HS637220

REPORT NUMBER: 201U-VER-04-08

# SAFETY COMPLIANCE TESTING FOR FMVSS 201 OCCUPANT PROTECTION IN INTERIOR IMPACT UPPER INTERIOR HEAD IMPACT PROTECTION

**FORD MOTOR COMPANY**
**2004 FORD ECONOLINE**

NHTSA NUMBER: C40208

GD TEST NUMBER: 8730-08

ADVANCED INFORMATION ENGINEERING SERVICES
A GENERAL DYNAMICS COMPANY
TRANSPORTATION SCIENCES CENTER
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BUFFALO, NEW YORK 14225

Test Date: May 13, 2004

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
Mail Code: NVS-220, Room 6111
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NHTSA, Office of Vehicle Safety Compliance

6.23.04

Date of Report Acceptance

Rec'd 6.23.04 KW

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| 15. *Supplementary Notes* | | |

16. *Abstract*

Compliance tests were conducted on the subject vehicle a 2004 Ford Econoline in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows in the table below:

| Target Point | Horizontal | Vertical | Velocity | HIC | HICd |
|---|---|---|---|---|---|
| None | - | - | - | - | - |
| None | - | - | - | - | - |

| | |
|---|---|
| 17. *Key Words*<br>Compliance Testing<br>Safety Engineering<br>FMVSS 201 | 18. *Distribution Statement*<br>Copies of this report are available from:<br>NHTSA Technical Reference Division<br>National Highway Traffic Safety Admin.<br>400 Seventh St., SW<br>Washington, DC 20590<br>Telephone No.: 202-366-4946 |

| | | | |
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## LIST OF DATA SHEETS

## SECTION 1

## PURPOSE AND TEST PROCEDURE

This head impact compliance test is part of the FMVSS 201 Upper Interior Head Impact Protection Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-99-C-01005. The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2004 Ford Econoline, NHTSA No. C40208, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact. The compliance test was conducted in accordance with the OVSC Laboratory Test Procedure No. TP-201U-01 dated April_03,1998.

## SECTION 2

## SUMMARY OF UPPER INTERIOR HEAD IMPACTS

A 2004 Ford Econoline, NHTSA No.C40208, was impacted at various locations throughout its upper interior by a 4.54 kg 50th percentile headform. A total of fifteen (15) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officers Technical Representative (COTR). A summary of test results can be found on data sheet 2-1. The fifteen (15) area chosen for testing were:

| | | | | |
|---|---|---|---|---|
| OP2 | OP1 | SR3 ANCH | BP3 | URBP |
| AP2 | SR1 | FHI | BP4 | BP2 |
| BP1 | AP3 | AP1 | SR2A | SR3B |

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201.

Five Free Motion Headforms (FMH), were used in this test series. All five FMH's were calibrated prior to and after the test series. Calibration information are included in Appendix B. Each FMH weighed 4.54 ± 0.5 kg and has an orthogonal tri-axis accelerometer pack mounted at the center of gravity (c.g.).

A total of three (3) channels of data for each target impact test are recorded on a Keyser-Threde data acquisition system. Data plots, along with still photographs, can be found in Section 3 of this report.

To document each target area impact test, one Weinberger high-speed video camera was placed at various locations to view the headform contact with the selected target area.

**DATA SHEET 2-1**

**SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS**

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| TARGET CODE | Target Coordinates | | | | | | Approach Angles (degrees) | | Velocity (kph) | FMH HIC | HIC(d) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Side | | | Passenger Side | | | | | | | |
| | X(mm) | Y(mm) | Z(mm) | X(mm) | Y(mm) | Z(mm) | Horizontal | Vertical | | | |
| AP1 | -2844.3 | -744.5 | -1919.2 | -2851.1 | 733.0 | -1920.9 | 117 | 18 | 23.54 | 353.0 | 432.8 |
| AP2 | -2730.3 | -763.0 | -1829.6 | -2741.9 | 759.2 | -1830.4 | 208 | 24 | 23.59 | 519.9 | 598.6 |
| AP3 | -2609.2 | -747.7 | -1693.8 | -2615.9 | 746.4 | -1692.1 | 140 | 33 | 23.71 | 535.1 | 570.1 |
| BP1 | -3392.0 | -658.1 | -2037.6 | -3371.4 | 650.6 | -2035.1 | 90 | 17 | 23.64 | 643.8 | 653.8 |
| BP2 | -3409.1 | -765.9 | -1749.0 | -3382.8 | 767.9 | -1741.0 | 90 | 4 | 23.64 | 533.0 | 568.5 |
| BP3 | -3343.2 | -819.9 | -1713.3 | -3353.7 | 814.8 | -1715.8 | 270 | -8 | 23.43 | 638.9 | 648.4 |
| BP4 | -3514.1 | -774.1 | -1558.2 | -3426.9 | 761.2 | -1553.7 | Relocated 1 circle | | - | - | - |
| Rel. BP4 | -3493.41 | -860.9 | -1574.02 | -3415.16 | 846.63 | -1598.24 | 106 | -10 | 23.47 | 652.1 | 658.4 |
| FH1 | -2770.3 | -650.2 | -1968.9 | -2772.6 | 647.1 | -1966.0 | 180 | 50 | 23.50 | 823.8 | 787.9 |
| FH2 | -2745.6 | -505.4 | -1975.6 | -2742.8 | 500.2 | -1971.4 | - | - | - | - | - |
| OP1 | -4670.0 | -683.6 | -2035.4 | -4712.7 | 662.6 | -2076.8 | Relocated 2 circles | | - | - | - |
| Rel. OP1 | - | - | - | -4712.06 | 620.47 | -2080.79 | 270 | 27 | 23.61 | 511.7 | 552.4 |
| OP2 | -4684.2 | -870.8 | -1746.3 | -4724.4 | 811.2 | -1769.6 | 270 | -8 | 23.38 | 710.1 | 702.2 |
| SR1 | -2984.9 | -670.1 | -2009.2 | -2999.8 | 664.7 | -2007.8 | 270 | 31 | 23.75 | 513.4 | 553.7 |
| SR2A | -3134.7 | -672.2 | -2016.3 | -3145.7 | 664.4 | -2018.6 | 90 | 34 | 23.71 | 750.1 | 732.3 |
| SR2B | -3096.2 | -674.7 | -2015.2 | -3070.5 | 665.2 | -2017.1 | - | - | - | - | - |
| SR3B | -3545.5 | -705.1 | -1998.3 | -3522.2 | 659.5 | -2029.1 | Relocated 1 circle | | - | - | - |
| Rel. SR3B | -3539.91 | -713.5 | -1980.85 | - | - | - | 90 | 36 | 23.79 | 896.1 | 842.5 |
| SR3 ANCH | -4535.5 | -723.0 | -2021.6 | -4943.5 | 705.7 | -2038.3 | 270 | 0 | 23.76 | 267.4 | 368.1 |
| RP1 | Rear Pillar and Rear Header excluded per s6.3(b) | | | | | | | | | | |
| RP2 | | | | | | | | | | | |
| RH | | | | | | | | | | | |
| URAP | -3193.5 | -542.5 | -2039.2 | -3197.0 | 544.4 | -2035.7 | - | - | - | - | - |
| URBP | -3361.0 | -523.8 | -2070.5 | -3360.2 | 512.7 | -2067.7 | 270 | 50 | 23.63 | 372.0 | 447.0 |
| UROP | -3994.1 | -520.8 | -2094.4 | -3998.9 | 526.6 | -2095.4 | - | - | - | - | - |
| URRP | -4674.9 | -552.5 | -2108.7 | -4715.1 | 532.3 | -2106.9 | - | - | - | - | - |

Ford's reference point for x,y,z coordinate correlation (Door striker upper bolt hole x= 3333 mm , y= -904 mm , and z= 1250 mm) to General Dynamic's coordinate system.

*HIC(d)=0.75446(Free Motion Headform HIC)+166.4

**DATA SHEET 2-2**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

| TEST VEHICLE INFORMATION: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Year/Make/Model/Body Style: | 2004 Ford Econoline | | | | | | | |
| VIN: | 1FMRE11W94HA29971 | | | | | | | |
| Month & Year of Manufacture: | 11/03(SEE CERTIFICATION LABEL) | | | | | | | |
| Vehicle Body Color: | Burgundy | | | | | | | |
| Engine Data: | 8 | Cylinders; | - | CID; | 4.6 | Liters; | - | cc |
| Engine Placement: | | X | Longitudinal; | or | | - | | Lateral |
| Transmission: | 4 | Speed; | - | Manual; | X | Automatic; | X | Overdrive |
| Final Drive: | X | Rear Wheel Drive; | - | Front Wheel Drive; | | - | | Four Wheel Drive |
| Odometer Reading: | | | 1598 | km | | | | |
| Options: | X | A/C; | X | Power Steering; | X | Pwr. Brakes; | - | Pwr. Windows |
| Interior Trim Information: | | | | | | | | |
| 1. Grab handles located on both A-Pillar trim pieces. | | | | | | | | |
| 2. Adjustable seat belt anchorages located on both B-Pillars. | | | | | | | | |
| 3. Seat belt anchorages were located on rear side rails for rear occupants. | | | | | | | | |

| DATA FROM TIRE PLACARD: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Tire Pressure (at capacity); | | | | | 280 | kPa FRONT | | |
| | | | | | 280 | kPa REAR | | |
| Recommended Tire Size: | | | | | P235/70R16 | | | |
| Tires on Test Vehicle: | P235/70R16 | | | Manufacturer: | | Michelin | | |
| Vehicle Capacity Data: | | | | | | | | |
| Number of Occupants: | 2 | Front; | 3 | Rear; | 3 | 3rd Seat; | 8 | Total |
| Type of Front Seats: | X | Bucket; | - | Bench; | | - | | Split Bench |
| Type of Front Seat Back: | - | Fixed; | X | Adjustable with | X | Lever or | - | Knob |
| Vehicle Capacity Weight (VCW)= | | | | | 809 | kg (A) | | |
| No. of Occupants x 68 kg. = | | | | | 544 | kg (B) | | |
| Rated Cargo/Luggage Weight (RCLW) = | | | | | 265 | kg (A-B) Max. RCLW = 136 kg. | | |

**DATA SHEET 2-2**

**GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)**

| TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS: | | | | | |
|---|---|---|---|---|---|
| Left Front = | 643 | kg | Left Rear = | 539 | kg |
| Right Front = | 649 | kg | Right Rear = | 535 | kg |
| TOTAL FRONT = | 1292 | kg | TOTAL REAR = | 1074 | kg |
| % of Total Weight = | 54.6 | % | % of Total Weight = | 45.4 | % |
| TOTAL WEIGHT = | | 2366 | kg | | |

| CALCULATION OF VEHICLE'S TARGET TEST WEIGHT: | | |
|---|---|---|
| Total Test Vehicle Delivered Weight= | 2366 | kg (A) |
| + Rated Cargo/Luggage Weight = | 136 | kg (B) |
| TEST VEHICLE TARGET WEIGHT = | 2502 | kg (A+B) |

| WEIGHT OF TEST VEHICLE (FULLY LOADED): | | | | | |
|---|---|---|---|---|---|
| Left Front = | 638 | kg | Left Rear = | 608 | kg |
| Right Front = | 650 | kg | Right Rear = | 602 | kg |
| TOTAL FRONT = | 1288 | kg | TOTAL REAR = | 1210 | kg |
| % of Total Weight = | 51.6 | % | % of Total Weight = | 48.4 | % |
| TOTAL TEST WEIGHT = | | 2498 | | | |
| Weight of vehicle secured in test vehicles cargo area = | | 136 | kg | | |

| TEST VEHICLE ATTITUDE (all dimensions in millimeters): | | | | |
|---|---|---|---|---|
| AS DELIVERED: | Left Front | 866 | Left Rear | 871 |
| | Right Front | 854 | Right Rear | 867 |
| FULLY LOADED: | Left Front | 869 | Left Rear | 853 |
| | Right Front | 857 | Right Rear | 849 |
| Test Vehicle Wheelbase: | | 3506 | millimeters | |

| TEST VEHICLE PITCH AND ROLL ANGLES: | | | | |
|---|---|---|---|---|
| AS DELIVERED: | PITCH ANGLES | | ROLL ANGLES | |
| | Left Door Sill | 1.1↓ | Front Bumper | 0.2↓ |
| | Right Door Sill | 0.5↑ | Rear Bumper | 0.0 |
| FULLY LOADED: | PITCH ANGLES | | ROLL ANGLES | |
| | Left Door Sill | 0.6↓ | Front Bumper | 0.0 |
| | Right Door Sill | 0.0 | Rear Bumper | 0.2↑ |
| AS TESTED: | PITCH ANGLES | | ROLL ANGLES | |
| | Left Door Sill | 0.6↓ | Front Bumper | 0.2↓ |
| | Right Door Sill | 0.5↑ | Rear Bumper | 0.2↑ |

**DATA SHEET 2-3**
**TARGET MEASUREMENT REFERENCE SHEET**

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| Measurements | Description | Left Side | Right Side |
|---|---|---|---|
| M | Seat fore / Aft travel (Front seats) | 178 | 178 |
| T° | Horizontal angle {CG-F1 (Left seat) to (Right A-pillar)} | 111 | - |
| A1° | 360° - T° | 249 | - |
| WE° | Horizontal angle {CG-F2 (Left seat) to (Left A-pillar)} | 200 | - |
| A2° | A2° = W° | 200 | - |
| U° | Horizontal angle {CG-F2 (Left seat) to (Left B-pillar)} | 270 | - |
| B1° | B1° = U° | 270 | - |
| V° | Horizontal angle {CG-FR (Left seat) to (Right B-pillar)} | 214 | - |
| B2° | B2° = V° | 214 | - |
| W° | Horizontal angle {CG-F2 (Right seat) to (Right A-pillar)} | - | 160 |
| A1° | A1° (Right) = W° (Right) | - | 160 |
| T° | Horizontal angle {CG-F1 (Right seat) to (Left A-pillar)} | - | 249 |
| A2° | 360° - T° (Right) | - | 111 |
| V° | Horizontal angle {CG-FR (Right seat) to (Right B-pillar)} | - | 146 |
| B1° | B1° (Right) = V° (Right) | - | 146 |
| U° | Horizontal angle {CG-F2 (Right seat) to (Right B-pillar)} | - | 90 |
| B2° | B2° (Right) = U° (Right) | - | 90 |
| J | A-pillar {(Plane 3) - (Plane 5)} | 458 | 458 |
| J/2 | J ÷ 2 | 229 | 229 |
| D1 | Upper Roof {(Plane A) - (Plane B)} | 3634 | |
| D1/2 | D1 ÷ 2 | 1817 | |
| D2 | Upper Roof {(Plane C) - (Plane D)} | 1568 | |
| D2/2 | D2 ÷ 2 | 784 | |
| .35D1 | .35 x D1 | 1271.9 | |
| .35D2 | .35 x D2 | 548.8 | |
| N | B-pillar {(BPR) - (lowest point on the daylight opening forward of B-pillar)} | 630 | 637 |
| N/2 | B-pillar {(BP3) - (lowest point on the daylight opening forward of B-pillar)} | 315 | 318.5 |
| N/4 | B-pillar {(BP3) - (lowest point on the daylight opening forward of B-pillar)} | 157.5 | 159.25 |
| Q | Other-pillar {(OPR) - (lowest point on the daylight opening forward of O-pillar)} | 578 | 619 |
| Q/2 | Other-pillar {(OP2) - (lowest point on the daylight opening forward of O-pillar)} | 289 | 309.5 |
| D | {(Corner of roof area, point 7) - (roof area center, point M)} | - | - |
| 3D/7 | (3 x D) ÷ 7 | - | - |
| MM | Widest door opening of slider door | - | 1182 |
| M | MM ÷ 2 | - | 591 |

**DATA SHEET 2-4**

**APPROACH ANGLE LIMITS**

| Left Side | | | | | Right Side | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Target Code | Horizontal Angles (deg.) | | Vertical Angles (deg.) | | Target Code | Horizontal Angles (deg.) | | Vertical Angles (deg.) | |
| | Minimum | Maximum | Minimum | Maximum | | Minimum | Maximum | Minimum | Maximum |
| AP1 | 200 | 249 | -5 | 25 | AP1 | 111 | 160 | -5 | 18 |
| AP2 | 200 | 249 | -5 | 24 | AP2 | 111 | 160 | -5 | 27 |
| AP3 | 200 | 249 | -5 | 32 | AP3 | 111 | 160 | -5 | 33 |
| BP1 | 214 | 270 | -10 | 27 | BP1 | 90 | 146 | -10 | 17 |
| BP2 | ANY | | 0 | 6 | BP2 | ANY | | 0 | 4 |
| BP3 | 214 | 270 | -10 | -8 | BP3 | 90 | 146 | -10 | -8 |
| BP4 | 214 | 270 | -10 | -10 | BP4 | 90 | 146 | -10 | -10 |
| OP1 | 270 | | -10 | 27 | OP1 | 90 | | -10 | -5 |
| OP2 | 270 | | -10 | -8 | OP2 | 90 | | -10 | -8 |
| RP1 | 270 | 345 | -10 | - | RP1 | 15 | 90 | -10 | - |
| RP2 | 270 | 345 | -10 | - | RP2 | 15 | 90 | -10 | - |
| FH1 | 180 | | 0 | 50 | FH1 | 180 | | 0 | 50 |
| FH2 | 180 | | 0 | 50 | FH2 | 180 | | 0 | 50 |
| RH | 360 | | 0 | - | RH | 0 | | 0 | - |
| SR1 | 270 | | 0 | 31 | SR1 | 90 | | 0 | 38 |
| SR2A | 270 | | 0 | 34 | SR2A | 90 | | 0 | 34 |
| SR2B | 270 | | 0 | 34 | SR2B | 90 | | 0 | 34 |
| SR3B | 270 | | 0 | 33 | SR3B | 90 | | 0 | 36 |
| SR3ANCH | ANY | | 0 | 0 | SR3ANCH | ANY | | 0 | 3 |
| URAP | ANY | | 0 | 50 | URAP | ANY | | 0 | 50 |
| URBP | ANY | | 0 | 50 | URBP | ANY | | 0 | 50 |
| UROP | ANY | | 0 | 50 | UROP | ANY | | 0 | 50 |
| URRP | ANY | | 0 | 50 | URRP | ANY | | 0 | 50 |

Rear Pillar and Rear Header excluded per s6.3(b)

Note : BP2 and SR3 ANCH target locations – Seat belt anchorage

**DATA SHEET 2-5**

**SUMMARY TARGET IMPACT LOCATION ON FMH**

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

↖ RIGHT SIDE OF FACE

| TARGET | Distance Above Point 0 (mm) | Distance Over From Pt. O (mm) |
|---|---|---|
| OP2 | 20 | 5 to the right |
| OP1 | 22 | 7 to the right |
| SR3 ANCH | 20 | 15 to the right |
| BP3 | 12 | 10 to the left |
| URBP | 45 | 7 to the left |
| AP2 | 26 | 6 to the right |
| SR1 | 40 | 21 to the left |
| FH1 | 29 | 6 to the left |
| BP4 | 7 | 33 to the left |
| BP2 | 18 | 4 to the left |
| BP1 | 65 | 22 to the left |
| AP3 | 13 | 7 to the left |
| AP1 | 18 | 0 |
| SR2A | 26 | 2 to the right |
| SR3B | 23 | 2 to the left |

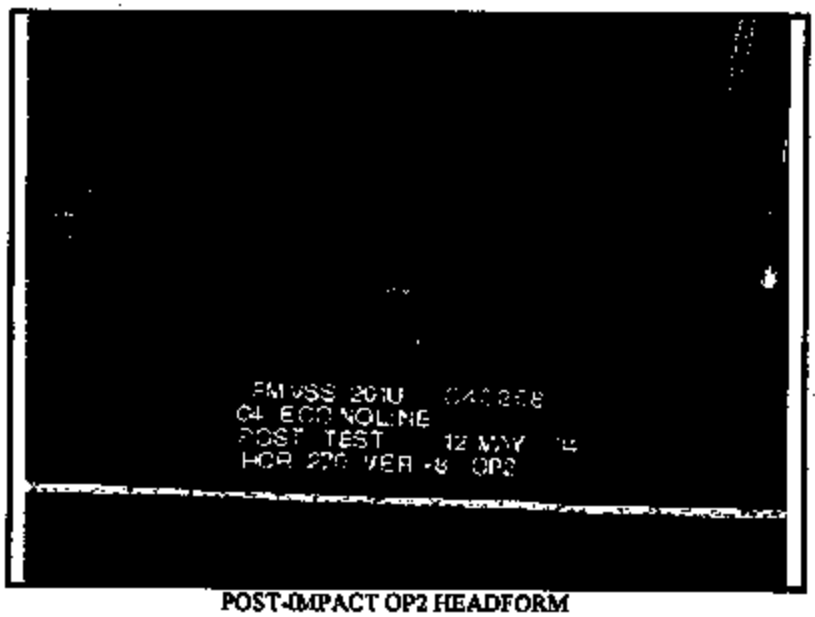
## SECTION 3

## SUMMARY OF TEST RESULTS AND DATA PLOTS

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | (1/0)(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 01 |
| Test Date: | May 12, 2004 |
| Target Location: | Driver Side Other Pillar |
| Target Code: | OP2 |
| Horizontal Impact Angle: | 270° |
| Vertical Impact Angle: | -8° |
| Ambient Temperature: | 22.7°C |
| Relative Humidity: | 41.8 |
| Time of Impact: | 10:45 |
| Headform Number: | 1255 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 5 | x | mm right | - | mm left |
| On Centerline | 20 | | mm up | | |



POST-IMPACT OP2 HEADFORM

| | |
|---|---|
| Free Motion HIC | 710.1 |
| HIC(d) | 702.2 |
| Impact Velocity (kph) | 23.38 |
| HIC T1 (msec) | 3.8 |
| HIC T2 (msec) | 6.6 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - OP2

FMH Headform

Test Date: May 12, 2004

Location: OP2

Work File: OP2

----------TEST RESULTS----------

Lab Temperature: 22.7 C

Lab Humidity: 41.8 %

Velocity at Impact: 23.38 KPH

Free Flight Distance: 213.16 mm

HICd: 702.2

HIC (36ms): 710.1

t1: 3.8 msec

t2: 6.6 msec

Duration: 2.9 msec

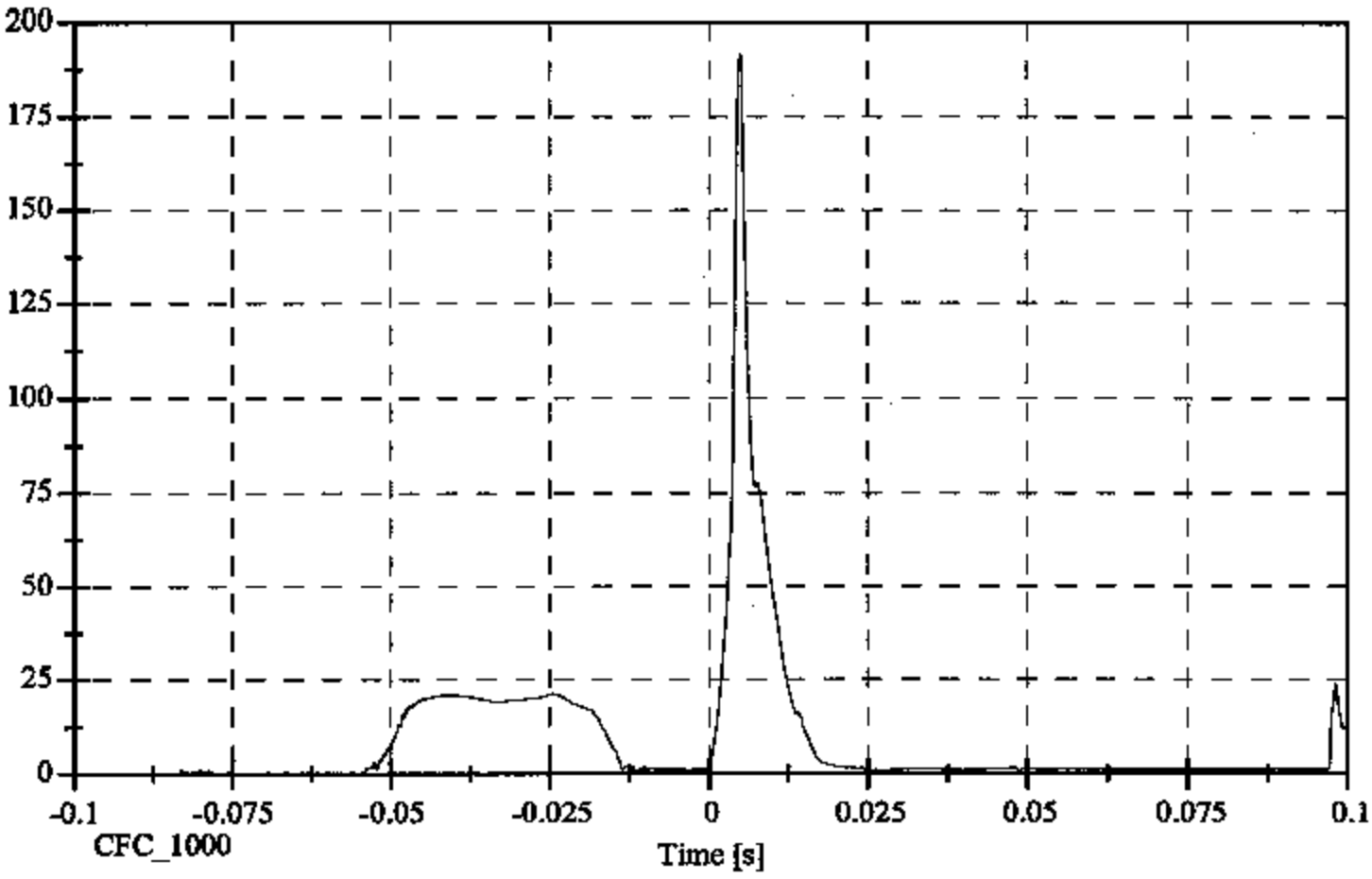
Average Acceleration: 8.7 g

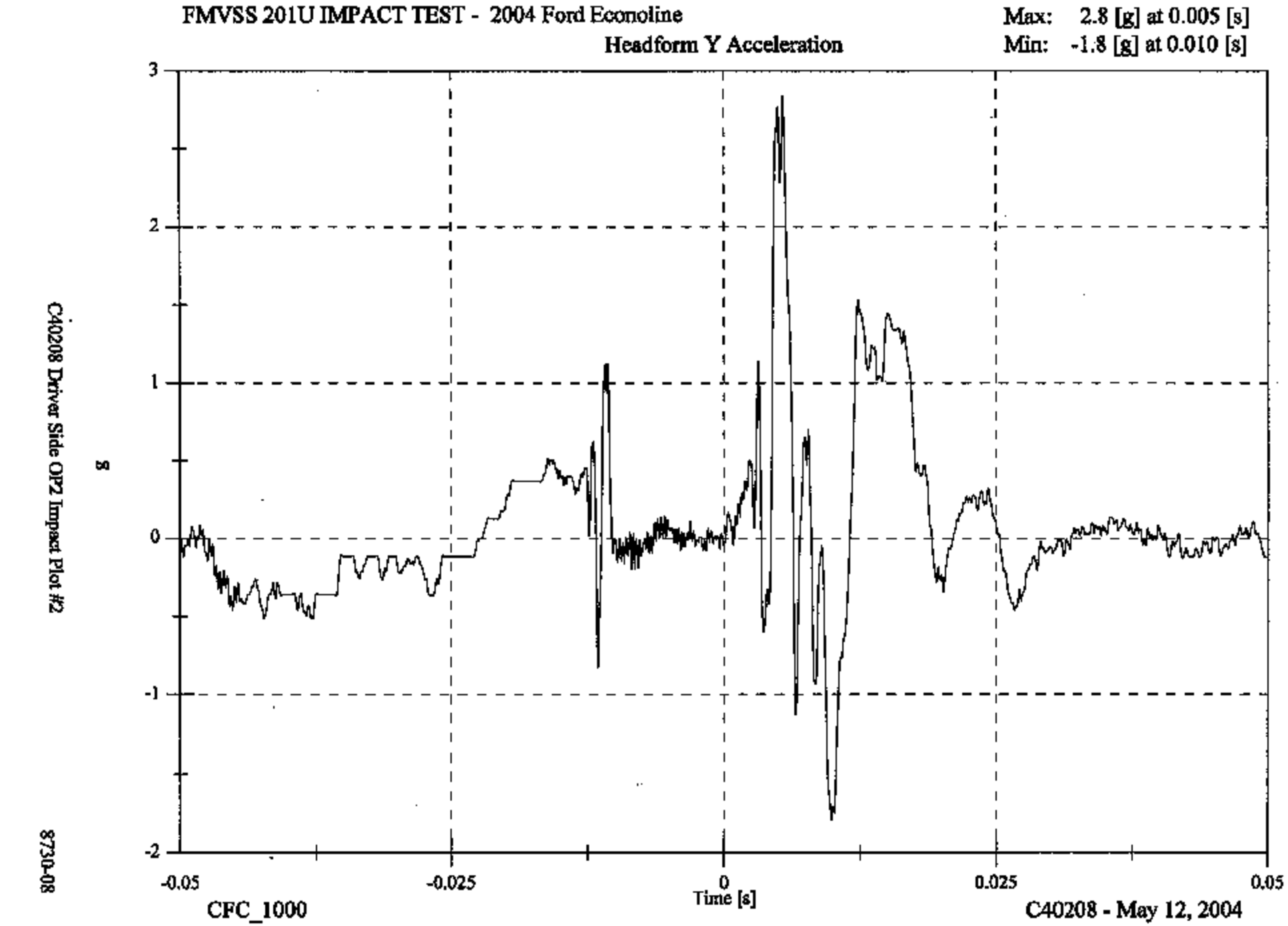
FMVSS 201U IMPACT TEST - 2004 Ford Econoline

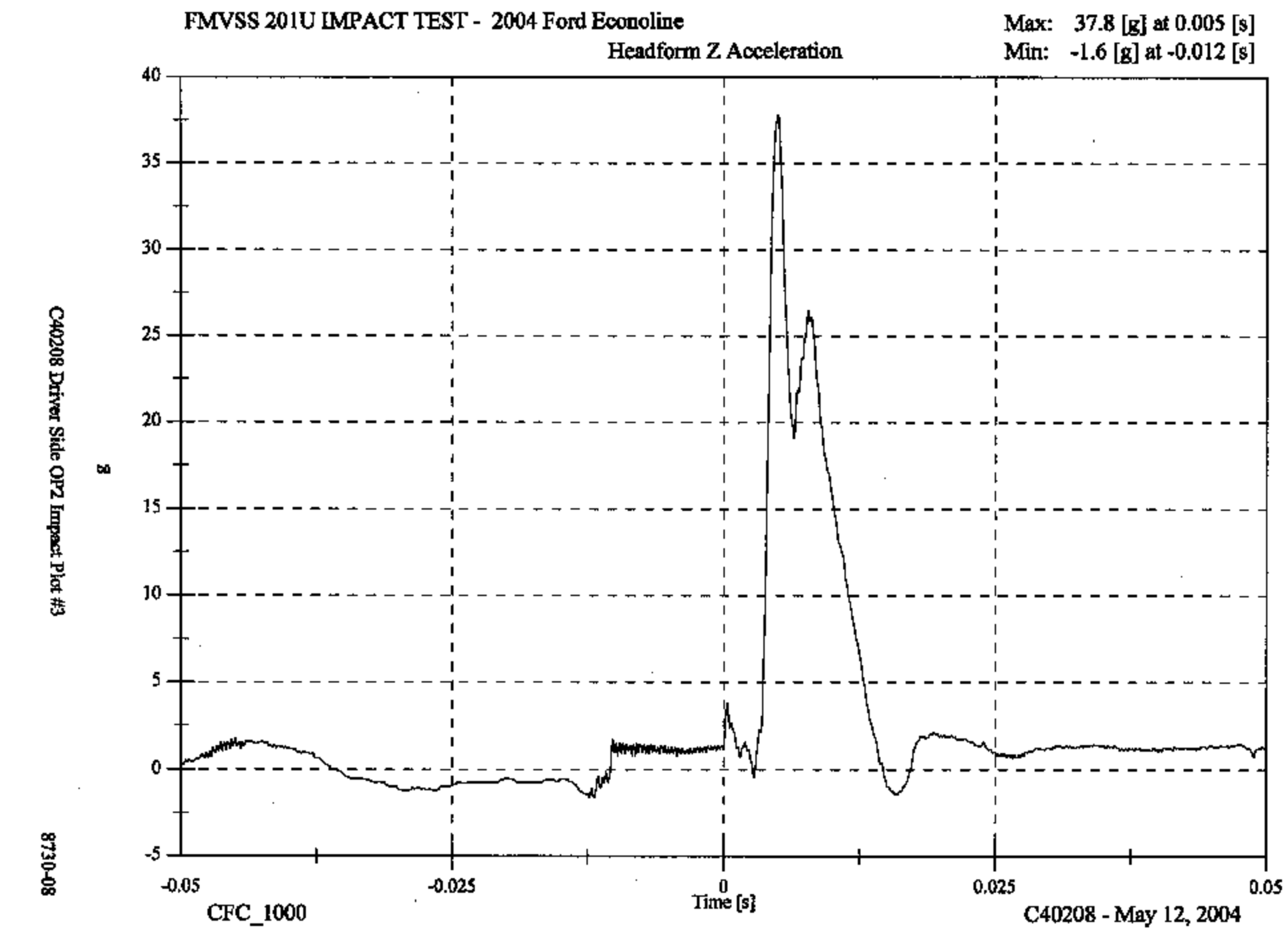
Headform Resultant

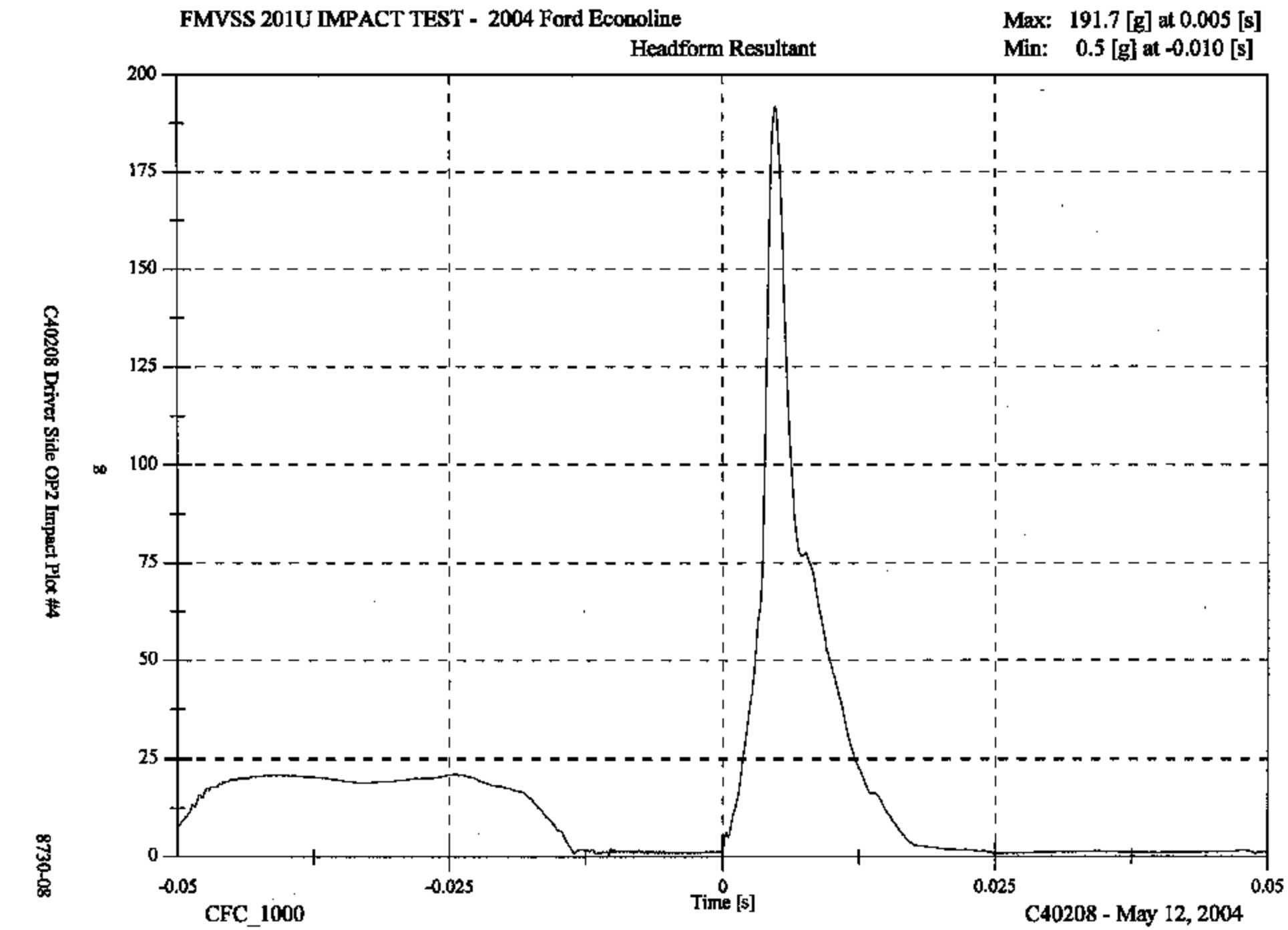
Max: 191.7 [g] at 0.005 [s]

Min: 0.0 [g] at -0.096 [s]




FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 2.8 [g] at 0.005 [s]
Min: -1.8 [g] at 0.010 [s]
C40208 Driver Side OP2 Impact Plot #2
g
3
2
1
0
-1
-2
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
8730-08

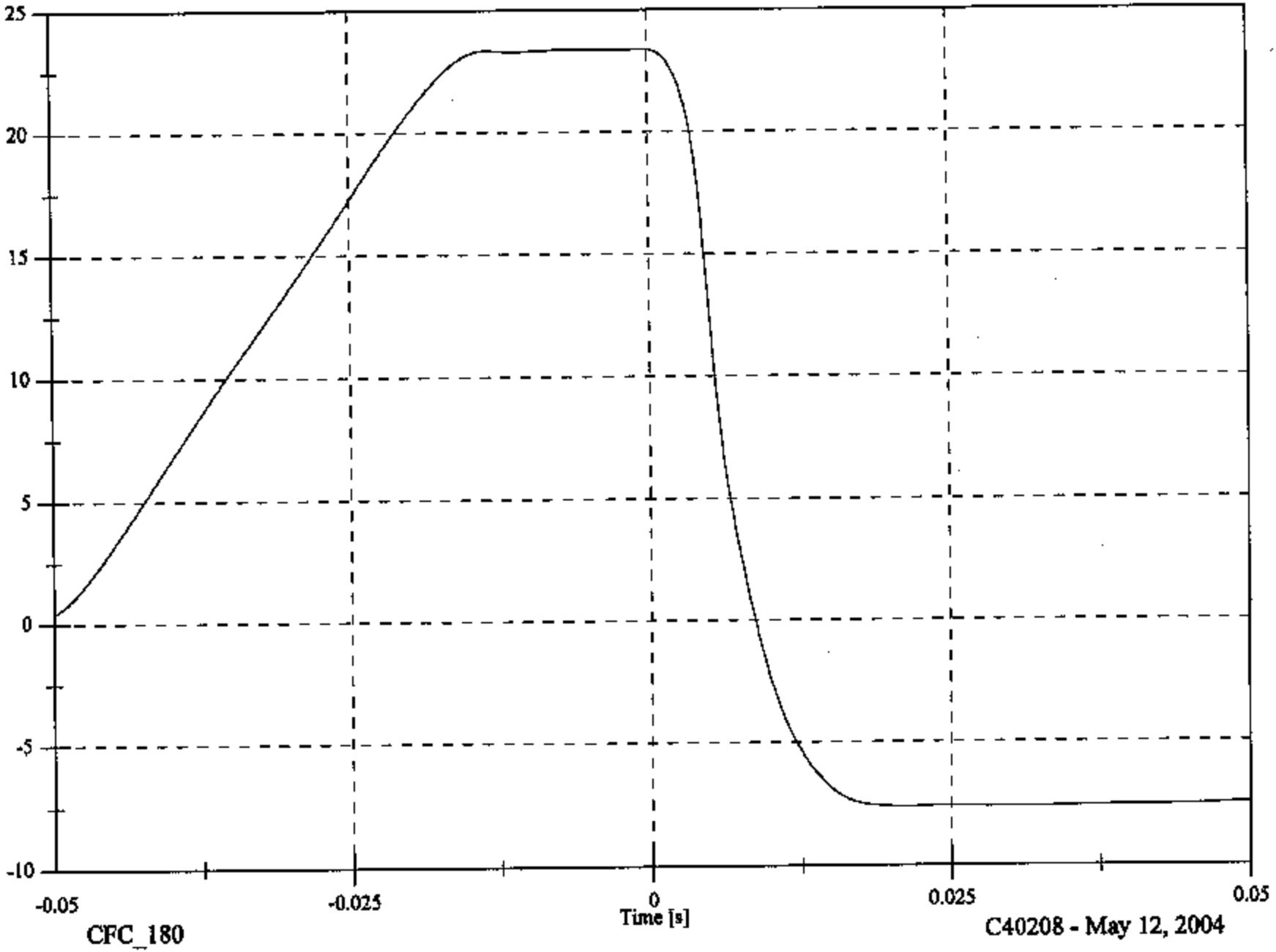

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 37.8 [g] at 0.005 [s]
Min: -1.6 [g] at -0.012 [s]
40
35
30
25
20
15
10
5
0
-5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side OP2 Impact Plot #3
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 191.7 [g] at 0.005 [s]
Min: 0.5 [g] at -0.010 [s]
200
175
150
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Driver Side OP2 Impact Plot #4
8730-08
CFC_1000
C40208 - May 12, 2004

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Velocity

Max: 23.4 [KPH] at -0.000 [s]
Min: -7.6 [KPH] at 0.021 [s]



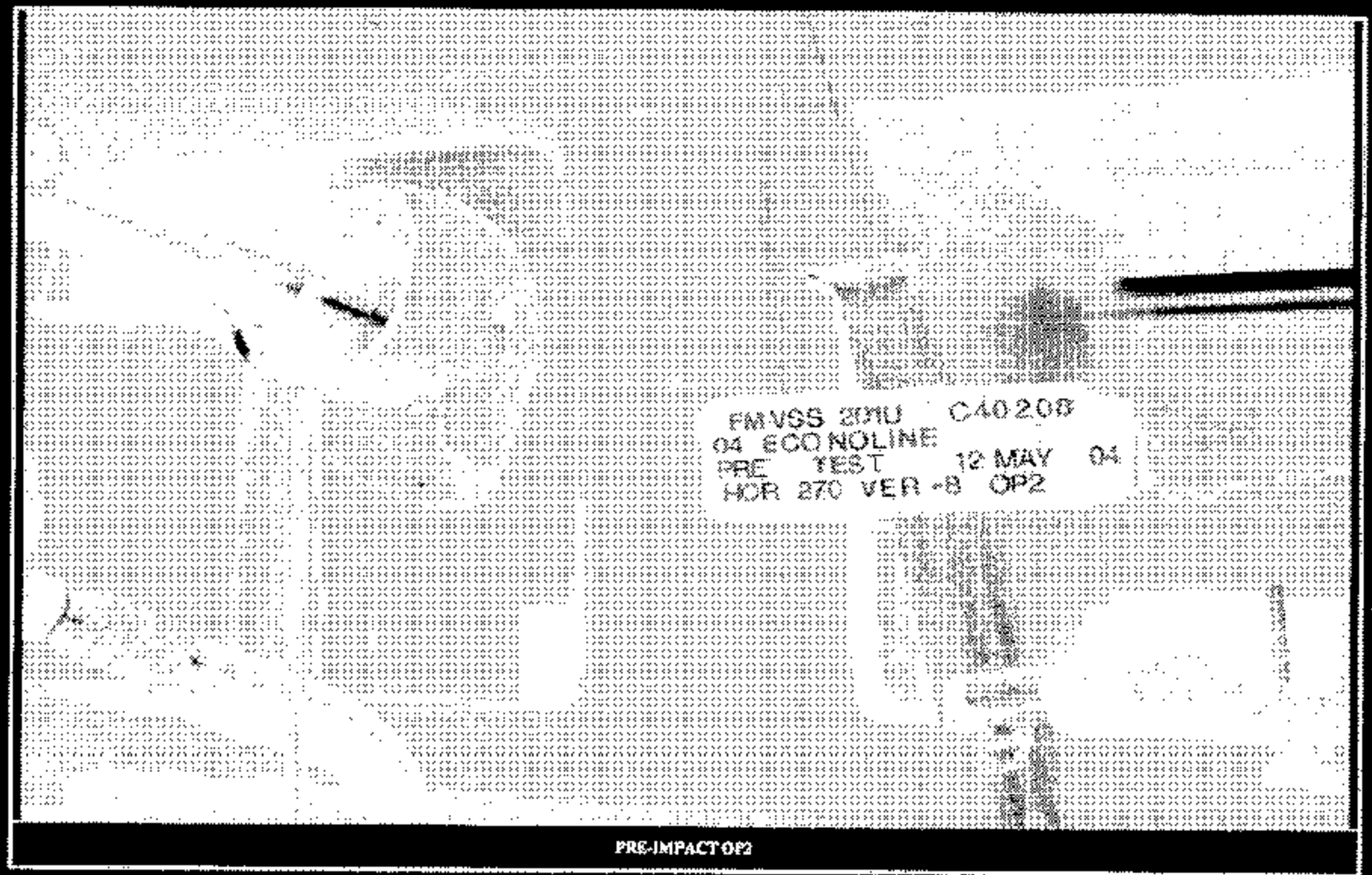

H&N

C40208 Driver Side OP2 Impact Plot #5

B730-08

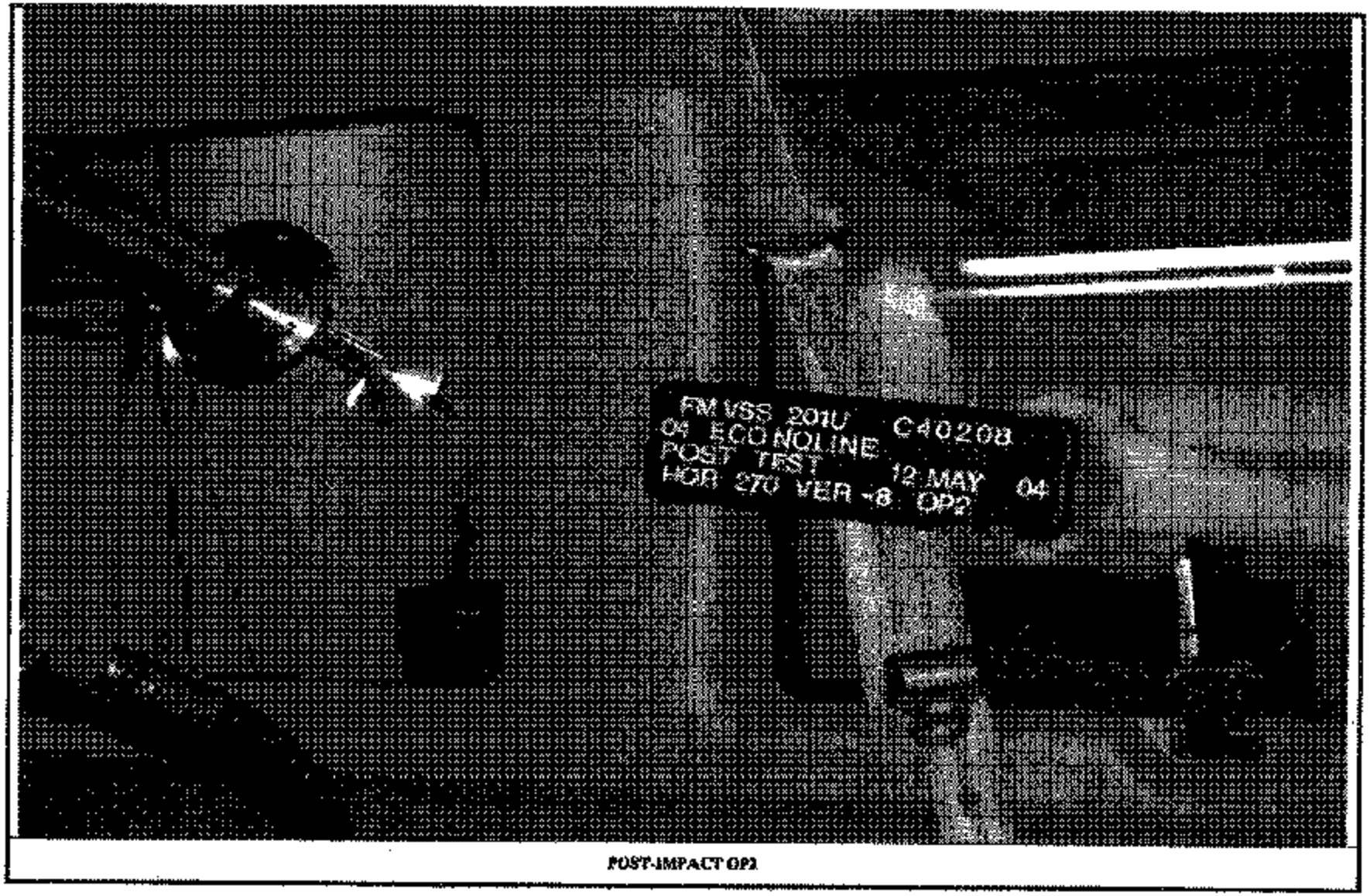
CFC_180

C40208 - May 12, 2004




PRE-IMPACT OP2

8730-08



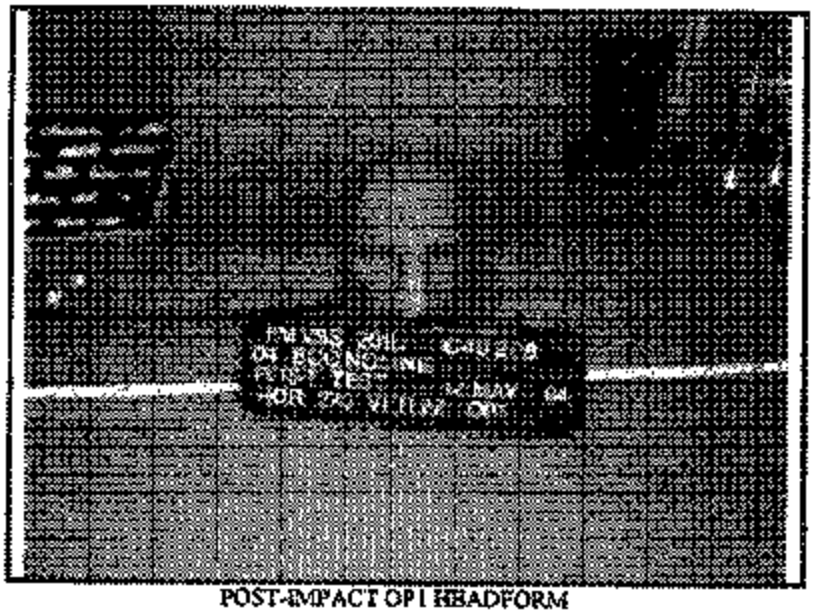

POST-IMPACT OP2

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 02 |
| Test Date: | May 12, 2004 |
| Target Location: | Driver Side Other Pillar |
| Target Code: | OP1 |
| Horizontal Impact Angle: | 270° |
| Vertical Impact Angle: | 27° |
| Ambient Temperature: | 22.6°C |
| Relative Humidity: | 42.3 |
| Time of Impact: | 11:20 |
| Headform Number: | 0355 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 7 | x | mm right | - | mm left |
| On Centerline | 22 | | mm up | | |



POST-IMPACT OP1 HEADFORM

| | |
|---|---|
| Free Motion HIC | 511.7 |
| HIC(d) | 552.4 |
| Impact Velocity (kph) | 23.61 |
| HIC T1 (msec) | 3.8 |
| HIC T2 (msec) | 14.5 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - OP1

FMH Headform 0355

Location: OP1

Test Date: May 12, 2004

Work File: OP1

## TEST RESULTS

Lab Temperature: 22.6 C

Lab Humidity: 42.3 %

Velocity at Impact: 23.61 KPH

Free Flight Distance: 224.20 mm

HICd: 552.4

HIC (36ms): 511.7

t1: 3.8 msec

t2: 14.5 msec

Duration: 10.7 msec

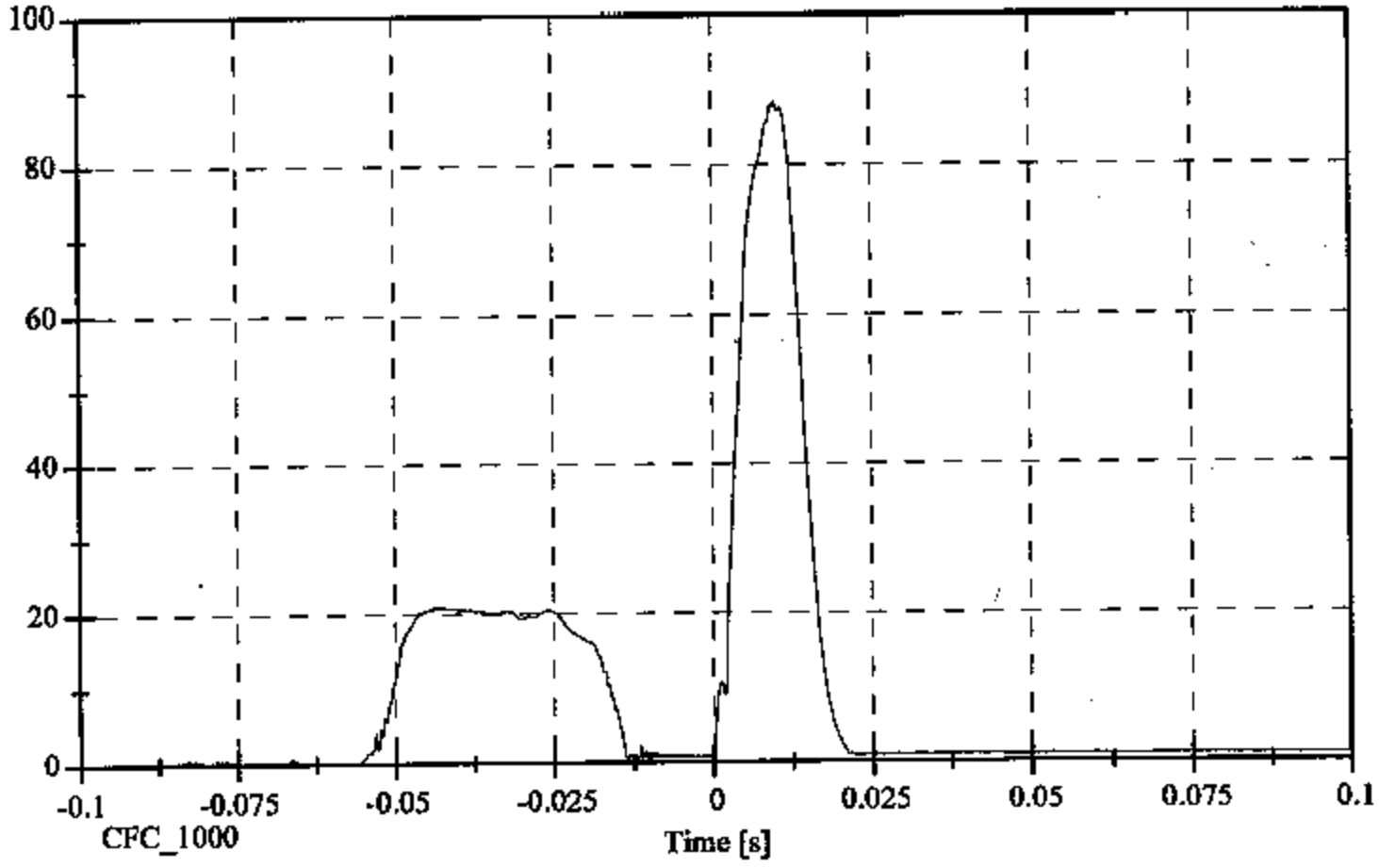
Average Acceleration: 8.7 g

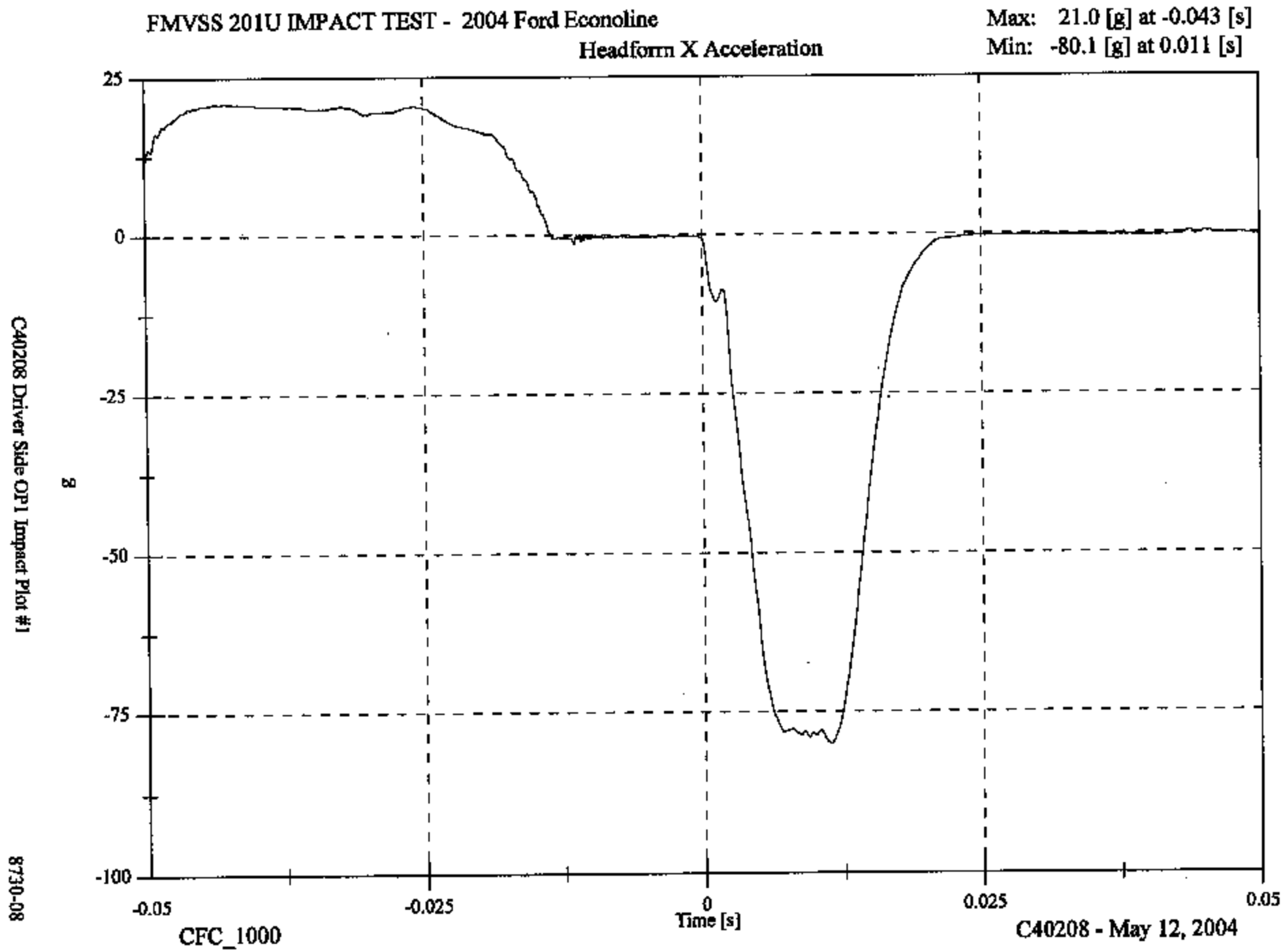
FMVSS 201U IMPACT TEST - 2004 Ford Econoline

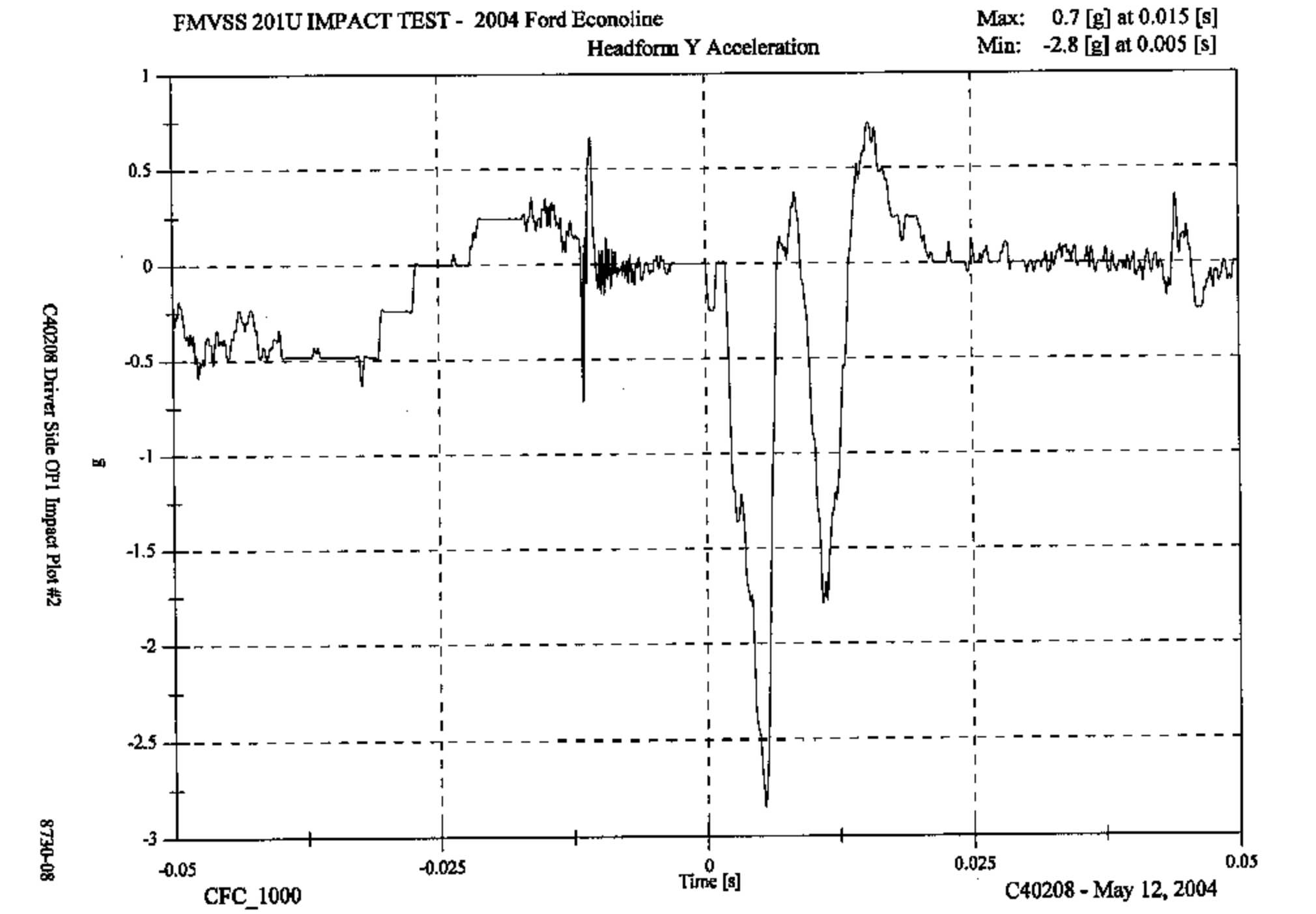
Headform Resultant

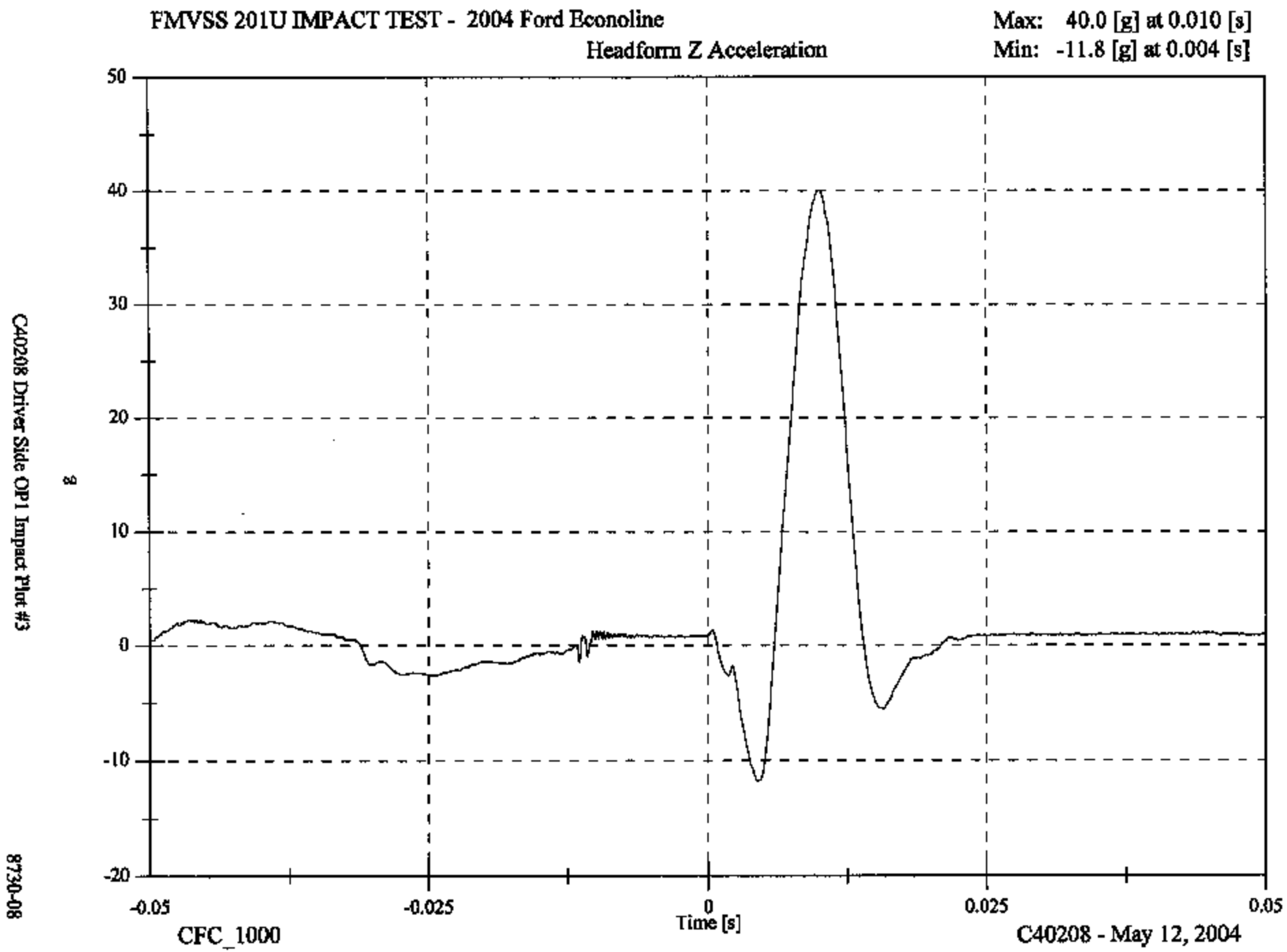
Max: 88.4 [g] at 0.010 [s]

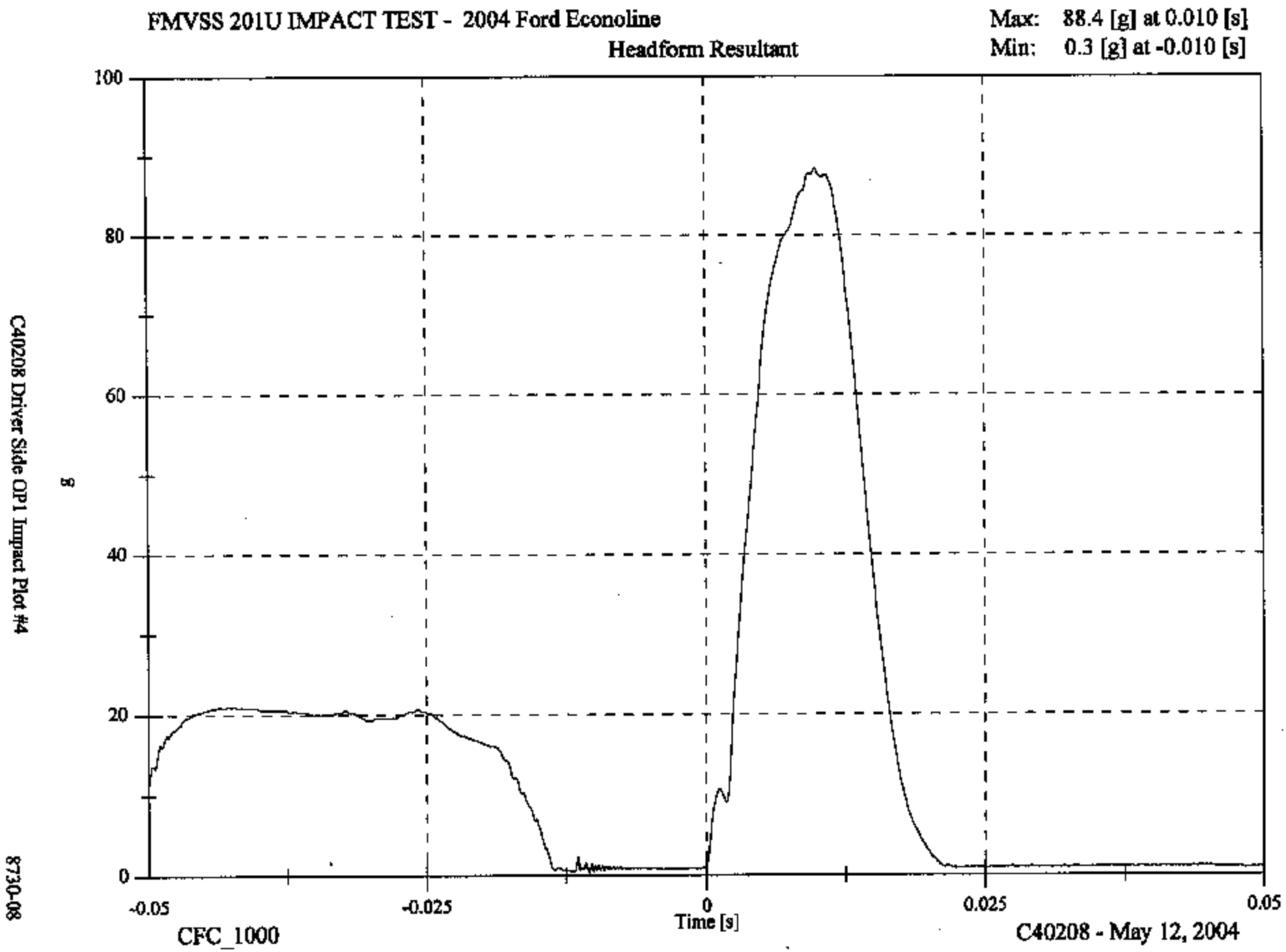
Min: 0.0 [g] at -0.099 [s]




FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform X Acceleration
Max: 21.0 [g] at -0.043 [s]
Min: -80.1 [g] at 0.011 [s]
25
0
-25
-50
-75
-100
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Driver Side OP1 Impact Plot #1
8730-08
CFC_1000
C40208 - May 12, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 0.7 [g] at 0.015 [s]
Min: -2.8 [g] at 0.005 [s]
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side OP1 Impact Plot #2
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 40.0 [g] at 0.010 [s]
Min: -11.8 [g] at 0.004 [s]
50
40
30
20
10
0
-10
-20
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side OP1 Impact Plot #3
8730-08

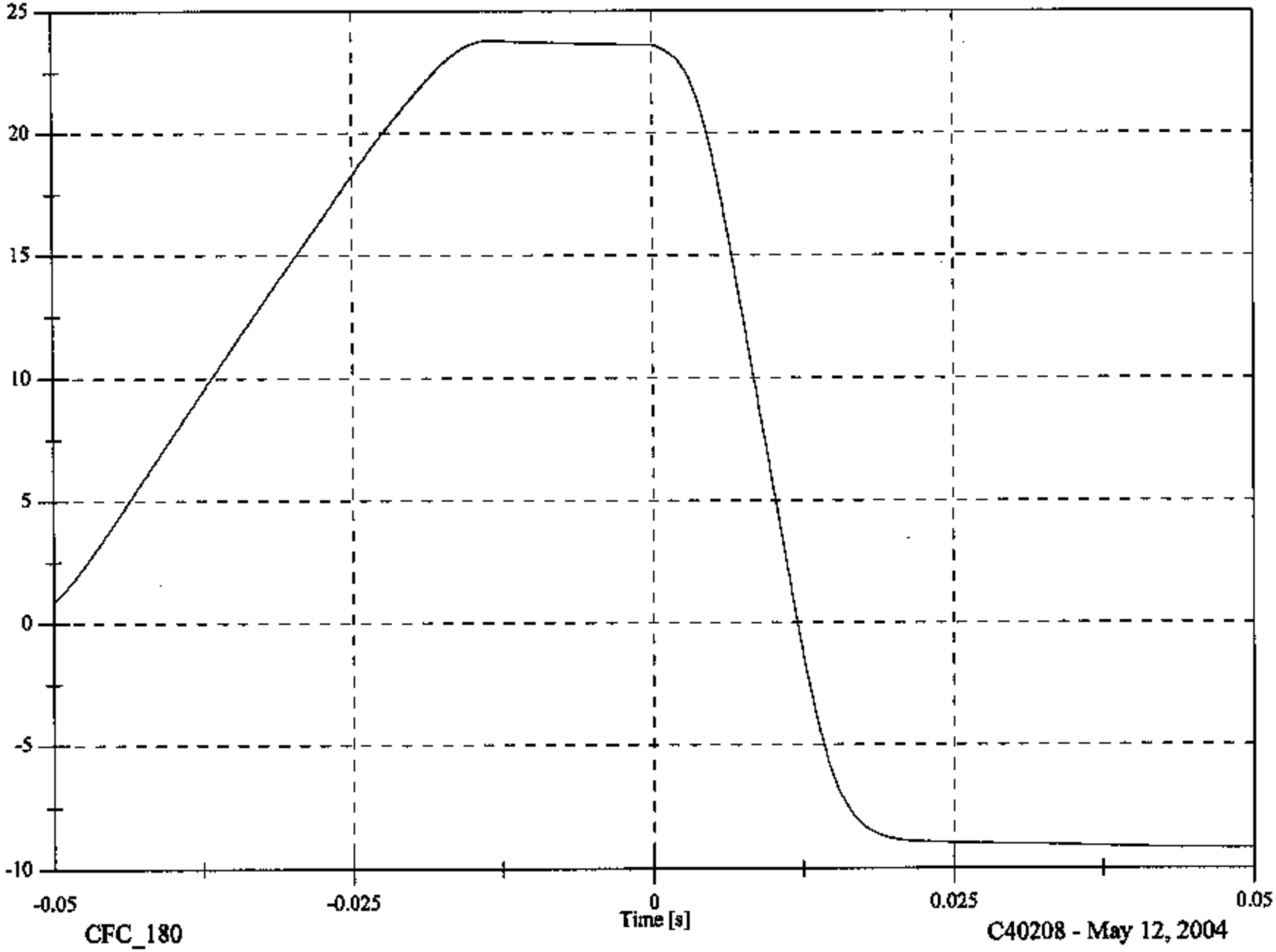

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 88.4 [g] at 0.010 [s]
Min: 0.3 [g] at -0.010 [s]
100
80
60
40
20
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side OP1 Impact Plot #4
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Velocity

Max: 23.8 [KPH] at -0.013 [s]

Min: -9.2 [KPH] at 0.050 [s]




C40208 Driver Side OP1 Impact Plot #5

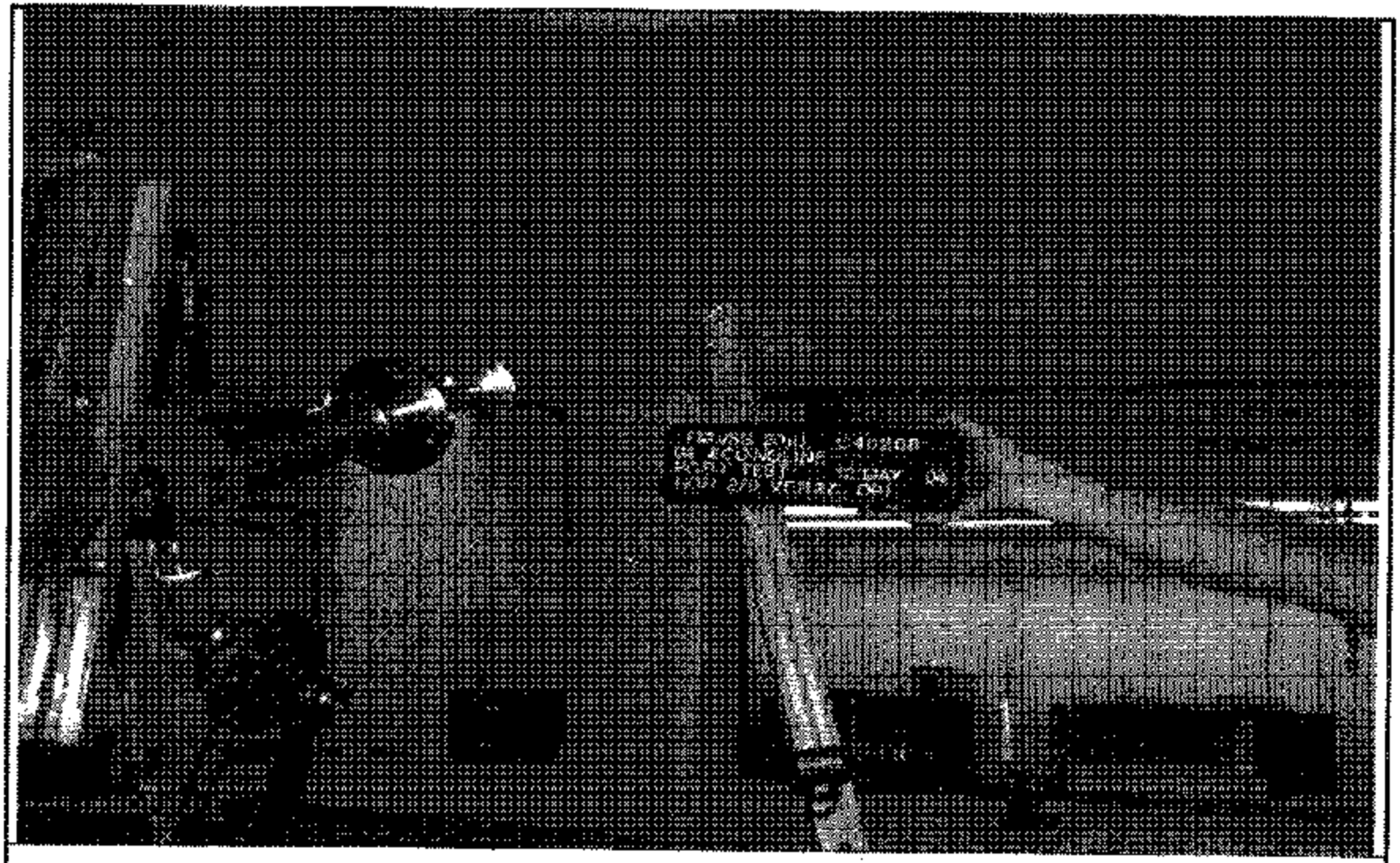
8730-08

CFC_180

C40208 - May 12, 2004


PRE-IMPACT OP1

8730-08



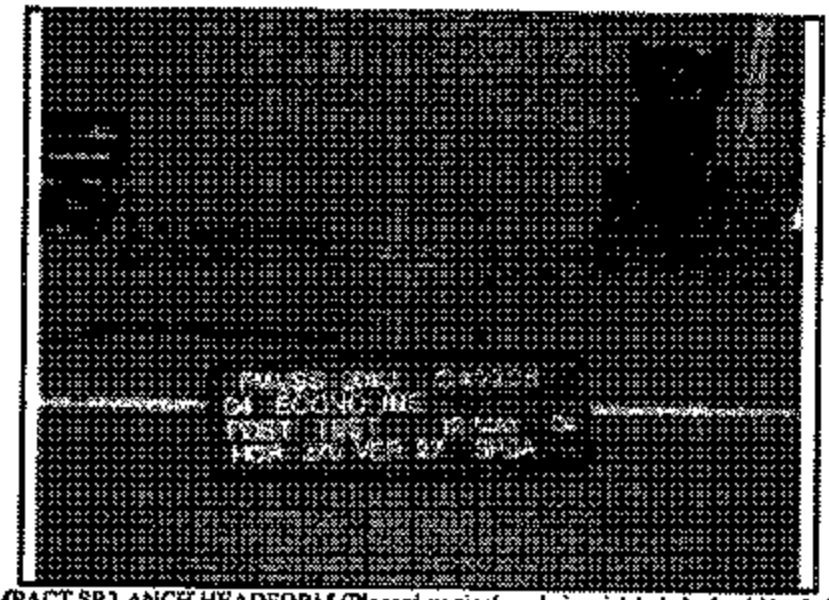
POST-IMPACT OF1

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 03 |
| Test Date: | May 12, 2004 |
| Target Location: | Driver Rear Side Rail |
| Target Code: | SR3 ANCH |
| Horizontal Impact Angle: | 270° |
| Vertical Impact Angle: | 0° |
| Ambient Temperature: | 23.3°C |
| Relative Humidity: | 42.6 |
| Time of Impact: | 13:10 |
| Headform Number: | 0062 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 15 | x | mm right | - | mm left |
| On Centerline | 20 | | mm up | | |



POST-IMPACT SR3 ANCH HEADFORM (Placard vertical angle is mislabeled, should be 0 degrees)

| | |
|---|---|
| Free Motion HIC | 267.4 |
| HIC(d) | 368.1 |
| Impact Velocity (kph) | 23.76 |
| HIC T1 (msec) | 3.7 |
| HIC T2 (msec) | 14.0 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - SR3 ANCH

FMH Headform 0062

Test Date: May 12, 2004

Location: SR3 ANCH

Work File: SR3ANCH

----------TEST RESULTS----------

Lab Temperature: 23.3 C

Lab Humidity: 42.6 %

Velocity at Impact: 23.76 KPH

Free Flight Distance: 206.03 mm

HICd: 368.1

HIC (36ms): 267.4

t1: 3.7 msec

t2: 14.0 msec

Duration: 10.3 msec

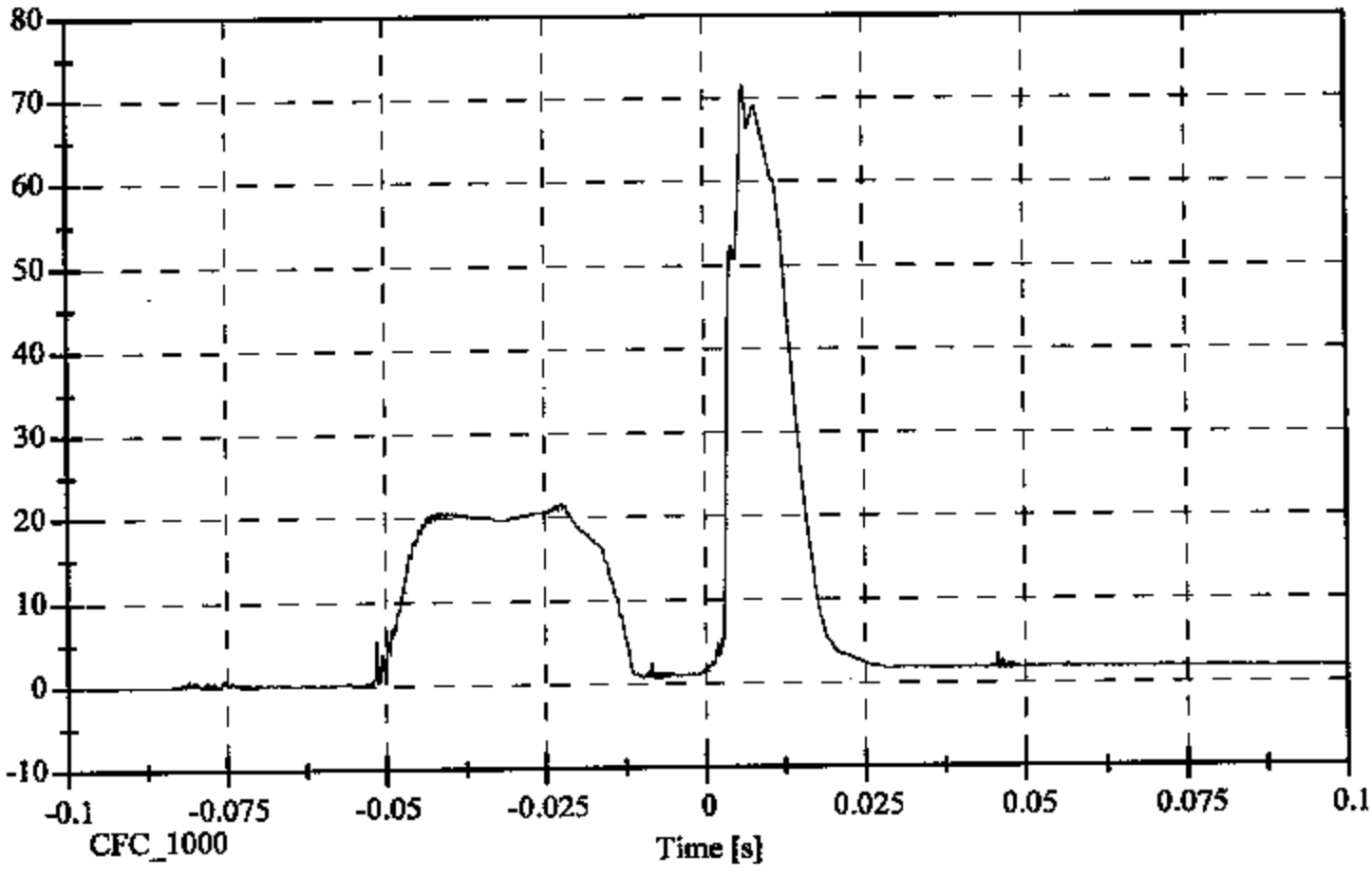
Average Acceleration: 8.0 g

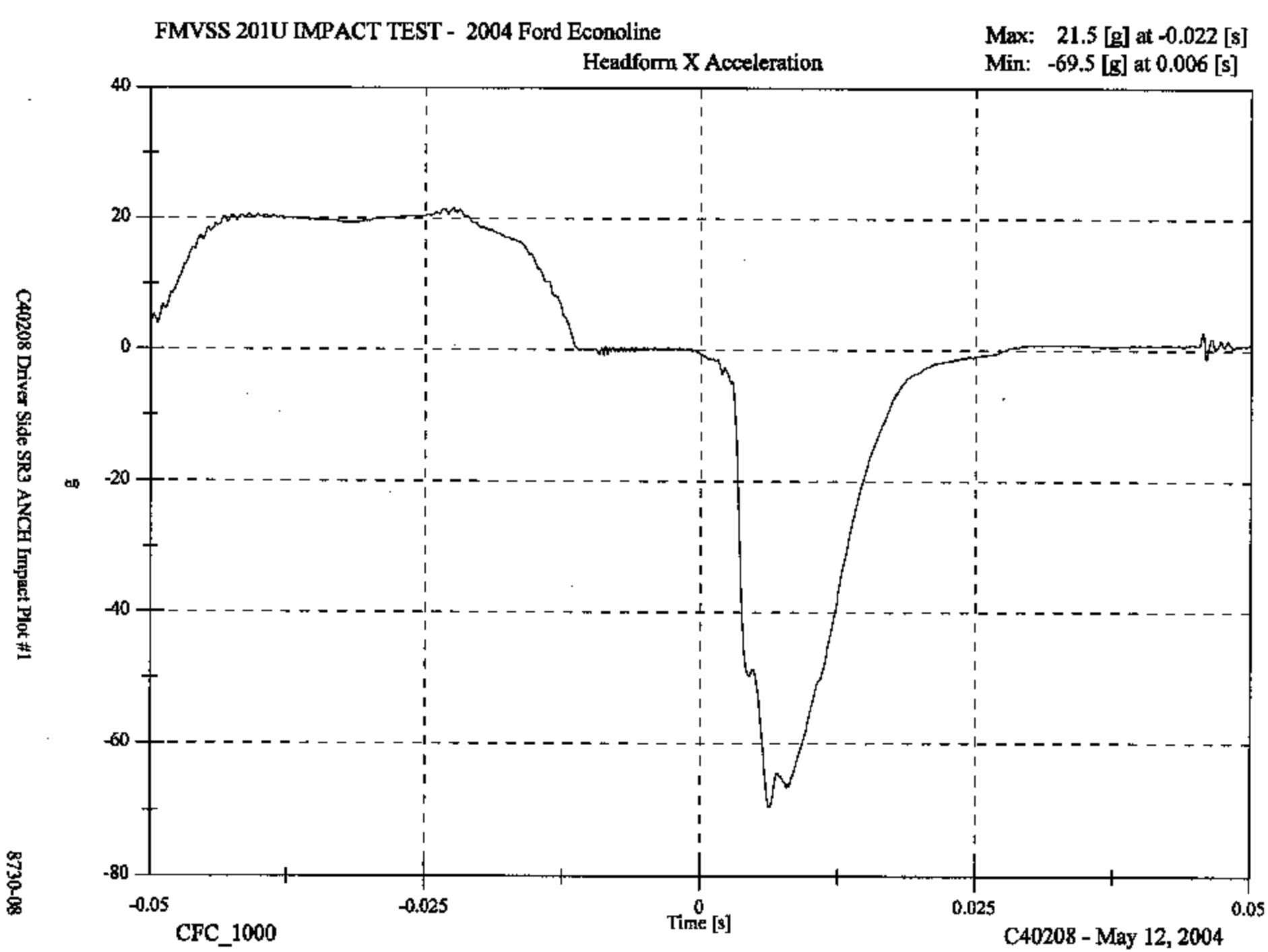
FMVSS 201U IMPACT TEST - 2004 Ford Econoline

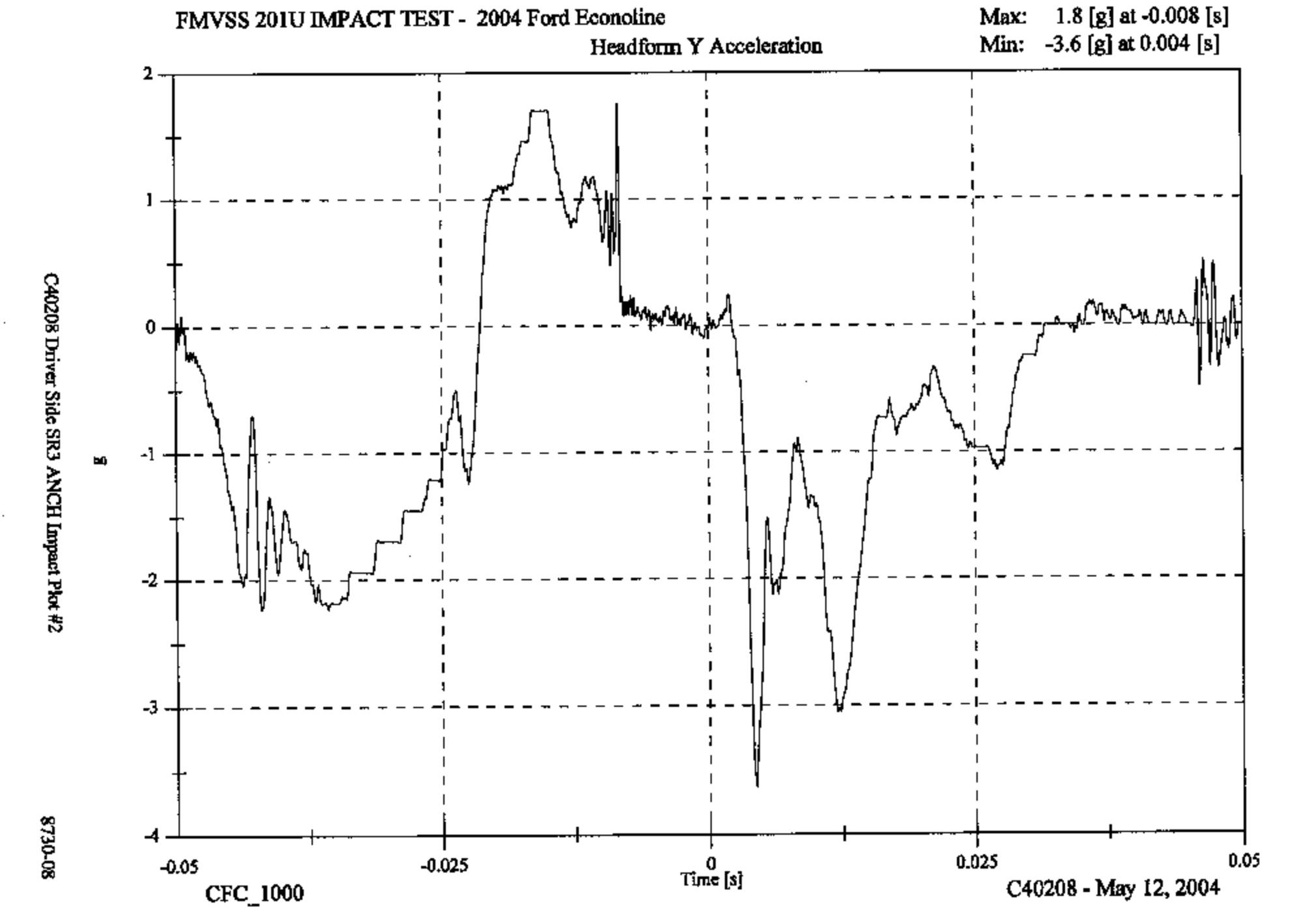
Headform Resultant

Max: 71.6 [g] at 0.006 [s]

Min: -0.0 [g] at -0.097 [s]




FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform X Acceleration
Max: 21.5 [g] at -0.022 [s]
Min: -69.5 [g] at 0.006 [s]
40
20
0
-20
-40
-60
-80
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Driver Side SR3 ANCH Impact Plot #1
8730-08
CFC_1000
C40208 - May 12, 2004

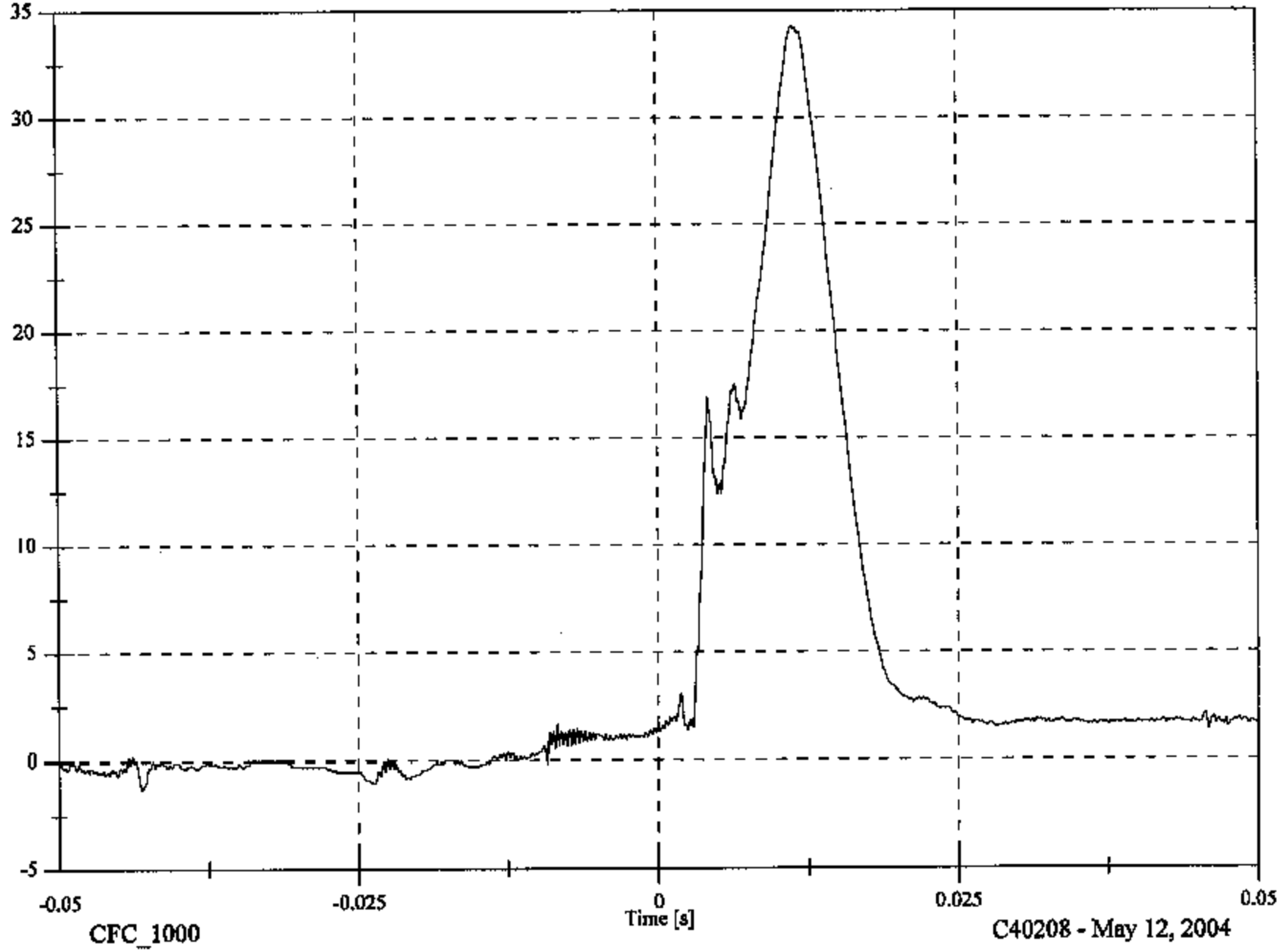

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 1.8 [g] at -0.008 [s]
Min: -3.6 [g] at 0.004 [s]
C40208 Driver Side SR3 ANCH Impact Plot #2
8730-08
g
2
1
0
-1
-2
-3
-4
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Z Acceleration

Max: 34.3 [g] at 0.011 [s]

Min: -1.3 [g] at -0.043 [s]




C40208 Driver Side SR3 ANCH Impact Plot #3

8730-08

CFC_1000

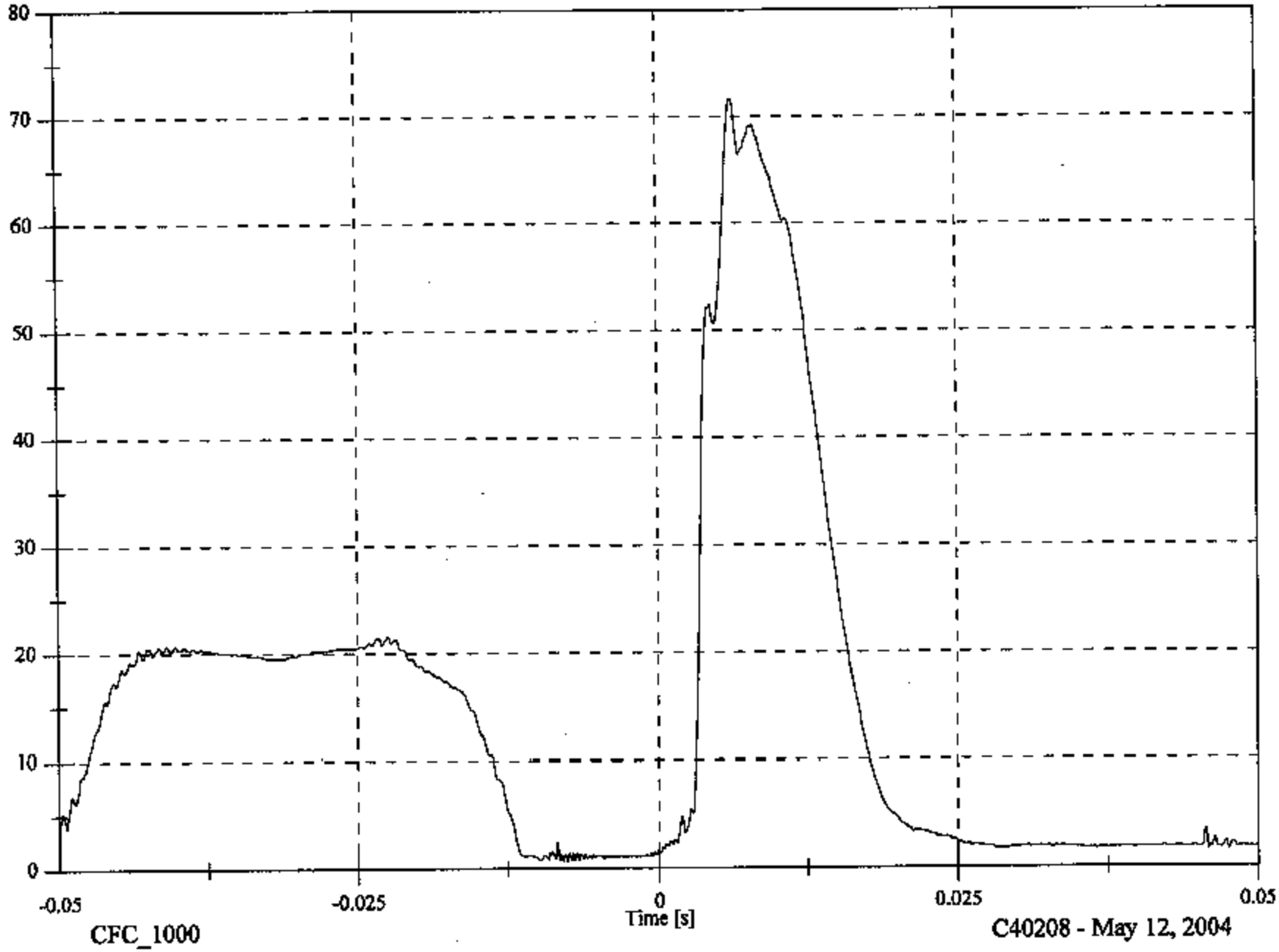
C40208 - May 12, 2004

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Resultant

Max: 71.6 [g] at 0.006 [s]

Min: 0.7 [g] at -0.008 [s]

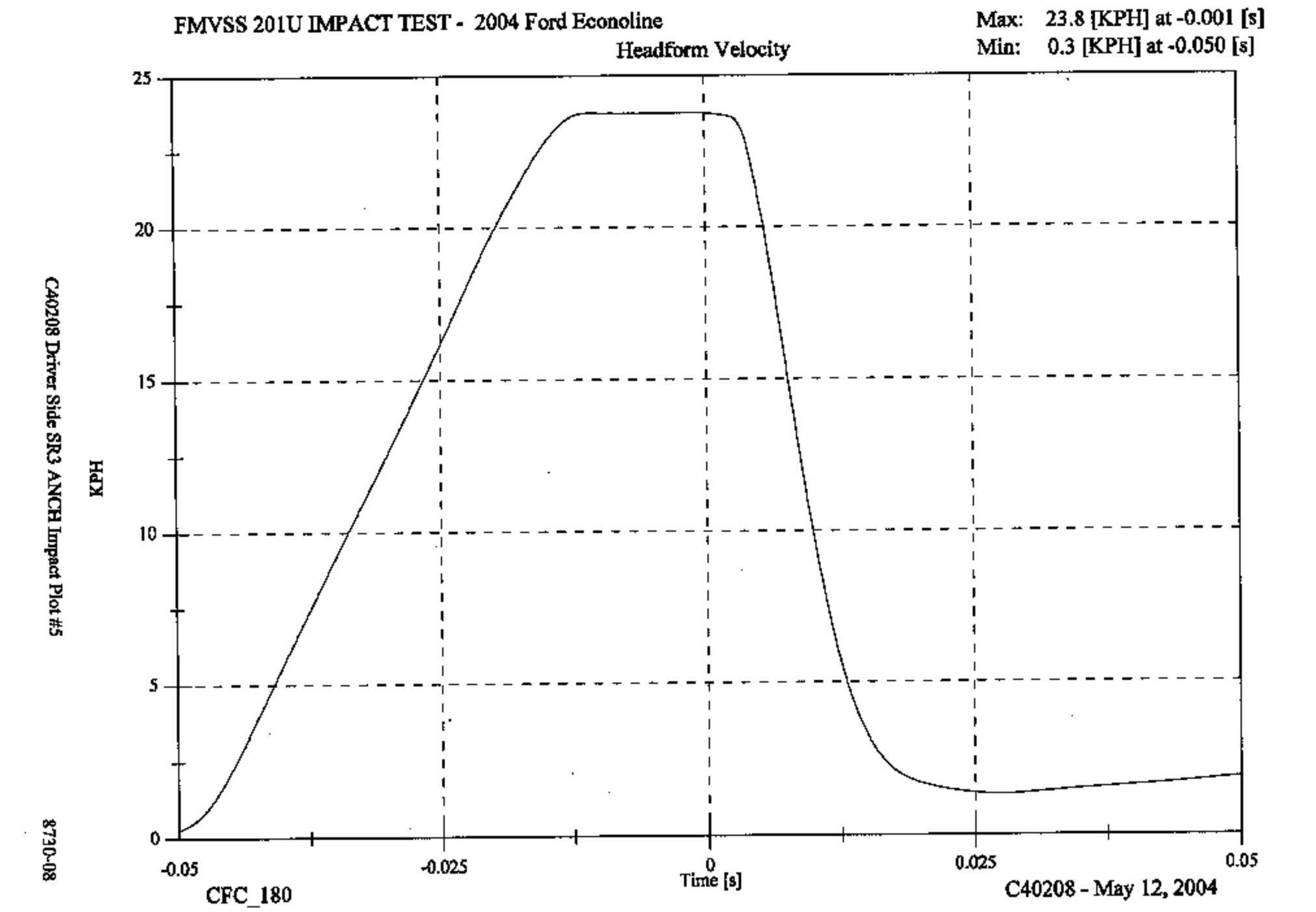


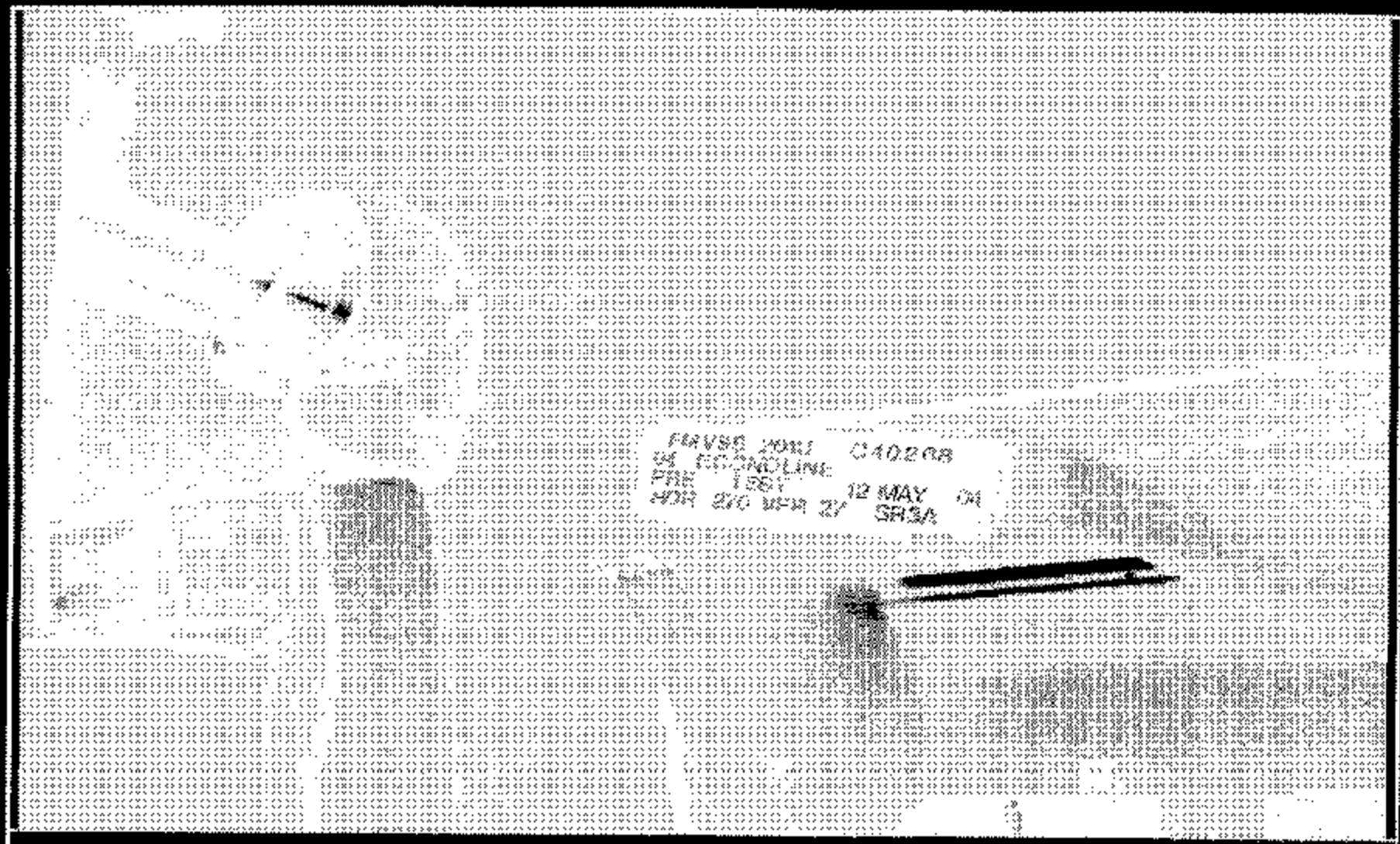

C40208 Driver Side SR3 ANCH Impact Plot #4

CFC_1000

C40208 - May 12, 2004

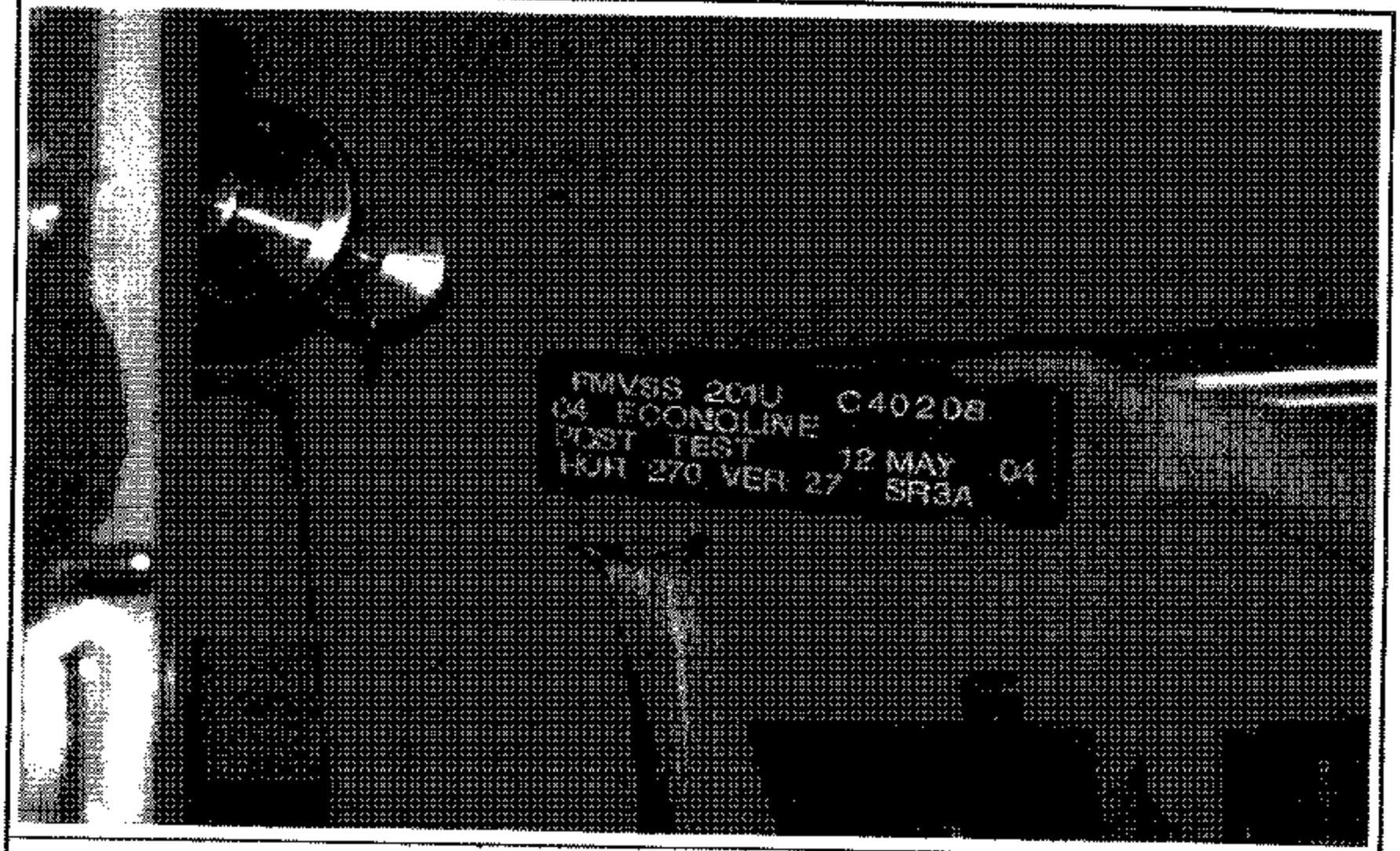
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Velocity
Max: 23.8 [KPH] at -0.001 [s]
Min: 0.3 [KPH] at -0.050 [s]
25
20
15
10
5
0
KPH
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_180
C40208 - May 12, 2004
C40208 Driver Side SR3 ANCH Impact Plot #5
8730-08



PRE-IMPACT SR3 ANCH (Placard vertical angle is mislabeled, should be 0 degrees)

8730-08



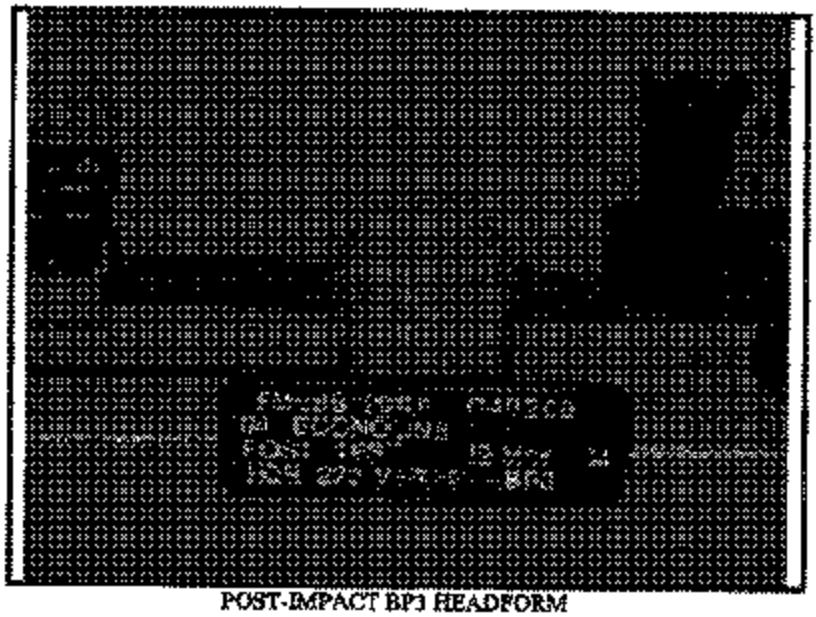

POST-IMPACT SR3 ANCH (Placard vertical angle is mislabeled, should be 0 degrees)

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 04 |
| Test Date: | May 12, 2004 |
| Target Location: | Driver Side B-Pillar |
| Target Code: | BP3 |
| Horizontal Impact Angle: | 270° |
| Vertical Impact Angle: | -8° |
| Ambient Temperature: | 22.9°C |
| Relative Humidity: | 44.3 |
| Time of Impact: | 13:50 |
| Headform Number: | 0805 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 10 | - | mm right | x | mm left |
| On Centerline | 12 | mm up | | | |



POST-IMPACT BP3 HEADFORM

| | |
|---|---|
| Free Motion HIC | 638.9 |
| HIC(d) | 648.4 |
| Impact Velocity (kph) | 23.43 |
| HIC T1 (msec) | 4.5 |
| HIC T2 (msec) | 9.9 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - BP3

FMH Headform 0805

Test Date: May 12, 2004

Location: BP3

Work File: BP3

----------TEST RESULTS----------

Lab Temperature: 22.9 C

Lab Humidity: 44.3 %

Velocity at Impact: 23.43 KPH

Free Flight Distance: 215.04 mm

HICd: 648.4

HIC (36ms): 638.9

t1: 4.5 msec

t2: 9.9 msec

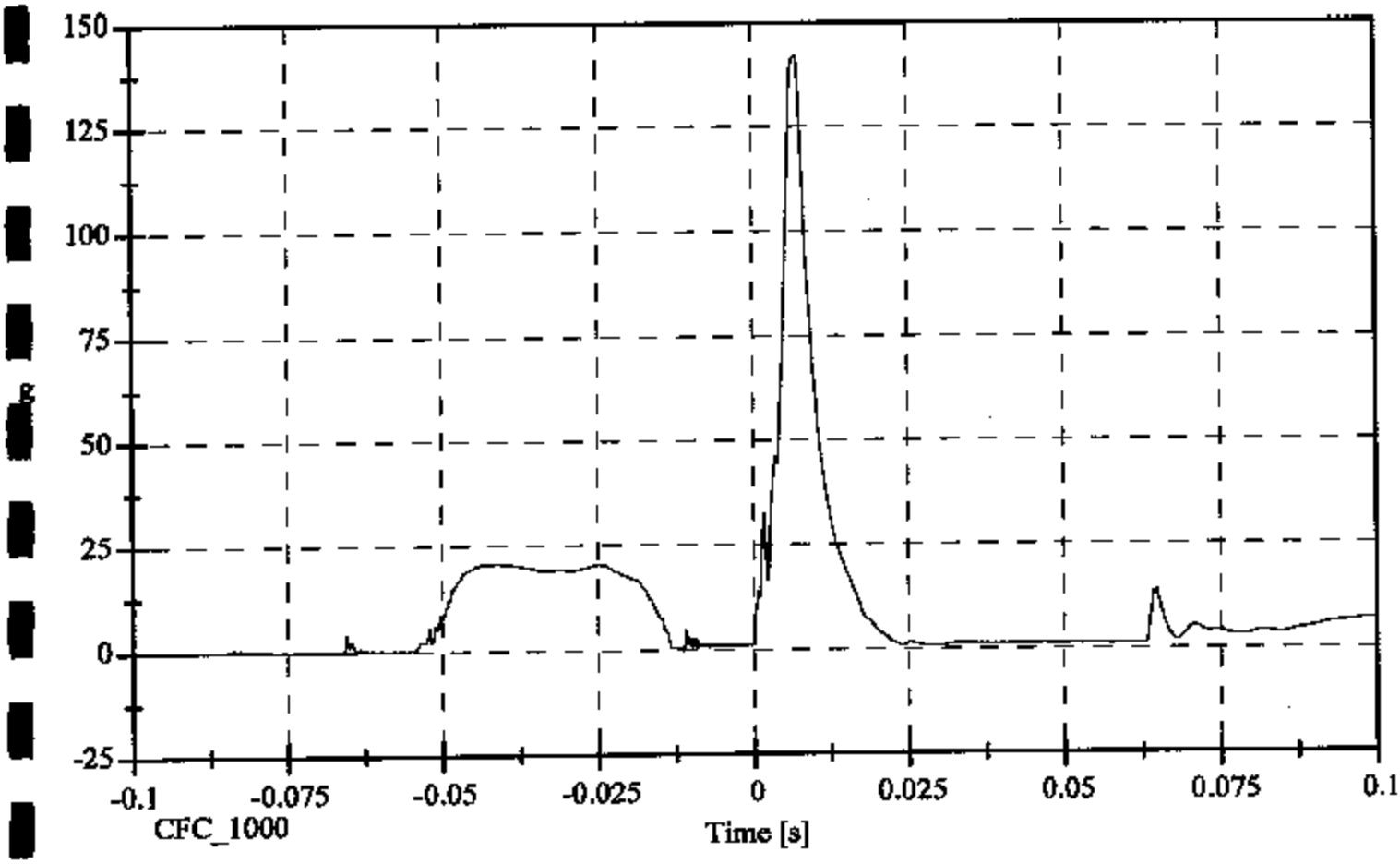
Duration: 5.3 msec

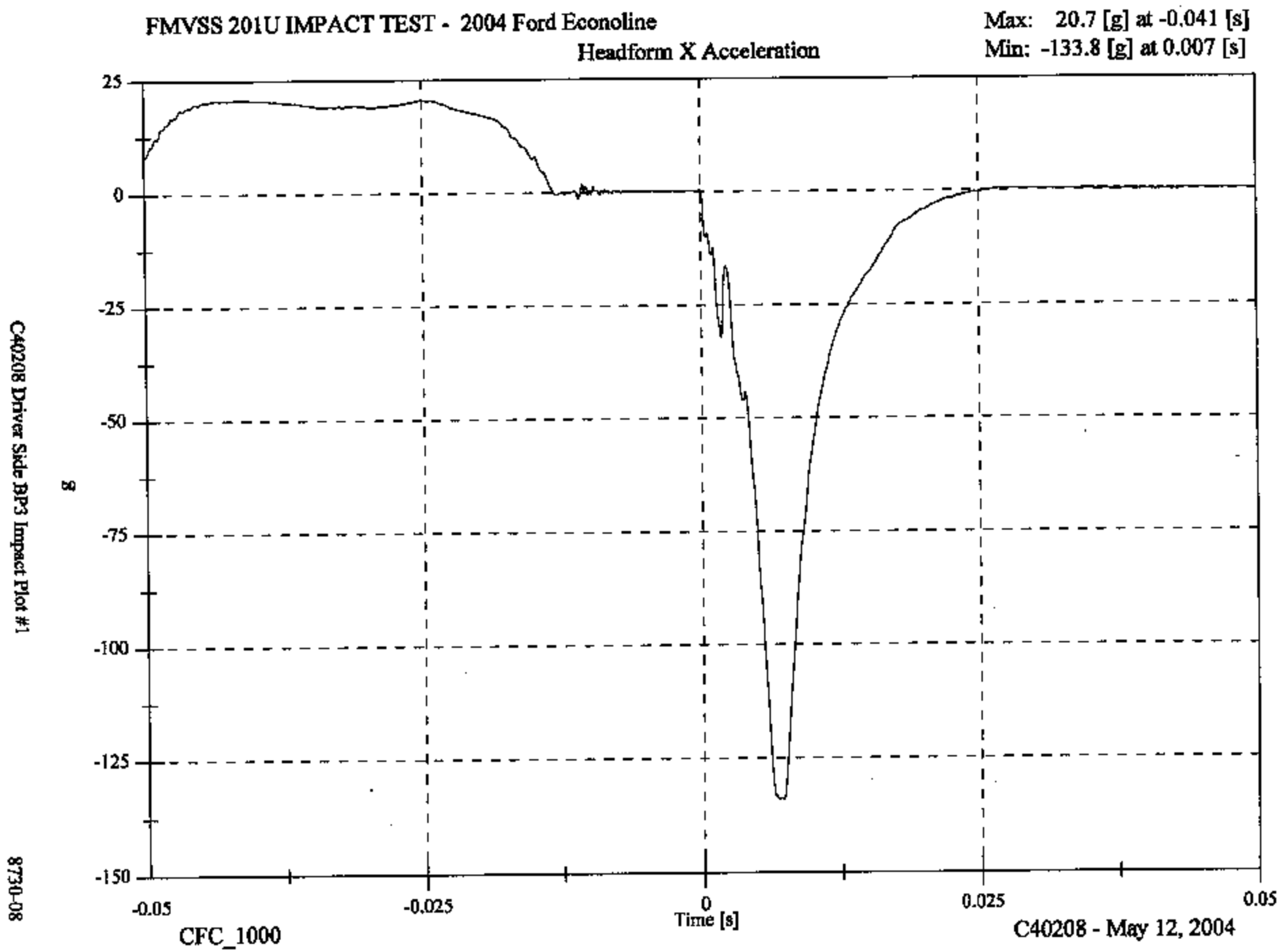
Average Acceleration: 9.3 g

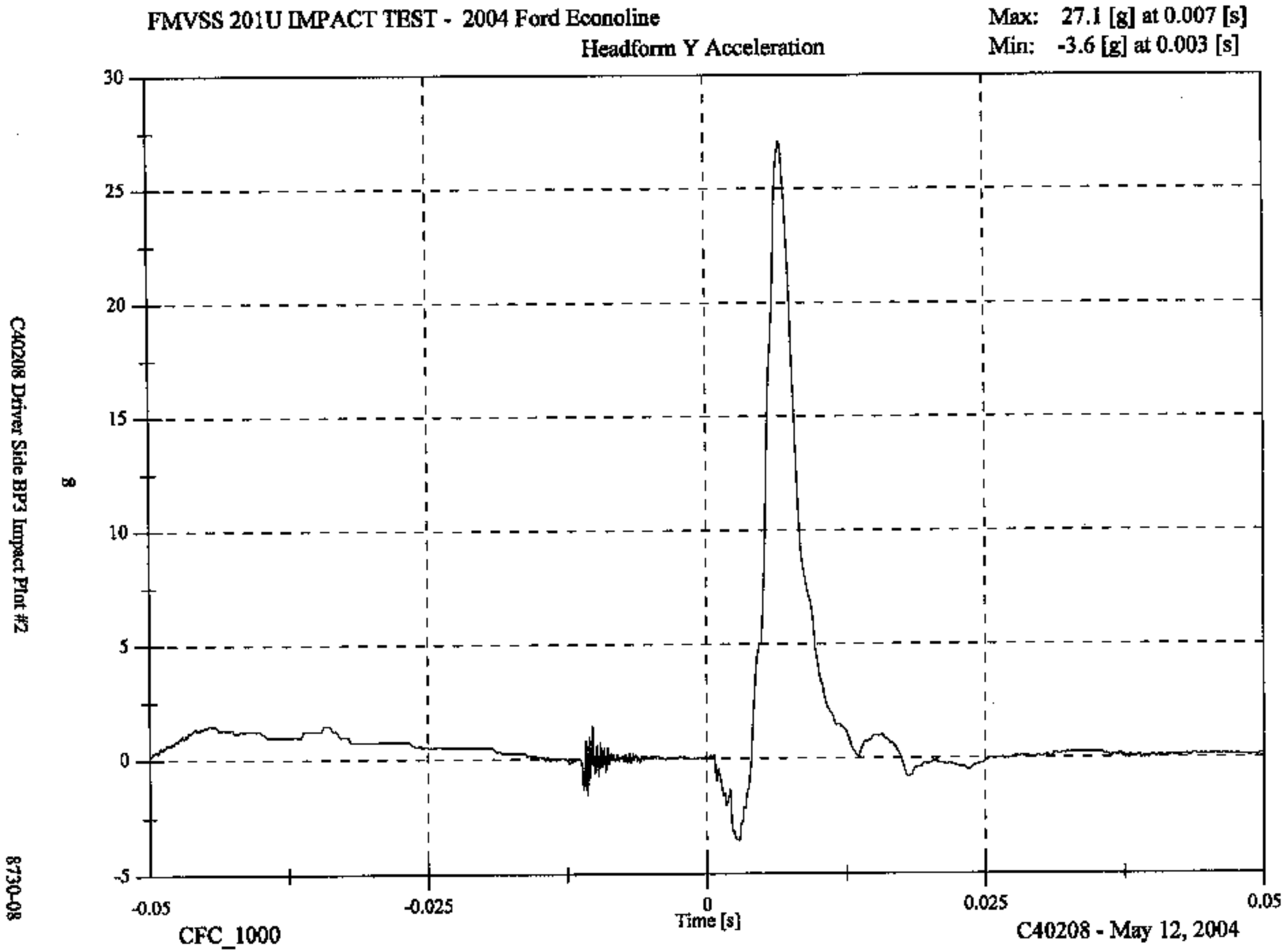
FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant

Max: 142.2 [g] at 0.007 [s]

Min: -0.0 [g] at -0.100 [s]




FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform X Acceleration
Max: 20.7 [g] at -0.041 [s]
Min: -133.8 [g] at 0.007 [s]
25
0
-25
-50
-75
-100
-125
-150
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Driver Side BP3 Impact Plot #1
8730-08
CFC_1000
C40208 - May 12, 2004

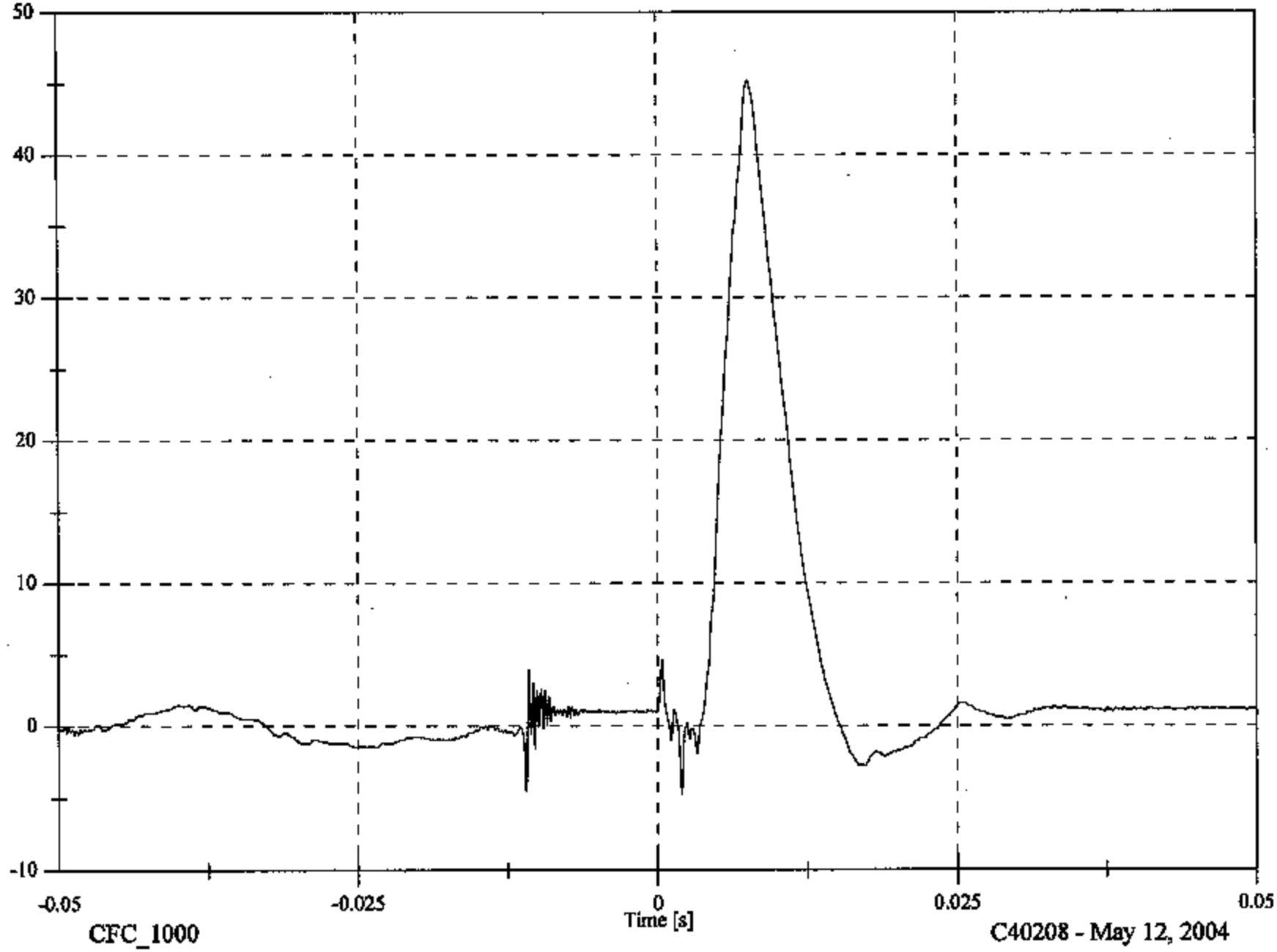

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 27.1 [g] at 0.007 [s]
Min: -3.6 [g] at 0.003 [s]
30
25
20
15
10
5
0
-5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side BP3 Impact Plot #2
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Z Acceleration

Max: 45.2 [g] at 0.008 [s]

Min: -4.7 [g] at 0.002 [s]

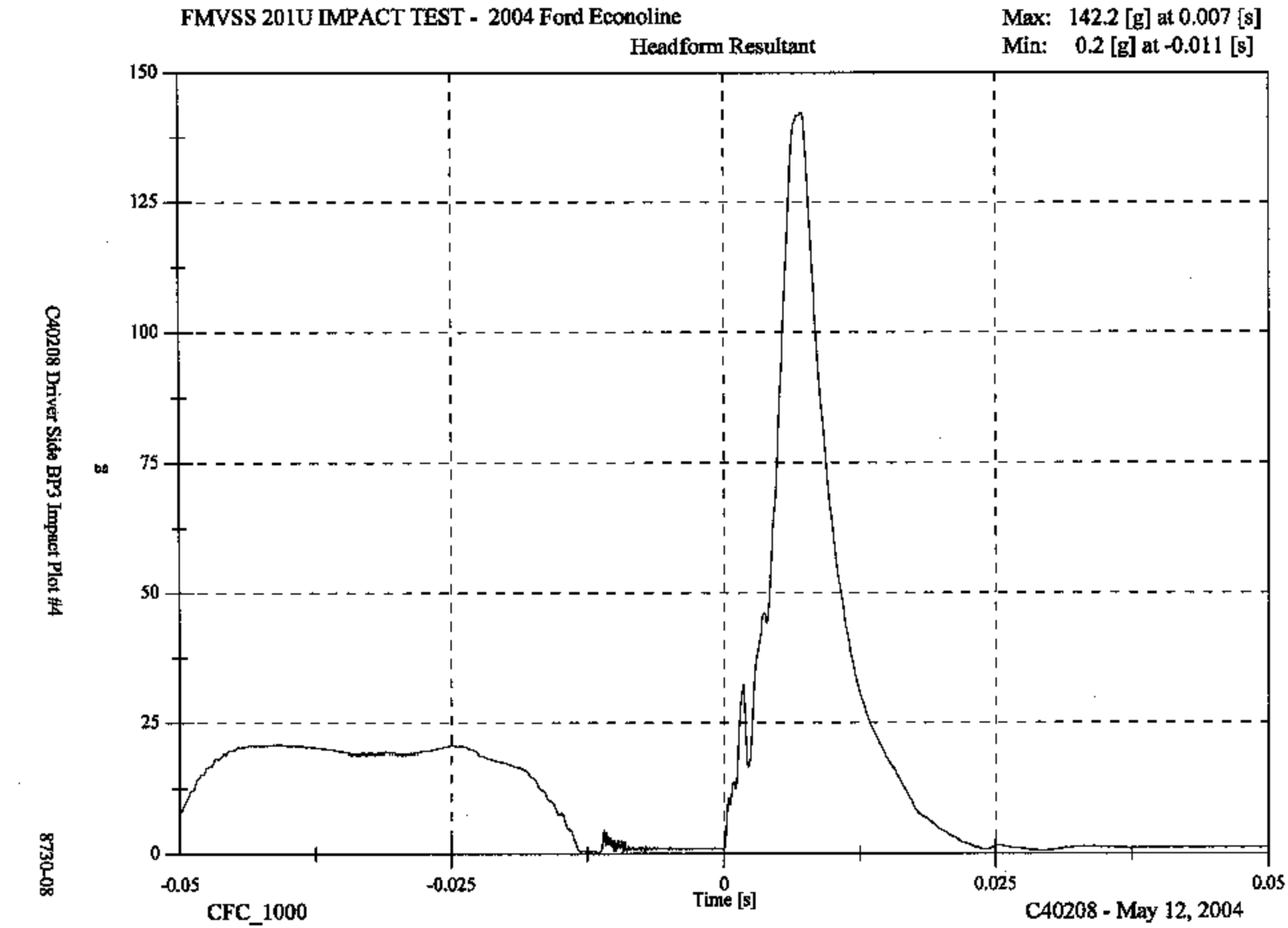



C40208 Driver Side BP3 Impact Plot #3

8730-08

CFC_1000

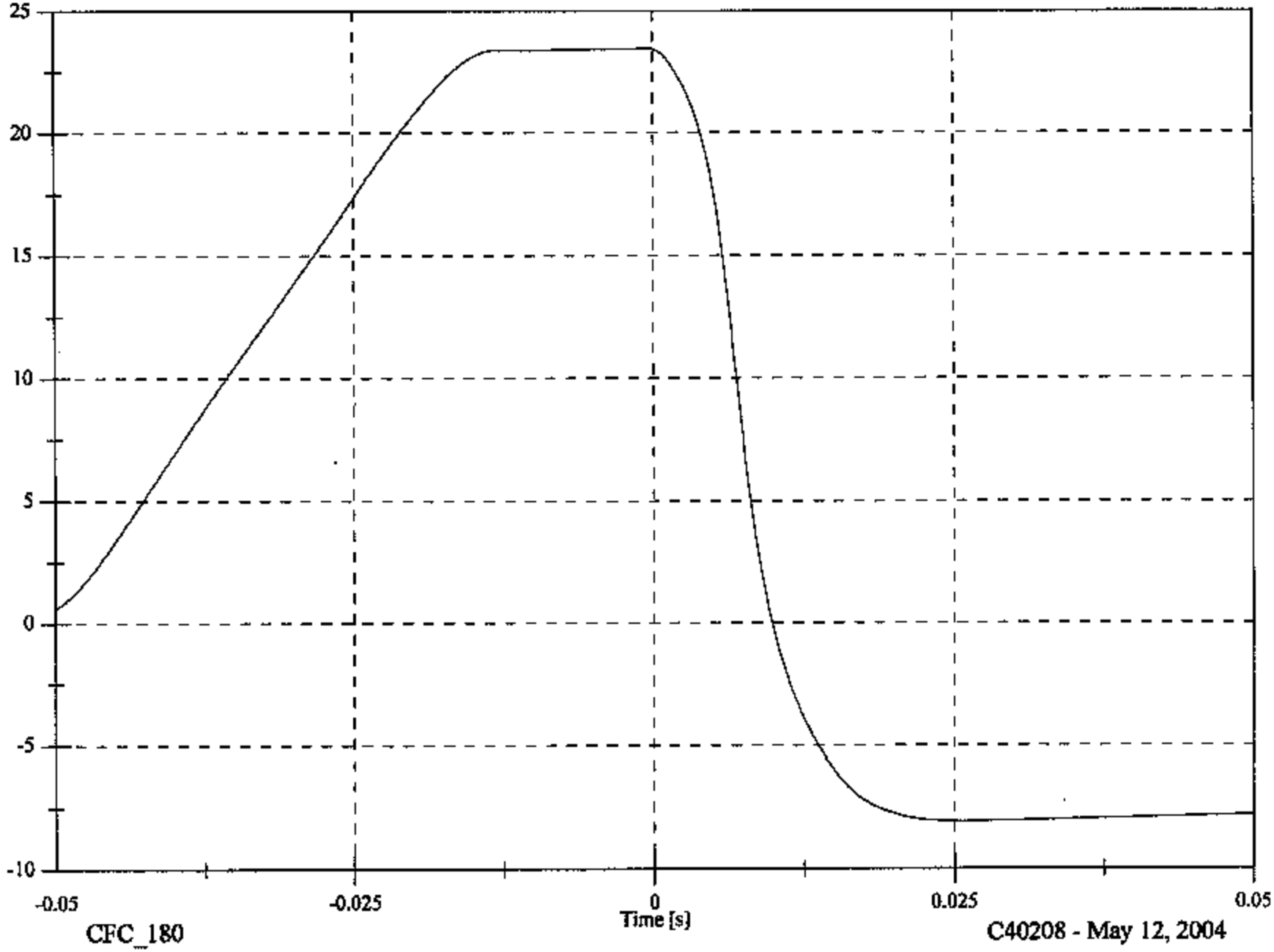
C40208 - May 12, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 142.2 [g] at 0.007 [s]
Min: 0.2 [g] at -0.011 [s]
150
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Driver Side BP3 Impact Plot #4
8730-08
CFC_1000
C40208 - May 12, 2004

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Velocity

Max: 23.4 [KPH] at -0.001 [s]
Min: -8.1 [KPH] at 0.026 [s]

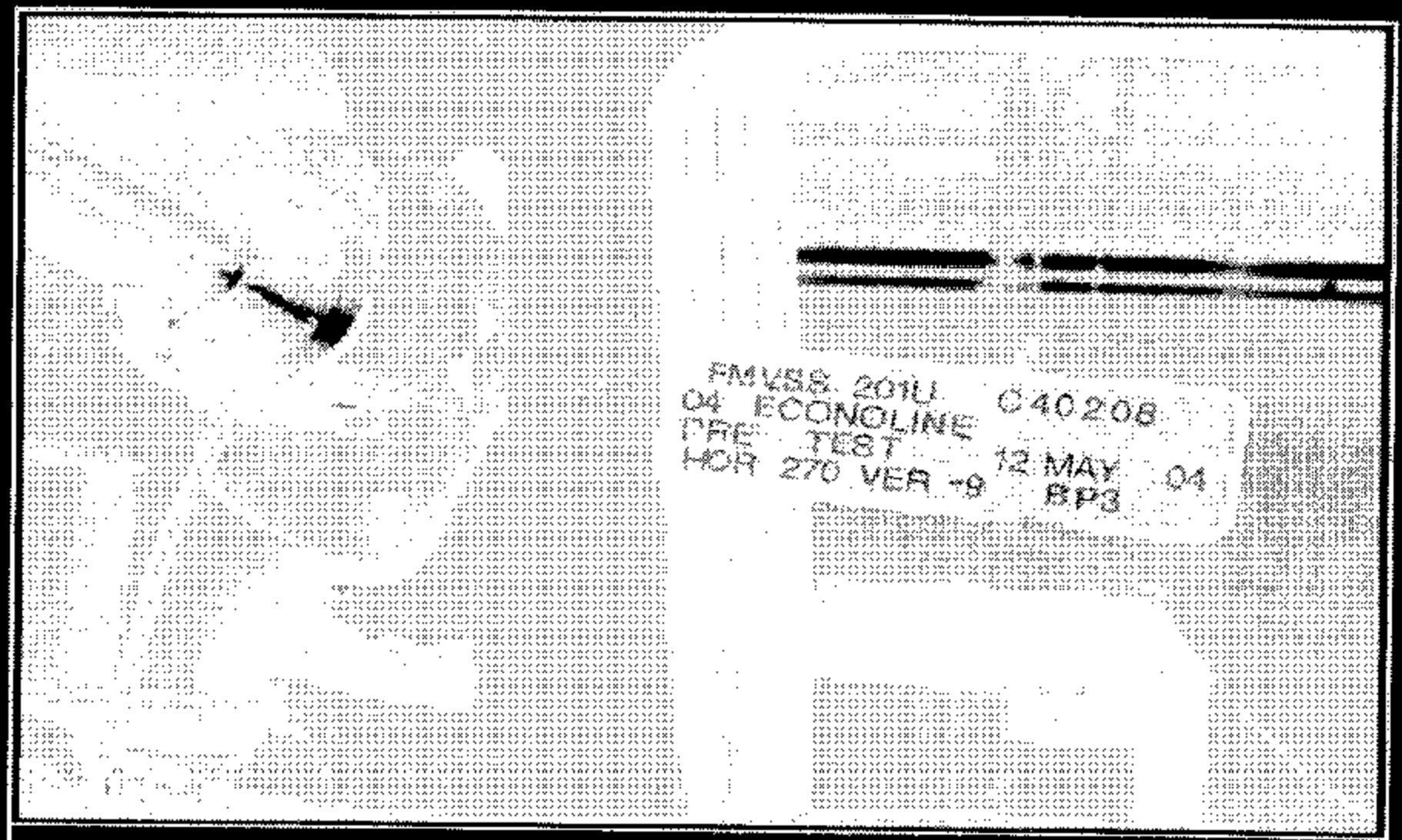



C40208 Driver Side BP3 Impact Plot #5

8730-08

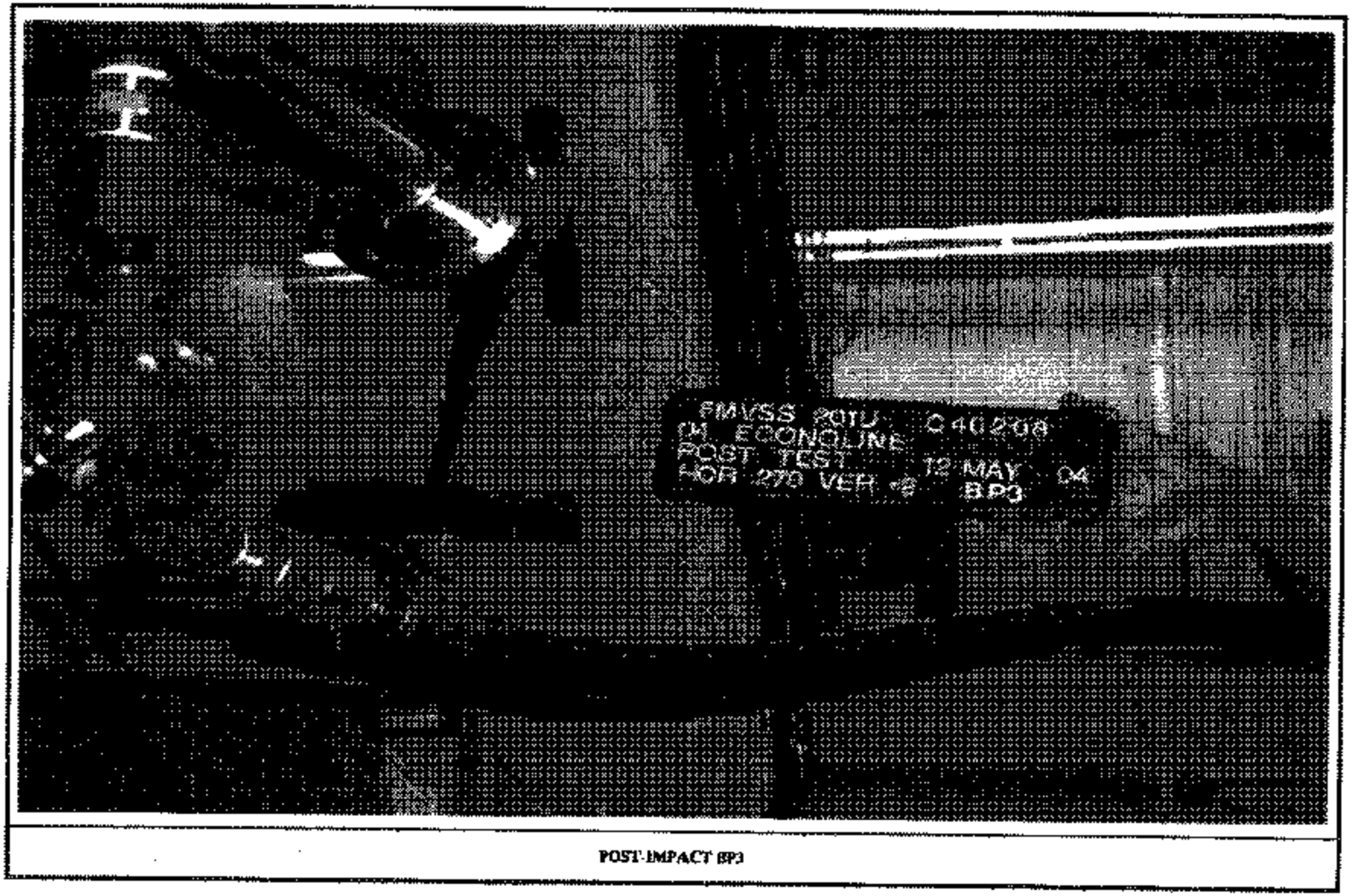
CFC_180

C40208 - May 12, 2004




PRE-IMPACT BP3

8730-08



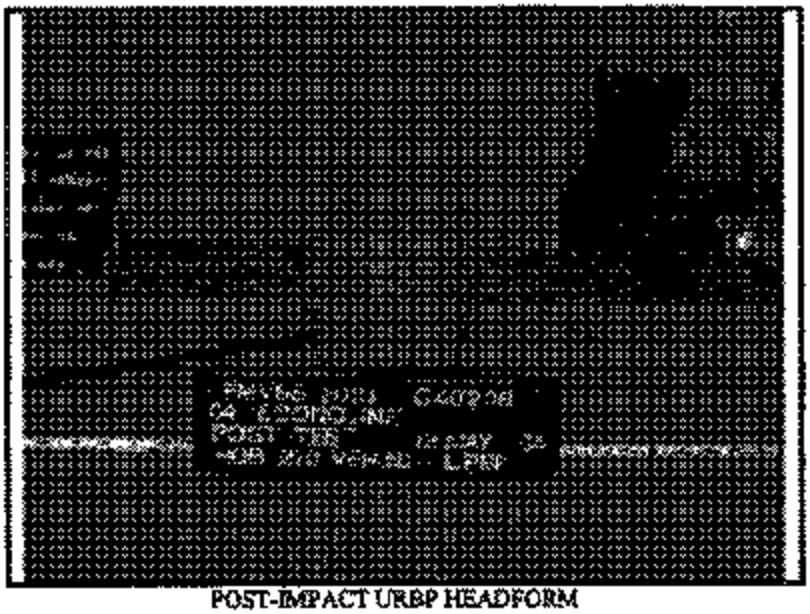

POST-IMPACT BP3

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 05 |
| Test Date: | May 12, 2004 |
| Target Location: | Driver Side Upper Roof |
| Target Code: | URBP |
| Horizontal Impact Angle: | 270° |
| Vertical Impact Angle: | 50° |
| Ambient Temperature: | 23.0°C |
| Relative Humidity: | 43.9 |
| Time of Impact: | 14:30 |
| Headform Number: | 0642 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | |
|---|---|---|---|---|
| On Centerline | 7 | - | mm right | x | mm left |
| On Centerline | 45 | | mm up | | |



POST-IMPACT URBP HEADFORM

| | |
|---|---|
| Free Motion HIC | 372.0 |
| HIC(d) | 447.0 |
| Impact Velocity (kph) | 23.63 |
| HIC T1 (msec) | 2.4 |
| HIC T2 (msec) | 14.4 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - URBP

FMH Headform 0642

Test Date: May 12, 2004

Location: URBP

Work File: URBP

----------TEST RESULTS----------

Lab Temperature: 23.0 C

Lab Humidity: 43.9 %

Velocity at Impact: 23.63 KPH

Free Flight Distance: 218.63 mm

HICd: 447.0

HIC (36ms): 372.0

t1: 2.4 msec

t2: 14.4 msec

Duration: 12.0 msec

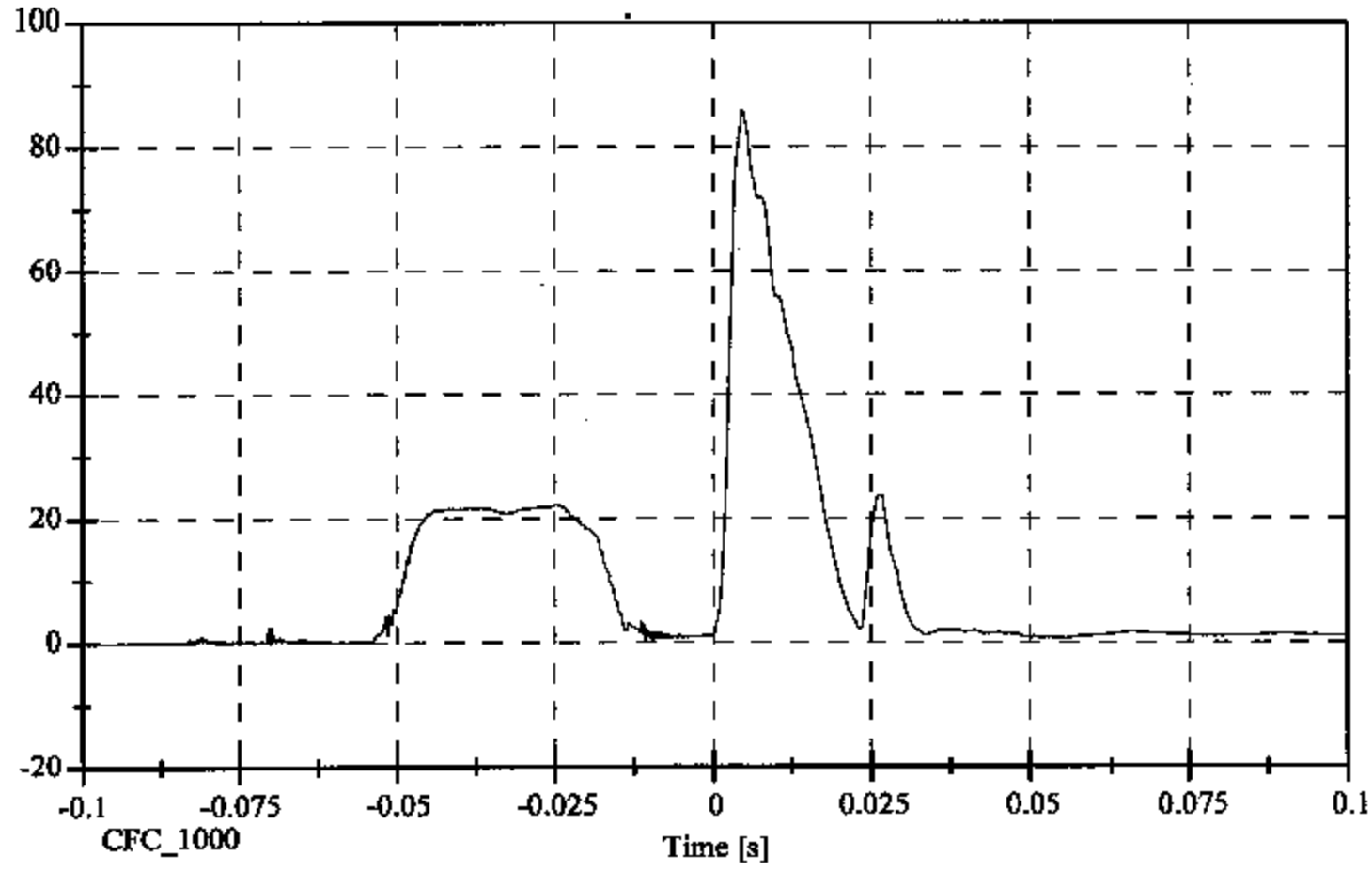
Average Acceleration: 9.2 g

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Resultant

Max: 85.7 [g] at 0.005 [s]

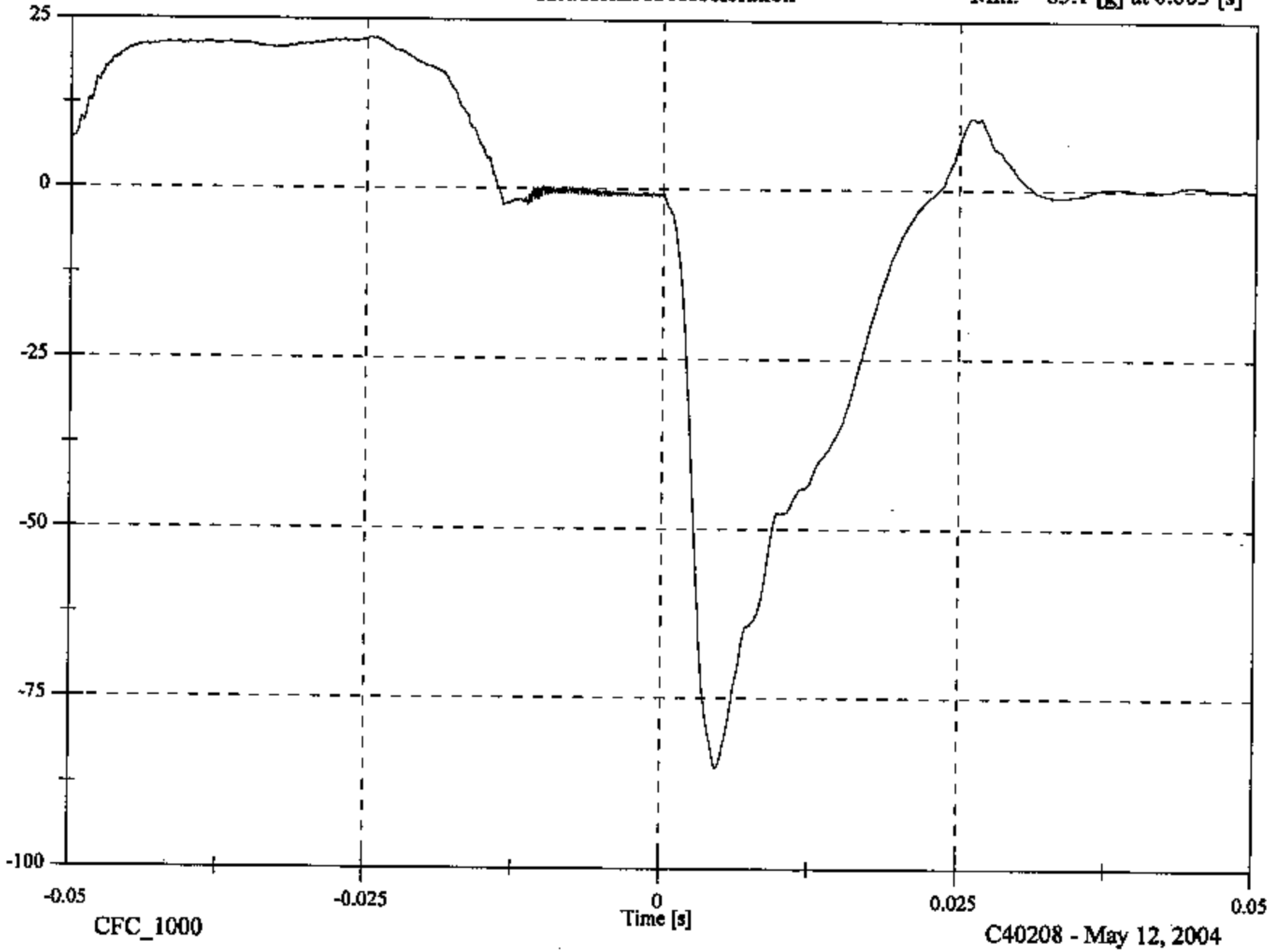
Min: -0.0 [g] at -0.099 [s]



FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform X Acceleration

Max: 22.2 [g] at -0.025 [s]
Min: -85.1 [g] at 0.005 [s]

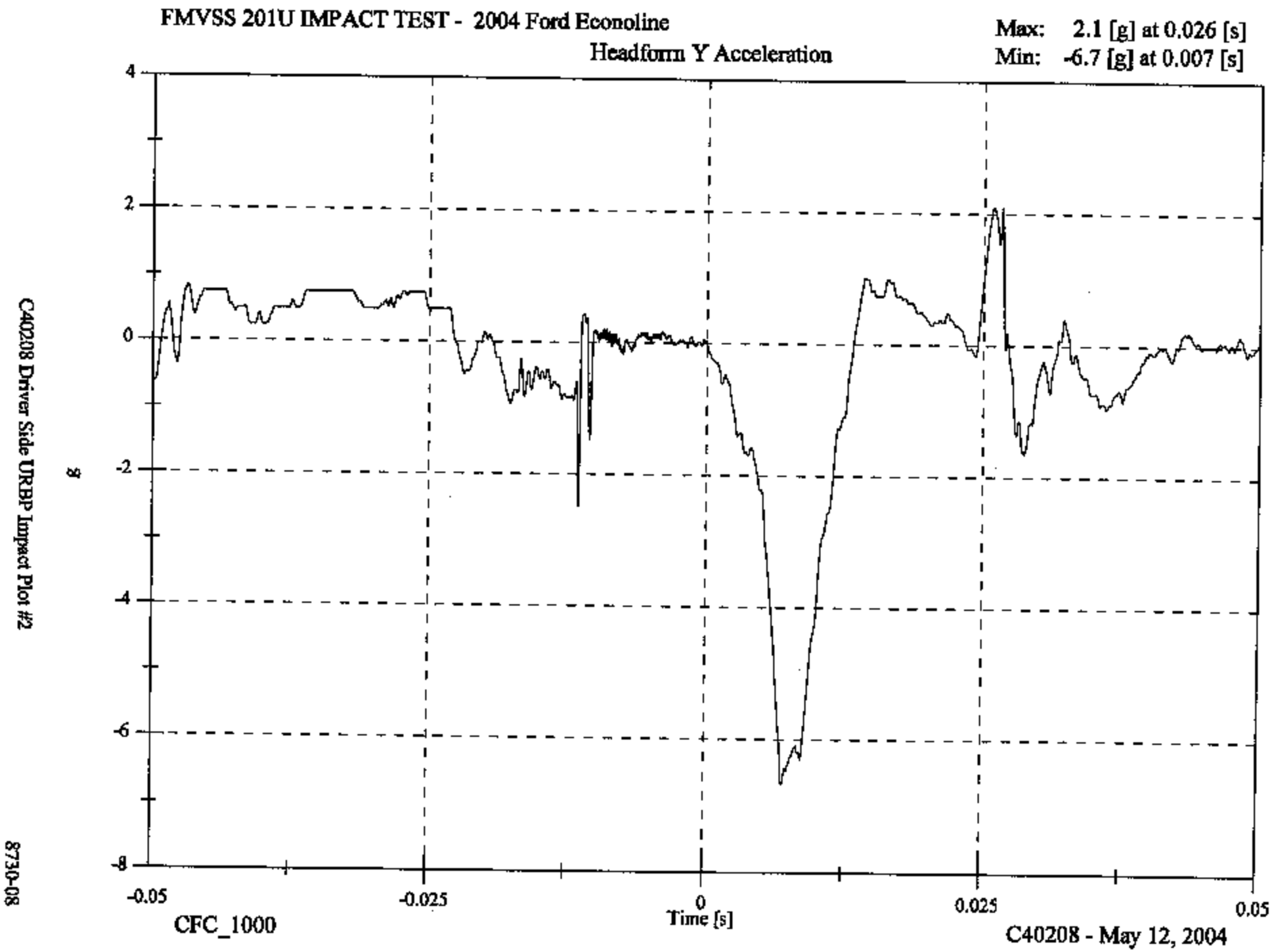


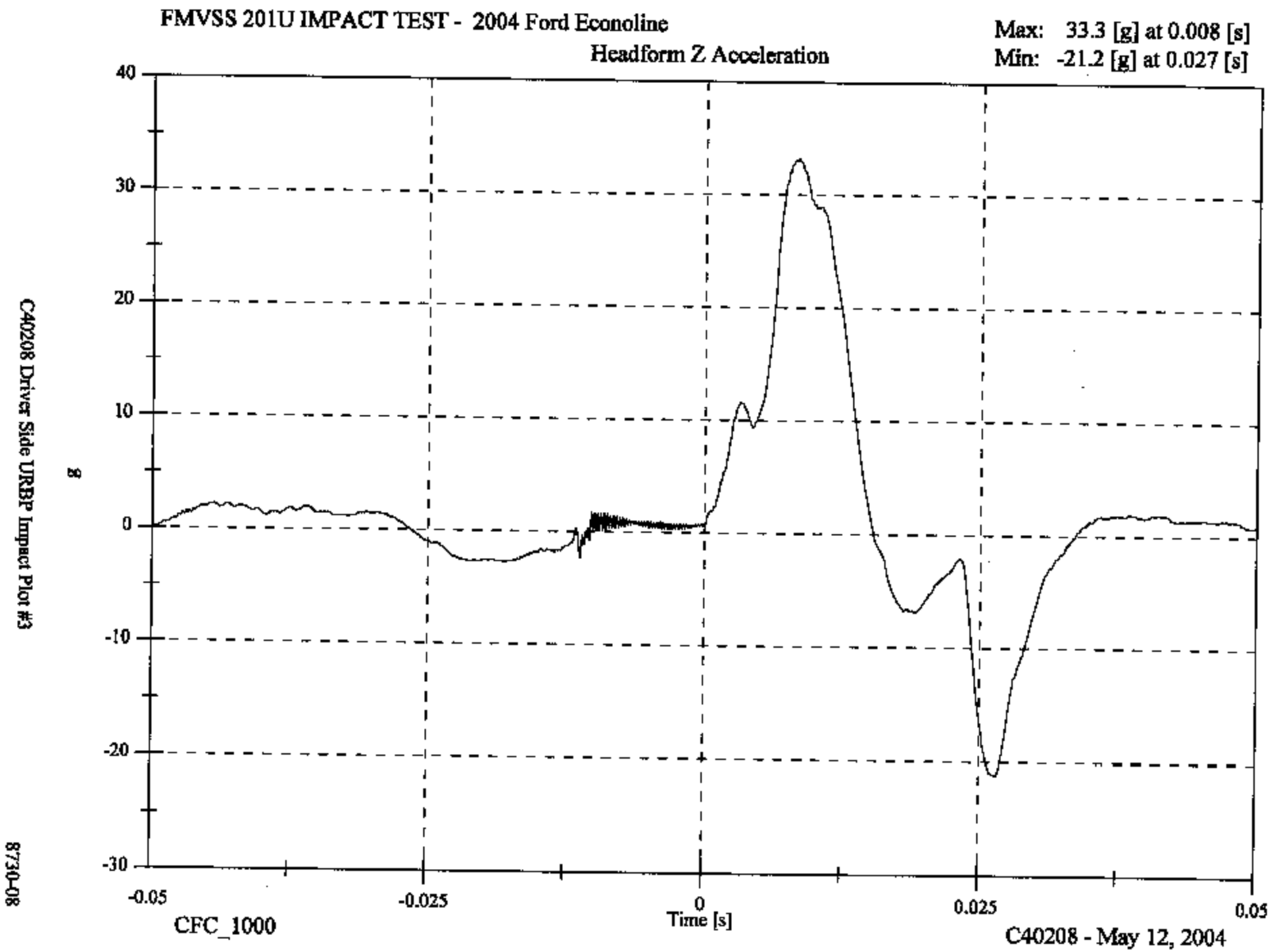

C40208 Driver Side URBP Impact Plot #1

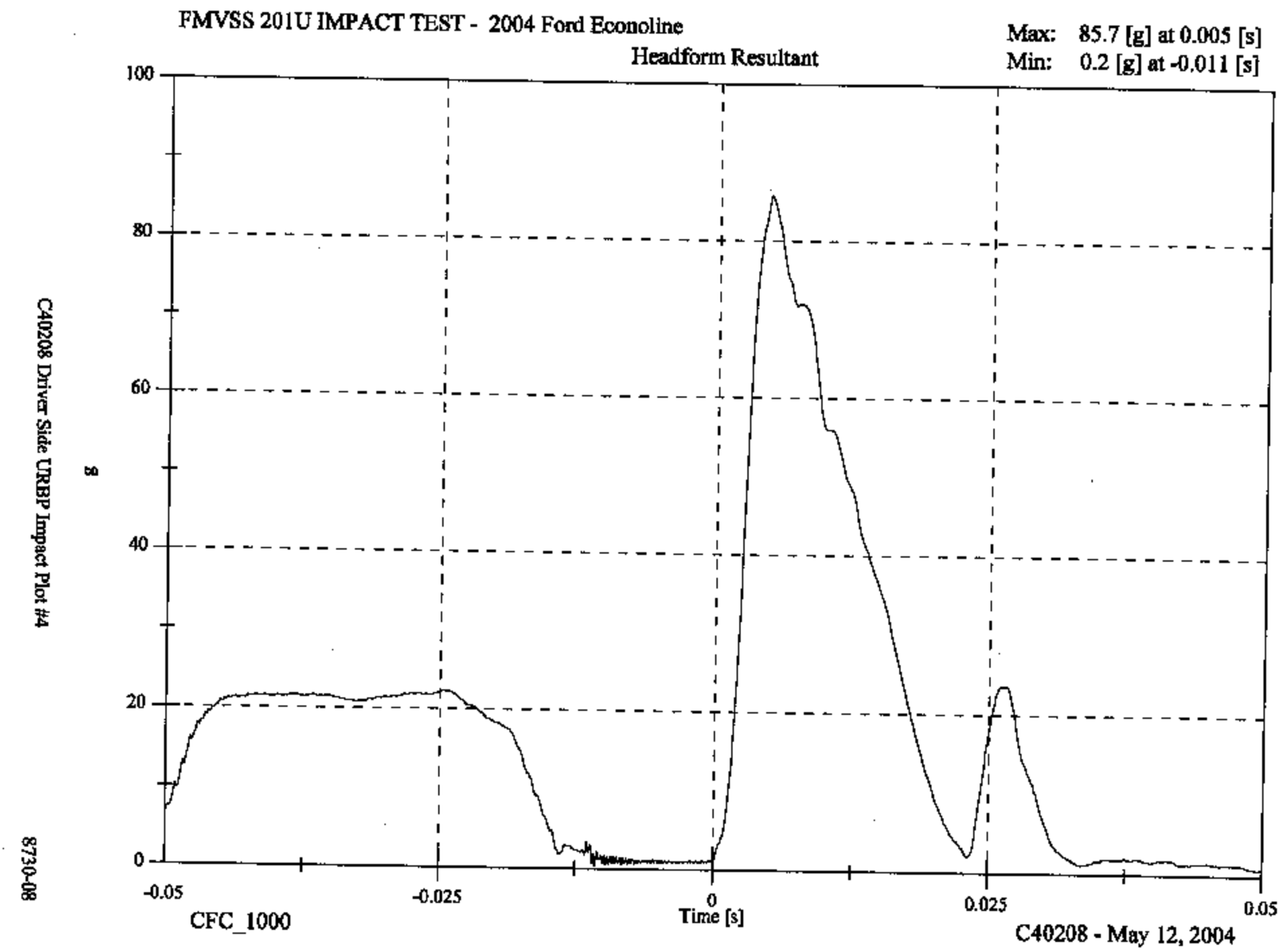
8730-08

CFC_1000

C40208 - May 12, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 2.1 [g] at 0.026 [s]
Min: -6.7 [g] at 0.007 [s]
C40208 Driver Side URBP Impact Plot #2
8730-08
g
4
2
0
-2
-4
-6
-8
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004

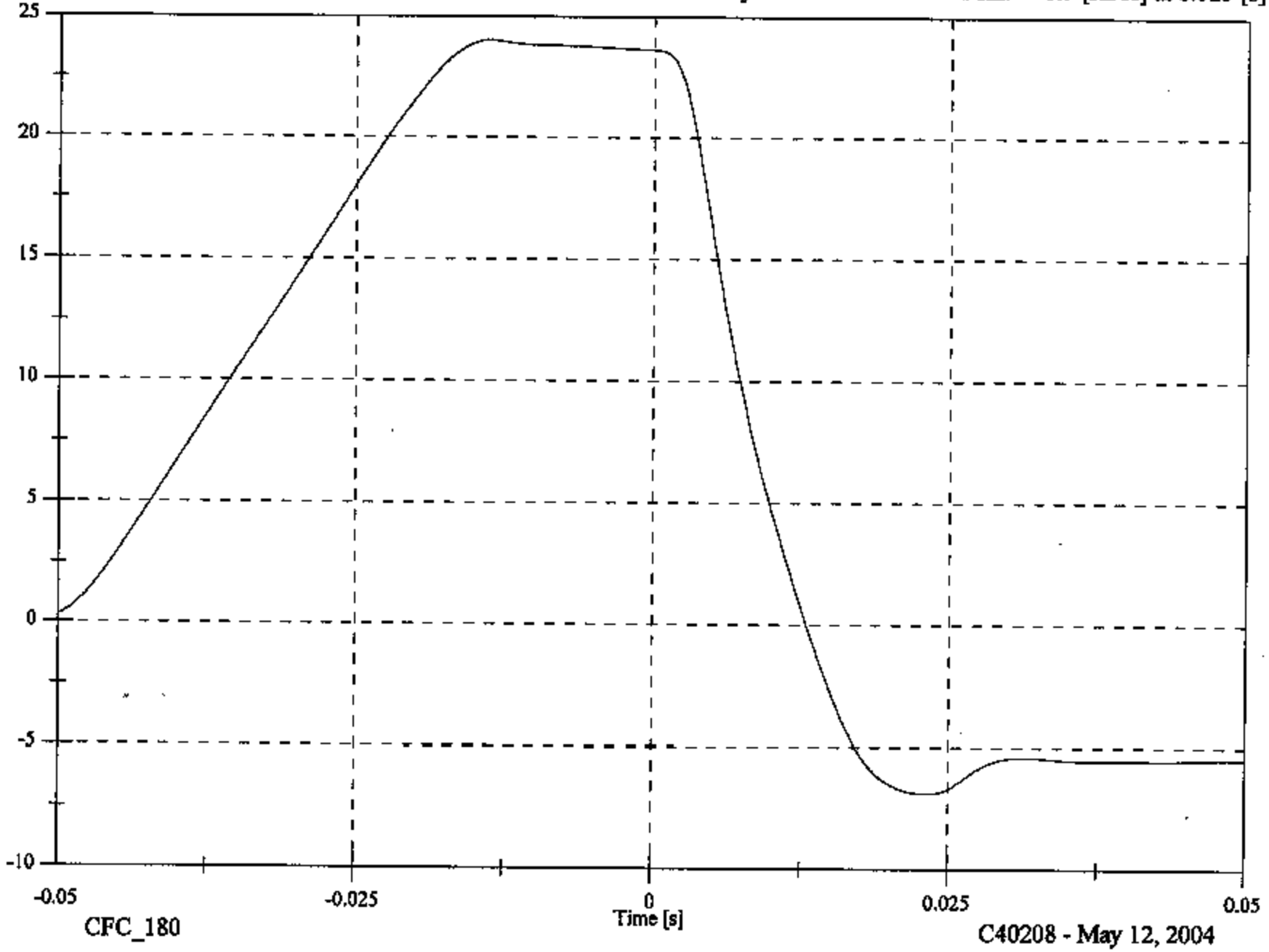

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 33.3 [g] at 0.008 [s]
Min: -21.2 [g] at 0.027 [s]
40
30
20
10
0
-10
-20
-30
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side URBP Impact Plot #3
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 85.7 [g] at 0.005 [s]
Min: 0.2 [g] at -0.011 [s]
100
80
60
40
20
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side URBP Impact Plot #4
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Velocity

Max: 24.0 [KPH] at -0.014 [s]
Min: -6.9 [KPH] at 0.023 [s]




C40208 Driver Side URBP Impact Plot #5

8730-08

CFC_180

C40208 - May 12, 2004


PRE-IMPACT URBP

8730-08

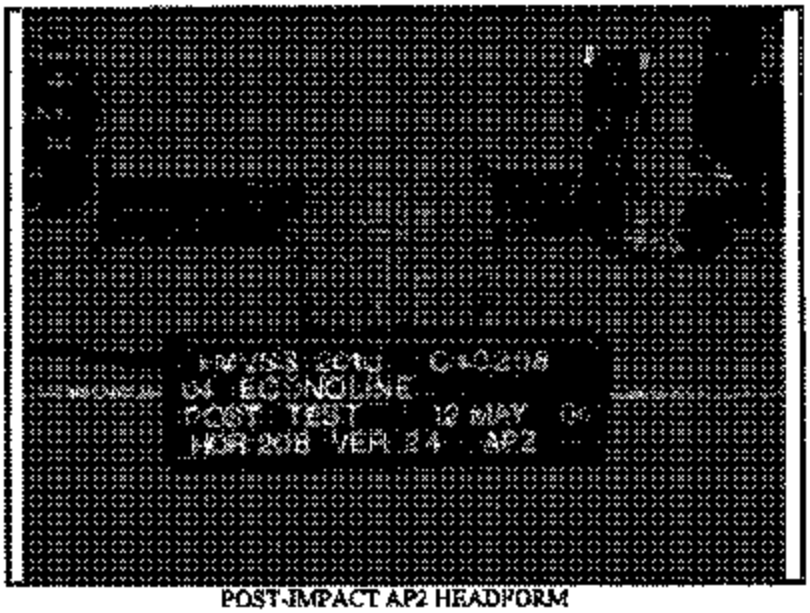

POST-IMPACT URBP

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 06 |
| Test Date: | May 12, 2004 |
| Target Location: | Driver Side A-Pillar |
| Target Code: | AP2 |
| Horizontal Impact Angle: | 208° |
| Vertical Impact Angle: | 24° |
| Ambient Temperature: | 23.4°C |
| Relative Humidity: | 41.4 |
| Time of Impact: | 15:00 |
| Headform Number: | 1255 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 6 | x | mm right | - | mm left |
| On Centerline | 26 | | mm up | | |




POST-IMPACT AP2 HEADFORM

| | |
|---|---|
| Free Motion HIC | 519.9 |
| HIC(d) | 358.6 |
| Impact Velocity (kph) | 23.59 |
| HIC T1 (msec) | 1.8 |
| HIC T2 (msec) | 10.0 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - AP2

FMH Headform 1255

Test Date: May 12, 2004

Location: AP2

Work File: AP2

----------TEST RESULTS----------

Lab Temperature: 23.4 C

Lab Humidity: 41.4 %

Velocity at Impact: 23.59 KPH

Free Flight Distance: 218.17 mm

HICd: 558.6

HIC (36ms): 519.9

t1: 1.8 msec

t2: 10.0 msec

Duration: 8.2 msec

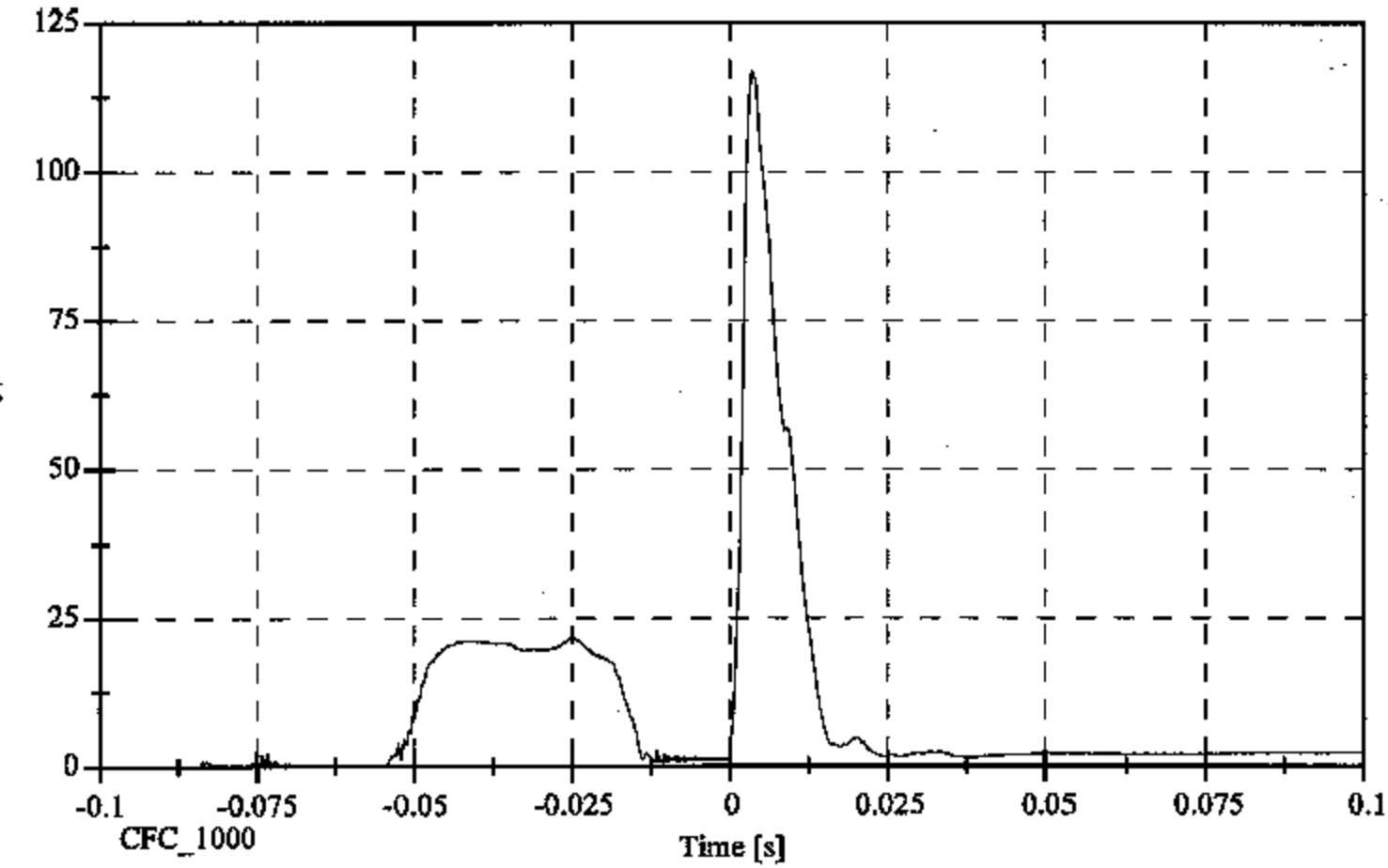
Average Acceleration: 8.7 g

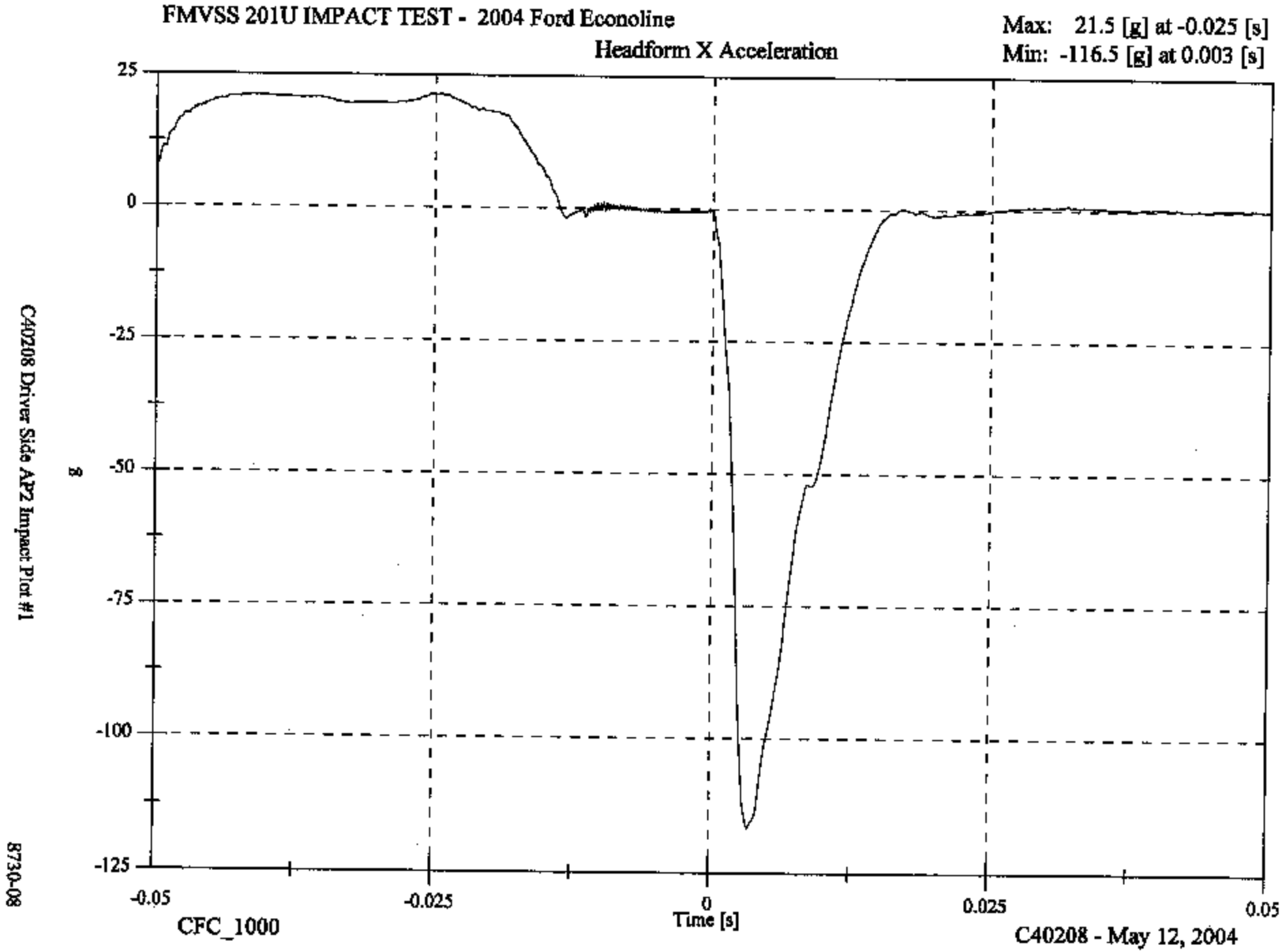
FMVSS 201U IMPACT TEST - 2004 Ford Econoline

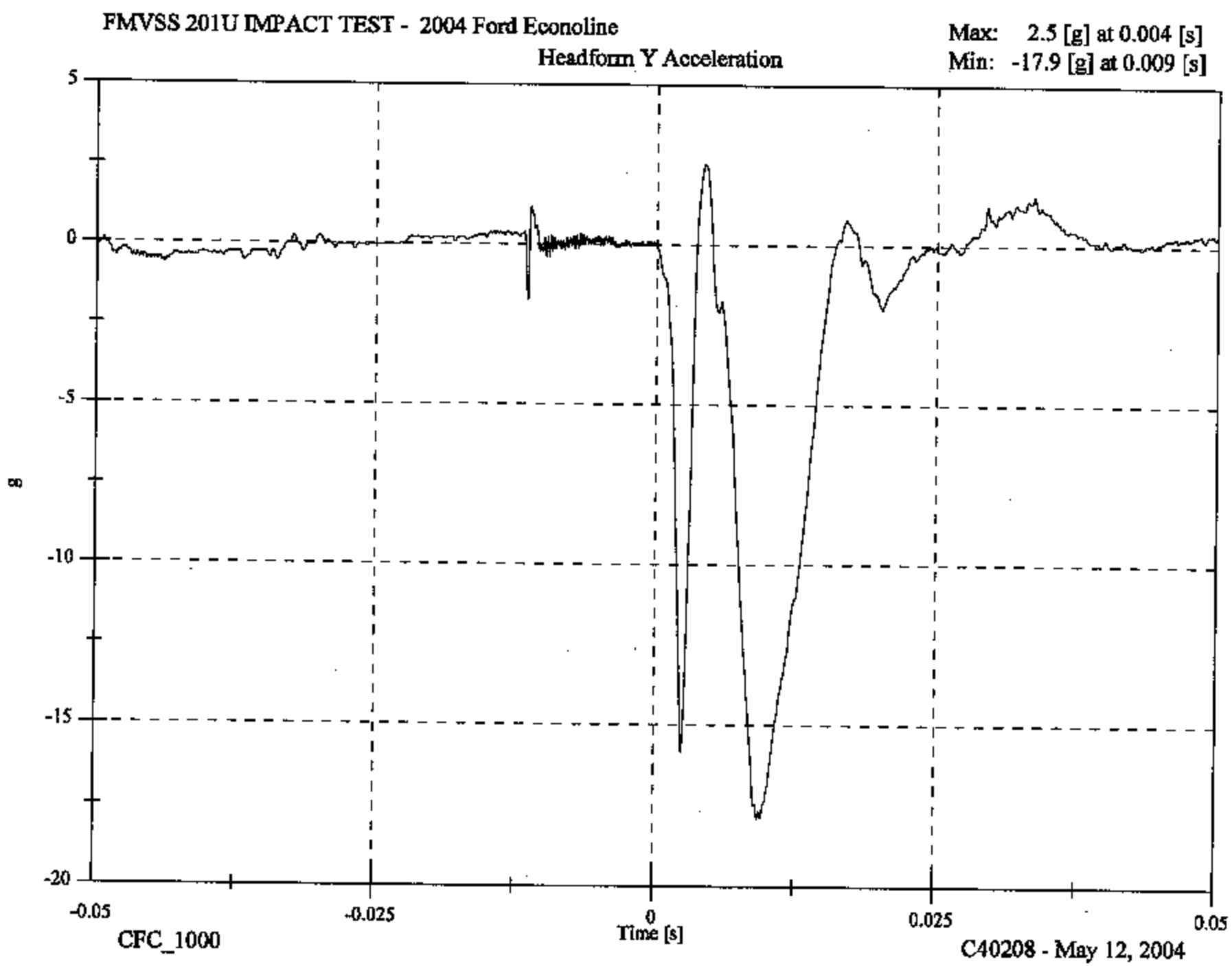
Headform Resultant

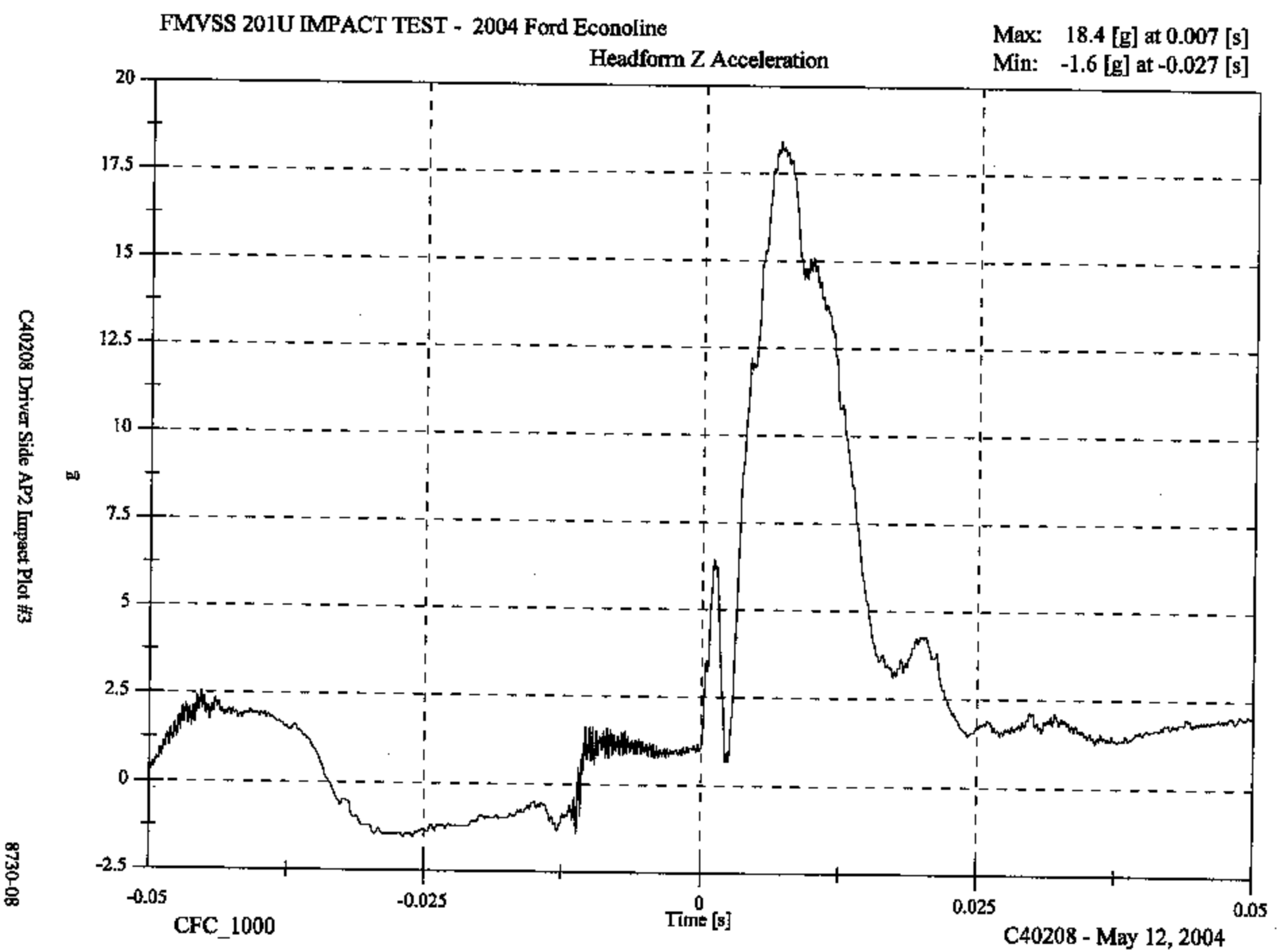
Max: 116.8 [g] at 0.003 [s]

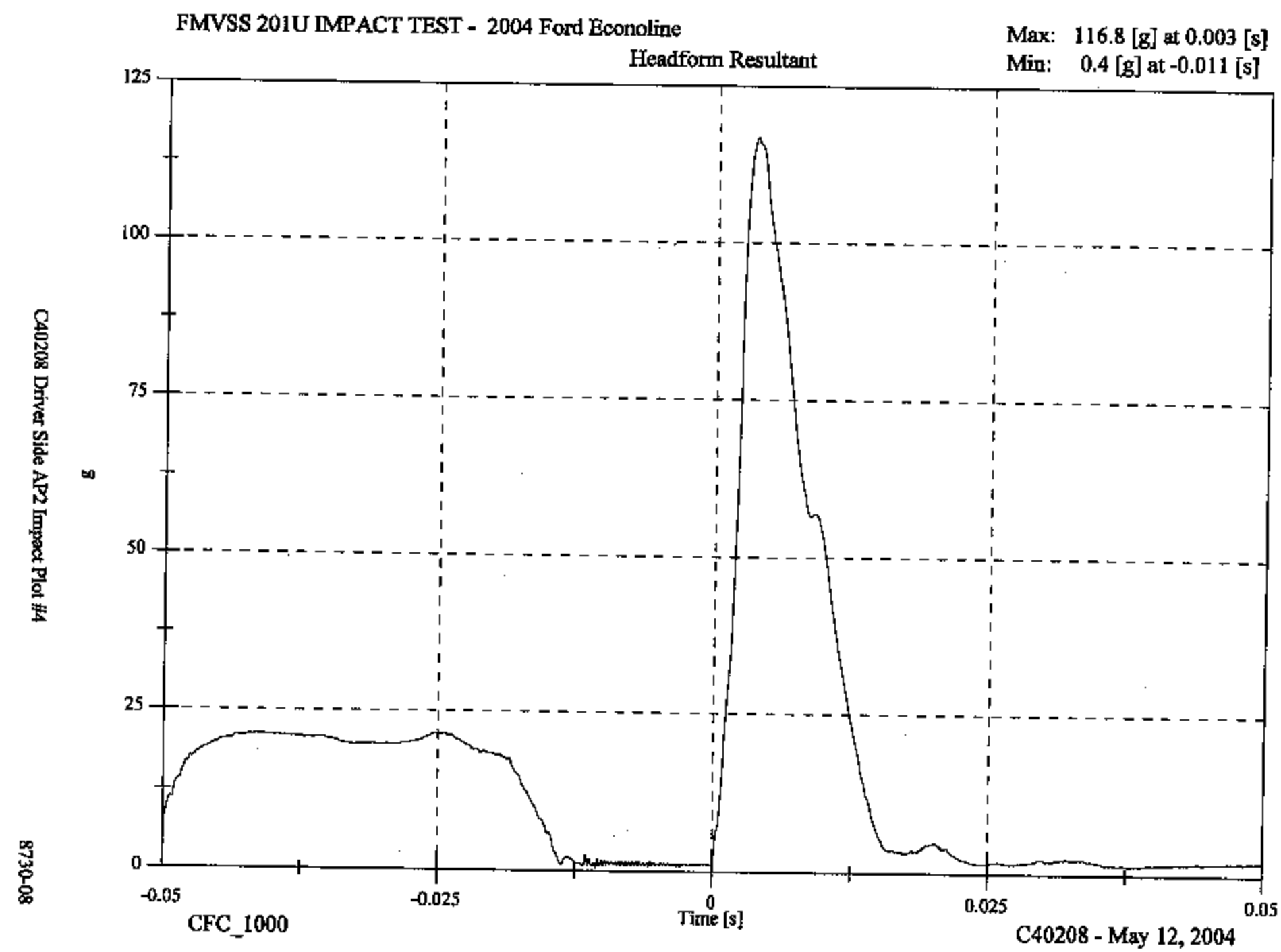
Min: 0.0 [g] at -0.058 [s]




FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform X Acceleration
Max: 21.5 [g] at -0.025 [s]
Min: -116.5 [g] at 0.003 [s]
25
0
-25
-50
-75
-100
-125
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side AP2 Impact Plot #1
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 2.5 [g] at 0.004 [s]
Min: -17.9 [g] at 0.009 [s]
5
0
-5
-10
-15
-20
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side AP2 Impact Plot #2
8730-08

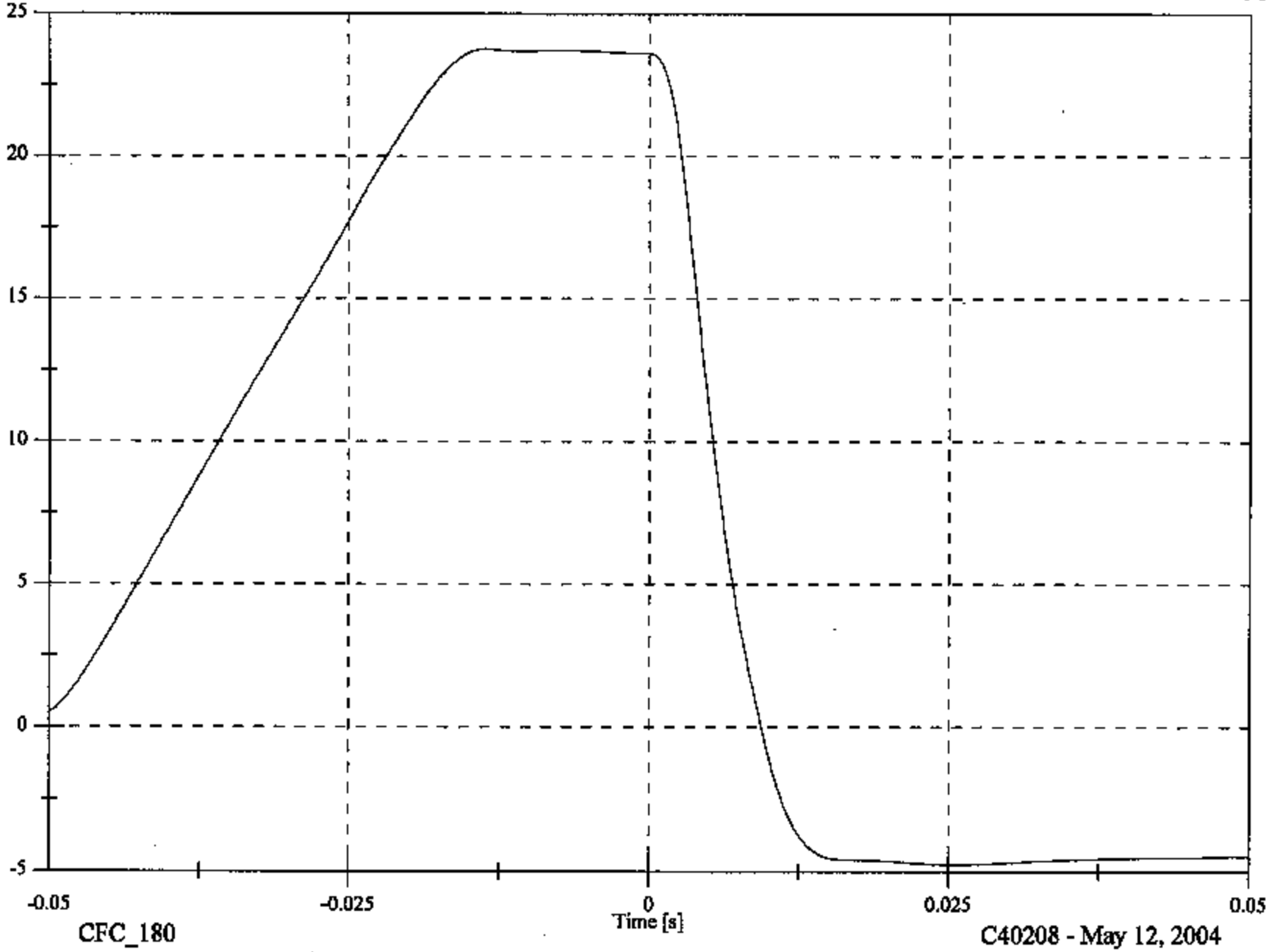

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 18.4 [g] at 0.007 [s]
Min: -1.6 [g] at -0.027 [s]
20
17.5
15
12.5
10
7.5
5
2.5
0
-2.5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side AP2 Impact Plot #3
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 116.8 [g] at 0.003 [s]
Min: 0.4 [g] at -0.011 [s]
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side AP2 Impact Plot #4
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Velocity

Max: 23.8 [KPH] at -0.014 [s]
Min: -4.8 [KPH] at 0.025 [s]




C40208 Driver Side AP2 Impact Plot #5

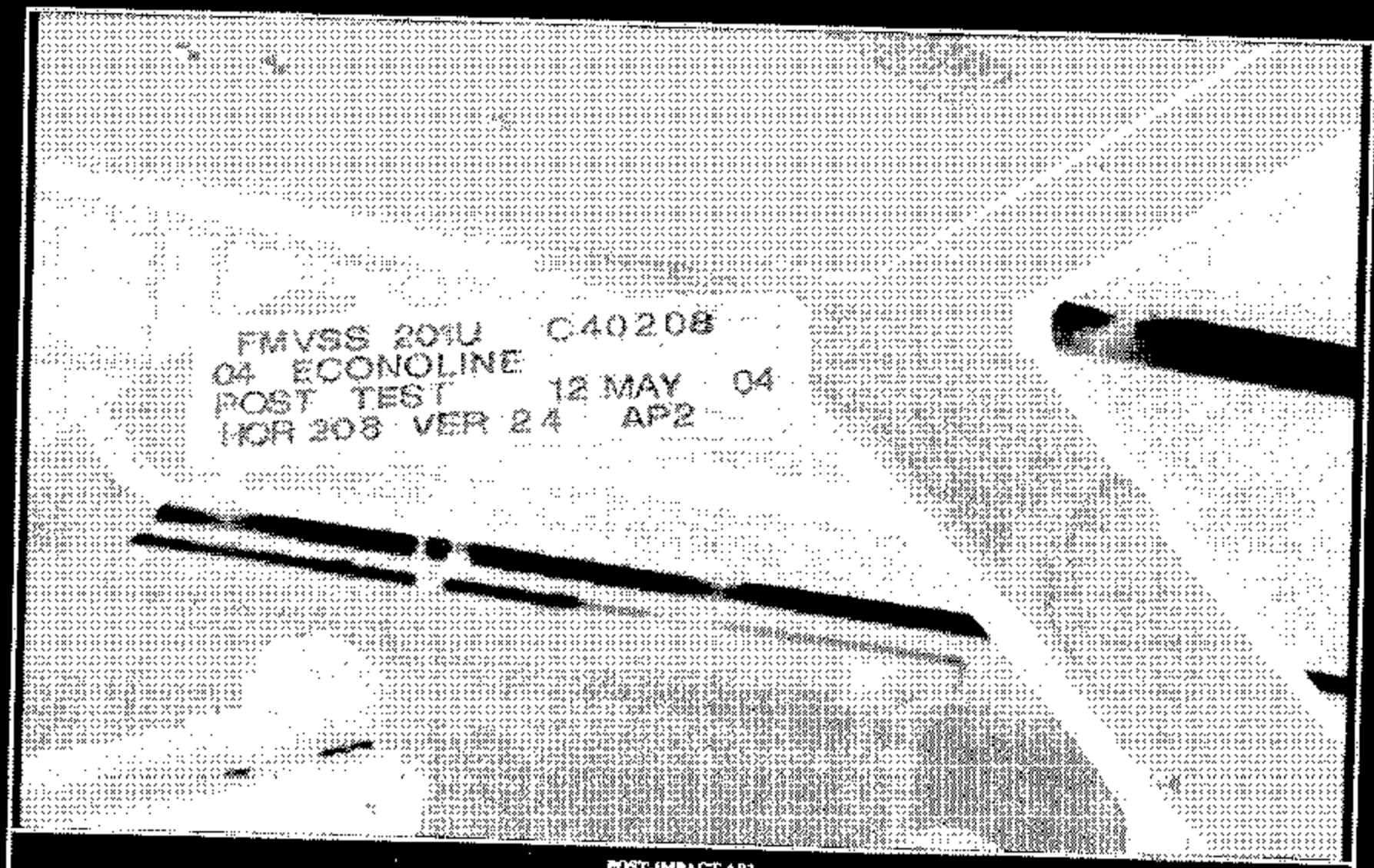
8730-08

CFC_180

C40208 - May 12, 2004

PRE-IMPACT AP2

8730-08




POST-IMPACT AP2

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 07 |
| Test Date: | May 12, 2004 |
| Target Location: | Driver Side Rail |
| Target Code: | SR1 |
| Horizontal Impact Angle: | 270° |
| Vertical Impact Angle: | 31° |
| Ambient Temperature: | 23.5°C |
| Relative Humidity: | 41.3 |
| Time of Impact: | 15:30 |
| Headform Number: | 0355 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 21 | - | mm right | x | mm left |
| On Centerline | 40 | | mm up | | |

POST-IMPACT SR1 HEADFORM

| | |
|---|---|
| Free Motion HIC | 513.4 |
| HIC(d) | 553.7 |
| Impact Velocity (kph) | 23.75 |
| HIC T1 (msec) | 1.4 |
| HIC T2 (msec) | 9.7 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - SR1

FMH Headform 0355

Test Date: May 12, 2004

Location: SR1

Work File: SR1

## TEST RESULTS

Lab Temperature: 23.5 C

Lab Humidity: 41.3 %

Velocity at Impact: 23.75 KPH

Free Flight Distance: 224.39 mm

HICd: 553.7

HIC (36ms): 513.4

t1: 1.4 msec

t2: 9.7 msec

Duration: 8.3 msec

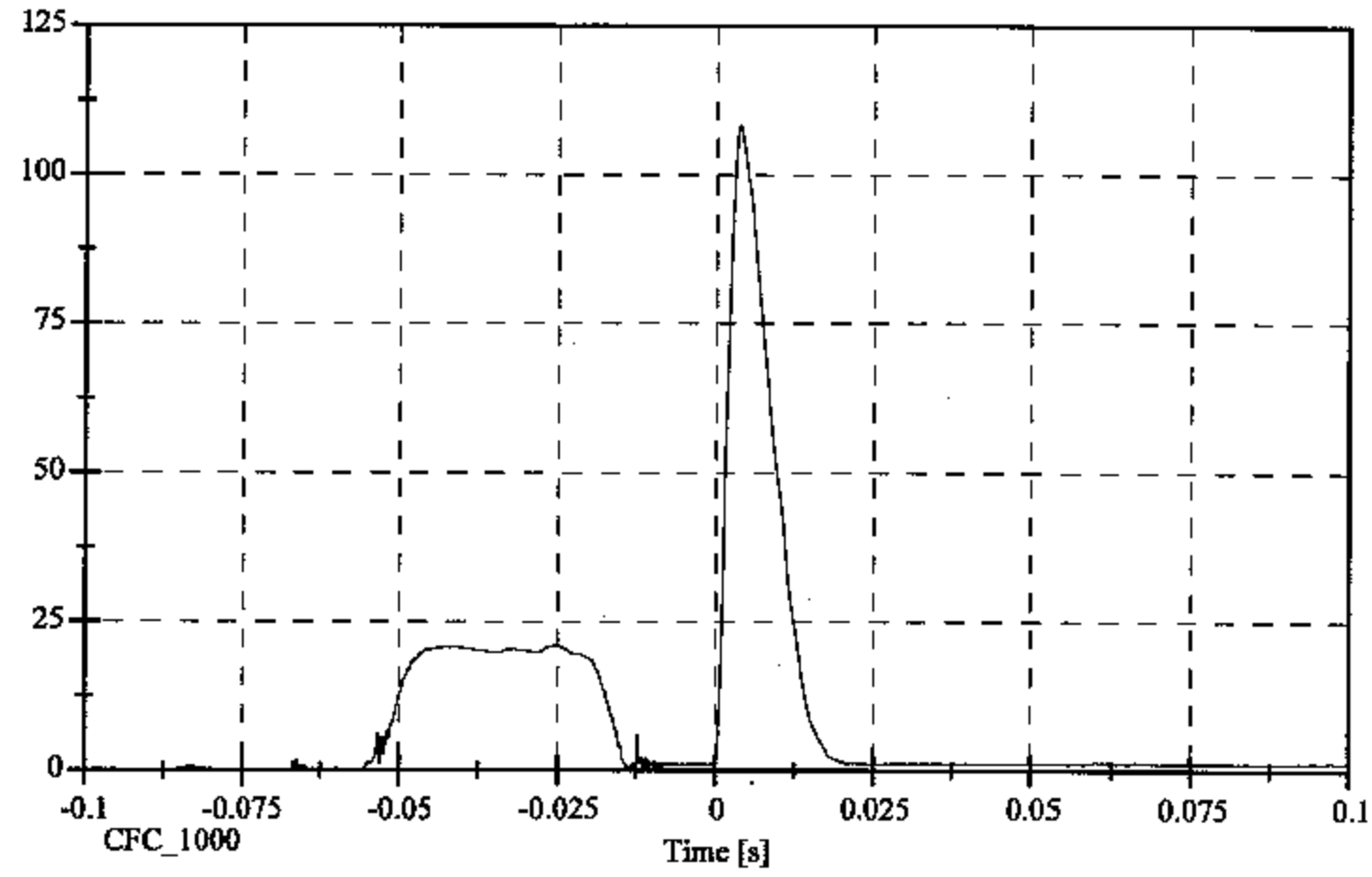
Average Acceleration: 8.4 g

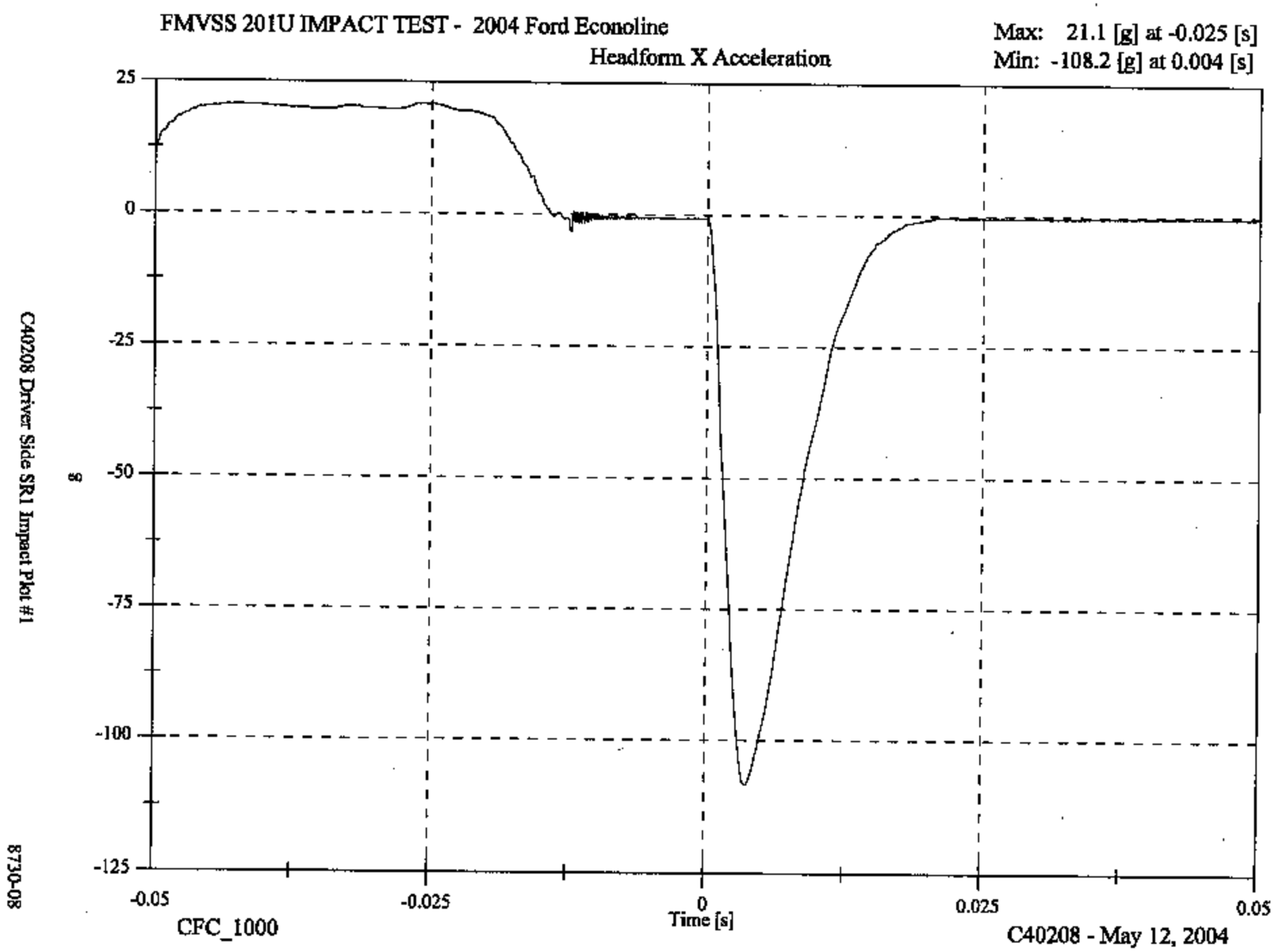
FMVSS 201U IMPACT TEST - 2004 Ford Econoline

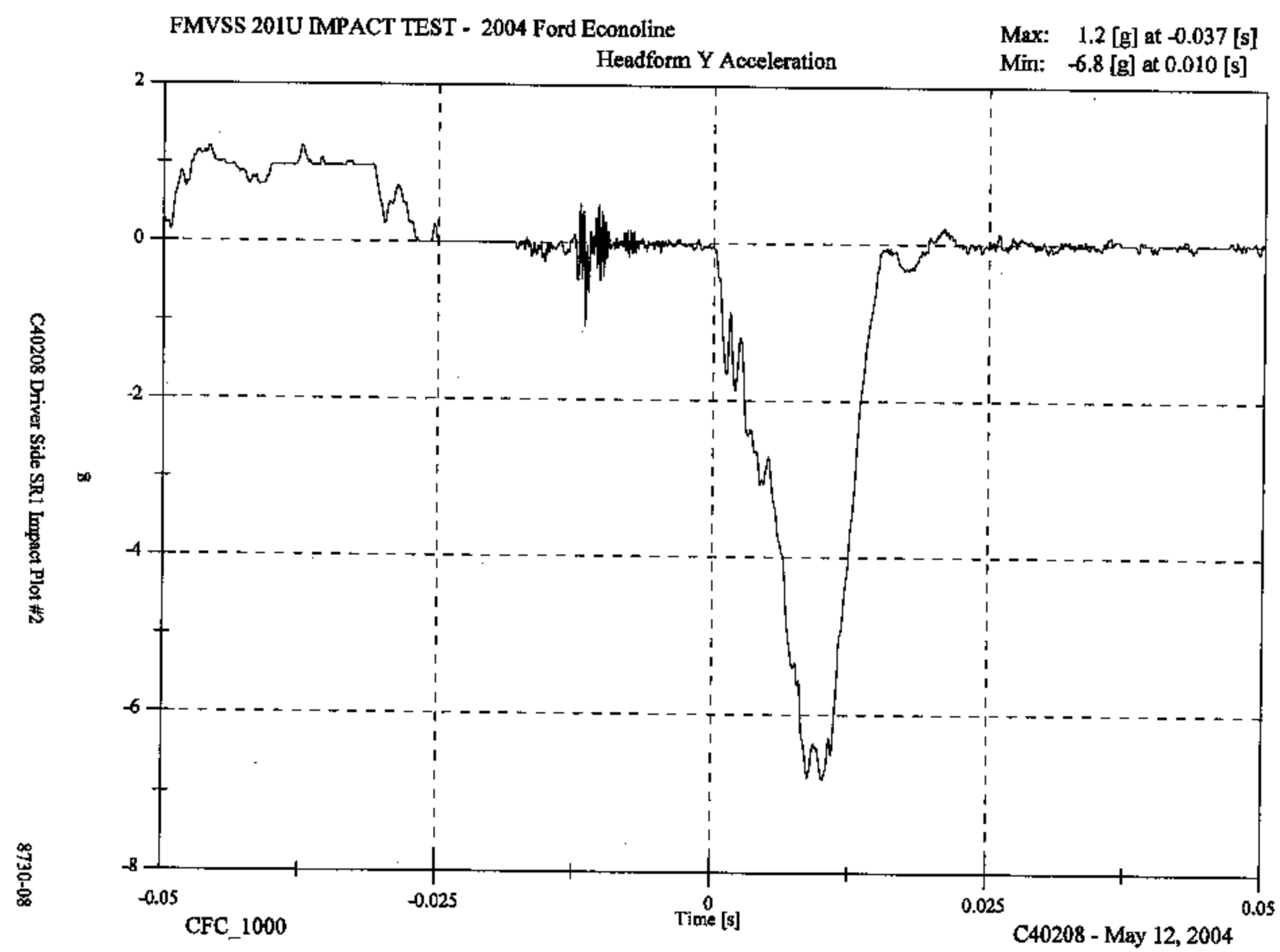
Headform Resultant

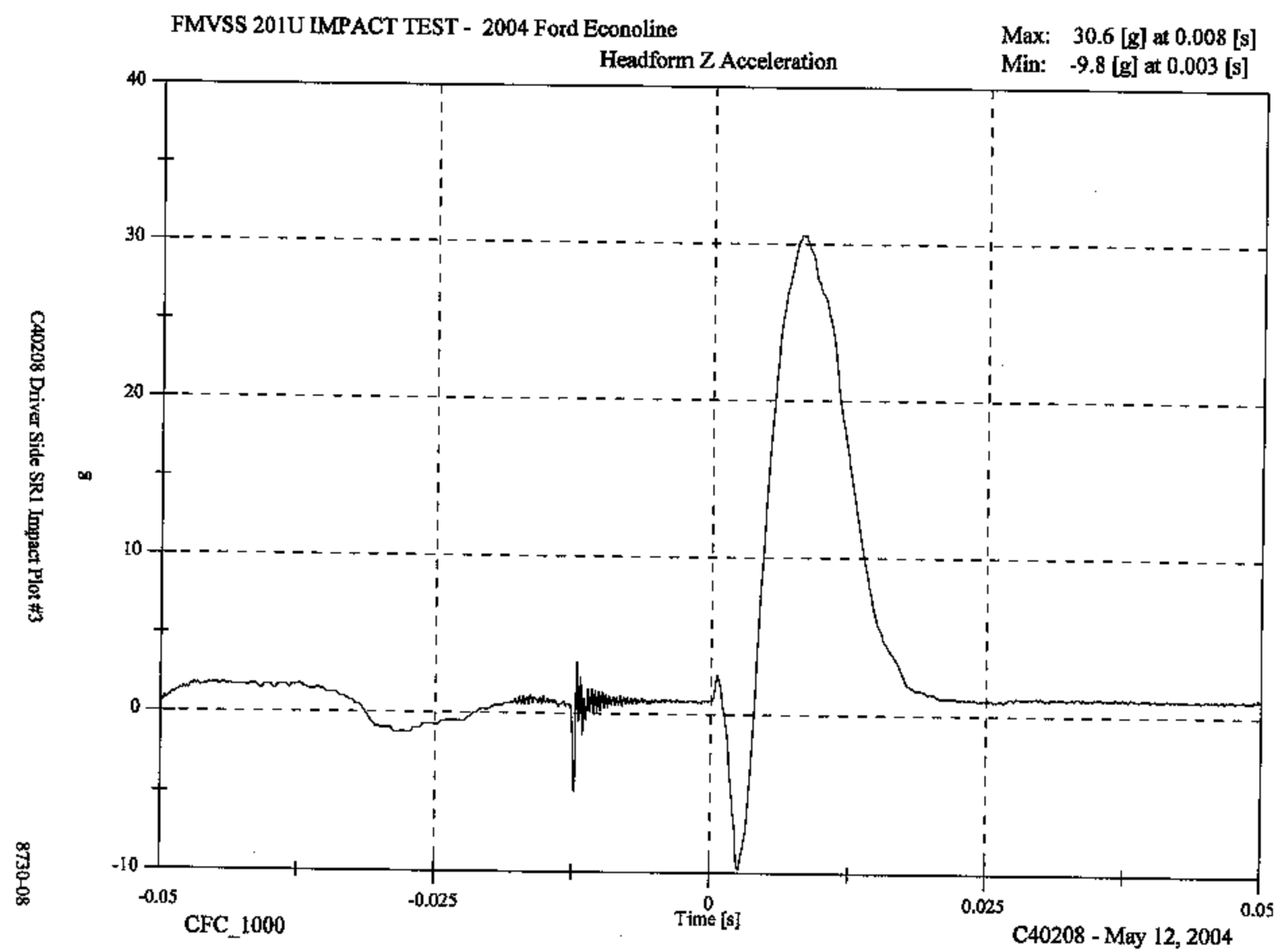
Max: 108.2 [g] at 0.004 [s]

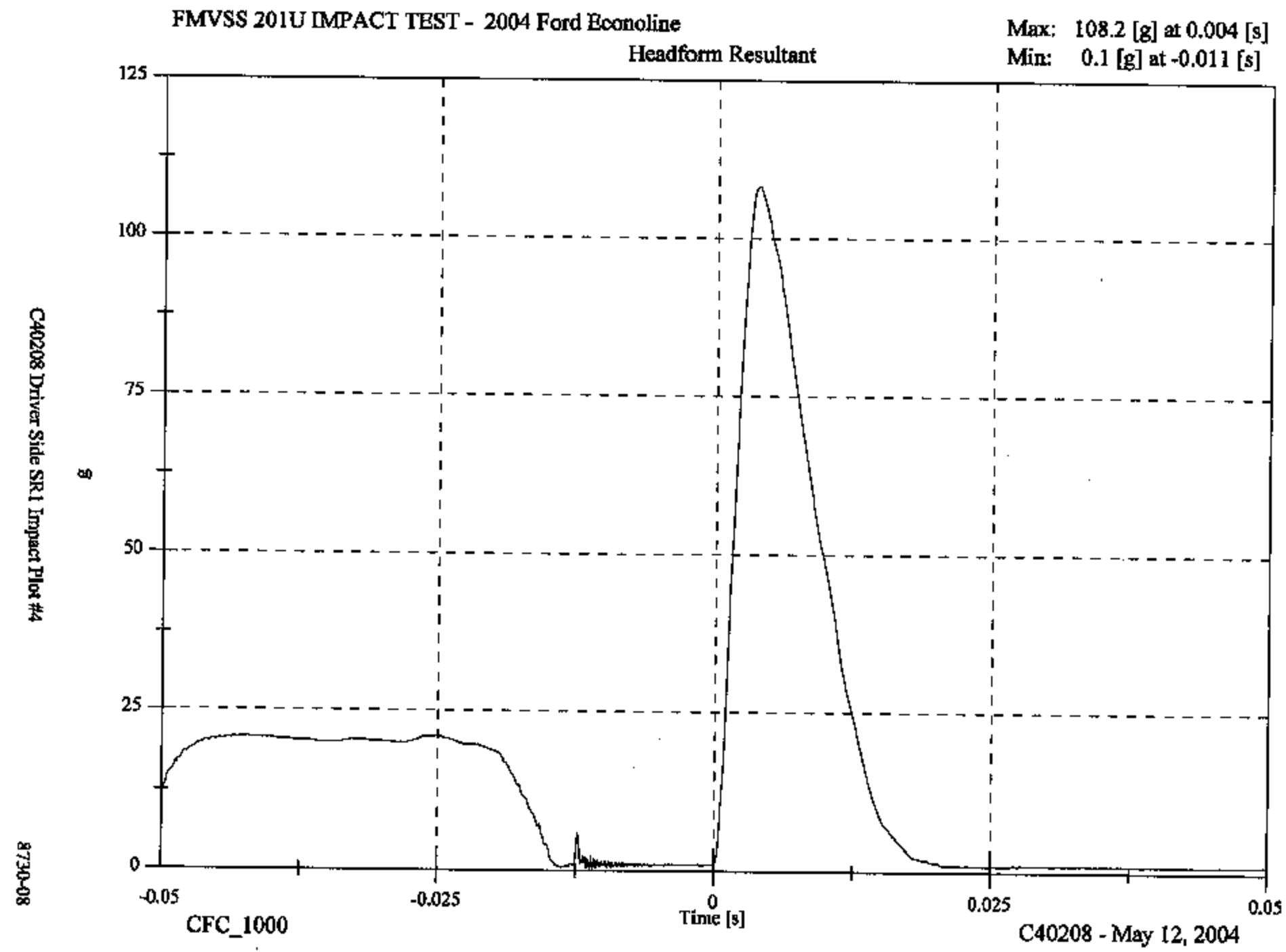
Min: 0.0 [g] at -0.092 [s]

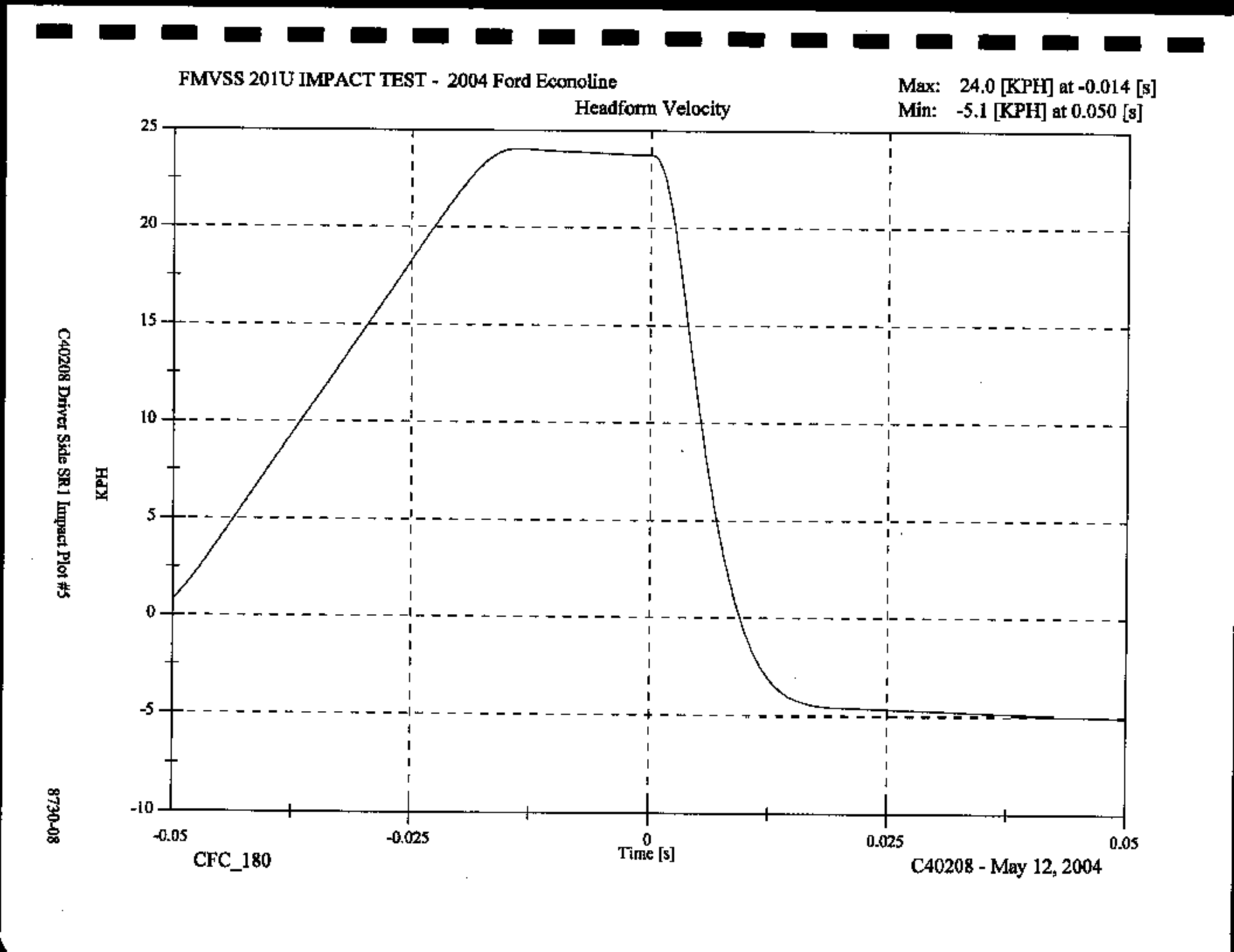



FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform X Acceleration
Max: 21.1 [g] at -0.025 [s]
Min: -108.2 [g] at 0.004 [s]
25
0
-25
-50
-75
-100
-125
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side SR1 Impact Plot #1
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 1.2 [g] at -0.037 [s]
Min: -6.8 [g] at 0.010 [s]
2
0
-2
-4
-6
-8
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side SR1 Impact Plot #2
8730-08

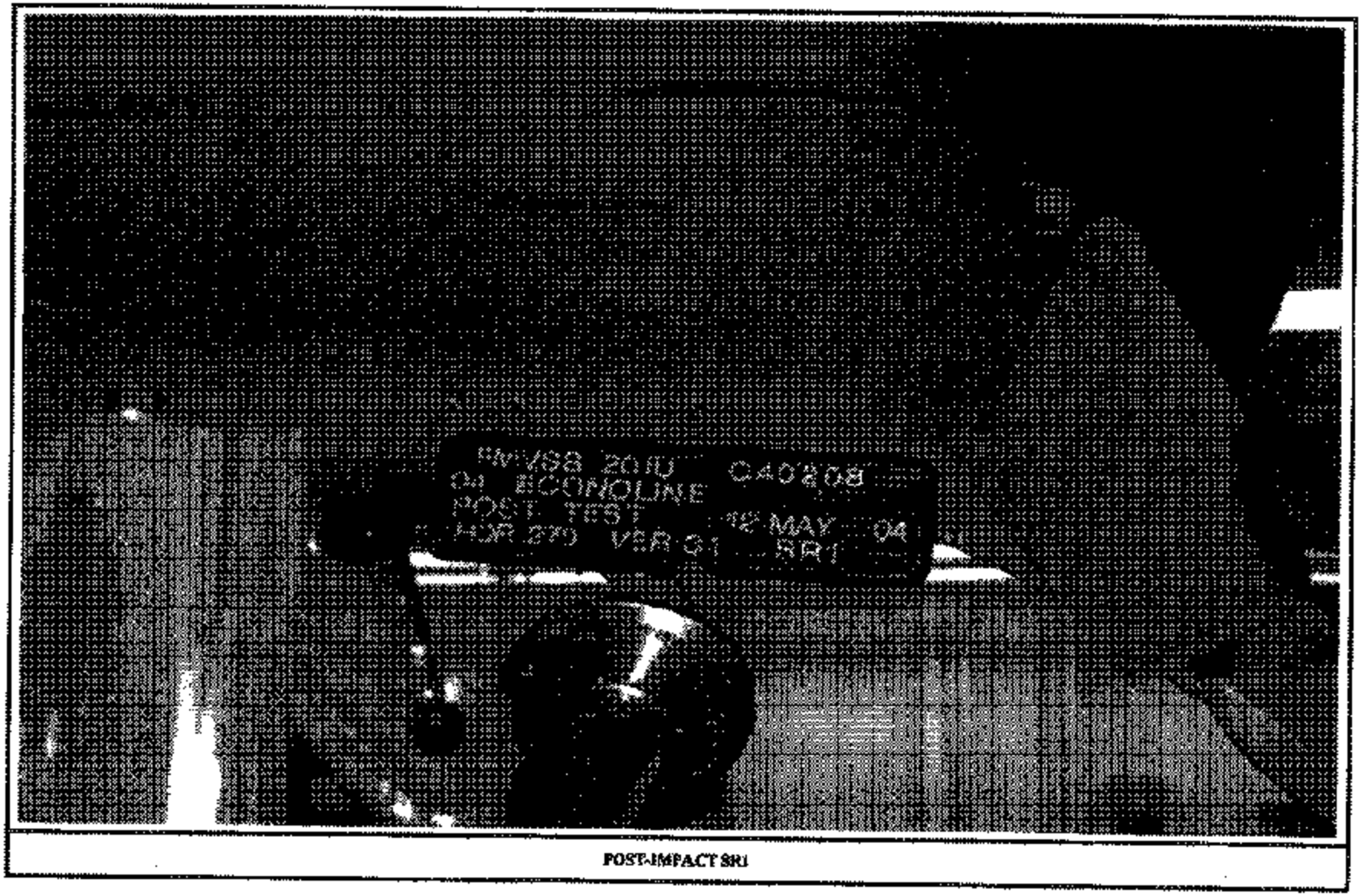

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 30.6 [g] at 0.008 [s]
Min: -9.8 [g] at 0.003 [s]
40
30
20
10
0
-10
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side SR1 Impact Plot #3
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 108.2 [g] at 0.004 [s]
Min: 0.1 [g] at -0.011 [s]
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side SR1 Impact Plot #4
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Velocity
Max: 24.0 [KPH] at -0.014 [s]
Min: -5.1 [KPH] at 0.050 [s]
KPH
25
20
15
10
5
0
-5
-10
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_180
C40208 - May 12, 2004
C40208 Driver Side SR1 Impact Plot #5
8730-08


PRE-IMPACT SR1

8730-08



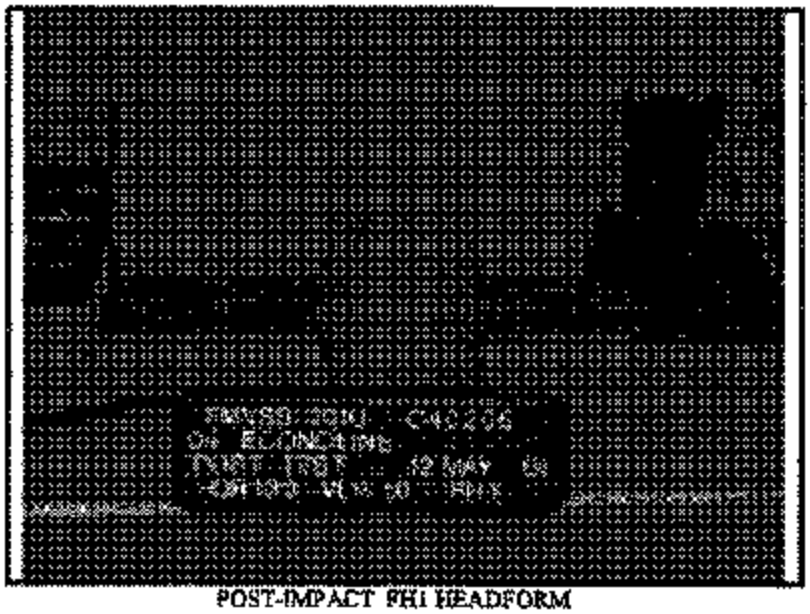

POST-IMPACT SR1

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 08 |
| Test Date: | May 12, 2004 |
| Target Location: | Driver Side Front Header |
| Target Code: | FH1 |
| Horizontal Impact Angle: | 180° |
| Vertical Impact Angle: | 50° |
| Ambient Temperature: | 23.5°C |
| Relative Humidity: | 40.5 |
| Time of Impact: | 16:10 |
| Headform Number: | 0062 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 6 | - | mm right | x | mm left |
| On Centerline | 29 | | mm up | | |



POST-IMPACT FH1 HEADFORM

| | |
|---|---|
| Free Motion HIC | 823.8 |
| HIC(d) | 787.9 |
| Impact Velocity (kph) | 23.50 |
| HIC T1 (msec) | 2.0 |
| HIC T2 (msec) | 7.2 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - FH1

FMH Headform 0062

Location: FH1

Test Date: May 12, 2004

Work File: FH1

## TEST RESULTS

Lab Temperature: 23.5 C

Lab Humidity: 40.5 %

Velocity at Impact: 23.50 KPH

Free Flight Distance: 210.63 mm

HICd: 787.9

HIC (36ms): 823.8

t1: 2.0 msec

t2: 7.2 msec

Duration: 5.2 msec

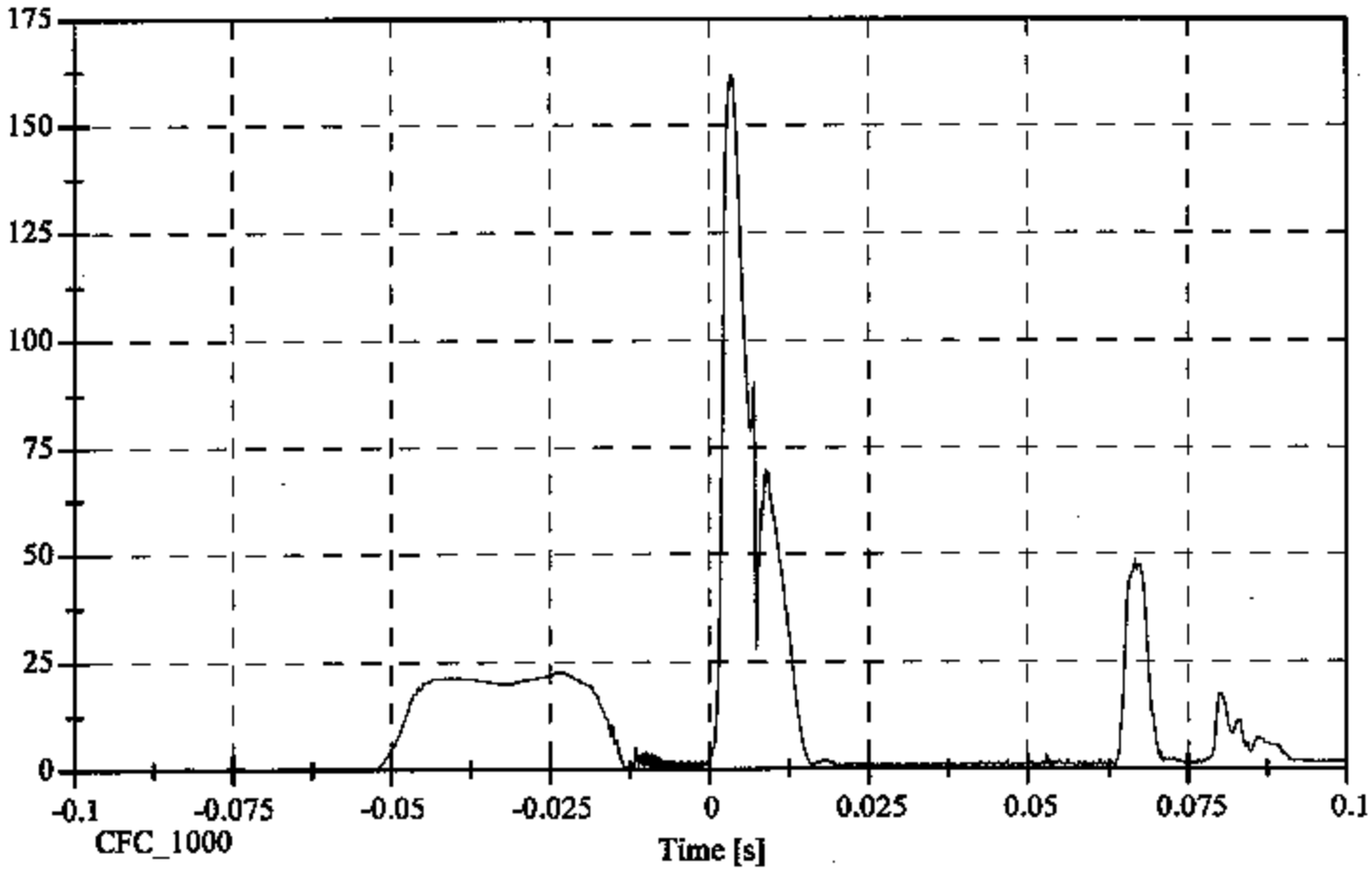
Average Acceleration: 10.3 g

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Resultant

Max: 161.9 [g] at 0.004 [s]

Min: 0.0 [g] at -0.099 [s]

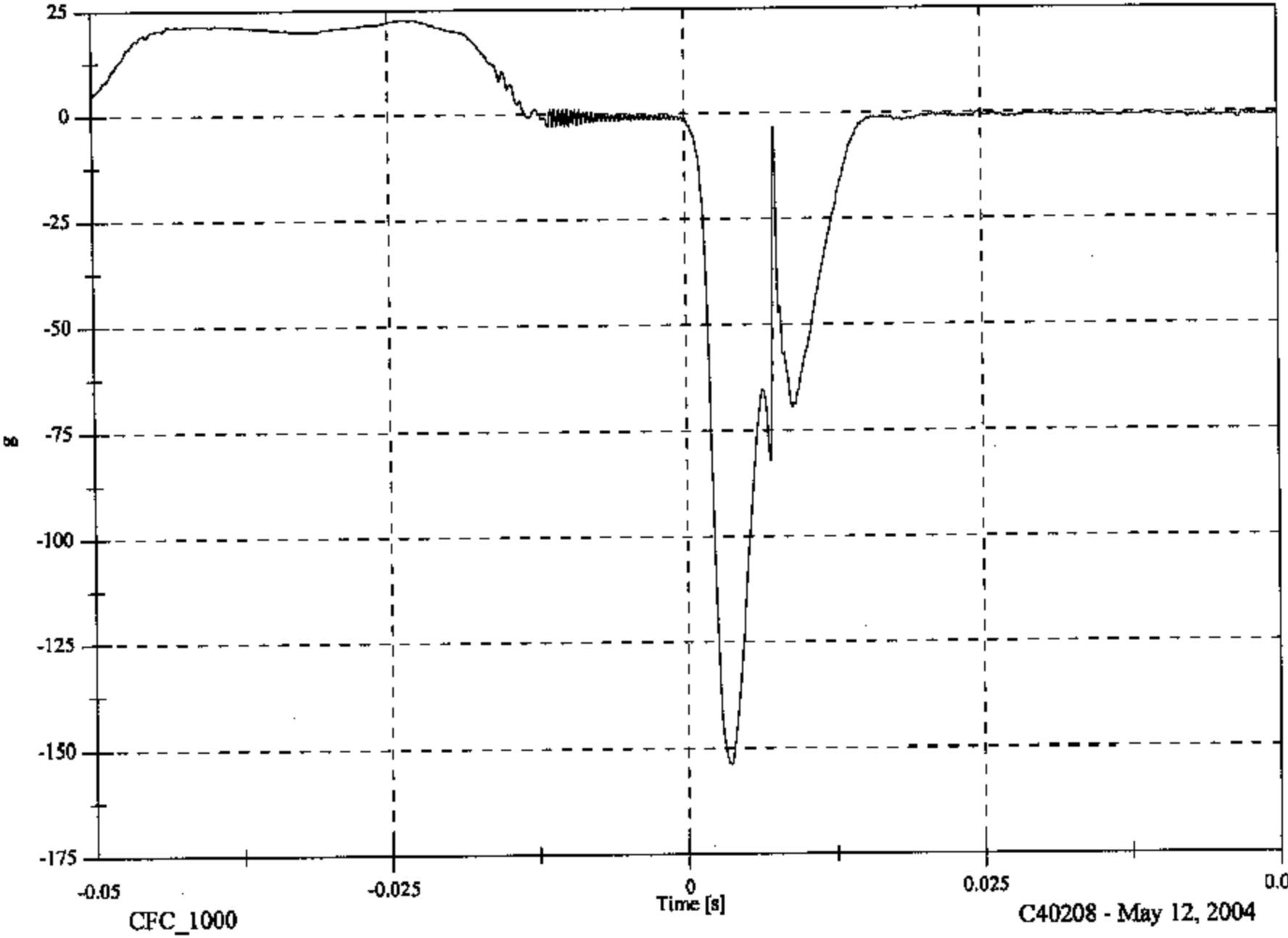


FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform X Acceleration

Max: 22.6 [g] at -0.024 [s]

Min: -153.7 [g] at 0.004 [s]

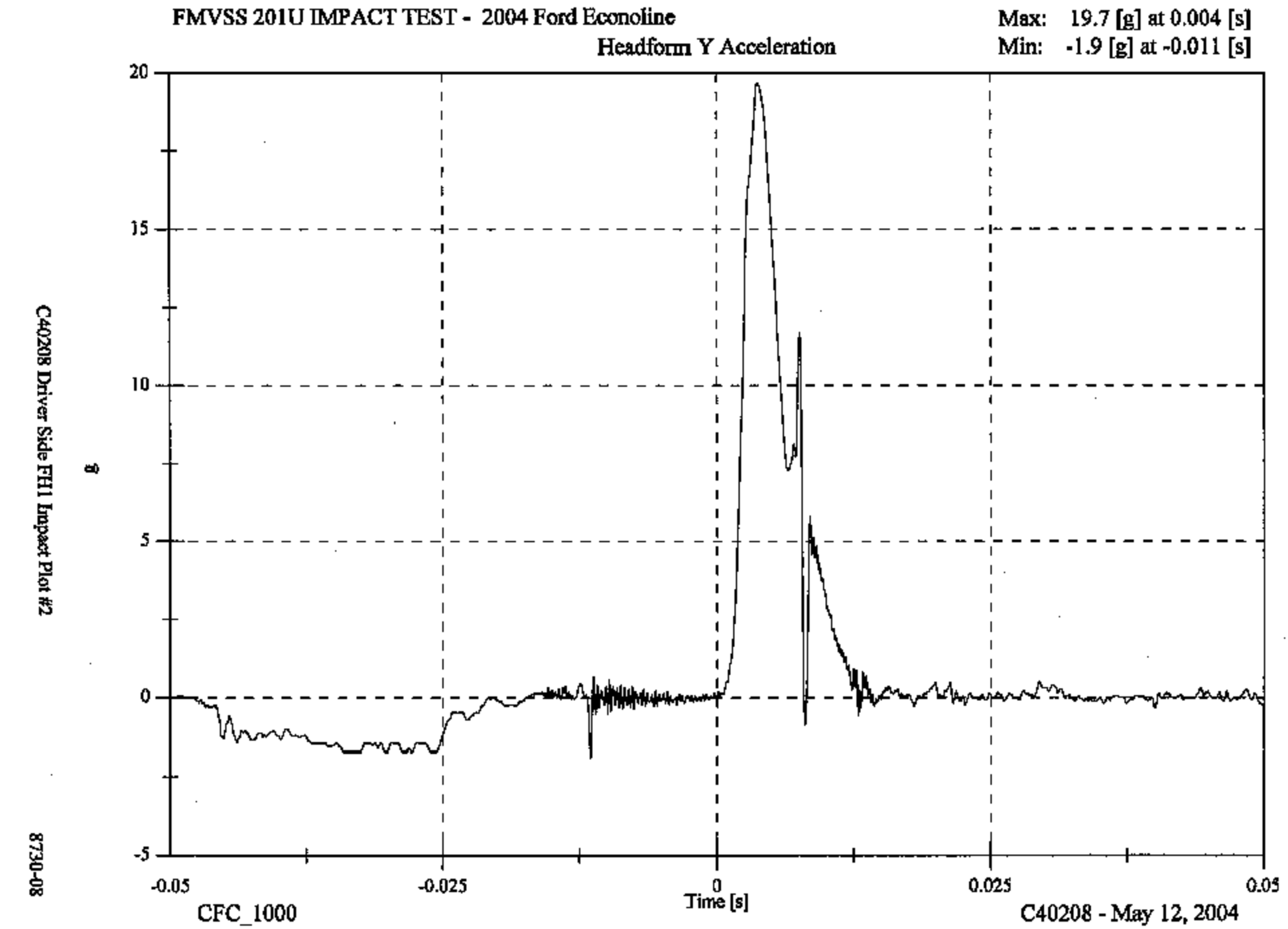


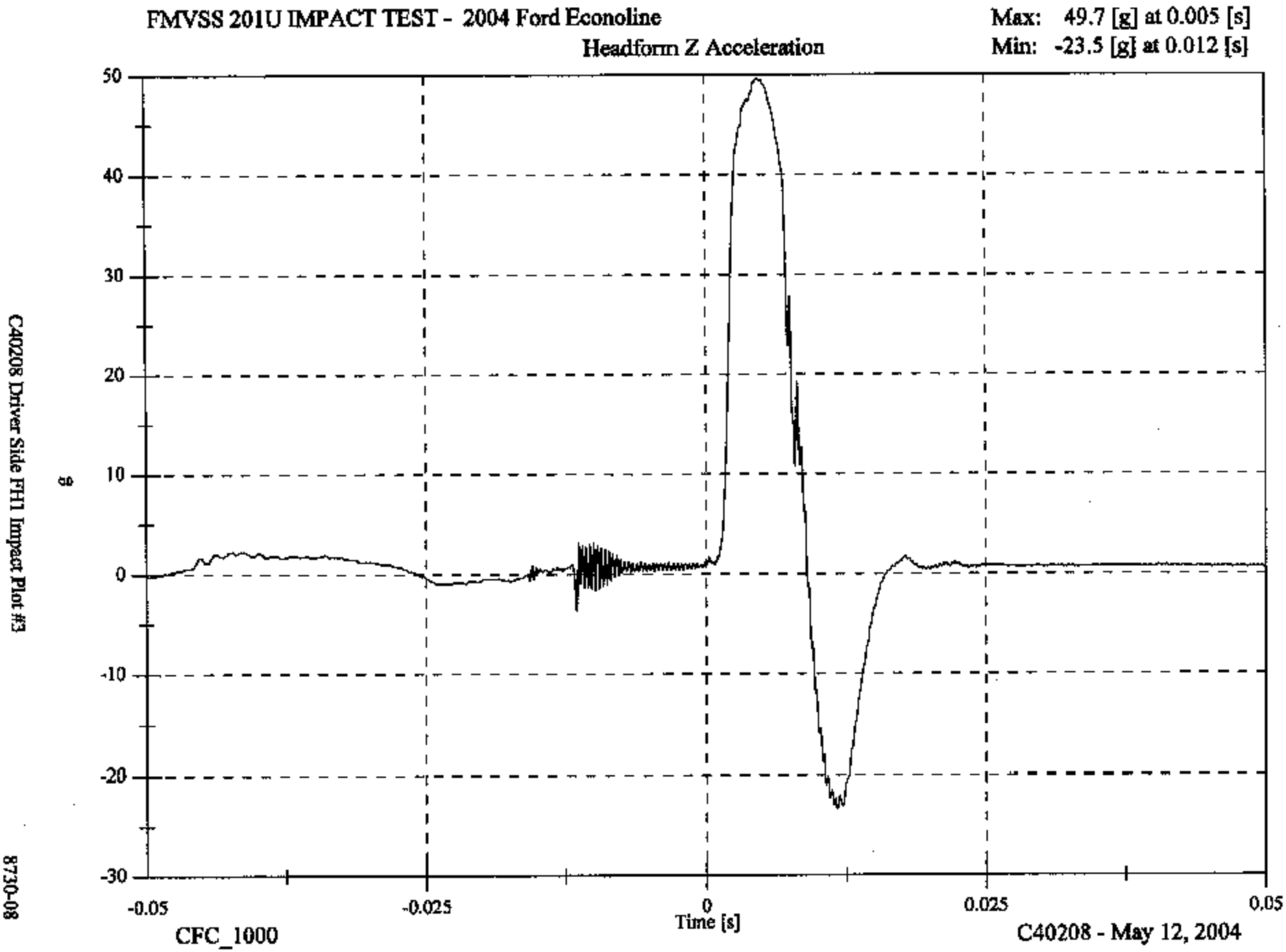

C40208 Driver Side FH1 Impact Plot #1

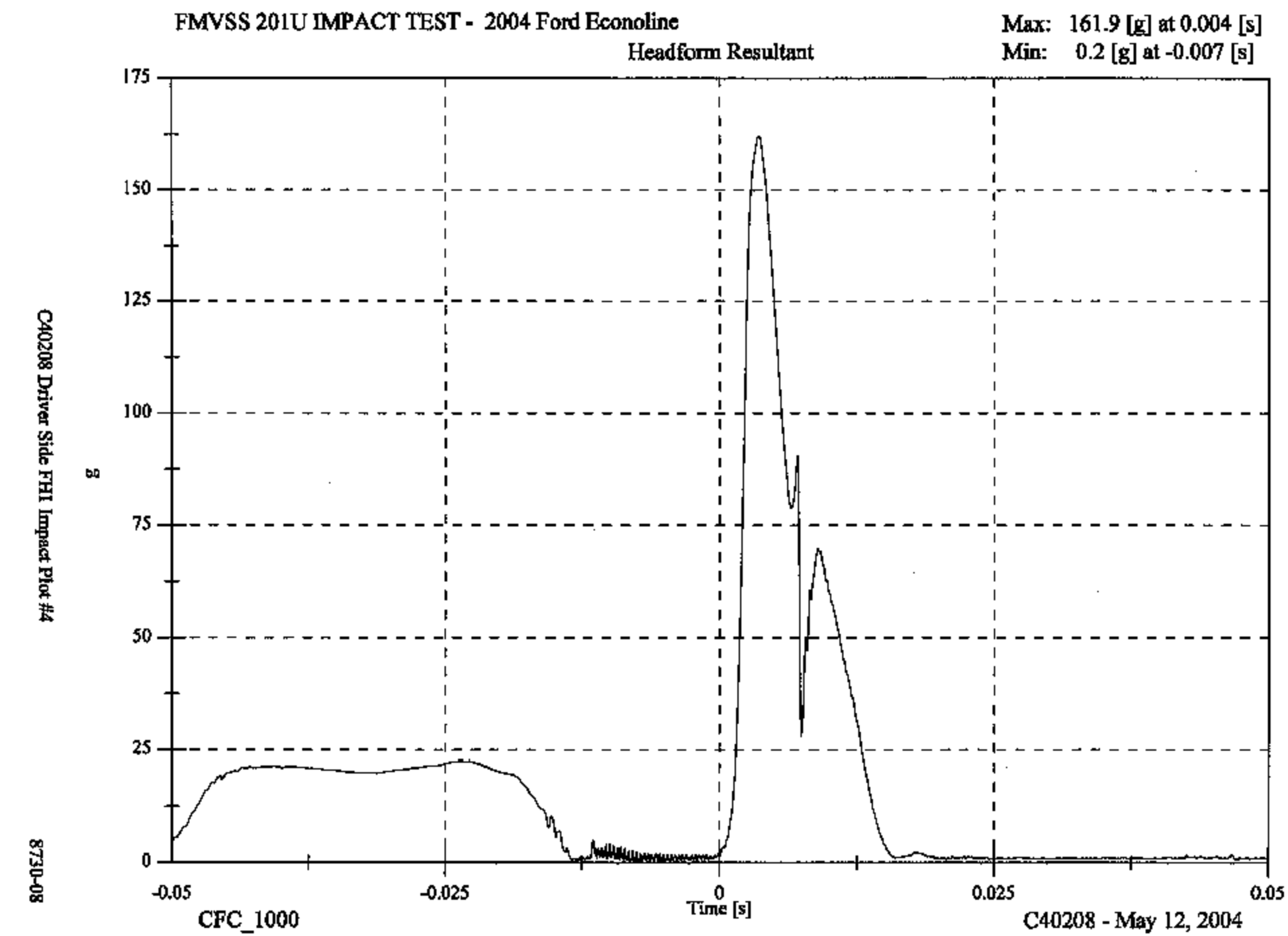
8730-08

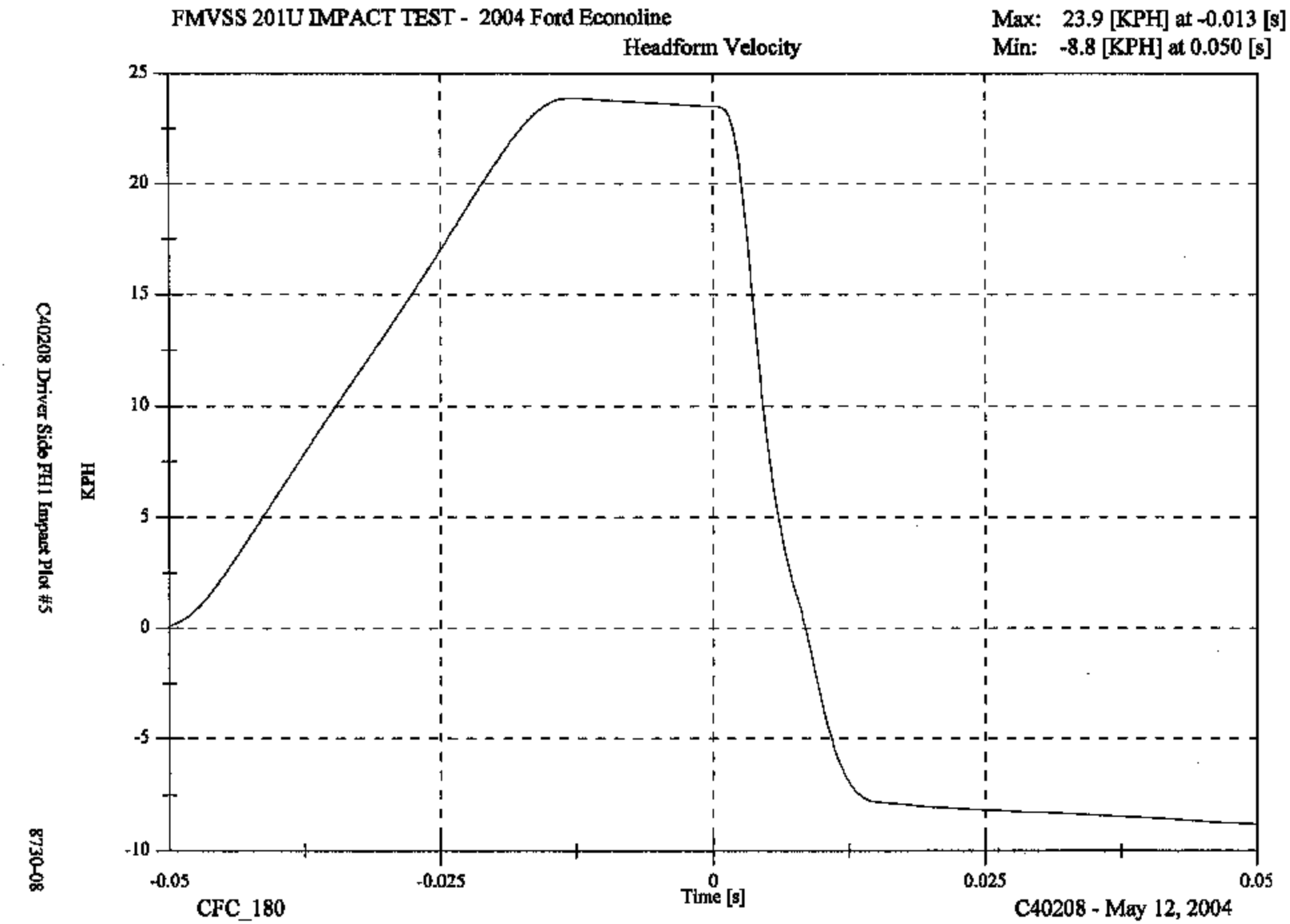
CFC_1000

C40208 - May 12, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 19.7 [g] at 0.004 [s]
Min: -1.9 [g] at -0.011 [s]
20
15
10
5
0
-5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side FH1 Impact Plot #2
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 49.7 [g] at 0.005 [s]
Min: -23.5 [g] at 0.012 [s]
50
40
30
20
10
0
-10
-20
-30
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side FH1 Impact Plot #3
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 161.9 [g] at 0.004 [s]
Min: 0.2 [g] at -0.007 [s]
175
150
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 12, 2004
C40208 Driver Side FH1 Impact Plot #4
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Velocity
Max: 23.9 [KPH] at -0.013 [s]
Min: -8.8 [KPH] at 0.050 [s]
25
20
15
10
5
0
-5
-10
KPH
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_180
C40208 - May 12, 2004
C40208 Driver Side FH1 Impact Plot #5
8730-08


PRE-IMPACT FH1

8730-08

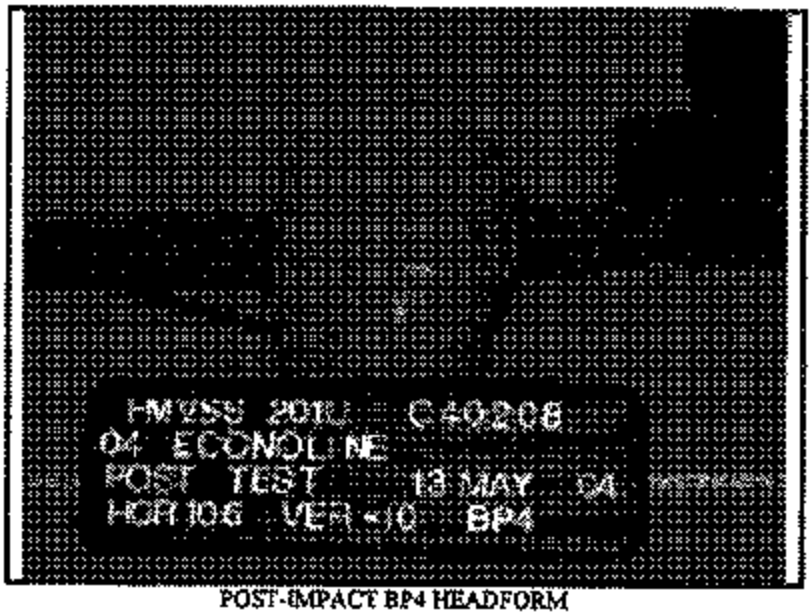

POST-IMPACT FH1

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 09 |
| Test Date: | May 13, 2004 |
| Target Location: | Passenger Side B-Pillar |
| Target Code: | BP4 |
| Horizontal Impact Angle: | 106° |
| Vertical Impact Angle: | -10° |
| Ambient Temperature: | 23.2°C |
| Relative Humidity: | 41.1 |
| Time of Impact: | 10:30 |
| Headform Number: | 0062 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 33 | - | mm right | x | mm left |
| On Centerline | 7 | | mm up | | |




POST-IMPACT BP4 HEADFORM

| | |
|---|---|
| Free Motion HIC | 652.1 |
| HIC(d) | 658.4 |
| Impact Velocity (kph) | 23.47 |
| HIC T1 (msec) | 2.9 |
| HIC T2 (msec) | 8.2 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - BP4

FMH Headform 0062

Test Date: May 13, 2004

Location: BP4

Work File: BP4

## TEST RESULTS

Lab Temperature: 23.2 C

Lab Humidity: 41.1 %

Velocity at Impact: 23.47 KPH

Free Flight Distance: 217.03 mm

HICd: 658.4

HIC (36ms): 652.1

t1: 2.9 msec

t2: 8.2 msec

Duration: 5.3 msec

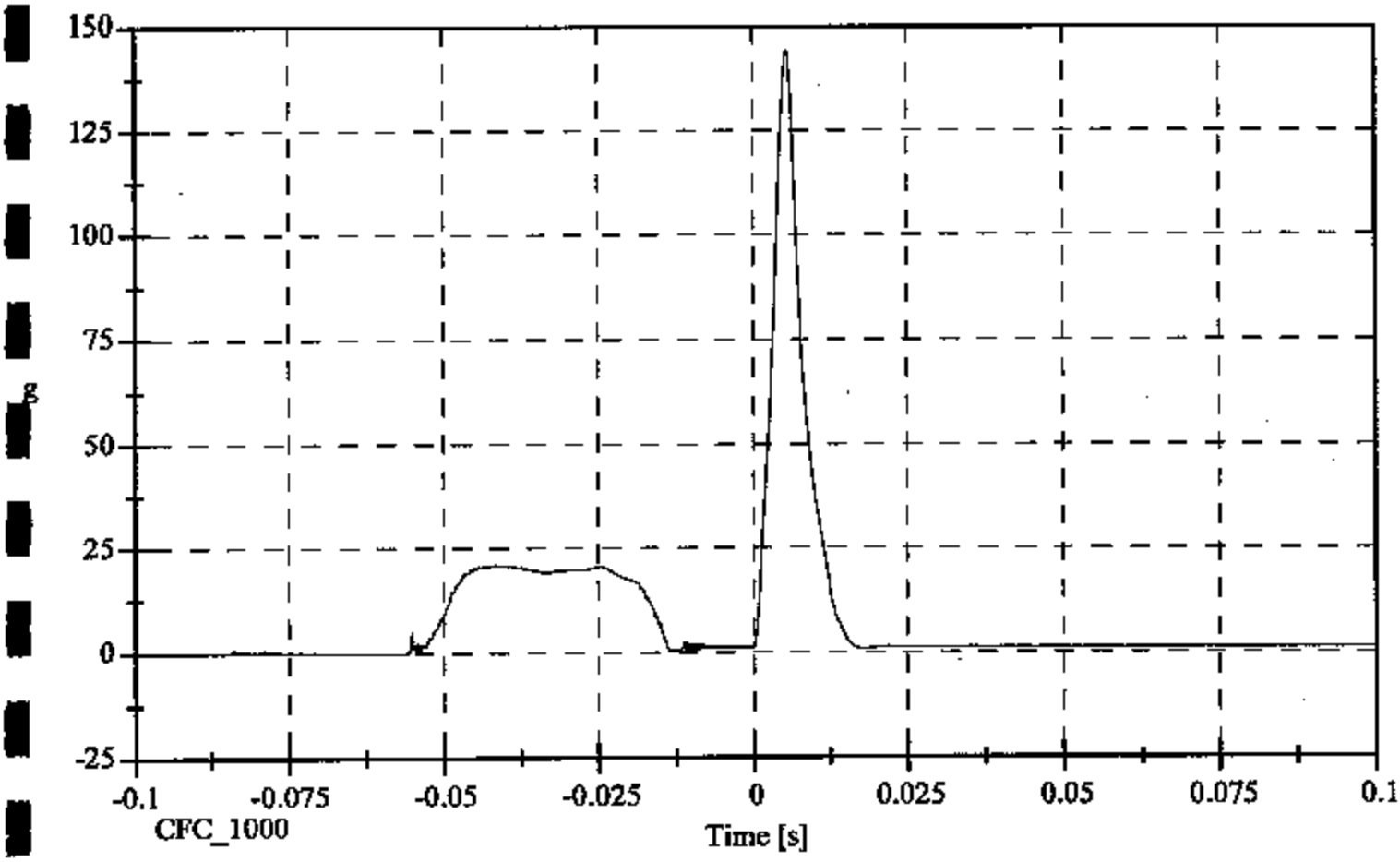
Average Acceleration: 8.1 g

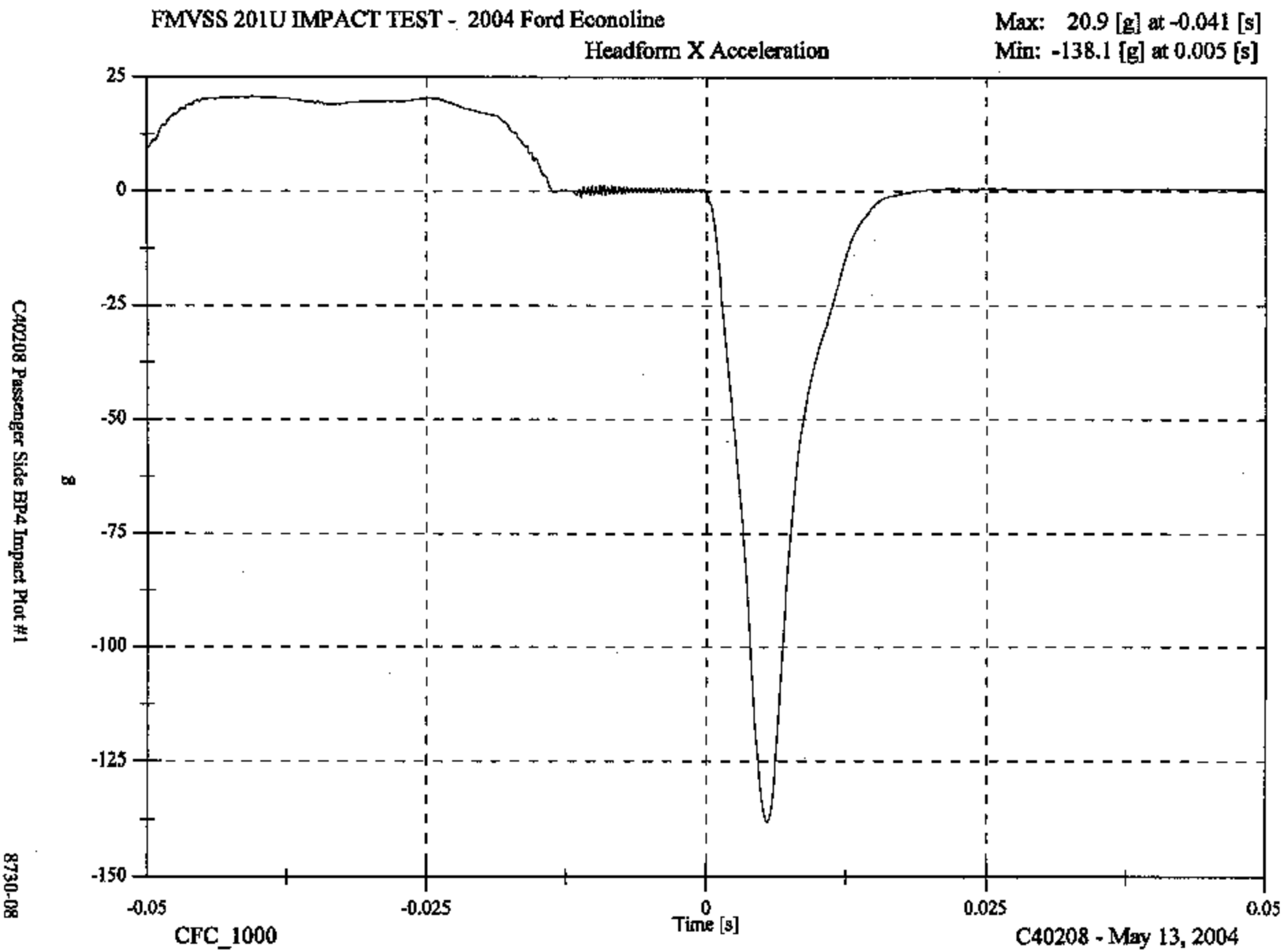
FMVSS 201U IMPACT TEST - 2004 Ford Econoline

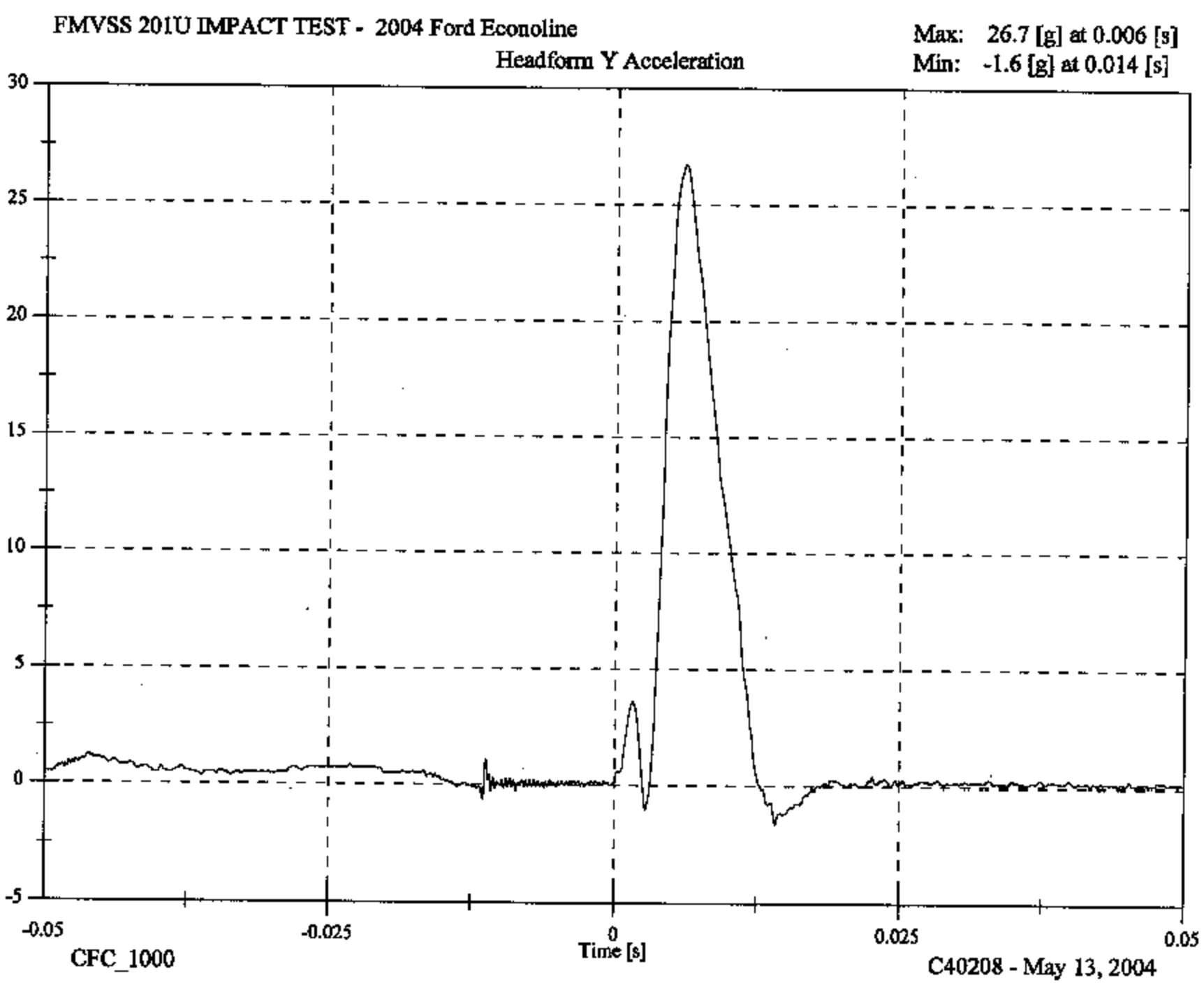
Headform Resultant

Max: 144.5 [g] at 0.006 [s]

Min: -0.0 [g] at -0.099 [s]



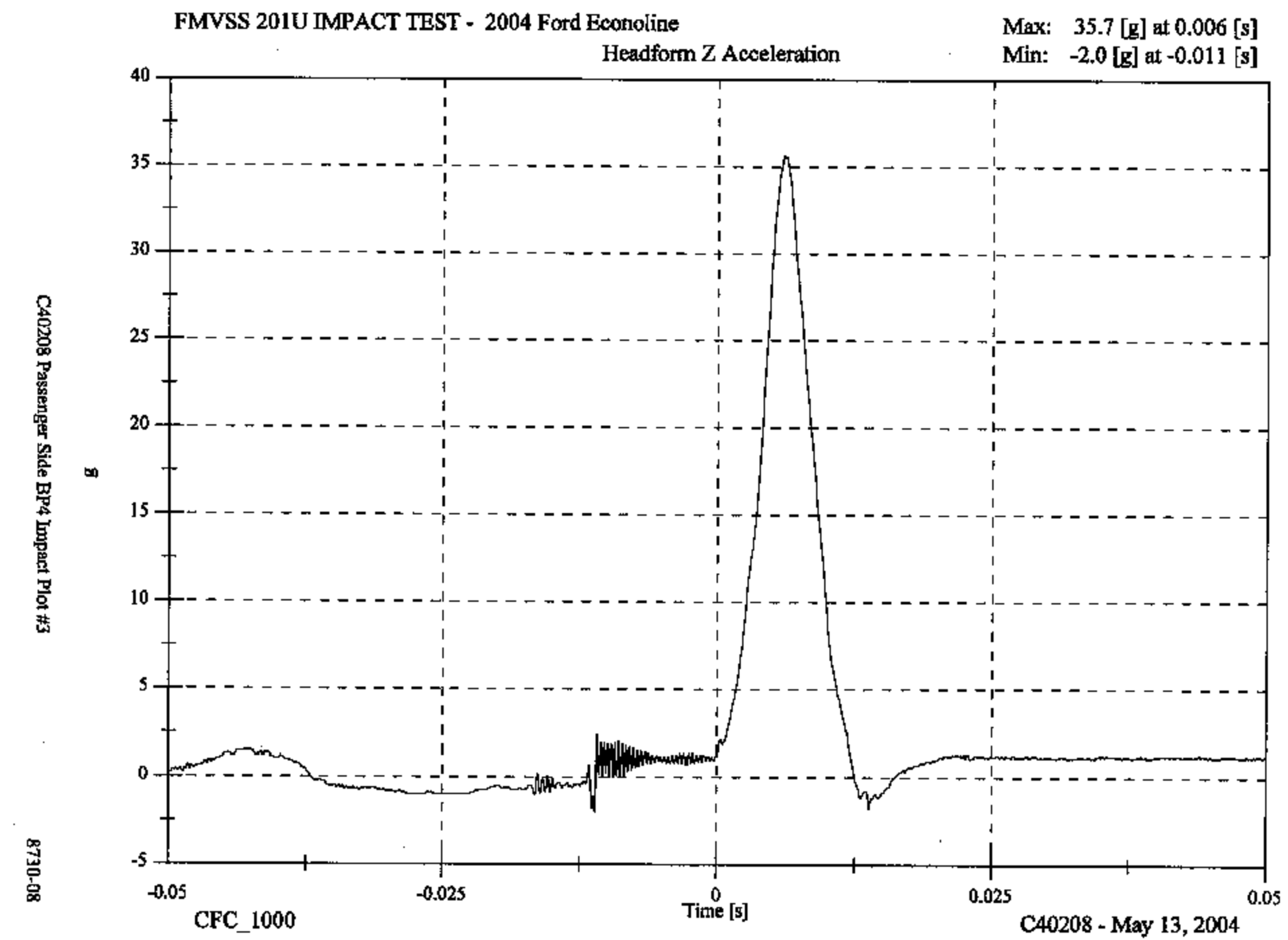

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform X Acceleration
Max: 20.9 [g] at -0.041 [s]
Min: -138.1 [g] at 0.005 [s]
25
0
-25
-50
-75
-100
-125
-150
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Passenger Side EP4 Impact Plot #1
8730-08
CFC_1000
C40208 - May 13, 2004

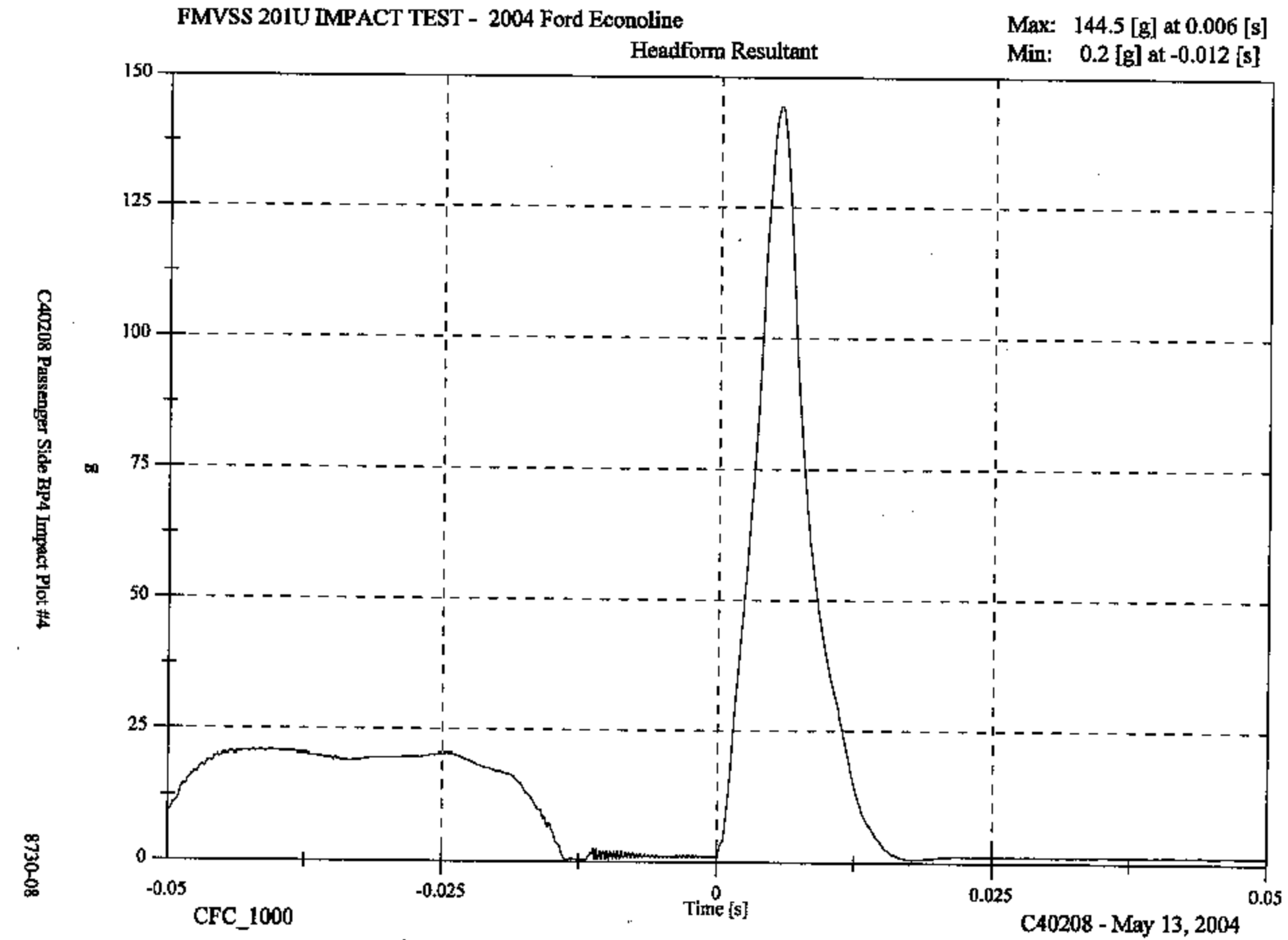


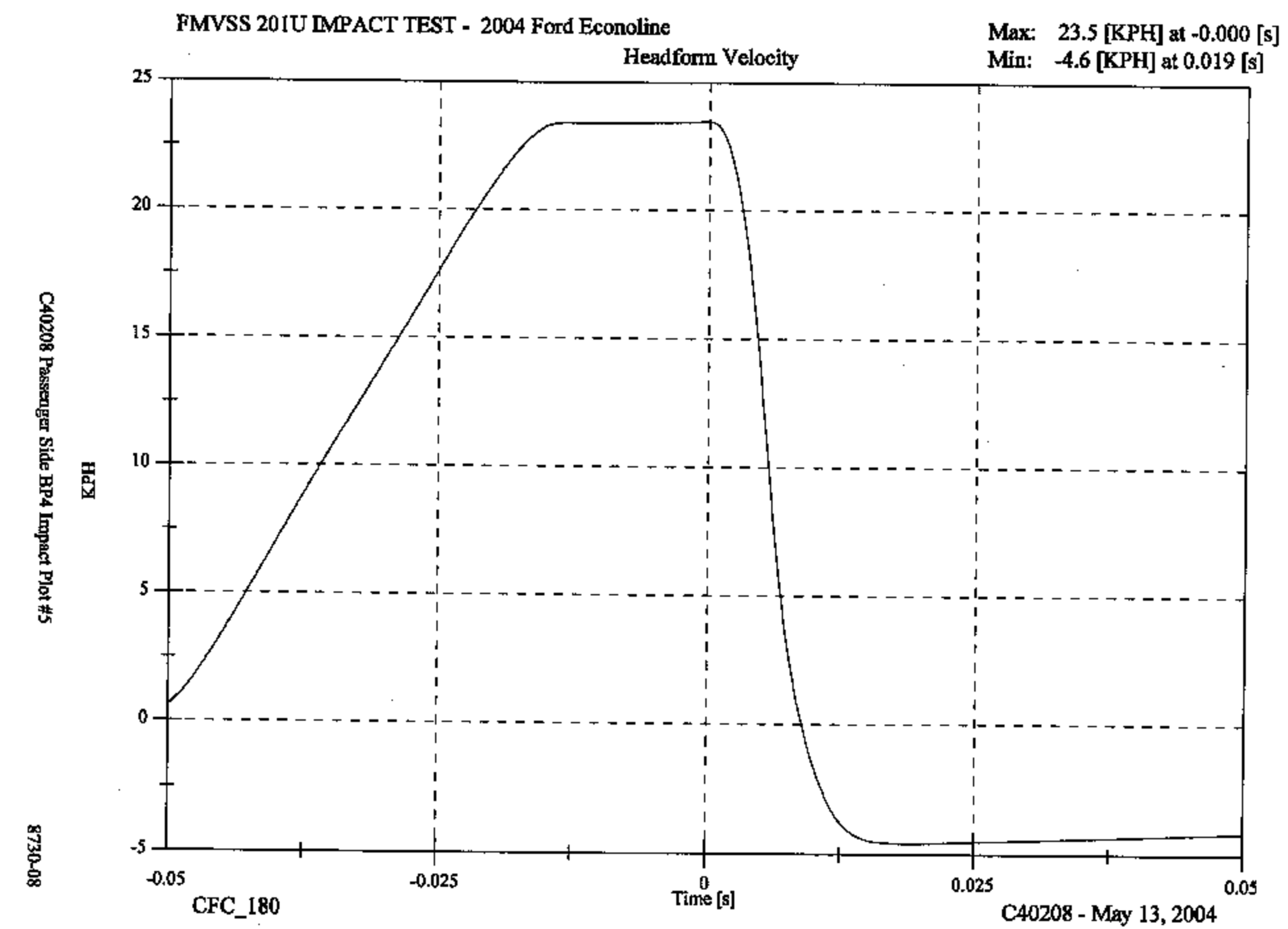

C40208 Passenger Side BP4 Impact Plot #2

8

8730-08

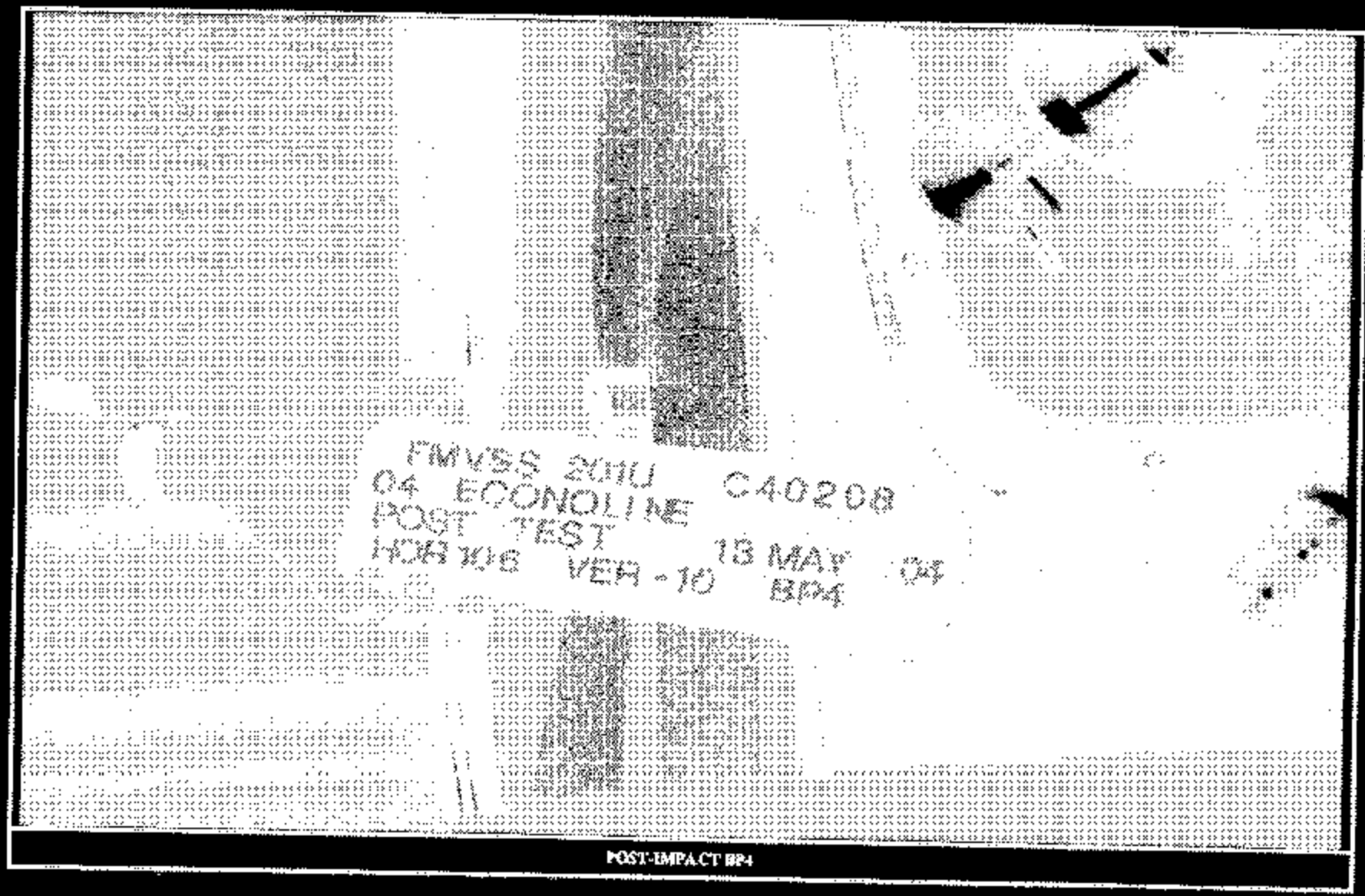

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 35.7 [g] at 0.006 [s]
Min: -2.0 [g] at -0.011 [s]
40
35
30
25
20
15
10
5
0
-5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side BP4 Impact Plot #3
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 144.5 [g] at 0.006 [s]
Min: 0.2 [g] at -0.012 [s]
150
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side BP4 Impact Plot #4
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Velocity
Max: 23.5 [KPH] at -0.000 [s]
Min: -4.6 [KPH] at 0.019 [s]
KPH
25
20
15
10
5
0
-5
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_180
C40208 - May 13, 2004
C40208 Passenger Side BP4 Impact Plot #5
8730-08


PRE-IMPACT BP4

8730-08



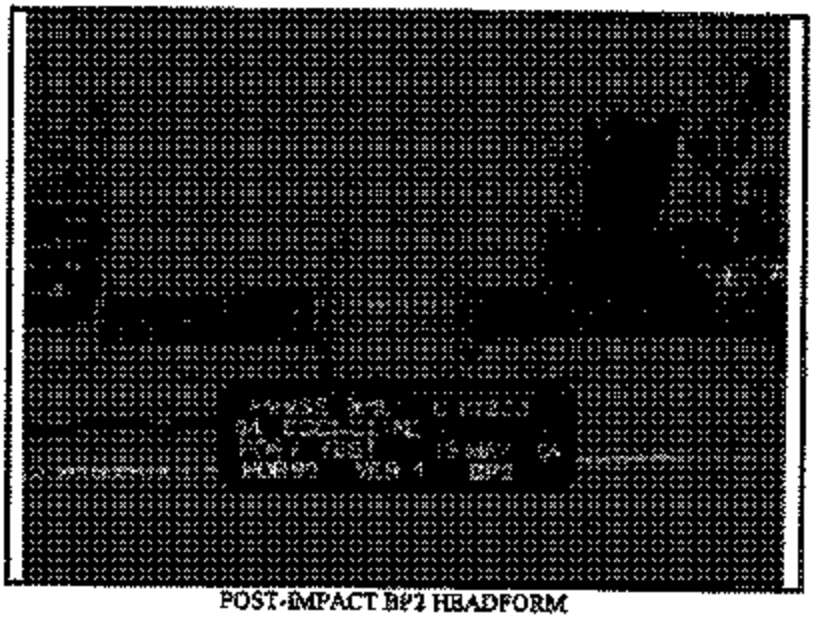

POST-IMPACT BP4

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 10 |
| Test Date: | May 13, 2004 |
| Target Location: | Passenger Side B-Pillar |
| Target Code: | BP2 |
| Horizontal Impact Angle: | 90° |
| Vertical Impact Angle: | 4° |
| Ambient Temperature: | 23.2°C |
| Relative Humidity: | 40.4 |
| Time of Impact: | 10:55 |
| Headform Number: | 1255 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 4 | - | mm right | x | mm left |
| On Centerline | 18 | mm up | | | |



POST-IMPACT BP2 HEADFORM

| | |
|---|---|
| Free Motion HIC | 533.0 |
| HIC(d) | 568.5 |
| Impact Velocity (kph) | 23.64 |
| HIC T1 (msec) | 2.0 |
| HIC T2 (msec) | 8.2 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - BP2

FMH Headform 1255 Location: BP2

Test Date: May 13, 2004 Work File: BP2

## TEST RESULTS

Lab Temperature: 23.2 C

Lab Humidity: 40.4 %

Velocity at Impact: 23.64 KPH

Free Flight Distance: 220.93 mm

HICd: 568.5

HIC (36ms): 533.0

t1: 2.0 msec

t2: 8.2 msec

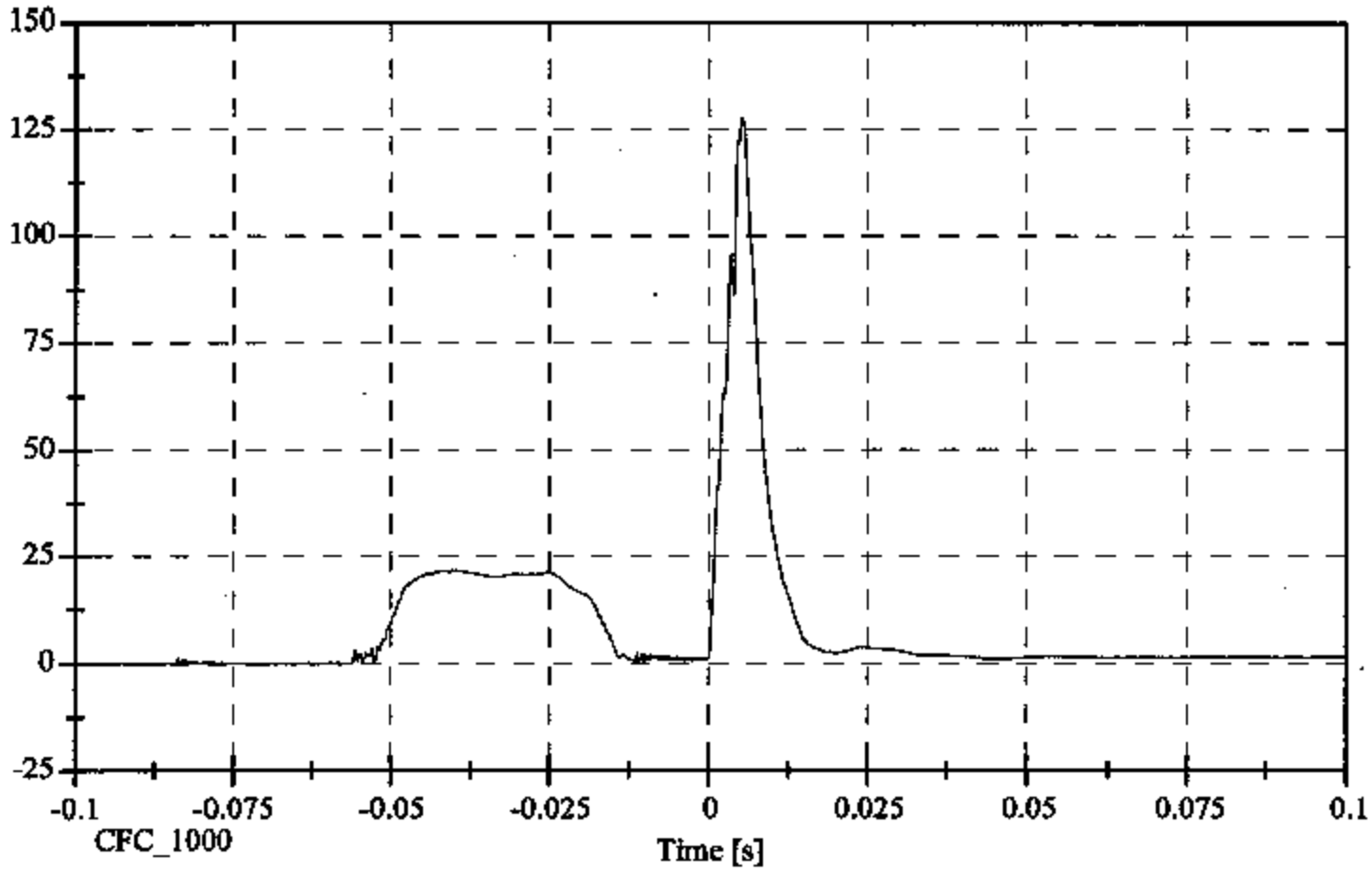
Duration: 6.2 msec

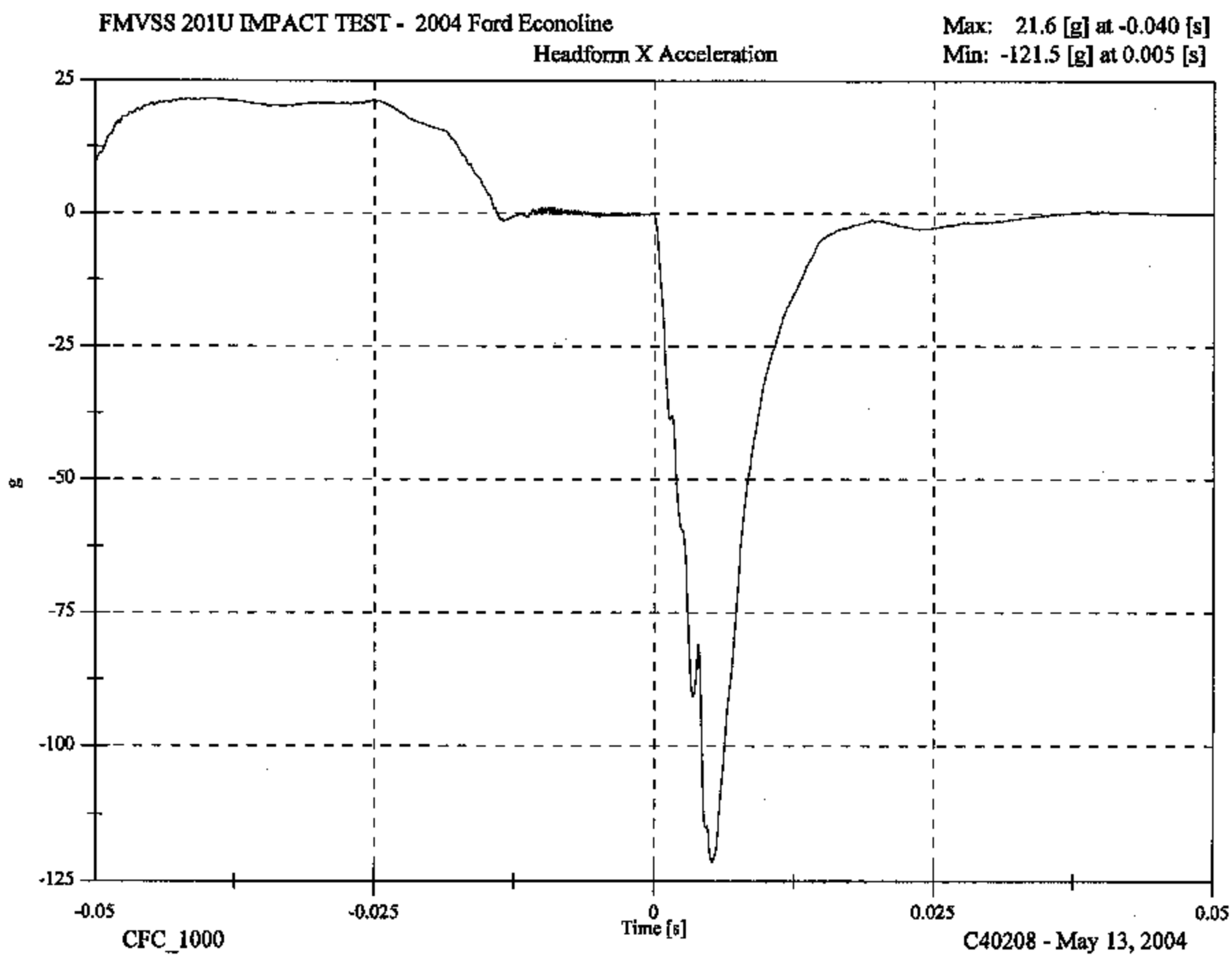
Average Acceleration: 8.3 g

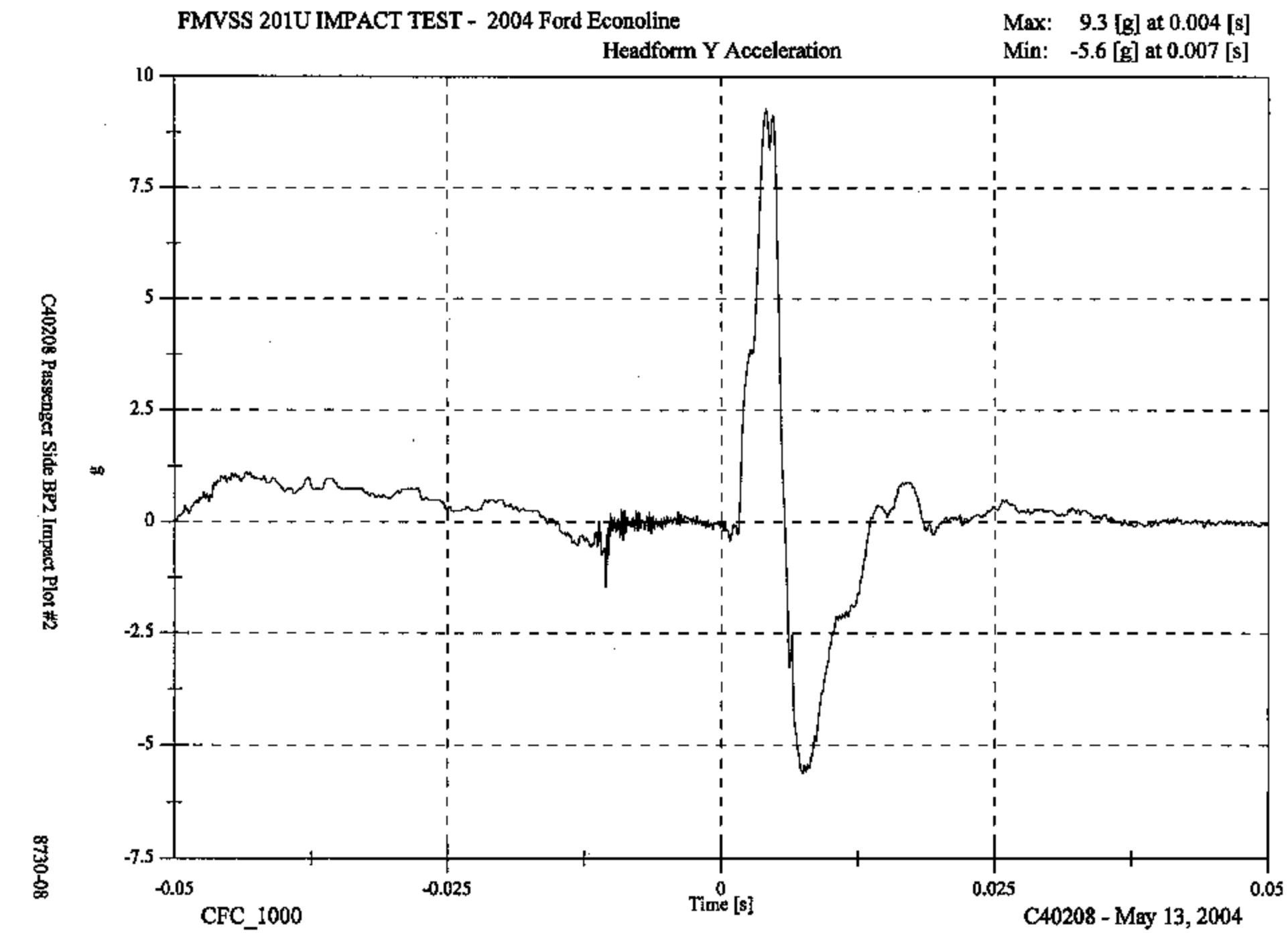
FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant

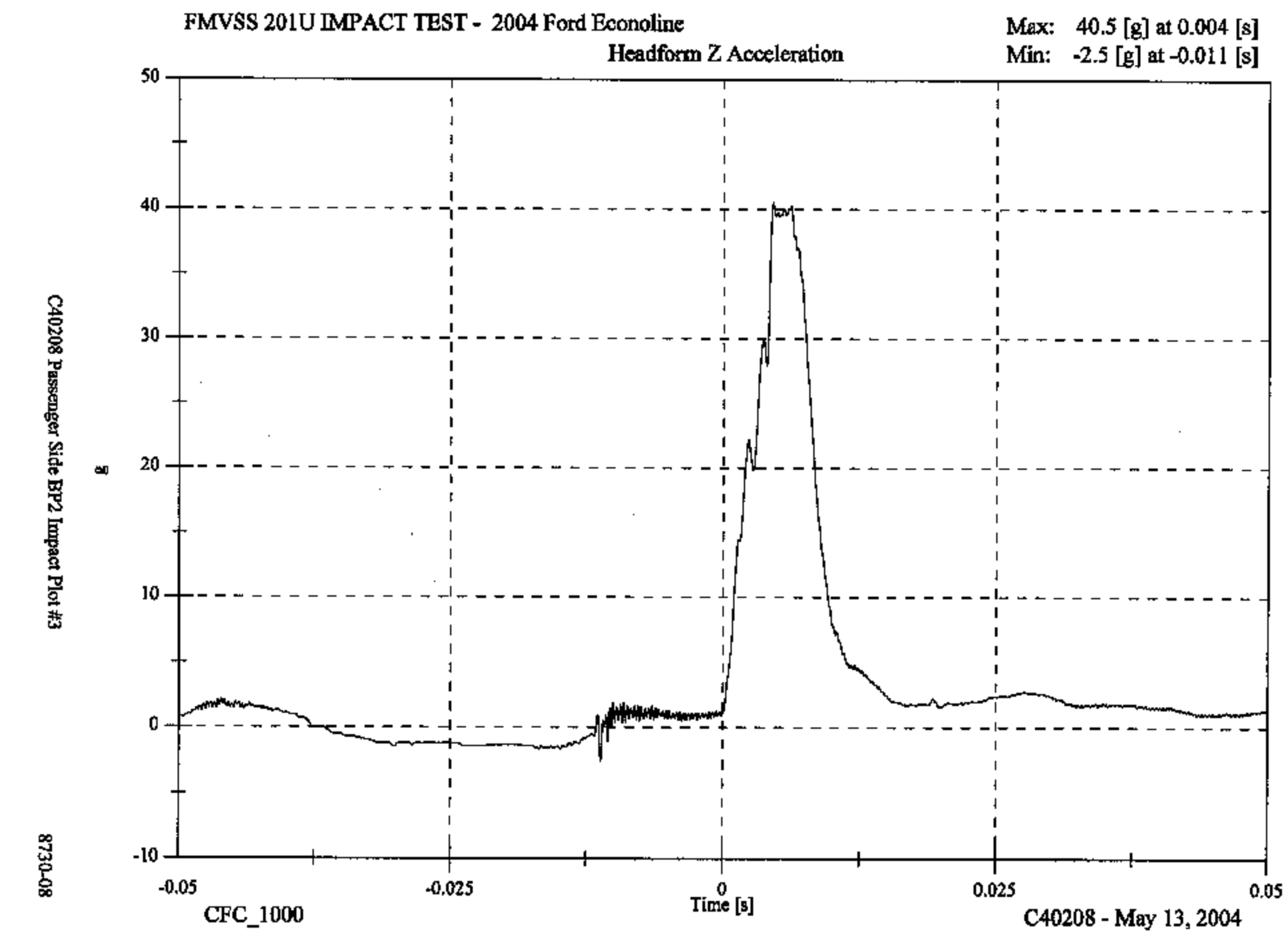
Max: 127.8 [g] at 0.005 [s]

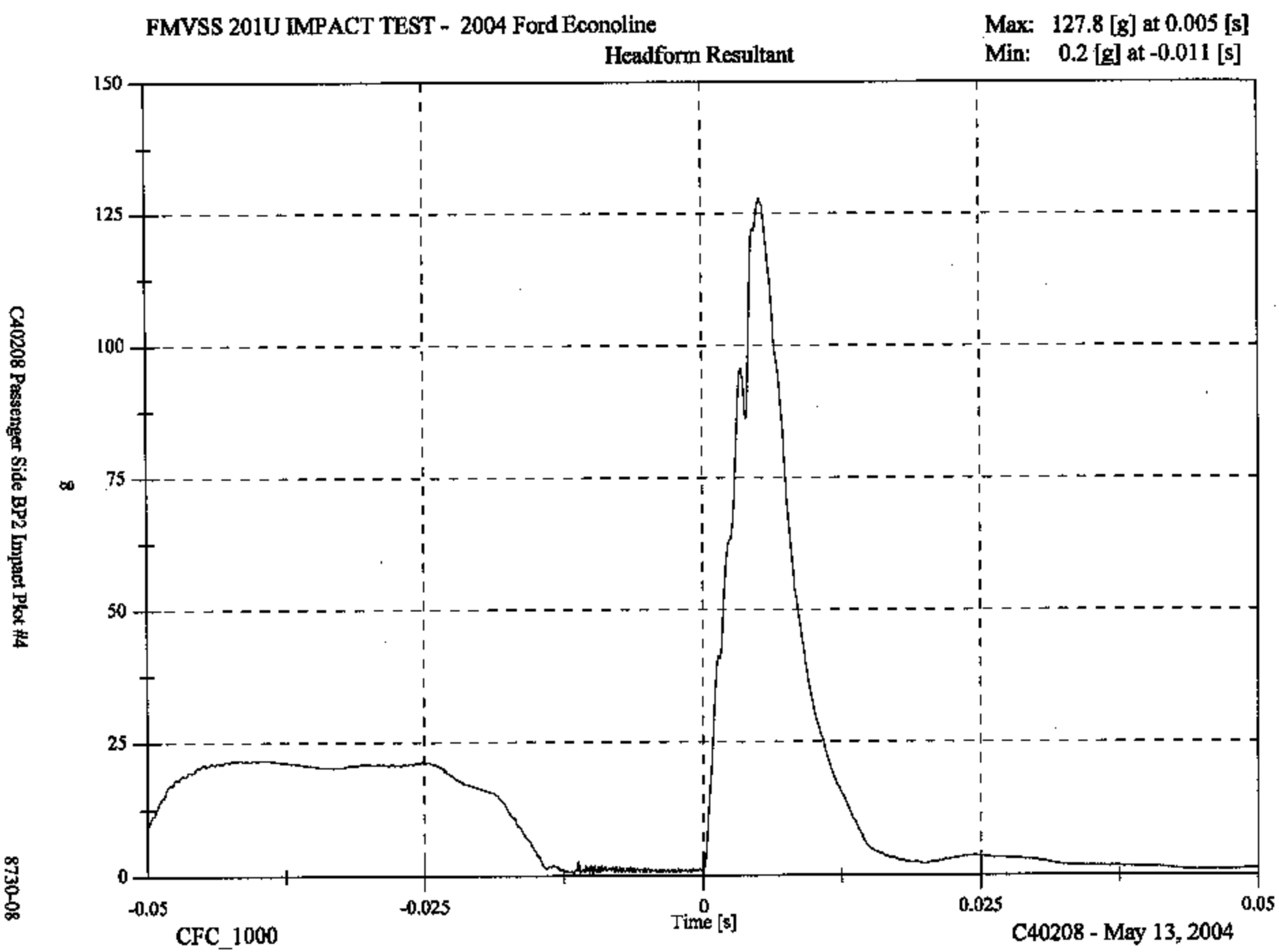
Min: -0.0 [g] at -0.099 [s]

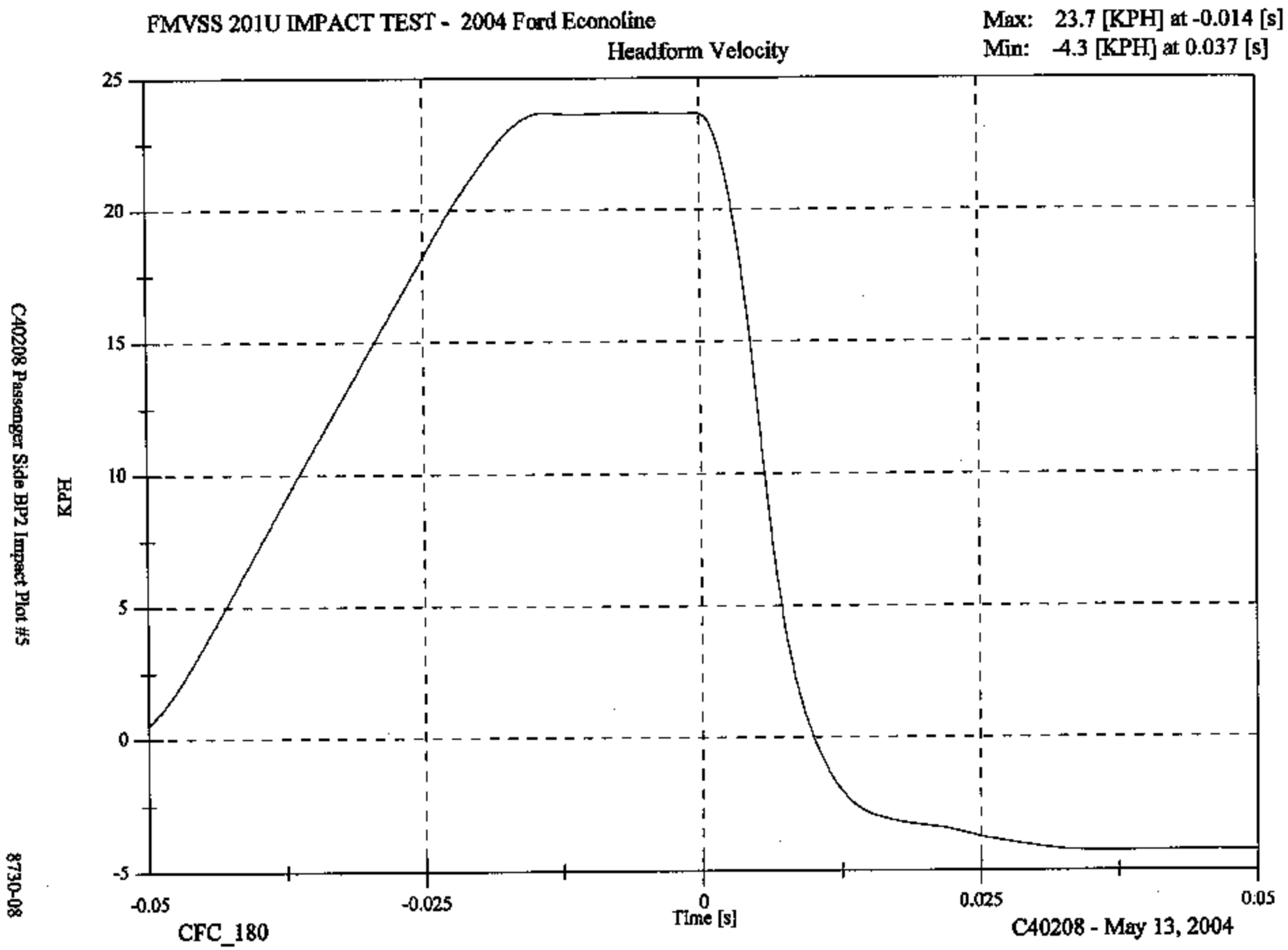


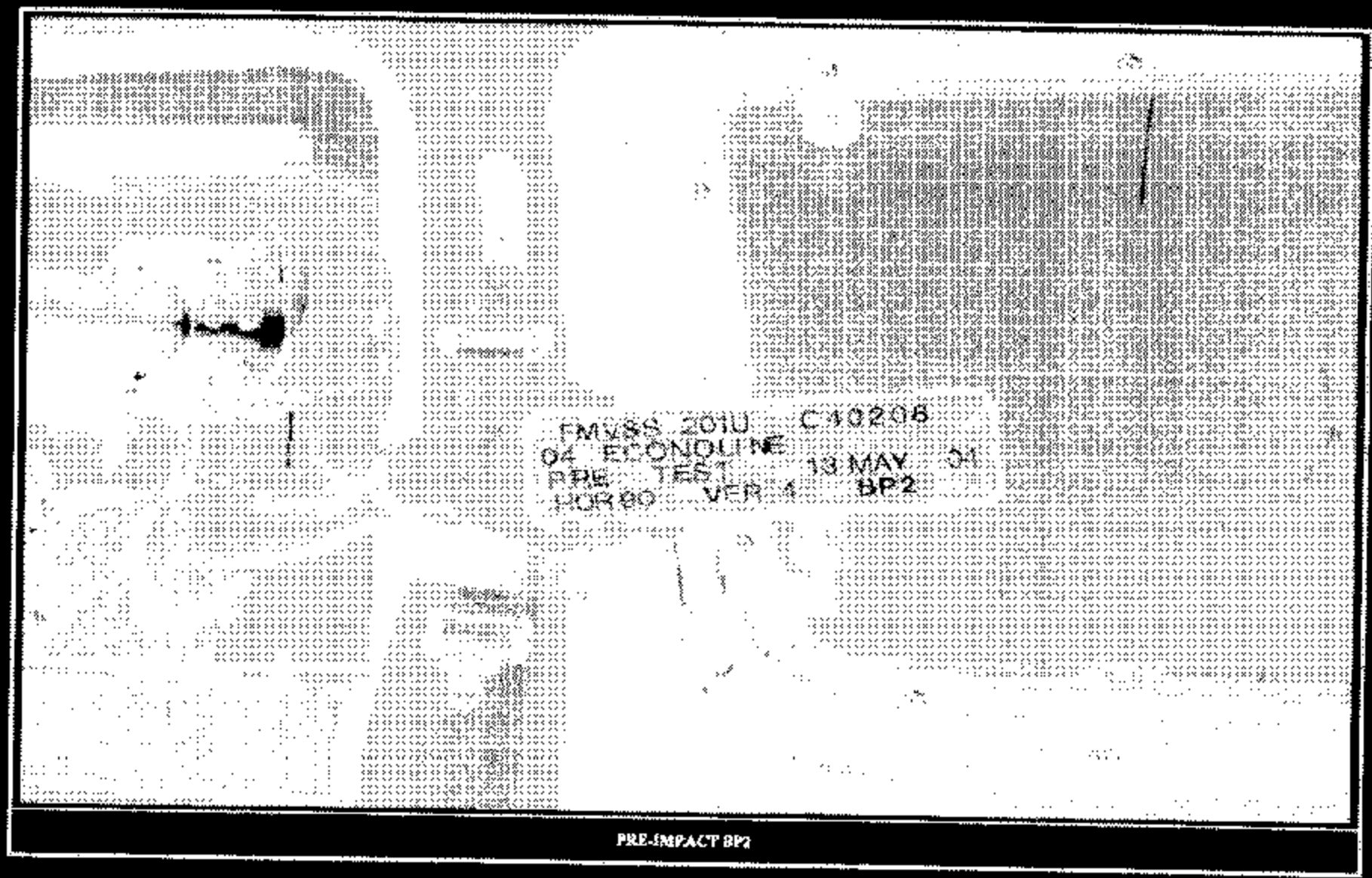

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform X Acceleration
Max: 21.6 [g] at -0.040 [s]
Min: -121.5 [g] at 0.005 [s]
25
0
-25
-50
-75
-100
-125
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side BP2 Impact Plot #1
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 9.3 [g] at 0.004 [s]
Min: -5.6 [g] at 0.007 [s]
10
7.5
5
2.5
0
-2.5
-5
-7.5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Passenger Side BP2 Impact Plot #2
8730-08
CFC_1000
C40208 - May 13, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 40.5 [g] at 0.004 [s]
Min: -2.5 [g] at -0.011 [s]
50
40
30
20
10
0
-10
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Passenger Side BP2 Impact Plot #3
8730-08
CFC_1000
C40208 - May 13, 2004

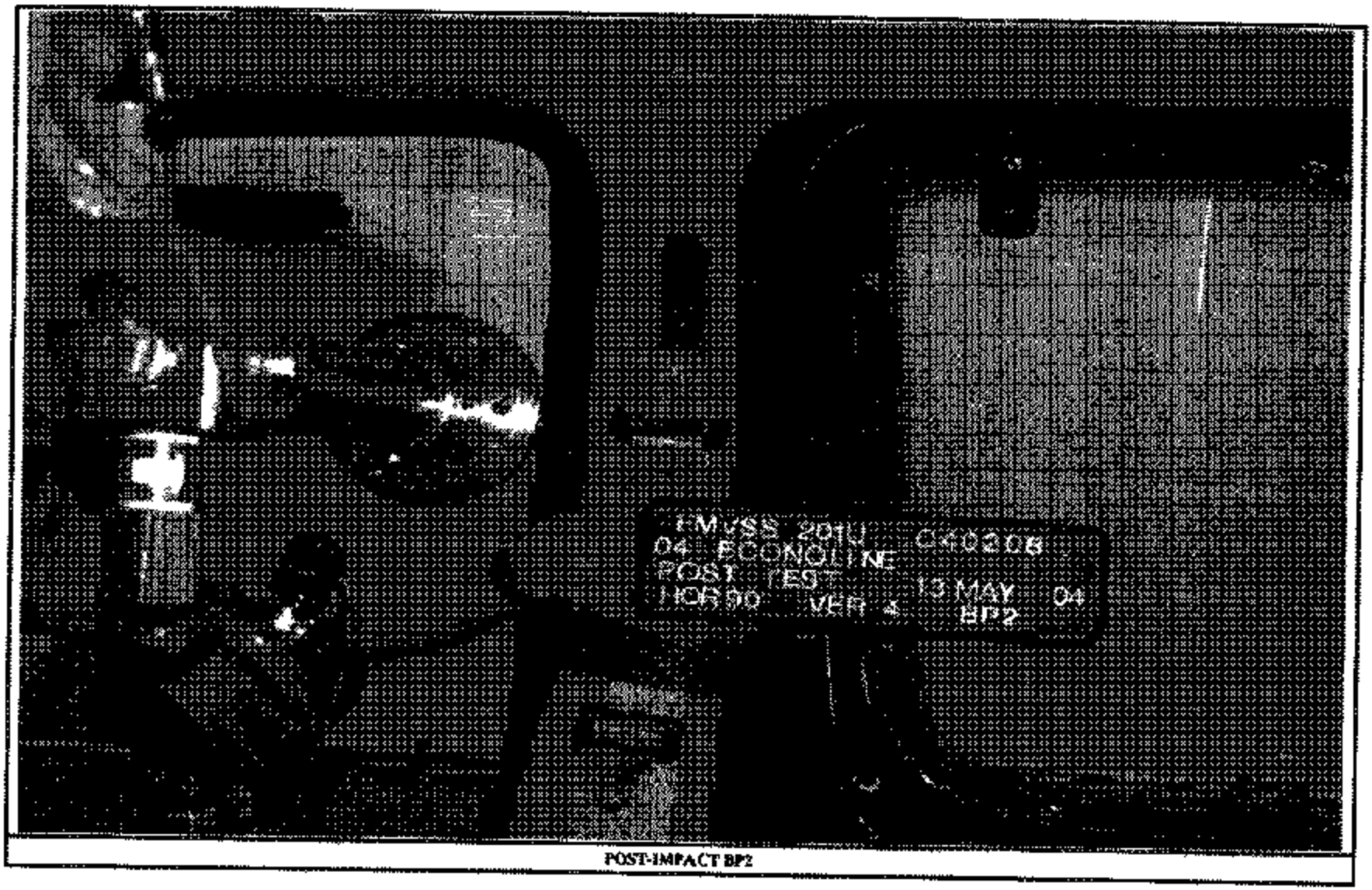

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 127.8 [g] at 0.005 [s]
Min: 0.2 [g] at -0.011 [s]
150
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Passenger Side BP2 Impact Plot #4
8730-08
CFC_1000
C40208 - May 13, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Velocity
Max: 23.7 [KPH] at -0.014 [s]
Min: -4.3 [KPH] at 0.037 [s]
25
20
15
10
5
0
-5
KPH
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Passenger Side BP2 Impact Plot #5
8730-08
CFC_180
C40208 - May 13, 2004




PRE-IMPACT BP2

8730-08



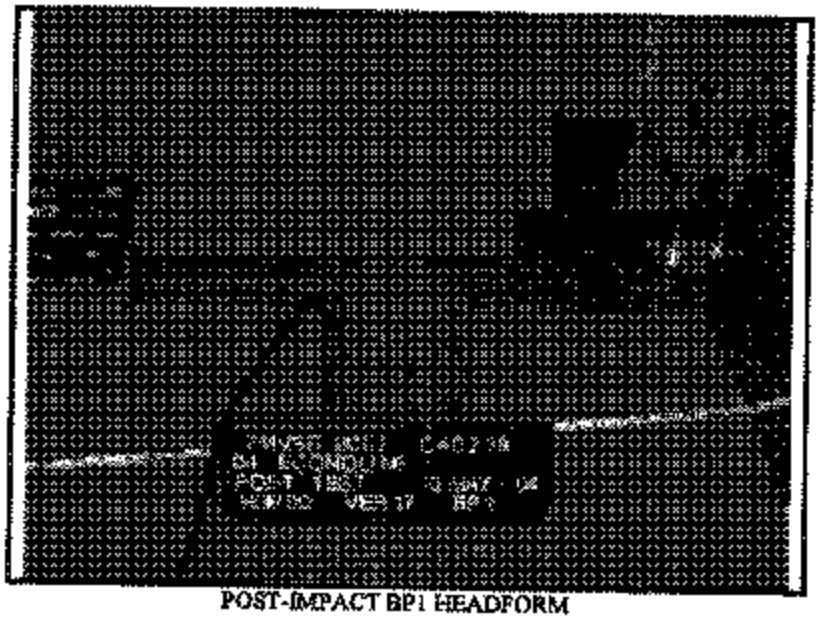

POST-IMPACT BP2

8736-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 11 |
| Test Date: | May 13, 2004 |
| Target Location: | Passenger Side B-Pillar |
| Target Code: | BP1 |
| Horizontal Impact Angle: | 90° |
| Vertical Impact Angle: | 17° |
| Ambient Temperature: | 23.6°C |
| Relative Humidity: | 39.9 |
| Time of Impact: | 11:15 |
| Headform Number: | 0355 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 22 | - | mm right | x | mm left |
| On Centerline | 65 | | mm up | | |



POST-IMPACT BP1 HEADFORM

| | |
|---|---|
| Free Motion HIC | 645.8 |
| HIC(d) | 653.6 |
| Impact Velocity (kph) | 23.64 |
| HIC T1 (msec) | 6.4 |
| HIC T2 (msec) | 13.6 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - BP1

FMH Headform 0355

Test Date: May 13, 2004

Location: BP1

Work File: BP1

## TEST RESULTS

Lab Temperature: 23.6 C

Lab Humidity: 39.9 %

Velocity at Impact: 23.64 KPH

Free Flight Distance: 225.06 mm

HICd: 653.6

HIC (36ms): 645.8

t1: 6.4 msec

t2: 13.6 msec

Duration: 7.2 msec

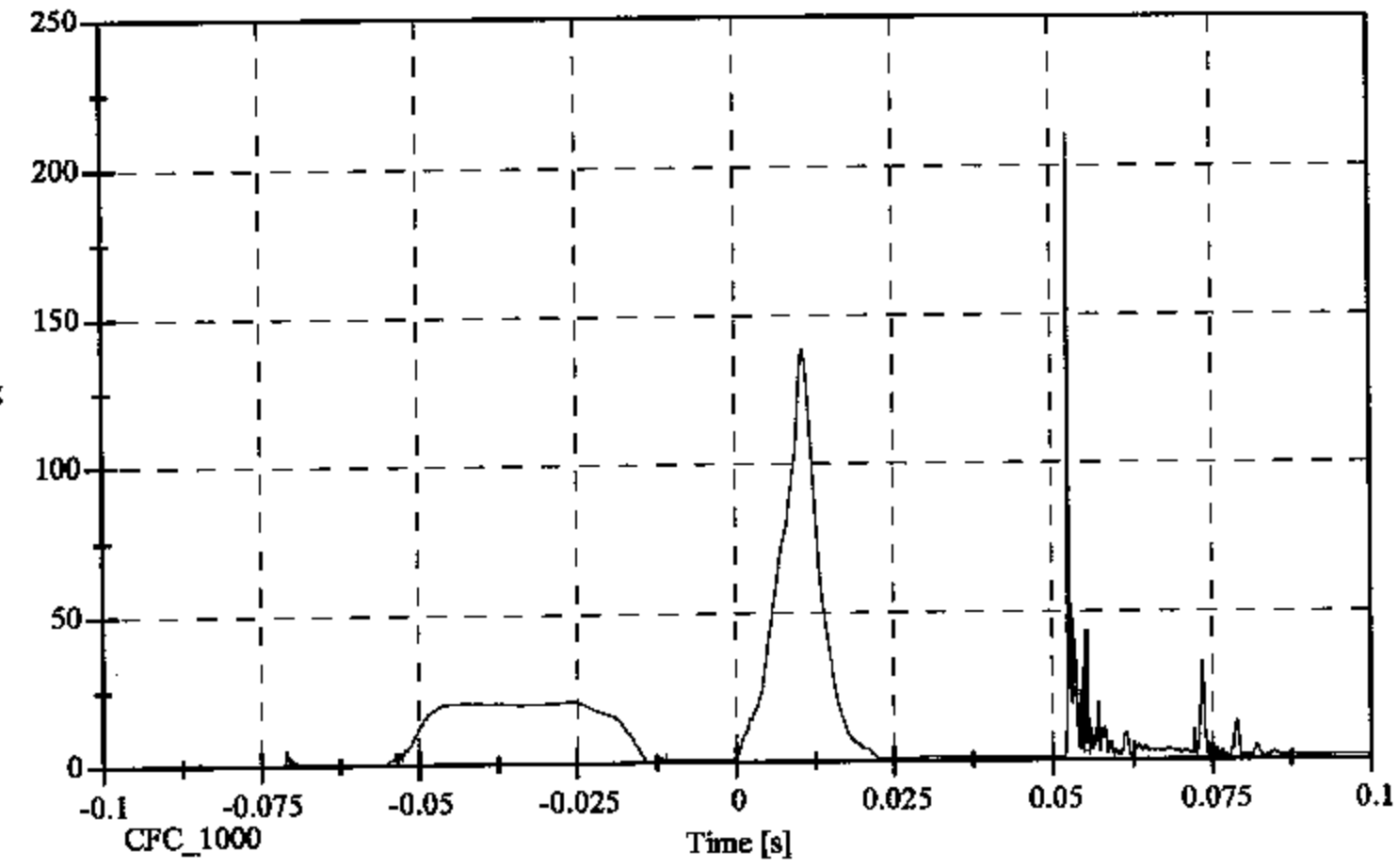
Average Acceleration: 9.9 g

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Resultant

Max: 210.4 [g] at 0.053 [s]

Min: 0.0 [g] at -0.091 [s]

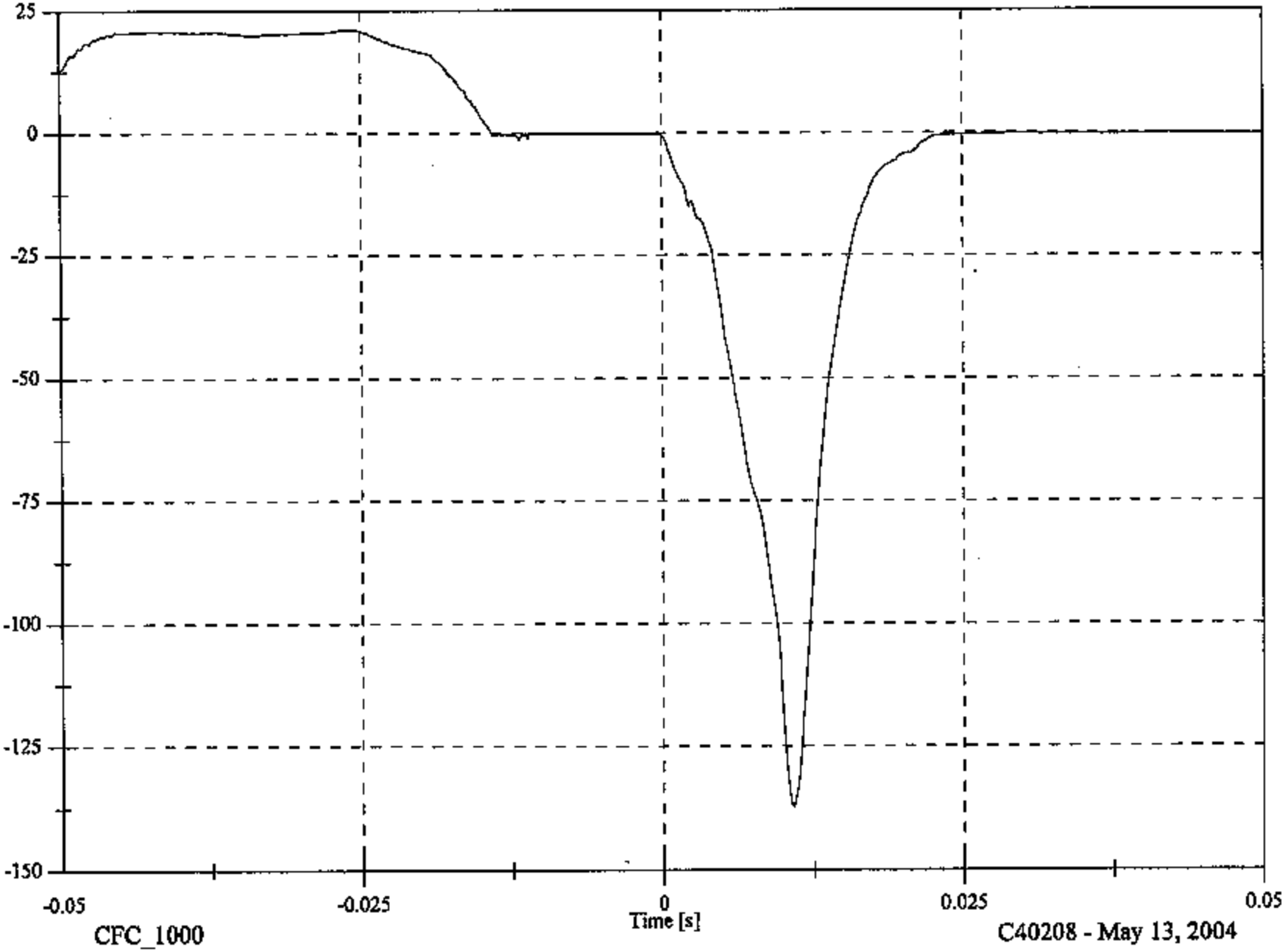


FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform X Acceleration

Max: 20.9 [g] at -0.025 [s]

Min: -137.1 [g] at 0.011 [s]

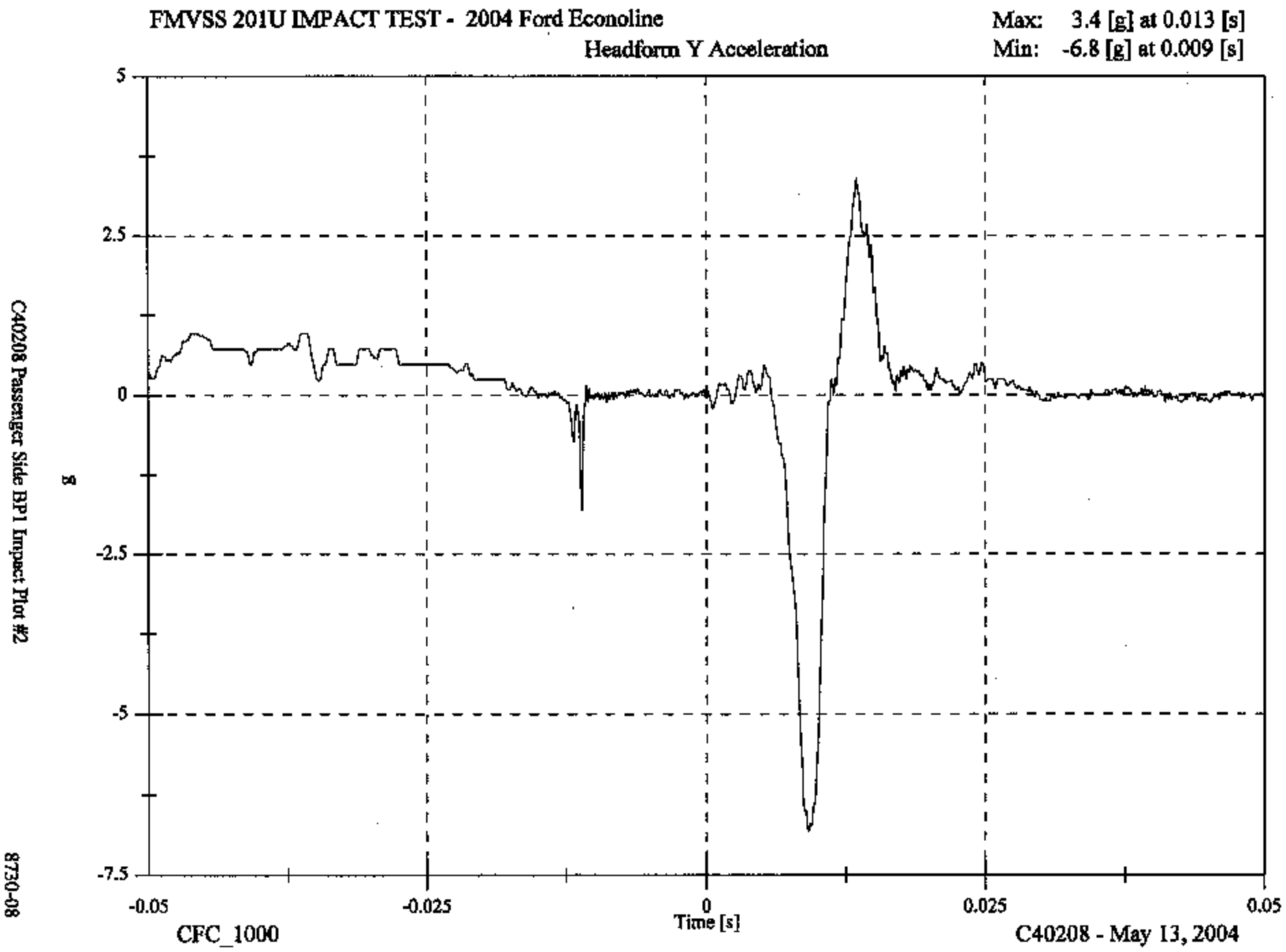


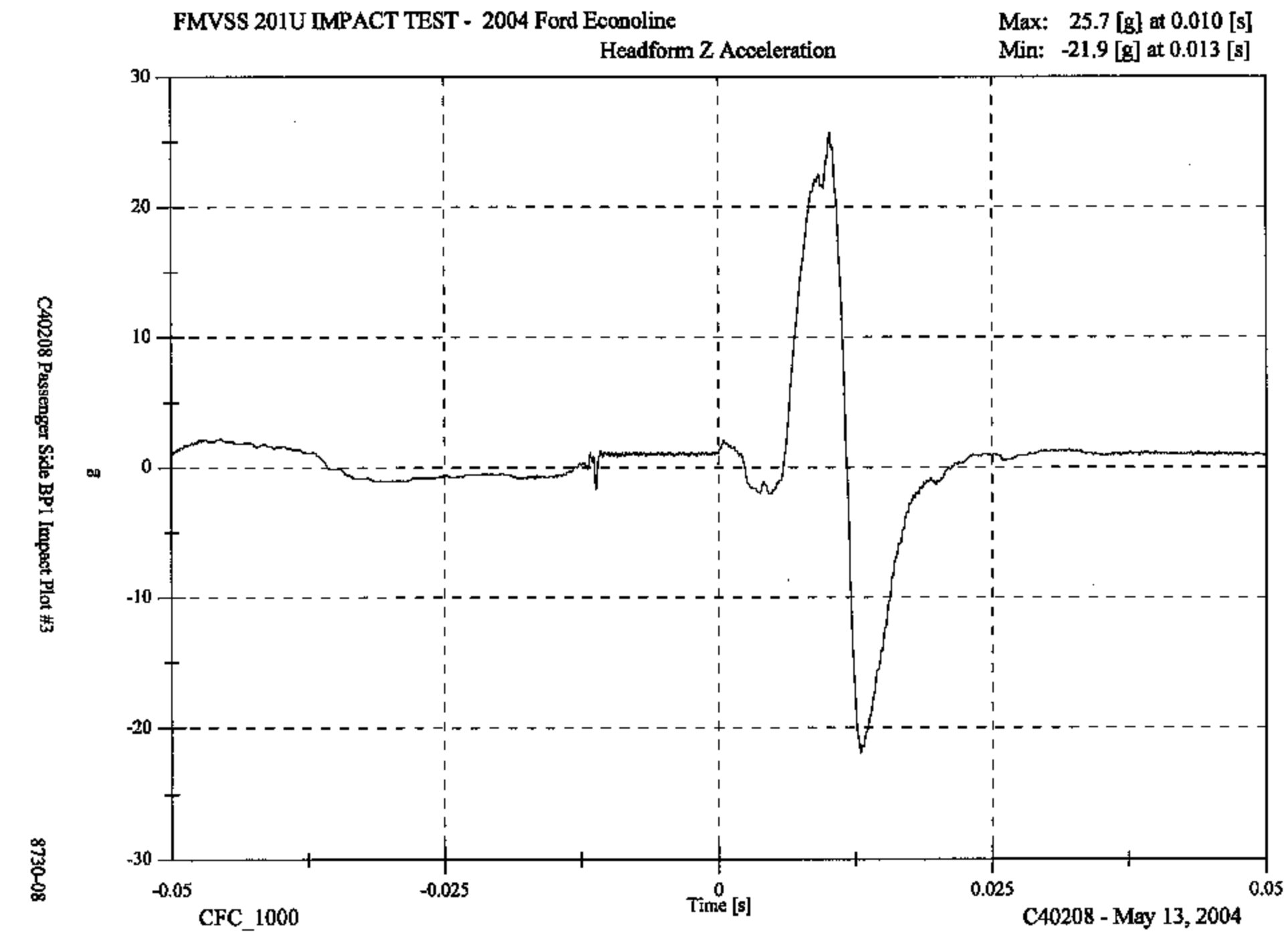

C40208 Passenger Side BP1 Impact Plot #1

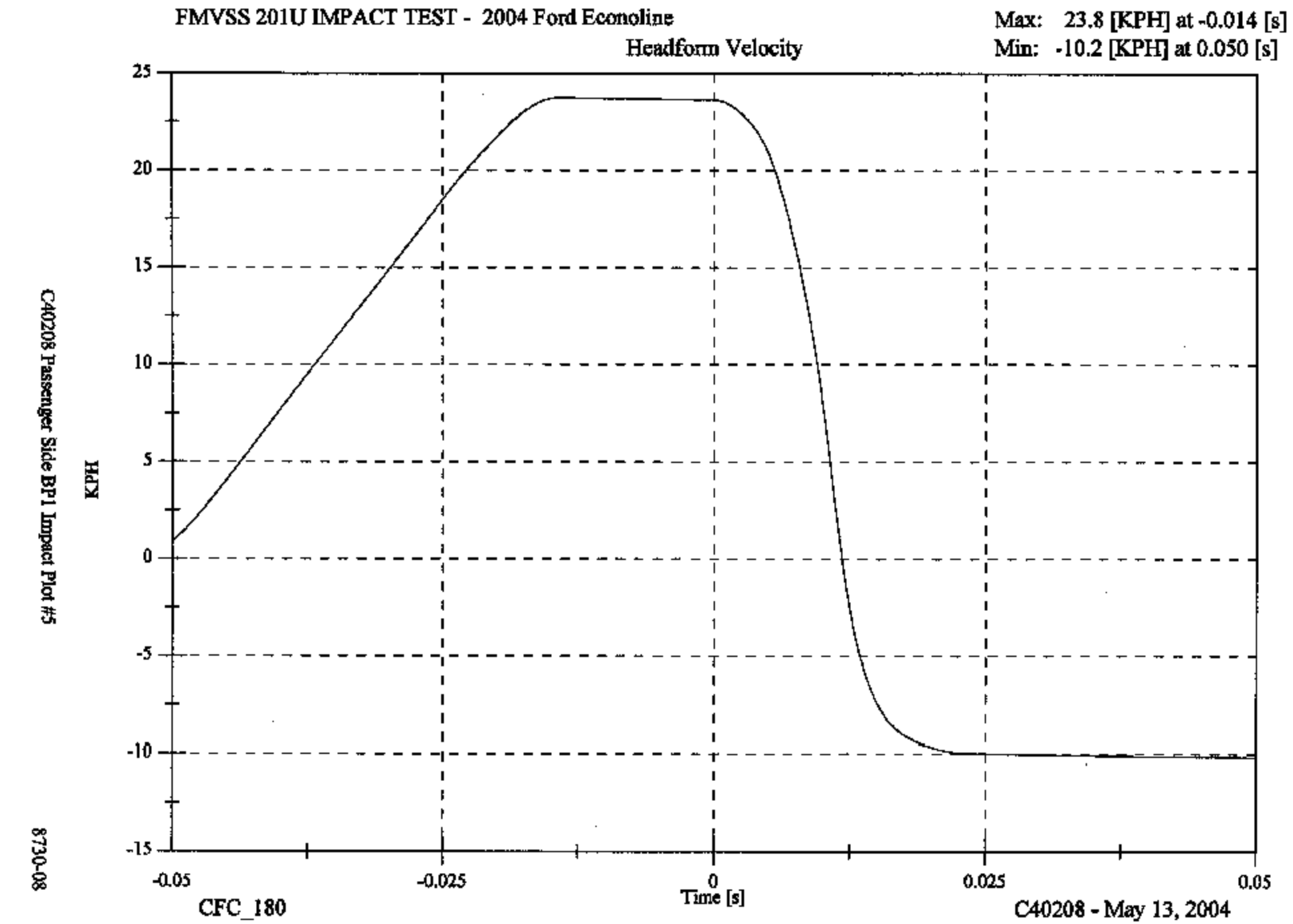
8730-08

CFC_1000

C40208 - May 13, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 3.4 [g] at 0.013 [s]
Min: -6.8 [g] at 0.009 [s]
5
2.5
0
-2.5
-5
-7.5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Passenger Side BP1 Impact Plot #2
8730-08
CFC_1000
C40208 - May 13, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 25.7 [g] at 0.010 [s]
Min: -21.9 [g] at 0.013 [s]
30
20
10
0
-10
-20
-30
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side BP1 Impact Plot #3
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Velocity
Max: 23.8 [KPH] at -0.014 [s]
Min: -10.2 [KPH] at 0.050 [s]
C40208 Passenger Side BP1 Impact Plot #5
8730-08
KPH
25
20
15
10
5
0
-5
-10
-15
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_180
C40208 - May 13, 2004


PRE-IMPACT BP1

8730-08

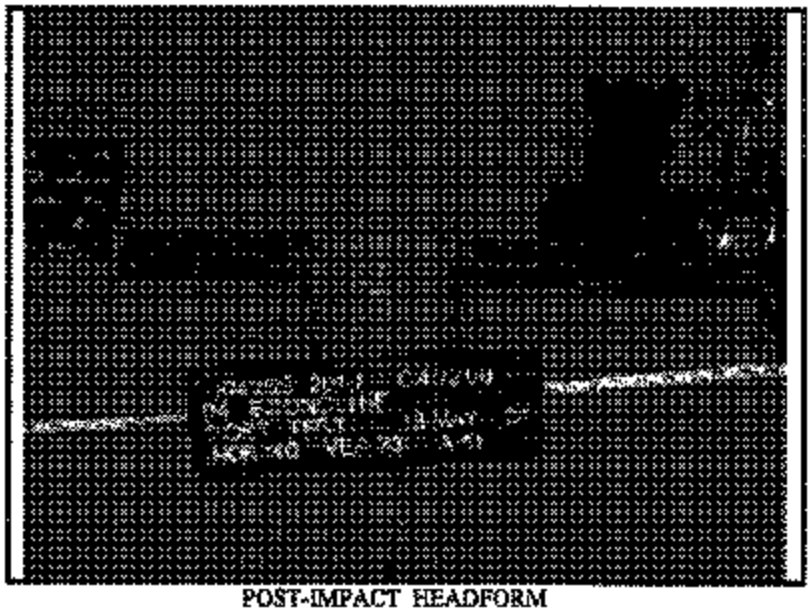

POST-IMPACT BP1

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 12 |
| Test Date: | May 13, 2004 |
| Target Location: | Passenger Side A-Pillar |
| Target Code: | AP3 |
| Horizontal Impact Angle: | 140° |
| Vertical Impact Angle: | 33° |
| Ambient Temperature: | 23.6°C |
| Relative Humidity: | 40.0 |
| Time of Impact: | 11:50 |
| Headform Number: | 0805 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 7 | - | mm right | x | mm left |
| On Centerline | 13 | mm up | | | |



POST-IMPACT HEADFORM

| | |
|---|---|
| Free Motion HIC | 535.1 |
| HIC(d) | 570.1 |
| Impact Velocity (kph) | 23.68 |
| HIC T1 (msec) | 0.9 |
| HIC T2 (msec) | 6.8 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - AP3

FMH Headform 805

Test Date: May 13, 2004

Location: AP3

Work File: AP3

----------TEST RESULTS----------

Lab Temperature: 23.6 C

Lab Humidity: 40.0 %

Velocity at Impact: 23.68 KPH

Free Flight Distance: 215.67 mm

HICd: 570.1

HIC (36ms): 535.1

t1: 0.9 msec

t2: 6.8 msec

Duration: 5.9 msec

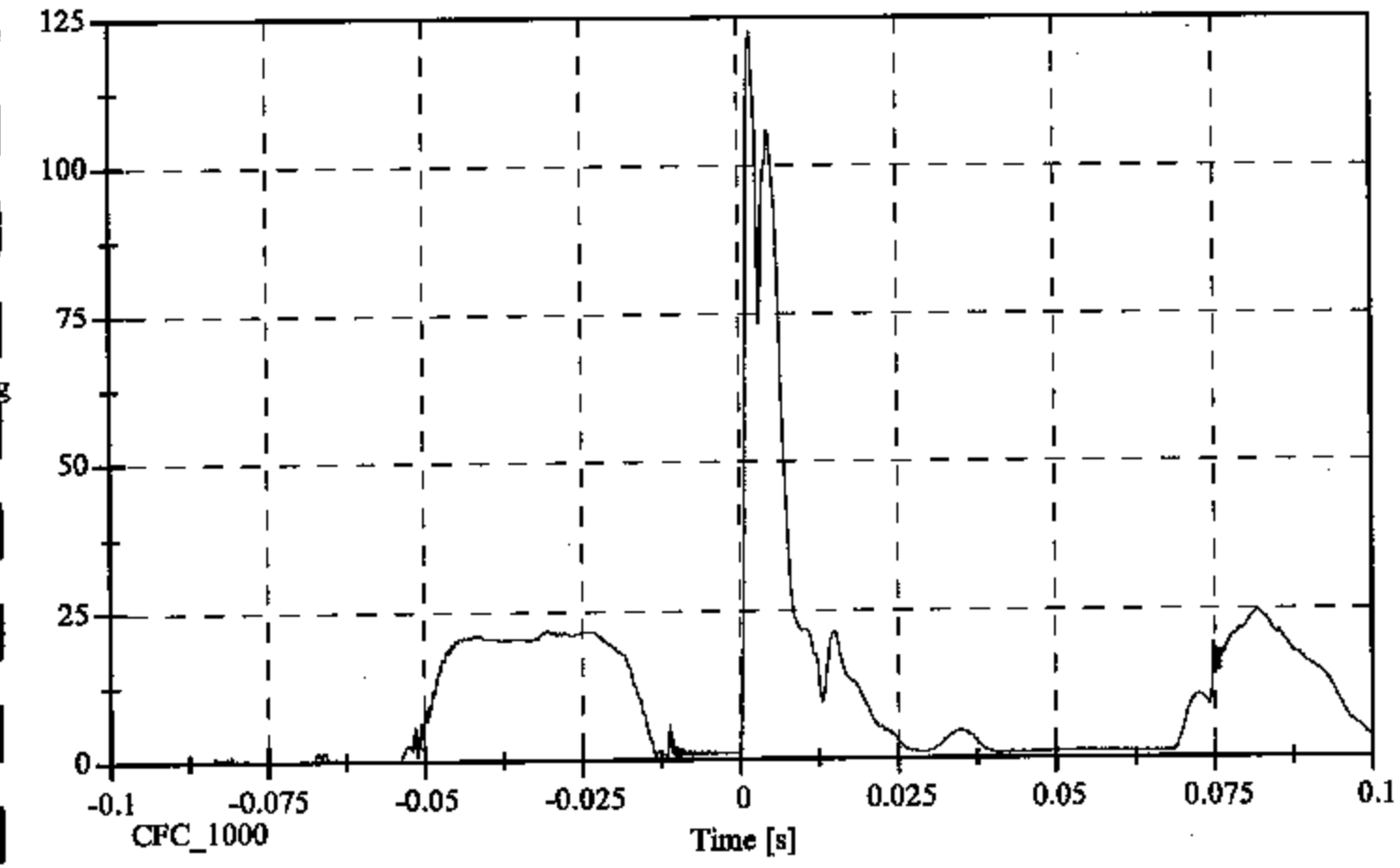
Average Acceleration: 10.6 g

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Resultant

Max: 122.6 [g] at 0.002 [s]

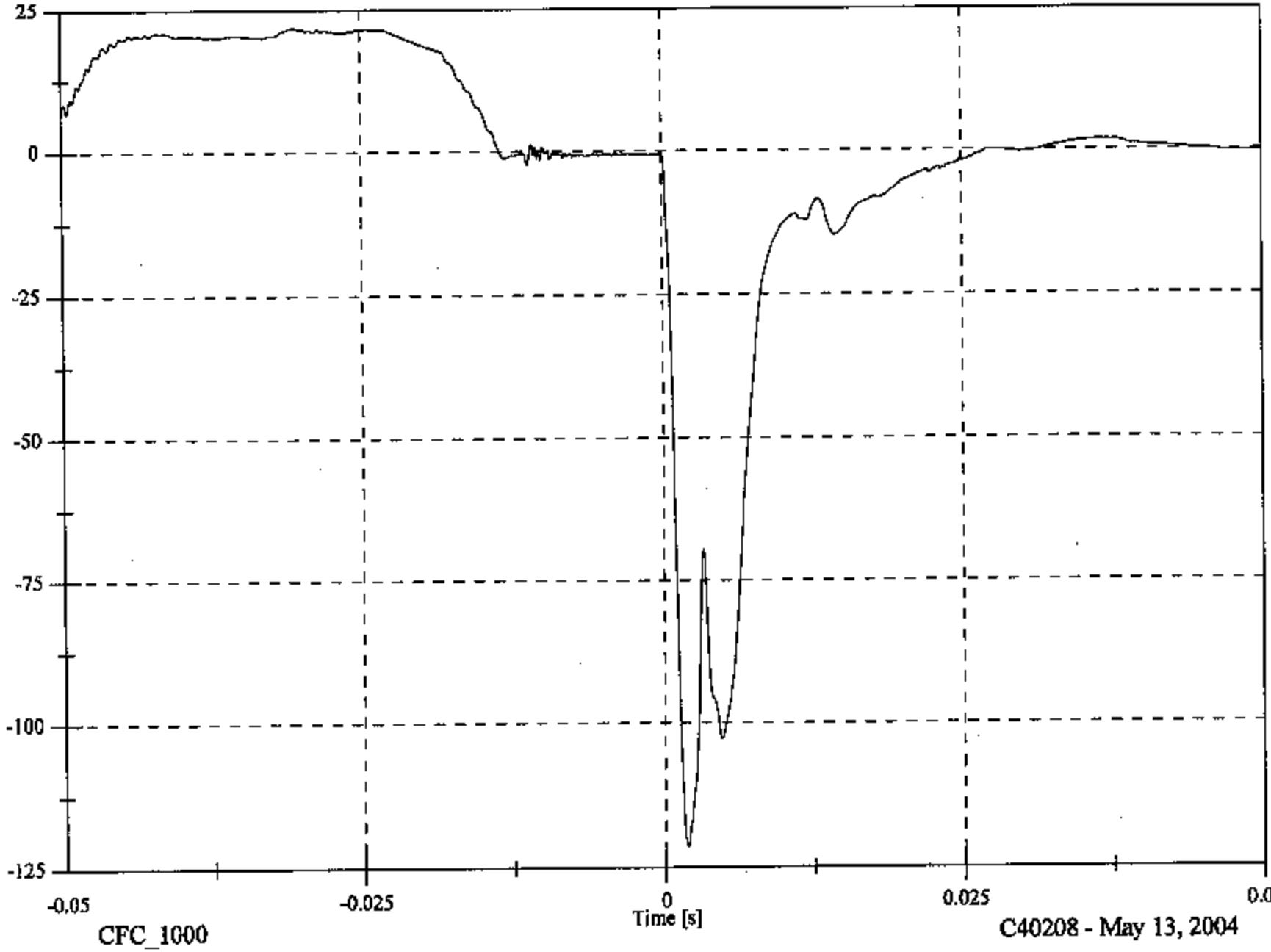
Min: 0.0 [g] at -0.090 [s]



FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform X Acceleration

Max: 21.9 [g] at -0.031 [s]
Min: -121.5 [g] at 0.002 [s]

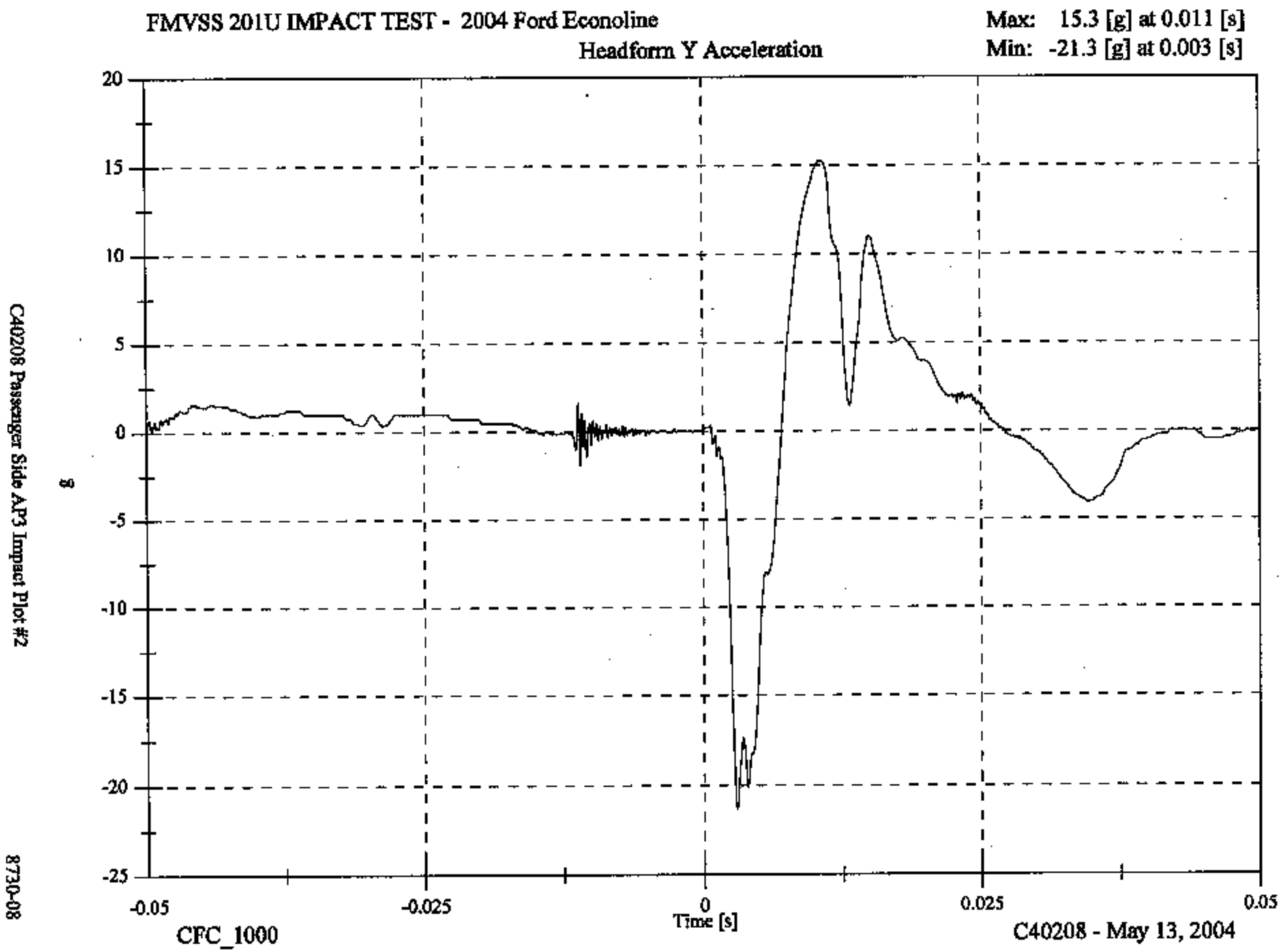



C40208 Passenger Side AP3 Impact Plot #1

8730-08

CFC_1000

C40208 - May 13, 2004

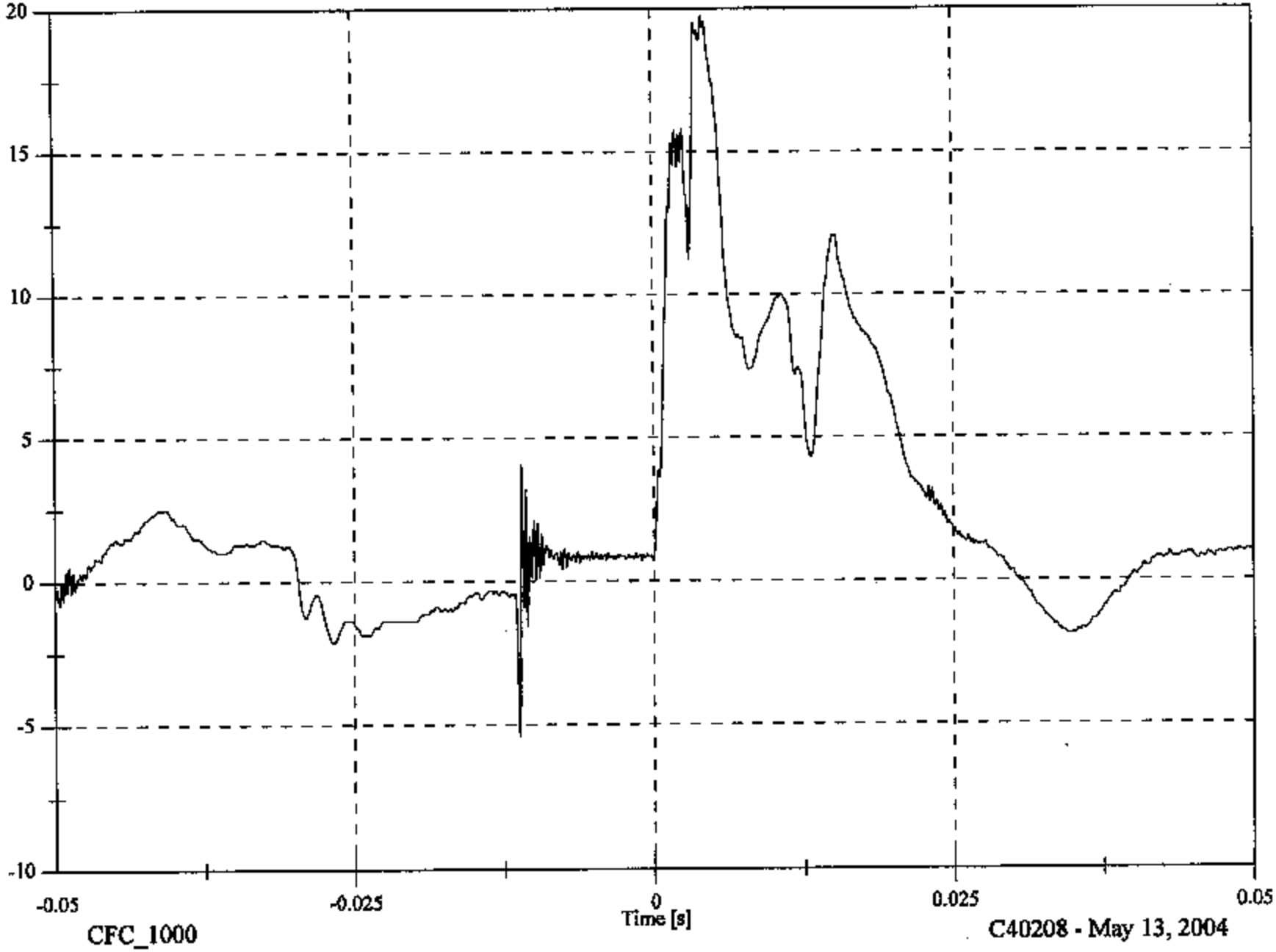

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 15.3 [g] at 0.011 [s]
Min: -21.3 [g] at 0.003 [s]
20
15
10
5
0
-5
-10
-15
-20
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side AP3 Impact Plot #2
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Z Acceleration

Max: 19.7 [g] at 0.004 [s]

Min: -5.4 [g] at -0.011 [s]

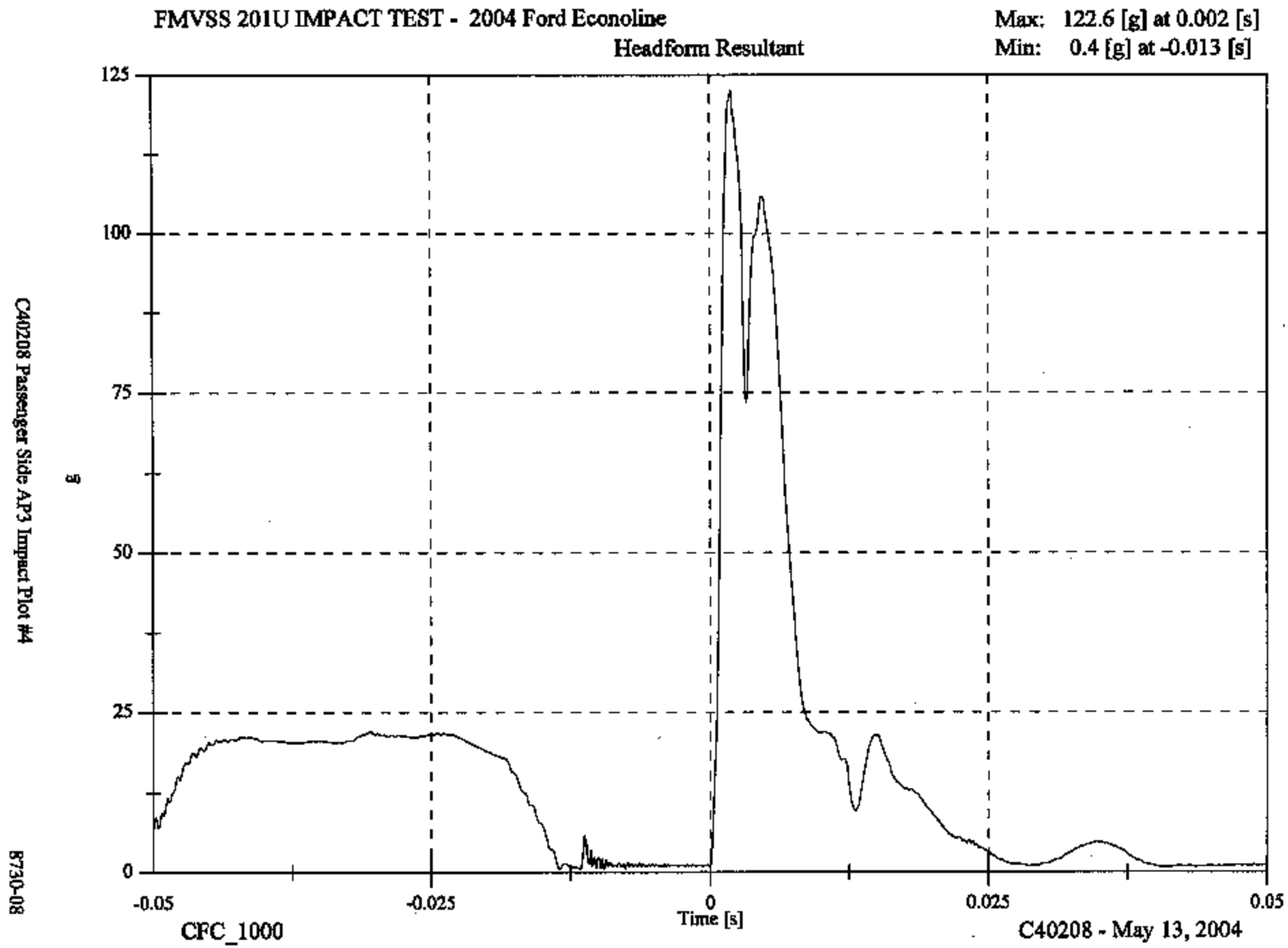


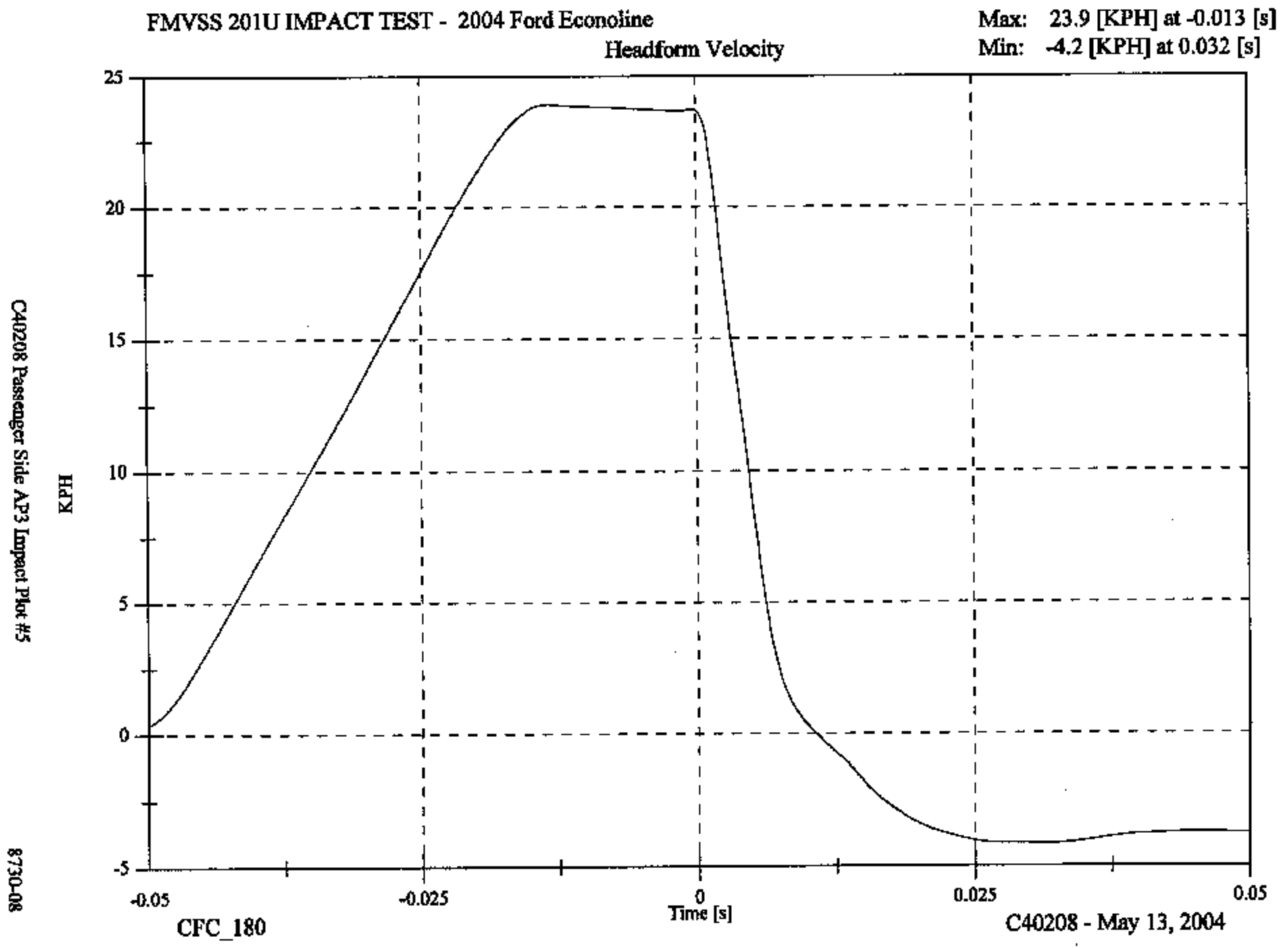

C40208 Passenger Side AP3 Impact Plot #3

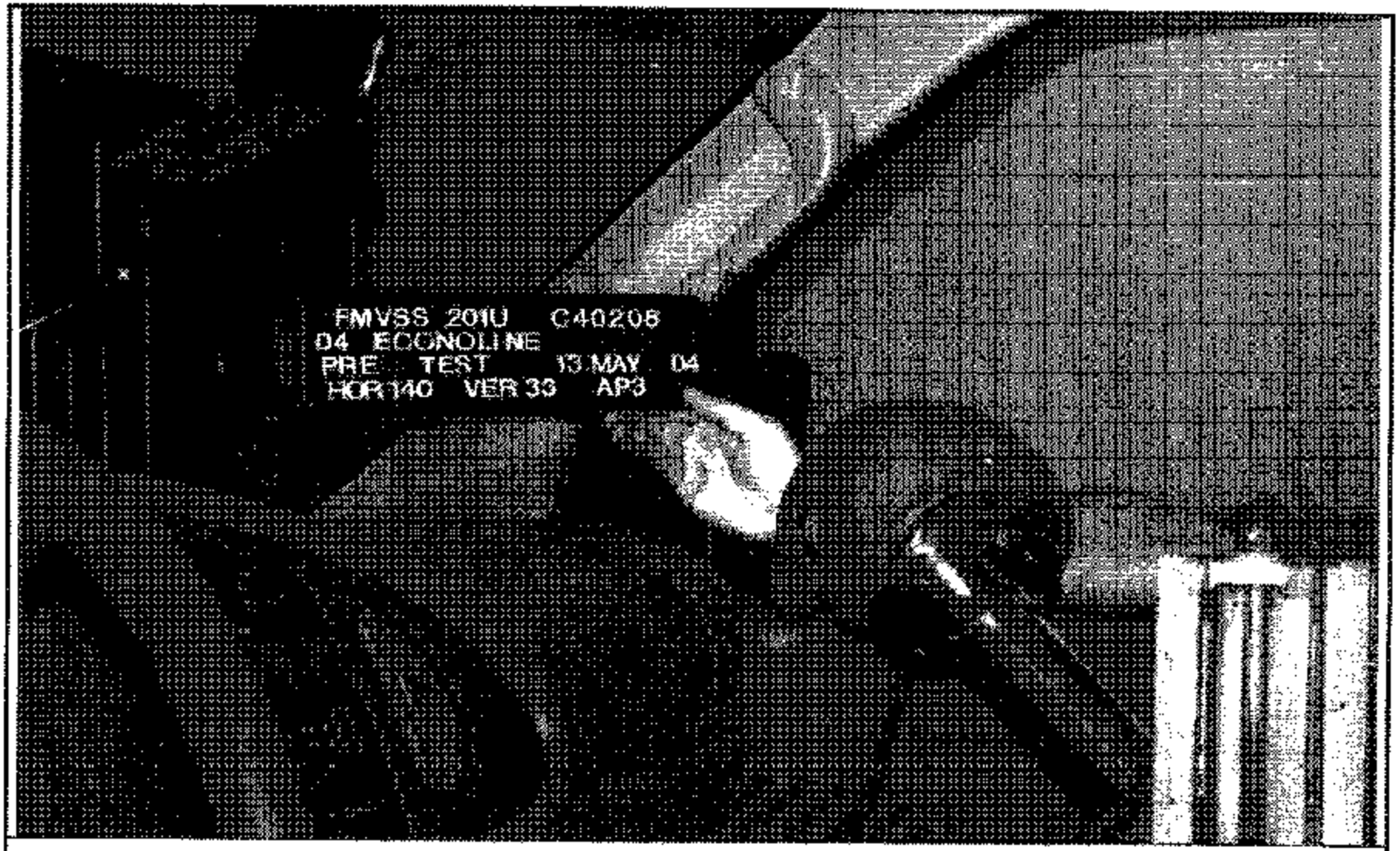
8730-08

CFC_1000

C40208 - May 13, 2004

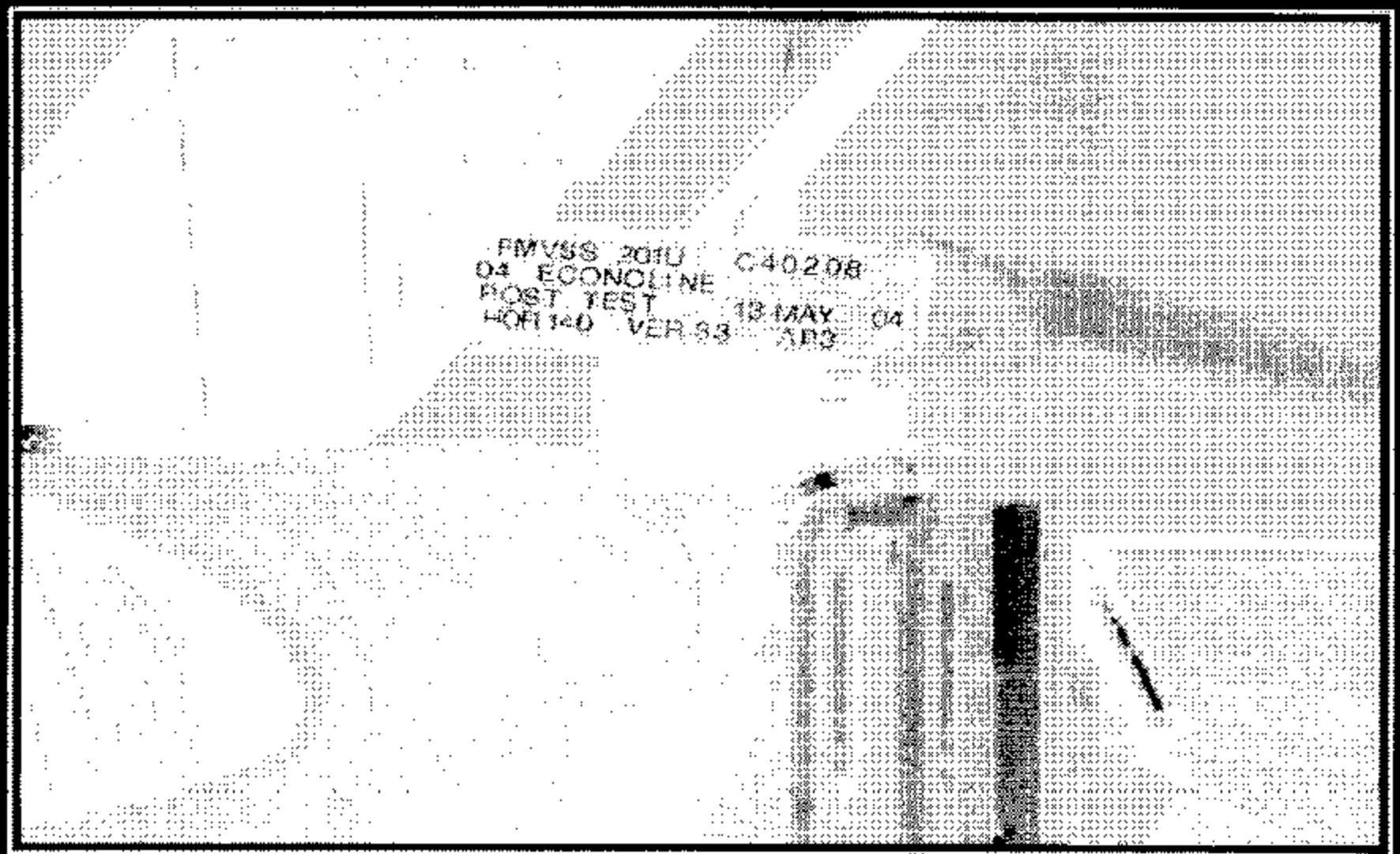

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 122.6 [g] at 0.002 [s]
Min: 0.4 [g] at -0.013 [s]
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side AP3 Impact Plot #4
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Velocity
Max: 23.9 [KPH] at -0.013 [s]
Min: -4.2 [KPH] at 0.032 [s]
25
20
15
10
5
0
-5
KPH
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Passenger Side AP3 Impact Plot #5
8730-08
CFC_180
C40208 - May 13, 2004




PRE-IMPACT AP3

8730-08



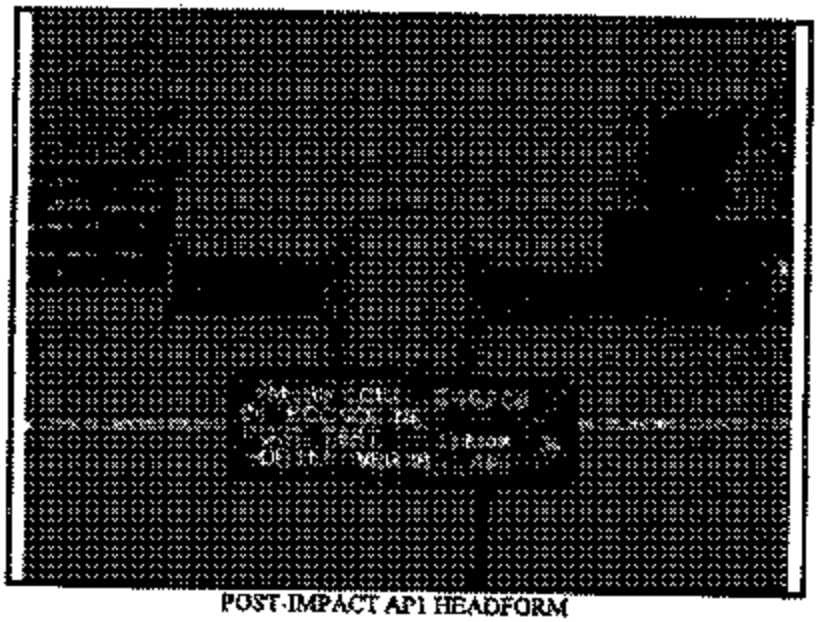

POST-IMPACT AP3

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 13 |
| Test Date: | May 13, 2004 |
| Target Location: | Passenger Side A-Pillar |
| Target Code: | AP1 |
| Horizontal Impact Angle: | 117° |
| Vertical Impact Angle: | 18° |
| Ambient Temperature: | 23.3°C |
| Relative Humidity: | 39.8 |
| Time of Impact: | 14:15 |
| Headform Number: | 0642 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | |
|---|---|---|---|---|
| On Centerline | 0 | - | mm right | - mm left |
| On Centerline | 18 | | mm up | |



POST-IMPACT AP1 HEADFORM

| | |
|---|---|
| Free Motion HIC | 353.1 |
| HIC(d) | 432.8 |
| Impact Velocity (kph) | 23.34 |
| HIC T1 (msec) | 2.7 |
| HIC T2 (msec) | 12.7 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - AP1

FMH Headform 0642

Test Date: May 13, 2004

Location: AP1

Work File: AP1

## TEST RESULTS

Lab Temperature: 23.3 C

Lab Humidity: 39.8 %

Velocity at Impact: 23.54 KPH

Free Flight Distance: 208.91 mm

HICd: 432.8

HIC (36ms): 353.1

t1: 2.7 msec

t2: 12.7 msec

Duration: 10.0 msec

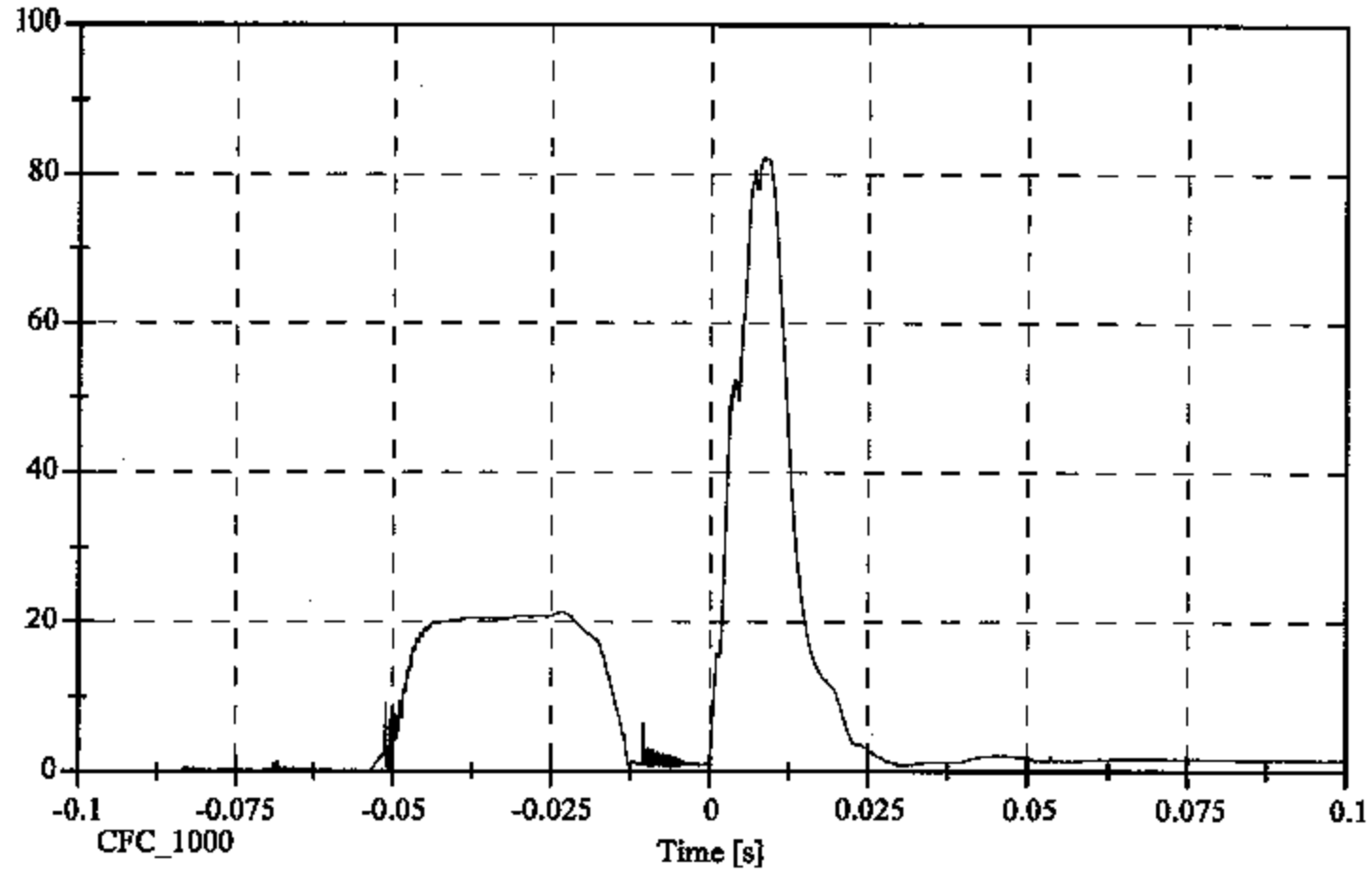
Average Acceleration: 8.4 g

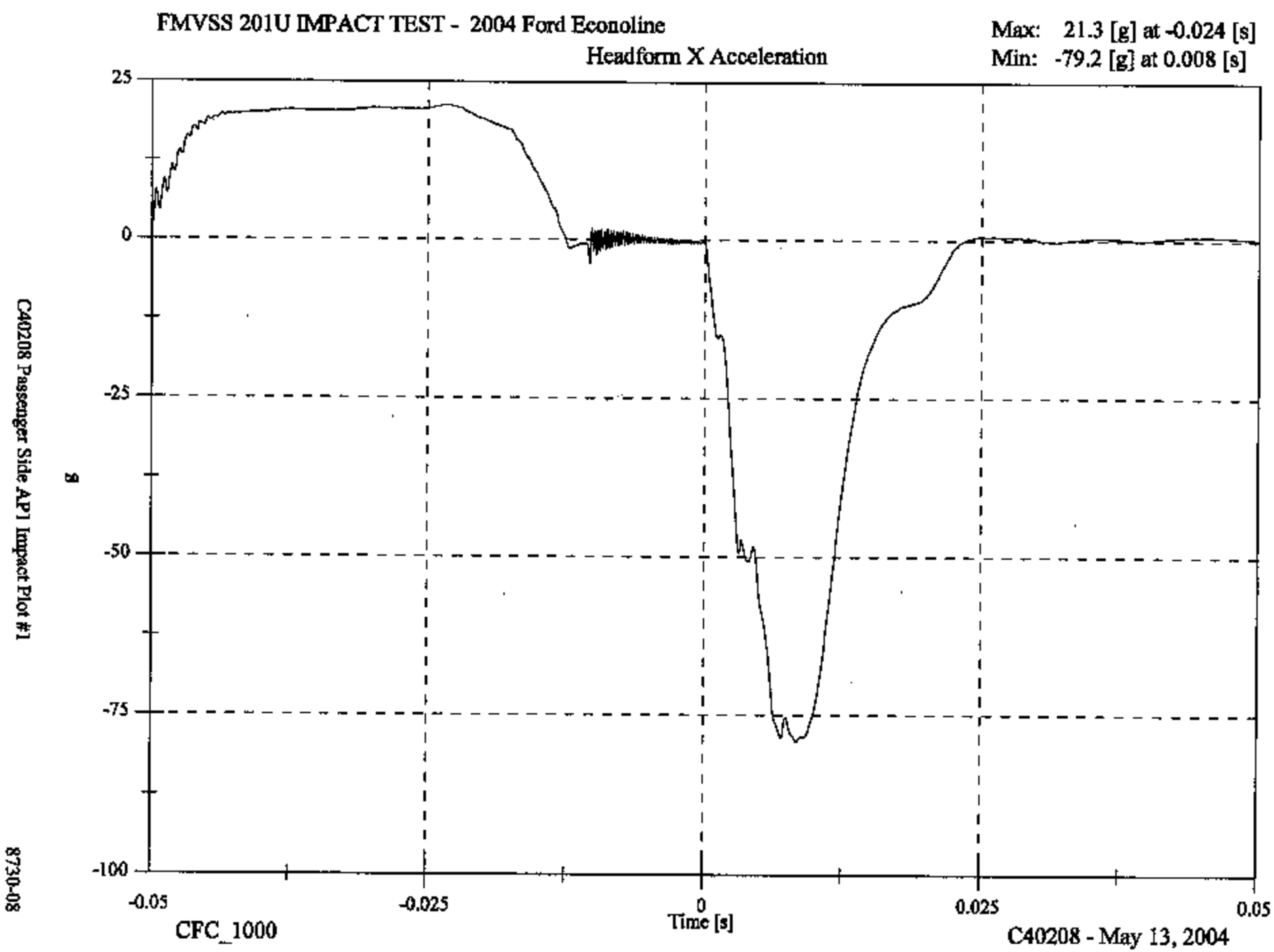
FMVSS 201U IMPACT TEST - 2004 Ford Econoline

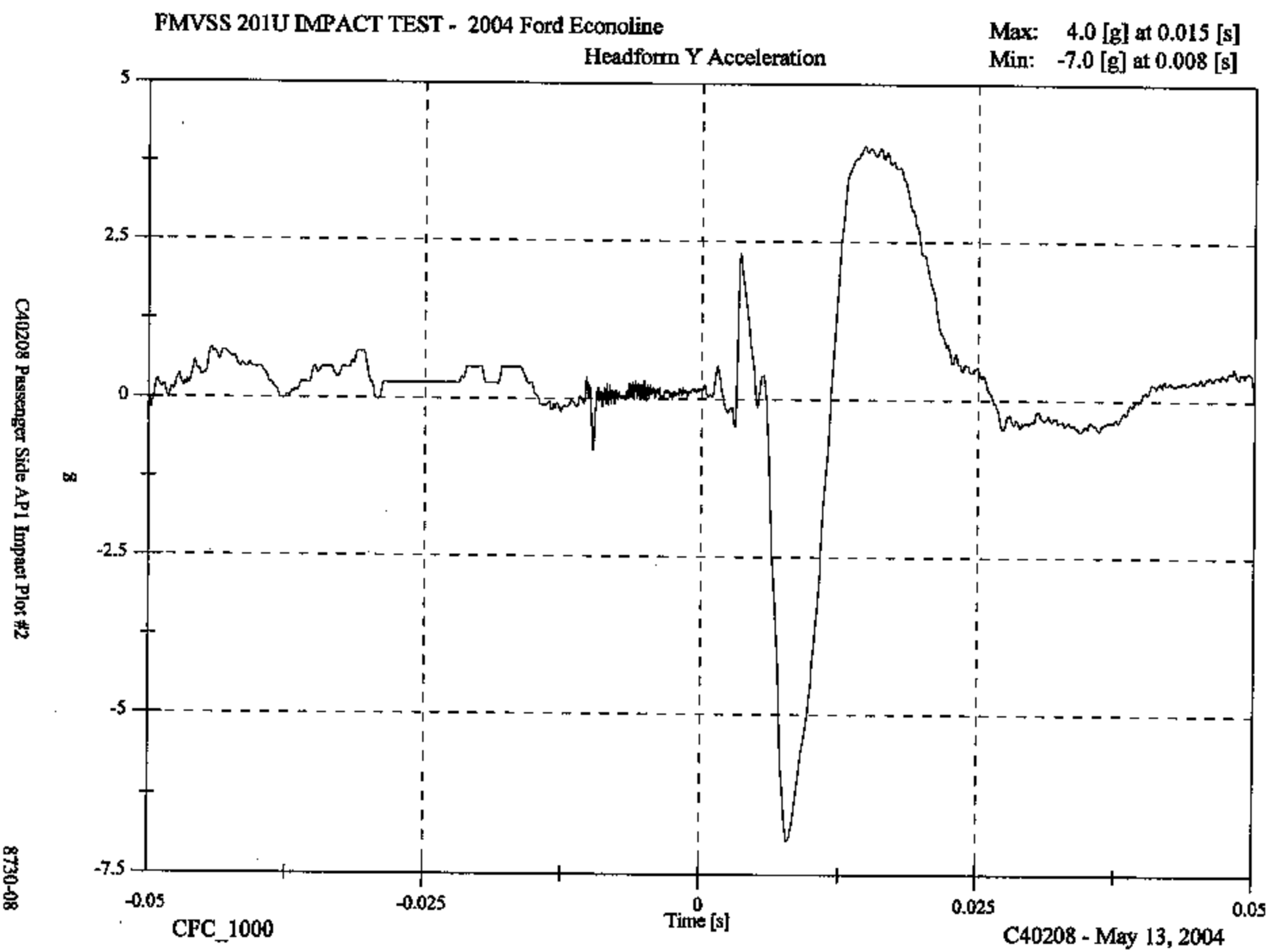
Headform Resultant

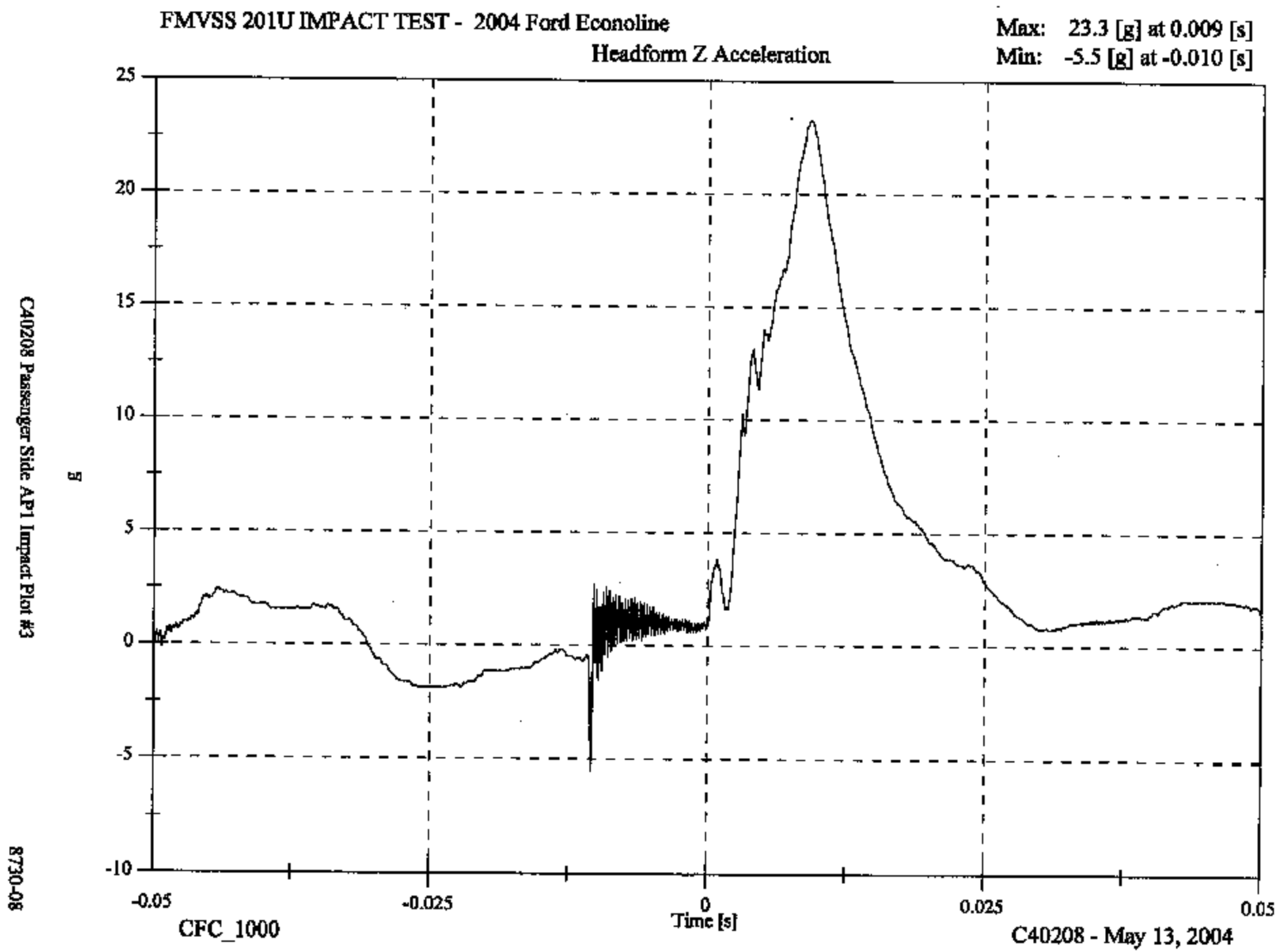
Max: 82.4 [g] at 0.008 [s]

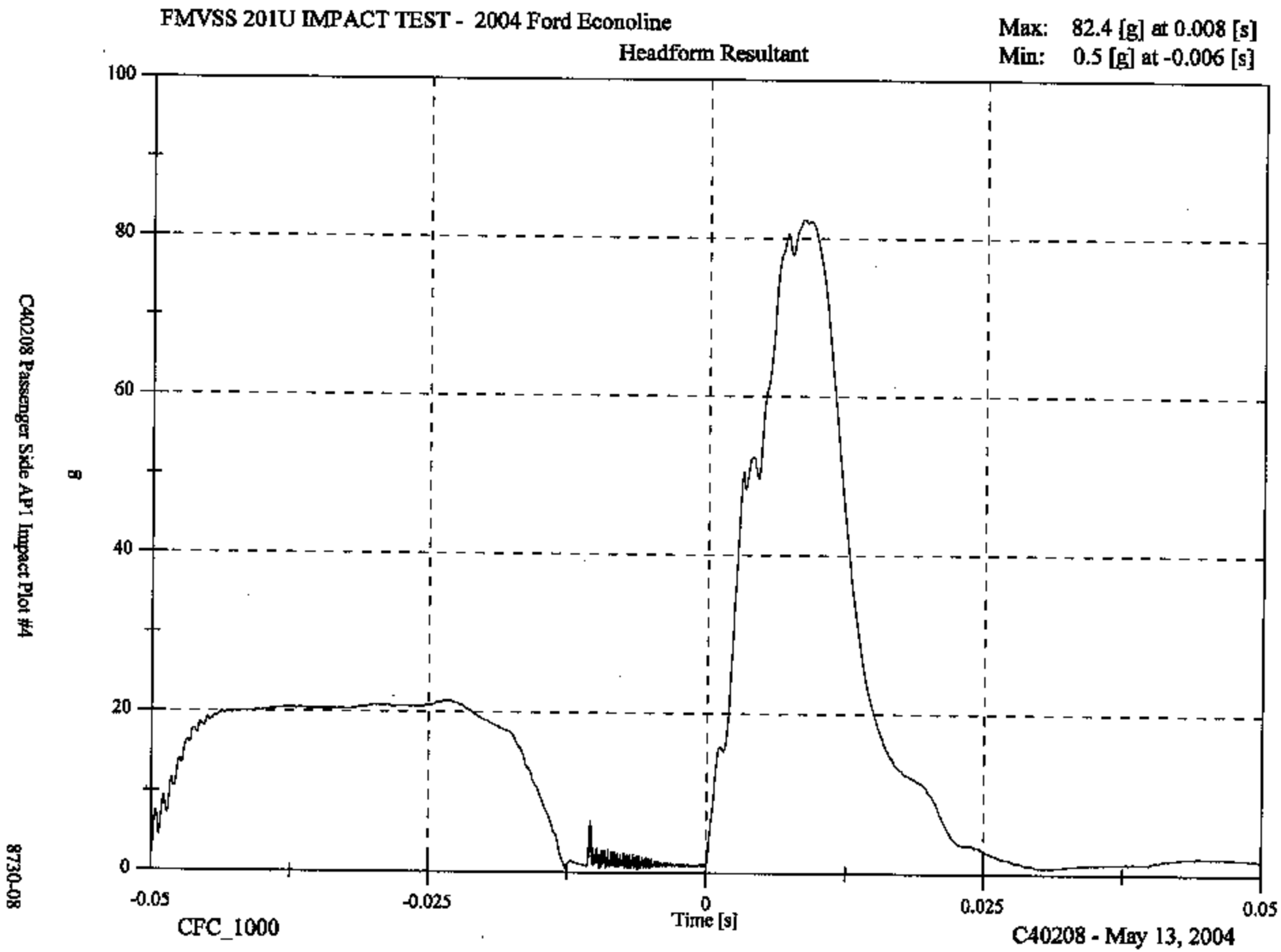
Min: 0.0 [g] at -0.085 [s]




FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform X Acceleration
Max: 21.3 [g] at -0.024 [s]
Min: -79.2 [g] at 0.008 [s]
25
0
-25
-50
-75
-100
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side AP1 Impact Plot #1
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 4.0 [g] at 0.015 [s]
Min: -7.0 [g] at 0.008 [s]
5
2.5
0
-2.5
-5
-7.5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side AP1 Impact Plot #2
8730-08

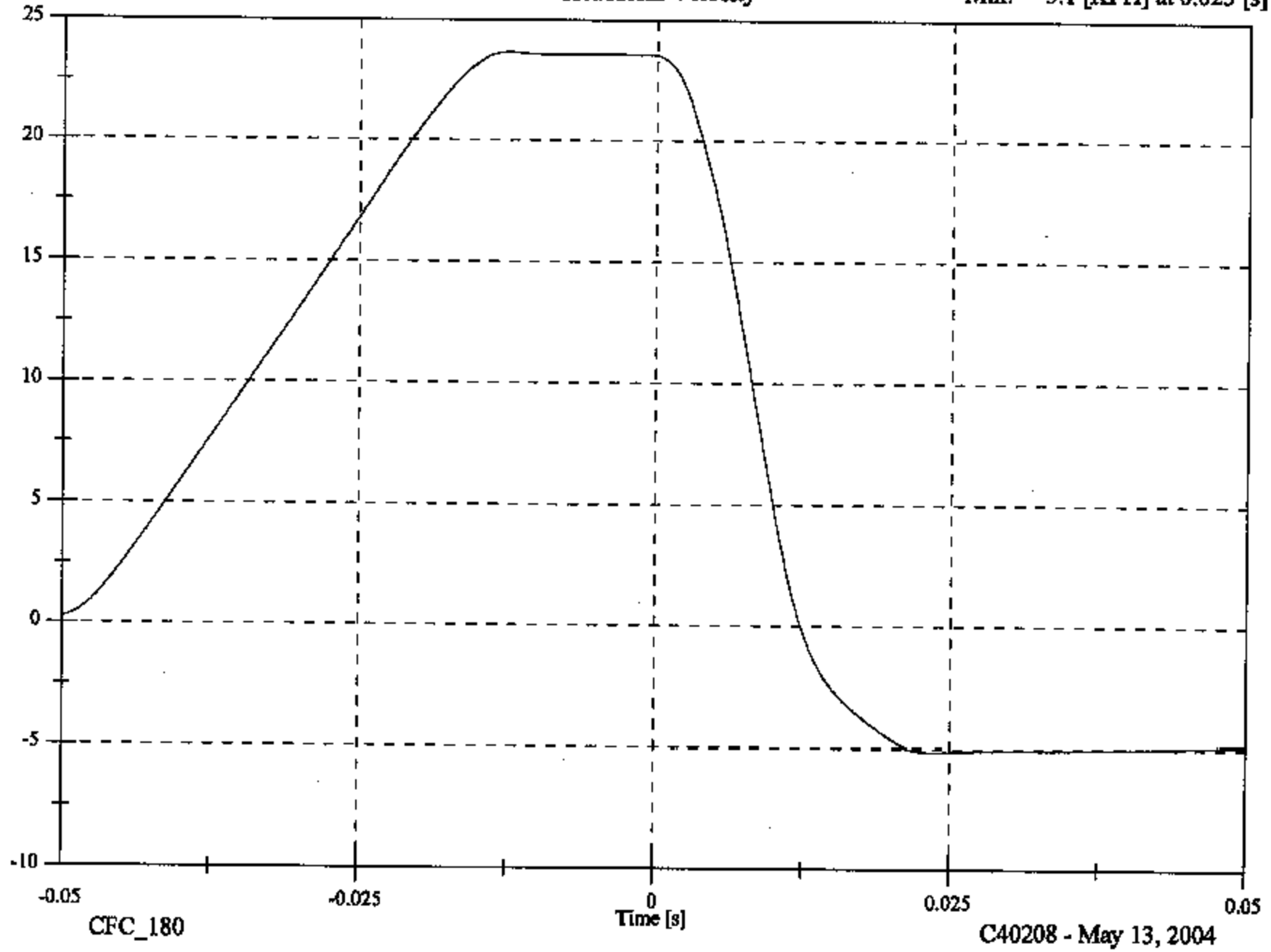

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 23.3 [g] at 0.009 [s]
Min: -5.5 [g] at -0.010 [s]
25
20
15
10
5
0
-5
-10
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side AP1 Impact Plot #3
8730-08


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 82.4 [g] at 0.008 [s]
Min: 0.5 [g] at -0.006 [s]
100
80
60
40
20
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side AP1 Impact Plot #4
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Velocity

Max: 23.7 [KPH] at -0.013 [s]
Min: -5.1 [KPH] at 0.023 [s]




C40208 Passenger Side AP1 Impact Plot #5

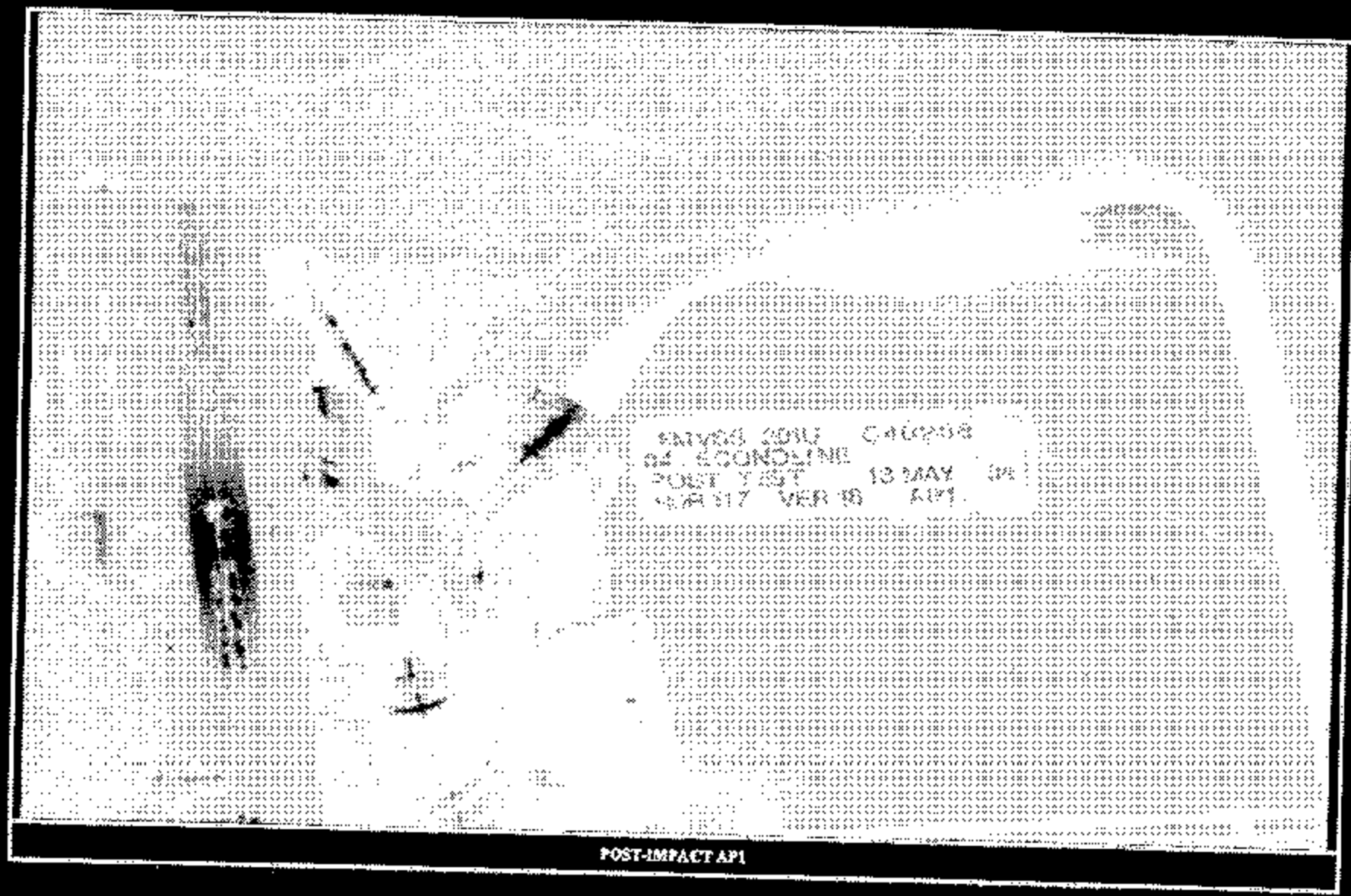
8730-08

CFC_180

C40208 - May 13, 2004


PRE-IMPACT API

8730-08



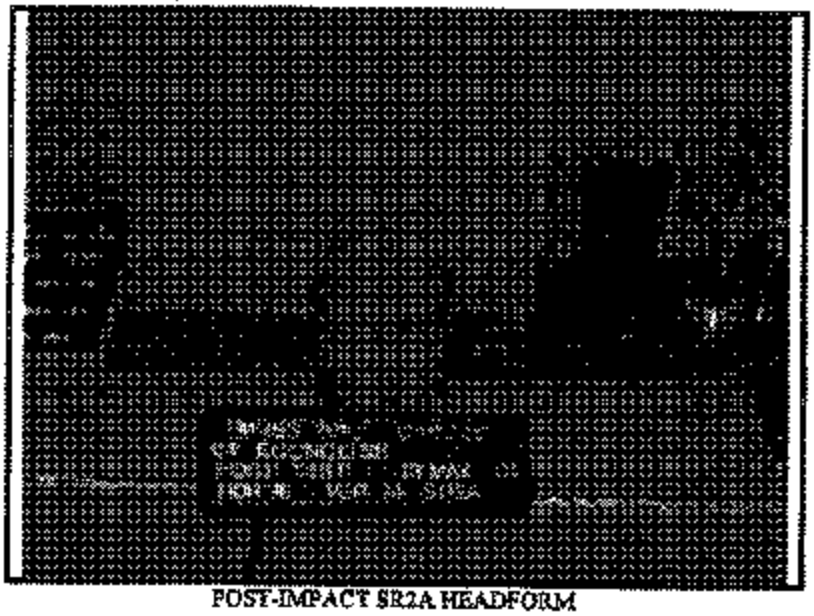
POST-IMPACT AP1

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 14 |
| Test Date: | May 13, 2004 |
| Target Location: | Passenger Side Rail |
| Target Code: | SR2A |
| Horizontal Impact Angle: | 90° |
| Vertical Impact Angle: | 34° |
| Ambient Temperature: | 23.1°C |
| Relative Humidity: | 39.6 |
| Time of Impact: | 14:40 |
| Headform Number: | 0062 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 2 | x | mm right | - | mm left |
| On Centerline | 26 | | mm up | | |



POST-IMPACT SR2A HEADFORM

| | |
|---|---|
| Free Motion HIC | 750.1 |
| HIC(d) | 732.3 |
| Impact Velocity (kph) | 23.71 |
| HIC T1 (msec) | 3.1 |
| HIC T2 (msec) | 11.1 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - SR2A

FMH Headform 0062

Test Date: May 13, 2004

Location: SR2A

Work File: SR2A

## TEST RESULTS

Lab Temperature: 23.1 C

Lab Humidity: 39.6 %

Velocity at Impact: 23.71 KPH

Free Flight Distance: 216.10 mm

HICd: 732.3

HIC (36ms): 750.1

t1: 3.1 msec

t2: 11.1 msec

Duration: 8.0 msec

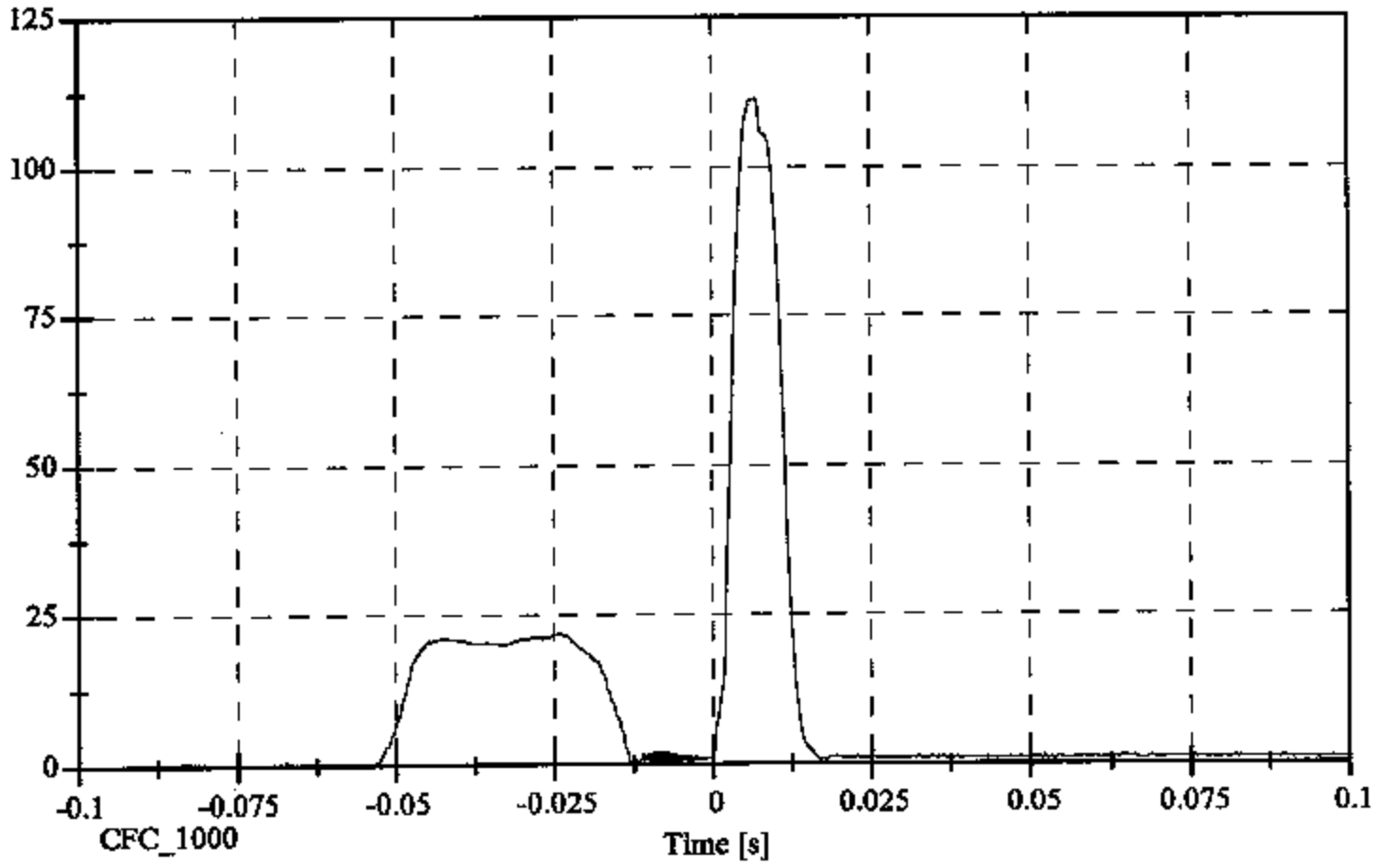
Average Acceleration: 8.6 g

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Resultant

Max: 111.5 [g] at 0.007 [s]

Min: 0.0 [g] at -0.096 [s]

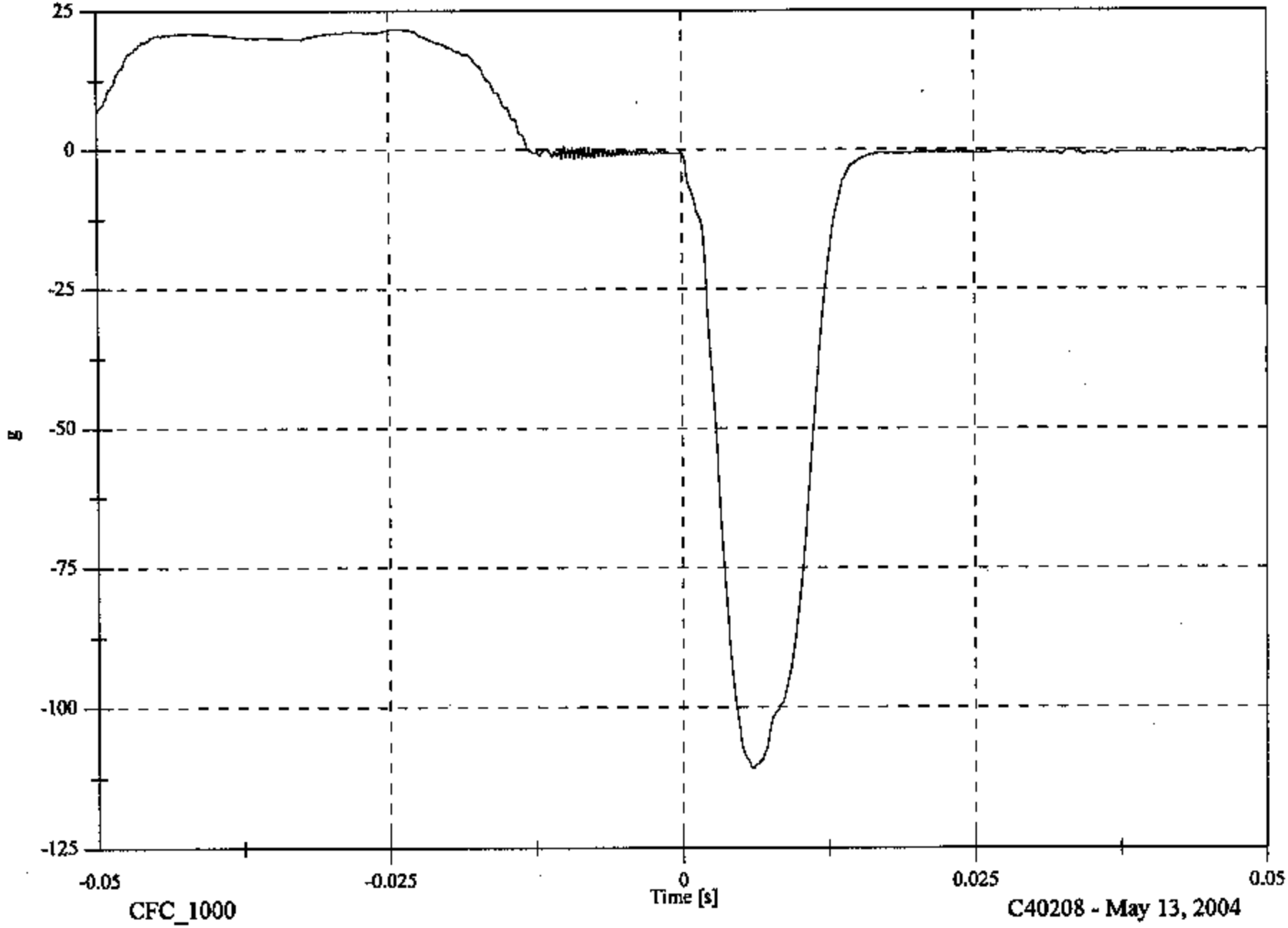


FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform X Acceleration

Max: 21.6 [g] at -0.024 [s]

Min: -110.7 [g] at 0.006 [s]

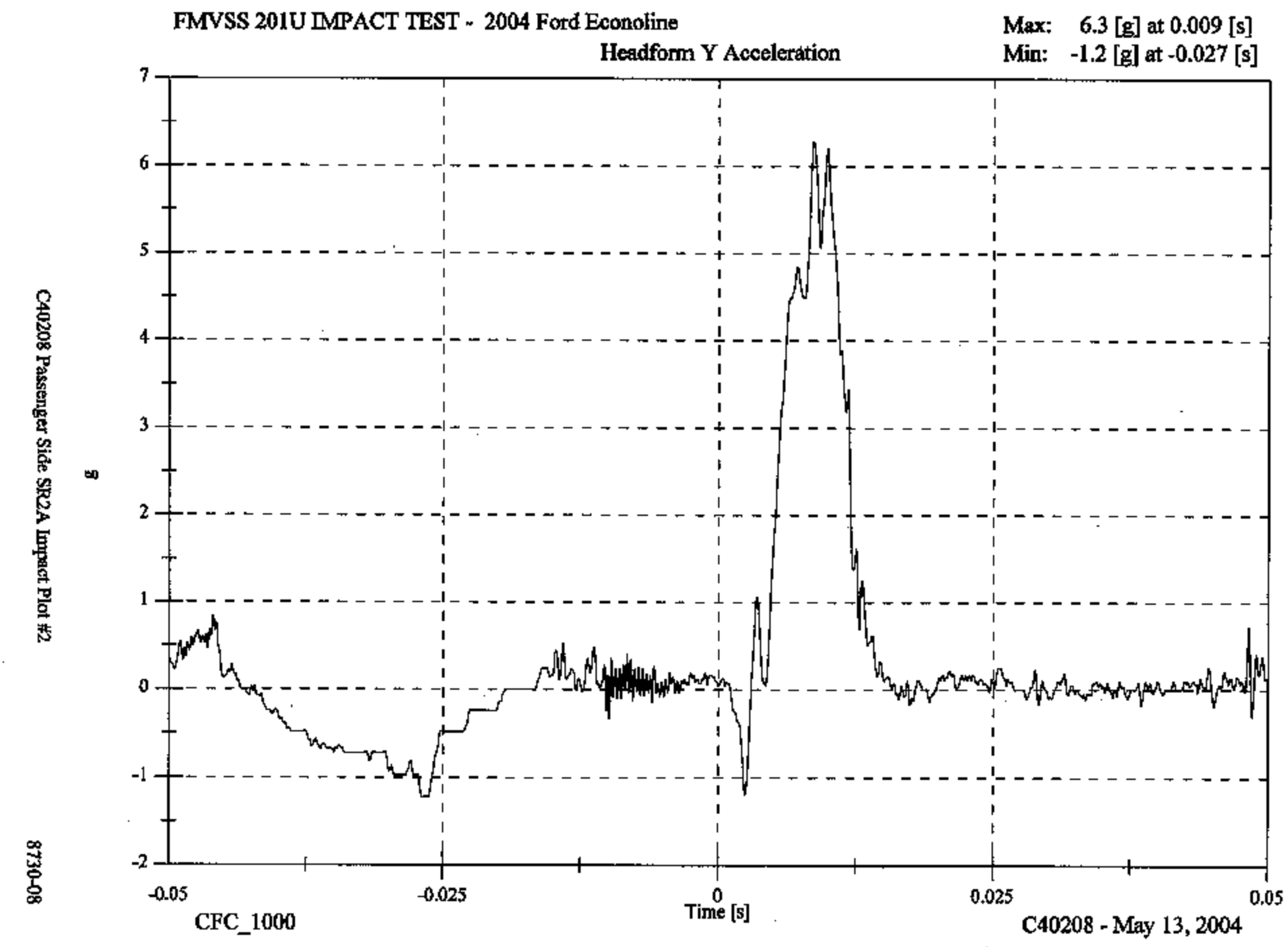



C40208 Passenger Side SR2A Impact Plot #1

8730-08

CFC_1000

C40208 - May 13, 2004

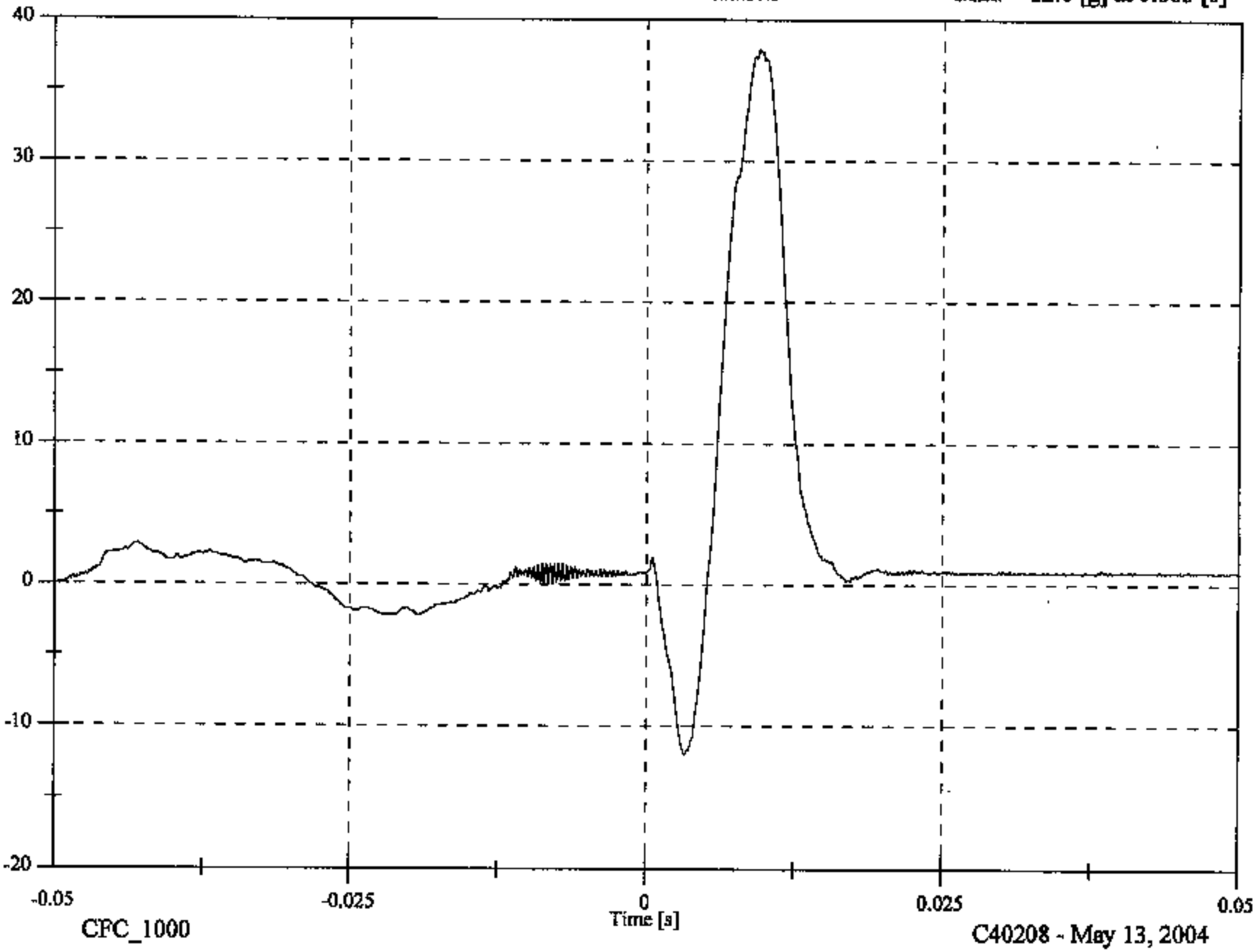

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 6.3 [g] at 0.009 [s]
Min: -1.2 [g] at -0.027 [s]
7
6
5
4
3
2
1
0
-1
-2
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side SR2A Impact Plot #2
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Z Acceleration

Max: 37.9 [g] at 0.009 [s]

Min: -12.0 [g] at 0.003 [s]

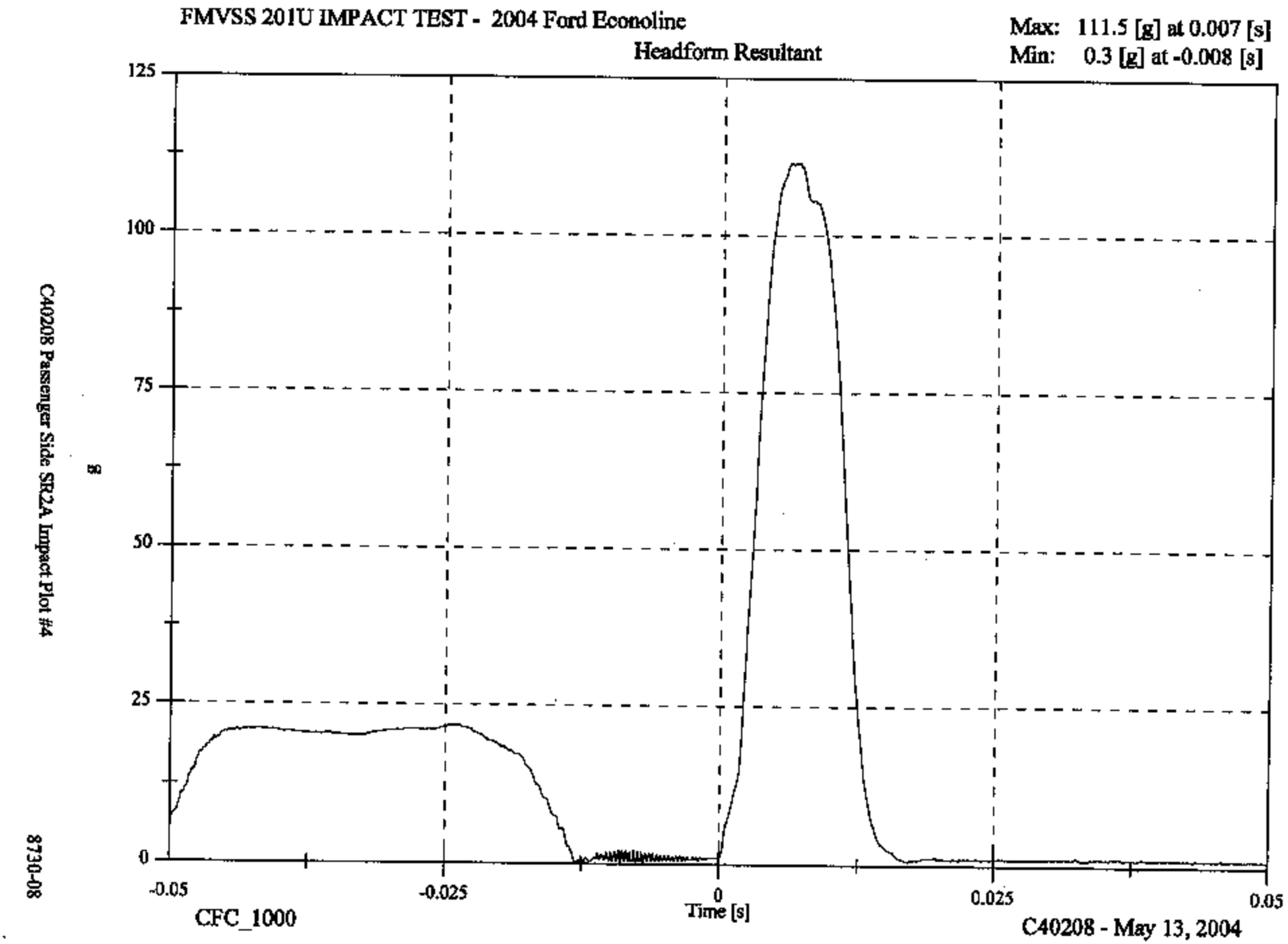



C40208 Passenger Side SR2A Impact Plot #3

8730-08

CFC_1000

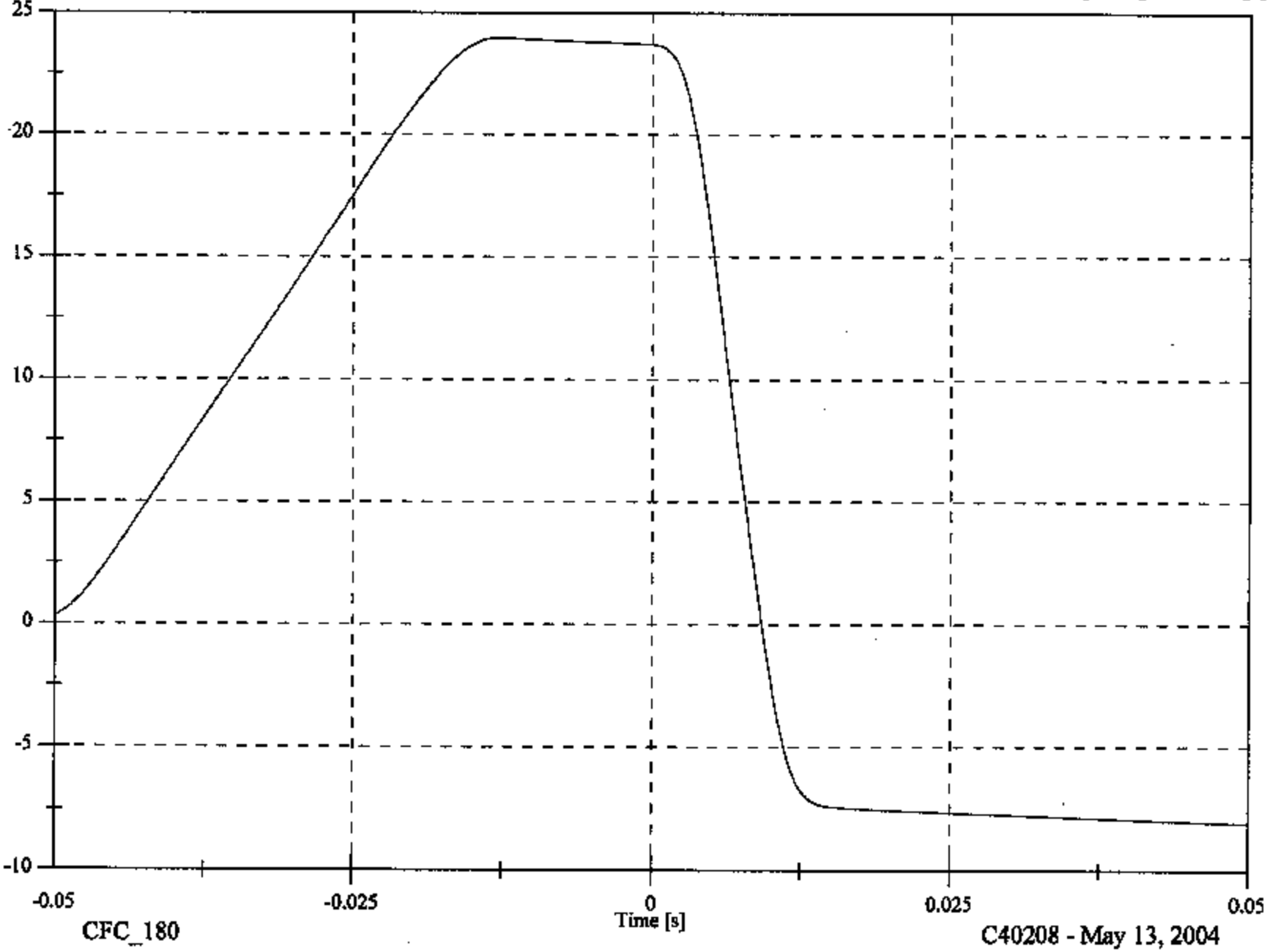
C40208 - May 13, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Resultant
Max: 111.5 [g] at 0.007 [s]
Min: 0.3 [g] at -0.008 [s]
125
100
75
50
25
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side SR2A Impact Plot #4
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Velocity

Max: 24.0 [KPH] at -0.013 [s]
Min: -8.0 [KPH] at 0.050 [s]




C40208 Passenger Side SR2A Impact Plot #5

8730-08

CFC_180

C40208 - May 13, 2004


PRE-IMPACT SR2A

8730-08

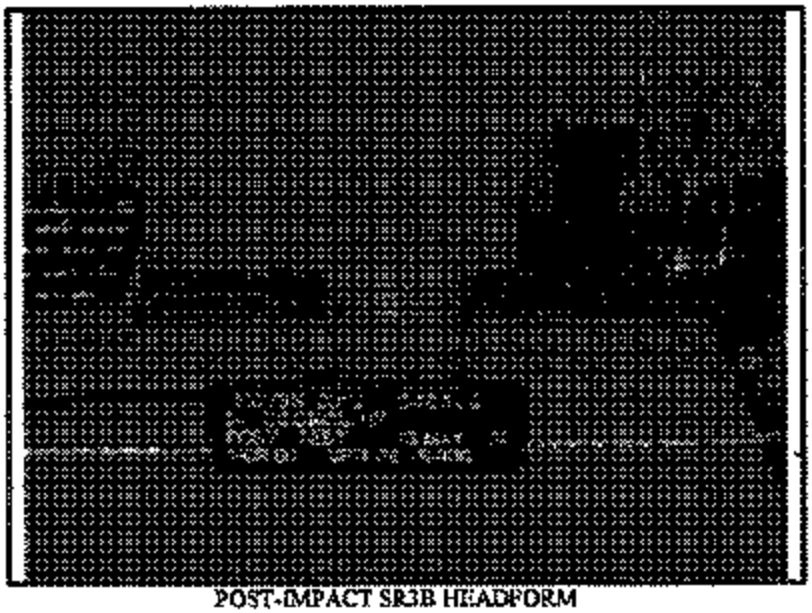

POST-IMPACT SR2A

8730-08

| | |
|---|---|
| VEHICLE YEAR/MAKE/MODEL/STYLE: | 2004 Ford Econoline |
| VIN: | 1FMRE11W94HA29971 |
| DATE OF MANUFACTURE: | 11/03(SEE CERTIFICATION LABEL) |
| COLOR: | Burgundy |

| | |
|---|---|
| Test Number: | 15 |
| Test Date: | May 13, 2004 |
| Target Location: | Passenger Side Rail |
| Target Code: | SR3B |
| Horizontal Impact Angle: | 90° |
| Vertical Impact Angle: | 36° |
| Ambient Temperature: | 23.3°C |
| Relative Humidity: | 39.5 |
| Time of Impact: | 15:00 |
| Headform Number: | 1235 |

| Impact Point Description (from lower midpoint on midsagittal line) | | | | | |
|---|---|---|---|---|---|
| On Centerline | 2 | - | mm right | x | mm left |
| On Centerline | 23 | mm up | | | |



POST-IMPACT SR3B HEADFORM

| | |
|---|---|
| Free Motion HIC | 896.1 |
| HIC(d) | 842.5 |
| Impact Velocity (kph) | 23.79 |
| HIC T1 (msec) | 4.1 |
| HIC T2 (msec) | 10.1 |

# FMVSS 201U IMPACT TEST - 2004 Ford Econoline C40208 - SR3B

FMH Headform 1255

Test Date: May 13, 2004

Location: SR3B

Work File: SR3B

## TEST RESULTS

Lab Temperature: 23.3 C

Lab Humidity: 39.5 %

Velocity at Impact: 23.79 KPH

Free Flight Distance: 220.34 mm

HICd: 842.5

HIC (36ms): 896.1

t1: 4.1 msec

t2: 10.1 msec

Duration: 6.0 msec

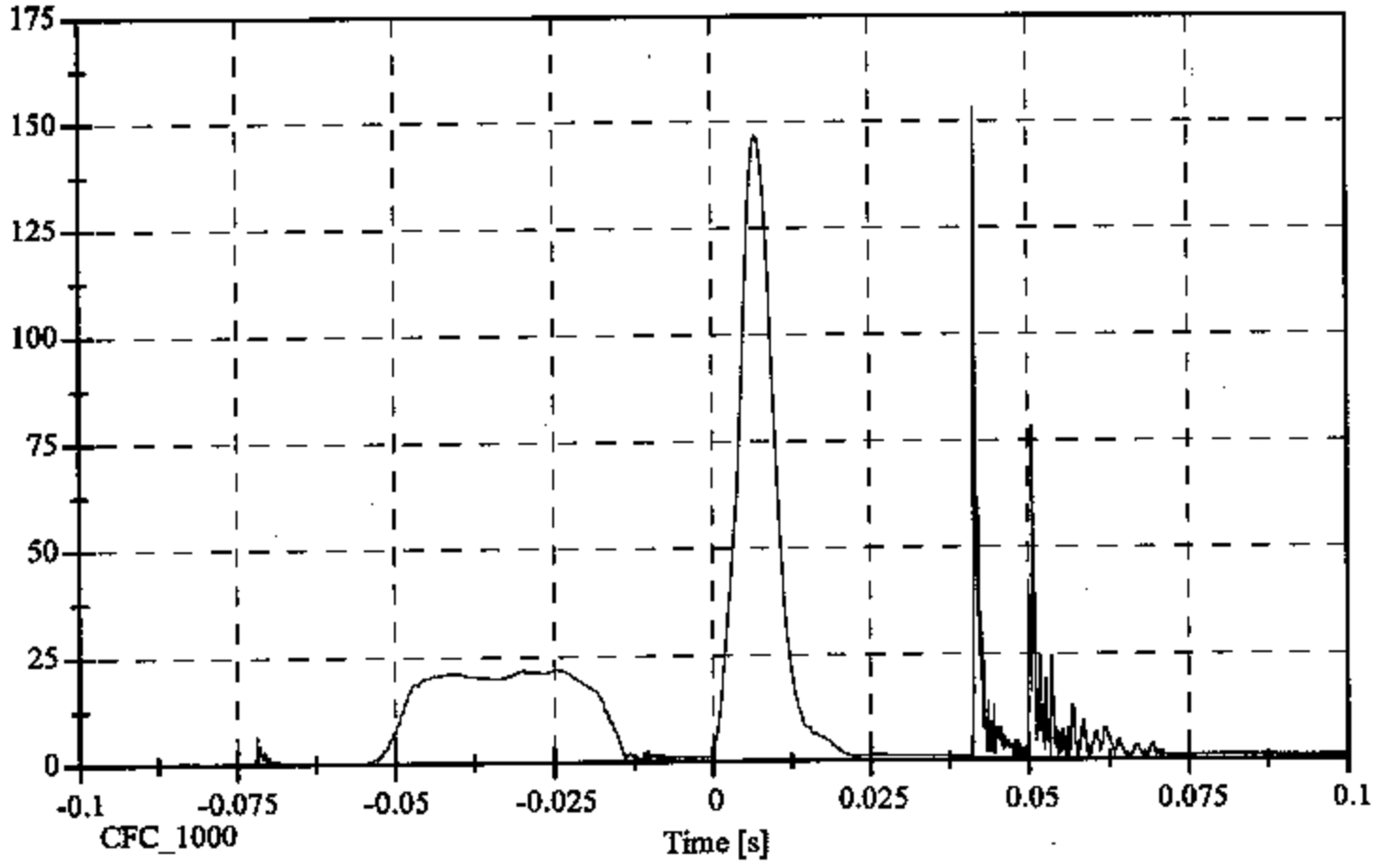
Average Acceleration: 10.1 g

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Resultant

Max: 153.4 [g] at 0.041 [s]

Min: 0.0 [g] at -0.085 [s]

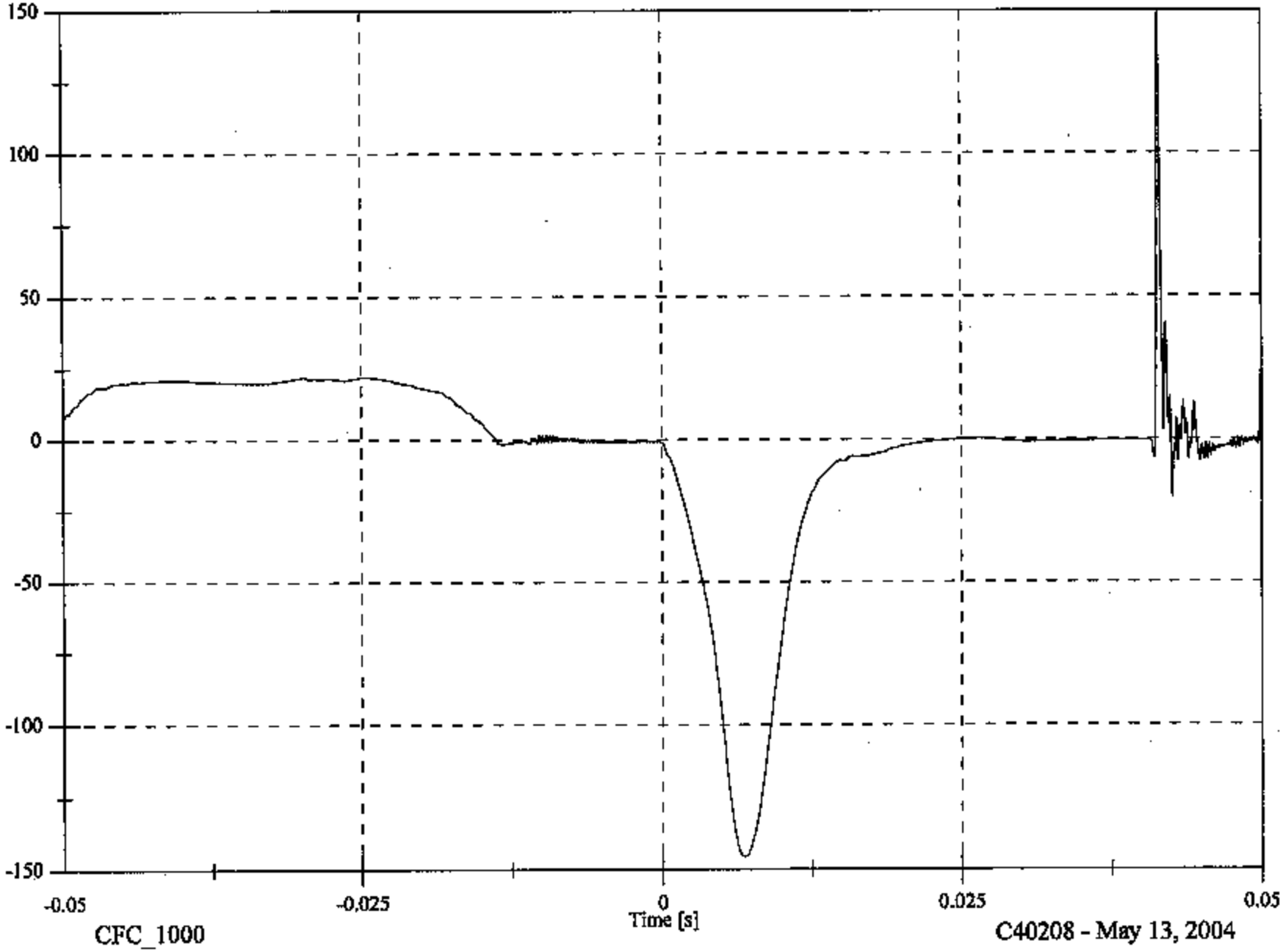


FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform X Acceleration

Max: 149.8 [g] at 0.041 [s]

Min: -145.6 [g] at 0.007 [s]

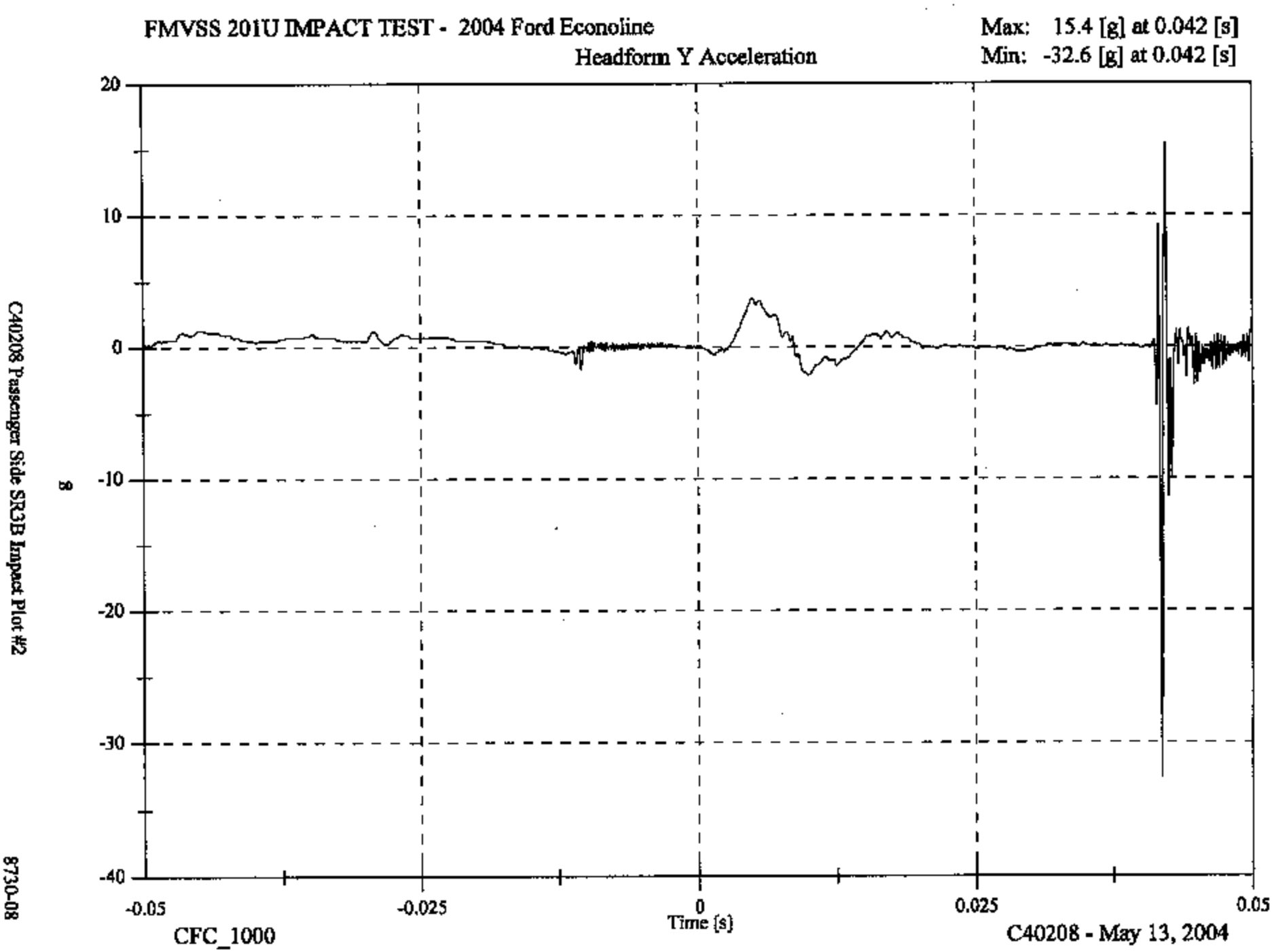


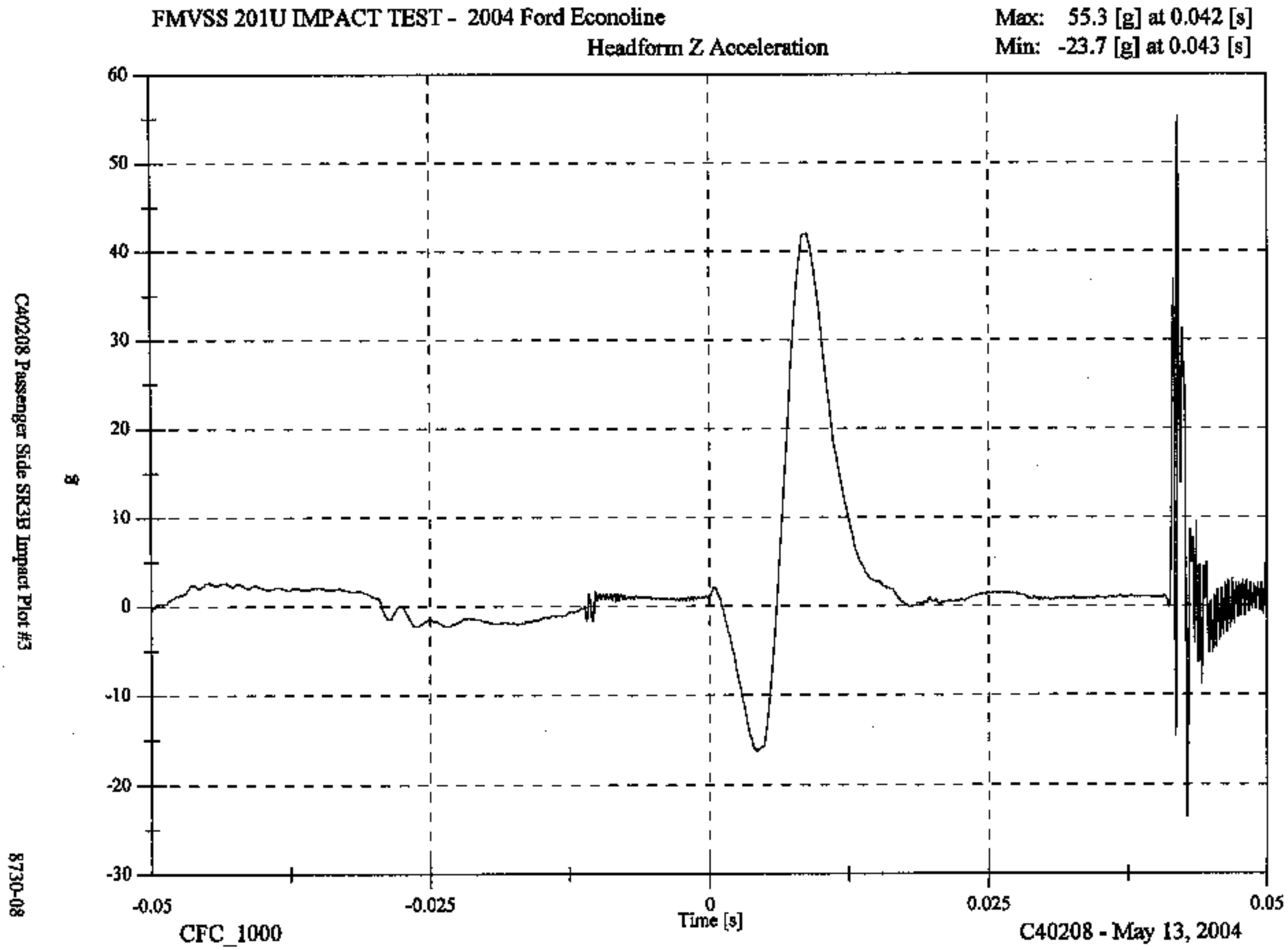

C40208 Passenger Side SR3B Impact Plot #1

8730-08

CFC_1000

C40208 - May 13, 2004


FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Y Acceleration
Max: 15.4 [g] at 0.042 [s]
Min: -32.6 [g] at 0.042 [s]
20
10
0
-10
-20
-30
-40
g
-0.05
-0.025
0
0.025
0.05
Time (s)
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side SR3B Impact Plot #2
8730-08

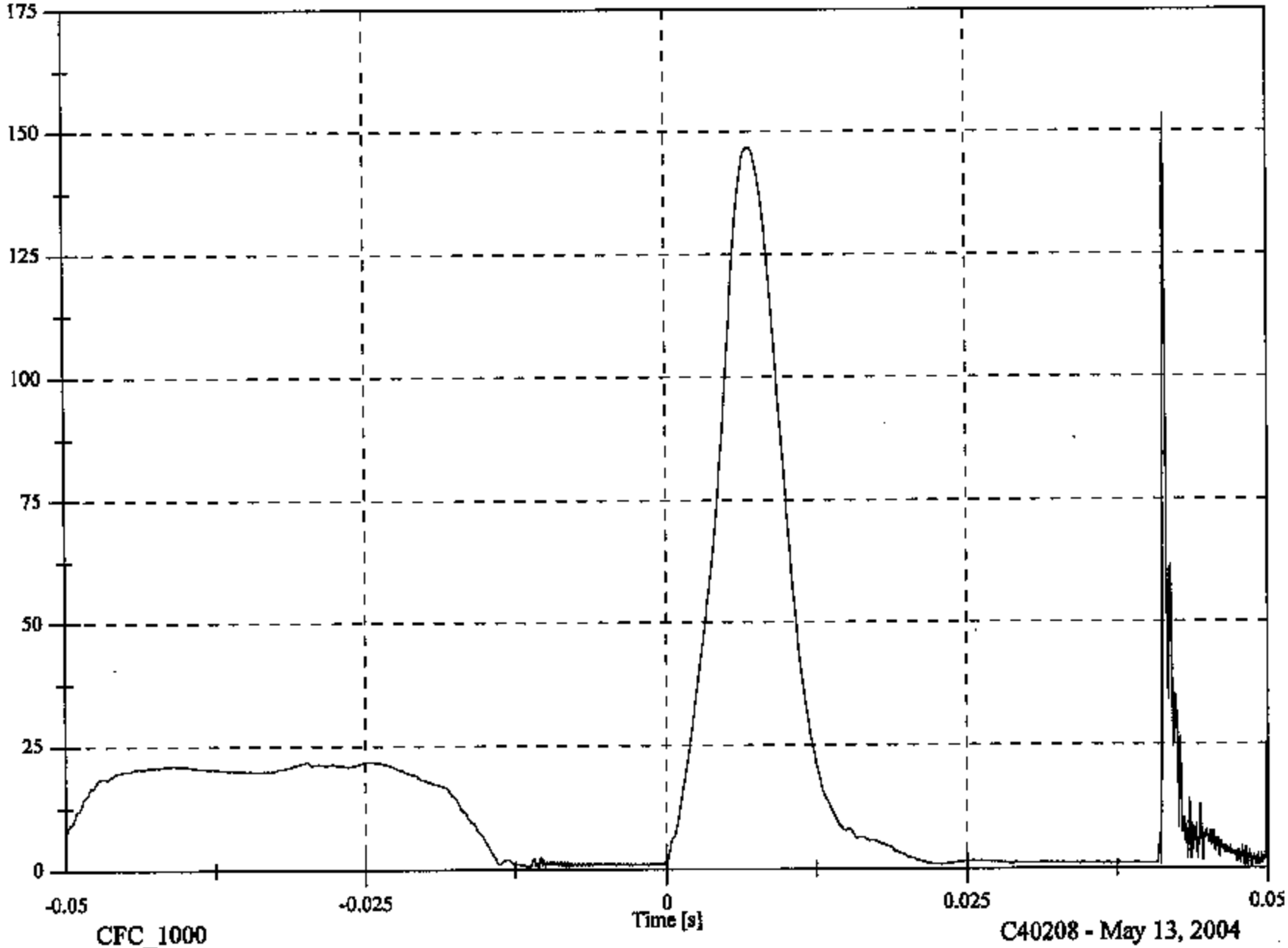

FMVSS 201U IMPACT TEST - 2004 Ford Econoline
Headform Z Acceleration
Max: 55.3 [g] at 0.042 [s]
Min: -23.7 [g] at 0.043 [s]
60
50
40
30
20
10
0
-10
-20
-30
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 13, 2004
C40208 Passenger Side SR3B Impact Plot #3
8730-08

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Resultant

Max: 153.4 [g] at 0.041 [s]

Min: 0.2 [g] at 0.049 [s]




C40208 Passenger Side SR3B Impact Plot #4

8

8730-08

CFC_1000

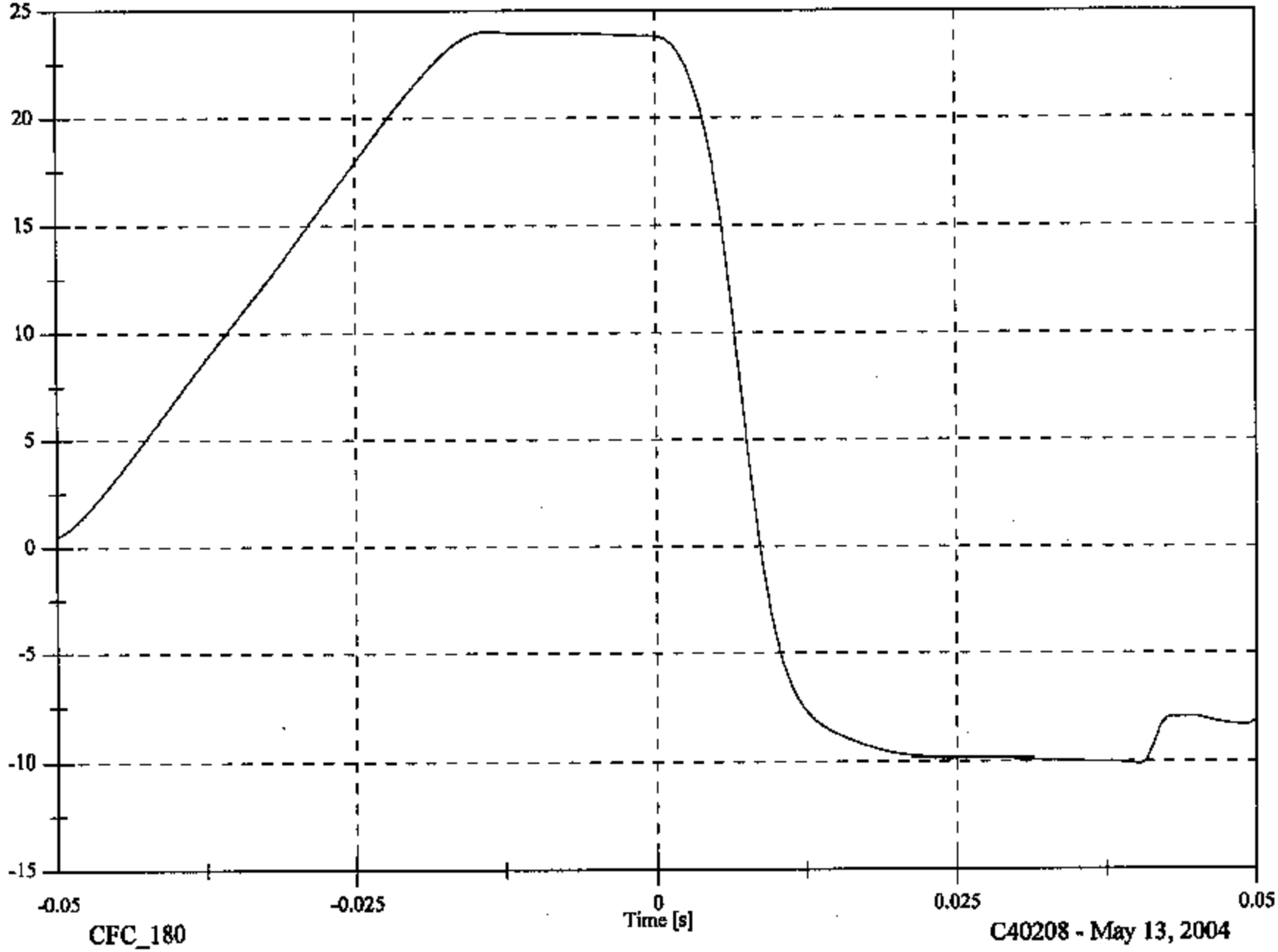
C40208 - May 13, 2004

FMVSS 201U IMPACT TEST - 2004 Ford Econoline

Headform Velocity

Max: 24.0 [KPH] at -0.014 [s]

Min: -10.1 [KPH] at 0.040 [s]




C40208 Passenger Side SK3B Impact Plot #5

HIN

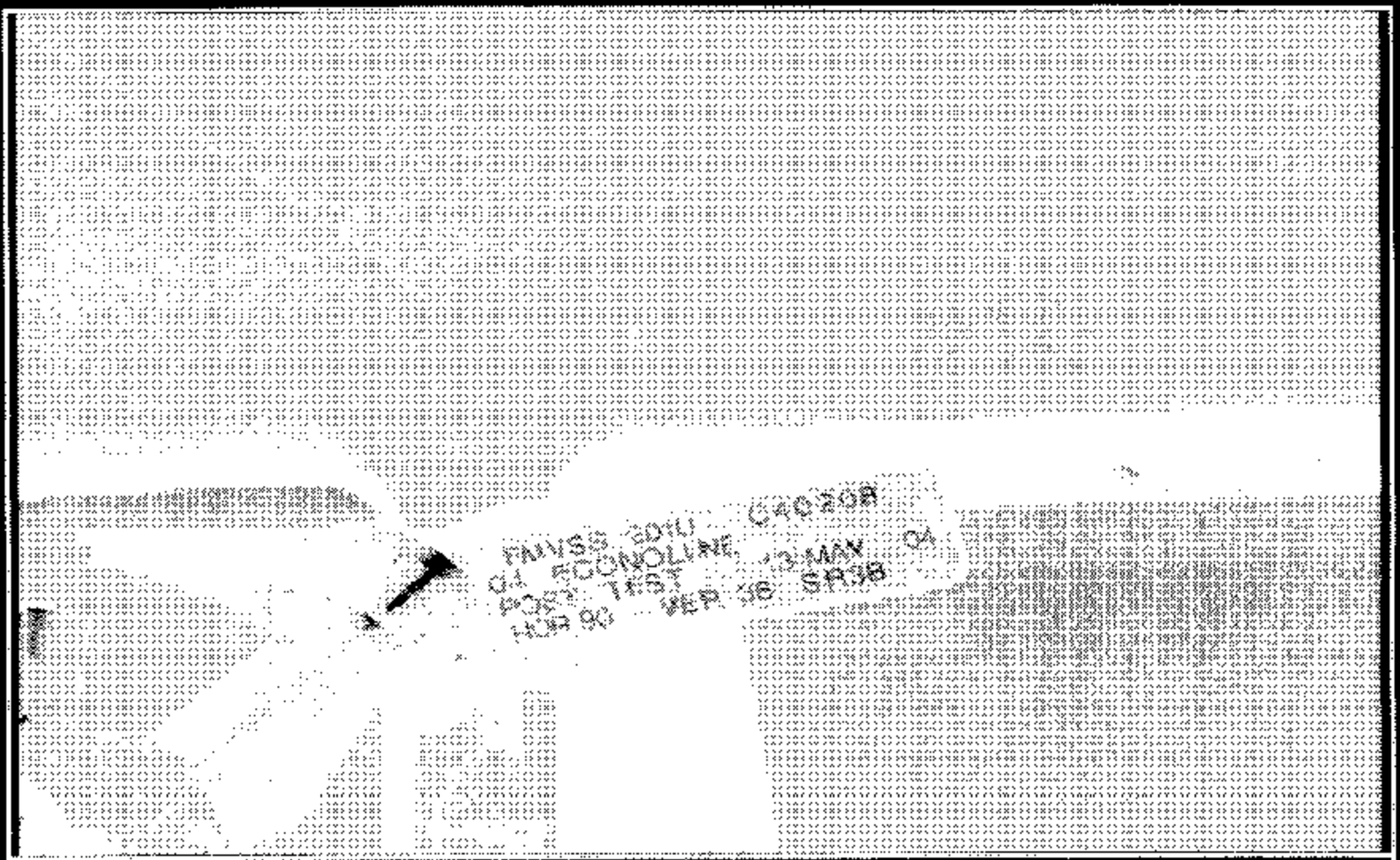
8730-08

CFC_180

C40208 - May 13, 2004

PRE-IMPACT SRSB

8730-08



POST-IMPACT SRB

8730-08

# APPENDIX A

# PHOTOGRAPHS

**PHOTOGRAPHS**

| FIGURE | VIEW |
|---|---|
| A-1 | LEFT SIDE VIEW OF VEHICLE |
| A-2 | RIGHT SIDE VIEW OF VEHICLE |
| A-3 | 3/4 FRONTAL VIEW FROM RIGHT SIDE OF VEHICLE |
| A-4 | 3/4 REAR VIEW FROM LEFT SIDE OF VEHICLE |
| A-5 | VEHICLE'S CERTIFICATION LABEL |
| A-6 | VEHICLE'S TIRE INFORMATION LABEL |
| A-7 | PRE-TEST DRIVER SIDE A-PILLAR |
| A-8 | PRE-TEST DRIVER SIDE FRONT HEADER |
| A-9 | PRE-TEST DRIVER SIDE SIDE RAIL |
| A-10 | PRE-TEST DRIVER SIDE B-PILLAR |
| A-11 | PRE-TEST DRIVER SIDE OTHER PILLAR |
| A-12 | PRE-TEST PASSENGER SIDE A-PILLAR |
| A-13 | PRE-TEST PASSENGER SIDE FRONT HEADER |
| A-14 | PRE-TEST PASSENGER SIDE SIDE RAIL |
| A-15 | PRE-TEST PASSENGER SIDE B-PILLAR |
| A-16 | PRE-TEST PASSENGER SIDE OTHER PILLAR |
| A-17 | PRE-TEST VEHICLE INTERIOR |
| A-18 | POST-TEST DRIVER SIDE A-PILLAR |
| A-19 | POST-TEST DRIVER FRONT HEADER |
| A-20 | POST-TEST DRIVER SIDE SIDE RAIL |
| A-21 | POST-TEST DRIVER SIDE B-PILLAR |
| A-22 | POST-TEST DRIVER SIDE OTHER PILLAR |
| A-23 | POST-TEST PASSENGER SIDE A-PILLAR |
| A-24 | POST-TEST PASSENGER FRONT HEADER |
| A-25 | POST-TEST PASSENGER SIDE SIDE RAIL |
| A-26 | POST-TEST PASSENGER SIDE B-PILLAR |
| A-27 | POST-TEST PASSENGER SIDE OTHER PILLAR |

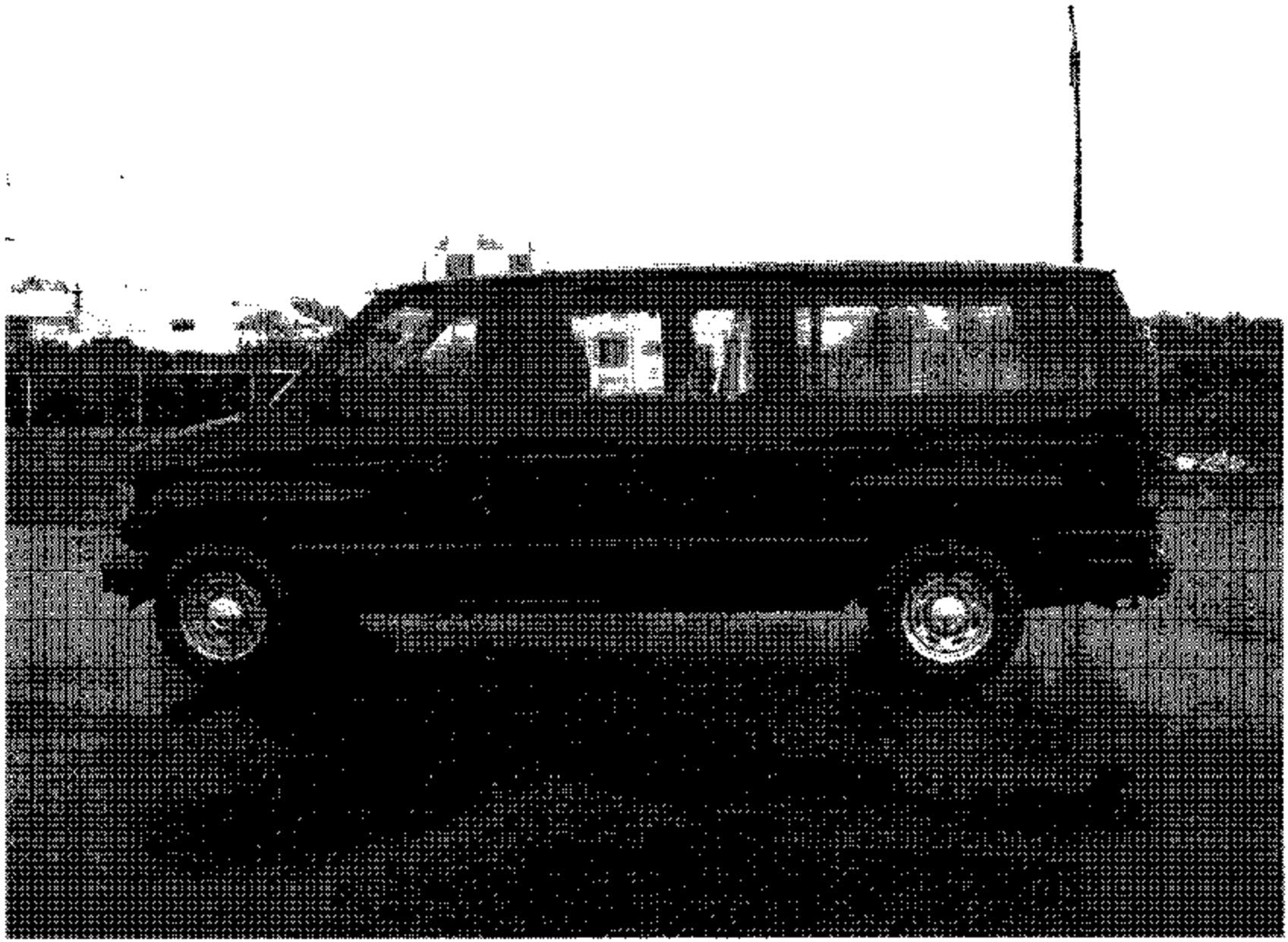


Figure A-1 : LEFT SIDE VIEW OF VEHICLE

Figure A-2 : RIGHT SIDE VIEW OF VEHICLE

Figure A-3 : 3/4 FRONTAL VIEW FROM RIGHT SIDE OF VEHICLE

Figure A-4 : 3/4 REAR VIEW FROM LEFT SIDE OF VEHICLE

Figure A-5 : VEHICLE'S CERTIFICATION LABEL

SAME AS CERT LABEL

Figure A-6 : VEHICLE'S TIRE INFORMATION LABEL

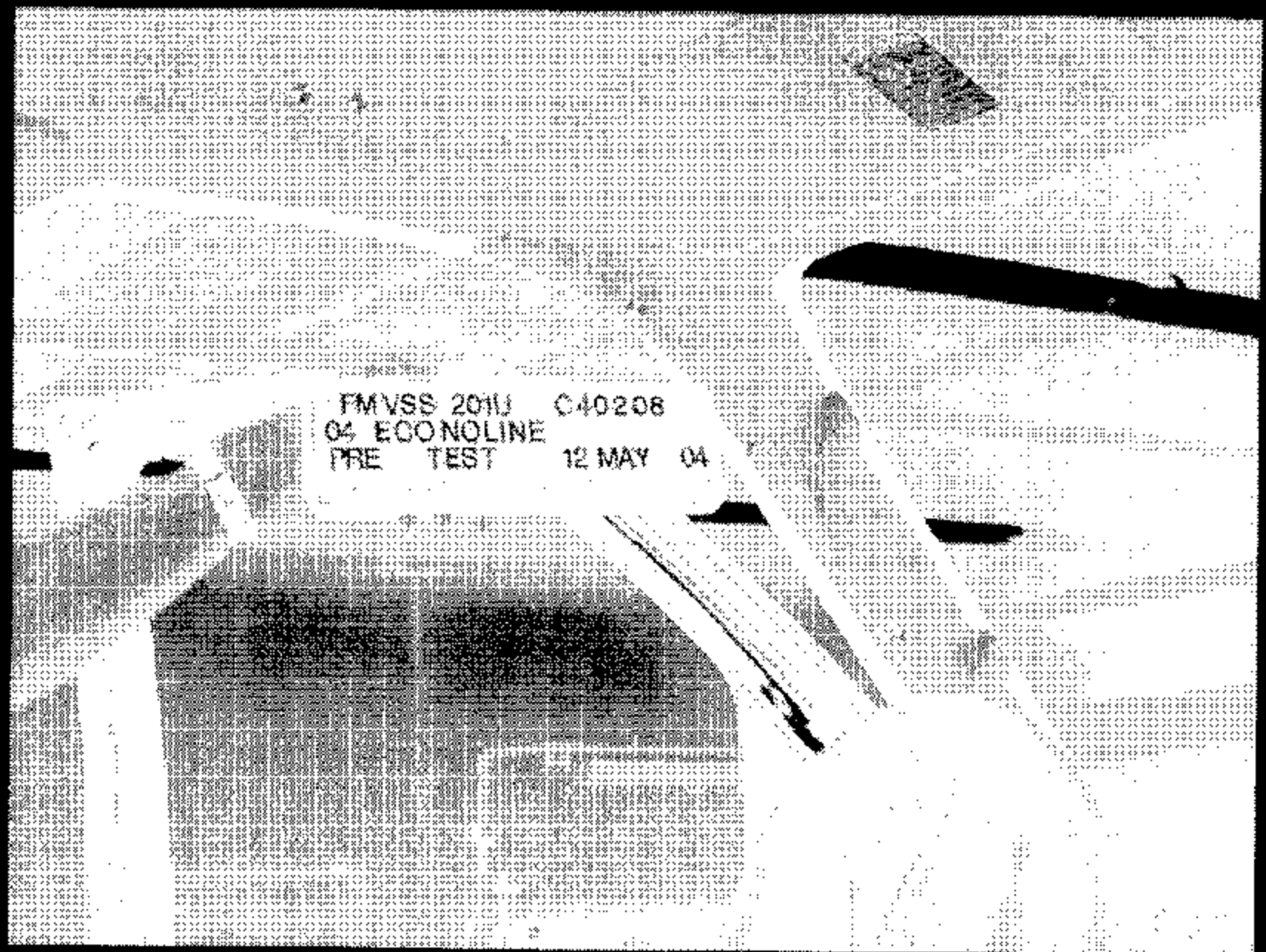



Figure A-7 : PRE-TEST DRIVER SIDE A-PILLAR

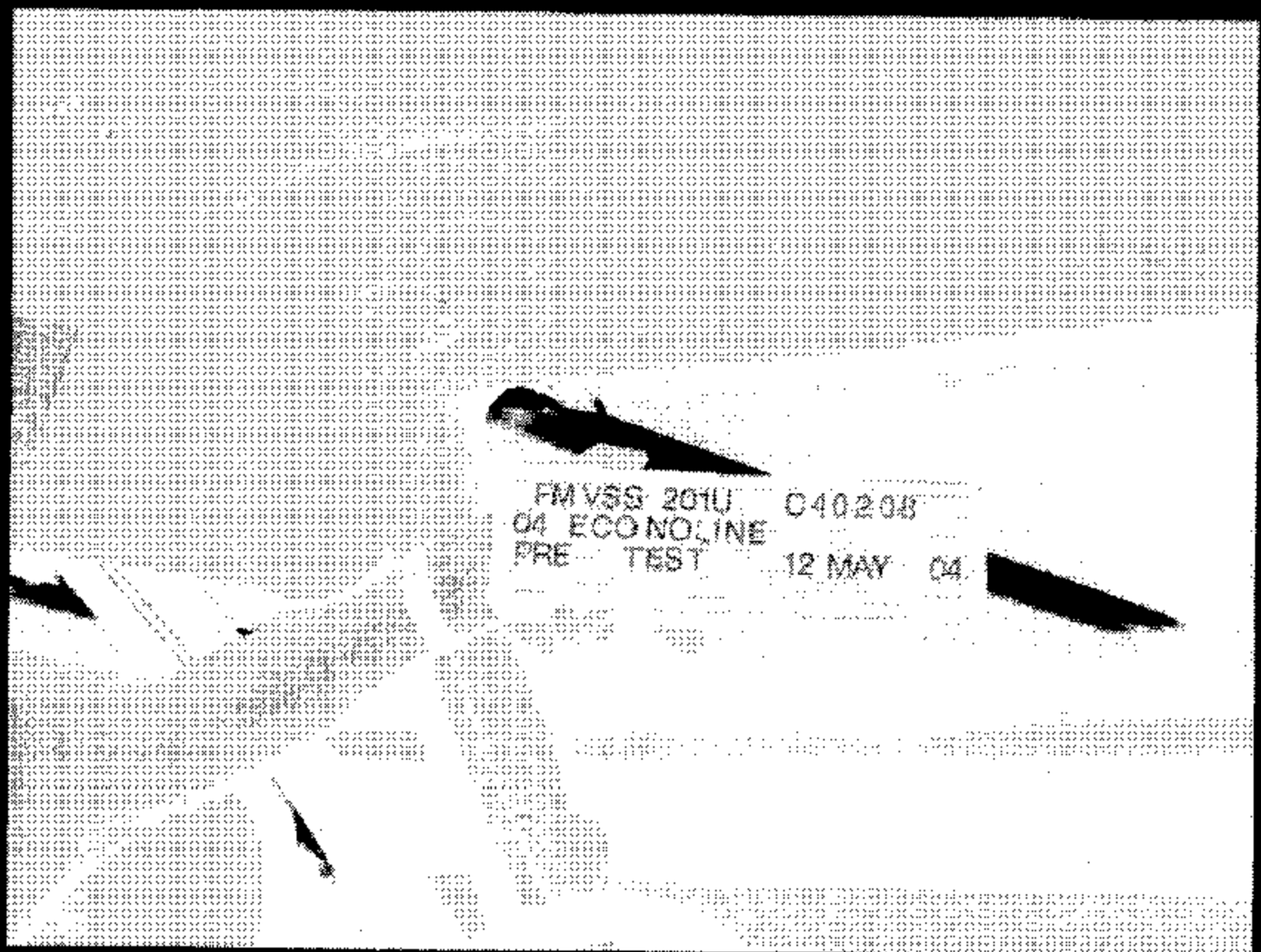



Figure A-8 : PRE-TEST DRIVER SIDE FRONT HEADER

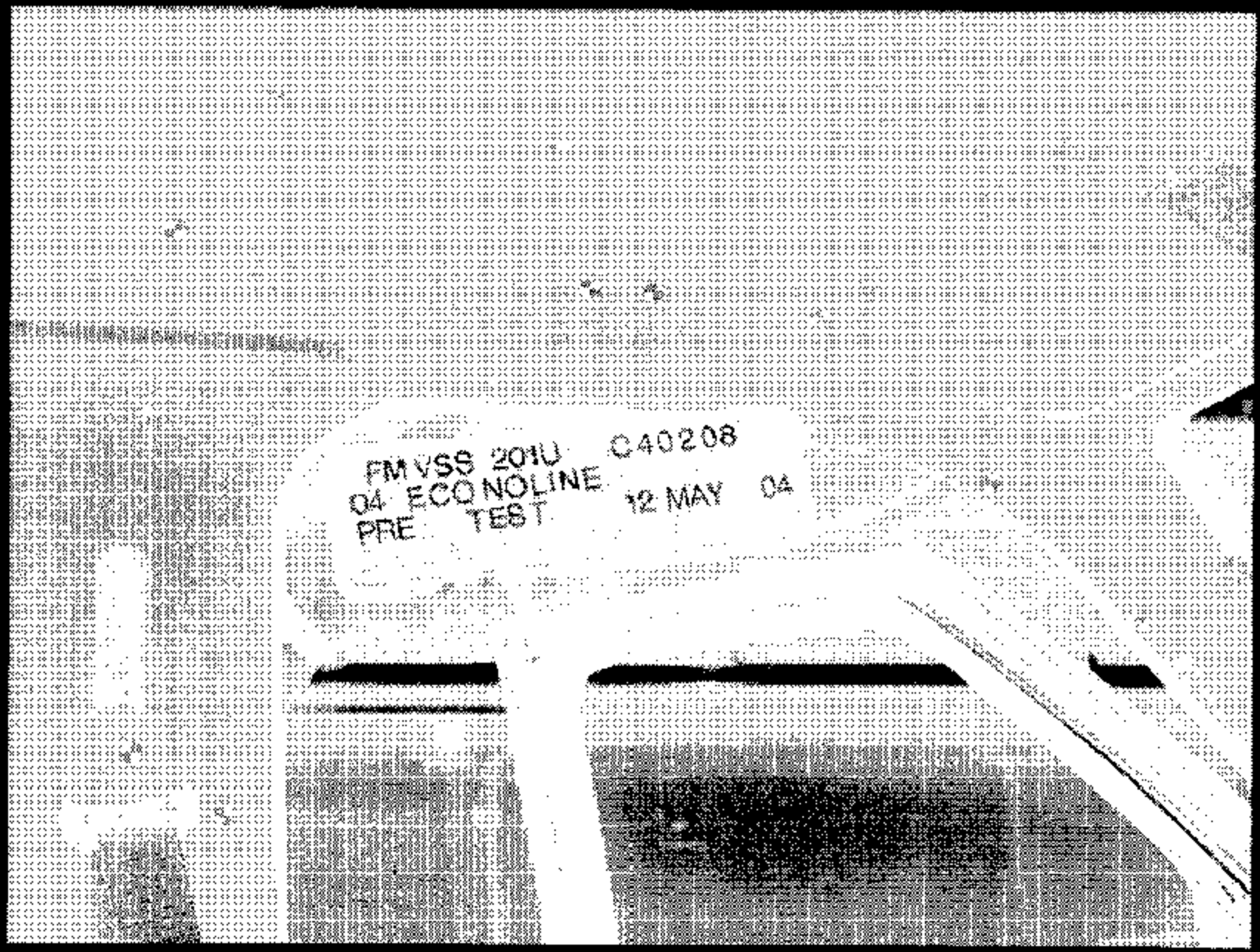



Figure A-9 : PRE-TEST DRIVER SIDE SIDE RAIL

Figure A-10 : PRE-TEST DRIVER SIDE B-PILLAR

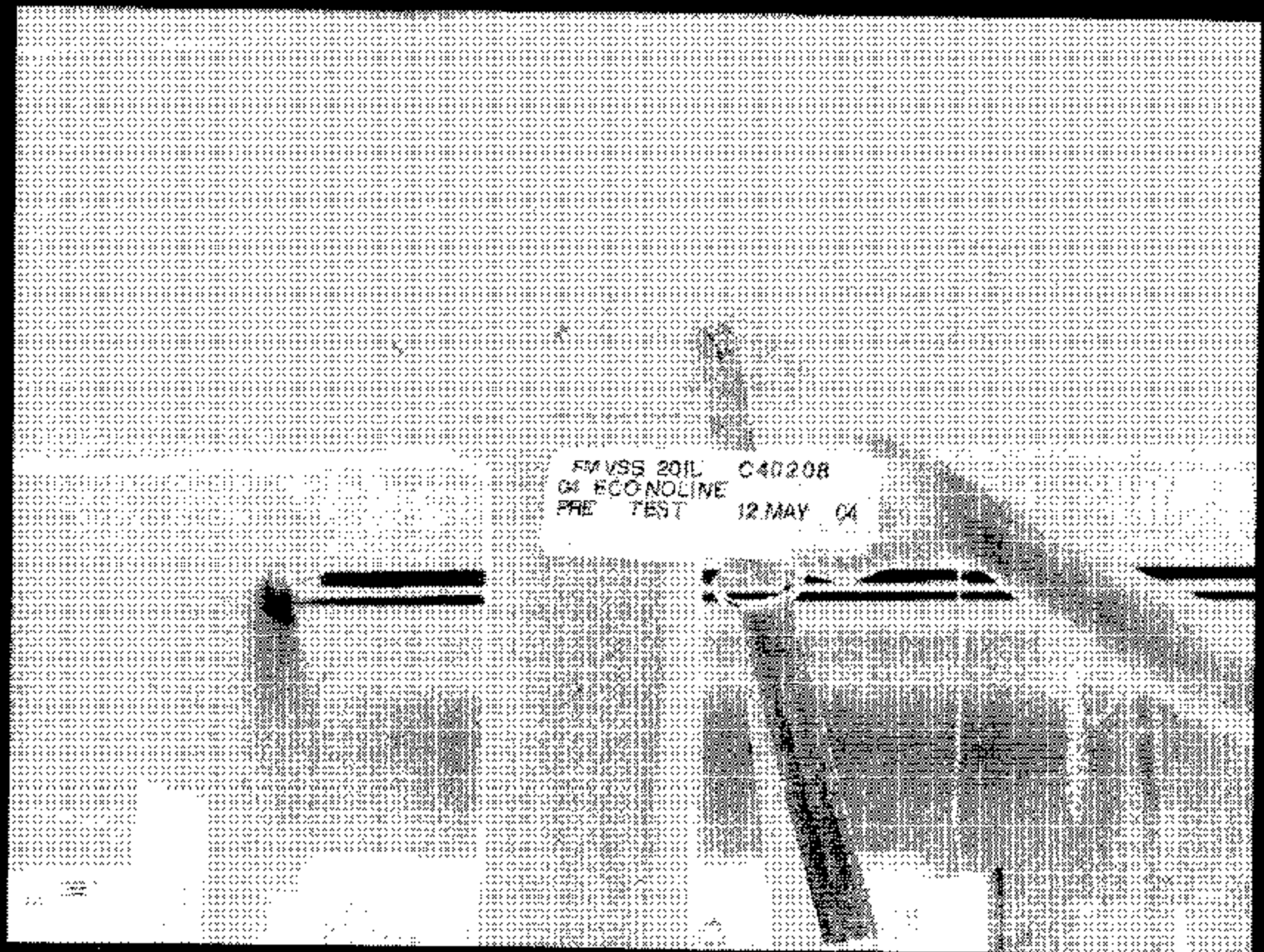



Figure A-11 : PRE-TEST DRIVER SIDE OTHER PILLAR


Figure A-12 : PRE-TEST PASSENGER SIDE A-PILLAR

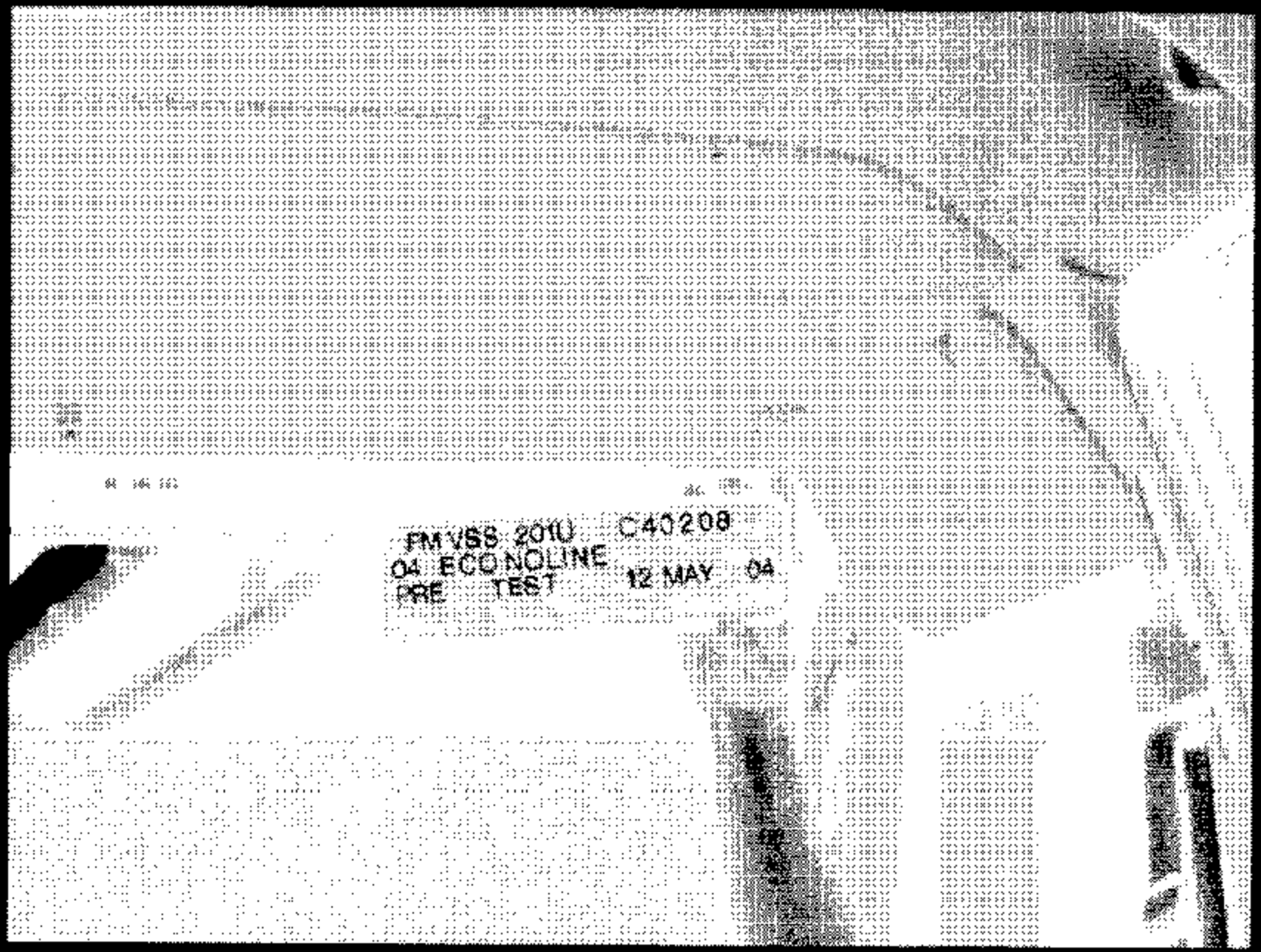



Figure A-13 : PRE-TEST PASSENGER SIDE FRONT HEADER

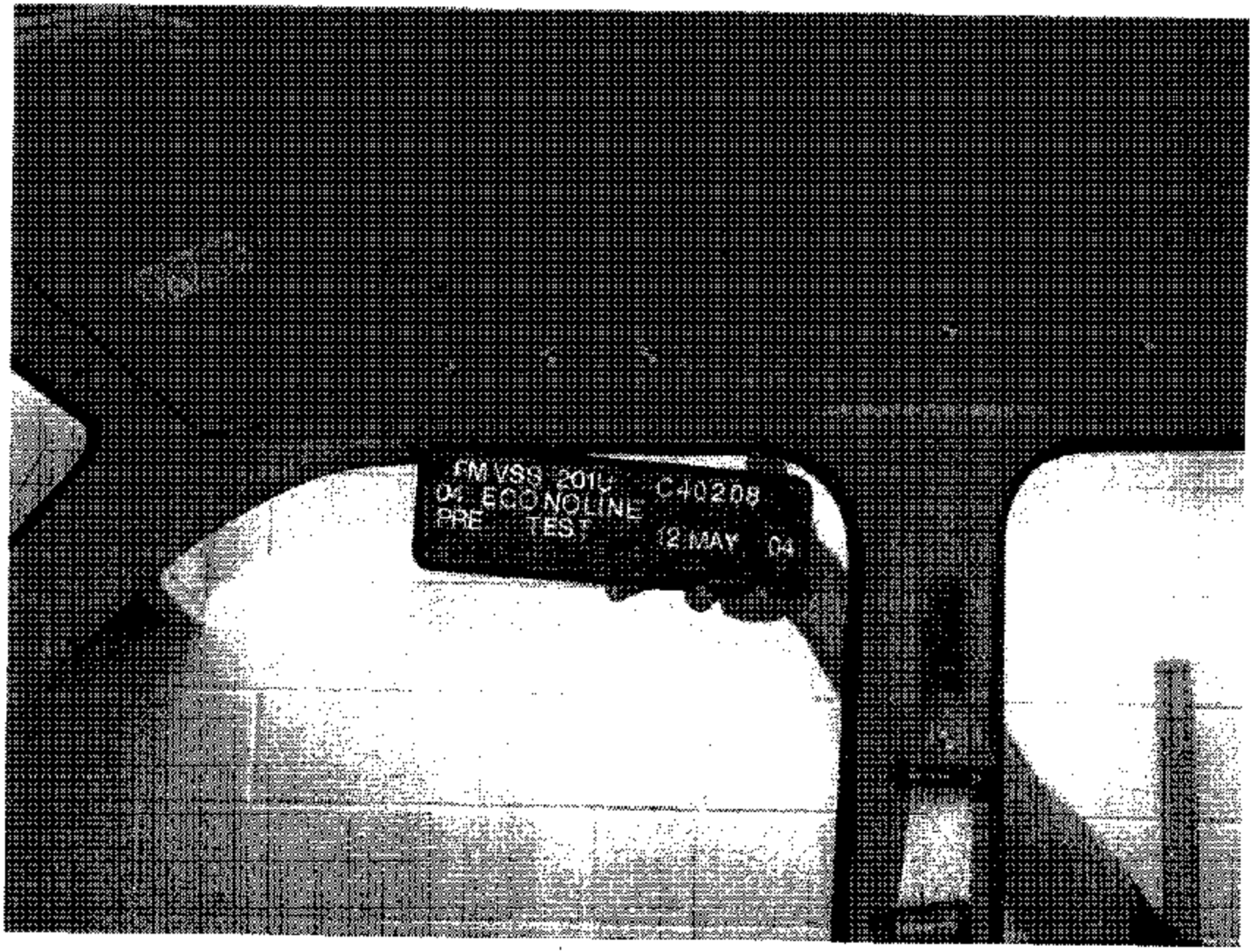



Figure A-14 : PRE-TEST PASSENGER SIDE SIDE RAIL

Figure A-15 : PRE-TEST PASSENGER SIDE B-PILLAR

Figure A-16 : PRE-TEST PASSENGER SIDE OTHER PILLAR

Figure A-17 : PRE-TEST VEHICLE INTERIOR

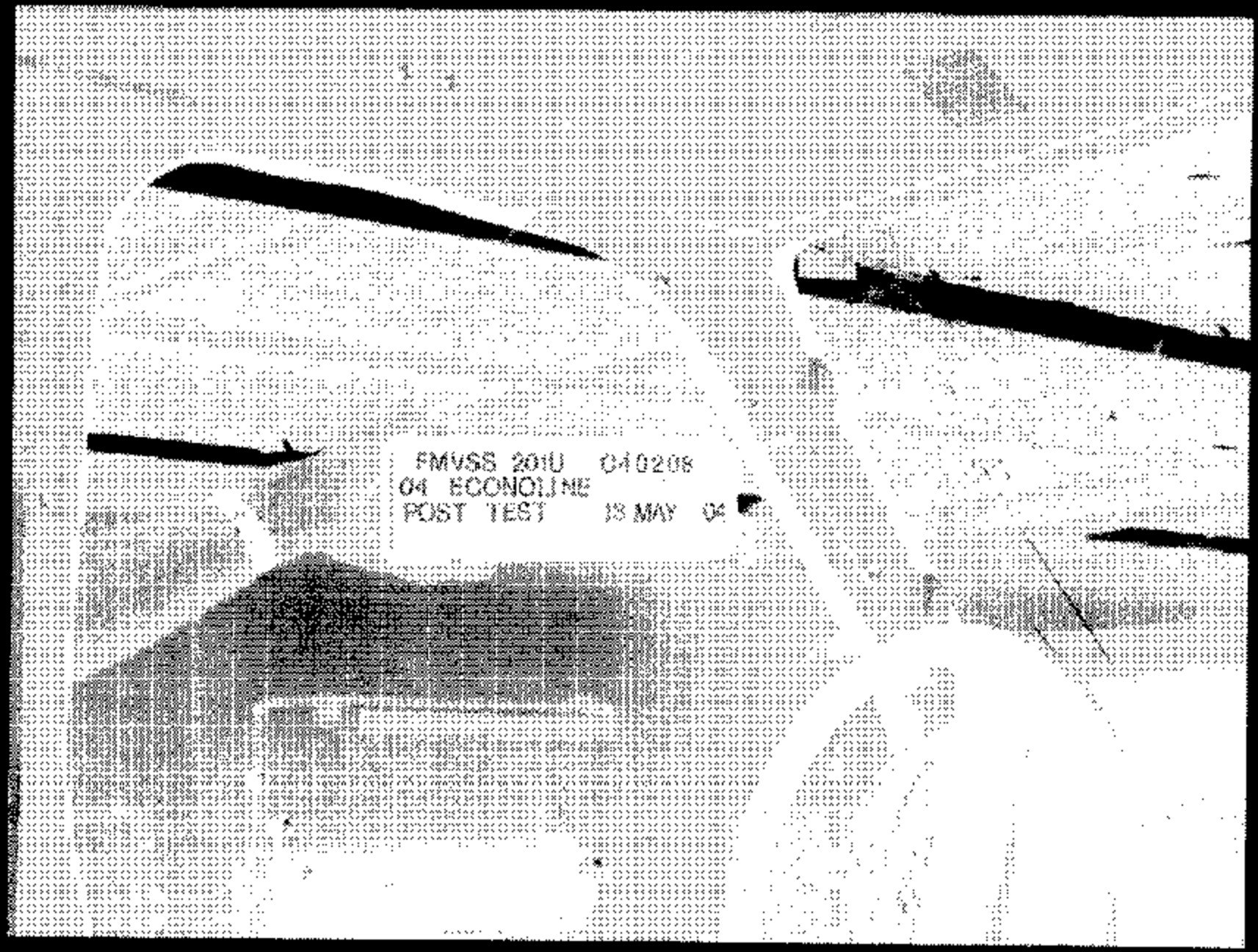



Figure A-18 : POST-TEST DRIVER SIDE A-PILLAR

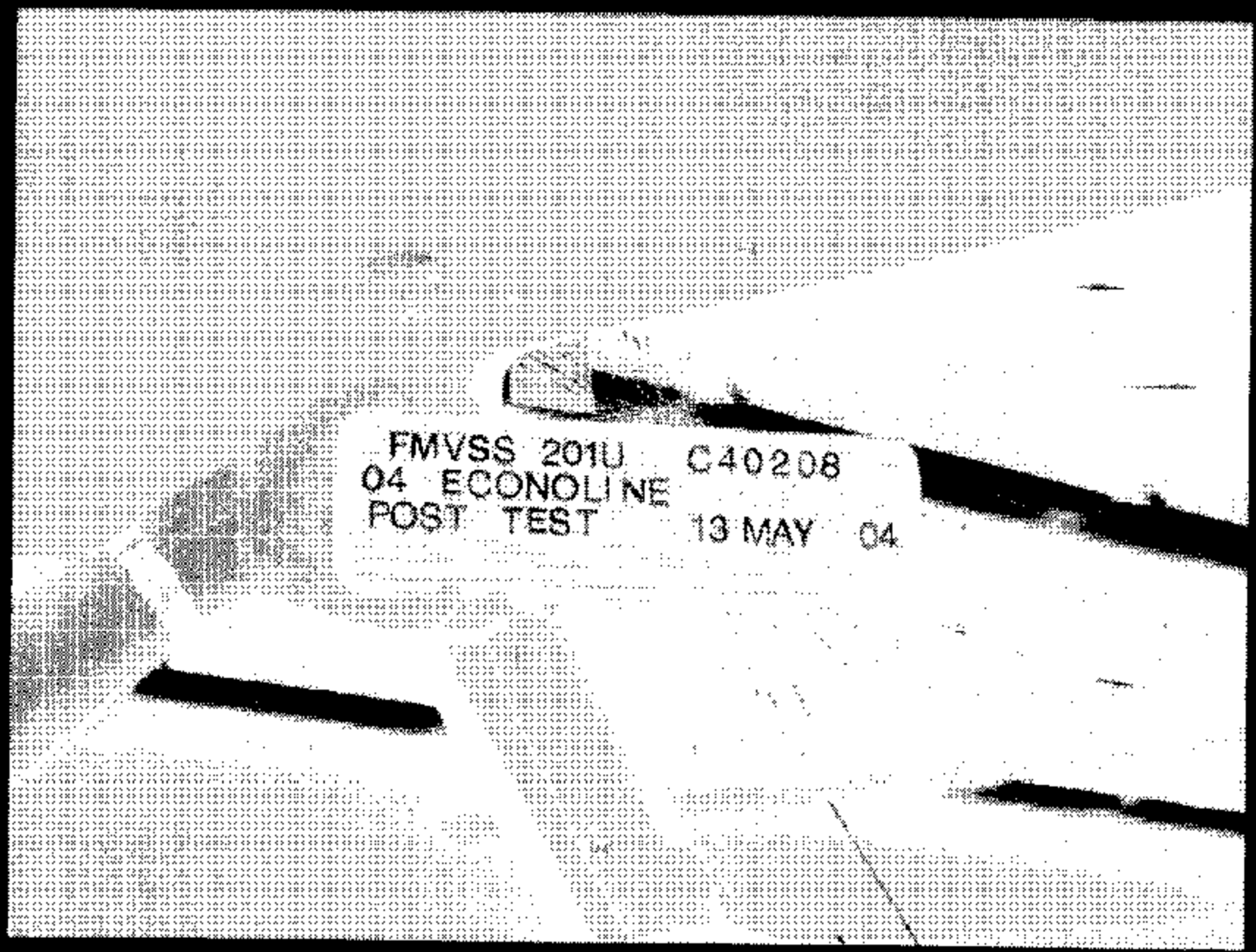



Figure A-19 : POST-TEST DRIVER SIDE FRONT HEADER

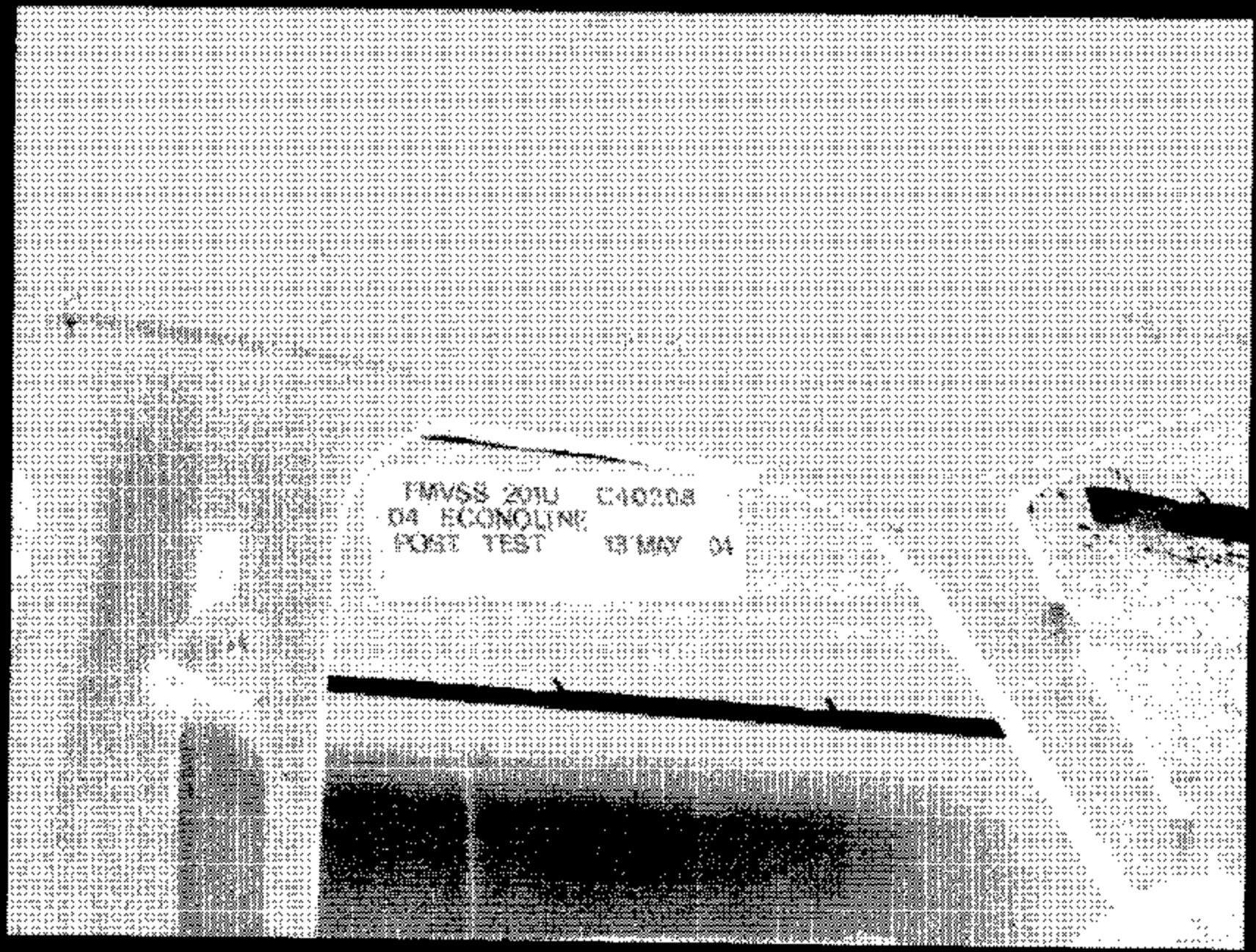



Figure A-20 : POST-TEST DRIVER SIDE SIDE RAIL


Figure A-21 : POST-TEST DRIVER SIDE B-PILLAR

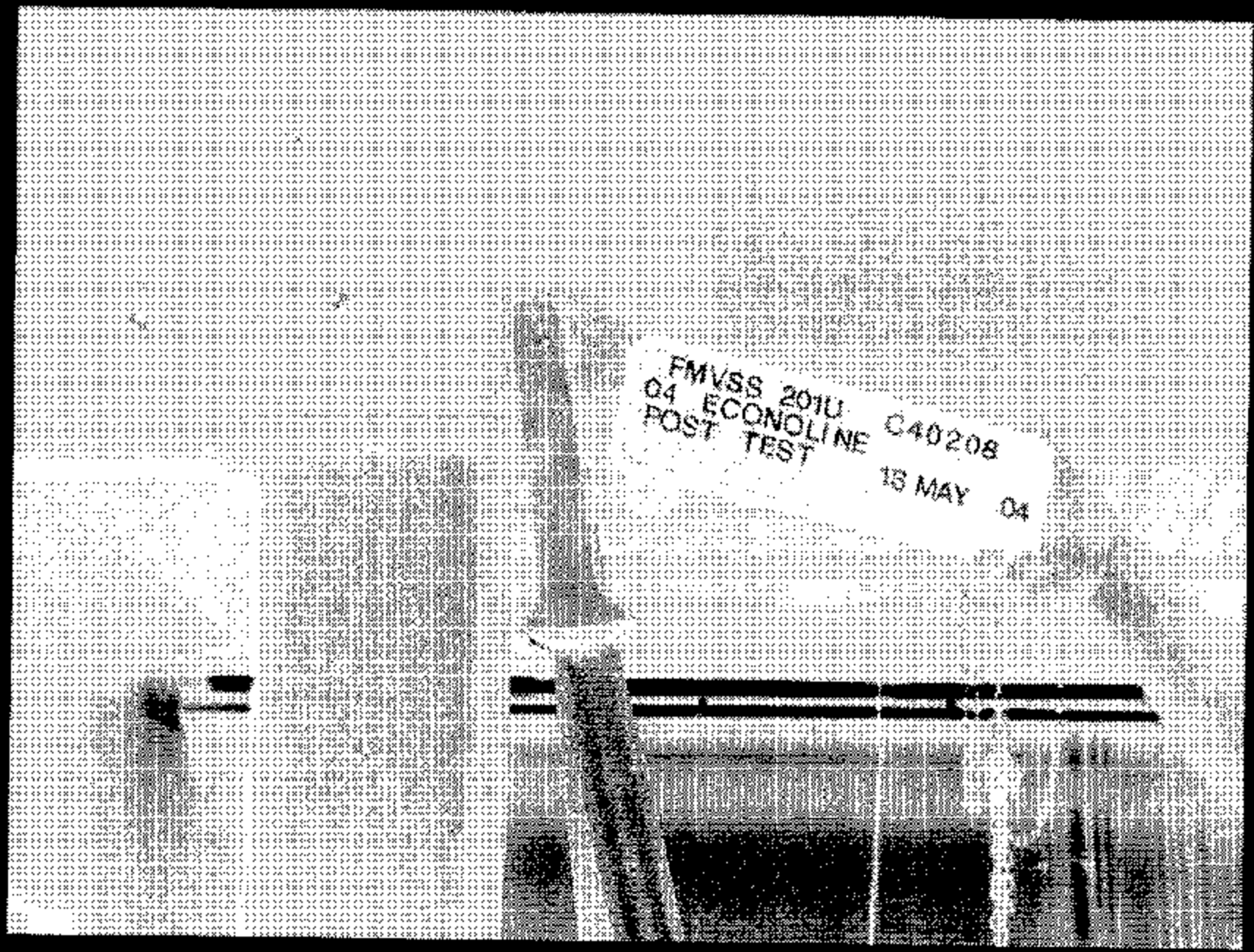



Figure A-22 : POST-TEST DRIVER SIDE OTHER PILLAR


Figure A-23 : POST-TEST PASSENGER SIDE A-PILLAR

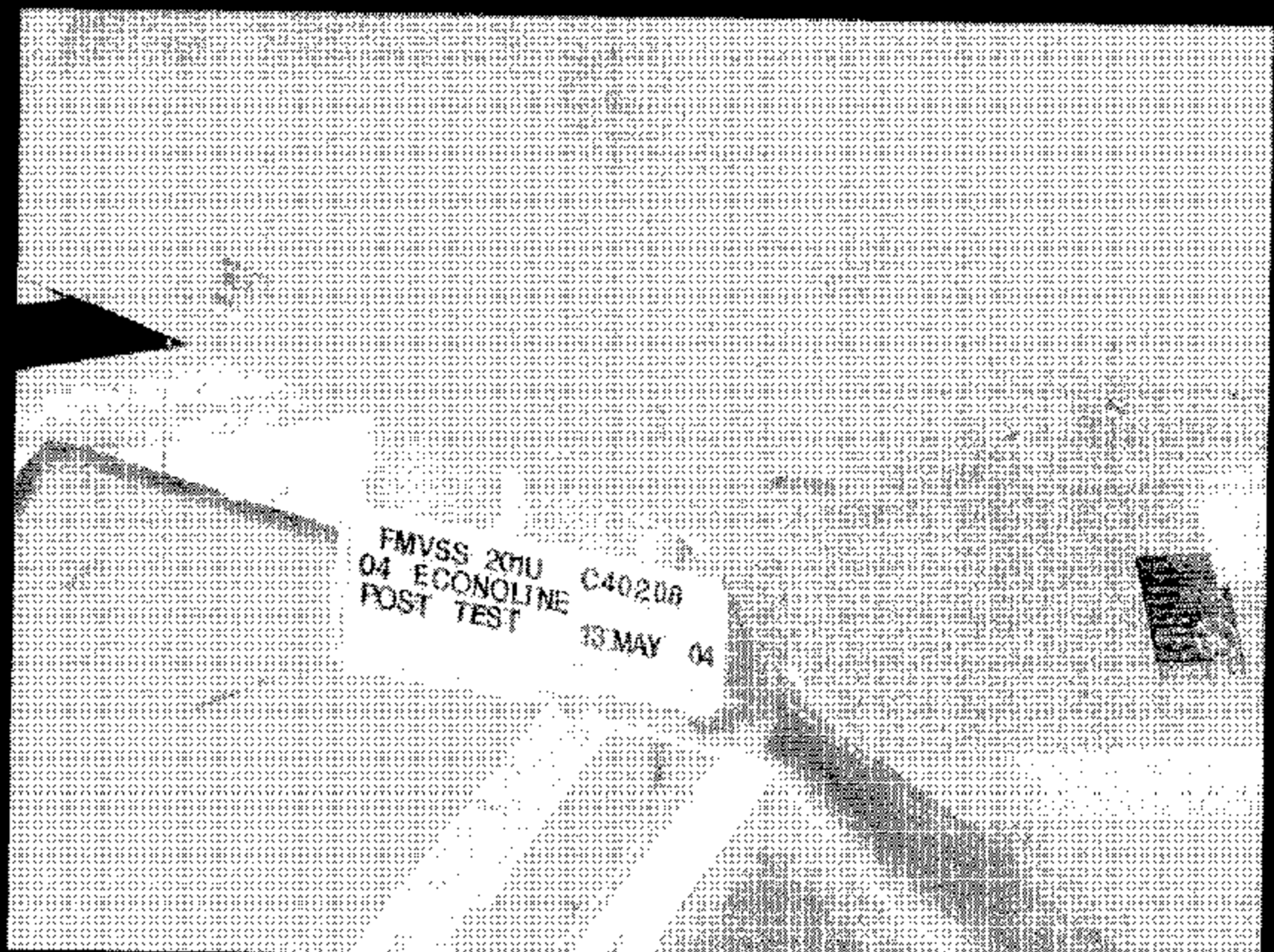



Figure A-24 : POST-TEST PASSENGER SIDE FRONT HEADER

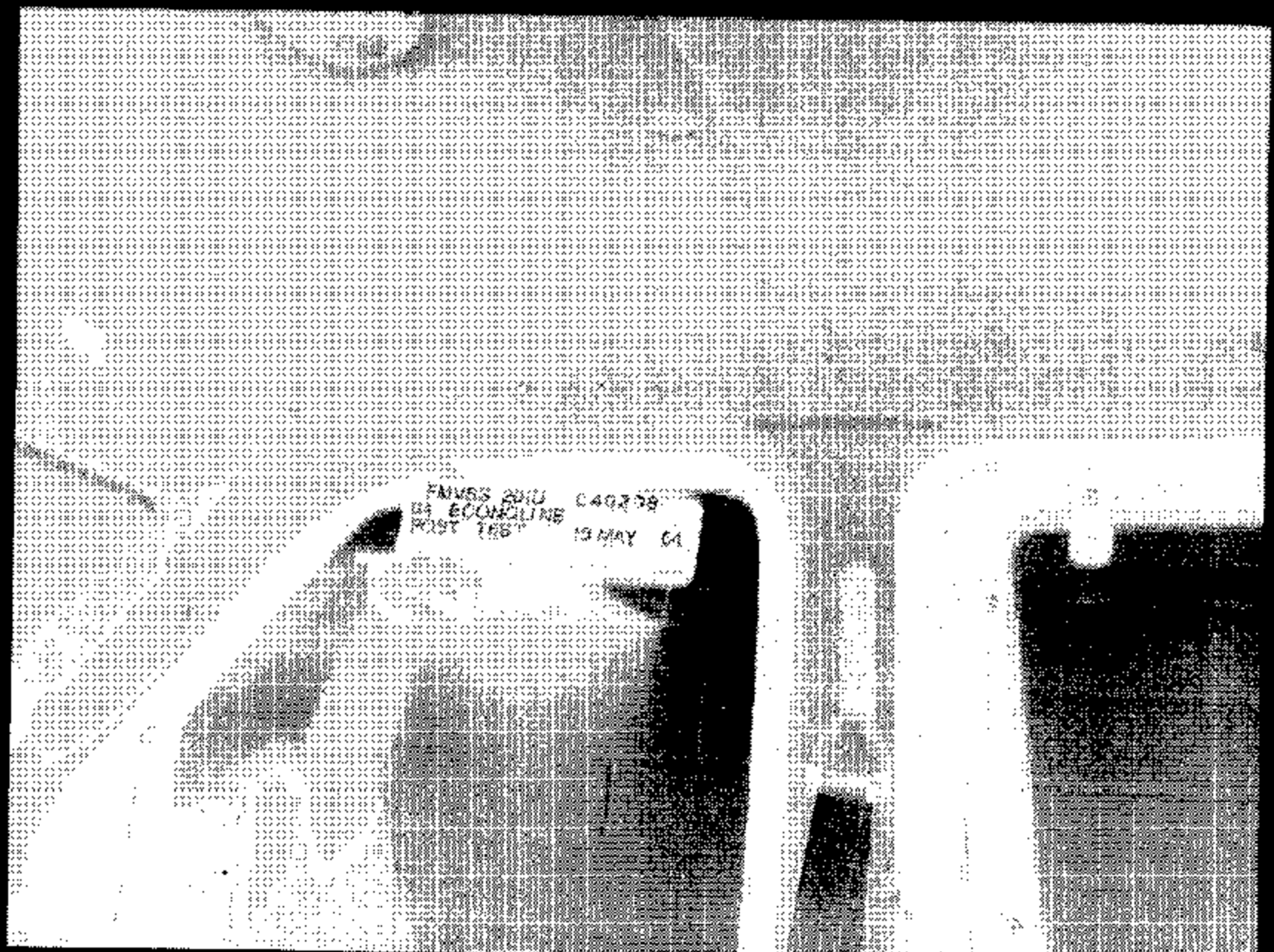



Figure A-25 : POST-TEST PASSENGER SIDE SIDE RAIL

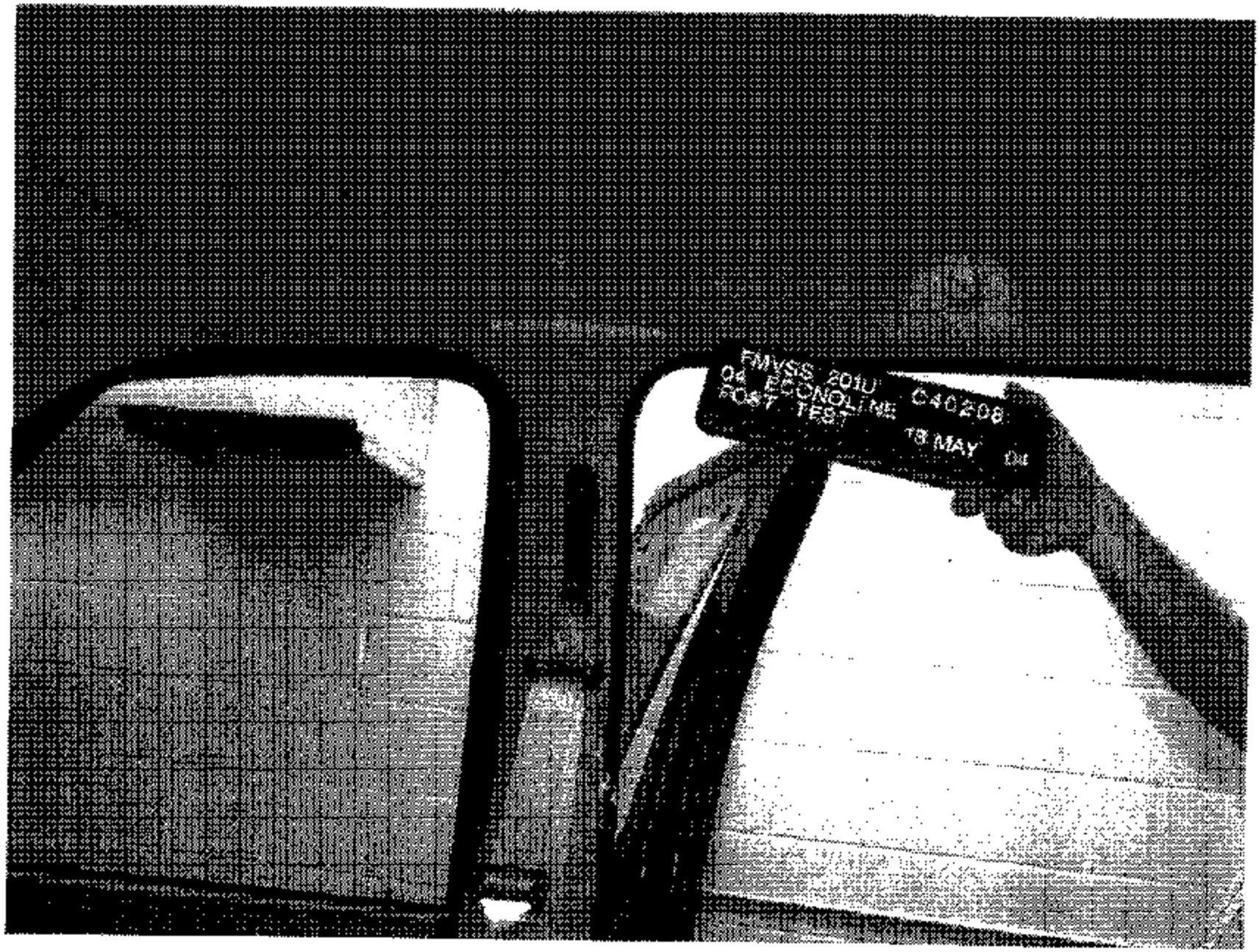



Figure A-26 : POST-TEST PASSENGER SIDE B-PILLAR

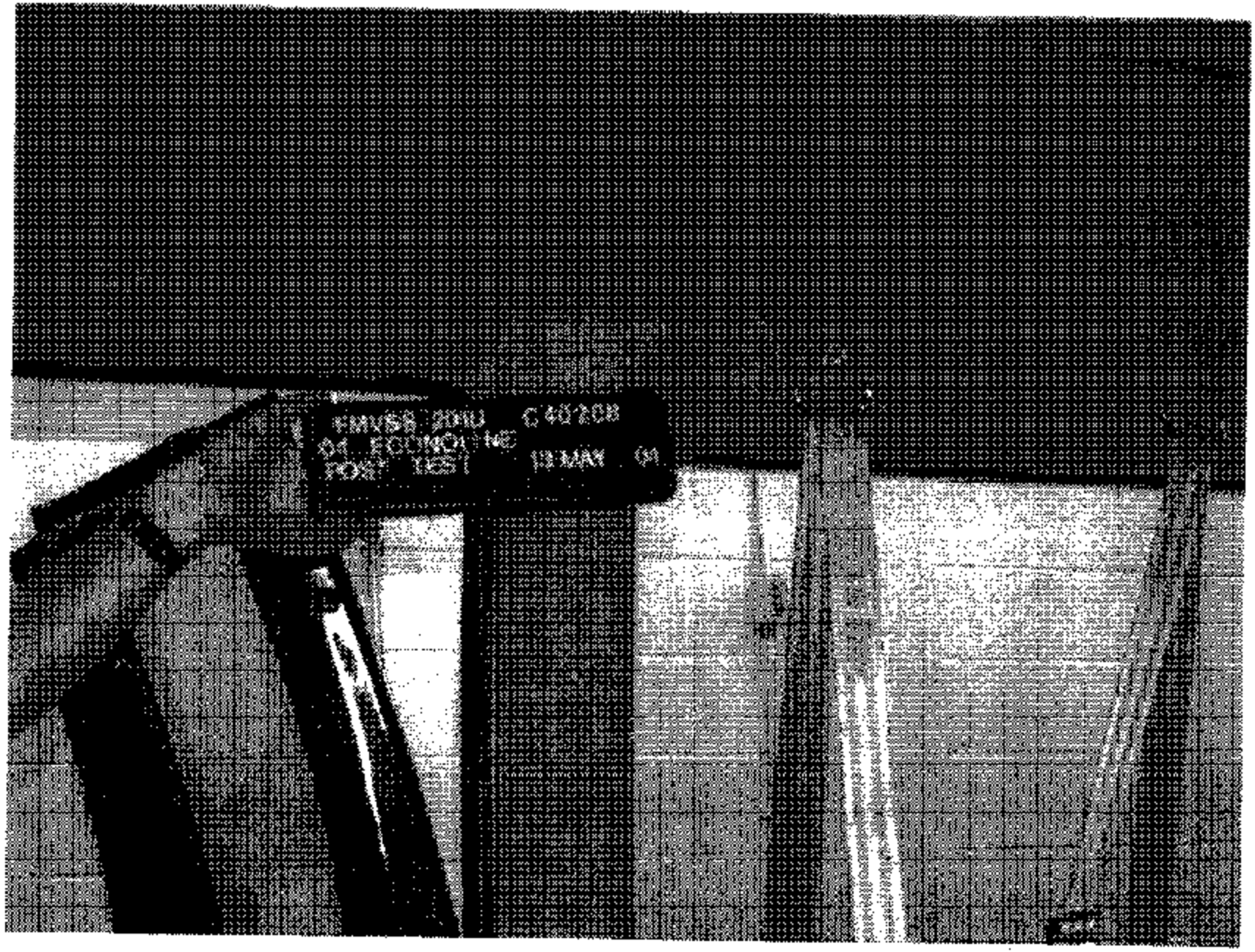


Figure A-27 : POST-TEST PASSENGER SIDE OTHER PILLAR

## APPENDIX B

## PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT

Appendix B contains the results from certification tests performed on the Free Motion Headforms utilized in this test program. The results indicate that the headforms meet all of the performance specifications given in 49 CFR Part 572 Subpart L.

The tests were conducted at the Dummy Certification Test Facility of Veridian Engineering. A summary of the test results are included in this Appendix.

PART 572L
HEAD DROP PRE-TEST

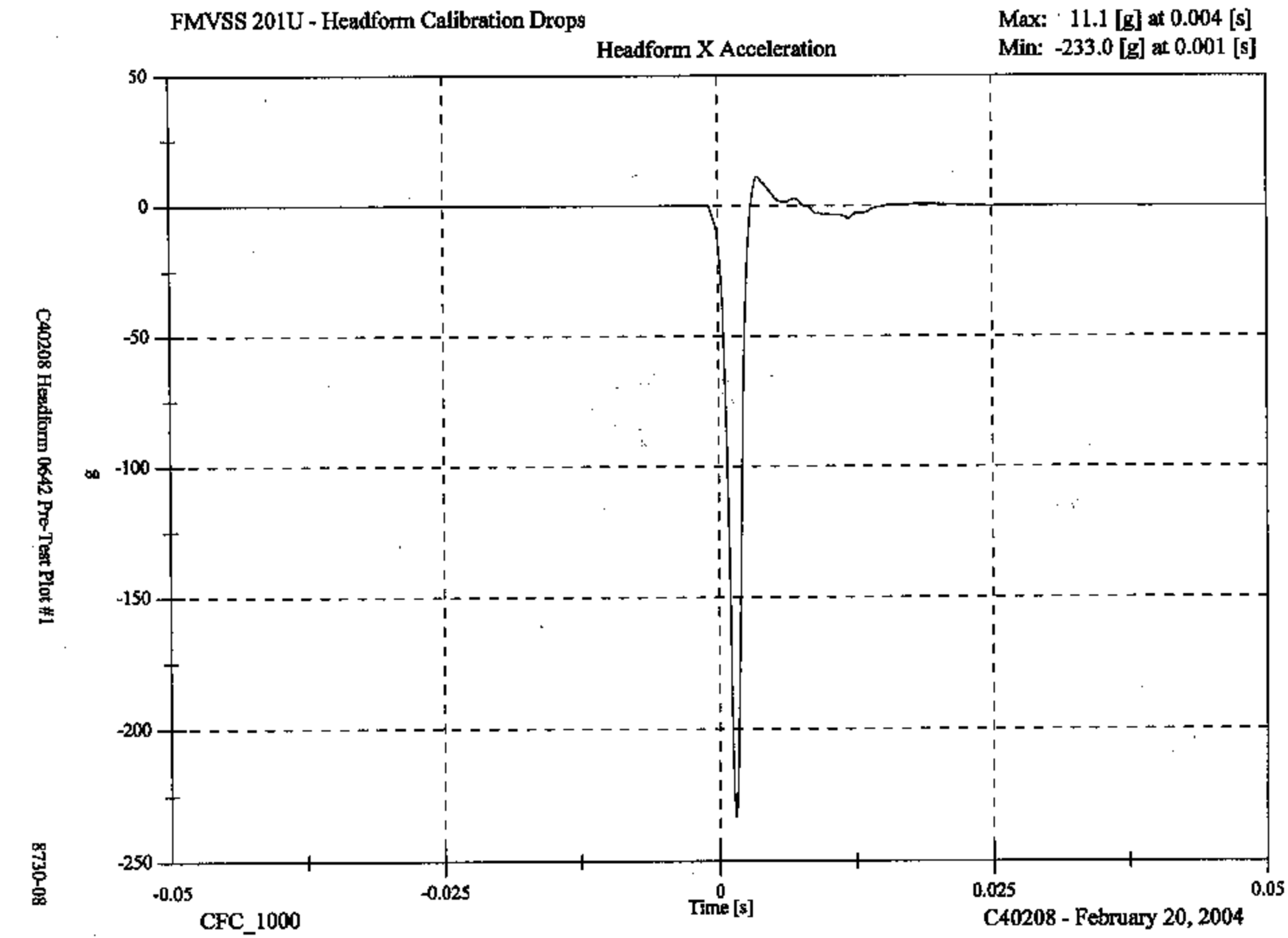
| | |
|---|---|
| MANUFACTURER: | FIRST TECHNOLOGIES SAFETY SYSTEMS |
| SERIAL NUMBER: | 0642 |
| CALIBRATION DATE: | February 20, 2004 |

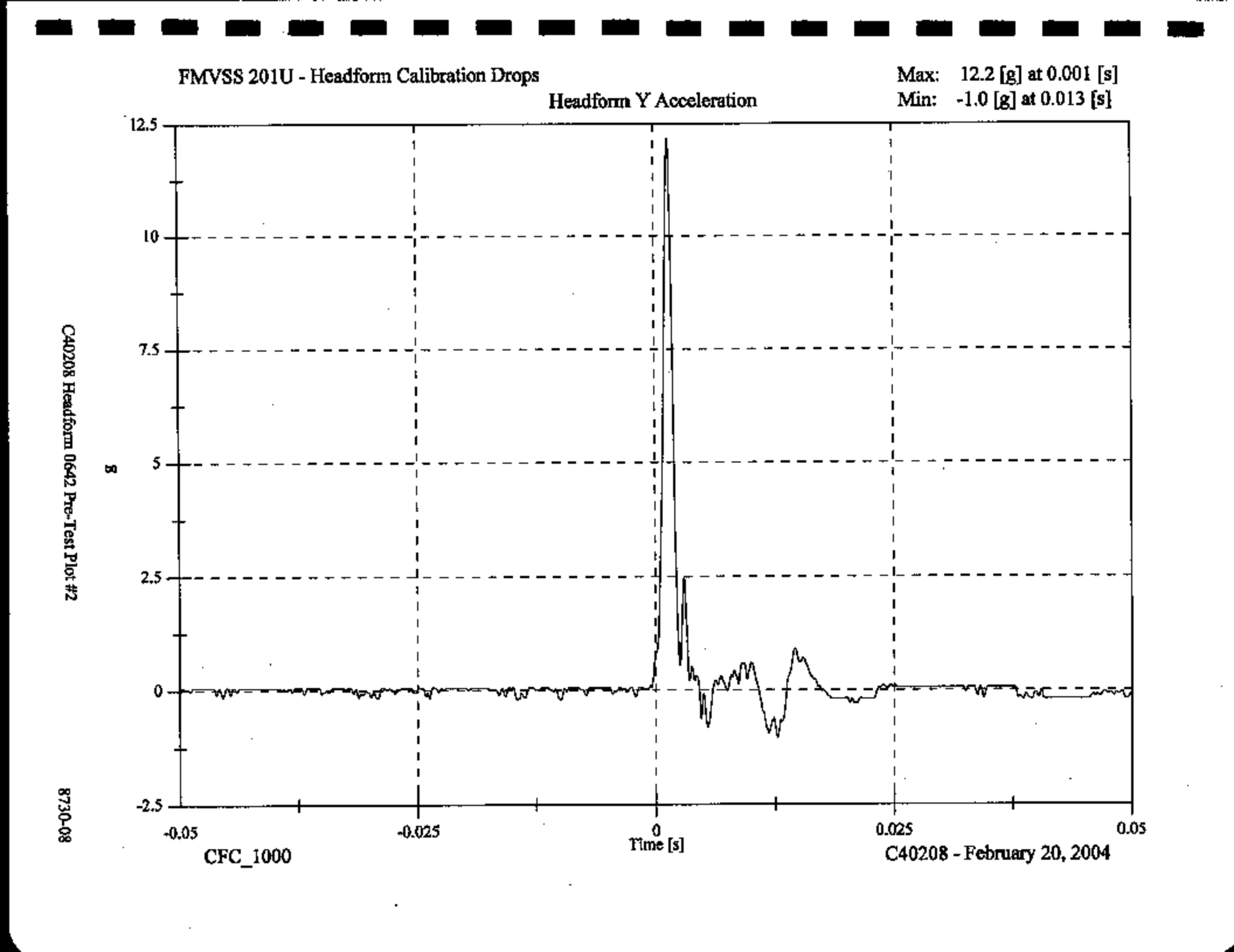
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 19°C to 26°C | 23.3 |
| RELATIVE HUMIDITY | 10% to 70% | 29 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 262.0 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 12.2 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

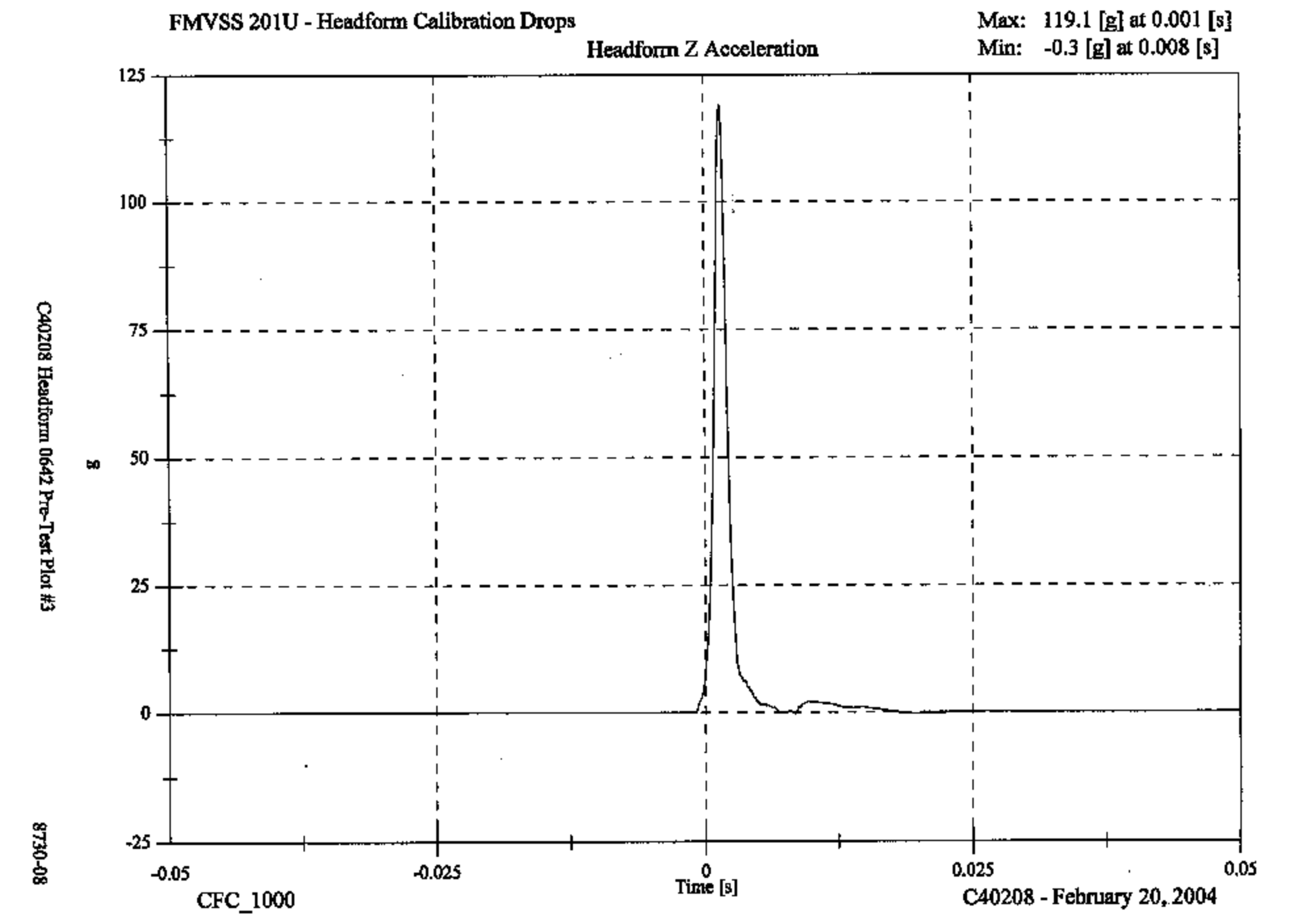
HEAD ACCELEROMETER CALIBRATION INFORMATION

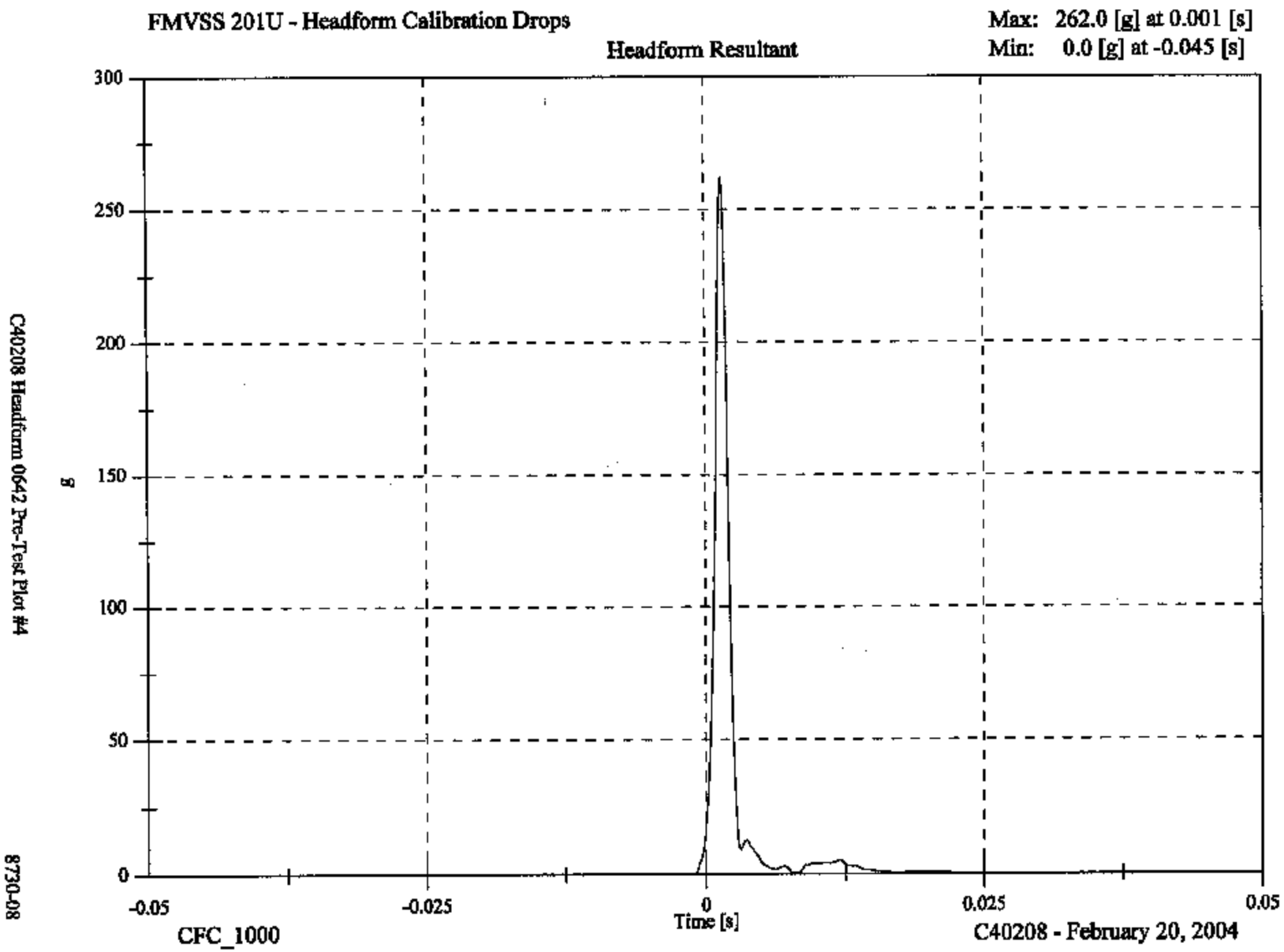
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J24876 | 08/22/03 | 02/23/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J33030 | 08/22/03 | 02/23/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J31009 | 08/22/03 | 02/23/04 |

REMARKS:


FMVSS 201U - Headform Calibration Drops
Headform X Acceleration
Max: 11.1 [g] at 0.004 [s]
Min: -233.0 [g] at 0.001 [s]
50
0
-50
-100
-150
-200
-250
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0642 Pre-Test Plot #1
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 12.2 [g] at 0.001 [s]
Min: -1.0 [g] at 0.013 [s]
12.5
10
7.5
5
2.5
0
-2.5
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0642 Pre-Test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 119.1 [g] at 0.001 [s]
Min: -0.3 [g] at 0.008 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Headform 0642 Pre-Test Plot #3
8730-08
CFC_1000
C40208 - February 20, 2004


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 262.0 [g] at 0.001 [s]
Min: 0.0 [g] at -0.045 [s]
300
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0642 Pre-Test Plot #4
8730-08

PART 572L
HEAD DROP PRE-TEST

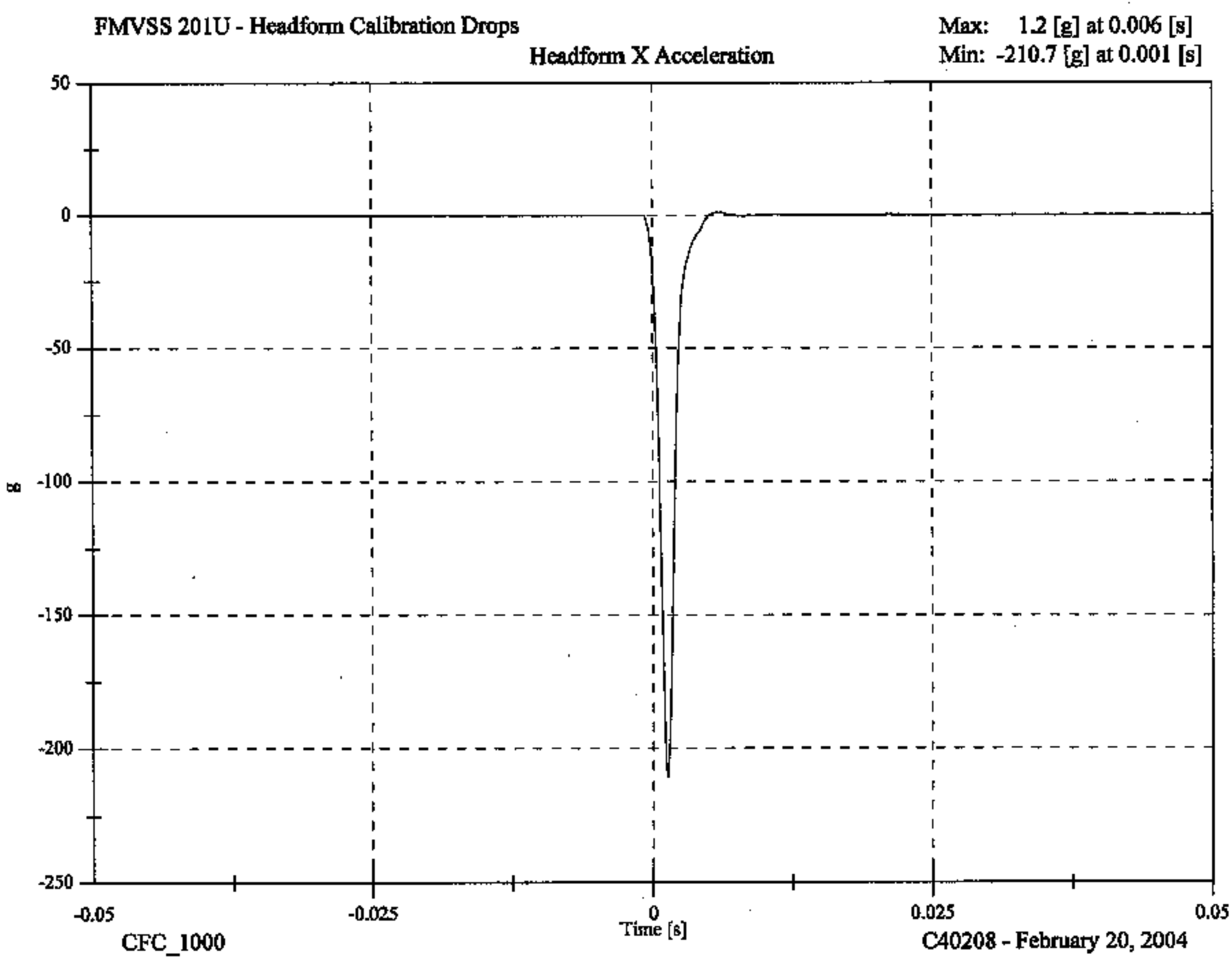
| | |
|---|---|
| MANUFACTURER: | FIRST TECHNOLOGIES SAFETY SYSTEMS |
| SERIAL NUMBER: | 0062 |
| CALIBRATION DATE: | February 20, 2004 |

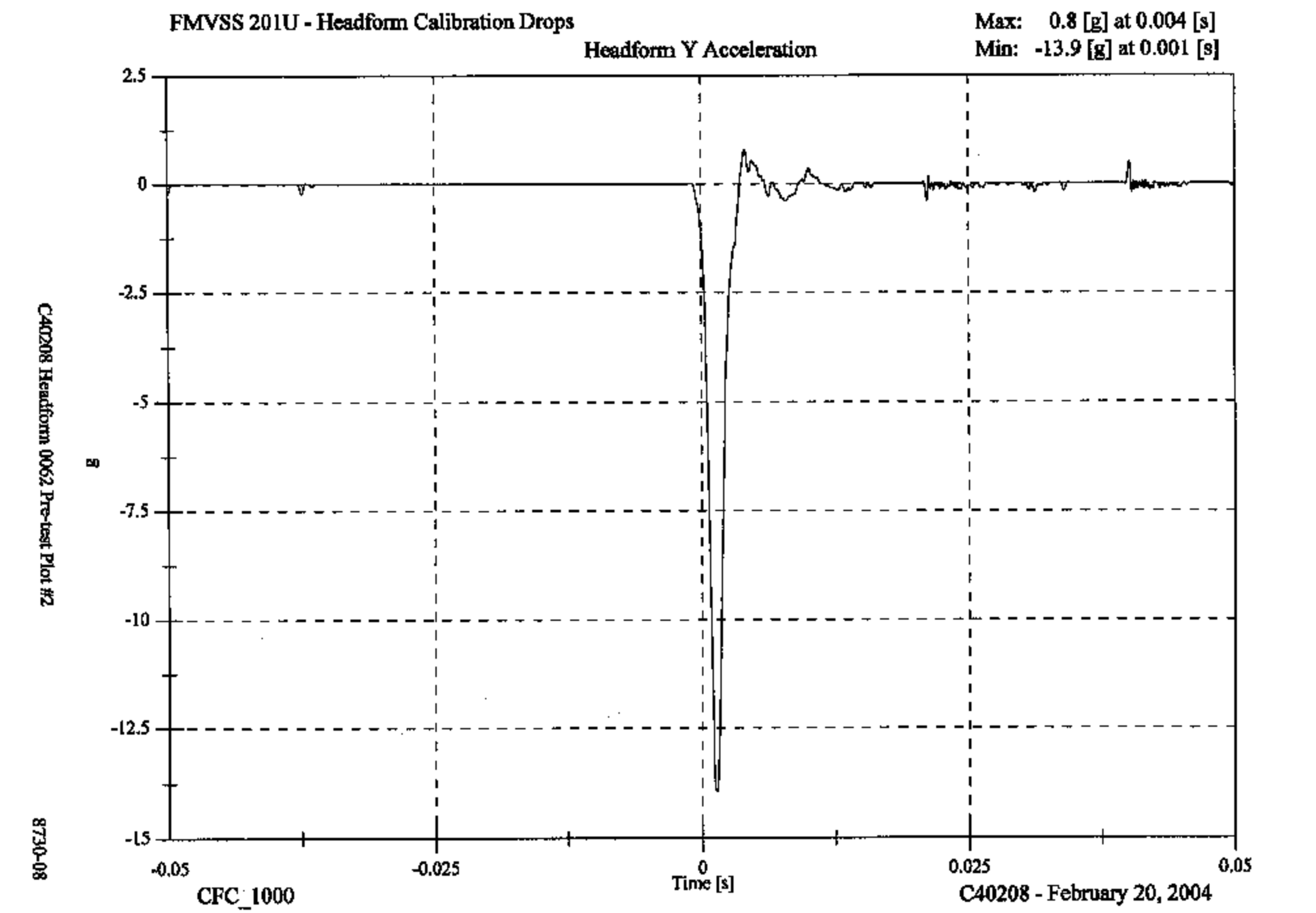
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 19°C to 26°C | 23.3 |
| RELATIVE HUMIDITY | 10% to 70% | 29 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 238.4 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 13.9 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

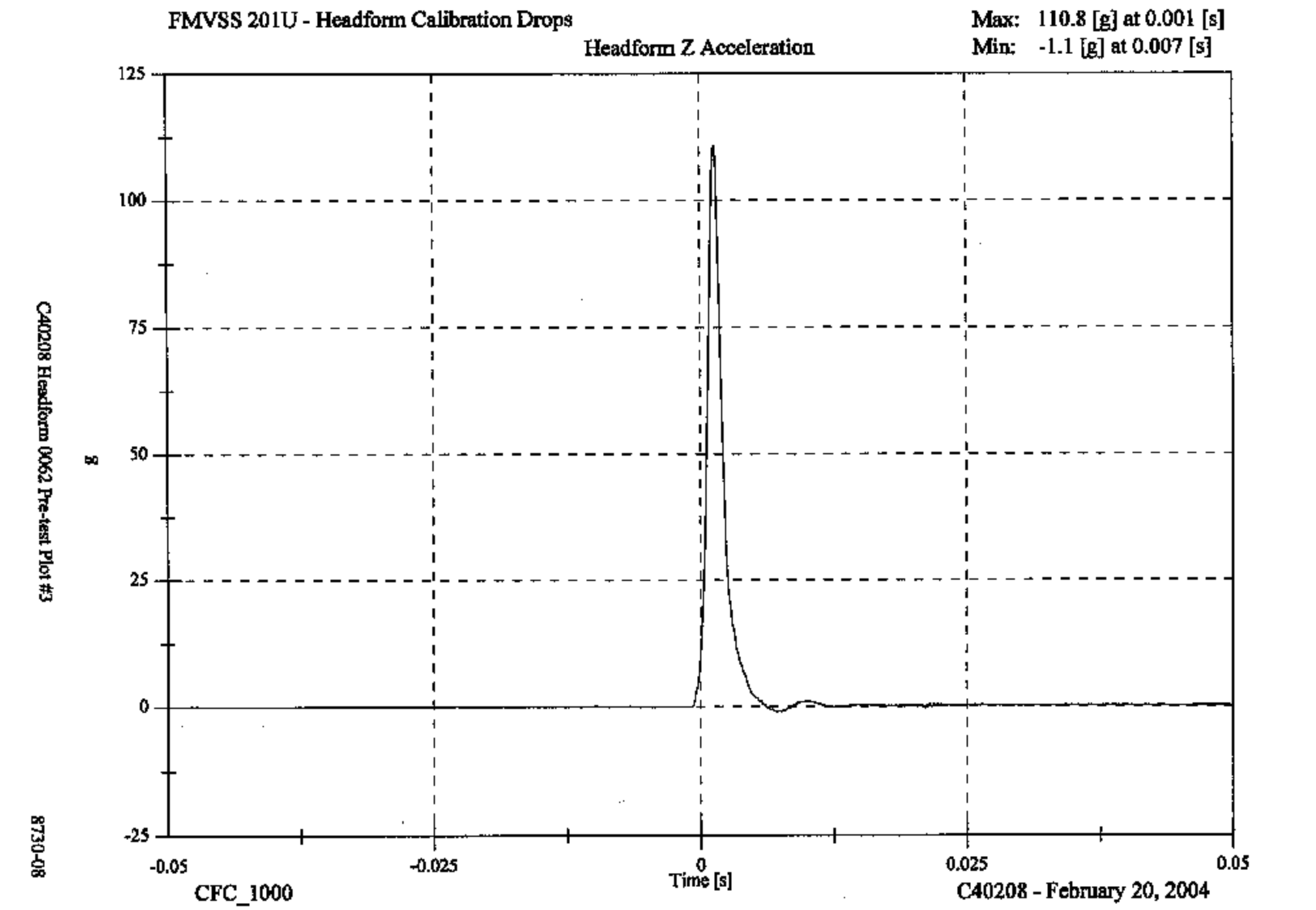
HEAD ACCELEROMETER CALIBRATION INFORMATION

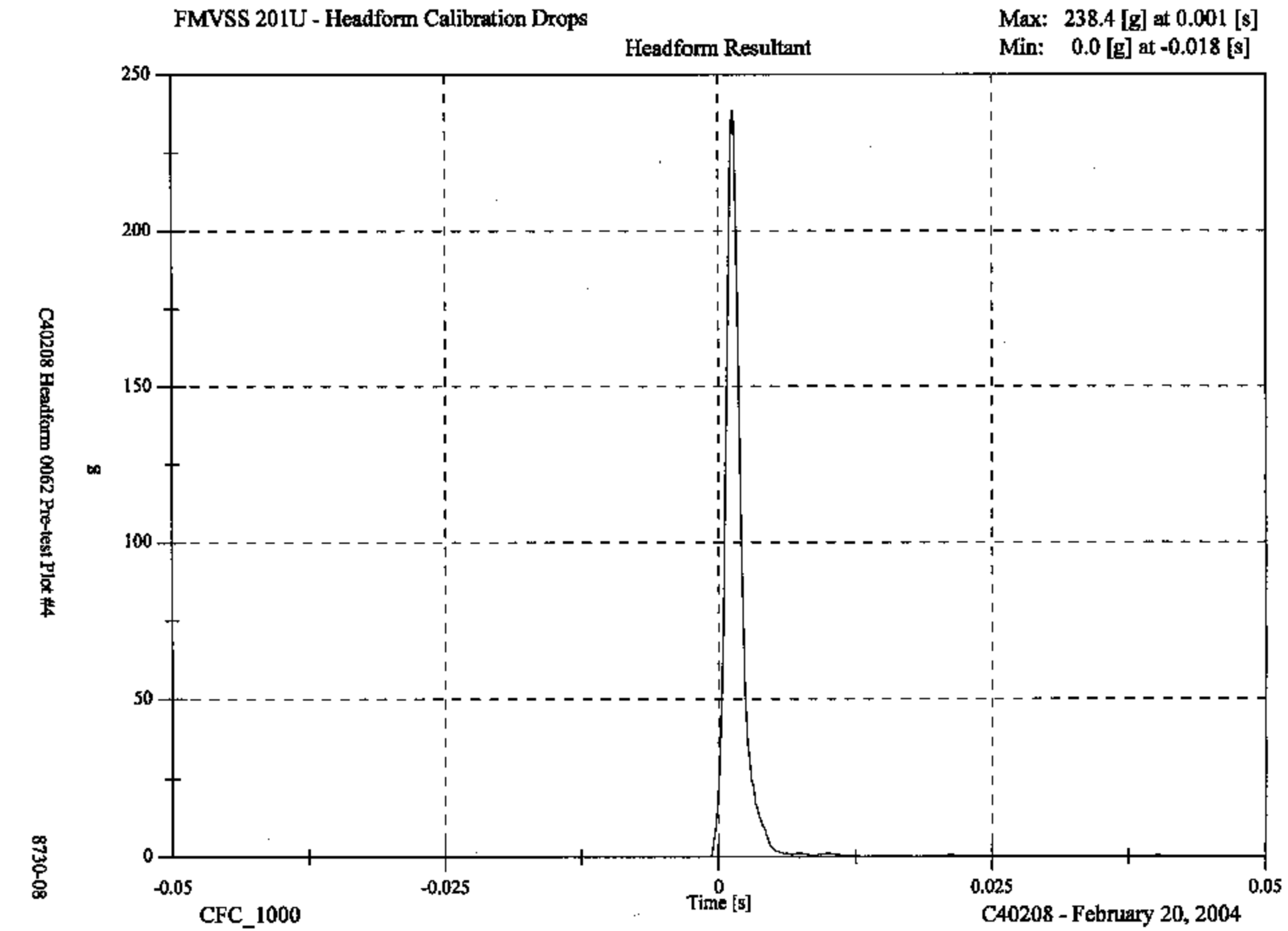
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J33127 | 08/22/03 | 02/23/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J33019 | 08/22/03 | 02/23/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J32782 | 08/22/03 | 02/23/04 |

REMARKS:


FMVSS 201U - Headform Calibration Drops
Headform X Acceleration
Max: 1.2 [g] at 0.006 [s]
Min: -210.7 [g] at 0.001 [s]
50
0
-50
-100
-150
-200
-250
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0062 Pre-test Plot #1
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 0.8 [g] at 0.004 [s]
Min: -13.9 [g] at 0.001 [s]
2.5
0
-2.5
-5
-7.5
-10
-12.5
-15
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0062 Pre-test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 110.8 [g] at 0.001 [s]
Min: -1.1 [g] at 0.007 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0062 Pre-test Plot #3
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 238.4 [g] at 0.001 [s]
Min: 0.0 [g] at -0.018 [s]
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0062 Pre-test Plot #4
8730-08

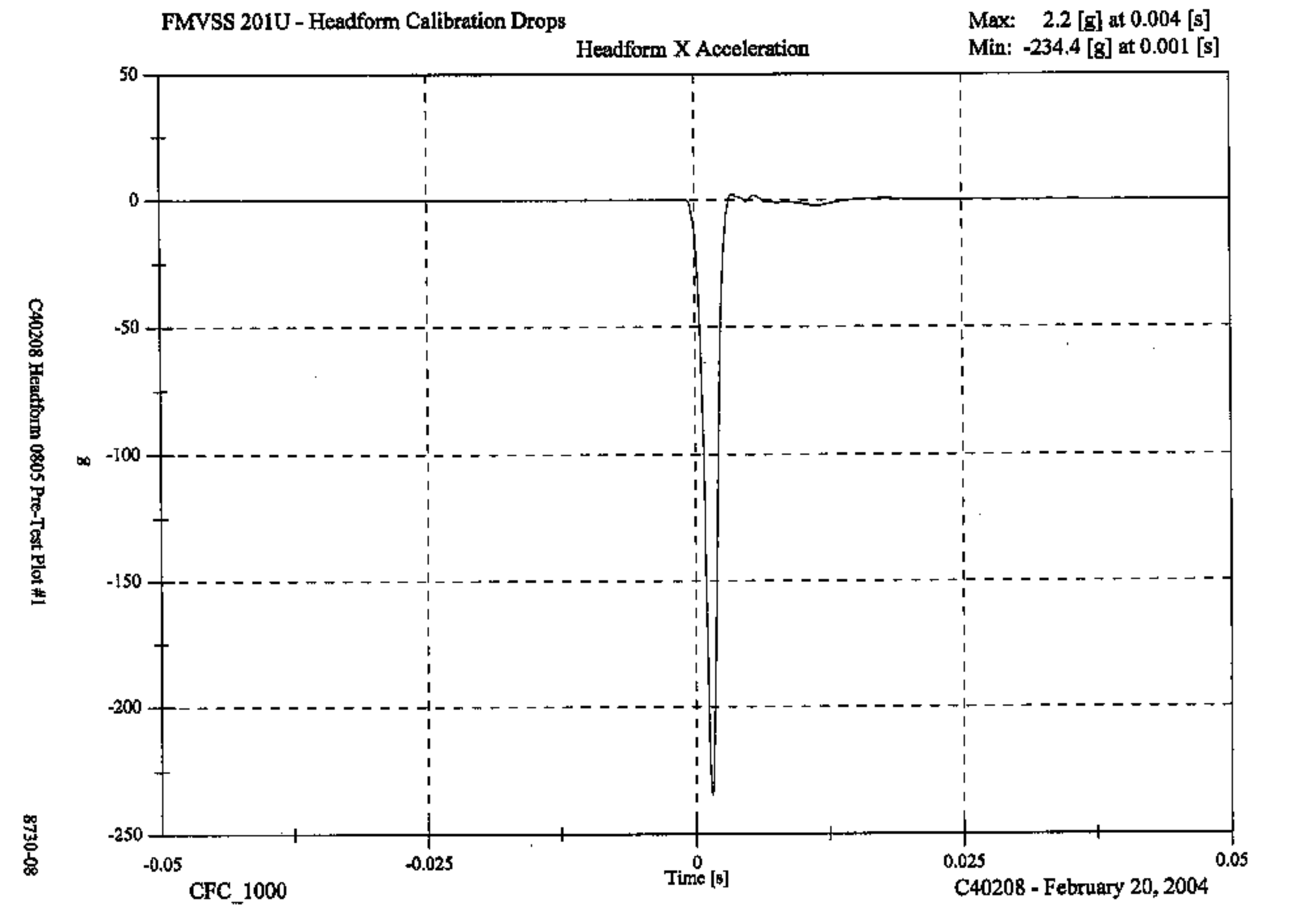
**PART 572L**
**HEAD DROP PRE-TEST**

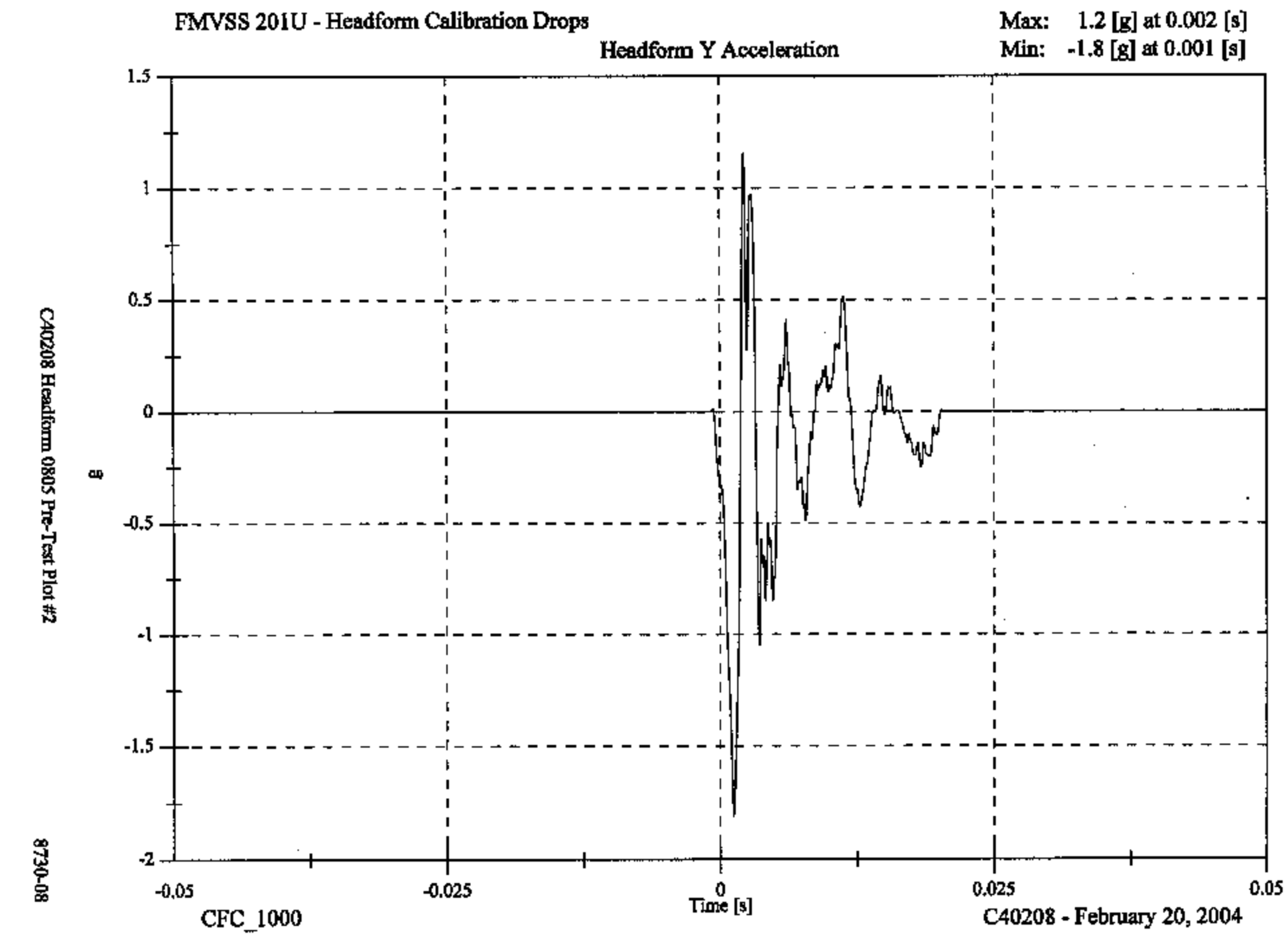
| | | |
|---|---|---|
| **MANUFACTURER:** | **FIRST TECHNOLOGIES SAFETY SYSTEMS** | |
| **SERIAL NUMBER:** | **805** | |
| **CALIBRATION DATE:** | **February 28, 2004** | |
| **TEST PARAMETER** | **SPECIFICATION** | **TEST RESULTS** |
| **TEMPERATURE** | **19°C to 26°C** | **23.3** |
| **RELATIVE HUMIDITY** | **10% to 70%** | **29** |
| **PEAK RESULTANT ACCELERATION** | **225 Gs to 275 Gs** | **261.0** |
| **PEAK LATERAL ACCELERATION** | **15 Gs Maximum** | **1.8** |
| **IS ACCELERATION CURVE UNIMODAL?** | **YES** | **YES** |

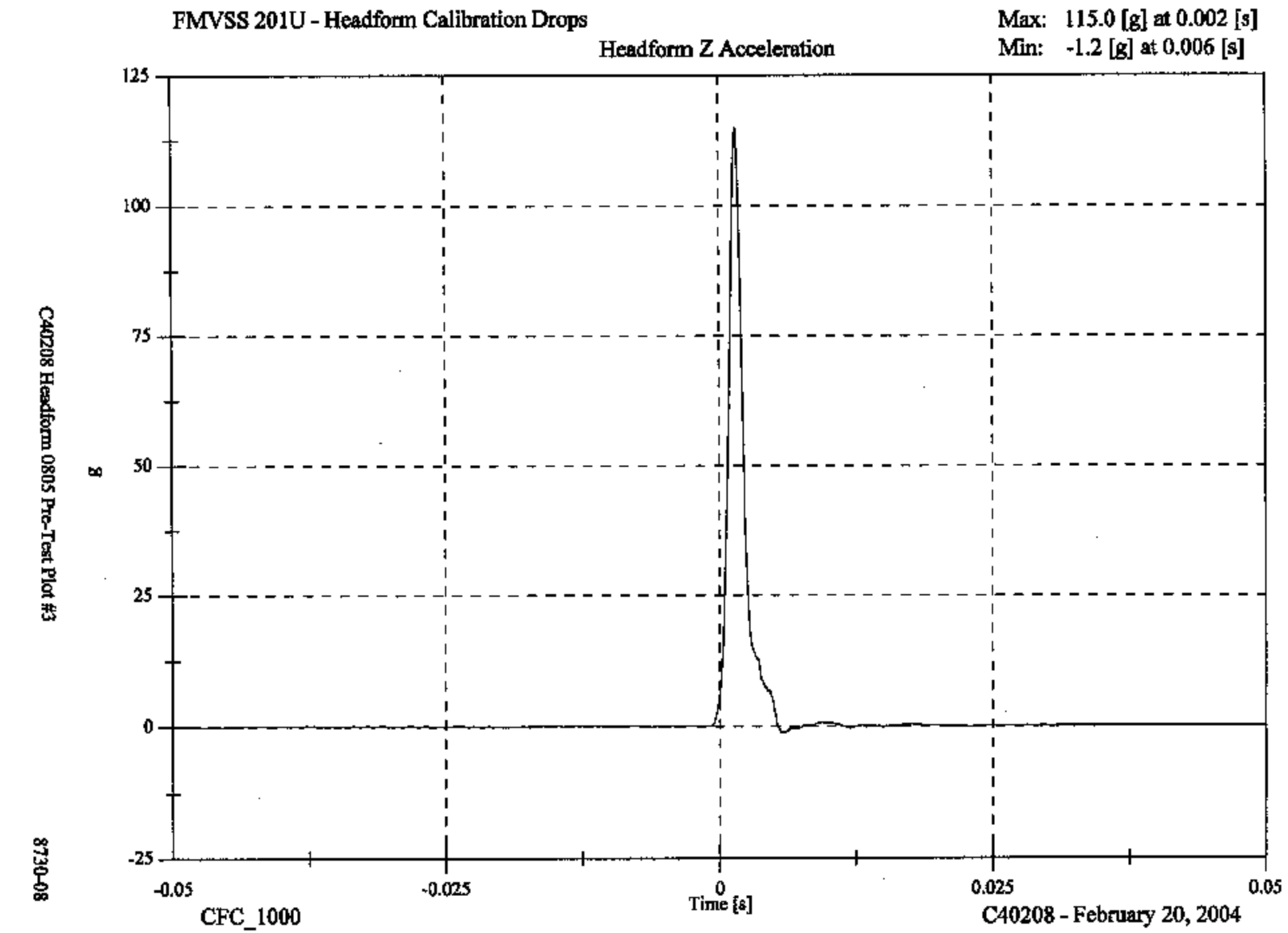
**HEAD ACCELEROMETER CALIBRATION INFORMATION**

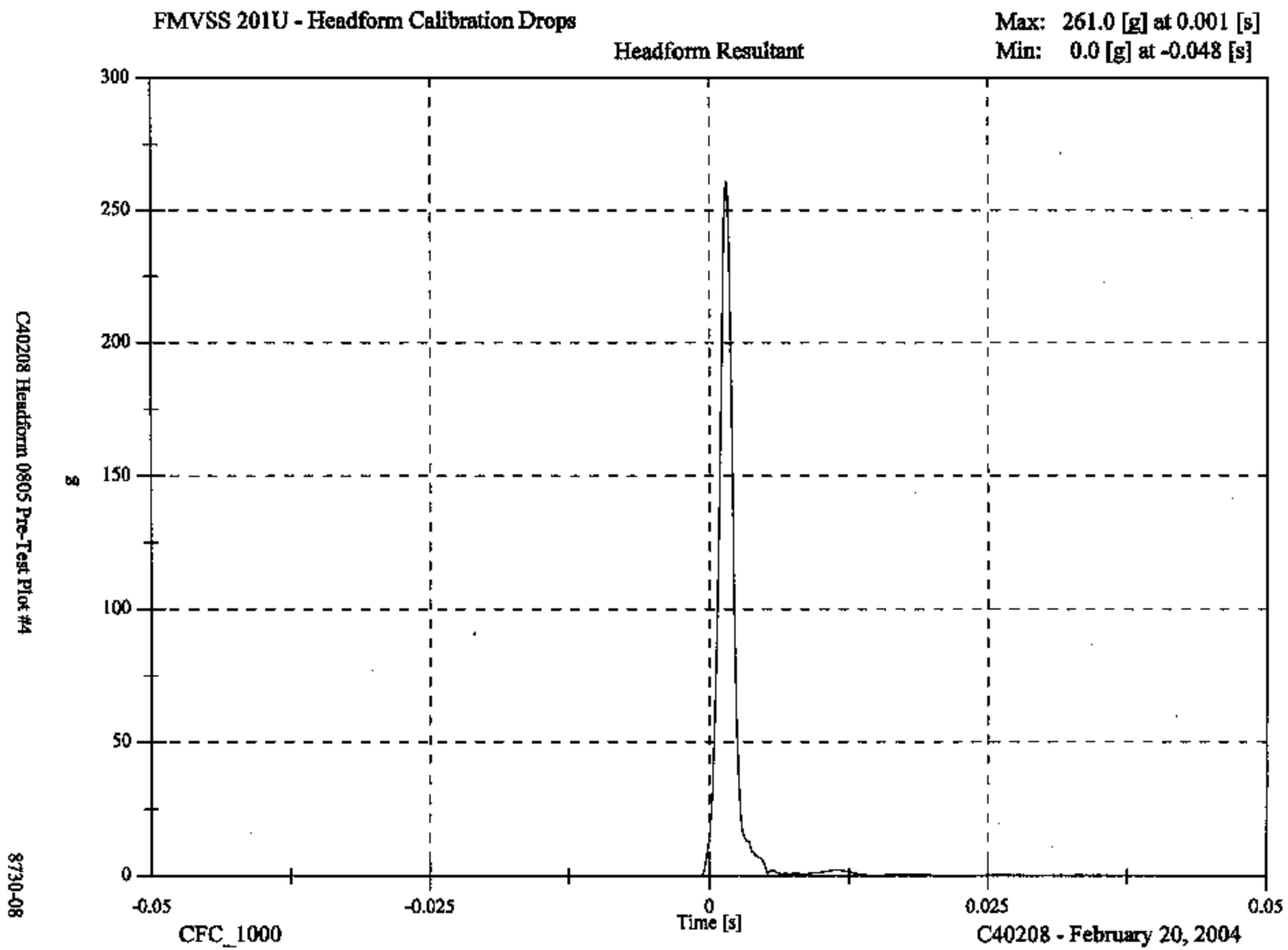
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J38127 | 08/22/03 | 02/23/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J37990 | 08/22/03 | 02/23/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J37854 | 08/22/03 | 02/23/04 |

**REMARKS:**


FMVSS 201U - Headform Calibration Drops
Headform X Acceleration
Max: 2.2 [g] at 0.004 [s]
Min: -234.4 [g] at 0.001 [s]
50
0
-50
-100
-150
-200
-250
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0805 Pre-Test Plot #1
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 1.2 [g] at 0.002 [s]
Min: -1.8 [g] at 0.001 [s]
1.5
1
0.5
0
-0.5
-1
-1.5
-2
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0805 Pre-Test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 115.0 [g] at 0.002 [s]
Min: -1.2 [g] at 0.006 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0805 Pre-Test Plot #3
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 261.0 [g] at 0.001 [s]
Min: 0.0 [g] at -0.048 [s]
300
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0805 Pre-Test Plot #4
8730-08

PART 572L
HEAD DROP PRE-TEST

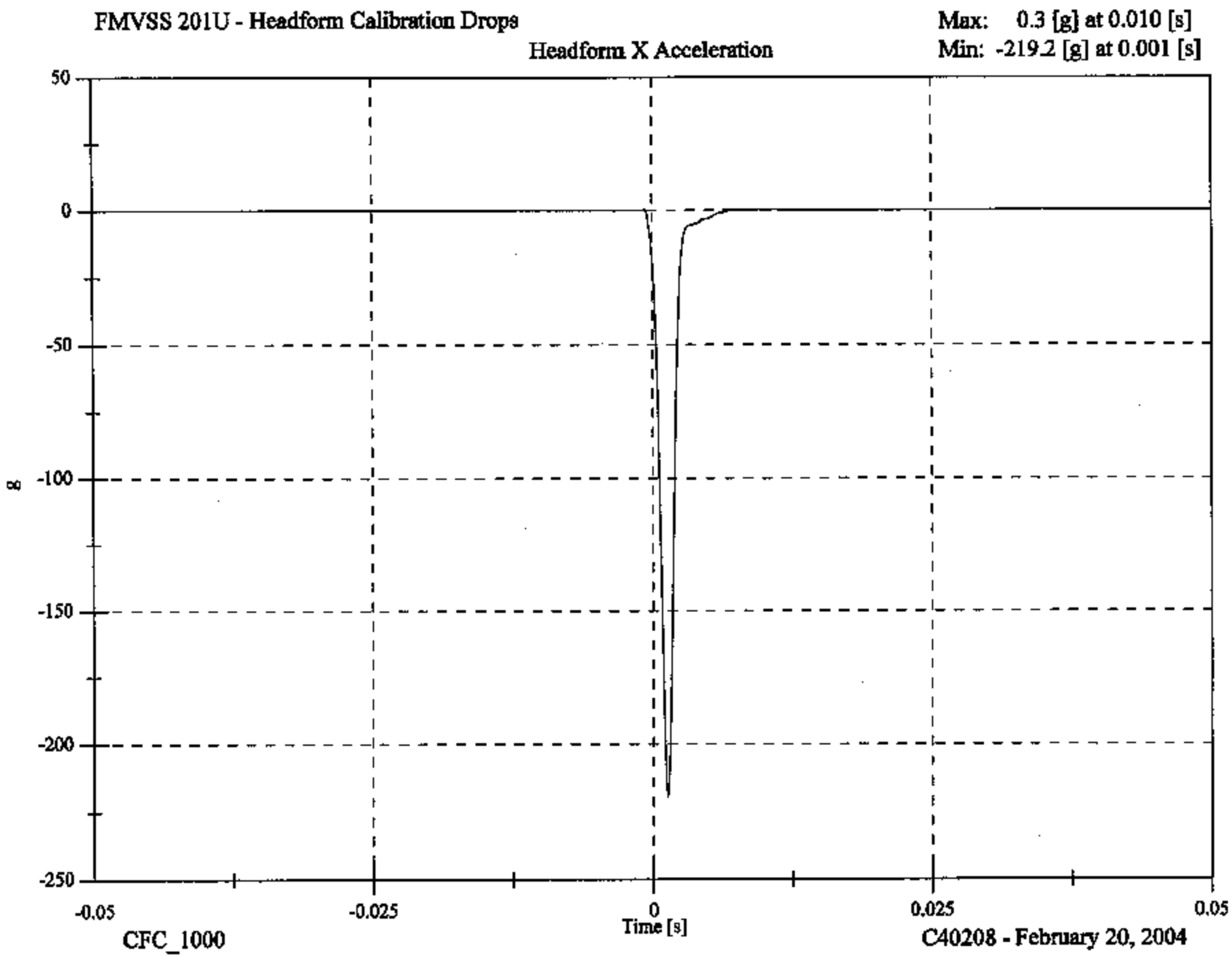
| | |
|---|---|
| MANUFACTURER: | FIRST TECHNOLOGIES SAFETY SYSTEMS |
| SERIAL NUMBER: | 0355 |
| CALIBRATION DATE: | February 20, 2004 |

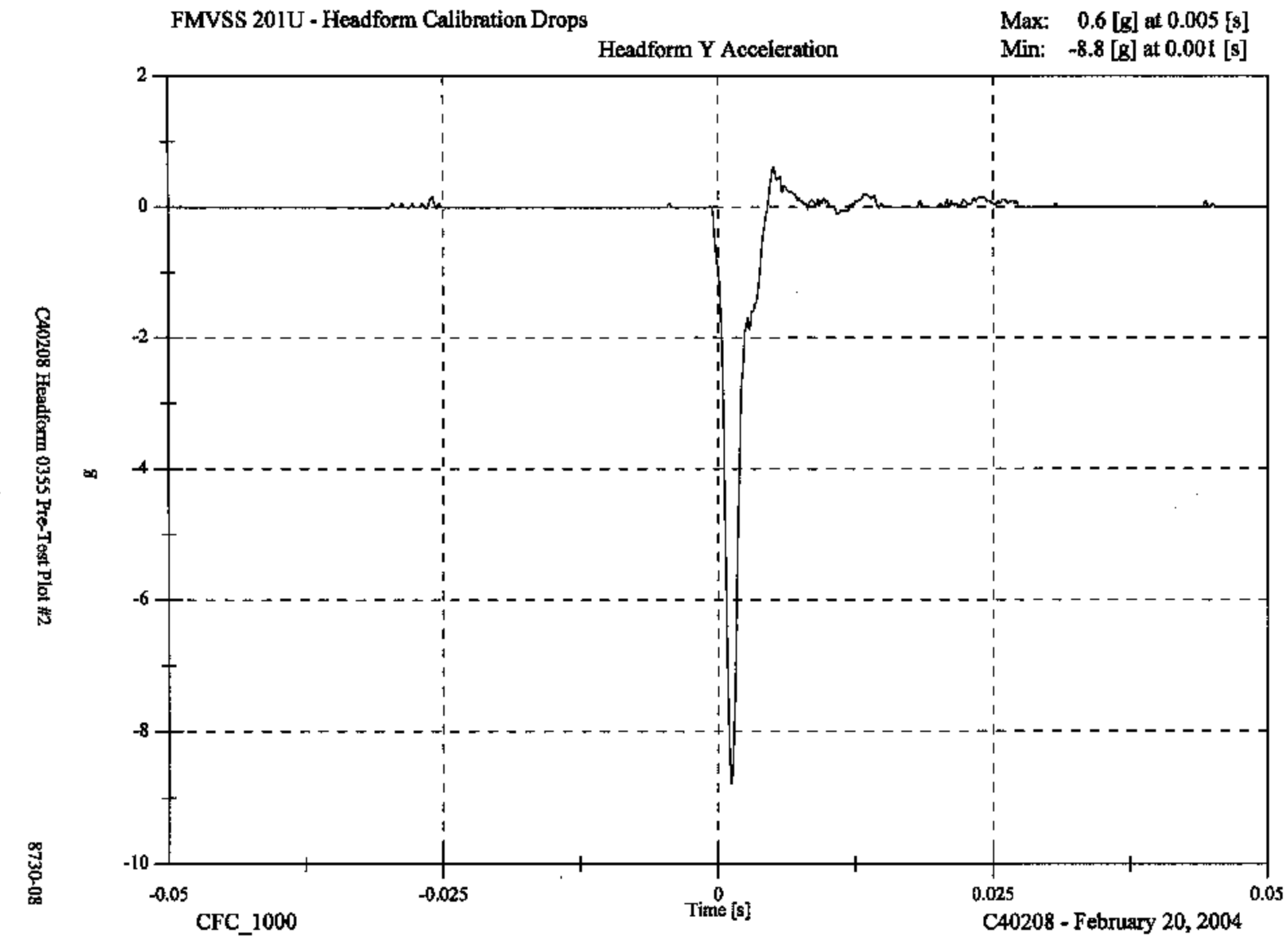
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 19°C to 26°C | 23.3 |
| RELATIVE HUMIDITY | 10% to 70% | 29 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 249.5 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 8.8 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

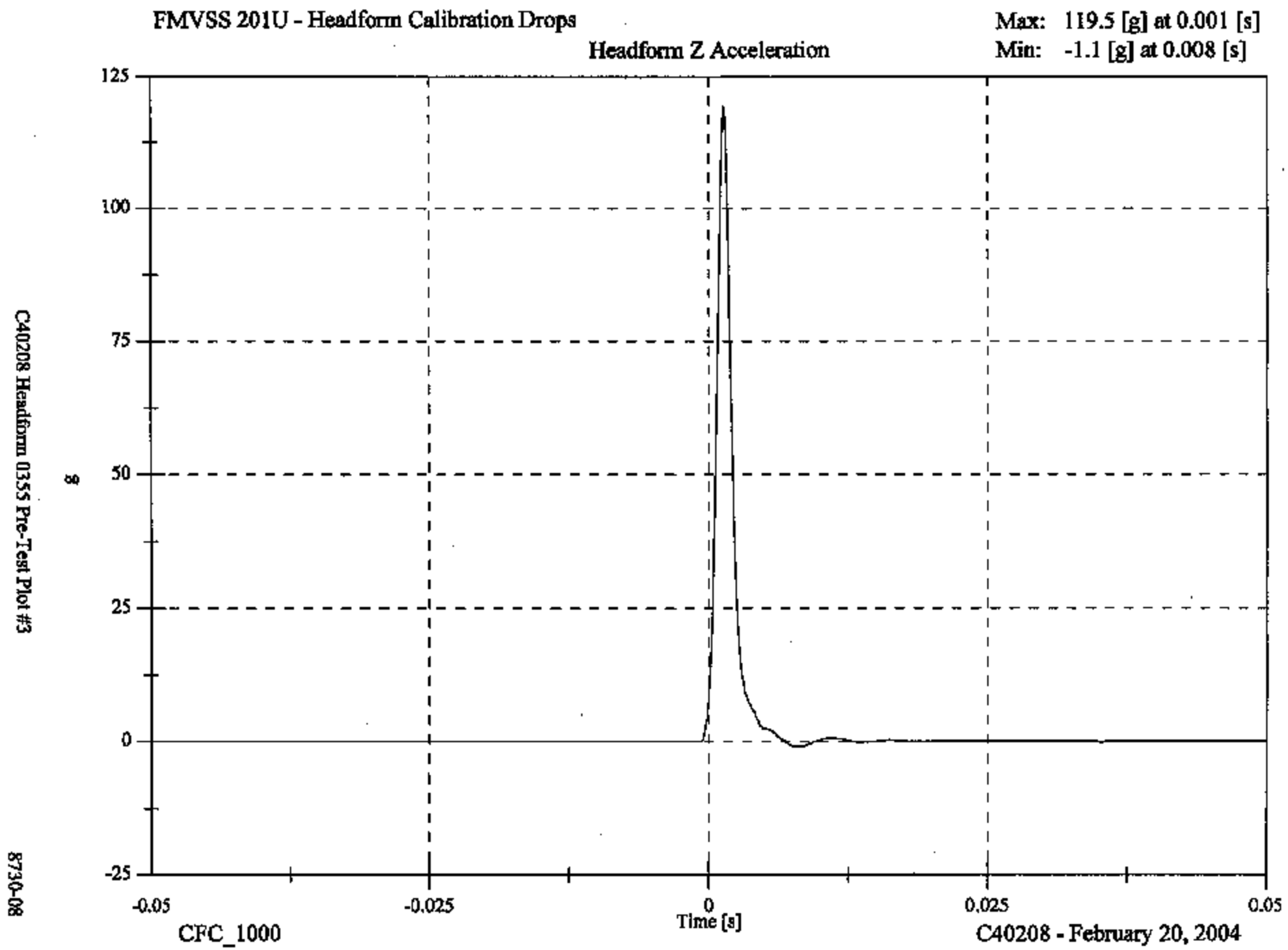
HEAD ACCELEROMETER CALIBRATION INFORMATION

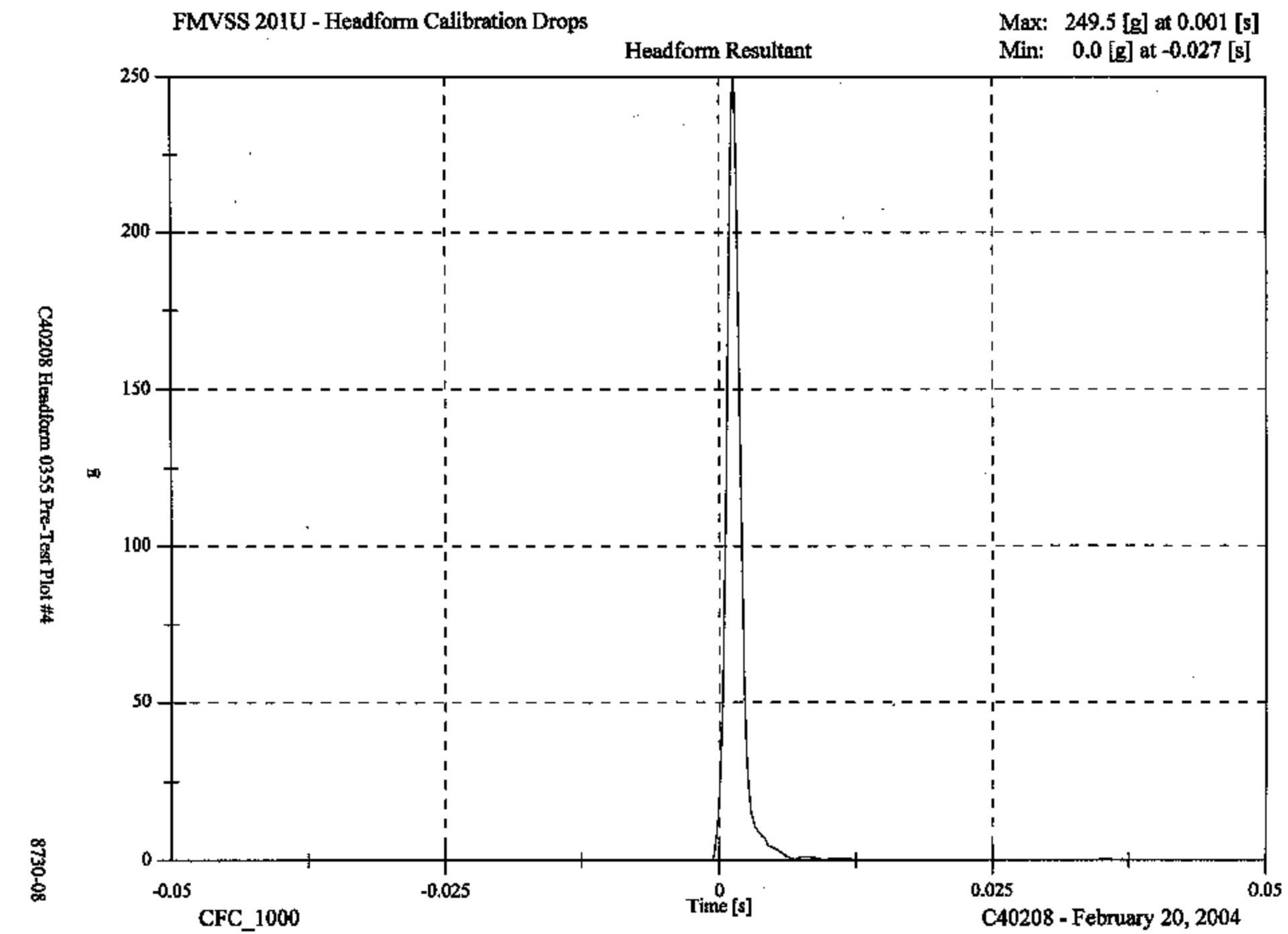
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J28671 | 08/22/03 | 02/23/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J32779 | 08/22/03 | 02/23/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J25854 | 08/22/03 | 02/23/04 |

REMARKS:


FMVSS 201U - Headform Calibration Drops
Headform X Acceleration
Max: 0.3 [g] at 0.010 [s]
Min: -219.2 [g] at 0.001 [s]
50
0
-50
-100
-150
-200
-250
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0355 Pre-Test Plot #1
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 0.6 [g] at 0.005 [s]
Min: -8.8 [g] at 0.001 [s]
2
0
-2
-4
-6
-8
-10
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0355 Pre-Test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 119.5 [g] at 0.001 [s]
Min: -1.1 [g] at 0.008 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0355 Pre-Test Plot #3
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 249.5 [g] at 0.001 [s]
Min: 0.0 [g] at -0.027 [s]
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 0355 Pre-Test Plot #4
8730-08

PART 571L
HEAD DROP PRE-TEST

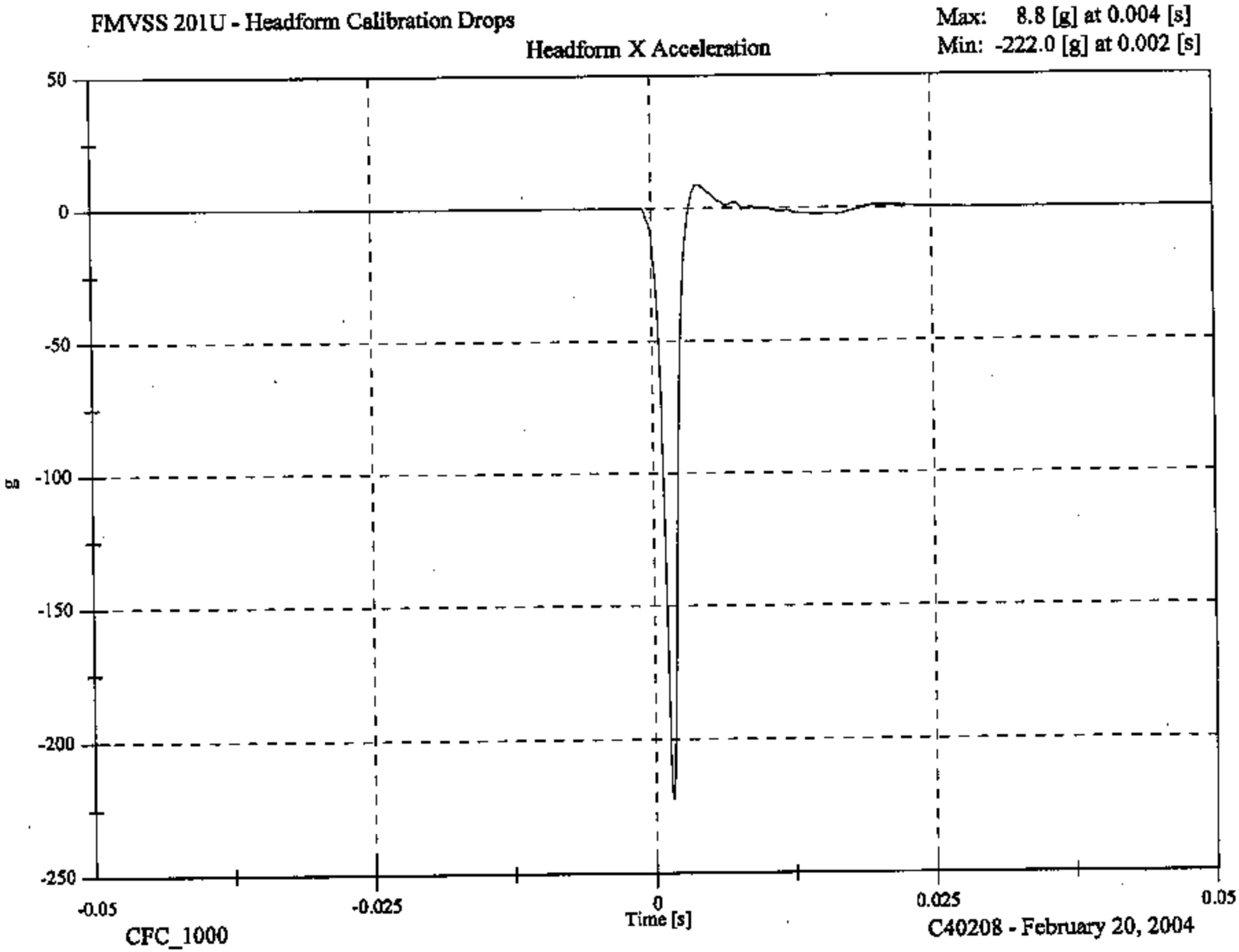
| | |
|---|---|
| MANUFACTURER: | FIRST TECHNOLOGIES SAFETY SYSTEMS |
| SERIAL NUMBER: | 1255 |
| CALIBRATION DATE: | February 20, 2004 |

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 15°C to 26°C | 23.3 |
| RELATIVE HUMIDITY | 10% to 70% | 29 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 256.7 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 9.6 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

HEAD ACCELEROMETER CALIBRATION INFORMATION

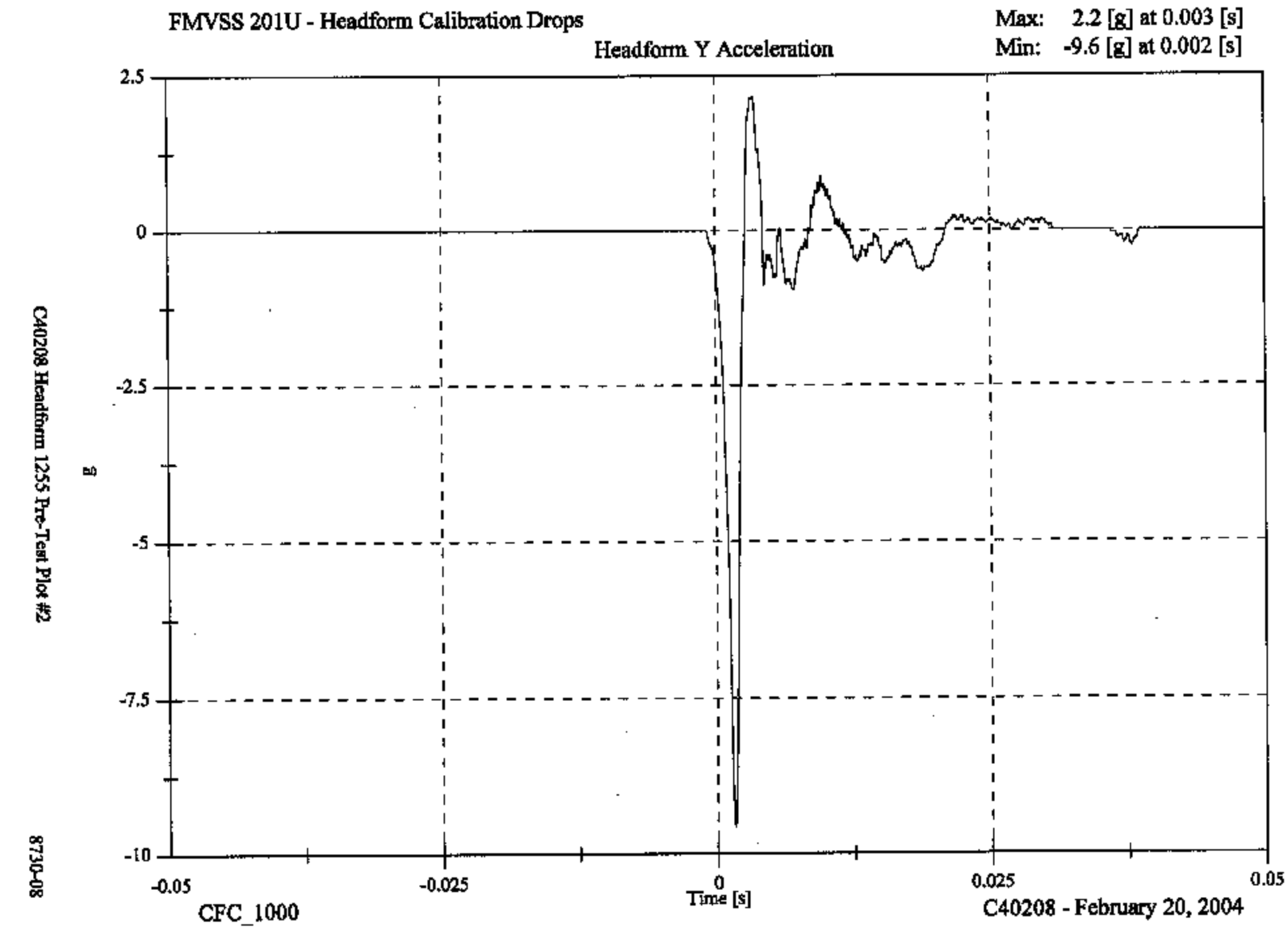
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J41086 | 08/22/03 | 02/23/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J40994 | 08/22/03 | 02/23/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J41007 | 08/22/03 | 02/23/04 |

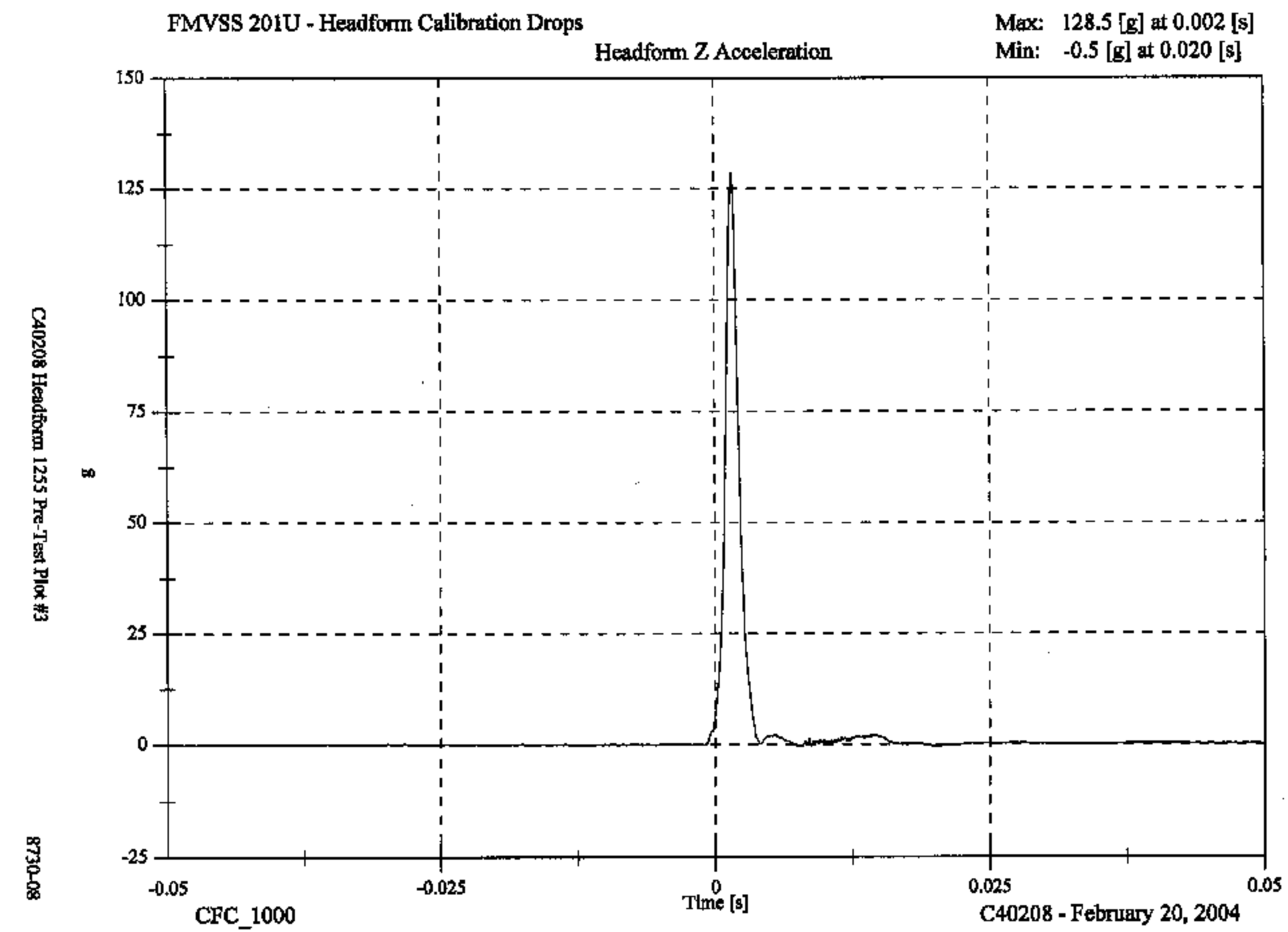
REMARKS:

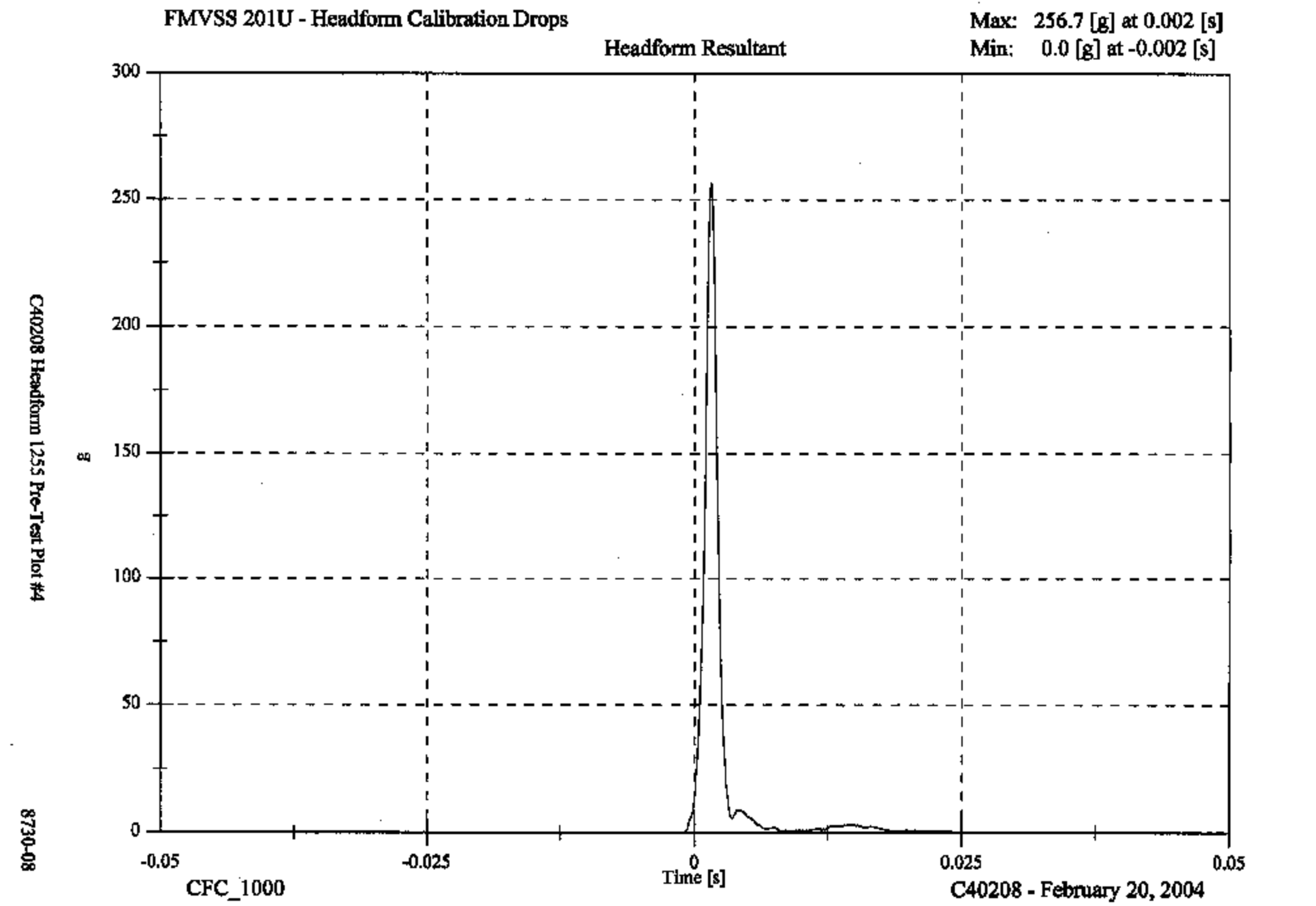



C40208 Headform 1255 Pre-Test Plot #1

8730-08


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 2.2 [g] at 0.003 [s]
Min: -9.6 [g] at 0.002 [s]
2.5
0
-2.5
-5
-7.5
-10
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 1255 Pre-Test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 128.5 [g] at 0.002 [s]
Min: -0.5 [g] at 0.020 [s]
150
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 1255 Pre-Test Plot #3
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 256.7 [g] at 0.002 [s]
Min: 0.0 [g] at -0.002 [s]
300
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - February 20, 2004
C40208 Headform 1255 Pre-Test Plot #4
8730-08

**PART 572L**
**HEAD DROP POST-TEST**

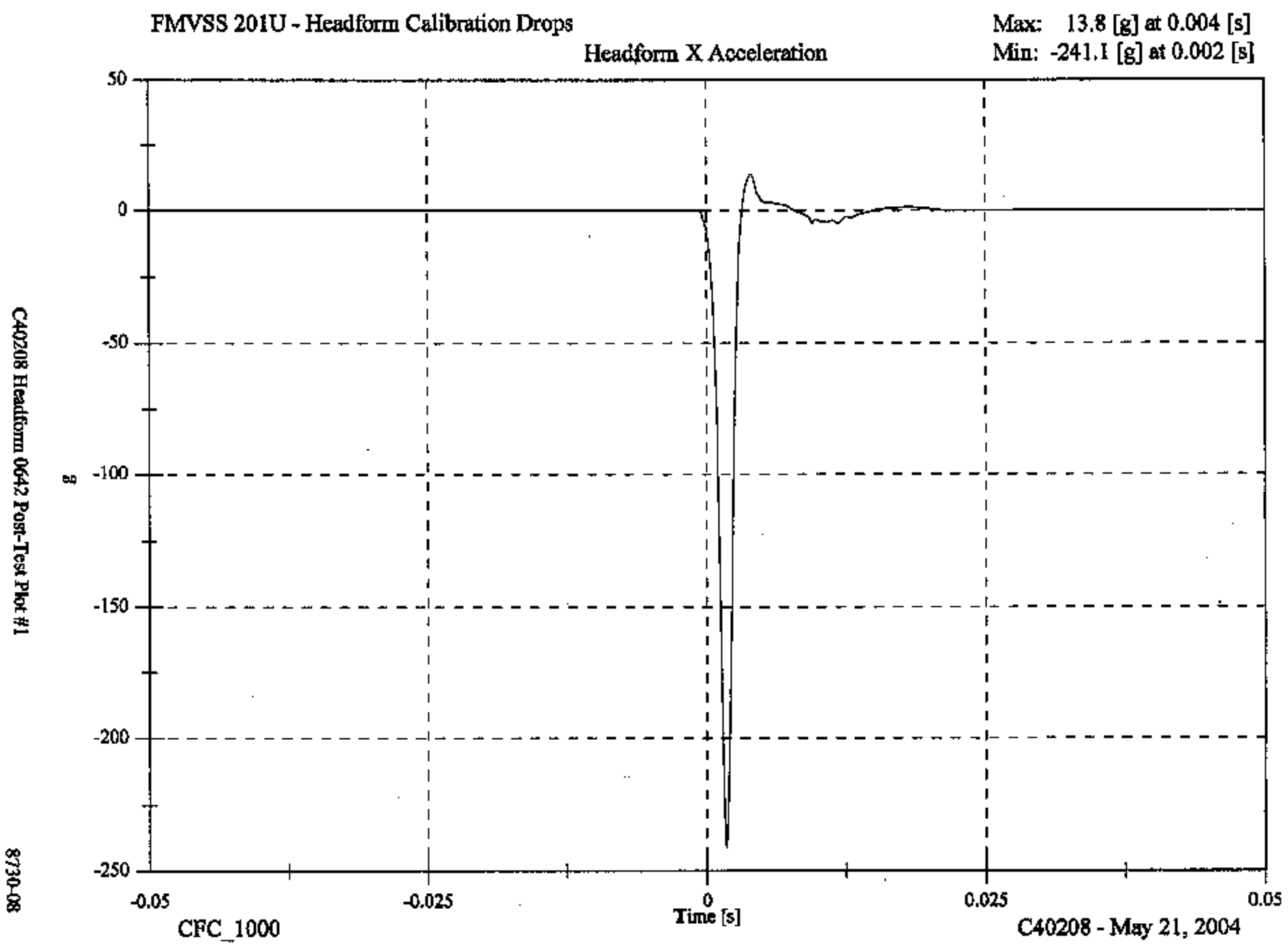
| | |
|---|---|
| **MANUFACTURER:** | **FIRST TECHNOLOGIES SAFETY SYSTEMS** |
| **SERIAL NUMBER:** | **0642** |
| **CALIBRATION DATE:** | **May 21, 2004** |

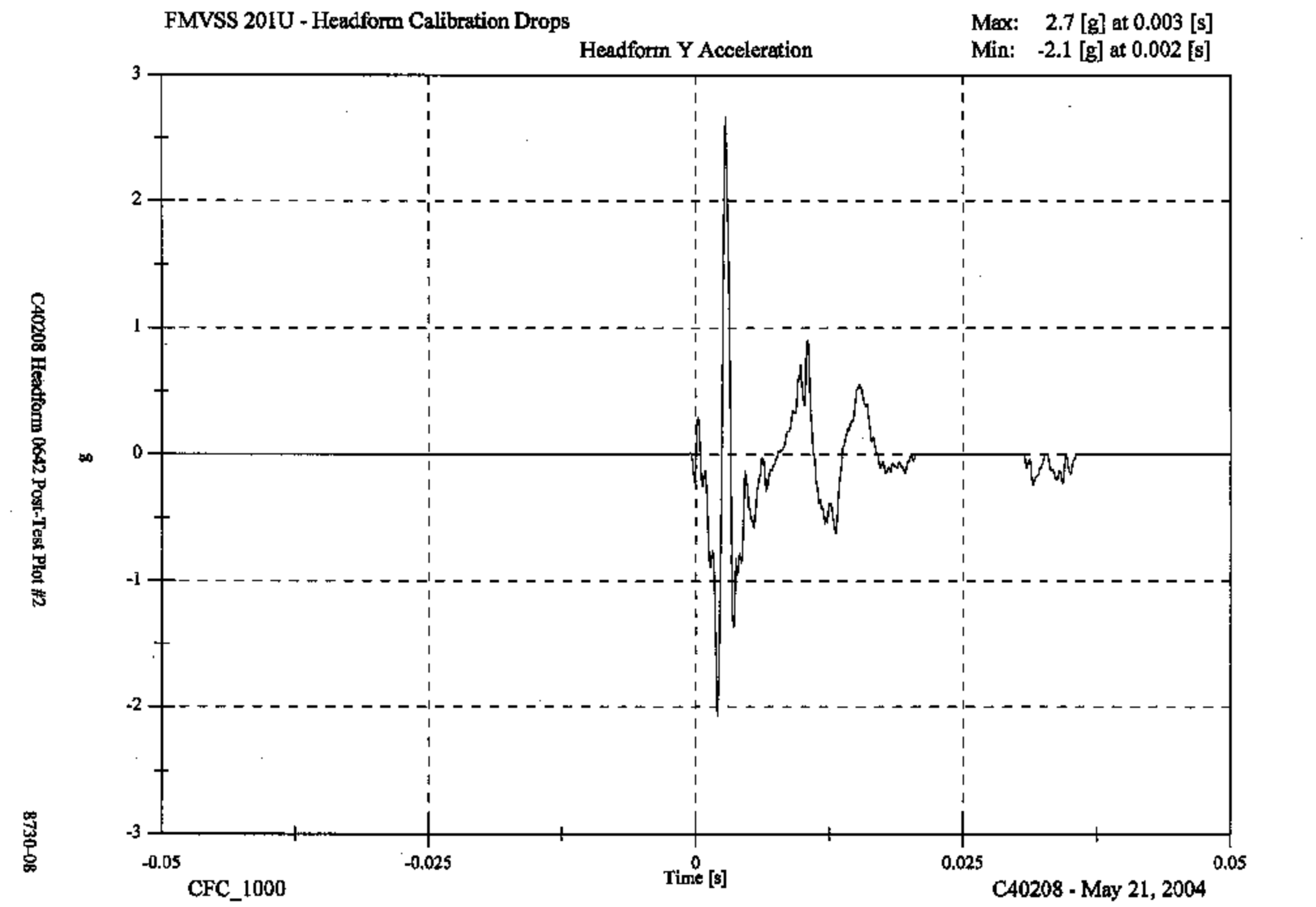
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 19°C to 26°C | 21.7 |
| RELATIVE HUMIDITY | 10% to 70% | 47 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 271.0 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 2.7 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

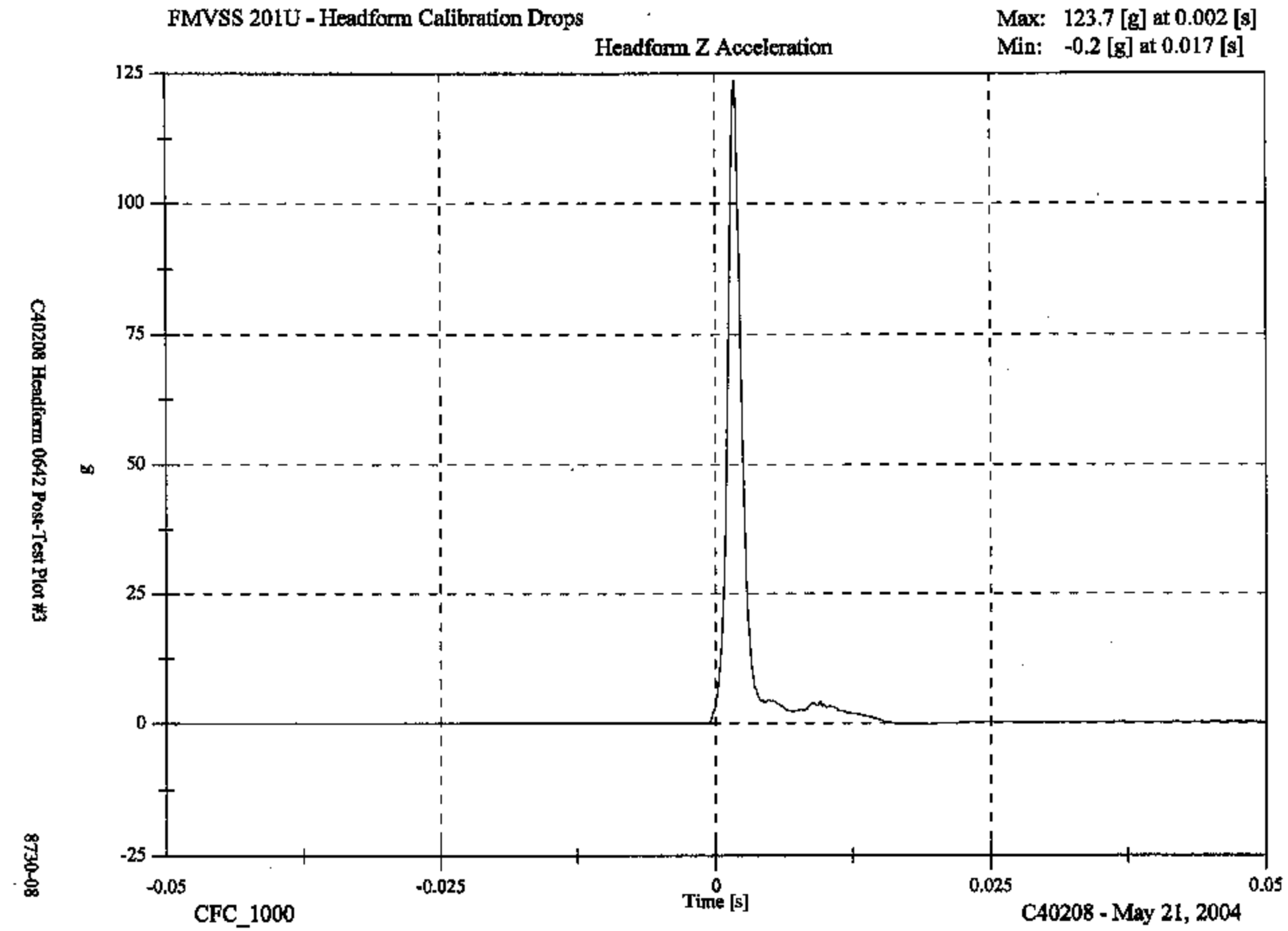
**HEAD ACCELEROMETER CALIBRATION INFORMATION**

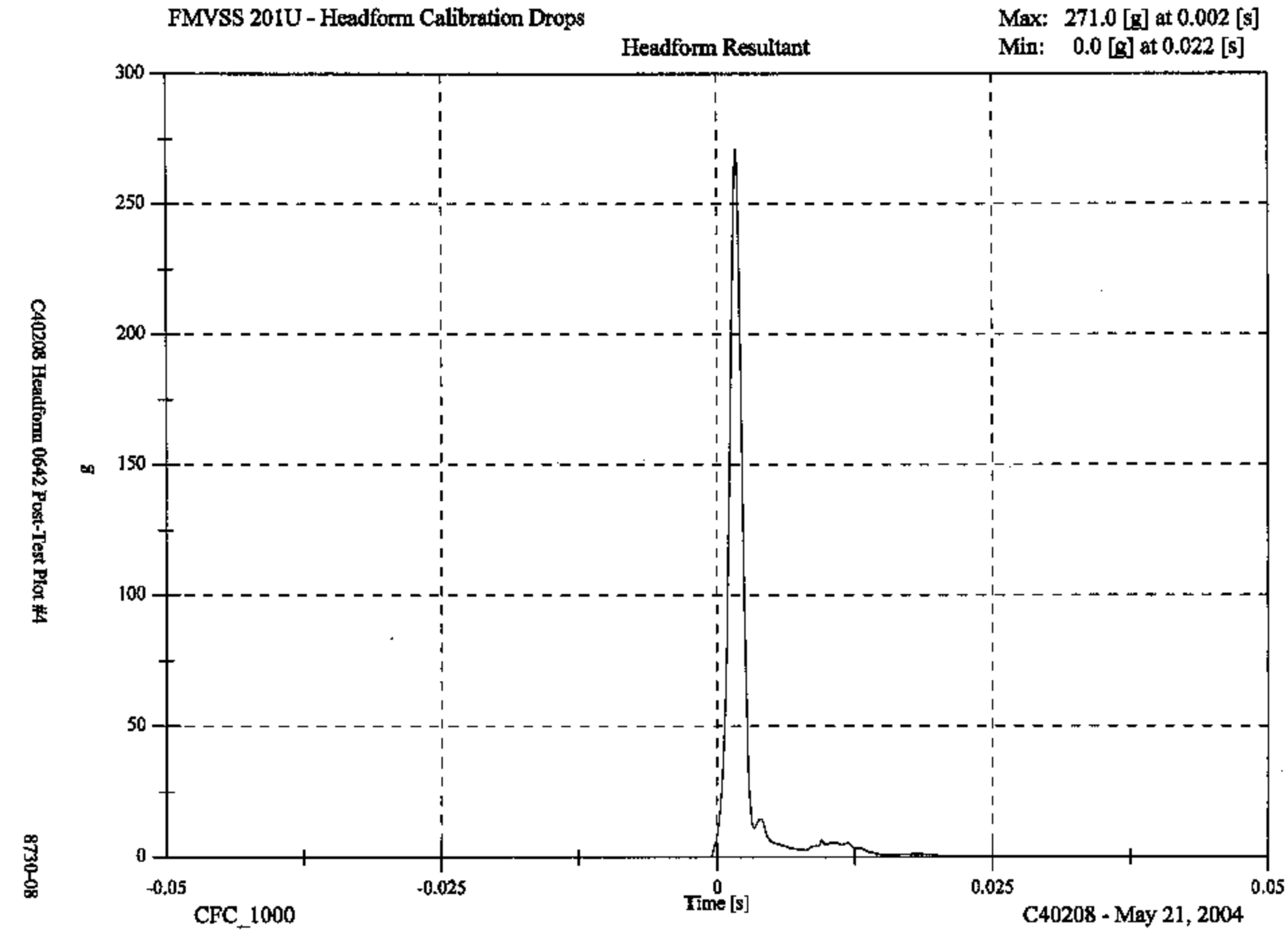
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J24876 | 3/01/04 | 9/01/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J33030 | 3/01/04 | 9/01/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J31009 | 3/01/04 | 9/01/04 |

**REMARKS:**


FMVSS 201U - Headform Calibration Drops
Headform X Acceleration
Max: 13.8 [g] at 0.004 [s]
Min: -241.1 [g] at 0.002 [s]
50
0
-50
-100
-150
-200
-250
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0642 Post-Test Plot #1
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 2.7 [g] at 0.003 [s]
Min: -2.1 [g] at 0.002 [s]
3
2
1
0
-1
-2
-3
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0642 Post-Test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 123.7 [g] at 0.002 [s]
Min: -0.2 [g] at 0.017 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0642 Post-Test Plot #3
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 271.0 [g] at 0.002 [s]
Min: 0.0 [g] at 0.022 [s]
300
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Headform 0642 Post-Test Plot #4
8730-08
CFC_1000
C40208 - May 21, 2004

**PART 572L**
**HEAD DROP POST-TEST**

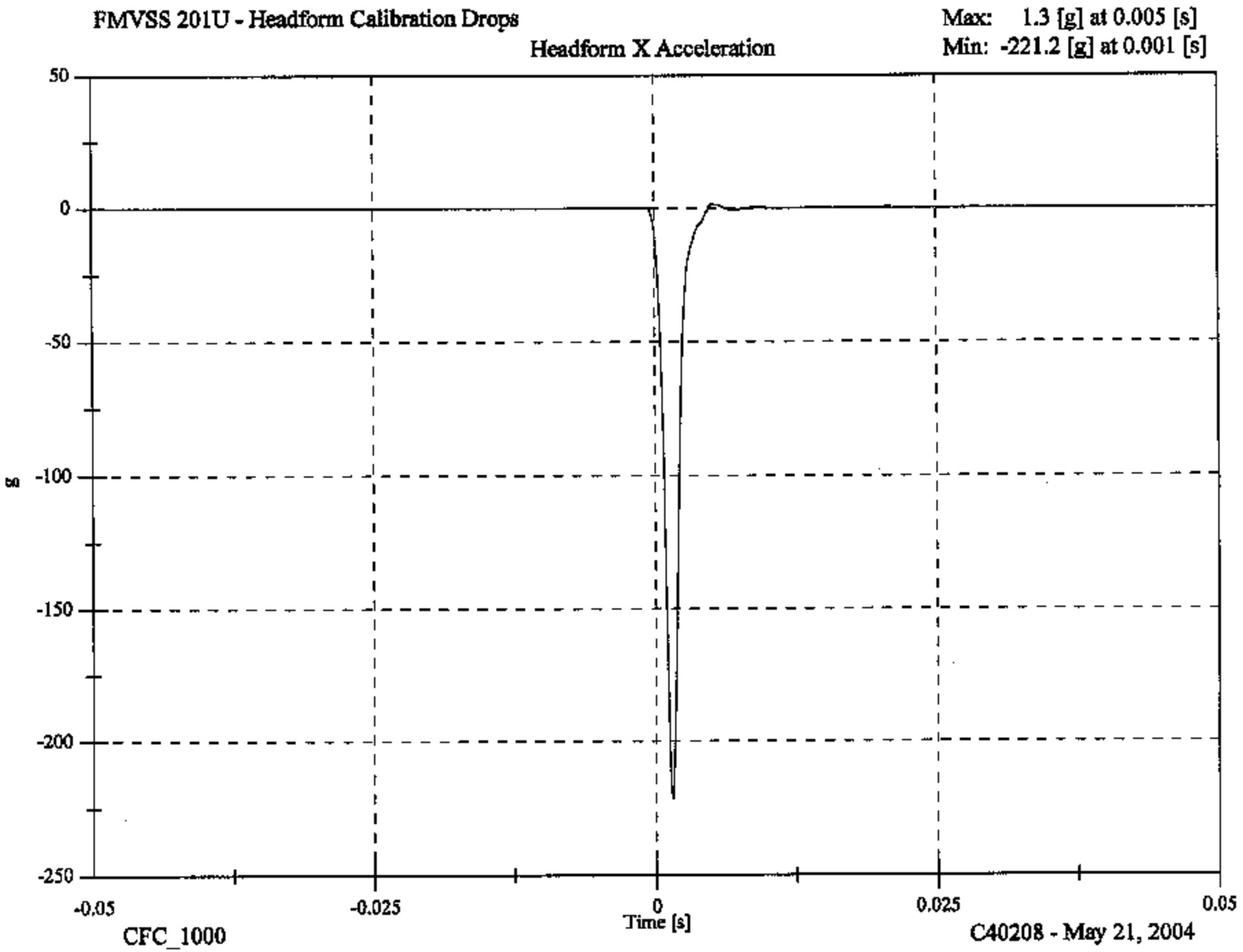
| | |
|---|---|
| **MANUFACTURER:** | **FIRST TECHNOLOGIES SAFETY SYSTEMS** |
| **SERIAL NUMBER:** | **0062** |
| **CALIBRATION DATE:** | **May 21, 2004** |

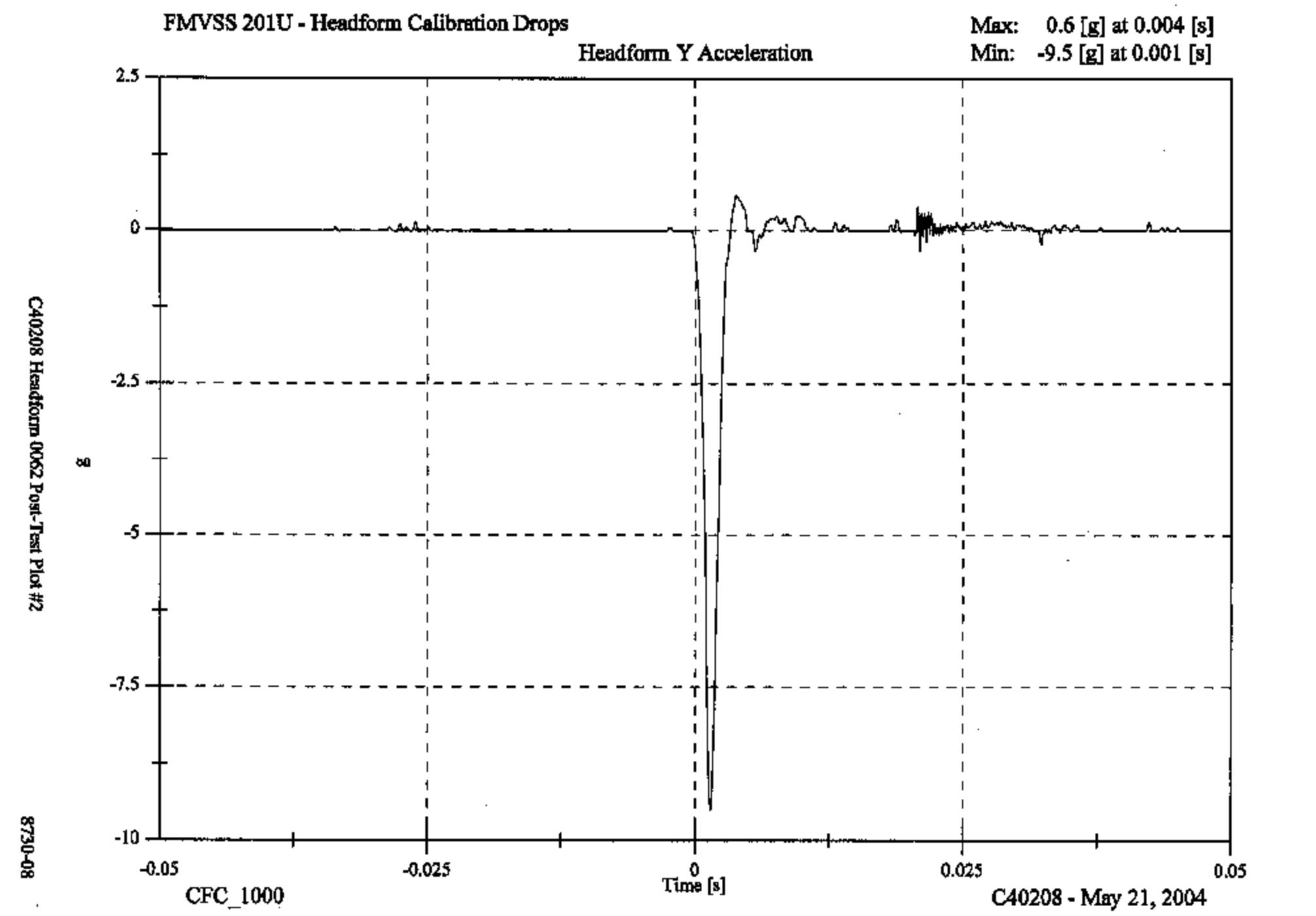
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 19°C to 26°C | 21.7 |
| RELATIVE HUMIDITY | 10% to 70% | 47 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 252.2 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 9.5 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

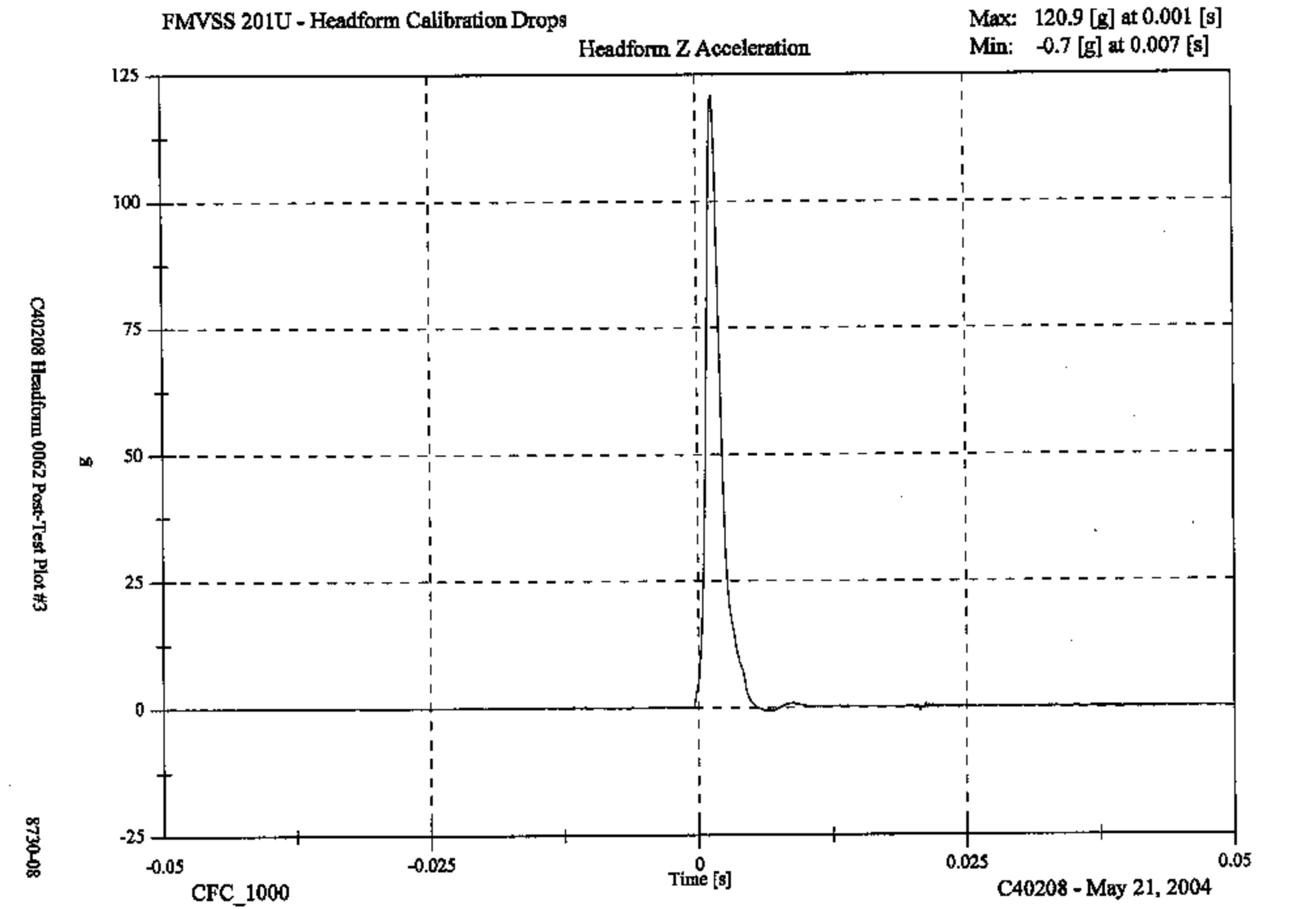
**HEAD ACCELEROMETER CALIBRATION INFORMATION**

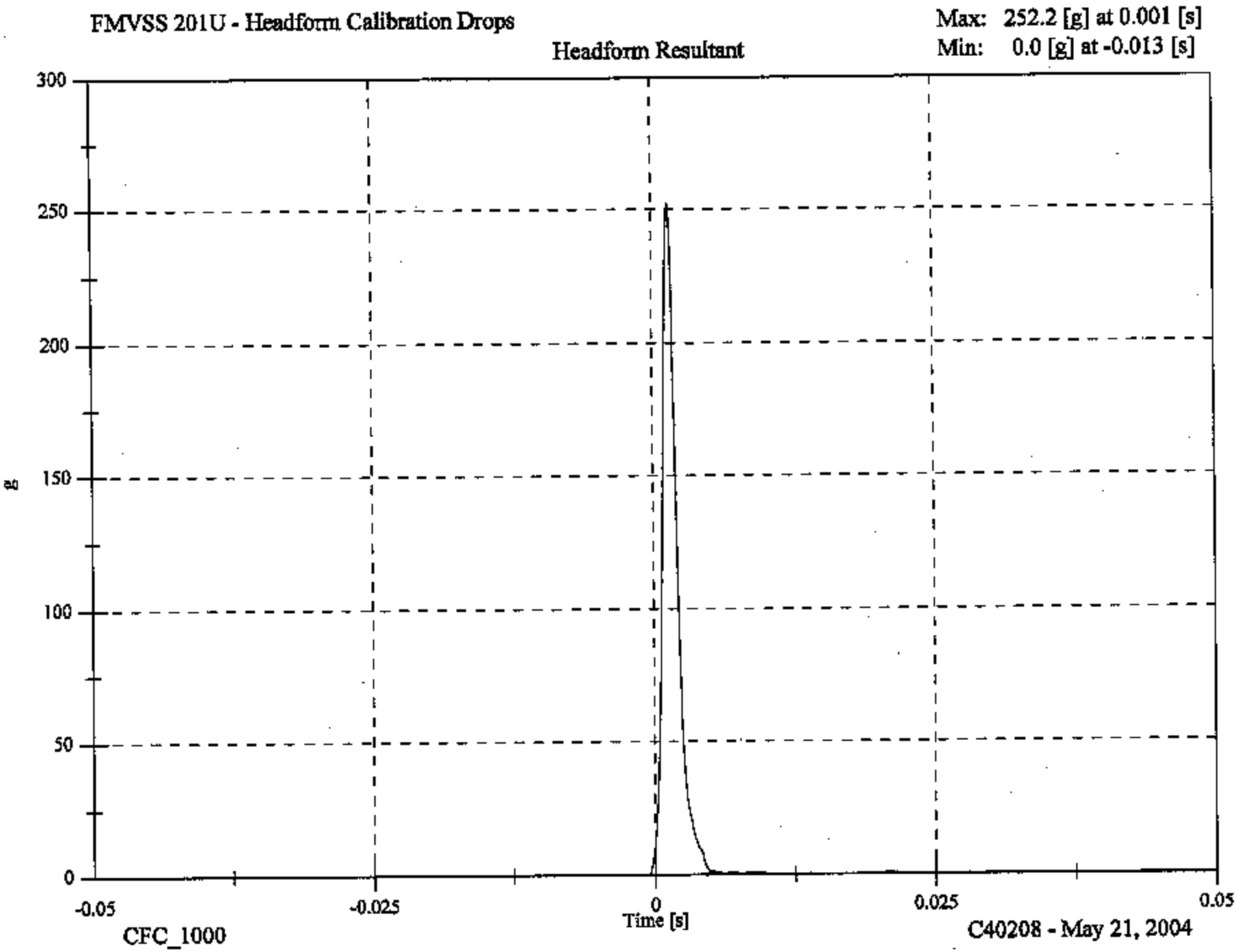
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J33127 | 3/01/04 | 9/01/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J33019 | 3/01/04 | 9/01/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J32782 | 3/01/04 | 9/01/04 |

**REMARKS:**


FMVSS 201U - Headform Calibration Drops
Headform X Acceleration
Max: 1.3 [g] at 0.005 [s]
Min: -221.2 [g] at 0.001 [s]
50
0
-50
-100
-150
-200
-250
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0062 Post-Test Plot #1
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 0.6 [g] at 0.004 [s]
Min: -9.5 [g] at 0.001 [s]
2.5
0
-2.5
-5
-7.5
-10
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0062 Post-Test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 120.9 [g] at 0.001 [s]
Min: -0.7 [g] at 0.007 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0062 Post-Test Plot #3
8730-08




C40208 Headform 0062 Post-Test Plot #4

8730-08

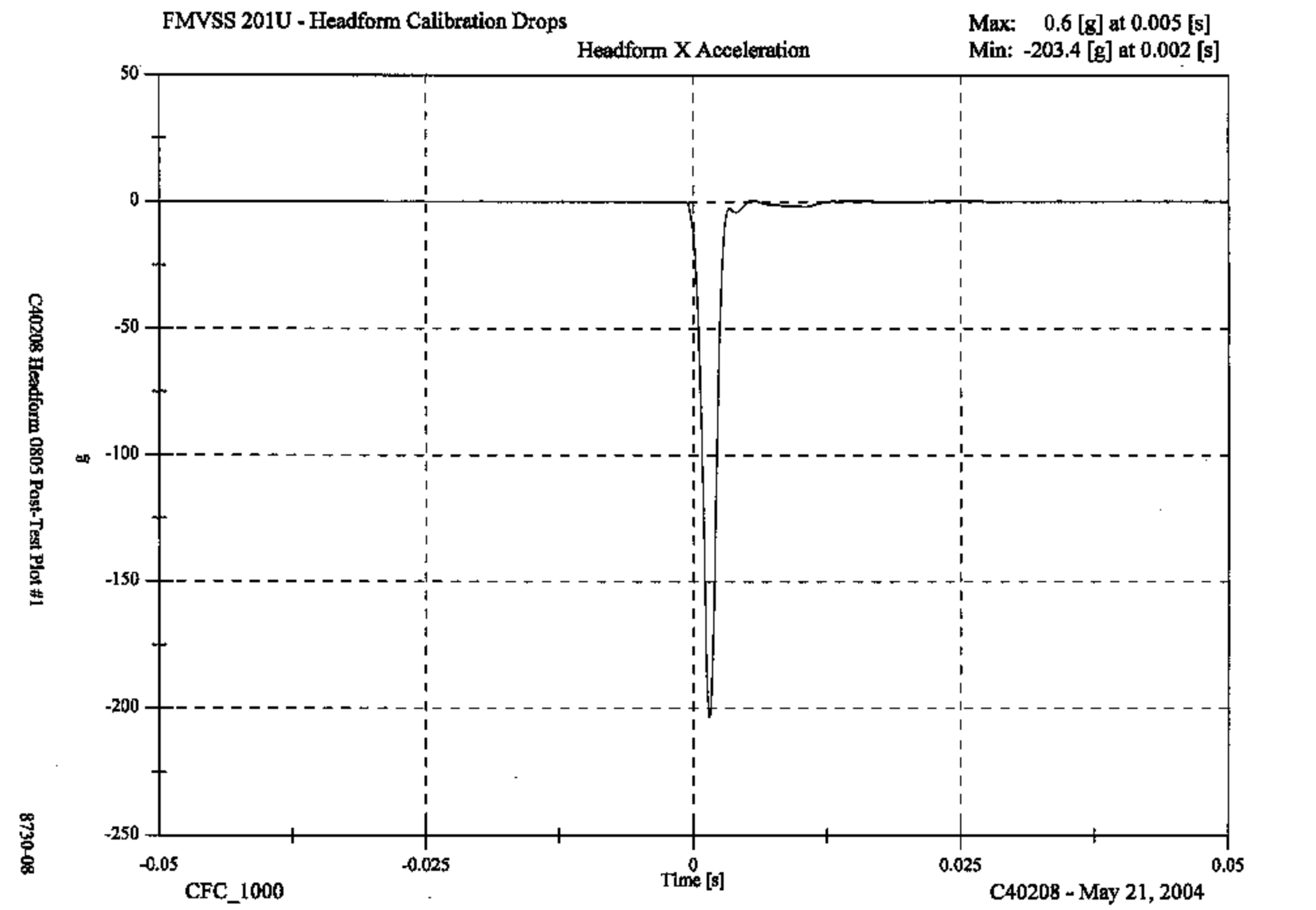
PART 572L
HEAD DROP POST-TEST

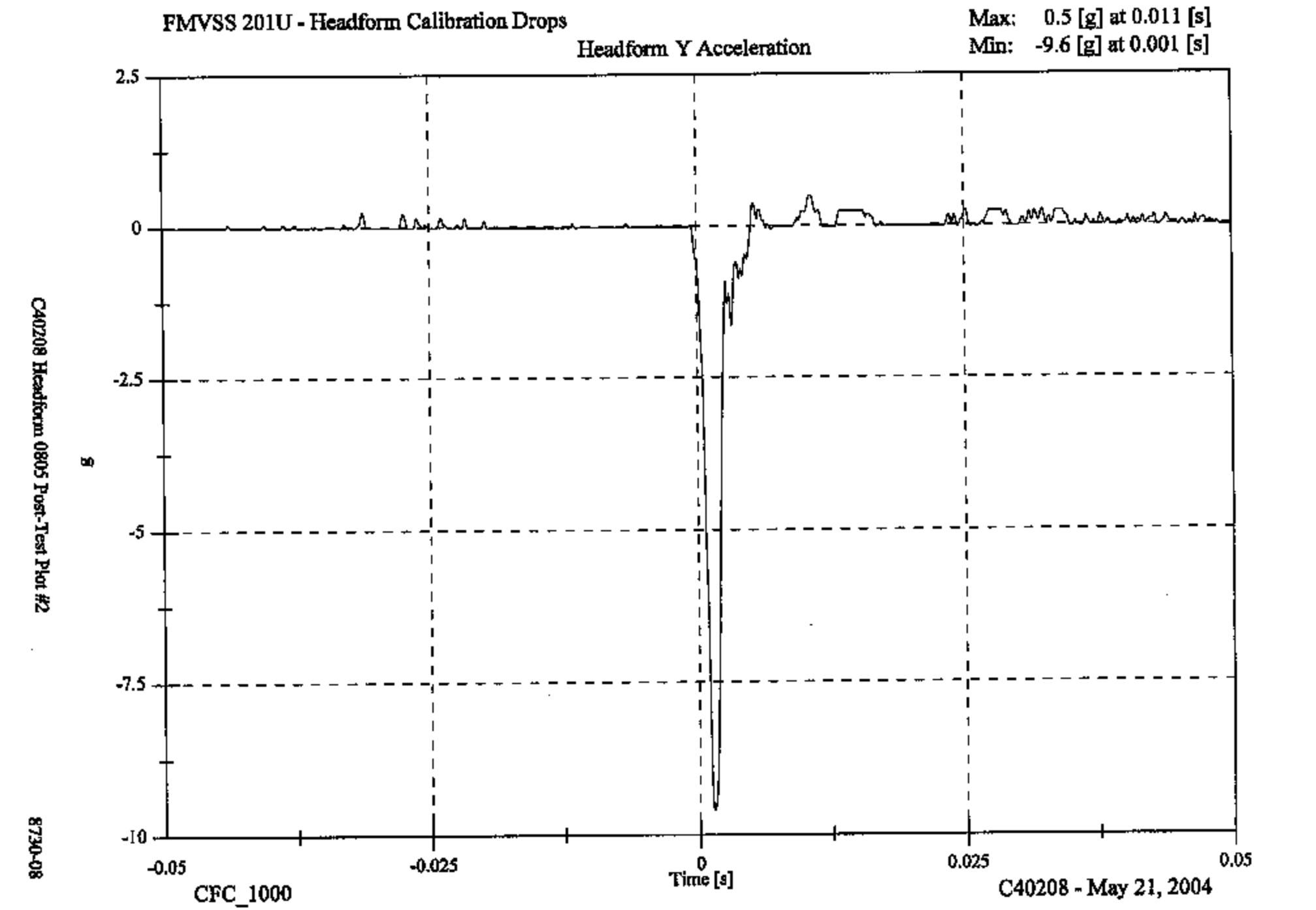
| | | |
|---|---|---|
| MANUFACTURER: | FIRST TECHNOLOGIES SAFETY SYSTEMS | |
| SERIAL NUMBER: | 805 | |
| CALIBRATION DATE: | May 21, 2004 | |
| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
| TEMPERATURE | 19°C to 26°C | 21.7 |
| RELATIVE HUMIDITY | 10% to 70% | 47 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 236.2 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 9.6 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

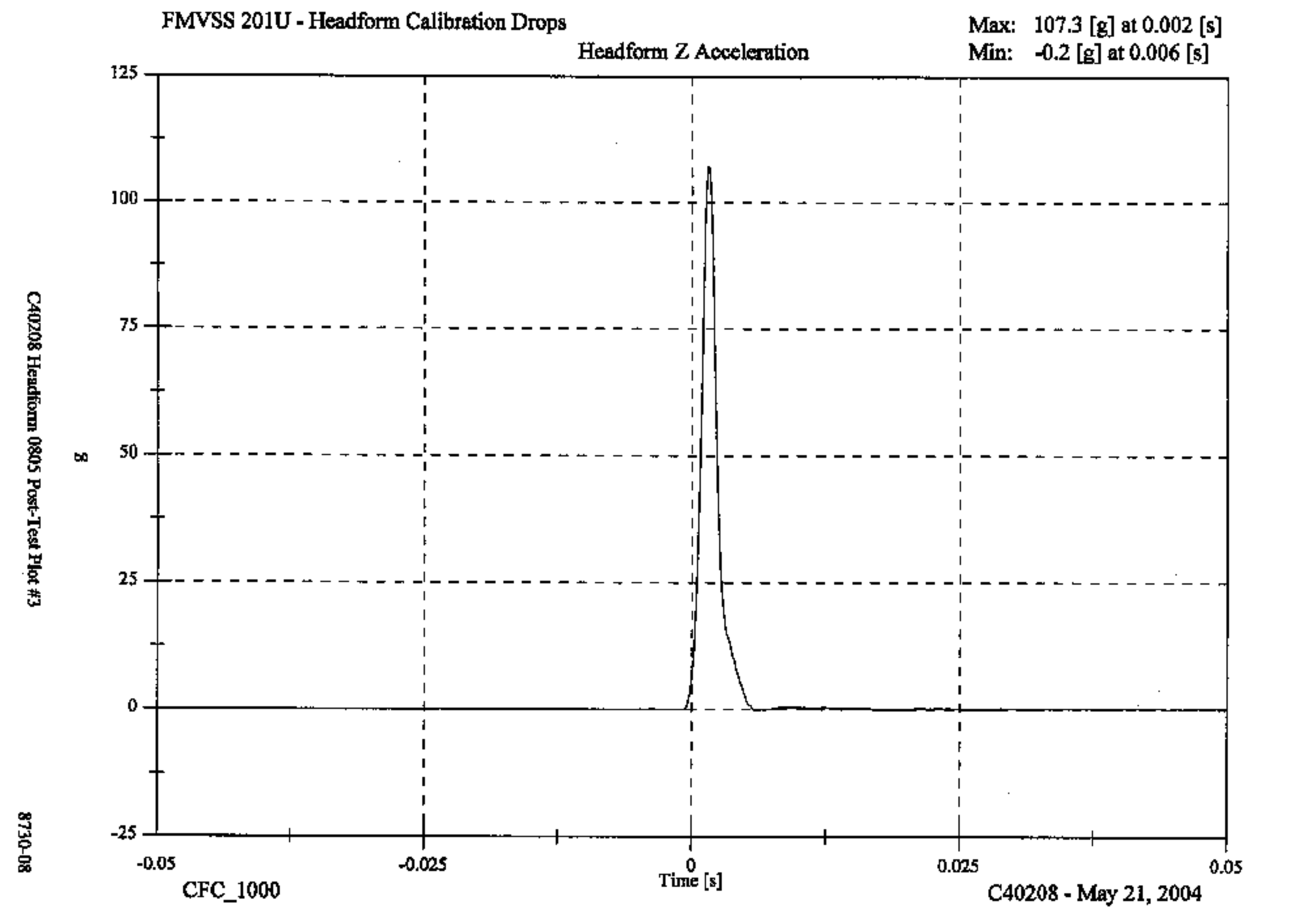
HEAD ACCELEROMETER CALIBRATION INFORMATION

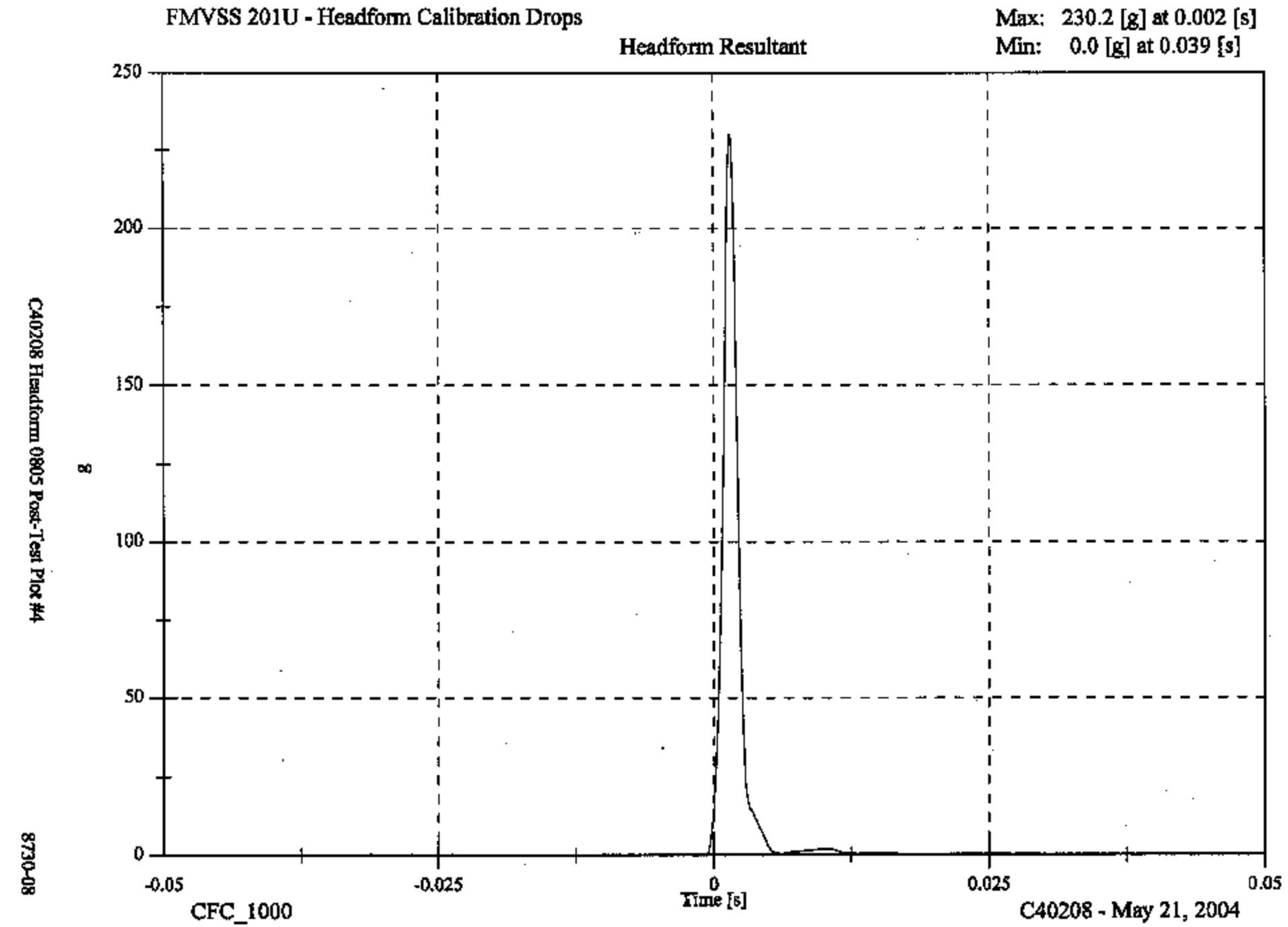
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J38127 | 3/01/04 | 9/01/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J37980 | 3/01/04 | 9/01/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J37854 | 3/01/04 | 9/01/04 |

REMARKS:


FMVSS 201U - Headform Calibration Drops
Headform X Acceleration
Max: 0.6 [g] at 0.005 [s]
Min: -203.4 [g] at 0.002 [s]
50
0
-50
-100
-150
-200
-250
g
-0.05
-0.025
0
0.025
0.05
Time [s]
C40208 Headform 0805 Post-Test Plot #1
8730-08
CFC_1000
C40208 - May 21, 2004


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 0.5 [g] at 0.011 [s]
Min: -9.6 [g] at 0.001 [s]
2.5
0
-2.5
-5
-7.5
-10
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0805 Post-Test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 107.3 [g] at 0.002 [s]
Min: -0.2 [g] at 0.006 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0805 Post-Test Plot #3
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 230.2 [g] at 0.002 [s]
Min: 0.0 [g] at 0.039 [s]
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0805 Post-Test Plot #4
8730-08

PART 572L
HEAD DROP POST-TEST

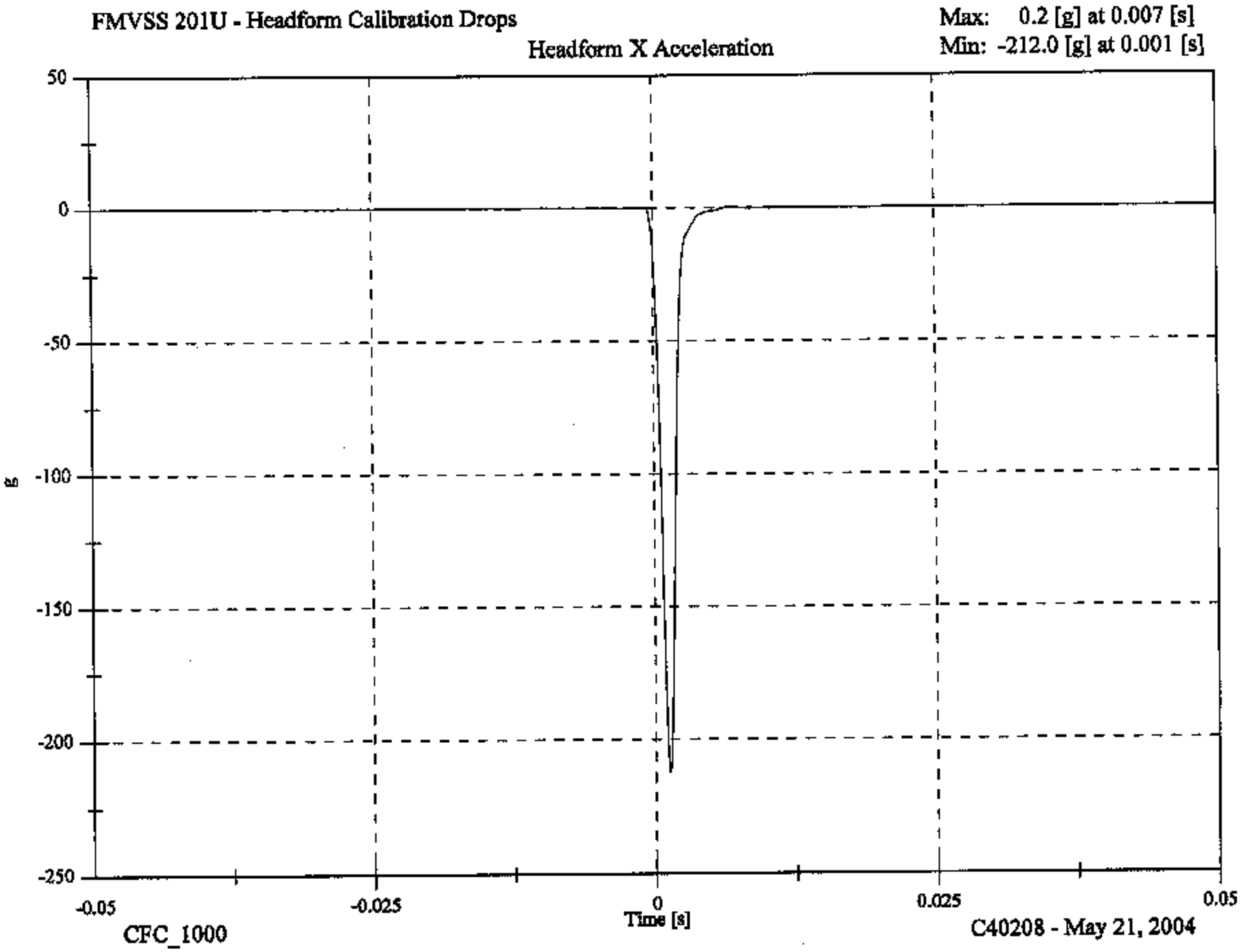
| | |
|---|---|
| MANUFACTURER: | FIRST TECHNOLOGIES SAFETY SYSTEMS |
| SERIAL NUMBER: | 0355 |
| CALIBRATION DATE: | May 21, 2004 |

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 19°C to 26°C | 21.7 |
| RELATIVE HUMIDITY | 10% to 70% | 47 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 241.2 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 6.6 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

HEAD ACCELEROMETER CALIBRATION INFORMATION

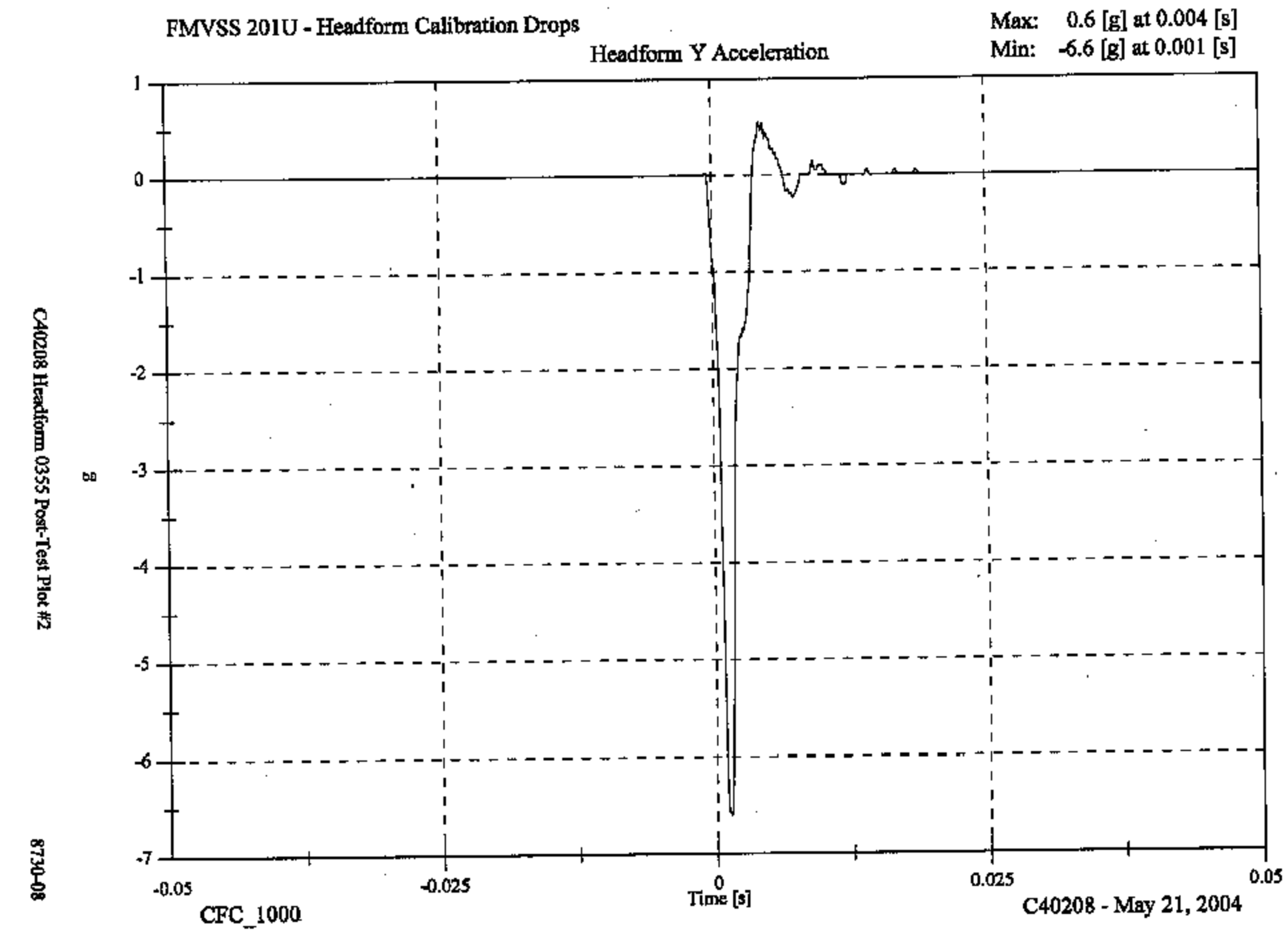
| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J28671 | 3/01/04 | 9/01/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J32779 | 3/01/04 | 9/01/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J25854 | 3/01/04 | 9/01/04 |

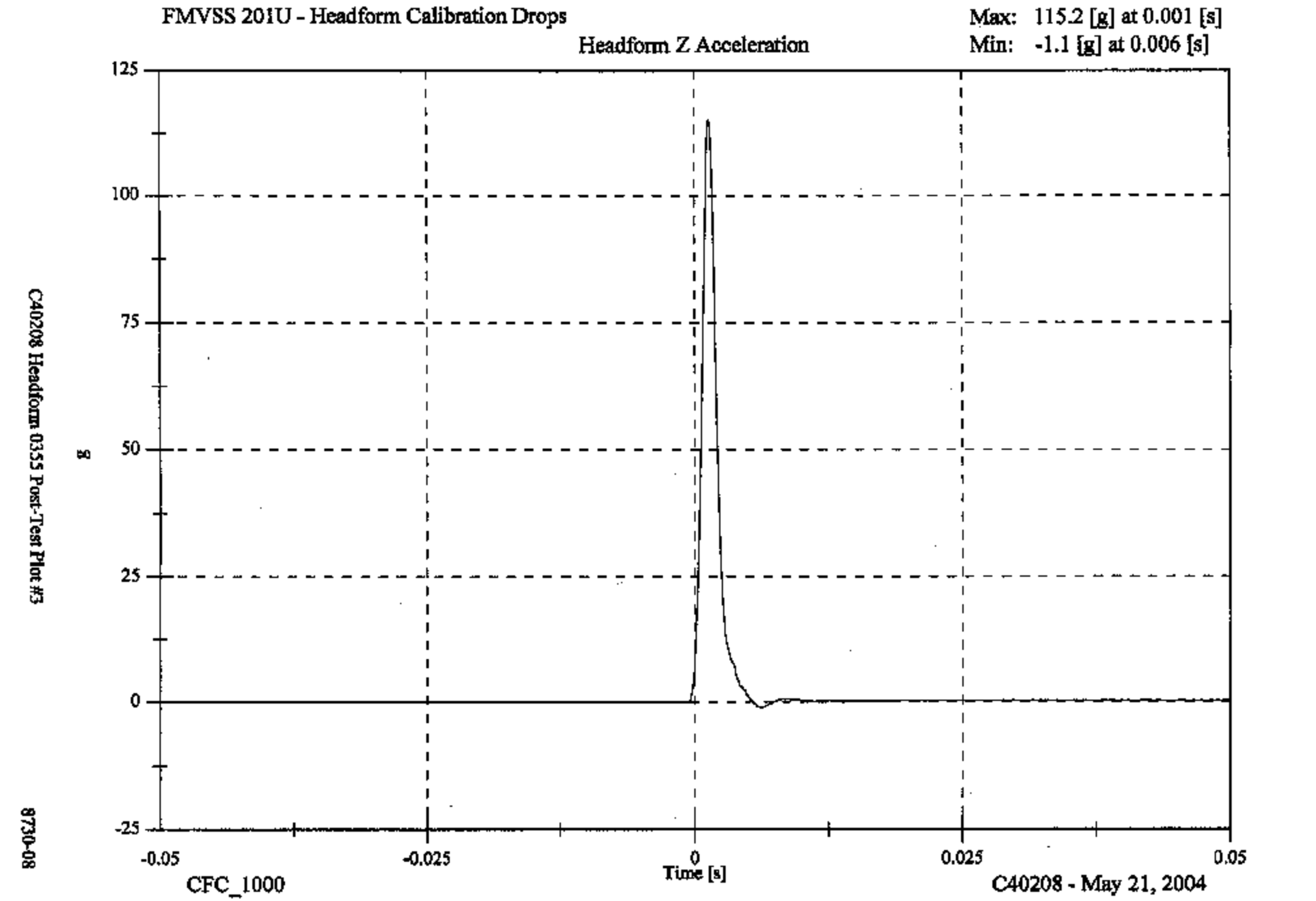
REMARKS:

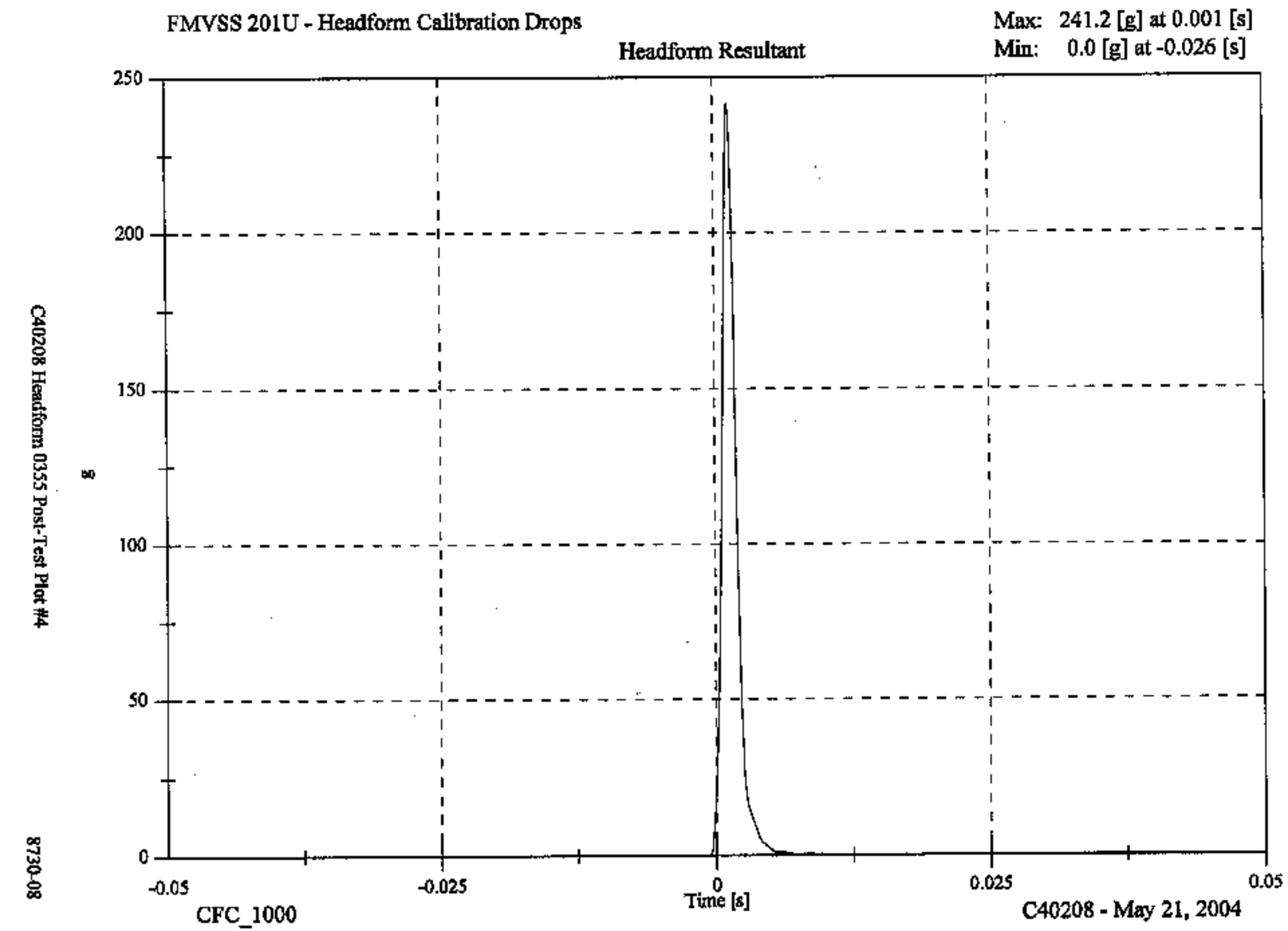



C40208 Headform 0355 Post-Test Plot #1

8730-08


FMVSS 201U - Headform Calibration Drops
Headform Y Acceleration
Max: 0.6 [g] at 0.004 [s]
Min: -6.6 [g] at 0.001 [s]
1
0
-1
-2
-3
-4
-5
-6
-7
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0355 Post-Test Plot #2
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 115.2 [g] at 0.001 [s]
Min: -1.1 [g] at 0.006 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0355 Post-Test Plot #3
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 241.2 [g] at 0.001 [s]
Min: 0.0 [g] at -0.026 [s]
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 0355 Post-Test Plot #4
8730-08

PART 572L
HEAD DROP POST-TEST

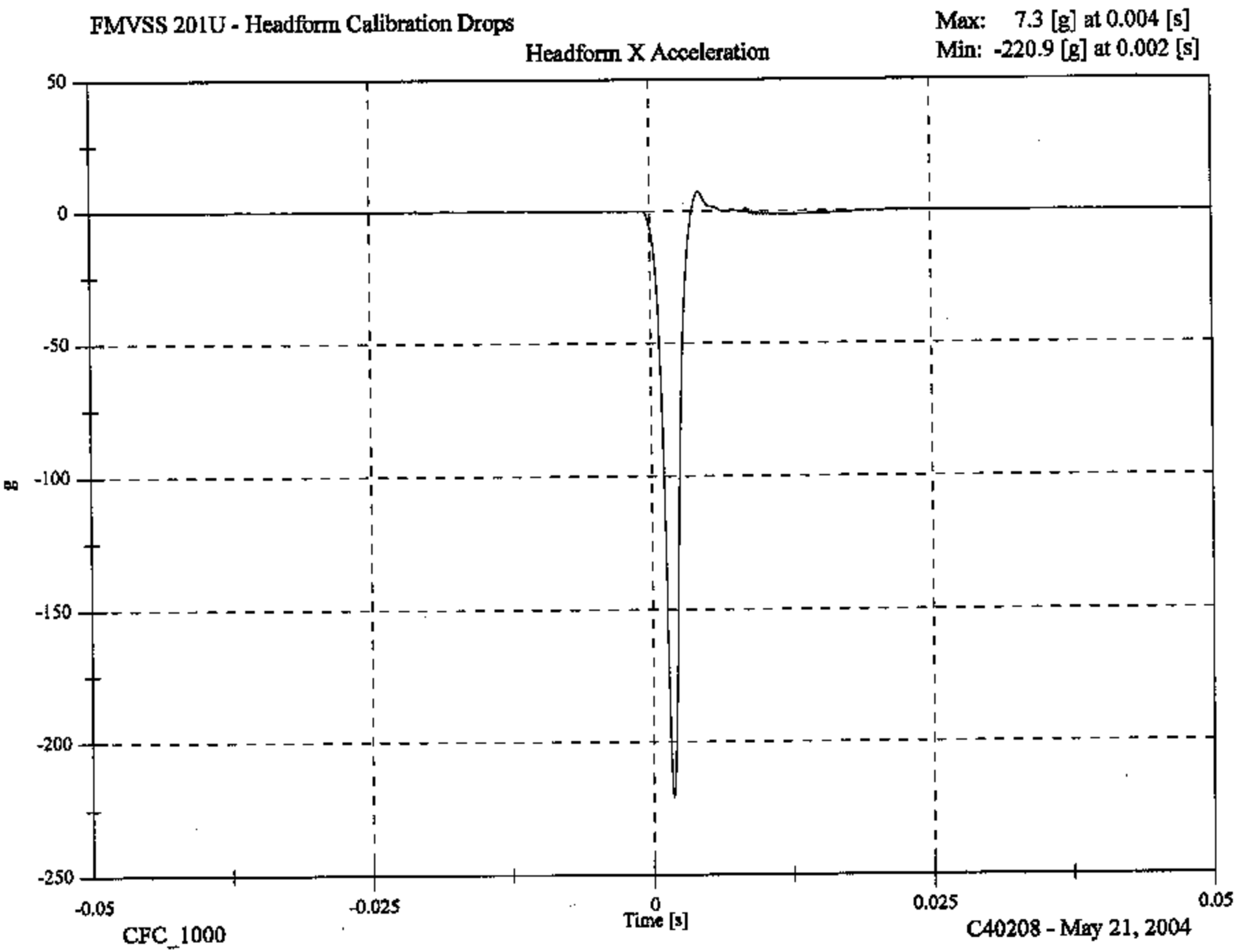
| | |
|---|---|
| MANUFACTURER: | FIRST TECHNOLOGIES SAFETY SYSTEMS |
| SERIAL NUMBER: | 1255 |
| CALIBRATION DATE: | May 21, 2004 |

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---|---|---|
| TEMPERATURE | 19°C to 26°C | 21.7 |
| RELATIVE HUMIDITY | 10% to 70% | 47 |
| PEAK RESULTANT ACCELERATION | 225 Gs to 275 Gs | 247.0 |
| PEAK LATERAL ACCELERATION | 15 Gs Maximum | 10.1 |
| IS ACCELERATION CURVE UNIMODAL? | YES | YES |

HEAD ACCELEROMETER CALIBRATION INFORMATION

| I.D. NUMBER | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | DATE OF LAST CALIBRATION | DATE OF NEXT CALIBRATION |
|---|---|---|---|---|---|
| 1 -LONGITUDINAL | ENDEVCO | 7264-2000T | J41006 | 3/01/04 | 9/01/04 |
| 2 - LATERAL | ENDEVCO | 7264-2000T | J40994 | 3/01/04 | 9/01/04 |
| 3 - VERTICAL | ENDEVCO | 7264-2000T | J41007 | 3/01/04 | 9/01/04 |

REMARKS:



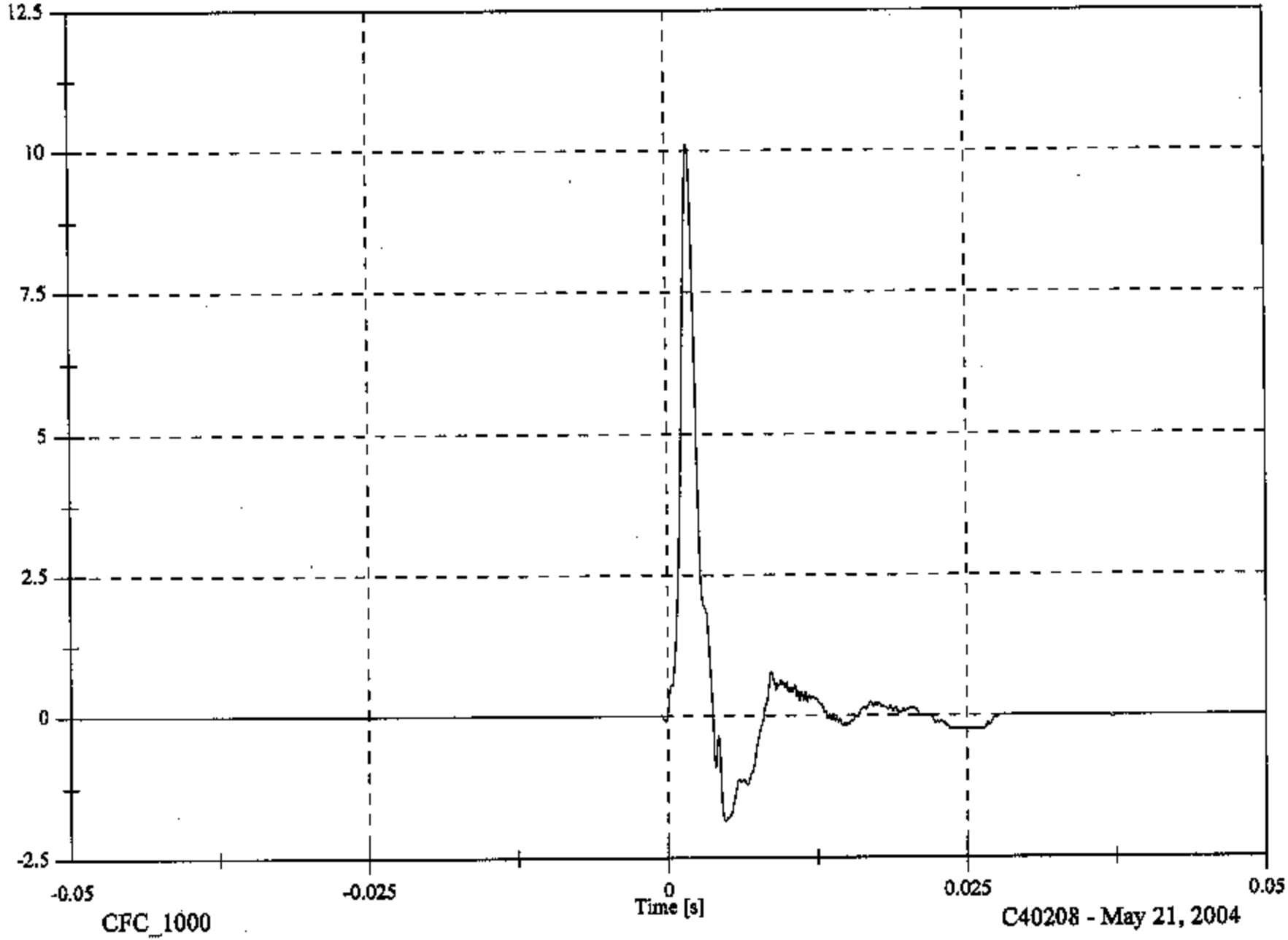

C40208 Headform 1255 Post-Test Plot #1

8730-08

FMVSS 201U - Headform Calibration Drops

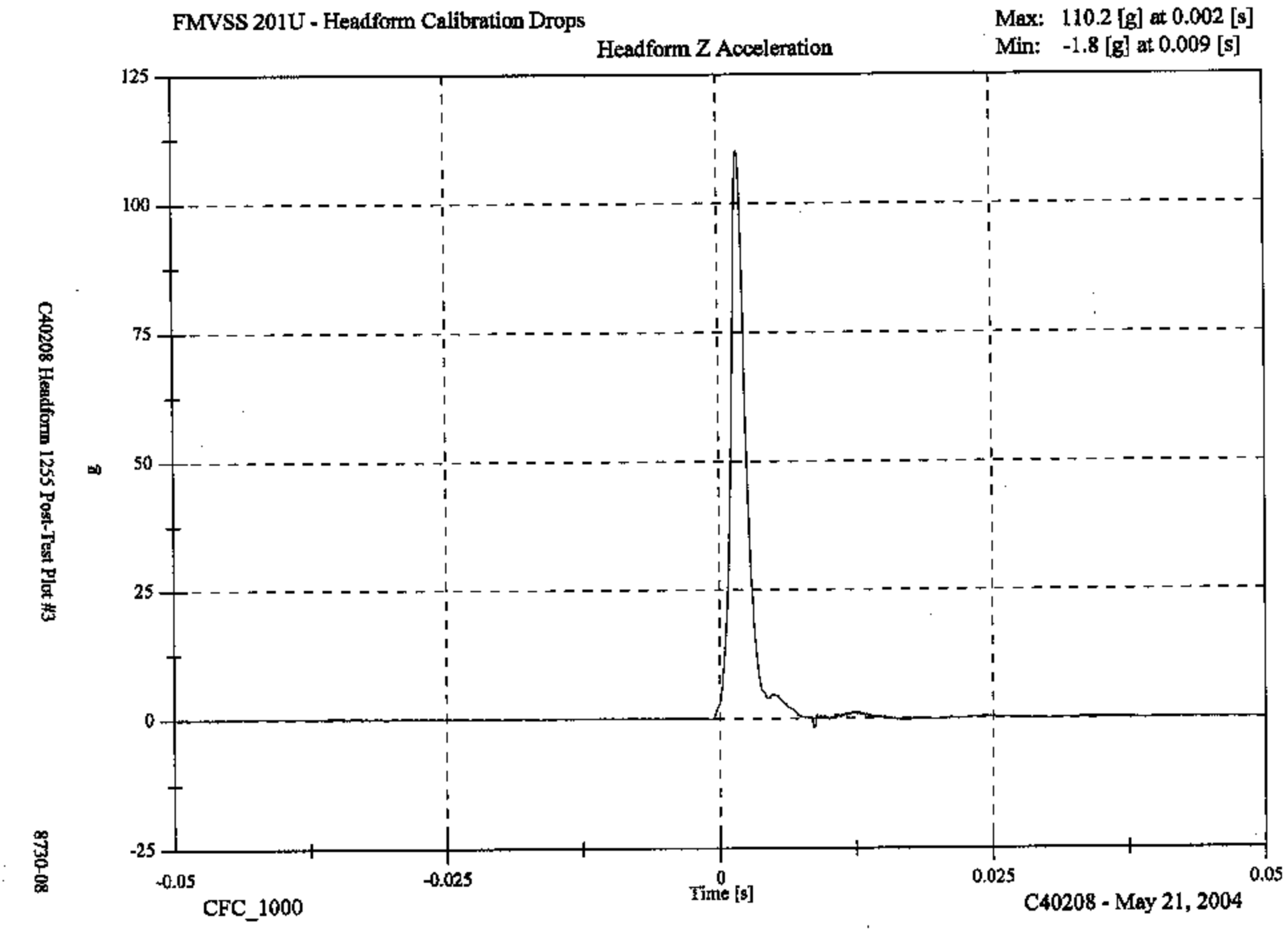
Headform Y Acceleration

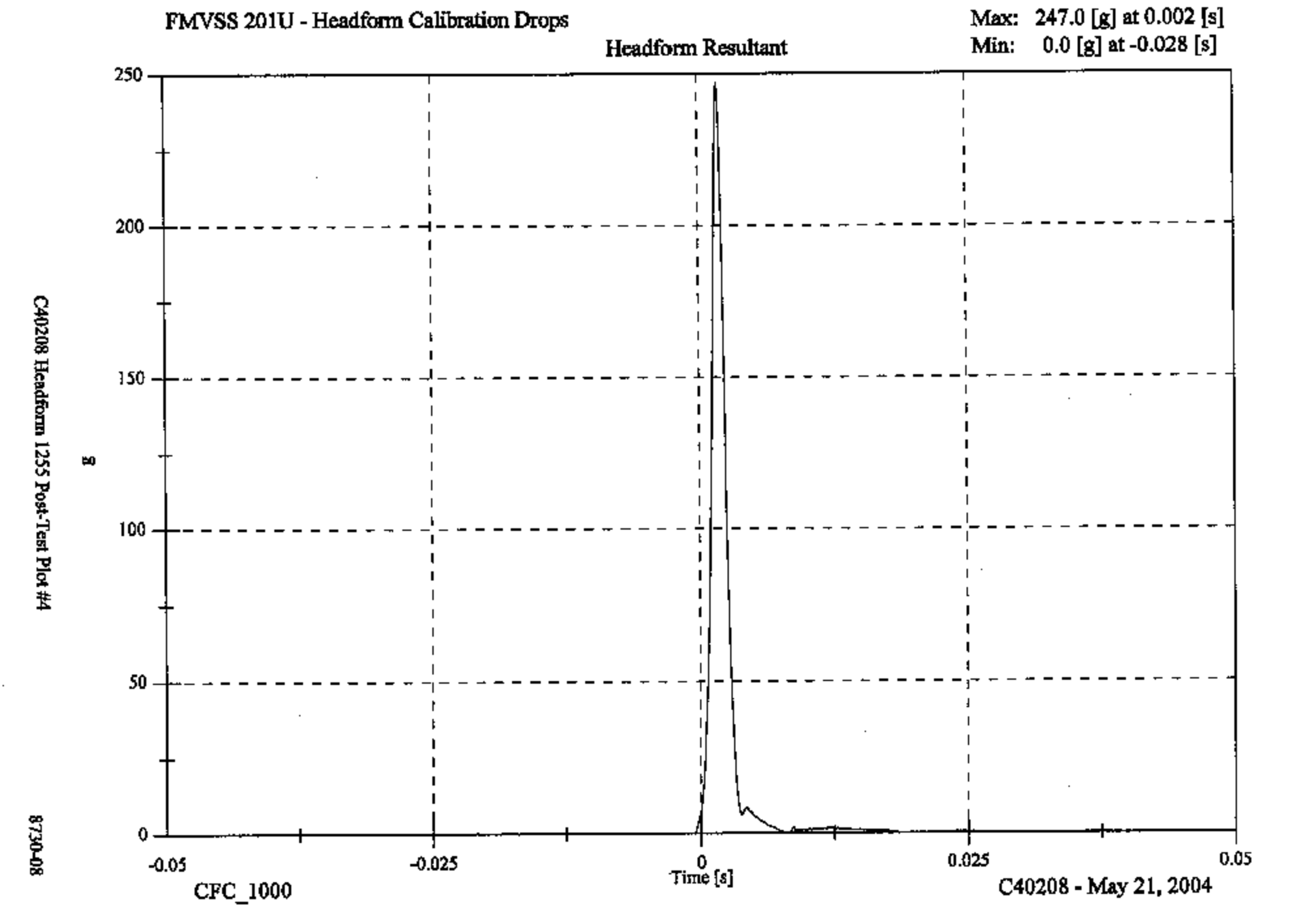
Max: 10.1 [g] at 0.002 [s]
Min: -1.8 [g] at 0.005 [s]




C40208 Headform 1255 Post-Test Plot #2

87730-08


FMVSS 201U - Headform Calibration Drops
Headform Z Acceleration
Max: 110.2 [g] at 0.002 [s]
Min: -1.8 [g] at 0.009 [s]
125
100
75
50
25
0
-25
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 1255 Post-Test Plot #3
8730-08


FMVSS 201U - Headform Calibration Drops
Headform Resultant
Max: 247.0 [g] at 0.002 [s]
Min: 0.0 [g] at -0.028 [s]
250
200
150
100
50
0
g
-0.05
-0.025
0
0.025
0.05
Time [s]
CFC_1000
C40208 - May 21, 2004
C40208 Headform 1255 Post-Test Plot #4
8730-08