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REPORT NUMBER: 214-CAL-02-09

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

GENERAL MOTORS CORP.
2003 CADILLAC CTS
4-DOOR SEDAN

NHTSA NUMBER: C30101

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

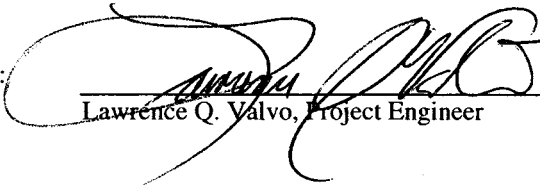


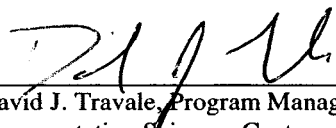
April 17, 2002

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 (NSA-30)
Washington, DC 20590


This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-97-C-01033. This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufactures' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

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| 4. Title and Subtitle Final Report of FMVSS 214 Compliance Side Impact Testing of a 2003 Cadillac CTS 4-Door Sedan NHTSA No.: C30101 | | | | 5. Report Date April 17, 2002 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 7. Author(s) Lawrence Q. Valvo, Project Engineer David J. Travale, Program Manager | | | | 8. Performing Organization Report No. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 15. Supplementary Notes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16. Abstract A 55/28 kph 90° Side Impact (Moving Deformable Barrier) Indicant Test was conducted on the subject Cadillac CTS 4-Door Sedan. 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 17, 2002. The impact velocity of the Moving Deformable Barrier (MDB) was 61.34 kph, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The target vehicle post-test maximum crush was 388 mm at level 2. The test vehicle's performance follows: <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 20%; text-align: center;"><u>Front SID</u></th> <th style="width: 10%;"></th> <th style="width: 20%; text-align: center;"><u>Rear SID</u></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration (LUR):</td> <td style="text-align: center;">46</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">43</td> <td style="text-align: center;">g's</td> </tr> <tr> <td>Left Lower Rib Acceleration (LLR):</td> <td style="text-align: center;">56</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">52</td> <td style="text-align: center;">g's</td> </tr> <tr> <td>Lower Spine Acceleration (T₁₂):</td> <td style="text-align: center;">77</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">45</td> <td style="text-align: center;">g's</td> </tr> <tr> <td>Thoracic Trauma Index (TTI):</td> <td style="text-align: center;">66</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">48</td> <td style="text-align: center;">g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td style="text-align: center;">74</td> <td style="text-align: center;">g's</td> <td style="text-align: center;">65</td> <td style="text-align: center;">g's</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event. | | | | | | | <u>Front SID</u> | | <u>Rear SID</u> | | Left Upper Rib Acceleration (LUR): | 46 | g's | 43 | g's | Left Lower Rib Acceleration (LLR): | 56 | g's | 52 | g's | Lower Spine Acceleration (T ₁₂): | 77 | g's | 45 | g's | Thoracic Trauma Index (TTI): | 66 | g's | 48 | g's | Pelvis Acceleration (PEV): | 74 | g's | 65 | g's |
| | <u>Front SID</u> | | <u>Rear SID</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Left Upper Rib Acceleration (LUR): | 46 | g's | 43 | g's | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Left Lower Rib Acceleration (LLR): | 56 | g's | 52 | g's | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lower Spine Acceleration (T ₁₂): | 77 | g's | 45 | g's | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thoracic Trauma Index (TTI): | 66 | g's | 48 | g's | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pelvis Acceleration (PEV): | 74 | g's | 65 | g's | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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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. DTNH22-97-C-01033. The purpose of this indicant test was to evaluate side impact protection in a 2003 Cadillac CTS 4-Door Sedan when tested at the New Car Assessment Program (NCAP) target test velocity of 62.0 kph, which is 8 kph faster than the target velocity required by the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 26, 2001).

SECTION 2

SUMMARY OF SIDE IMPACT TEST

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

A 2003 Cadillac CTS 4-Door Sedan 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 61.34 kph (38.1 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 17, 2002. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are included in Appendix A.

Two restrained Side Impact Dummies (SIDs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OVSC Side Impact Laboratory Test Procedure. Both SIDs were certified prior to this test. The side impact test was documented by one real-time camera and 10 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SIDs 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 (T₁₂) uniaxial and redundant accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)
5. Head triaxial accelerometers (X-, Y- and Z-direction)

A summary of the side impact dummy (SID) configuration and verification test data can be found in Appendix C. A total of 48 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 | Rear SID |
|-----------------|-----------|----------|
| TTI (g) | 66 | 48 |
| PEV (g) | 74 | 65 |

SECTION 3

SUMMARY OF TEST RESULTS

DATA SHEET 1

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2003 Cadillac CTS 4-Door Sedan

Vehicle Body Color: Silver VIN: 1G6DM57N130106842

Vehicle NHTSA No.: C30101 Month & Year of Manufacture: 3/02

Engine Data: 6 Cylinders; - CID; 3.2 Liters; - cc

Engine Placement: X Longitudinal; or - Lateral

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

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

Odometer Reading 209 km

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

DATA FROM TIRE PLACARD

Tire Pressure* (at capacity); 210 kPa FRONT
210 kPa REAR

Recommended Tire Size: P225/55 R16

Tires on Test Vehicle: P225/55 R16 ; Manufacturer: Goodyear

Vehicle Capacity Data:

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

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

Type of Rear Seat: - Bucket; X 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 = 400 kg (A)

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

Vehicle Cargo Capacity = 59.8 kg (A-B)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

| | | | |
|---------------------|------------------|---------------------|-----------------|
| Left Front = | <u>438.0</u> kg | Left Rear = | <u>376.0</u> kg |
| Right Front = | <u>432.5</u> kg | Right Rear = | <u>378.0</u> kg |
| TOTAL FRONT = | <u>870.5</u> kg | TOTAL REAR = | <u>754.0</u> kg |
| % of Total Weight = | <u>53.6</u> % | % of Total Weight = | <u>46.4</u> % |
| TOTAL WEIGHT = | <u>1624.5</u> kg | | |

* Tire pressure used in test.

DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

| | | | |
|---|---|---------------|------------|
| Total Test Vehicle Delivered Weight with Max. Fluids | = | <u>1624.5</u> | kg (A) |
| Maximum Cargo Carrying Capacity of Test Vehicle | = | <u>59.8</u> | kg (B) |
| Weight of instrumented Side Impact Dummies (2 X 81.2 kg) | = | <u>162.4</u> | kg (C) |
| TEST VEHICLE TARGET WEIGHT: | = | <u>1846.7</u> | kg (A+B+C) |

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

| | | | | | | | |
|----------------------------|---|---------------|----|-------------------|---|--------------|----|
| Left Front | = | <u>486.5</u> | kg | Left Rear | = | <u>420.0</u> | kg |
| Right Front | = | <u>485.0</u> | kg | Right Rear | = | <u>447.5</u> | kg |
| TOTAL FRONT | = | <u>971.5</u> | kg | TOTAL REAR | = | <u>867.5</u> | kg |
| % of Total Weight | = | <u>52.8%</u> | % | % of Total Weight | = | <u>47.2%</u> | % |
| TOTAL TEST WEIGHT = | | <u>1839.0</u> | kg | | | | |

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

| | | | | | | | |
|----------------------------|---|--------------|----|-------------------|---|--------------|----|
| Left Front | = | <u>486.5</u> | kg | Left Rear | = | <u>420.0</u> | kg |
| Right Front | = | <u>485.0</u> | kg | Right Rear | = | <u>447.5</u> | kg |
| TOTAL FRONT | = | <u>971.5</u> | kg | TOTAL REAR | = | <u>867.5</u> | kg |
| % of Total Weight | = | <u>52.8%</u> | % | % of Total Weight | = | <u>47.2%</u> | % |
| TOTAL TEST WEIGHT = | | <u>1839</u> | kg | | | | |

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

AS DELIVERED:

| | | | | | | | |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>706</u> | Right Front | <u>705</u> | Left Rear | <u>716</u> | Right Rear | <u>718</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

FULLY LOADED:

| | | | | | | | |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>692</u> | Right Front | <u>700</u> | Left Rear | <u>682</u> | Right Rear | <u>694</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

READY FOR TEST:

| | | | | | | | |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>694</u> | Right Front | <u>706</u> | Left Rear | <u>682</u> | Right Rear | <u>694</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

Test Vehicle Wheelbase: 2885 millimeters

C.G. = 1360.92 millimeters rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

| | | |
|--------------|-------------|-------------|
| Right Side = | <u>4680</u> | millimeters |
| Left Side = | <u>4680</u> | millimeters |
| Centerline = | <u>4860</u> | millimeters |

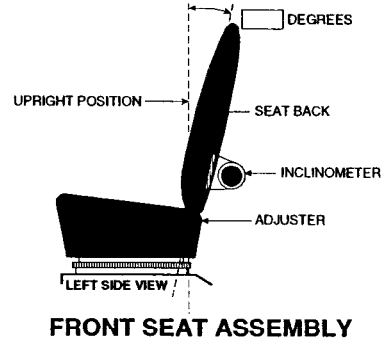
DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101

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: Mid travel position

Total Length of Adjustment Travel: 220 millimeters

Total Number of Adjustment Positions or Detents: Infinite (power seat adjuster)

FRONT SEAT BACK ADJUSTMENT POSITION: Frame at belt tower set to 21 degrees from vertical.

Seat Back Torso Angle: 24 degrees

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: 0 millimeters

Seat Back Adjustment Position: Fixed

ADJUSTABLE STEERING COLUMN POSITION: Mid-position

WINDOW POSITIONS: Left Front: Closed Left Rear: Closed

Right Front: Removed Right Rear: Removed

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:

66.2 liters (Fuel Tank Usable Capacity)

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

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

Wheelbase = 2885 millimeters

Impact Point is 503 millimeters rearward of front axle centerline
(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 498 millimeters rearward of front axle centerline

DATA SHEET 2

TEST VEHICLE SUMMARY OF RESULTS

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 2003 Cadillac CTS

Body Style: 4-Door Sedan

VIN: 1G6DM57N130106842

NHTSA No.: C30101

Test Date: April 17, 2002

Overall Length = 4860 millimeters; Overall Width = 1785 millimeters

VEHICLE TEST WEIGHT (Pre-Test):

Left Front = 486.5 kg Left Rear = 420.0 kg

Right Front = 485.0 kg Right Rear = 447.5 kg

TOTAL FRONT = 971.5 kg TOTAL REAR = 867.5 kg

TOTAL VEHICLE WEIGHT 1839.0 kg

Wheelbase = 2885 millimeters

Longitudinal C.G. from Center of Front Axle = 1360.92 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 11 mm below nominal impact point (Vertical)

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (231 mm above ground) = 180 millimeters

2. LEVEL 2 (481 mm above ground) = 388 millimeters

3. LEVEL 3 (619 mm above ground) = 360 millimeters

4. LEVEL 4 (880 mm above ground) = 337 millimeters

5. LEVEL 5 (1366 mm above ground) = 88 millimeters

Maximum Post-Test Intrusion = 388 millimeters

OCCUPANTS:

Front Passenger:

Rear Passenger:

Dummy Identification 026 268

Restraints Used 3-point active seat belt; side impact airbag; side curtain 3-point active seat belt; side curtain

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 Cadillac CTS 4-Door Sedan

NHTSA No. C30101

MDB FACE MANUFACTURER AND SERIAL NUMBER:

072C1198-1; 021C1001

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

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

MDB WEIGHT:

| | | | | | | | |
|--|---|---------------|---------|------------|---|--------------|----|
| Left Front | = | <u>409.5</u> | kg | Left Rear | = | <u>281.5</u> | kg |
| Right Front | = | <u>372.5</u> | kg | Right Rear | = | <u>299.0</u> | kg |
| TOTAL FRONT | = | <u>782.0</u> | kg | TOTAL REAR | = | <u>580.5</u> | kg |
| TOTAL MDB WEIGHT | = | <u>1362.5</u> | kg | | | | |
| Impact Angle (MDB C/L to Target Vehicle C/L) | = | <u>90</u> | degrees | | | | |
| Impact Speed | = | <u>61.34</u> | kph | | | | |

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

| | | | |
|------------------------------------|---|------------|-------------|
| 1. Row A at Center of Bumper Level | = | <u>159</u> | millimeters |
| 2. Row B at Top of Bumper Level | = | <u>105</u> | millimeters |
| 3. Row C at Mid Level | = | <u>158</u> | millimeters |
| 4. Row D at Top of Stack Level | = | <u>178</u> | millimeters |

INSTRUMENTATION:

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

DATA SHEET 4

POST-TEST OBSERVATIONS

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101

VISIBLE DUMMY CONTACT POINTS:

LEFT FRONT SID

LEFT REAR SID

Head: Side of head to side curtain
Arm to side impact airbag

Upper Torso: _____

Lower Torso: Pelvis to rear half of door trim

Left Knee: Left knee to forward half of door trim below arm rest

Right Knee: Right knee to left knee

Side of head to C-pillar trim and side curtain

Shoulder to rear half of door trim above arm rest

Pelvis to rear half of door trim below arm rest

Left knee to forward half of door trim below arm rest

Right knee to left knee

DOOR OPENING:

LEFT DOOR

RIGHT DOOR

Front: Closed / Inoperable

Rear: Closed / Inoperable

Closed / Operable

Closed / Operable

MDB DISTANCE FROM TARGET IMPACT POINT:

Vertical: 11 mm below

Horizontal: 5 mm forward

ARM REST LOCATIONS:

Front: 270 mm below bottom of window opening

Rear: 320 mm below bottom of window opening

SEAT MOVEMENT:

Front: Seat back was deformed inboard against the center console

Rear: None

GLAZING DAMAGE:

Windshield: Left side of windshield cracked during the event

Window: Both windows on the left side doors shattered during the event

PILLAR PERFORMANCE:

No visible tears or separations

SILL SEPARATION:

None

AIR BAG DEPLOYMENT STATUS:

| | DRIVER | FRONT PASSENGER | REAR PASSENGER |
|---------|--------|-----------------|----------------|
| FRONT | No | No | N/A |
| SIDE | Yes | No | N/A |
| CURTAIN | Yes | No | Yes |

OTHER NOTABLE IMPACT EFFECTS:

None

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 5

SID INSTRUMENTATION DATA

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101

| | Front Dummy ID# 026 | | | | Rear Dummy ID# 268 | | | |
|------------------------------|---------------------|----------------|----------------|----------------|--------------------|----------------|----------------|----------------|
| | 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: | | | | | | | | |
| Longitudinal X | 7.2 | 28.2 | -8.4 | 49.6 | 9.6 | 150.0 | -11.6 | 83.0 |
| Lateral Y | 70.9 | 46.5 | -15.7 | 163.3 | 73.4 | 52.4 | -15.9 | 151.1 |
| Vertical Z | 34.5 | 127.0 | -15.5 | 60.6 | 18.5 | 52.9 | -31.1 | 64.4 |
| Resultant R | 71.7 | 46.5 | - | - | 74.4 | 52.4 | - | - |
| HIC | 422.7 | | | | 223.0 | | | |
| RIB ACCELERATIONS: | | | | | | | | |
| Upper Rib Lateral Y | 46.1 | 23.2 | -12.0 | 110.6 | 42.6 | 46.9 | -5.3 | 135.0 |
| Upper Rib Lateral Y(R) | 46.8 | 23.1 | -12.5 | 110.6 | 41.5 | 46.9 | -5.0 | 135.0 |
| Lower Rib Lateral Y | 55.6 | 28.2 | -16.6 | 76.9 | 51.6 | 48.1 | -5.9 | 83.8 |
| Lower Rib Lateral Y(R) | 57.4 | 28.2 | -17.0 | 76.9 | 52.0 | 48.2 | -5.7 | 84.4 |
| SPINE ACCELERATIONS: | | | | | | | | |
| Lower Lateral Y | 77.4 | 28.2 | -24.4 | 69.4 | 44.9 | 50.7 | -6.0 | 71.9 |
| Lower Lateral Y(R) | 77.9 | 28.2 | -23.9 | 69.4 | 46.9 | 51.3 | -6.3 | 71.9 |
| PELVIC ACCELERATIONS: | | | | | | | | |
| Lateral Y | 74.3 | 24.4 | -27.2 | 69.4 | 65.3 | 41.9 | -14.0 | 71.3 |
| Lateral Y(R) | 73.6 | 24.4 | -27.0 | 70.0 | 66.2 | 41.9 | -14.3 | 70.6 |

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

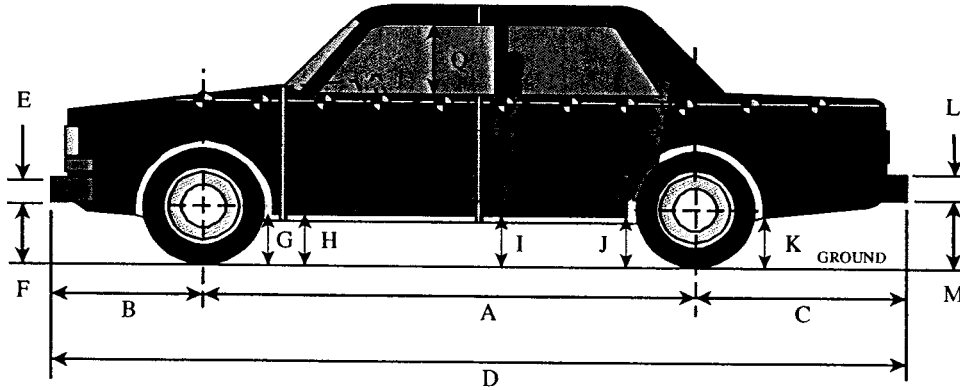
Note: Above data has been FIR filtered, Y(R) denotes redundant Y direction accelerometer.
 Head Accelerations are filtered at SAE Class 1000.

DATA SHEET 6

VEHICLE SIDE MEASUREMENTS

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



LEFT SIDE VIEW

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

| | PRE-TEST (as delivered) | PRE-TEST (as tested) | POST-TEST (as tested) | Δ CHANGE |
|----|----------------------------|-------------------------|--------------------------|-----------------|
| A | 2880 | 2885 | 2855 | -30 |
| B | 850 | 847 | 887 | 40 |
| C | 1130 | 1128 | 1094 | -34 |
| D | 4860 | - | 4836 | -24 |
| E | 235 | - | 235 | 0 |
| F | 272 | 266 | 252 | -14 |
| G | 208 | 191 | 212 | 21 |
| H | 209 | 191 | 202 | 11 |
| I | 219 | 195 | 200 | 5 |
| J1 | 191 | 160 | 170 | 10 |
| J2 | 196 | 164 | 175 | 11 |
| K | 265 | 227 | 245 | 18 |
| L | 206 | - | 206 | 0 |
| M | 318 | 281 | 262 | -19 |
| N | 698 | - | 632 | -66 |
| O | 708 | - | 697 | -11 |
| P | 1255 | - | 1150 | -105 |
| Q | 425 | - | 440 | 15 |
| R | 4680 | - | 4683 | 3 |
| S | 4680 | - | 4646 | -34 |
| T | 1785 | - | 1591 | -194 |

D = Length at Centerline

E&L = Bumper Thickness

R = Right Side Length

S = Left Side Length

T = Width at B-Pillar

J1 = To Pinch Weld

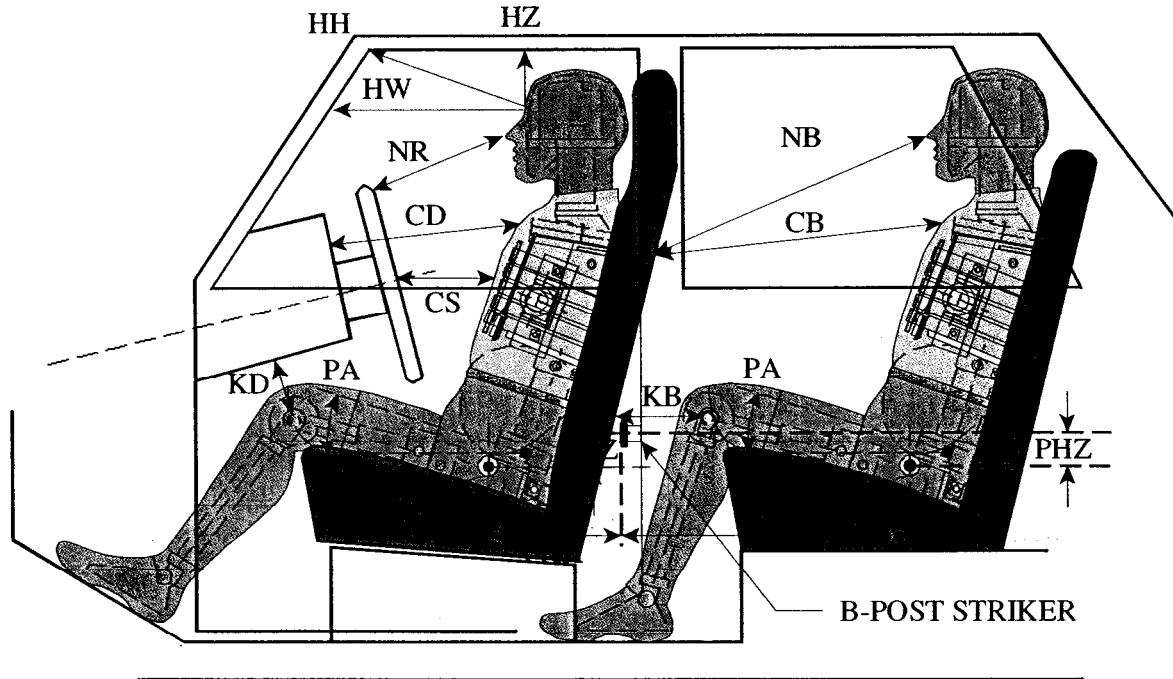
J2 = To Sill

DATA SHEET 7

SID LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



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 ± 3 mm

| | DRIVER ID# 026 | LEFT REAR PASS. ID# 268 |
|---------------------|----------------|-------------------------|
| HH | 396 | N/A |
| HW | 735 | N/A |
| HZ | 207 | 130 |
| NR/NB | 453 | 584 |
| CD/CB | 541 | 516 |
| CS | 357 | N/A |
| KDL(KDA°)/KBL(KDA°) | 168 / (32 °) | 225 / (21 °) |
| KDR(KBA°)/KBR(KBA°) | 172 / (36 °) | 225 / (21 °) |
| PA° | 24.0° | 24.2° |
| PHX | 141 | 216 |
| PHZ | 137 | 297 |

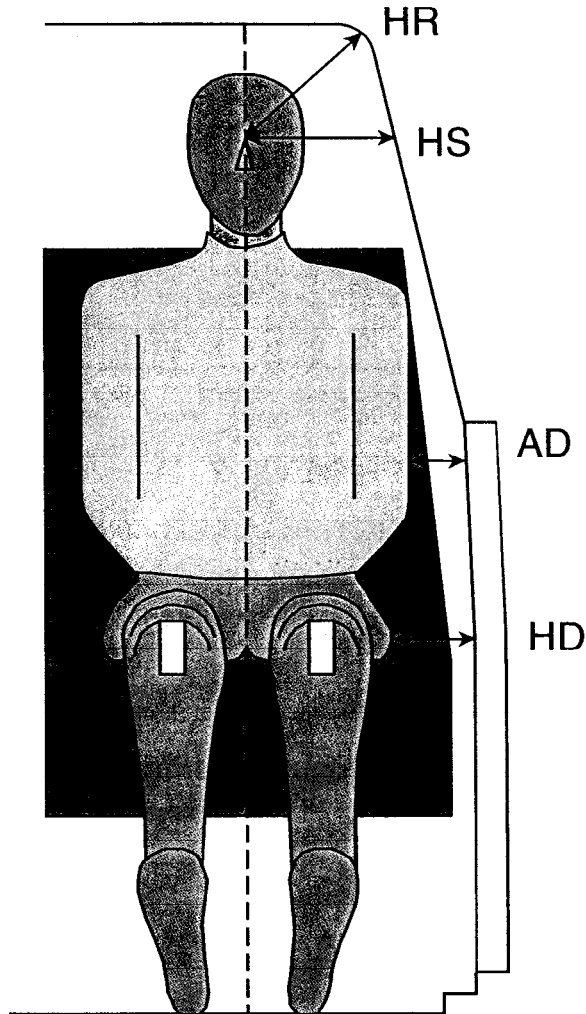
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

DATA SHEET 8

SID LATERAL CLEARANCE DIMENSIONS

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



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

| | DRIVER ID # 026 | | LEFT REAR PASS. ID # 268 | |
|-----|-----------------|------------|--------------------------|------------|
| HR | 203 | | 194 | |
| HS | 336 | | 218 | |
| AD* | LOWER: 126 | UPPER: 119 | LOWER: 114 | UPPER: 119 |
| HD | 145 | | 178 | |

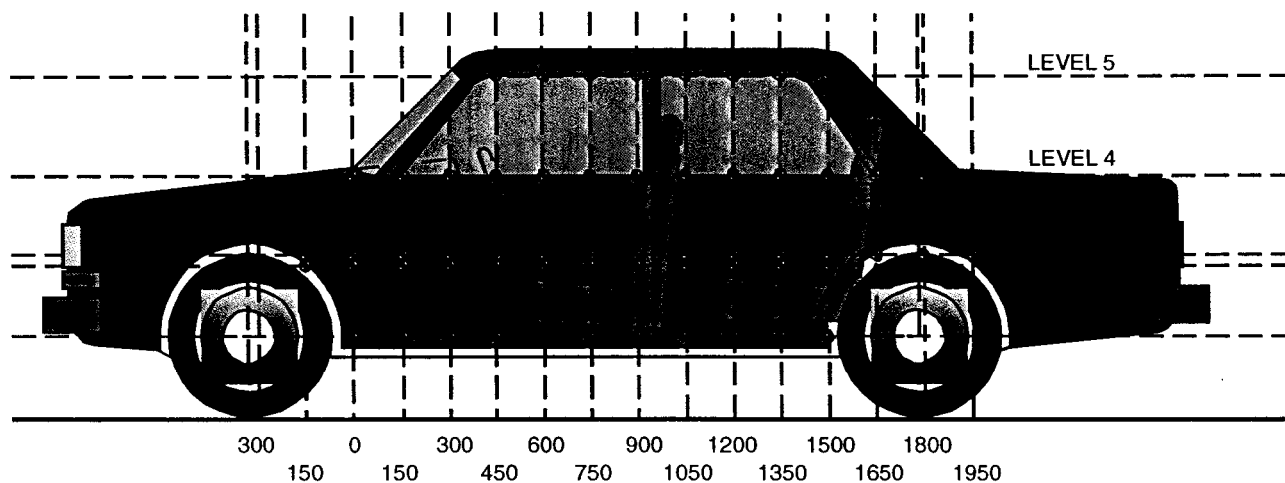
* Lower measurement is taken laterally at the center of the lower rib accelerometer height from the SID arm to the closest part of the vehicle side. Upper measurement is taken laterally at the center of the upper rib accelerometer height from the SID arm to the closest part of the vehicle side.

DATA SHEET 9

VEHICLE SIDE MEASUREMENTS

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



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 - SILL TOP HEIGHT

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

Measurements Along the Vertical 750 mm Line Shown Above:

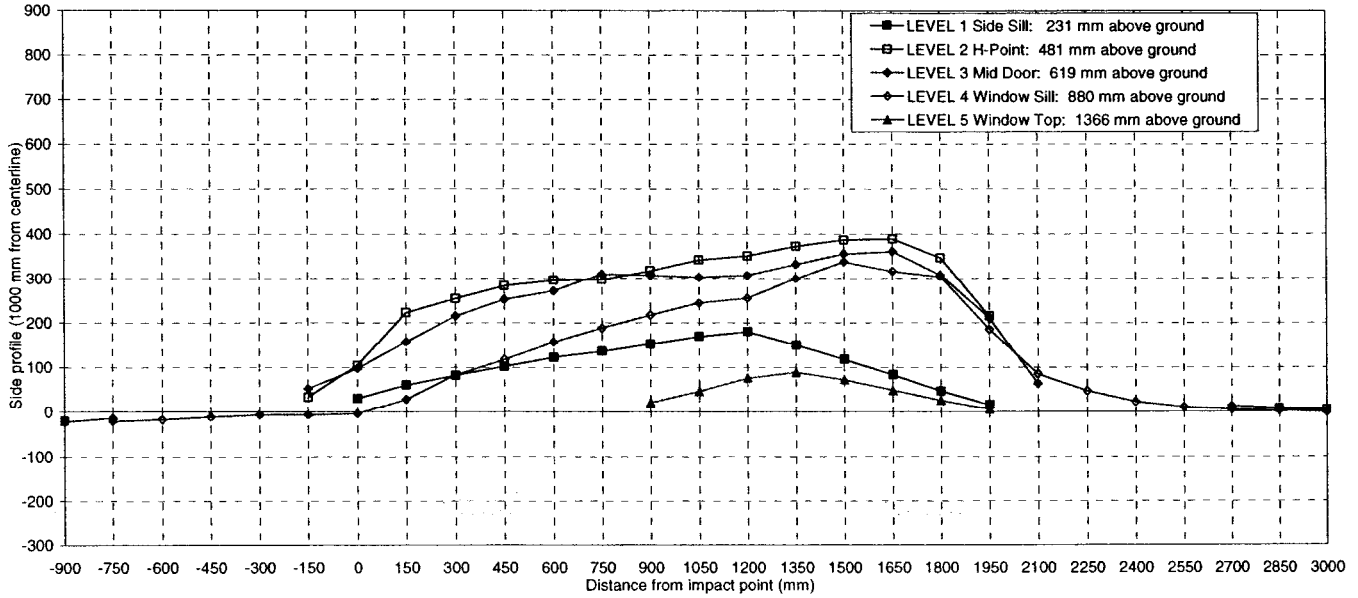
| | | | |
|----------------------------|---|-------------|-------------|
| Level 5 @ Window Top | = | <u>1366</u> | millimeters |
| Level 4 @ Window Sill | = | <u>880</u> | millimeters |
| Level 3 @ Mid Door | = | <u>619</u> | millimeters |
| Level 2 @ Occupant H-Point | = | <u>481</u> | millimeters |
| Level 1 @ Sill Top Height | = | <u>231</u> | millimeters |

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



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

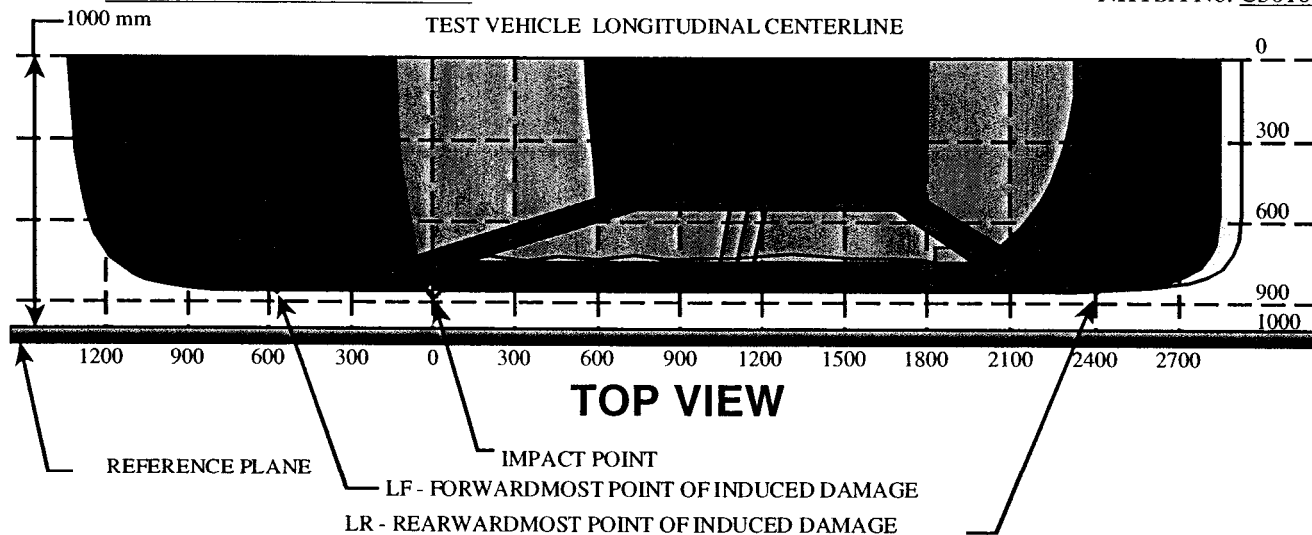
| LEVEL | HEIGHT (mm) | | DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|-------|--|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | | | -900 | -750 | -600 | -450 | -300 | -150 | 0 | 150 | 300 | 450 | 600 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | 1650 | 1800 | 1950 | 2100 | 2250 | 2400 | 2550 | 2700 | 2850 | 3000 | |
| LEVEL 1 SIDE SILL | 231 | PRE | -- | -- | -- | -- | -- | 133 | 181 | 177 | 175 | 171 | 170 | 169 | 165 | 164 | 166 | 163 | 162 | 160 | 154 | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | POST | -- | -- | -- | -- | -- | 233 | 241 | 259 | 277 | 293 | 306 | 321 | 334 | 344 | 316 | 280 | 245 | 207 | 170 | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | CRUSH | N/A | N/A | N/A | N/A | N/A | N/A | 60 | 82 | 102 | 122 | 136 | 152 | 169 | 180 | 150 | 117 | 83 | 47 | 16 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| LEVEL 2 H POINT | 481 | PRE | 190 | -- | -- | -- | 146 | 149 | 145 | 143 | 137 | 136 | 134 | 131 | 129 | 130 | 129 | 128 | 130 | 128 | 125 | -- | -- | -- | -- | -- | -- | 162 | 187 | |
| | | POST | 170 | -- | -- | -- | 179 | 253 | 367 | 397 | 420 | 431 | 431 | 448 | 470 | 480 | 501 | 514 | 518 | 474 | 339 | -- | -- | -- | -- | -- | -- | 170 | 193 | |
| | | CRUSH | -20 | N/A | N/A | N/A | N/A | 33 | 104 | 222 | 254 | 283 | 295 | 297 | 317 | 341 | 350 | 372 | 386 | 388 | 346 | 214 | N/A | N/A | N/A | N/A | N/A | 8 | 6 | |
| LEVEL 3 MID DOOR | 619 | PRE | 209 | 158 | -- | -- | 146 | 144 | 143 | 141 | 135 | 131 | 128 | 126 | 125 | 125 | 124 | 123 | 119 | 120 | 121 | 116 | -- | -- | -- | 135 | 166 | 188 | | |
| | | POST | 187 | 144 | -- | -- | 198 | 241 | 300 | 366 | 387 | 402 | 437 | 432 | 427 | 431 | 455 | 478 | 479 | 427 | 331 | 179 | -- | -- | -- | 148 | 174 | 191 | | |
| | | CRUSH | -22 | -14 | N/A | N/A | N/A | 52 | 97 | 157 | 215 | 252 | 271 | 309 | 306 | 302 | 306 | 331 | 355 | 360 | 307 | 210 | 63 | N/A | N/A | N/A | 13 | 8 | 3 | |
| LEVEL 4 WINDOW SILL | 880 | PRE | -- | 295 | 263 | 244 | 228 | 215 | 202 | 193 | 184 | 177 | 169 | 163 | 157 | 152 | 149 | 146 | 141 | 141 | 141 | 144 | 146 | 153 | 159 | 171 | 180 | 195 | 215 | |
| | | POST | -- | 274 | 246 | 233 | 221 | 208 | 196 | 221 | 267 | 294 | 326 | 351 | 374 | 396 | 404 | 445 | 478 | 456 | 444 | 329 | 231 | 200 | 182 | 182 | 185 | 198 | 214 | |
| | | CRUSH | N/A | -21 | -17 | -11 | -7 | -7 | 3 | 28 | 83 | 117 | 157 | 188 | 217 | 244 | 255 | 299 | 337 | 315 | 303 | 185 | 85 | 47 | 23 | 11 | 5 | 3 | -1 | |
| LEVEL 5 WINDOW TOP | 1366 | PRE | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 444 | 428 | 425 | 427 | 422 | 421 | 425 | 447 | -- | -- | -- | -- | -- | -- | -- | | |
| | | POST | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 465 | 474 | 501 | 515 | 494 | 469 | 451 | 453 | -- | -- | -- | -- | -- | -- | -- | | |
| | | CRUSH | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 21 | 46 | 76 | 88 | 72 | 48 | 26 | 6 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |

DATA SHEET 11

VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



MEASUREMENT CONVENTIONS:

Forward of the impact point (towards front of vehicle) is considered negative (—).

Rearward of the impact point (toward rearend of vehicle) is considered positive (+).

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

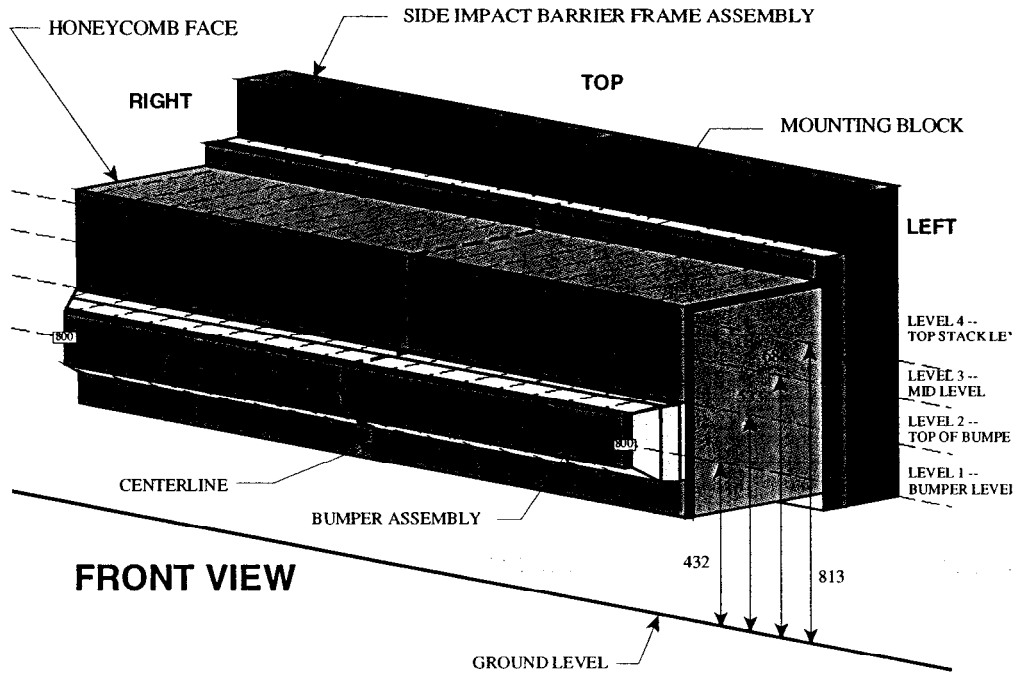
| DPD MEASUREMENTS | POST TEST (mm) | PRETEST (mm) | STATIC CRUSH (mm) |
|------------------|----------------|--------------|-------------------|
| 1 (LR = 3000 mm) | 193 | 187 | 6 |
| 2 2370 | 186 | 158 | 28 |
| 3 1740 | 492 | 129 | 363 |
| 4 1110 | 474 | 129 | 345 |
| 5 480 | 422 | 137 | 285 |
| 6 (LF = -150 mm) | 198 | 146 | 52 |

DATA SHEET 12

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



NOTE: Dimensions are shown in millimeters, mm

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

| LEVEL | HEIGHT AT CL (mm)* | | DISTANCE RIGHT OF CENTER (mm) | | | | | | | | | DISTANCE LEFT OF CENTER (mm) | | | | | | | | |
|--------------------------|--------------------|-------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------------------------------|-----|-----|-----|-----|-----|-----|-----|--|
| | | | 800 | 700 | 600 | 500 | 400 | 300 | 200 | 100 | 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | |
| LEVEL 4 TOP STACK | 813 | PRE | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | |
| | | POST | 631 | 612 | 598 | 605 | 621 | 629 | 621 | 628 | 634 | 643 | 652 | 665 | 683 | 701 | 718 | 750 | 797 | |
| | | CRUSH | 12 | -7 | -21 | -14 | 2 | 10 | 2 | 9 | 15 | 24 | 33 | 46 | 64 | 82 | 99 | 131 | 178 | |
| LEVEL 3 MID LEVEL | 686 | PRE | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | |
| | | POST | 627 | 610 | 611 | 617 | 623 | 638 | 634 | 632 | 631 | 633 | 632 | 632 | 644 | 657 | 678 | 720 | 777 | |
| | | CRUSH | 8 | -9 | -8 | -2 | 4 | 19 | 15 | 13 | 12 | 14 | 13 | 13 | 25 | 38 | 59 | 101 | 158 | |
| LEVEL 2 TOP BUMPER | 533 | PRE | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | |
| | | POST | 667 | 659 | 660 | 660 | 659 | 658 | 657 | 661 | 667 | 672 | 675 | 680 | 684 | 688 | 692 | 704 | 724 | |
| | | CRUSH | 48 | 40 | 41 | 41 | 40 | 39 | 38 | 42 | 43 | 53 | 56 | 61 | 65 | 69 | 73 | 85 | 105 | |
| LEVEL 1 MID BUMPER | 432 | PRE | 535 | 519 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 519 | 535 | 535 | |
| | | POST | 634 | 617 | 612 | 613 | 624 | 621 | 622 | 621 | 625 | 631 | 634 | 639 | 645 | 646 | 654 | 678 | 690 | |
| | | CRUSH | 99 | 98 | 94 | 95 | 106 | 103 | 104 | 103 | 107 | 113 | 116 | 121 | 127 | 128 | 136 | 159 | 155 | |

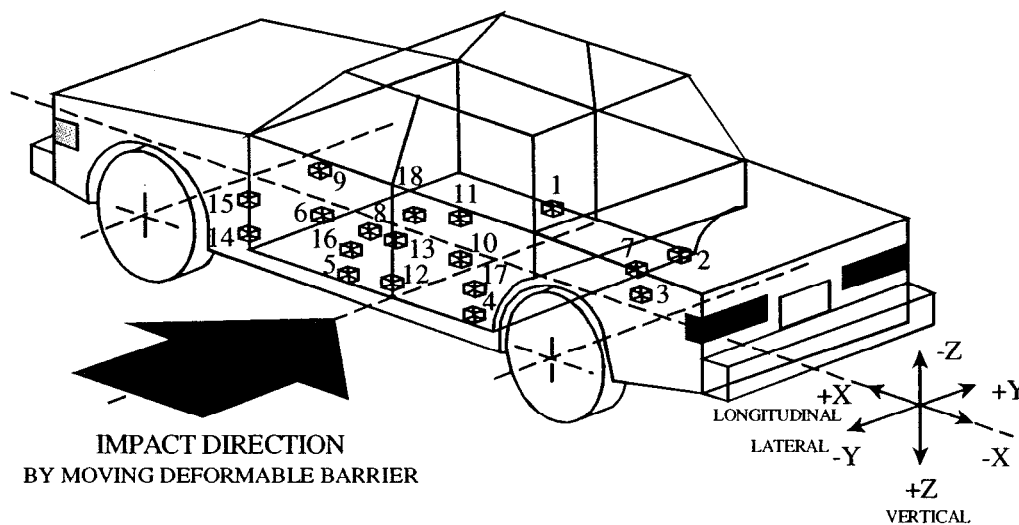
*Heights measured above ground level.

DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



- 1-Right Side Sill @ Front Seat
- 2-Right Side Sill @ Rear Seat
- 3-Rear Floorpan Above Axle
- 4-Left Side Sill @ Rear Seat
- 5-Left Side Sill @ Front Seat
- 6-Left Front Door on Centerline
- 7-Right Rear Occupant Compartment
- 8-Midrear of Left Front Door
- 9-Left Front Door Upper Centerline

- 10-Midrear of Left Rear Door
- 11-Left Rear Door Upper Centerline
- 12-Left Lower B-Pillar
- 13-Left Middle B-Pillar
- 14-Left Lower A-Pillar
- 15-Left Middle A-Pillar
- 16-Front Seat Track
- 17-Rear Seat Track
- 18-Vehicle CG

DATA SHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101

| Accel. No. | Location | Coordinates (mm)±3 mm | | | Long. (x) | | Lat. (y) | | Vert. (z) | | Resultant | |
|------------|----------------------------------|-----------------------|------|------|------------|-------------|----------|-------------|-----------|-------------|-----------|-------------|
| | | X* | Y* | Z* | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) |
| 1 | Right Side Sill at Front Seat | 3103 | 663 | -280 | pos. 4.1 | 59.6 | 34.0 | 21.4 | 7.4 | 24.6 | 35.4 | 21.4 |
| | | | | | neg. -8.1 | 19.0 | -3.7 | 15.6 | -7.9 | 21.4 | - | - |
| 2 | Right Side Sill at Rear Seat | 2057 | 616 | -200 | pos. 2.8 | 59.3 | 20.5 | 20.2 | 5.1 | 29.1 | 21.8 | 20.1 |
| | | | | | neg. -7.2 | 19.7 | -2.2 | 139.3 | -6.8 | 23.3 | - | - |
| 3 | Rear Floorpan Above Axle | 1193 | -18 | -524 | pos. 2.6 | 116.3 | 35.8 | 68.6 | 22.1 | 20.4 | 36.0 | 68.6 |
| | | | | | neg. -10.9 | 14.5 | -2.7 | 121.8 | -21.1 | 16.2 | - | - |
| 4 | Left Side Sill at Rear Seat | 2061 | -586 | -200 | pos. - | - | 75.6 | 7.3 | - | - | - | - |
| | | | | | neg. - | - | -36.7 | 20.5 | - | - | - | - |
| 5 | Left Side Sill at Front Seat | 3074 | -618 | -262 | pos. - | - | 142.6 | 4.3 | - | - | - | - |
| | | | | | neg. - | - | -32.5 | 21.4 | - | - | - | - |
| 6** | Left Front Door on Centerline | - | - | - | pos. - | - | - | - | - | - | - | - |
| | | | | | neg. - | - | - | - | - | - | - | - |
| 7 | Right Rear Occupant Compartment | 2133 | 385 | -197 | pos. - | - | 21.0 | 20.1 | - | - | - | - |
| | | | | | neg. - | - | -2.1 | 139.6 | - | - | - | - |
| 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

NHTSA No. C30101

Vehicle: 2003 Cadillac CTS 4-Door Sedan

| Accel. No. | Location | Coordinates (mm)±3 | | | Long. (x) | | Lat. (y) | | Vert. (z) | | Resultant | |
|------------|----------------------|--------------------|------|------|-----------|-------------|----------|-------------|-----------|-------------|-----------|-------------|
| | | X* | Y* | Z* | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) | Max (g) | Time (msec) |
| 12 | Left Lower B-Pillar | 2238 | -663 | -350 | - | - | 327.8 | 4.2 | - | - | - | - |
| | | | | | pos. | | -86.5 | 8.7 | - | - | - | - |
| 13 | Left Middle B-Pillar | 2232 | -698 | -589 | - | - | ** | - | - | - | - | - |
| | | | | | pos. | | ** | - | - | - | - | - |
| 14 | Left Lower A-Pillar | 3320 | -642 | -384 | - | - | 268.3 | 5.5 | - | - | - | - |
| | | | | | pos. | | -233.0 | 10.5 | - | - | - | - |
| 15 | Left Middle A-Pillar | 3229 | -645 | -980 | - | - | 24.2 | 37.1 | - | - | - | - |
| | | | | | pos. | | -6.7 | 56.6 | - | - | - | - |
| 16 | Front Seat Track | 2238 | -623 | -235 | - | - | 73.6 | 4.4 | - | - | - | - |
| | | | | | pos. | | -29.1 | 19.3 | - | - | - | - |
| 17 | Rear Seat Track | 1938 | -642 | -339 | - | - | 16.2 | 23.2 | - | - | - | - |
| | | | | | pos. | | -2.2 | 122.7 | - | - | - | - |
| 18 | Vehicle CG | 2623 | 45 | -486 | 16.2 | 20.8 | 159.8 | 16.7 | 35.8 | 22.2 | 159.9 | 16.7 |
| | | | | | pos. | 25.5 | -104.6 | 22.6 | -22.7 | 26.4 | - | - |
| | | | | | neg. | | | | | | | |

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

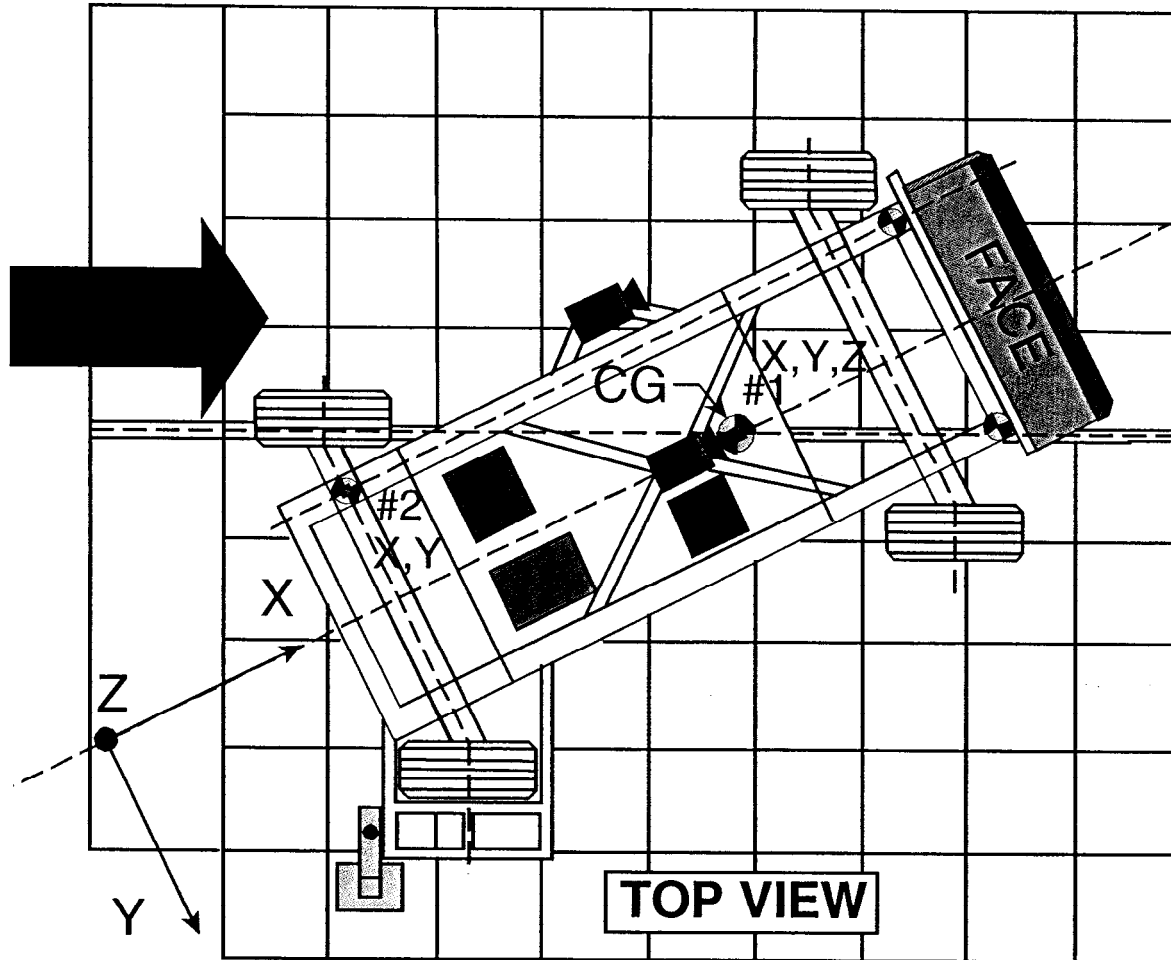
** Wire cut at 7 ms

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



| 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 | 1.1 | 142.8 | -18.1 | 42.2 |
| | Lateral..... Y | | | | 2.4 | 57.5 | -8.4 | 28.5 |
| | Vertical..... Z | | | | 9.5 | 14.5 | -19.2 | 19.9 |
| | Resultant..... R | | | | 24.7 | 19.8 | - | - |
| 2 | Rear Frame Member | | | | | | | |
| | Longitudinal... X | 386 | -660 | -660 | 2.2 | 158.9 | -21.0 | 27.2 |
| | Lateral..... Y | | | | 4.1 | 25.1 | -1.8 | 127.0 |

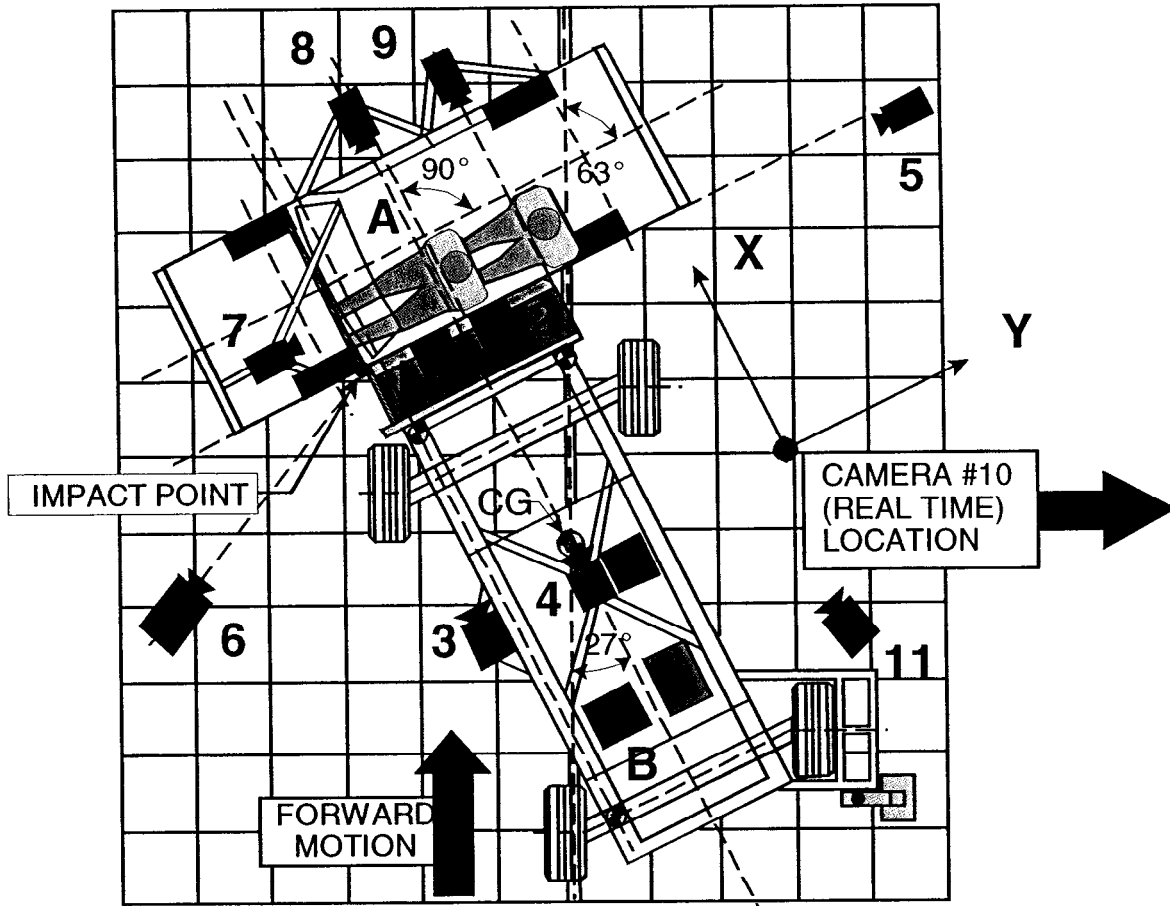
*Reference: X = Rear Bumper (+ Forward)
 Y = Vehicle Centerline (+ To Right)
 Z = Ground Level (+ Down)
 All measurements accurate to within ±3 mm.

DATA SHEET 15

HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No. C30101



| Camera No. | View | Coordinates (millimeters) | | | Angle (deg.) | Lens (mm) | Film Speed (fps) |
|------------|--|---------------------------|-------|-------|--------------|-----------|------------------|
| | | X* | Y* | Z* | | | |
| 1 | Overhead view of test vehicle | 137 | 840 | -4880 | -90 | 8 | 1000 |
| 2 | Overhead closeup view of impact plane | 275 | 904 | -4880 | -90 | 12.5 | 1015 |
| 3 | MDB onboard closeup view of impact point | -1470 | 0 | -847 | 0 | 13 | 1010 |
| 4 | MDB onboard view of driver dummy | -1140 | 838 | -1586 | -17 | 7.5 | 1010 |
| 5 | Right side ground level overall view | 40 | 9300 | -1114 | -5 | 25 | 950 |
| 6 | Left side ground level overall view | -1798 | -1612 | -1076 | -7 | 13 | 1005 |
| 7 | Test vehicle onboard driver front view | 563 | -412 | -1265 | -8 | 13 | 900 |
| 8 | Test vehicle onboard driver side view | 1830 | 890 | -1042 | -8 | 8 | 1015 |
| 9 | Test vehicle onboard passenger side view | 1790 | 1760 | -1075 | -11 | 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

SECTION 5

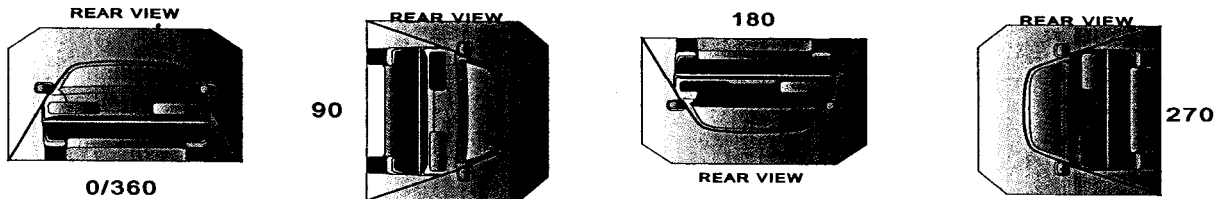
FUEL SYSTEM INTEGRITY

DATA SHEET 17

ROLLOVER DATA

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No.: C30101



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 | |
|----------------|--------------------------------|---------|---------|---------|---------------------|---------|------------|---------|---------|---------|----------------------------|---------|
| | minutes | seconds | minutes | seconds | minutes | seconds | minutes | seconds | minutes | seconds | minutes | seconds |
| 0° - 90° | 1 | 17 | 5 | 6 | 6 | 17 | 7 | | | | | |
| 90° - 180° | 1 | 2 | 5 | 6 | 6 | 2 | 7 | | | | | |
| 180°-270° | 1 | 2 | 5 | 6 | 6 | 2 | 7 | | | | | |
| 270°-360° | 1 | 12 | 5 | 6 | 6 | 12 | 7 | | | | | |

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

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

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

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

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

IV. SOLVENT SPILLAGE LOCATION(S):

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

APPENDIX A
PHOTOGRAPHS

TABLE OF 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-TEST REAR VIEW OF TEST VEHICLE

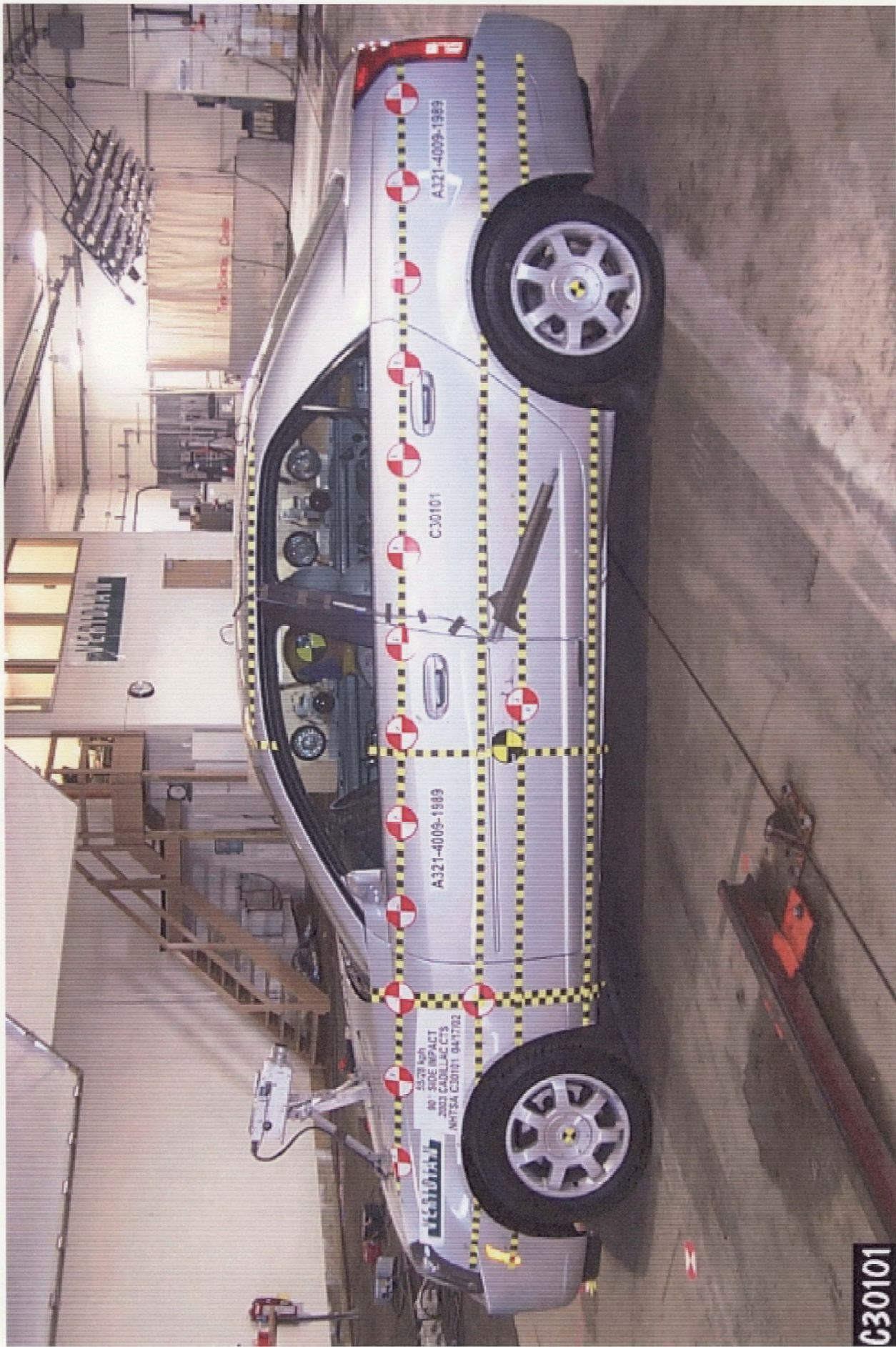


Figure A-5: PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE

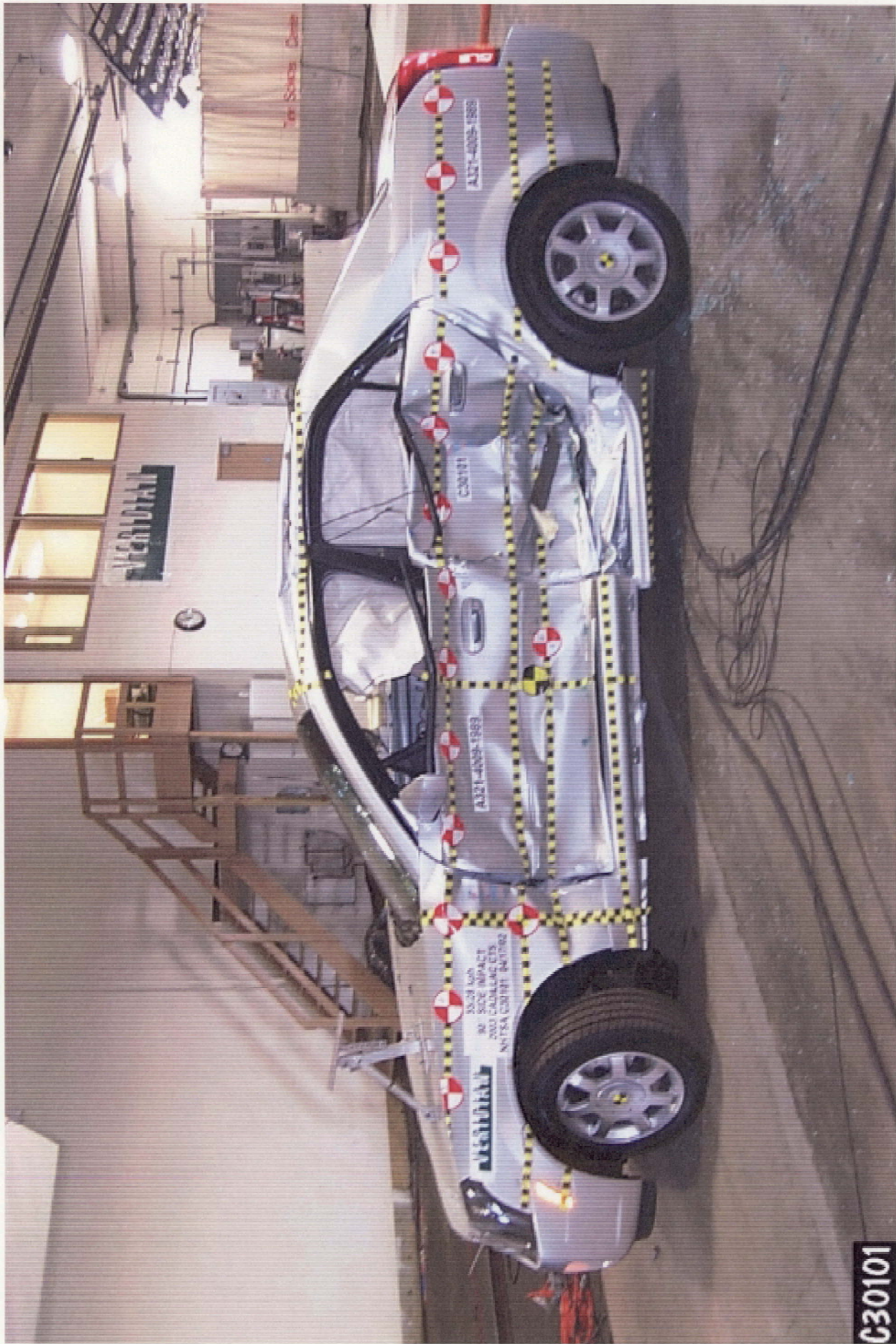


Figure A-6: POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE

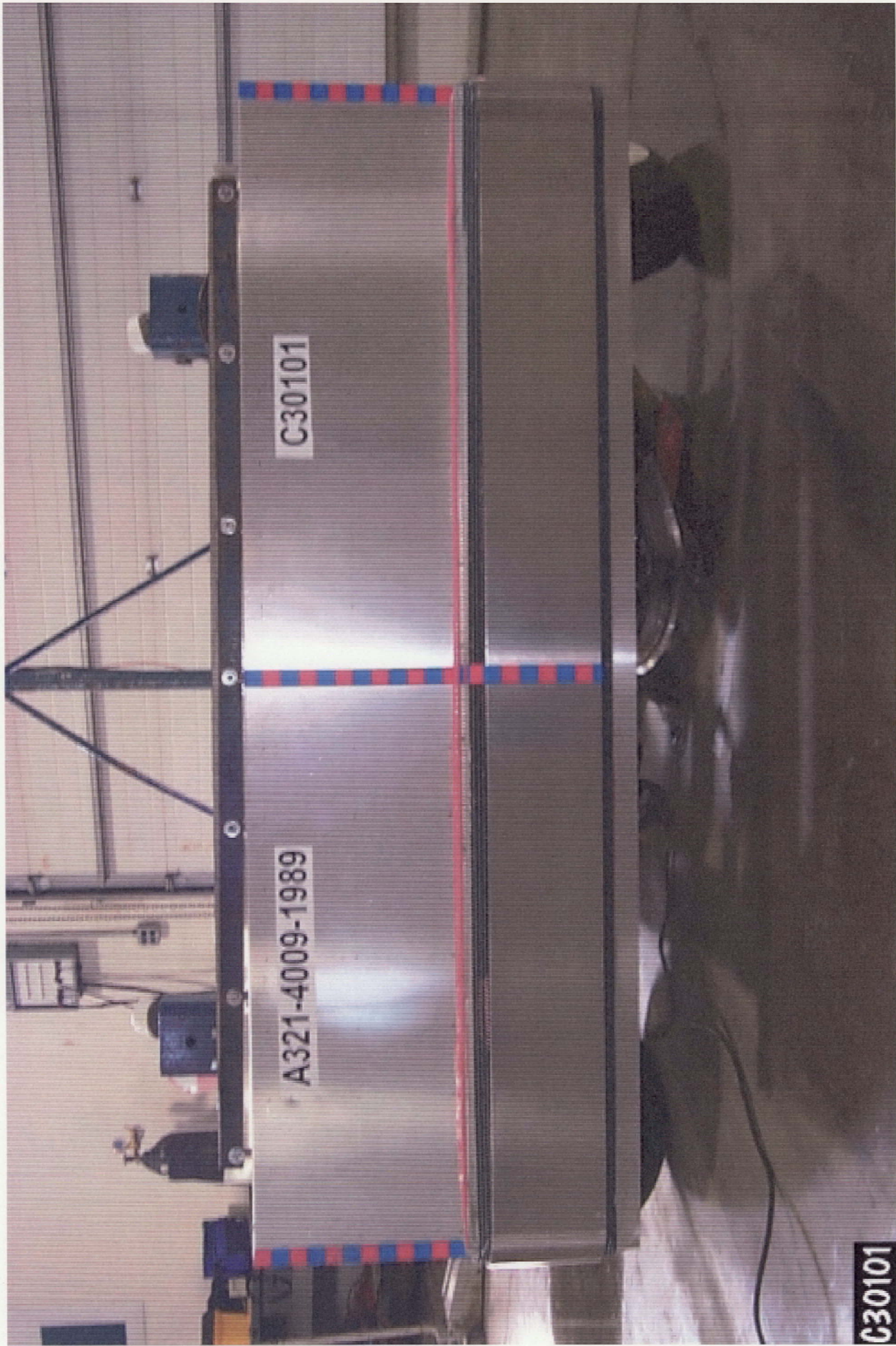


Figure A-7: PRE-TEST FRONTAL VIEW OF IMPACTOR FACE

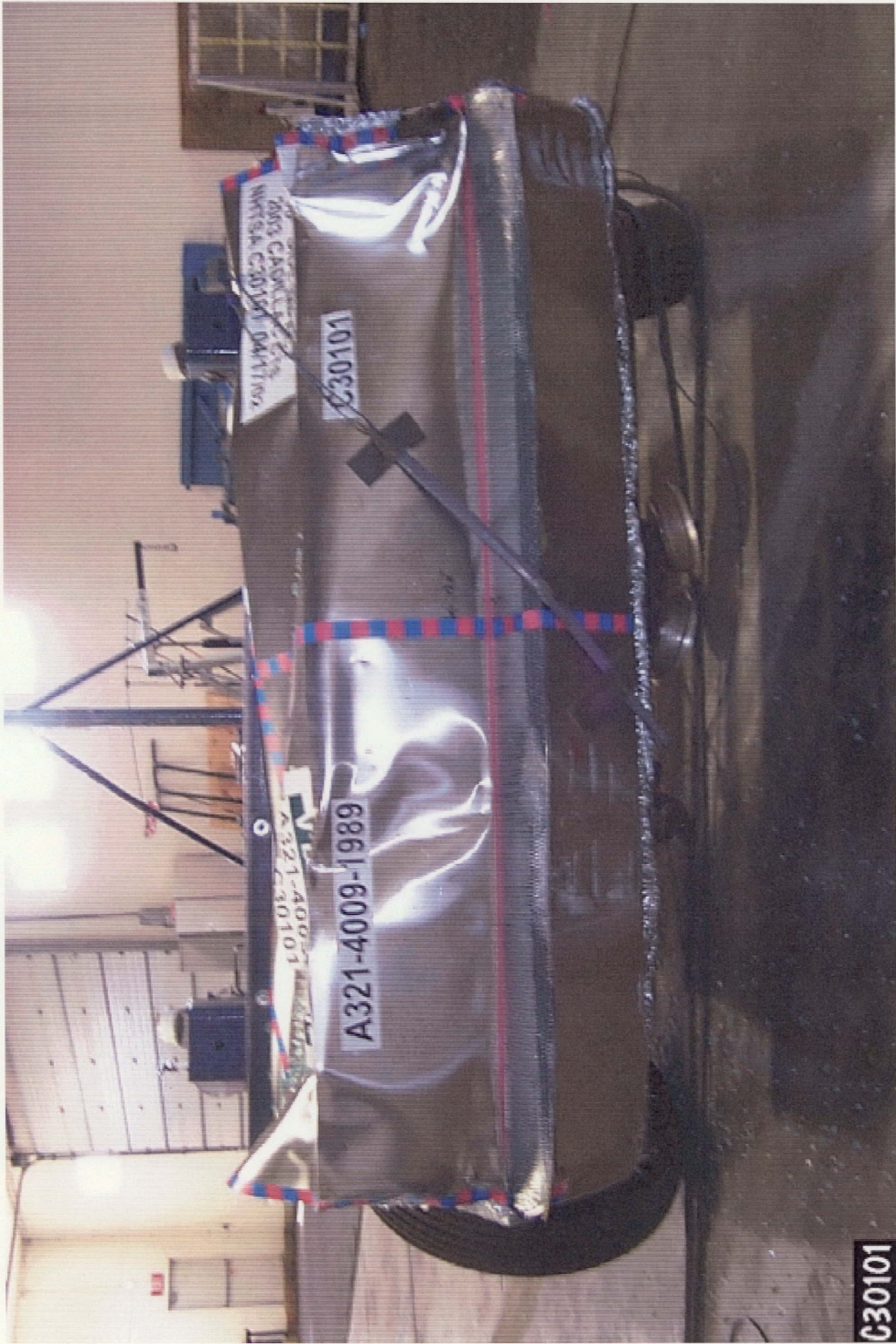


Figure A-8: POST-TEST FRONTAL VIEW OF IMPACTOR FACE

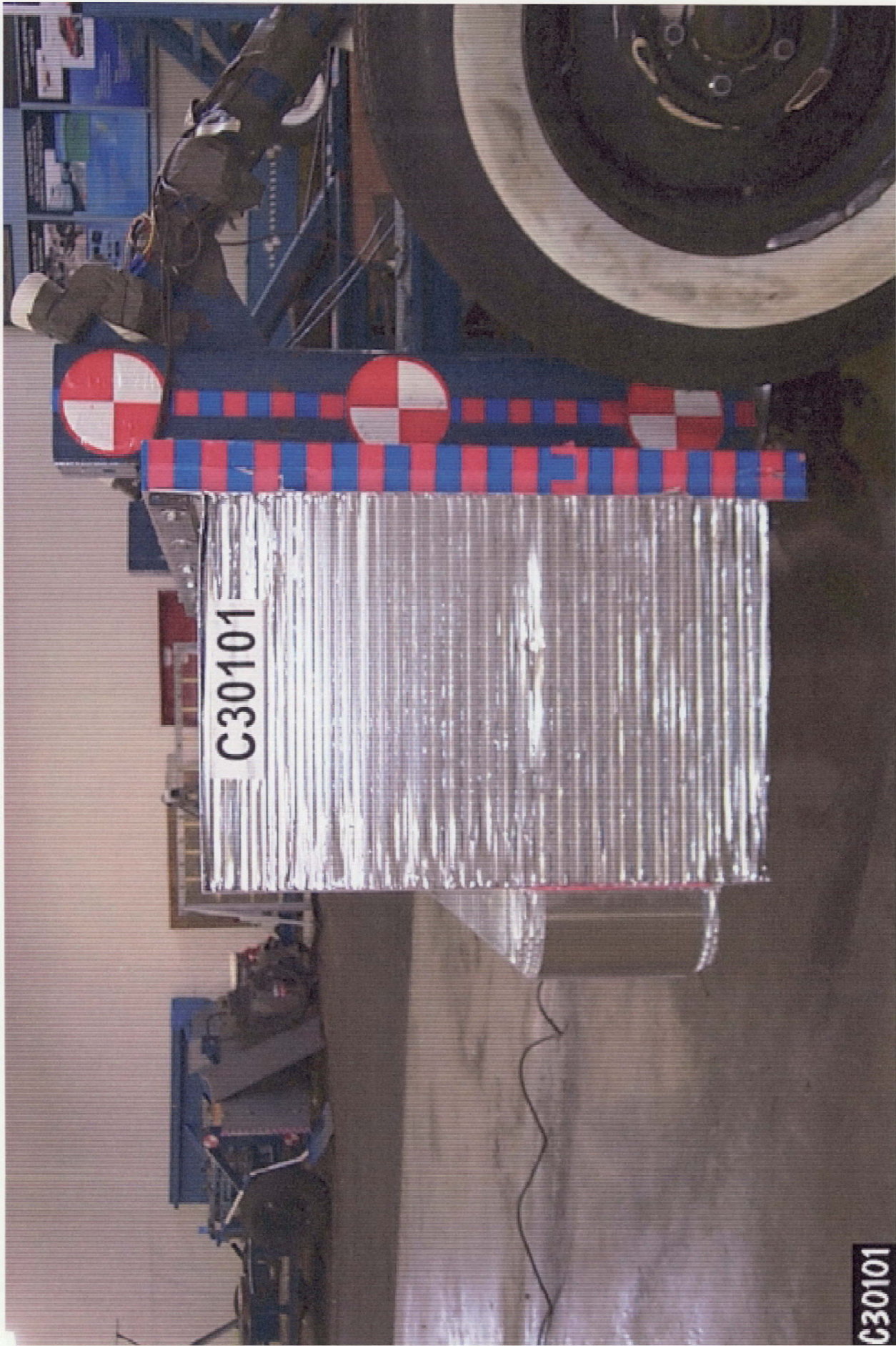


Figure A-9: PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE

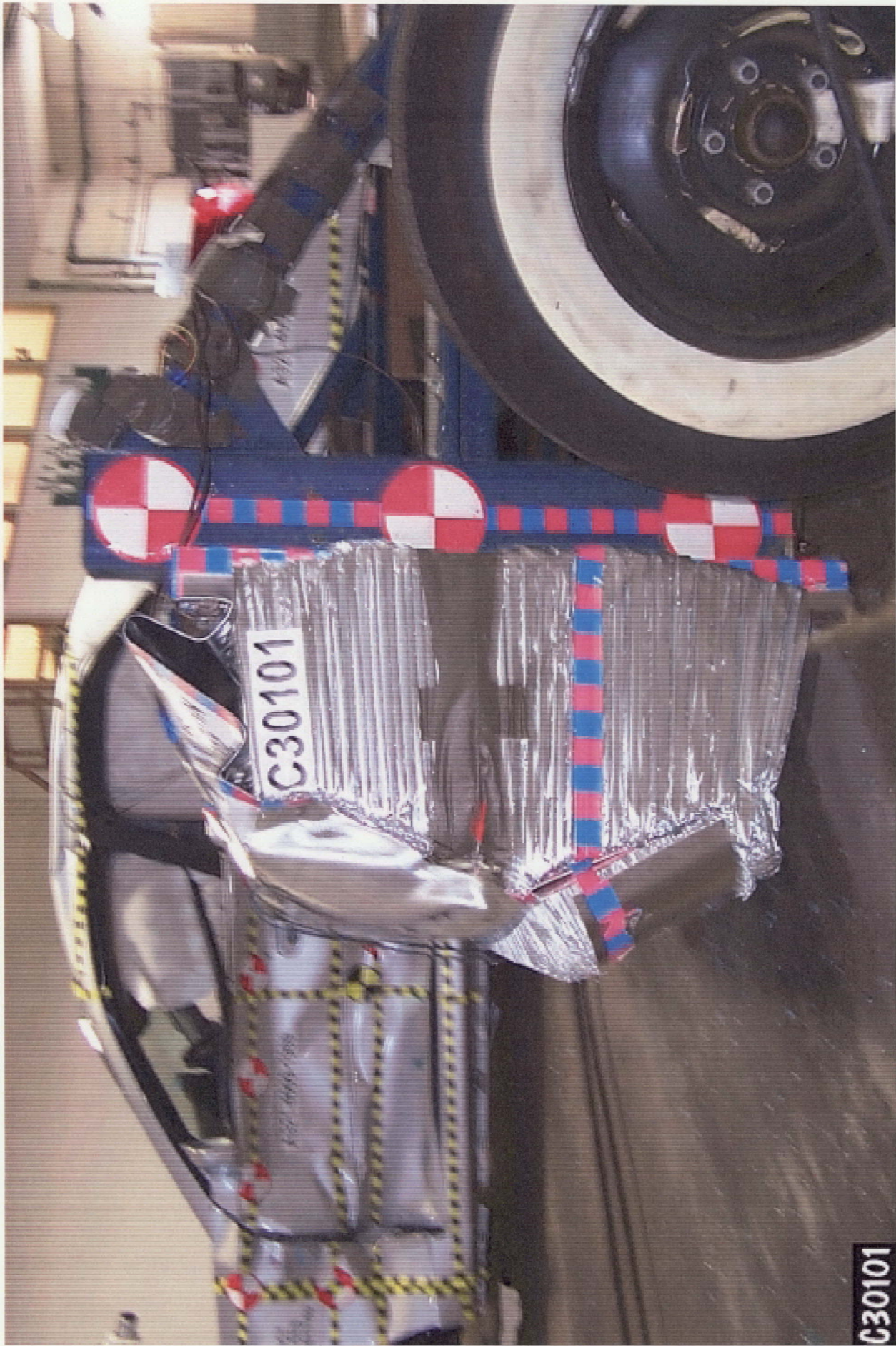


Figure A-10: POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-11: PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-12: POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-13: PRE-TEST TOP VIEW OF IMPACTOR FACE



Figure A-14: POST-TEST TOP VIEW OF IMPACTOR FACE



Figure A-15: PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE



Figure A-16: POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE



Figure A-17: PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-18: POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-19: PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-20: POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-21: PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID



A-24

8502-36

Figure A-22: POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID

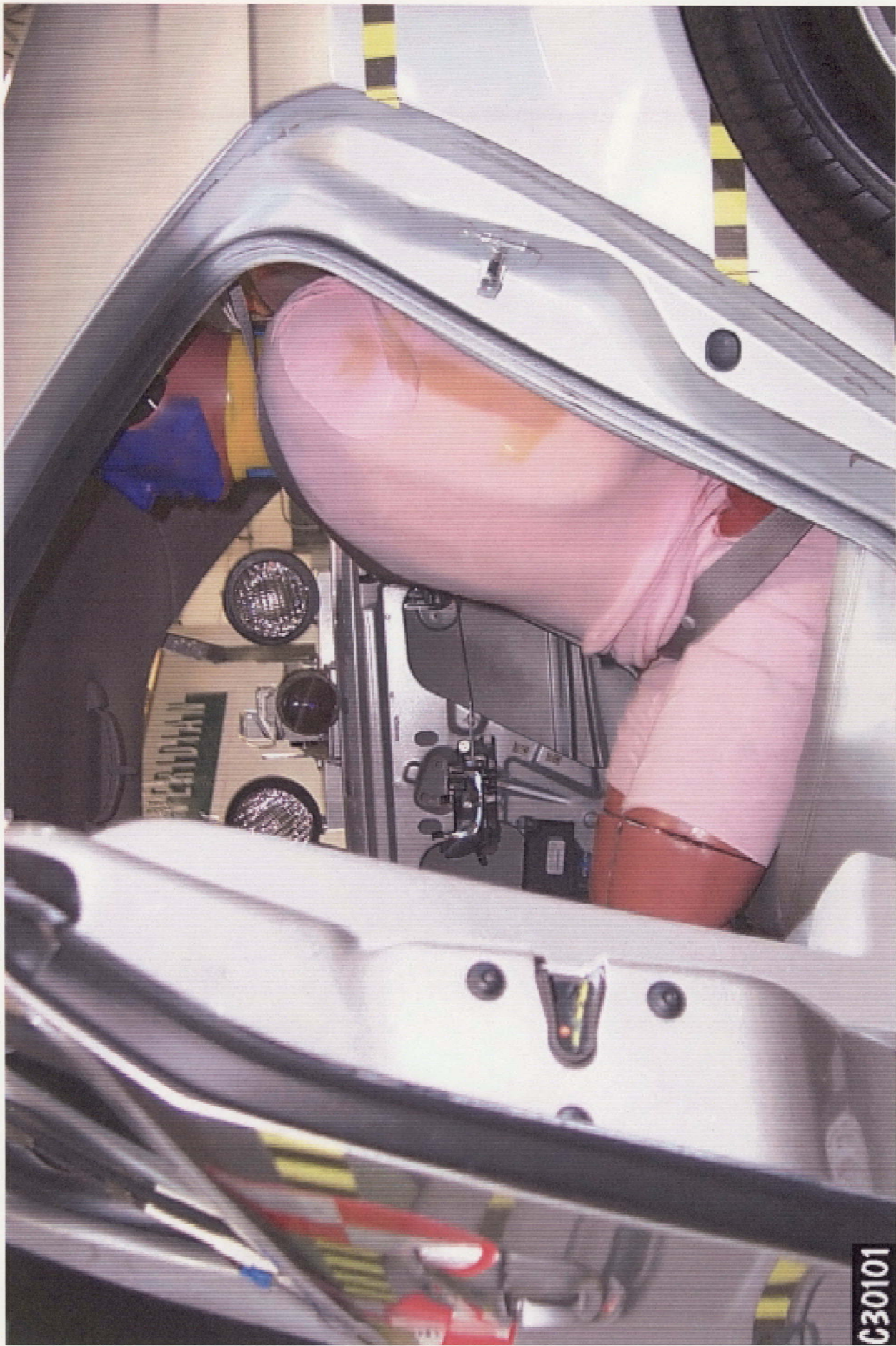


Figure A-23: PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-24: POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID



Figure A-25: PRE-TEST FRONT INTERIOR TRIM



Figure A-26: POST-TEST FRONT INTERIOR TRIM SHOWING SID IMPACT LOCATIONS



Figure A-27: PRE-TEST REAR INTERIOR TRIM



Figure A-28: POST-TEST REAR INTERIOR TRIM SHOWING SID IMPACT LOCATIONS



Figure A-29: PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



Figure A-30: PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



Figure A-31: POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET



MFD BY GENERAL MOTORS CORP

DATE
03/02

GVWR
2017 KG
4446 LB

GAWR FRT
955 KG
2104 LB

GAWR RR
1062 KG
2342 LB

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

1G6DM57N130106842

TYPE: PASS CAR

C30101

Figure A-32: CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL




TIRE - LOADING INFORMATION

| OCCUPANTS | | VEHICLE CAP. WT. | |
|-----------|-----|------------------|-----|
| FRT. CTR. | RR. | TOTAL | LBS |
| 2 | 0 | 5 | 882 |

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.
1G6DM57N130106842
 MODEL: DM69 DAC

| TIRE SIZE | SPEED RTG | COLD TIRE PRESSURE |
|----------------|-----------|--------------------|
| FRT P225/55R16 | H | 210KPA(30PSI) |
| RR P225/55R16 | H | 210KPA(30PSI) |
| SPA T125/70R16 | M | 420KPA(60PSI) |

IF TIRES ARE HOT, ADD 28KPA(4PSI).
 SEE OWNER'S MANUAL  FOR MORE INFORMATION.

C30101

Figure A-33: CLOSE-UP VIEW OF VEHICLE'S TIRE PLACARD LABEL

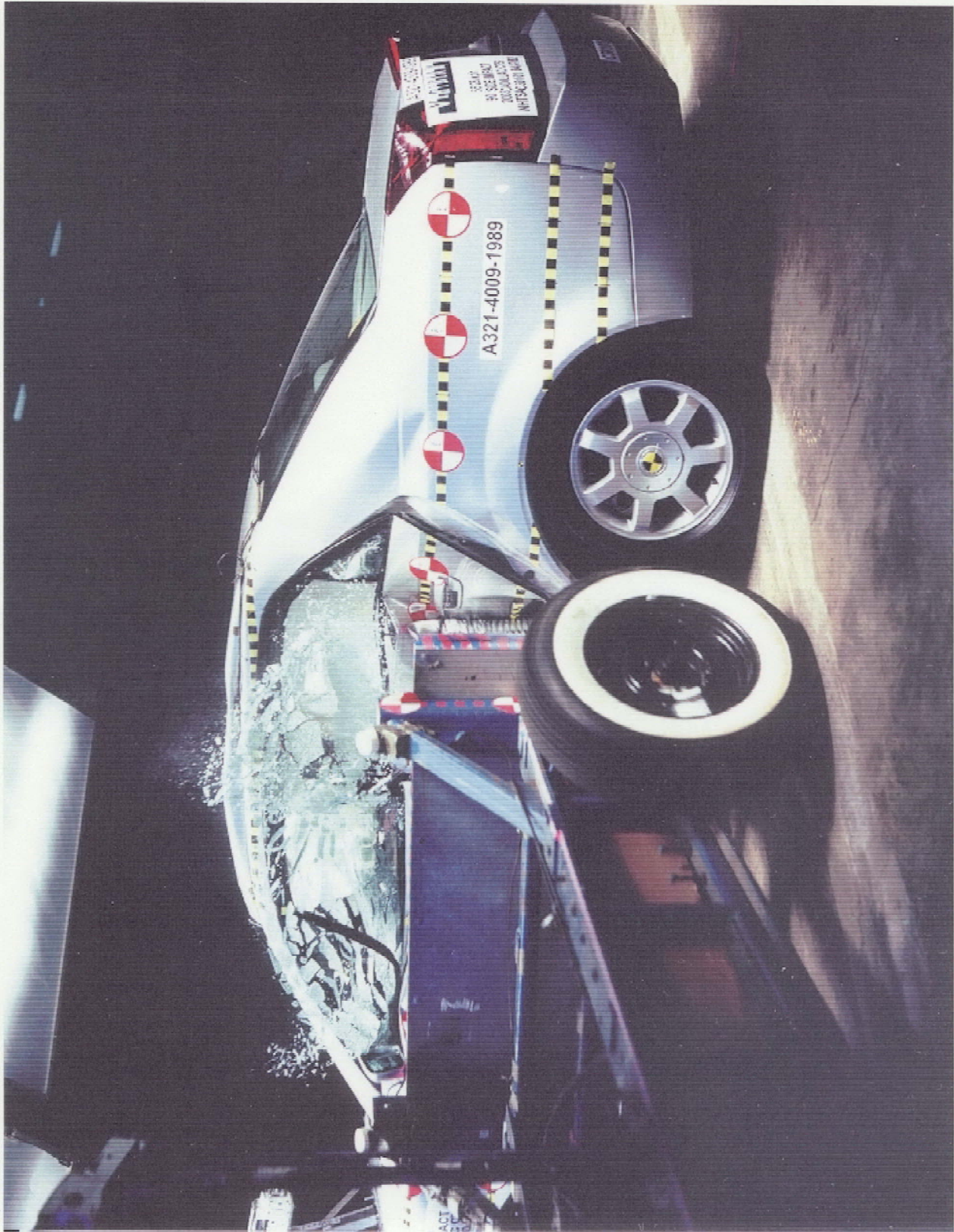


Figure A-34: IMPACT PHOTO



Figure A-35: ROLLOVER 90 DEGREES



Figure A-36: ROLLOVER 180 DEGREES

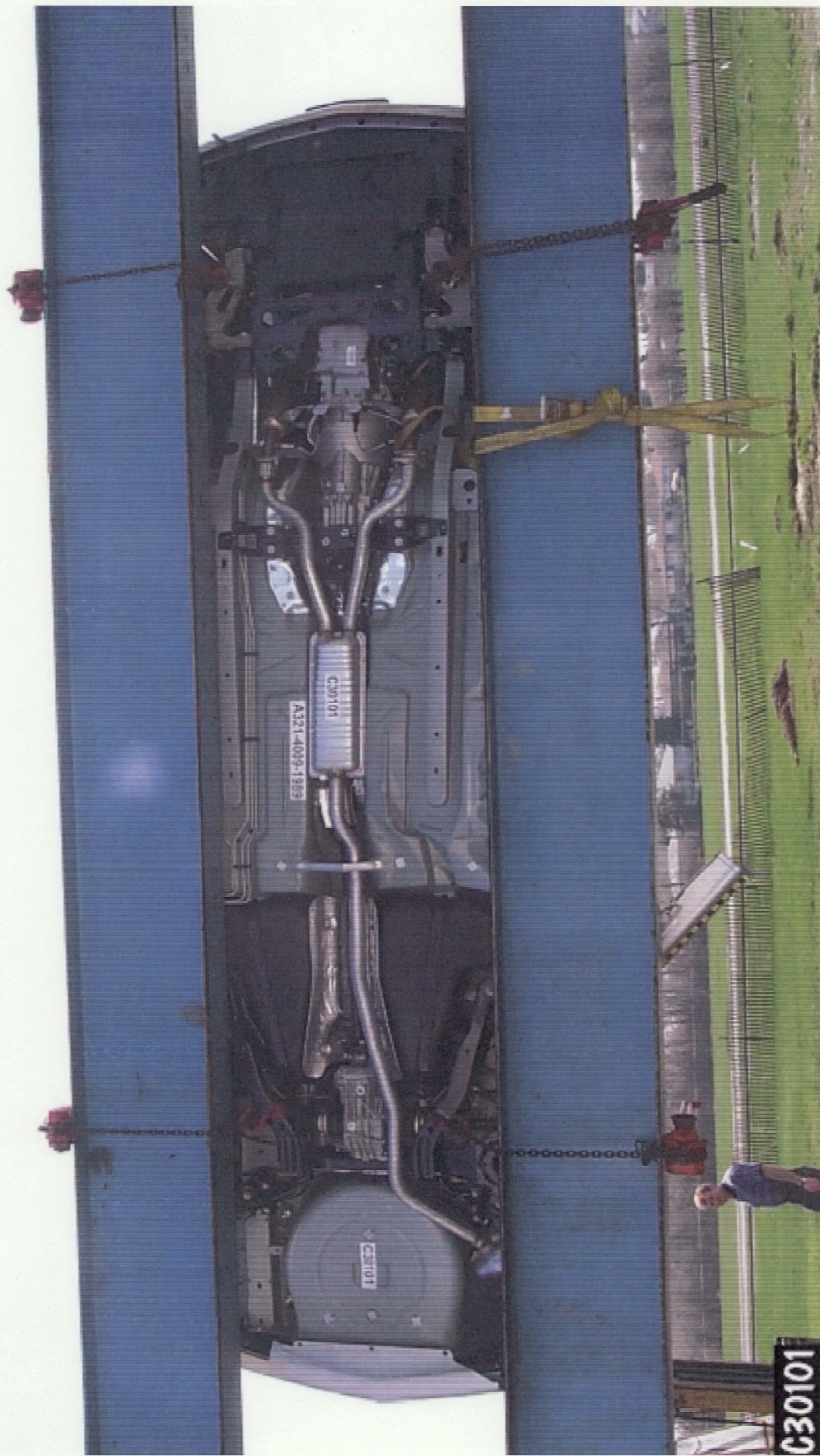


Figure A-37: ROLLOVER 270 DEGREES



Figure A-38: ROLLOVER 360 DEGREES

APPENDIX B

VEHICLE, MDB AND SID RESPONSE DATA

TABLE OF DATA PLOTS

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

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|-----------------|--|-------------|
| 1 | DRIVER HEAD (X) ACCELERATION VS TIME | B- 6 |
| 2 | DRIVER HEAD (X) VELOCITY VS TIME | B- 7 |
| 3 | DRIVER HEAD (Y) ACCELERATION VS TIME | B- 8 |
| 4 | DRIVER HEAD (Y) VELOCITY VS TIME | B- 9 |
| 5 | DRIVER HEAD (Z) ACCELERATION VS TIME | B- 10 |
| 6 | DRIVER HEAD (Z) VELOCITY VS TIME | B- 11 |
| 7 | DRIVER HEAD RESULTANT ACCELERATION VS TIME | B- 12 |
| 8 | DRIVER UPPER RIB (Y) ACCELERATION VS TIME | B- 13 |
| 9 | DRIVER UPPER RIB (Y) VELOCITY VS TIME | B- 14 |
| 10 | DRIVER LOWER RIB (Y) ACCELERATION VS TIME | B- 15 |
| 11 | DRIVER LOWER RIB (Y) VELOCITY VS TIME | B- 16 |
| 12 | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME | B- 17 |
| 13 | DRIVER LOWER SPINE (Y) VELOCITY VS TIME | B- 18 |
| 14 | DRIVER PELVIC (Y) ACCELERATION VS TIME | B- 19 |
| 15 | DRIVER PELVIC (Y) VELOCITY VS TIME | B- 20 |
| 16 | PASSENGER HEAD (X) ACCELERATION VS TIME | B- 21 |
| 17 | PASSENGER HEAD (X) VELOCITY VS TIME | B- 22 |
| 18 | PASSENGER HEAD (Y) ACCELERATION VS TIME | B- 23 |
| 19 | PASSENGER HEAD (Y) VELOCITY VS TIME | B- 24 |
| 20 | PASSENGER HEAD (Z) ACCELERATION VS TIME | B- 25 |
| 21 | PASSENGER HEAD (Z) VELOCITY VS TIME | B- 26 |
| 22 | PASSENGER HEAD RESULTANT ACCELERATION VS TIME | B- 27 |
| 23 | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME | B- 28 |
| 24 | PASSENGER UPPER RIB (Y) VELOCITY VS TIME | B- 29 |
| 25 | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME | B- 30 |
| 26 | PASSENGER LOWER RIB (Y) VELOCITY VS TIME | B- 31 |
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| 29 | PASSENGER PELVIC (Y) ACCELERATION VS TIME | B- 34 |
| 30 | PASSENGER PELVIC (Y) VELOCITY VS TIME | B- 35 |

DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS ACCELERATION DATA - FIR FILTERED

| <u>Plot No.</u> | <u>Data Plot Title</u> | <u>Page</u> |
|-----------------|--|-------------|
| 31 | DRIVER UPPER RIB (Y) ACCELERATION VS TIME | B- 36 |
| 32 | DRIVER LOWER RIB (Y) ACCELERATION VS TIME | B- 37 |
| 33 | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME | B- 38 |
| 34 | DRIVER PELVIC (Y) ACCELERATION VS TIME | B- 39 |
| 35 | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME | B- 40 |
| 36 | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME | B- 41 |
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| 38 | PASSENGER PELVIC (Y) ACCELERATION VS TIME | B- 43 |

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

| <u>Plot No.</u> | <u>Data Plot Title</u> | <u>Page</u> |
|-----------------|--|-------------|
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| 40 | RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY VS TIME | B- 45 |
| 41 | RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME | B- 46 |
| 42 | RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME | B- 47 |
| 43 | RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME | B- 48 |
| 44 | RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY VS TIME | B- 49 |
| 45 | RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION VS TIME | B- 50 |
| 46 | RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME | B- 51 |
| 47 | RIGHT SIDE SILL AT REAR SEAT (X) VELOCITY VS TIME | B- 52 |
| 48 | RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME | B- 53 |
| 49 | RIGHT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME | B- 54 |
| 50 | RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME | B- 55 |
| 51 | RIGHT SIDE SILL AT REAR SEAT (Z) VELOCITY VS TIME | B- 56 |
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| 53 | REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME | B- 58 |
| 54 | REAR FLOORPAN ABOVE AXLE (X) VELOCITY VS TIME | B- 59 |
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| 56 | REAR FLOORPAN ABOVE AXLE (Y) VELOCITY VS TIME | B- 61 |
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| 58 | REAR FLOORPAN ABOVE AXLE (Z) VELOCITY VS TIME | B- 63 |
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| 61 | LEFT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME | B- 66 |
| 62 | LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME | B- 67 |
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| 64 | RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME | B- 69 |
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| 69 | UPPER B-POST (Y) VELOCITY VS TIME | B- 74 |
| 70 | LOWER A-POST (Y) ACCELERATION VS TIME | B- 75 |
| 71 | LOWER A-POST (Y) VELOCITY VS TIME | B- 76 |
| 72 | UPPER A-POST (Y) ACCELERATION VS TIME | B- 77 |
| 73 | UPPER A-POST (Y) VELOCITY VS TIME | B- 78 |
| 74 | FRONT SEAT TRACK (Y) ACCELERATION VS TIME | B- 79 |
| 75 | FRONT SEAT TRACK (Y) VELOCITY VS TIME | B- 80 |
| 76 | REAR SEAT TRACK (Y) ACCELERATION VS TIME | B- 81 |
| 77 | REAR SEAT TRACK (Y) VELOCITY VS TIME | B- 82 |
| 78 | VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME | B- 83 |
| 79 | VEHICLE CENTER OF GRAVITY (X) VELOCITY 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> |
|-----------------|---|-------------|
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| 81 | VEHICLE CENTER OF GRAVITY (Y) VELOCITY ACCELERATION VS TIME | B- 86 |
| 82 | VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME | B- 87 |
| 83 | VEHICLE CENTER OF GRAVITY (Z) VELOCITY VS TIME | B- 88 |
| 84 | VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME | B- 89 |

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> |
|-----------------|--|-------------|
| 85 | MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME | B- 90 |
| 86 | MDB CENTER OF GRAVITY (X) VELOCITY VS TIME | B- 91 |
| 87 | MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME | B- 92 |
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| 91 | MDB CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME | B- 96 |
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| 93 | MDB REAR (X) VELOCITY VS TIME | B- 98 |
| 94 | MDB REAR (Y) ACCELERATION VS TIME | B- 99 |
| 95 | MDB REAR (Y) VELOCITY VS TIME | B- 100 |

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

| <u>Plot No.</u> | <u>Data Plot Title</u> | <u>Page</u> |
|-----------------|--|-------------|
| 96 | DRIVER UPPER RIB (Y) ACCELERATION VS TIME | B- 101 |
| 97 | DRIVER UPPER RIB (Y) VELOCITY VS TIME | B- 102 |
| 98 | DRIVER LOWER RIB (Y) ACCELERATION VS TIME | B- 103 |
| 99 | DRIVER LOWER RIB (Y) VELOCITY VS TIME | B- 104 |
| 100 | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME | B- 105 |
| 101 | DRIVER LOWER SPINE (Y) VELOCITY VS TIME | B- 106 |
| 102 | DRIVER PELVIC (Y) ACCELERATION VS TIME | B- 107 |
| 103 | DRIVER PELVIC (Y) VELOCITY VS TIME | B- 108 |
| 104 | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME | B- 109 |
| 105 | PASSENGER UPPER RIB (Y) VELOCITY VS TIME | B- 110 |
| 106 | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME | B- 111 |
| 107 | PASSENGER LOWER RIB (Y) VELOCITY VS TIME | B- 112 |
| 108 | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 113 |
| 109 | PASSENGER LOWER SPINE (Y) VELOCITY VS TIME | B- 114 |
| 110 | PASSENGER PELVIC (Y) ACCELERATION VS TIME | B- 115 |
| 111 | PASSENGER PELVIC (Y) VELOCITY VS TIME | B- 116 |

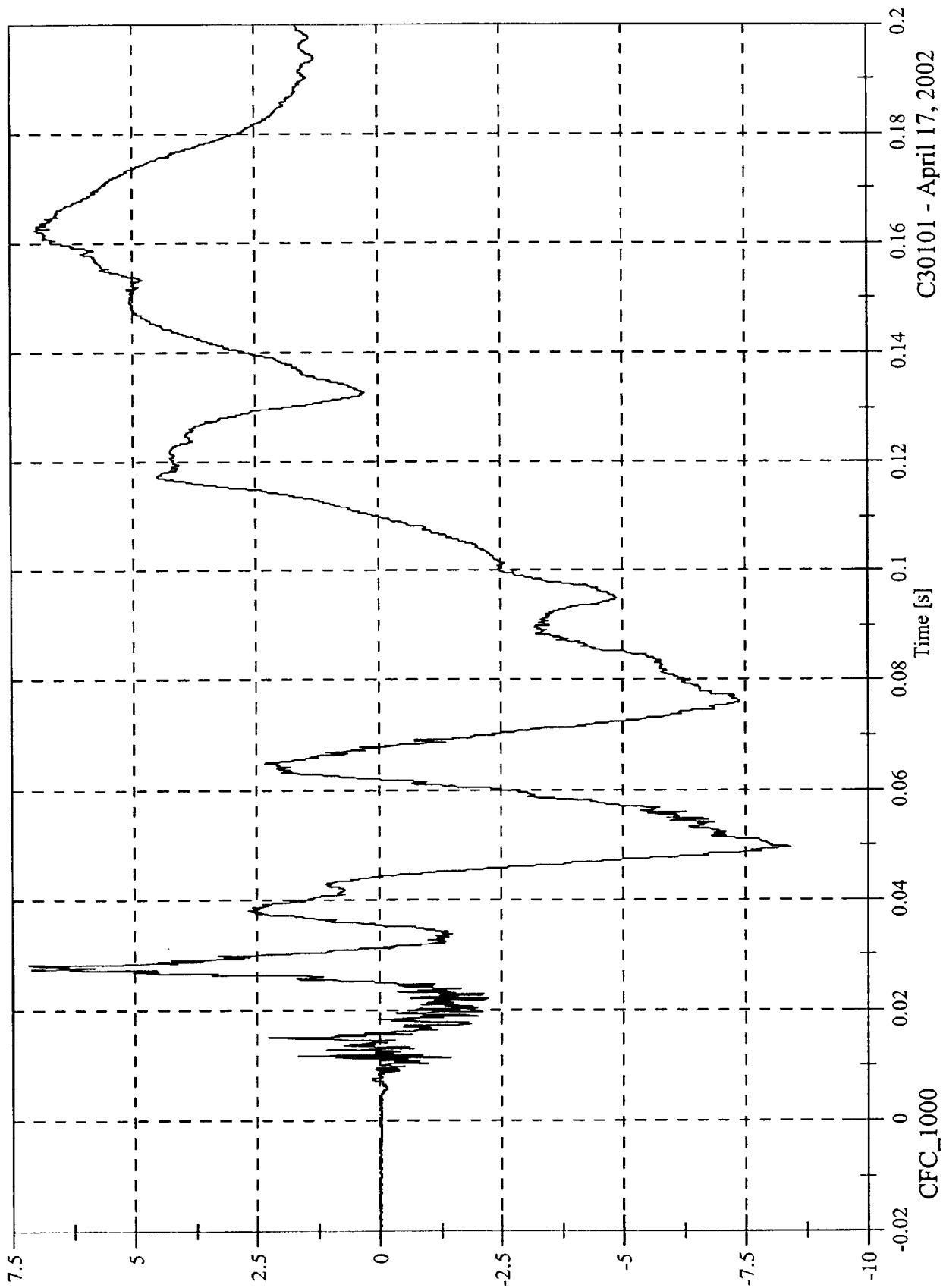
**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)
ACCELERATION DATA - FIR FILTERED**

| <u>Plot No.</u> | <u>Data Plot Title</u> | <u>Page</u> |
|-----------------|--|-------------|
| 112 | DRIVER UPPER RIB (Y) ACCELERATION VS TIME | B- 117 |
| 113 | DRIVER LOWER RIB (Y) ACCELERATION VS TIME | B- 118 |
| 114 | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME | B- 119 |
| 115 | DRIVER PELVIC (Y) ACCELERATION VS TIME | B- 120 |
| 116 | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME | B- 121 |
| 117 | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME | B- 122 |
| 118 | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 123 |
| 119 | PASSENGER PELVIC (Y) ACCELERATION VS TIME | B- 124 |

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 7.2 [g] at 0.028 [s]
Min: -8.4 [g] at 0.050 [s]

P1 Head x



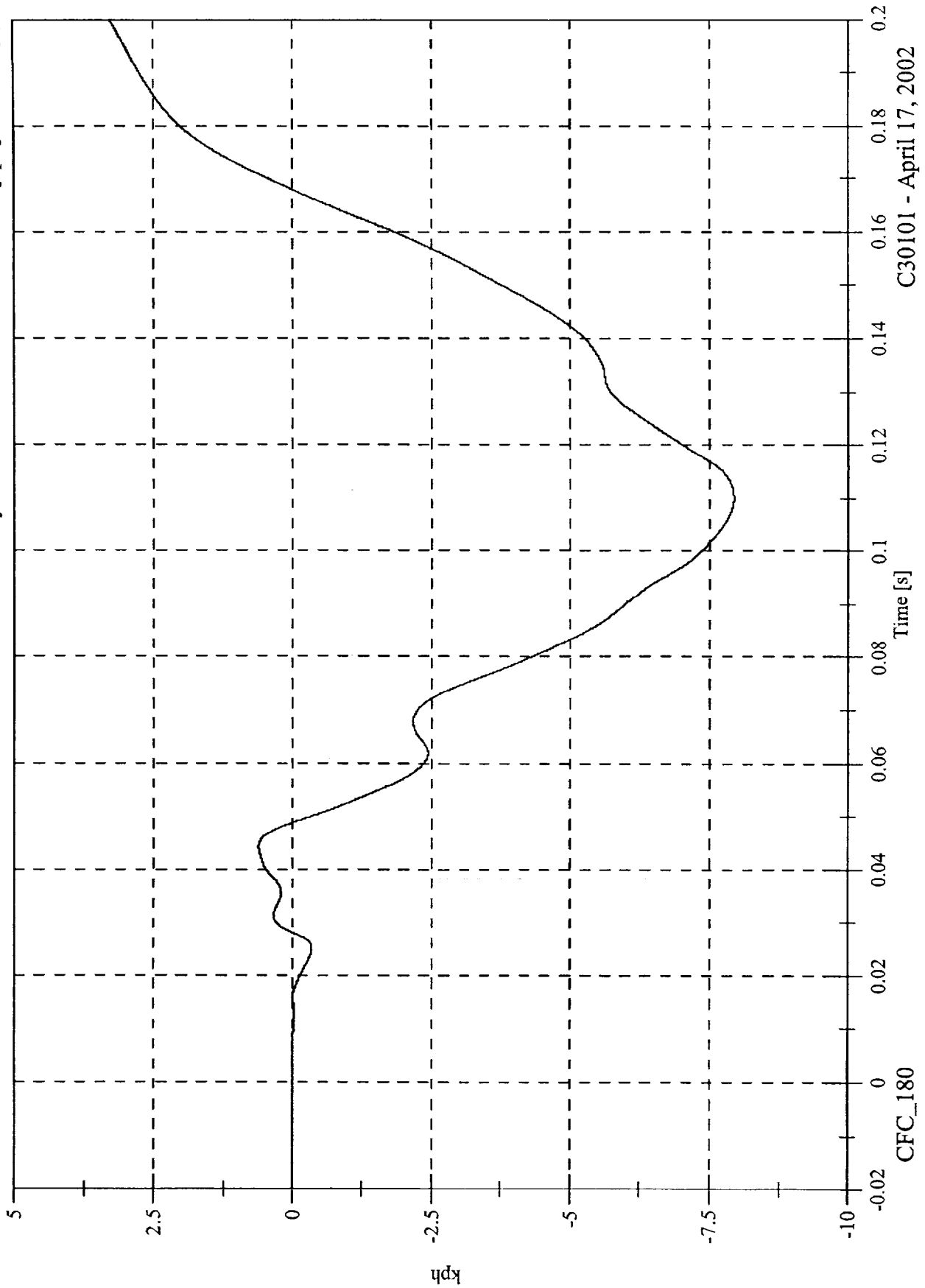
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 3.3 [kph] at 0.200 [s]

Min: -7.9 [kph] at 0.110 [s]

P1 Head x Velocity

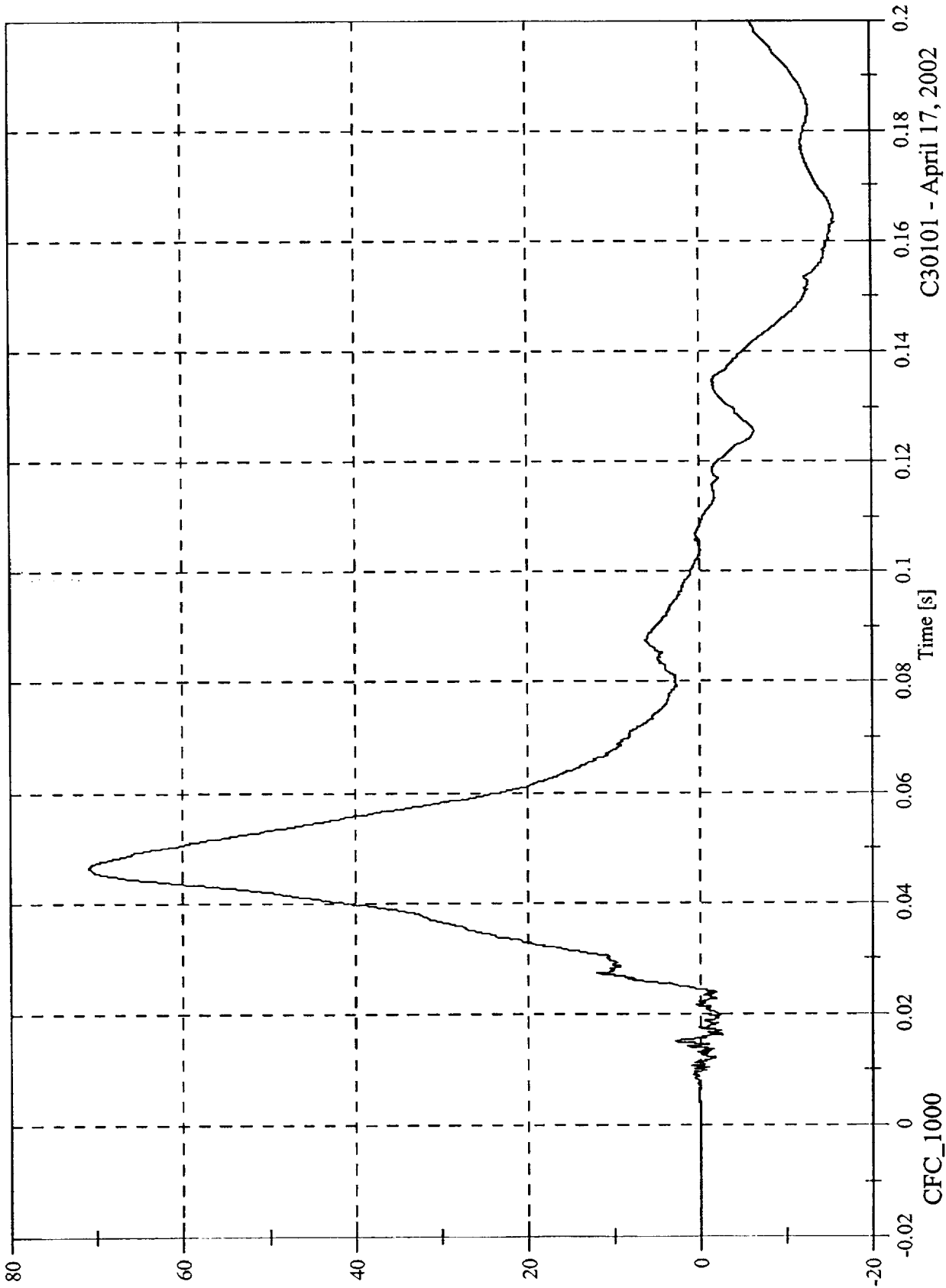


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 70.9 [g] at 0.046 [s]
Min: -15.7 [g] at 0.163 [s]

P1 Head y



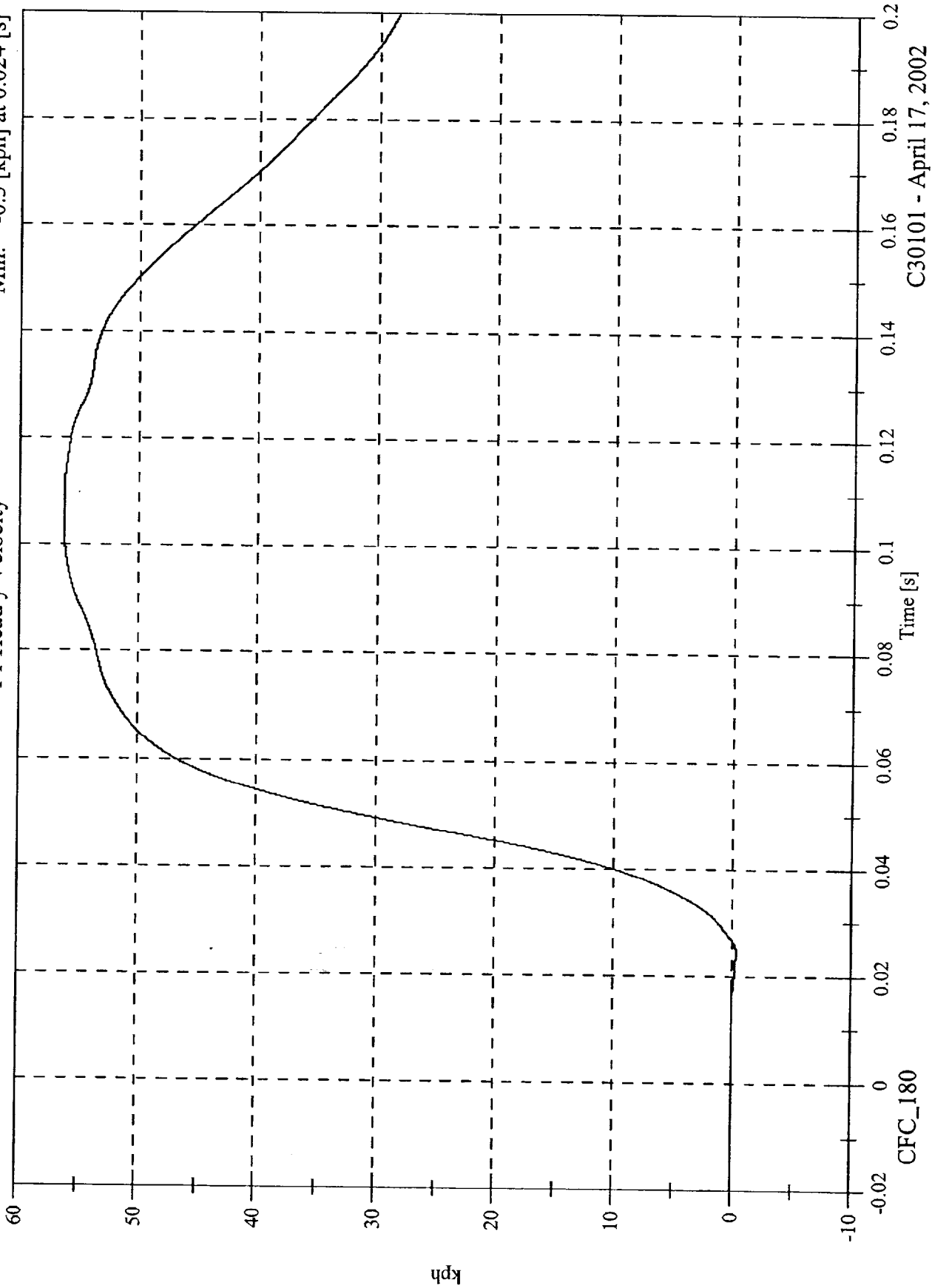
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Head y Velocity

Max: 56.4 [kph] at 0.109 [s]

Min: -0.3 [kph] at 0.024 [s]



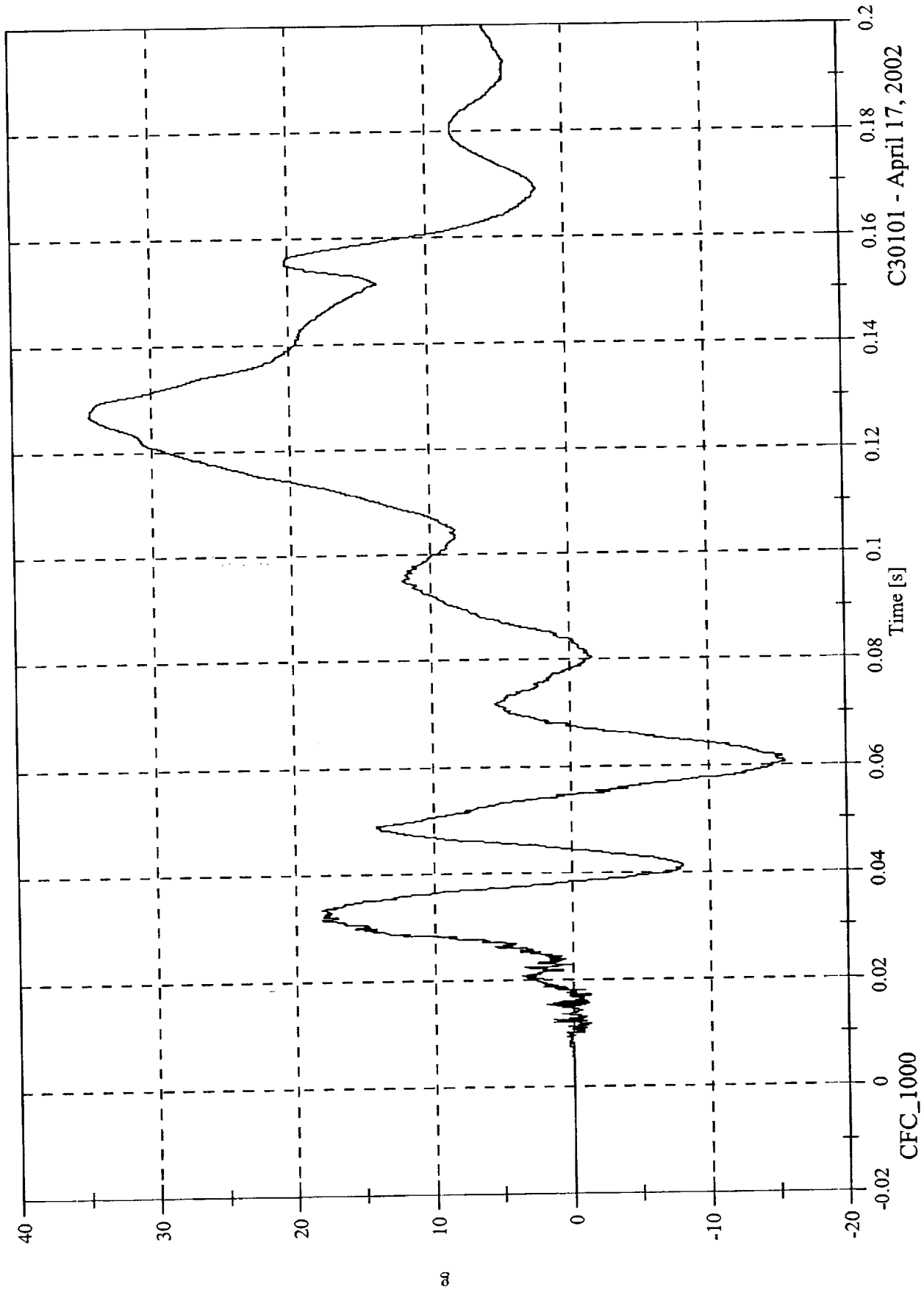
CFC_180

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 34.5 [g] at 0.127 [s]
Min: -15.5 [g] at 0.061 [s]

P1 Head z

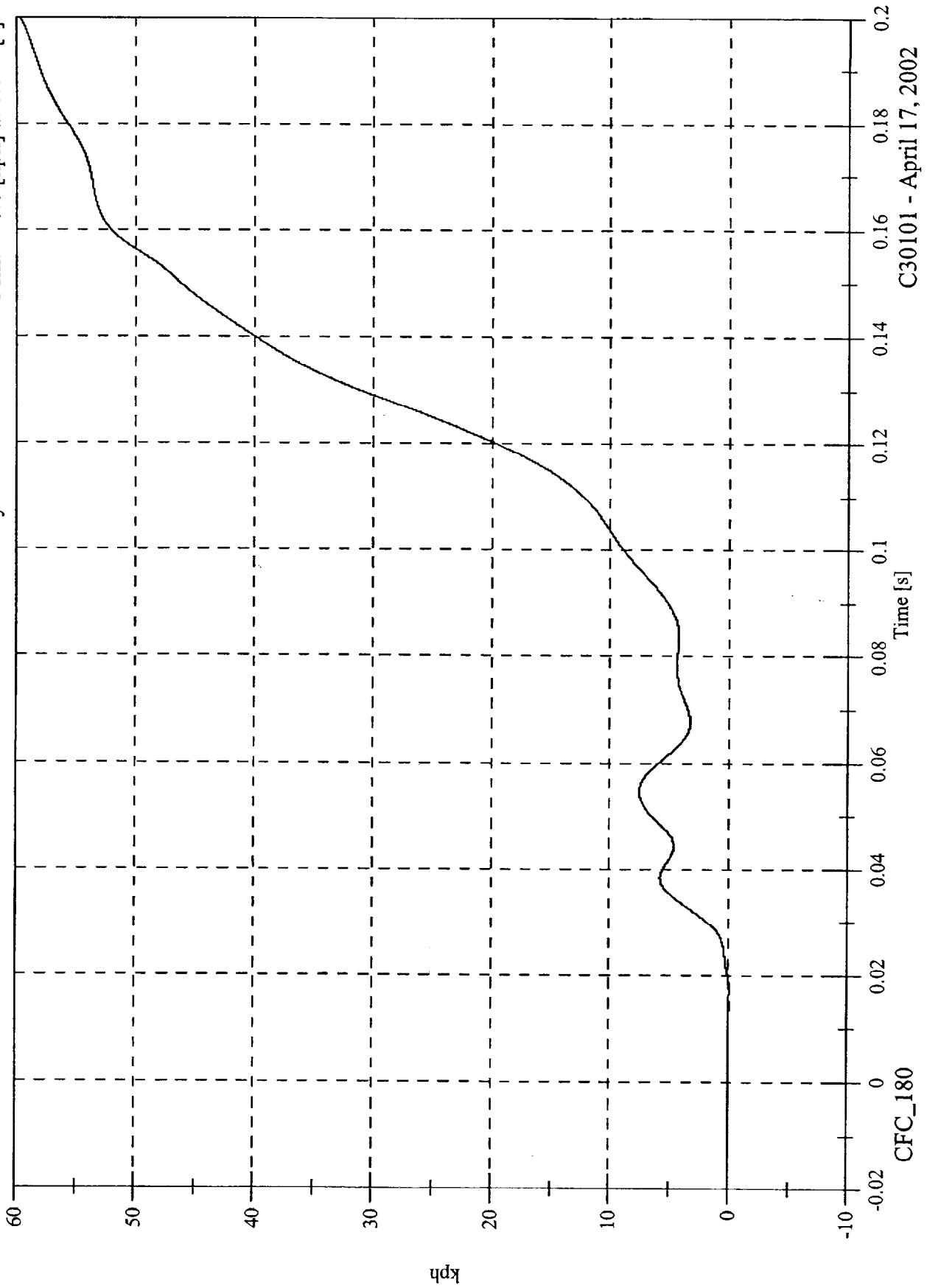


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 59.7 [kph] at 0.200 [s]
Min: -0.0 [kph] at 0.018 [s]

P1 Head z Velocity

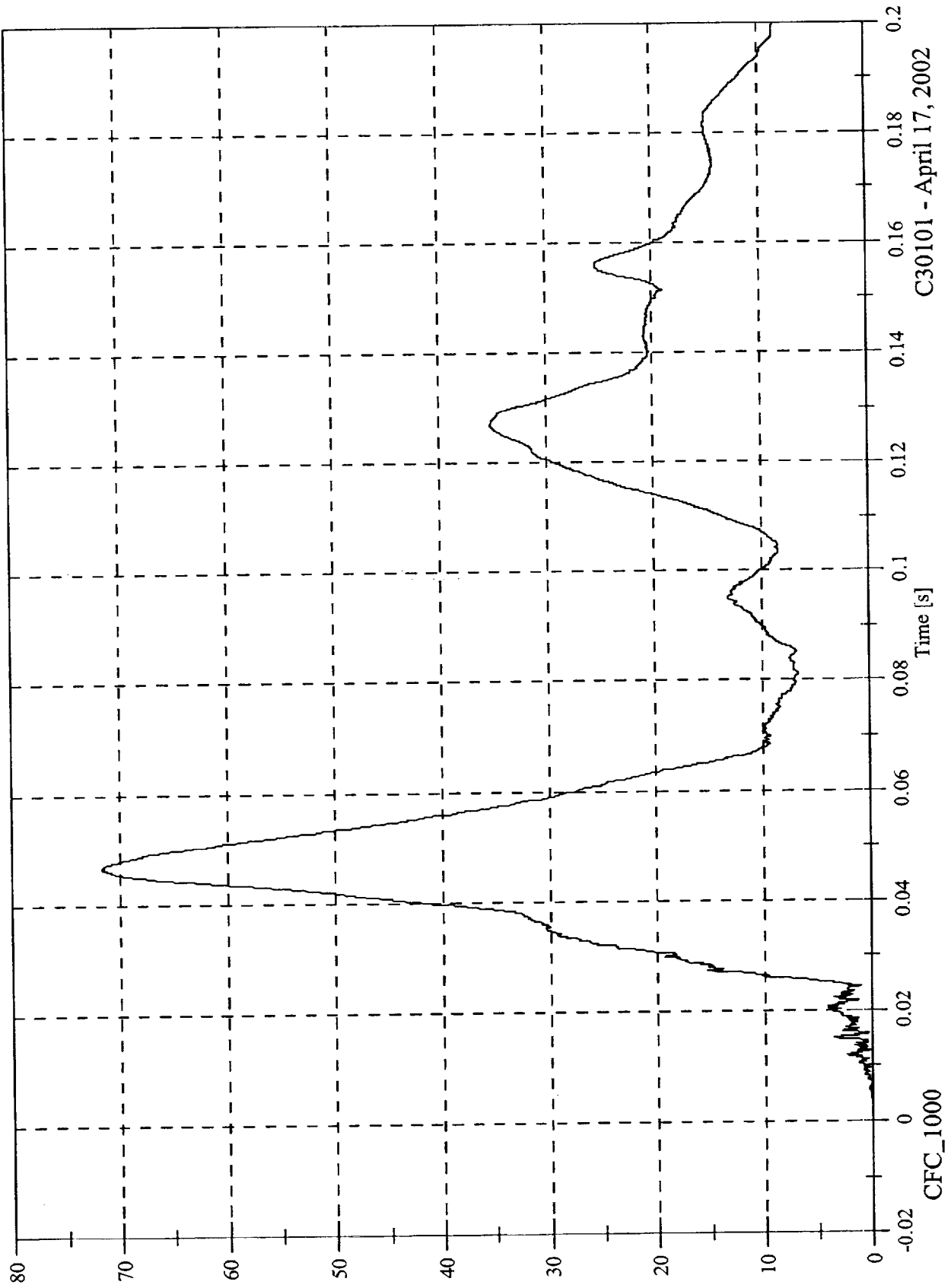


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 71.7 [g] at 0.047 [s]
Min: 0.0 [g] at -0.004 [s]

P1 Head Resultant



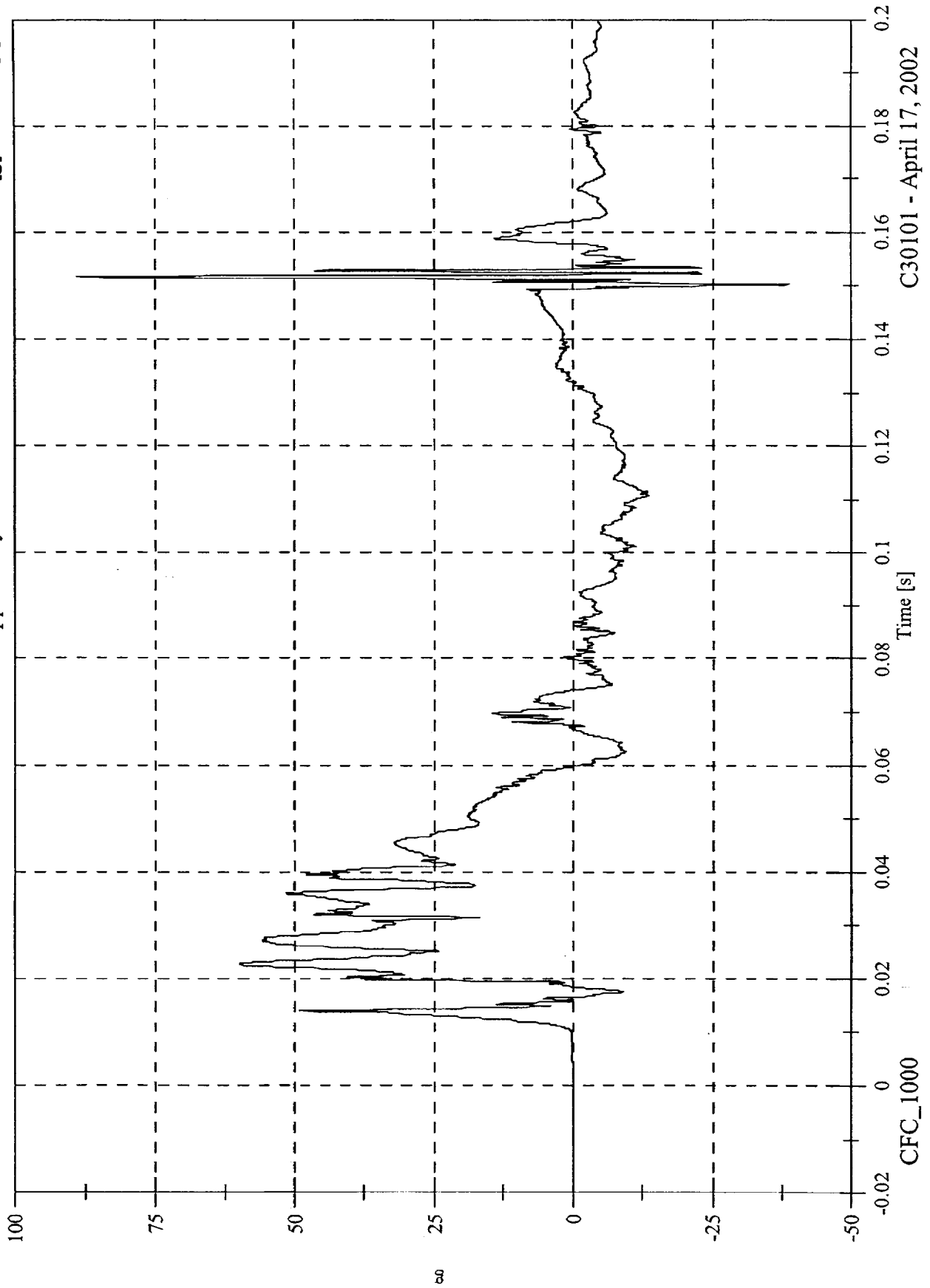
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Upper Rib y

Max: 88.9 [g] at 0.152 [s]

Min: -38.8 [g] at 0.150 [s]

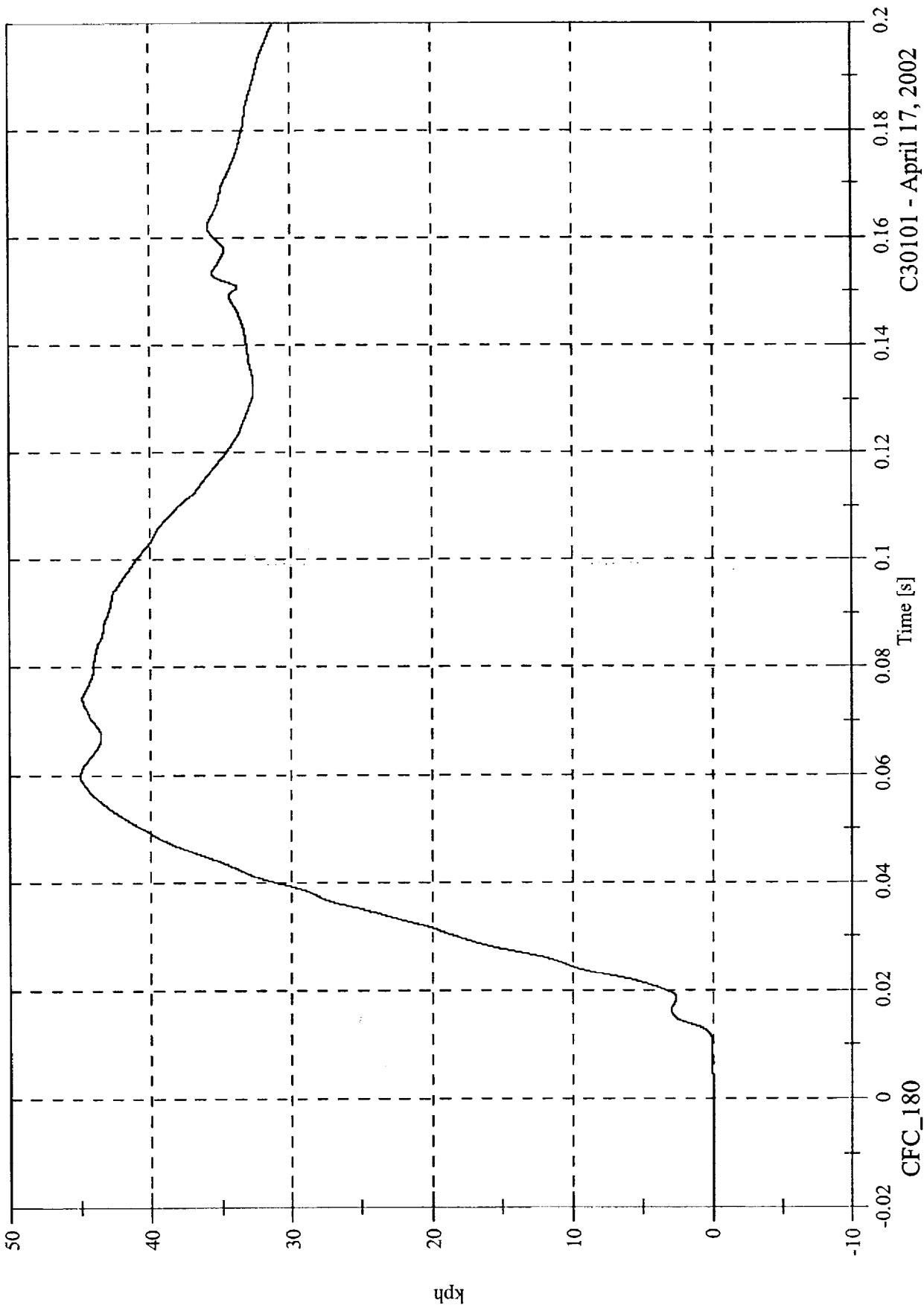


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 45.0 [kph] at 0.060 [s]
Min: -0.0 [kph] at -0.015 [s]

P1 Upper Rib y Velocity



C30101 - April 17, 2002

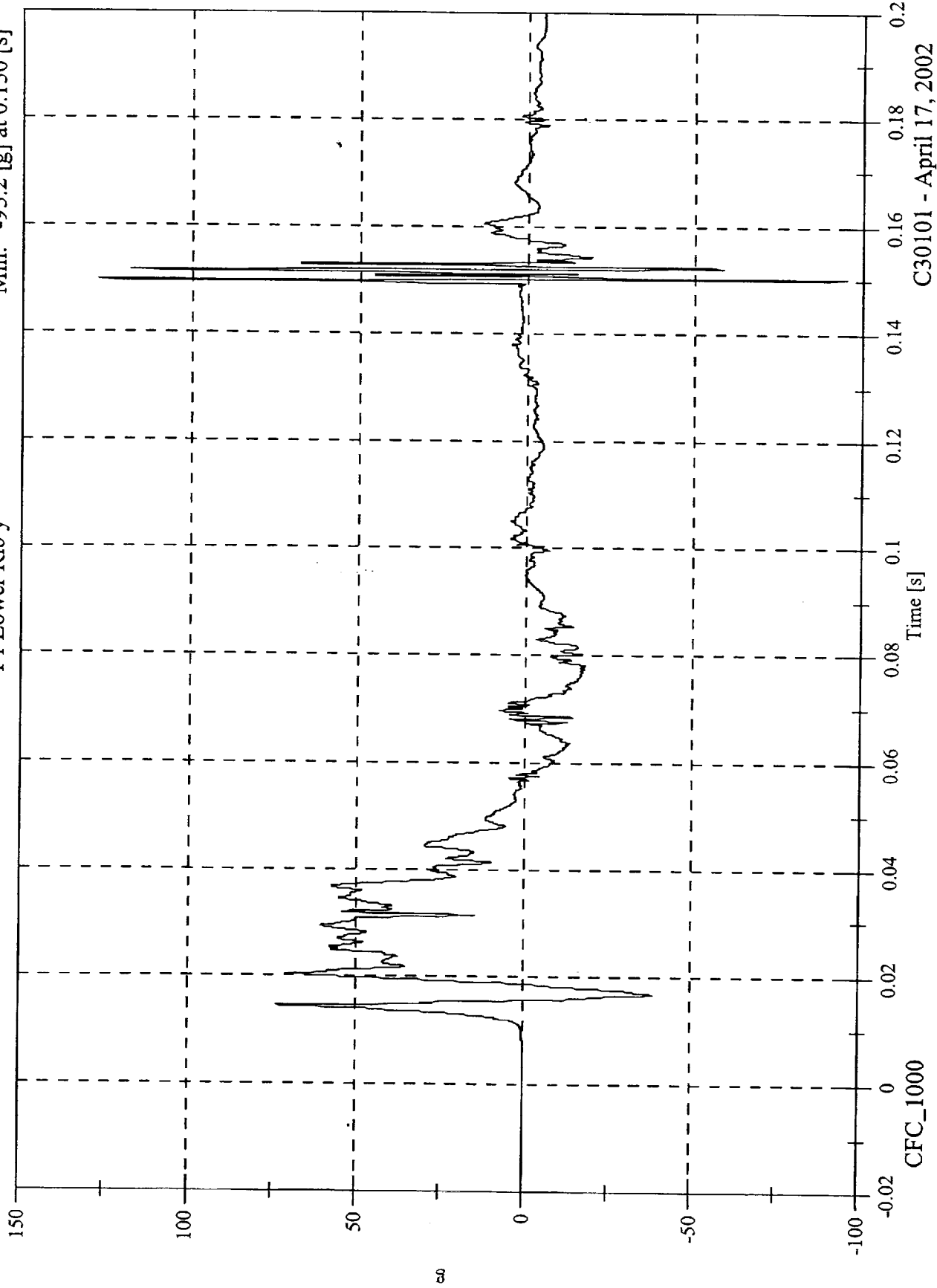
CFC_180



FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Lower Rib y

Max: 127.7 [g] at 0.150 [s]
Min: -95.2 [g] at 0.150 [s]

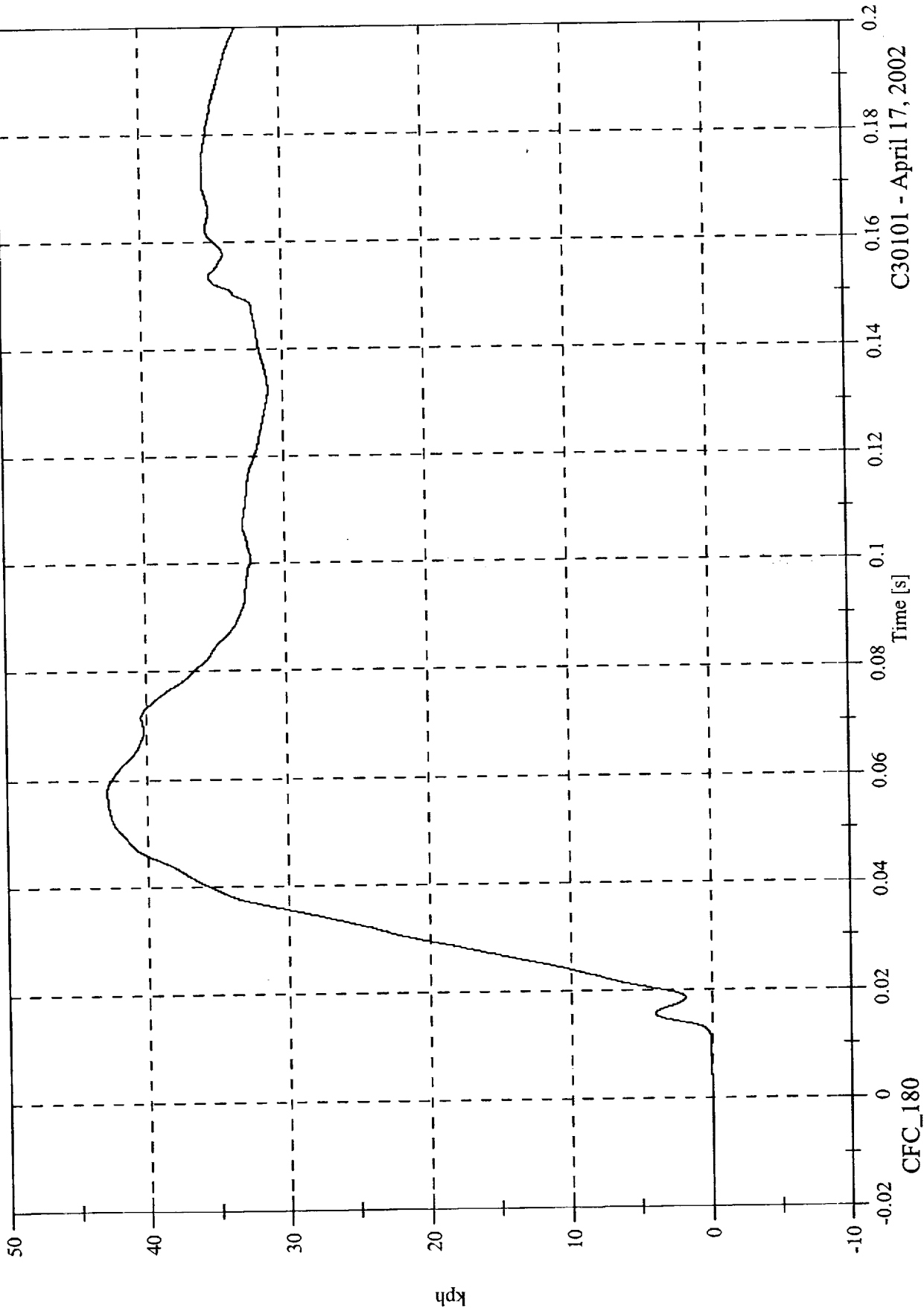


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Lower Rib y Velocity

Max: 42.9 [kph] at 0.058 [s]
Min: -0.0 [kph] at -0.016 [s]



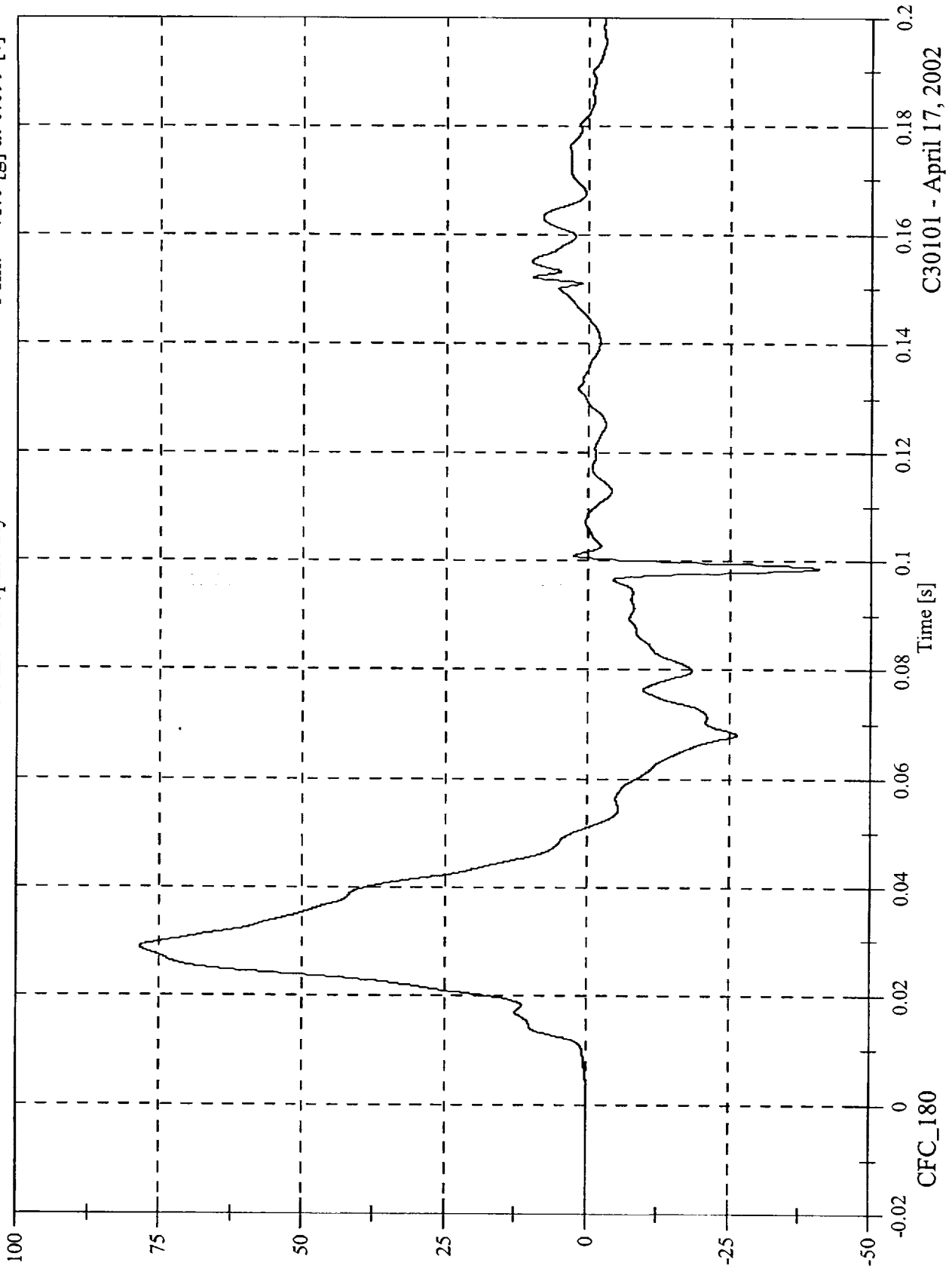
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 78.5 [g] at 0.029 [s]

Min: -41.0 [g] at 0.099 [s]

P1 Lower Spine Ry



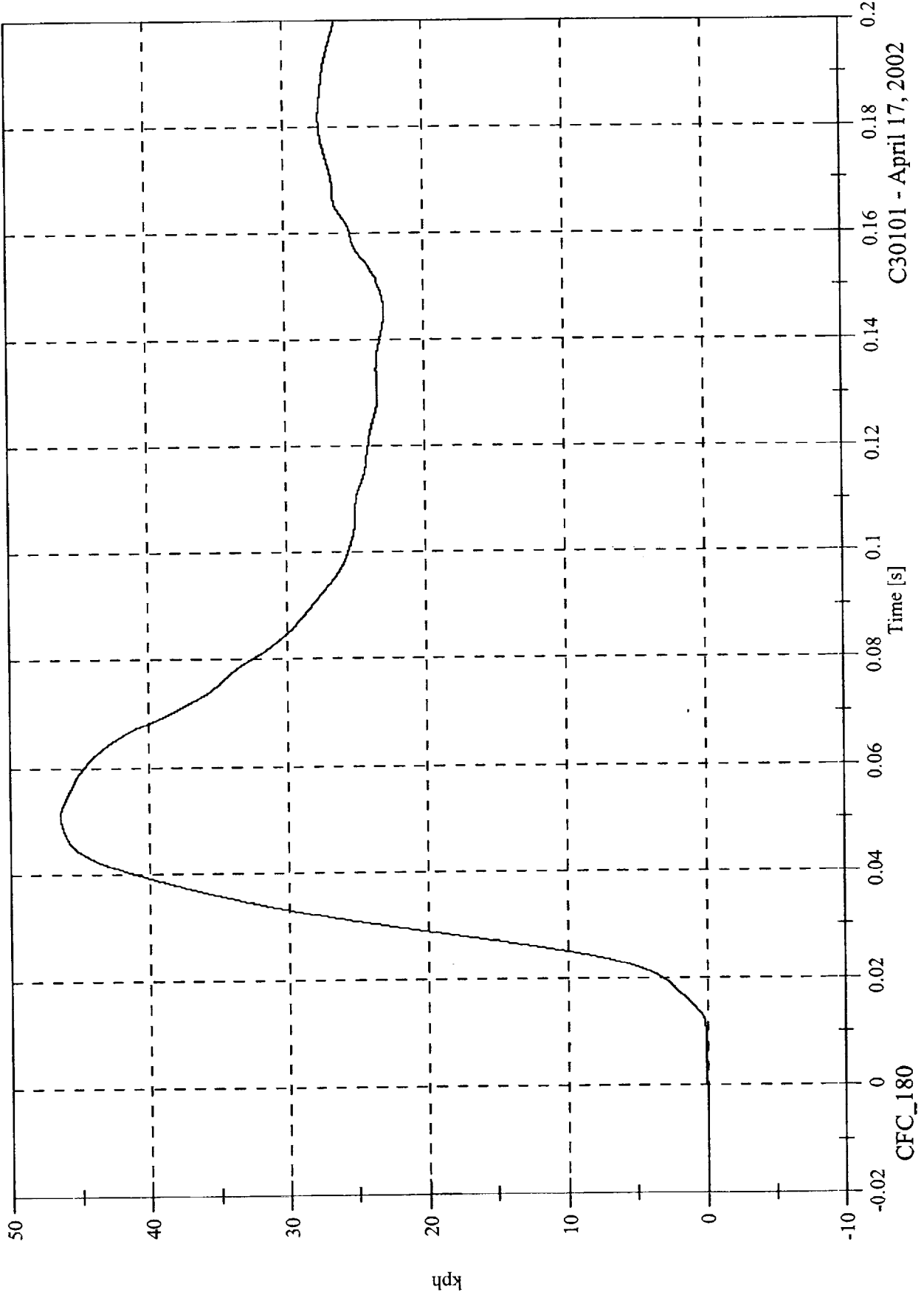
CFC_180

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Lower Spine y Velocity

Max: 46.4 [kph] at 0.051 [s]
Min: -0.0 [kph] at -0.020 [s]

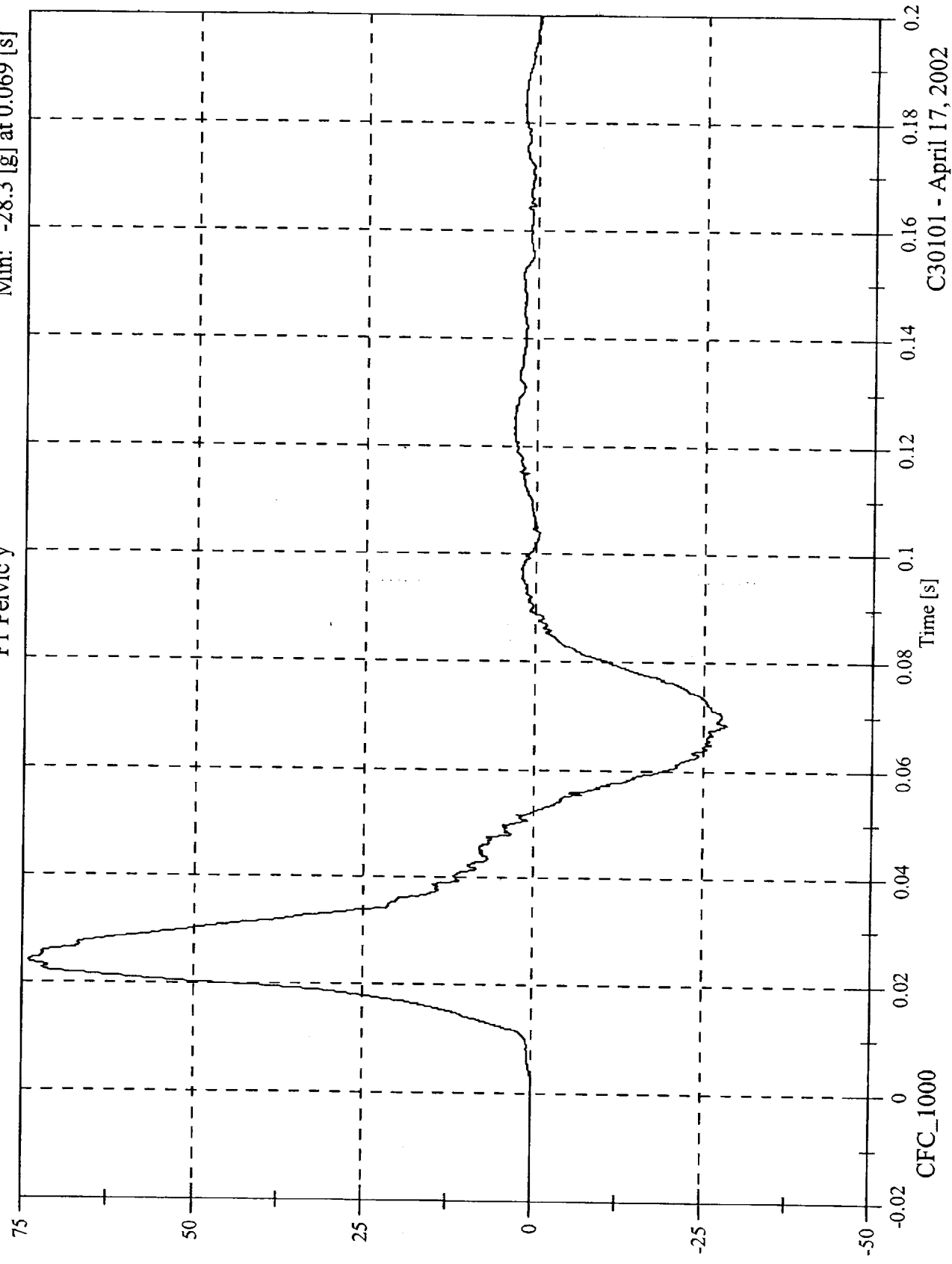


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 74.2 [g] at 0.024 [s]
Min: -28.3 [g] at 0.069 [s]

P1 Pelvic y

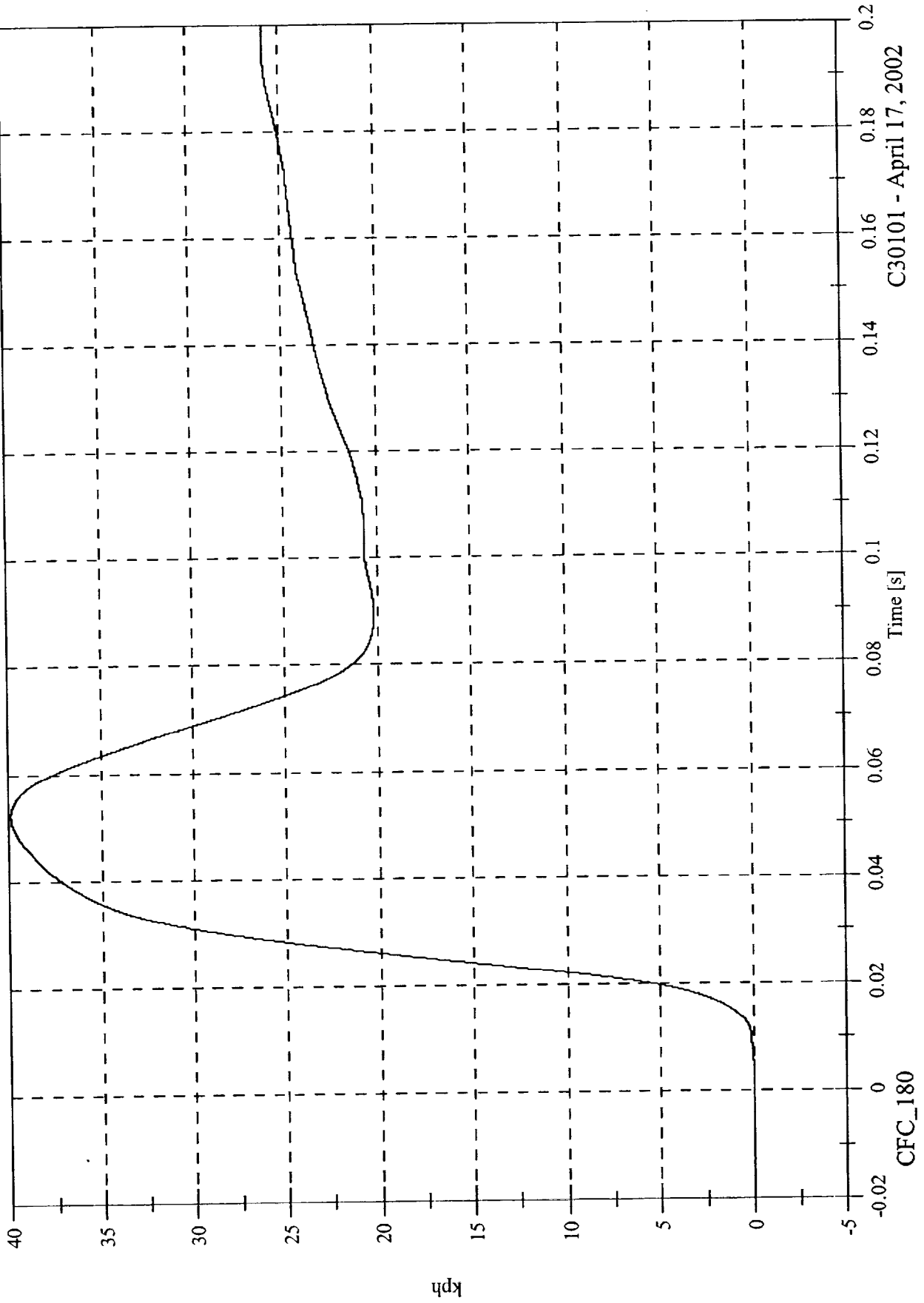


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 39.9 [kph] at 0.052 [s]
Min: -0.0 [kph] at -0.020 [s]

P1 Pelvic Velocity

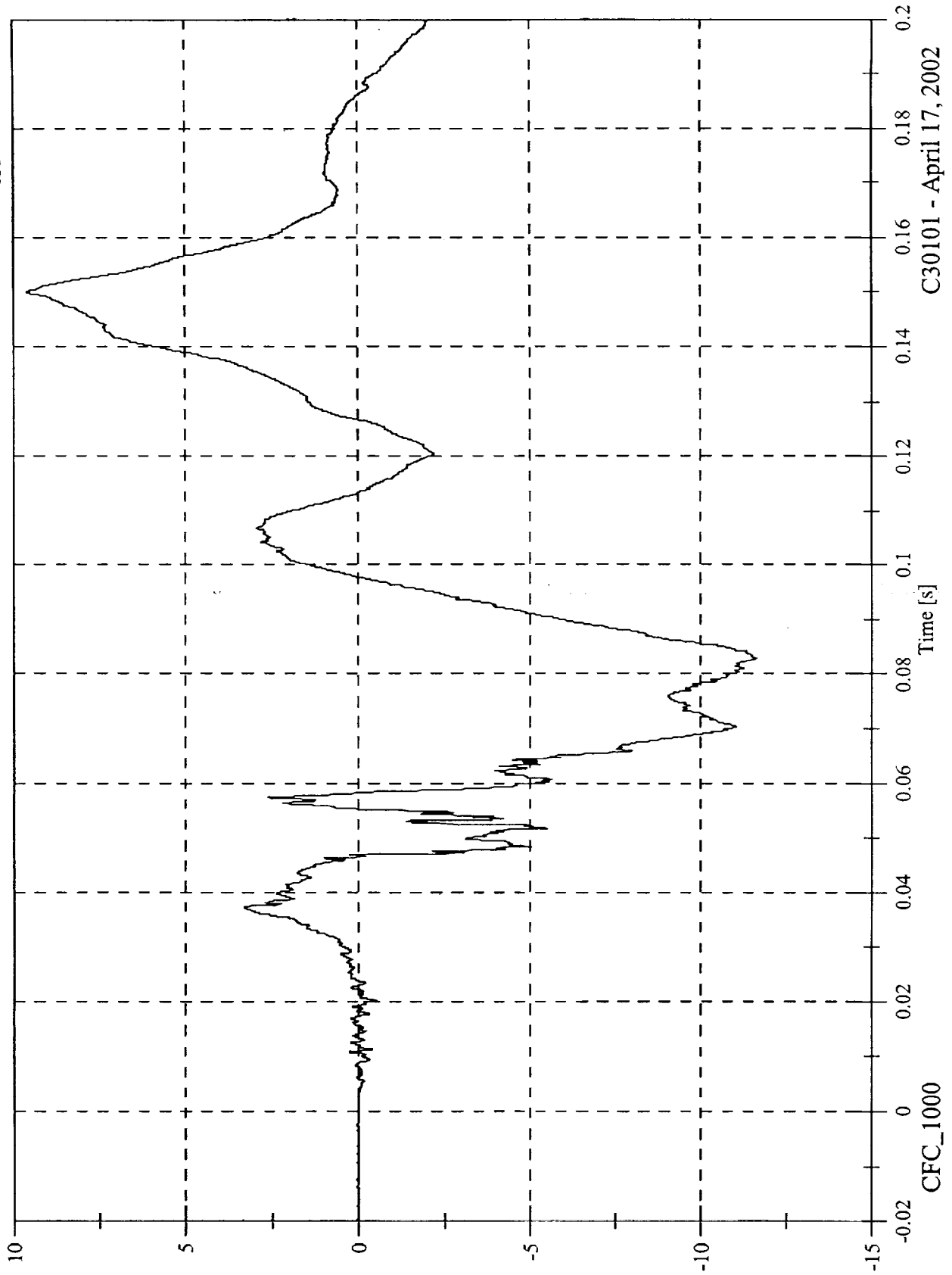


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 9.6 [g] at 0.150 [s]
Min: -11.6 [g] at 0.083 [s]

P4 Head x

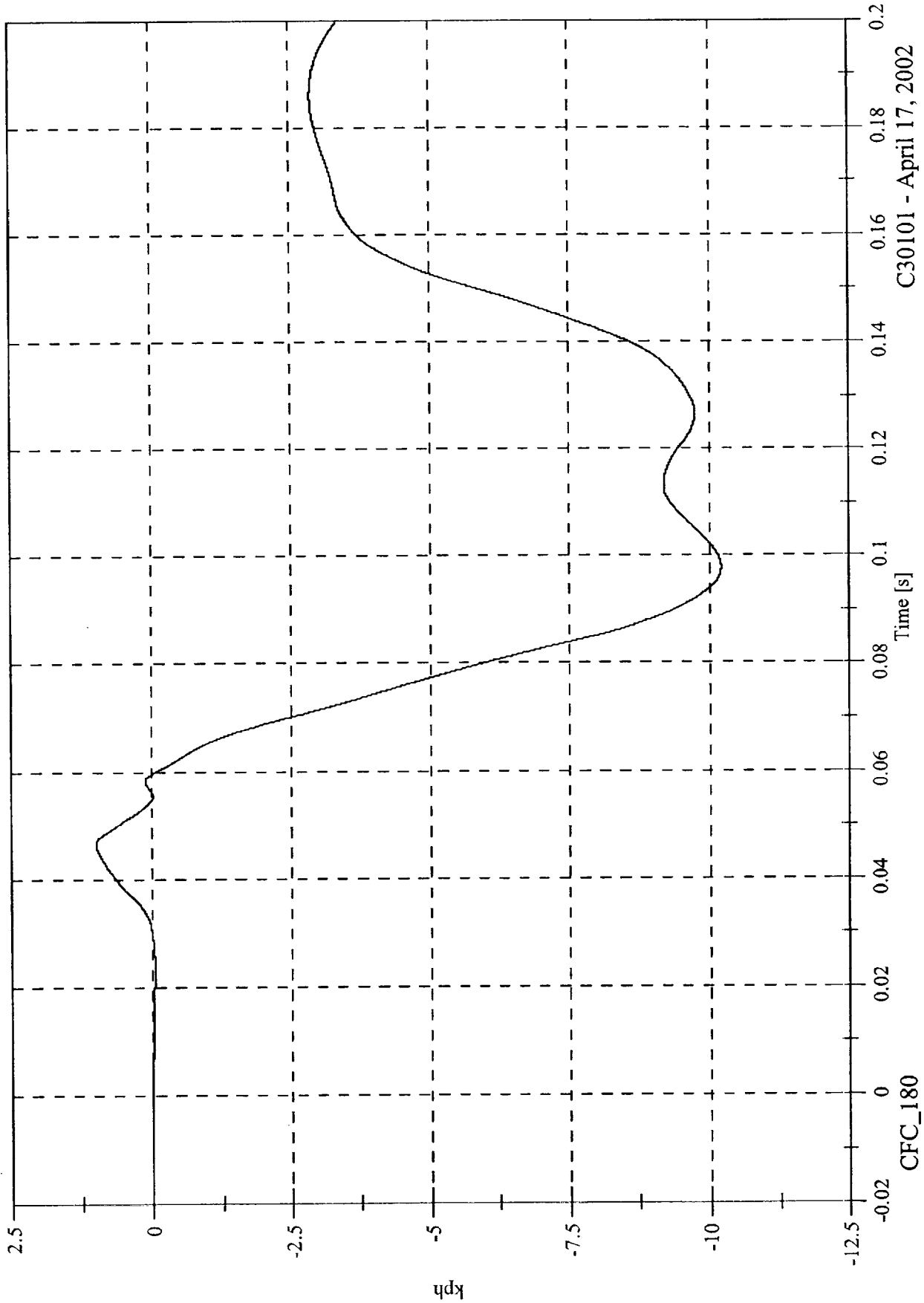


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 1.0 [kph] at 0.047 [s]
Min: -10.2 [kph] at 0.098 [s]

P4 Head x Velocity

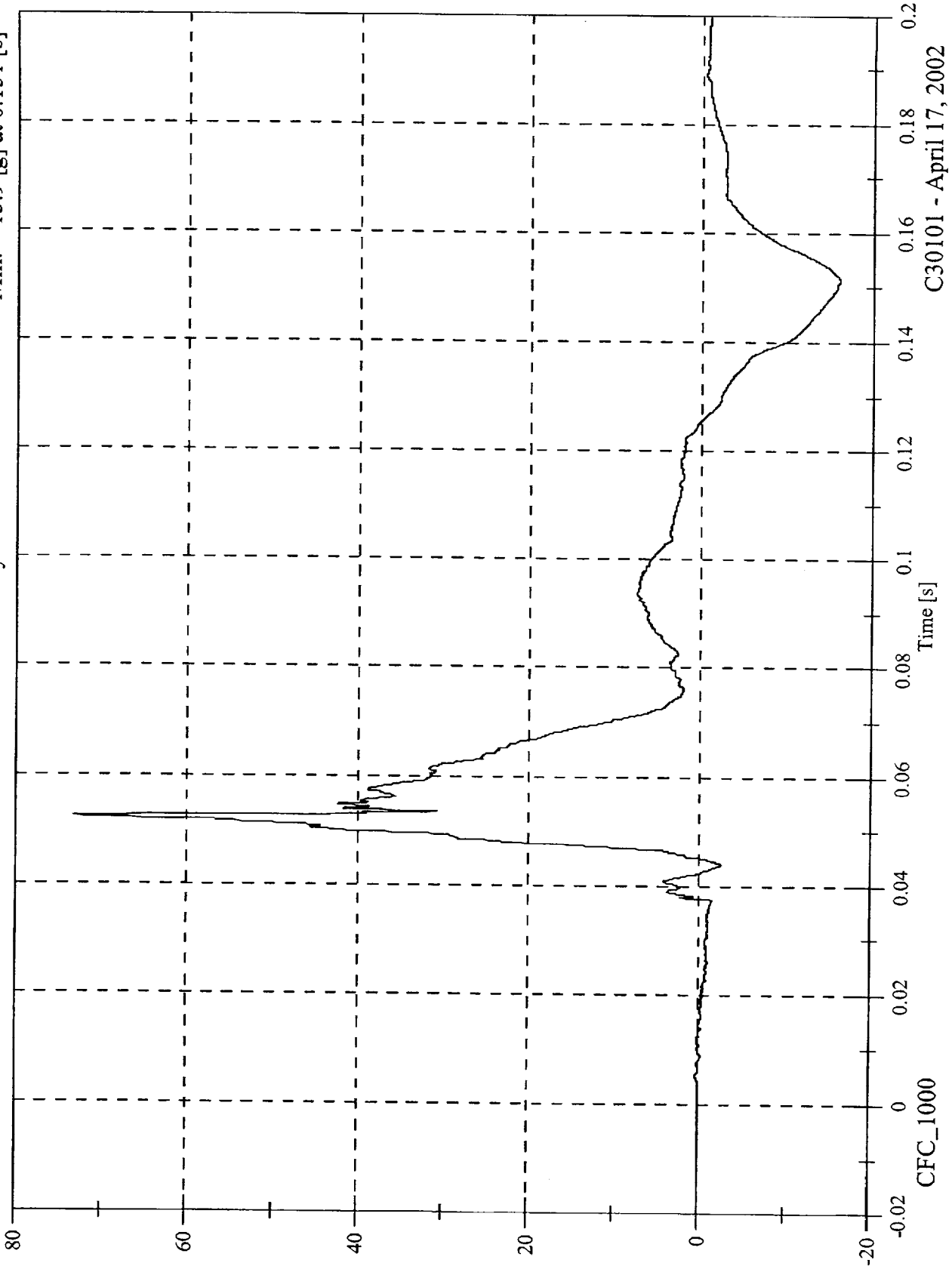


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 73.4 [g] at 0.052 [s]
Min: -15.9 [g] at 0.151 [s]

P4 Head y



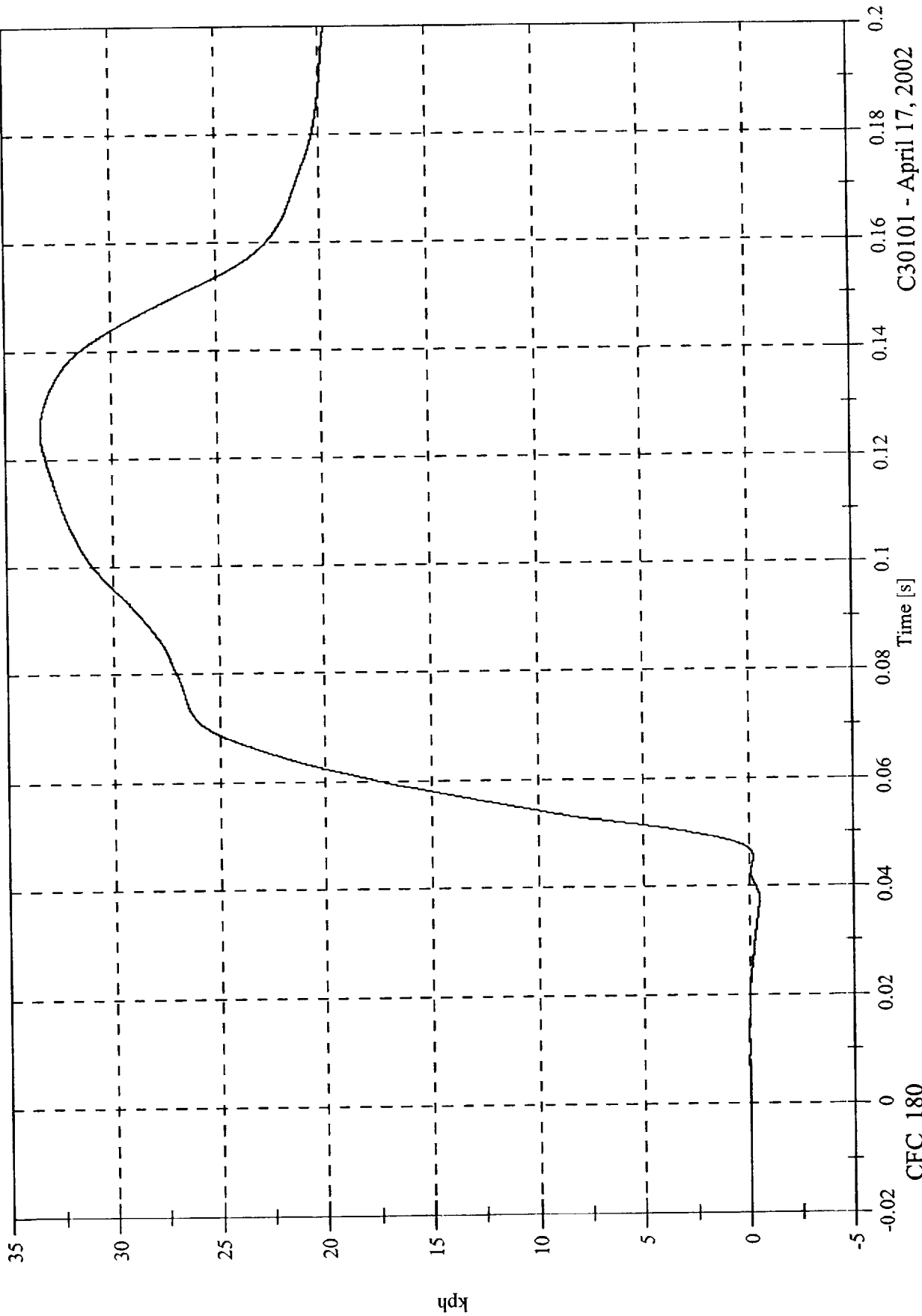
CFC_1000

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 33.4 [kph] at 0.126 [s]
Min: -0.5 [kph] at 0.037 [s]

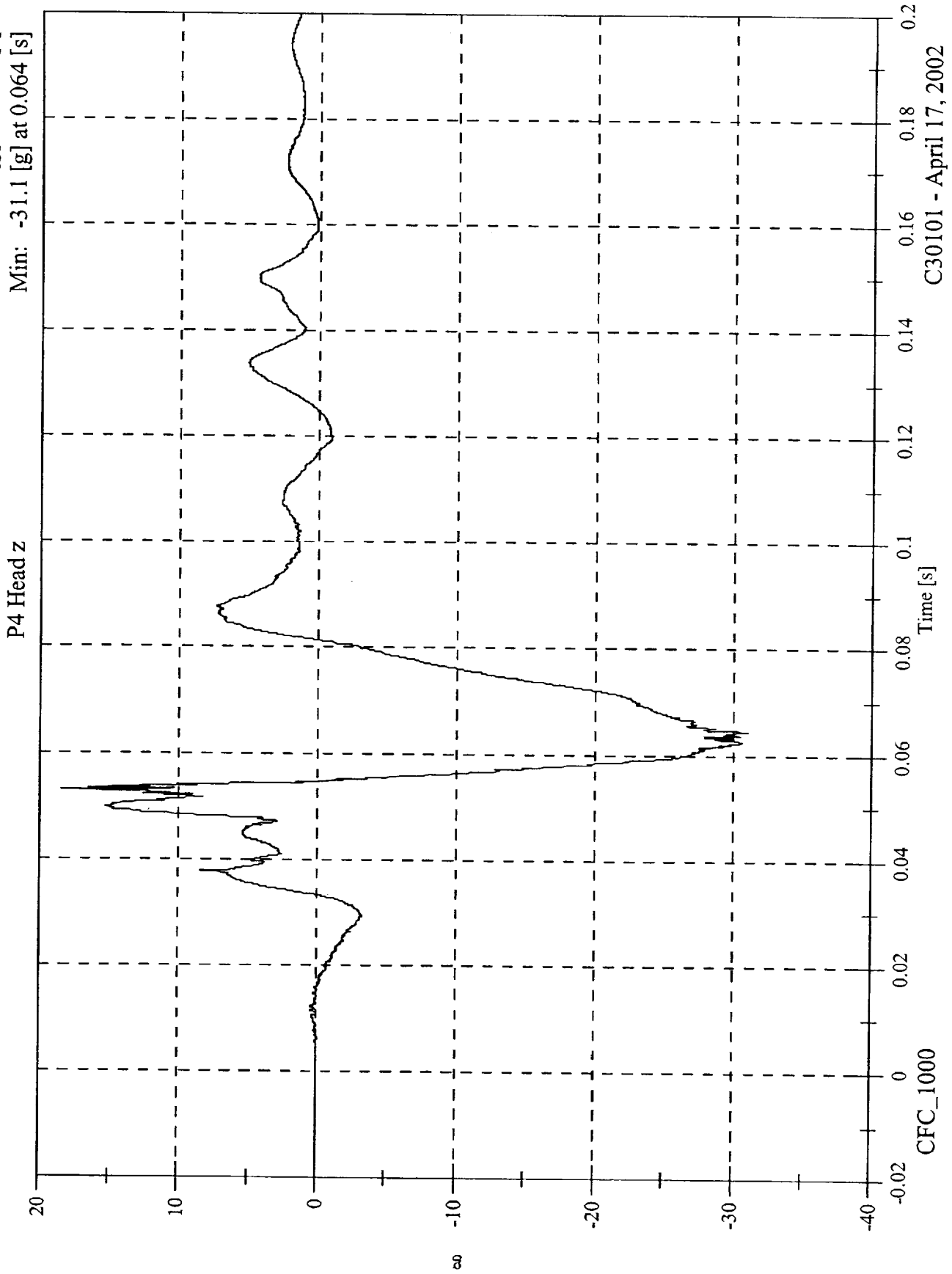
P4 Head y Velocity



C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 18.5 [g] at 0.053 [s]
Min: -31.1 [g] at 0.064 [s]

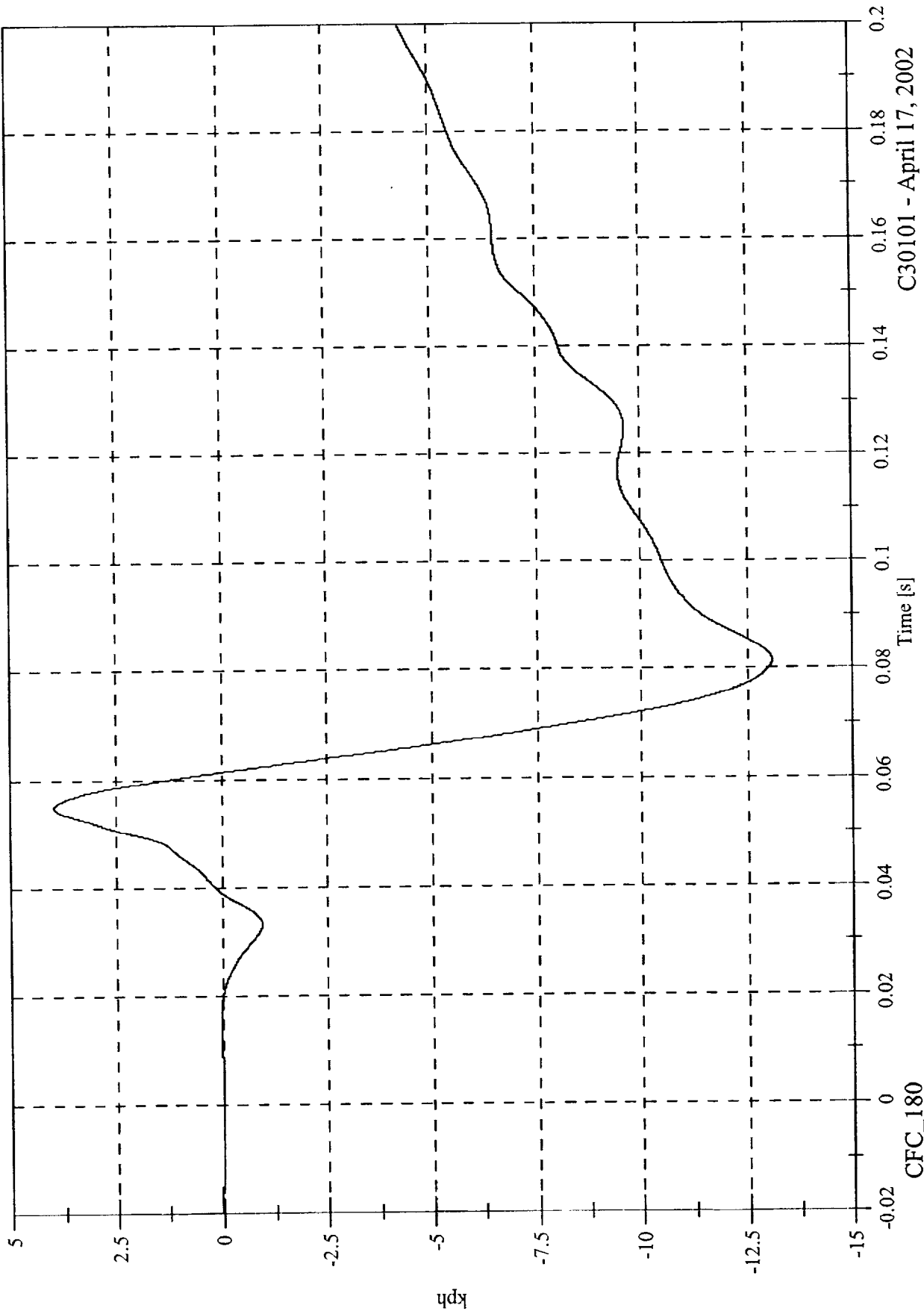


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 4.0 [kph] at 0.055 [s]
Min: -13.1 [kph] at 0.081 [s]

P4 Head z Velocity



C30101 - April 17, 2002

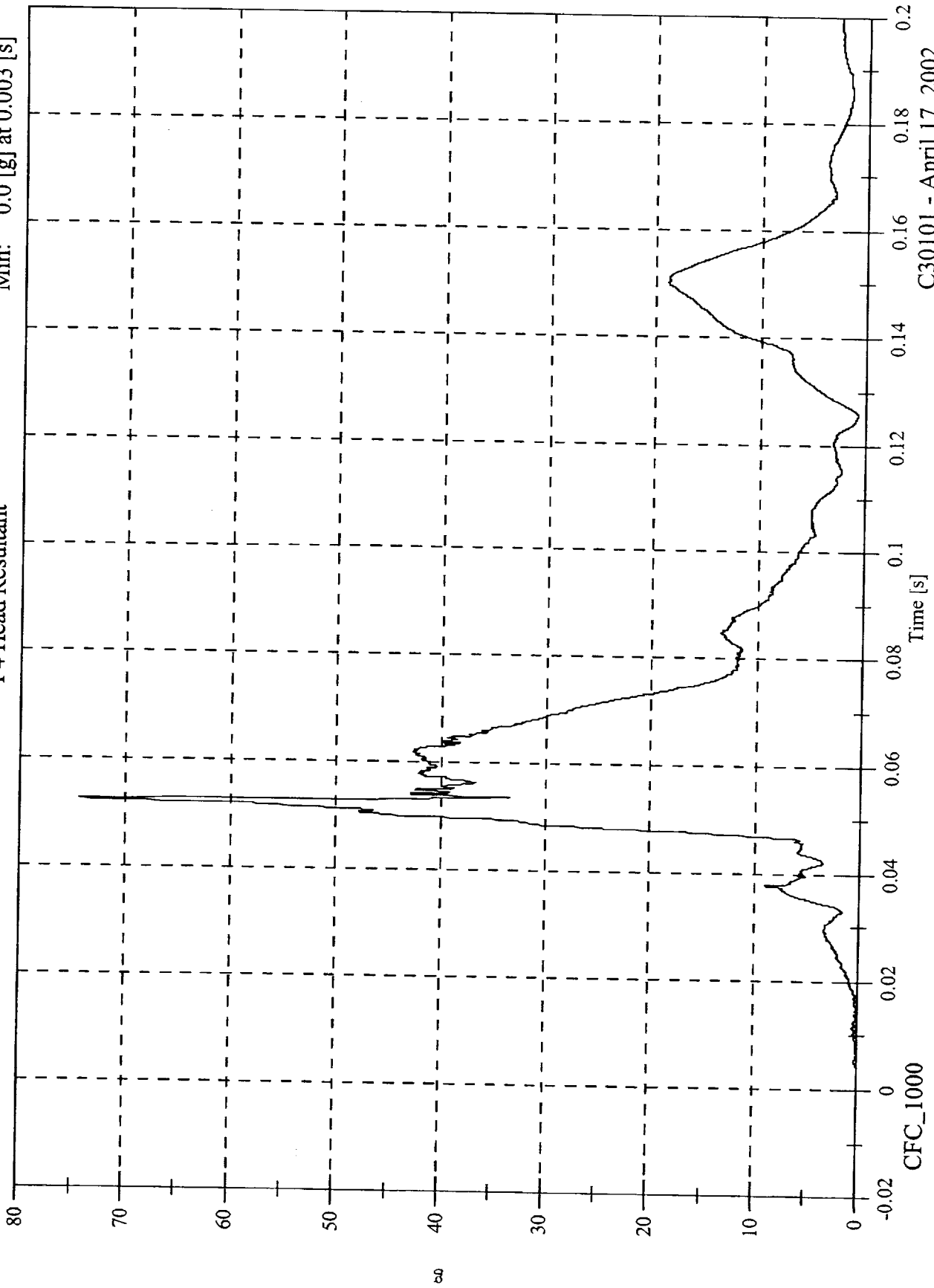
CFC_180

FMVSS 214D Inducant Test - 2003 Cadillac CTS

P4 Head Resultant

Max: 74.4 [g] at 0.052 [s]

Min: 0.0 [g] at 0.003 [s]

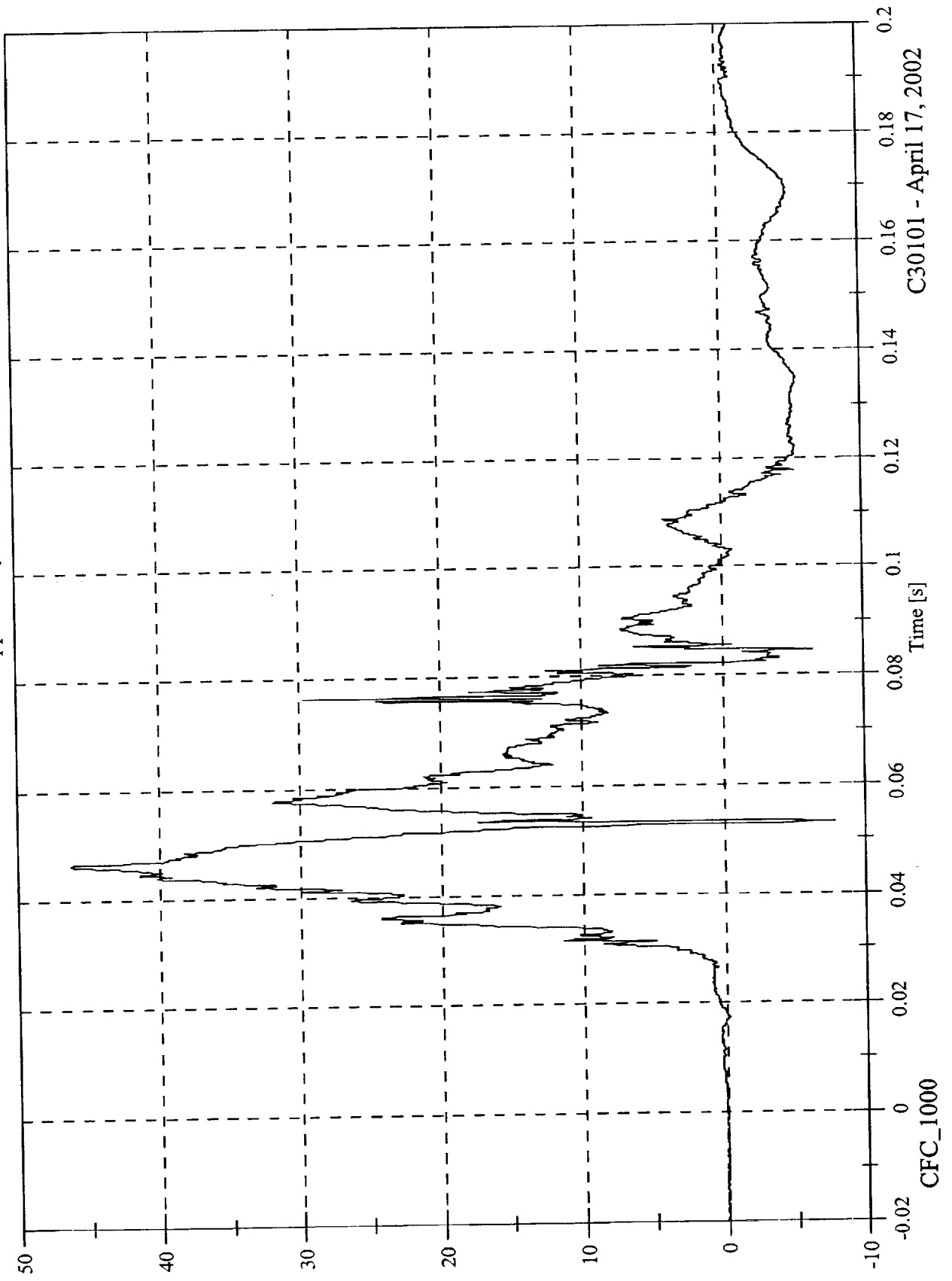


C30101 - April 17, 2002

Max: 46.3 [g] at 0.046 [s]
Min: -7.8 [g] at 0.053 [s]

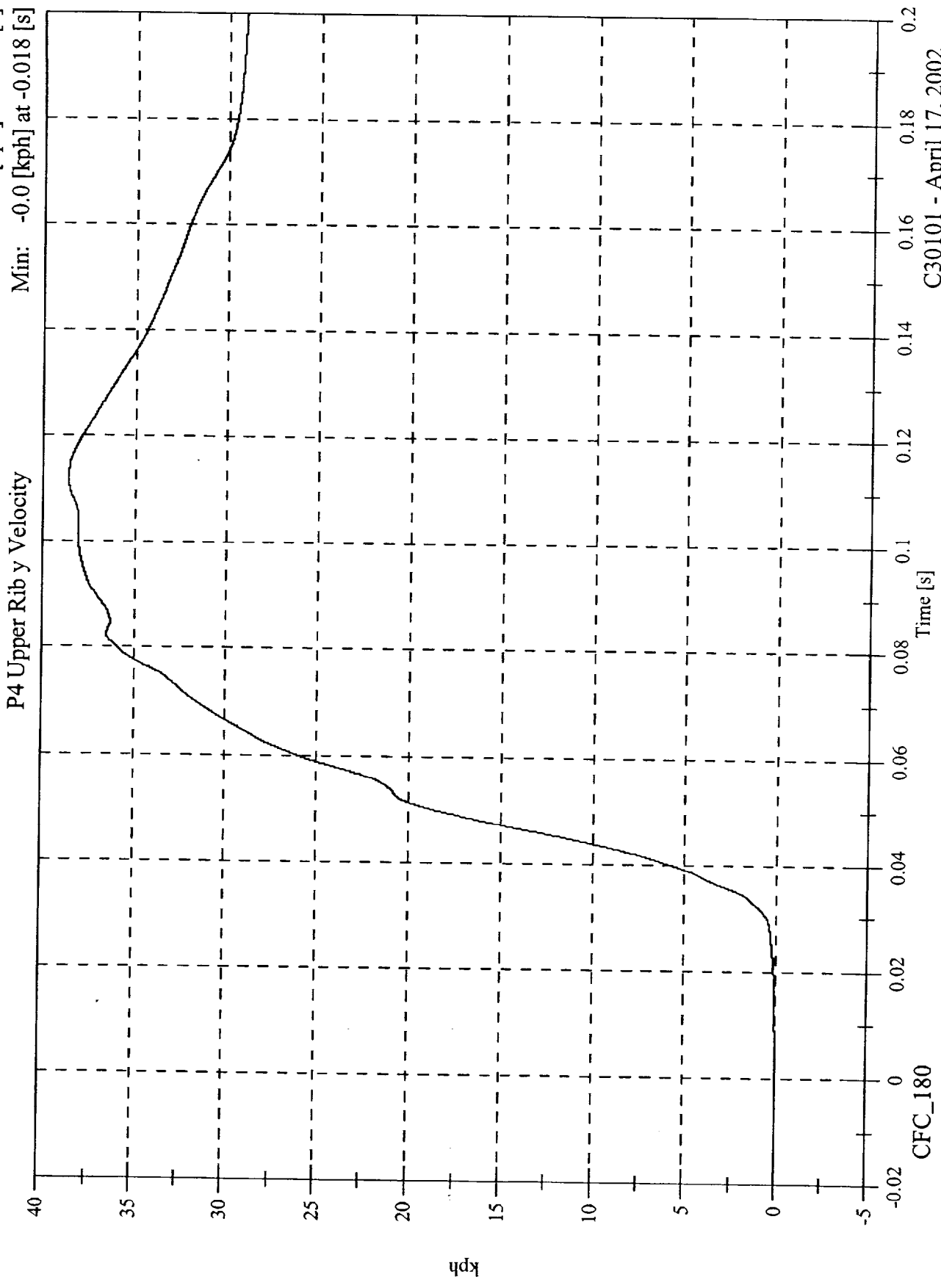
FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Upper Rib y



C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

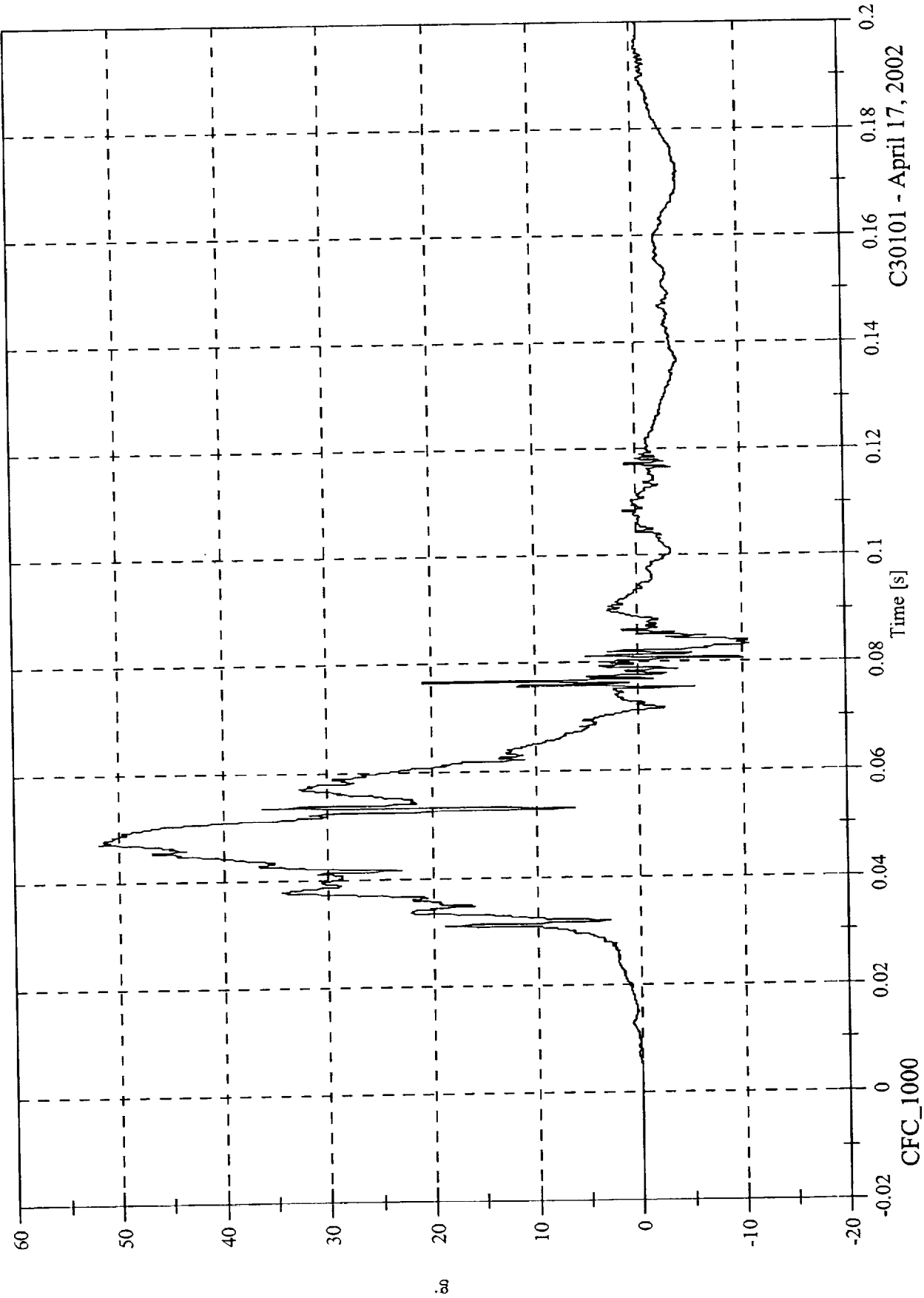


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 51.9 [g] at 0.047 [s]
Min: -10.7 [g] at 0.083 [s]

P4 Lower Rib y



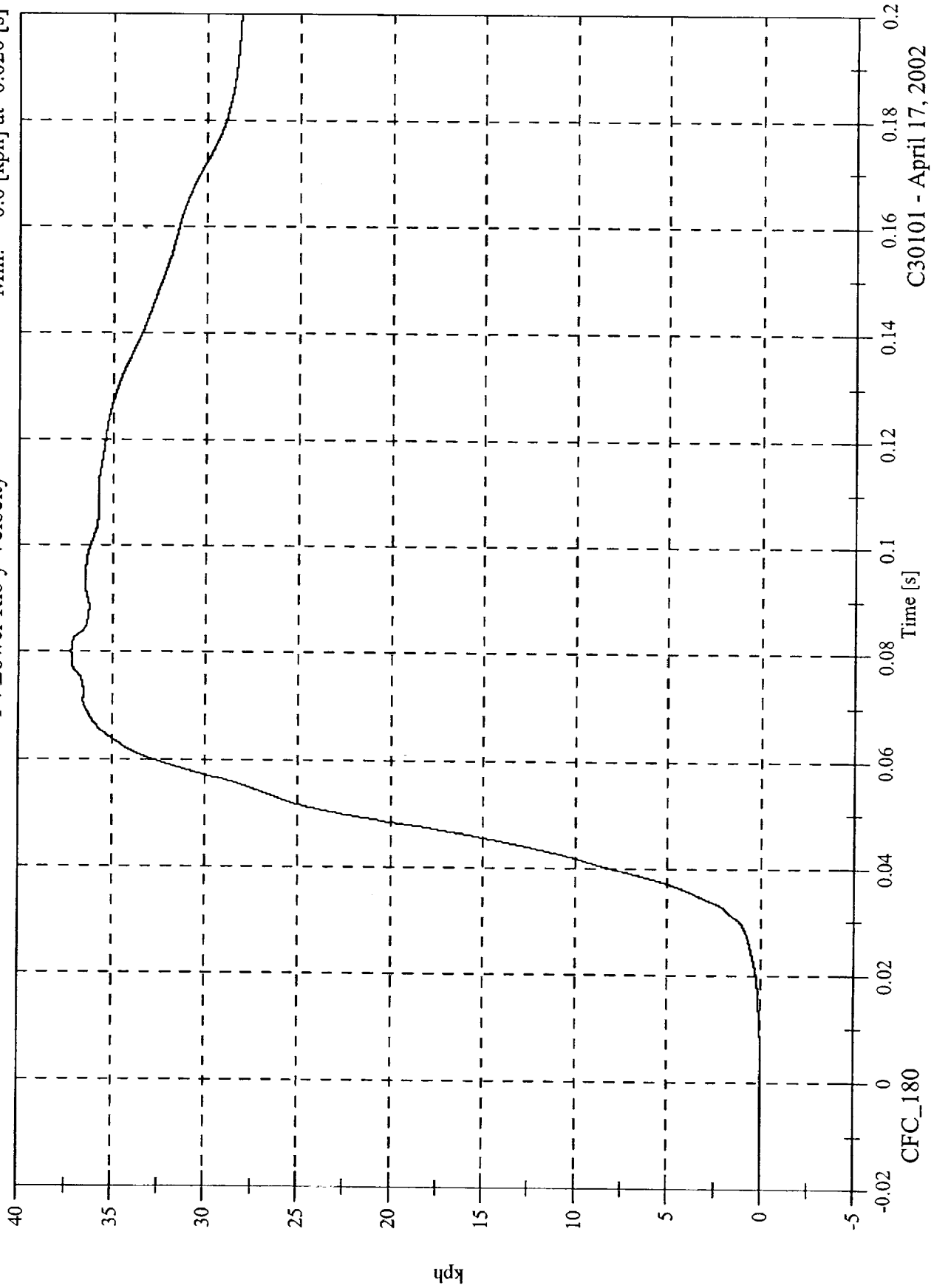
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Lower Rib y Velocity

Max: 37.2 [kph] at 0.080 [s]

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

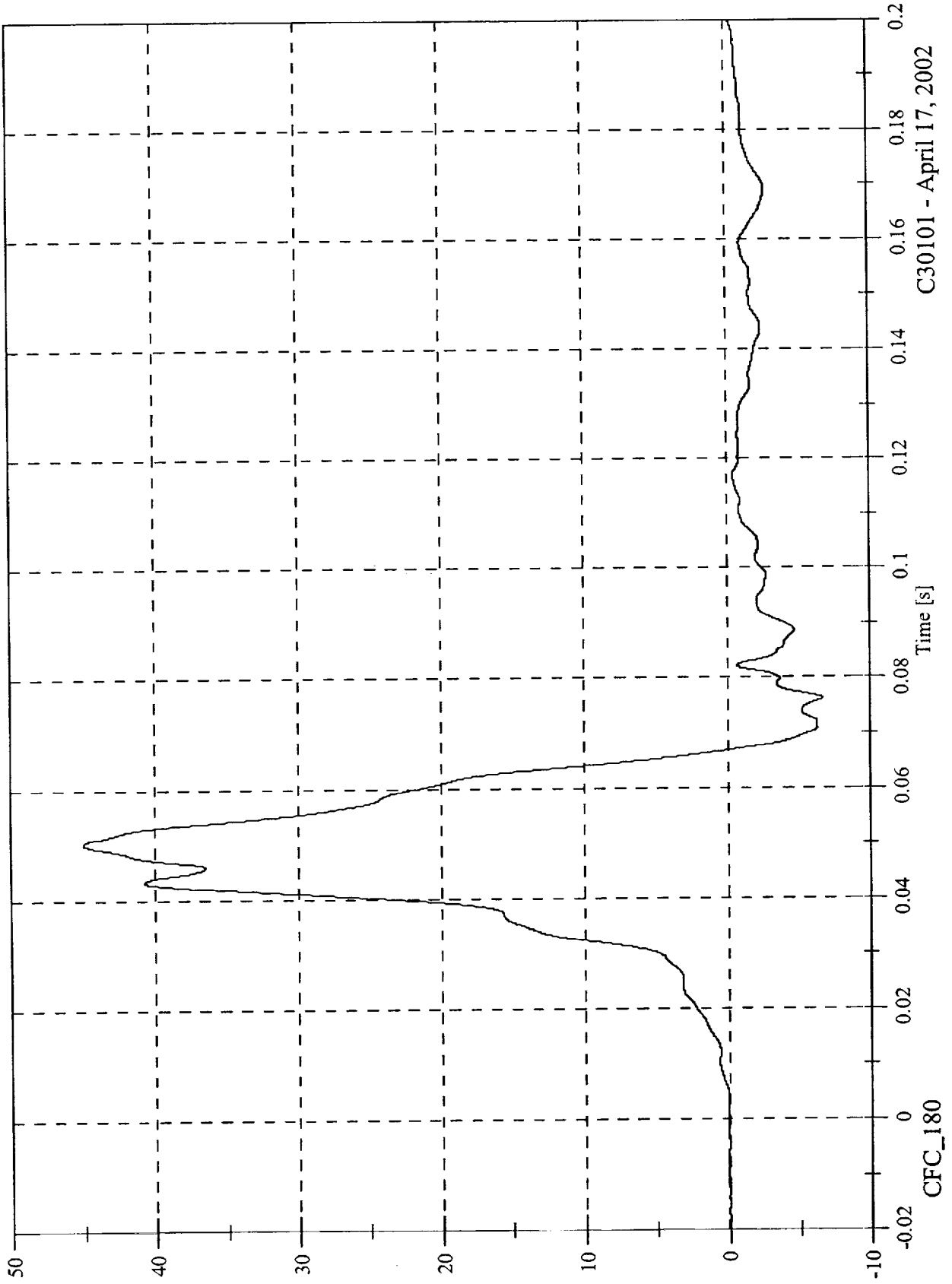


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Lower Spine y

Max: 45.0 [g] at 0.050 [s]
Min: -6.7 [g] at 0.076 [s]



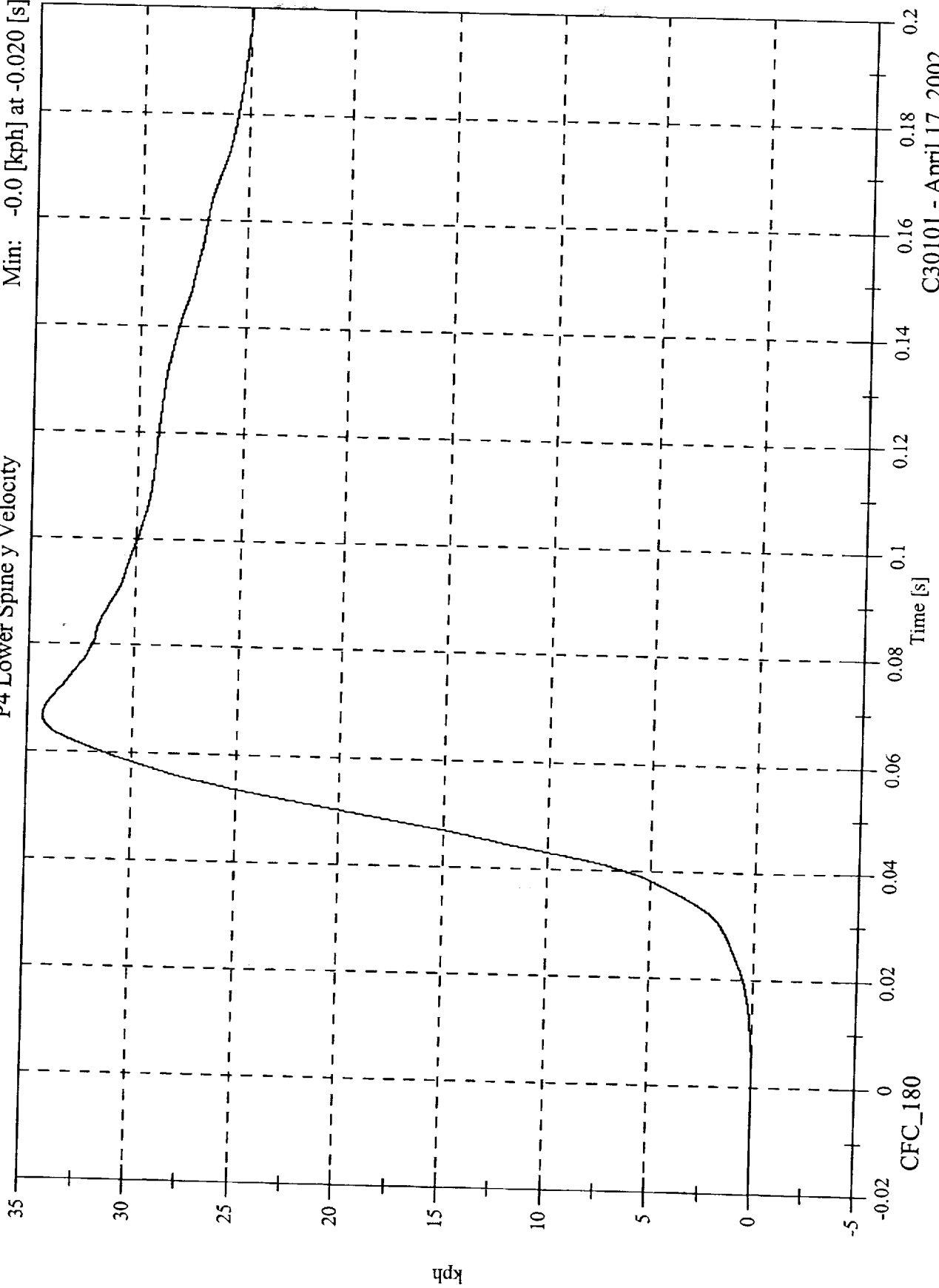
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Lower Spine y Velocity

Max: 34.3 [kph] at 0.067 [s]

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

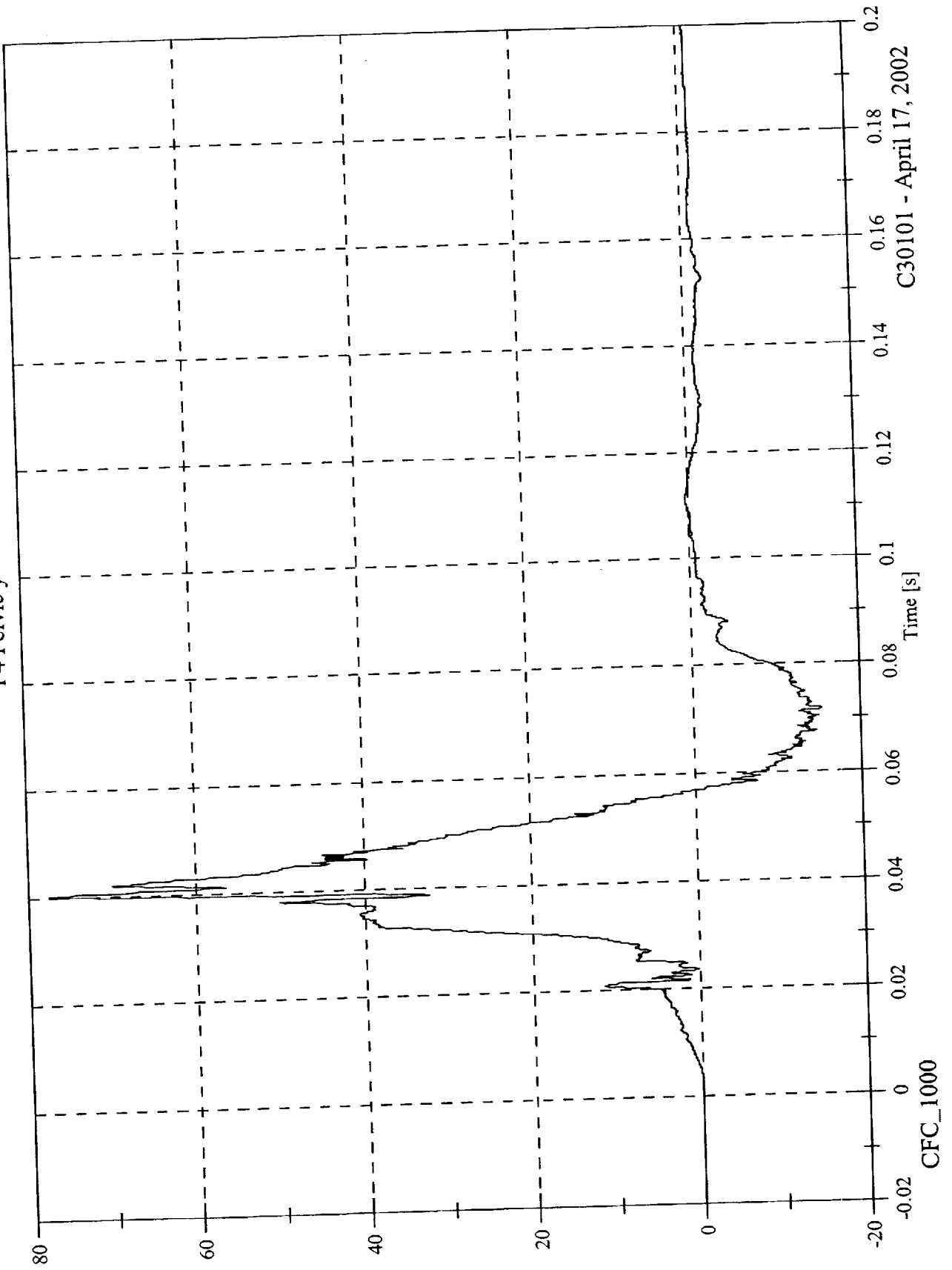


C30101 - April 17, 2002

Max: 77.6 [g] at 0.040 [s]
Min: -15.3 [g] at 0.072 [s]

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Pelvic y

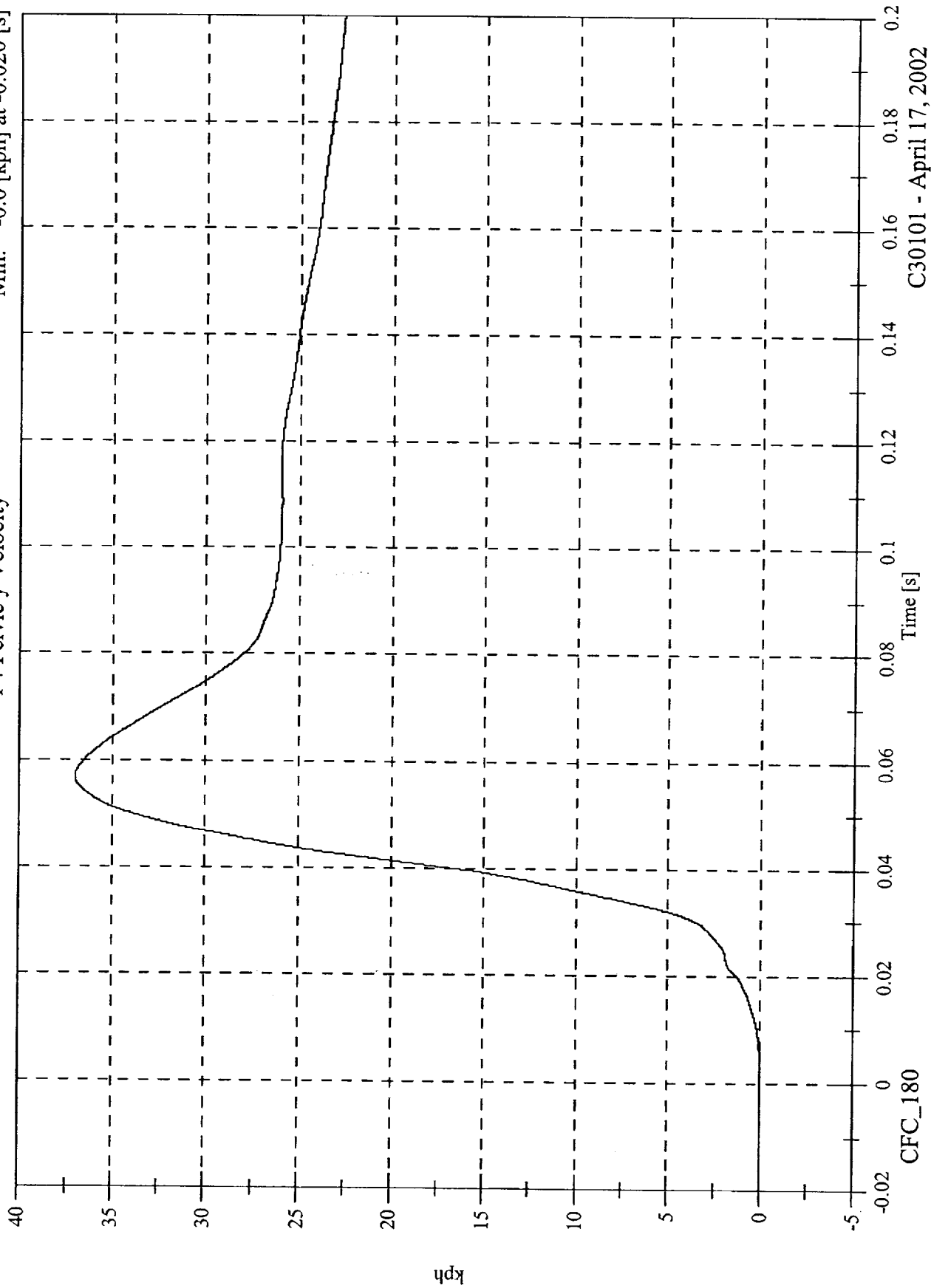


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 37.0 [kph] at 0.057 [s]
Min: -0.0 [kph] at -0.020 [s]

P4 Pelvic y Velocity



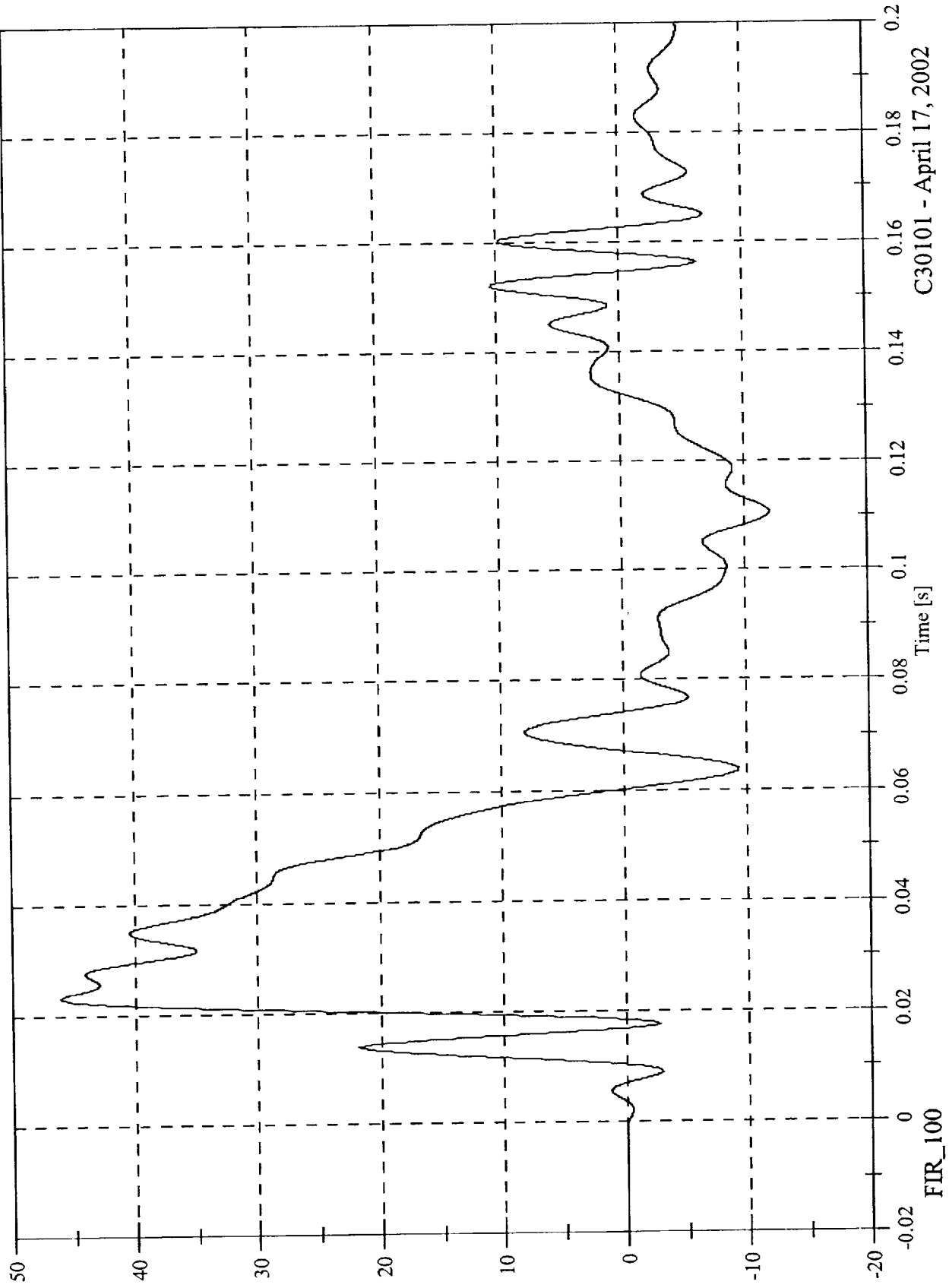
CFC_180

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Upper Rib y

Max: 46.1 [g] at 0.023 [s]
Min: -12.0 [g] at 0.111 [s]

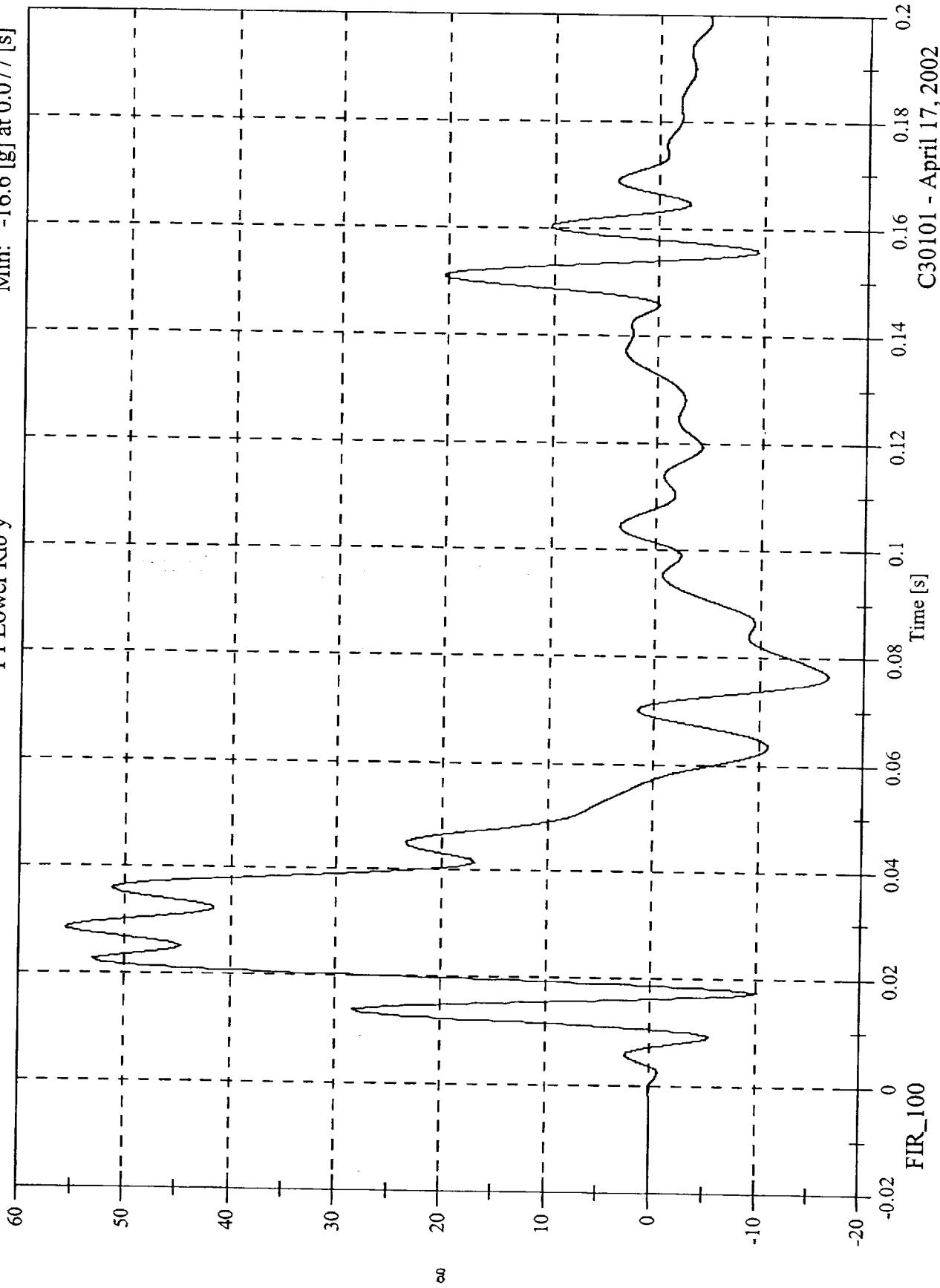


C30101 - April 17, 2002

FMVSS 214D Inducant Test - 2003 Cadillac CTS

Max: 55.6 [g] at 0.028 [s]
Min: -16.6 [g] at 0.077 [s]

P1 Lower Rib y

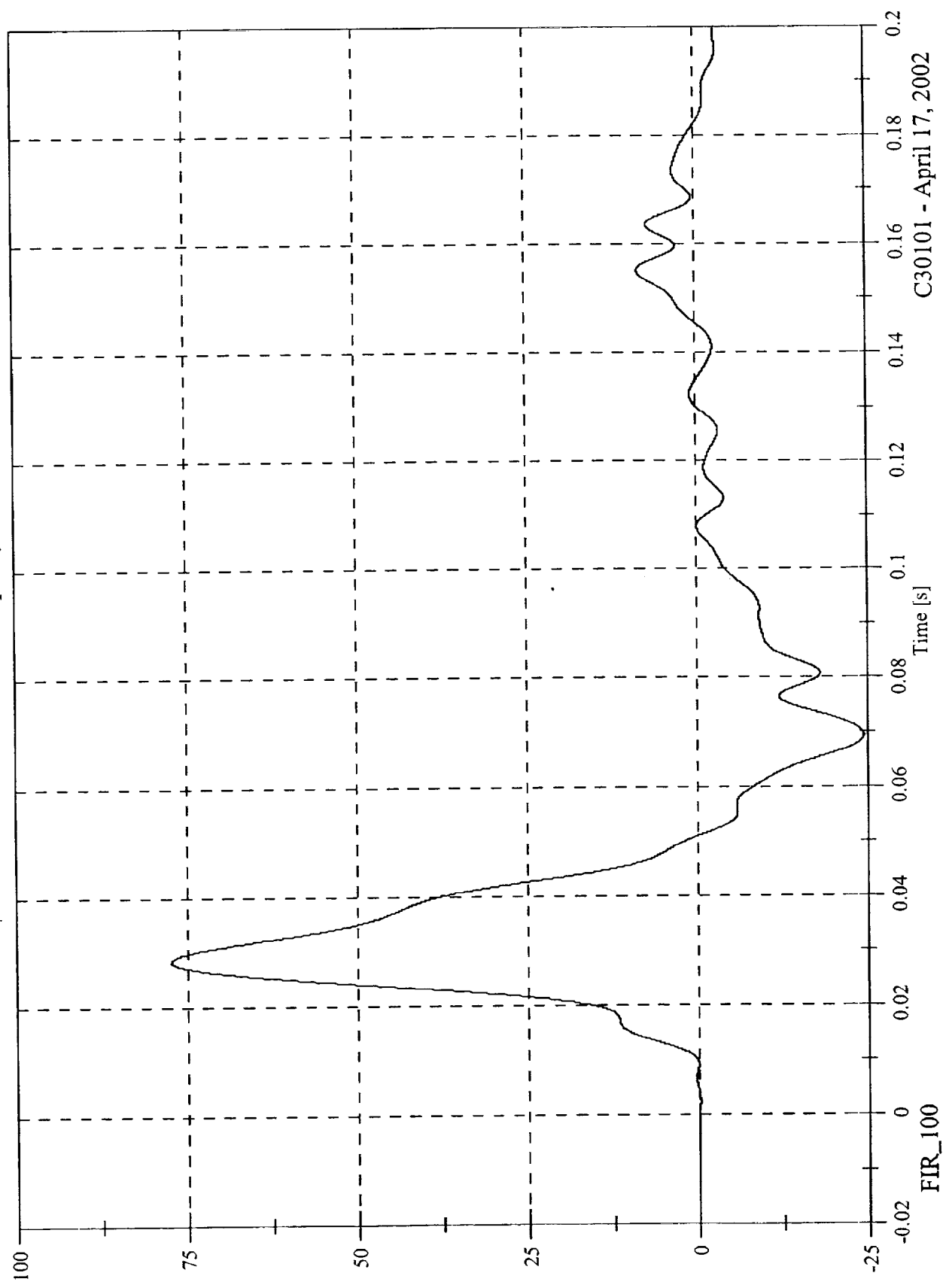


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Lower Spine y

Max: 77.4 [g] at 0.028 [s]
Min: -24.4 [g] at 0.069 [s]



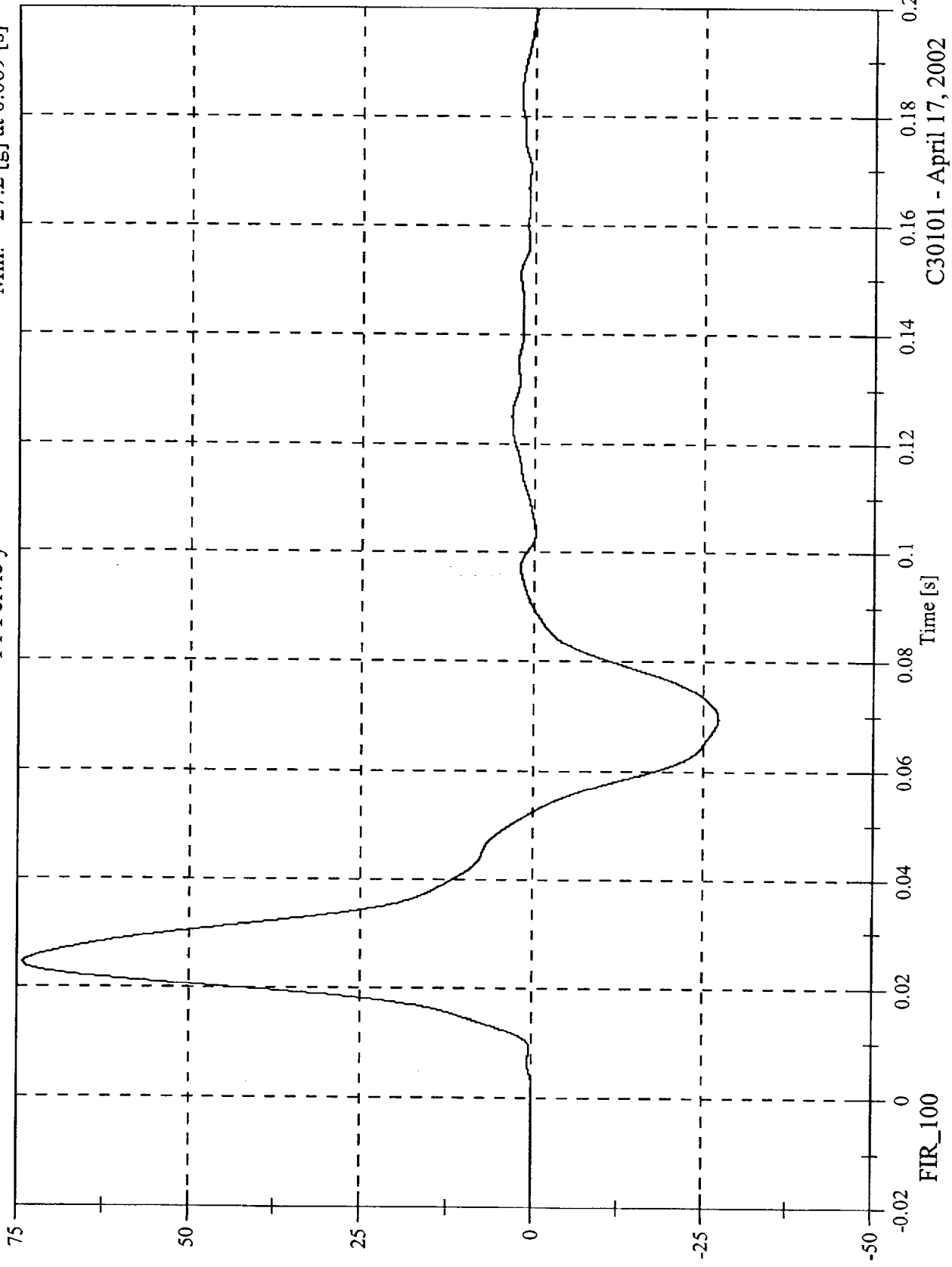
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 74.3 [g] at 0.024 [s]

Min: -27.2 [g] at 0.069 [s]

P1 Pelvic y



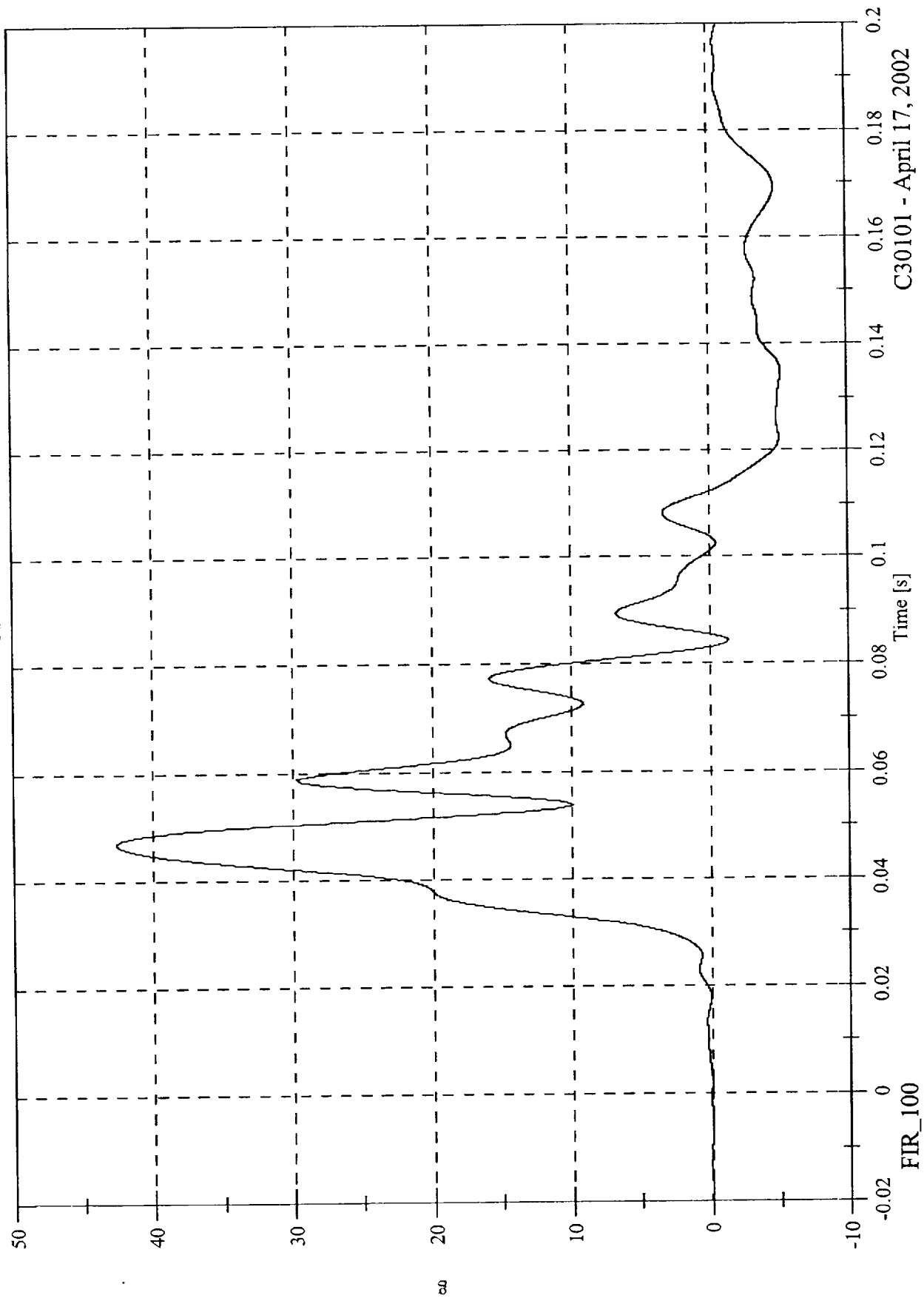
FIR_100

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Upper Rib y

Max: 42.6 [g] at 0.047 [s]
Min: -5.3 [g] at 0.135 [s]



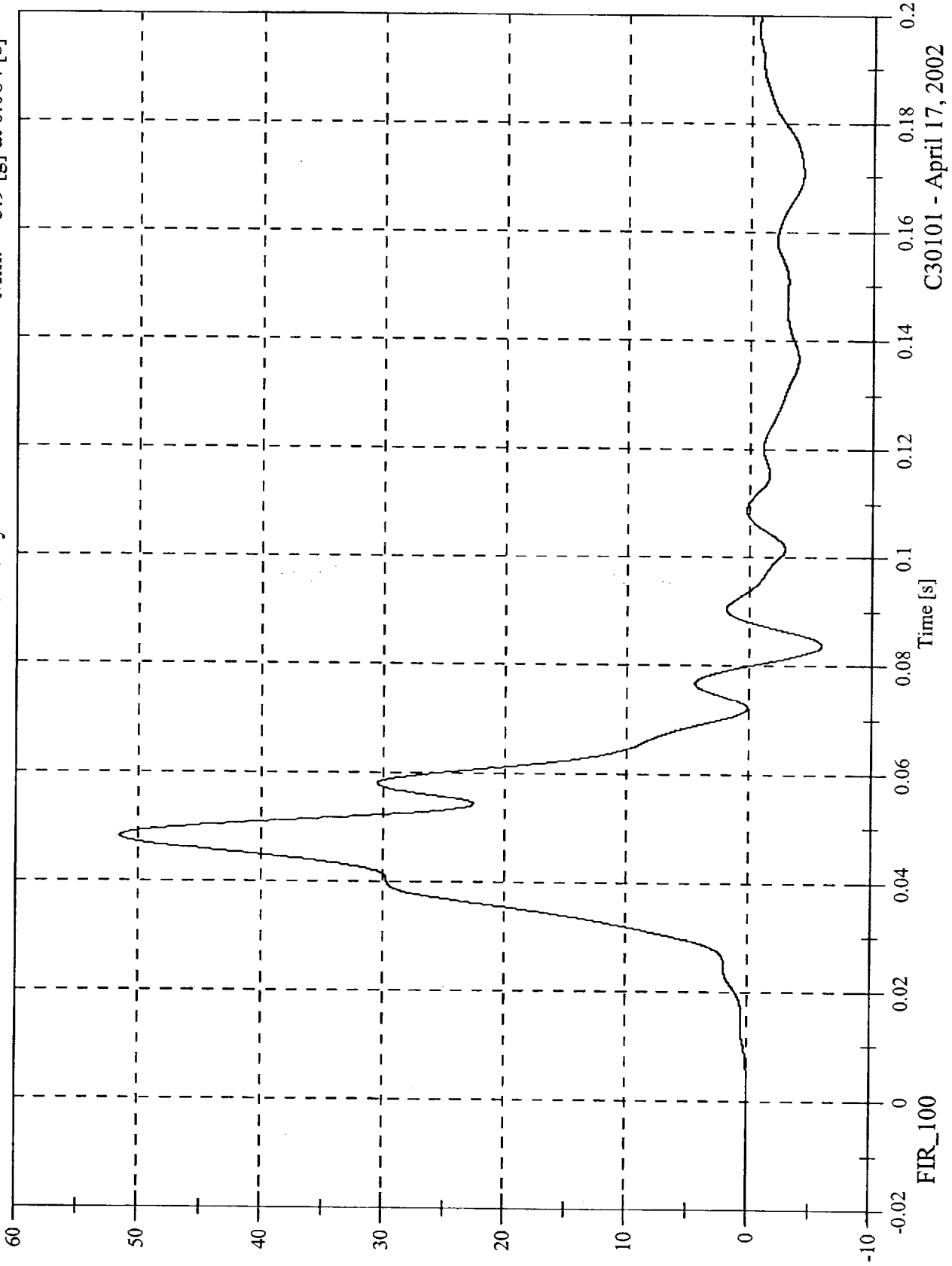
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 51.6 [g] at 0.048 [s]

Min: -5.9 [g] at 0.084 [s]

P4 Lower Rib y



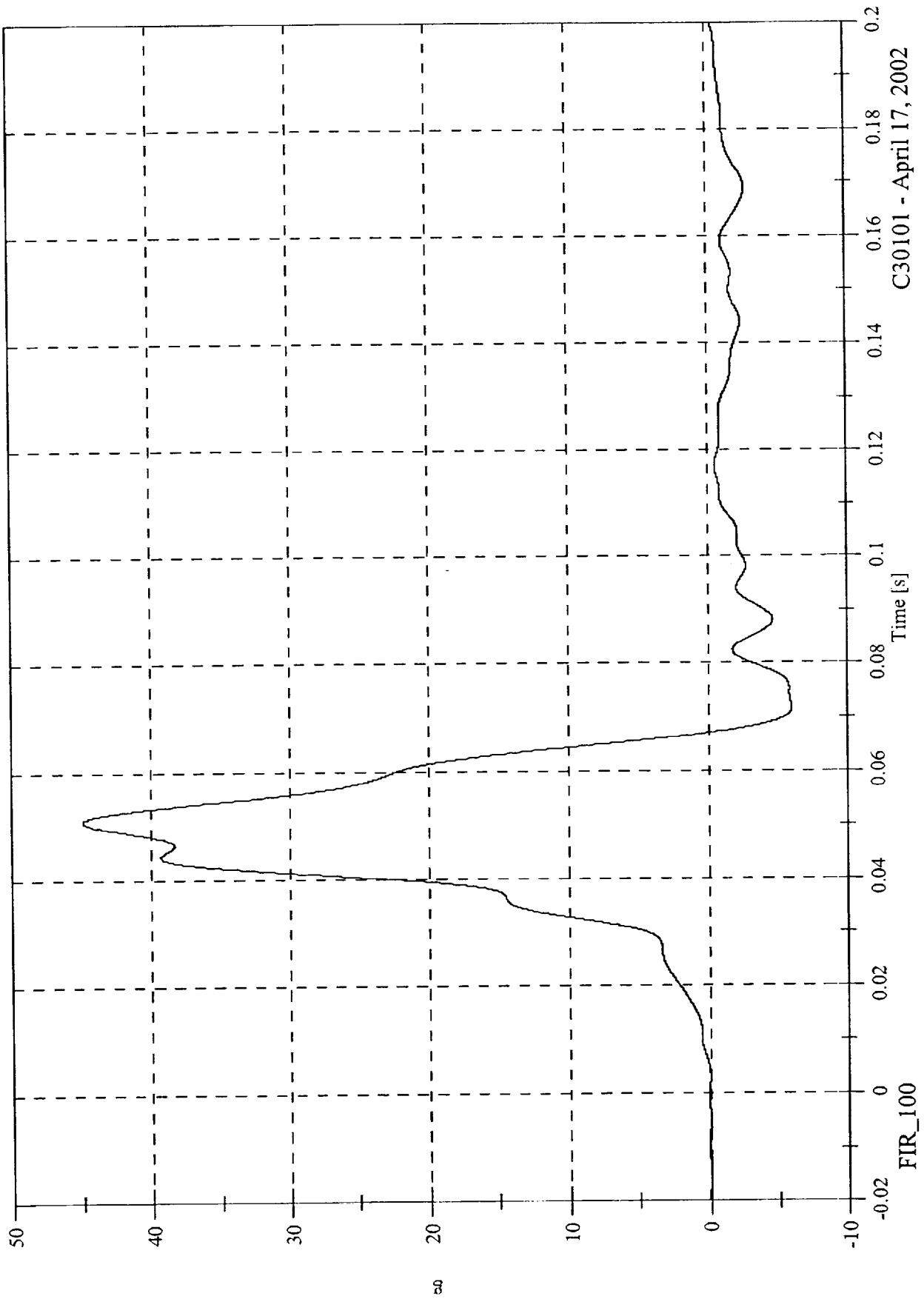
FIR_100

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 44.9 [g] at 0.051 [s]
Min: -6.0 [g] at 0.072 [s]

P4 Lower Spine y

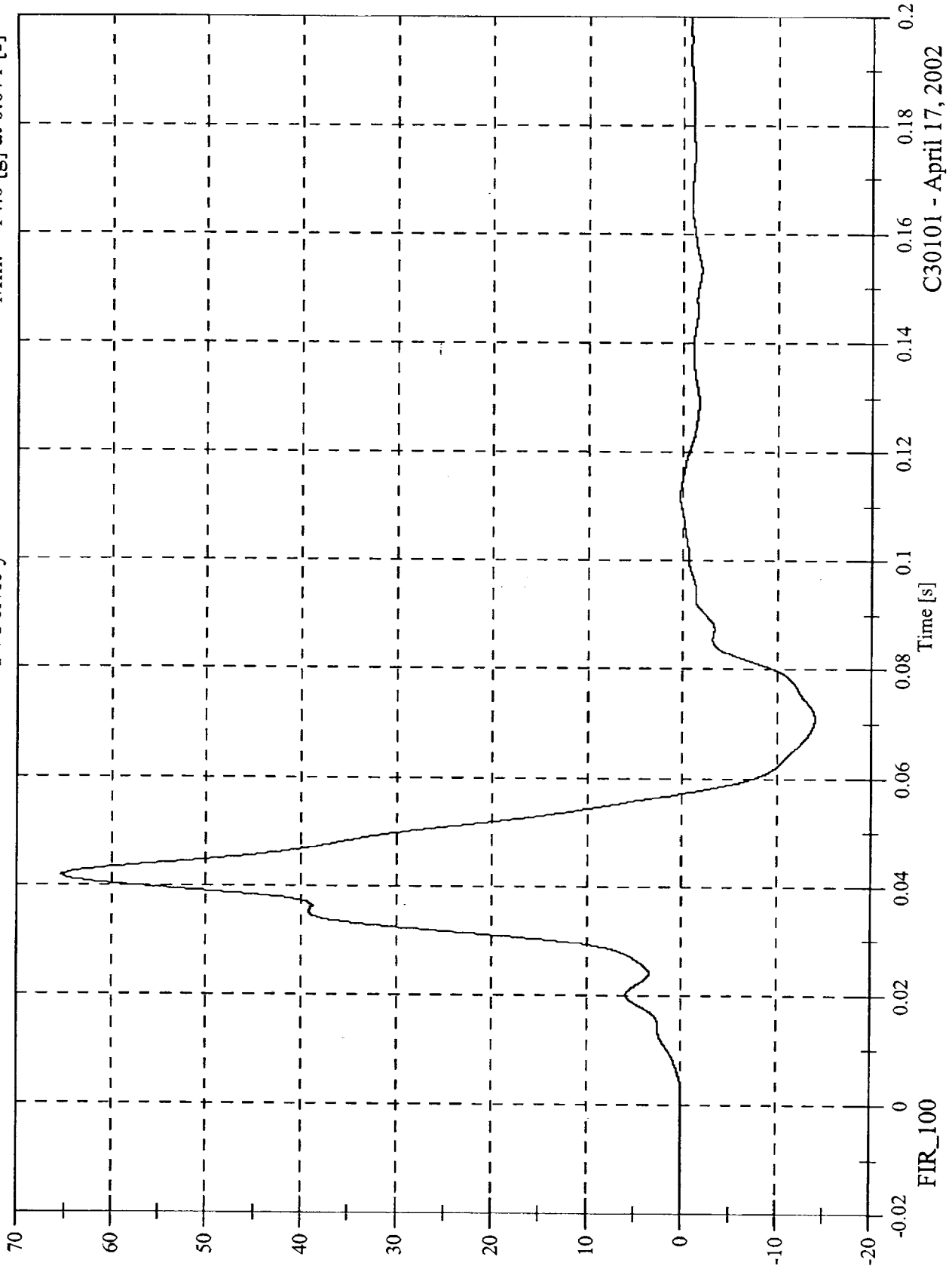


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 65.3 [g] at 0.042 [s]
Min: -14.0 [g] at 0.071 [s]

P4 Pelvic y



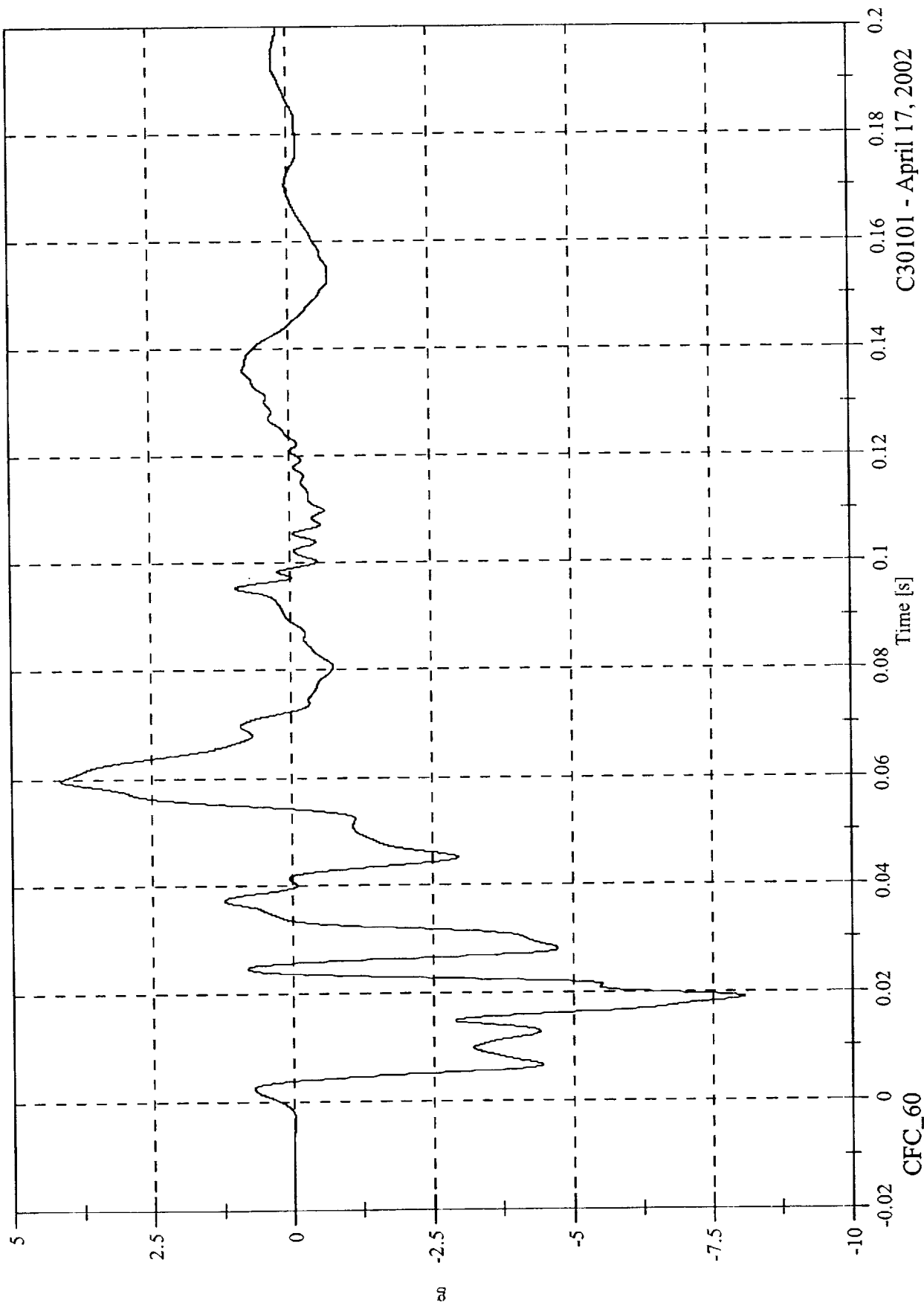
FIR_100

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 1 Right Front Sill at Front Seat x

Max: 4.1 [g] at 0.060 [s]
Min: -8.1 [g] at 0.019 [s]



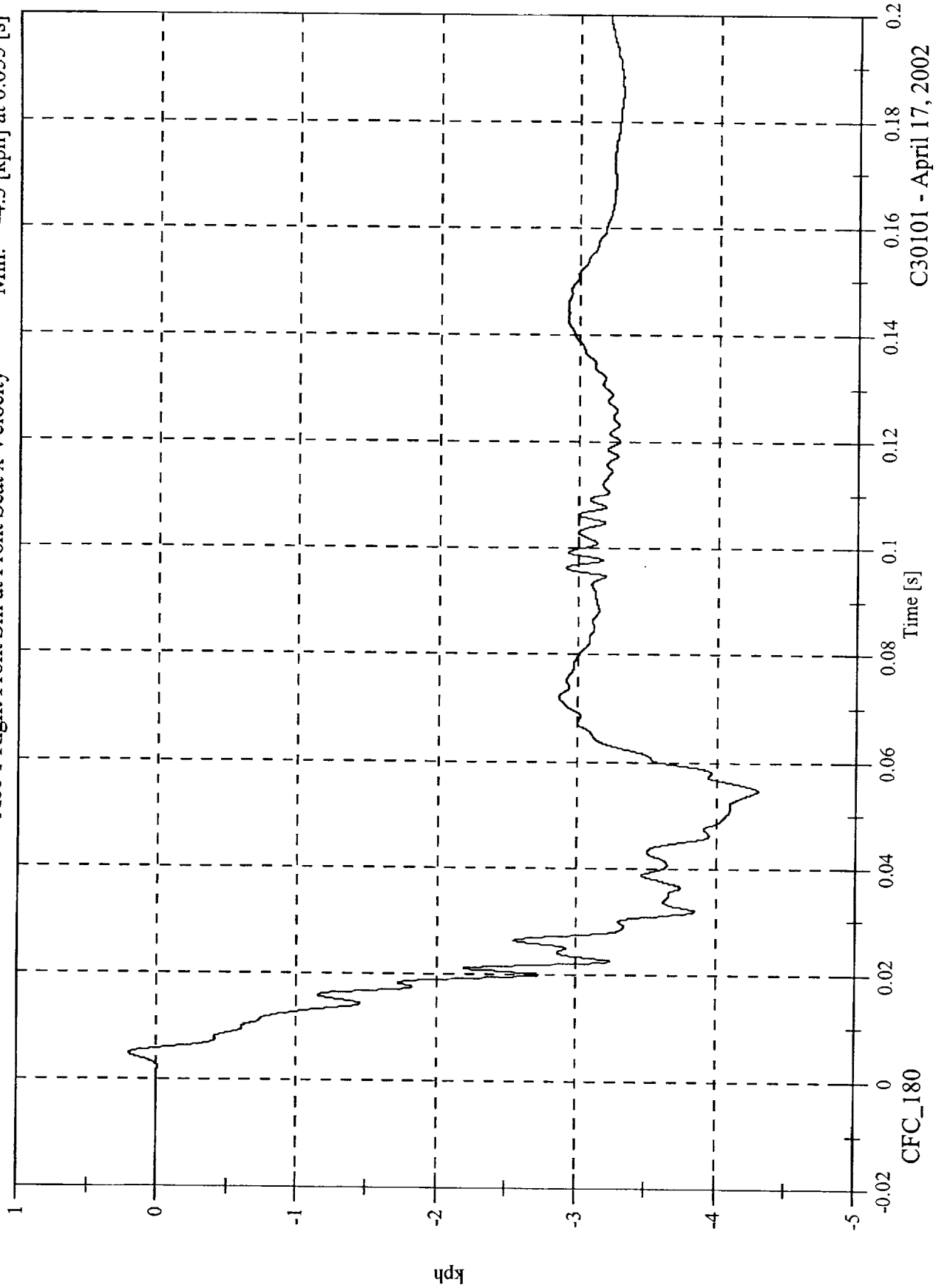
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 1 Right Front Sill at Front Seat x Velocity

Max: 0.2 [kph] at 0.005 [s]

Min: -4.3 [kph] at 0.055 [s]



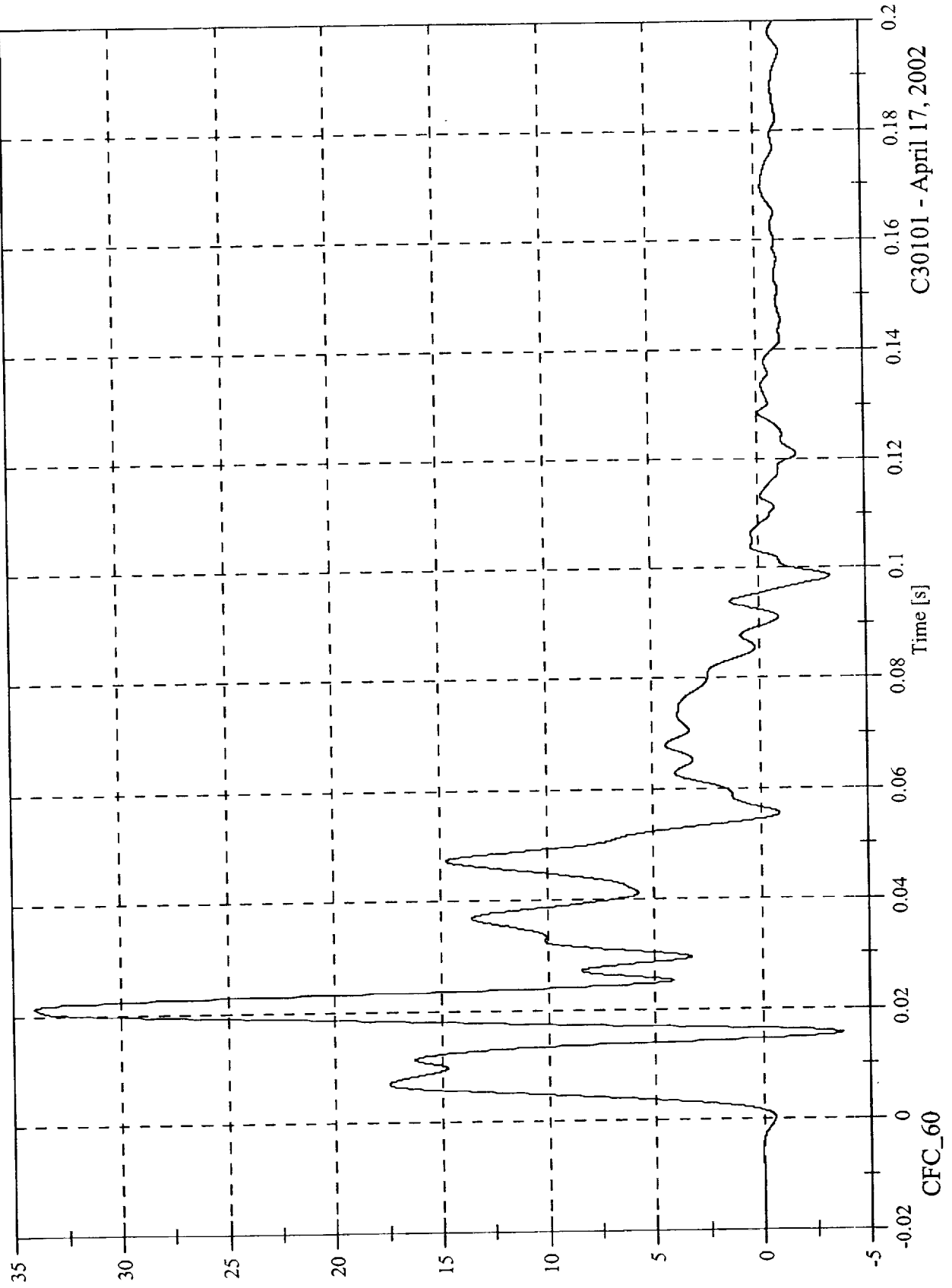
CFC_180

C30101 - April 17, 2002

Max: 34.0 [g] at 0.021 [s]
Min: -3.7 [g] at 0.016 [s]

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 1 Right Front Sill at Front Seat y



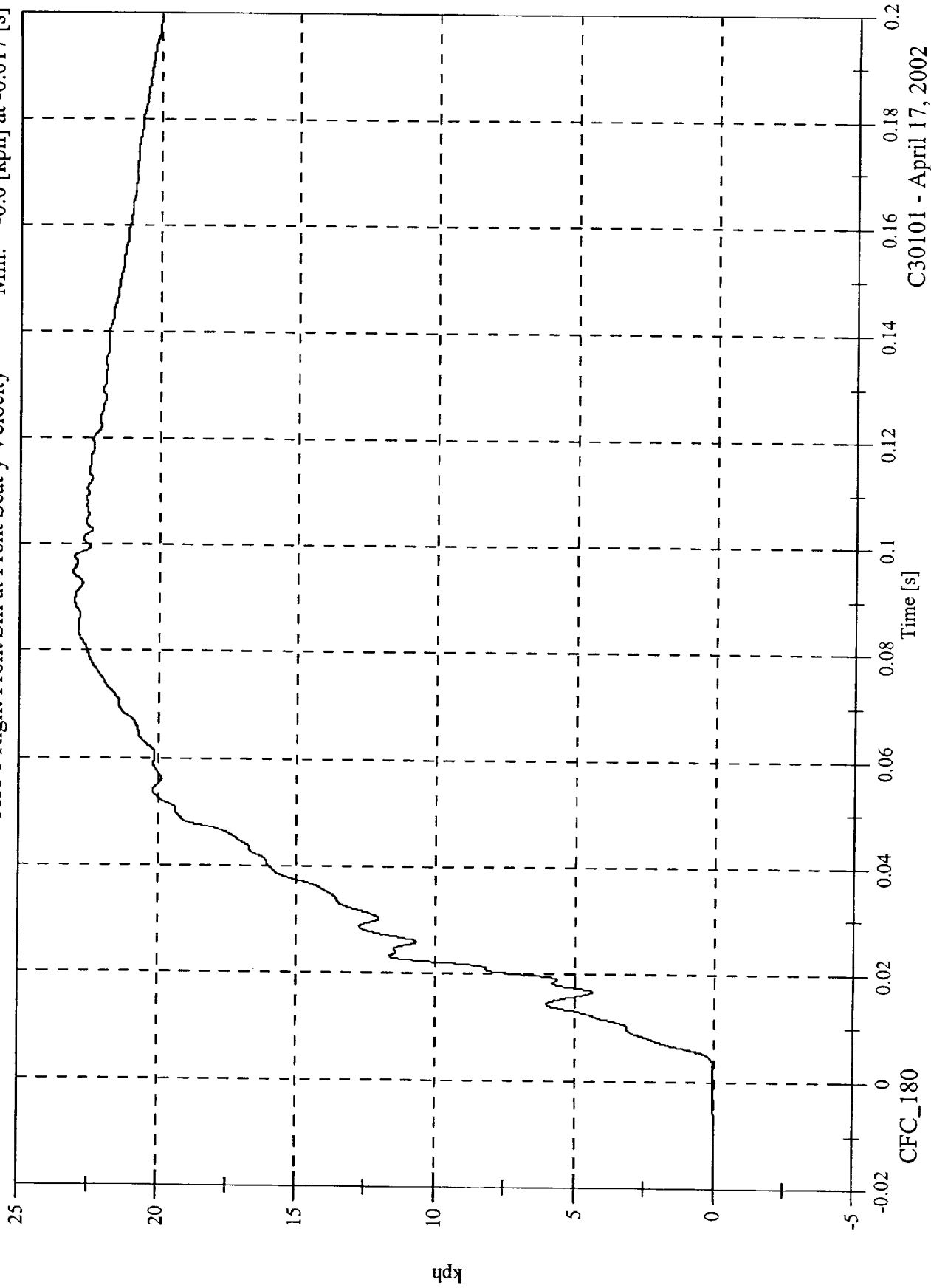
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 1 Right Front Sill at Front Seat y Velocity

Max: 23.1 [kph] at 0.095 [s]

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

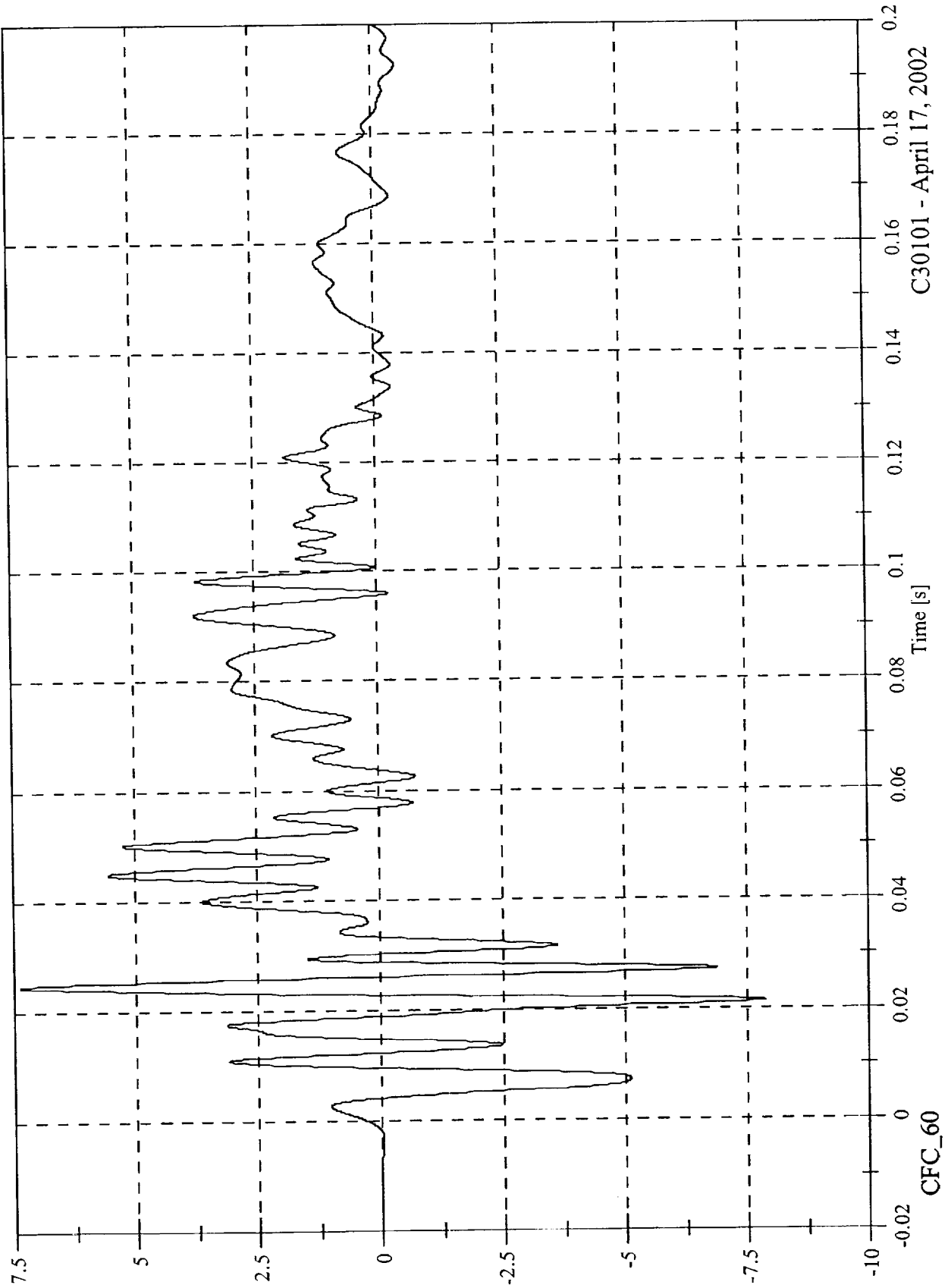


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 7.4 [g] at 0.025 [s]
Min: -7.9 [g] at 0.021 [s]

Acc 1 Right Front Sill at Front Seat z



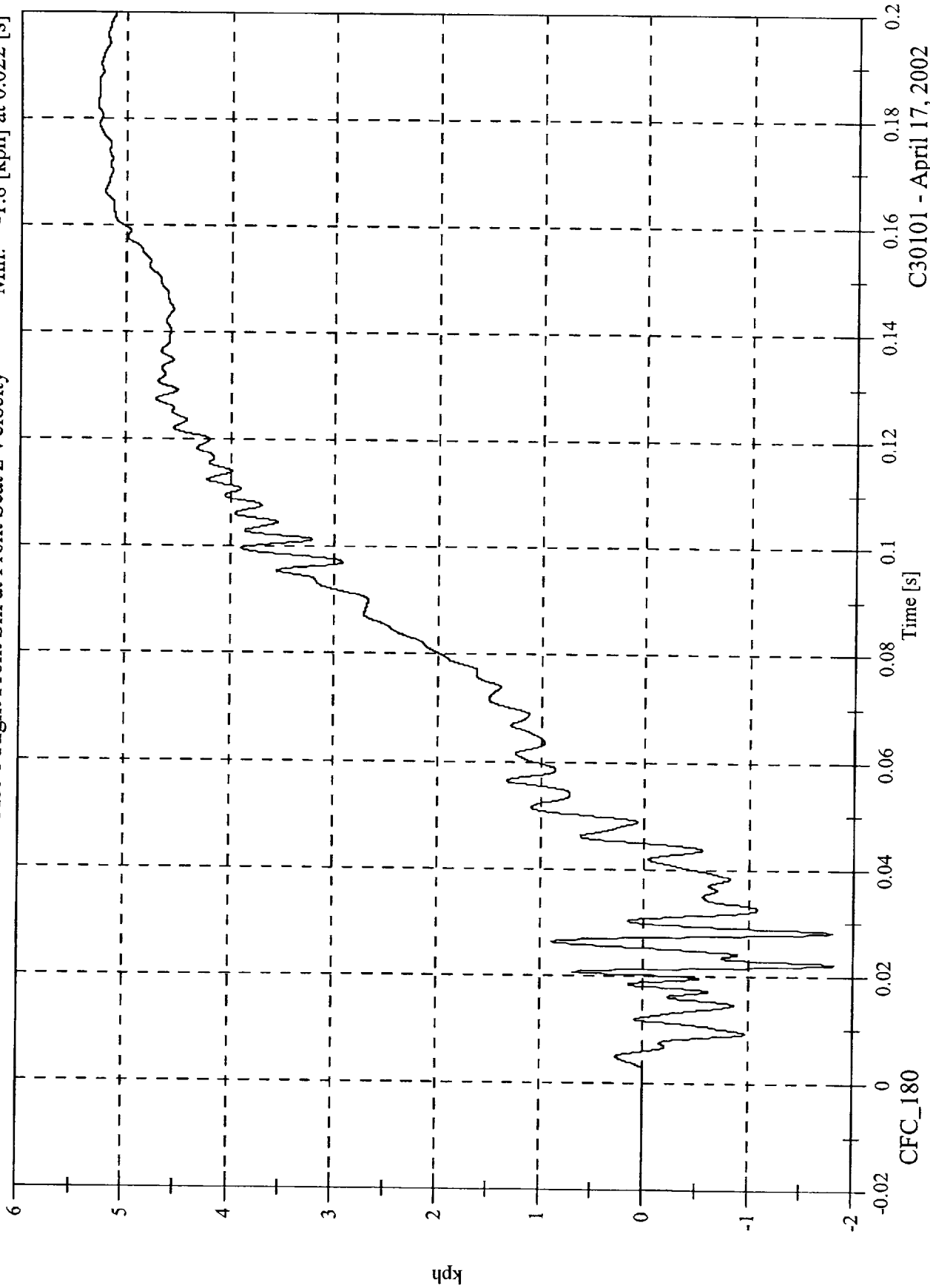
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 1 Right Front Sill at Front Seat z Velocity

Max: 5.3 [kph] at 0.182 [s]

Min: -1.8 [kph] at 0.022 [s]

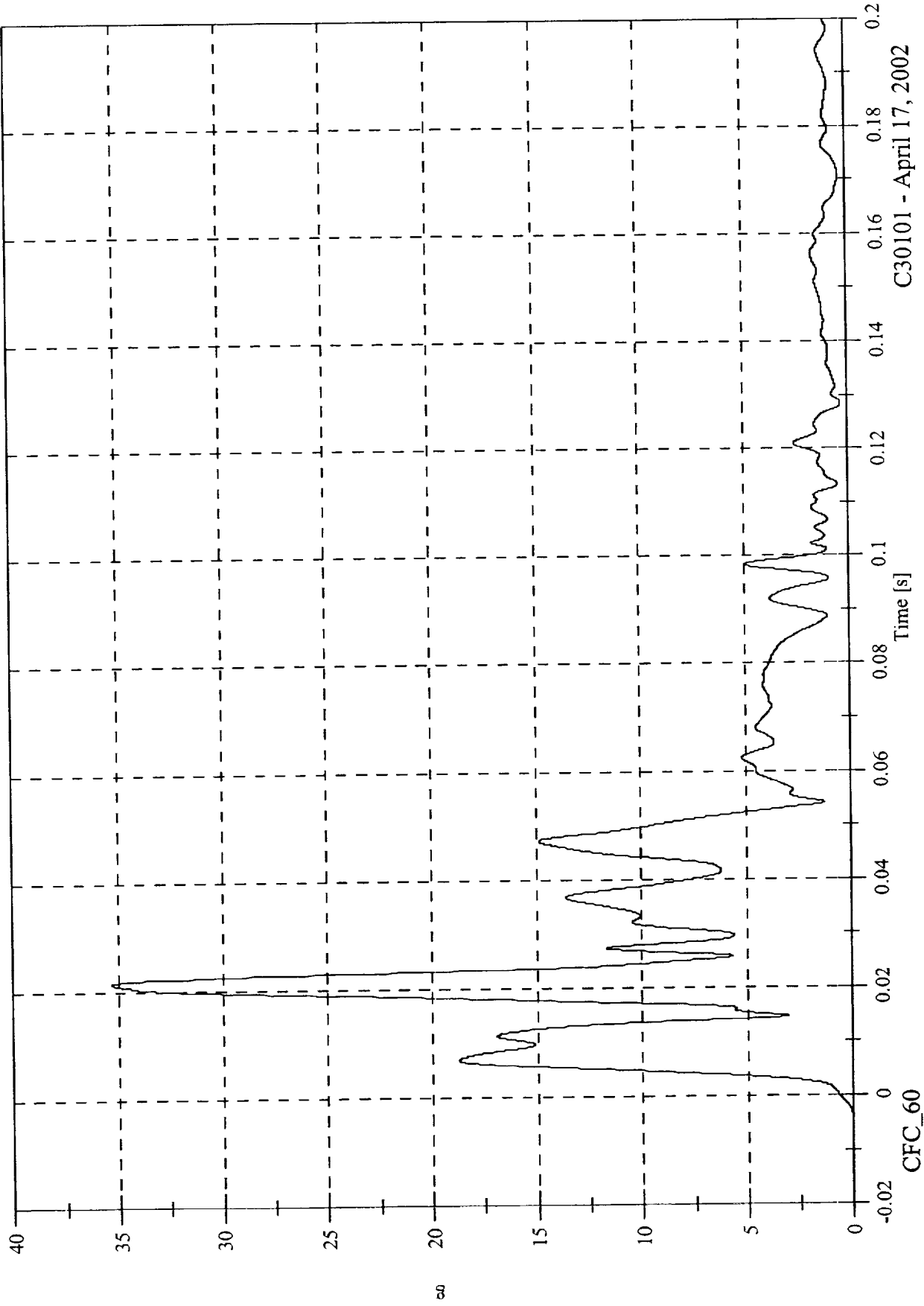


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS
Acc 1 Right Front Sill at Front Seat Resultant

Max: 35.4 [g] at 0.021 [s]

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



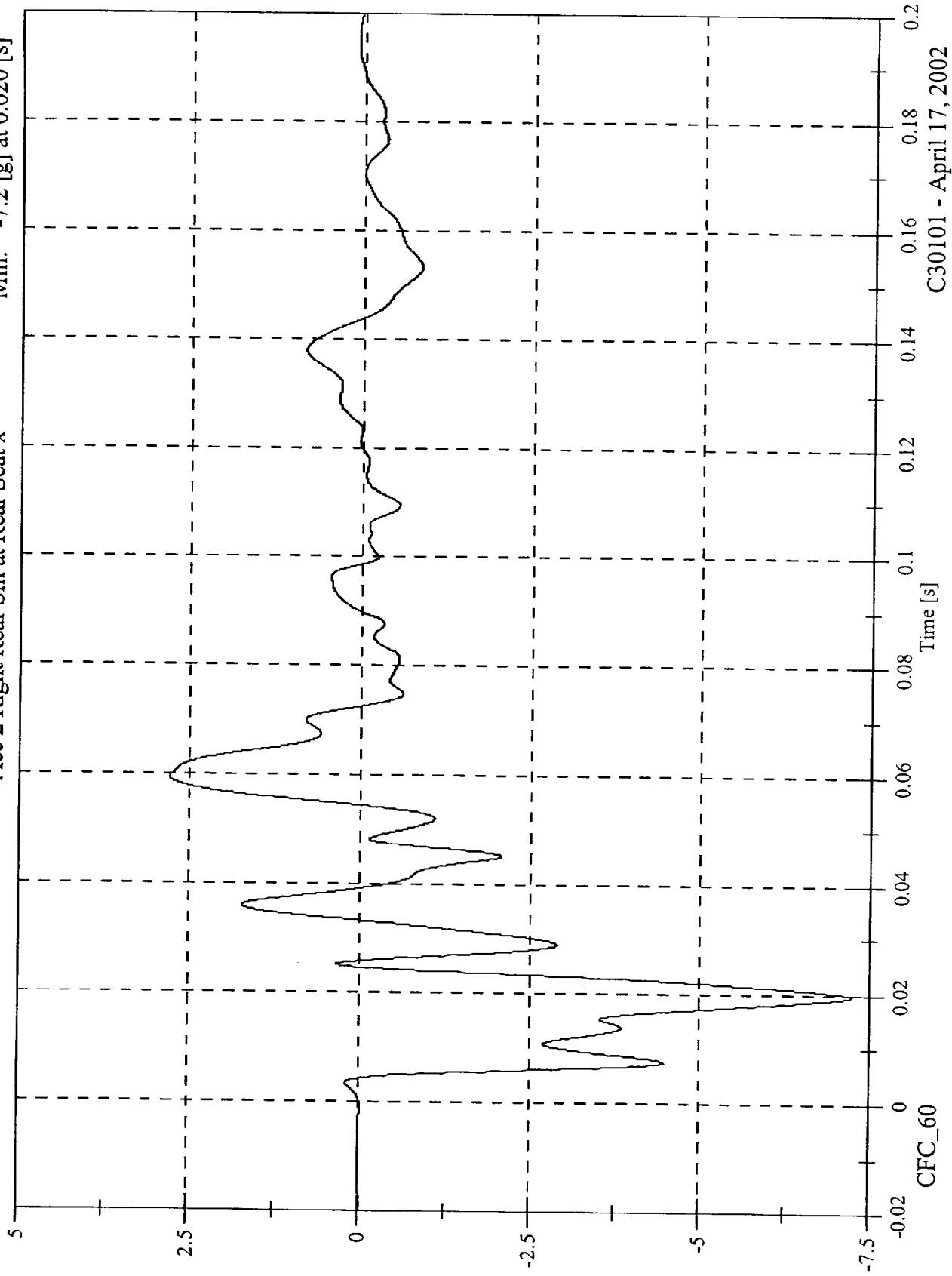
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 2.8 [g] at 0.059 [s]

Min: -7.2 [g] at 0.020 [s]

Acc 2 Right Rear Sill at Rear Seat x



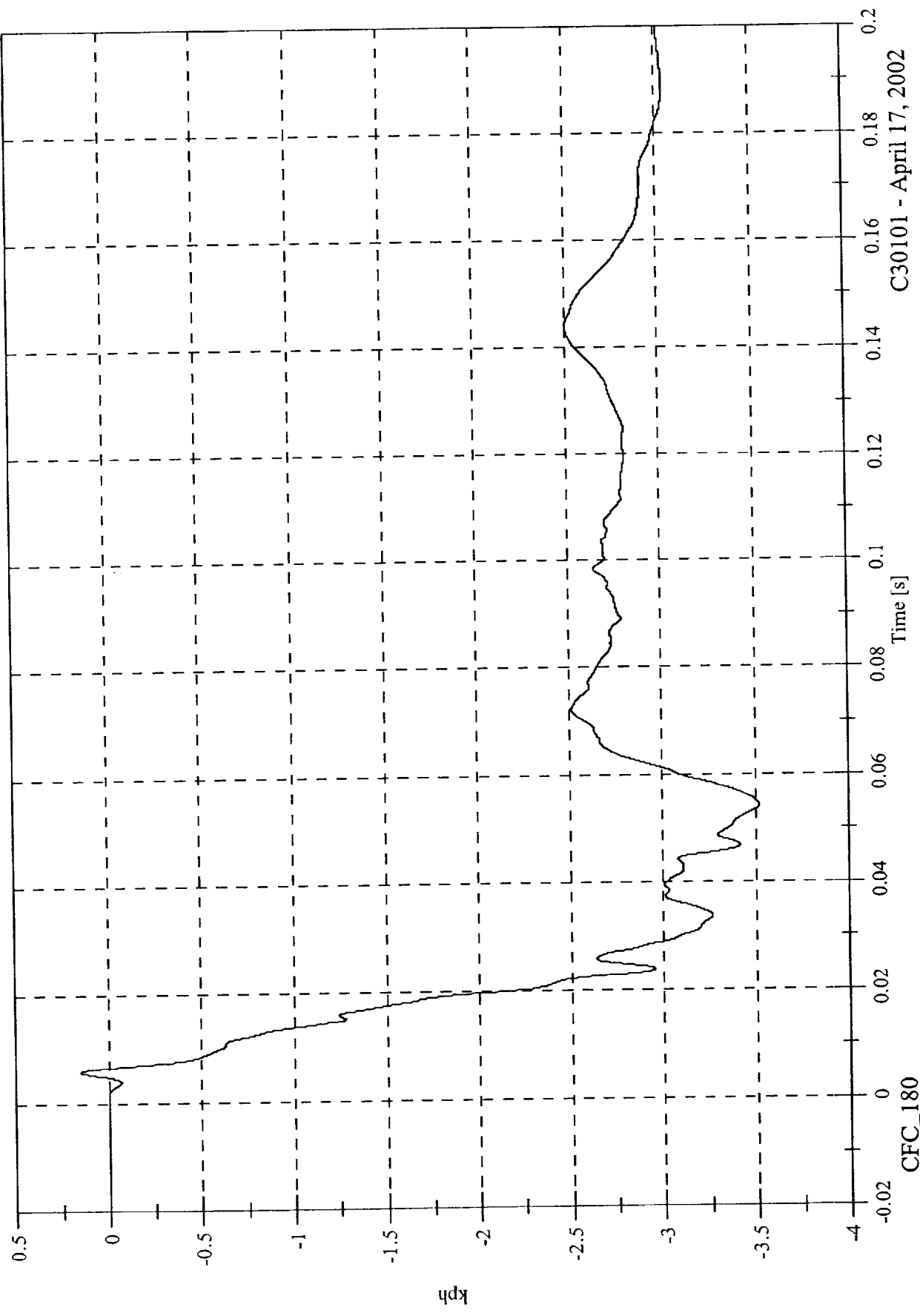
CFC_60

Time [s]

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS
Acc 2 Right Rear Sill at Rear Seat x Velocity

Max: 0.1 [kph] at 0.006 [s]
Min: -3.5 [kph] at 0.054 [s]



C30101 - April 17, 2002

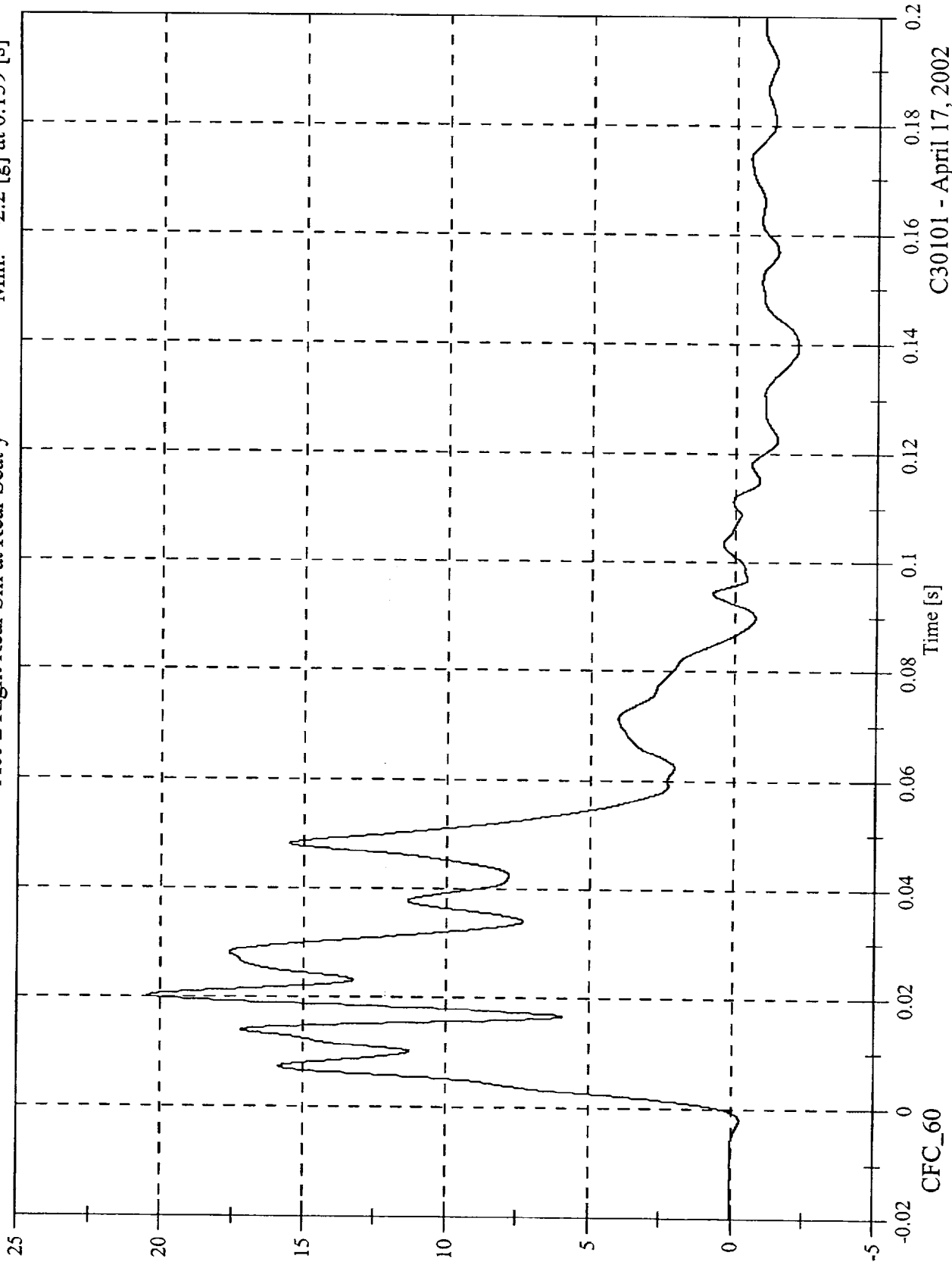
CFC_180

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 20.5 [g] at 0.020 [s]

Min: -2.2 [g] at 0.139 [s]

Acc 2 Right Rear Sill at Rear Seat y

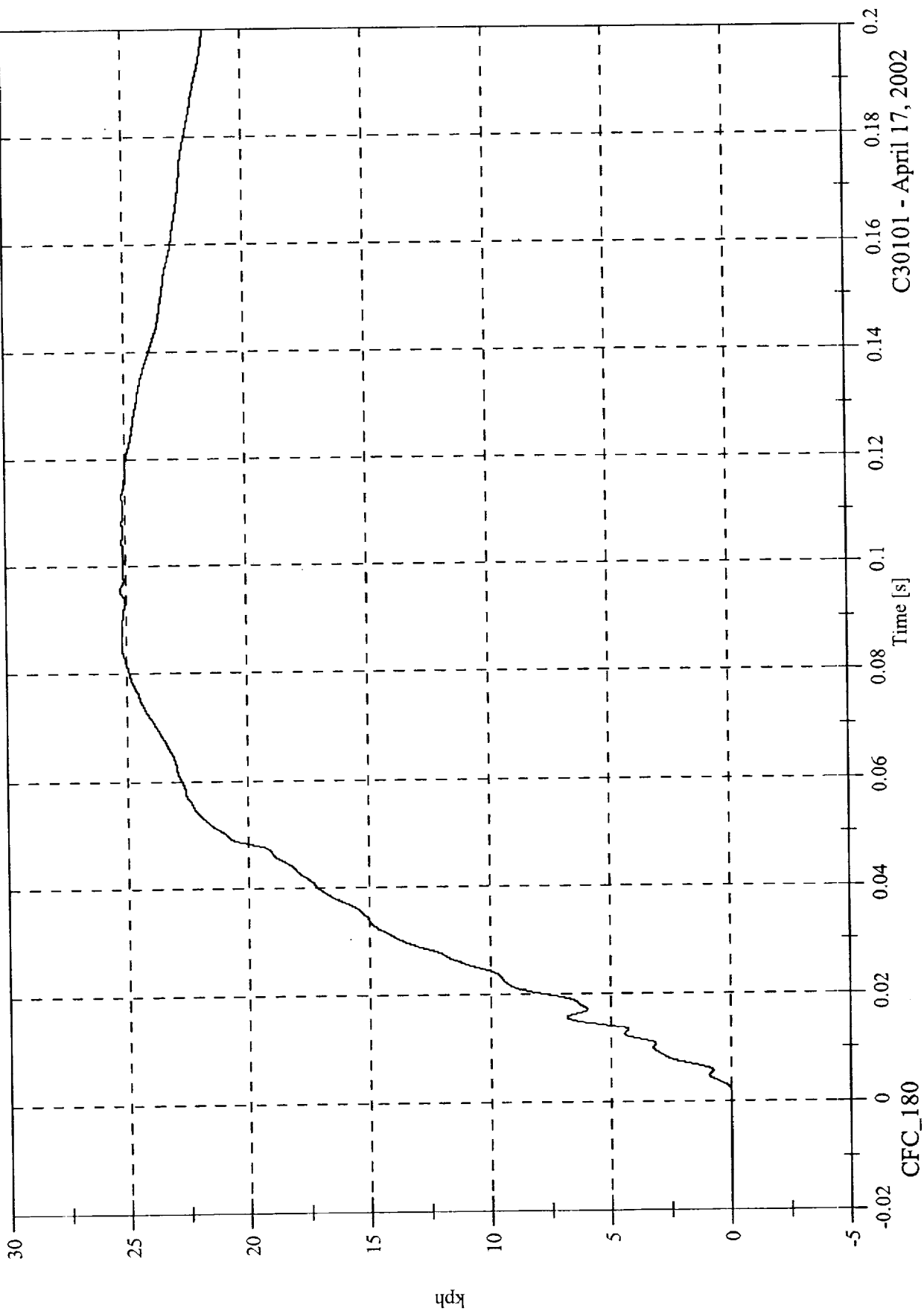


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 2 Right Rear Sill at Rear Seat y Velocity

Max: 25.3 [kph] at 0.096 [s]
Min: -0.0 [kph] at -0.020 [s]



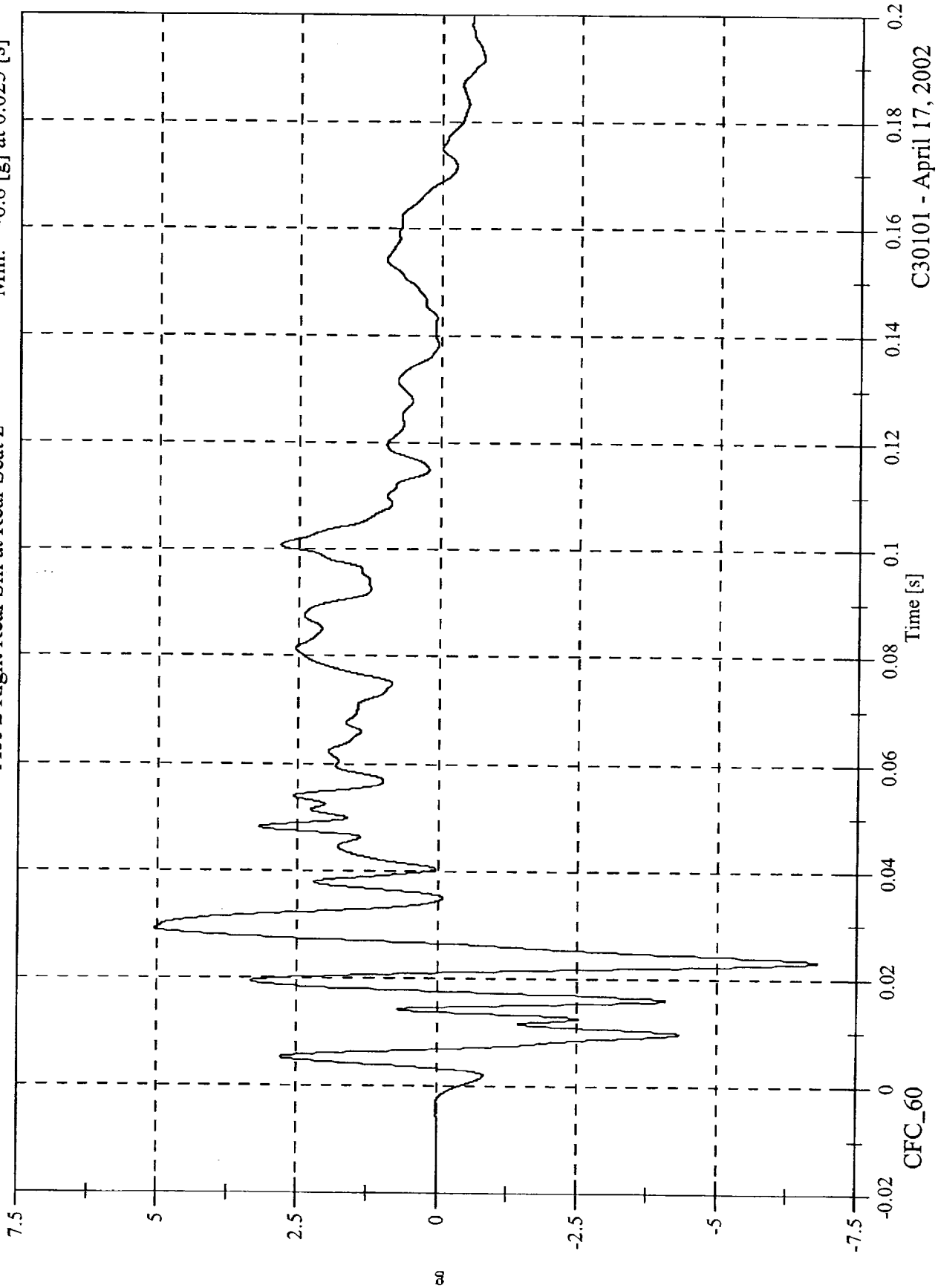
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 5.1 [g] at 0.029 [s]

Min: -6.8 [g] at 0.023 [s]

Acc 2 Right Rear Sill at Rear Seat z

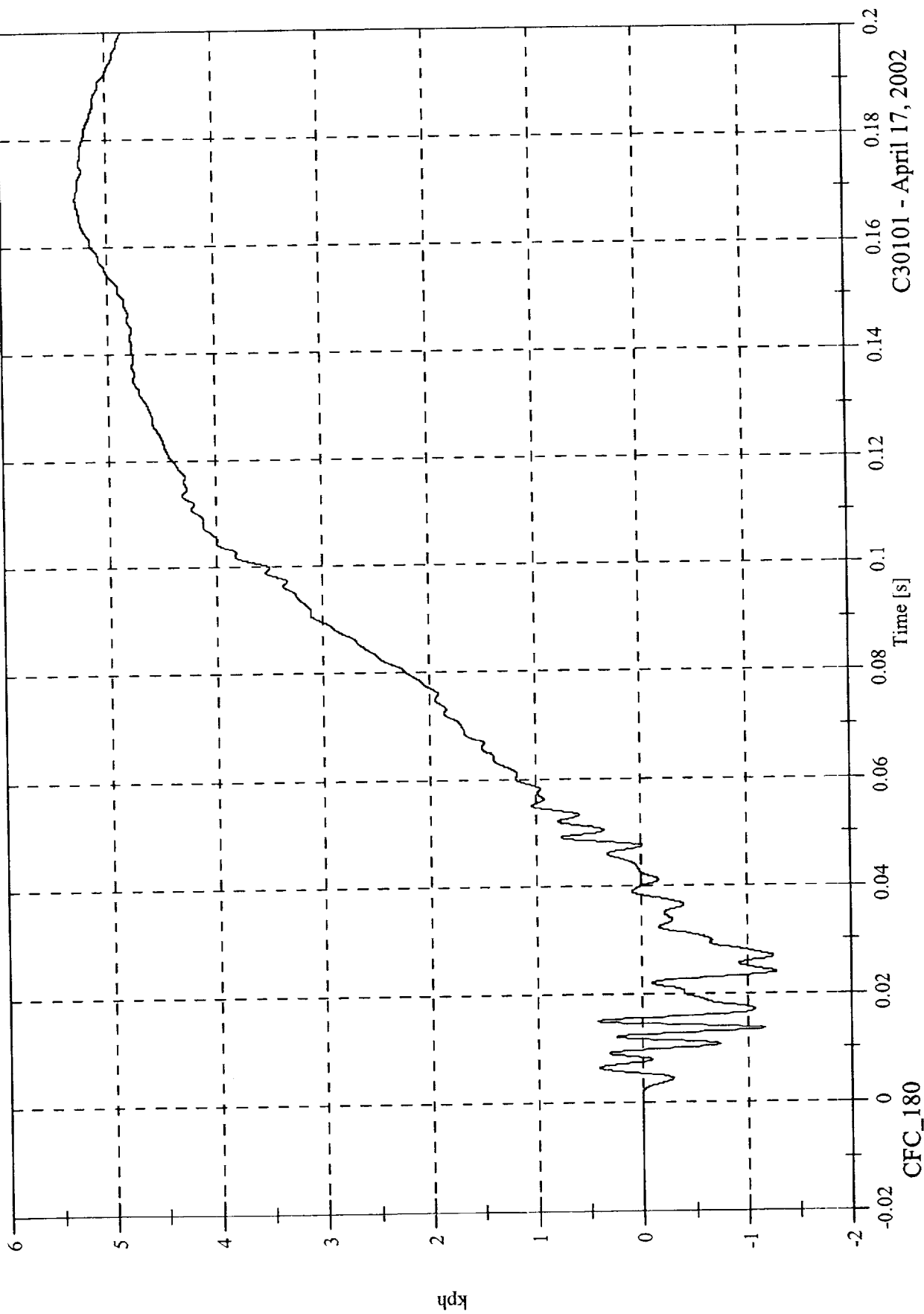


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 2 Right Rear Sill at Rear Seat z Velocity

Max: 5.3 [kph] at 0.169 [s]
Min: -1.3 [kph] at 0.024 [s]



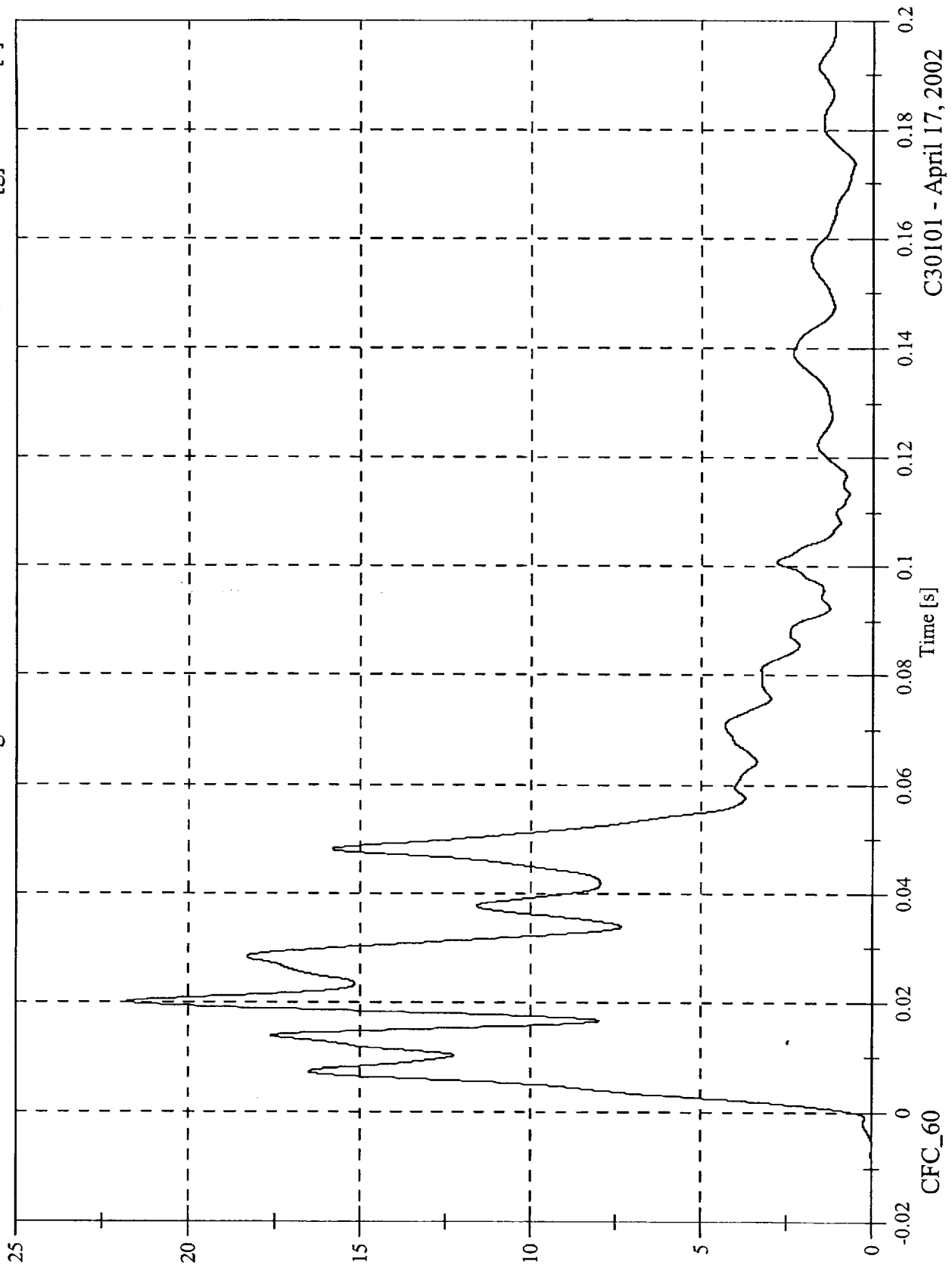
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 2 Right Rear Sill at Rear Seat Resultant

Max: 21.8 [g] at 0.020 [s]

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

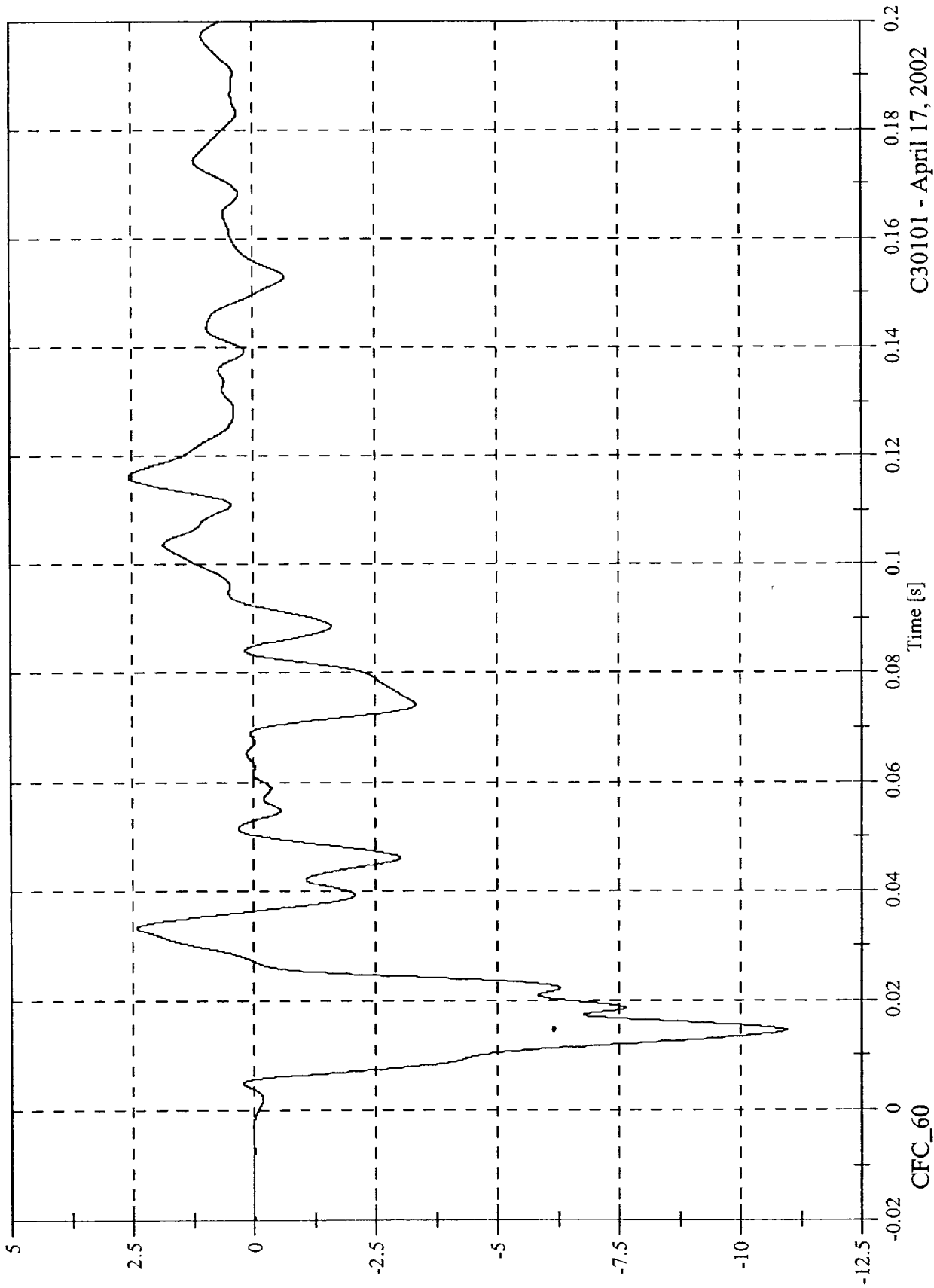


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 2.6 [g] at 0.116 [s]
Min: -10.9 [g] at 0.015 [s]

Acc 3 Rear Floorpan x

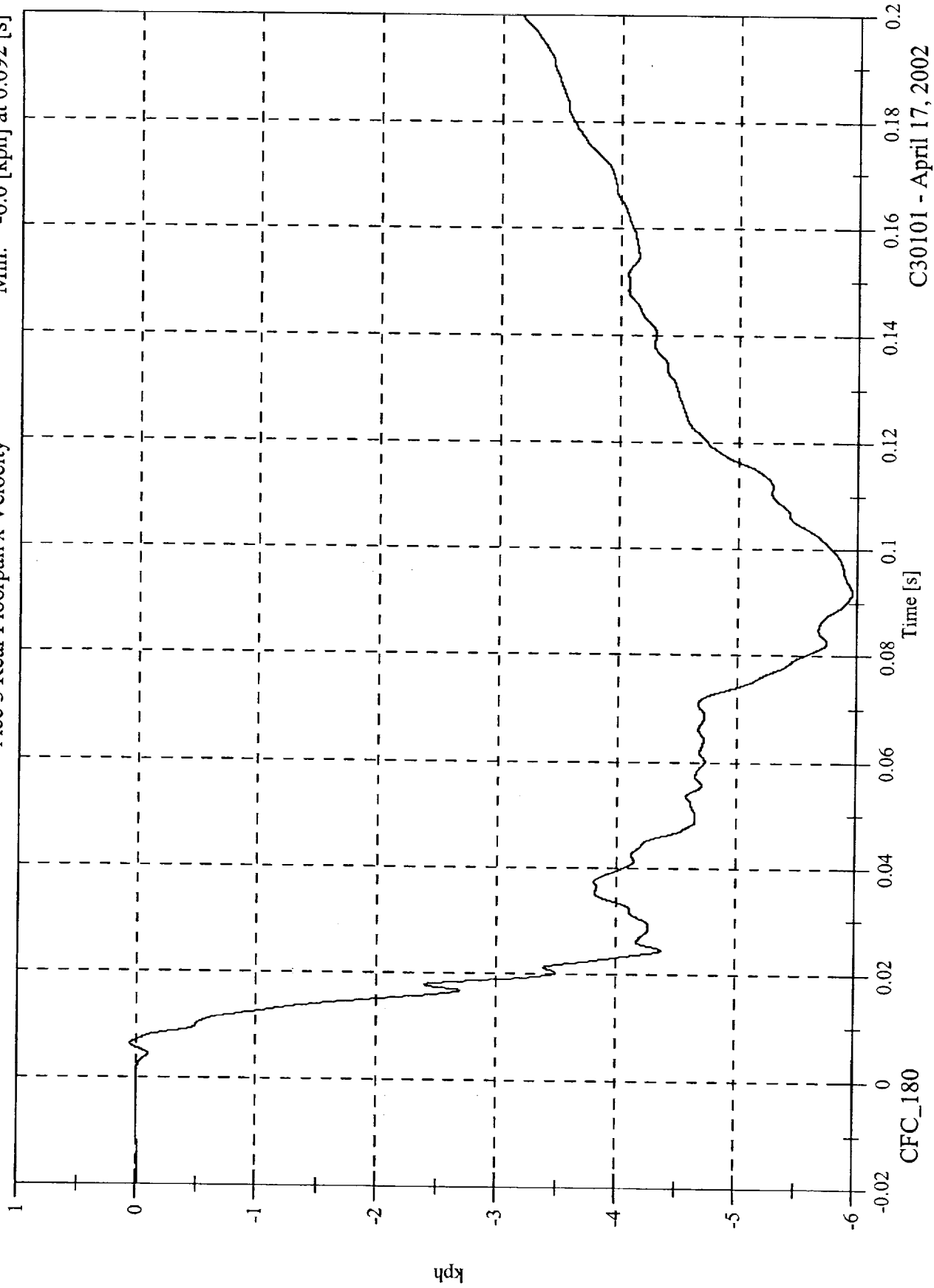


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 0.1 [kph] at 0.006 [s]
Min: -6.0 [kph] at 0.092 [s]

Acc 3 Rear Floorpan x Velocity

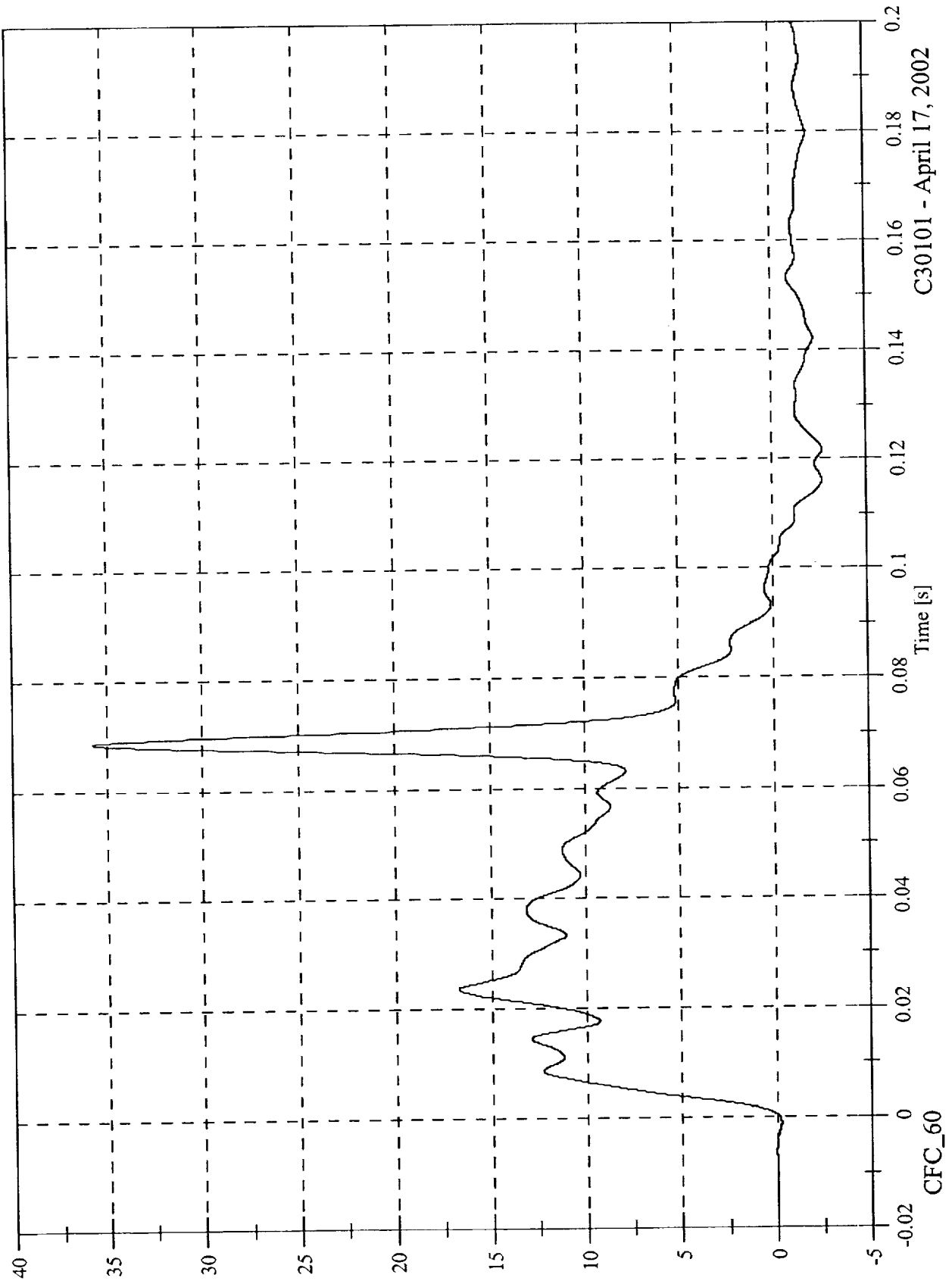


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 3 Rear Floorpan y

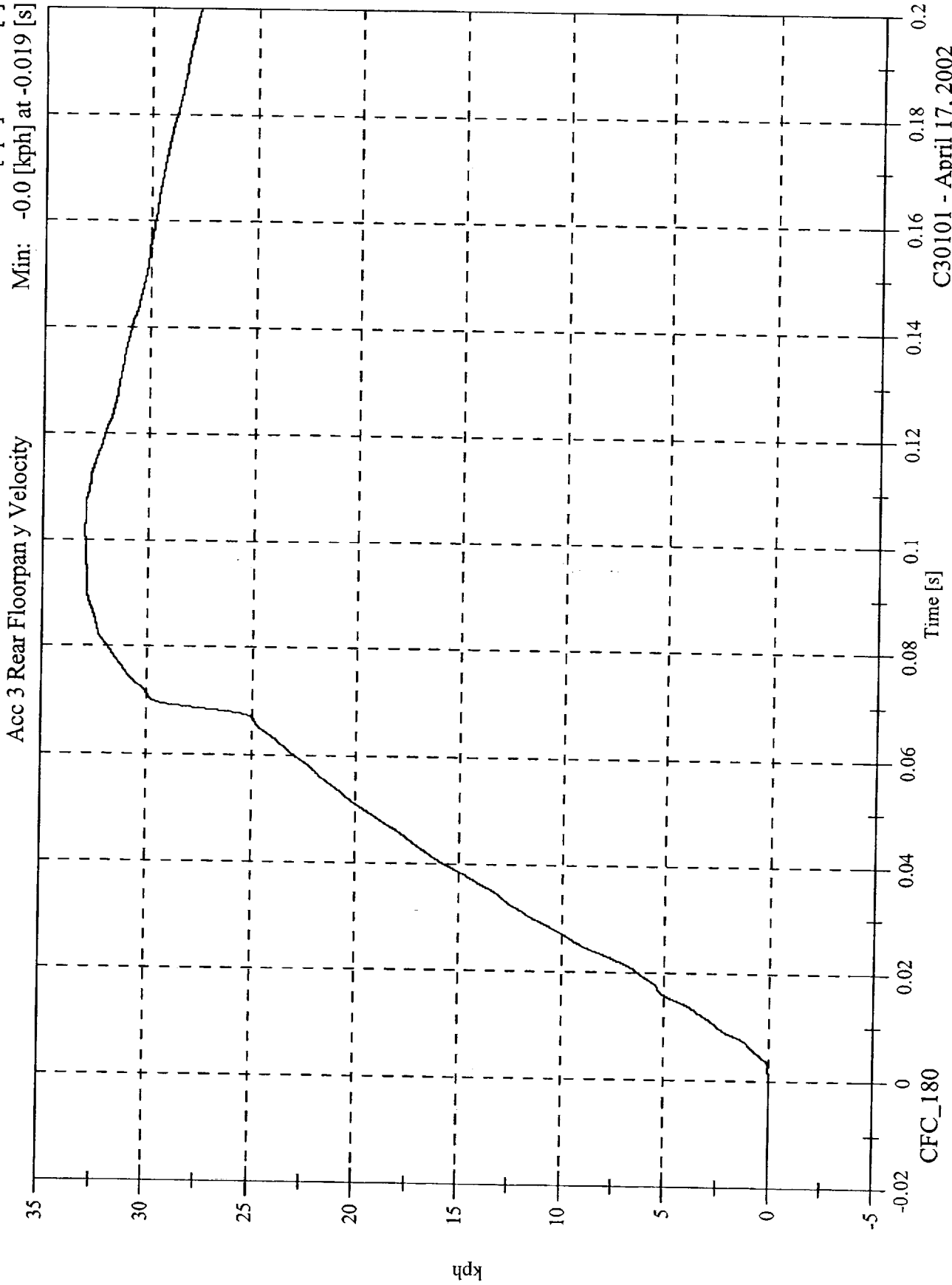
Max: 35.8 [g] at 0.069 [s]
Min: -2.7 [g] at 0.122 [s]



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FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 33.0 [kph] at 0.102 [s]
Min: -0.0 [kph] at -0.019 [s]

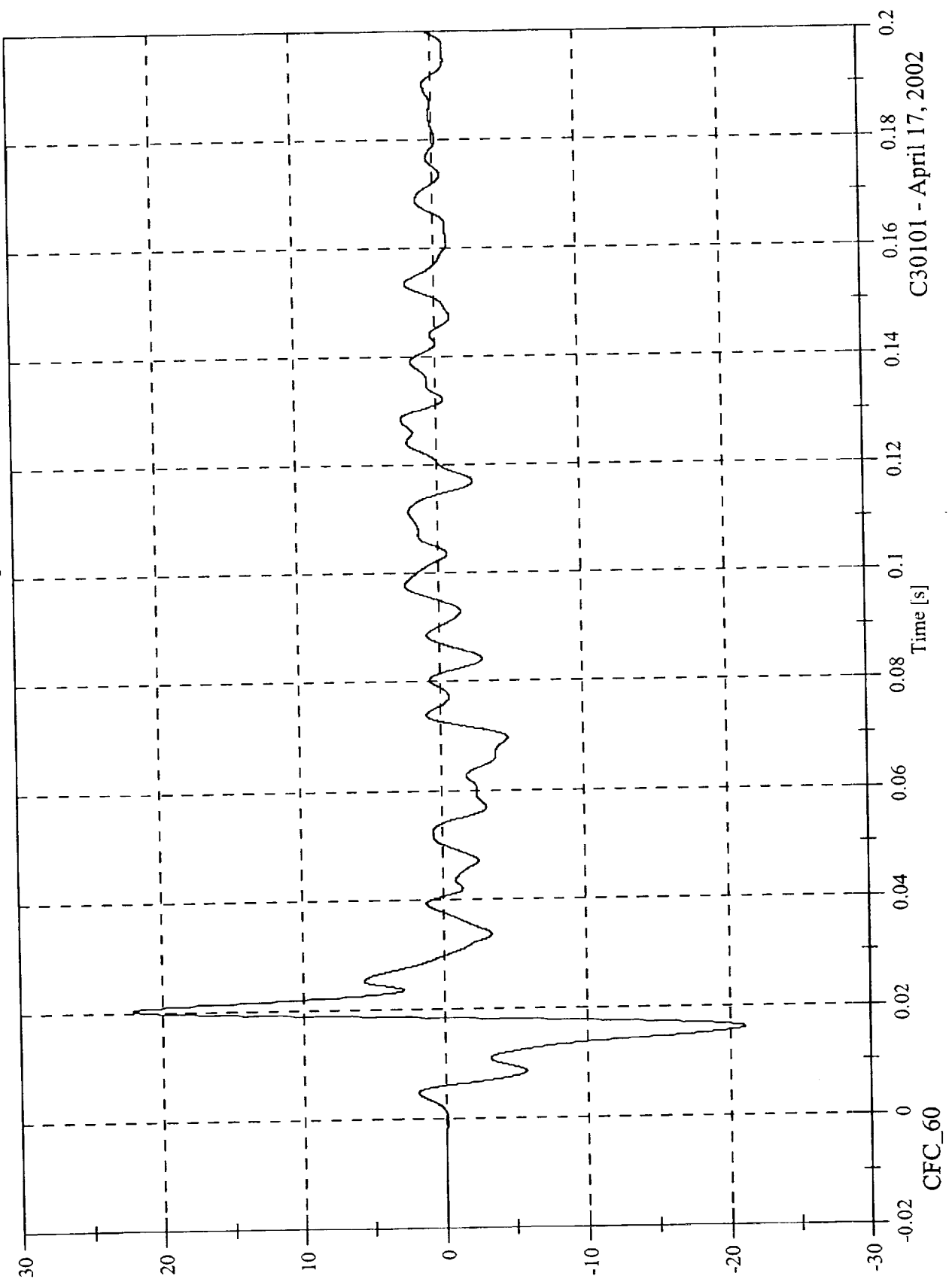


C30101 - April 17, 2002

Max: 22.1 [g] at 0.020 [s]
Min: -21.1 [g] at 0.016 [s]

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 3 Rear Floorpan z



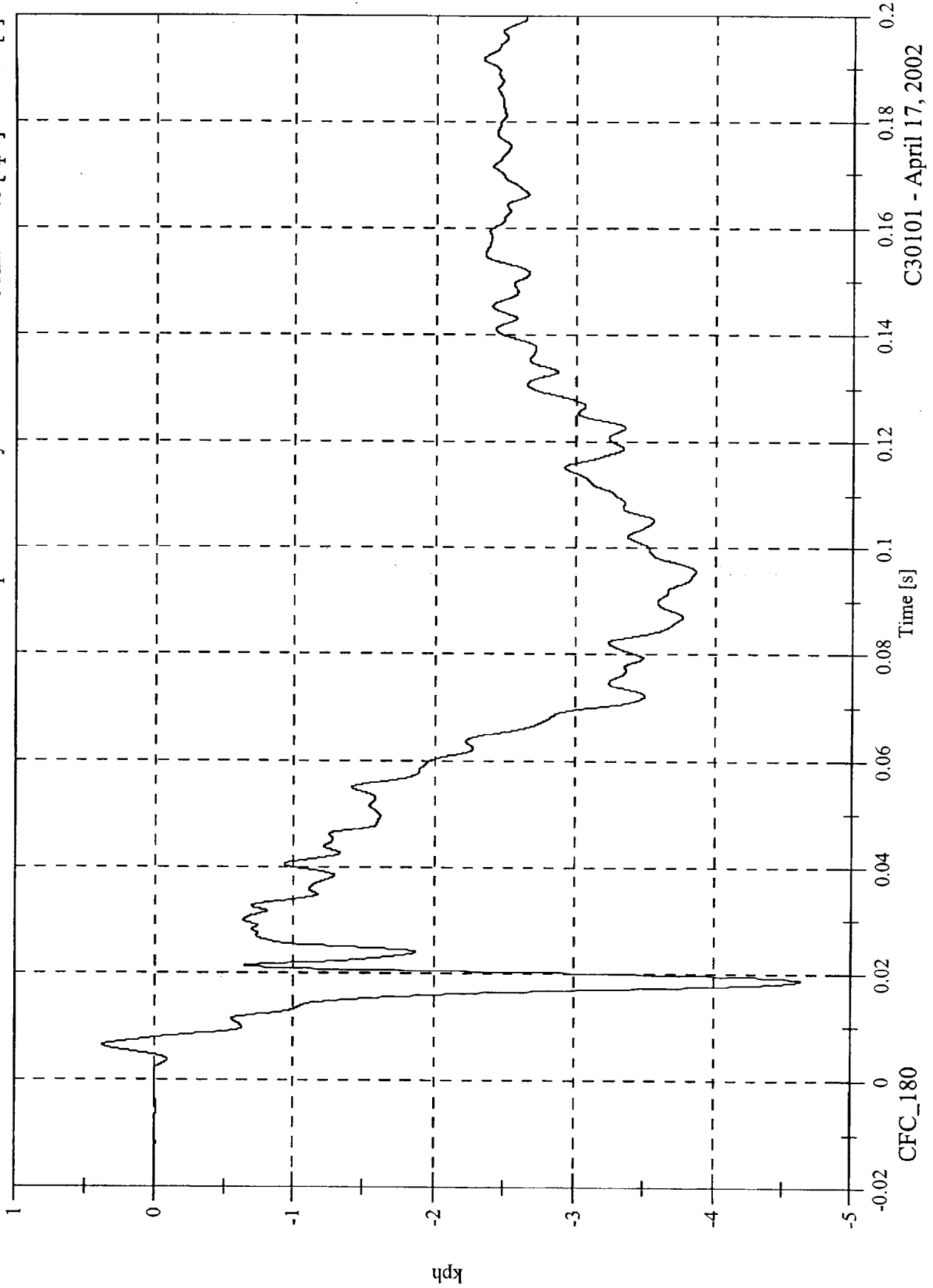
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 3 Rear Floorpan z Velocity

Max: 0.4 [kph] at 0.006 [s]

Min: -4.6 [kph] at 0.019 [s]



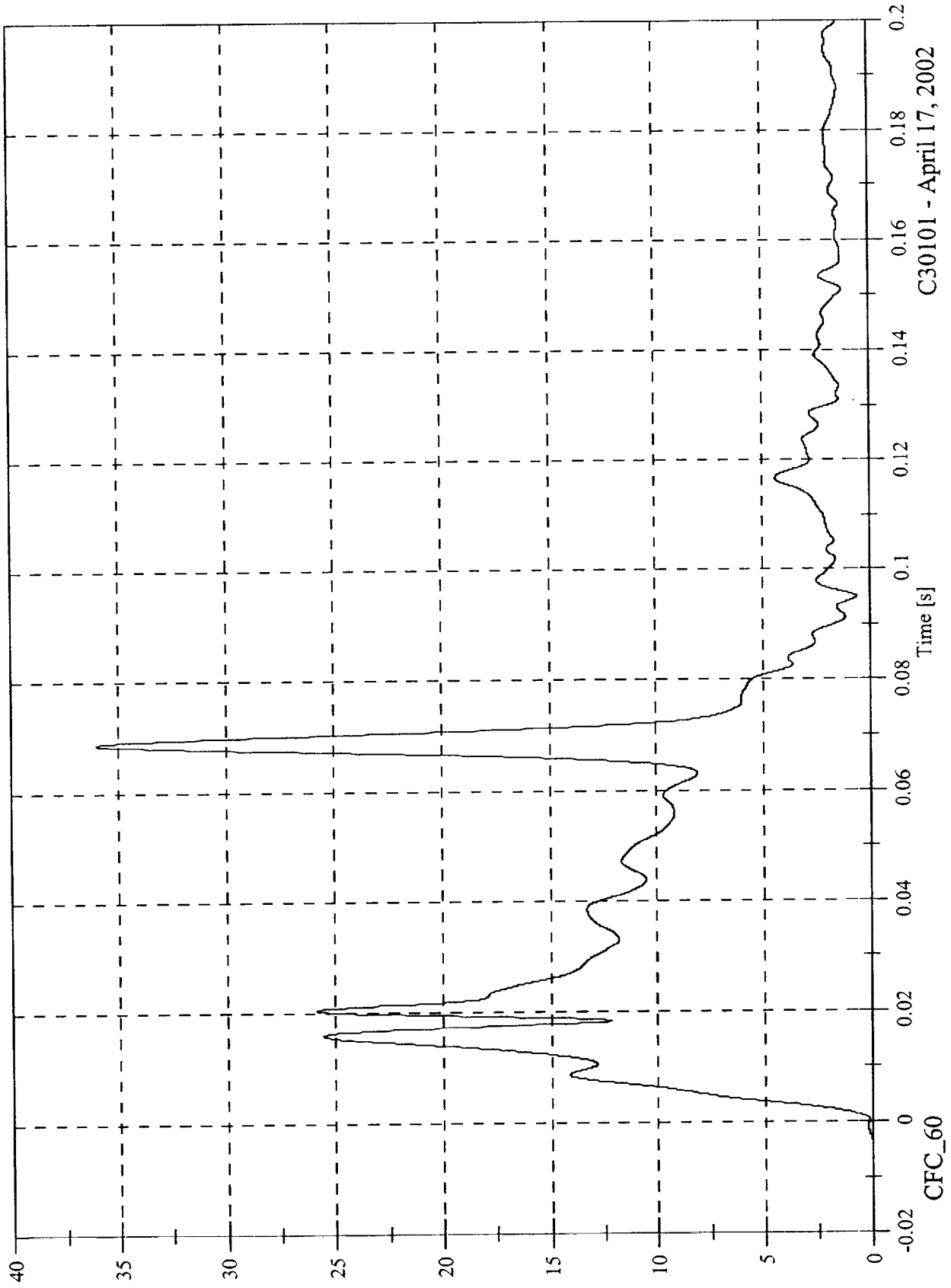
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 3 Rear Floorpan Resultant

Max: 36.0 [g] at 0.069 [s]

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



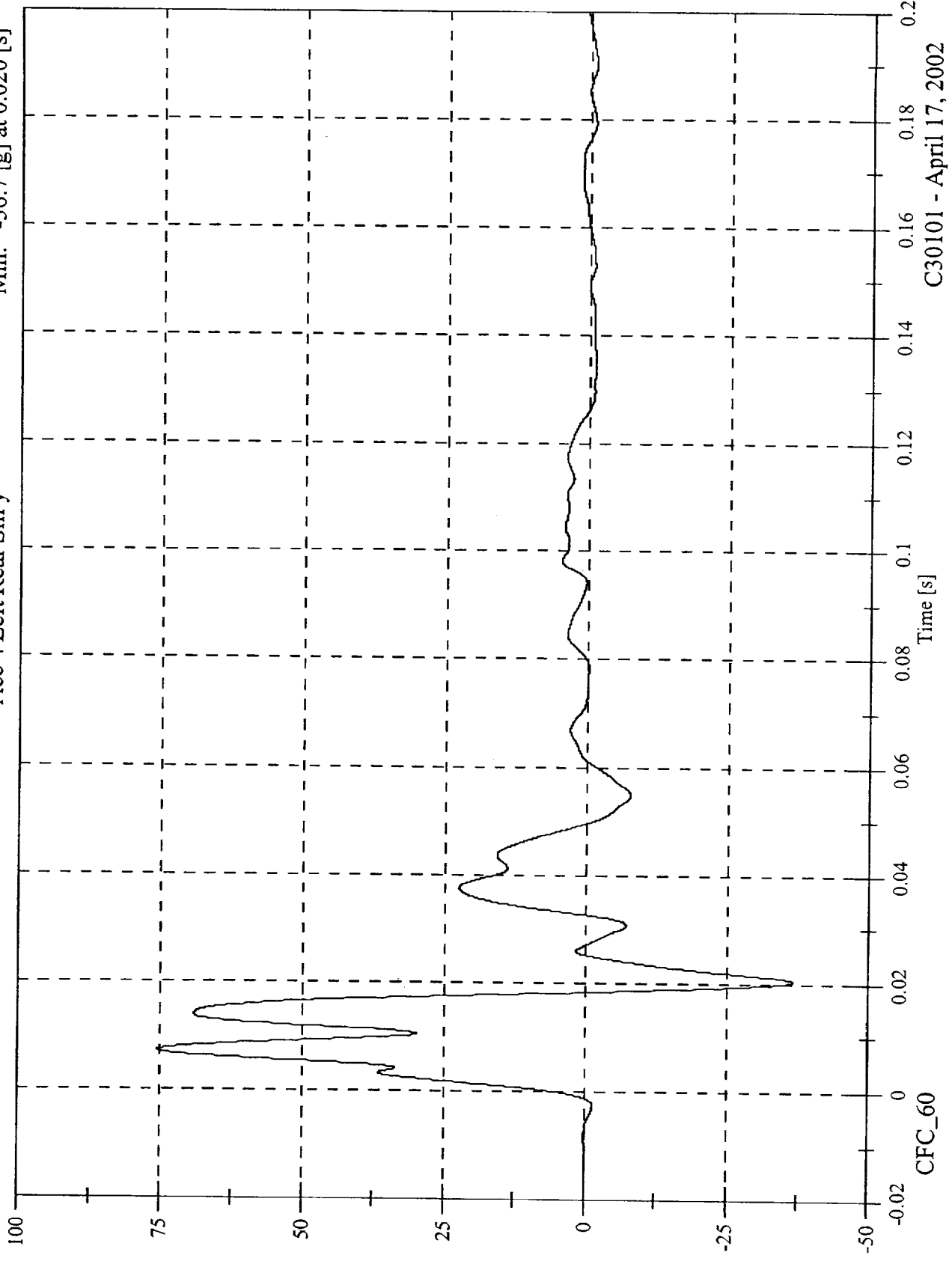
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 75.6 [g] at 0.007 [s]

Min: -36.7 [g] at 0.020 [s]

Acc 4 Left Rear Sill y



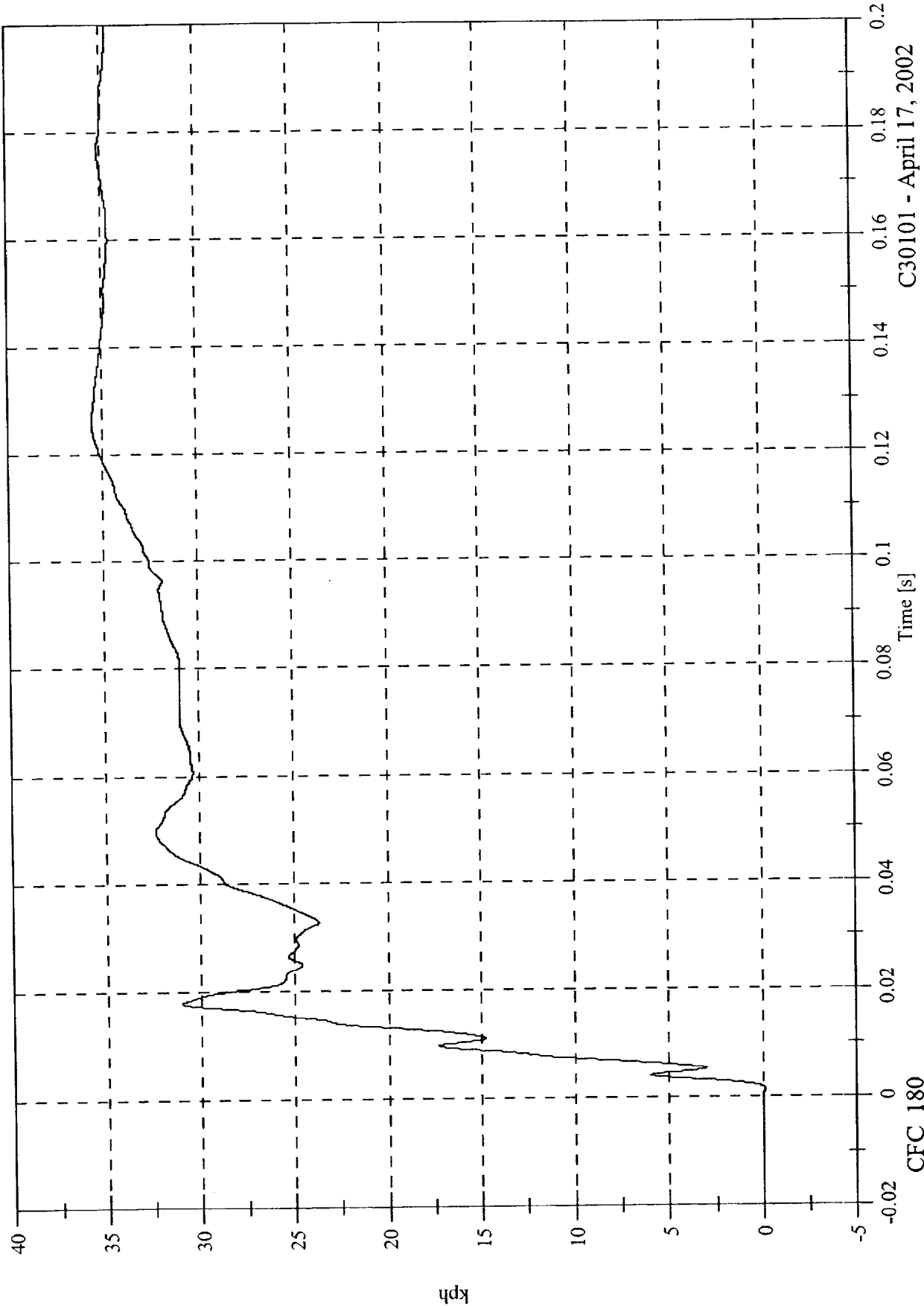
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 35.5 [kph] at 0.125 [s]

Min: -0.1 [kph] at 0.001 [s]

Acc 4 Left Rear Sill y Velocity

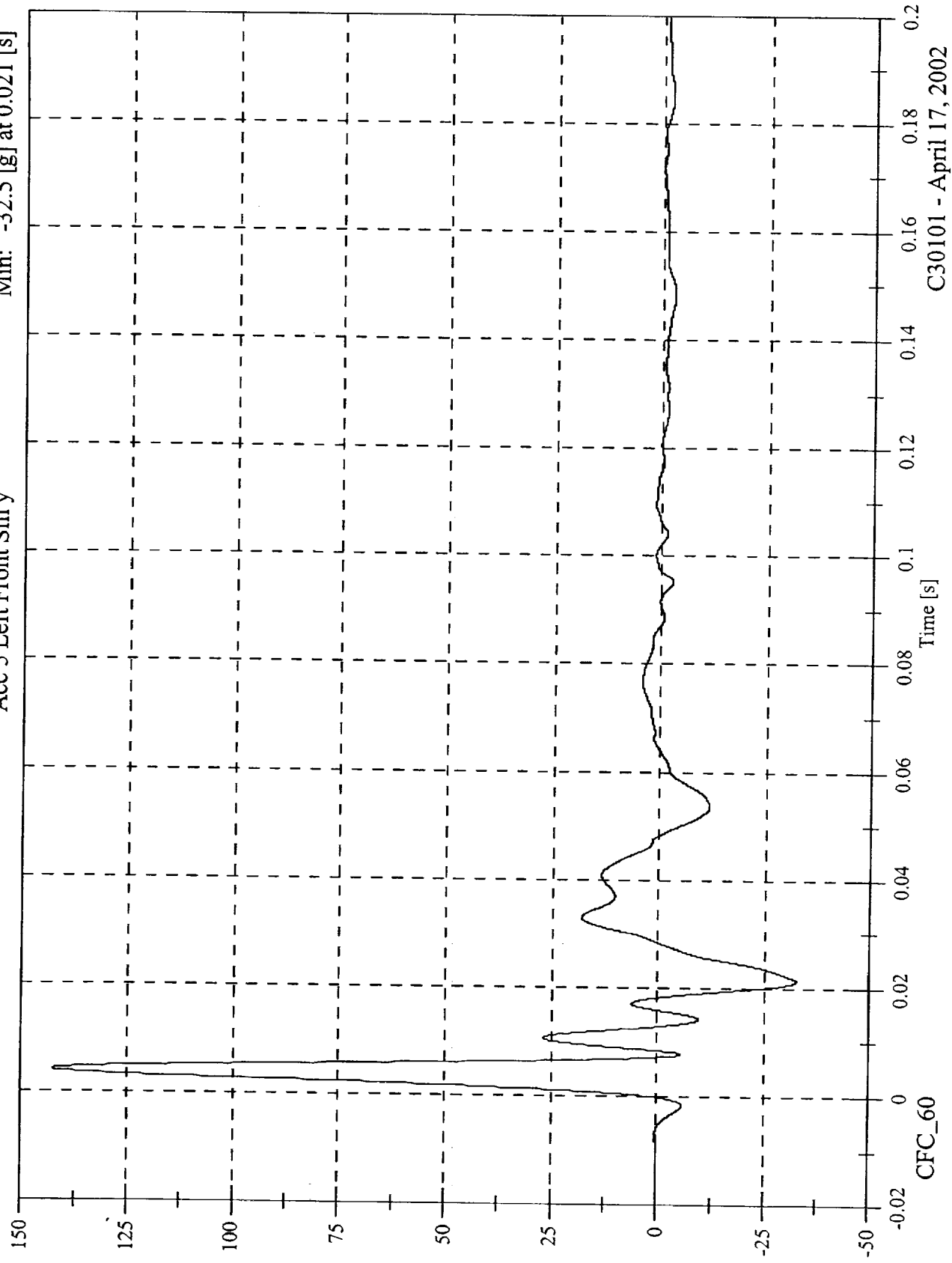


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 142.6 [g] at 0.004 [s]
Min: -32.5 [g] at 0.021 [s]

Acc 5 Left Front Sill y



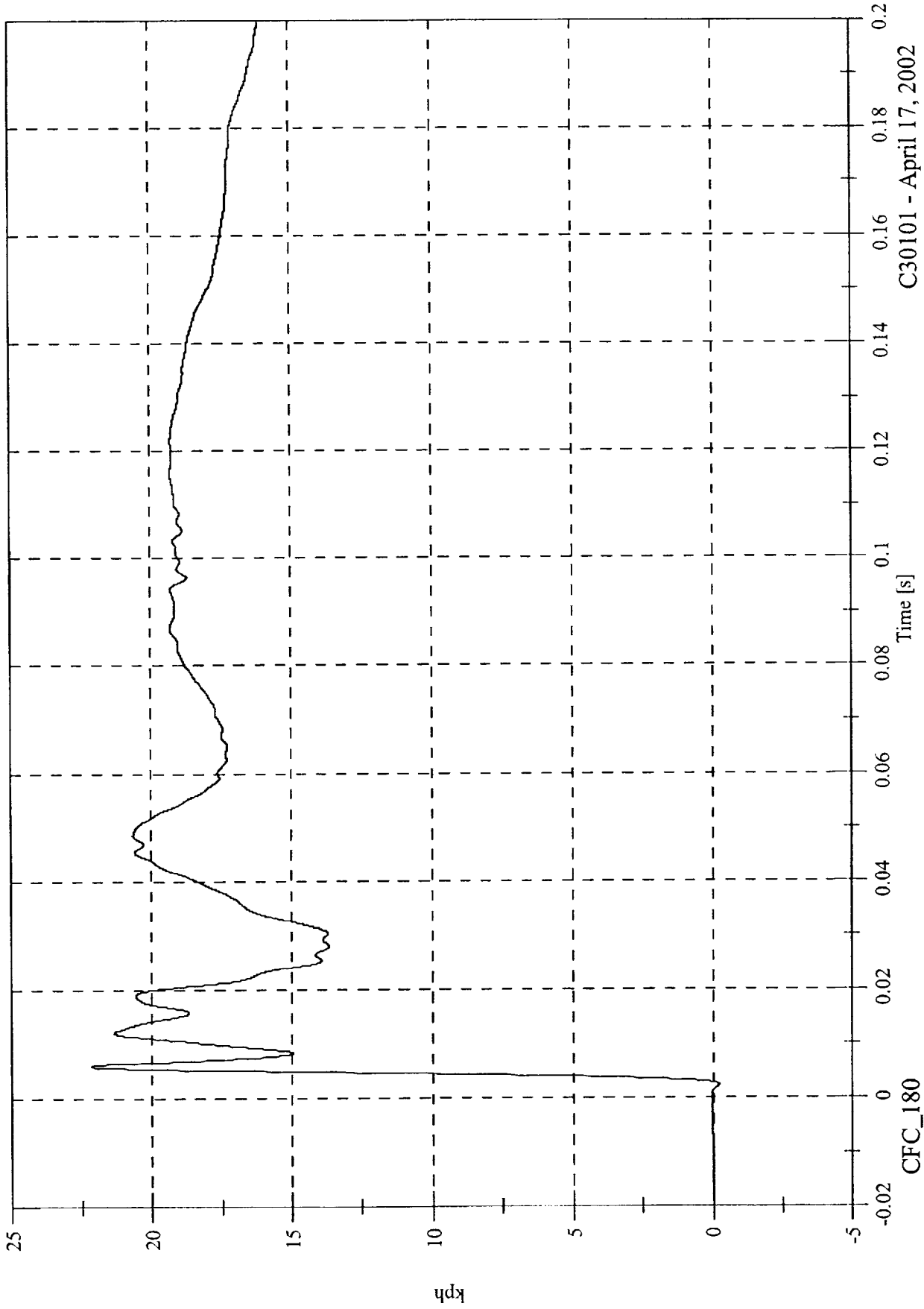
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 22.2 [kph] at 0.006 [s]

Min: -0.2 [kph] at 0.002 [s]

Acc 5 Left Front Sill y Velocity



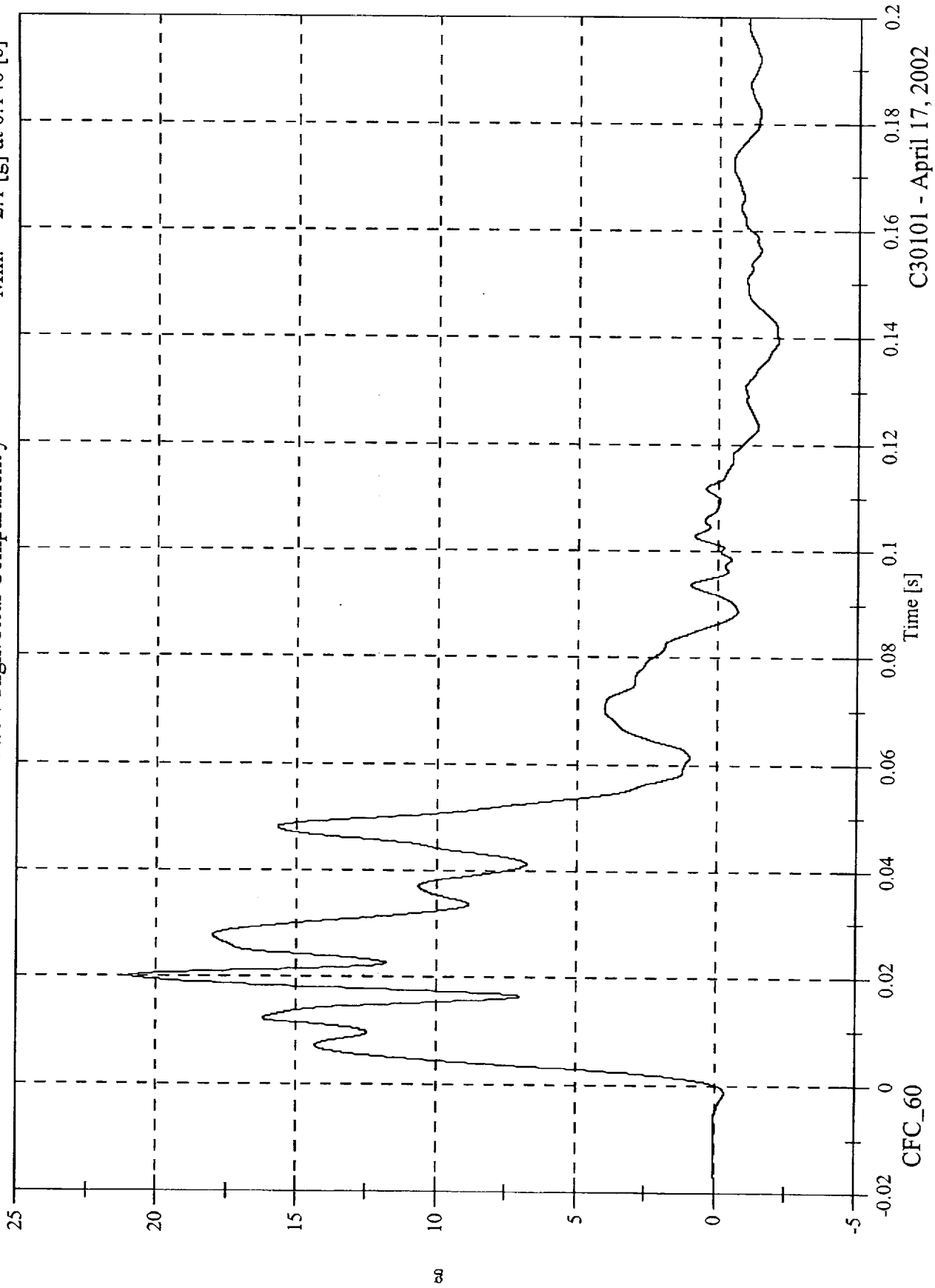
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 21.0 [g] at 0.020 [s]

Min: -2.1 [g] at 0.140 [s]

Acc 7 Right Rear Compartment y



CFC_60

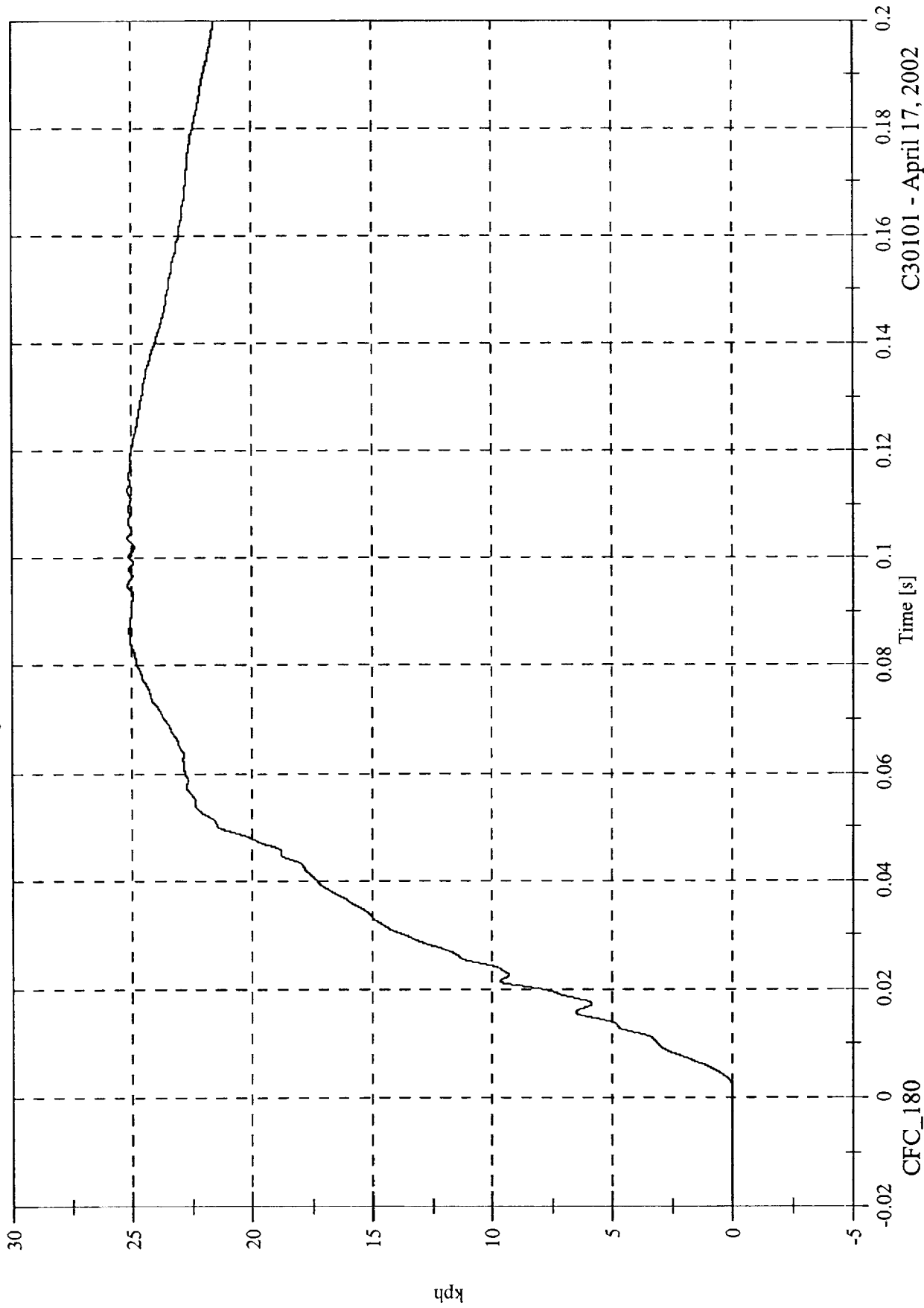
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 7 Right Rear Compartment y Velocity

Max: 25.2 [kph] at 0.113 [s]

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



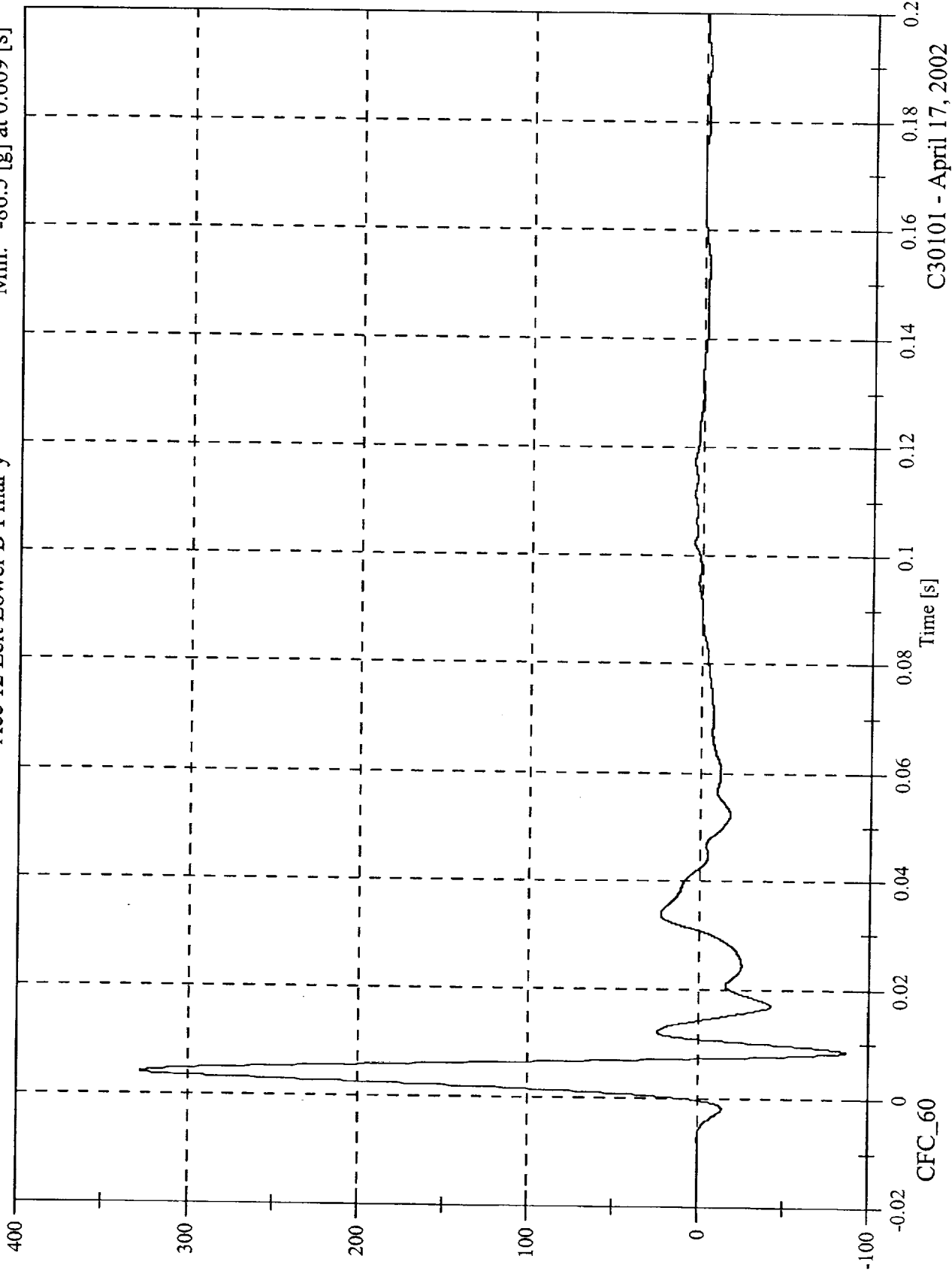
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 327.8 [g] at 0.004 [s]

Min: -86.5 [g] at 0.009 [s]

Acc 12 Left Lower B-Pillar y

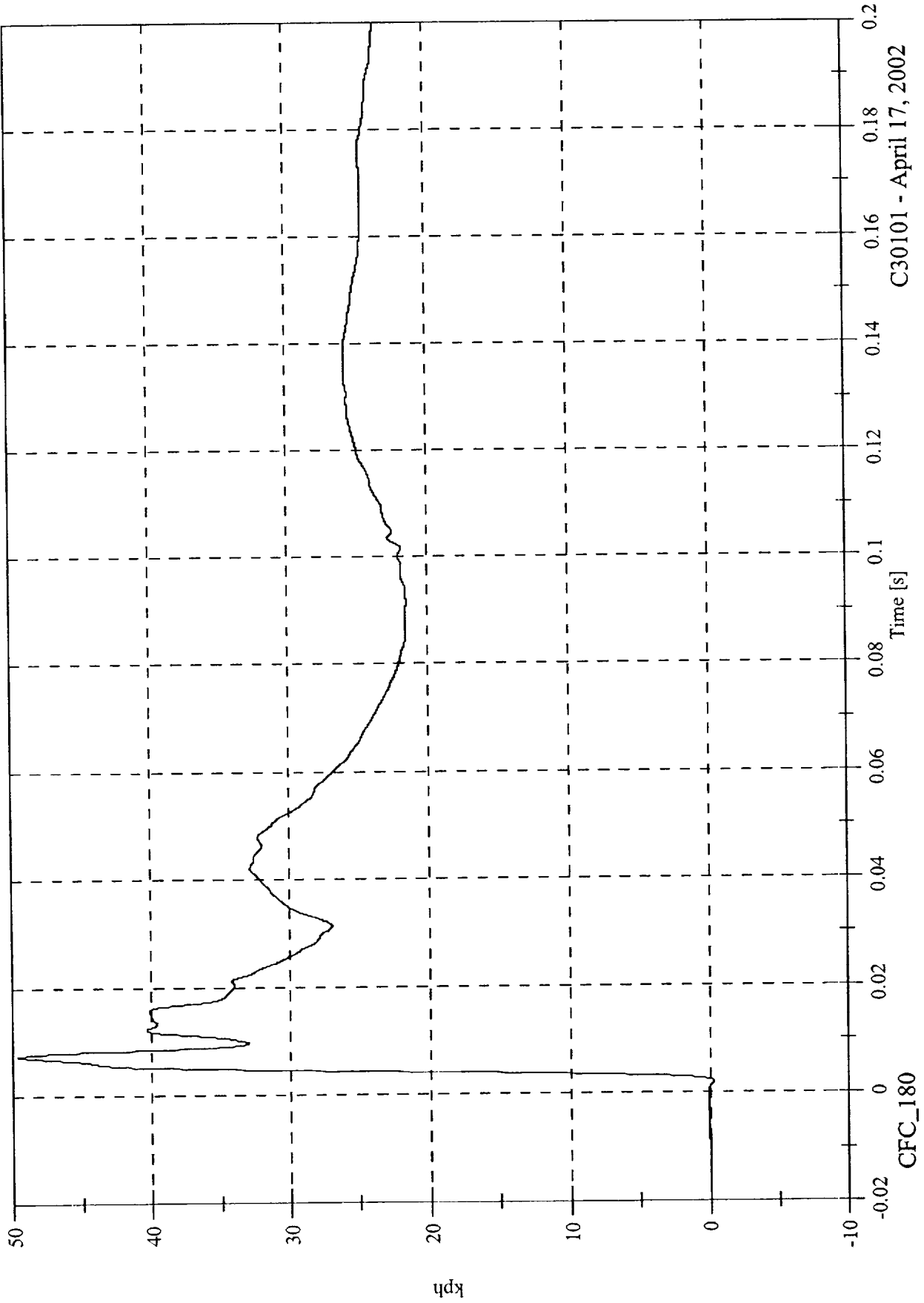


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FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 12 Left Lower B-Pillar y Velocity

Max: 49.7 [kph] at 0.007 [s]
Min: -0.3 [kph] at 0.002 [s]



C30101 - April 17, 2002

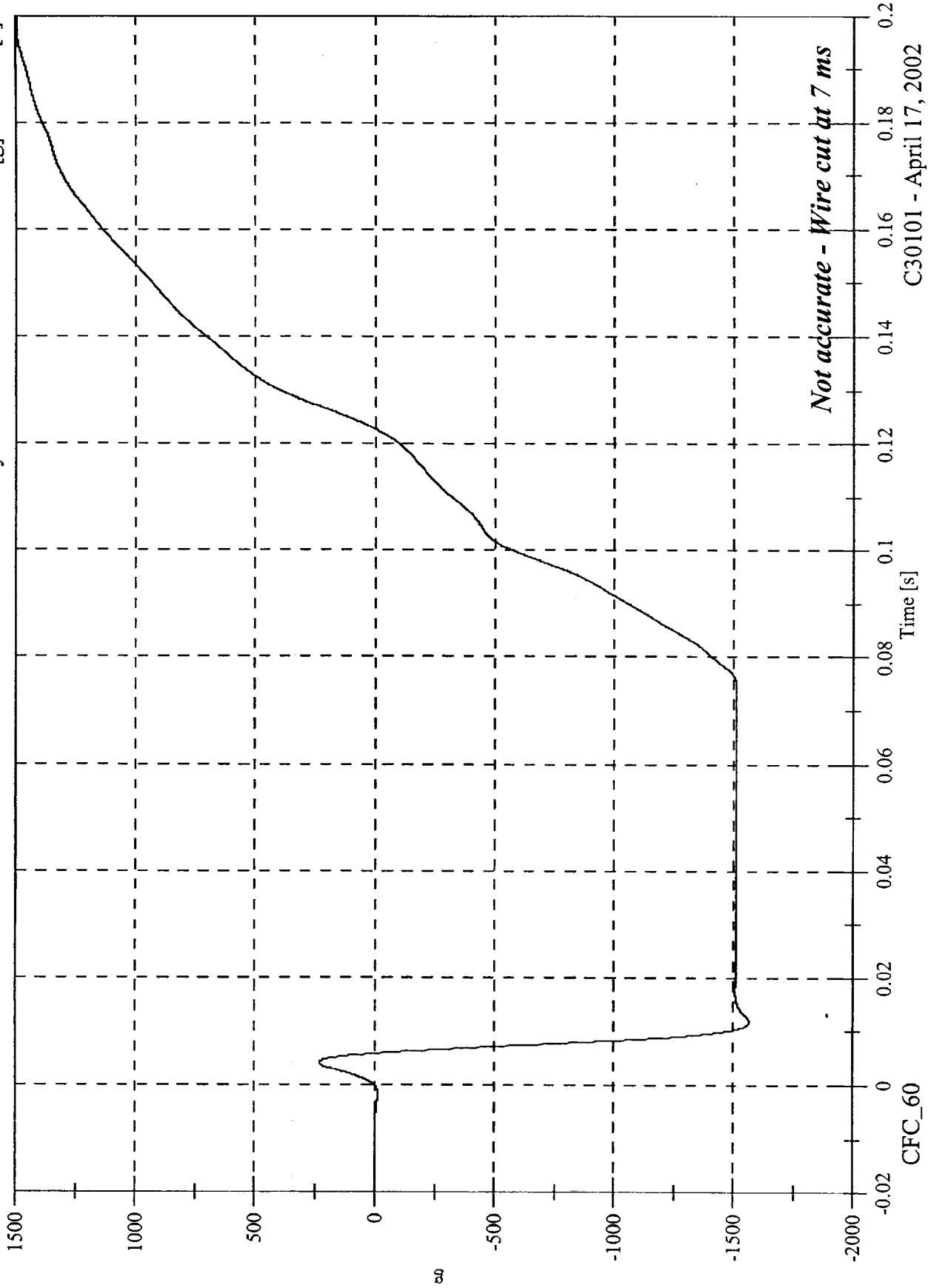
CFC_180

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 13 Left Middle B-Pillar y

Max: 1496.8 [g] at 0.198 [s]

Min: -1565.5 [g] at 0.012 [s]



Not accurate - Wire cut at 7 ms

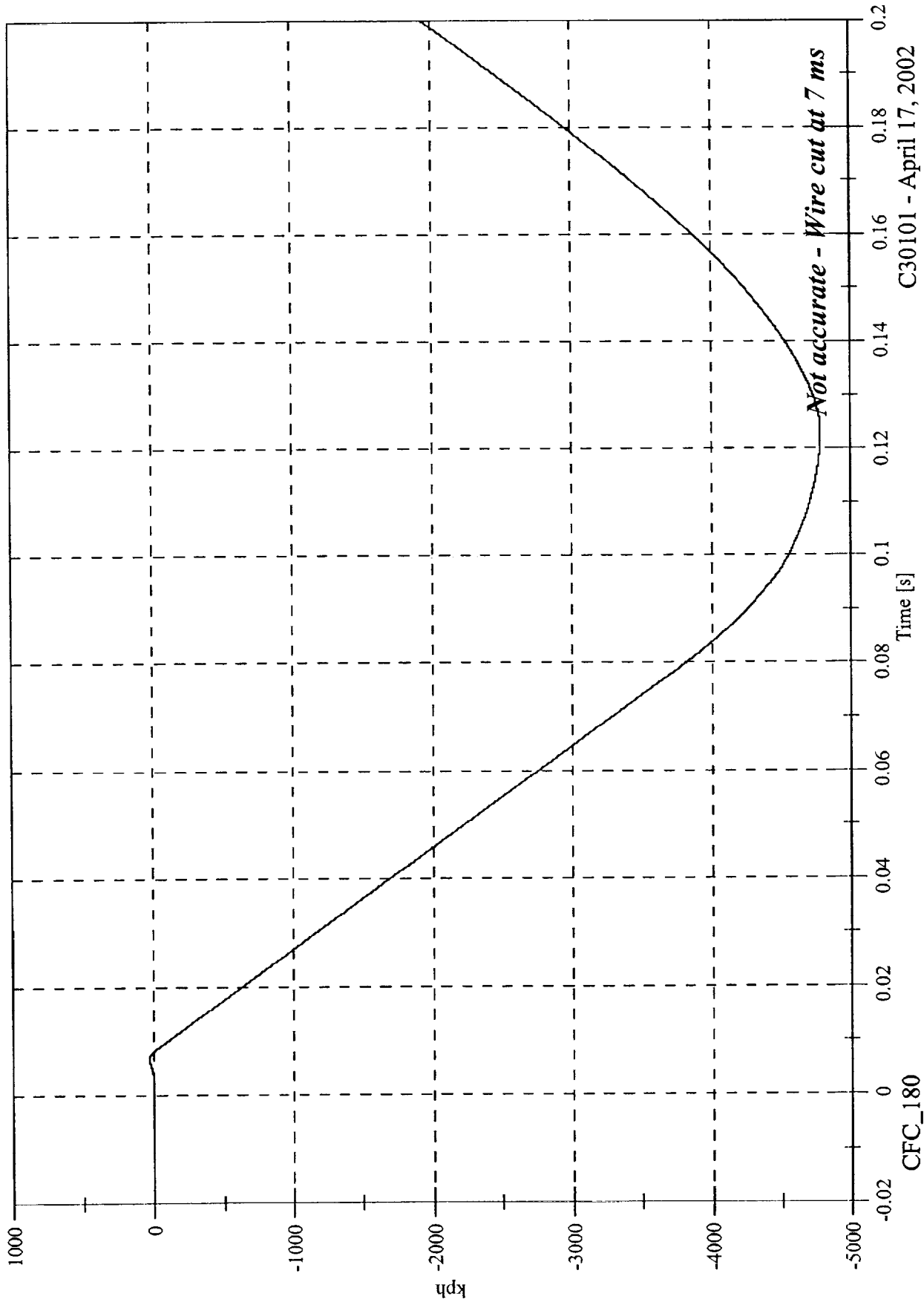
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 13 Left Middle B-Pillar y Velocity

Max: 33.7 [kph] at 0.007 [s]

Min: -4783.7 [kph] at 0.123 [s]

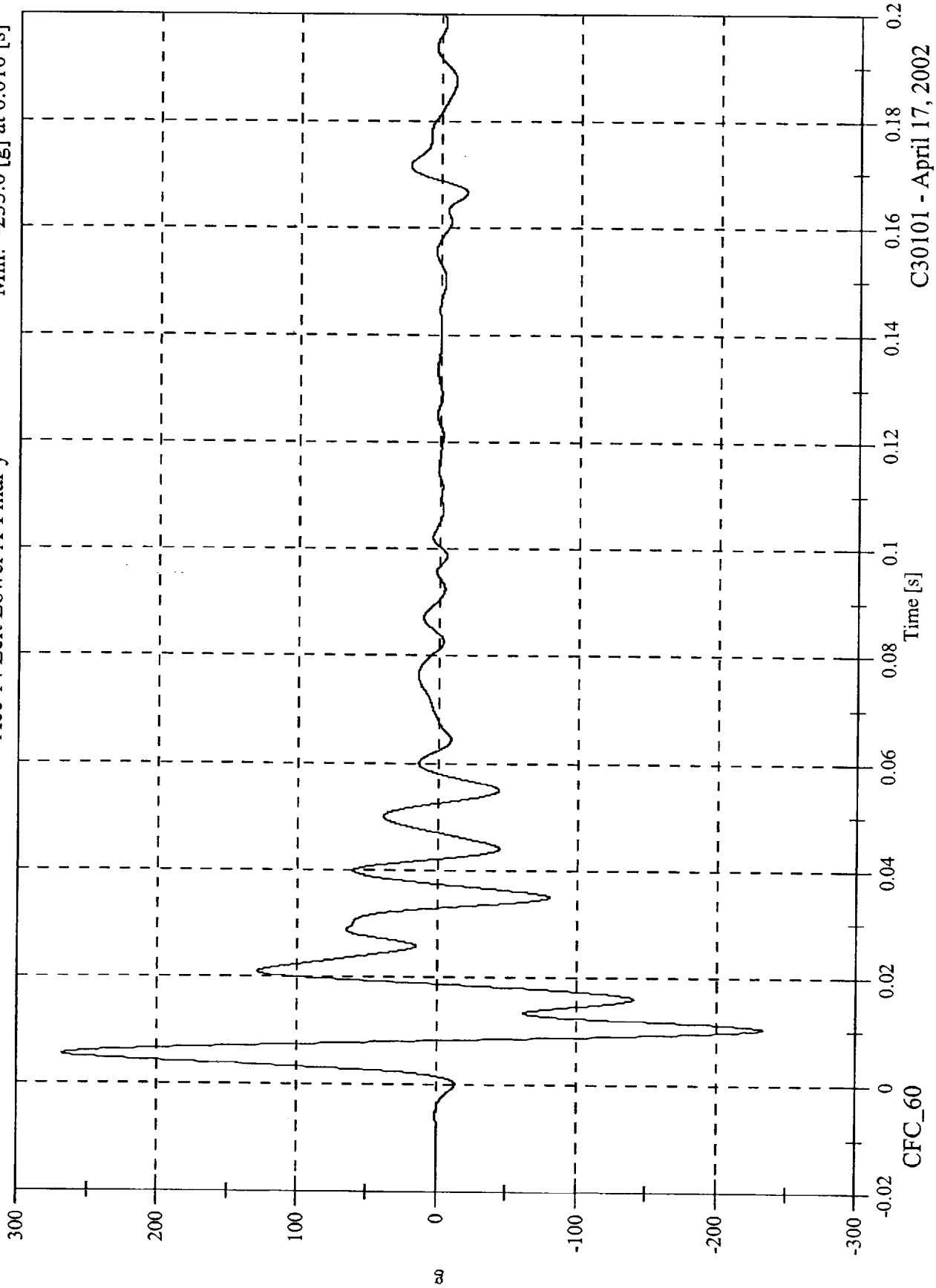


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 268.3 [g] at 0.006 [s]
Min: -233.0 [g] at 0.010 [s]

Acc 14 Left Lower A-Pillar y



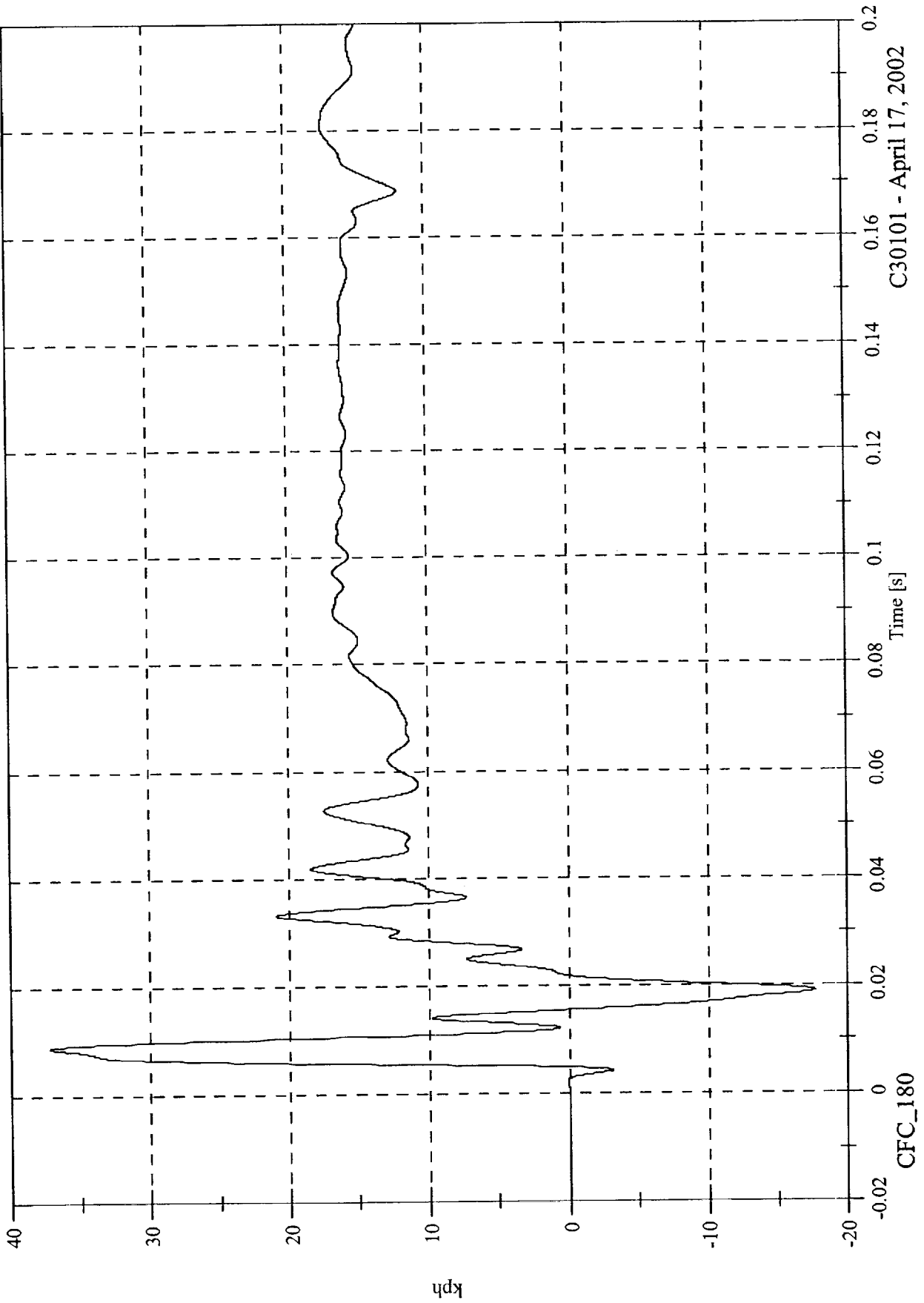
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 14 Left Lower A-Pillar y Velocity

Max: 37.3 [kph] at 0.009 [s]

Min: -17.6 [kph] at 0.019 [s]



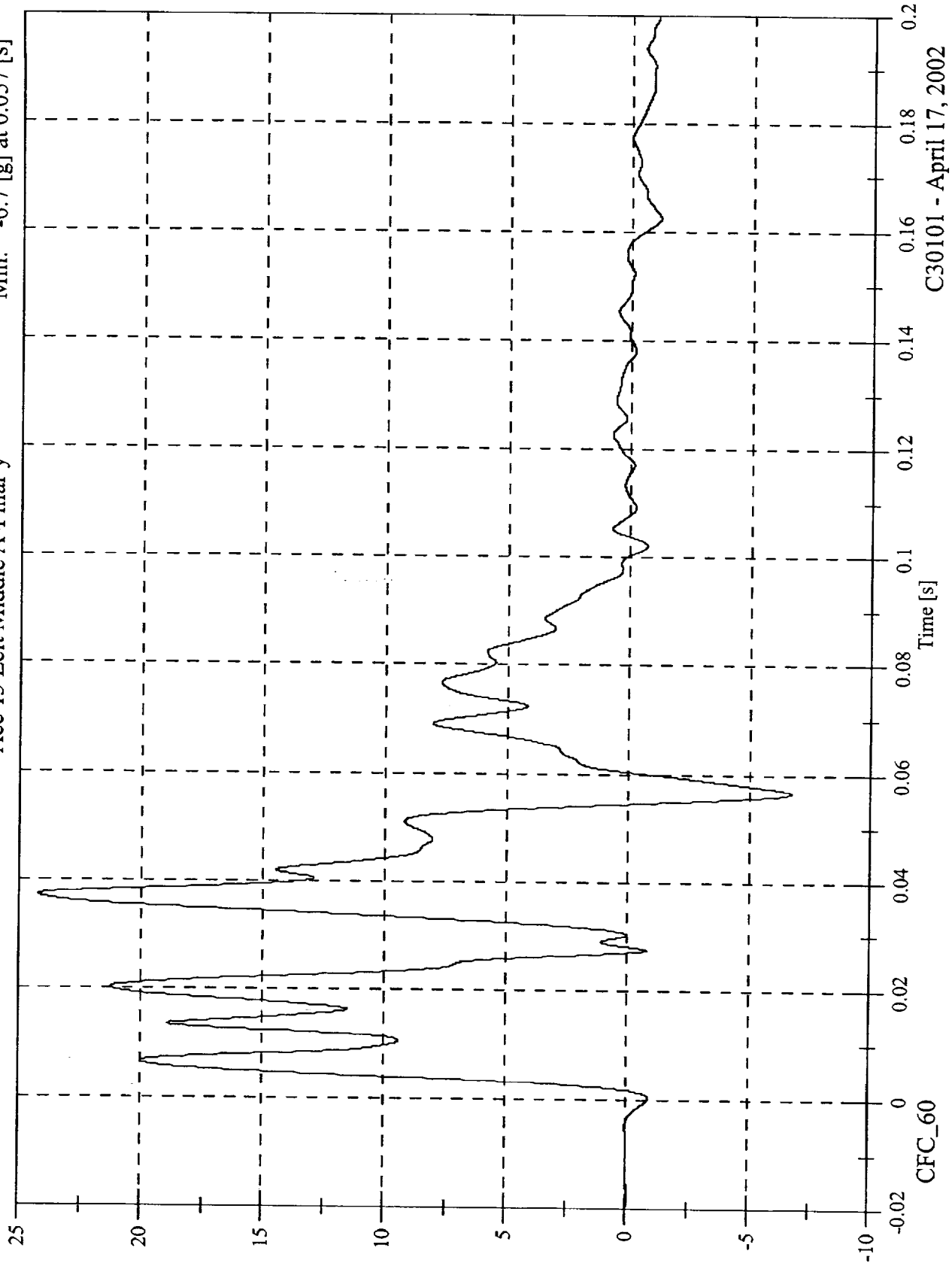
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 15 Left Middle A-Pillar y

Max: 24.2 [g] at 0.037 [s]

Min: -6.7 [g] at 0.057 [s]



CFC_60

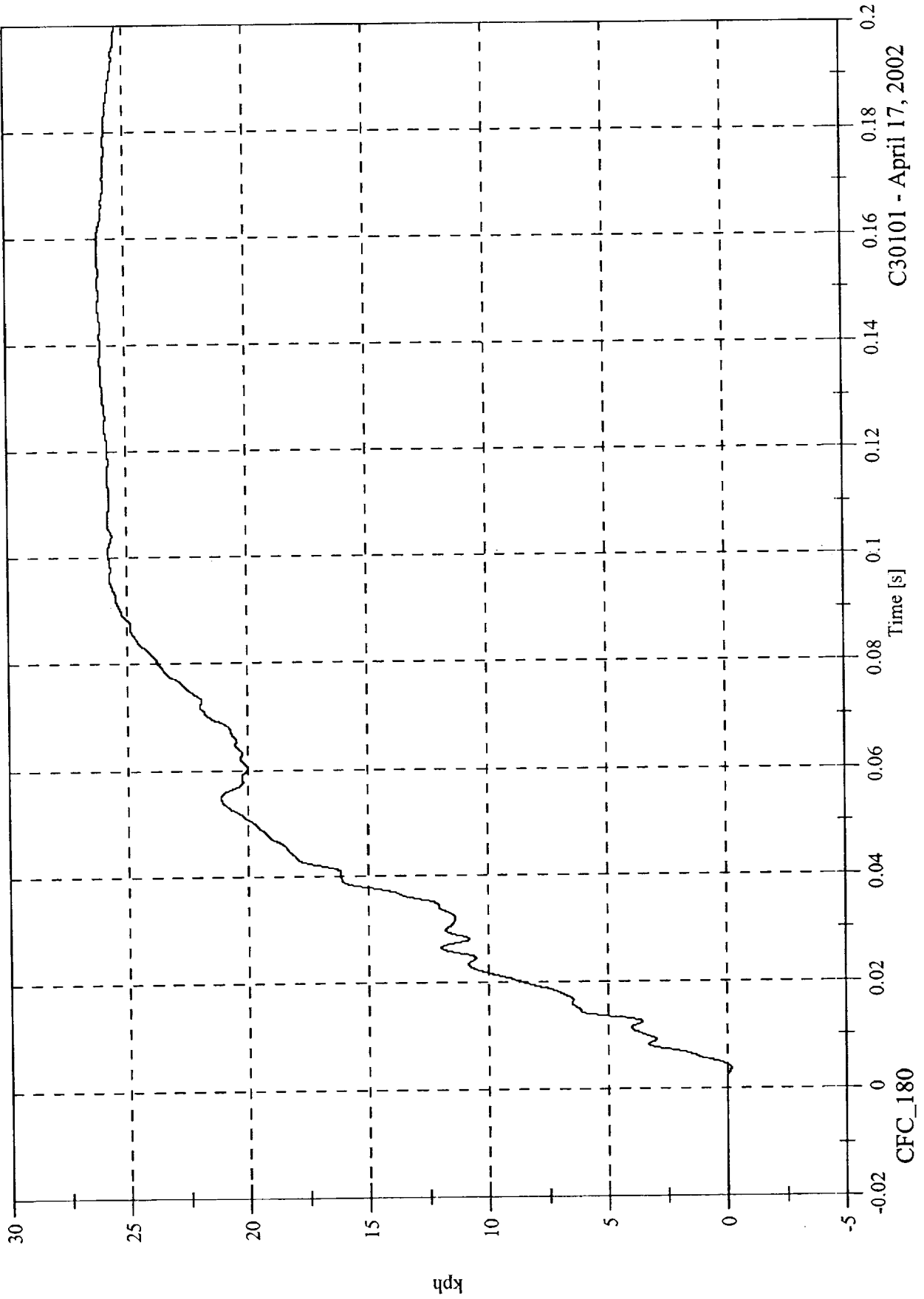
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 15 Left Middle A-Pillar y Velocity

Max: 26.2 [kph] at 0.159 [s]

Min: -0.1 [kph] at 0.004 [s]



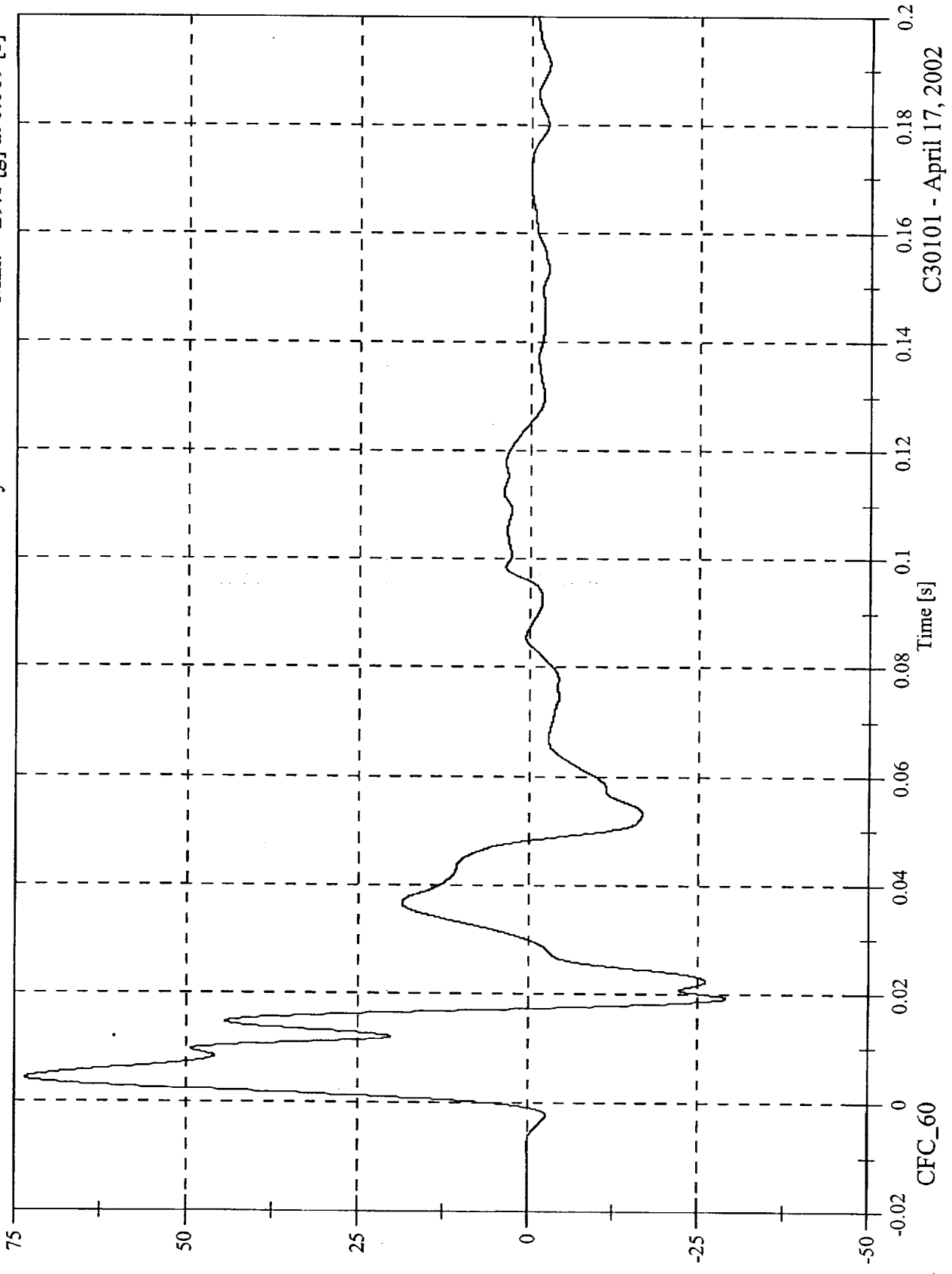
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 73.6 [g] at 0.004 [s]

Min: -29.1 [g] at 0.019 [s]

Acc 16 Front Seat Track y

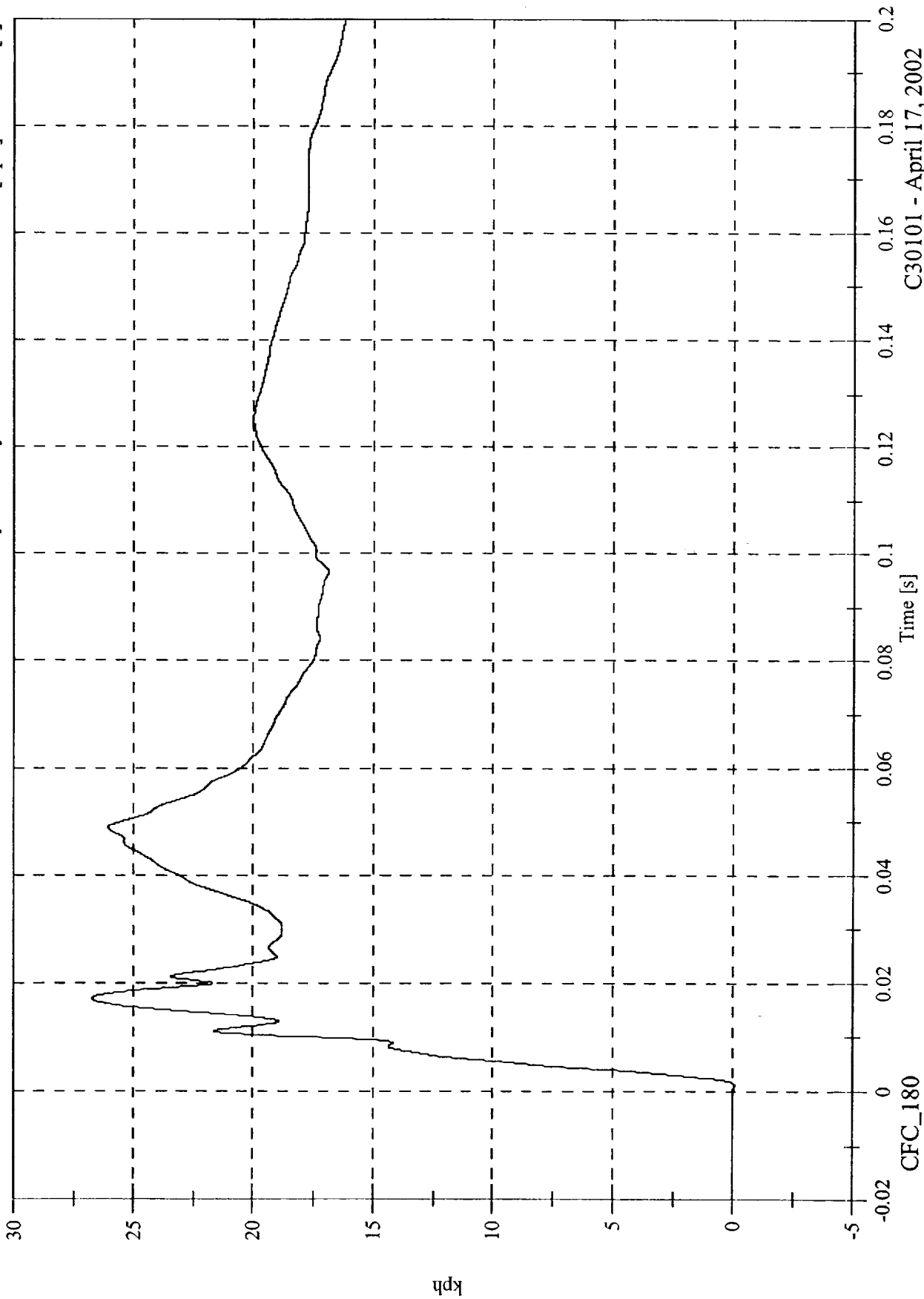


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 16 Front Seat Track y Velocity

Max: 26.8 [kph] at 0.017 [s]
Min: -0.1 [kph] at 0.001 [s]



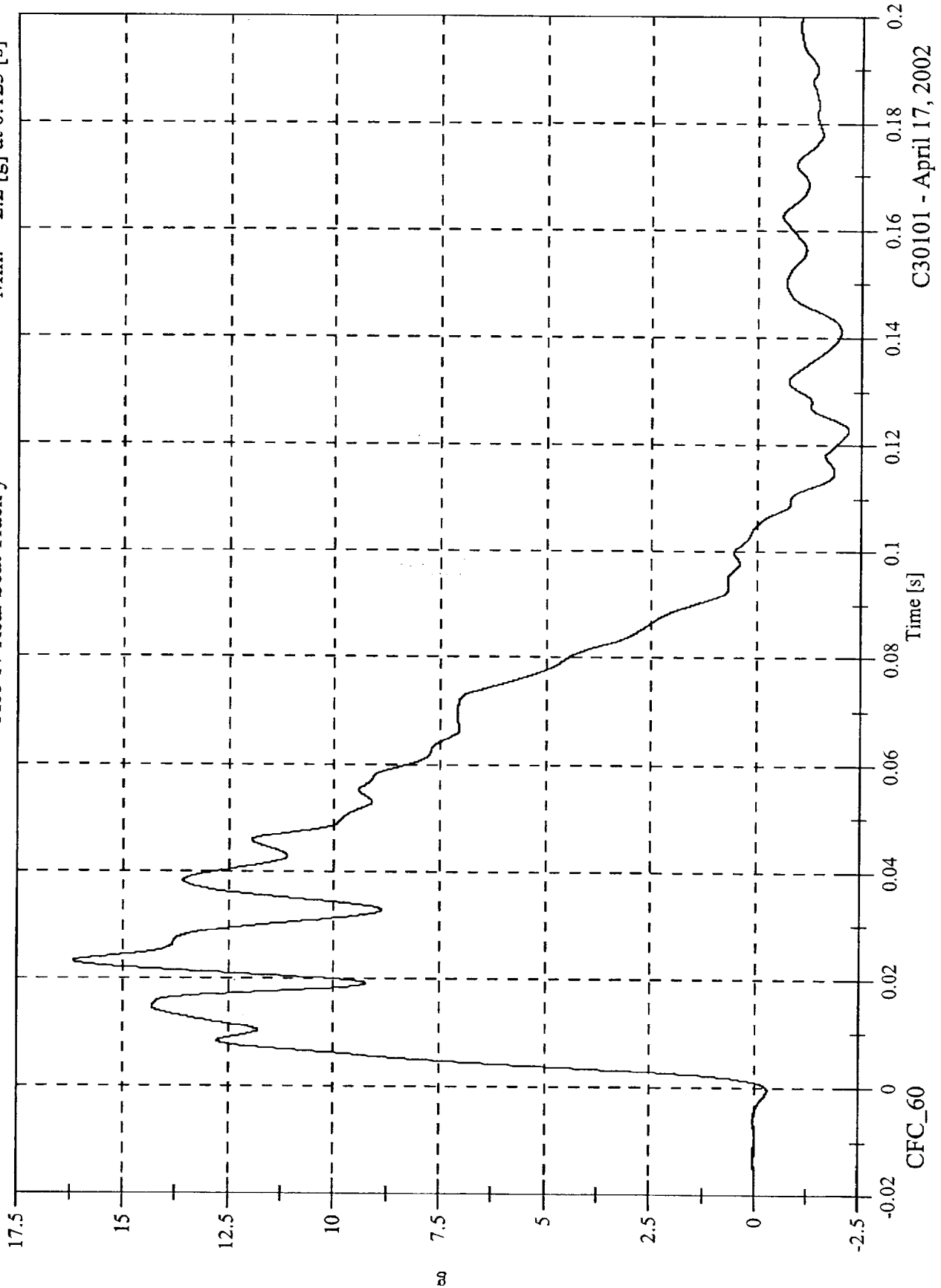
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 16.2 [g] at 0.023 [s]

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

Acc 17 Rear Seat Track y

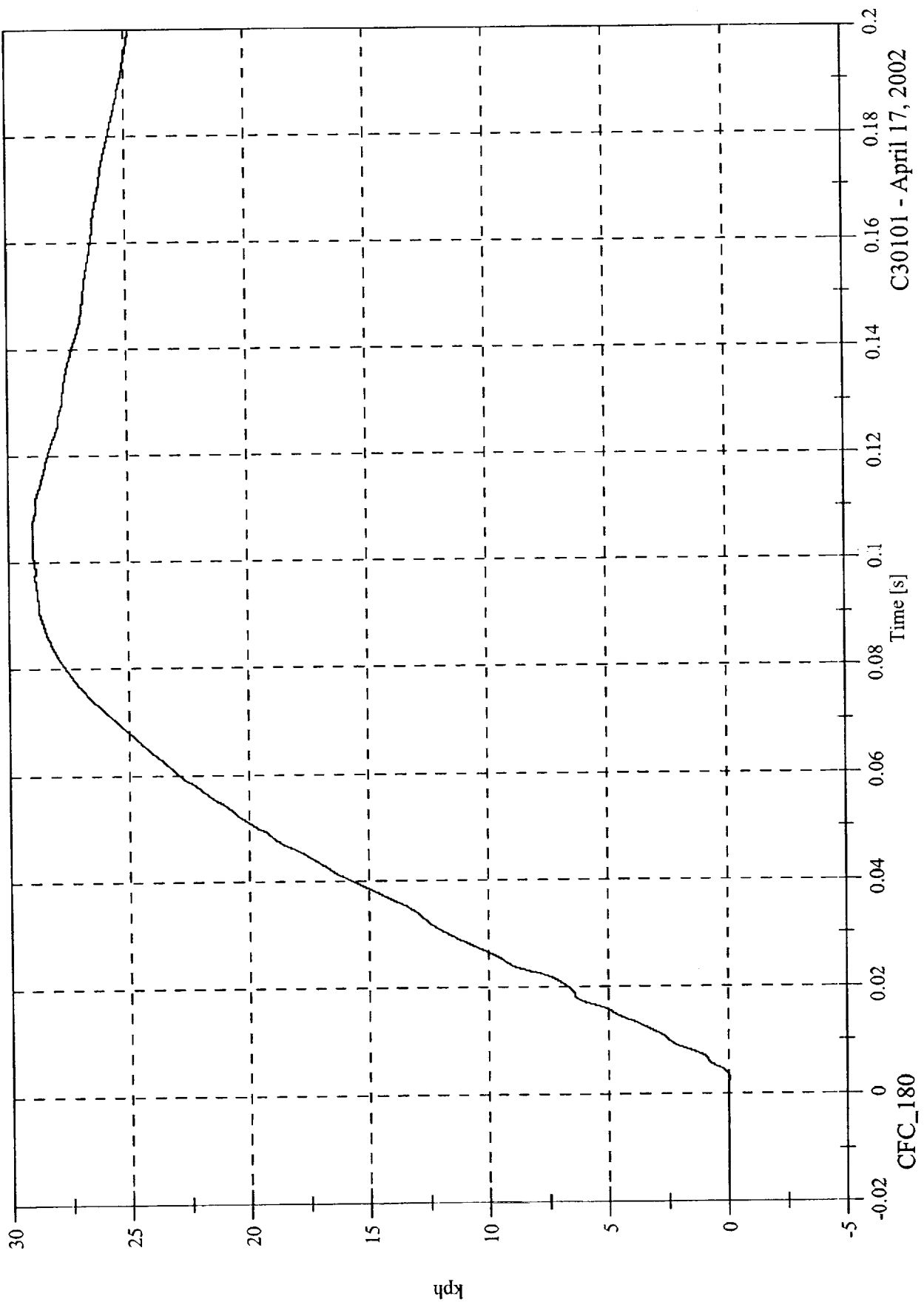


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 29.0 [kph] at 0.107 [s]
Min: -0.0 [kph] at 0.003 [s]

Acc 17 Rear Seat Track y Velocity



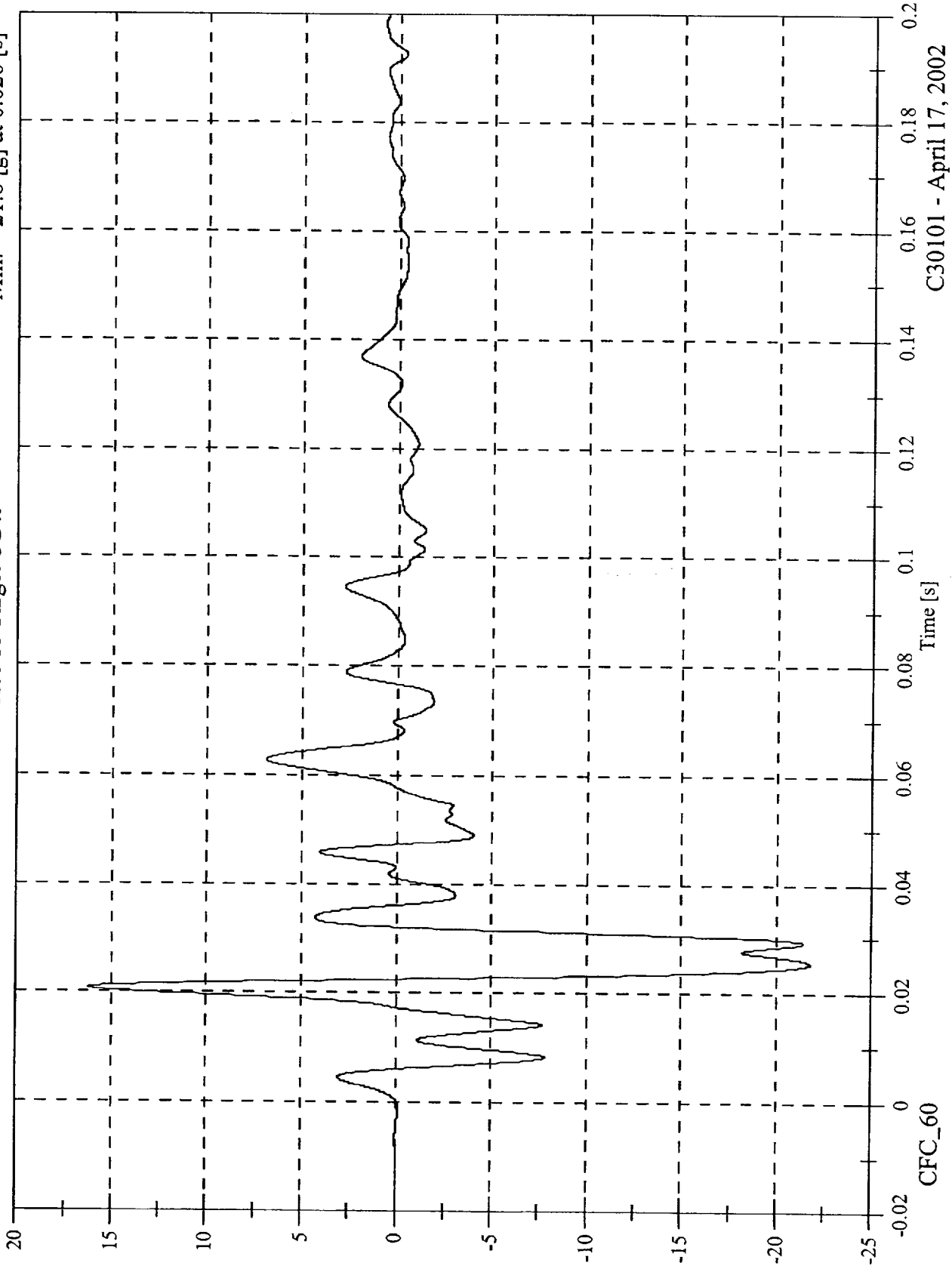
C30101 - April 17, 2002

CFC_180

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 16.2 [g] at 0.021 [s]
Min: -21.8 [g] at 0.026 [s]

Acc 18 Target CG x



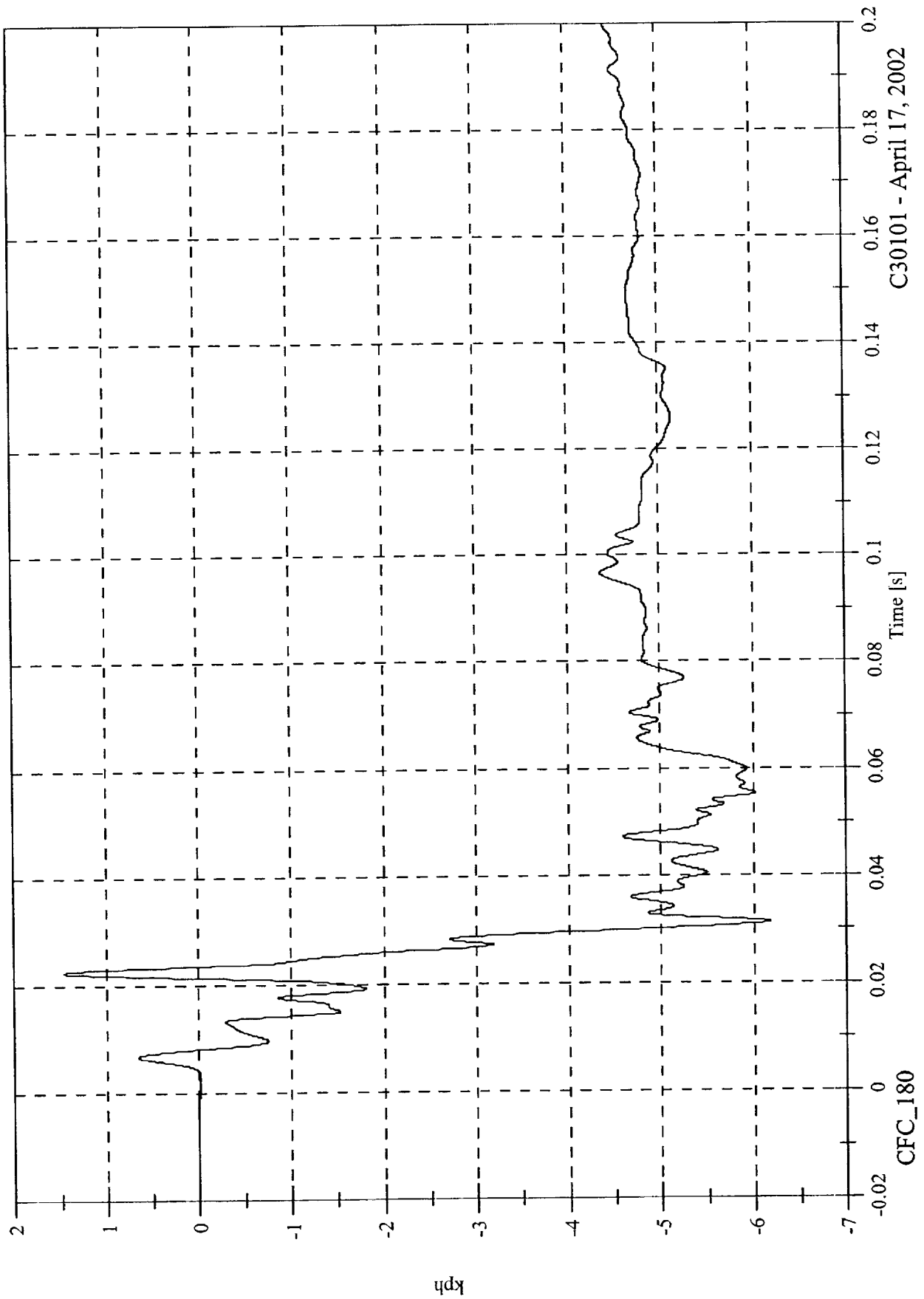
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 1.5 [kph] at 0.022 [s]

Min: -6.2 [kph] at 0.031 [s]

Acc 18 Target CG x Velocity



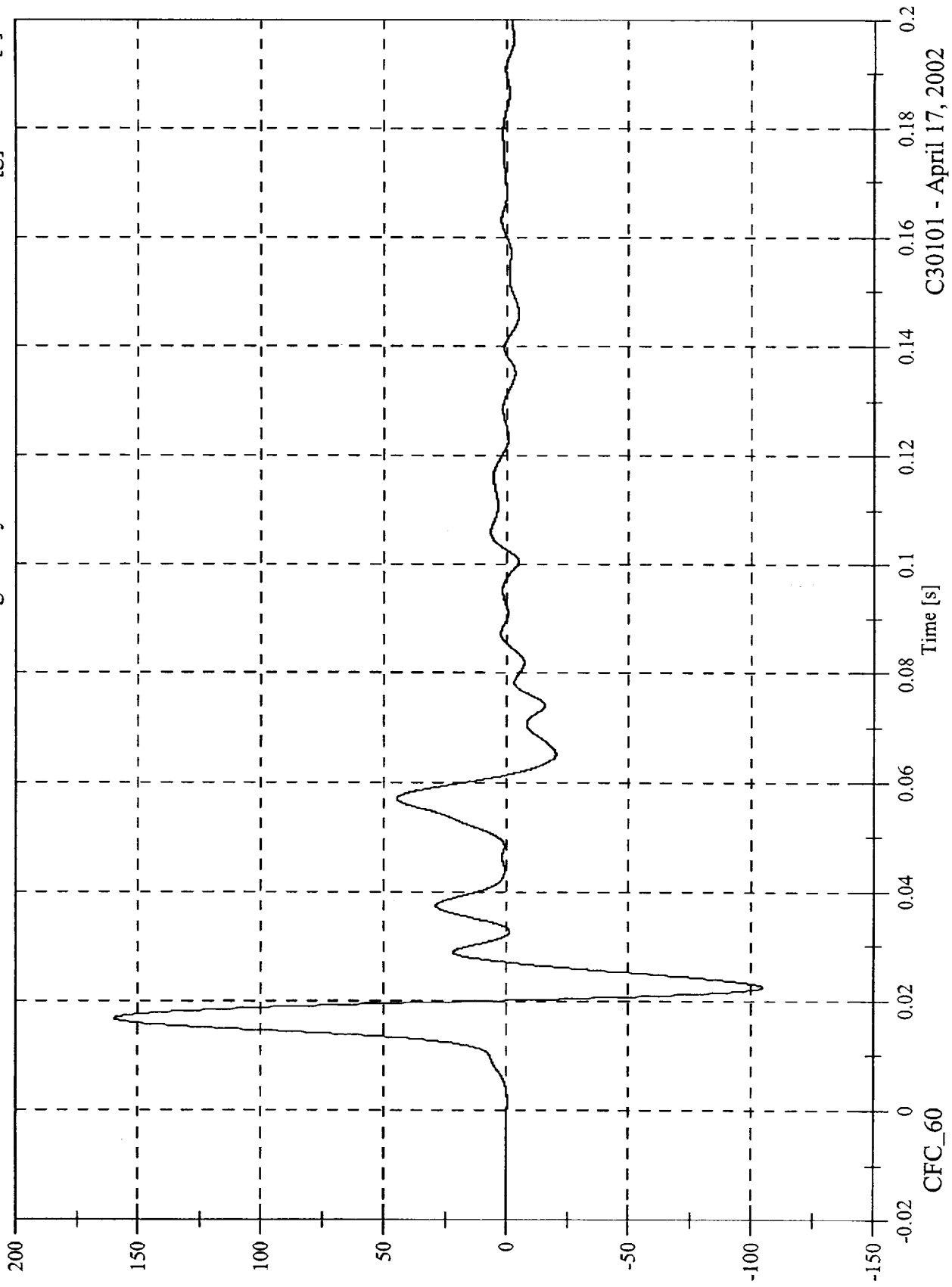
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 18 Target CG y

Max: 159.8 [g] at 0.017 [s]

Min: -104.6 [g] at 0.023 [s]

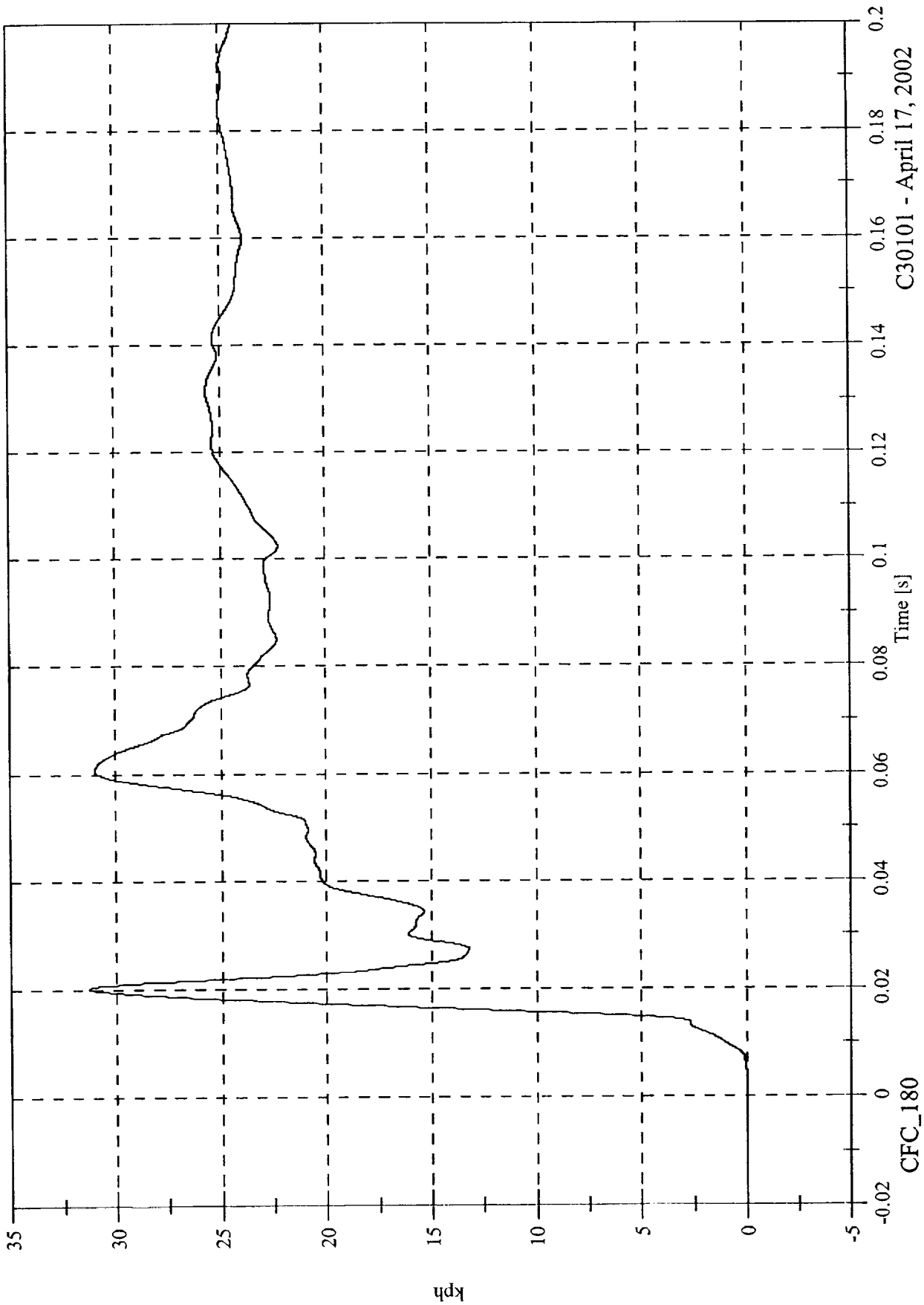


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 31.3 [kph] at 0.020 [s]
Min: -0.0 [kph] at -0.020 [s]

Acc 18 Target CG y Velocity



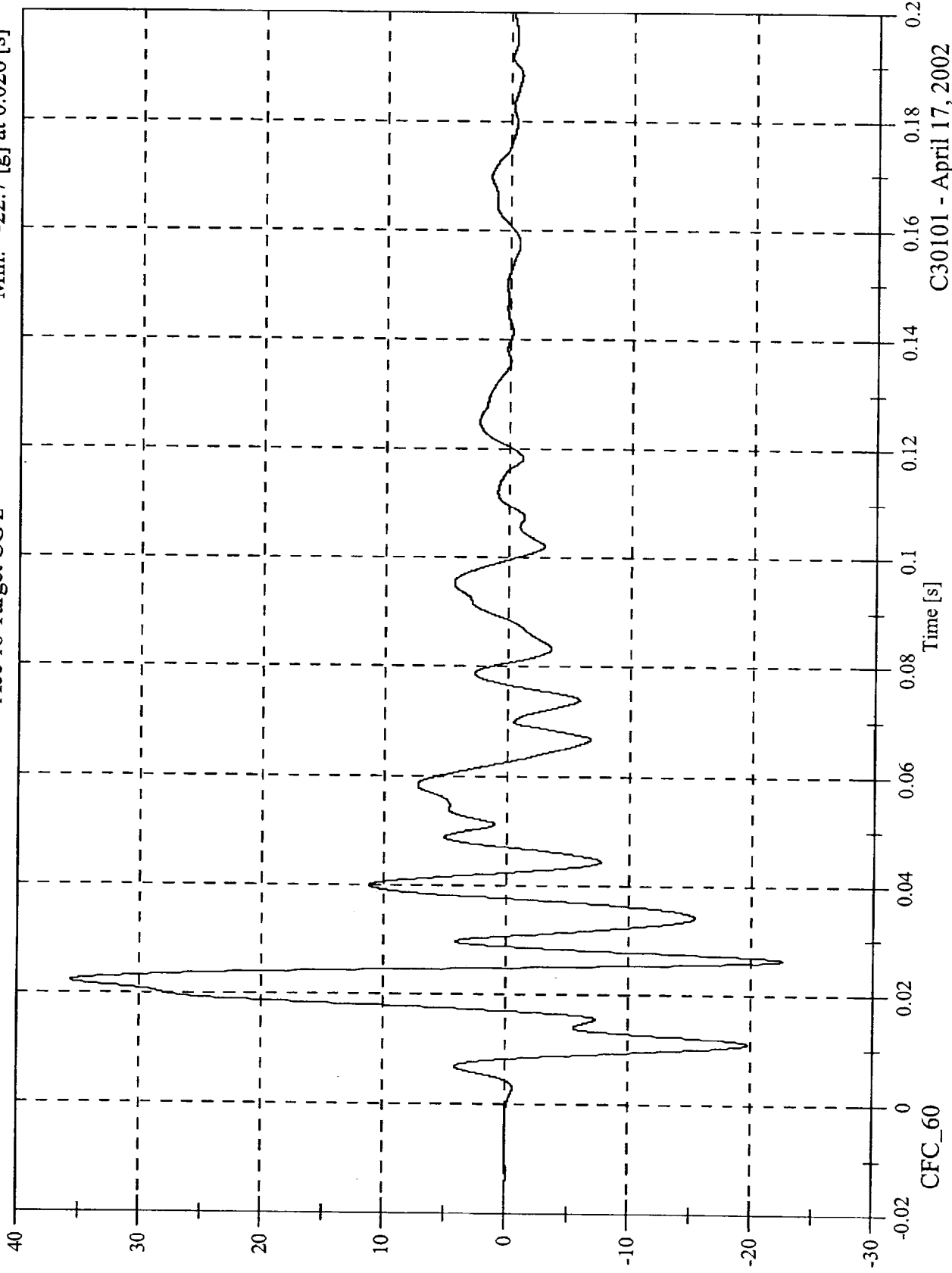
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 35.8 [g] at 0.022 [s]

Min: -22.7 [g] at 0.026 [s]

Acc 18 Target CG z

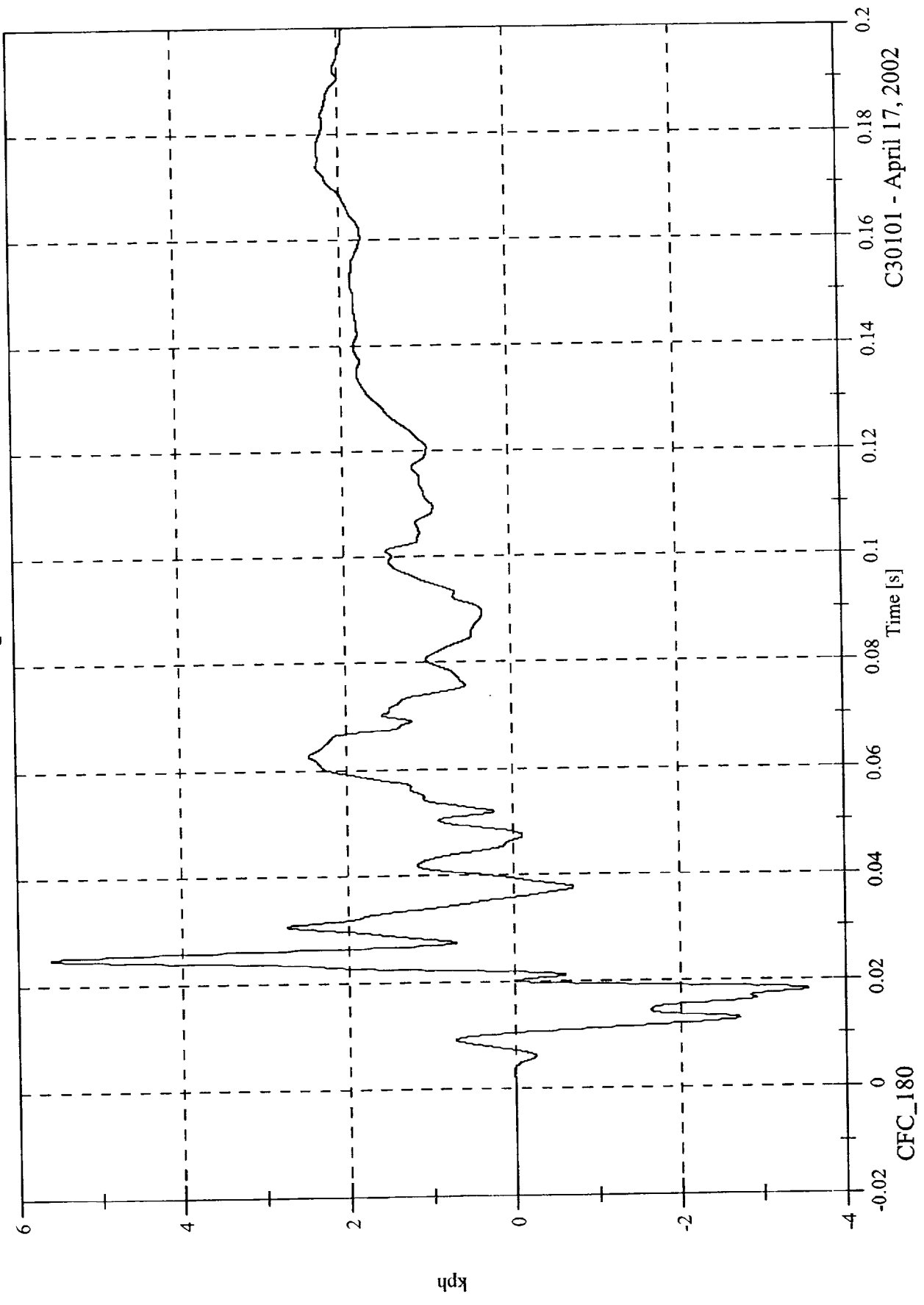


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Acc 18 Target CG z Velocity

Max: 5.6 [kph] at 0.025 [s]
Min: -3.6 [kph] at 0.018 [s]



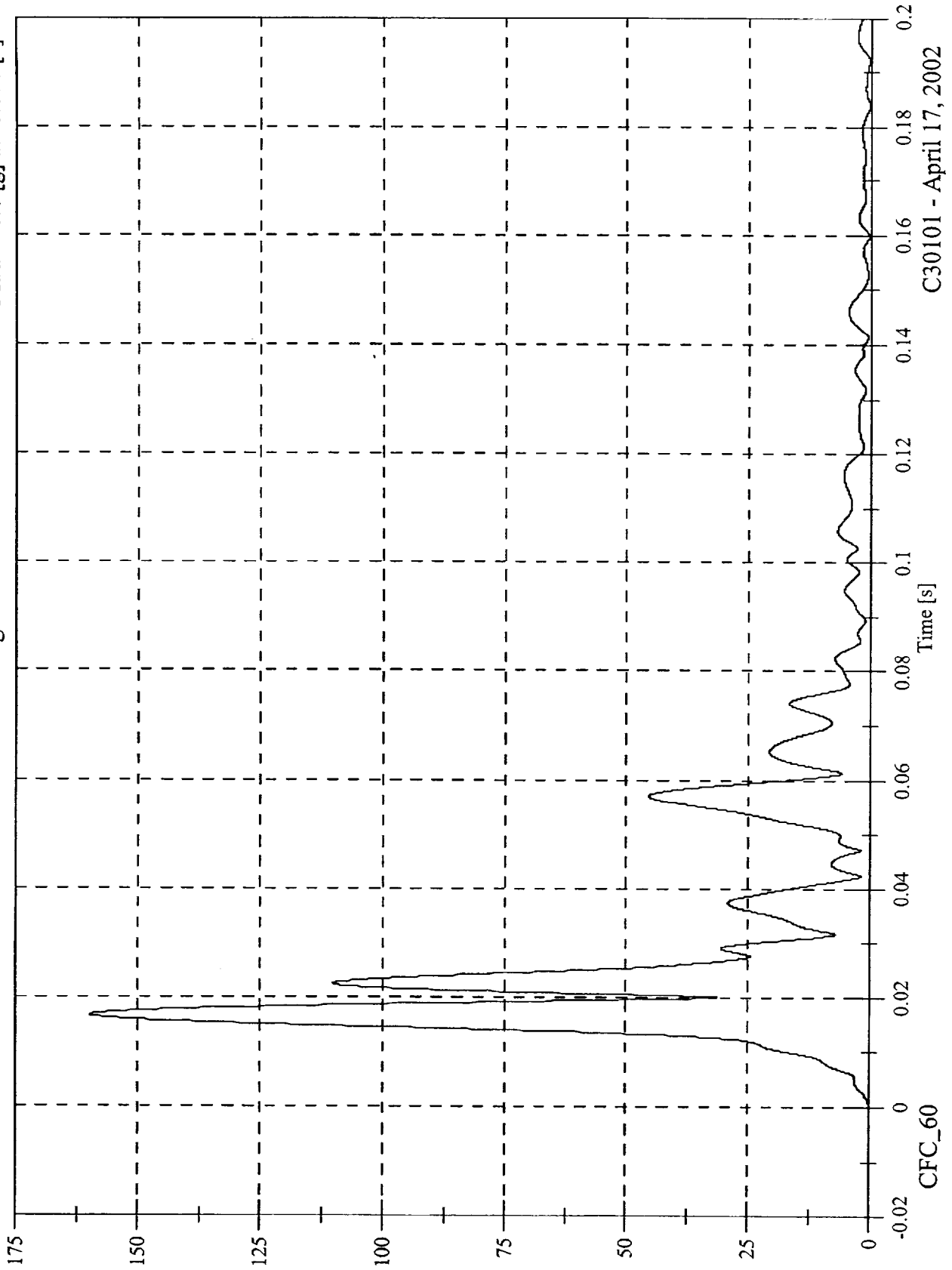
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 159.9 [g] at 0.017 [s]

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

Acc 18 Target CG Resultant



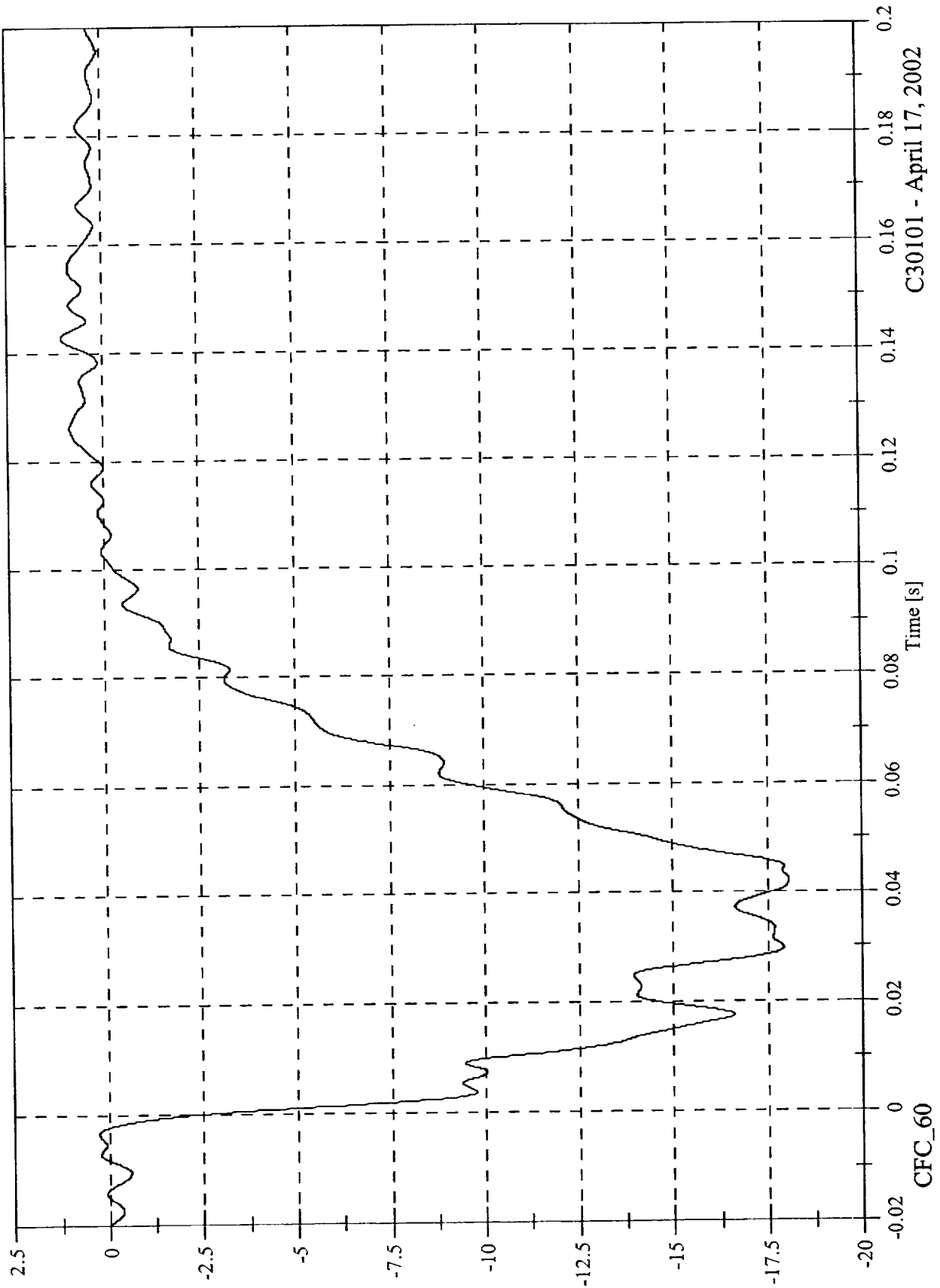
CFC_60

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 1.1 [g] at 0.143 [s]
Min: -18.1 [g] at 0.042 [s]

Moving Barrier CG X



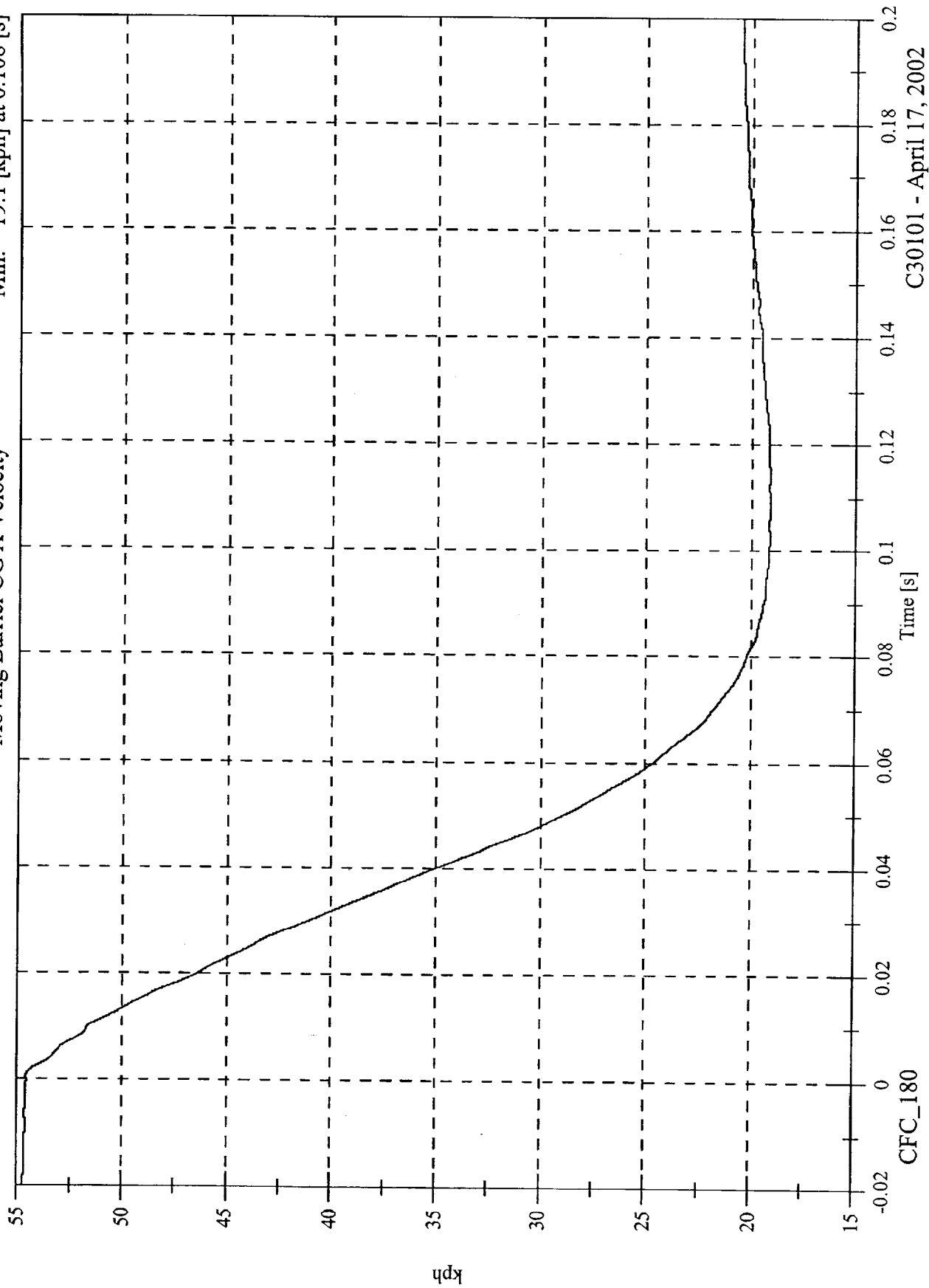
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 54.7 [kph] at -0.019 [s]

Min: 19.1 [kph] at 0.108 [s]

Moving Barrier CG X Velocity



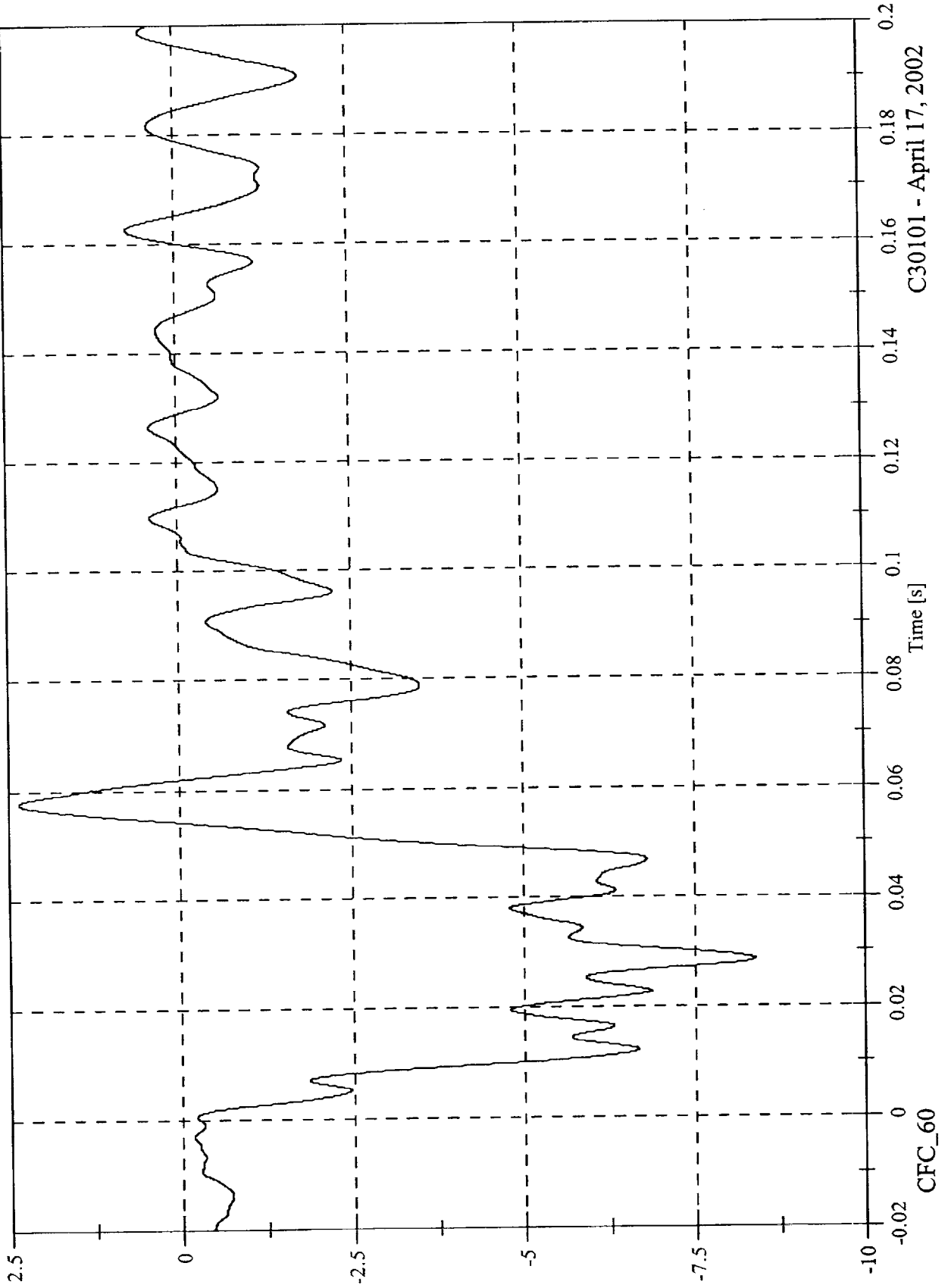
CFC_180

C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 2.4 [g] at 0.057 [s]
Min: -8.4 [g] at 0.029 [s]

Moving Barrier CG Y



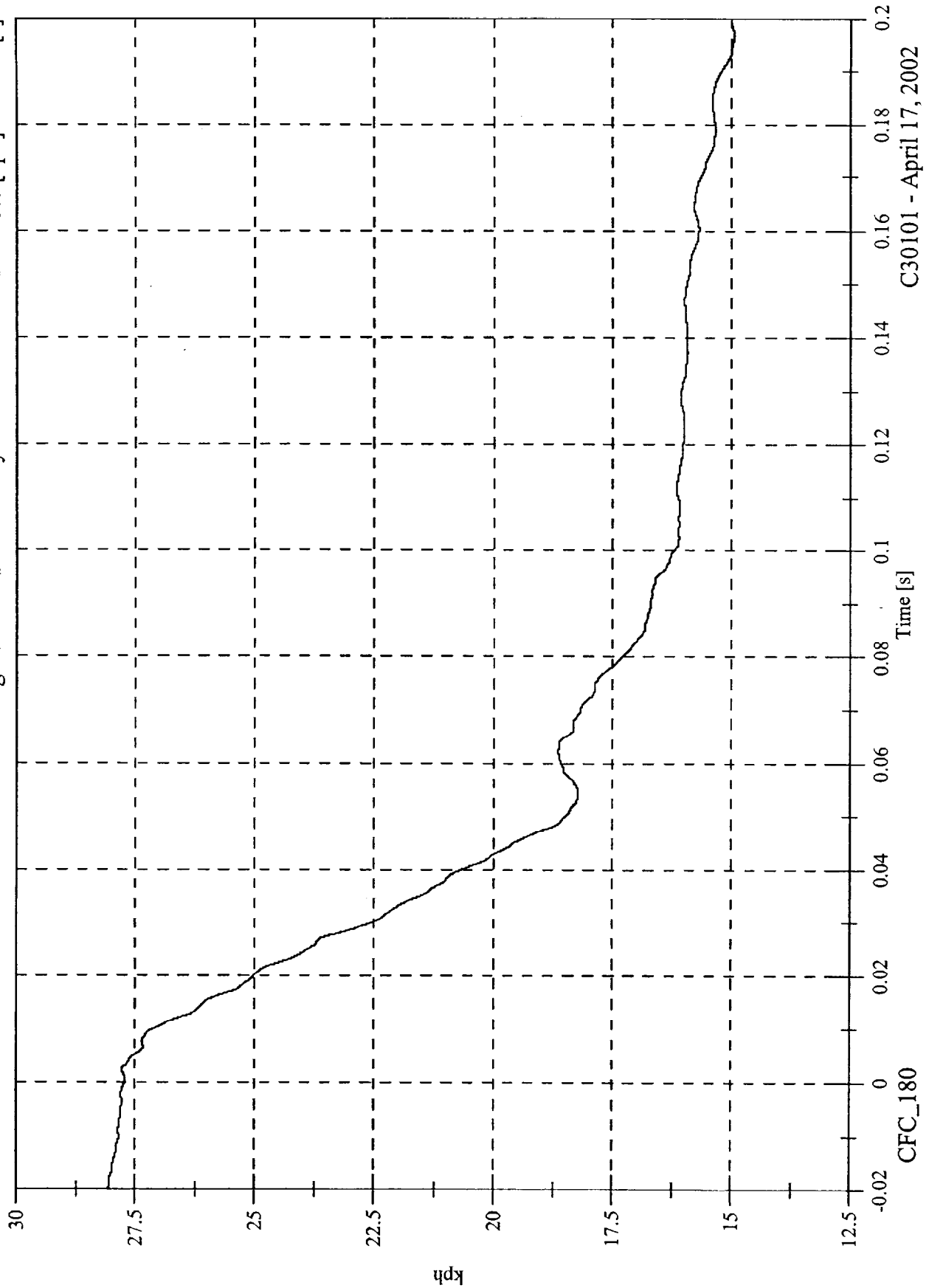
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Moving Barrier CG Y Velocity

Max: 28.1 [kph] at -0.020 [s]

Min: 15.0 [kph] at 0.197 [s]

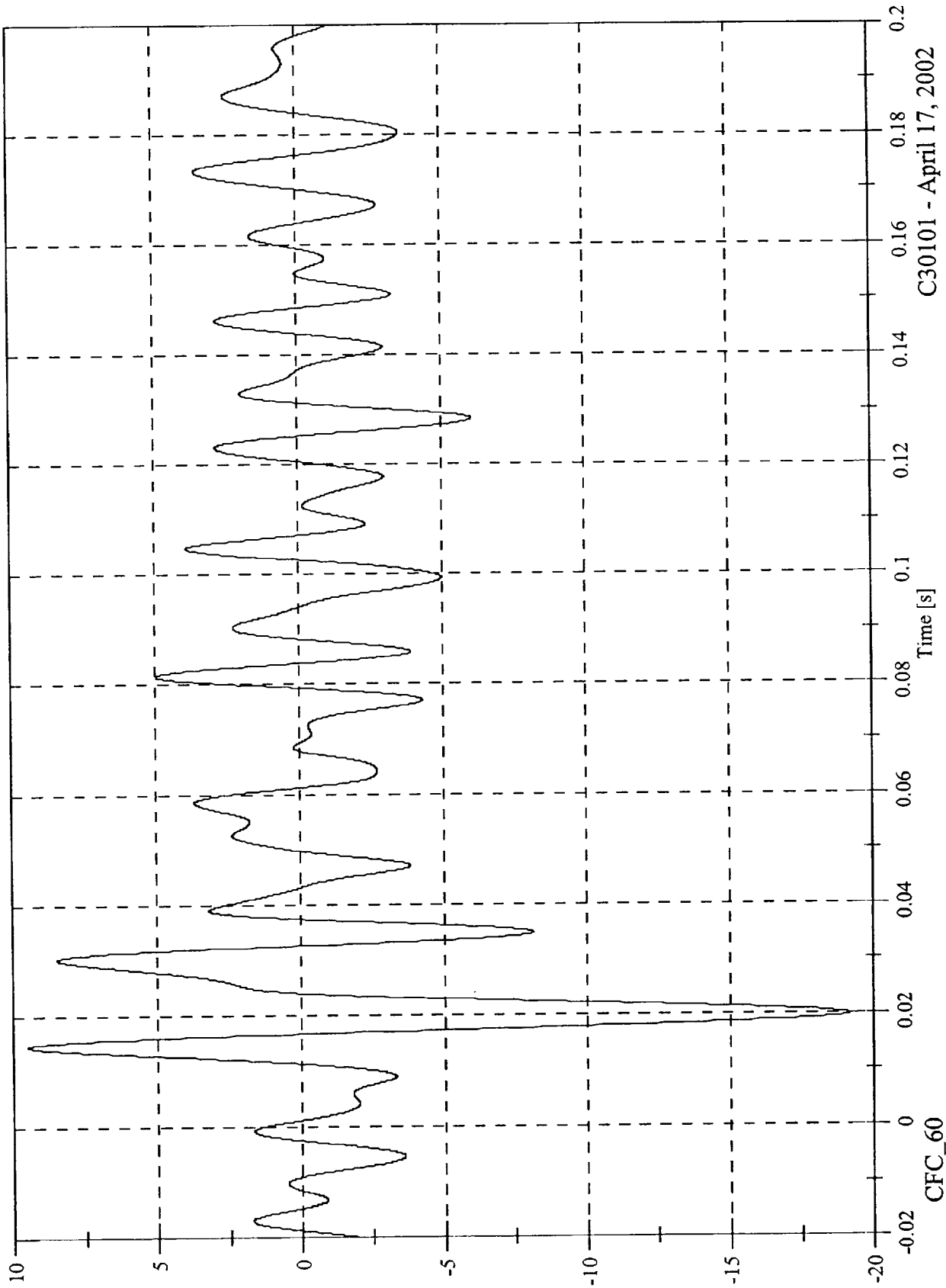


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 9.5 [g] at 0.015 [s]
Min: -19.2 [g] at 0.020 [s]

Moving Barrier CG Z



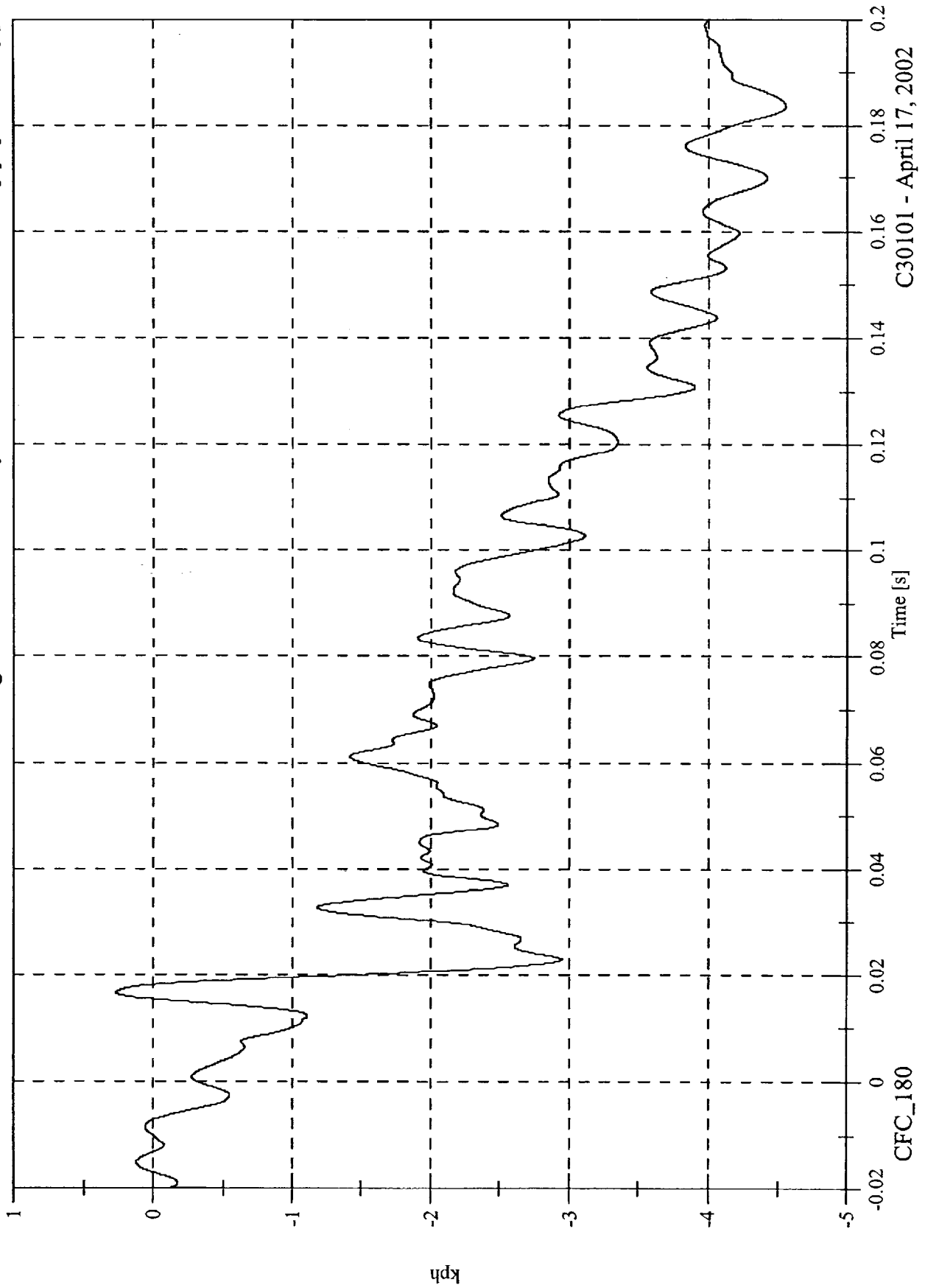
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Moving Barrier CG Z Velocity

Max: 0.3 [kph] at 0.017 [s]

Min: -4.6 [kph] at 0.184 [s]

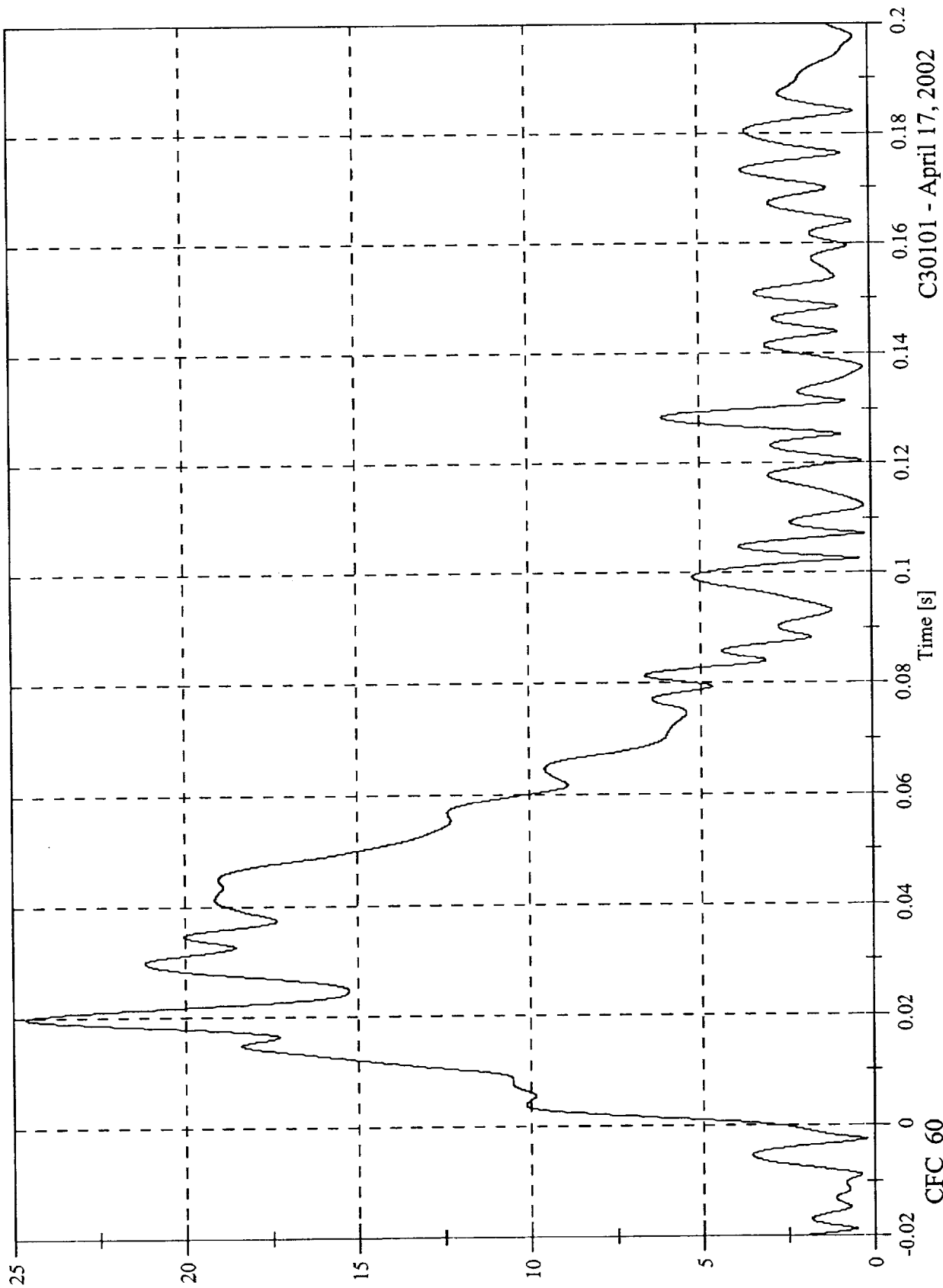


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 24.7 [g] at 0.020 [s]
Min: 0.2 [g] at 0.107 [s]

Moving Barrier CG Resultant



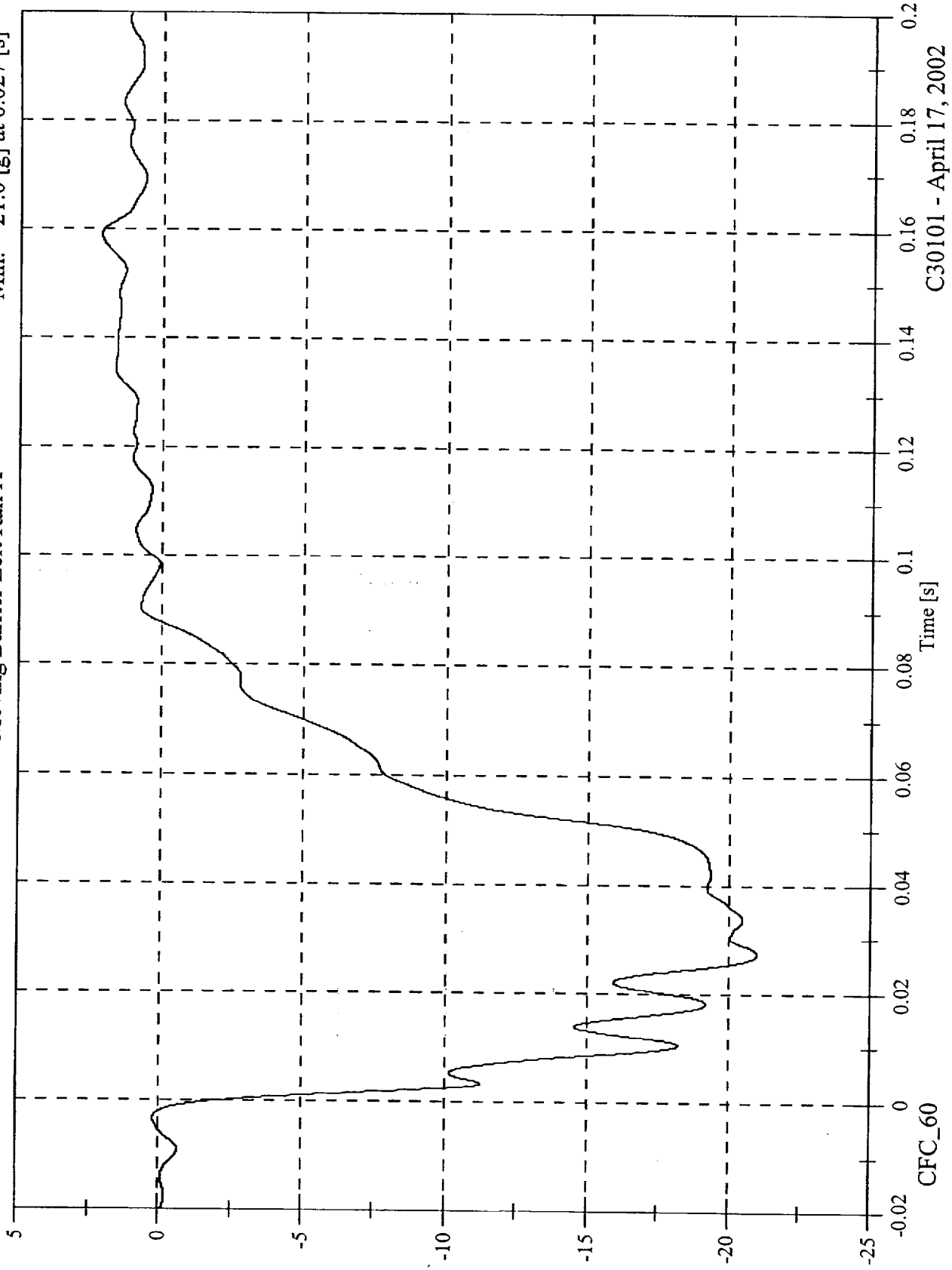
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 2.2 [g] at 0.159 [s]

Min: -21.0 [g] at 0.027 [s]

Moving Barrier Left Rail X

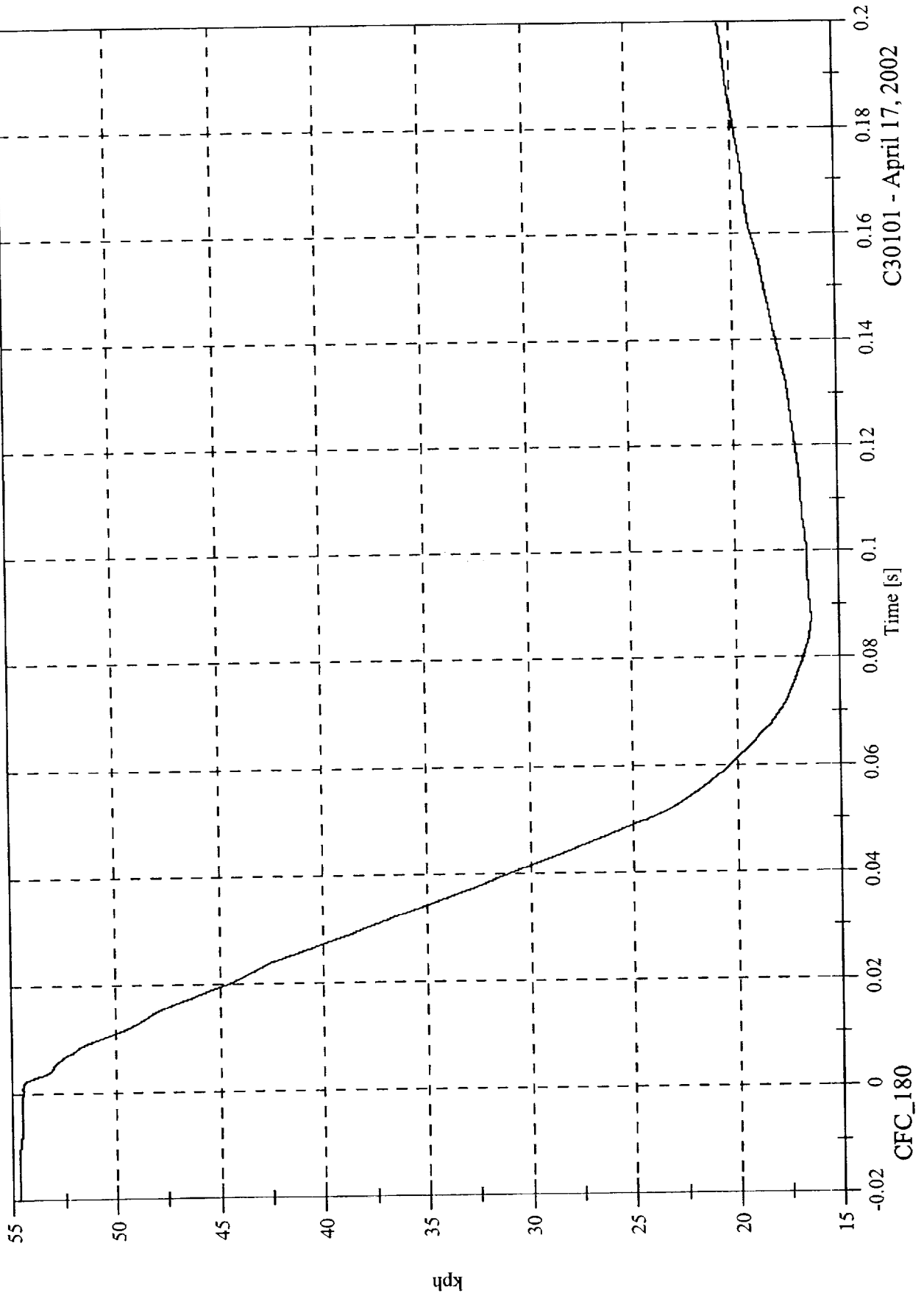


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Moving Barrier Left Rail X Velocity

Max: 54.7 [kph] at -0.019 [s]
Min: 16.4 [kph] at 0.088 [s]



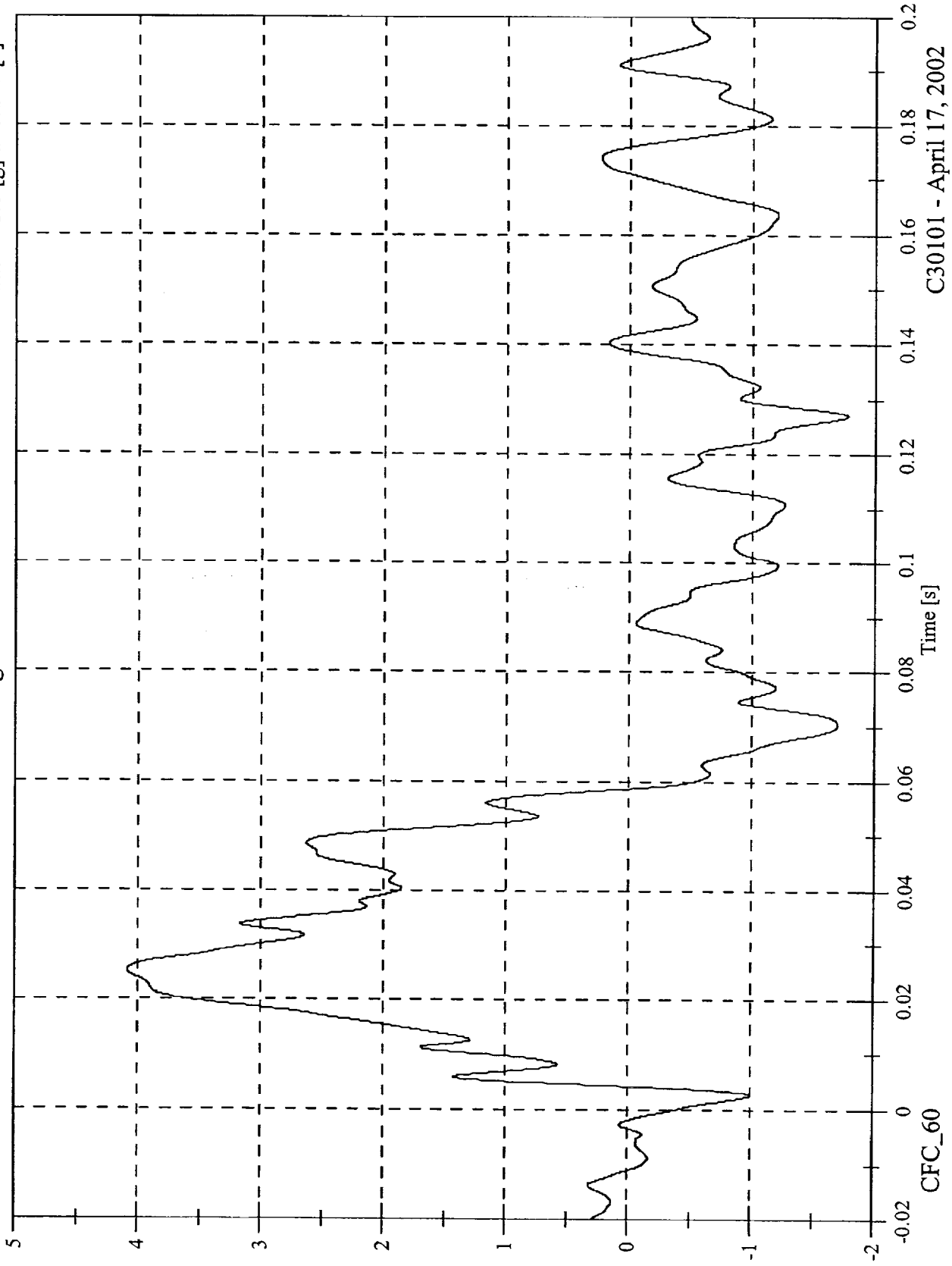
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 4.1 [g] at 0.025 [s]

Min: -1.8 [g] at 0.127 [s]

Moving Barrier Left Rail Y



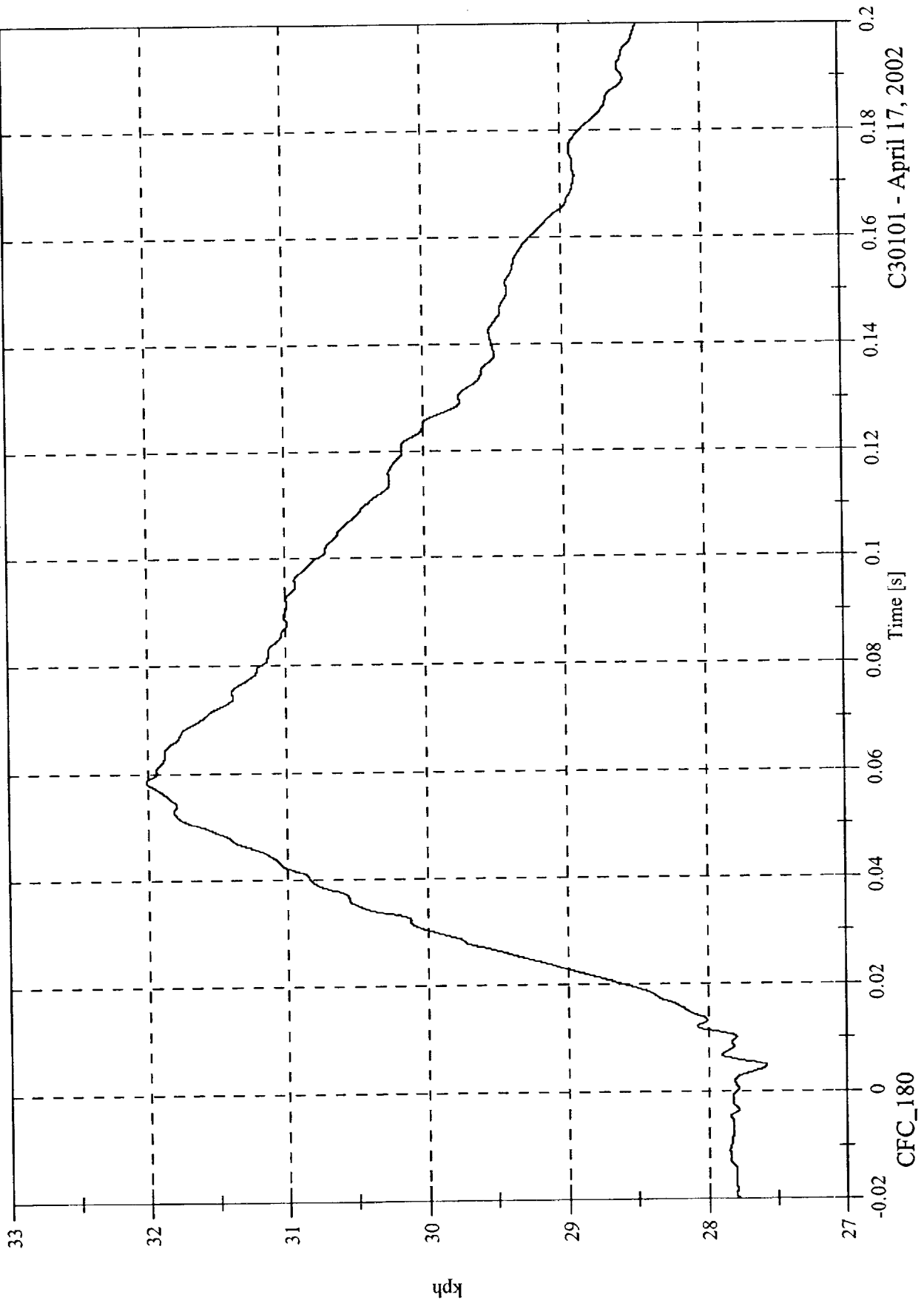
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Moving Barrier Left Rail Y Velocity

Max: 32.0 [kph] at 0.058 [s]

Min: 27.6 [kph] at 0.005 [s]



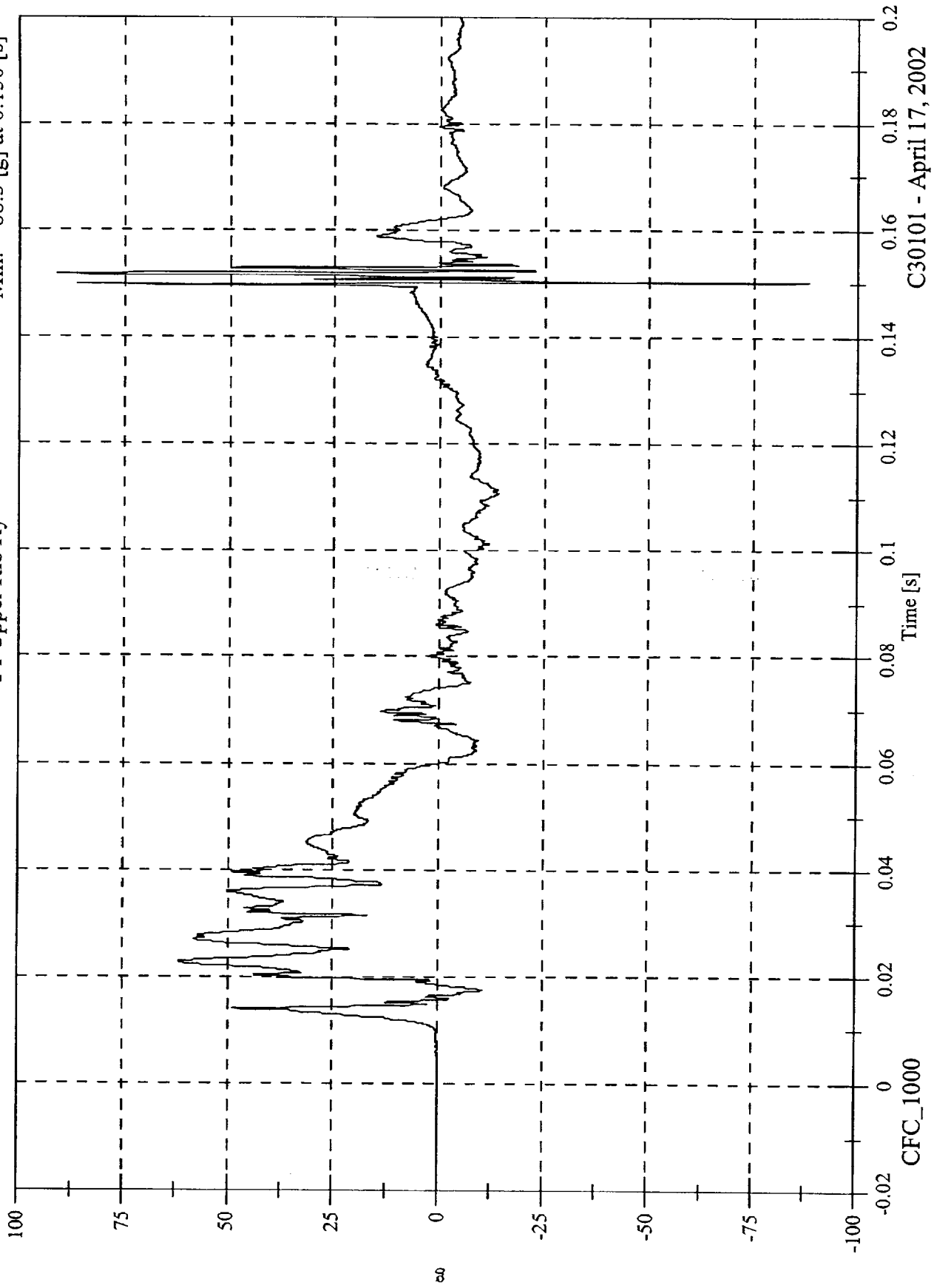
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Upper Rib Ry

Max: 91.2 [g] at 0.152 [s]

Min: -88.3 [g] at 0.150 [s]

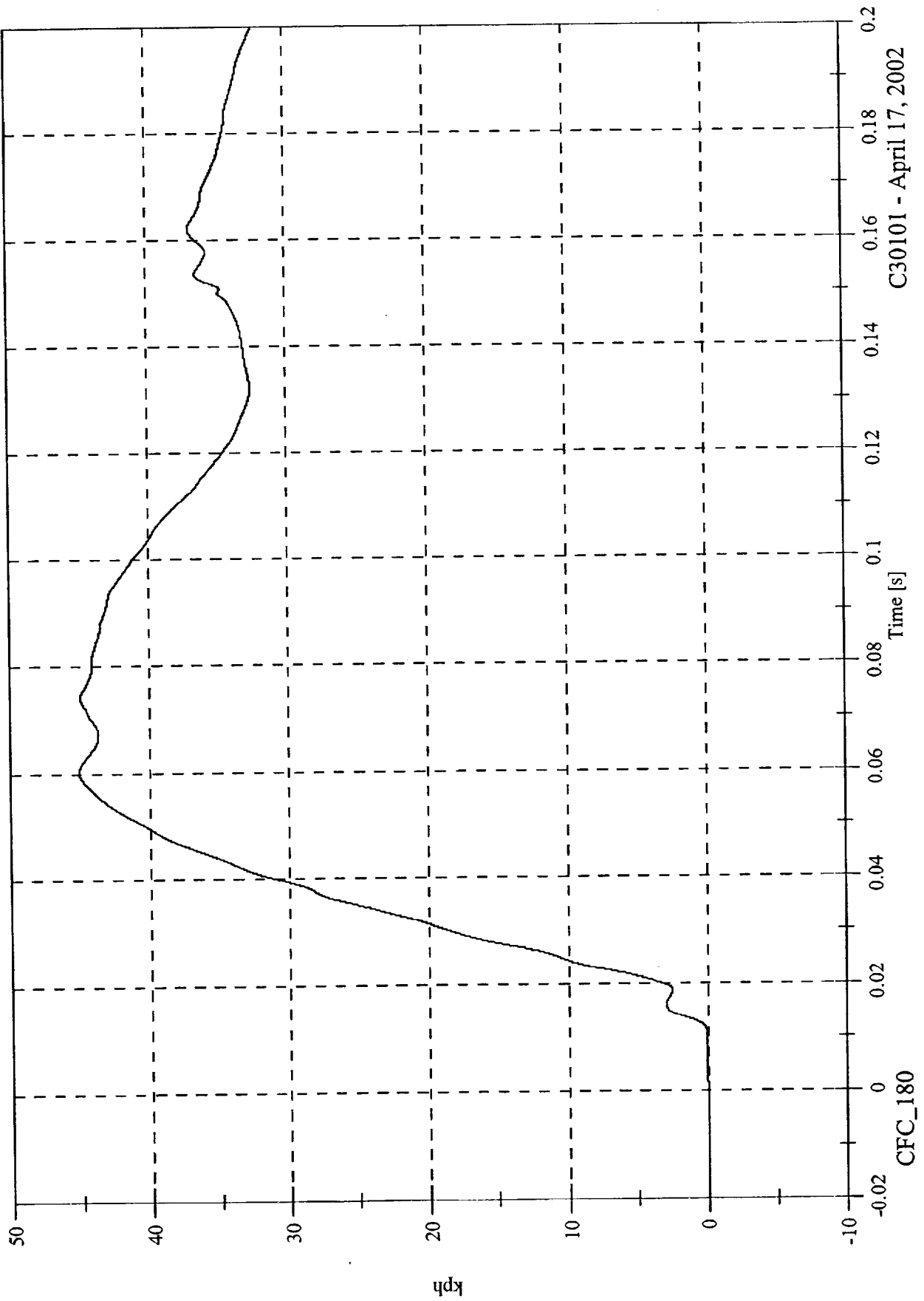


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Upper Rib Ry Velocity

Max: 45.1 [kph] at 0.060 [s]
Min: -0.0 [kph] at -0.015 [s]

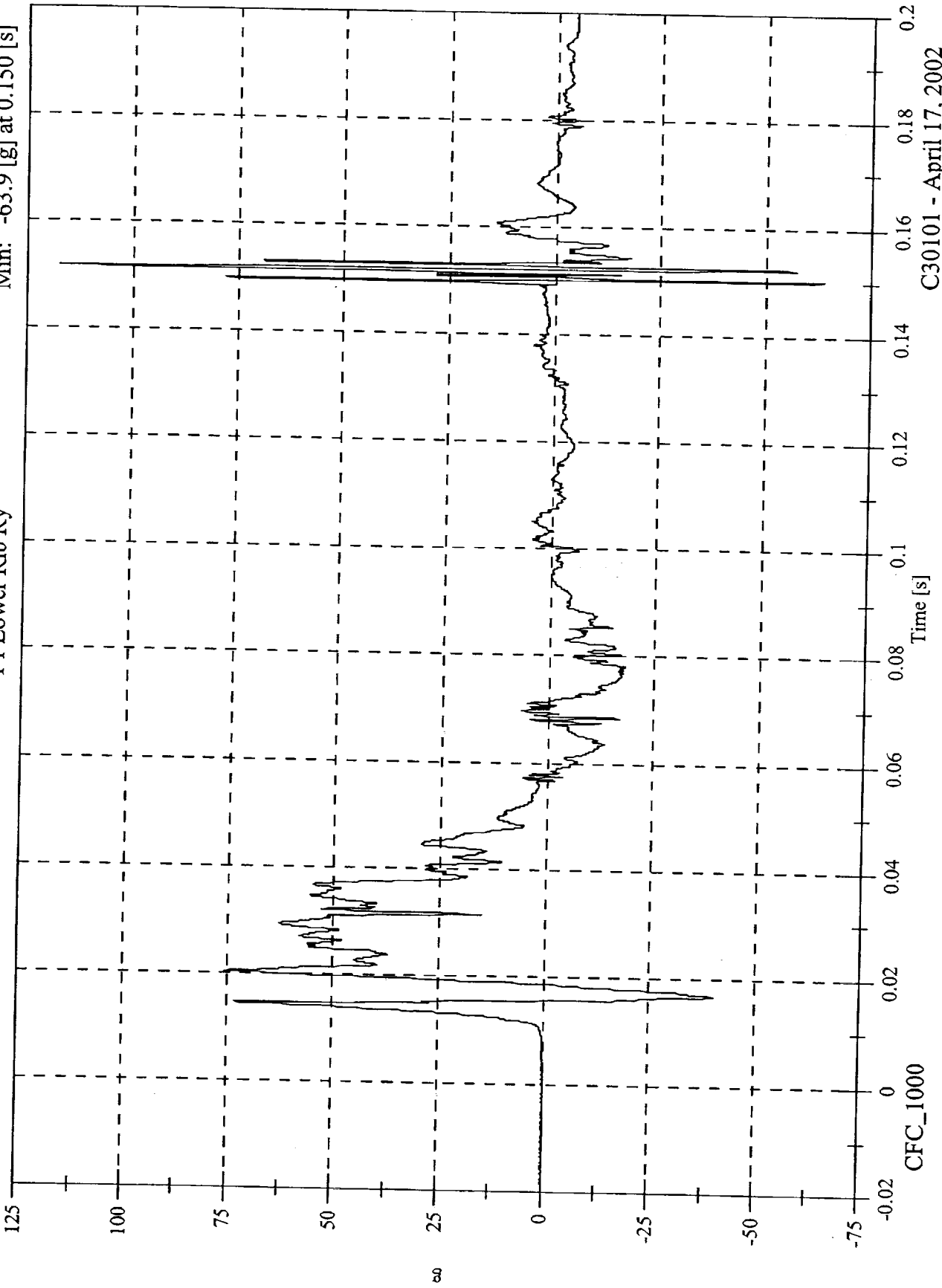


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 117.5 [g] at 0.152 [s]
Min: -63.9 [g] at 0.150 [s]

P1 Lower Rib Ry

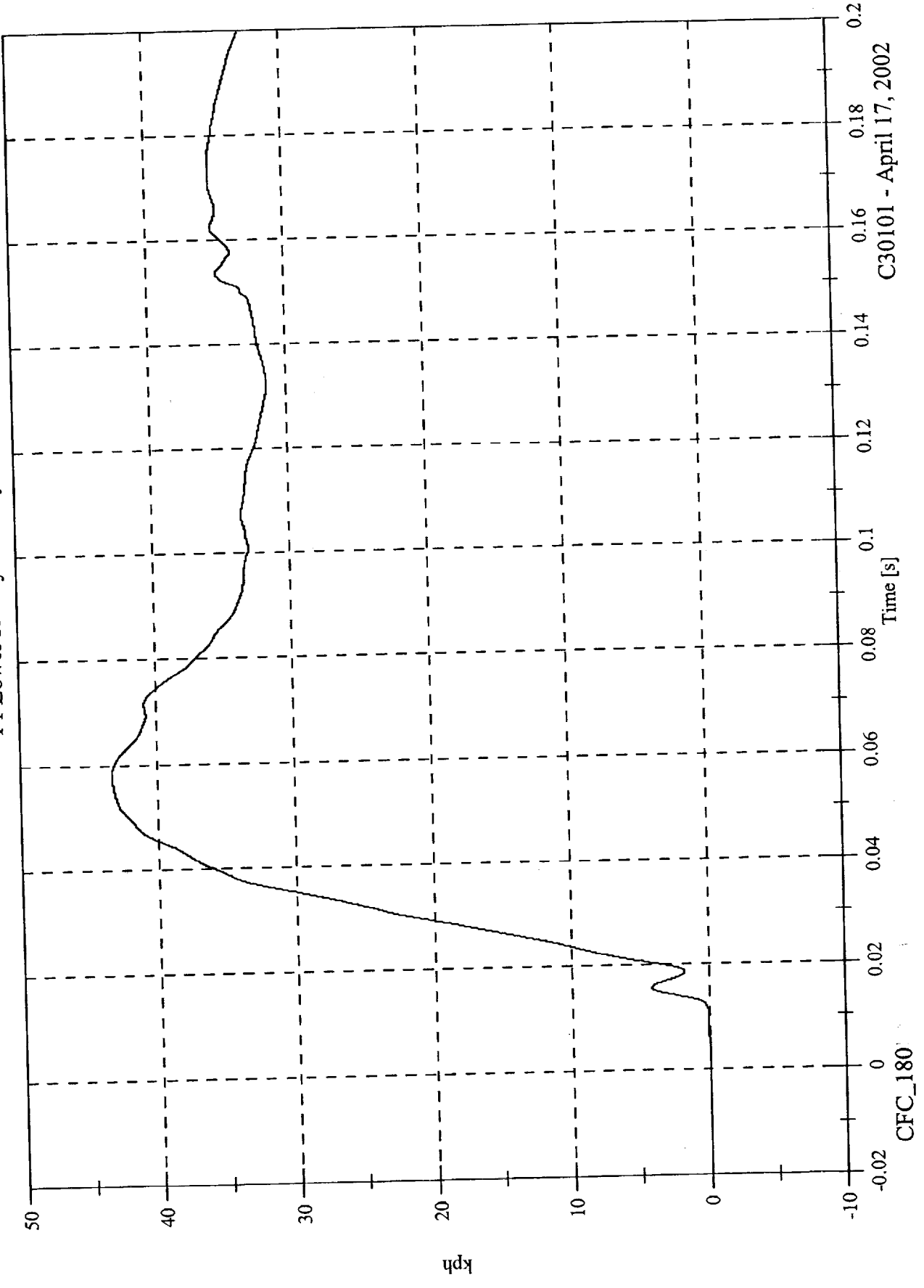


C30101 - April 17, 2002

Max: 43.3 [kph] at 0.058 [s]
Min: -0.0 [kph] at -0.019 [s]

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Lower Rib Ry Velocity



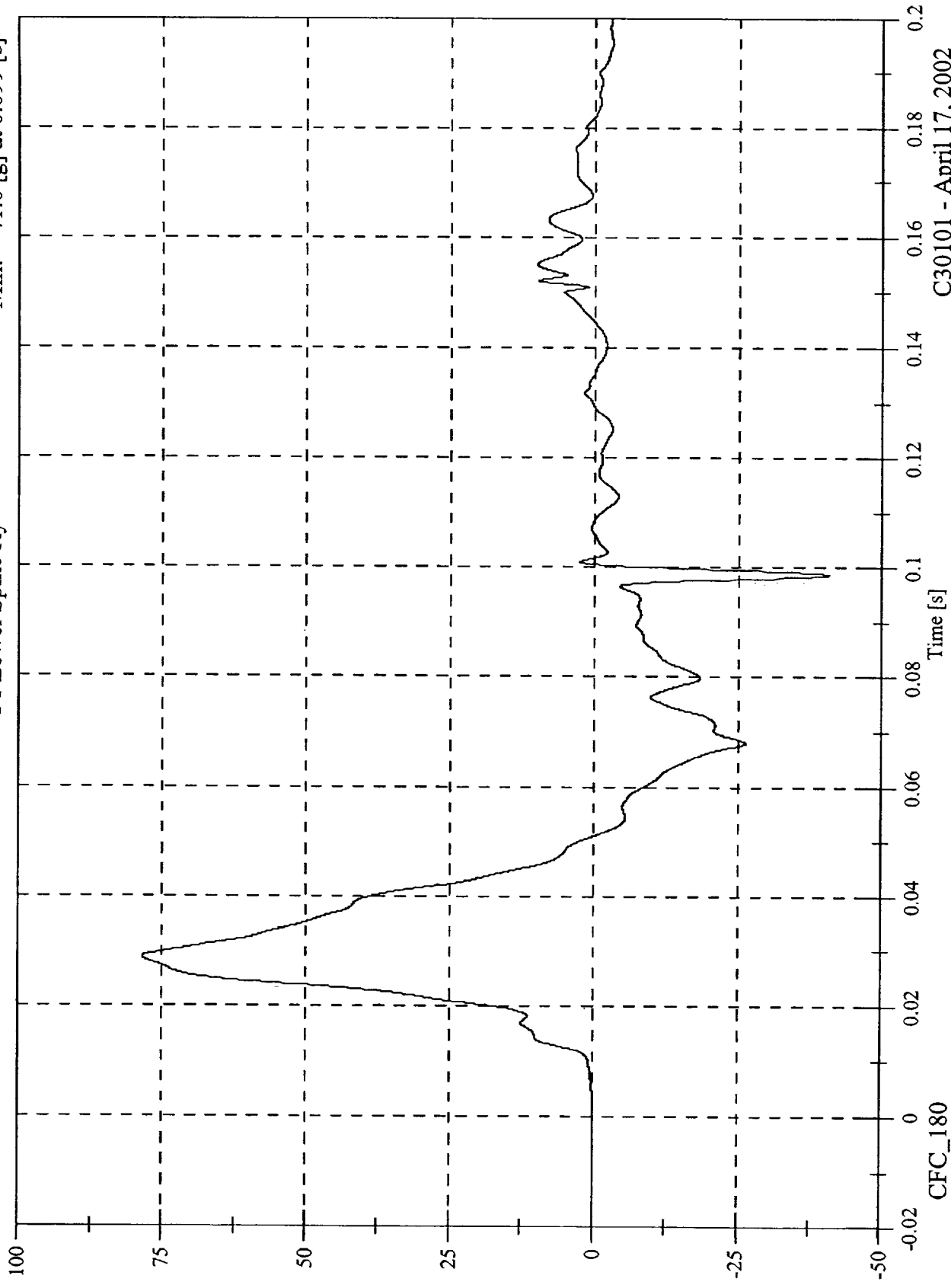
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 78.5 [g] at 0.029 [s]

Min: -41.0 [g] at 0.099 [s]

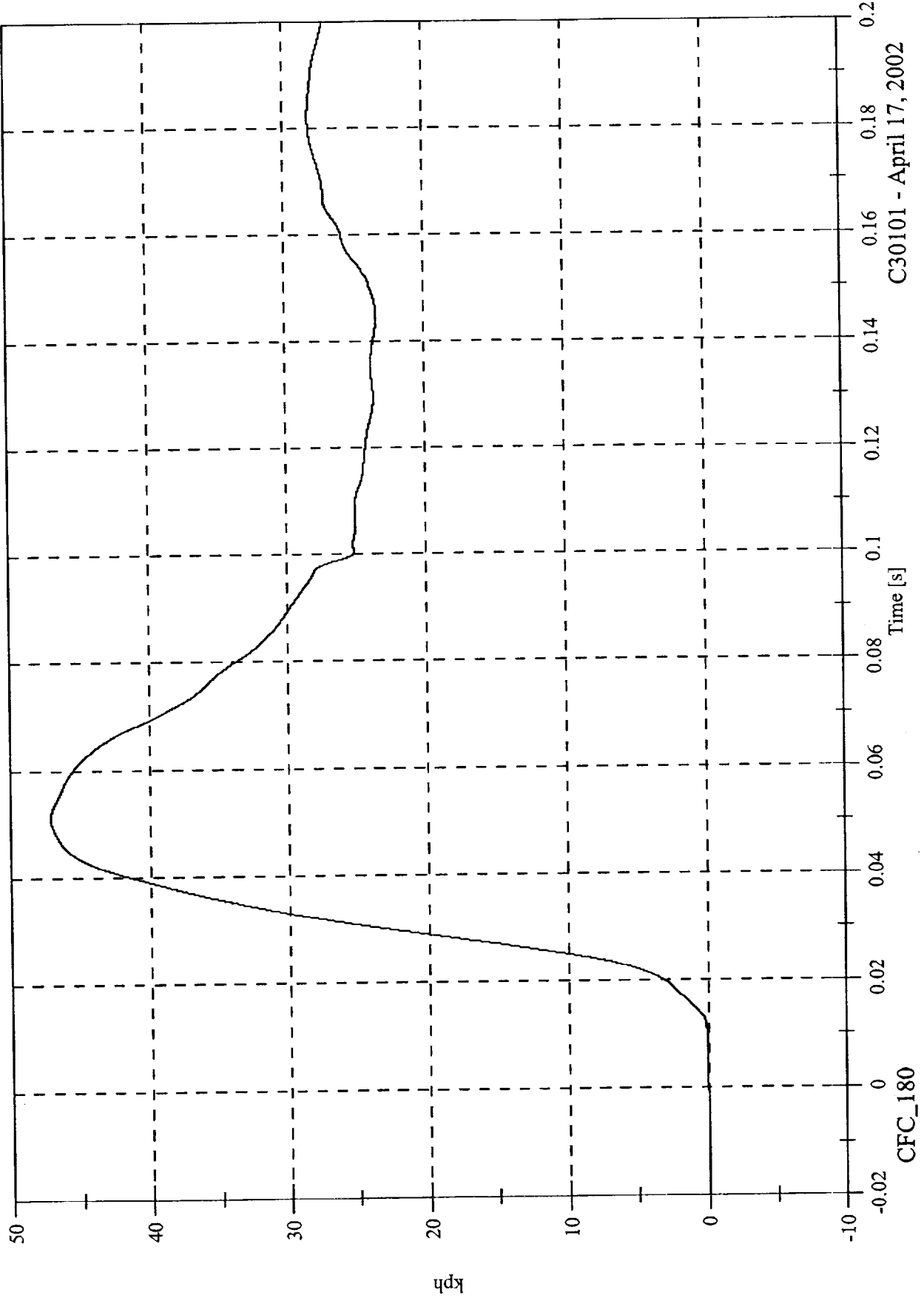
P1 Lower Spine Ry



C30101 - April 17, 2002

Max: 47.2 [kph] at 0.051 [s]
Min: -0.0 [kph] at -0.020 [s]

FMVSS 214D Indicant Test - 2003 Cadillac CTS
P1 Lower Spine Ry Velocity



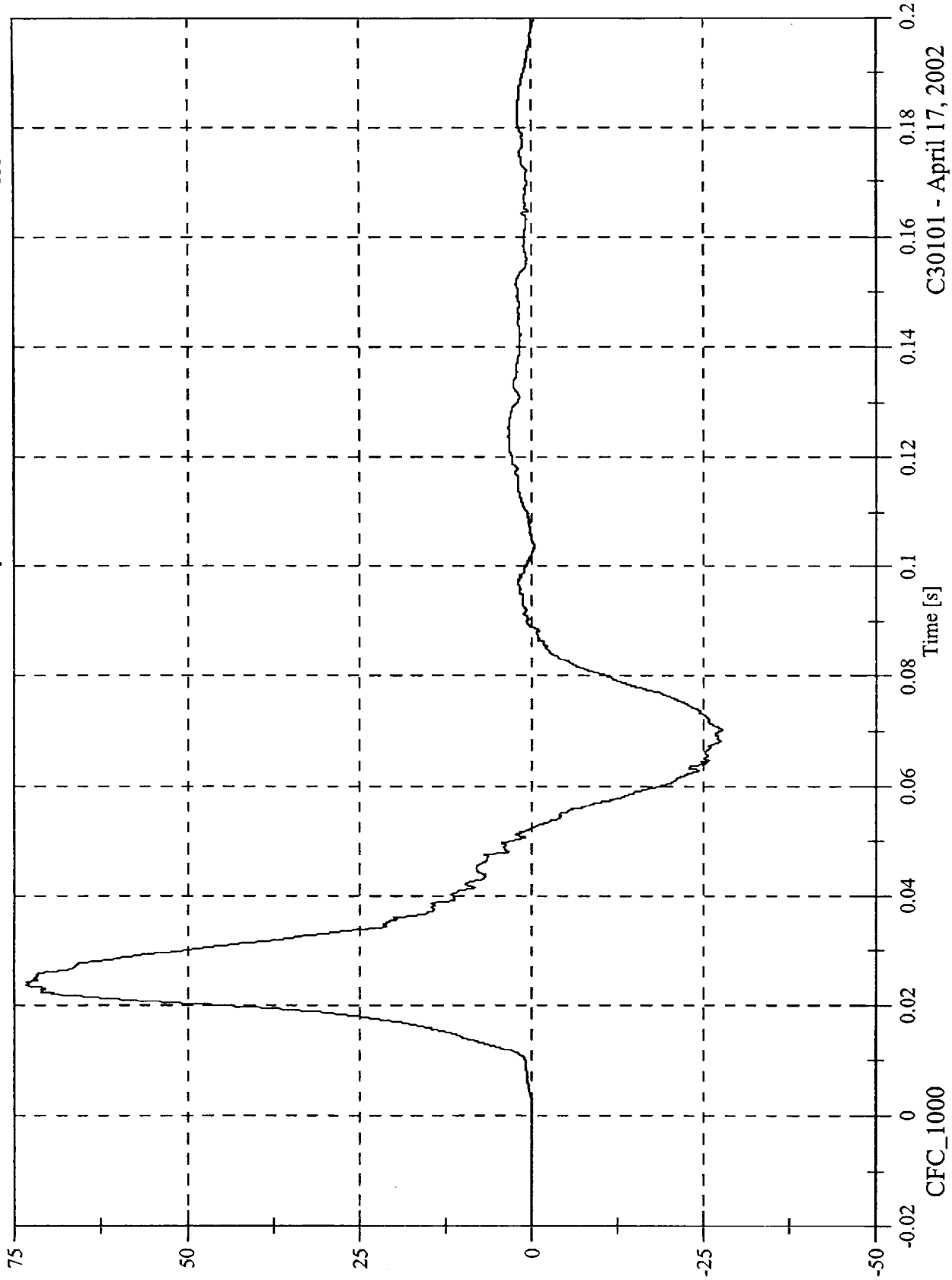
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 73.4 [g] at 0.024 [s]

Min: -27.8 [g] at 0.070 [s]

P1 Pelvic Ry

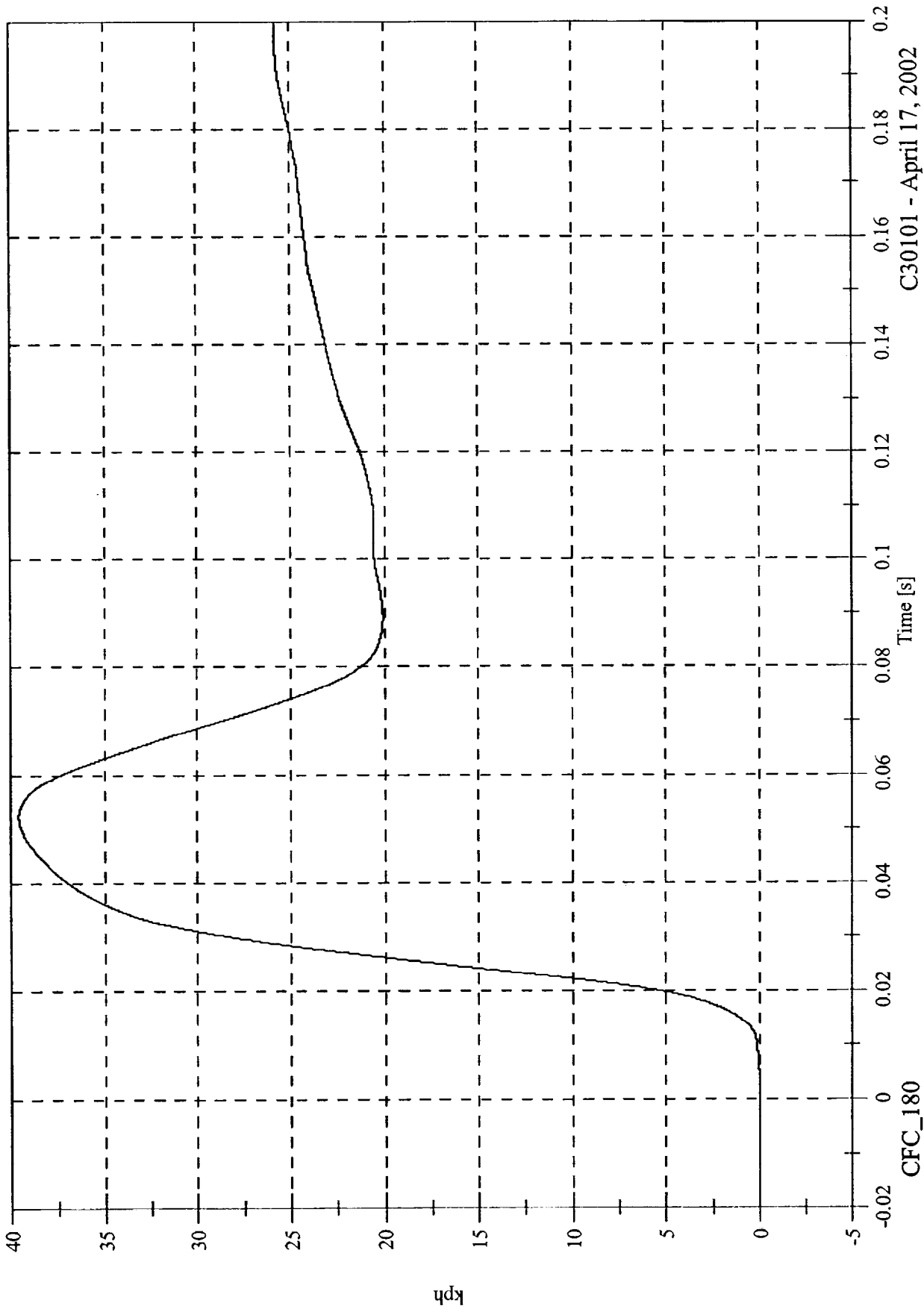


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 39.6 [kph] at 0.052 [s]
Min: -0.0 [kph] at -0.020 [s]

P1 Pelvic Ry Velocity



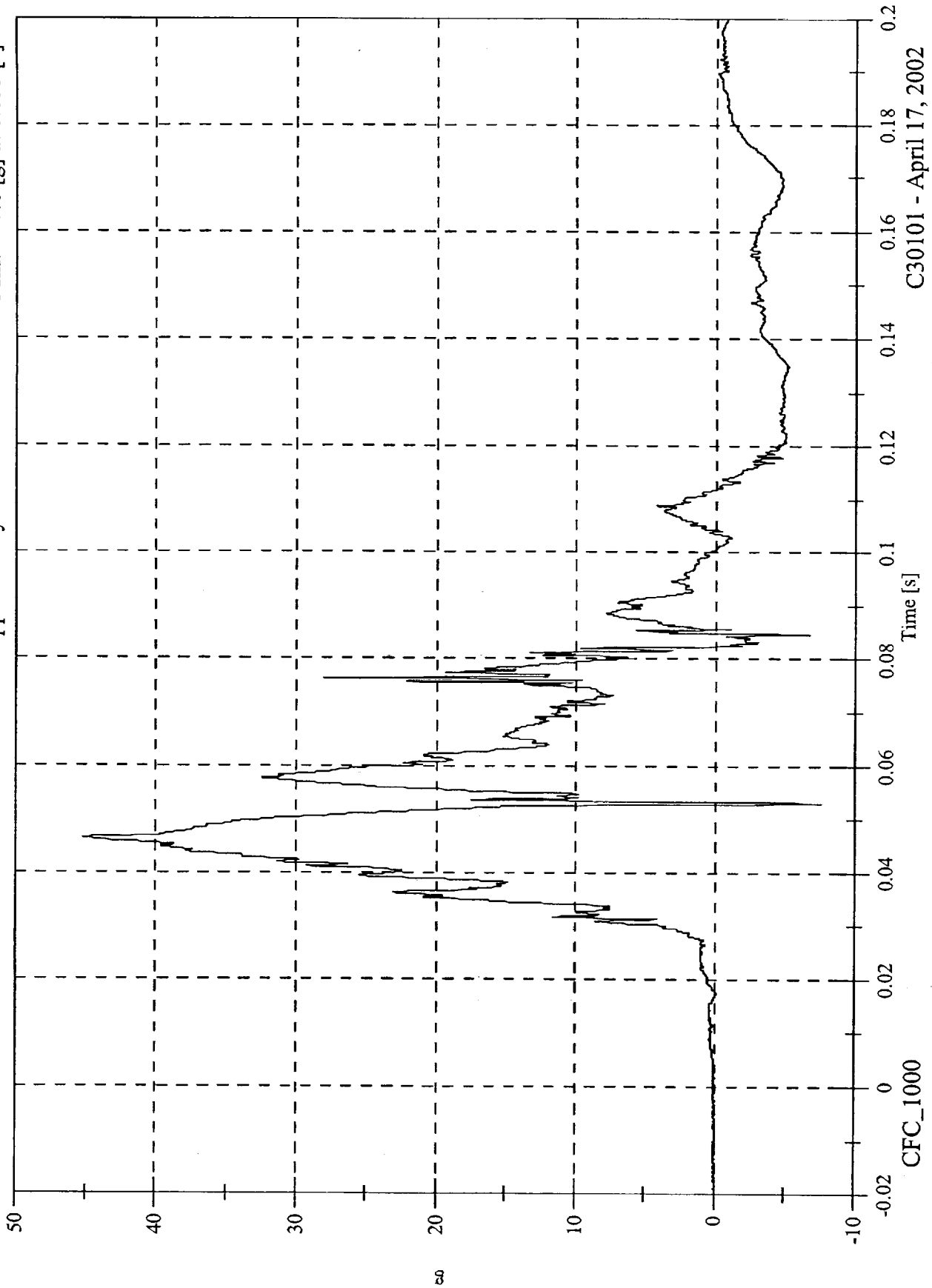
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Upper Rib Ry

Max: 45.2 [g] at 0.046 [s]

Min: -7.6 [g] at 0.053 [s]

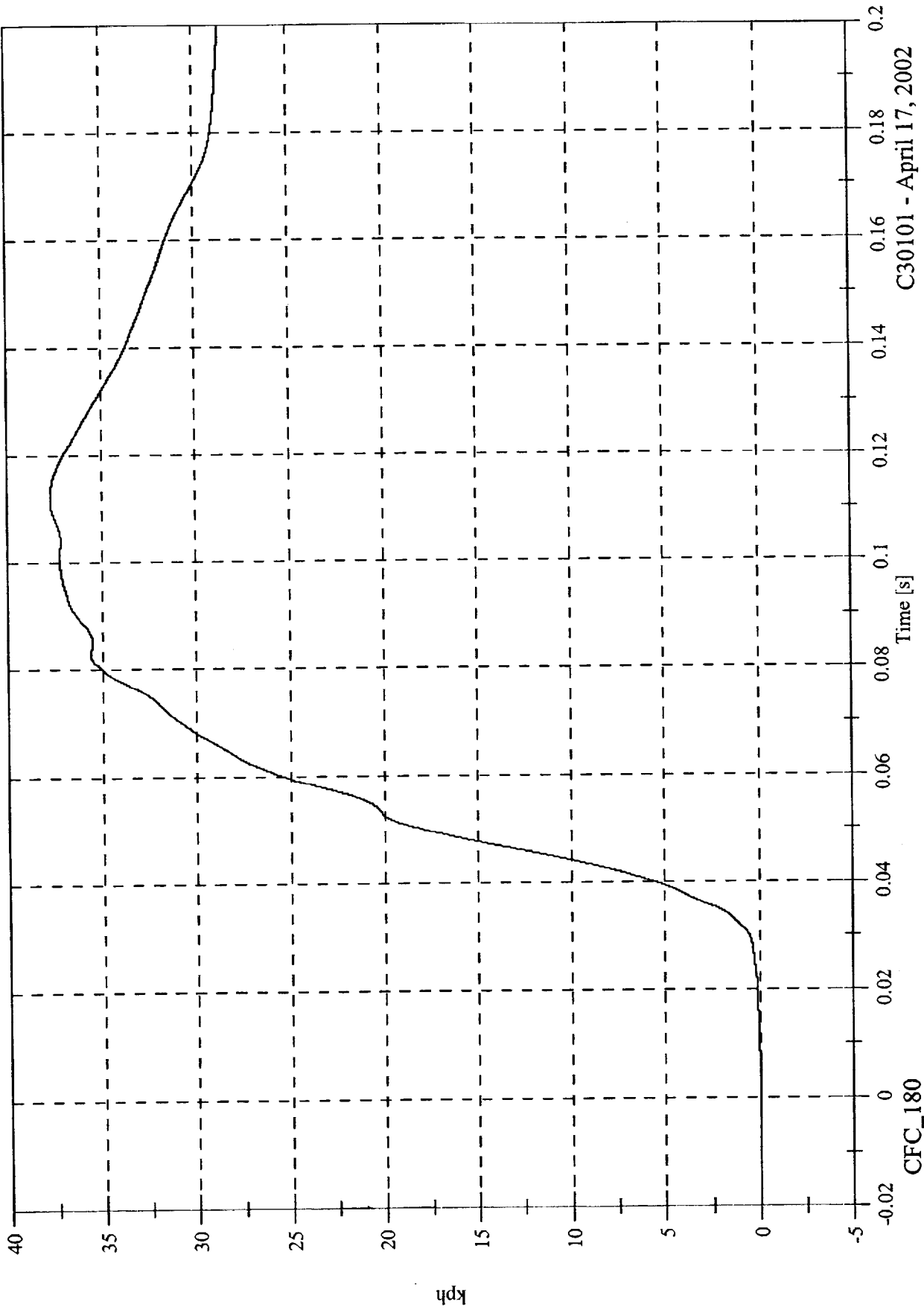


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Upper Rib Ry Velocity

Max: 37.7 [kph] at 0.112 [s]
Min: -0.0 [kph] at -0.018 [s]



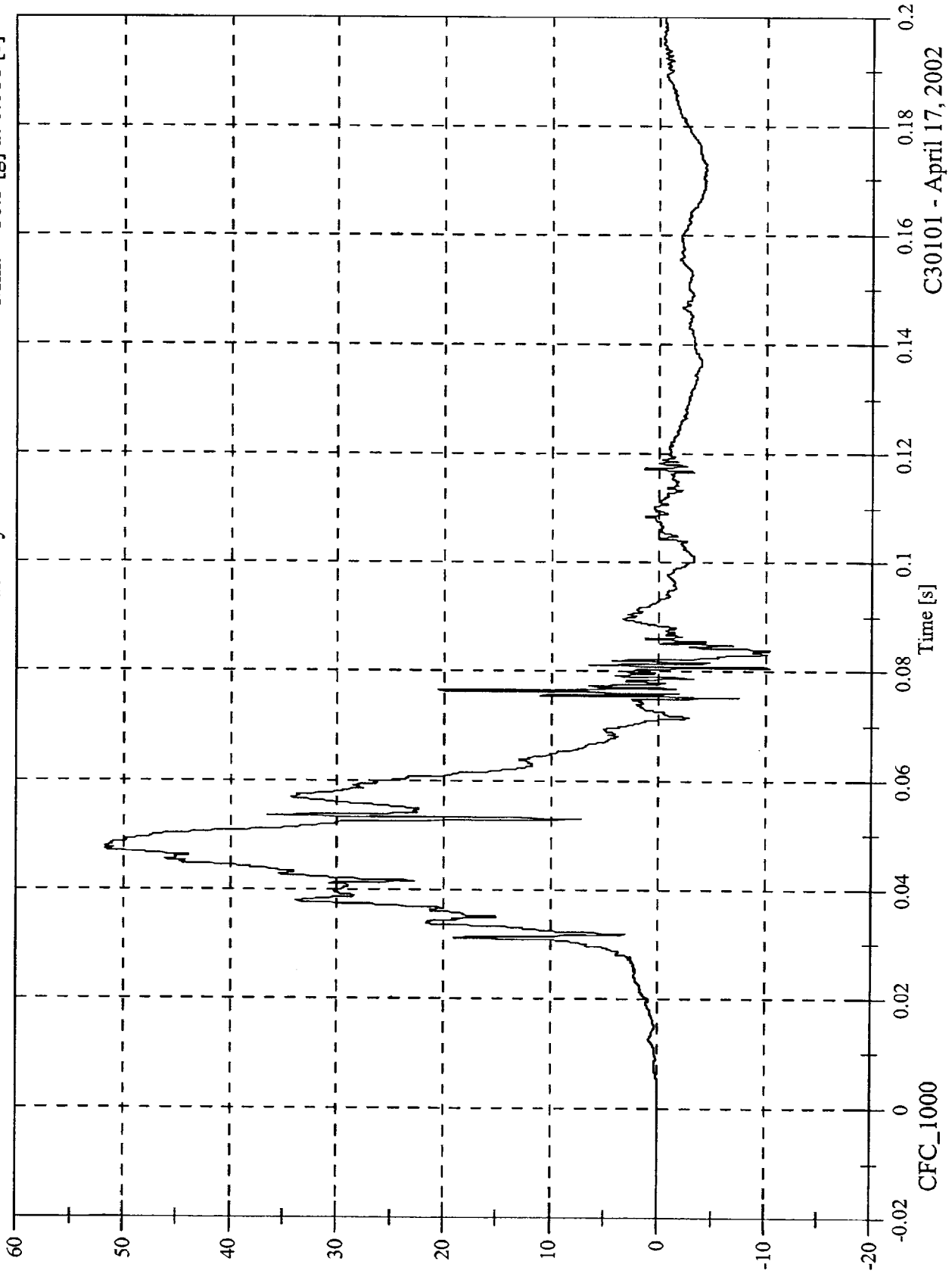
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Lower Rib Ry

Max: 51.8 [g] at 0.048 [s]

Min: -10.5 [g] at 0.081 [s]



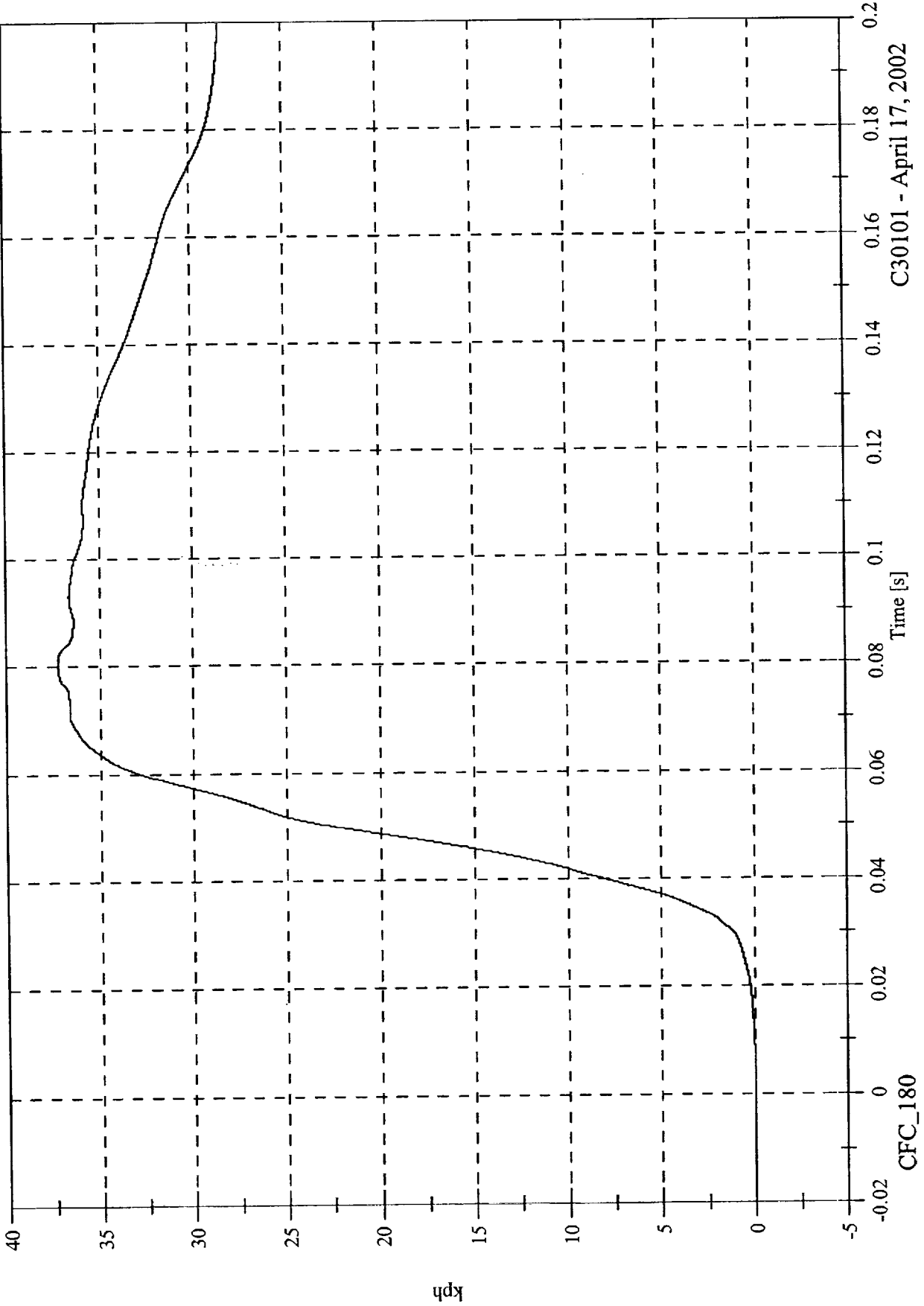
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 37.3 [kph] at 0.080 [s]

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

P4 Lower Rib Ry Velocity

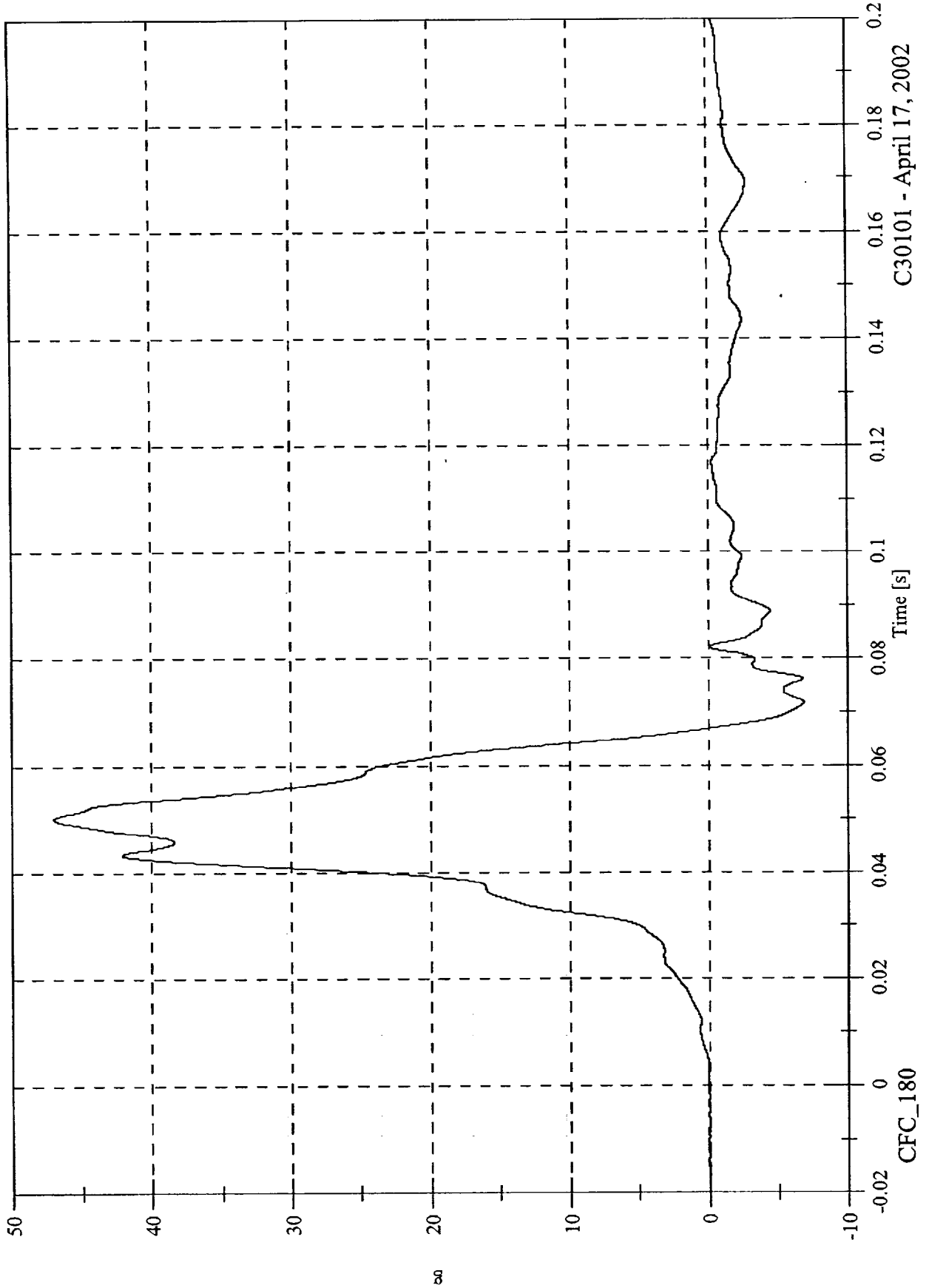


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Lower Spine Ry

Max: 47.0 [g] at 0.050 [s]
Min: -6.8 [g] at 0.072 [s]

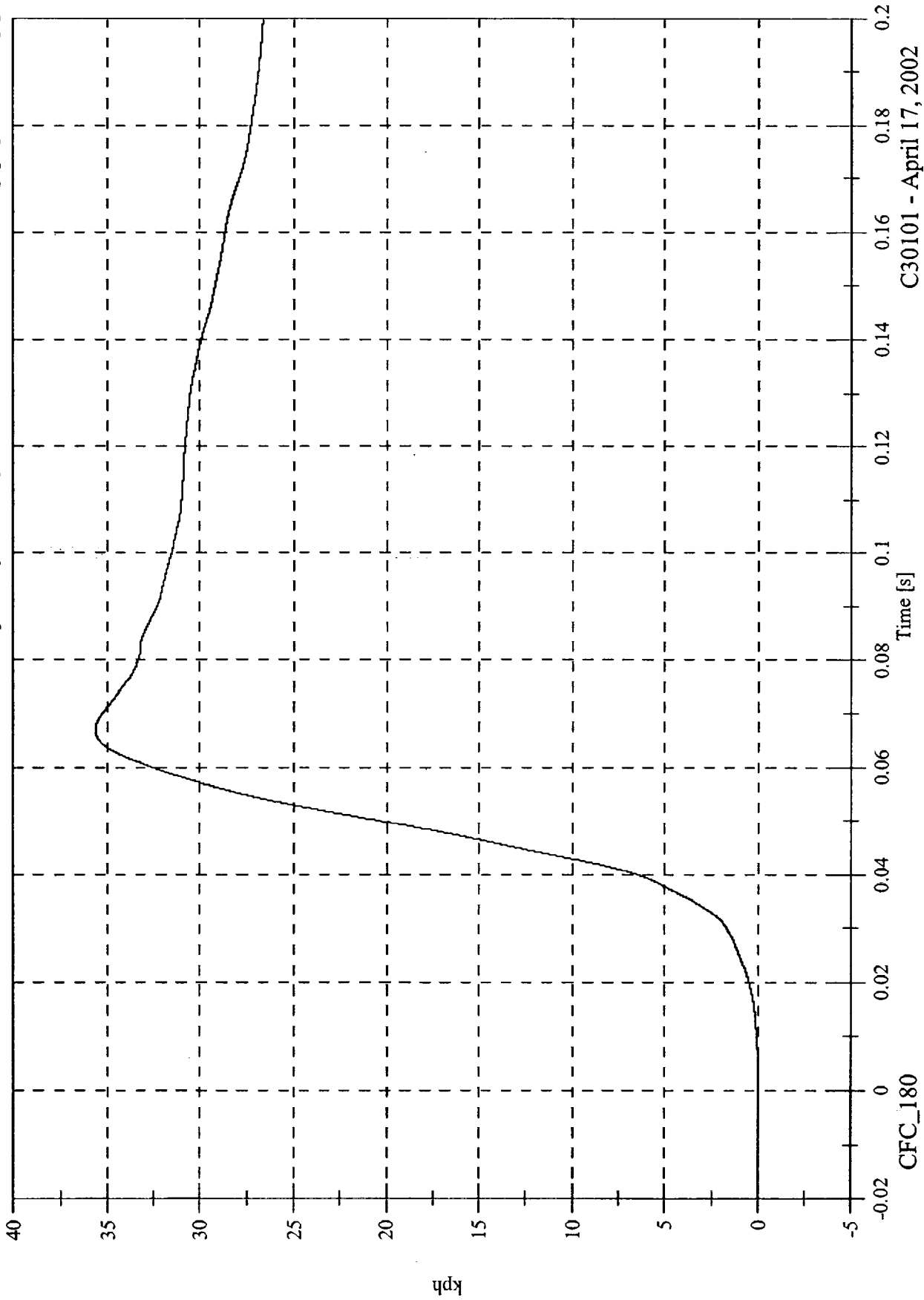


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Lower Spine Ry Velocity

Max: 35.6 [kph] at 0.067 [s]
Min: -0.0 [kph] at -0.017 [s]



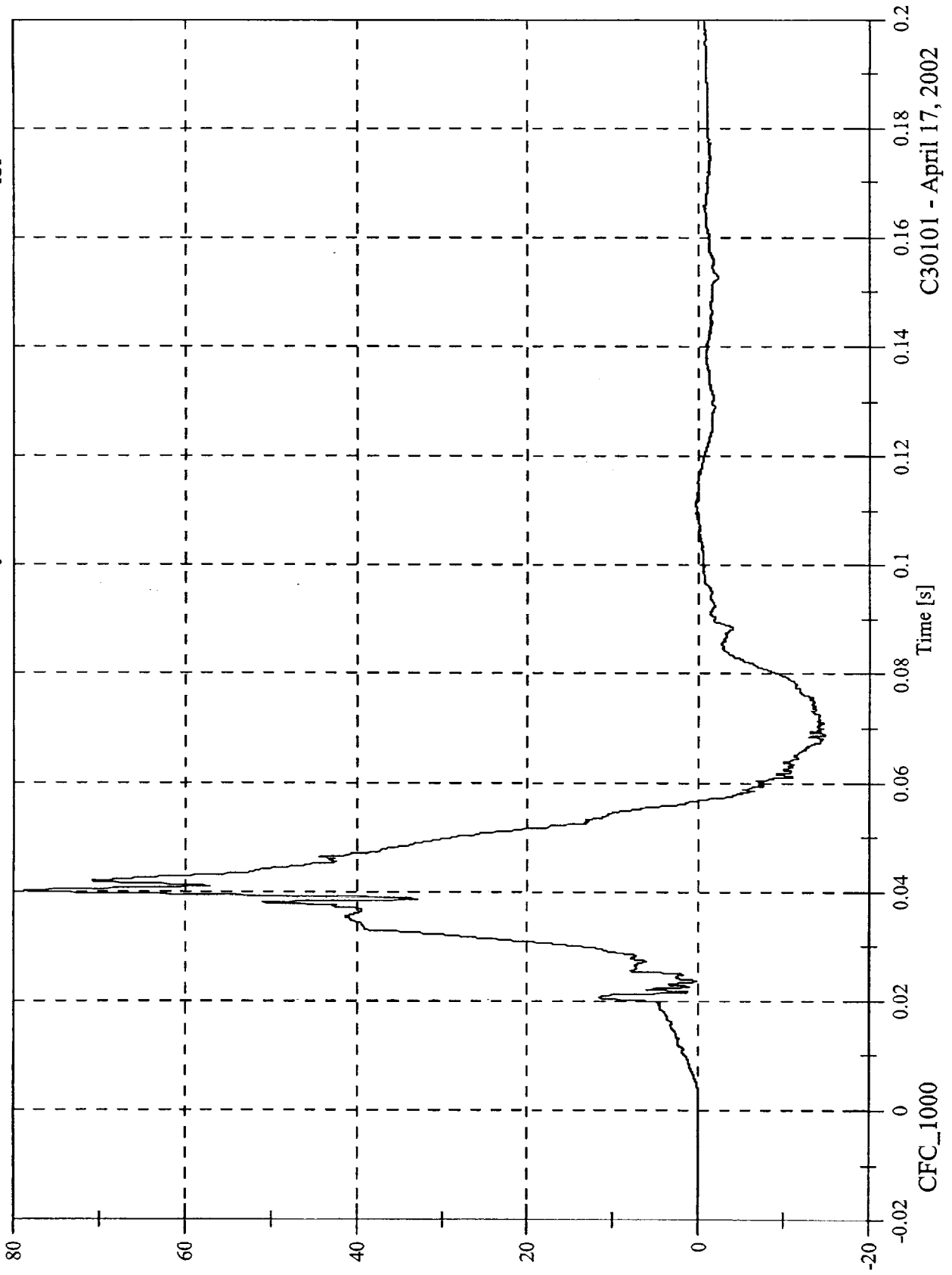
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 78.8 [g] at 0.040 [s]

Min: -14.8 [g] at 0.069 [s]

P4 Pelvic Ry

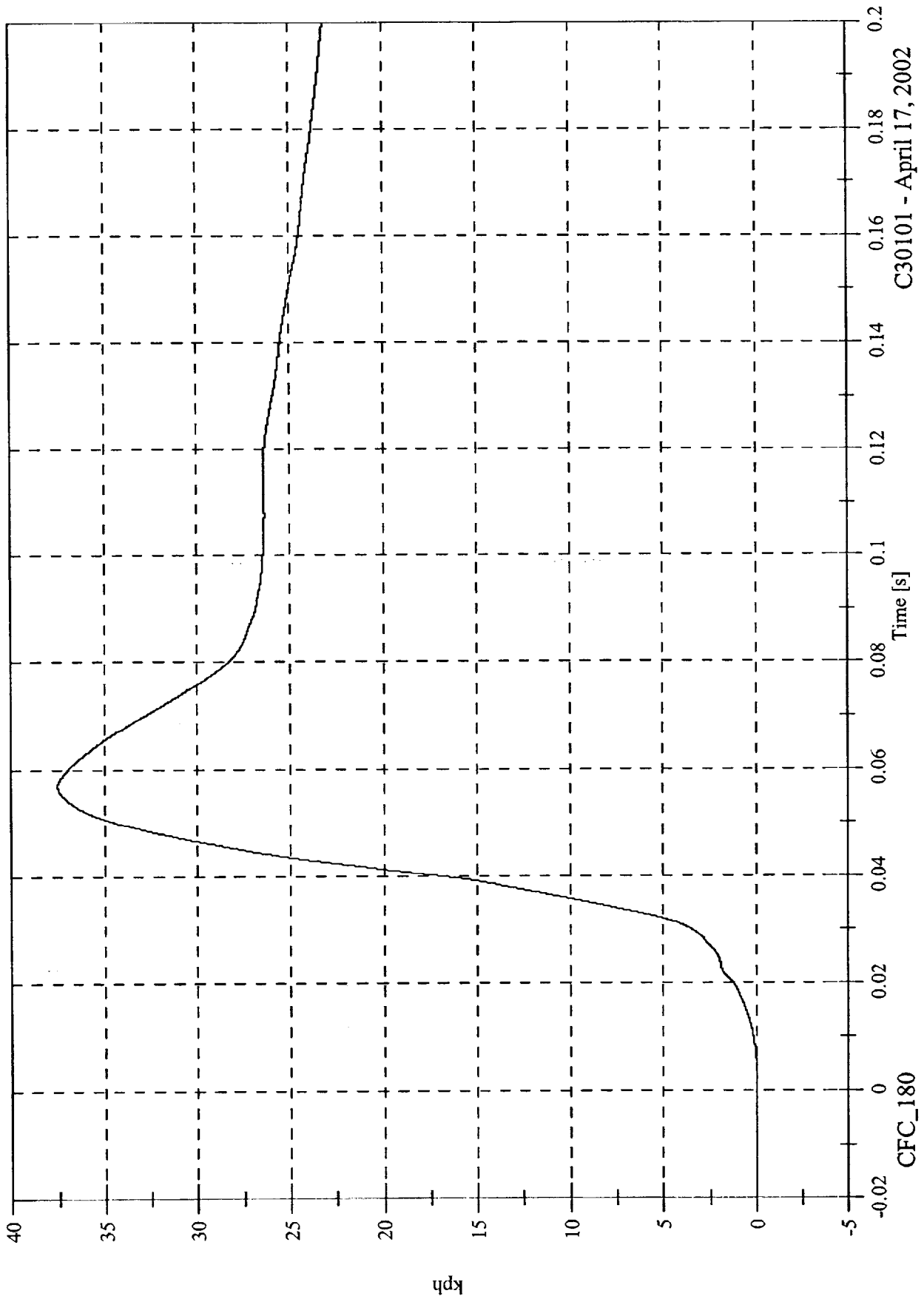


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 37.5 [kph] at 0.057 [s]
Min: -0.0 [kph] at -0.020 [s]

P4 Pelvic Ry Velocity



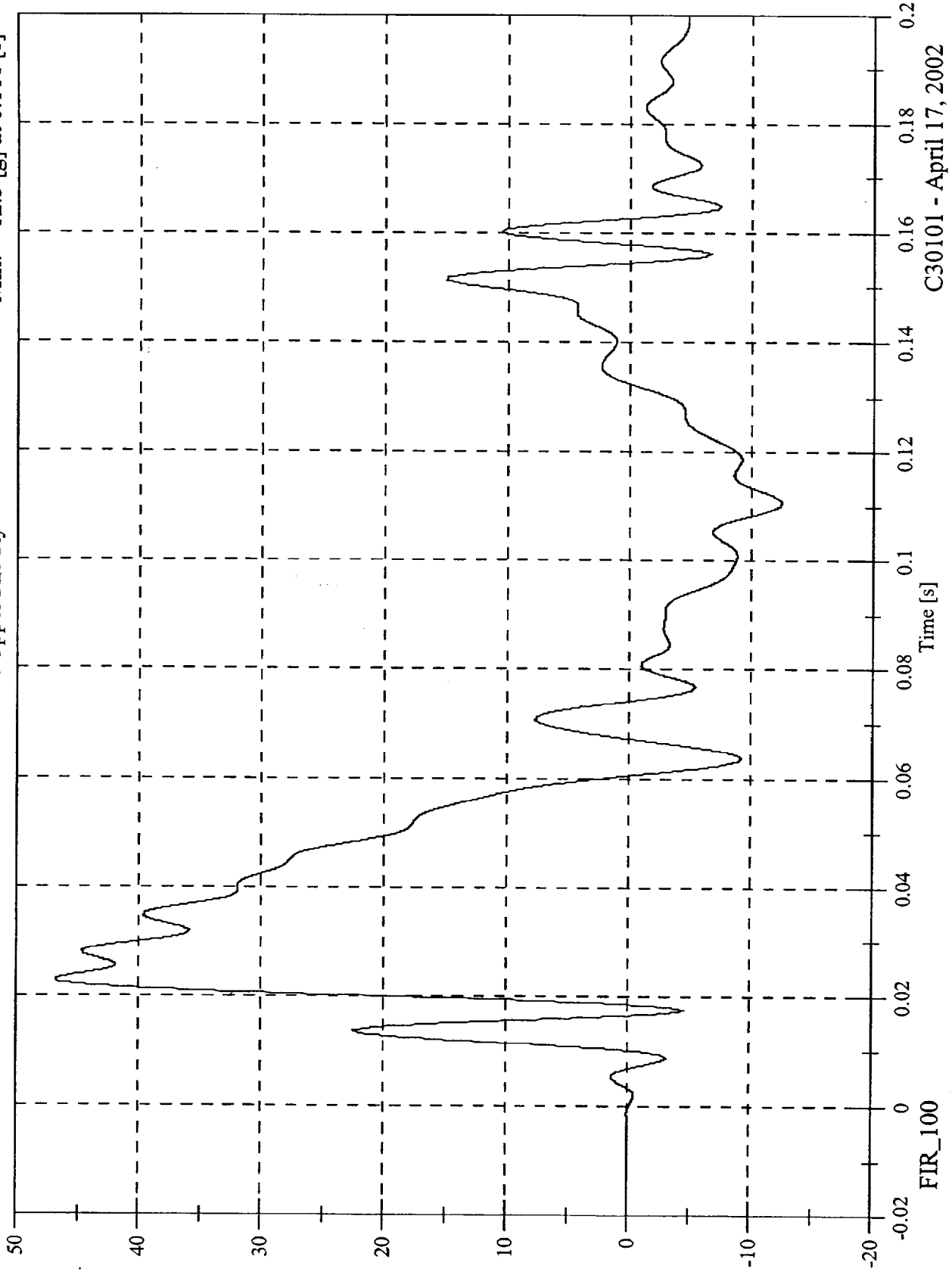
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Upper Rib Ry

Max: 46.8 [g] at 0.023 [s]

Min: -12.5 [g] at 0.111 [s]

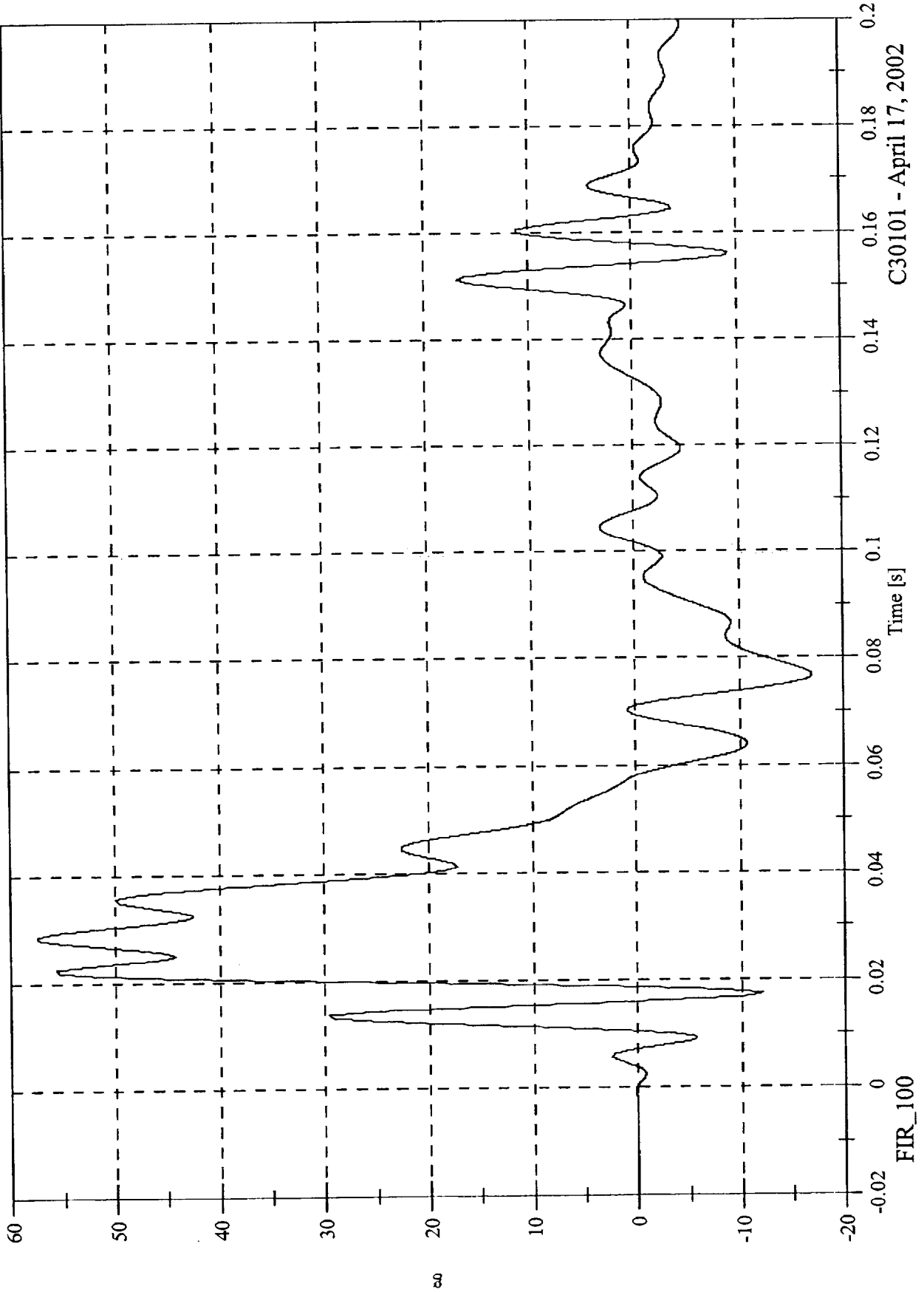


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Lower Rib Ry

Max: 57.4 [g] at 0.028 [s]
Min: -17.0 [g] at 0.077 [s]

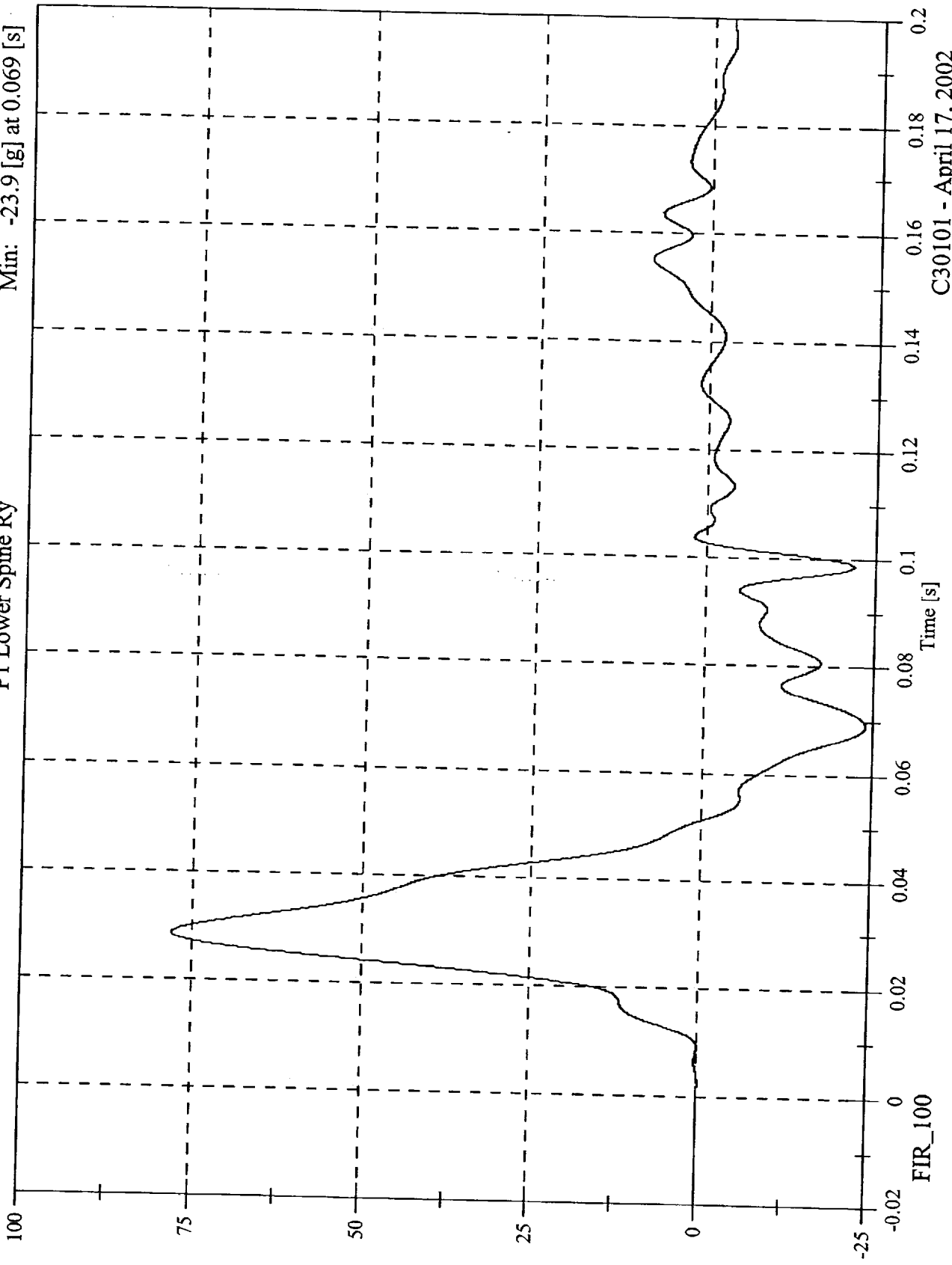


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Lower Spine Ry

Max: 77.9 [g] at 0.028 [s]
Min: -23.9 [g] at 0.069 [s]

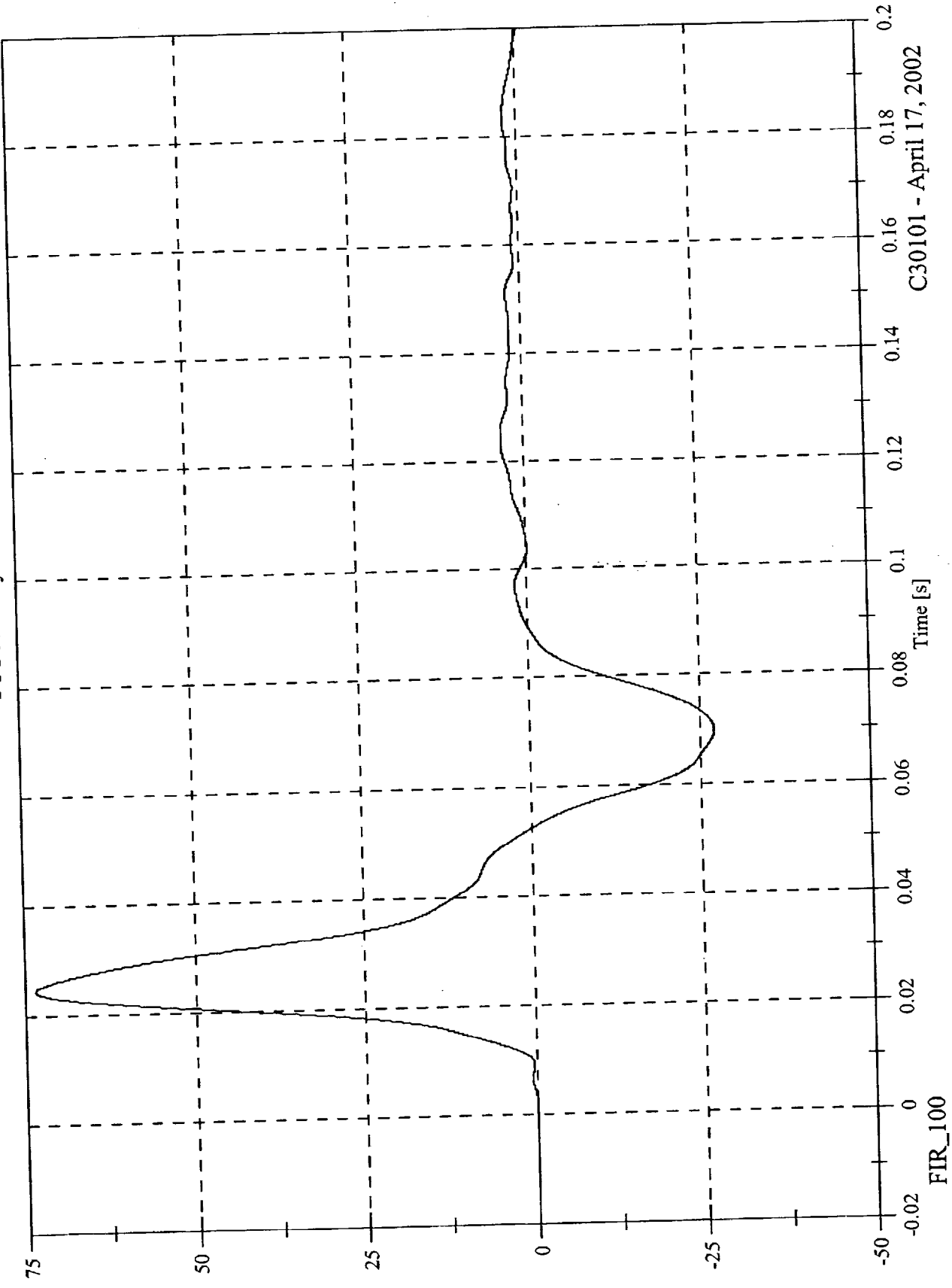


C30101 - April 17, 2002

Max: 73.6 [g] at 0.024 [s]
Min: -27.0 [g] at 0.070 [s]

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P1 Pelvic Ry



C30101 - April 17, 2002

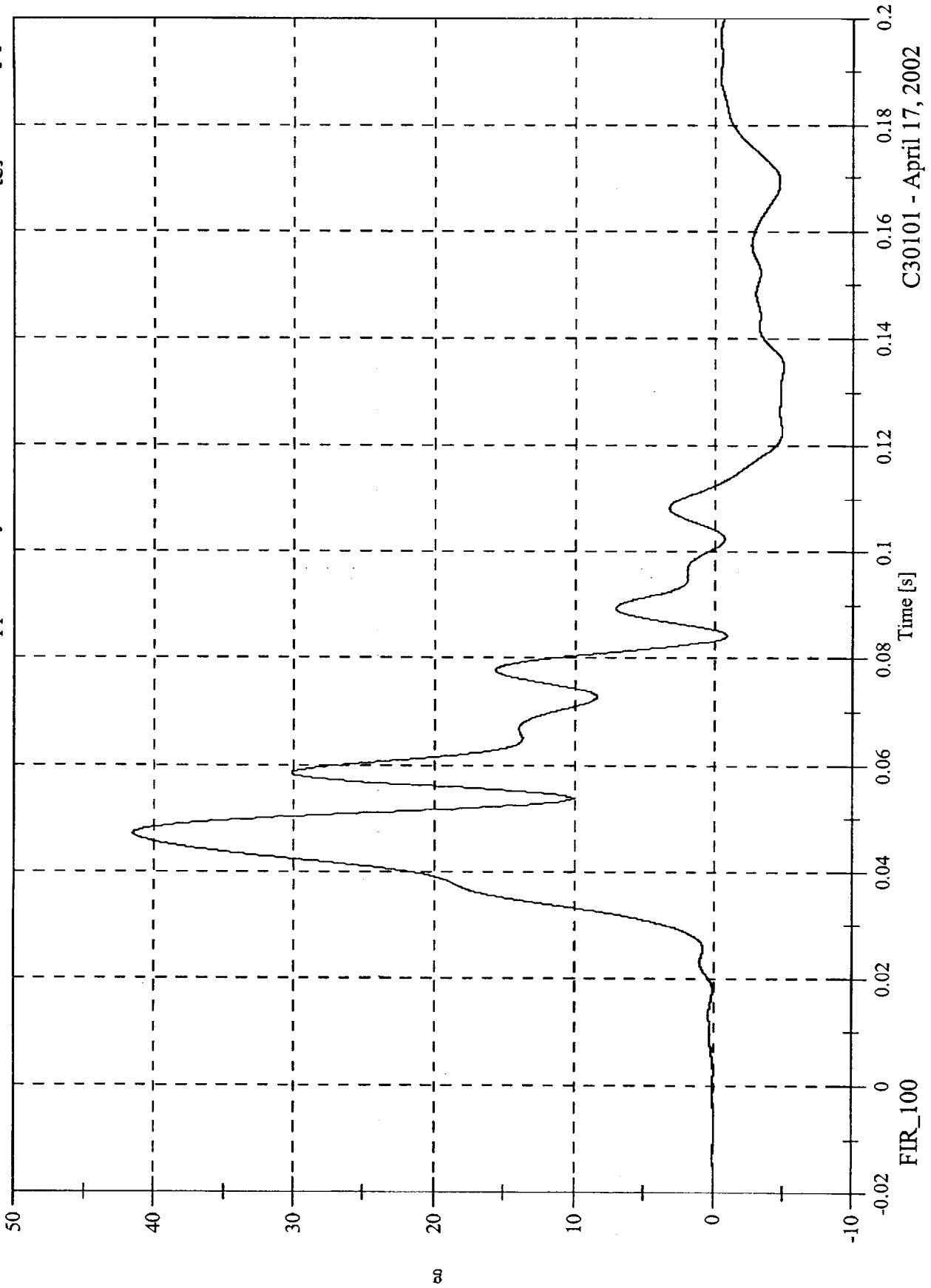
FIR_100

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 41.5 [g] at 0.047 [s]

Min: -5.0 [g] at 0.135 [s]

P4 Upper Rib Ry

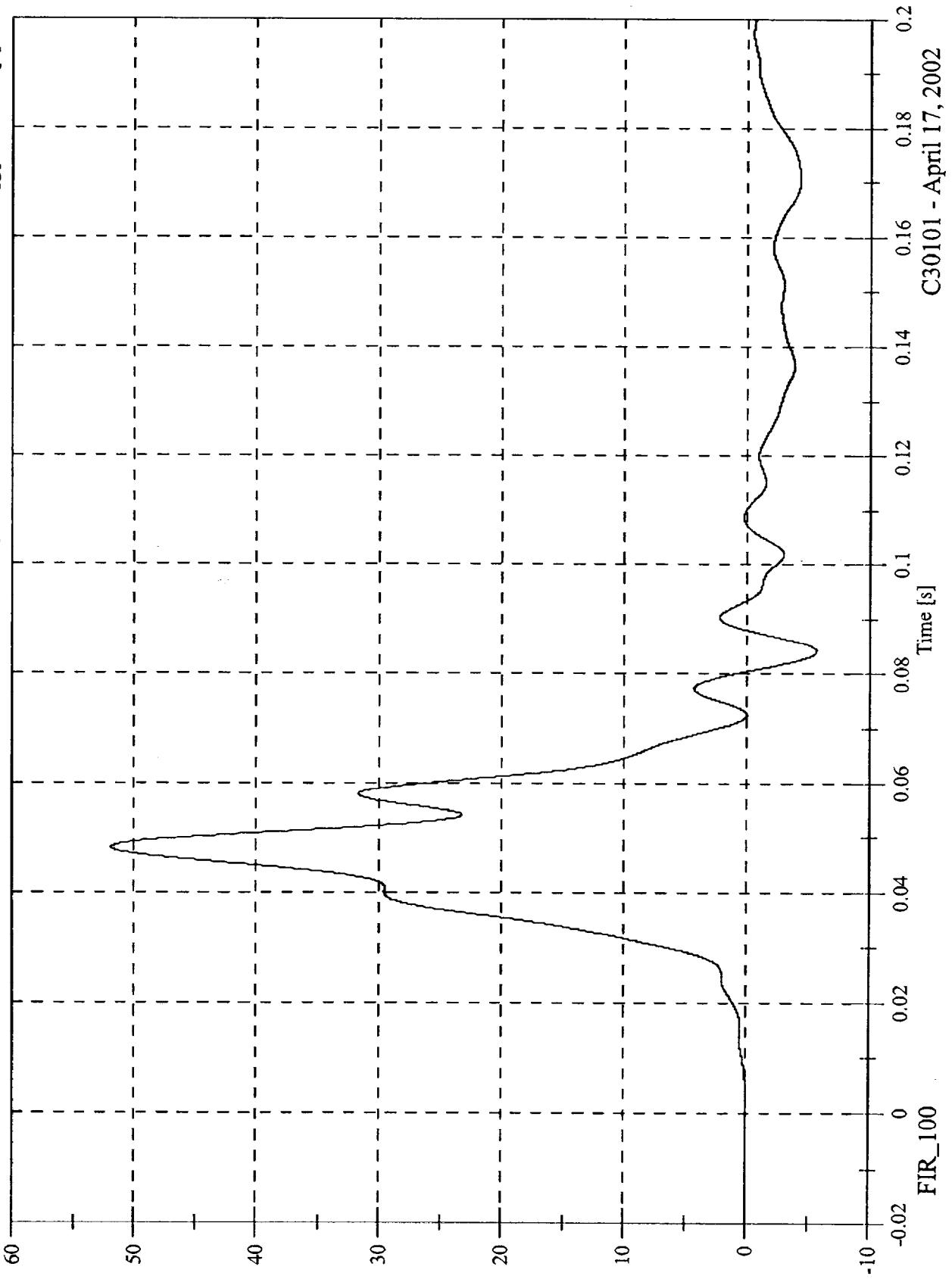


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Lower Rib Ry

Max: 52.0 [g] at 0.048 [s]
Min: -5.7 [g] at 0.084 [s]



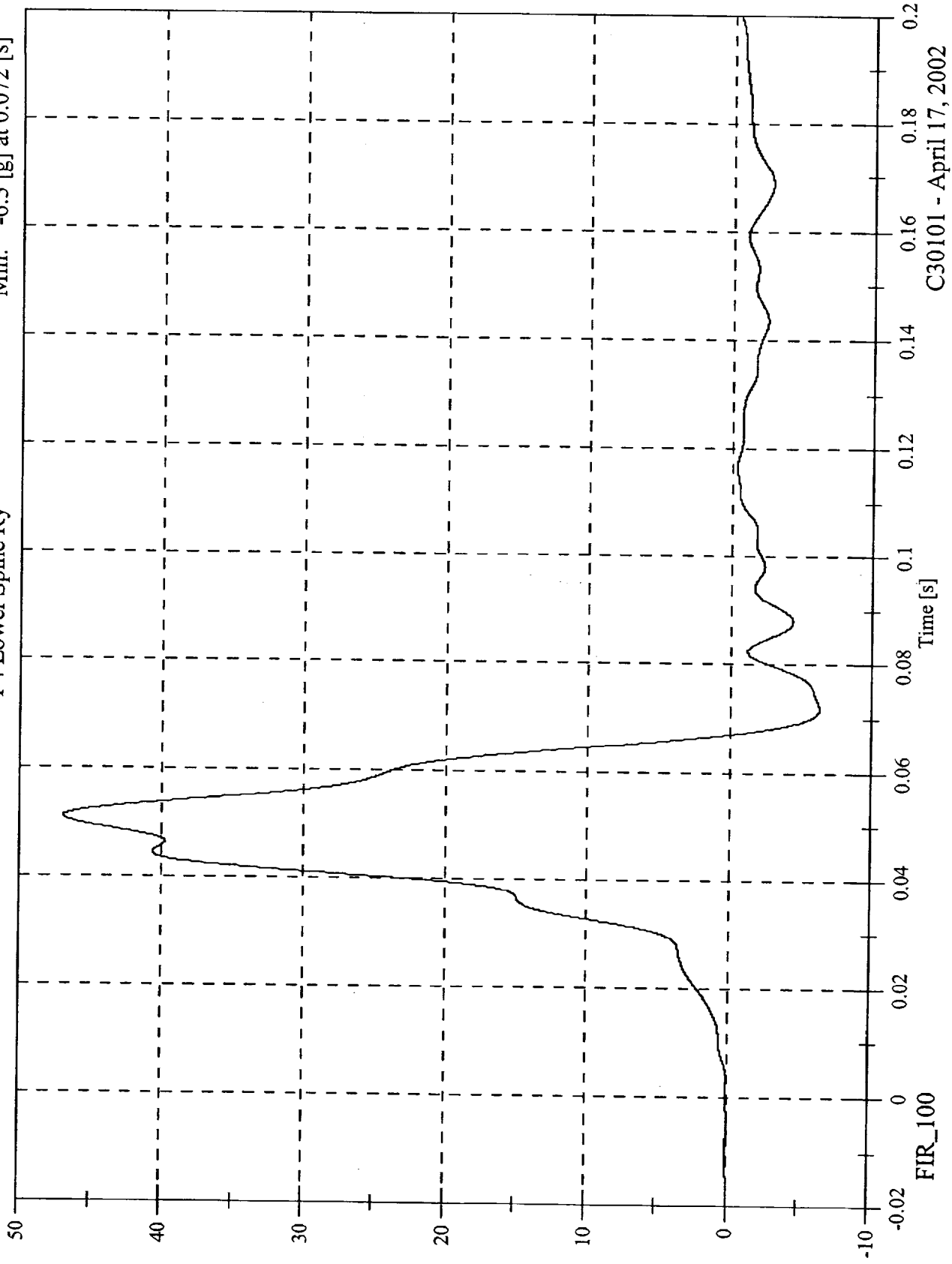
C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

P4 Lower Spine Ry

Max: 46.9 [g] at 0.051 [s]

Min: -6.3 [g] at 0.072 [s]

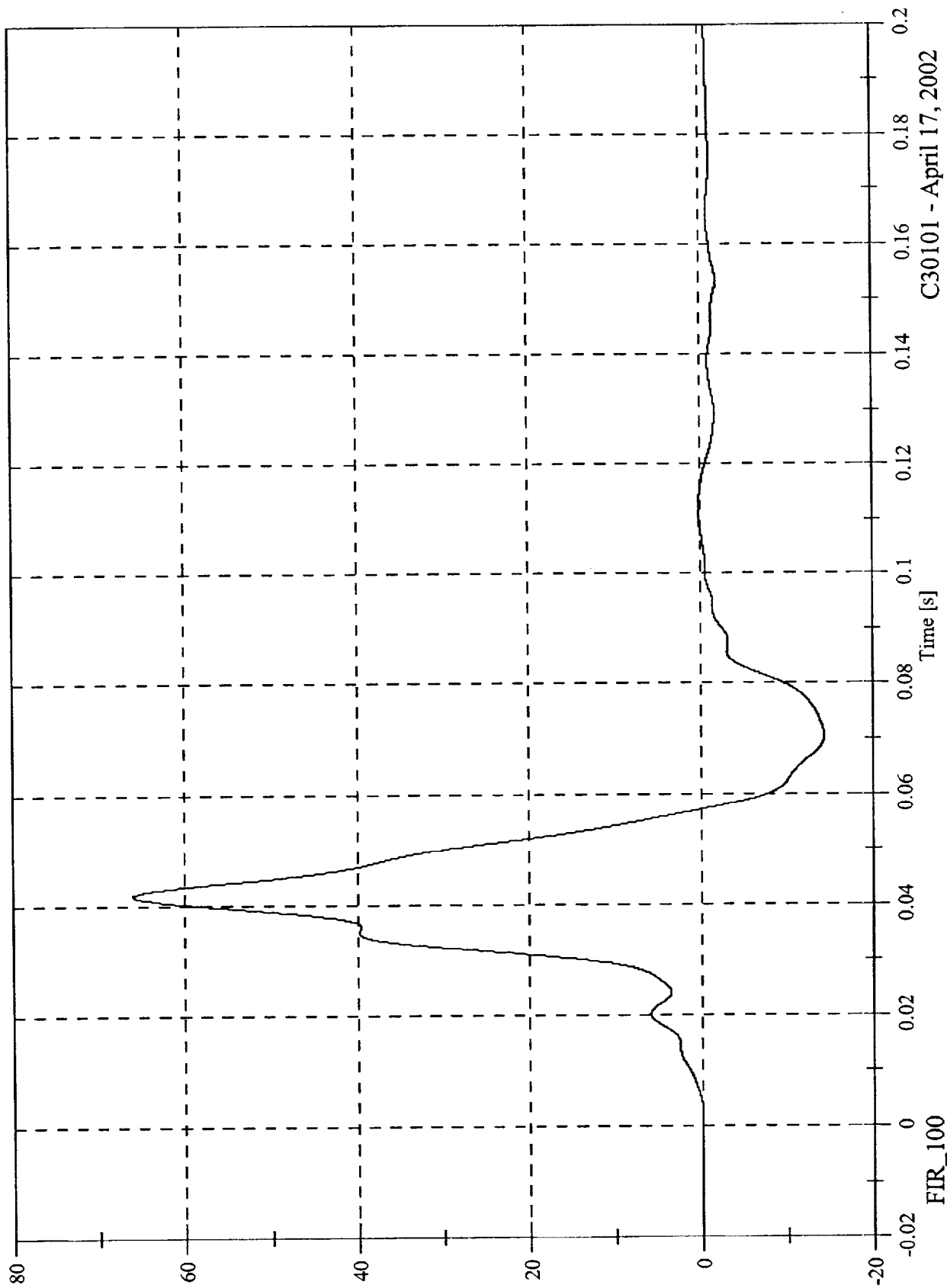


C30101 - April 17, 2002

FMVSS 214D Indicant Test - 2003 Cadillac CTS

Max: 66.2 [g] at 0.042 [s]
Min: -14.3 [g] at 0.071 [s]

P4 Pelvic Ry



C30101 - April 17, 2002

APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

Date: 3/19/02; 3/15/02; 5/22/02

Sequential Test Number:

4; 3; 1; 1

Laboratory Technician:

B. Swiecicki

| TEST PARAMETER | SPECIFICATION | SID NO.: 026 | | SID NO.: 268 | |
|------------------------------------|---------------|--------------|-----------|--------------|-----------|
| | | PRE TEST | POST TEST | PRE TEST | POST TEST |
| SH- Seated Height (mm) | 889 - 909 | 899 | 899 | 899 | 899 |
| RH- Rib Height (mm) | 501 - 521 | 518 | 518 | 513 | 513 |
| HP- Hip Pivot Height (mm) | 99 ref. | 99 | 99 | 99 | 99 |
| RD- Rib from Back Line (mm) | 229 - 241 | 236 | 236 | 236 | 236 |
| KV- Knee Pivot from Back Line (mm) | 511 - 526 | 518 | 518 | 518 | 518 |
| SW- Knee Pivot to Floor (mm) | 490 - 505 | 493 | 493 | 495 | 495 |
| HW- Hip Width (mm) | 356 - 391 | 371 | 371 | 378 | 378 |
| THORAX IMPACTS | | | | | |
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.1 | 21.1 | 20.6 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 33 | 30.0 | 32 | 31.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.29 | 4.32 | 4.3 | 4.27 |
| UPPER RIB (g's) | 37 - 46 | 39.07 | 38.48 | 45.5 | 44.49 |
| LOWER RIB (g's) | 37 - 46 | 38.57 | 38.58 | 43.4 | 43.25 |
| LOWER SPINE (g's) | 15 - 22 | 20.1 | 19.27 | 21 | 21.03 |
| PELVIS IMPACT | | | | | |
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.1 | 21.7 | 21.1 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 34 | 31.0 | 30 | 31.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.32 | 4.29 | 4.32 | 4.32 |
| PELVIS (g's) | 40 - 60 | 48.33 | 45.89 | 41.7 | 50.94 |

REMARKS: None

CALIBRATION TEST RESULTS

PRE-TEST

SID NO.: 026

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 4
Date: 3/19/02 Laboratory Technician: B. Swiecicki

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

* Test not required for SID certification.

REMARKS: None

EXTERNAL DIMENSIONS
PRE-TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 4
Date: 3/19/02 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm) | 889 - 909 | 899 |
| RH- Rib Height (mm) | 502 - 520 | 518 |
| HP- Hip Pivot Height (mm) | 99 ref. | 99 |
| RD- Rib from Back Line (mm) | 229 - 241 | 236 |
| KH- Knee Pivot from Back Line (mm) | 511 - 526 | 518 |
| KV- Knee Pivot to Floor (mm) | 490 - 505 | 493 |
| HW- Hip Width (mm) | 356 - 391 | 371 |

REMARKS: None

**THORACIC SHOCK ABSORBER TESTS
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 1.3
 Date: September 20, 2001 Laboratory Technician: B. Swiecicki

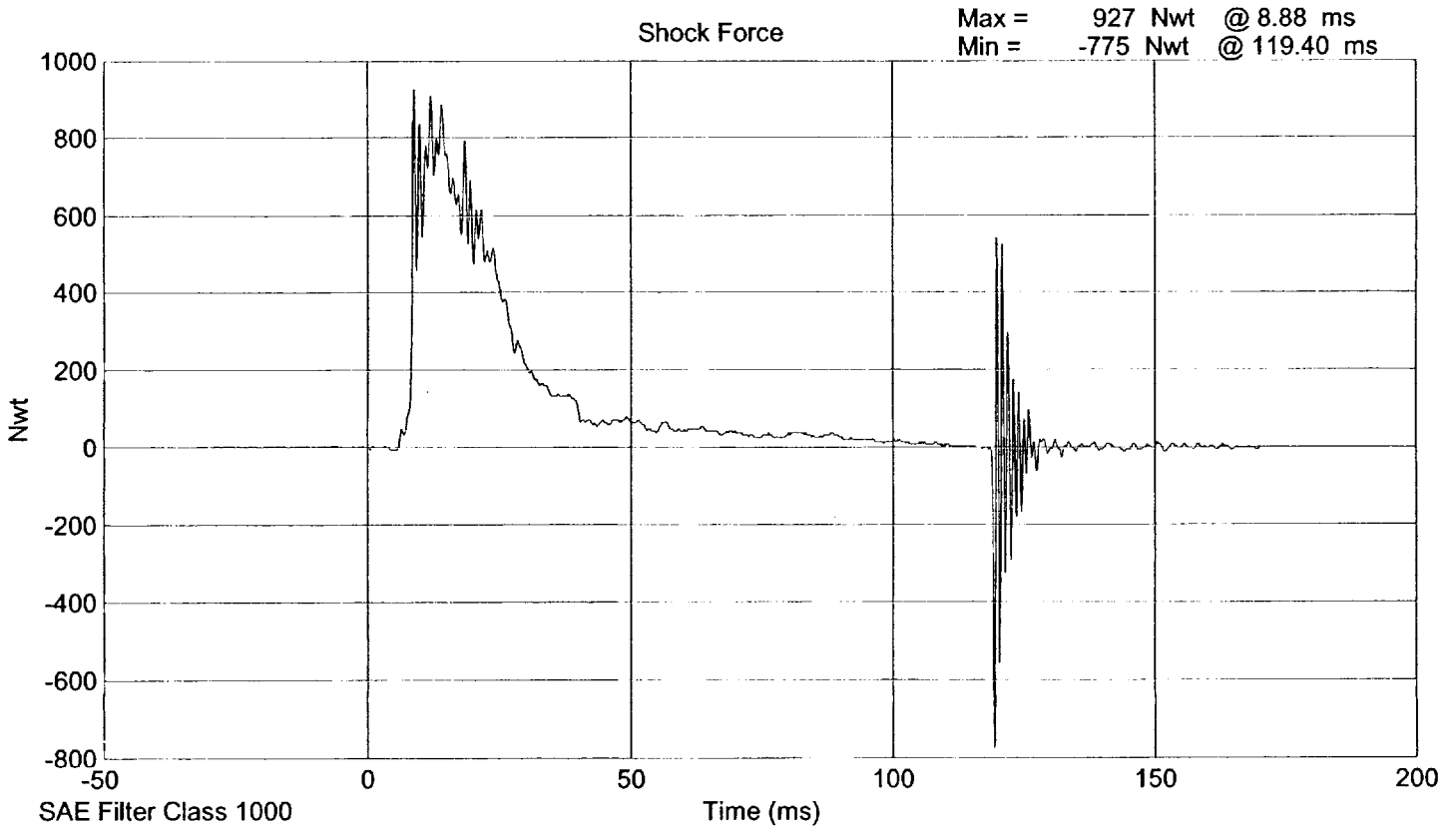
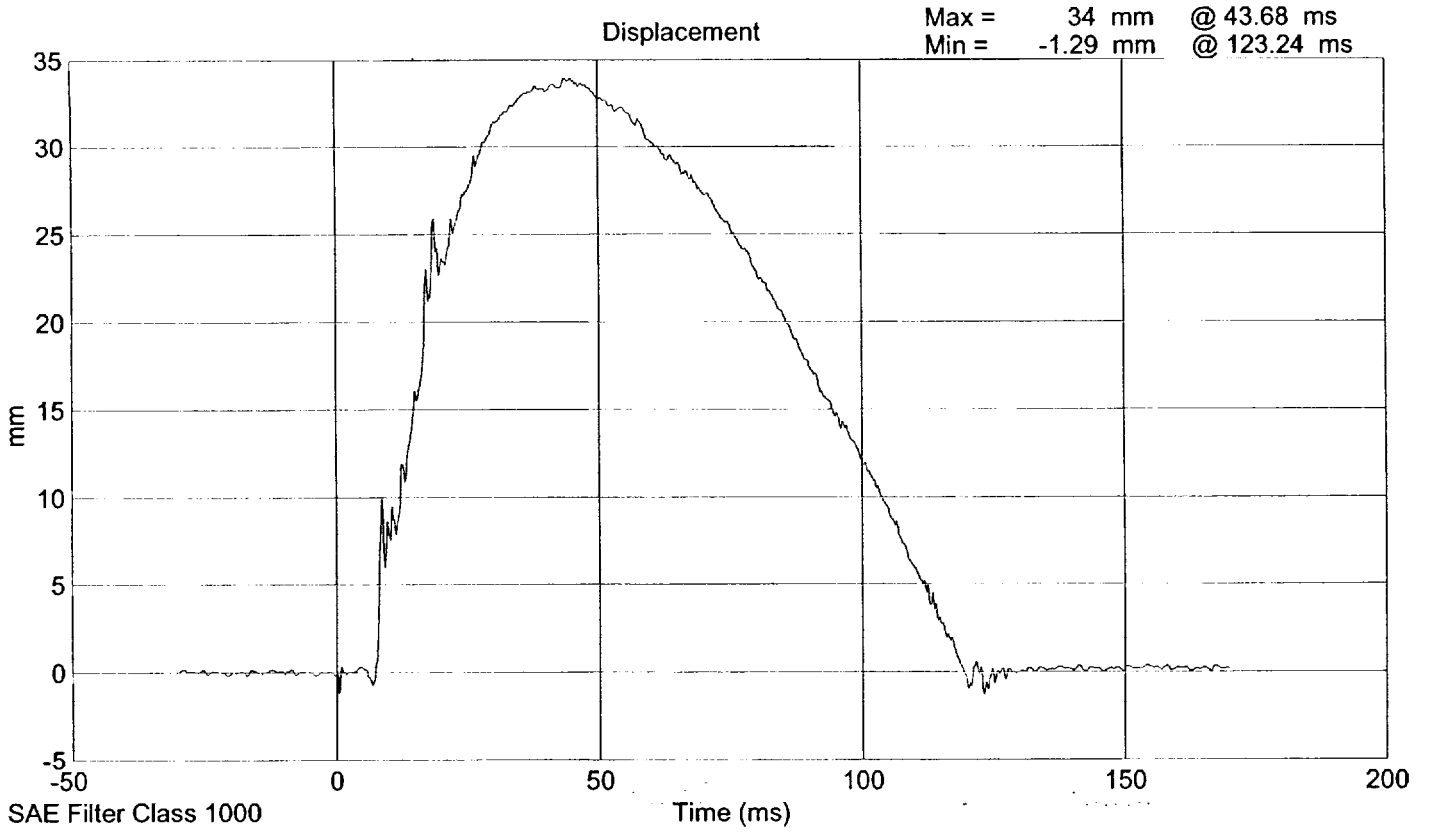
DAMPER IDENTIFICATION: 026

| TEST PARAMETER | | SPECIFICATION | TEST RESULTS |
|-----------------------|-------------------|---------------|--------------|
| TEMPERATURE (°C) | | 18.9 - 25.5 | 21.1 |
| RELATIVE HUMIDITY (%) | | 10 - 70 | 32 |
| VELOCITY 3.05 m/s | FORCE (N) | 836 - 1125 | 926 |
| | DISPLACEMENT (mm) | 30 - 35 | 34 |
| VELOCITY 4.27 m/s | FORCE (N) | 1730 - 2099 | 1773 |
| | DISPLACEMENT (mm) | 32 - 37 | 36 |
| VELOCITY 6.10 m/s | FORCE (N) | 3741 - 4448 | 4155 |
| | DISPLACEMENT (mm) | 33 - 40 | 40 |

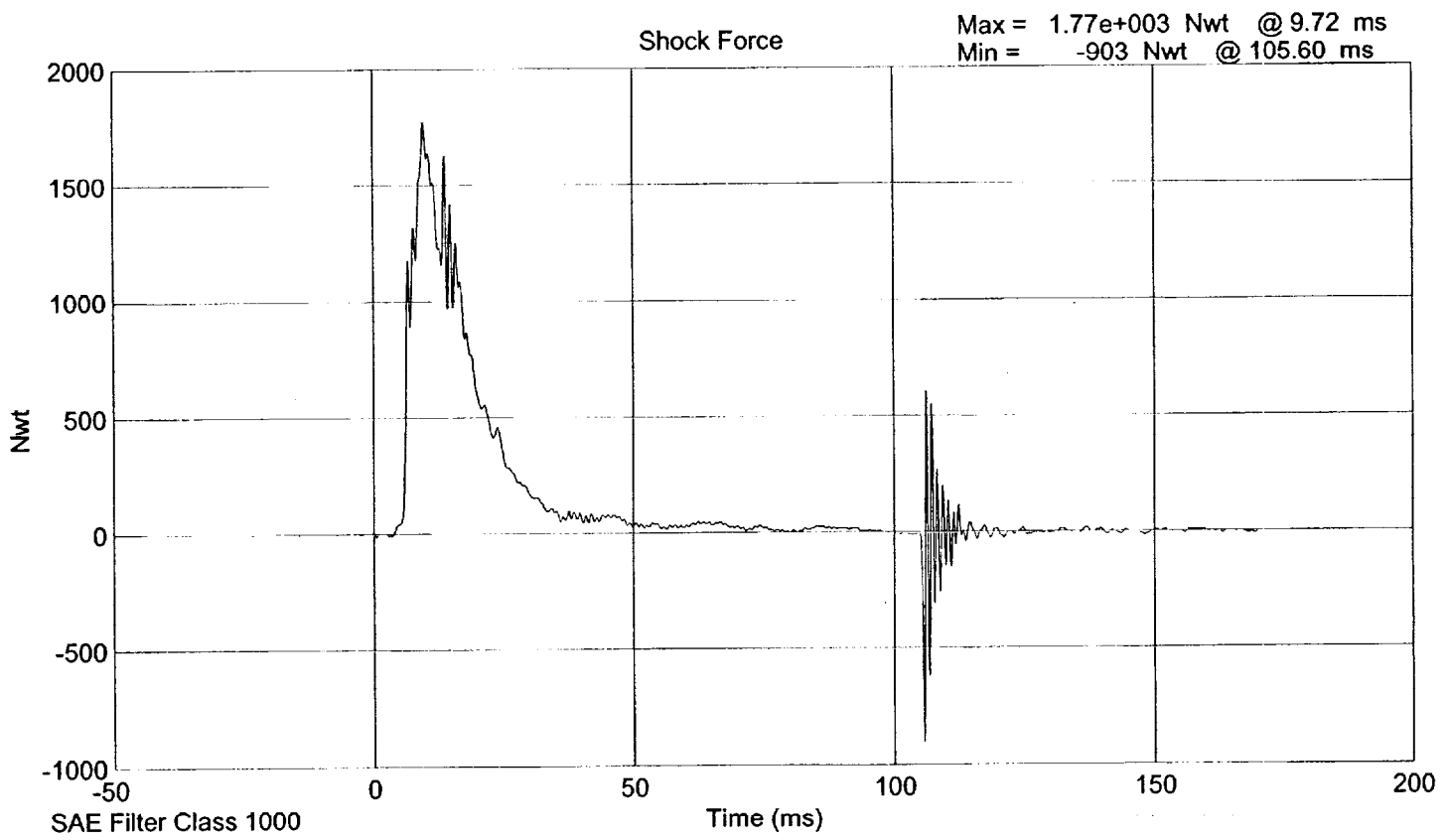
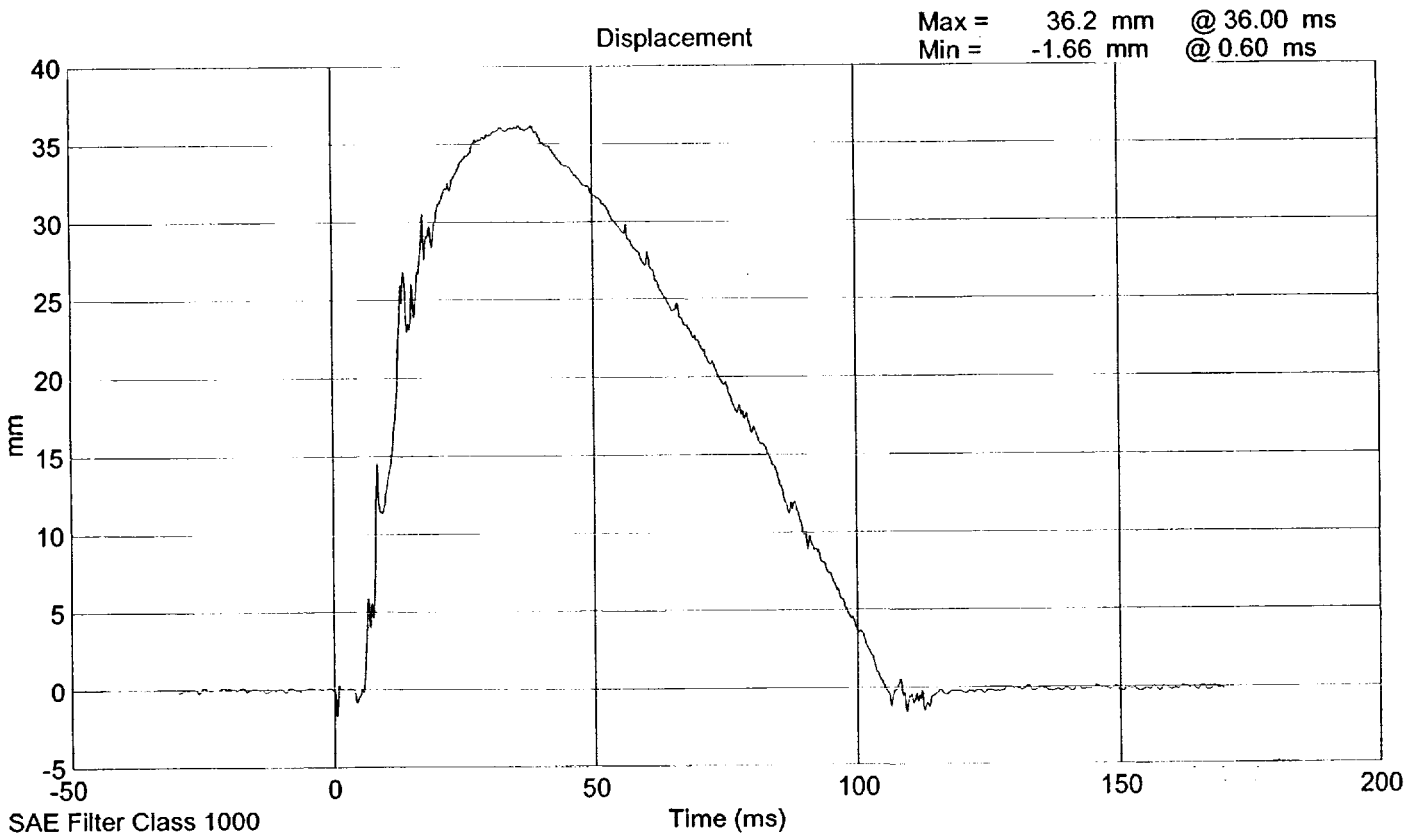
DAMPER SETTING: 5

REMARKS: None

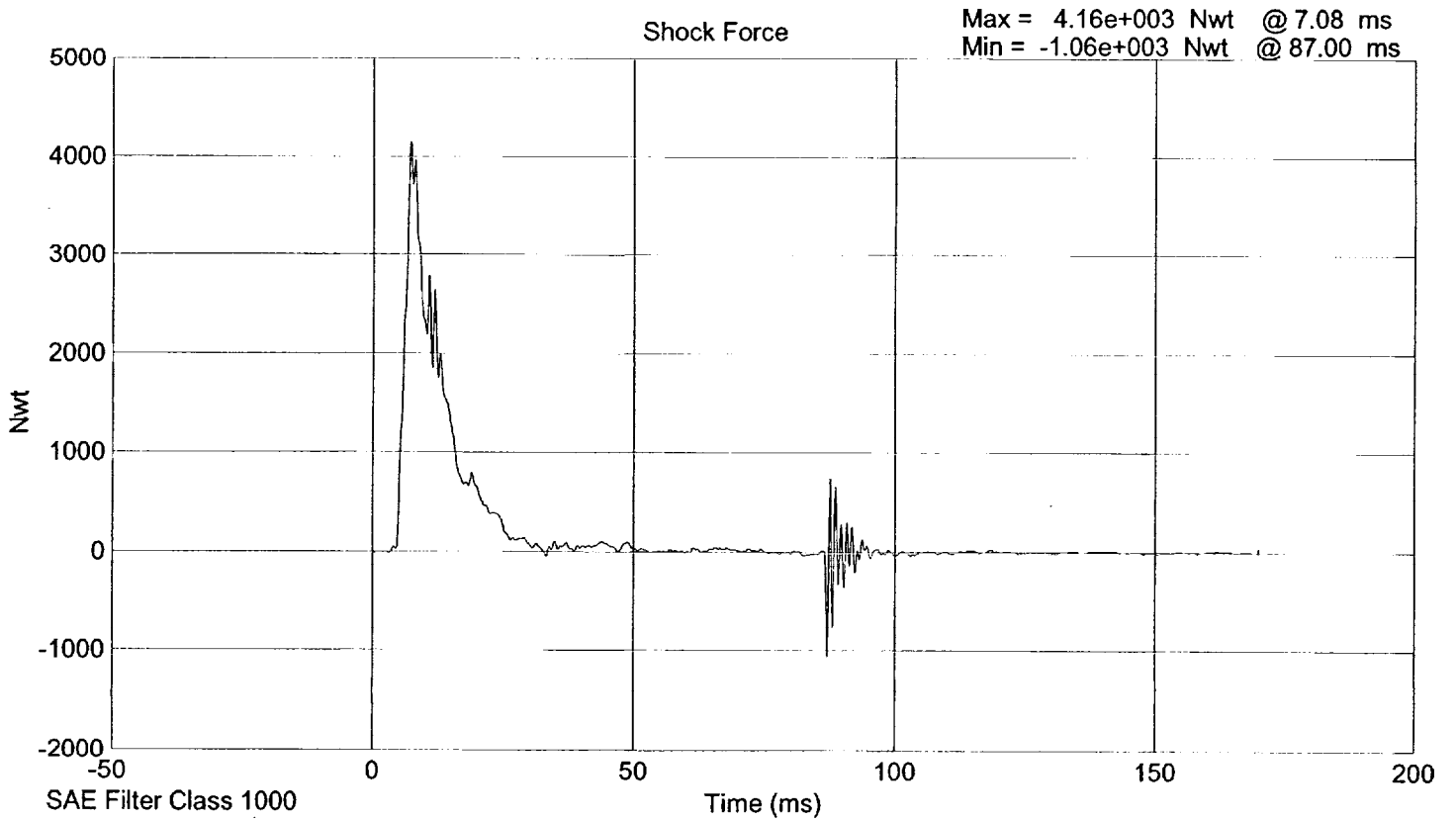
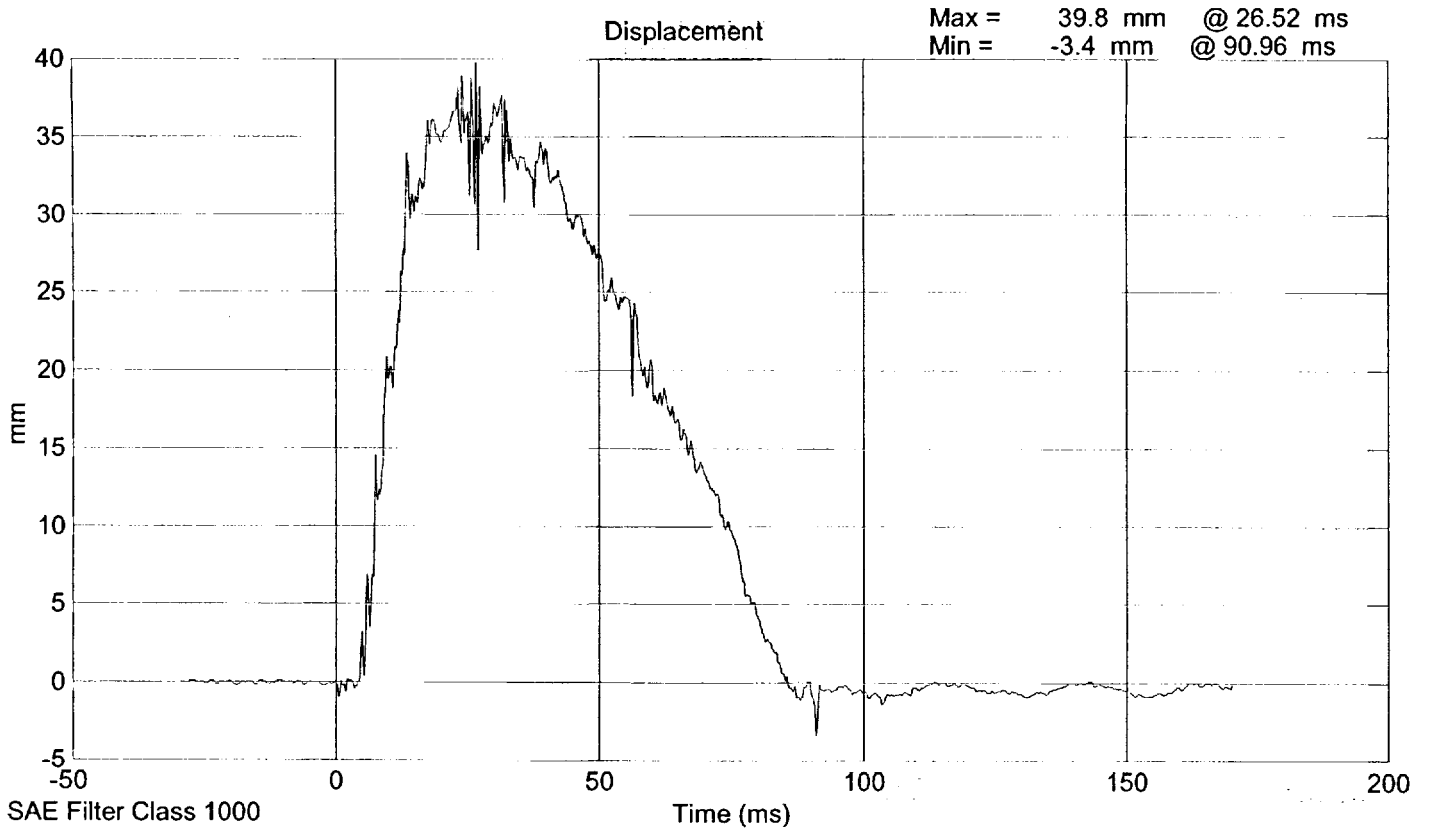
SID 026 Shock Absorber Impact Test @ 3.048 m/s



SID 026 Shock Absorber Impact Test @ 4.2672 m/s



SID 026 Shock Absorber Impact Test @ 6.096 m/s



LATERAL THORAX IMPACT TEST
PRE-TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 4
Date: 3/19/02 Laboratory Technician: B. Swiecicki

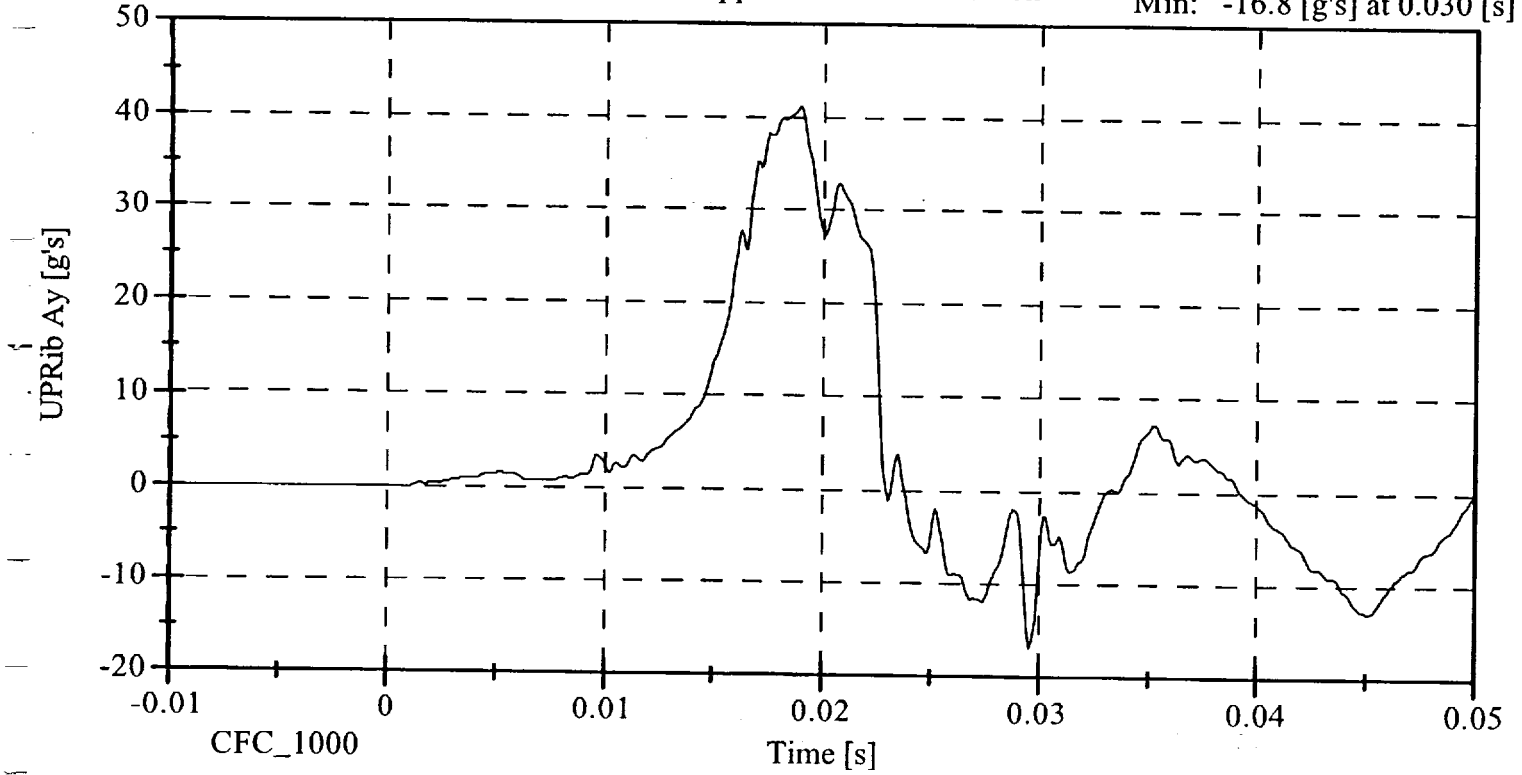
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.1 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 33 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.29 |
| UPPER RIB (g's) | 37 - 46 | 39.07 |
| LOWER RIB (g's) | 37 - 46 | 38.57 |
| LOWER SPINE (g's) | 15 - 22 | 20.10 |

REMARKS: None

Upper Rib Y Acceleration

Max: 41.1 [g's] at 0.019 [s]

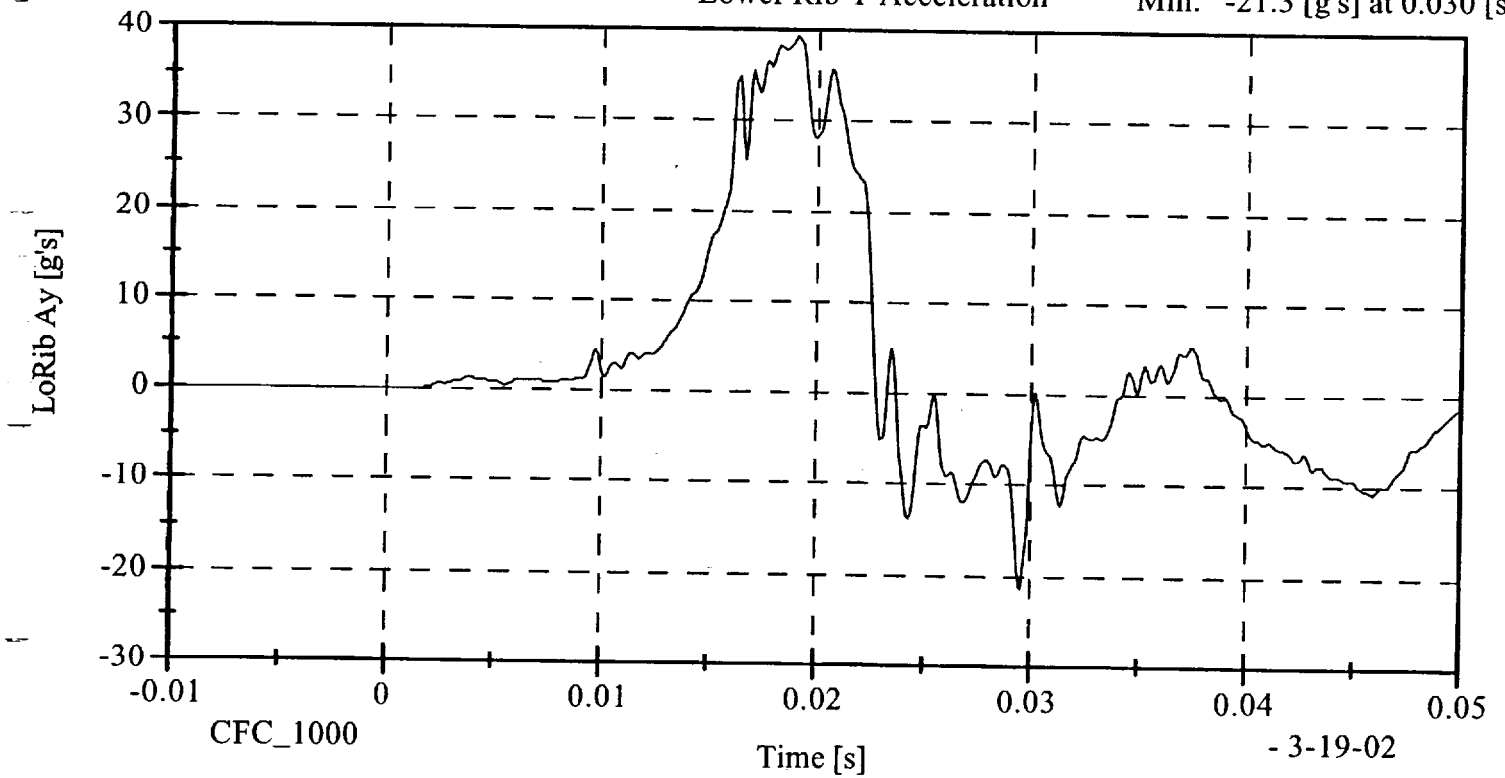
Min: -16.8 [g's] at 0.030 [s]



Lower Rib Y Acceleration

Max: 39.4 [g's] at 0.019 [s]

Min: -21.3 [g's] at 0.030 [s]

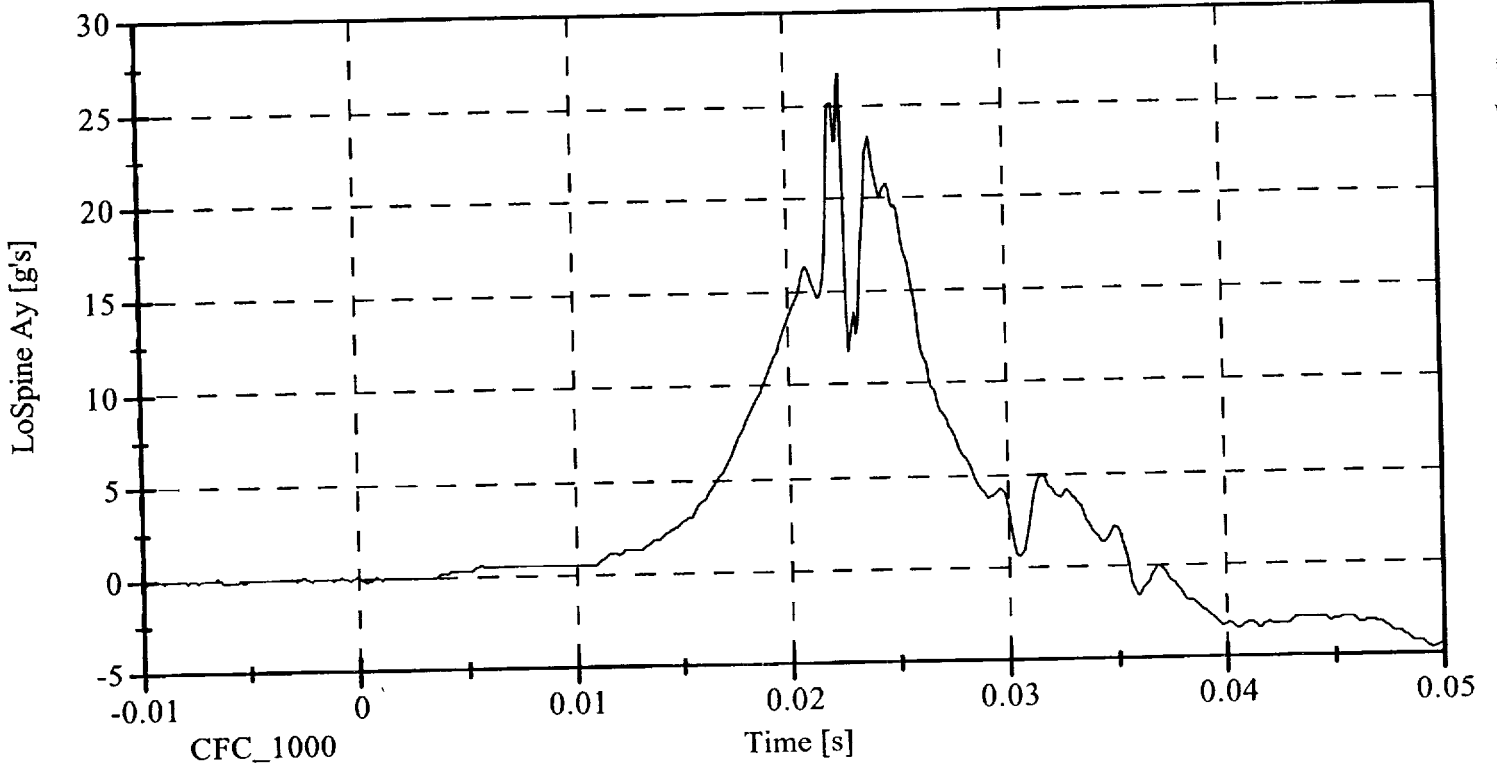


- 3-19-02

Max: 26.8 [g's] at 0.023 [s]

Lower Spine Y Acceleration

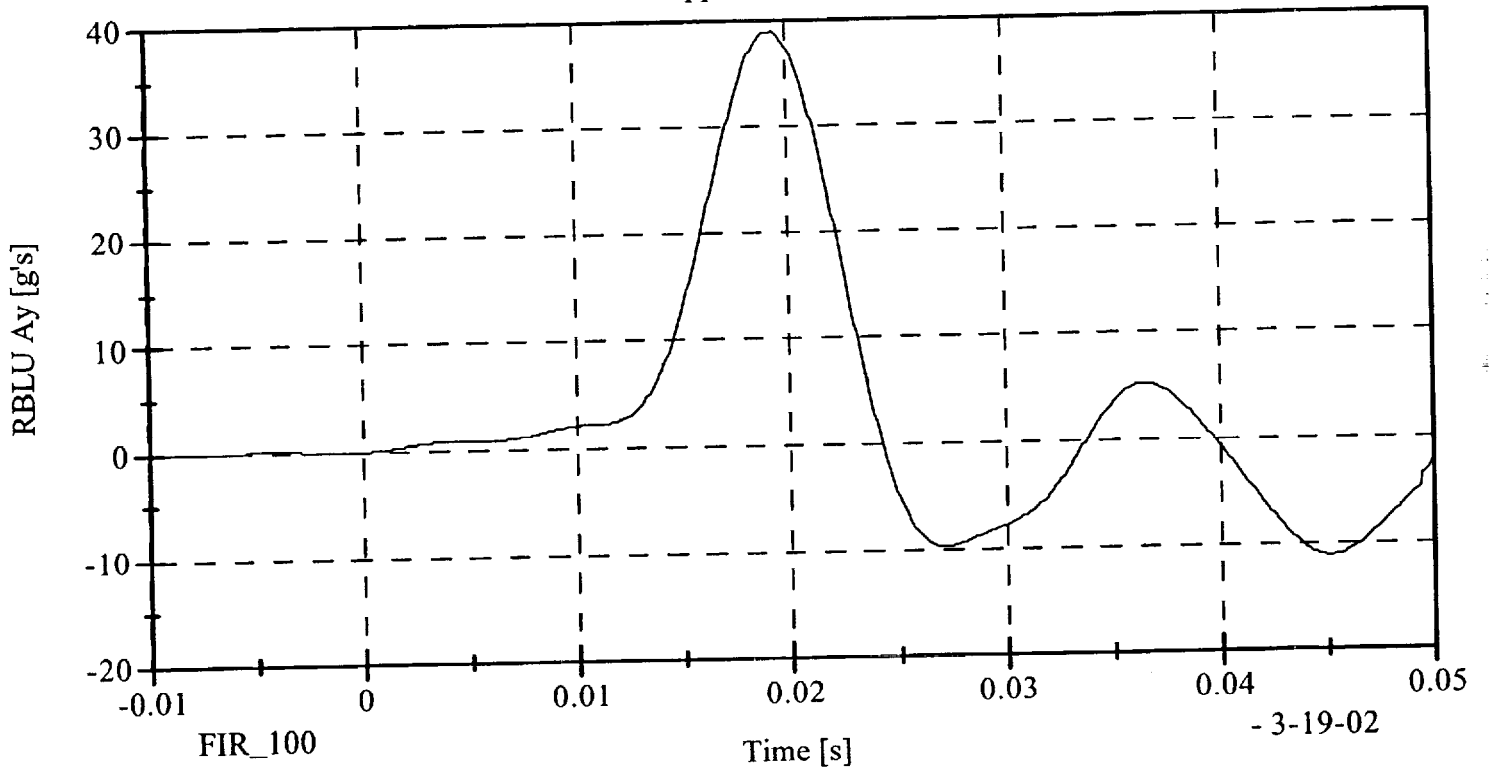
Min: -4.6 [g's] at 0.050 [s]

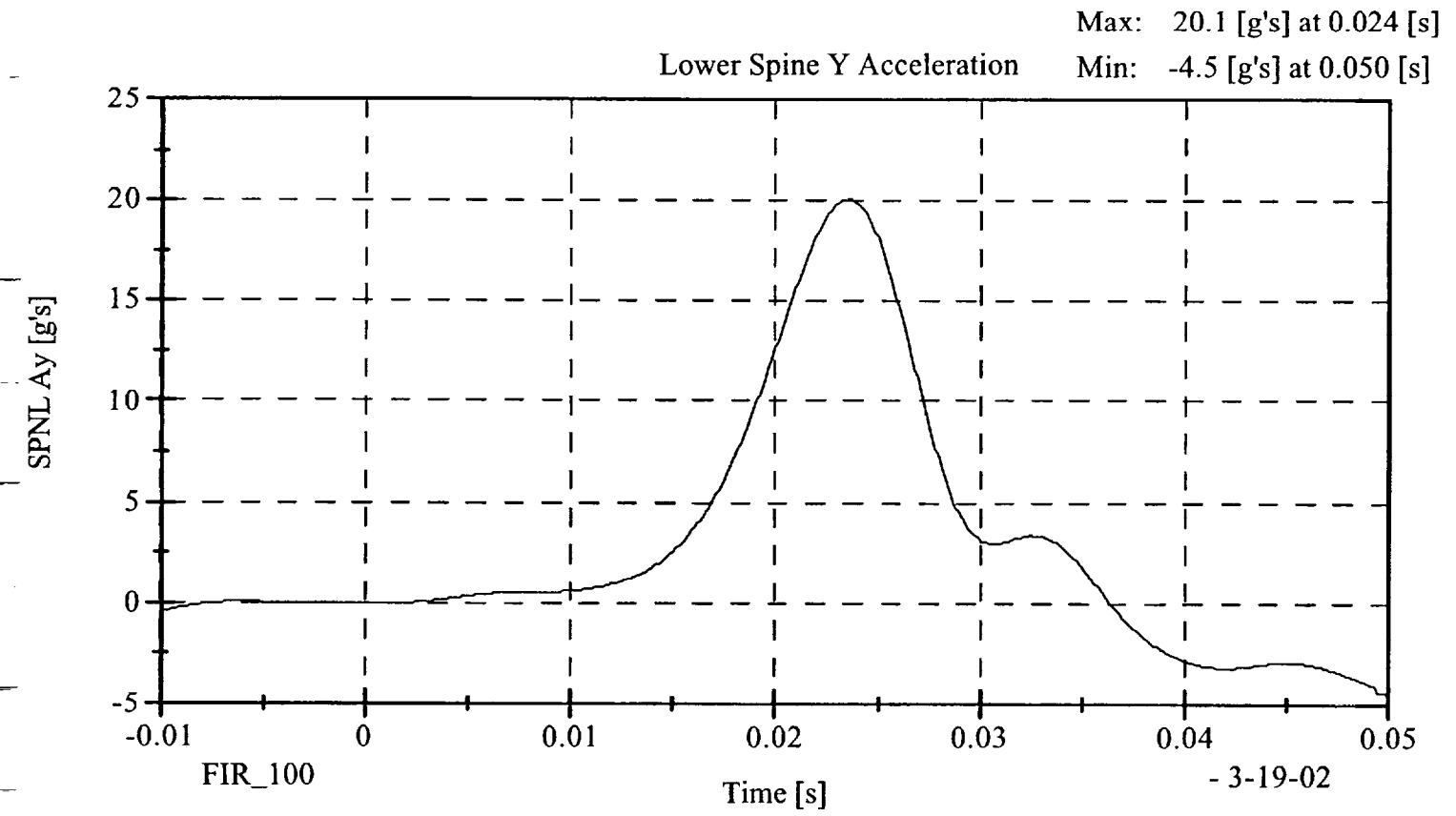
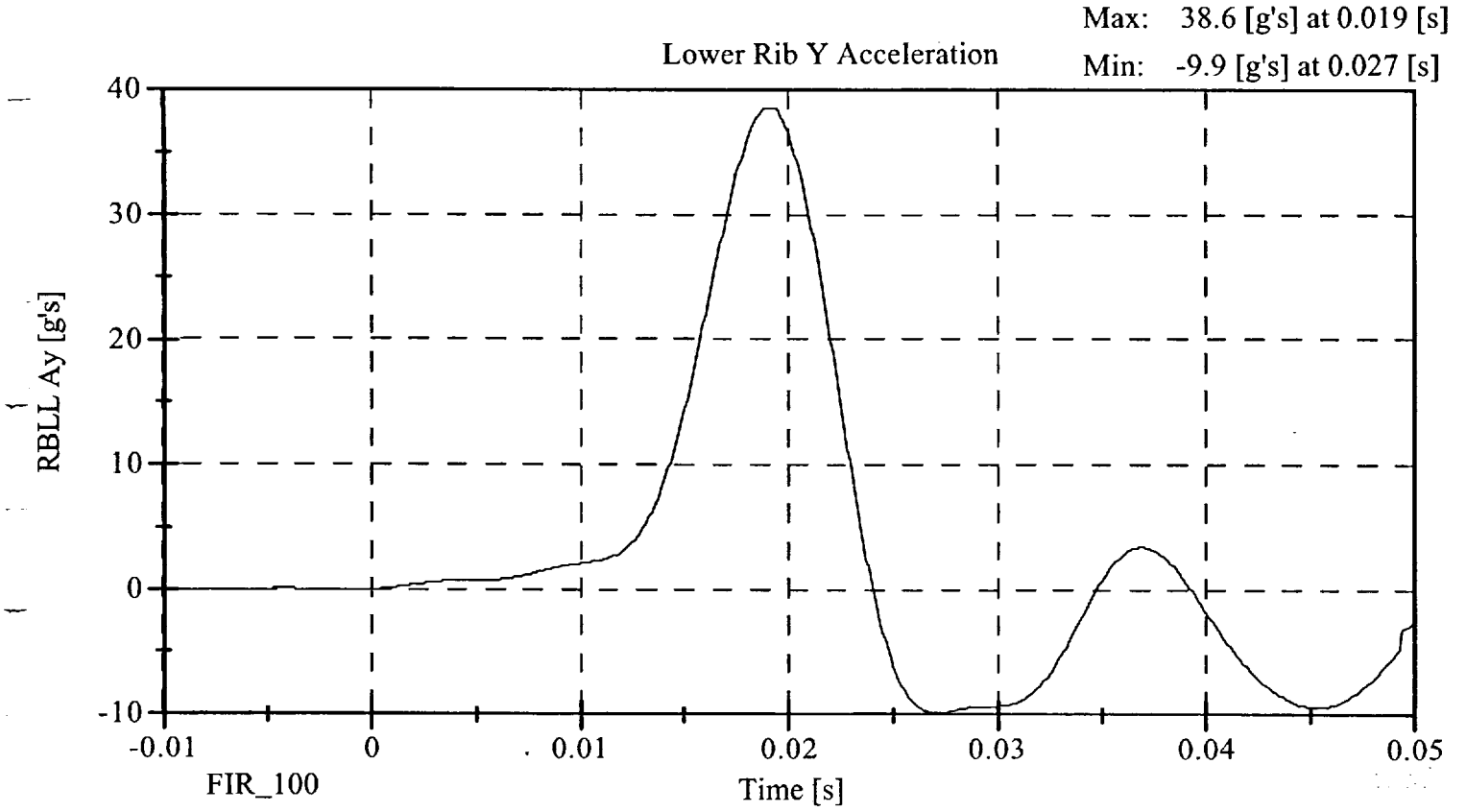


Max: 39.1 [g's] at 0.019 [s]

Upper Rib Y Acceleration

Min: -11.1 [g's] at 0.045 [s]





LATERAL PELVIS IMPACT TEST
PRE-TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 4
Date: 3/19/02 Laboratory Technician: B. Swiecicki

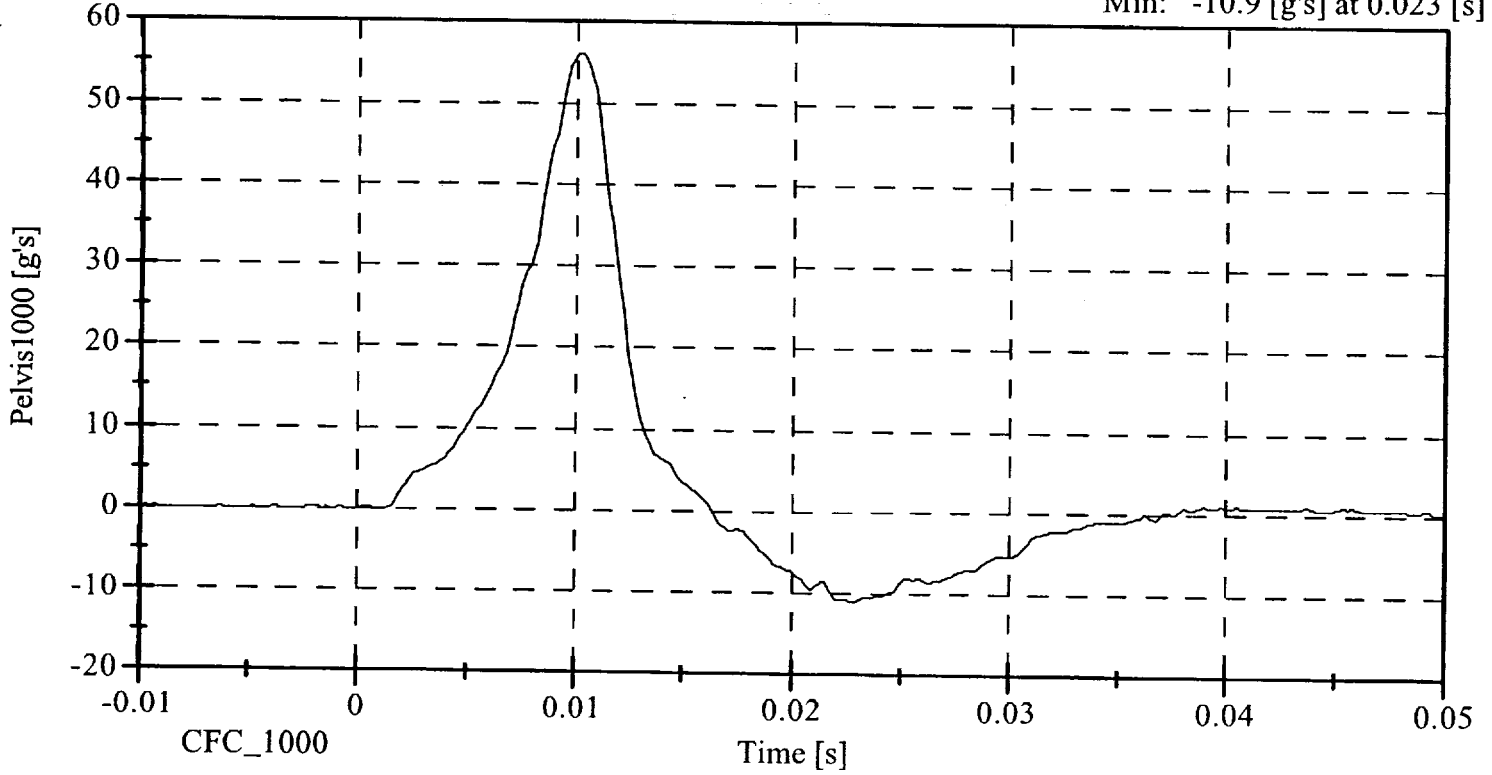
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.1 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 34.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.32 |
| PELVIS ACCELERATION (g's) | 40 - 60 | 48.33 |

REMARKS: None

Pelvis Acceleration

Max: 56.2 [g's] at 0.010 [s]

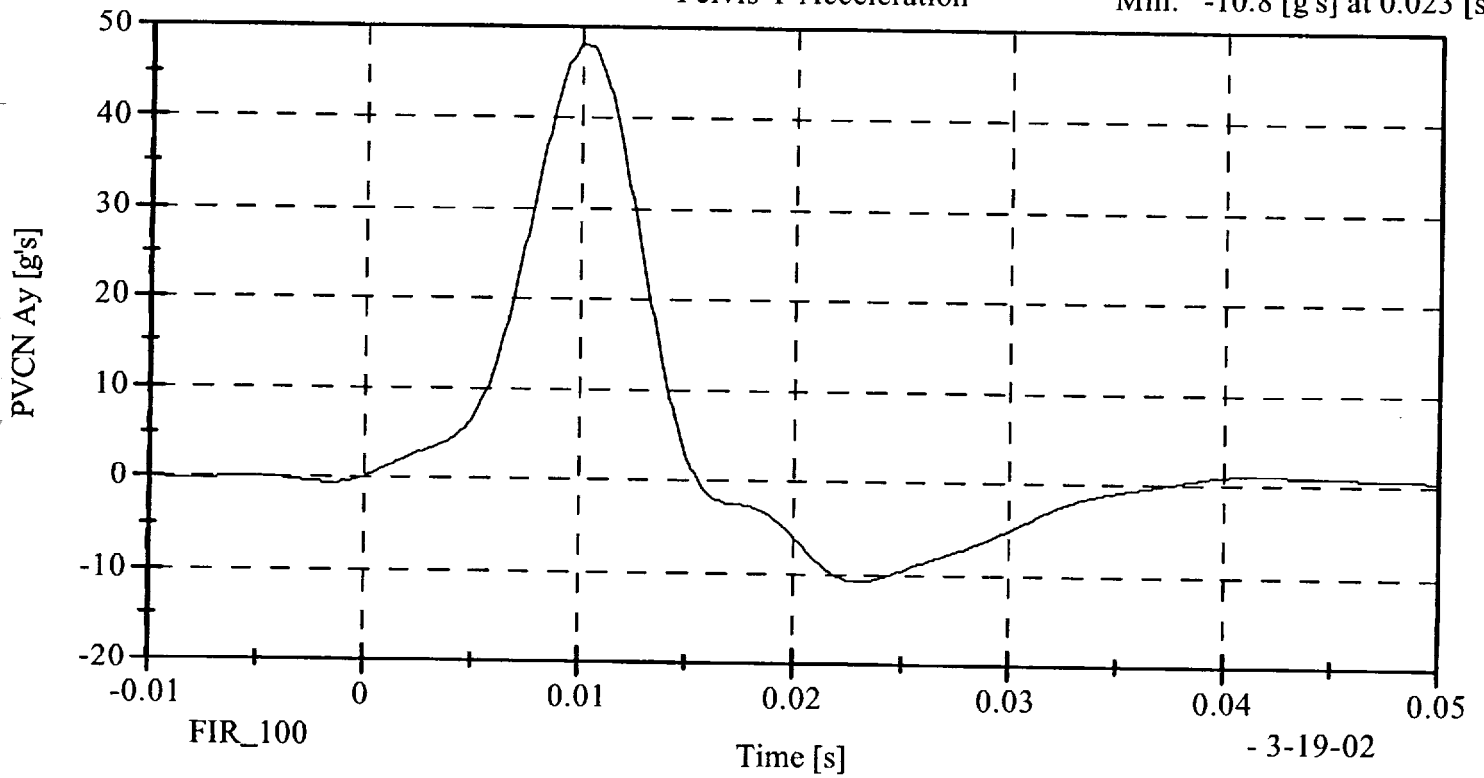
Min: -10.9 [g's] at 0.023 [s]



Pelvis Y Acceleration

Max: 48.3 [g's] at 0.010 [s]

Min: -10.8 [g's] at 0.023 [s]



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

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 4
Date: 3/18/02 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-------------------------------------|------------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 20.6 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 29 |
| PEAK RESULTANT ACCELERATION (Gs) | 210 - 260 | 251.8 |
| PEAK LATERAL ACCELERATION (Gs) | Not to Exceed 10 | 4.66 |
| UNIMODAL CRITERIA ABOVE 100 Gs (ms) | 0.9 - 1.5 | 1.18 |

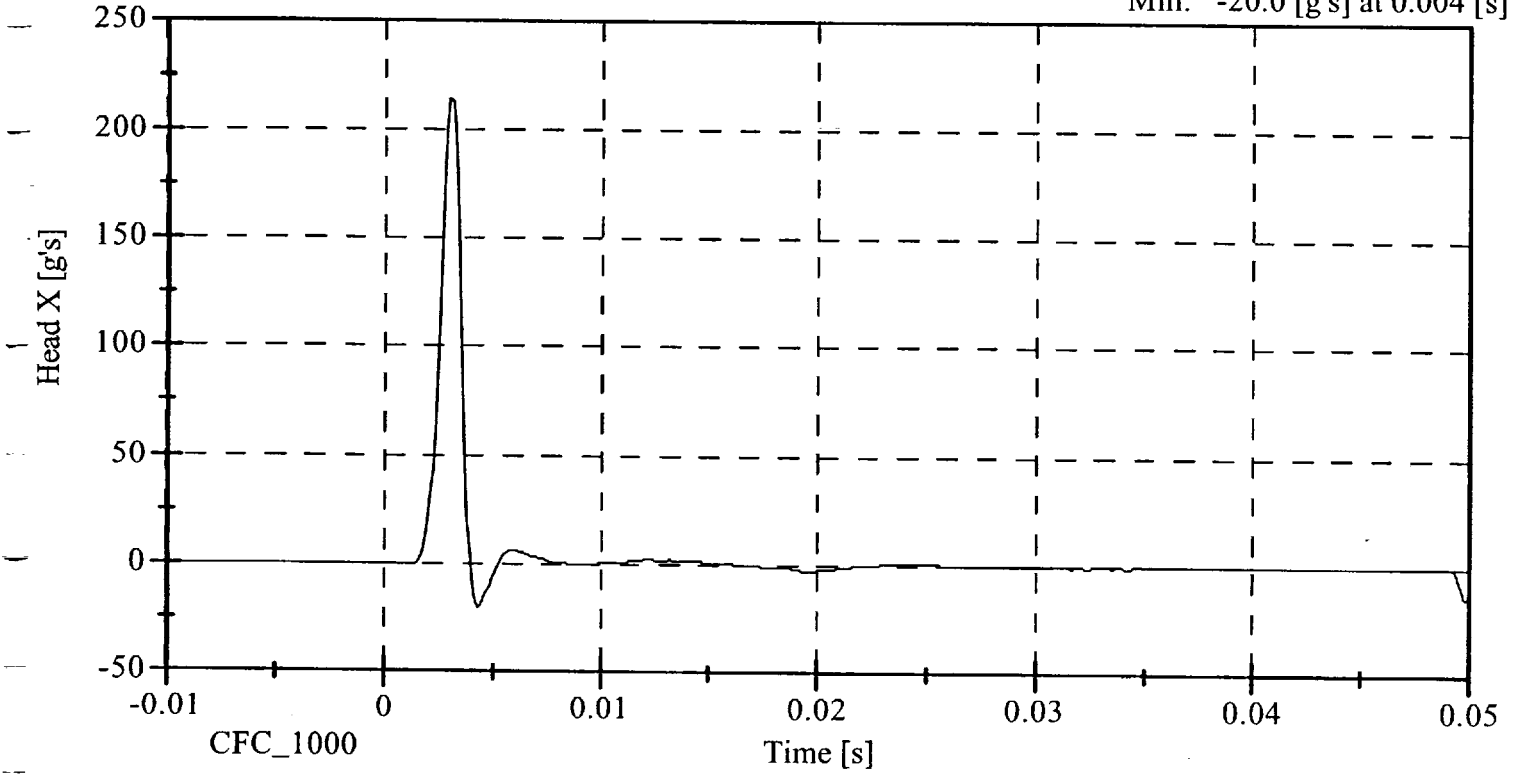
REMARKS: None

026 Head Drop

Headform X Acceleration

Max: 213.6 [g's] at 0.003 [s]

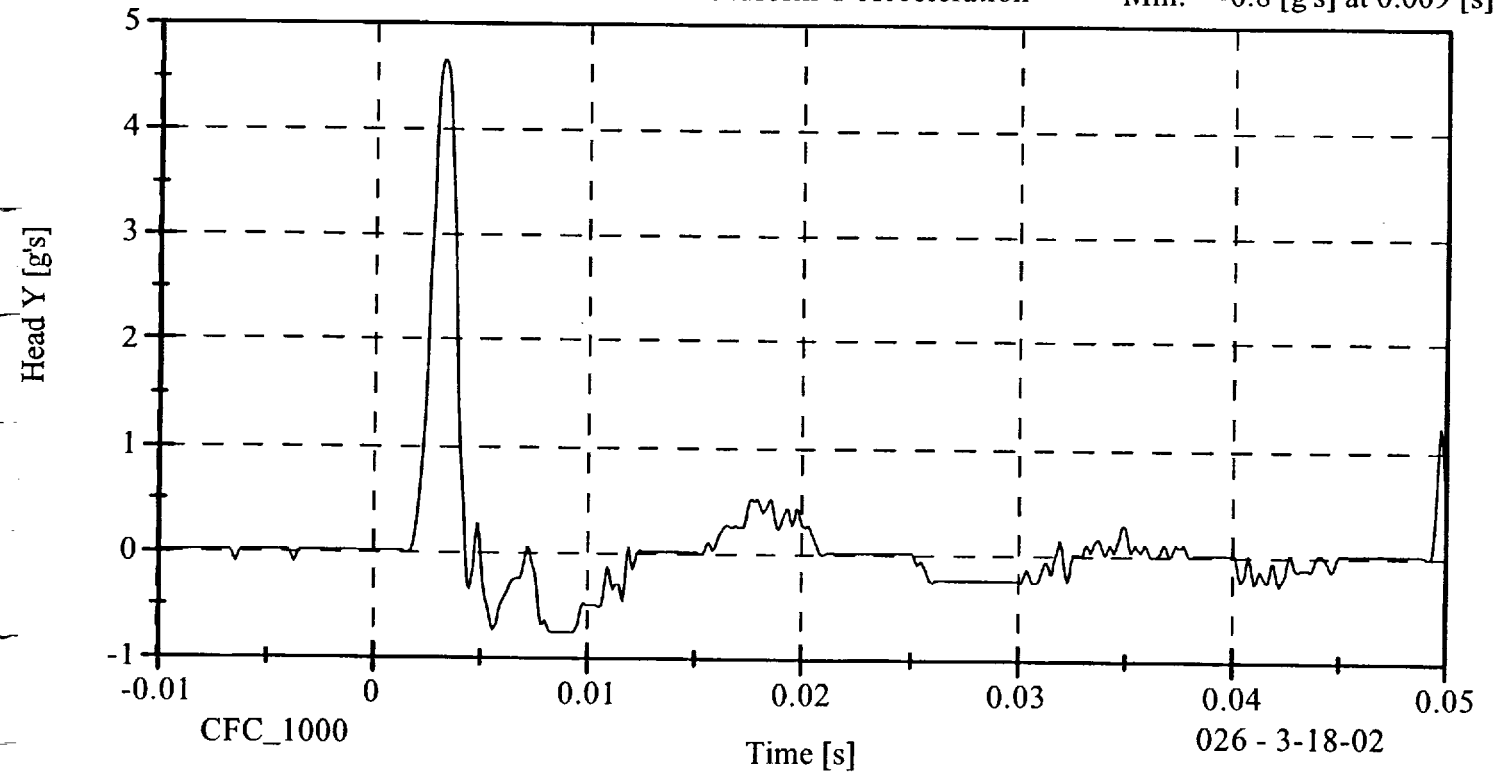
Min: -20.0 [g's] at 0.004 [s]



Headform Y Acceleration

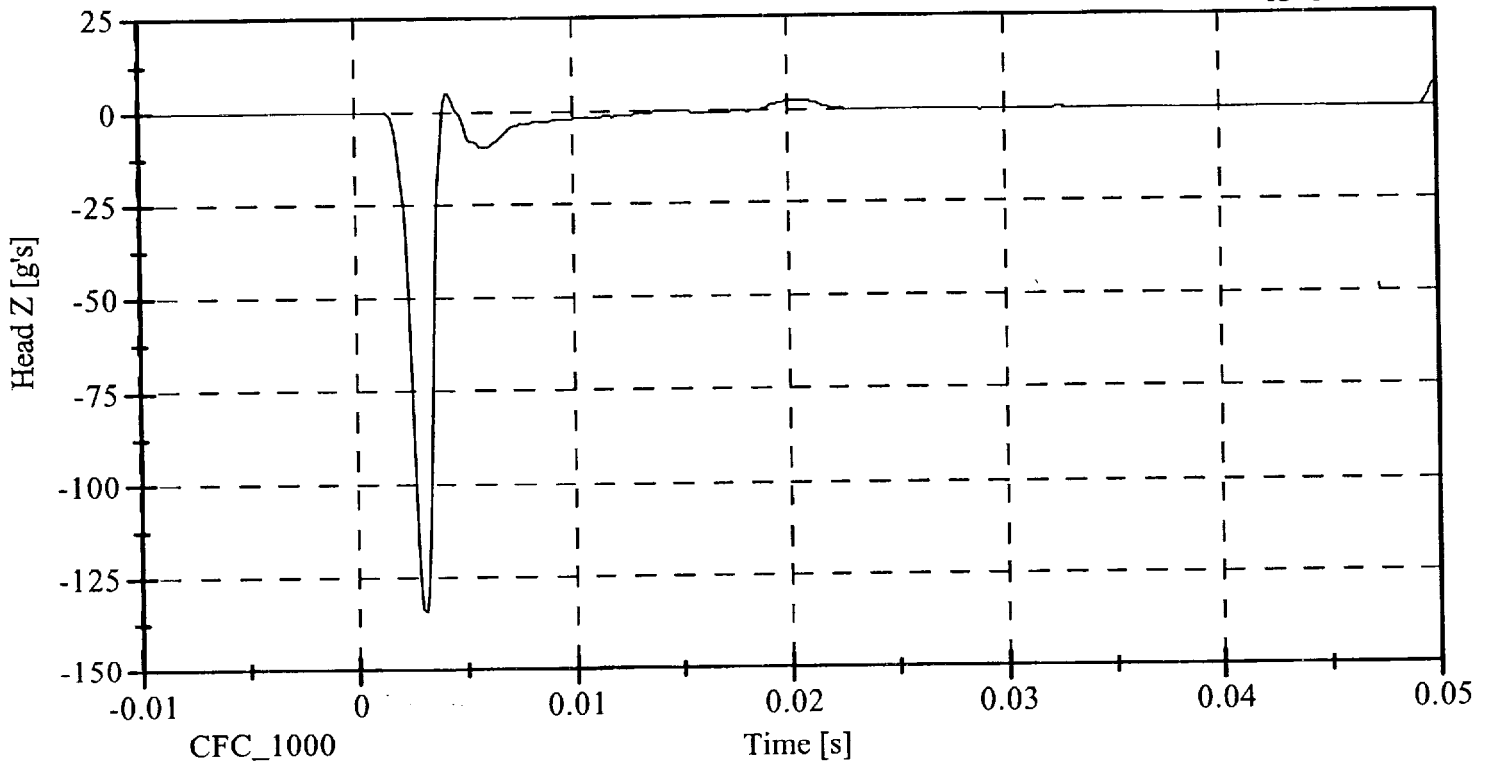
Max: 4.7 [g's] at 0.003 [s]

Min: -0.8 [g's] at 0.009 [s]



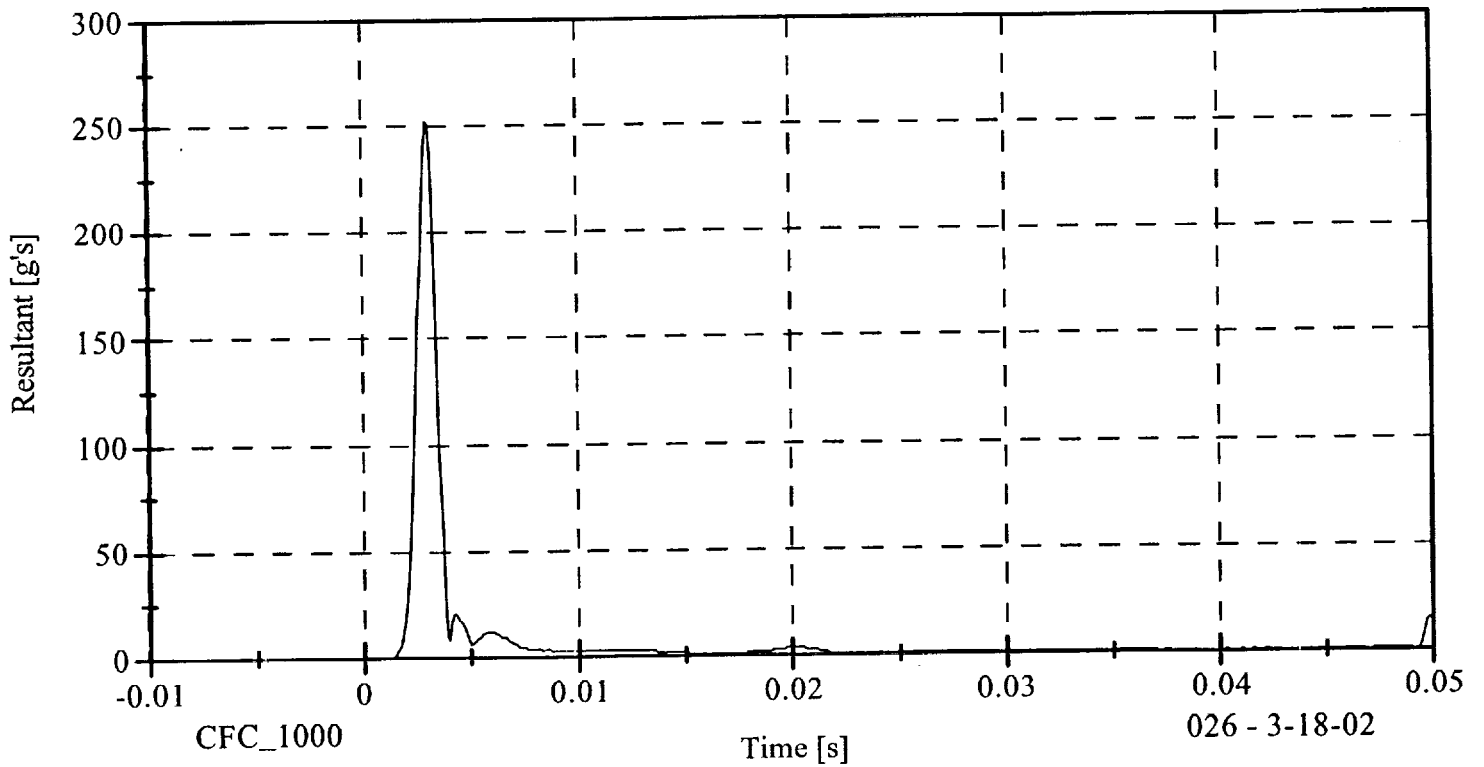
Headform Z Acceleration

Max: 6.1 [g's] at 0.050 [s]
Min: -134.2 [g's] at 0.003 [s]



Headform Resultant

Max: 251.8 [g's] at 0.003 [s]
Min: 0.0 [g's] at 0.038 [s]



026 - 3-18-02

**ABDOMINAL COMPRESSION TEST
PRE-TEST**

(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 4
Date: 3/19/02 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 30 |
| FORCE @ 13 mm (N) | 104 - 162 | 117.2 |
| FORCE @ 19 mm (N) | 163 - 221 | 159.2 |
| FORCE @ 25 mm (N) | 222 - 280 | 235.8 |
| FORCE @ 33 mm (N) | 325 - 391 | 348.3 |

REMARKS: None

Dummy S/N 026

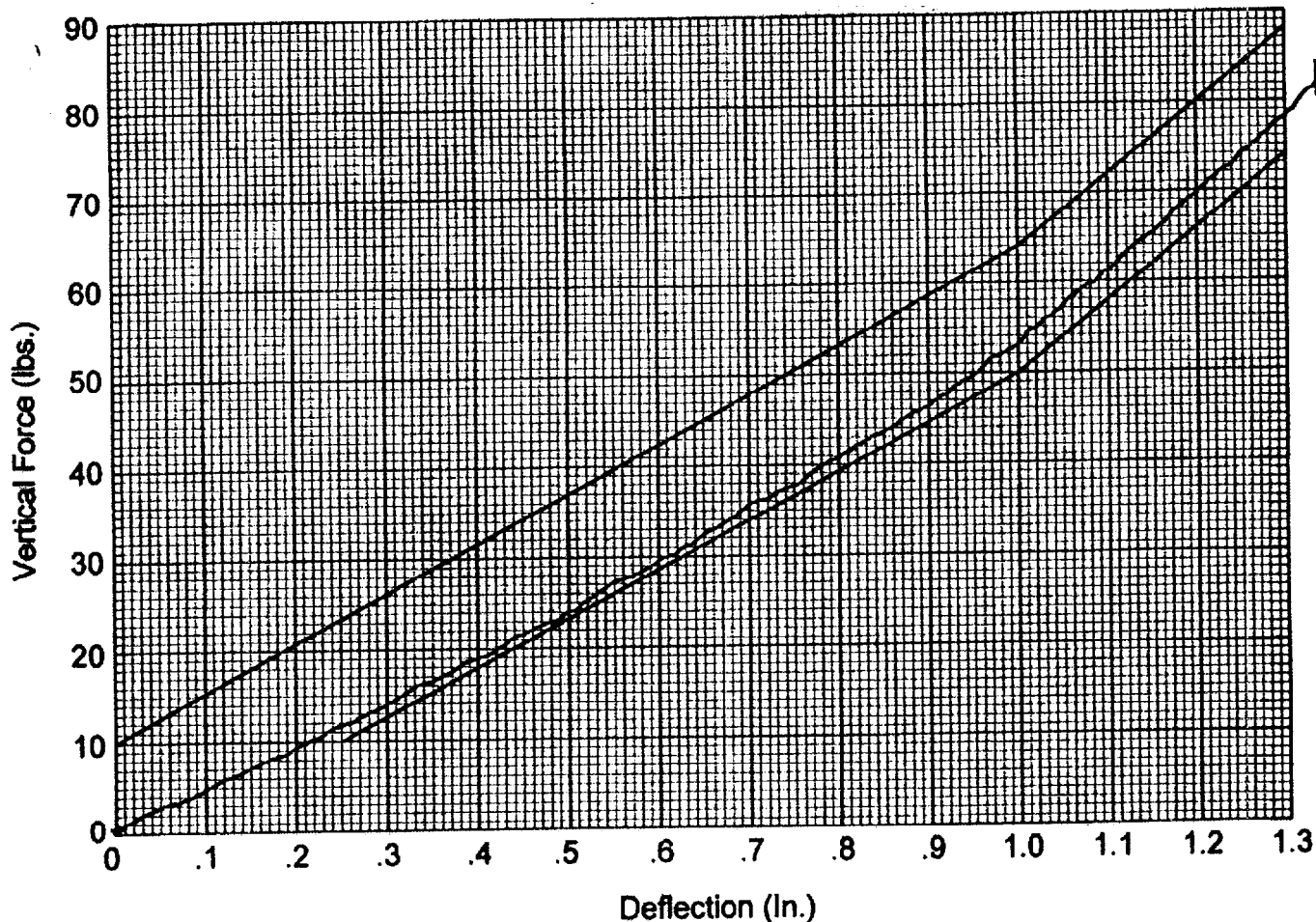
W/A _____

Date 3-19-02

Performed By [Signature]

Temp. 71°

Humidity 30%



Hybrid II
Abdomen Static Press

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

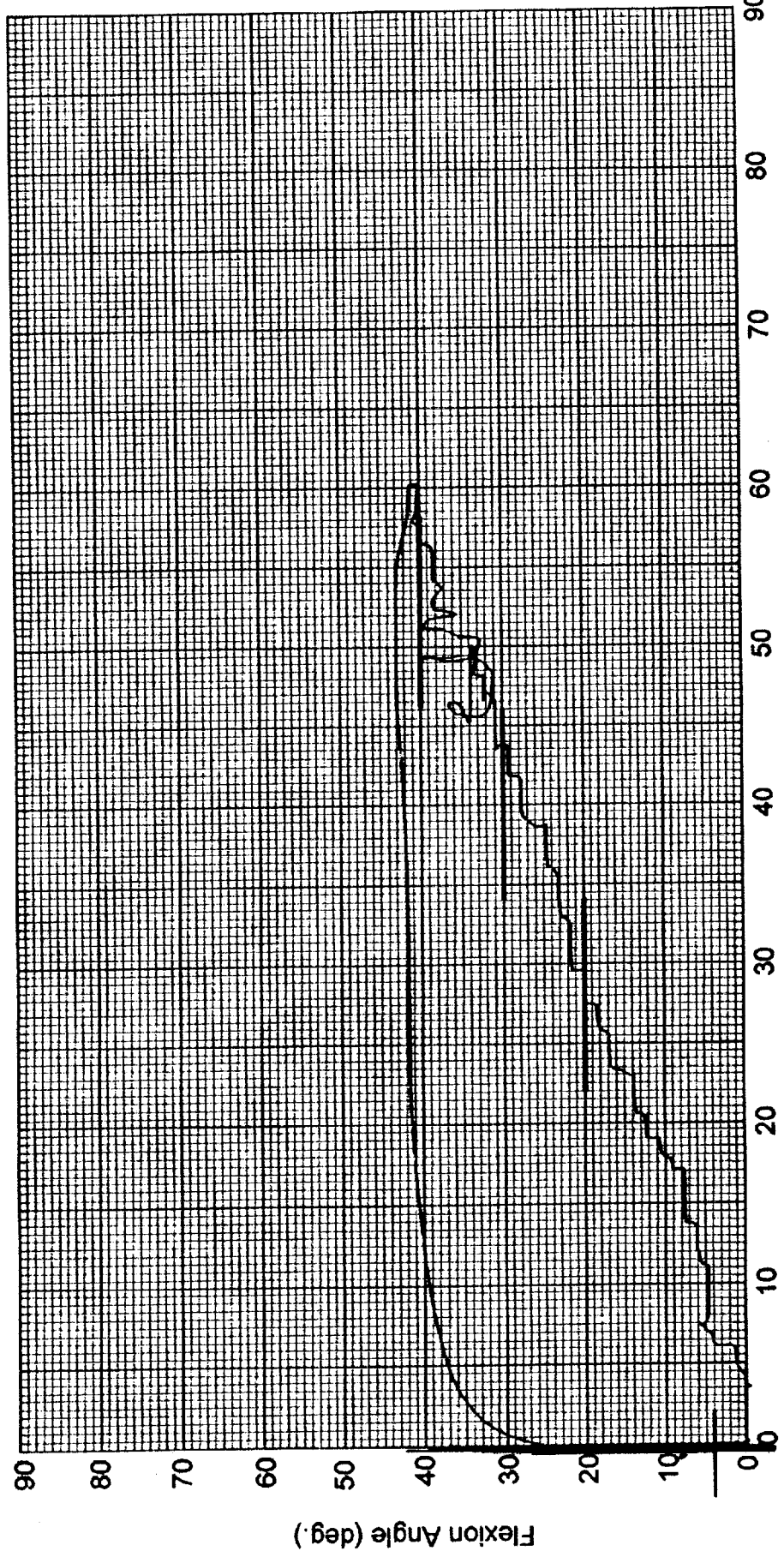
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 4
Date: 3/19/02 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.1 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 29 |
| FORCE @ 0° (N) | 0 - 26.7 | 0.0 |
| FORCE @ 20° (N) | 97.8 - 151.2 | 122.3 |
| FORCE @ 30° (N) | 151.2 - 204.6 | 198.8 |
| FORCE @ 40° (N) | 204.6 - 258 | 253.5 |
| RETURN ANGLE | 12° max. | 4° |

REMARKS: None

Dummy S/N 026
 W/A _____
 Date 3-19-02
 Performed By [Signature]
 Temp. 70°
 Humidity 29%



Hybrid II Lumbar Spine Flexion Test

PRE-TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 4
 Date: 3/19/02 Laboratory Technician: B. Swiecicki

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

REMARKS: None

CALIBRATION TEST RESULTS

PRE-TEST

SID NO.: 268

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 3
Date: March 15, 2002 Laboratory Technician: B. Swiecicki

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

* Test not required for SID certification.

REMARKS: None

EXTERNAL DIMENSIONS
PRE-TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 3
Date: March 15, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm) | 889 - 909 | 899 |
| RH- Rib Height (mm) | 502 - 520 | 513 |
| HP- Hip Pivot Height (mm) | 99 ref. | 99 |
| RD- Rib from Back Line (mm) | 229 - 241 | 236 |
| KH- Knee Pivot from Back Line (mm) | 511 - 526 | 518 |
| KV- Knee Pivot to Floor (mm) | 490 - 505 | 495 |
| HW- Hip Width (mm) | 356 - 391 | 378 |

REMARKS: None

**THORACIC SHOCK ABSORBER TESTS
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1.3
 Date: December 6, 2001 Laboratory Technician: B. Swiecicki

DAMPER IDENTIFICATION: 268

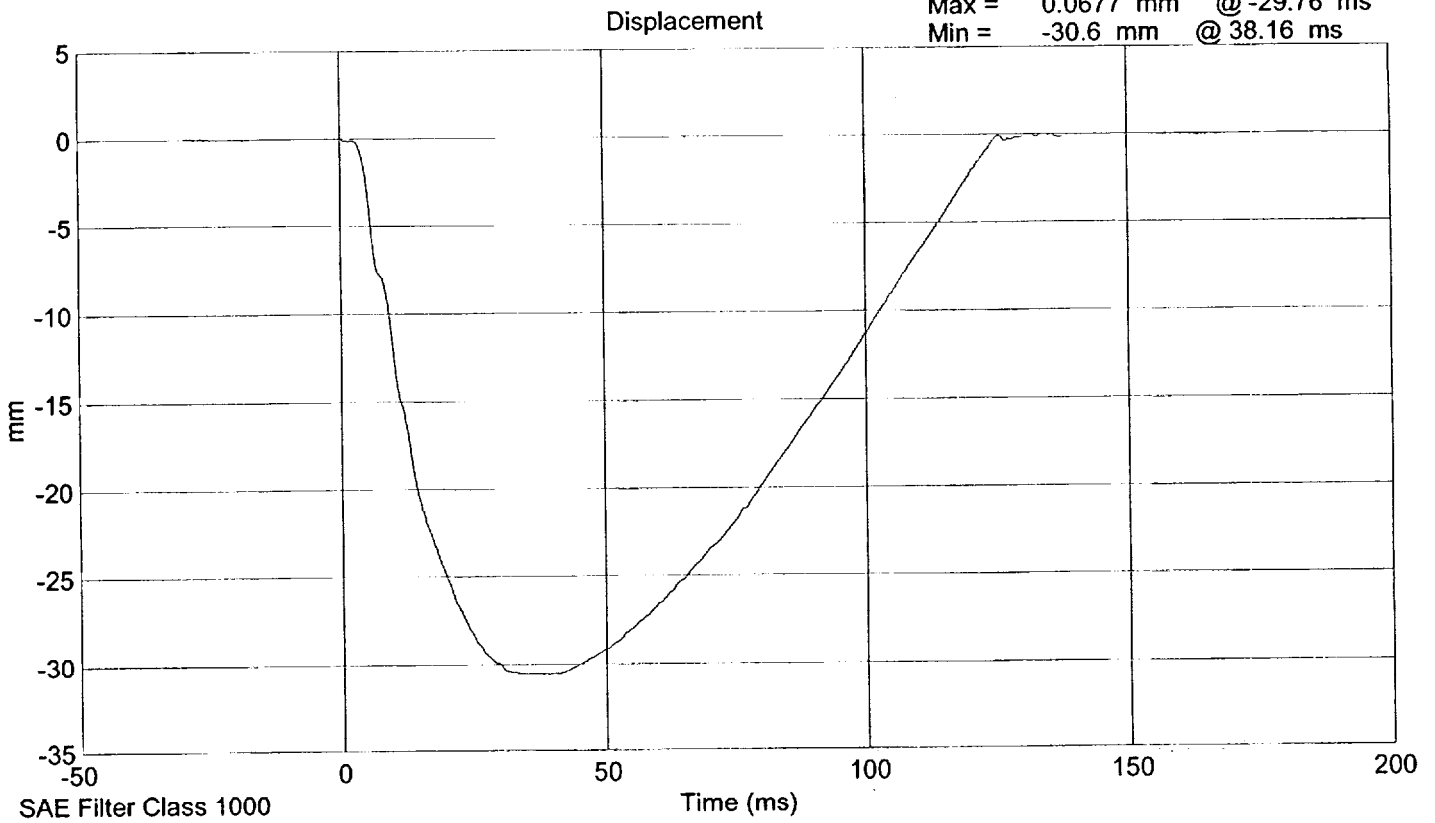
| TEST PARAMETER | | SPECIFICATION | TEST RESULTS |
|-----------------------|-------------------|---------------|--------------|
| TEMPERATURE (°C) | | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | | 10 - 70 | 31 |
| VELOCITY 3.05 m/s | FORCE (N) | 836 - 1125 | 1104.3 |
| | DISPLACEMENT (mm) | 30 - 35 | 30.6 |
| VELOCITY 4.27 m/s | FORCE (N) | 1730 - 2099 | 1779.3 |
| | DISPLACEMENT (mm) | 32 - 37 | 33.2 |
| VELOCITY 6.10 m/s | FORCE (N) | 3741 - 4448 | 3822.0 |
| | DISPLACEMENT (mm) | 33 - 40 | 36.9 |

DAMPER SETTING: 5

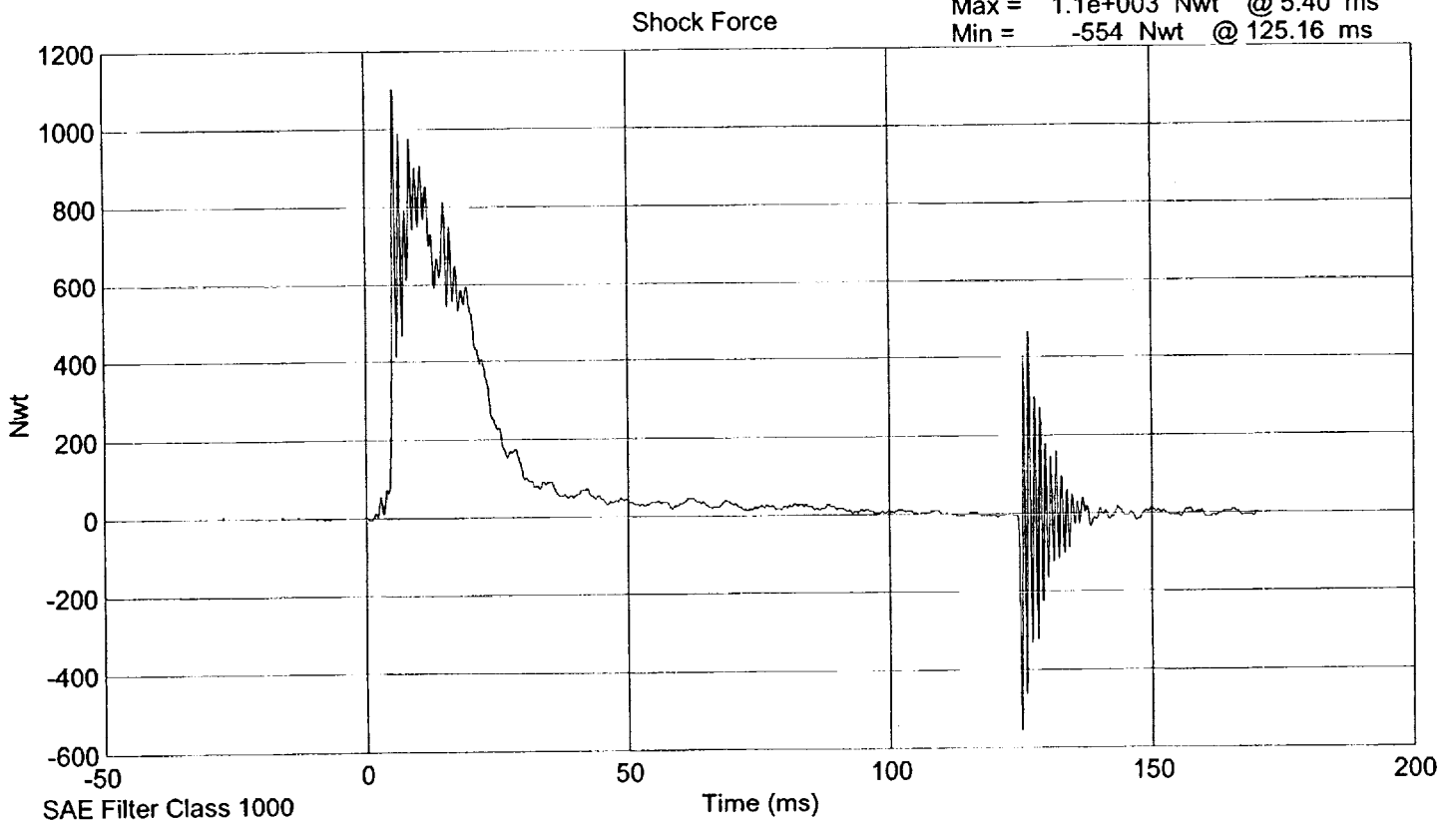
REMARKS: None

SID 268 Shock Absorber Impact Test @ 3.048 m/s

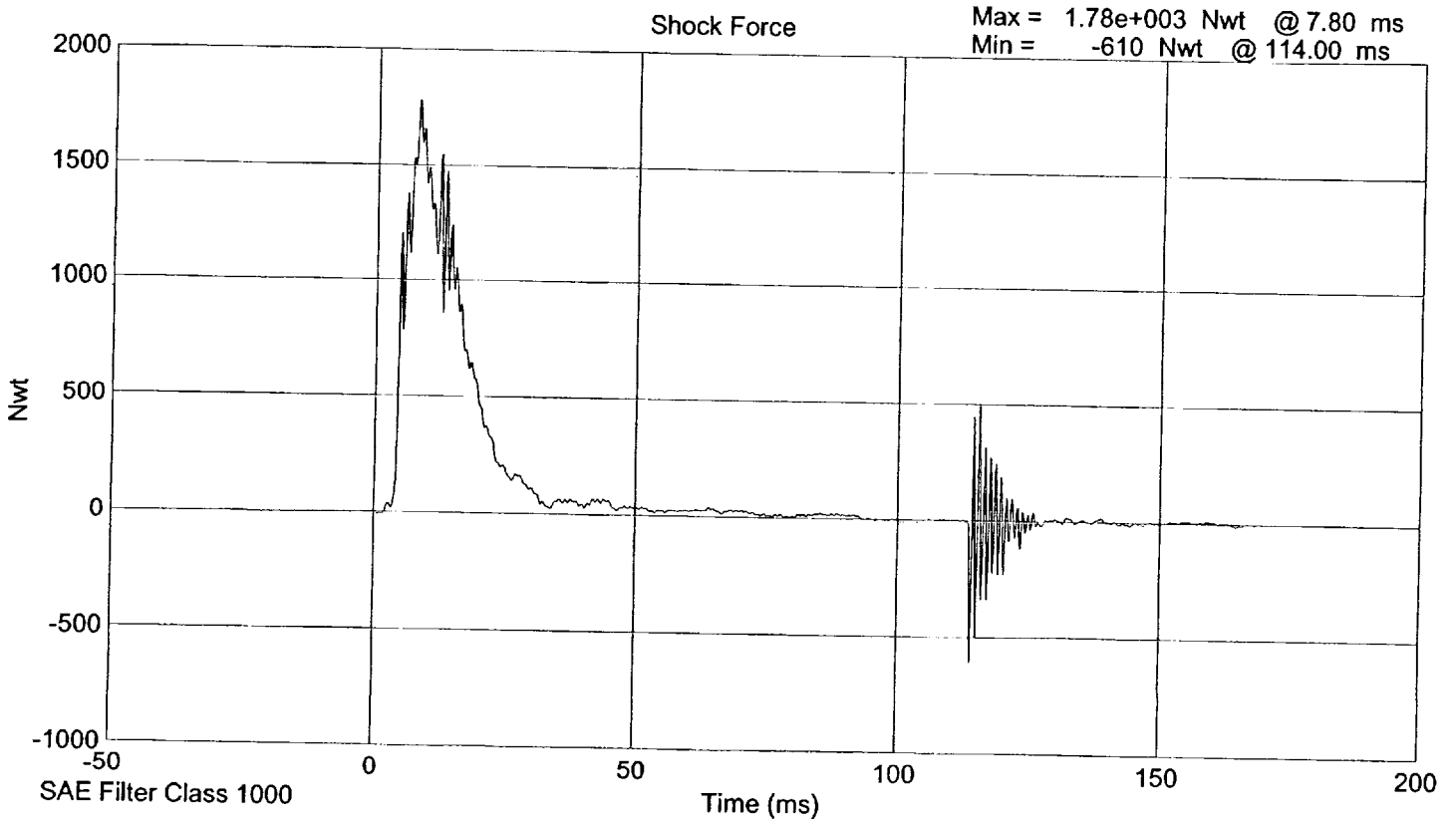
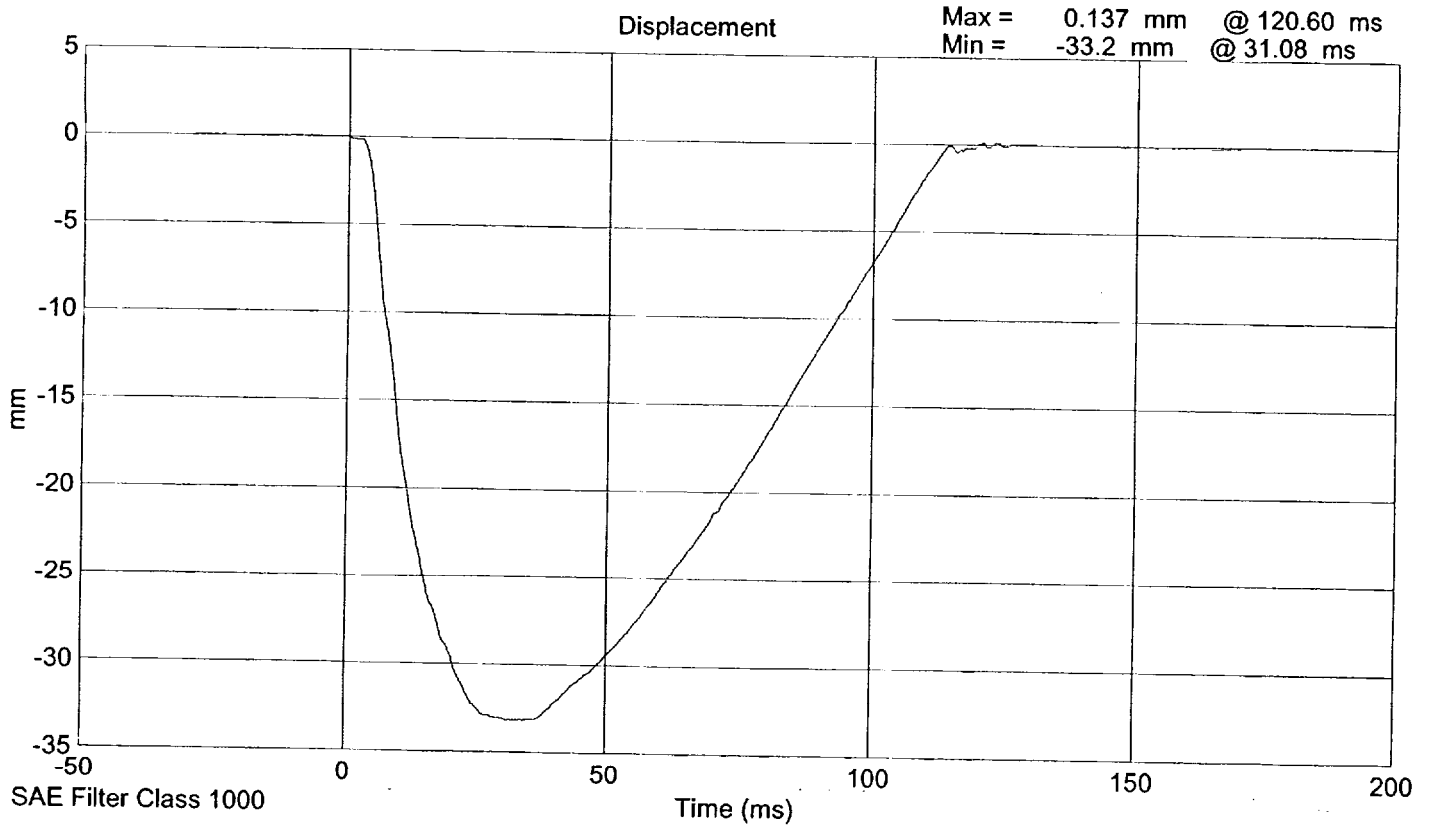
Max = 0.0677 mm @ -29.76 ms
Min = -30.6 mm @ 38.16 ms



Max = 1.1e+003 Nwt @ 5.40 ms
Min = -554 Nwt @ 125.16 ms



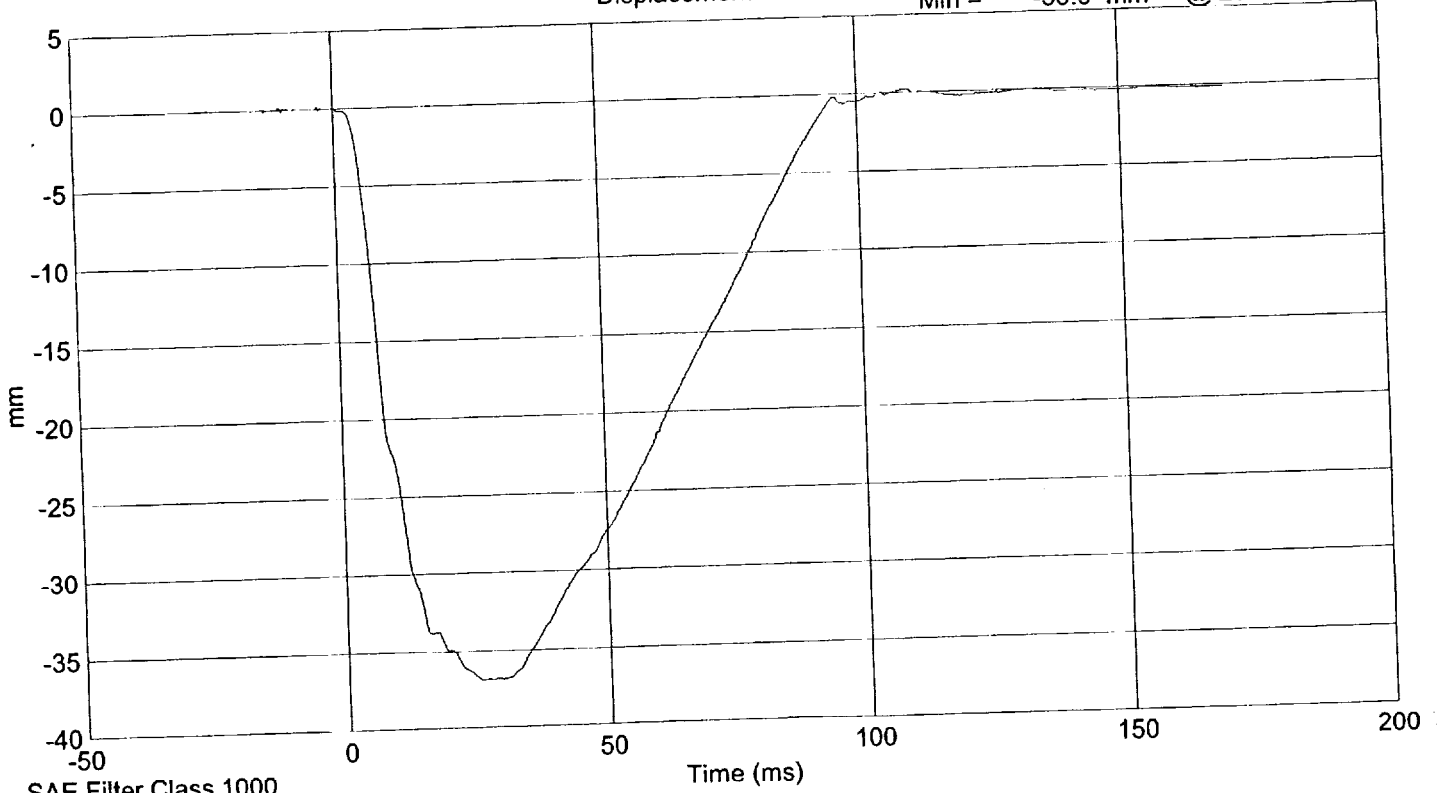
SID 268 Shock Absorber Impact Test @ 4.2672 m/s



SID 268 Shock Absorber Impact Test @ 6.096 m/s

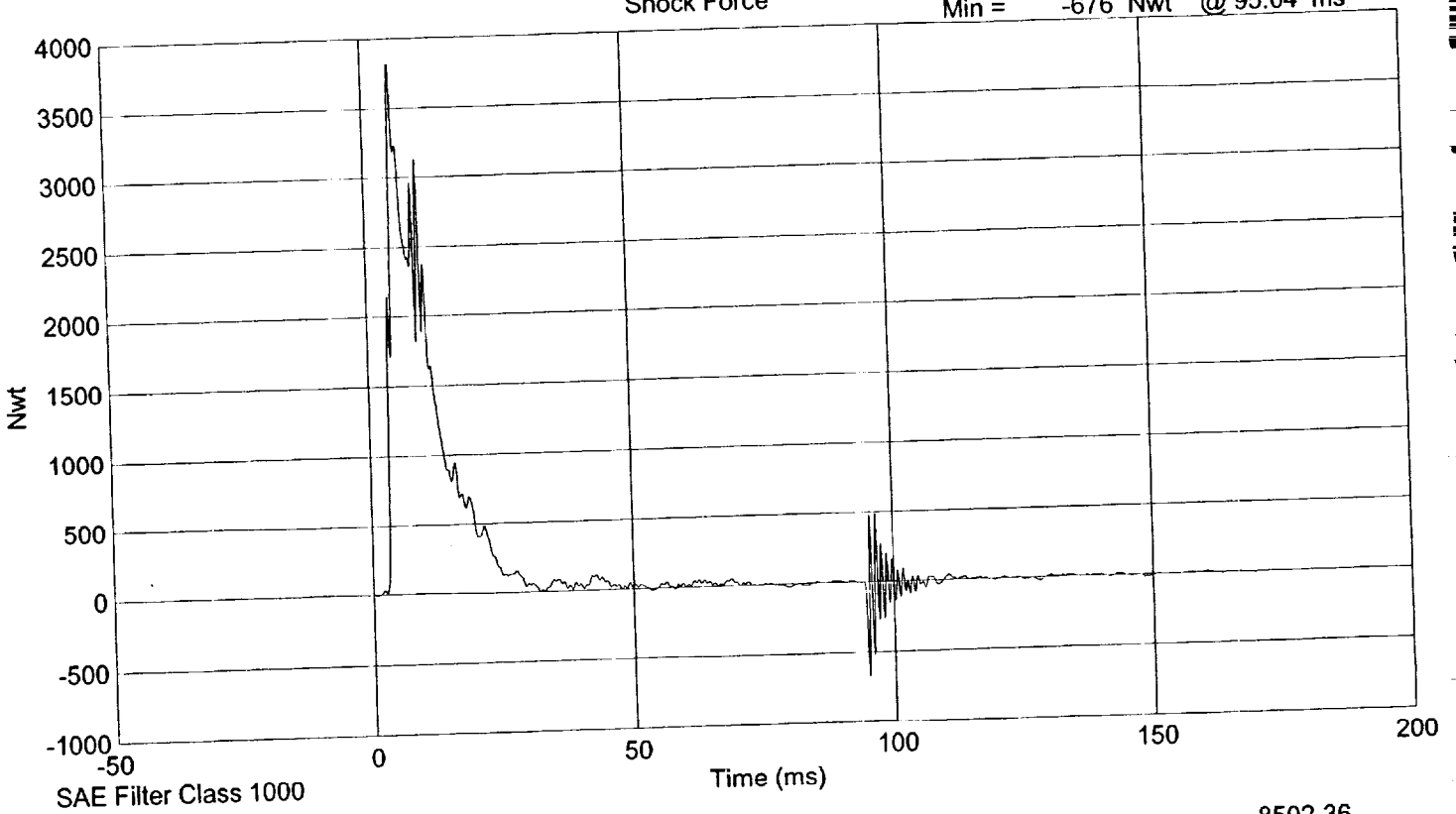
Displacement

Max = 0.219 mm @ 108.60 ms
Min = -36.9 mm @ 25.44 ms



Shock Force

Max = 3.82e+003 Nwt @ 5.16 ms
Min = -676 Nwt @ 95.04 ms



**LATERAL THORAX IMPACT TEST
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

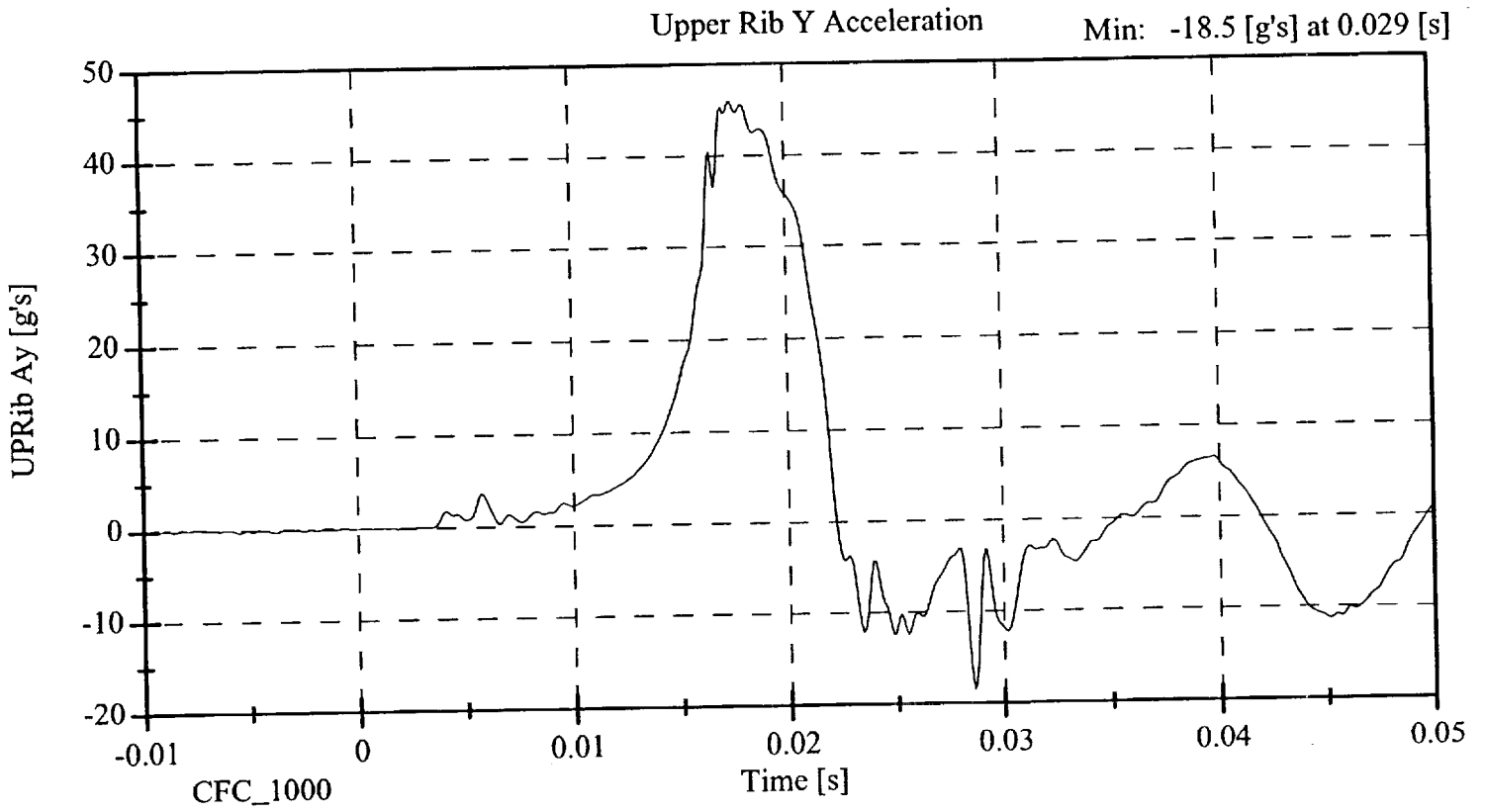
SID Serial No.: 268 Sequential Test Number: 3
Date: March 15, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 20.6 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 32.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.30 |
| UPPER RIB (g's) | 37 - 46 | 45.5 |
| LOWER RIB (g's) | 37 - 46 | 43.4 |
| LOWER SPINE (g's) | 15 - 22 | 21.0 |

REMARKS: None

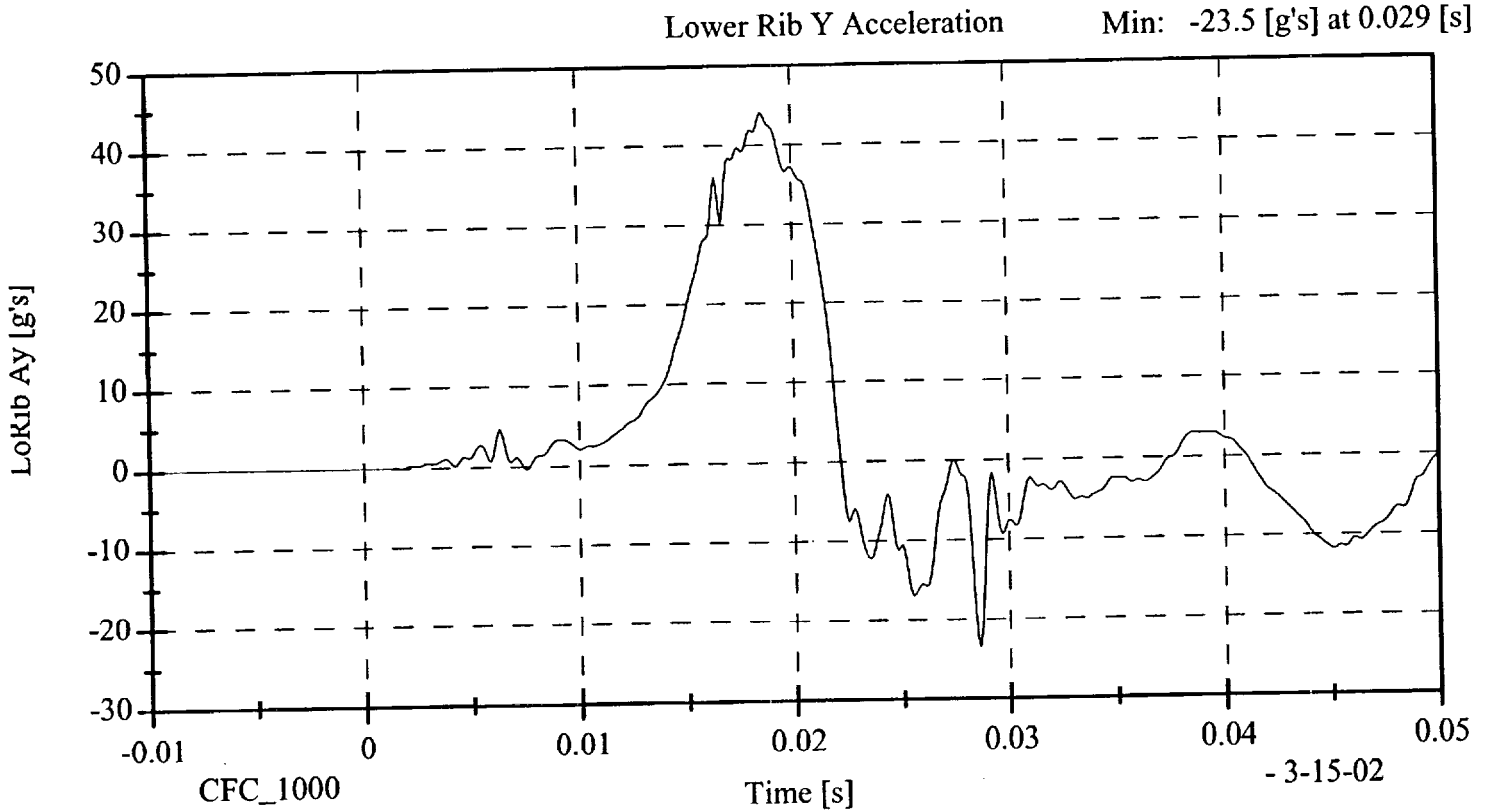
Max: 46.0 [g's] at 0.018 [s]

Min: -18.5 [g's] at 0.029 [s]



Max: 44.0 [g's] at 0.019 [s]

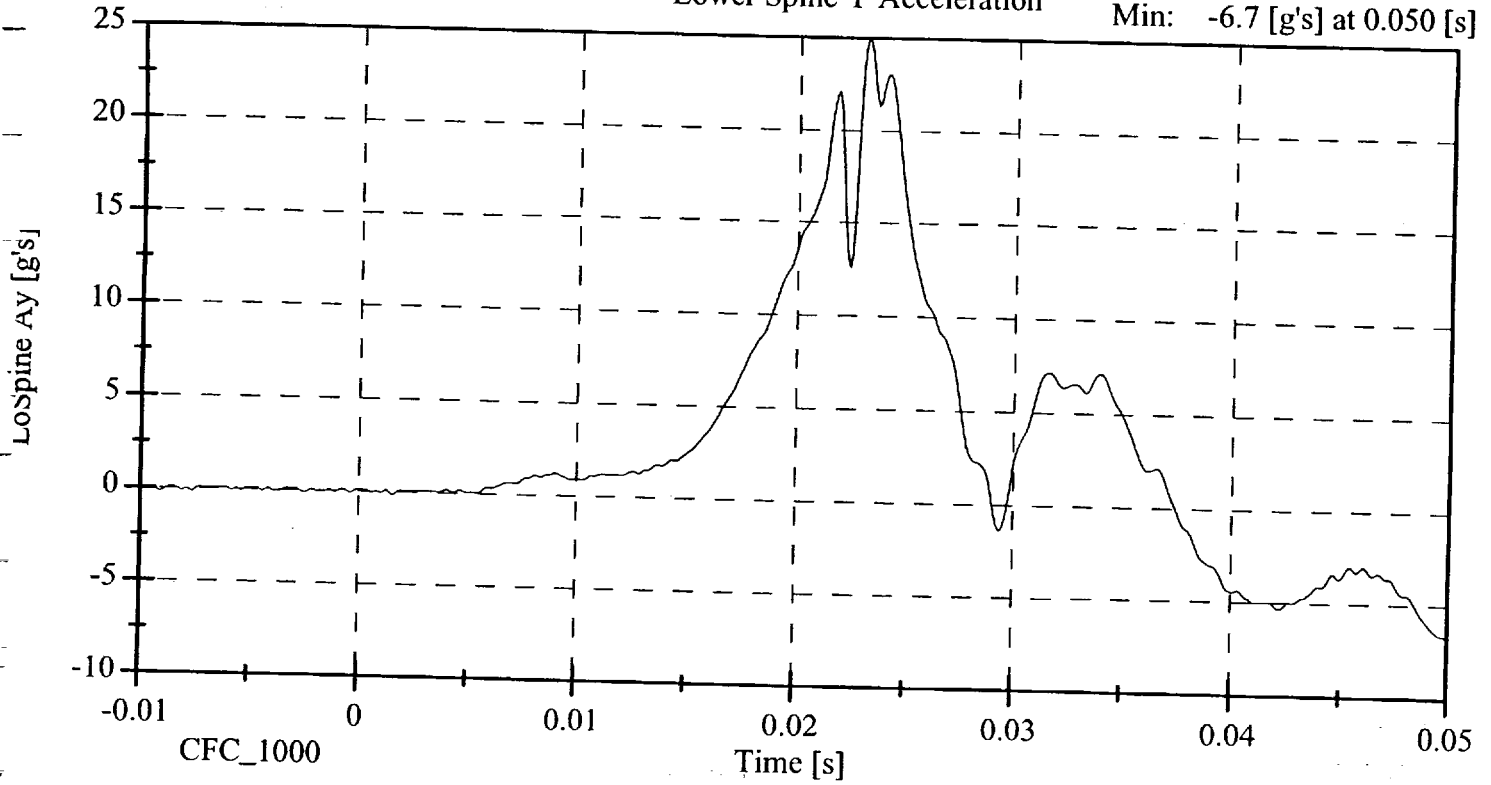
Min: -23.5 [g's] at 0.029 [s]



Lower Spine Y Acceleration

Max: 25.0 [g's] at 0.023 [s]

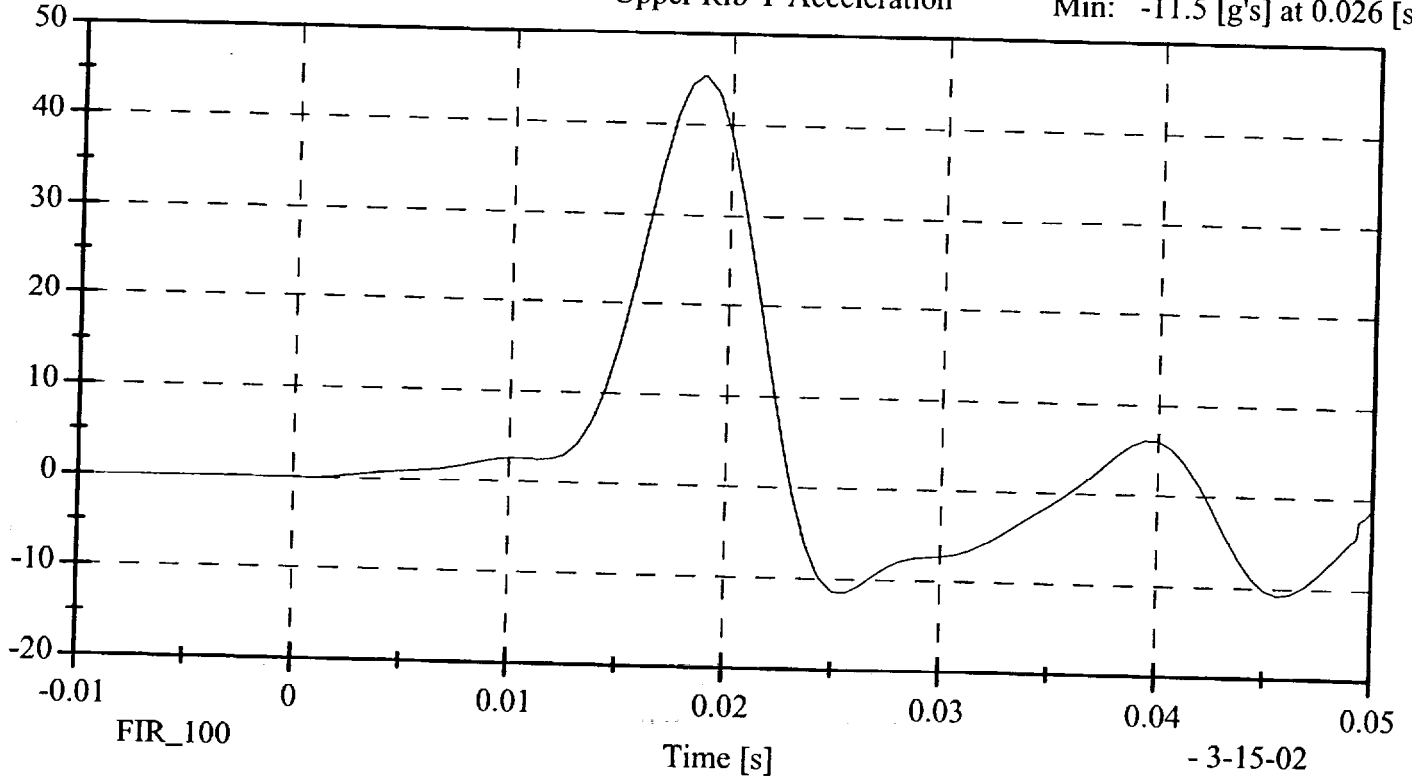
Min: -6.7 [g's] at 0.050 [s]



Upper Rib Y Acceleration

Max: 45.5 [g's] at 0.019 [s]

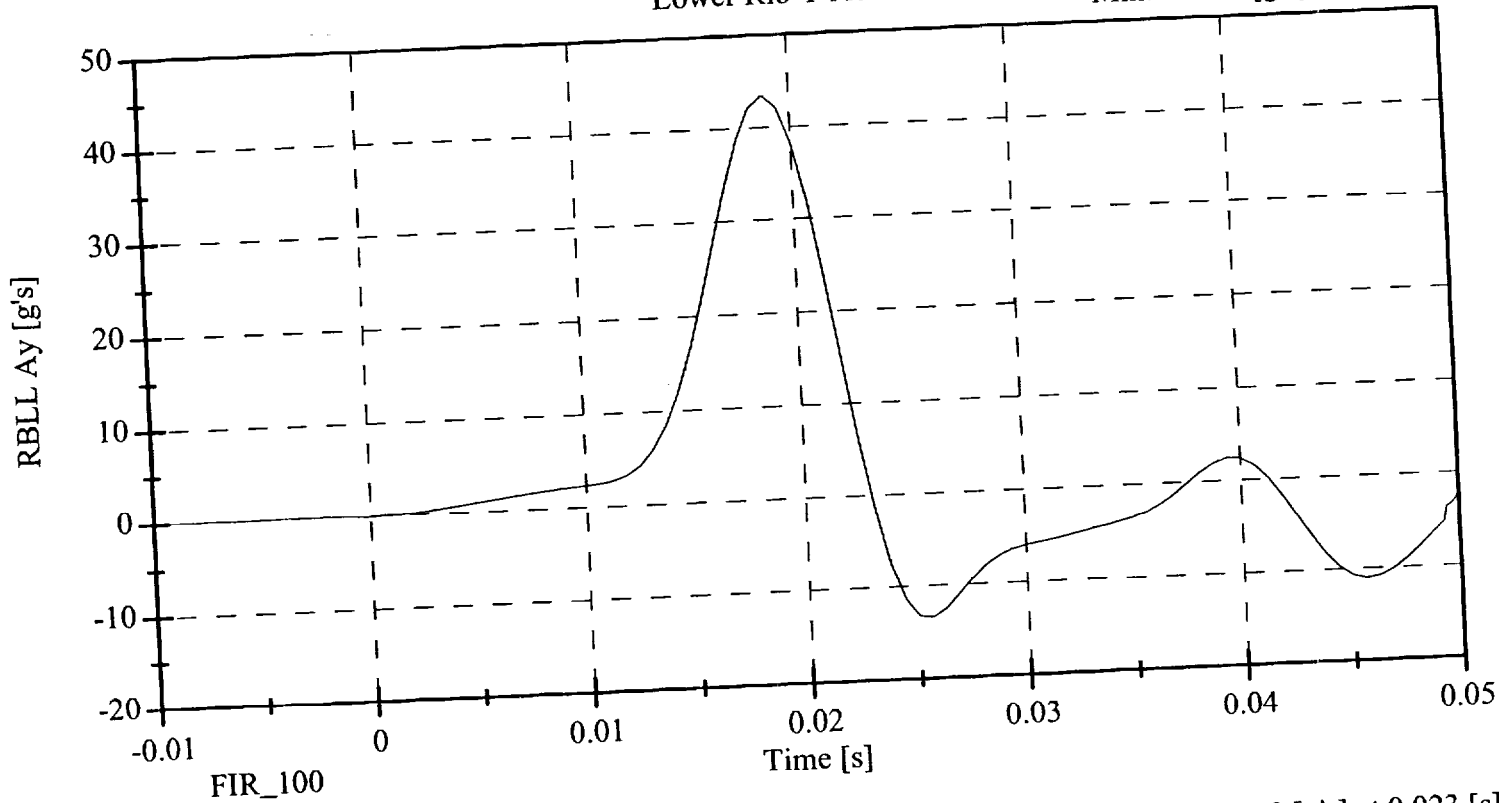
Min: -11.5 [g's] at 0.026 [s]



Max: 43.4 [g's] at 0.019 [s]

Min: -13.4 [g's] at 0.026 [s]

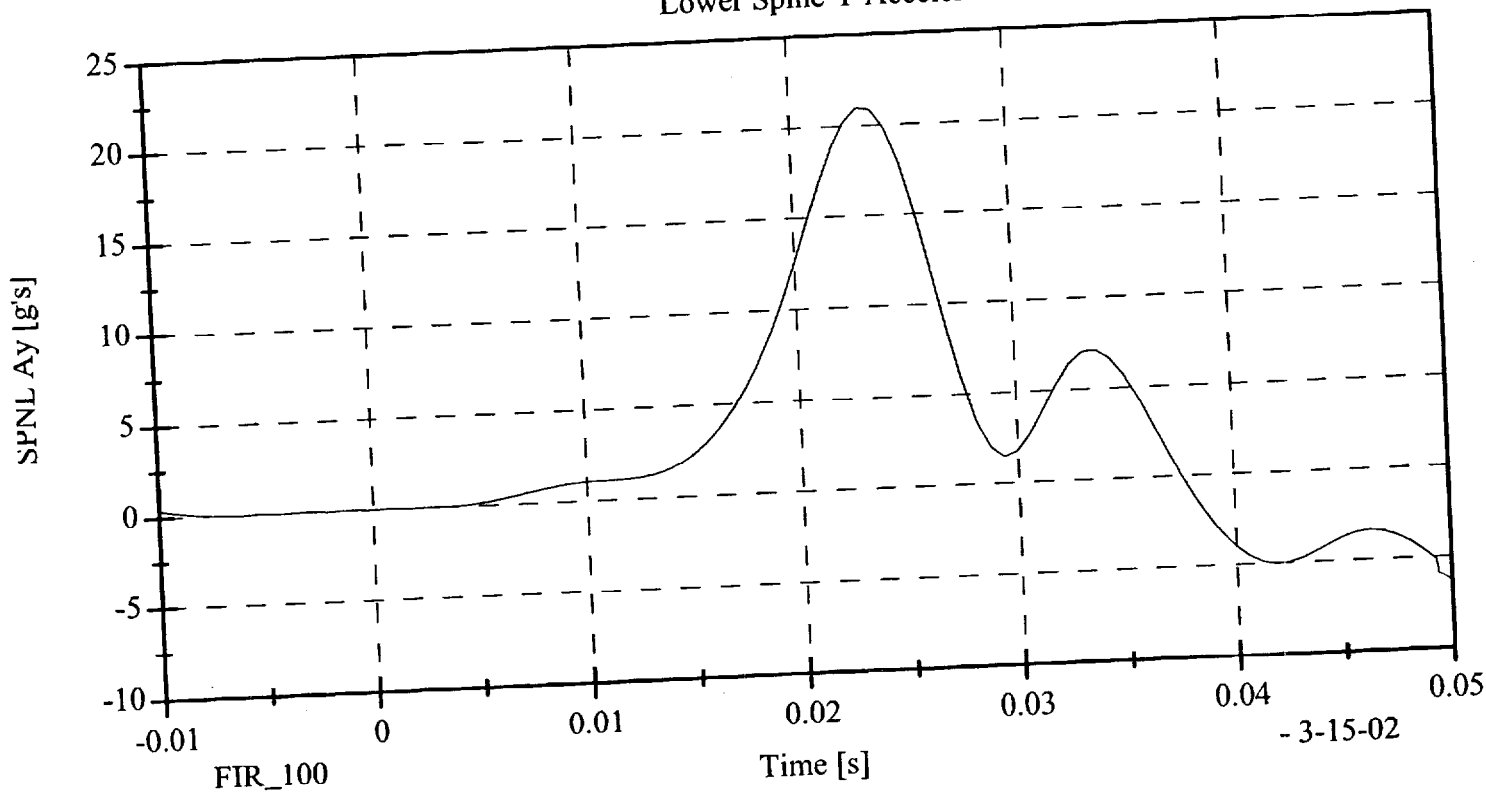
Lower Rib Y Acceleration



Lower Spine Y Acceleration

Max: 21.0 [g's] at 0.023 [s]

Min: -6.2 [g's] at 0.050 [s]



- 3-15-02

LATERAL PELVIS IMPACT TEST
PRE-TEST

CONFIGURED FOR LEFT SIDE IMPACT

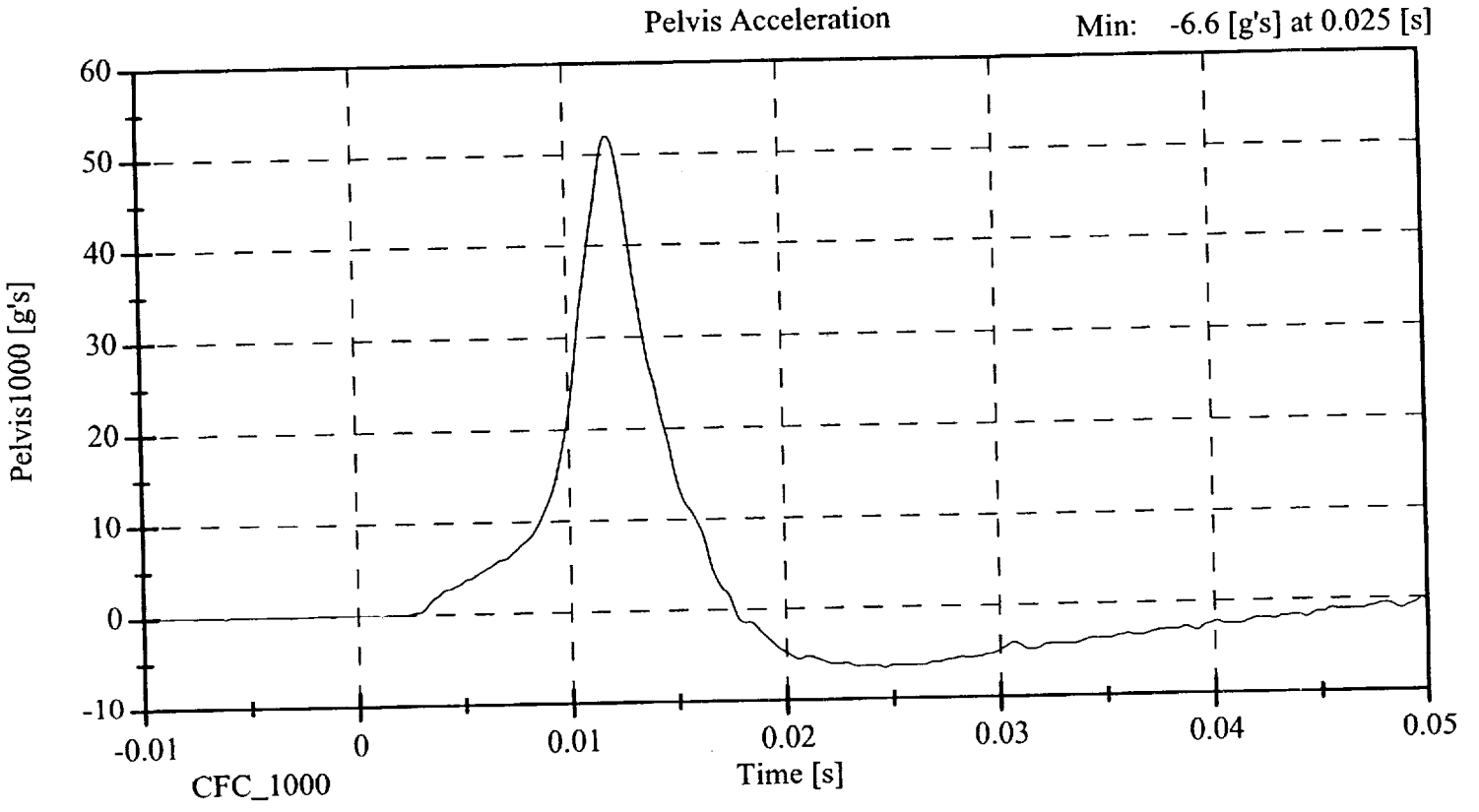
SID Serial No.: 268 Sequential Test Number: 3
Date: March 14, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.1 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 30.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.32 |
| PELVIS ACCELERATION (g's) | 40 - 60 | 41.7 |

REMARKS: None

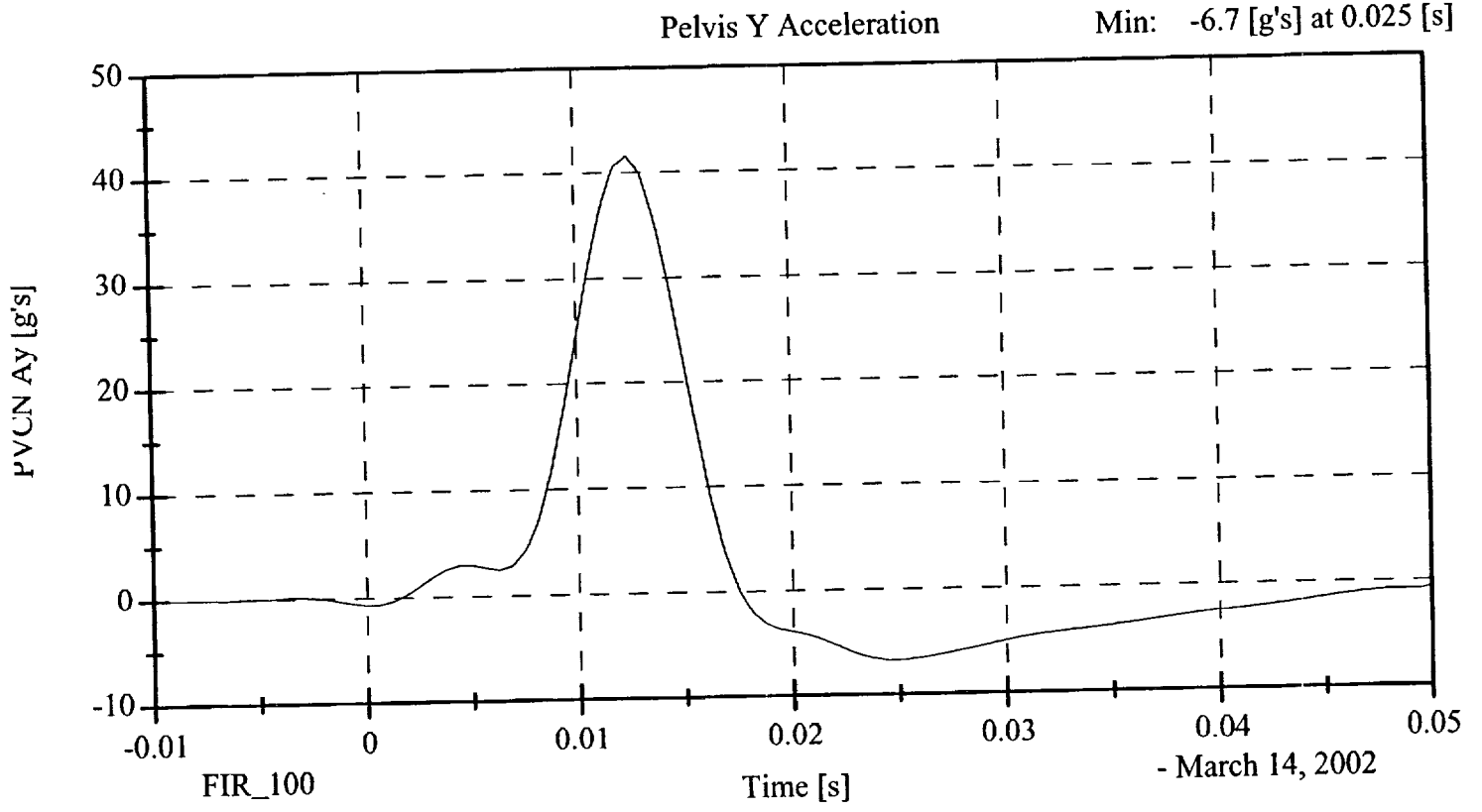
Max: 52.0 [g's] at 0.012 [s]

Min: -6.6 [g's] at 0.025 [s]



Max: 41.7 [g's] at 0.013 [s]

Min: -6.7 [g's] at 0.025 [s]



- March 14, 2002

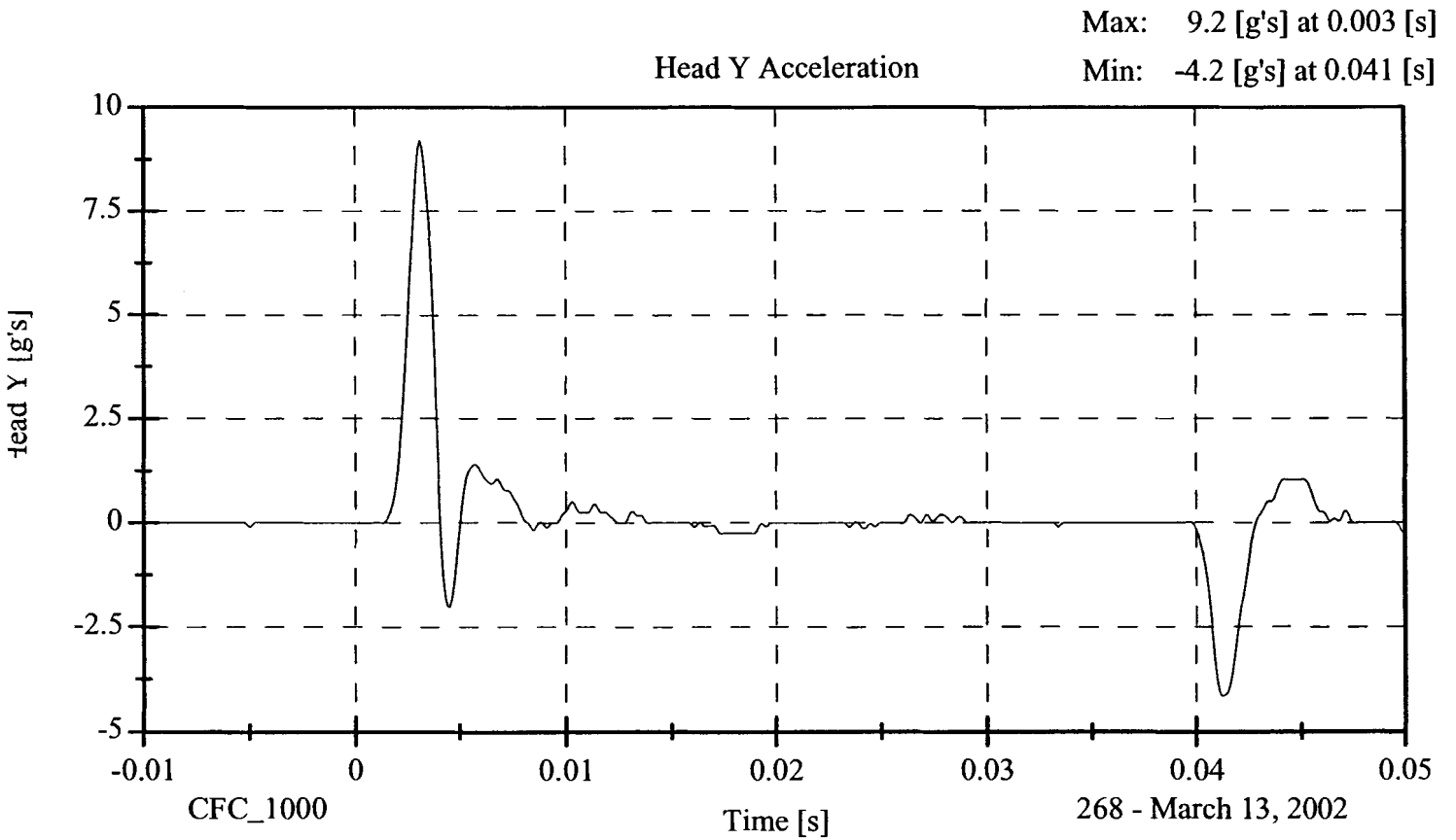
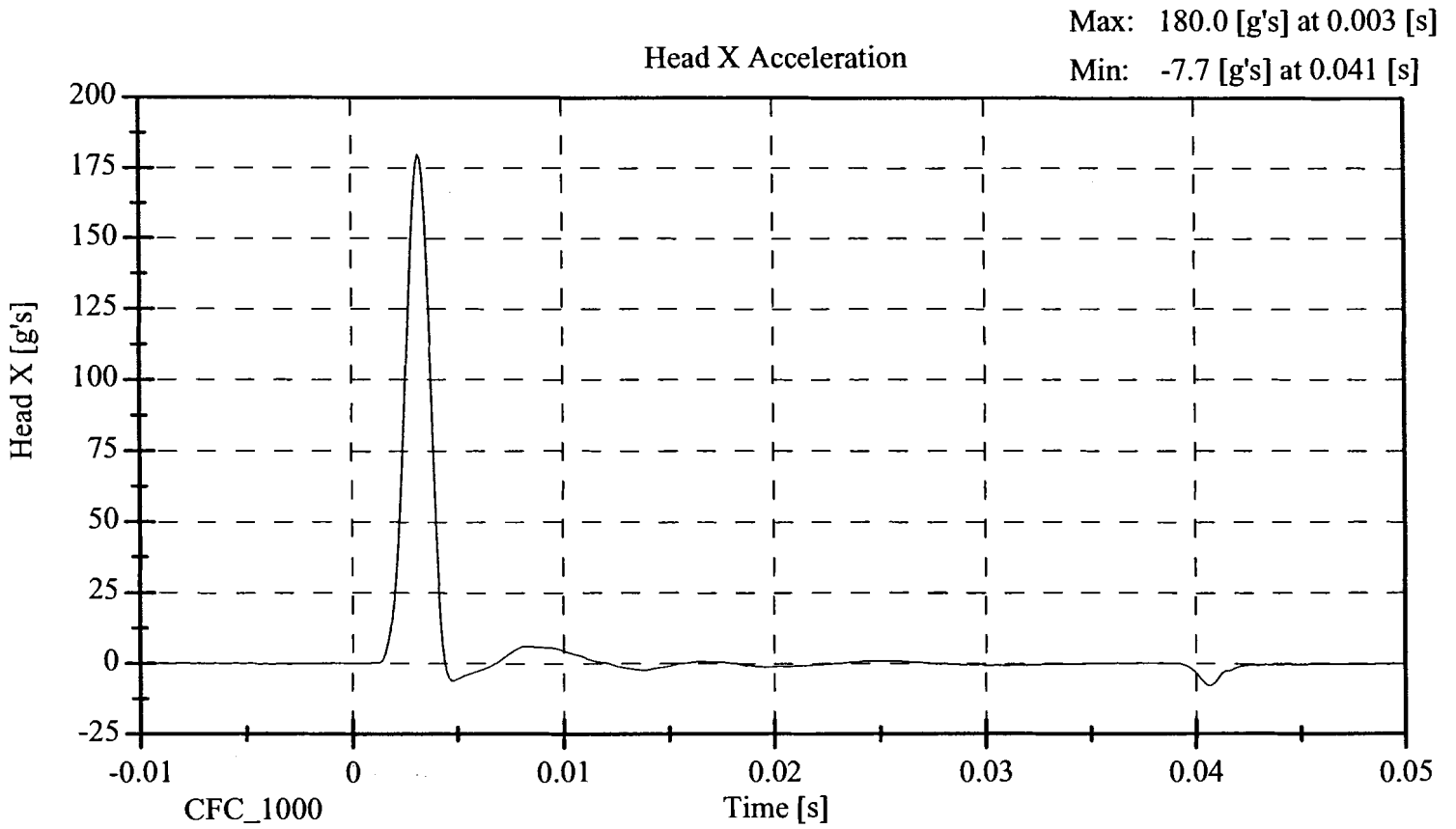
**HEAD DROP TEST
PRE-TEST**
(Test not required for SID certification)

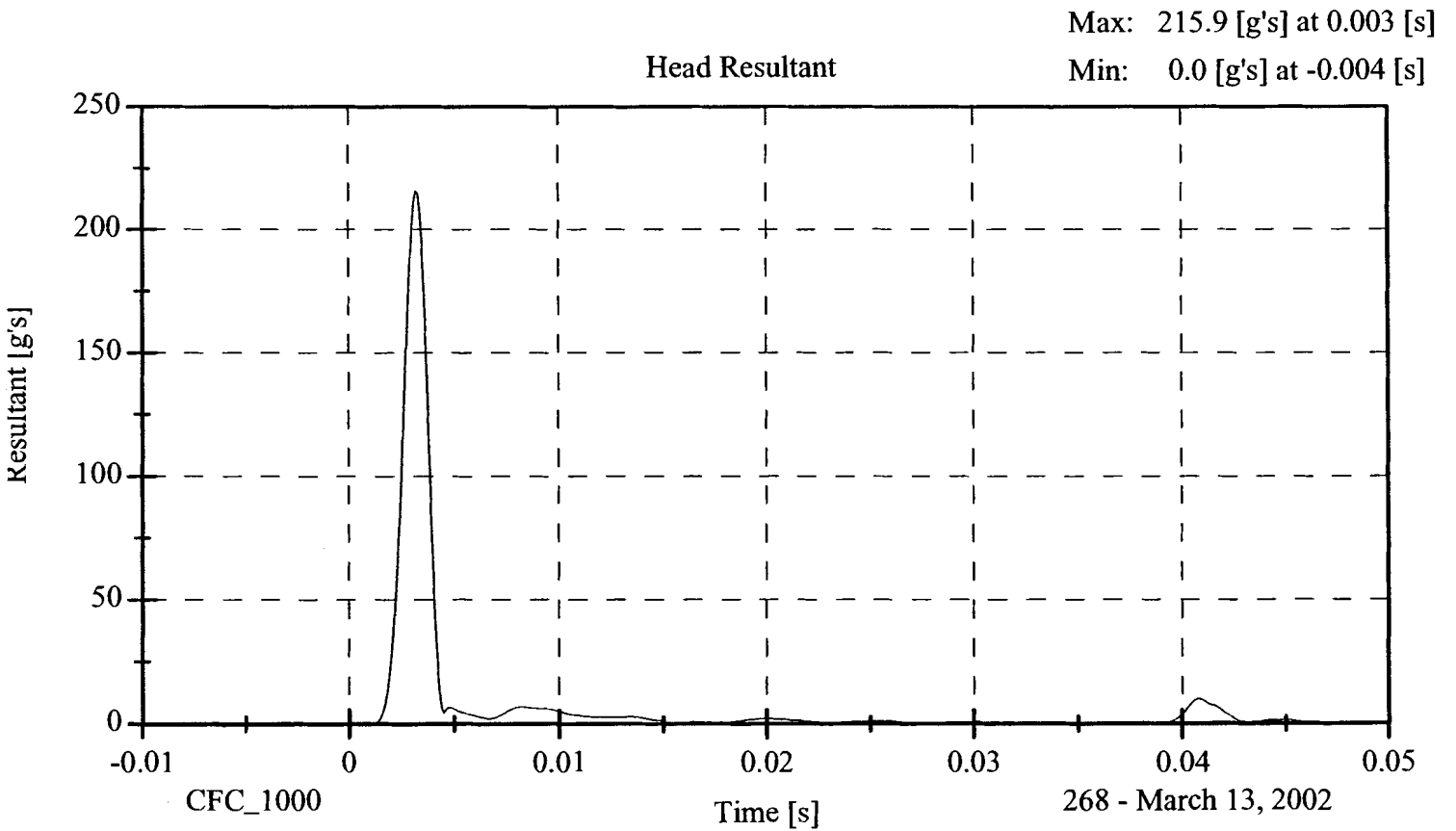
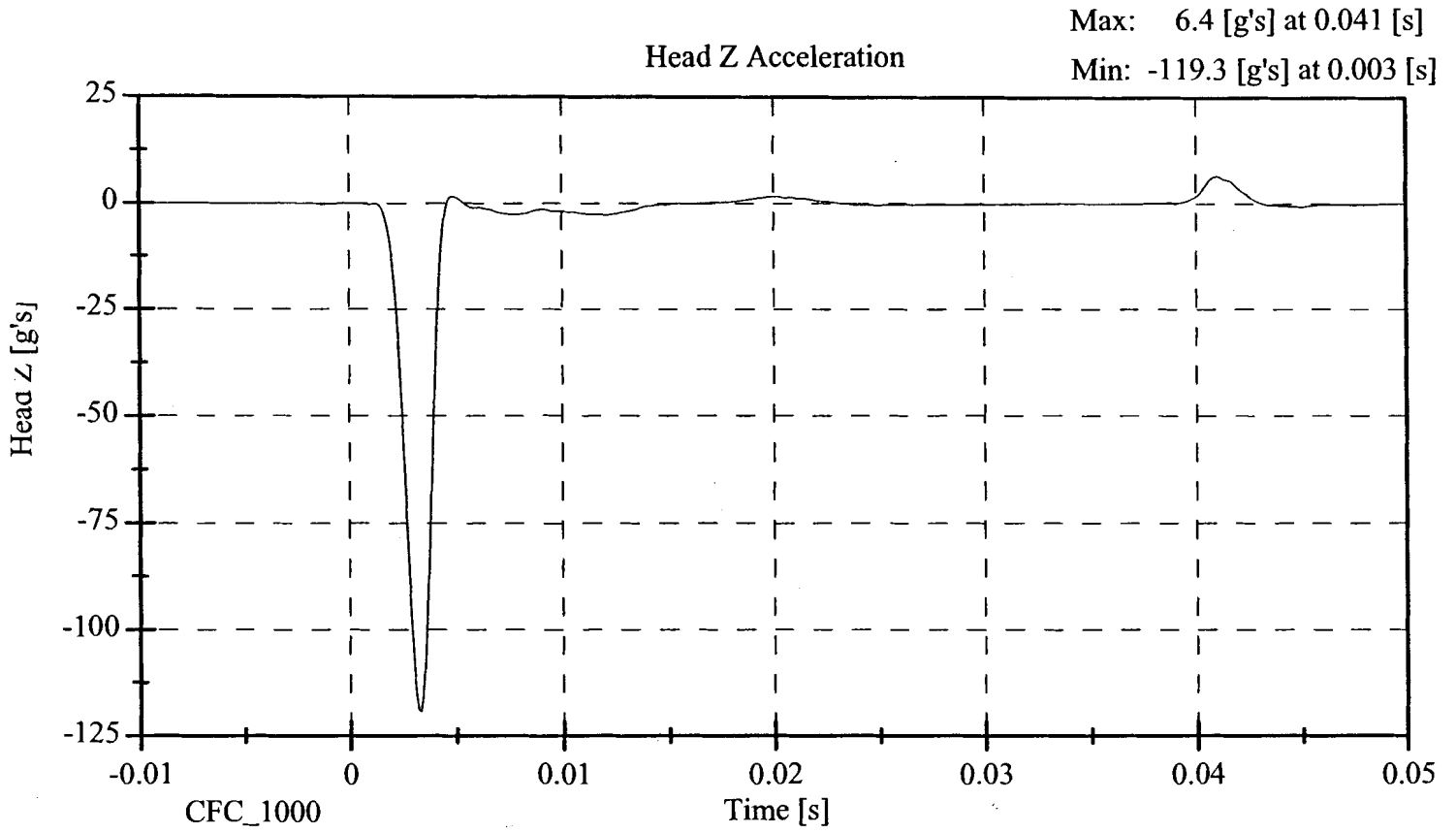
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 3
Date: March 13, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-------------------------------------|------------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.1 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 29.0 |
| PEAK RESULTANT ACCELERATION (Gs) | 210 - 260 | 215.93 |
| PEAK LATERAL ACCELERATION (Gs) | Not to Exceed 10 | 9.21 |
| UNIMODAL CRITERIA ABOVE 100 Gs (ms) | 0.9 - 1.5 | 1.38 |

REMARKS: None





**ABDOMINAL COMPRESSION TEST
PRE-TEST**
(Test not required for SID certification)

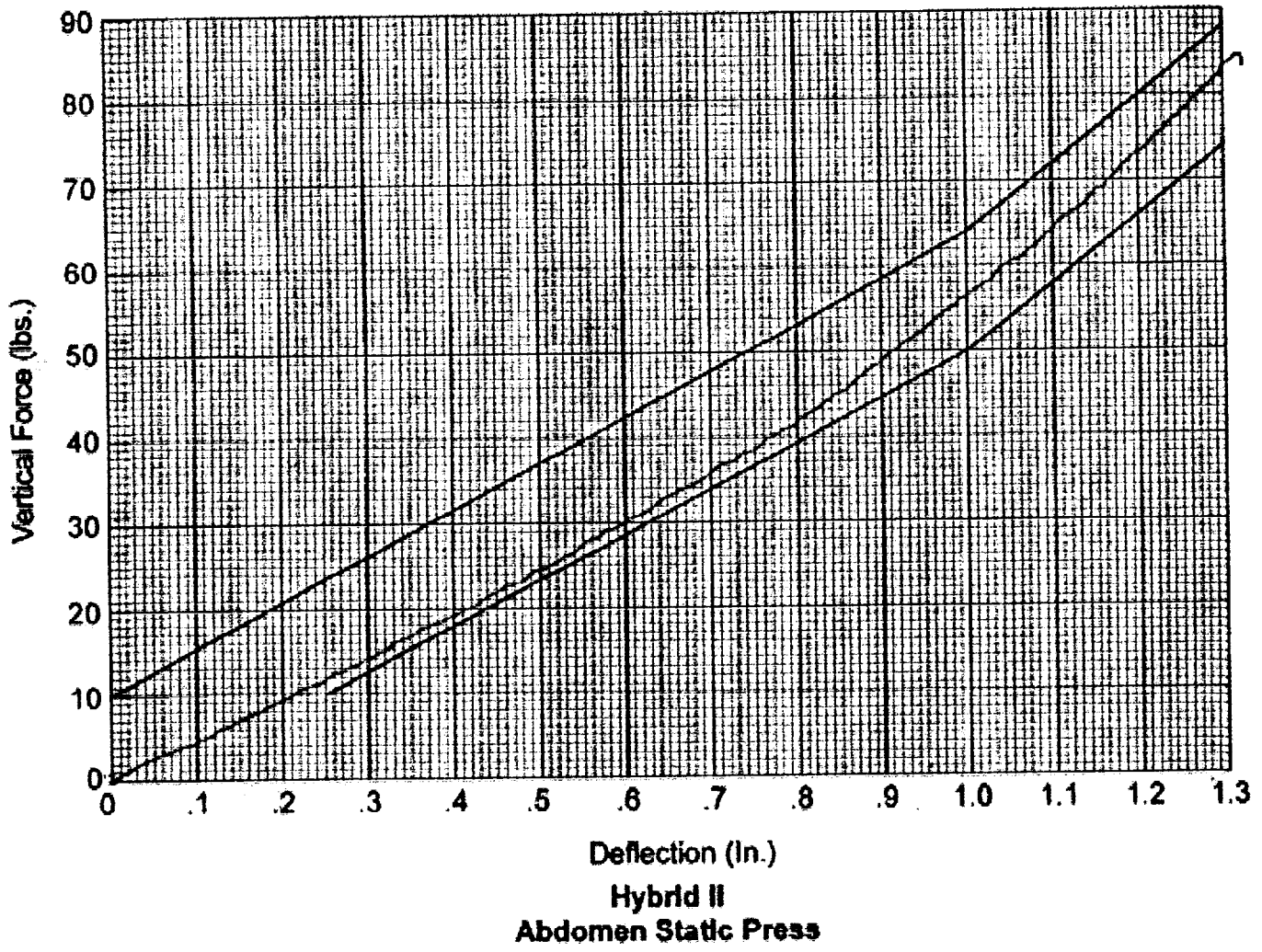
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 3
Date: March 15, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 31.0 |
| FORCE @ 13 mm (N) | 104 - 162 | 111.2 |
| FORCE @ 19 mm (N) | 163 - 221 | 171.2 |
| FORCE @ 25 mm (N) | 222 - 280 | 253.5 |
| FORCE @ 33 mm (N) | 325 - 391 | 369.2 |

REMARKS: None

Dummy S/N 268
W/A _____
Date 3-15-02
Performed By [Signature]
Temp. 71°
Humidity 31%



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

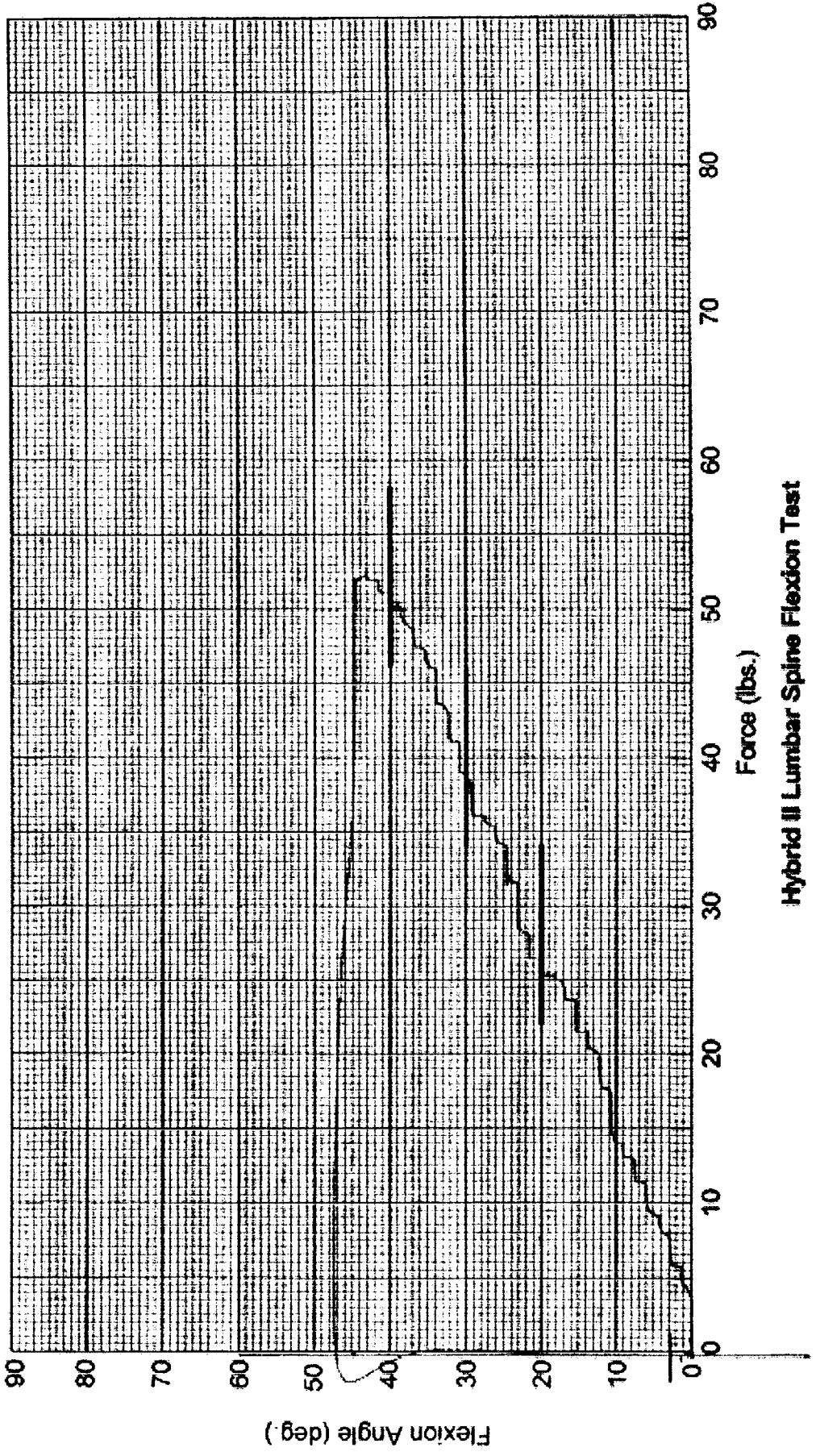
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 3
Date: March 15, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 31.0 |
| FORCE @ 0° (N) | 0 - 26.7 | 0.0 |
| FORCE @ 20° (N) | 97.8 - 151.2 | 113.4 |
| FORCE @ 30° (N) | 151.2 - 204.6 | 171.3 |
| FORCE @ 40° (N) | 204.6 - 258 | 222.4 |
| RETURN ANGLE | 12° max. | 3° |

REMARKS: None

Dummy SN 268
W/A _____
Date 3-15-02
Performed By [Signature]
Temp. 71
Humidity 31%



Hybrid II Lumbar Spine Flexion Test

PRE-TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 3
 Date: March 15, 2002 Laboratory Technician: B. Swiecicki

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

REMARKS: None

CALIBRATION TEST RESULTS

POST TEST

SID NO.: 026

CONFIGURED FOR LEFT SIDE IMPACT

**EXTERNAL DIMENSIONS
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 1
Date: May 22, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm) | 889 - 909 | 899 |
| RH- Rib Height (mm) | 502 - 520 | 518 |
| HP- Hip Pivot Height (mm) | 99 ref. | 99 |
| RD- Rib from Back Line (mm) | 229 - 241 | 236 |
| KH- Knee Pivot from Back Line (mm) | 511 - 526 | 518 |
| KV- Knee Pivot to Floor (mm) | 490 - 505 | 493 |
| HW- Hip Width (mm) | 356 - 391 | 371 |

REMARKS: None

LATERAL THORAX IMPACT TEST
POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 1
Date: May 21, 2002 Laboratory Technician: B. Swiecicki

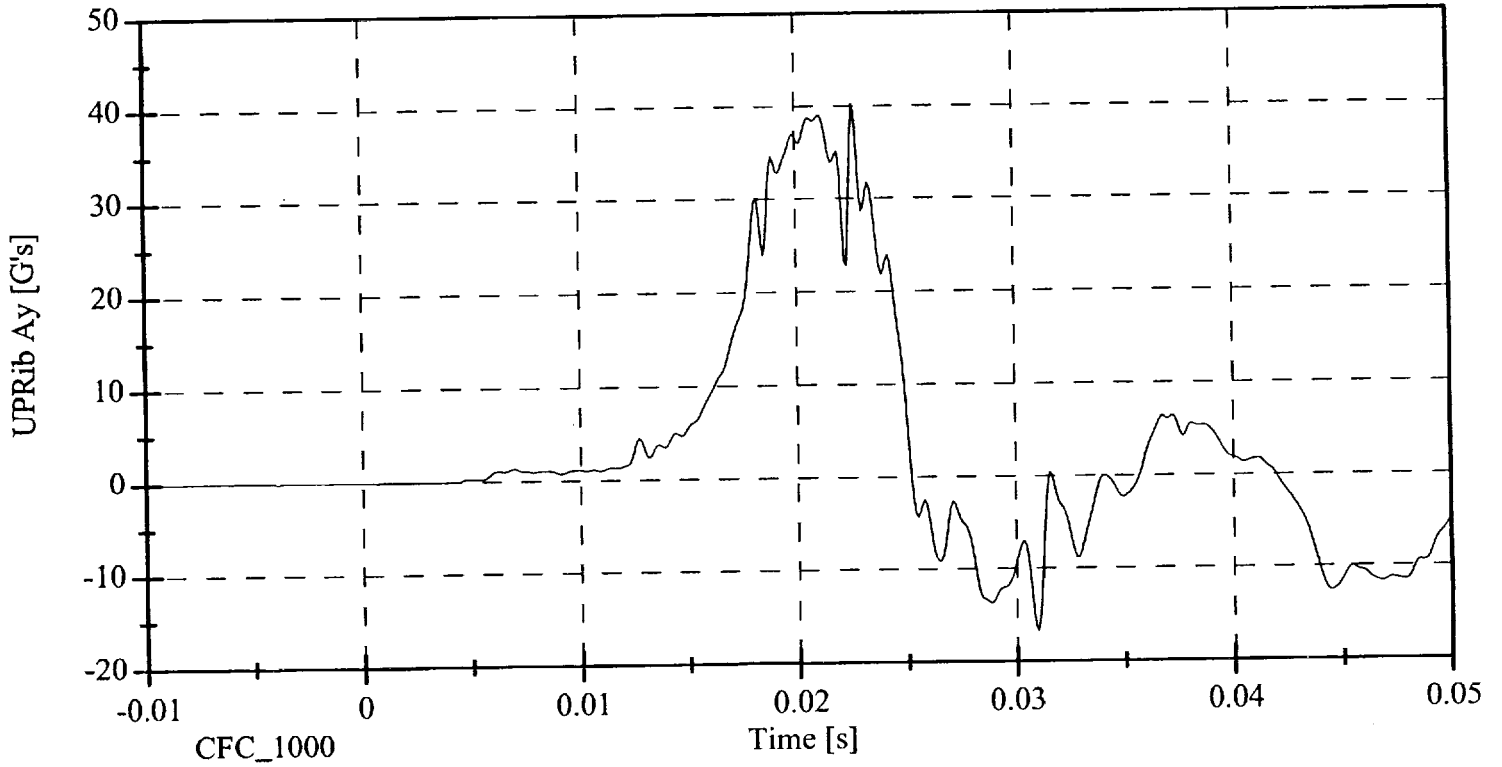
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.1 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 30.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.32 |
| UPPER RIB (g's) | 37 - 46 | 38.48 |
| LOWER RIB (g's) | 37 - 46 | 38.58 |
| LOWER SPINE (g's) | 15 - 22 | 19.27 |

REMARKS: None

Upper Rib Y Acceleration

Max: 40.2 [G's] at 0.023 [s]

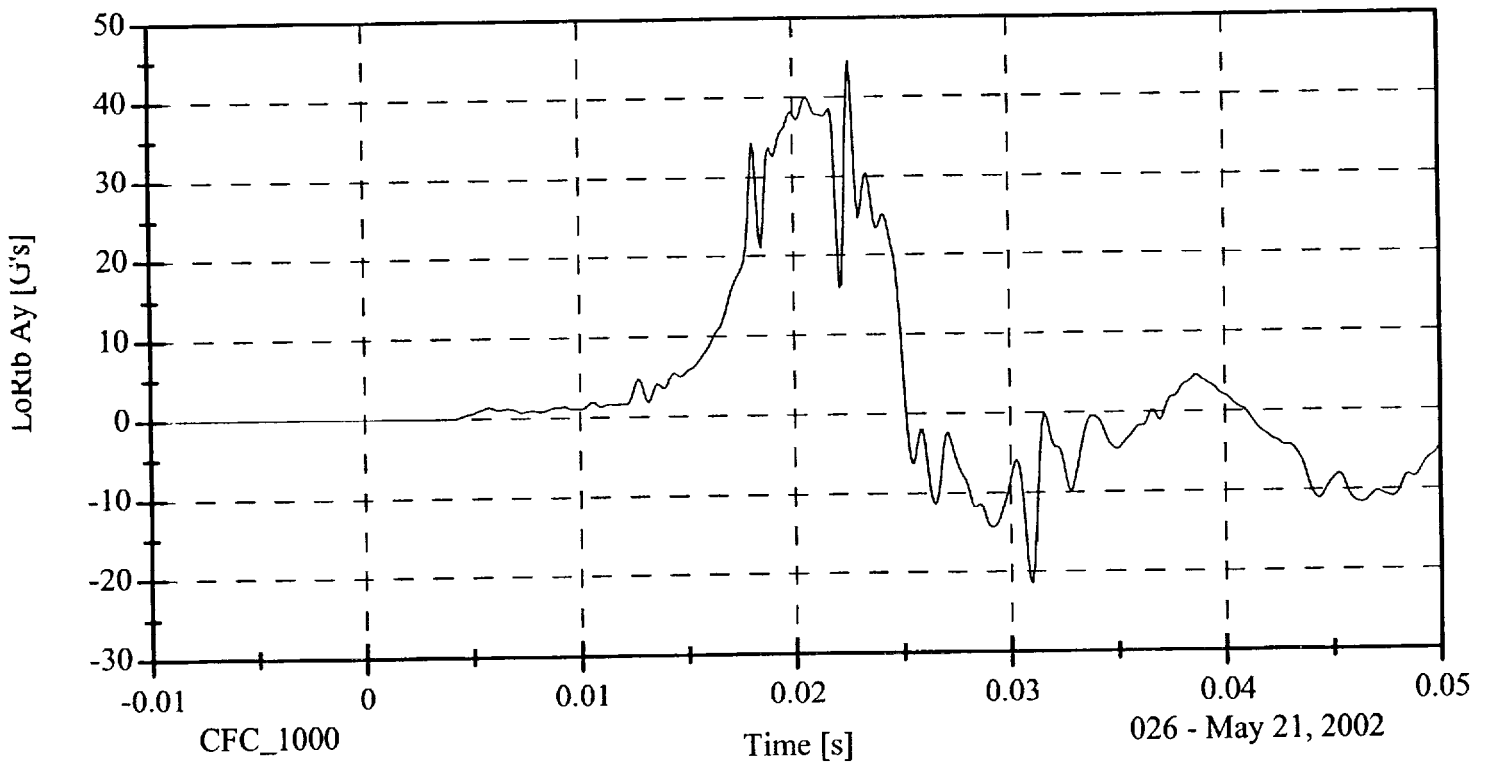
Min: -16.7 [G's] at 0.031 [s]



Lower Rib Y Acceleration

Max: 44.5 [G's] at 0.023 [s]

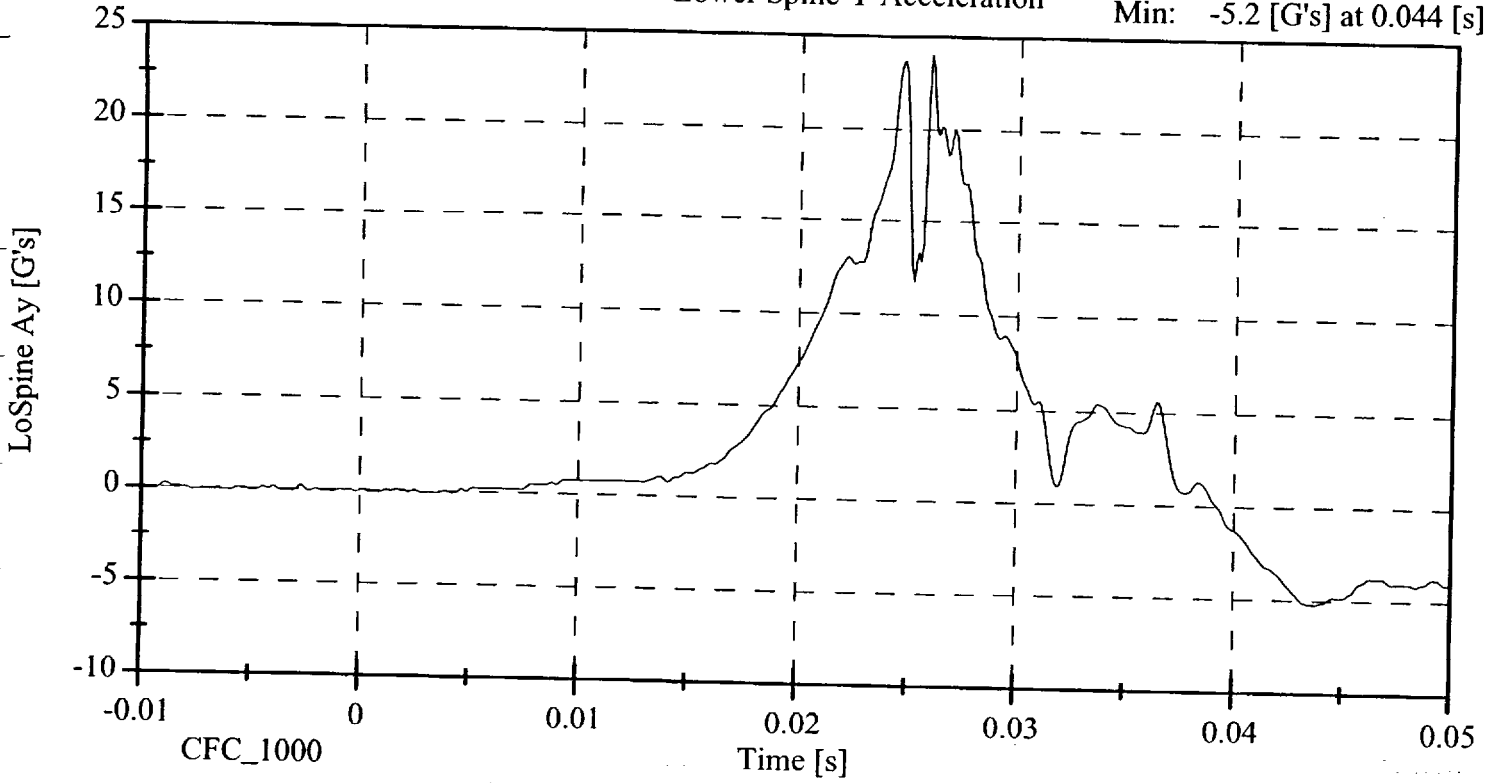
Min: -21.5 [G's] at 0.031 [s]



Lower Spine Y Acceleration

Max: 24.0 [G's] at 0.026 [s]

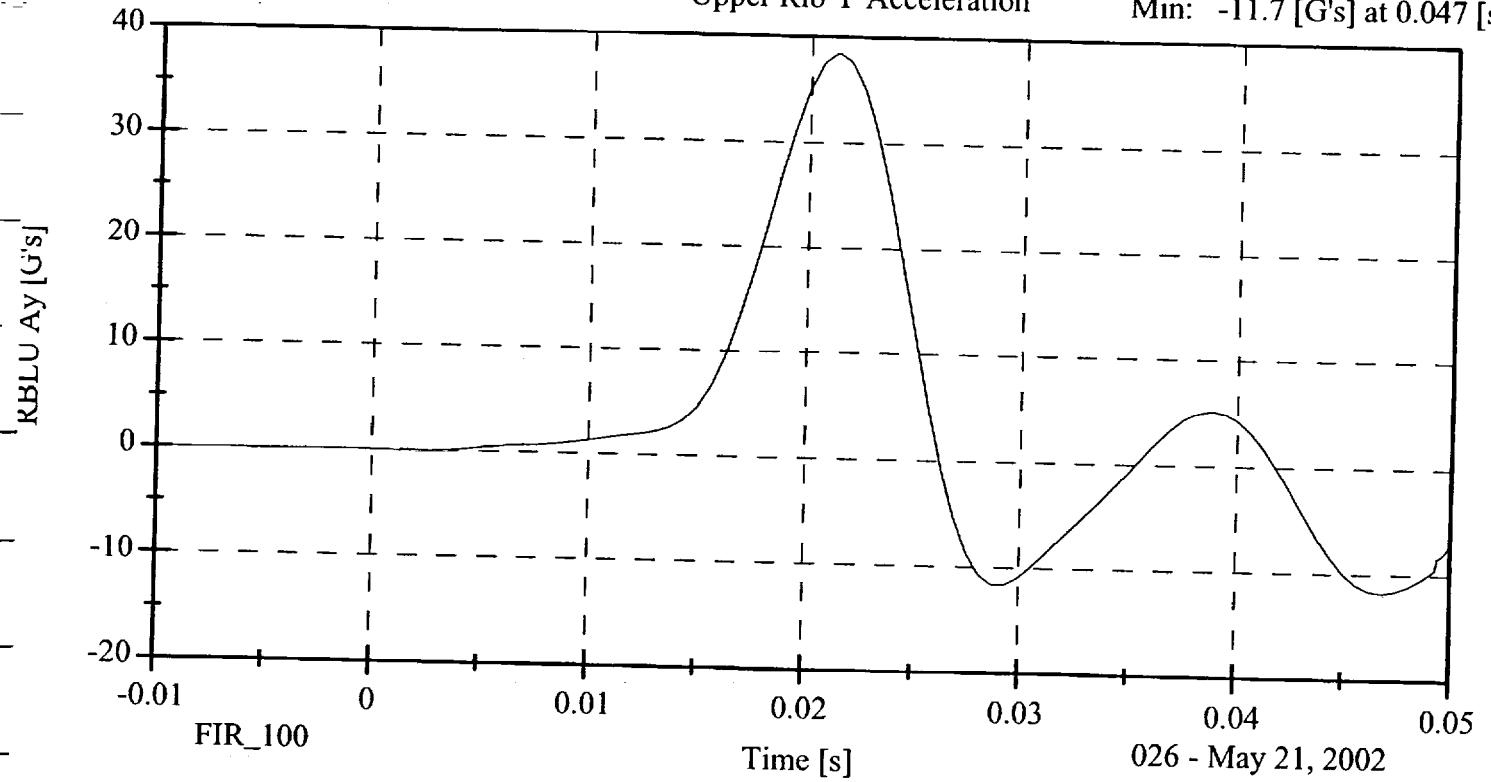
Min: -5.2 [G's] at 0.044 [s]



Upper Rib Y Acceleration

Max: 38.5 [G's] at 0.021 [s]

Min: -11.7 [G's] at 0.047 [s]

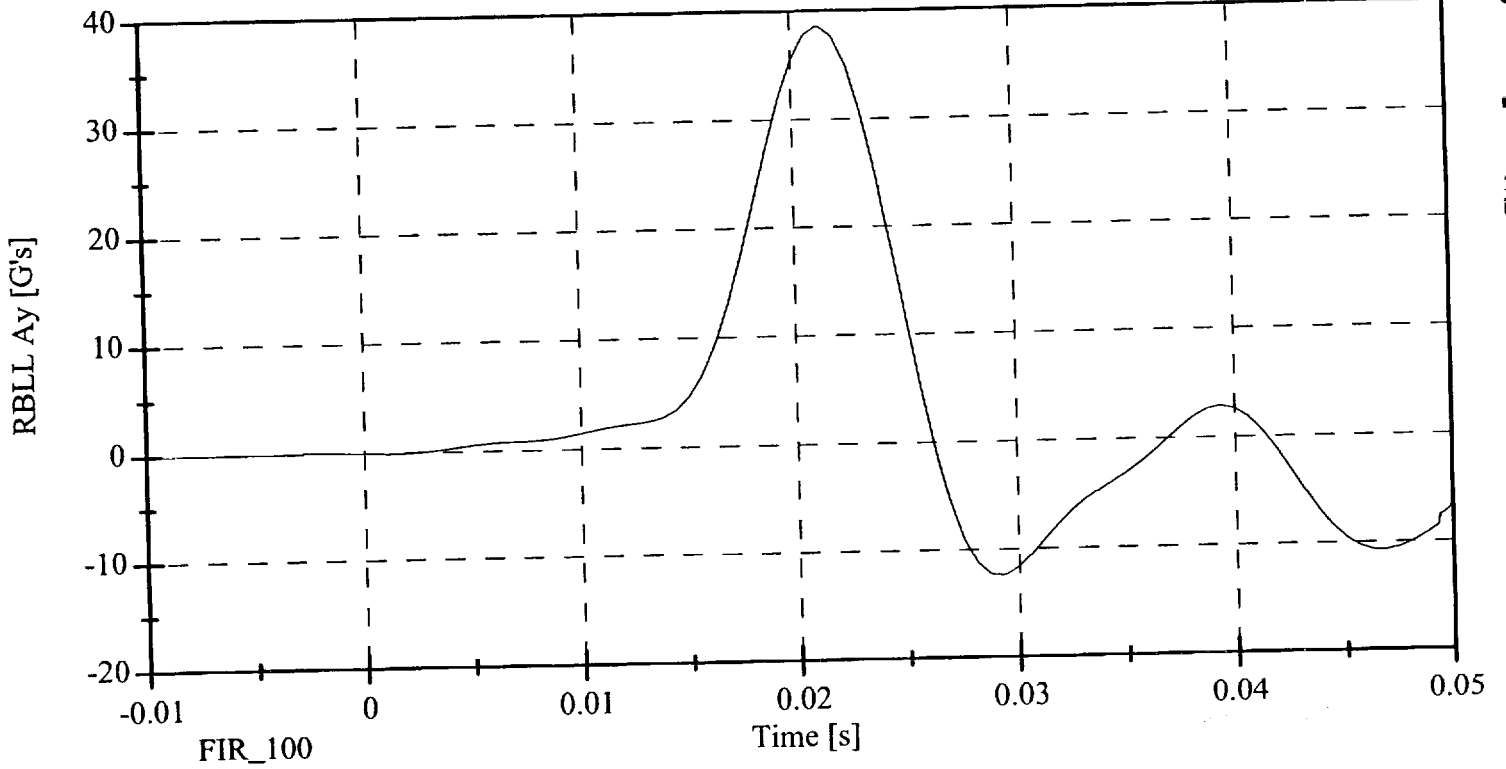


026 - May 21, 2002

Lower Rib Y Acceleration

Max: 38.6 [G's] at 0.021 [s]

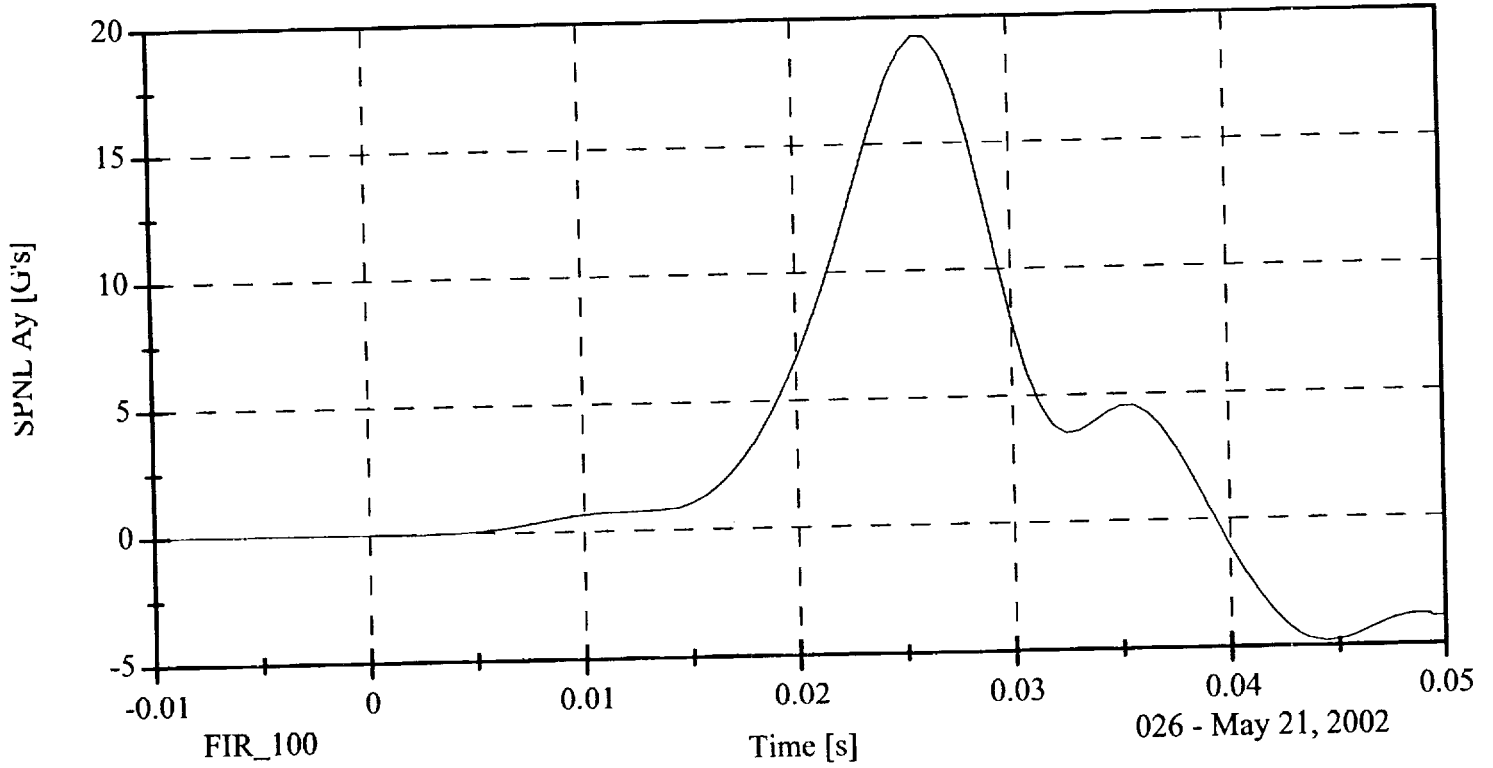
Min: -12.4 [G's] at 0.029 [s]



Lower Spine Y Acceleration

Max: 19.3 [G's] at 0.026 [s]

Min: -4.8 [G's] at 0.044 [s]



LATERAL PELVIS IMPACT TEST
POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

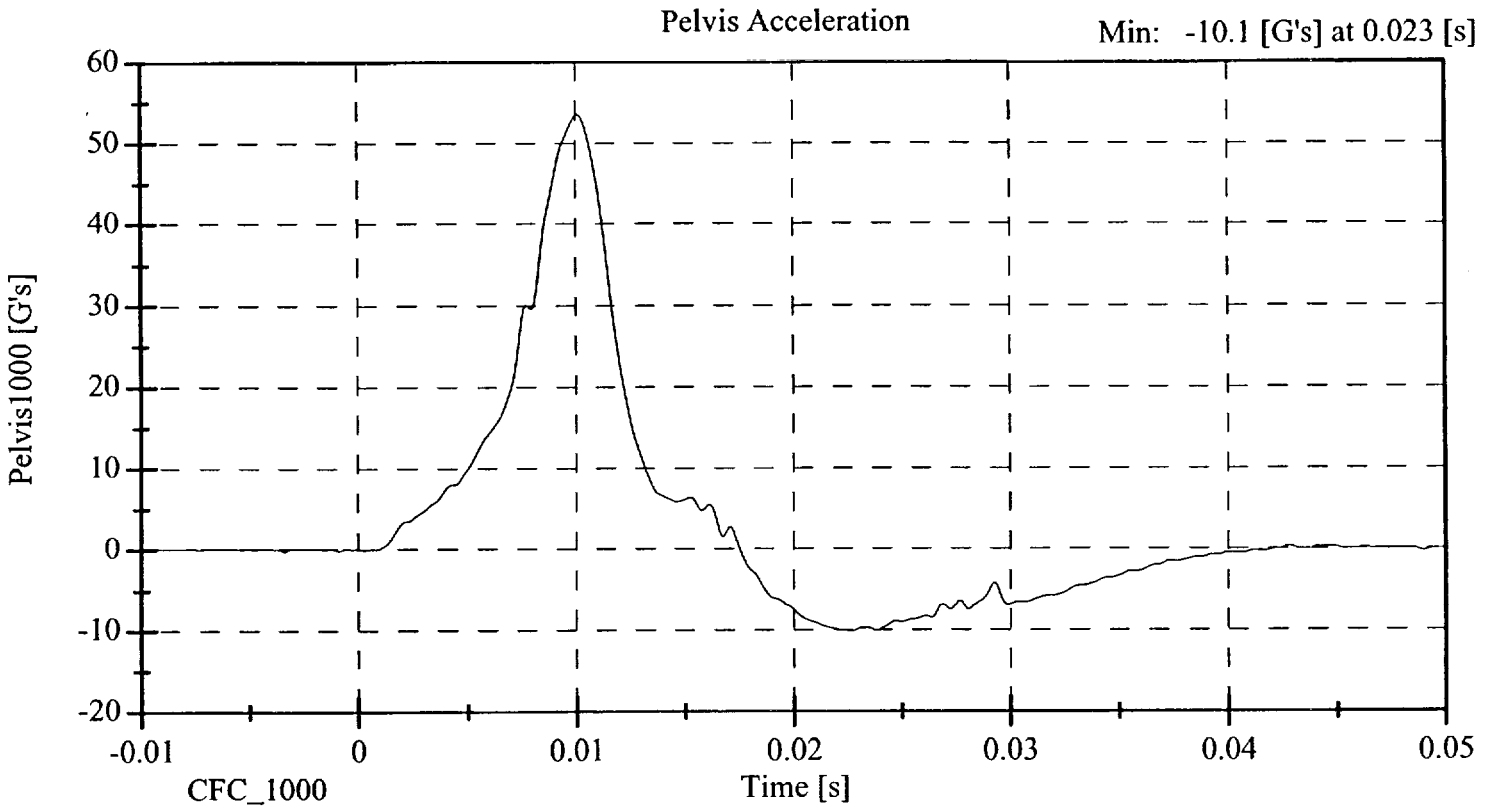
SID Serial No.: 026 Sequential Test Number: 1
Date: May 21, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 31.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.29 |
| PELVIS ACCELERATION (g's) | 40 - 60 | 45.89 |

REMARKS: None

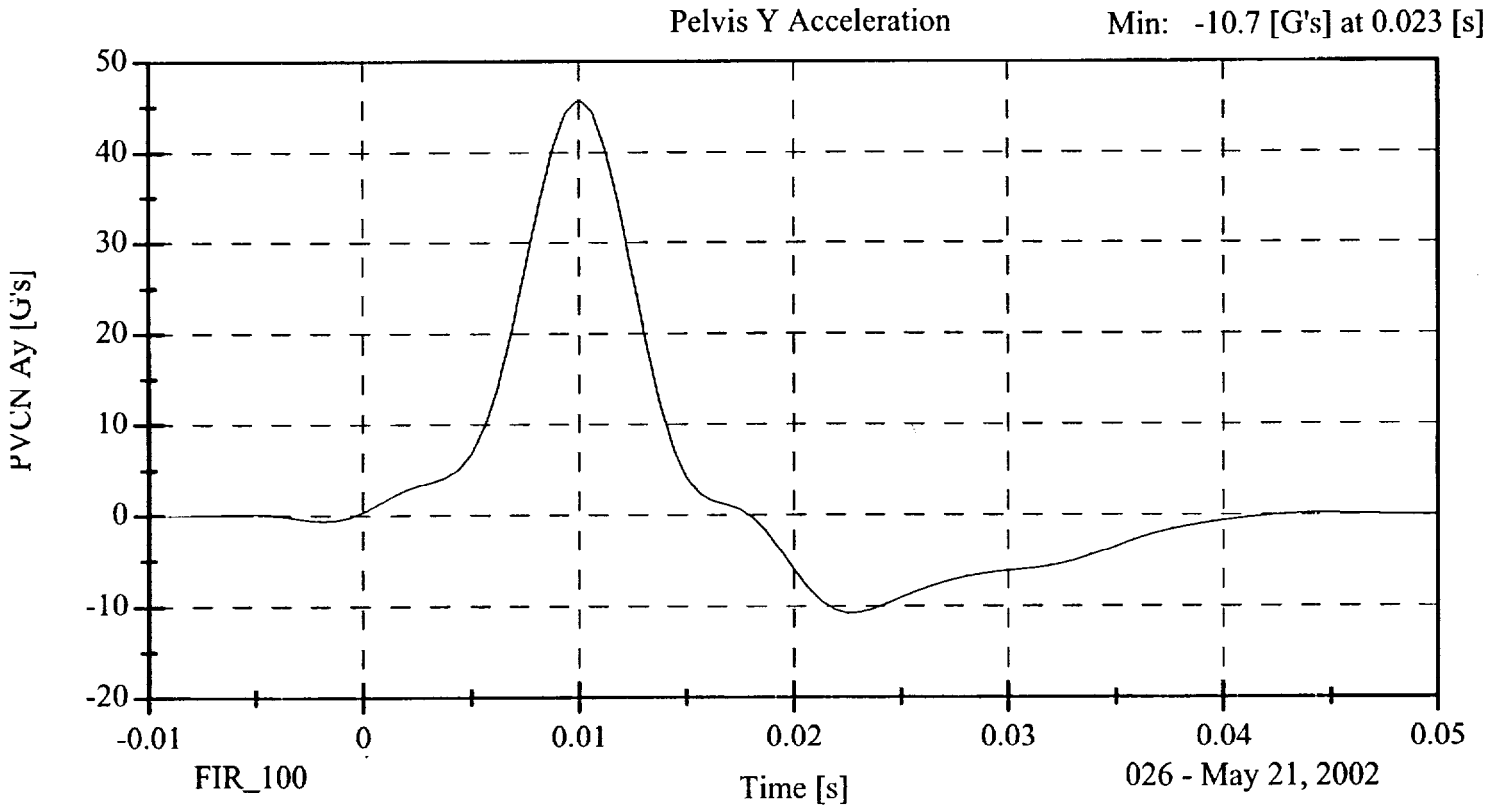
Max: 53.6 [G's] at 0.010 [s]

Min: -10.1 [G's] at 0.023 [s]



Max: 45.9 [G's] at 0.010 [s]

Min: -10.7 [G's] at 0.023 [s]



026 - May 21, 2002

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

CONFIGURED FOR LEFT SIDE IMPACT

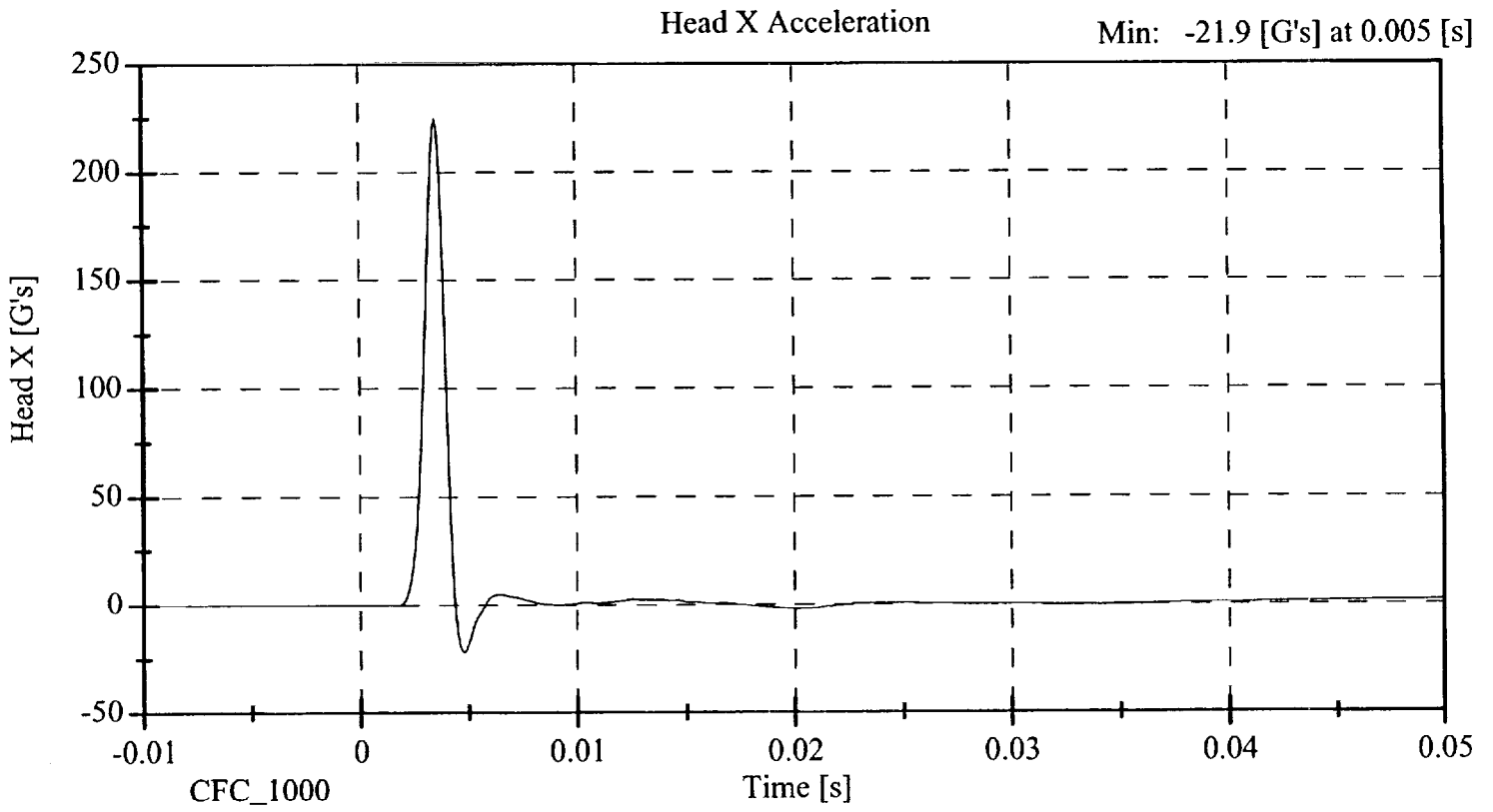
SID Serial No.: 026 Sequential Test Number: 1
Date: May 17, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-------------------------------------|------------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 20.6 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 35.0 |
| PEAK RESULTANT ACCELERATION (Gs) | 210 - 260 | 258.04 |
| PEAK LATERAL ACCELERATION (Gs) | Not to Exceed 10 | 1.82 |
| UNIMODAL CRITERIA ABOVE 100 Gs (ms) | 0.9 - 1.5 | 1.17 |

REMARKS: None

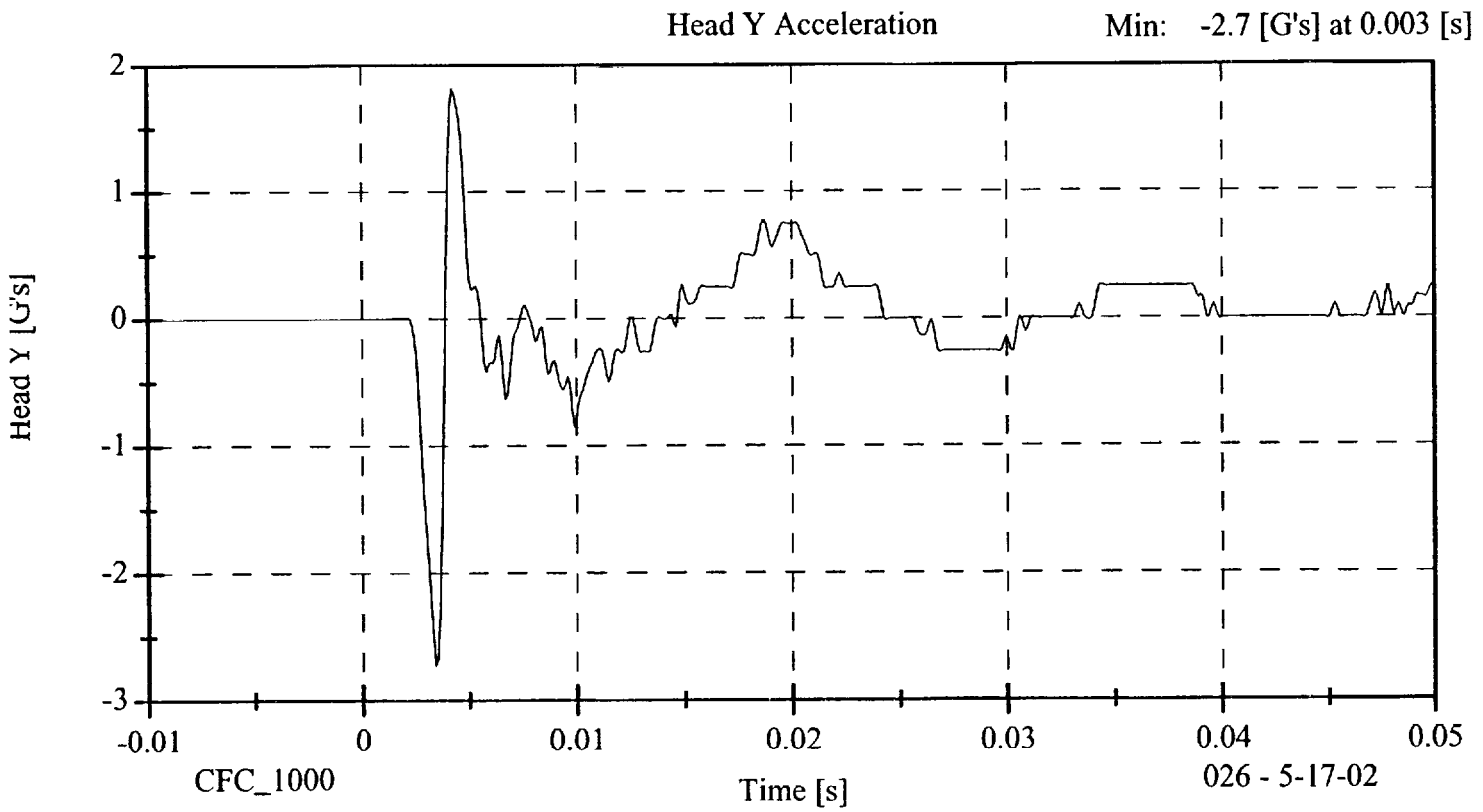
Max: 224.7 [G's] at 0.003 [s]

Min: -21.9 [G's] at 0.005 [s]



Max: 1.8 [G's] at 0.004 [s]

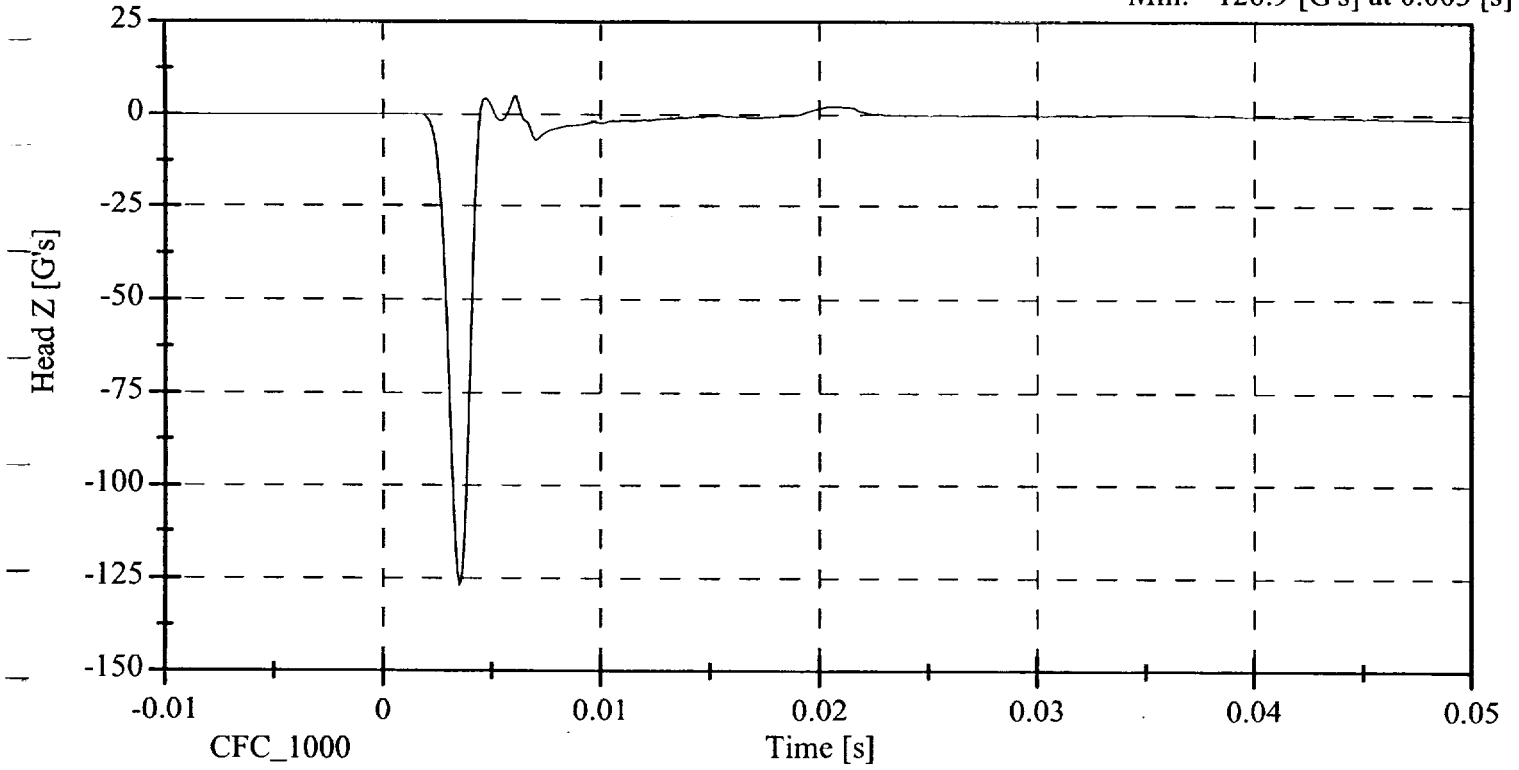
Min: -2.7 [G's] at 0.003 [s]



026 - 5-17-02

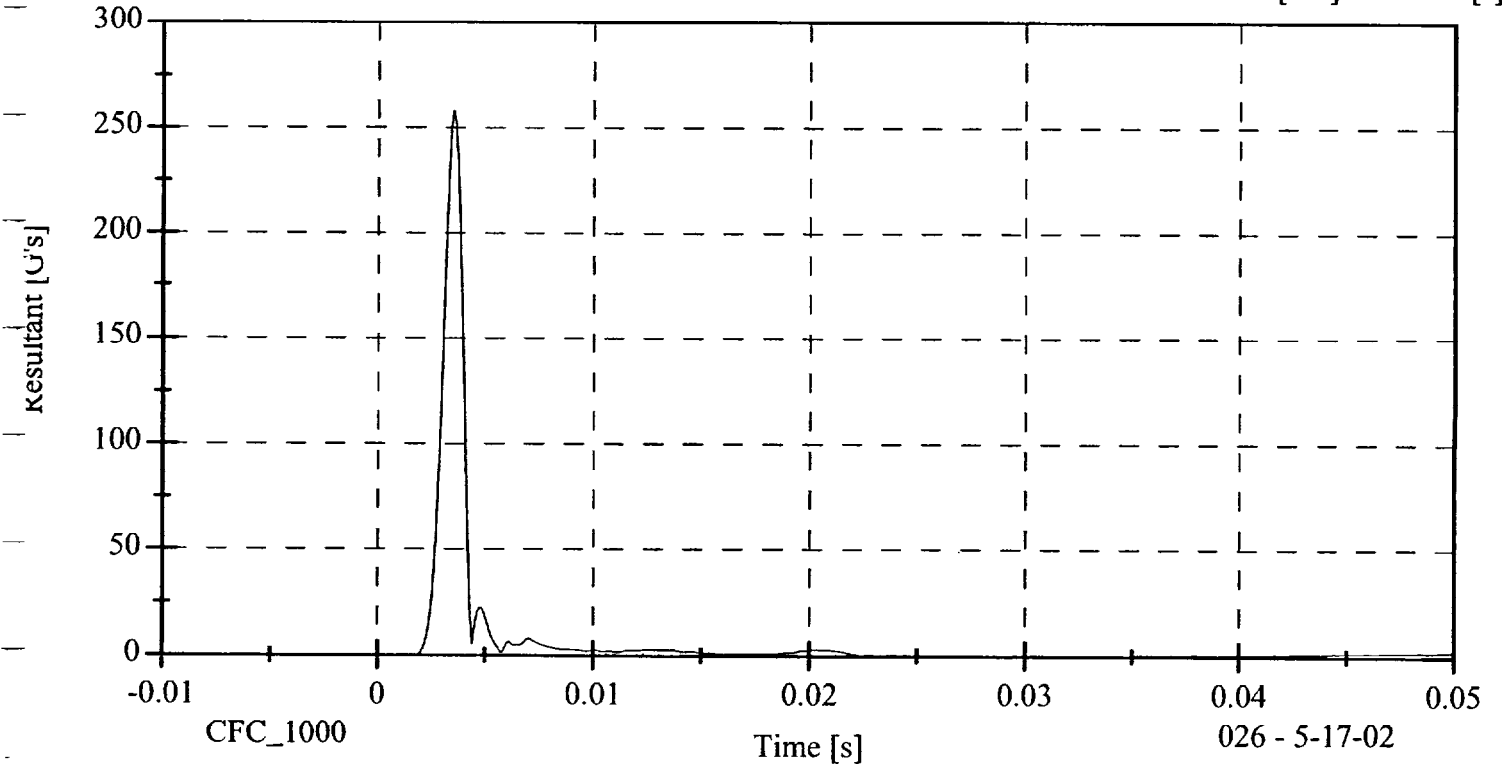
Head Z Acceleration

Max: 5.0 [G's] at 0.006 [s]
Min: -126.9 [G's] at 0.003 [s]



Head Resultant

Max: 258.0 [G's] at 0.003 [s]
Min: 0.0 [G's] at -0.009 [s]



026 - 5-17-02

**ABDOMINAL COMPRESSION TEST
POST TEST**
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 1
Date: May 22, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 35.0 |
| FORCE @ 13 mm (N) | 104 - 162 | 122.3 |
| FORCE @ 19 mm (N) | 163 - 221 | 183.3 |
| FORCE @ 25 mm (N) | 222 - 280 | 262.9 |
| FORCE @ 33 mm (N) | 325 - 391 | 371.4 |

REMARKS: None

Dummy S/N 026

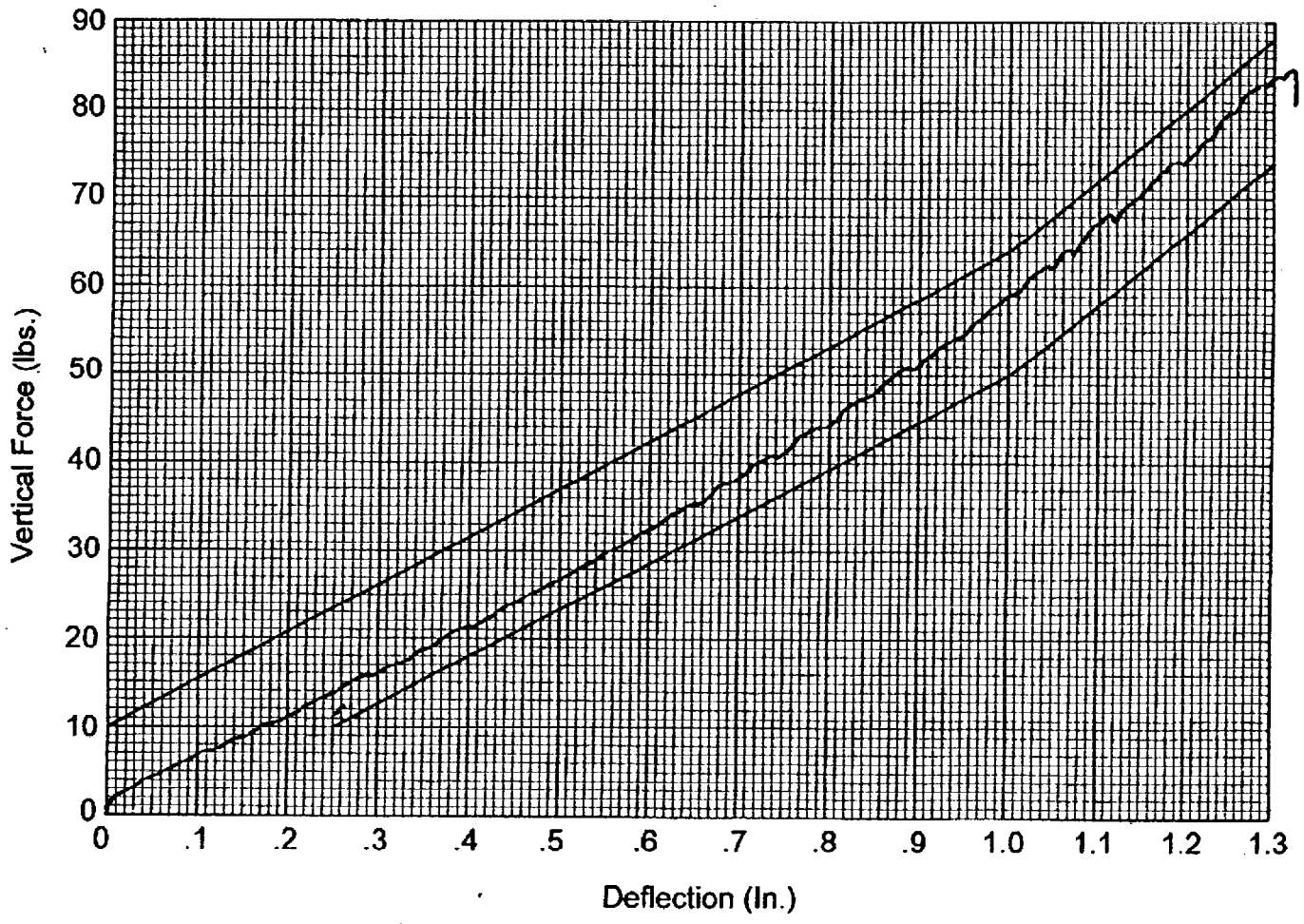
W/A _____

Date 5-22-02

Performed By [Signature]

Temp. 71°

Humidity 35%



Hybrid II
Abdomen Static Press

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

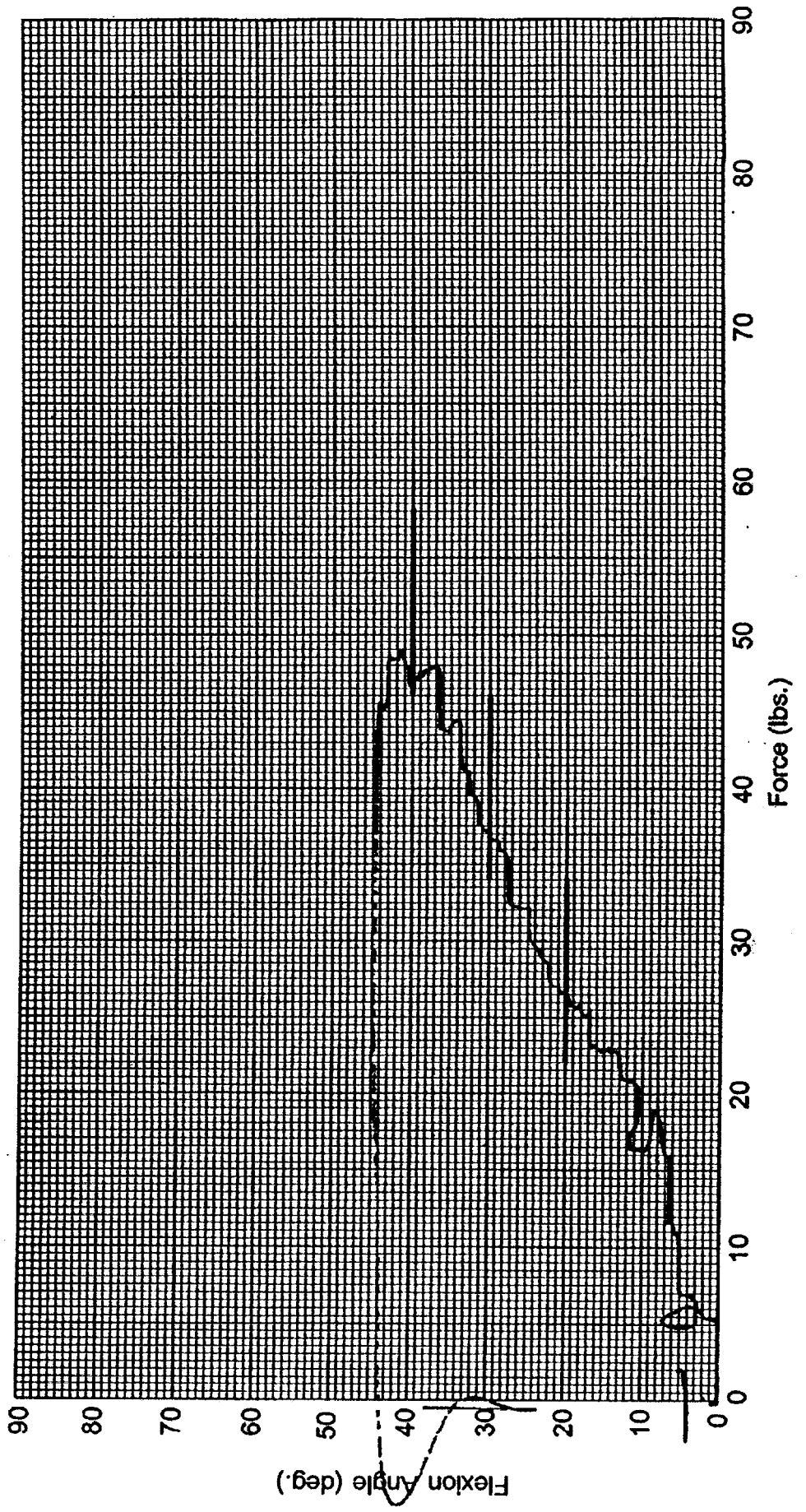
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 1
Date: May 22, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 35.0 |
| FORCE @ 0° (N) | 0 - 26.7 | 0 |
| FORCE @ 20° (N) | 97.8 - 151.2 | 117.9 |
| FORCE @ 30° (N) | 151.2 - 204.6 | 162.4 |
| FORCE @ 40° (N) | 204.6 - 258 | 209.1 |
| RETURN ANGLE | 12° max. | 4° |

REMARKS: None

Dummy S/N 026
 W/A _____
 Date 5-22-02
 Performed By [Signature]
 Temp. 71°
 Humidity 35%



Hybrid II Lumbar Spine Flexion Test

POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 026 Sequential Test Number: 1
 Date: May 22, 2002 Laboratory Technician: B. Swiecicki

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

REMARKS: None

CALIBRATION TEST RESULTS

POST TEST

SID NO.: 268

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1
Date: May 22, 2002 Laboratory Technician: B. Swiecicki

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

* Test not required for SID certification.

REMARKS: None

EXTERNAL DIMENSIONS
POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1
Date: May 22, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm) | 889 - 909 | 899 |
| RH- Rib Height (mm) | 502 - 520 | 513 |
| HP- Hip Pivot Height (mm) | 99 ref. | 99 |
| RD- Rib from Back Line (mm) | 229 - 241 | 236 |
| KH- Knee Pivot from Back Line (mm) | 511 - 526 | 518 |
| KV- Knee Pivot to Floor (mm) | 490 - 505 | 495 |
| HW- Hip Width (mm) | 356 - 391 | 378 |

REMARKS: None

LATERAL THORAX IMPACT TEST
POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1
Date: May 21, 2002 Laboratory Technician: B. Swiecicki

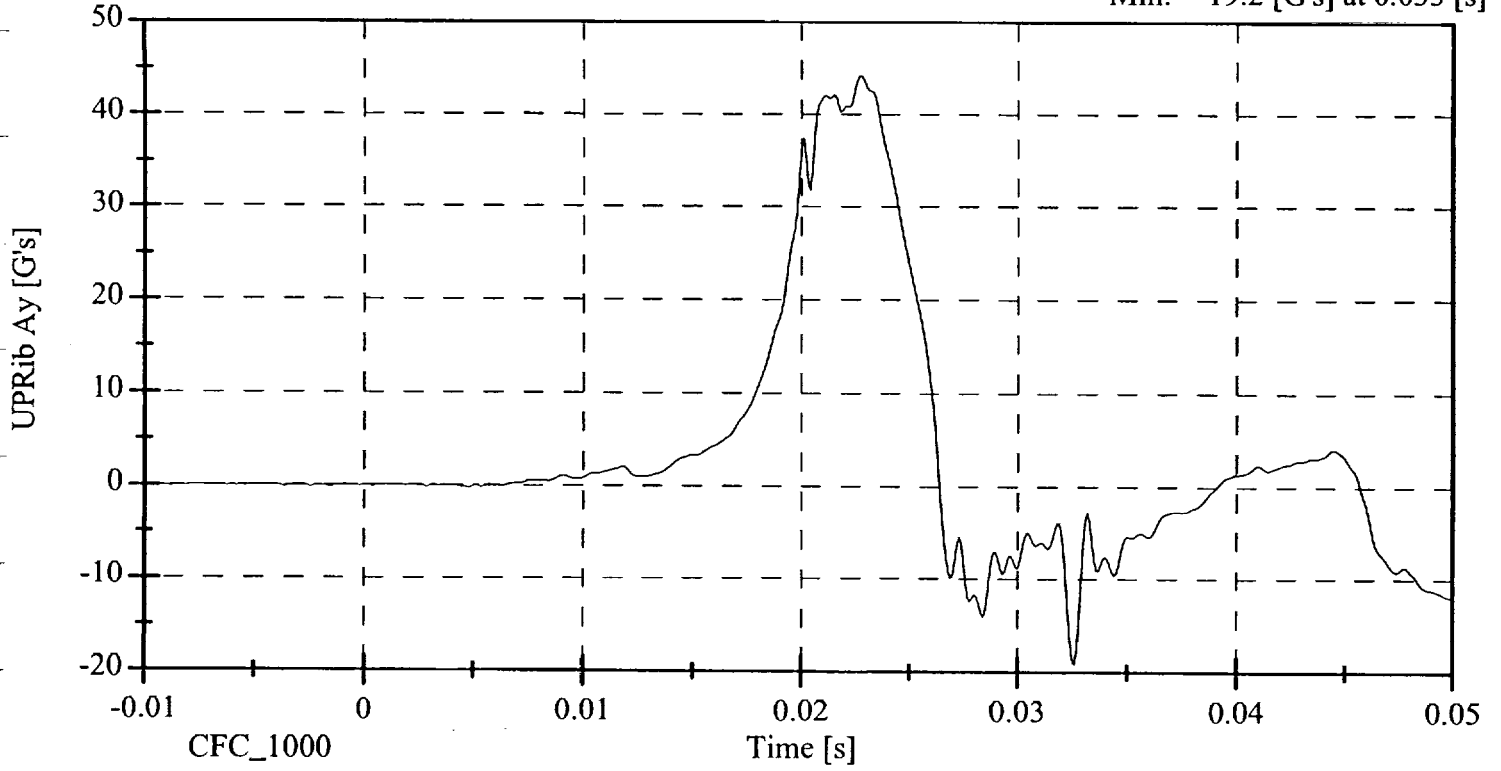
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 31.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.27 |
| UPPER RIB (g's) | 37 - 46 | 44.49 |
| LOWER RIB (g's) | 37 - 46 | 43.25 |
| LOWER SPINE (g's) | 15 - 22 | 21.03 |

REMARKS: None

Upper Rib Y Acceleration

Max: 44.2 [G's] at 0.023 [s]

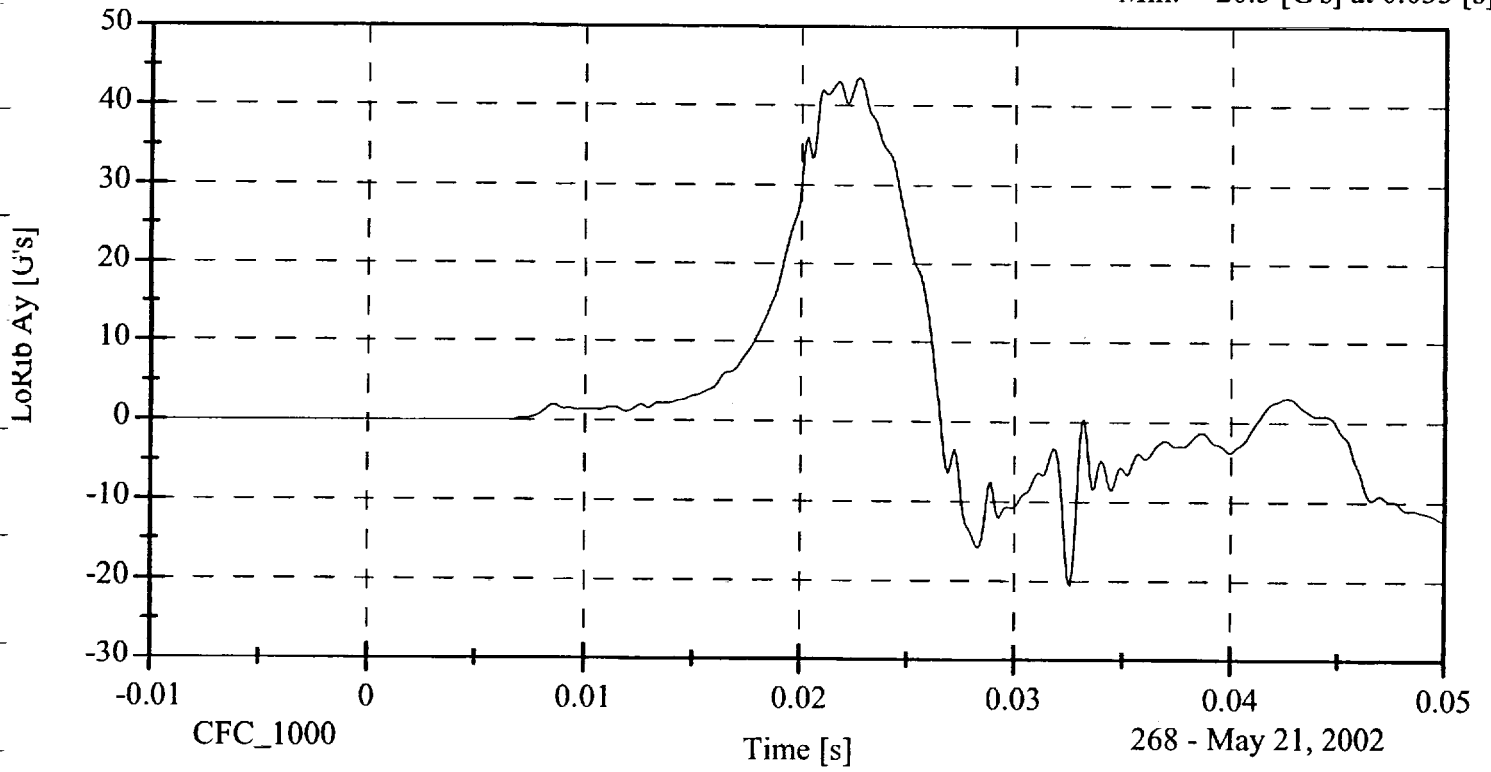
Min: -19.2 [G's] at 0.033 [s]



Lower Rib Y Acceleration

Max: 43.6 [G's] at 0.023 [s]

Min: -20.5 [G's] at 0.033 [s]

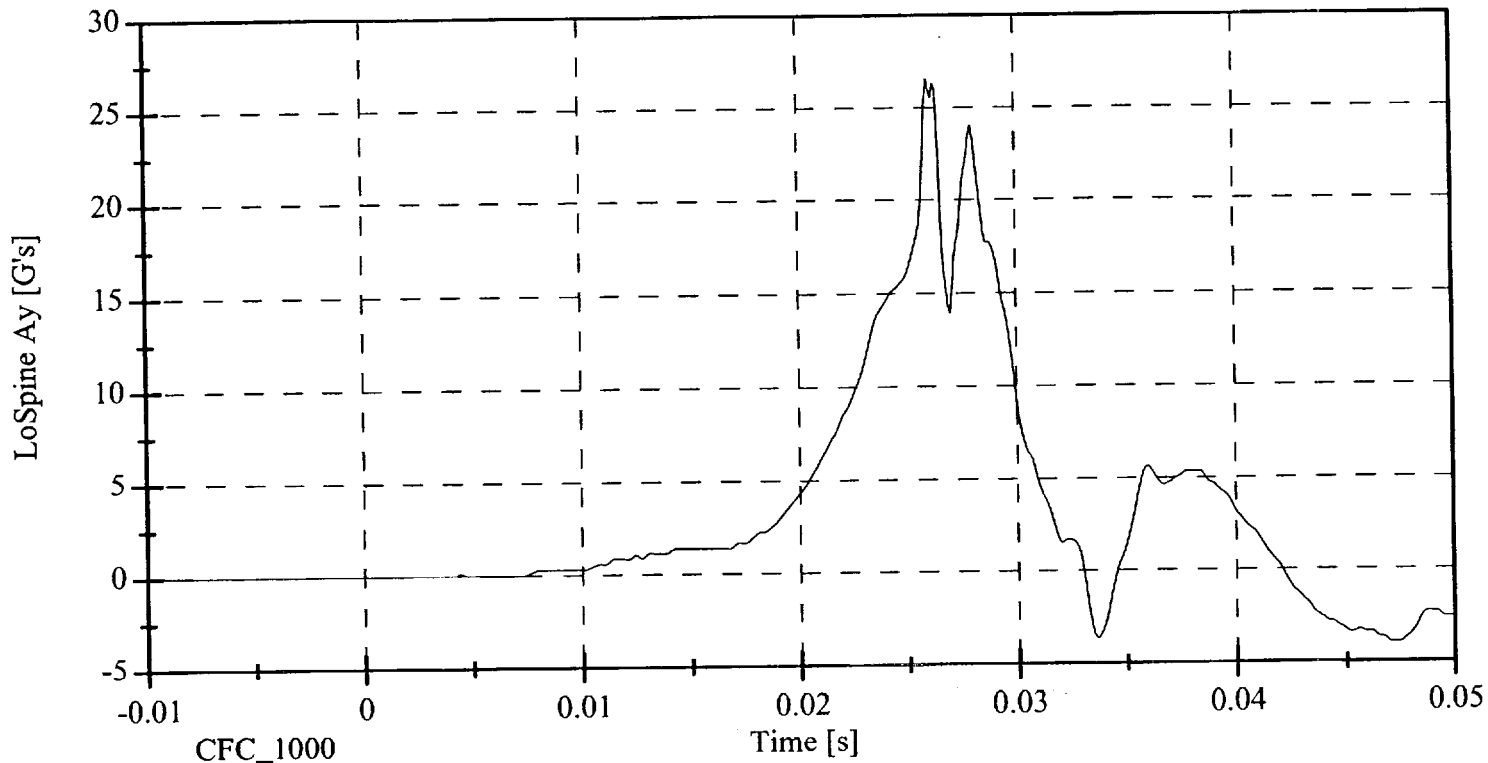


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Max: 26.5 [G's] at 0.026 [s]

Lower Spine Y Acceleration

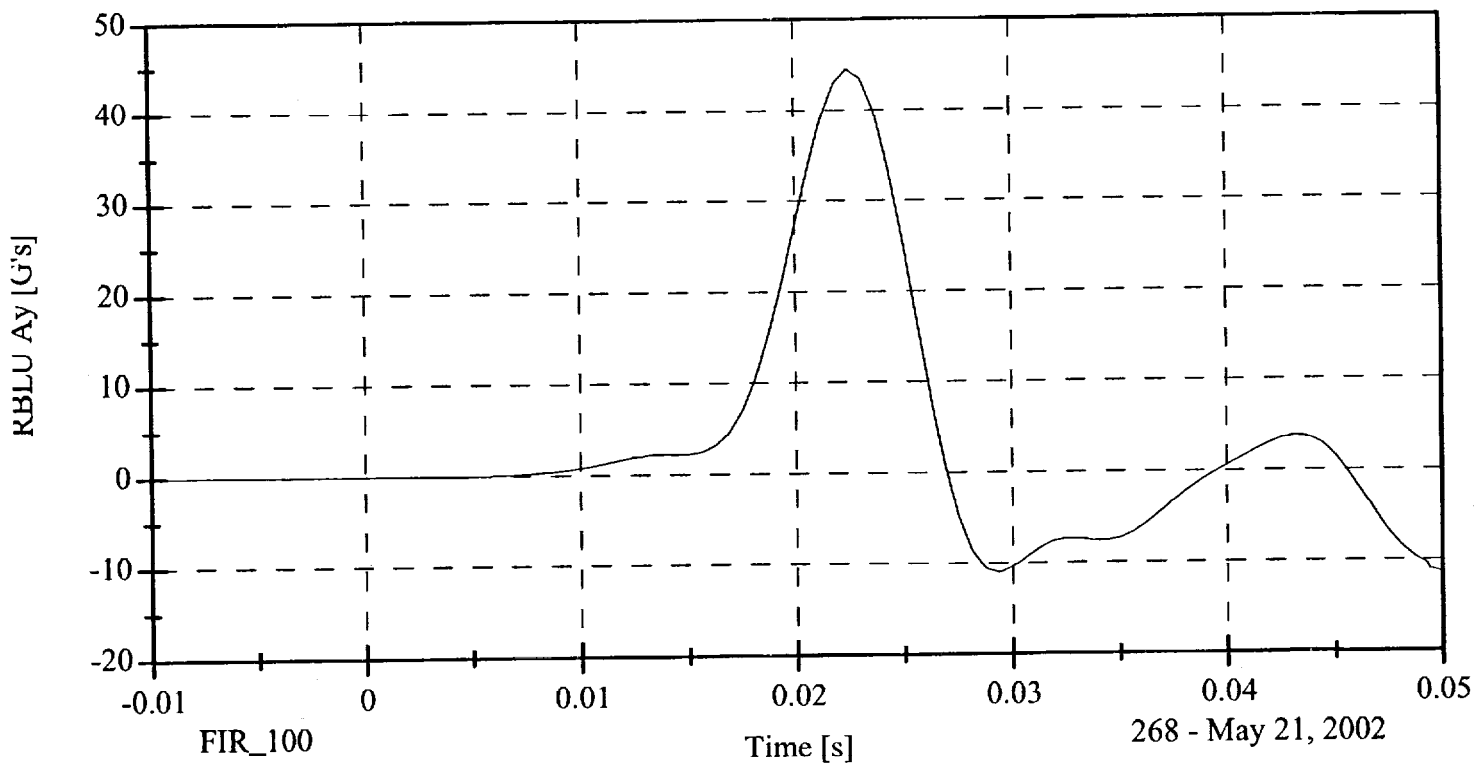
Min: -4.0 [G's] at 0.047 [s]



Max: 44.5 [G's] at 0.023 [s]

Upper Rib Y Acceleration

Min: -11.4 [G's] at 0.050 [s]

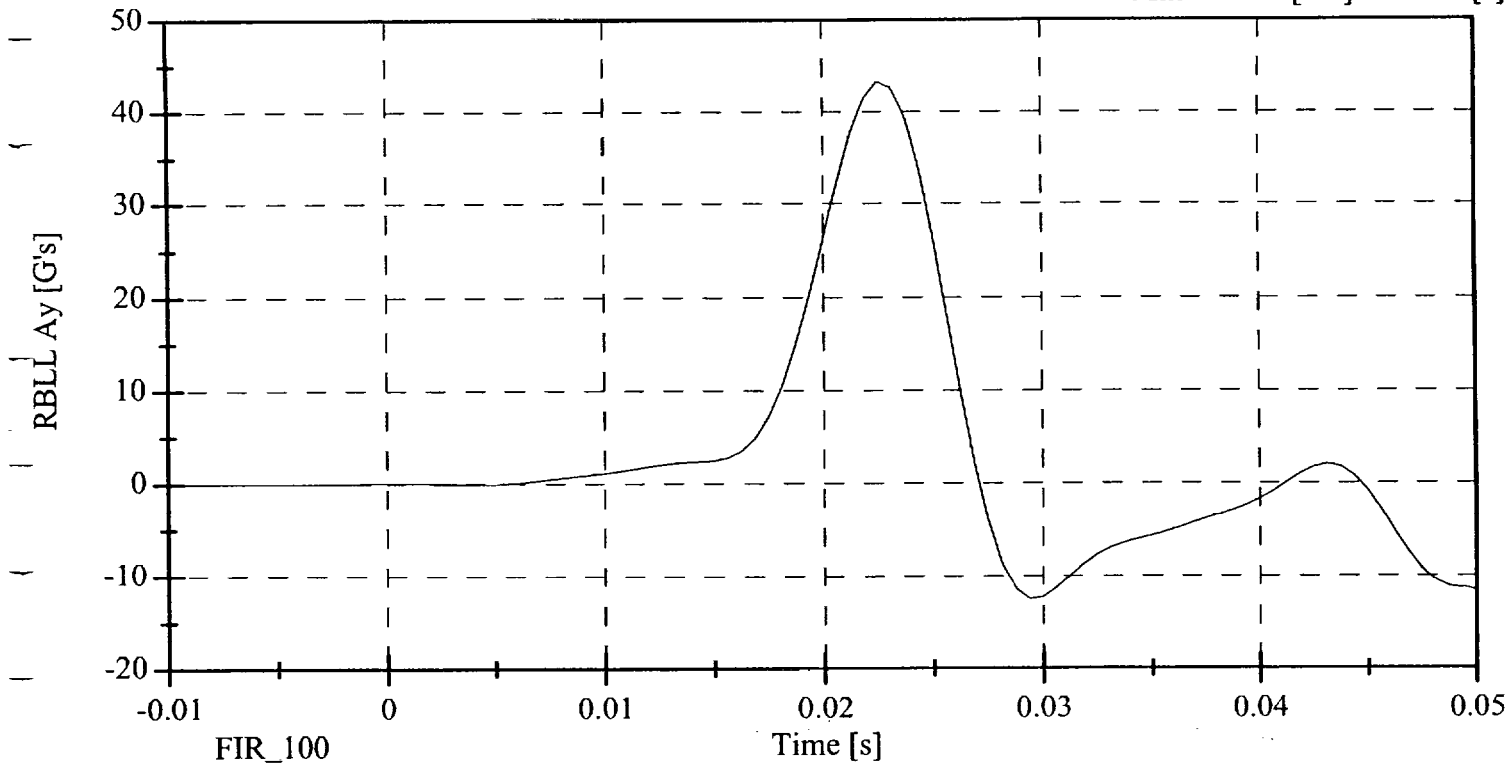


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Lower Rib Y Acceleration

Max: 43.3 [G's] at 0.023 [s]

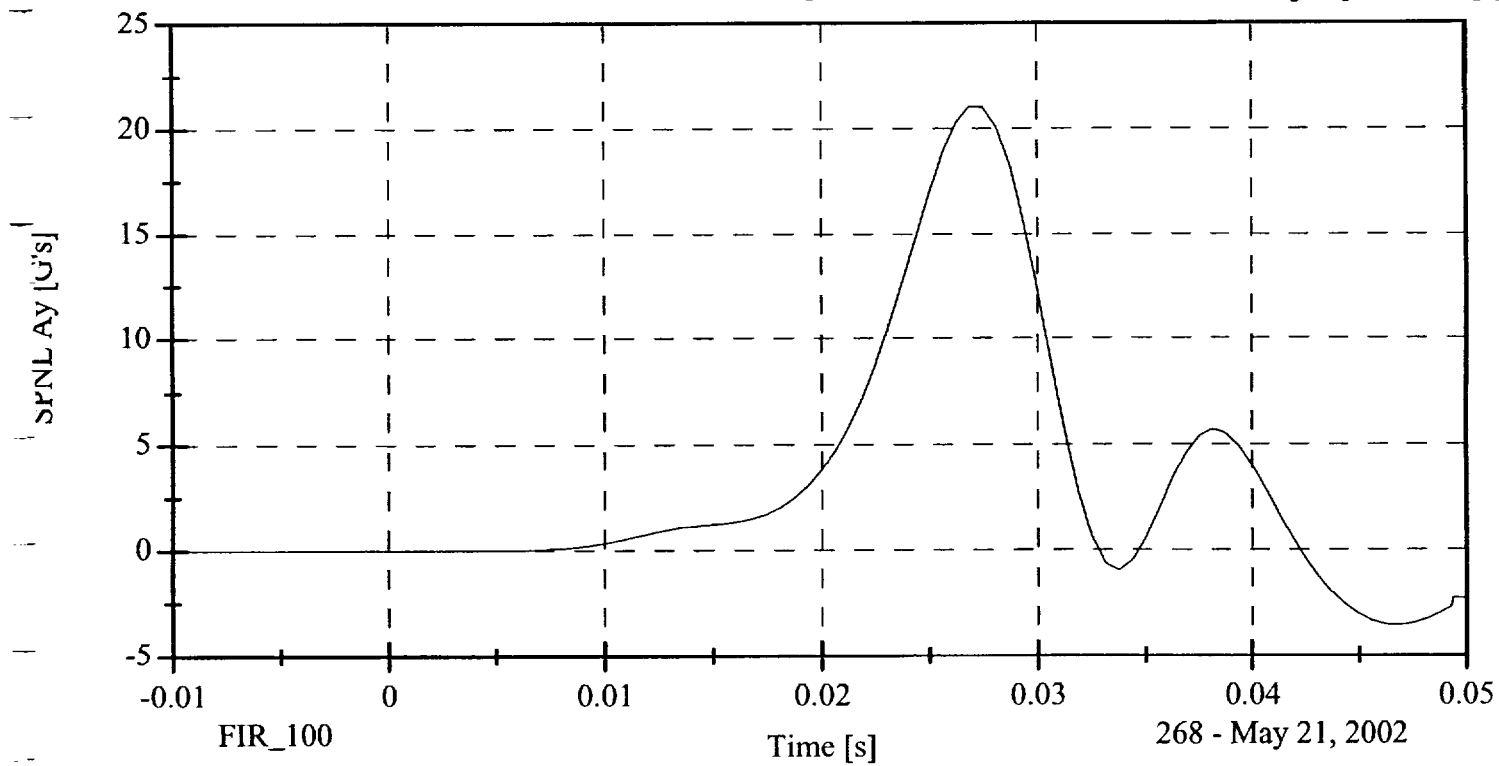
Min: -12.5 [G's] at 0.029 [s]



Lower Spine Y Acceleration

Max: 21.0 [G's] at 0.027 [s]

Min: -3.6 [G's] at 0.047 [s]



**LATERAL PELVIS IMPACT TEST
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1
Date: May 21, 2002 Laboratory Technician: B. Swiecicki

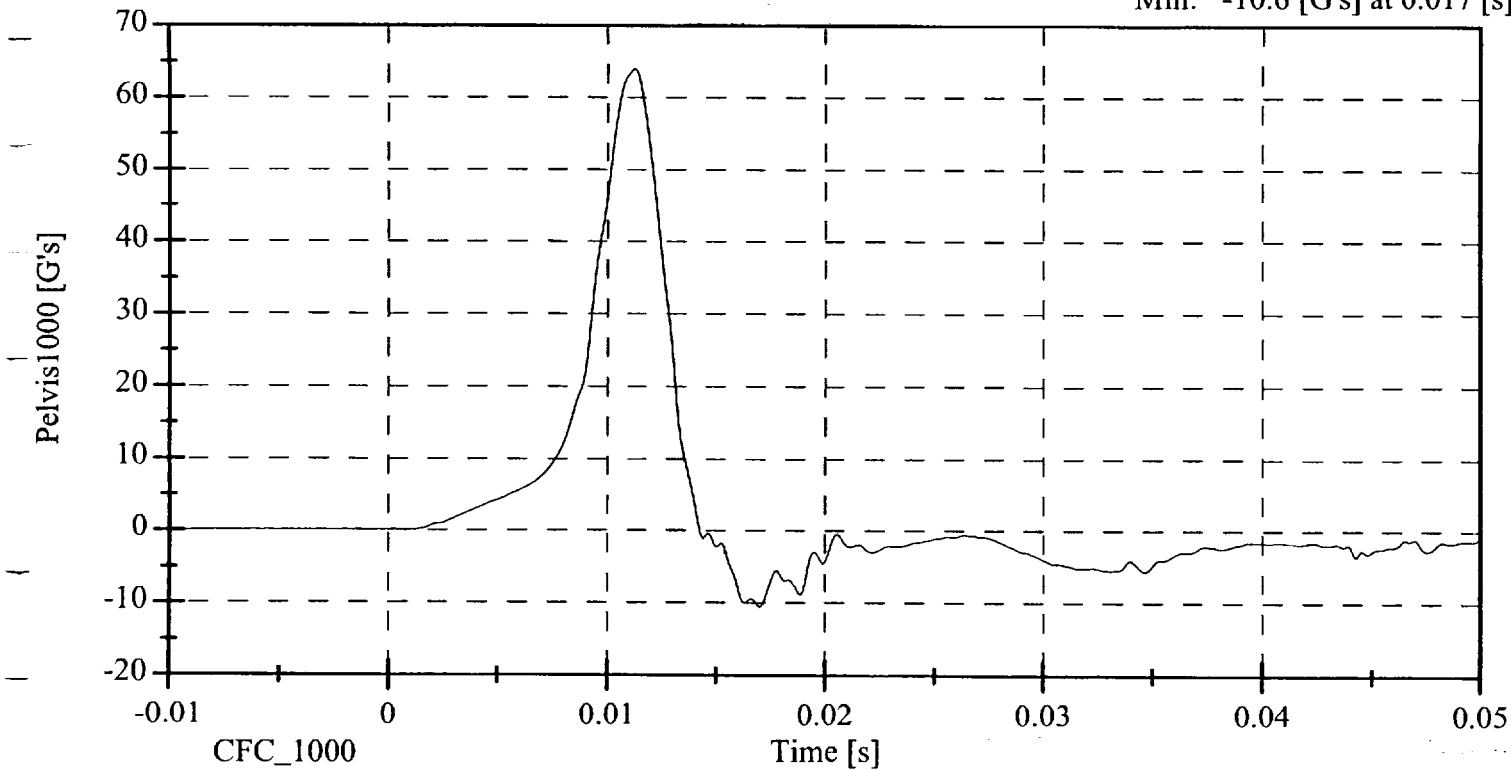
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---------------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 31.0 |
| PROBE SPEED (m/s) | 4.27 - 4.33 | 4.32 |
| PELVIS ACCELERATION (g's) | 40 - 60 | 50.94 |

REMARKS: None

Pelvis Acceleration

Max: 64.0 [G's] at 0.011 [s]

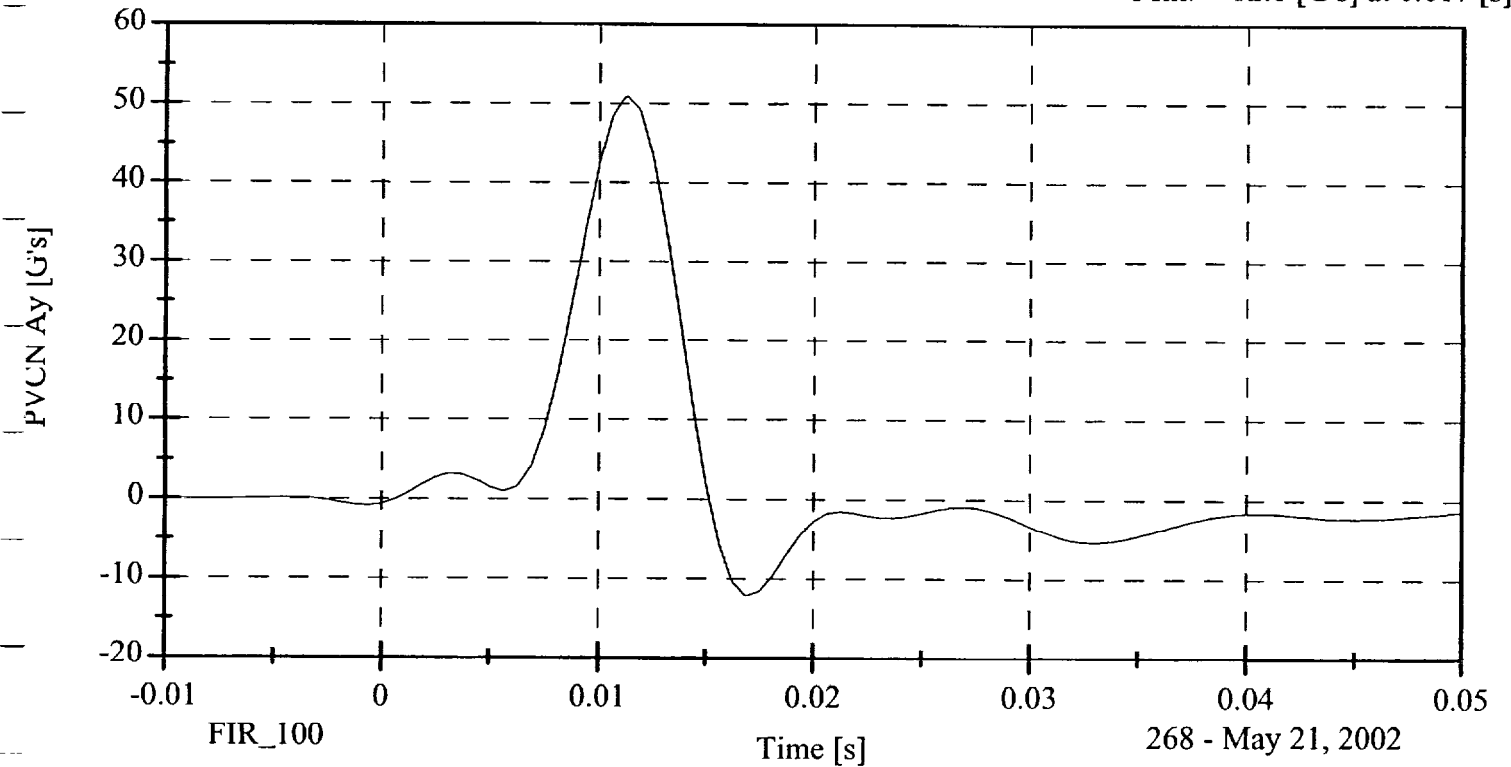
Min: -10.6 [G's] at 0.017 [s]



Pelvis Y Acceleration

Max: 50.9 [G's] at 0.011 [s]

Min: -12.1 [G's] at 0.017 [s]



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

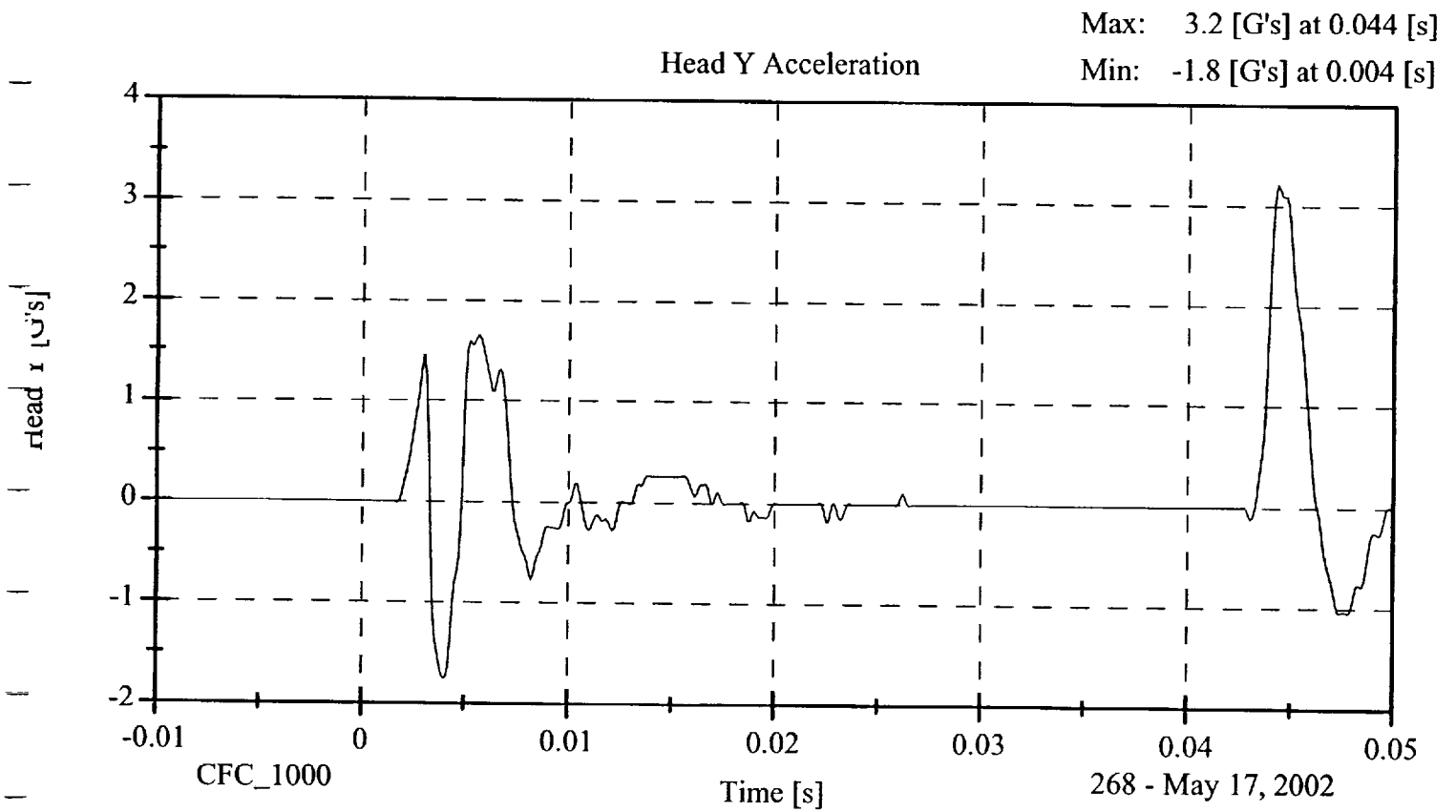
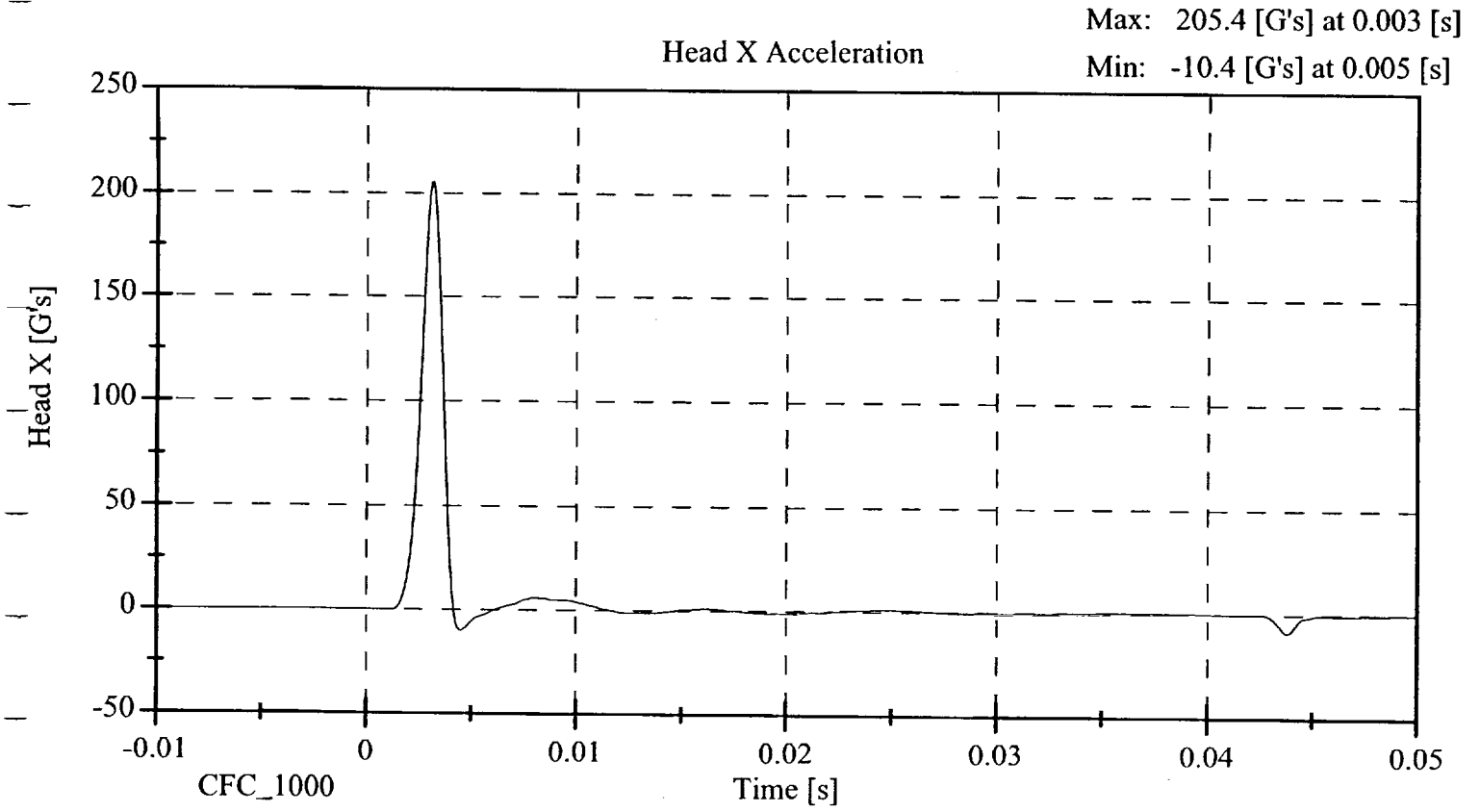
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1
Date: May 17, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-------------------------------------|------------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 20.6 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 35.0 |
| PEAK RESULTANT ACCELERATION (Gs) | 210 - 260 | 248.30 |
| PEAK LATERAL ACCELERATION (Gs) | Not to Exceed 10 | 3.22 |
| UNIMODAL CRITERIA ABOVE 100 Gs (ms) | 0.9 - 1.5 | 1.27 |

REMARKS: None

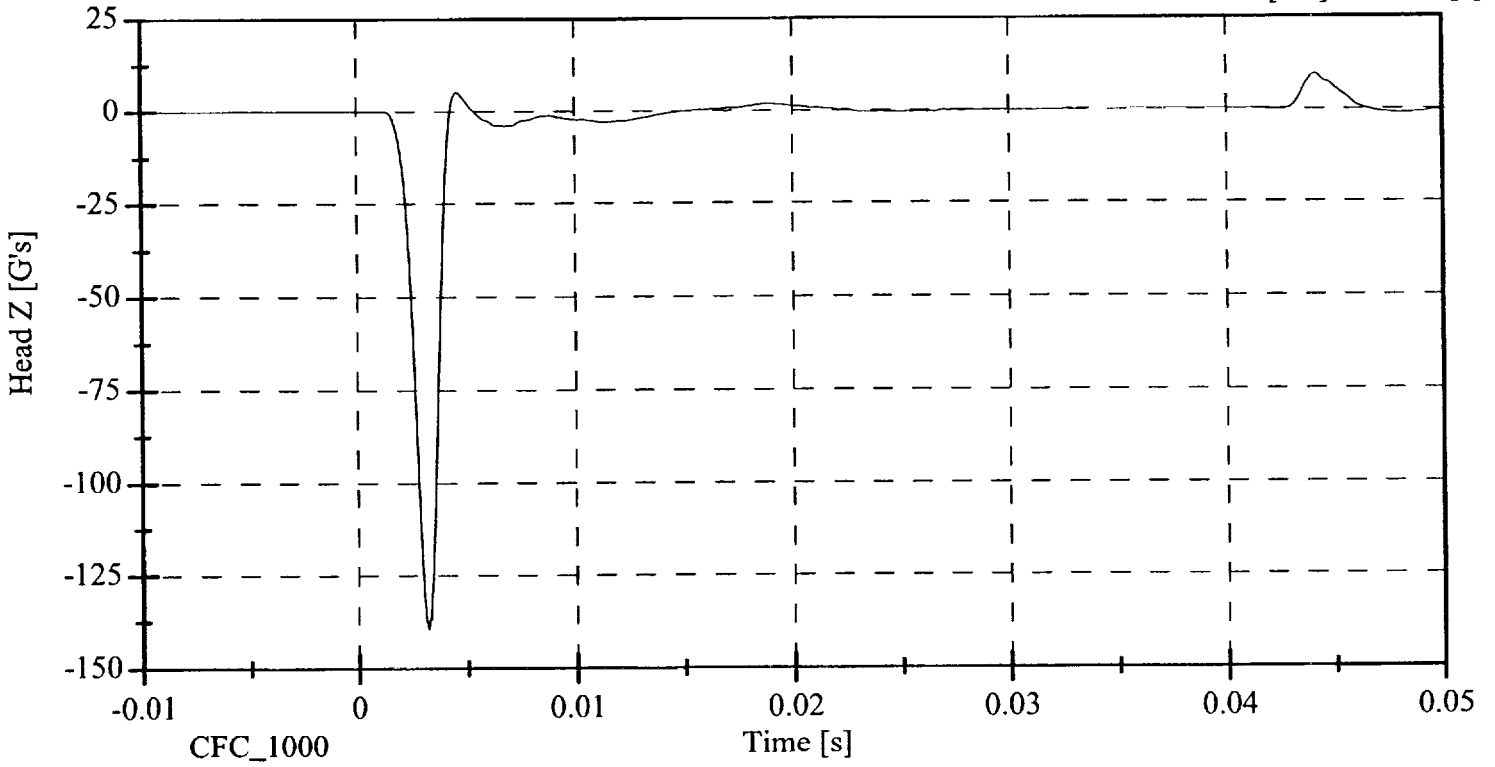
268 Head Drop



268 Head Drop

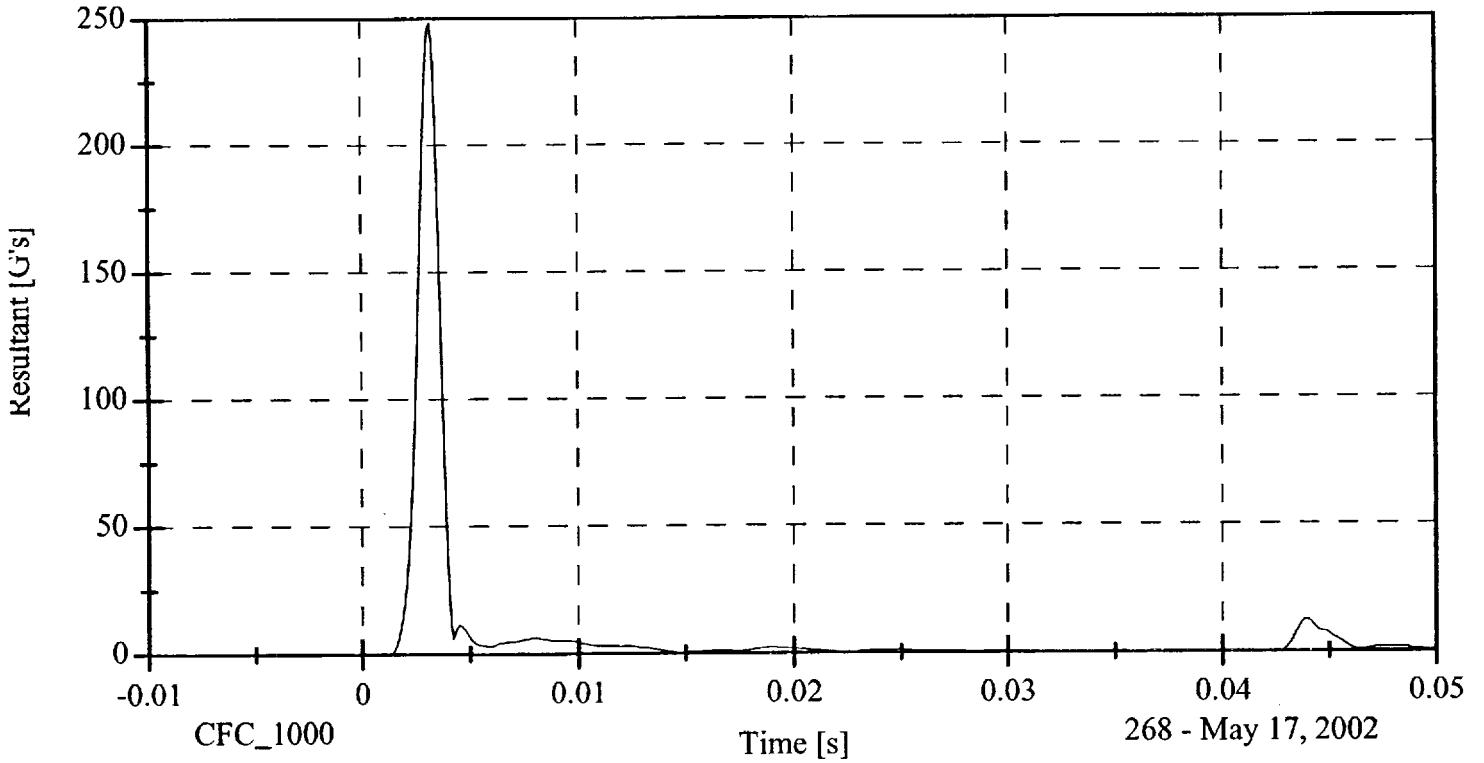
Head Z Acceleration

Max: 9.5 [G's] at 0.044 [s]
Min: -139.5 [G's] at 0.003 [s]



Head Resultant

Max: 248.3 [G's] at 0.003 [s]
Min: 0.0 [G's] at 0.000 [s]



**ABDOMINAL COMPRESSION TEST
POST TEST**
(Test not required for SID certification)

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1
Date: May 22, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 35.0 |
| FORCE @ 13 mm (N) | 104 - 162 | 117.9 |
| FORCE @ 19 mm (N) | 163 - 221 | 177.9 |
| FORCE @ 25 mm (N) | 222 - 280 | 258.0 |
| FORCE @ 33 mm (N) | 325 - 391 | 373.7 |

REMARKS: None

Dummy S/N 268

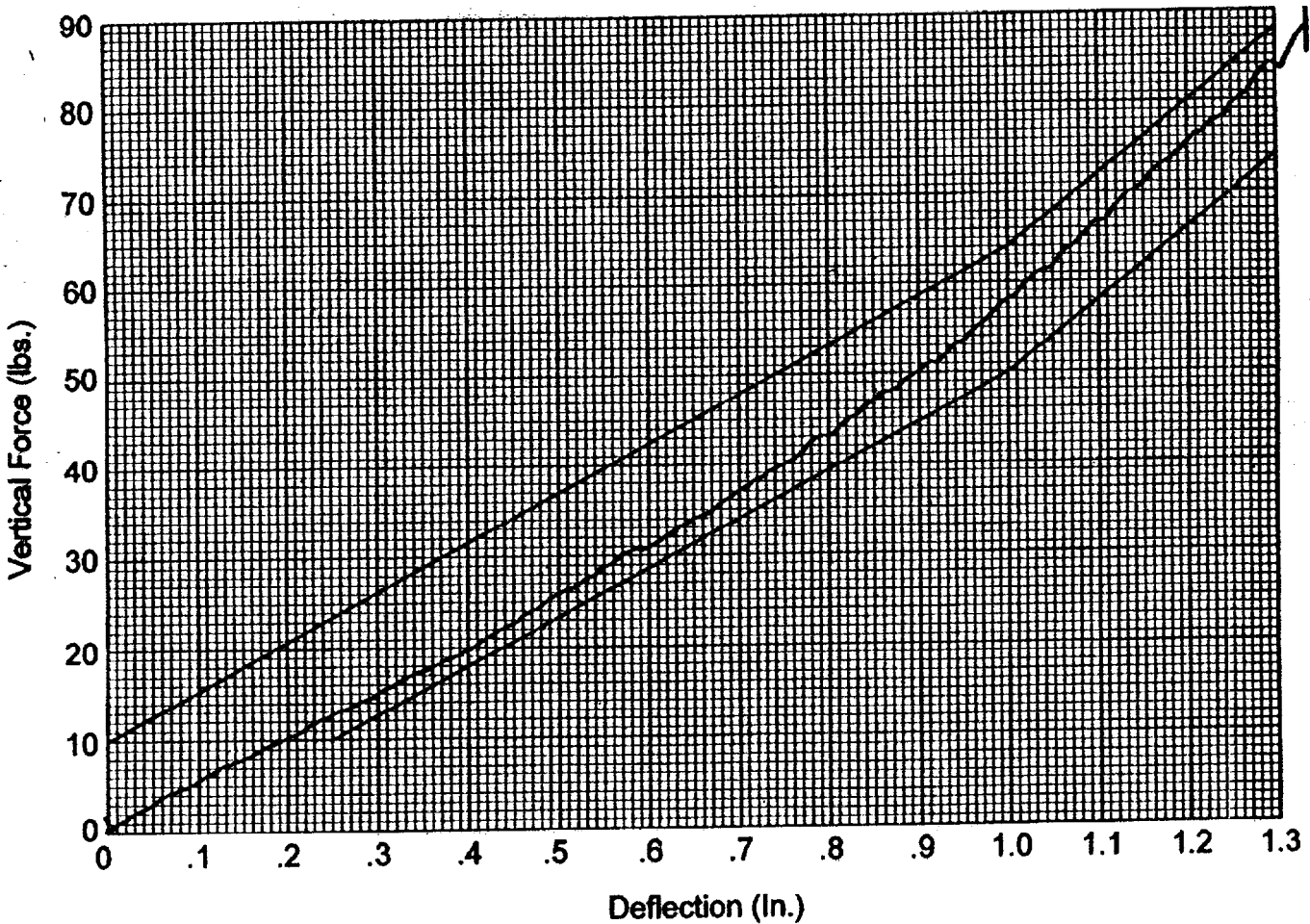
W/A _____

Date 5-22-02

Performed By [Signature]

Temp. 71'

Humidity 35%



Hybrid II
Abdomen Static Press

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

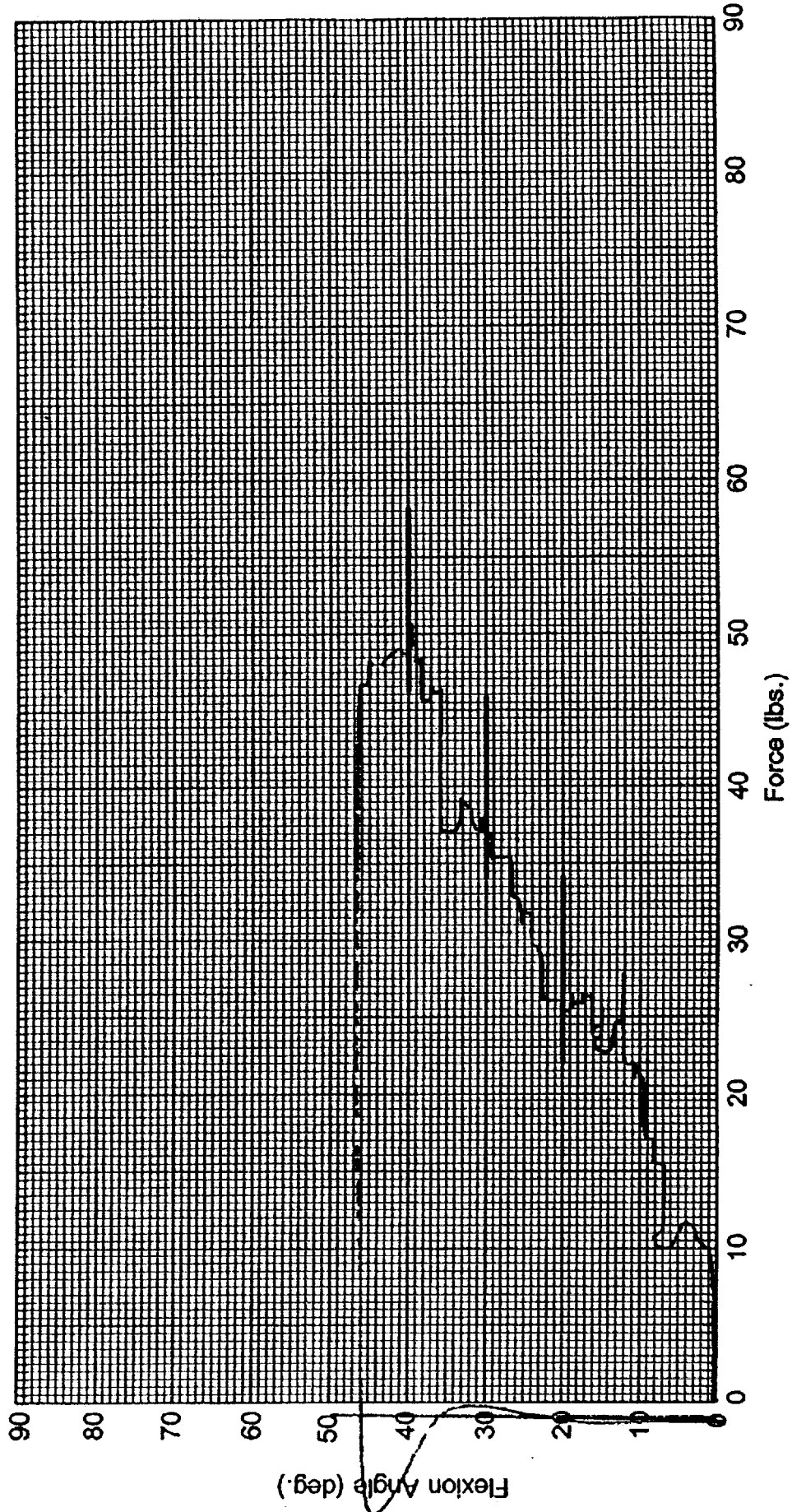
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1
Date: May 22, 2002 Laboratory Technician: B. Swiecicki

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C) | 18.9 - 25.5 | 21.7 |
| RELATIVE HUMIDITY (%) | 10 - 70 | 35.0 |
| FORCE @ 0° (N) | 0 - 26.7 | 0 |
| FORCE @ 20° (N) | 97.8 - 151.2 | 113.4 |
| FORCE @ 30° (N) | 151.2 - 204.6 | 166.8 |
| FORCE @ 40° (N) | 204.6 - 258 | 220.2 |
| RETURN ANGLE | 12° max. | 1° |

REMARKS: None

Dummy S/N 268
 W/A _____
 Date 5-22-02
 Performed By [Signature]
 Temp. 71°
 Humidity 35%



Hybrid II Lumbar Spine Flexion Test

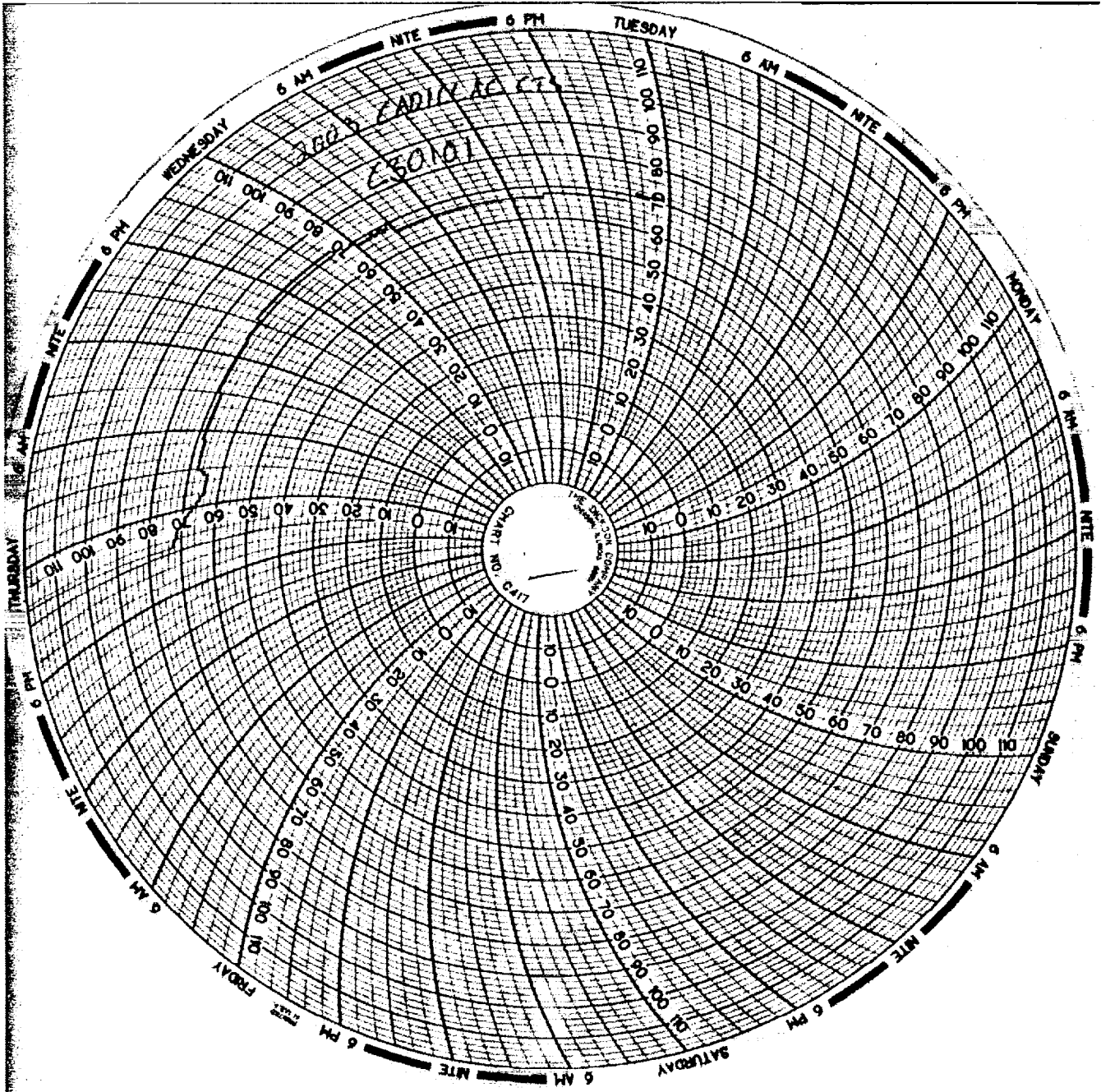
POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID Serial No.: 268 Sequential Test Number: 1
 Date: May 22, 2002 Laboratory Technician: B. Swiecicki

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

REMARKS: None

TEMPERATURE TRACE



APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

SID INSTRUMENTATION

| FRONT SID NO.: 026 | | | |
|-----------------------|---------------|--------------|------------------|
| | SERIAL NUMBER | MANUFACTURER | CALIBRATION DATE |
| HEAD AX | AC-P18663 | ENDEVCO | 03/07/02 |
| HEAD AY | AC-P18639 | ENDEVCO | 03/07/02 |
| HEAD AZ | AC-P19222 | ENDEVCO | 03/07/02 |
| UPPER RIB | AC-P19255 | ENDEVCO | 03/07/02 |
| LOWER RIB | AC-P17535 | ENDEVCO | 03/07/02 |
| LOWER SPINE | AC-P15534 | ENDEVCO | 03/07/02 |
| PELVIS | AC-P16585 | ENDEVCO | 03/07/02 |
| UPPER RIB REDUNDANT | AC-P19216 | ENDEVCO | 03/07/02 |
| LOWER RIB REDUNDANT | AC-P23303 | ENDEVCO | 03/07/02 |
| LOWER SPINE REDUNDANT | AC-P15526 | ENDEVCO | 03/07/02 |
| PELVIS REDUNDANT | AC-P16576 | ENDEVCO | 03/07/02 |

| REAR SID NO.: 268 | | | |
|-----------------------|---------------|--------------|------------------|
| | SERIAL NUMBER | MANUFACTURER | CALIBRATION DATE |
| HEAD AX | AC-P18731 | ENDEVCO | 03/05/02 |
| HEAD AY | AC-P17299 | ENDEVCO | 03/05/02 |
| HEAD AZ | AC-P16662 | ENDEVCO | 03/05/02 |
| UPPER RIB | AC-P14388 | ENDEVCO | 03/05/02 |
| LOWER RIB | AC-P17236 | ENDEVCO | 03/05/02 |
| LOWER SPINE | AC-P16597 | ENDEVCO | 03/05/02 |
| PELVIS | AC-P23142 | ENDEVCO | 03/05/02 |
| UPPER RIB REDUNDANT | AC-P12587 | ENDEVCO | 03/05/02 |
| LOWER RIB REDUNDANT | AC-P16625 | ENDEVCO | 03/05/02 |
| LOWER SPINE REDUNDANT | AC-P23340 | ENDEVCO | 03/05/02 |
| PELVIS REDUNDANT | AC-P16593 | ENDEVCO | 03/05/02 |

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-B10827 | ENDEVCO | 02/14/02 |
| RIGHT FRONT SILL (Y) | AC-A13513 | ENDEVCO | 02/14/02 |
| RIGHT FRONT SILL (Z) | AC-B11408 | ENDEVCO | 02/14/02 |
| RIGHT REAR SILL (X) | AC-J32143 | ENDEVCO | 01/07/02 |
| RIGHT REAR SILL (Y) | AC-J32838 | ENDEVCO | 01/07/02 |
| RIGHT REAR SILL (Z) | AC-J32174 | ENDEVCO | 01/07/02 |
| REAR FLOORPAN ABOVE AXLE (X) | AC-J27927 | ENDEVCO | 02/25/02 |
| REAR FLOORPAN ABOVE AXLE (Y) | AC-J27941 | ENDEVCO | 02/18/02 |
| REAR FLOORPAN ABOVE AXLE (Z) | AC-ACC06 | ENDEVCO | 02/18/02 |
| LEFT REAR SILL (Y) | AC-B10951 | ENDEVCO | 01/15/02 |
| LEFT FRONT SILL (Y) | AC-J26604 | ENDEVCO | 11/05/01 |
| LEFT FRONT DOOR CENTERLINE (Y) | - | - | - |
| RIGHT REAR SEAT OCCUPANT COMP. (Y) | AC-X83 | ICS | 01/15/02 |
| MID REAR OF LEFT FRONT DOOR (Y) | - | - | - |
| LEFT FRONT DOOR UPPER CVL (Y) | - | - | - |
| MID REAR OF LEFT REAR DOOR (Y) | - | - | - |
| LEFT REAR DOOR UPPER CVL (Y) | - | - | - |
| LOWER LEFT B- PILLAR (Y) | AC-P23288 | ENDEVCO | 11/01/01 |
| MIDDLE LEFT B-PILLAR (Y) | AC-P23465 | ENDEVCO | 02/19/02 |
| LOWER LEFT A-PILLAR (Y) | AC-B10955 | ENDEVCO | 02/11/02 |
| UPPER LEFT A-PILLAR (Y) | AC-P23276 | ENDEVCO | 11/01/01 |
| FRONT SEAT TRACK (Y) | AC-J32186 | ENDEVCO | 02/11/02 |
| REAR SEAT TRACK (Y) | AC-J32176 | ENDEVCO | 03/07/02 |
| VEHICLE CG (X) | AC-P18948 | ENDEVCO | 02/26/02 |
| VEHICLE CG (Y) | AC-P23471 | ENDEVCO | 02/26/02 |
| VEHICLE CG (Z) | AC-P22943 | ENDEVCO | 02/26/02 |
| MDB CG (X) | AC-C16682 | ENDEVCO | 03/15/02 |
| MDB CG (Y) | AC-CJ54 | ENDEVCO | 03/15/02 |
| MDB CG (Z) | AC-GK12 | ENDEVCO | 03/15/02 |
| MDB REAR FRAME MEMBER (X) | AC-CX05 | ENDEVCO | 03/15/02 |
| MDB REAR FRAME MEMBER (Y) | AC-C16685 | ENDEVCO | 03/15/02 |

REMARKS: None