

636591  
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: 8675-17214-07

VERIDIAN ENGINEERING  
TRANSPORTATION SCIENCES CENTER  
P.O. BOX 400  
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April 29, 2003

**FINAL REPORT**

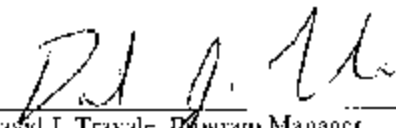
U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Safety Assurance  
Office of Vehicle Safety Compliance  
400 Seventh Street, SW  
Room 6111 (NVS-220)  
Washington, DC 20590

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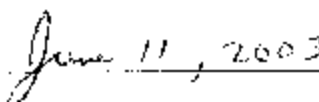
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June 11, 2003

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Acceptance Date:

# TECHNICAL REPORT STANDARD TITLE PAGE

| 1. Report No.<br>214-CAL-03-07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2. Government Accession No.                                                  | 3. Recipient's Catalog No.                                                                                                                                                                                                                                                |             |              |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
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| 4. Title and Subtitle<br>Final Report of FMVSS 214 Compliance Side Impact Testing of a<br>2003 Kia Sorento MPV<br>NHTSA No. C30511                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 5. Report Date<br>April 29, 2003                                             | 5. Performing Organization Code<br>CAI.                                                                                                                                                                                                                                   |             |              |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| 7. Author(s)<br>Lawrence Q. Valvo, Project Engineer<br>David J. Travale, Program Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 8. Performing Organization Report No.<br>8675 F214-07                        |                                                                                                                                                                                                                                                                           |             |              |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| 9. Performing Organization Name and Address<br>Veridian Engineering Transportation Sciences Center<br>P.O. Box 400<br>Buffalo, New York 14225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10. Work Unit No.                                                            | 11. Contractor or Grant No.<br>DTNH22 02 D 0111-1                                                                                                                                                                                                                         |             |              |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
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| 15. Supplementary Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                              |                                                                                                                                                                                                                                                                           |             |              |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| <p>16. Abstract</p> <p>A 55/28 kph 90° Side Impact (Moving Deformable Barrier) Indirect 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°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="1"> <thead> <tr> <th></th> <th>Front SID H3</th> <th></th> <th>Rear SID H3</th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td>33</td> <td>g's</td> <td>25</td> <td>g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td>32</td> <td>g's</td> <td>24</td> <td>g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td>44</td> <td>g's</td> <td>23</td> <td>g's</td> </tr> <tr> <td>Thoracic Trauma Index (TTI):</td> <td>38</td> <td>g's</td> <td>24</td> <td>g's</td> </tr> <tr> <td>Pelvis Acceleration (PIV):</td> <td>45</td> <td>g's</td> <td>31</td> <td>g's</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 bar remained jammed closed due to deformation. The driver and passenger frontal airbags deployed and the right rear tire deflated during the event.</p> |                                                                              |                                                                                                                                                                                                                                                                           |             | Front SID H3 |  | Rear SID H3 |  | Left Upper Rib Acceleration: | 33 | g's | 25 | g's | Left Lower Rib Acceleration: | 32 | g's | 24 | g's | Lower Spine Acceleration: | 44 | g's | 23 | g's | Thoracic Trauma Index (TTI): | 38 | g's | 24 | g's | Pelvis Acceleration (PIV): | 45 | g's | 31 | g's |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Front SID H3                                                                 |                                                                                                                                                                                                                                                                           | Rear SID H3 |              |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| Left Upper Rib Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 33                                                                           | g's                                                                                                                                                                                                                                                                       | 25          | g's          |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| Left Lower Rib Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 32                                                                           | g's                                                                                                                                                                                                                                                                       | 24          | g's          |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| Lower Spine Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 44                                                                           | g's                                                                                                                                                                                                                                                                       | 23          | g's          |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| Thoracic Trauma Index (TTI):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 38                                                                           | g's                                                                                                                                                                                                                                                                       | 24          | g's          |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| Pelvis Acceleration (PIV):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 45                                                                           | g's                                                                                                                                                                                                                                                                       | 31          | g's          |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| 17. Key Words<br>Compliance Testing<br>Side Impact Protection<br>FMVSS 214<br>Side Impact Dummy (SID) HIII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                              | 18. Distribution Statement<br>Copies of this report are available from:<br>National Highway Traffic Safety Administration<br>Technical Reference Division (TIS)<br>Room 5108 (NPO 230)<br>400 Seventh St., S.W.<br>Washington, D.C. 20590<br>Telephone No. (202) 366-4946 |             |              |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
| 19. Security Classification of Report<br>UNCLASSIFIED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 20. Security Classification of Page<br>UNCLASSIFIED                          | 21. No. of Pages<br>3-17                                                                                                                                                                                                                                                  |             |              |  |             |  |                              |    |     |    |     |                              |    |     |    |     |                           |    |     |    |     |                              |    |     |    |     |                            |    |     |    |     |
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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 (LP-214D-06, dated July 26, 2001).

## SECTION 2

### SUMMARY OF SIDE IMPACT TEST

This Side Impact Protection Indicator 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 (PELV) 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 |
|-----------------|--------------|-------------|
| TH (g)          | 38           | 24          |
| PELV (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> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

#### FULLY LOADED:

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>823</u> | Right Front | <u>834</u> | Left Rear | <u>810</u> | Right Rear | <u>825</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

#### READY FOR TEST:

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>823</u> | Right Front | <u>836</u> | Left Rear | <u>824</u> | Right Rear | <u>838</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

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 |

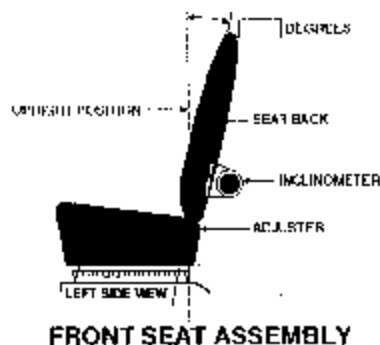
# DATA SHEET 1 (continued)

## 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

### POSITION OF IMPACT (MDB) ON MONORAIL:

Cribbed 27° to left

### MDB DETAILS:

|                                                     |   |             |             |
|-----------------------------------------------------|---|-------------|-------------|
| Overall Width of Framework Carriage                 | = | <u>1750</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>167</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> |
|-----------------------------|---|----------|

# 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 113/016                                                              |
| 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) |
| HEAD ACCELERATIONS:    |                     |             |                |             |                    |             |                |             |
| NAATH X Arm Y          | 27.5                | 69.5        | -5.3           | 35.3        | 68.7               | 66.5        | -5.2           | 43.6        |
| NAATH X Arm Z          | 11.7                | 43.4        | -4.8           | 116.9       | 9.0                | 68.0        | -11.6          | 73.6        |
| NAATH Y Arm X          | 1.8                 | 186.0       | -12.6          | 46.2        | 7.9                | 73.9        | -27.6          | 61.7        |
| NAATH Y Arm Z          | 13.1                | 43.2        | -4.7           | 126.8       | 10.3               | 44.4        | -25.8          | 61.8        |
| NAATH Z Arm X          | 4.6                 | 48.8        | -18.5          | 75.1        | 16.1               | 68.9        | -31.3          | 61.6        |
| NAATH Z Arm Y          | 26.7                | 64.7        | -6.3           | 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              |             |                |             |
| NECK FORCES:           |                     |             |                |             |                    |             |                |             |
| Longitudinal X         | 31.3                | 198.4       | -378.4         | 69.6        | 505.4              | 71.0        | -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          | 111.8       | 357.6              | 41.8        | -1824.6        | 71.1        |
| Resultant R            | 699.4               | 69.1        | -              | -           | 2409.3             | 71.7        | -              | -           |
| NECK MOMENTS:          |                     |             |                |             |                    |             |                |             |
| 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       | 11.8           | 71.4        |
| Resultant R            | 39.6                | 69.5        | -              | -           | 36.5               | 71.3        | -              | -           |
| RIB ACCELERATIONS:     |                     |             |                |             |                    |             |                |             |
| 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       |
| SPINE ACCELERATIONS:   |                     |             |                |             |                    |             |                |             |
| 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        |
| PELVIS ACCELERATIONS:  |                     |             |                |             |                    |             |                |             |
| 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.

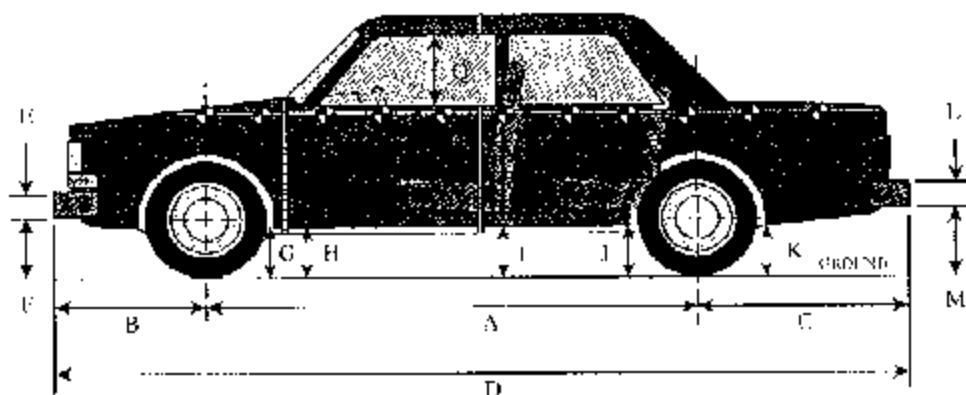
| Data invalid after 17 ms

# 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<br>(as delivered) | PRE-TEST<br>(as tested) | POST-TEST<br>(as tested) | 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 | 319                        | 299                     | 304                      | 5      |
| K  | 425                        | 366                     | 353                      | -13    |
| L  | 281                        |                         | 281                      | -3     |
| M  | 462                        | 401                     | 353                      | -51    |
| N  | 752                        | -                       | 742                      | -10    |
| O  | 707                        | -                       | 698                      | -9     |
| P  | 1414                       | -                       | 1371                     | -13    |
| Q  | 540                        |                         | 583                      | 43     |
| R  | 1388                       | -                       | 1398                     | 10     |
| S  | 4388                       | -                       | 1358                     | -30    |
| T  | 1816                       |                         | 1595                     | -221   |

D = Length at Centerline

F&L = Bumper Thickness

R = Right Side Length

S = Left Side Length

T = Width at B-Pillar

J1 = To Dash Weld

J2 = To Sill

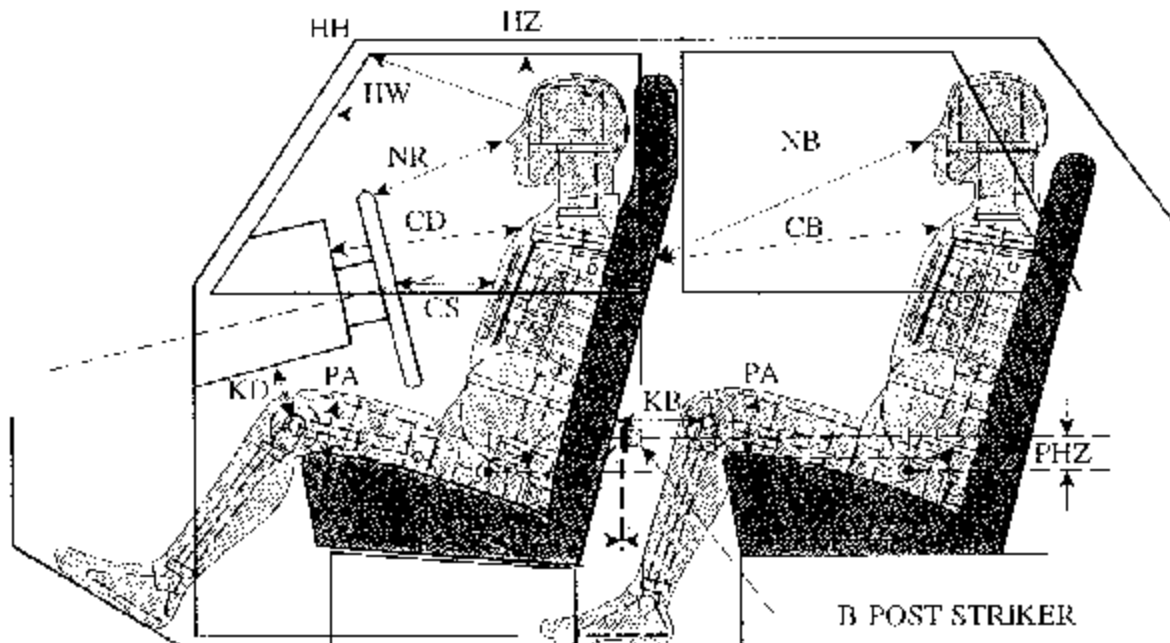


# DATA SHEET 7

## SID II3 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                     |

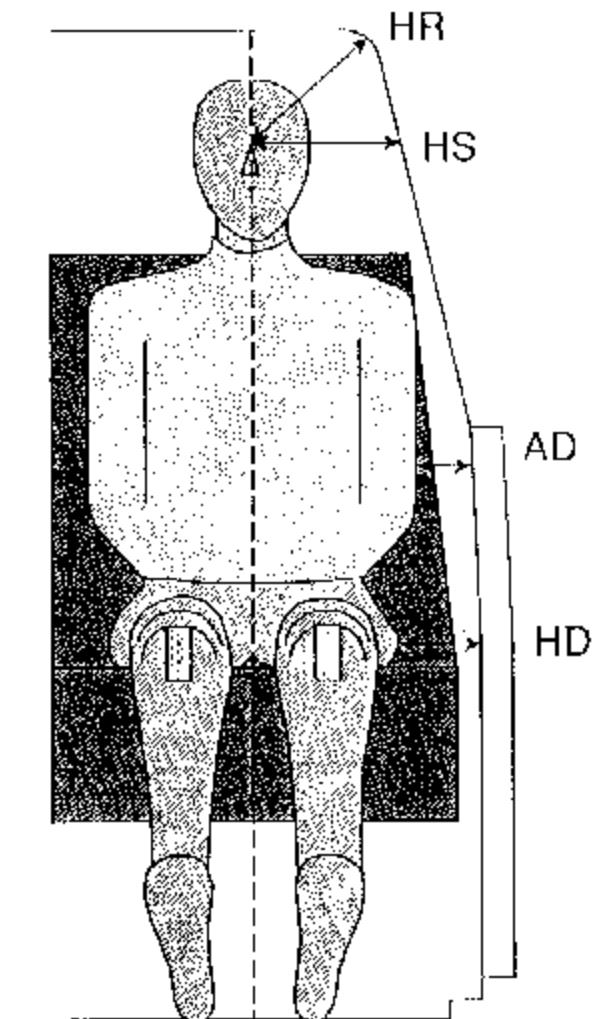
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4 door vehicle would use the C post striker as a reference point.

# DATA SHEET 8

## SID H3 LATERAL CLEARANCE DIMENSIONS

Vehicle: 2003 Kia Sorento MPV

NHTSA No. CJ0511



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.

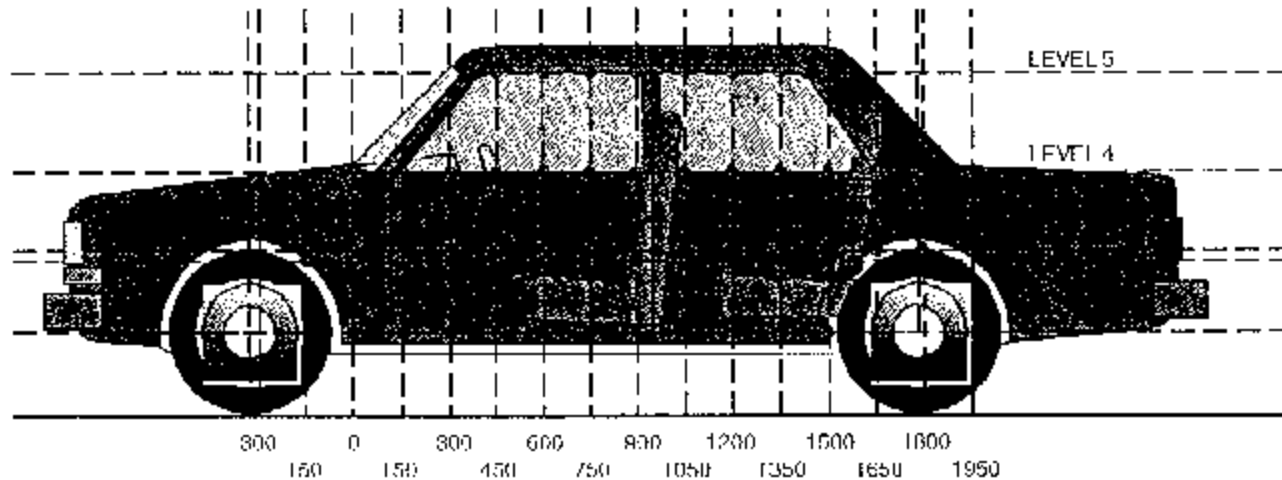
Upper measurement is taken laterally at the center of the upper rib accelerometer height from the SID H3 arm segment to the closest part of the vehicle side.

# 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:

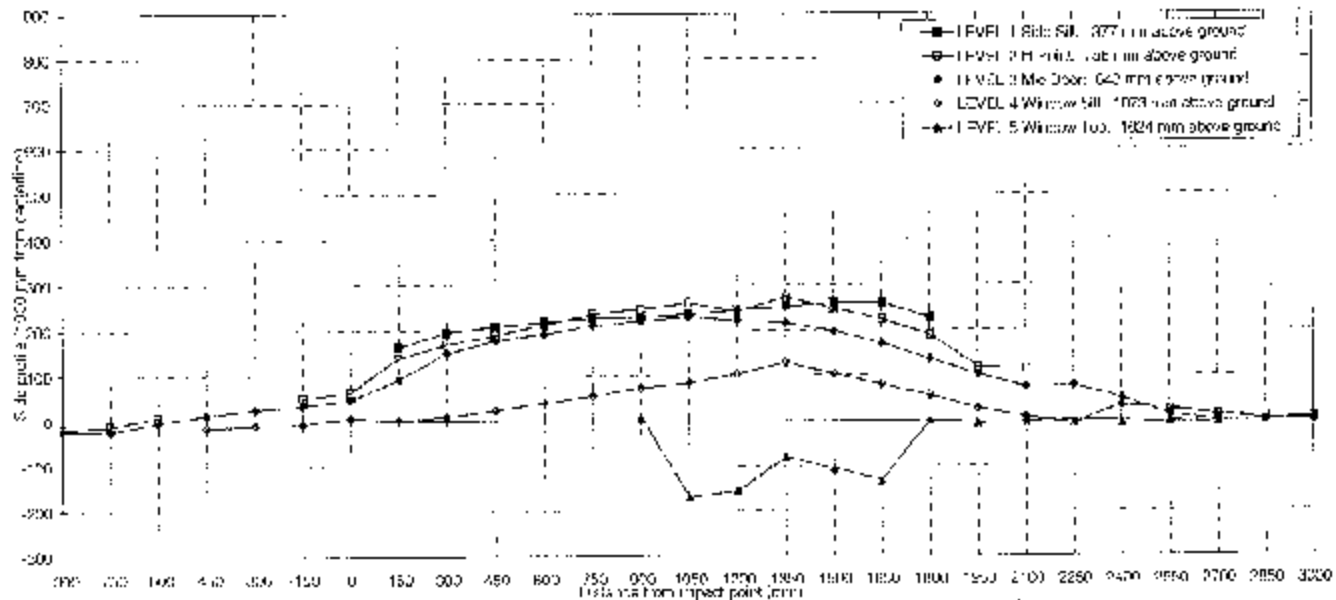
|                                                          |   |      |             |
|----------------------------------------------------------|---|------|-------------|
| Level 5 @ Window Top                                     | = | 1624 | millimeters |
| Level 4 @ Window Sill                                    | = | 1073 | millimeters |
| Level 3 @ Mid Door                                       | = | 843  | millimeters |
| Level 2 @ Occupant H Point                               | = | 756  | millimeters |
| Level 1 @ Axle Centerline Height<br>(or Sill Top Height) | = | 377  | 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 0.5 mm

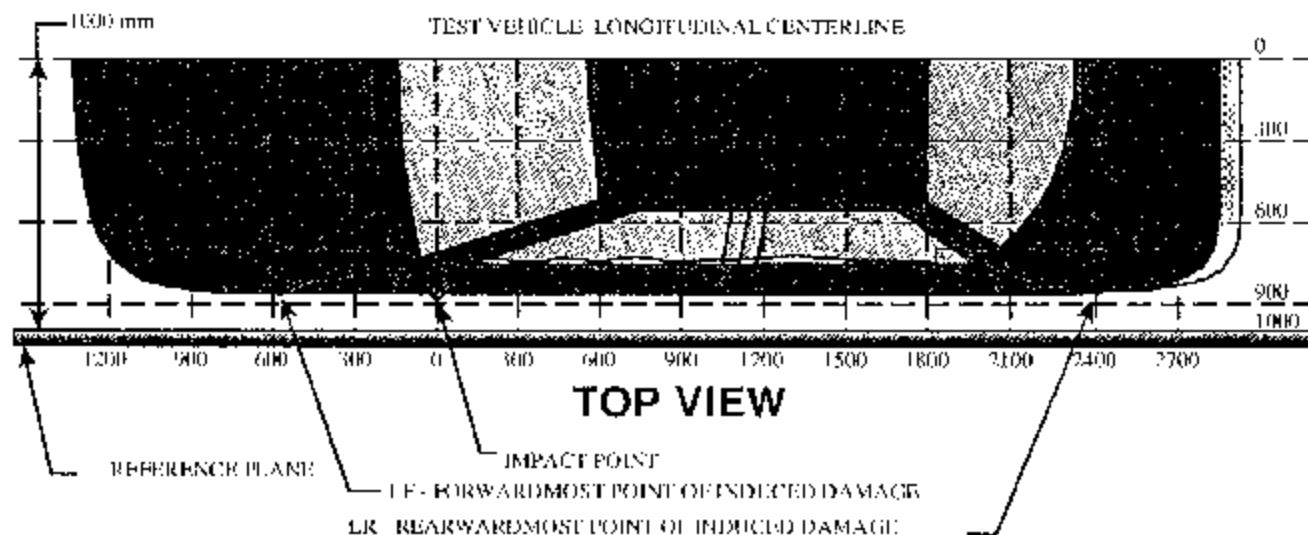
|                        |             | DISTANCE IN MILLIMETERS FROM IMPACT POINT |      |      |      |      |      |      |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |  |
|------------------------|-------------|-------------------------------------------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| LEVEL                  | HEIGHT (mm) |                                           | -914 | -762 | -610 | -458 | -306 | -154 | 0   | 152 | 304 | 456 | 608 | 760 | 912 | 1064 | 1216 | 1368 | 1520 | 1672 | 1824 | 1976 | 2128 | 2280 | 2432 | 2584 | 2736 | 2888 | 3040 |     |  |
| LEVEL 1<br>SIDE SILL   | 377         | REF                                       | --   | --   | --   | --   | --   | --   | REF | 120 | 180 | 110 | 140 | 140 | 122 | 142  | 150  | 150  | 153  | 155  | --   | --   | --   | --   | --   | --   | --   | --   | --   | --  |  |
|                        |             | POST                                      | --   | --   | --   | --   | --   | --   | 214 | 240 | 306 | 267 | 370 | 360 | 302 | 392  | 431  | 415  | 415  | 391  | --   | --   | --   | --   | --   | --   | --   | --   | --   |     |  |
|                        |             | CRUSH                                     | NA   | NA   | NA   | NA   | NA   | NA   | NA  | 156 | 250 | 308 | 278 | 277 | 29  | 258  | 251  | 251  | 260  | 263  | 270  | 263  | 405  | NA   | NA   | NA   | NA   | NA   | NA   |     |  |
| LEVEL 2<br>H-BEAM      | 161         | REF                                       | 196  | 120  | 72   | --   | --   | 51   | 103 | 124 | 105 | 103 | 103 | 102 | 109 | 104  | 103  | 122  | 100  | 136  | 100  | 104  | 71   | --   | --   | 161  | 154  | 154  | 158  |     |  |
|                        |             | POST                                      | 170  | 103  | 120  | --   | --   | 115  | 110 | 244 | 273 | 291 | 215 | 300 | 255 | 354  | 346  | 378  | 353  | 396  | 356  | 222  | 206  | --   | --   | 144  | 150  | 160  | 191  |     |  |
|                        |             | CRUSH                                     | 112  | 112  | 7    | NA   | NA   | 50   | 140 | 190 | 190 | 210 | 246 | 315 | 263 | 210  | 271  | 271  | 271  | 271  | 271  | 271  | 271  | 271  | 271  | 271  | 271  | 271  | 271  | 271 |  |
| LEVEL 3<br>MID DOOR    | 642         | REF                                       | 207  | 157  | 118  | 57   | 58   | 117  | 103 | 114 | 191 | 100 | 100 | 100 | 100 | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  |     |  |
|                        |             | POST                                      | 186  | 178  | 168  | 170  | 21   | 129  | 159 | 190 | 252 | 270 | 295 | 310 | 300 | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300 |  |
|                        |             | CRUSH                                     | 172  | 174  | 174  | 11   | 11   | 57   | 103 | 114 | 191 | 100 | 100 | 100 | 100 | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100 |  |
| LEVEL 4<br>WINDOW SILL | 1023        | REF                                       | --   | --   | --   | 210  | 291  | 218  | 103 | 114 | 191 | 100 | 100 | 100 | 100 | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  |     |  |
|                        |             | POST                                      | --   | --   | --   | 299  | 290  | 210  | 103 | 114 | 191 | 100 | 100 | 100 | 100 | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100 |  |
|                        |             | CRUSH                                     | NA   | NA   | NA   | 16   | 11   | 8    | 103 | 114 | 191 | 100 | 100 | 100 | 100 | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100 |  |
| LEVEL 5<br>WINDOW TOP  | 1824        | REF                                       | --   | --   | --   | --   | --   | --   | --  | --  | --  | --  | --  | --  | 260 | 364  | 360  | 318  | 350  | 368  | 350  | 390  | 360  | 390  | 360  | 390  | 360  | 390  | 360  |     |  |
|                        |             | POST                                      | --   | --   | --   | --   | --   | --   | --  | --  | --  | --  | --  | --  | NA  | 161  | 190  | 260  | 340  | 220  | 350  | 354  | 350  | 370  | 394  | 404  | 446  | --   | --   |     |  |
|                        |             | CRUSH                                     | NA   | NA   | NA   | NA   | NA   | NA   | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   | 170  | 157  | 82   | 170  | 173  | 2    | 6    | 4    | 4    | 4    | 4    | 4    | 4    | 4   |  |

# DATA SHEET 11

## VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30511



### MEASUREMENT CONVENTIONS

Forward of the impact point (towards front of vehicle) is considered negative (-)  
 Rearward of the impact point (towards rear of vehicle) is considered positive (+).

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

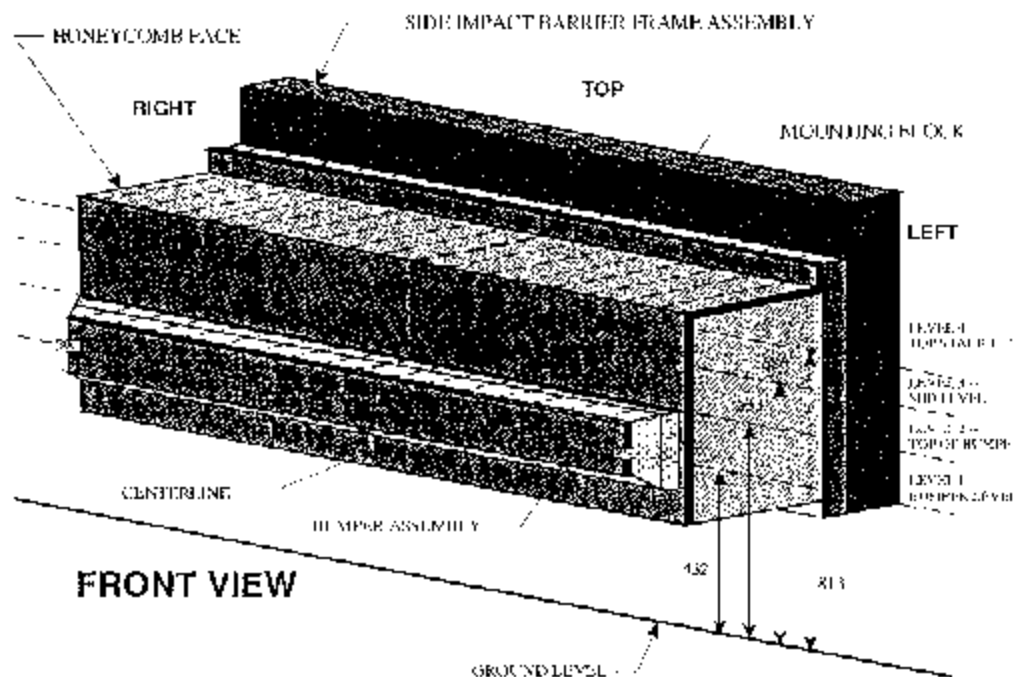
| DPD MEASUREMENTS | POST TEST (mm) | PRETEST (mm) | STATIC CRUSH (mm) |
|------------------|----------------|--------------|-------------------|
| 1 (LR - 2875mm)  | 167            | 160          | 7                 |
| 2                | 2188           | 97           | 76                |
| 3                | 1501           | 150          | 260               |
| 4                | 814            | 105          | 240               |
| 5                | 127            | 104          | 178               |
| 6 (LL - 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 |     | 100                          | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| LEVEL 4<br>TOP<br>STACK  | 813               | PRE   | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 | 619 | 619 |
|                          |                   | POST  | 734                           | 715 | 699 | 682 | 663 | 641 | 609 | 675 | 675 | 675                          | 658 | 639 | 701 | 722 | 742 | 751 | 828 |
|                          |                   | CRUSH | 115                           | 97  | 80  | 68  | 62  | 80  | 80  | 56  | 56  | 59                           | 70  | 54  | 103 | 113 | 135 | 162 | 209 |
| LEVEL 3<br>MID<br>LEVEL  | 686               | PRE   | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 | 619 | 619 |
|                          |                   | POST  | 705                           | 679 | 664 | 652 | 637 | 619 | 609 | 650 | 650 | 650                          | 659 | 603 | 648 | 680 | 705 | 732 | 763 |
|                          |                   | CRUSH | 86                            | 57  | 45  | 38  | 62  | 78  | 60  | 36  | 36  | 40                           | 40  | 43  | 49  | 61  | 86  | 113 | 144 |
| LEVEL 2<br>TOP<br>BUMPER | 533               | PRE   | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 | 619 | 619 |
|                          |                   | POST  | 732                           | 743 | 740 | 733 | 736 | 734 | 734 | 734 | 732 | 732                          | 730 | 711 | 711 | 735 | 746 | 739 | 750 |
|                          |                   | CRUSH | 112                           | 124 | 121 | 119 | 117 | 113 | 113 | 113 | 113 | 111                          | 114 | 111 | 116 | 117 | 120 | 130 | 140 |
| LEVEL 1<br>MID<br>BUMPER | 432               | PRE   | 518                           | 519 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518                          | 518 | 518 | 518 | 518 | 518 | 519 | 535 |
|                          |                   | POST  | 670                           | 654 | 649 | 648 | 649 | 649 | 649 | 651 | 650 | 647                          | 647 | 650 | 651 | 652 | 660 | 672 | 696 |
|                          |                   | CRUSH | 152                           | 135 | 131 | 130 | 121 | 131 | 132 | 133 | 132 | 129                          | 129 | 122 | 133 | 134 | 142 | 155 | 161 |

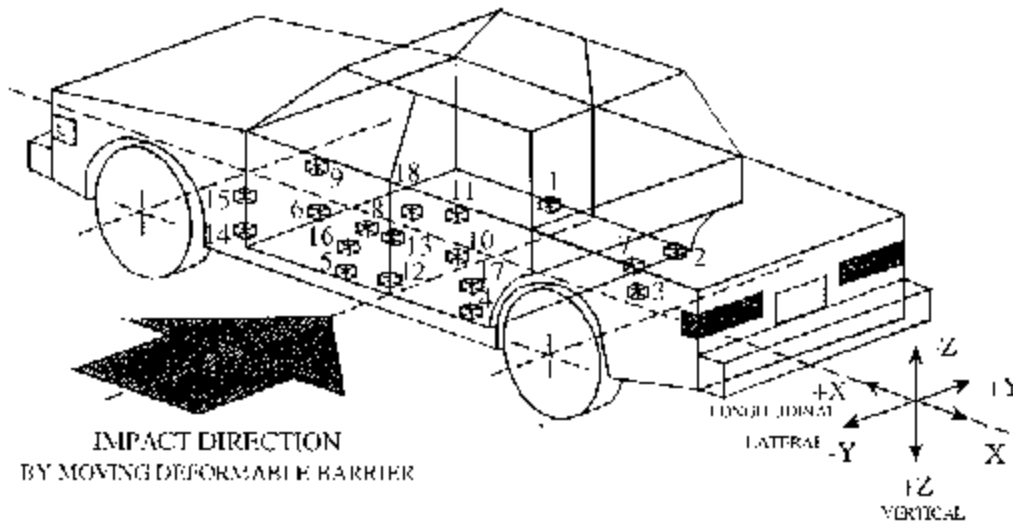
\*Heights measured above ground level.

# 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 Sonesta MPV

NHTSA No. C30511

| Accel. No. | Location                         | Coordinates (m, ft) *E3 |      |      | 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) |
| 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     | 1835                    | 610  | -469 | pos. 8.1  | 17.8        | 29.5     | 6.3         | 8.5       | 32.5        | 21.3      | 6.4         |
|            |                                  |                         |      |      | neg. -5.7 | 8.5         | -2.5     | 100.8       | -12.7     | 25.6        | -         | -           |
| 3          | Rear Floorpan Above Axle         | 1168                    | 62   | -720 | pos. 4.6  | 75.7        | 31.5     | 6.2         | 8.2       | 31.9        | 3.8       | 5.3         |
|            |                                  |                         |      |      | neg. -5.5 | 44.9        | -3.5     | 17.4        | -7.8      | 68.9        | -         | -           |
| 4          | Left Side Sill at Rear Seat      | 1899                    | -632 | 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  | -457 | 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.



# DATA SHEET 13 (continued)

## VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Kia Sorrento MPV

NHTSA No. C-0511

| Accel No. | Location             | Coordinates (mm)±3 |      |       | Long. (X) |             | Lat. (Y) |             | Vert. (Z) |             | Resulant |             |
|-----------|----------------------|--------------------|------|-------|-----------|-------------|----------|-------------|-----------|-------------|----------|-------------|
|           |                      | 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  | -         | -           | 260.9    | 4.4         | -         | -           | -        | -           |
|           |                      |                    |      |       | -         | -           | -70.8    | 13.4        | -         | -           | -        | -           |
| 13        | Left Middle B-Pillar | 2069               | -698 | -936  | -         | -           | 125.4    | 4.4         | -         | -           | -        | -           |
|           |                      |                    |      |       | -         | -           | -69.8    | 14.1        | -         | -           | -        | -           |
| 14        | Left Lower A-Pillar  | 3130               | -655 | -710  | -         | -           | 162.8    | 4.8         | -         | -           | -        | -           |
|           |                      |                    |      |       | -         | -           | 78.7     | 84.1        | -         | -           | -        | -           |
| 15        | Left Middle A-Pillar | 2087               | -688 | -1204 | -         | -           | 68.8     | 28.6        | -         | -           | -        | -           |
|           |                      |                    |      |       | -         | -           | -34.6    | 32.0        | -         | -           | -        | -           |
| 16        | Front Seat Track     | 2224               | -609 | -513  | -         | -           | 73.6     | 9.2         | -         | -           | -        | -           |
|           |                      |                    |      |       | -         | -           | -26.0    | 58.2        | -         | -           | -        | -           |
| 17        | Rear Seat Track      | 1171               | -352 | -703  | -         | -           | 25.3     | 6.5         | -         | -           | -        | -           |
|           |                      |                    |      |       | -         | -           | -3.2     | 17.3        | -         | -           | -        | -           |
| 18        | Vehicle CG           | 2560               | 16   | -727  | 14.5      | 23.0        | 40.7     | 26.4        | 45.0      | 29.0        | 57.0     | 36.6        |
|           |                      |                    |      |       | -7.4      | 9.8         | -19.5    | 41.1        | -50.3     | 36.7        | -        | -           |

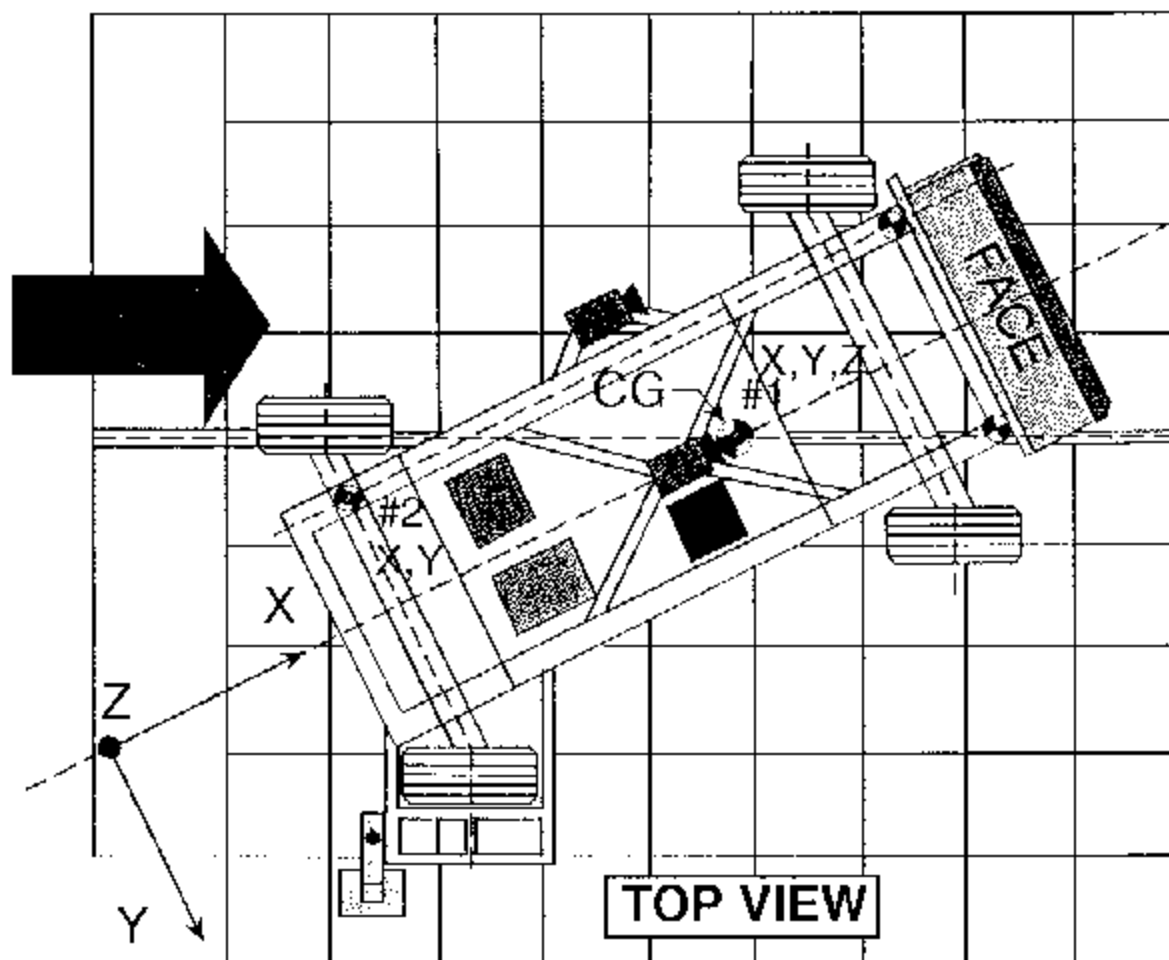
\*Reference: X - Rear Bumper (+ Forward) Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Down)

# 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       | -3.9         | 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        |

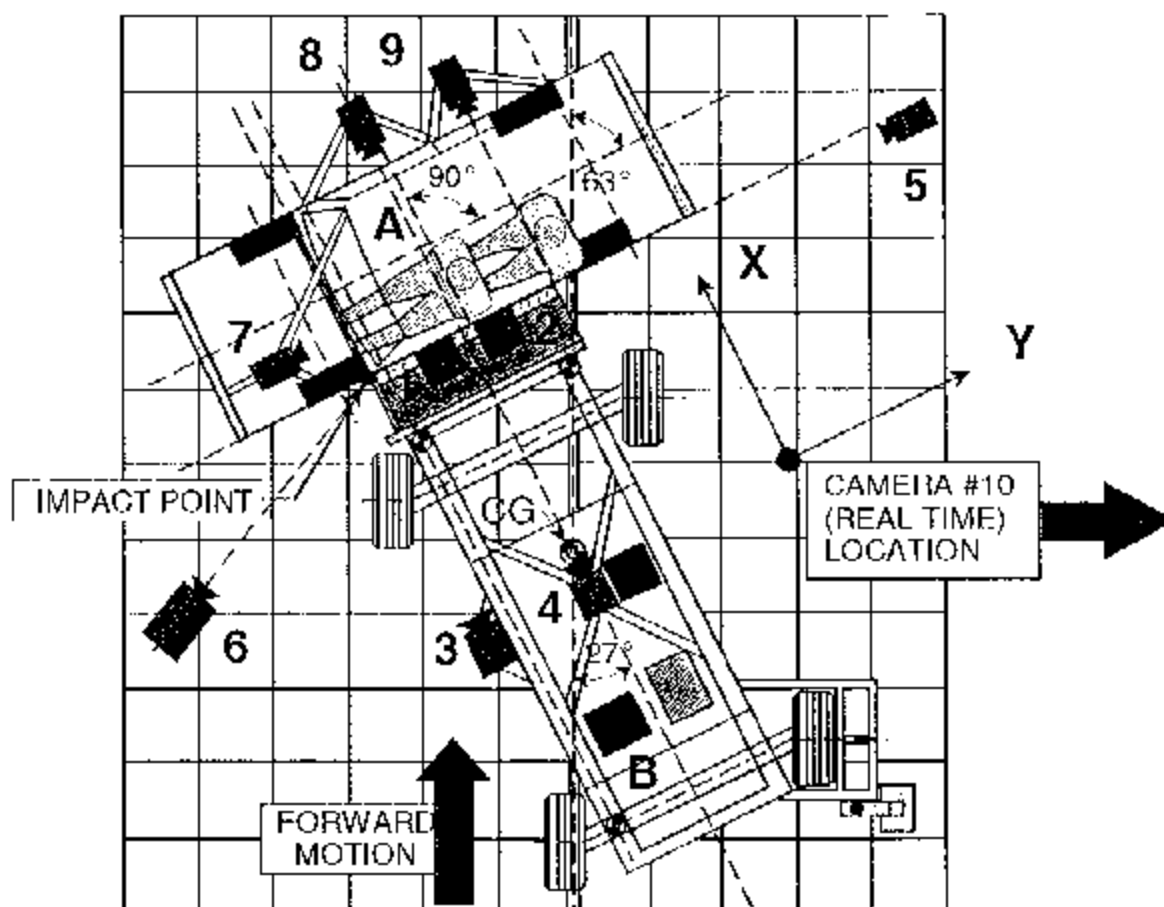
\*Reference: X = Rear Bumper (+ Forward)  
 Y = Vehicle Centerline (+ To Right)  
 Z = Ground Level (+ Down)  
 All measurements accurate to within  $\pm 3$  mm.

# DATA SHEET 15

## HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Kia Sorento MPV

NHTSA No. C30811



| 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   | 192                       | 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 16

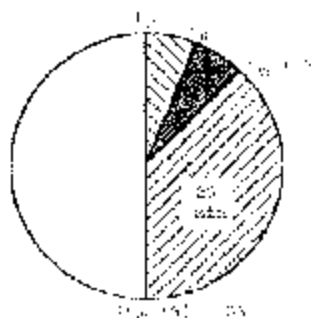
## FMVSS 301 FUEL SYSTEM INTEGRITY DATA

NHTSA No.: C30511 TEST DATE: April 29, 2003  
 Vehicle Mfr/Make/Model: Kia Motors Corp. 2003 Kia Soranto MPV

### TEST VEHICLE IMPACT TYPE:

- Frontal (48.28 kph)  
 - Oblique (48.28 kph) with 0° barrier face first  
 contacting the driver side  
 (driver/passenger)  
 - Rear Moving Barrier (48.28 kph)  
 - Lateral Moving Barrier (32.19 kph)  
X Side Impact Moving Deformable Barrier (62.0 kph)  
 contacting the driver side  
 (driver/passenger)

### FUEL SPILLAGE MEASUREMENT:



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

| ACTUAL | MAX ALLOWED |
|--------|-------------|
| 0 g    | 28 g        |
| 0 g    | 142 g       |
| 0 g    | 28 g/1 min  |

### SOLVENT SPILLAGE DETAILS:

None

# DATA SHEET 17

## ROLLOVER DATA

Vehicle: 2003 Kia Sorento MPV

NHTSA No.: C30511



90



180



REAR VIEW



270

### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

| Rollover Stage |   | Rotation Time (spec. 1-3 min) |   |         | FMVSS 301 Hold Time |         | Total Time |         |   |         | Next Whole Minute Interval |         |
|----------------|---|-------------------------------|---|---------|---------------------|---------|------------|---------|---|---------|----------------------------|---------|
| 0°-90°         | 1 | minutes                       | 8 | seconds | 5                   | minutes | 6          | minutes | 8 | seconds | 7                          | minutes |
| 90°-180°       | 1 | minutes                       | 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) |
|----------------------------------------|----------|----------|------------------------|
| 143 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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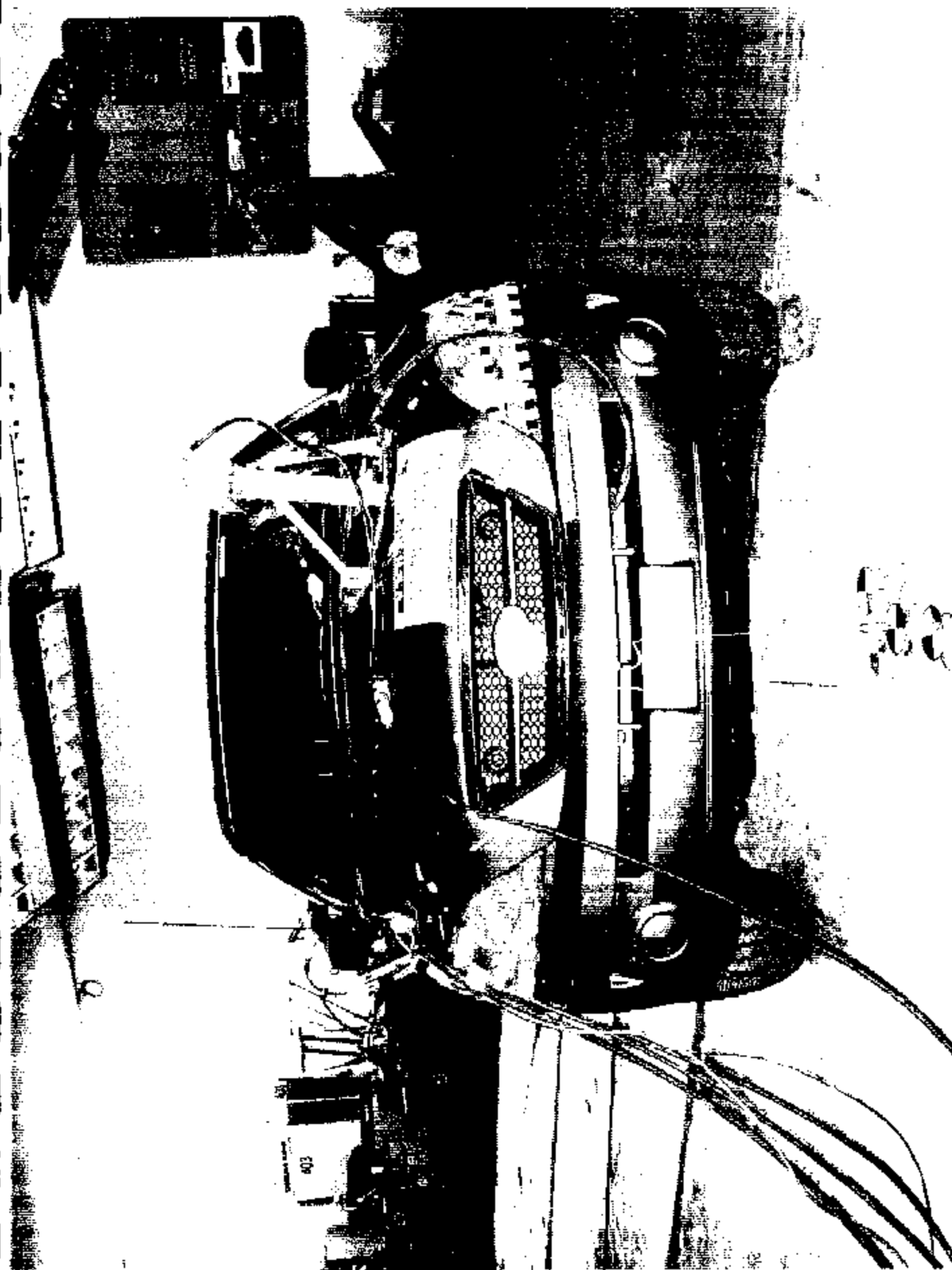


Figure A 1 PRE-TEST FRONTAL VIEW OF TEST VEHICLE

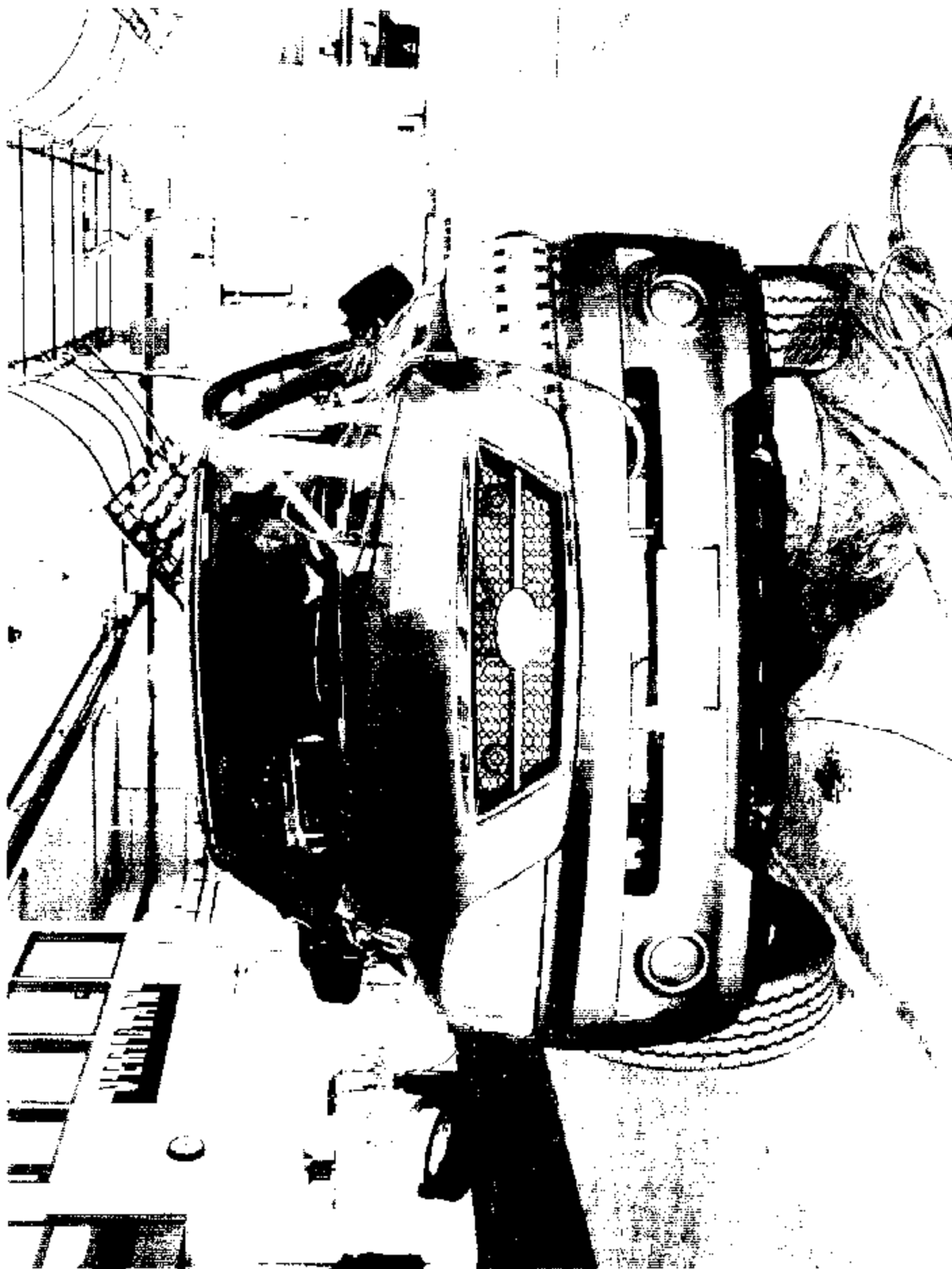


Figure A-2 POST-TEST FRONTAL VIEW OF TEST VEHICLE



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



Figure A-4 POST-TES 1 REAR VIEW OF TEST VEHICLE

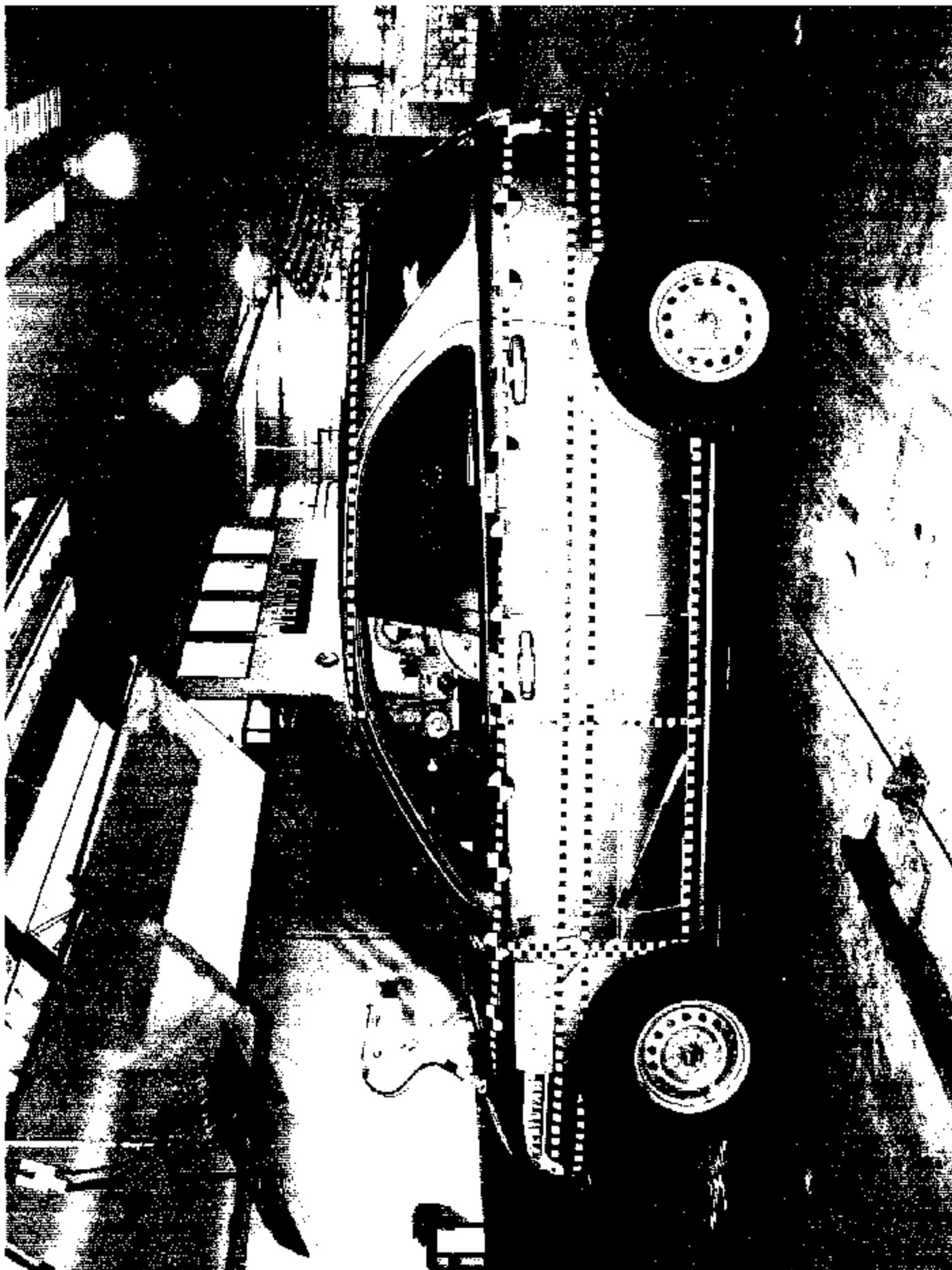


Figure A-5 PRJ-TEST IMPACTED SIDE VIEW OF TEST VEHICLE

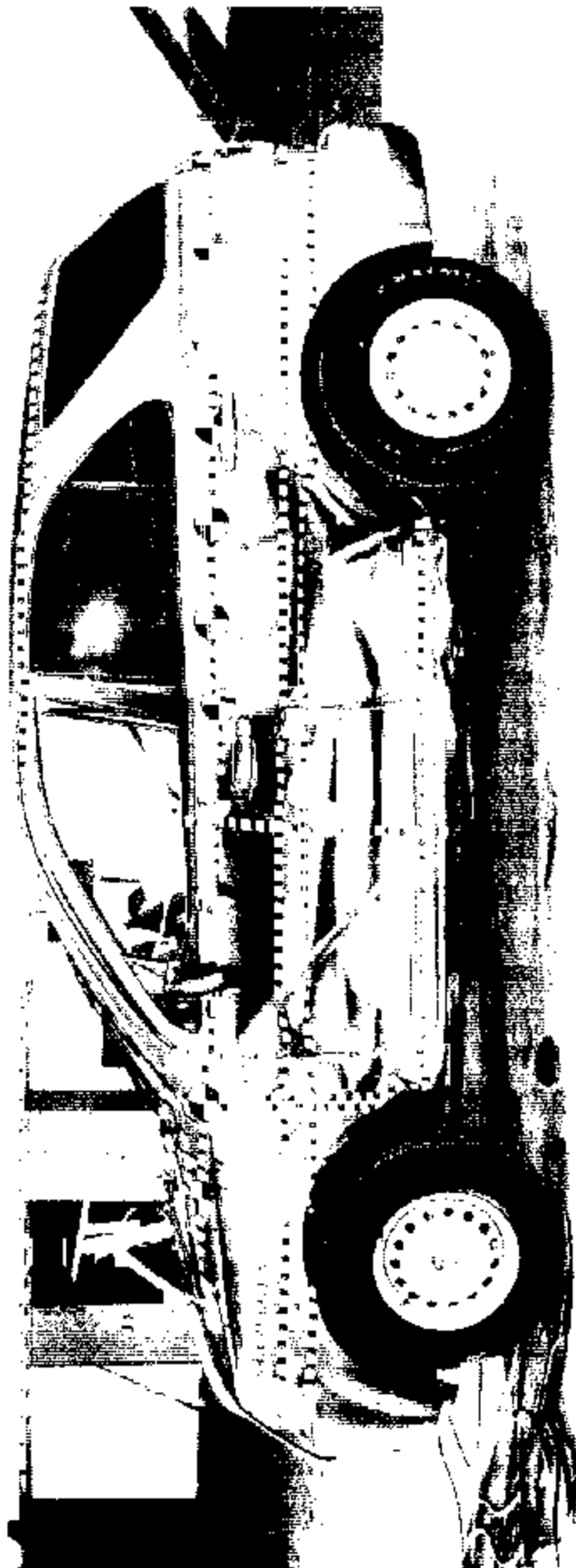


Figure A-6 POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE

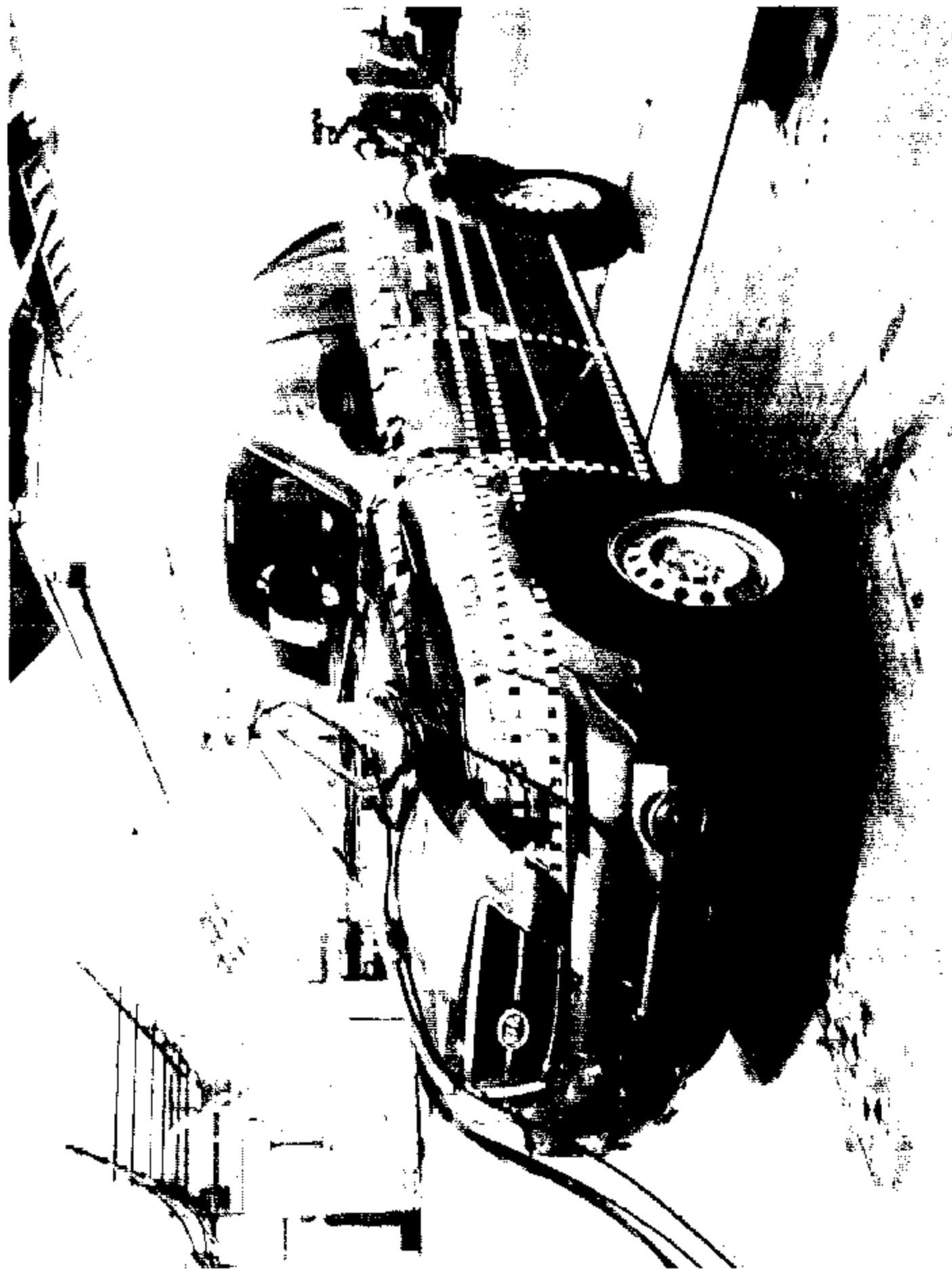


Figure A-3 PRE-TEST LEFT FRONT VIEW OF TEST VEHICLE

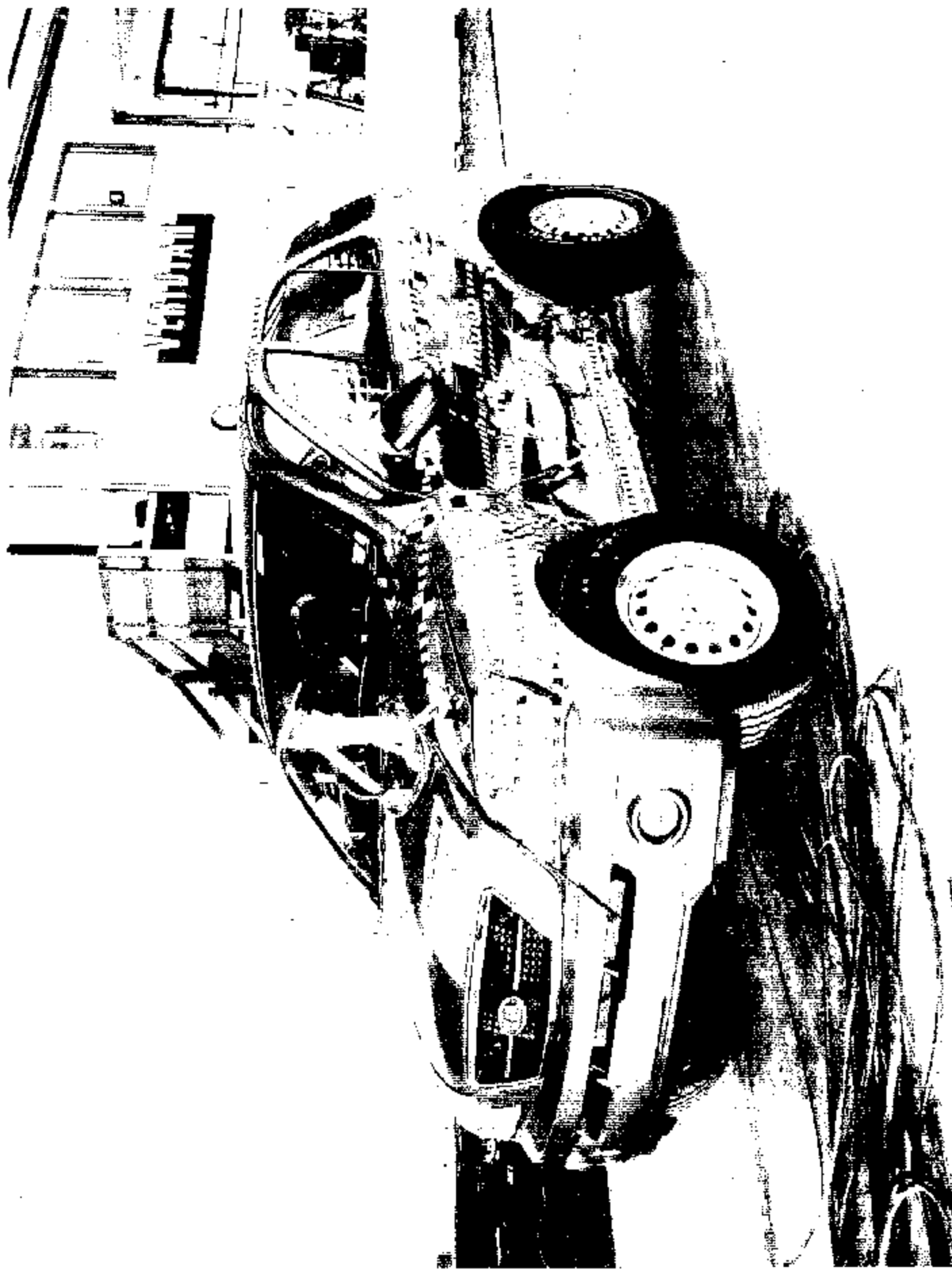


Figure A 8 POST TEST LEFT FRONT VIEW OF TEST VEHICLE



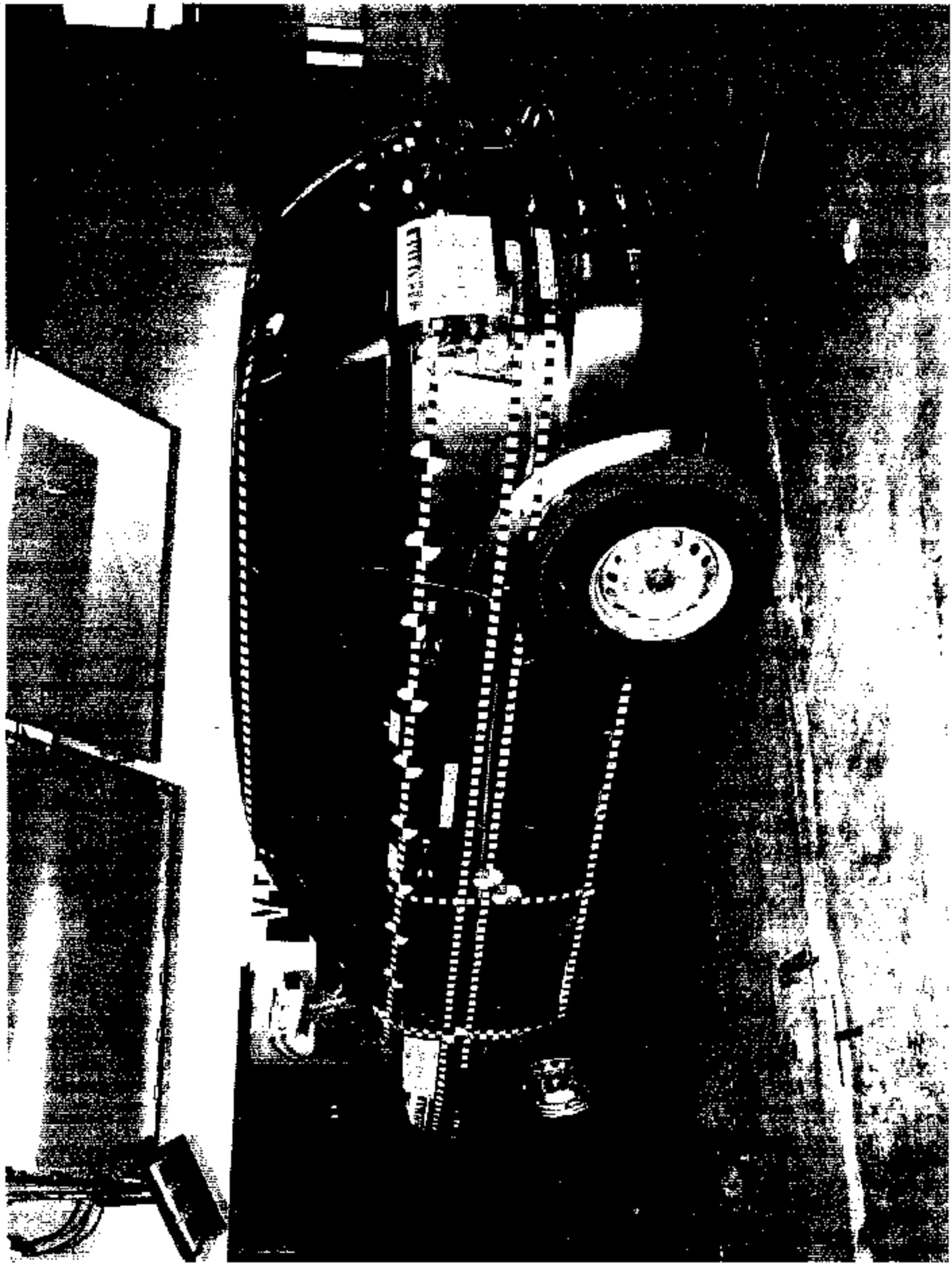


Figure A-9 PRE TEST LEFT REAR VIEW OF TEST VEHICLE

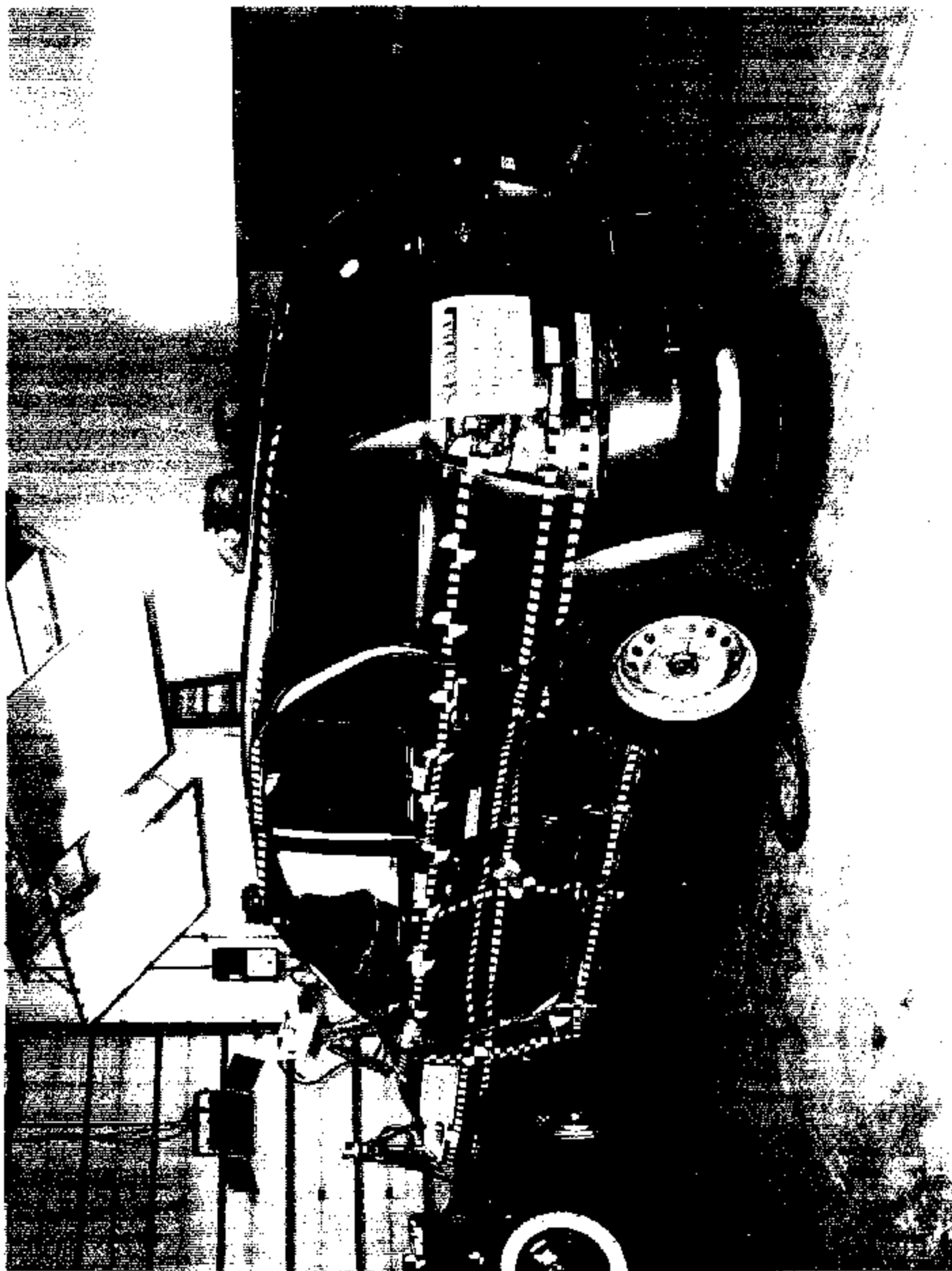


Figure A-10 POST-TEST LEFT REAR VIEW OF TEST VEHICLE

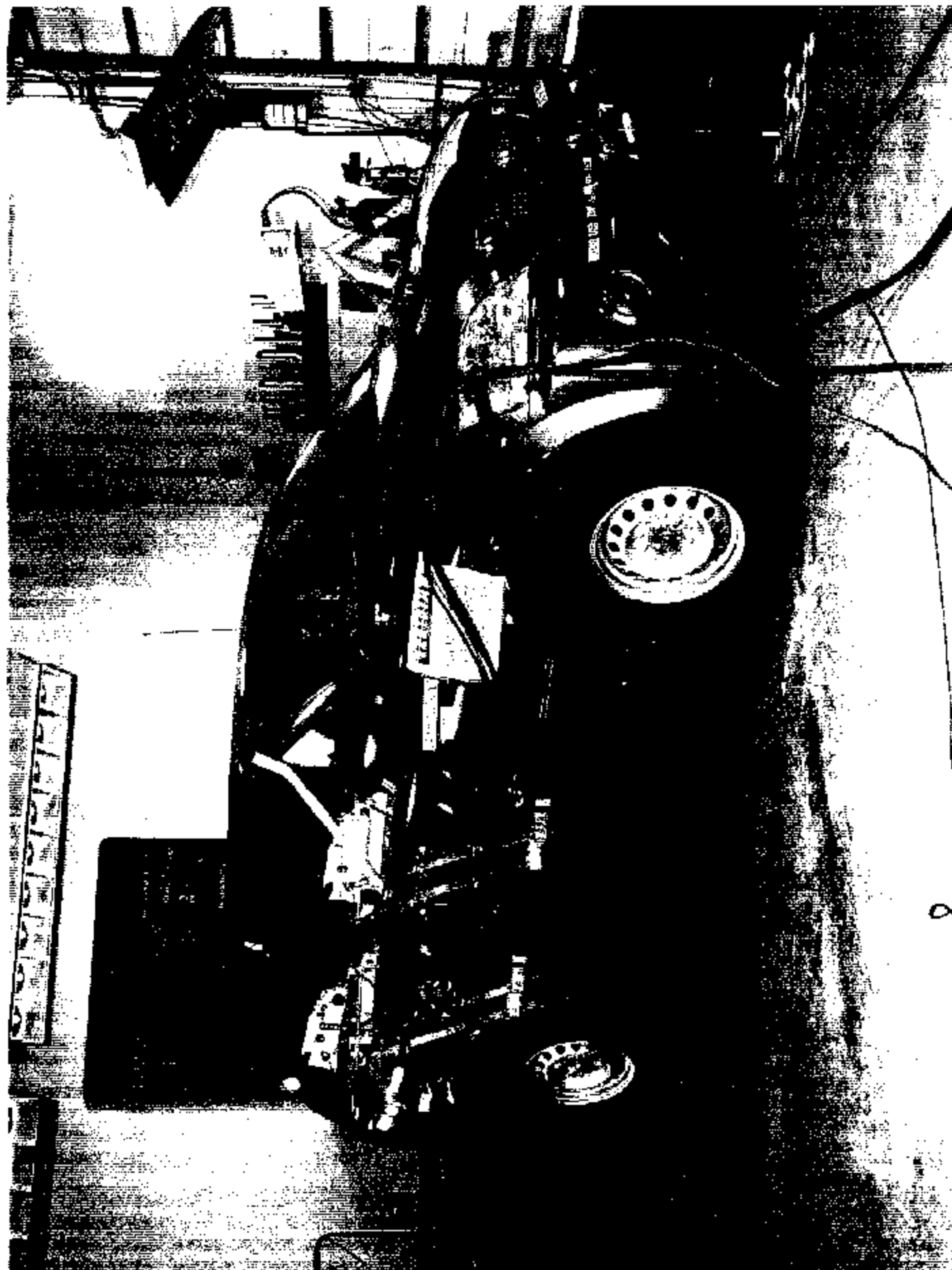


Figure A-1 PRE TEST RIGHT FRONT VIEW OF TEST VEHICLE

2

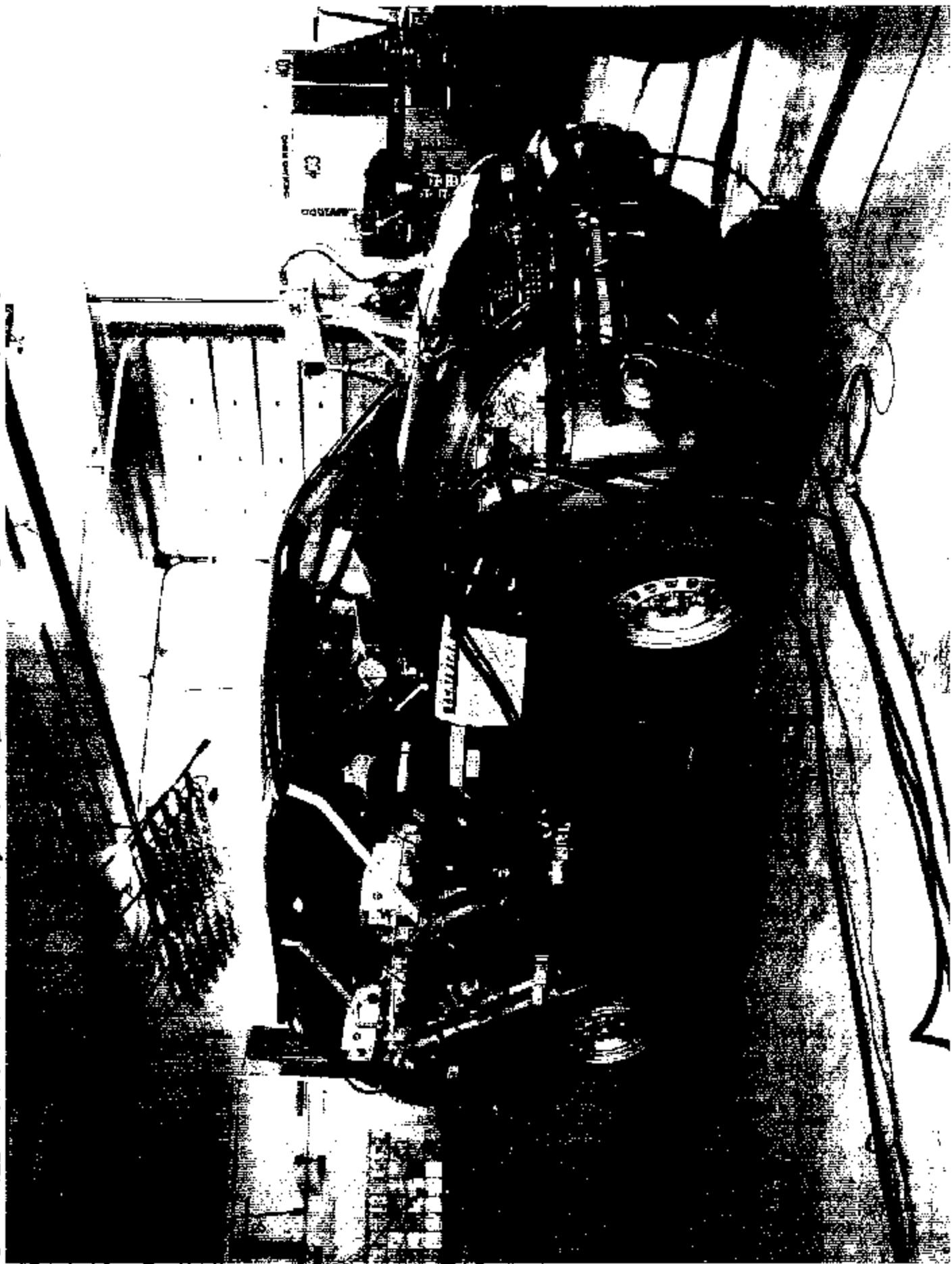


Figure A-12 POST-TEST RIGHT FRONT VIEW OF TEST VEHICLE

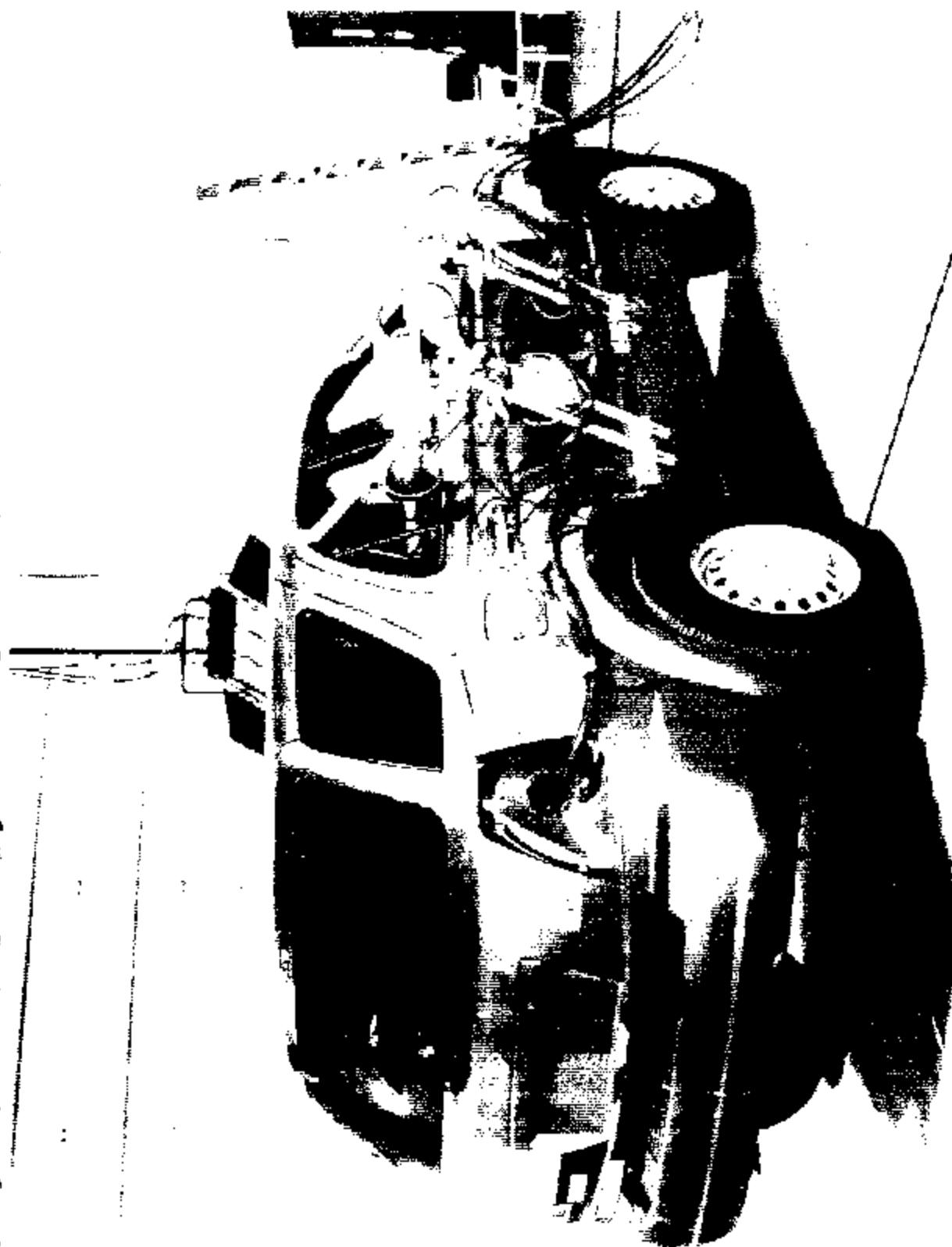


Figure A-13 PRE-TEST RIGHT REAR VIEW OF TEST VEHICLE

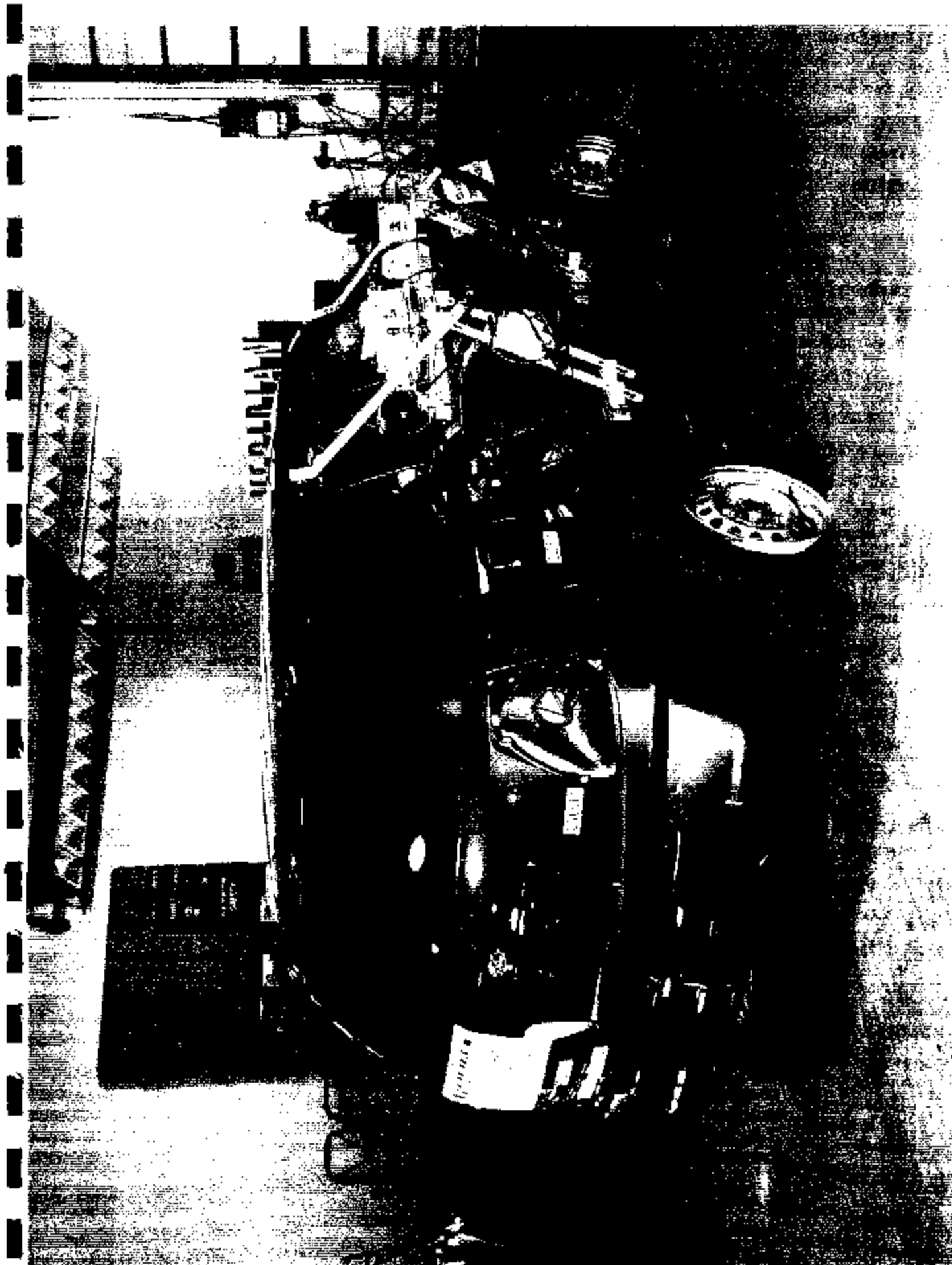


Figure A-14 POST-TEST RIGHT REAR VIEW OF TEST VEHICLE

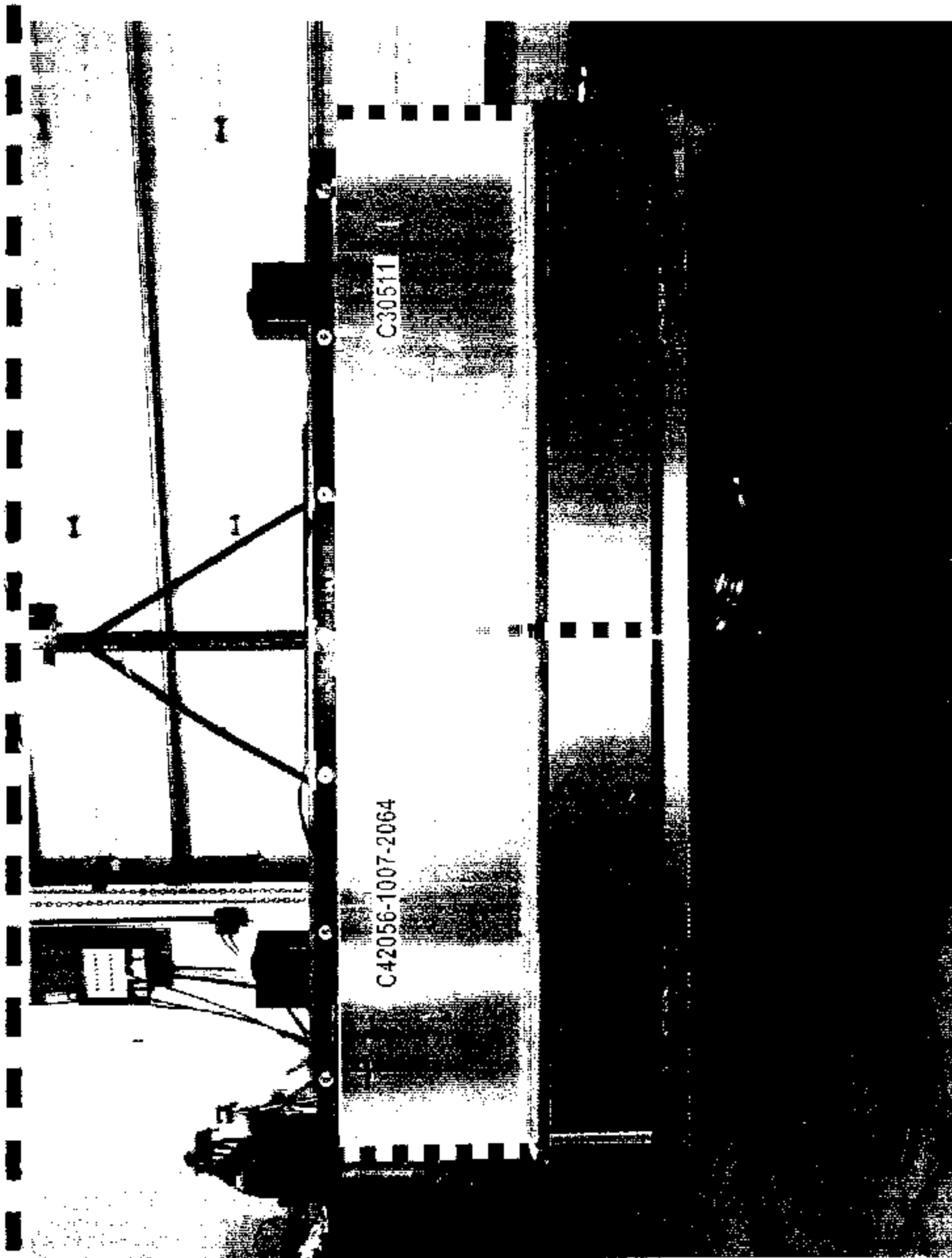


Figure A-15 PRE-TEST FRONTAL VIEW OF IMPACTOR FACE

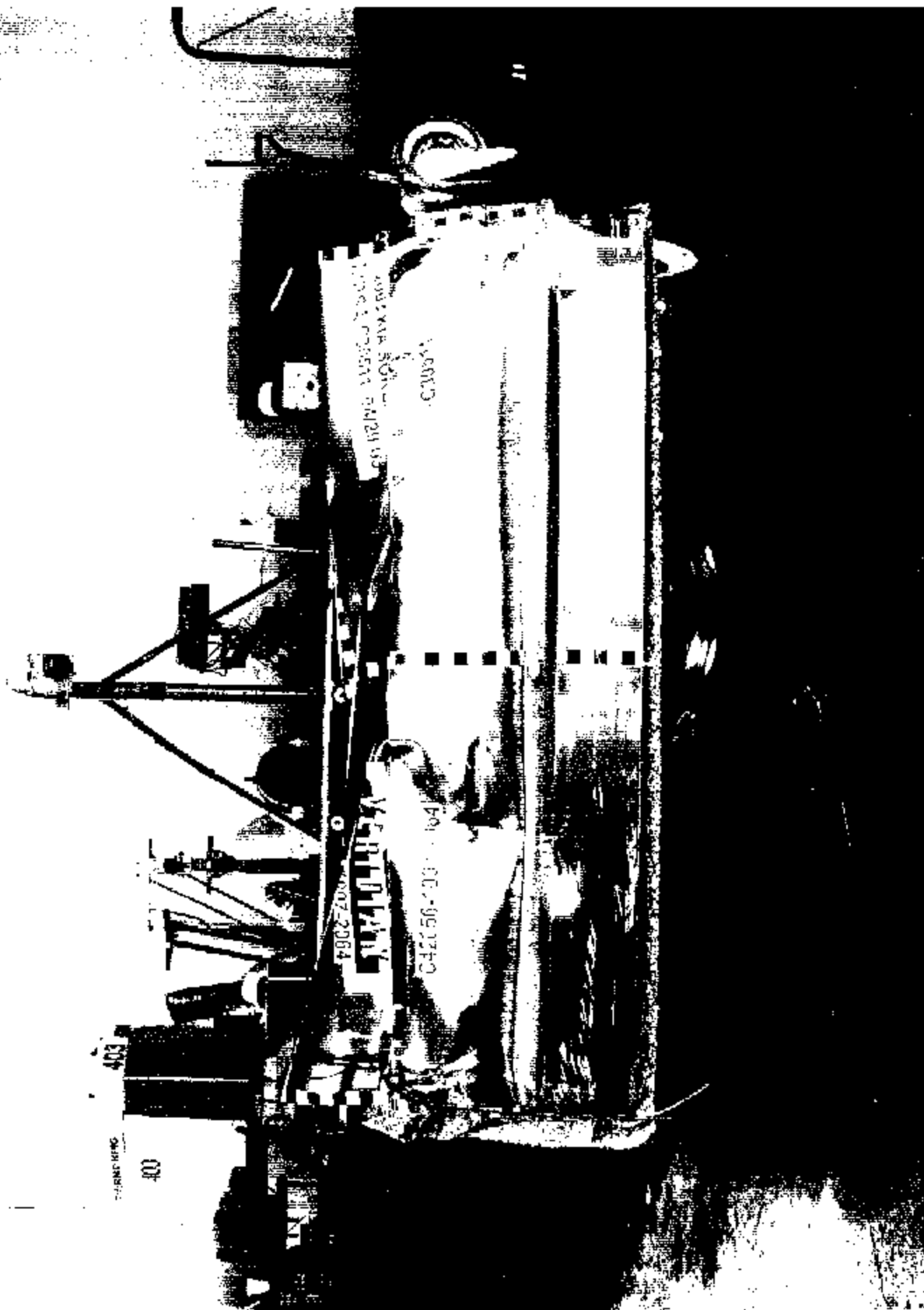


Figure A-16 POST-TEST FRONTAL VIEW OF IMPACTOR FACE



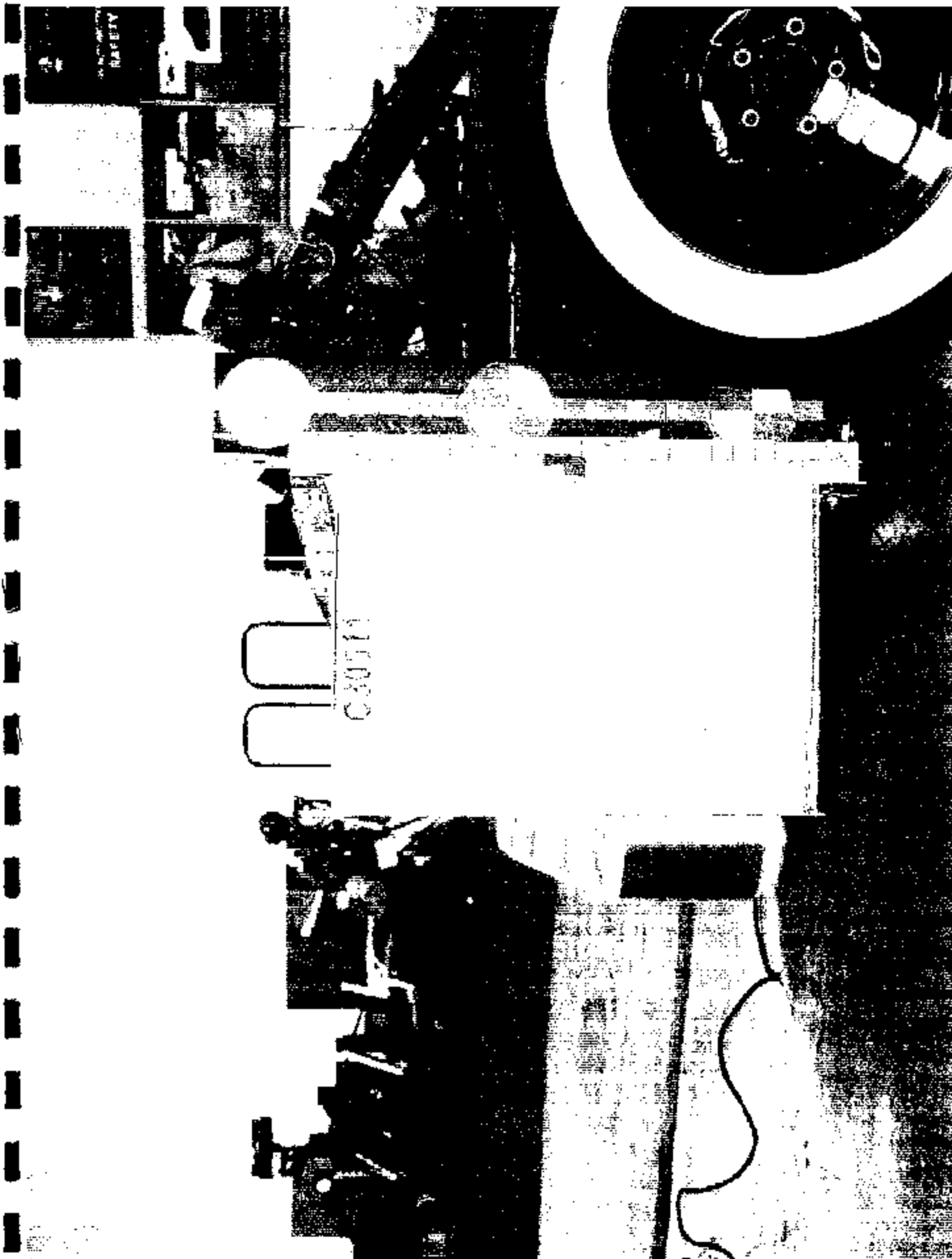


Figure A-19 PRE-HIT SLIGHT SIDE VIEW OF IMPACTOR FACE

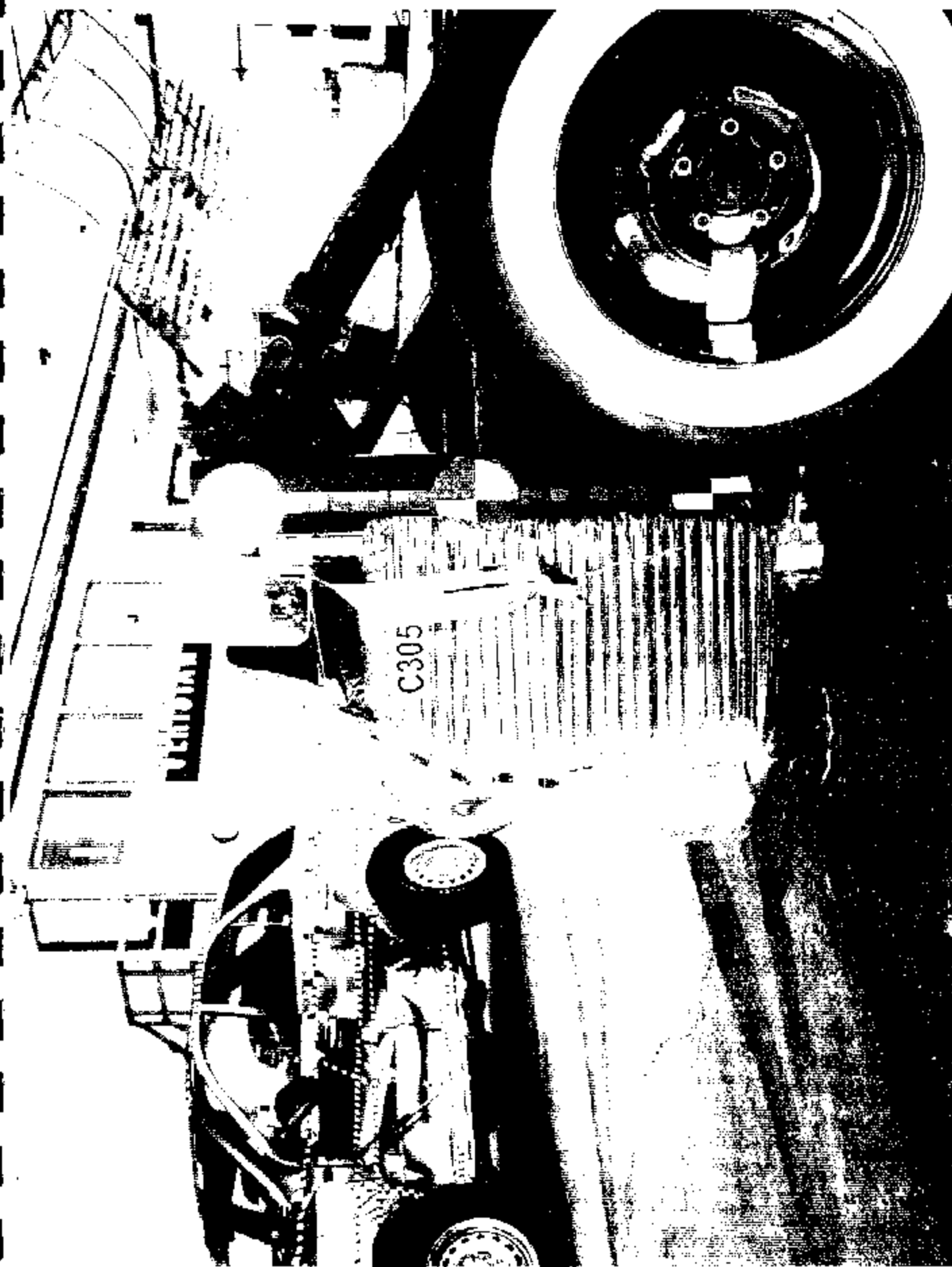


Figure A-18 POST-IMPACT LEFT SIDE VIEW OF IMPACTOR FACI-

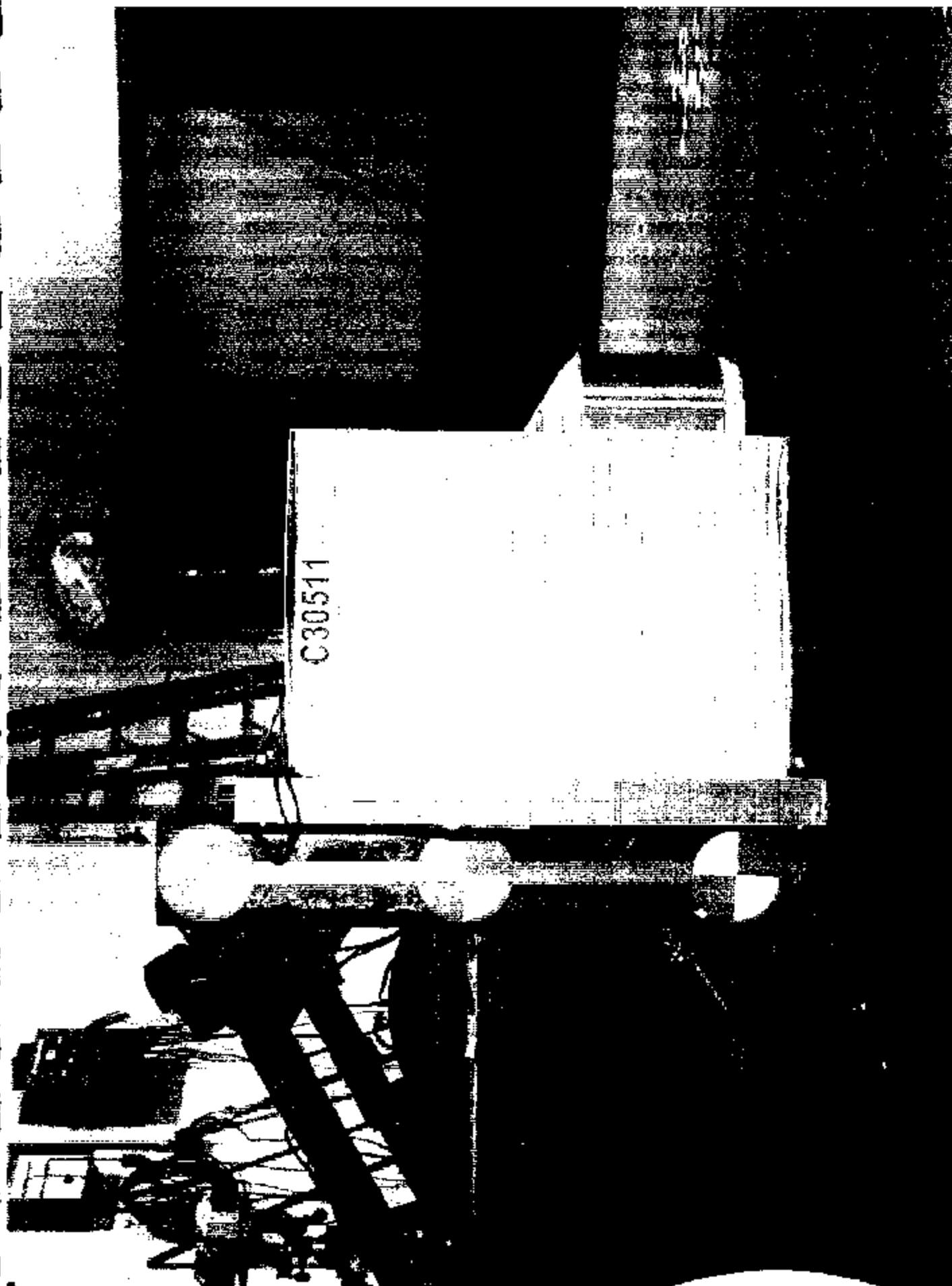


Figure A-19 PROJECTILE RIGHT SIDE VIEW OF IMPACTOR FACE

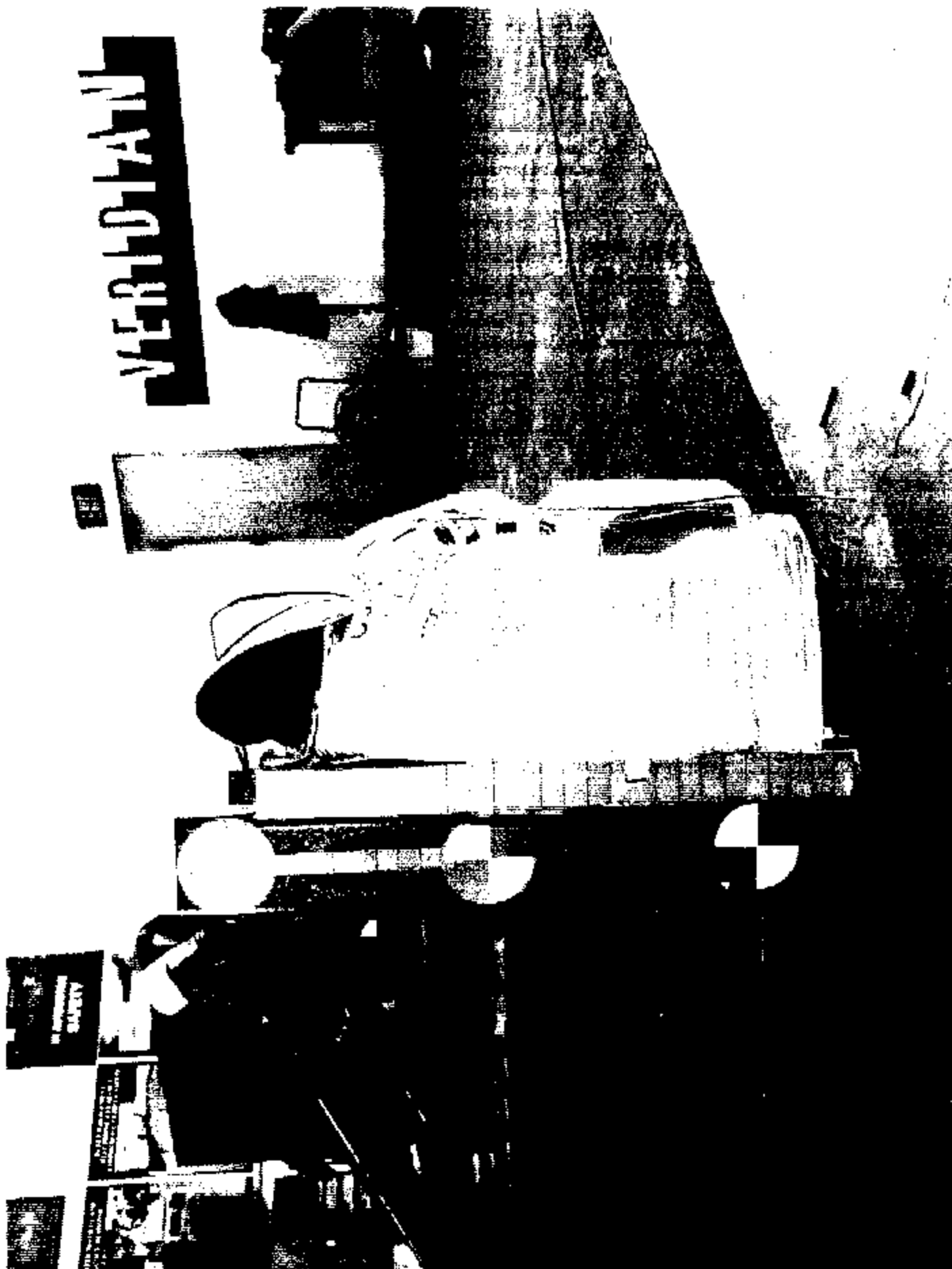


Figure A-20 POST TEST RIGHT SIDE VU W/O IMPACTOR FACE

55/28 kph 90° IMPACT  
2003 KIA SORENTO  
NHTSA C30511 04/29/03

VERIDIAN

C42056-1007-2064

Figure A 2J P3H TEST TOP VIEW OF IMPACTOR FACE

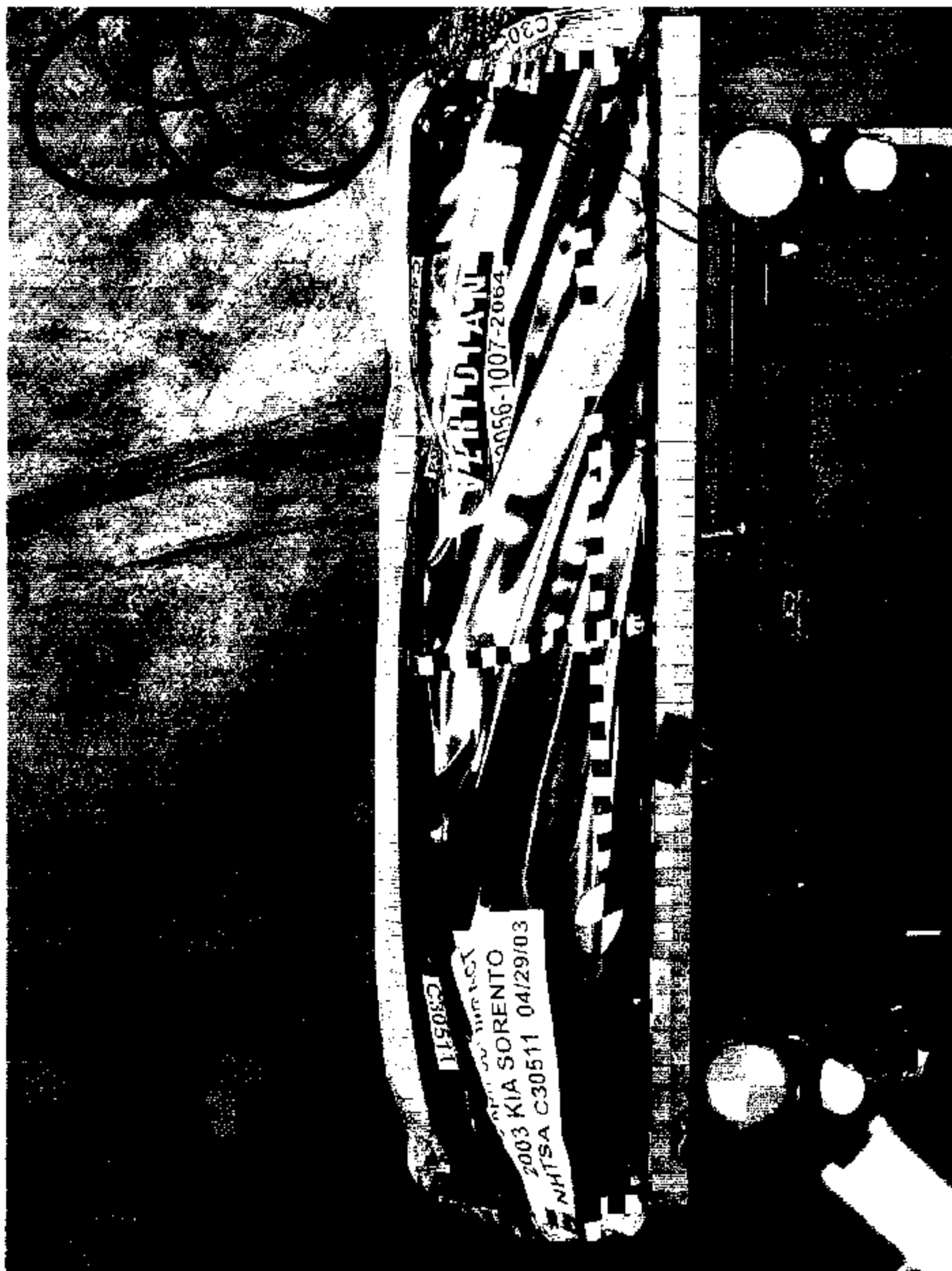


Figure A 22 POST TEST TOP VIEW OF IMPACTOR FACE



FIGURE A-23 PRE-TEST OVERHEAD VIEW OF ALIGNED MDR AND VEHICLE



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



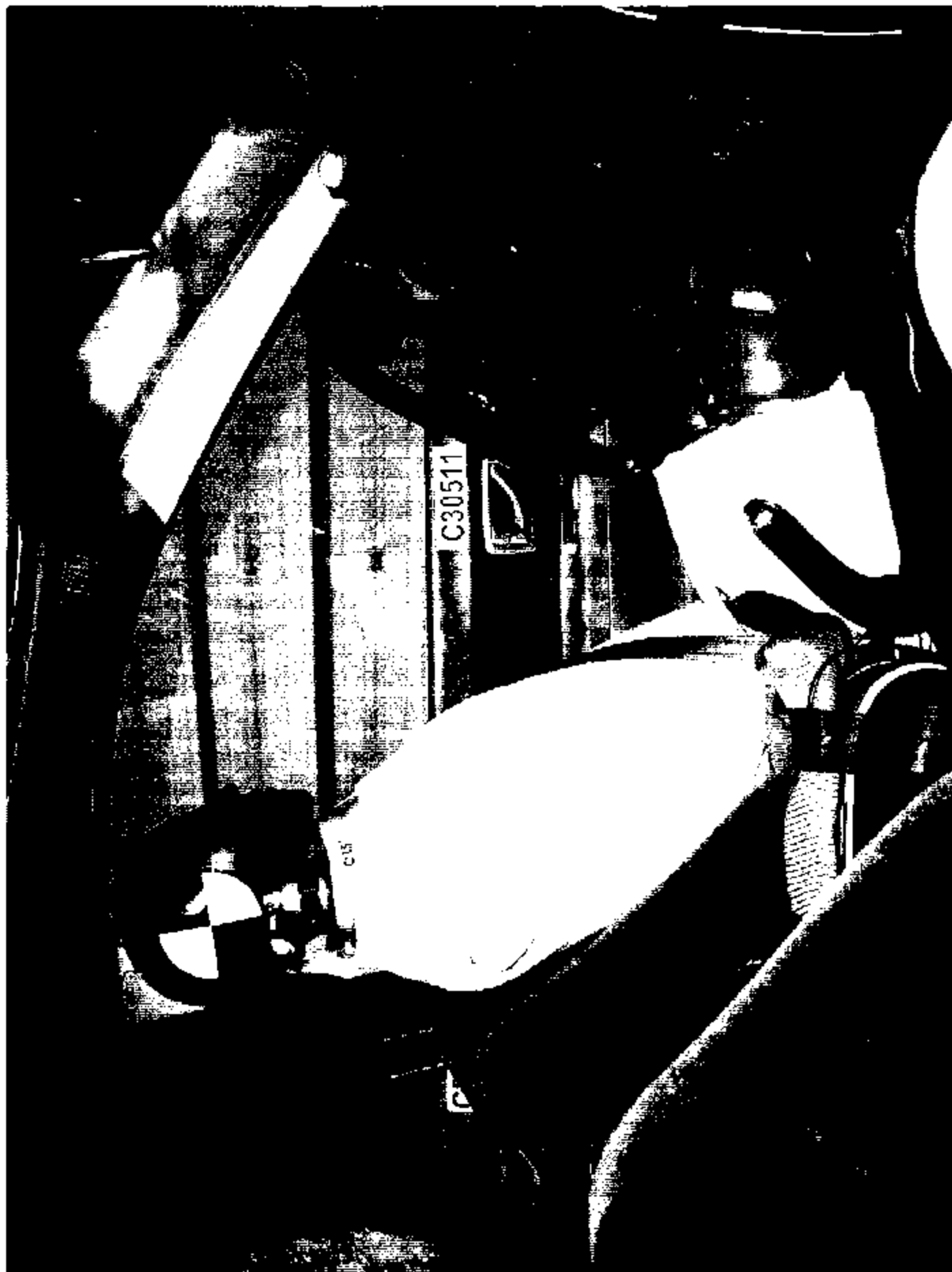


Figure A-25 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SIDE



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

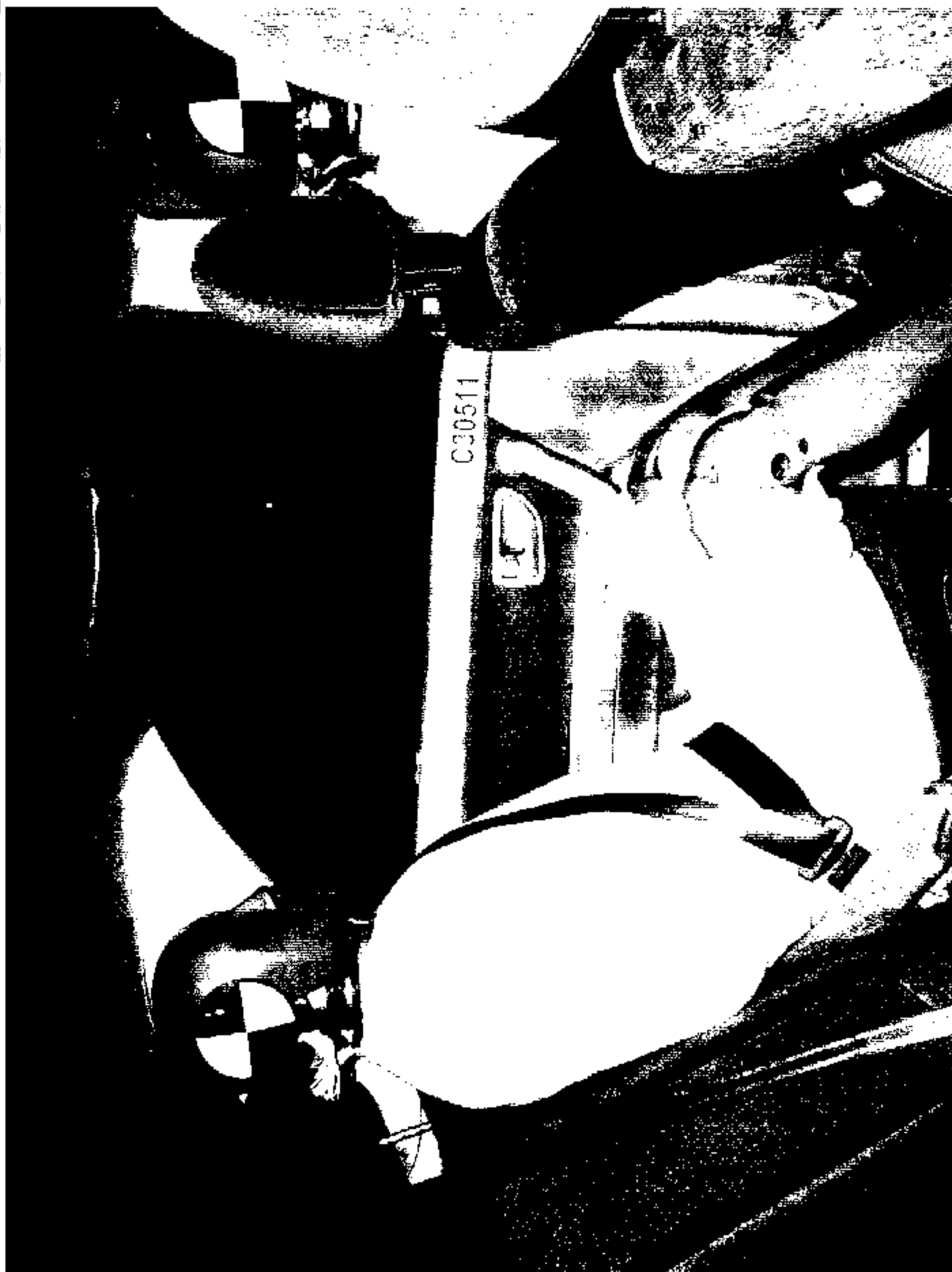


Figure A-27 PRIEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SIDE JTS

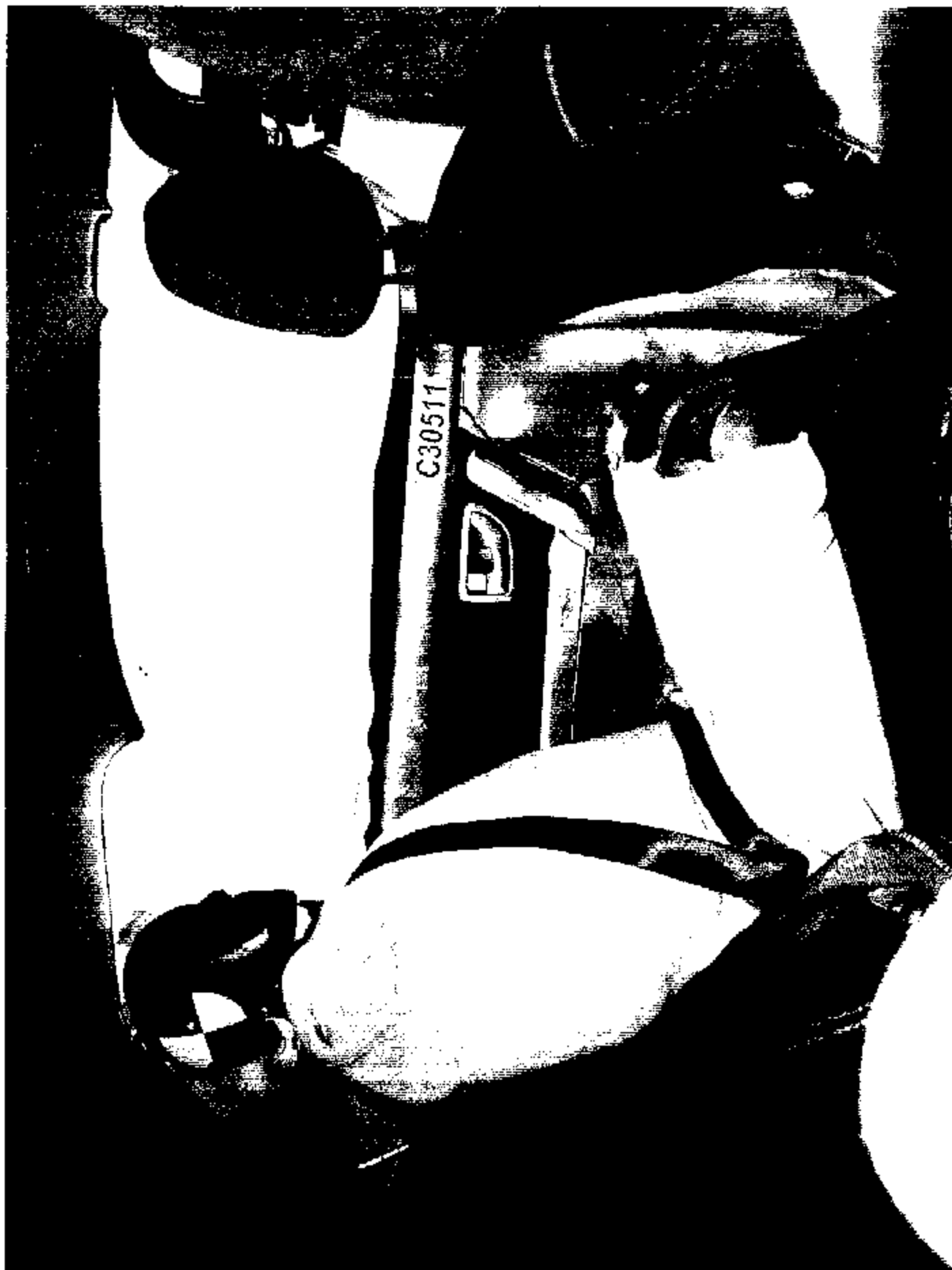


Figure A-28 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID HG



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

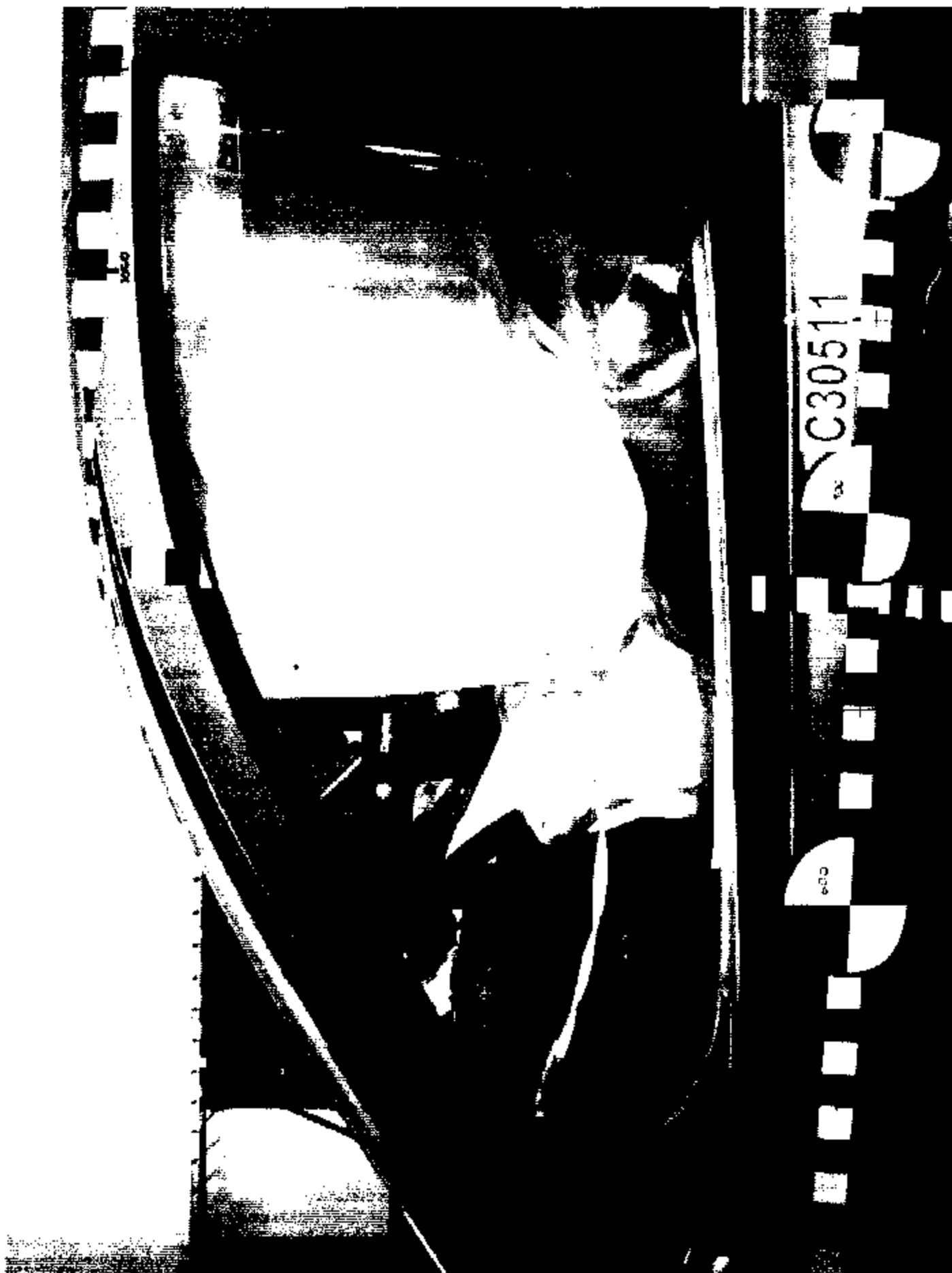


Figure A-30 POST-TITLE LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID

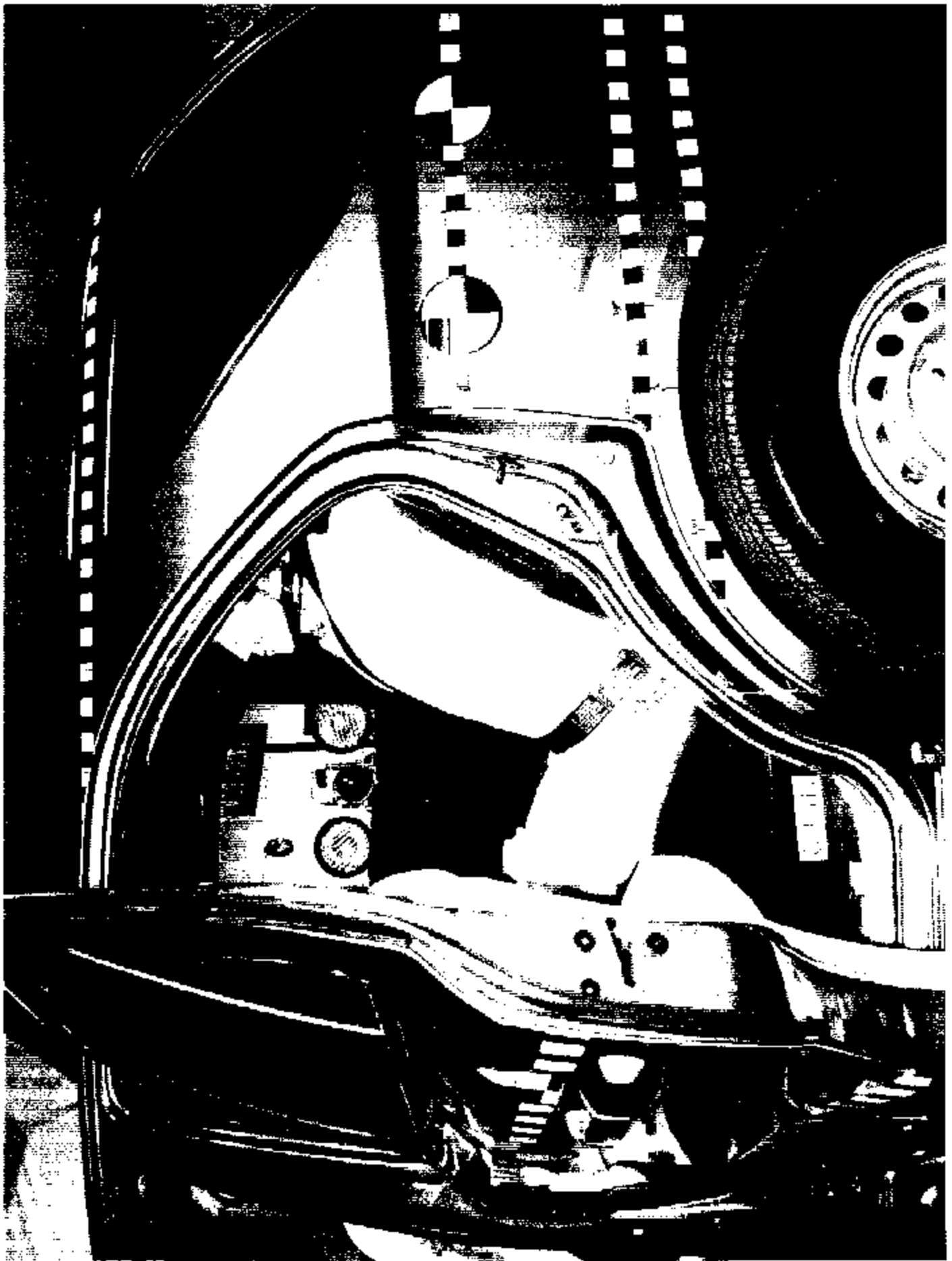


Figure A-31 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SIDE H3

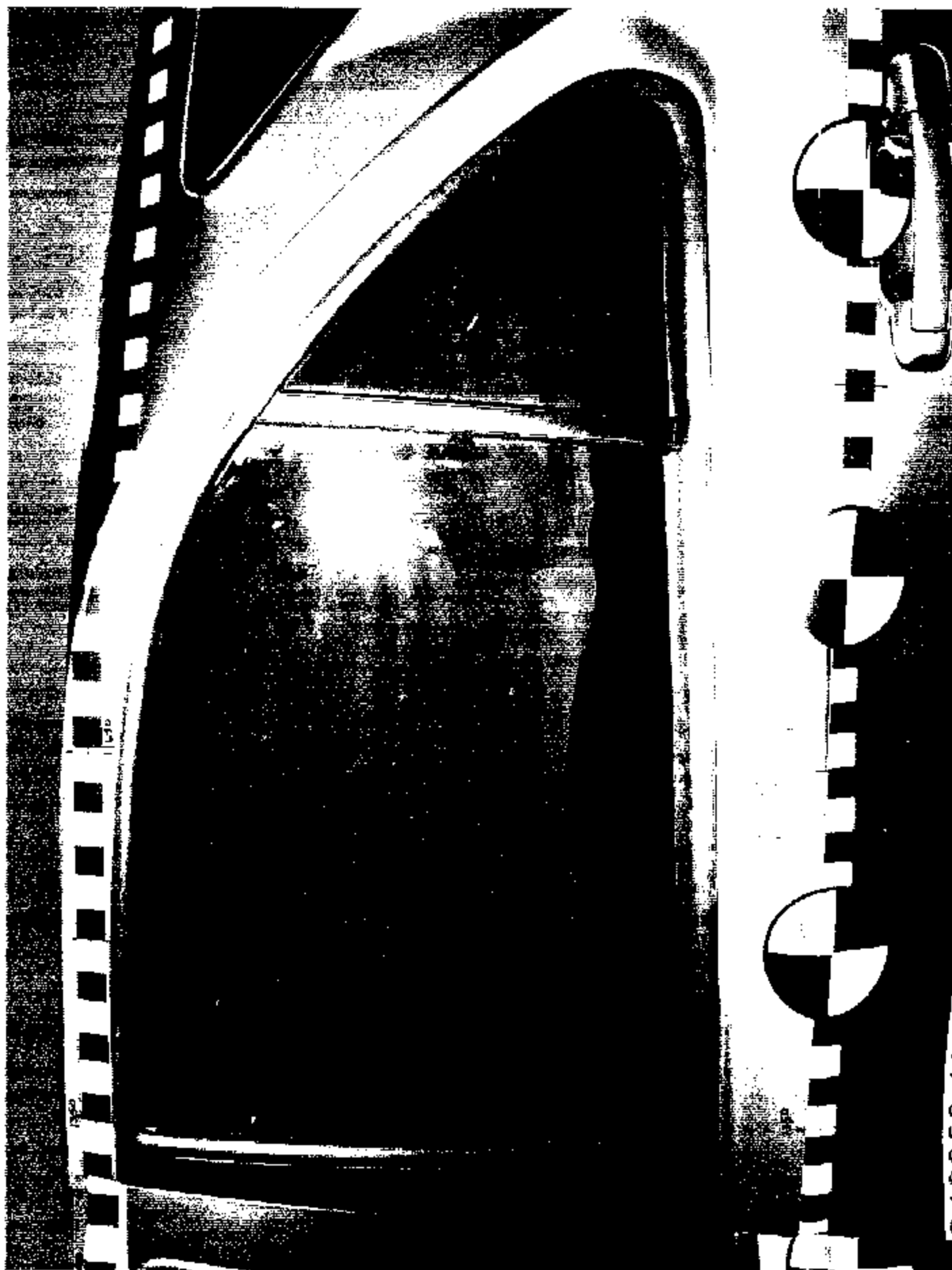


Figure A-32 POST TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SIDE II





Figure A-33 PRE-TEST INTERIOR OF URON 1 DOOR



Figure A-34 POST-TEST INTERIOR OF FRONT DOOR SHOWING SID-13 IMPACT LOCATIONS



Figure A-35 PRE TEST INTERIOR OF REAR DOOR

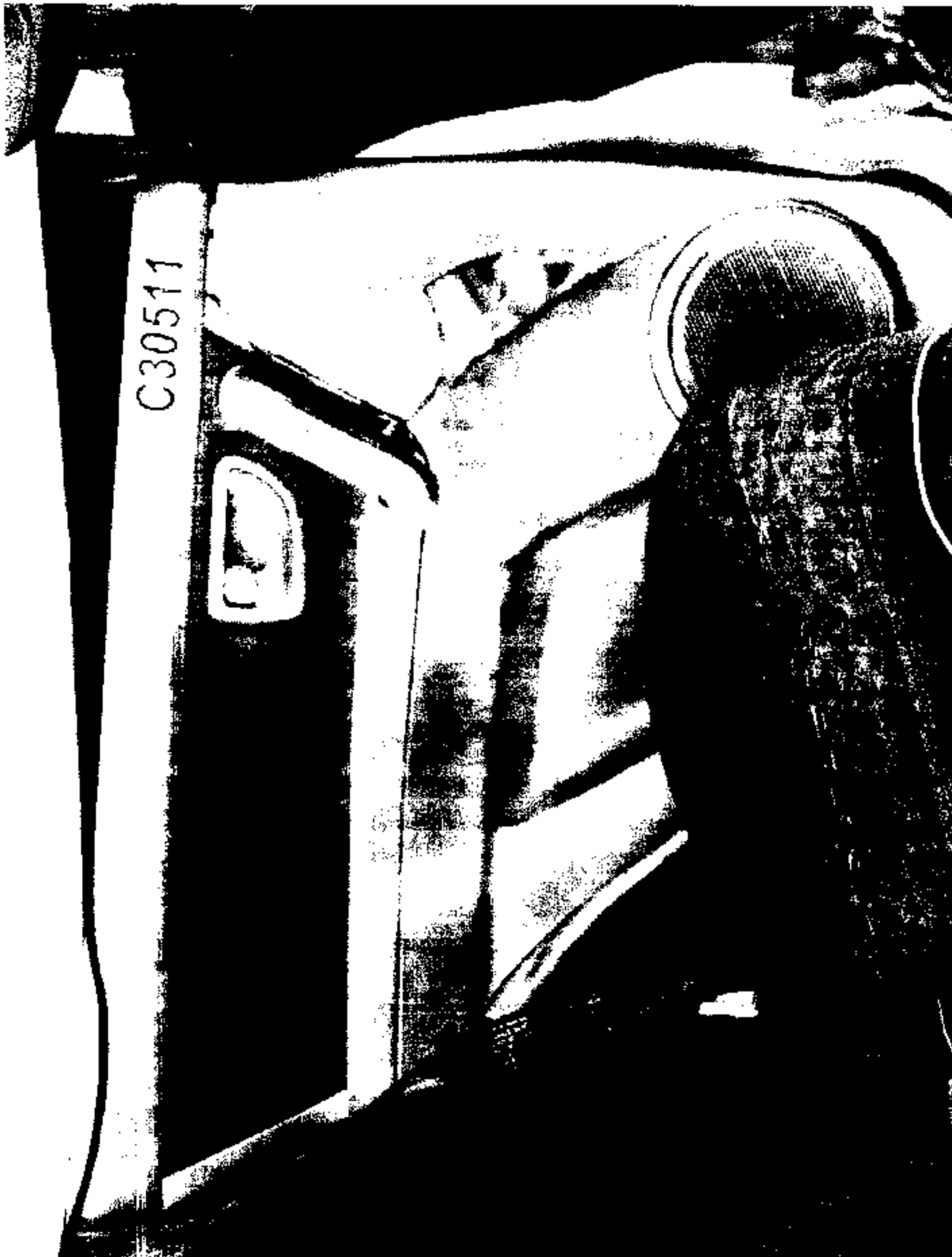


Figure A-36 POST-TEST INTERIOR OF REAR DOOR SHOWING SID II3 IMPACT LOCATIONS

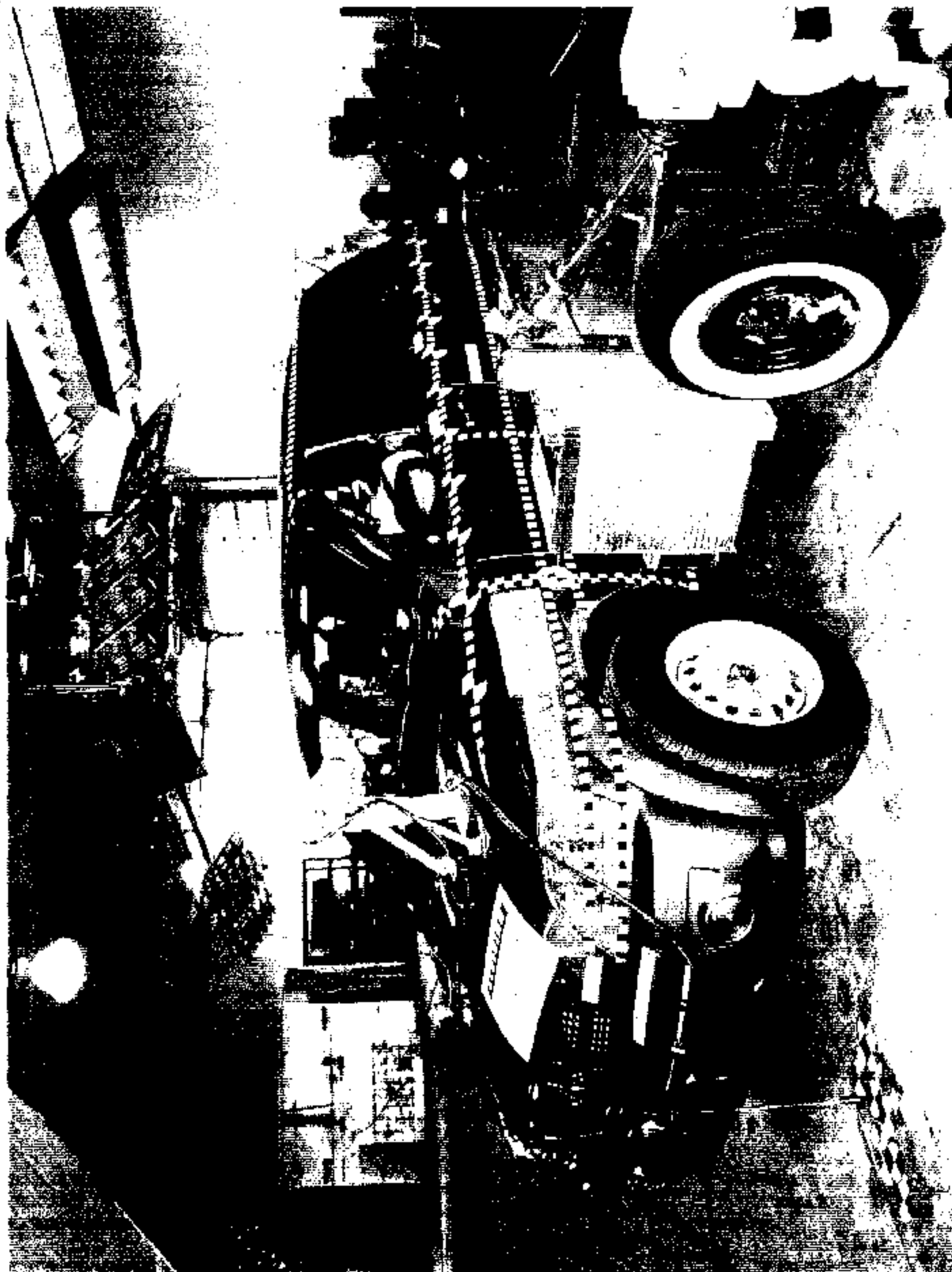


Figure A-37 PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION

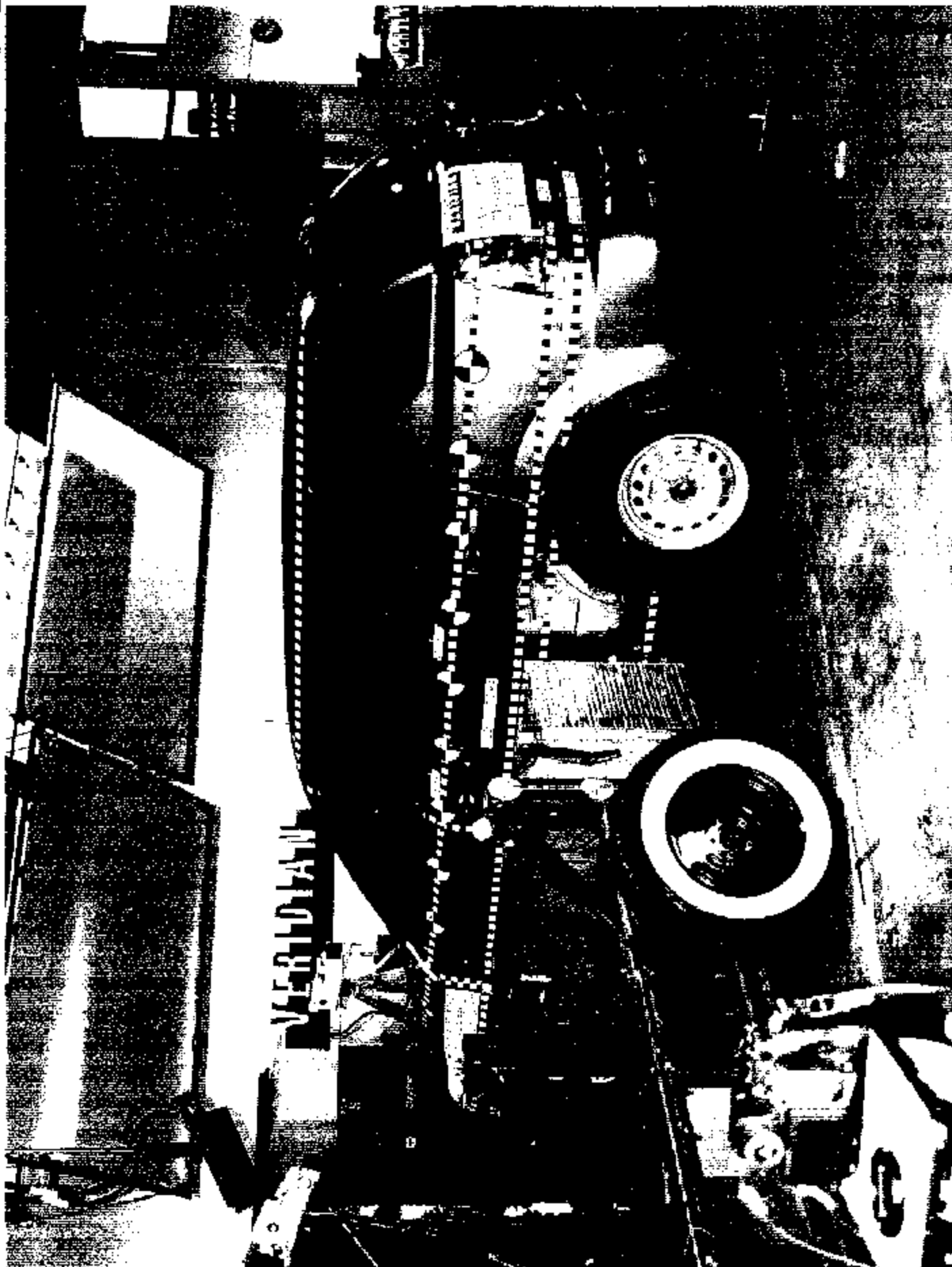


Figure A-38 PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION

3/03

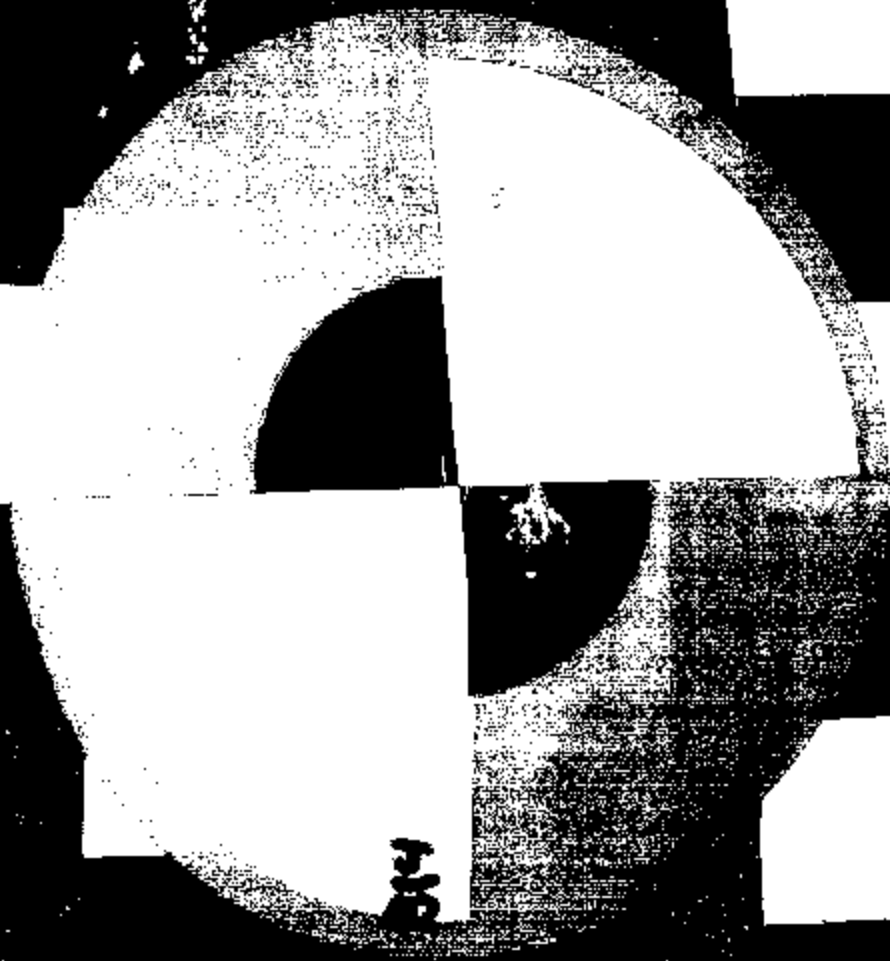


Figure A.39 POST TEST CLOSE-UP VIEW OF IMPACT POINT TARGET

FOR FURTHER INFORMATION,  
SEE OWNER'S MANUAL

MFD. BY KIA MOTORS CORP.

3307

1500

2822

1280

5644

2560

12/27/02

KNDJC733X35094874

M.P.V

L4

E

U

MADE IN KOREA

GW

W

Figure A-16 CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL



|                                                                                                                      |            |                            |                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------|------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>SORENTO</b>                                                                                                       | <b>2WD</b> | <b>GVWR 2480KG(5467LB)</b> | <b>MANUFACTURED BY</b><br> <b>KIA MOTORS</b> |
|                                                                                                                      | <b>4WD</b> | <b>GVWR 2560KG(5644LB)</b> |                                                                                                                               |
| <b>GAWR(FRONT) : 280KG(2822LB) USING P245/70R16 TIRES</b><br><b>ON 16X7JJ RIMS. INFLATE TO : 210KPA (30PSI) COLD</b> |            |                            |                                                                                                                               |
| <b>GAWR(REAR) : 1500KG(3307LB) USING P245/70R16 TIRES</b><br><b>ON 16X7JJ RIMS. INFLATE TO : 210KPA (30PSI) COLD</b> |            |                            |                                                                                                                               |
| <b>SPARE(FULL SIZE) : P245/70R16 TIRES ON 16X7JJ RIMS.</b><br><b>INFLATE TO : 210KPA (30PSI) COLD</b>                |            |                            |                                                                                                                               |

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



Figure A-42 IMPACT PHOTO

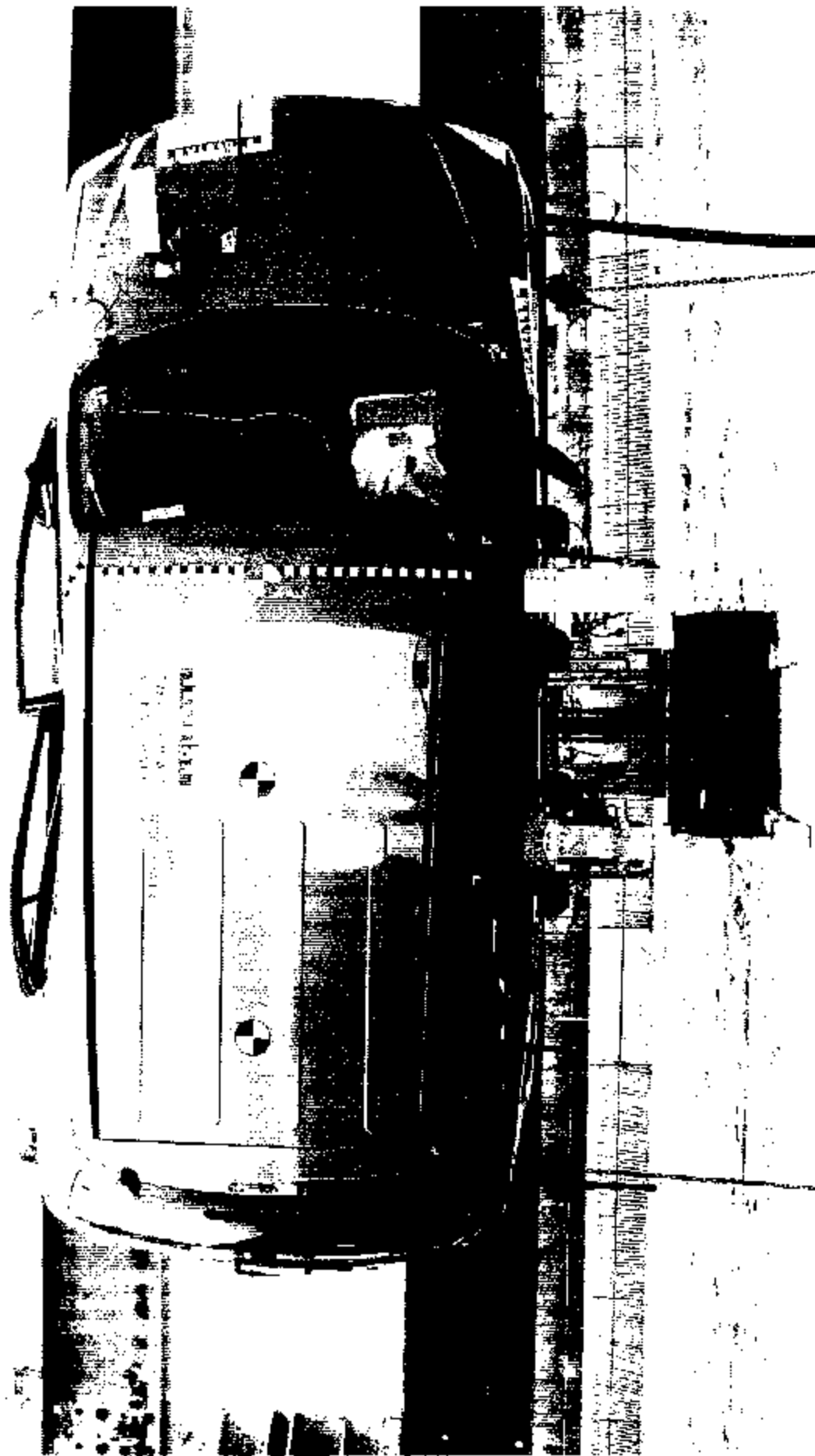


Figure A-43 ROLL OVER 90 DEGREES

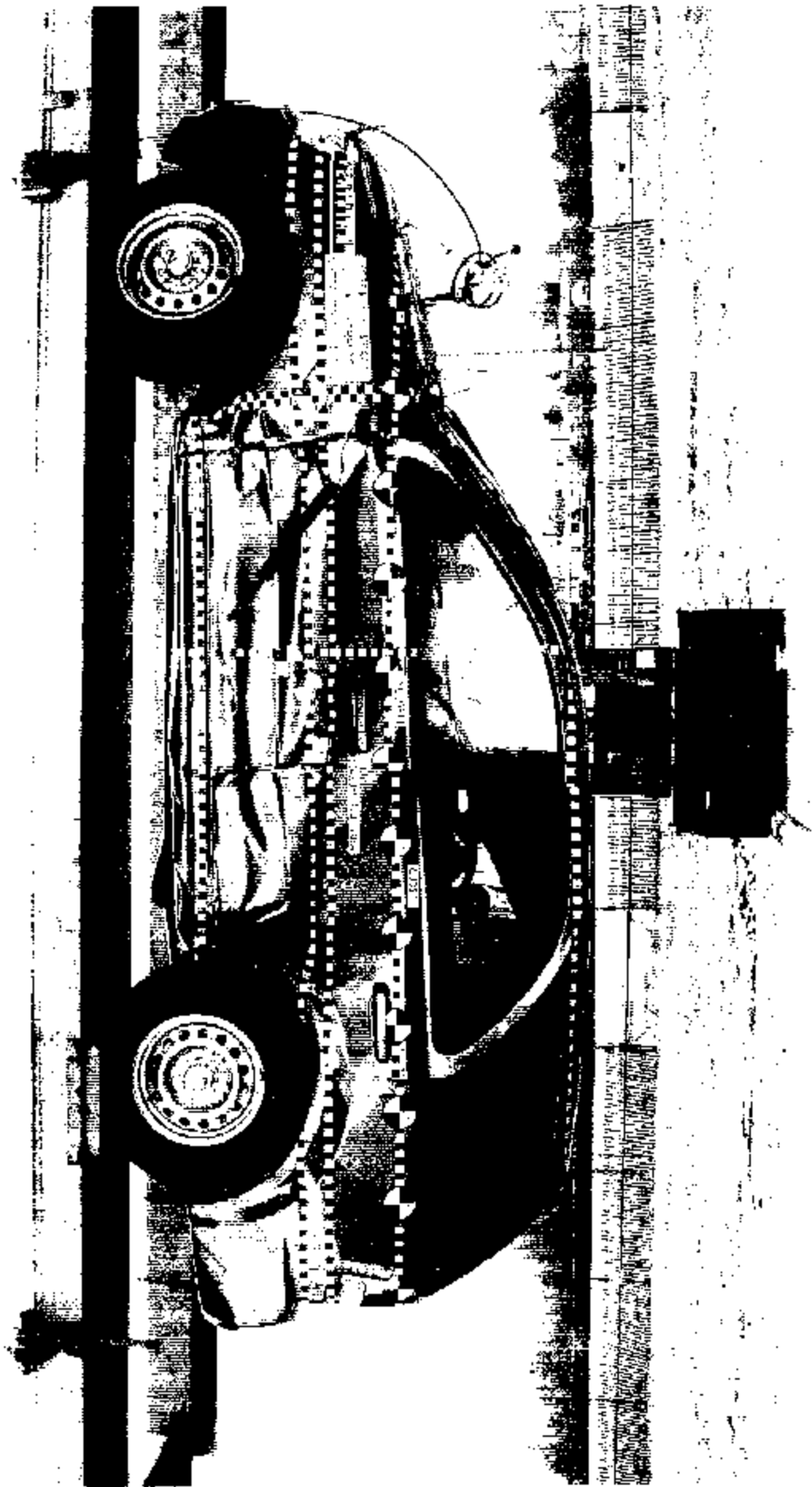


Figure A-4: ROLLOVER 180 DEGREES

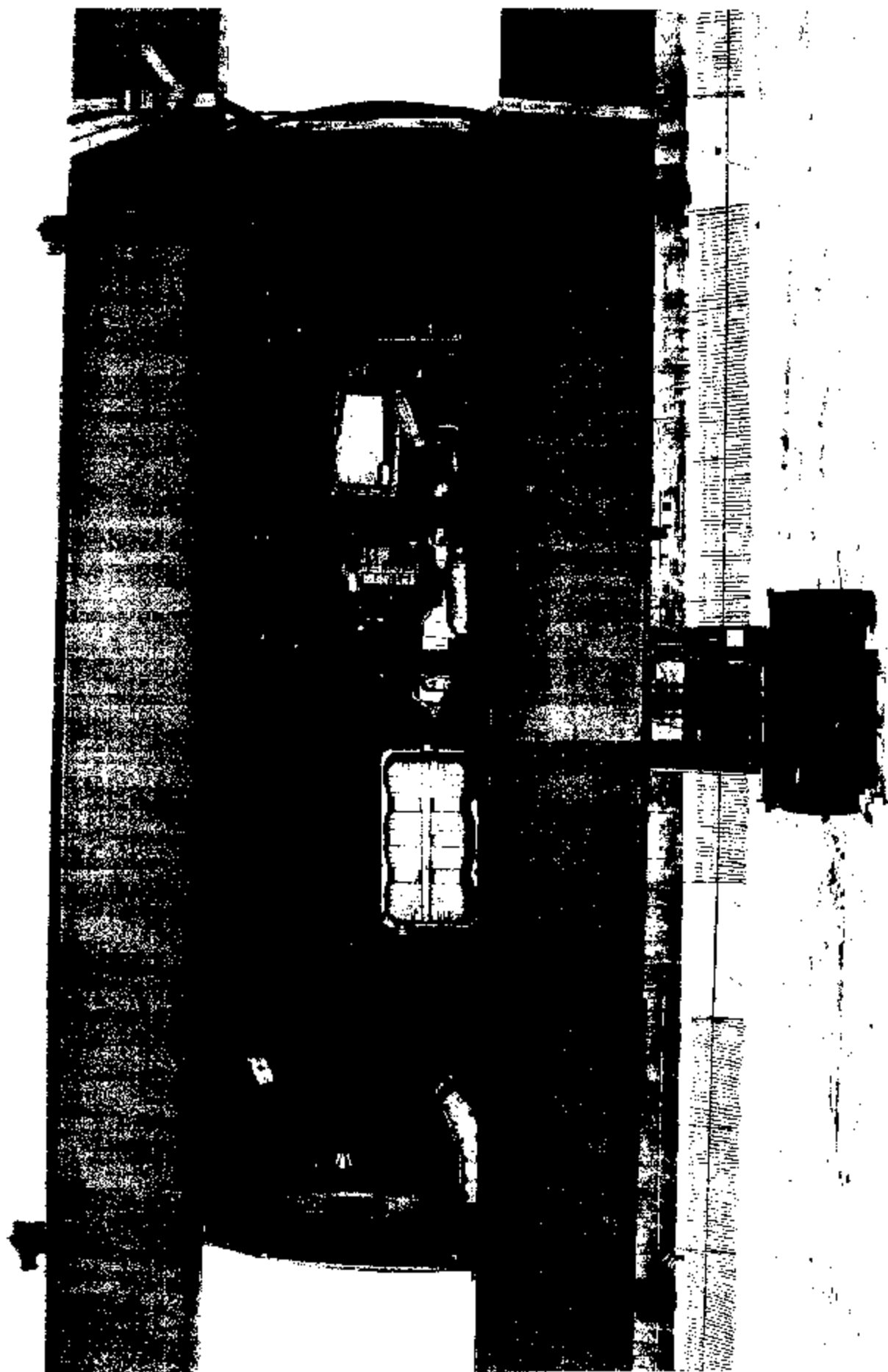


Figure A-45 ROLL OVER 270 DEGREES

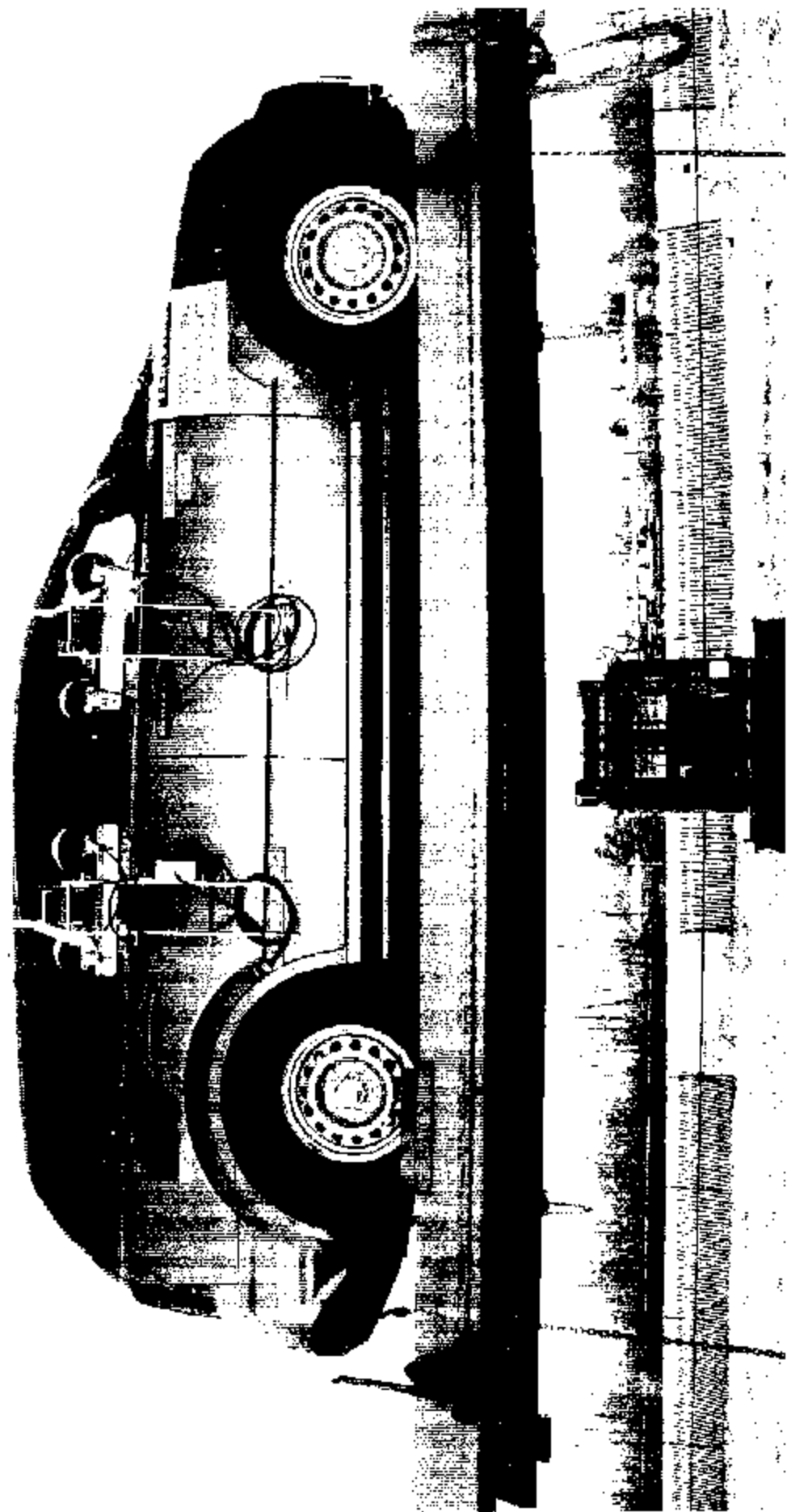


Figure A-46 ROLLOVER 360 DEGREES



Figure A 47 POST TEST P4 DOOR LATCUESTRICKER

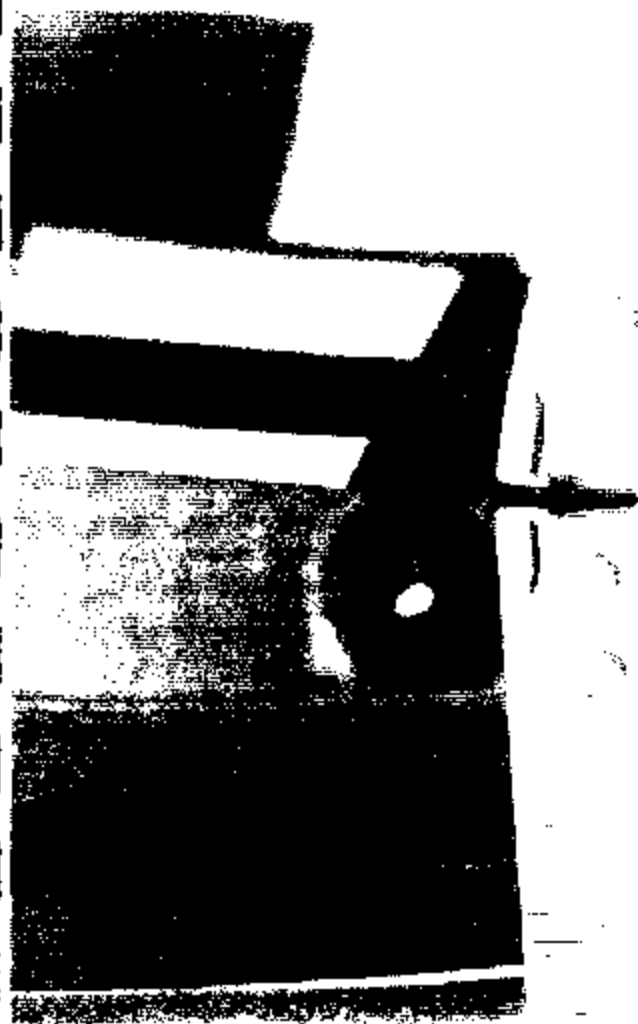


Figure A 48 POST TEST P4 DOOR TO BODY MEASUREMENT AT STRIKER HEIGHT



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

| <u>Plot No.</u> | <u>Data Plot Title</u>                             | <u>Page</u> |
|-----------------|----------------------------------------------------|-------------|
| 1               | DRIVER HEAD 9 ARRAY X ARM (Y) ACCELERATION VS TIME | B- 7        |
| 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       |
| 17              | DRIVER HEAD (Z) ACCELERATION VS TIME               | B- 23       |
| 18              | DRIVER HEAD (Z) VELOCITY VS TIME                   | B- 24       |
| 19              | DRIVER HEAD RESULTANT ACCELERATION VS TIME         | B- 25       |
| 20              | DRIVER UPPER NECK (X) FORCE VS TIME                | B- 26       |
| 21              | DRIVER UPPER NECK (Y) FORCE VS TIME                | B- 27       |
| 22              | DRIVER UPPER NECK (Z) FORCE VS TIME                | B- 28       |
| 23              | DRIVER UPPER NECK RESULTANT FORCE VS TIME          | B- 29       |
| 24              | DRIVER UPPER NECK (X) MOMENT VS TIME               | B- 30       |
| 25              | DRIVER UPPER NECK (Y) MOMENT VS TIME               | B- 31       |
| 26              | DRIVER UPPER NECK (Z) MOMENT VS TIME               | B- 32       |
| 27              | DRIVER UPPER NECK RESULTANT MOMENT VS TIME         | B- 33       |
| 28              | DRIVER UPPER RIB (Y) ACCELERATION VS TIME          | B- 34       |
| 29              | DRIVER UPPER RIB (Y) VELOCITY VS TIME              | B- 35       |
| 30              | DRIVER LOWER RIB (Y) ACCELERATION VS TIME          | B- 36       |
| 31              | DRIVER LOWER RIB (Y) VELOCITY VS TIME              | B- 37       |
| 32              | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME        | B- 38       |
| 33              | DRIVER LOWER SPINE (Y) VELOCITY VS TIME            | B- 39       |
| 34              | DRIVER PELVIC (Y) ACCELERATION VS TIME             | B- 40       |
| 35              | DRIVER PELVIC (Y) VELOCITY VS TIME                 | B- 41       |

**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> |
|-----------------|-------------------------------------------------------|-------------|
| 36              | PASSENGER HEAD 9 ARRAY X ARM (Y) ACCELERATION VS TIME | B- 42       |
| 37              | PASSENGER HEAD 9 ARRAY X ARM (Y) VELOCITY VS TIME     | B- 43       |
| 38              | PASSENGER HEAD 9 ARRAY X ARM (Z) ACCELERATION VS TIME | B- 44       |
| 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       |
| 42              | PASSENGER HEAD 9 ARRAY Y ARM (Z) ACCELERATION VS TIME | B- 48       |
| 43              | PASSENGER HEAD 9 ARRAY Y ARM (Z) VELOCITY VS TIME     | B- 49       |
| 44              | PASSENGER HEAD 9 ARRAY Z ARM (X) ACCELERATION VS TIME | B- 50       |
| 45              | PASSENGER HEAD 9 ARRAY Z ARM (X) VELOCITY VS TIME     | B- 51       |
| 46              | PASSENGER HEAD 9 ARRAY Z ARM (Y) ACCELERATION VS TIME | B- 52       |
| 47              | PASSENGER HEAD 9 ARRAY Z ARM (Y) VELOCITY VS TIME     | B- 53       |
| 48              | PASSENGER HEAD (X) ACCELERATION VS TIME               | B- 54       |
| 49              | PASSENGER HEAD (X) VELOCITY VS TIME                   | B- 55       |
| 50              | PASSENGER HEAD (Y) ACCELERATION VS TIME               | B- 56       |
| 51              | PASSENGER HEAD (Y) VELOCITY VS TIME                   | B- 57       |
| 52              | PASSENGER HEAD (Z) ACCELERATION VS TIME               | B- 58       |
| 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       |
| 56              | DRIVER UPPER NECK (Y) FORCE VS TIME                   | B- 62       |
| 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 - FOR 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

| <u>Plot No.</u> | <u>Data Plot Title</u>                                       | <u>Page</u> |
|-----------------|--------------------------------------------------------------|-------------|
| 79              | RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME       | B- 85       |
| 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> |
|-----------------|-------------------------------------------------------------|-------------|
| 118             | VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME          | B- 124      |
| 119             | VEHICLE CENTER OF GRAVITY (X) VELOCITY VS TIME              | B- 125      |
| 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      |
| 126             | MDB CENTER OF GRAVITY (X) VELOCITY VS TIME           | B- 132      |
| 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 100, LOWER SPINE - FILTER CLASS 180**  
**INTEGRATION DATA - FILTER CLASS 130**

| <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**

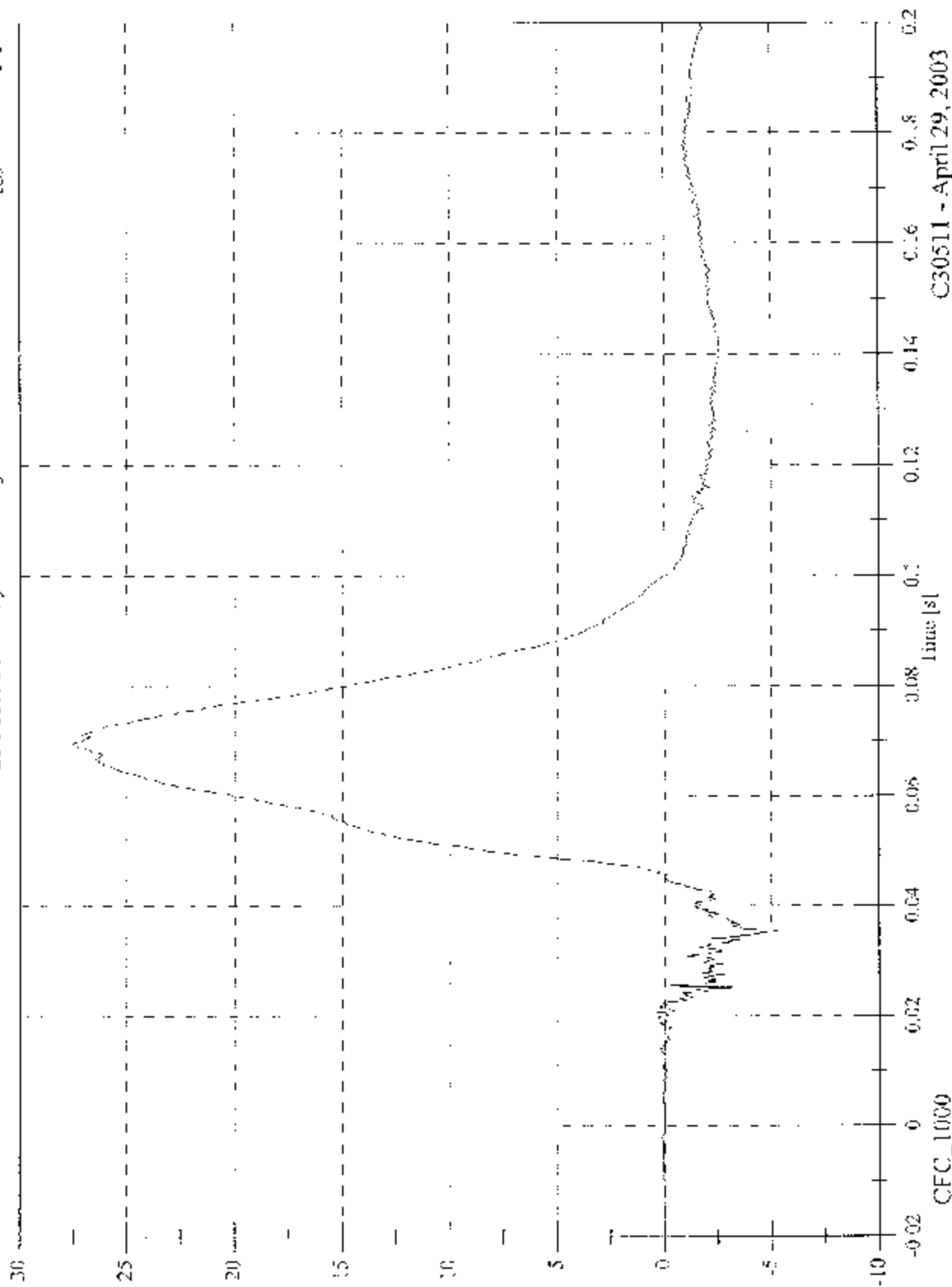
| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 152             | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 158      |
| 153             | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 159      |
| 154             | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 160      |
| 155             | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 161      |
| 156             | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME   | B- 162      |
| 157             | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 163      |
| 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

Max: 27.5 [g] at 0.069 [s]

V2P1 Head 9 Array X Arm Ay

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



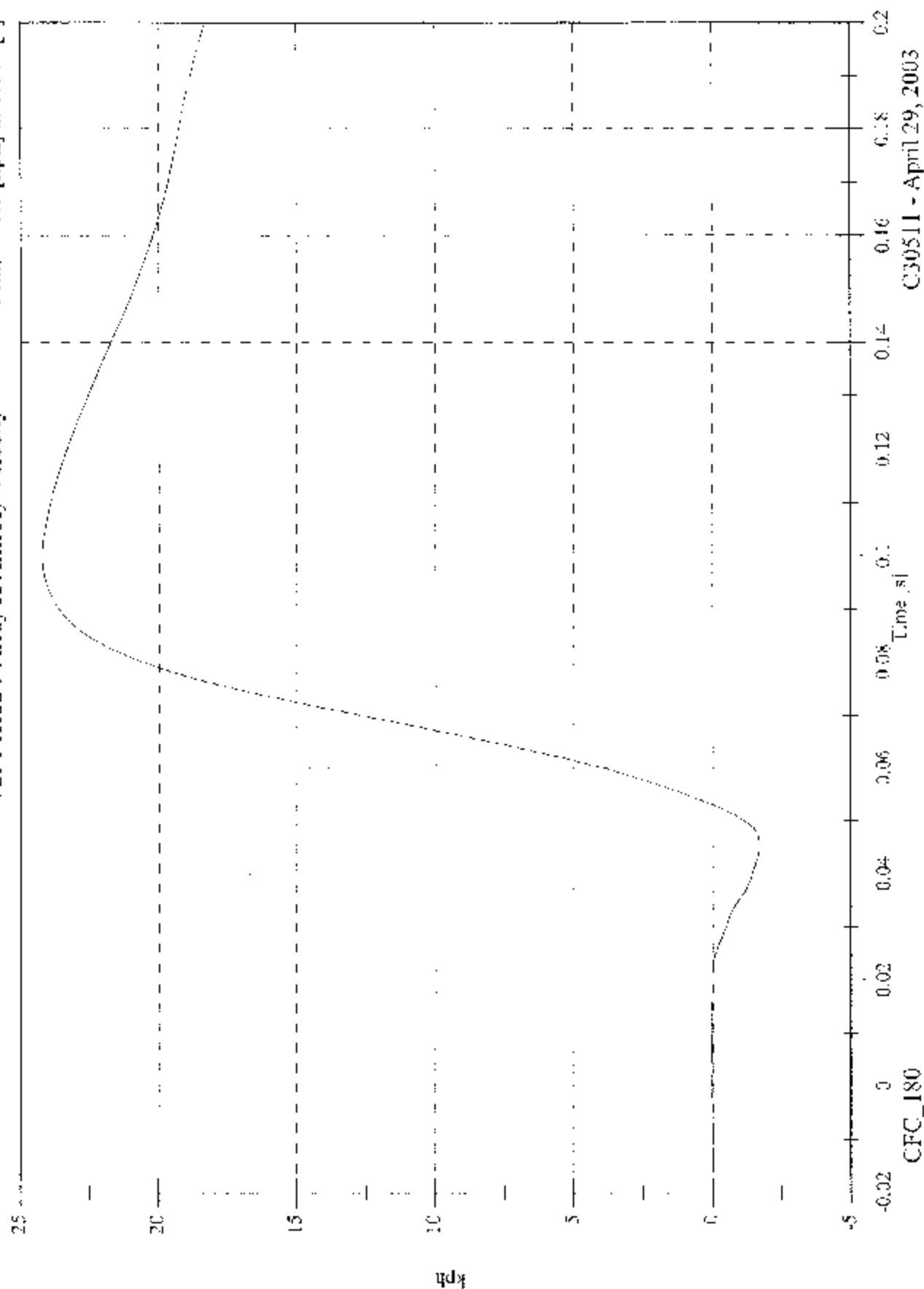
C30511 - April 29, 2003

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 0.0915 [s]



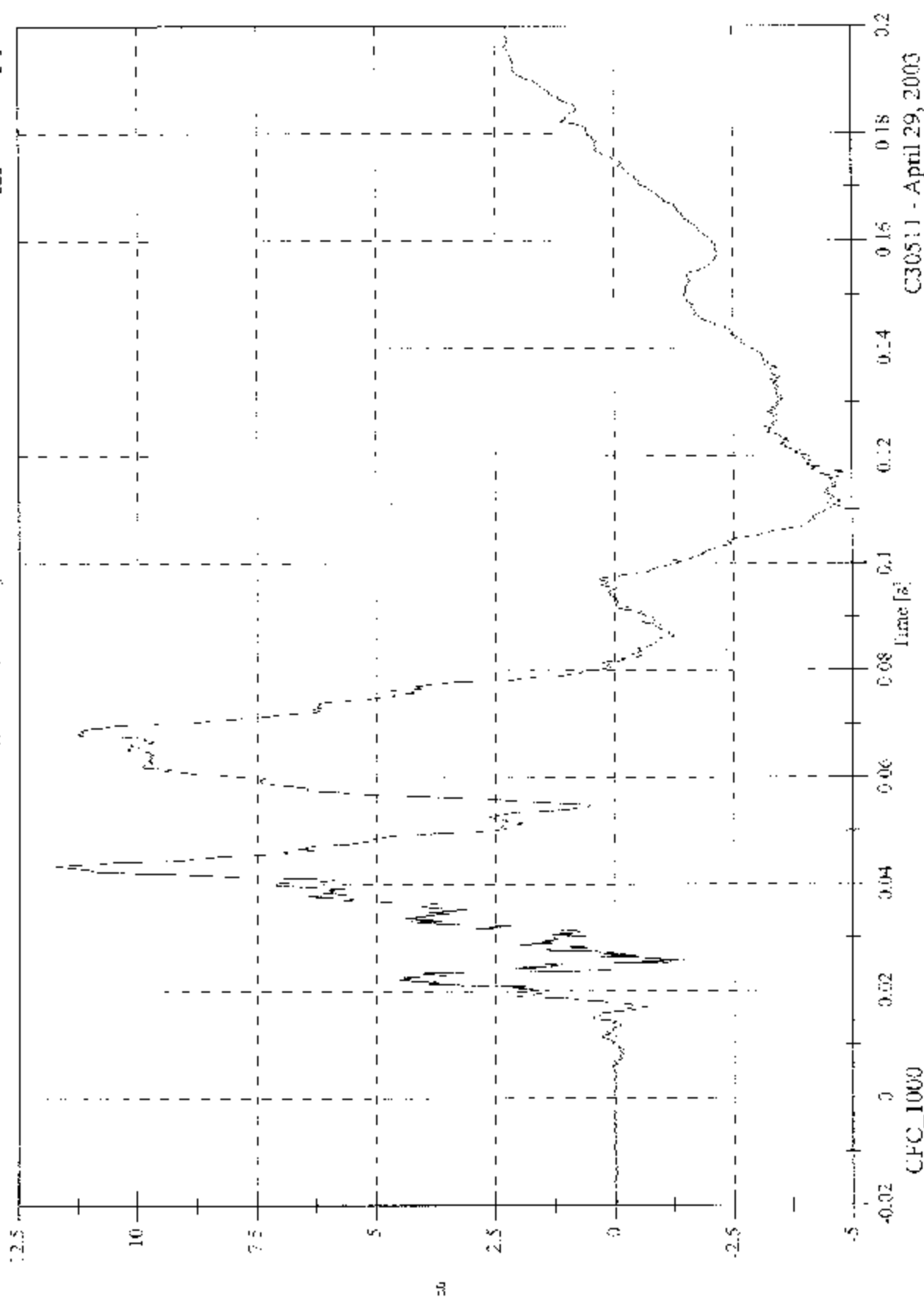
C30511 - April 29, 2003



FMVSS 214D Indicant - 2003 Kia Sorento

Max: 11.7 [g] at 0.043 [s]  
Min: -4.8 [g] at 0.117 [s]

V2Pl Head 9 Array X Arm Az



CFC\_1000

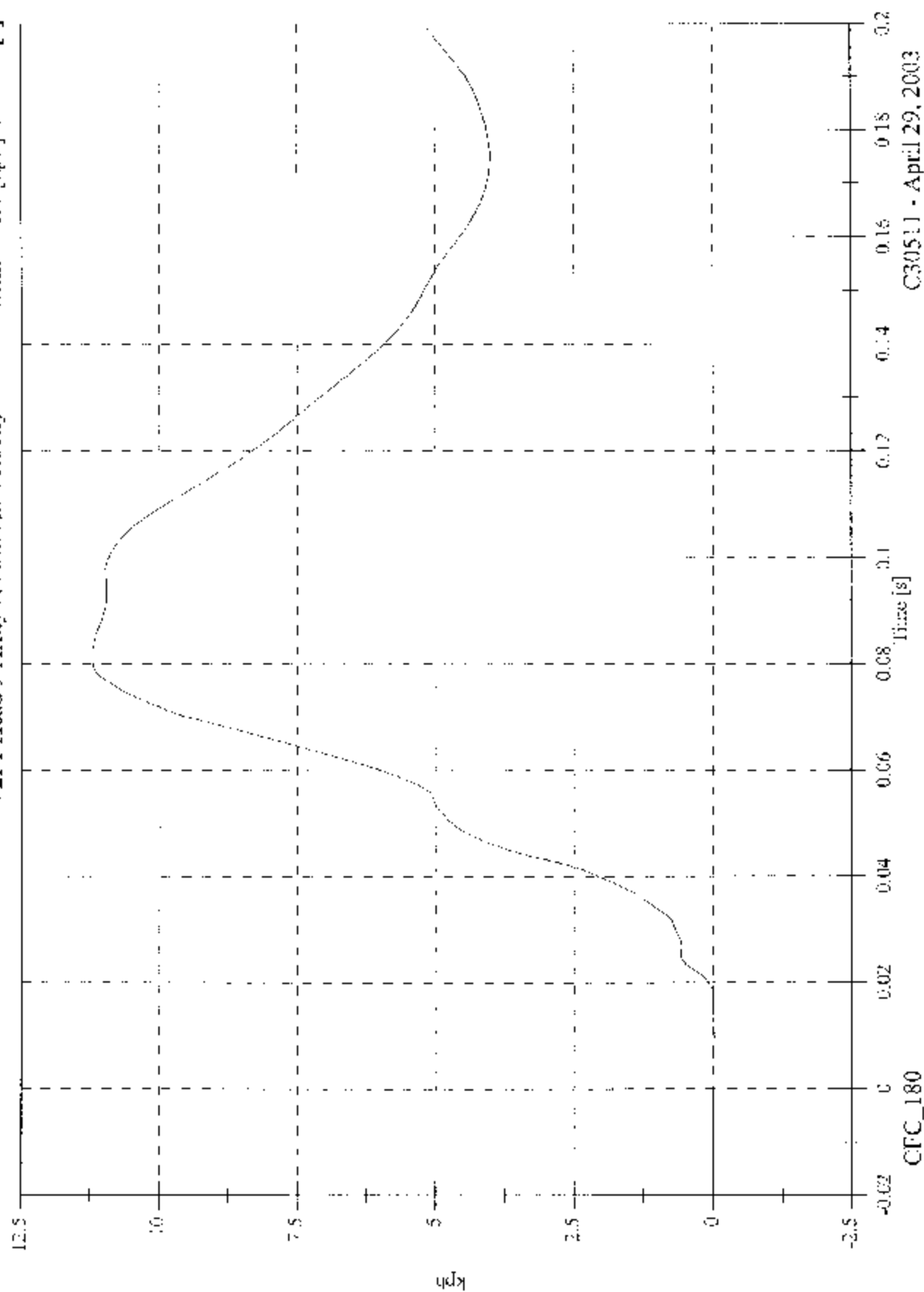
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 11.2 [kph] at 0.081 [s]

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

V2P1 Head 9 Array X Ann Az Velocity



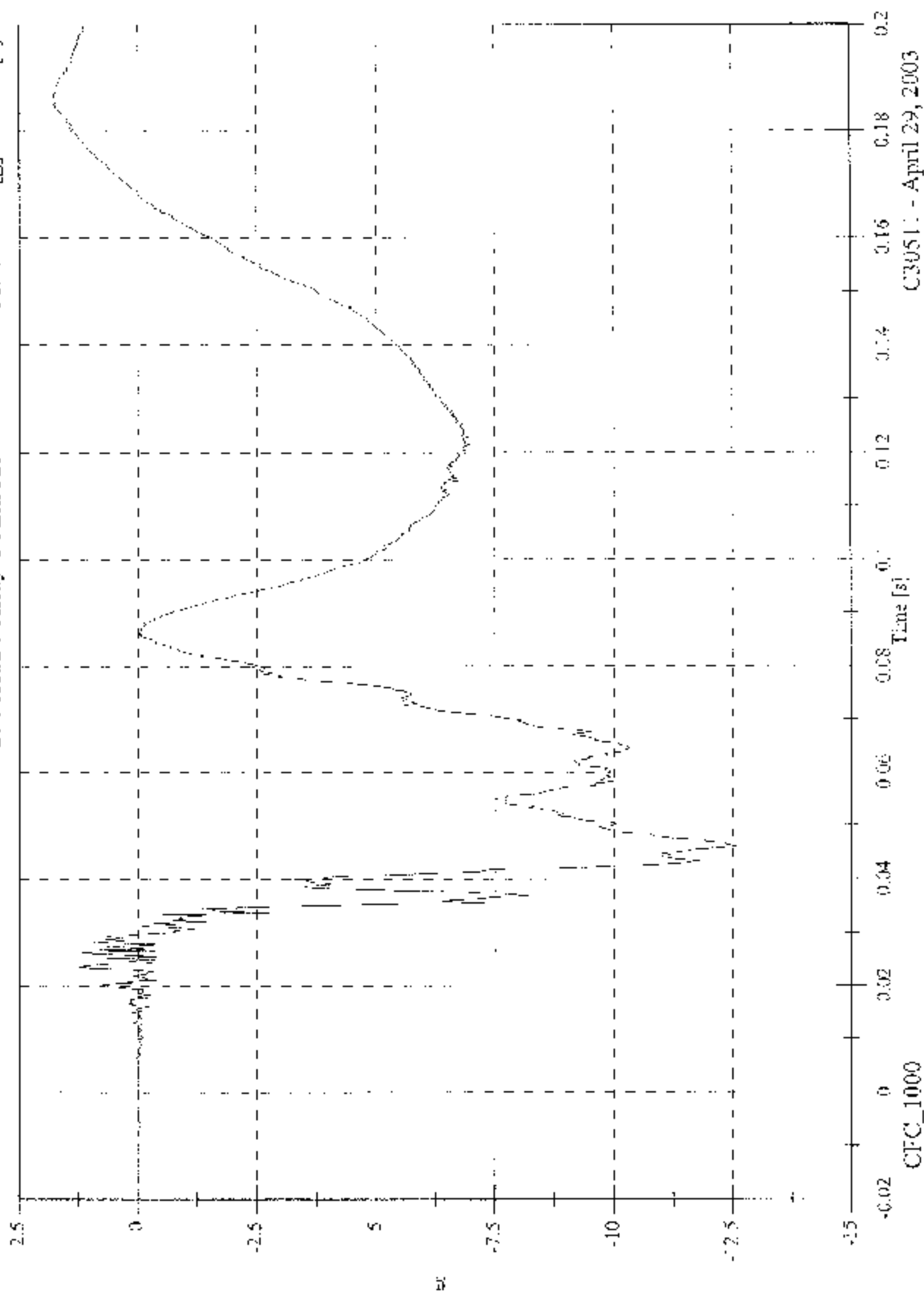
C30511 - April 29, 2003

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]



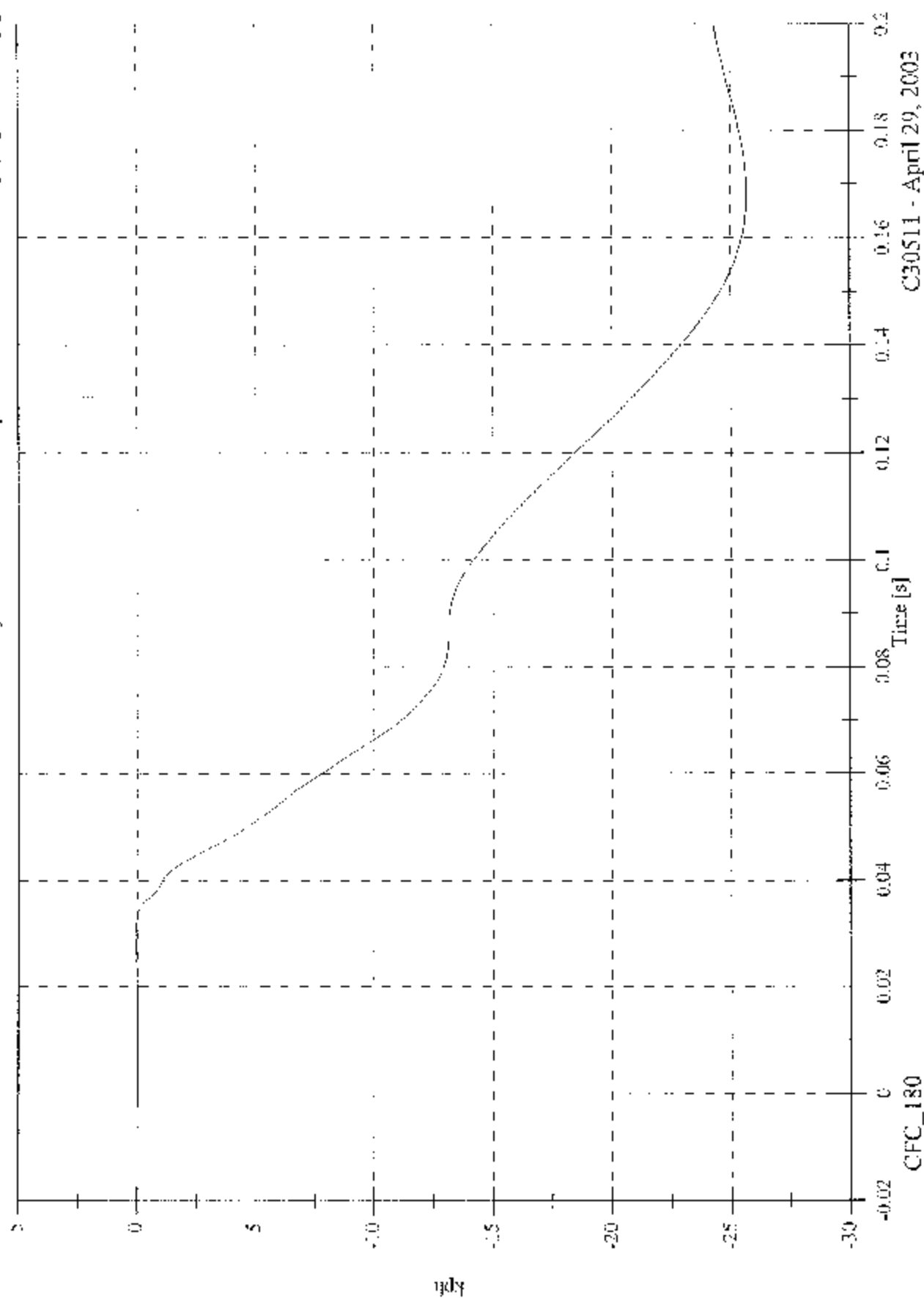
C39511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorrento

V2P1 Head 9 Array Y Arm Ax Velocity

Max: 0.1 [kph] at 0.030 [s]

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



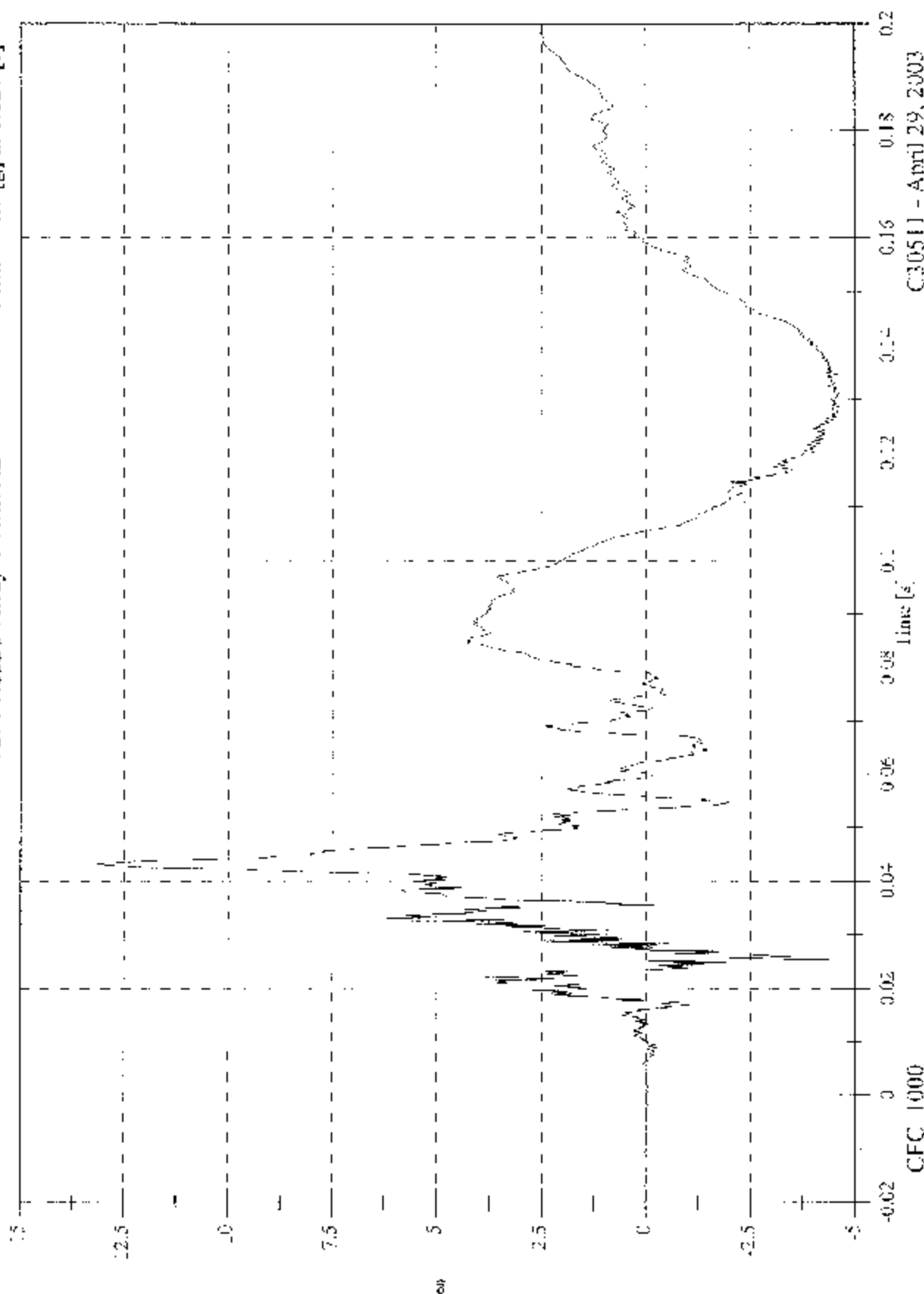
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

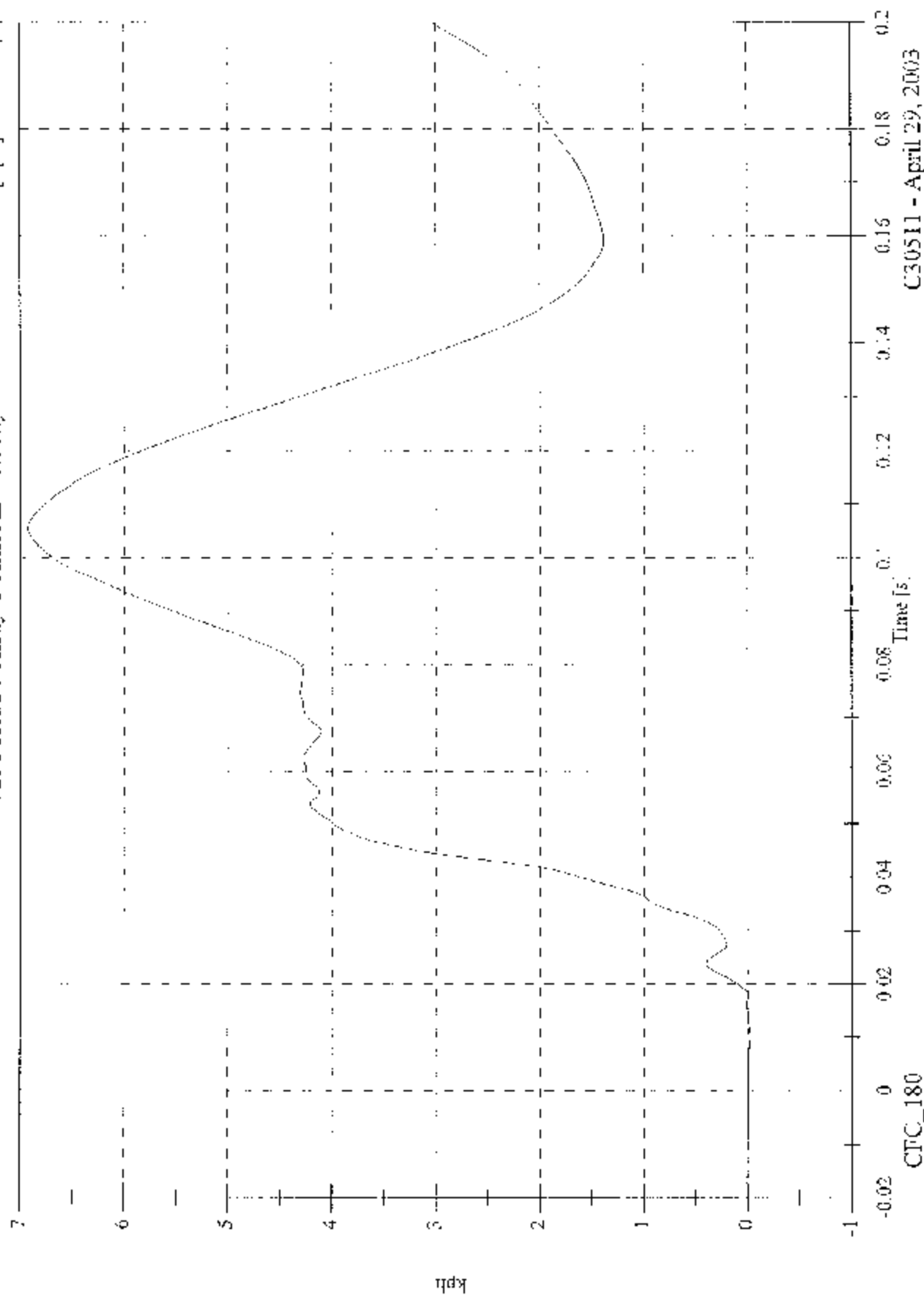
Max: 13.1 [g] at 0.043 [s]

V2PI Head 9 Array Y Arm Az

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



C30511 - April 29, 2003

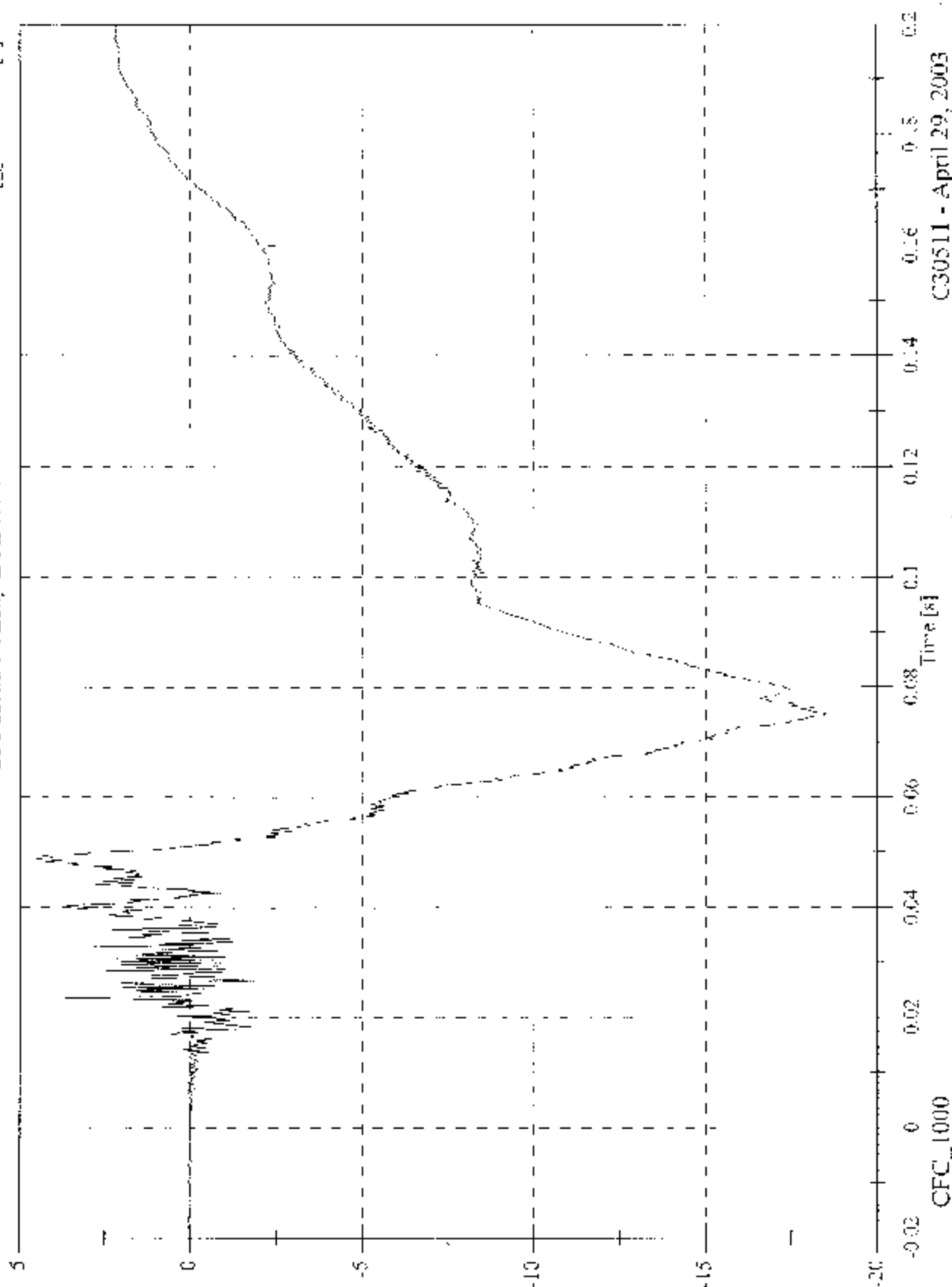


FMVSS 214D Inducam - 2003 Kia Sorento

Max: 4.6 [g] at 0.049 [s]

V2P1 Head 9 Array Z Arm Ax

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



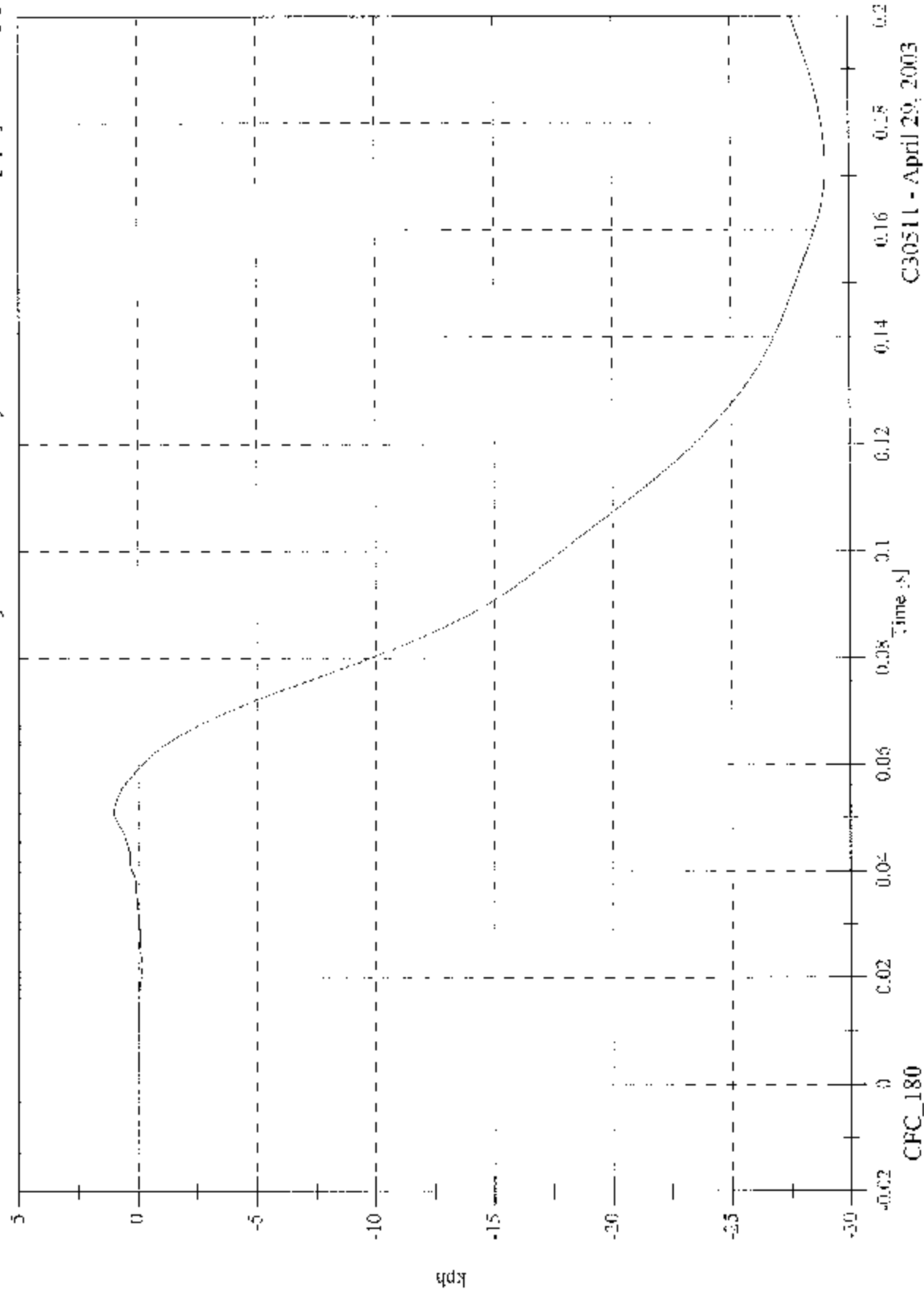
C30511 - April 29, 2003

FMVSS 214D Indican: - 2003 Kia Sorento

Max: 1.0 [kph] at 0.051 [s]

V2P1 Head 9 Array Z Arm Ax Velocity

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



CPC\_180

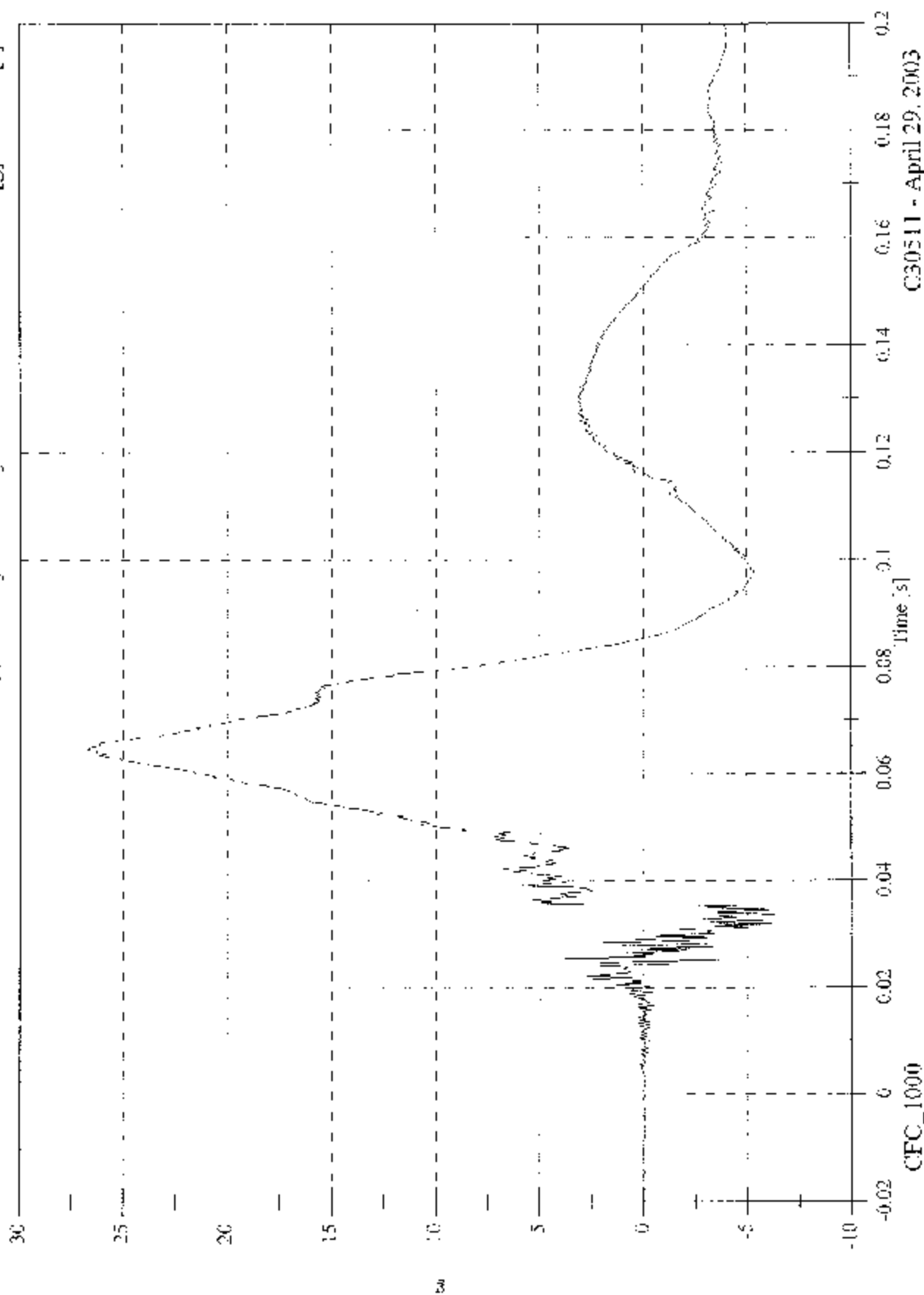
C30511 - April 29, 2003



FMVSS 214D Inducant - 2003 Kia Sorento

Max: 26.7 [g] at 0.065 [s]  
Min: -6.8 [g] at 0.034 [s]

V2PI Head 9 Array Z Arm Ay



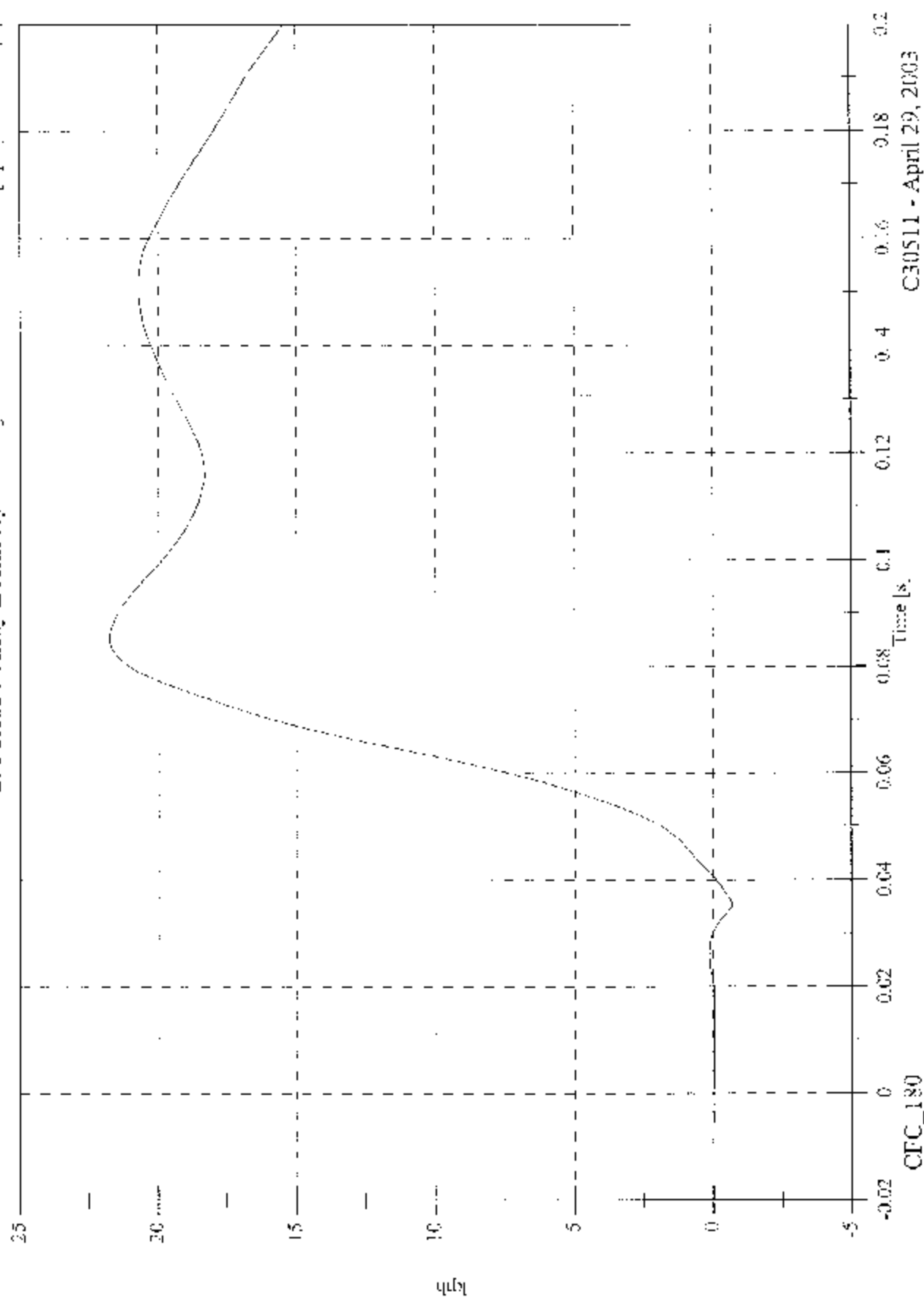
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 21.8 [mph] at 0.085 [s]

V2P1 Head 9 Array Z Arm Ay Velocity

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

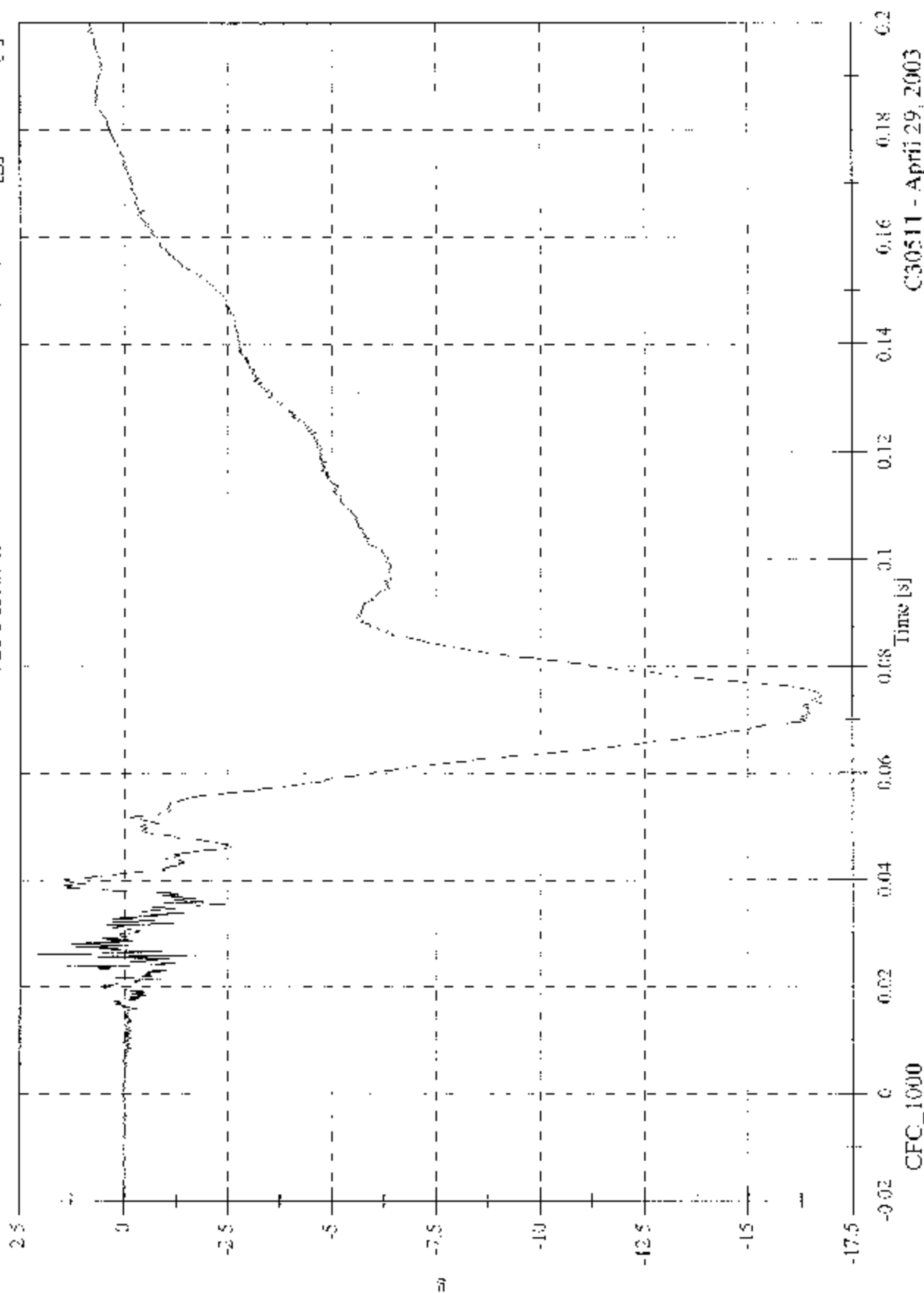


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 2.3 [g] at 0.026 [s]  
Min: -16.8 [g] at 0.075 [s]

V2P1 Head x



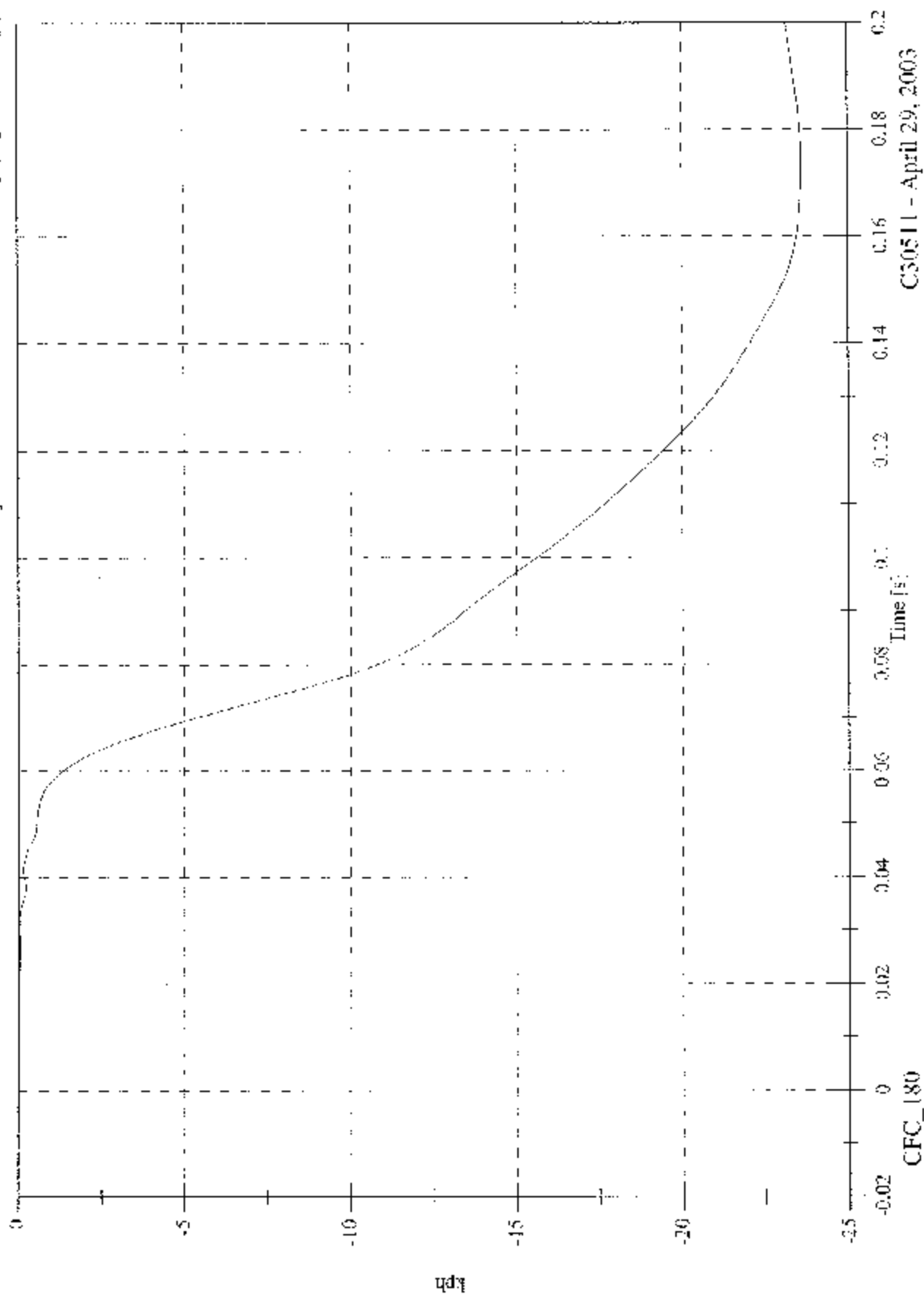
CFC\_1000

C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 0.0 [kph] at 0.003 [s]  
Min: -23.6 [kph] at 0.174 [s]

VZP1 Head x Velocity

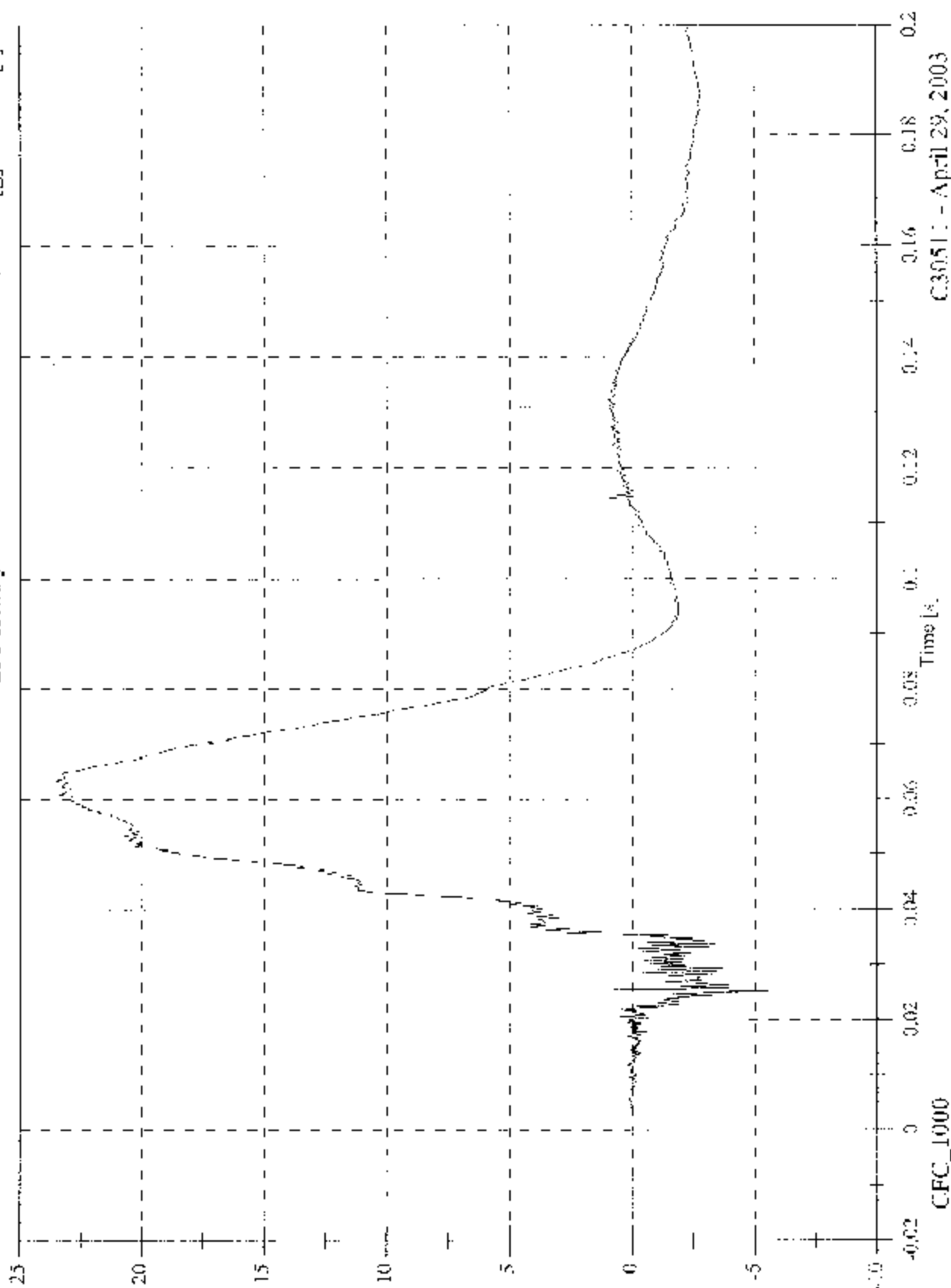


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 23.5 [g] at 0.063 [s]  
Min: -5.5 [g] at 0.025 [s]

V2P1 Head y



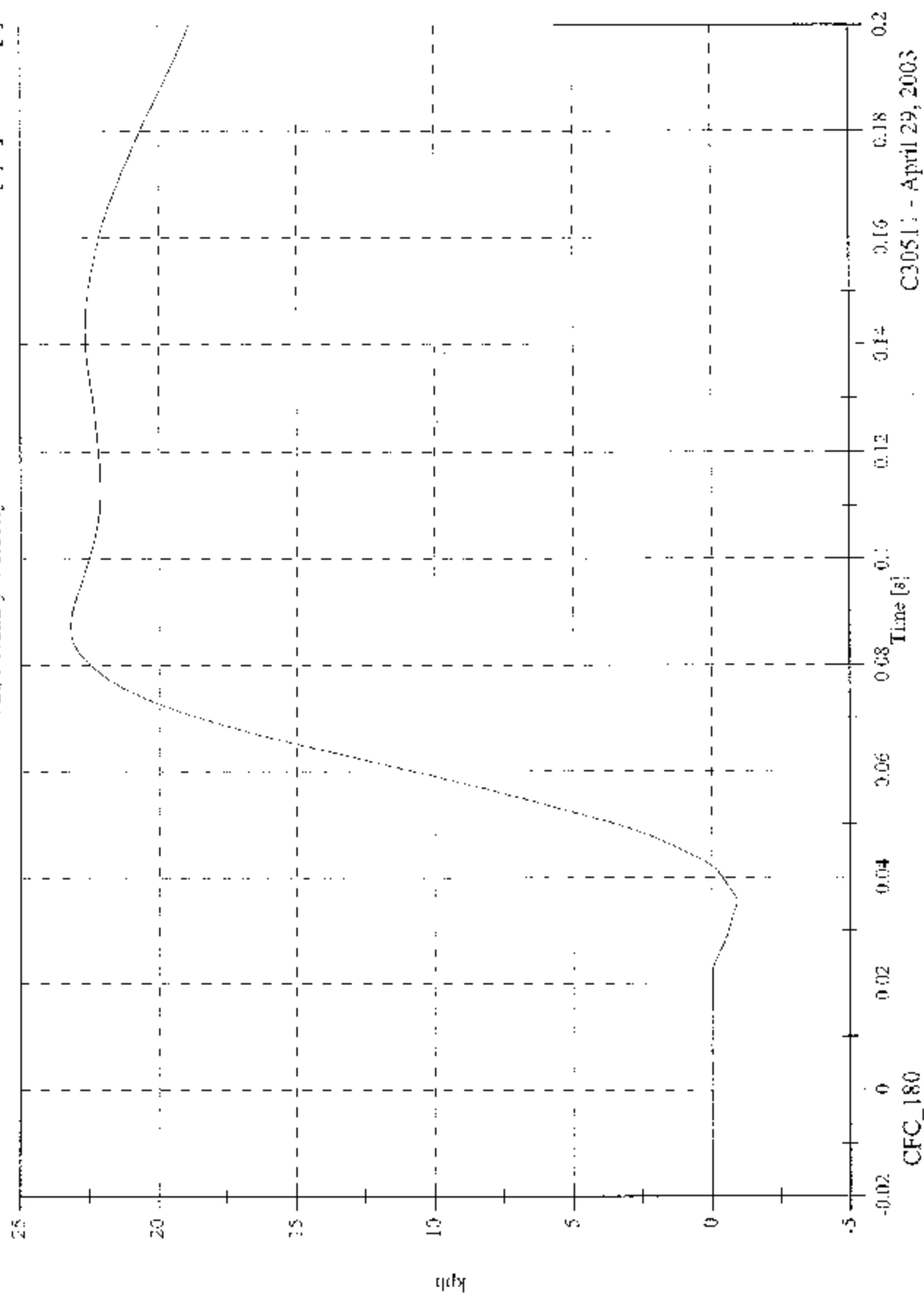
C30511 - April 29, 2003

FMVSS 214D Indicator - 2003 Kia Sorento

Max: 23.2 [kph] at 0.087 [s]

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

V2P1 Head y Velocity

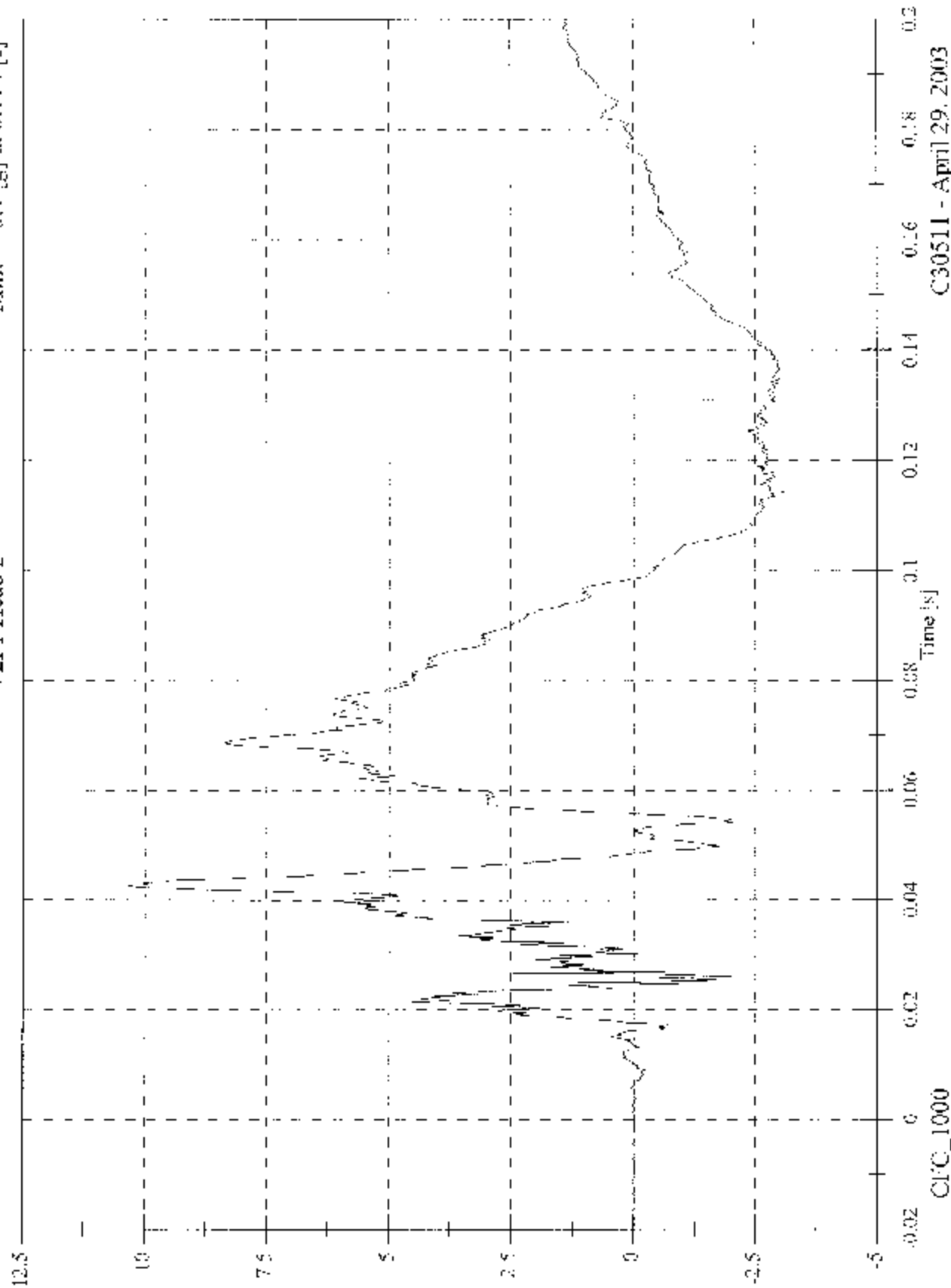


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorelto

Max: 10.4 [g] at 0.043 [s]  
Min: -3.1 [g] at 0.114 [s]

V2P1 Head z



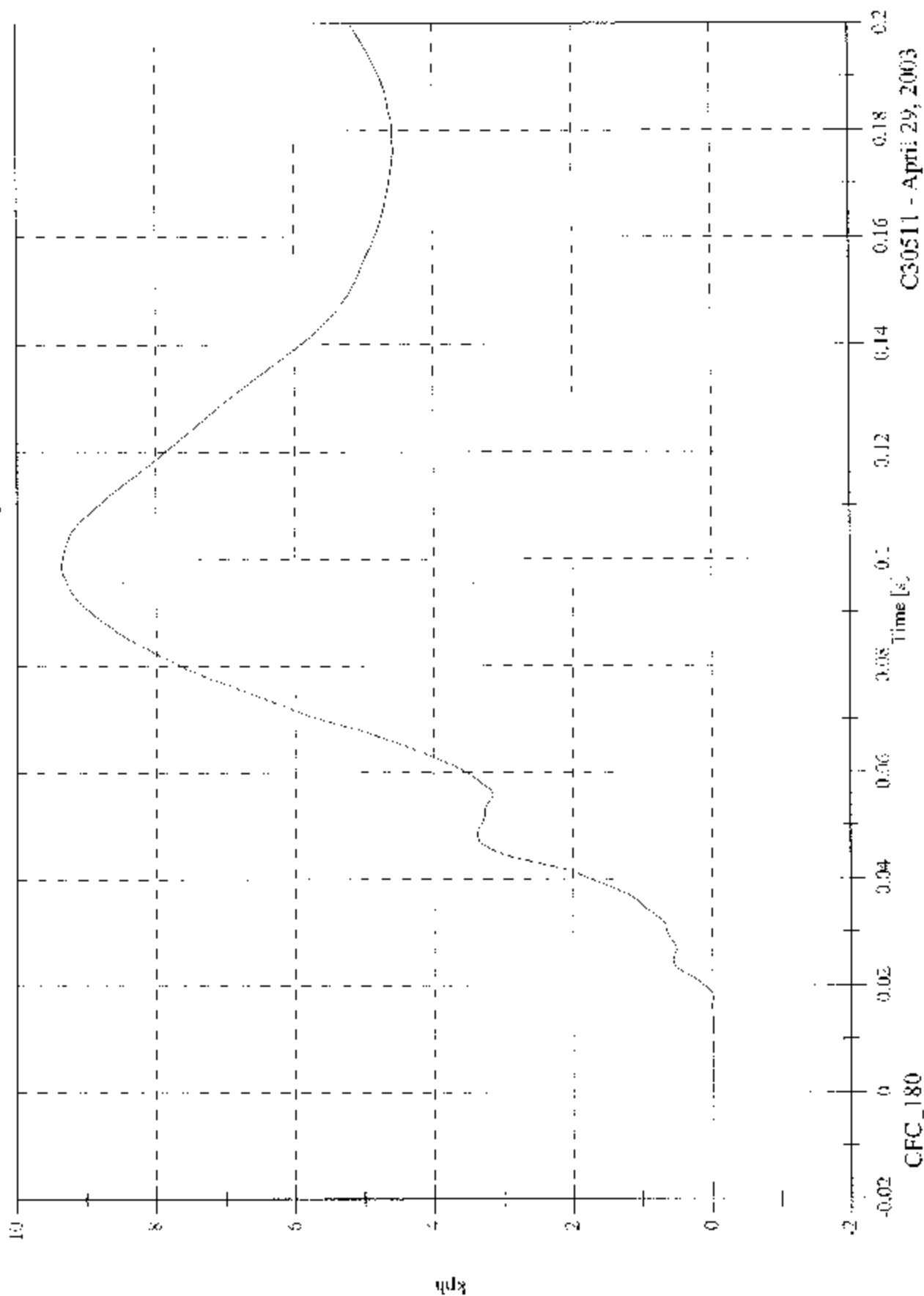
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 9.4 [sph] at 0.099 [s]

Min: -0.9 [kph] at 0.010 [s]

V2P1 Head z Velocity



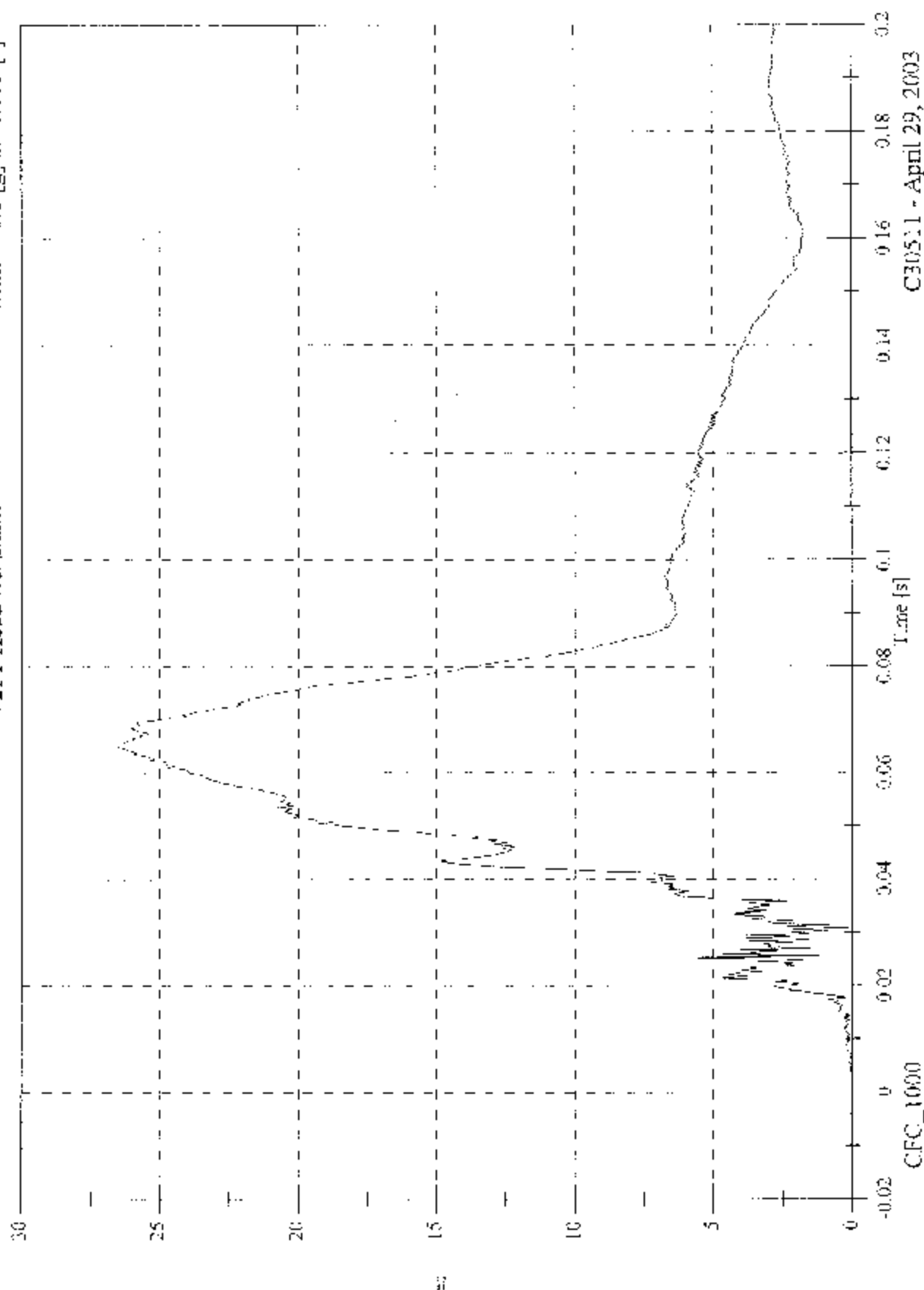
C30511 - April 29, 2003



FMVSS 214D Inducant - 2003 Kia Sorento

V2P1 Head Resultant

Max: 26.6 [g] at 0.065 [s]  
Min: 0.0 [g] at -0.003 [s]



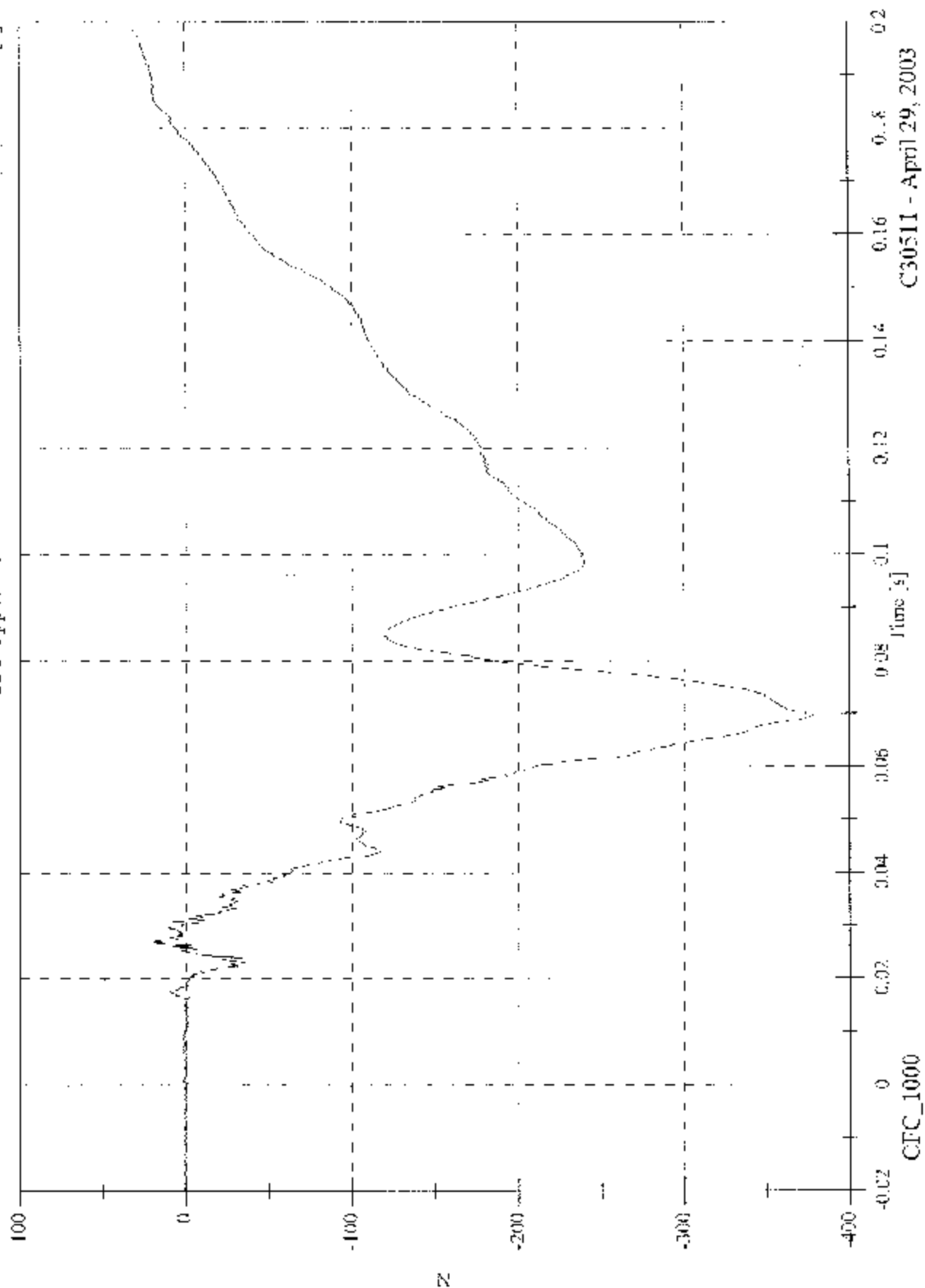
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 31.3 [N] at 0.198 [s]

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

V2P1 Upper Neck Fx

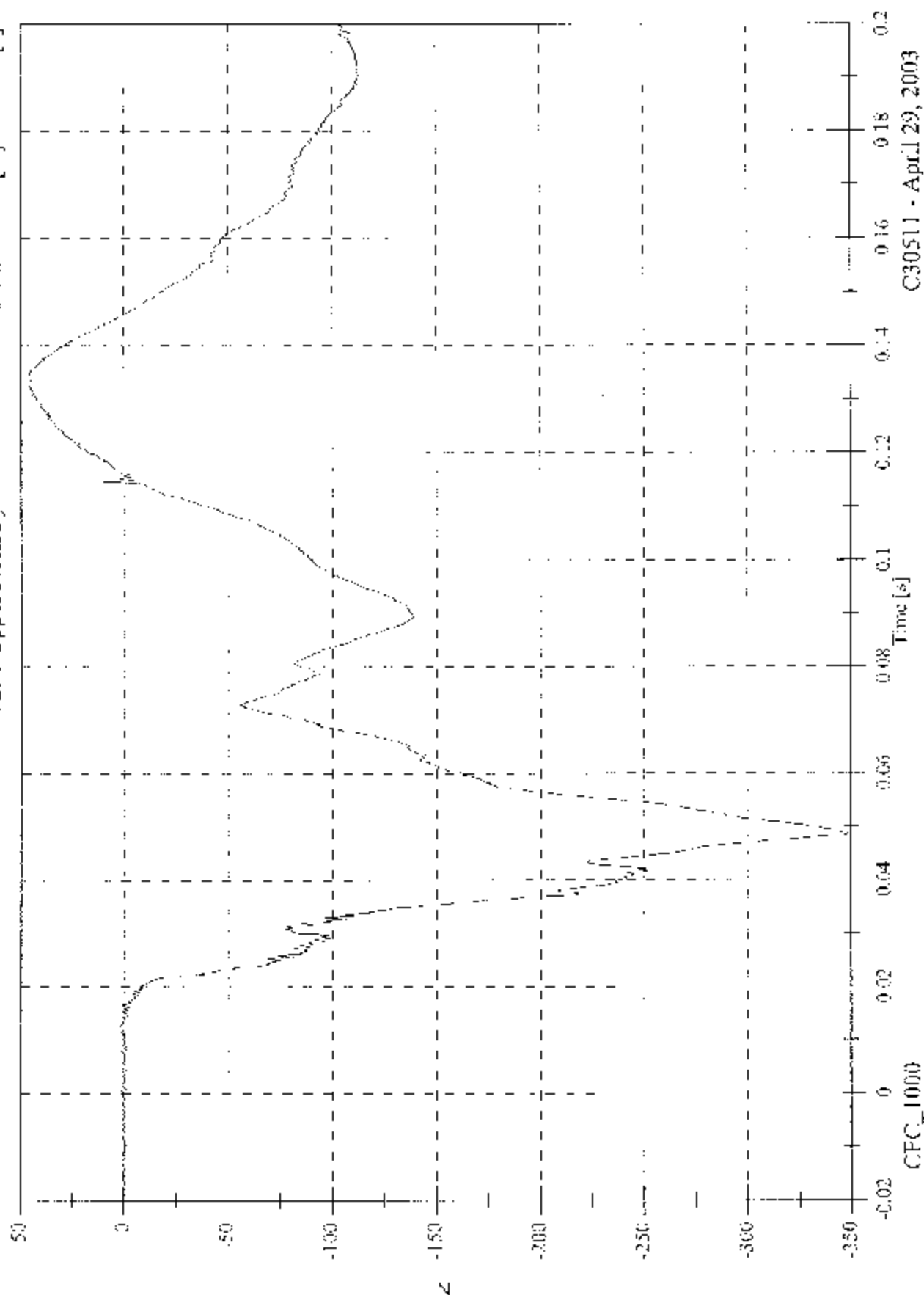


C30511 - April 29, 2003

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]

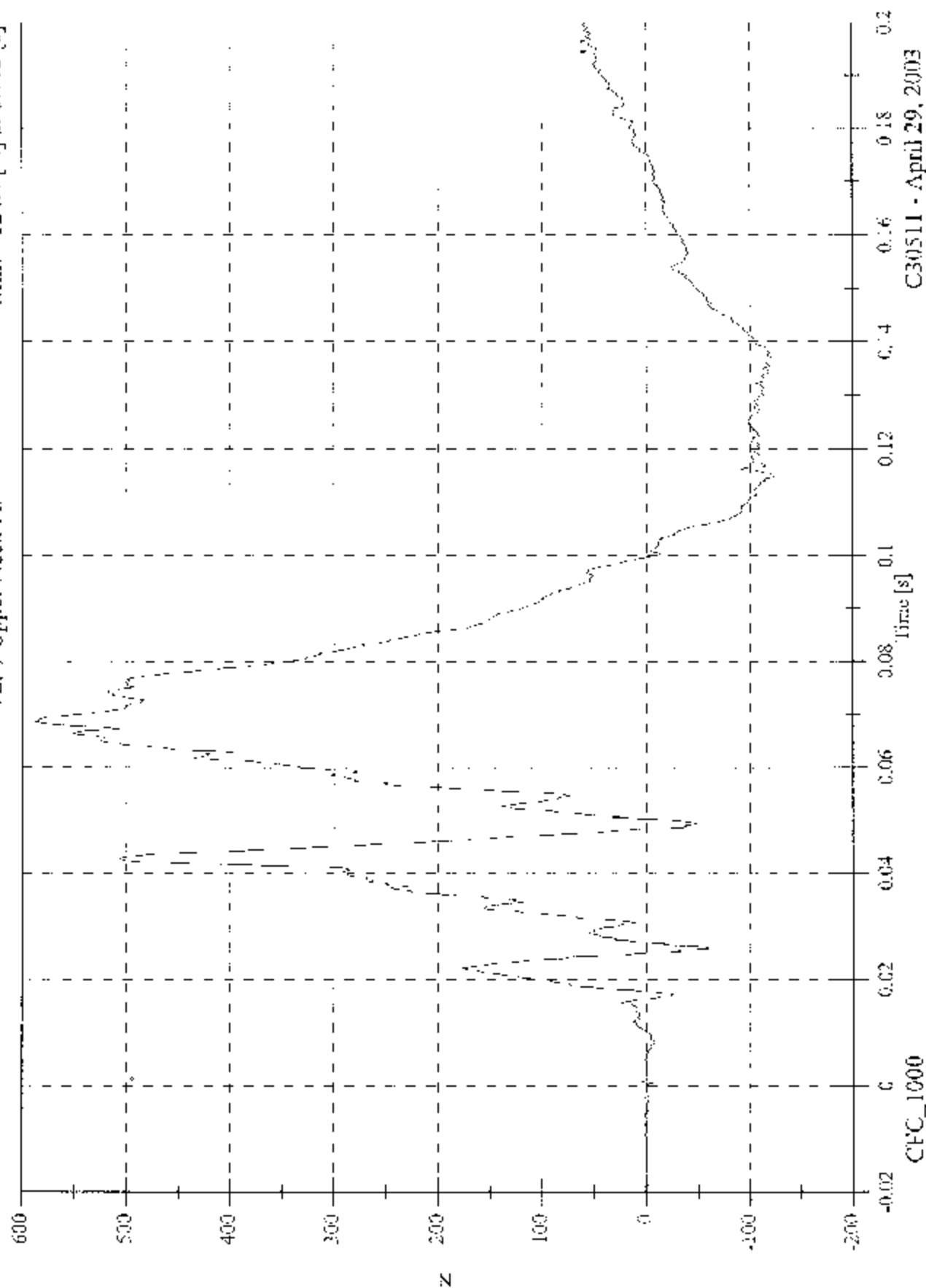


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 587.2 [N] at 0.069 [s]  
Min: -124.4 [N] at 0.115 [s]

V2P1 Upper Neck Fz

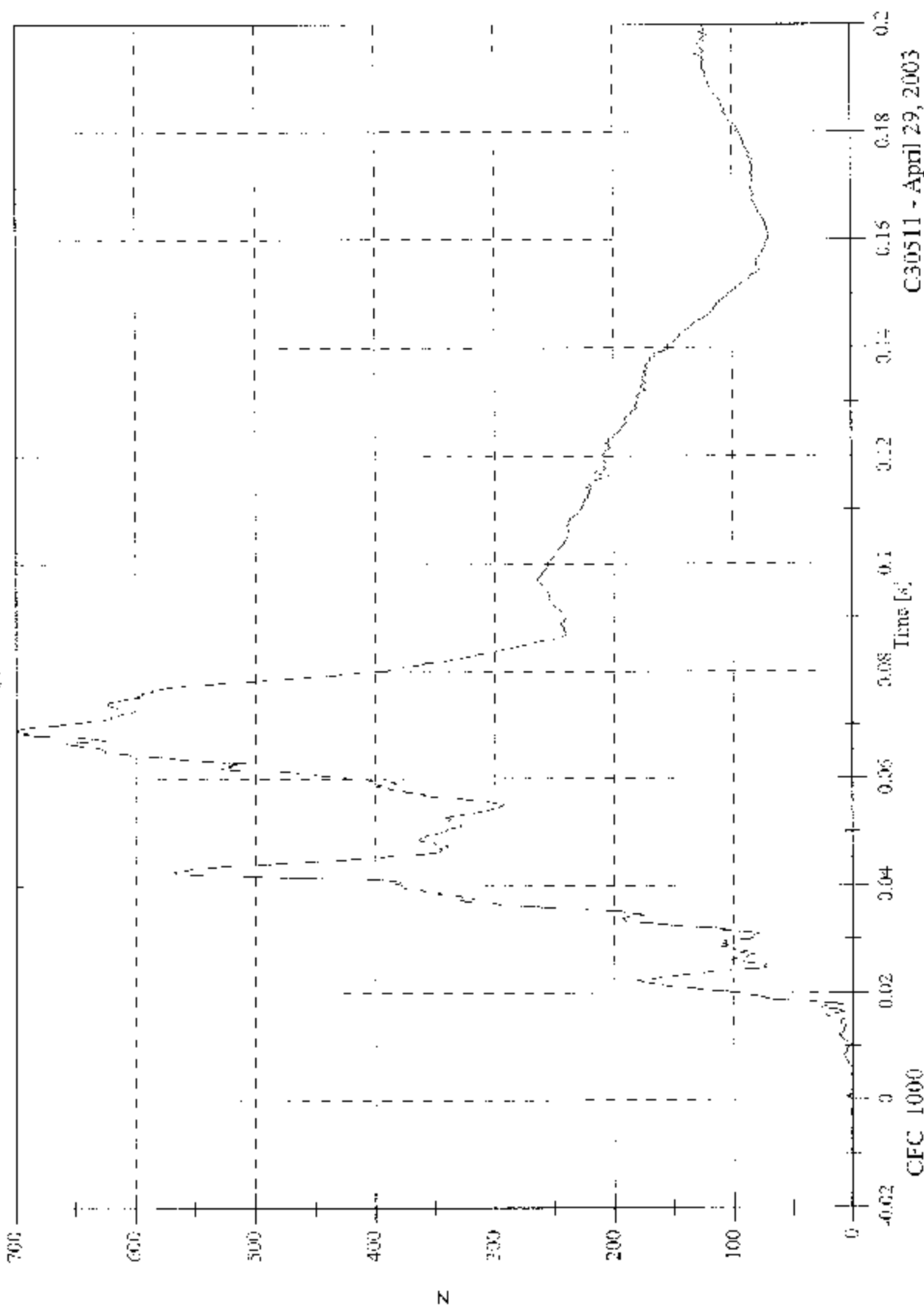


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 699.4 [N] at 0.069 [s]  
Min: 0.1 [N] at -0.008 [s]

V2PI Upper Neck F Resultant

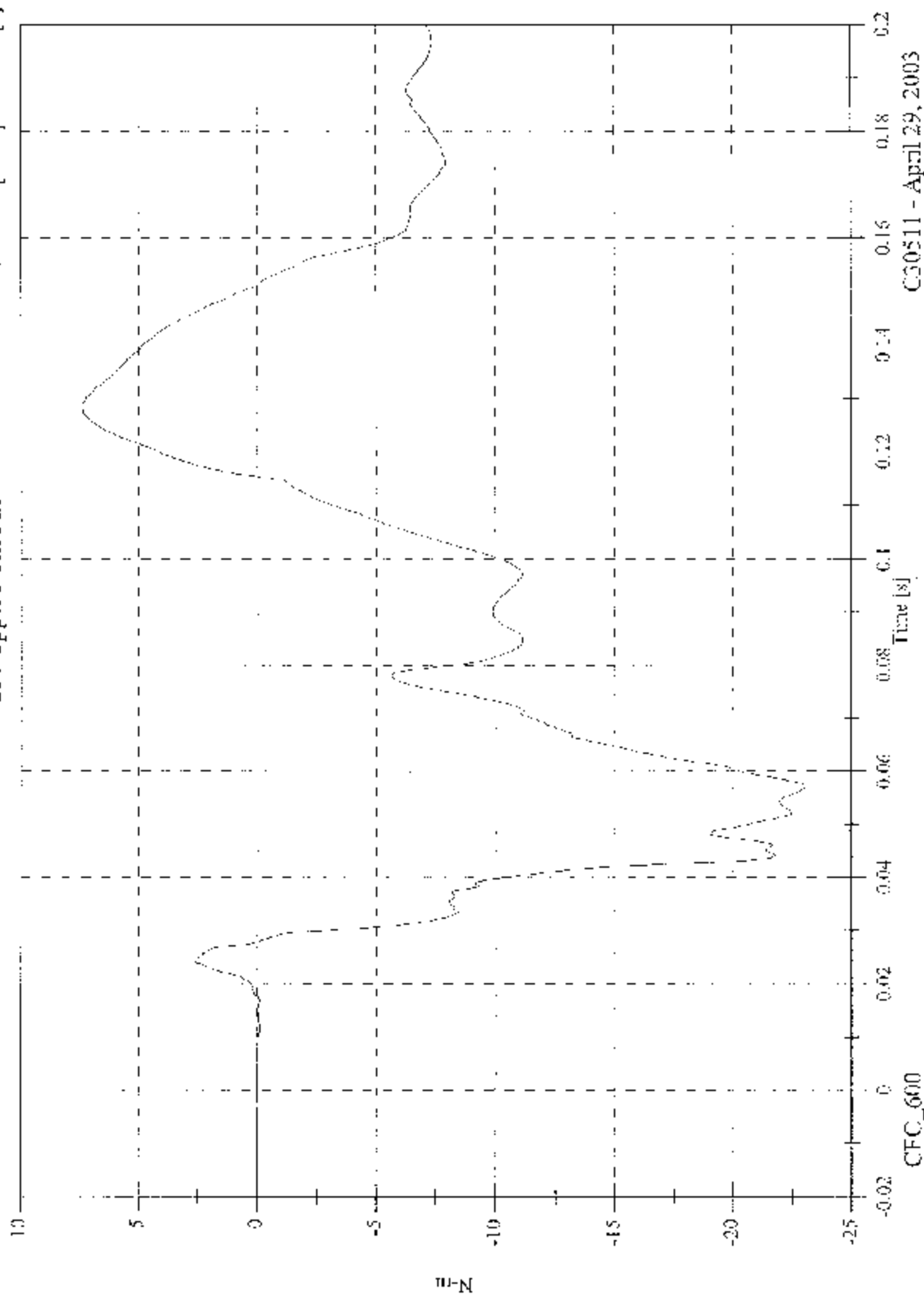


C30511 - April 29, 2003

# FMVSS 214D Indicant - 2003 Kia Sorento

Max: 7.4 [N-m] at 0.128 [s]  
 Min: -23.0 [N-m] at 0.057 [s]

V2PI Upper Neck Mx

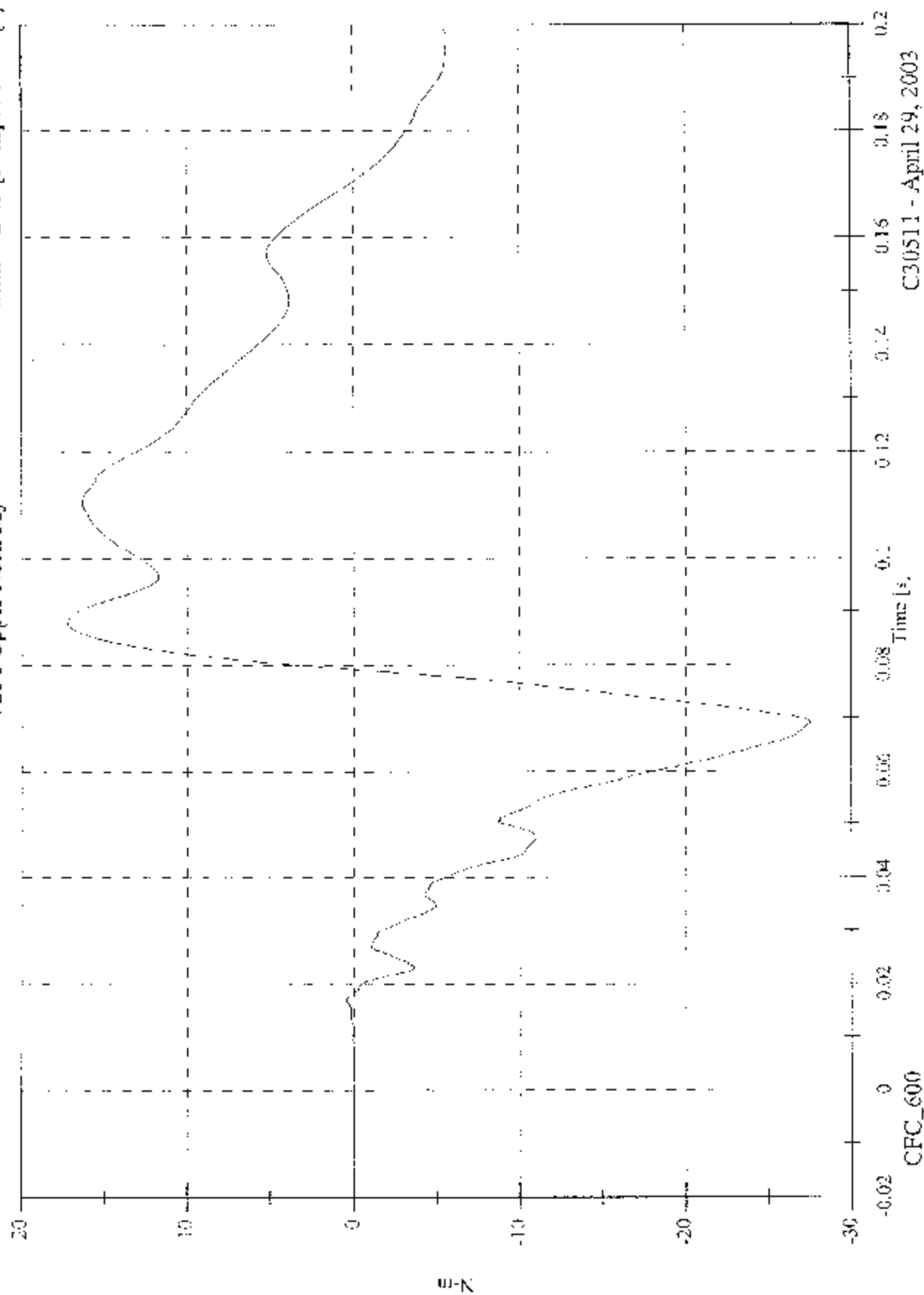


C30511 - April 29, 2003

FMVSS 214D Indican1 - 2003 Kia Sorento

Max: 17.2 [N-m] at 0.088 [s]  
Min: -27.5 [N-m] at 0.069 [s]

V2P1 Upper Neck My



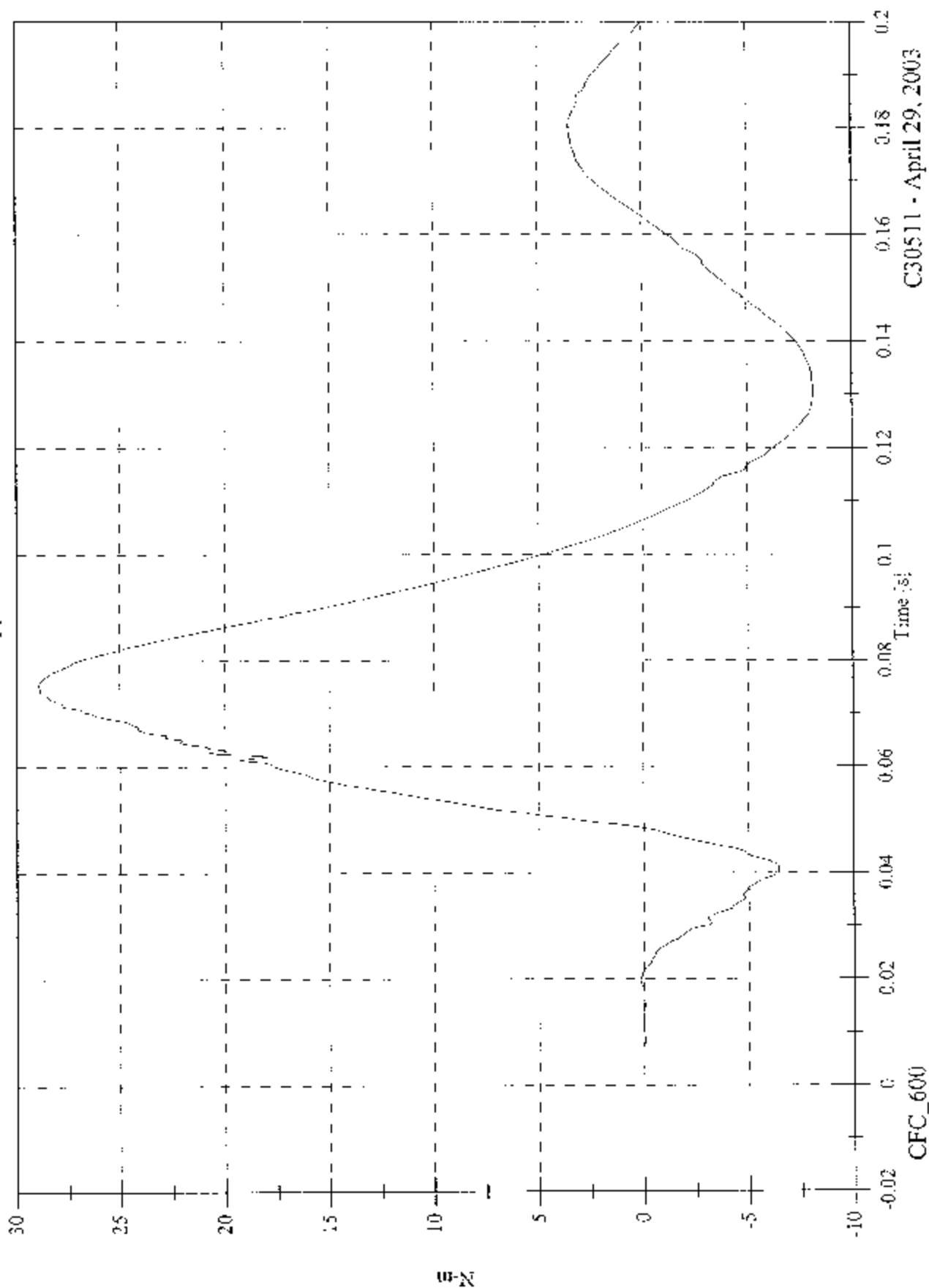
CFC\_600

C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

V2P1 Upper Neck Mz

Max: 28.9 [N-m] at 0.075 [s]  
Min: -8.2 [N-m] at 0.130 [s]



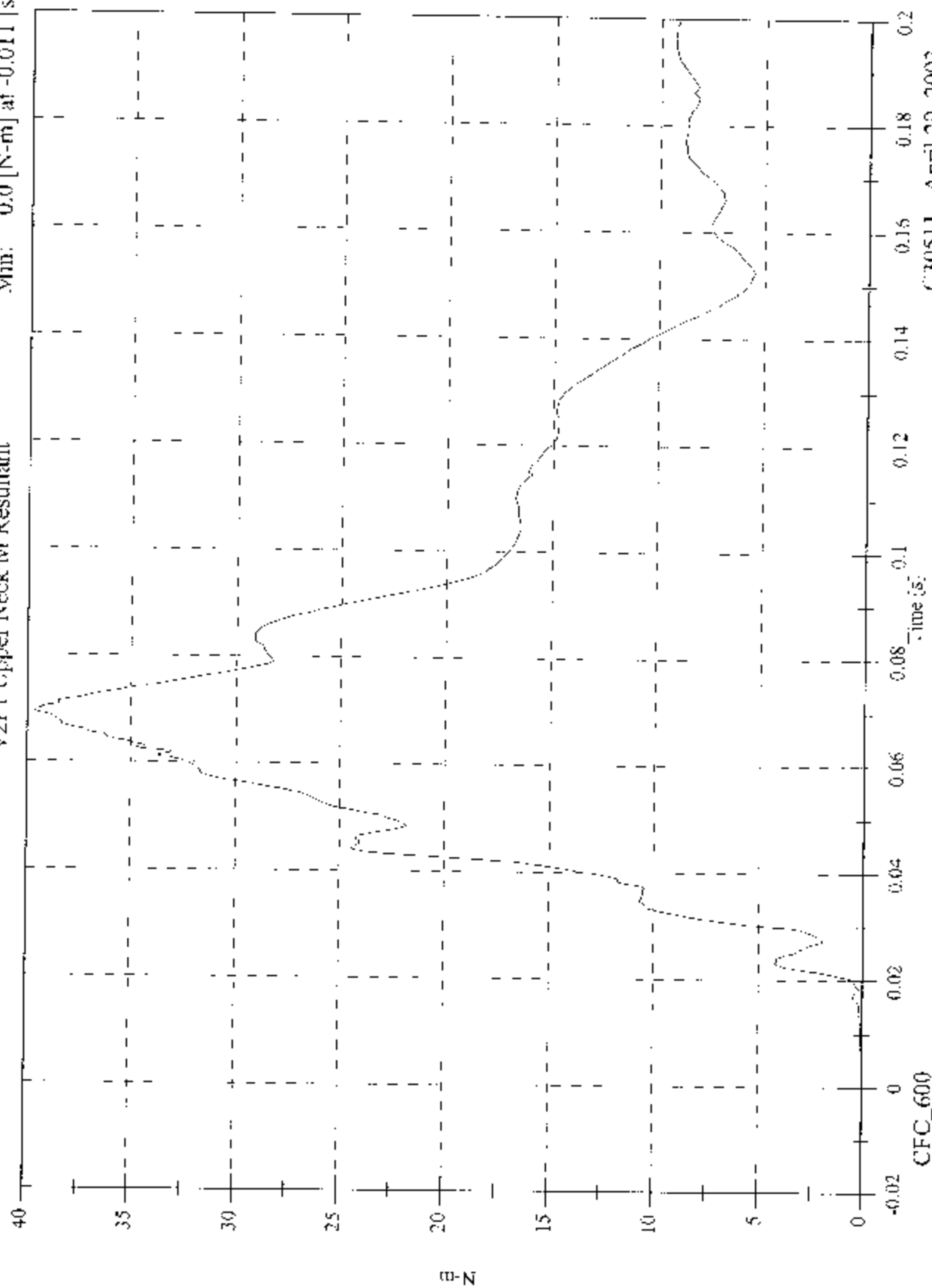
C30511 - April 29, 2003



FMVSS 214D Indicant - 2003 Kia Sorento

Max: 39.6 [N-m] at 0.069 [s]  
 Min: 0.0 [N-m] at -0.011 [s]

V2P1 Upper Neck M Resultant

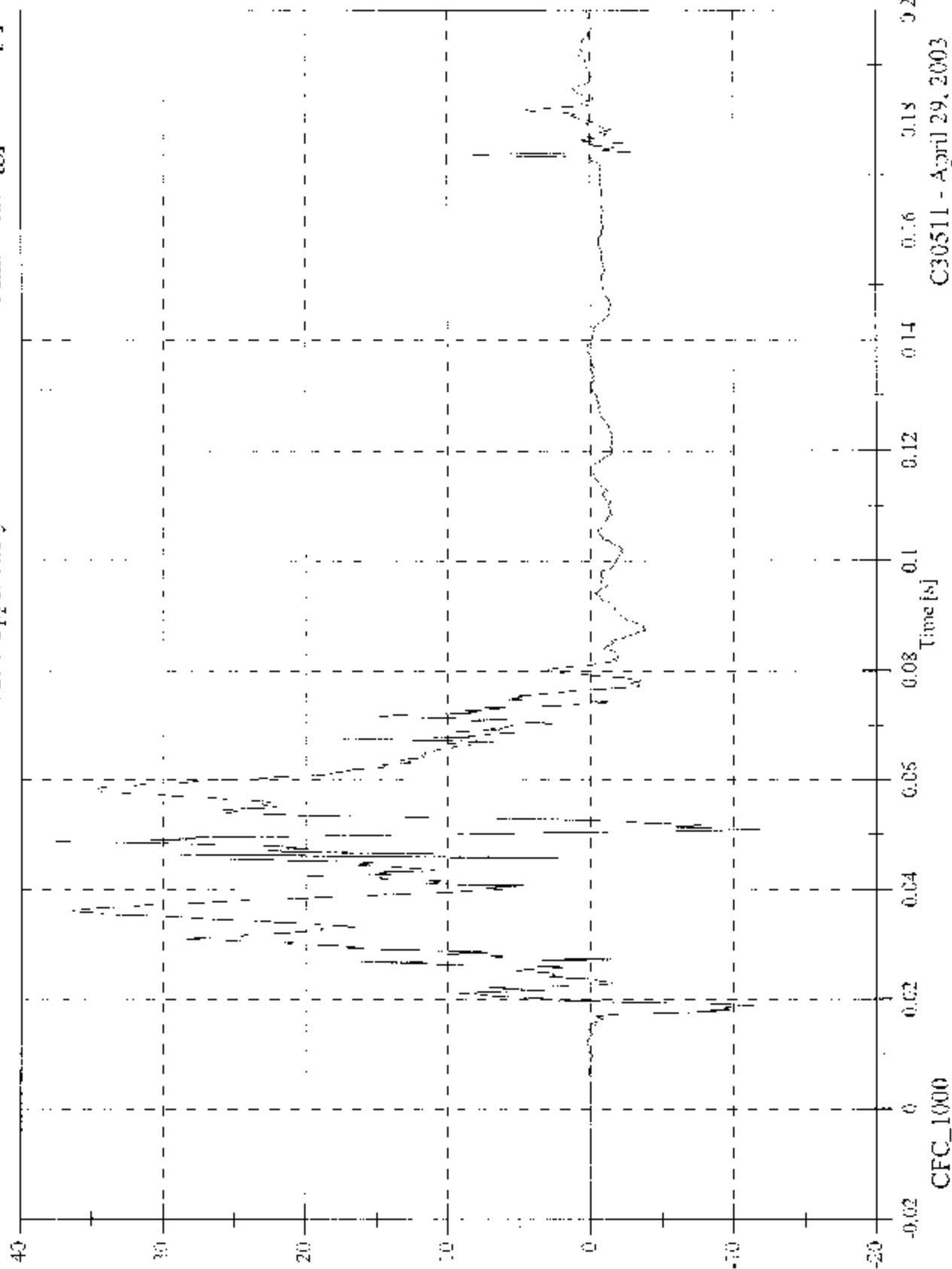


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 37.6 [g] at 0.049 [s]  
Min: -12.3 [g] at 0.051 [s]

V2P1 Upper Ribs y

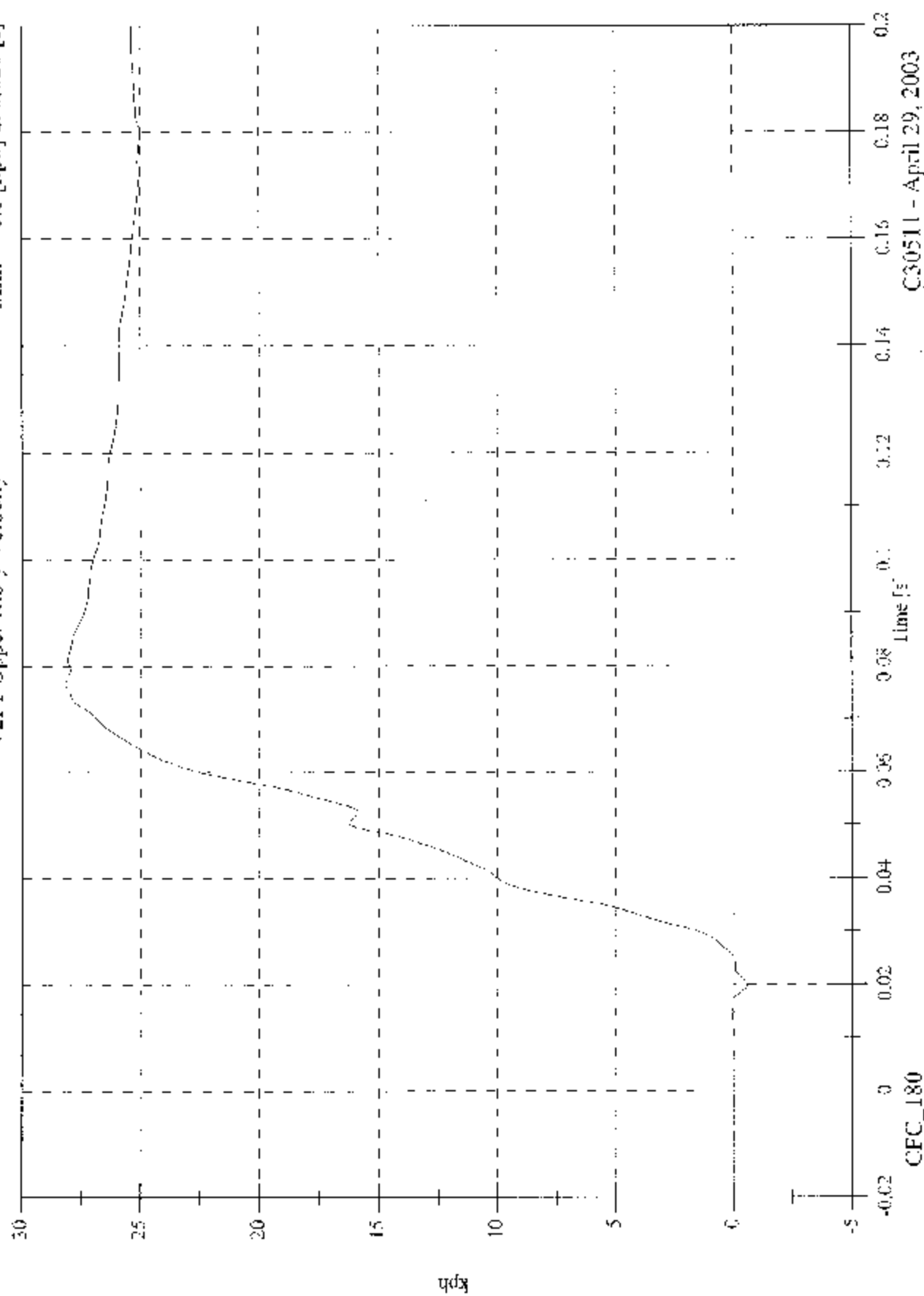


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 28.2 [kph] at 0.076 [s]  
Min: -0.6 [kph] at 0.020 [s]

V2P1 Upper Rib y Velocity



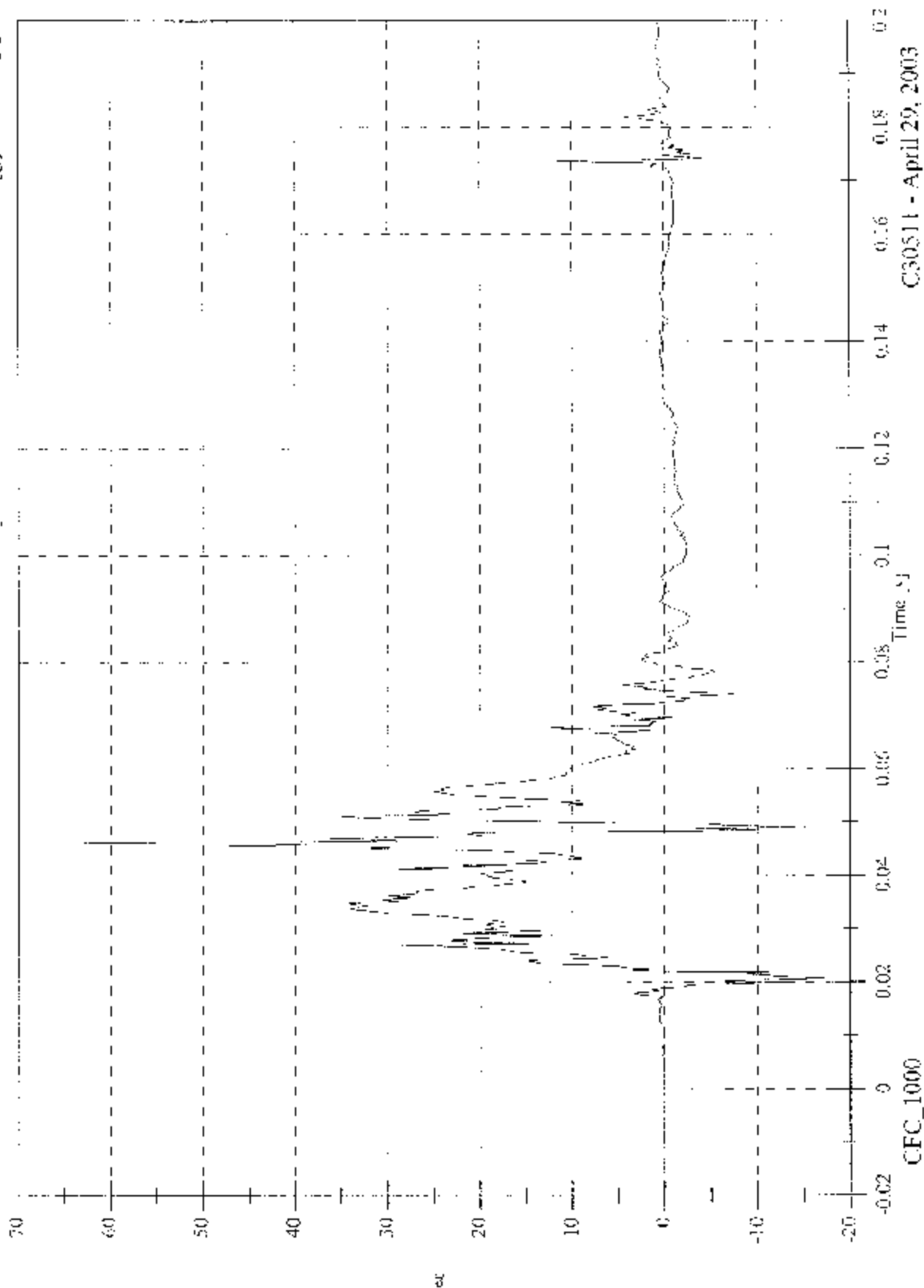
CFC\_180

C30511 - April 29, 2003

# FMVSS 214D Incident - 2003 Kia Sorento

Max: 62.9 [g] at 0.046 [s]  
 Min: -17.1 [g] at 0.021 [s]

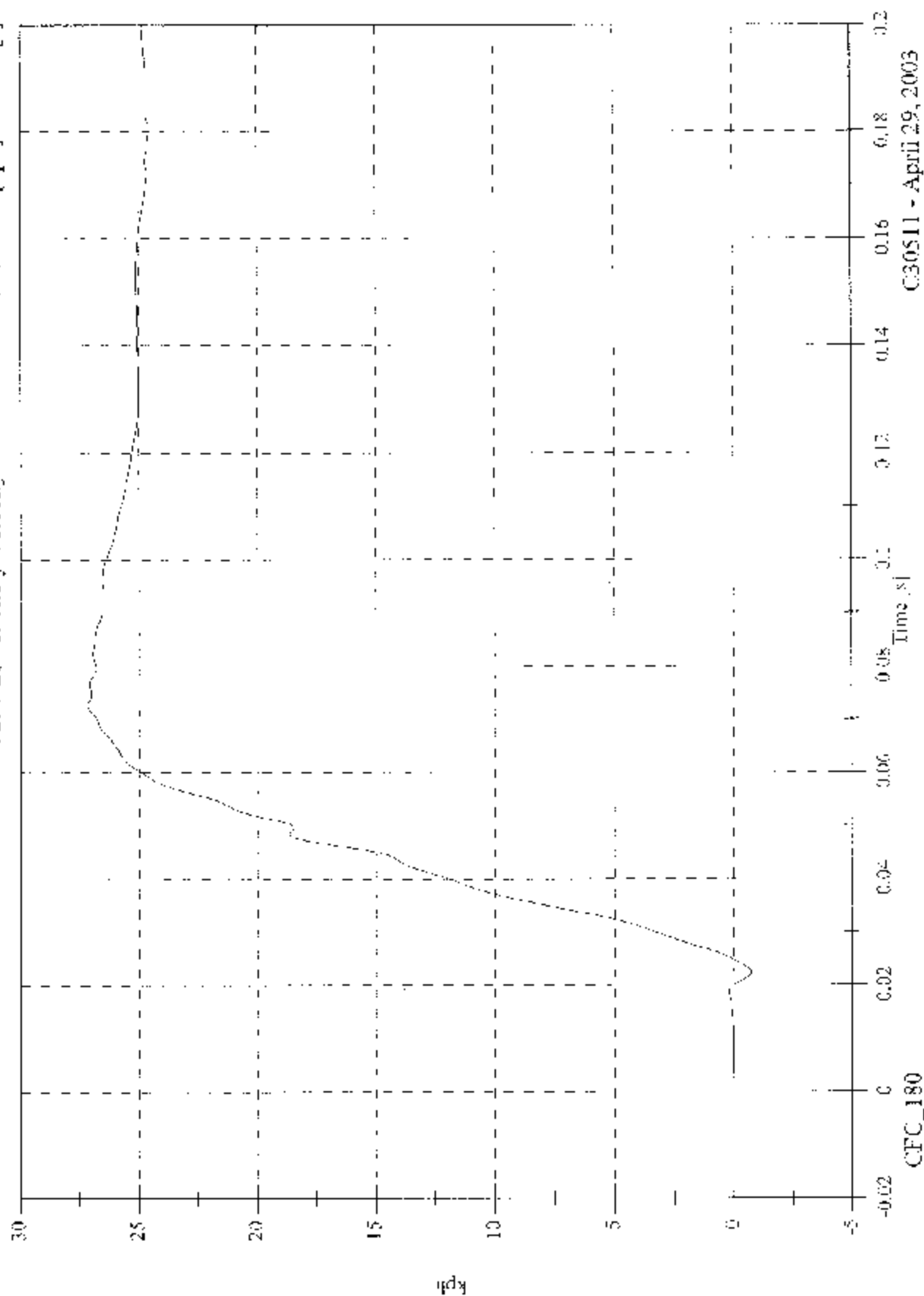
V2P1 Lower Rib y



FMVSS 214D Indicant - 2003 Kia Sorento

Max: 27.2 [kph] at 0.073 [s]  
Min: -0.8 [kph] at 0.022 [s]

V2PI Lower Rib y Velocity



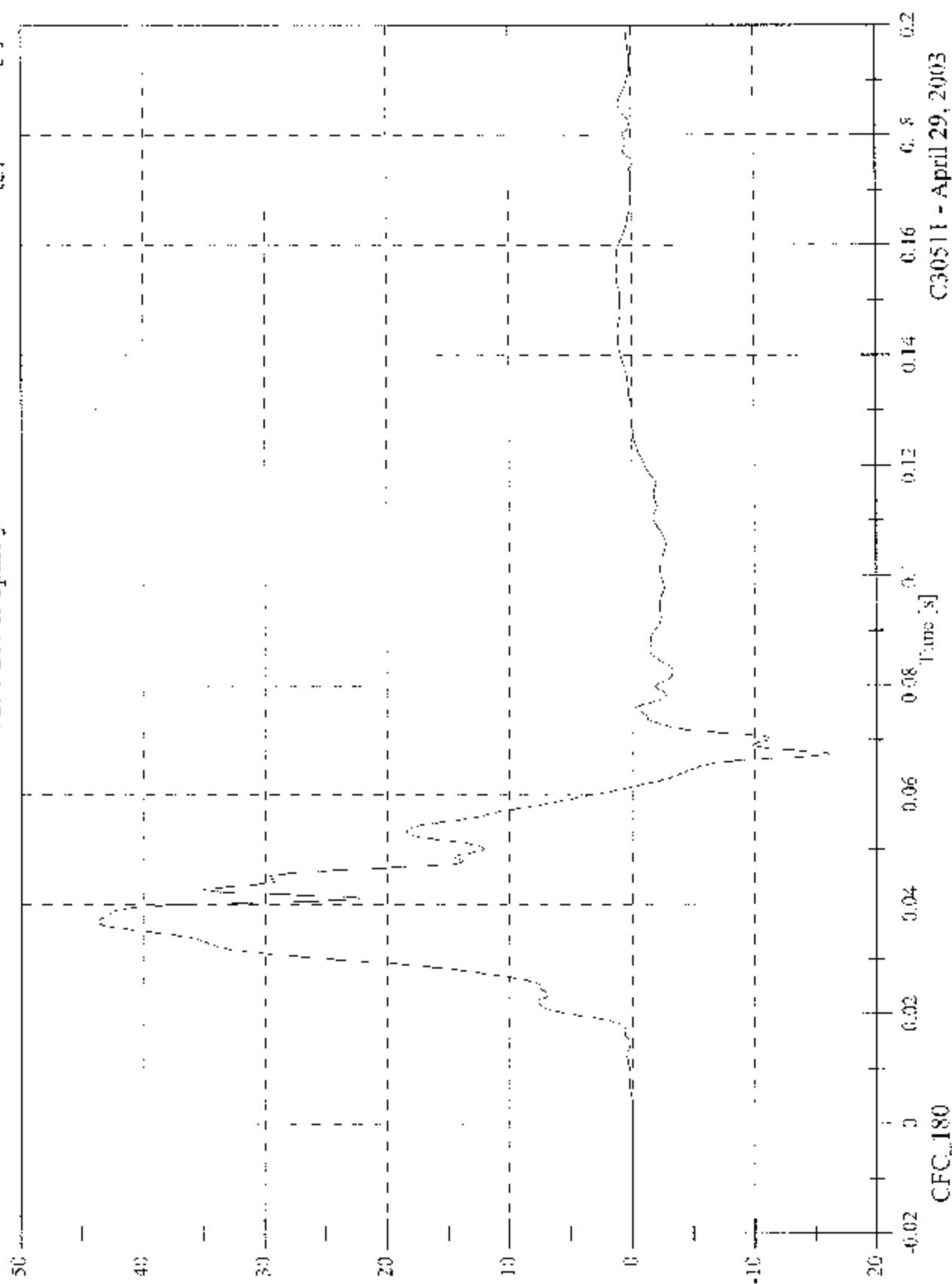
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 43.9 [g] at 0.037 [s]

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

V2PI Lower Spine y

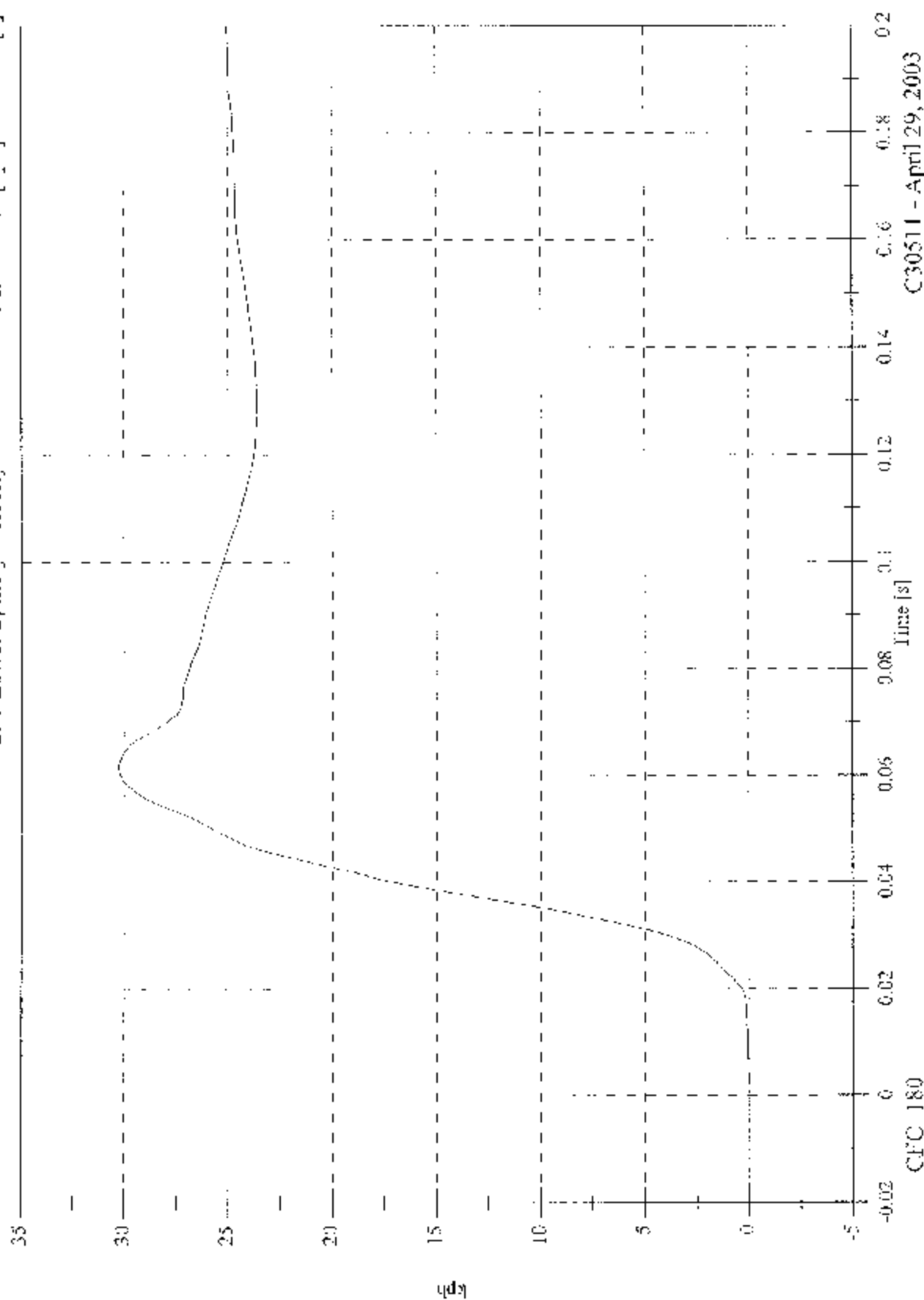


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 30.3 [kph] at 0.061 [s]  
Min: -0.0 [kph] at -0.020 [s]

V2P1 Lower Spine y Velocity

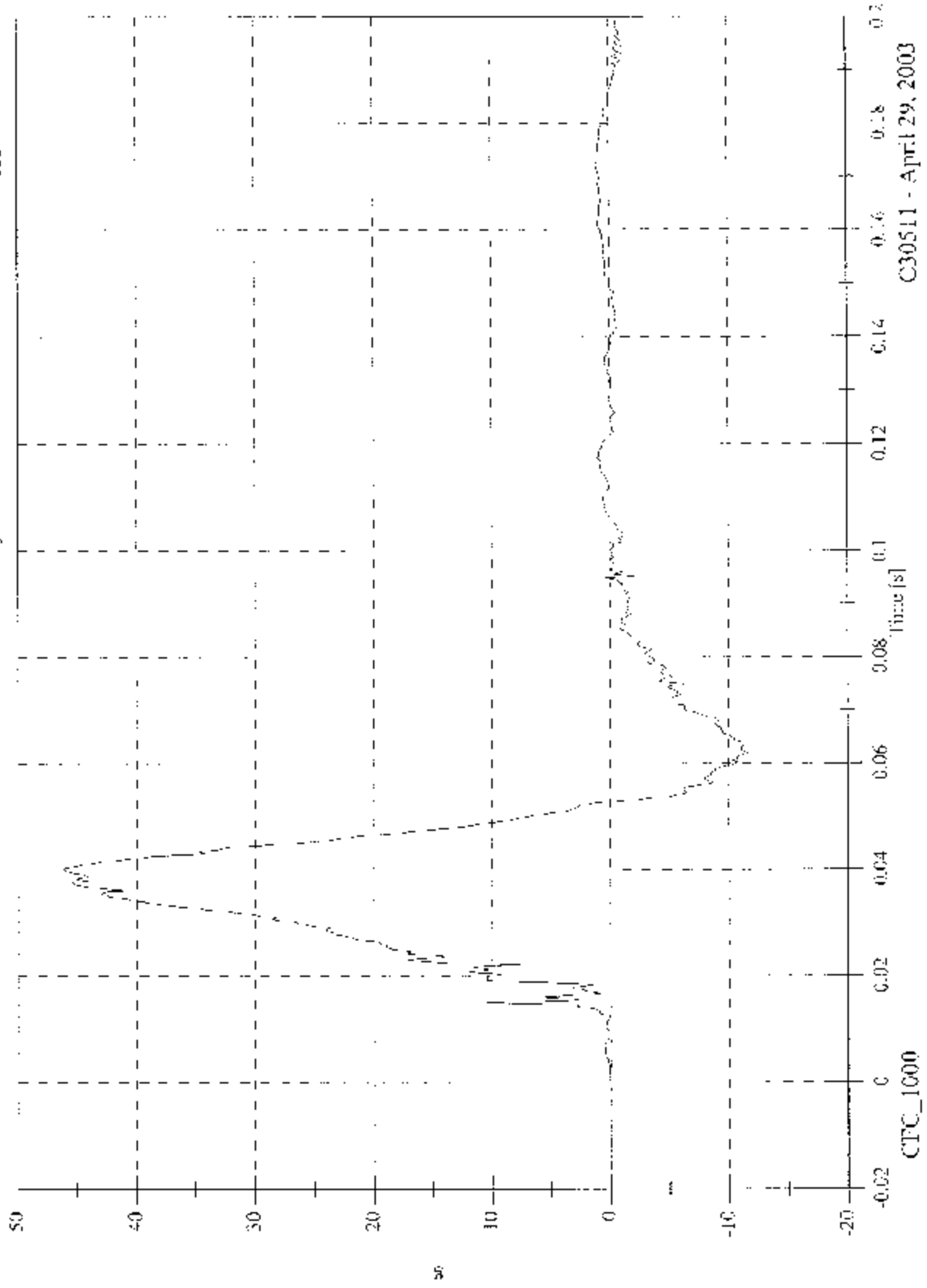


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 46.1 [g] at 0.040 [s]  
Min: -11.6 [g] at 0.062 [s]

V2P1 Pelvic y



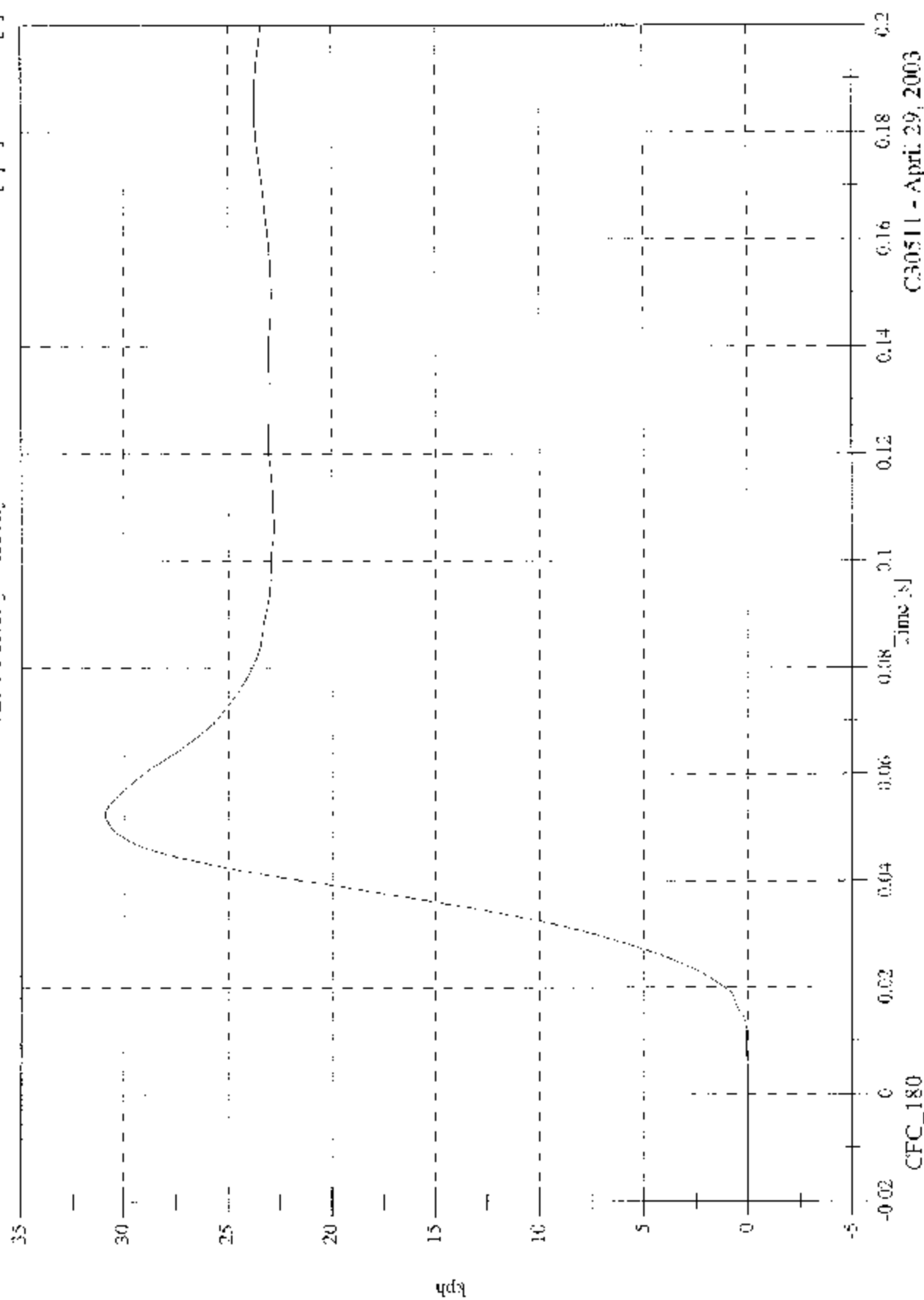
C30511 - April 29, 2003



FMVSS 214D Indicate - 2003 Kia Sorento

Max: 30.9 [kph] at 0.053 [s]  
Min: -0.0 [kph] at -0.020 [s]

V2P1 Pelvic y Velocity



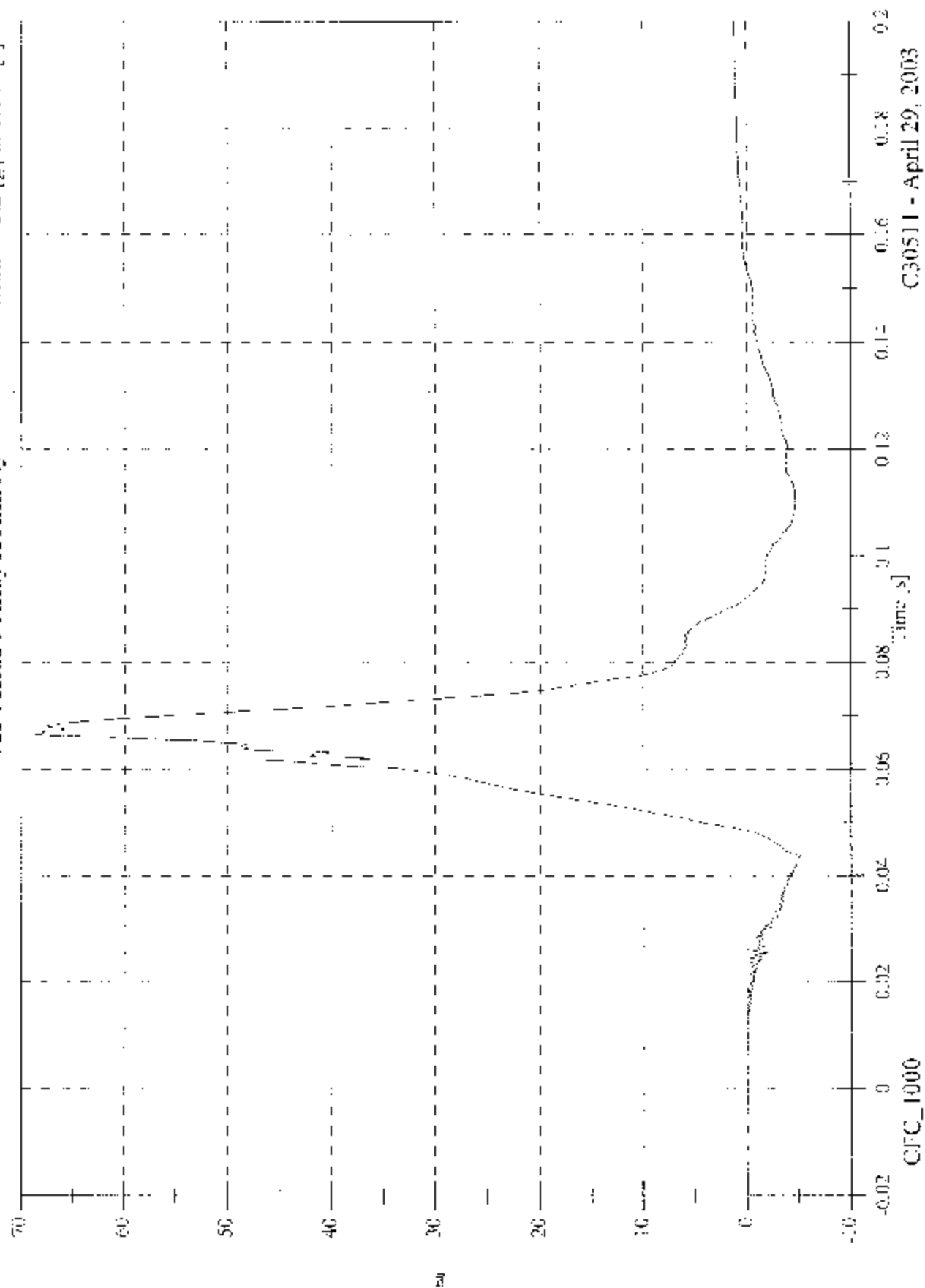
CFC\_180

C30511 - April 29, 2003

# TMVSS 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]



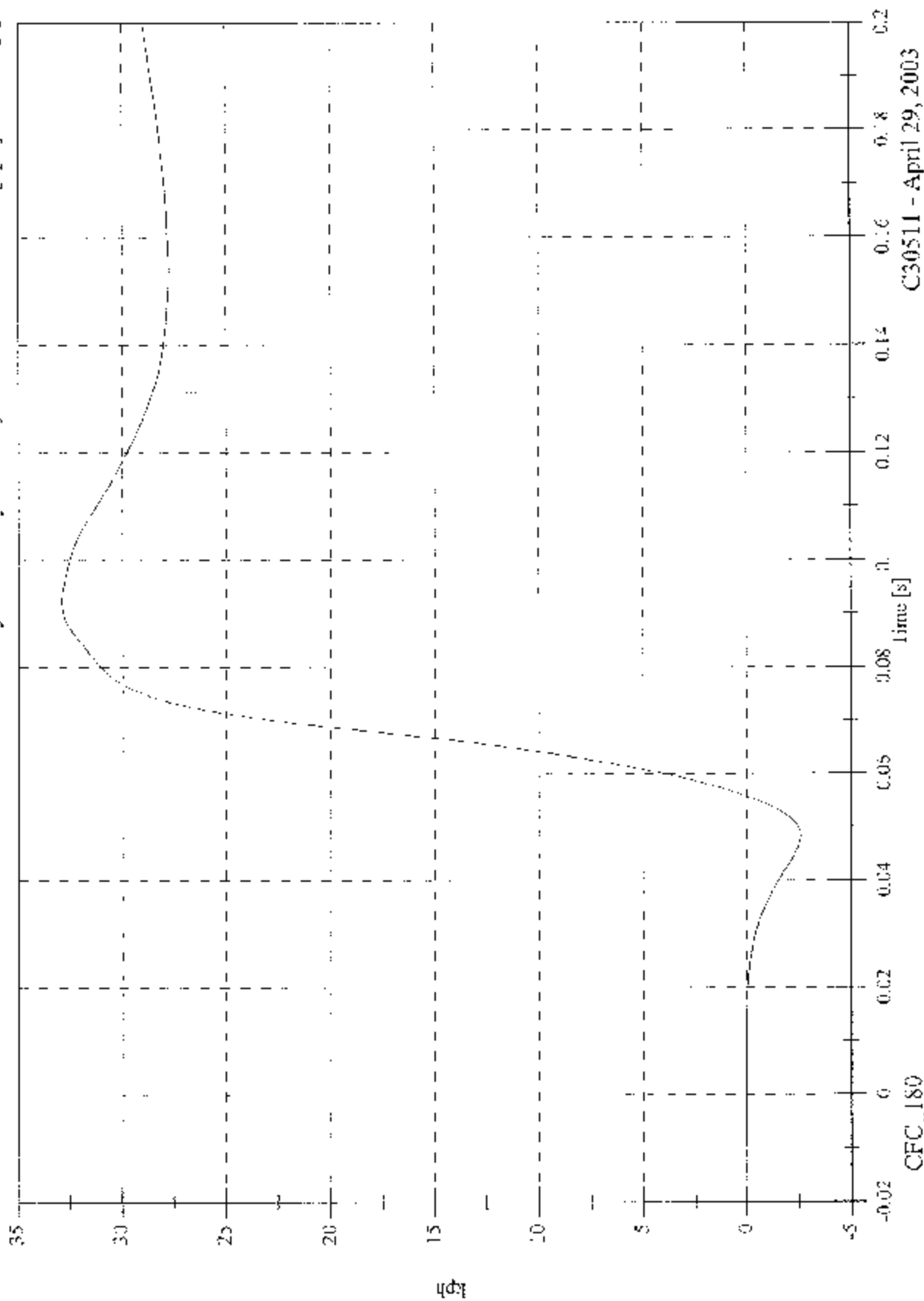
C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

VZP4 Head 9 Array X Arm Ay Velocity

Max: 32.9 [kph] at 0.092 [s]

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



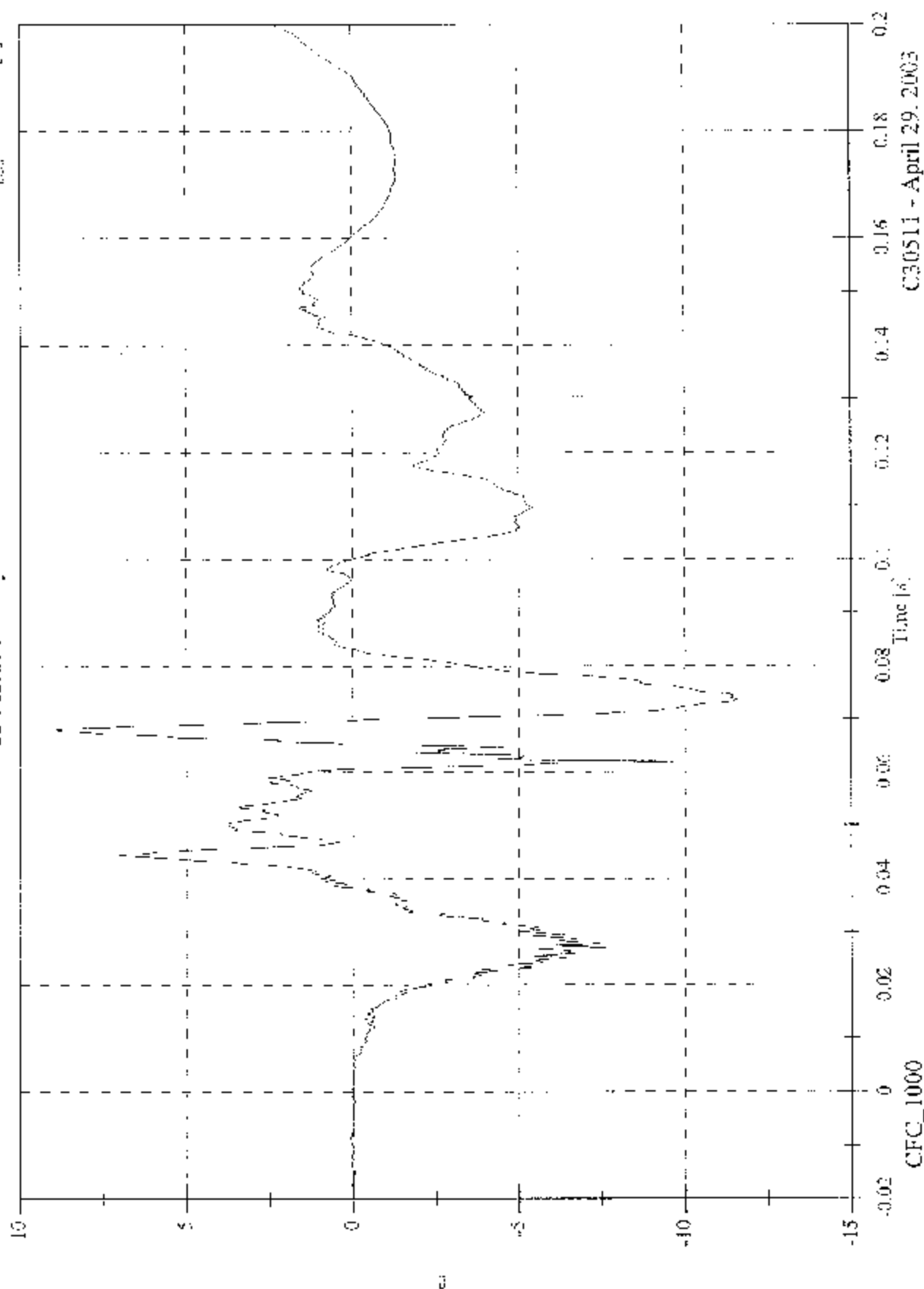
CFC\_180

C30511 - April 29, 2003

# FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head 9 Array X Axis Az

Max: 9.0 [g] at 0.068 [s]  
Min: -11.6 [g] at 0.074 [s]

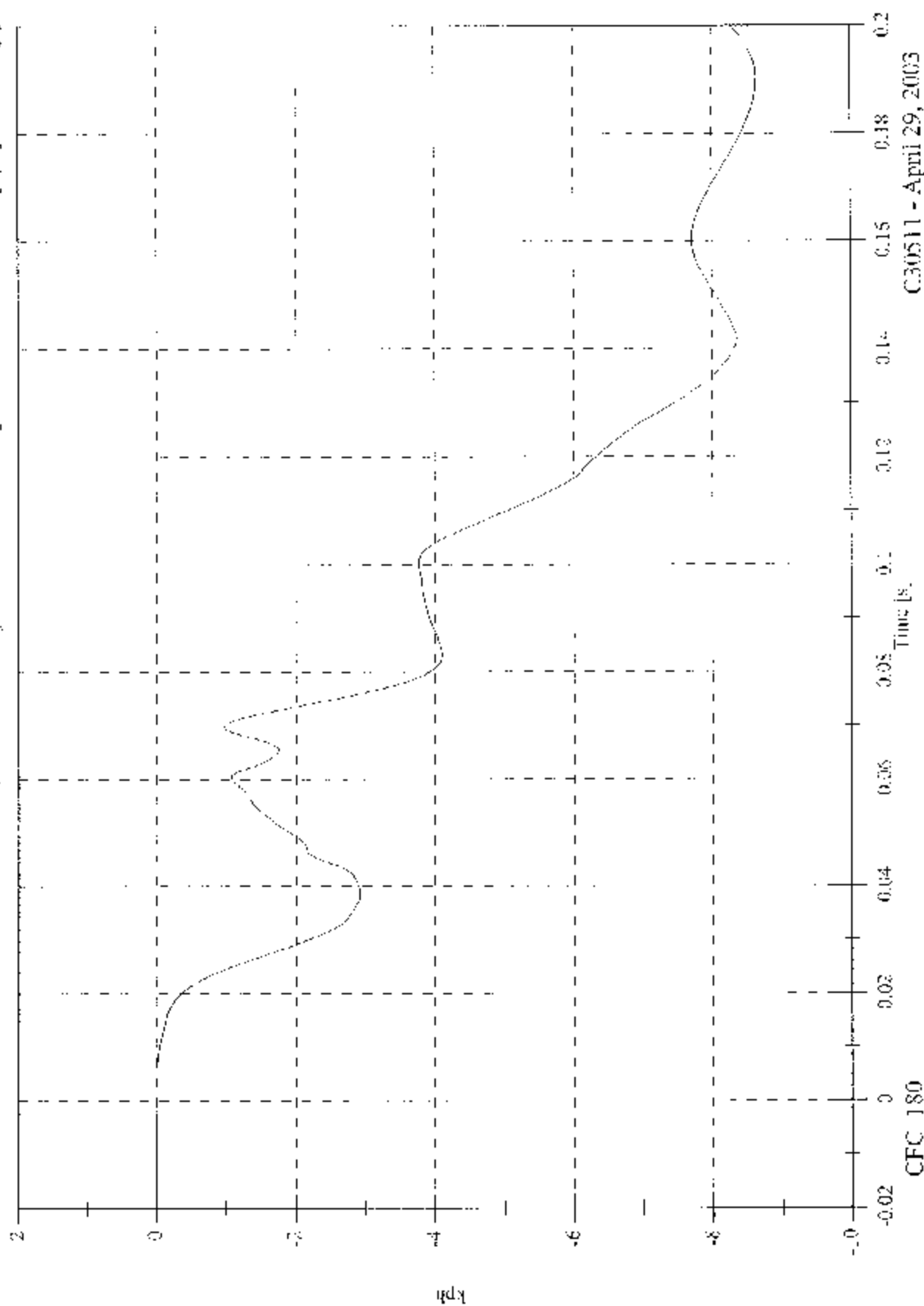


C30511 - April 29, 2003

FMVSS 214D Inducant - 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]



CFC\_180

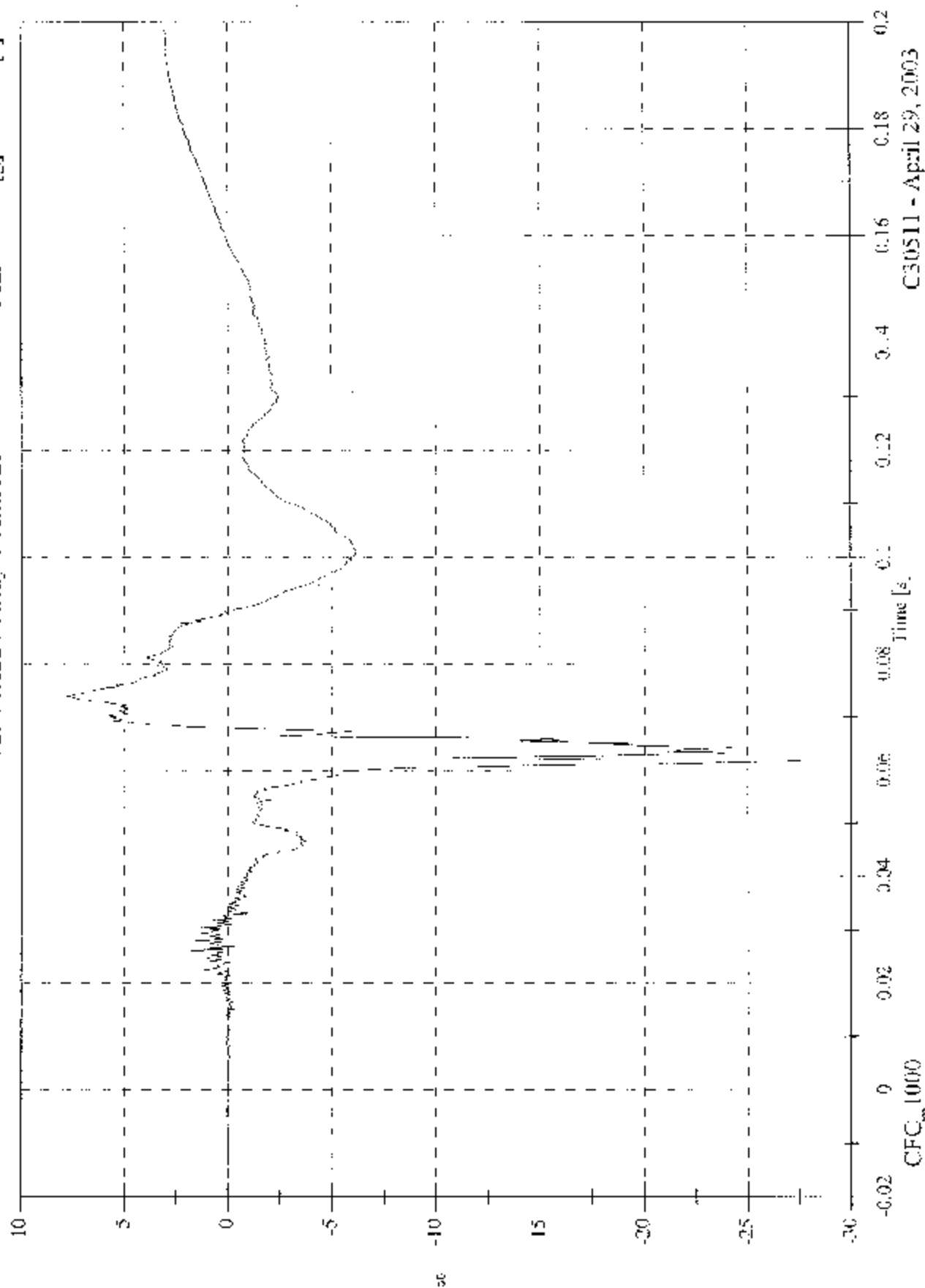
C30511 - April 29, 2003

FMVSS 214D Incitant - 2003 Kia Sorento

Max: 7.9 [g] at 0.074 [s]

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

V2P4 Head 9 Array Y Arm Ax

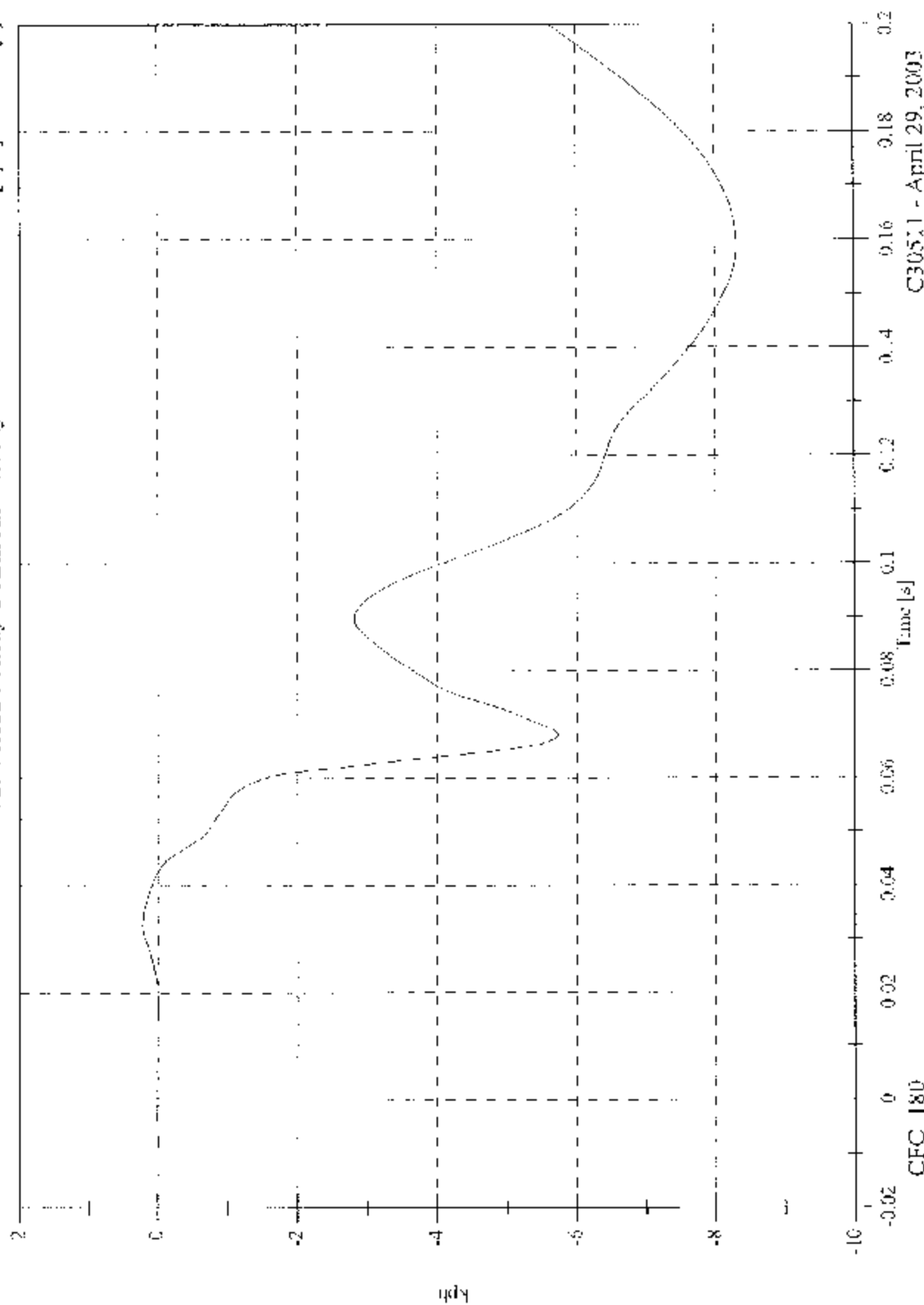


FMVSS 214D Indicant - 2003 Kia Sorento

V2P4 Head 9 Array Y Arm Ax Velocity

Max: 0.2 [kph] at 0.033 [s]

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



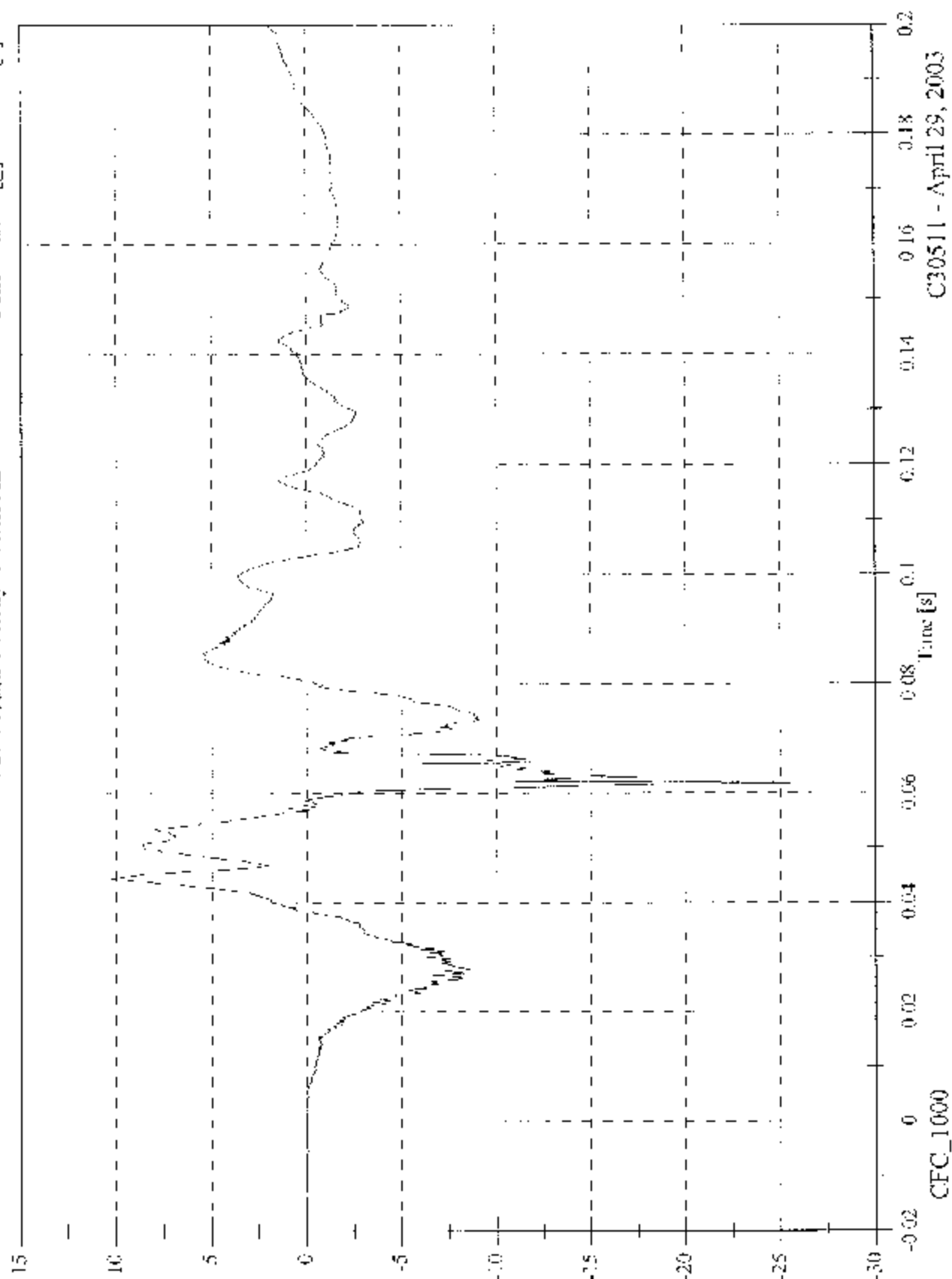
C30511 - April 29, 2003

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]



C30511 - April 29, 2003

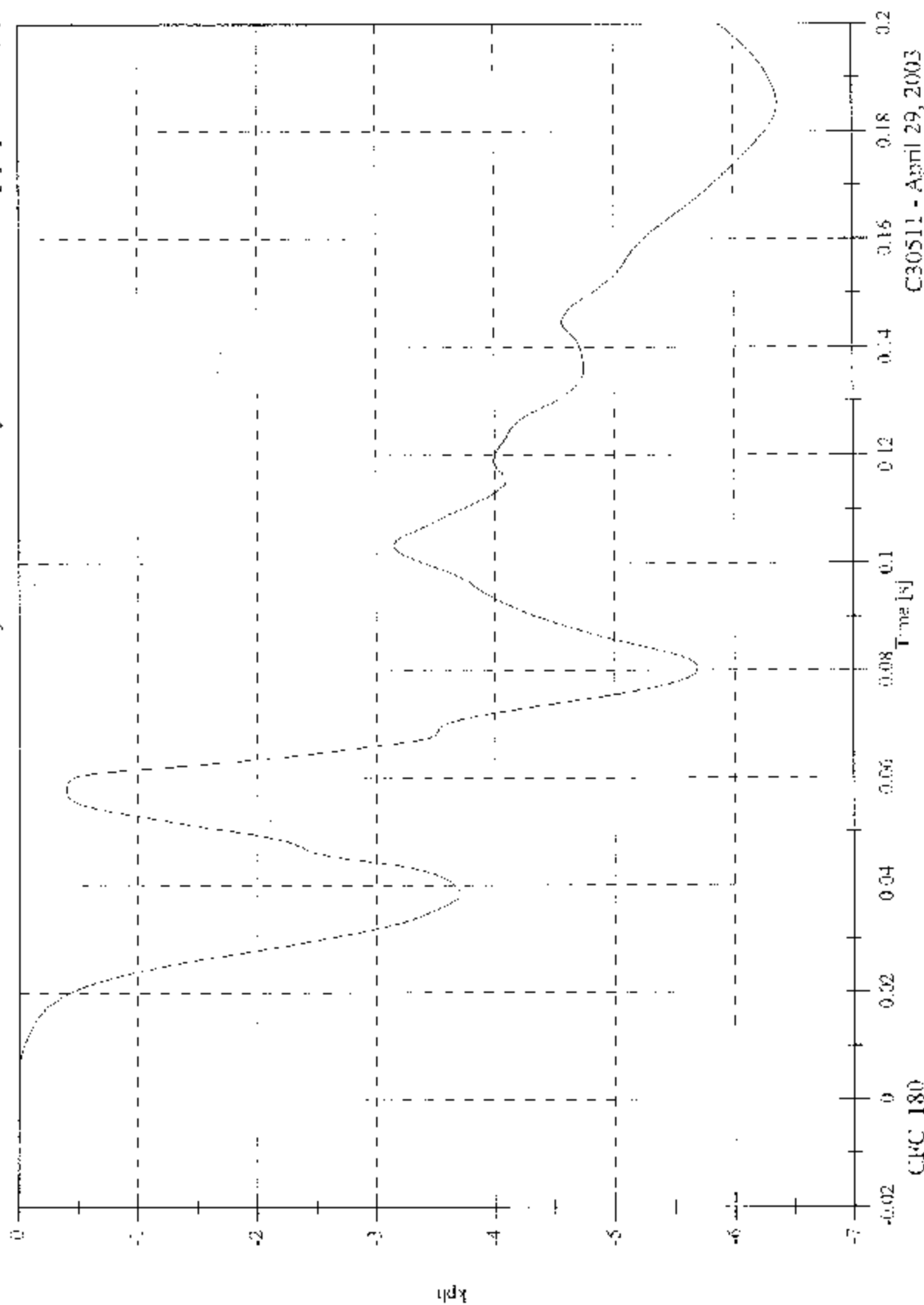


FMVSS 214D Inducant - 2003 Kia Sorento

V2P4 Ilead 9 Array Y Arm Az Velocity

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

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

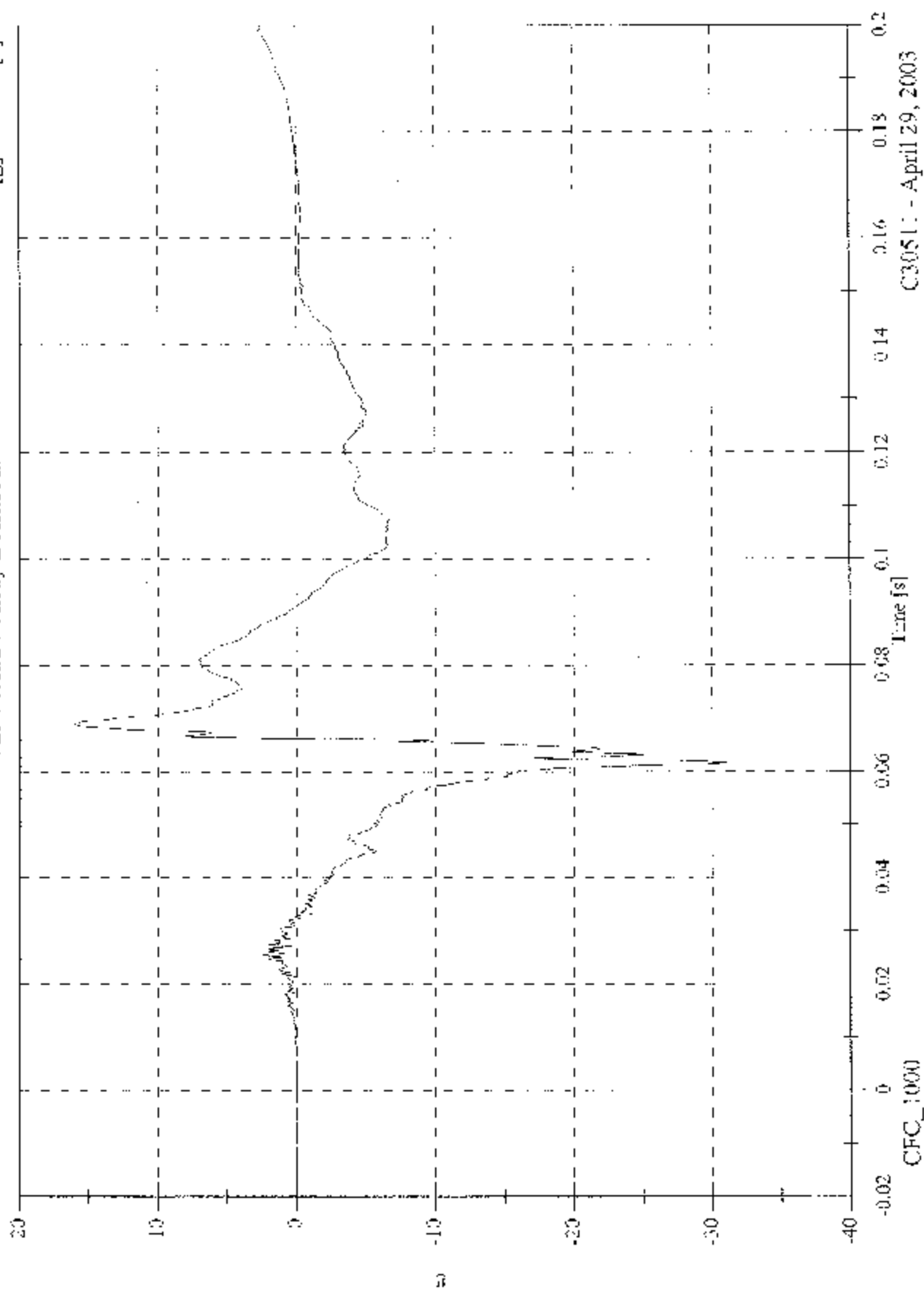


C30511 - April 29, 2003

# FMVSS 214D Indicant - 2003 Kia Sorento

Max: 16.1 [g] at 0.069 [s]  
 Min: -31.3 [g] at 0.062 [s]

V2P4 Head 9 Array Z Arm Ax

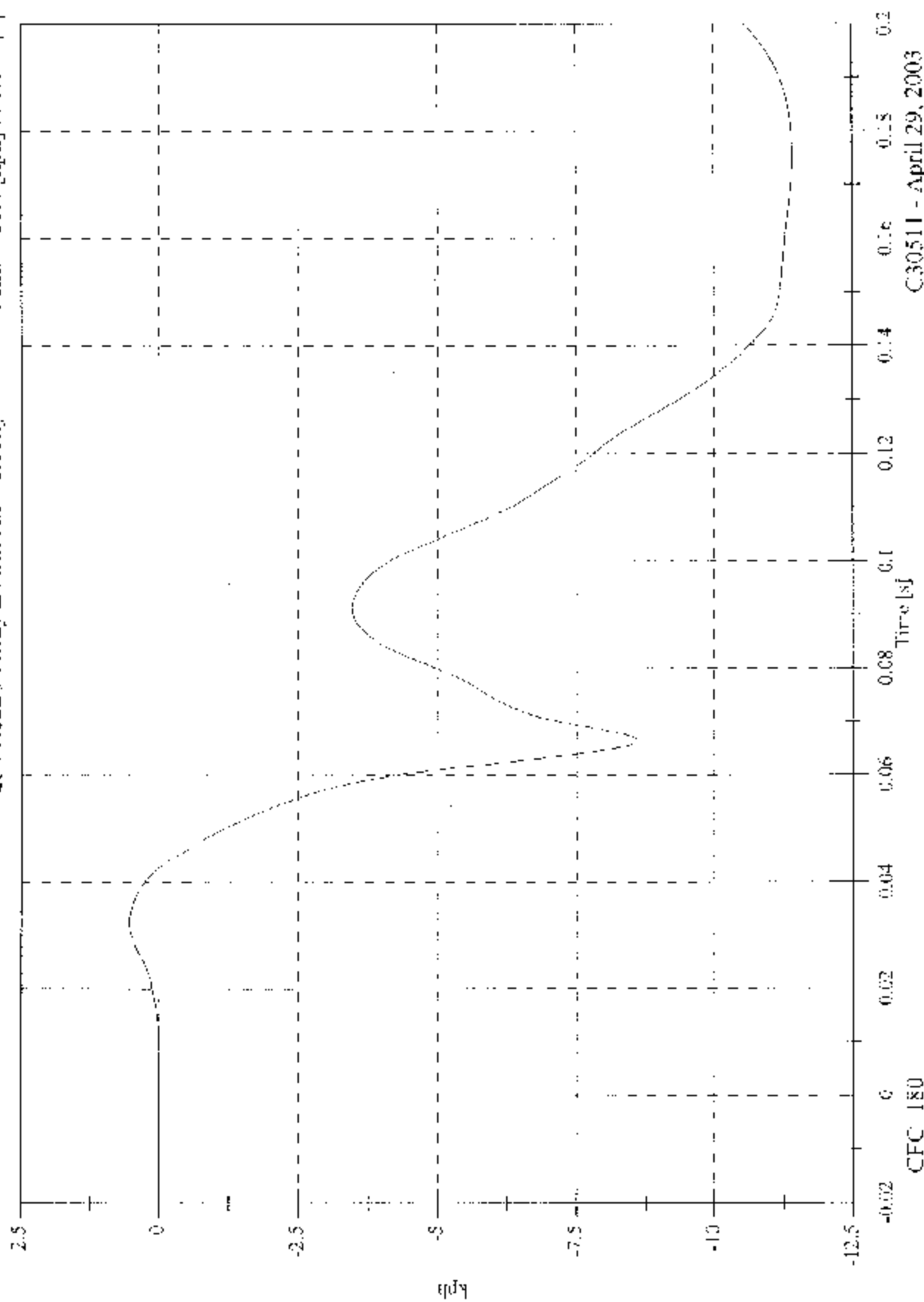


C30511 - April 29, 2003

FMVSS 214D Indicator - 2003 Kia Sorento

V2P4 Head 9 Array Z Att: Ax Velocity

Max: 0.6 [kph] at 0.032 [s]  
Min: -11.4 [kph] at 0.175 [s]

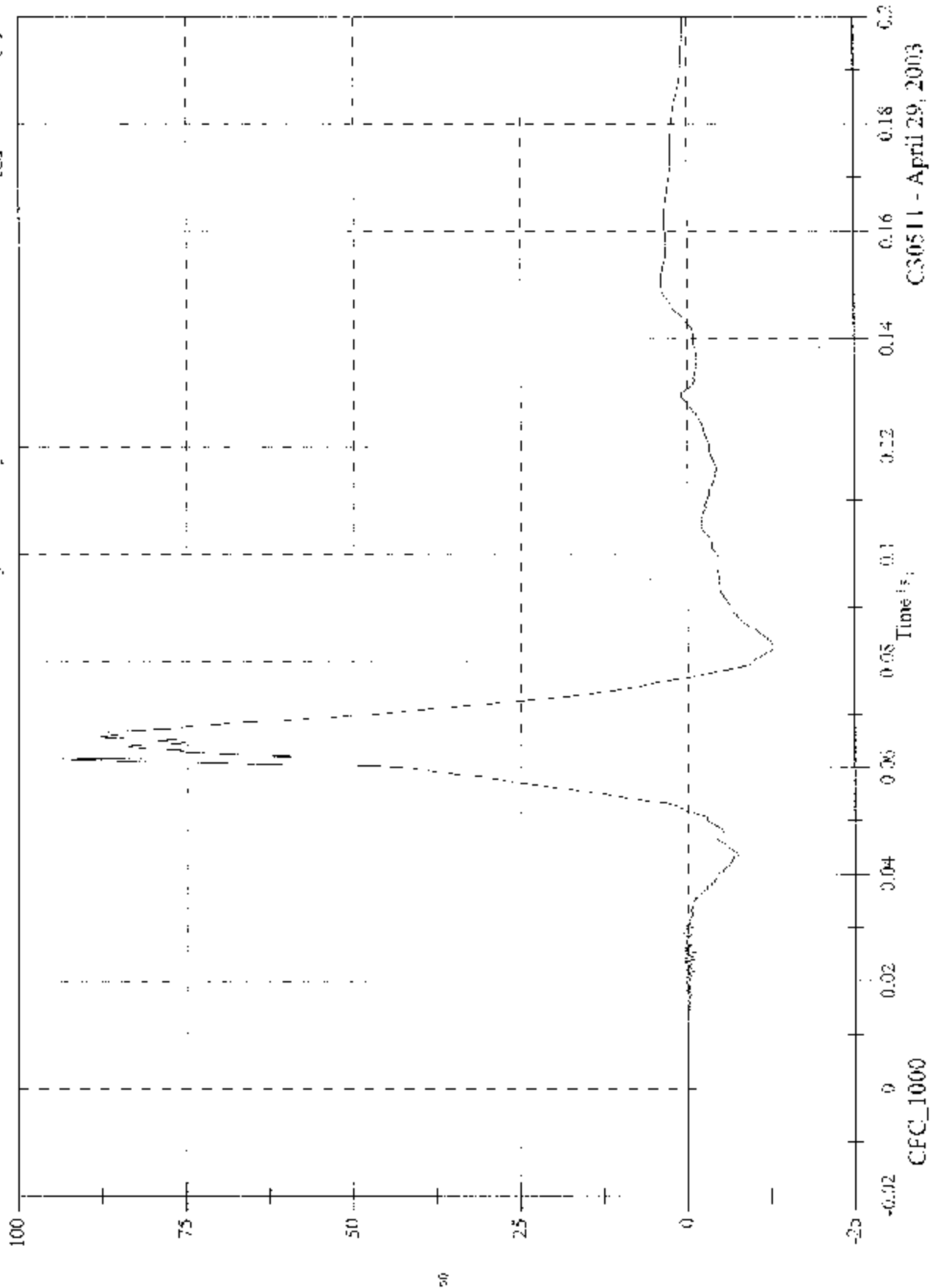


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 95.9 [g] at 0.062 [s]  
Min: -12.8 [g] at 0.083 [s]

V2P4 IIeac 9 Array Z Arm Ay



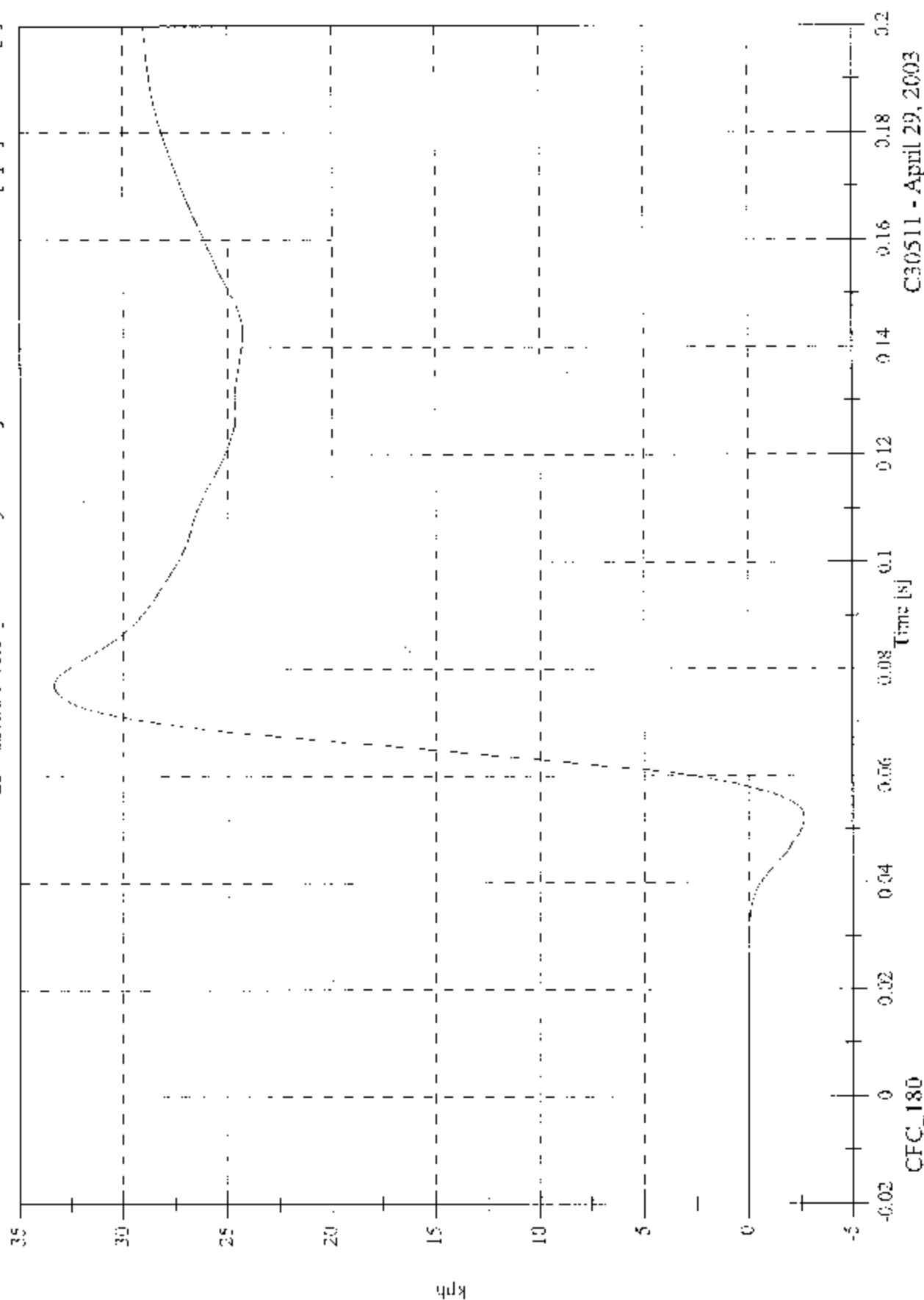
C30511 - April 29, 2003

FMVSS 214D Indicent - 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]

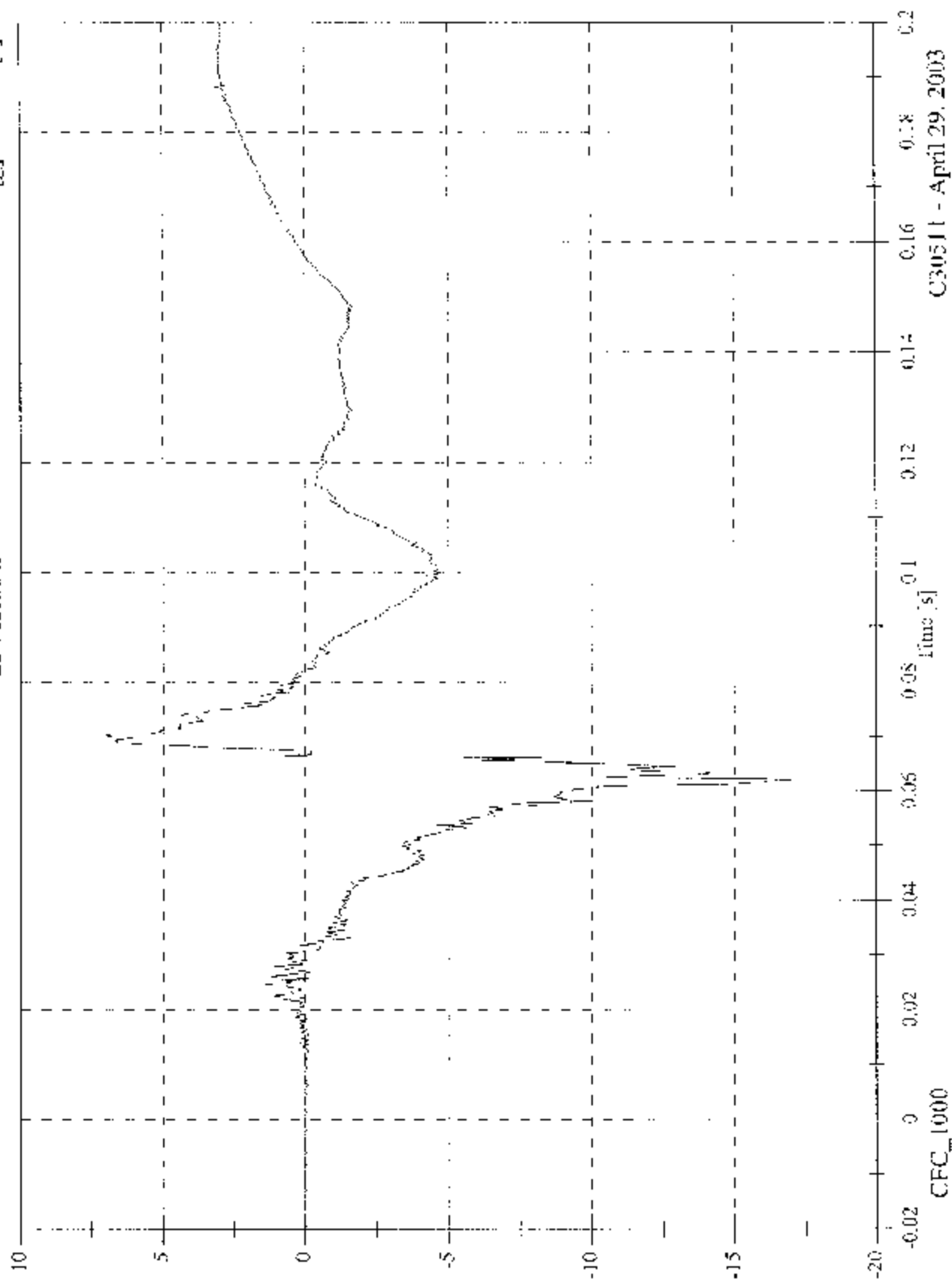


C30511 - April 29, 2003

FMVSS 214D Indican - 2003 Kia Sorento

Max: 7.0 [g] at 0.070 [s]  
Min: -17.0 [g] at 0.062 [s]

V2P4 Head x



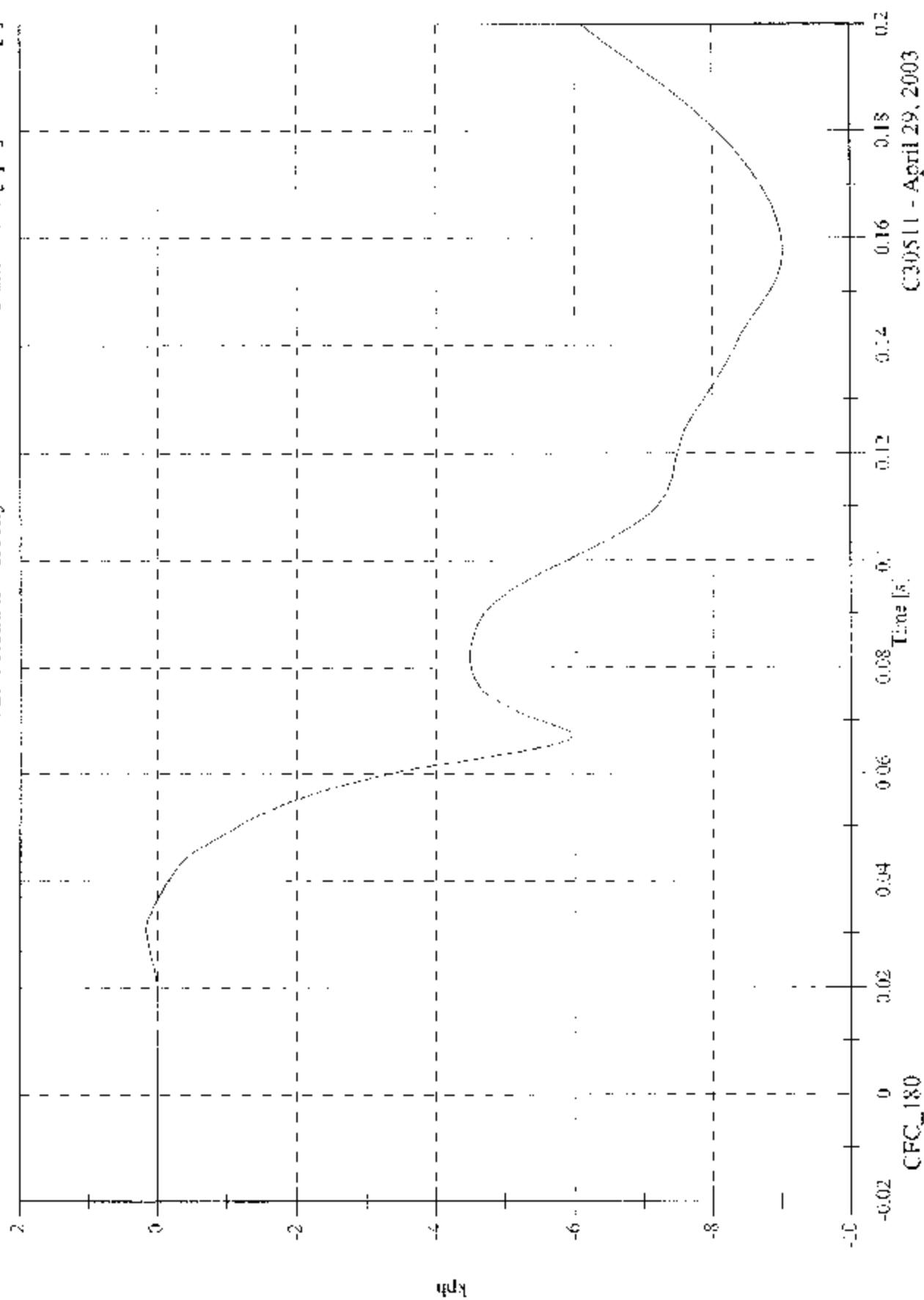
C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 0.2 [kph] at 0.031 [s]

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

V2P4 Head x Velocity

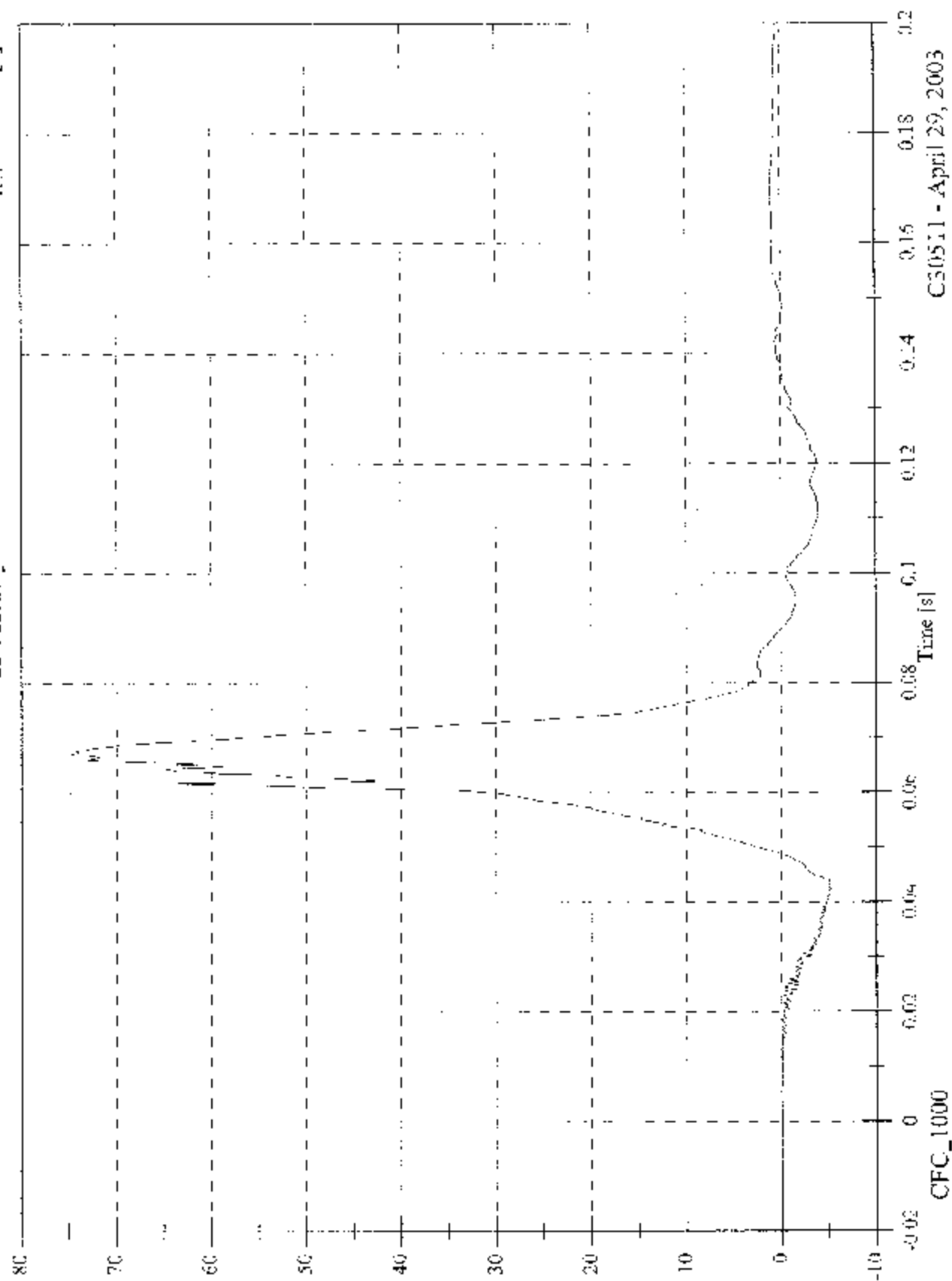


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 74.7 [g] at 0.067 [s]  
Min: -5.2 [g] at 0.042 [s]

V2P4 Head y



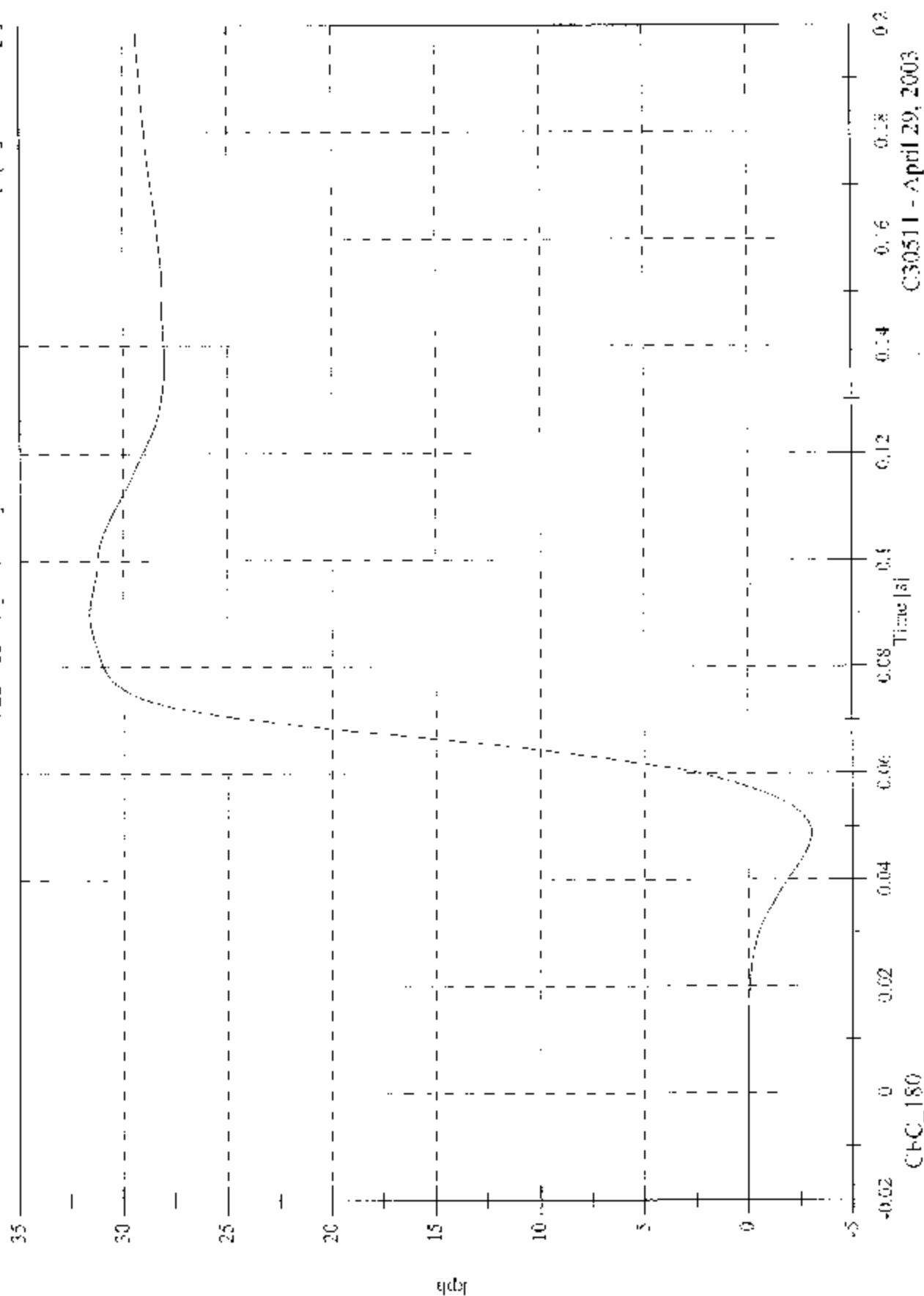
C30511 - April 29, 2003



FMVSS 214D Inducant - 2003 Kia Sorento

Max: 31.6 [kph] at 0.090 [s]  
Min: -3.0 [kph] at 0.049 [s]

V2P4 Head y Velocity

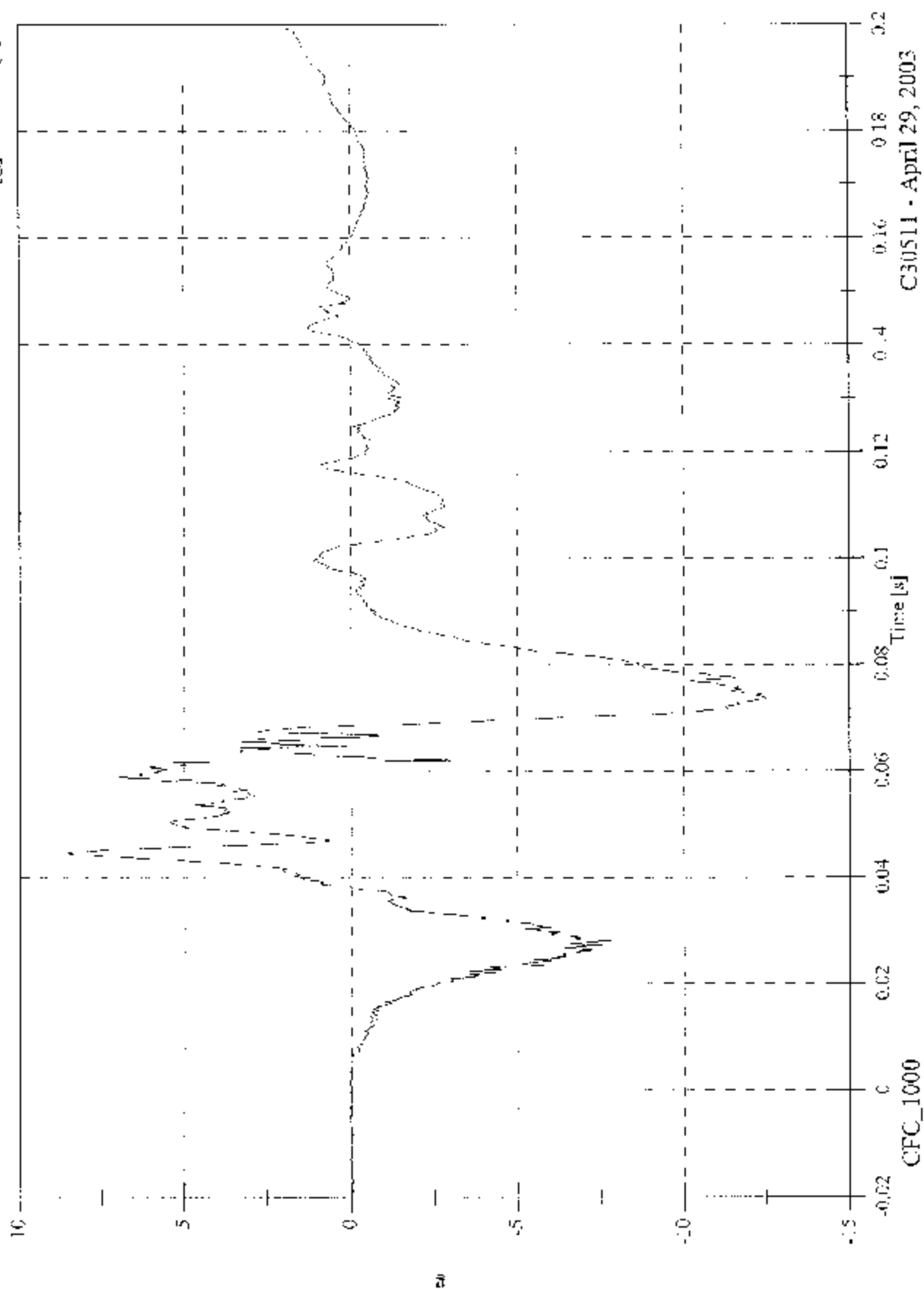


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 8.6 [g] at 0.044 [s]  
Min: -12.5 [g] at 0.074 [s]

V2P4 ILead z



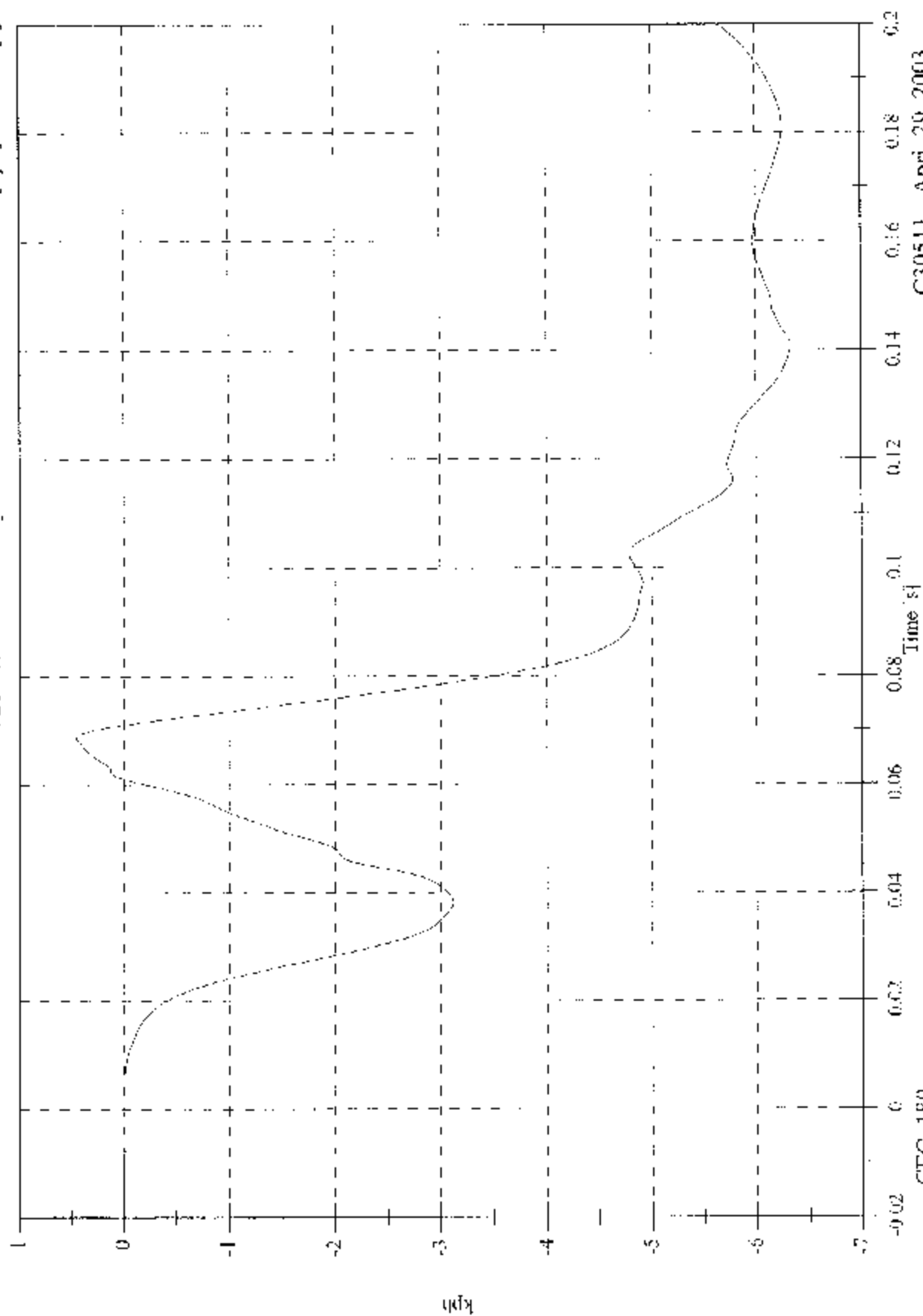
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 0.5 [kph] at 0.068 [s]

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

V2P4 Head z Velocity



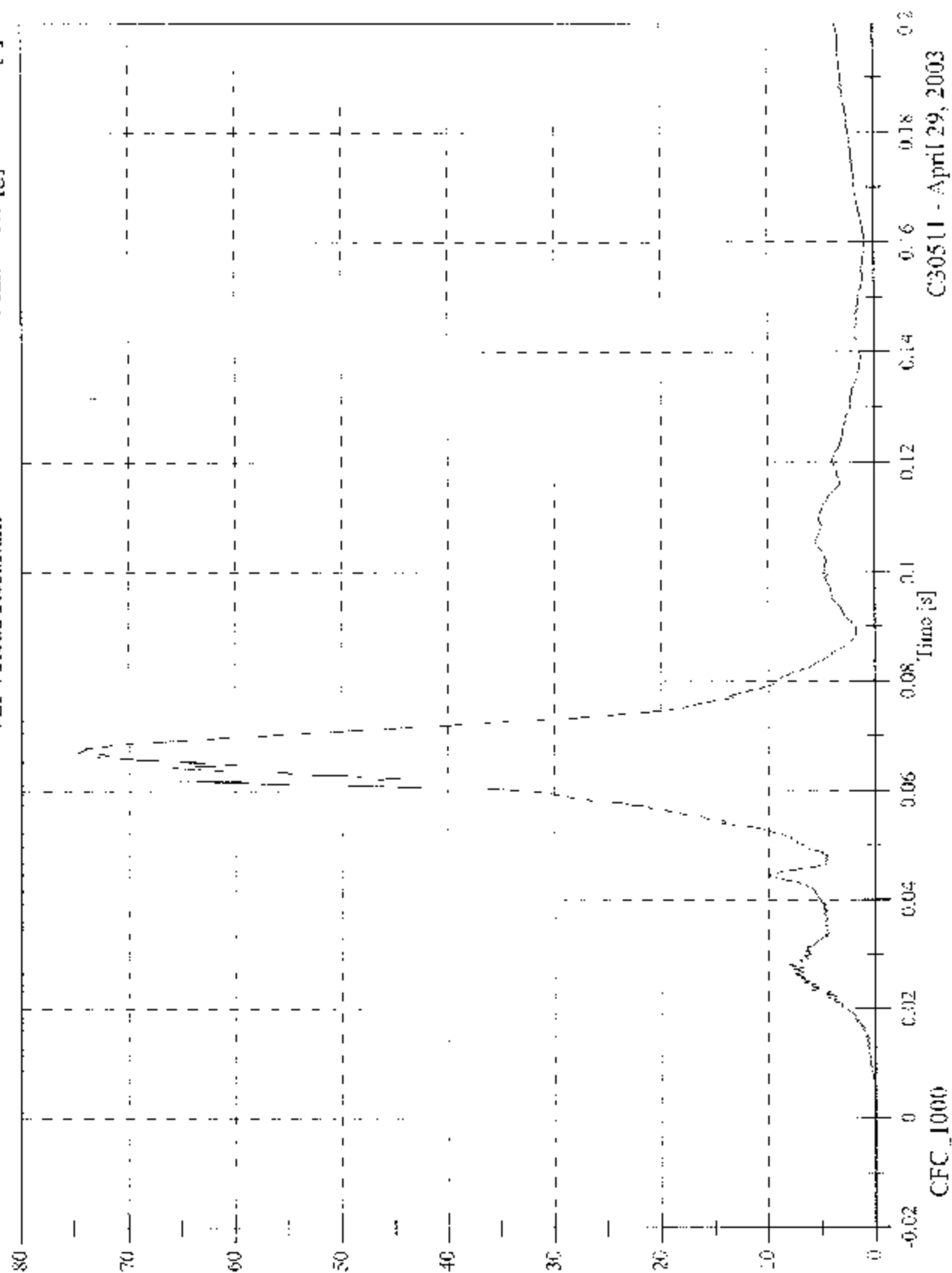
CFC\_180

C30511 - April 29, 2003

# FMVSS 214D Indicant - 2003 Kia Sorento

Max: 74.7 [g] at 0.067 [s]  
 Min: 0.0 [g] at -0.009 [s]

V2P4 Flead Resultant

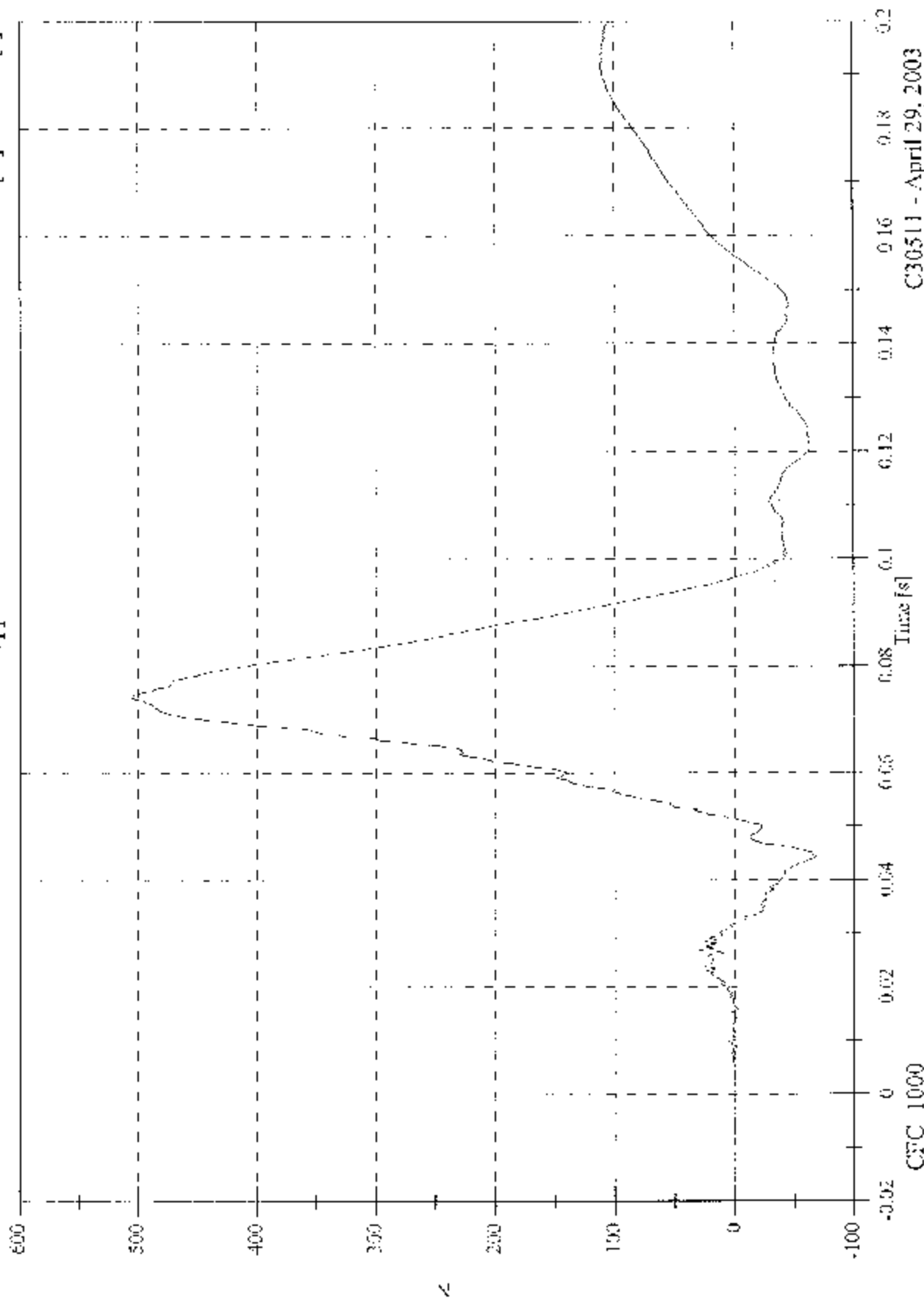


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 505.4 [N] at 0.074 [s]  
Min: -69.2 [N] at 0.044 [s]

V2P4 Upper Neck Fx

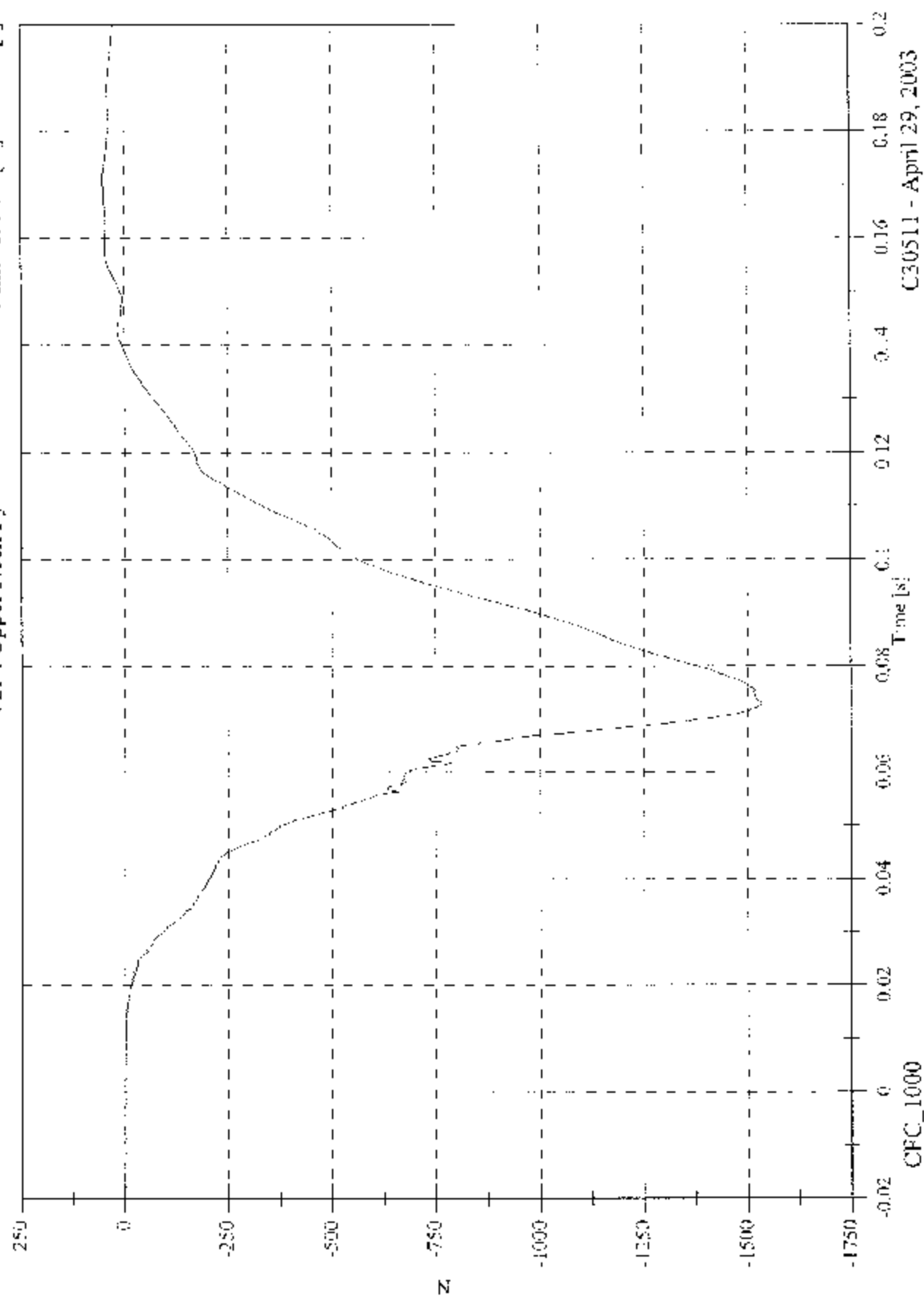


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 52.1 [N] at 0.171 [s]  
Min: -1534.8 [N] at 0.073 [s]

V2P4 Upper Neck Fy

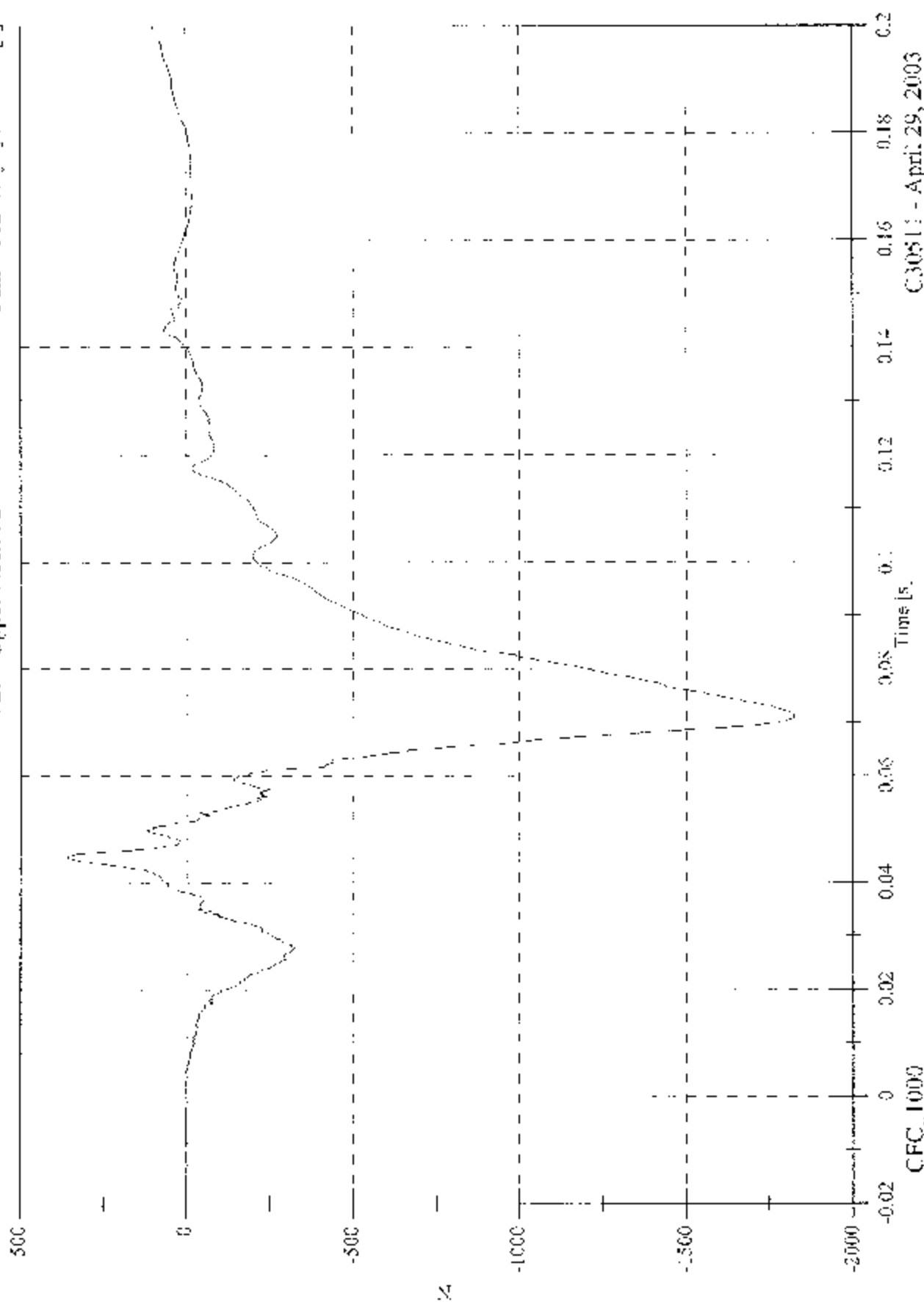


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 357.6 [N] at 0.045 [s]  
Min: -1824.6 [N] at 0.071 [s]

V2P4 Upper Neck Fz



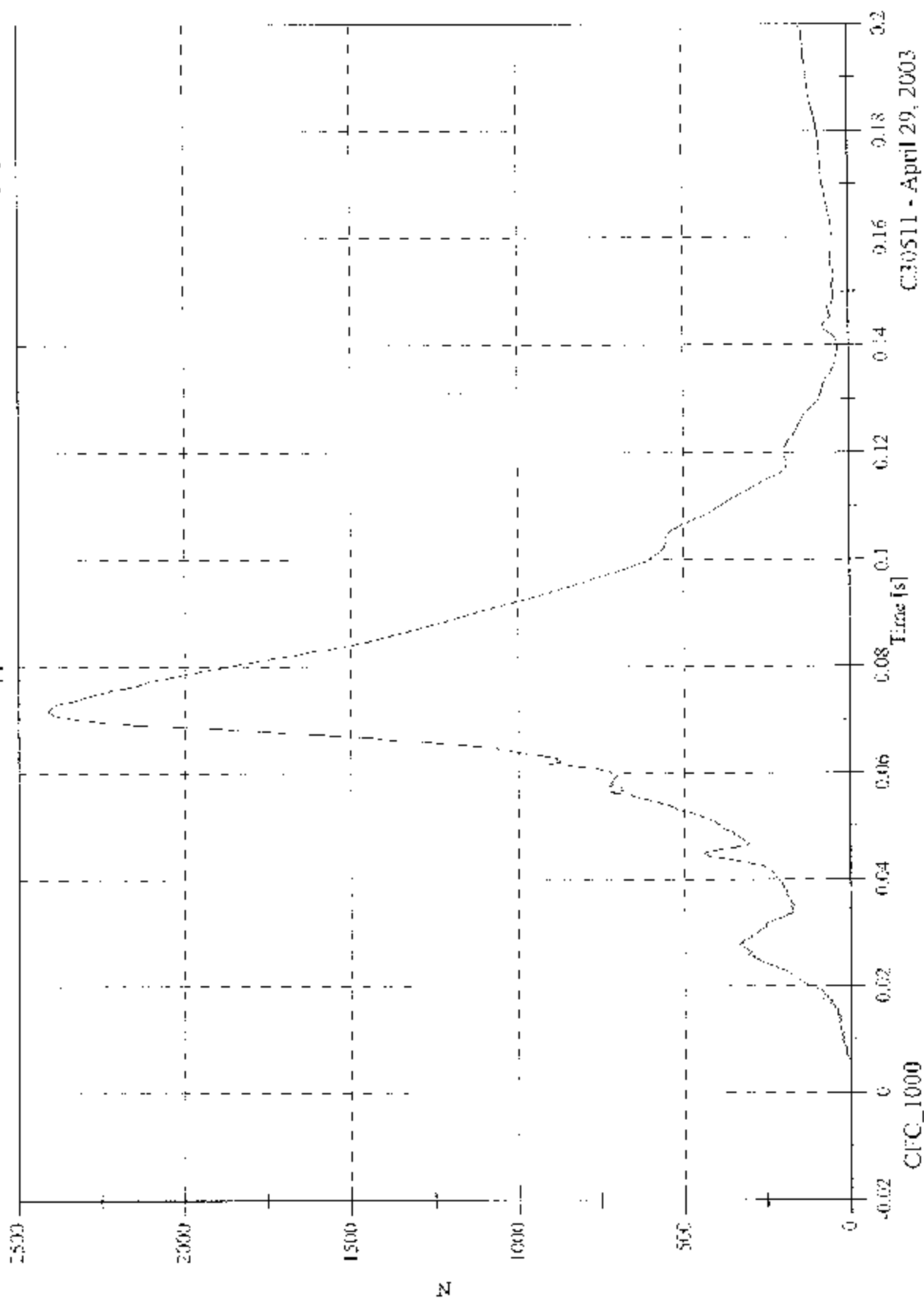
C30511 - April 29, 2003

# LMVSS 2.4D Indicant - 2003 Kia Sorento

Max: 2409.3 [N] at 0.072 [s]

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

V2P4 Upper Neck F Resultant



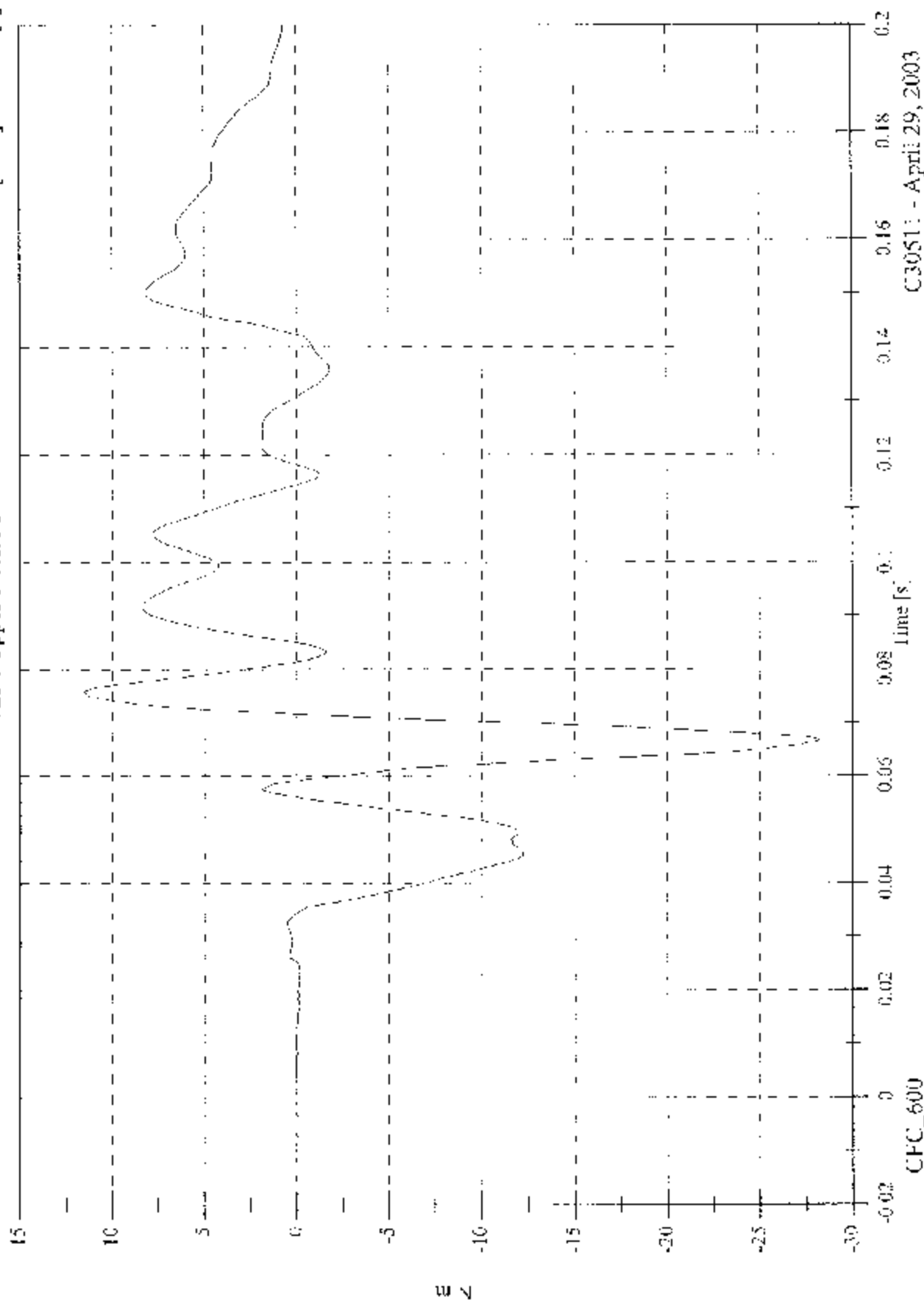
C30511 - April 29, 2003



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]



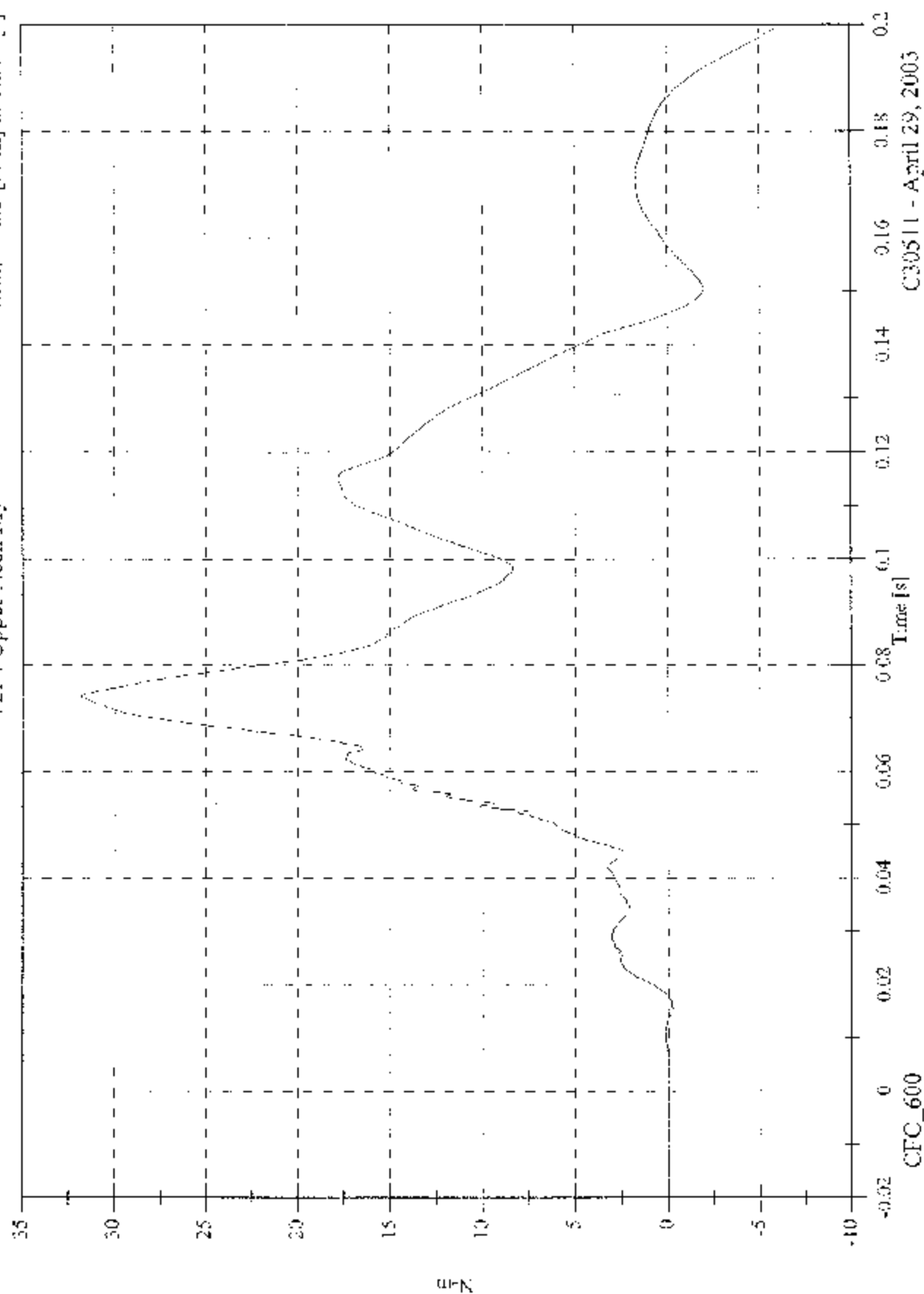
C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

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

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

V2P4 Upper Neck My

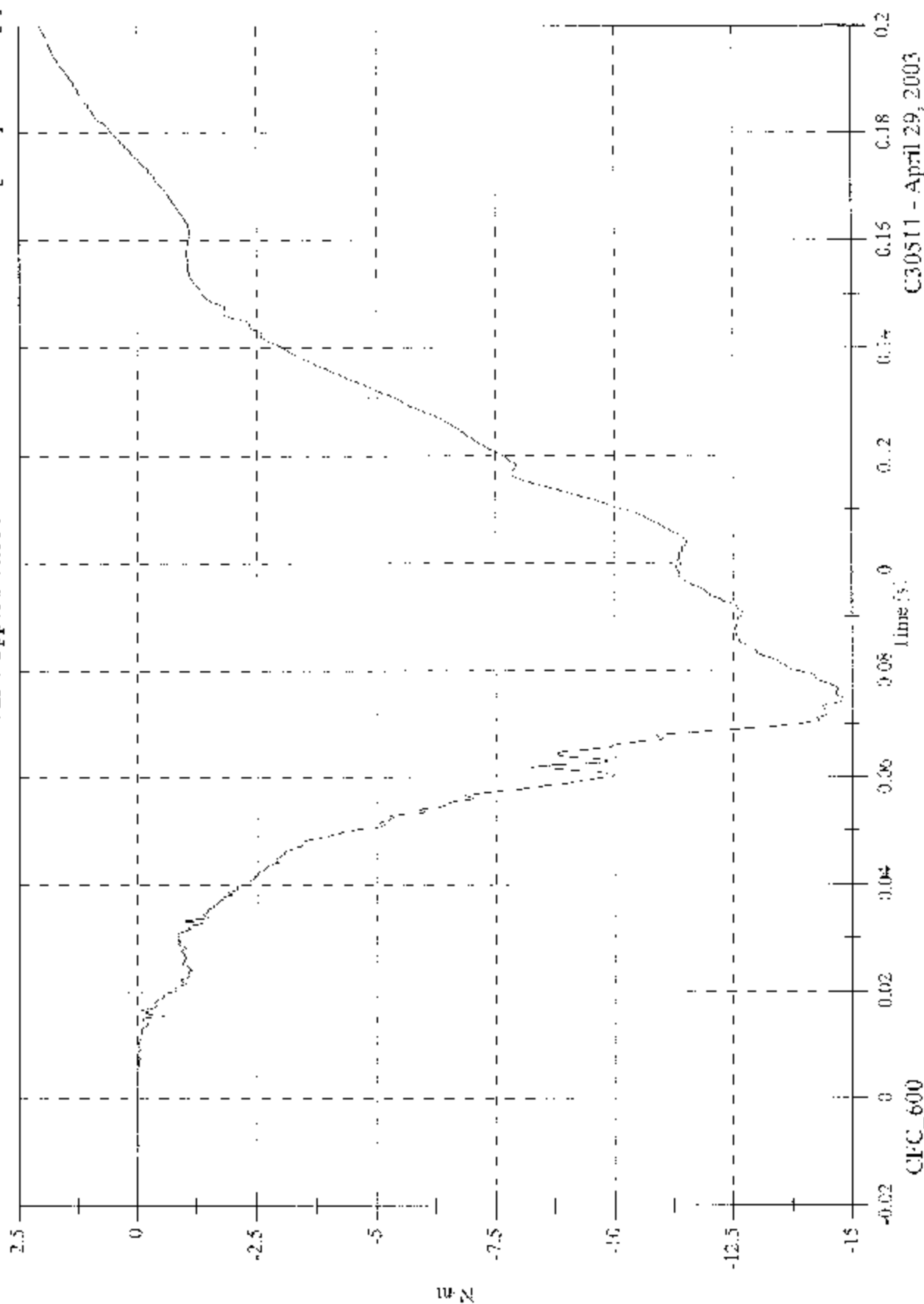


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Soranto

Max: 2.1 [N-m] at 0.200 [s]  
Min: -14.8 [N-m] at 0.074 [s]

V2P4 Upper Neck Mz

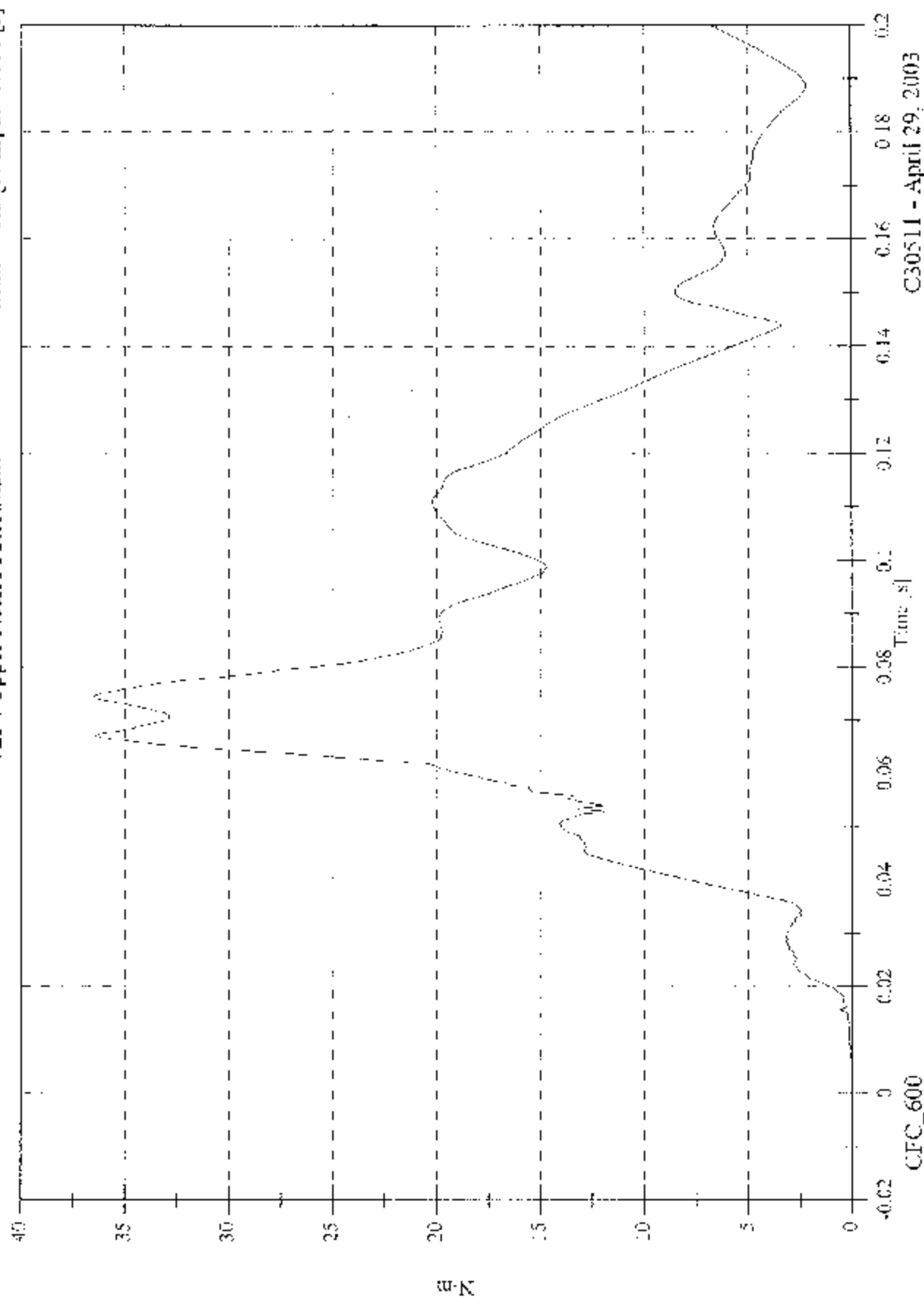


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 K.a Sorenso

Max: 36.5 [N-m] at 0.074 [s]  
Min: 0.0 [N-m] at 0.006 [s]

V2P4 Upper Neck M Resultant

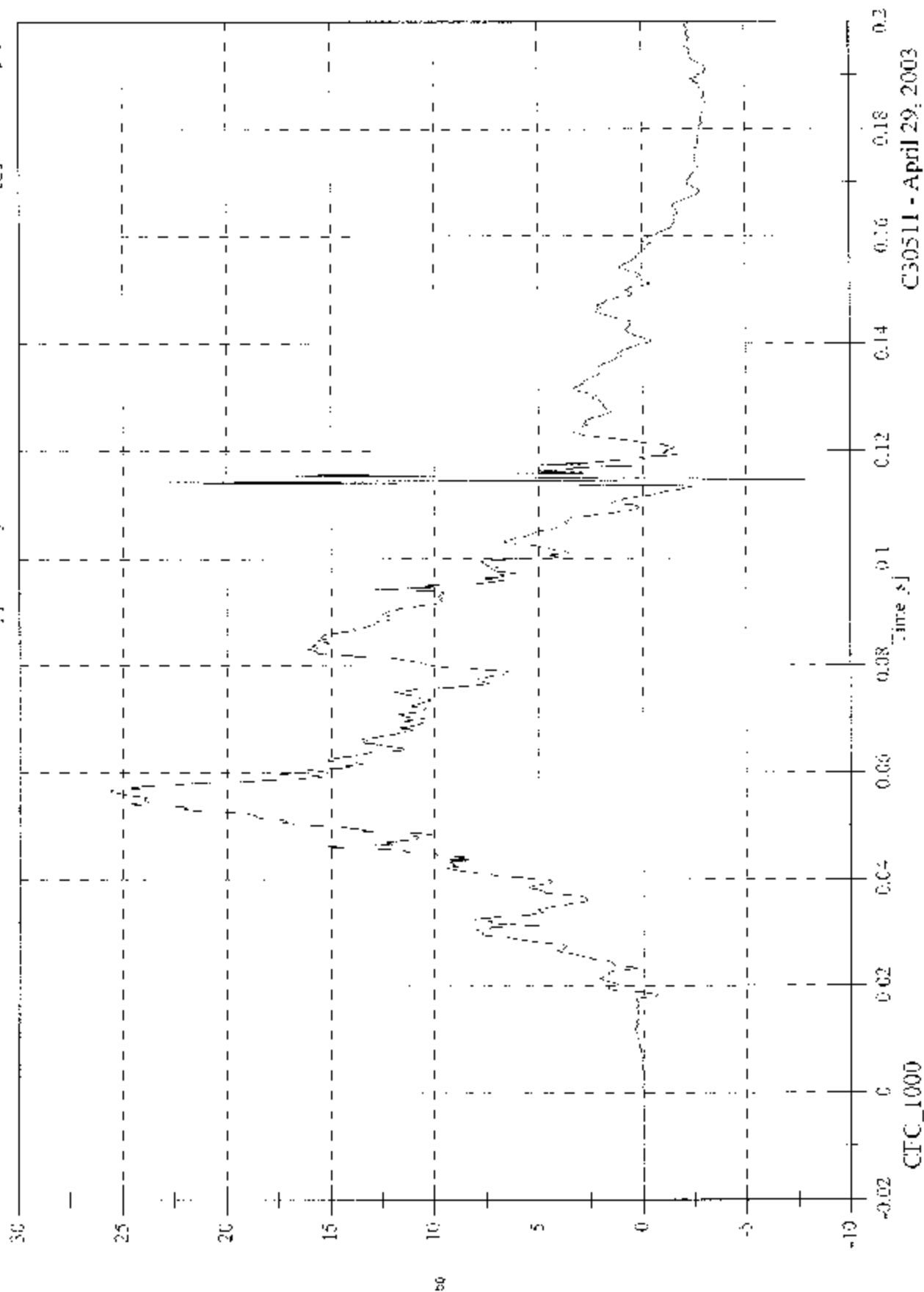


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 26.0 [g] at 0.114 [s]  
Min: -8.0 [g] at 0.115 [s]

V2P4 Upper Rib y

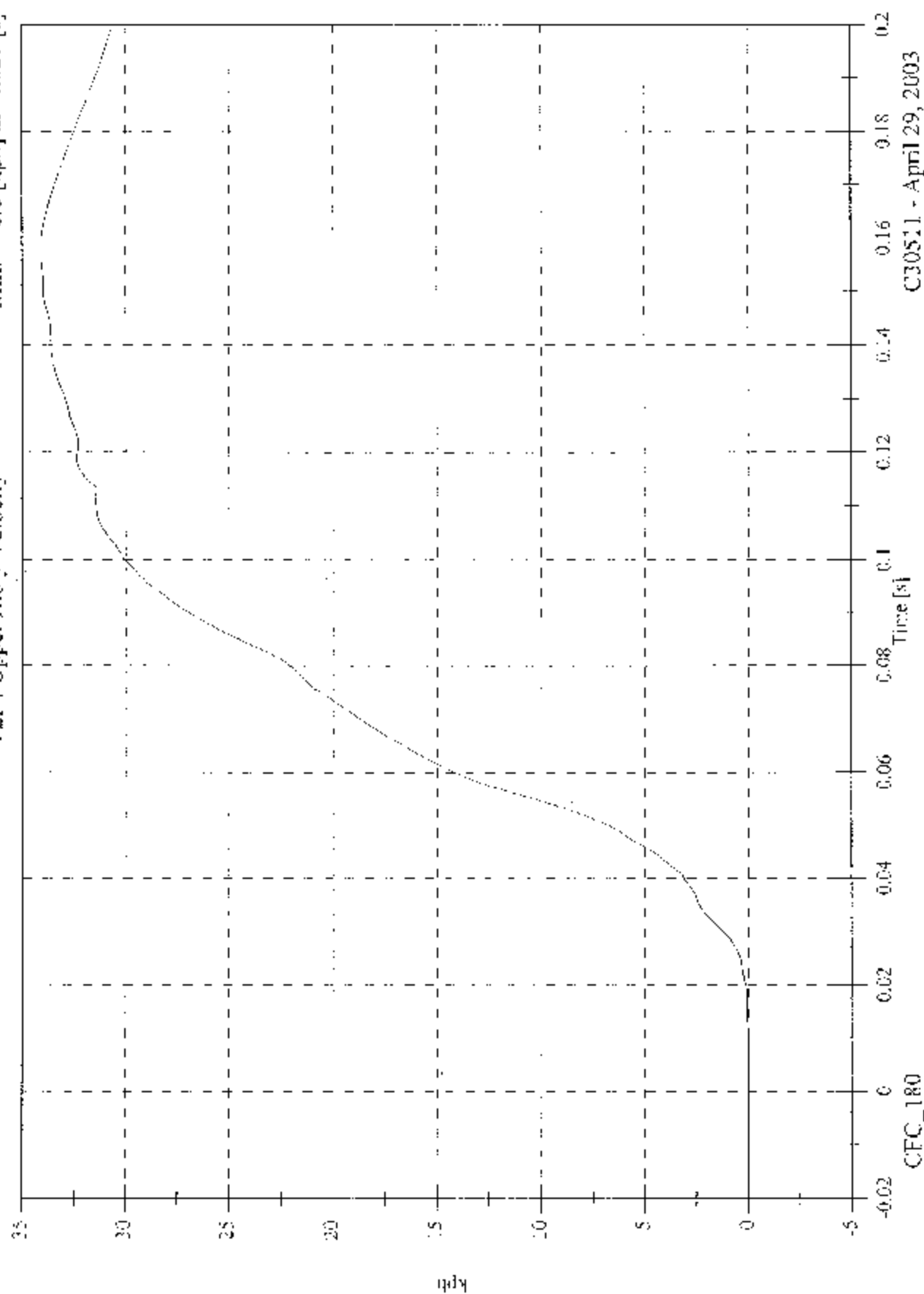


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 34.1 [kph] at 0.157 [s]  
Min: -0.0 [kph] at -0.020 [s]

V2P4 Upper Rib v Velocity



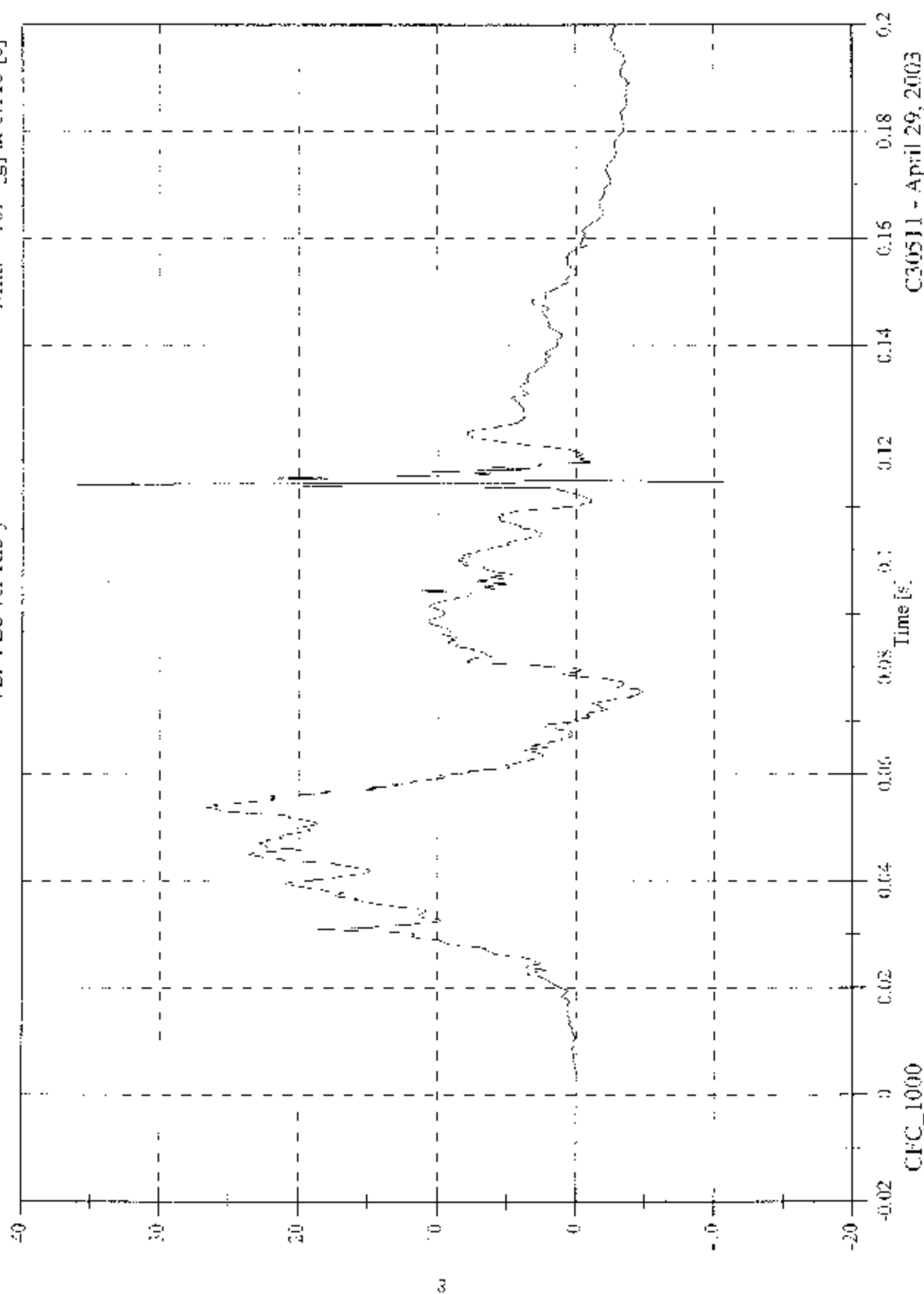
C30S11 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

V2P4 Lower Rib y

Max: 36.0 [g] at 0.114 [s]

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

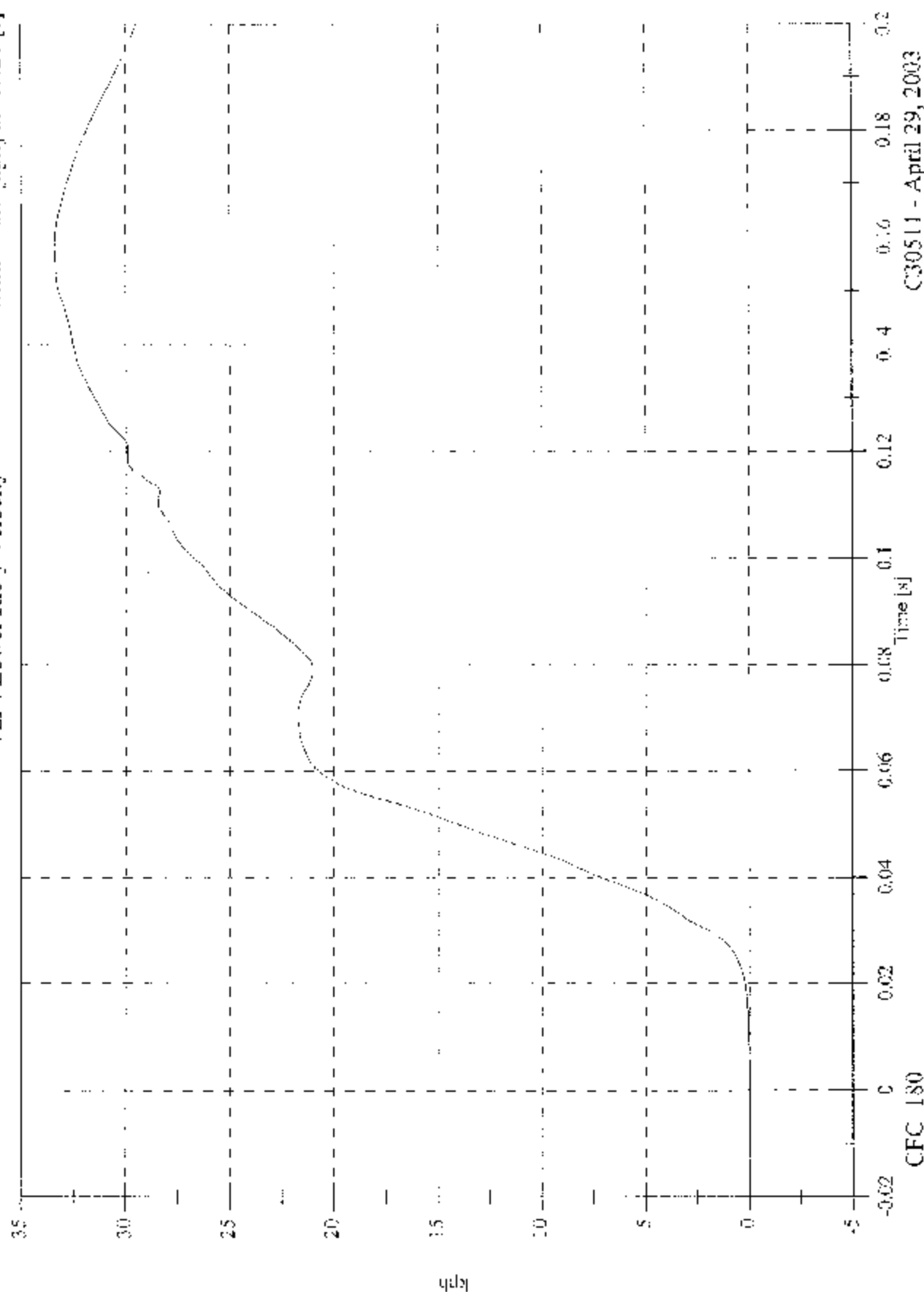


C30511 - April 29, 2003

# FMVSS 214D Indicant - 2003 Kia Sorento

Max: 33.4 [kph] at 0.158 [s]  
 Min: -0.0 [kph] at -0.020 [s]

V2P4 Lower Rib y Velocity



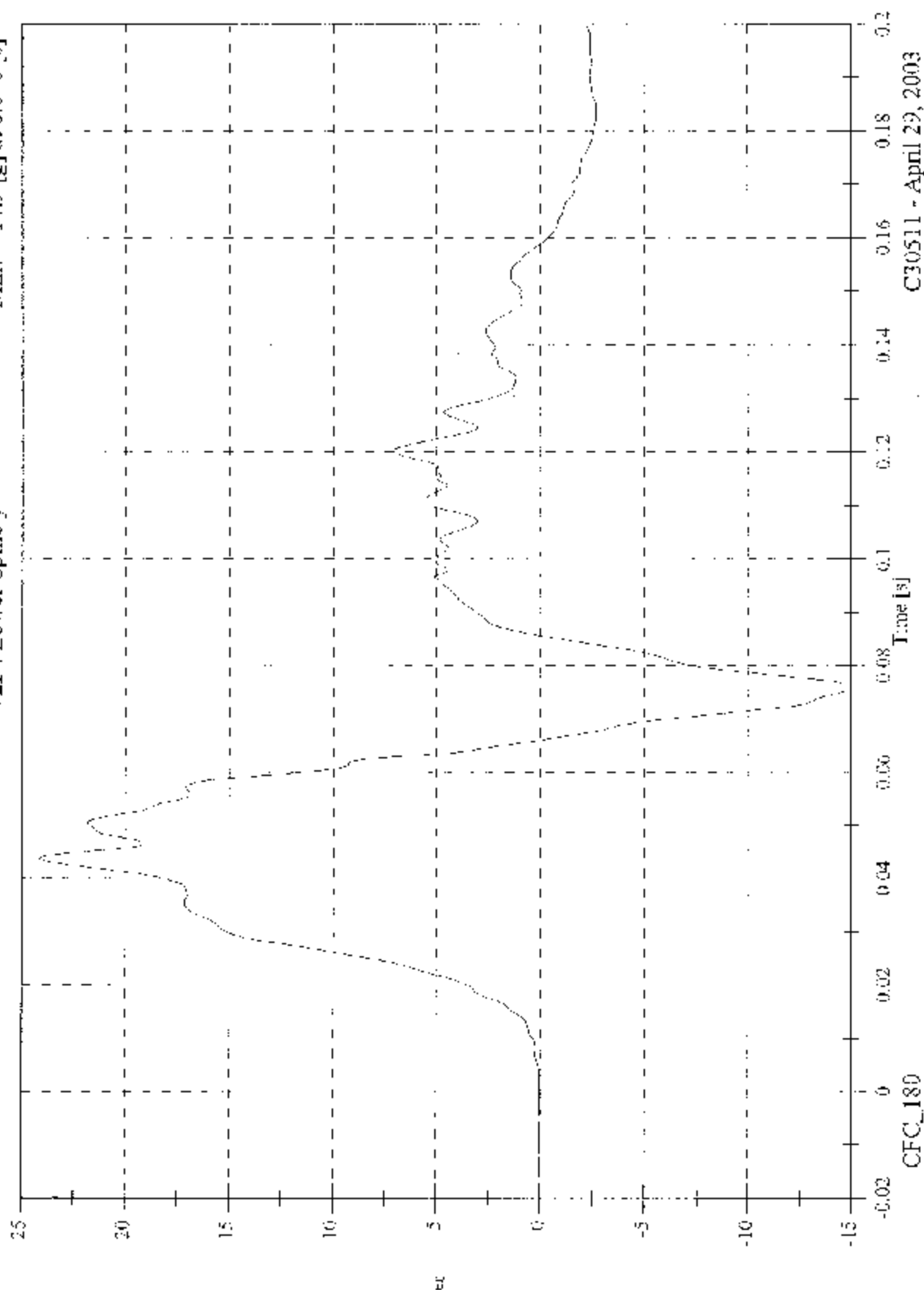
C30511 - April 29, 2003



FMVSS 214D Inducant - 2003 Kia Sorento

Max: 24.2 [g] at 0.044 [s]  
Min: -14.9 [g] at 0.076 [s]

V2P4 Lower Spine y

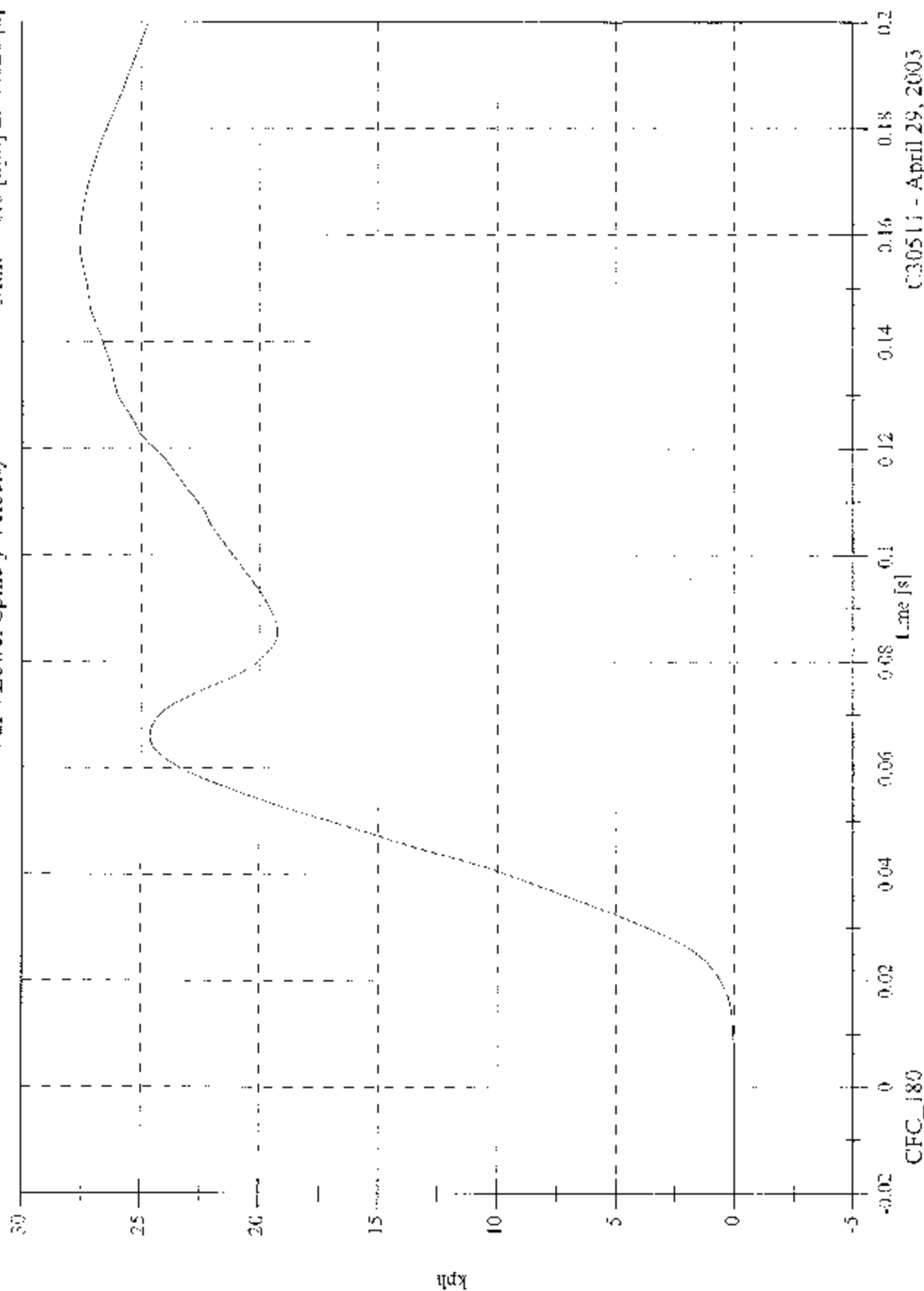


C30511 - April 29, 2003

# FMVSS 214D Inducant - 2003 Kia Sorento

Max: 27.6 [kph] at 0.159 [s]  
 Min: -0.0 [kph] at -0.020 [s]

V2P4 Lower Spine y Velocity

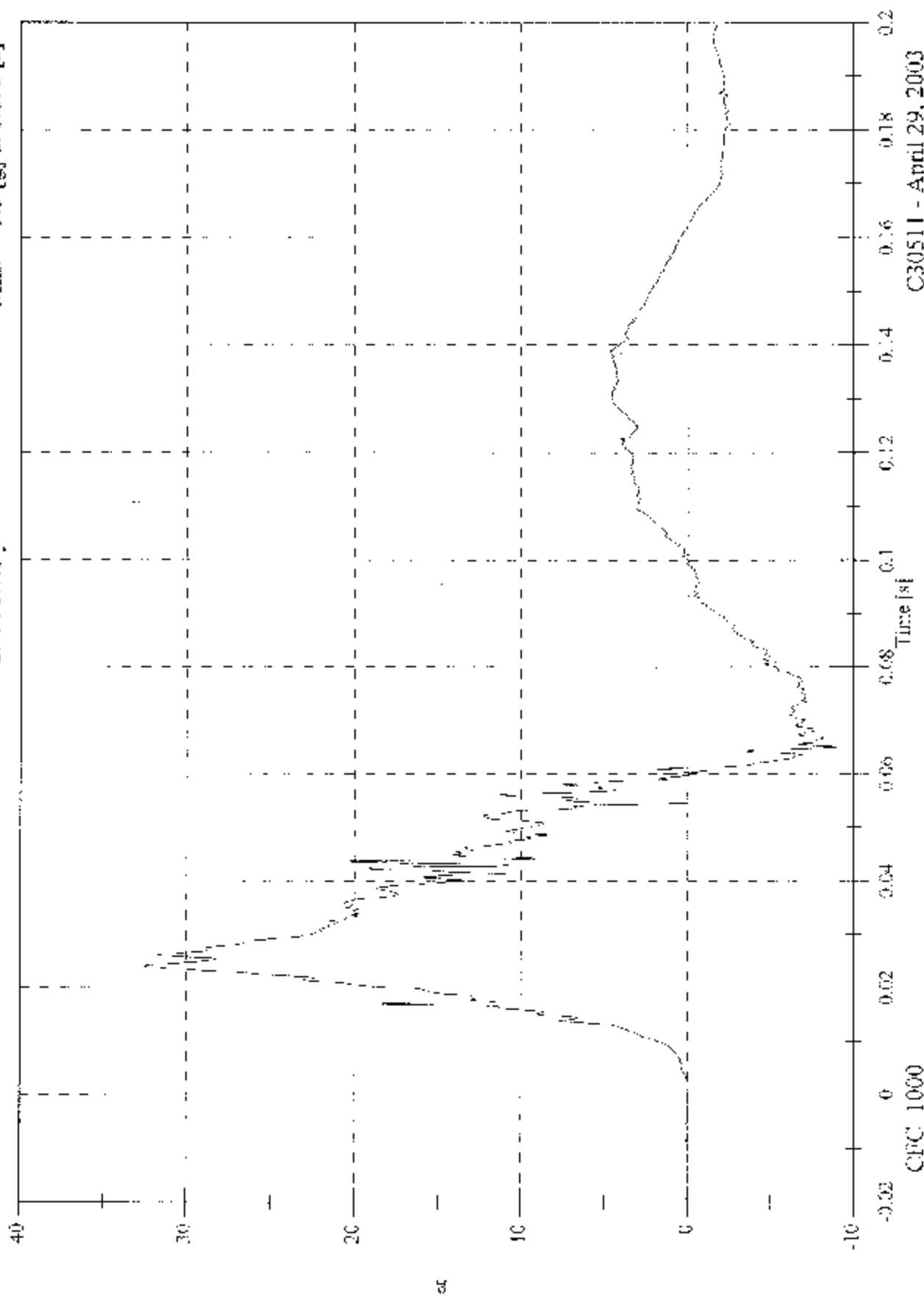


030511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

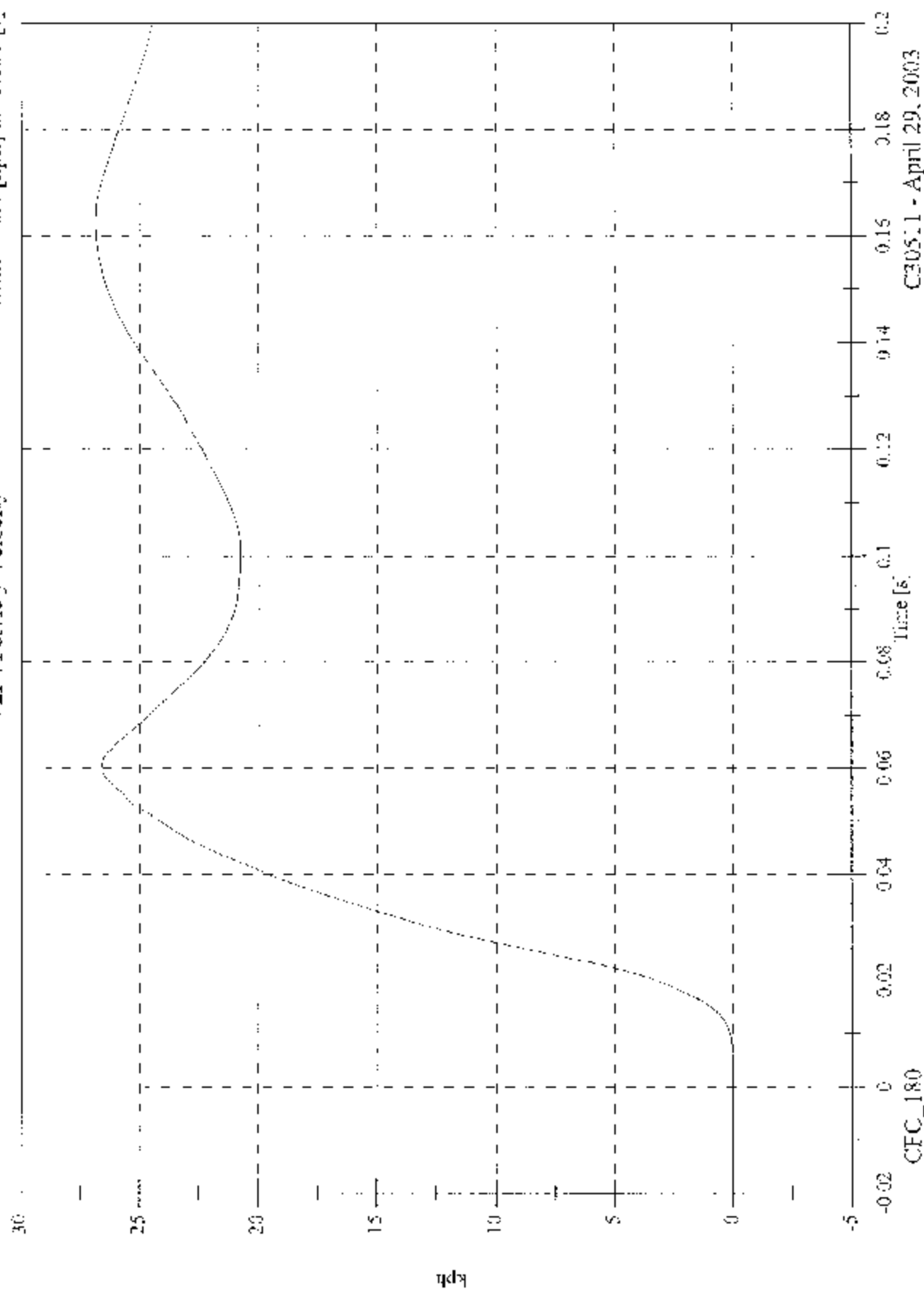
Max: 32.5 [g] at 0.024 [s]  
Min: -9.3 [g] at 0.065 [s]

V2P4 Pelvic y



C30511 - April 29, 2003

V2P4 Pelvic y Velocity



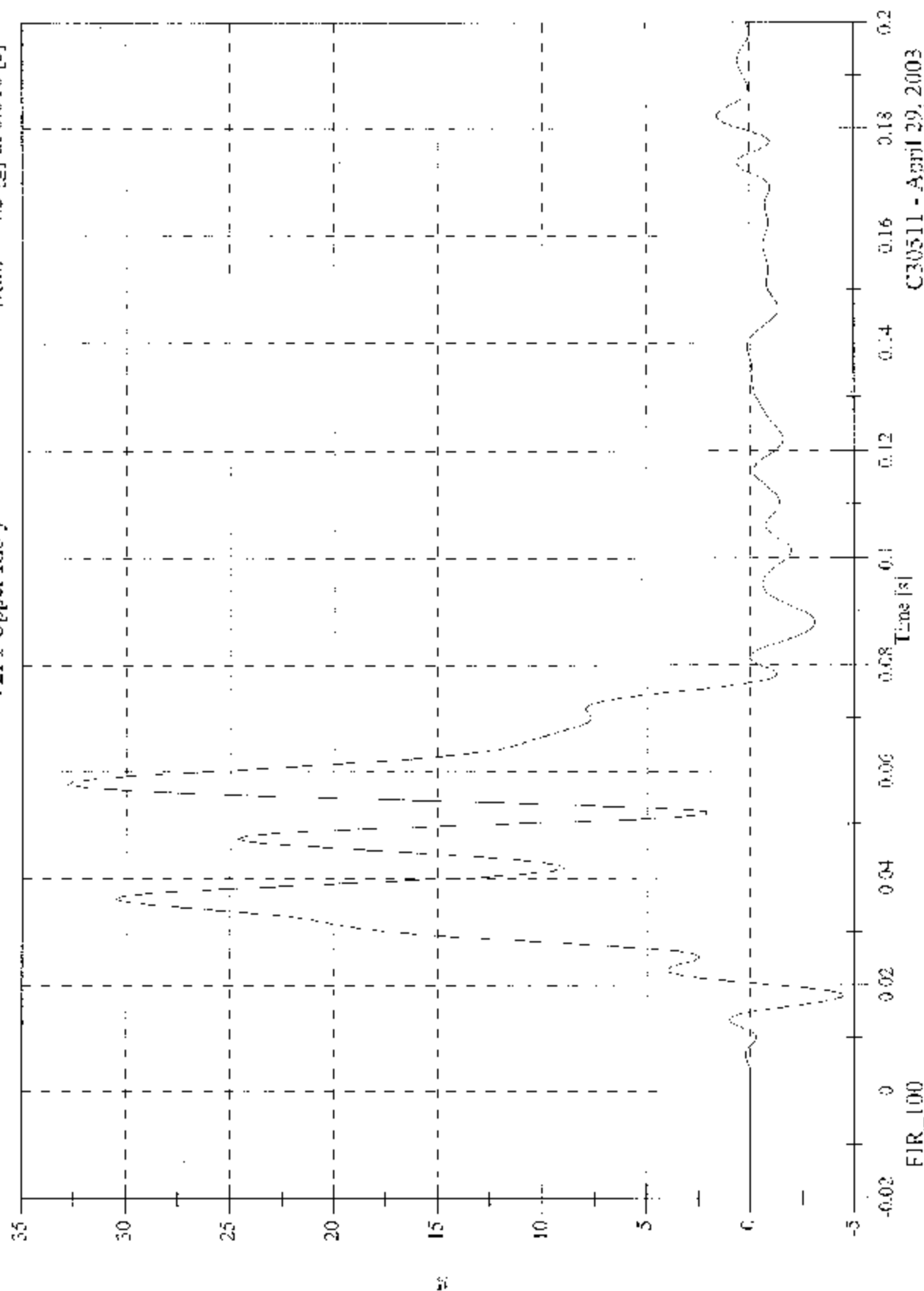
C30511 - April 29, 2003

FMVSS 214D IndicanL - 2003 Kia Sorento

V2P1 Upper Rib y

Max: 32.8 [g] at 0.057 [s]

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



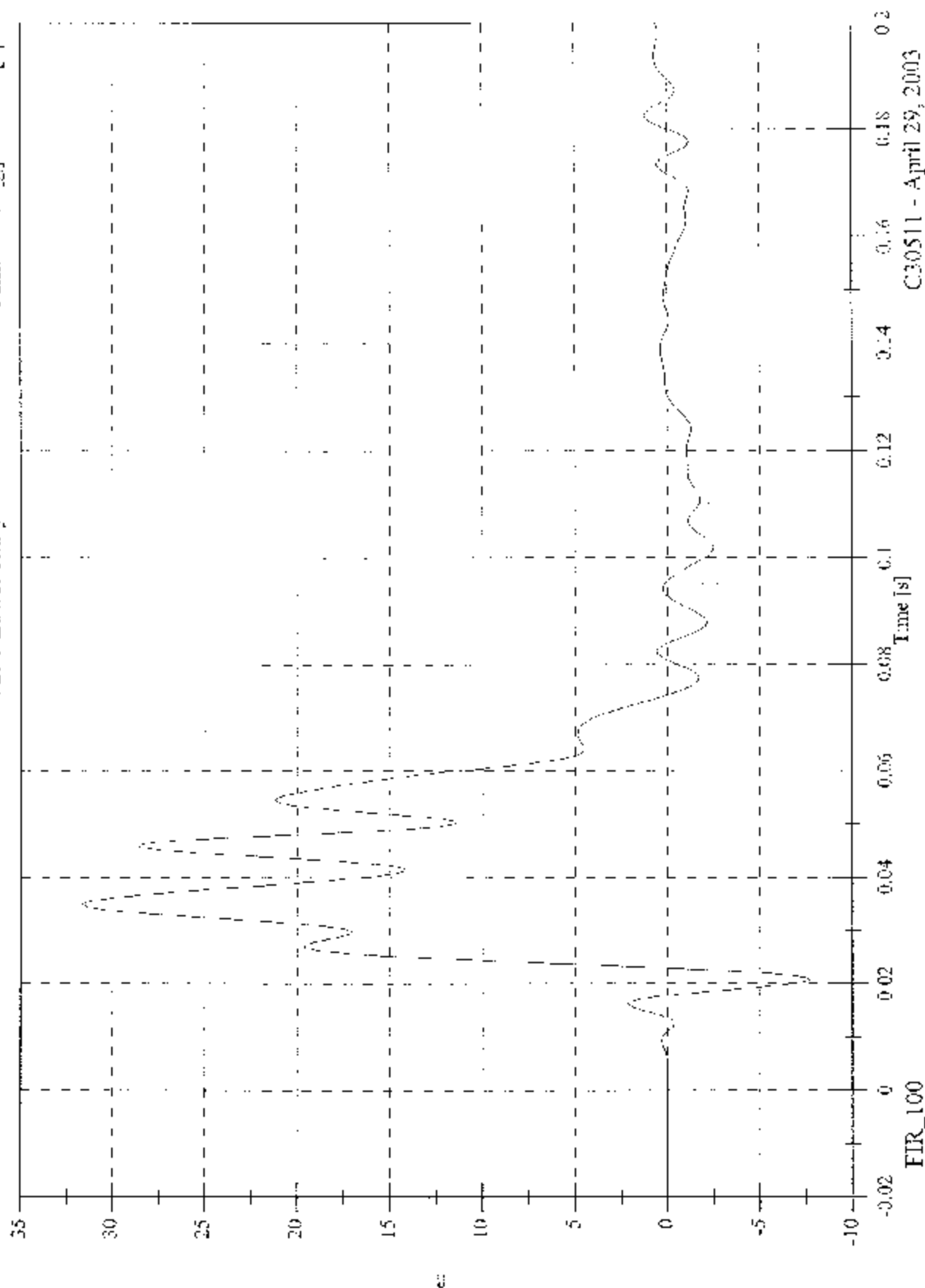
C30511 - April 29, 2003

FMVSS 214D Incitant - 2003 Kia Sorento

Max: 31.7 [g] at 0.035 [s]

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

V2P; Lower Rib y



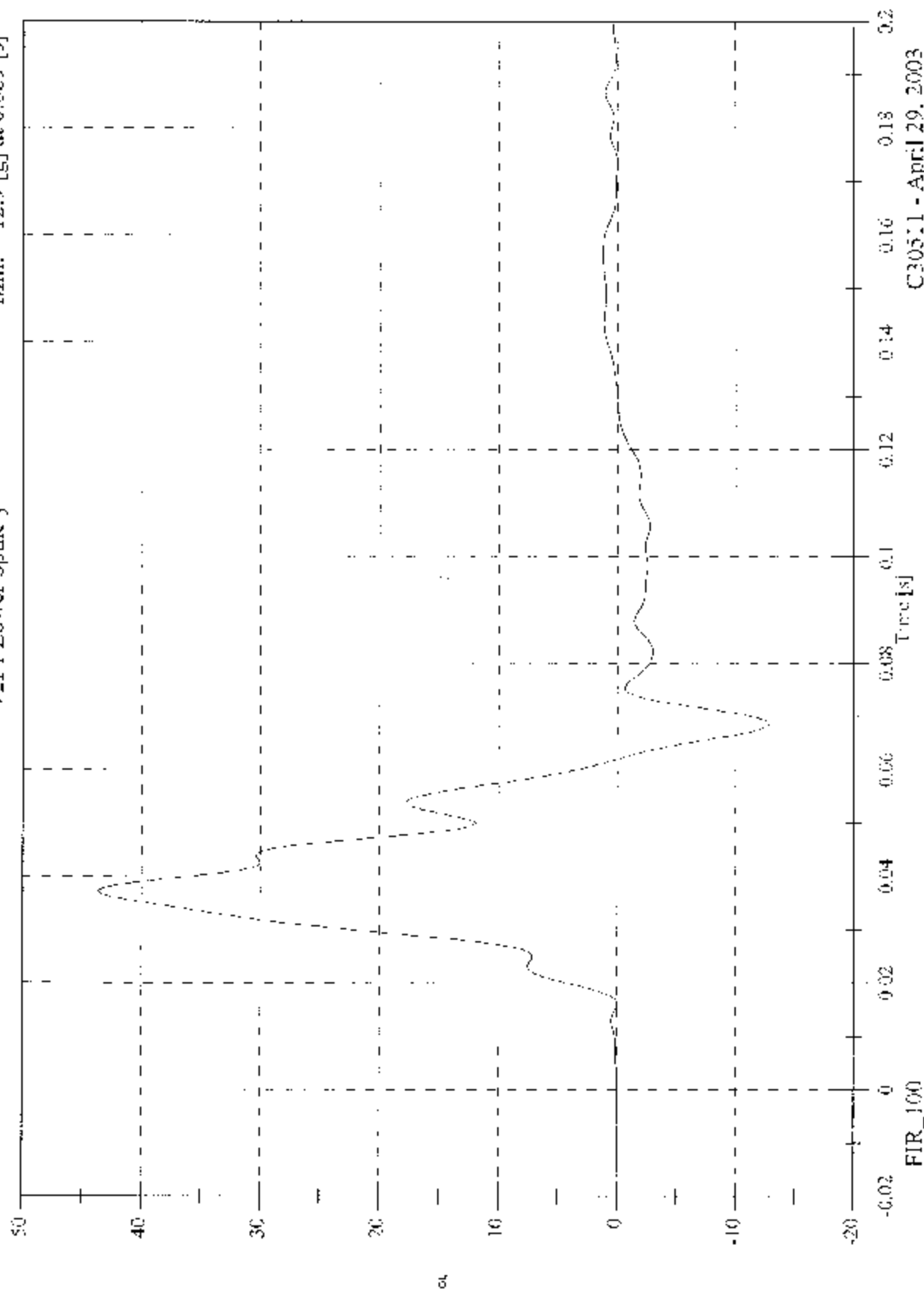
C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 43.6 [g] at 0.037 [s]

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

V2P1 Lower Spine y



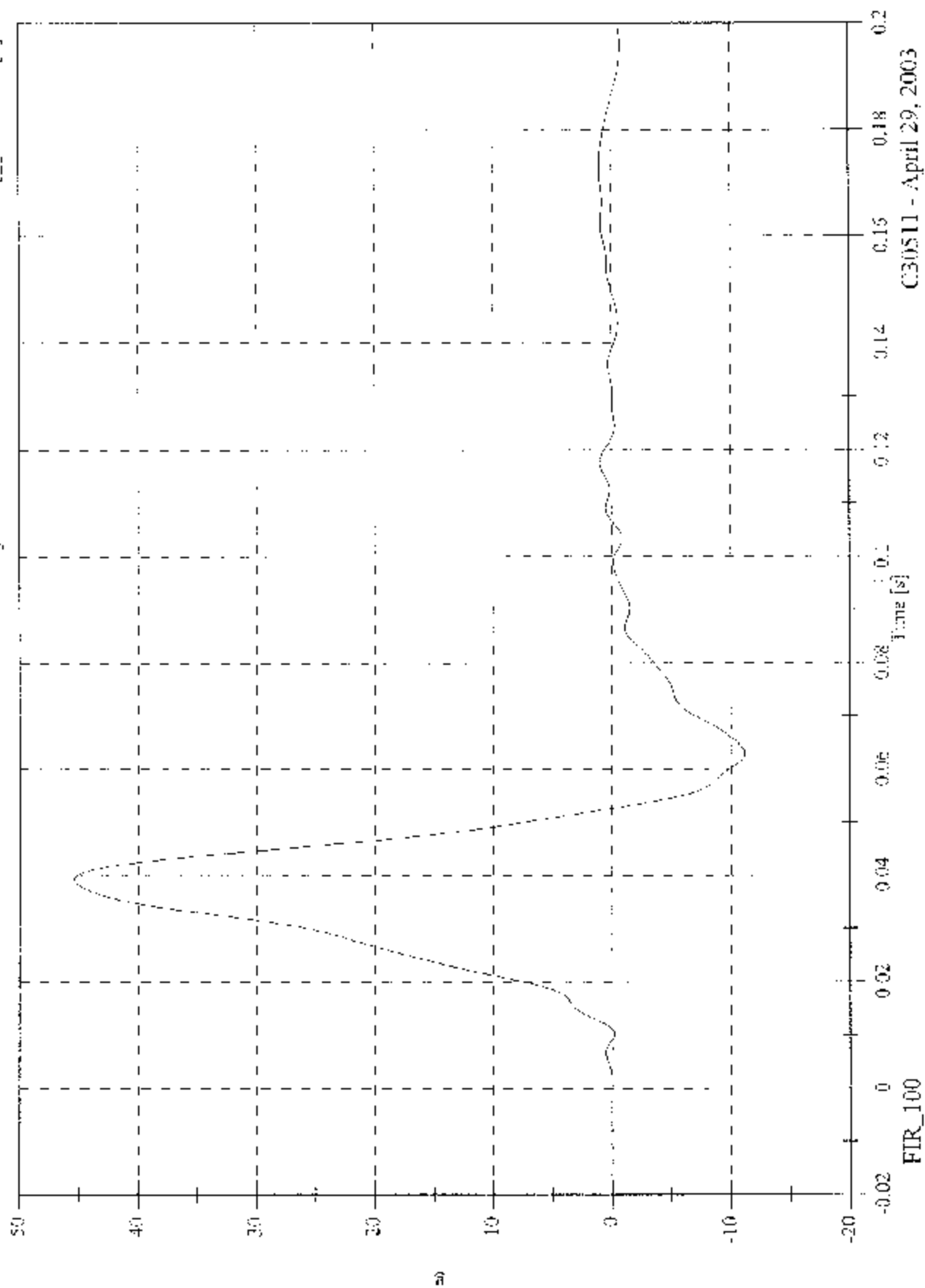
C3051.1 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 45.4 [g] at 0.039 [s]

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

V2P1 Pelvic y



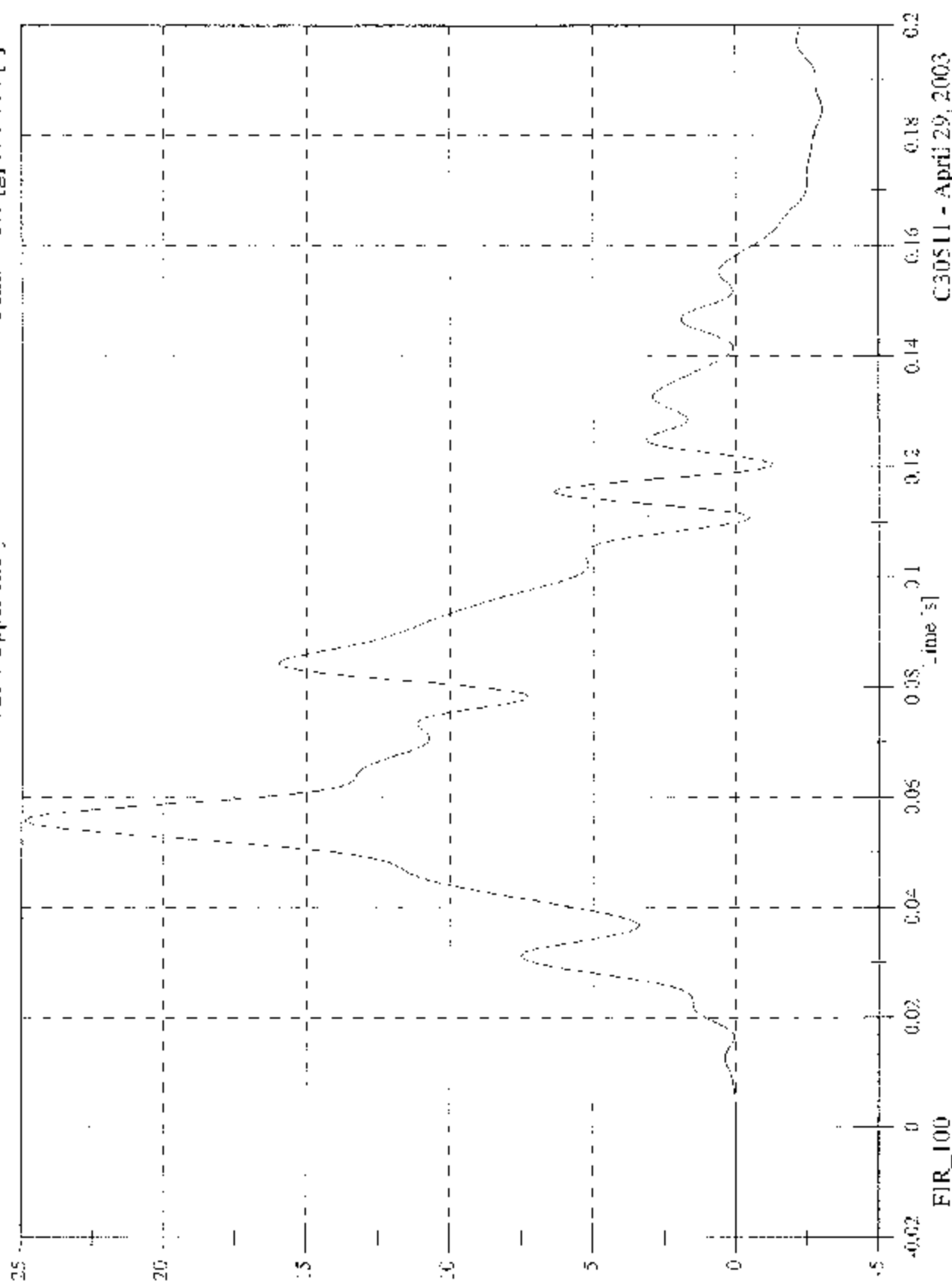
C30511 - April 29, 2003



FMVSS 214D Inducant - 2003 Kia Sorento

V2P4 Upper Rib y

Max: 24.9 [g] at 0.056 [s]  
Min: -3.0 [g] at 0.184 [s]



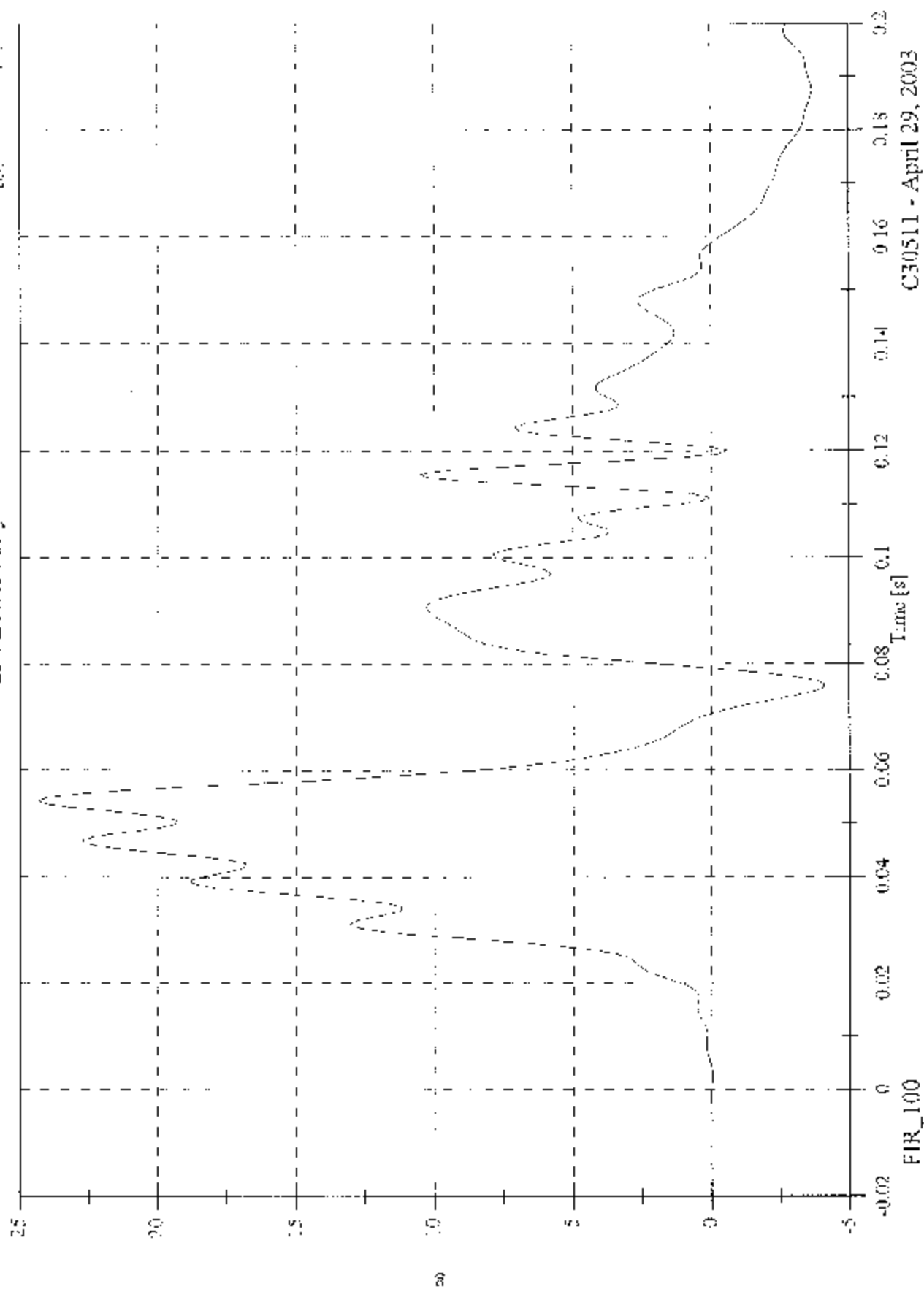
C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 24.4 [g] at 0.054 [s]

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

V2P4 Lower Rib y



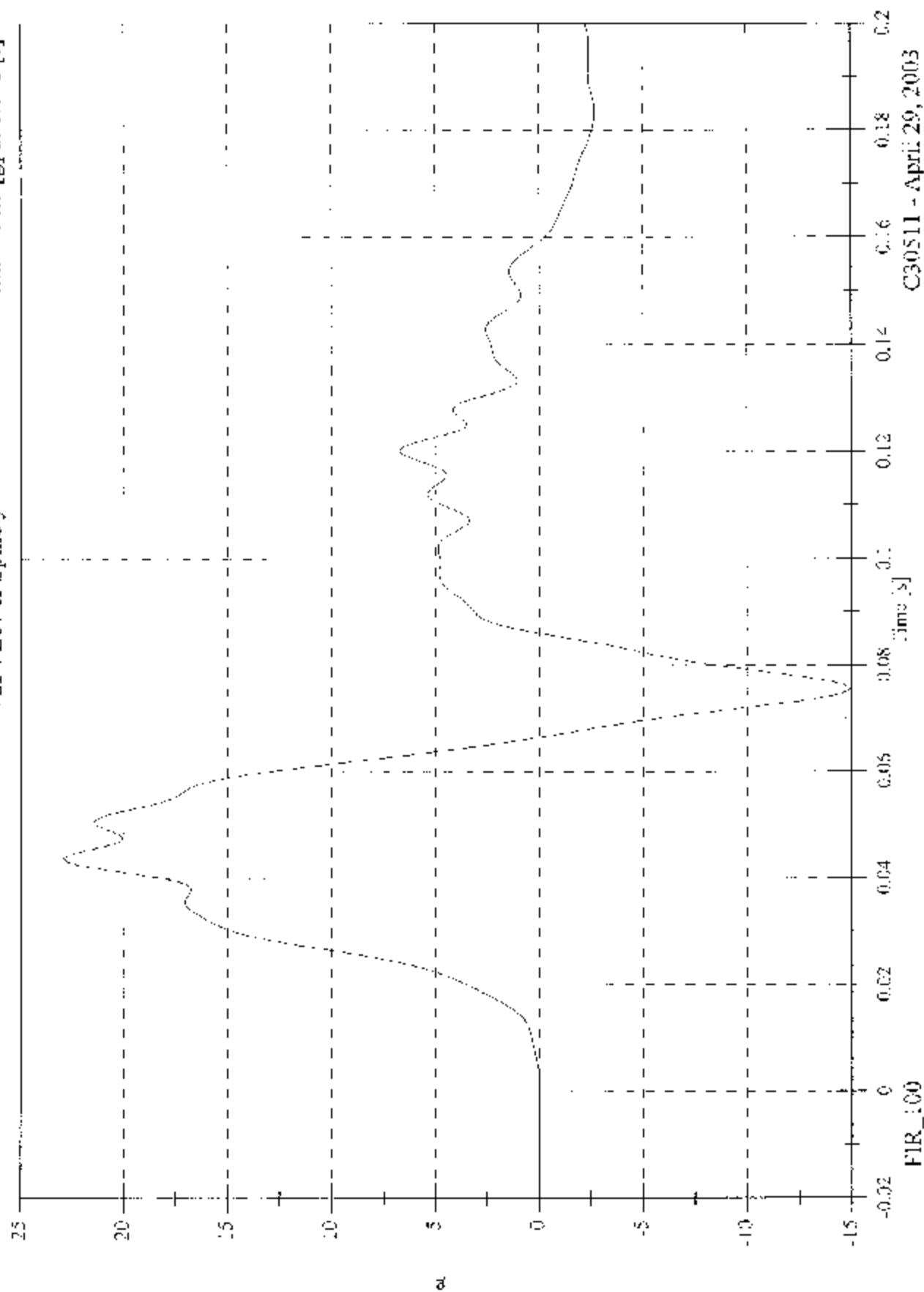
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 22.9 [g] at 0.044 [s]

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

V2P4 Lower Spine y

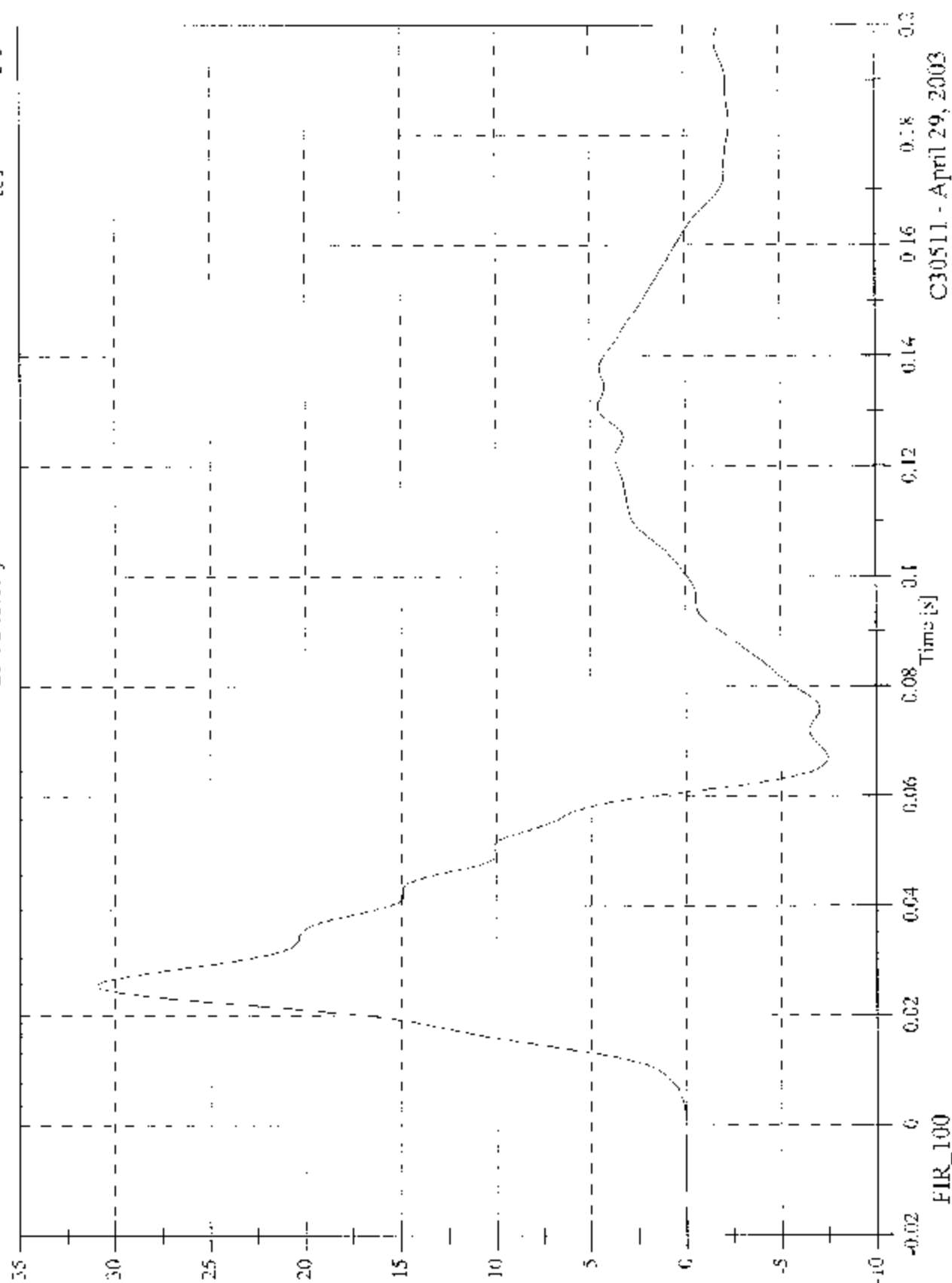


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 30.9 [g] at 0.026 [s]  
Min: -7.5 [g] at 0.067 [s]

V2P4 Pelvic y

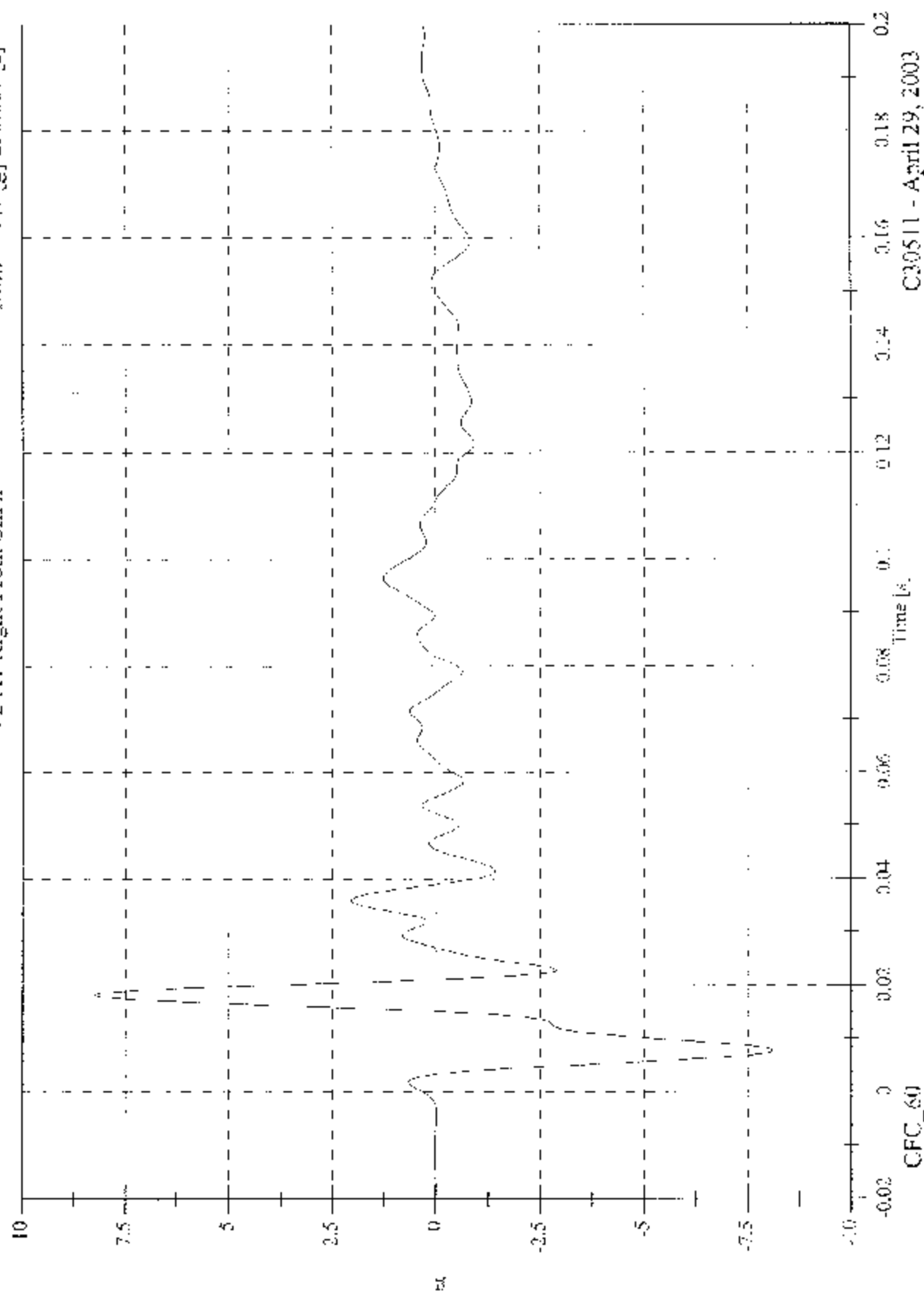


C30511 - April 29, 2003

FMVSS 214D Inducant - 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]



CFC\_60

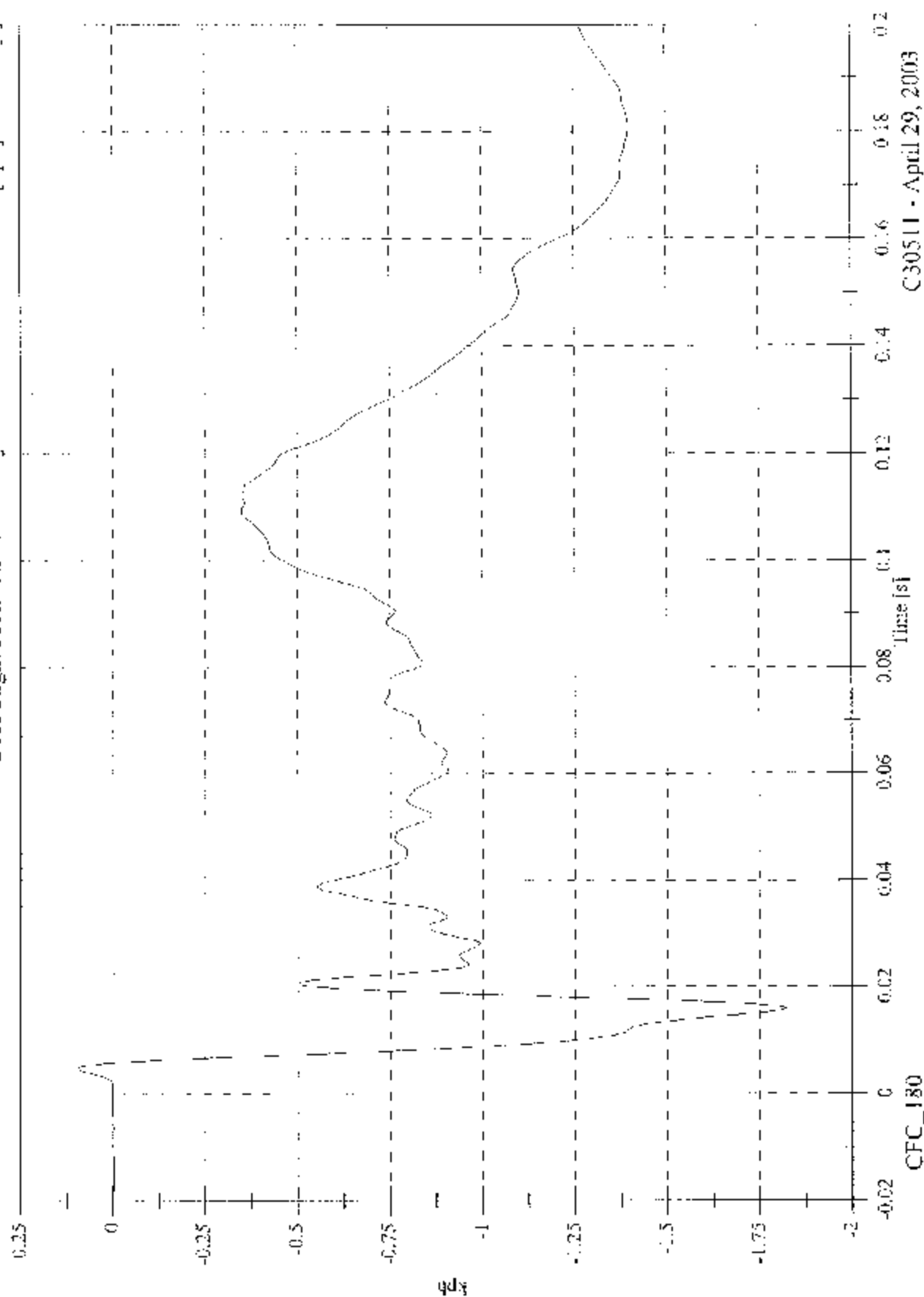
C30511 - April 29, 2003

FMVSS 214D Inducant - 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]



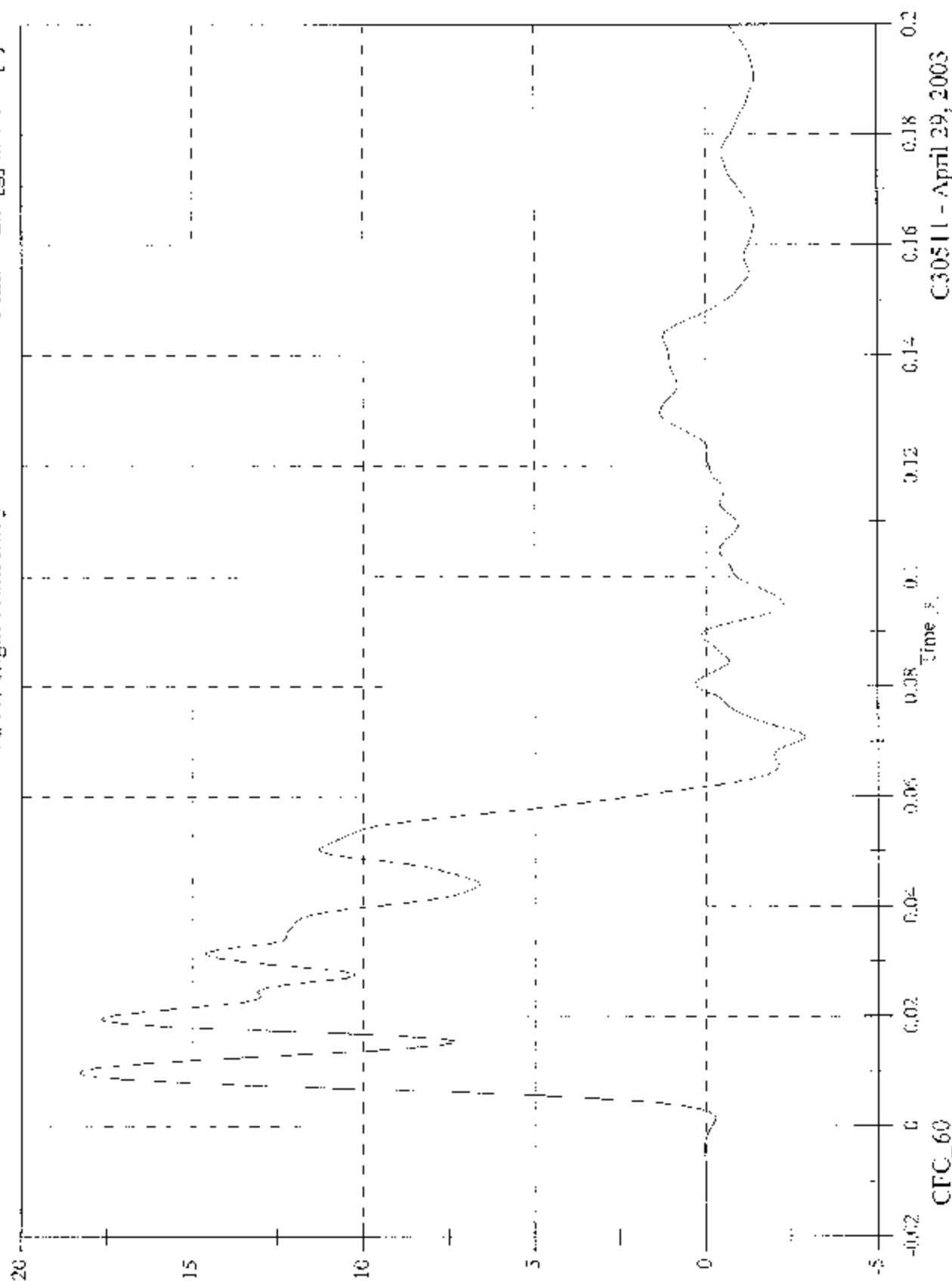
C30511 - April 29, 2003

FMVSS 214D Incident - 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]



CFC\_60

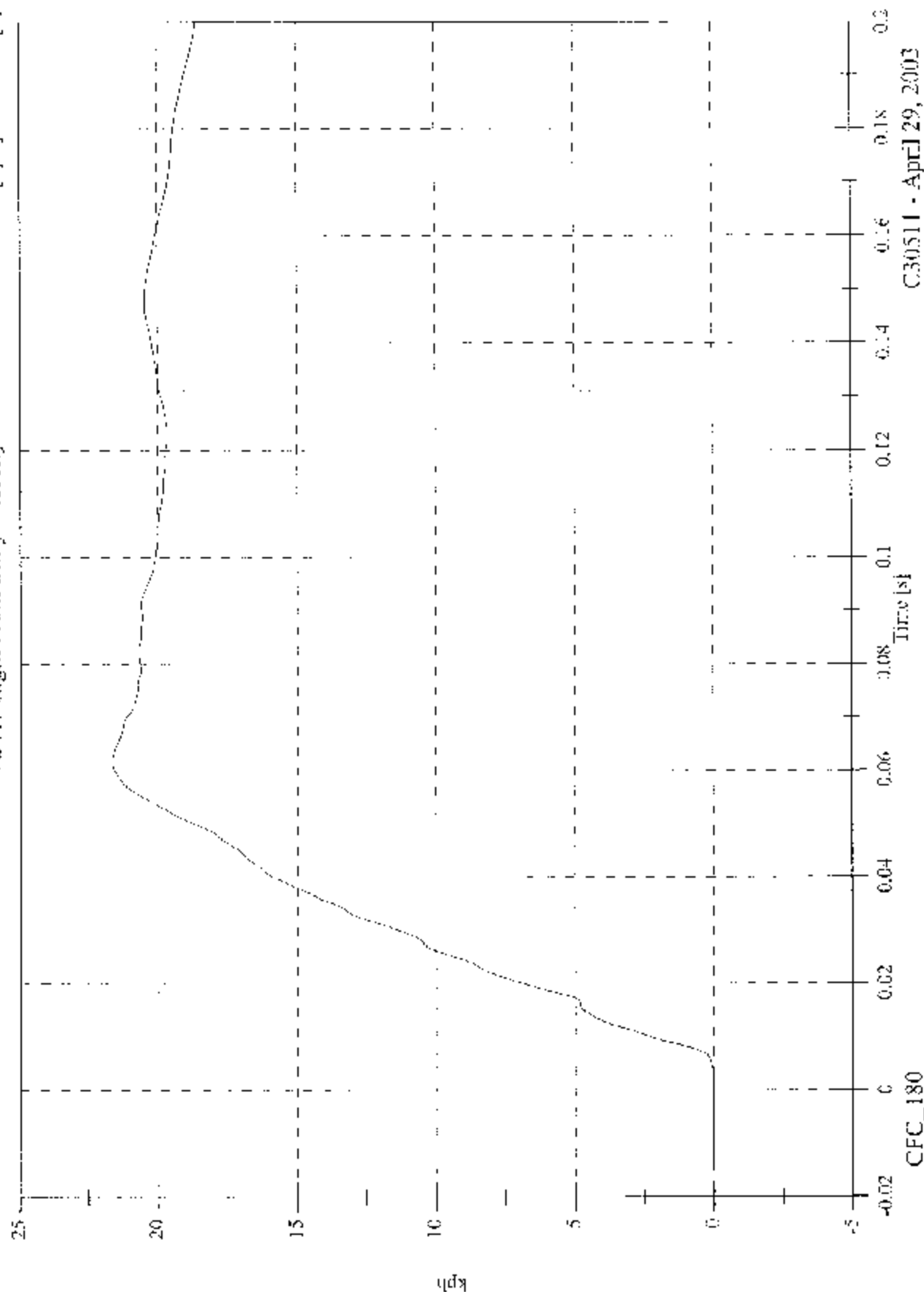
C30511 - April 29, 2003

FMVSS 214D Incitant - 2003 Kia Sorento

Max: 21.7 [kph] at 0.062 [s]

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

V2 A1 Right Front Sill y Velocity



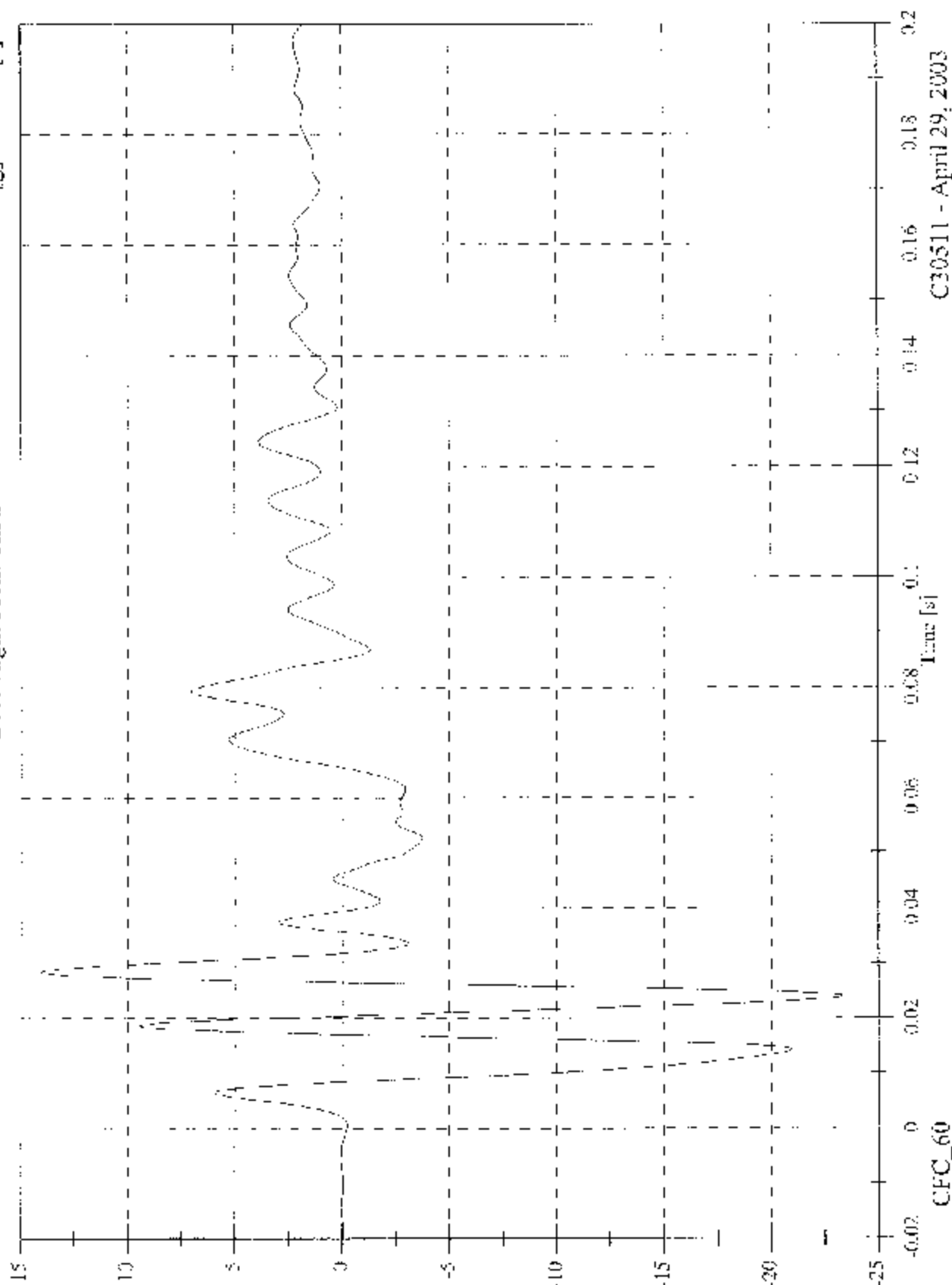
C30511 - April 29, 2003



FMVSS 214D Inducant - 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]

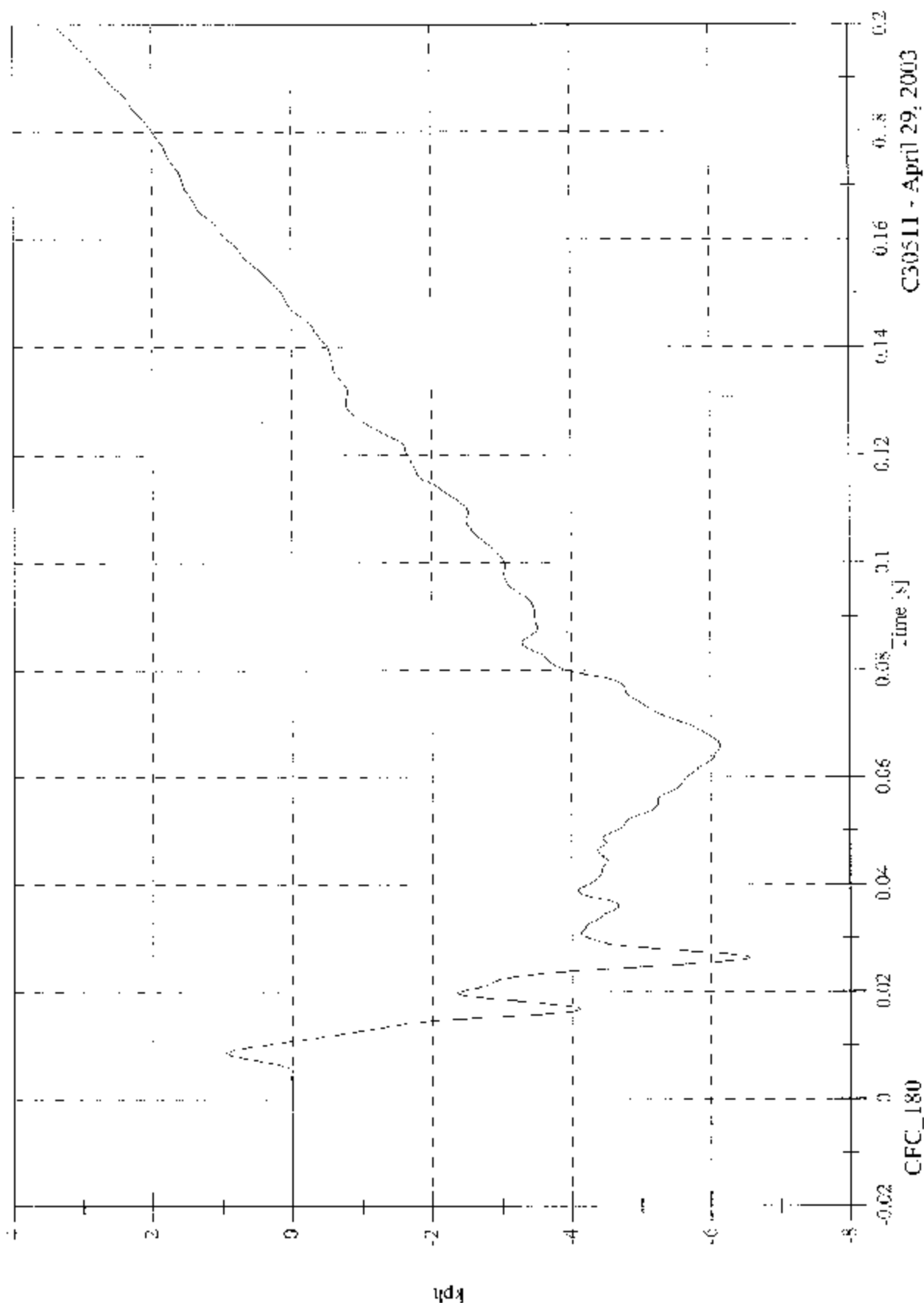


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

V2 A1 Right Front Sil: z Velocity

Max: 3.4 [kph] at 0.200 [s]  
Min: -6.5 [kph] at 0.026 [s]



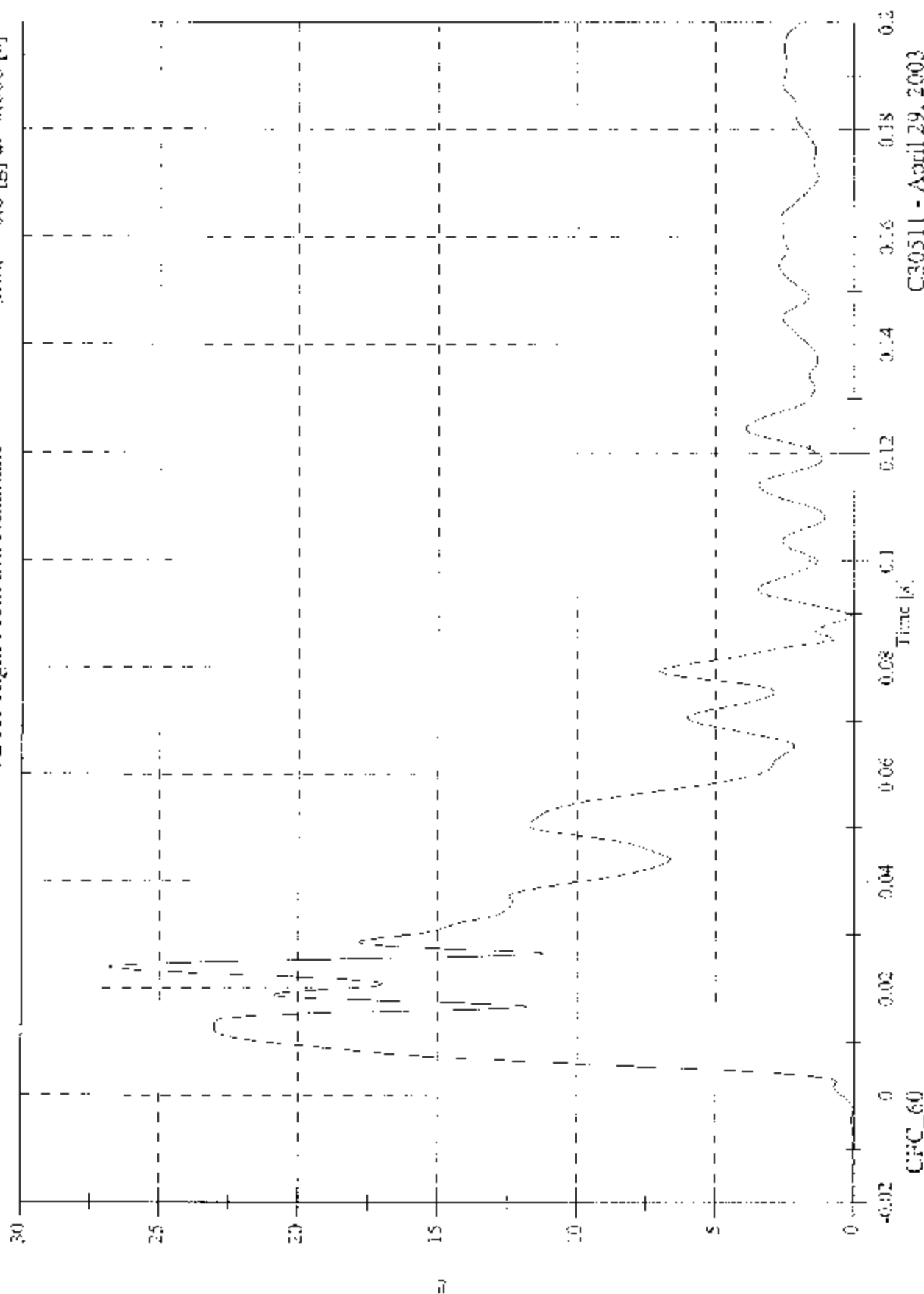
C30511 - April 29, 2003

FMVSS 214D Indium - 2003 Kia Sorento

Max: 26.8 [g] at 0.024 [s]

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

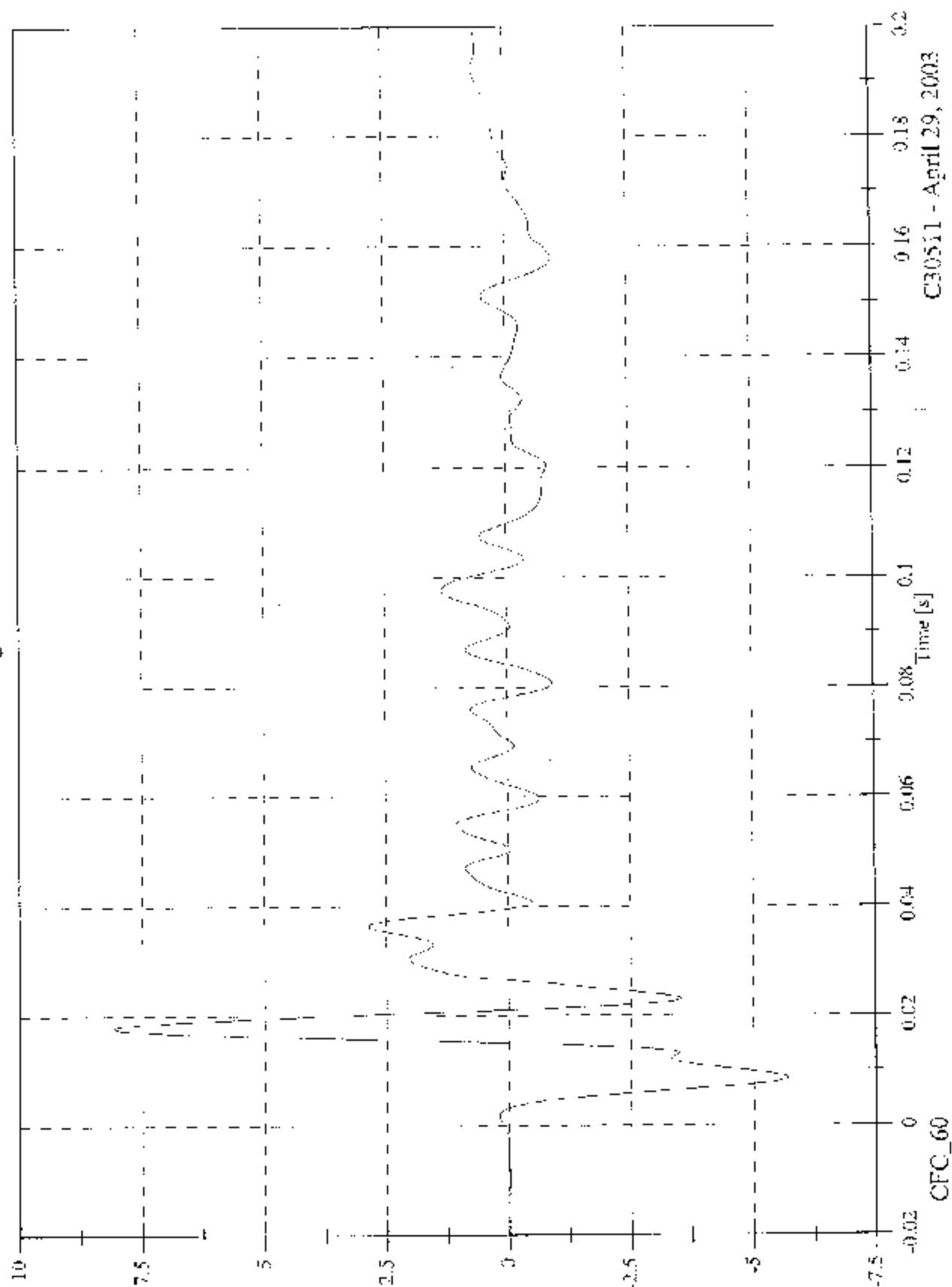
V2 A1 Right Front Sill Resultant



FMVSS 214D Indicant - 2003 Kia Sorento

Max: 8.1 [g] at 0.018 [s]  
Min: -5.7 [g] at 0.008 [s]

V2 A2 Right Rear Sill x



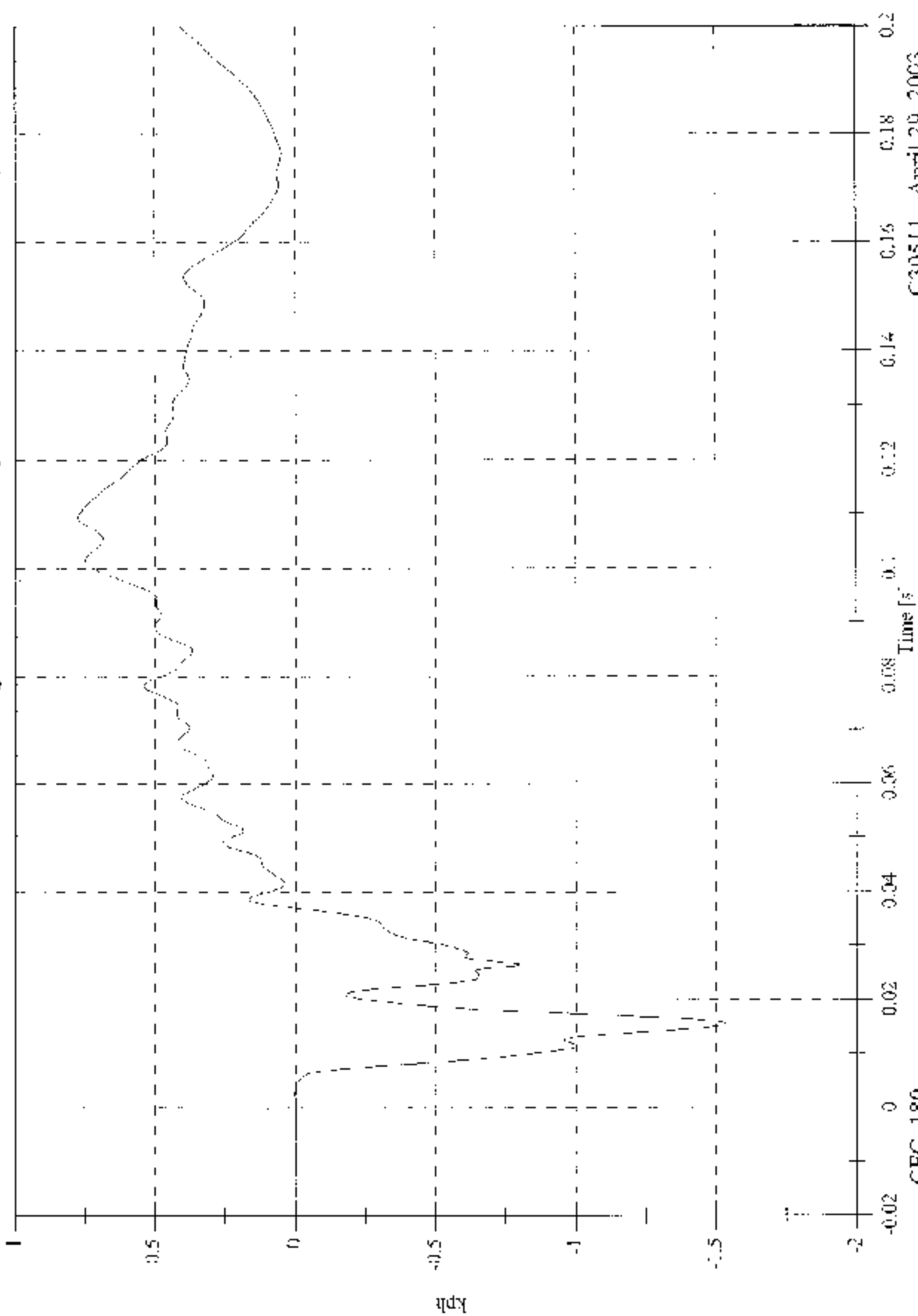
C30511 - April 29, 2003

TMVSS 214D Indicant - 2003 Kia Sorento

Max: 0.8 [kph] at 0.109 [s]

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

V2 A2 Right Rear Sill x Velocity



CFC\_180

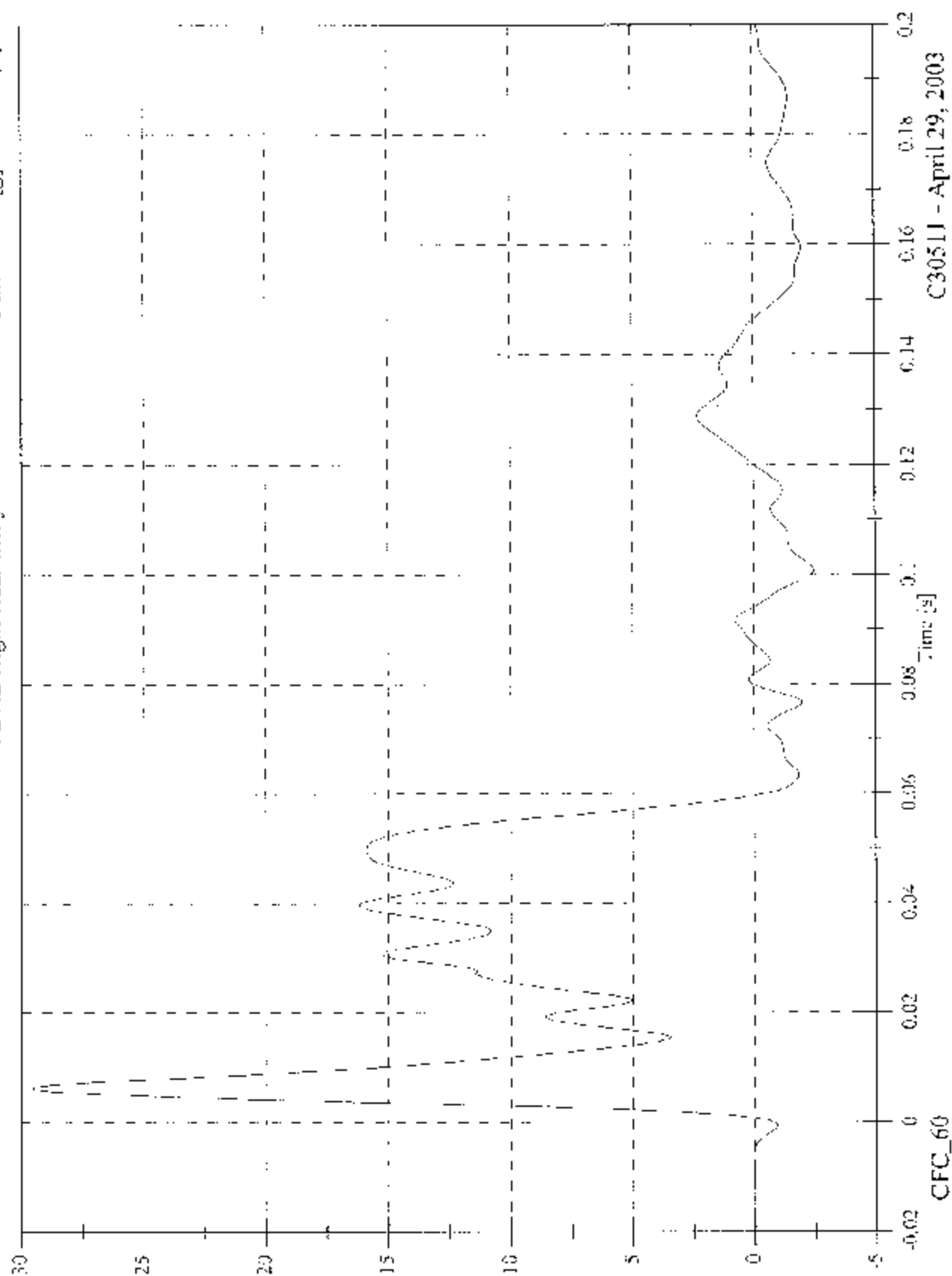
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 29.5 [g] at 0.006 [s]

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

V2 A2 Right Rear Sill y



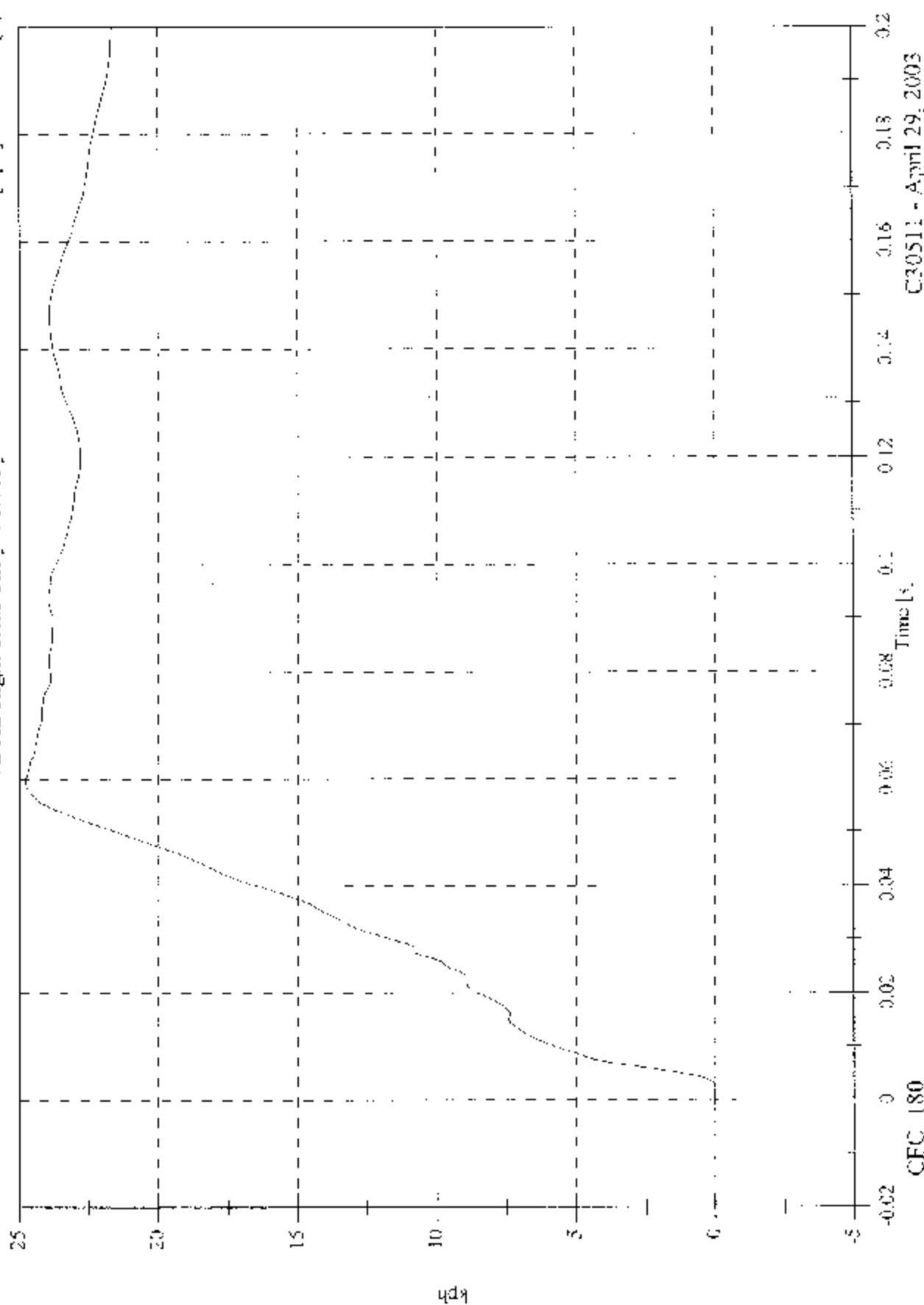
C30511 - April 29, 2003

FMVSS 214D Indicat - 2003 Kia Sorento

Max: 24.8 [kph] at 0.059 [s]

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

V2 A2 Right Rear Sill y Velocity



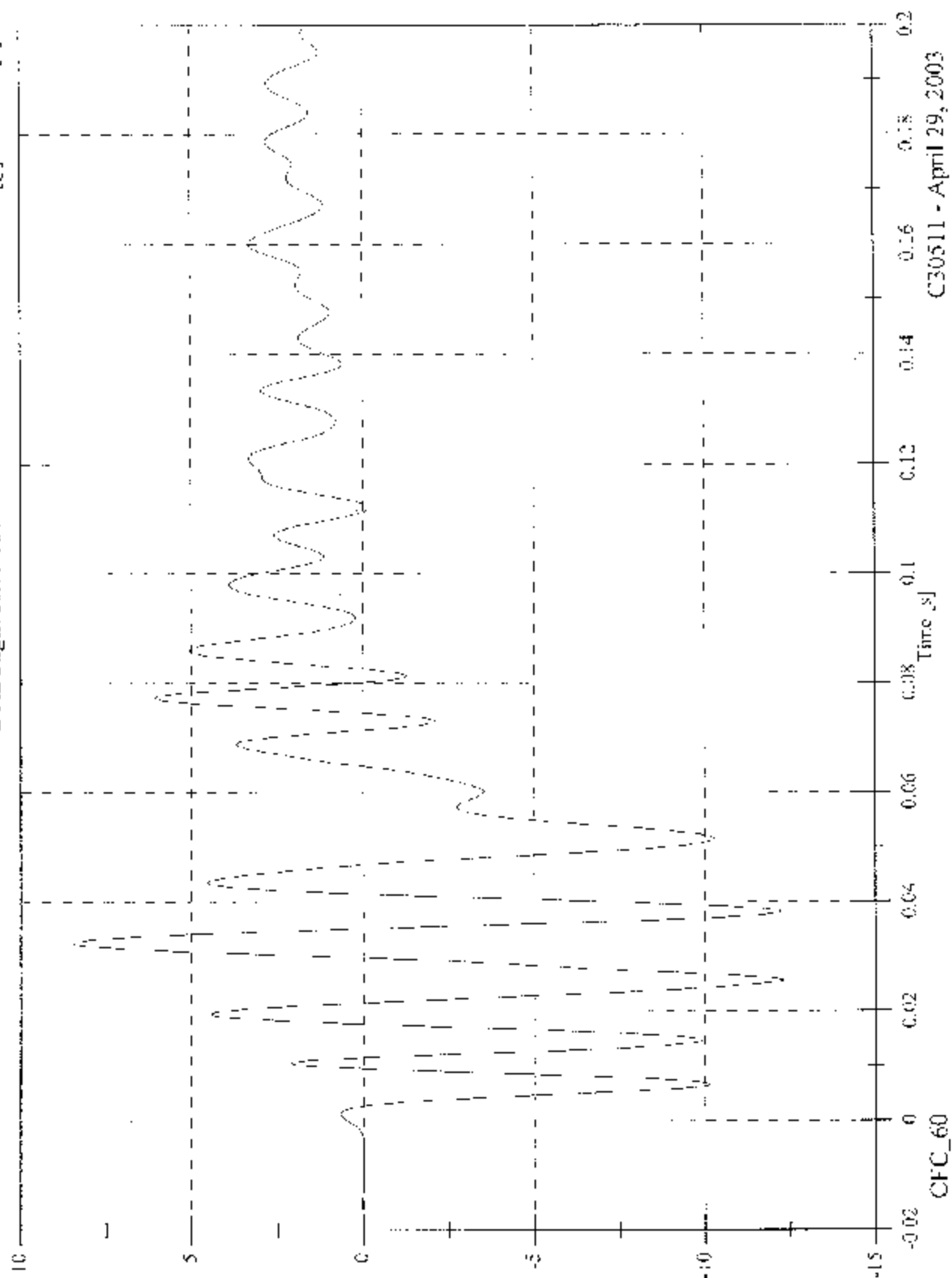
CFC\_180

C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 8.5 [g] at 0.032 [s]  
Min: -2.3 [g] at 0.026 [s]

V2 A2 Right Rear Sull z



C30511 - April 29, 2003

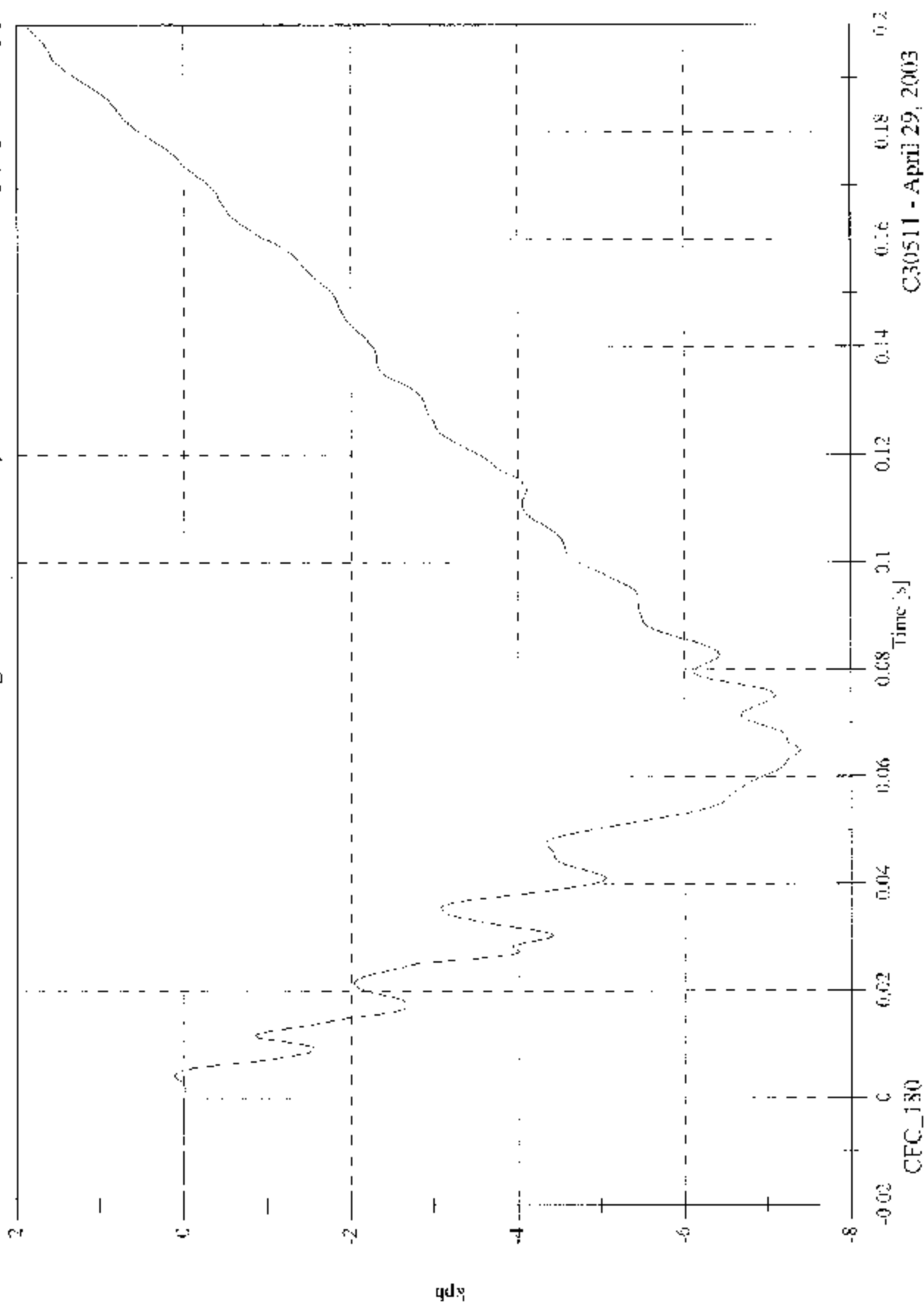


FMVSS 214D Indicant - 2003 Kia Sorento

Max: 1.9 [kph] at 0.200 [s]

Y2 A2 Right Rear Sill z Velocity

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



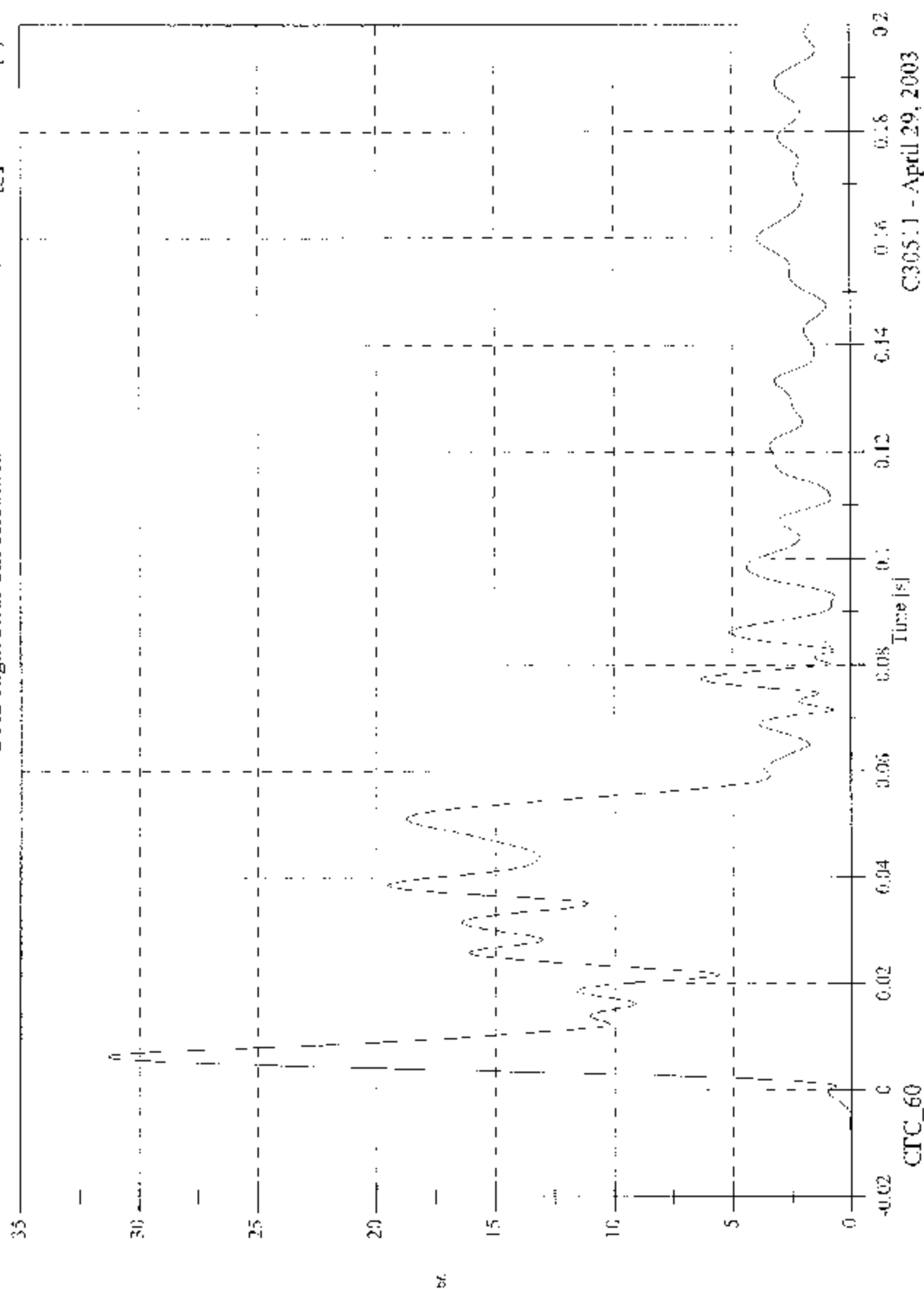
C30511 - April 29, 2003

CFC\_180

# FMVSS 214D Indicant - 2003 Kia Sorento

Max: 31.3 [g] at 0.006 [s]  
Min: 0.0 [g] at -0.013 [s]

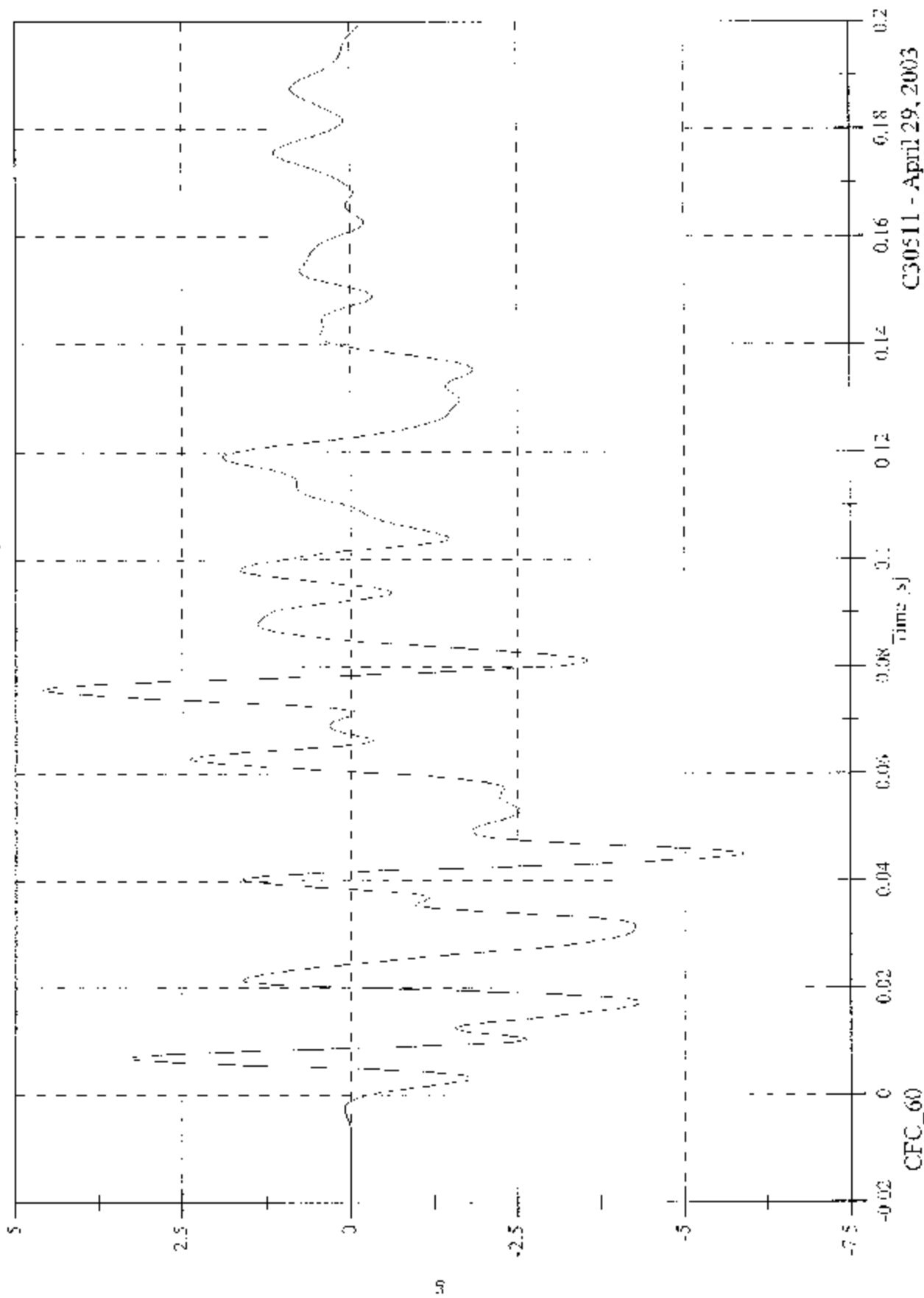
V2 A2 Right Rear Sill Resultant



FMVSS 214D Inducant - 2003 Kia Sorento

V2 A3 Rear Floorpan x

Max: 4.6 [g] at 0.076 [s]  
Min: -5.9 [g] at 0.045 [s]

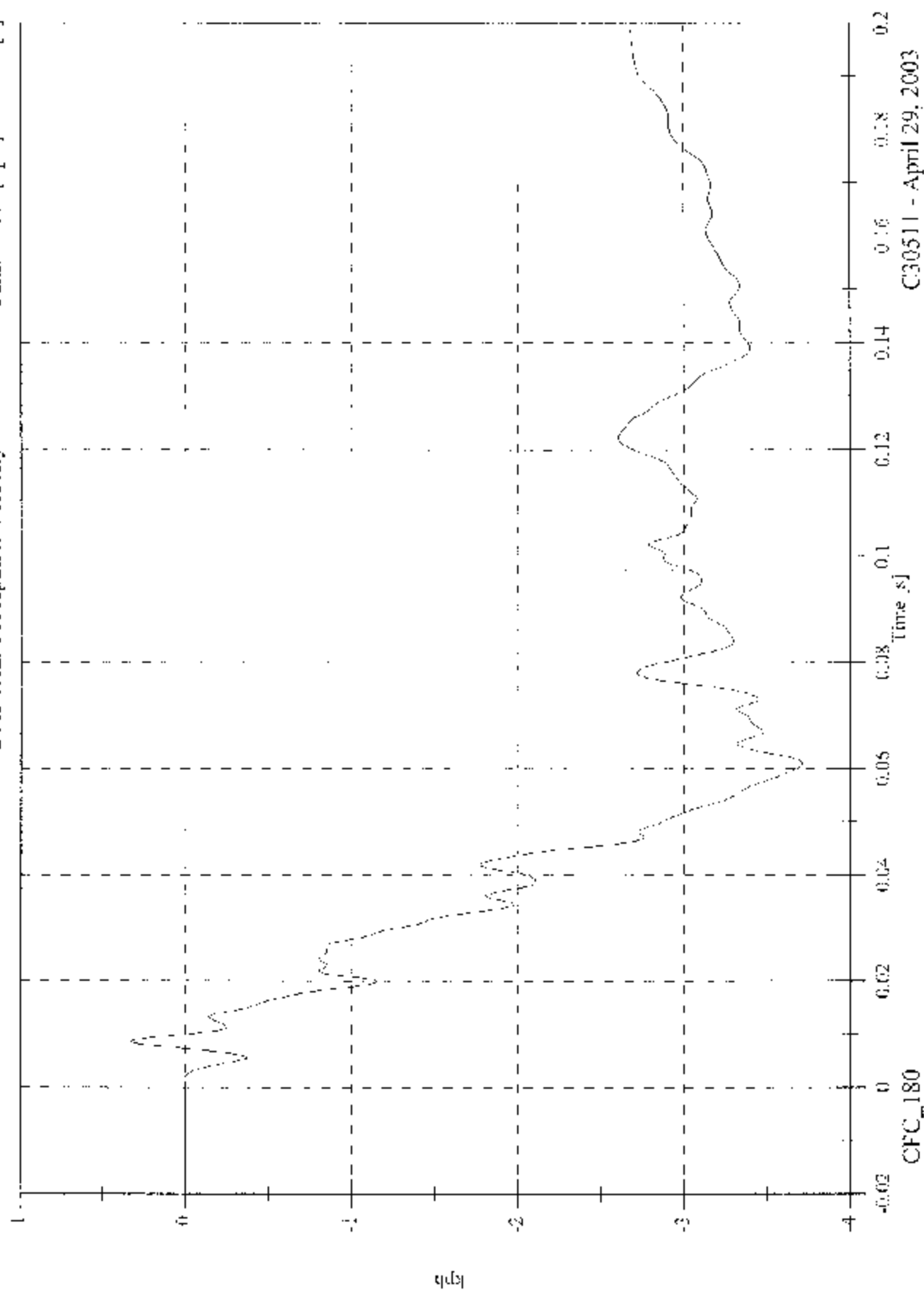


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 0.3 [kph] at 0.009 [s]  
Min: -3.7 [kph] at 0.061 [s]

V2 A3 Rear Floorpan x Velocity

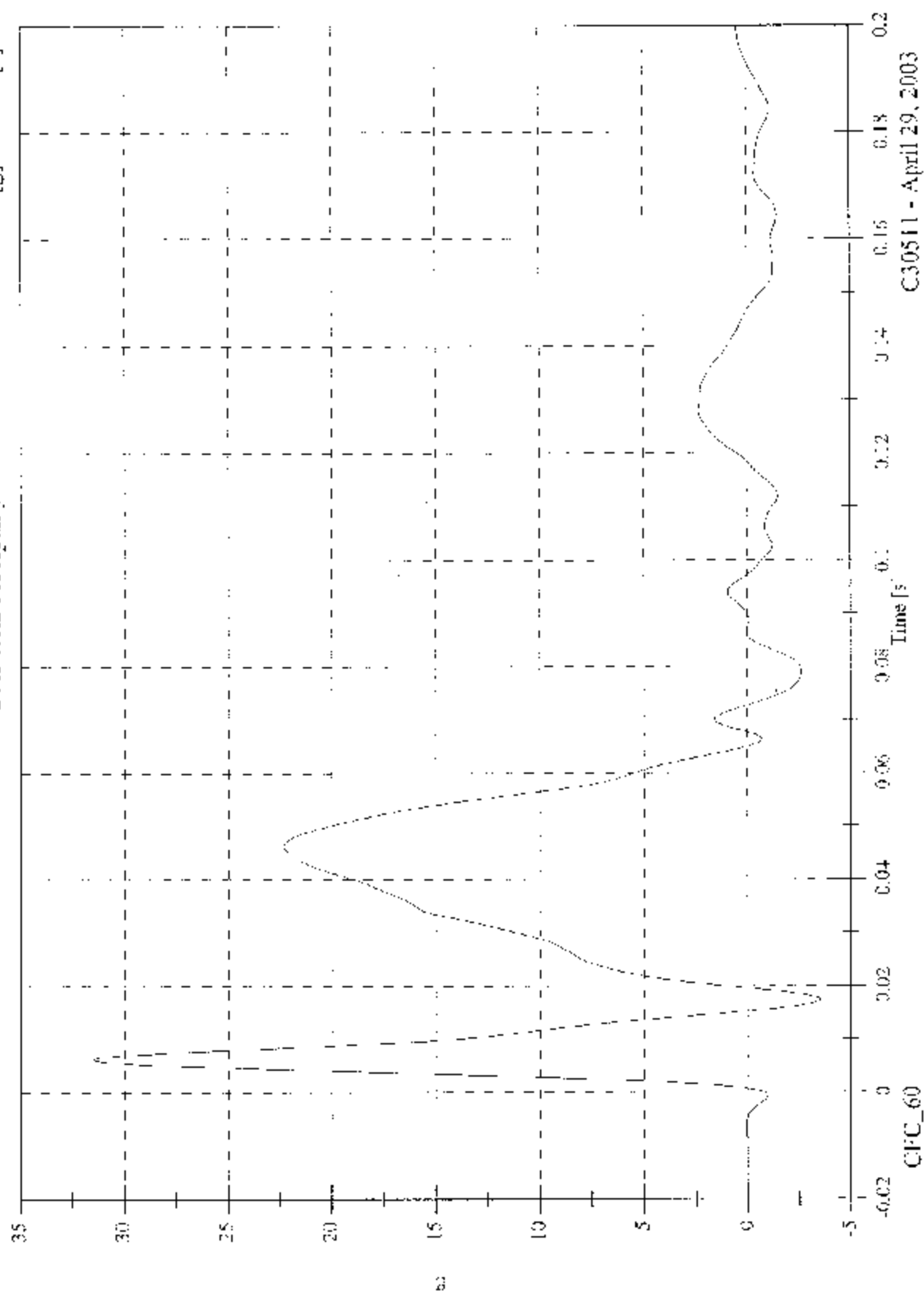


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 31.5 [g] at 0.006 [s]  
Min: -3.5 [g] at 0.017 [s]

V2 A3 Rear Floorpan y

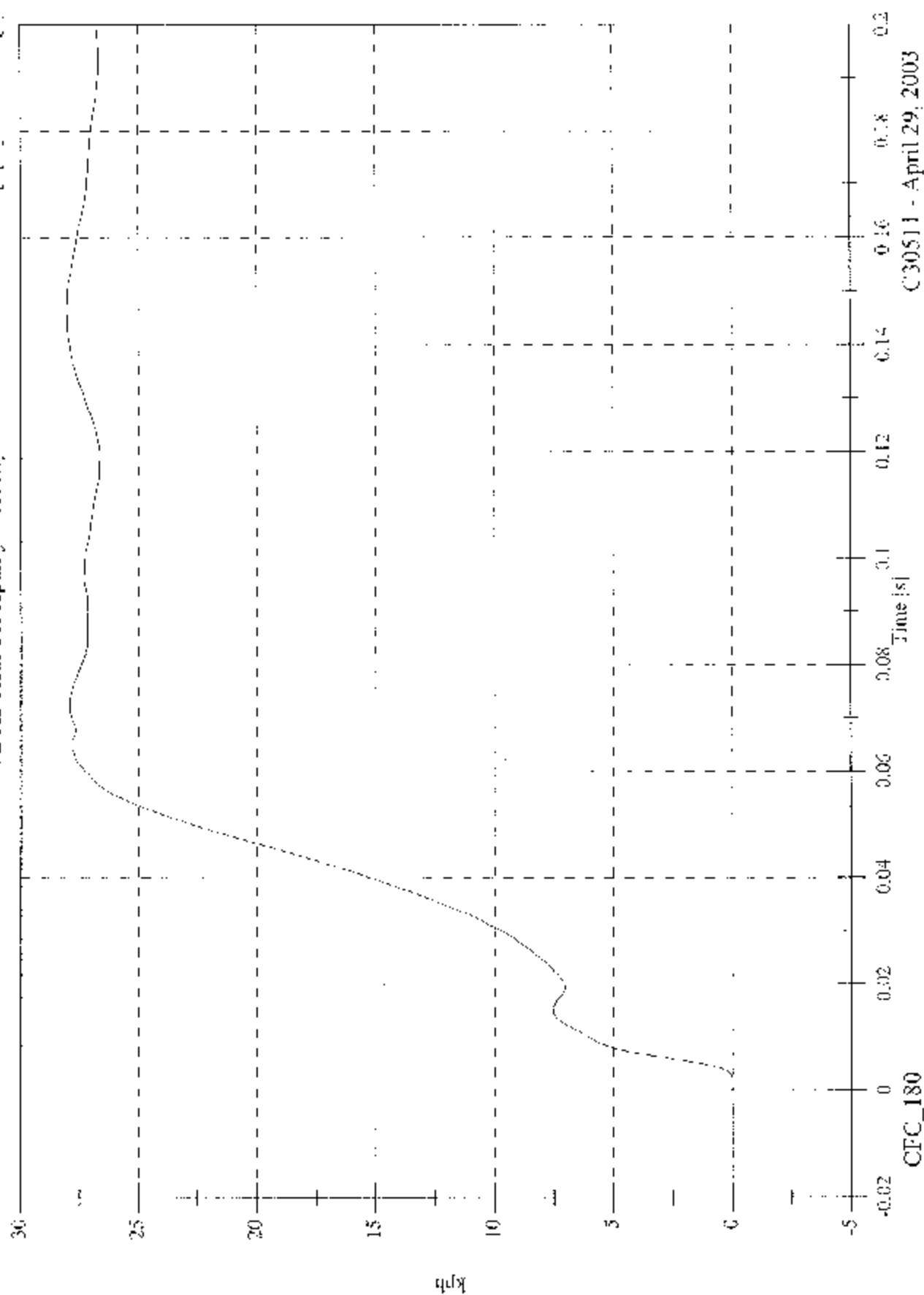


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 28.0 [kph] at 0.147 [s]  
Min: -0.0 [kph] at -0.020 [s]

V2 A3 Rear Floorpan y Velocity



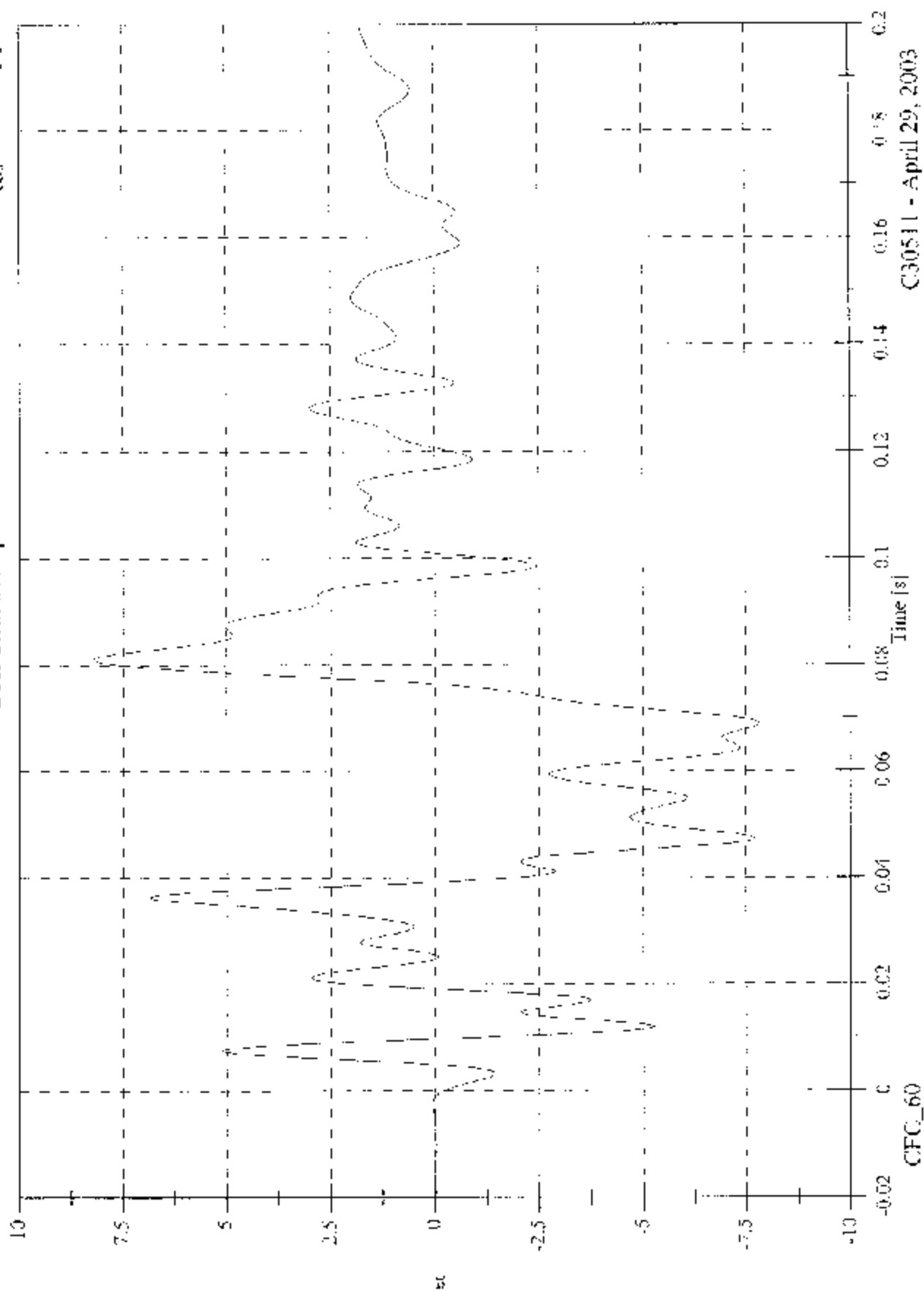
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2 A3 Rear Floorpan z

Max: 8.2 [g] at 0.081 [s]

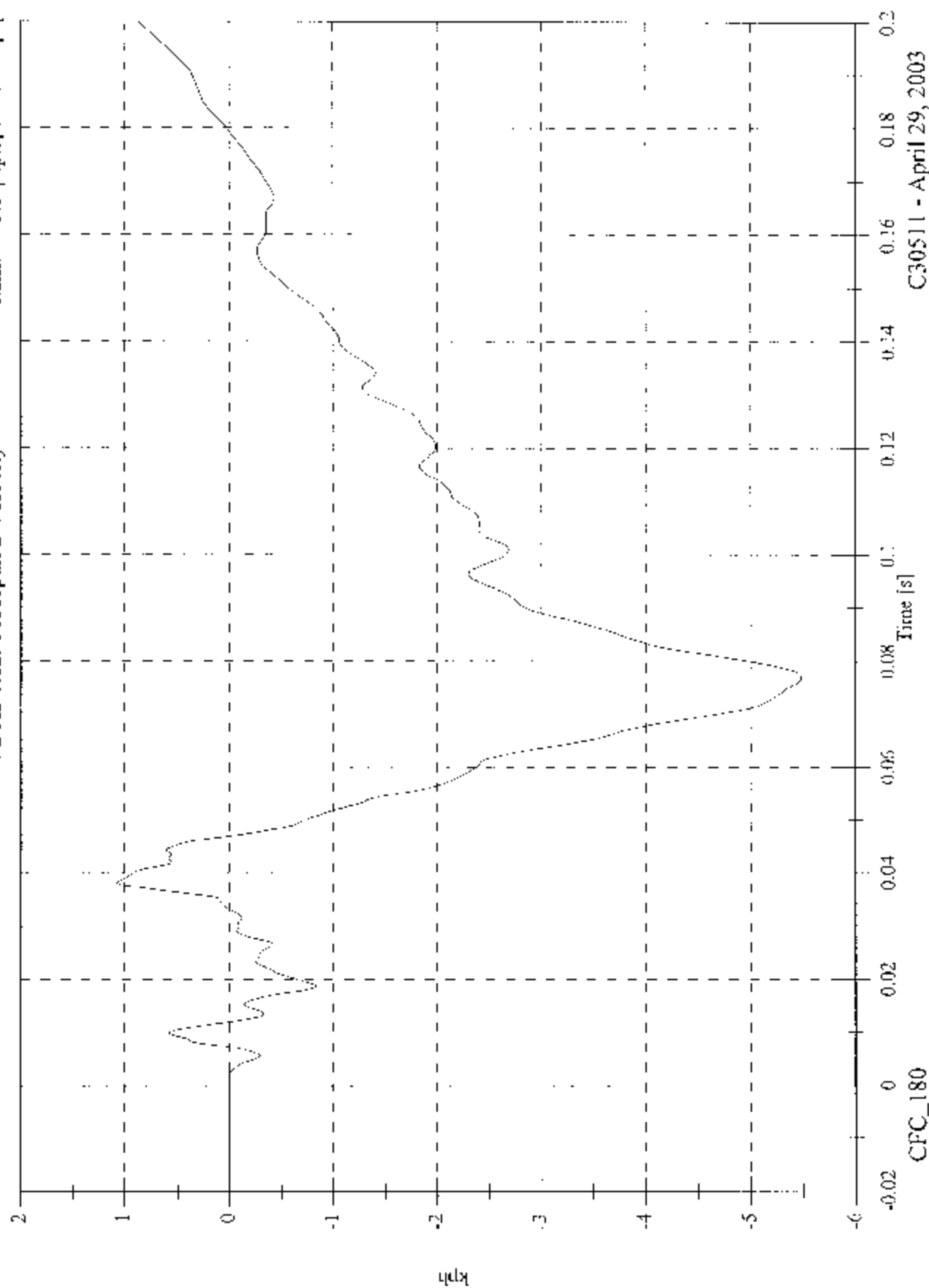
Min: -7.8 [g] at 0.069 [s]



FMVSS 214D Inducant - 2003 Kia Sorento

Max: 1.1 [kph] at 0.038 [s]  
Min: -5.5 [kph] at 0.077 [s]

V2 A3 Rear Floorpan z Velocity



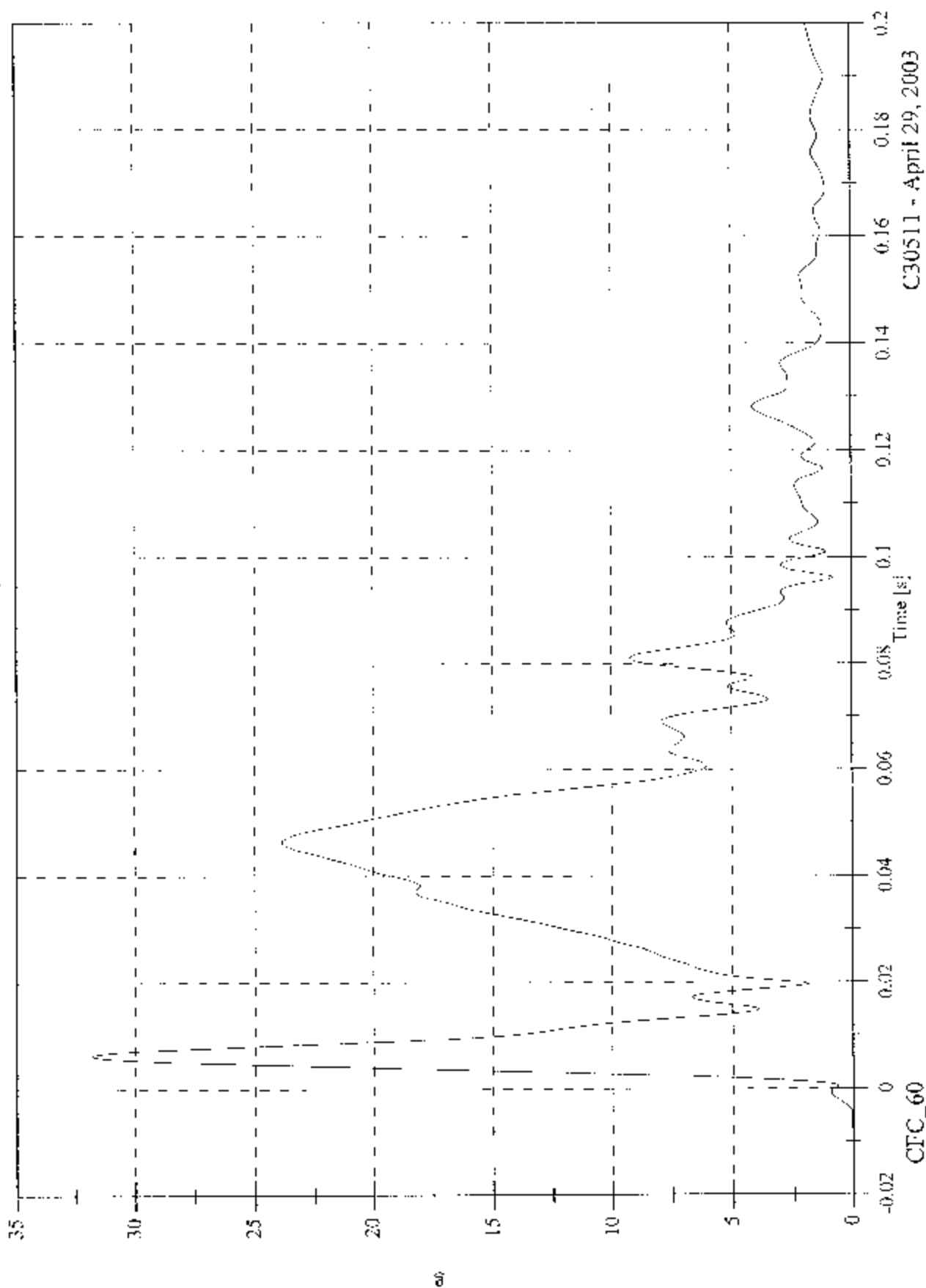
C30511 - April 29, 2003



FMVSS 214D Indicant - 2003 Kia Sorento

Max: 31.8 [g] at 0.006 [s]  
Min: 0.0 [g] at -0.016 [s]

V2 A3 Rear Floorpan Resultant

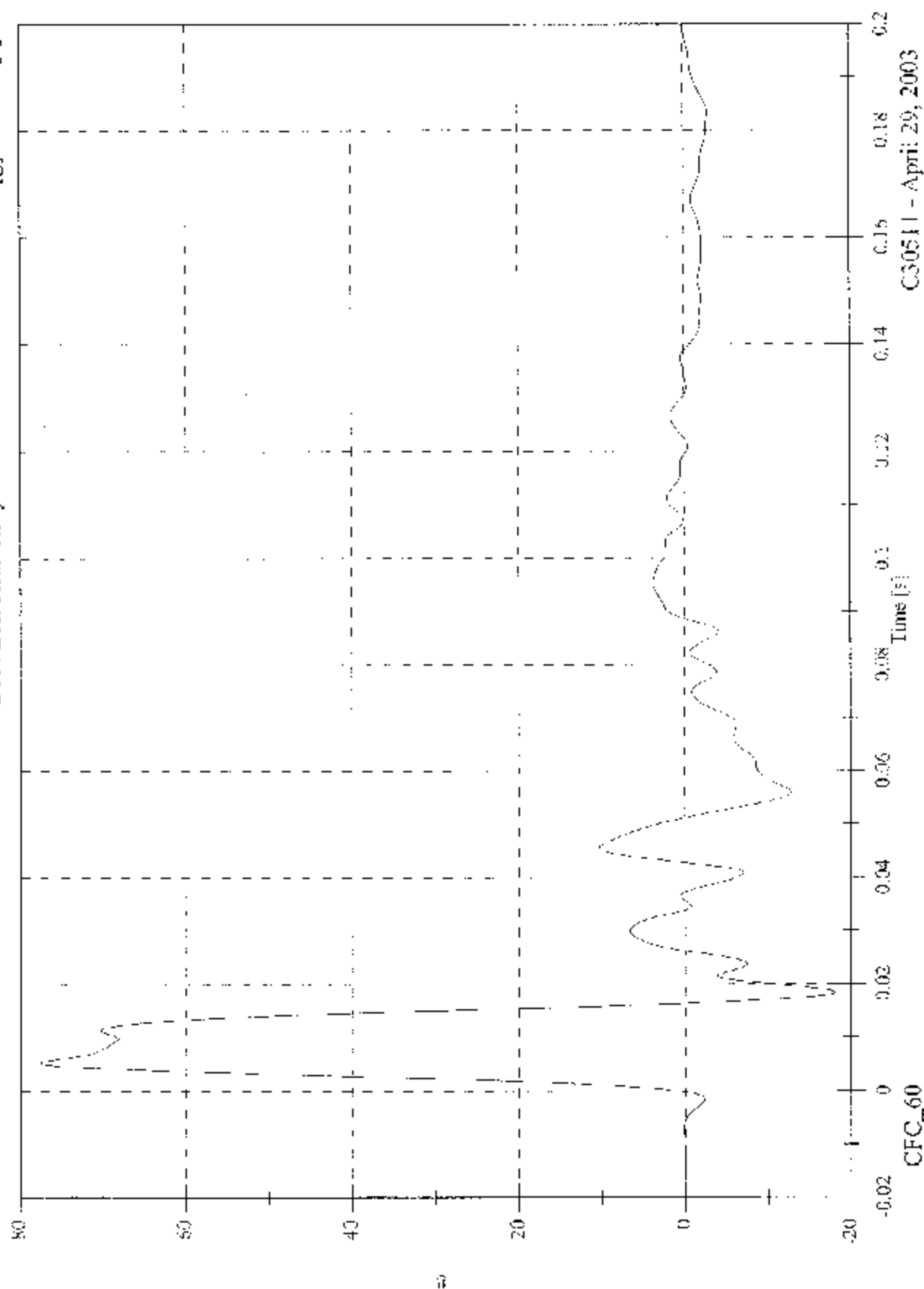


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2 A4 Left Rear Sill y

Max: 77.6 [g] at 0.003 [s]  
Min: -18.1 [g] at 0.018 [s]



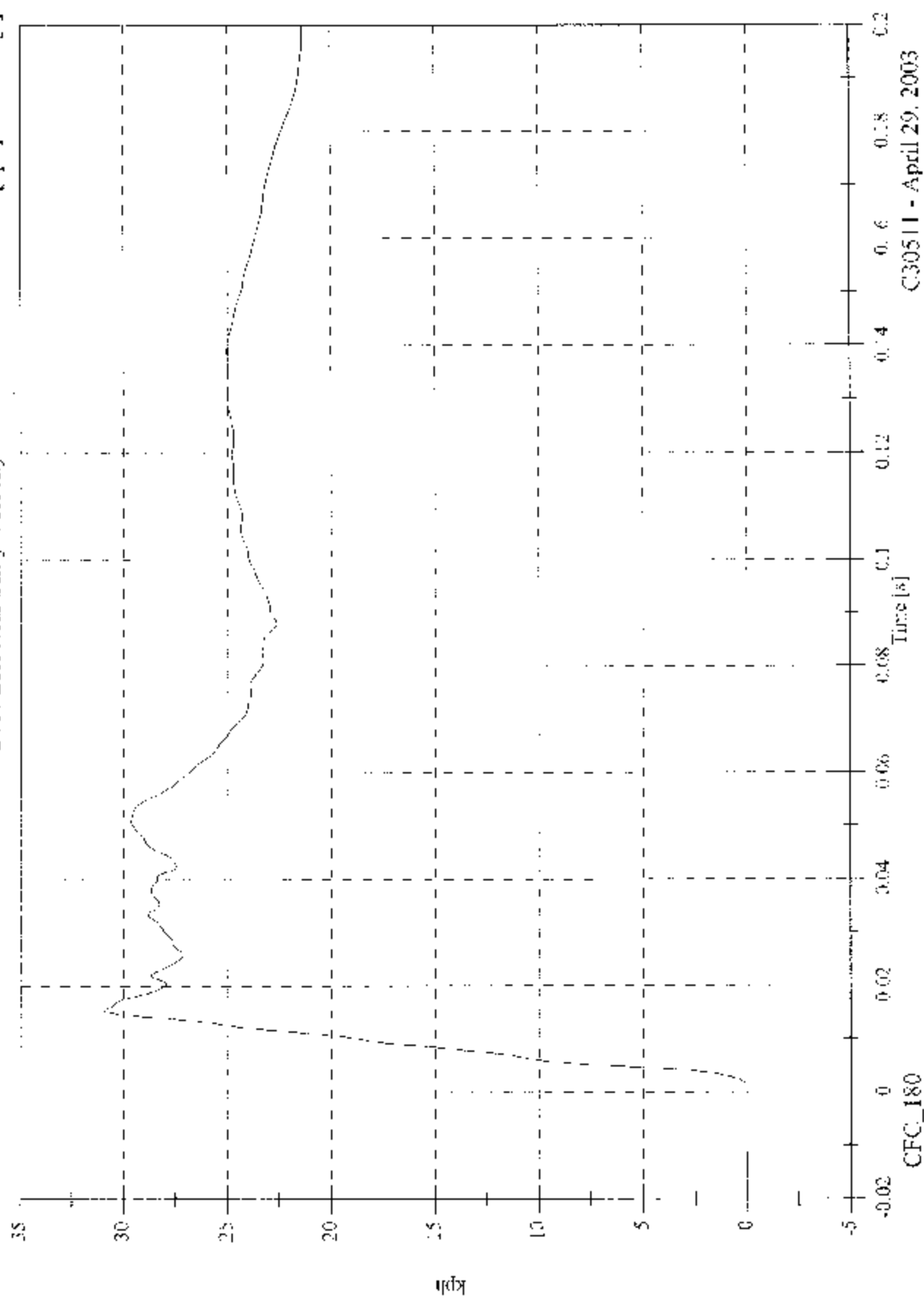
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 30.9 [kph] at 0.015 [s]

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

V2 A4 Left Rear Sill y Velocity



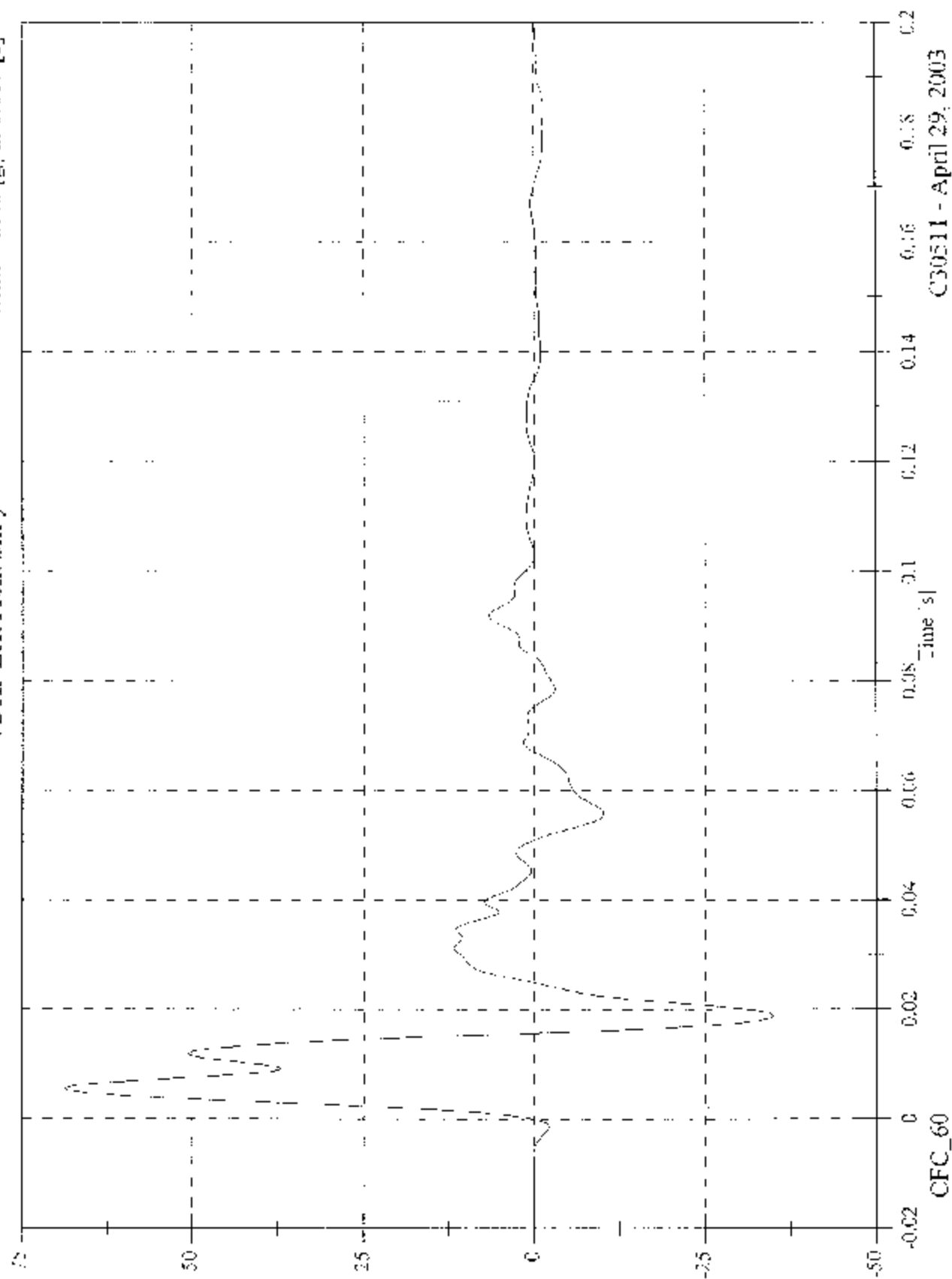
CFC\_I80

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 68.7 [g] at 0.006 [s]  
Min: -35.0 [g] at 0.019 [s]

V2\_A5 Left Front Sill y



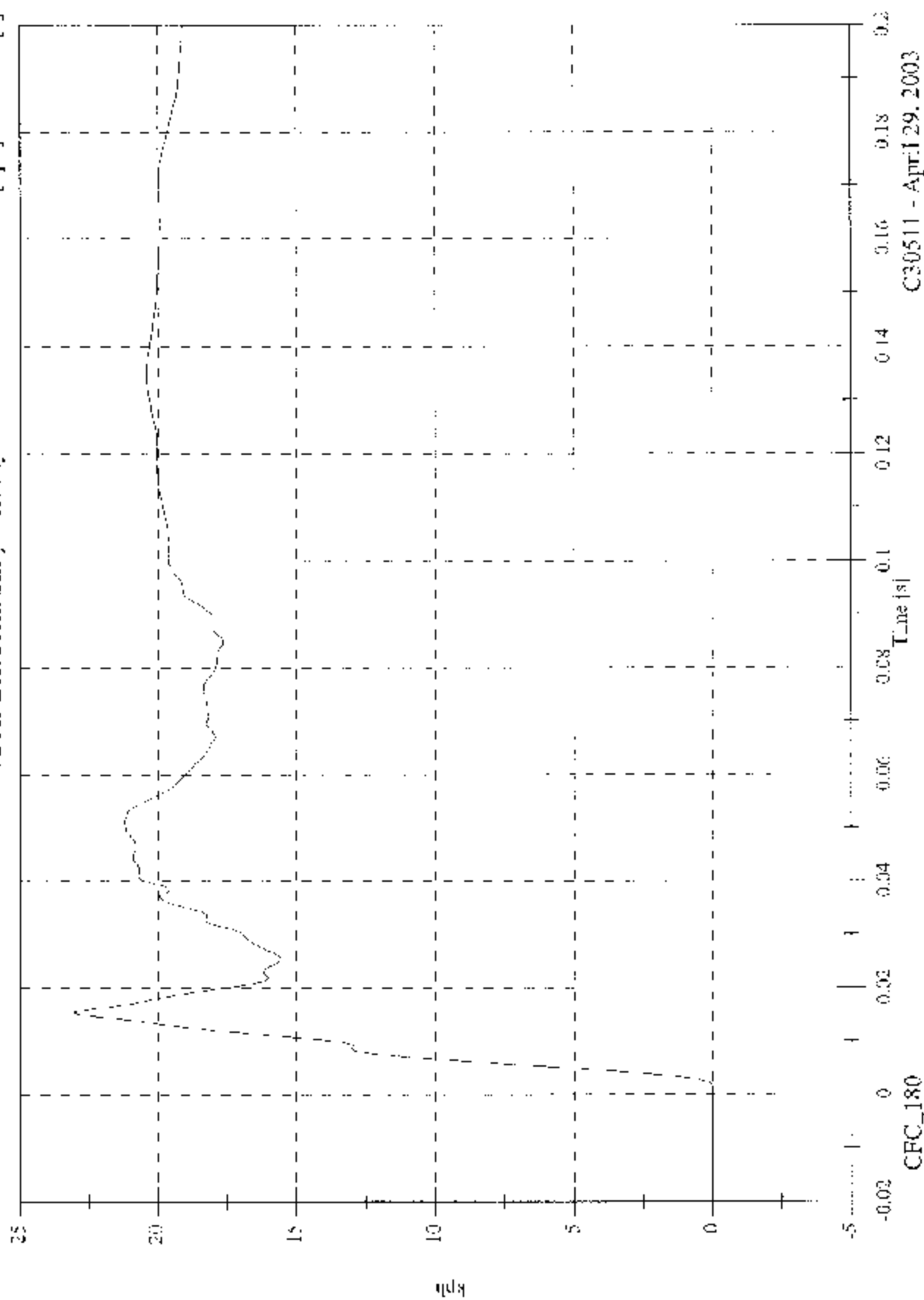
C30511 - April 29, 2003

TMVSS 214D Inducant - 2003 Kia Sorento

Max: 23.1 [kph] at 0.015 [s]

V2 A5 Left Front Sili. y Velocity

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



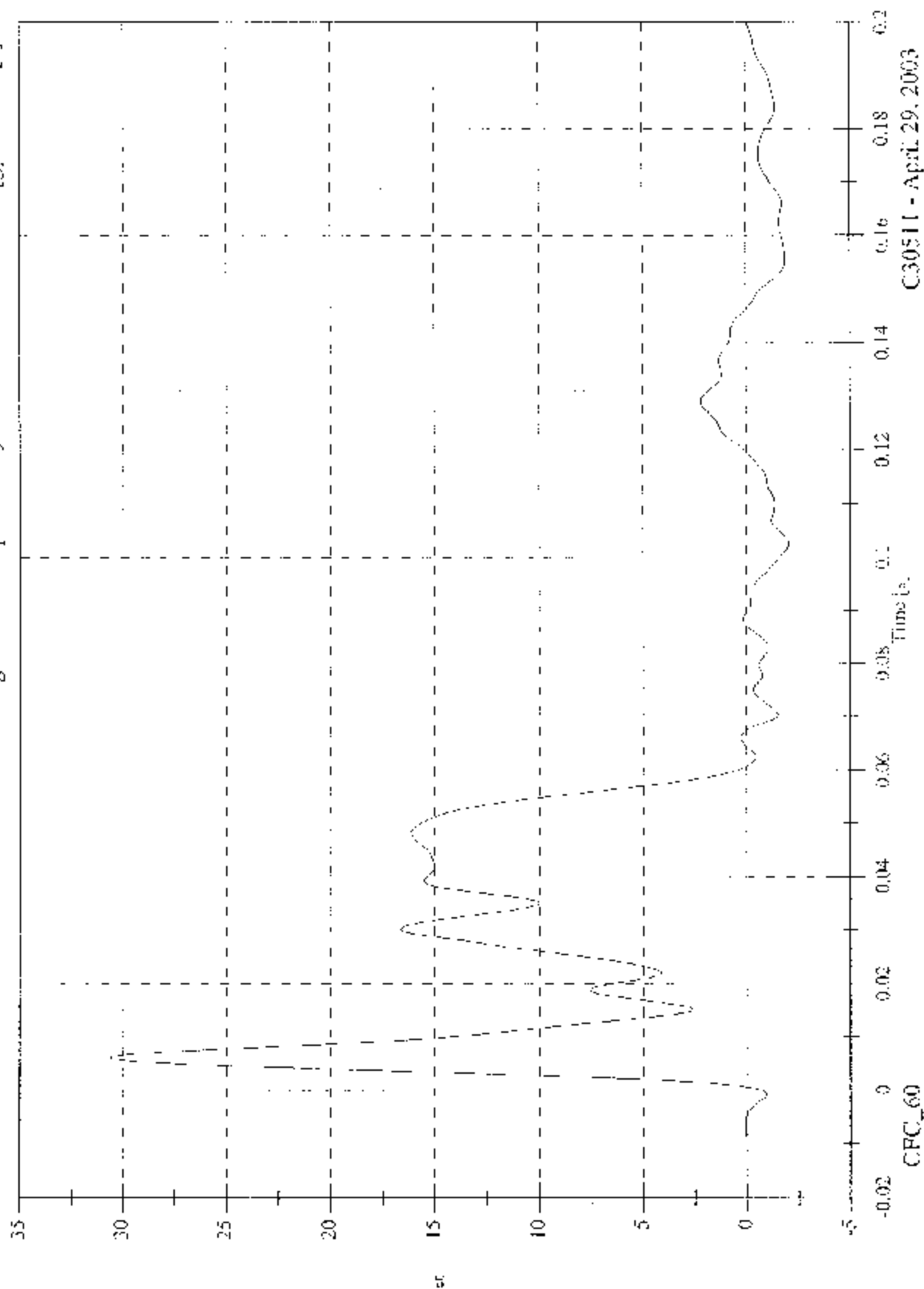
CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicate - 2003 Kia Sorento

Max: 30.6 [g] at 0.006 [s]  
Min: -2.0 [g] at 0.103 [s]

V2 A7 Right Rear Compartment y

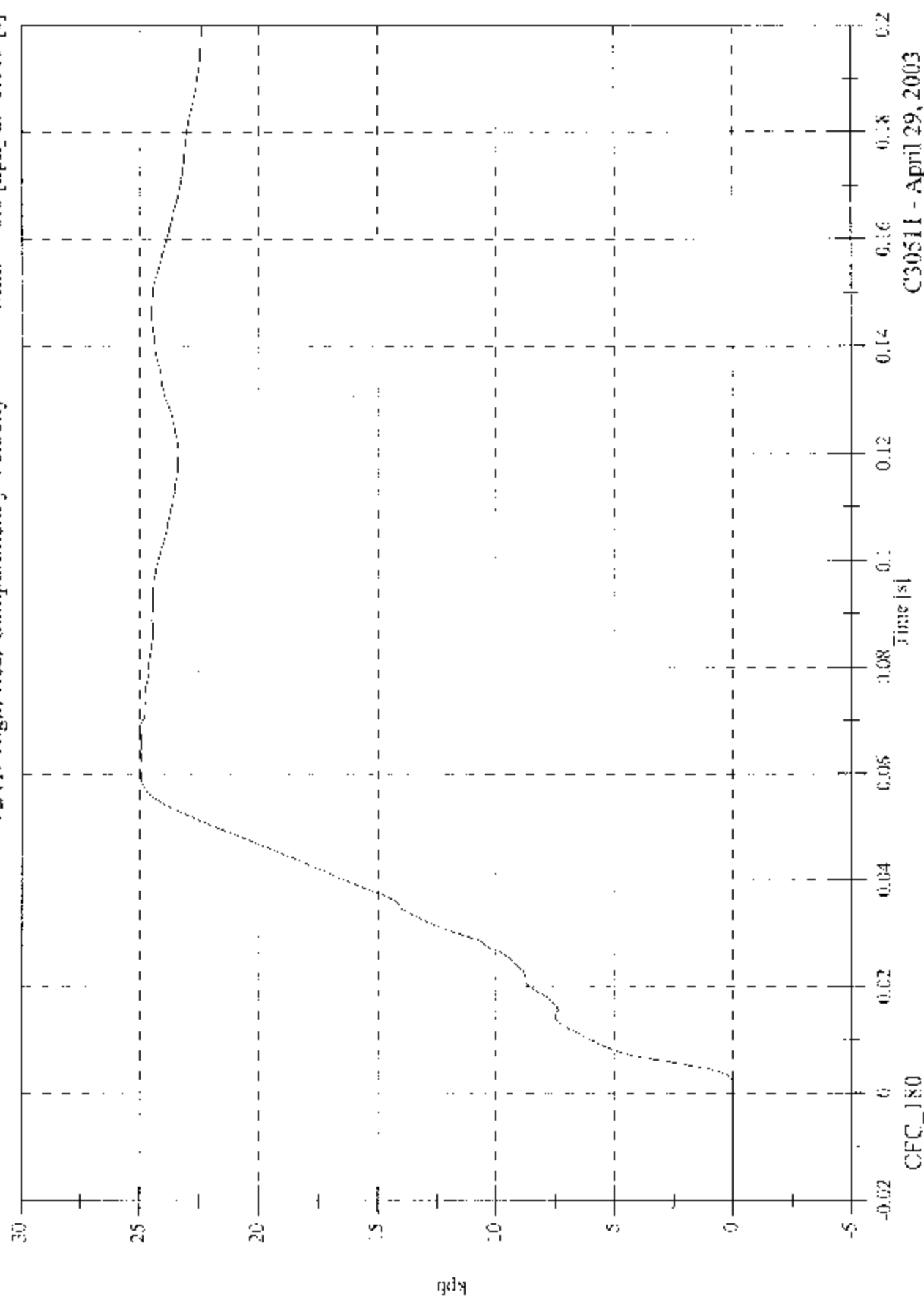


C30511 - April 29, 2003

FMVSS 214D Inducant - 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]

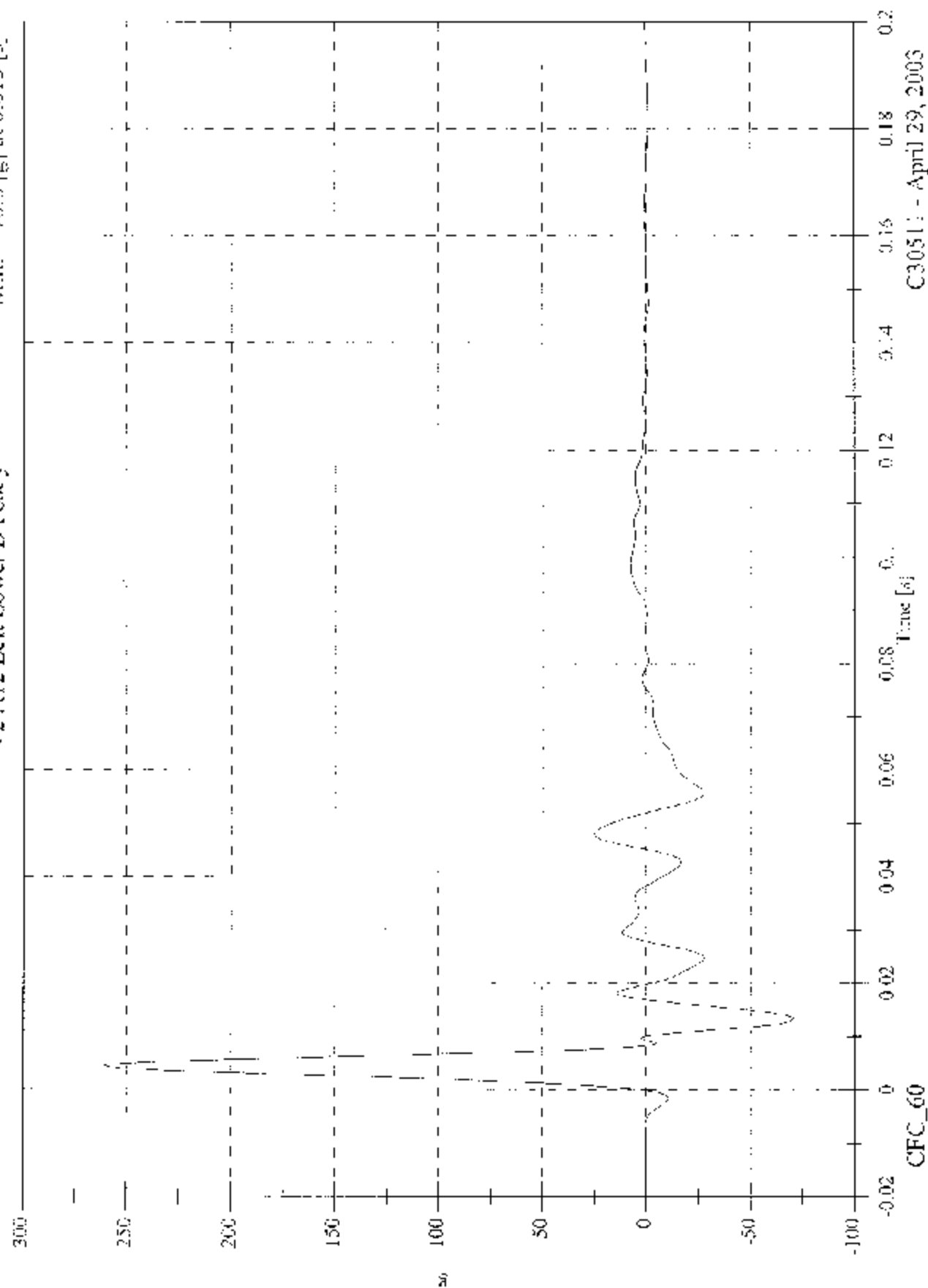


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 260.9 [g] at 0.004 [s]  
Min: -70.8 [g] at 0.013 [s]

V2 A12 Left Lower B Post y

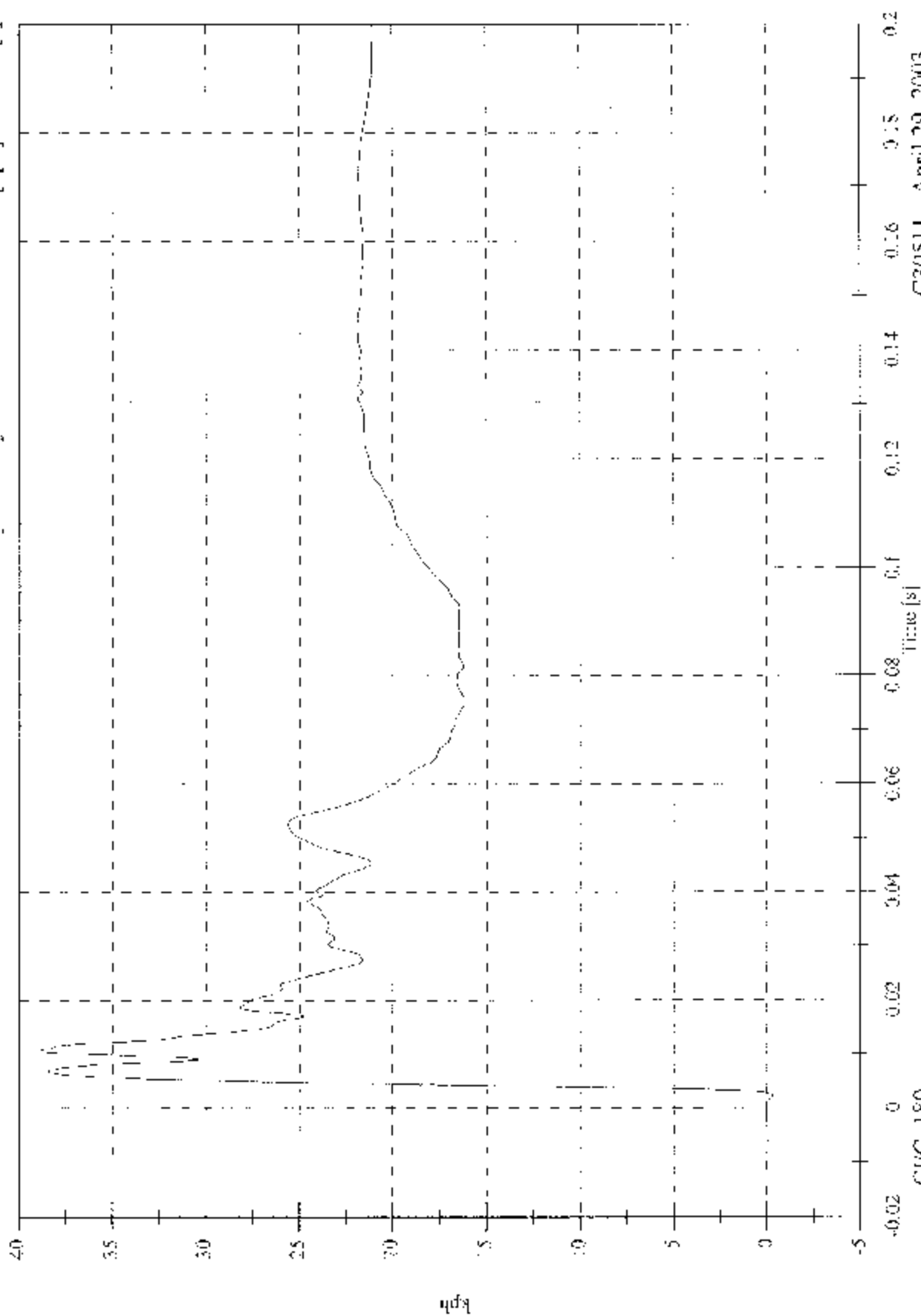




FMVSS 214D Inducant - 2003 Kia Sorento

Max: 39.0 [kph] at 0.011 [s]  
Min: -0.3 [kph] at 0.002 [s]

V2 A12 Left Lower B Post y Velocity



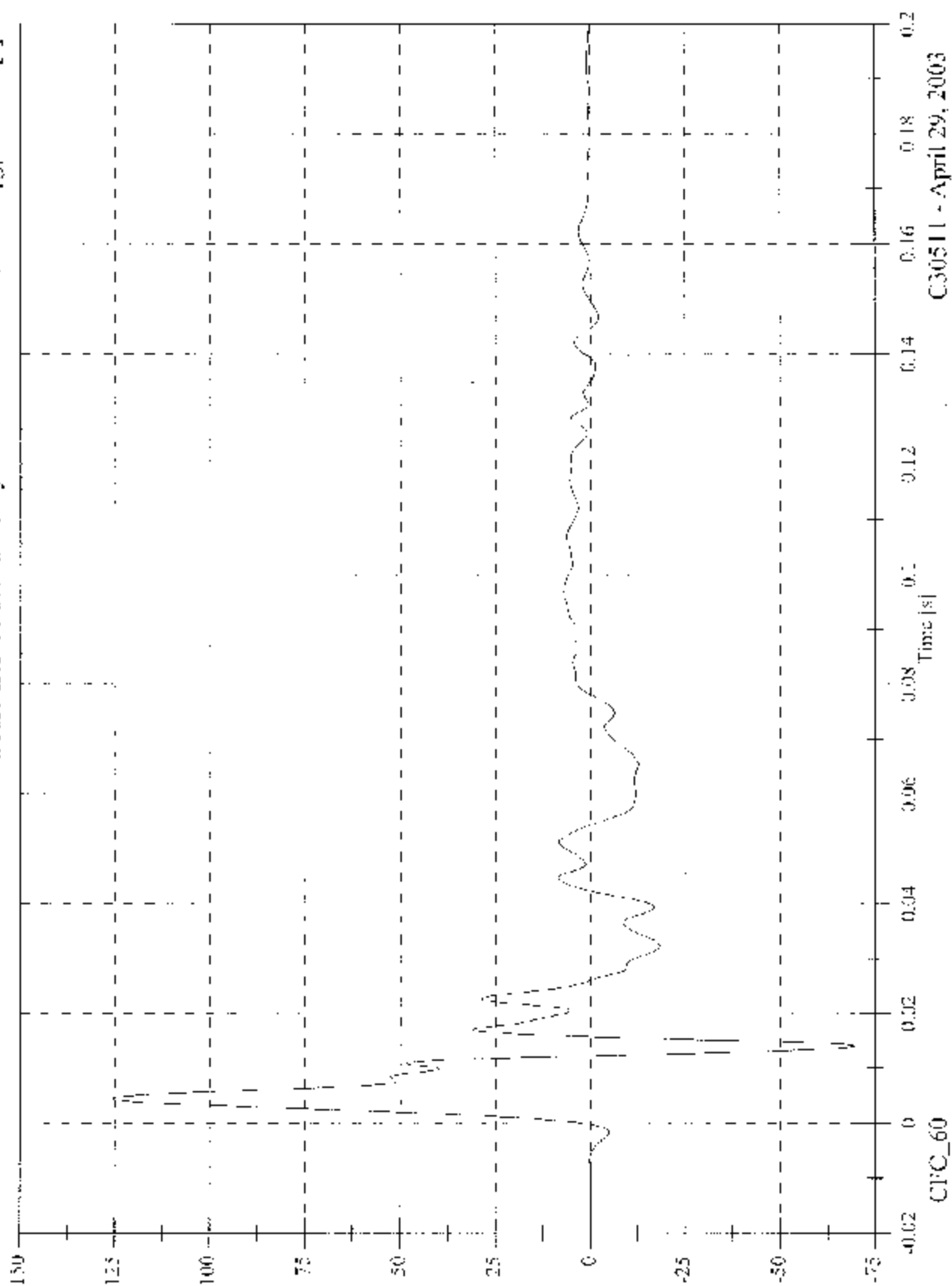
CPC\_180

C30511 - April 29, 2003

# 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]



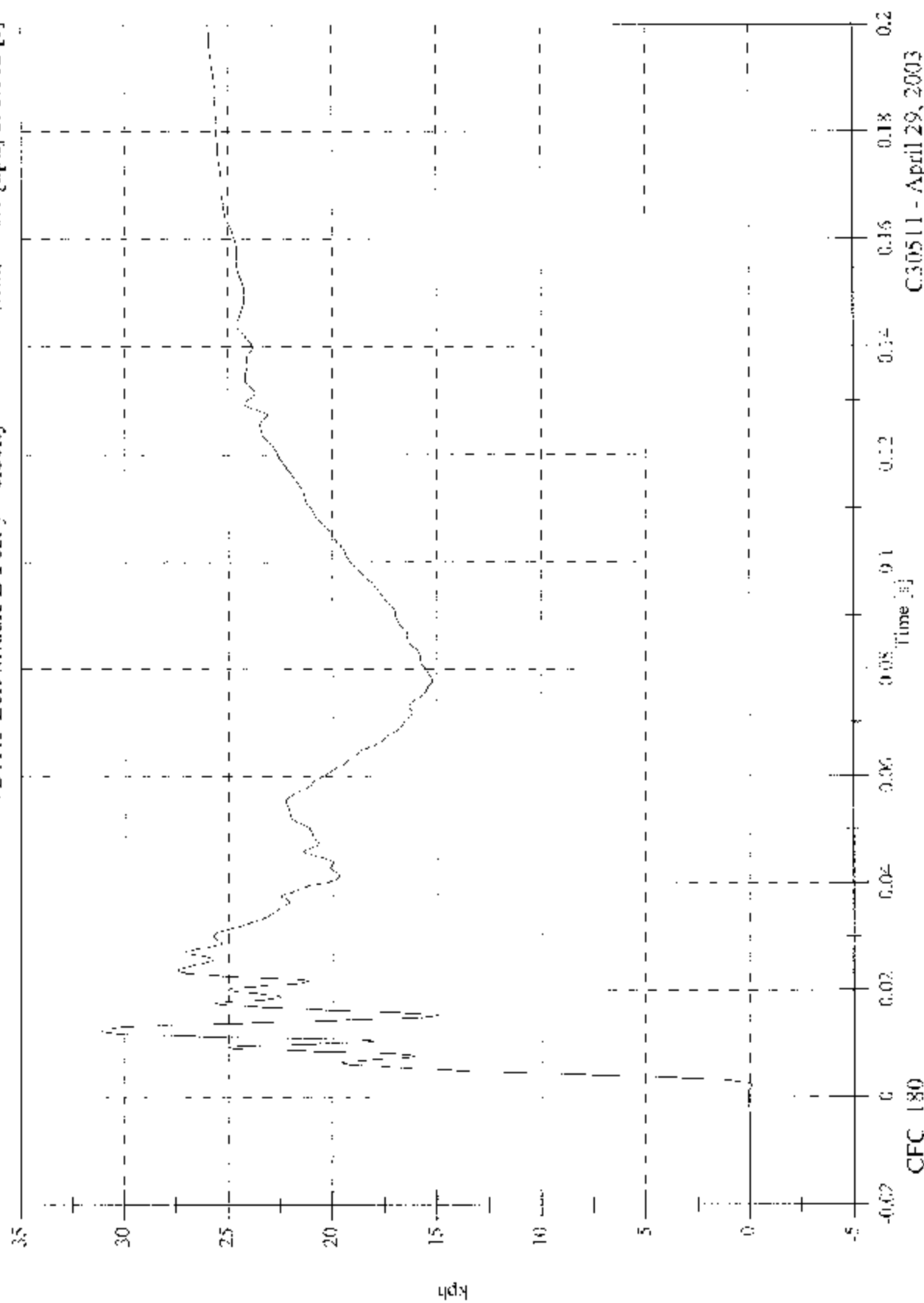
CPC\_60

C30511 - April 29, 2003

FMVSS 214D Incicant - 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]



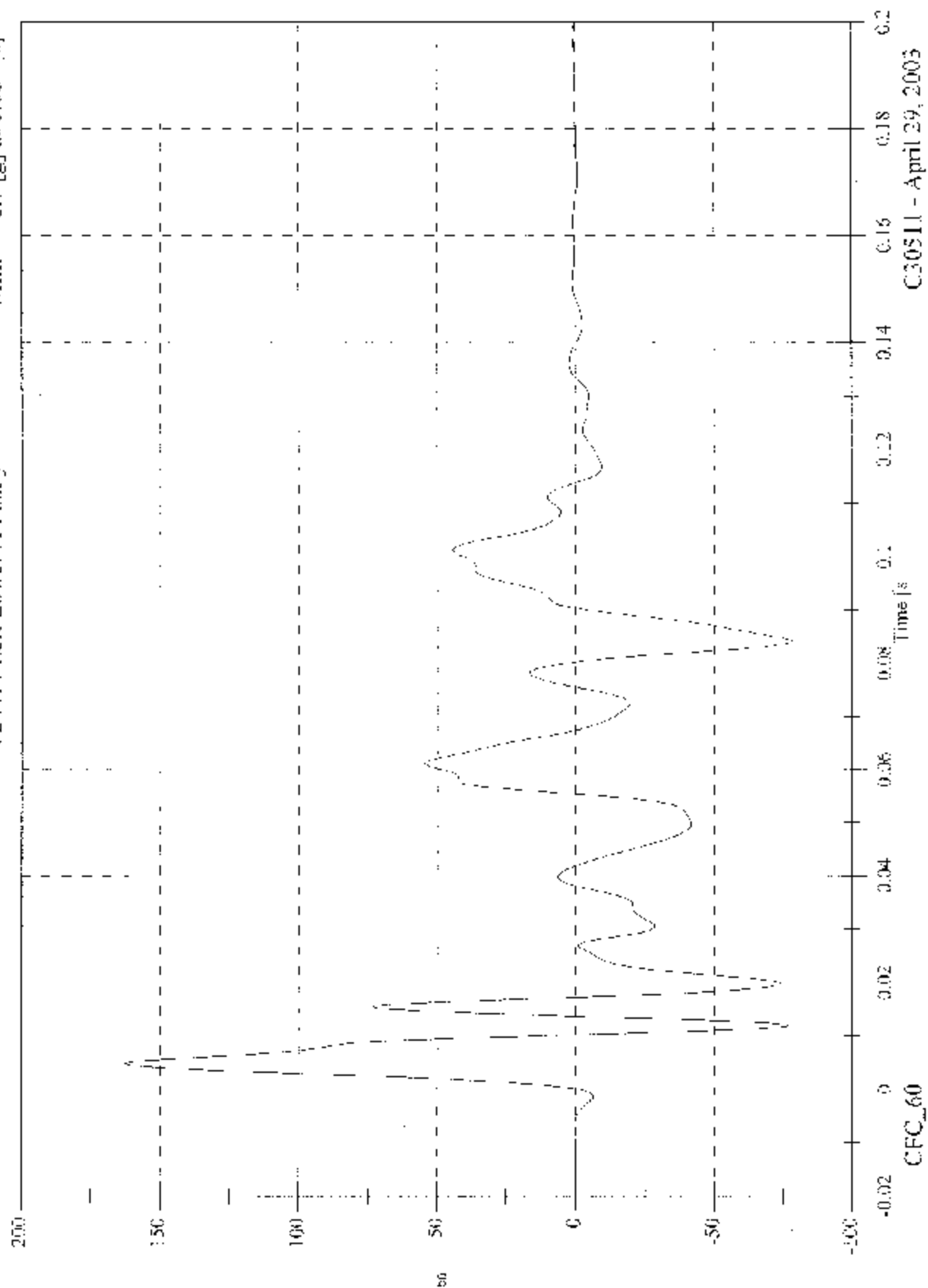
CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 162.8 [g] at 0.005 [s]  
Min: -78.7 [g] at 0.084 [s]

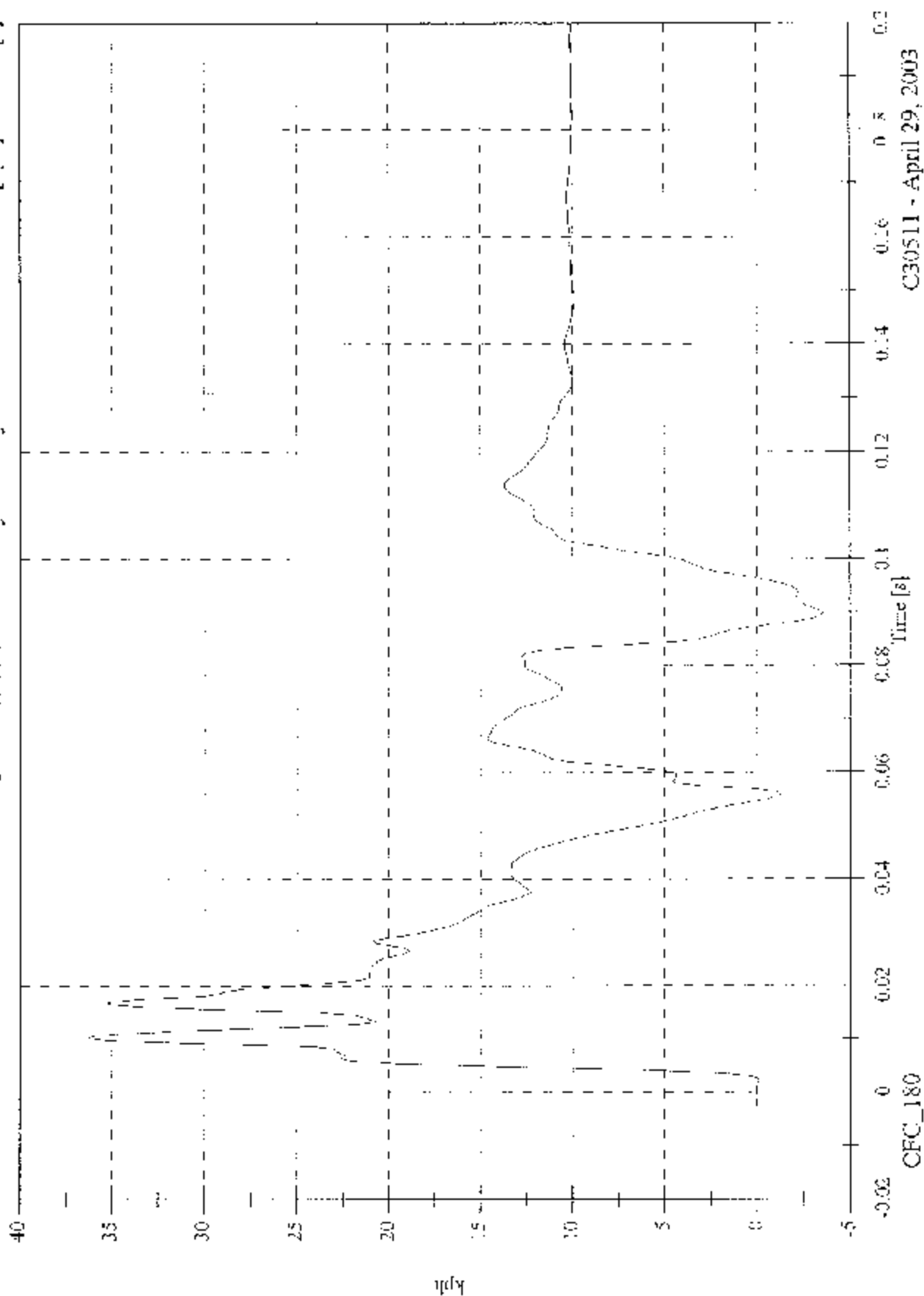
V2 A14 Left Lower A Post y



# FMVSS 214D Indicant - 2003 Kia Sorento

Max: 36.2 [kph] at 0.010 [s]  
 Min: -3.5 [kph] at 0.090 [s]

V2 A14 Left Lower A Post y Velocity



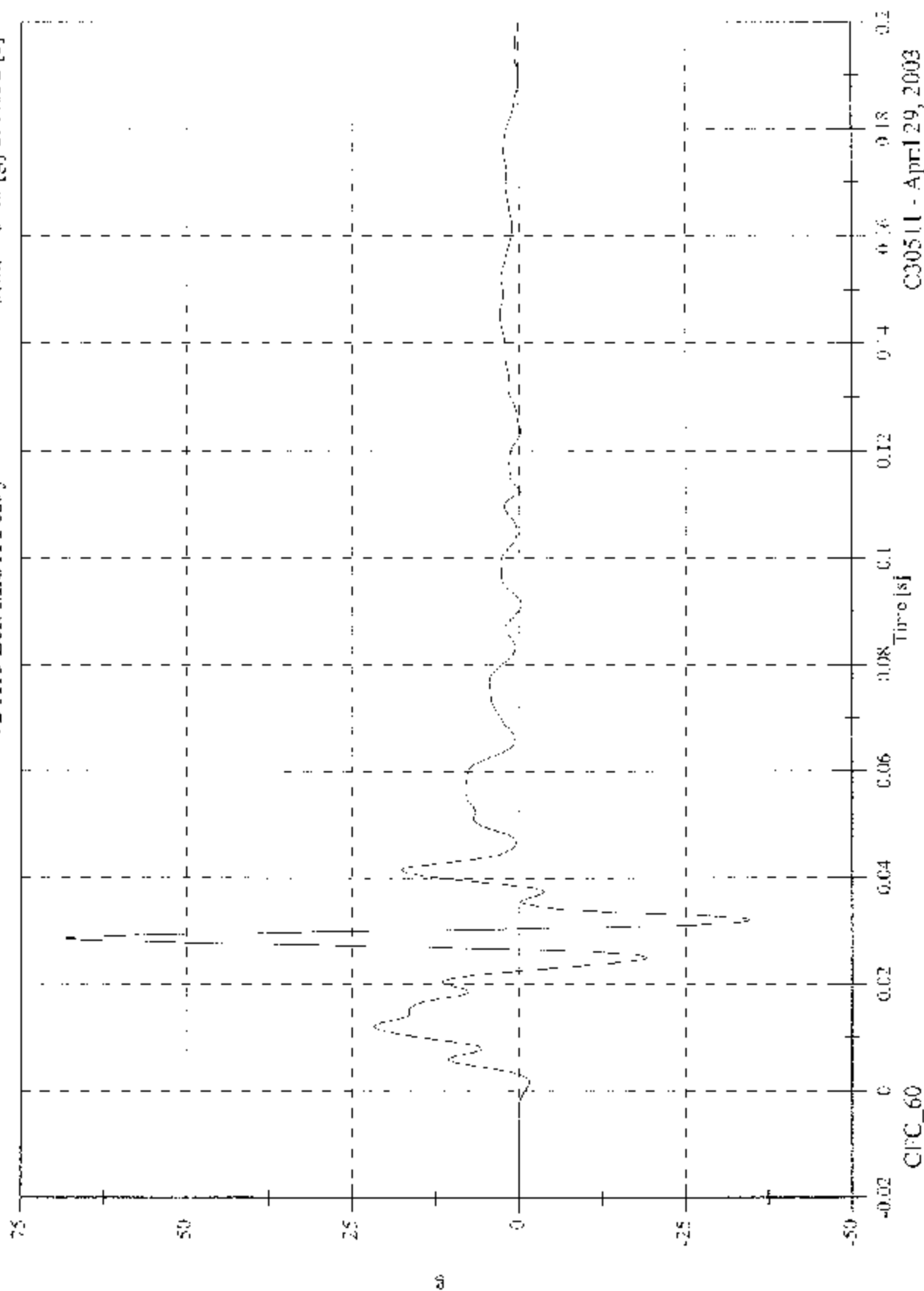
CFC\_180

C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

V2 A15 Left Mid A Post y

Max: 68.8 [g] at 0.029 [s]  
Ymin: -34.6 [g] at 0.032 [s]

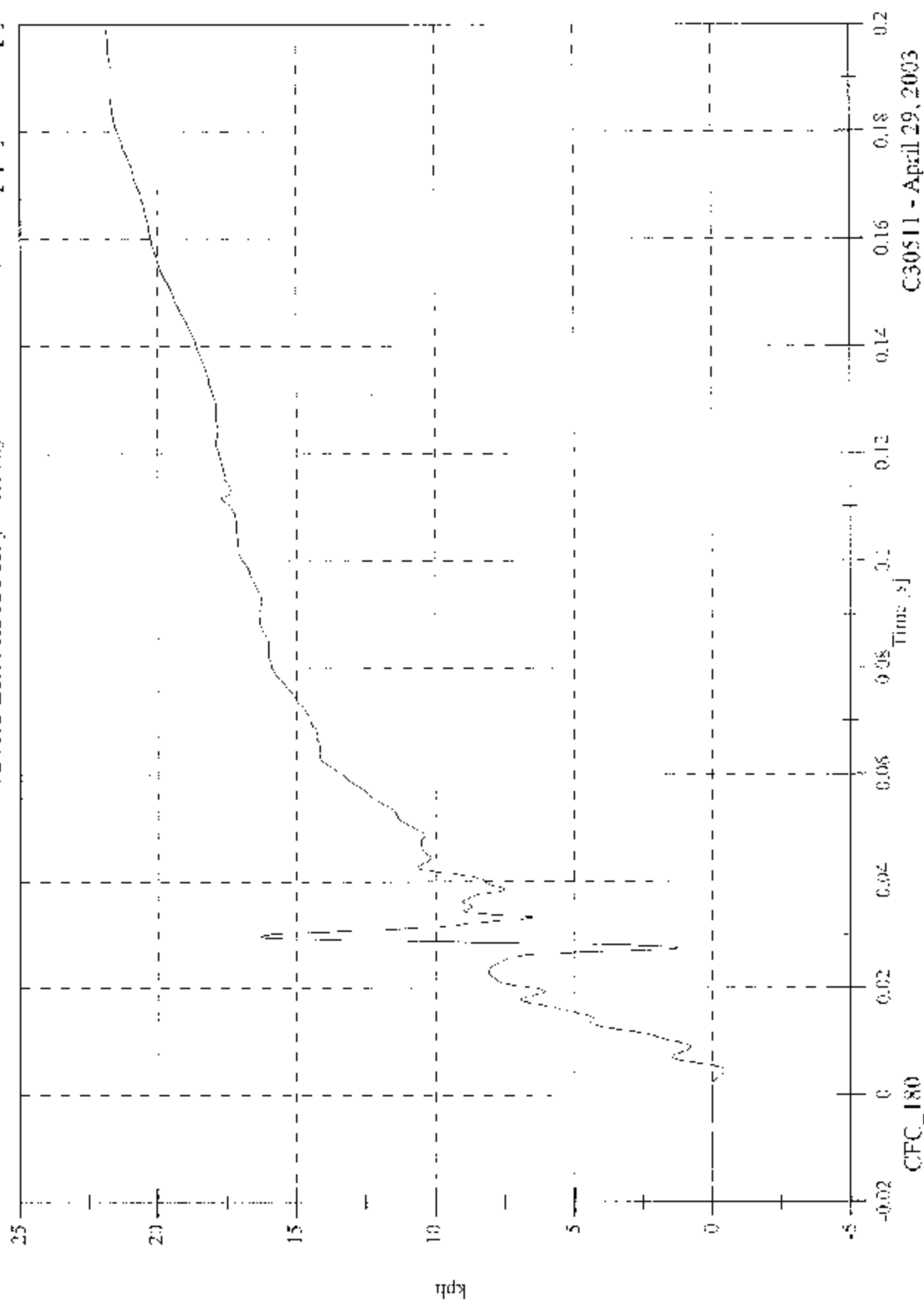


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 21.9 [kph] at 0.200 [s]  
Min: -0.4 [kph] at 0.005 [s]

V2 A15 Left Mid A Post y Velocity



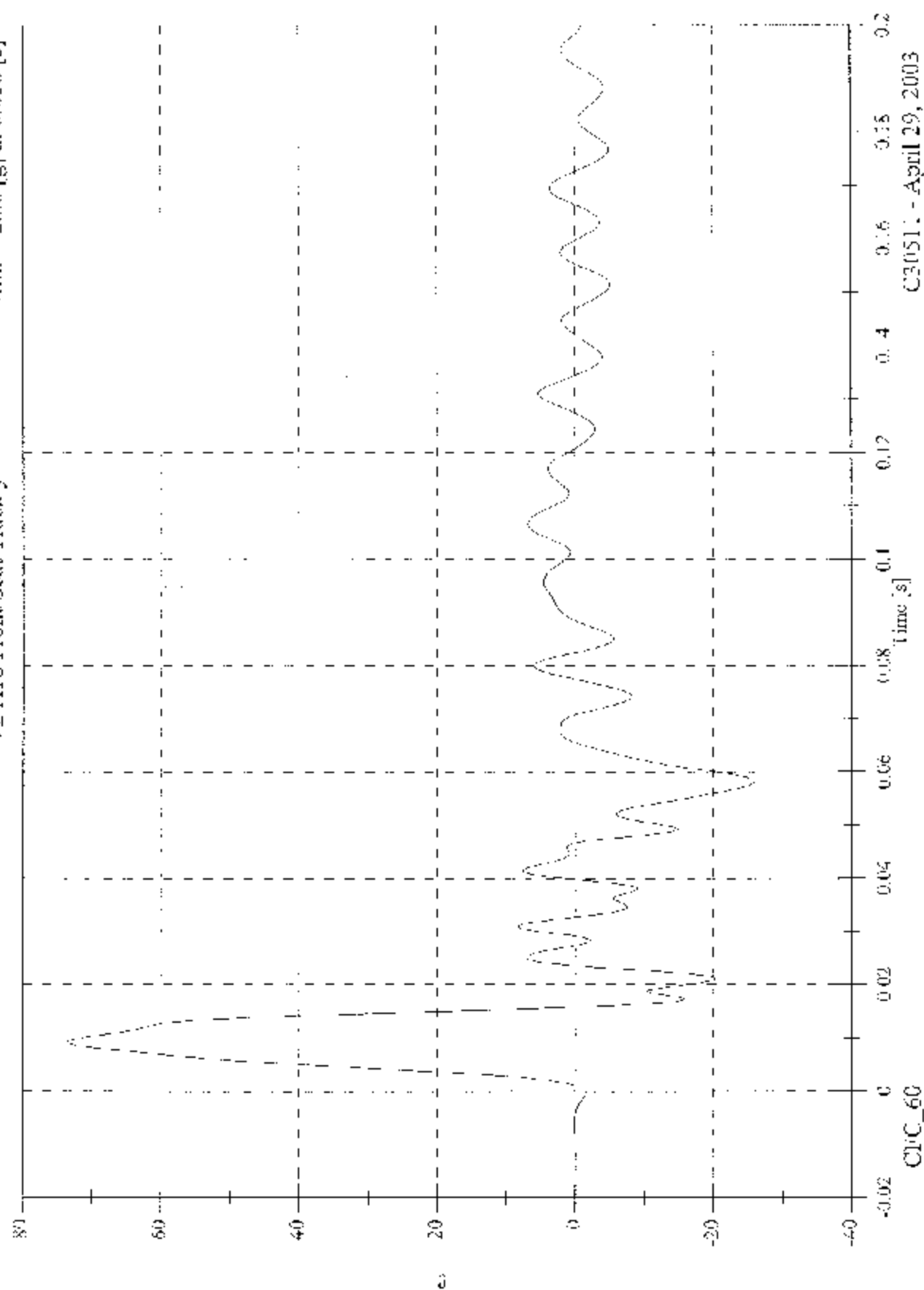
C30511 - April 29, 2003

FMVSS 214D Incitant - 2003 Kia Sorento

Max: 73.6 [g] at 0.009 [s]

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

V2 A16 Front Seat Track y

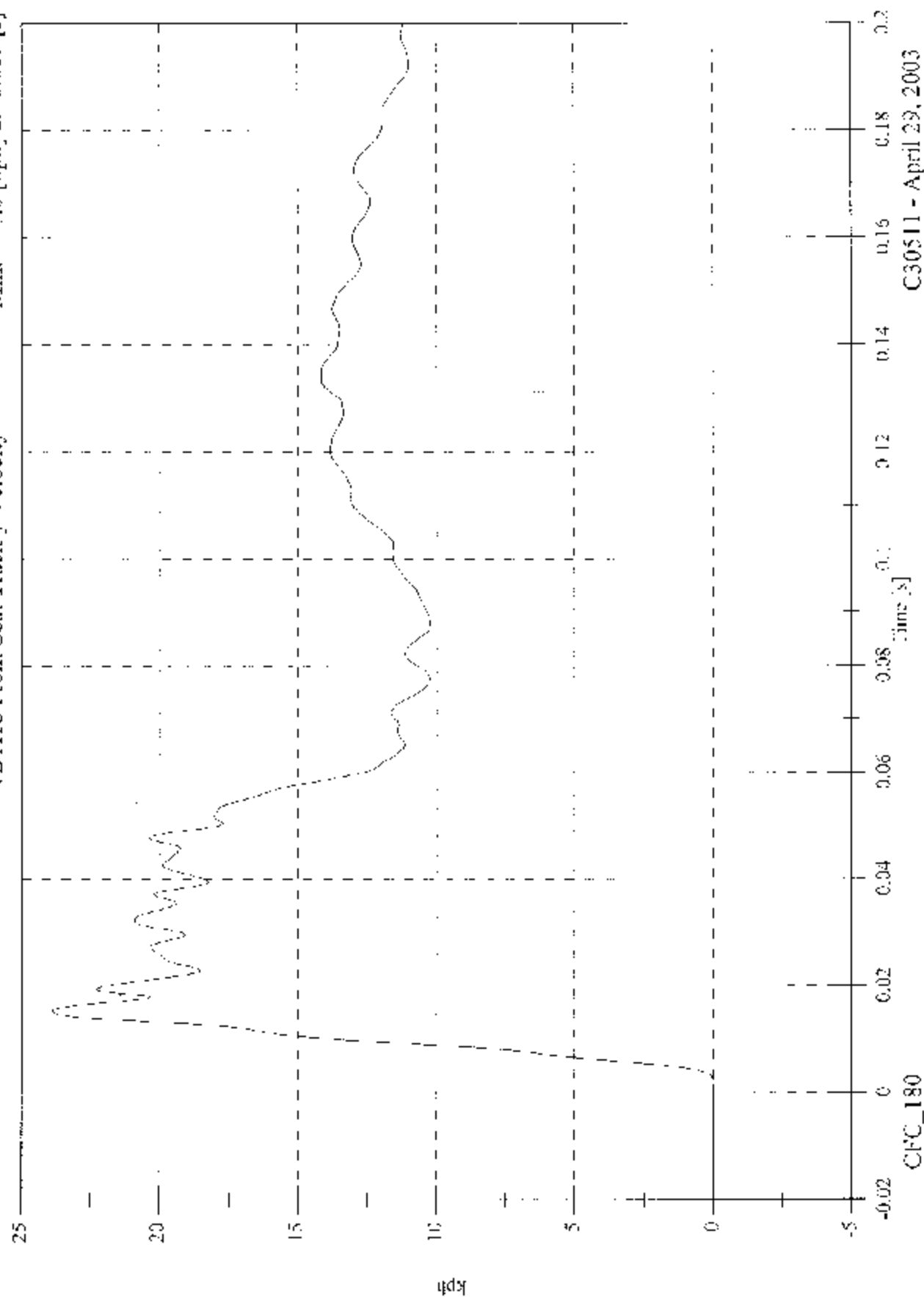




FMVSS 214D Indicant - 2003 Kia Sorento

Max: 23.9 [kph] at 0.015 [s]  
Min: -0.0 [kph] at -0.009 [s]

V2 A16 Front Seat Track y Velocity

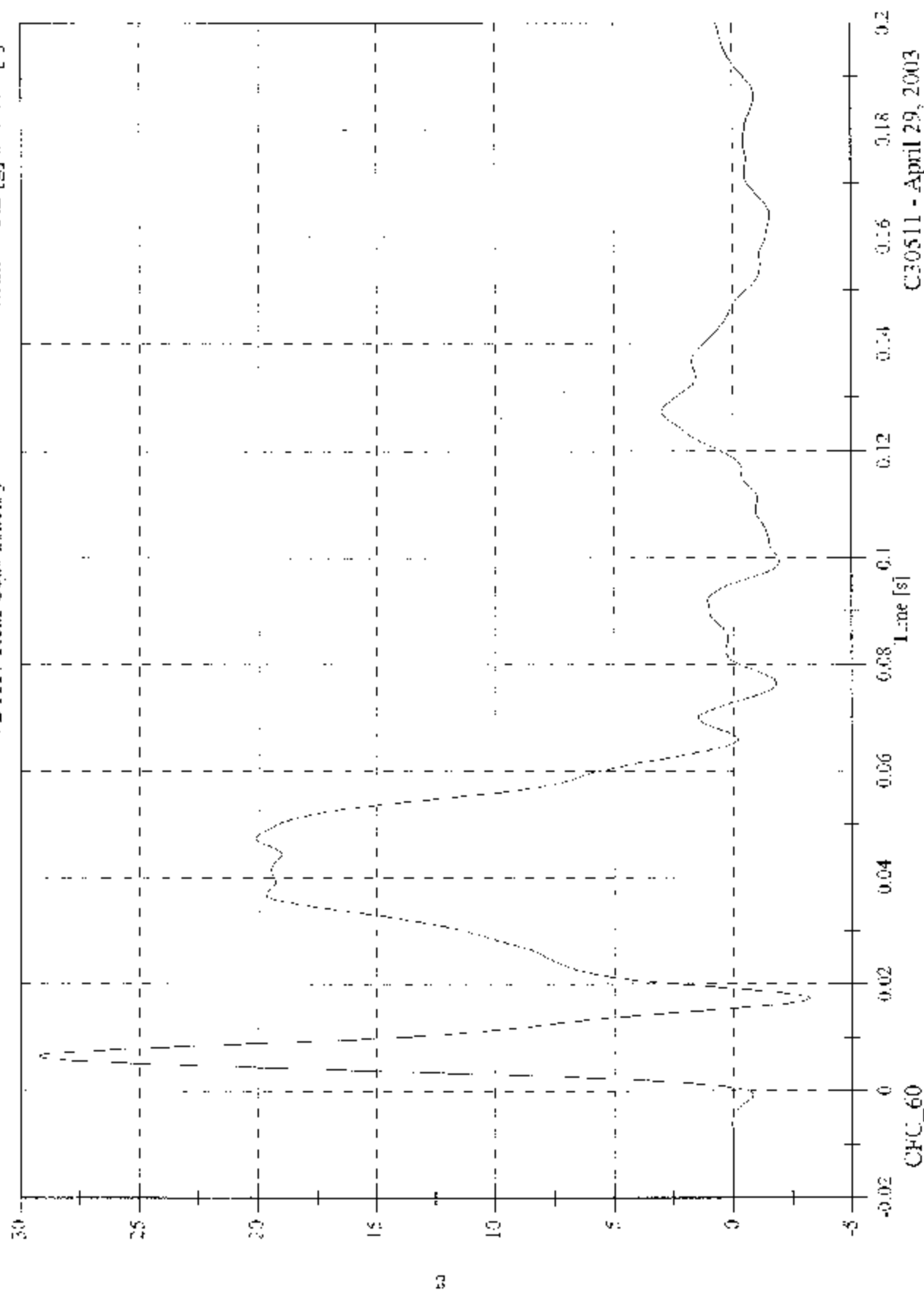


C30511 - April 28, 2003

FMVSS 214D Indicator - 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]

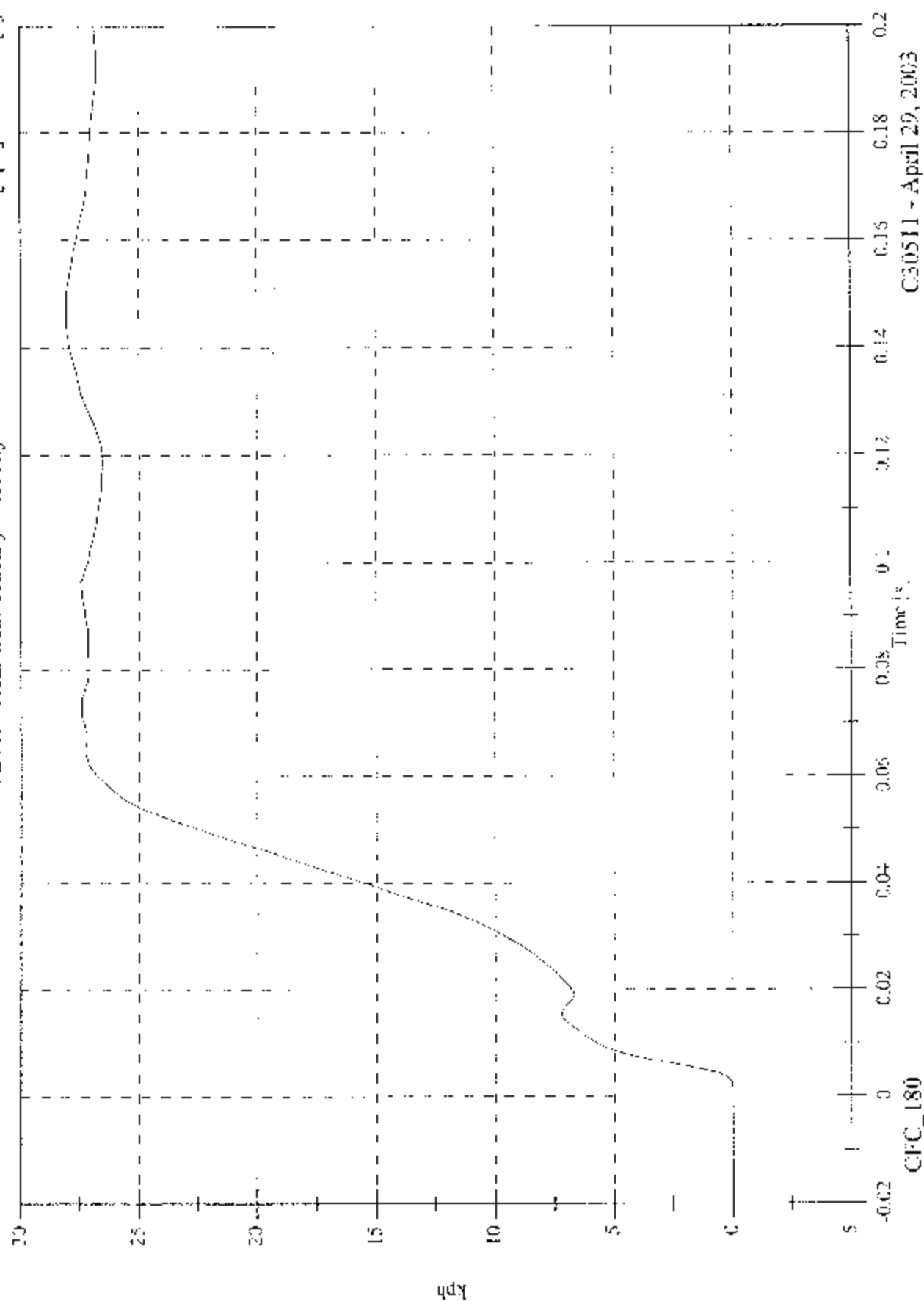


C30511 - April 29, 2003

FMVSS 214D Inducant - 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]



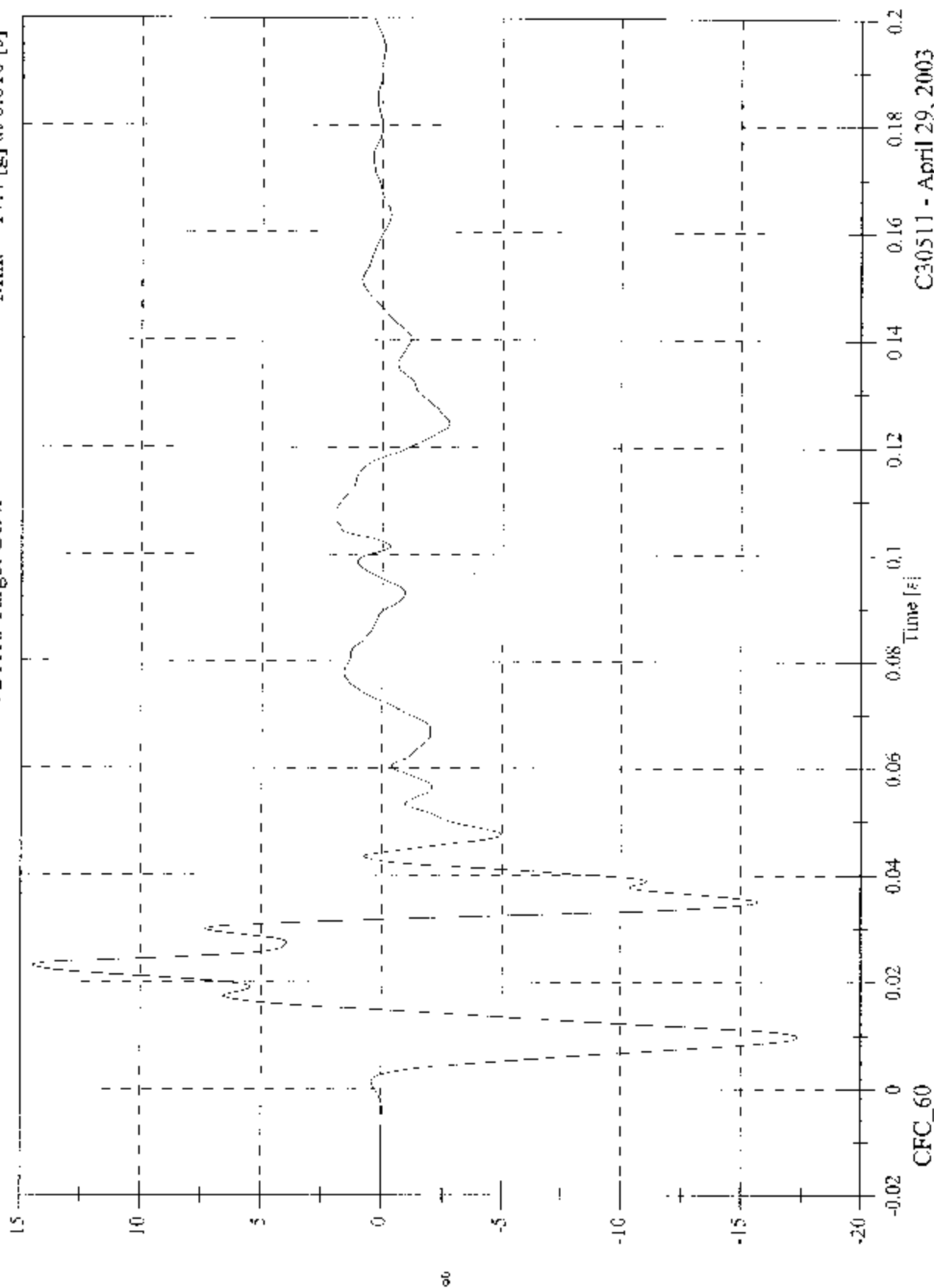
CFC\_180

C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

V2 A18 Target CG x

Max: 14.5 [g] at 0.023 [s]  
Min: -17.4 [g] at 0.010 [s]

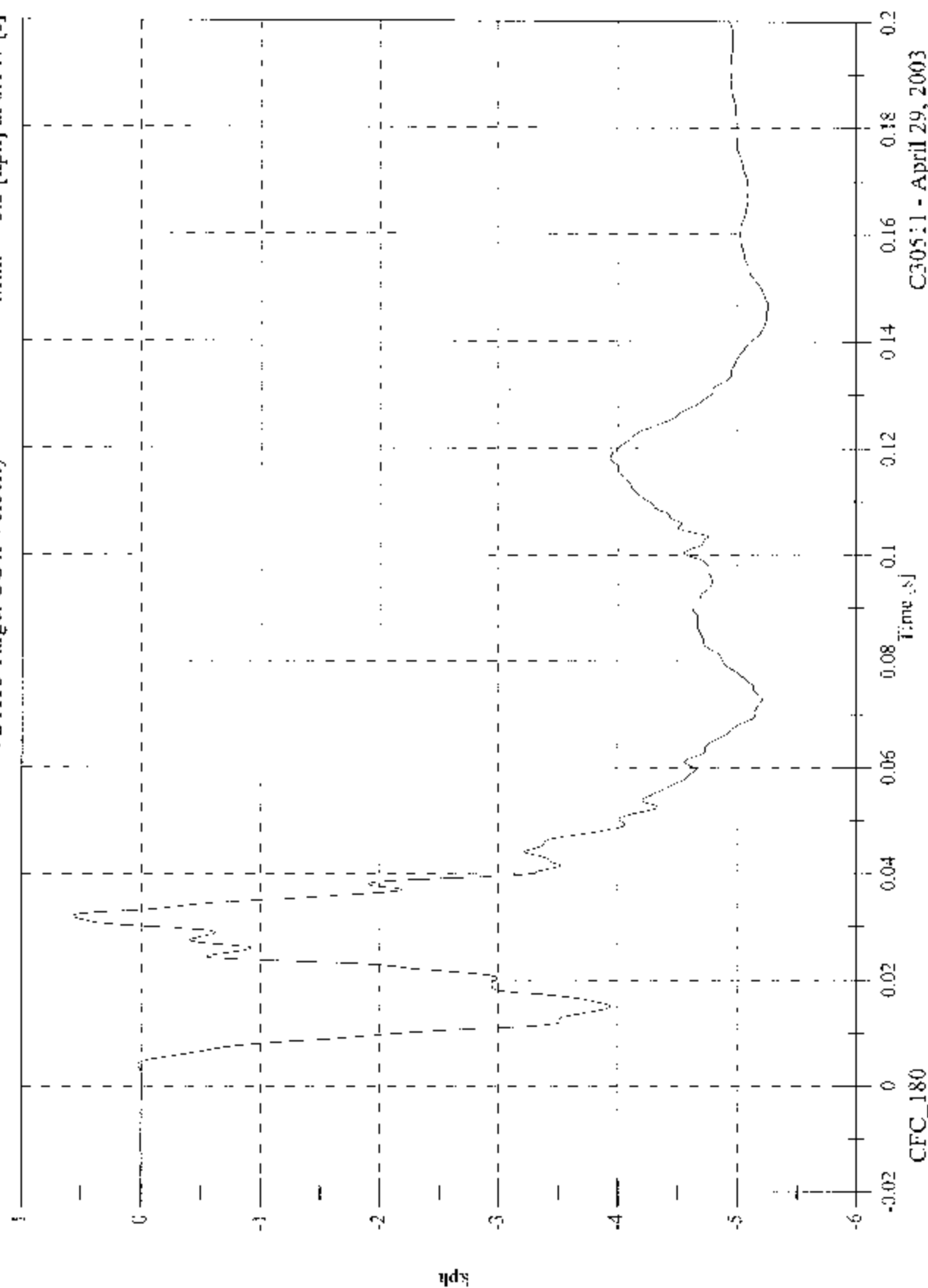


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 0.6 [kph] at 0.032 [s]  
Min: -5.3 [kph] at 0.147 [s]

V2 A18 Target CG x Velocity

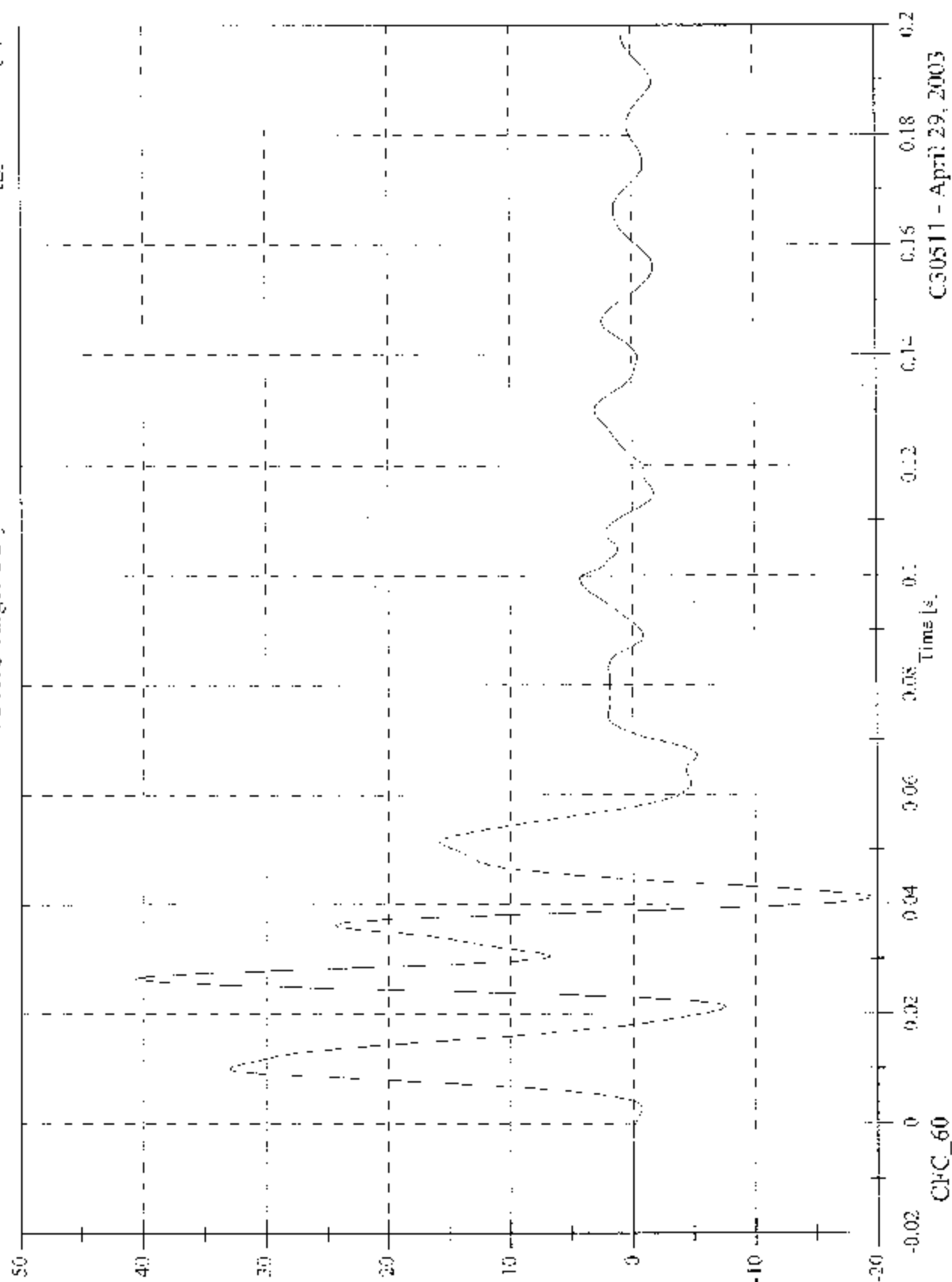


C30511 - April 29, 2003

# FMVSS 214D Inducant - 2003 Kia Sorento

Max: 40.7 [g] at 0.026 [s]  
 Min: -19.5 [g] at 0.041 [s]

V2 A18 Target CG y

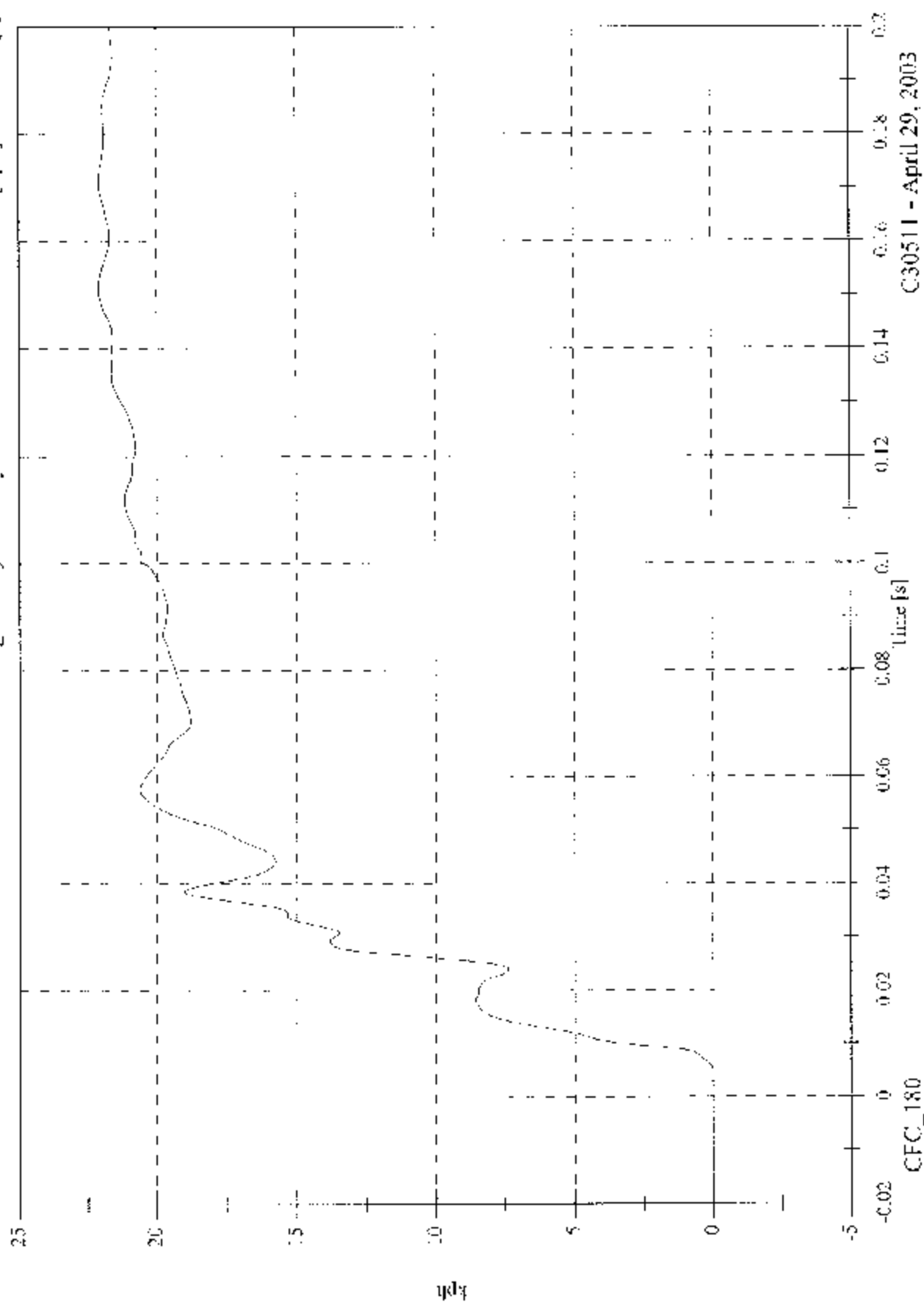


C30511 - April 29, 2003

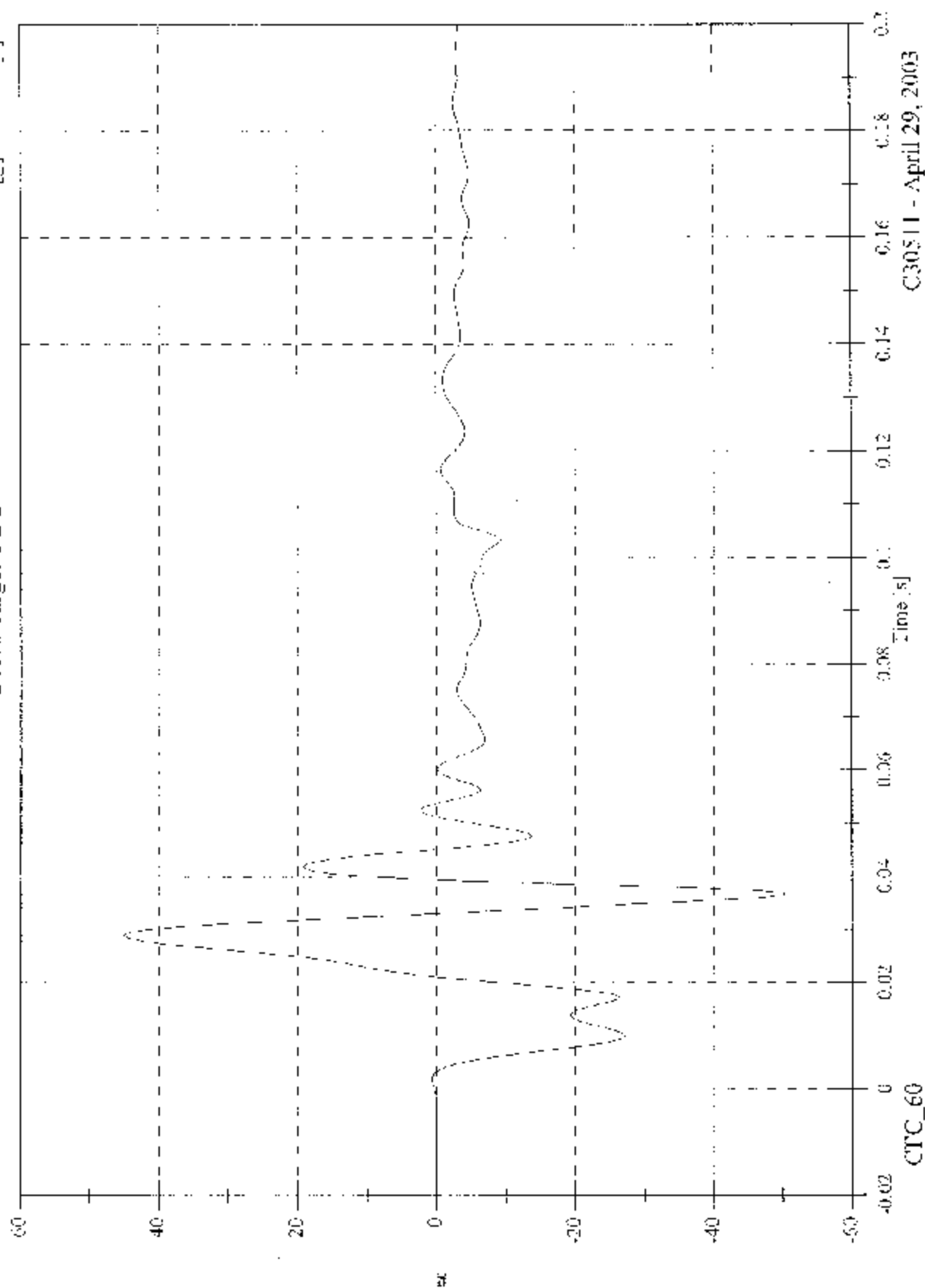
FMVSS 214D Incleam - 2003 Kia Sorento

Max: 22.1 [kph] at 0.151 [s]  
Min: -0.9 [kph] at -0.020 [s]

V2 A18 Target CG y Velocity



C30511 - April 29, 2003

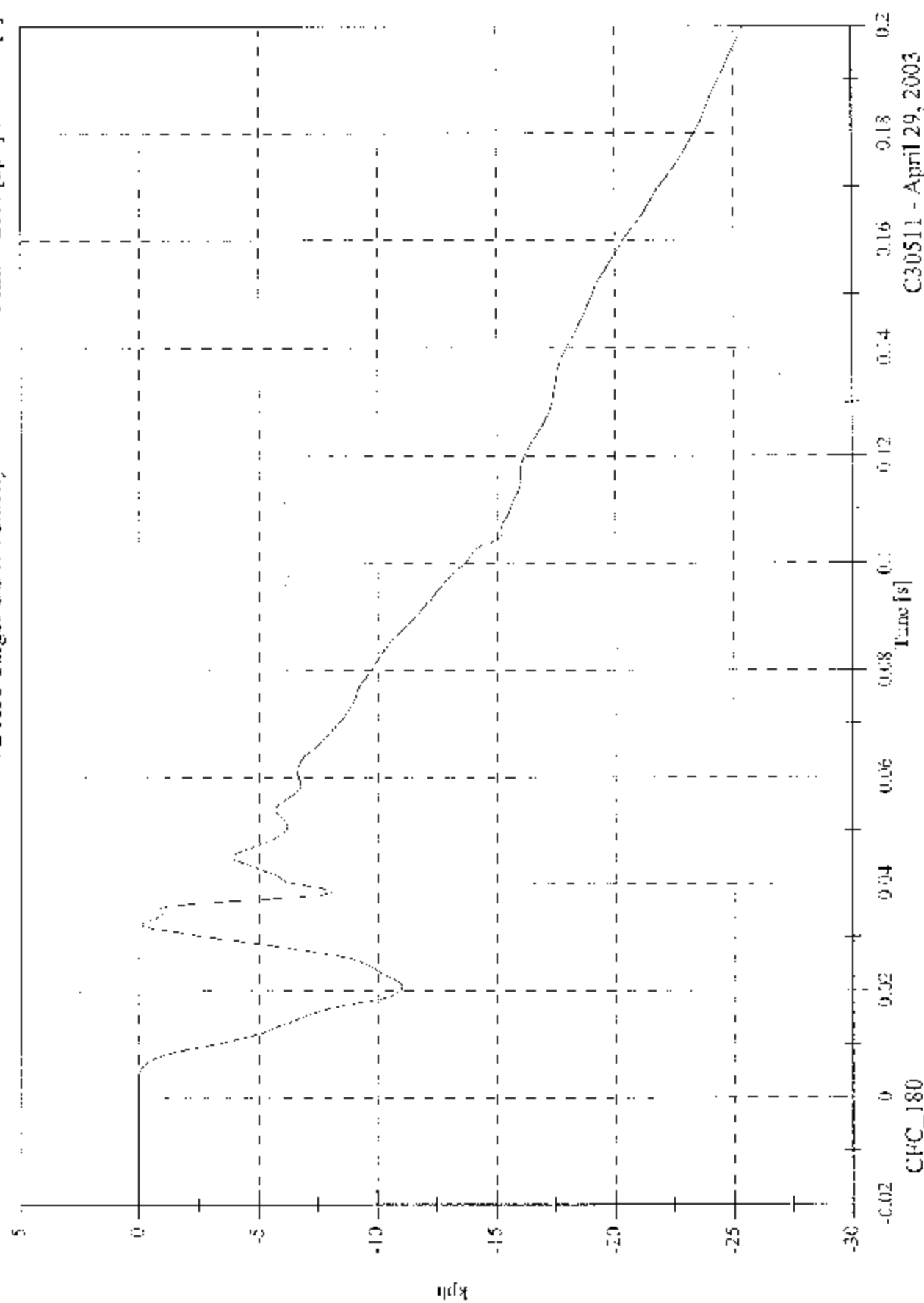




FMVSS 214D Indicant - 2003 Kia Sorento

Max: 0.0 [kph] at 0.004 [s]  
Min: -25.4 [kph] at 0.200 [s]

V2 A18 Target CG z Velocity

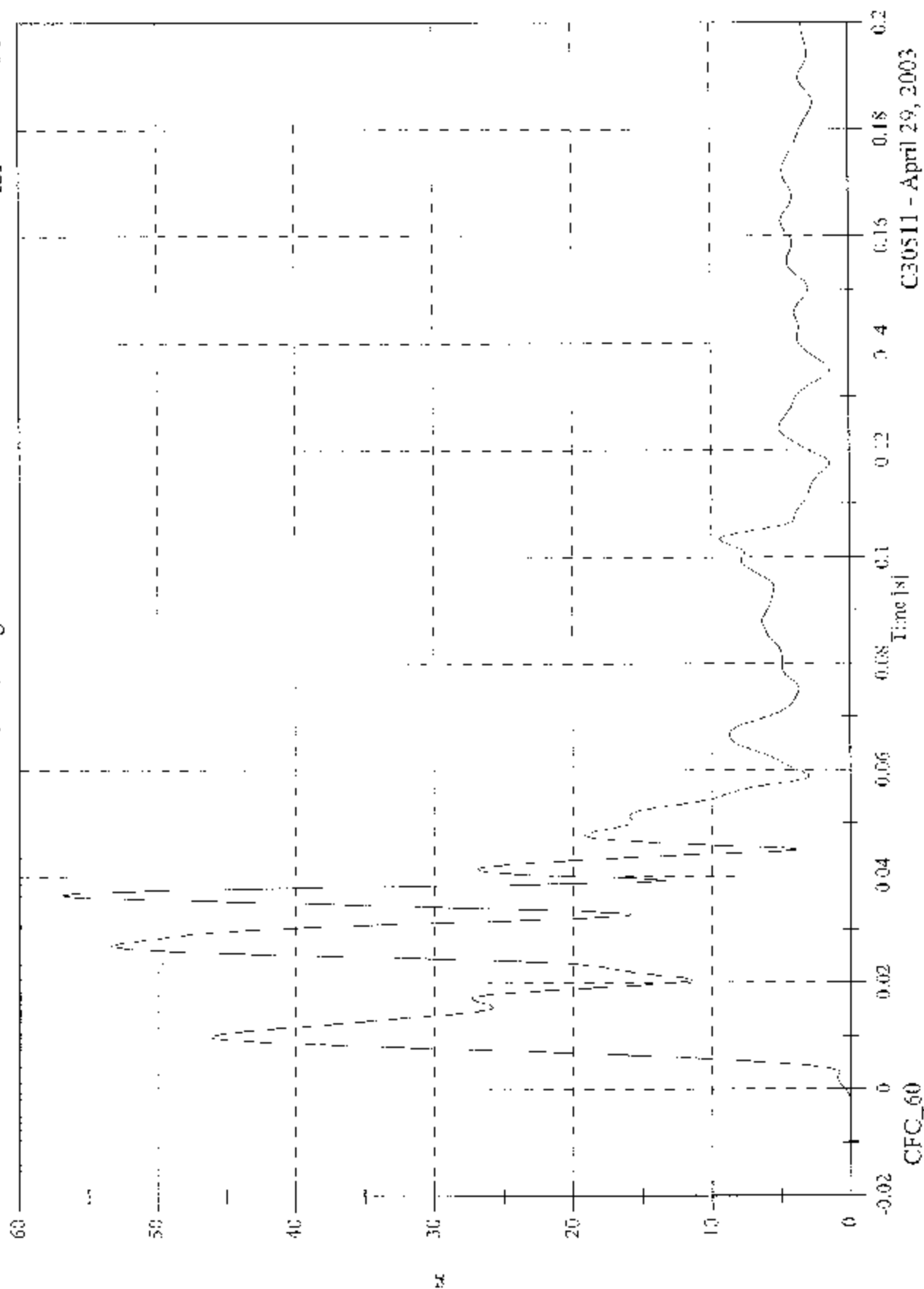


C30511 - April 29, 2003

# FMVSS 214D Indicaant - 2003 Kia Sorento

Max: 57.0 [g] at 0.037 [s]  
Min: 0.0 [g] at -0.014 [s]

V2 A18 Target CG Resultant

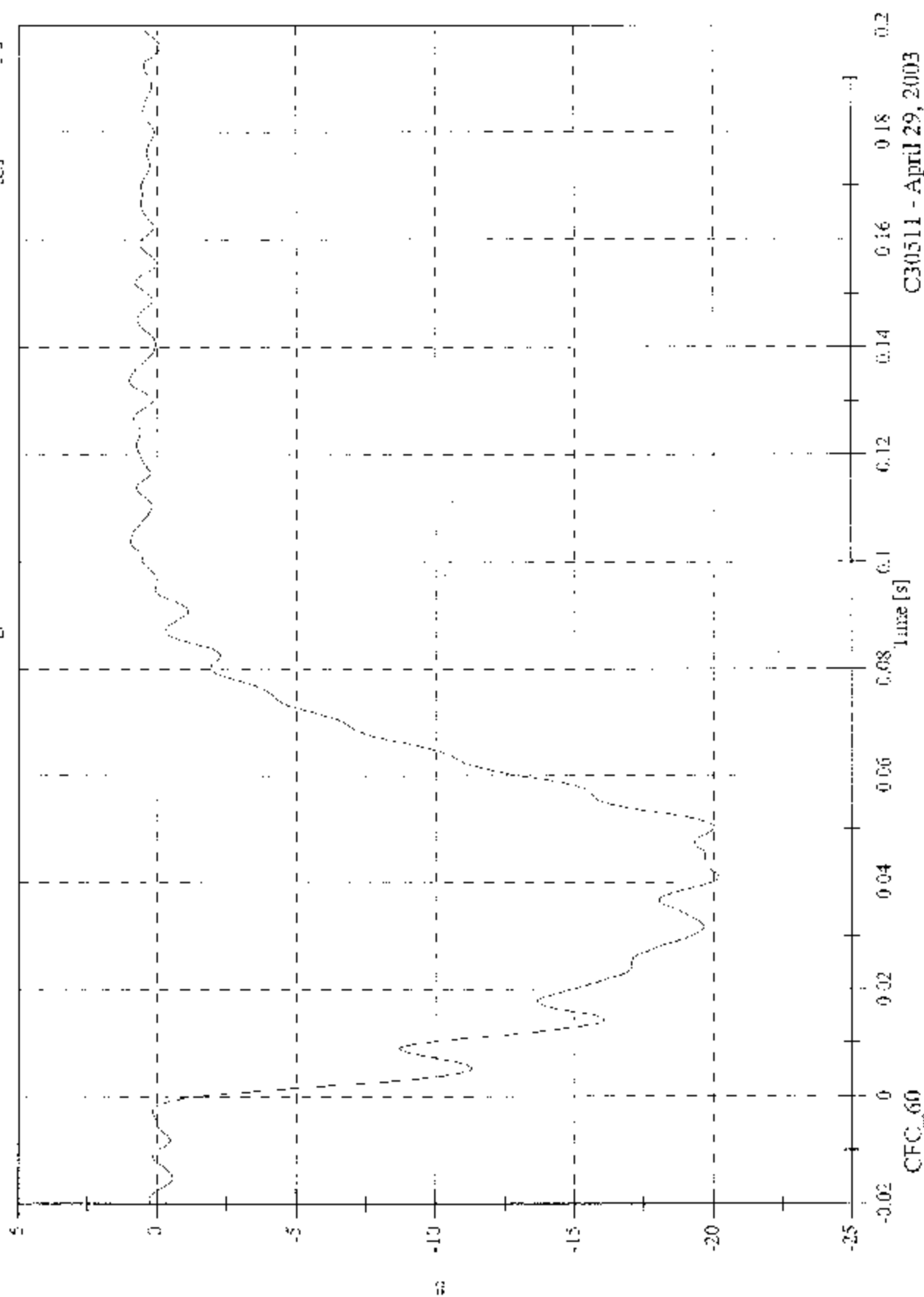


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 1.0 [g] at 0.134 [s]  
Min: -20.2 [g] at 0.041 [s]

V1 Moving Barrier CG X



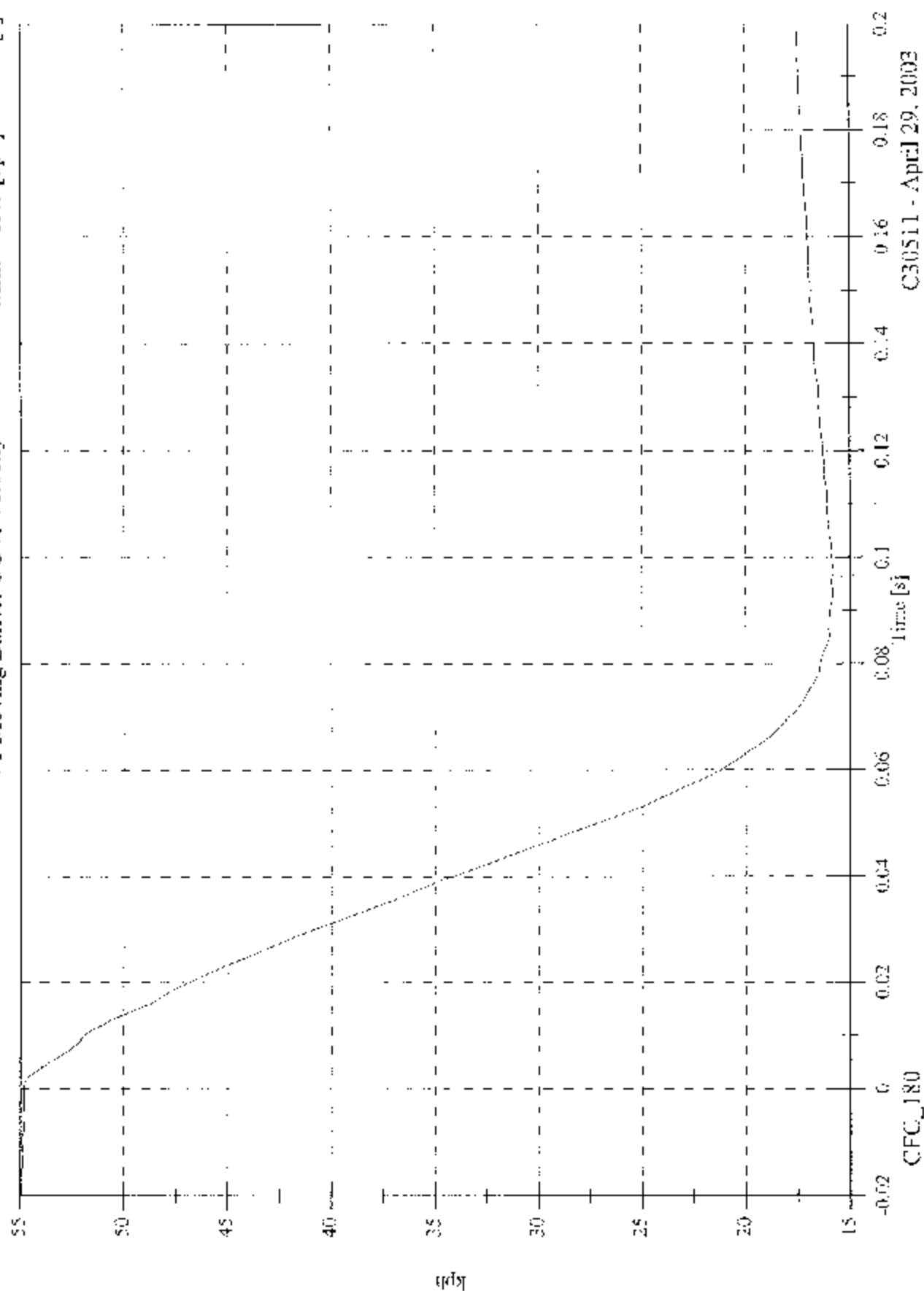
C30511 - April 29, 2003

UMVSS 214D Inducant - 2003 Kia Sorento

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

V1 Moving Barrier CG X Velocity

Min: 15.3 [kph] at 0.093 [s]

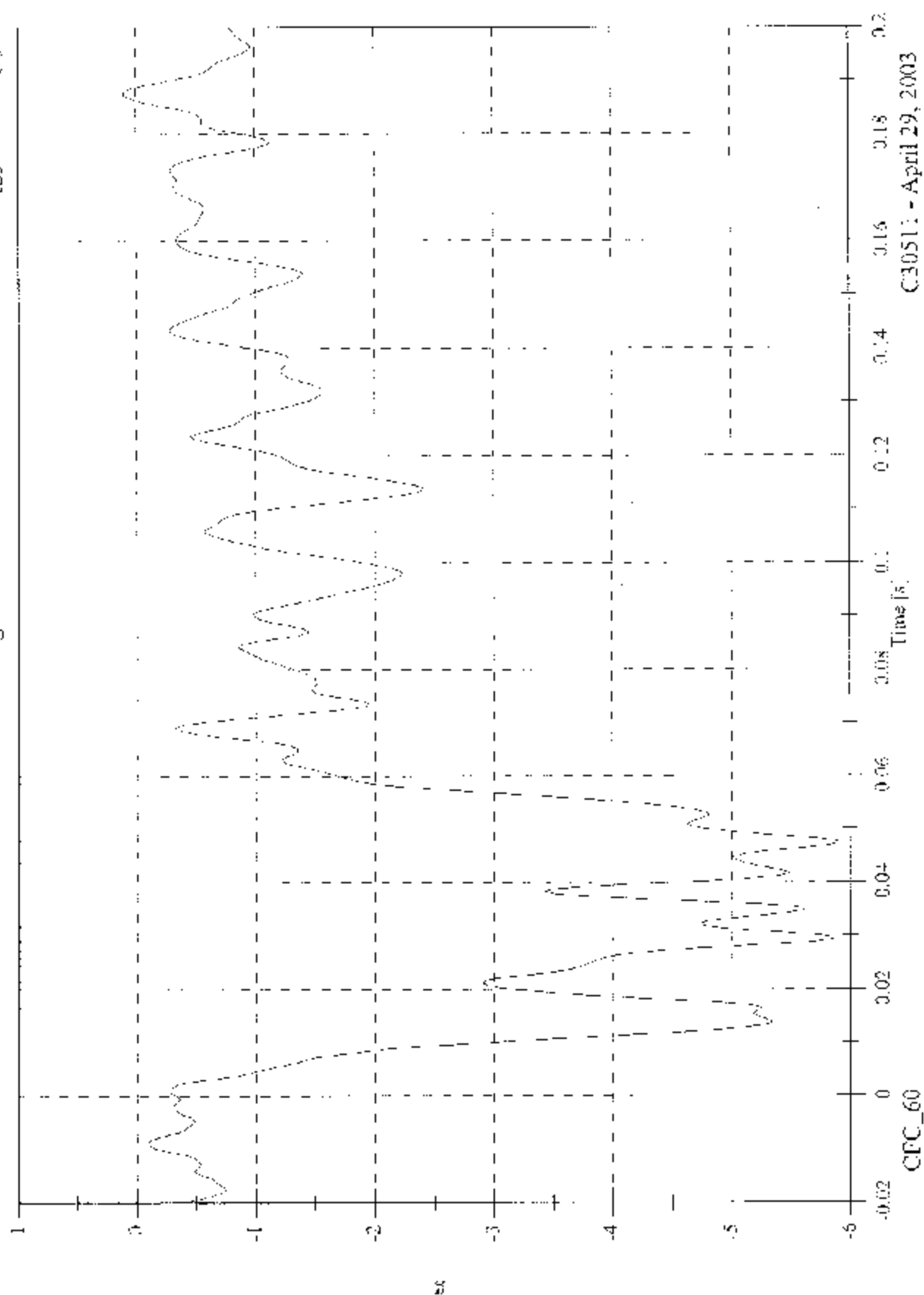


C30511 - April 29, 2003

EMVSS 214D Indicant - 2003 Kia Sorento

Max: 0.1 [g] at 0.188 [s]  
Min: -5.9 [g] at 0.047 [s]

V1 Moving Barrier CG Y



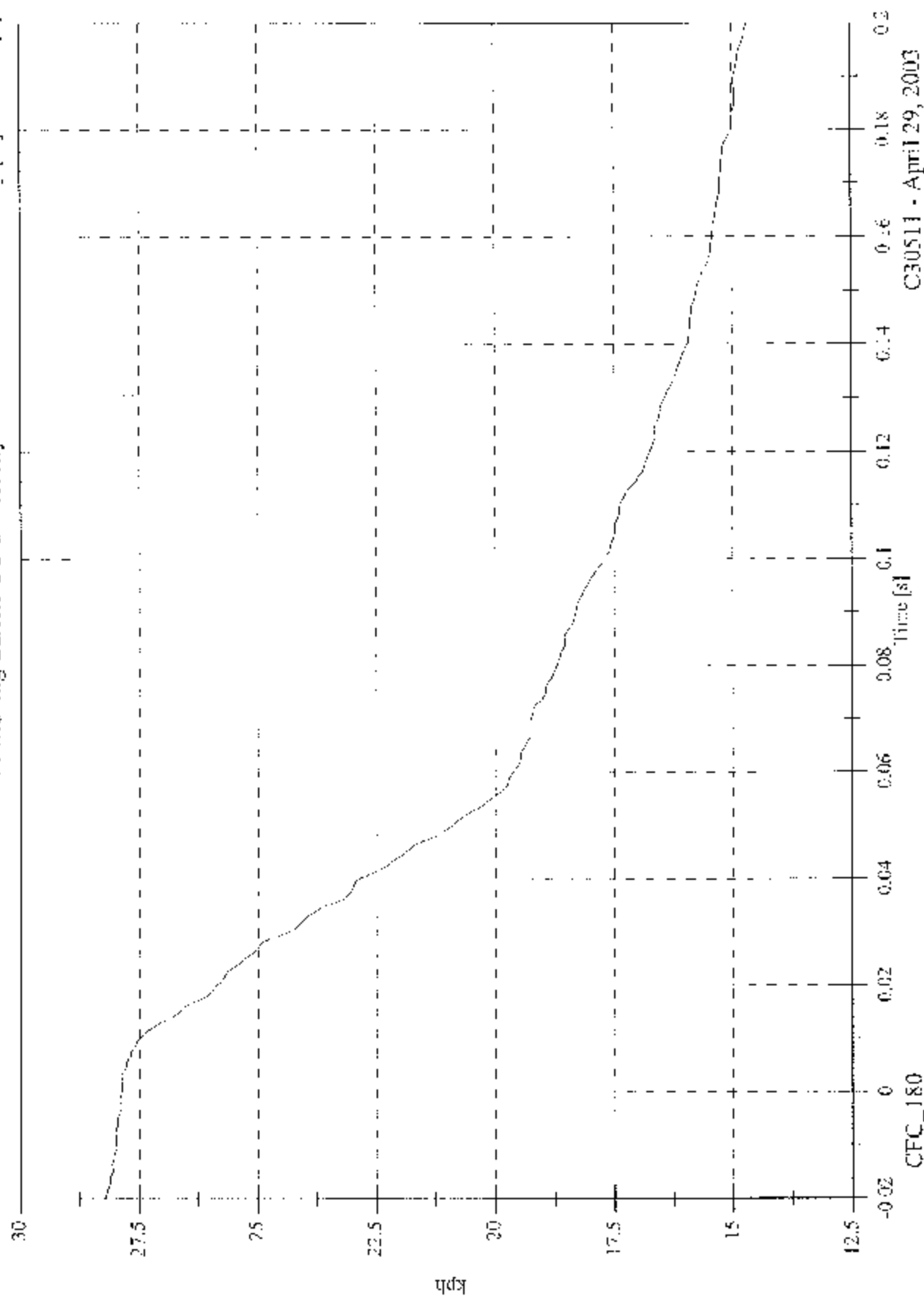
C30511 - April 29, 2003

FMVSS 214D Indictant - 2003 Kia Sorento

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

Min: 14.7 [kph] at 0.200 [s]

V1 Moving Barrier CG Y Velocity



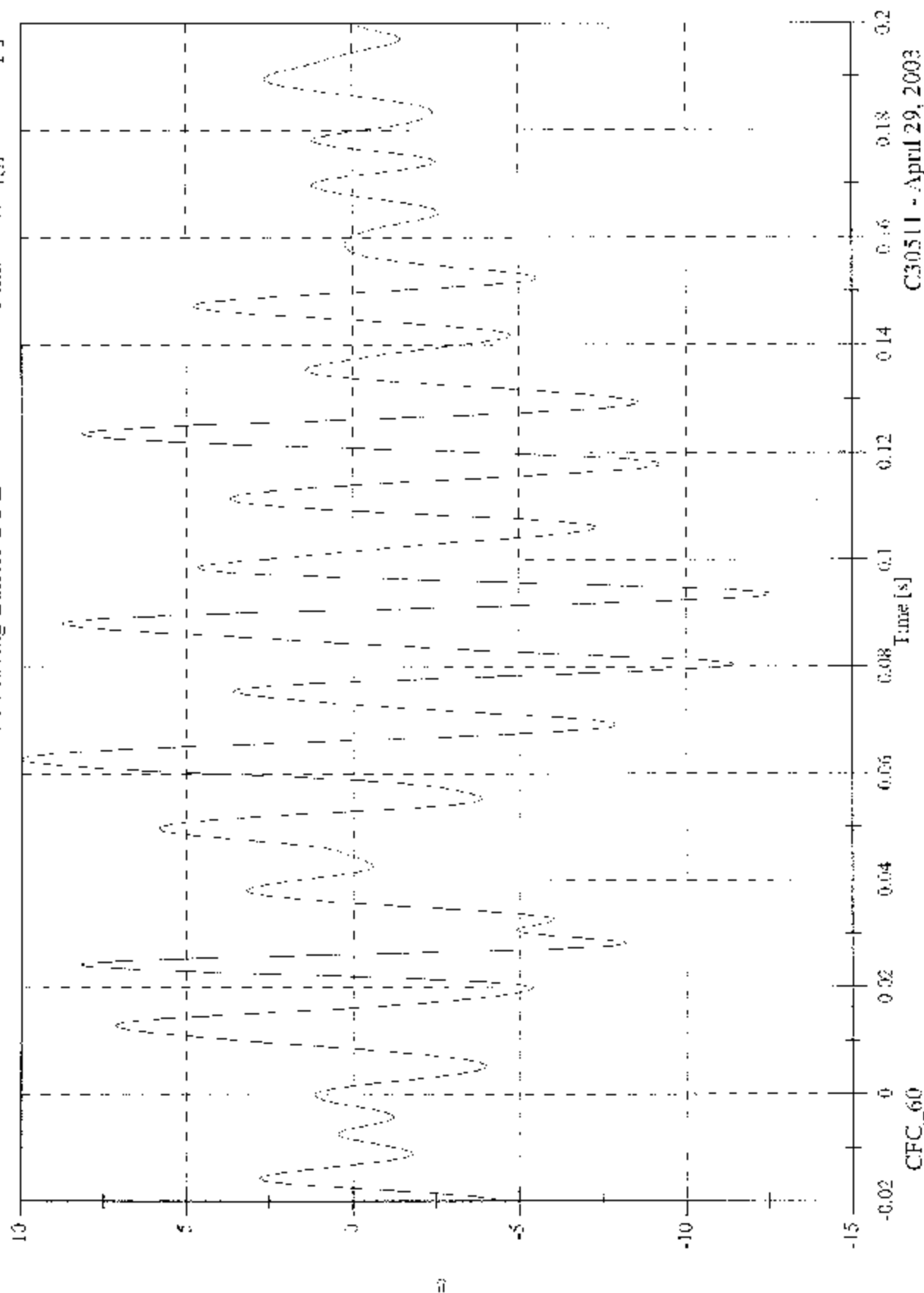
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 10.0 [g] at 0.063 [s]

V1 Moving Barrier CG Z

Min: -12.5 [g] at 0.095 [s]



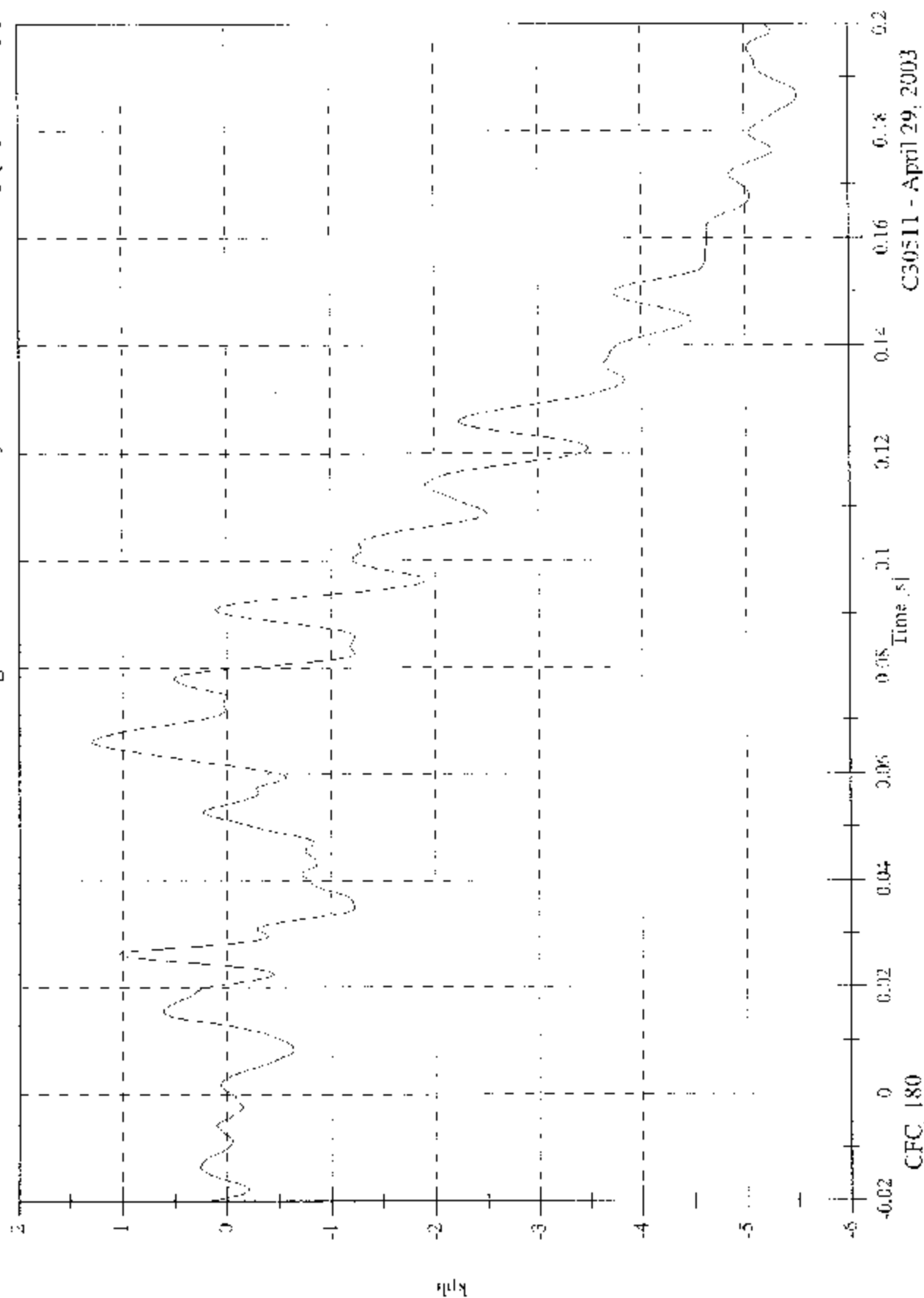
C30511 - April 29, 2003

FMVSS 214D Inducant - 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]



C30511 - April 29, 2003

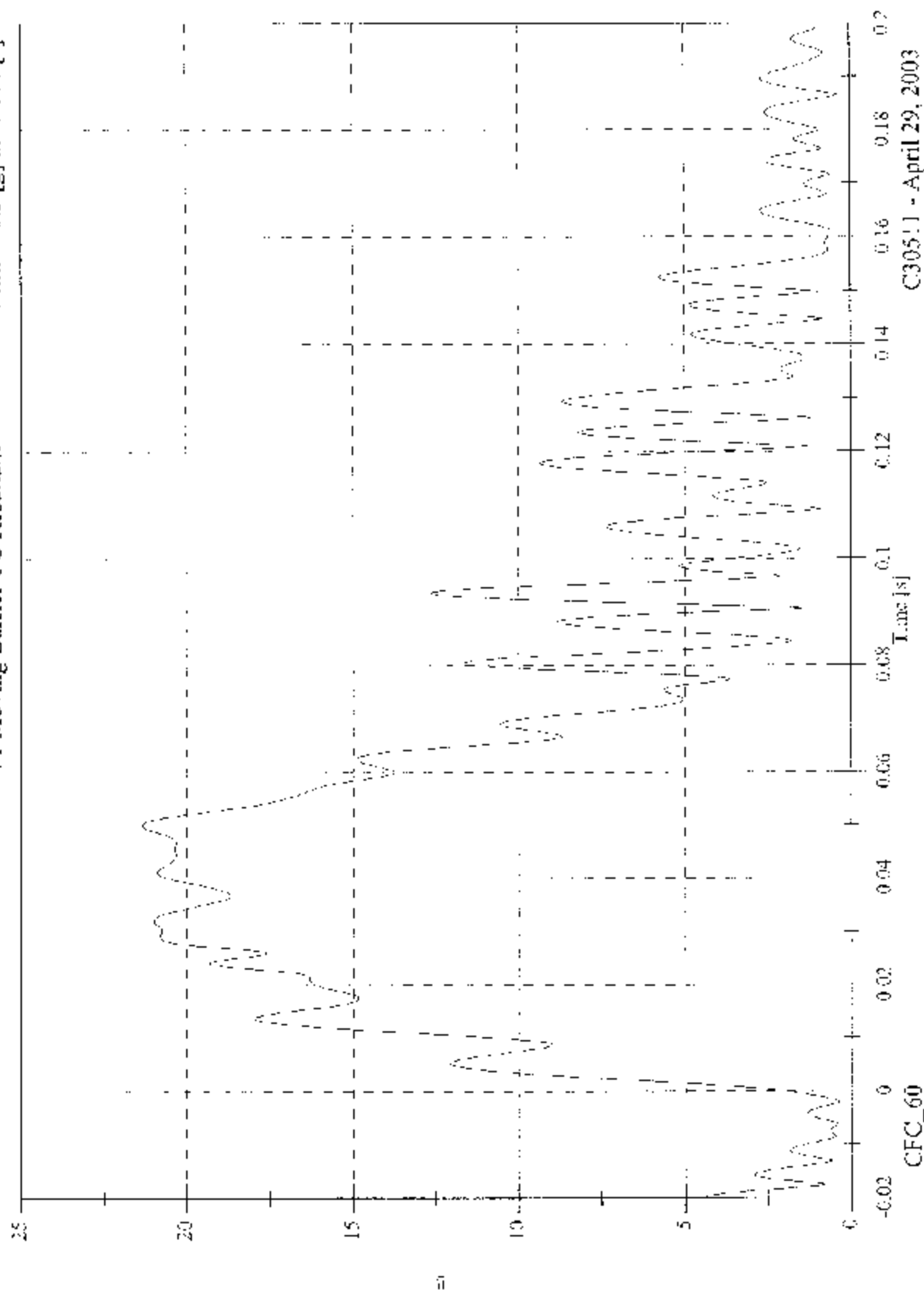


FMVSS 214D Inducant - 2003 Kia Sorento

Max: 21.4 [g] at 0.050 [s]

V1 Moving Barrier CG Resultant

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

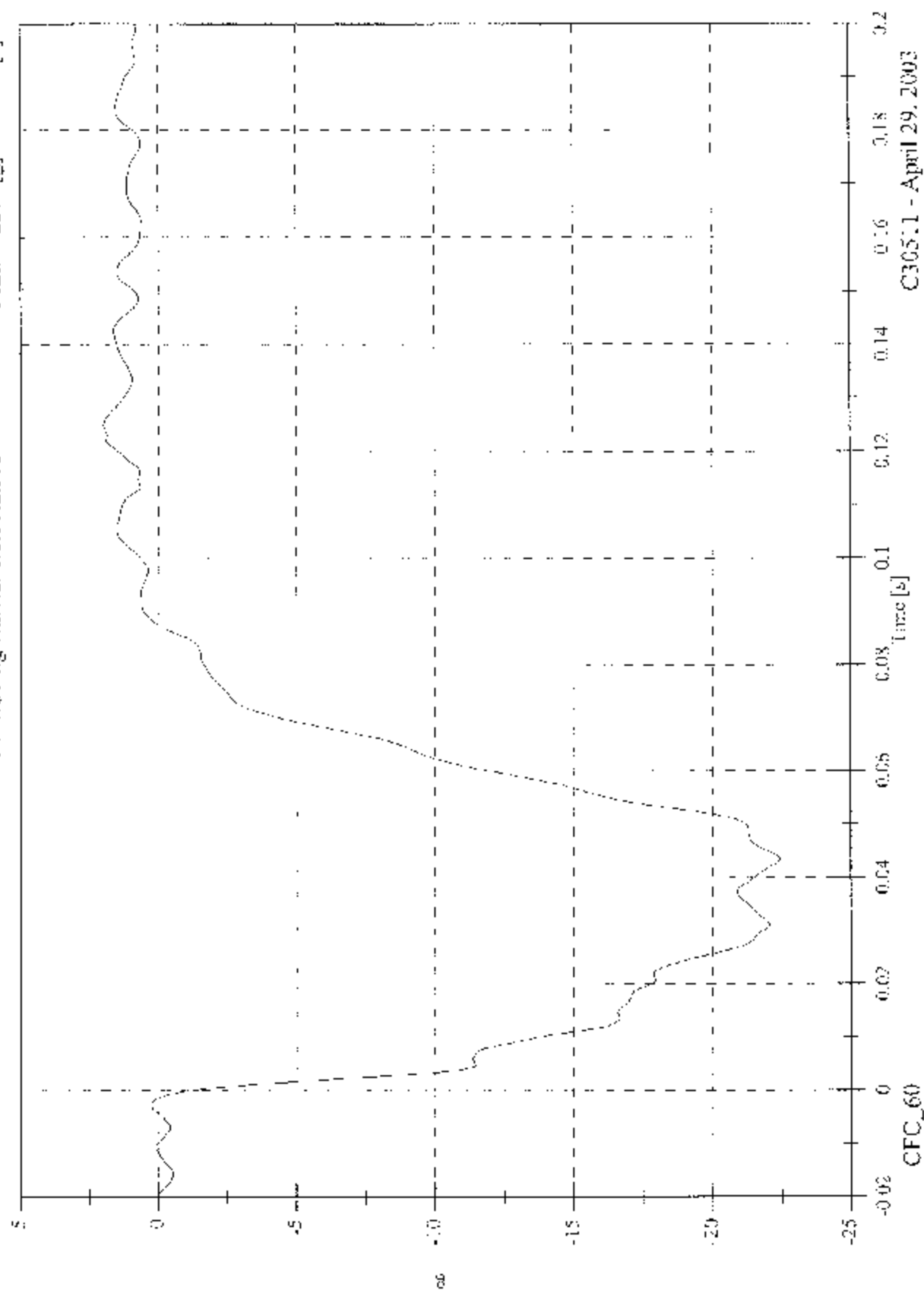


FMVSS 214D Indicant - 2003 Kia Sorento

Max: 2.0 [g] at 0.125 [s]

V1 Moving Barrier Left Rail X

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



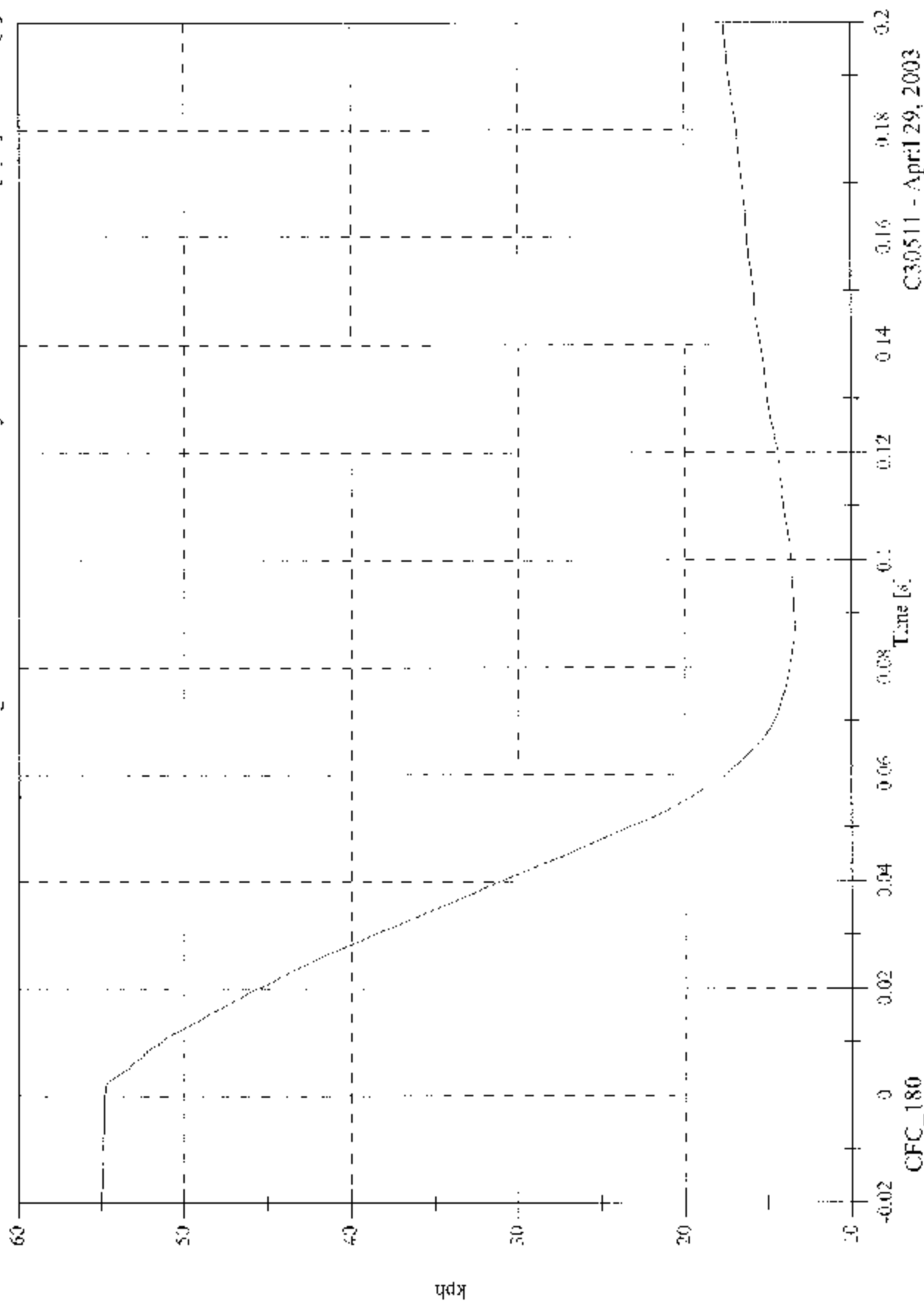
C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorrento

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

V1 Moving Barrier Left Rail X Velocity

Min: 13.4 [kph] at 0.086 [s]

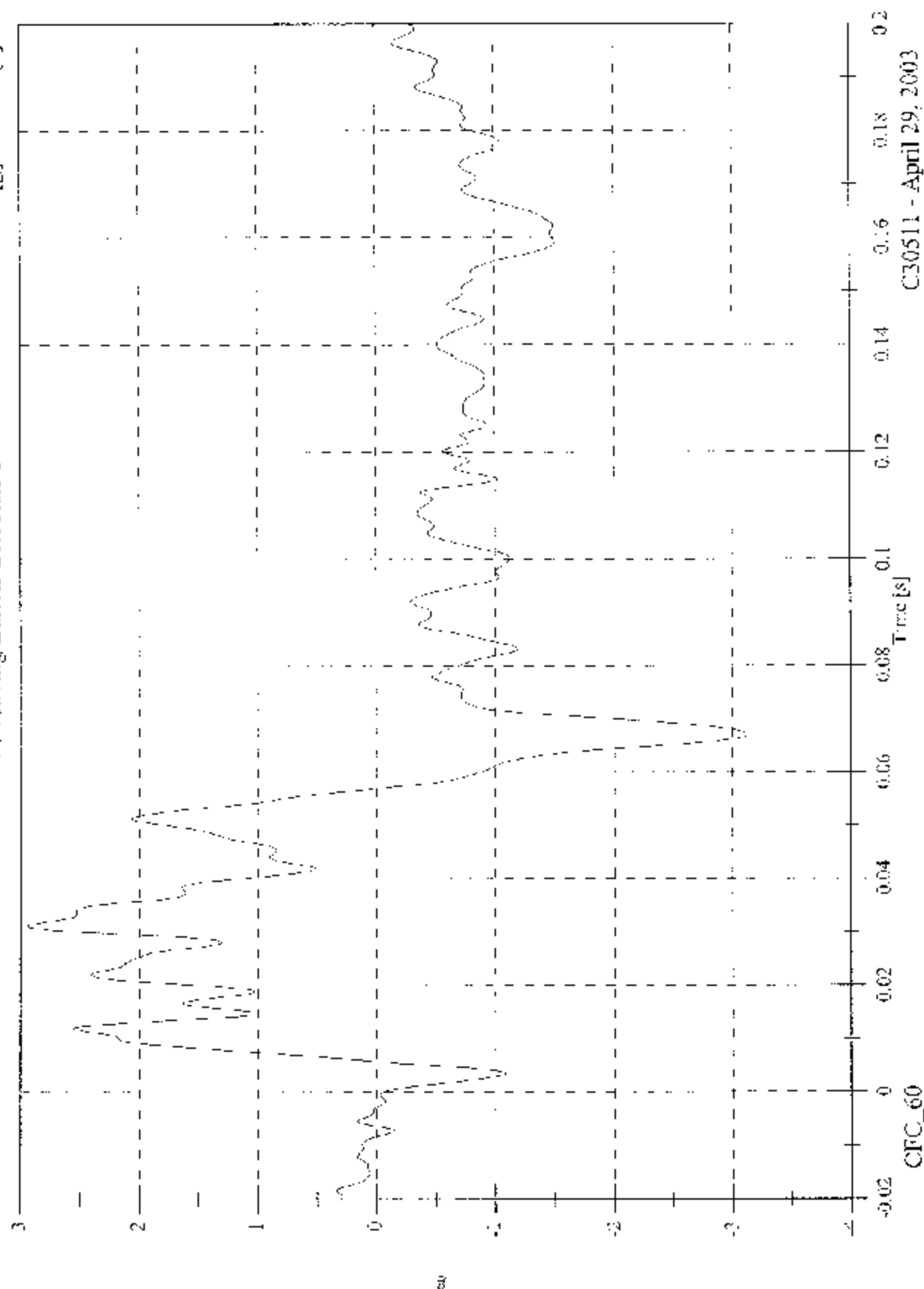


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 2.9 [g] at 0.031 [s]  
Min: -3.1 [g] at 0.067 [s]

V1 Moving Barrier Left Rail Y

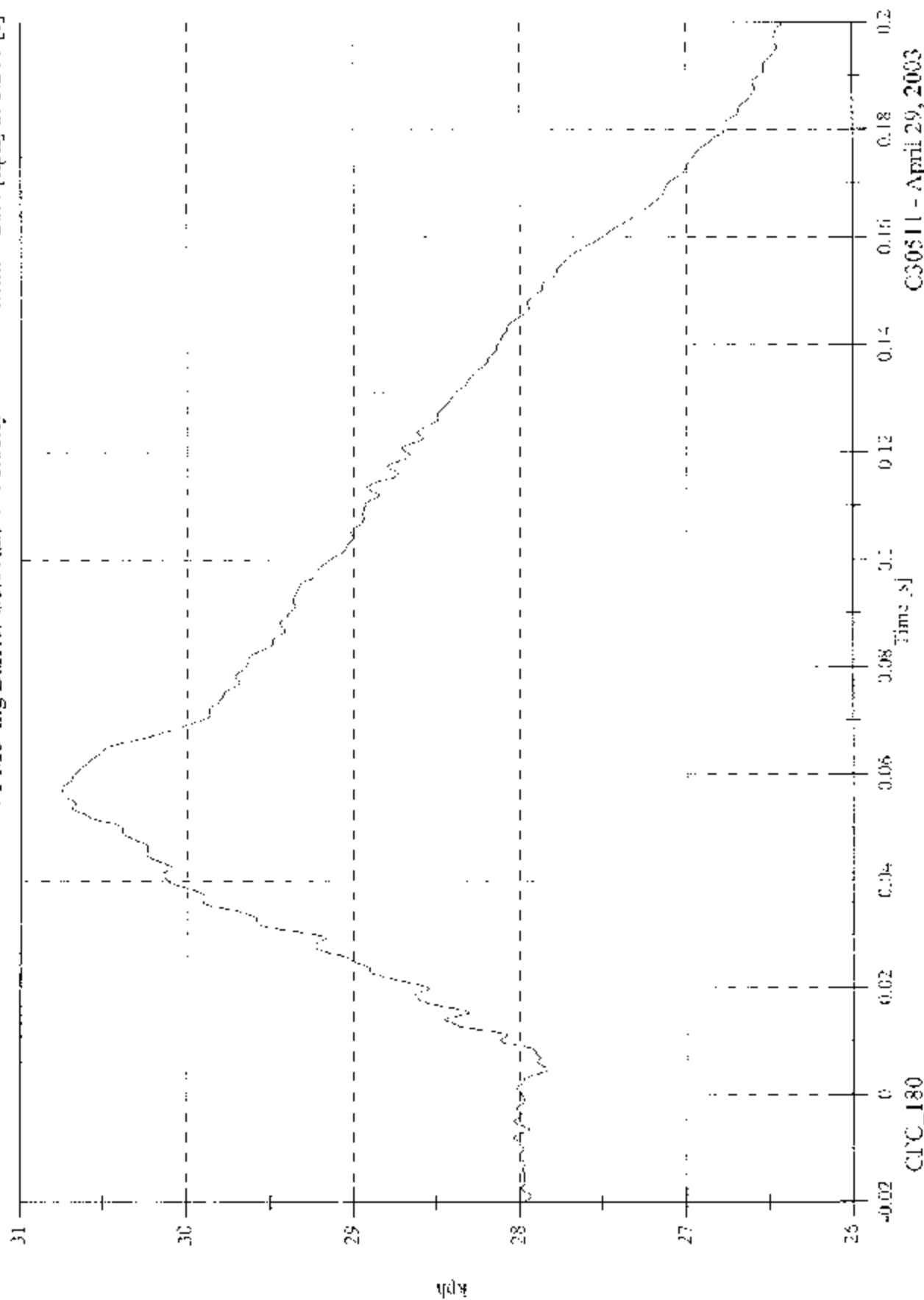


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 30.8 [kph] at 0.057 [s]  
Min: 26.4 [kph] at 0.200 [s]

VI Moving Barrier Left Rai. Y Velocity



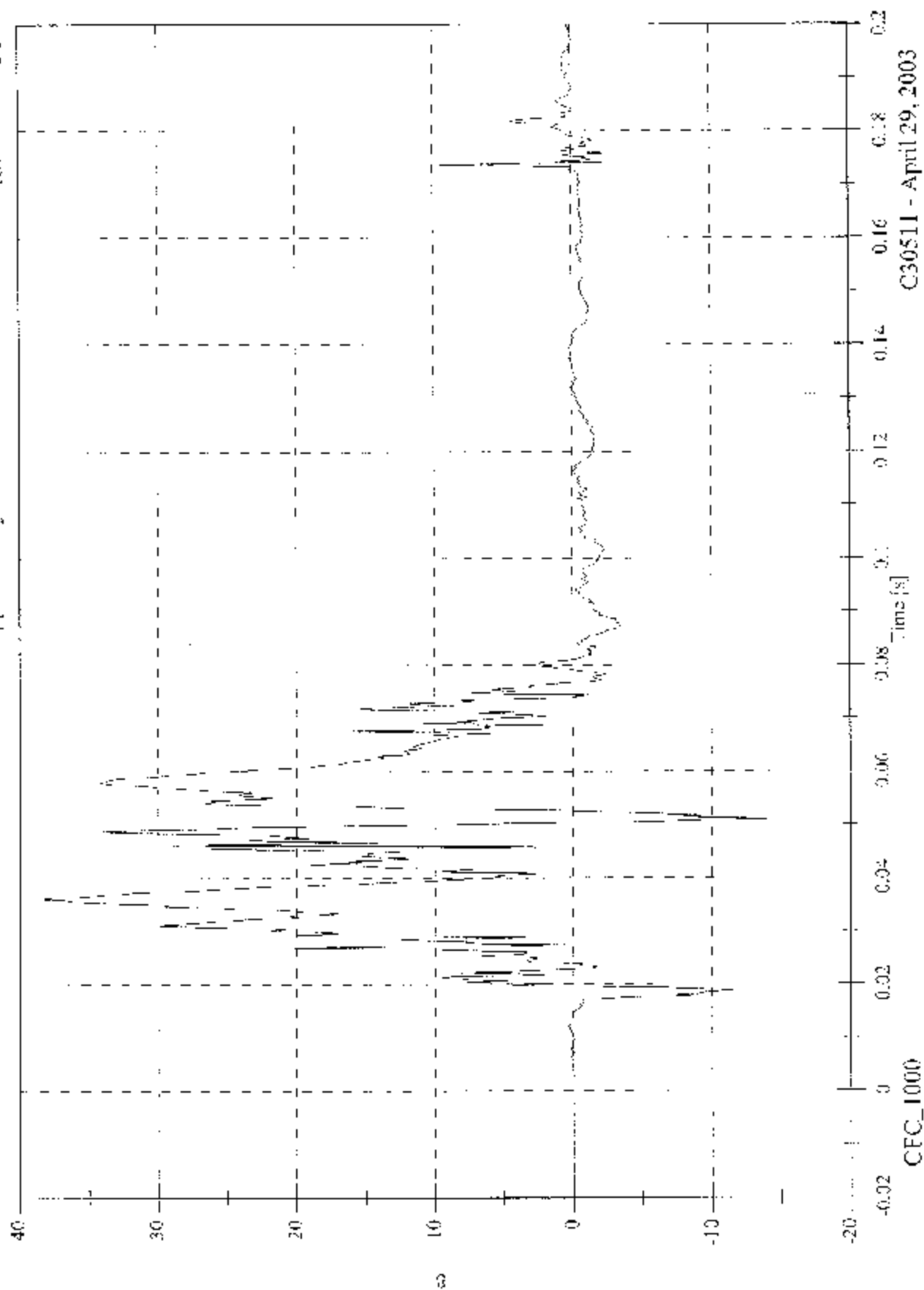
CIVC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 38.7 [g] at 0.036 [s]  
Min: -14.0 [g] at 0.051 [s]

v2P1 Upper Rib Ry

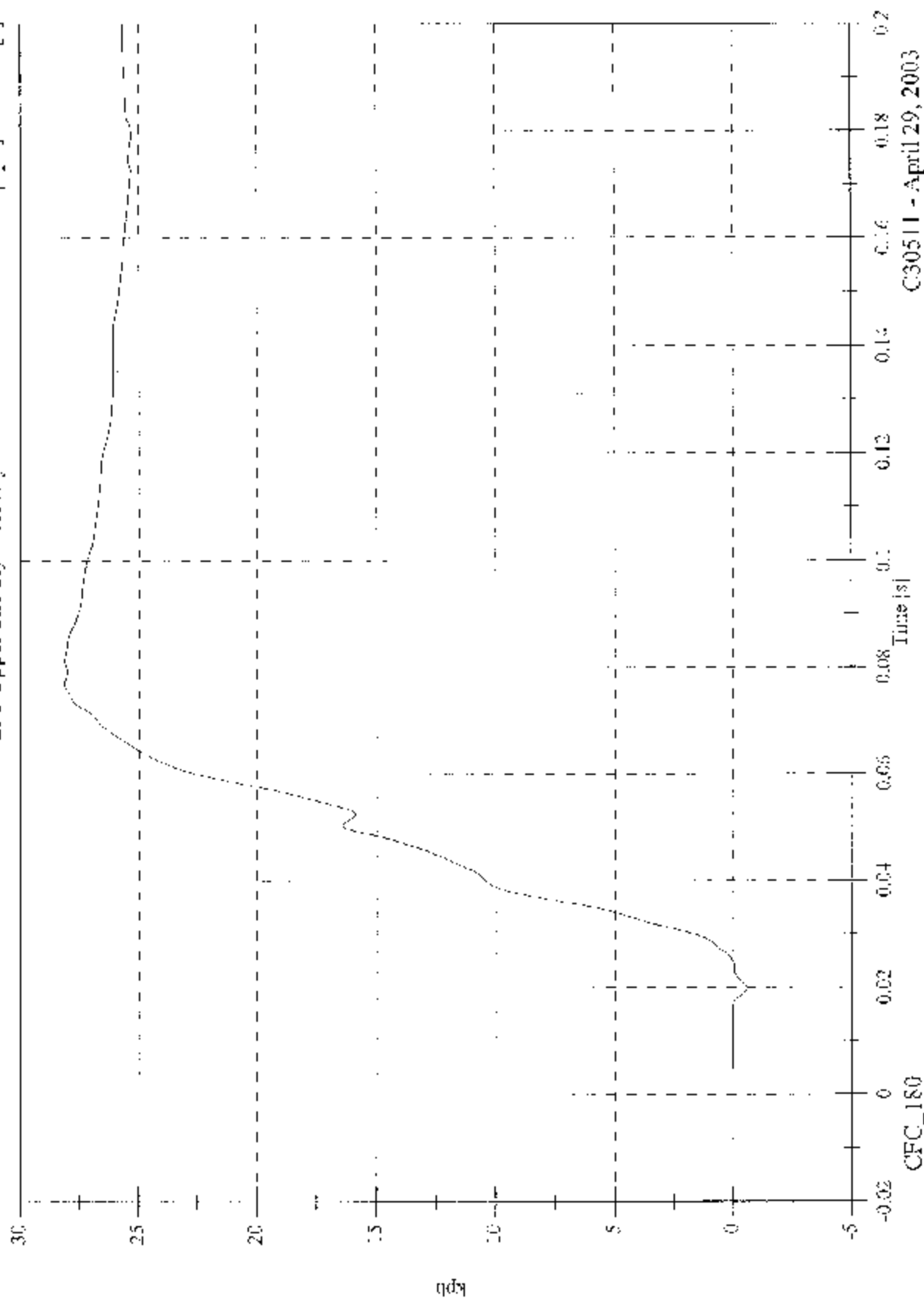


FMVSS 214D Inducant - 2003 Kia Sorento

Max: 28.2 [kph] at 0.077 [s]

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

V2P1 Upper Rib Ry Velocity



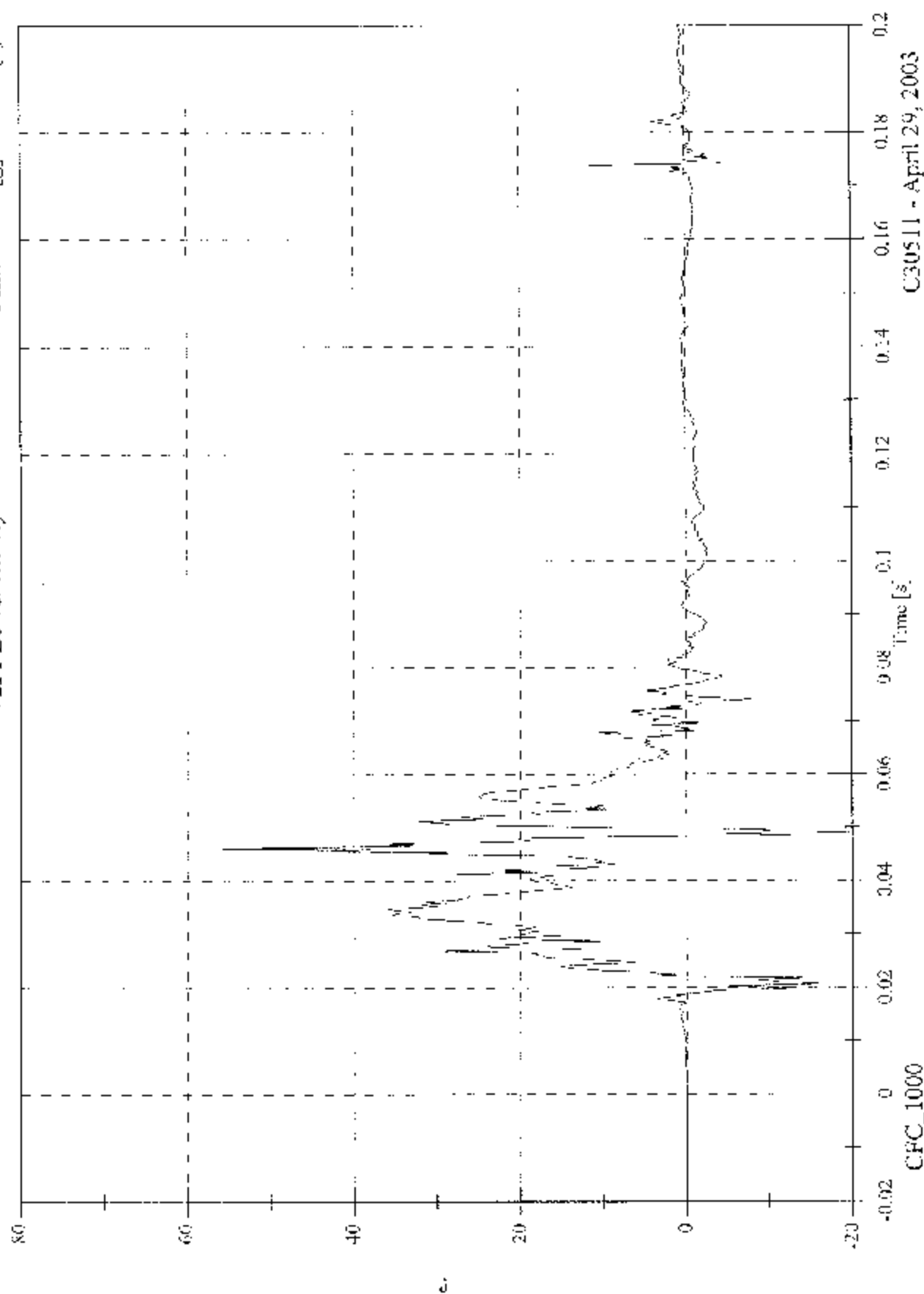
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 61.7 [g] at 0.046 [s]

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

V2P1 Lower Rib Ry



C30511 - April 29, 2003

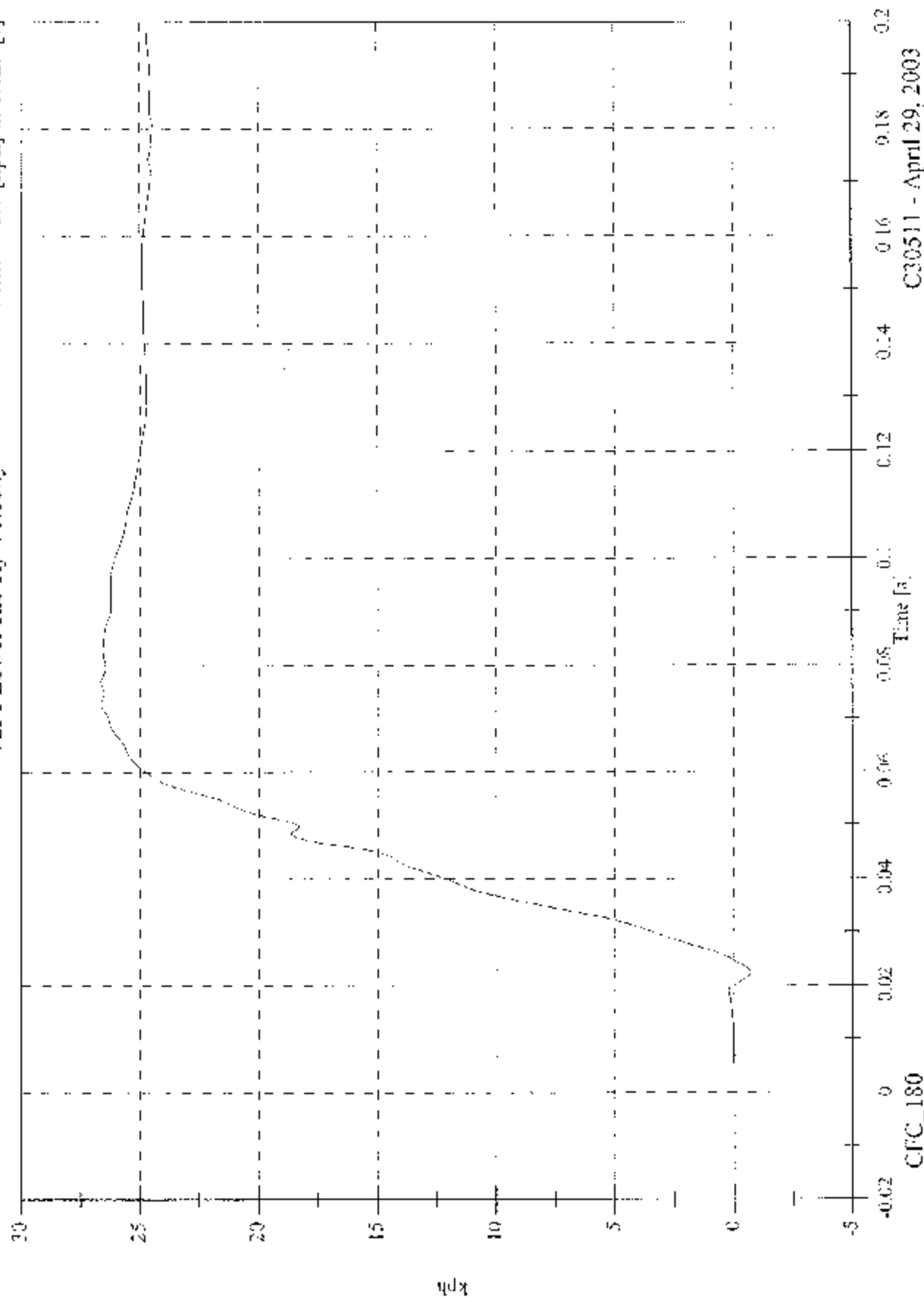


FMVSS 214D Indicator - 2003 Kia Sorento

Max: 26.7 [kph] at 0.073 [s]

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

V2P1 Lower Rib Ry Velocity



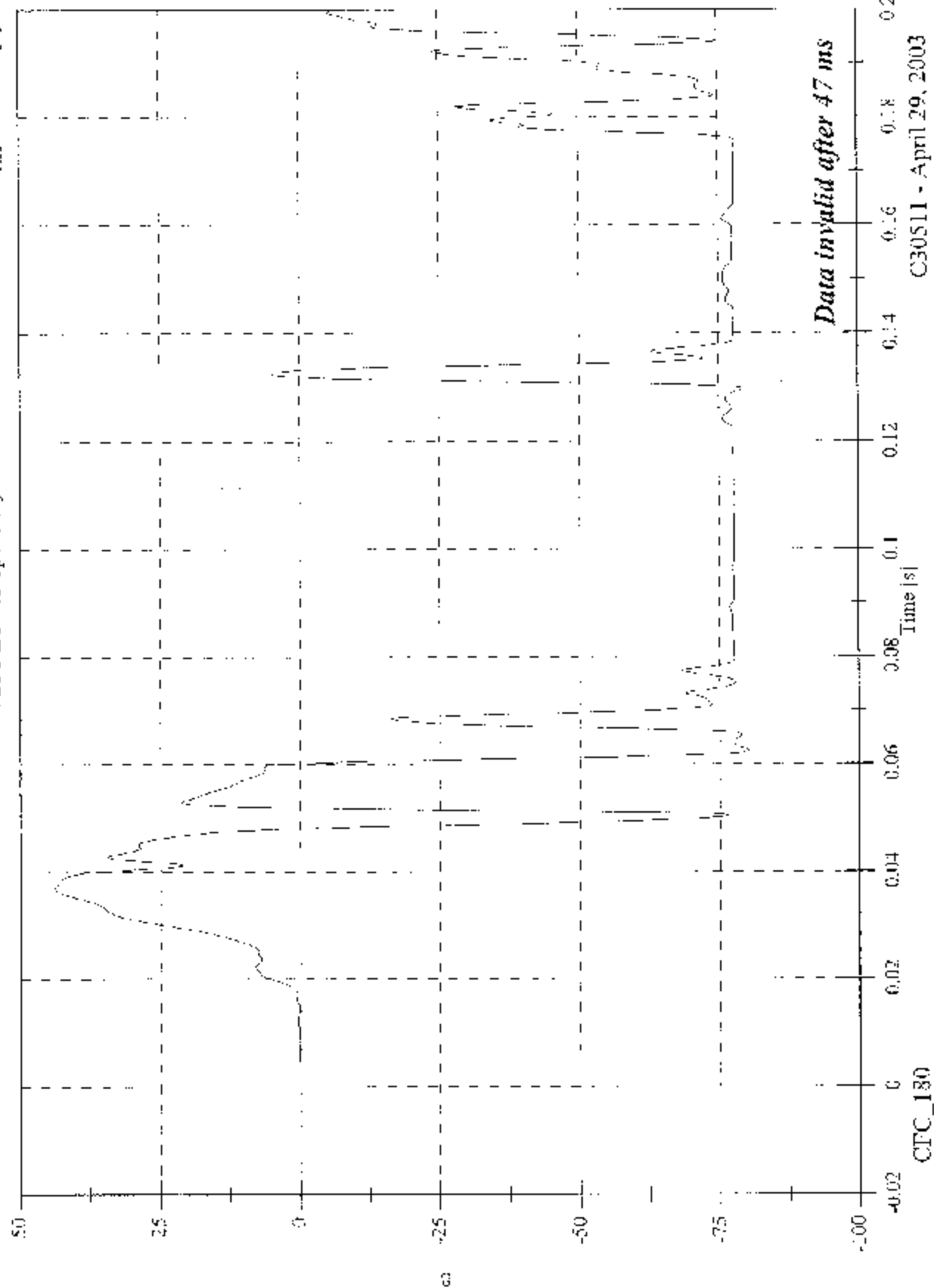
C30511 - April 29, 2003

CFC\_180

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 43.8 [g] at 0.037 [s]  
Min: -80.2 [g] at 0.062 [s]

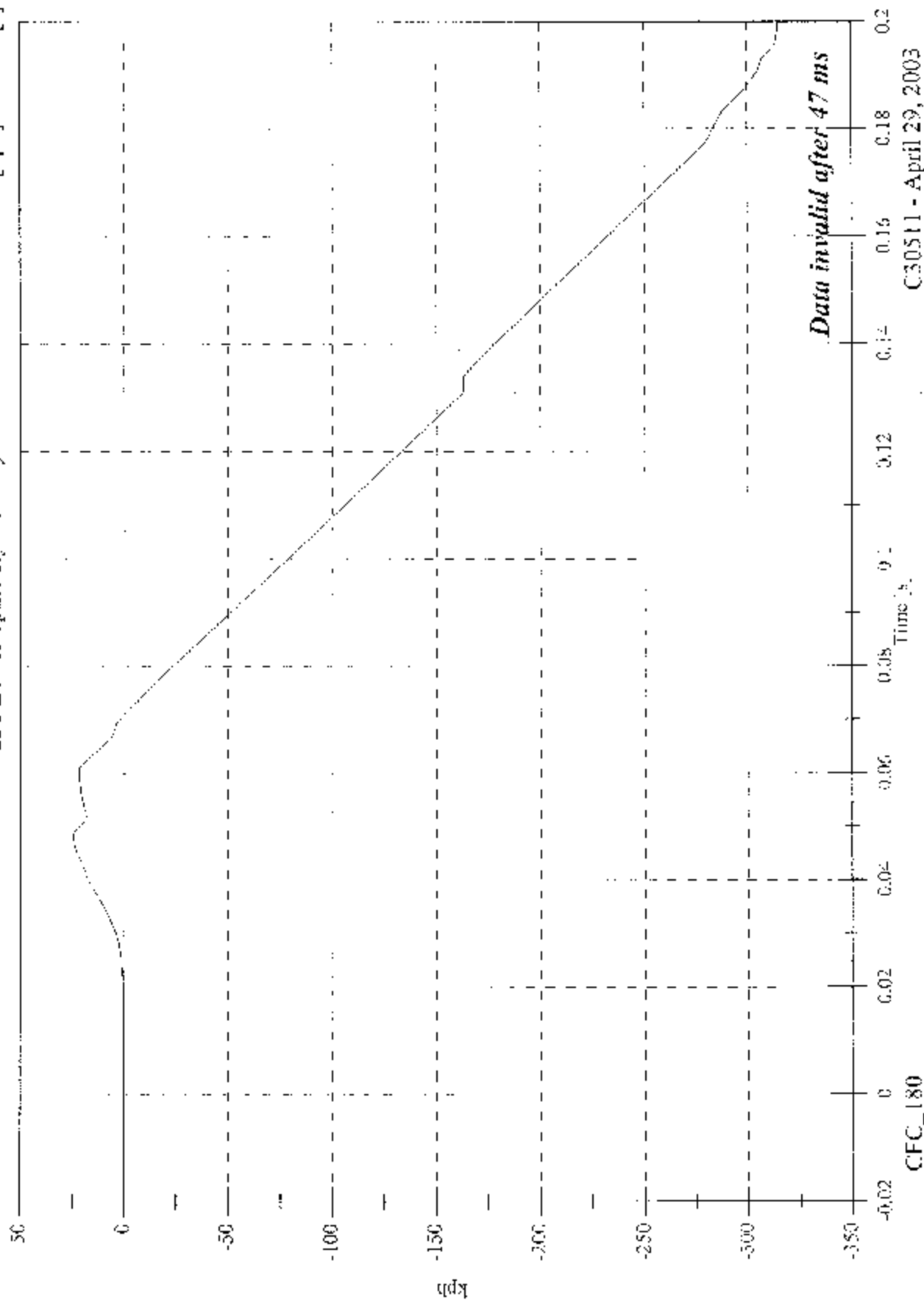
V2P1 Lower Spine Ry



FMVSS 214D Indican - 2003 Kia Sorento

Max: 24.5 [kph] at 0.048 [s]  
Min: -315.0 [kph] at 0.200 [s]

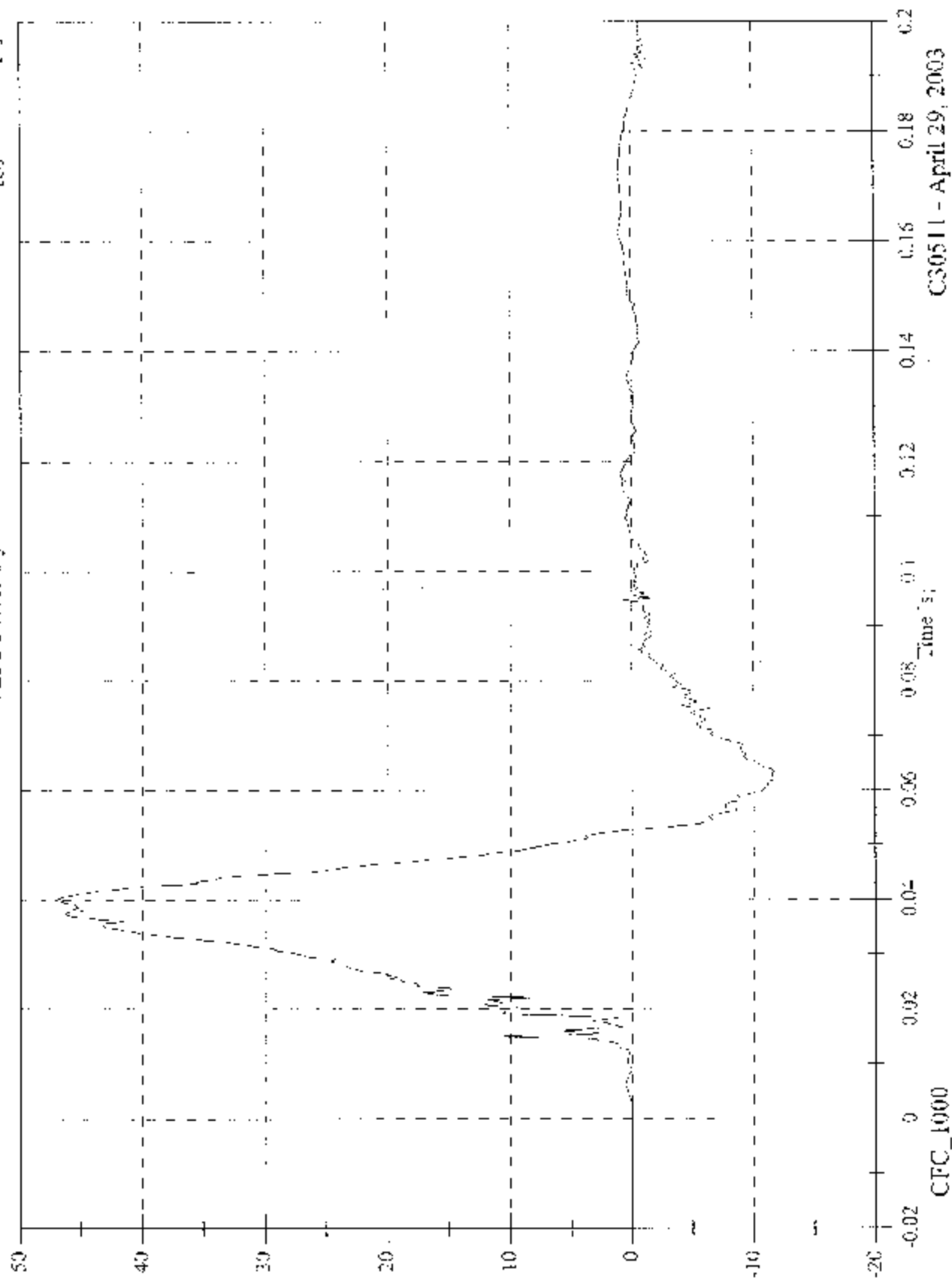
V2P1 Lower Spine Ry Velocity



FMVSS 214D Indicant - 2003 Kia Sorento

Max: 47.2 [g] at 0.040 [s]  
Min: -11.8 [g] at 0.062 [s]

V2P1 Pelvic Ry

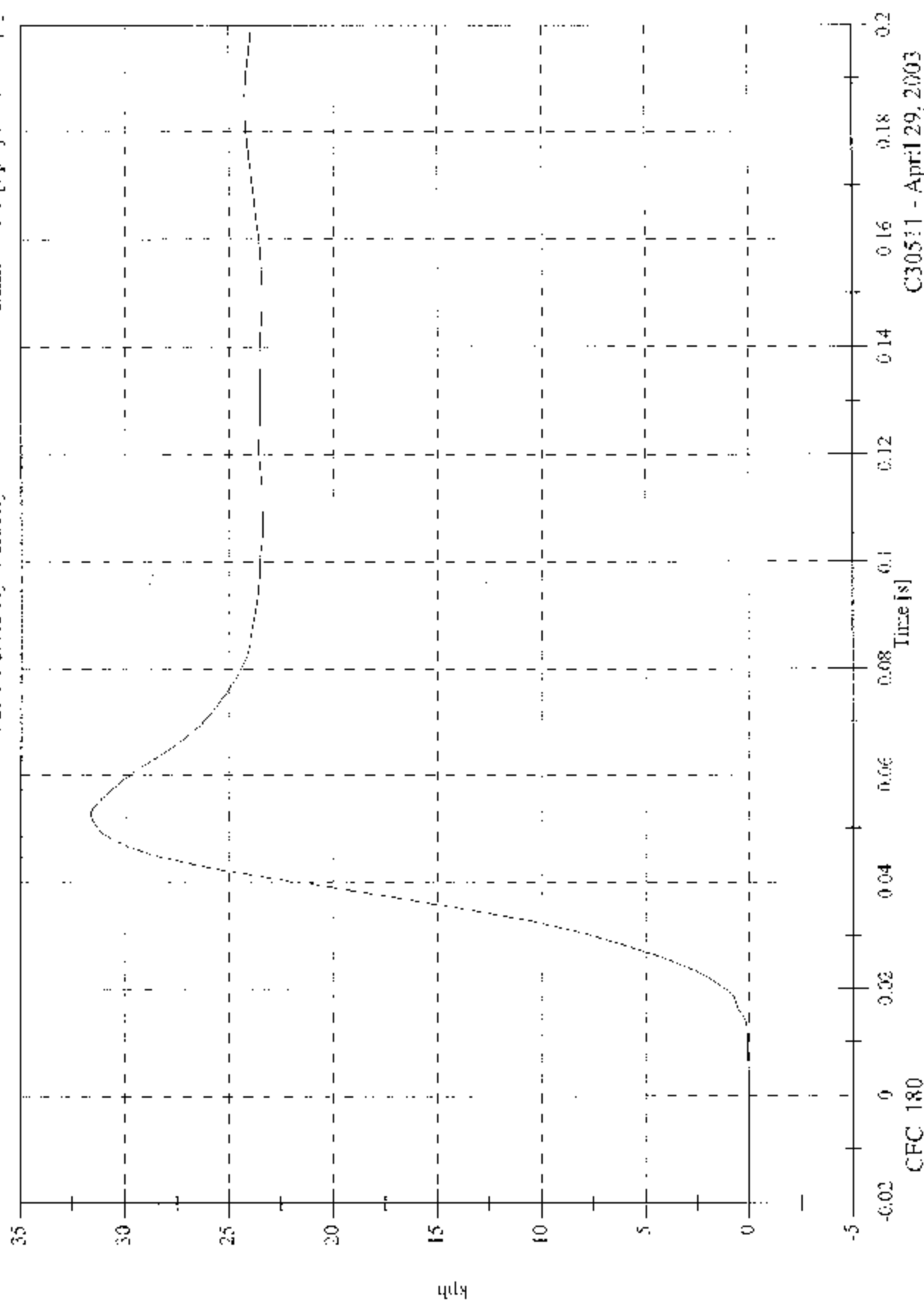


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 31.6 [kph] at 0.053 [s]  
Min: -0.0 [kph] at -0.020 [s]

V2P1 Pelvic Ry Velocity



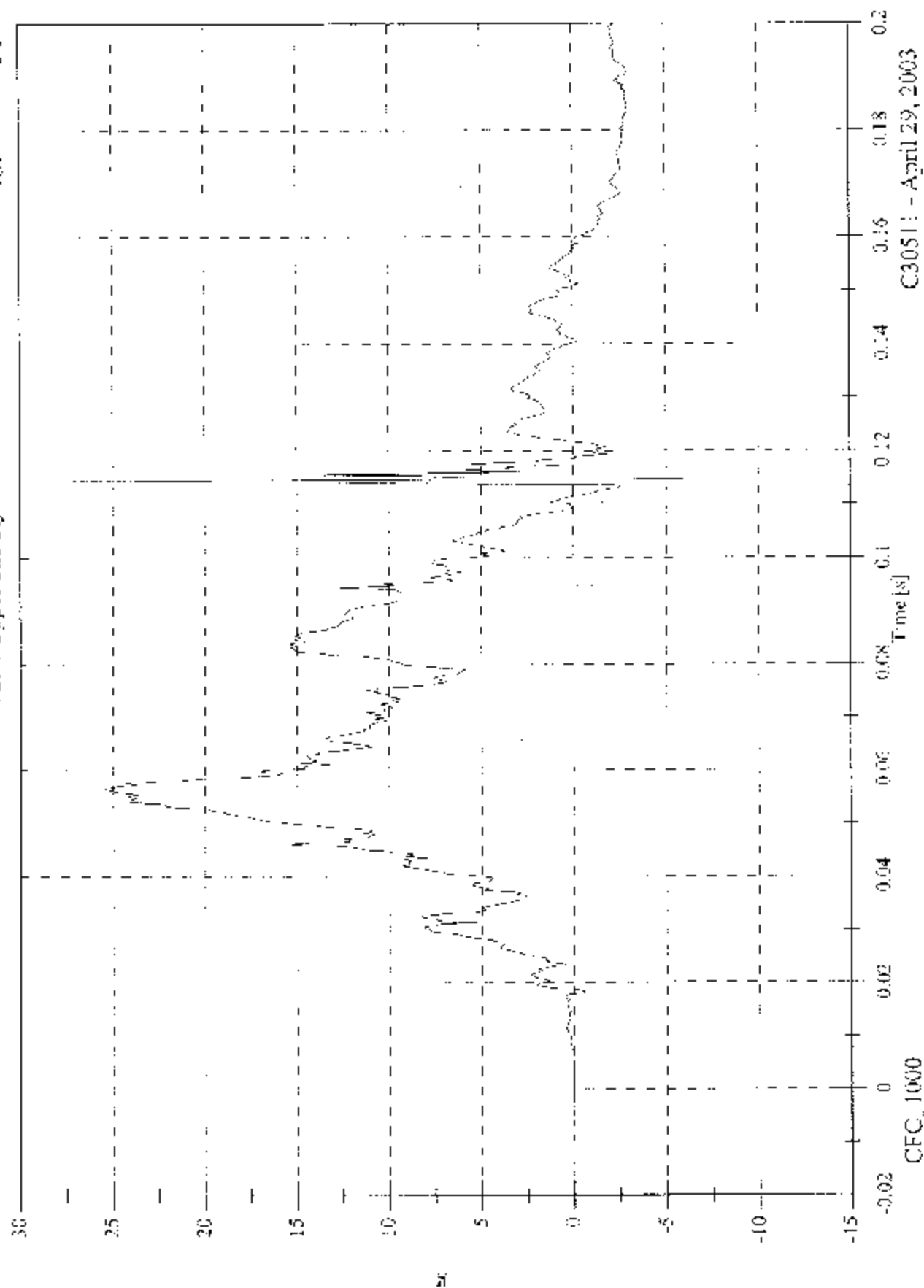
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 27.1 [g] at 0.114 [s]

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

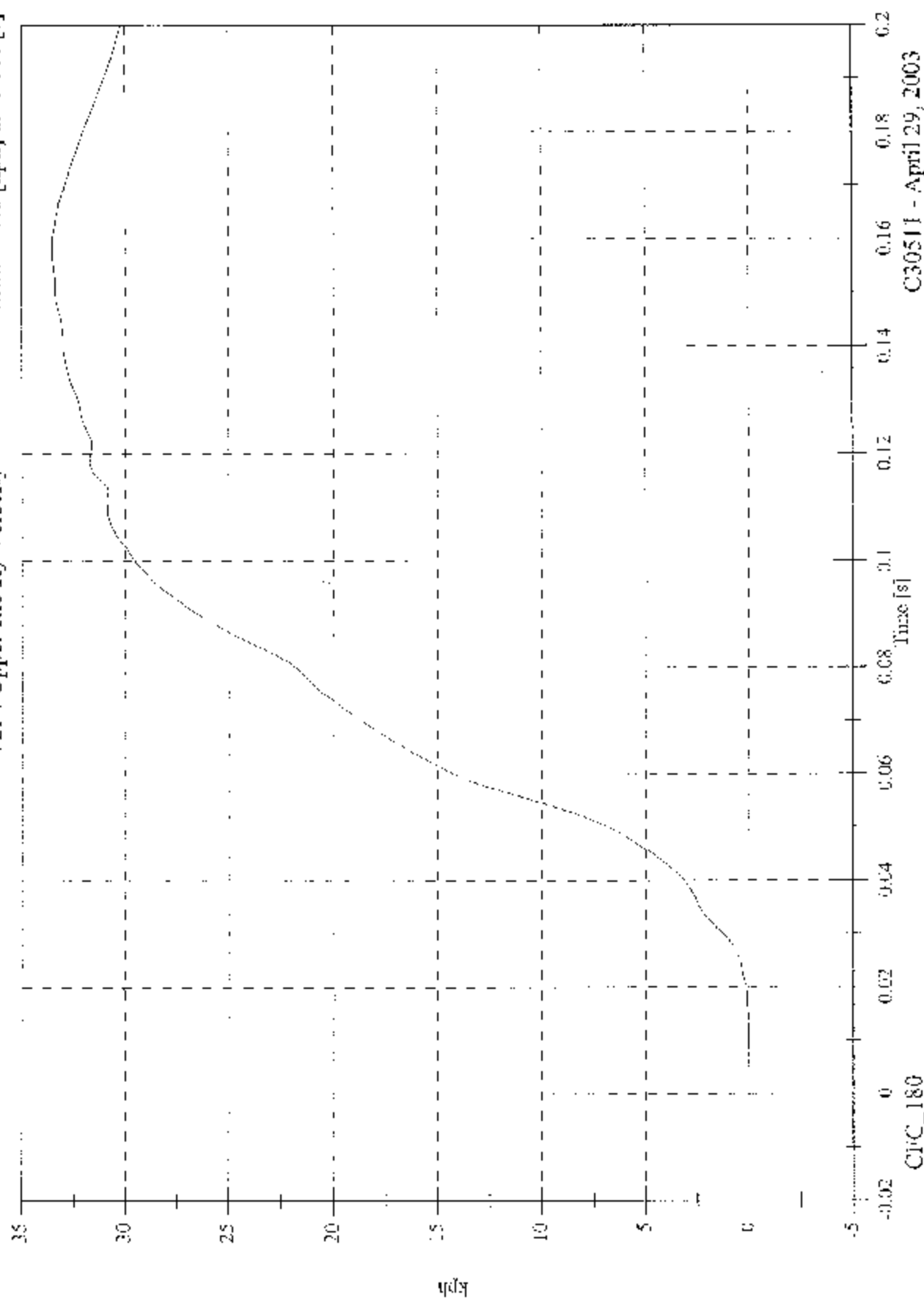
V2P4 Upper Rib Ry



FMVSS 214D Indictant - 2003 Kia Sorento

Max: 33.5 [kph] at 0.158 [s]  
Min: -0.0 [kph] at -0.018 [s]

V2P4 Upper Rib Ry Velocity



CJC\_180

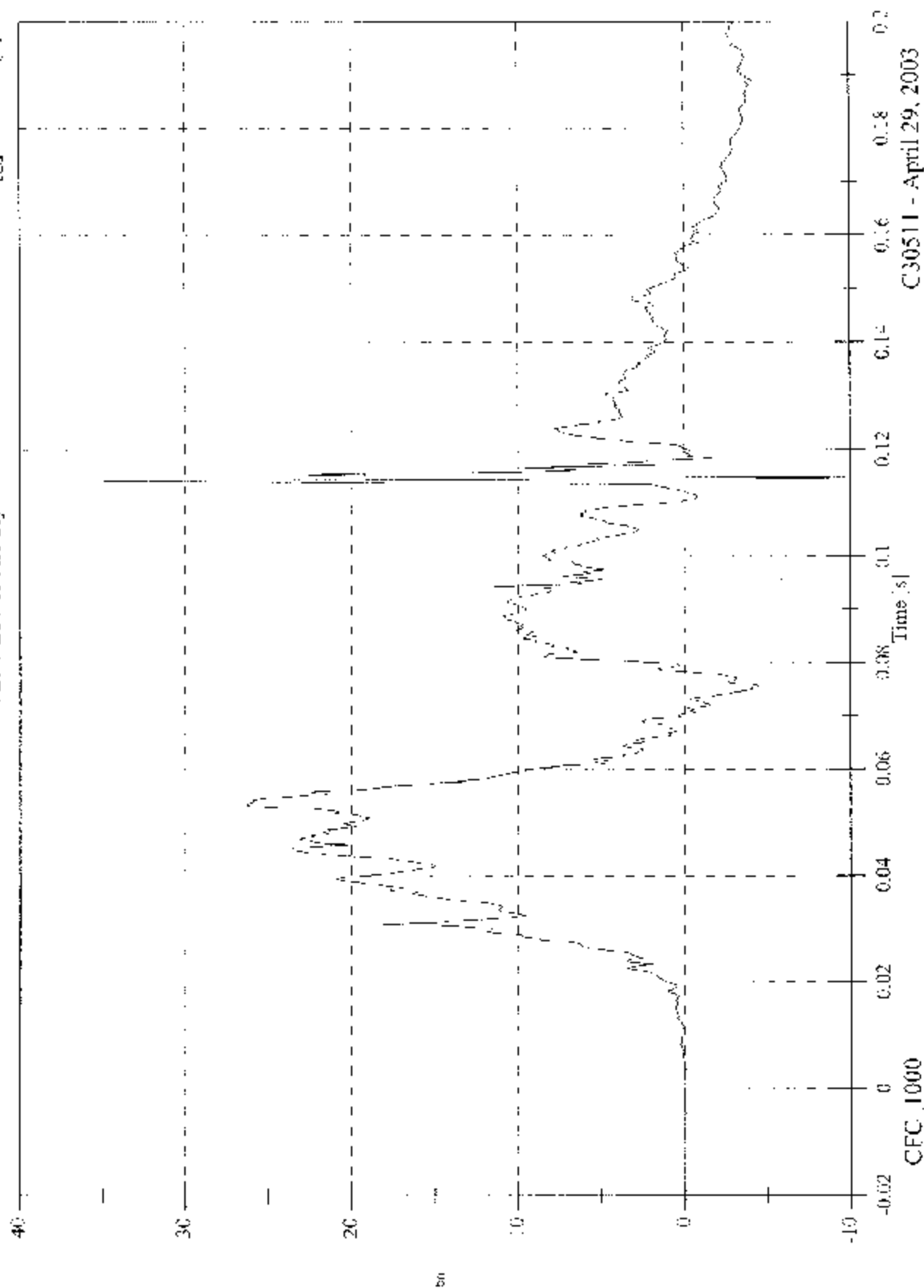
C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

Max: 36.6 [g] at 0.114 [s]

V2P4 Lower Rib Ry

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

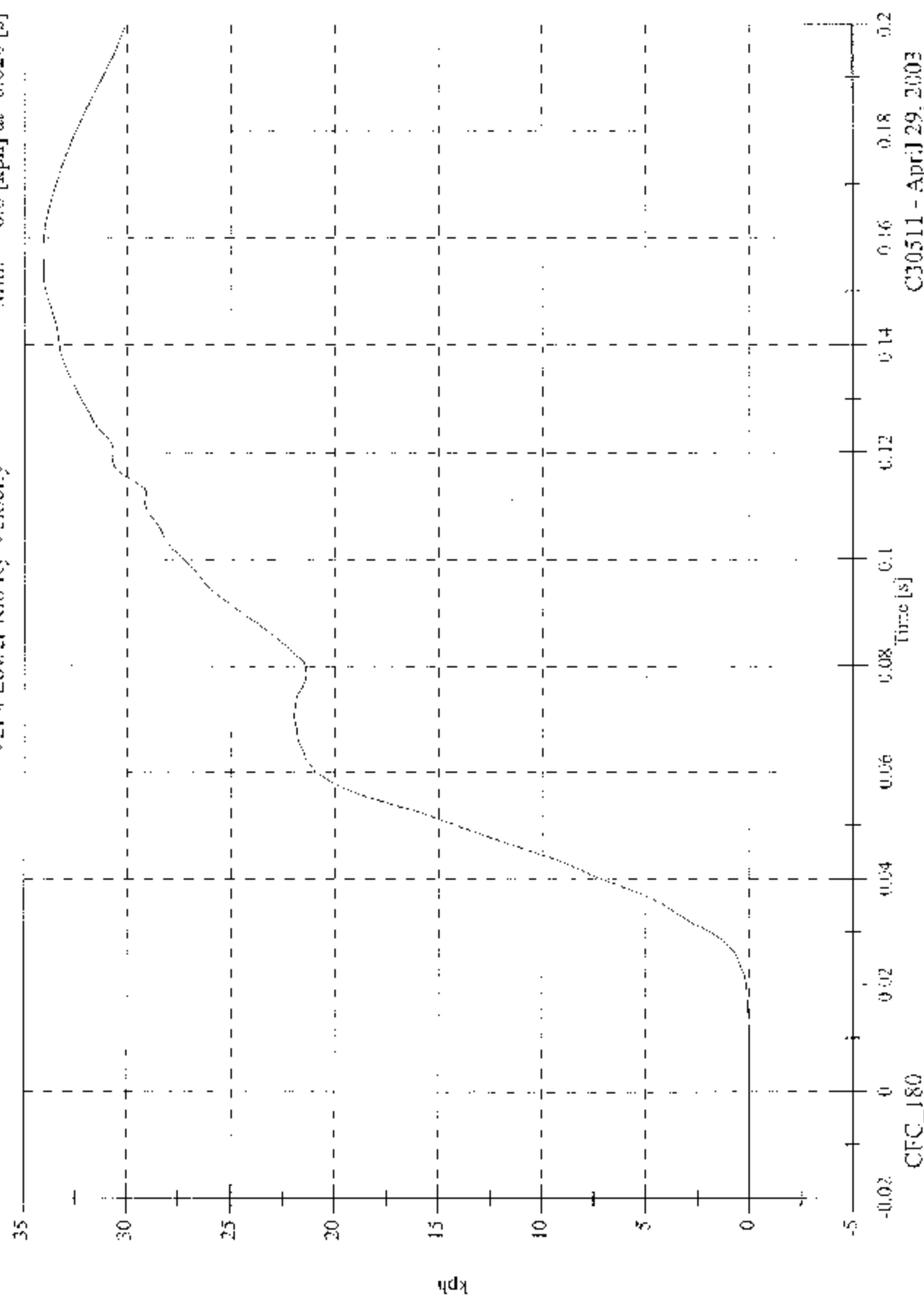




FMVSS 214D Inducant - 2003 Kia Sorento

Max: 34.1 [kph] at 0.158 [s]  
Min: -0.0 [kph] at -0.020 [s]

V2P4 Lower Rib Ry Velocity

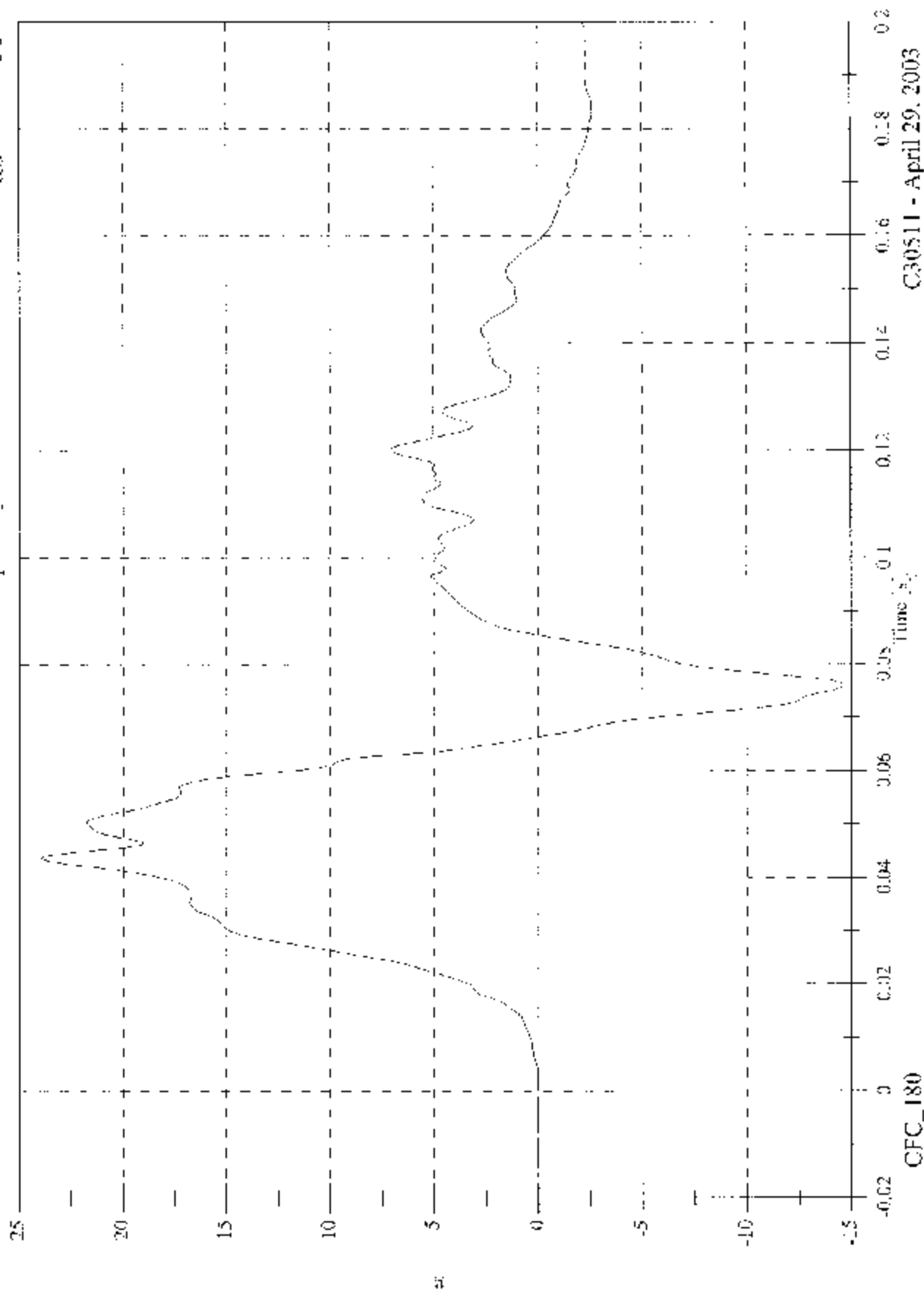


C30511 - April 29, 2003

# FMVSS 214D Indicant - 2003 Kia Sorento

Max: 23.9 [g] at 0.044 [s]  
Min: -14.6 [g] at 0.076 [s]

V2P4 Lower Spine Ry

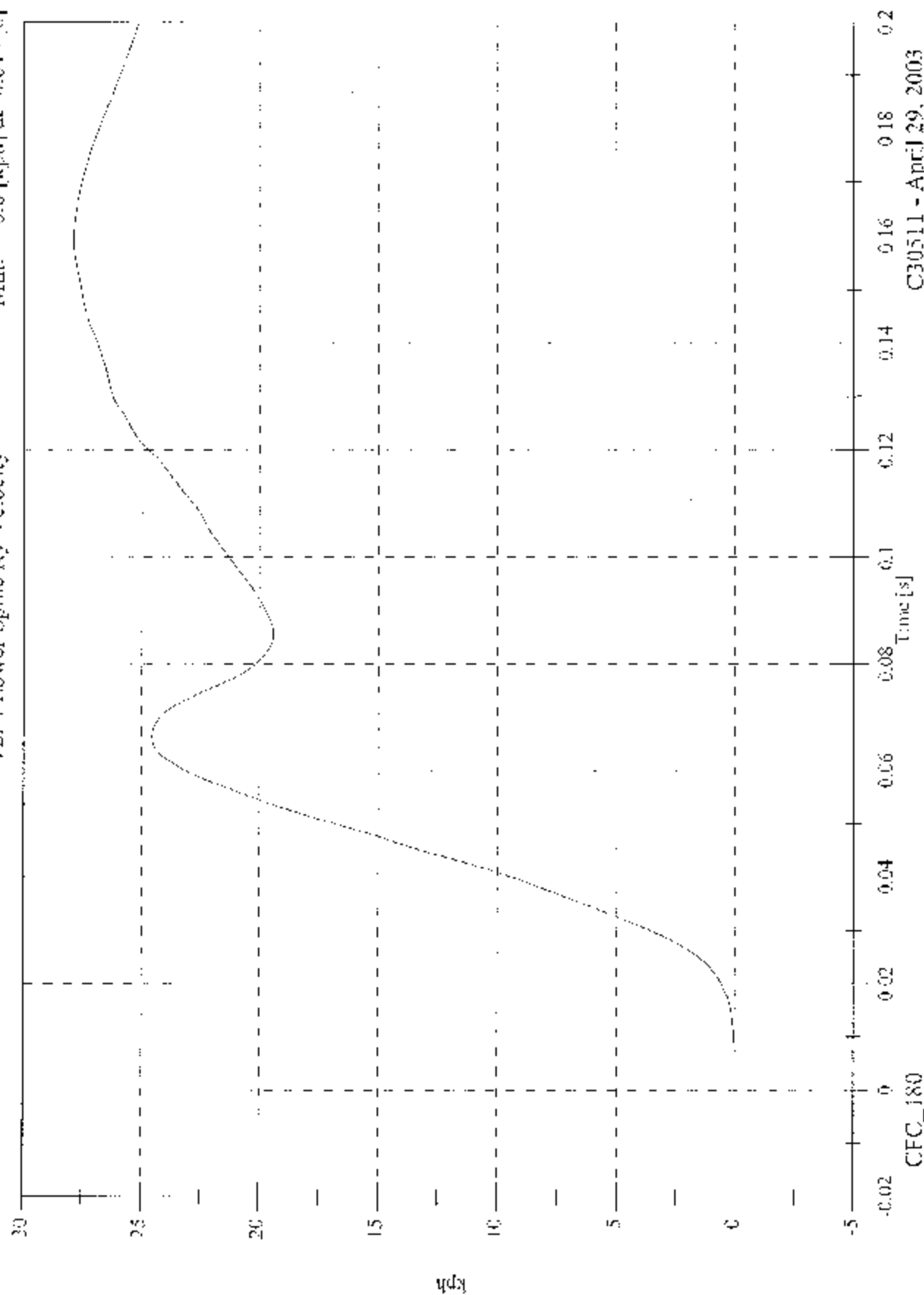


C30511 - April 29, 2003

FMVSS 214D Indident - 2003 Kia Sorento

Max: 27.9 [kph] at 0.159 [s]  
Min: -0.0 [kph] at -0.014 [s]

V2P4 Lower Spine Ry Velocity



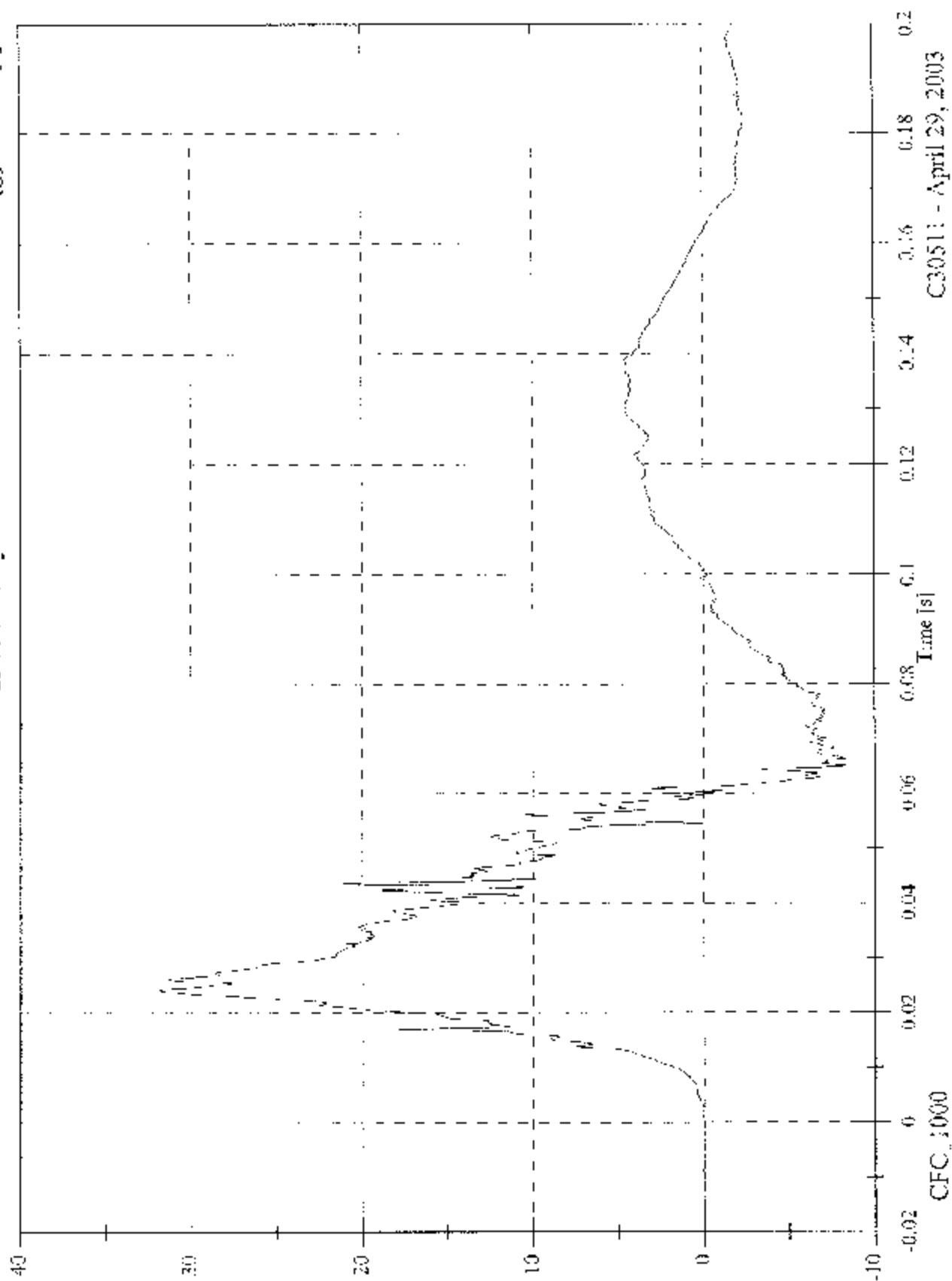
CFC\_180

C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 31.8 [g] at 0.024 [s]  
Min: -8.4 [g] at 0.065 [s]

V2P4 Pelvic Ry

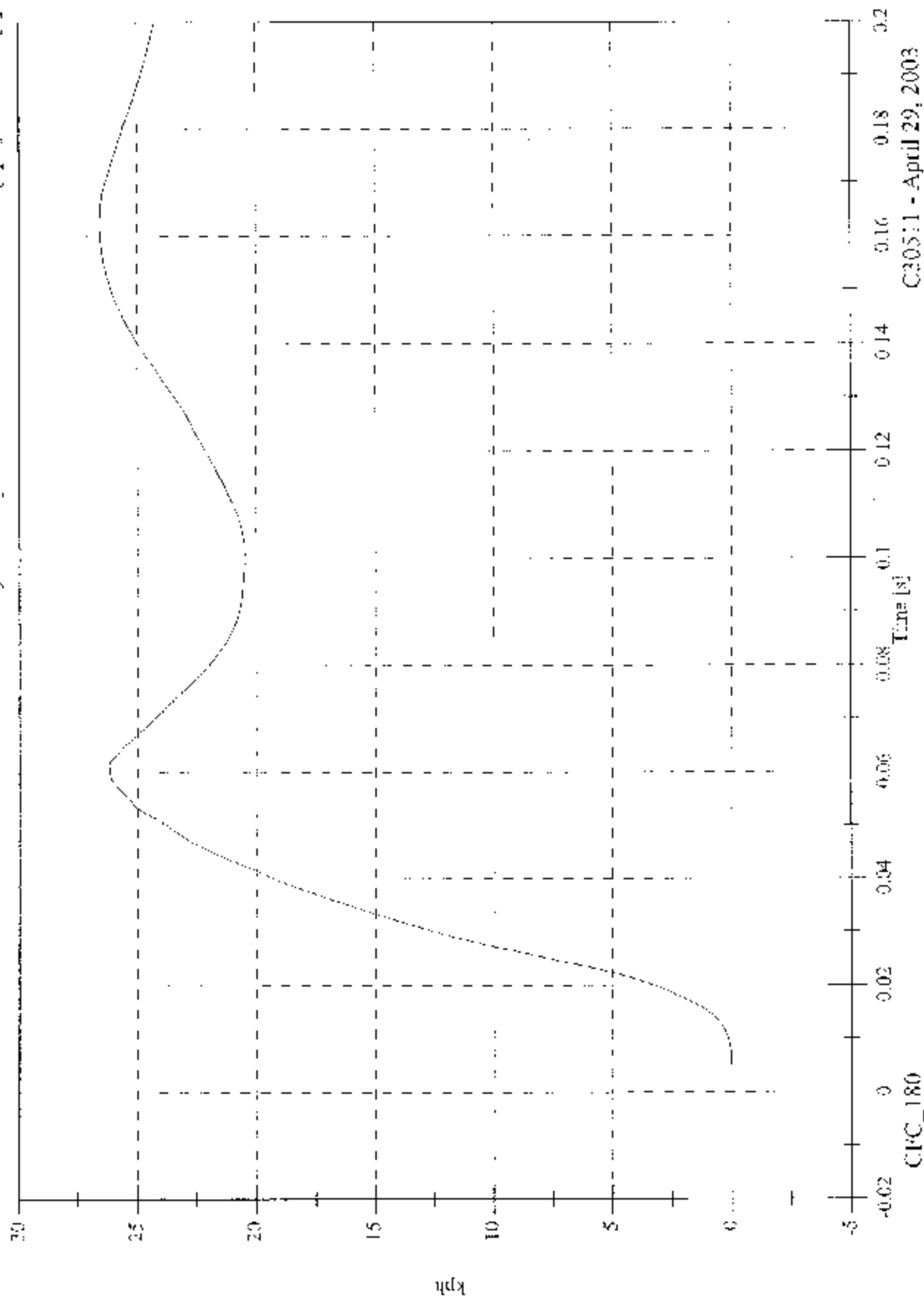


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 26.6 [kph] at 0.162 [s]  
Min: -0.0 [kph] at -0.020 [s]

V2P4 Pelvic Ry Velocity

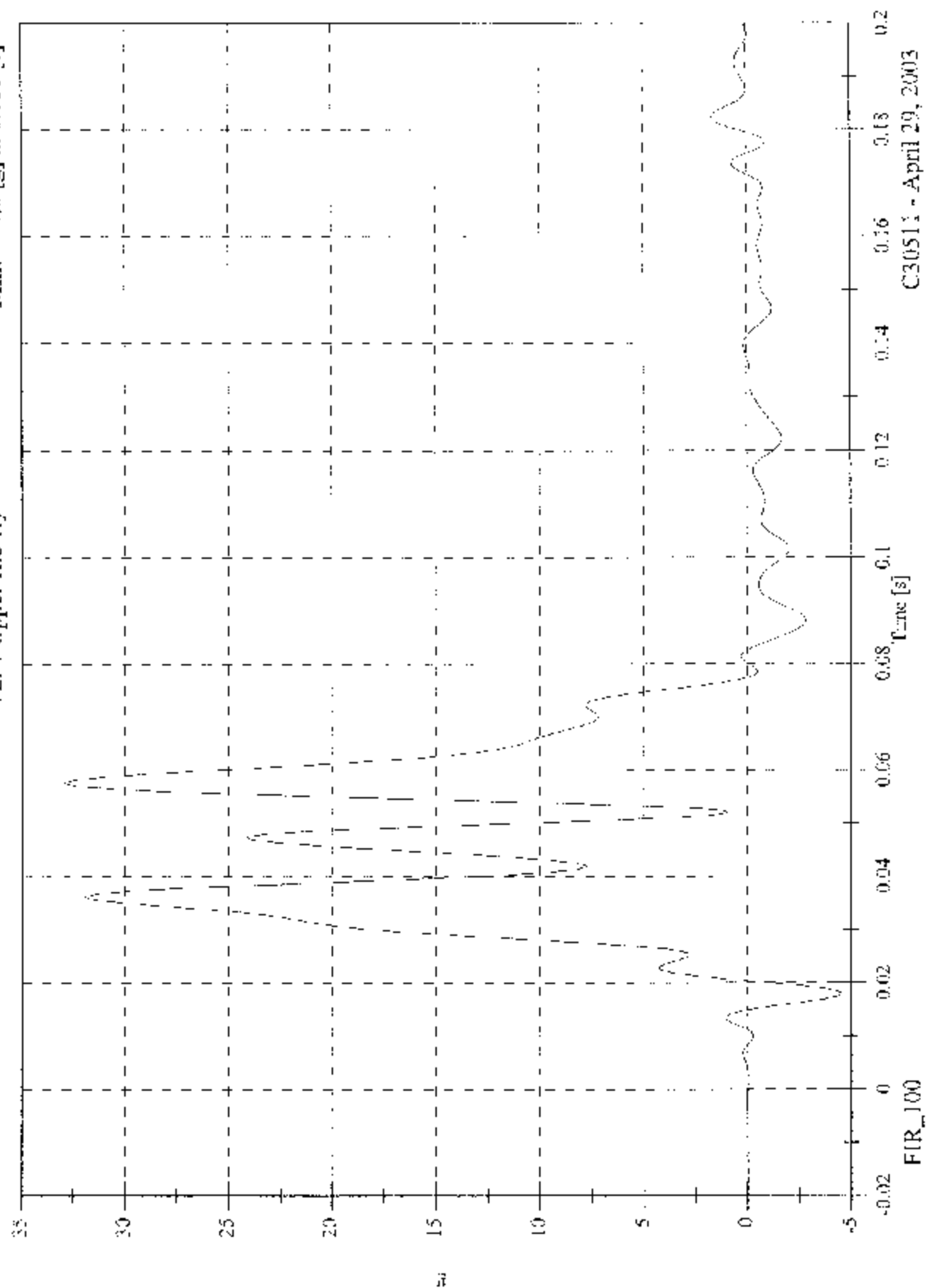


C305:1 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 33.1 [g] at 0.057 [s]  
Min: -4.6 [g] at 0.018 [s]

V2P1 Upper Rib Ry



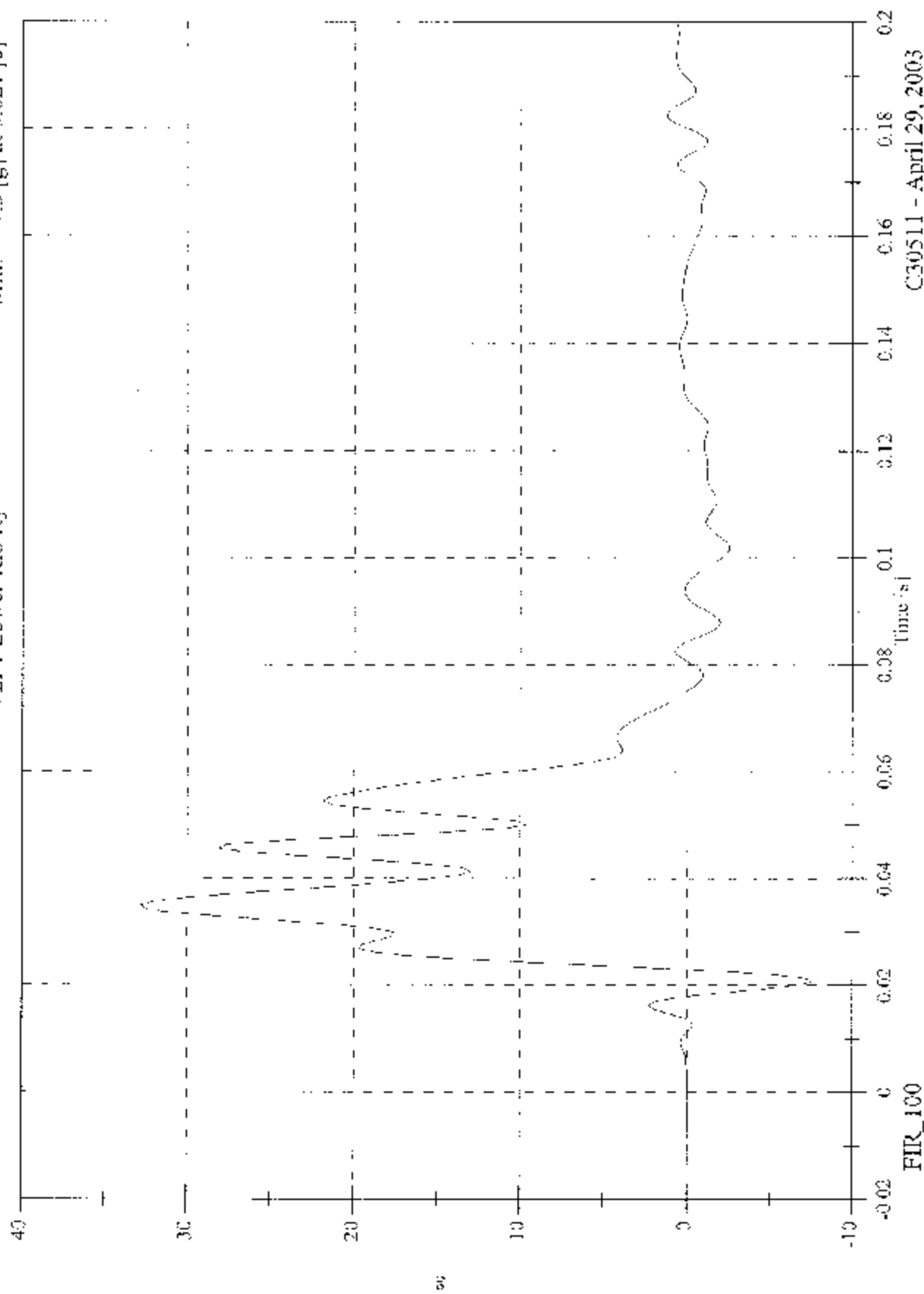
C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 32.8 [g] at 0.035 [s]

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

V2P1 Lower Rib Ry

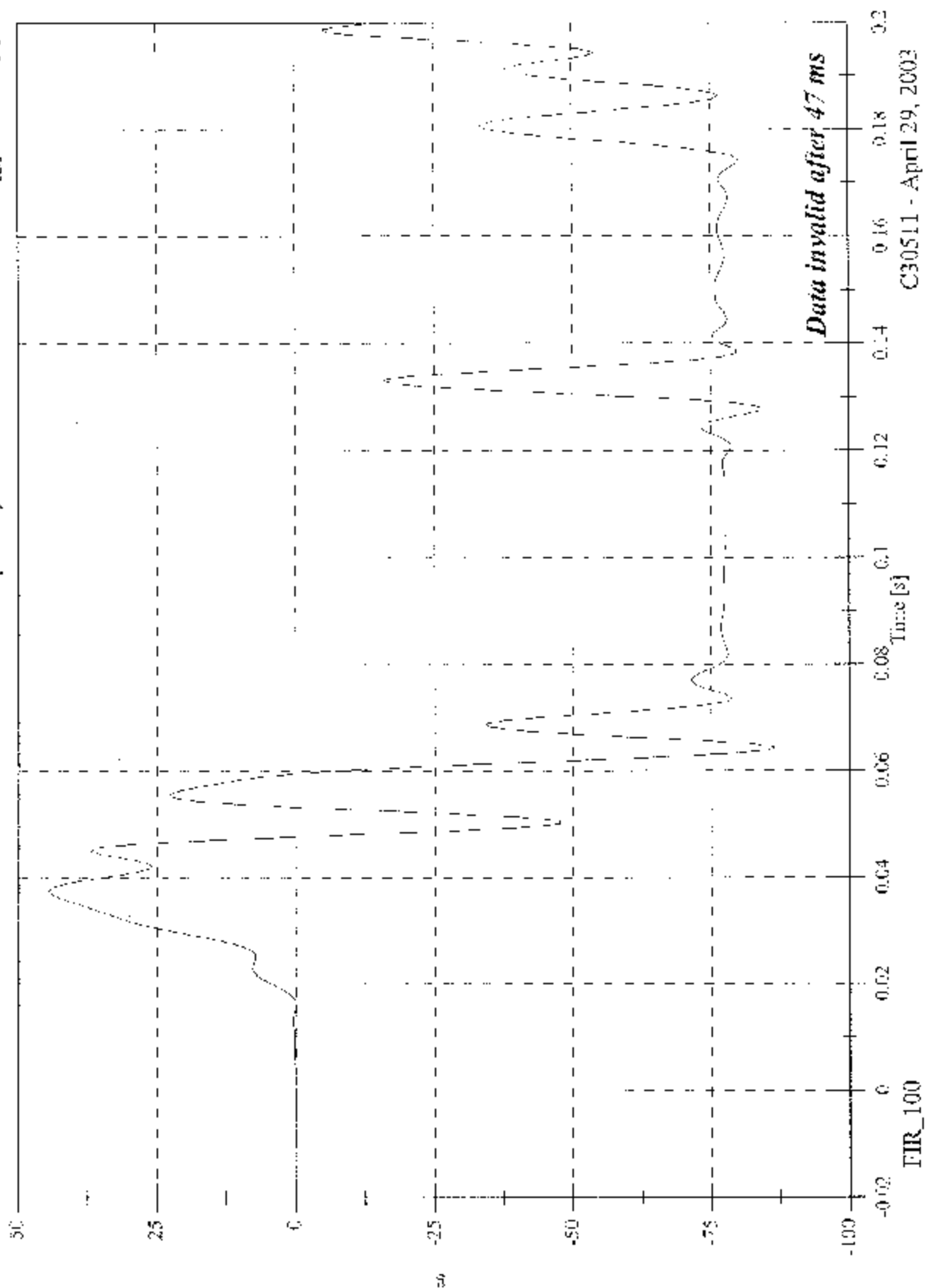


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

V2PI Lower Spine Ky

Max: 44.6 [g] at 0.037 [s]  
Min: -86.5 [g] at 0.064 [s]



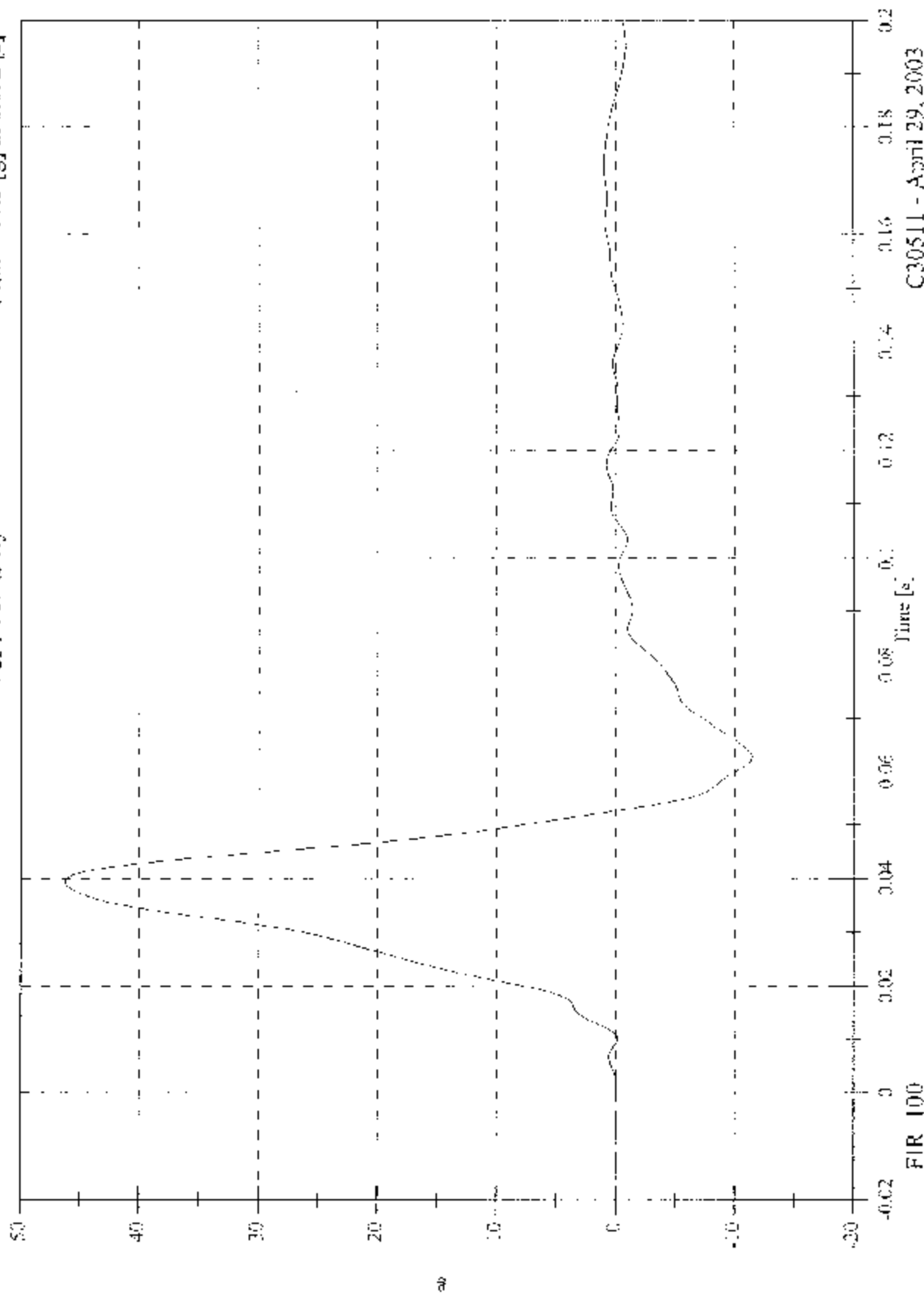
C30511 - April 29, 2003



FMVSS 214D Indicant - 2003 Kia Sorento

V2P] Pelvic Ry

Max: 46.3 [g] at 0.039 [s]  
Min: -11.5 [g] at 0.062 [s]

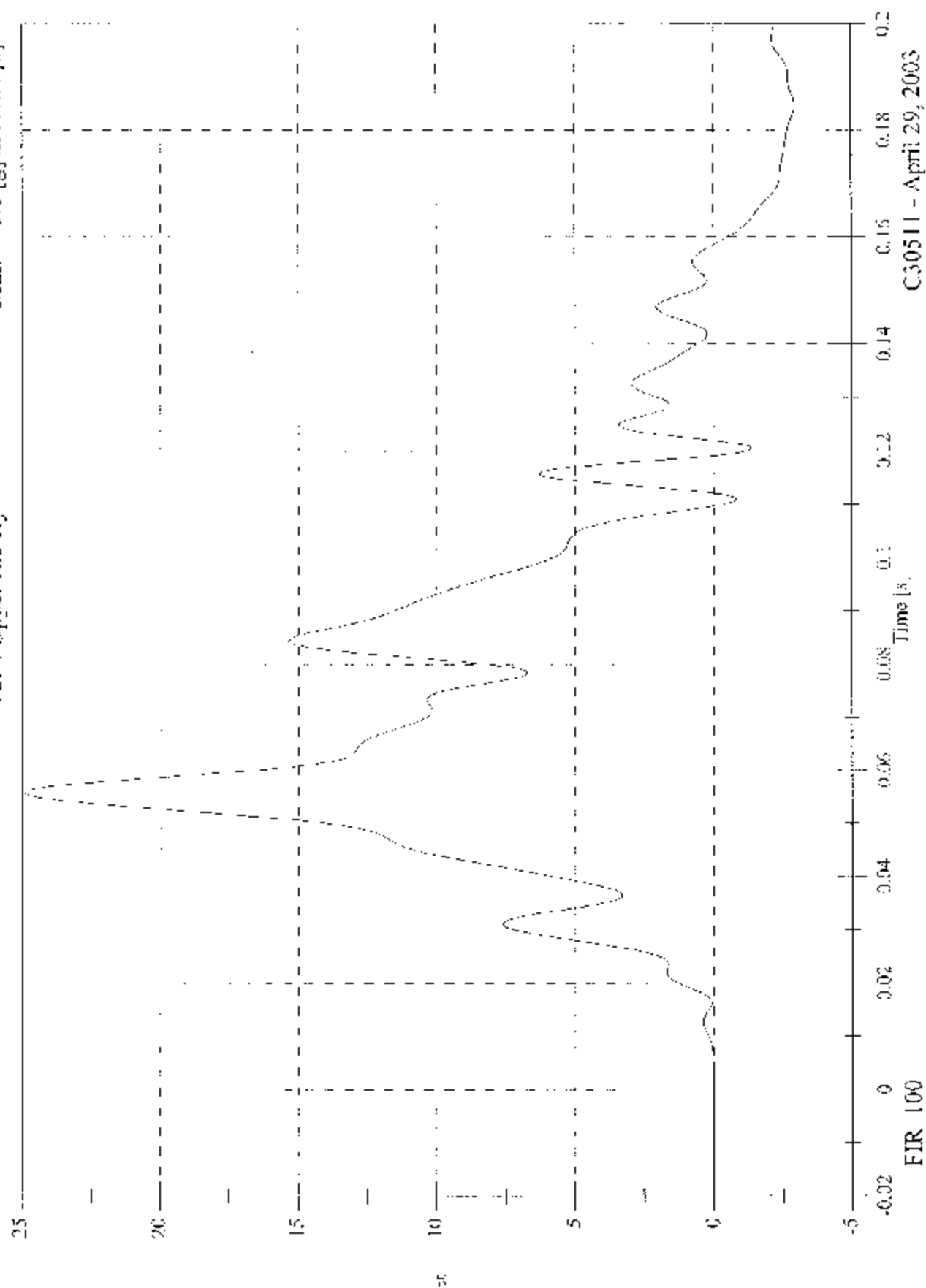


C30511 - April 29, 2003

FMVSS 214D Inducant - 2003 Kia Sorento

V2P4 Upper Rib Ry

Max: 24.9 [g] at 0.056 [s]  
Min: -3.0 [g] at 0.184 [s]



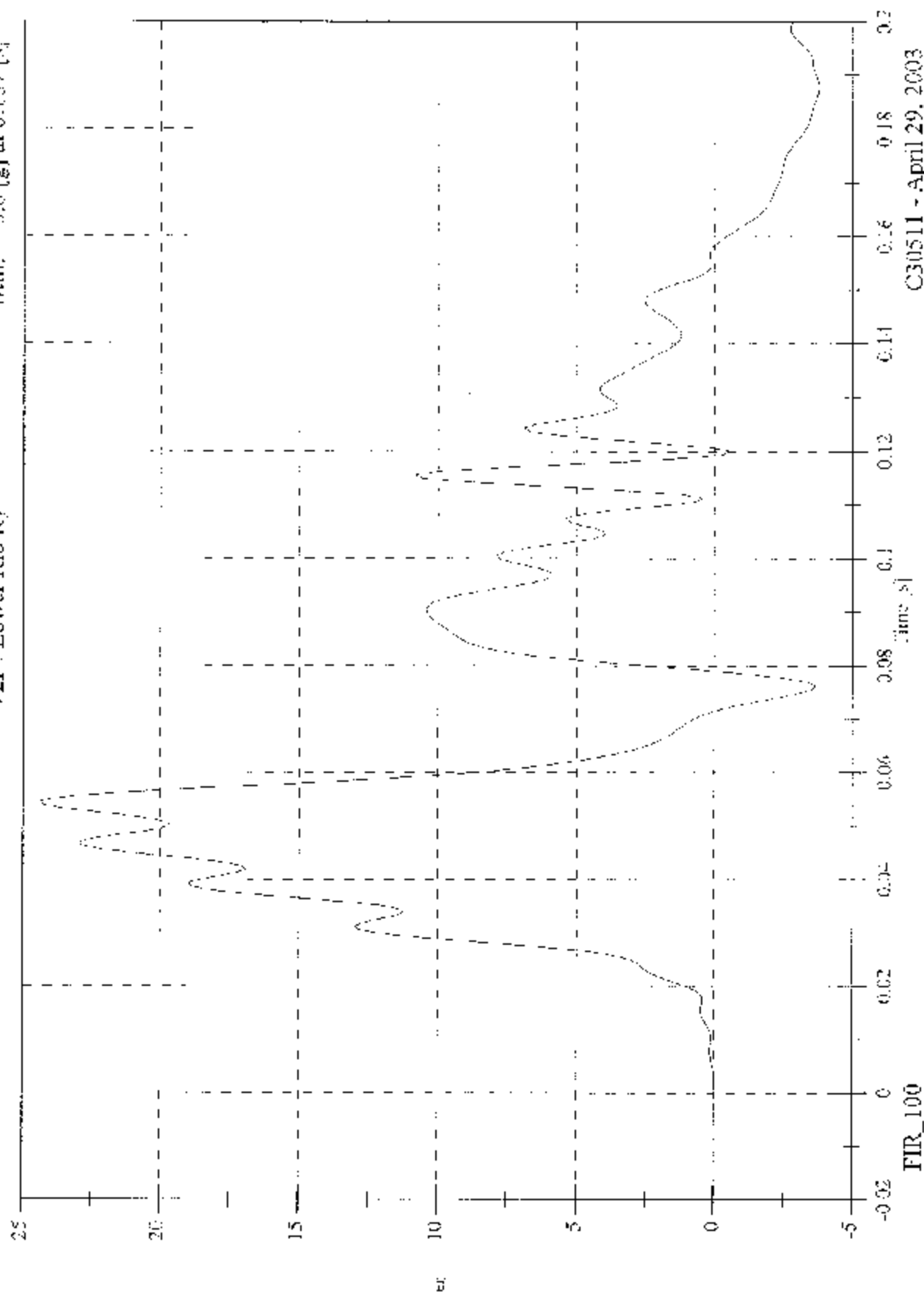
C30511 - April 29, 2003

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]

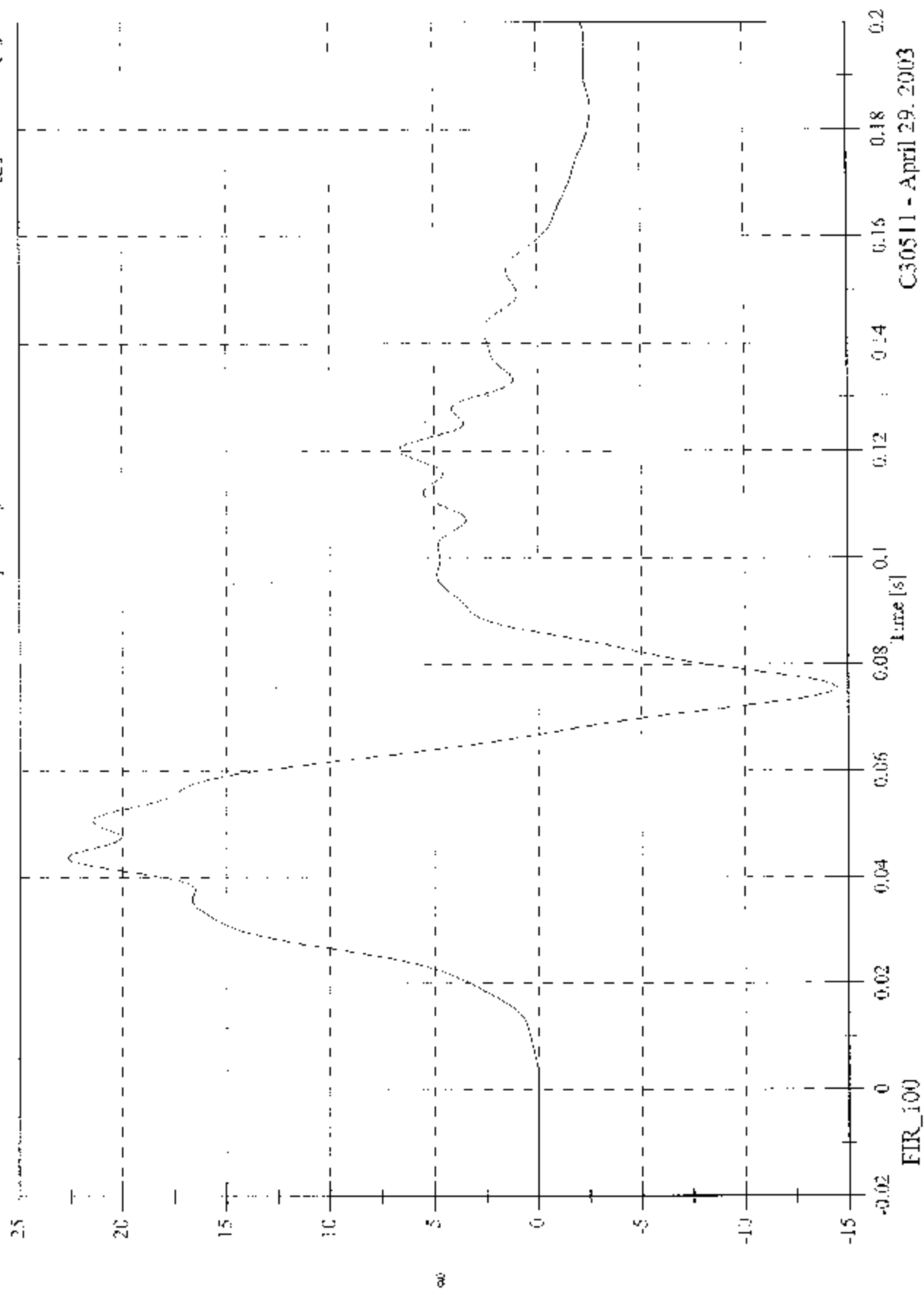


C30511 - April 29, 2003

FMVSS 214D Indicant - 2003 Kia Sorento

Max: 22.7 [g] at 0.044 [s]  
Min: -14.5 [g] at 0.076 [s]

V2P4 Lower Spine Ry

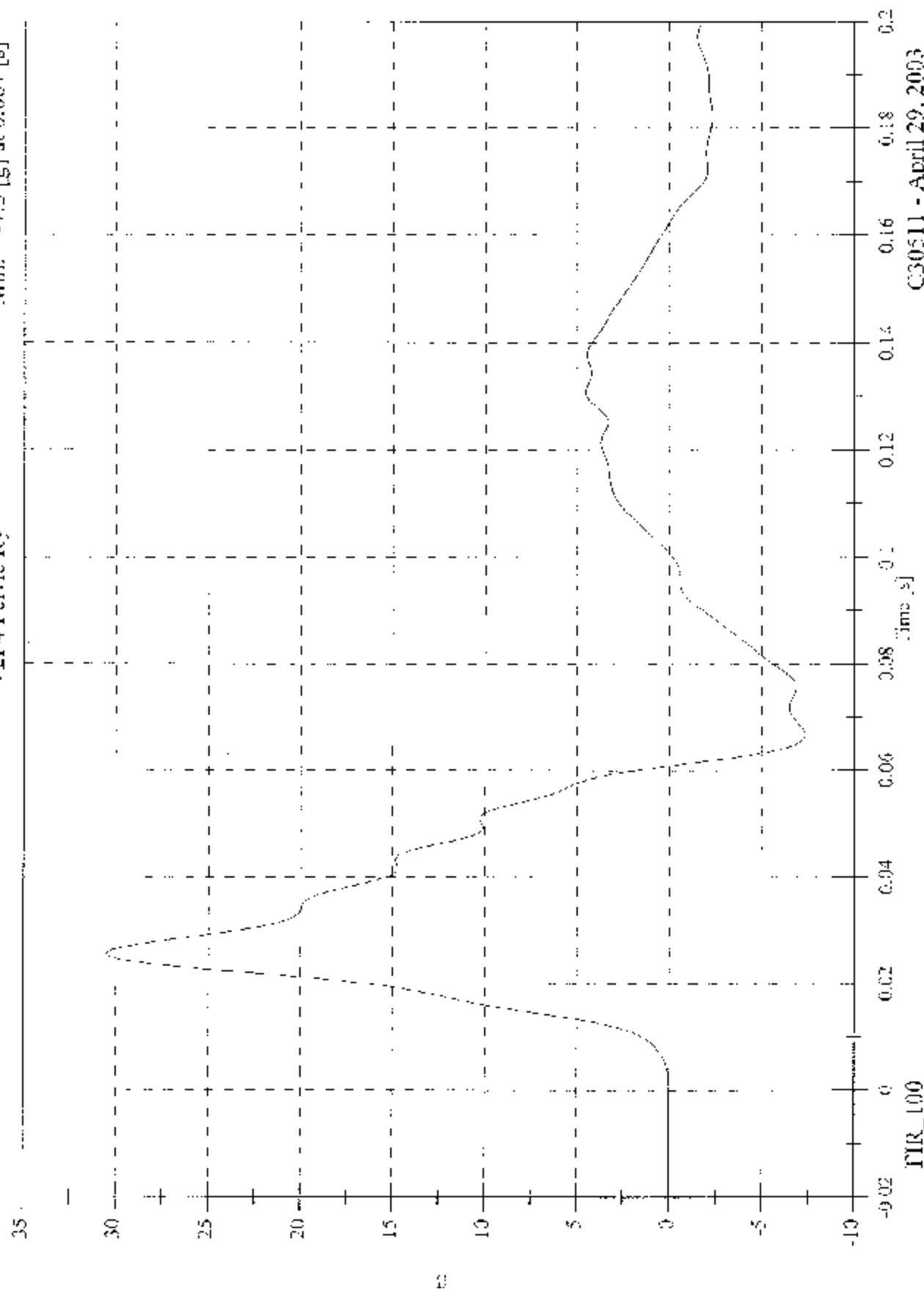


C30511 - April 29, 2003

FMVSS 214D Indicate - 2003 Kia Sorento

V2P4 Pelvic Ry

Max: 30.5 [g] at 0.026 [s]  
Min: -7.5 [g] at 0.067 [s]



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:  
Laboratory Technician:

1.1, 1.3  
B. Swiecicki

| TEST PARAMETER                     | SPECIFICATION | SID H3 015<br>NO.: |              | SID H3 016<br>NO.: |              |
|------------------------------------|---------------|--------------------|--------------|--------------------|--------------|
|                                    |               | PRE<br>TEST        | POST<br>TEST | PRE<br>TEST        | POST<br>TEST |
| SH- Seater 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)        | 729 - 741     | 739                | 739          | 739                | 739          |
| 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)                    | 31 - 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)                       | 10 - 60       | 13.04              | 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          |
| RI- 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

SHD 413 Serial No.: 015 Sequential Test Number: 11  
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              | FORCE (N)         | 836 - 1125    | 997.8        |
| 3.05 m/s              | DISPLACEMENT (mm) | 30 - 33       | 32.2         |
| VELOCITY              | FORCE (N)         | 1730 - 2099   | 1909.7       |
| 4.27 m/s              | DISPLACEMENT (mm) | 32 - 37       | 35.0         |
| VELOCITY              | FORCE (N)         | 3741 - 4448   | 4336.4       |
| 6.10 m/s              | 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:

015SI.04-23-03

### TEST RESULTS

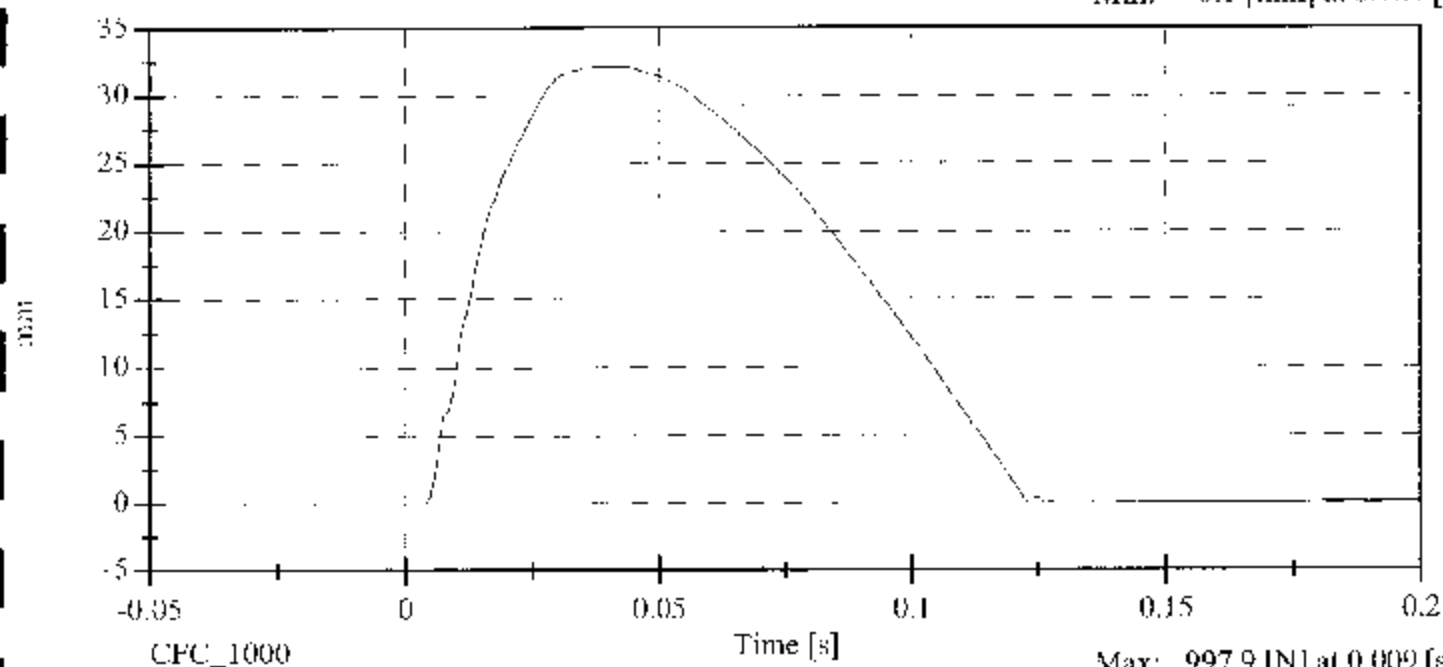
| TEST CONDITION   | PARAMETERS       | RESULTS  | STATUS |
|------------------|------------------|----------|--------|
| Lab Temperature: | 18.9-25.5 C      | 21.1 C   | Passed |
| Lab Humidity:    | 10-70 %          | 35.00 %  | Passed |
| Displacement:    | 30.00-35.00 mm   | 32.18 mm | Passed |
| 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]

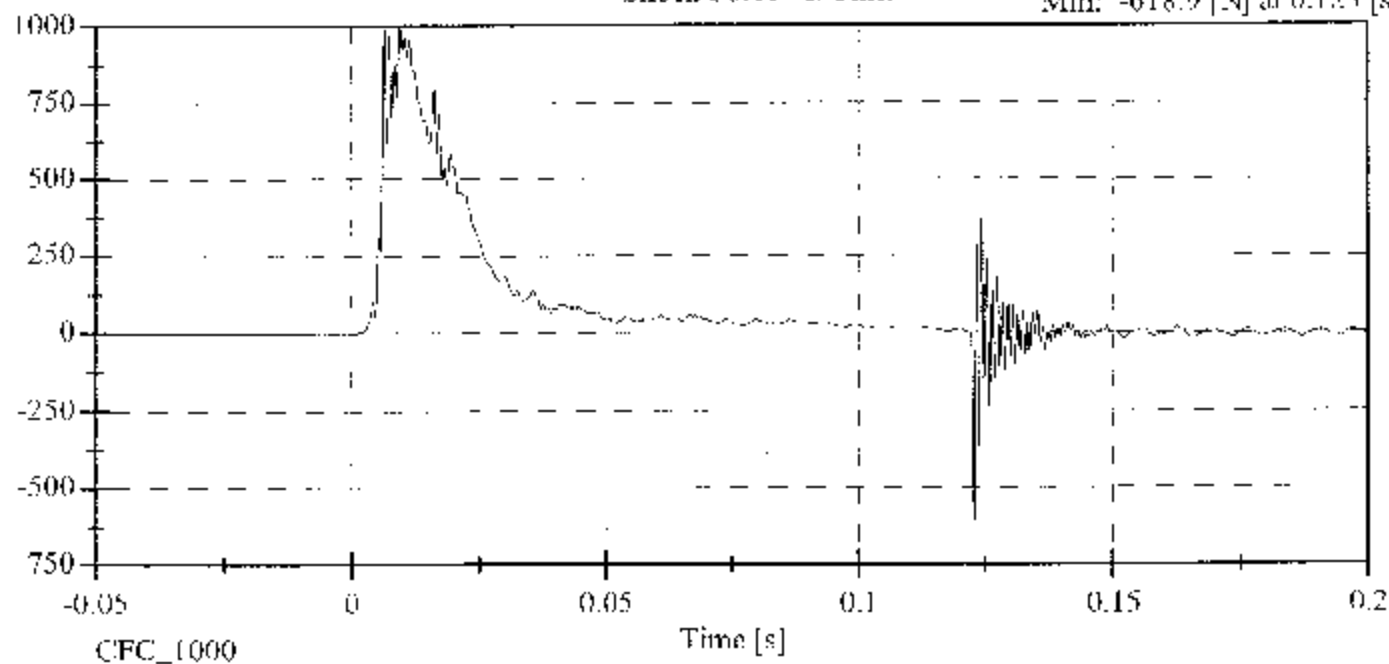
Min: -0.1 [mm] at 0.124 [s]



Shock Force vs. Time

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-----

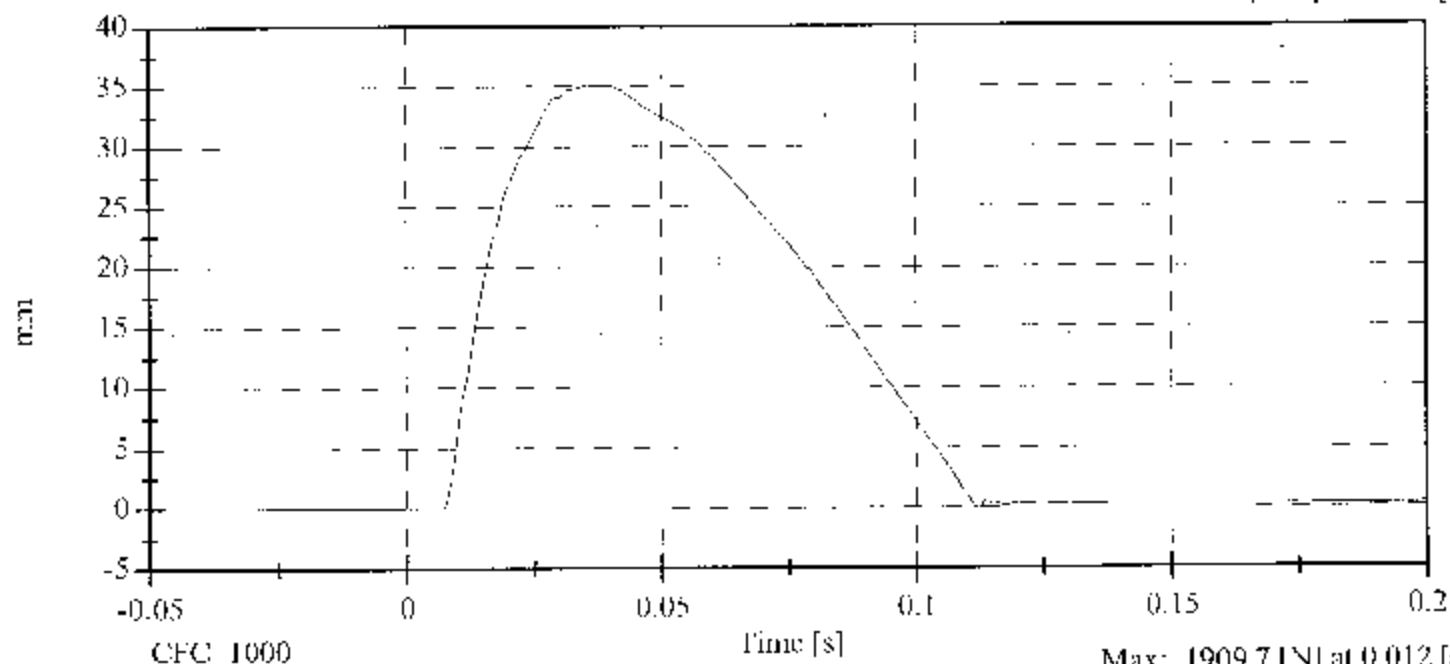
| TEST CONDITION   | PARAMETERS        | RESULTS   | STATUS |
|------------------|-------------------|-----------|--------|
| Lab Temperature: | 18.9-25.5 C       | 21.1 C    | Passed |
| Lab Humidity:    | 10-70 %           | 35.00 %   | Passed |
| Displacement:    | 32.00-37.00 mm    | 35.02 mm  | 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]

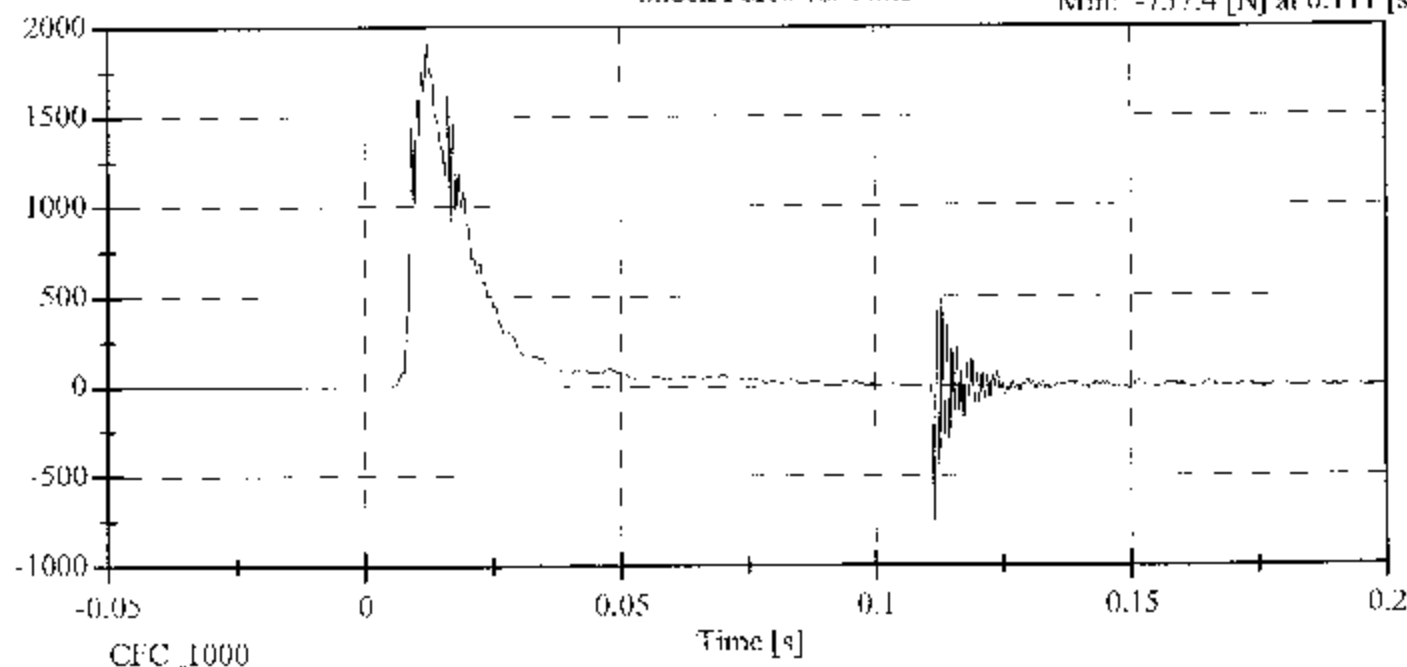
Min: -0.1 [mm] at 0.112 [s]



Shock Force vs. Time

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

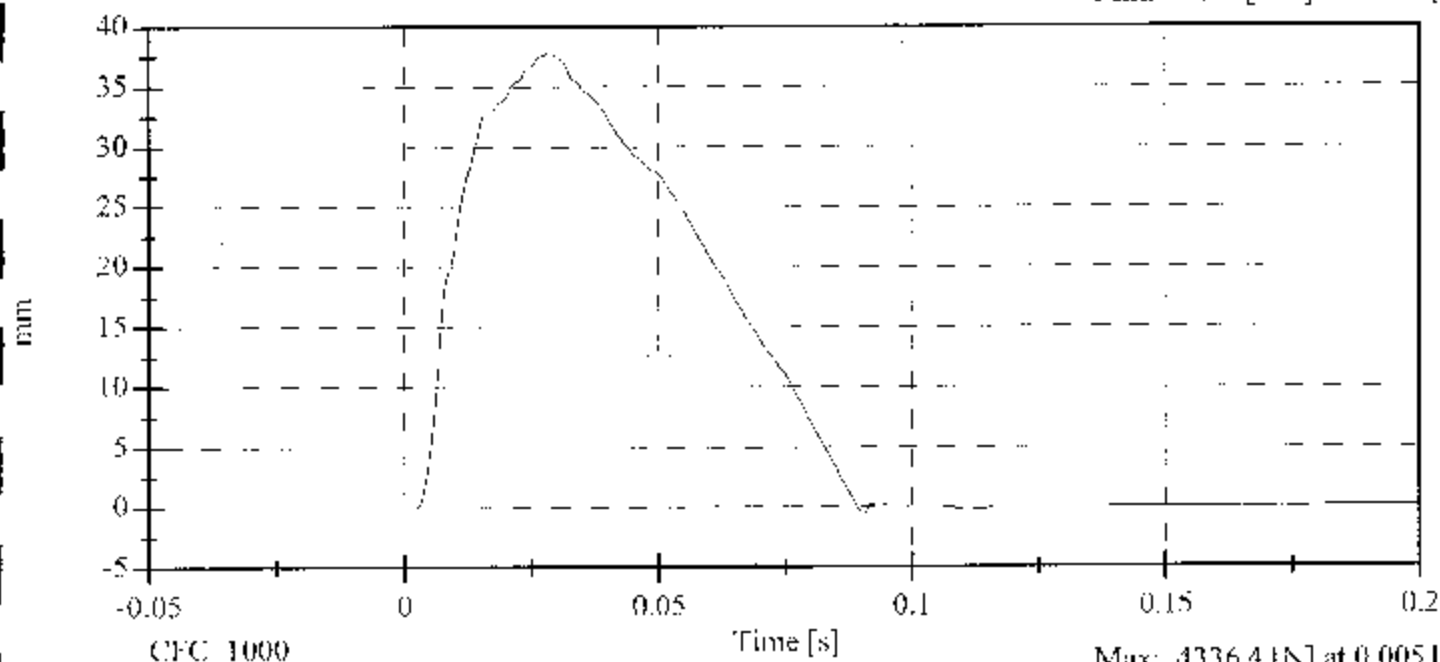
| TEST CONDITION   | PARAMETERS        | RESULTS   | STATUS |
|------------------|-------------------|-----------|--------|
| Lab Temperature: | 18.9-25.5 C       | 21.1 C    | Passed |
| Lab Humidity:    | 10-70 %           | 40.00 %   | Passed |
| Displacement:    | 33.00-40.00 mm    | 37.86 mm  | 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]

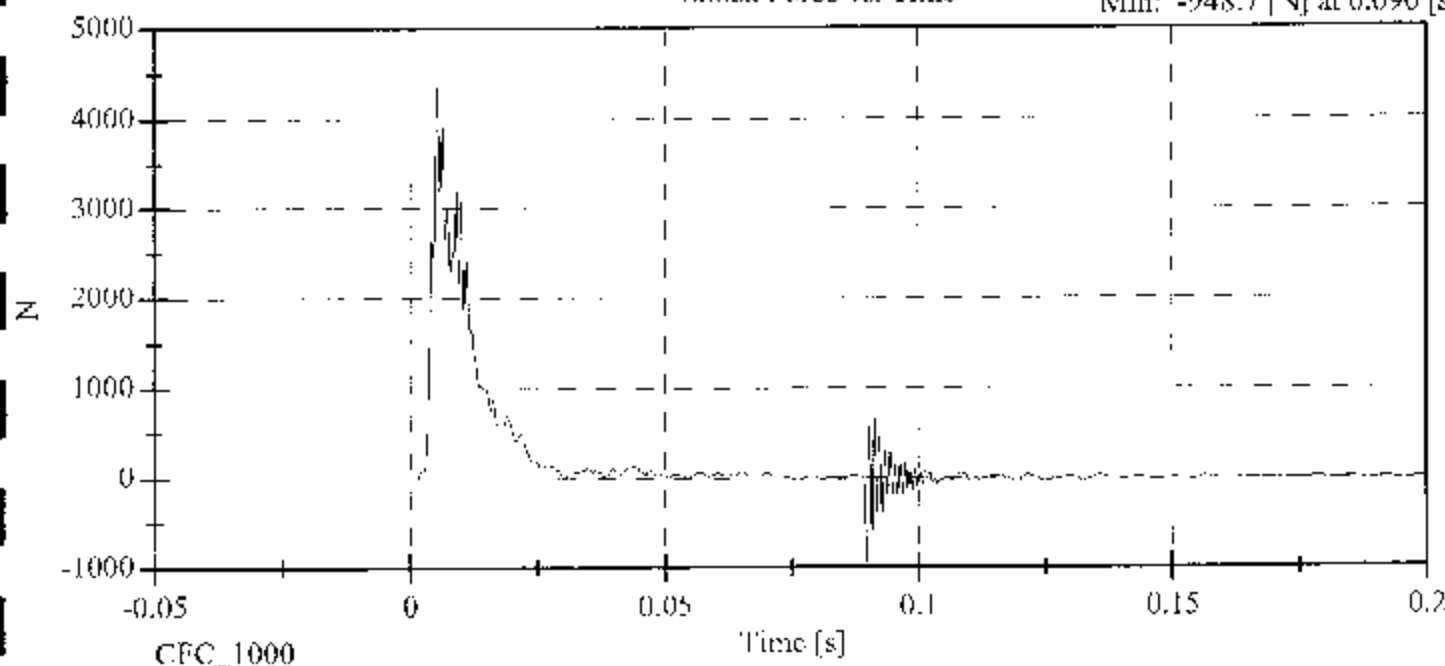
Min: -0.5 [mm] at 0.091 [s]



Shock Force vs. Time

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

STD H3 Serial No.: 015

Sequential Test Number:

1

Date: April 28, 2003

Laboratory Technician:

R. Swiecicki

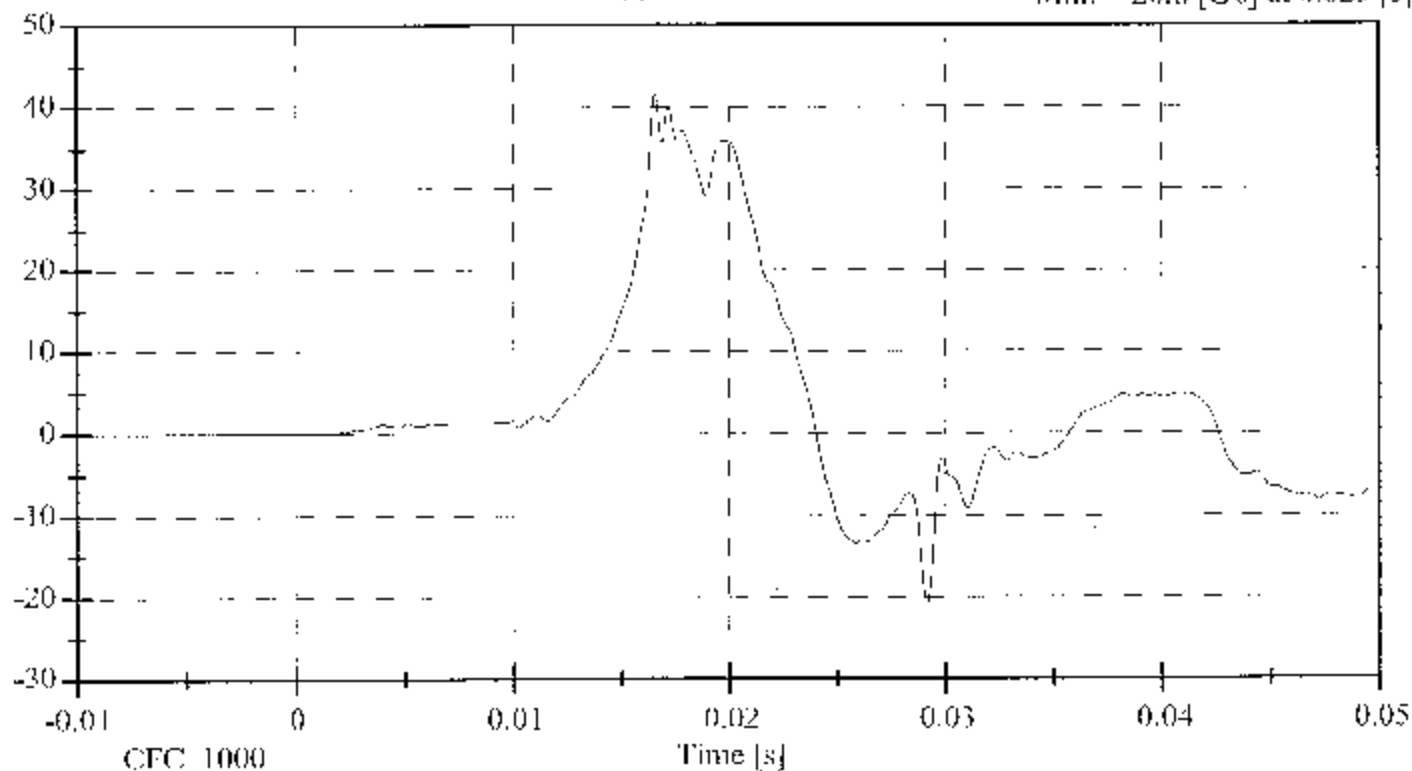
| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 31.0         |
| PROBE SPEED (m/s)     | 4.27 - 4.33   | 4.28         |
| UPPER RIB (g's)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

REMARKS: None

## Upper Rib Y Acceleration

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

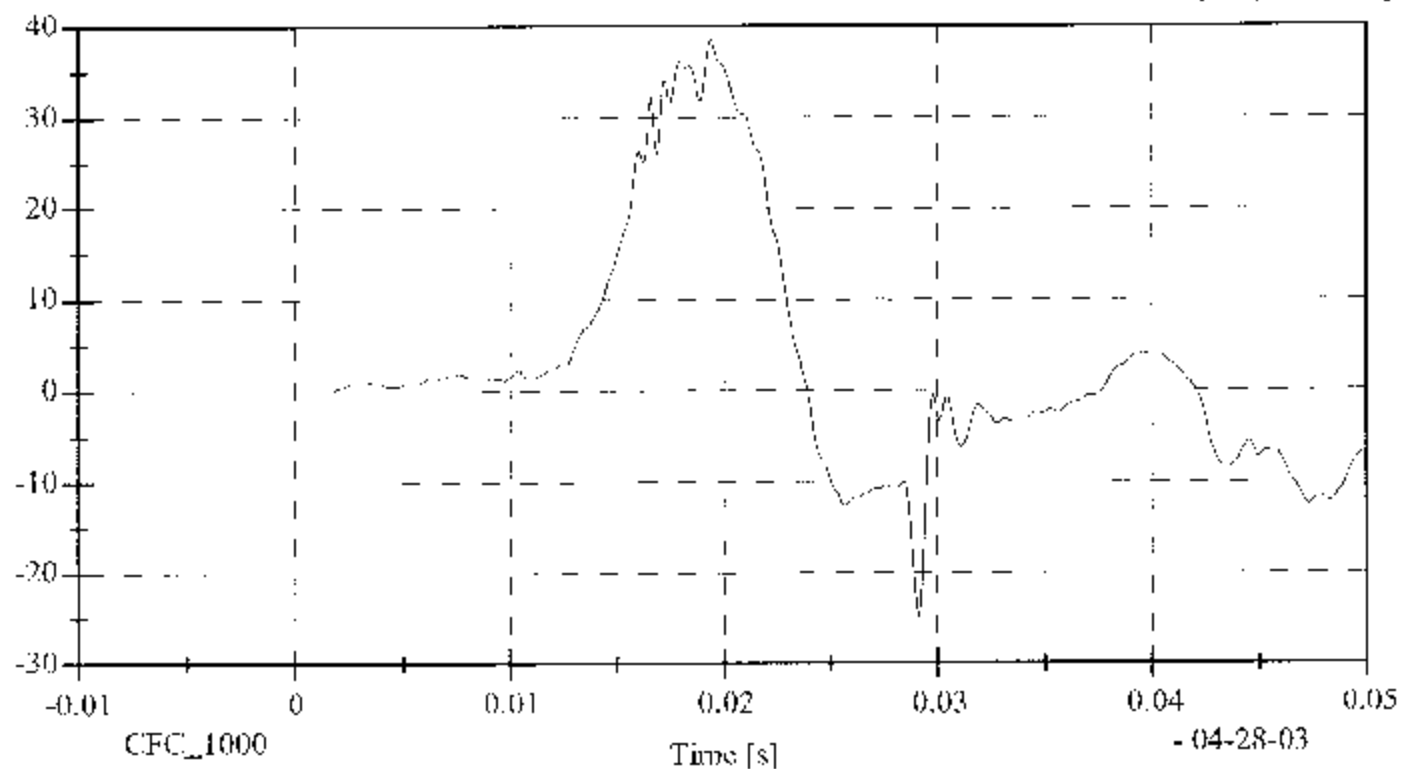
Min: -20.8 [G's] at 0.029 [s]



## Lower Rib Y Acceleration

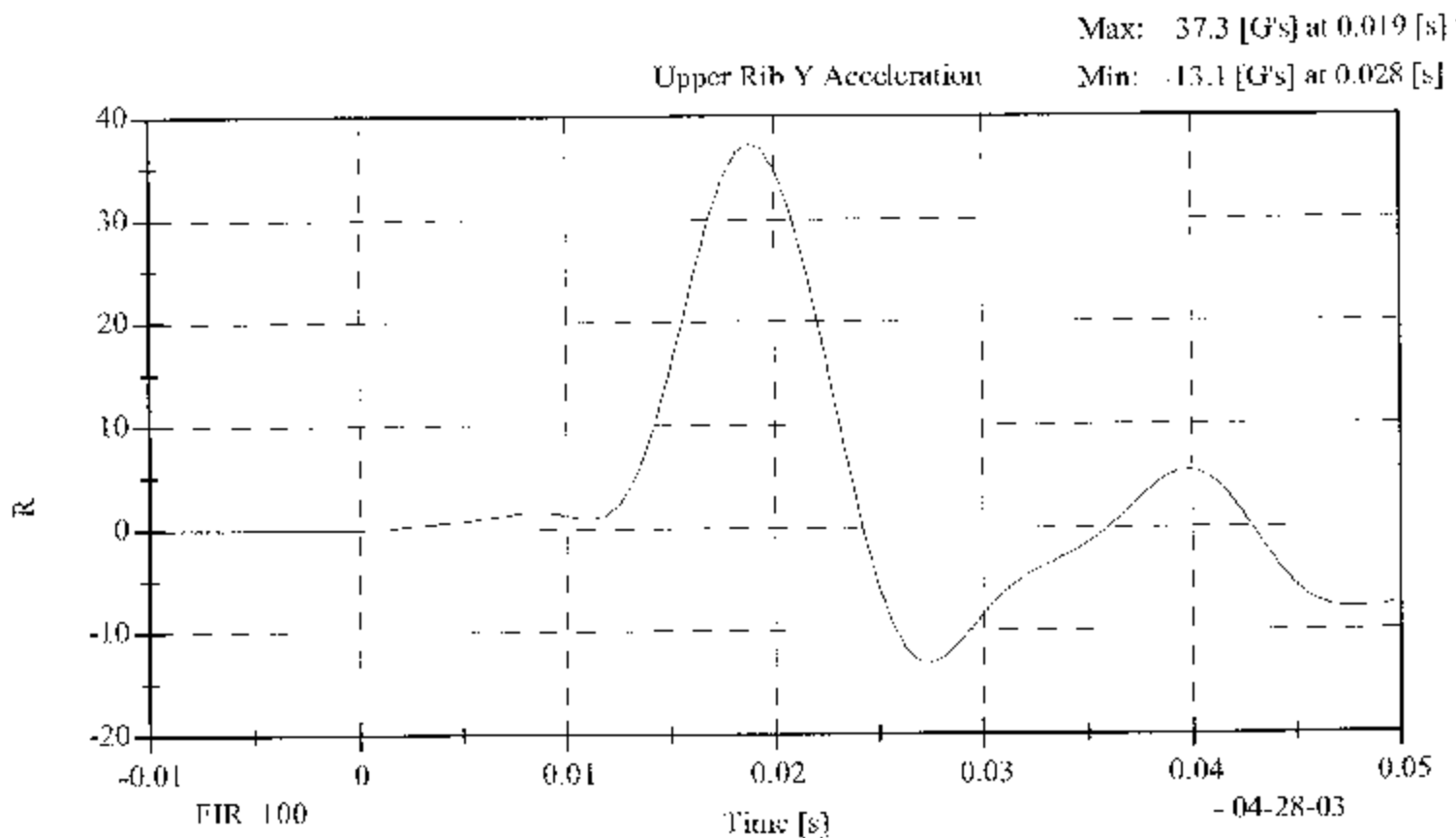
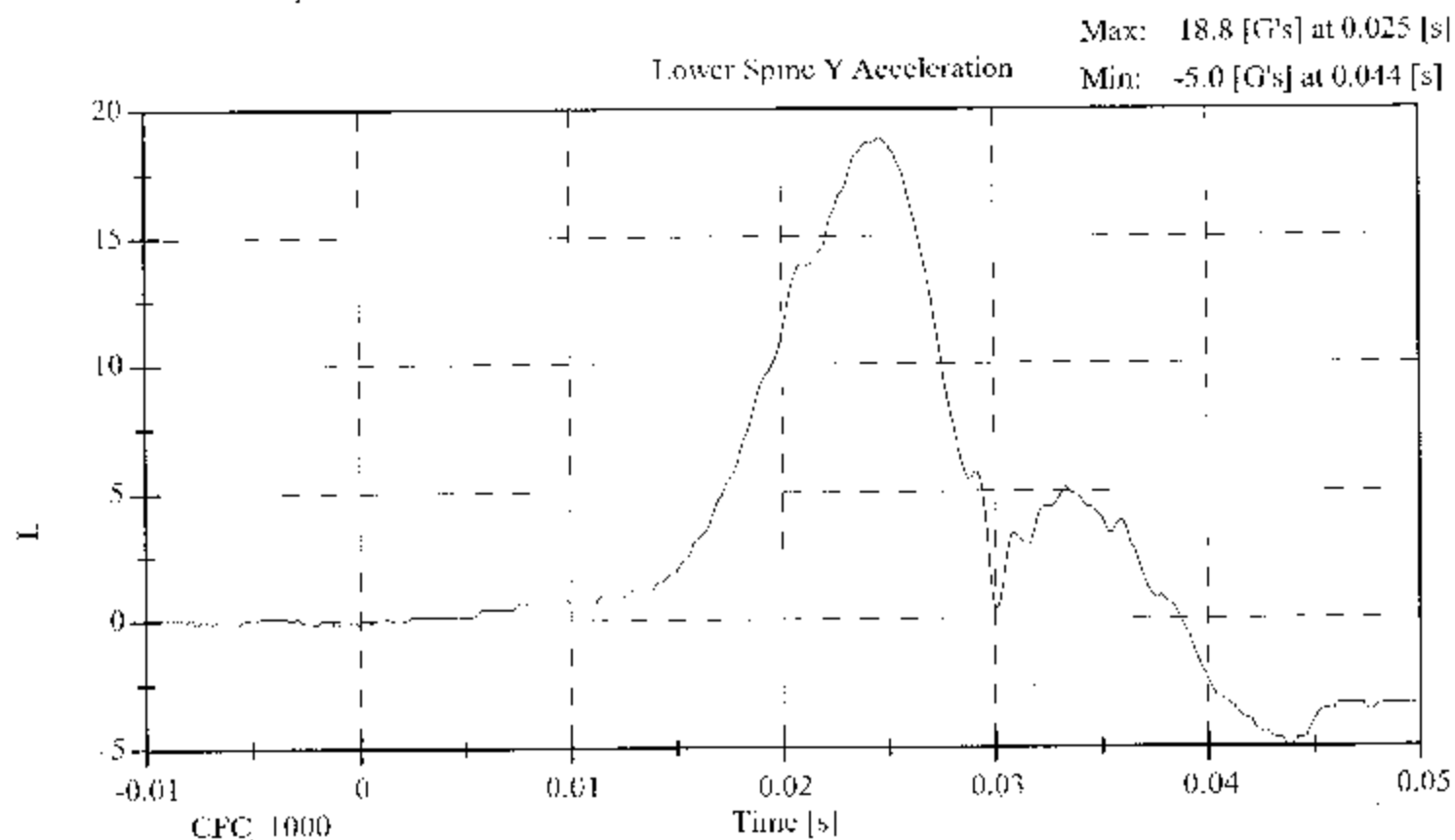
Max: 38.6 [G's] at 0.019 [s]

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



- 04-28-03

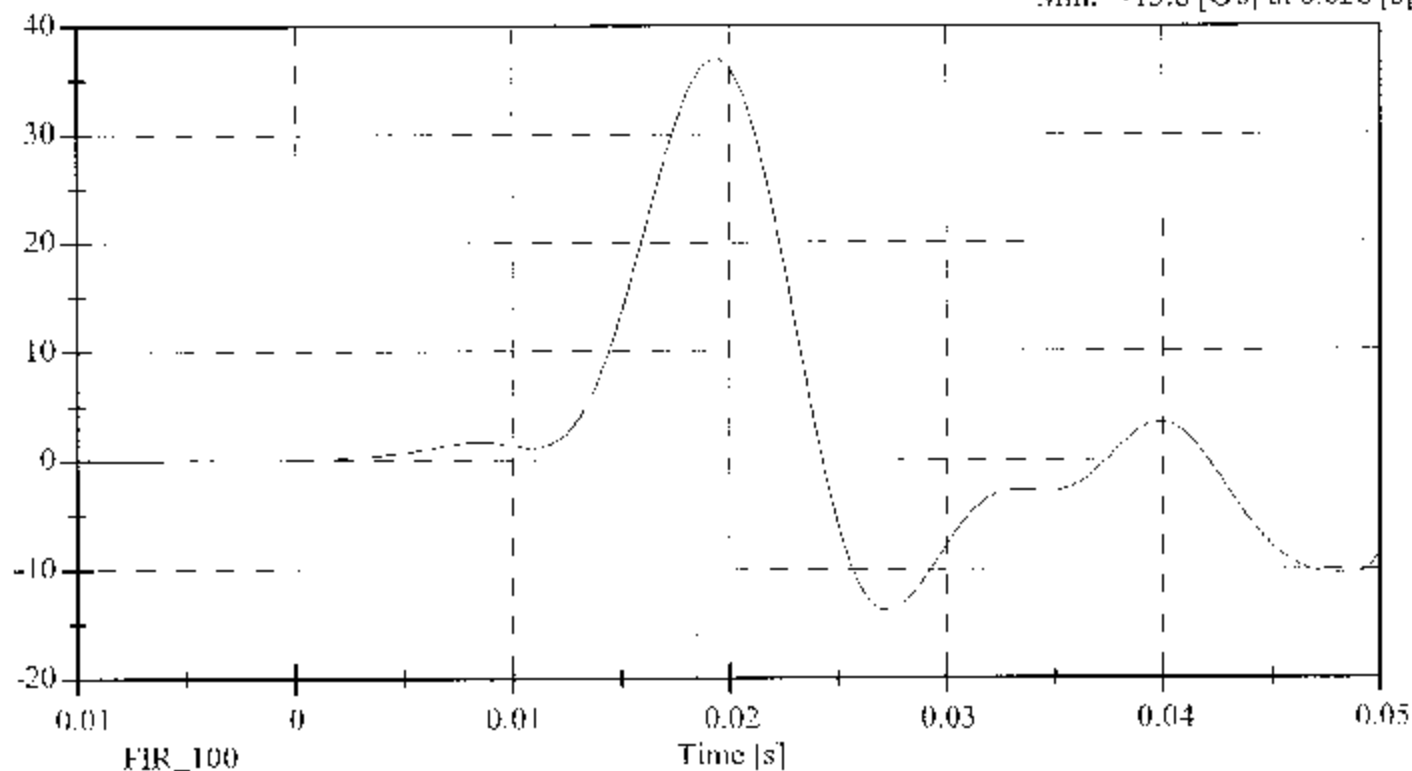




Lower Rib Y Acceleration

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

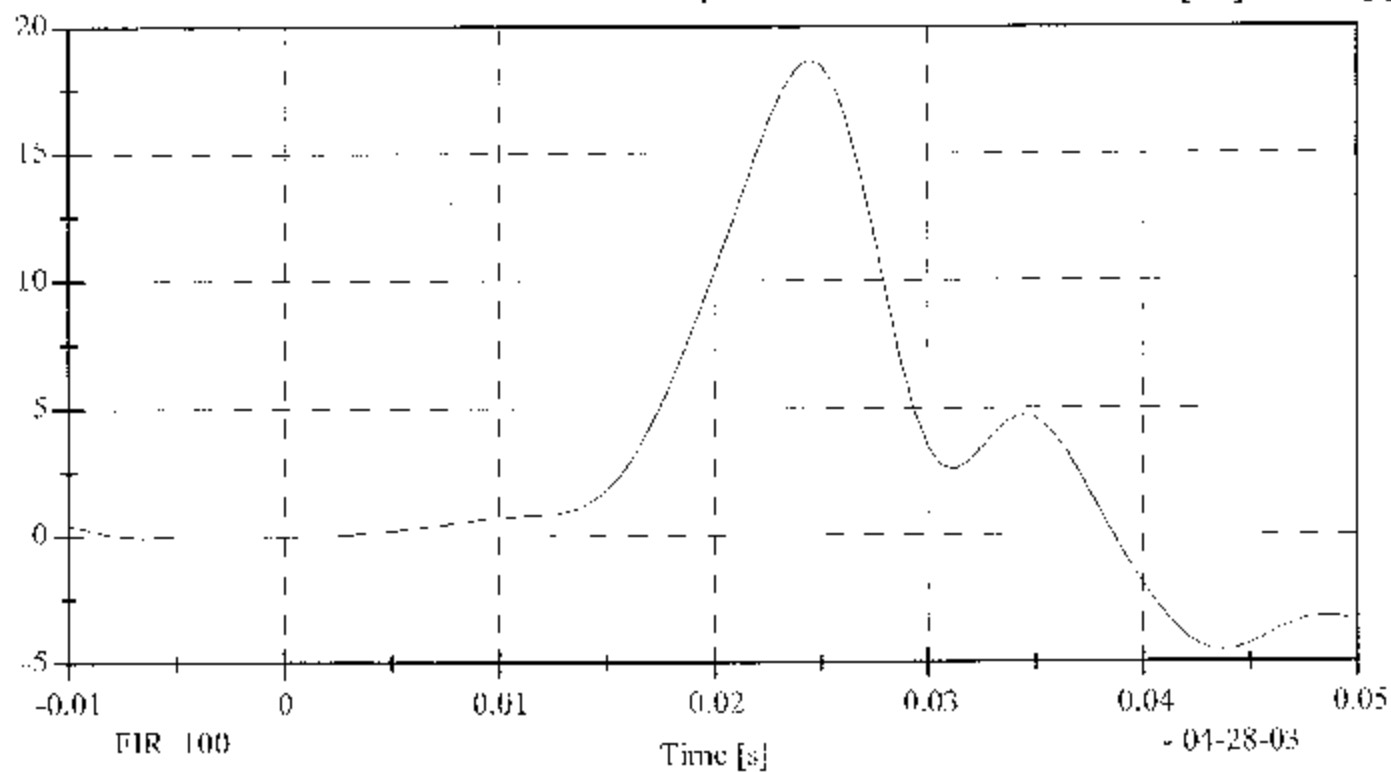
Min: -13.8 [G's] at 0.028 [s]



Lower Spine Y Acceleration

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

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



# 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

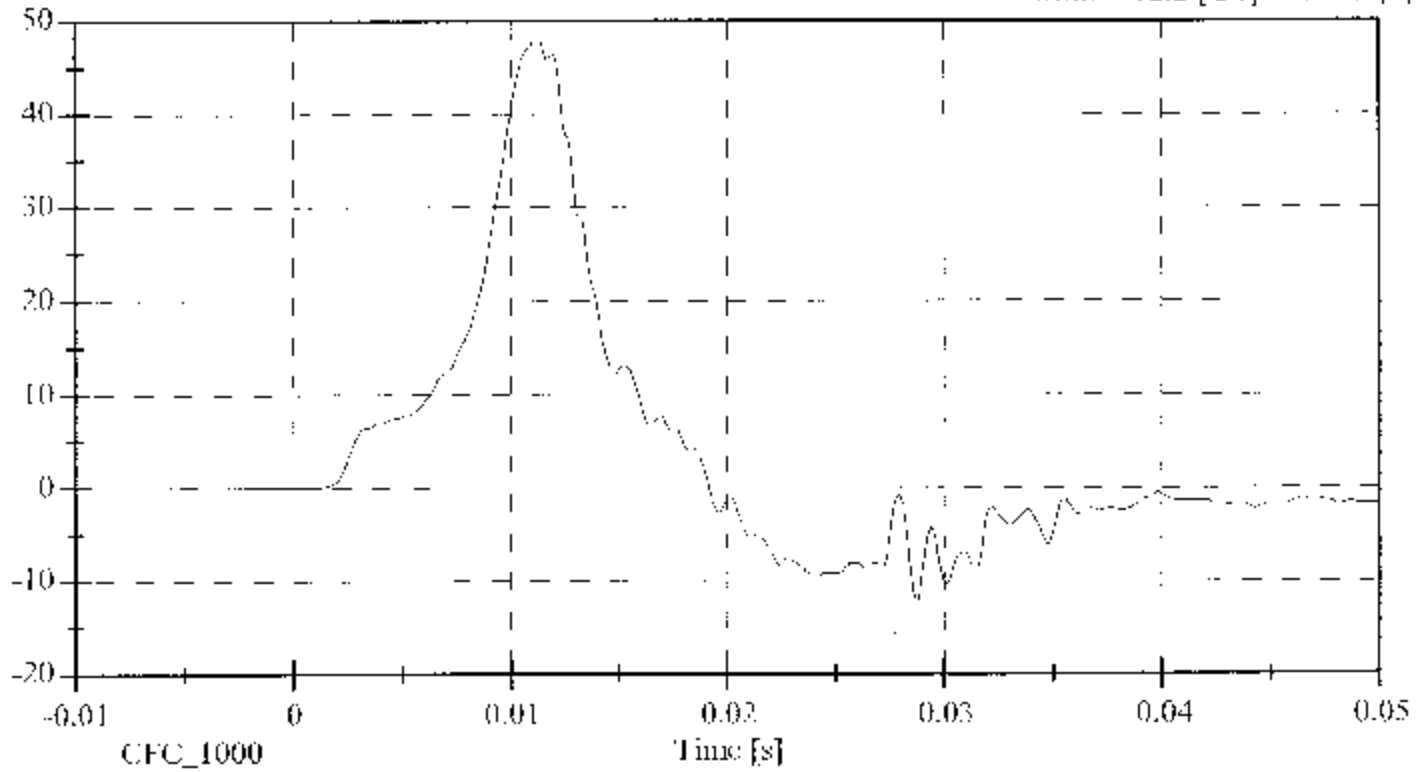
| TEST PARAMETER            | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C)          | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%)     | 10 - 70       | 31.0         |
| PROBE SPEED (m/s)         | 4.27 - 4.33   | 4.28      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

REMARKS: None

Pelvis Acceleration

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

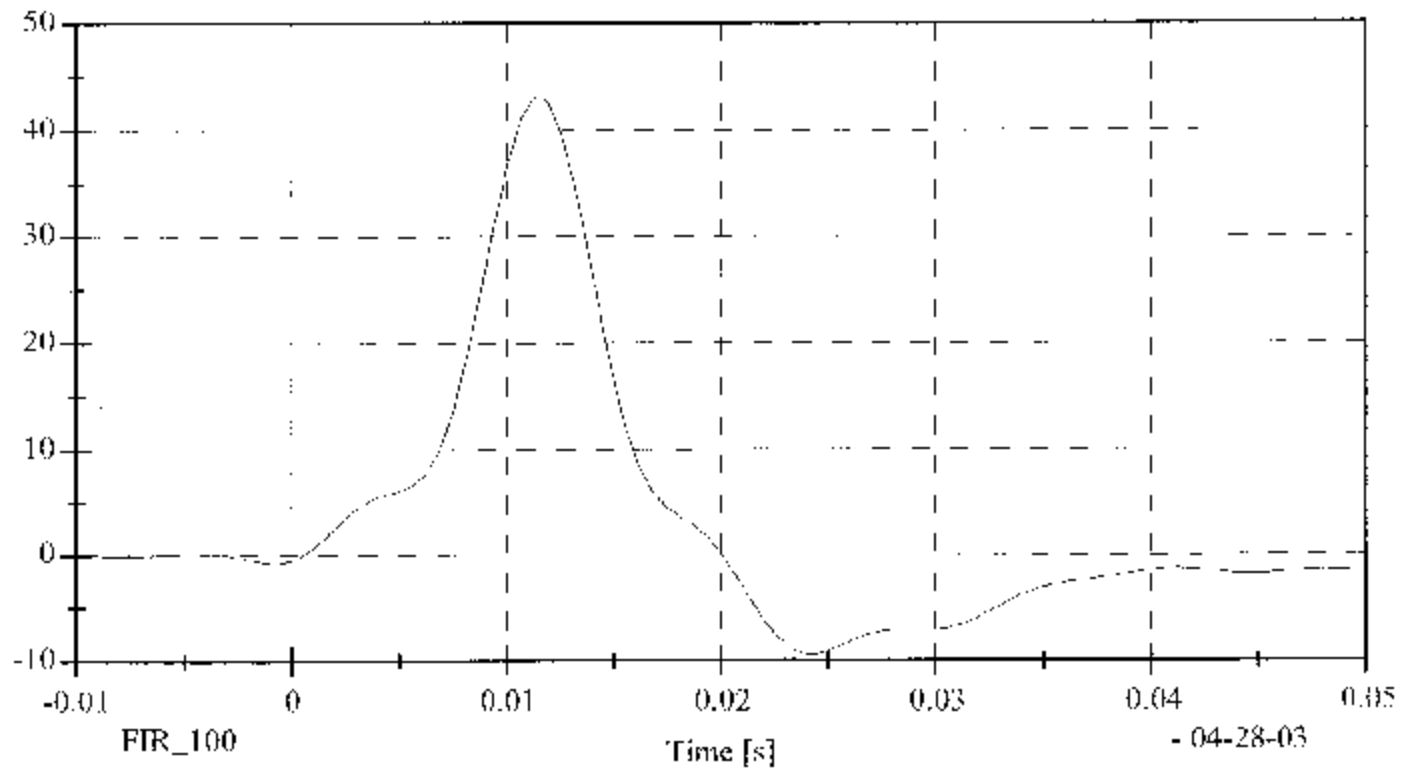
Min: -12.2 [G's] at 0.029 [s]



Pelvis Y Acceleration

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

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



- 04-28-03

**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. Swizicki

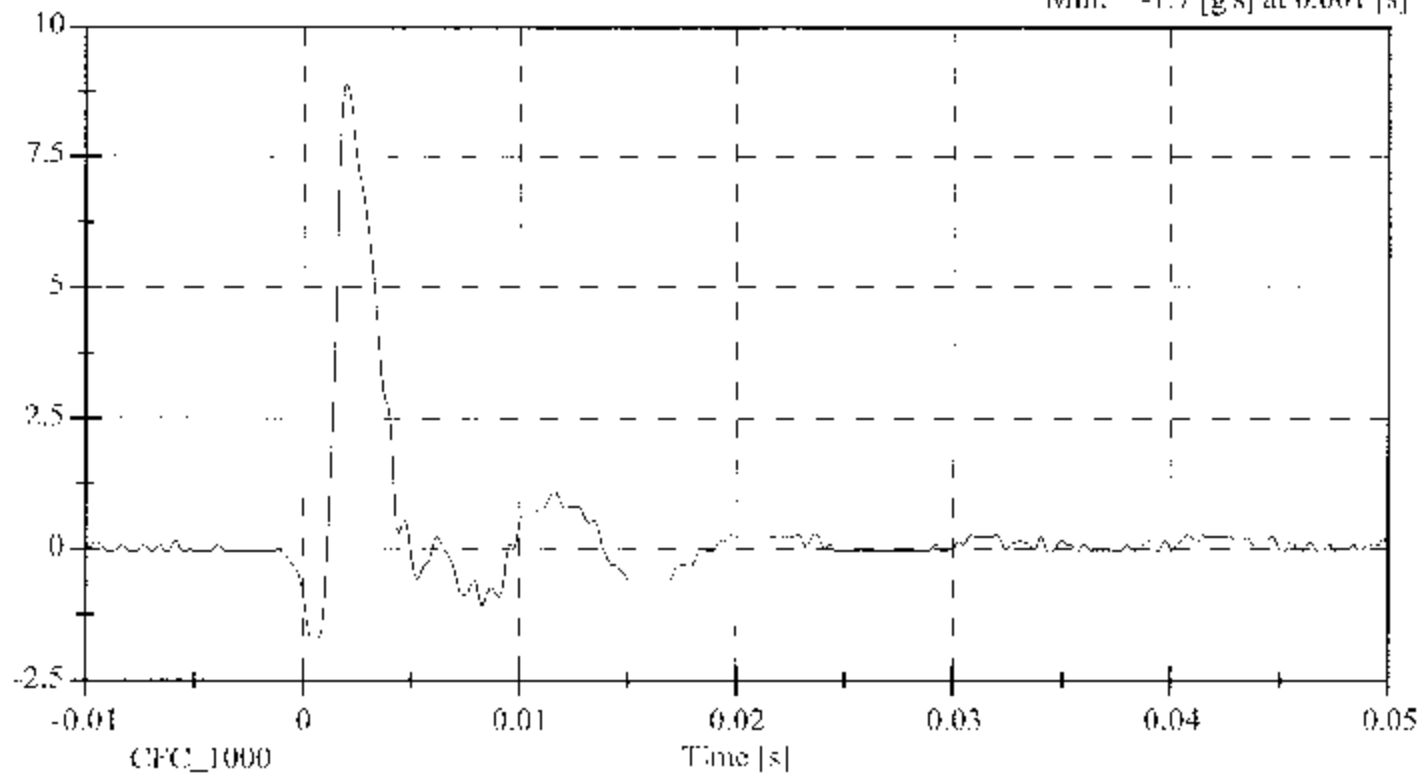
| TEST PARAMETER                   | SPECIFICATION    | TEST RESULTS |
|----------------------------------|------------------|--------------|
| TEMPERATURE (°C)                 | 20.6 - 22.2      | 21.1         |
| RELATIVE HUMIDITY (%)            | 10 - 70          | 38.0         |
| PEAK RESULTANT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

REMARKS: None

Head X Acceleration

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

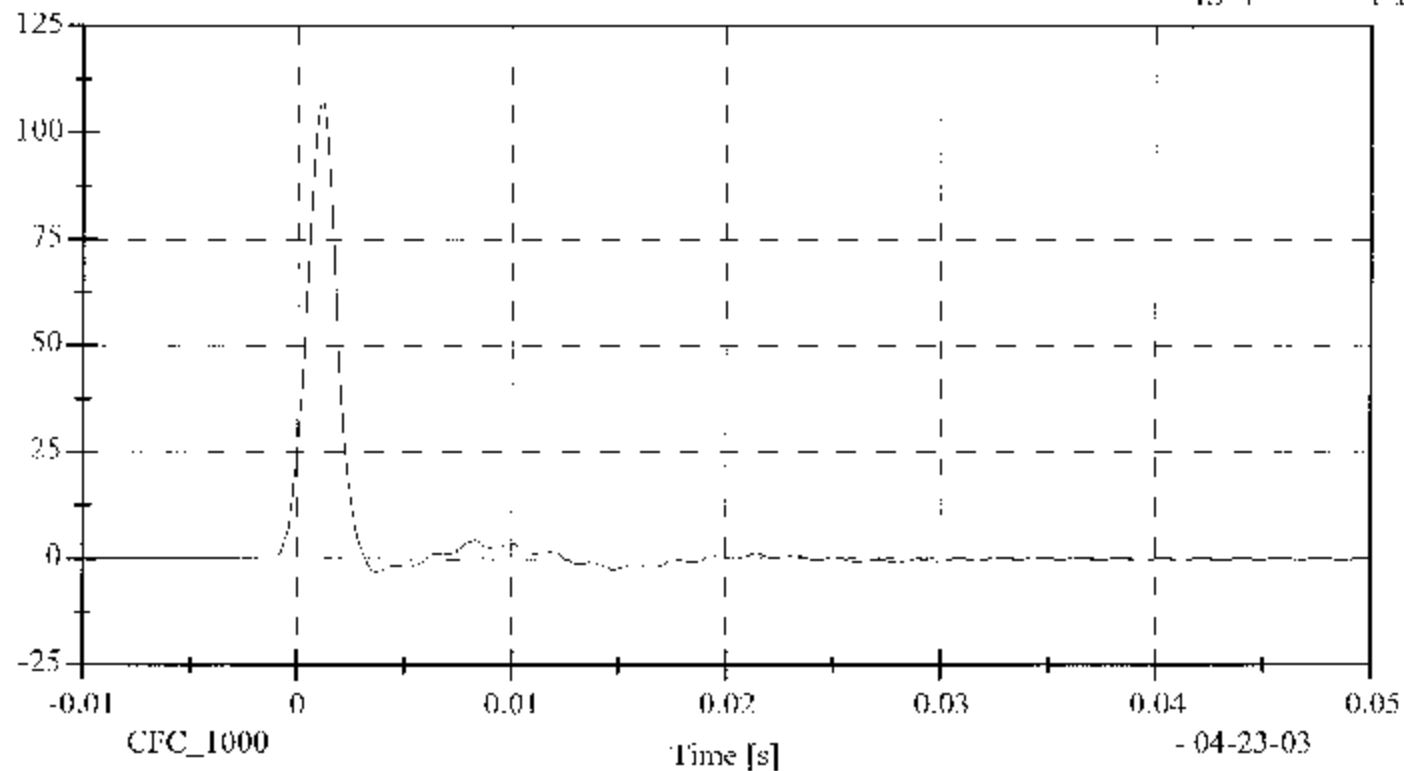
Min: -1.7 [g's] at 0.001 [s]

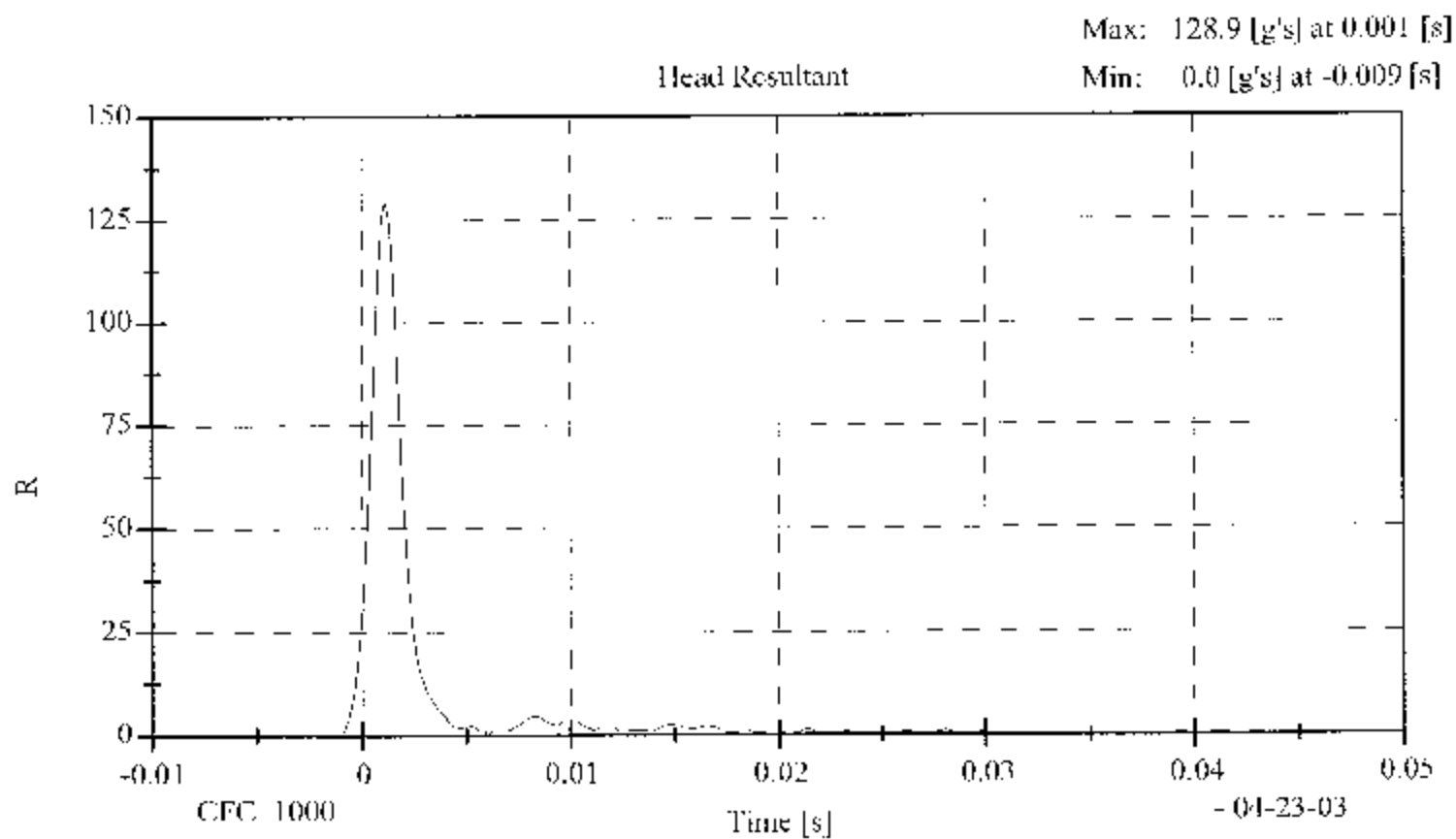
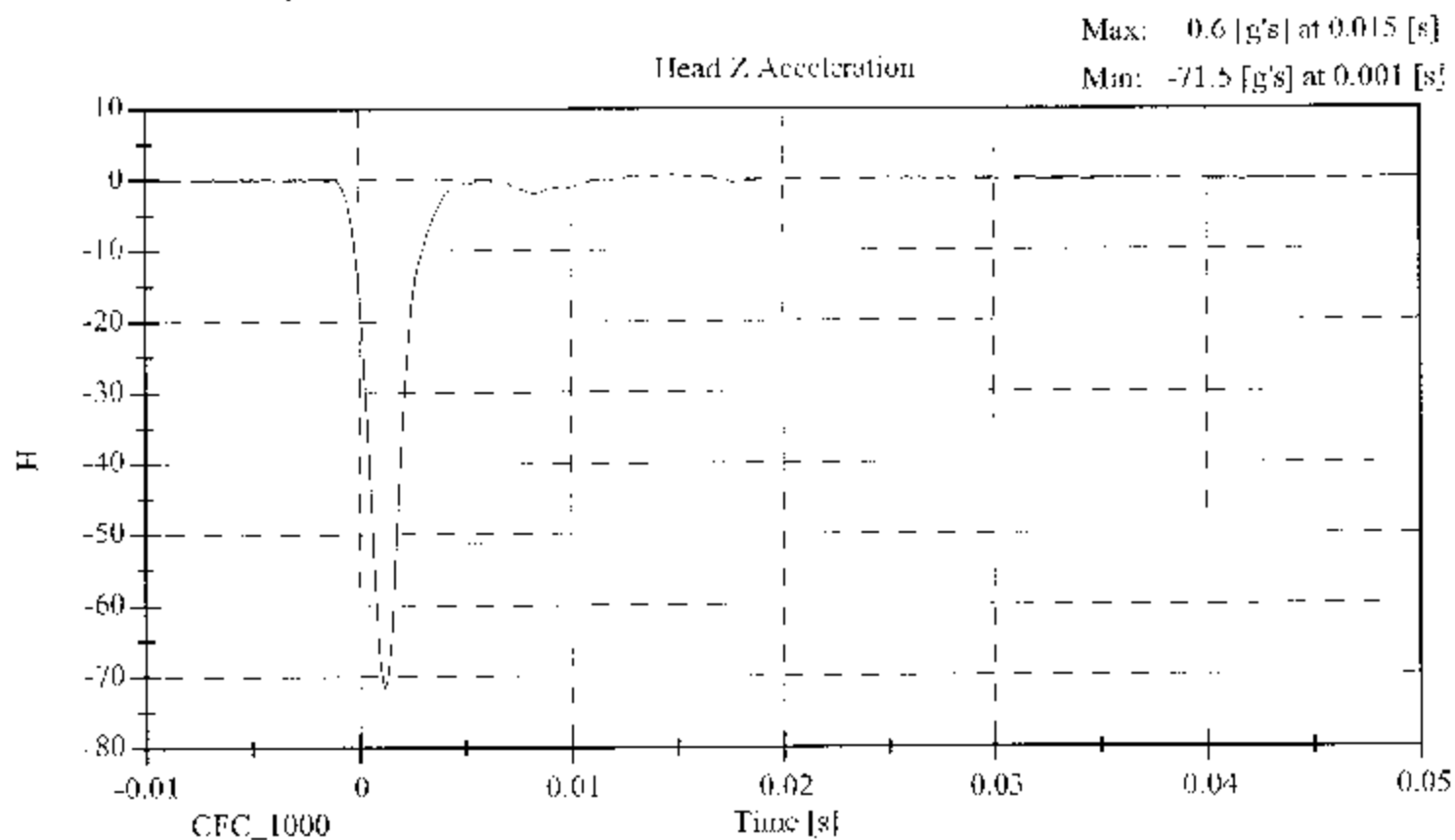


Head Y Acceleration

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

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





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

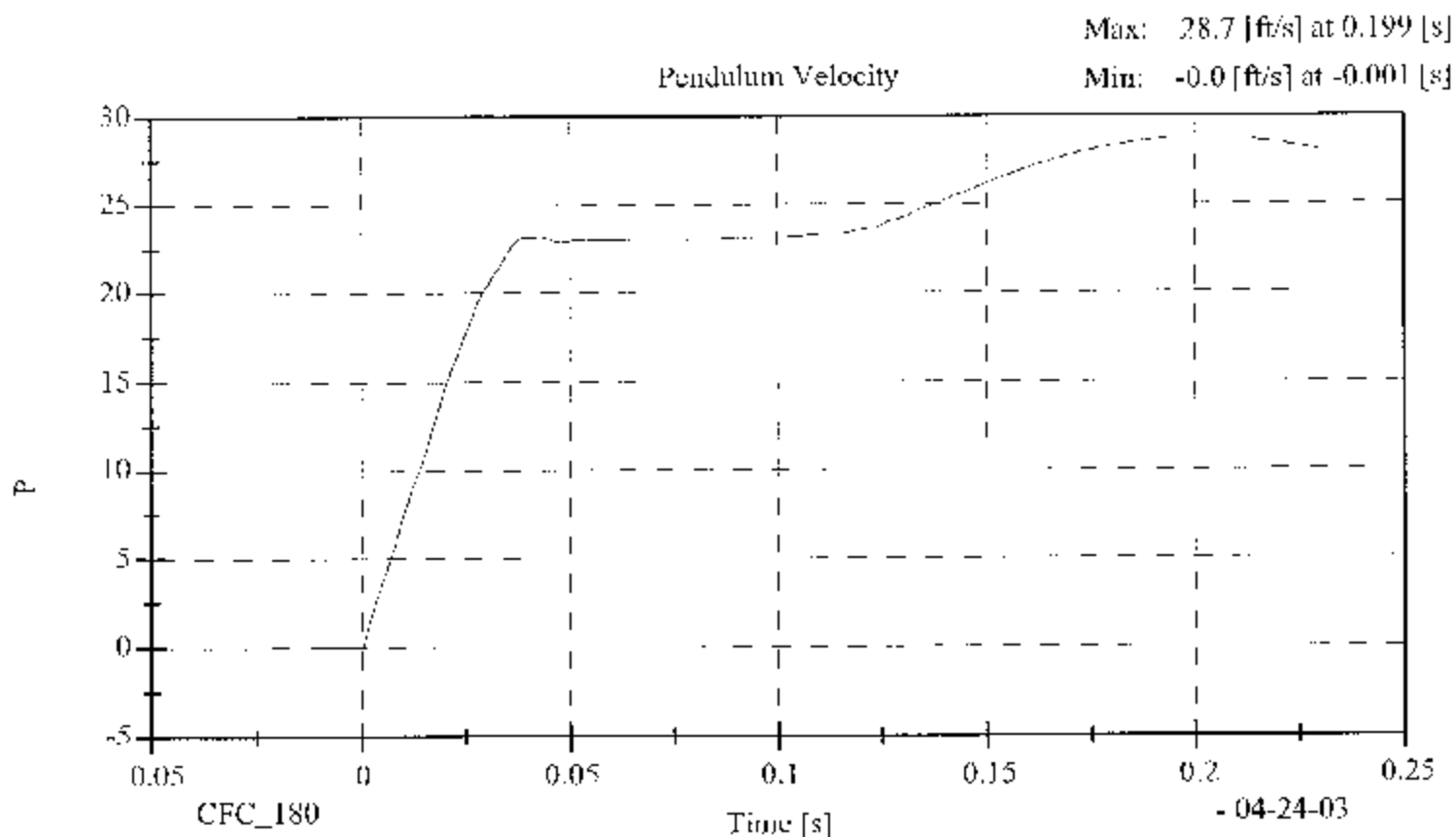
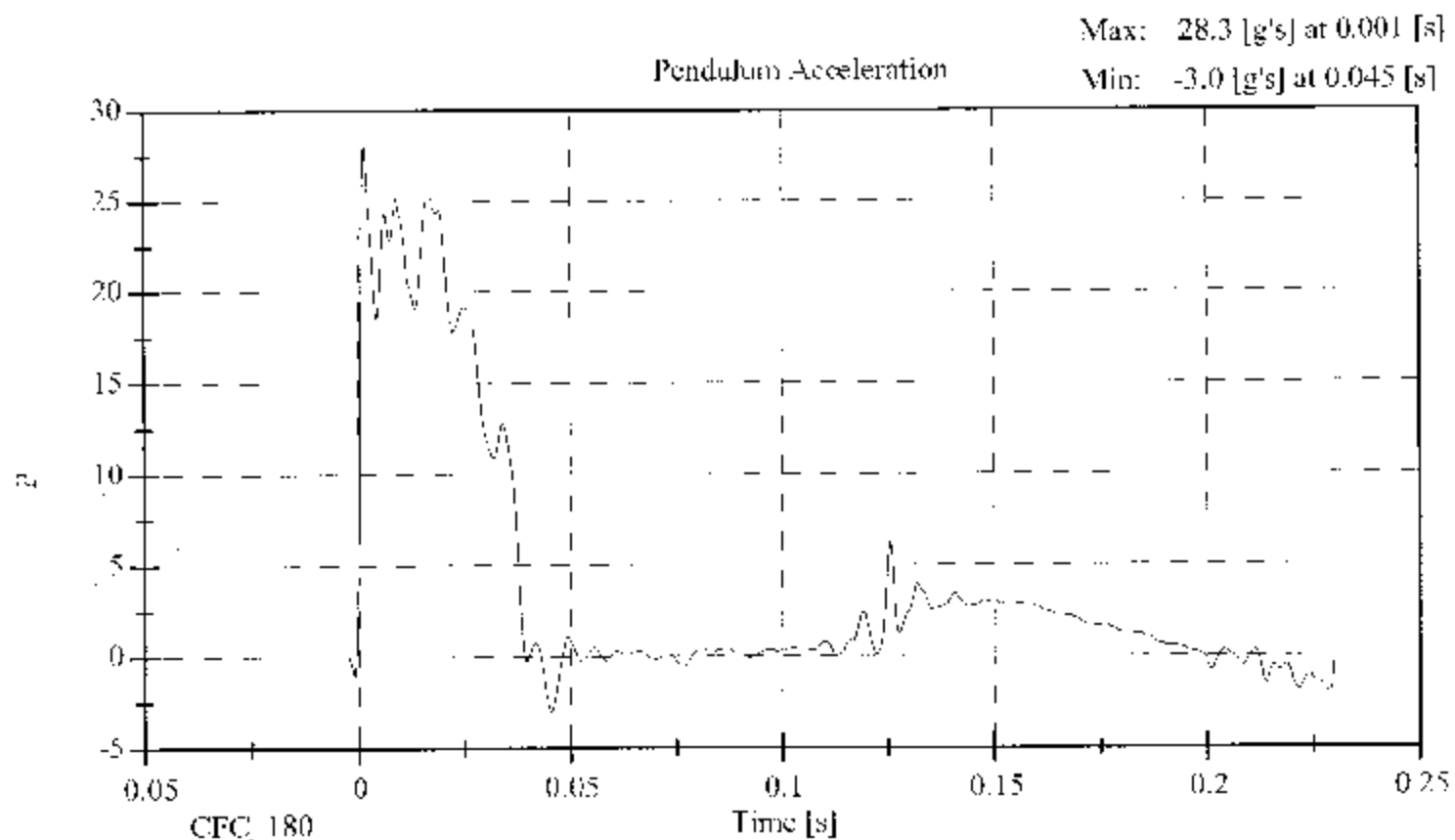
**CONFIGURED FOR LEFT SIDE IMPACT**

SHD Serial No.: 015 Sequential Test Number: 1  
Date: April 21, 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 F MOMENT |               |              |
| ROTATION wrt MOMENT (ms)                                          | 0 - 20        | 8.10         |

REMARKS: None

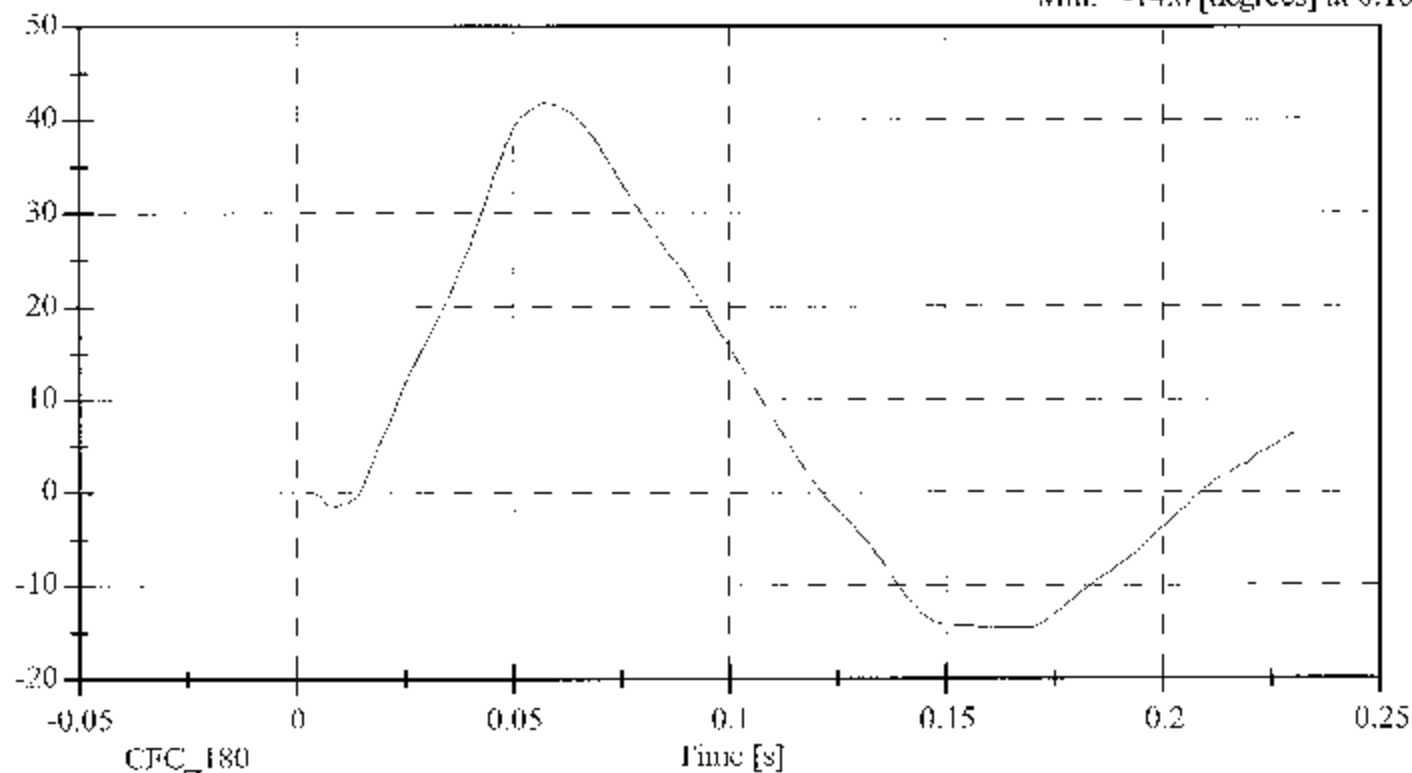




Max: 41.7 [degrees] at 0.057

Min: -14.6 [degrees] at 0.165

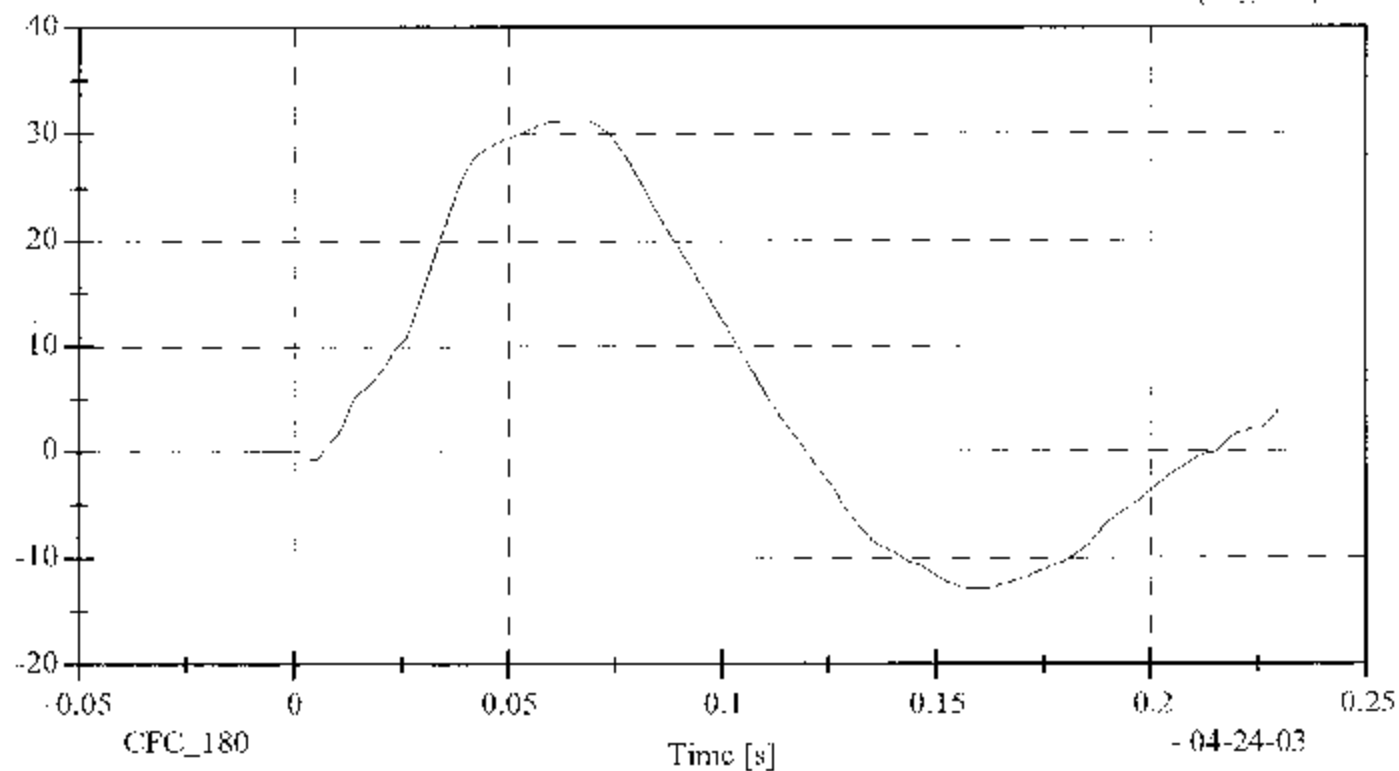
Head Rotation



Max: 31.3 [degrees] at 0.064

Min: -12.9 [degrees] at 0.160

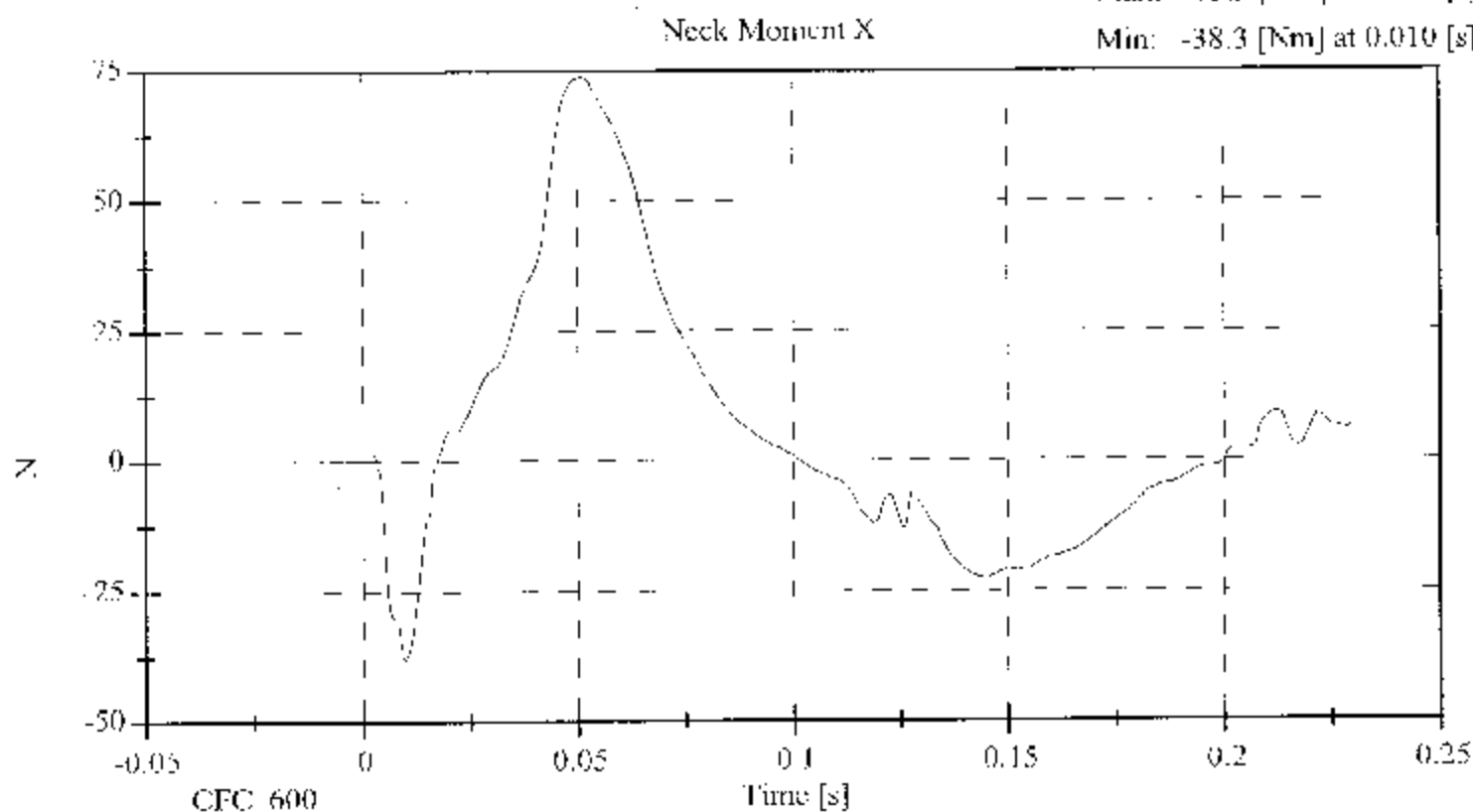
Arm Rotation



- 04-24-03

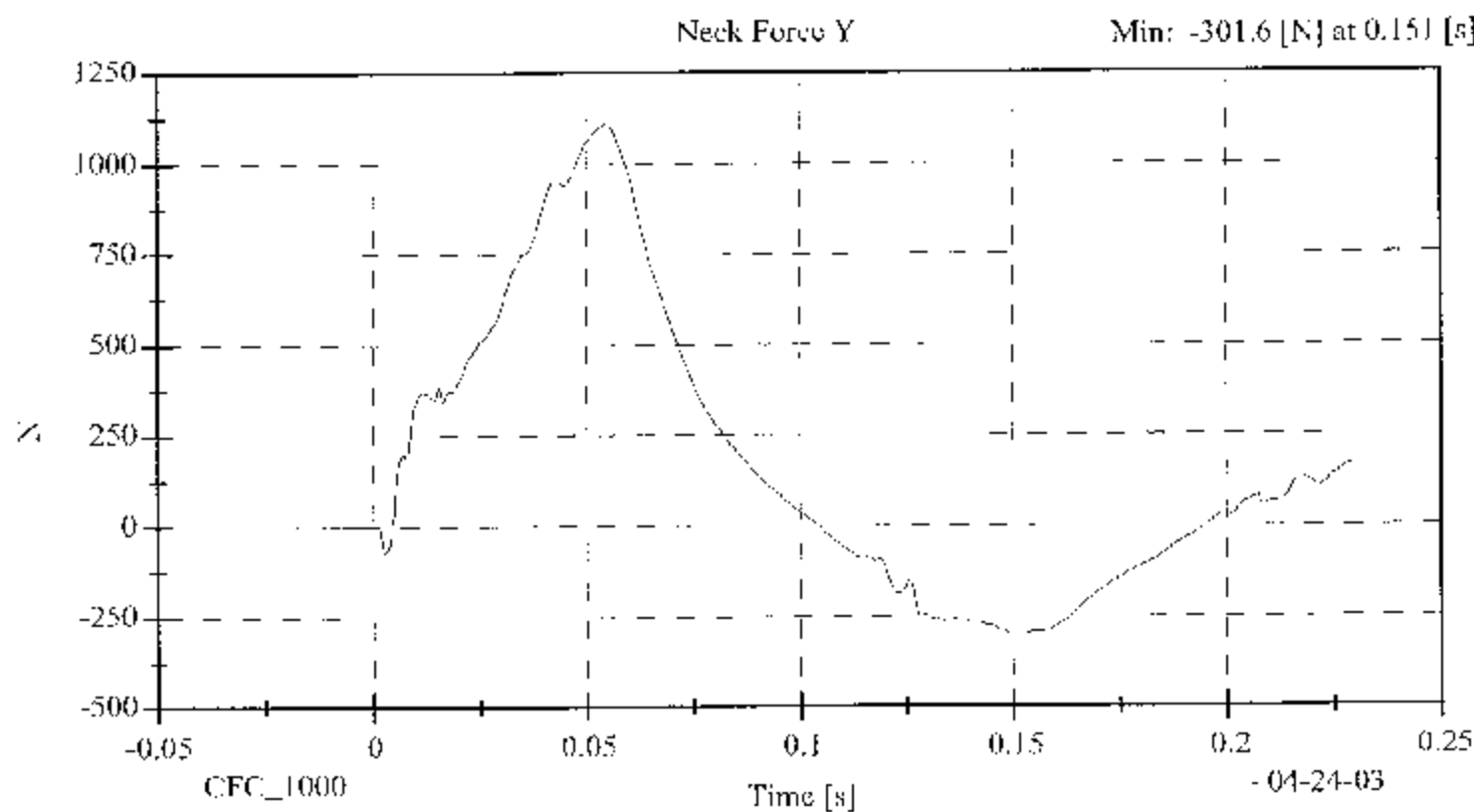
Max: 73.9 [Nm] at 0.051 [s]

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



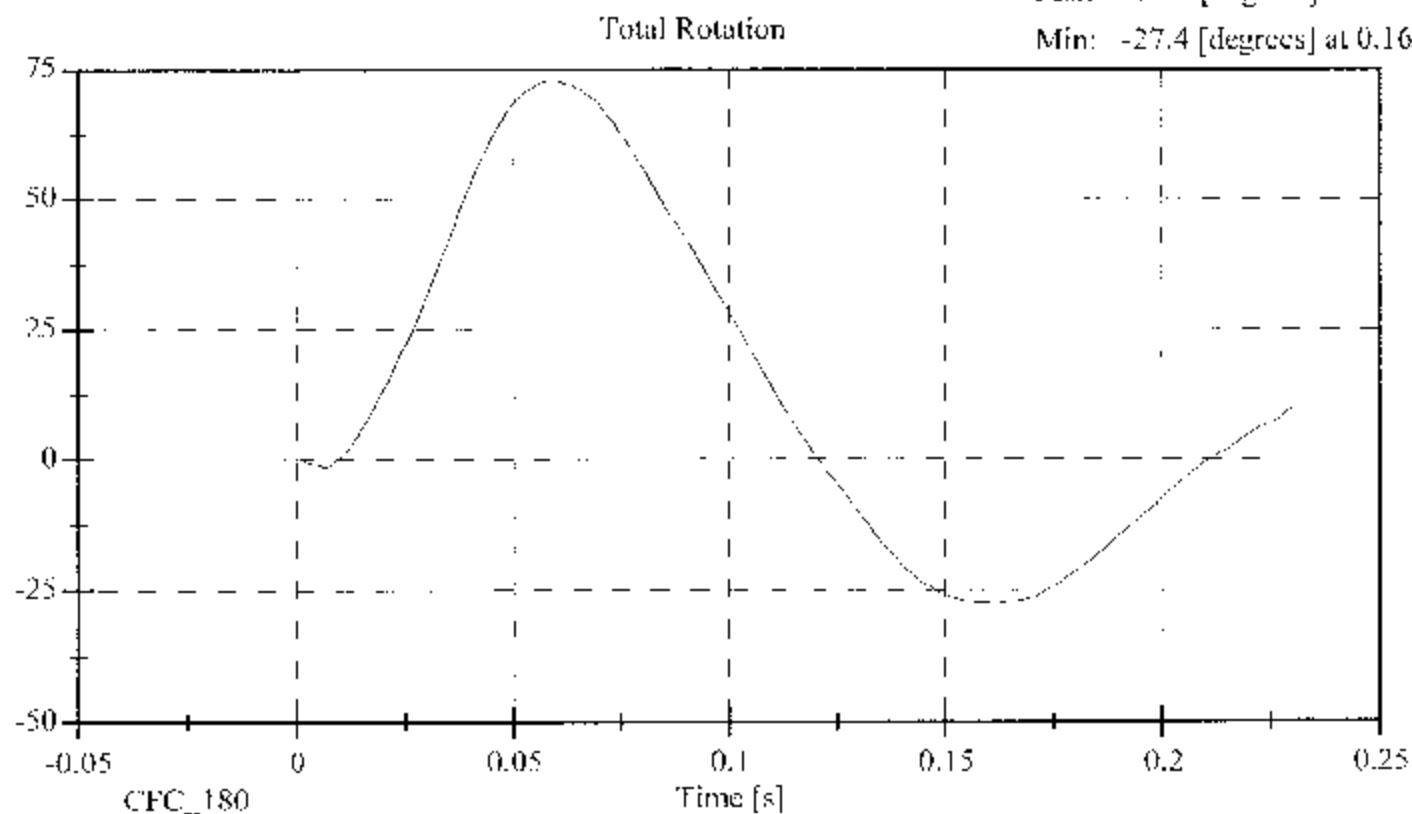
Max: 1108.3 [N] at 0.055 [s]

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



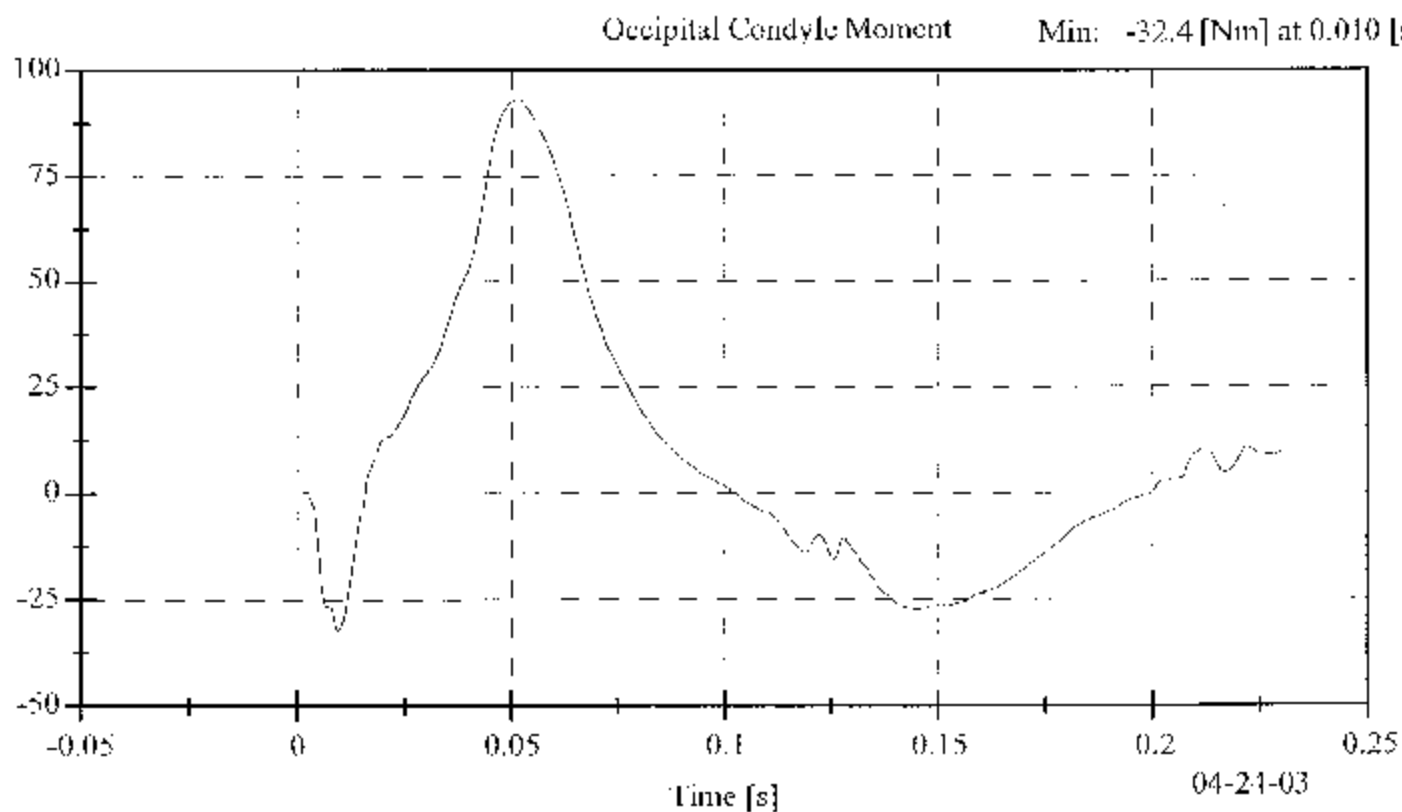
Max: 72.7 [degrees] at 0.055

Min: -27.4 [degrees] at 0.162



Max: 93.0 [Nm] at 0.051 [s]

Min: -32.4 [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.: 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



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

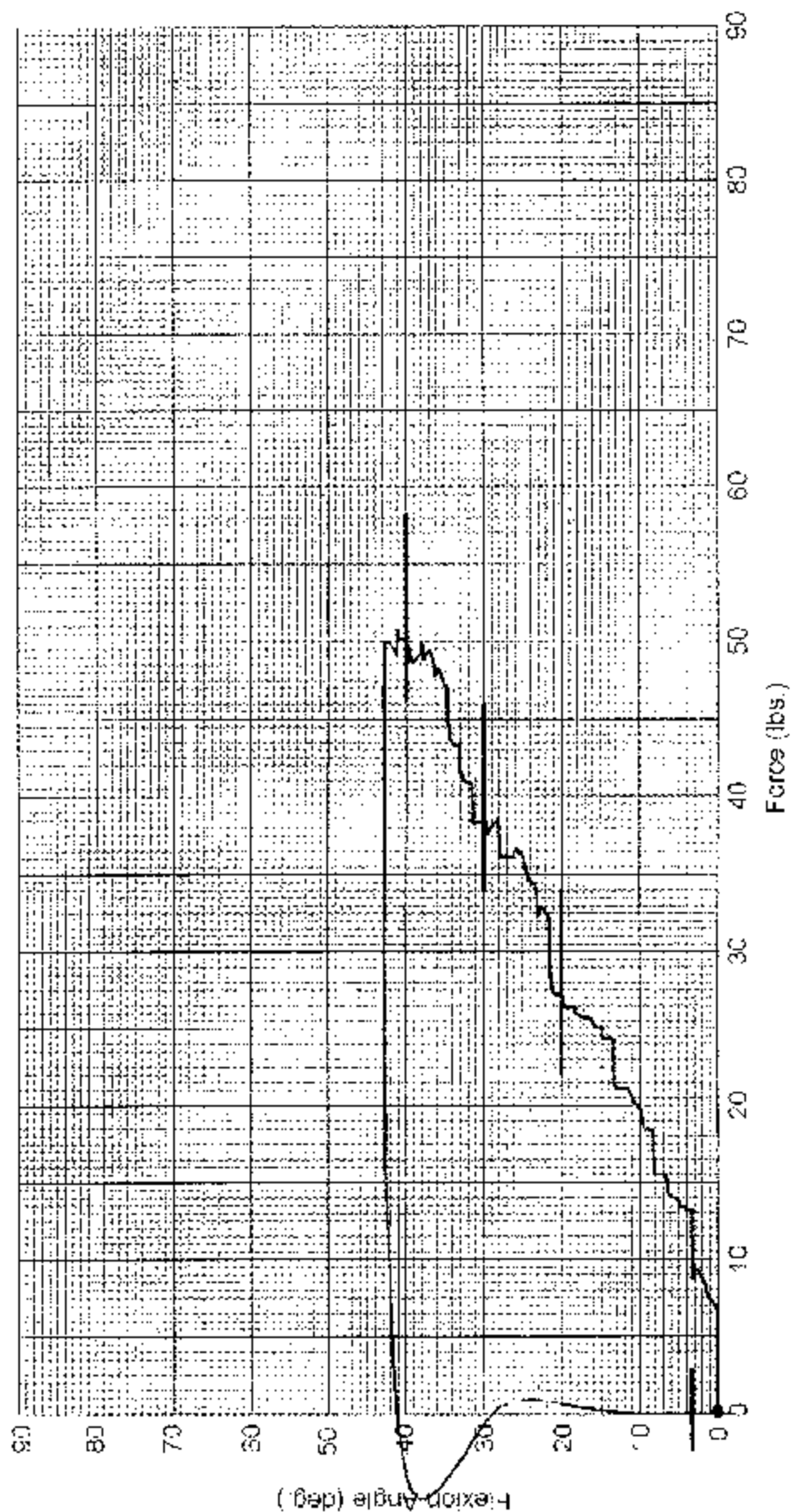
**CONFIGURED FOR LEFT SIDE IMPACT**

SID 113 Serial No : 015 Sequential Test Number: 1  
 Date: April 28, 2003 Laboratory Technician: B. Swieczki

| 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  | 131.0        |
| 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 045  
 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,<br>ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                              | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT,<br>ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASUREMENT, STIFFENERS                   | OK       |
| STERNUM      | VISUAL                                            | OK       |
| LUMBAR SPINE | VISUAL                                            | OK       |
| ABDOMEN      | VISUAL                                            | OK       |
| PELVIS       | VISUAL, PALPATE,<br>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. Swiechki

| 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 II-3 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       | 40.9         |
| VELOCITY<br>3.05 m/s  | FORCE (N)         | 836 - 1125    | 934.7        |
|                       | DISPLACEMENT (mm) | 30 - 35       | 31.7         |
| VELOCITY<br>4.27 m/s  | FORCE (N)         | 1730 - 2099   | 1867.3       |
|                       | DISPLACEMENT (mm) | 32 - 37       | 34.9         |
| VELOCITY<br>6.10 m/s  | FORCE (N)         | 3741 - 4448   | 4438.7       |
|                       | 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

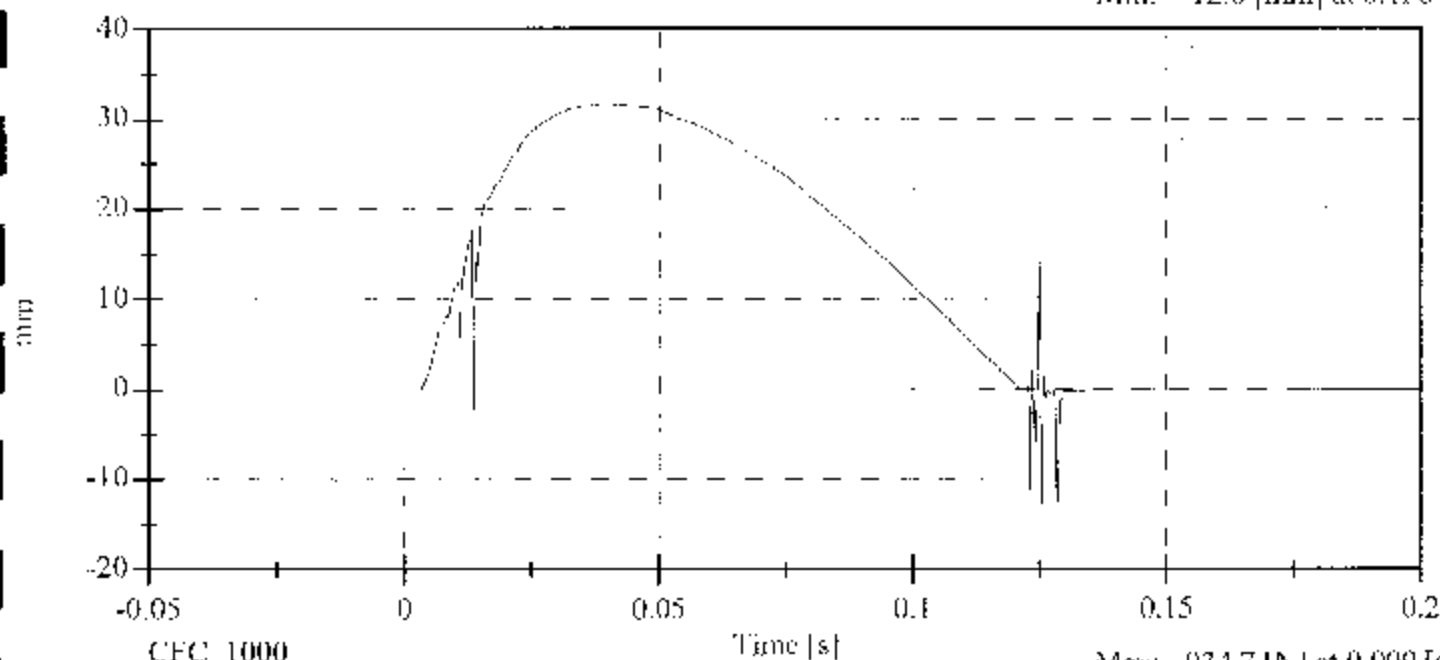
| TEST CONDITION   | PARAMETERS       | RESULTS  | STATUS |
|------------------|------------------|----------|--------|
| Lab Temperature: | 18.9-25.5 C      | 21.1 C   | Passed |
| Lab Humidity:    | 10-70 %          | 40.00 %  | Passed |
| Displacement:    | 30.00-35.00 mm   | 31.65 mm | Passed |
|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

Shock Low

Displacement vs. Time

Max: 31.6 [mm] at 0.037 [s]

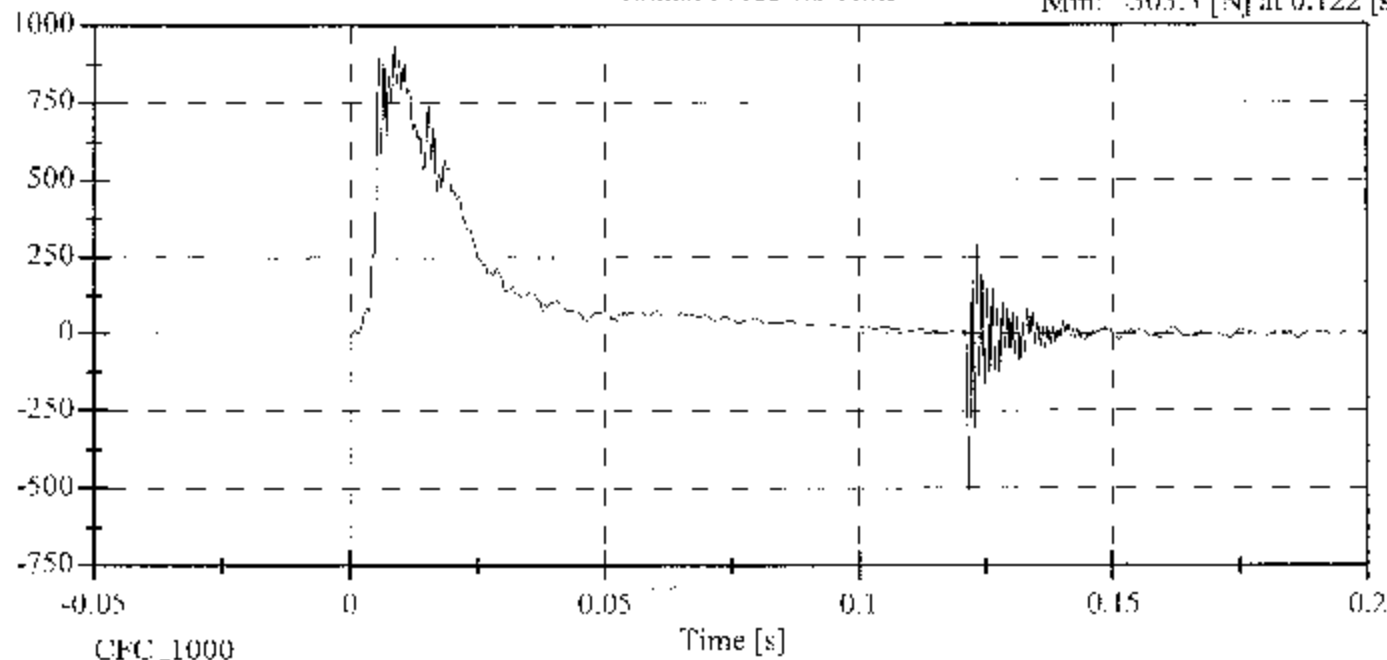
Min: -12.8 [mm] at 0.128 [s]



Shock Force vs. Time

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

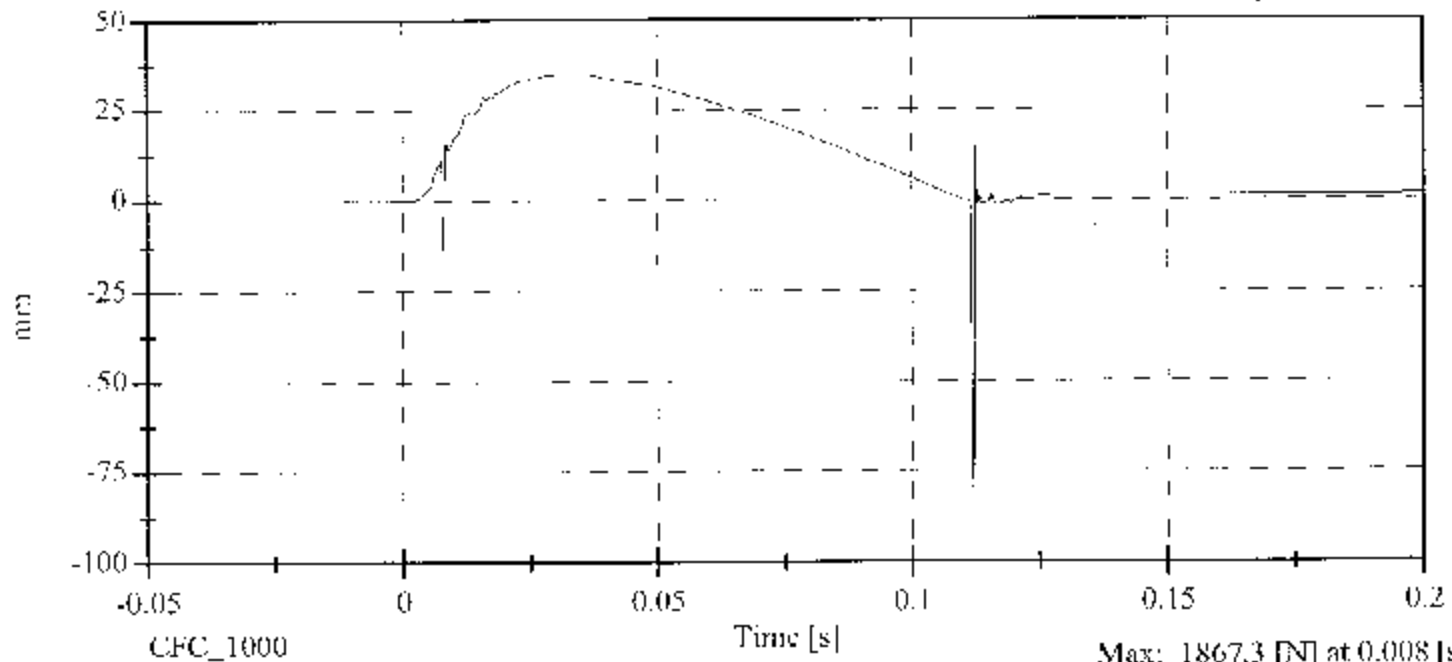
| TEST CONDITION   | PARAMETERS        | RESULTS   | STATUS |
|------------------|-------------------|-----------|--------|
| Lab Temperature: | 18.9-25.5 C       | 21.1 C    | Passed |
| Lab Humidity:    | 10-70 %           | 40.00 %   | Passed |
| Displacement:    | 32.00-37.00 mm    | 34.91 mm  | 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]

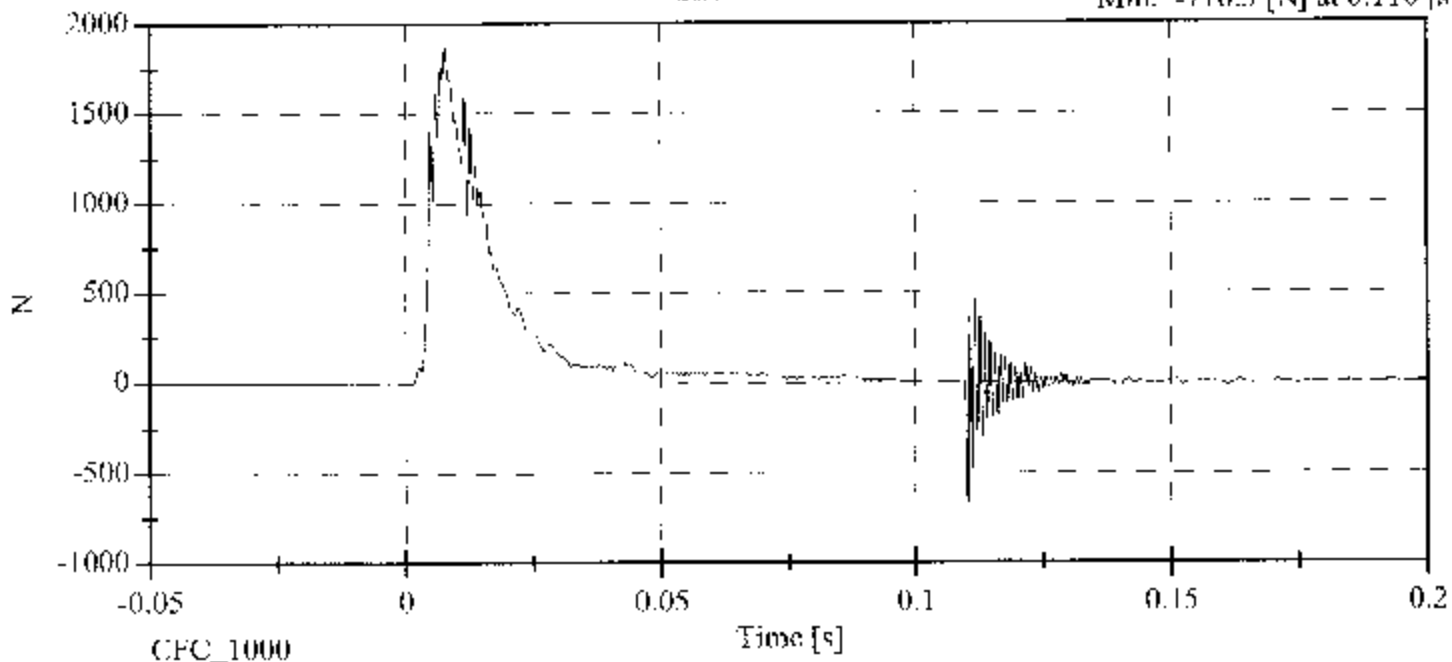
Min: -79.4 [mm] at 0.112 [s]



Shock Force vs. Time

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

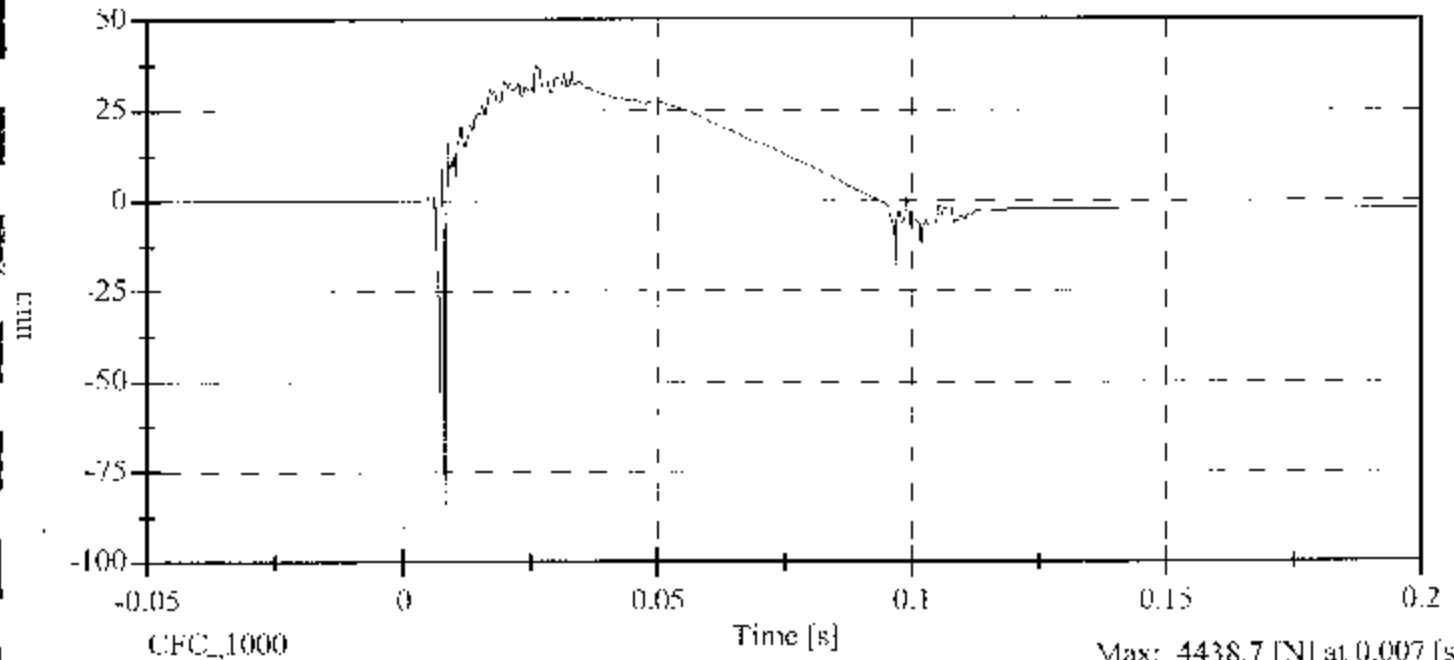
| TEST CONDITION   | PARAMETERS        | RESULTS   | STATUS |
|------------------|-------------------|-----------|--------|
| Lab Temperature: | 18.9-25.5 C       | 21.1 C    | Passed |
| Lab Humidity:    | 10-70 %           | 40.00 %   | Passed |
| Displacement:    | 33.00-40.00 mm    | 37.56 mm  | 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]

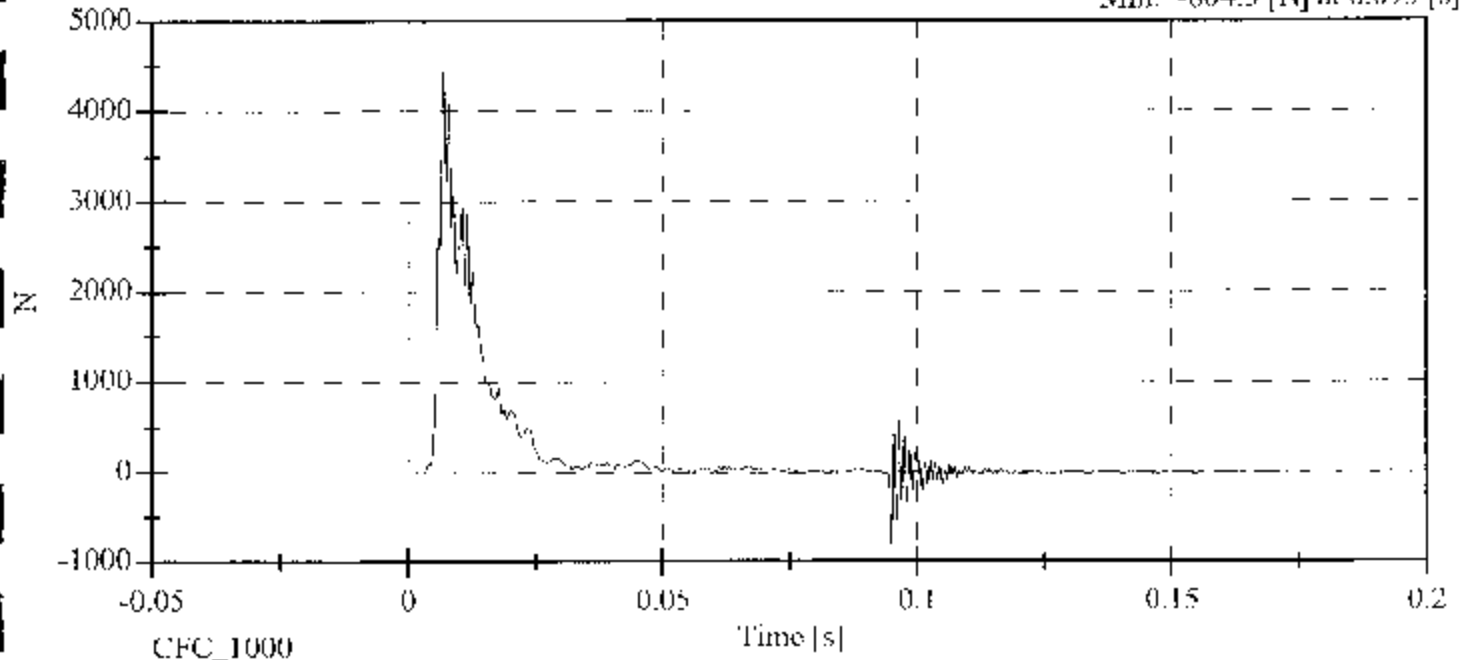
Min: -85.8 [mm] at 0.008 [s]



Max: 4438.7 [N] at 0.007 [s]

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

Shock Force vs. Time





**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. Swieczicki

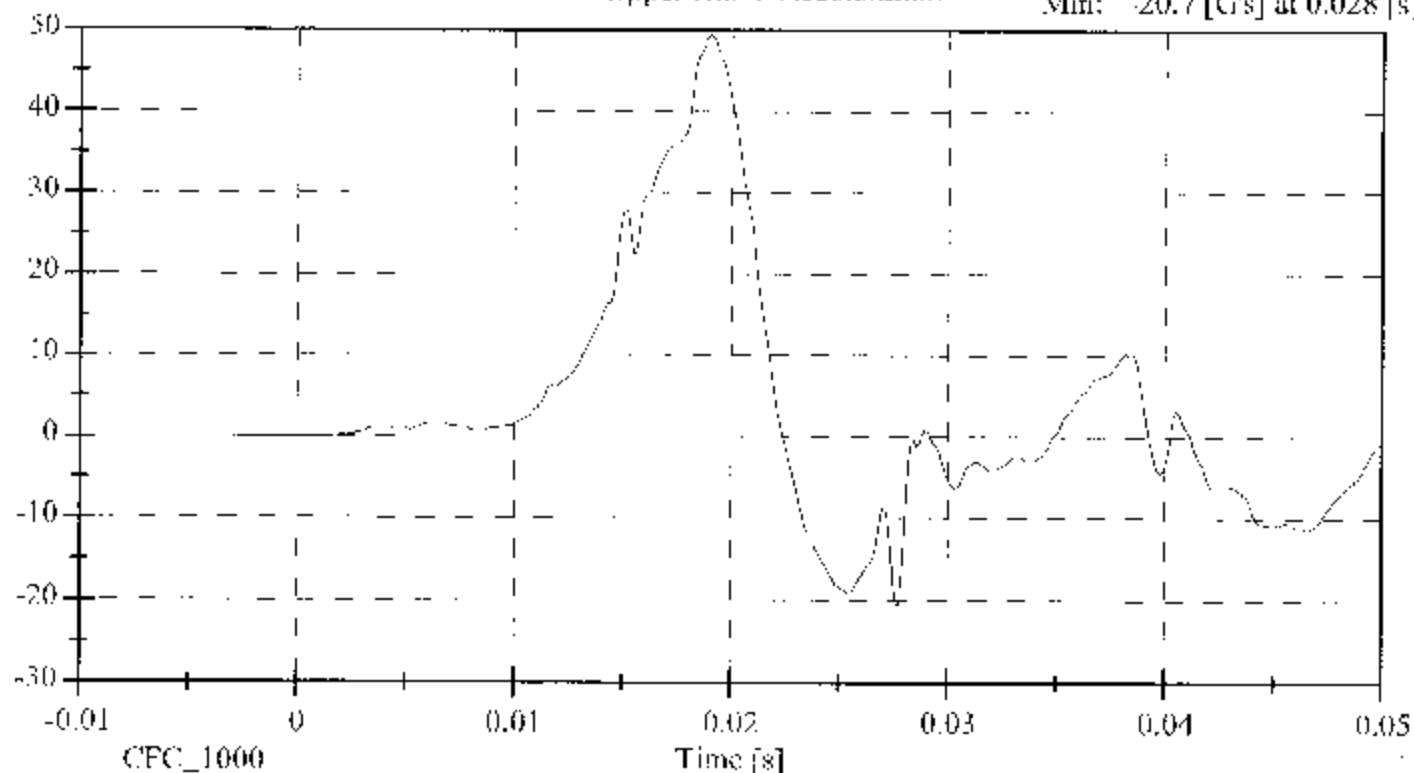
| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 31.0         |
| PROBE SPEED (m/s)     | 4.27 - 4.33   | 4.27         |
| UPPER RIB (g's)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

REMARKS: None

Upper Rib Y Acceleration

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

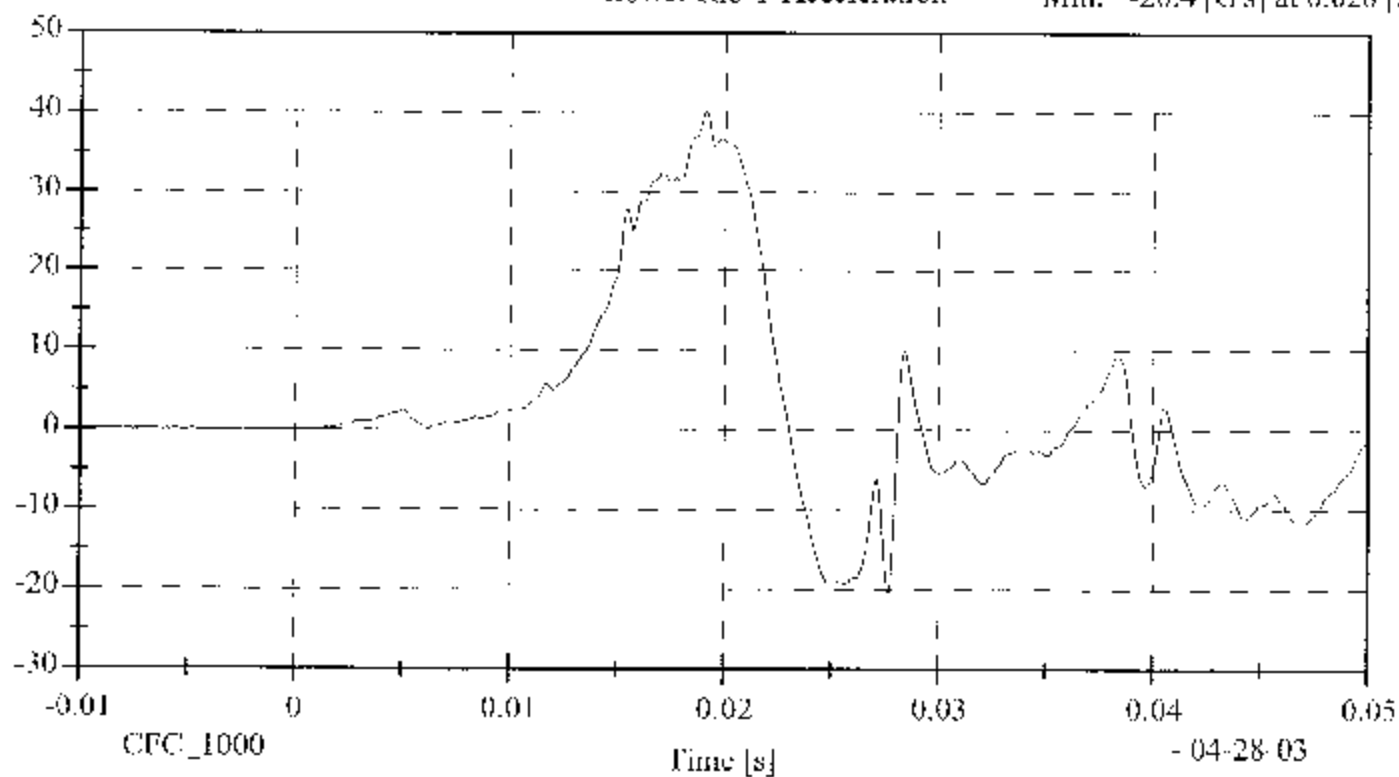
Min: -20.7 [G's] at 0.028 [s]

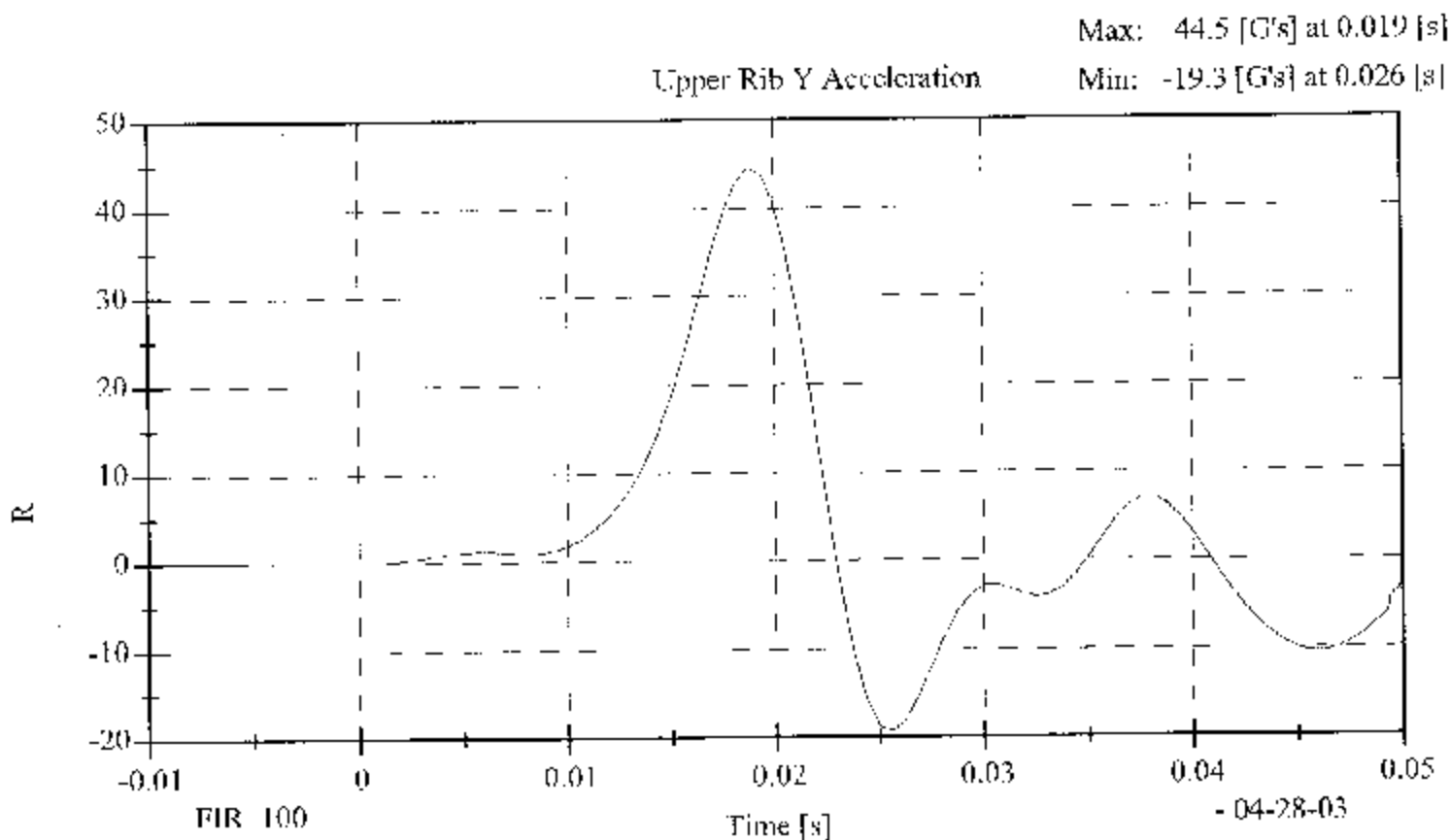
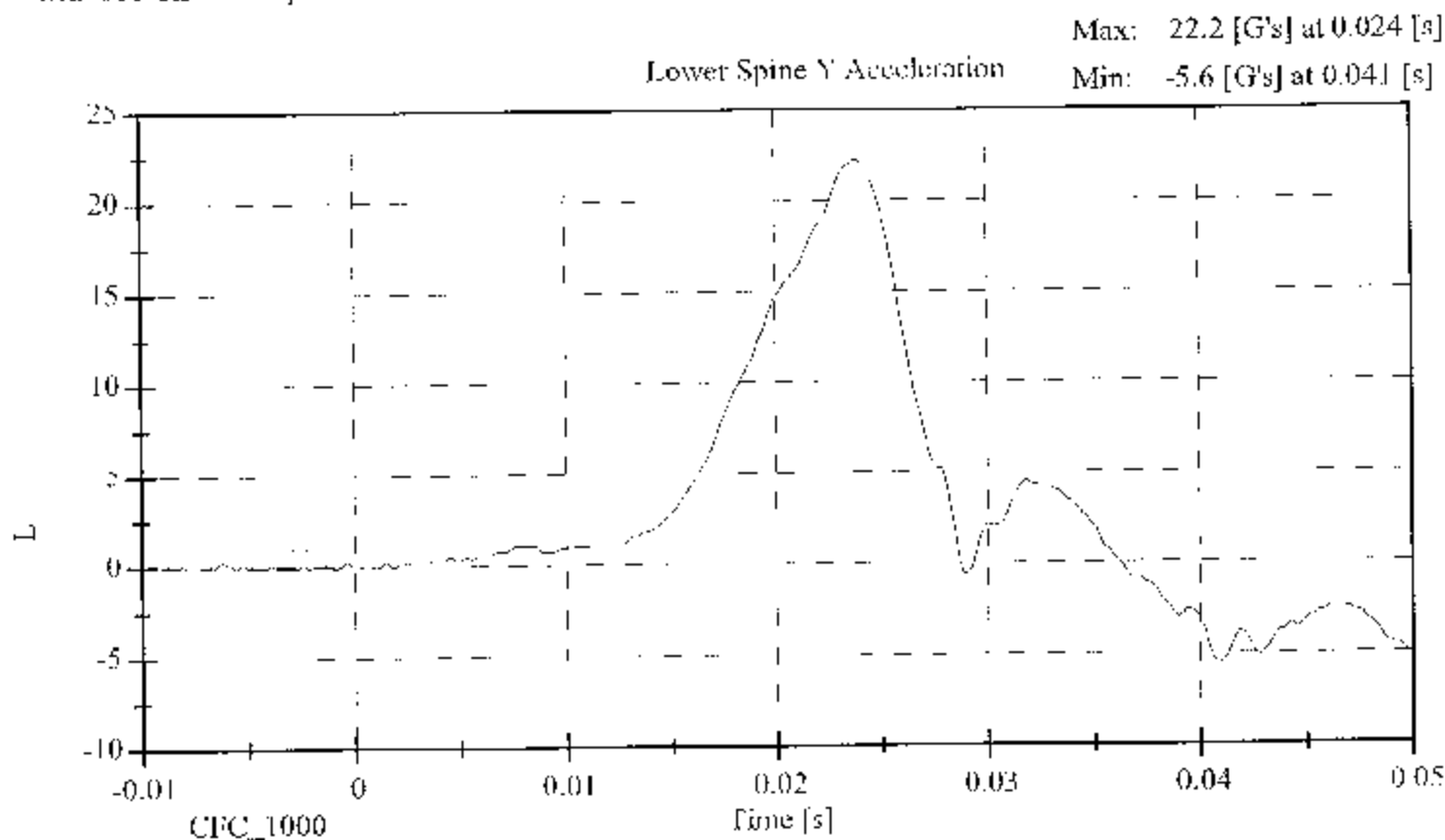


Lower Rib Y Acceleration

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

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

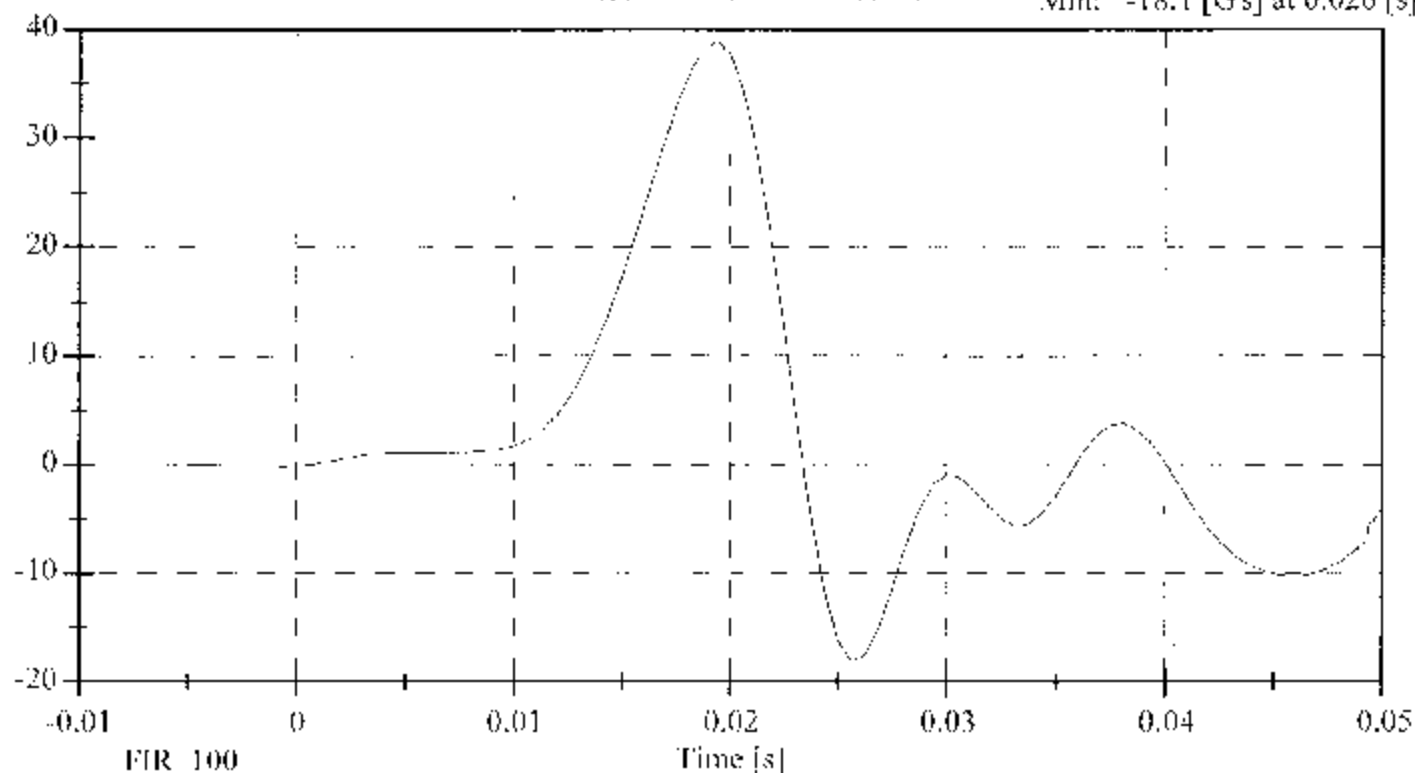




## Lower Rib Y Acceleration

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

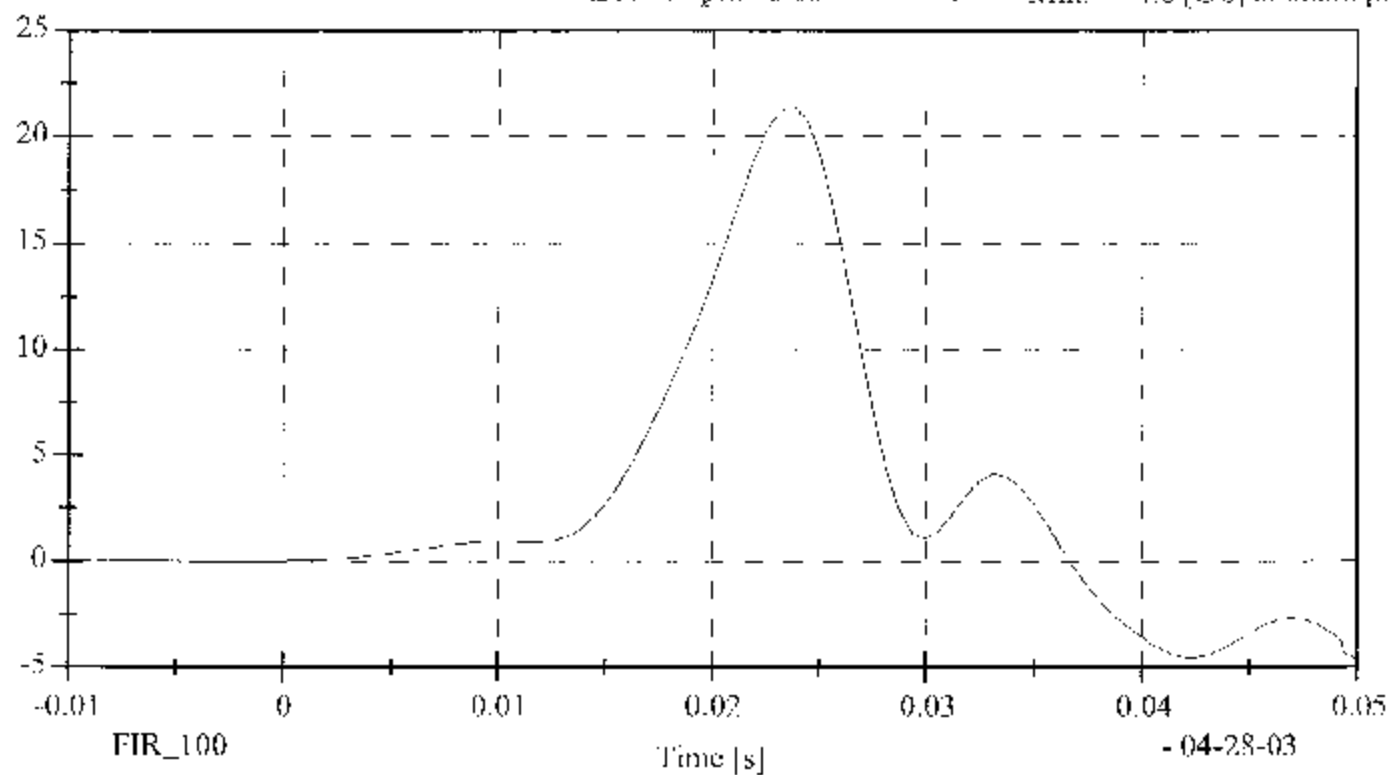
Min: -18.1 [G's] at 0.026 [s]



## Lower Spine Y Acceleration

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

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



- 04-28-03

**LATERAL PELVIS IMPACT TEST  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID 113 Serial No.: 016 Sequential Test Number: 1  
 Date: April 28, 2003 Laboratory Technician: B. Swicicki

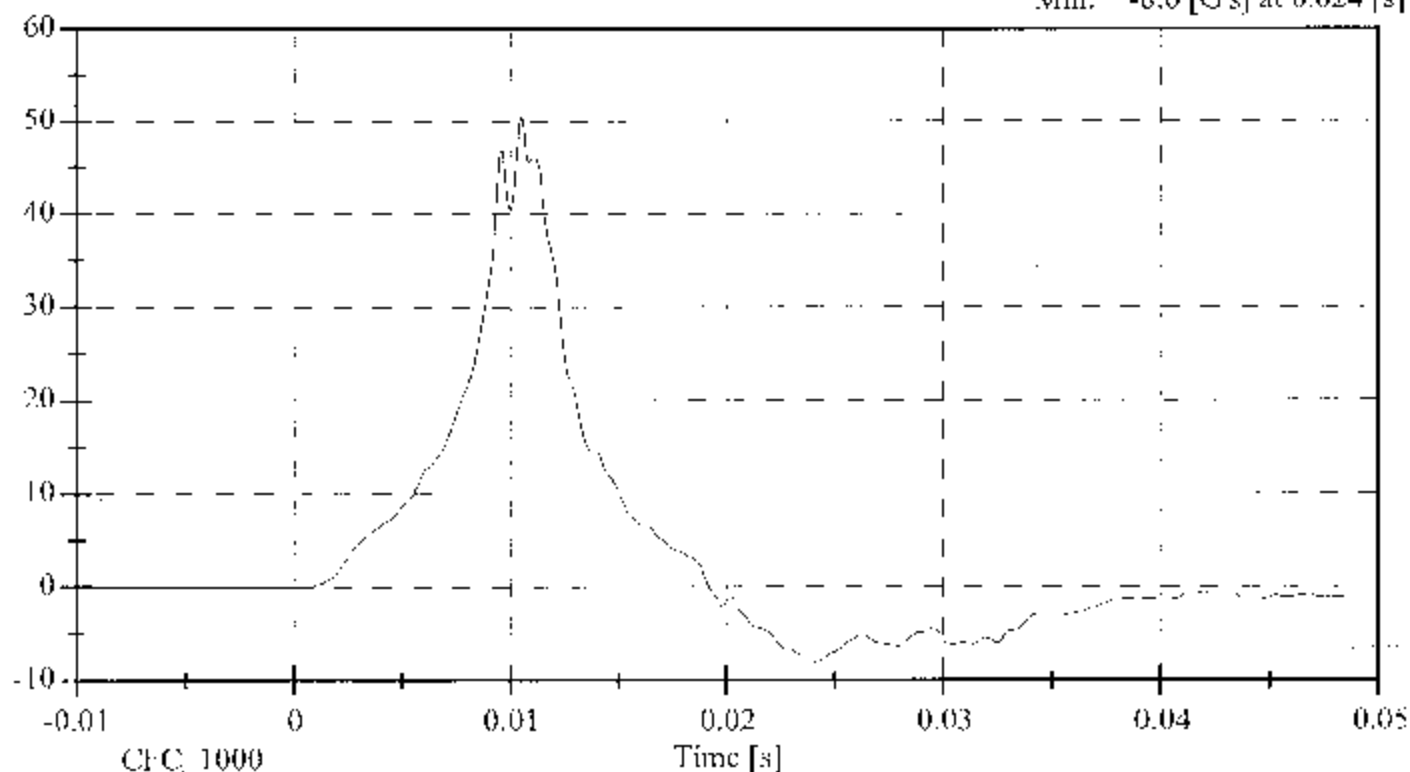
| TEST PARAMETER            | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C)          | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%)     | 10 - 70       | 31.0         |
| PROBE SPEED (m/s)         | 4.27 - 4.33   | 4.30      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

REMARKS: None

Pelvis Acceleration

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

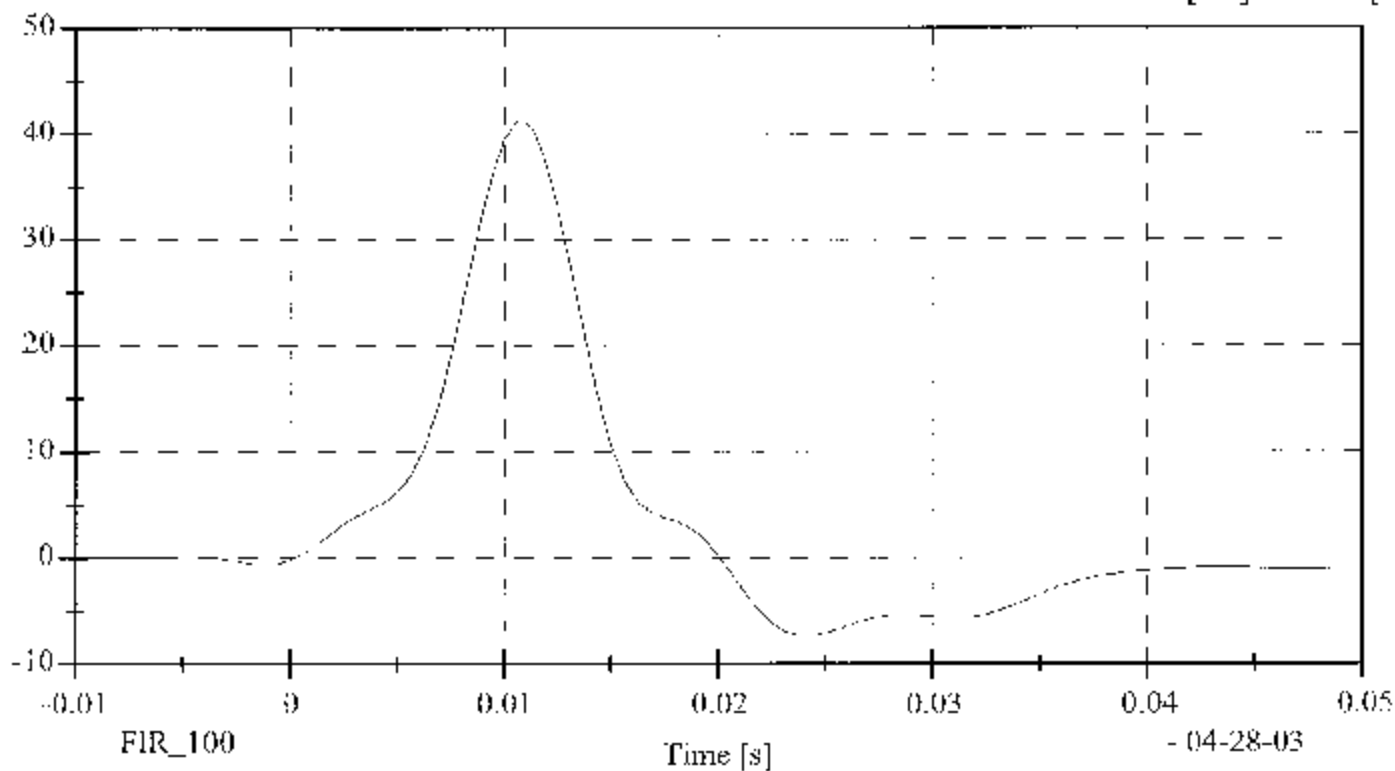
Min: -8.0 [G's] at 0.024 [s]



Pelvis Y Acceleration

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

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



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

**CONFIGURED FOR LEF1 SIDE IMPACT**

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

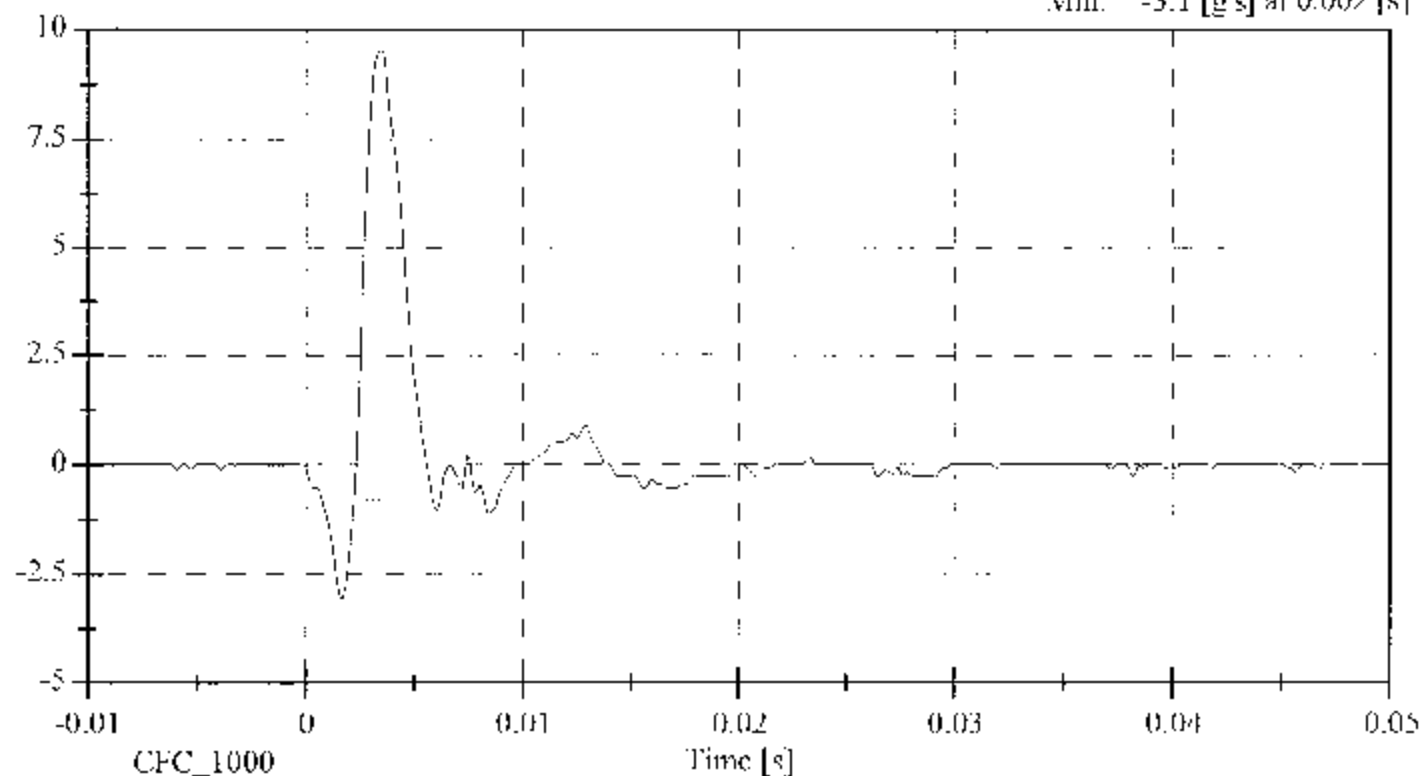
| TEST PARAMETER                   | SPECIFICATION    | TEST RESULTS |
|----------------------------------|------------------|--------------|
| TEMPERATURE (°C)                 | 20.6 - 22.2      | 21.1         |
| RELATIVE HUMIDITY (%)            | 10 - 70          | 38.0         |
| PEAK RESULTANT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

REMARKS: None

Head X Acceleration

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

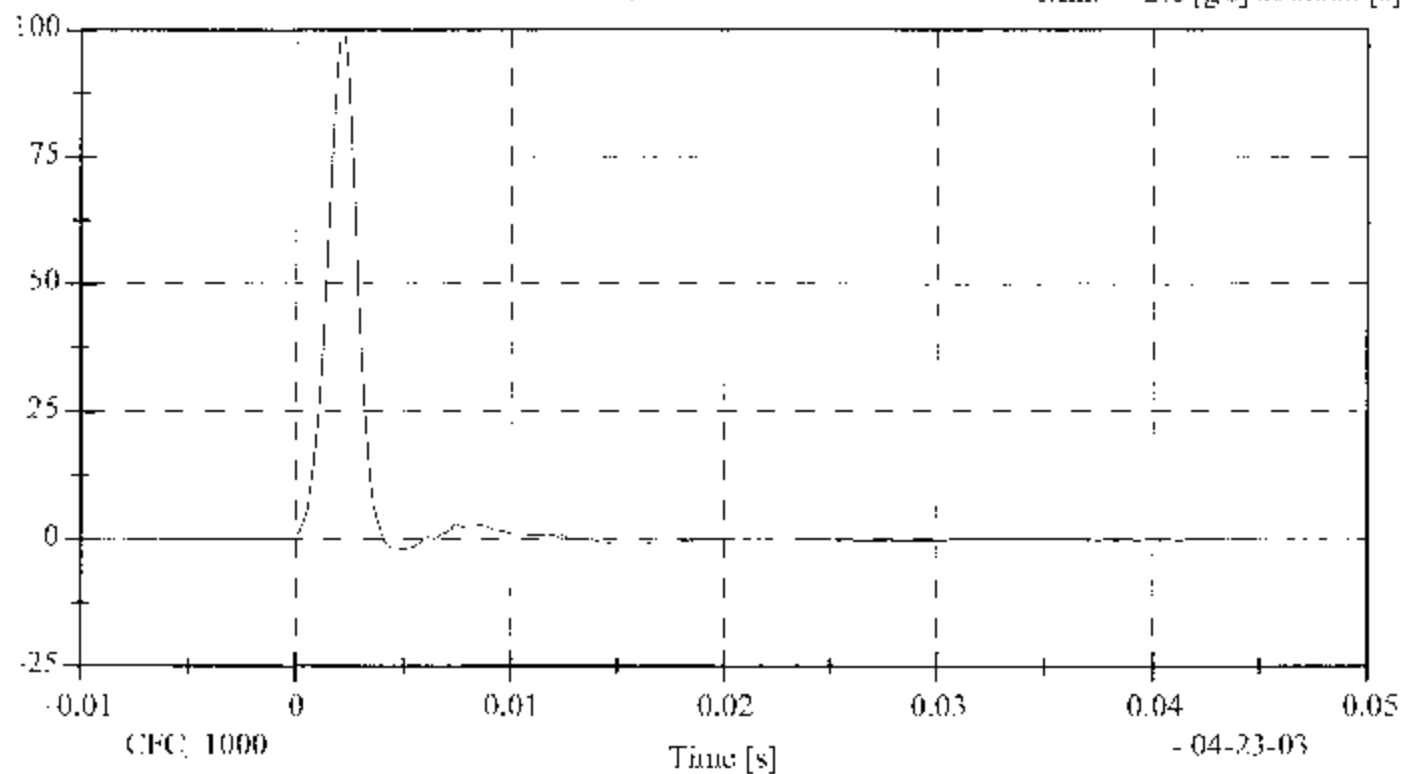
Min: -3.1 [g's] at 0.002 [s]



Head Y Acceleration

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

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

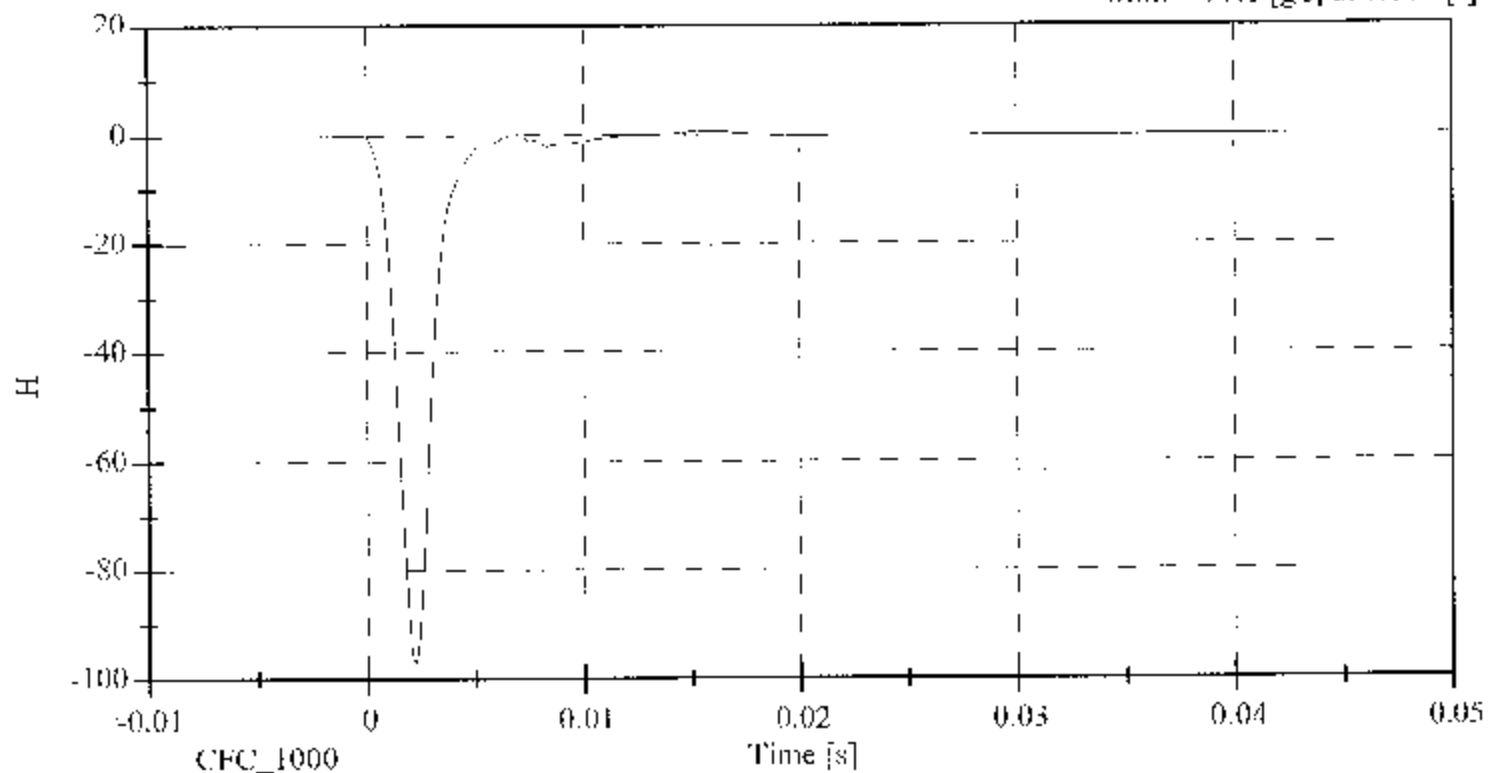




Head Z Acceleration

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

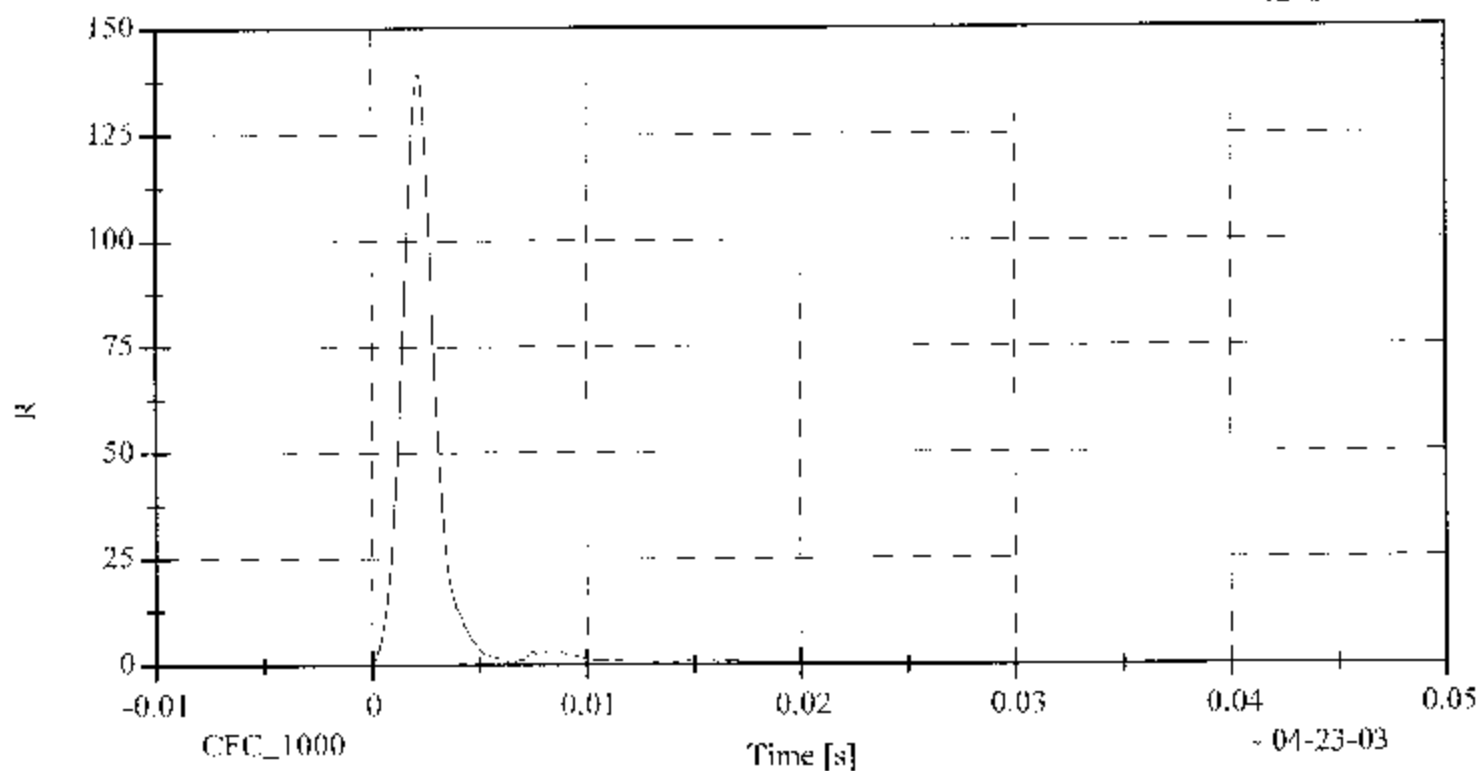
Min: -97.1 [g's] at 0.002 [s]



Head Resultant

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

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



~ 04-23-03

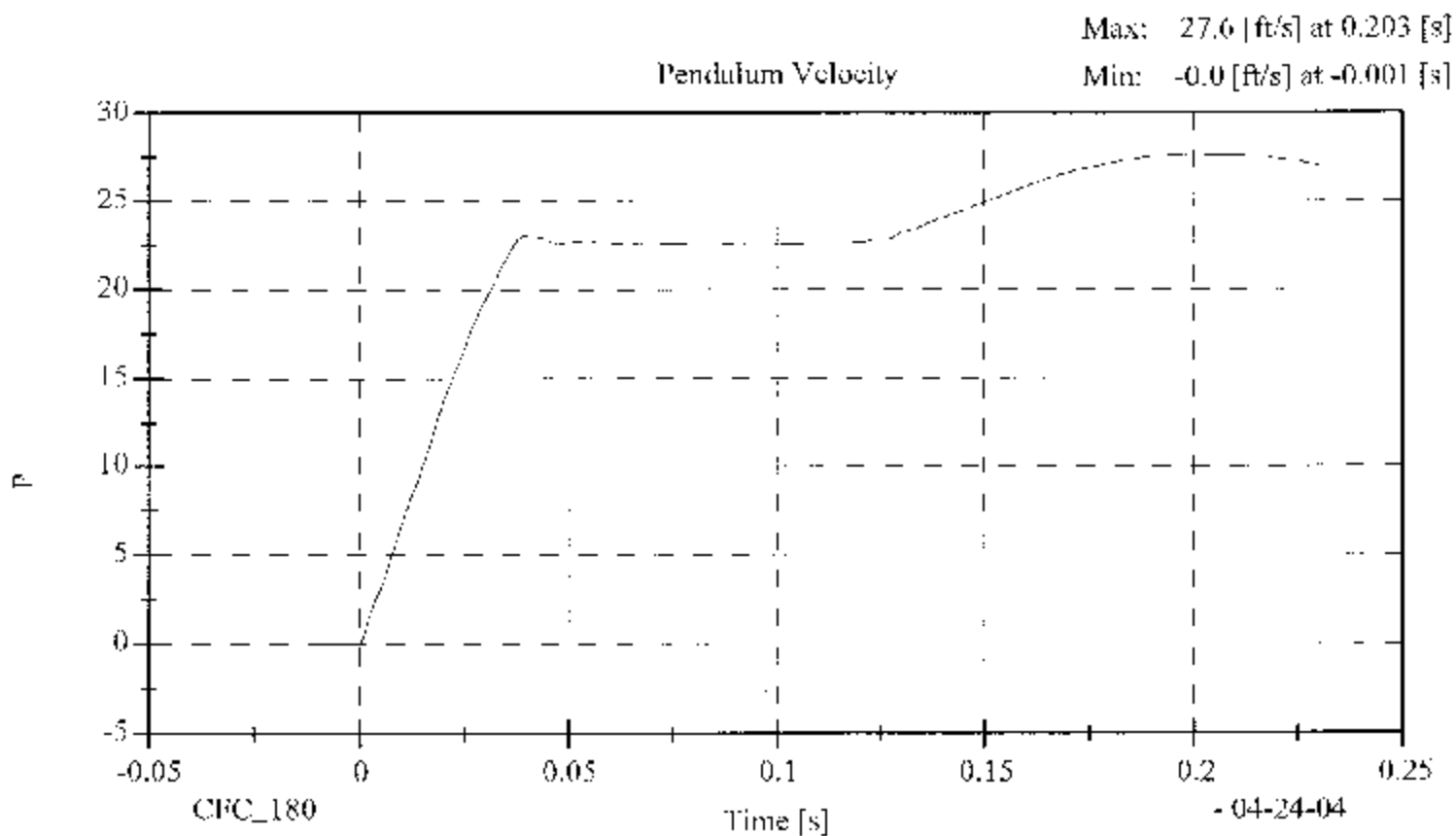
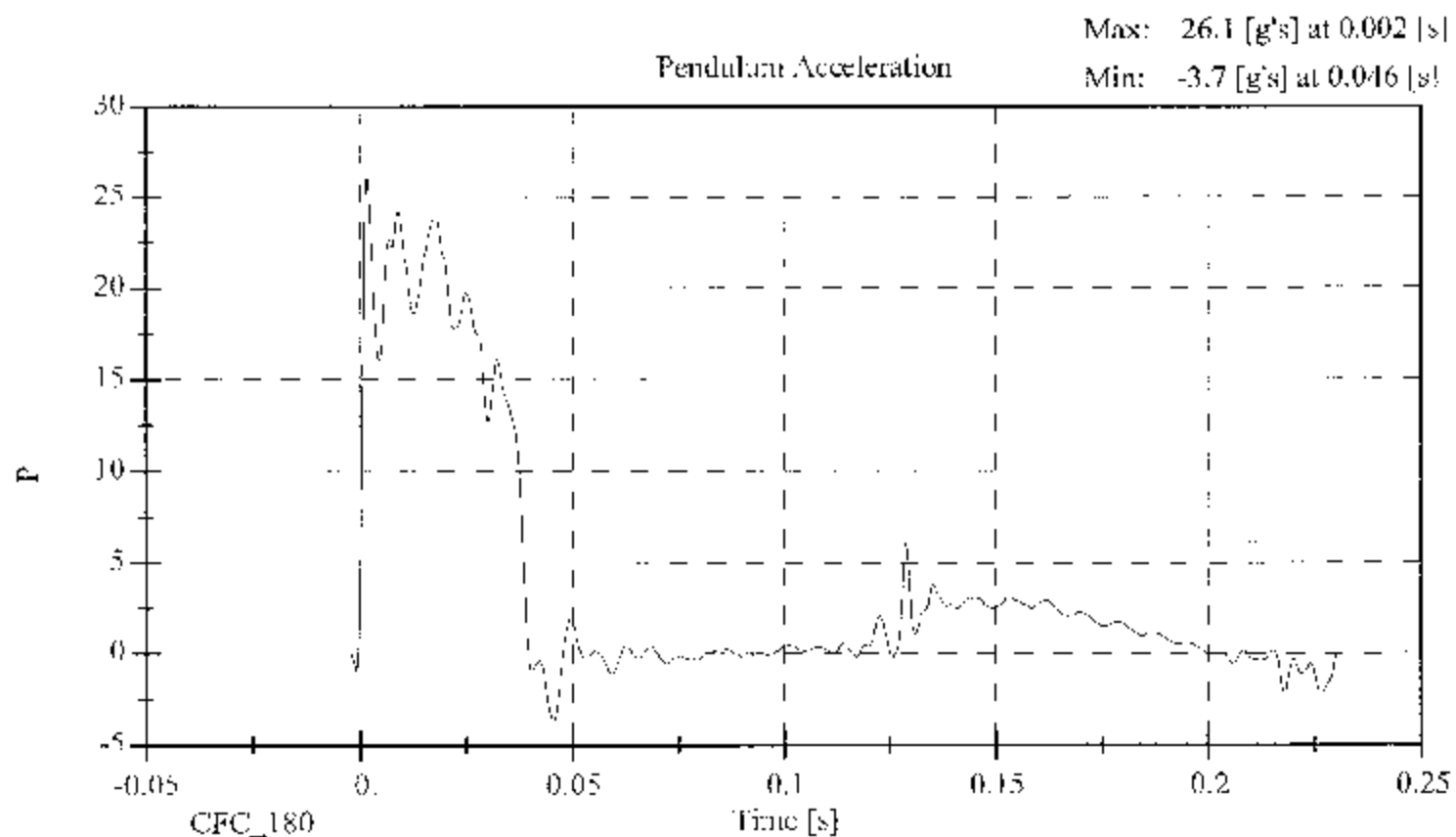
**LATERAL NECK BENDING TEST**  
**PRE-TEST**  
 (Test not required for SID certification)

**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        |

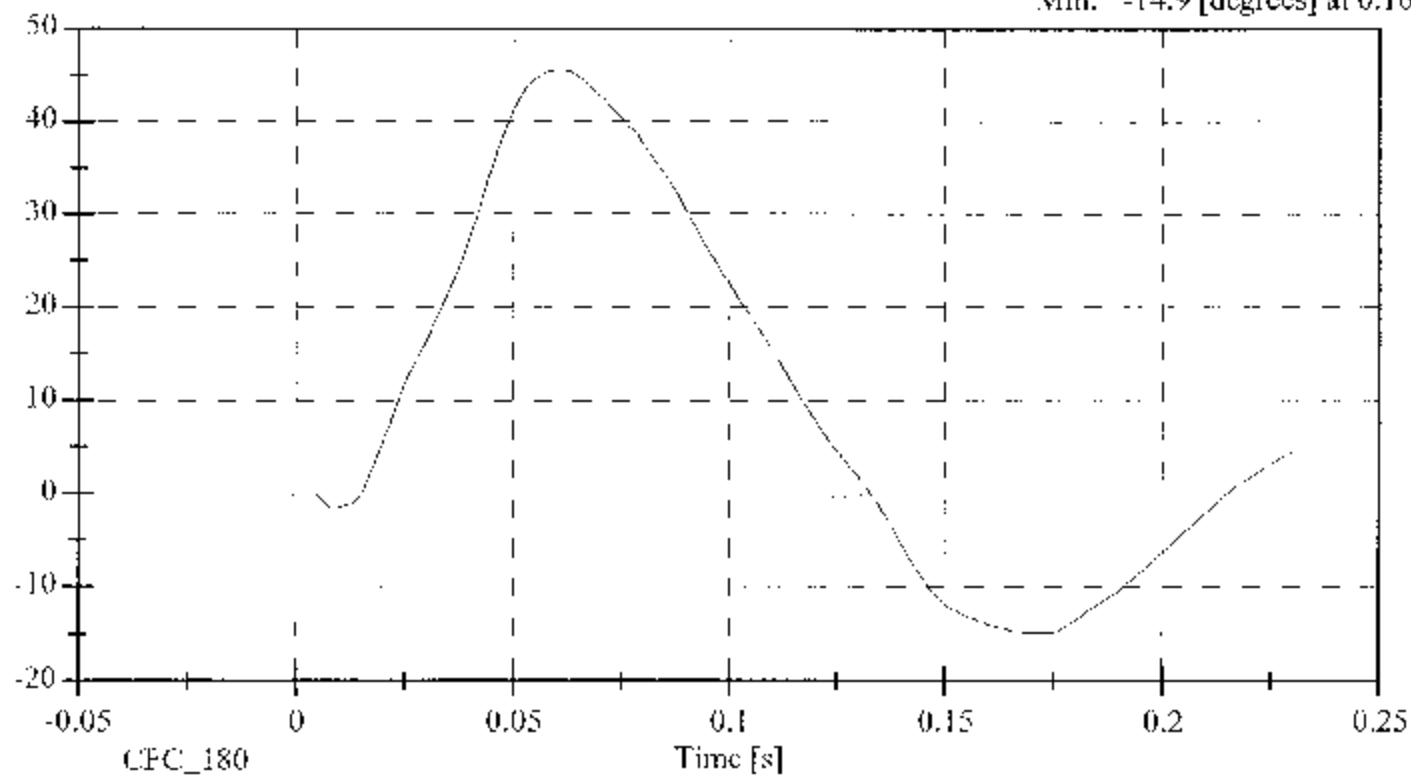
REMARKS: None



Head Rotation

Max: 45.5 [degrees] at 0.061

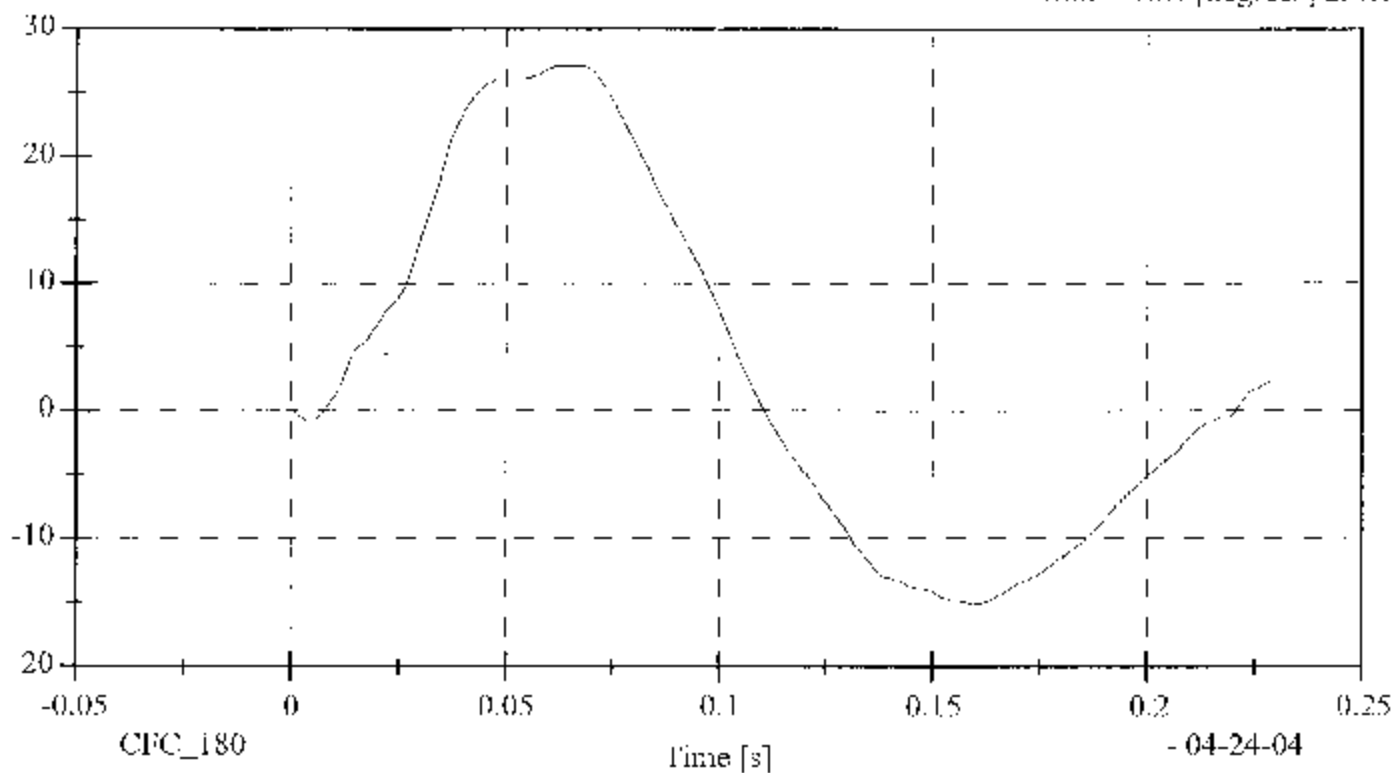
Min: -14.9 [degrees] at 0.169



Arm Rotation

Max: 27.1 [degrees] at 0.061

Min: -15.1 [degrees] at 0.161

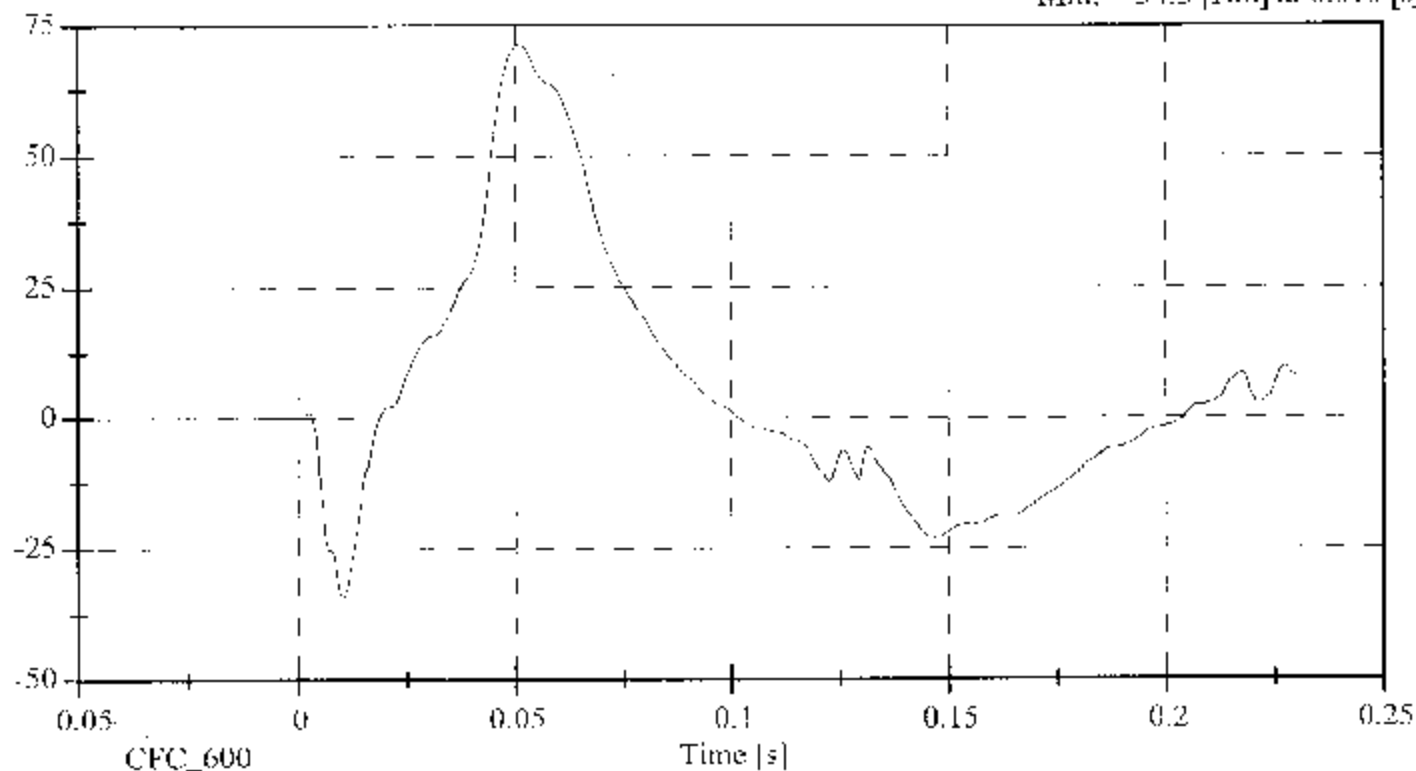


- 04-24-04

Neck Moment X

Max: 71.4 [Nm] at 0.051 [s]

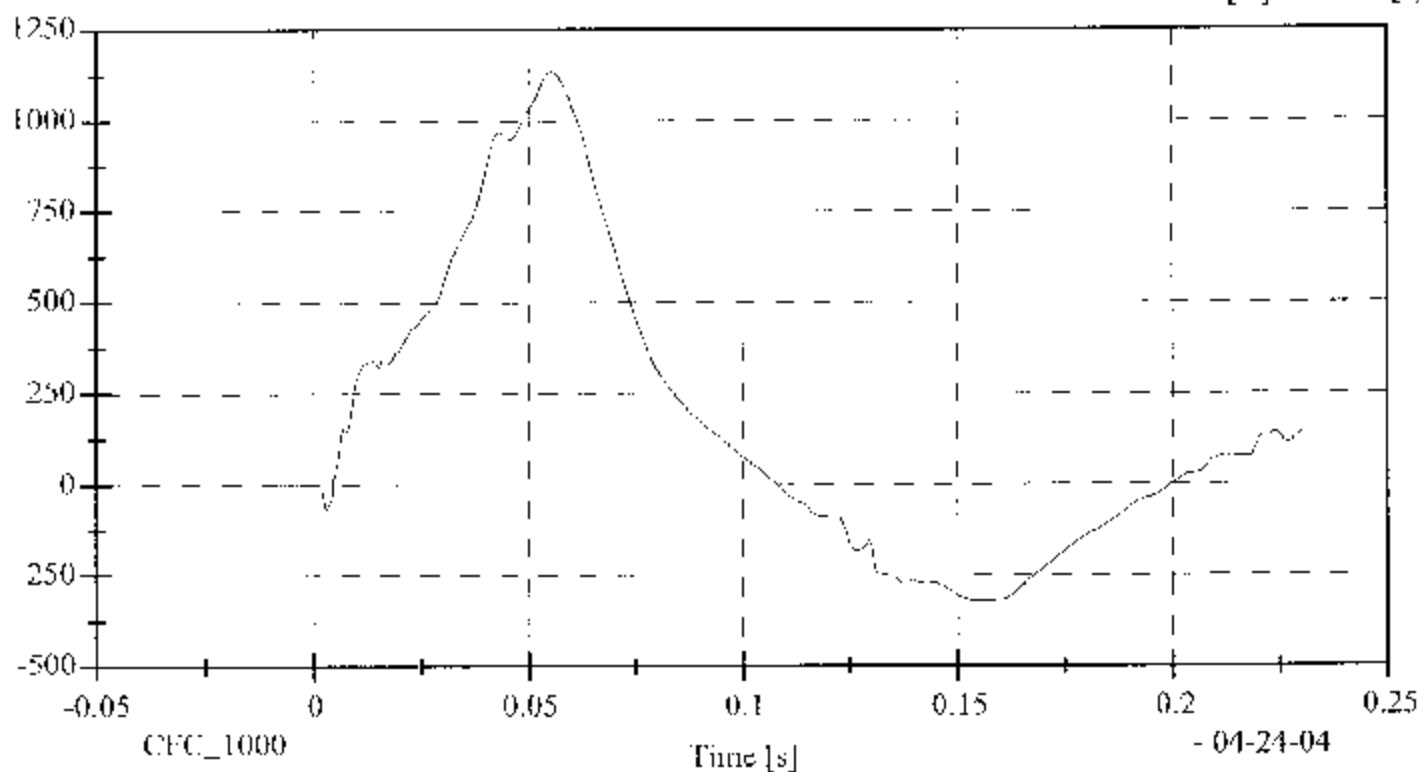
Min: -34.3 [Nm] at 0.010 [s]



Neck Force Y

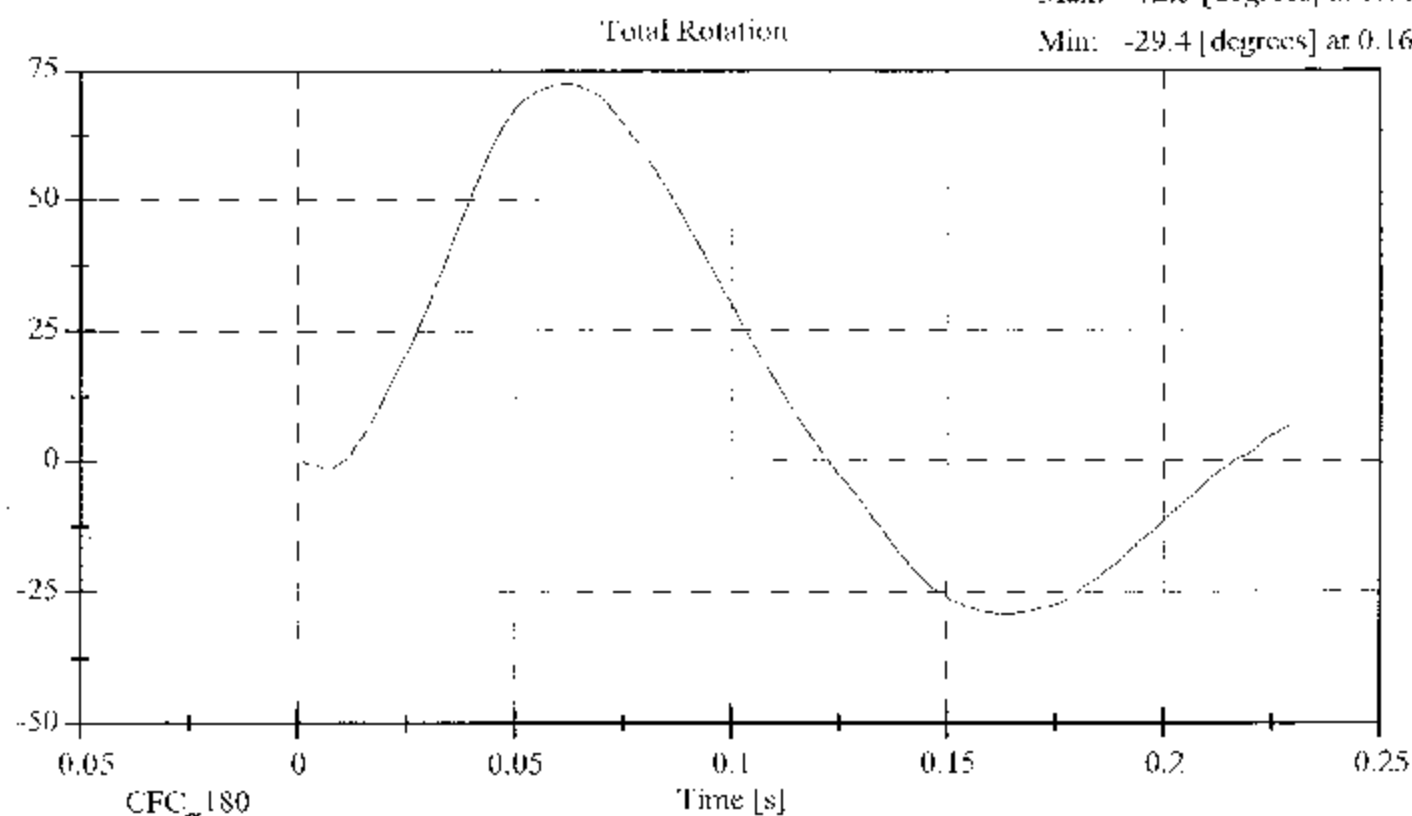
Max: 1135.4 [N] at 0.055 [s]

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



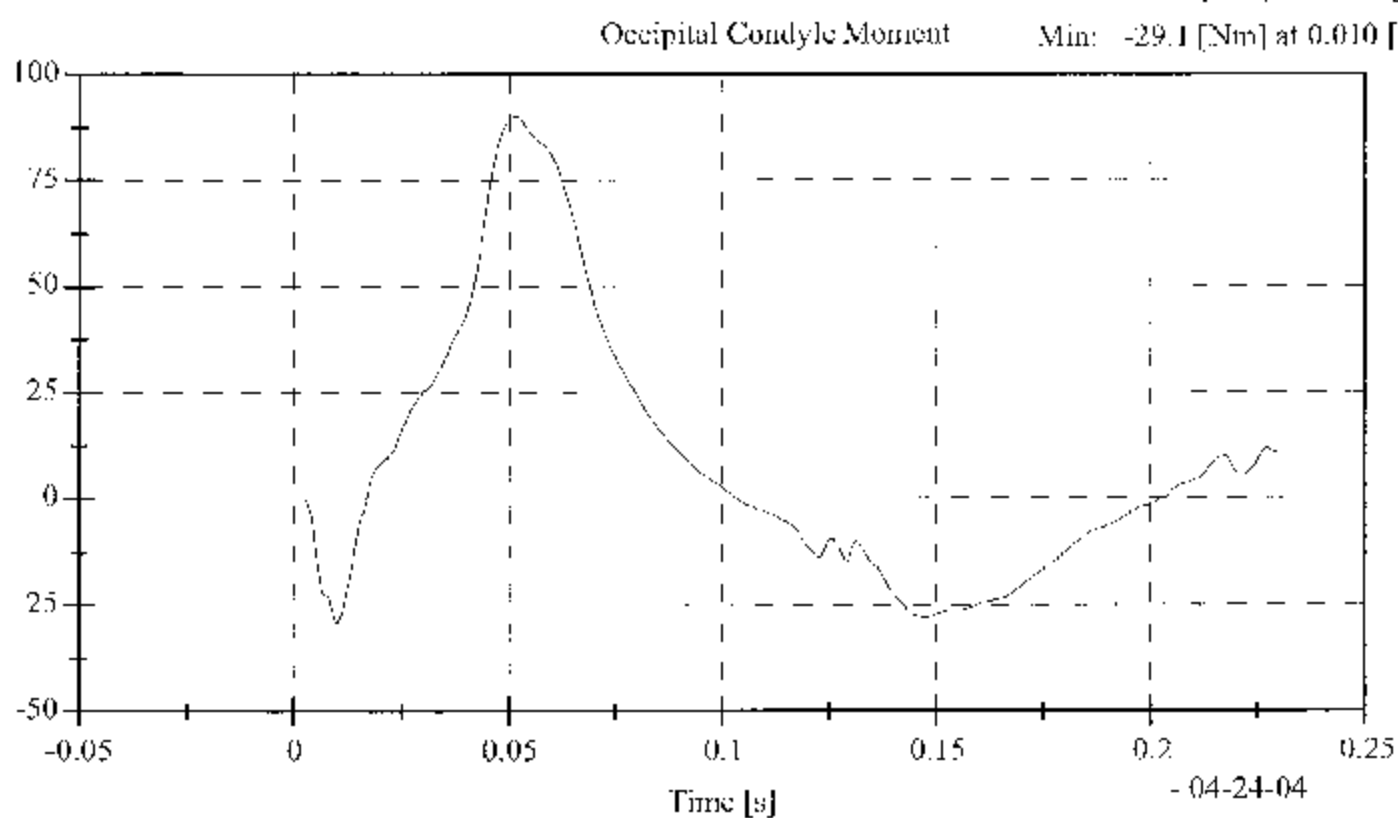
Max: 72.5 [degrees] at 0.062

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)     | 323 - 391     | 379.4        |

REMARKS: None

Dummy S/N

016

W/A

Date

4-25-03

Performed By

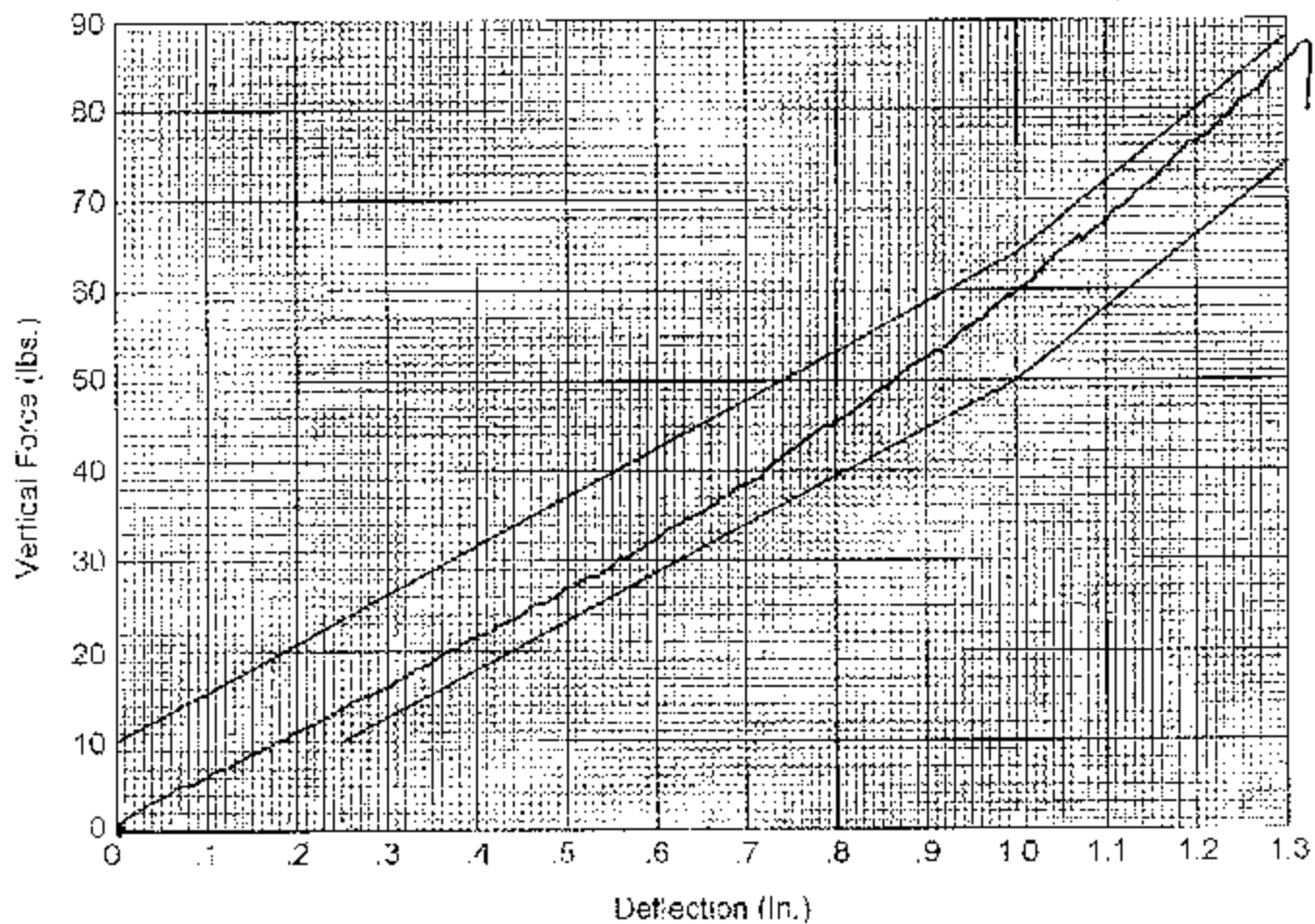
[Signature]

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. Swieczicki

| 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.      | 3.1"         |

REMARKS: None

Dummy S/N

016

W/A

Date

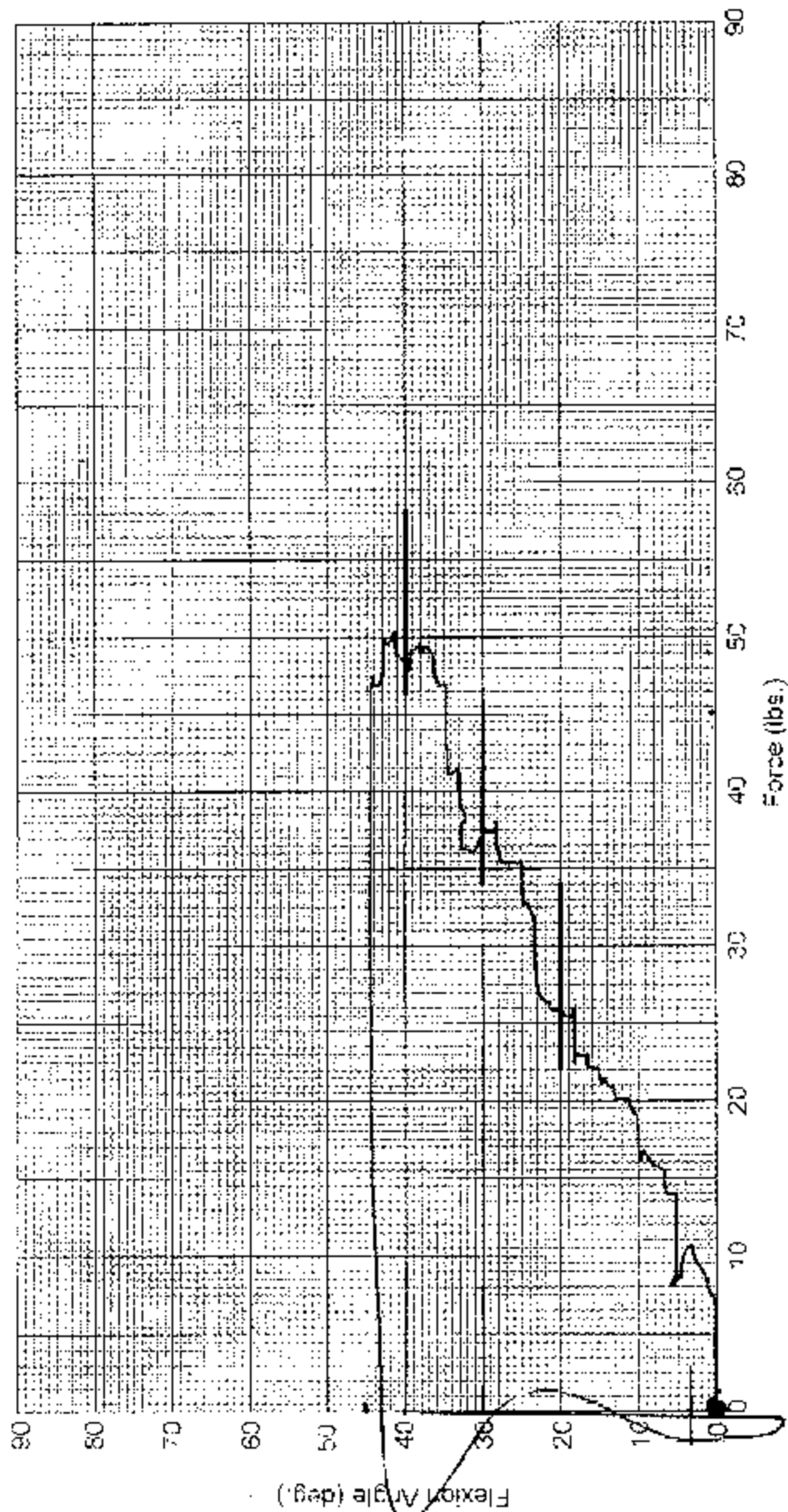
4-28-03

Performed By

Temp

Humidity

75%



Hybrid II Lumbar Spine Flexion Test

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

SIDEB 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,<br>ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                              | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT,<br>ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                       | OK       |
| STERNUM      | VISUAL                                            | OK       |
| LUMBAR SPINE | VISUAL                                            | OK       |
| ABDOMEN      | VISUAL                                            | OK       |
| PELVIS       | VISUAL, PALPATE,<br>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 #3 Serial No.: 015 Sequential Test Number: 1  
 Date: May 2, 2003 Laboratory Technician: B. Swieticki

| 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 113 Serial No.: 015 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swiecicki

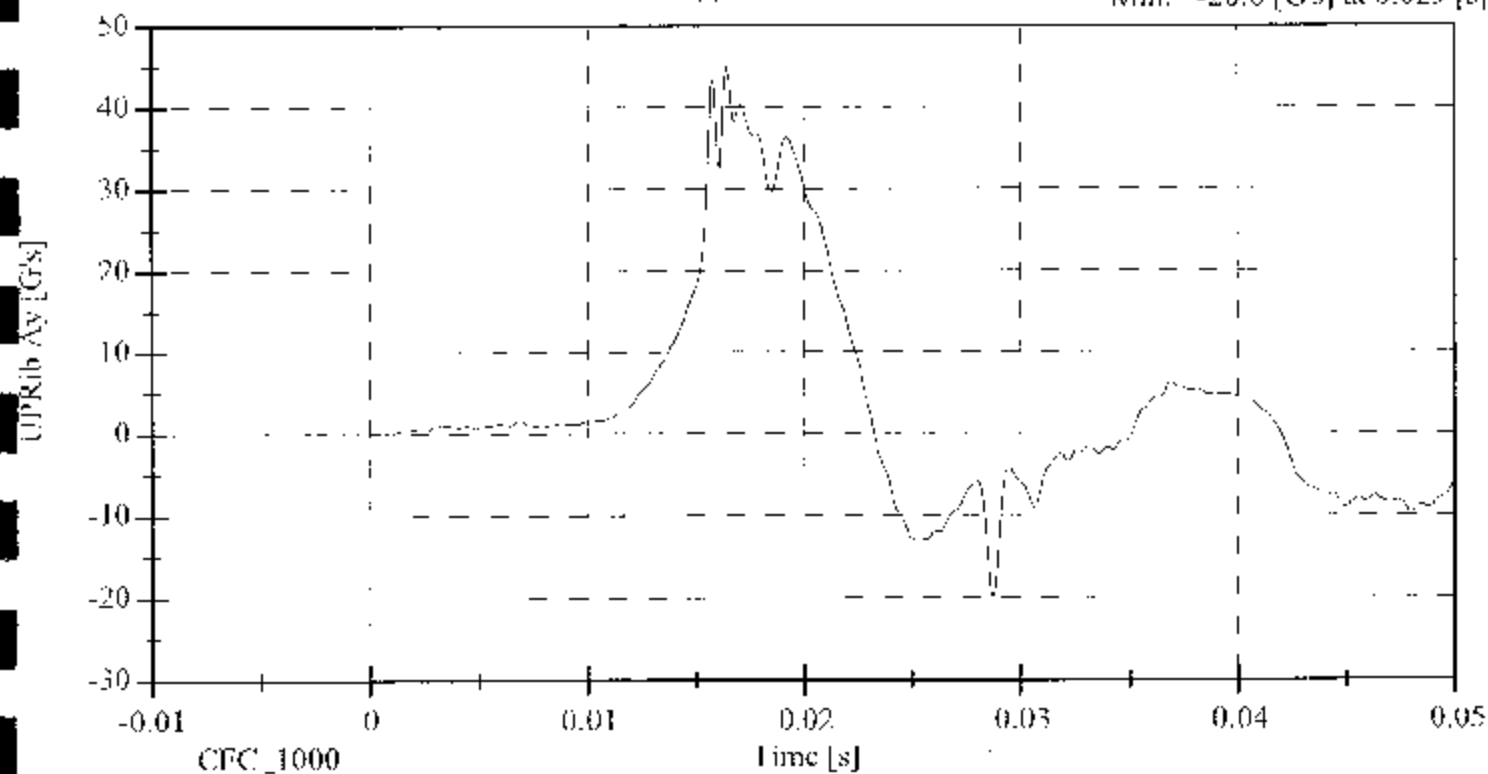
| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 37.0         |
| PROBE SPEED (m/s)     | 4.27 - 4.33   | 4.30         |
| UPPER RIB (g's)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

REMARKS: None

Upper Rib Y Acceleration

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

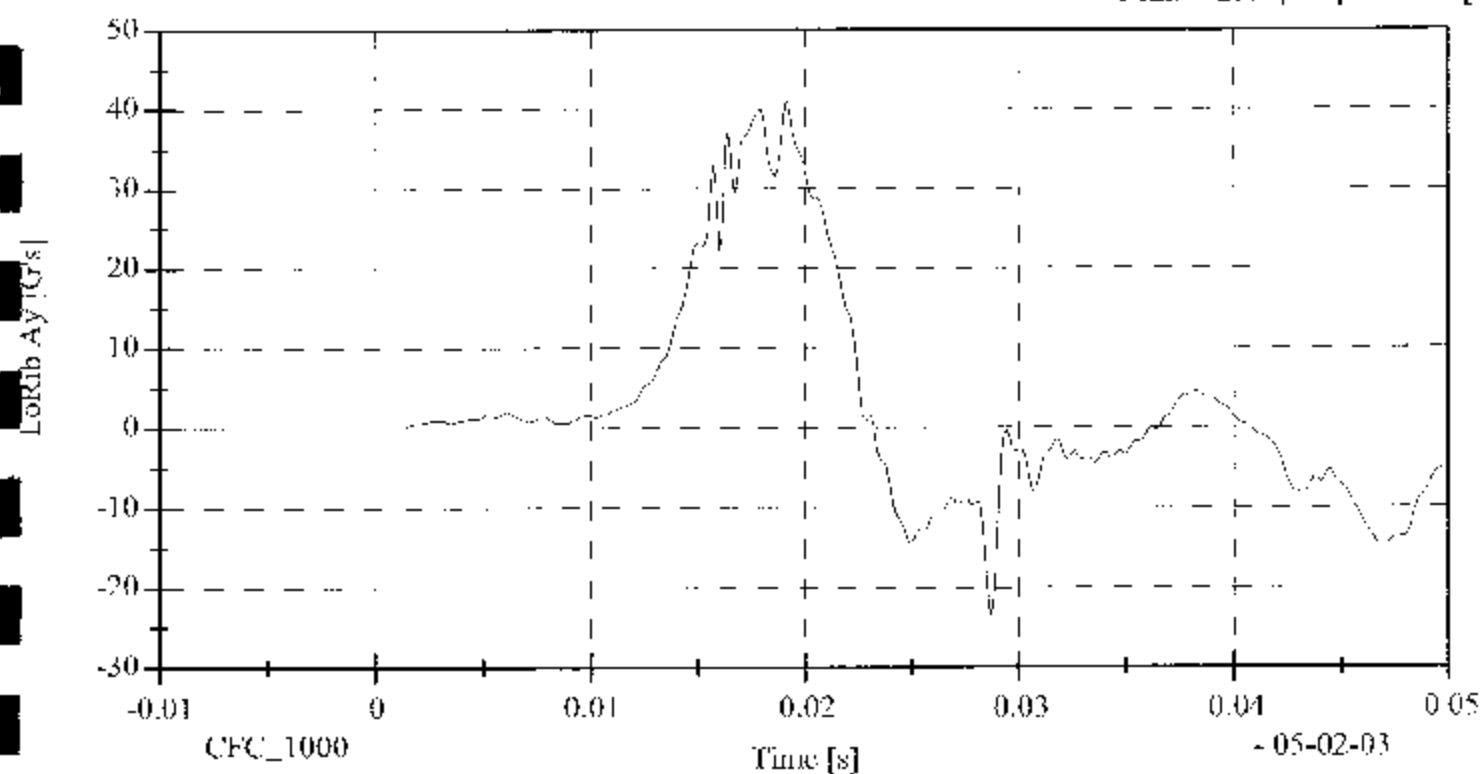
Min: -20.0 [G's] at 0.029 [s]



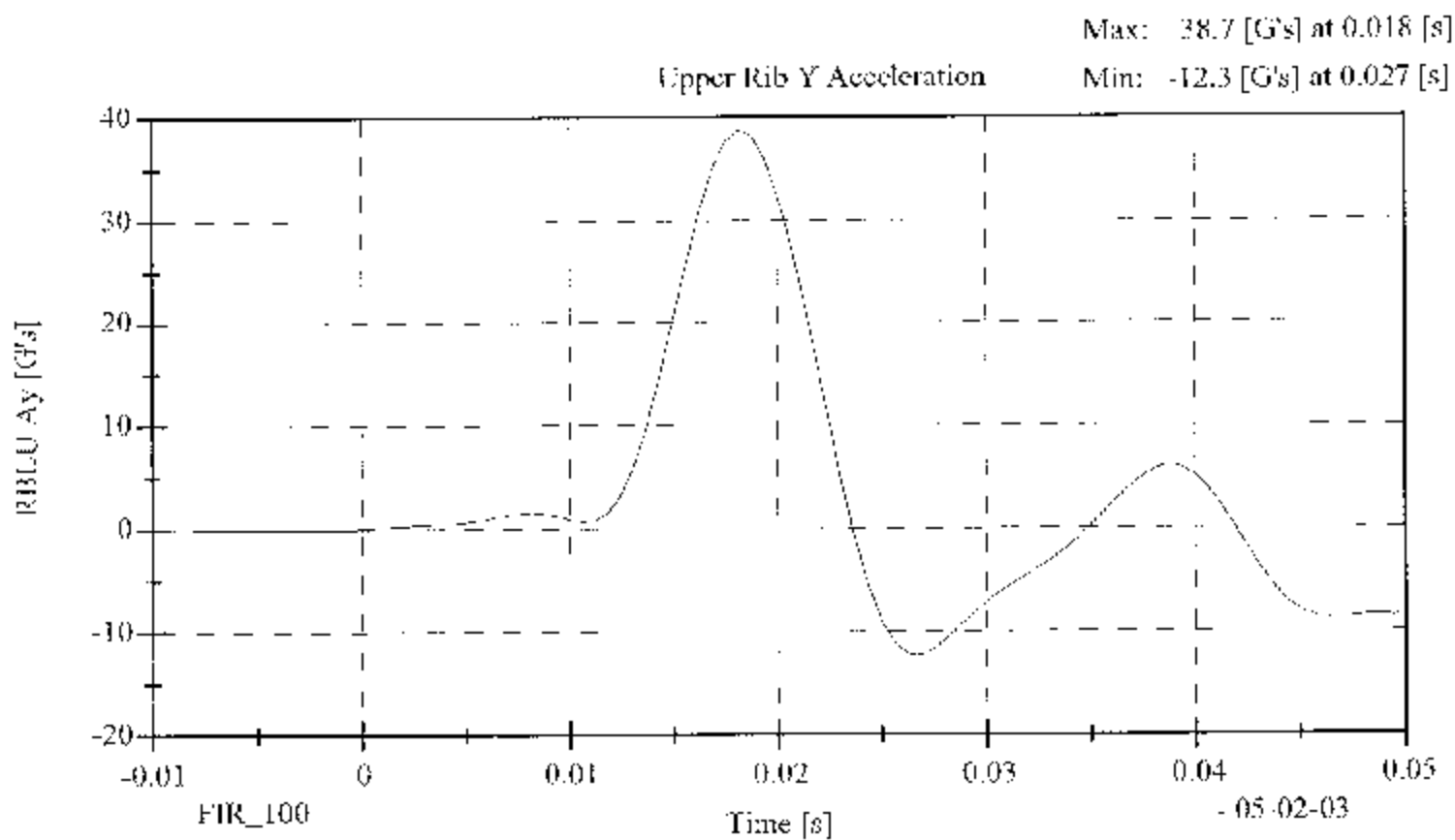
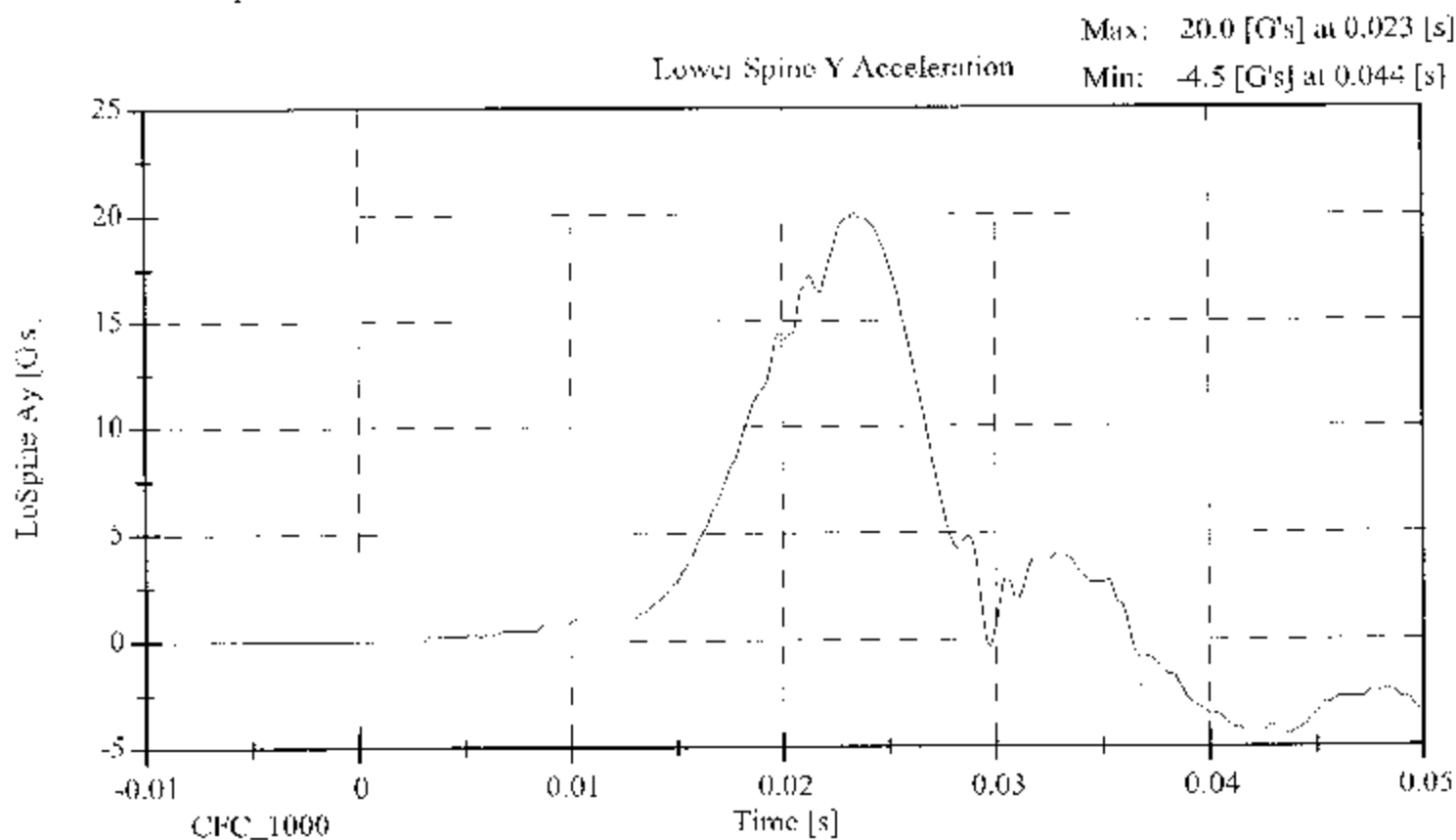
Lower Rib Y Acceleration

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

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



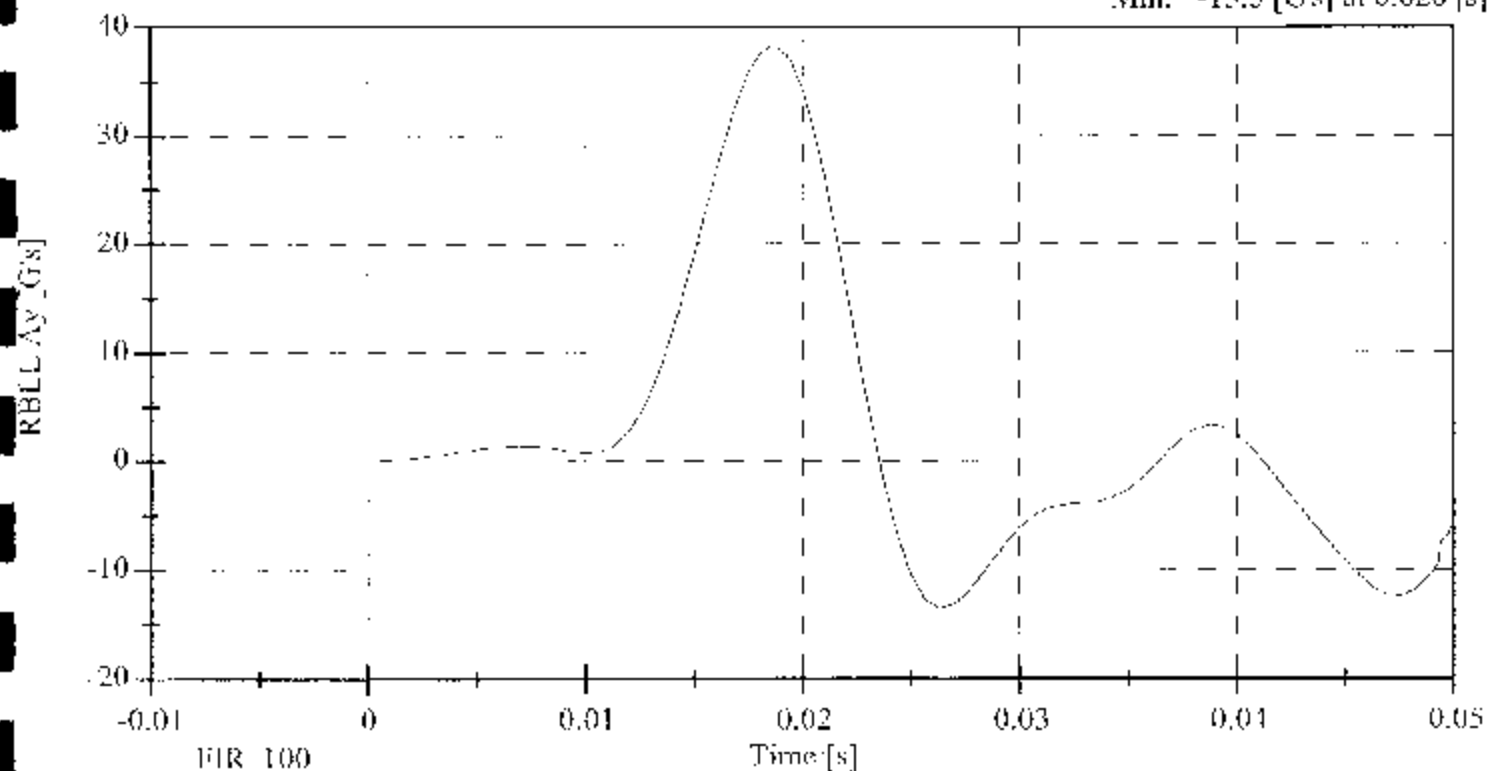




Lower Rib Y Acceleration

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

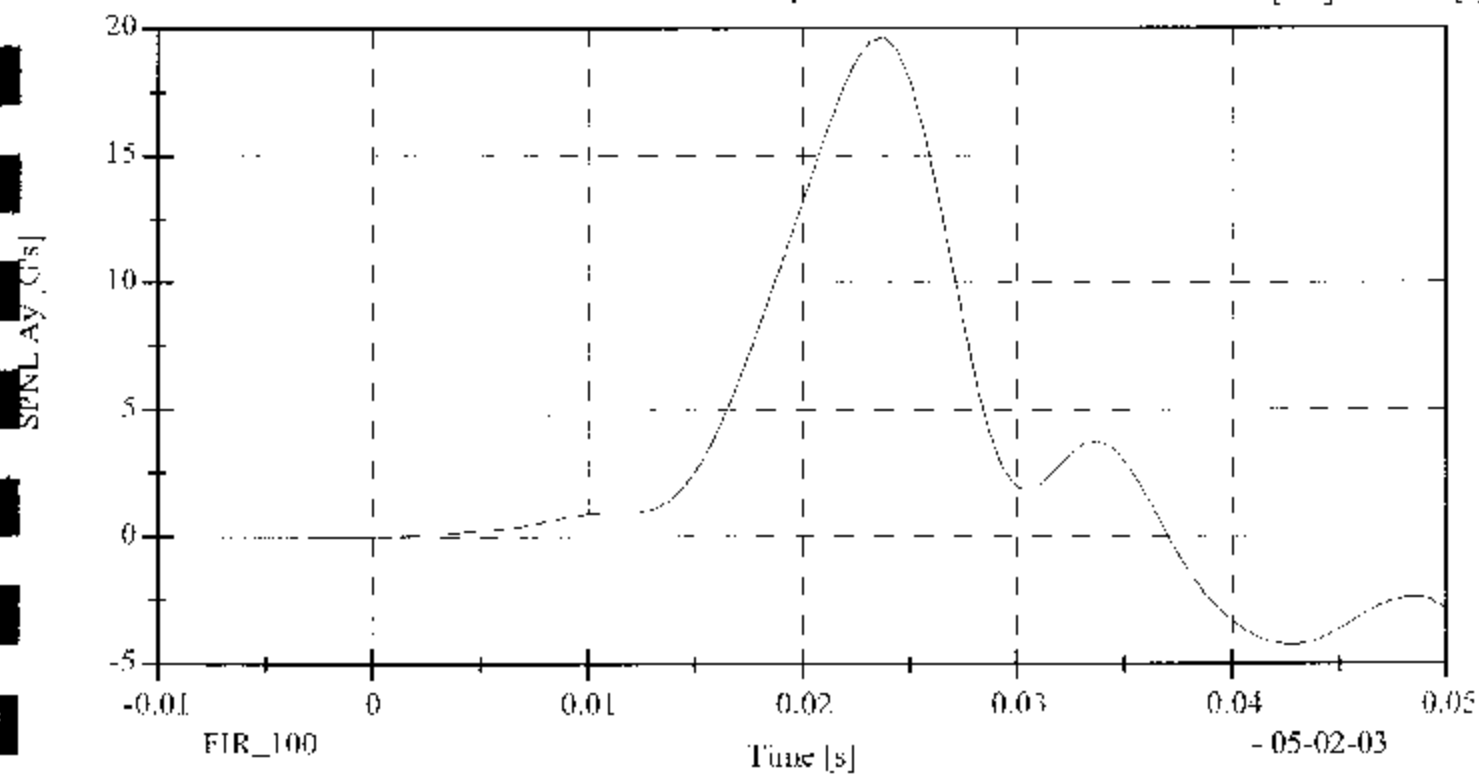
Min: -13.5 [G's] at 0.026 [s]



Lower Spine Y Acceleration

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

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



**LATERAL PELVIS IMPACT TEST  
POST TEST**

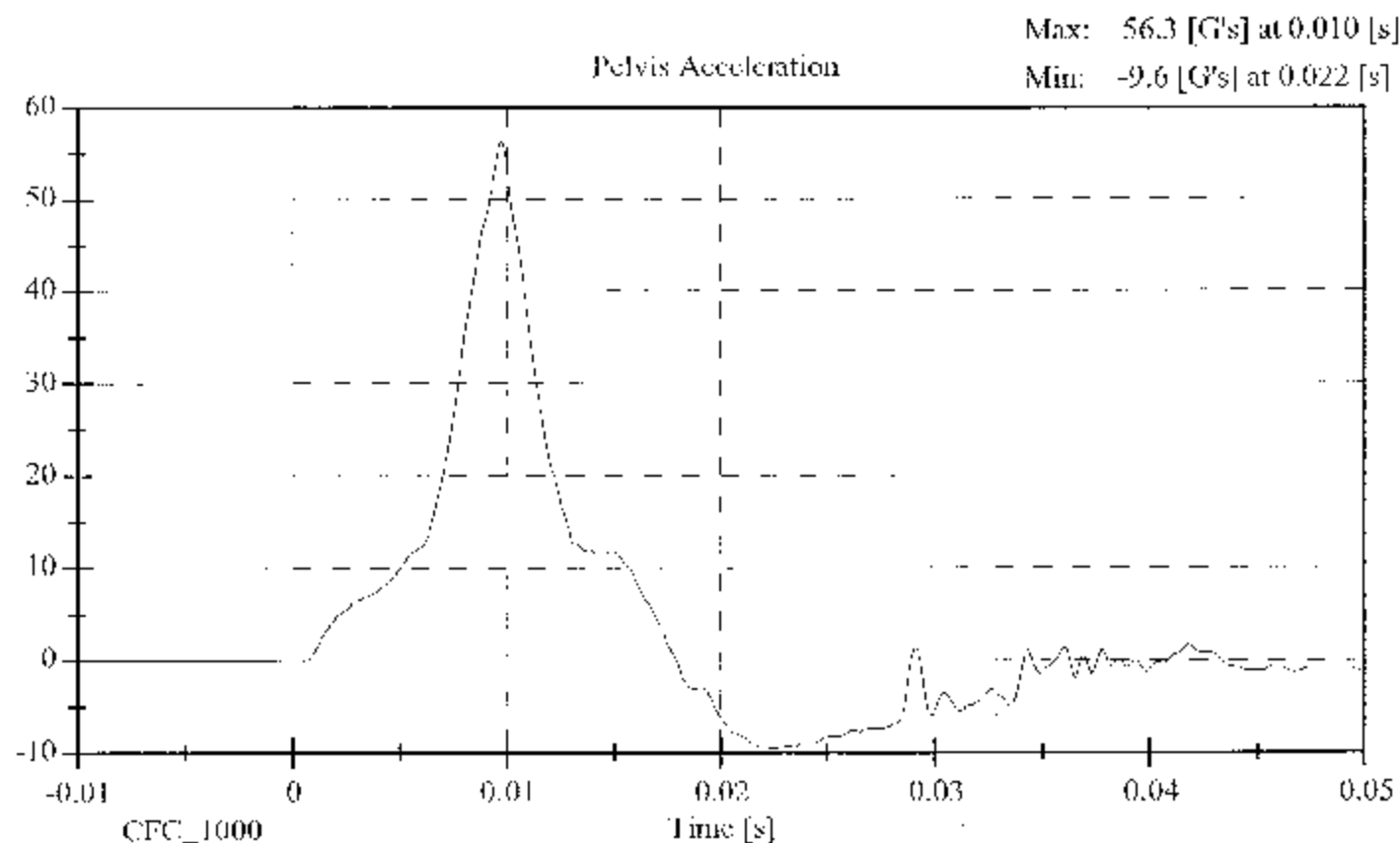
**CONFIGURED FOR LEFT SIDE IMPACT**

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

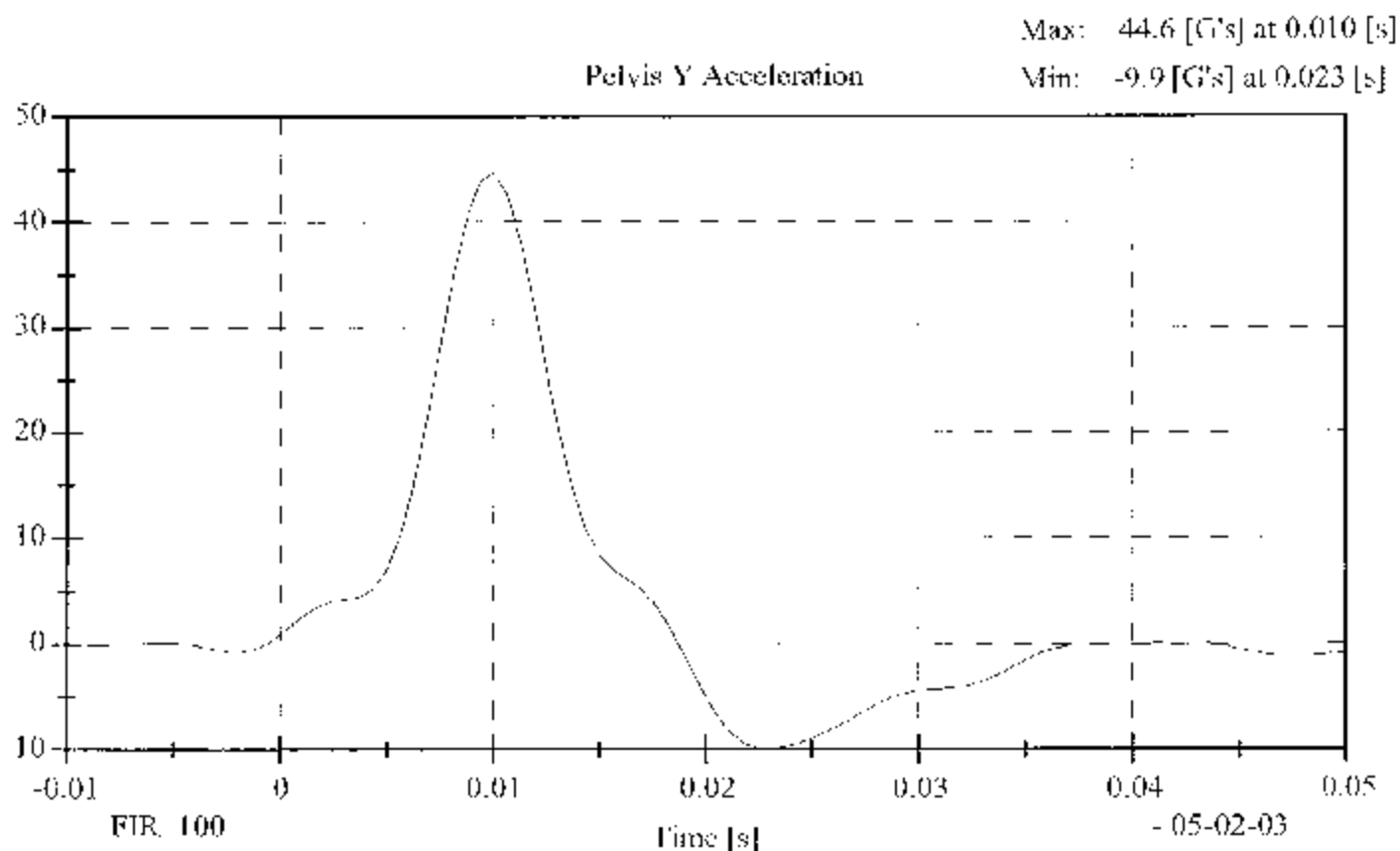
| TEST PARAMETER            | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C)          | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%)     | 10 - 70       | 37.0         |
| PROBE SPEED (m/s)         | 4.27 - 4.33   | 4.31      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

**REMARKS:** None

Pelvis1000 [G's]



PVCN Ay [G's]



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

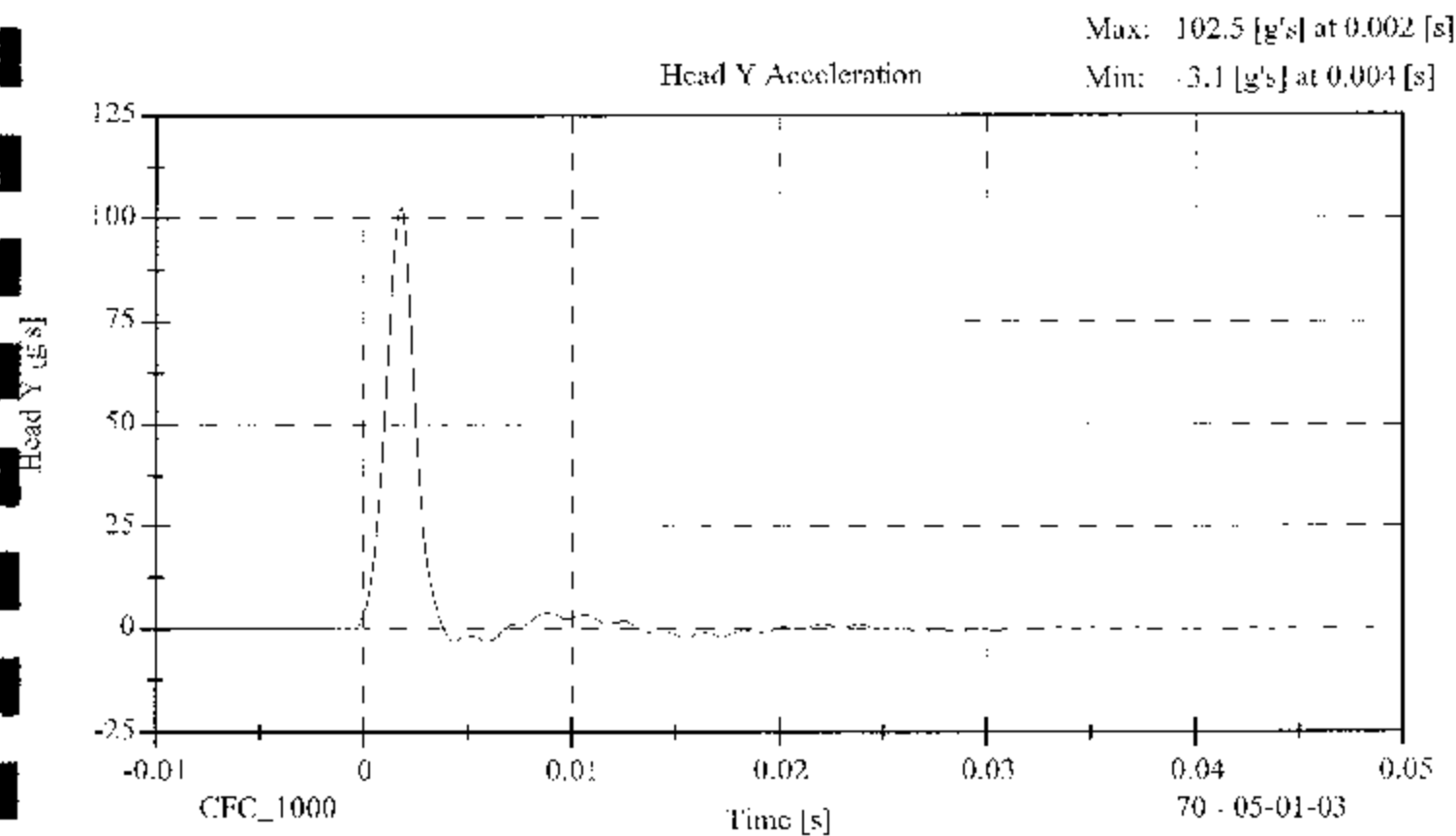
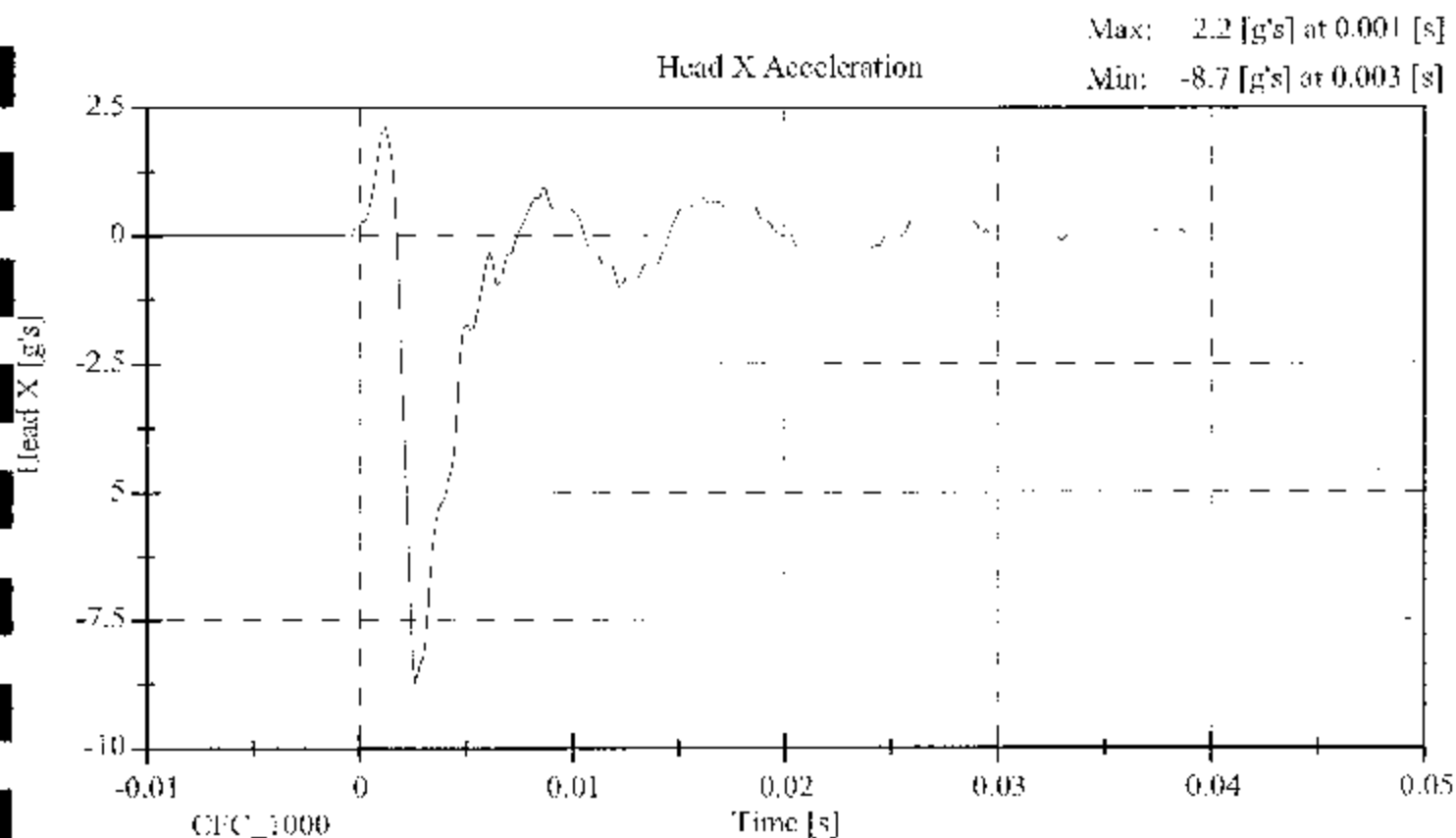
**CONFIGURED FOR LEFT SIDE IMPACT**

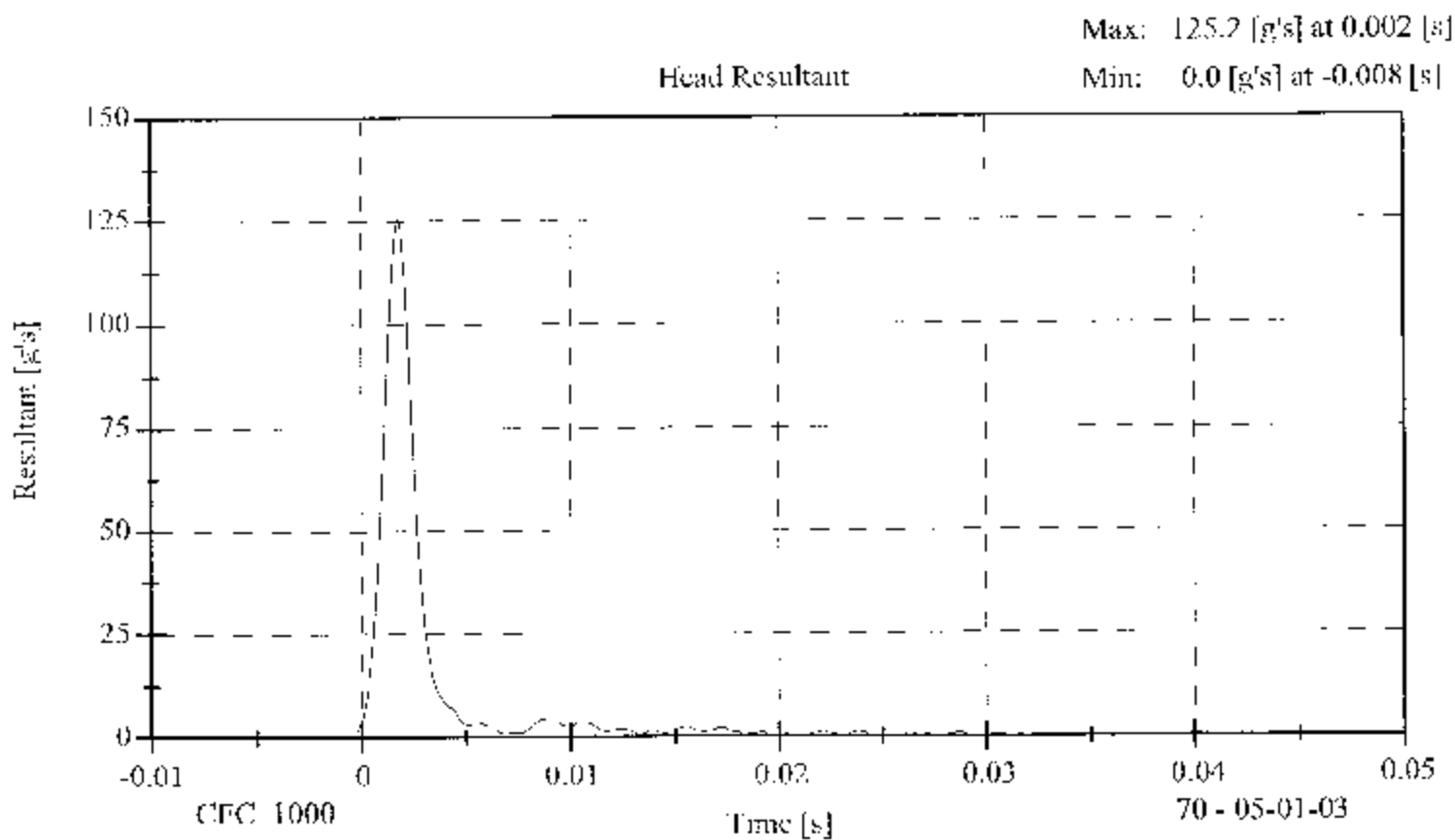
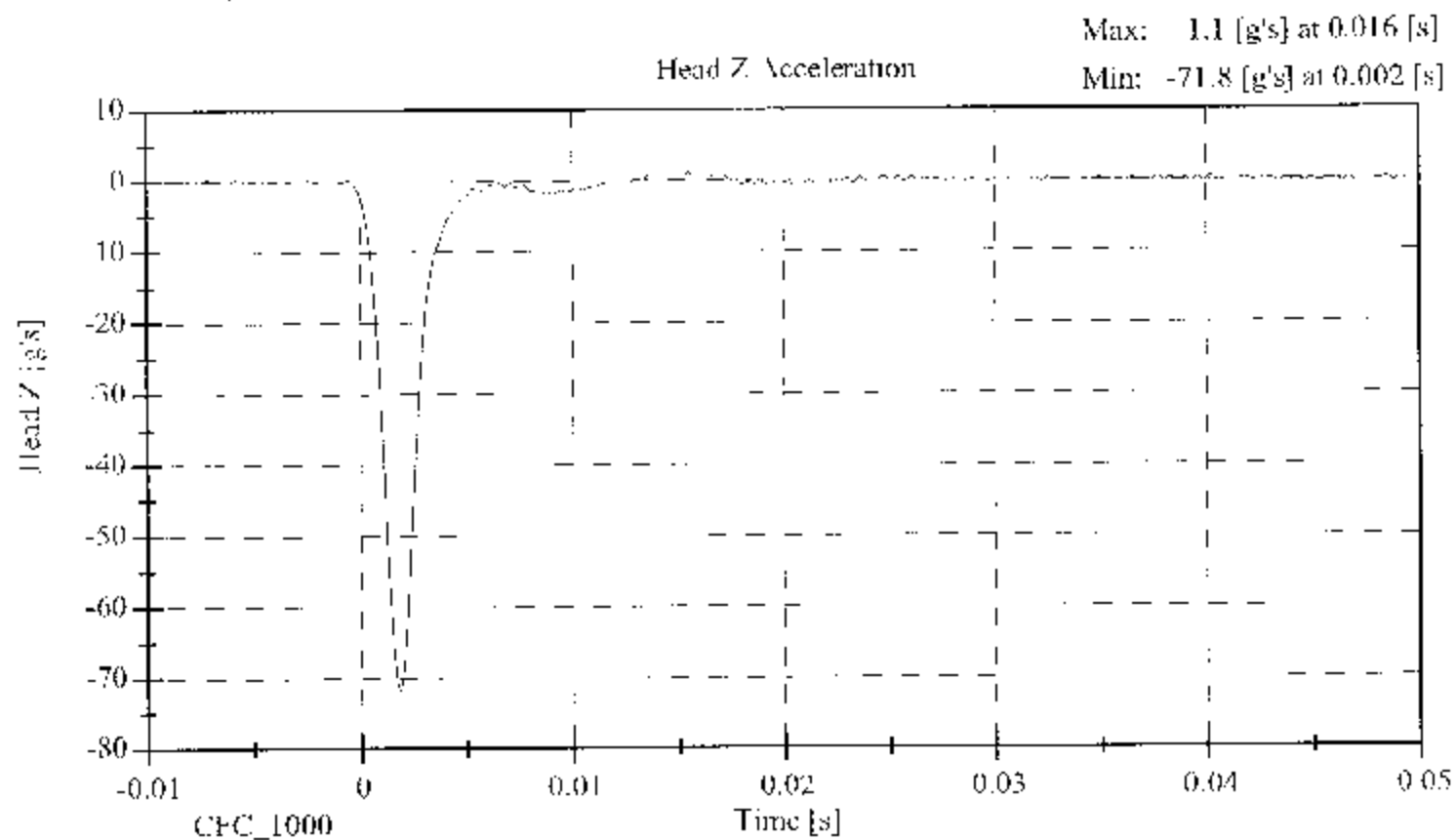
SID Serial No: 015 Sequential Test Number: 1  
Date: May 1, 2003 Laboratory Technician: B. Swiecicki

| 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 | 7.15         |
| CURVE PERCENT NONMODAL (%)       | < 15             | 3.69         |

REMARKS: None

# 015 Head Drop





# LATERAL NECK BENDING TEST POST-TEST

(Test not required for SID certification)

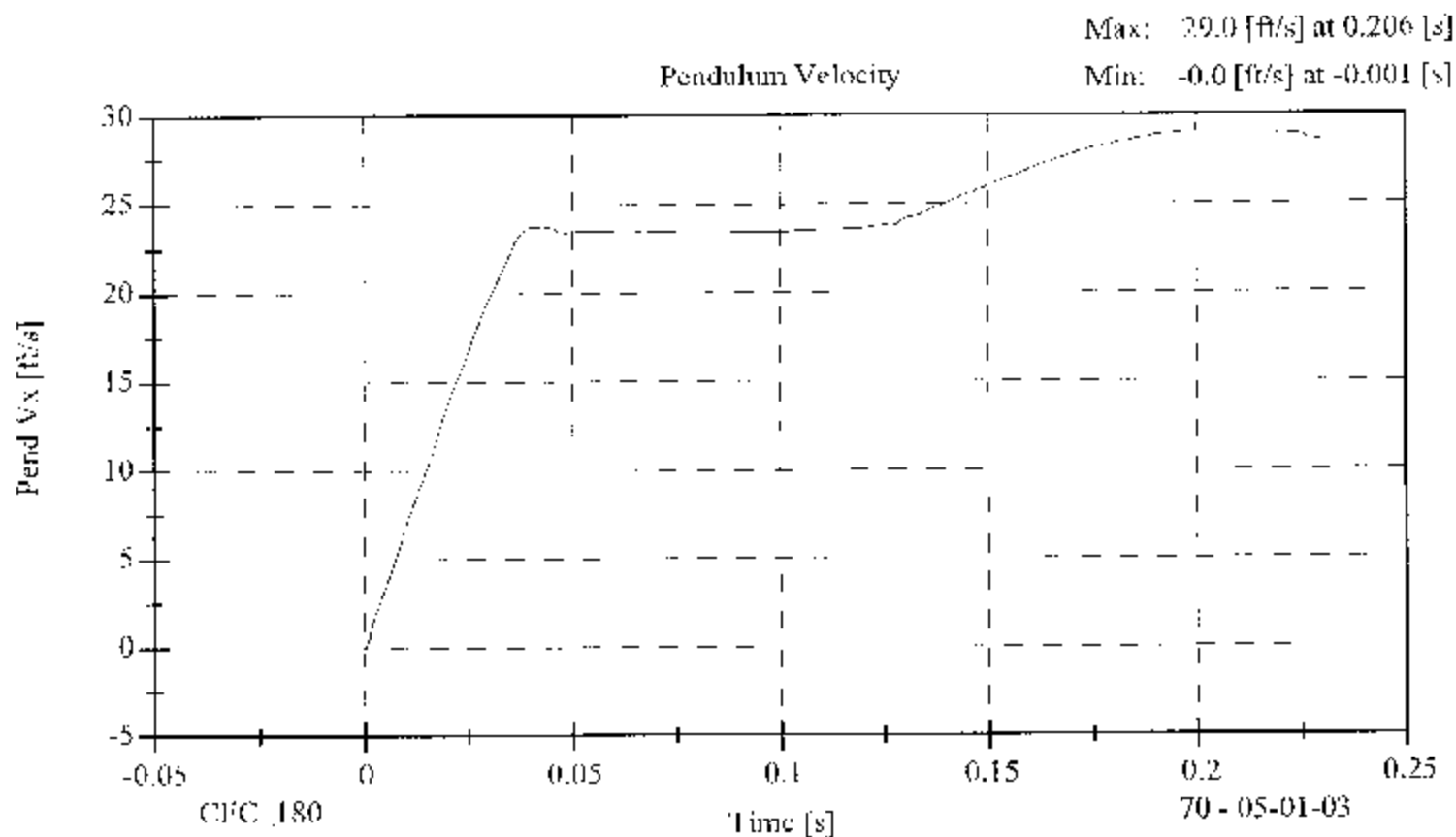
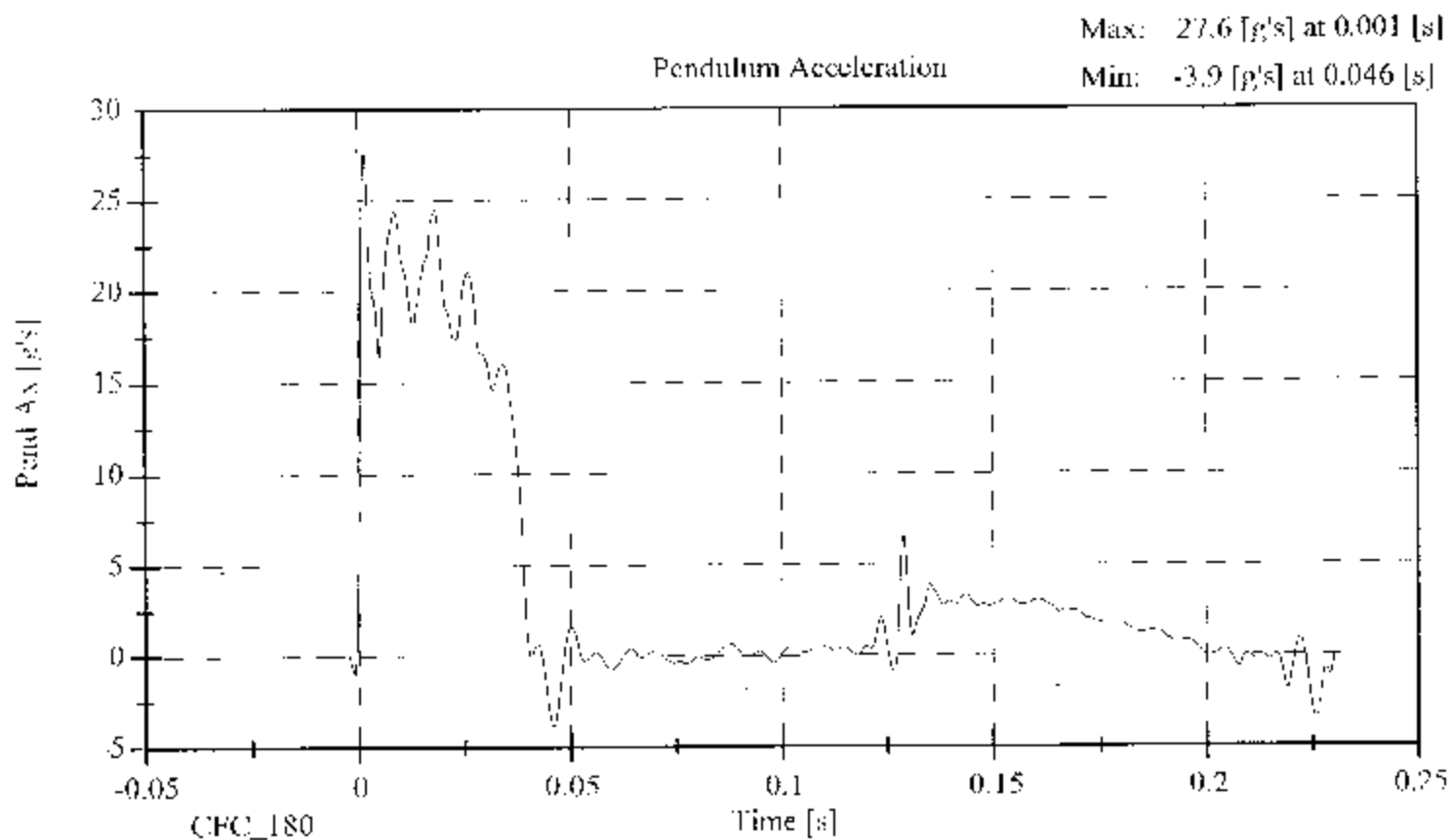
## CONFIGURED FOR LEFT SIDE IMPACT

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)                                          | 61 - 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

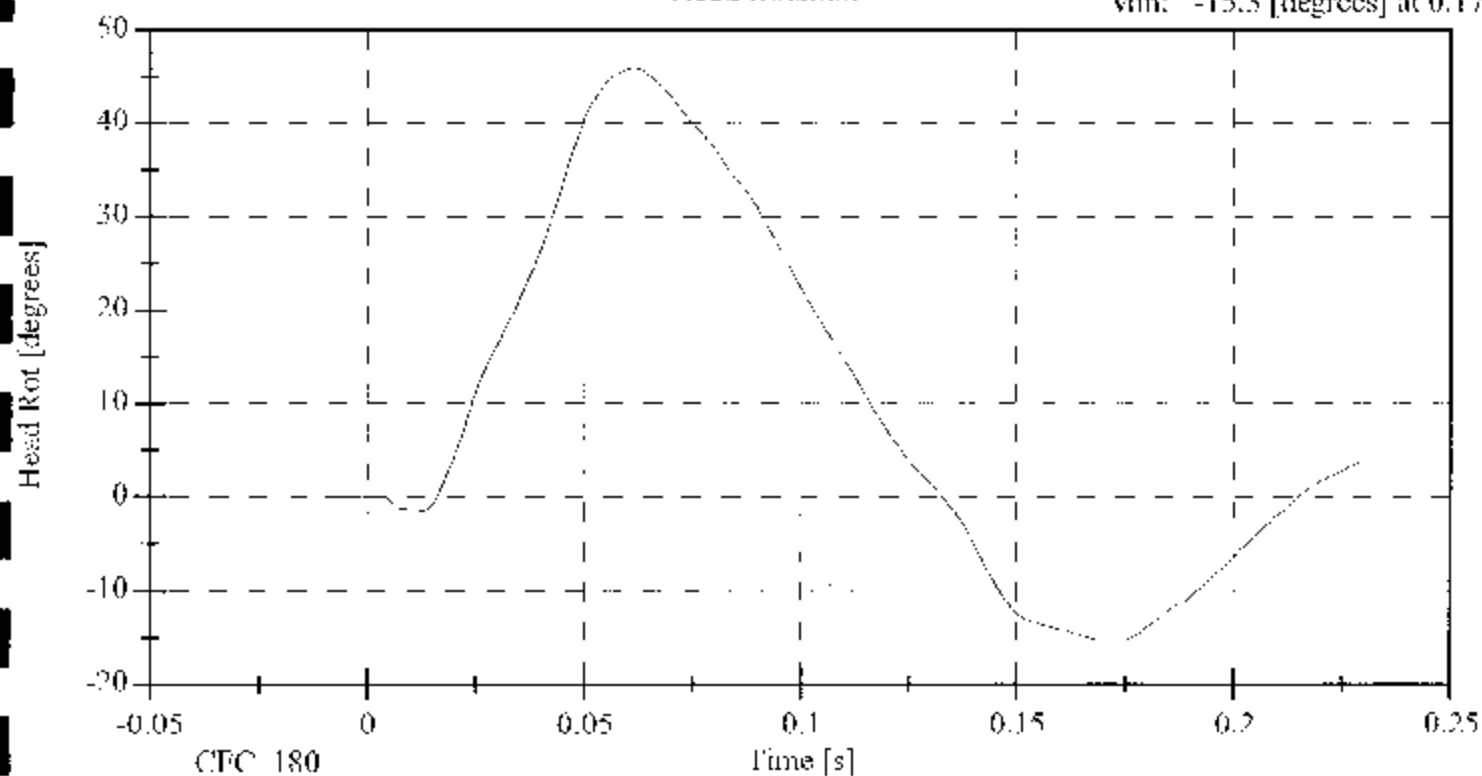




Head Rotation

Max: 45.9 [degrees] at 0.061

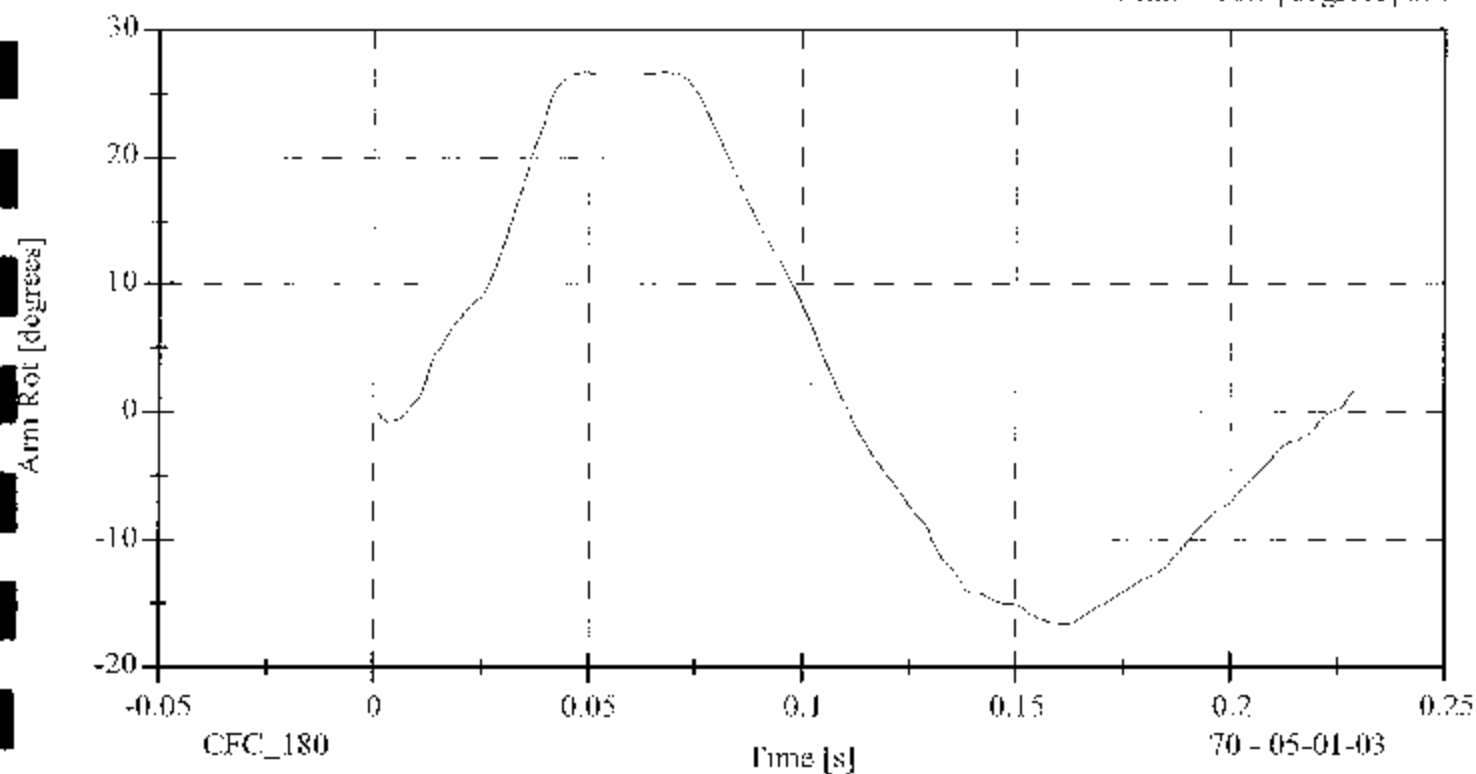
Min: -15.3 [degrees] at 0.170



Arm Rotation

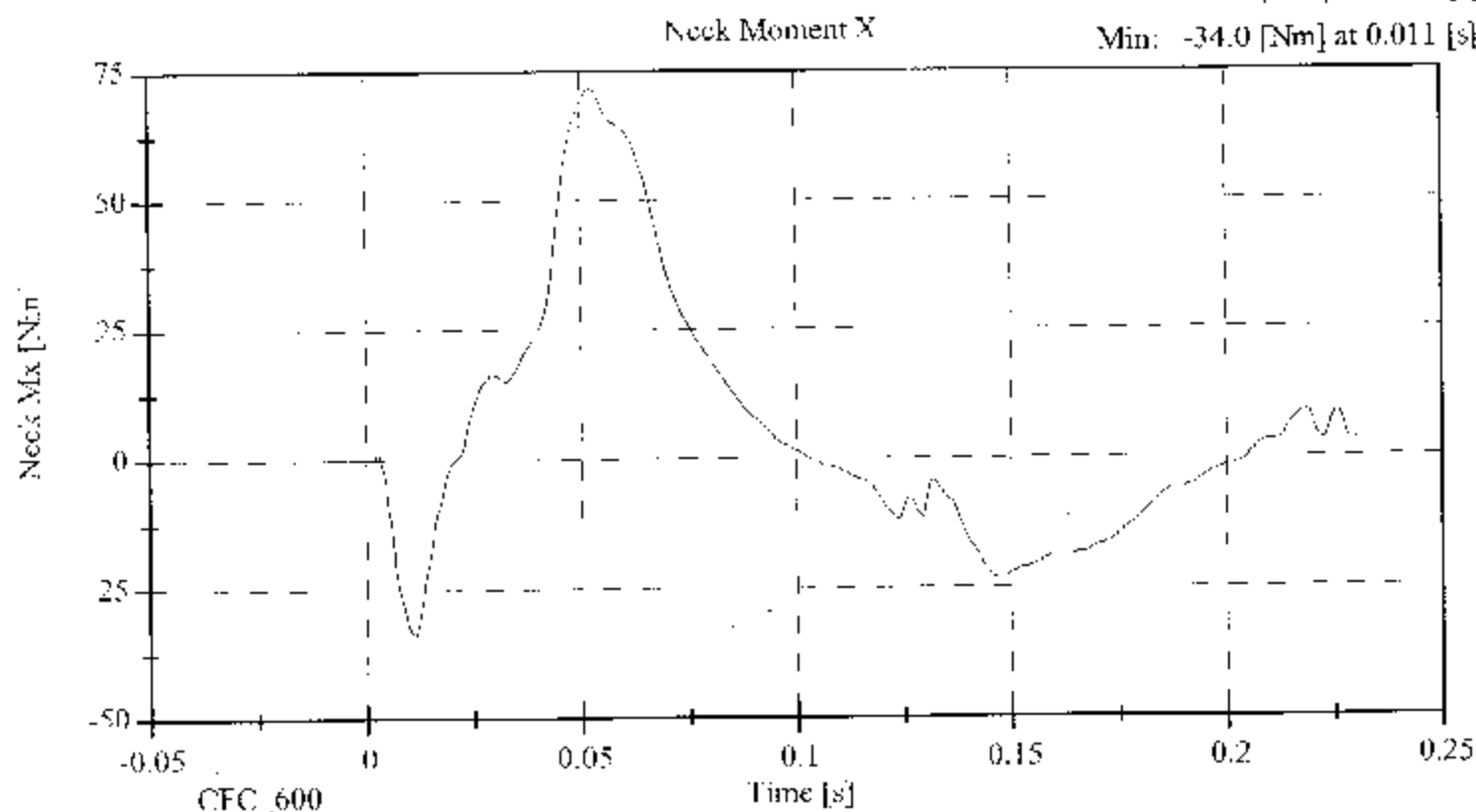
Max: 26.6 [degrees] at 0.049

Min: -16.6 [degrees] at 0.162



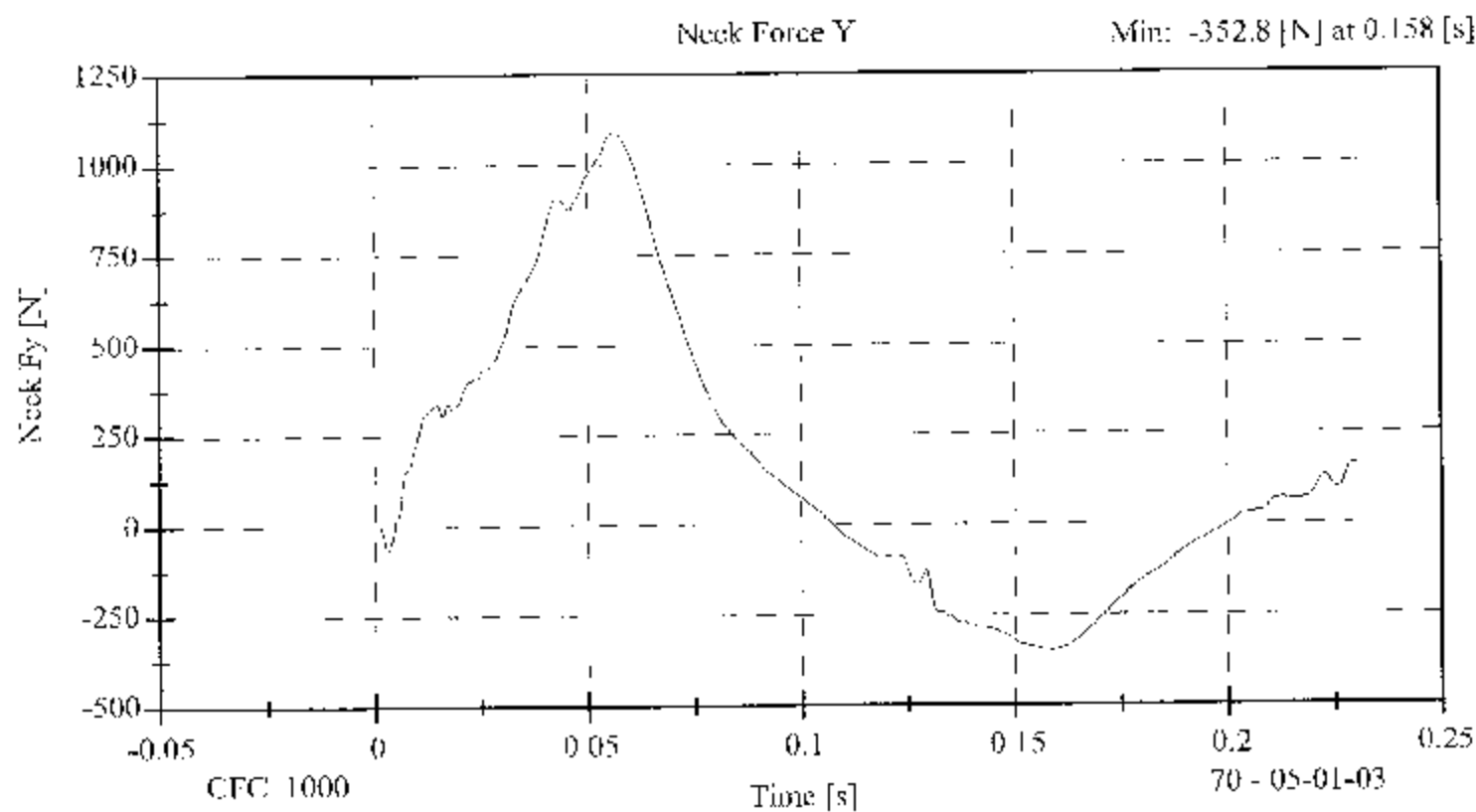
Max: 71.7 [Nm] at 0.052 [s]

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



Max: 1090.1 [N] at 0.057 [s]

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

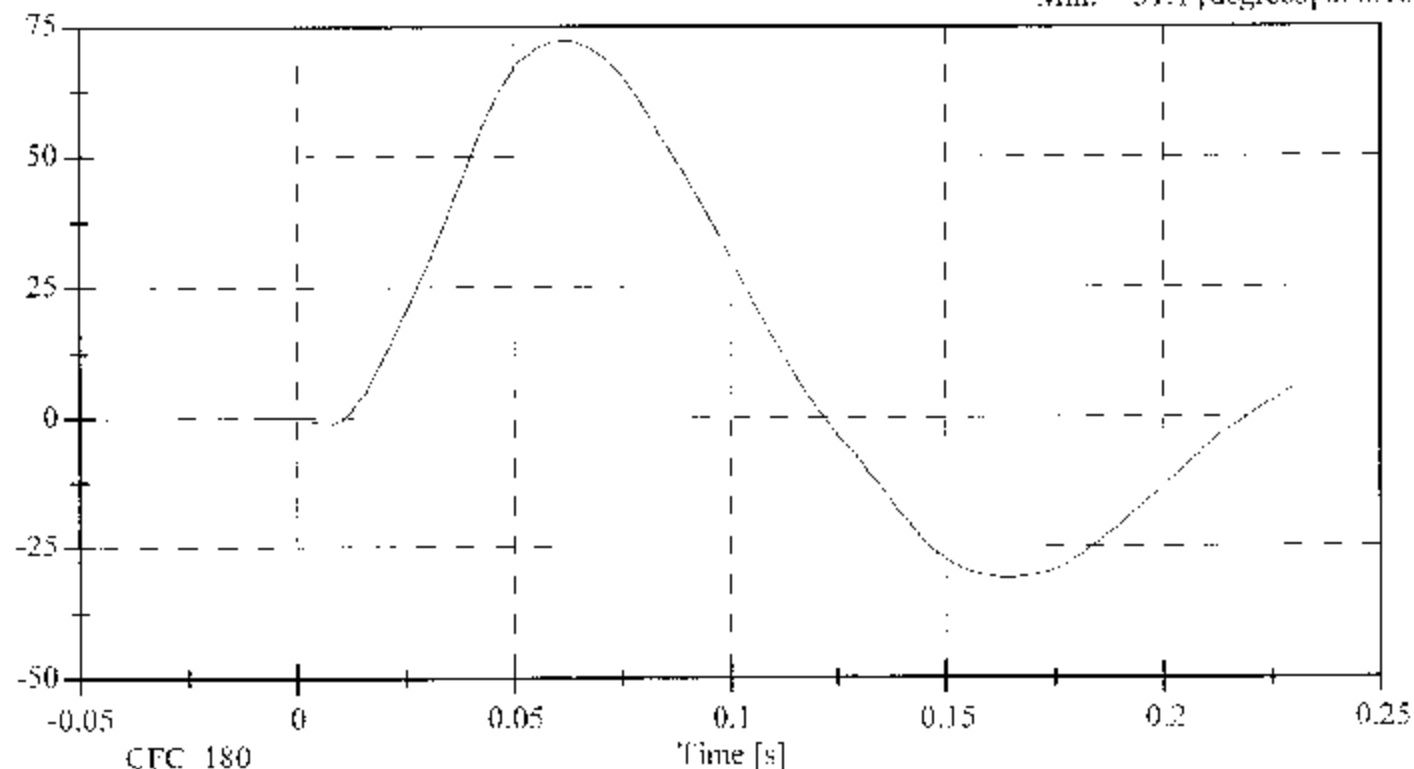


Total Rotation

Max: 72.3 [degrees] at 0.067

Min: -31.1 [degrees] at 0.161

Tot Rot [degrees]

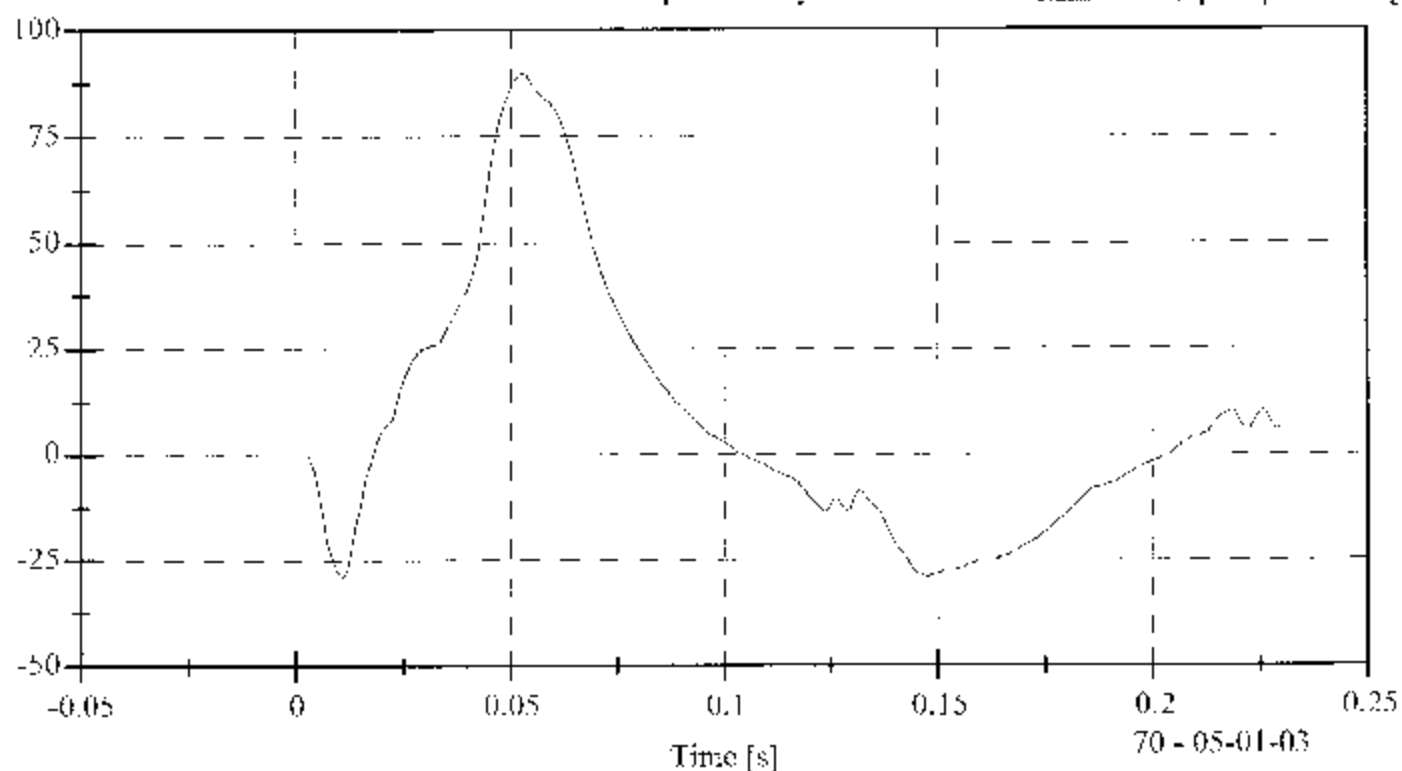


Occipital Condyle Moment

Max: 89.8 [Nm] at 0.053 [s]

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

MOCY [Nm]



**ABDOMINAL COMPRESSION TEST  
POST TEST**

(Test not required for SID certification)

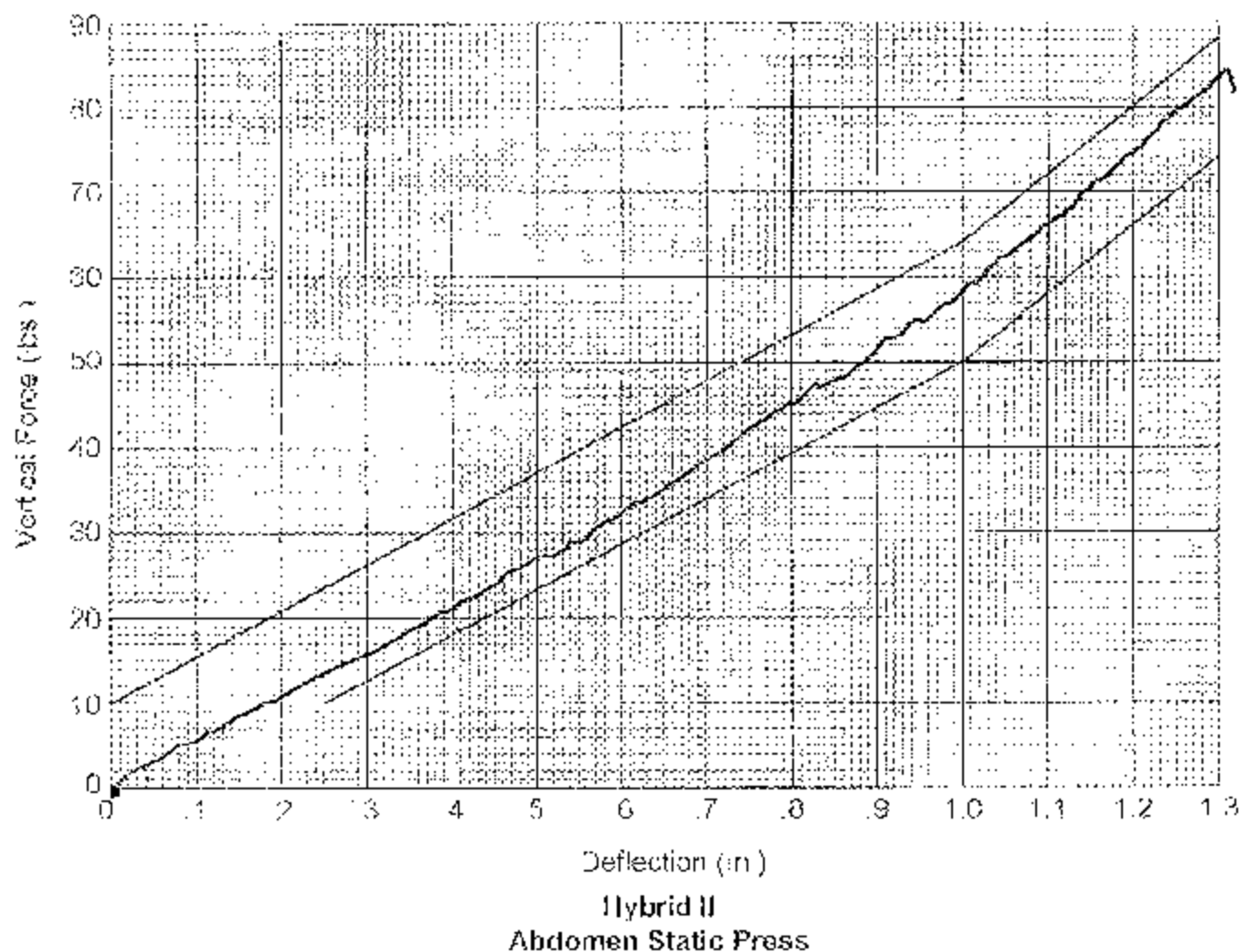
**CONFIGURED FOR LEFT SIDE IMPACT**

SID II3 Serial No.: 045 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     | 371.1        |

REMARKS: None

Dummy S/N .... 015  
W/A .....  
Date 5-20-68  
Performed By R  
Temp. 24.5  
Humidity 57%



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

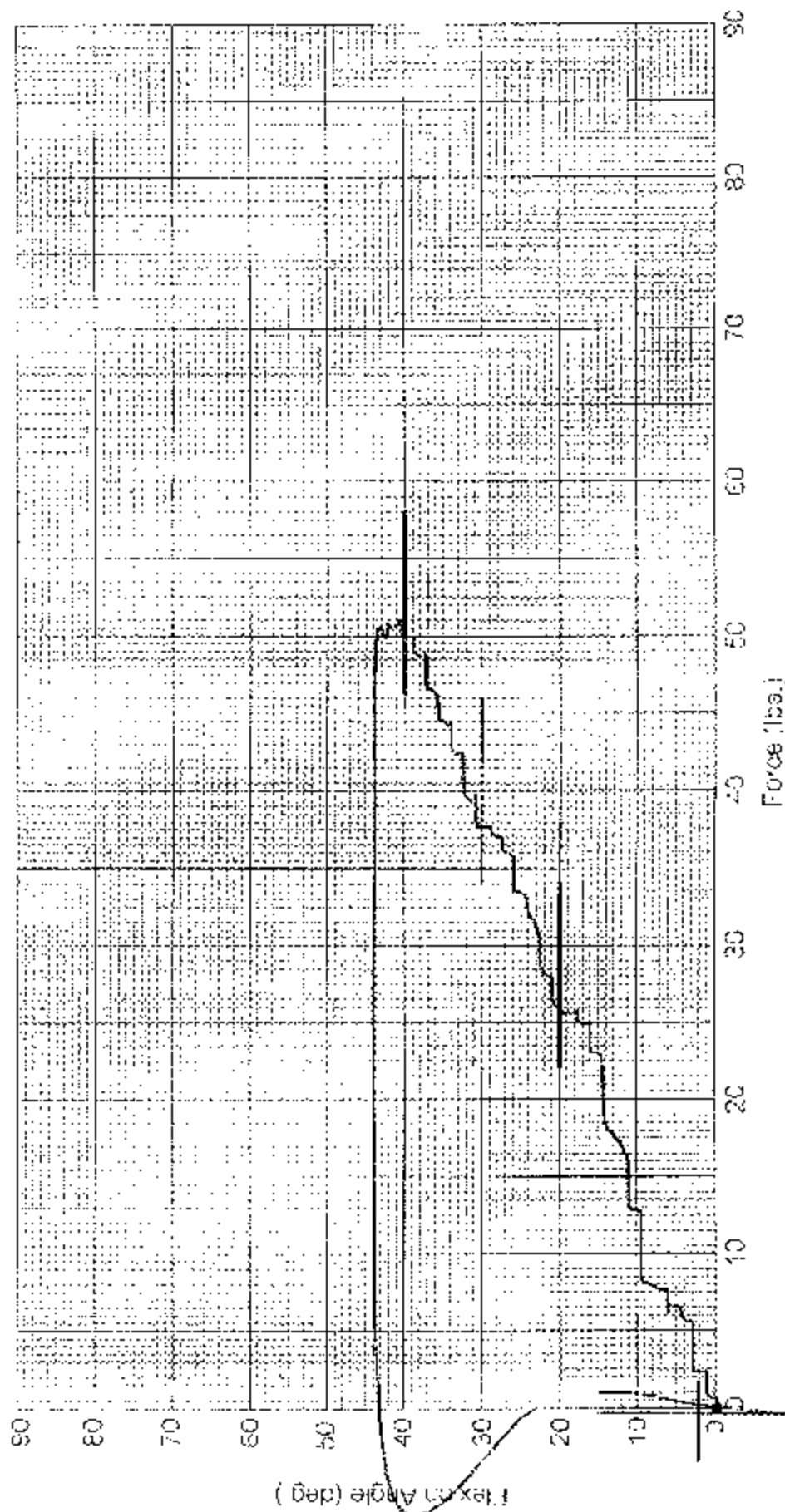
**CONFIGURED FOR LEFT SIDE IMPACT**

SID U3 Serial No.: 015 Sequential Test Number: 1  
 Date: May 2, 2003 Laboratory Technician: B. Swiecicki

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 23.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 37.0         |
| FORCE @ 0° (N)        | 0 - 76.7      | 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 5-02-85  
 Performed By [Signature]  
 Temp. 78°  
 Humidity 57%



Hybrid II Lumbar Spine Flexion Test

56-552-011-025-000

0-75-1-100-100



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

SID H3 Serial No: 035  
 Date: May 2, 2003

Sequential Test Number:  
 Laboratory Technician:

1  
 B. Swiecicki

| PART         | ITEMS CHECKED                                     | COMMENTS |
|--------------|---------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                                 | OK       |
| HEAD         | VISUAL, BALLAST,<br>ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                              | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT,<br>ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                       | OK       |
| STERNUM      | VISUAL                                            | OK       |
| LUMBAR SPINE | VISUAL                                            | OK       |
| ABDOMEN      | VISUAL                                            | OK       |
| PELVIS       | VISUAL, PALPATE,<br>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 113 Serial No.: 016 Sequential Test Number: 1  
Date: May 2, 2003 Laboratory Technician: B. Swieczicki

| 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)        | 239 - 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 II3 Serial No: 016 Sequential Test Number: 1  
 Date: May 2, 2003 Laboratory Technician: B. Swieczki

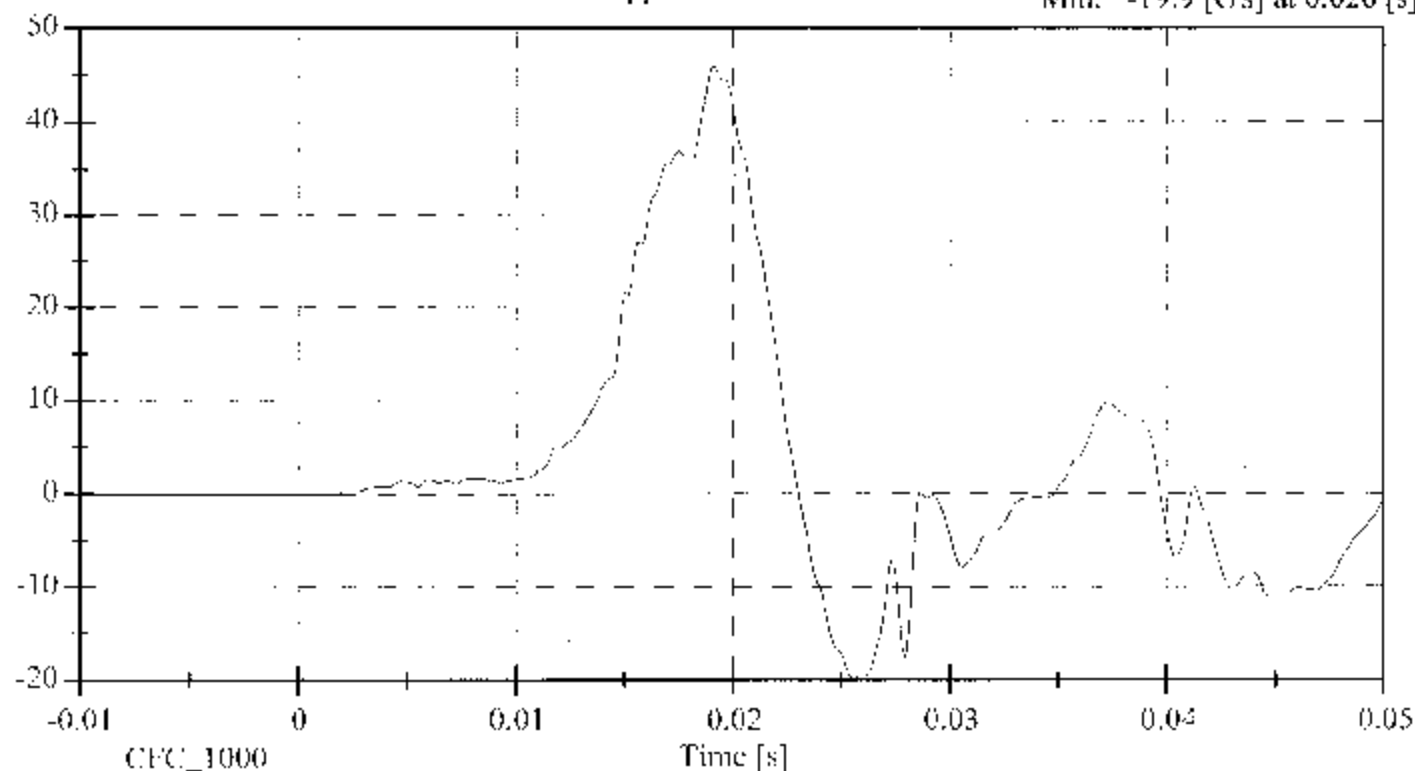
| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 37.0         |
| PROBE SPEED (m/s)     | 4.2 / 4.33    | 4.29         |
| UPPER RIB (g's)       | 37 - 46       | 42.97        |
| LOWER RIB (g's)       | 37 - 46       | 40.28        |
| LOWER SPINE (g's)     | 15 - 22       | 21.81        |

REMARKS: None

## Upper Rib Y Acceleration

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

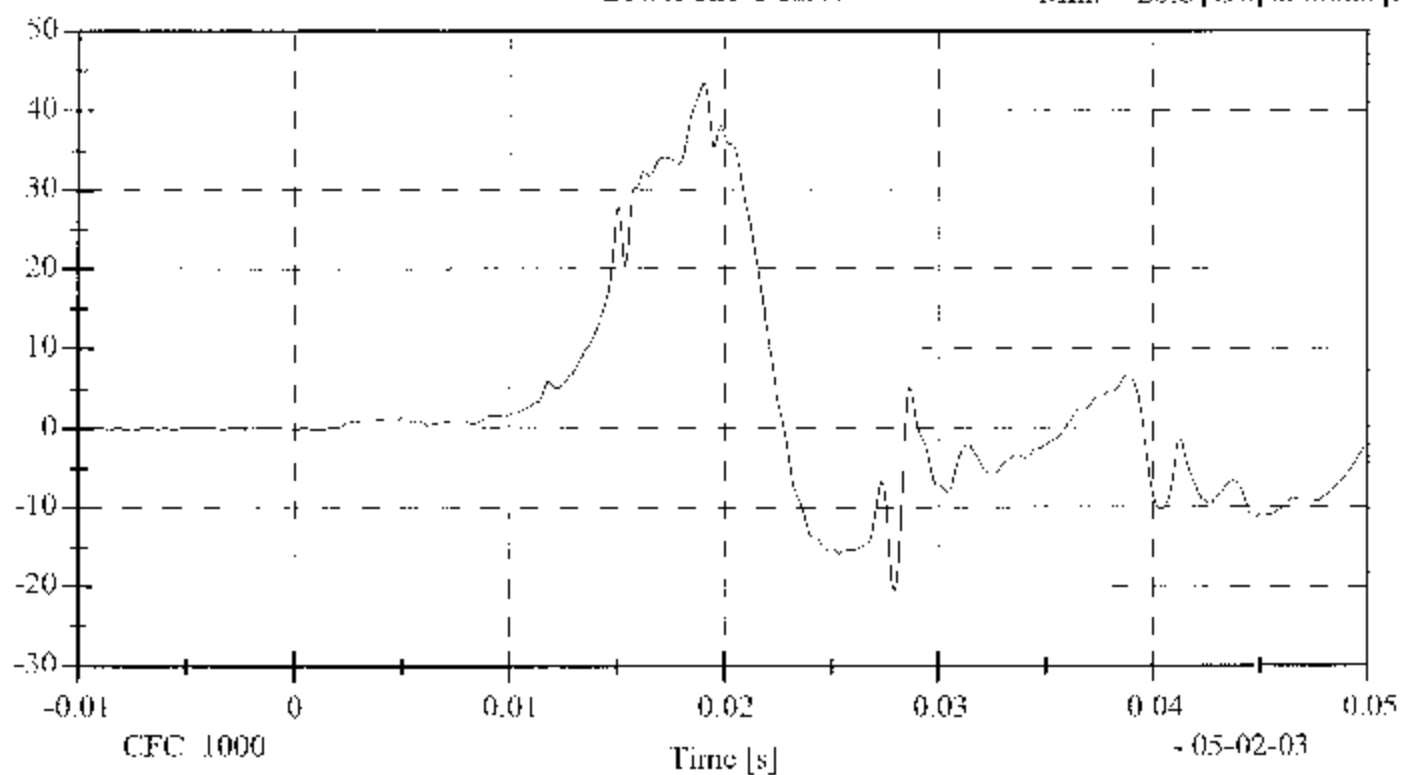
Min: -19.9 [G's] at 0.026 [s]

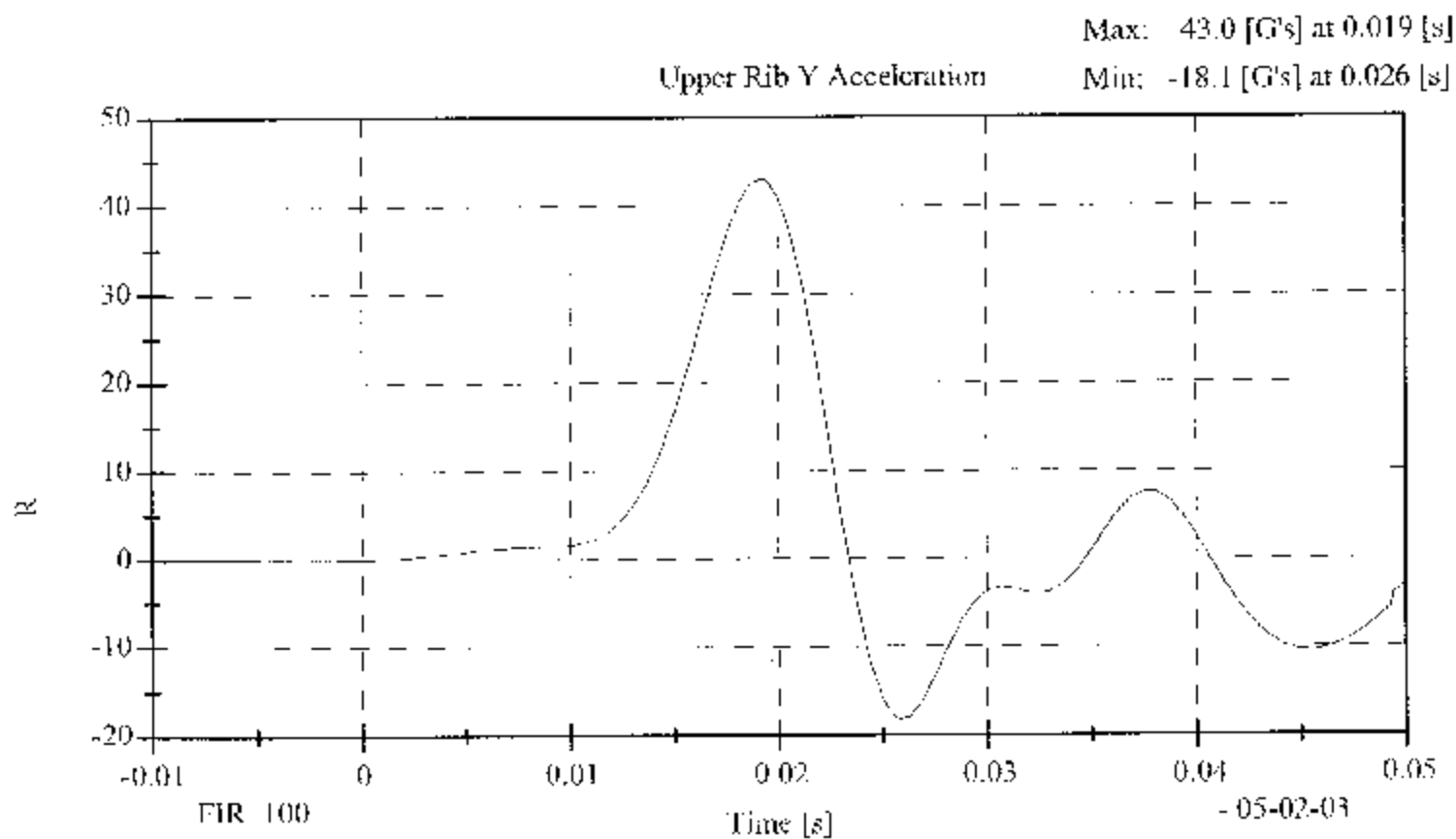
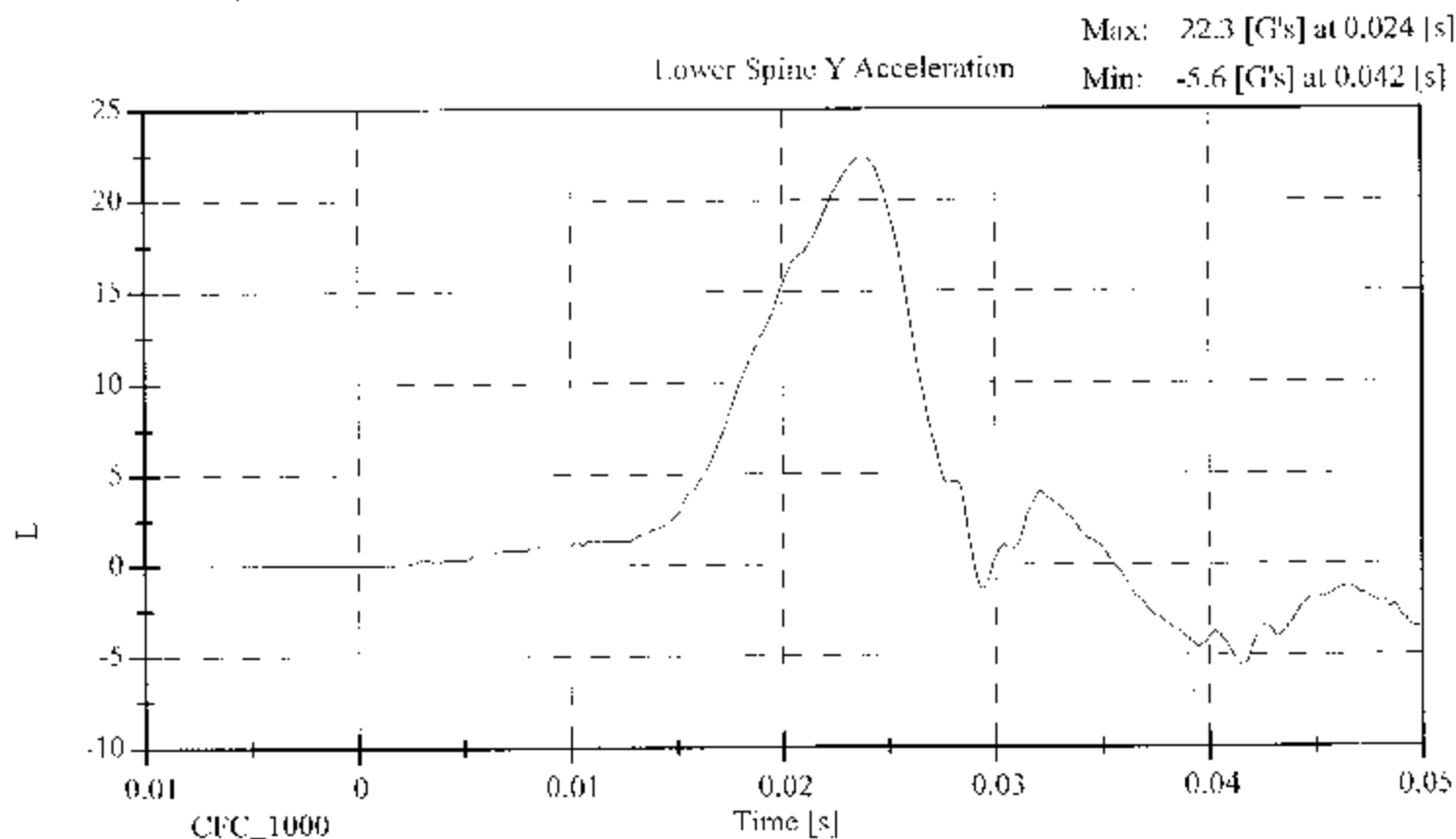


## Lower Rib Y Acceleration

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

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

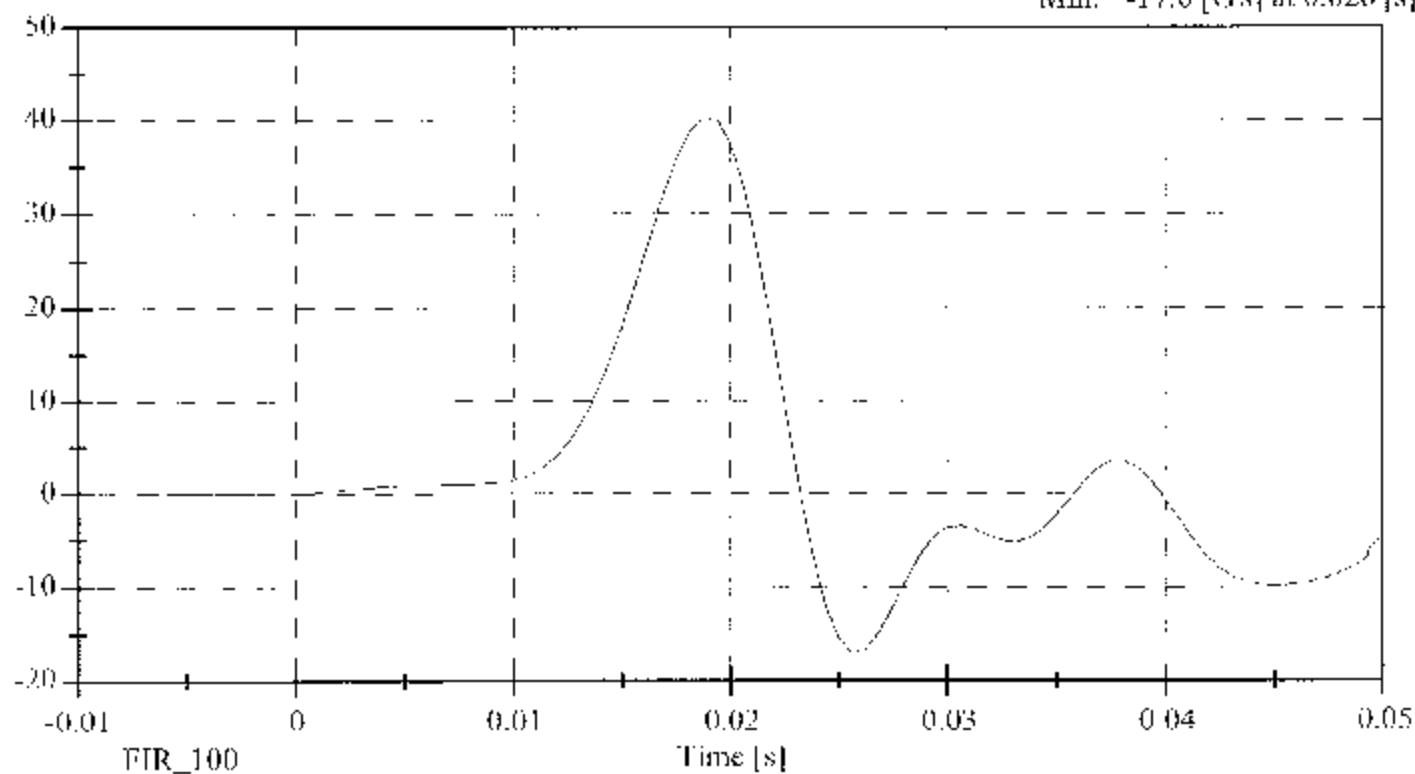




## Lower Rib Y Acceleration

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

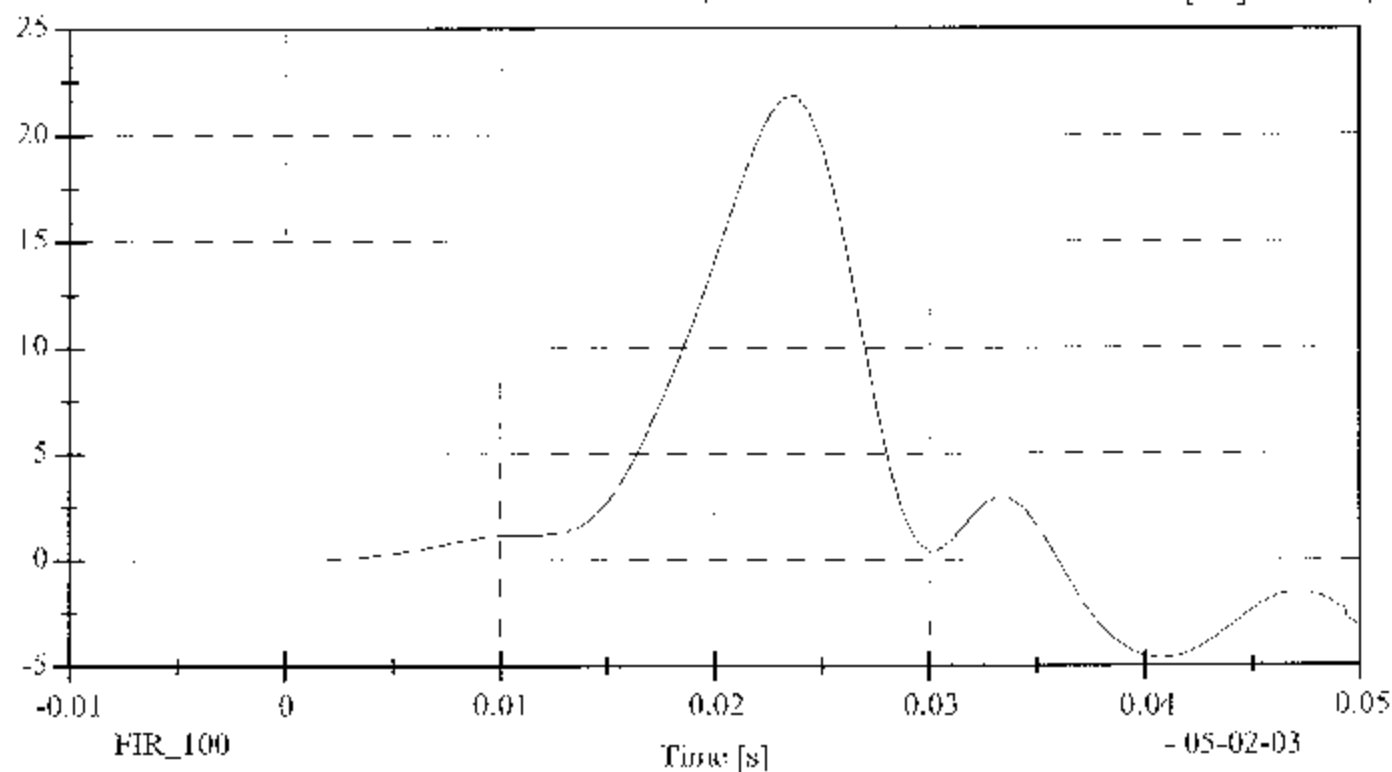
Min: -17.0 [G's] at 0.026 [s]



## Lower Spine Y Acceleration

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

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





**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        |

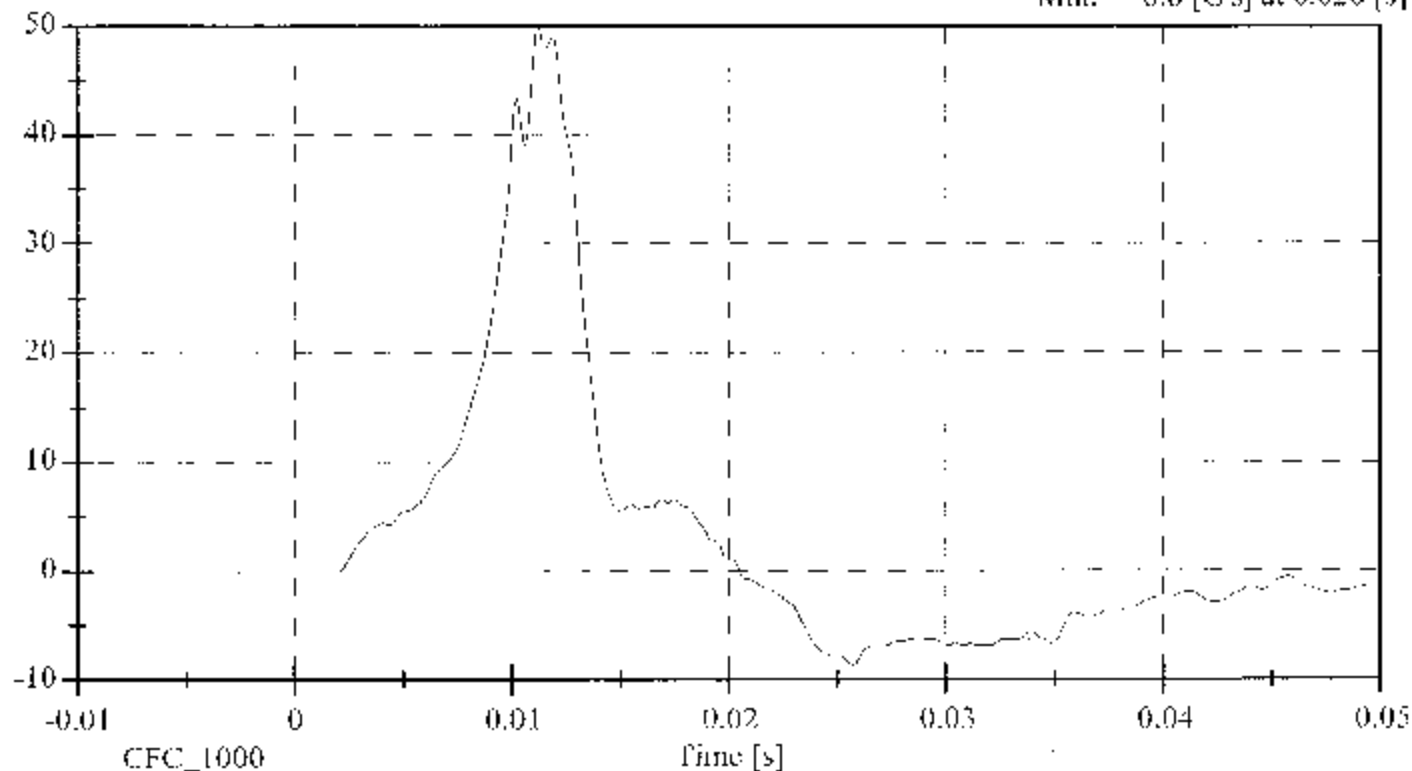
REMARKS: None

Pelvis Acceleration

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

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

Pelvis1000 [G's]

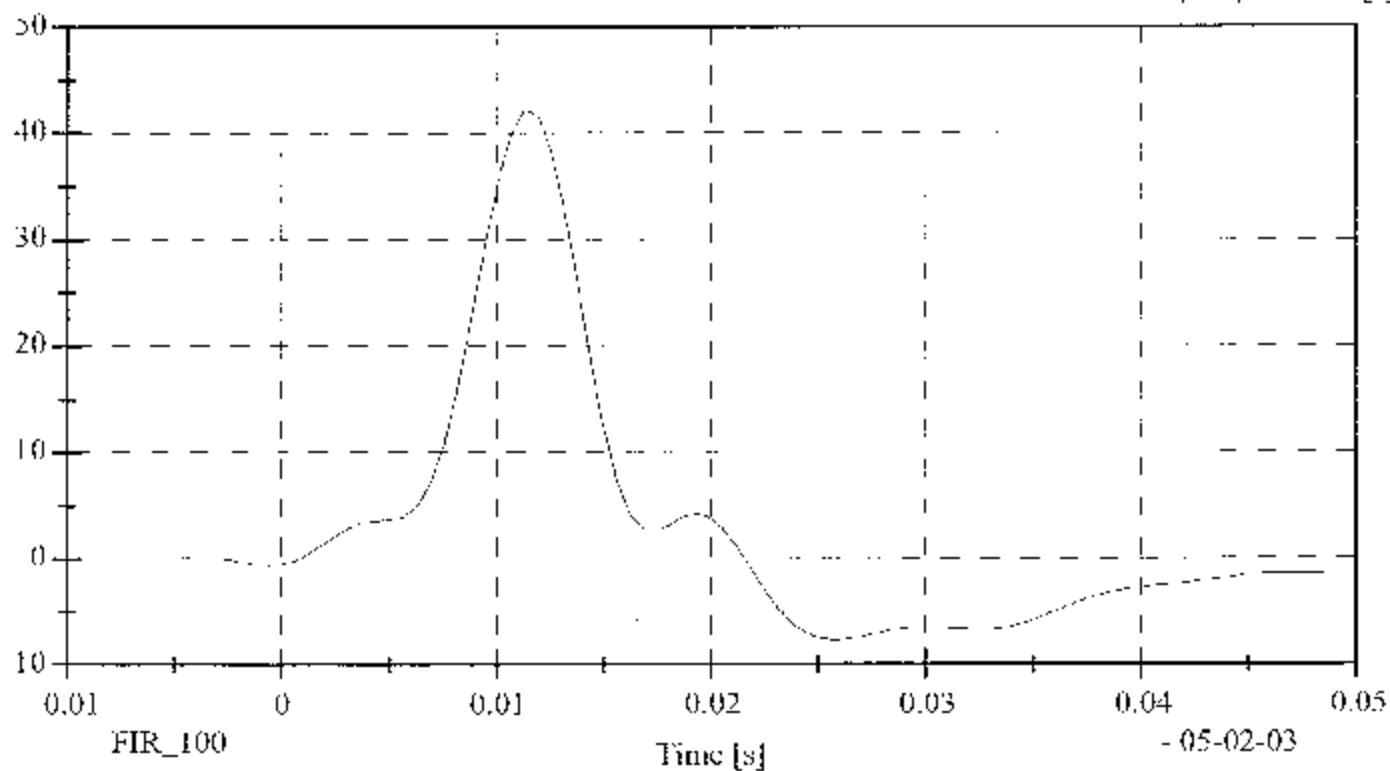


Pelvis Y Acceleration

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

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

PVCN Ay [G's]



-05-02-03

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

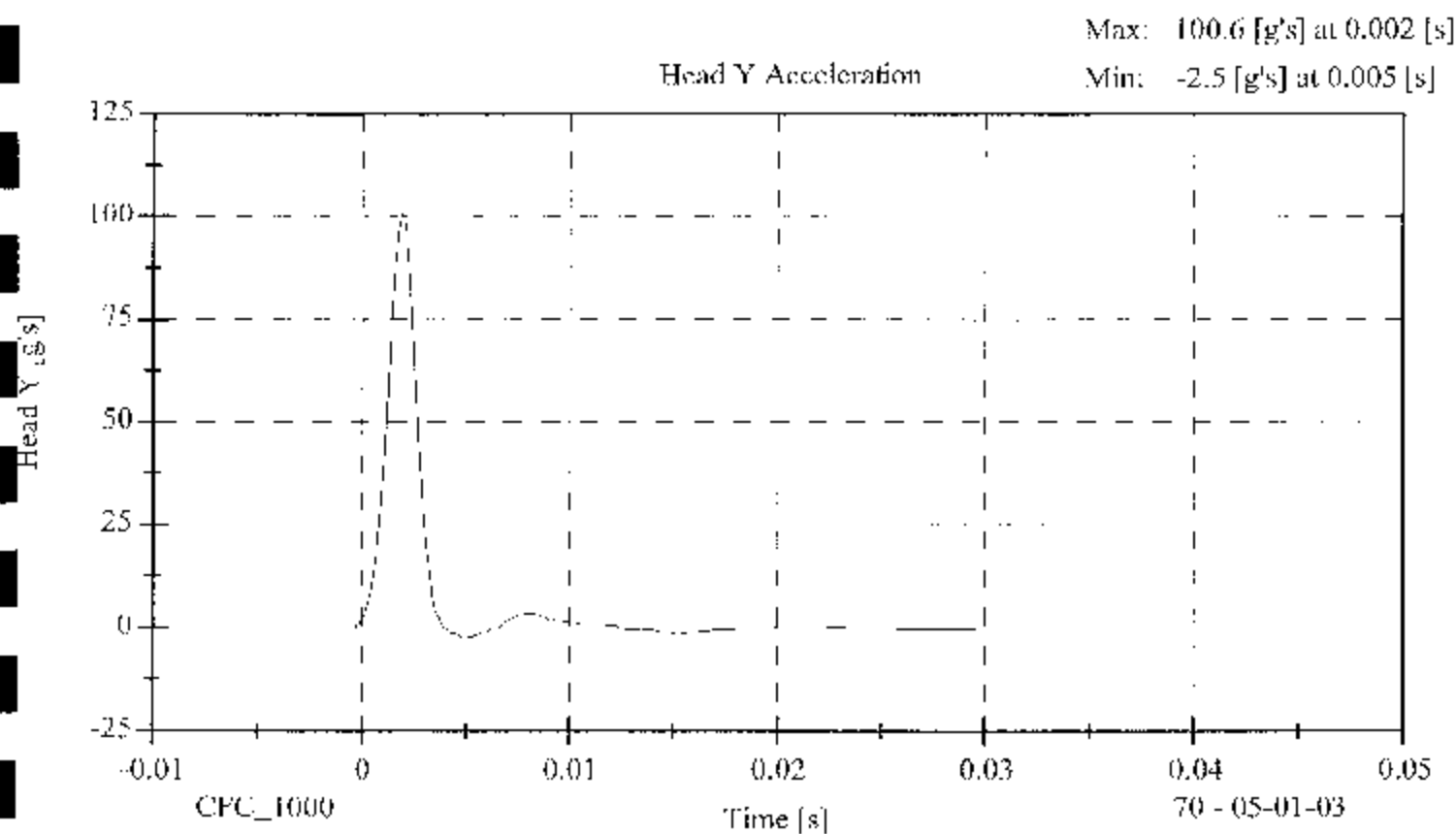
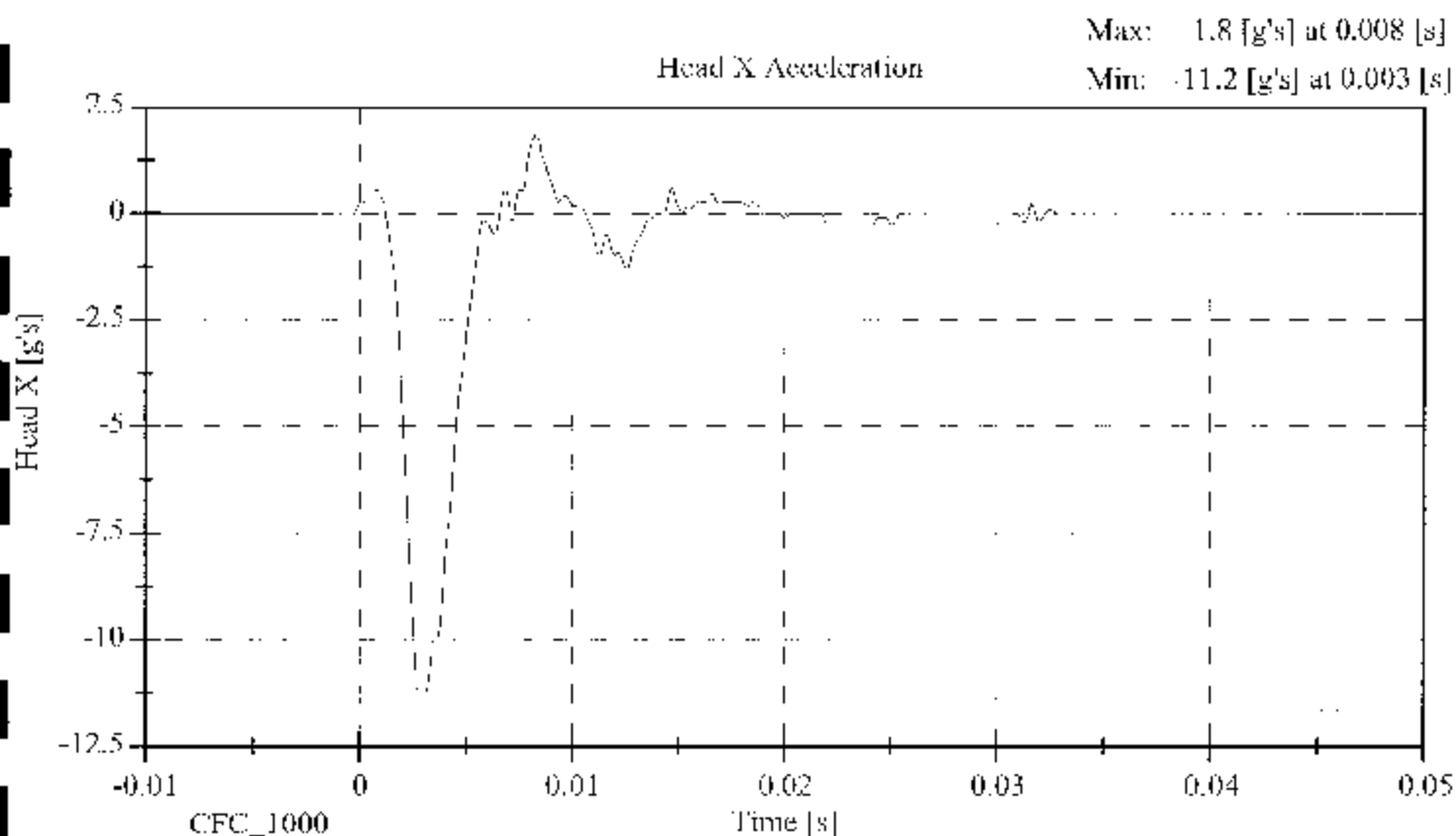
**CONFIGURED FOR LEFT SIDE IMPACT**

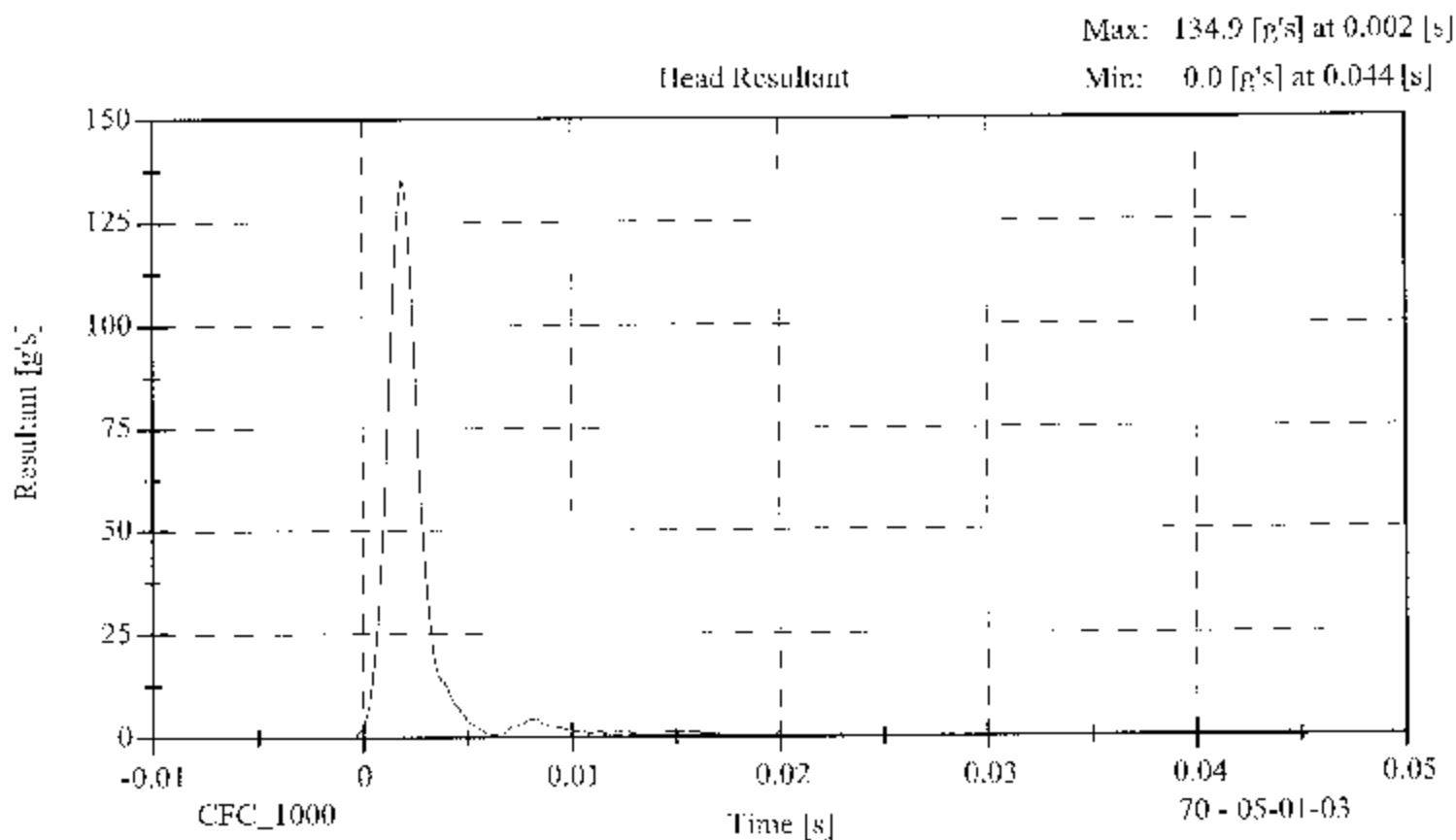
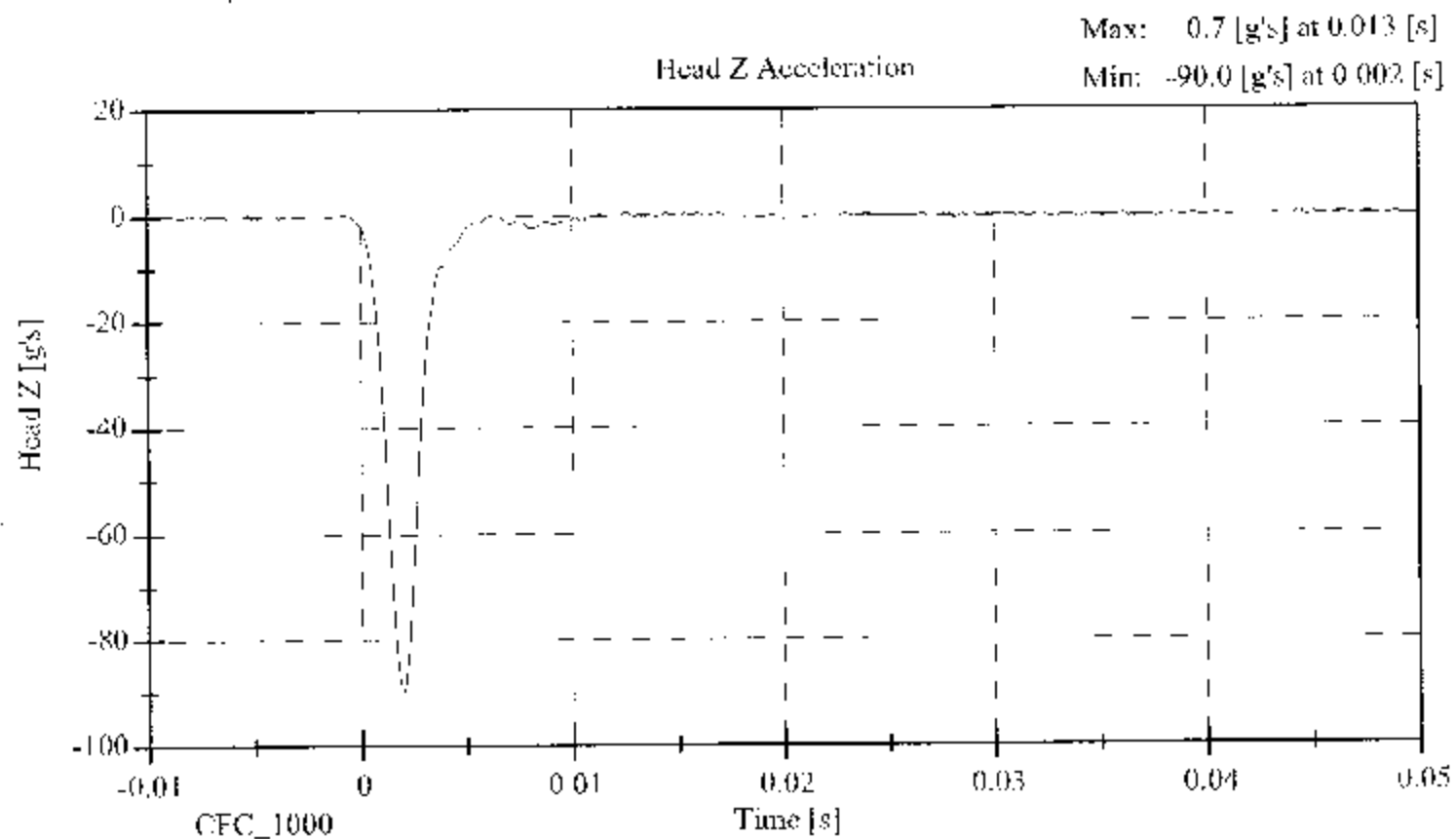
SID Serial No.: 016 Sequential Test Number: 1  
Date: May 1, 2003 Laboratory Technician: B. Swiecicki

| TEST PARAMETER                   | SPECIFICATION    | TEST RESULTS |
|----------------------------------|------------------|--------------|
| TEMPERATURE (°C)                 | 20.6 – 22.2      | 21.3         |
| 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

# 016 Head Drop





# **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

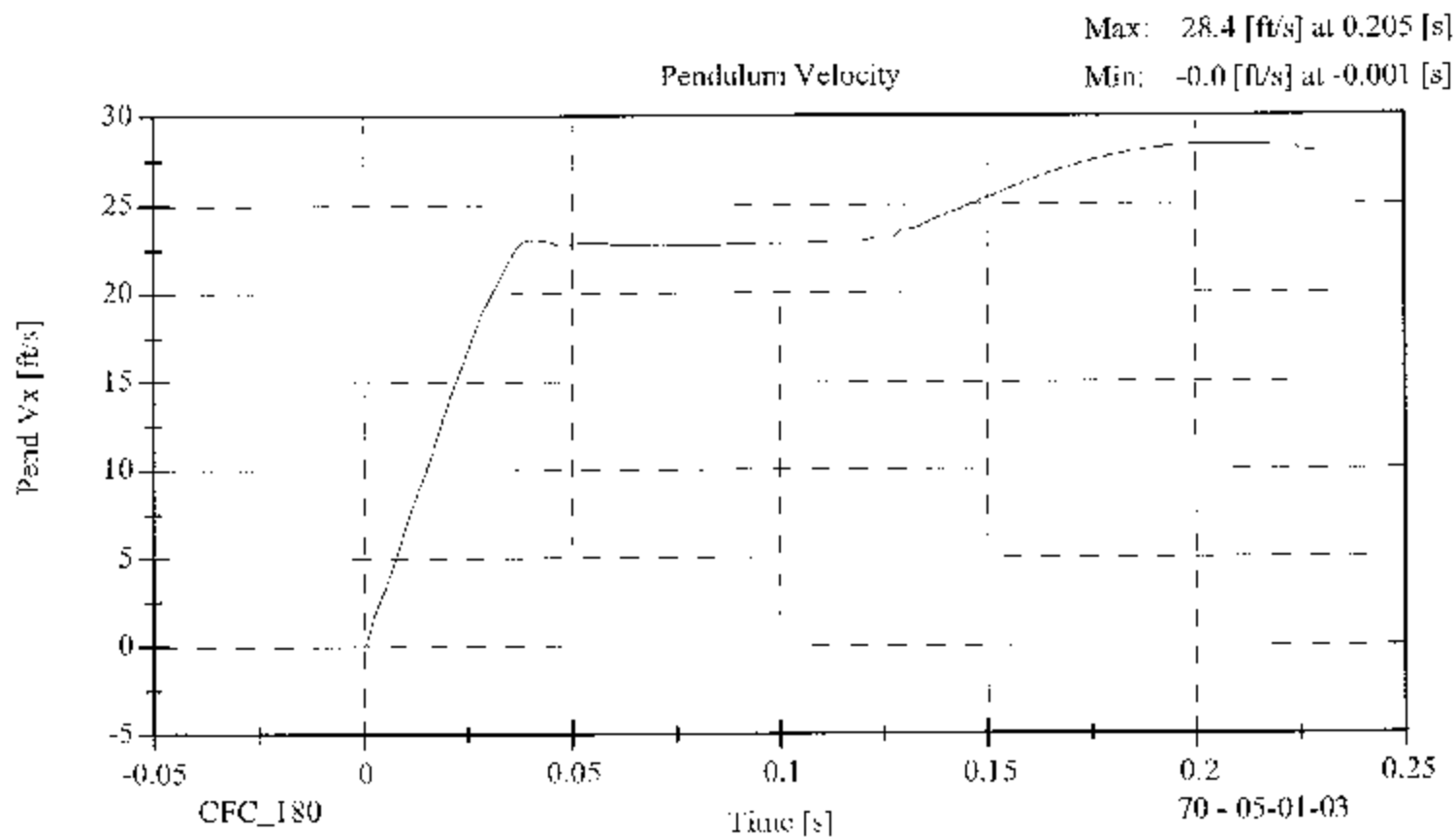
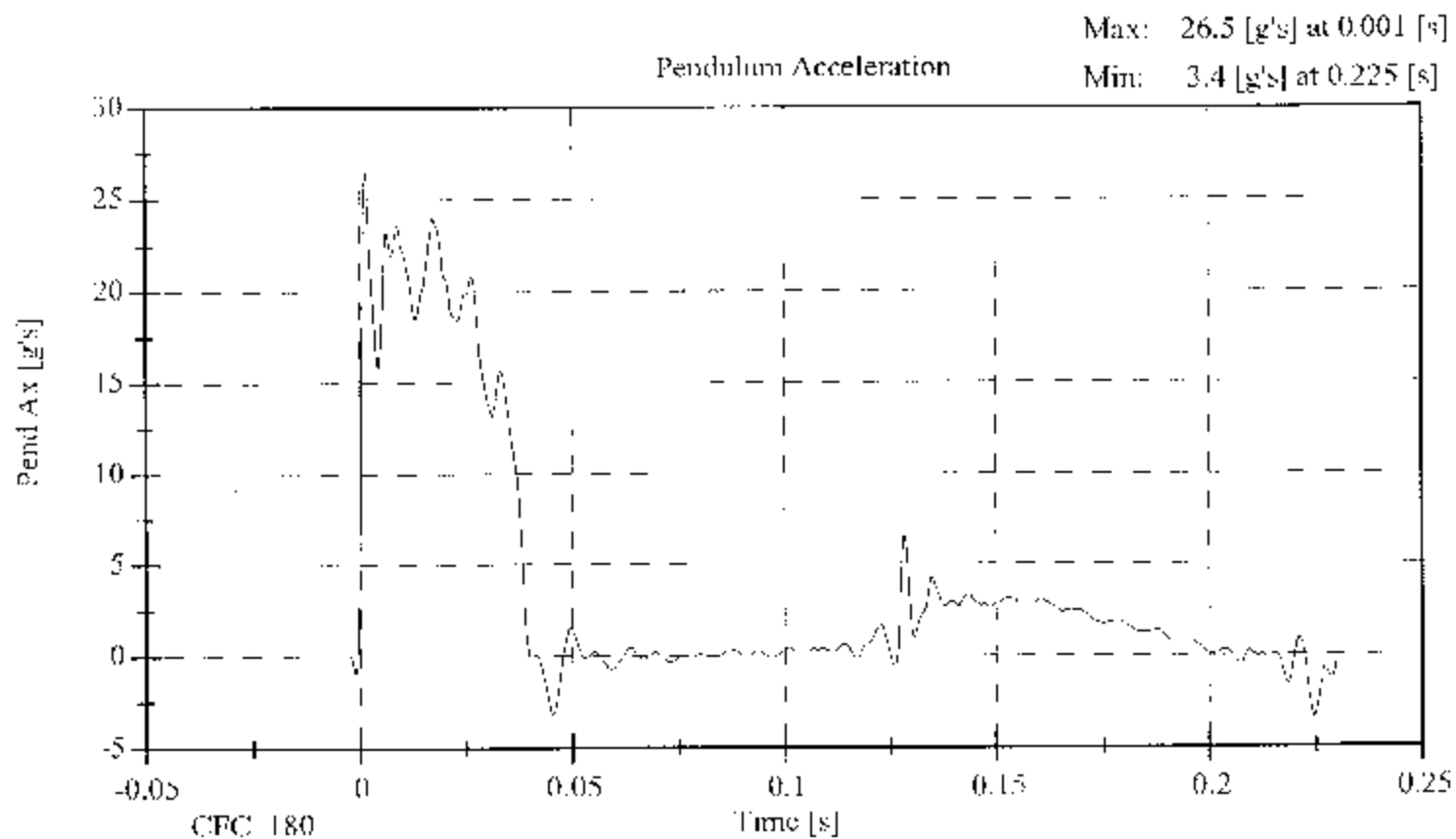
Date: May 1, 2003

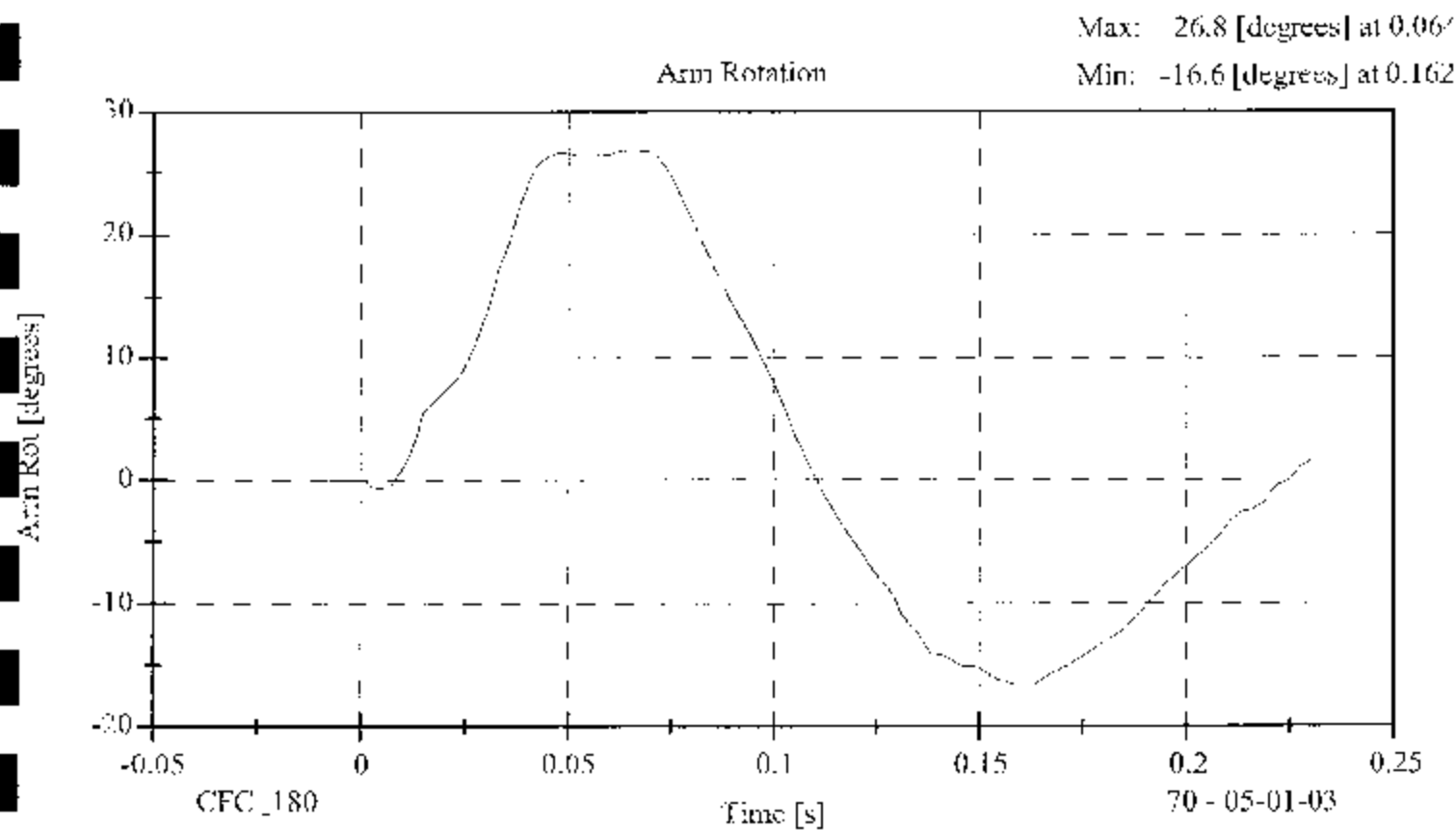
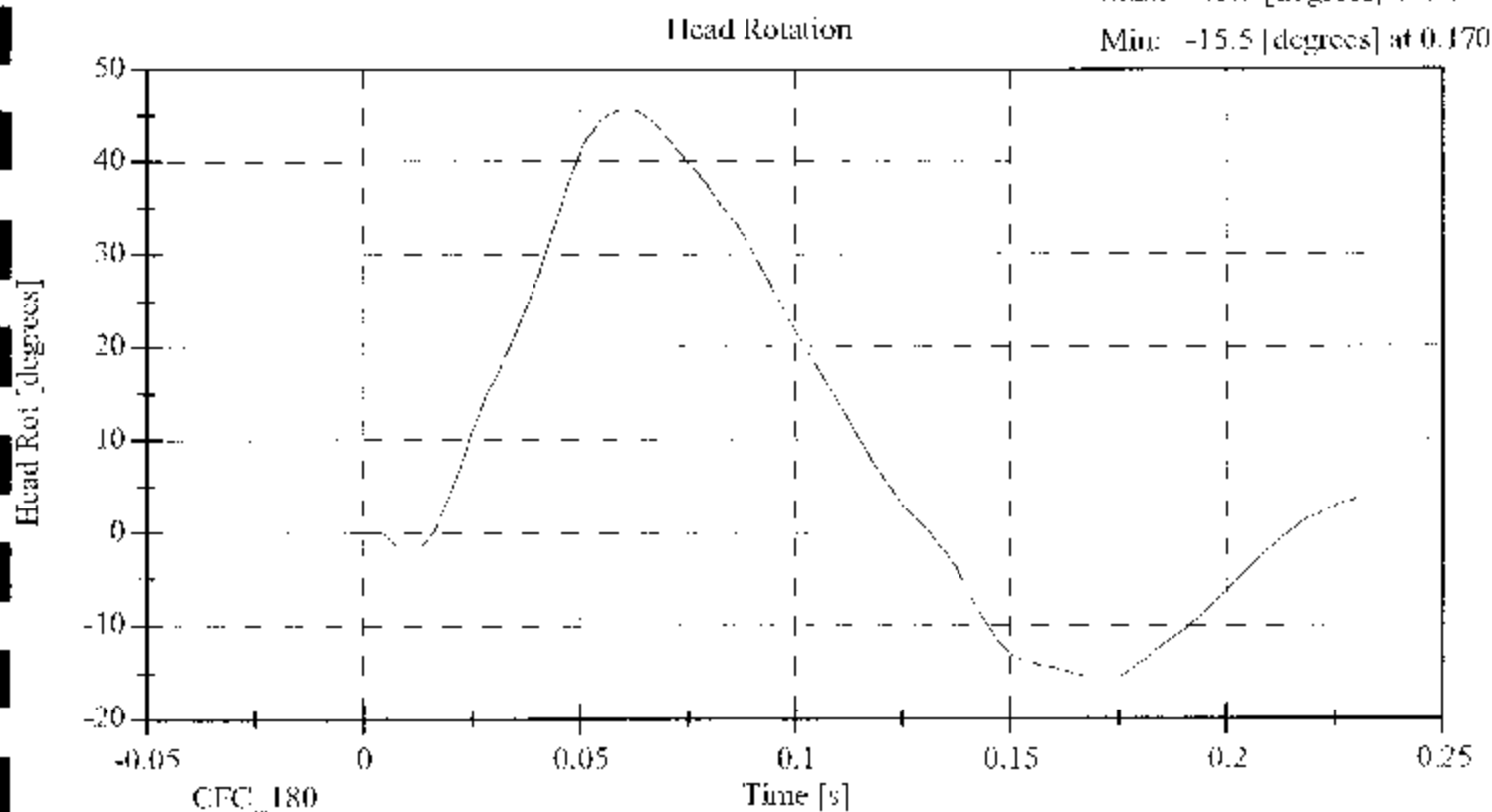
Laboratory Technician:

B. Swieczicki

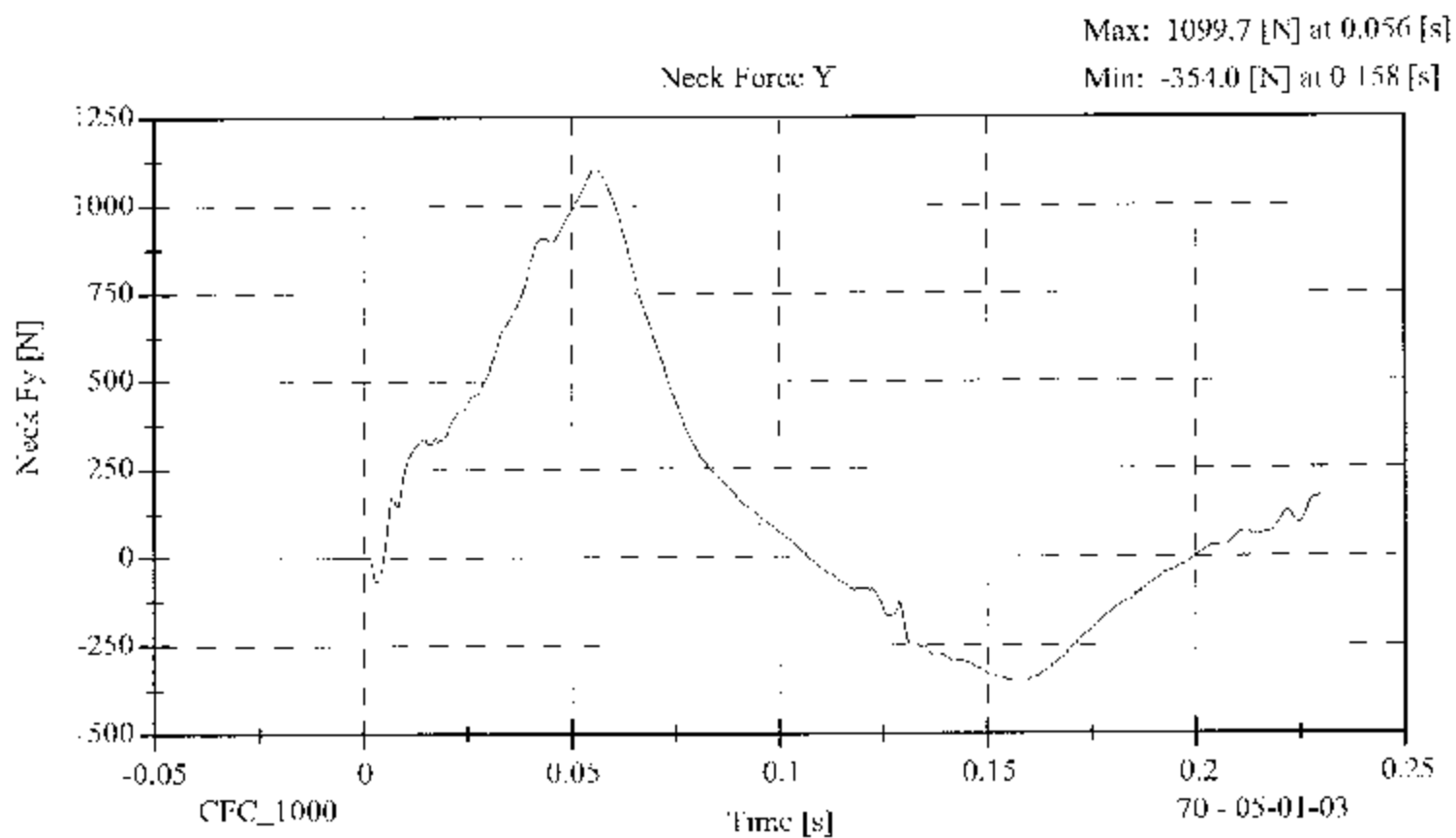
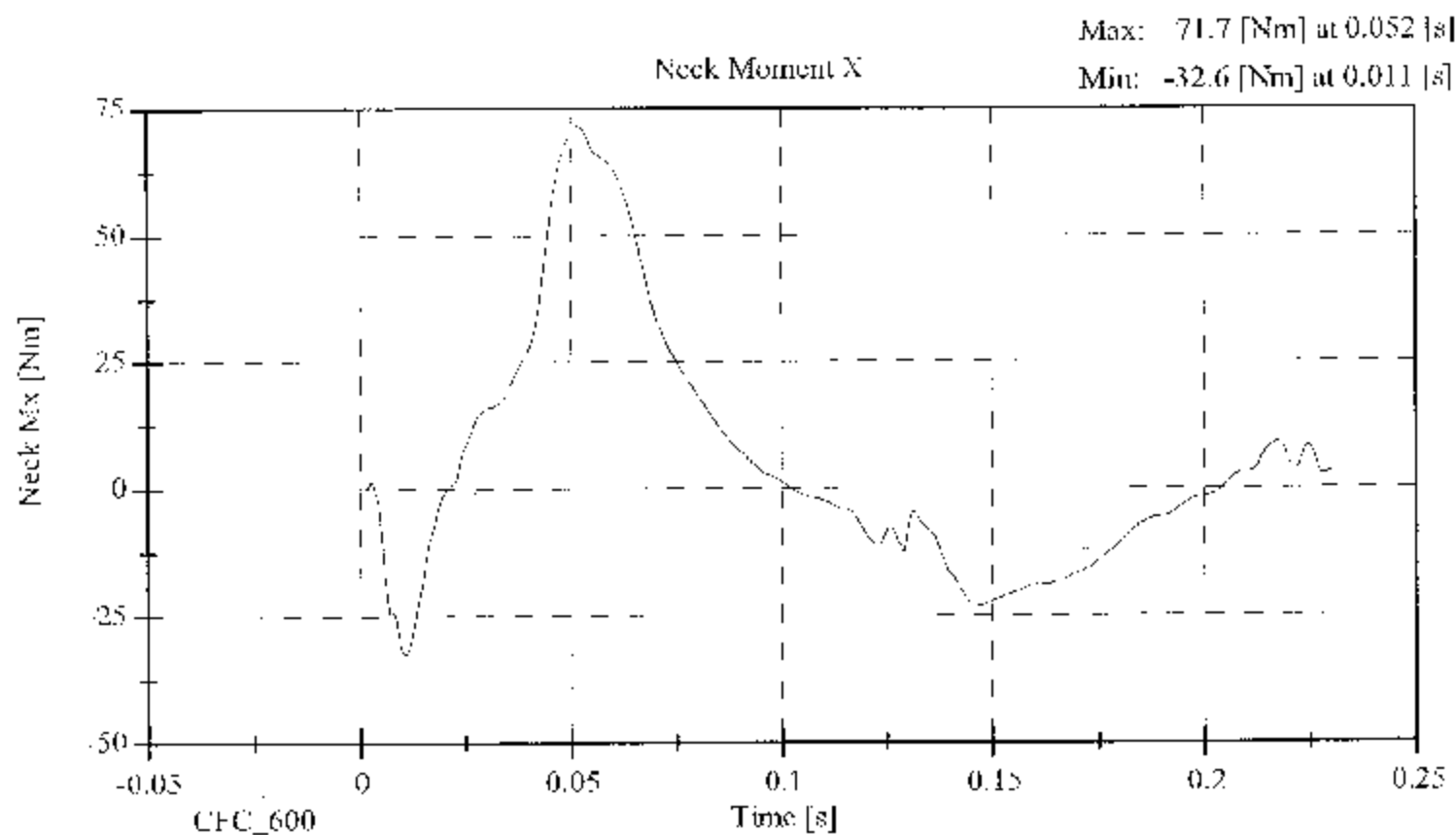
| TEST PARAMETER                                                  | SPECIFICATION | TEST RESULTS |
|-----------------------------------------------------------------|---------------|--------------|
| TEMPERATURE (°C)                                                | 20.6 - 22.2   | 21.1         |
| RELATIVE 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)                                          | 61 - 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







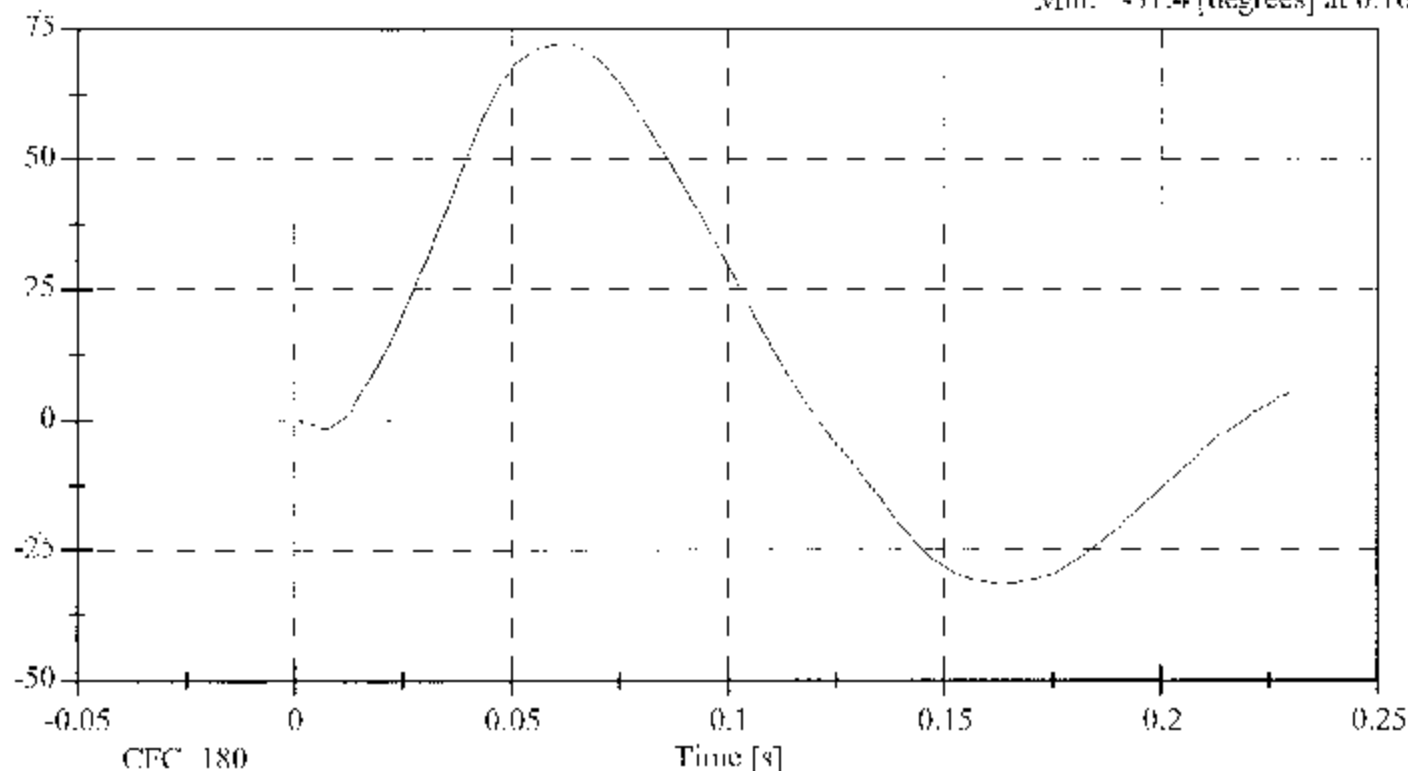


Tot Rot [degrees]

Total Rotation

Max: 72.2 [degrees] at 0.062

Min: -31.4 [degrees] at 0.163

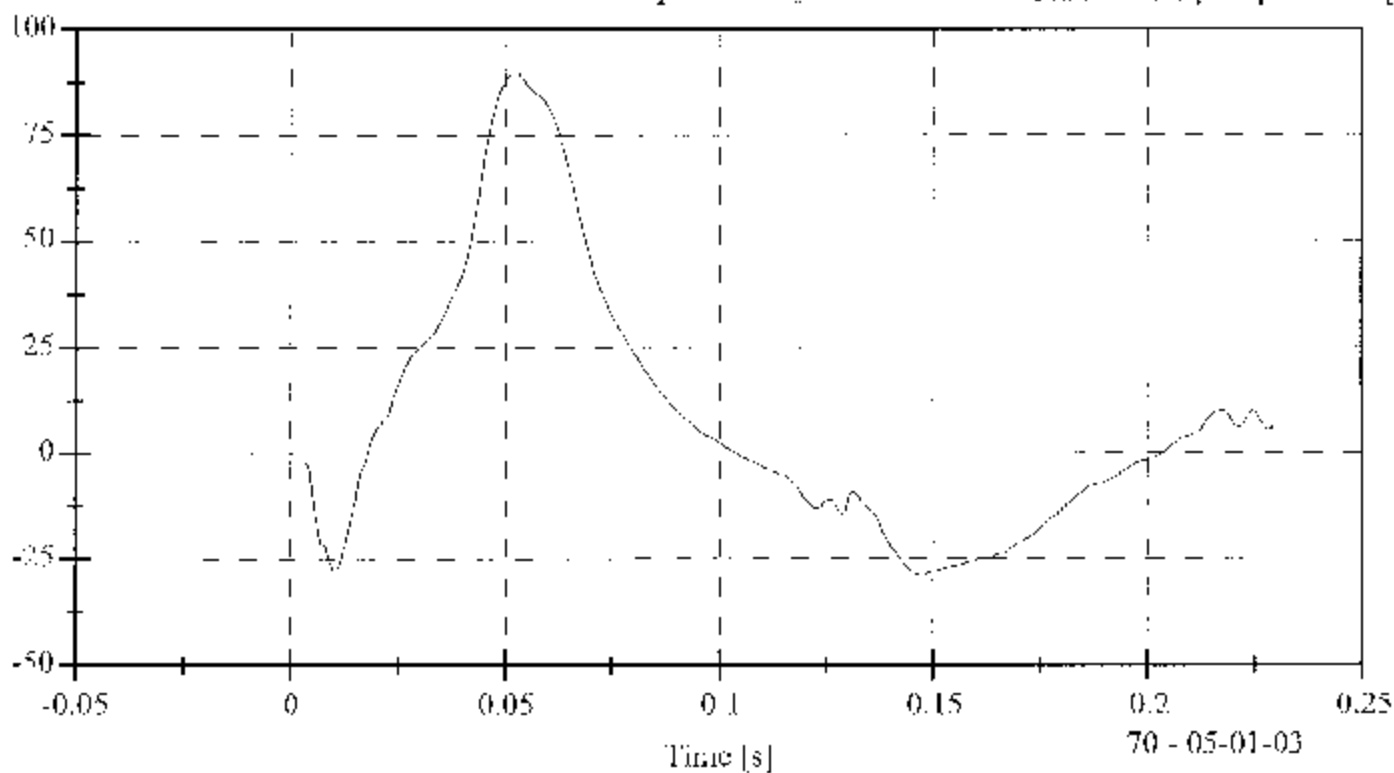


Occipital Condyle Moment

Max: 89.8 [Nm] at 0.052 [s]

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

MOCY [Nm]



ABDOMINAL COMPRESSION TEST  
POST TEST

(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID III 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 @ 35 mm (N)     | 325 - 391     | 361.2        |

REMARKS: None

Dummy S/N ... 016 ...

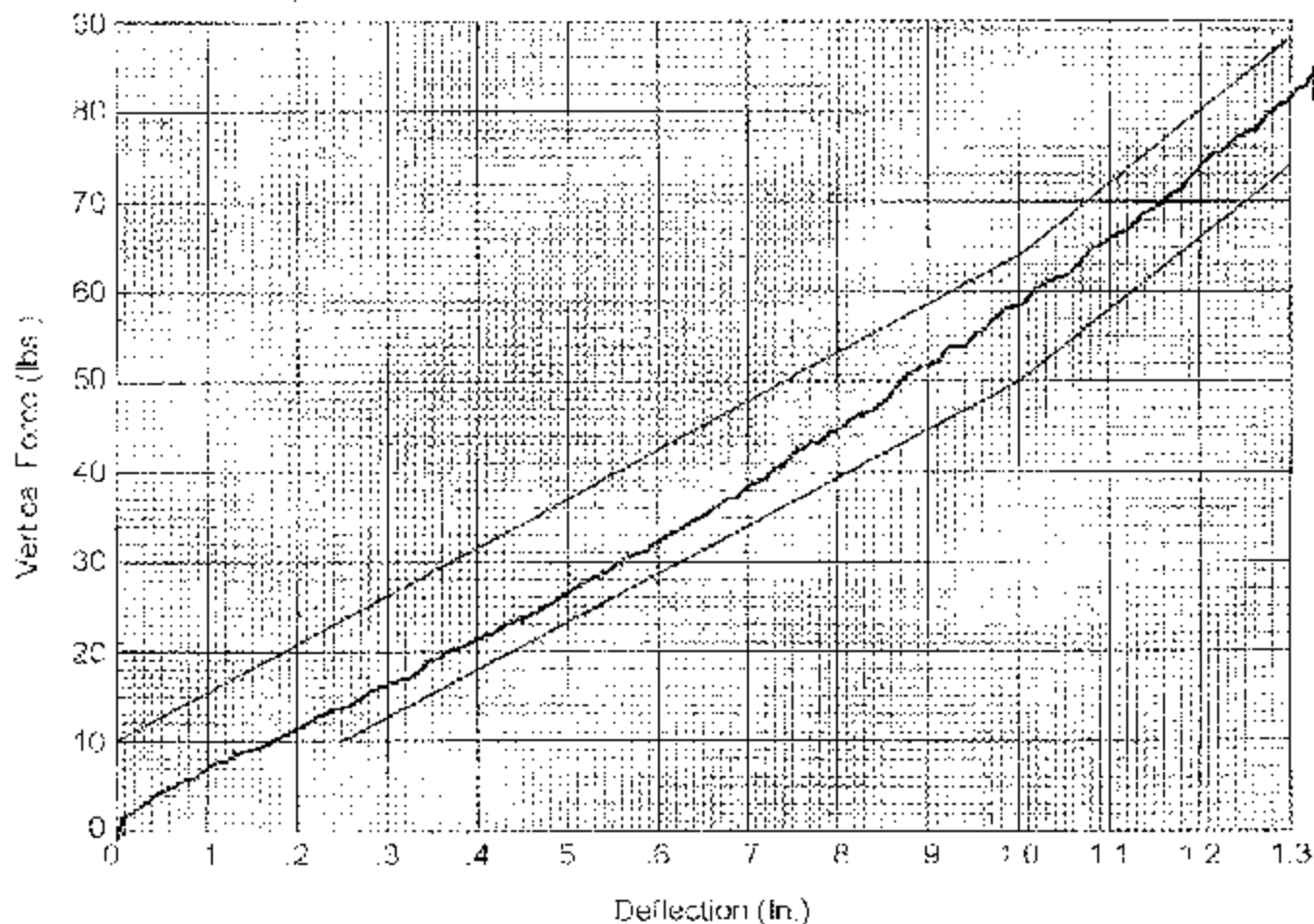
W/A ..

Date ... 5-13-73 ...

Performed By ... [Signature] ...

Temp. ... 78° ...

Humidity ... 37% ...



Hybrid II  
Abdomen Static Press

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

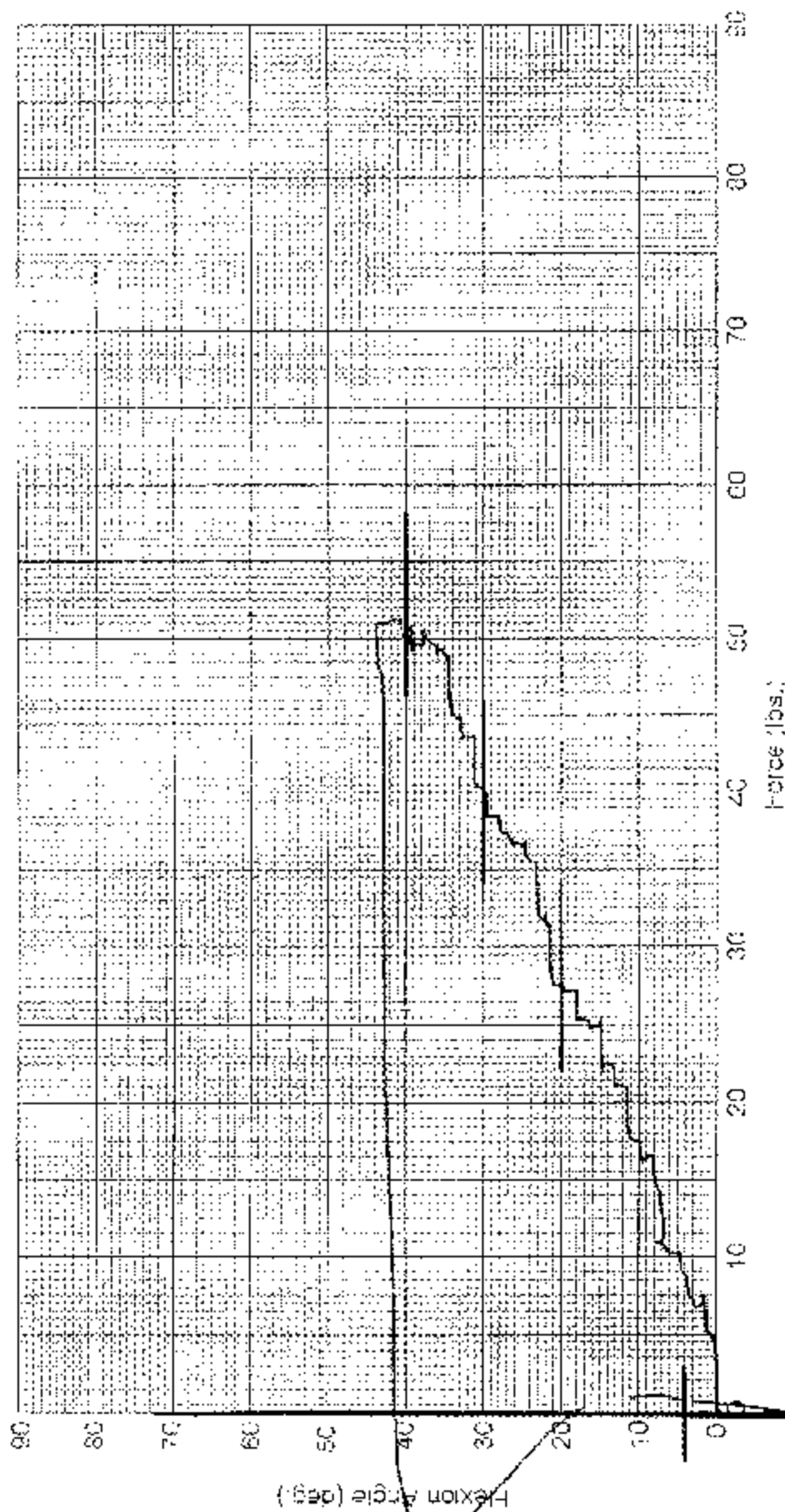
**CONFIGURED FOR LEFT SIDE IMPACT**

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

| 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 ..... 5476  
 WIA .....  
 Date ..... 05-02-03  
 Performed By .....  
 Temp. ..... 70  
 Humidity ..... 33%



Hybrid II Lumbar Spine Flexion Test

FM-053-CE T-303-800

8675-F214-07

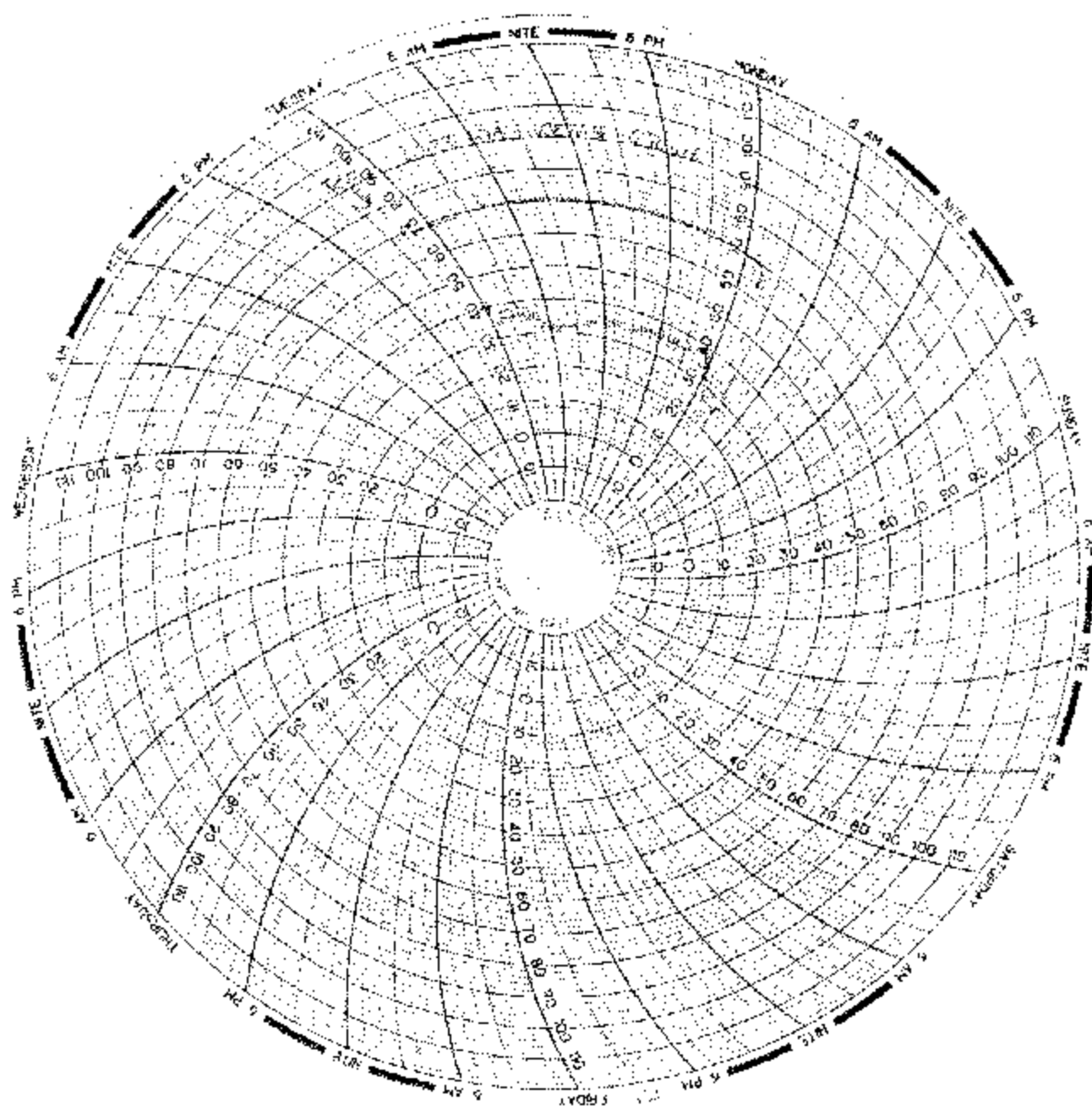
**POST TEST DUMMY INSPECTION LIST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

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

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

REMARKS: None

# TEMPERATURE TRACE





## APPENDIX D

### TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**  
**SID 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-P16636       | 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-P16825       | ENDEVCO      | 02/18/03         |
| PELVIS REDUNDANT      | AC-P16845       | ENDEVCO      | 02/18/03         |

| REAR SID NO.: 016     |               |              |                  |
|-----------------------|---------------|--------------|------------------|
|                       | SERIAL NUMBER | MANUFACTURER | CALIBRATION DATE |
| NAAH HEAD X ARM Y     | AC-01G18-F08  | ENTRAN       | 03/01/03         |
| 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-P18511     | 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-J33383                   | 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-P171392                  | ENDEVCO      | 02/10/03         |
| REAR FLOORPAN ABOVE AXLE (Y)       | AC-P19253                   | ENDEVCO      | 02/10/03         |
| REAR FLOORPAN ABOVE AXLE (Z)       | AC-P23138                   | ENDEVCO      | 07/10/03         |
| 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-8084-011                 | ICS          | 11/20/02         |
| MID REAR OF LEFT FRONT DOOR (Y)    | -                           | -            | -                |
| LEFT FRONT DOOR UPPER CM. (Y)      | -                           | -            | -                |
| MID REAR OF LEFT REAR DOOR (Y)     | -                           | -            | -                |
| LEFT REAR DOOR UPPER CM. (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-8083-037                 | 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-P23851                   | 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-C14048                   | ENDEVCO      | 04/17/03         |
| MDB REAR FRAME MEMBER (Y)          | AC-C16680                   | ENDEVCO      | 04/15/03         |

REMARKS: None