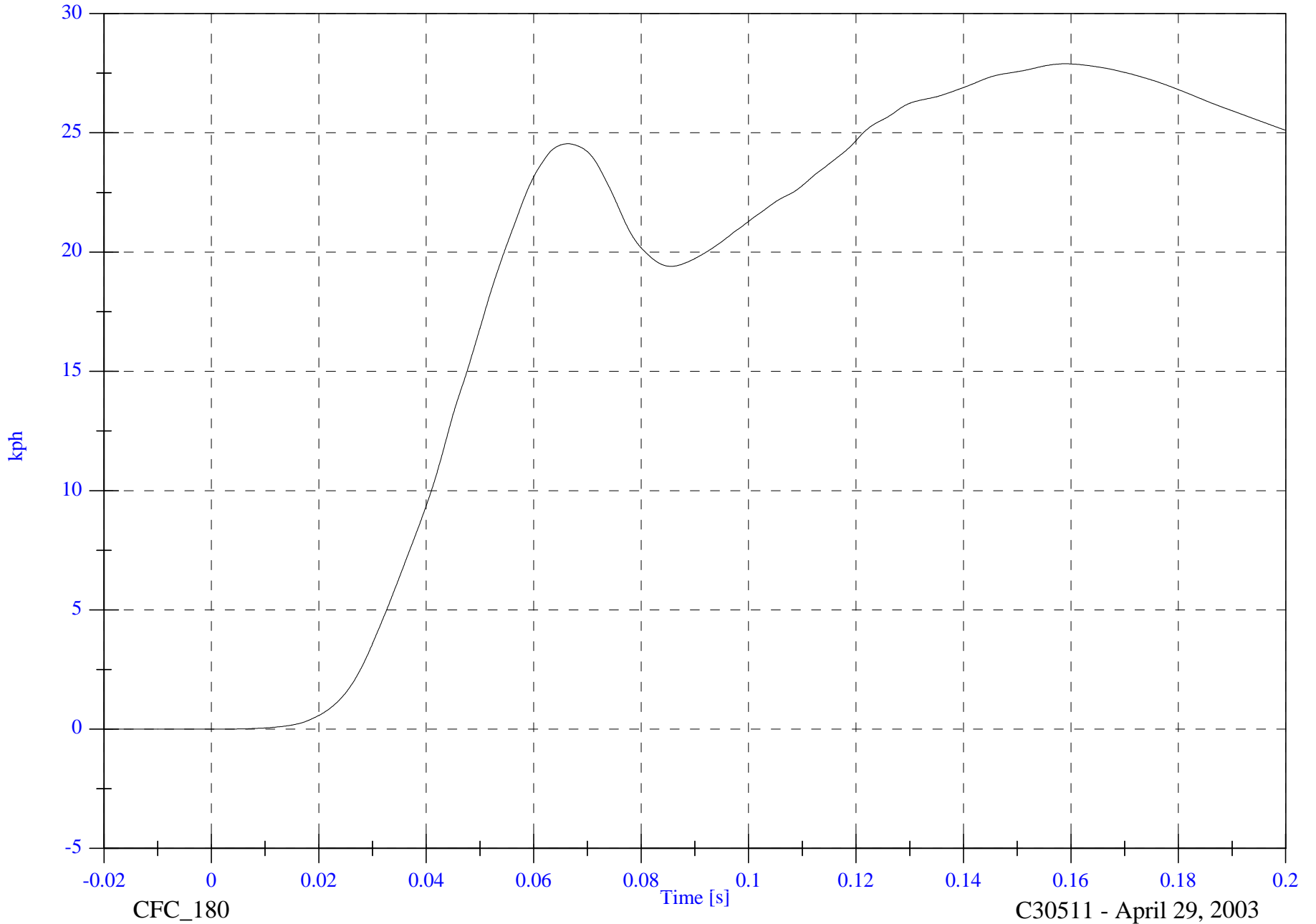
V2P4 Lower Spine Ry Velocity

Max: 27.9 [kph] at 0.159 [s]

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

B-155

8675-F214-07



CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

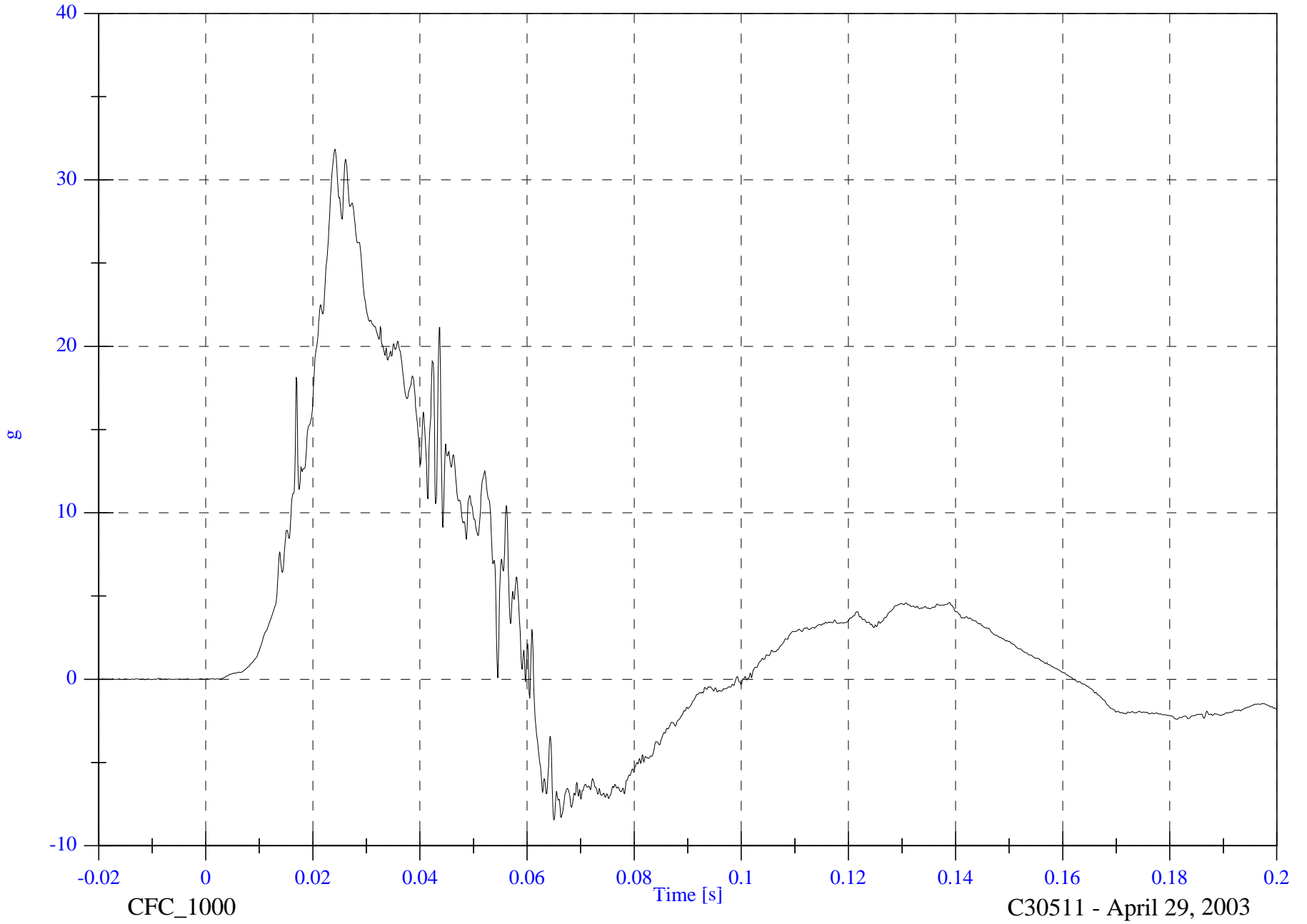
V2P4 Pelvic Ry

Max: 31.8 [g] at 0.024 [s]

Min: -8.4 [g] at 0.065 [s]

B-156

8675-F214-07



FMVSS 214D Indicant - 2003 Kia Sorento

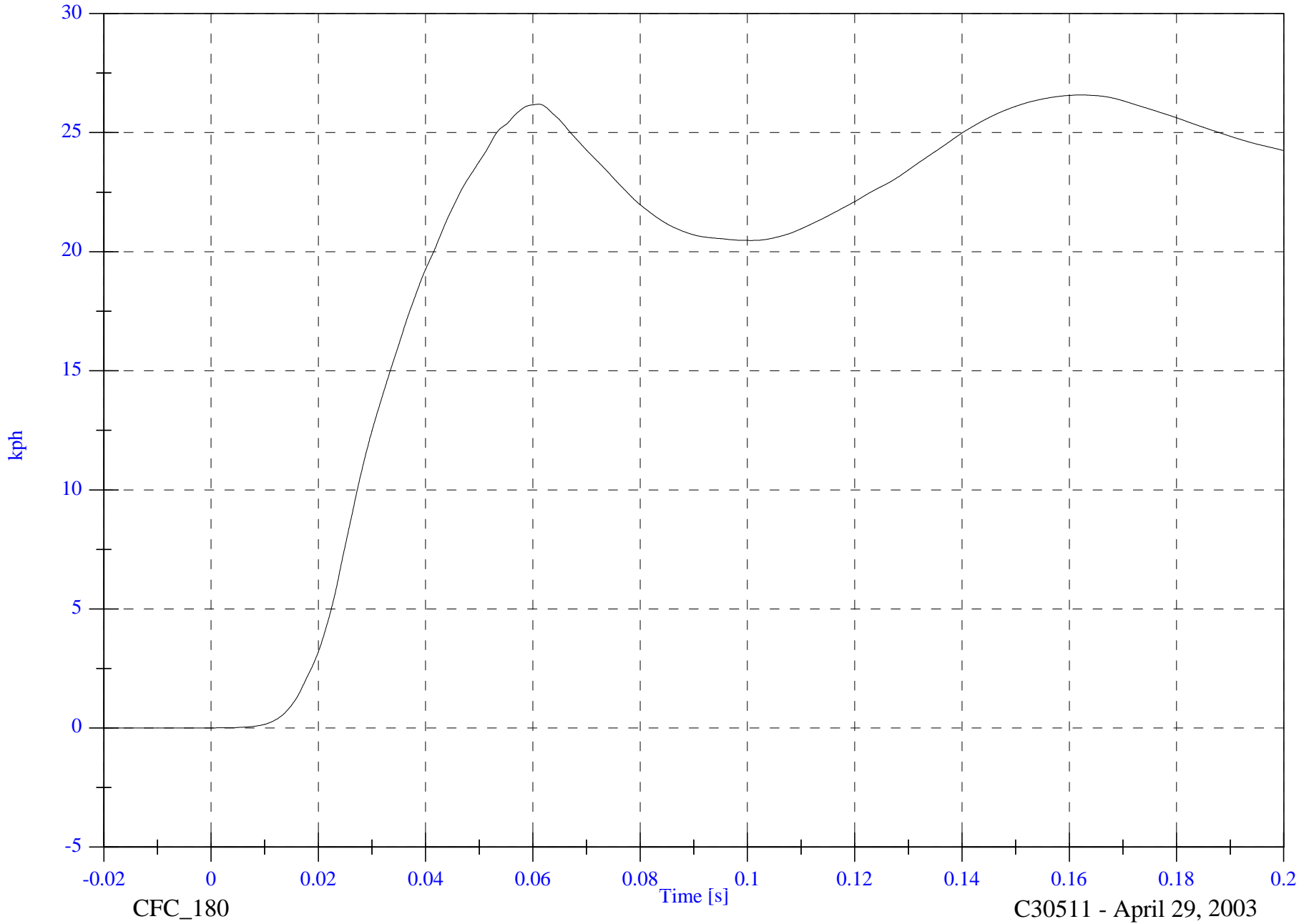
V2P4 Pelvic Ry Velocity

Max: 26.6 [kph] at 0.162 [s]

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

B-157

8675-F214-07



FMVSS 214D Indicant - 2003 Kia Sorento

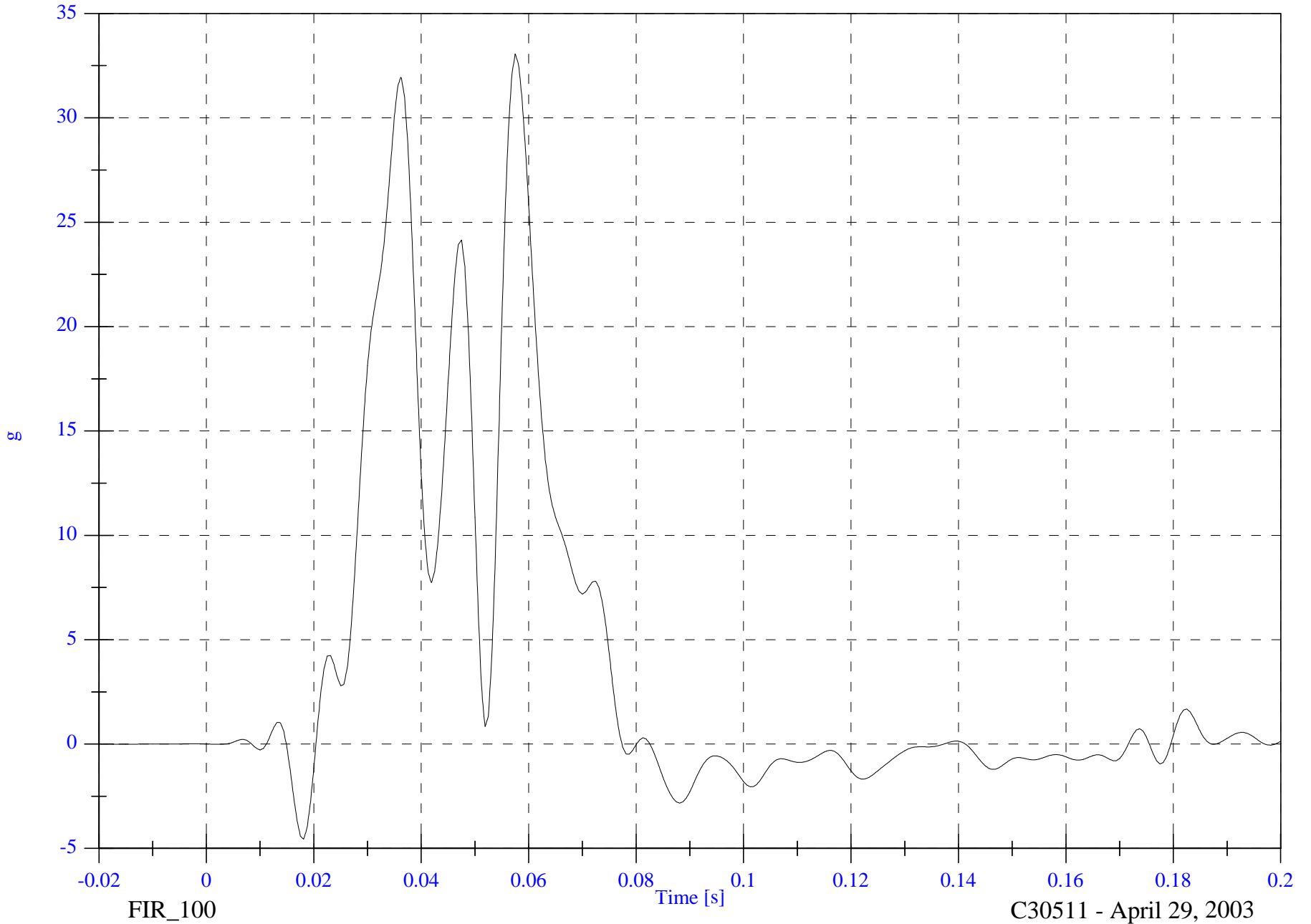
V2P1 Upper Rib Ry

Max: 33.1 [g] at 0.057 [s]

Min: -4.6 [g] at 0.018 [s]

B-158

8675-F214-07



FIR\_100

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

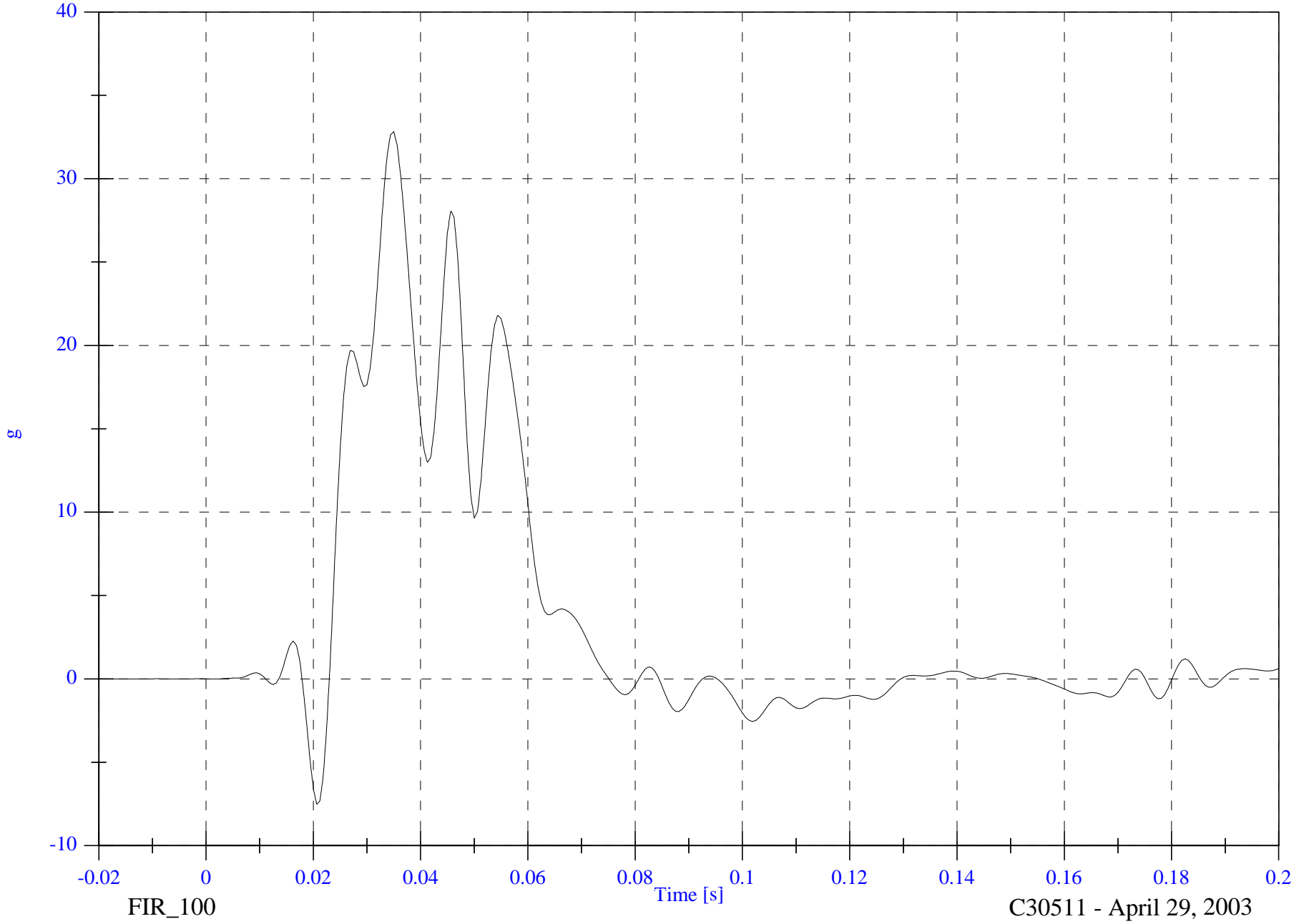
V2P1 Lower Rib Ry

Max: 32.8 [g] at 0.035 [s]

Min: -7.5 [g] at 0.021 [s]

B-159

8675-F214-07



FIR\_100

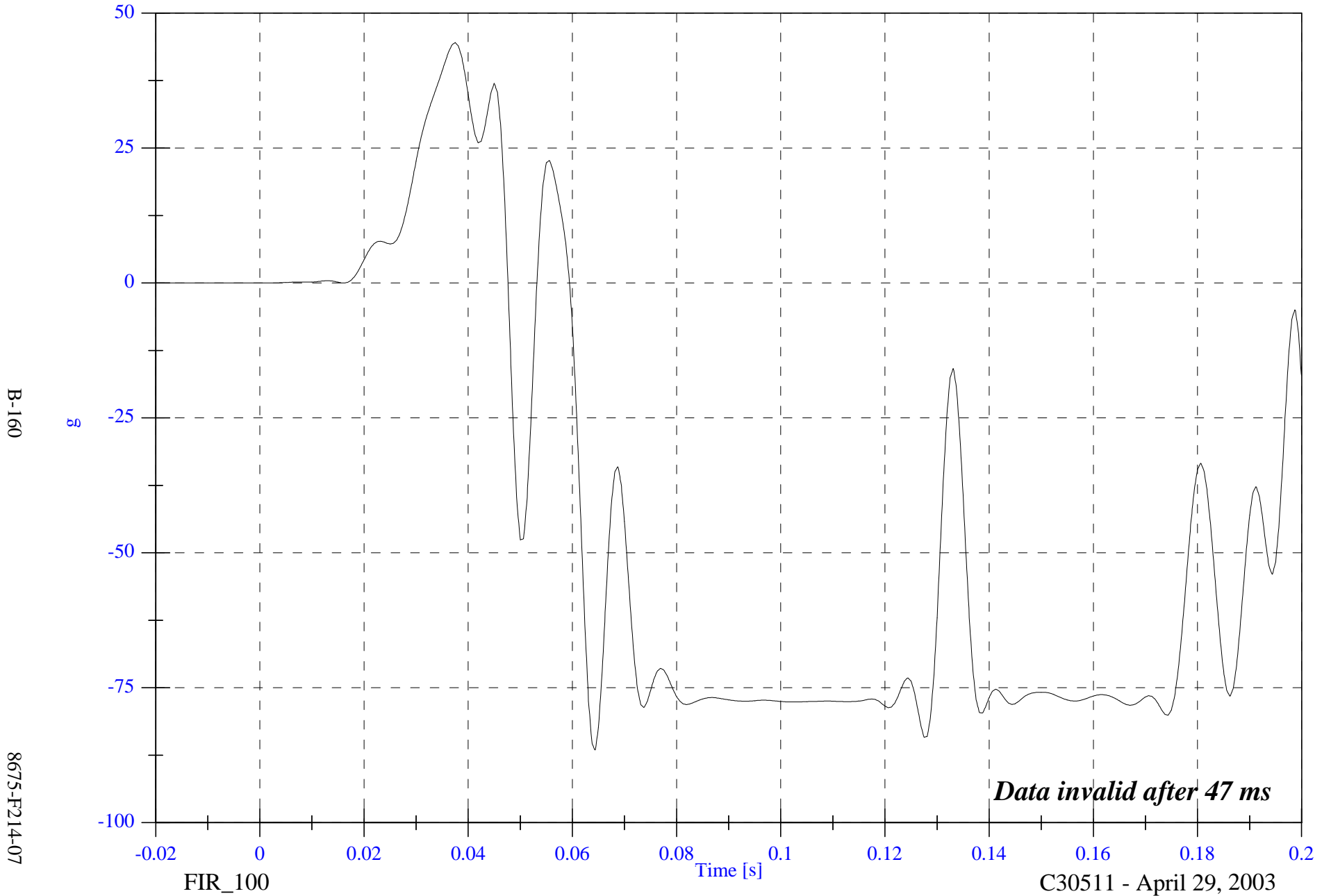
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Lower Spine Ry

Max: 44.6 [g] at 0.037 [s]

Min: -86.5 [g] at 0.064 [s]

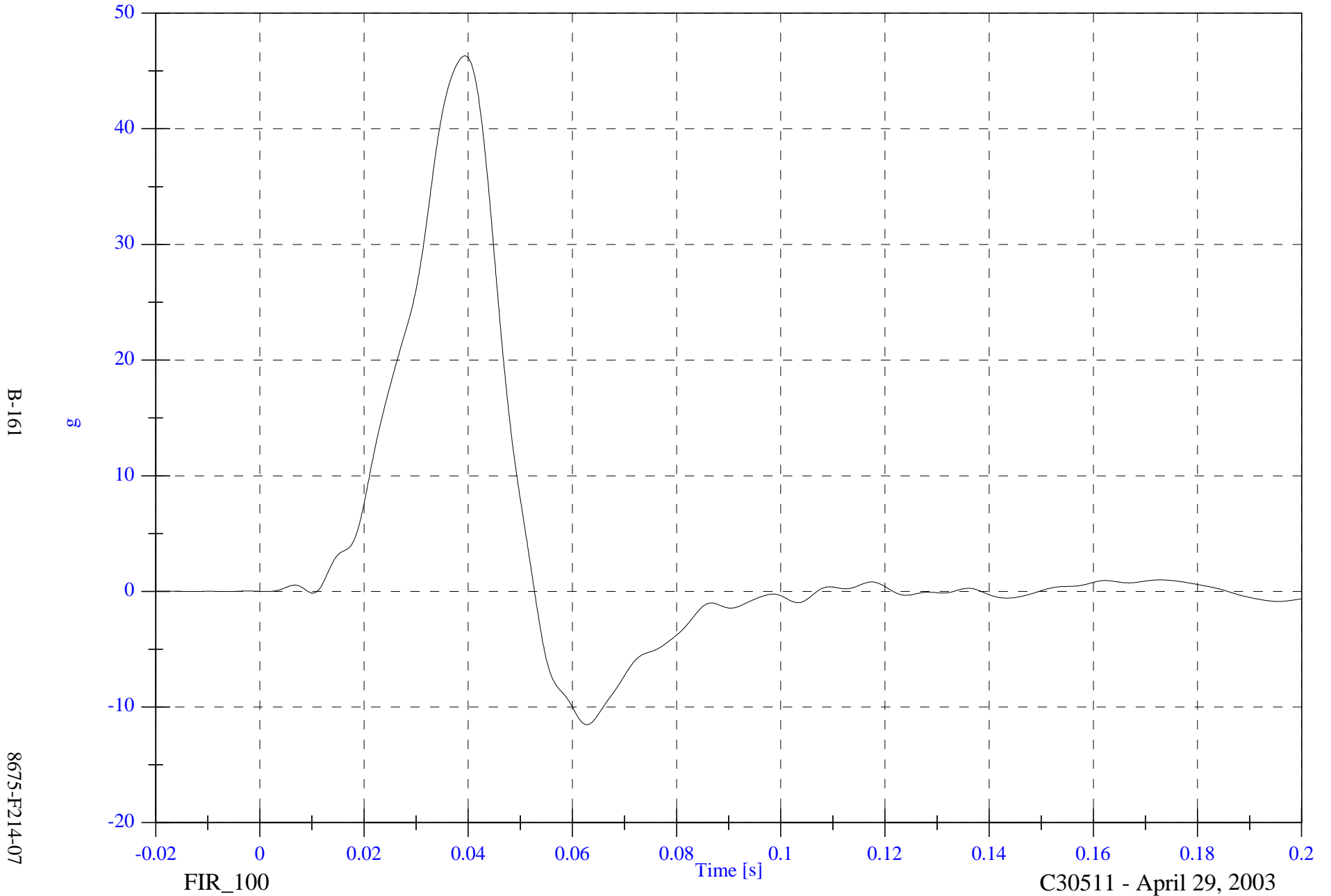


FMVSS 214D Indicant - 2003 Kia Sorento

V2P1 Pelvic Ry

Max: 46.3 [g] at 0.039 [s]

Min: -11.5 [g] at 0.062 [s]



B-161

8675-F214-07

FMVSS 214D Indicant - 2003 Kia Sorento

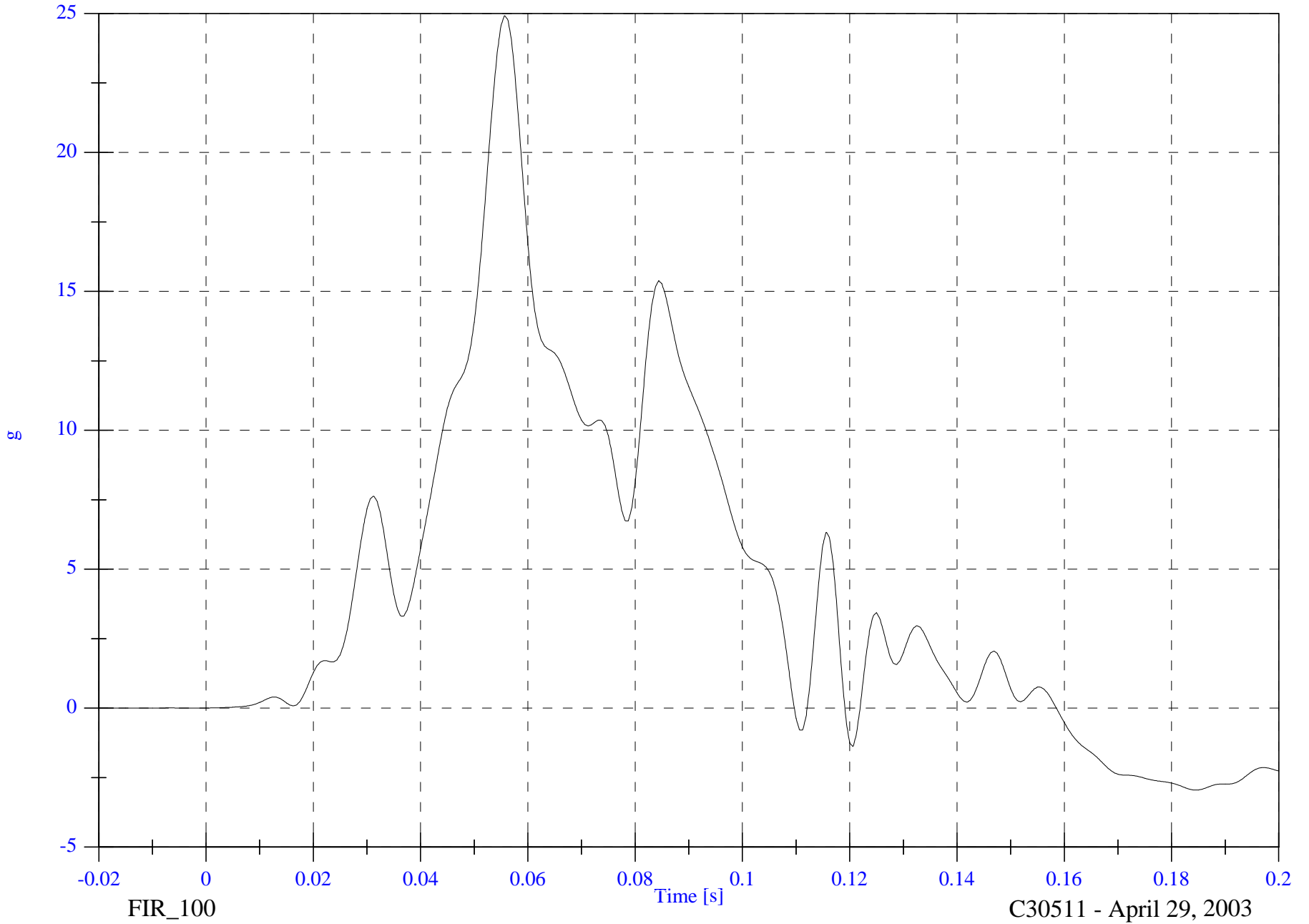
V2P4 Upper Rib Ry

Max: 24.9 [g] at 0.056 [s]

Min: -3.0 [g] at 0.184 [s]

B-162

8675-F214-07



FIR\_100

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

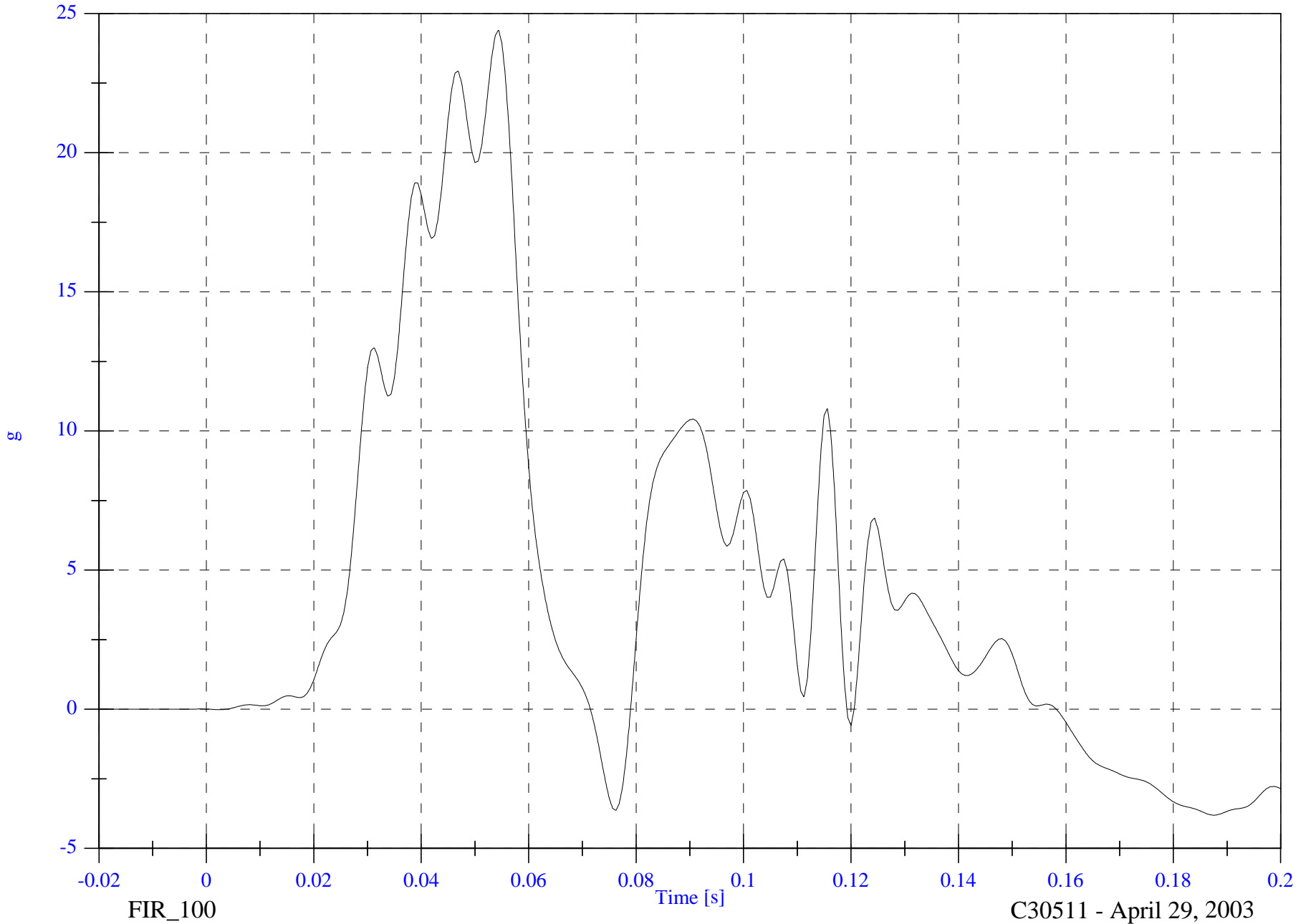
V2P4 Lower Rib Ry

Max: 24.4 [g] at 0.054 [s]

Min: -3.8 [g] at 0.187 [s]

B-163

8675-F214-07



FMVSS 214D Indicant - 2003 Kia Sorento

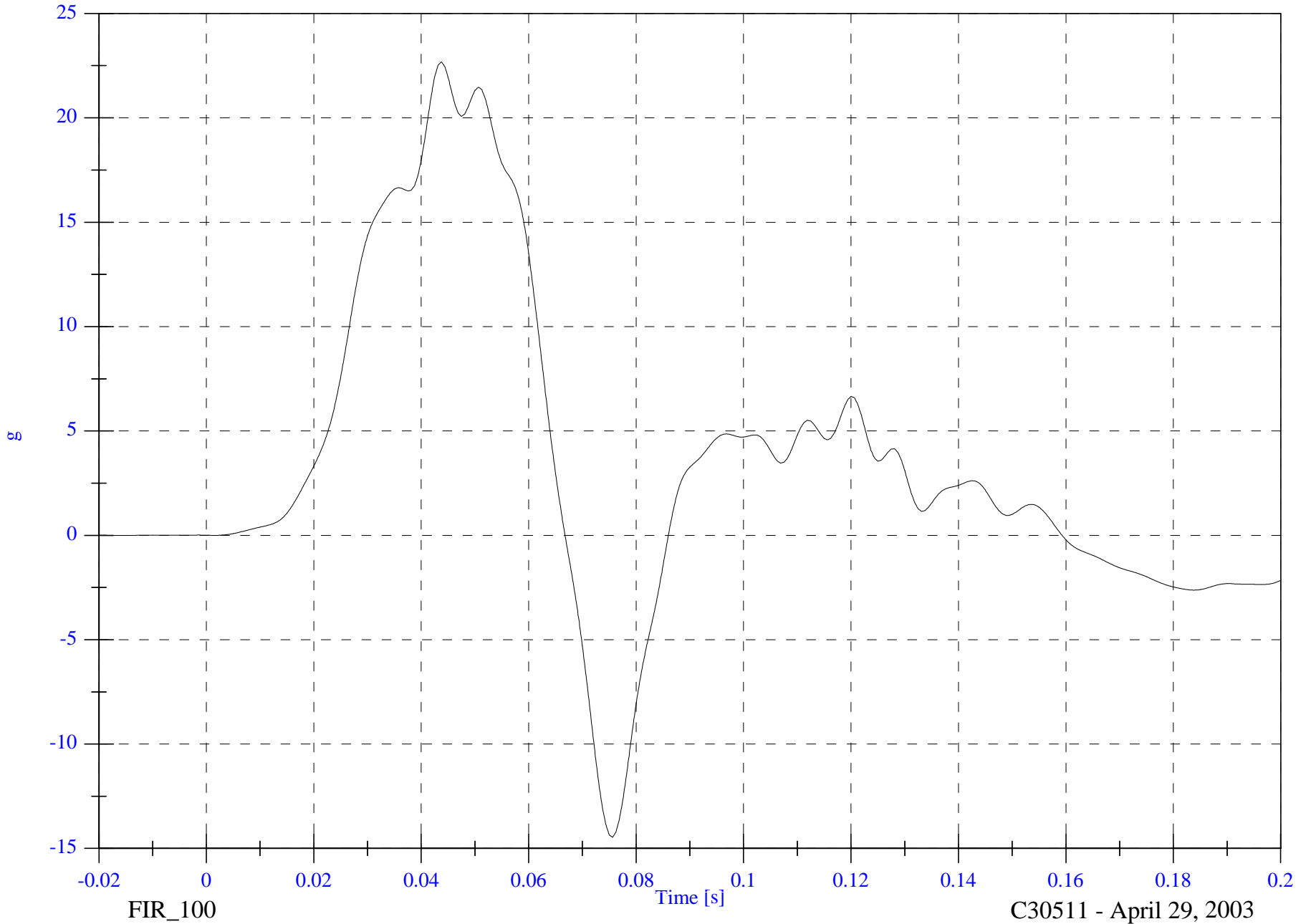
V2P4 Lower Spine Ry

Max: 22.7 [g] at 0.044 [s]

Min: -14.5 [g] at 0.076 [s]

B-164

8675-F214-07



FIR\_100

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Pelvic Ry

Max: 30.5 [g] at 0.026 [s]

Min: -7.3 [g] at 0.067 [s]



B-165

8675-F214-07

FIR\_100

C30511 - April 29, 2003

**APPENDIX C**

**SID HYBRID III CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

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

Date: April 28, 2003; May 2, 2003

Sequential Test Number:

1.1, 1.1

Laboratory Technician:

B. Swiecicki

TEST PARAMETER	SPECIFICATION	SID H3 015		SID H3 016	
		PRE TEST	POST TEST	PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	902	902	902	902
RH- Rib Height (mm)	501 - 521	511	511	513	513
HP- Hip Pivot Height (mm)	99 ref.	99	99	99	99
RD- Rib from Back Line (mm)	229 - 241	239	239	239	239
KV- Knee Pivot from Back Line (mm)	511 - 526	521	521	521	521
SW- Knee Pivot to Floor (mm)	490 - 505	495	495	495	495
HW- Hip Width (mm)	356 - 391	371	371	371	371
<b>THORAX IMPACTS</b>					
TEMPERATURE (°C)	18.9 - 25.5	21.1	21.1	21.1	21.1
RELATIVE HUMIDITY (%)	10 - 70	31	37	31	37
PROBE SPEED (m/s)	4.27 - 4.33	4.28	4.3	4.27	4.29
UPPER RIB (g's)	37 - 46	37.31	38.69	44.48	42.97
LOWER RIB (g's)	37 - 46	37.07	38.27	38.86	40.28
LOWER SPINE (g's)	15 - 22	18.65	19.6	21.43	21.81
<b>PELVIS IMPACT</b>					
TEMPERATURE (°C)	18.9 - 25.5	21.1	21.1	21.1	21.1
RELATIVE HUMIDITY (%)	10 - 70	31	37	31	37
PROBE SPEED (m/s)	4.27 - 4.33	4.28	4.31	4.3	4.27
PELVIS (g's)	40 - 60	43.04	44.61	41.28	42.12

**REMARKS:** None

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**SID H3 NO.: 015**

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
Date: April 28, 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.
LATERAL NECK BEND 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.: 015 Sequential Test Number: 1  
Date: April 28, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 – 909	902
RH- Rib Height (mm)	502 – 520	511
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 – 241	239
KH- Knee Pivot from Back Line (mm)	511 – 526	521
KV- Knee Pivot to Floor (mm)	490 – 505	495
HW- Hip Width (mm)	356 - 391	371

**REMARKS:** None

**THORACIC SHOCK ABSORBER TESTS  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1.1  
Date: April 24, 2003 Laboratory Technician: B. Swiecicki

DAMPER IDENTIFICATION: 015

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)		18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)		10 - 70	35.0
VELOCITY 3.05 m/s	FORCE (N)	836 - 1125	997.8
	DISPLACEMENT (mm)	30 - 35	32.2
VELOCITY 4.27 m/s	FORCE (N)	1730 - 2099	1909.7
	DISPLACEMENT (mm)	32 - 37	35.0
VELOCITY 6.10 m/s	FORCE (N)	3741 - 4448	4336.4
	DISPLACEMENT (mm)	33 - 40	37.9

DAMPER SETTING: 5

**REMARKS:** None

# Shock Test - Low at 3.05 m/s

Low Part 572F Shock Absorber Impact

Calibration Date: 04-24-03

Serial No: 015

Work File: 015SL 04-23-03

## -----TEST RESULTS-----

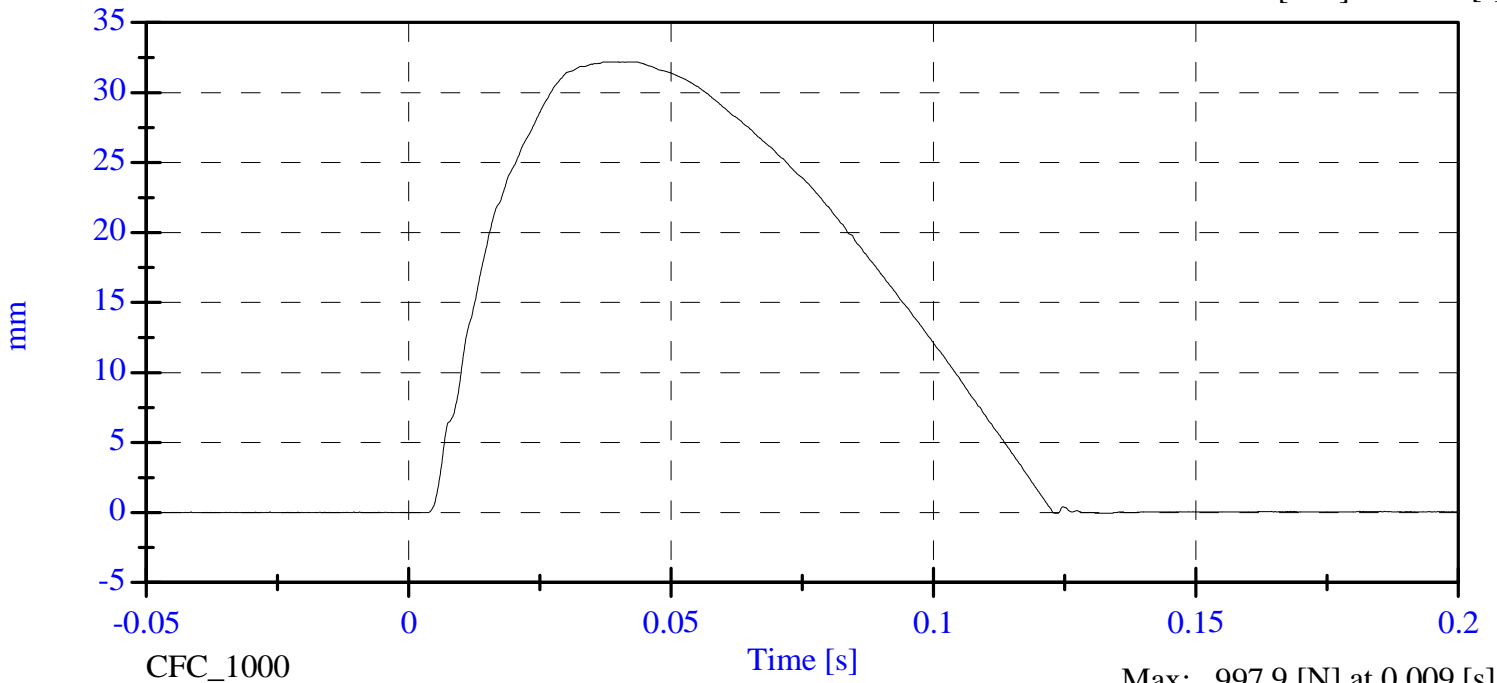
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	35.00 %	Passed
Displacement:	30.00-35.00 mm	32.18 mm	Passed
Maximum Force:	836.00-1125.00 N	997.85 N	Passed

Shock Test - Low

Displacement vs. Time

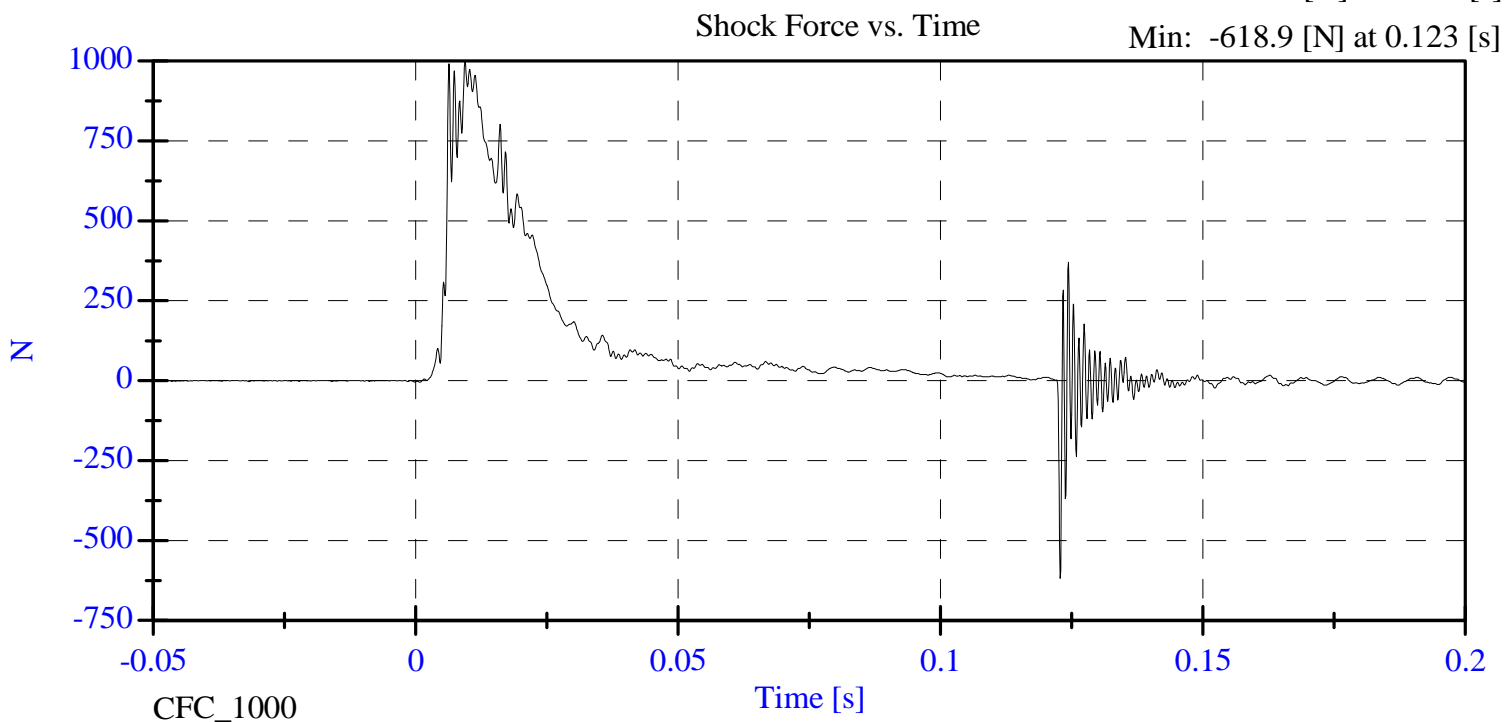
Max: 32.2 [mm] at 0.041 [s]

Min: -0.1 [mm] at 0.124 [s]



Max: 997.9 [N] at 0.009 [s]

Min: -618.9 [N] at 0.123 [s]



# Shock Test - Medium at 4.27 m/s

Medium Part 572F Shock Absorber Impact

Calibration Date: 04-24-03

Serial No: 015

Work File: 015SM 04-23-03

## -----TEST RESULTS-----

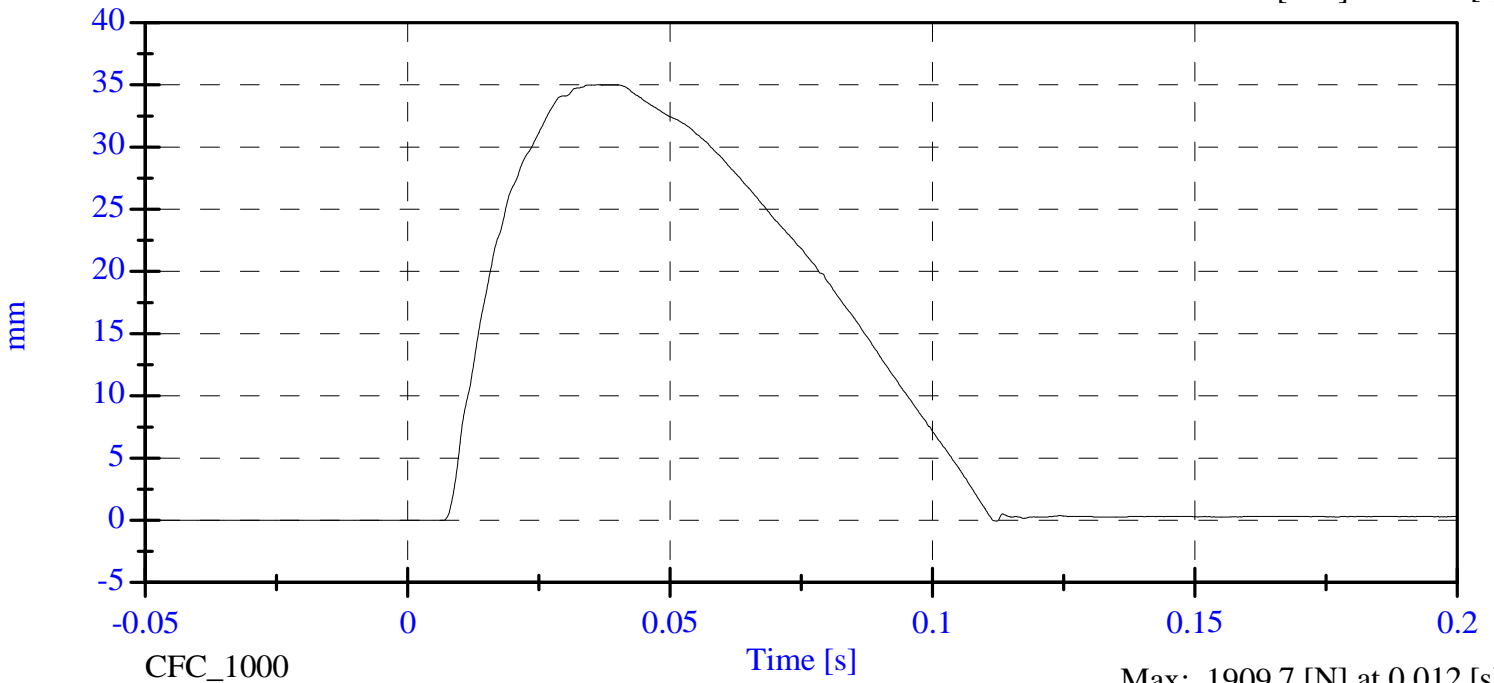
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	35.00 %	Passed
Displacement:	32.00-37.00 mm	35.02 mm	Passed
Maximum Force:	1730.00-2099.00 N	1909.74 N	Passed

Shock Test - Medium

Displacement vs. Time

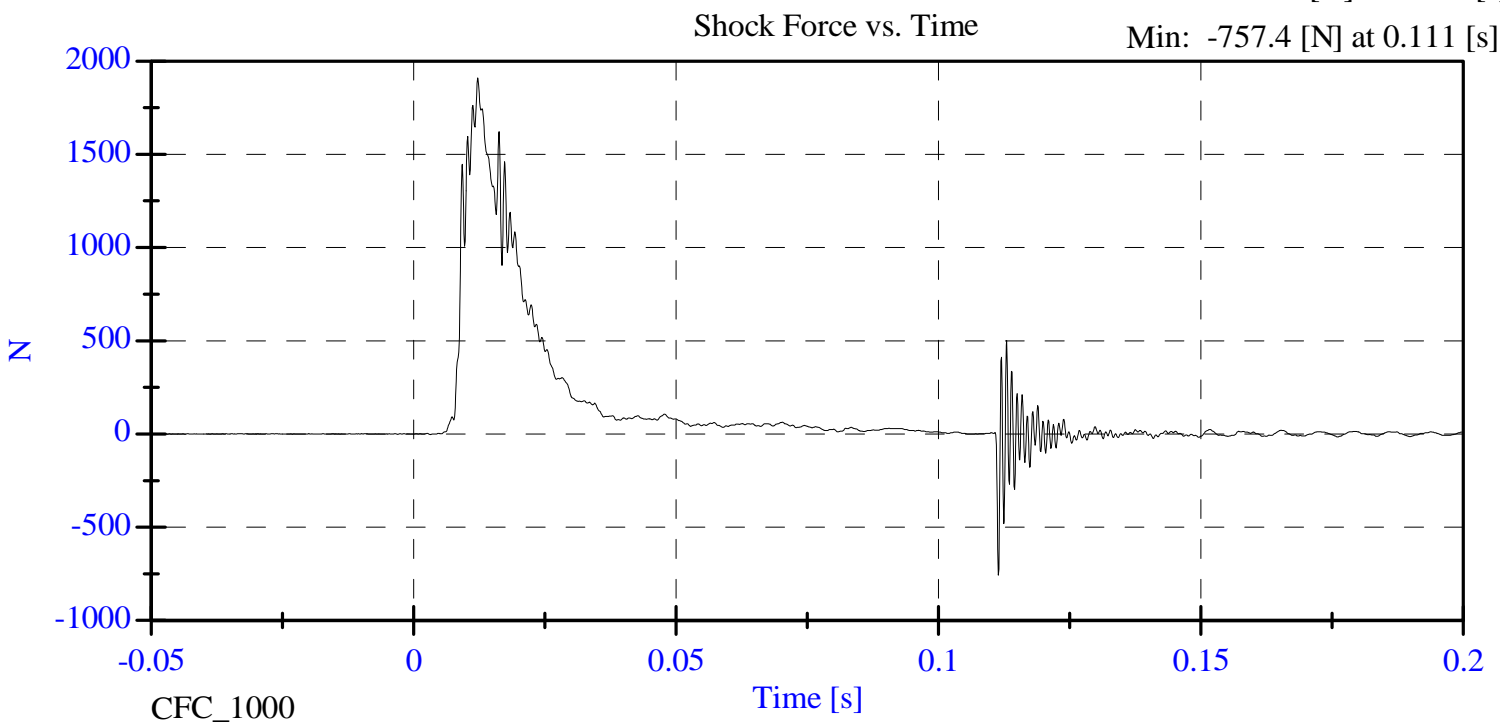
Max: 35.0 [mm] at 0.036 [s]

Min: -0.1 [mm] at 0.112 [s]



Max: 1909.7 [N] at 0.012 [s]

Min: -757.4 [N] at 0.111 [s]



# Shock - High at 6.10 m/s

High Part 572F Shock Absorber Impact

Calibration Date: 04-25-03

Serial No: 015

Work File: 015SH2 04-23-03

## -----TEST RESULTS-----

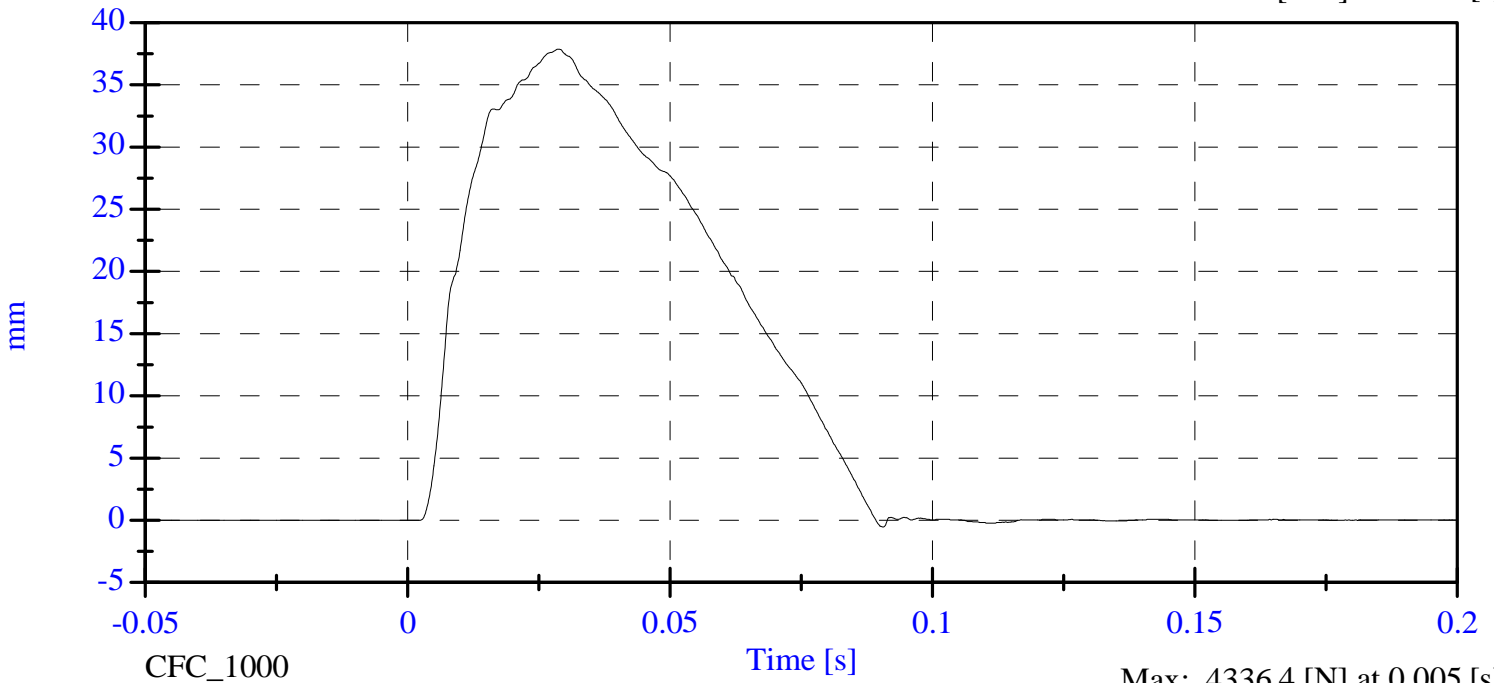
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	40.00 %	Passed
Displacement:	33.00-40.00 mm	37.86 mm	Passed
Maximum Force:	3741.00-4448.00 N	4336.39 N	Passed

Shock - High

Displacement vs. Time

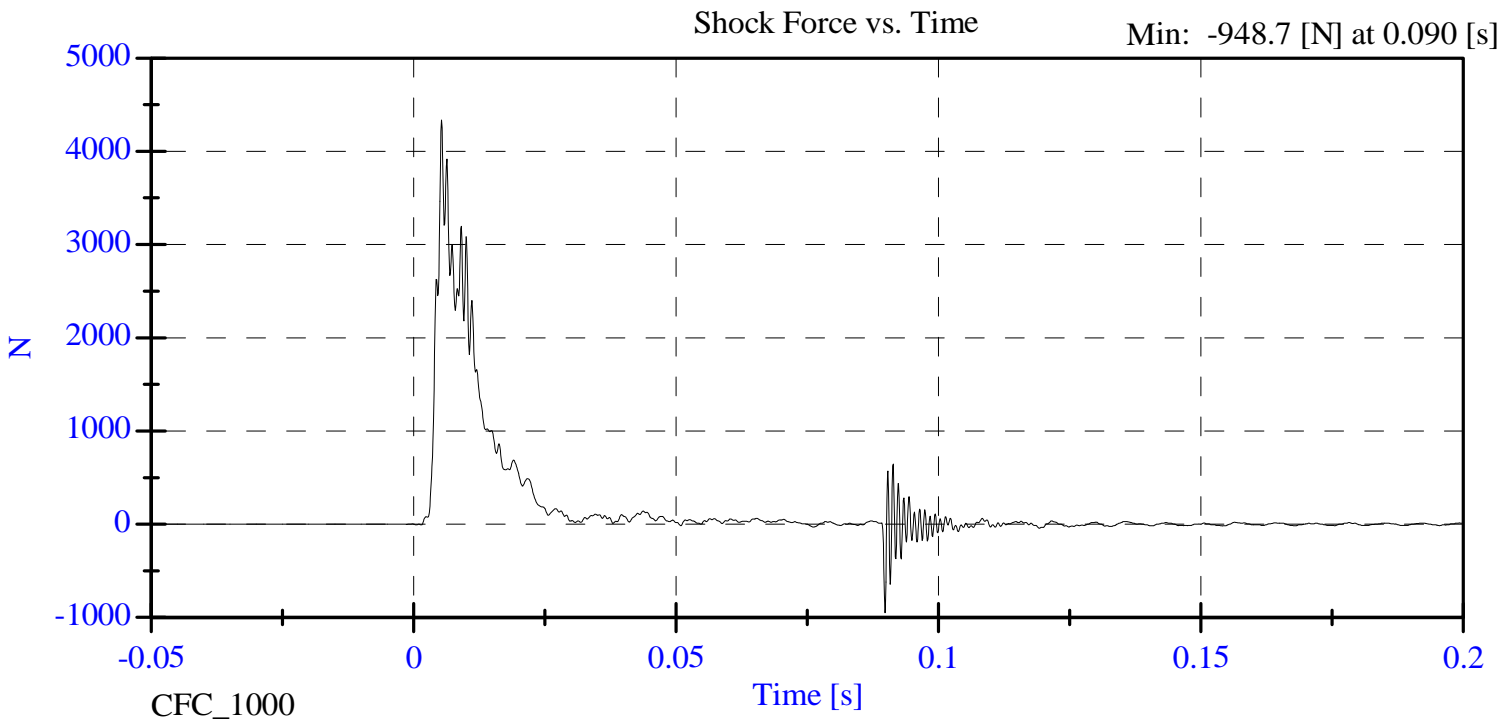
Max: 37.9 [mm] at 0.029 [s]

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



Max: 4336.4 [N] at 0.005 [s]

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



**LATERAL THORAX IMPACT TEST  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
Date: April 28, 2003 Laboratory Technician: B. Swiecicki

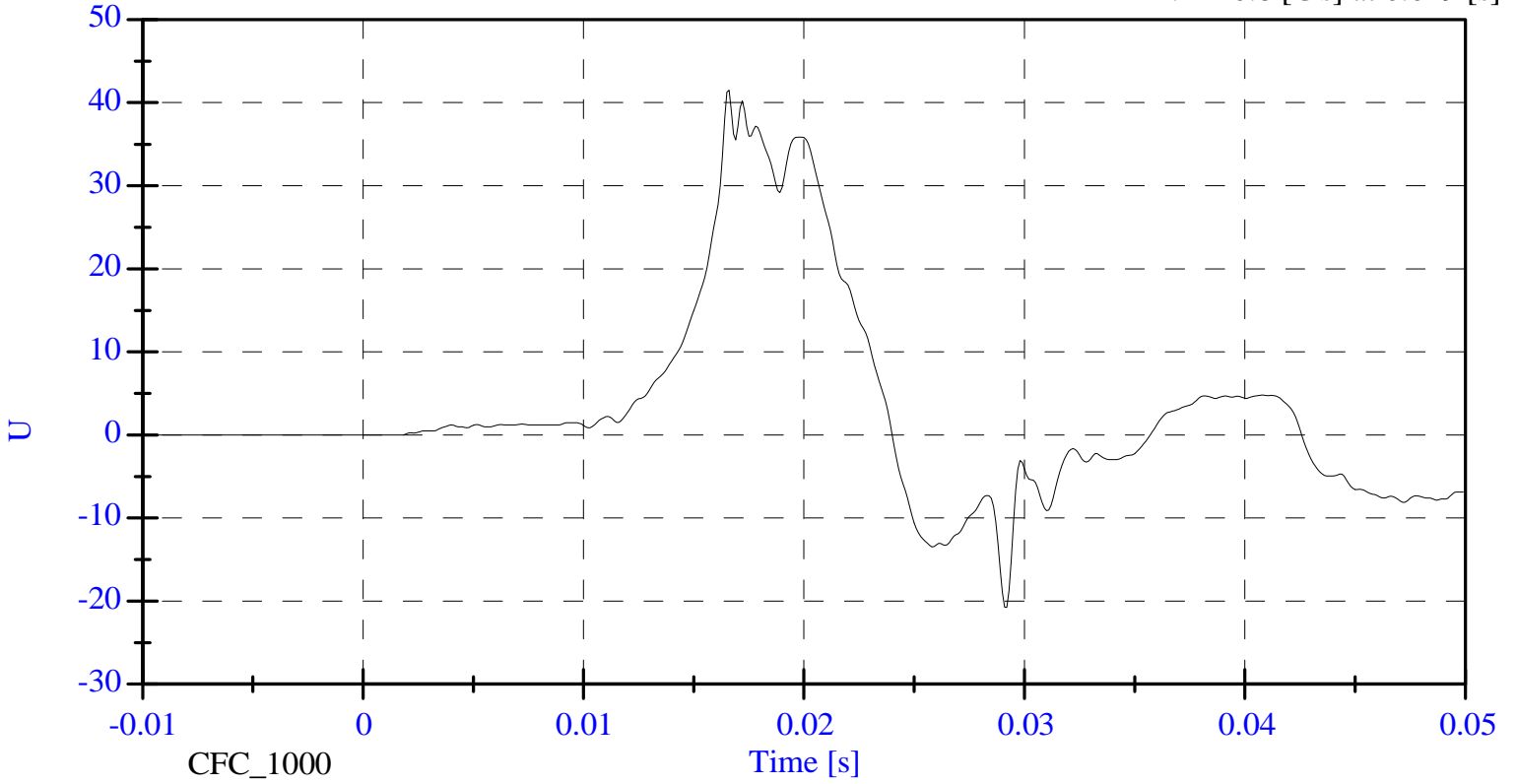
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	31.0
PROBE SPEED (m/s)	4.27 - 4.33	4.28
UPPER RIB (g's)	37 - 46	37.31
LOWER RIB (g's)	37 - 46	37.07
LOWER SPINE (g's)	15 - 22	18.65

**REMARKS:** None

Max: 41.5 [G's] at 0.017 [s]

Min: -20.8 [G's] at 0.029 [s]

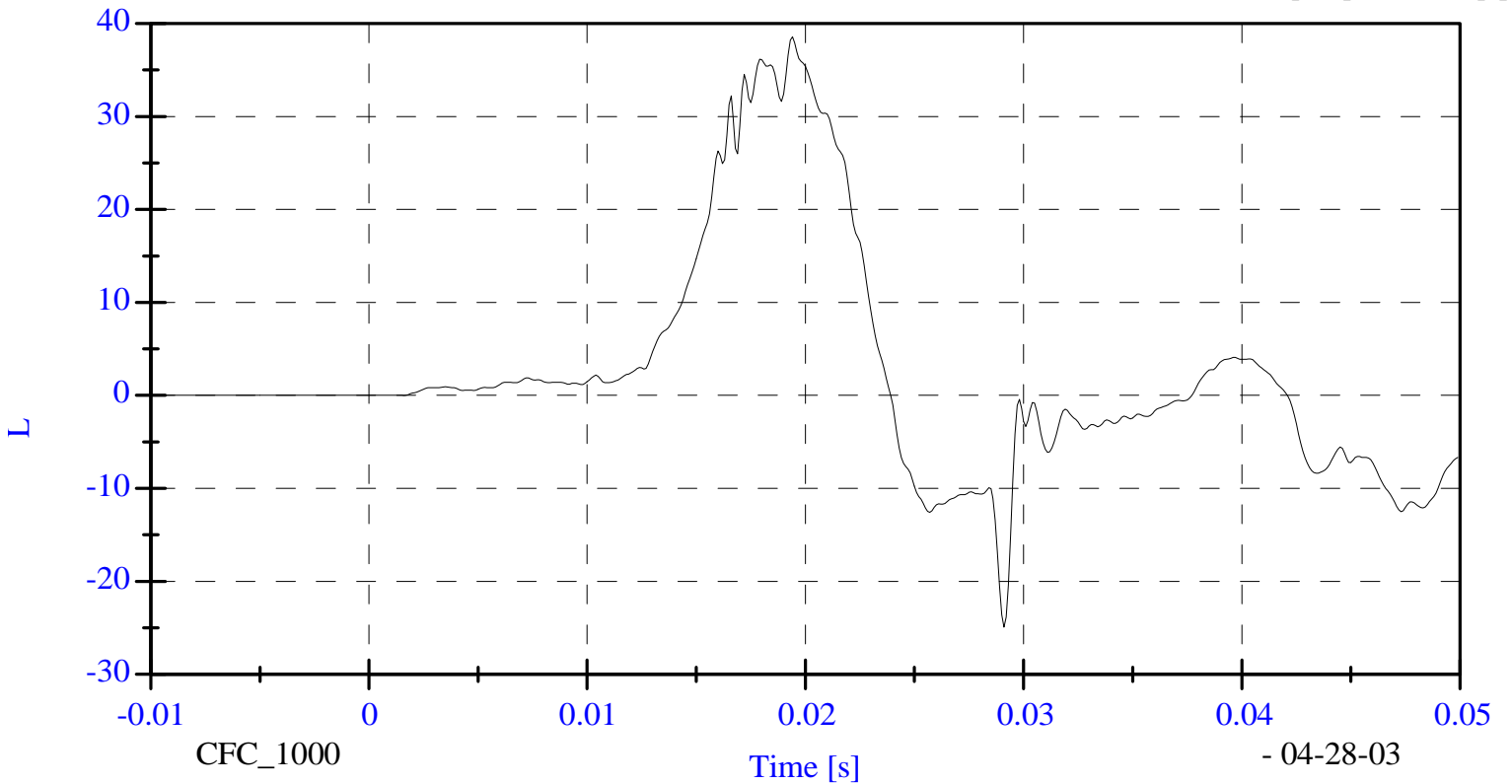
Upper Rib Y Acceleration



Max: 38.6 [G's] at 0.019 [s]

Min: -24.9 [G's] at 0.029 [s]

Lower Rib Y Acceleration

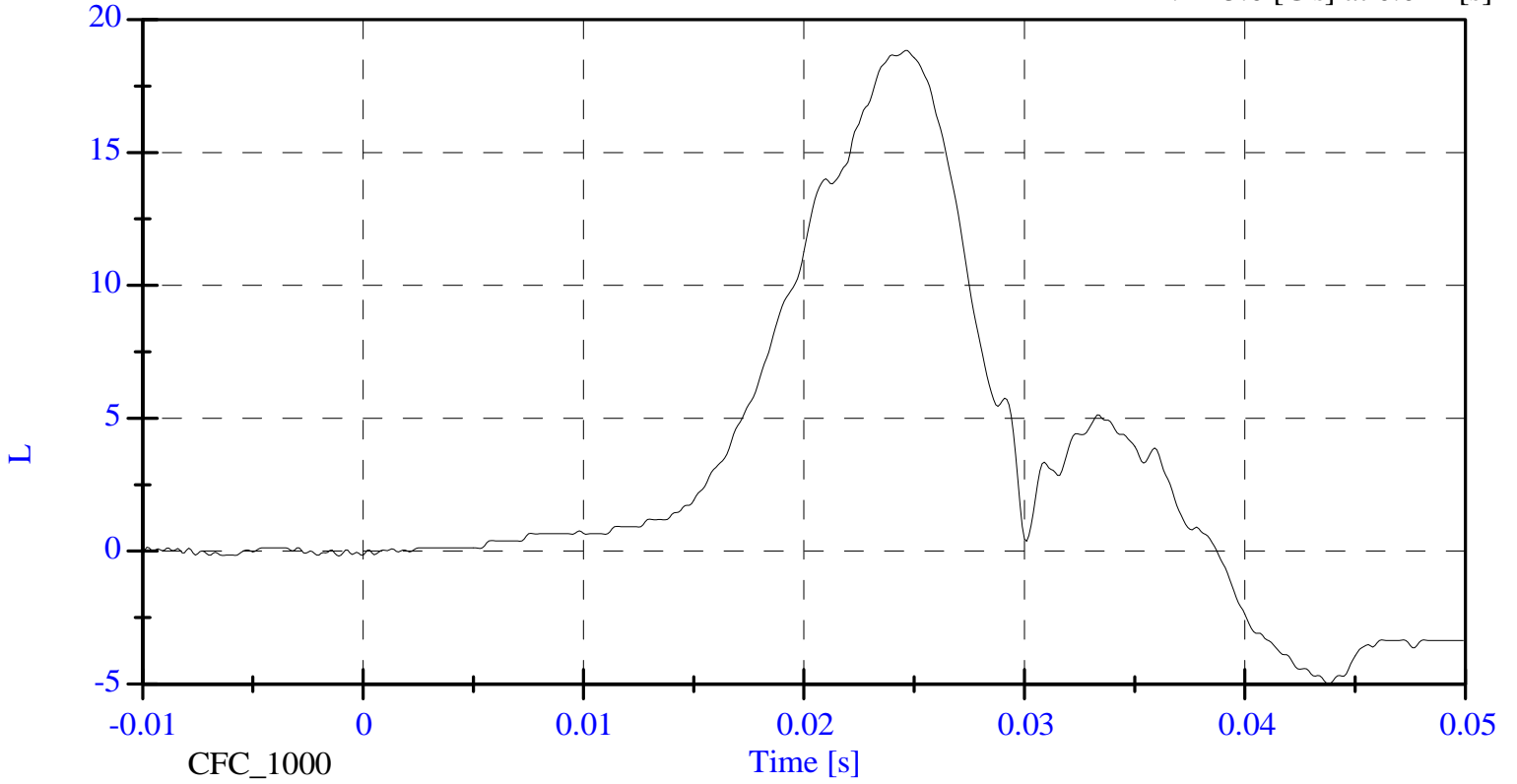


- 04-28-03

Lower Spine Y Acceleration

Max: 18.8 [G's] at 0.025 [s]

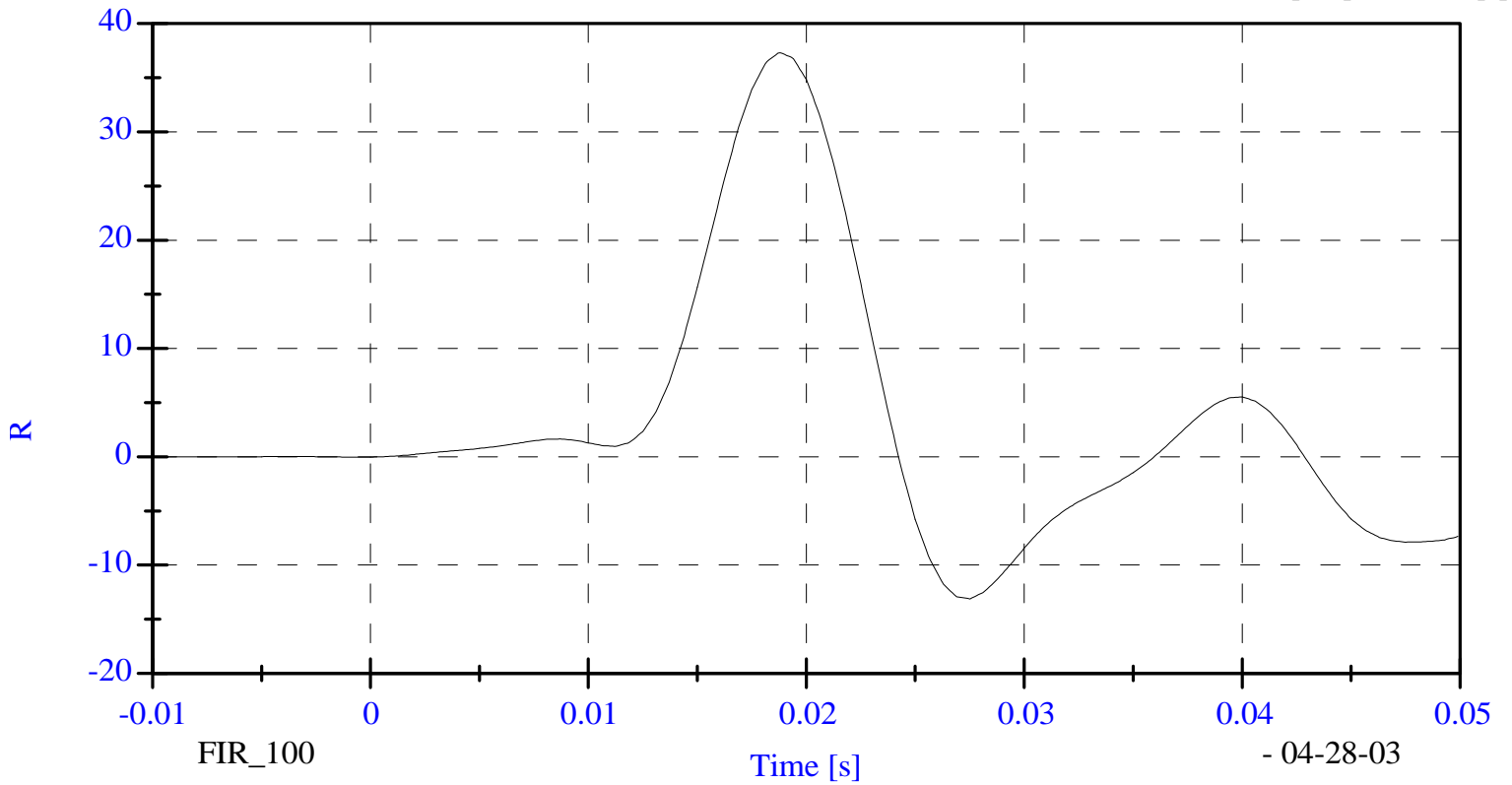
Min: -5.0 [G's] at 0.044 [s]



Upper Rib Y Acceleration

Max: 37.3 [G's] at 0.019 [s]

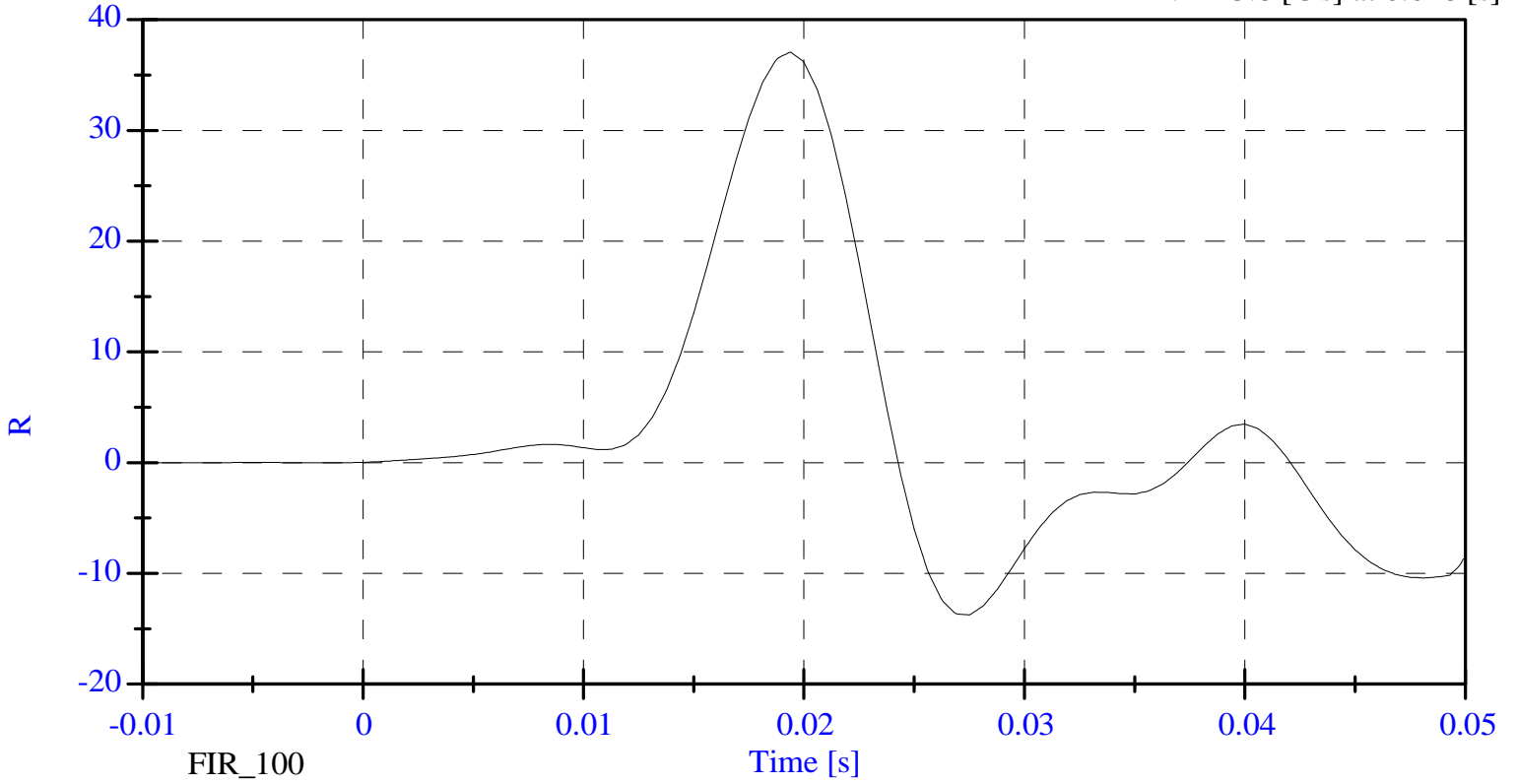
Min: -13.1 [G's] at 0.028 [s]



Max: 37.1 [G's] at 0.019 [s]

Min: -13.8 [G's] at 0.028 [s]

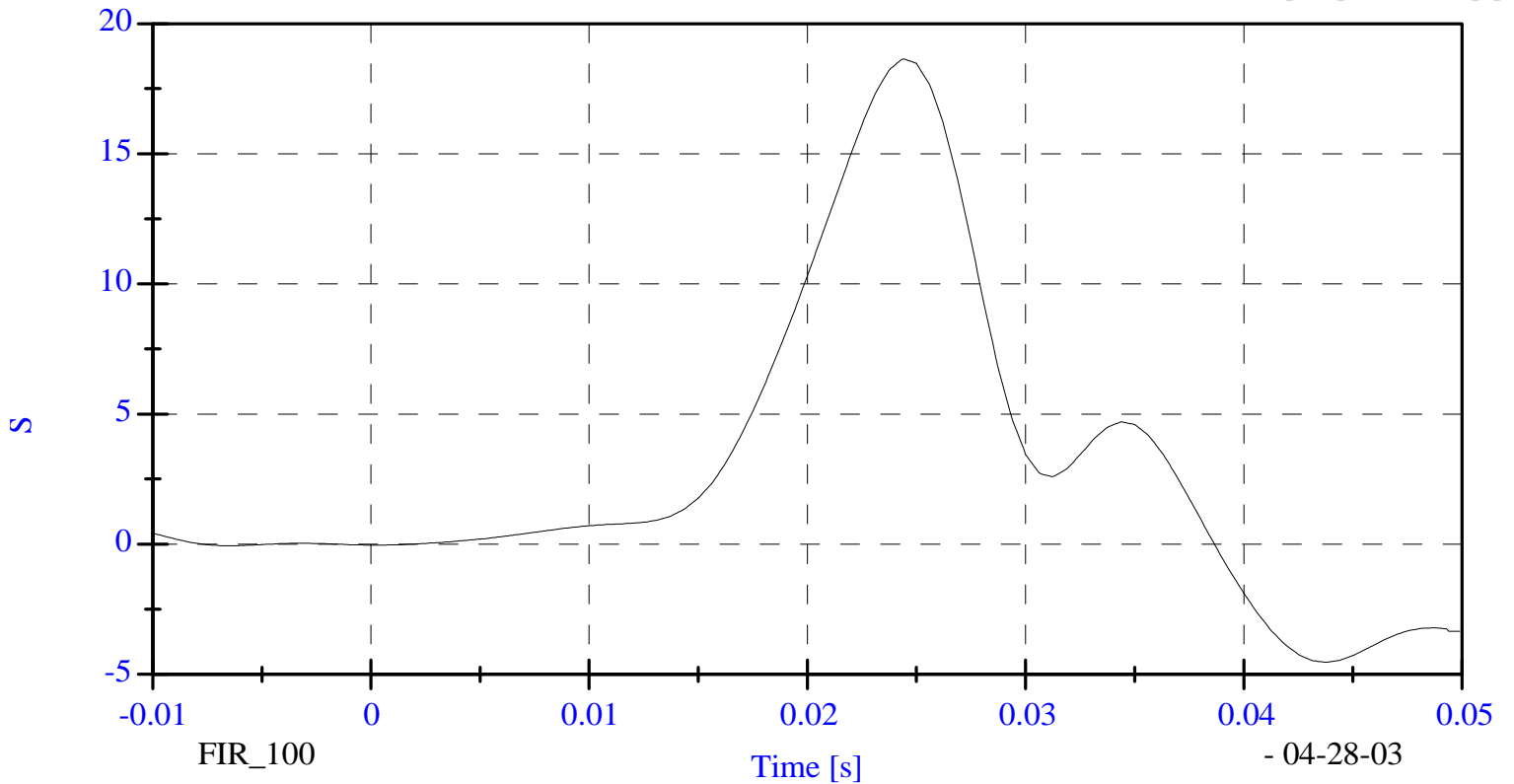
Lower Rib Y Acceleration



Max: 18.6 [G's] at 0.024 [s]

Min: -4.5 [G's] at 0.044 [s]

Lower Spine Y Acceleration



- 04-28-03

**LATERAL PELVIS IMPACT TEST  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
Date: April 28, 2003 Laboratory Technician: B. Swiecicki

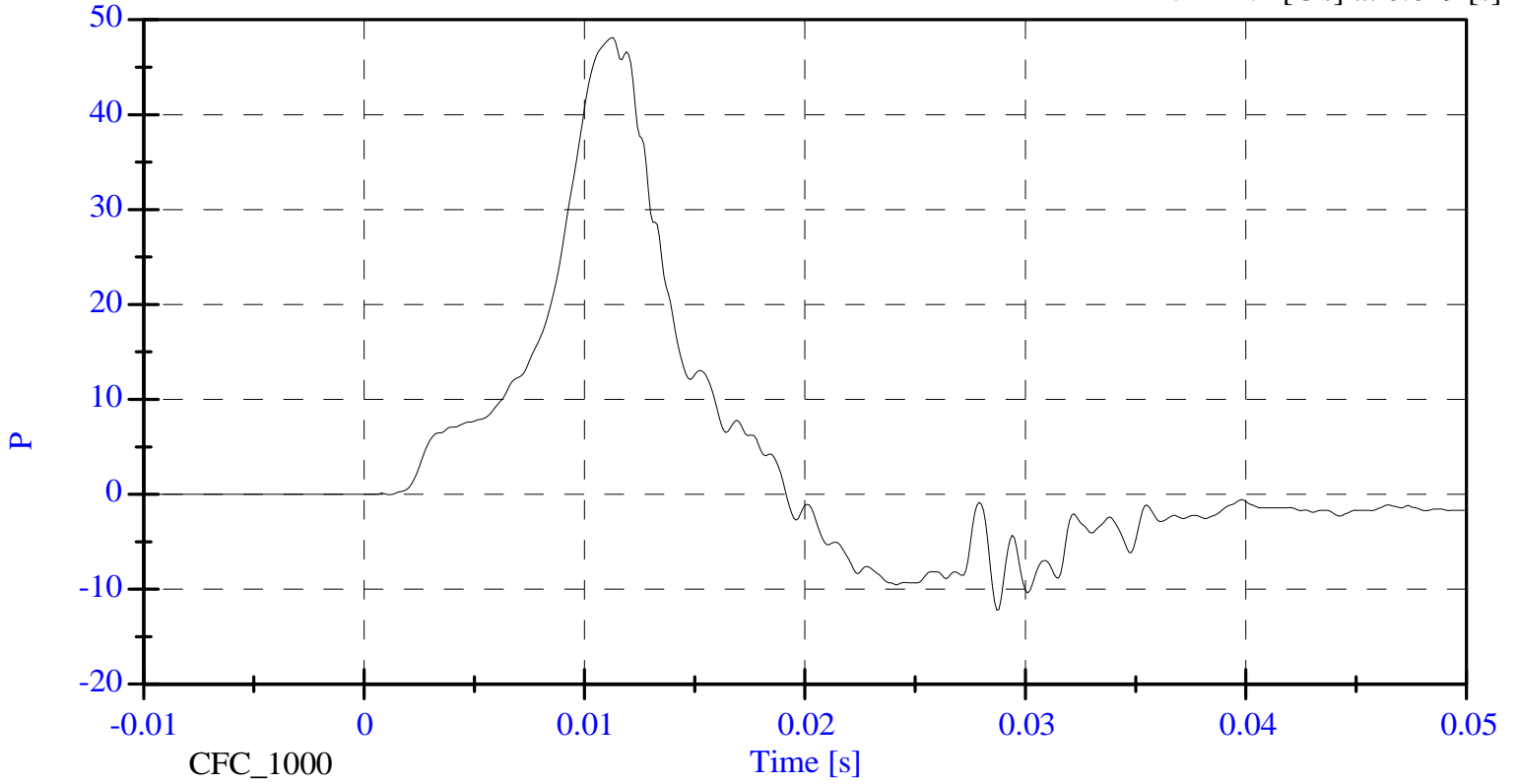
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	31.0
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	43.04

**REMARKS:** None

Max: 48.1 [G's] at 0.011 [s]

Min: -12.2 [G's] at 0.029 [s]

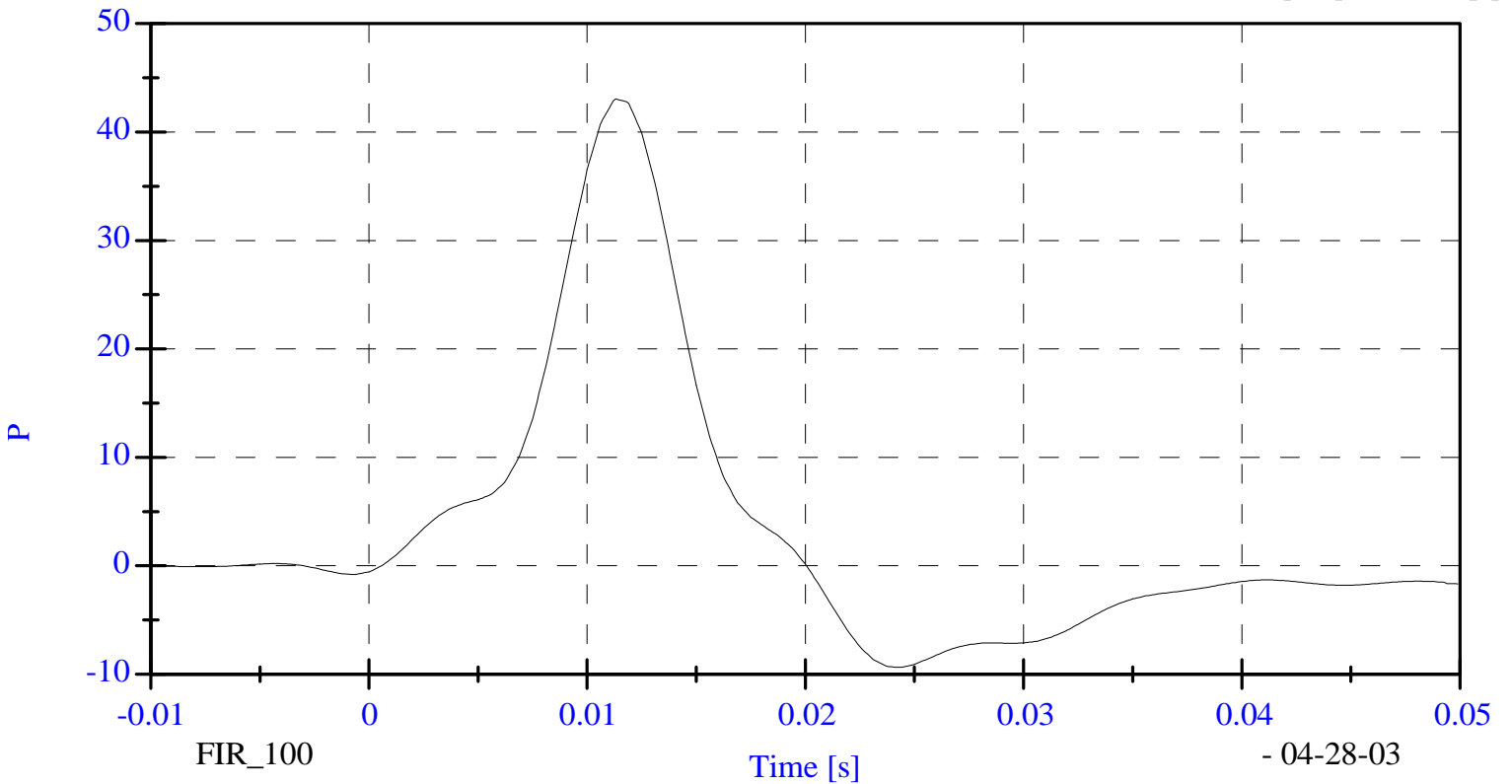
Pelvis Acceleration



Max: 43.0 [G's] at 0.011 [s]

Min: -9.4 [G's] at 0.024 [s]

Pelvis Y Acceleration



**HEAD DROP TEST  
PRE-TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 015 Sequential Test Number: 1  
Date: April 23, 2003 Laboratory Technician: B. Swiecicki

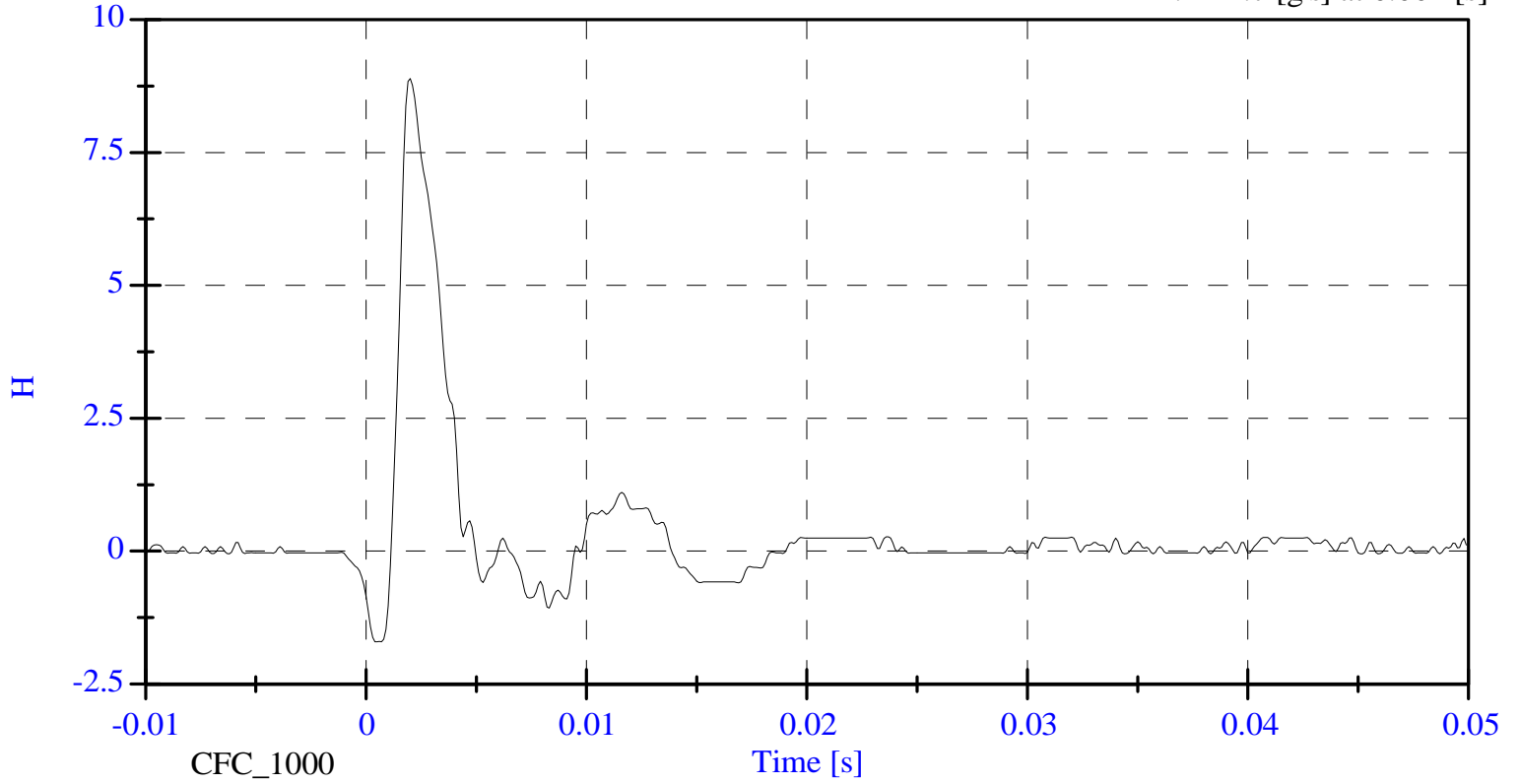
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 – 22.2	21.1
RELATIVE HUMIDITY (%)	10 – 70	38.0
PEAK RESULTANT ACCELERATION (Gs)	120 – 150	128.88
PEAK LATERAL ACCELERATION (Gs)	Not to Exceed 15	8.90
CURVE PERCENT NONMODAL (%)	< 15	3.73

**REMARKS:** None

Max: 8.9 [g's] at 0.002 [s]

Min: -1.7 [g's] at 0.001 [s]

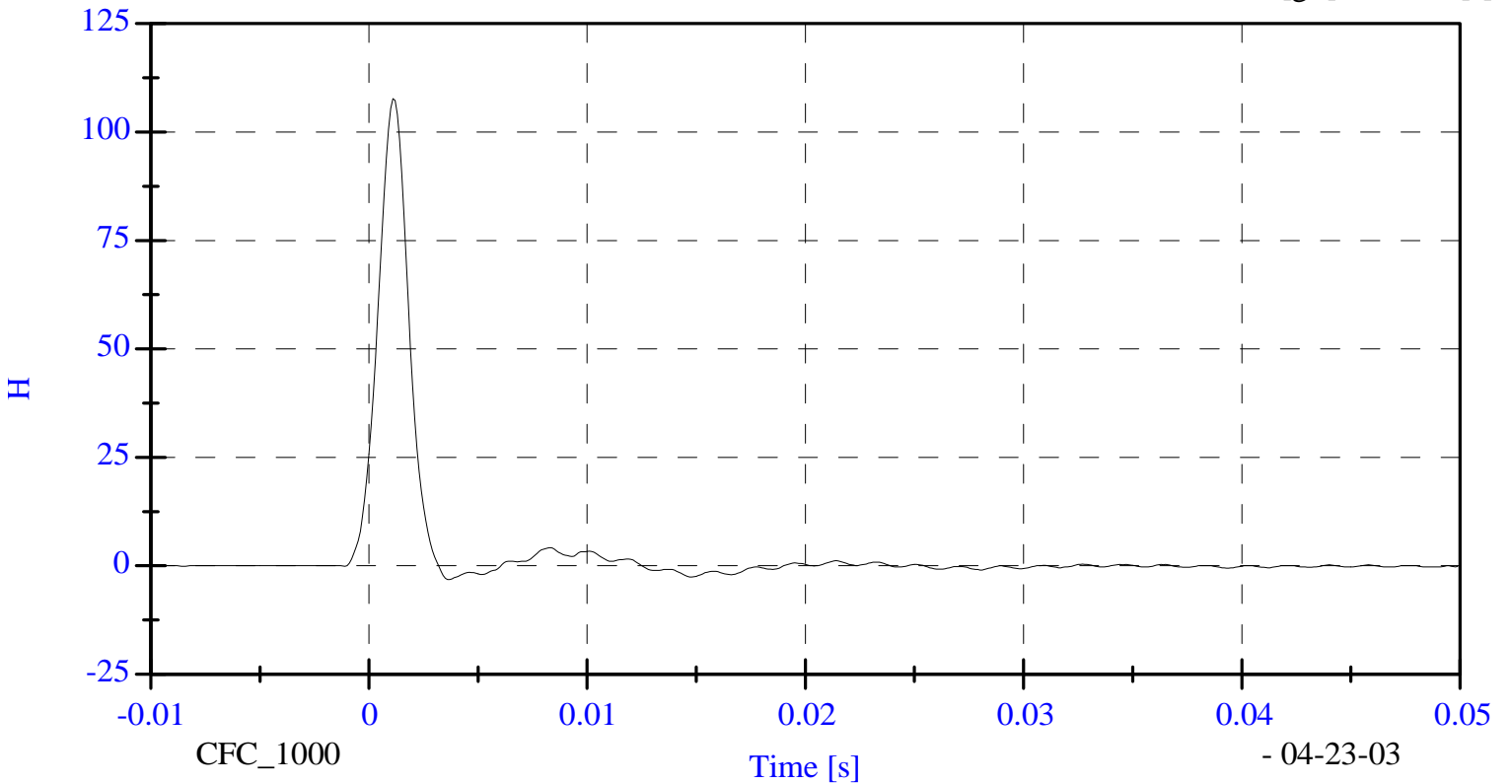
Head X Acceleration



Max: 107.7 [g's] at 0.001 [s]

Min: -3.2 [g's] at 0.004 [s]

Head Y Acceleration

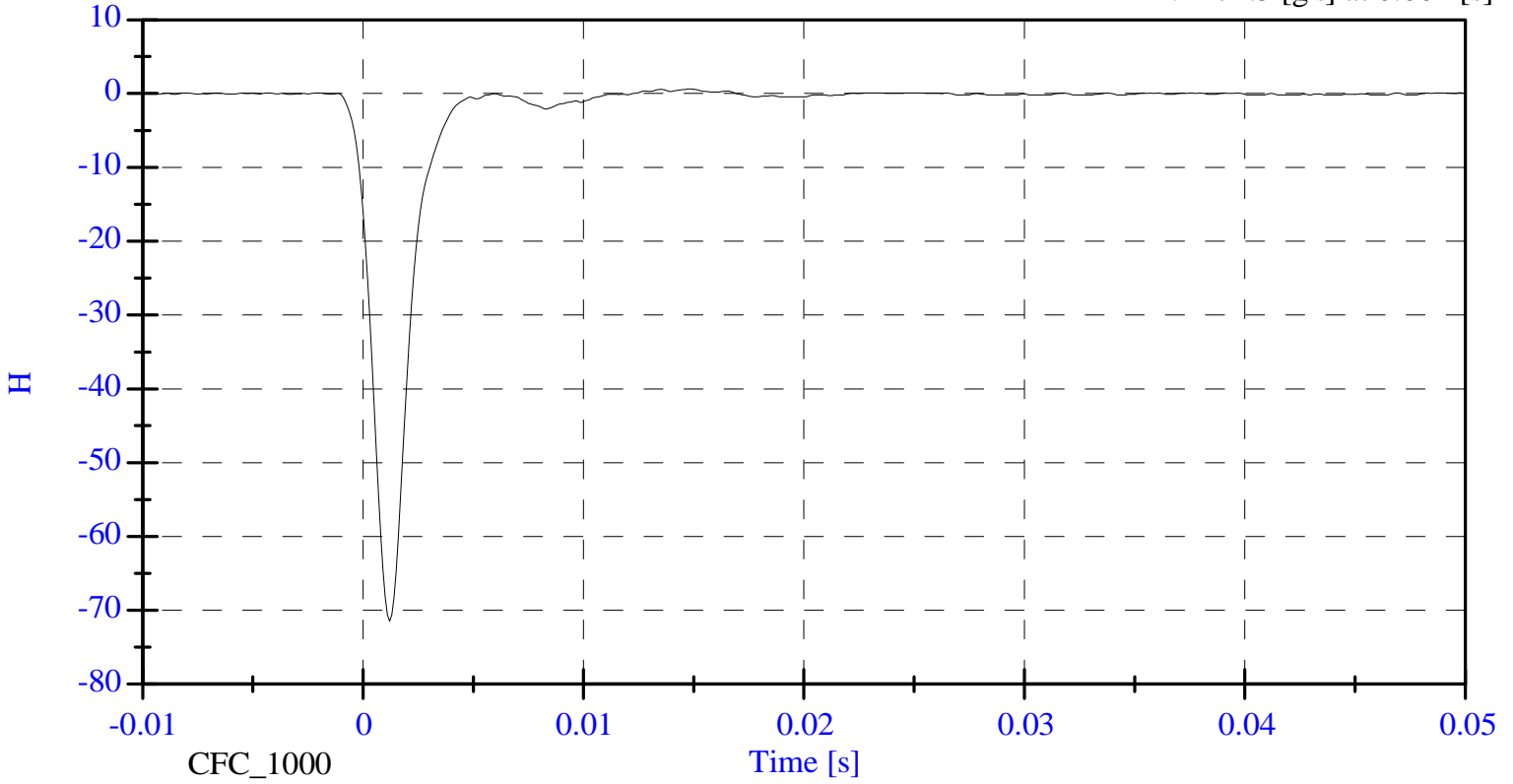


- 04-23-03

Max: 0.6 [g's] at 0.015 [s]

Min: -71.5 [g's] at 0.001 [s]

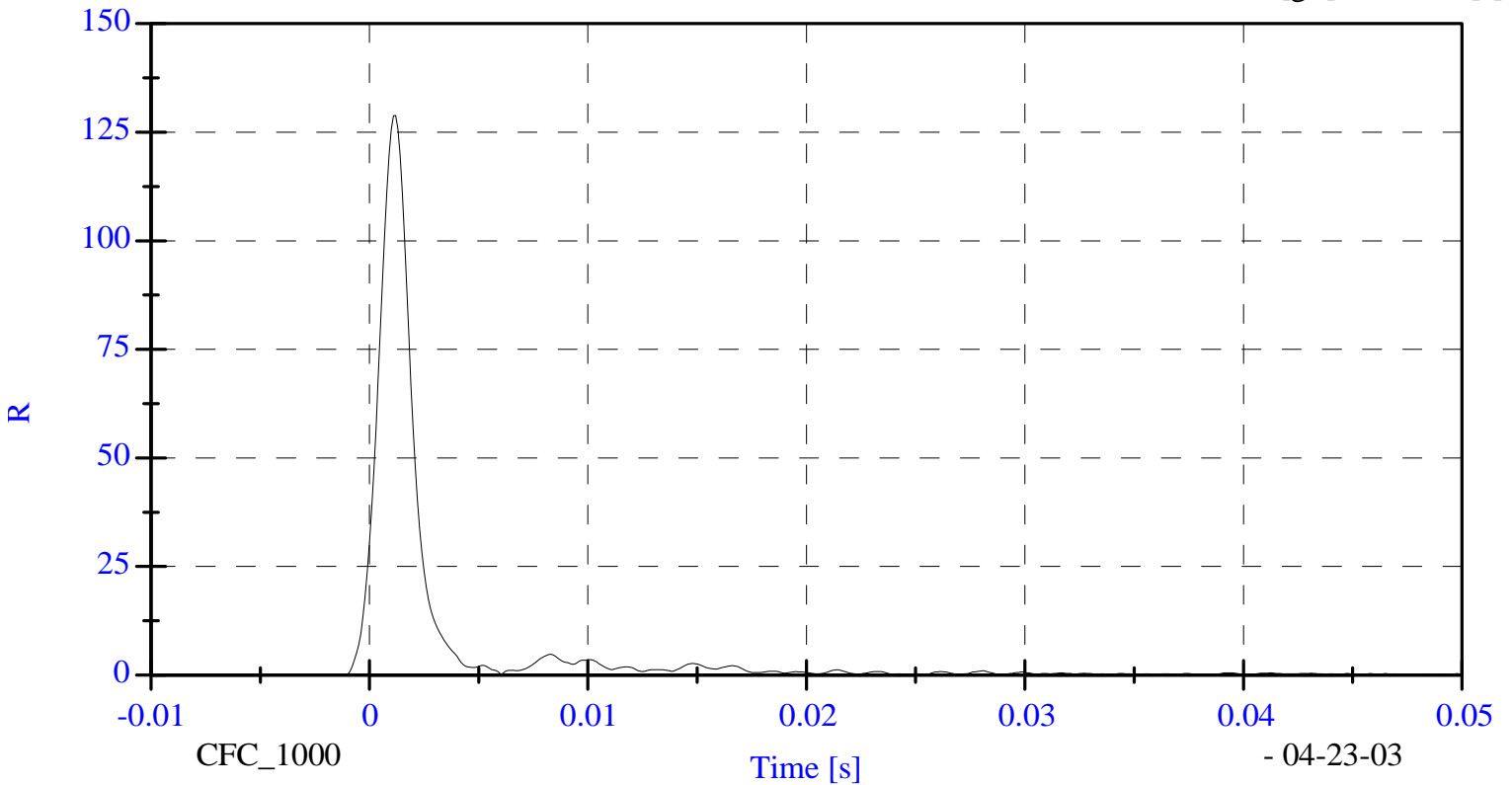
Head Z Acceleration



Max: 128.9 [g's] at 0.001 [s]

Min: 0.0 [g's] at -0.009 [s]

Head Resultant



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

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 015 Sequential Test Number: 1  
Date: April 24, 2003 Laboratory Technician: B. Swiecicki

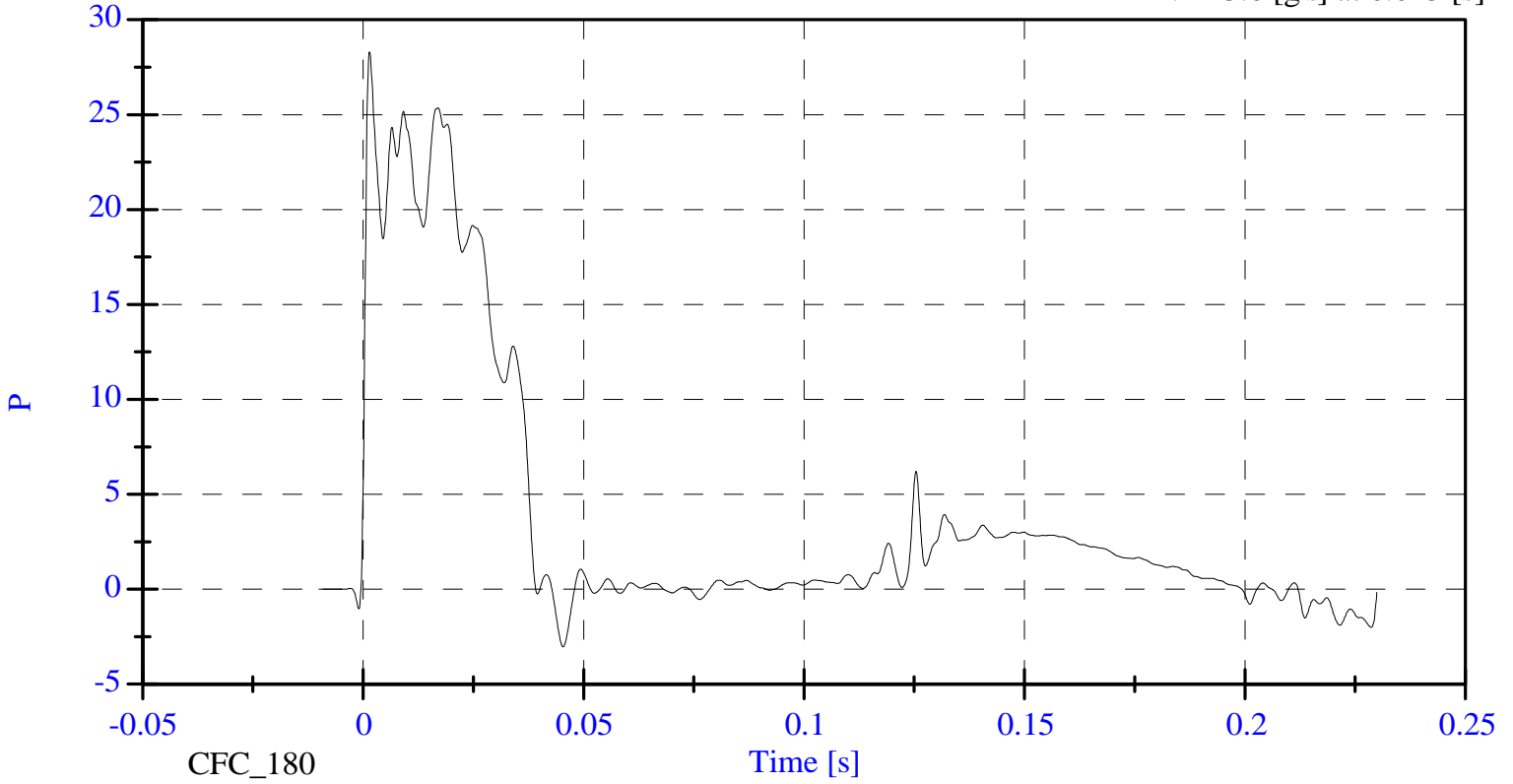
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 - 22.2	21.1
RELATIVE HUMIDITY (%)	10 - 70	33.0
IMPACT VELOCITY (m/s)	6.89 - 7.13	6.92
PENDULUM DELTA V		
DELTA V @ 10 ms (m/s)	1.96 - 2.55	2.21
DELTA V @ 20 ms (m/s)	4.12 - 5.10	4.44
DELTA V @ 30 ms (m/s)	5.73 - 7.01	6.19
DELTA V @ 40-70 ms (m/s)	6.27 - 7.64	7.18
D PLANE ROTATION		
MAXIMUM ROTATION (deg)	64 - 78	72.73
ROT. ANGLE TIME to ZERO (ms)	50 - 70	61.20
MOMENT ABOUT THE OCCIPITAL CONDYLE		
MAX OCCIPITAL MOMENT (Nm)	88 - 108	92.99
OCCIPITAL MOMENT DECAY (ms)	40.0 - 60.0	51.00
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT		
ROTATION wrt MOMENT (ms)	0 - 20	8.10

**REMARKS:** None

Max: 28.3 [g's] at 0.001 [s]

Min: -3.0 [g's] at 0.045 [s]

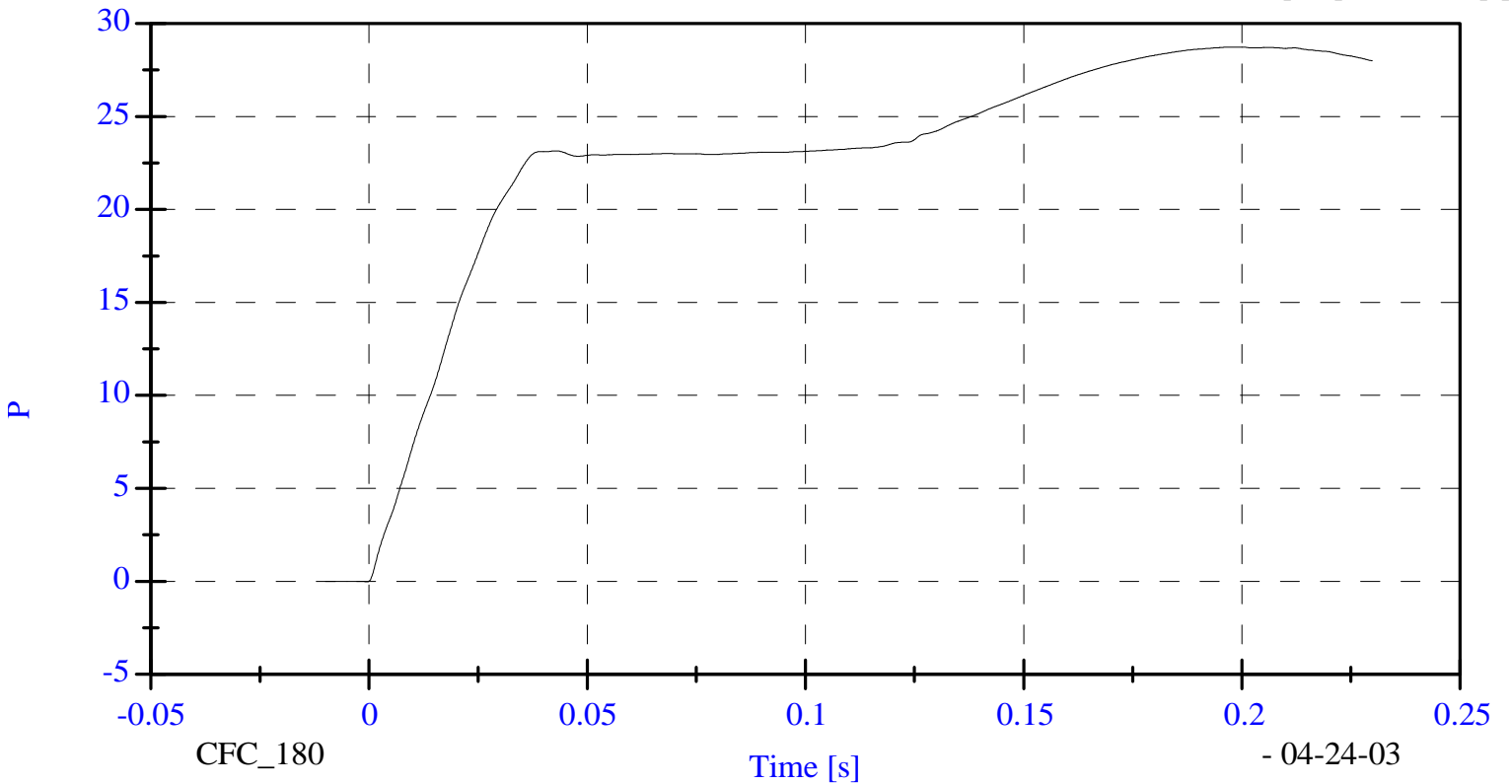
Pendulum Acceleration



Max: 28.7 [ft/s] at 0.199 [s]

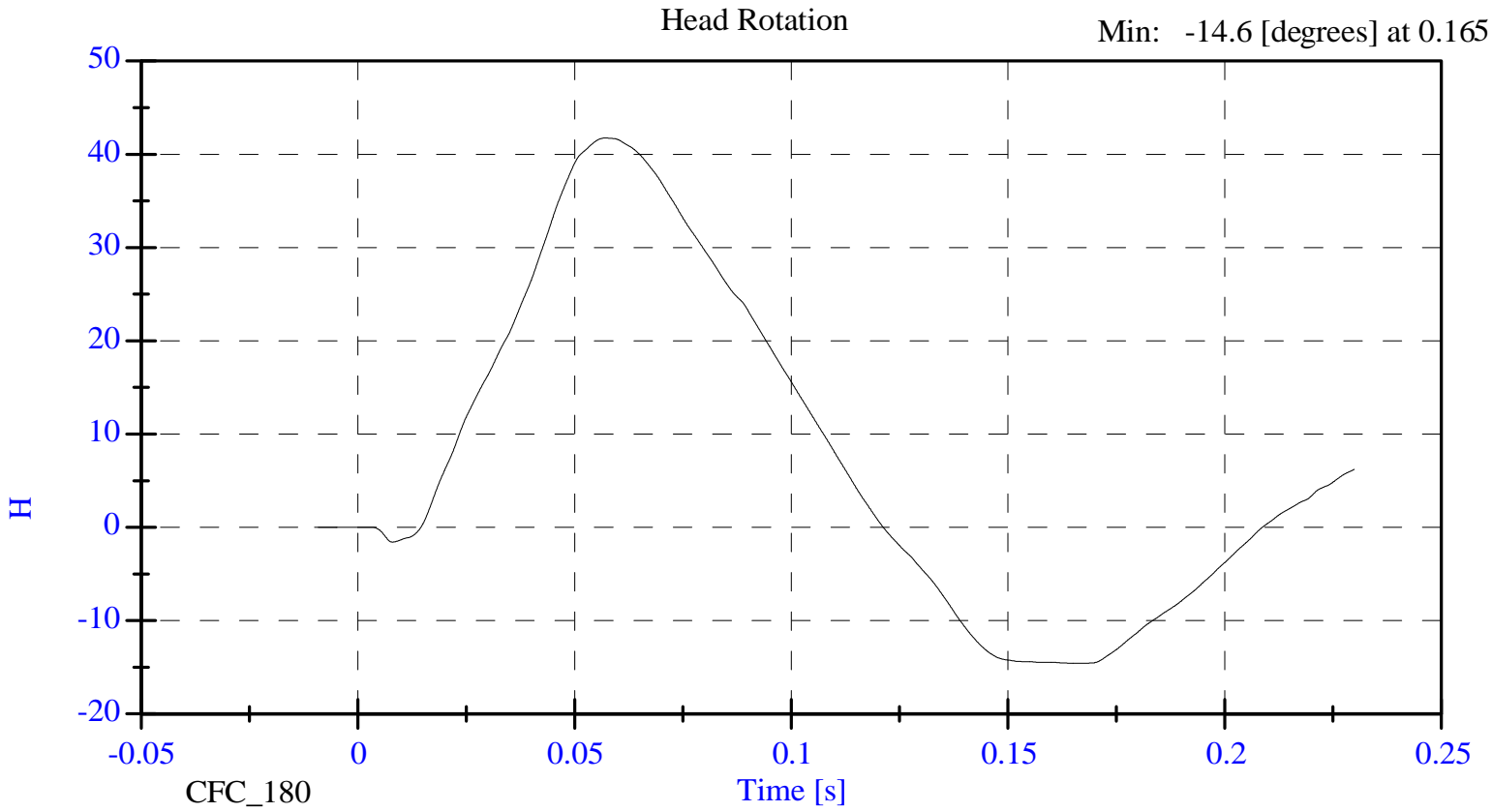
Min: -0.0 [ft/s] at -0.001 [s]

Pendulum Velocity



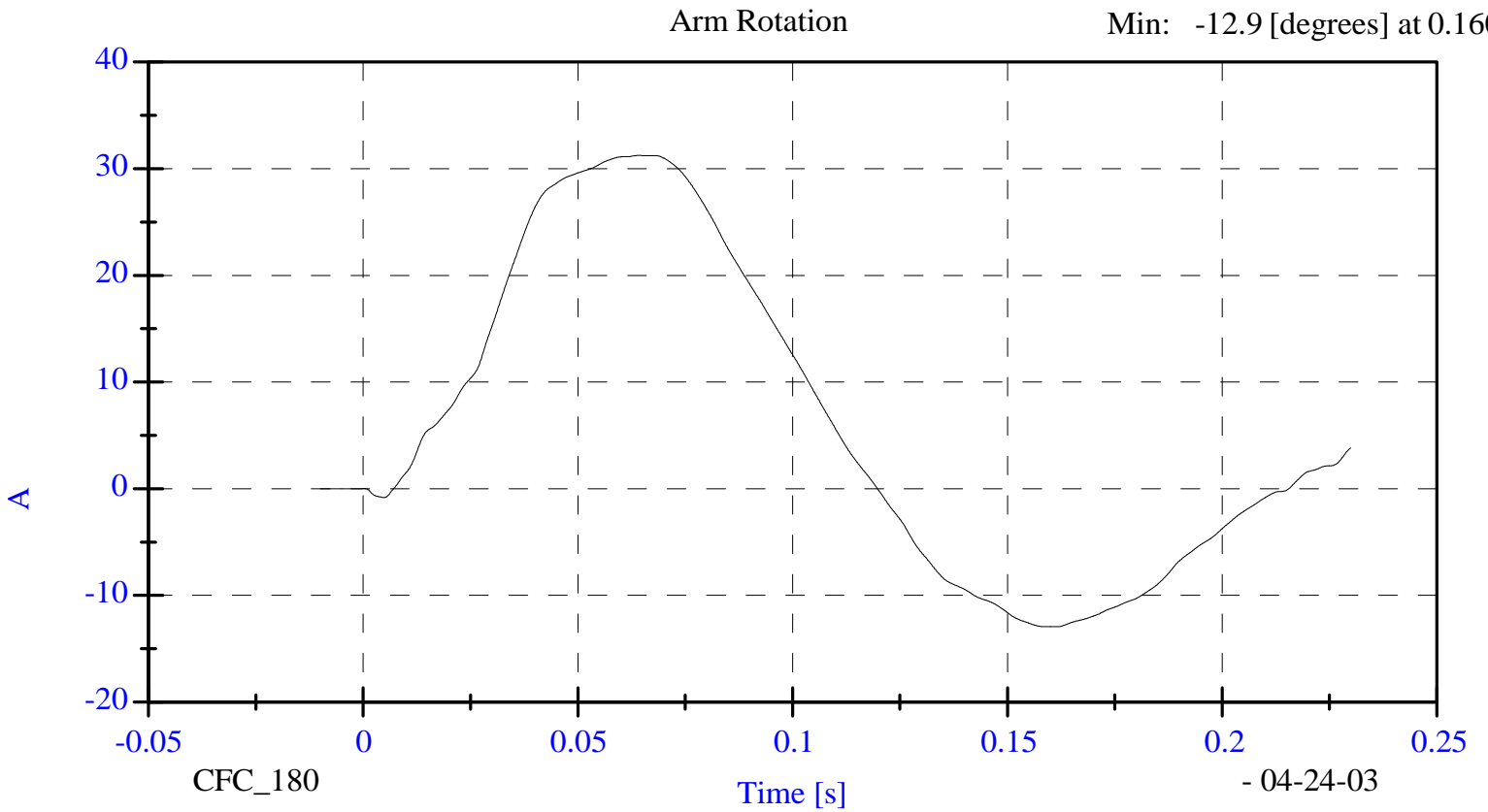
Max: 41.7 [degrees] at 0.057

Min: -14.6 [degrees] at 0.165



Max: 31.3 [degrees] at 0.064

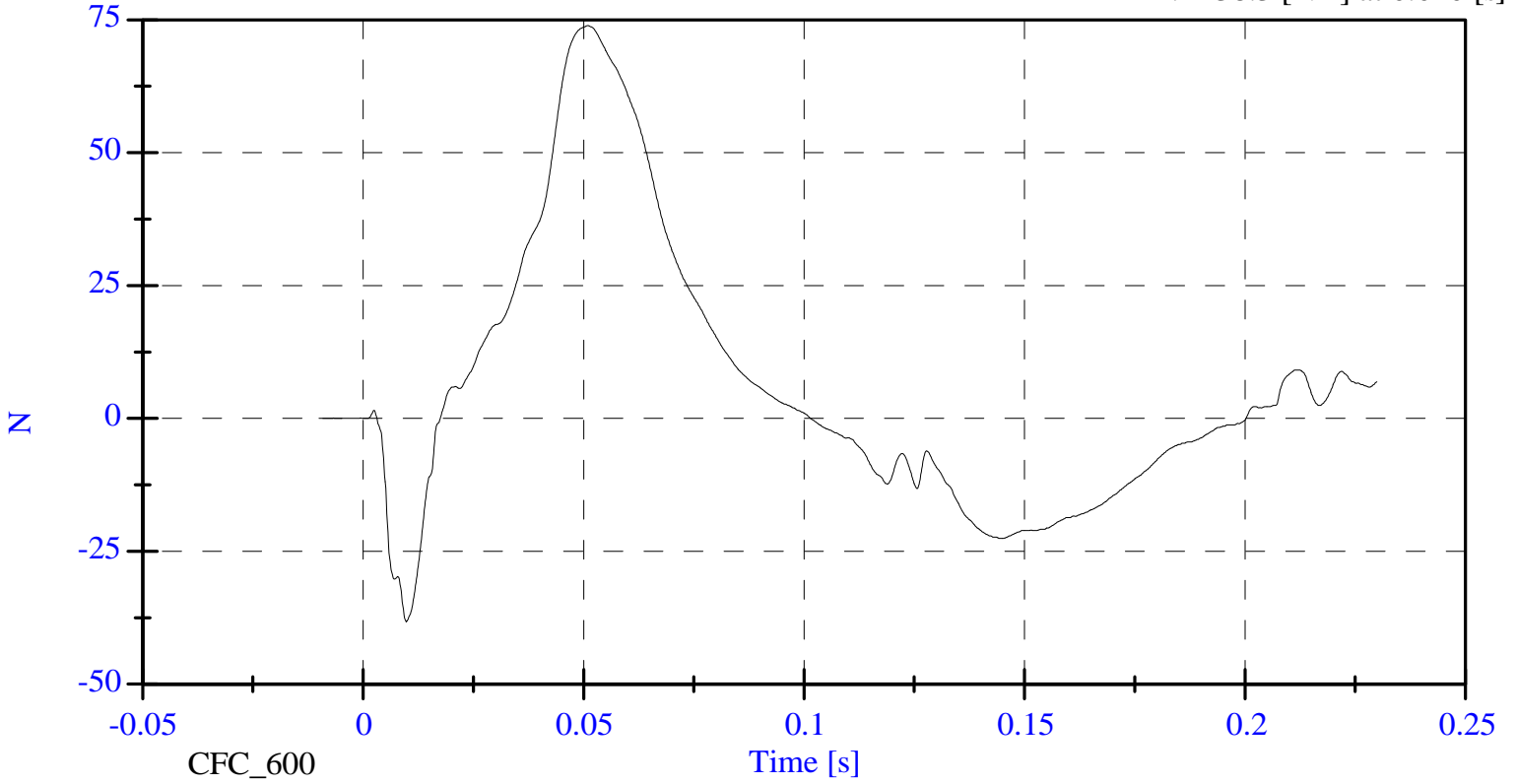
Min: -12.9 [degrees] at 0.160



Max: 73.9 [Nm] at 0.051 [s]

Min: -38.3 [Nm] at 0.010 [s]

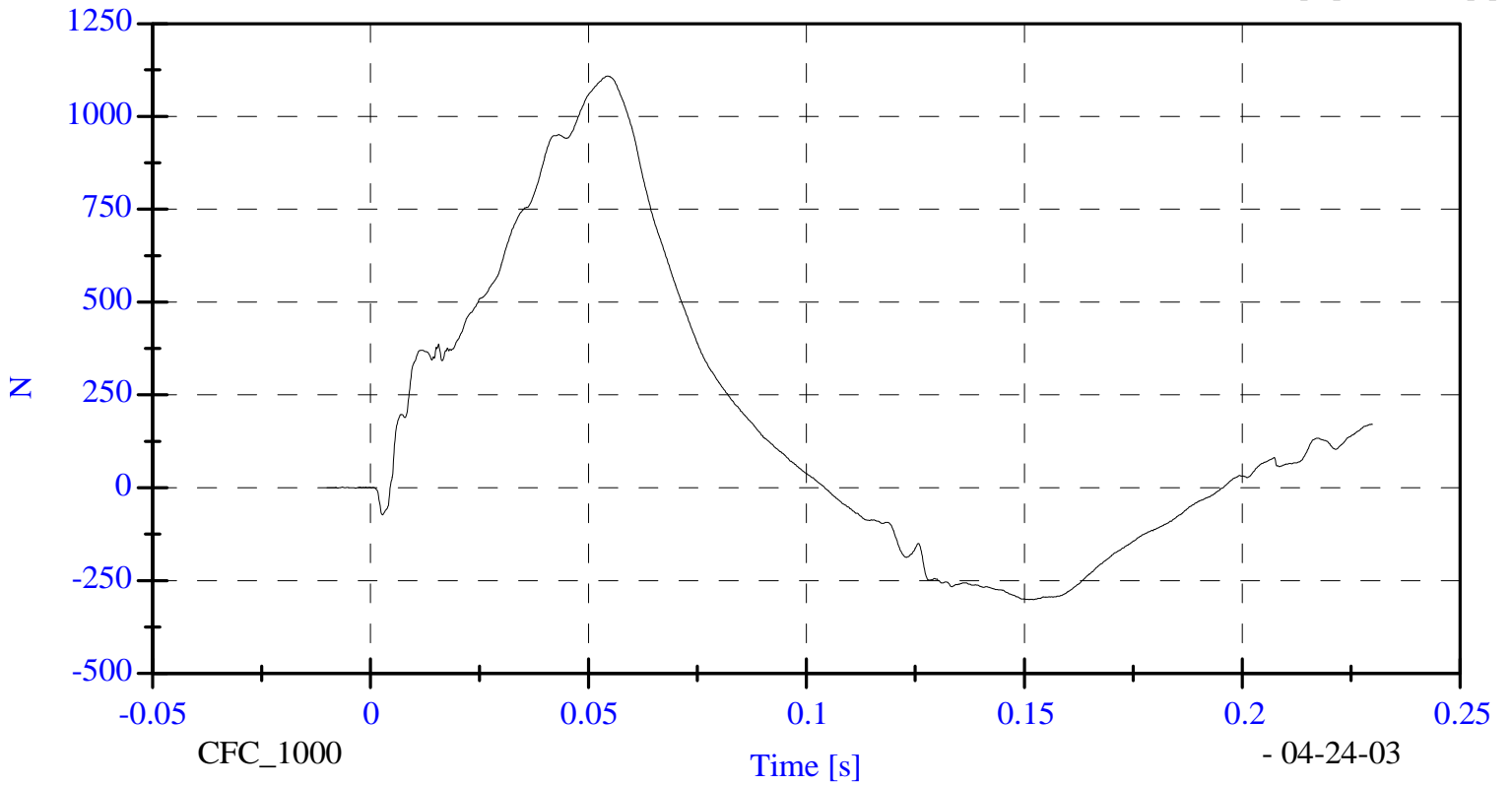
Neck Moment X



Max: 1108.3 [N] at 0.055 [s]

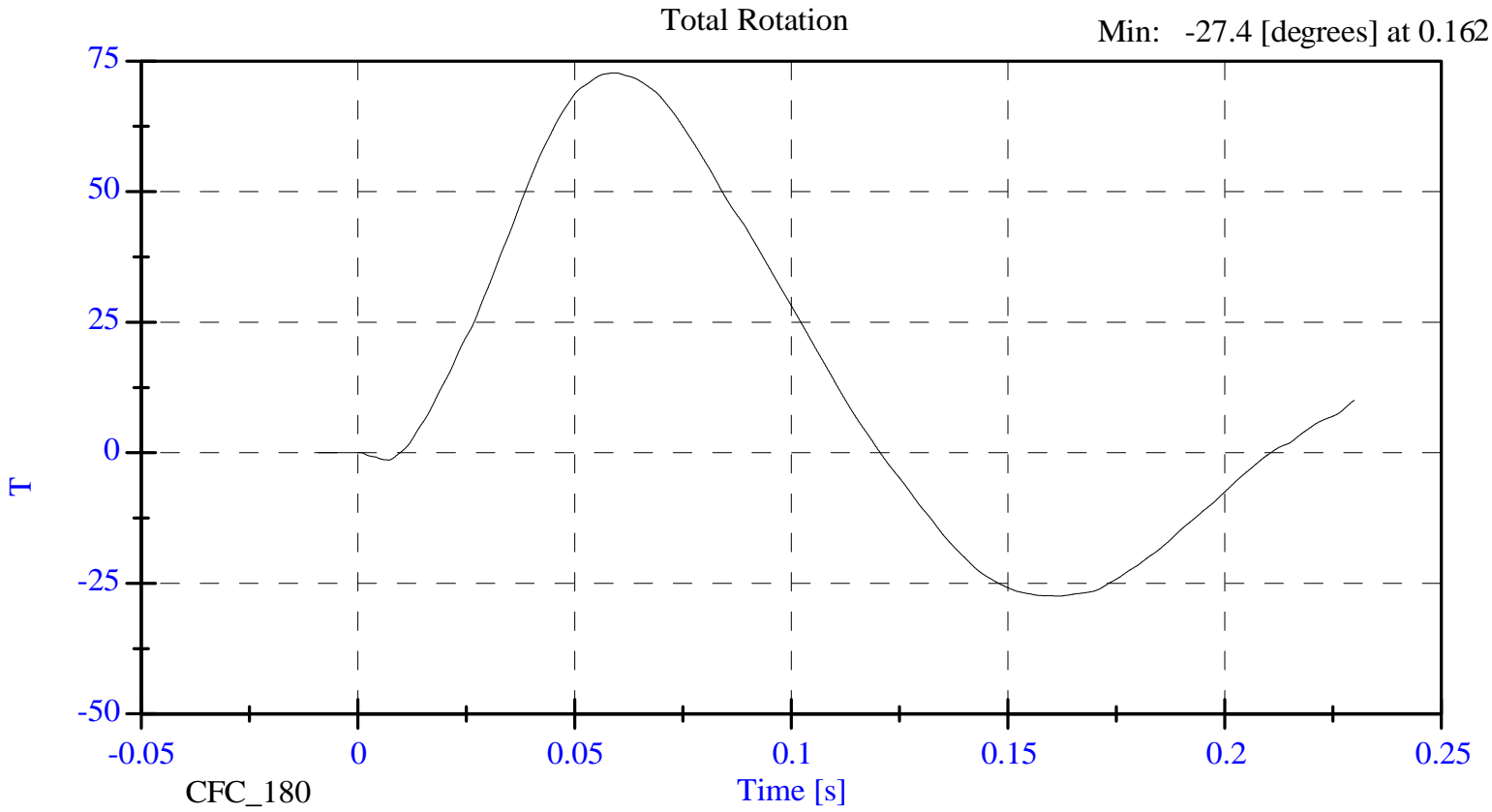
Min: -301.6 [N] at 0.151 [s]

Neck Force Y



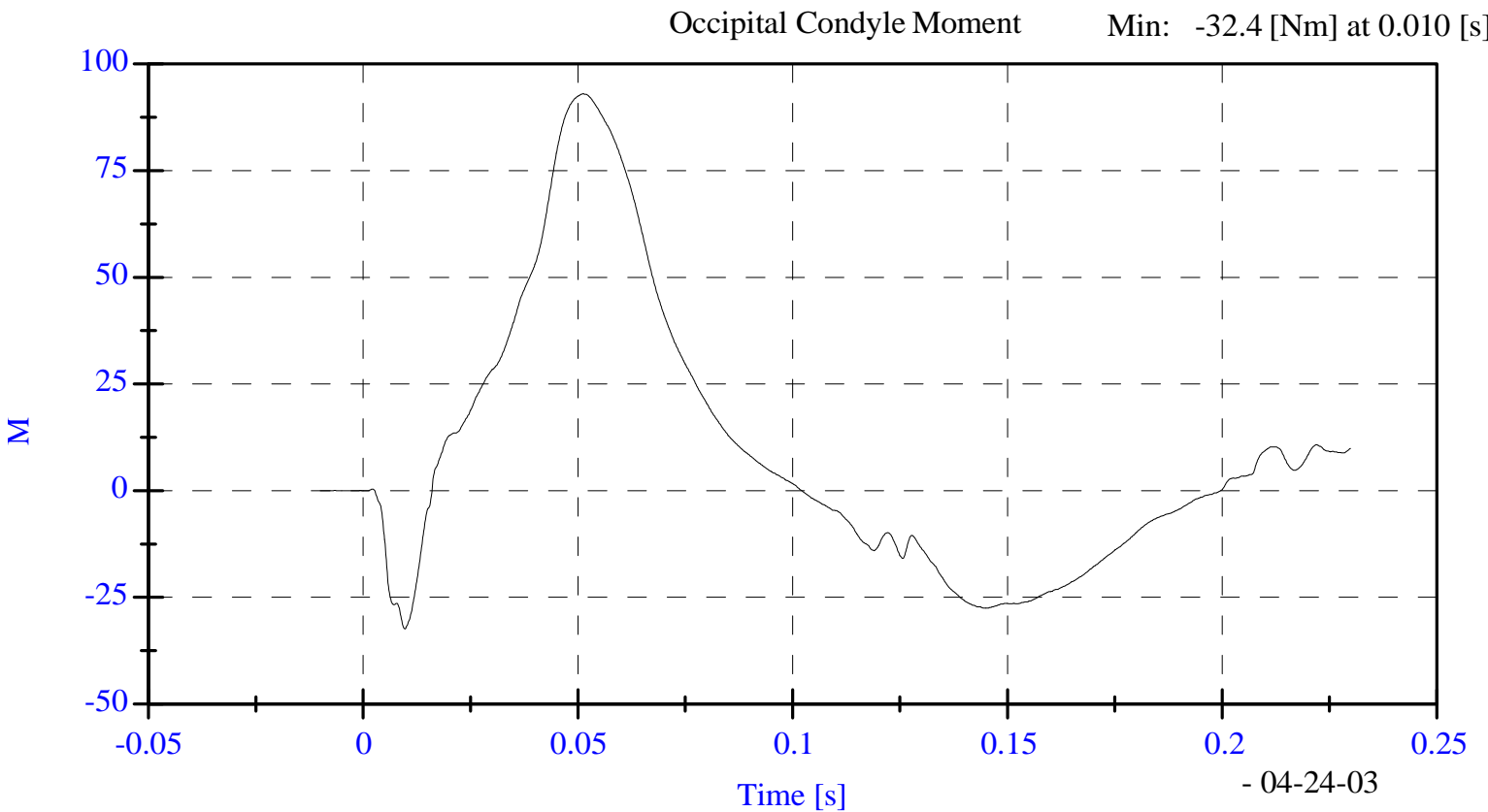
Max: 72.7 [degrees] at 0.059

Min: -27.4 [degrees] at 0.162



Max: 93.0 [Nm] at 0.051 [s]

Min: -32.4 [Nm] at 0.010 [s]



- 04-24-03

**ABDOMINAL COMPRESSION TEST  
PRE-TEST**

(Test not required for SID certification)

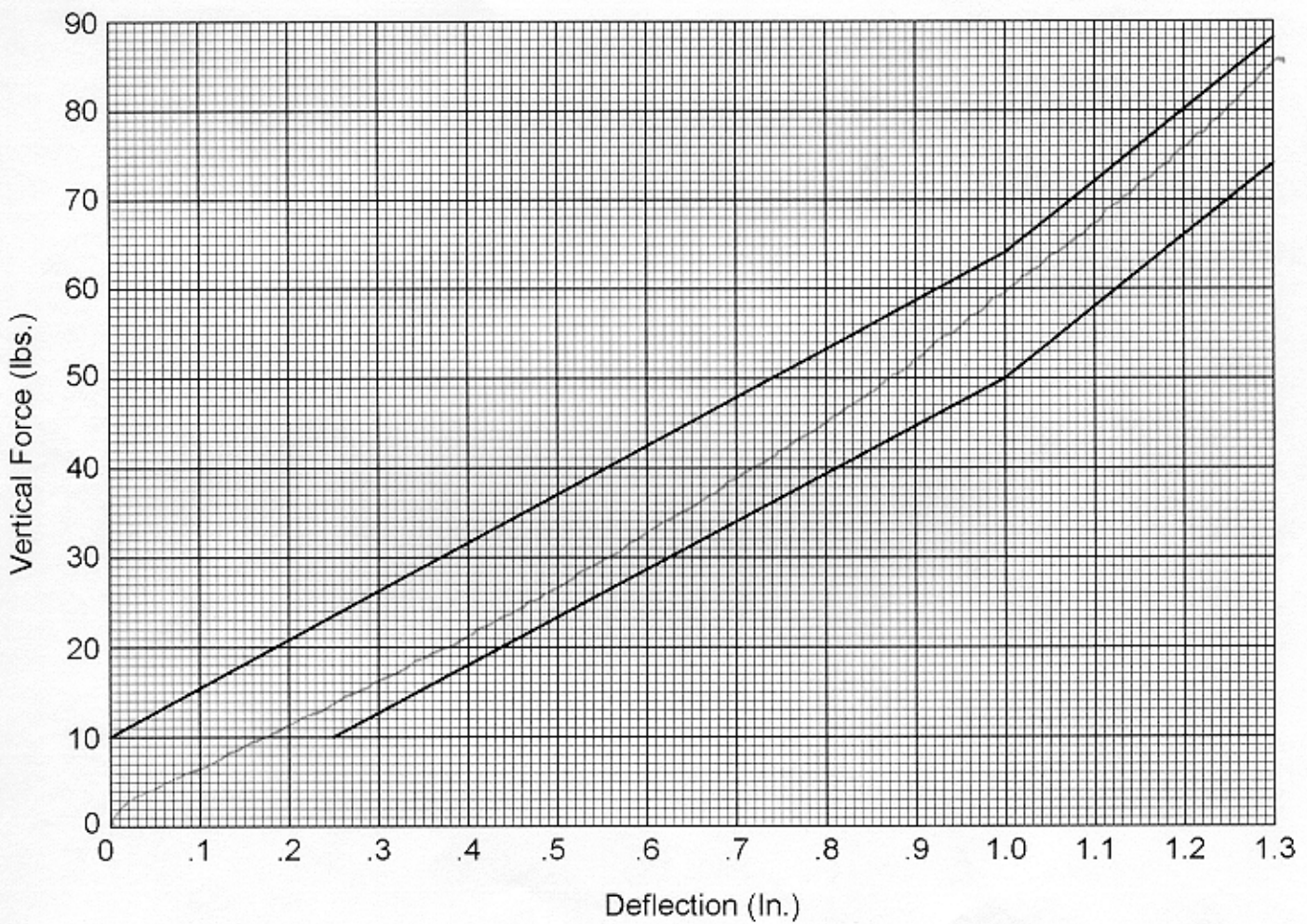
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
Date: April 28, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	35.0
FORCE @ 13 mm (N)	104 - 162	118.8
FORCE @ 19 mm (N)	163 - 221	186.8
FORCE @ 25 mm (N)	222 - 280	265.1
FORCE @ 33 mm (N)	325 - 391	379.0

**REMARKS:** None

Dummy S/N 015  
 W/A \_\_\_\_\_  
 Date 4-28-03  
 Performed By [Signature]  
 Temp. 70°  
 Humidity 35%



**Hybrid II  
 Abdomen Static Press**

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

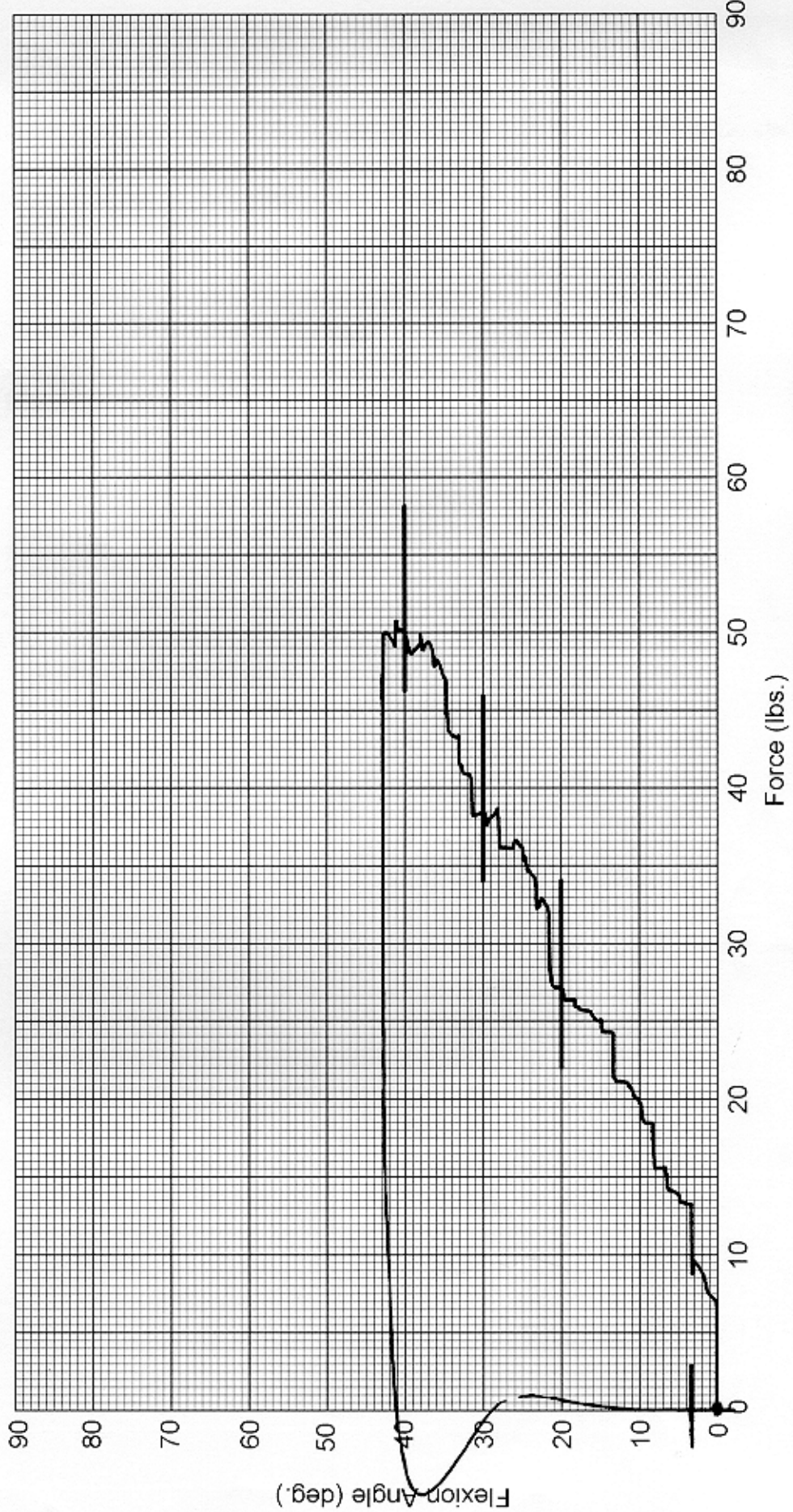
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
 Date: April 28, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	35.0
FORCE @ 0° (N)	0 - 26.7	0.2
FORCE @ 20° (N)	97.8 - 151.2	121.0
FORCE @ 30° (N)	151.2 - 204.6	169.0
FORCE @ 40° (N)	204.6 - 258	222.0
RETURN ANGLE	12° max.	3.3°

**REMARKS:** None

Dummy S/N 015  
 W/A \_\_\_\_\_  
 Date 4-28-03  
 Performed By [Signature]  
 Temp. 70°  
 Humidity 35%



Hybrid II Lumbar Spine Flexion Test

**PRE-TEST DUMMY INSPECTION LIST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
 Date: April 28, 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**

**PRE-TEST**

**SID H3 NO.: 016**

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: April 28, 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.
LATERAL NECK BEND 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.: 016 Sequential Test Number: 1  
Date: April 28, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	513
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	239
KH- Knee Pivot from Back Line (mm)	511 - 526	521
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	371

**REMARKS:** None

**THORACIC SHOCK ABSORBER TESTS  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1.1  
Date: April 25, 2003 Laboratory Technician: B. Swiecicki

DAMPER IDENTIFICATION: 016

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)		18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)		10 - 70	40.0
VELOCITY	FORCE (N)	836 - 1125	934.7
3.05 m/s	DISPLACEMENT (mm)	30 - 35	31.7
VELOCITY	FORCE (N)	1730 - 2099	1867.3
4.27 m/s	DISPLACEMENT (mm)	32 - 37	34.9
VELOCITY	FORCE (N)	3741 - 4448	4438.7
6.10 m/s	DISPLACEMENT (mm)	33 - 40	37.6

DAMPER SETTING: 5

**REMARKS:** None

# Shock Low at 3.05 m/s

Low Part 572F Shock Absorber Impact

Calibration Date: 04-25-03

Serial No: 016

Work File: 016SL1 04-25-03

## -----TEST RESULTS-----

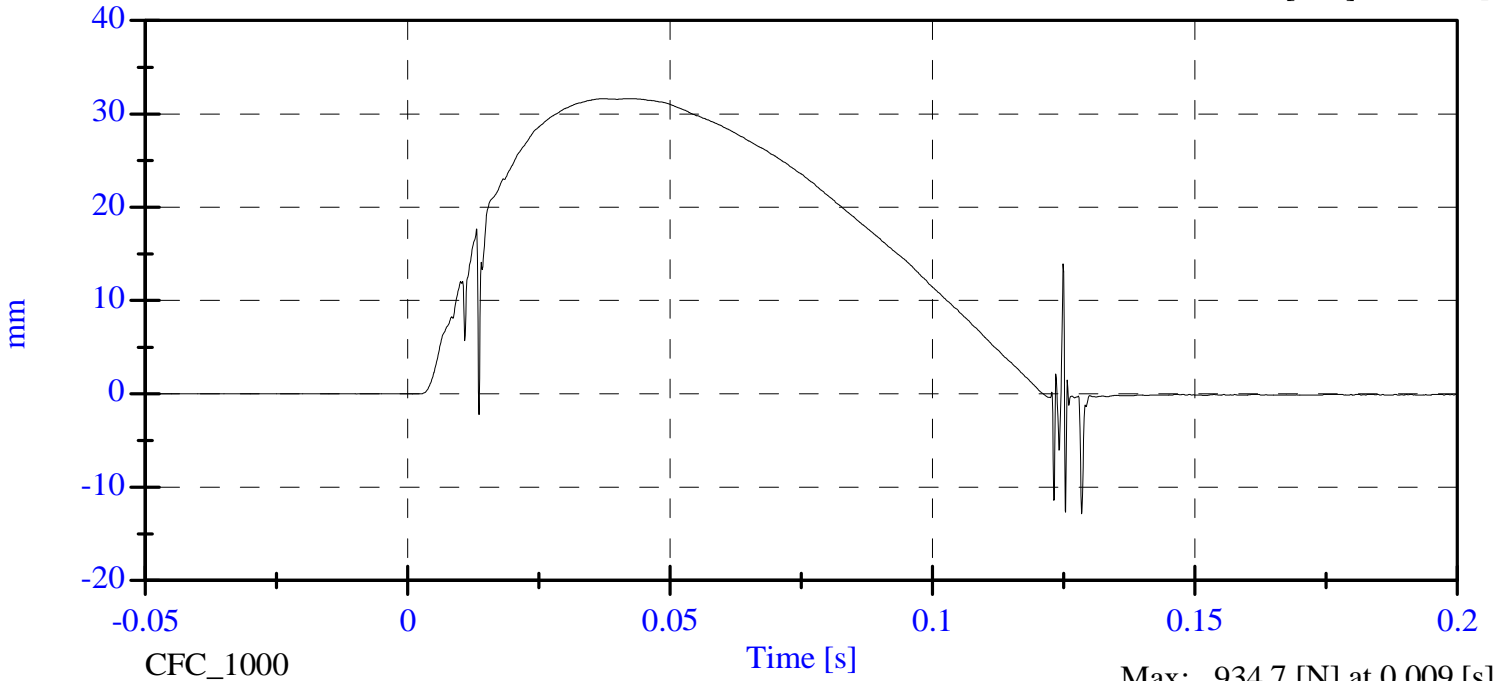
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	40.00 %	Passed
Displacement:	30.00-35.00 mm	31.65 mm	Passed
Maximum Force:	836.00-1125.00 N	934.69 N	Passed

Shock Low

Displacement vs. Time

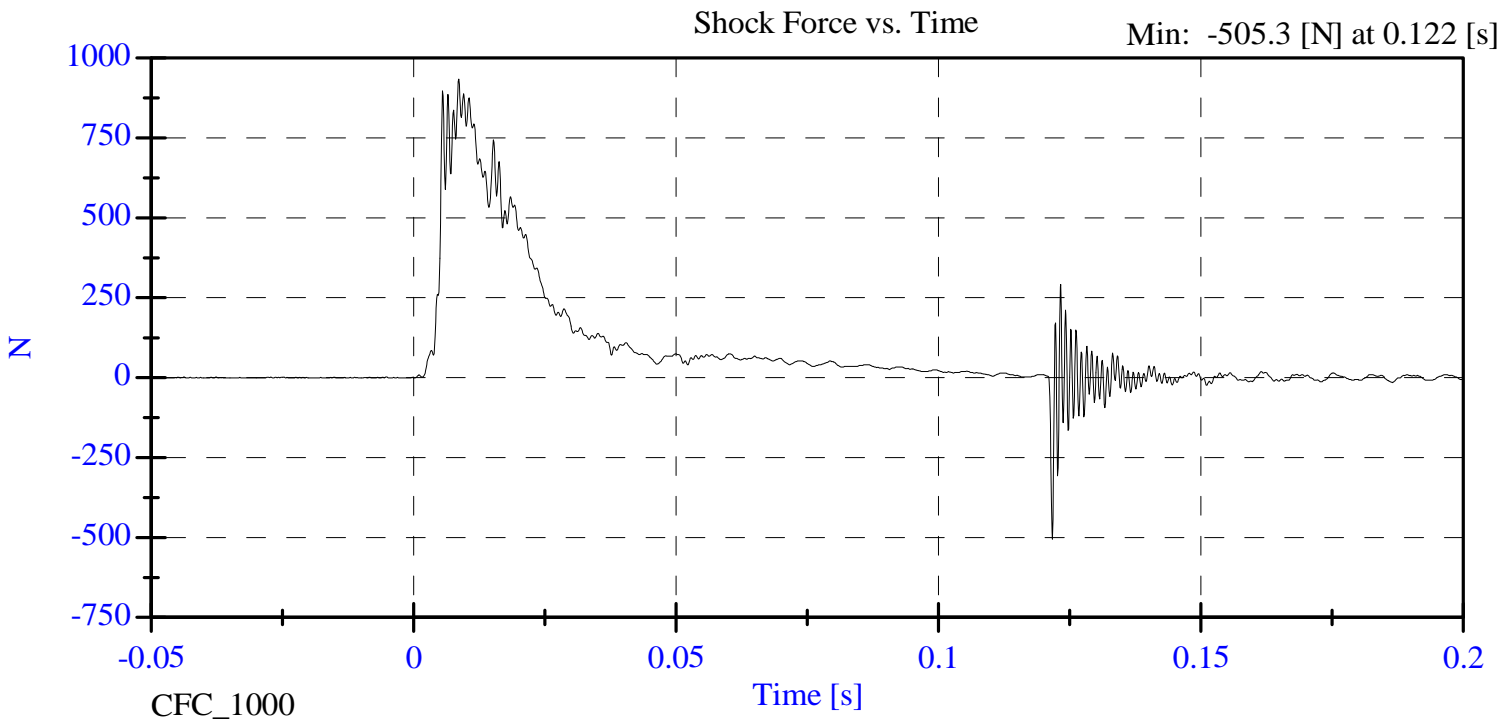
Max: 31.6 [mm] at 0.037 [s]

Min: -12.8 [mm] at 0.128 [s]



Max: 934.7 [N] at 0.009 [s]

Min: -505.3 [N] at 0.122 [s]



# Shock Med at 4.27 m/s

Medium Part 572F Shock Absorber Impact

Calibration Date: 04-25-03

Serial No: 016

Work File: 016SM 04-25-03

## -----TEST RESULTS-----

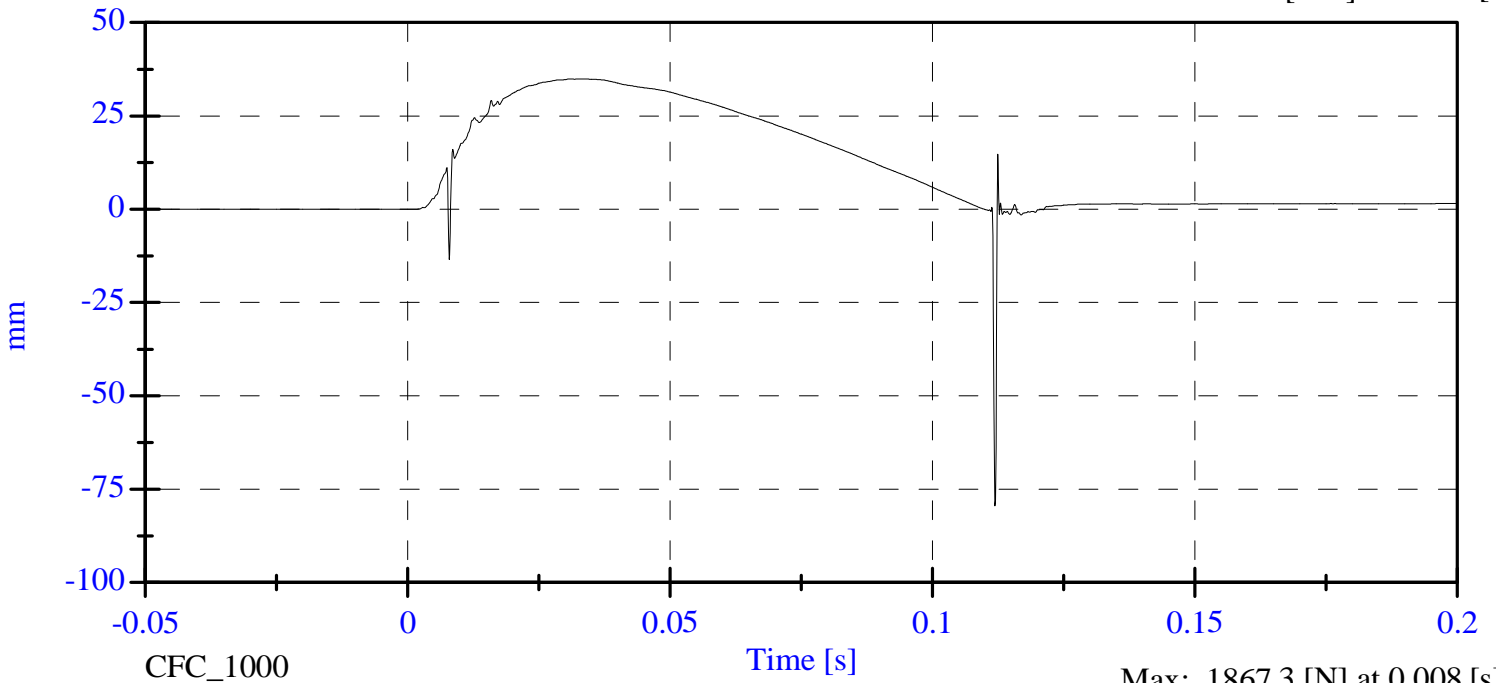
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	40.00 %	Passed
Displacement:	32.00-37.00 mm	34.91 mm	Passed
Maximum Force:	1730.00-2099.00 N	1867.29 N	Passed

Shock Med

Displacement vs. Time

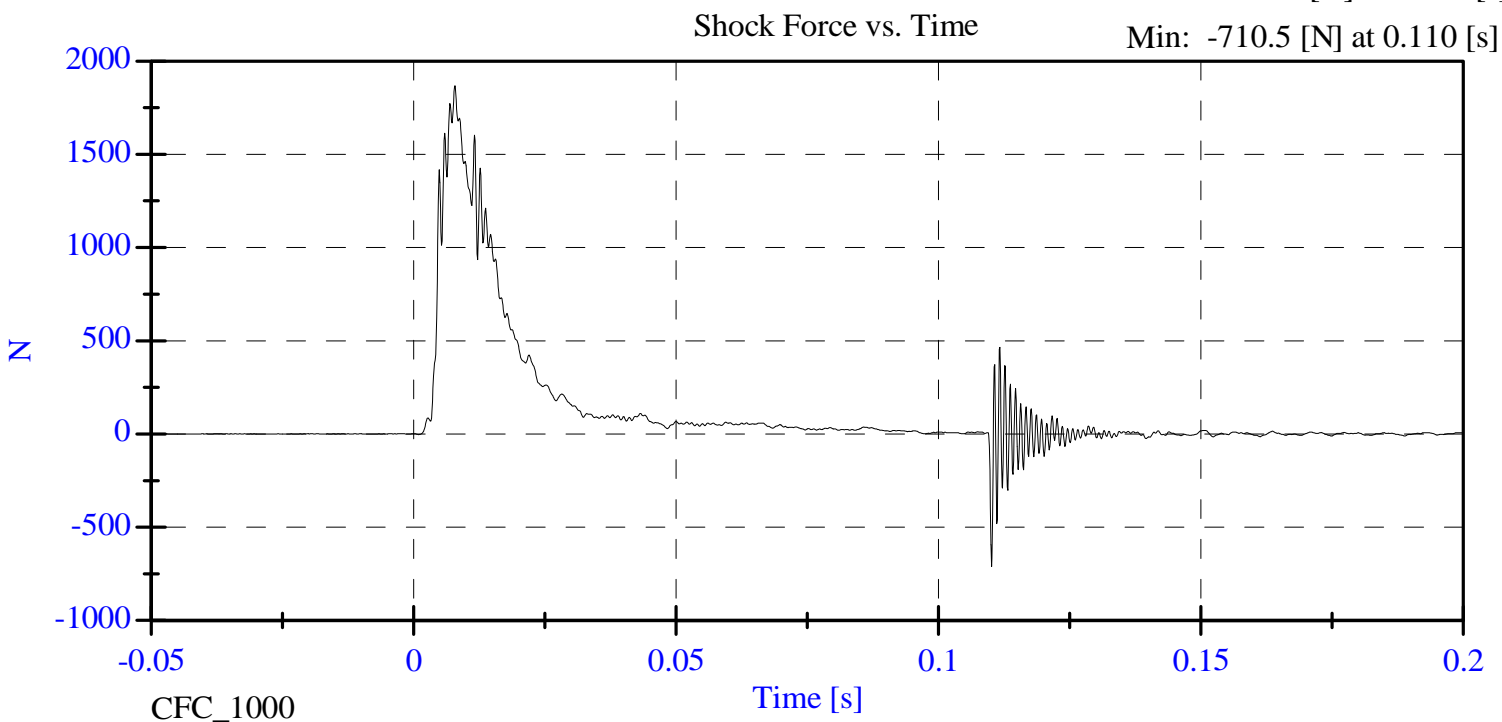
Max: 34.9 [mm] at 0.033 [s]

Min: -79.4 [mm] at 0.112 [s]



Max: 1867.3 [N] at 0.008 [s]

Min: -710.5 [N] at 0.110 [s]



# Shock High at 6.10 m/s

High Part 572F Shock Absorber Impact

Calibration Date: 04-25-03

Serial No: 016

Work File: 016SH2 04-25-03

## -----TEST RESULTS-----

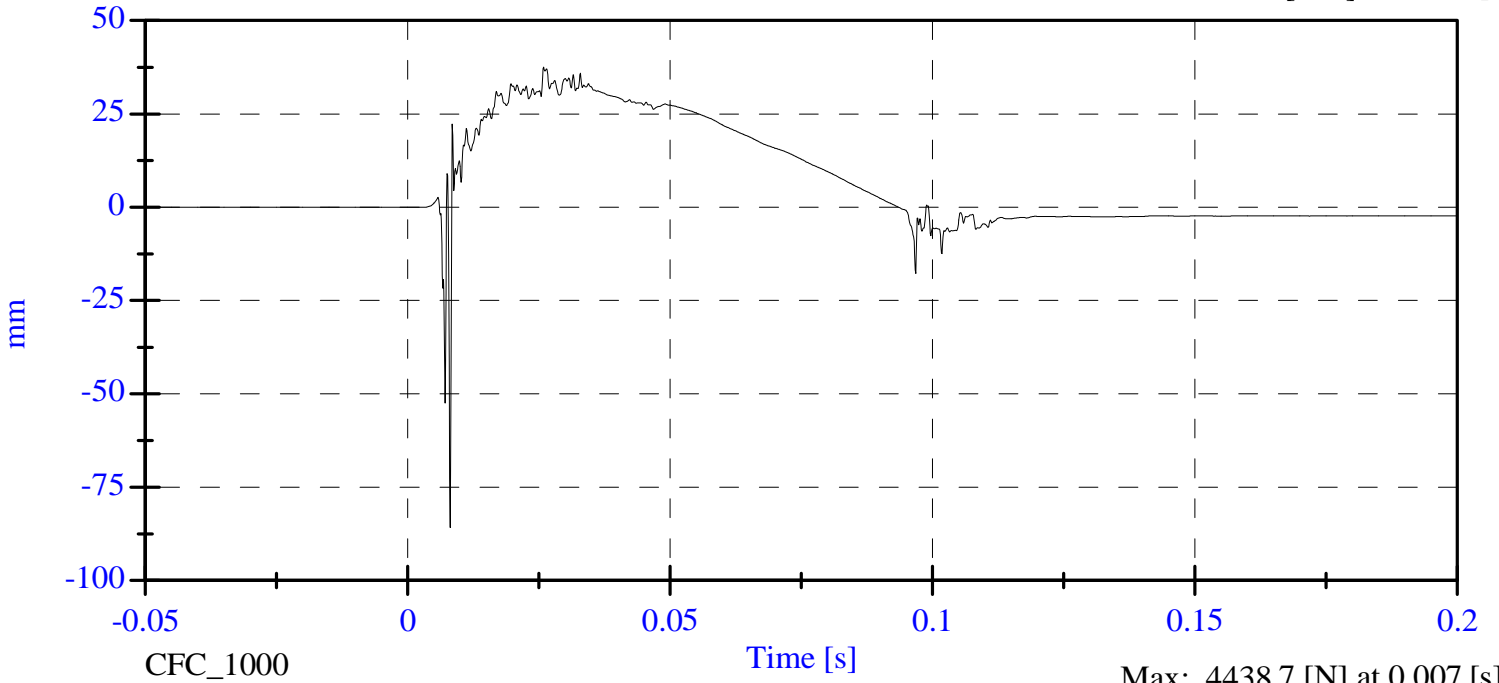
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	40.00 %	Passed
Displacement:	33.00-40.00 mm	37.56 mm	Passed
Maximum Force:	3741.00-4448.00 N	4438.69 N	Passed

Shock High

Displacement vs. Time

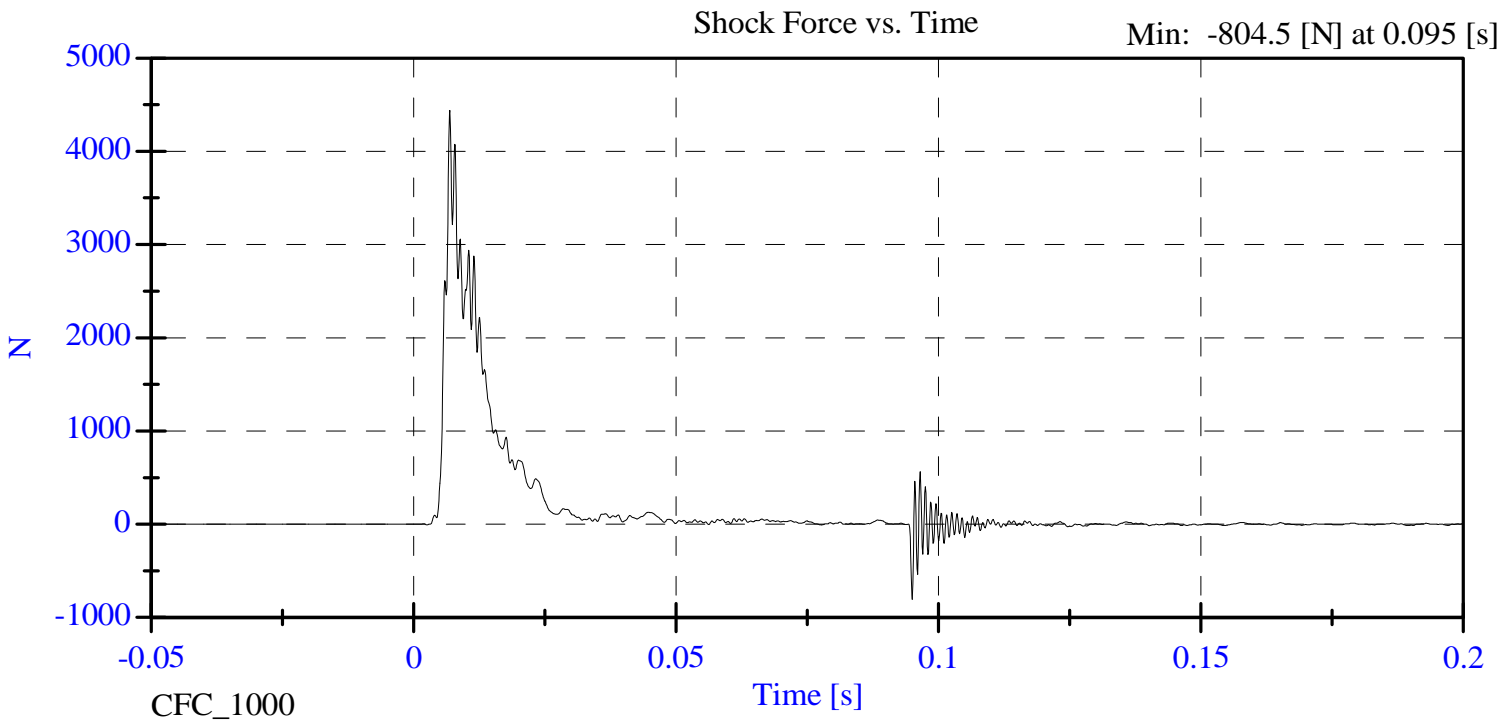
Max: 37.6 [mm] at 0.026 [s]

Min: -85.8 [mm] at 0.008 [s]



Max: 4438.7 [N] at 0.007 [s]

Min: -804.5 [N] at 0.095 [s]



**LATERAL THORAX IMPACT TEST  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: April 28, 2003 Laboratory Technician: B. Swiecicki

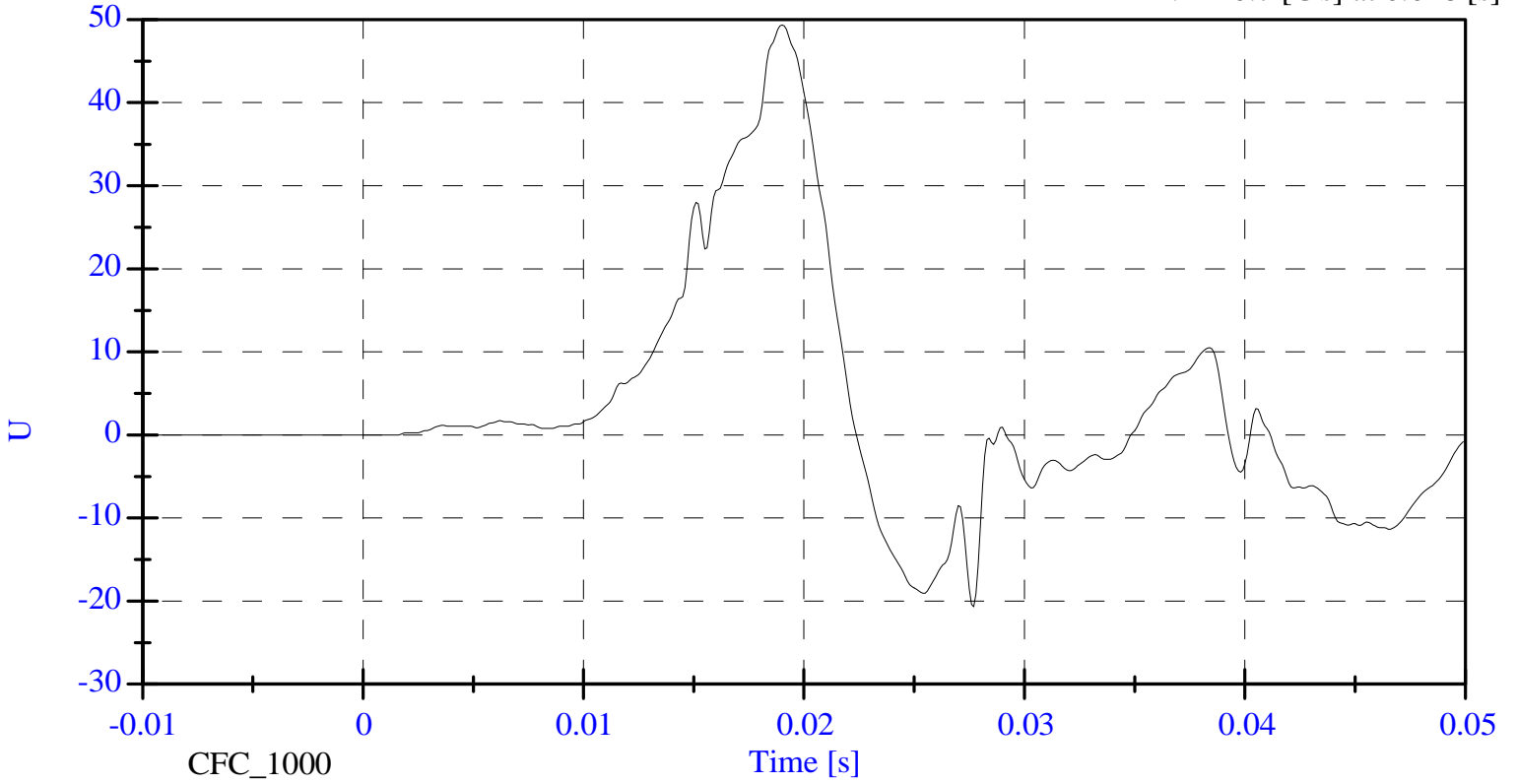
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	31.0
PROBE SPEED (m/s)	4.27 - 4.33	4.27
UPPER RIB (g's)	37 - 46	44.48
LOWER RIB (g's)	37 - 46	38.86
LOWER SPINE (g's)	15 - 22	21.43

**REMARKS:** None

Max: 49.4 [G's] at 0.019 [s]

Min: -20.7 [G's] at 0.028 [s]

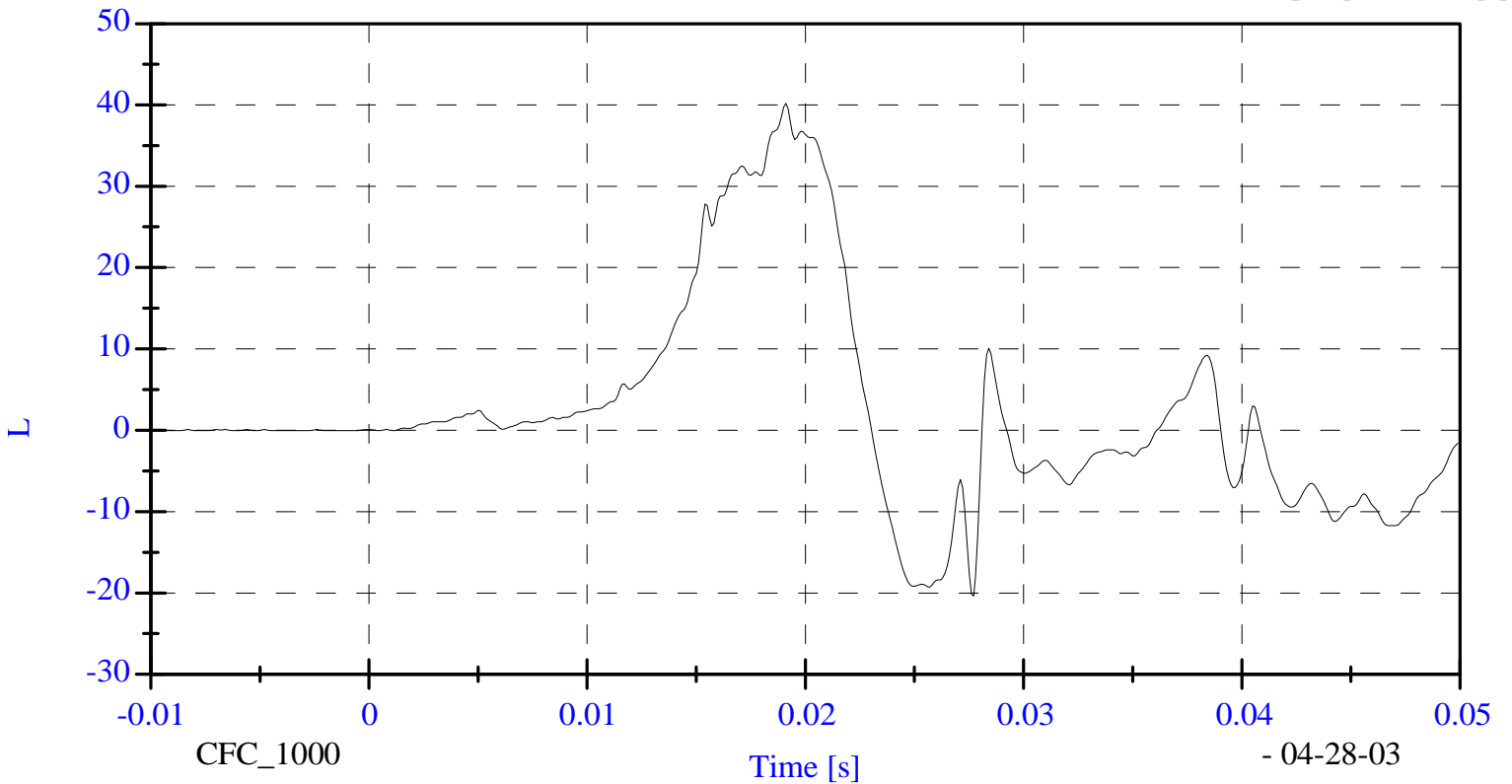
Upper Rib Y Acceleration



Max: 40.2 [G's] at 0.019 [s]

Min: -20.4 [G's] at 0.028 [s]

Lower Rib Y Acceleration

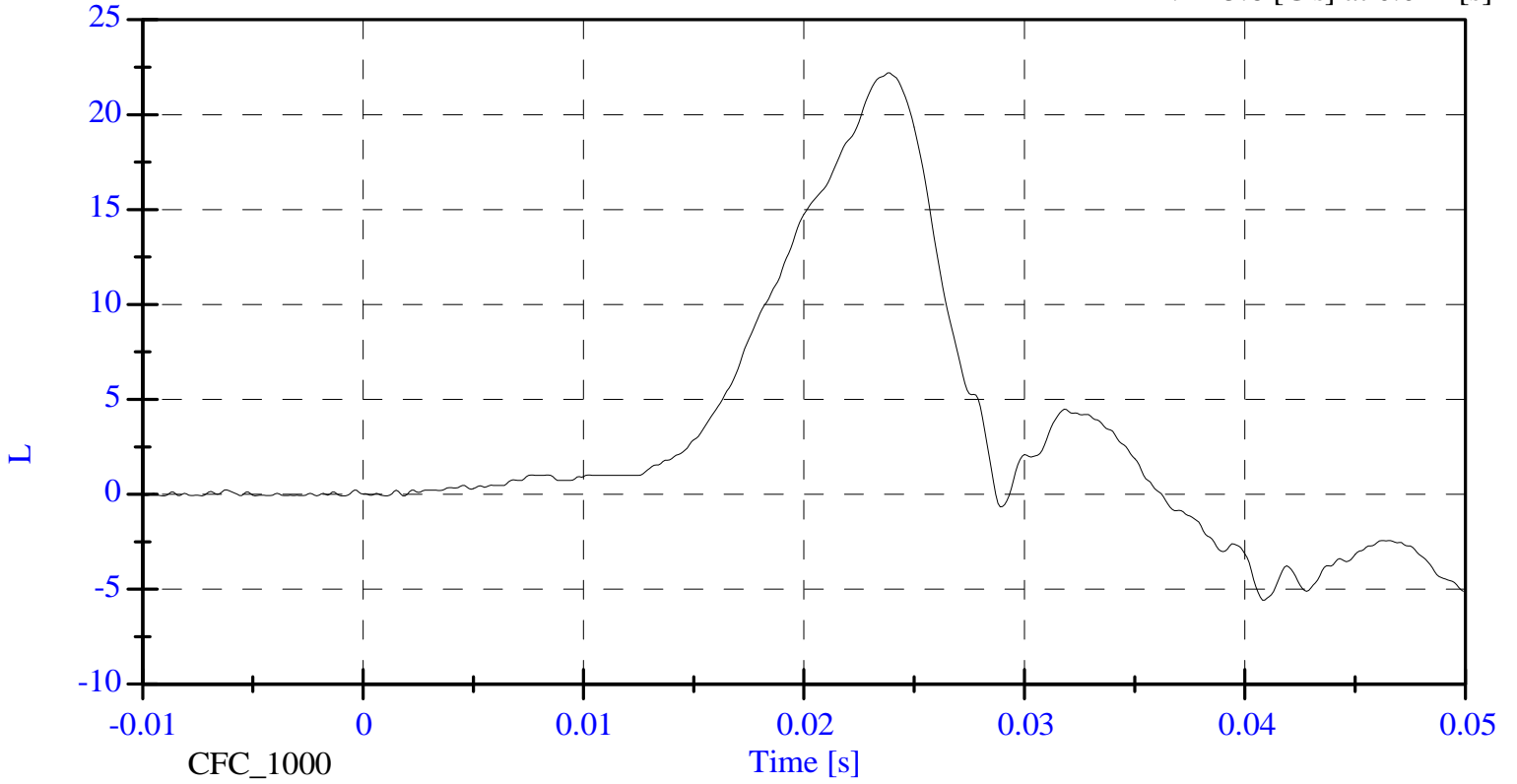


- 04-28-03

Max: 22.2 [G's] at 0.024 [s]

Min: -5.6 [G's] at 0.041 [s]

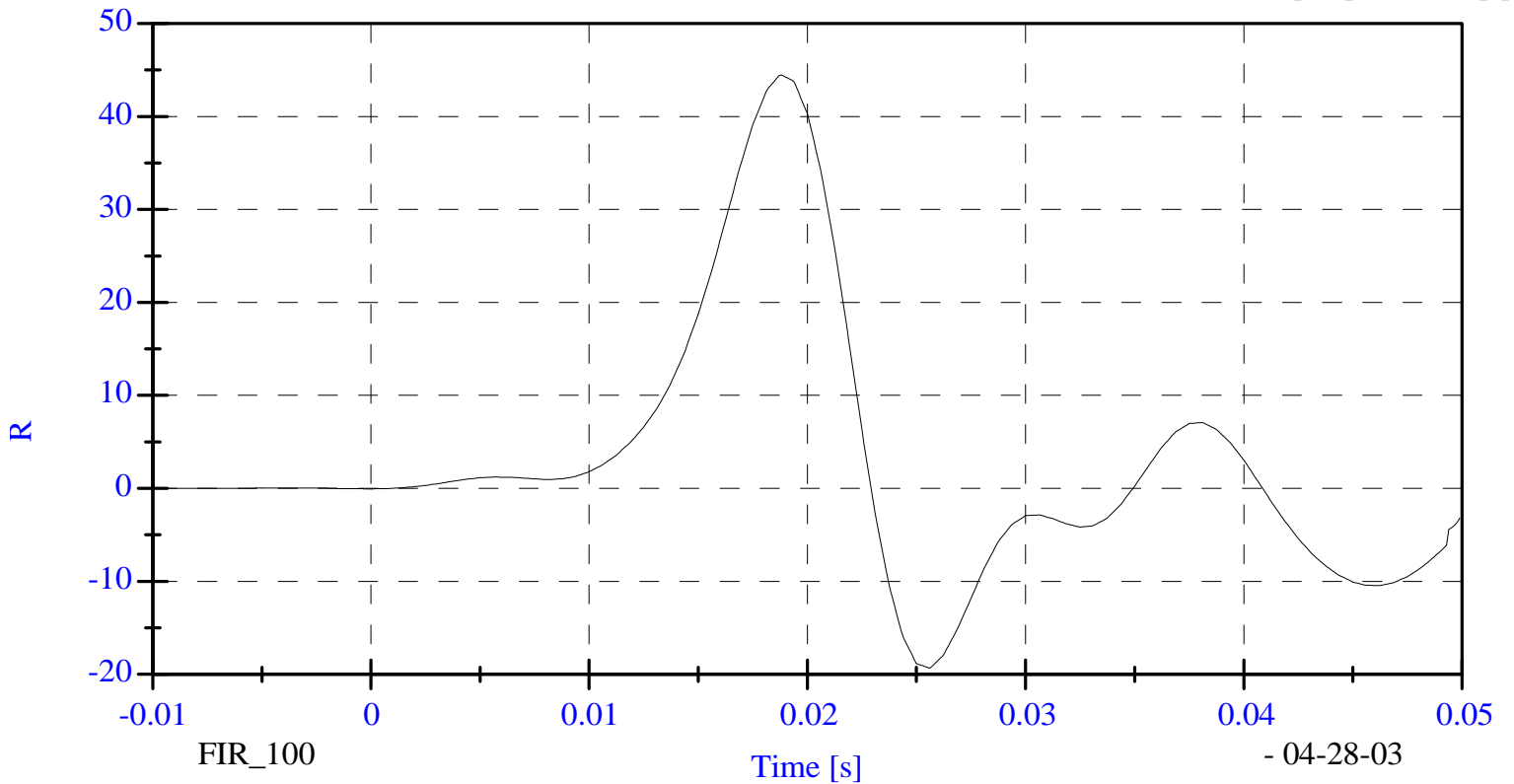
Lower Spine Y Acceleration



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

Min: -19.3 [G's] at 0.026 [s]

Upper Rib Y Acceleration

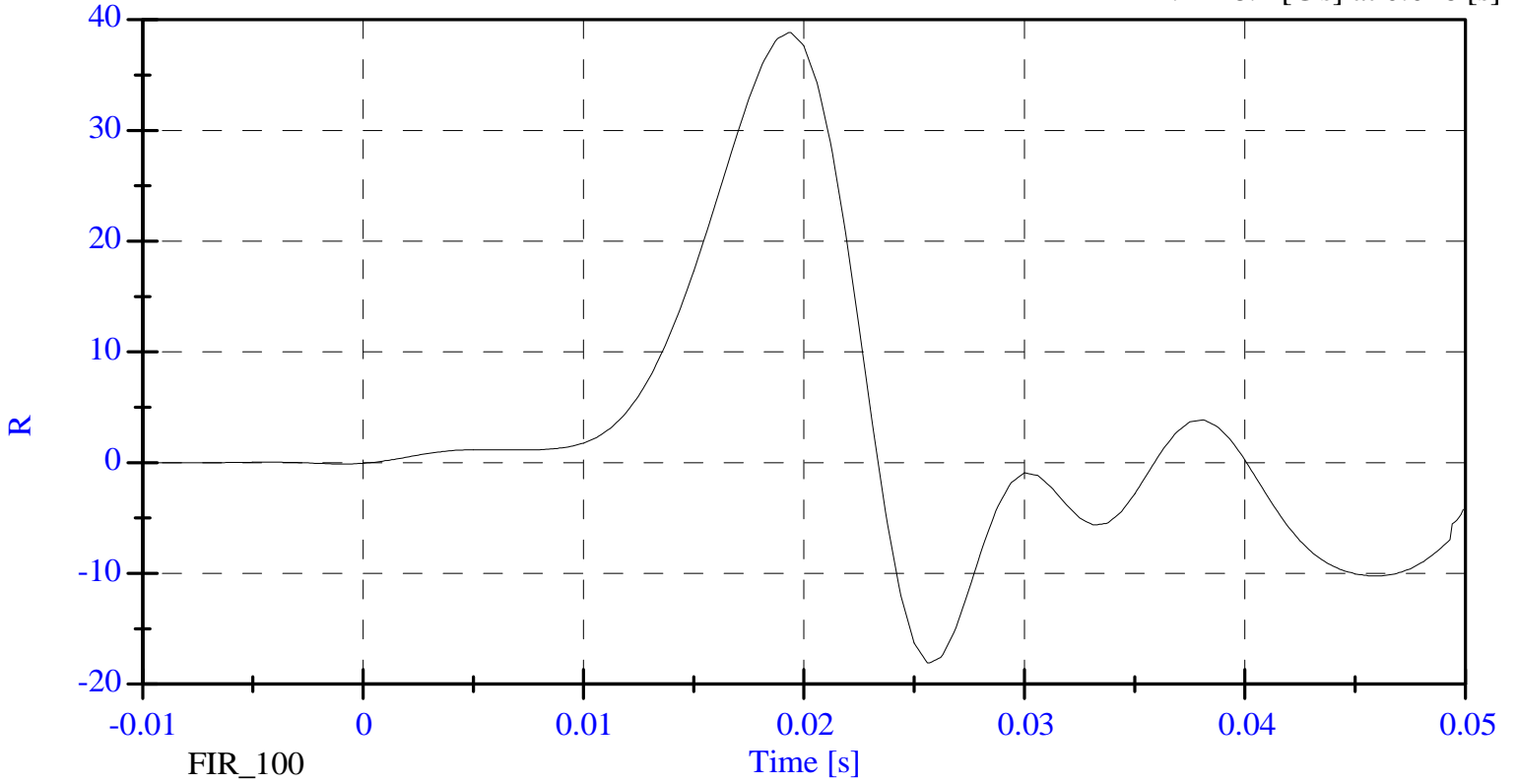


- 04-28-03

Max: 38.9 [G's] at 0.019 [s]

Min: -18.1 [G's] at 0.026 [s]

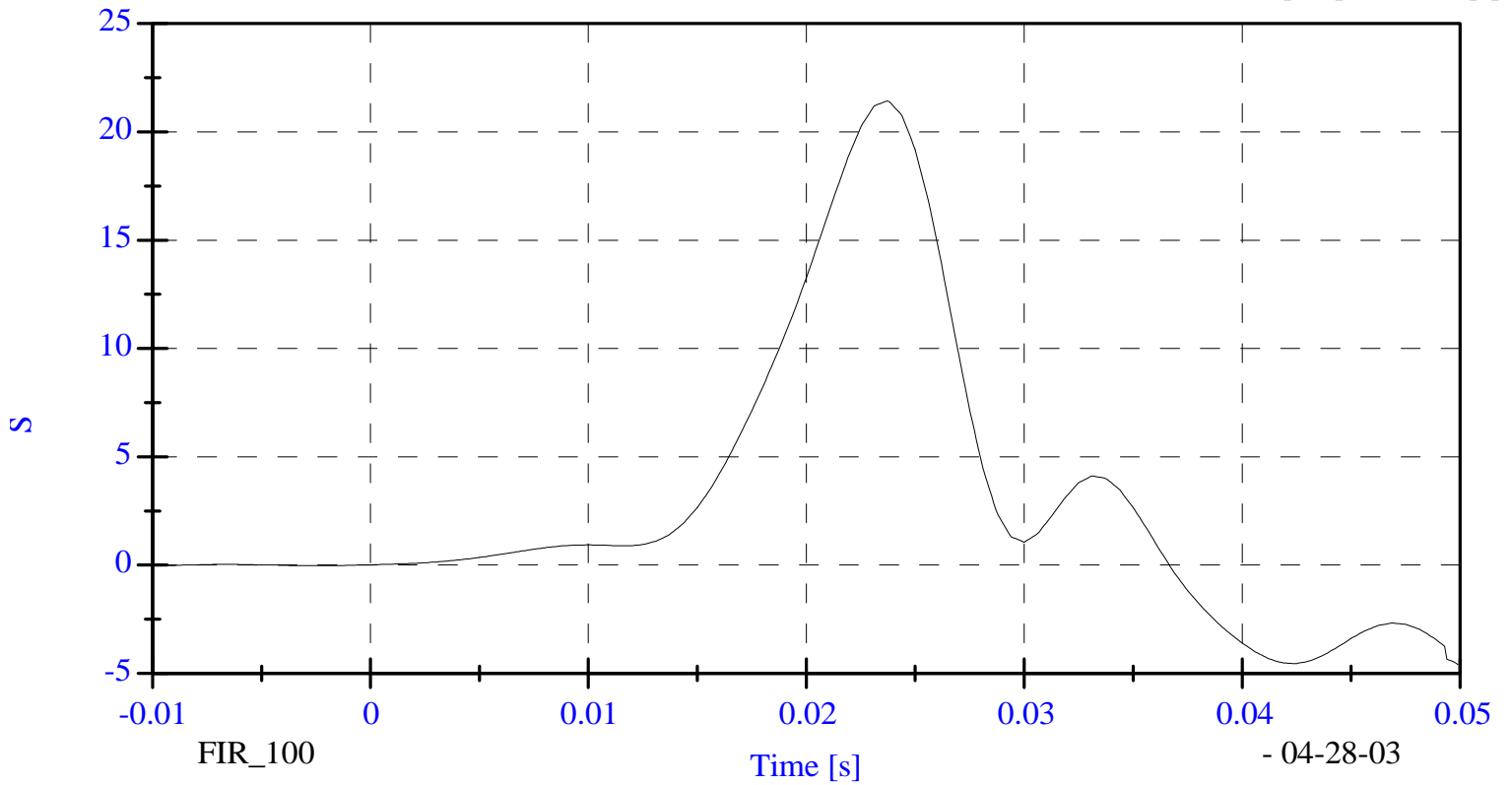
Lower Rib Y Acceleration



Max: 21.4 [G's] at 0.024 [s]

Min: -4.6 [G's] at 0.050 [s]

Lower Spine Y Acceleration



**LATERAL PELVIS IMPACT TEST  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: April 28, 2003 Laboratory Technician: B. Swiecicki

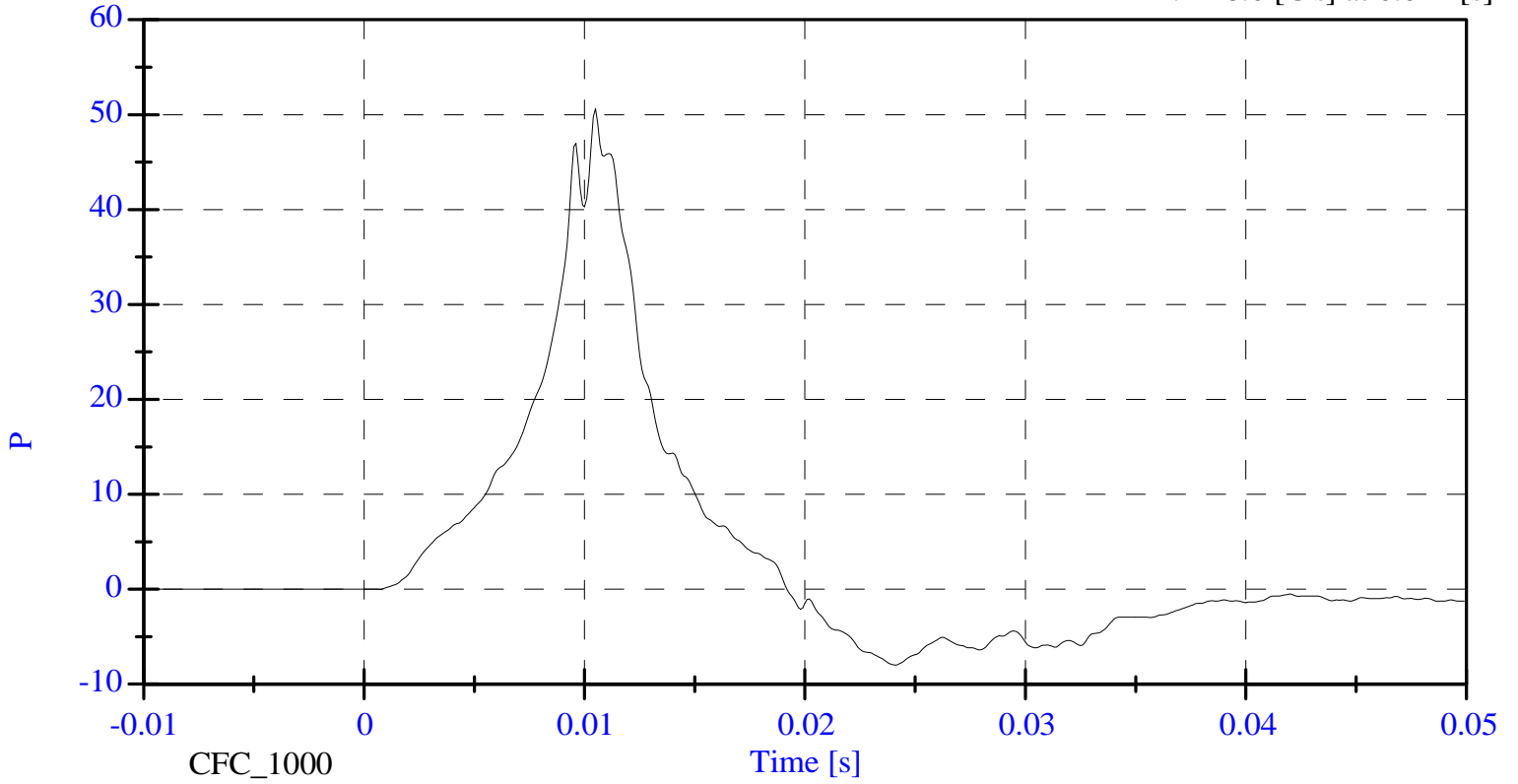
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	31.0
PROBE SPEED (m/s)	4.27 - 4.33	4.30
PELVIS ACCELERATION (g's)	40 - 60	41.28

**REMARKS:** None

Max: 50.7 [G's] at 0.011 [s]

Min: -8.0 [G's] at 0.024 [s]

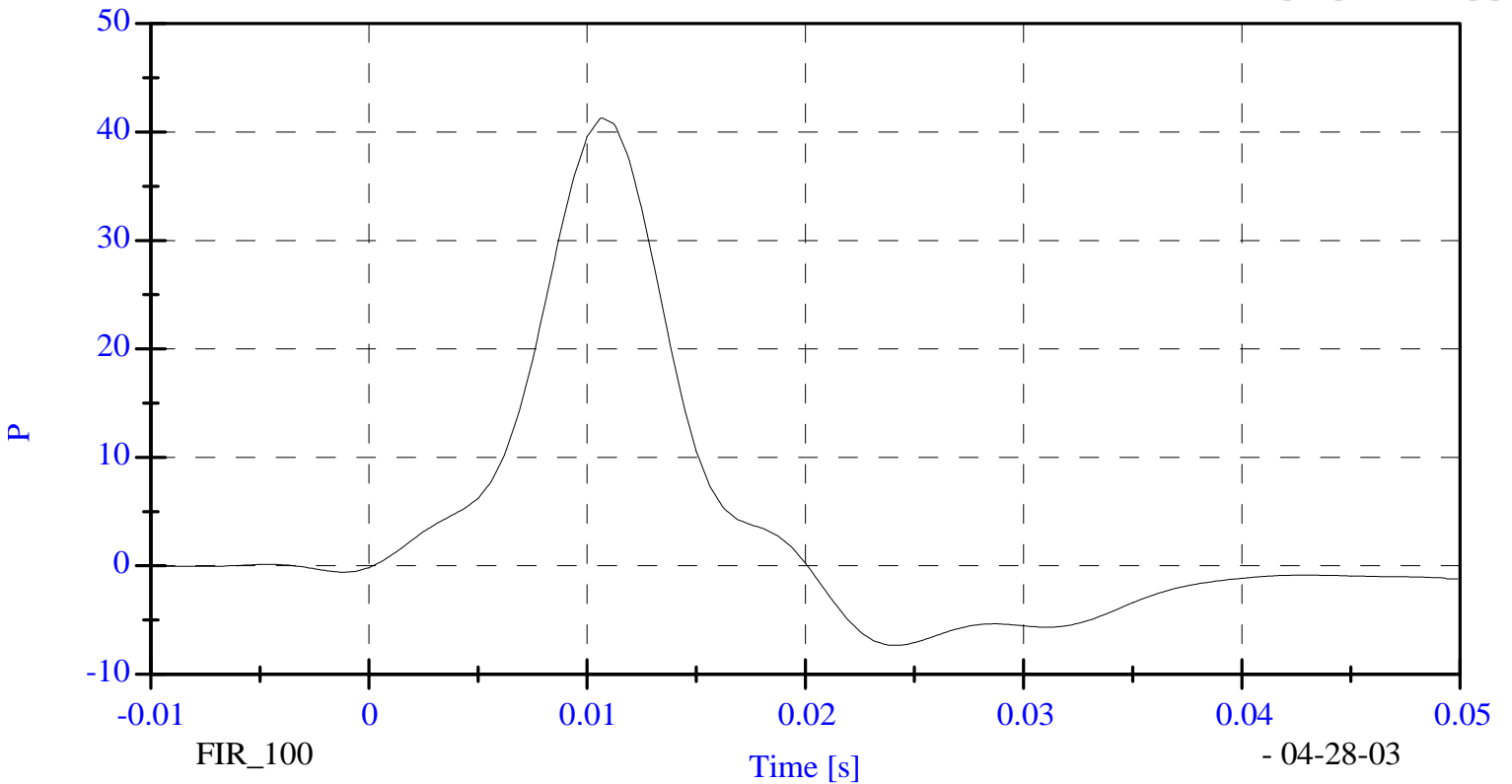
Pelvis Acceleration



Max: 41.3 [G's] at 0.011 [s]

Min: -7.3 [G's] at 0.024 [s]

Pelvis Y Acceleration



**HEAD DROP TEST  
PRE-TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 016 Sequential Test Number: 1  
Date: April 23, 2003 Laboratory Technician: B. Swiecicki

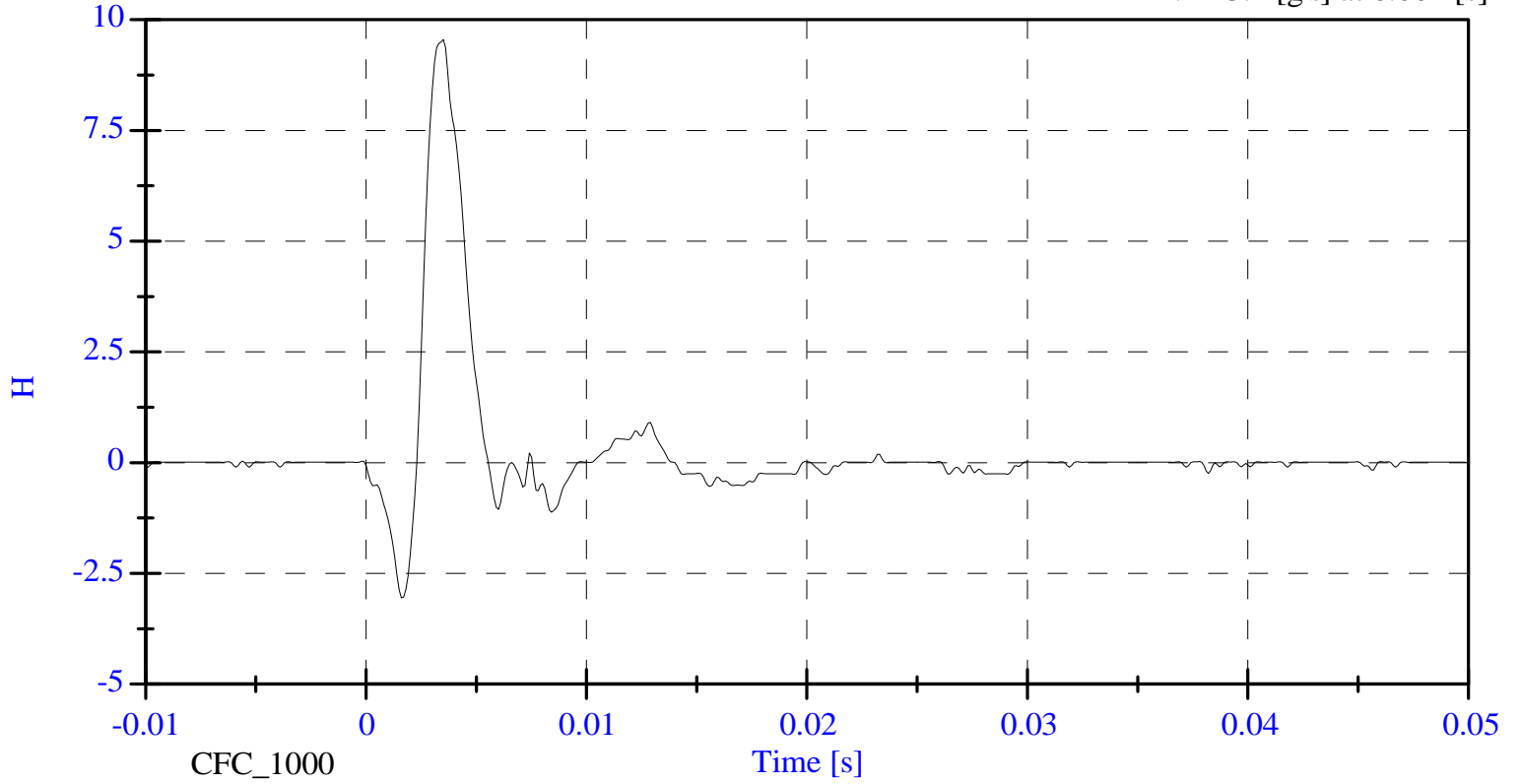
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 – 22.2	21.1
RELATIVE HUMIDITY (%)	10 – 70	38.0
PEAK RESULTANT ACCELERATION (Gs)	120 – 150	139.37
PEAK LATERAL ACCELERATION (Gs)	Not to Exceed 15	9.55
CURVE PERCENT NONMODAL (%)	< 15	2.46

**REMARKS:** None

Max: 9.6 [g's] at 0.004 [s]

Min: -3.1 [g's] at 0.002 [s]

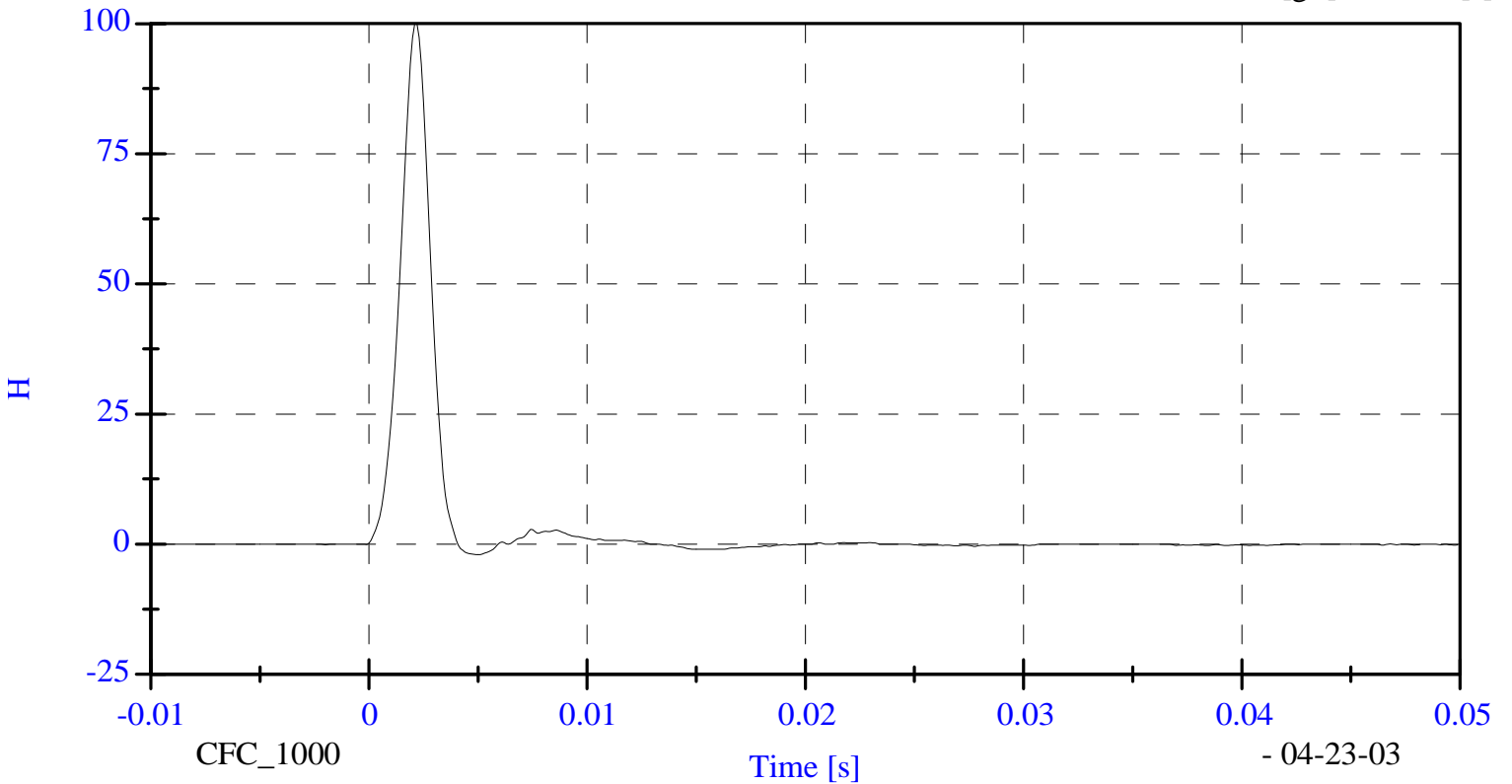
Head X Acceleration



Max: 100.0 [g's] at 0.002 [s]

Min: -2.0 [g's] at 0.005 [s]

Head Y Acceleration

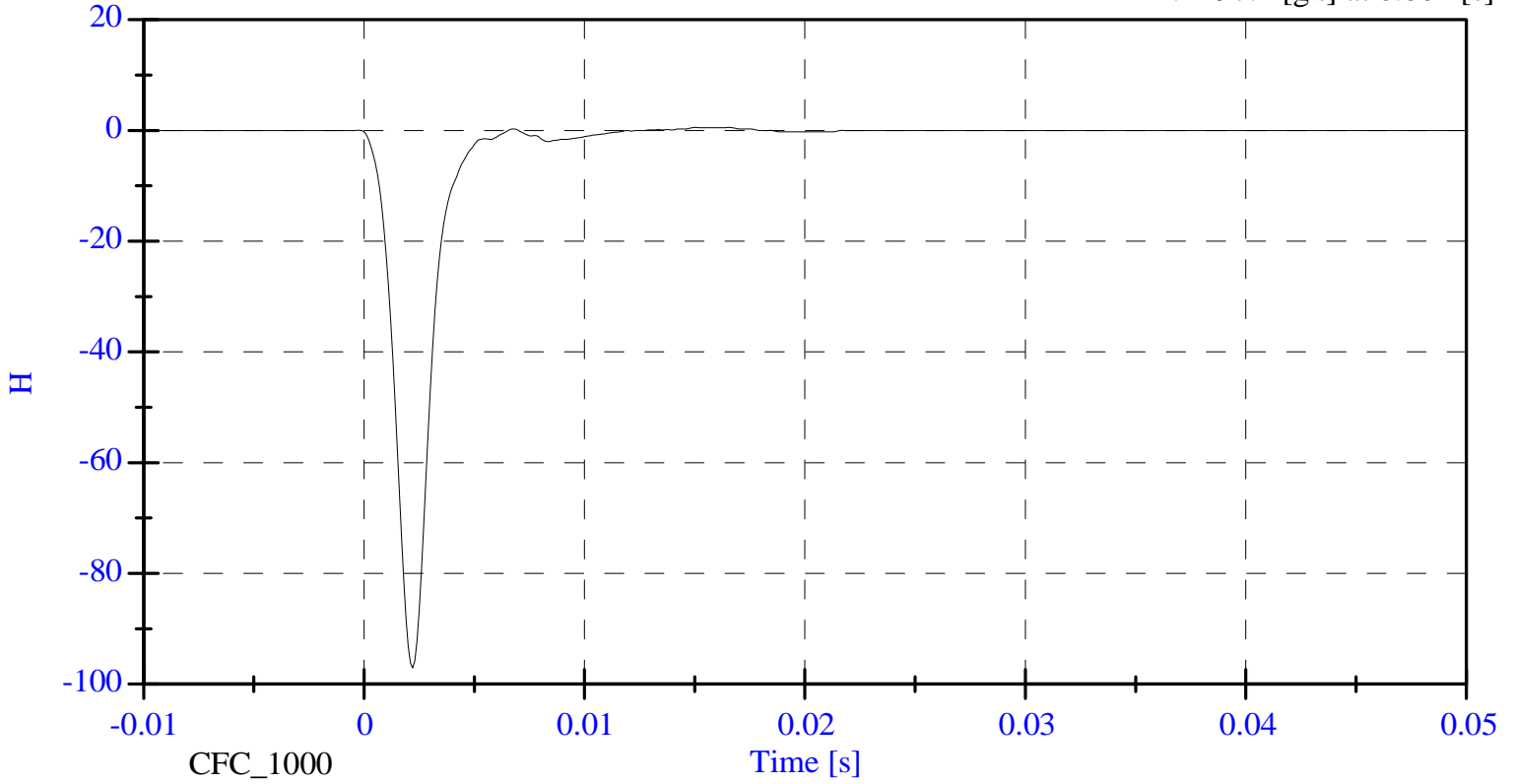


- 04-23-03

Max: 0.5 [g's] at 0.015 [s]

Min: -97.1 [g's] at 0.002 [s]

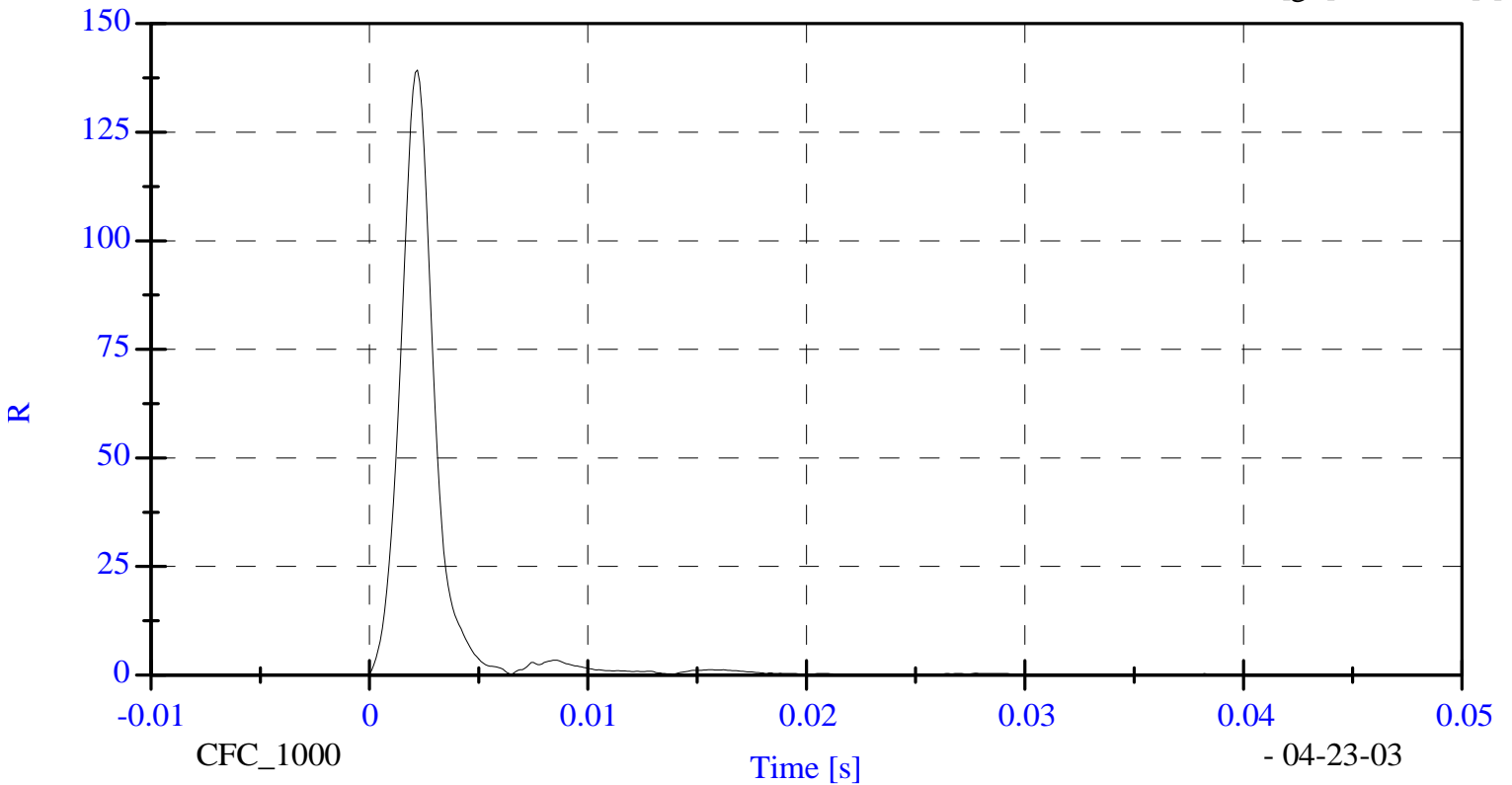
Head Z Acceleration



Max: 139.4 [g's] at 0.002 [s]

Min: 0.0 [g's] at -0.006 [s]

Head Resultant



- 04-23-03

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

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 016 Sequential Test Number: 1  
 Date: April 24, 2003 Laboratory Technician: B. Swiecicki

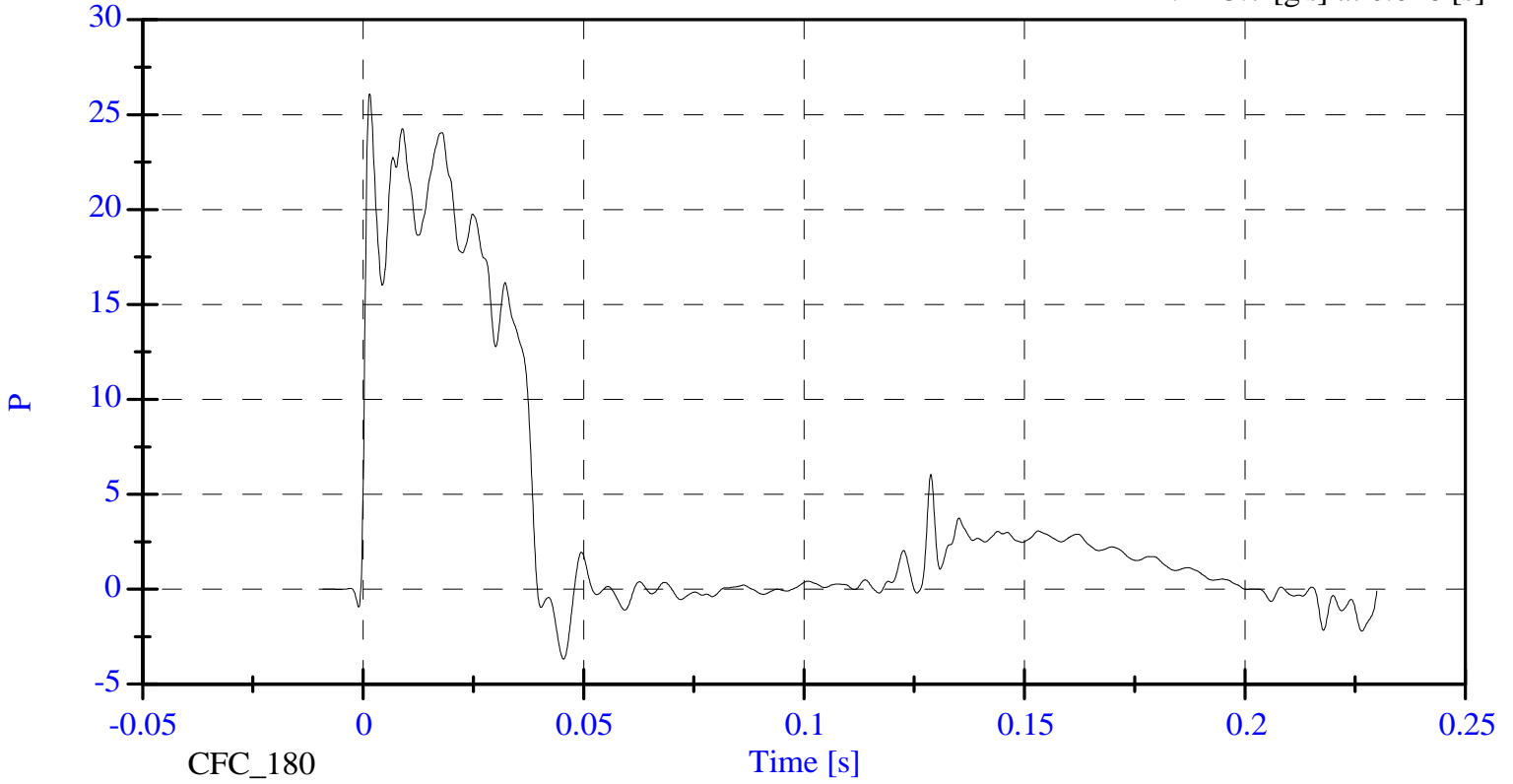
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 - 22.2	21.1
RELATIVE HUMIDITY (%)	10 - 70	33.0
IMPACT VELOCITY (m/s)	6.89 - 7.13	6.93
PENDULUM DELTA V		
DELTA V @ 10 ms (m/s)	1.96 - 2.55	2.04
DELTA V @ 20 ms (m/s)	4.12 - 5.10	4.15
DELTA V @ 30 ms (m/s)	5.73 - 7.01	5.90
DELTA V @ 40-70 ms (m/s)	6.27 - 7.64	7.00
D PLANE ROTATION		
MAXIMUM ROTATION (deg)	64 - 78	72.51
ROT. ANGLE TIME to ZERO (ms)	50 - 70	60.80
MOMENT ABOUT THE OCCIPITAL CONDYLE		
MAX OCCIPITAL MOMENT (Nm)	88 - 108	90.22
OCCIPITAL MOMENT DECAY (ms)	40.0 - 60.0	51.50
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT		
ROTATION wrt MOMENT (ms)	0 - 20	10.10

**REMARKS:** None

Max: 26.1 [g's] at 0.002 [s]

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

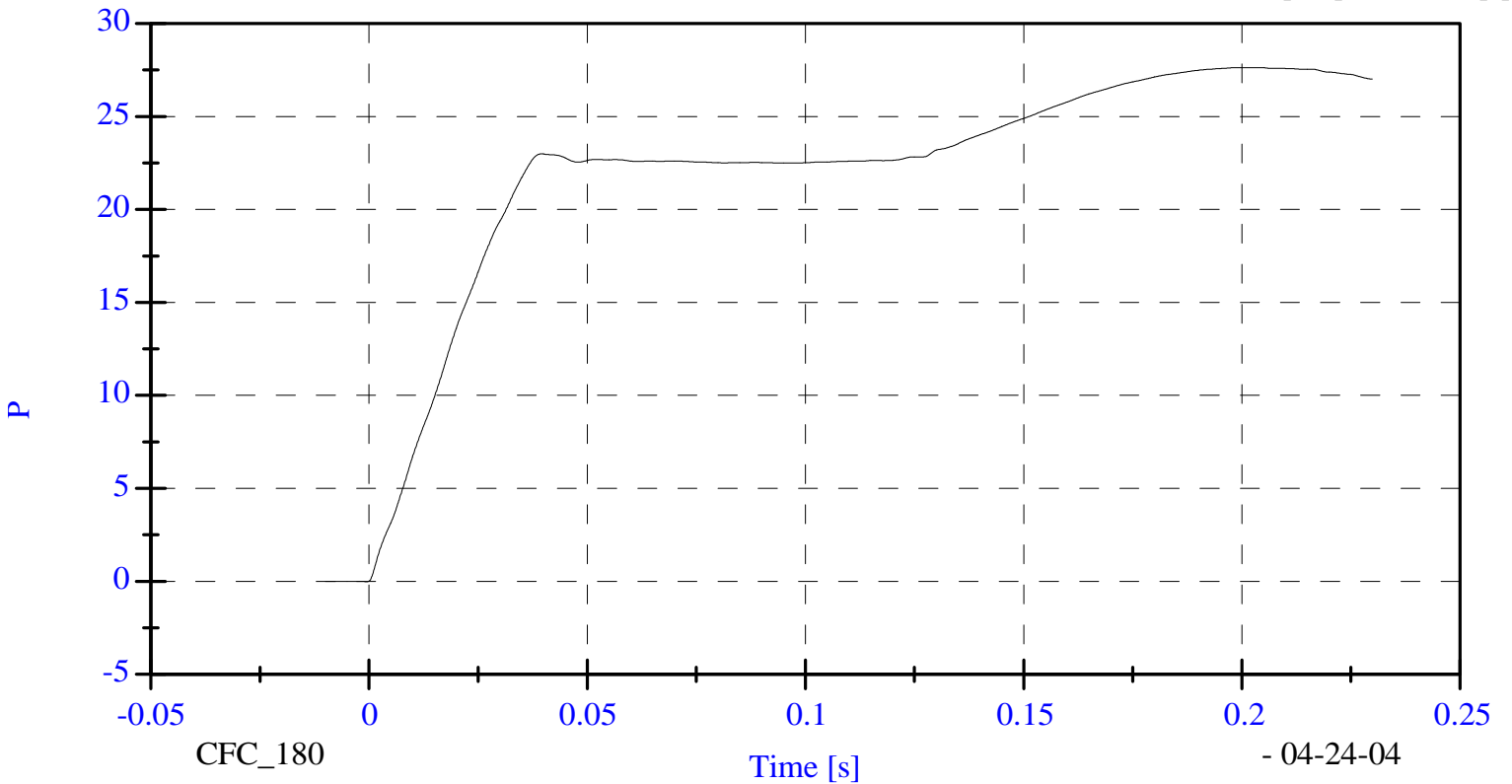
Pendulum Acceleration



Max: 27.6 [ft/s] at 0.203 [s]

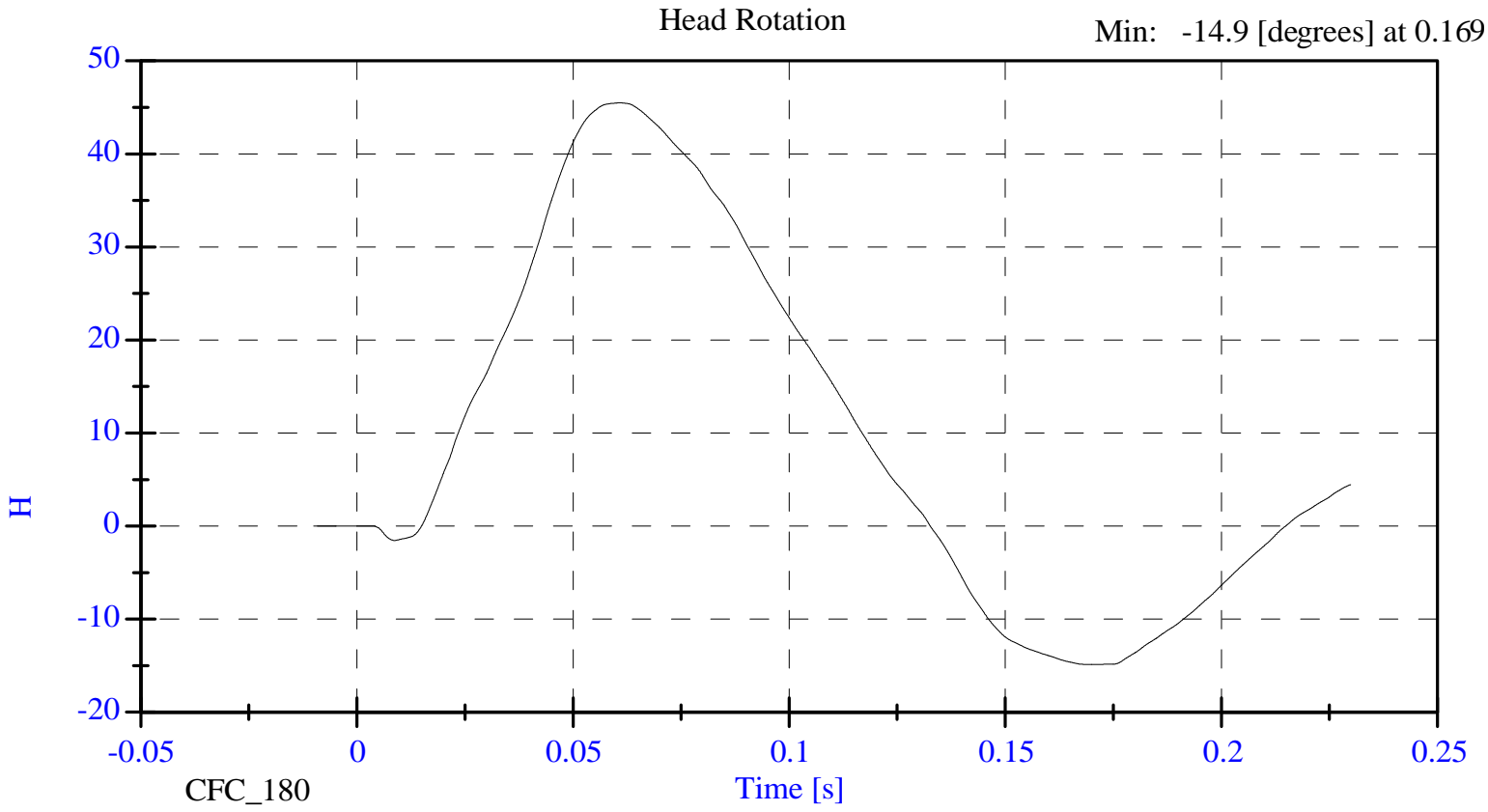
Min: -0.0 [ft/s] at -0.001 [s]

Pendulum Velocity



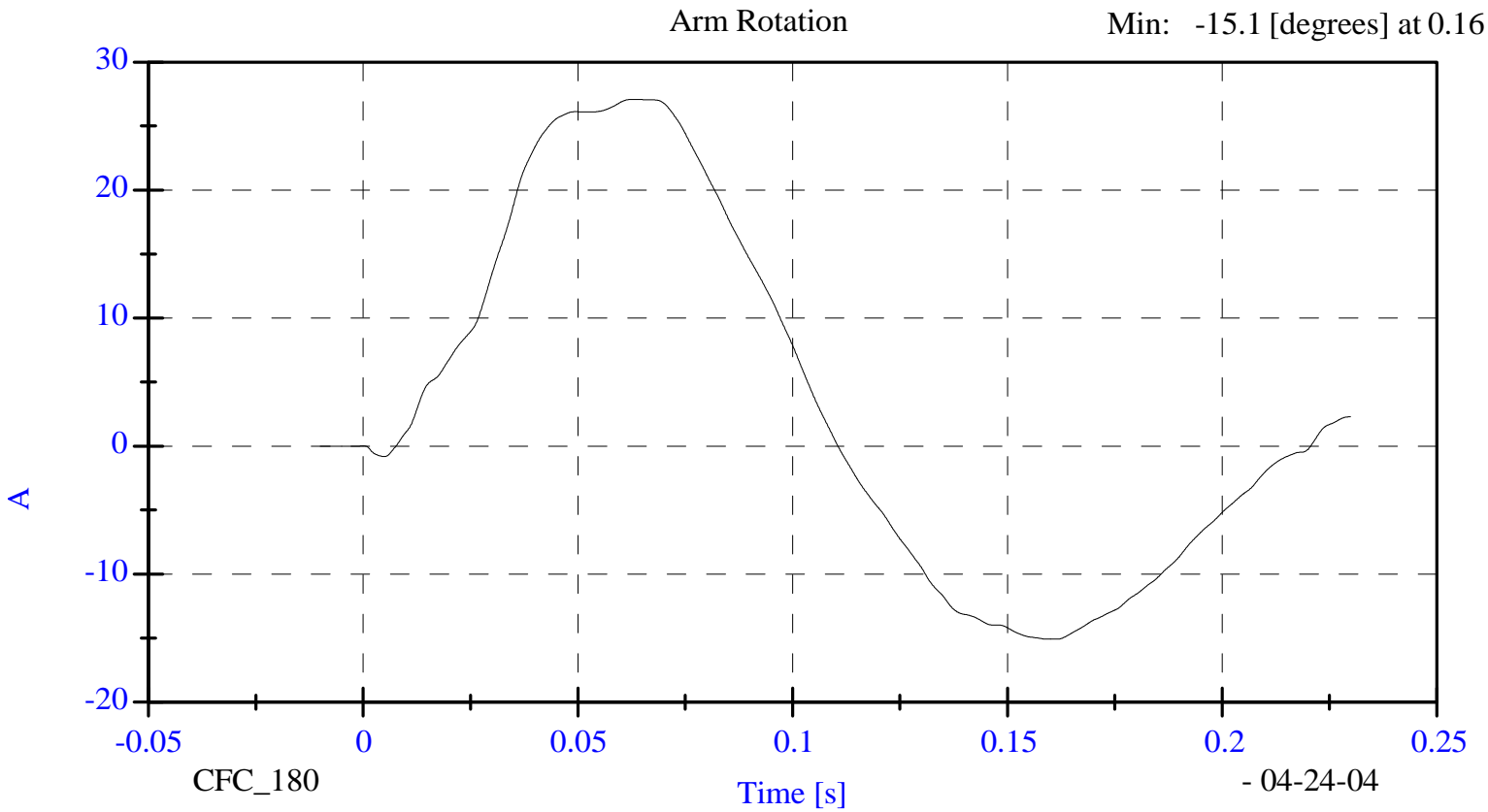
Max: 45.5 [degrees] at 0.061

Min: -14.9 [degrees] at 0.169



Max: 27.1 [degrees] at 0.062

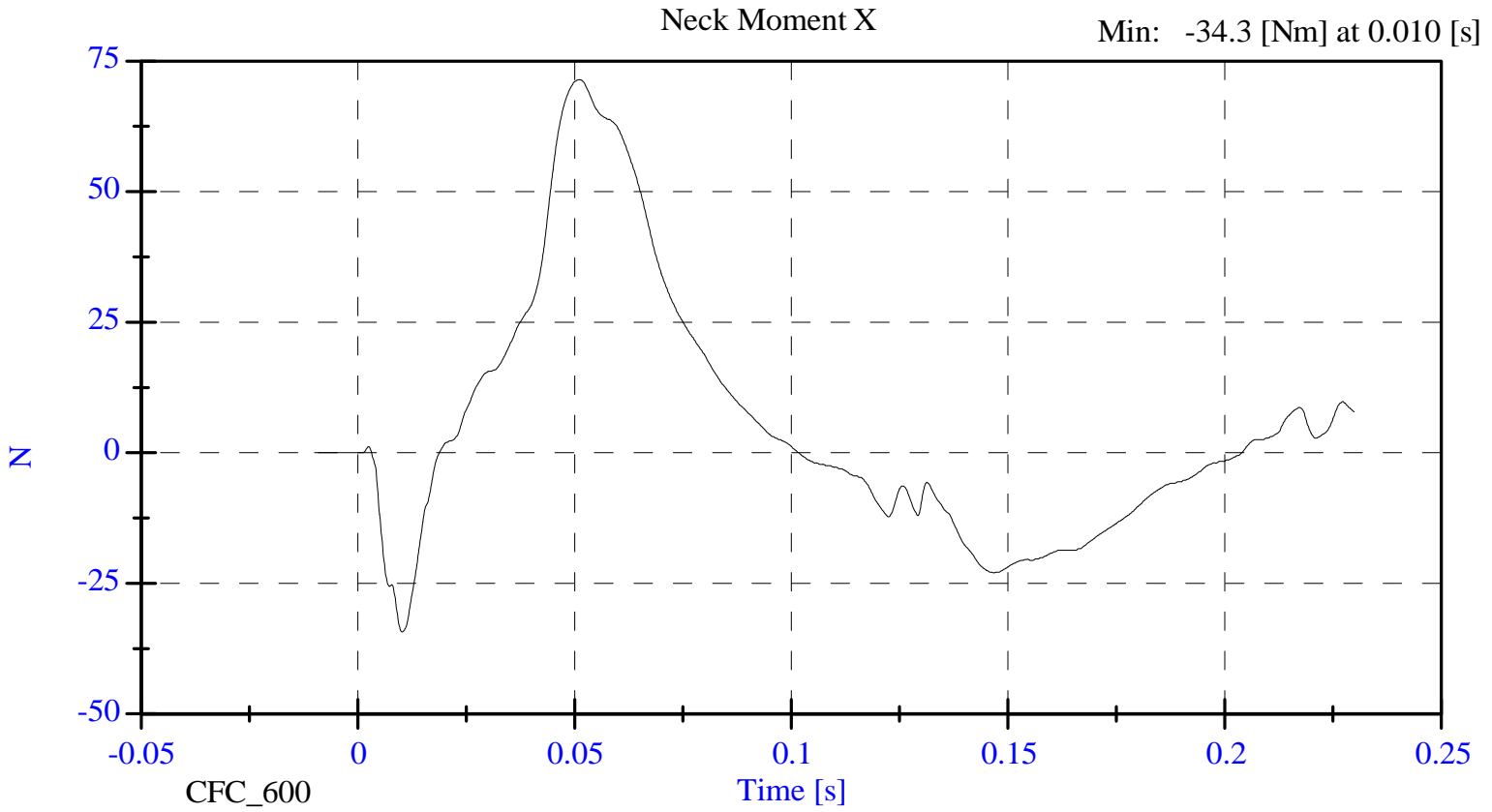
Min: -15.1 [degrees] at 0.161



- 04-24-04

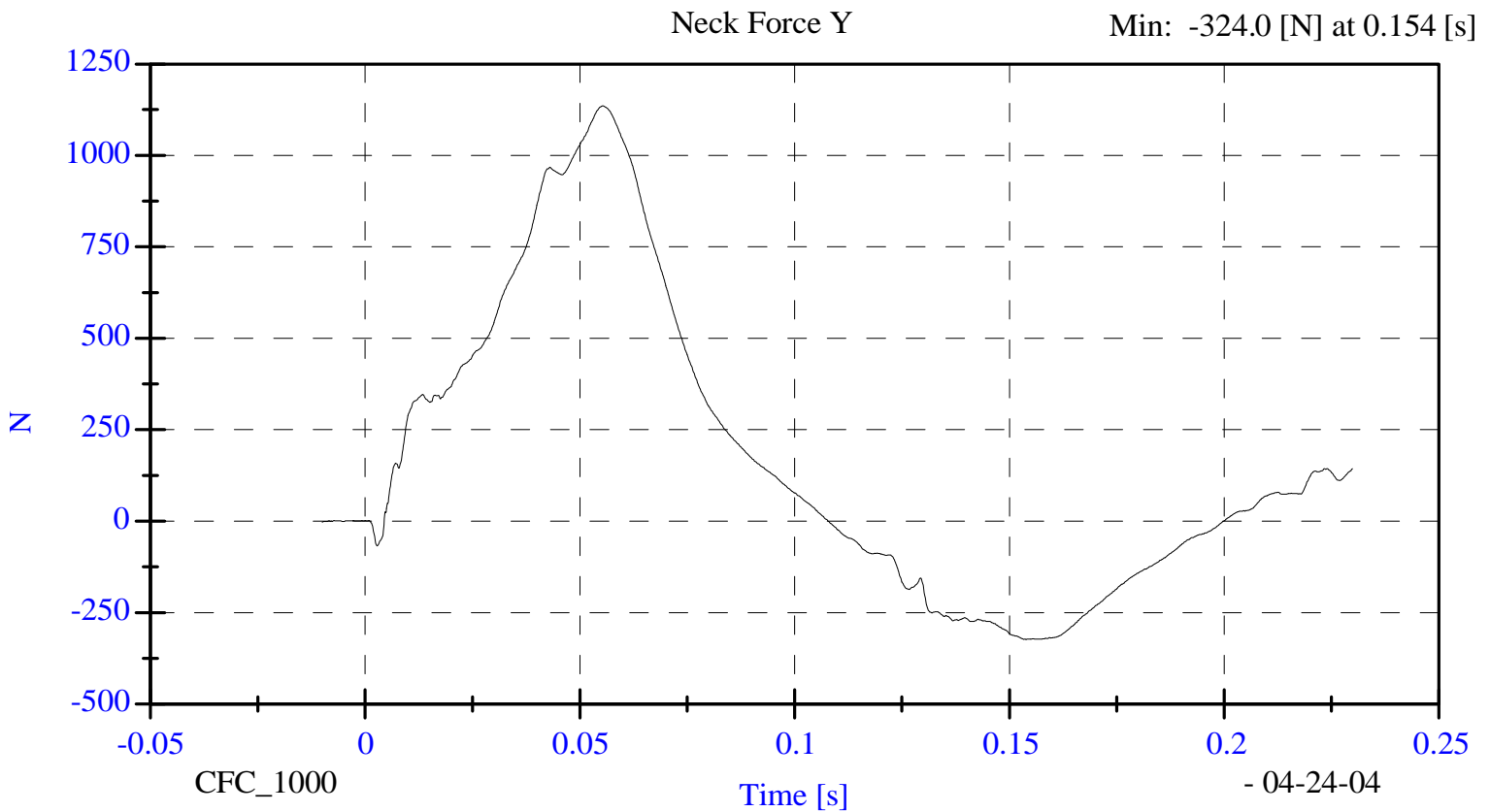
Max: 71.4 [Nm] at 0.051 [s]

Min: -34.3 [Nm] at 0.010 [s]



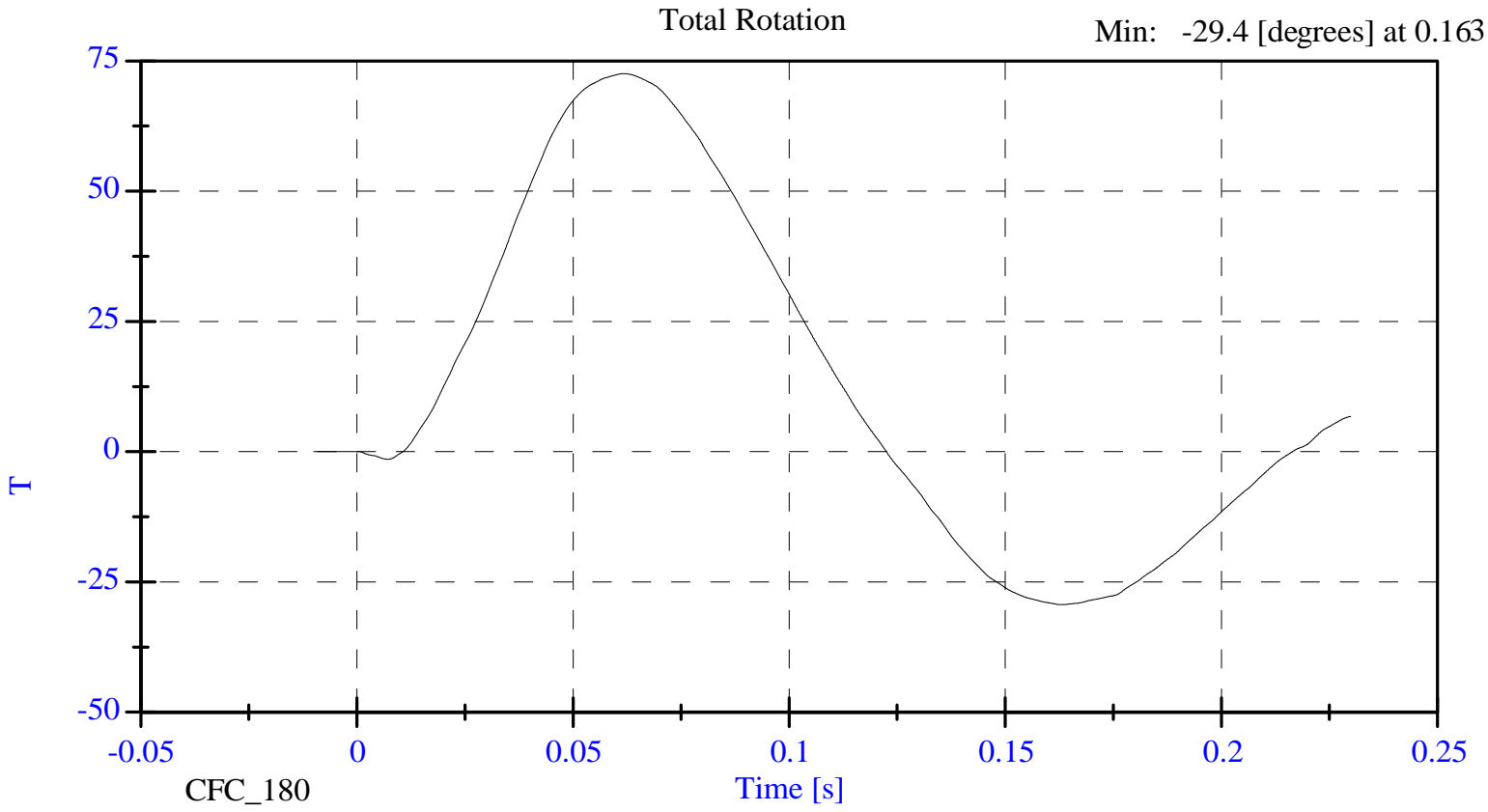
Max: 1135.4 [N] at 0.055 [s]

Min: -324.0 [N] at 0.154 [s]



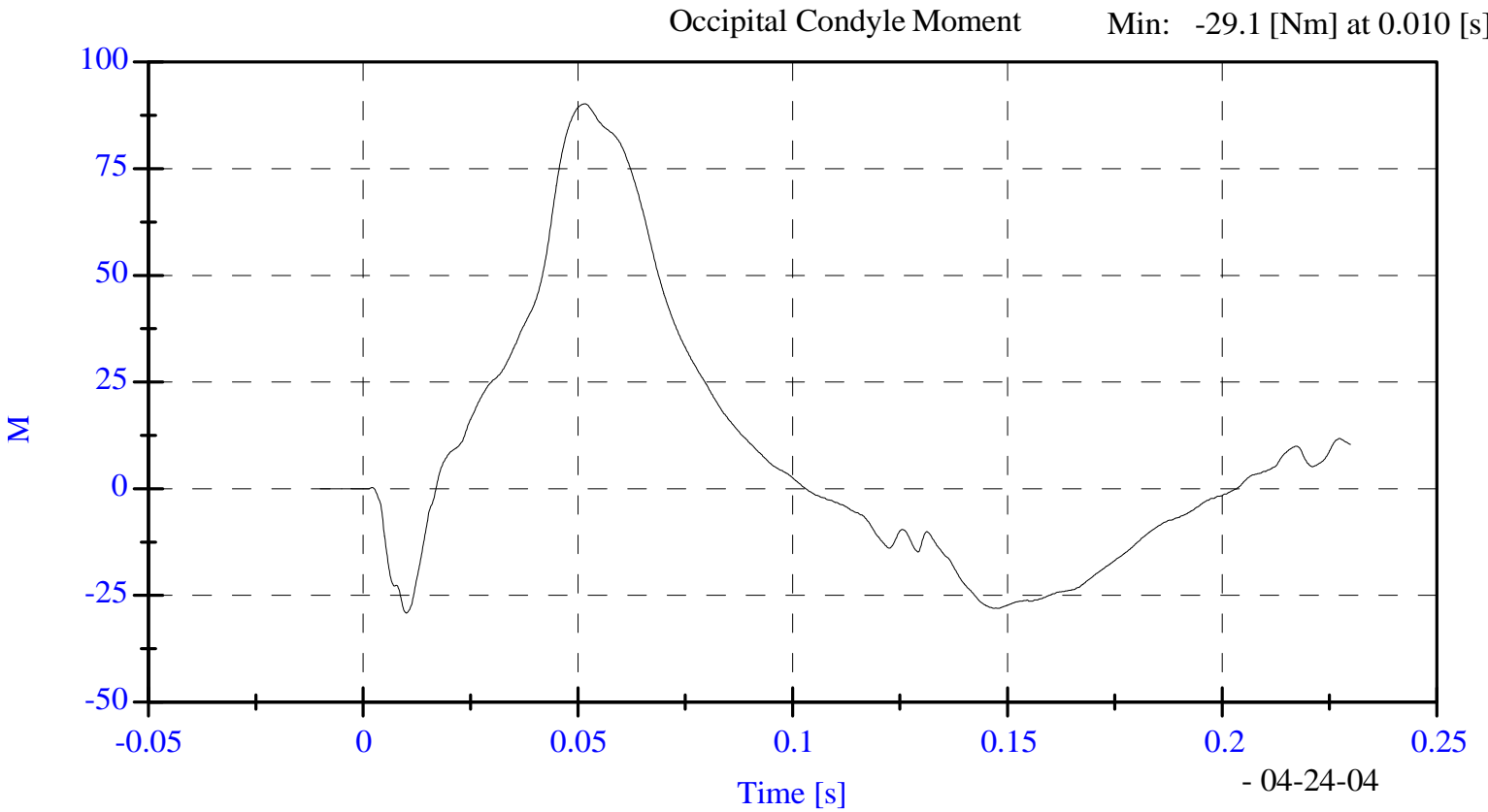
Max: 72.5 [degrees] at 0.062

Min: -29.4 [degrees] at 0.163



Max: 90.2 [Nm] at 0.052 [s]

Min: -29.1 [Nm] at 0.010 [s]



**ABDOMINAL COMPRESSION TEST  
PRE-TEST**

(Test not required for SID certification)

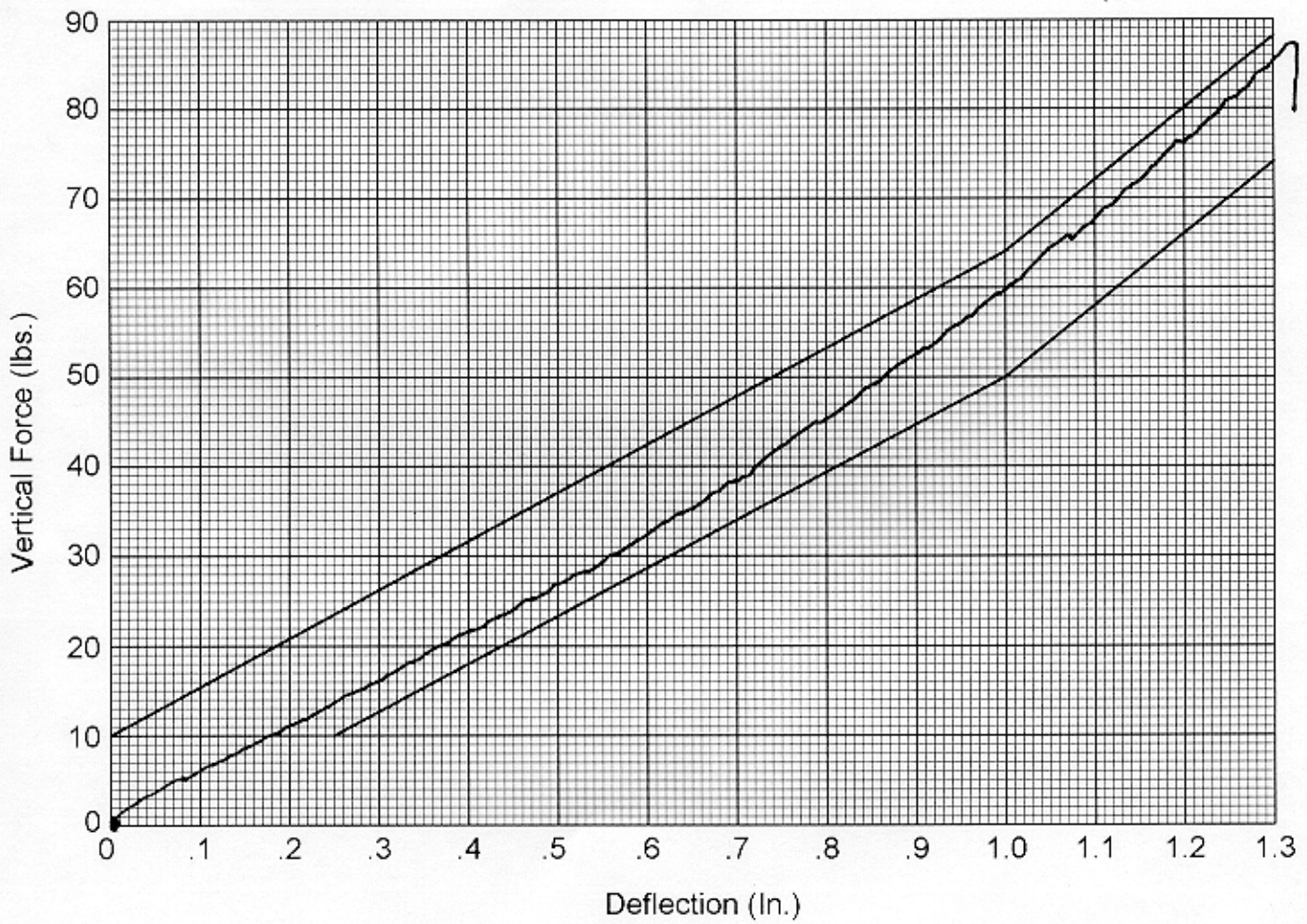
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: April 28, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	35.0
FORCE @ 13 mm (N)	104 - 162	120.1
FORCE @ 19 mm (N)	163 - 221	187.7
FORCE @ 25 mm (N)	222 - 280	266.0
FORCE @ 33 mm (N)	325 - 391	379.4

**REMARKS:** None

Dummy S/N 016  
W/A \_\_\_\_\_  
Date 4-28-03  
Performed By [Signature]  
Temp. 70°  
Humidity 35%



**Hybrid II  
Abdomen Static Press**

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

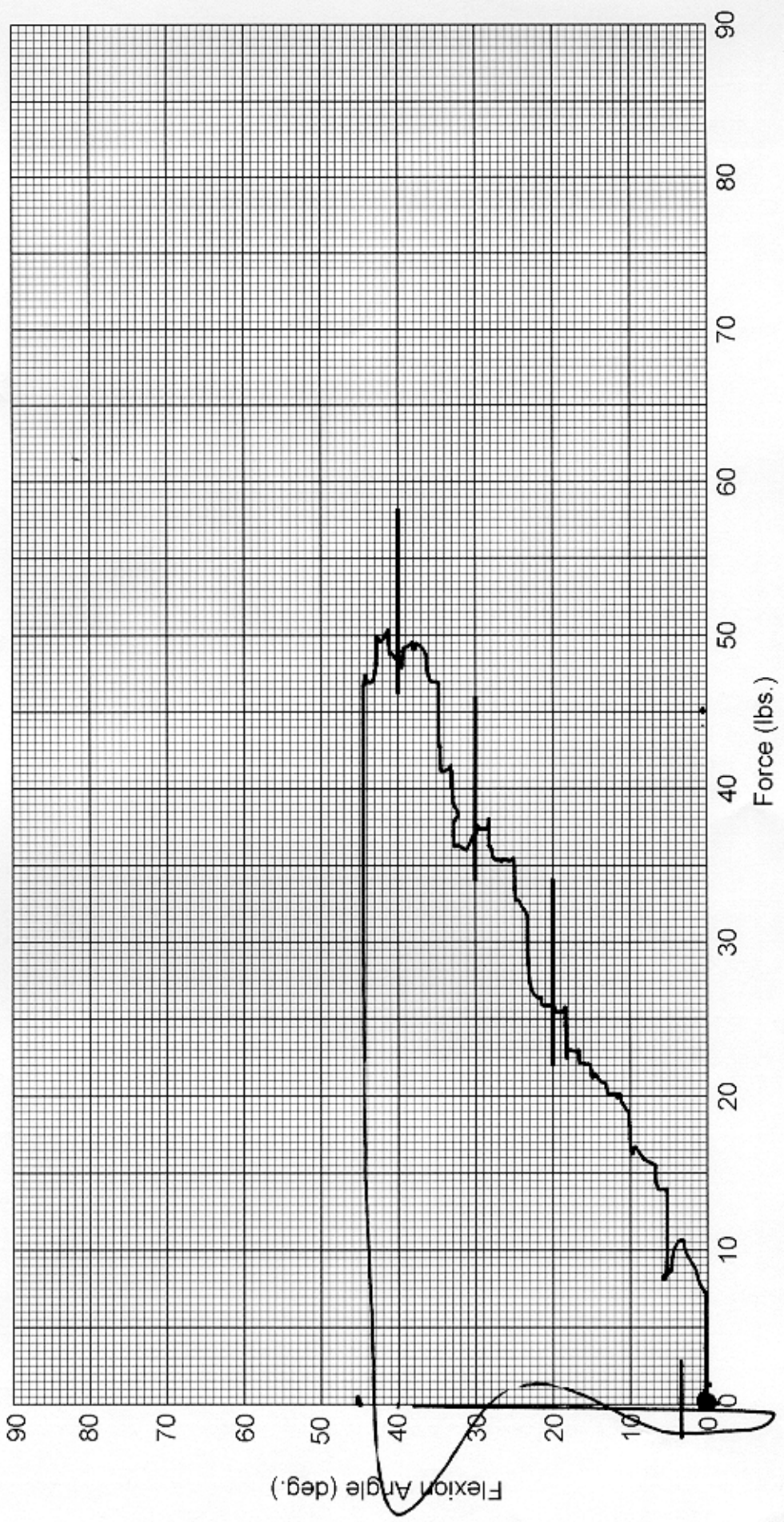
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
 Date: April 28, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	35.0
FORCE @ 0° (N)	0 - 26.7	0.2
FORCE @ 20° (N)	97.8 - 151.2	114.8
FORCE @ 30° (N)	151.2 - 204.6	164.6
FORCE @ 40° (N)	204.6 - 258	210.2
RETURN ANGLE	12° max.	3.4°

**REMARKS:** None

Dummy S/N 016  
W/A \_\_\_\_\_  
Date 4-28-03  
Performed By [Signature]  
Temp. 70°  
Humidity 35%



Hybrid II Lumbar Spine Flexion Test

**PRE-TEST DUMMY INSPECTION LIST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
 Date: April 28, 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.: 015**

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
Date: May 2, 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.
LATERAL NECK BEND 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.: 015 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	511
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	239
KH- Knee Pivot from Back Line (mm)	511 - 526	521
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	371

**REMARKS:** None

**LATERAL THORAX IMPACT TEST  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

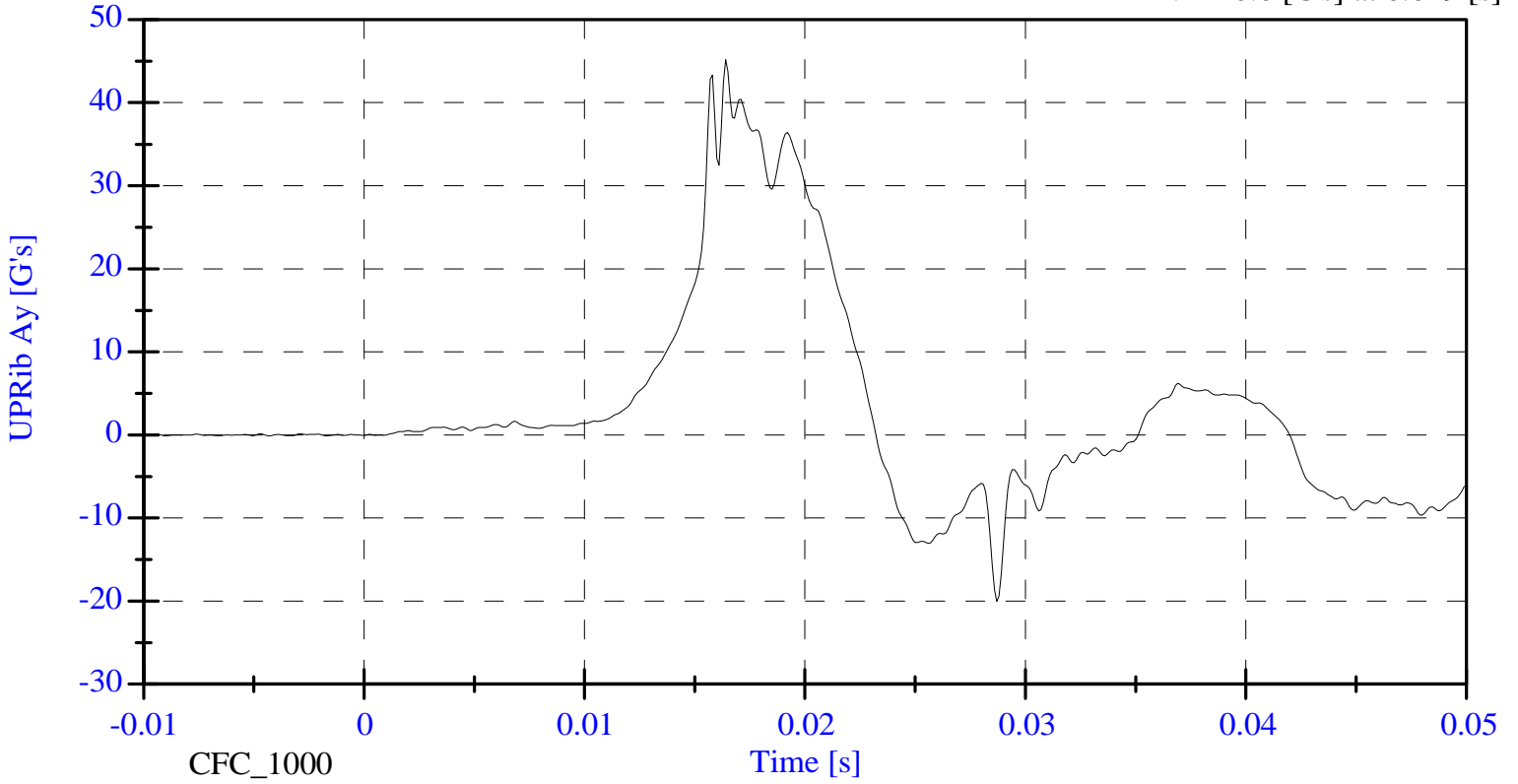
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37.0
PROBE SPEED (m/s)	4.27 - 4.33	4.30
UPPER RIB (g's)	37 - 46	38.69
LOWER RIB (g's)	37 - 46	38.27
LOWER SPINE (g's)	15 - 22	19.60

**REMARKS:** None

Max: 45.2 [G's] at 0.016 [s]

Min: -20.0 [G's] at 0.029 [s]

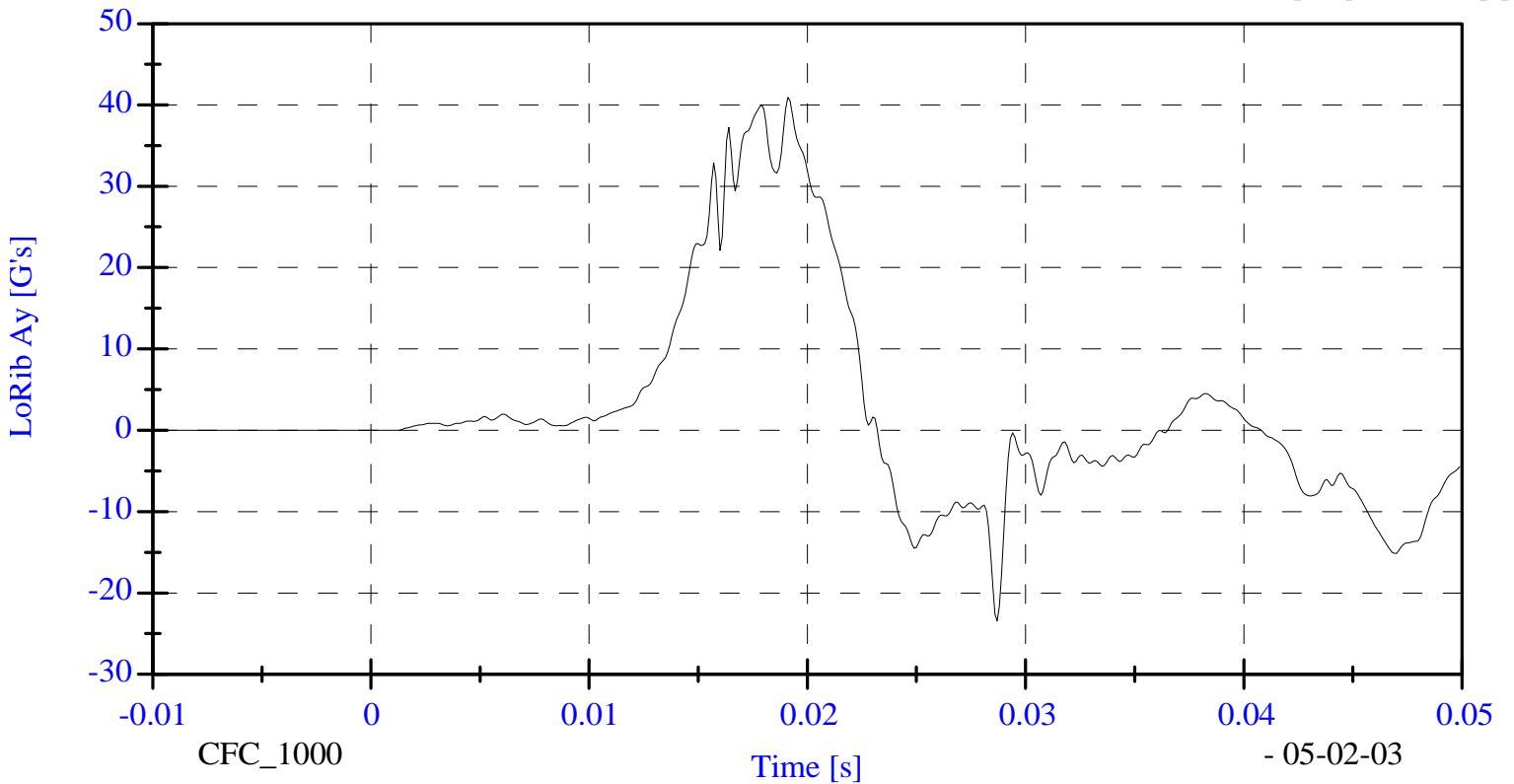
Upper Rib Y Acceleration



Max: 40.9 [G's] at 0.019 [s]

Min: -23.4 [G's] at 0.029 [s]

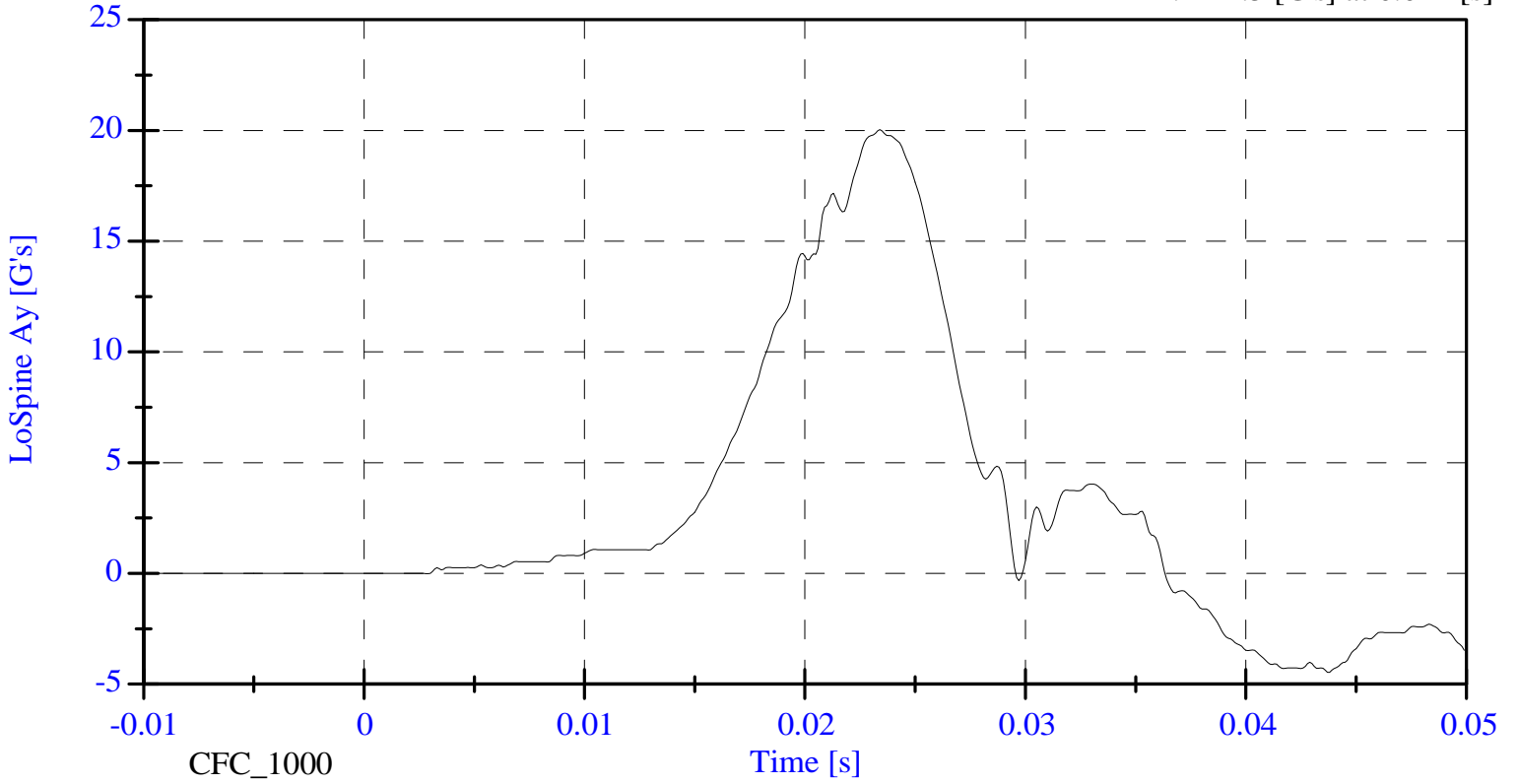
Lower Rib Y Acceleration



Lower Spine Y Acceleration

Max: 20.0 [G's] at 0.023 [s]

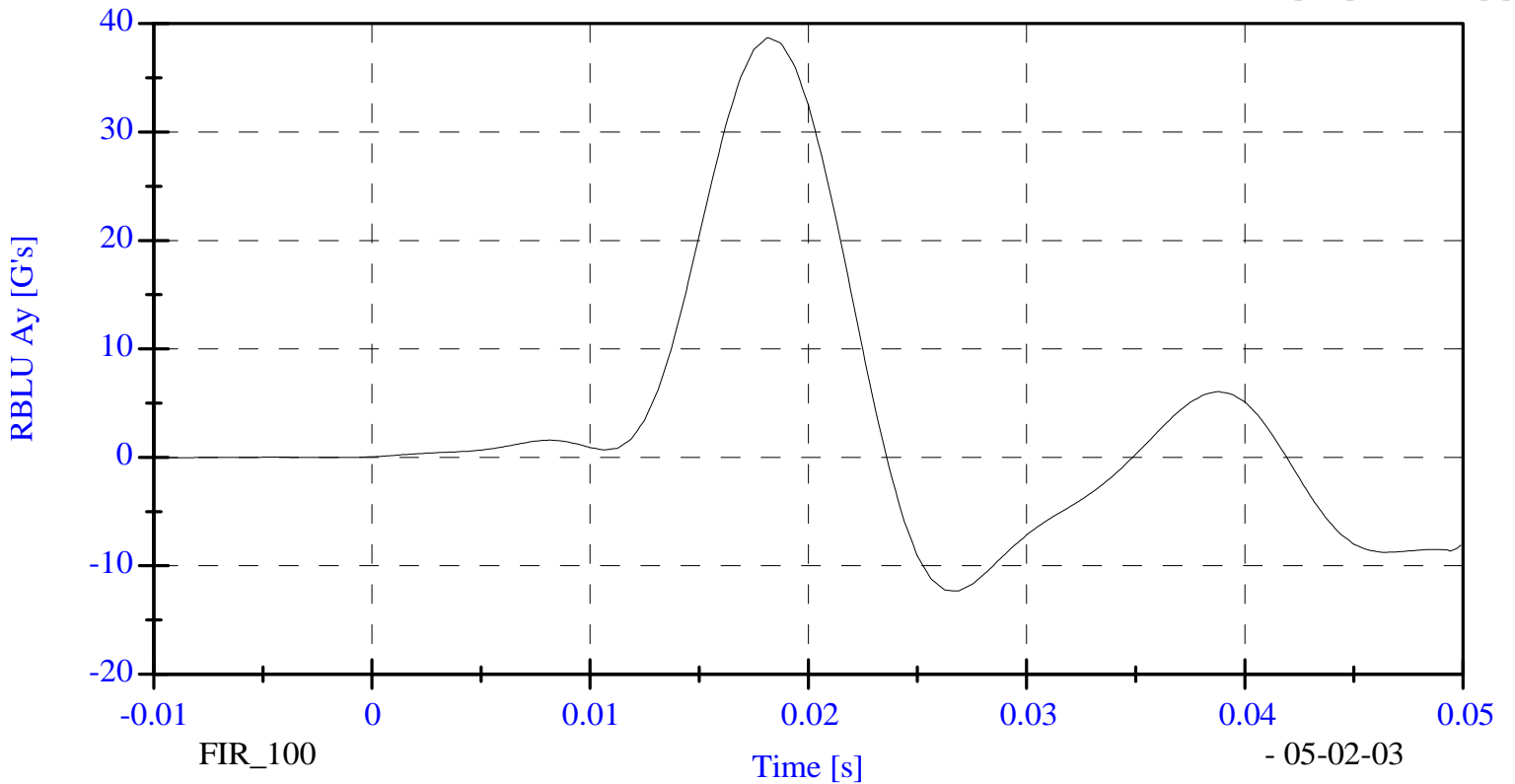
Min: -4.5 [G's] at 0.044 [s]



Upper Rib Y Acceleration

Max: 38.7 [G's] at 0.018 [s]

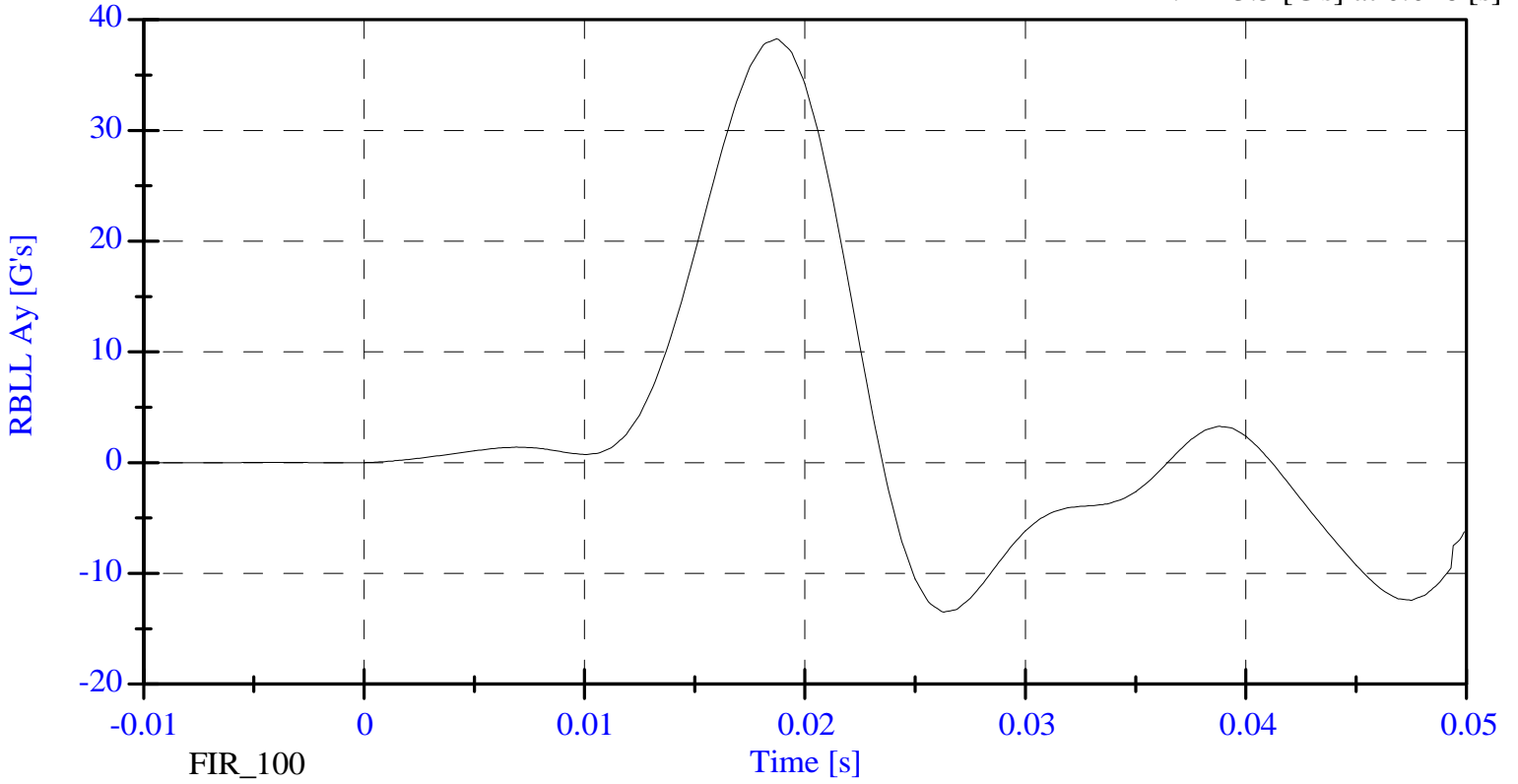
Min: -12.3 [G's] at 0.027 [s]



Max: 38.3 [G's] at 0.019 [s]

Min: -13.5 [G's] at 0.026 [s]

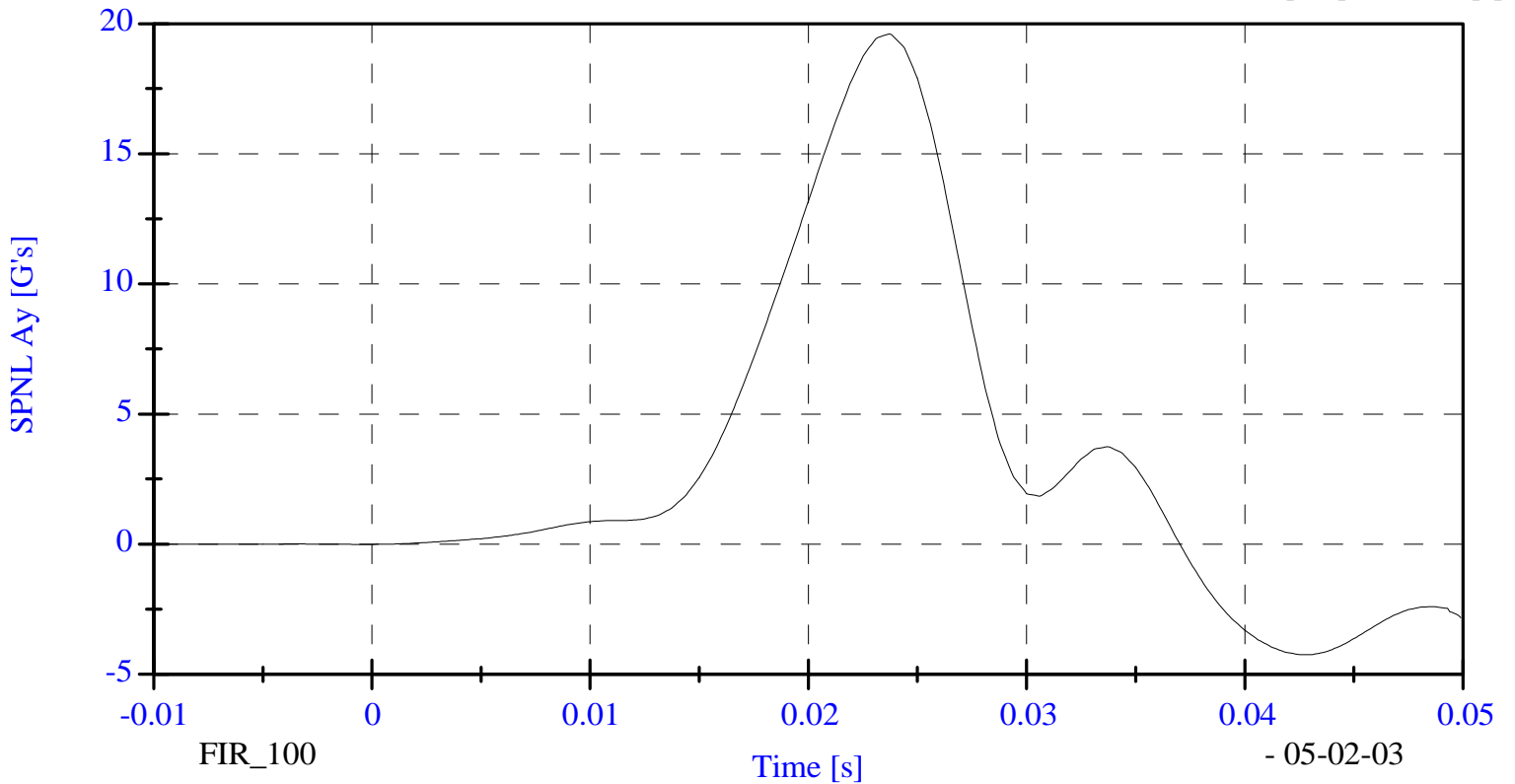
Lower Rib Y Acceleration



Max: 19.6 [G's] at 0.024 [s]

Min: -4.3 [G's] at 0.043 [s]

Lower Spine Y Acceleration



**LATERAL PELVIS IMPACT TEST  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

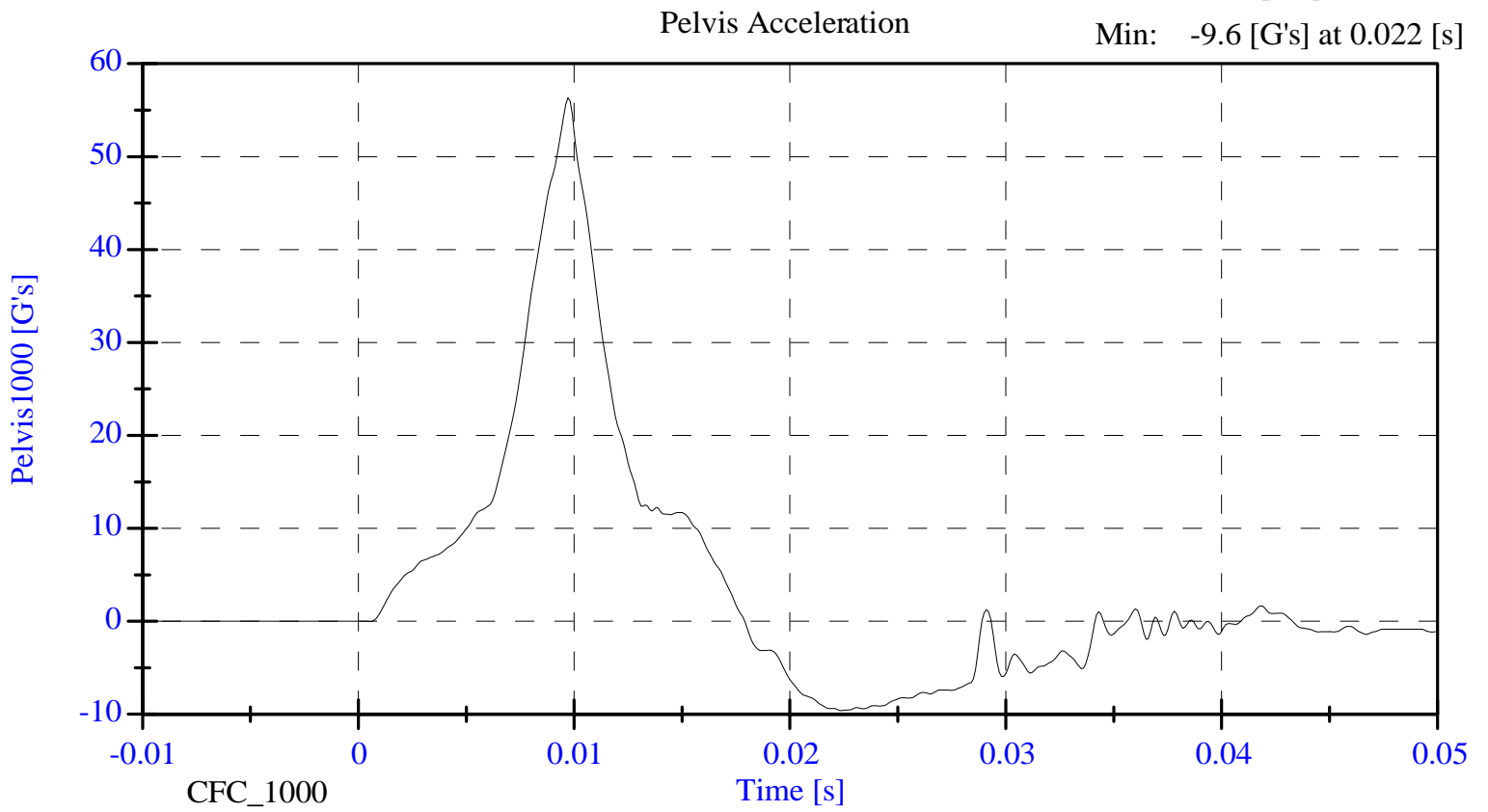
SID H3 Serial No.: 015 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37.0
PROBE SPEED (m/s)	4.27 - 4.33	4.31
PELVIS ACCELERATION (g's)	40 - 60	44.61

**REMARKS:** None

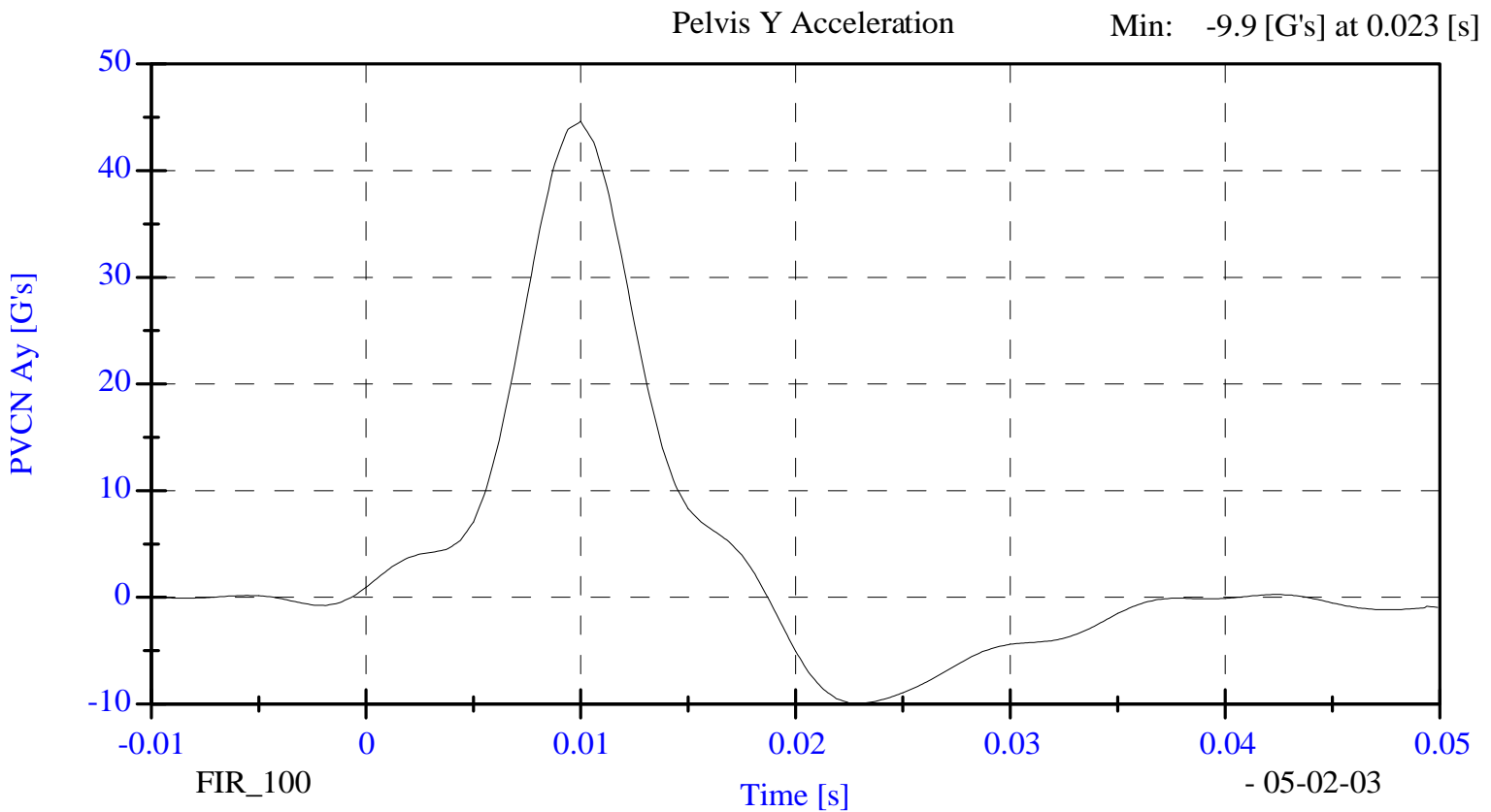
Max: 56.3 [G's] at 0.010 [s]

Min: -9.6 [G's] at 0.022 [s]



Max: 44.6 [G's] at 0.010 [s]

Min: -9.9 [G's] at 0.023 [s]



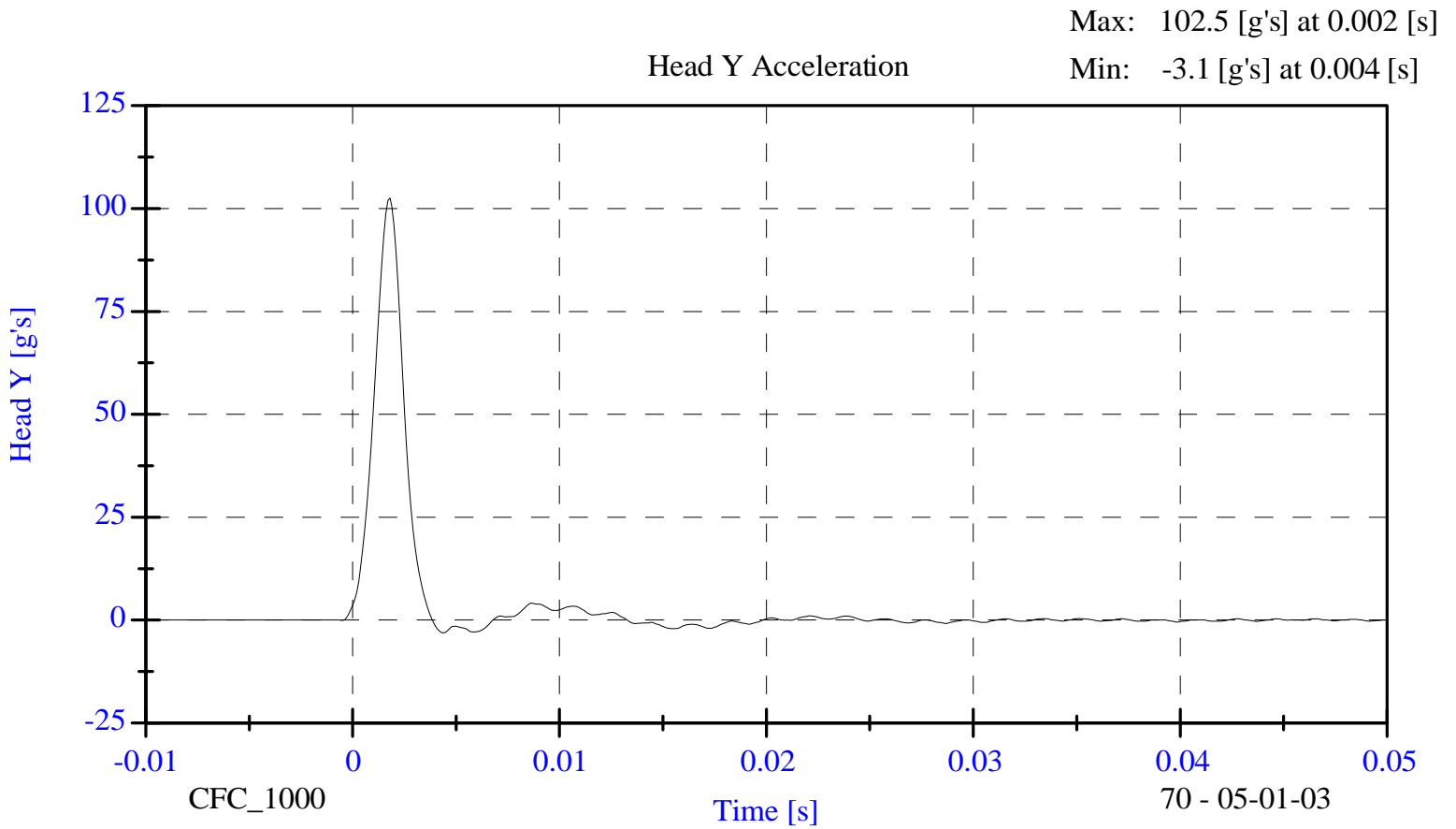
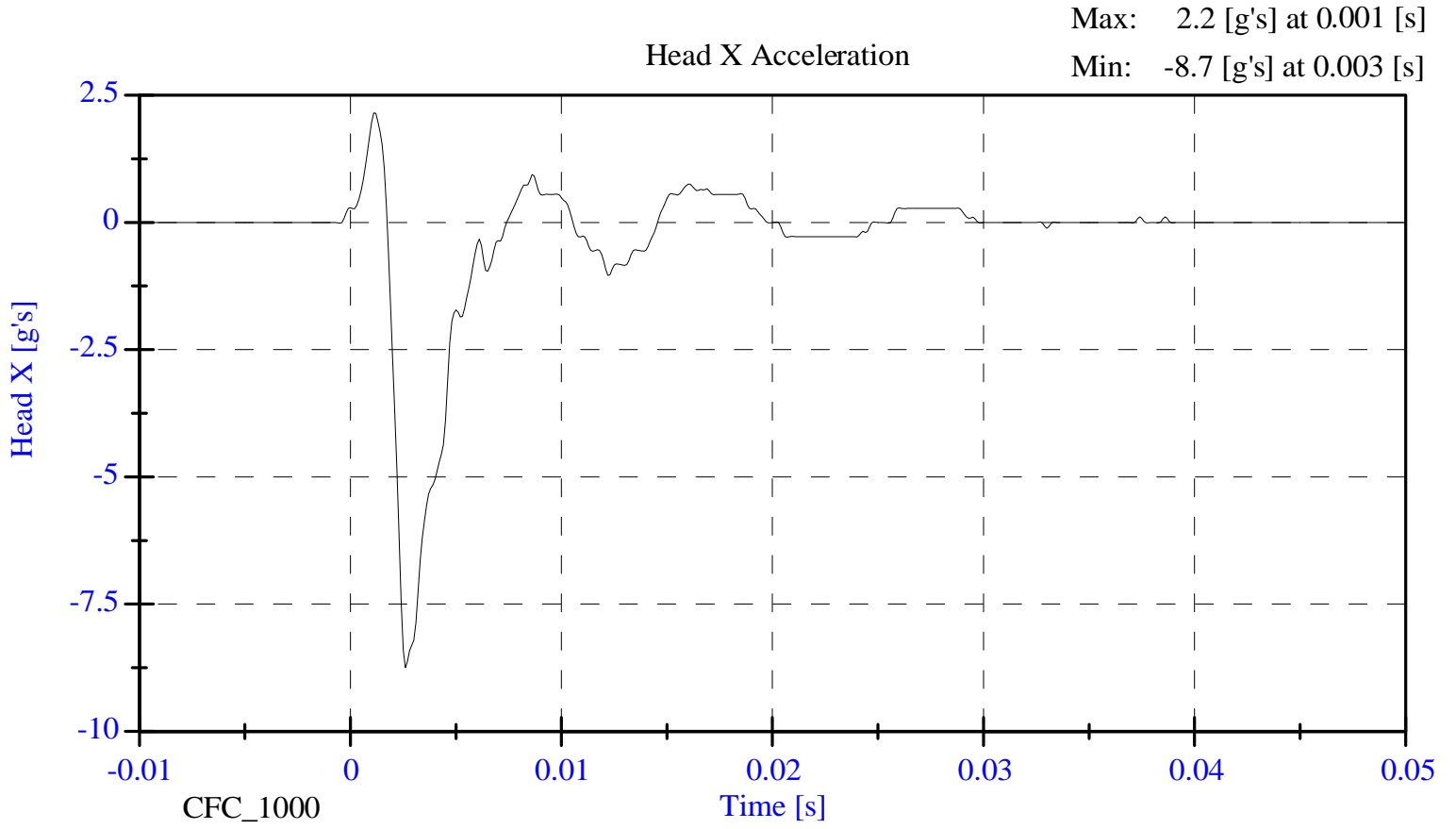
**HEAD DROP TEST  
POST-TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 015 Sequential Test Number: 1  
Date: May 1, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 – 22.2	21.1
RELATIVE HUMIDITY (%)	10 – 70	41.0
PEAK RESULTANT ACCELERATION (Gs)	120 – 150	125.17
PEAK LATERAL ACCELERATION (Gs)	Not to Exceed 15	2.15
CURVE PERCENT NONMODAL (%)	< 15	3.69

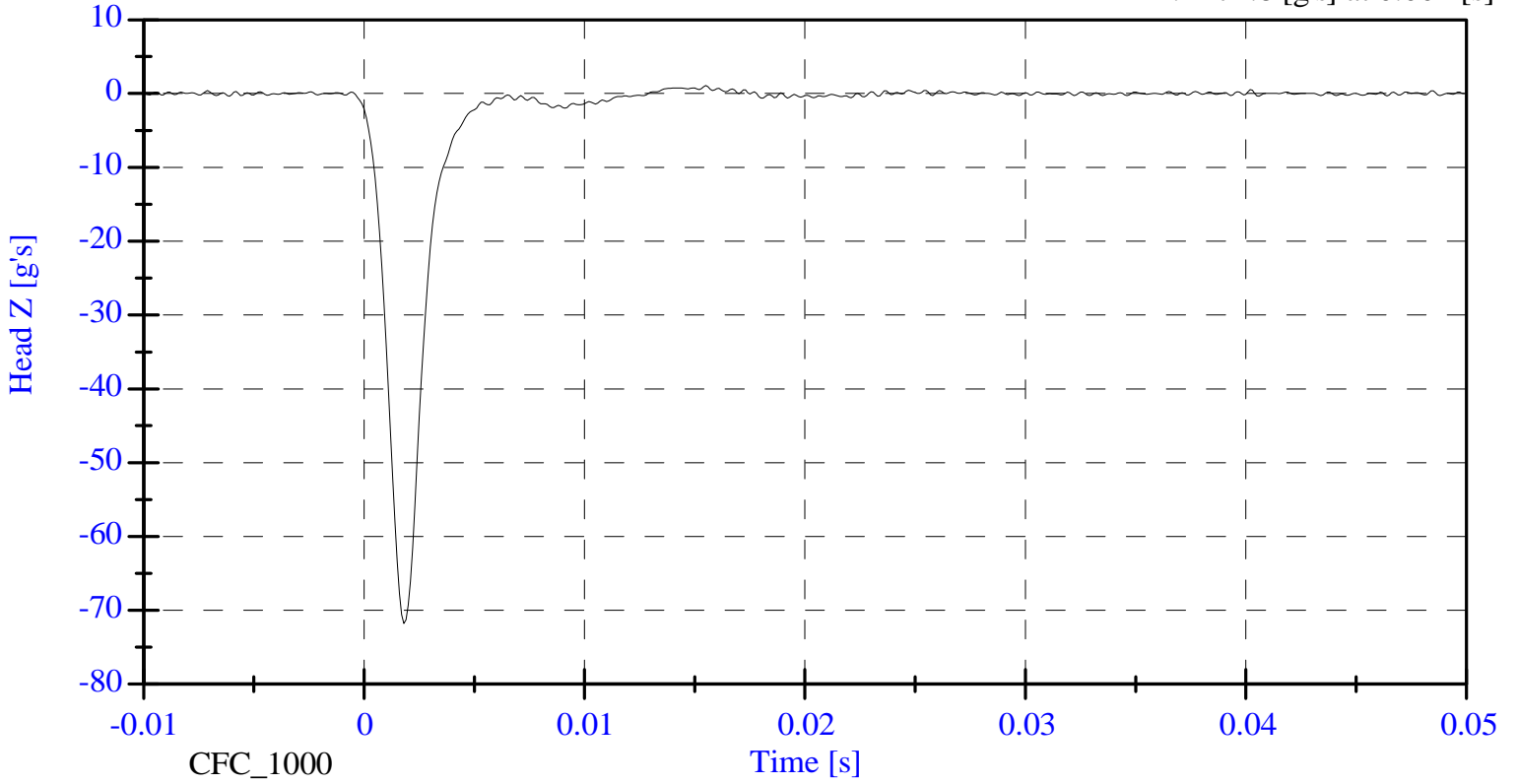
**REMARKS:** None



Head Z Acceleration

Max: 1.1 [g's] at 0.016 [s]

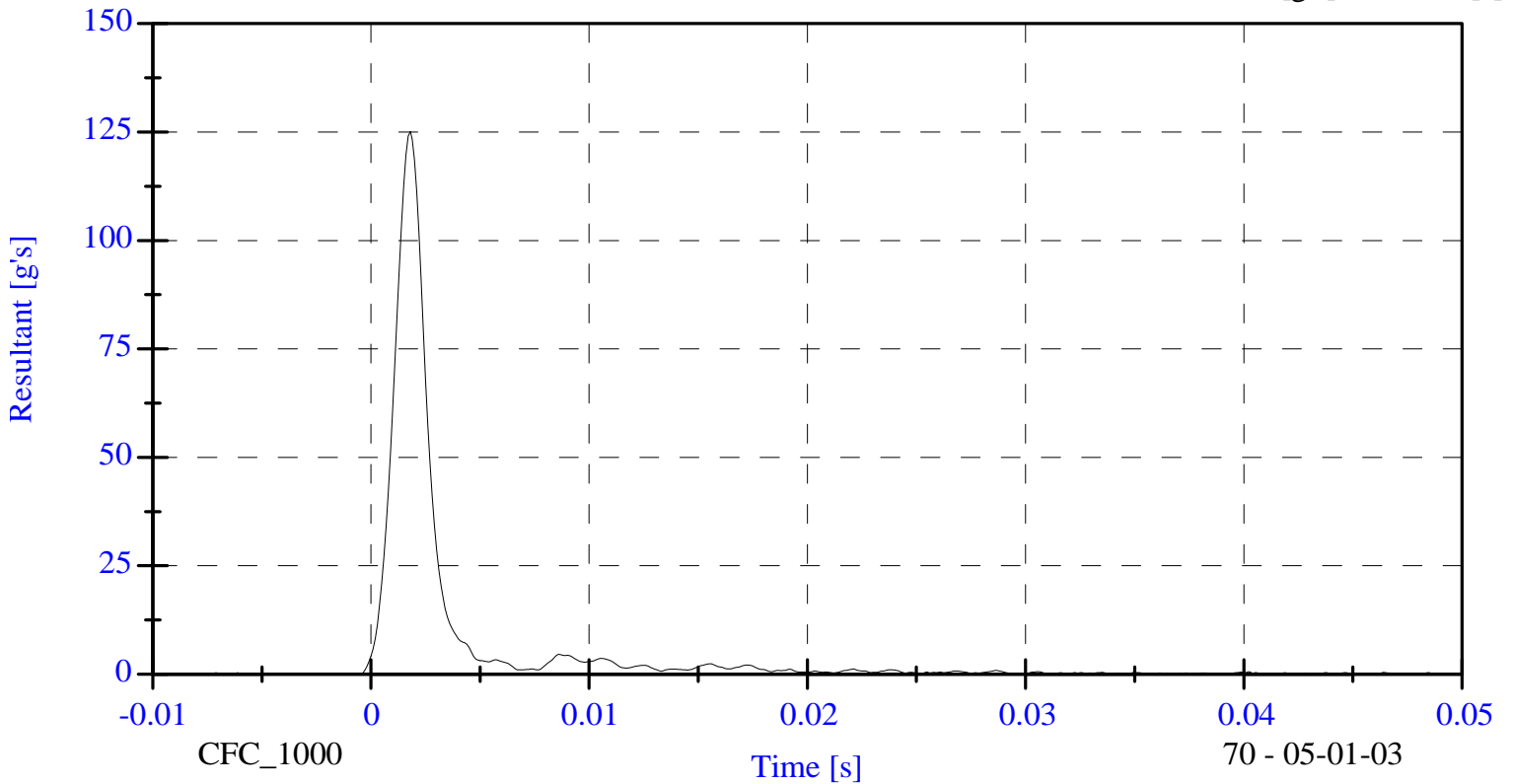
Min: -71.8 [g's] at 0.002 [s]



Head Resultant

Max: 125.2 [g's] at 0.002 [s]

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



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

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 015 Sequential Test Number: 1  
Date: May 1, 2003 Laboratory Technician: B. Swiecicki

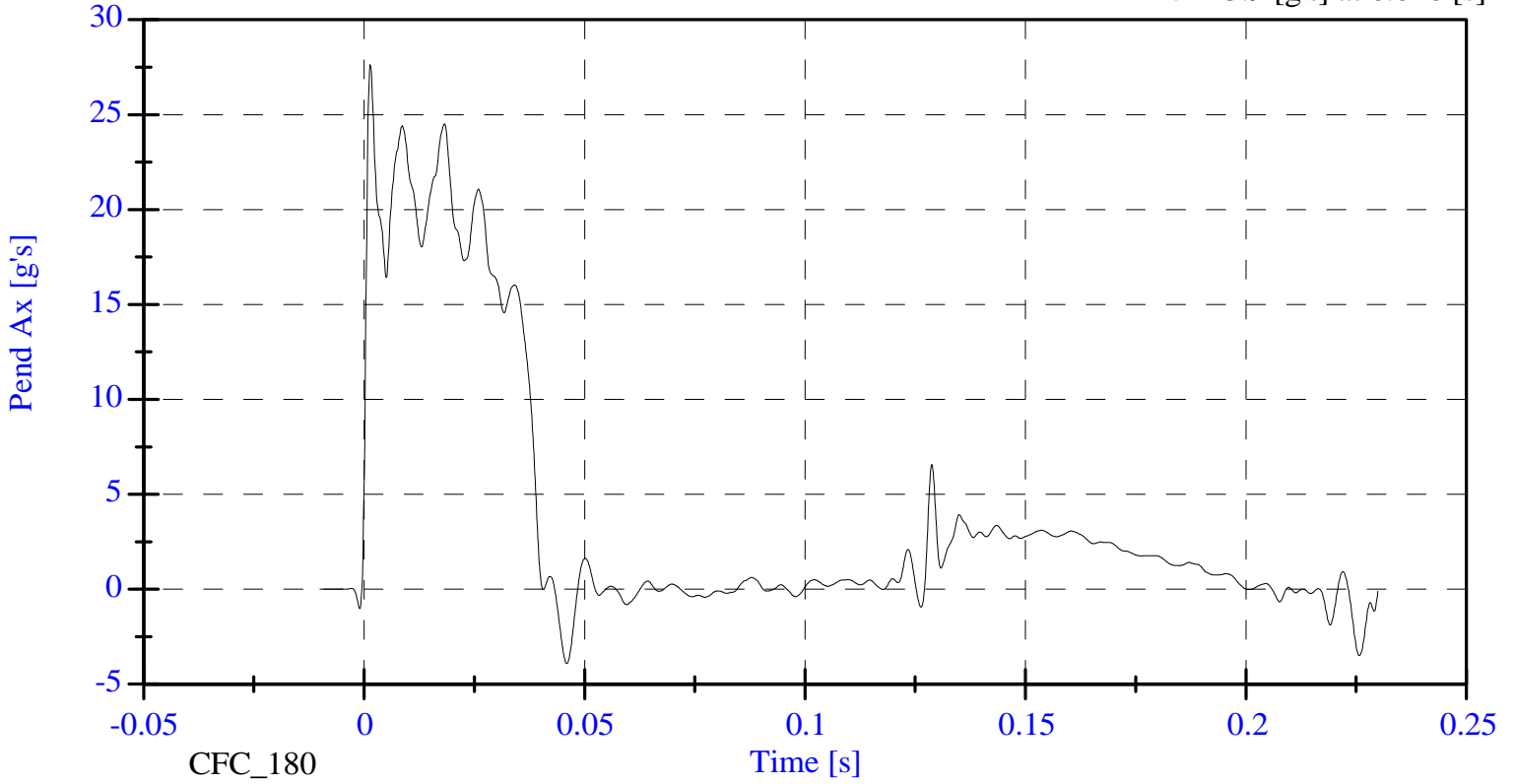
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 - 22.2	21.1
RELATIVE HUMIDITY (%)	10 - 70	40.0
IMPACT VELOCITY (m/s)	6.89 - 7.13	6.99
PENDULUM DELTA V		
DELTA V @ 10 ms (m/s)	1.96 - 2.55	2.09
DELTA V @ 20 ms (m/s)	4.12 - 5.10	4.17
DELTA V @ 30 ms (m/s)	5.73 - 7.01	6.00
DELTA V @ 40-70 ms (m/s)	6.27 - 7.64	7.24
D PLANE ROTATION		
MAXIMUM ROTATION (deg)	64 - 78	72.3
ROT. ANGLE TIME to ZERO (ms)	50 - 70	59.1
MOMENT ABOUT THE OCCIPITAL CONDYLE		
MAX OCCIPITAL MOMENT (Nm)	88 - 108	89.77
OCCIPITAL MOMENT DECAY (ms)	40.0 - 60.0	51.4
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT		
ROTATION wrt MOMENT (ms)	0 - 20	9.9

**REMARKS:** None

Max: 27.6 [g's] at 0.001 [s]

Min: -3.9 [g's] at 0.046 [s]

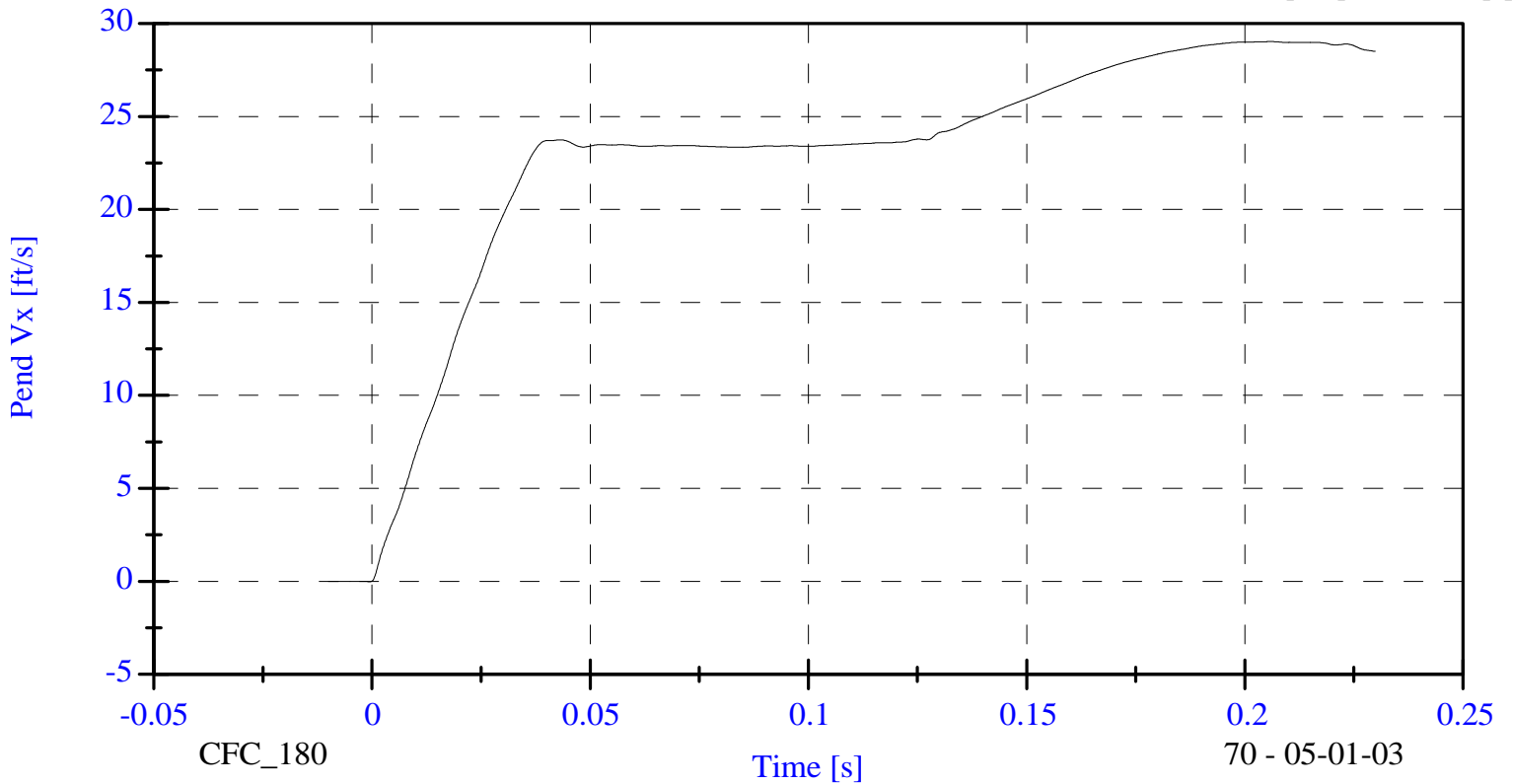
Pendulum Acceleration



Max: 29.0 [ft/s] at 0.206 [s]

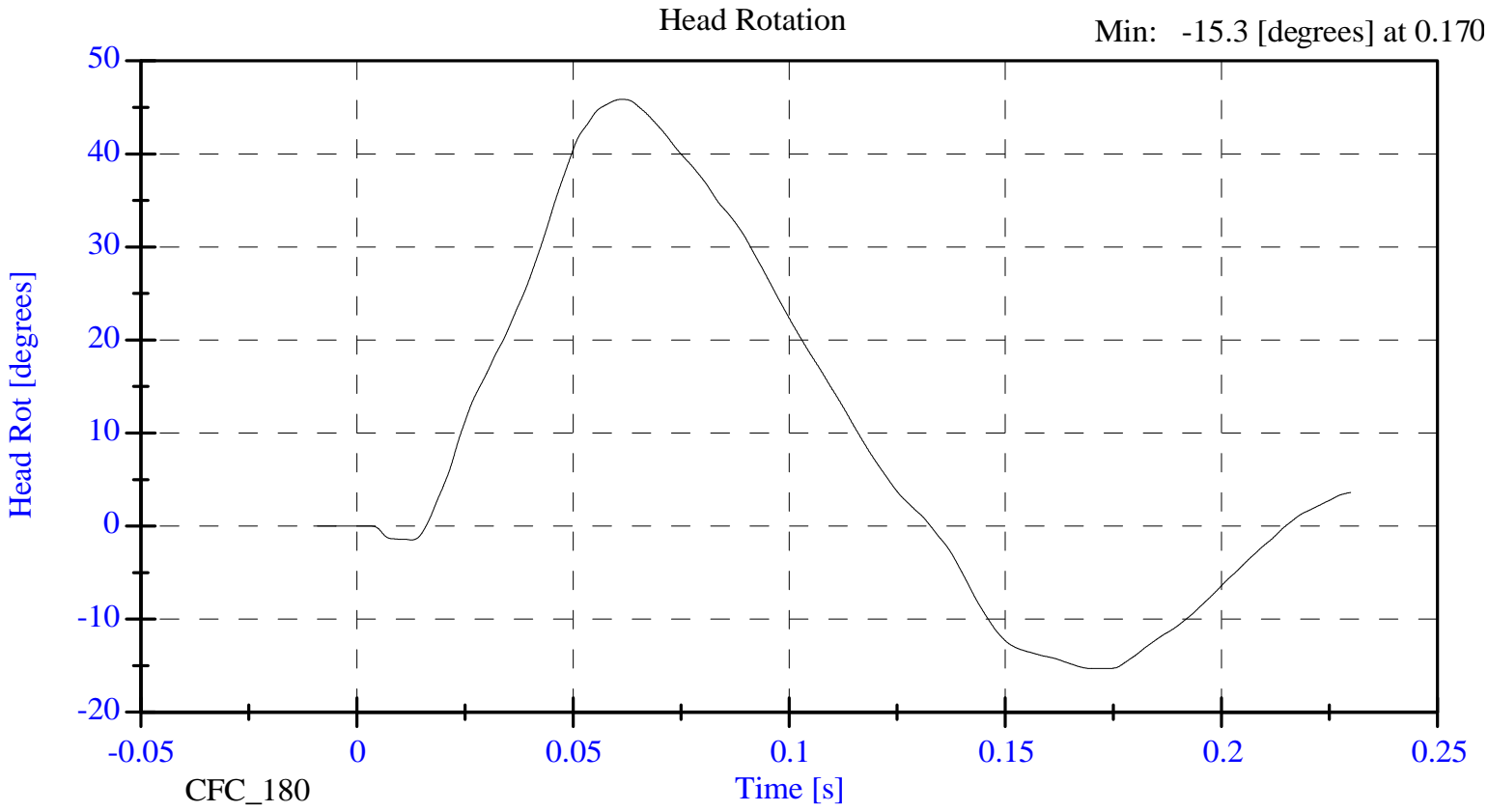
Min: -0.0 [ft/s] at -0.001 [s]

Pendulum Velocity



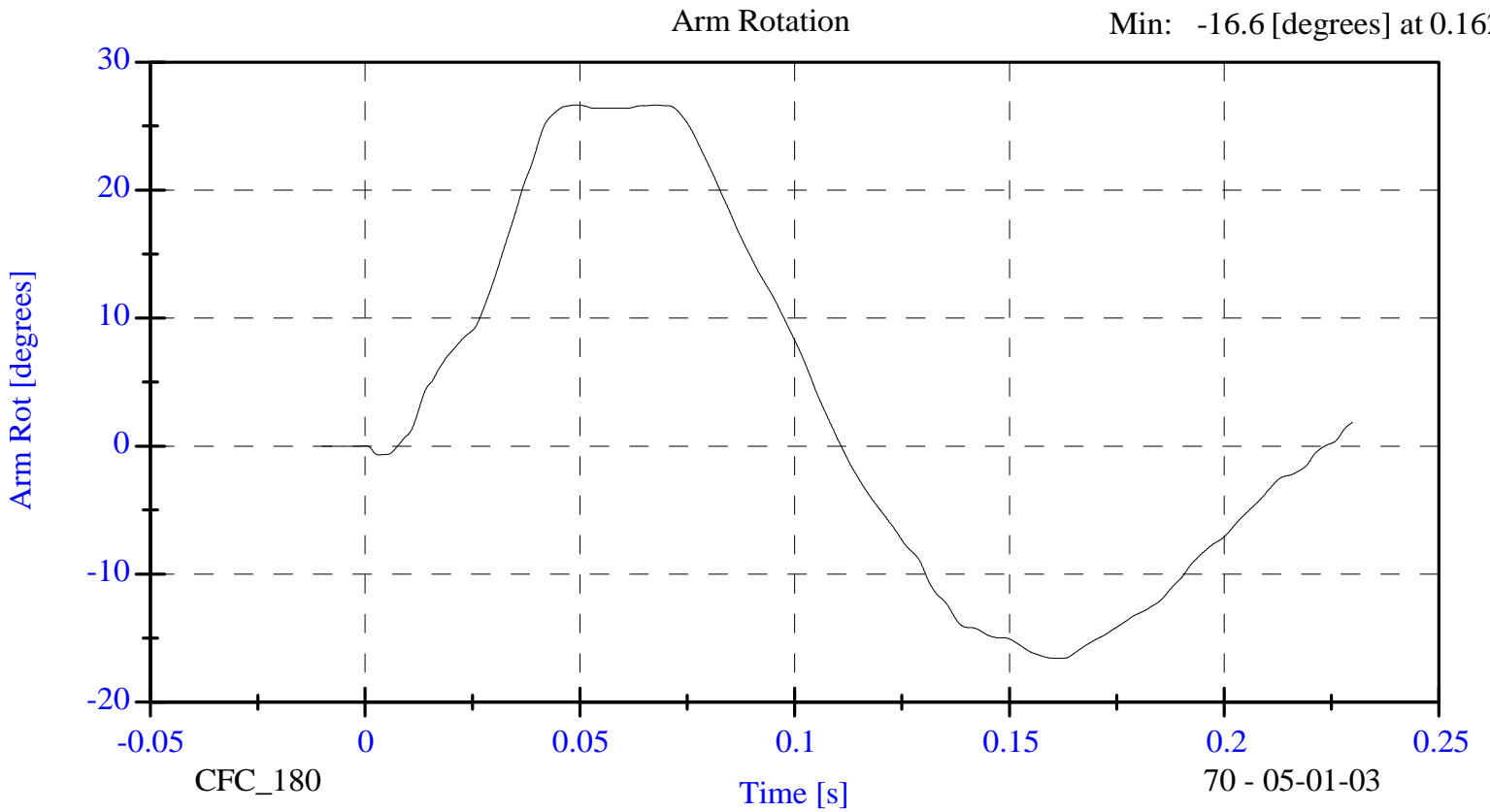
Max: 45.9 [degrees] at 0.061

Min: -15.3 [degrees] at 0.170



Max: 26.6 [degrees] at 0.049

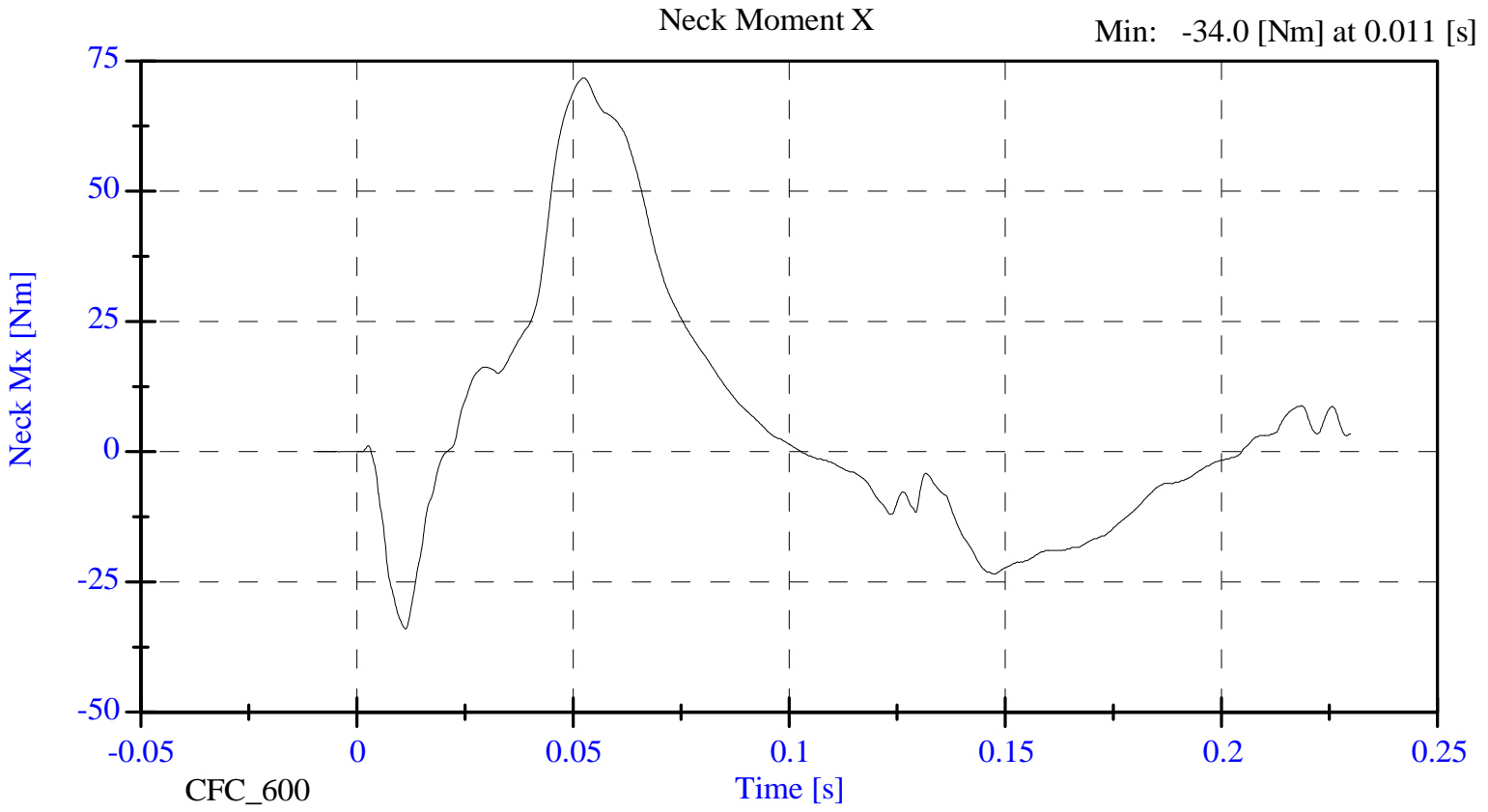
Min: -16.6 [degrees] at 0.162



70 - 05-01-03

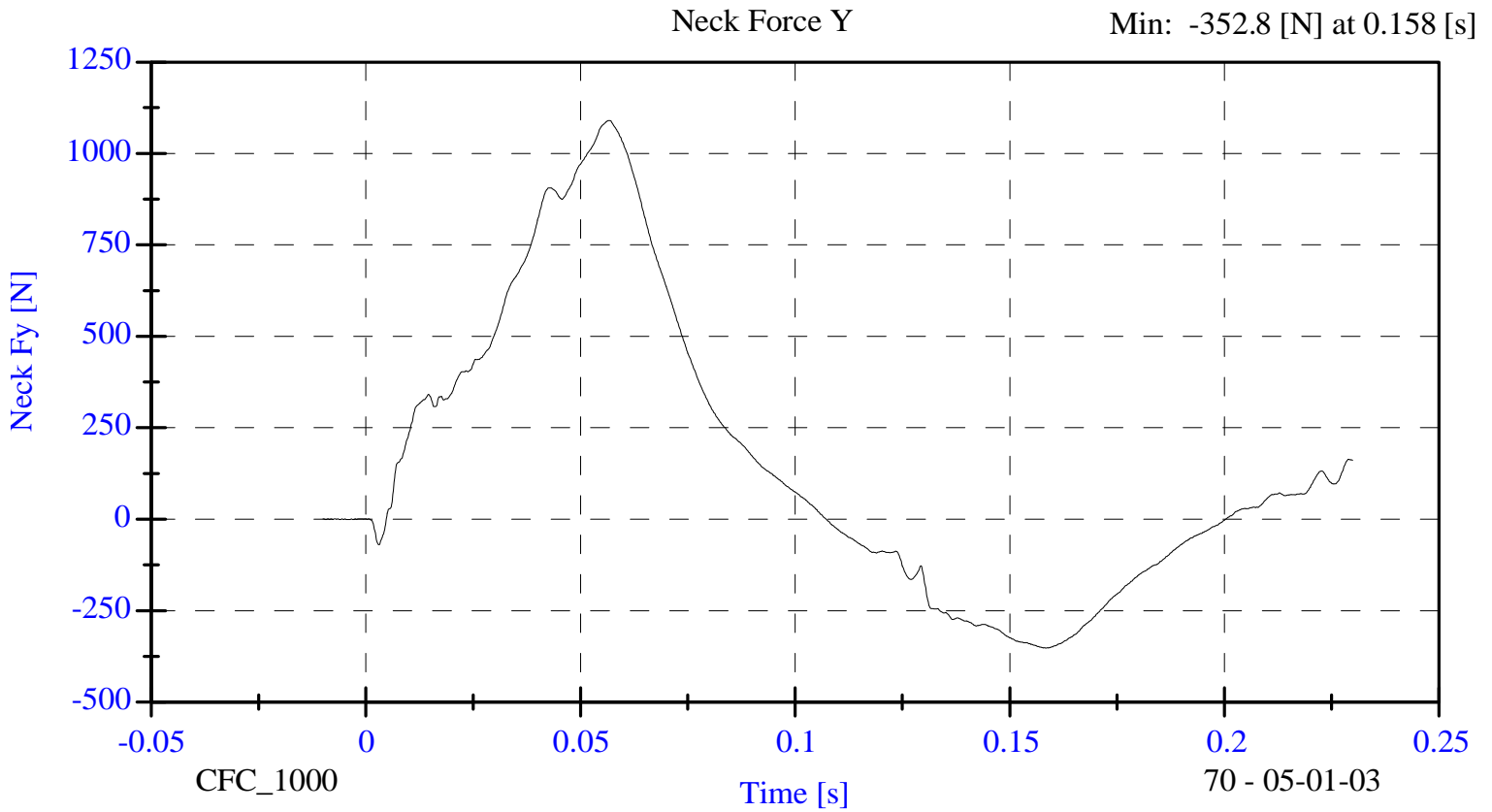
Max: 71.7 [Nm] at 0.052 [s]

Min: -34.0 [Nm] at 0.011 [s]



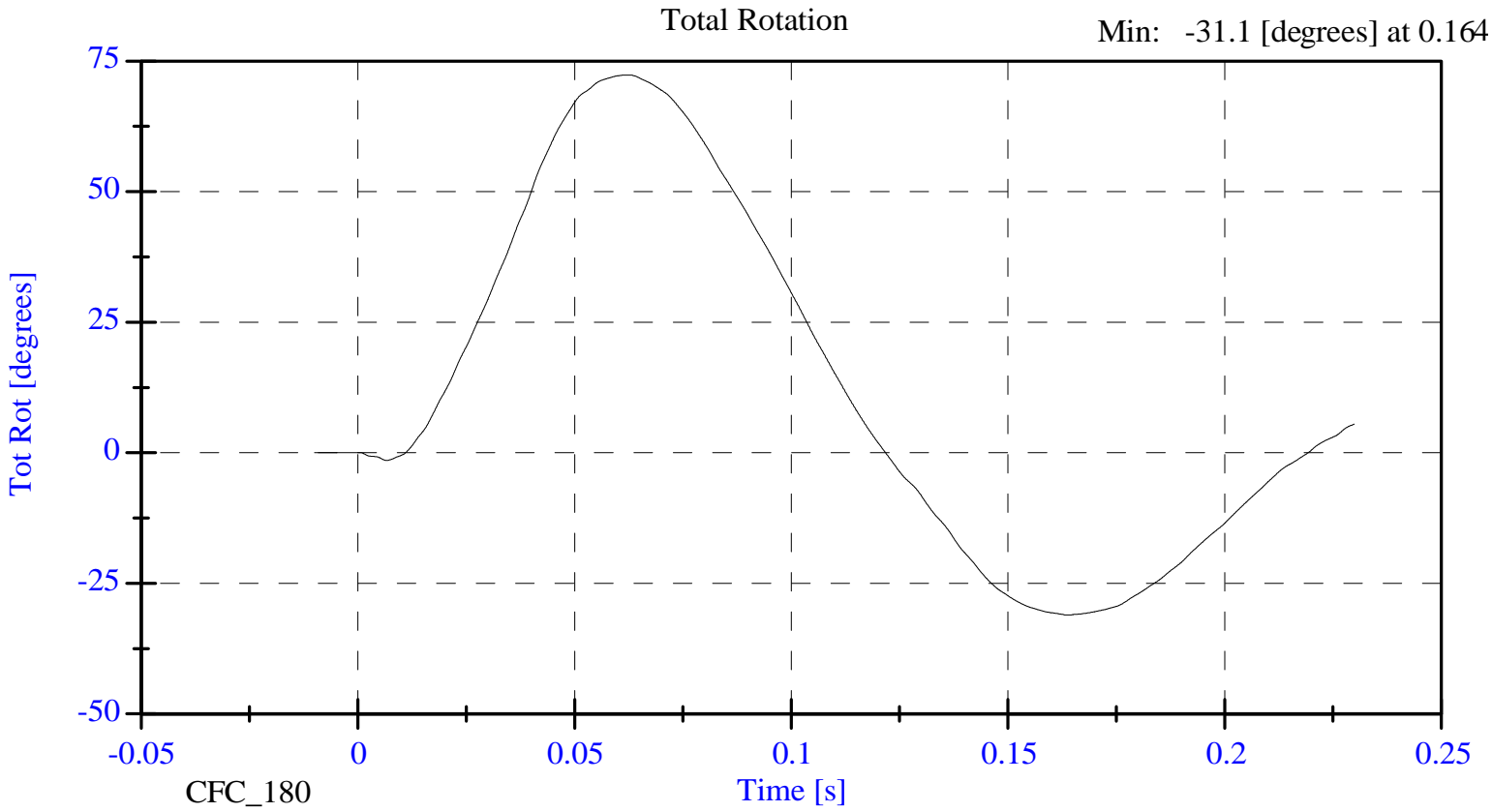
Max: 1090.1 [N] at 0.057 [s]

Min: -352.8 [N] at 0.158 [s]



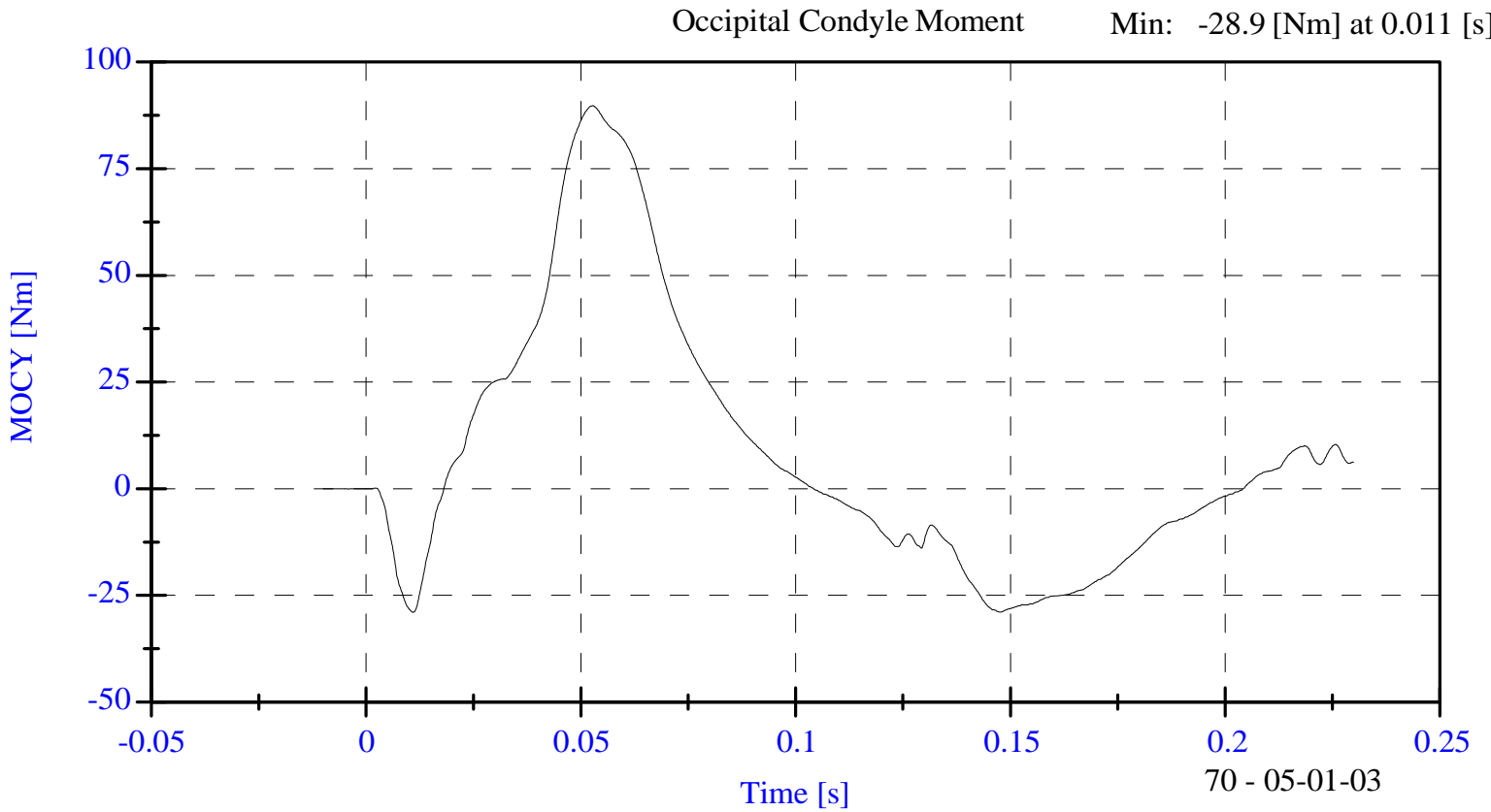
Max: 72.3 [degrees] at 0.063

Min: -31.1 [degrees] at 0.164



Max: 89.8 [Nm] at 0.053 [s]

Min: -28.9 [Nm] at 0.011 [s]



**ABDOMINAL COMPRESSION TEST  
POST TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37.0
FORCE @ 13 mm (N)	104 - 162	120.1
FORCE @ 19 mm (N)	163 - 221	187.7
FORCE @ 25 mm (N)	222 - 280	260.2
FORCE @ 33 mm (N)	325 - 391	371.4

**REMARKS:** None

Dummy S/N 015

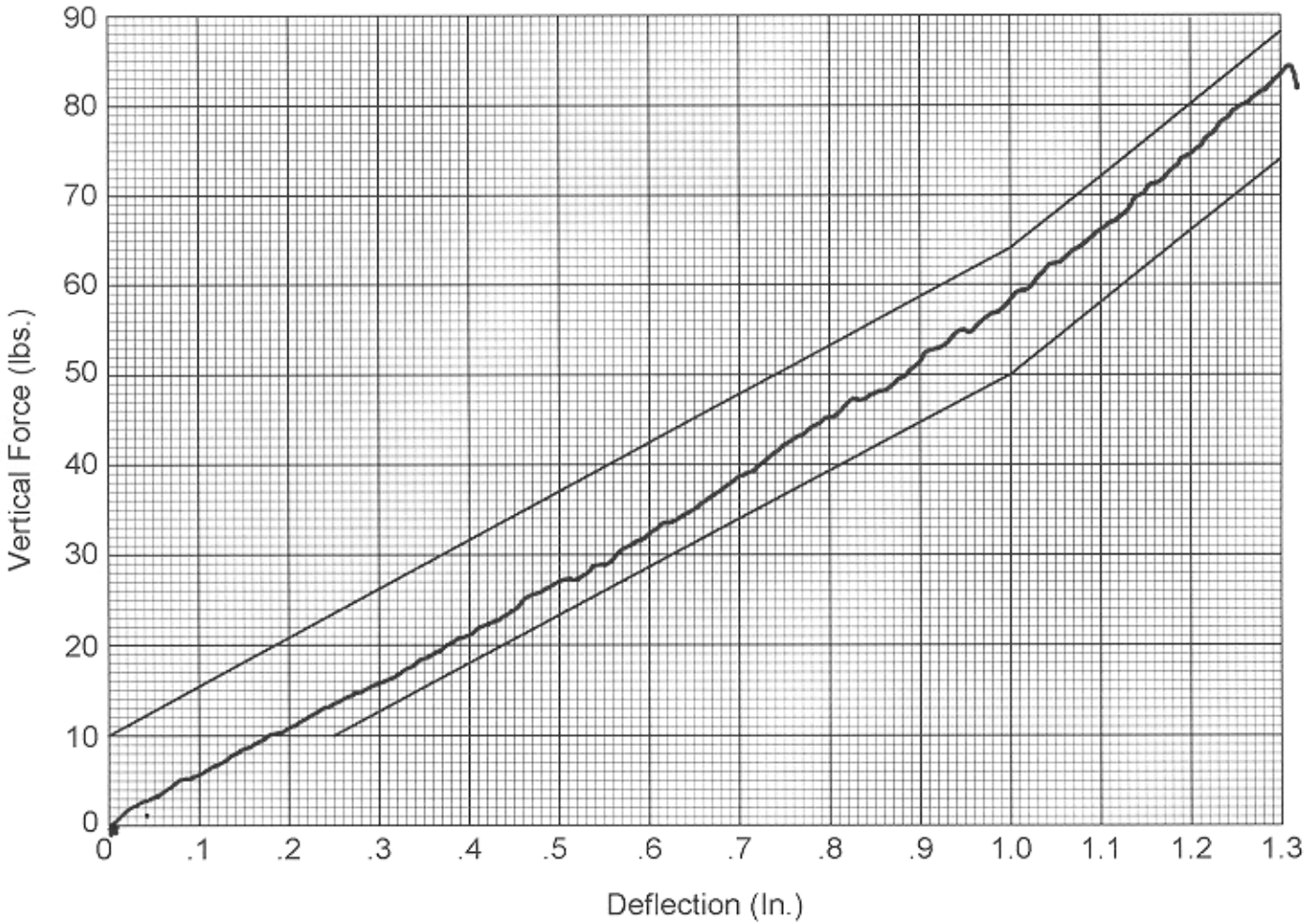
W/A \_\_\_\_\_

Date 5-02-03

Performed By BQ

Temp. 70°

Humidity 37%



**Hybrid II  
Abdomen Static Press**

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

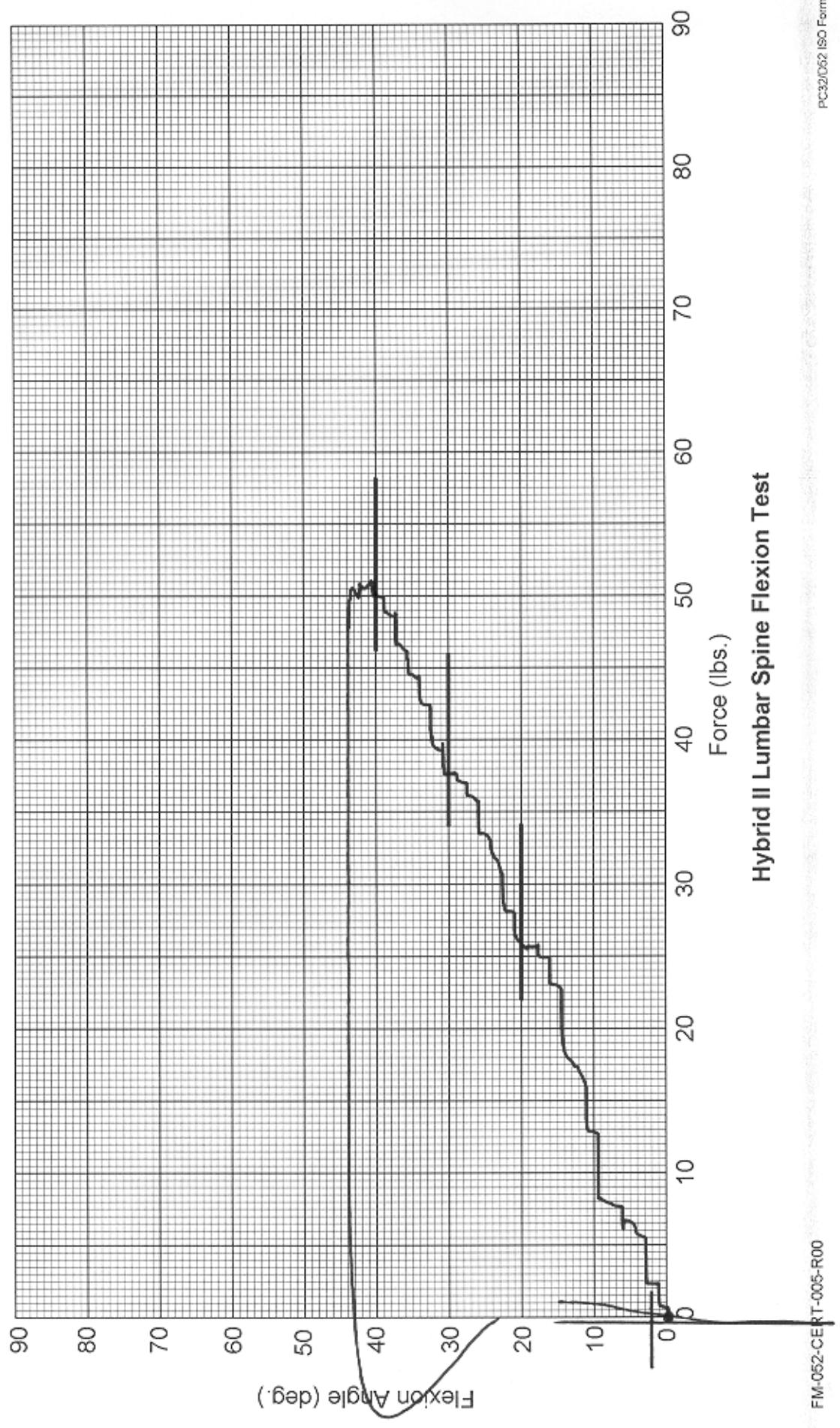
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 015 Sequential Test Number: 1  
 Date: May 2, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37.0
FORCE @ 0° (N)	0 - 26.7	0.0
FORCE @ 20° (N)	97.8 - 151.2	114.3
FORCE @ 30° (N)	151.2 - 204.6	167.5
FORCE @ 40° (N)	204.6 - 258	222.4
RETURN ANGLE	12° max.	2°

**REMARKS:** None

Dummy S/N 015  
 W/A \_\_\_\_\_  
 Date 5-02-03  
 Performed By [Signature]  
 Temp. 70°  
 Humidity 37%



Hybrid II Lumbar Spine Flexion Test

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

SID H3 Serial No.: 015 Sequential Test Number: 1  
 Date: May 2, 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.: 016**

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: May 2, 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.
LATERAL NECK BEND 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.: 016 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	902
RH- Rib Height (mm)	502 - 520	513
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	239
KH- Knee Pivot from Back Line (mm)	511 - 526	521
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	371

**REMARKS:** None

**LATERAL THORAX IMPACT TEST  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

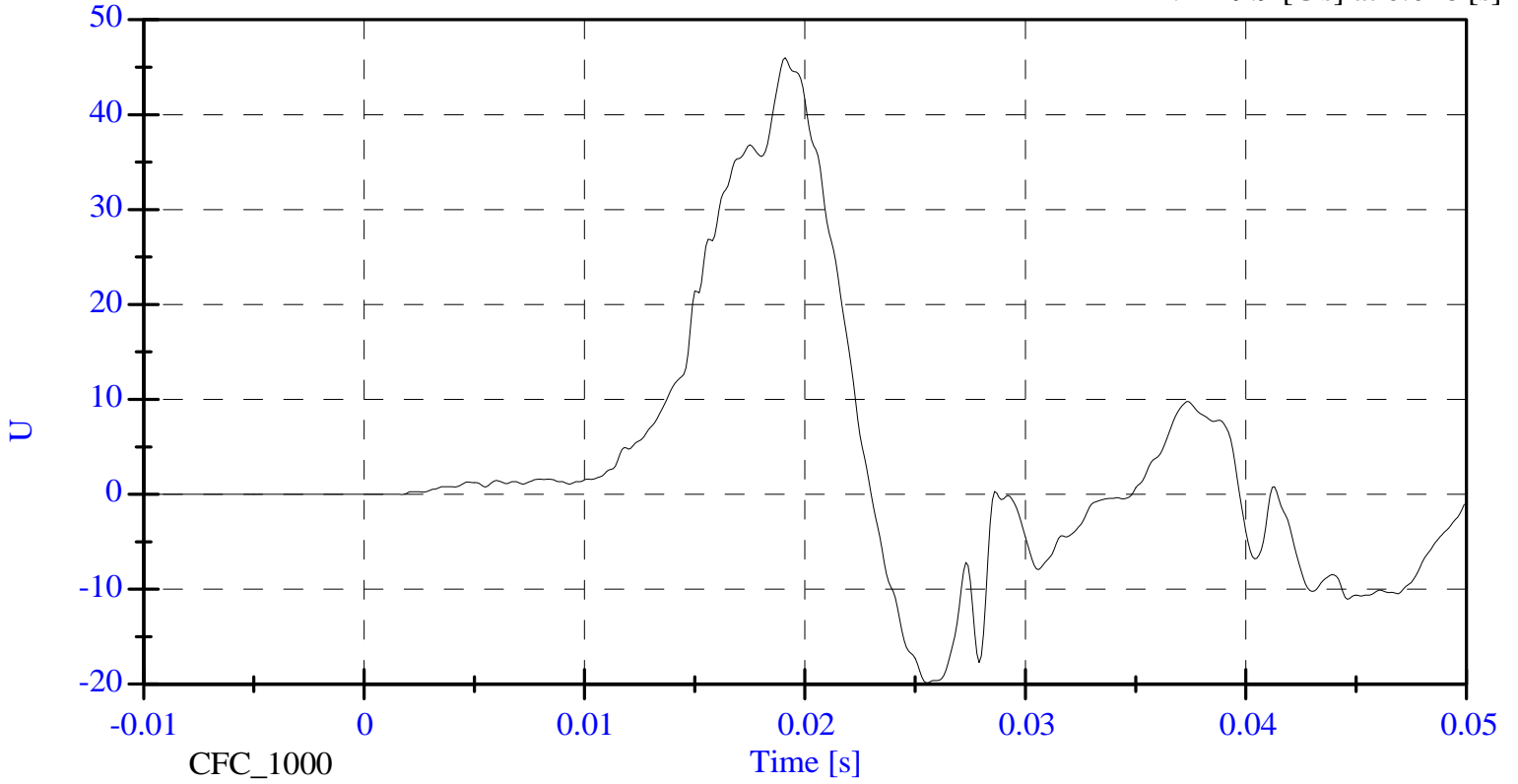
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37.0
PROBE SPEED (m/s)	4.27 - 4.33	4.29
UPPER RIB (g's)	37 - 46	42.97
LOWER RIB (g's)	37 - 46	40.28
LOWER SPINE (g's)	15 - 22	21.81

**REMARKS:** None

Max: 46.0 [G's] at 0.019 [s]

Min: -19.9 [G's] at 0.026 [s]

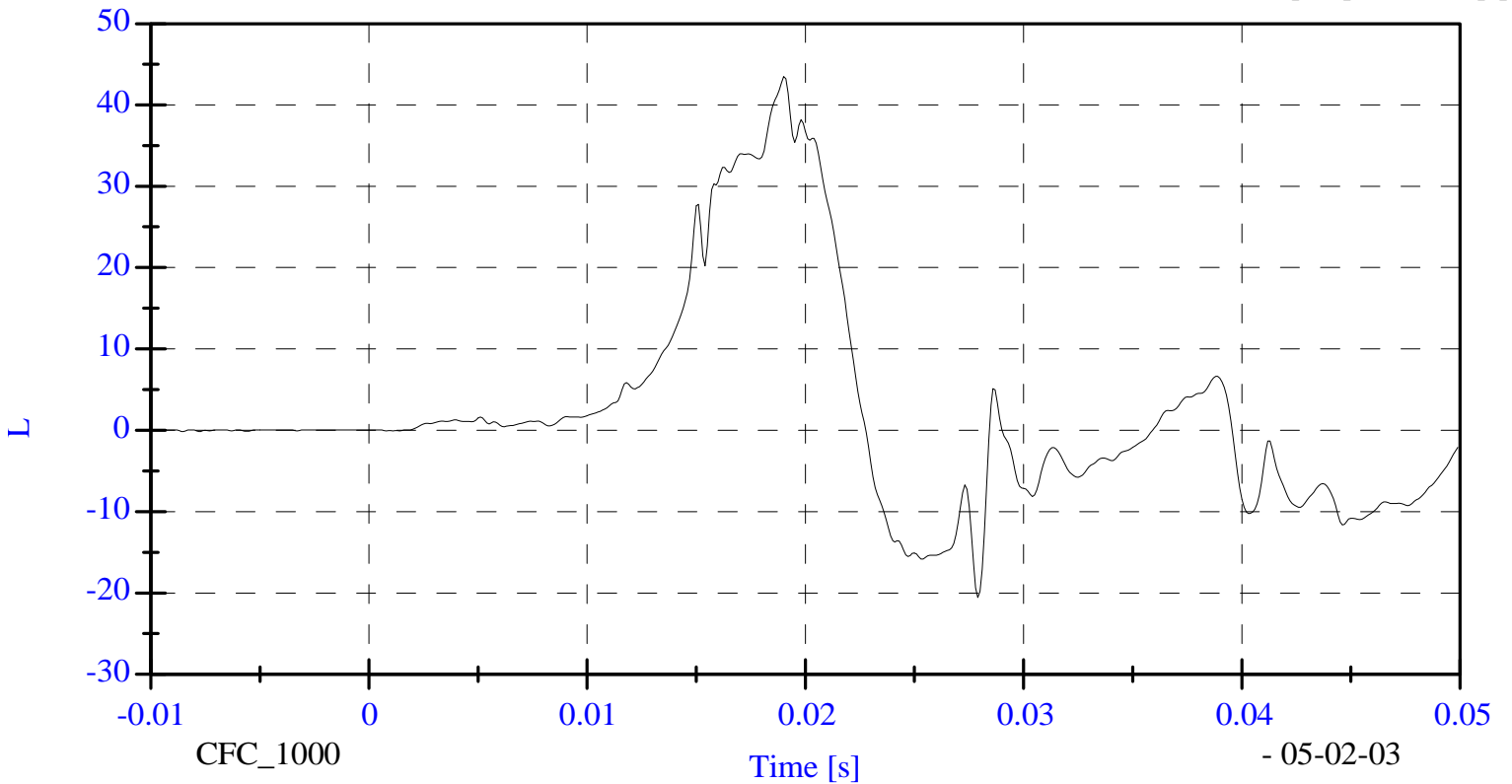
Upper Rib Y Acceleration



Max: 43.5 [G's] at 0.019 [s]

Min: -20.6 [G's] at 0.028 [s]

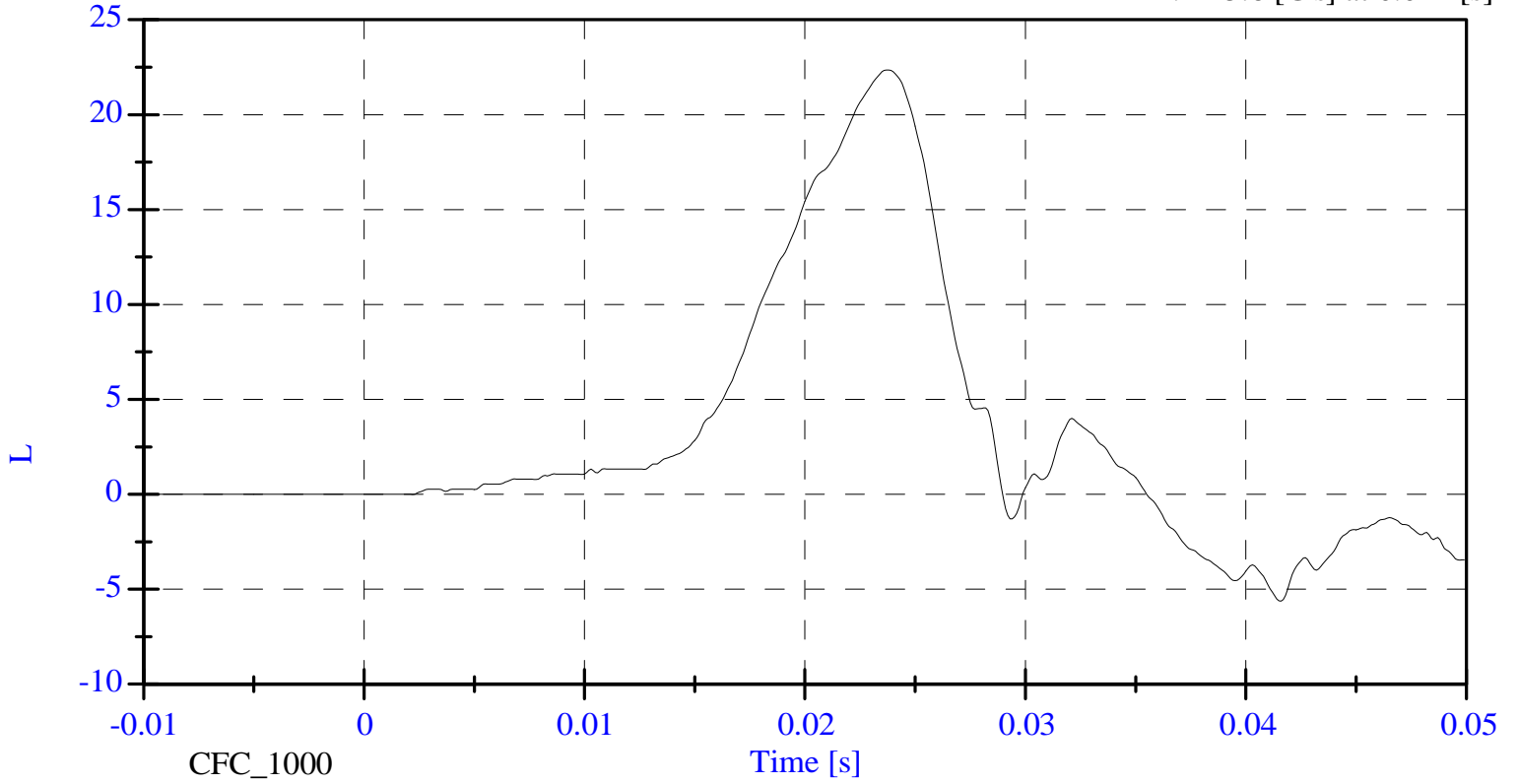
Lower Rib Y Acceleration



Lower Spine Y Acceleration

Max: 22.3 [G's] at 0.024 [s]

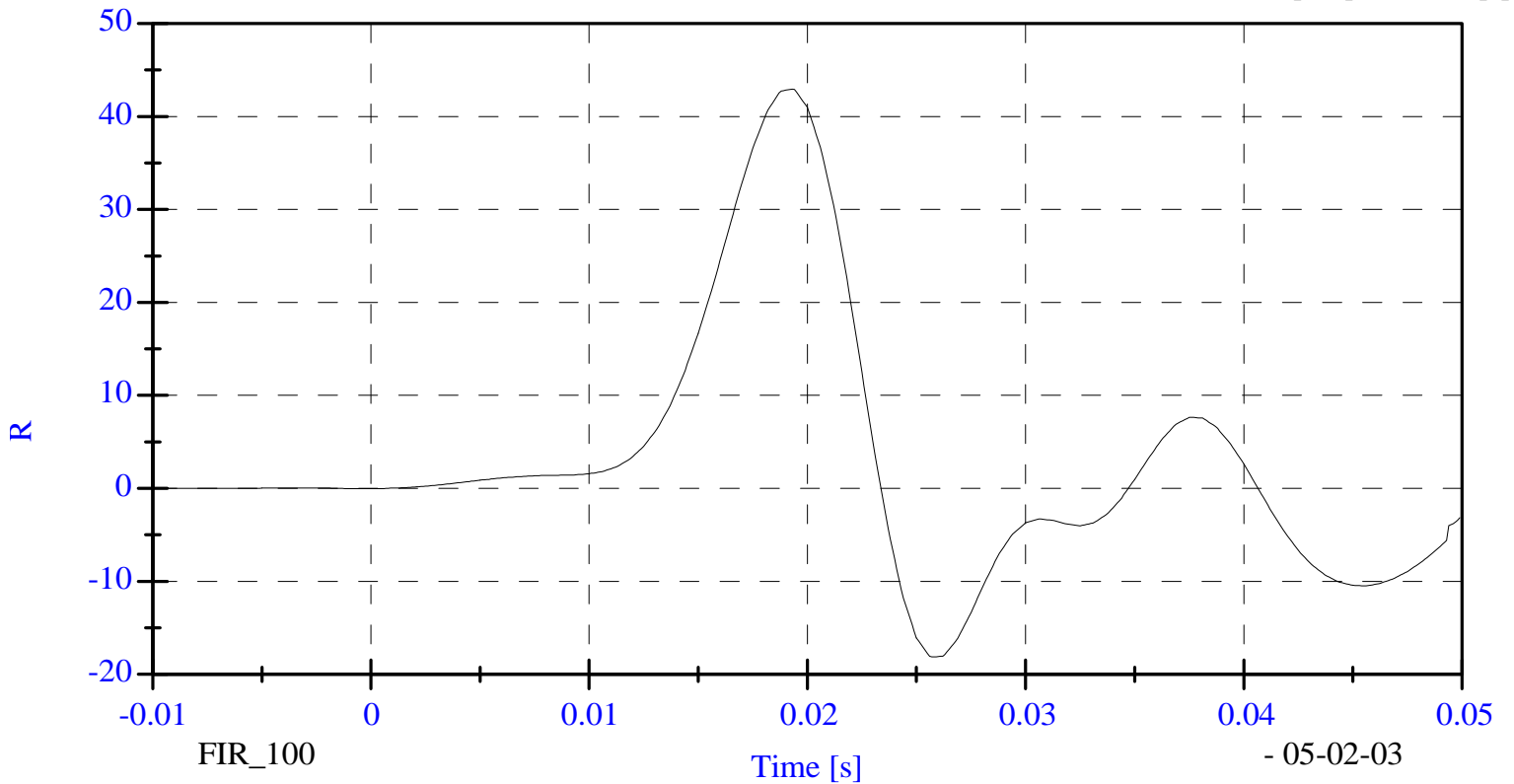
Min: -5.6 [G's] at 0.042 [s]



Upper Rib Y Acceleration

Max: 43.0 [G's] at 0.019 [s]

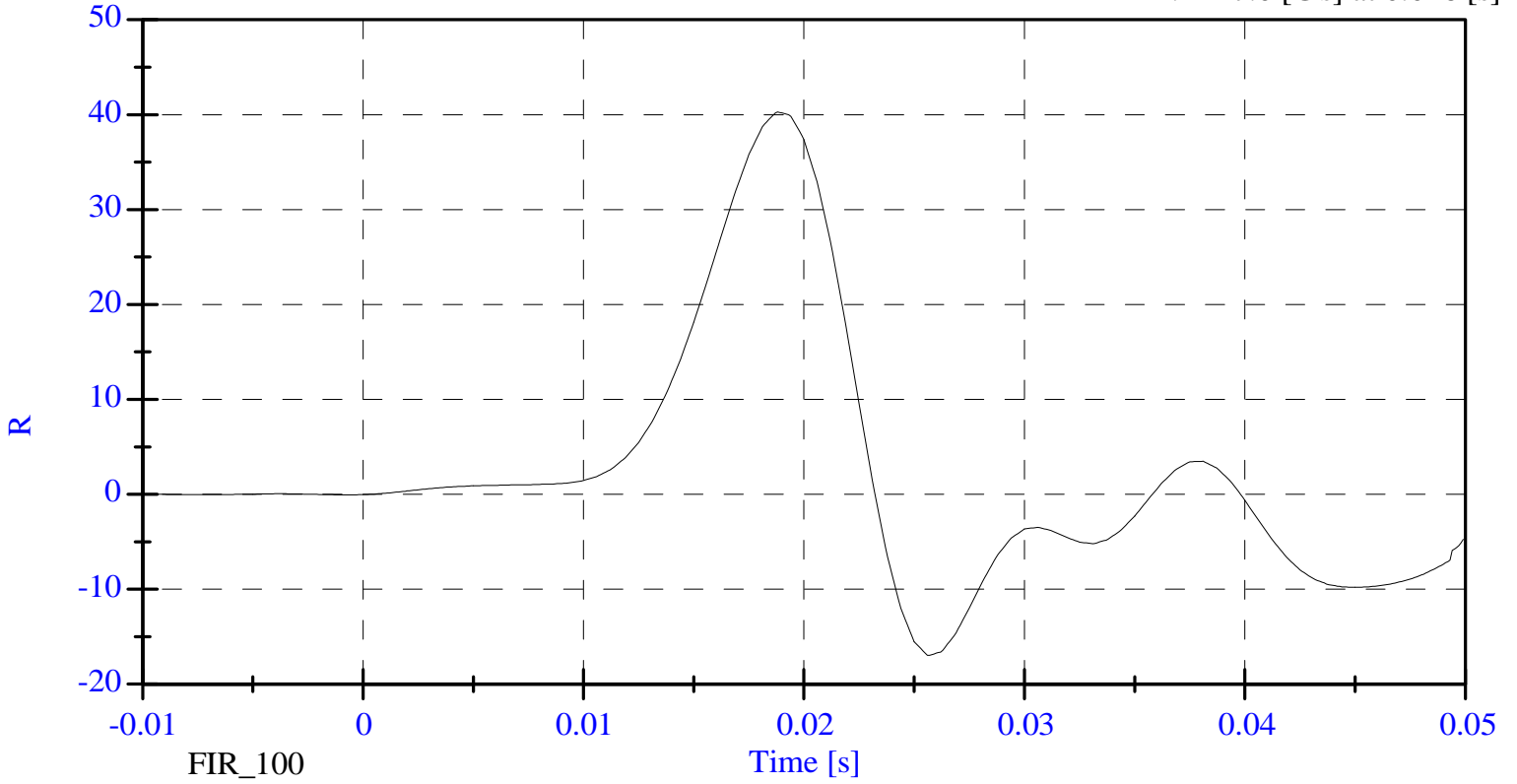
Min: -18.1 [G's] at 0.026 [s]



Max: 40.3 [G's] at 0.019 [s]

Min: -17.0 [G's] at 0.026 [s]

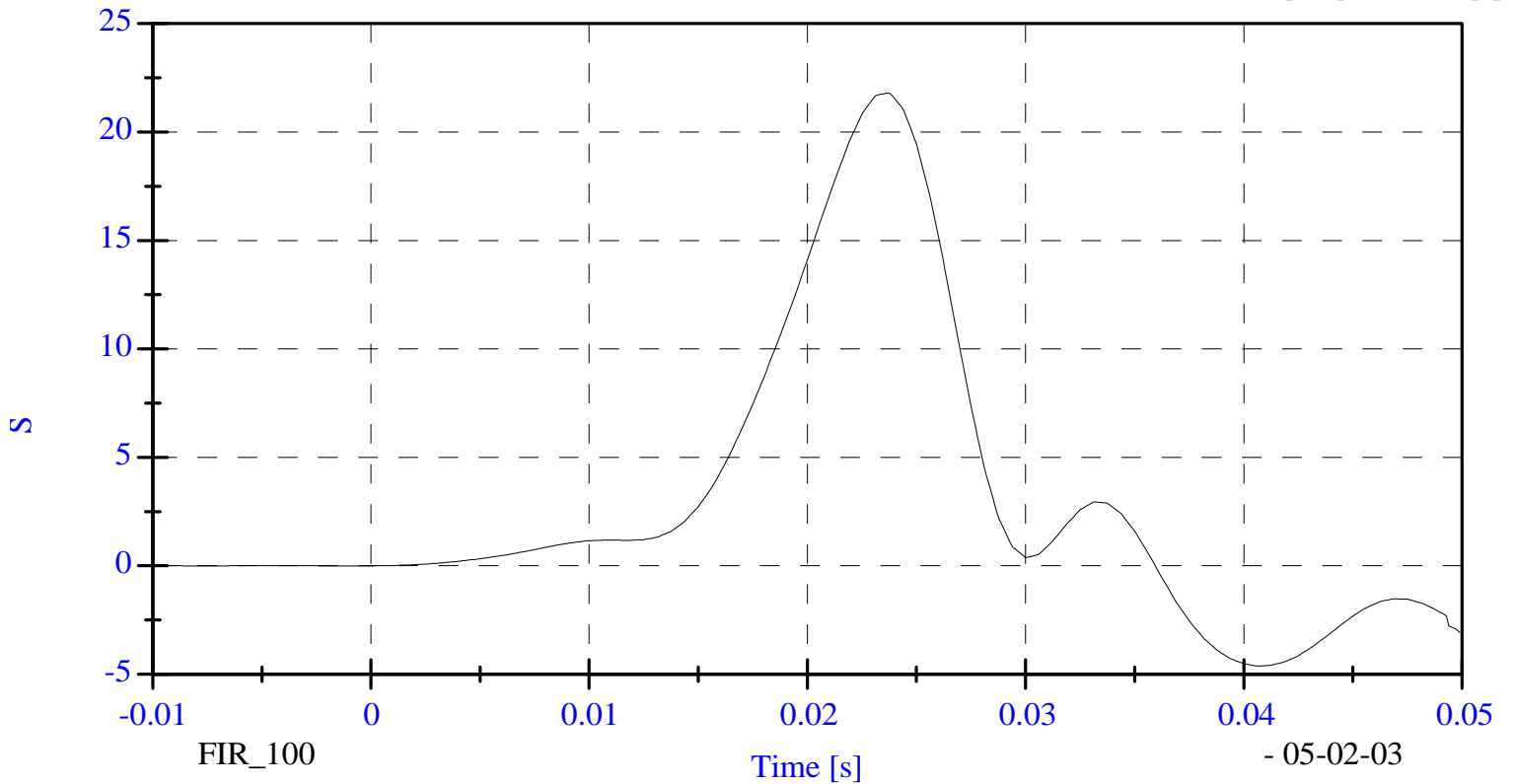
Lower Rib Y Acceleration



Max: 21.8 [G's] at 0.024 [s]

Min: -4.6 [G's] at 0.041 [s]

Lower Spine Y Acceleration



**LATERAL PELVIS IMPACT TEST  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

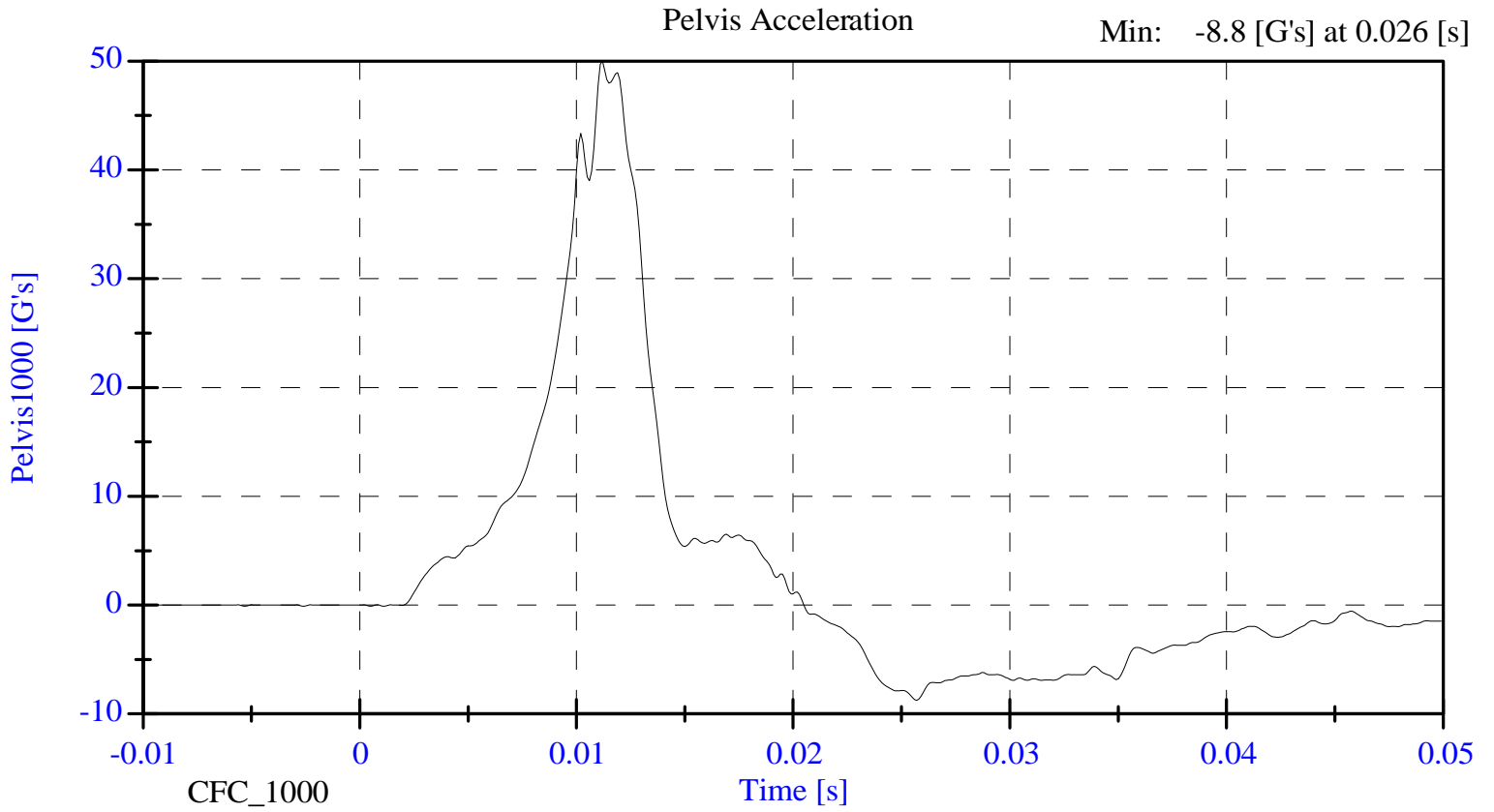
SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37.0
PROBE SPEED (m/s)	4.27 - 4.33	4.27
PELVIS ACCELERATION (g's)	40 - 60	42.12

**REMARKS:** None

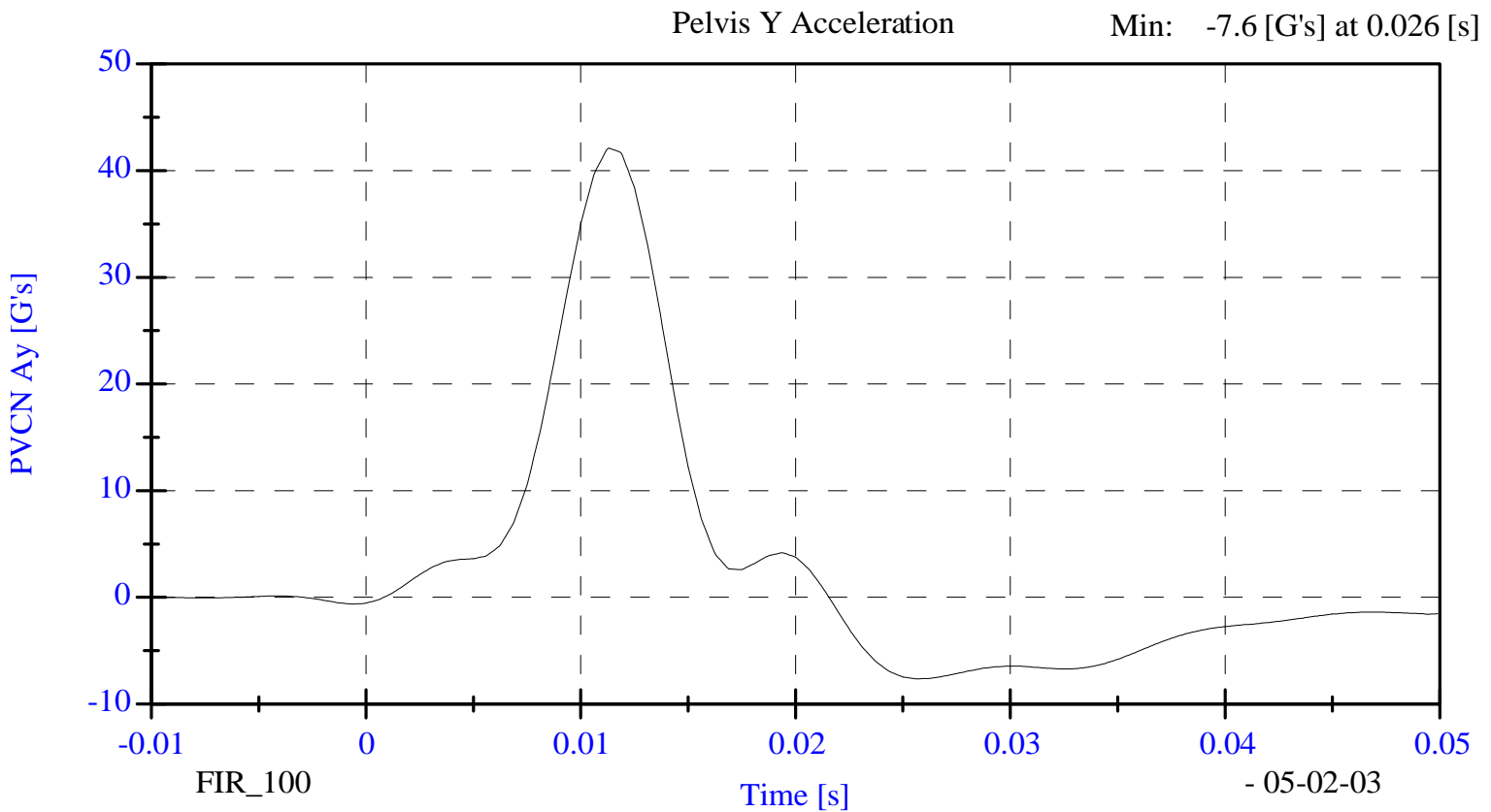
Max: 50.0 [G's] at 0.011 [s]

Min: -8.8 [G's] at 0.026 [s]



Max: 42.1 [G's] at 0.011 [s]

Min: -7.6 [G's] at 0.026 [s]



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

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 016 Sequential Test Number: 1  
Date: May 1, 2003 Laboratory Technician: B. Swiecicki

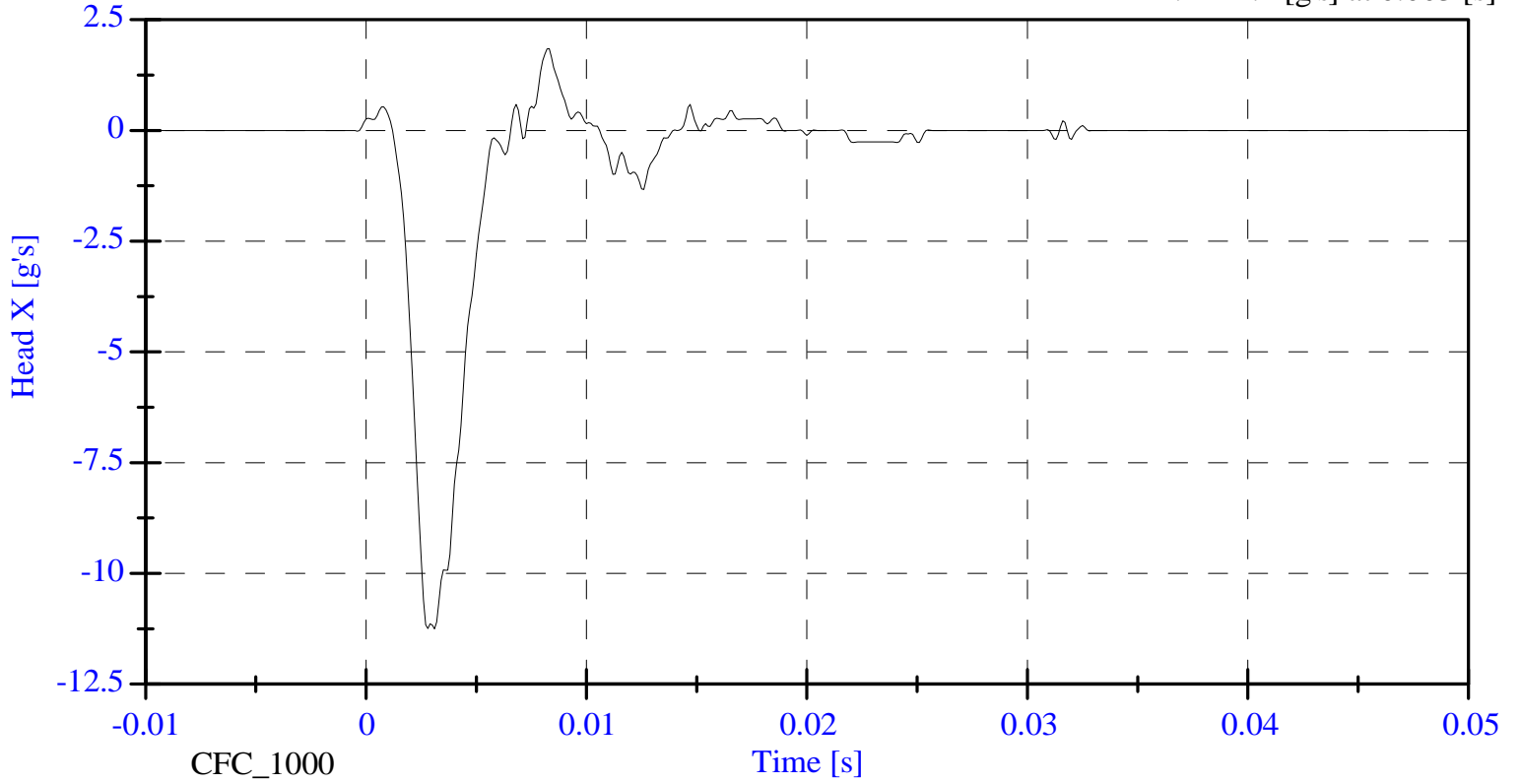
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 – 22.2	21.1
RELATIVE HUMIDITY (%)	10 – 70	41.0
PEAK RESULTANT ACCELERATION (Gs)	120 – 150	134.95
PEAK LATERAL ACCELERATION (Gs)	Not to Exceed 15	1.85
CURVE PERCENT NONMODAL (%)	< 15	3.36

**REMARKS:** None

Head X Acceleration

Max: 1.8 [g's] at 0.008 [s]

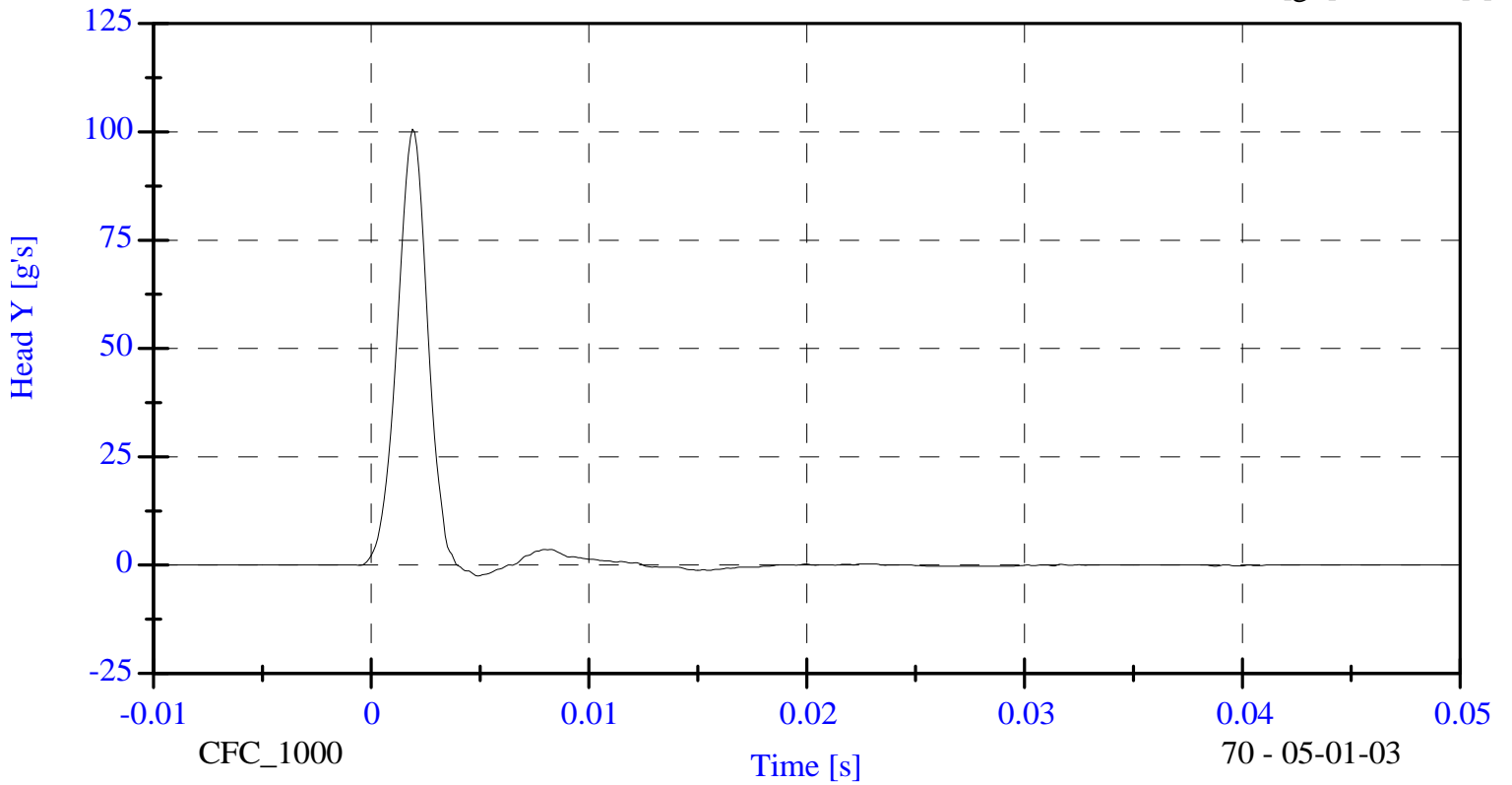
Min: -11.2 [g's] at 0.003 [s]



Head Y Acceleration

Max: 100.6 [g's] at 0.002 [s]

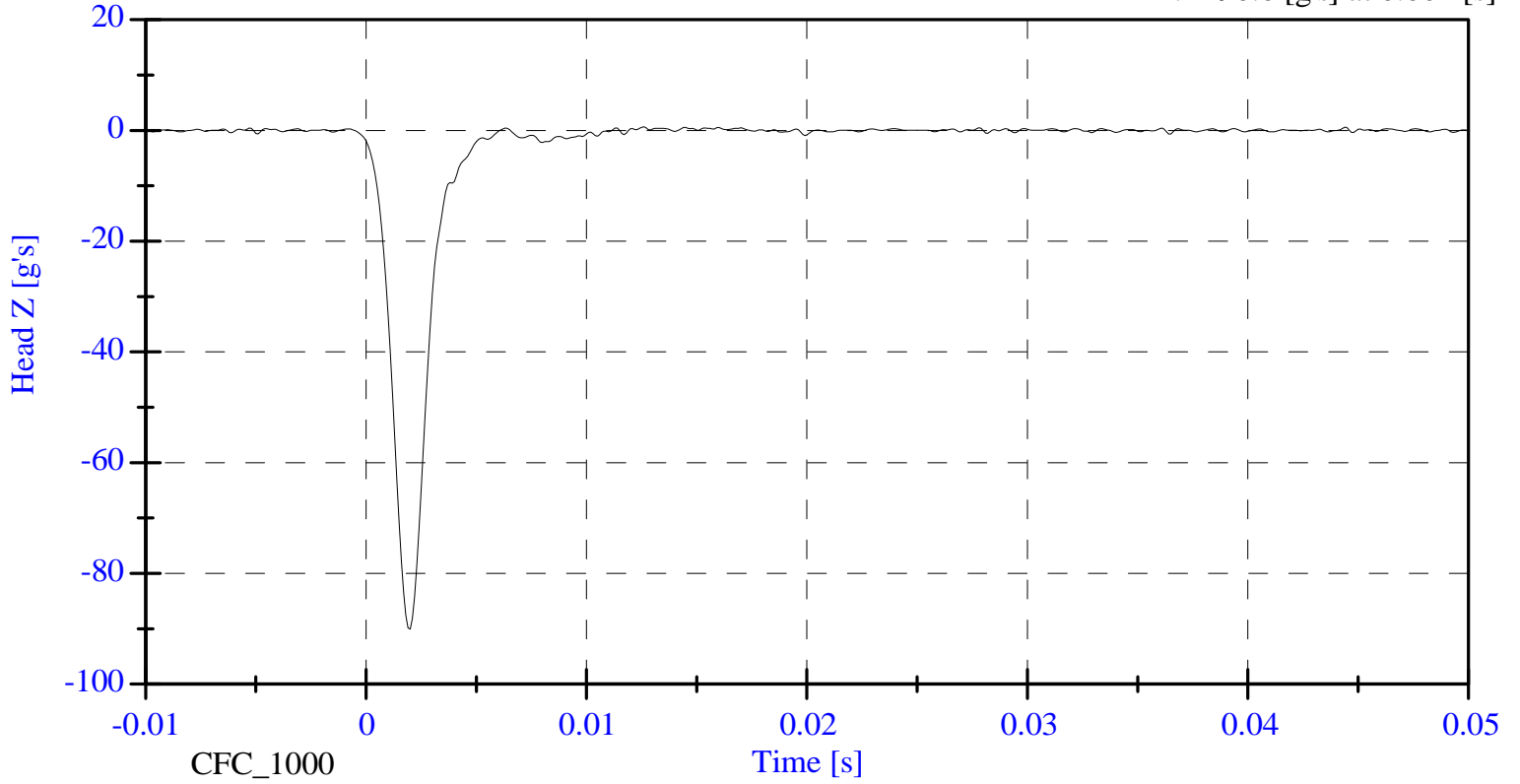
Min: -2.5 [g's] at 0.005 [s]



Head Z Acceleration

Max: 0.7 [g's] at 0.013 [s]

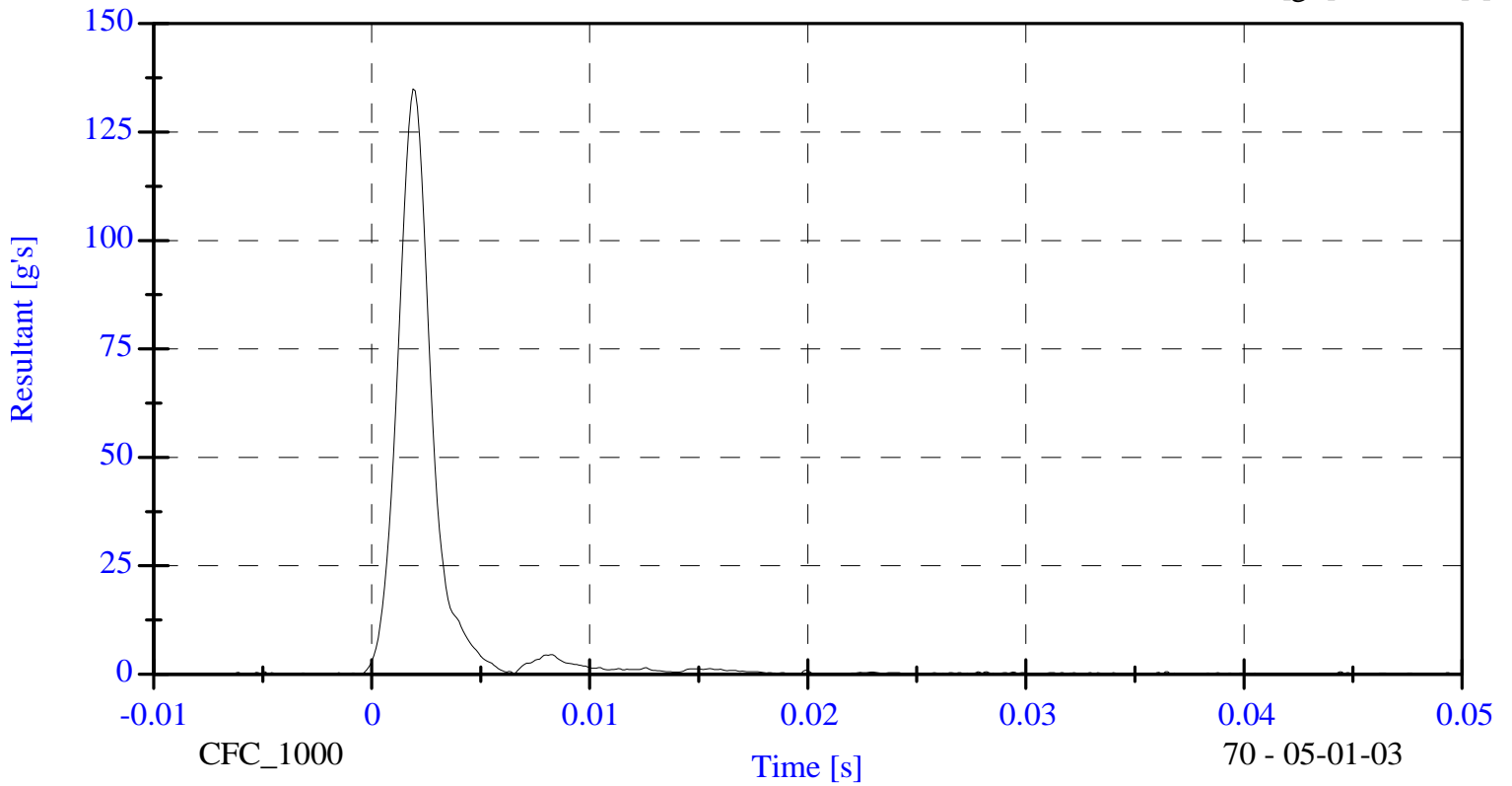
Min: -90.0 [g's] at 0.002 [s]



Head Resultant

Max: 134.9 [g's] at 0.002 [s]

Min: 0.0 [g's] at 0.044 [s]



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

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial No.: 016 Sequential Test Number: 1  
Date: May 1, 2003 Laboratory Technician: B. Swiecicki

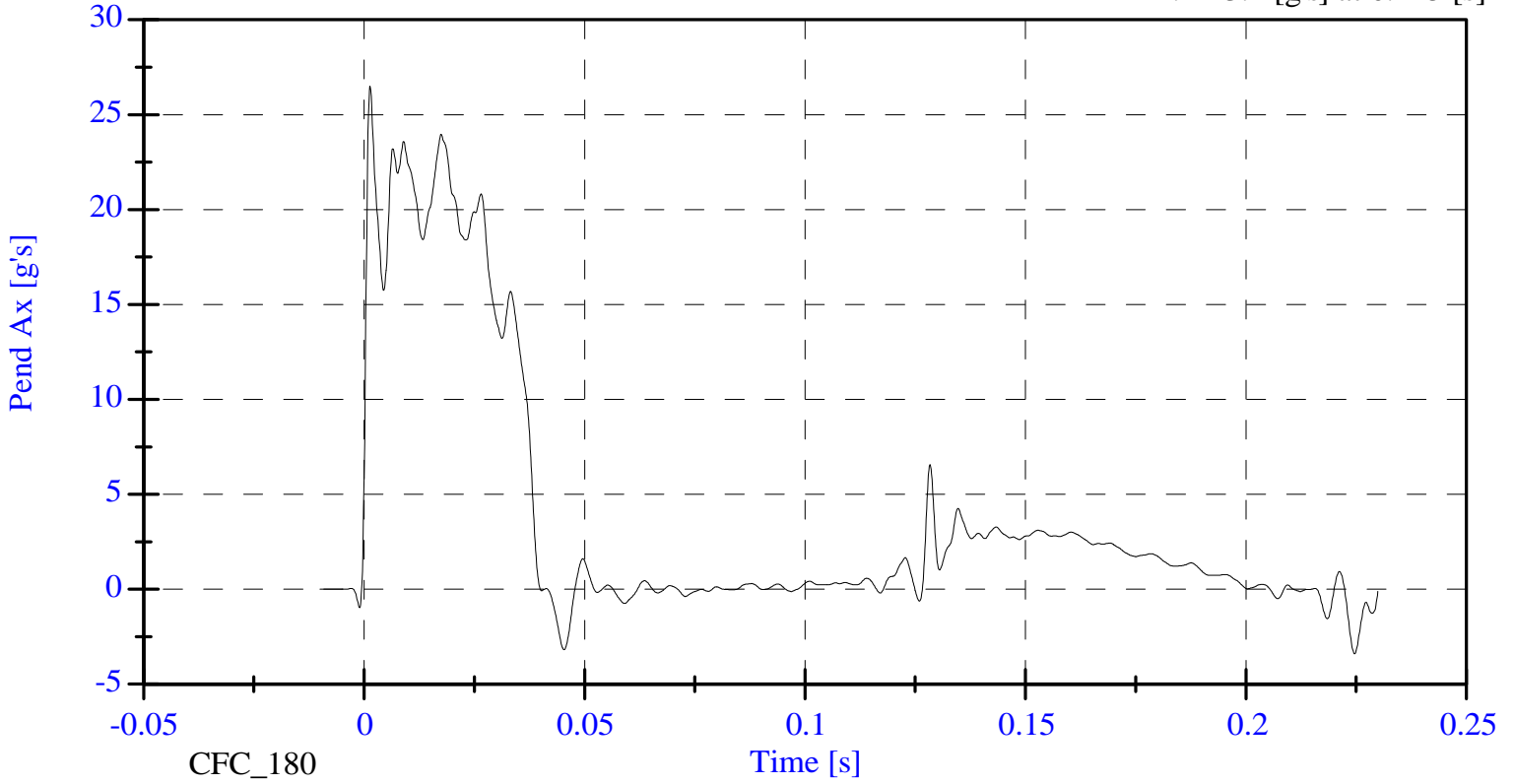
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	20.6 - 22.2	21.1
RELATIVE HUMIDITY (%)	10 - 70	40.0
IMPACT VELOCITY (m/s)	6.89 - 7.13	6.97
PENDULUM DELTA V		
DELTA V @ 10 ms (m/s)	1.96 - 2.55	2.05
DELTA V @ 20 ms (m/s)	4.12 - 5.10	4.13
DELTA V @ 30 ms (m/s)	5.73 - 7.01	6.00
DELTA V @ 40-70 ms (m/s)	6.27 - 7.64	7.01
D PLANE ROTATION		
MAXIMUM ROTATION (deg)	64 - 78	72.21
ROT. ANGLE TIME to ZERO (ms)	50 - 70	58.60
MOMENT ABOUT THE OCCIPITAL CONDYLE		
MAX OCCIPITAL MOMENT (Nm)	88 - 108	89.83
OCCIPITAL MOMENT DECAY (ms)	40.0 - 60.0	51.70
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT		
ROTATION wrt MOMENT (ms)	0 - 20	10.40

**REMARKS:** None

Max: 26.5 [g's] at 0.001 [s]

Min: -3.4 [g's] at 0.225 [s]

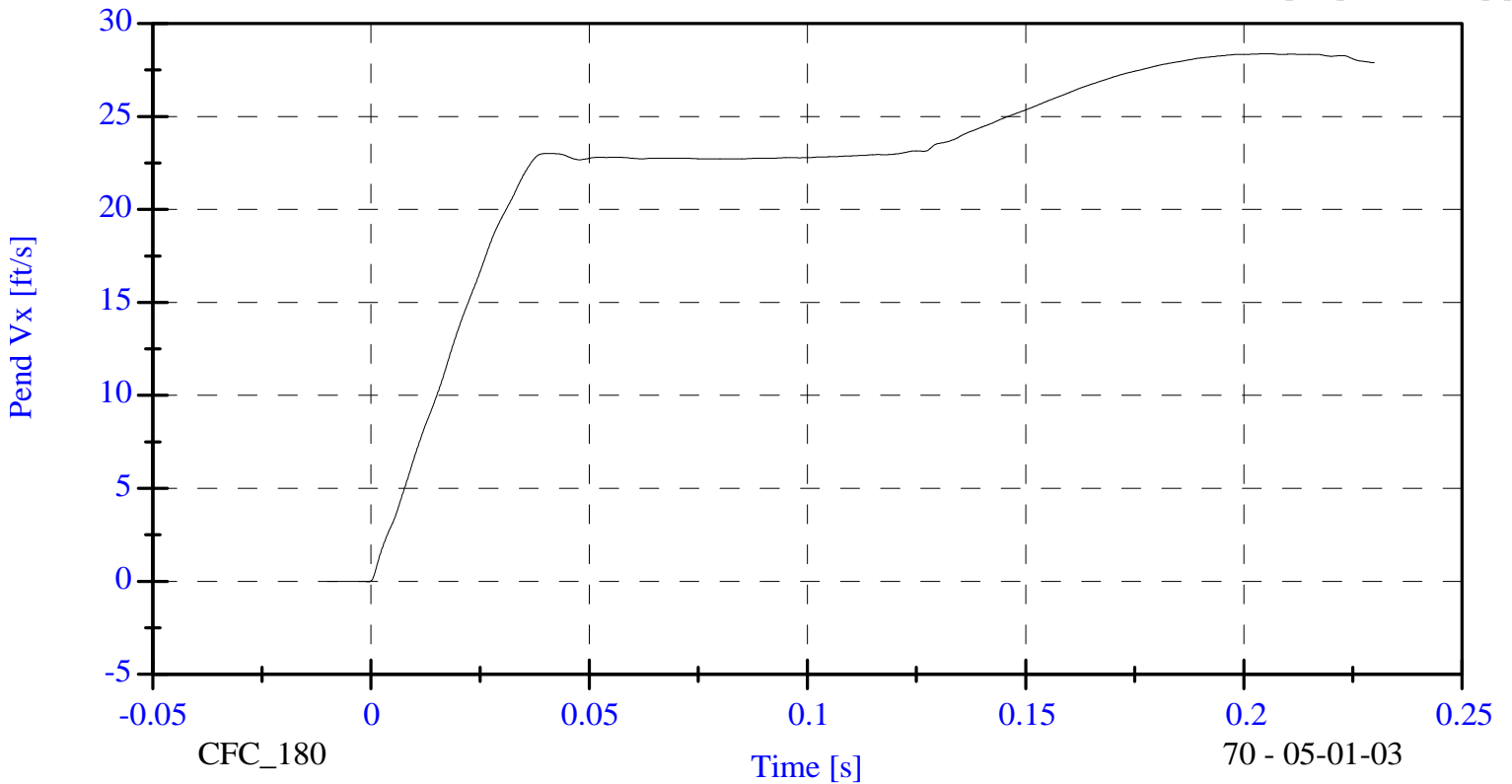
Pendulum Acceleration



Max: 28.4 [ft/s] at 0.205 [s]

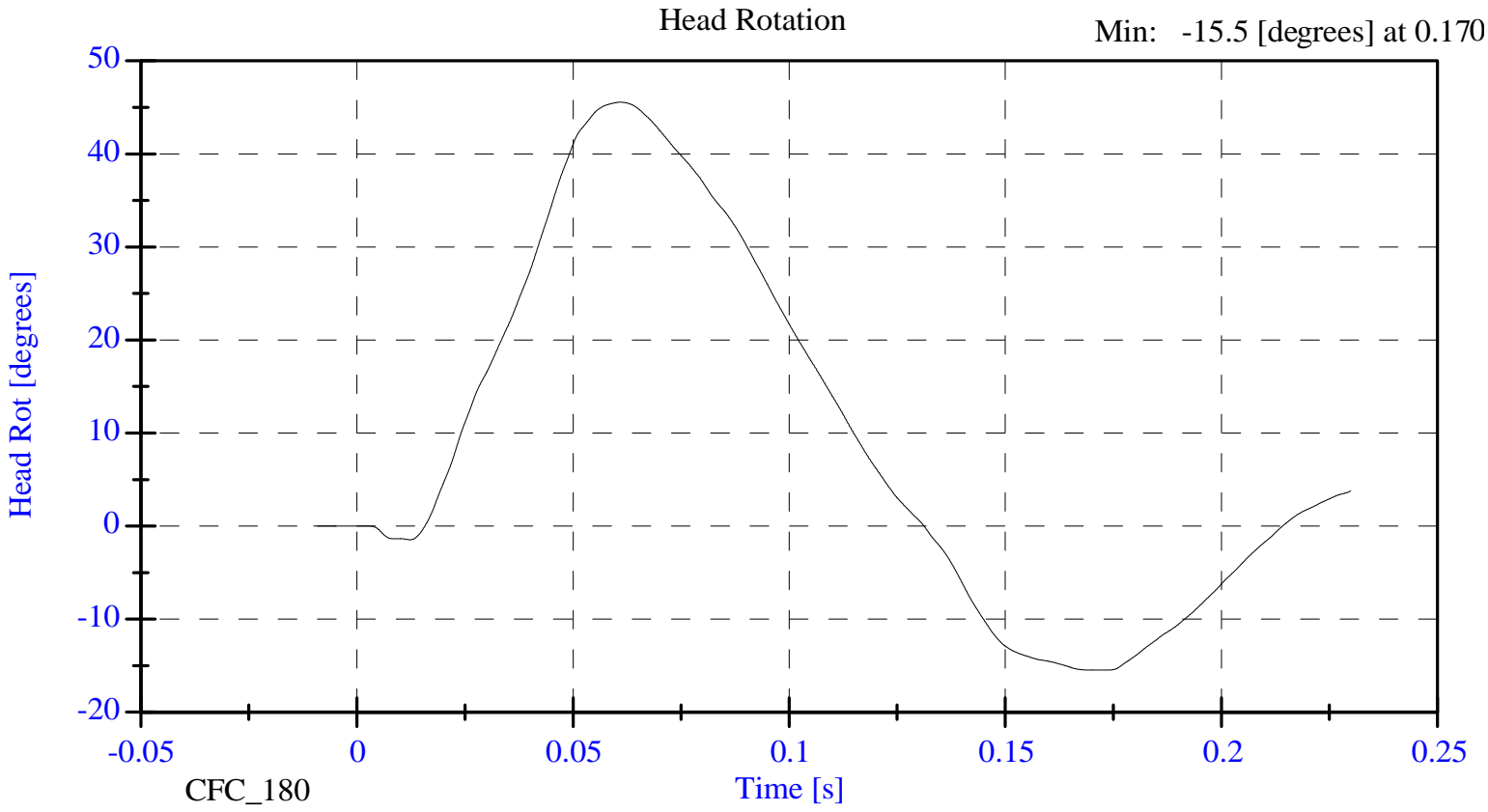
Min: -0.0 [ft/s] at -0.001 [s]

Pendulum Velocity



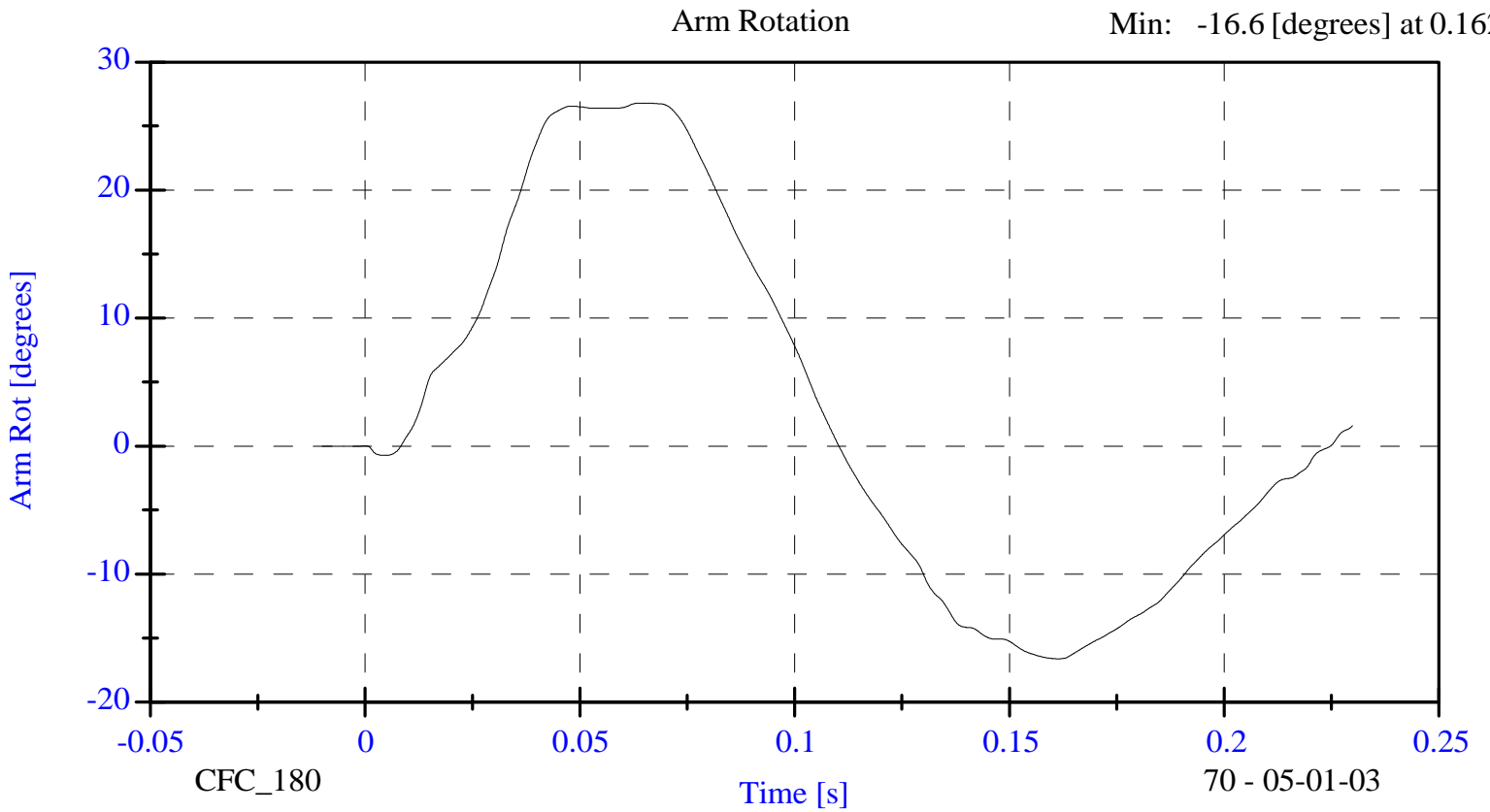
Max: 45.6 [degrees] at 0.061

Min: -15.5 [degrees] at 0.170



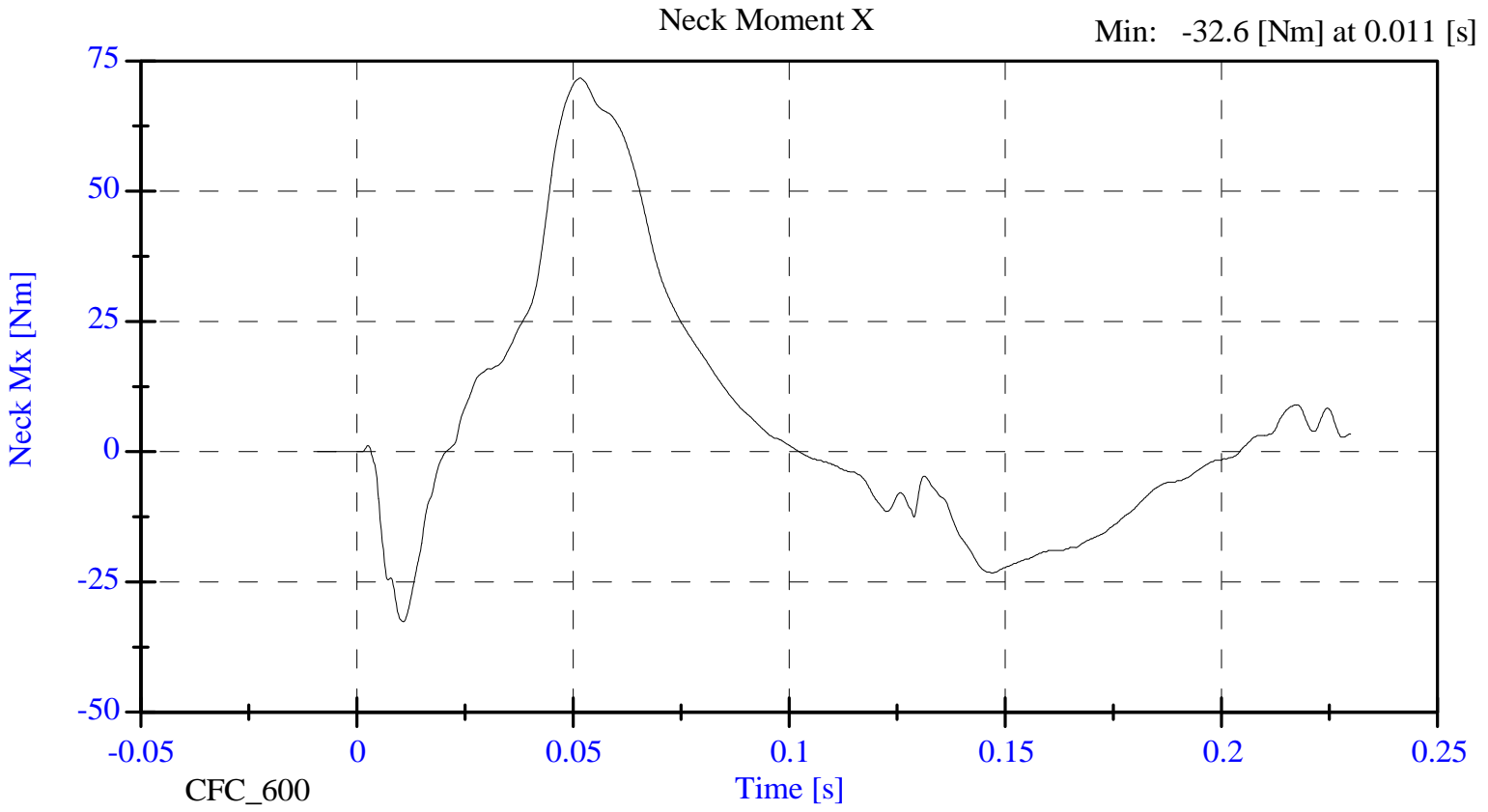
Max: 26.8 [degrees] at 0.064

Min: -16.6 [degrees] at 0.162



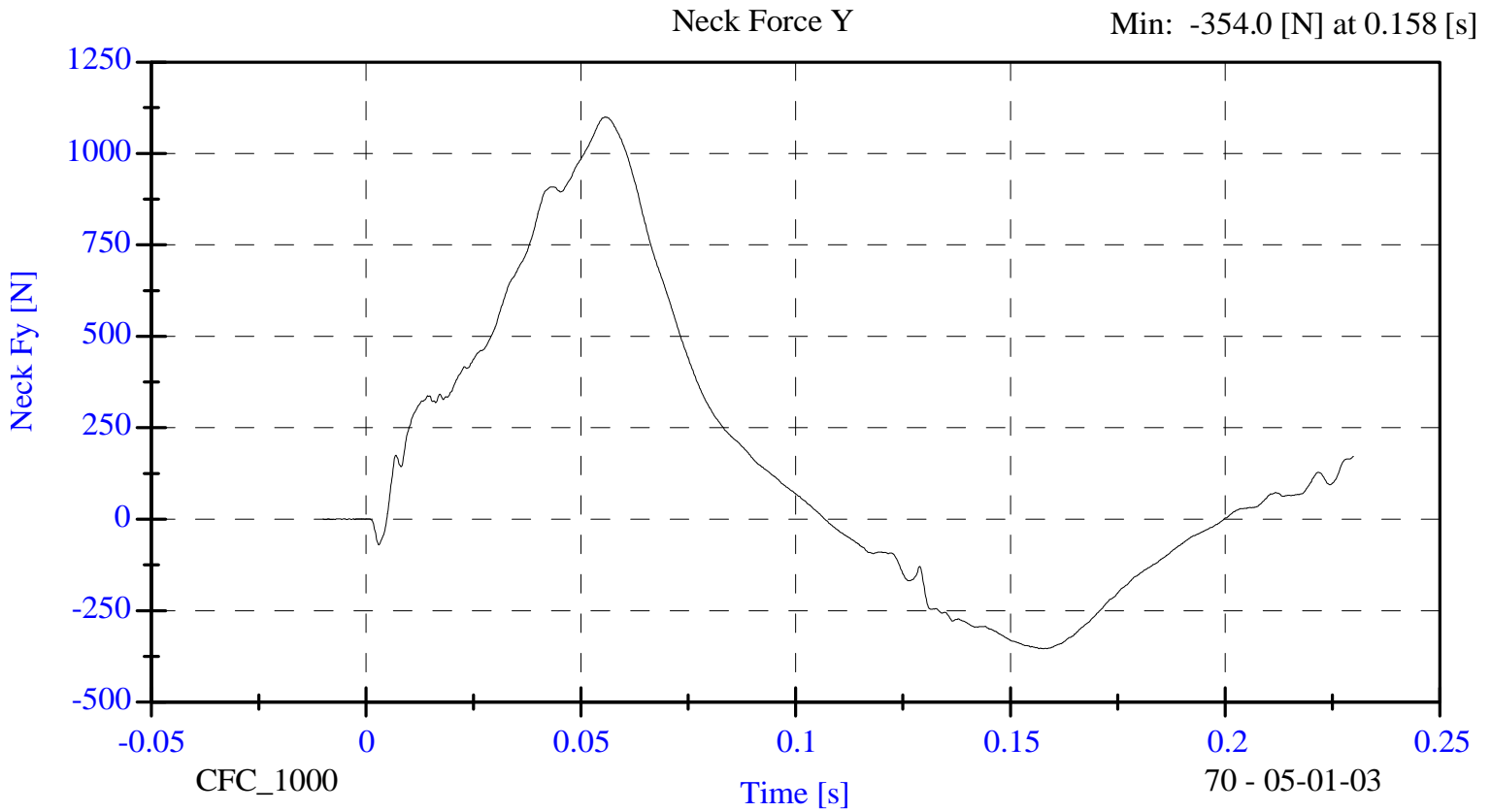
Max: 71.7 [Nm] at 0.052 [s]

Min: -32.6 [Nm] at 0.011 [s]



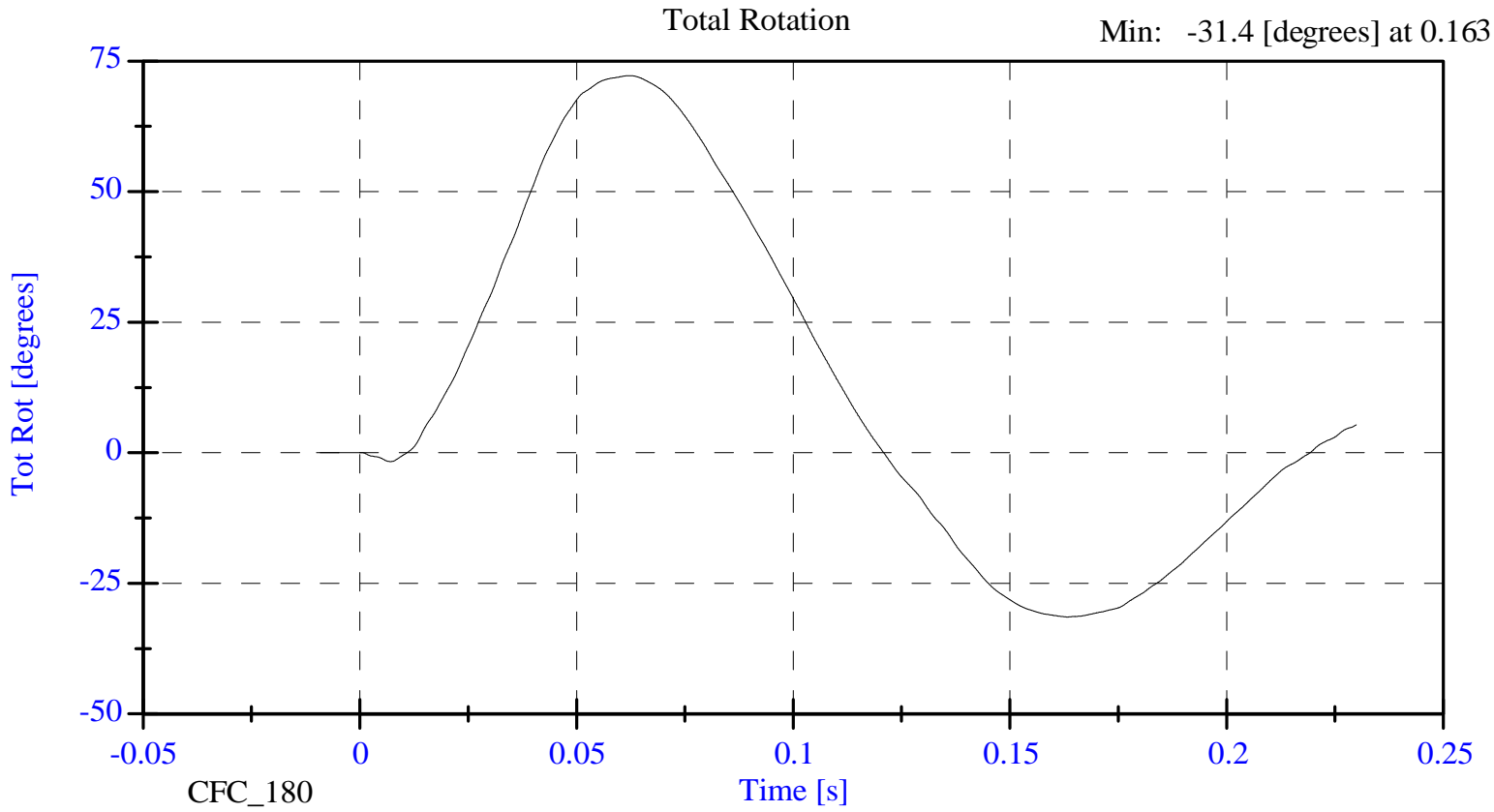
Max: 1099.7 [N] at 0.056 [s]

Min: -354.0 [N] at 0.158 [s]



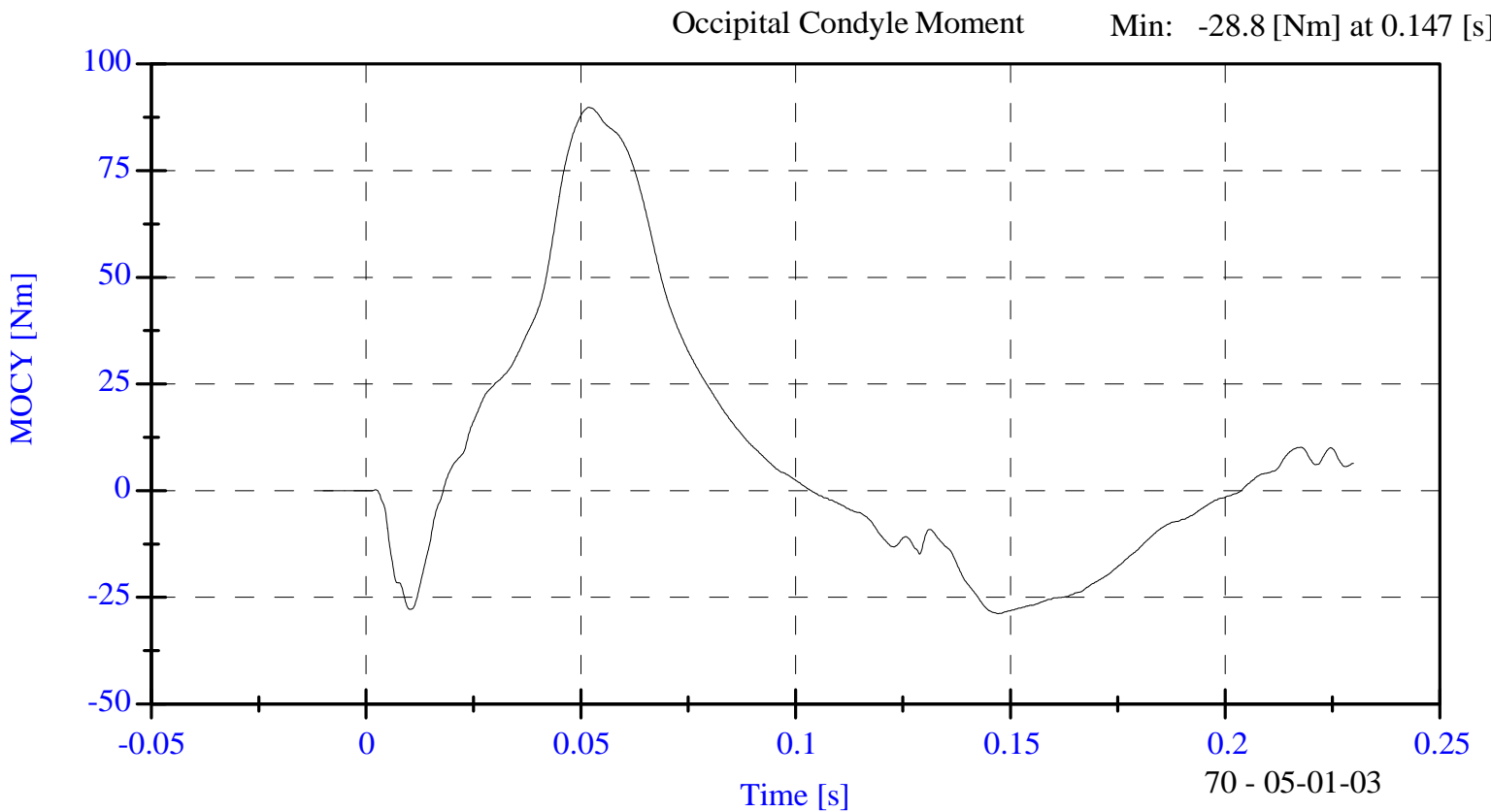
Max: 72.2 [degrees] at 0.062

Min: -31.4 [degrees] at 0.163



Max: 89.8 [Nm] at 0.052 [s]

Min: -28.8 [Nm] at 0.147 [s]



**ABDOMINAL COMPRESSION TEST  
POST TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37.0
FORCE @ 13 mm (N)	104 - 162	118.3
FORCE @ 19 mm (N)	163 - 221	186.8
FORCE @ 25 mm (N)	222 - 280	259.6
FORCE @ 33 mm (N)	325 - 391	361.2

**REMARKS:** None

Dummy S/N 016

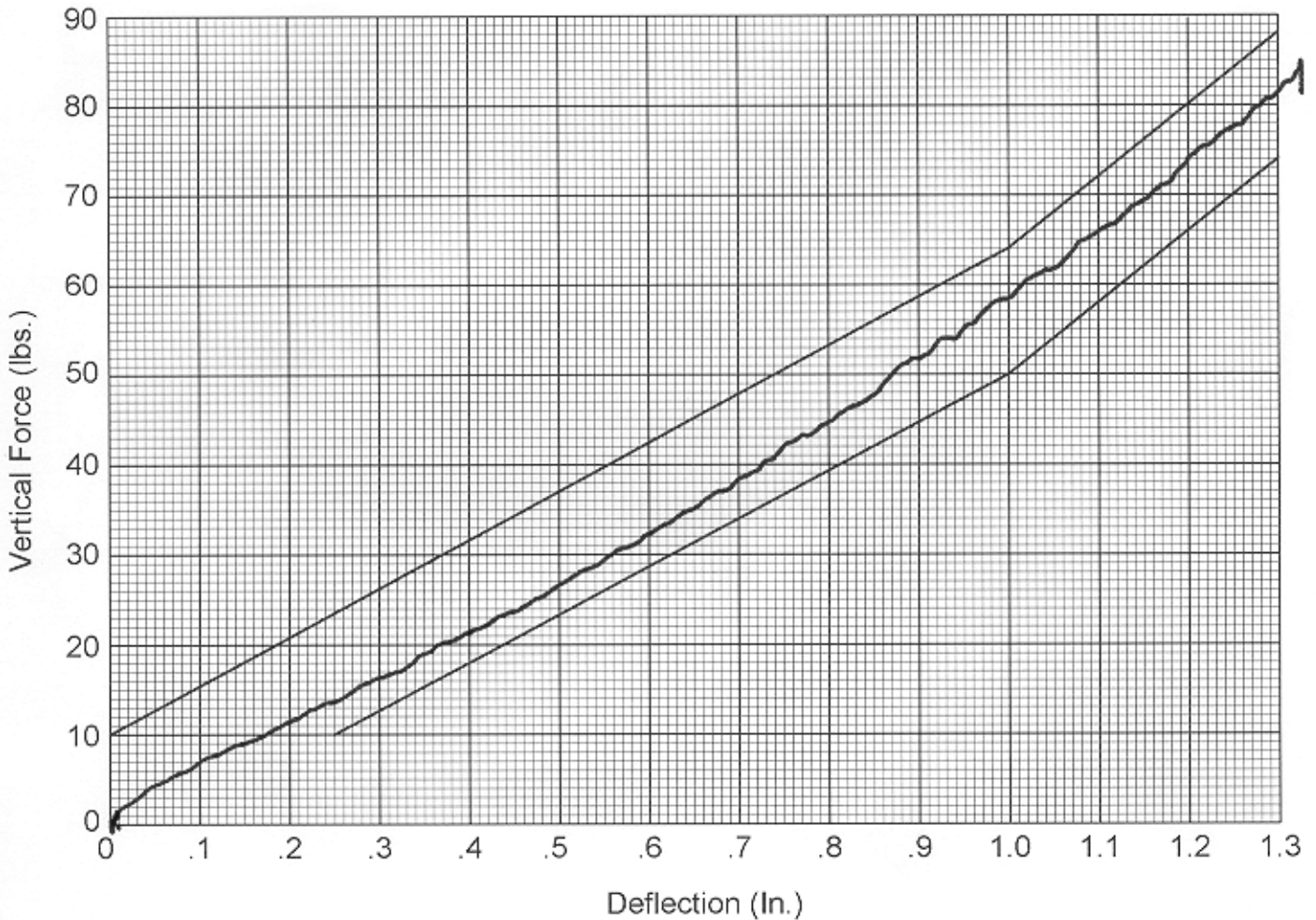
W/A \_\_\_\_\_

Date 5-02-03

Performed By [Signature]

Temp. 70°

Humidity 37%



Hybrid II  
Abdomen Static Press

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

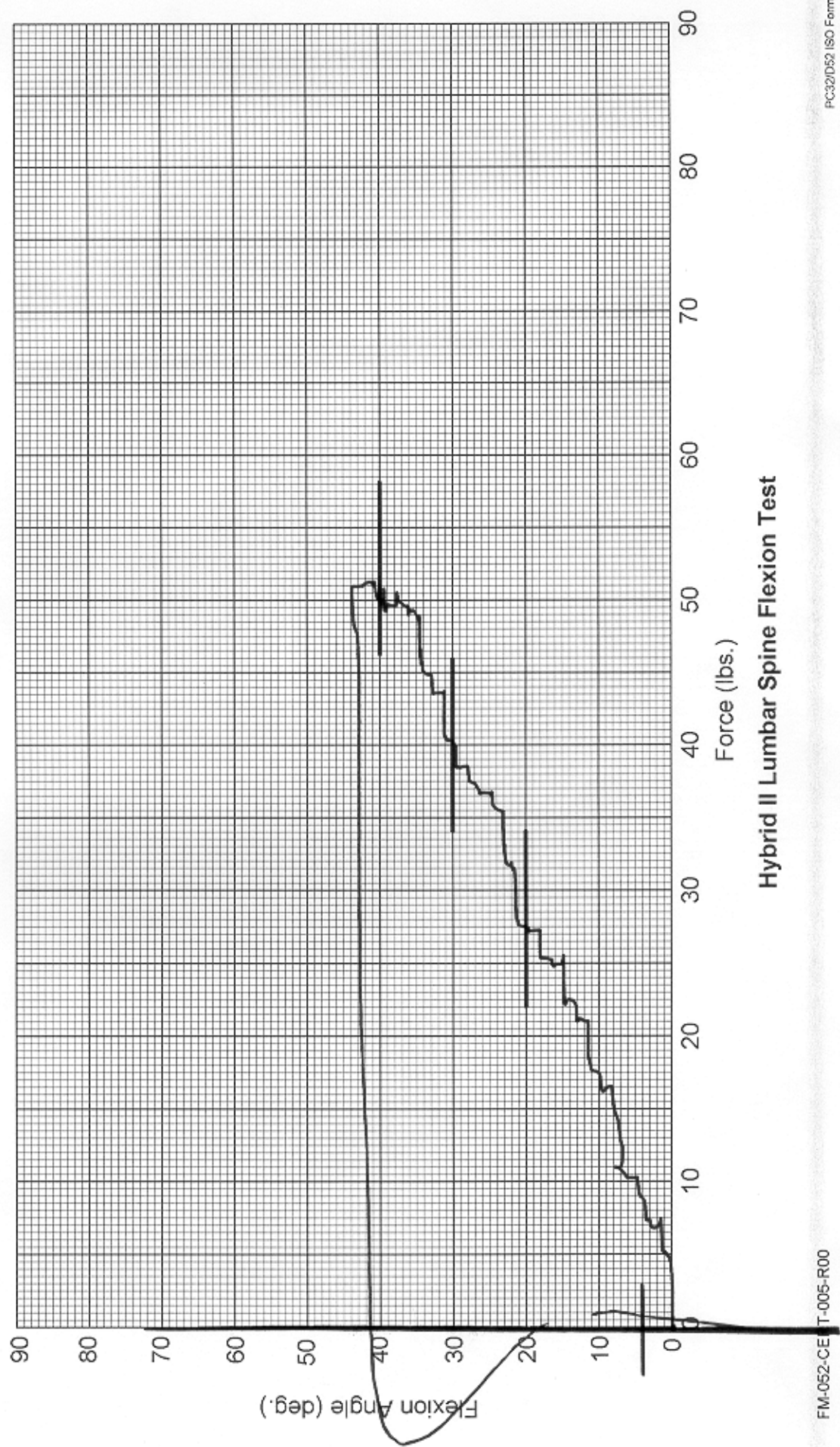
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 016 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.1
RELATIVE HUMIDITY (%)	10 - 70	37.0
FORCE @ 0° (N)	0 - 26.7	0.0
FORCE @ 20° (N)	97.8 - 151.2	121.9
FORCE @ 30° (N)	151.2 - 204.6	178.8
FORCE @ 40° (N)	204.6 - 258	223.7
RETURN ANGLE	12° max.	4°

**REMARKS:** None

Dummy S/N 016  
 W/A \_\_\_\_\_  
 Date 5-02-03  
 Performed By [Signature]  
 Temp. 70°  
 Humidity 37%



Hybrid II Lumbar Spine Flexion Test

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

SID H3 Serial No.: 016 Sequential Test Number: 1  
 Date: May 2, 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



**APPENDIX D**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION  
SID INSTRUMENTATION**

	FRONT SID NO.: 015		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
NAAH HEAD X ARM Y	AC-01G18-F06	ENTRAN	04/07/03
NAAH HEAD X ARM Z	AC-01B00L13-F39	ENTRAN	04/07/03
NAAH HEAD Y ARM X	AC-00L13-F14	ENTRAN	04/07/03
NAAH HEAD Y ARM Z	AC-01G18-F16	ENTRAN	04/07/03
NAAH HEAD Z ARM X	AC-01B00L13-F72	ENTRAN	04/07/03
NAAH HEAD Z ARM Y	AC-01G18-F12	ENTRAN	04/07/03
HEAD AX	AC-P23993	ENDEVCO	11/04/02
HEAD AY	AC-P23939	ENDEVCO	11/04/02
HEAD AZ	AC-P23999	ENDEVCO	11/04/02
UPPER NECK FX	LC-260FX	DENTON	11/12/02
UPPER NECK FY	LC-260FY	DENTON	11/12/02
UPPER NECK FZ	LC-260FZ	DENTON	11/12/02
UPPER NECK MX	LC-260MX	DENTON	11/12/02
UPPER NECK MY	LC-260MY	DENTON	11/12/02
UPPER NECK MZ	LC-260MZ	DENTON	11/12/02
UPPER RIB	AC-P16862	ENDEVCO	02/18/03
LOWER RIB	AC-P16656	ENDEVCO	02/18/03
LOWER SPINE	AC-P16866	ENDEVCO	02/18/03
PELVIS	AC-P16676	ENDEVCO	02/18/03
UPPER RIB REDUNDANT	AC-P23156	ENDEVCO	02/18/03
LOWER RIB REDUNDANT	AC-P16645	ENDEVCO	02/18/03
LOWER SPINE REDUNDANT	AC-P16823	ENDEVCO	02/18/03
PELVIS REDUNDANT	AC-P16843	ENDEVCO	02/18/03

	REAR SID NO.: 016		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
NAAH HEAD X ARM Y	AC-01G18-F08	ENTRAN	04/01/03
NAAH HEAD X ARM Z	AC-00L20-A13	ENTRAN	04/01/03
NAAH HEAD Y ARM X	AC-00L20-A08	ENTRAN	03/28/03
NAAH HEAD Y ARM Z	AC-01G18-F13	ENTRAN	03/28/03
NAAH HEAD Z ARM X	AC-01J02-F18	ENTRAN	03/28/03
NAAH HEAD Z ARM Y	AC-01G25-N11	ENTRAN	03/28/03
HEAD AX	AC-P23960	ENDEVCO	11/10/02
HEAD AY	AC-P23940	ENDEVCO	11/09/02
HEAD AZ	AC-P23899	ENDEVCO	11/10/02
UPPER NECK FX	LC-261FX	DENTON	11/12/02
UPPER NECK FY	LC-261FY	DENTON	11/12/02
UPPER NECK FZ	LC-261FZ	DENTON	11/12/02
UPPER NECK MX	LC-261MX	DENTON	11/12/02
UPPER NECK MY	LC-261MY	DENTON	11/12/02
UPPER NECK MZ	LC-261MZ	DENTON	11/12/02
UPPER RIB	AC-P18524	ENDEVCO	02/17/03
LOWER RIB	AC-P18533	ENDEVCO	02/17/03
LOWER SPINE	AC-P18514	ENDEVCO	02/17/03
PELVIS	AC-P18519	ENDEVCO	02/17/03
UPPER RIB REDUNDANT	AC-P18528	ENDEVCO	02/17/03
LOWER RIB REDUNDANT	AC-P18518	ENDEVCO	02/17/03
LOWER SPINE REDUNDANT	AC-P18688	ENDEVCO	02/17/03
PELVIS REDUNDANT	AC-P18531	ENDEVCO	02/17/03

**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)	AC-J30491	ENDEVCO	04/14/03
RIGHT FRONT SILL (Y)	AC-J31026	ENDEVCO	04/14/03
RIGHT FRONT SILL (Z)	AC-J32831	ENDEVCO	04/14/03
RIGHT REAR SILL (X)	AC-J32383	ENDEVCO	01/21/03
RIGHT REAR SILL (Y)	AC-J29805	ENDEVCO	01/21/03
RIGHT REAR SILL (Z)	AC-J25745	ENDEVCO	01/21/03
REAR FLOORPAN ABOVE AXLE (X)	AC-P21392	ENDEVCO	02/10/03
REAR FLOORPAN ABOVE AXLE (Y)	AC-P19253	ENDEVCO	02/10/03
REAR FLOORPAN ABOVE AXLE (Z)	AC-P23138	ENDEVCO	02/10/03
LEFT REAR SILL (Y)	AC-D29	ICS	01/10/03
LEFT FRONT SILL (Y)	AC-D77	ICS	01/10/03
LEFT FRONT DOOR CENTERLINE (Y)	-	-	-
RIGHT REAR SEAT OCCUPANT COMP. (Y)	AC-8084-014	ICS	11/20/02
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)	AC-8084-010	ICS	11/08/02
MIDDLE LEFT B-PILLAR (Y)	AC-J33198	ENDEVCO	04/16/03
LOWER LEFT A-PILLAR (Y)	AC-8083-032	ICS	11/20/02
UPPER LEFT A-PILLAR (Y)	AC-P23884	ENDEVCO	03/25/03
FRONT SEAT TRACK (Y)	AC-8084-018	ICS	11/11/02
REAR SEAT TRACK (Y)	AC-X92	ICS	04/28/03
VEHICLE CG (X)	AC-P23864	ENDEVCO	03/13/03
VEHICLE CG (Y)	AC-P23926	ENDEVCO	03/13/03
VEHICLE CG (Z)	AC-P23854	ENDEVCO	03/13/03
MDB CG (X)	AC-C16433	ENDEVCO	04/17/03
MDB CG (Y)	AC-C16416	ENDEVCO	04/17/03
MDB CG (Z)	AC-C16499	ENDEVCO	04/17/03
MDB REAR FRAME MEMBER (X)	AC-C14948	ENDEVCO	04/17/03
MDB REAR FRAME MEMBER (Y)	AC-C16680	ENDEVCO	04/15/03

**REMARKS:** None