

REPORT NUMBER: 201U-VER-04-02

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

**TOYOTA MOTOR MANUFACTURING INDIANA, INC.
2004 TOYOTA SIENNA**

NHTSA NUMBER: C45103

GD TEST NUMBER: 8730-02

**ADVANCED INFORMATION ENGINEERING SERVICES
A GENERAL DYNAMICS COMPANY
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225**



Test Date: December 22, 2003

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
400 Seventh Street, SW
Washington, DC 20590**

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Prepared by:


James Czarniecki, Project Engineer

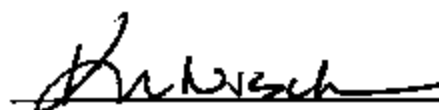
Approved by:


for David J. Travale, Program Manager
Transportation Science Center

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16. Abstract Compliance tests were conducted on the subject vehicle, a 2004 Toyota Sienna, 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	-	-	-	-	-
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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, 2004 Toyota Sienna, NHTSA No. C45103, 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 Toyota Sienna, NHTSA No. C45103, was impacted at various locations throughout its upper interior by a 4.54 kg 50th percentile headform. A total of Twelve (12) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officer's Technical Representative (COTR). A summary of test results can be found on data sheet 2-1. The Twelve (12) area chosen for testing were:

BP4	SD	AP3	AP1	BP1
OP1	RH	BP3	URBP	AP2
OP1	RP2			

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 Threda 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 Toyota Sienna
VIN:	5TDZA23C34S070133
DATE OF MANUFACTURE:	09/03/03 (CERTIFICATION LABEL)
COLOR:	Silver

TARGET CODE	Driver Side				Passenger Side				Approach Angles (degrees)		Velocity (ft/s)	FMH HIC	HIC(4)
	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Horizontal	Vertical			
AP1	2025.6	-653.7	2271.3	2016.7	646.8	2268.7			140	25	23.54	617.1	597.4
AP2	1907.7	-707.5	2183.4	1910.8	704.7	2182.9			210	43	No Data	No Data	No Data
AP3	1723.4	-728.0	2090.8	1728.3	731.8	2085.4			130	35	23.45	452.2	507.6
BP1	2568.7	-591.4	2331.2	2555.7	573.0	2334.7			90	33	23.57	723	737.7
BP2	2558.4	-718.2	2158.4	2552.2	702.0	2159.3			-	-	-	-	-
BP3	2488.1	-764.0	2084.3	2487.1	748.6	2086.6			270	-7	23.8	916.6	857.9
BP4	2667.3	-781.3	1959.9	2662.4	756.2	1959.3			132	-7	23.71	354.1	433.6
FH1	1955.6	-557.4	2298.7	1946.5	550.2	2297.2			Relocated 1 circle		-	-	-
Rel FH1	1956.0	-539.3	2298.1	1943.0	526.4	2298.4			-	-	-	-	-
FH2	1929.5	-410.0	2304.1	1914.2	403.1	2302.6			-	-	-	-	-
OP1 D	3635.1	-756.1	2129.9	-	-	-			270	1	23.61	599.5	618.7
OP1 P	-	-	-	3601.9	563.3	2361.6			90	31	23.55	775.1	751.2
OP2	3657.1	-754.6	2159.6	3656.6	701.7	2173.0			-	-	-	-	-
RP1	4347.9	-654.0	2263.1	4339.5	602.1	2268.1			-	-	-	-	-
RP2	4459.4	-541.2	2170.1	4462.4	538.6	2167.8			290	15	23.87	216	329.4
RH	4272.3	-413.7	2363.2	4256.4	355.5	2372.1			0	50	23.56	479.1	528.1
SD	3125.8	-622.9	2363.3	3119.5	557.4	2363.3			Relocated 2 circles		-	-	-
R4L SD	3125.1	-589.5	2354.6	3118.6	560.2	2362.4			90	48	23.69	914.6	836.4
SR1	2375.6	-606.0	2316.2	2167.1	598.3	2318.2			-	-	-	-	-
SR2A	2324.9	-609.8	2318.0	2315.2	571.1	2327.9			-	-	-	-	-
SR2B	2262.8	-611.9	2315.0	2255.0	607.1	2313.5			-	-	-	-	-
SR3	3125.9	-586.8	2356.6	3120.0	592.8	2376.1			-	-	-	-	-

URAP	2253.0	-507.4	2364.6	2245.9	500.6	2366.6	-	-	-	-	-
URBP	2568.2	-502.0	2386.7	2557.7	487.8	2400.3	270	38	23.62	606.9	624.3
URDP	3611.7	-526.2	2403.5	3602.5	486.1	2409.7	-	-	-	-	-
URRP	4151.7	-549.8	2361.6	4143.8	497.1	2369.4	-	-	-	-	-

Toyota's reference point for x,y,z coordinate translation (Door striker lower bolt hole x= 2484.7 mm, y= 883.4 mm, and z=1615.7 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 Toyota Sienna					
VIN:				5TDZA23C34S070133					
Month & Year of Manufacture:				09/03 (SEE CERTIFICATION LABEL)					
Vehicle Body Color:				Silver					
Engine Data:	6	Cylinders;	-	CID;	3.3	Liters;	-	cc	
Engine Placement:		x	Longitudinal;	or		Lateral			
Transmission:	5	Speed;	-	Manual;	x	Automatic;	-	Overdrive	
Final Drive:	-	Rear Wheel Drive;	x	Front Wheel Drive;	-	Four Wheel Drive			
Odometer Reading:		178	km						
Options:	x	A/C;	x	Pwr. Steering;	x	Pwr. Brakes;	x	Pwr. Windows	
Interior Trim Information:									
1. Sunglass holder on driver side front outboard seating position side rail.									
2. Grab handle on passenger side front outboard seating position side rail.									
3. Vehicle temperature controllers on second row driver side outboard seating position side rail.									
4. Adjustable seat belt anchorages on both B-Pillar's									
5. Non-adjustable seat belt anchorages on both Rear Pillars									
6. Grab handles on both second row outboard seating position side rails.									
7. Grab handles on both third row outboard seating position side rails.									
8. Adjustable seat belt anchorage on driver side B-Pillar.									

DATA FROM TIRE PLACARD:									
Tire Pressure (at capacity);				240	kPa FRONT				
				240	kPa REAR				
Recommended Tire Size:									
Tires on Test Vehicle:				P215/65R16	Manufacturers:			Michelin	
Vehicle Capacity Data:									
Number of Occupants:	2	Front;	2	Rear;	3	3rd Seat;	7	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)=				526	kg (A)				
No. of Occupants x 68 kg. =				476	kg (B)				
Rated Cargo/Luggage Weight (RCLW) =				50	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	=	543.0	kg	Left Rear	= 407.0 kg
Right Front	=	539.0	kg	Right Rear	= 383.0 kg
TOTAL FRONT	=	1082.0	kg	TOTAL REAR	= 790.0 kg
% of Total Weight	=	57.8	%	% of Total Weight	= 42.2 %
TOTAL WEIGHT	=	1872	kg		

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:			
Total Test Vehicle Delivered Weight=	1872	kg (A)	
+ Rated Cargo/Luggage Weight =	50	kg (B)	
TEST VEHICLE TARGET WEIGHT =	1922	kg (A+B)	

WEIGHT OF TEST VEHICLE (FULLY LOADED):					
Left Front	=	536.0	kg	Left Rear	= 438.0 kg
Right Front	=	530.0	kg	Right Rear	= 412.0 kg
TOTAL FRONT	=	1066.0	kg	TOTAL REAR	= 850.0 kg
% of Total Weight	=	55.6	%	% of Total Weight	= 44.4 %
TOTAL TEST WEIGHT	=	1916.0			
Weight of vehicle secured in test vehicles cargo area =	50	kg			

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	799	Left Rear	794
	Right Front	799	Right Rear	794
FULLY LOADED:	Left Front	796	Left Rear	782
	Right Front	798	Right Rear	784
Test Vehicle Wheelbase:	3030	millimeters		

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.11	Front Bumper	0.21
	Right Door Sill	0.11	Rear Bumper	0.31
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.21	Front Bumper	0.11
	Right Door Sill	0.21	Rear Bumper	0.31
AS TESTED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.11	Front Bumper	0.11
	Right Door Sill	0.11	Rear Bumper	0.31

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

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C34S070133
DATE OF MANUFACTURE:	09/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Measurements	Description	Left Side	Right Side
M	Seat fore / Aft travel (Front seats)	240	240
T°	Horizontal angle (CG-F1 (Left seat) to (Right A-pillar))	114	-
A1°	360° - T°	246	-
WE°	Horizontal angle (CG-F2 (Left seat) to (Left A-pillar))	203	-
A2°	A2° = W°	203	-
U°	Horizontal angle (CG-F2 (Left seat) to (Left B-pillar))	273	-
B1°	B1° = U°	273	-
V°	Horizontal angle (CG-FR (Left seat) to (Right B-pillar))	280	-
B2°	B2° = V°	280	-
W°	Horizontal angle (CG-F2 (Right seat) to (Right A-pillar))	-	156
A1°	A1° (Right) = W° (Right)	-	156
T°	Horizontal angle (CG-F1 (Right seat) to (Left A-pillar))	-	247
A2°	360° - T° (Right)	-	113
V°	Horizontal angle (CG-FR (Right seat) to (Right B-pillar))	-	159
B1°	B1° (Right) = V° (Right)	-	159
U°	Horizontal angle (CG-F2 (Right seat) to (Right B-pillar))	-	87
B2°	B2° (Right) = U° (Right)	-	87
J	A-pillar ((Plane 3) - (Plane 5))	370	369
J/2	J ÷ 2	185	184.5
D1	Upper Roof ((Plane A) - (Plane B))		2734
D1/2	D1 ÷ 2		1367
D2	Upper Roof ((Plane C) - (Plane D))		1436
D2/2	D2 ÷ 2		718
.35D1	.35 x D1		956.9
.35D2	.35 x D2		502.6
N	B-pillar ((BPR) - (lowest point on the daylight opening forward of B-pillar))	496	496
N/2	B-pillar ((BP3) - (lowest point on the daylight opening forward of B-pillar))	248	248
N/4	B-pillar ((BP3) - (lowest point on the daylight opening forward of B-pillar))	124	124
Q	Other-pillar ((OPR) - (lowest point on the daylight opening forward of O-pillar))	383	383
Q/2	Other-pillar ((OP2) - (lowest point on the daylight opening forward of O-pillar))	191	191
D	((Corner of roof area, point 7) - (roof area center, point M))	1081	1081
3D/7	(3 x D) ÷ 7	463	463
MM	Widest door opening of slider door	990	992
M	MM ÷ 2	495	496

DATA SHEET 2-4

APPROACH ANGLE LIMITS

Target Code	Left Side		Vertical Angles (deg.)		Target Code	Right Side		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	203	246	-5	26	AP1	113	156	-5	26
AP2	203	246	-5	43	AP2	113	156	-5	43
AP3	203	246	-5	33	AP3	113	156	-5	33
BP1	200	273	-10	33	BP1	87	159	-10	33
BP2	ANY	ANY	0	9	BP2	ANY	ANY	0	9
BP3	200	273	-10	-7	BP3	87	159	-10	-7
BP4	200	273	-10	-10	BP4	87	159	-10	-10
OP1	ANY	ANY	0	31	OP1	90	90	-10	31
OP2	270	270	-10	-7	OP2	90	90	-10	-7
RP1	170	345	-10	23	RP1	15	90	-10	23
RP2	ANY	ANY	0	15	RP2	ANY	ANY	0	15
RH1	180	180	0	90	RH1	180	180	0	90
RH2	180	180	0	90	RH2	180	180	0	90
RH	360	360	0	90	RH	0	0	0	90
SR1	270	270	0	45	SR1	90	90	0	45
SR2A	270	270	0	90	SR2A	90	90	0	90
SR2B	270	270	0	90	SR2B	90	90	0	90
SR3	270	270	0	48	SR3	90	90	0	48
SD	270	270	0	48	SD	90	90	0	48
URAP	ANY	ANY	0	90	URAP	ANY	ANY	0	90
URBP	ANY	ANY	0	36	URBP	ANY	ANY	0	36
URCP	ANY	ANY	0	43	URCP	ANY	ANY	0	43
URRP	ANY	ANY	0	90	URRP	ANY	ANY	0	90

Note: BP2, RP2 and OP1 Driver Side target location - Seat belt anchorage

DATA SHEET 2-5

SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C34S070133
DATE OF MANUFACTURE:	09/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver



K RIGHT SIDE OF FACE

TARGET	Distance Above Point O (mm)	Distance Over From Pt. O (mm)
BP4	15	8 to the left
SD	10	0
AP3	25	8 to the left
AP1	29	25 to the right
BP1	45	5 to the right
OP1	28	4 to the left
RH	19	24 to the right
BP3	15	12 to the left
URBP	21	0
AP2	22	12 to the right
OP1	15	6 to the right
RP2	23	0

SECTION 3
SUMMARY OF TEST RESULTS AND DATA PLOTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C34S070133
DATE OF MANUFACTURE:	09/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	01
Test Date:	December 19, 2003
Target Location:	R-Pillar
Target Code:	BP4
Horizontal Impact Angle:	132°
Vertical Impact Angle:	-7°
Ambient Temperature:	21°C
Relative Humidity:	20%
Time of Impact:	10:05
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	8	mm right	mm left
On Centerline	13	mm up	



POST-IMPACT BP4 HEADFORM

Free Motion HIC	354.1
HIC(d)	433.6
Impact Velocity (kph)	23.71
HIC T1 (msec)	3.1
HIC T2 (msec)	11.7

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - BP4

FMH Headform 805

Location: BP4

Test Date: December 19, 2003

Work File: BP4

TEST RESULTS

Lab Temperature: 21 C

HICd: 433.6

Lab Humidity: 20 %

HIC (36ms): 354.1

Velocity at Impact: 23.71 KPH

t1: 3.1 msec

t2: 11.7 msec

Free Flight Distance: 216.24 mm

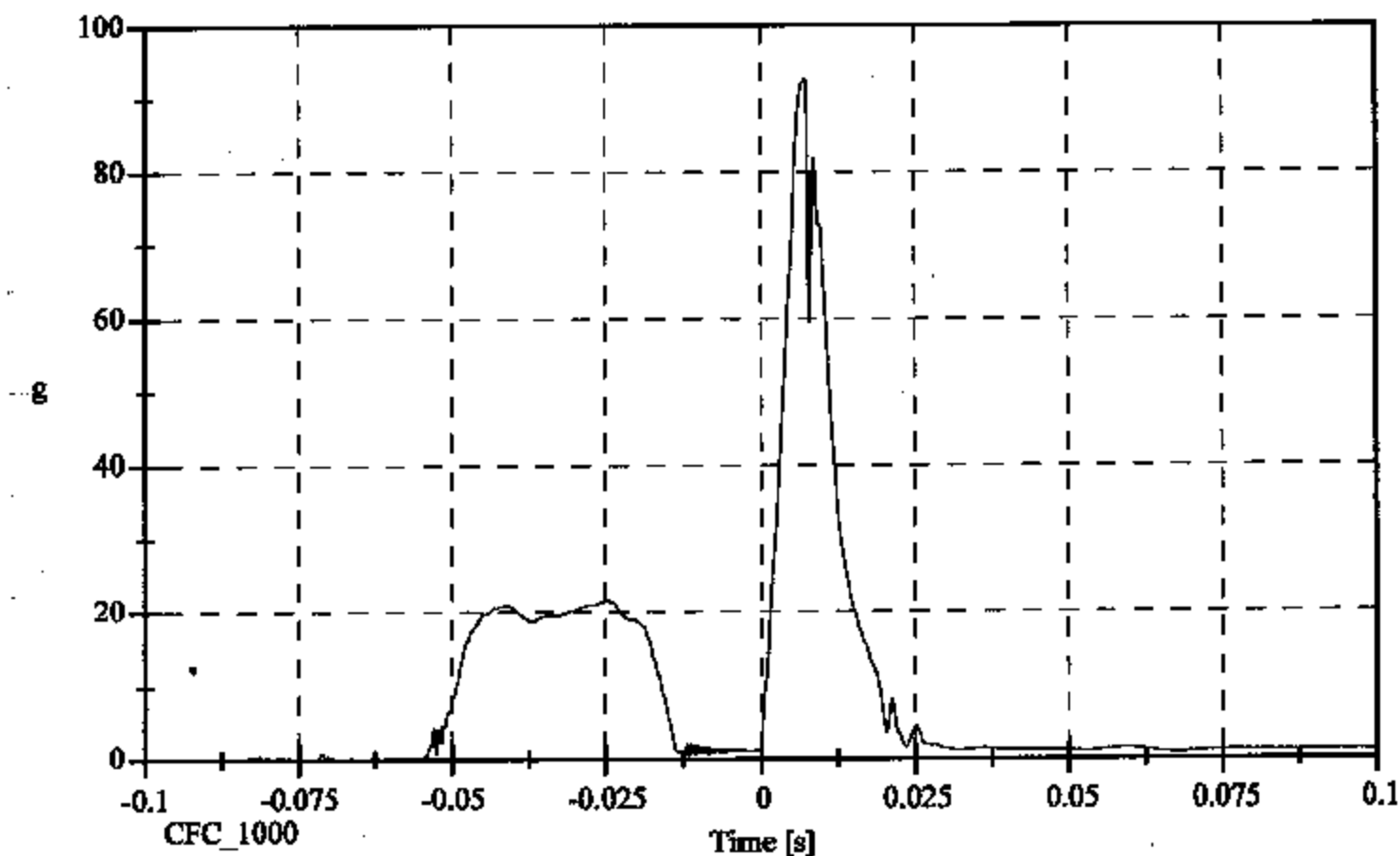
Duration: 8.6 msec

Average Acceleration: 8.2 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 92.8 [g] at 0.007 [s]

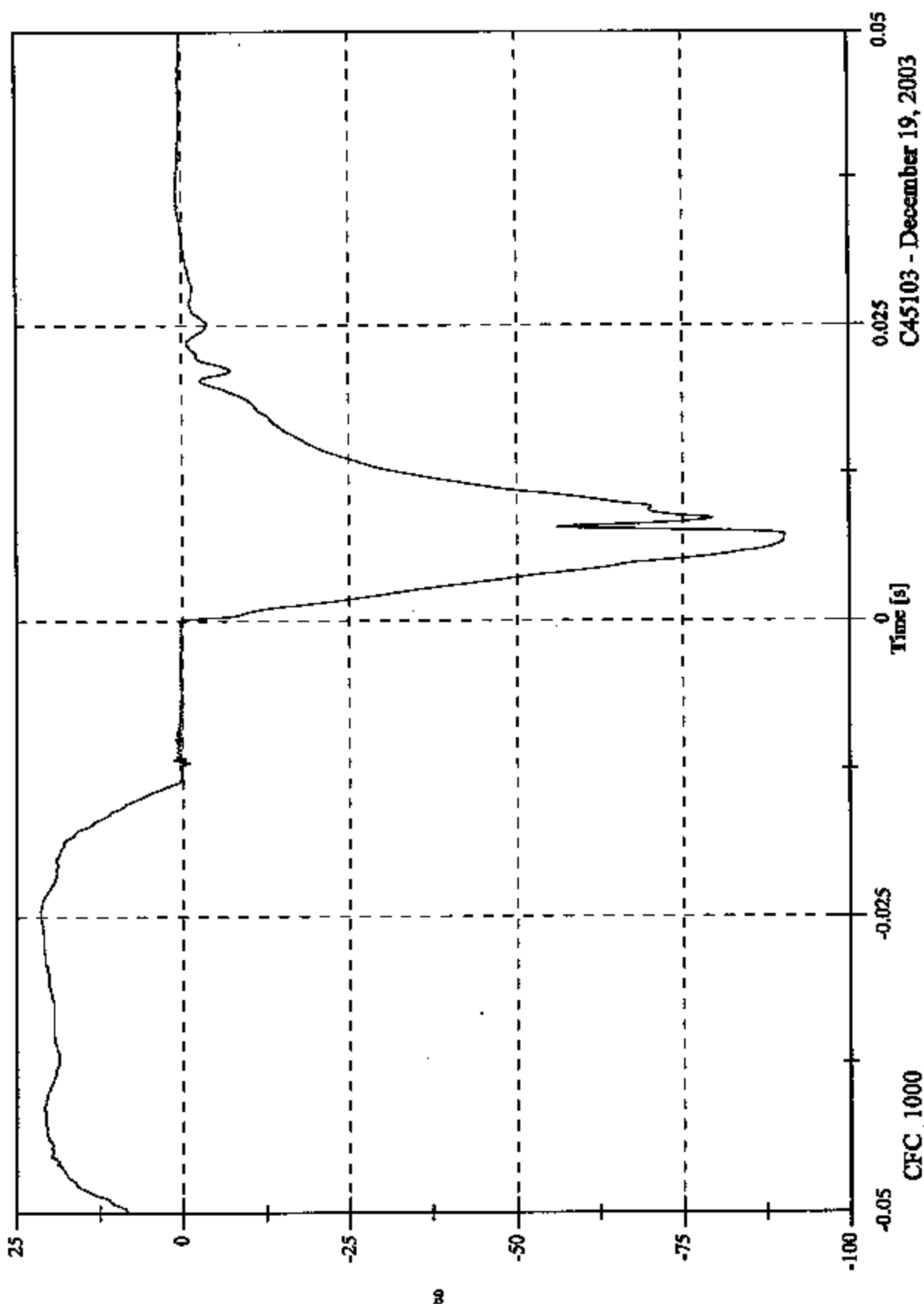
Min: 0.0 [g] at -0.064 [s]



FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 21.4 [g] at -0.025 [s]
Min: -90.3 [g] at 0.007 [s]



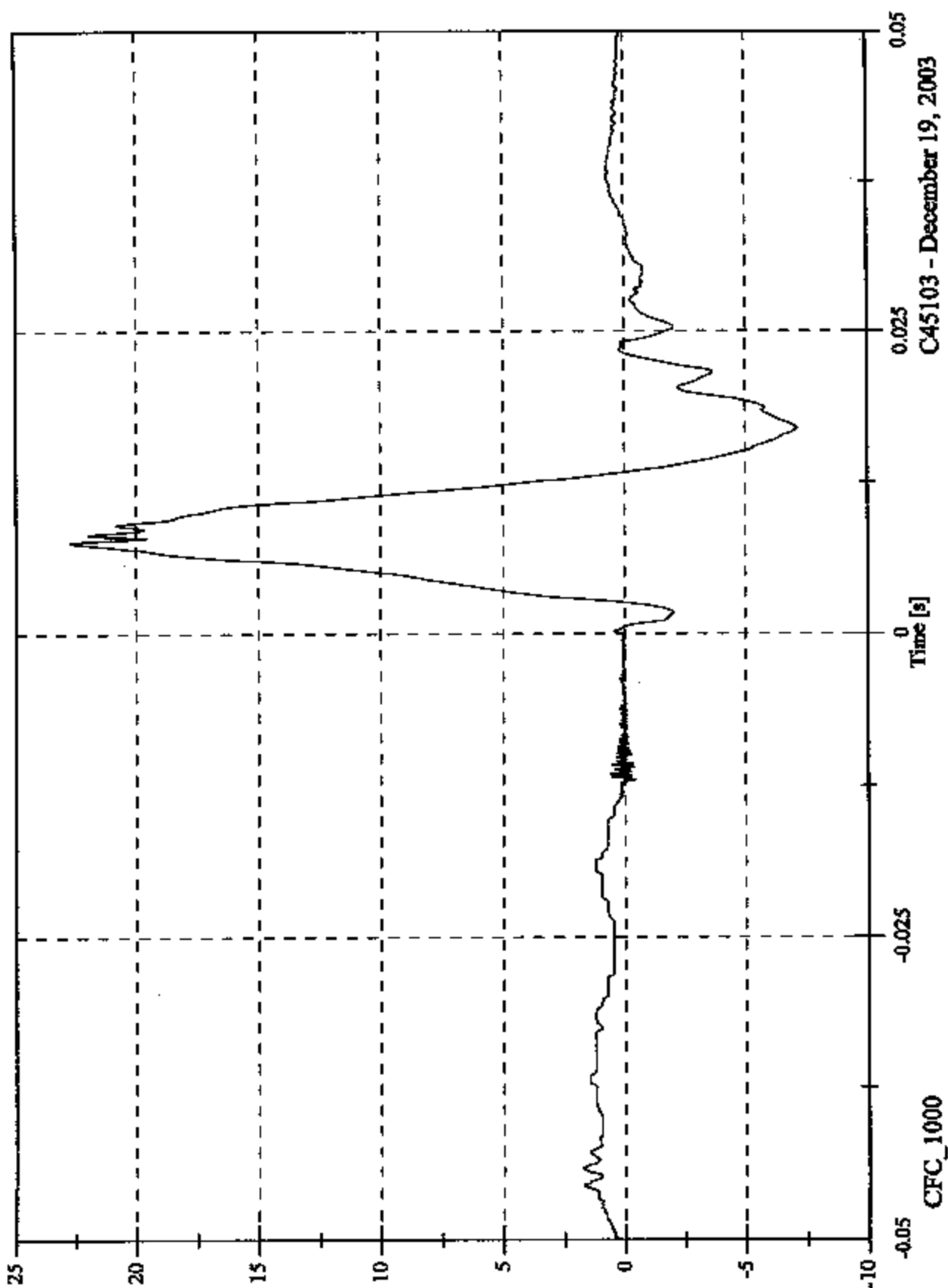
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C45103 Passenger Side BP4 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 22.7 [g] at 0.008 [s]
Min: -7.1 [g] at 0.017 [s]

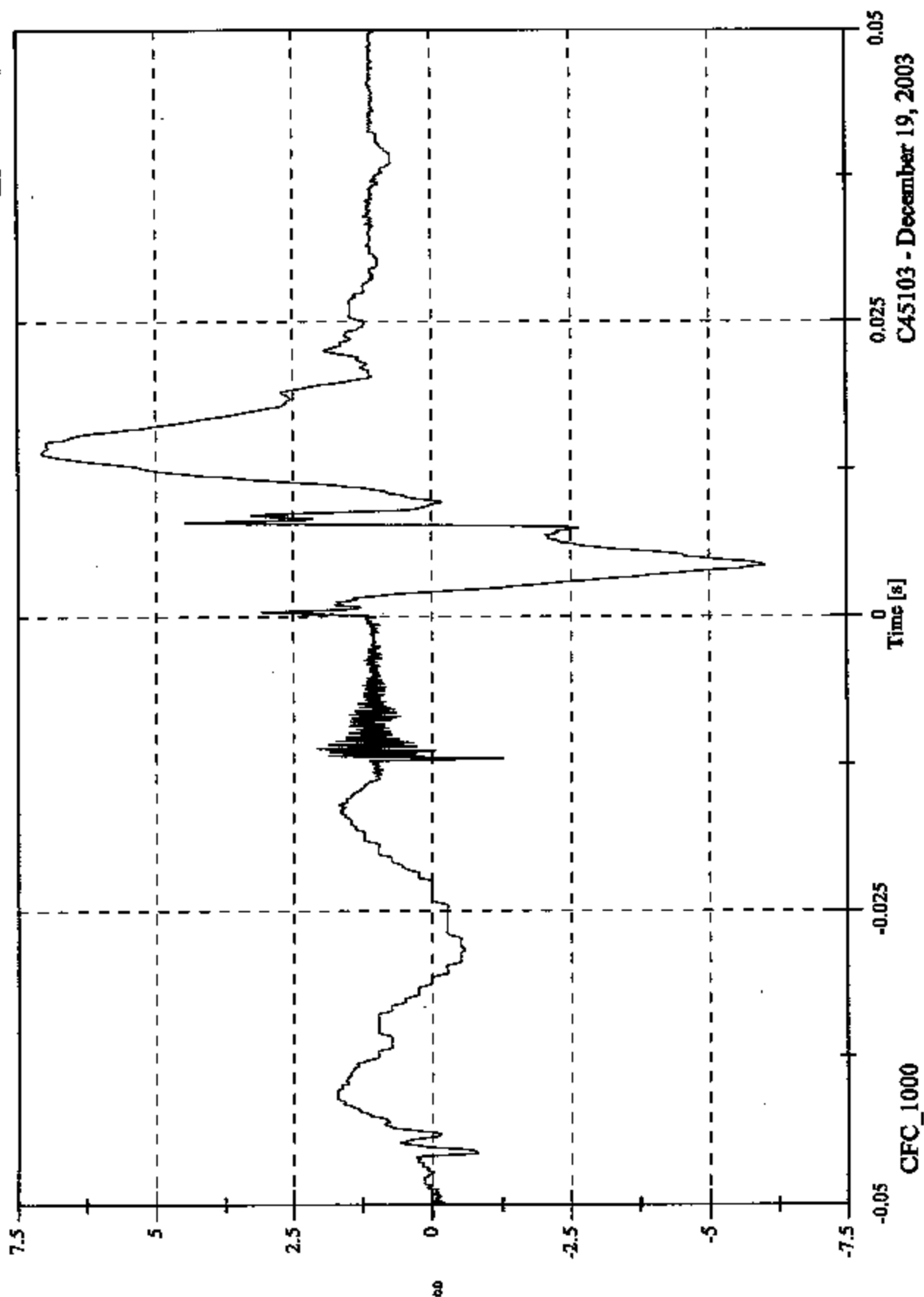


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FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 7.1 [g] at 0.014 [s]
Min: -6.0 [g] at 0.004 [s]

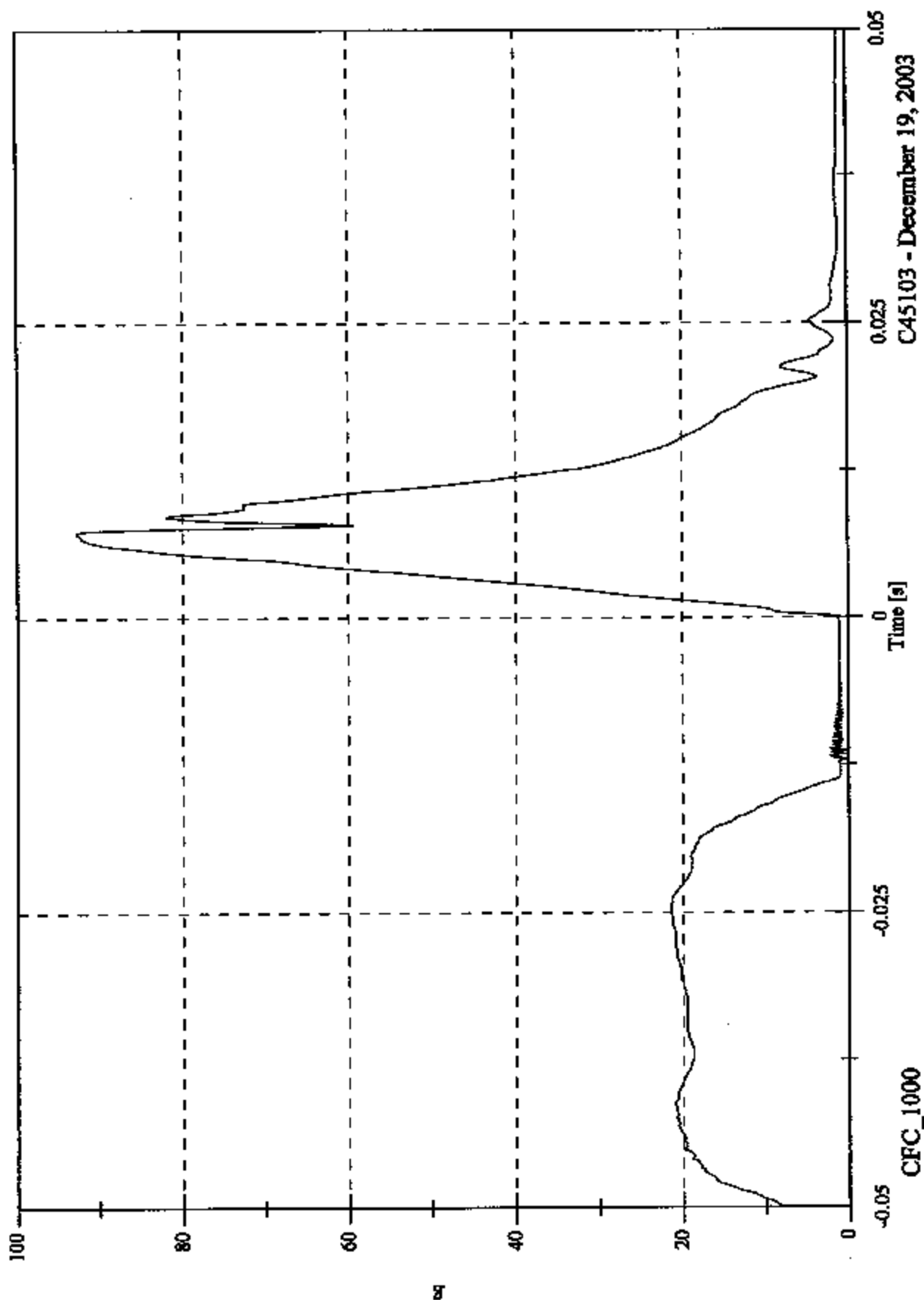


C45103 Passenger Side BP4 Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 92.8 [g] at 0.007 [s]
Min: 0.1 [g] at -0.012 [s]

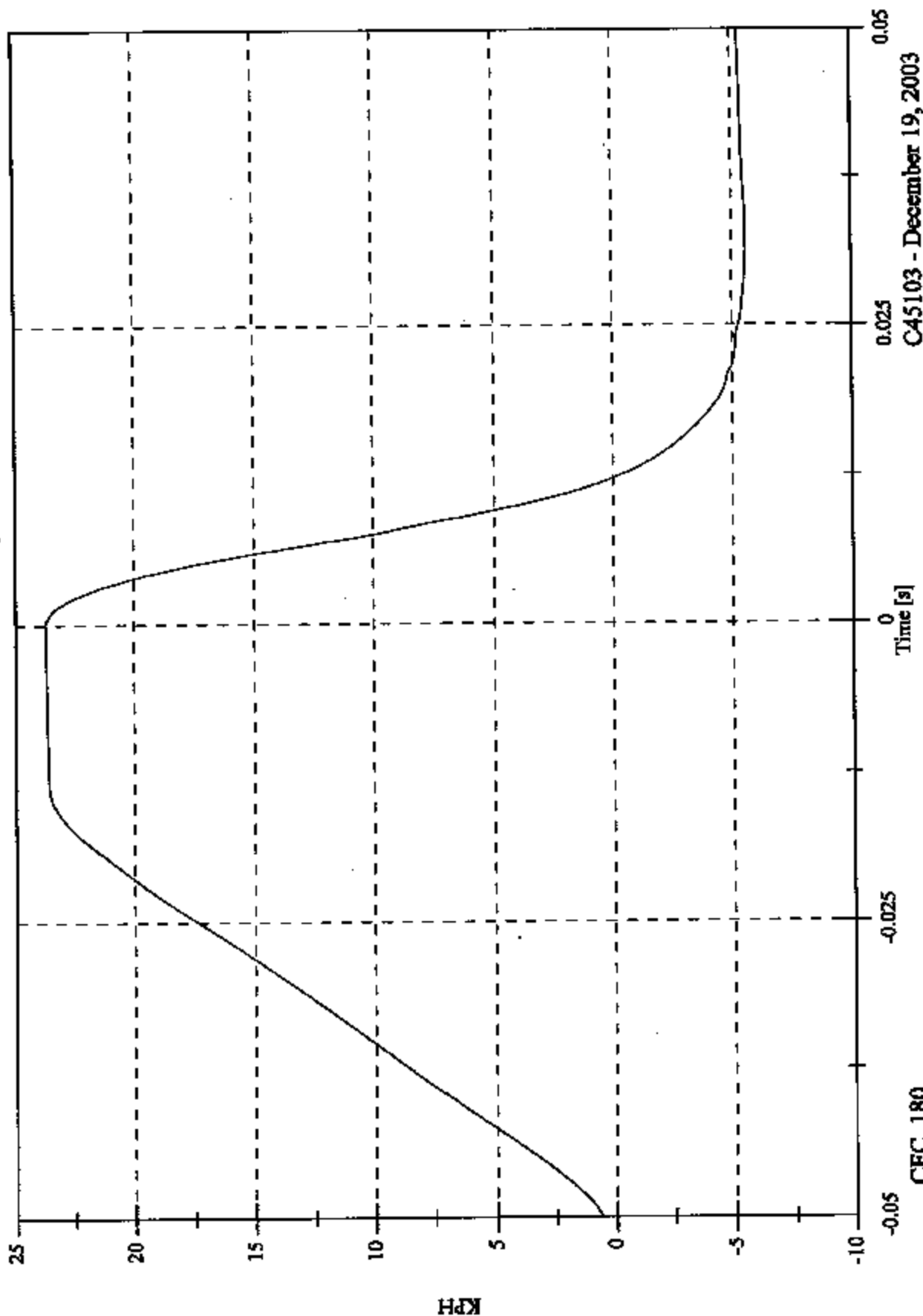


C45103 Passenger Side BP4 Impact Plot #4

Max: 23.7 [KPH] at 0.000 [s]
Min: -5.6 [KPH] at 0.032 [s]

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Velocity



CFC_180



THE LOYALTY

8730-72



POST-SUBJECTS

8730-02

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C34S070135
DATE OF MANUFACTURE:	0903 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	02
Test Date:	December 19, 2003
Target Location:	Sliding Door
Target Code:	SD
Horizontal Impact Angle:	90°
Vertical Impact Angle:	48°
Ambient Temperature:	21°C
Relative Humidity:	20%
Time of Impact:	10:43
Headform Number:	0642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	mm right	mm left
On Centerline	10	mm up	



POST-IMPACT SD HEADFORM

Free Motion HIC	914.6
HIC(d)	836.4
Impact Velocity (kph)	23.69
HIC T1 (msec)	2.8
HIC T2 (msec)	10.3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - SD

FMH Headform 0642

Location: SD

Test Date: December 19, 2003

Work File: SD

TEST RESULTS

Lab Temperature: 21 C

HICd: 856.4

Lab Humidity: 20 %

HIC (36ms): 914.6

Velocity at Impact: 23.69 KPH

t1: 2.8 msec

t2: 10.3 msec

Free Flight Distance: 217.77 mm

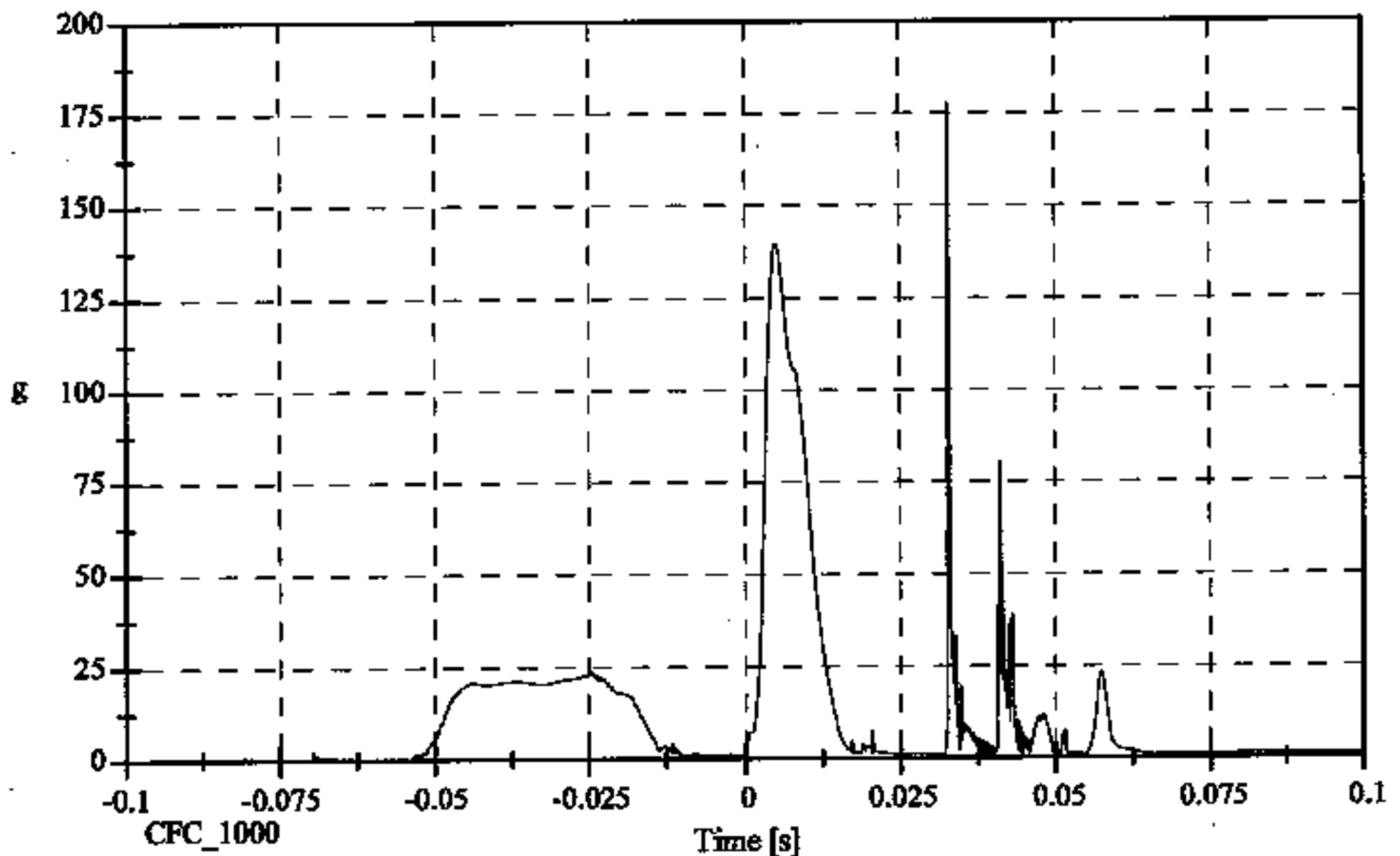
Duration: 7.5 msec

Average Acceleration: 10.5 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 177.5 [g] at 0.033 [s]

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

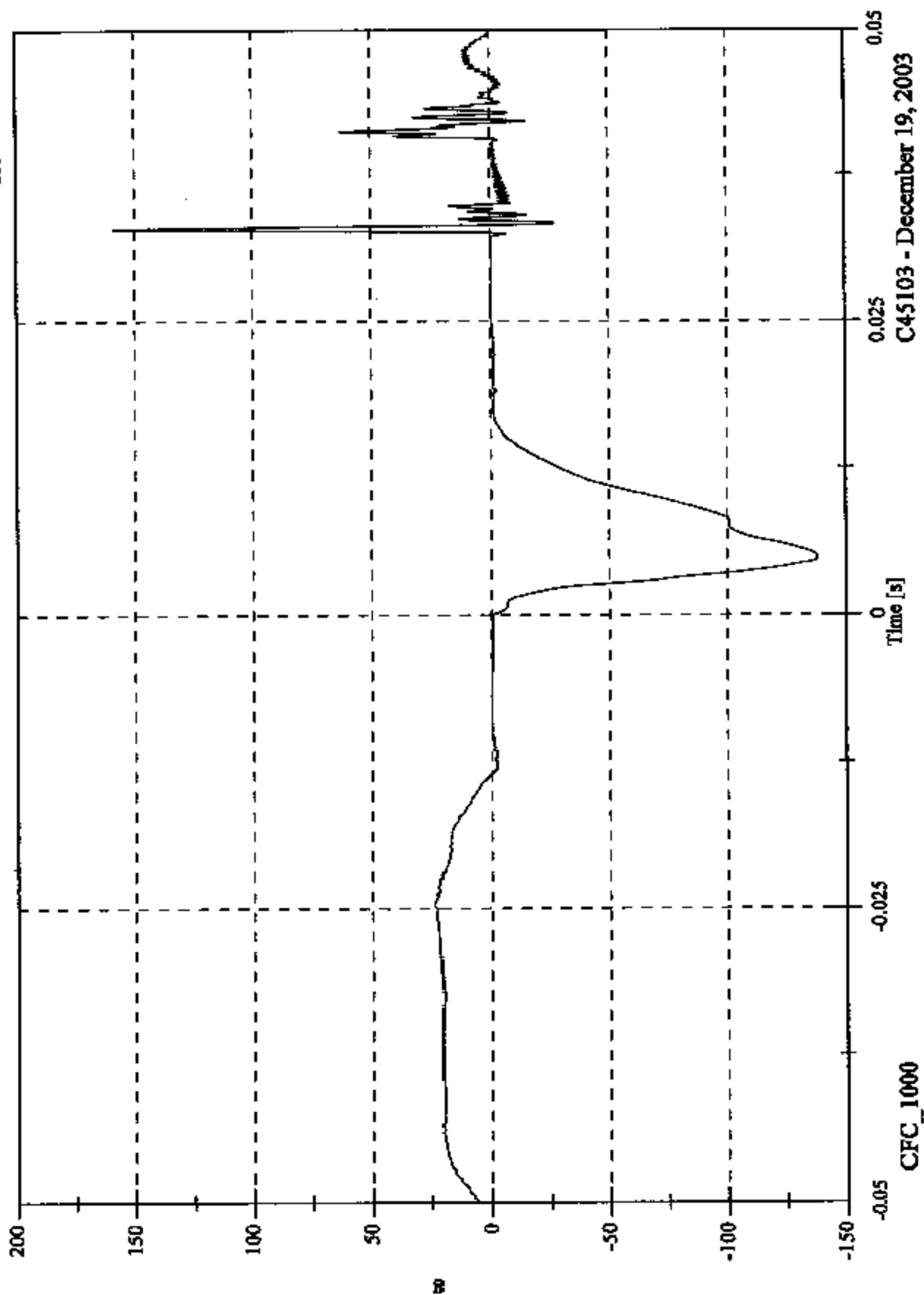


FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 158.5 [g] at 0.033 [s]

Min: -138.3 [g] at 0.005 [s]



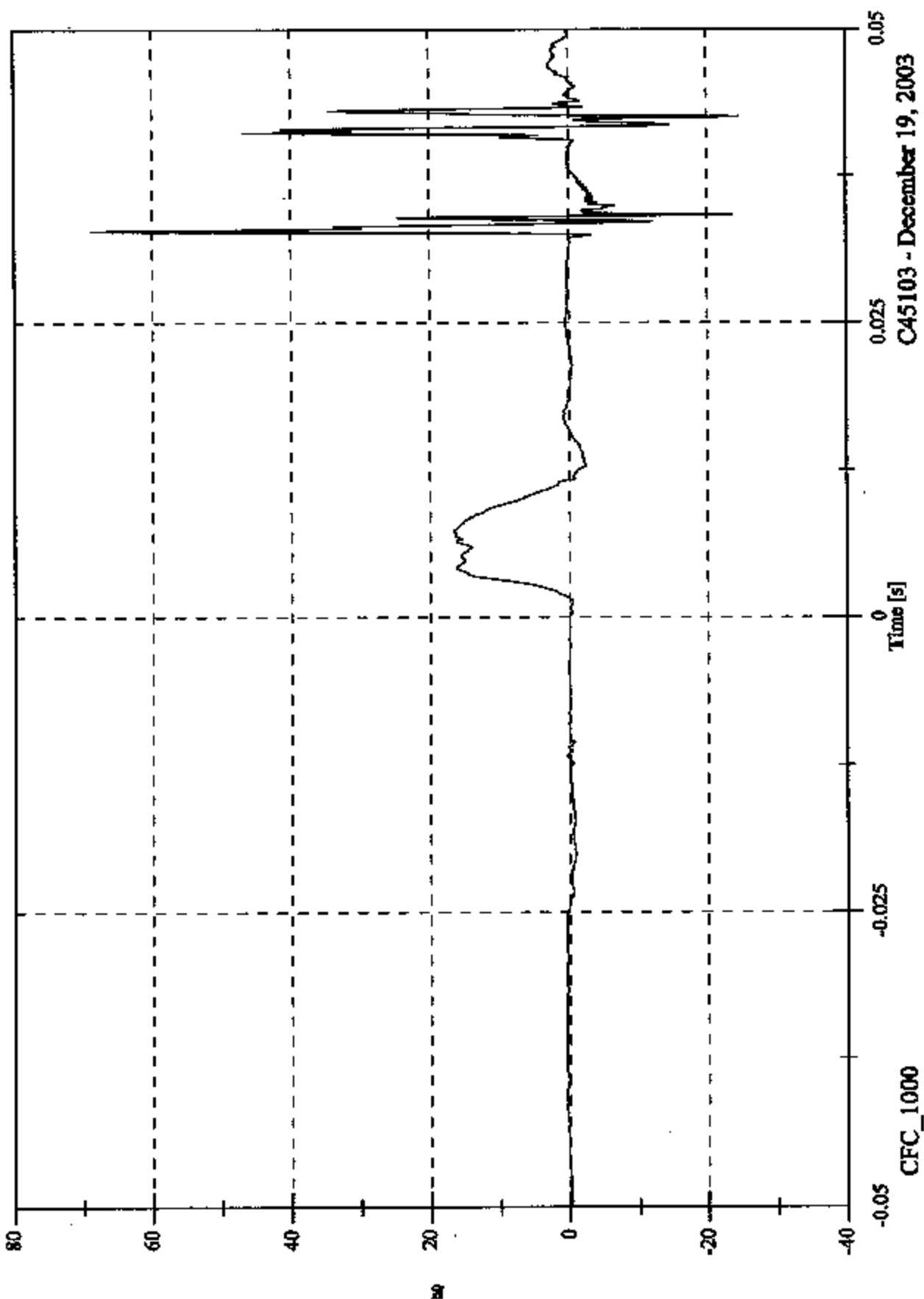
C45103 - December 19, 2003

C45103 Passenger Side SD Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 68.9 [g] at 0.033 [s]
Min: -24.7 [g] at 0.042 [s]



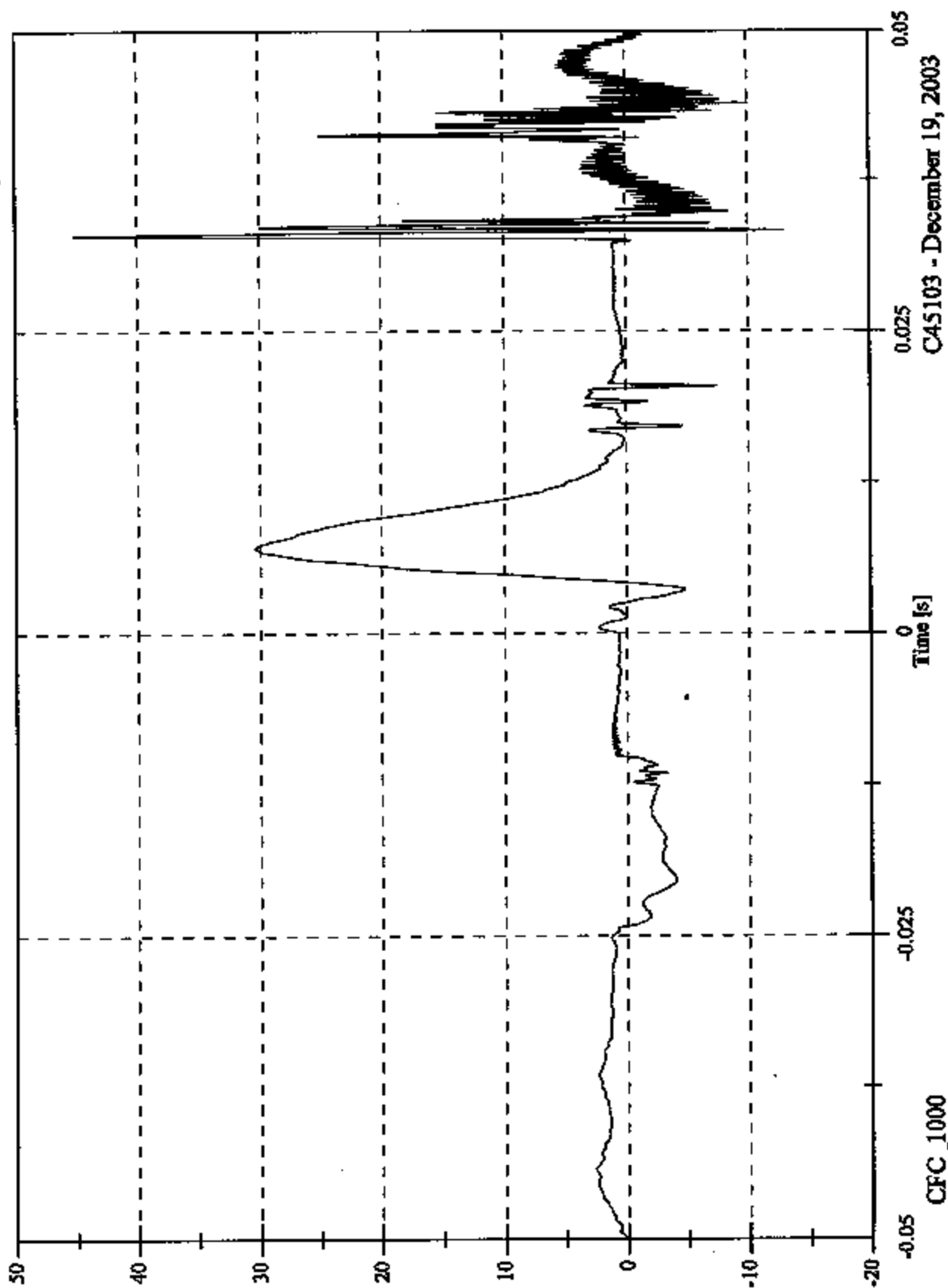
C45103 Passenger Side SD Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 45.2 [g] at 0.033 [s]

Min: -12.9 [g] at 0.033 [s]

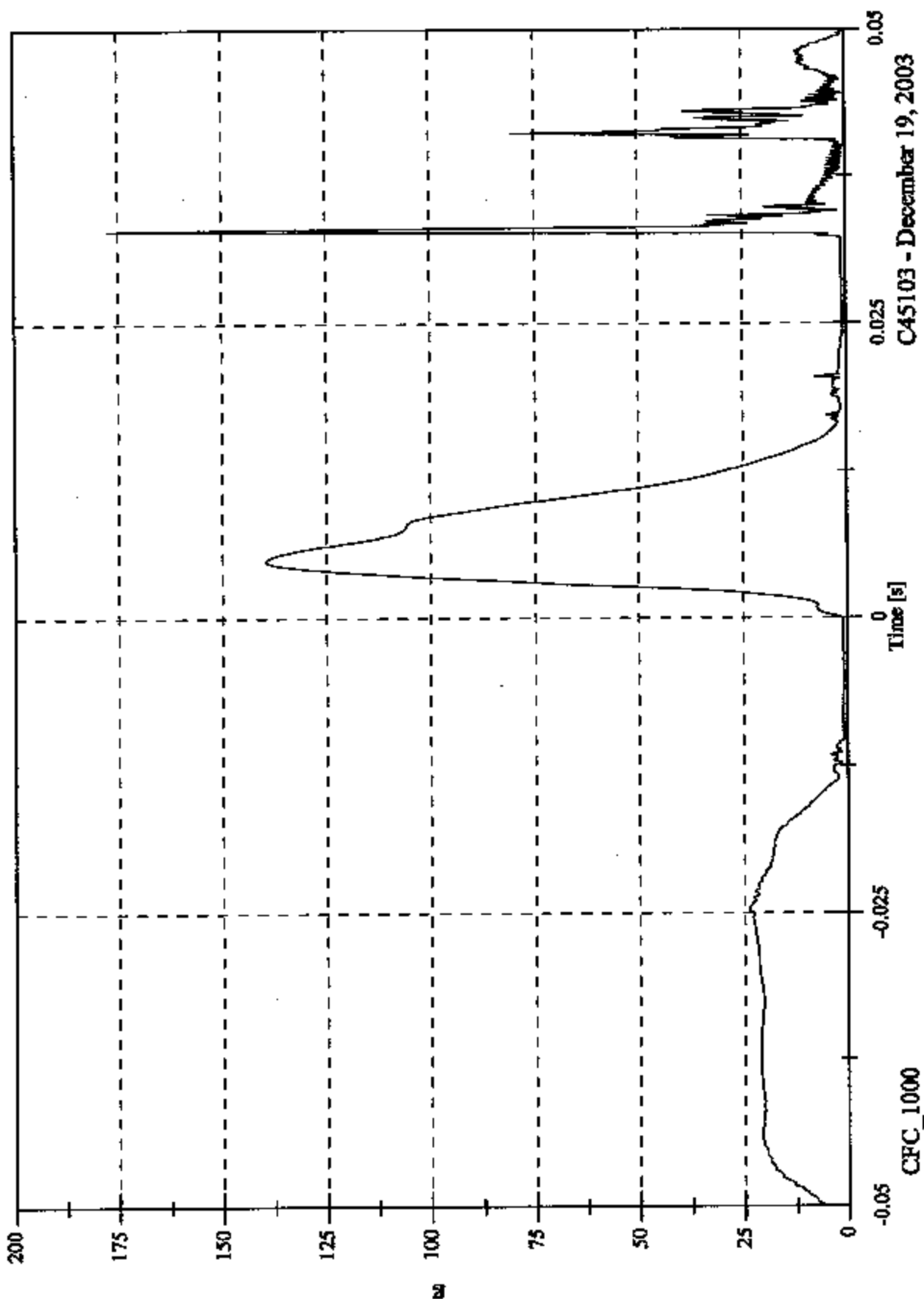


C45103 Passenger Side SD Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 177.5 [g] at 0.033 [s]
Min: 0.3 [g] at 0.050 [s]

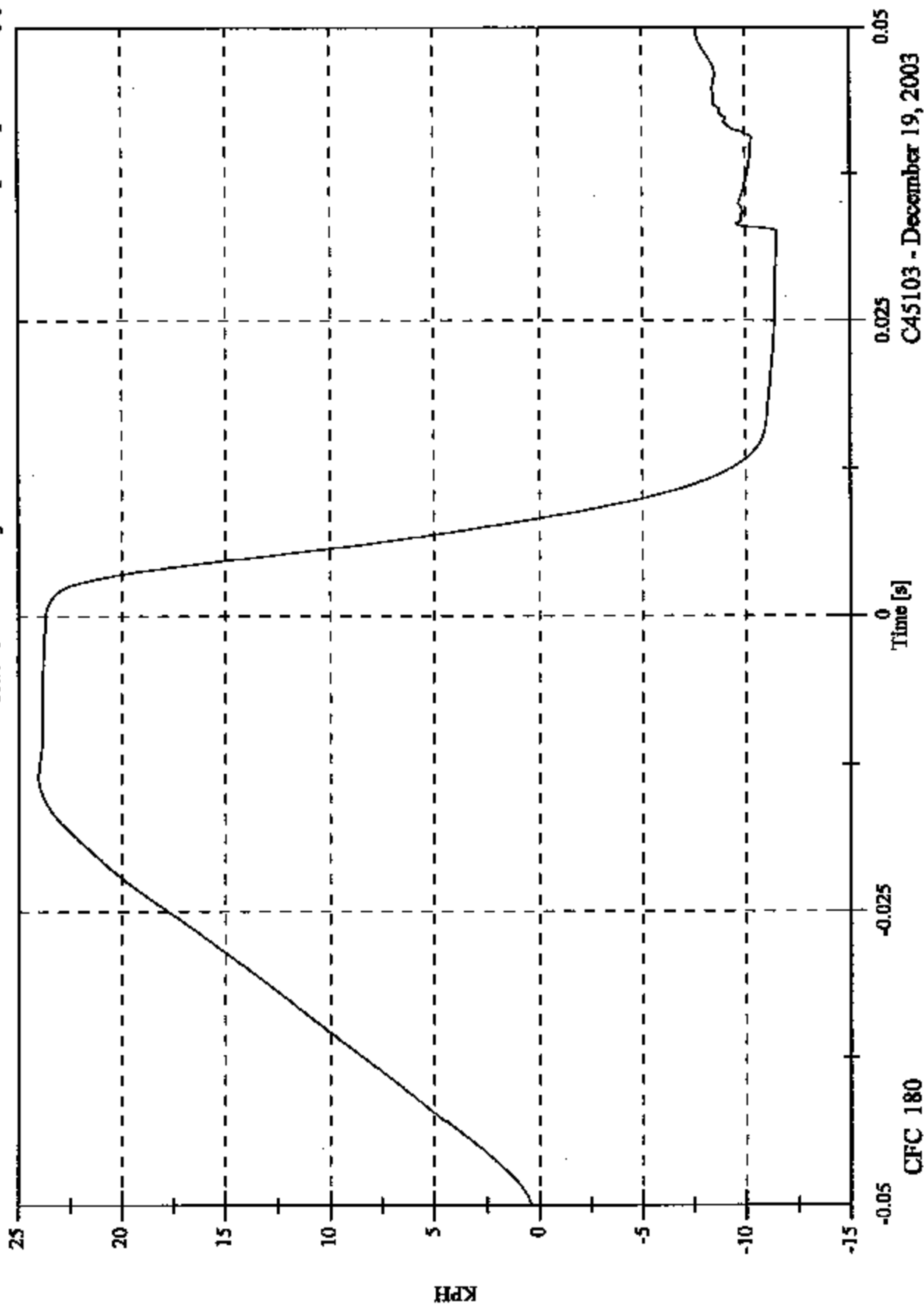


C45103 Passenger Side SD Impact Plot #4

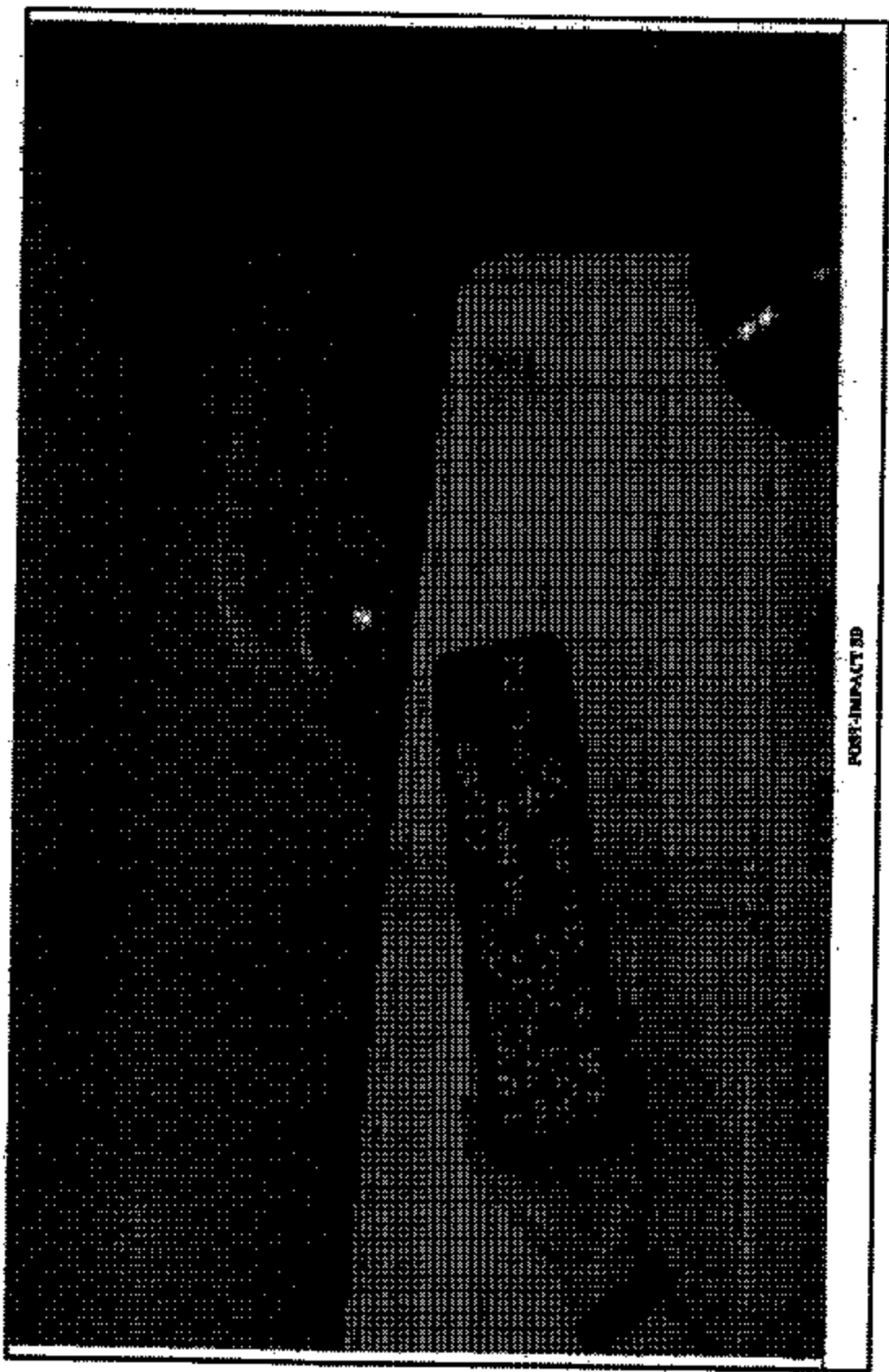
C45103 - December 19, 2003

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Velocity

Max: 24.0 [KPH] at -0.014 [s]
Min: -11.5 [KPH] at 0.033 [s]

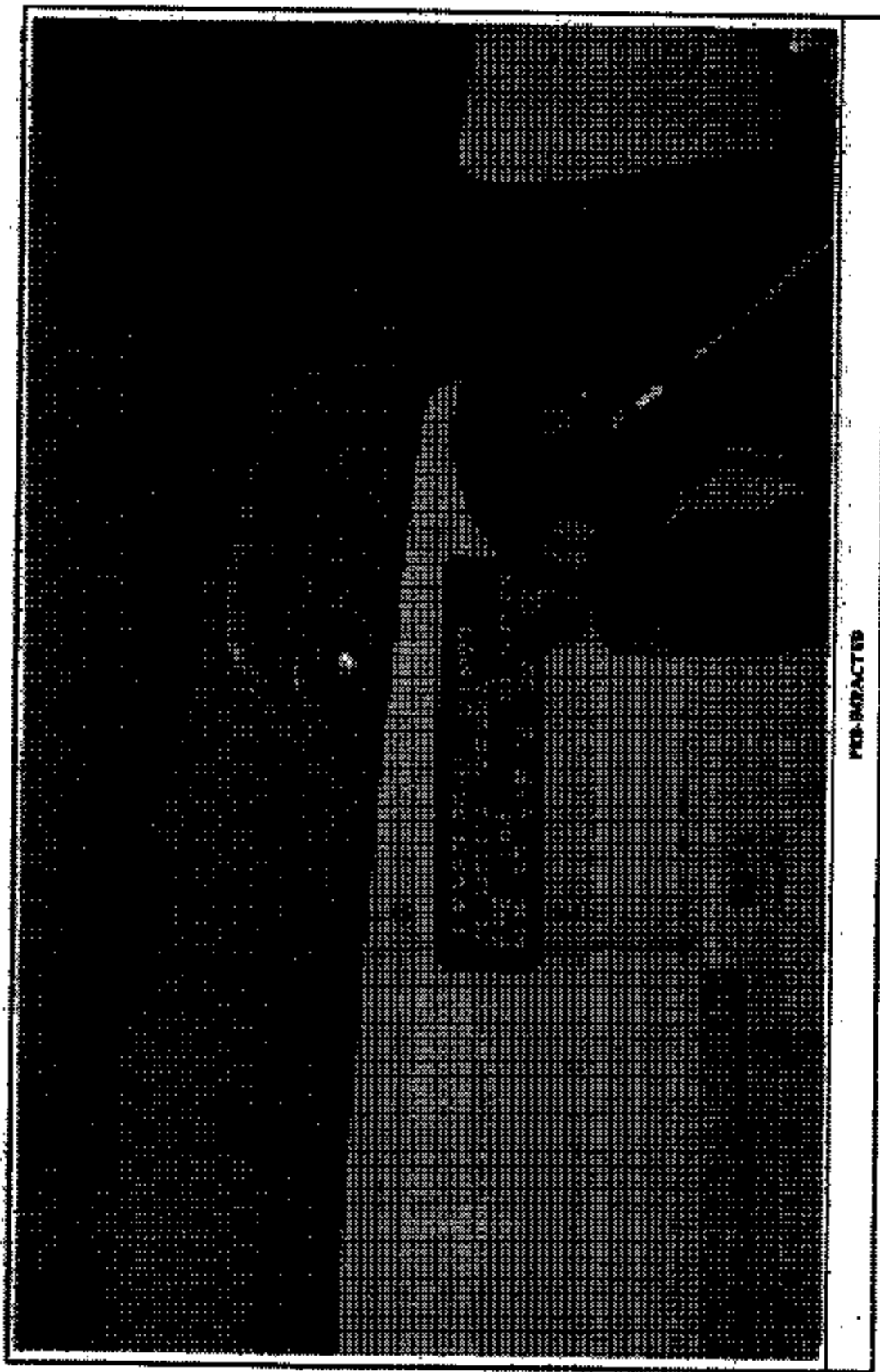


C45103 Passenger Side SD Impact Plot #5



POST-IMPACT 3D

8730-02



8730-02

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C349070133
DATE OF MANUFACTURE:	09/03/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	09
Test Date:	December 19, 2003
Target Location:	A-Pillar
Target Code:	AP3
Horizontal Impact Angle:	130°
Vertical Impact Angle:	35°
Ambient Temperature:	21 °C
Relative Humidity:	20%
Time of Impact:	11:25
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	8	mm right	☒ mm left
On Centerline	25	mm up	



POST-IMPACT AP3 HEADFORM

Free Motion HIC	452.2
HIC(d)	507.6
Impact Velocity (kph)	33.45
HIC T1 (msec)	1.2
HIC T2 (msec)	9.7

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - AP3

FMH Headform 1255

Location: AP3

Test Date: December 19, 2003

Work File: AP3

TEST RESULTS

Lab Temperature: 21 C

HICd: 507.6

Lab Humidity: 20 %

HIC (36ms): 452.2

Velocity at Impact: 23.45 KPH

t1: 1.2 msec

t2: 9.7 msec

Free Flight Distance: 214.18 mm

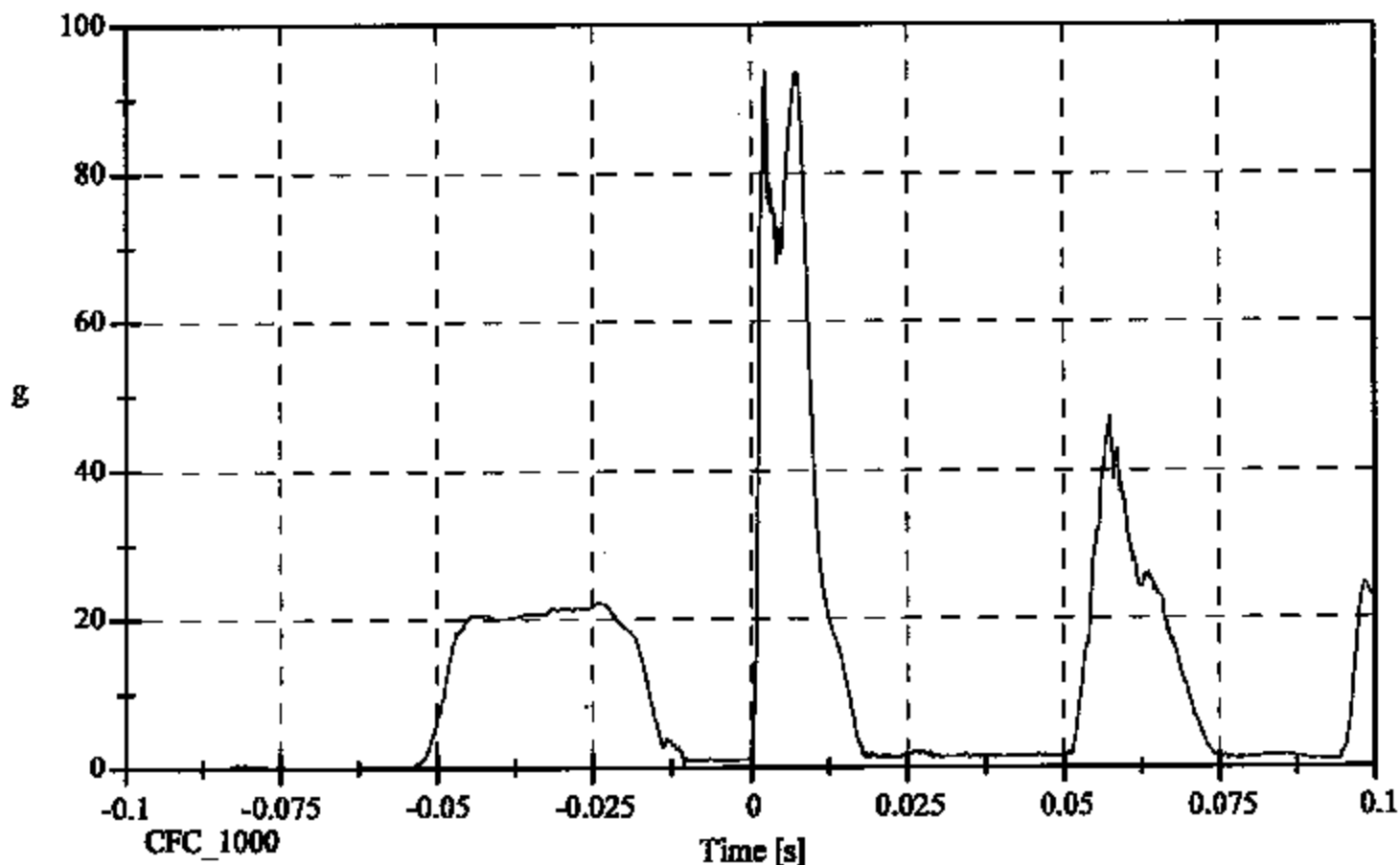
Duration: 8.5 msec

Average Acceleration: 10.9 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 93.6 [g] at 0.002 [s]

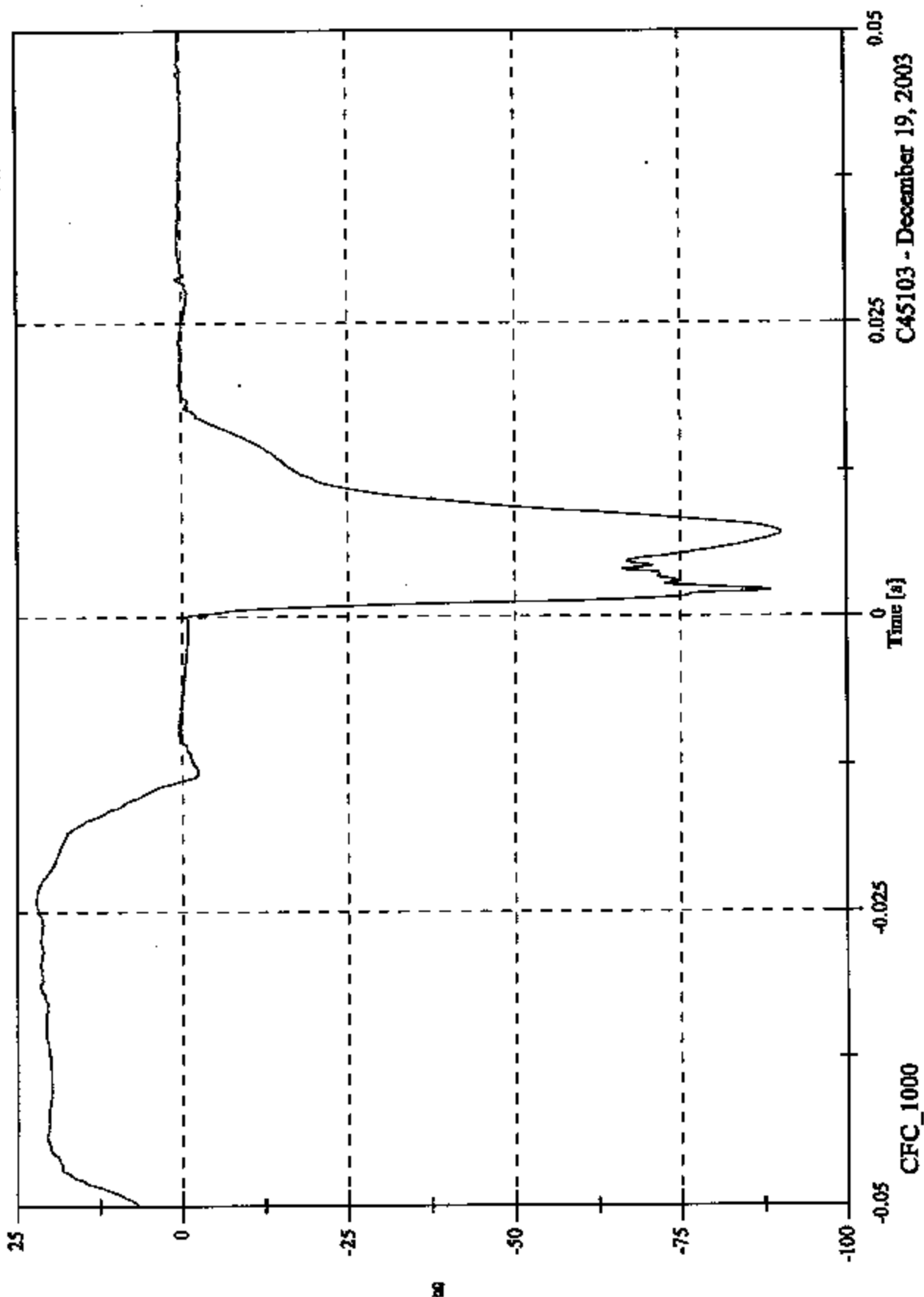
Min: 0.0 [g] at -0.055 [s]



FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 22.2 [g] at -0.024 [s]
Min: -90.1 [g] at 0.007 [s]



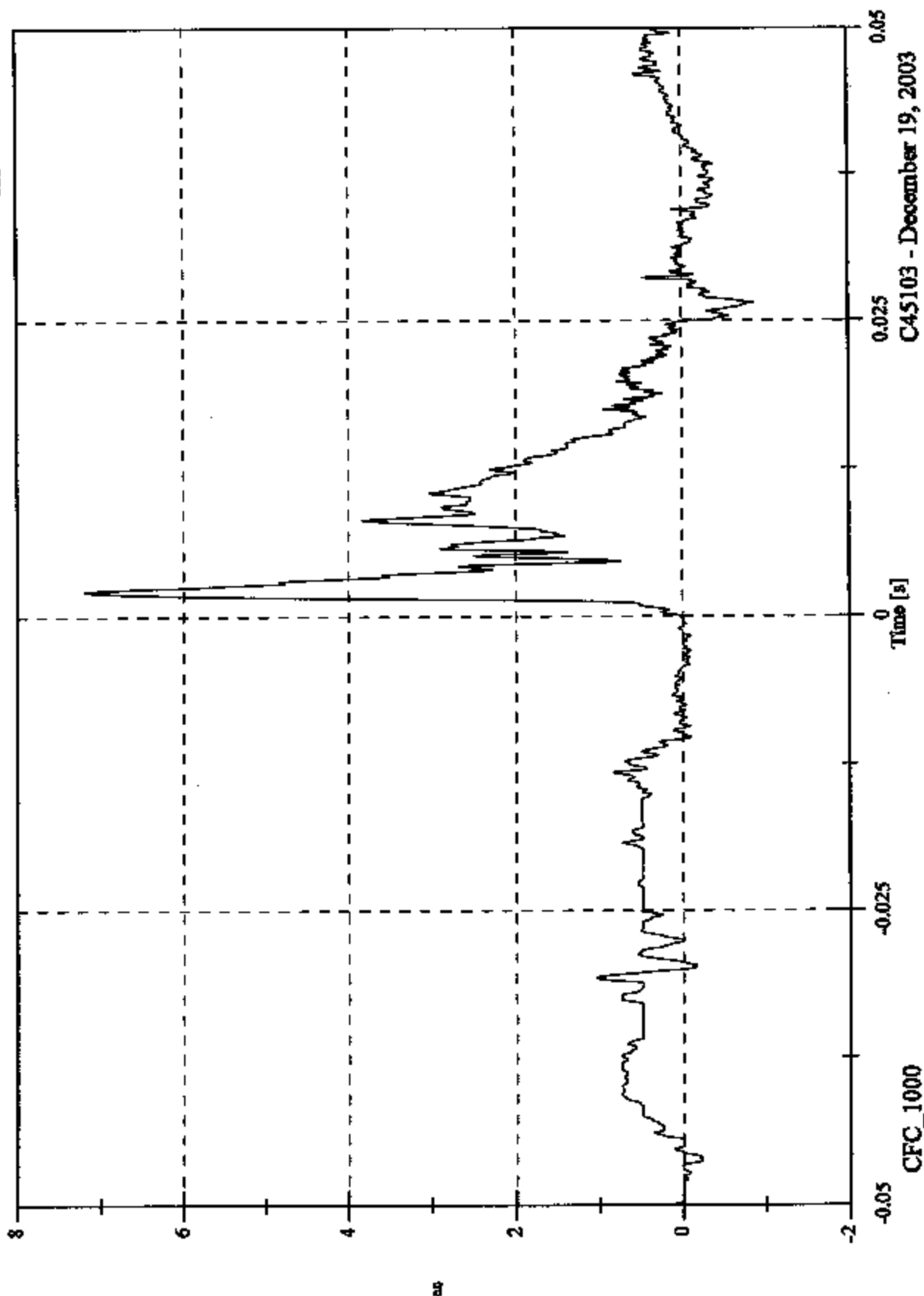
C45103 - December 19, 2003

C45103 Passenger Side AP3 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 7.2 [g] at 0.002 [s]
Min: -0.9 [g] at 0.026 [s]



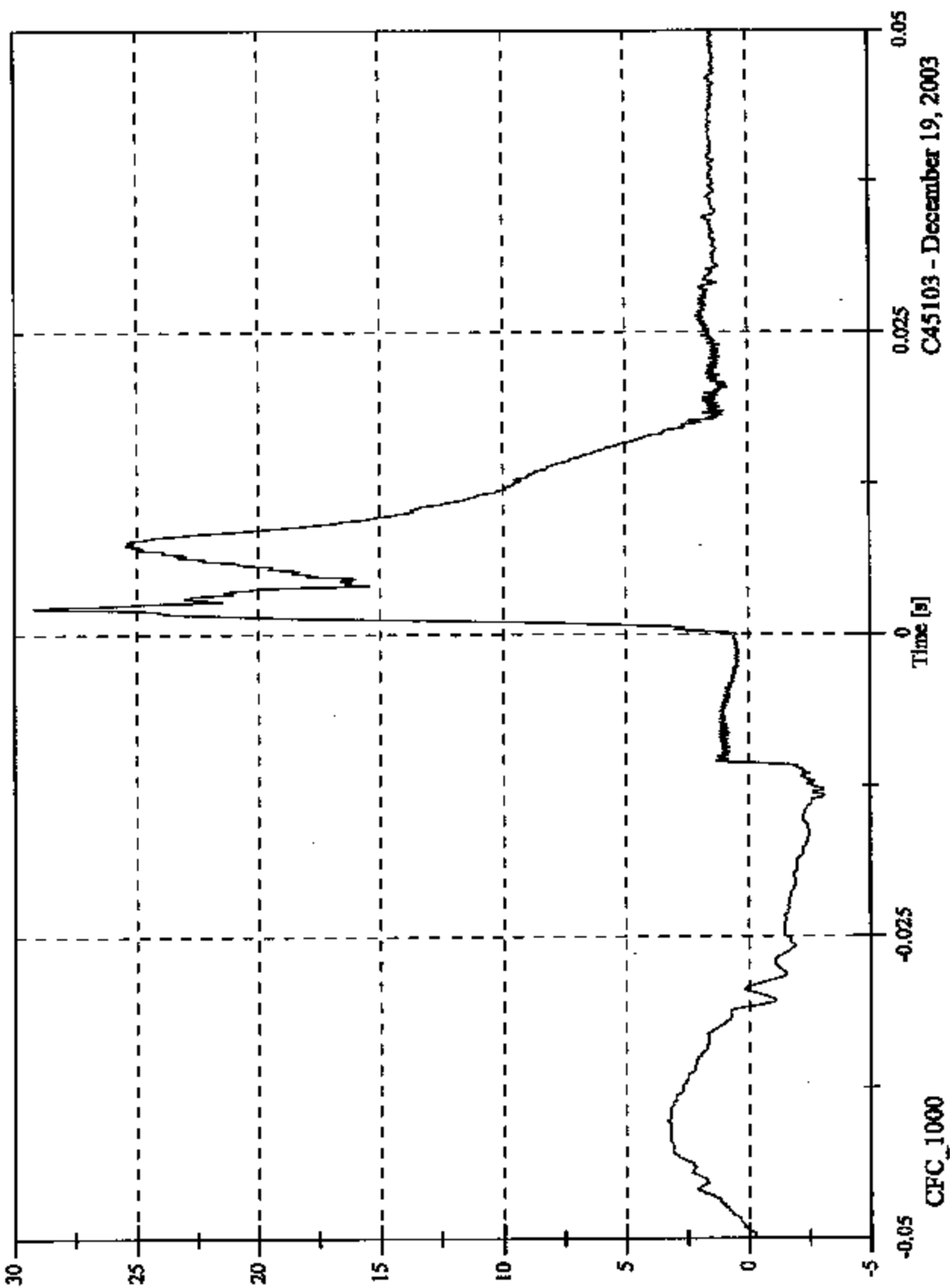
C45103 Passenger Side AP3 Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 29.2 [g] at 0.002 [s]

Min: -3.1 [g] at -0.013 [s]

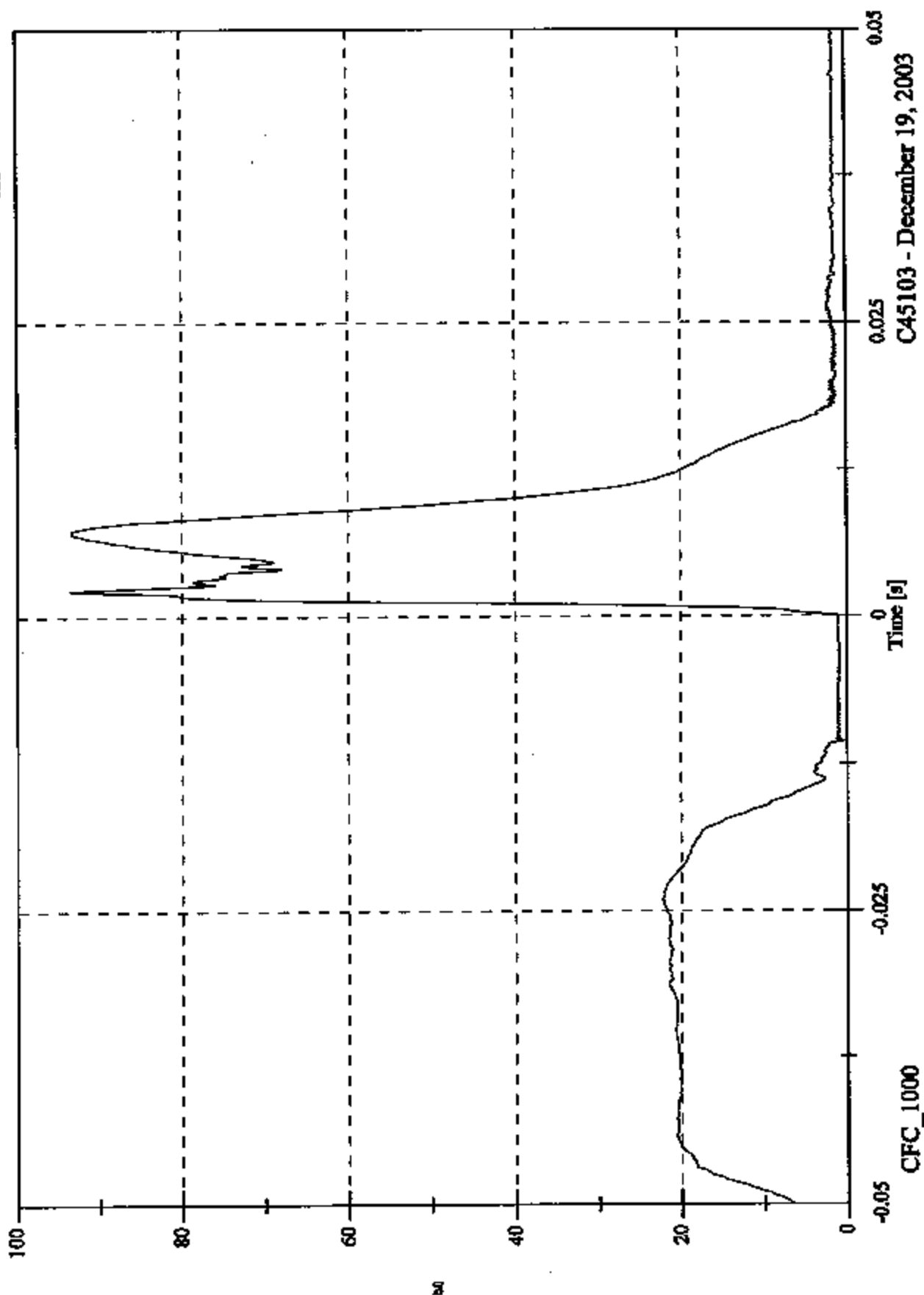


C45103 Passenger Side AP3 Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 93.6 [g] at 0.002 [s]
Min: 0.3 [g] at -0.011 [s]



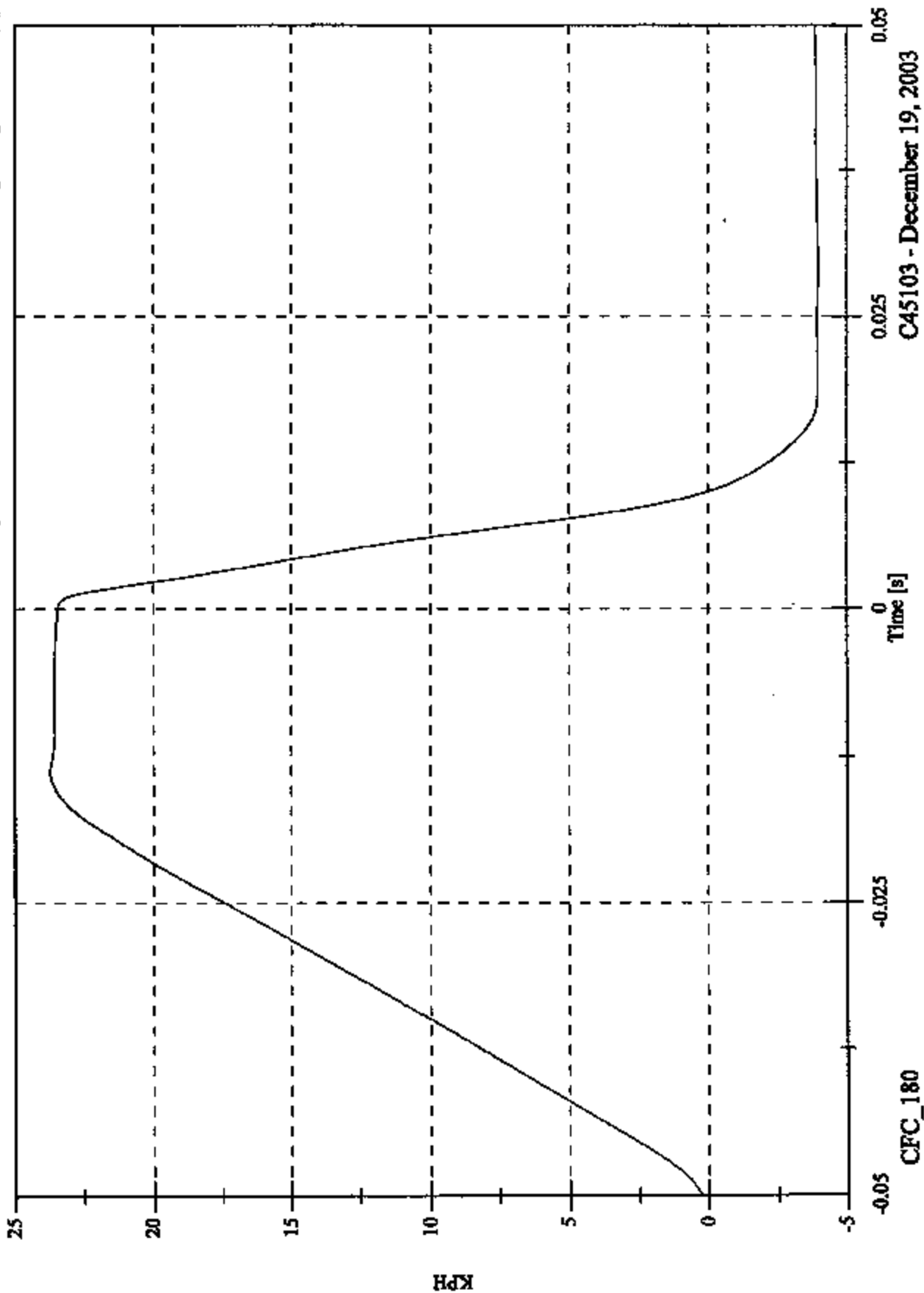
C45103 - December 19, 2003

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Max: 23.7 [KPH] at -0.014 [s]

Min: -4.0 [KPH] at 0.028 [s]

Headform Velocity



CFC_180

Time [s]

-0.025

0.025

0.05

C45103 - December 19, 2003



FMVSS 2011 C45103
04 TOYOTA SIENNA
PHE TEST 12 DEC 03
MCH 150 VER 33 APR 33

PRE-IMPACT

8730-02



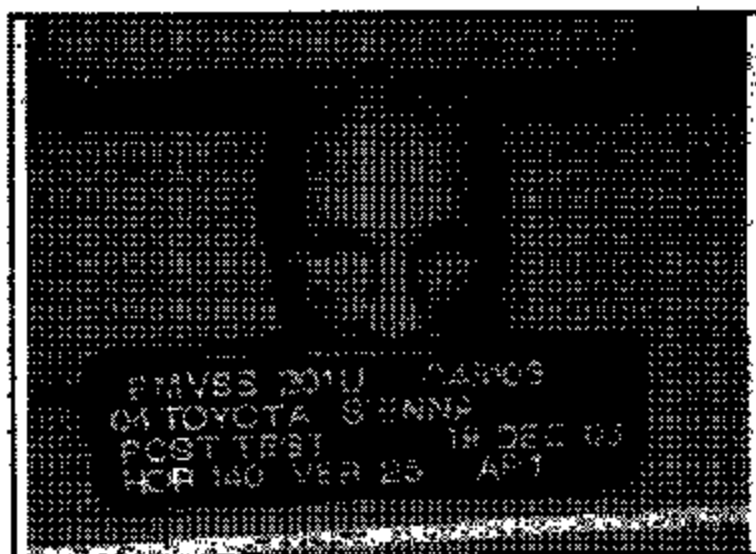
POST-IMPACT AIR

8736-02

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C34S070133
DATE OF MANUFACTURE:	DATE (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	04
Test Date:	December 19, 2003
Target Location:	A-Pillar
Target Code:	AP1
Horizontal Impact Angle:	140°
Vertical Impact Angle:	25°
Ambient Temperature:	21°C
Relative Humidity:	20%
Time of Impact:	12:05
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	25	mm right	mm left	
On Centerline	29	mm up		



POST-IMPACT AP1 HEADFORM

Free Motion HIC	617.1
HIC(d)	597.4
Impact Velocity (kph)	23.54
HIC T1 (msec)	2.4
HIC T2 (msec)	12.4

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - AP1

FMH Headform 355

Location: AP1

Test Date: December 19, 2003

Work File: AP1

TEST RESULTS

Lab Temperature: 21 C

HICd: 617.1

Lab Humidity: 20 %

HIC (36ms): 597.4

Velocity at Impact: 23.54 KPH

t1: 2.4 msec

t2: 10.4 msec

Free Flight Distance: 223.94 mm

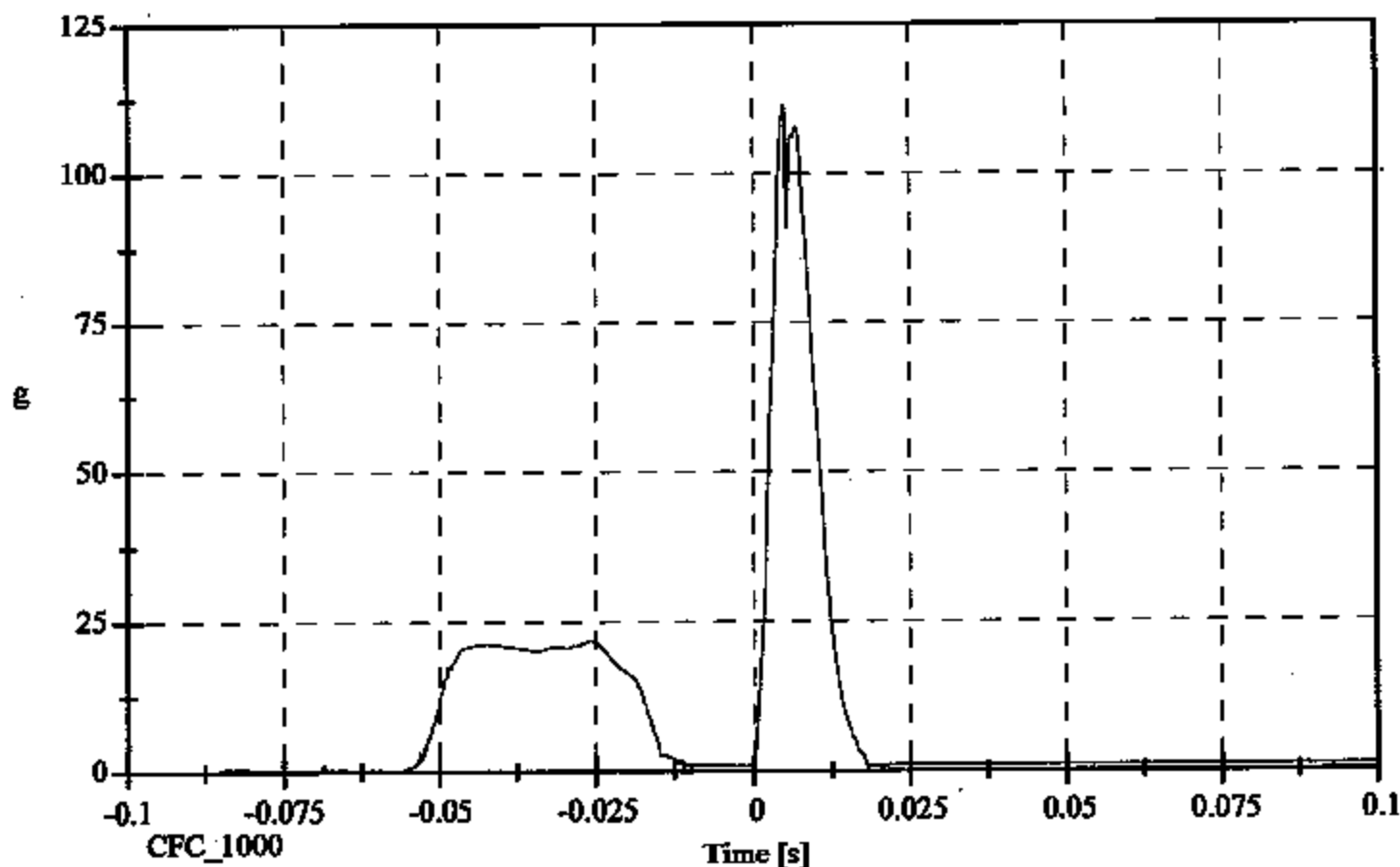
Duration: 8.0 msec

Average Acceleration: 8.4 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 111.5 [g] at 0.005 [s]

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

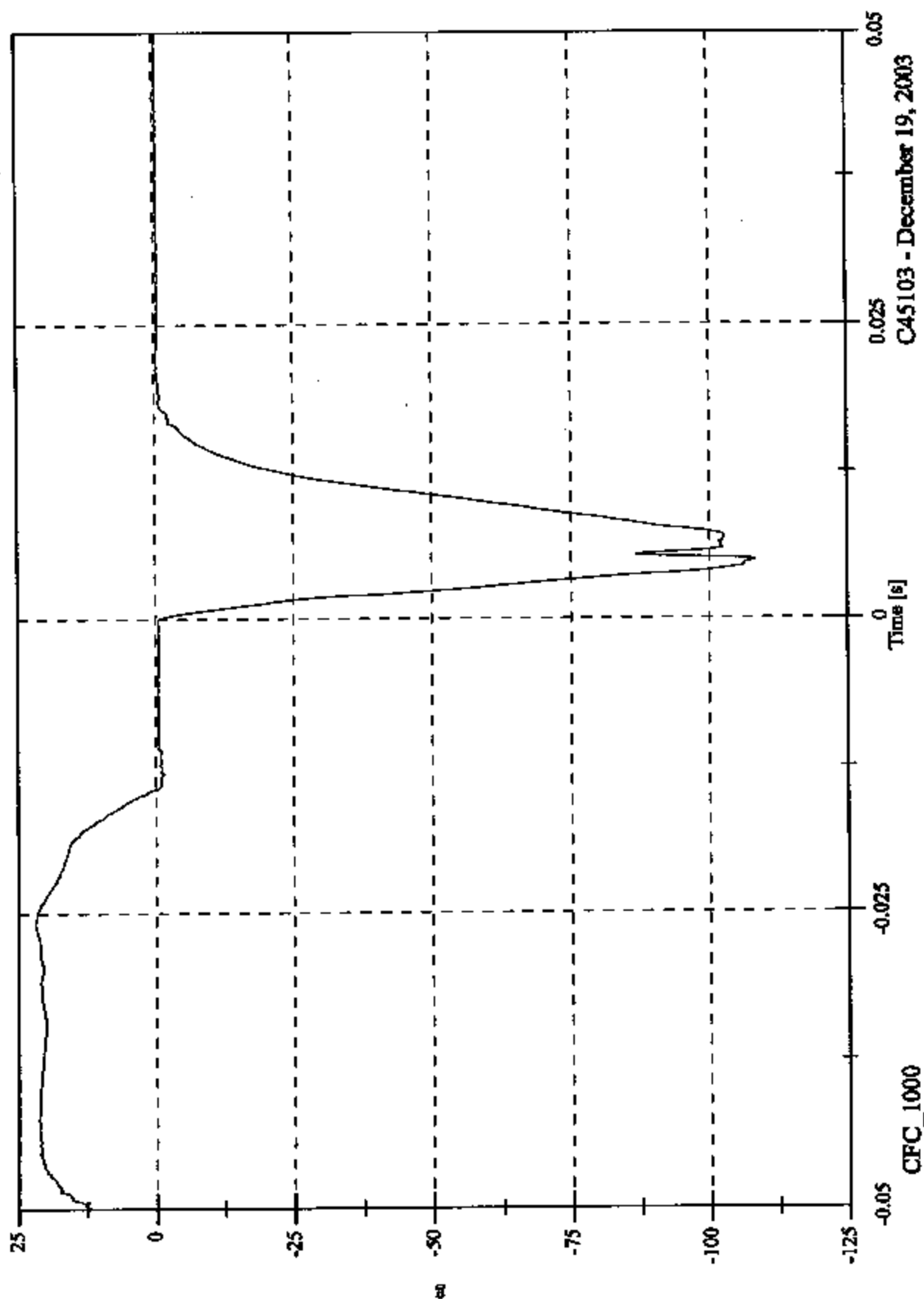


FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 21.9 [g] at -0.026 [s]

Min: -108.3 [g] at 0.005 [s]



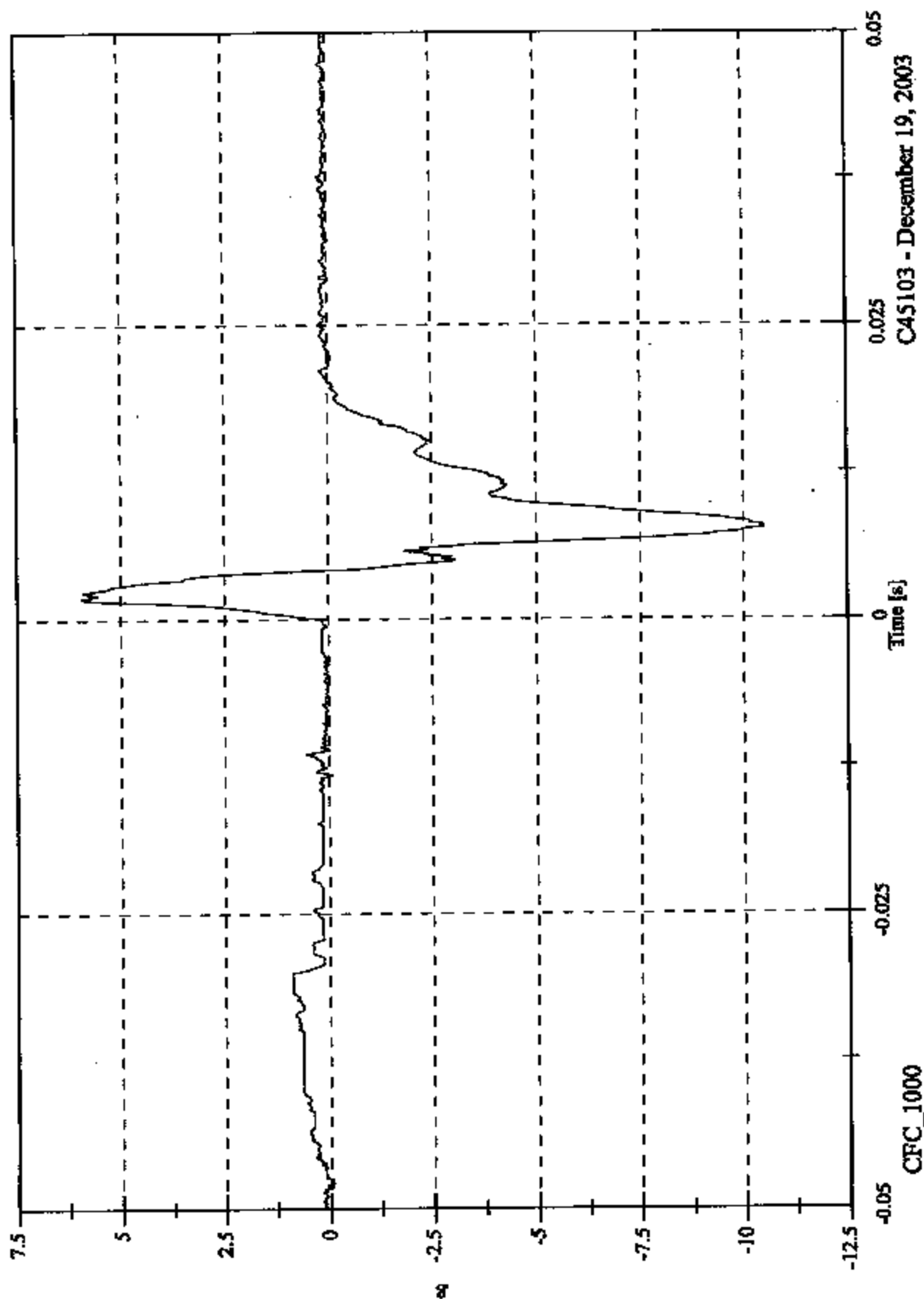
C45103 Passenger Side AP1 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Max: 6.0 [g] at 0.002 [s]

Headform Y Acceleration

Min: -10.5 [g] at 0.008 [s]

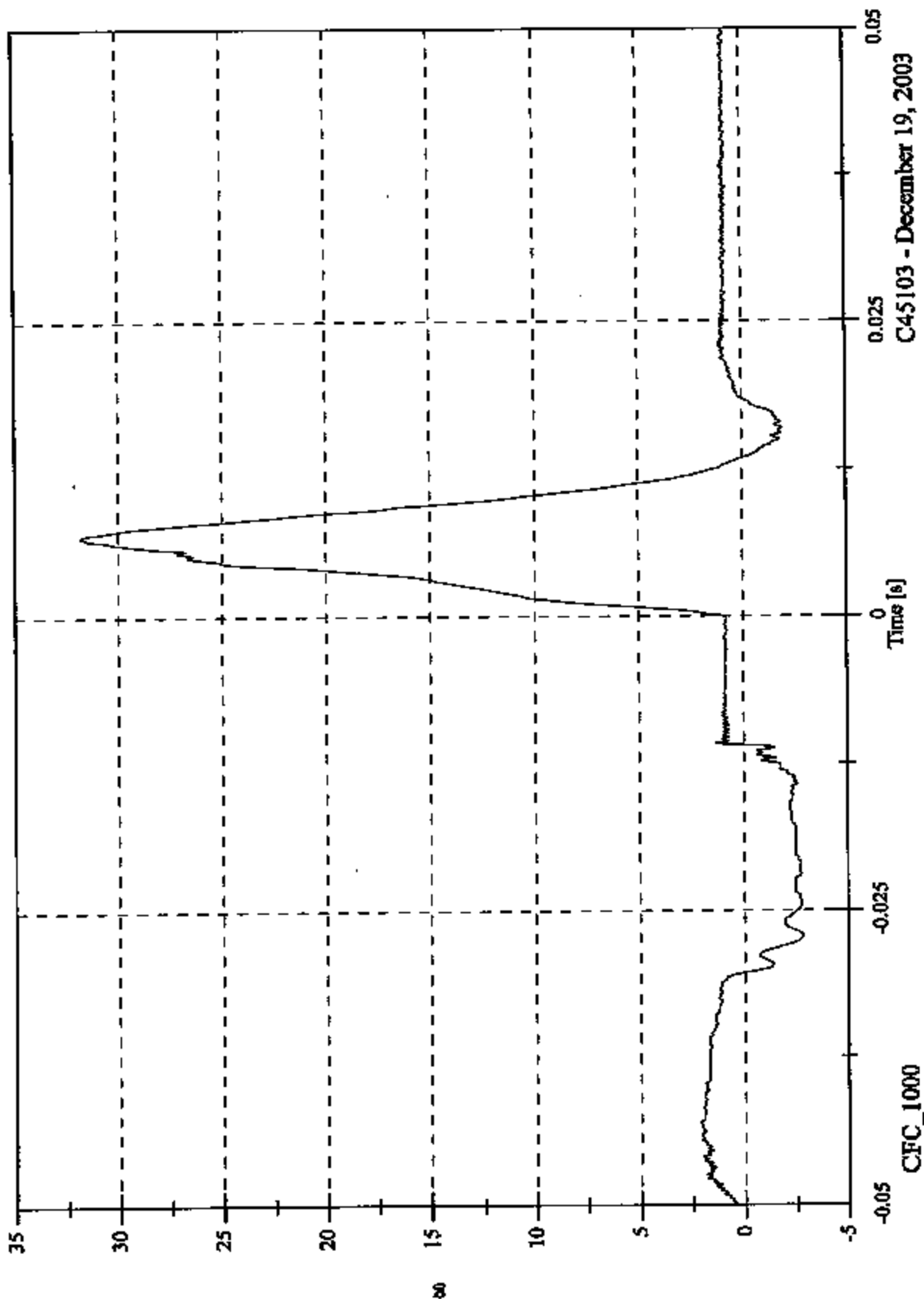


CFC_1000

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 31.8 [g] at 0.007 [s]
Min: -2.8 [g] at -0.027 [s]

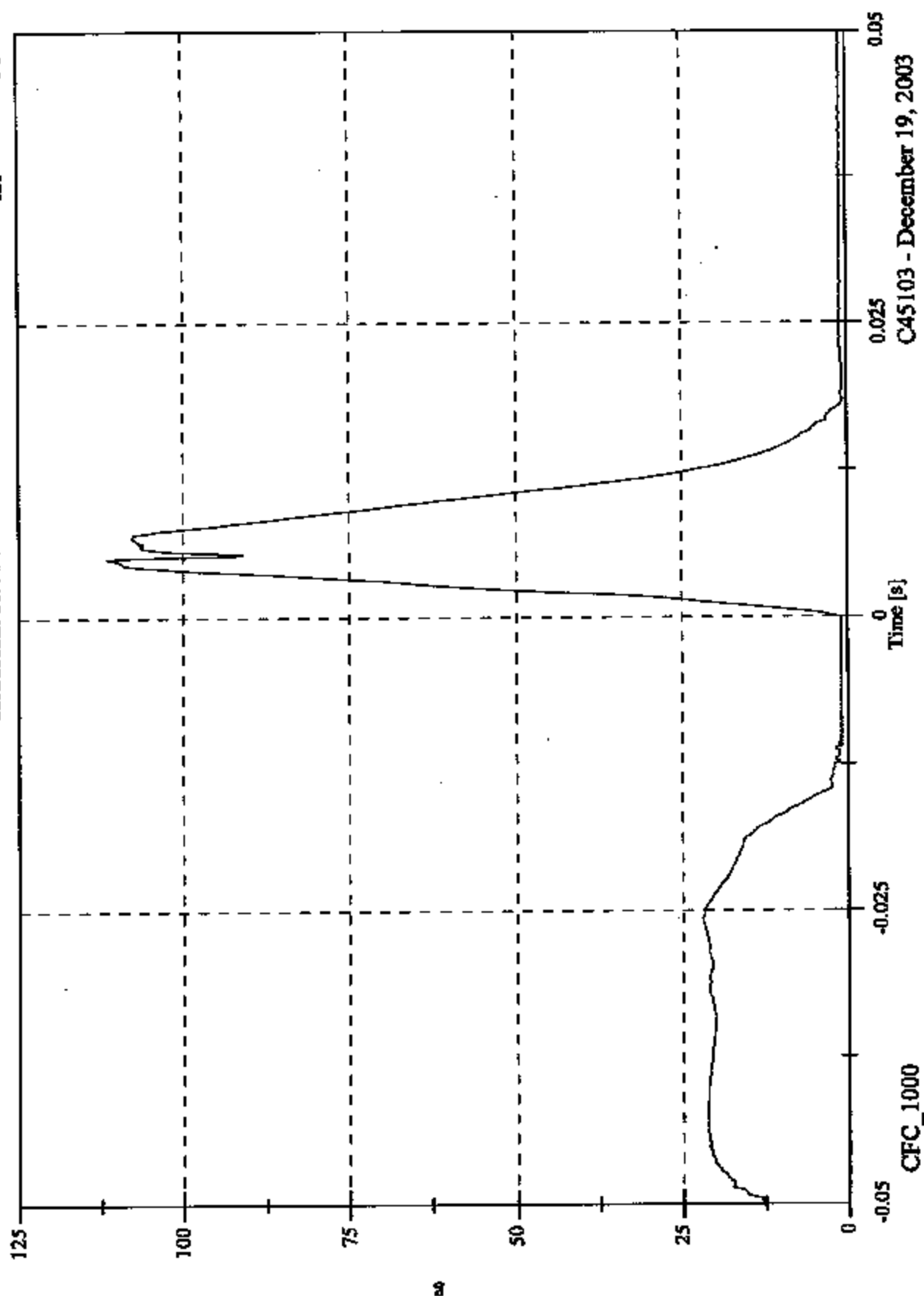


FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 111.5 [g] at 0.005 [s]

Min: 0.6 [g] at 0.018 [s]

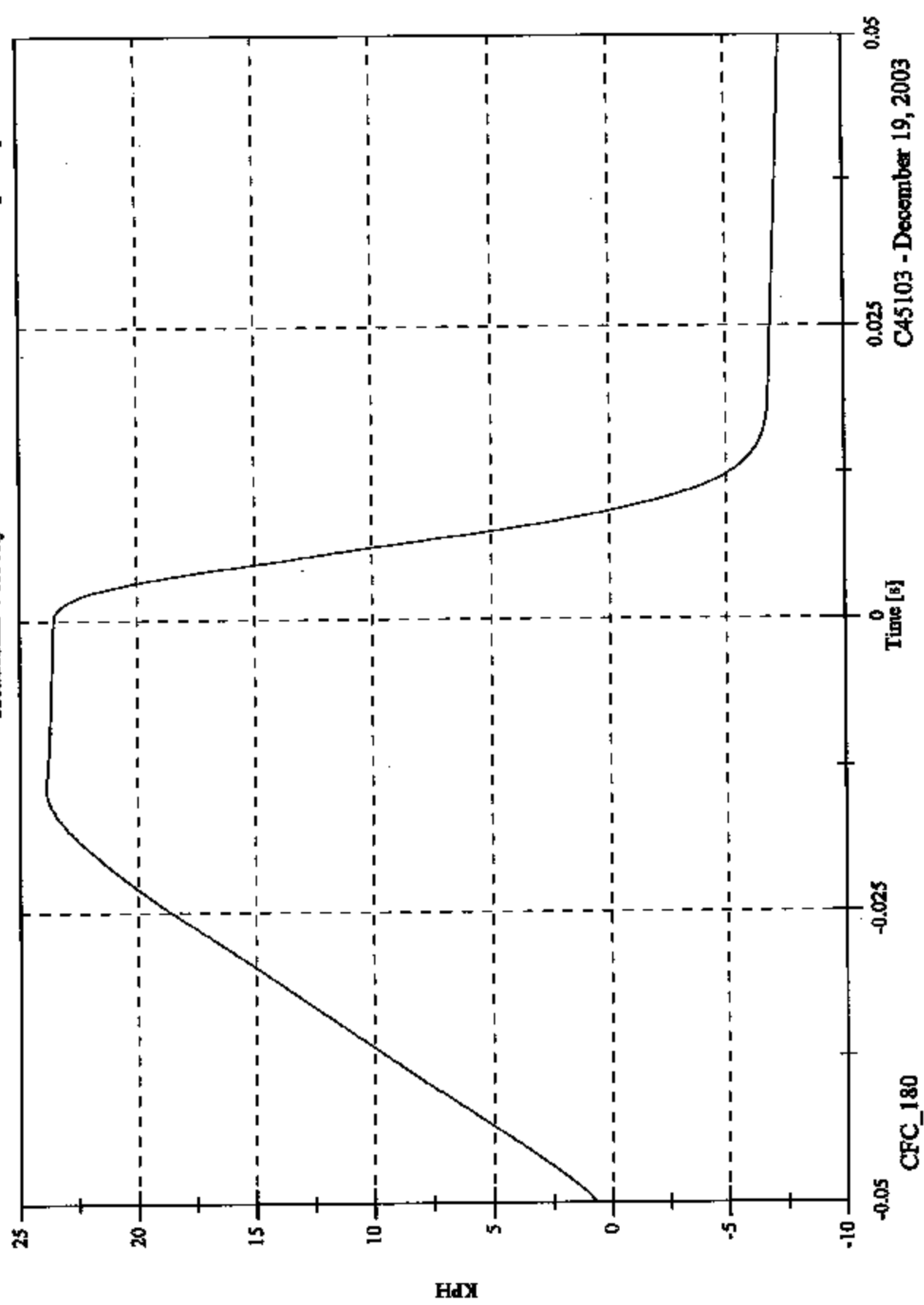


C45103 Passenger Side API Impact Plot #4

Max: 23.9 [KPH] at -0.014 [s]
Min: -7.3 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Velocity



CFC_180

C45103 Passenger Side API Impact Plot #5

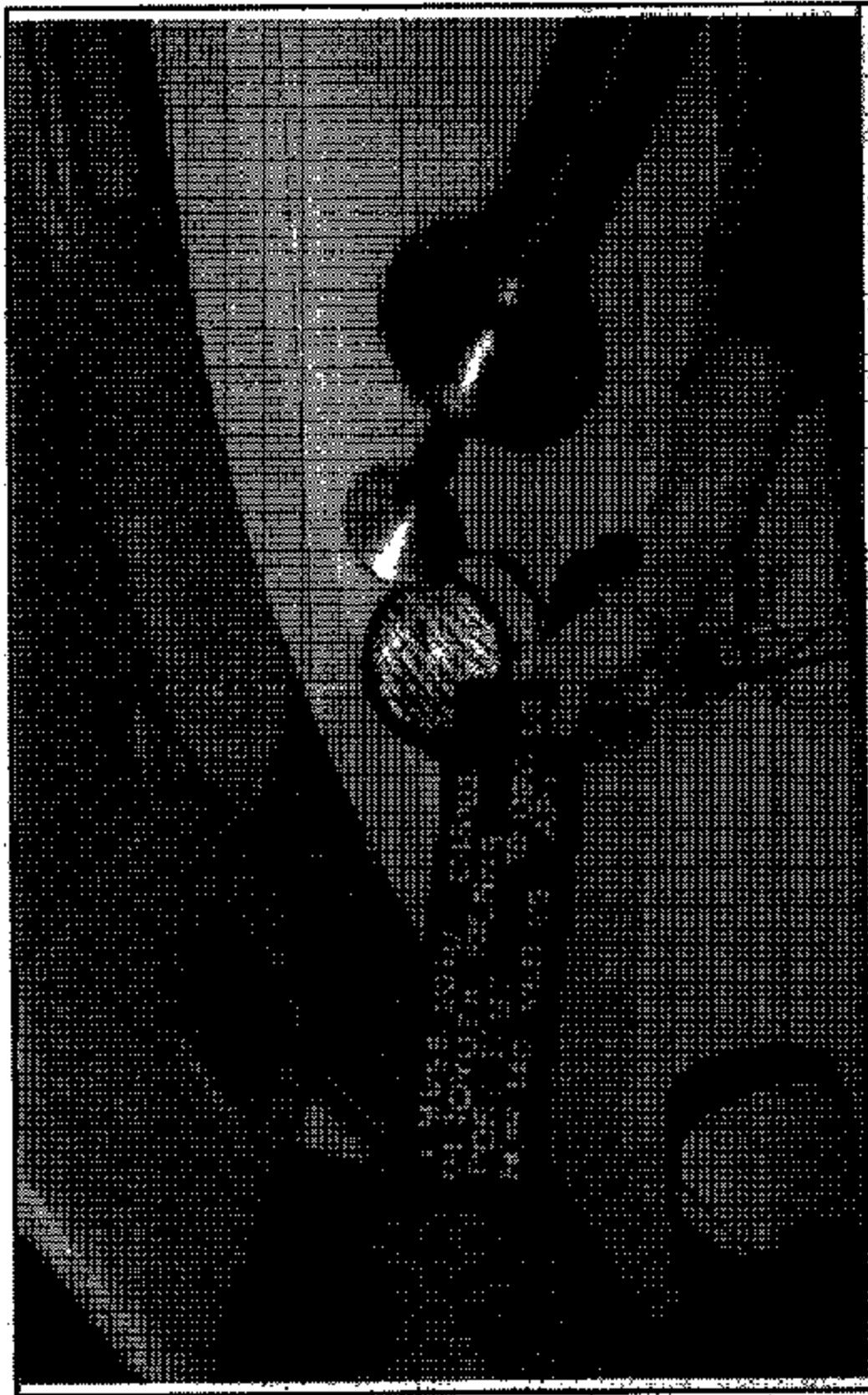


PRE-IMPACT AD

8730-02

20-0618

POST-IMPACT VIEW



VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	STDZA33C34S070133
DATE OF MANUFACTURE:	09/01 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	05
Test Date:	December 19, 2003
Target Location:	B-Pillar
Target Code:	BP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	33°
Ambient Temperature:	21°C
Relative Humidity:	28%
Time of Impact:	14:00
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	5	mm right		mm left
On Centerline	45	mm up		



Free Motion HIC	723.0
HIC(d)	737.7
Impact Velocity (kph)	23.57
HIC T1 (msec)	5.4
HIC T2 (msec)	13.2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - BP1

FMH Headform 0062

Location: BP1

Test Date: December 19, 2003

Work File: BP1

TEST RESULTS

Lab Temperature: 21 C

HICd: 723.0

Lab Humidity: 20 %

HIC (36ms): 737.7

Velocity at Impact: 23.57 KPH

t1: 5.4 msec

t2: 13.2 msec

Free Flight Distance: 214.17 mm

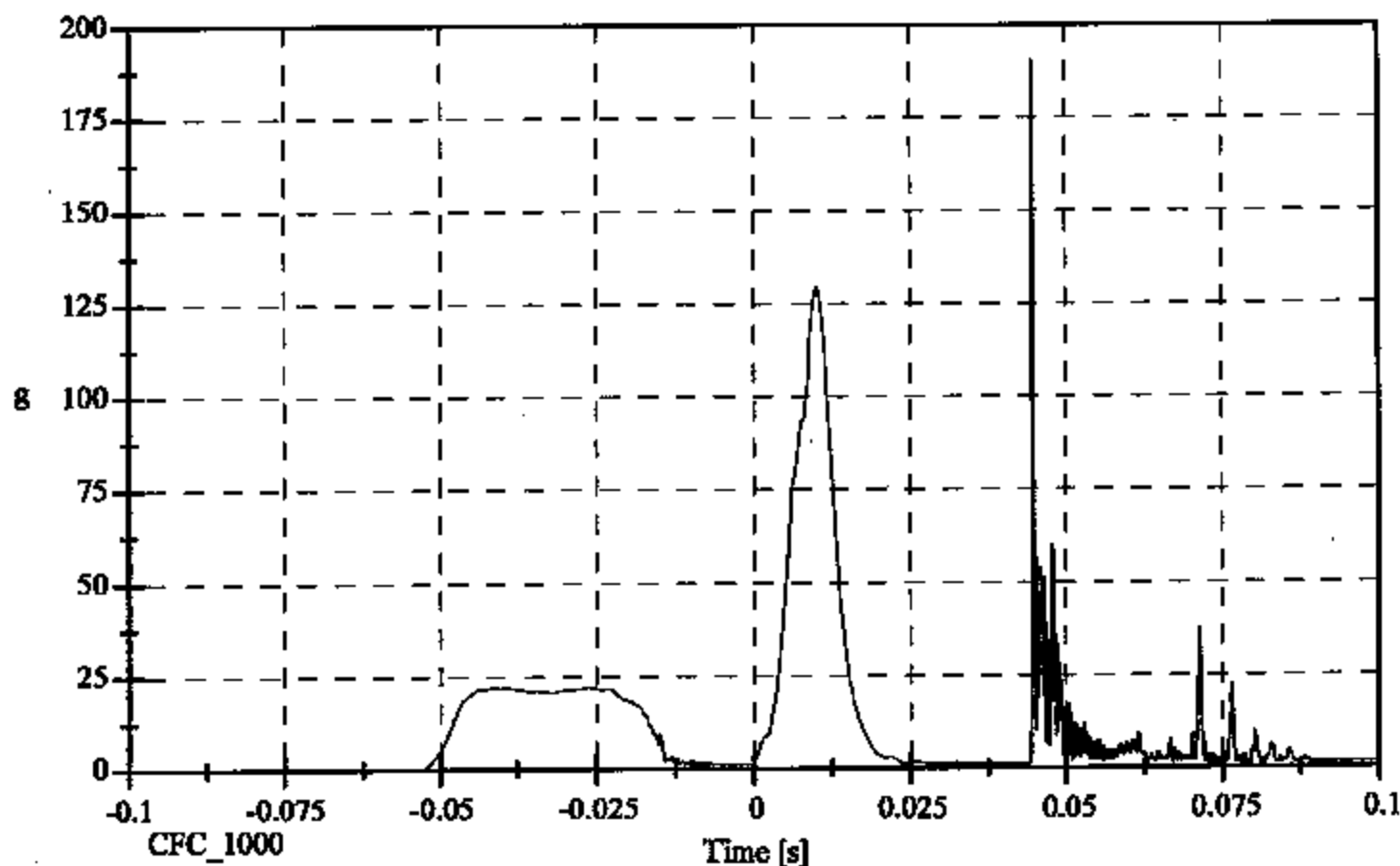
Duration: 7.8 msec

Average Acceleration: 10.6 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 190.3 [g] at 0.045 [s]

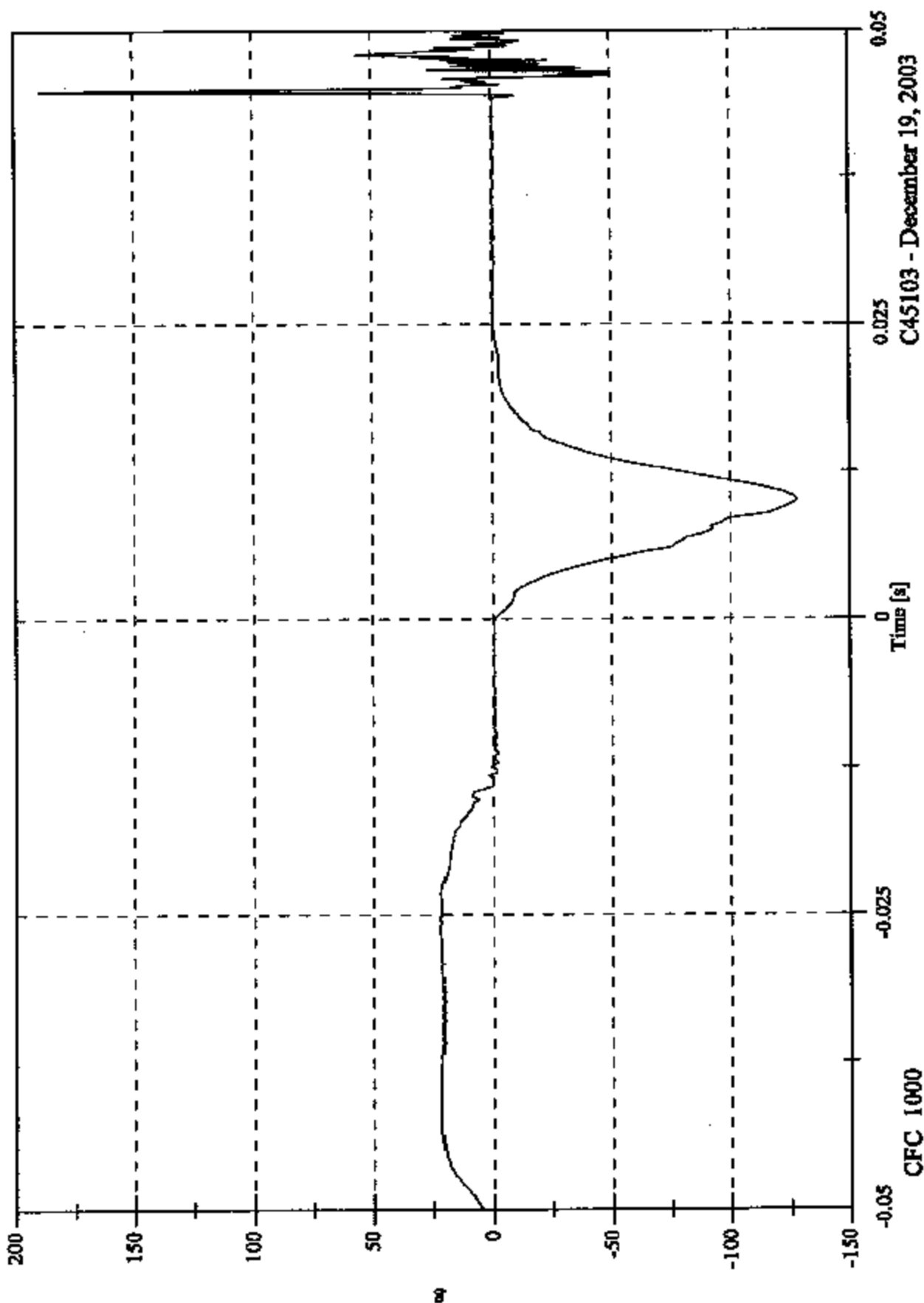
Min: 0.0 [g] at -0.084 [s]



FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 188.9 [g] at 0.045 [s]
Min: -127.7 [g] at 0.010 [s]



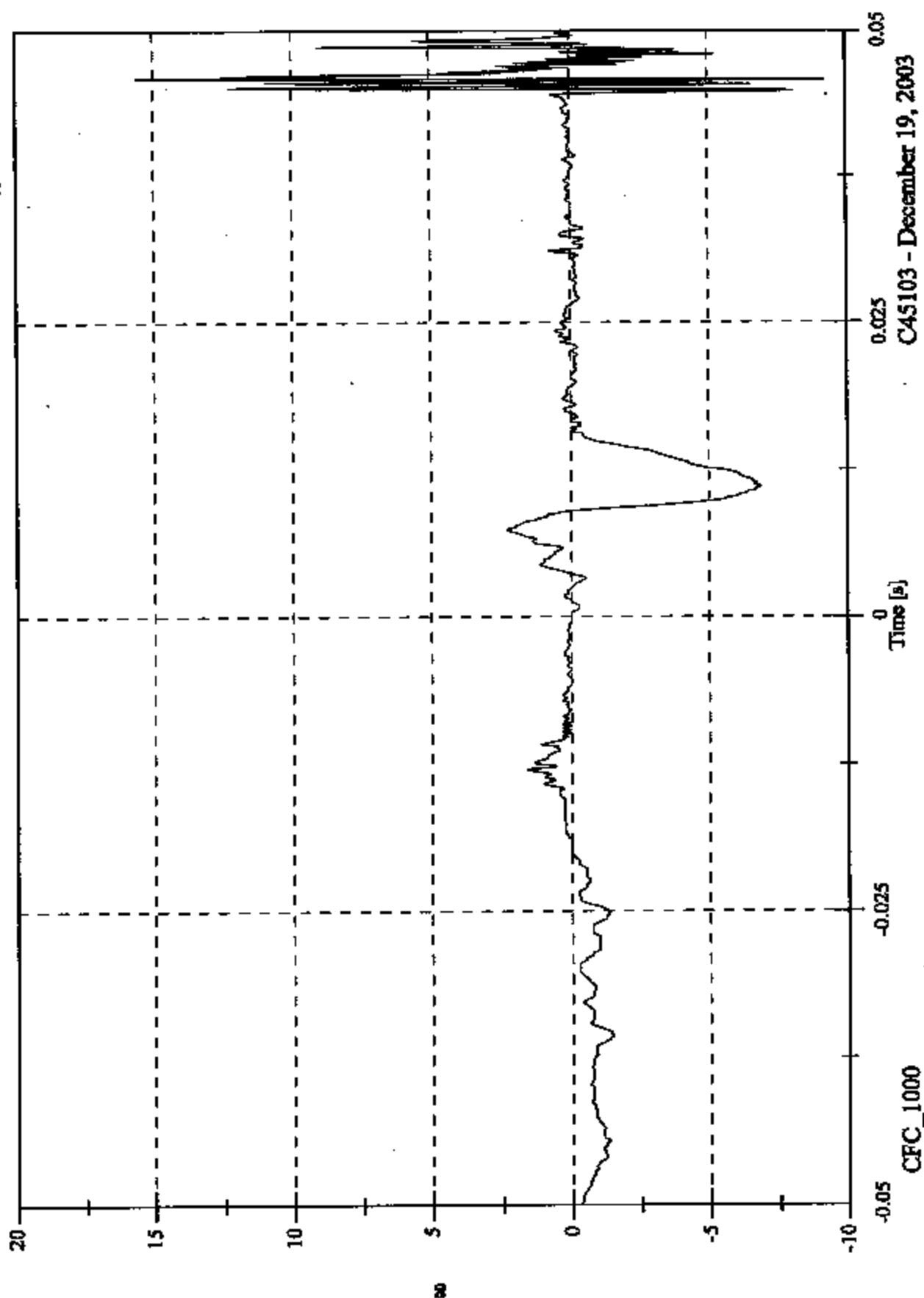
C45103 Passenger Side BP1 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 15.6 [g] at 0.046 [s]

Min: -9.2 [g] at 0.046 [s]



CFC_1000

Time [s]

-0.025

0.025

0.05

C45103 - December 19, 2003

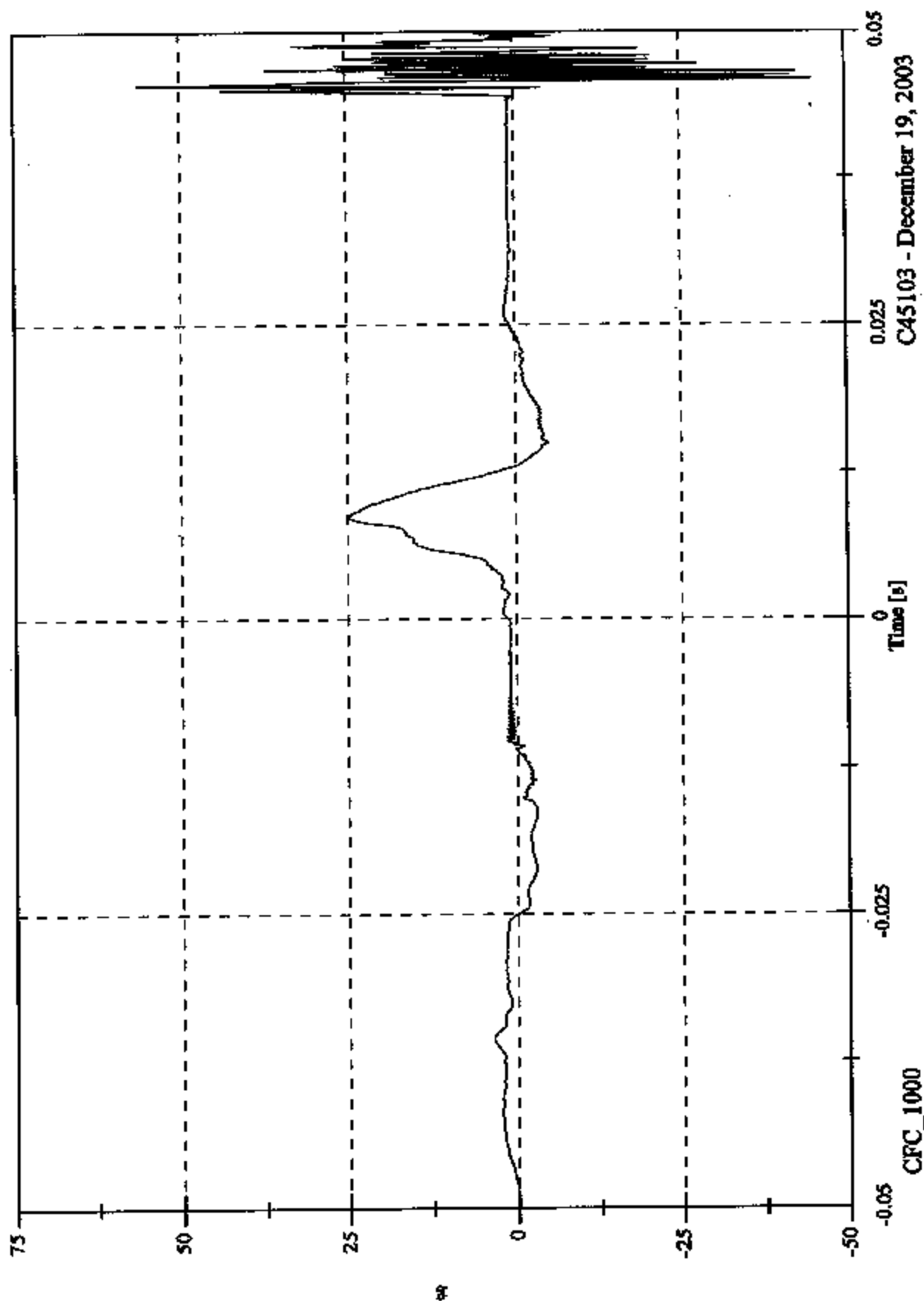
C45103 Passenger Side BP1 Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 56.2 [g] at 0.045 [s]

Min: -44.9 [g] at 0.046 [s]



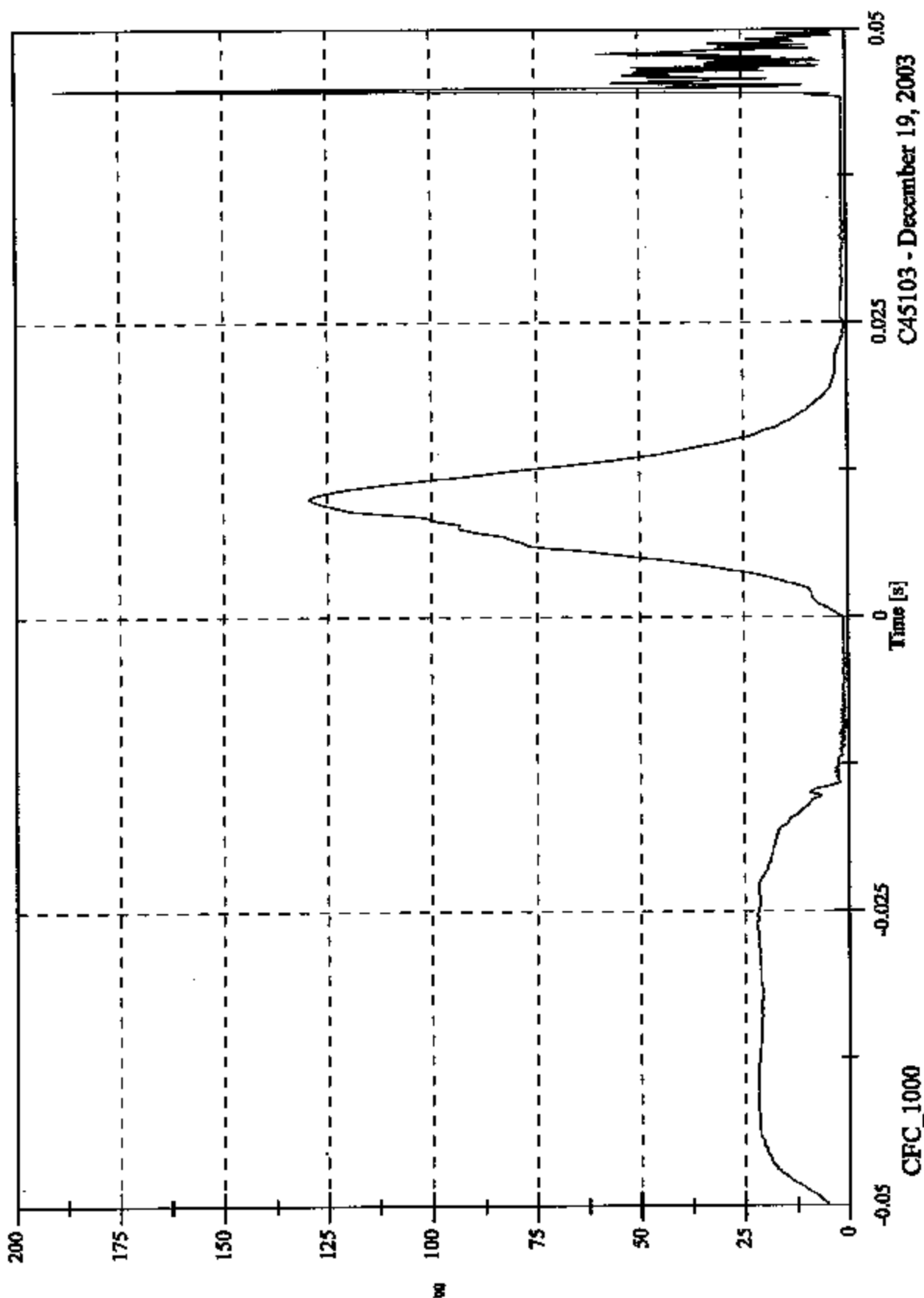
C45103 - December 19, 2003

C45103 Passenger Side BP1 Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 190.3 [g] at 0.045 [s]
Min: 0.4 [g] at -0.009 [s]

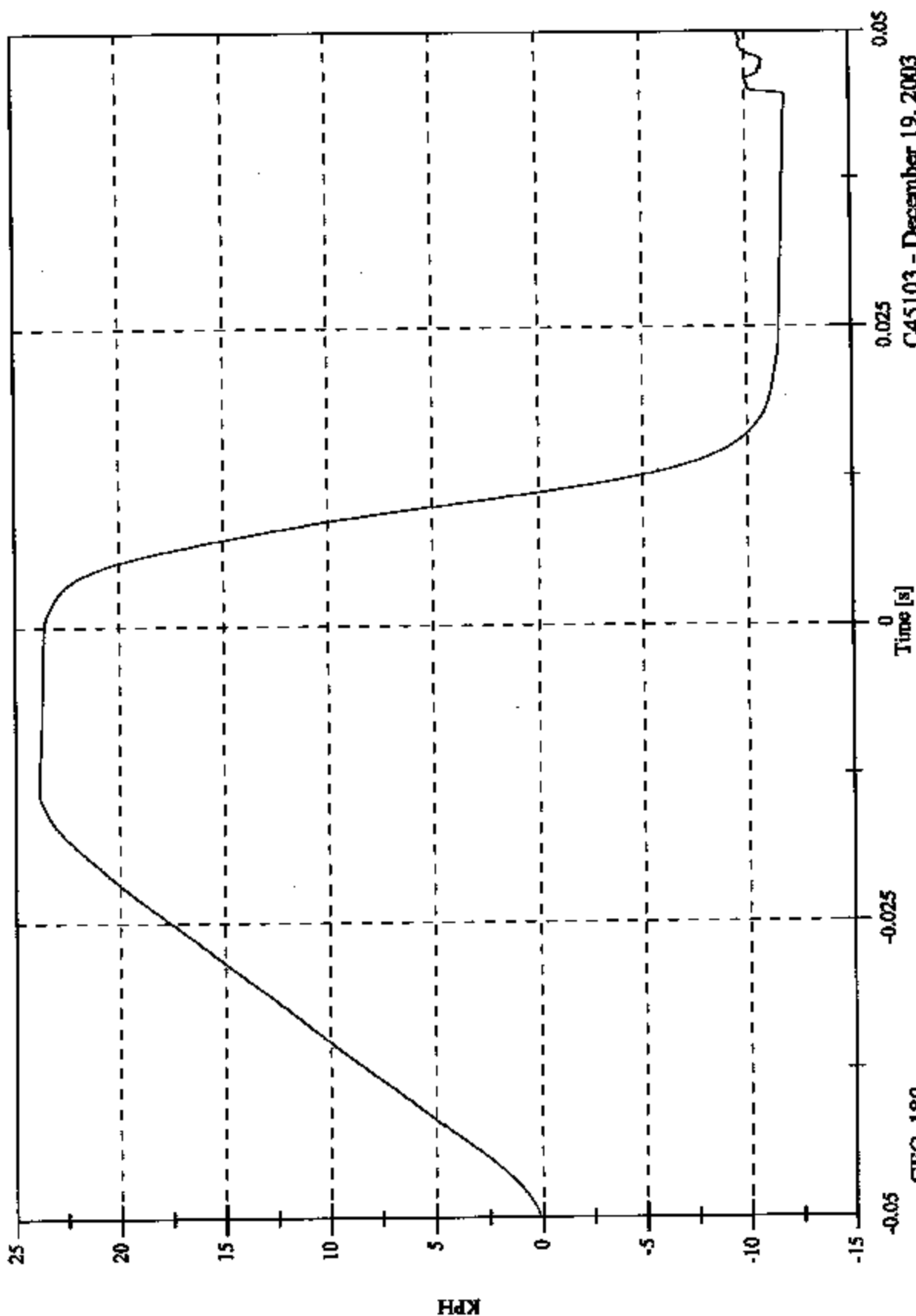


C45103 Passenger Side BP1 Impact Plot #4

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Velocity

Max: 23.9 [KPH] at -0.013 [s]

Min: -11.9 [KPH] at 0.044 [s]



CFC_180

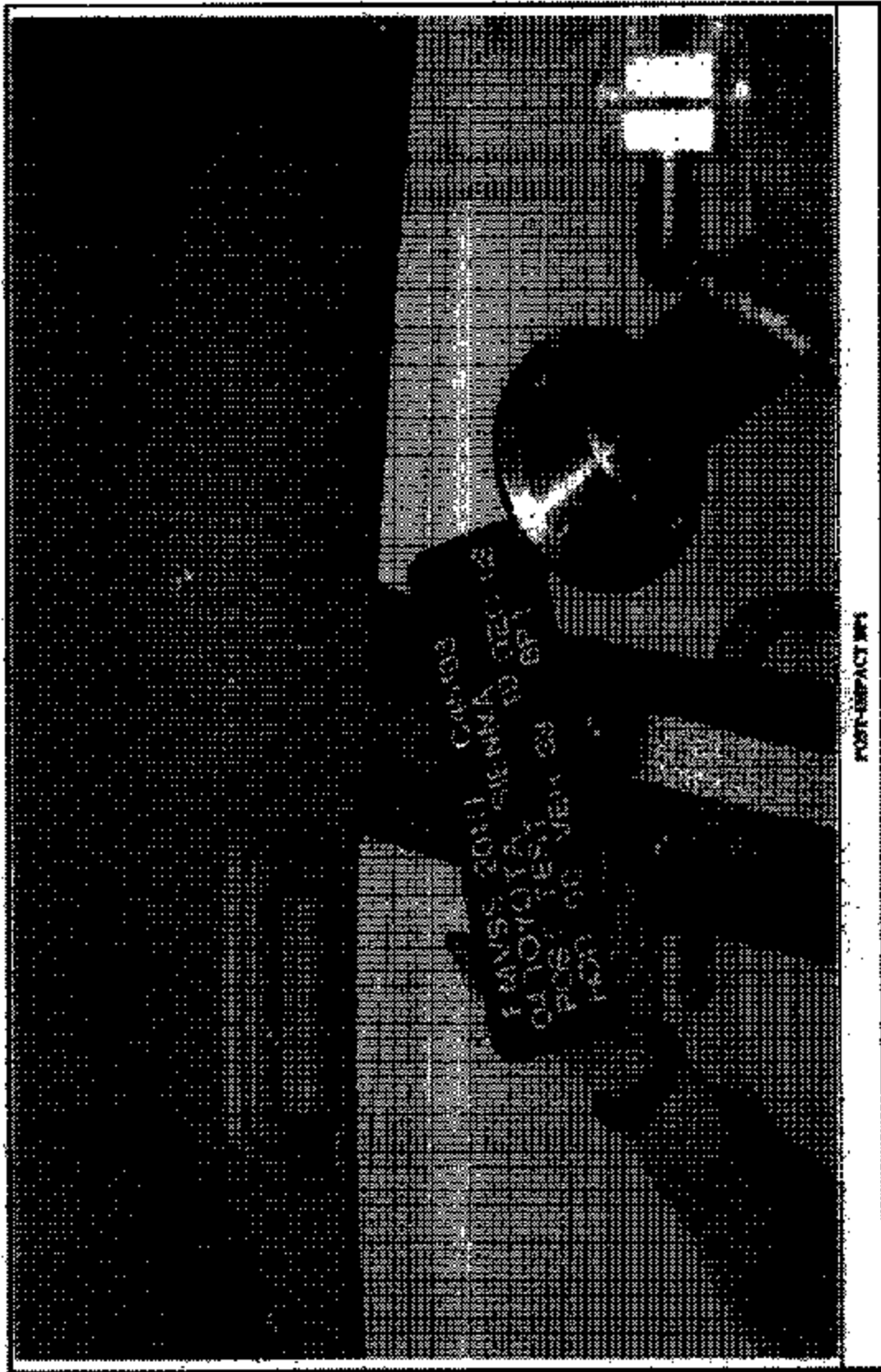
C45103 Passenger Side BP1 Impact Plot #5

20-0618



PRE-IMPACT BP1

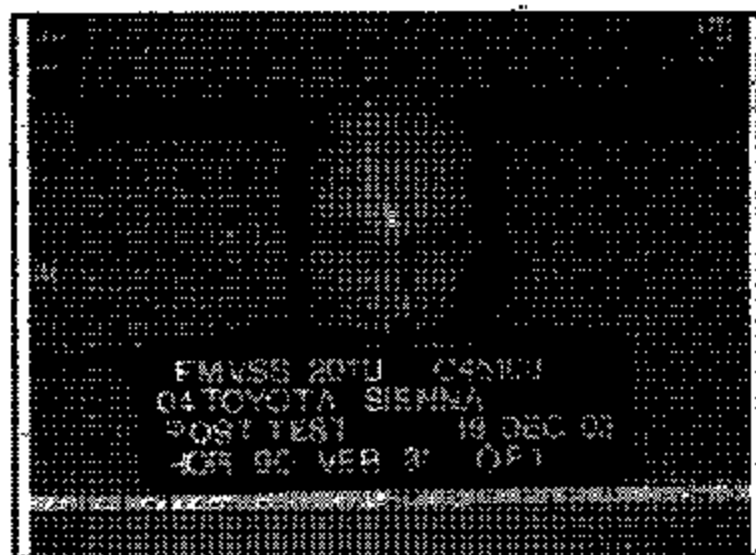
8730-02



VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C34S070133
DATE OF MANUFACTURE:	09/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	06
Test Date:	December 19, 2003
Target Location:	Other Pillar
Target Code:	OP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	31°
Ambient Temperature:	21°C
Relative Humidity:	30%
Time of Impact:	14:40
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	4	mm right	☒ mm left
On Centerline	28	mm up	



POST-IMPACT OPT HEADFORM

Free Motion HIC	775.1
HIC(d)	751.2
Impact Velocity (kph)	23.55
HIC T1 (msec)	4.6
HIC T2 (msec)	11.8

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - OP1

FMH Headform 805

Location: OP1

Test Date: December 19, 2003

Work File: OP1

TEST RESULTS

Lab Temperature: 21 C

HICd: 751.2

Lab Humidity: 20 %

HIC (36ms): 775.1

Velocity at Impact: 23.55 KPH

t1: 4.6 msec

t2: 11.8 msec

Free Flight Distance: 221.64 mm

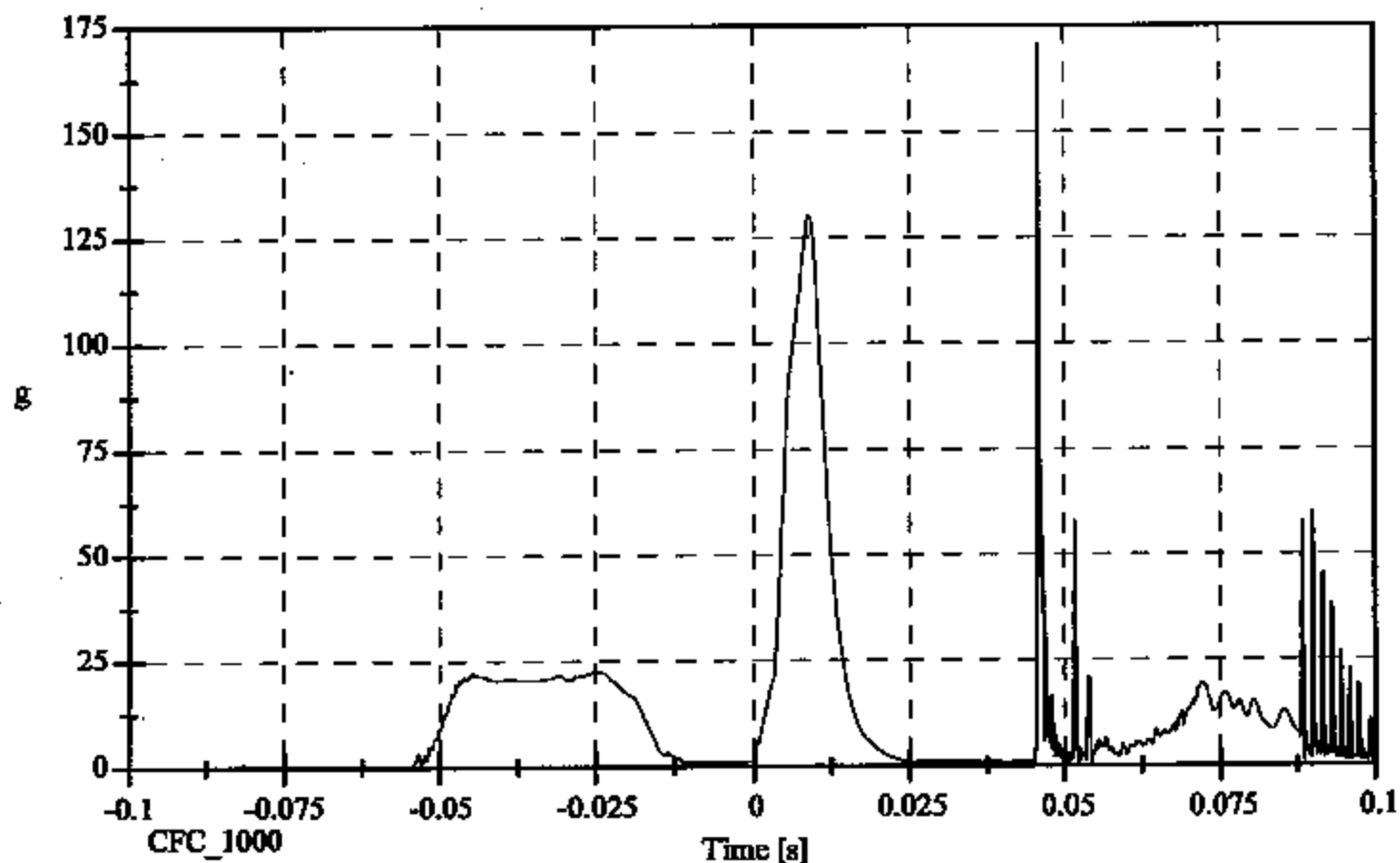
Duration: 7.2 msec

Average Acceleration: 11.7 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 170.6 [g] at 0.046 [s]

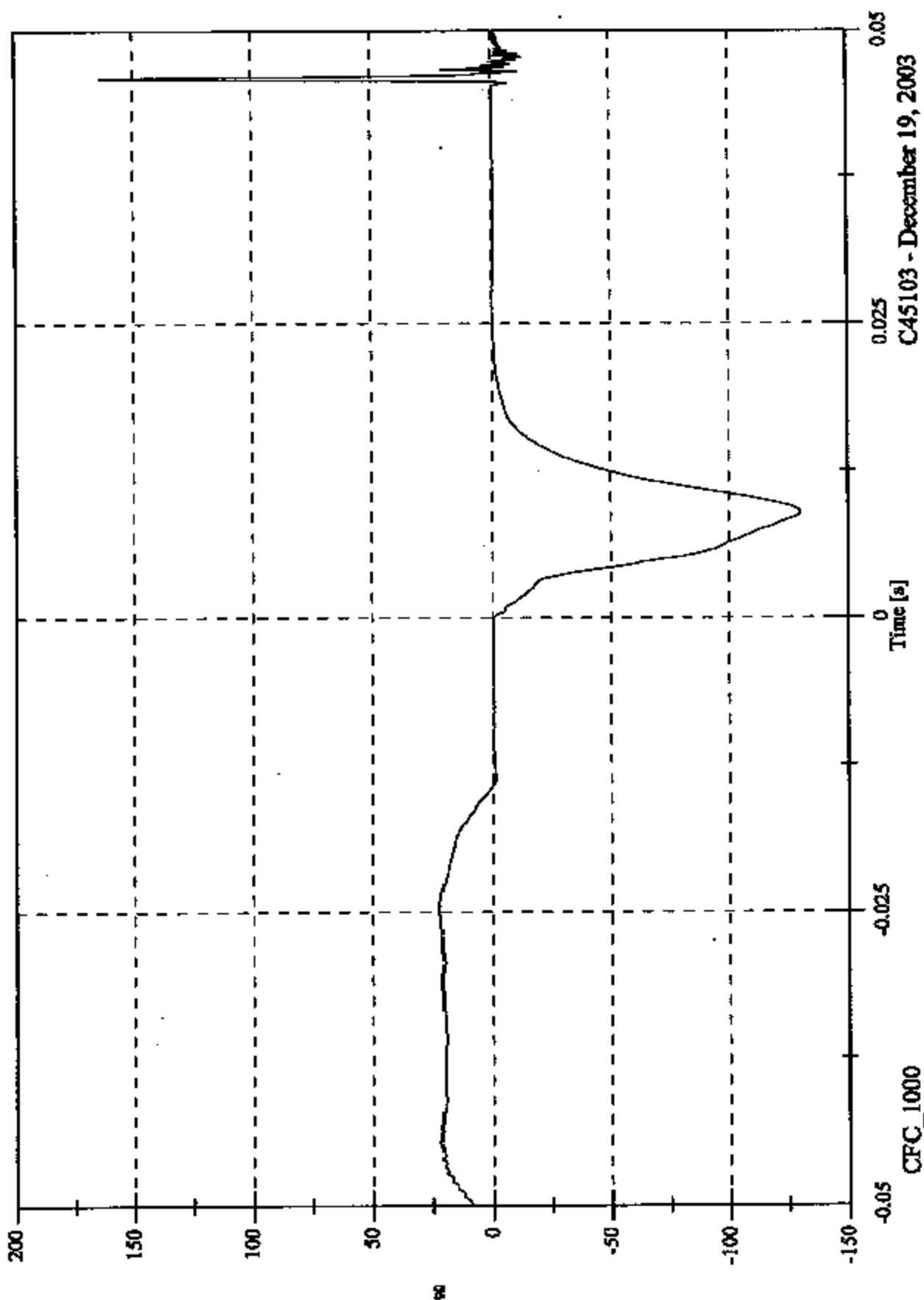
Min: 0.0 [g] at -0.089 [s]



FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 163.9 [g] at 0.046 [s]
Min: -130.2 [g] at 0.009 [s]



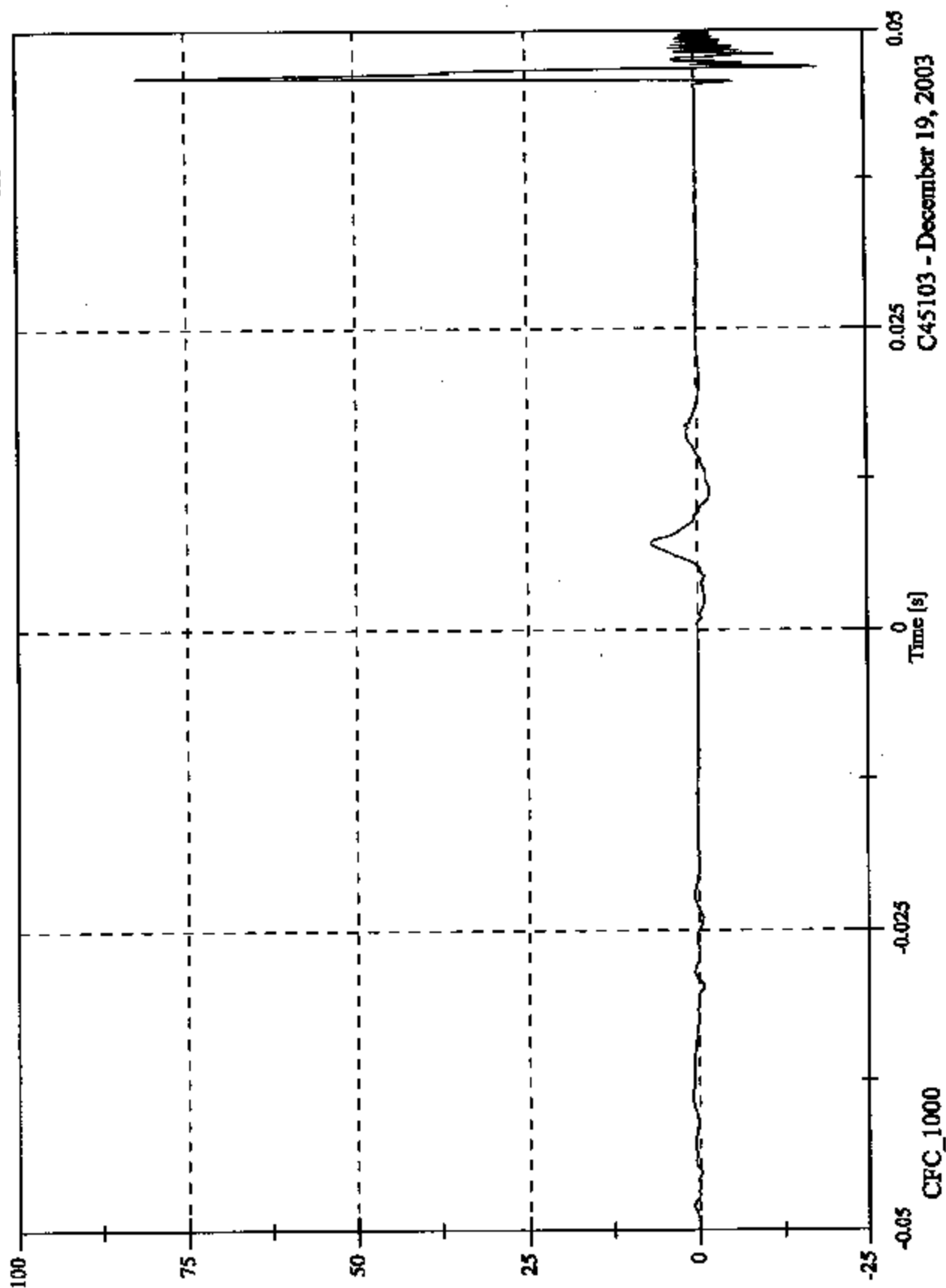
C45103 Passenger Side OP1 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 82.2 [g] at 0.046 [s]

Min: -18.2 [g] at 0.047 [s]



CFC_1000

Time [s]

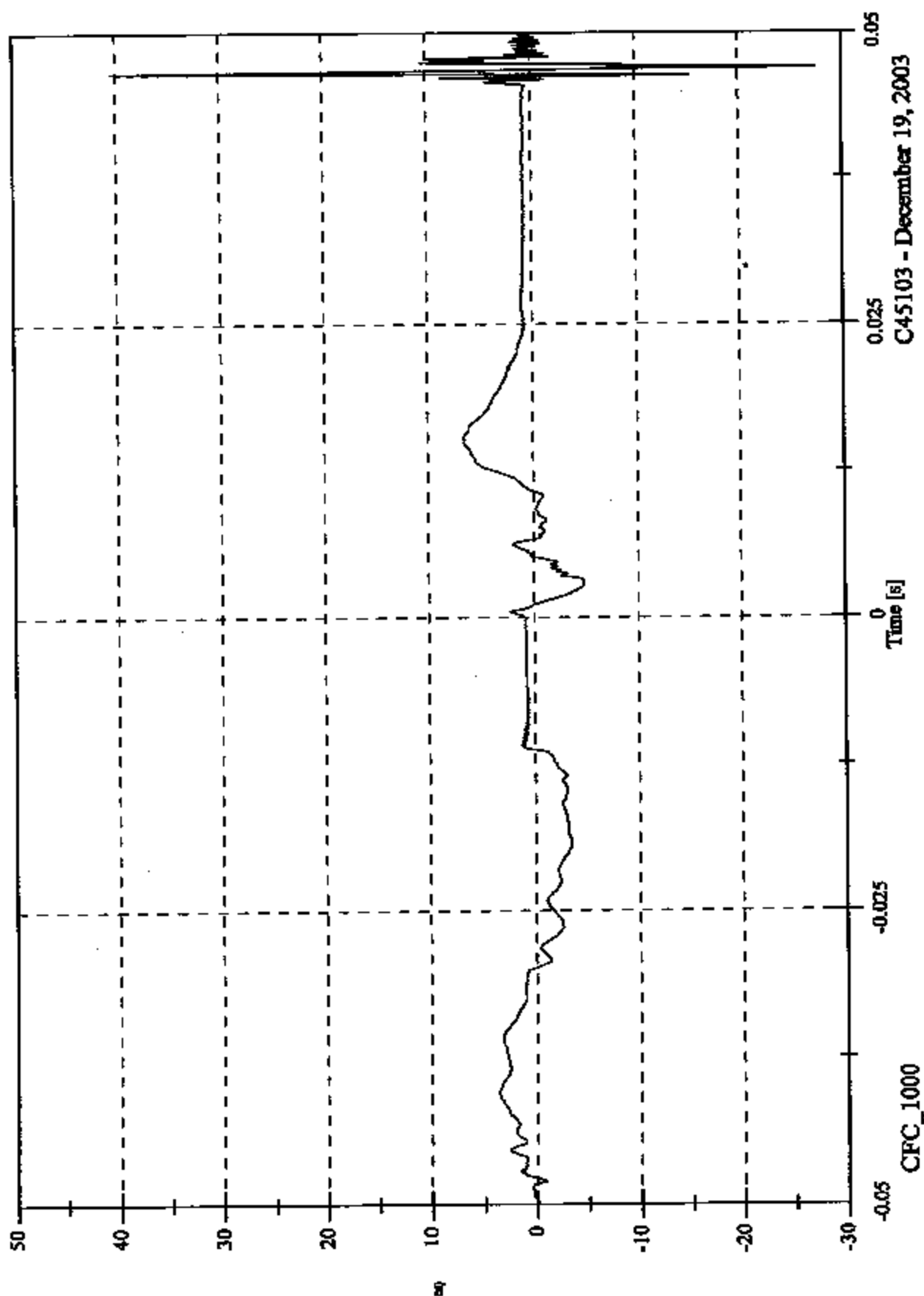
C45103 - December 19, 2003

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 40.5 [g] at 0.046 [s]

Min: -27.4 [g] at 0.047 [s]

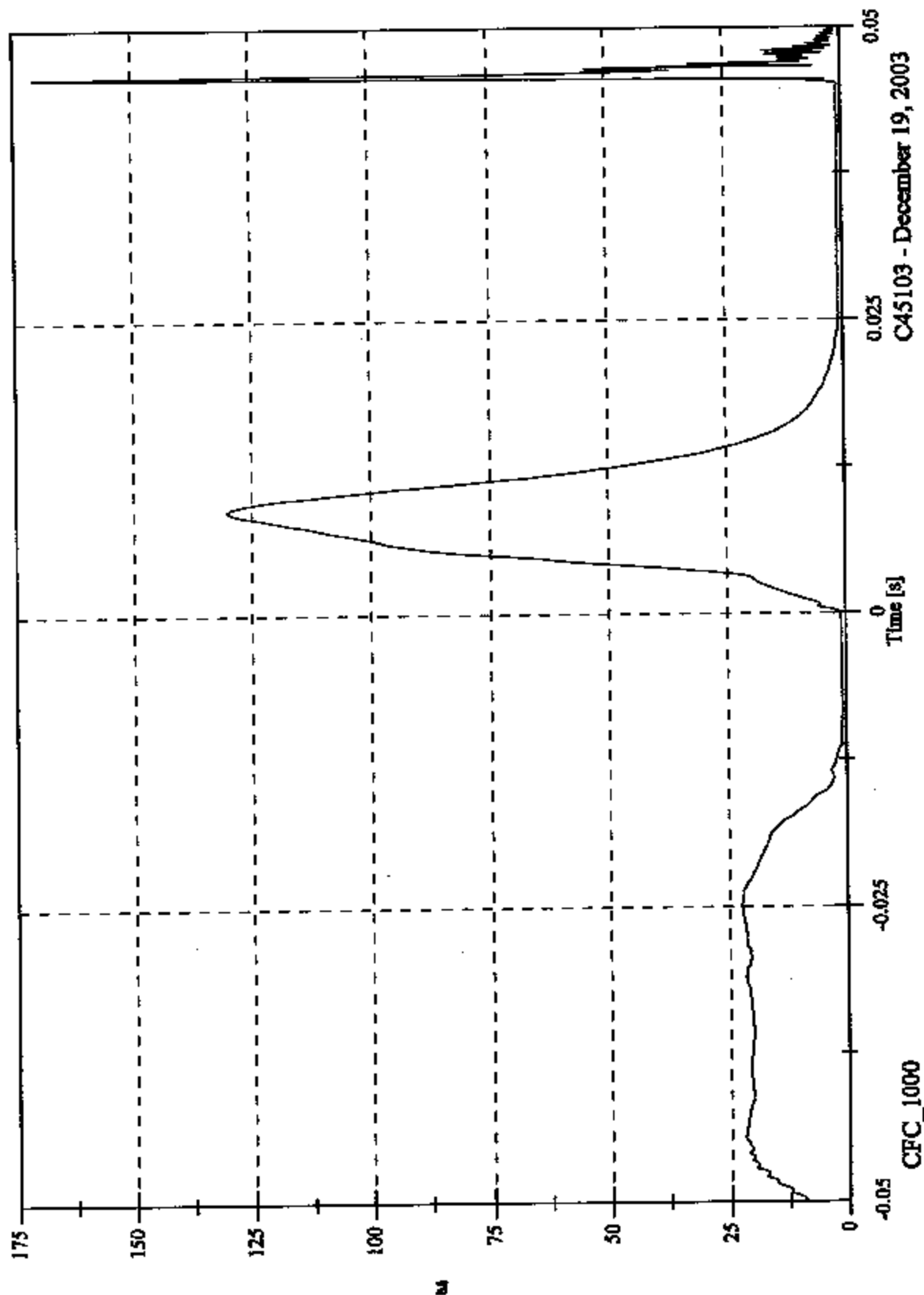


C45103 Passenger Side OP1 Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 170.6 [g] at 0.046 [s]
Min: 0.5 [g] at -0.011 [s]

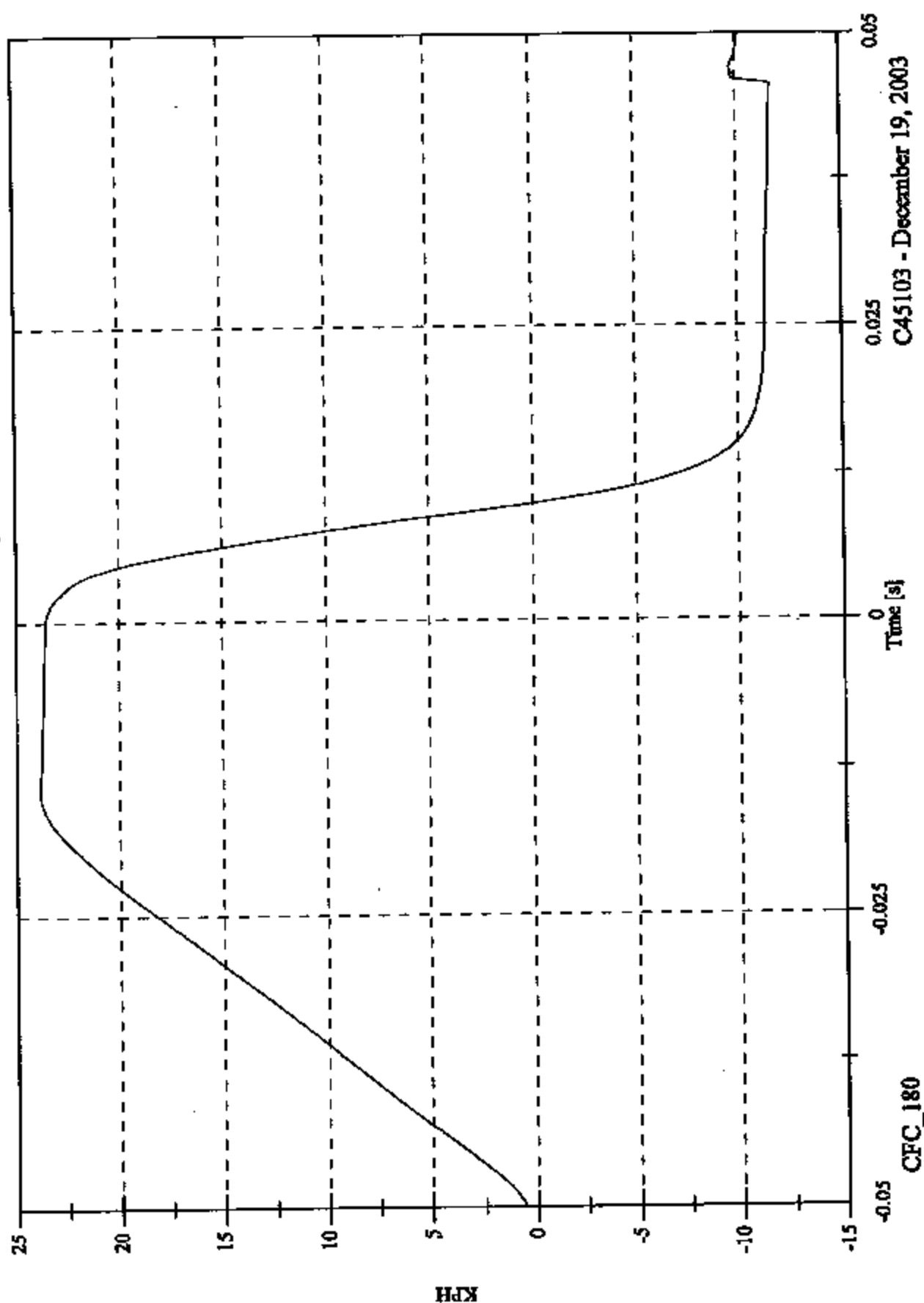


C45103 Passenger Side OP1 Impact Plot #4

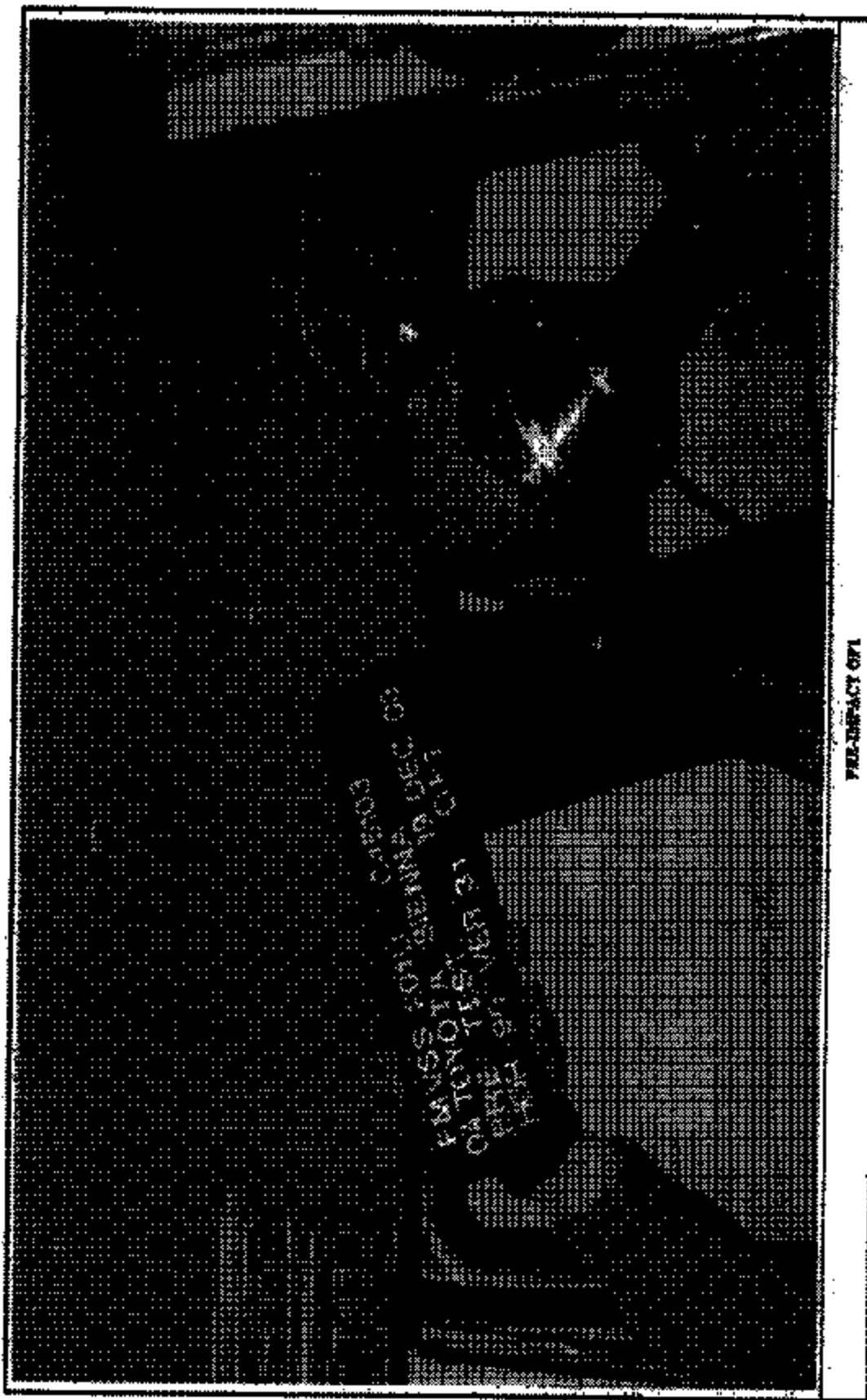
Max: 23.9 [KPH] at -0.014 [s]
Min: -11.7 [KPH] at 0.045 [s]

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Velocity

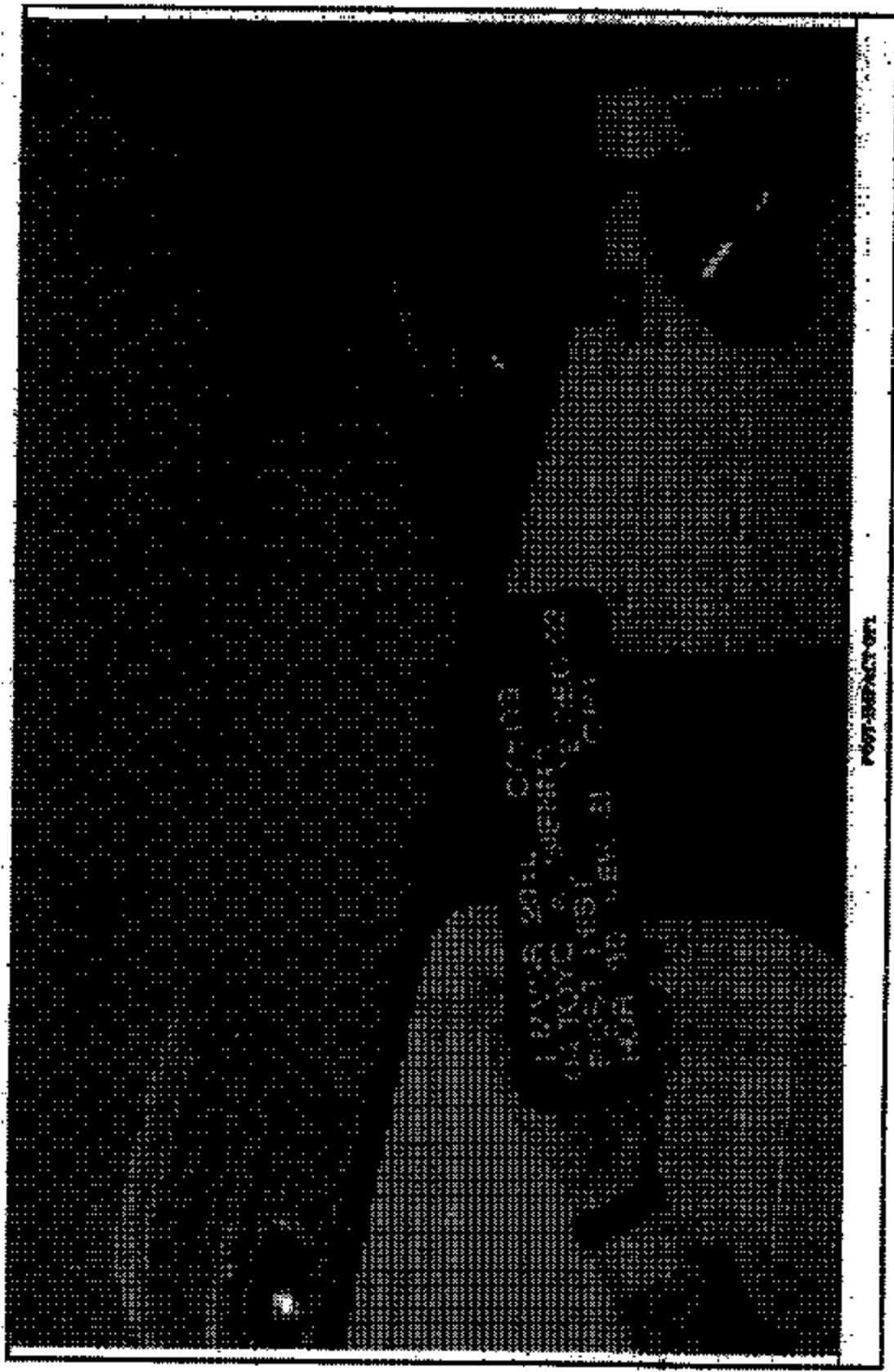


C45103 Passenger Side OPI Impact Plot #5



FBI-IMPACT 071

8730-02



POST-REPRODUCTION

8730-02

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TD2A21C84S070133
DATE OF MANUFACTURE:	09/11(SHE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	07
Test Date:	December 19, 2003
Target Location:	Rear Header
Target Code:	RH
Horizontal Impact Angle:	0°
Vertical Impact Angle:	90°
Ambient Temperature:	21°C
Relative Humidity:	20%
Time of Impact:	15:20
Headform Number:	0642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	24	☒ mm right	☐ mm left
On Centerline	19	☐ mm up	



POST-IMPACT RH HEADFORM

Free Motion HIC	479.1
HIC(d)	328.1
Impact Velocity (kph)	23.36
HIC T1 (msec)	4.5
HIC T2 (msec)	14.7

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - RH

FMH Headform 0642

Location: RH

Test Date: December 19, 2003

Work File: RH

TEST RESULTS

Lab Temperature: 21 C

HICd: 528.1

Lab Humidity: 20 %

HIC (36ms): 479.4

Velocity at Impact: 23.56 KPH

t1: 4.5 msec

t2: 14.3 msec

Duration: 9.8 msec

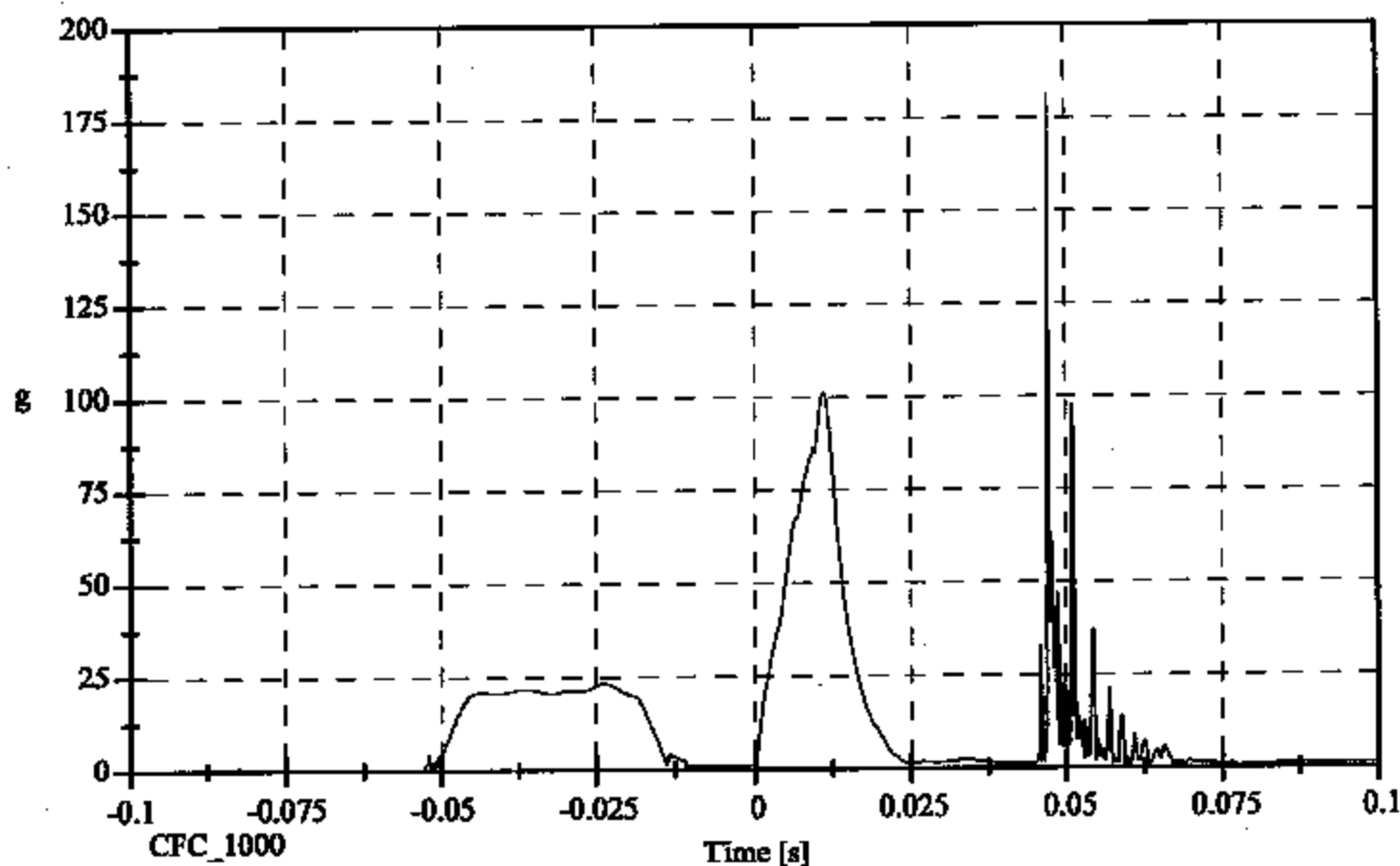
Free Flight Distance: 212.31 mm

Average Acceleration: 10.4 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 181.1 [g] at 0.047 [s]

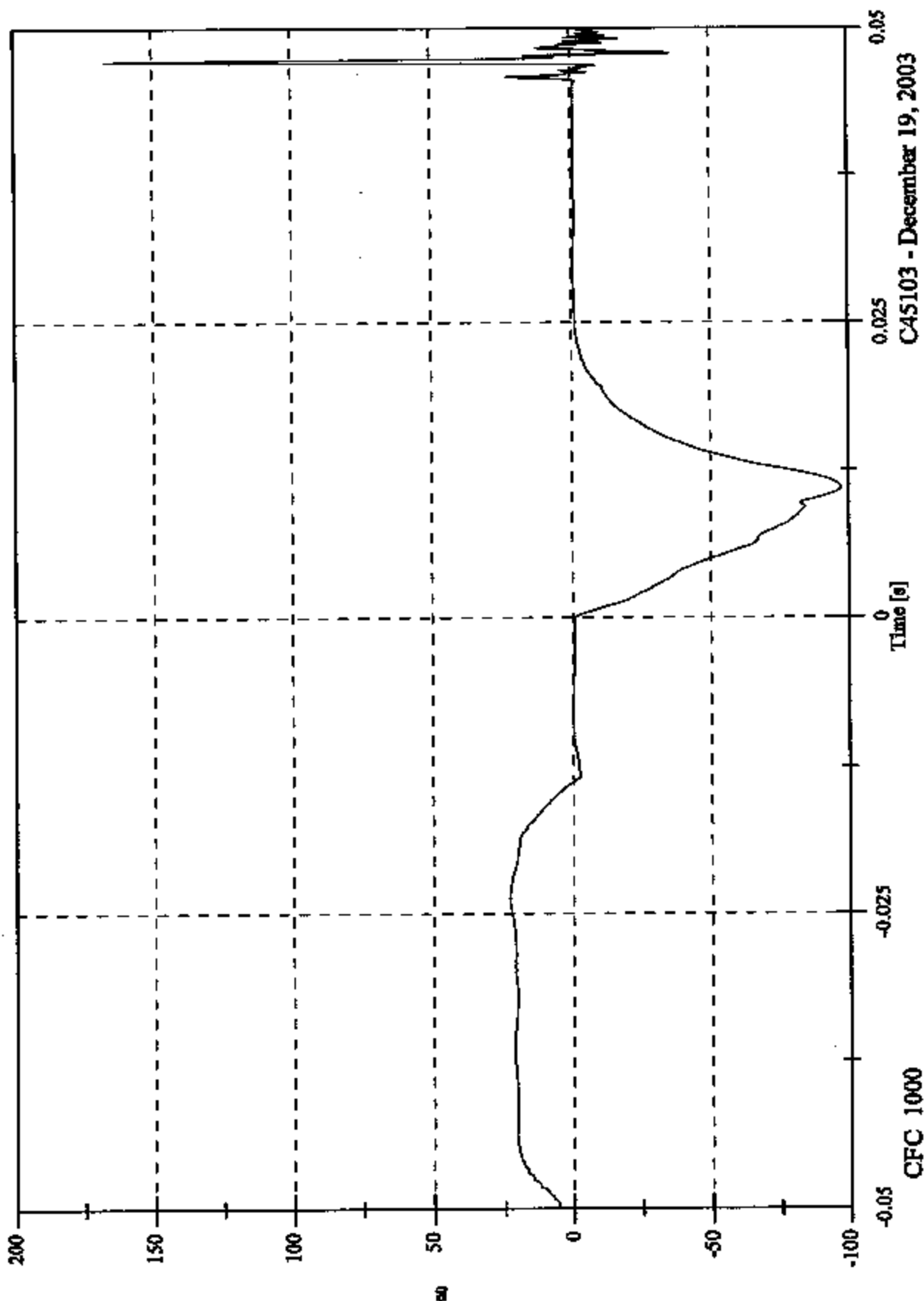
Min: 0.0 [g] at -0.085 [s]



FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 166.9 [g] at 0.047 [s]
Min: -97.0 [g] at 0.011 [s]



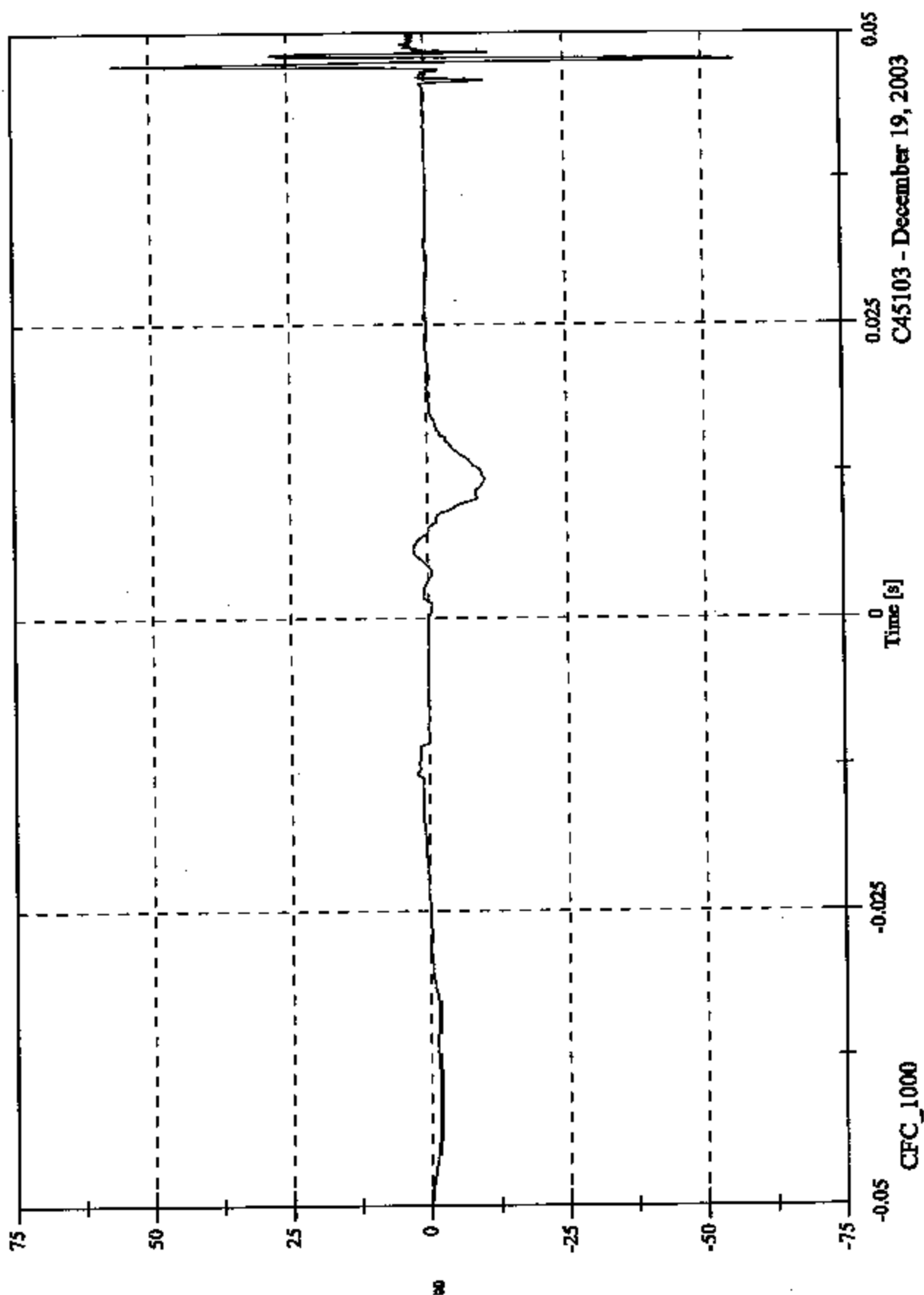
C45103 Passenger Side RH Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 56.9 [g] at 0.047 [s]

Min: -56.0 [g] at 0.048 [s]



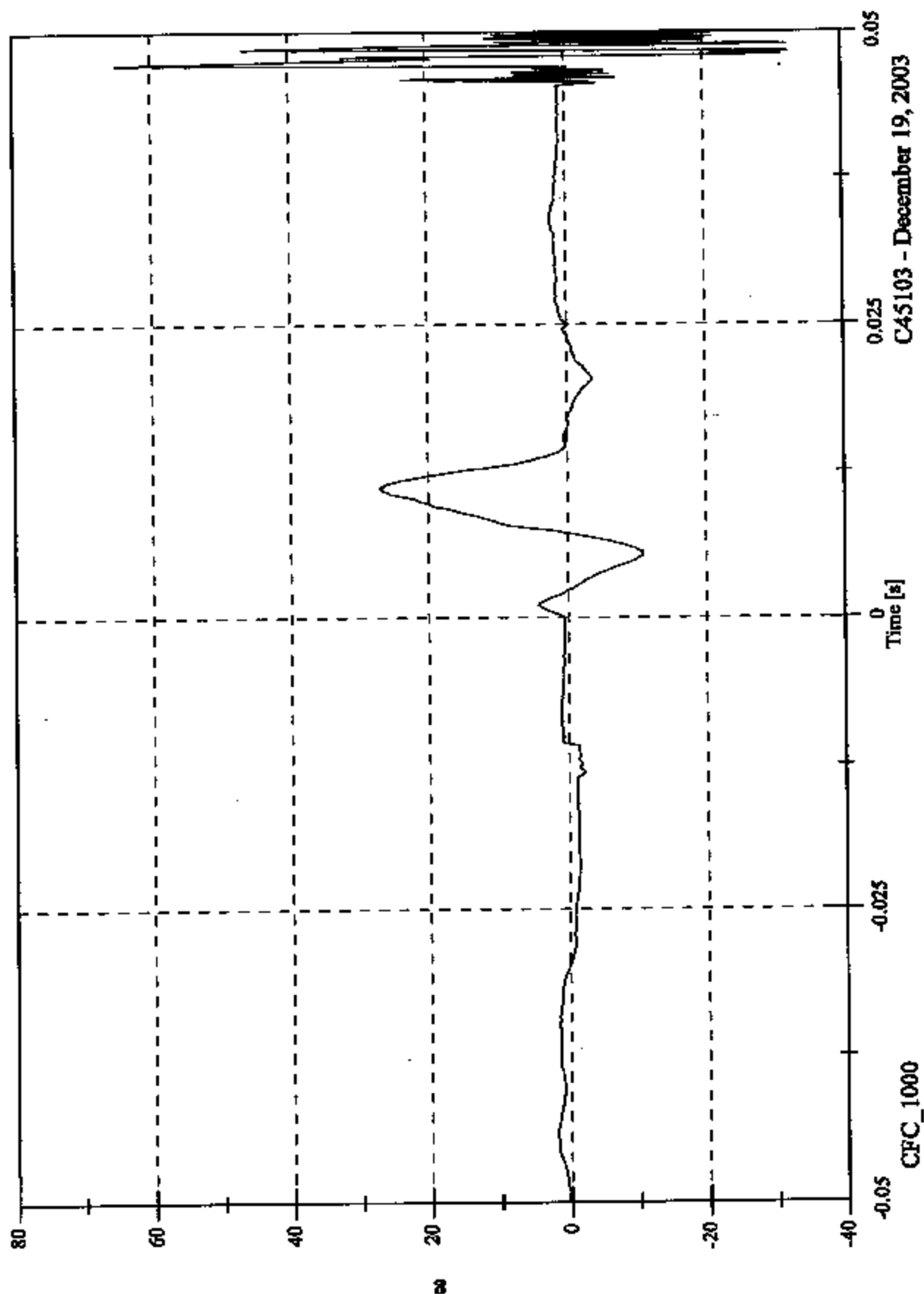
C45103 Passenger Side RH Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 64.9 [g] at 0.047 [s]

Min: -32.3 [g] at 0.048 [s]



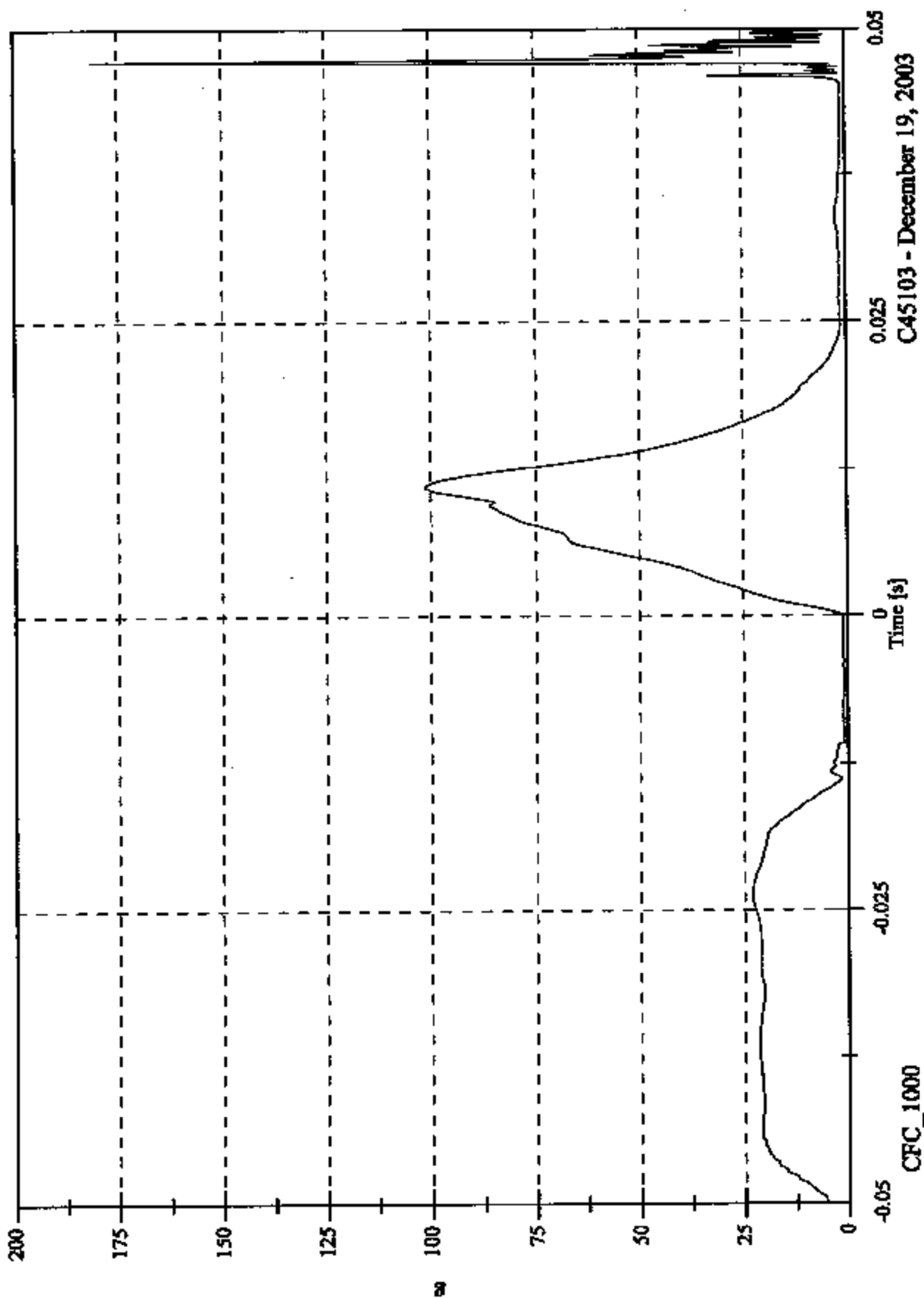
C45103 - December 19, 2003

C45103 Passenger Side RH Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 181.1 [g] at 0.047 [s]
Min: 0.6 [g] at -0.011 [s]

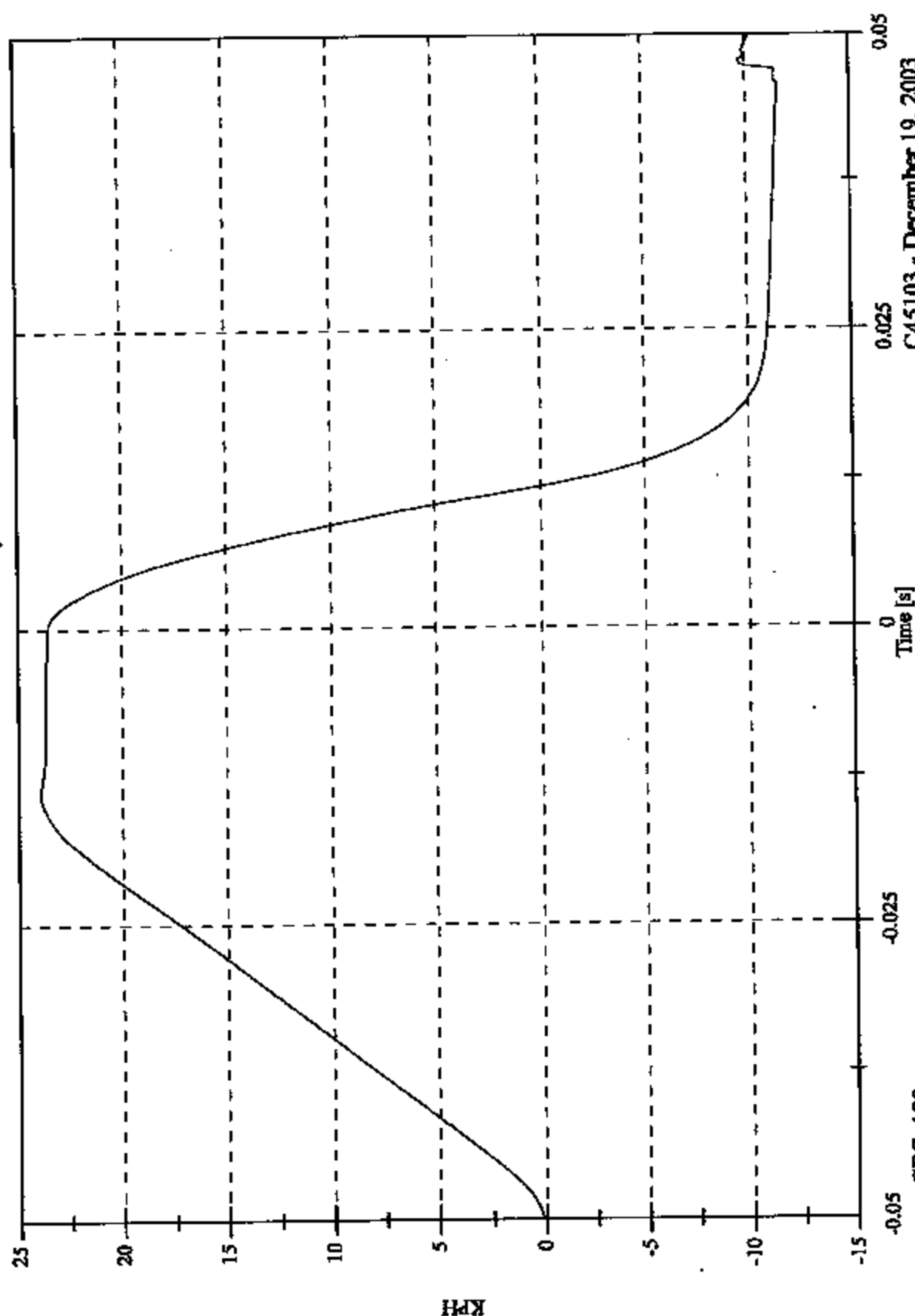


C45103 Passenger Side RH Impact Plot #4

Max: 23.9 [KPH] at -0.014 [s]
Min: -11.6 [KPH] at 0.046 [s]

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Velocity



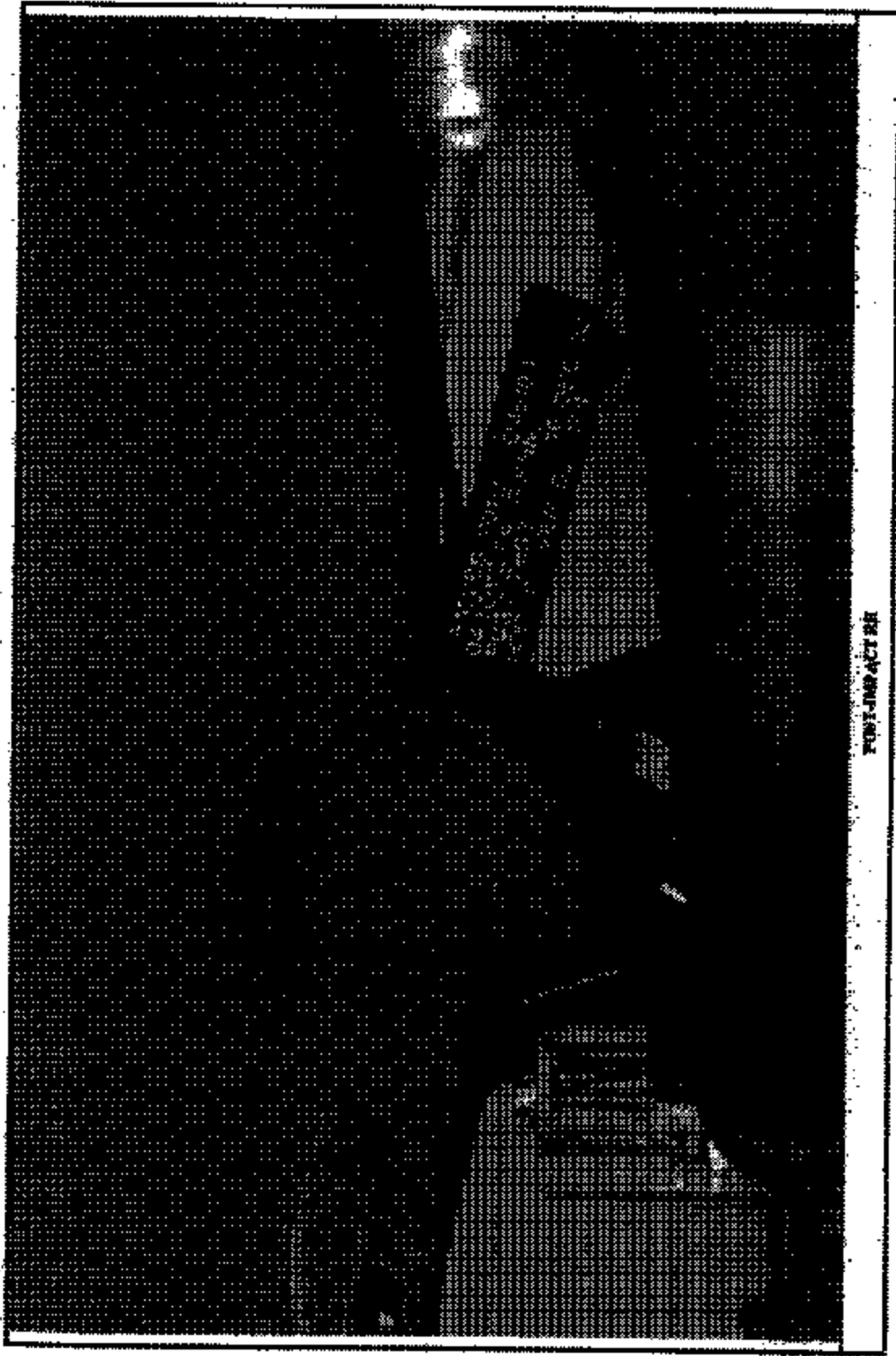
CFC_180

C45103 - December 19, 2003

20-0128



THE NEW YORK TIMES



8730-02

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23G345070133
DATE OF MANUFACTURE:	09/10/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	08
Test Date:	December 22, 2003
Target Location:	B-Pillar
Target Code:	BP3
Horizontal Impact Angle:	270°
Vertical Impact Angle:	7°
Ambient Temperature:	22°C
Relative Humidity:	20%
Time of Impact:	9:40
Headform Number:	0642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	12	☒ mm right	☐ mm left
On Centerline	15	☐ mm up	



POST-IMPACT BP3 HEADFORM

Free Motion HIC	916.6
HIC(d)	857.9
Impact Velocity (kph)	23.80
HIC T1 (msec)	5.2
HIC T2 (msec)	8.0

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - BP3

FMH Headform 0642

Location: BP3

Test Date: December 22, 2003

Work File: BP3

TEST RESULTS

Lab Temperature: 22 C

HICd: 857.9

Lab Humidity: 20 %

HIC (36ms): 916.6

Velocity at Impact: 23.80 KPH

t1: 5.2 msec

t2: 8.0 msec

Free Flight Distance: 208.70 mm

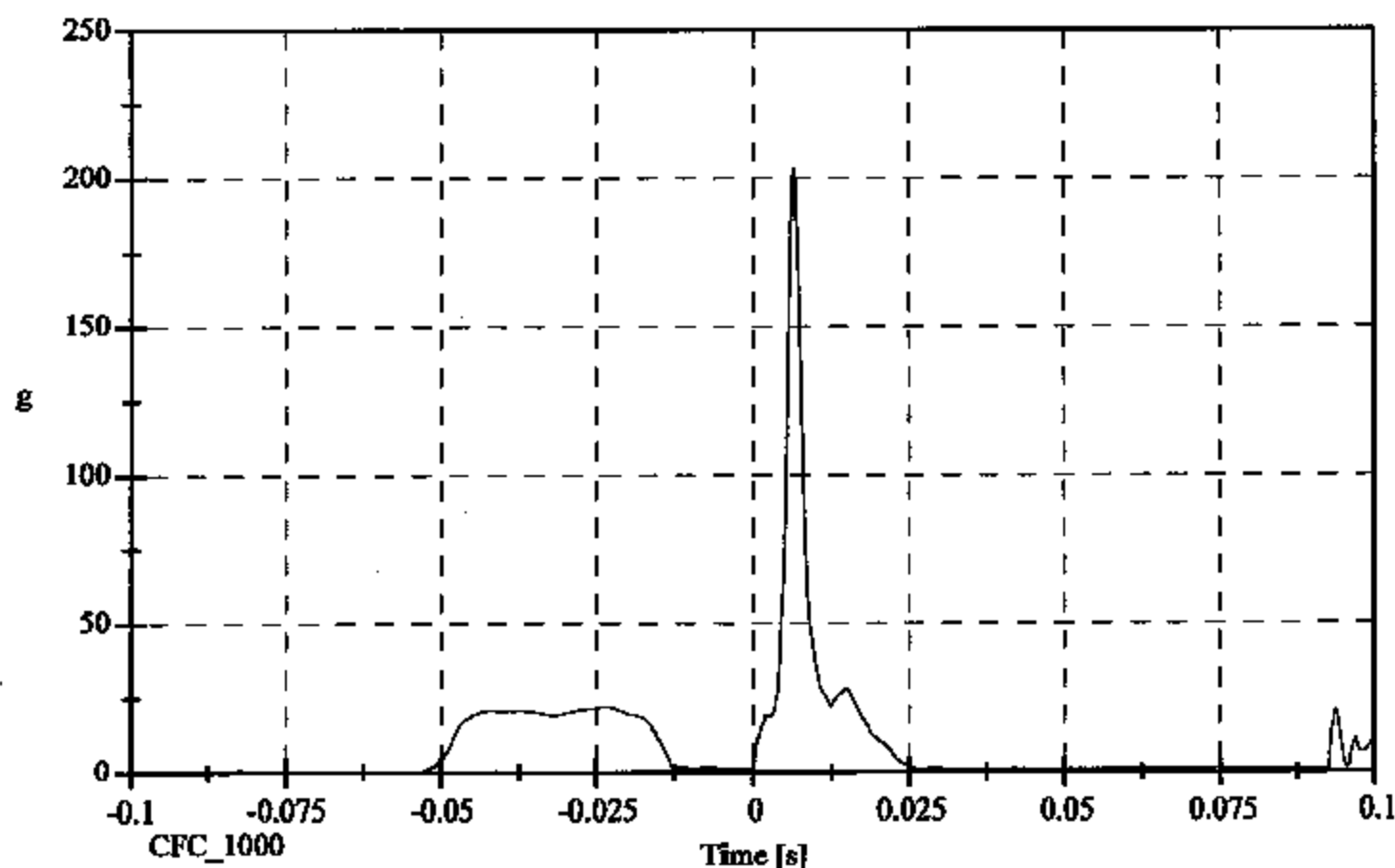
Duration: 2.8 msec

Average Acceleration: 9.0 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 203.0 [g] at 0.006 [s]

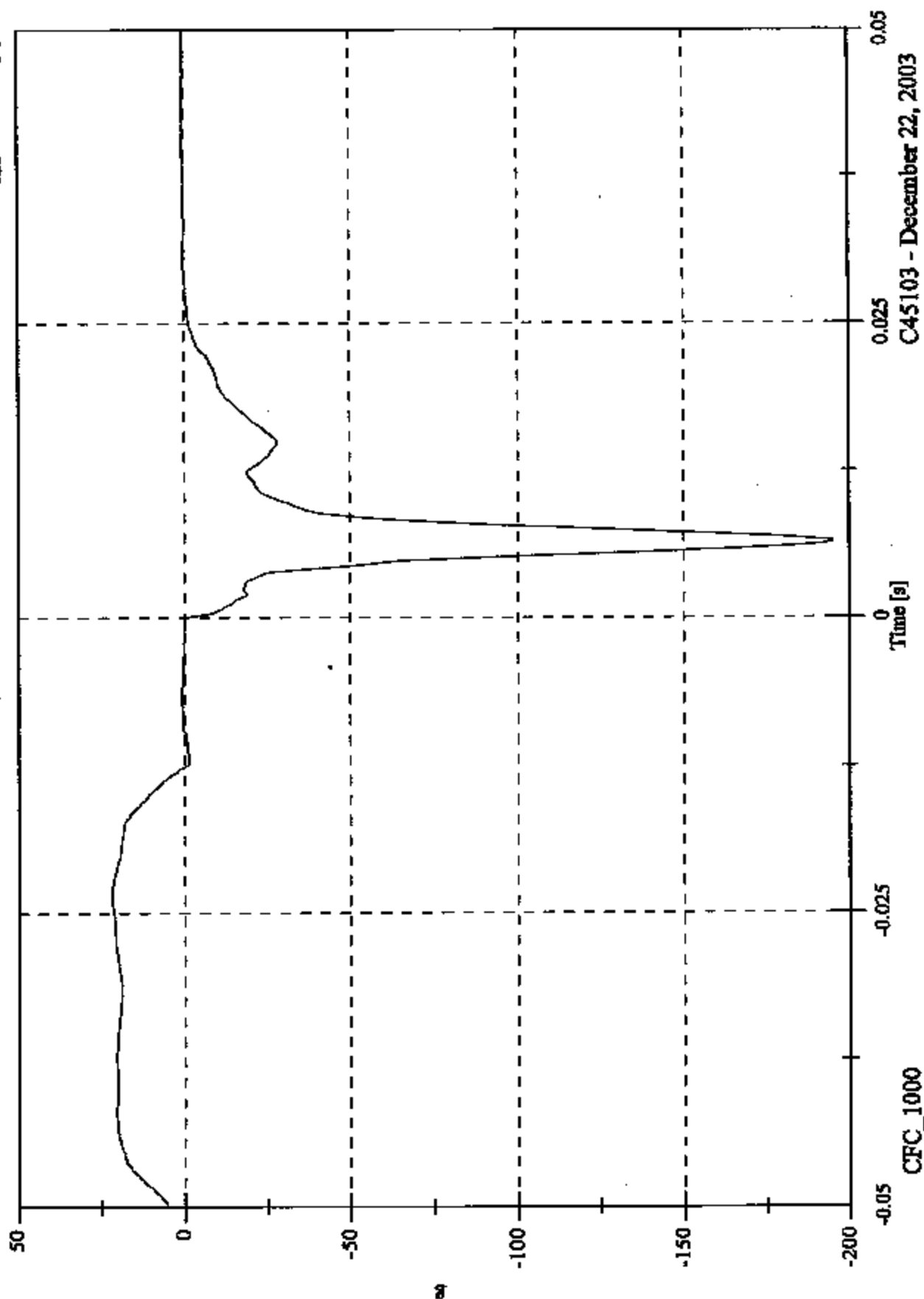
Min: 0.0 [g] at -0.086 [s]



FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 21.9 [g] at -0.023 [s]
Min: -195.0 [g] at 0.006 [s]



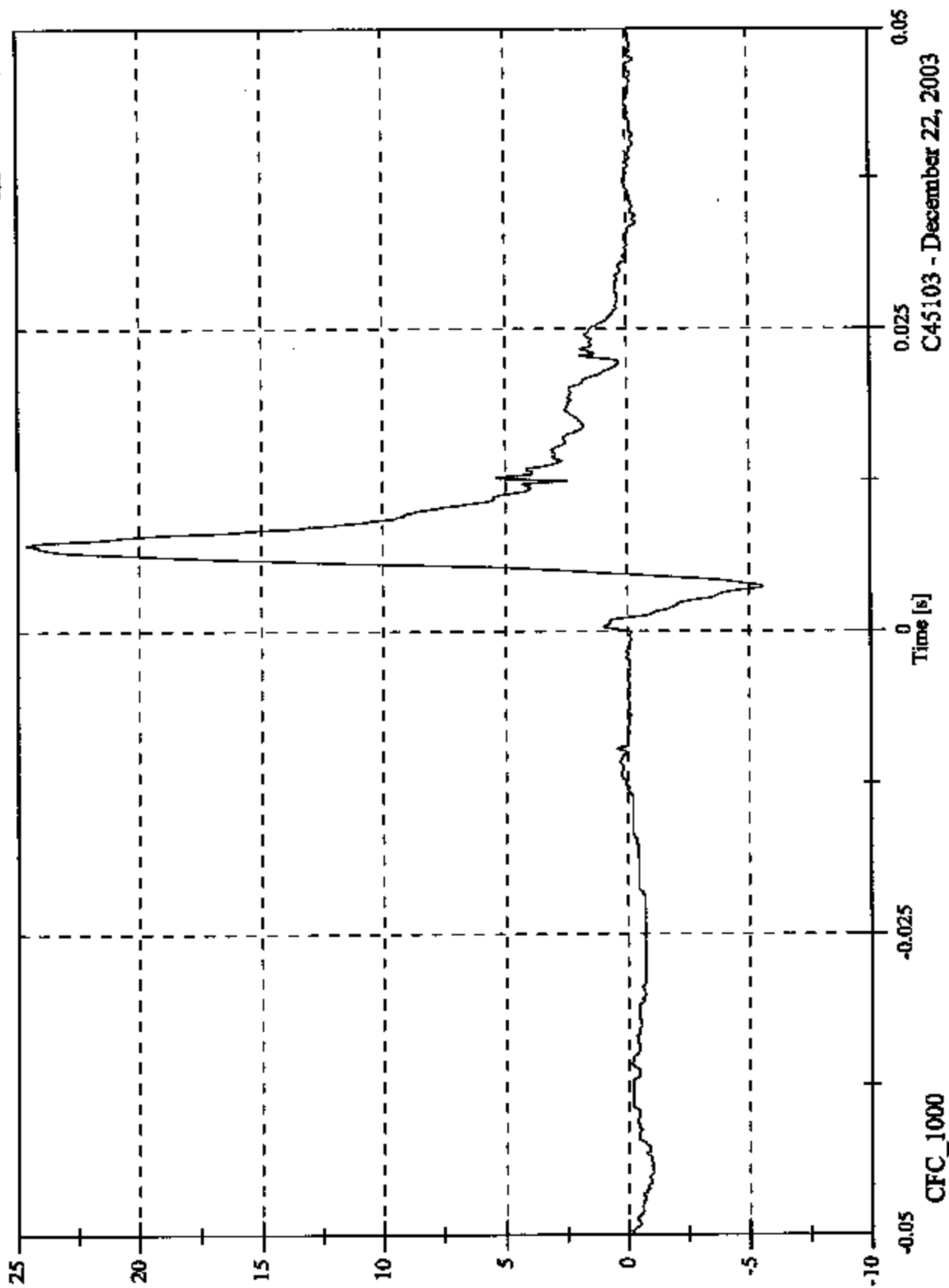
CFC_1000

C45103 Driver Side BP3 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 24.6 [g] at 0.007 [s]
Min: -5.6 [g] at 0.004 [s]



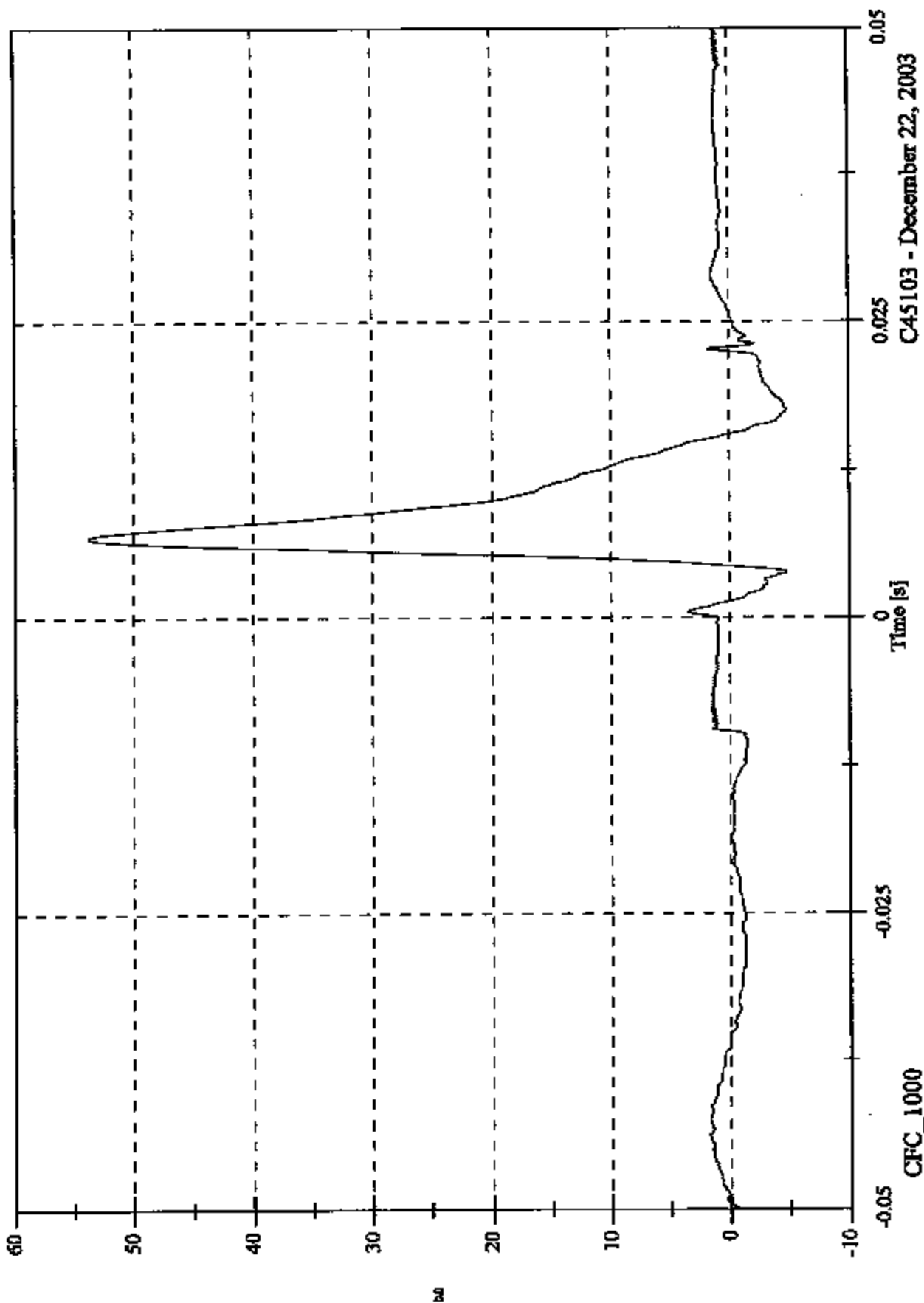
8

C45103 Driver Side BP3 Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 53.7 [g] at 0.007 [s]
Min: -4.8 [g] at 0.018 [s]



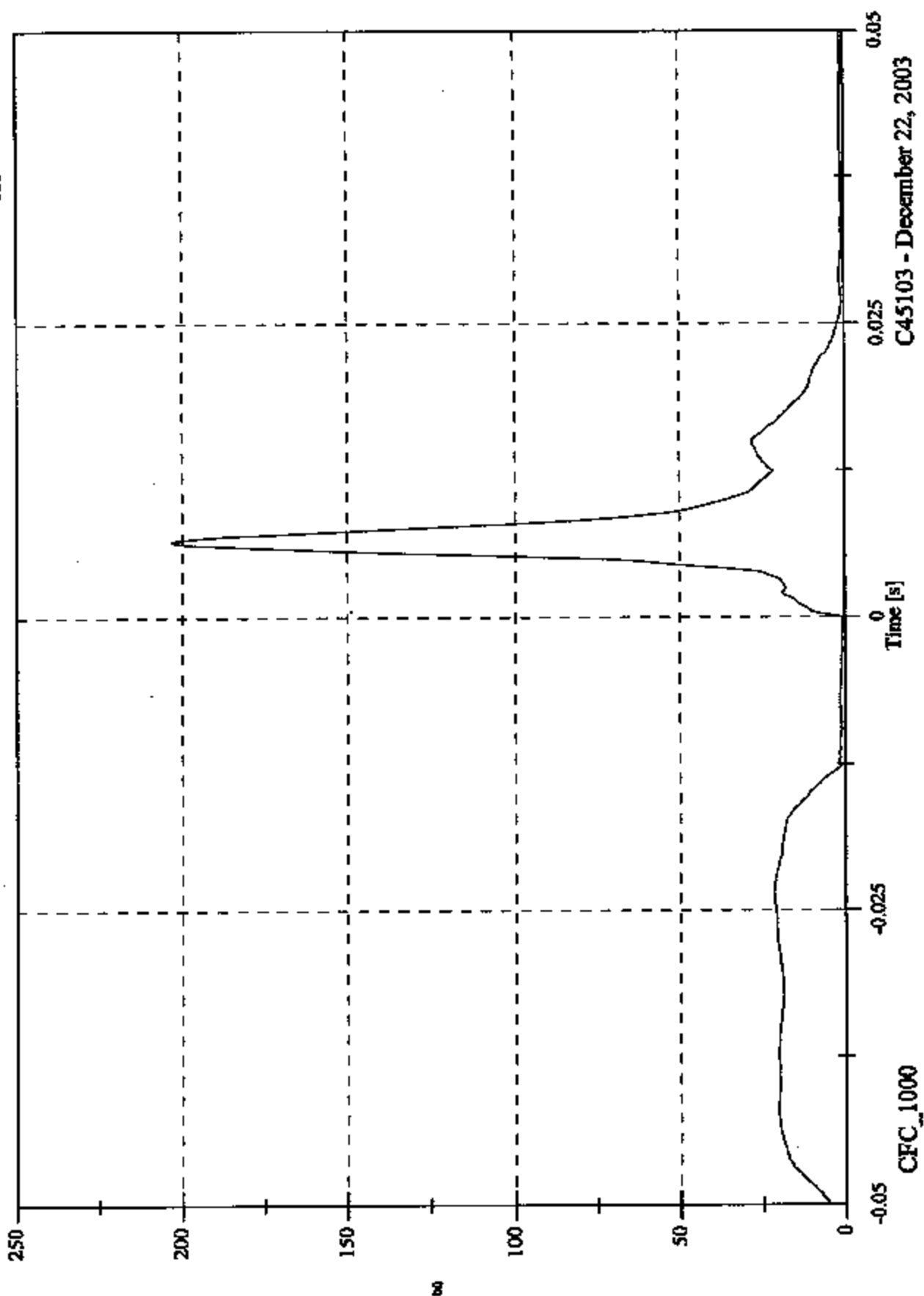
C45103 Driver Side BP3 Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 203.0 [g] at 0.006 [s]

Min: 0.3 [g] at -0.010 [s]

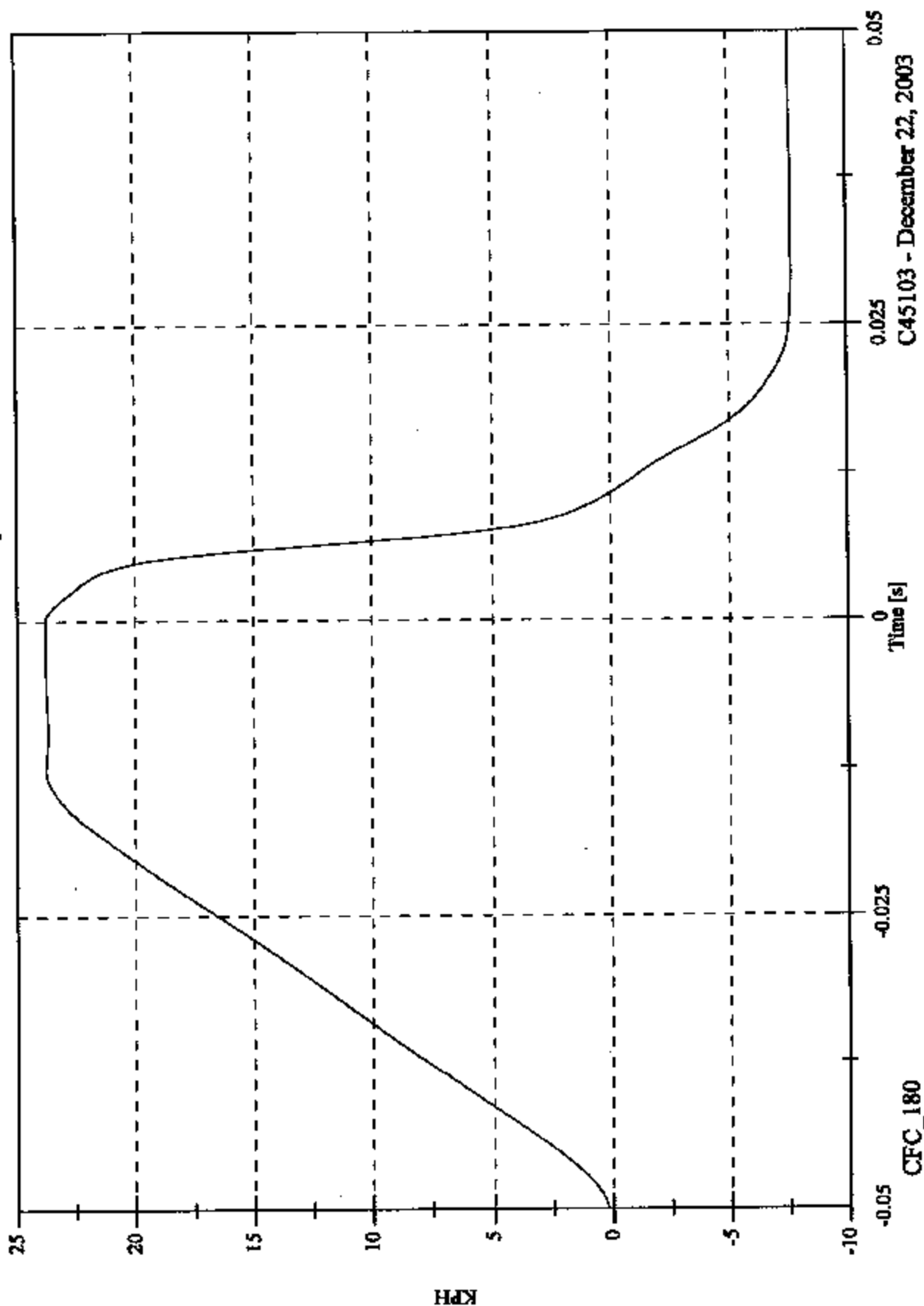


C45103 - December 22, 2003

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Velocity

Max: 23.8 [KPH] at -0.000 [s]

Min: -7.7 [KPH] at 0.030 [s]



C45103 Driver Side BP3 Impact Plot #5



PMVSS 2017 C-5100
24 TONOTA SIE HMA
PAC 7187
KOH 270 VSC. 22050 13
BF

FOR IMPACT 202

8730-03

POST-IMPACT VIEW



VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23CS48070133
DATE OF MANUFACTURE:	09/14/03 CERTIFICATION LABEL
COLOR:	Silver

Test Number:	09
Test Date:	December 22, 2003
Target Location:	Upper Roof
Target Code:	URBP
Horizontal Impact Angle:	270°
Vertical Impact Angle:	38°
Ambient Temperature:	22°C
Relative Humidity:	20%
Time of Impact:	10:10
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	mm right	mm left
On Centerline	21	mm up	



POST-IMPACT URBP HEADFORM

Free Motion HIC	606.9
HIC(a)	624.3
Impact Velocity (kph)	23.62
HIC T1 (msec)	3.7
HIC T2 (msec)	13.2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - URBP

FMH Headform 805

Location: URBP

Test Date: December 22, 2003

Work File: URBP

TEST RESULTS

Lab Temperature: 22 C

HICd: 624.3

Lab Humidity: 20 %

HIC (36ms): 606.9

Velocity at Impact: 23.62 KPH

t1: 3.7 msec

t2: 13.2 msec

Free Flight Distance: 219.69 mm

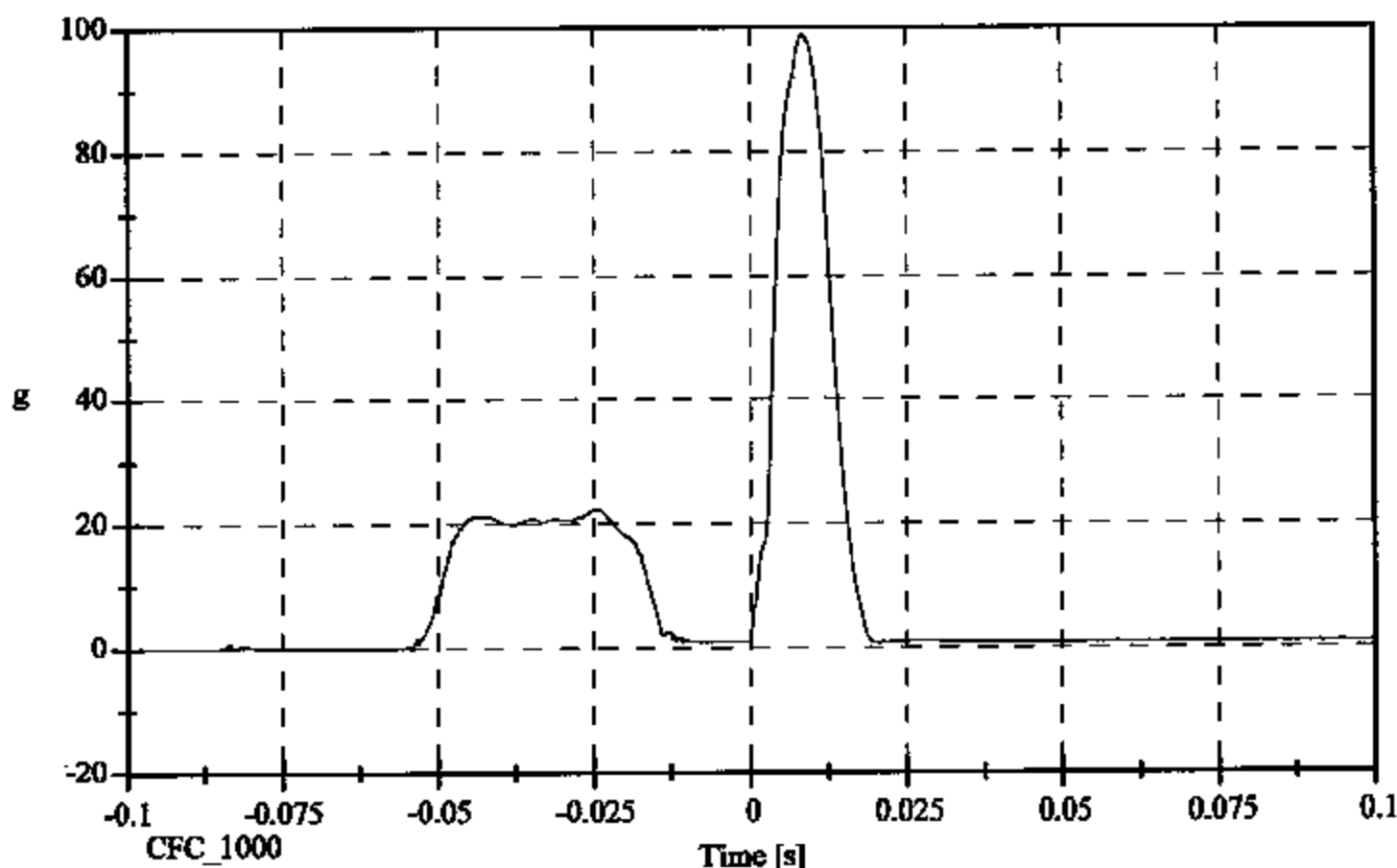
Duration: 9.5 msec

Average Acceleration: 8.8 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 98.8 [g] at 0.008 [s]

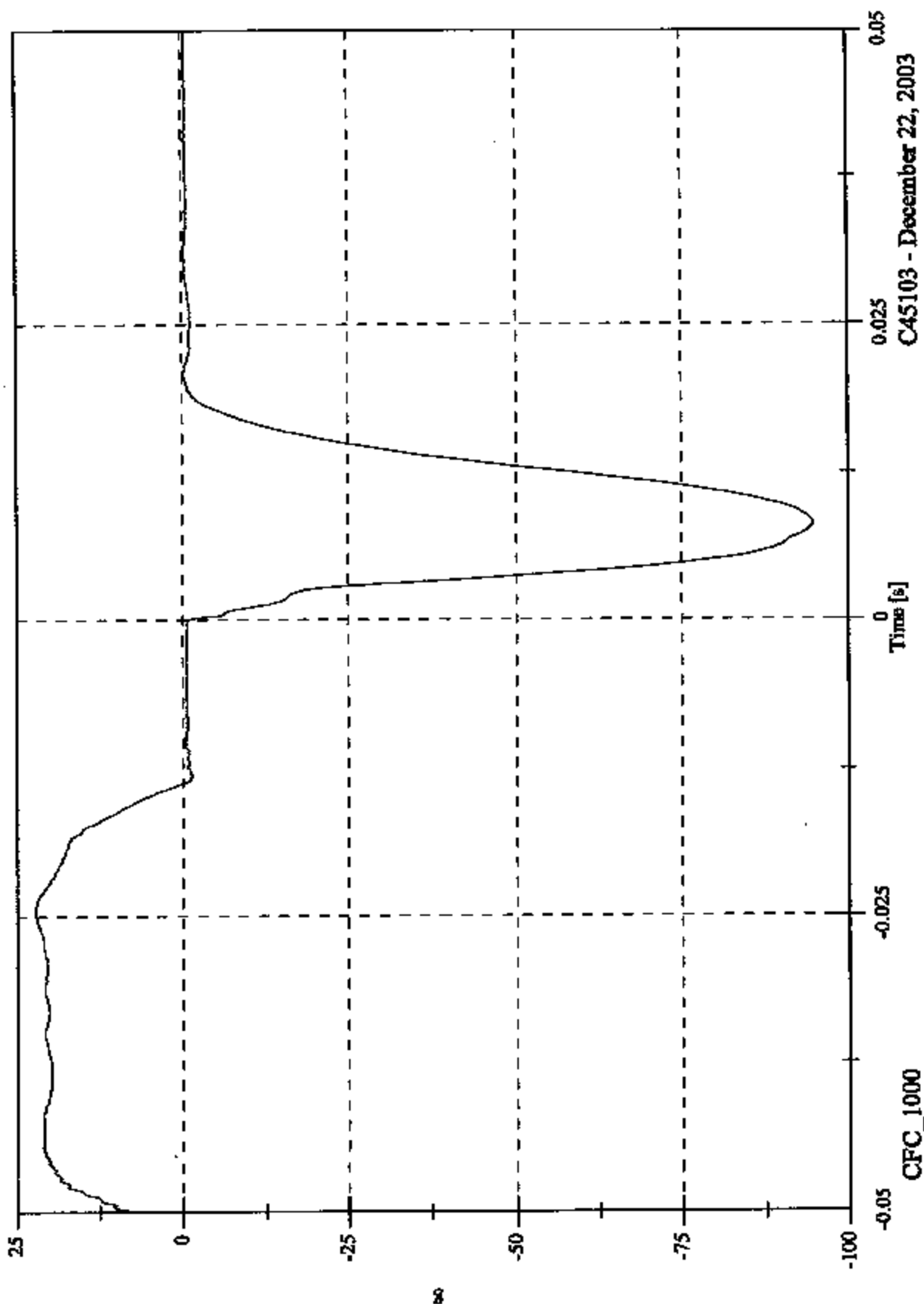
Min: -0.0 [g] at -0.099 [s]



FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 22.2 [g] at -0.024 [s]
Min: -94.8 [g] at 0.008 [s]

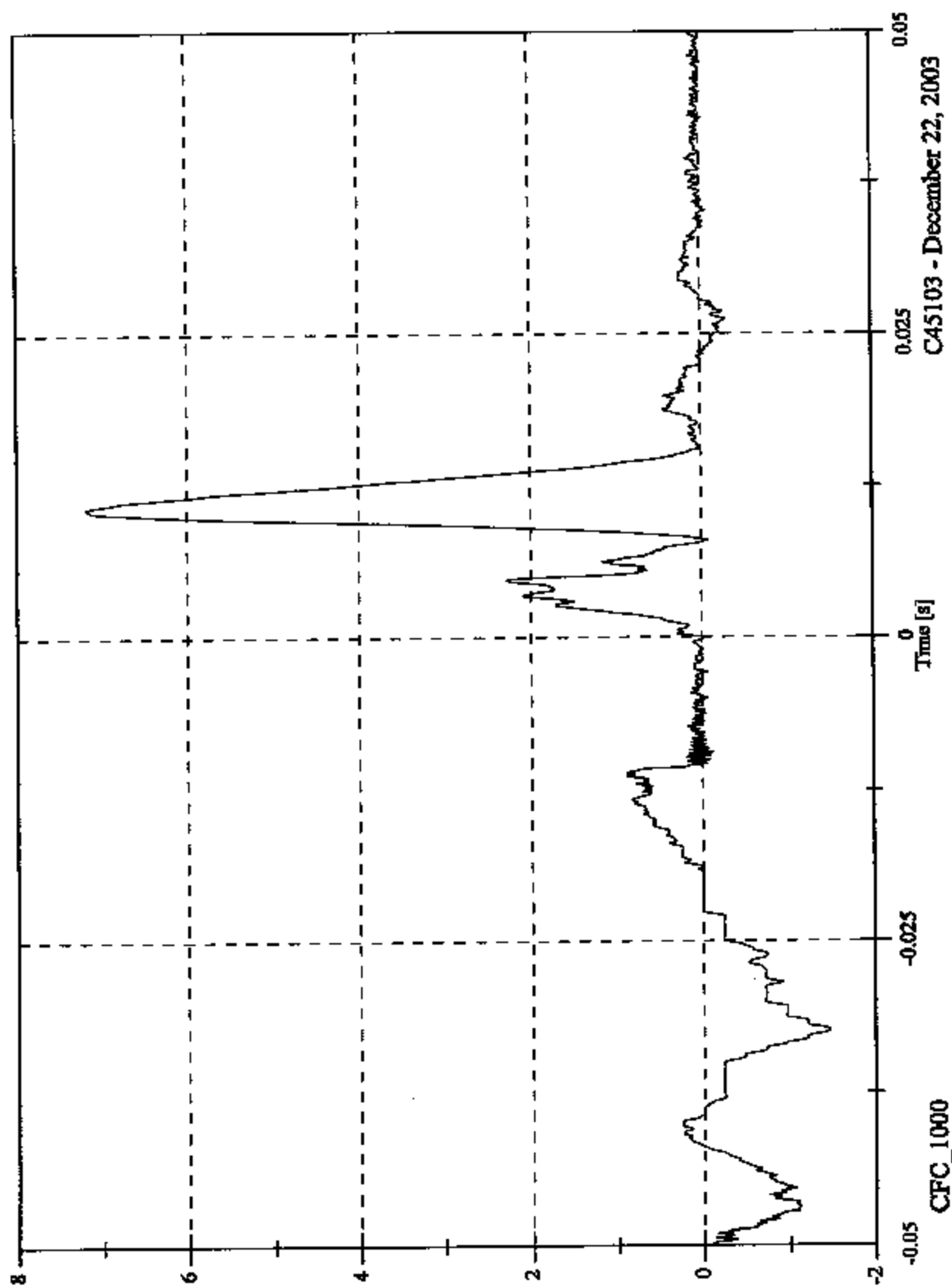


C45103 - December 22, 2003

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 7.2 [g] at 0.011 [s]
Min: -1.5 [g] at -0.032 [s]

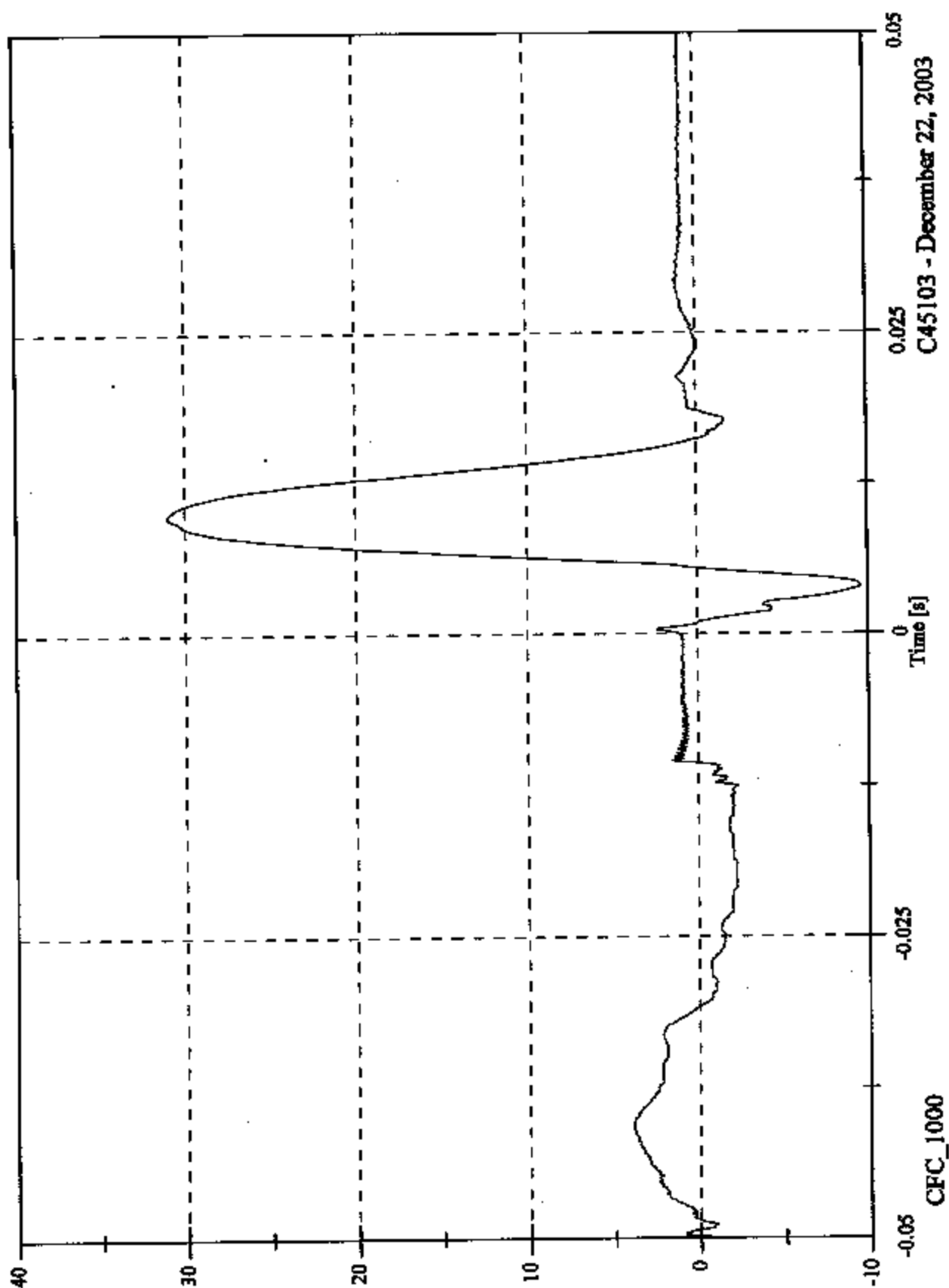


C45103 - December 22, 2003

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 31.1 [g] at 0.010 [s]
Min: -9.6 [g] at 0.004 [s]

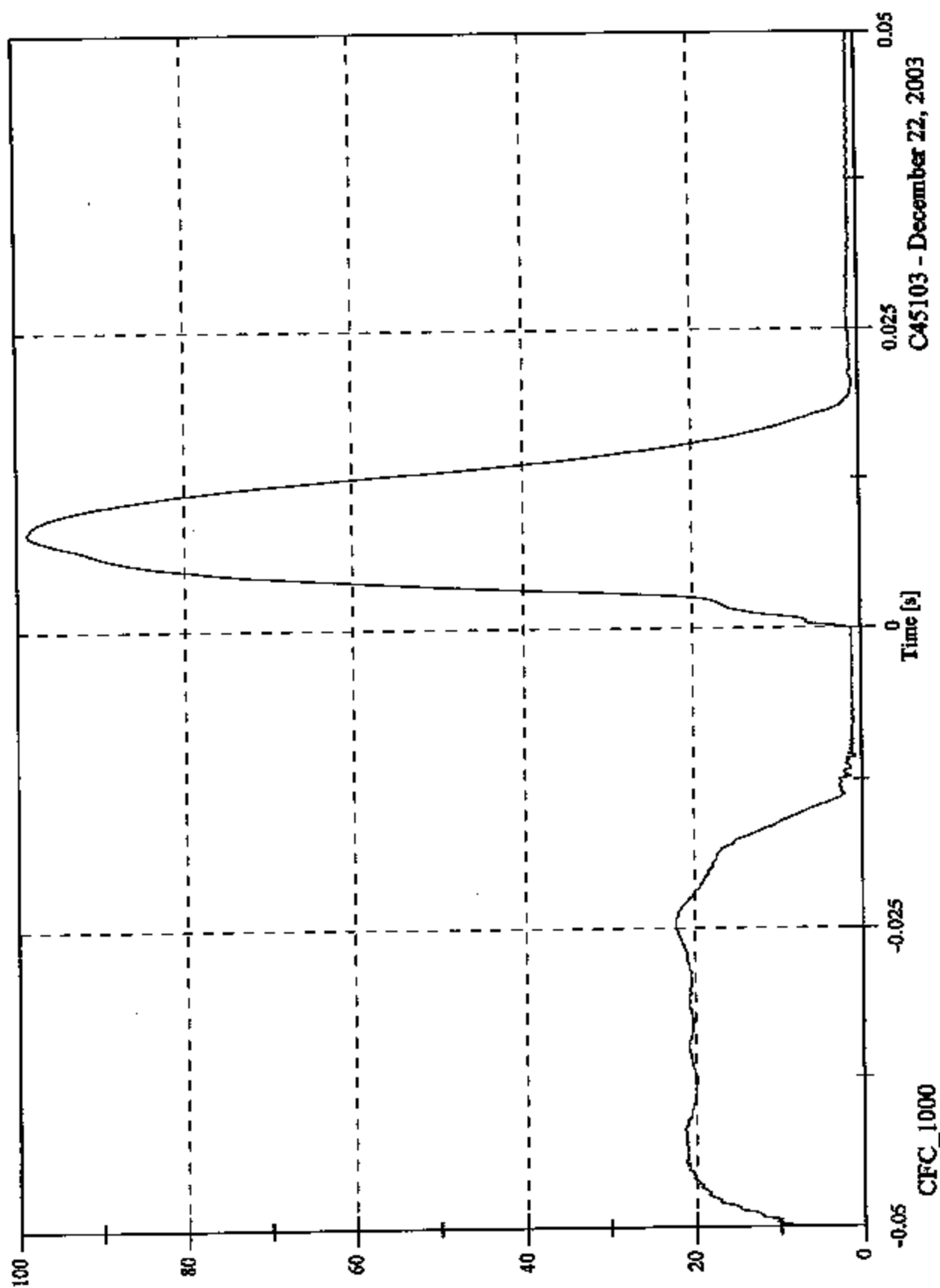


FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

Max: 98.8 [g] at 0.008 [s]

Min: 0.7 [g] at -0.011 [s]

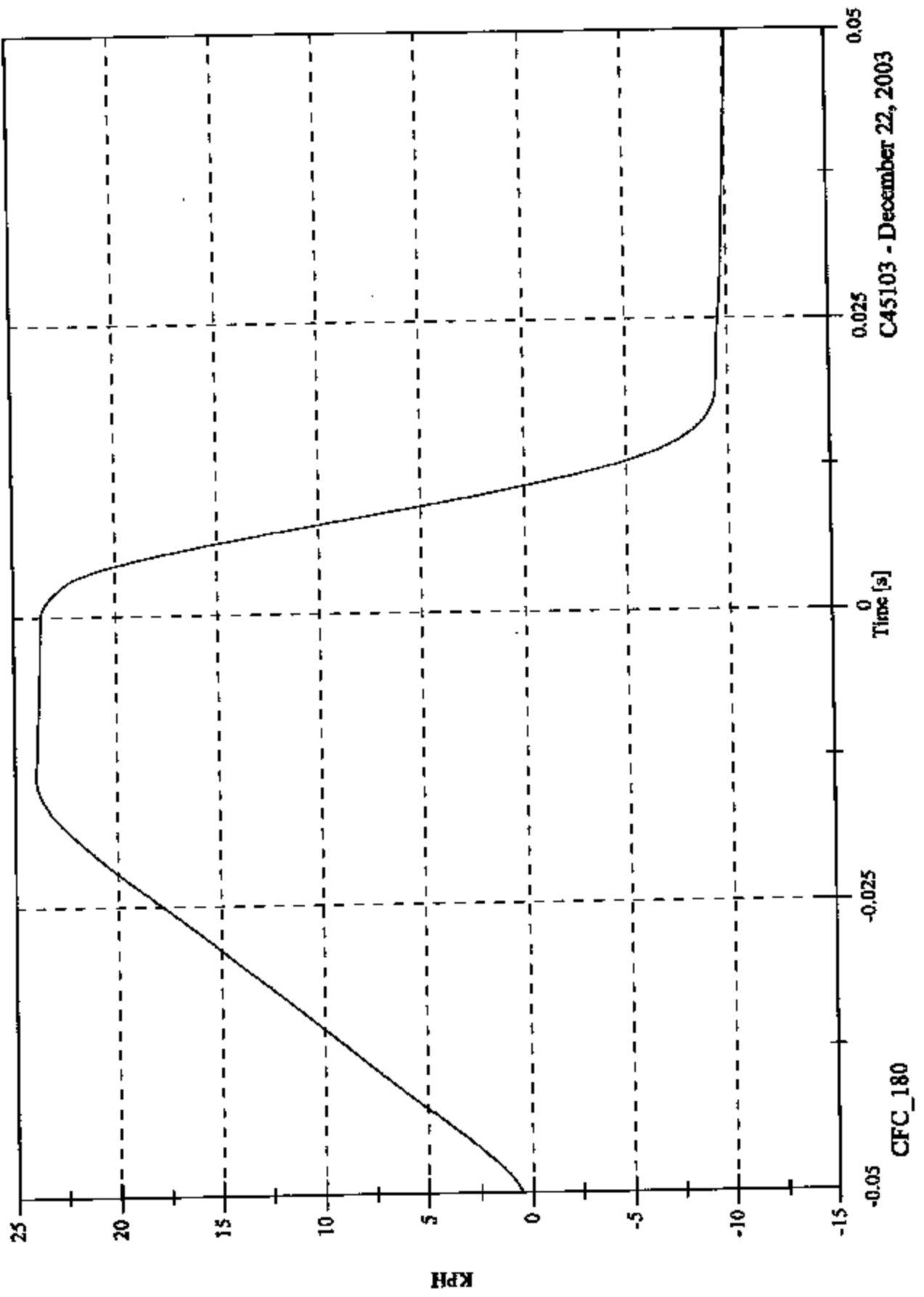


C45103 Driver Side URBP Impact Plot #4

Max: 24.0 [KPH] at -0.014 [s]
Min: -10.1 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Velocity



C45103 - December 22, 2003

CFC_180

C45103 Driver Side URBP Impact Plot #5



PHOTOGRAPHY

6736-02



POST-IMPACT VIEW

8730-02

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C34S070133
DATE OF MANUFACTURE:	04/05/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	10
Test Date:	December 22, 2003
Target Location:	A-Pillar
Target Code:	AP2
Horizontal Impact Angle:	210°
Vertical Impact Angle:	43°
Ambient Temperature:	22°C
Relative Humidity:	20%
Time of Impact:	11:00
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	12	mm right	mm left
On Centerline	22	mm up	

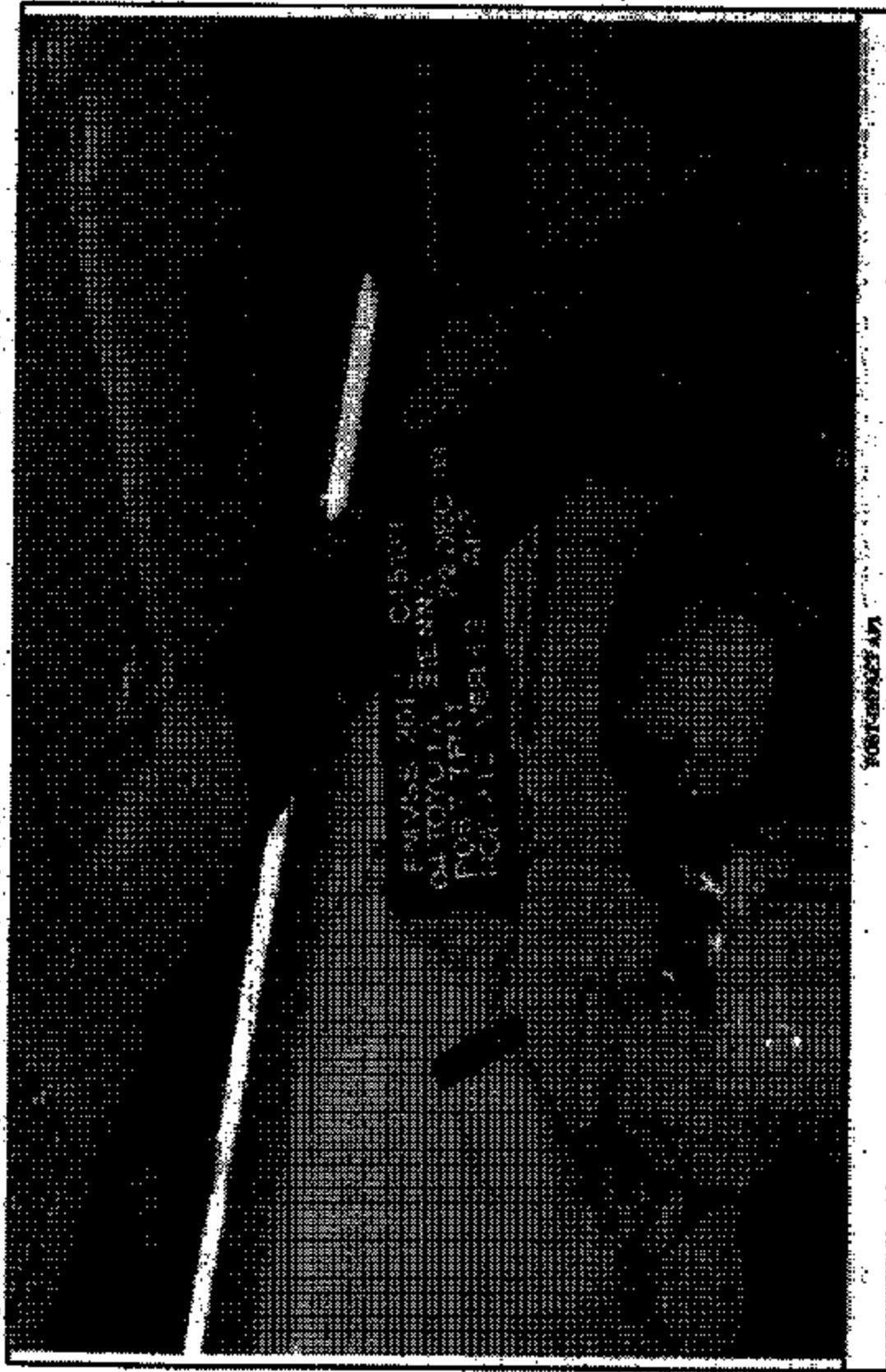


POST-IMPACT AP2 HEADFORM

Free Motion HIC	No Data
HIC(d)	No Data
Impact Velocity (kph)	No Data
HIC T1 (msec)	No Data
HIC T2 (msec)	No Data

FMVSS 301V C4E100
 04T0X01A 8K6H1A 22 DEC 03
 TEST APR2
 FOR 210 VER 40

WATERGATE



8730-02

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA33C345070133
DATE OF MANUFACTURE:	0603 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	11
Test Date:	December 22, 2003
Target Location:	Other Pillar
Target Code:	CP1
Horizontal Impact Angle:	270°
Vertical Impact Angle:	1°
Ambient Temperature:	22°C
Relative Humidity:	20%
Time of Impact:	12:00
Headform Number:	0353

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	6	☒ mm right	☐ mm left
On Centerline	15	mm up	



POST-IMPACT OF HEADFORM

Free Motion HIC	599.5
HIC(d)	618.7
Impact Velocity (kph)	23.61
HIC T1 (msec)	2.8
HIC T2 (msec)	11.0

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - OP1

FMH Headform 0355

Location: OP1

Test Date: December 22, 2003

Work File: OP1

TEST RESULTS

Lab Temperature: 22 C

HICd: 618.7

Lab Humidity: 20 %

HIC (36ms): 599.5

Velocity at Impact: 23.61 KPH

t1: 2.8 msec

t2: 11.0 msec

Free Flight Distance: 215.74 mm

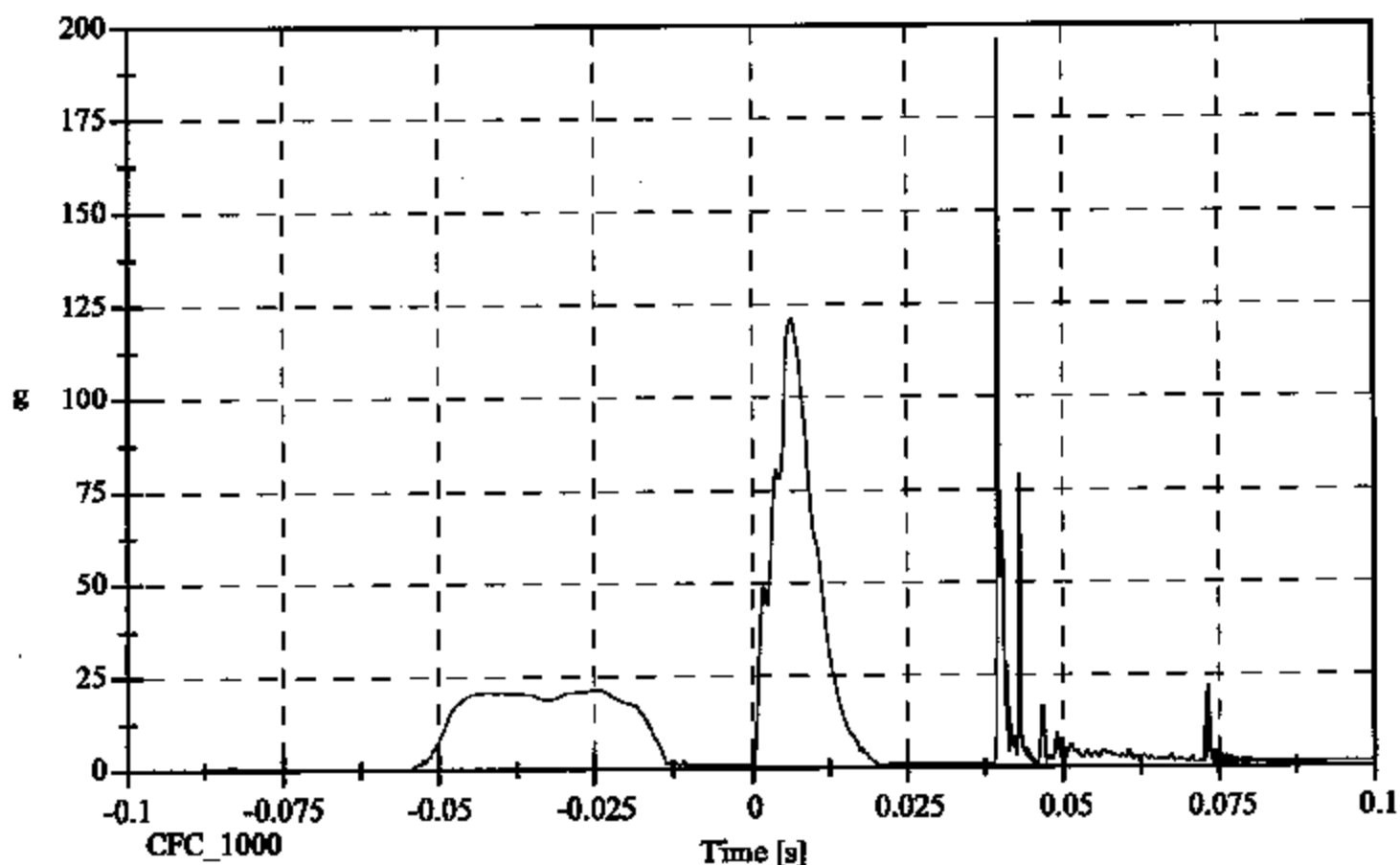
Duration: 8.2 msec

Average Acceleration: 9.8 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 196.0 [g] at 0.040 [s]

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

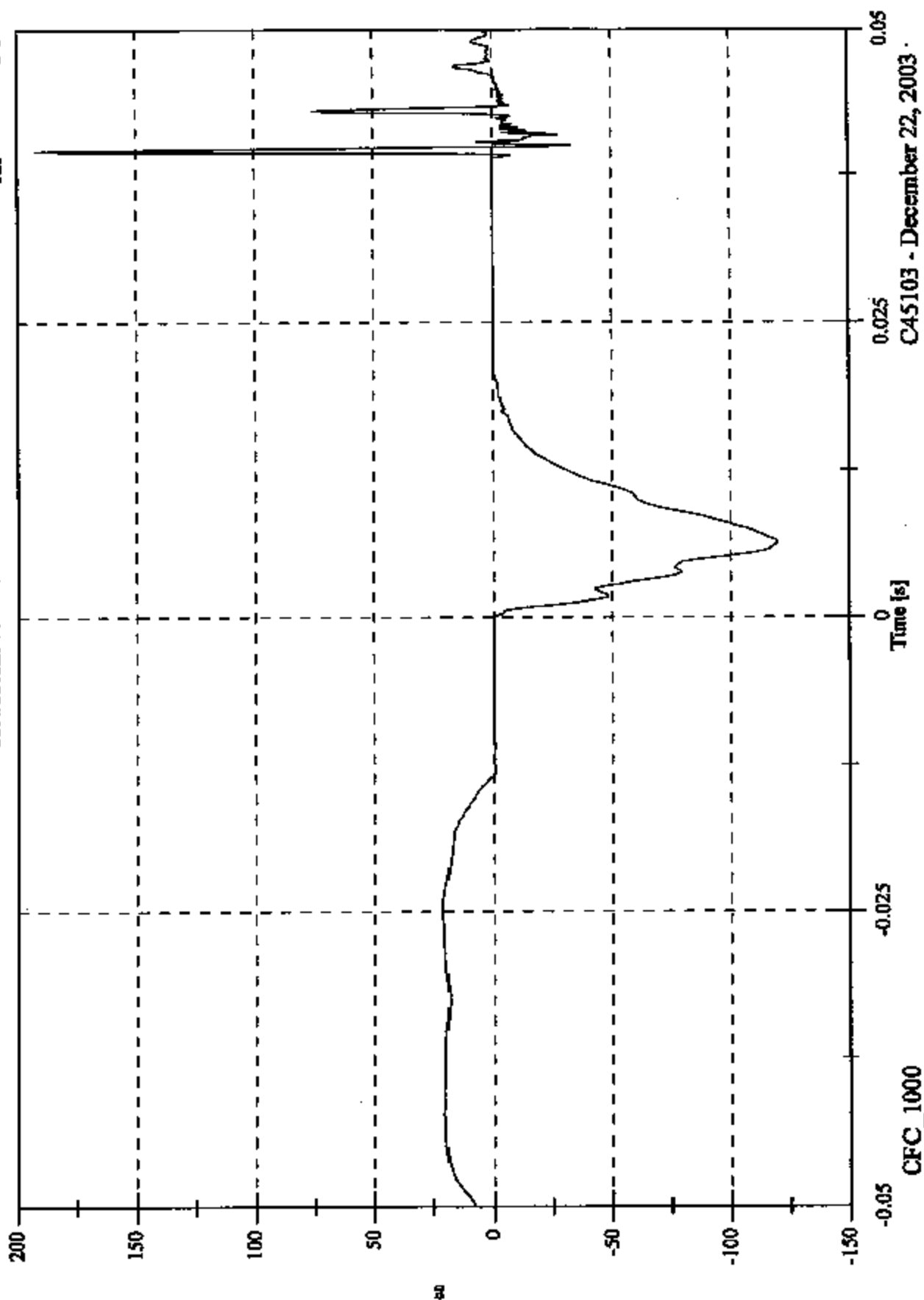


FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 192.4 [g] at 0.040 [s]

Min: -119.4 [g] at 0.006 [s]

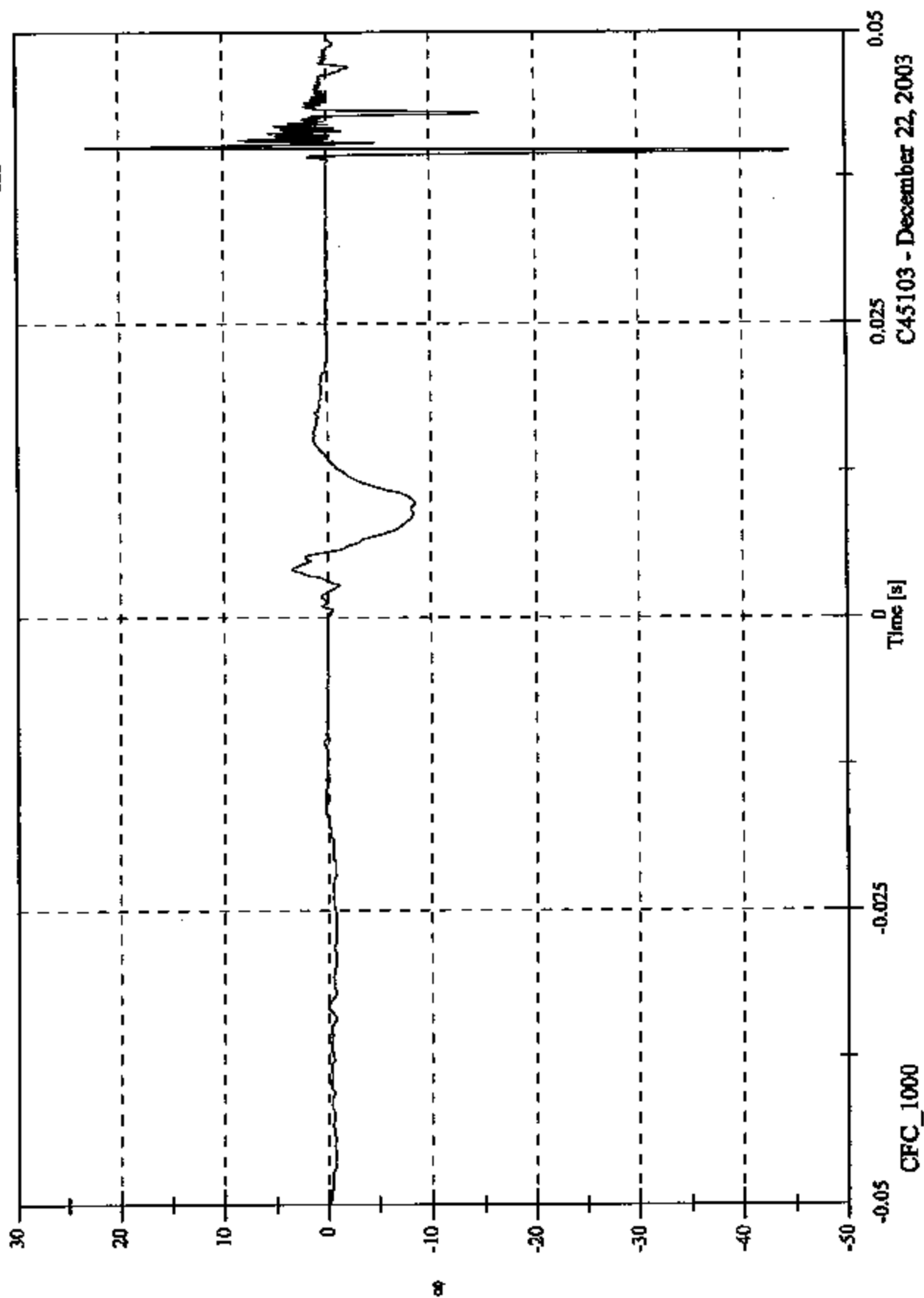


C45103 Driver Side OP1 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 23.2 [g] at 0.040 [s]
Min: -44.6 [g] at 0.040 [s]



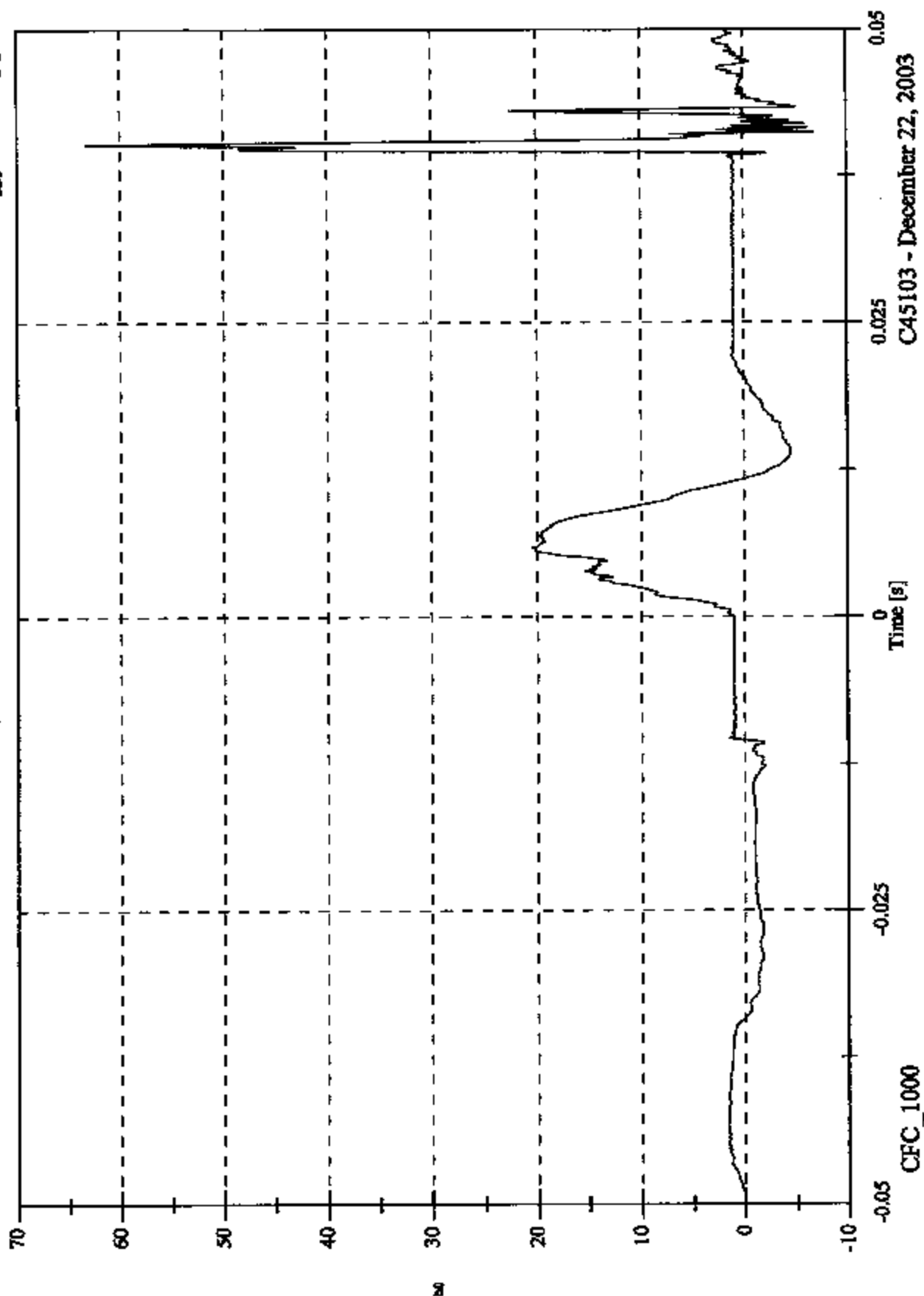
C45103 Driver Side OPI Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 63.3 [g] at 0.040 [s]

Min: -6.9 [g] at 0.041 [s]

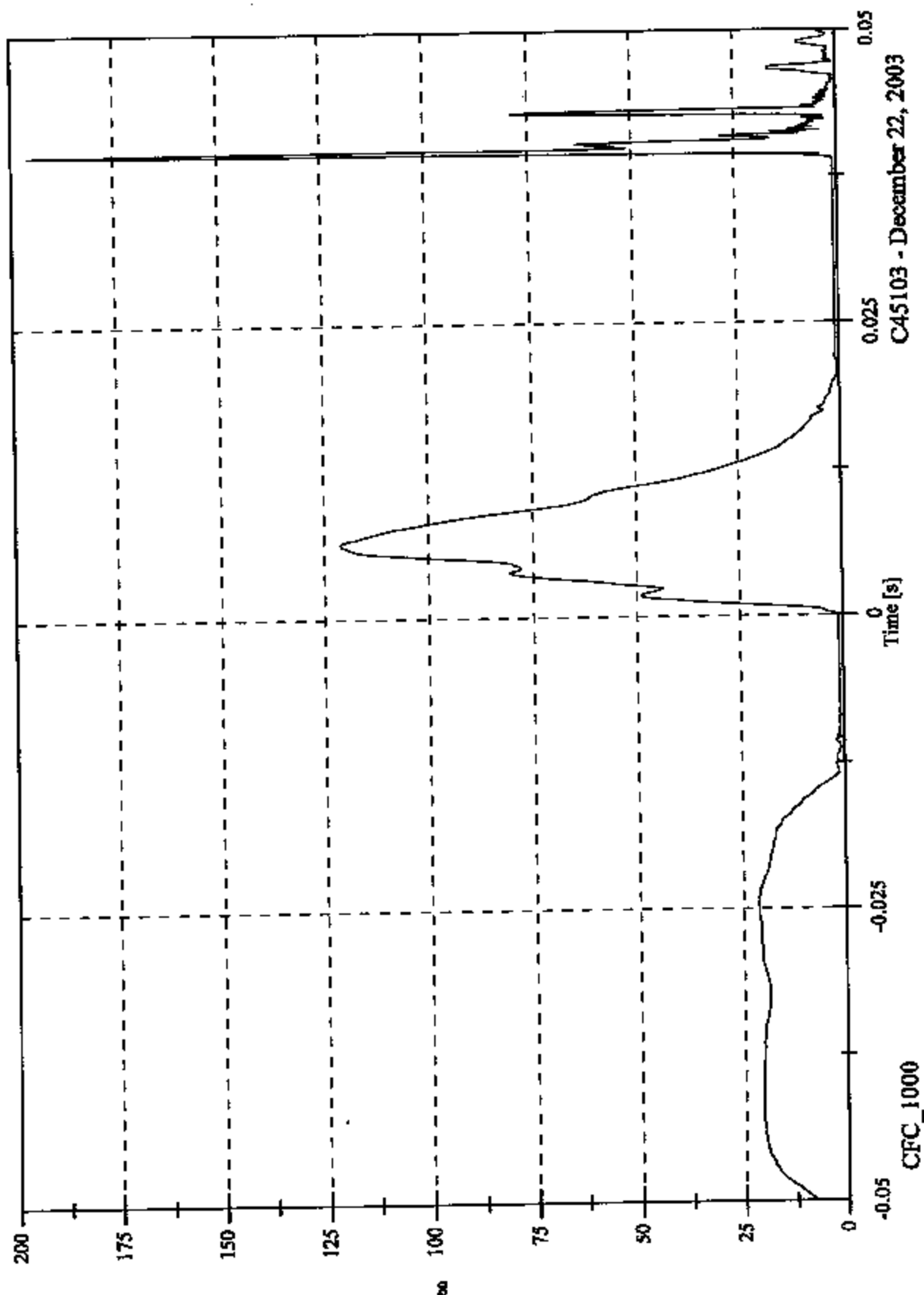


C45103 - December 22, 2003

C45103 Driver Side OP1 Impact Plot #3

Max: 196.0 [g] at 0.040 [s]
Min: 0.4 [g] at -0.010 [s]

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant



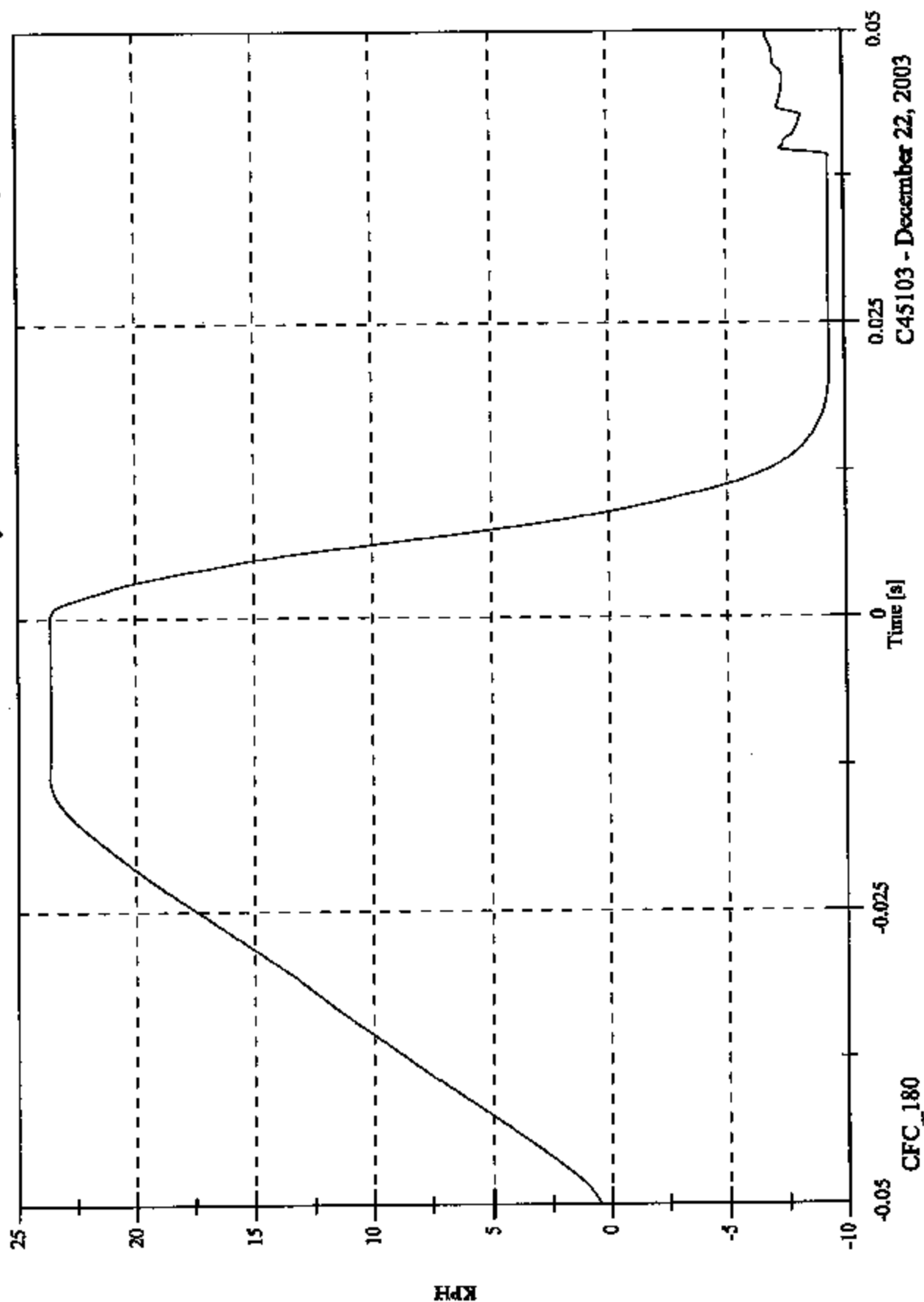
C45103 - December 22, 2003

C45103 Driver Side OP1 Impact Plot #4

Max: 23.6 [KPH] at -0.013 [s]
Min: -9.4 [KPH] at 0.039 [s]

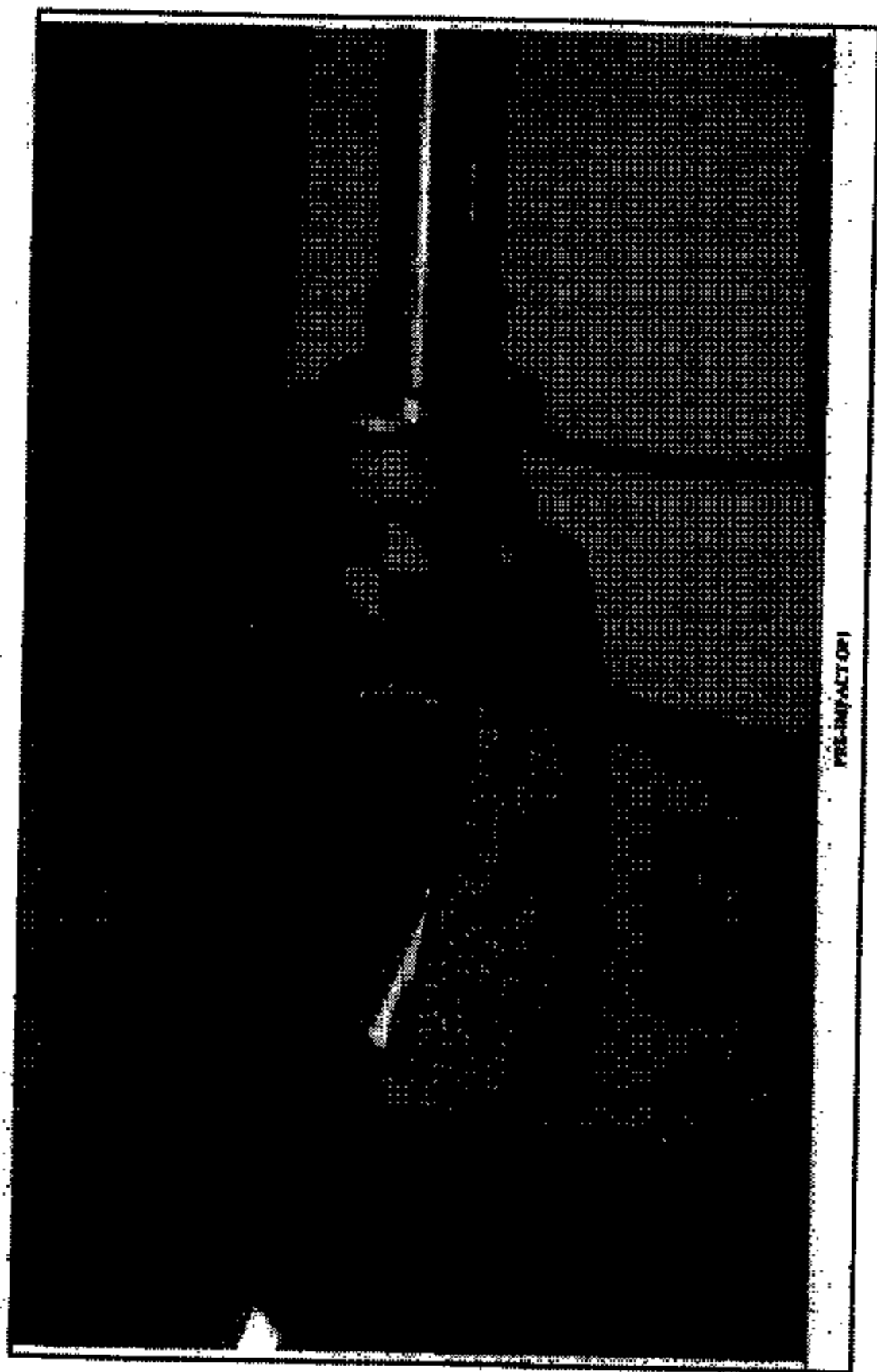
FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Velocity



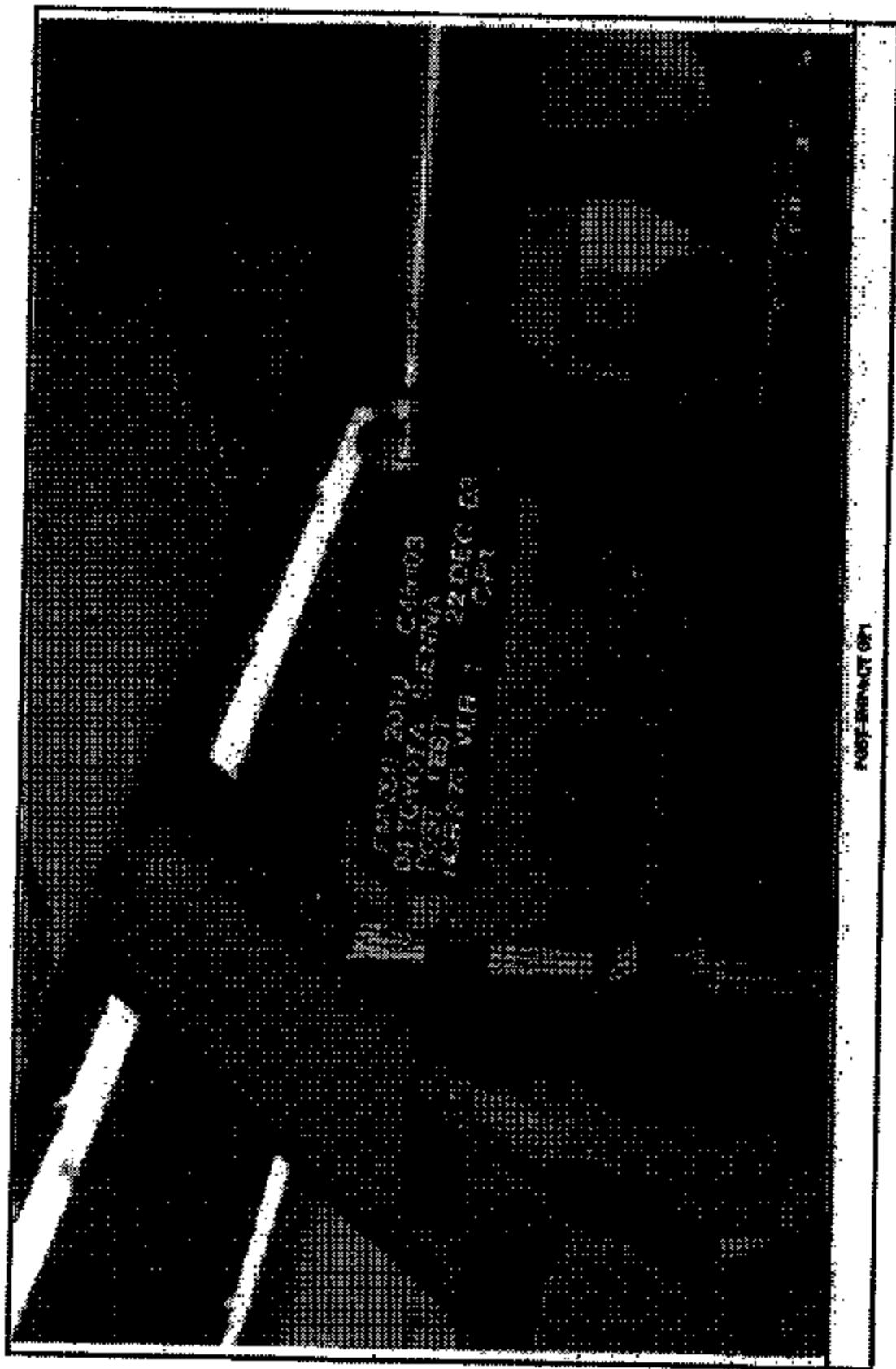
C45103 - December 22, 2003

C45103 Driver Side OP1 Impact Plot #5



FBI-IMPACT (P)

8730-02

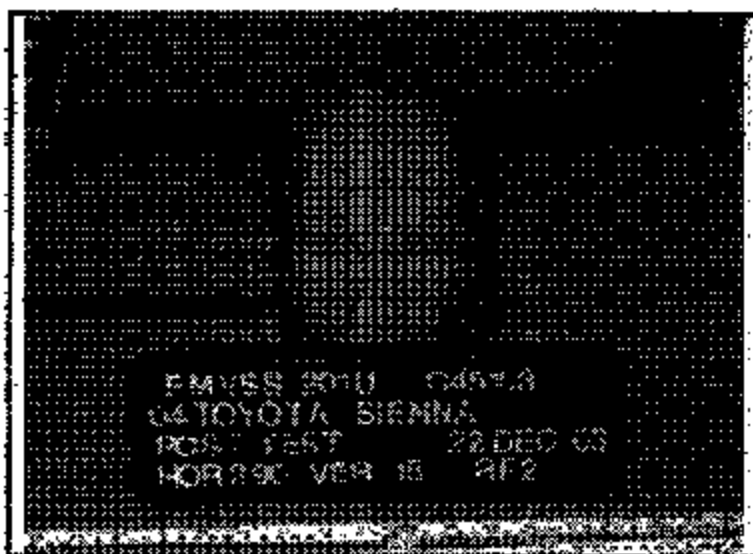


8730-02

VEHICLE YEAR/MAKE/MODEL/STYLE:	2004 Toyota Sienna
VIN:	5TDZA23C34S070133
DATE OF MANUFACTURE:	04/03 (SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	12
Test Date:	December 22, 2003
Target Location:	Rear Pillar
Target Code:	RP2
Horizontal Impact Angle:	290°
Vertical Impact Angle:	15°
Ambient Temperature:	22°C
Relative Humidity:	20%
Time of Impact:	14:30
Headform Number:	1253

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	mm right	mm left
On Centerline	23	mm up	



POST-IMPACT RP2 HEADFORM

Free Motion HIC	216.0
HIC(δ)	329.4
Impact Velocity (kph)	23.87
HIC T1 (msec)	1.0
HIC T2 (msec)	14.8

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan C45103 - RP2

FMH Headform 1255

Location: RP2

Test Date: December 22, 2003

Work File: RP2

TEST RESULTS

Lab Temperature: 22 C

HICd: 329.4

Lab Humidity: 20 %

HIC (36ms): 216.0

Velocity at Impact: 23.87 KPH

t1: 1.0 msec

t2: 14.8 msec

Free Flight Distance: 213.70 mm

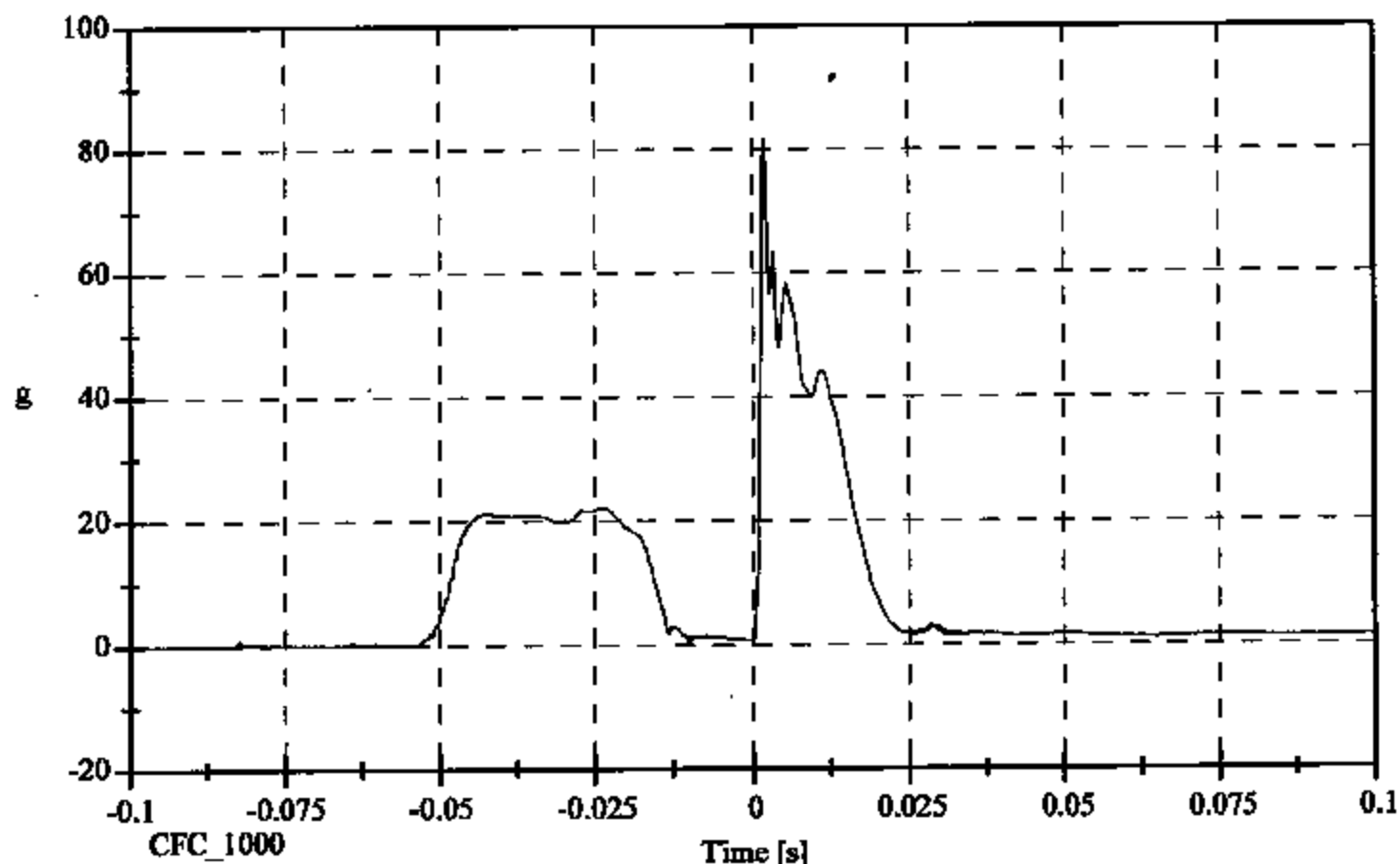
Duration: 13.8 msec

Average Acceleration: 7.9 g

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Resultant

Max: 81.7 [g] at 0.002 [s]

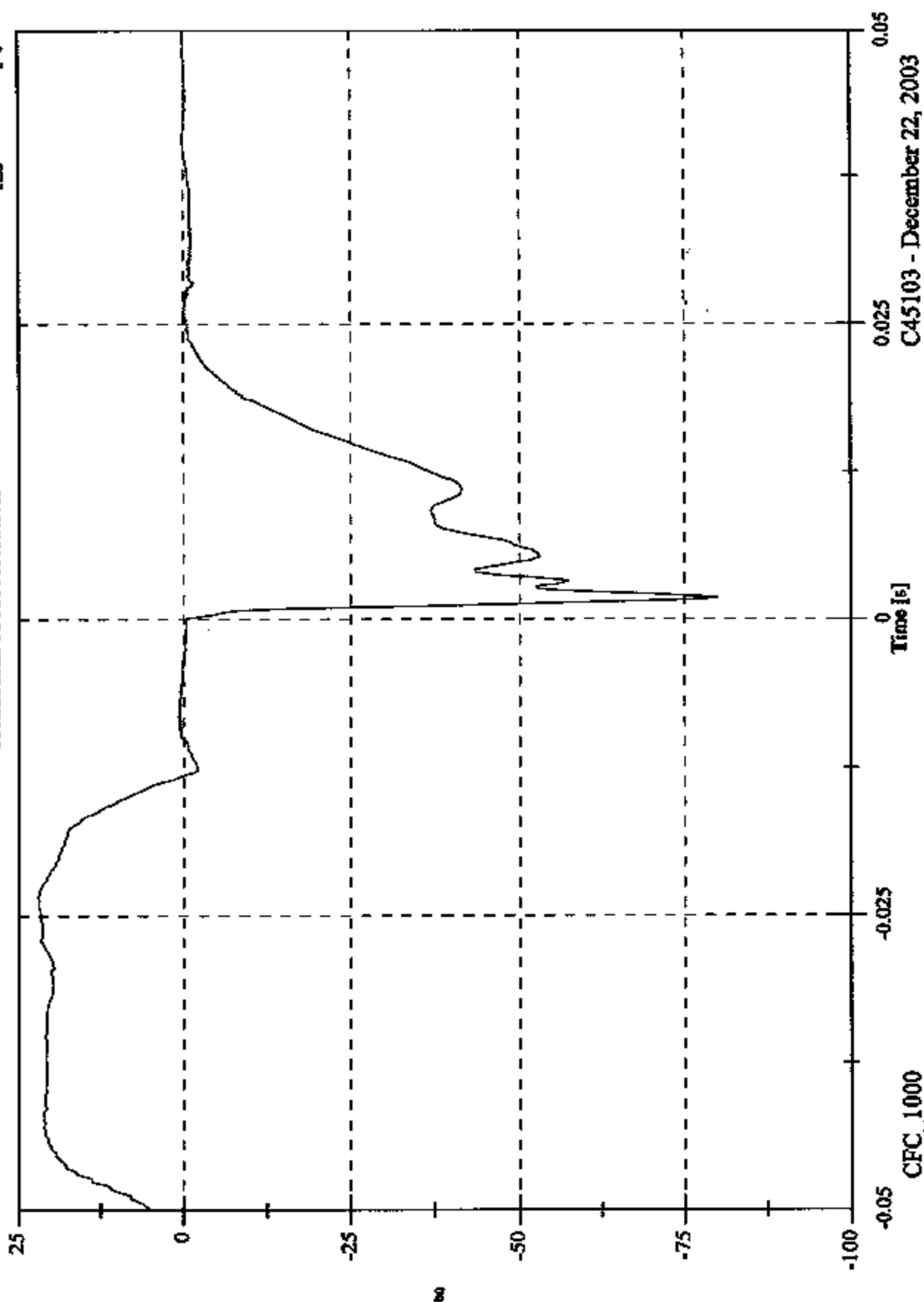
Min: -0.0 [g] at -0.099 [s]



FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform X Acceleration

Max: 22.0 [g] at -0.024 [s]
Min: -79.9 [g] at 0.002 [s]



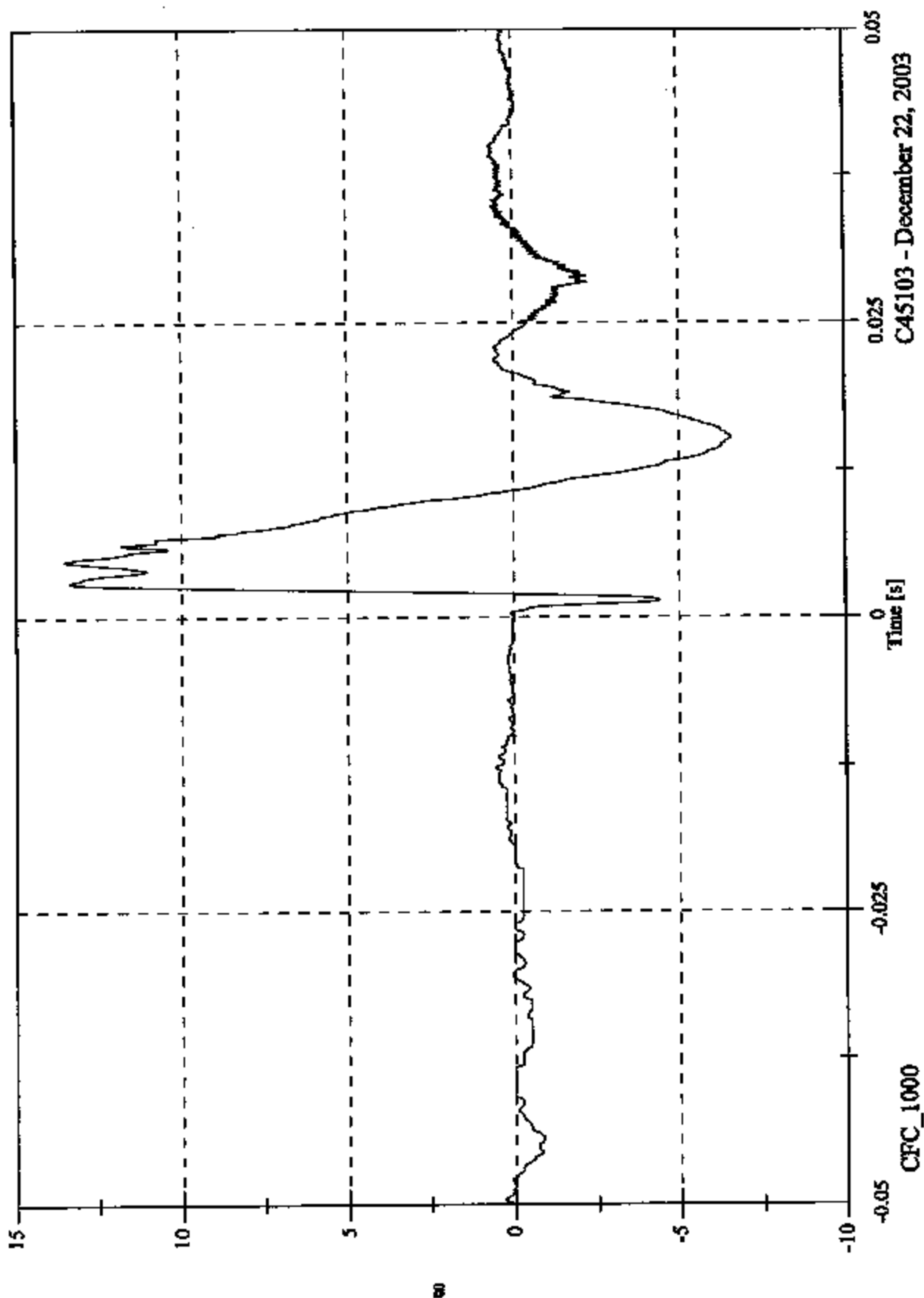
C45103 Driver Side RP2 Impact Plot #1

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Y Acceleration

Max: 13.5 [g] at 0.005 [s]

Min: -6.6 [g] at 0.015 [s]



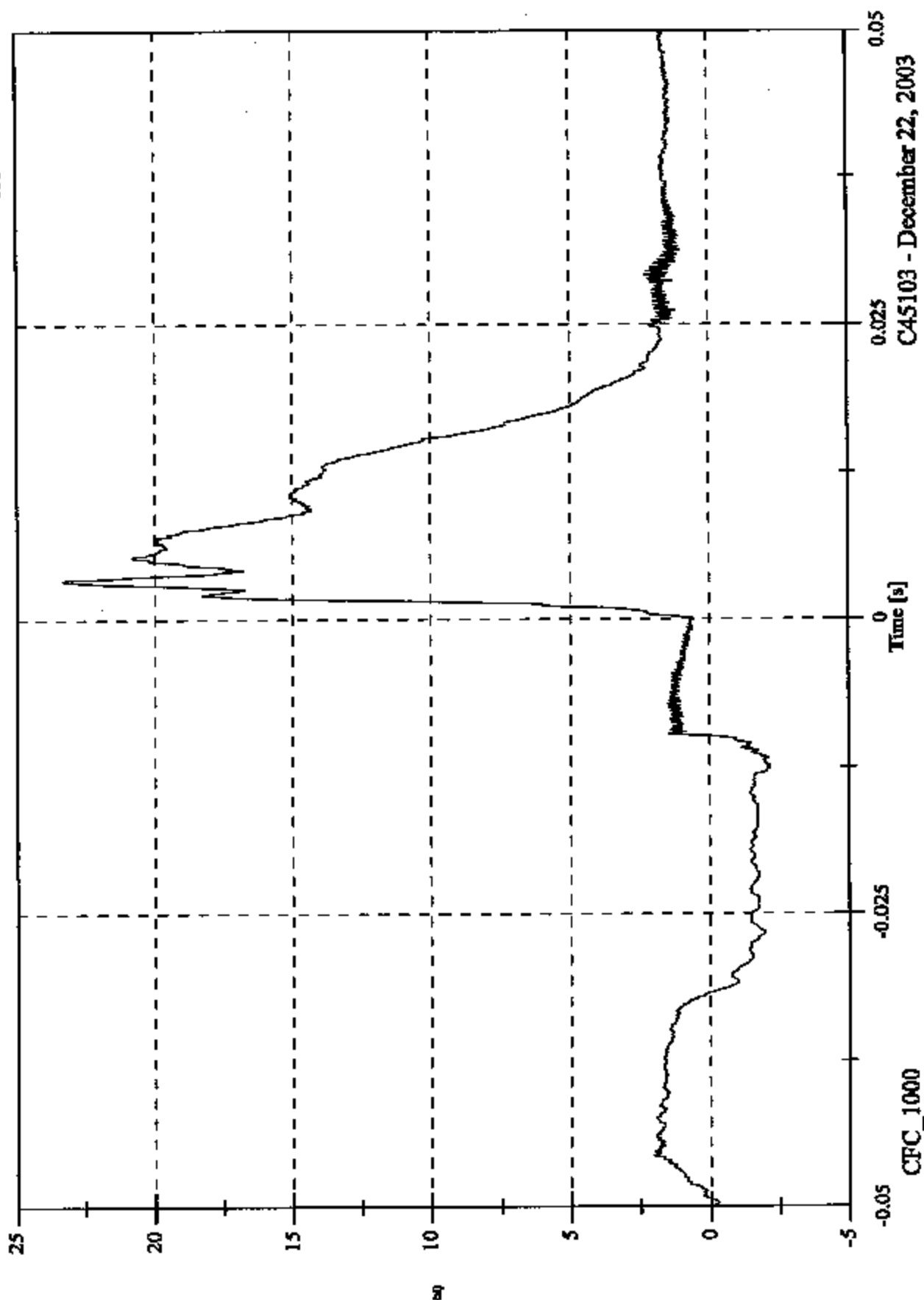
C45103 - December 22, 2003

C45103 Driver Side RP2 Impact Plot #2

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Z Acceleration

Max: 23.4 [g] at 0.003 [s]
Min: -2.2 [g] at -0.012 [s]



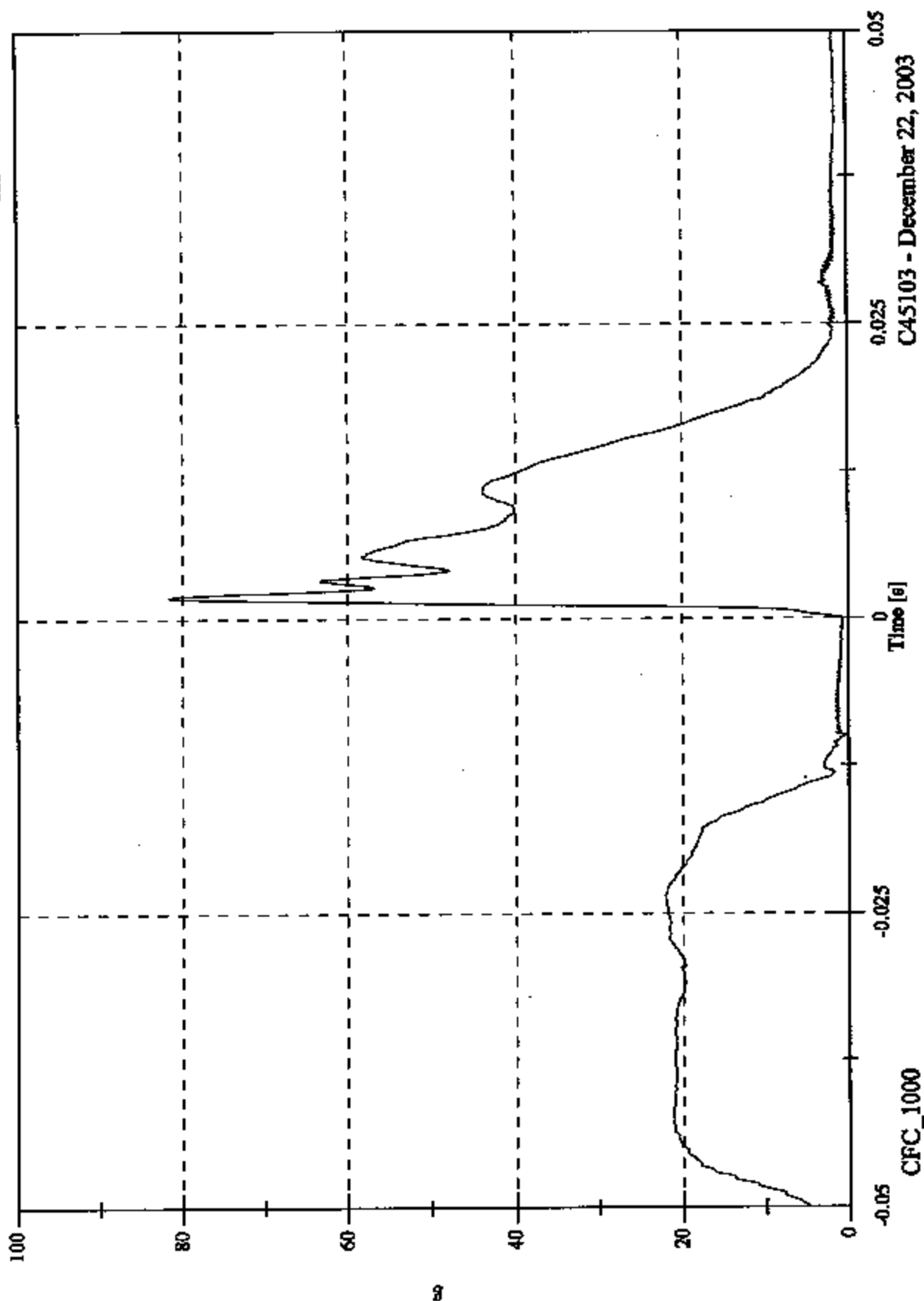
C45103 Driver Side RP2 Impact Plot #3

FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan

Headform Resultant

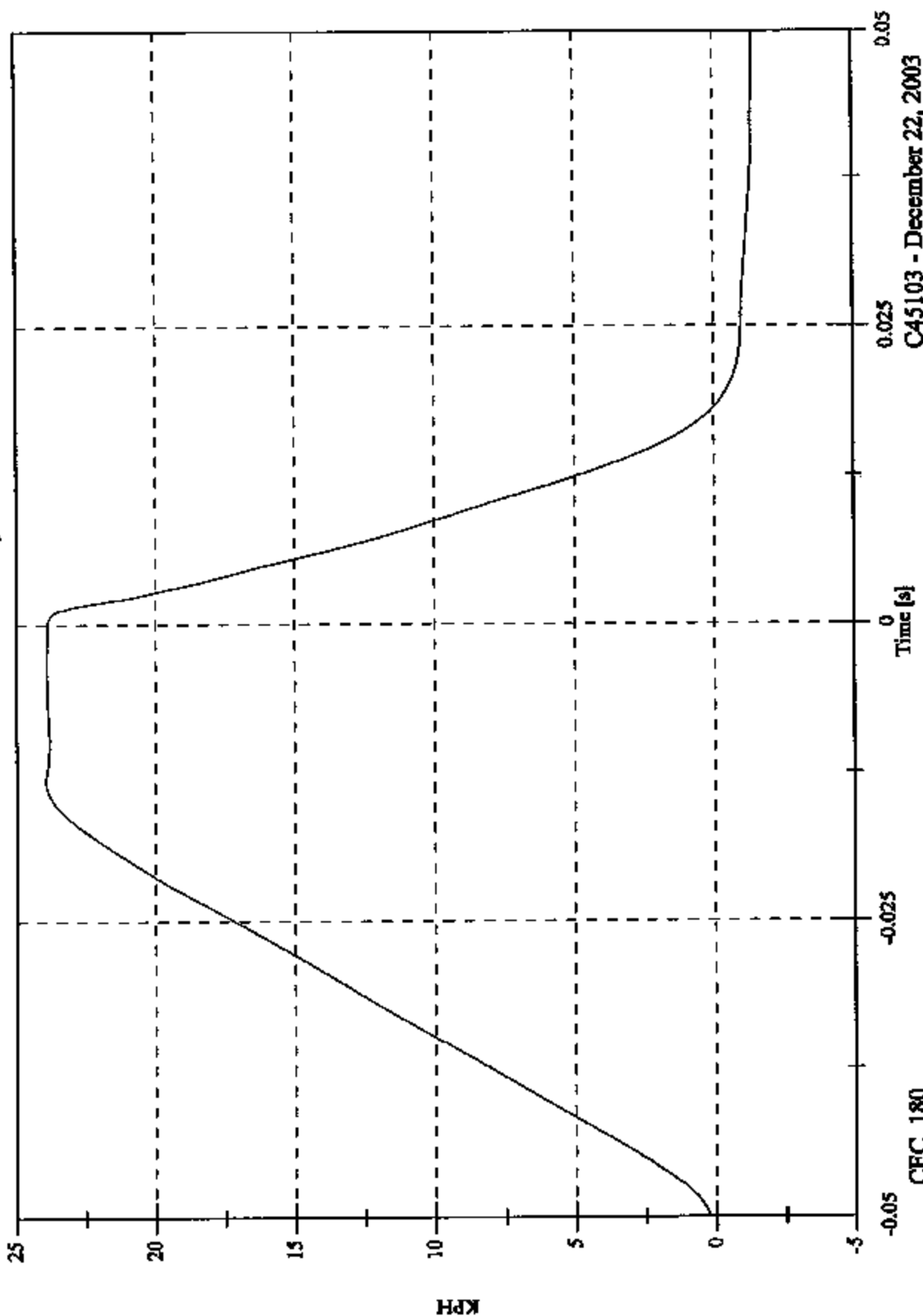
Max: 81.7 [g] at 0.002 [s]

Min: 0.2 [g] at -0.010 [s]

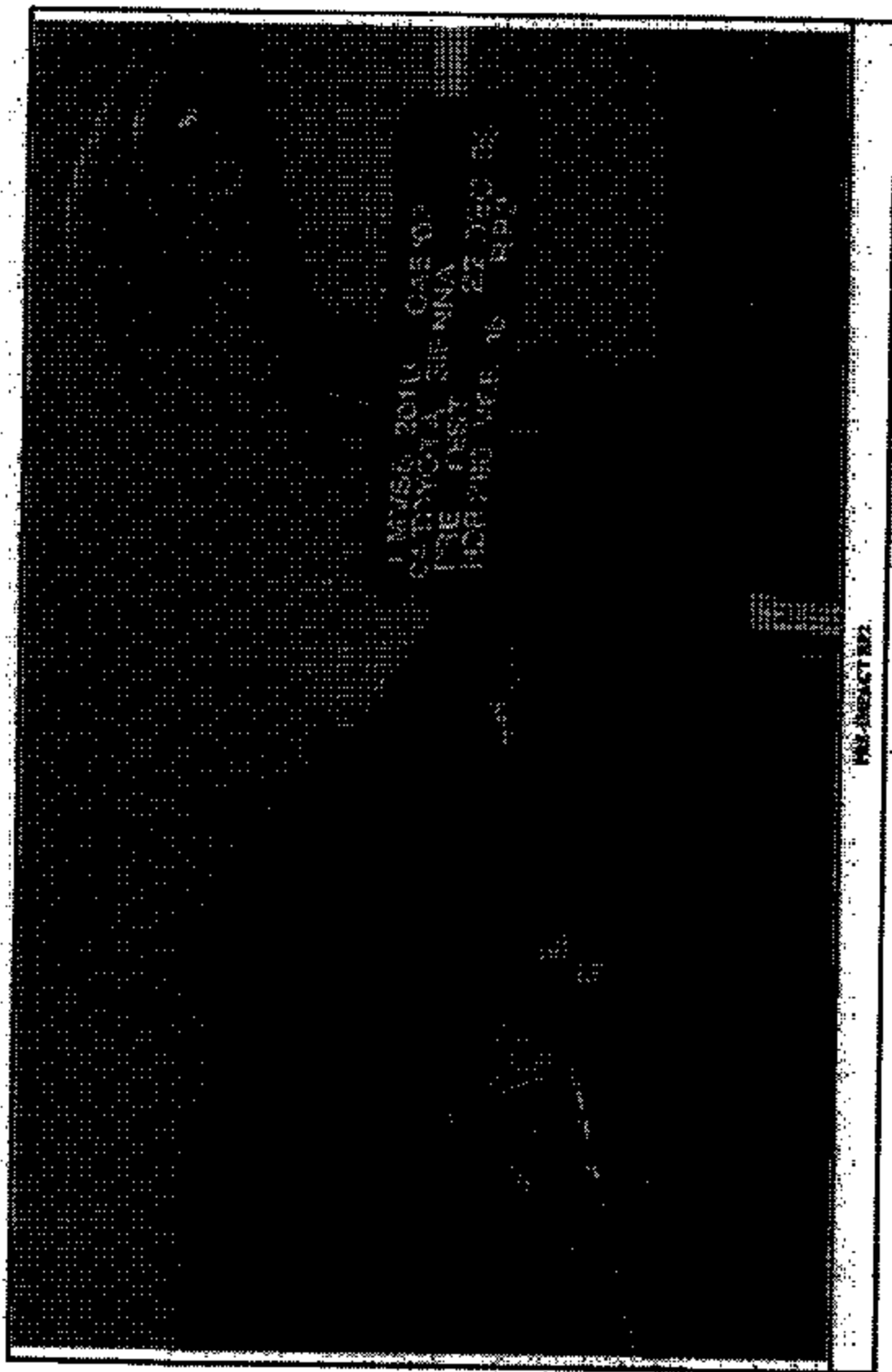


FMVSS 201U IMPACT TEST - 2004 Toyota Sienna Minivan
Headform Velocity

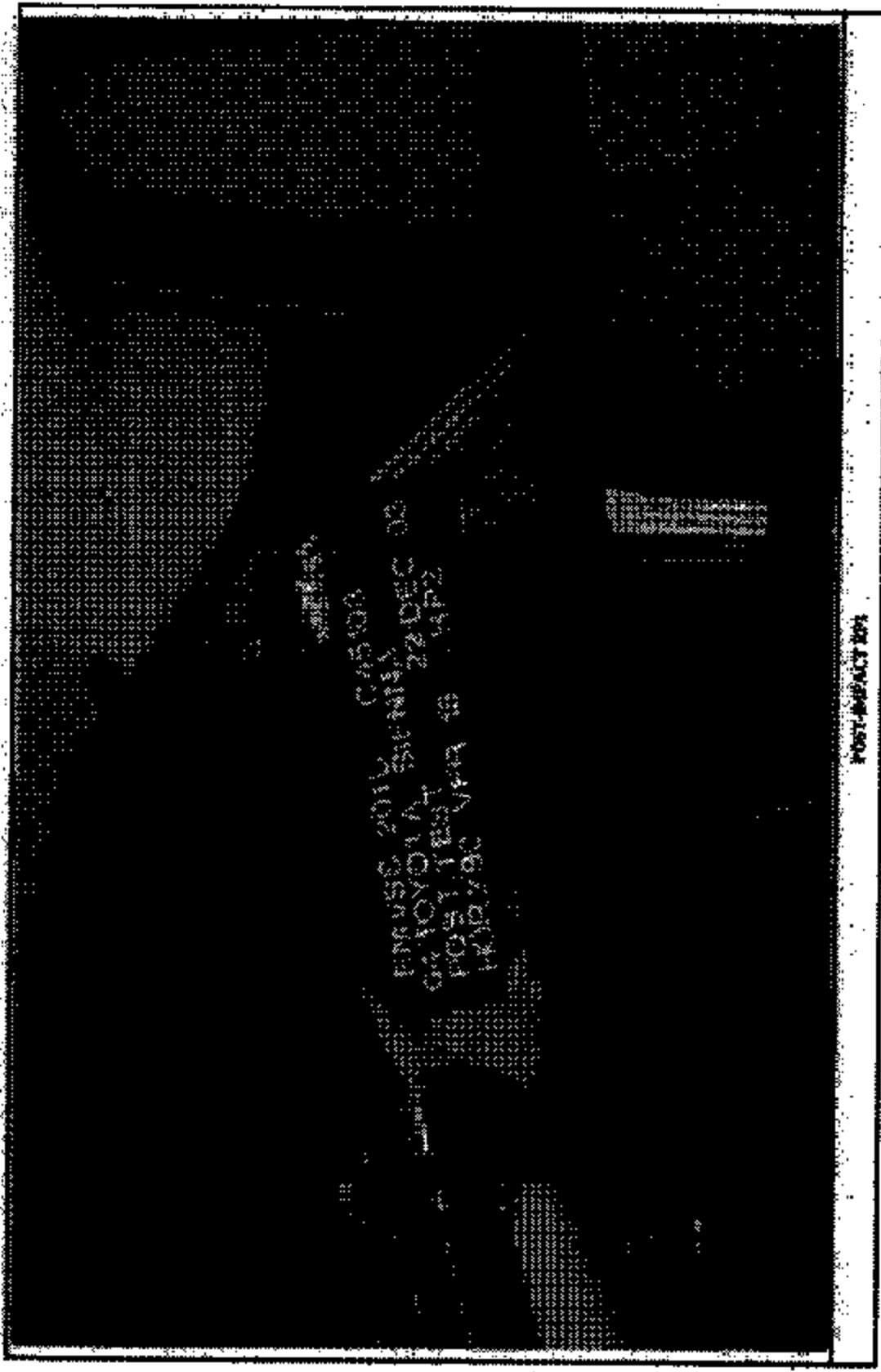
Max: 23.9 [KPH] at -0.013 [s]
Min: -1.4 [KPH] at 0.049 [s]



C45103 Driver Side RP2 Impact Plot #5



20-0578



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POST-TEST-1504

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 LEFT SIDE OF VEHICLE
A-4	3/4 REAR VIEW FROM RIGHT 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 SLIDING DOOR
A-12	PRE-TEST DRIVER SIDE OTHER PILLAR
A-13	PRE-TEST DRIVER SIDE REAR PILLAR
A-14	PRE-TEST PASSENGER SIDE A-PILLAR
A-15	PRE-TEST PASSENGER SIDE FRONT HEADER
A-16	PRE-TEST PASSENGER SIDE SIDE RAIL
A-17	PRE-TEST PASSENGER SIDE B-PILLAR
A-18	PRE-TEST PASSENGER SIDE SLIDING DOOR
A-19	PRE-TEST PASSENGER SIDE OTHER PILLAR
A-20	PRE-TEST PASSENGER SIDE REAR PILLAR
A-21	POST-TEST DRIVER SIDE A-PILLAR
A-22	POST-TEST DRIVER FRONT HEADER
A-23	POST-TEST DRIVER SIDE SIDE RAIL
A-24	POST-TEST DRIVER SIDE B-PILLAR
A-25	POST-TEST DRIVER SIDE SLIDING DOOR
A-26	POST-TEST DRIVER SIDE OTHER PILLAR
A-27	POST-TEST DRIVER SIDE REAR PILLAR
A-28	POST-TEST PASSENGER SIDE A-PILLAR
A-29	POST-TEST PASSENGER FRONT HEADER
A-30	POST-TEST PASSENGER SIDE SIDE RAIL
A-31	POST-TEST PASSENGER SIDE B-PILLAR
A-32	POST-TEST PASSENGER SIDE SLIDING DOOR
A-33	POST-TEST PASSENGER SIDE OTHER PILLAR
A-34	POST-TEST PASSENGER SIDE REAR 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 LEFT SIDE OF VEHICLE

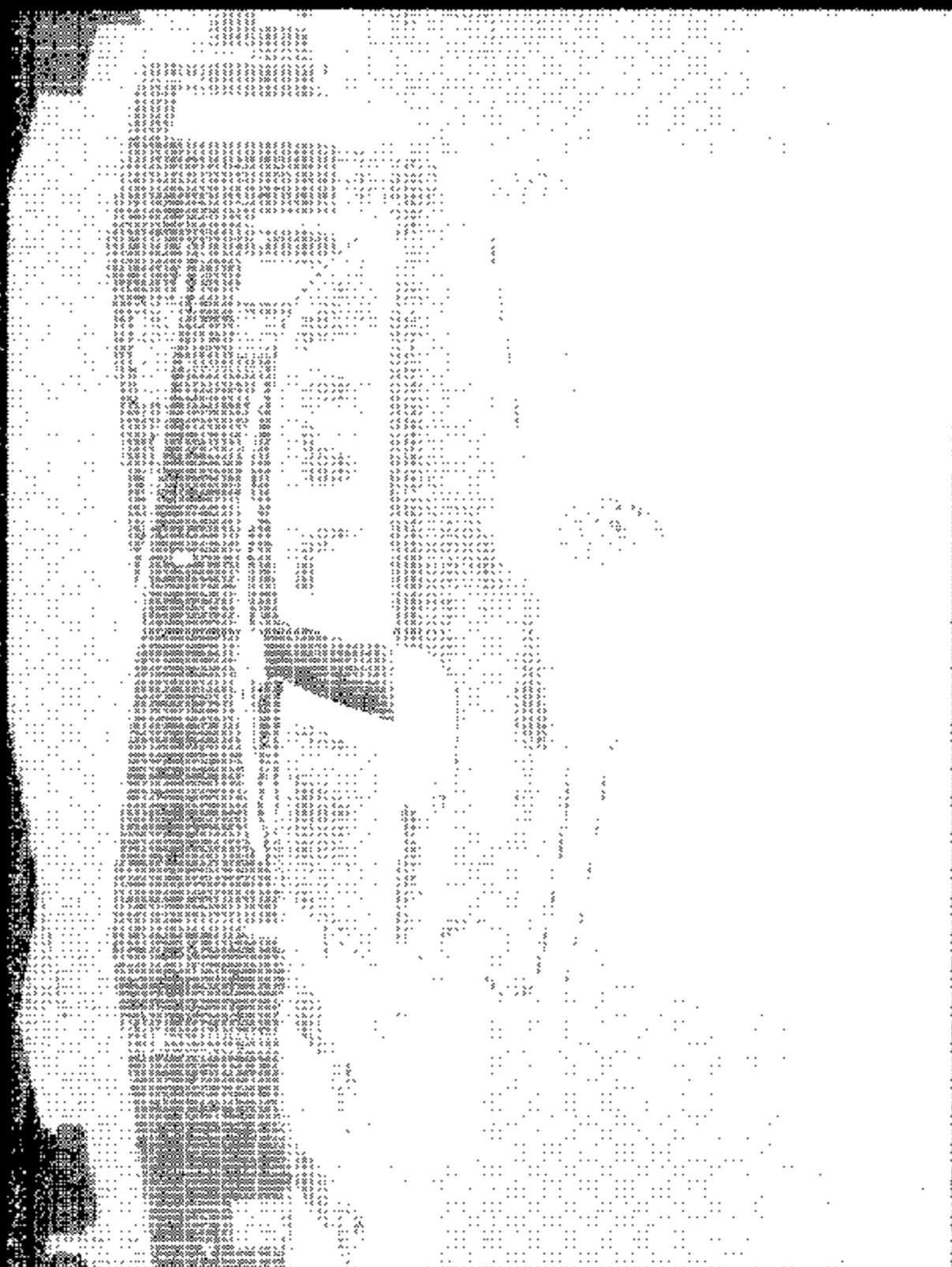


Figure A-4: 3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE

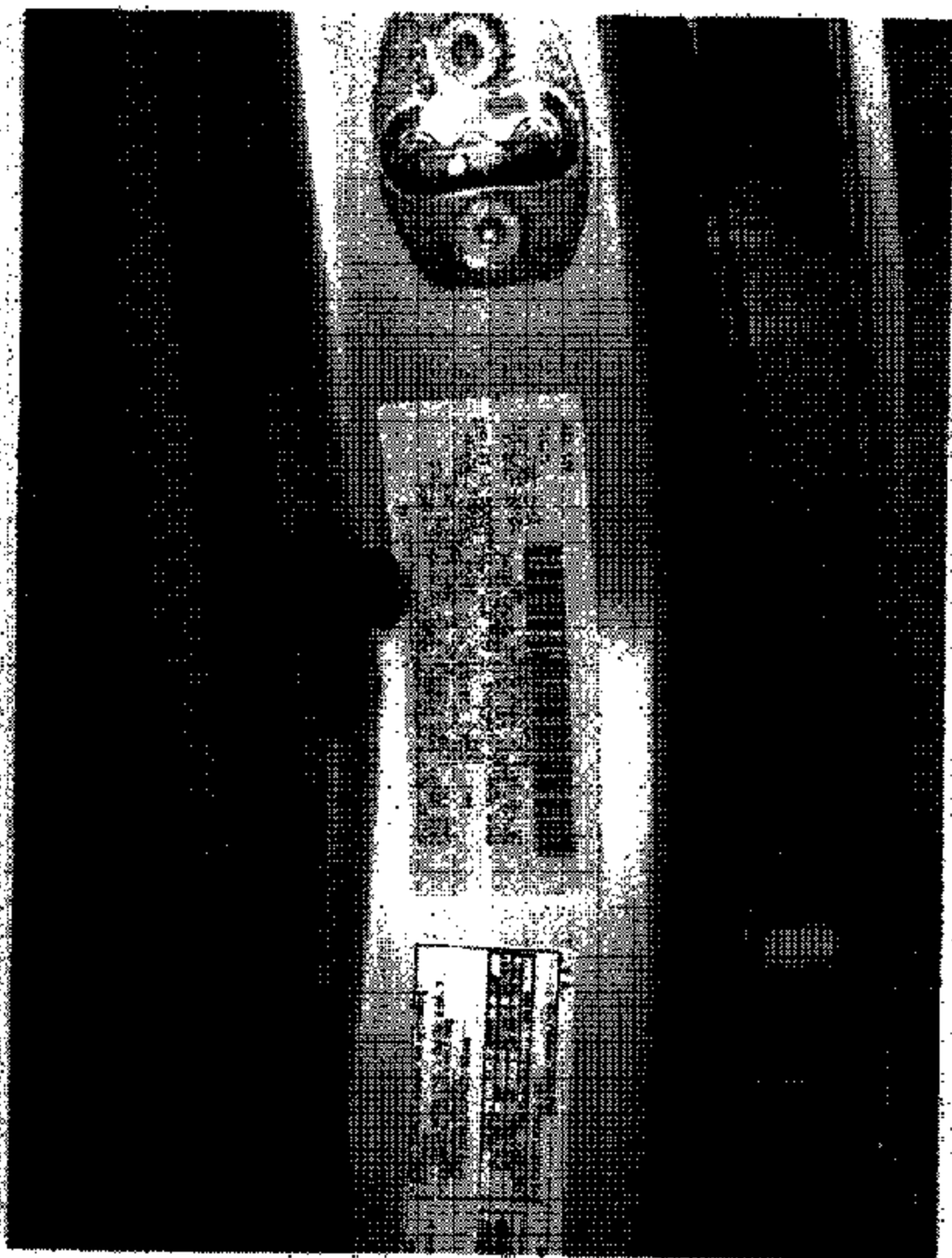


Figure A-5 : VEHICLE'S CERTIFICATION LABEL

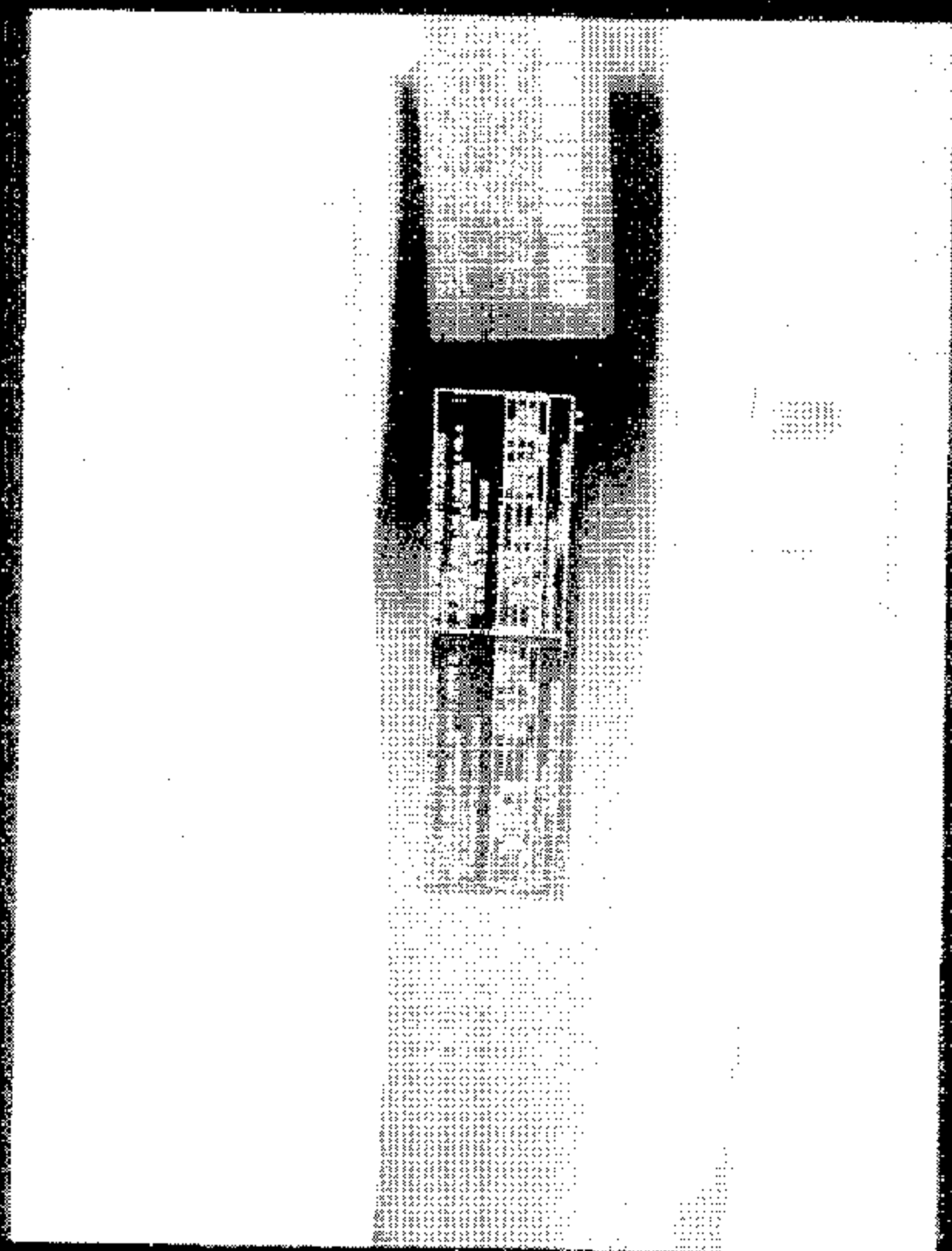


Figure A-6. VEHICLES TIRE INFORMATION LABEL.



Figure A-9 PRE-TEST DRIVER SIDE A-PILLAR

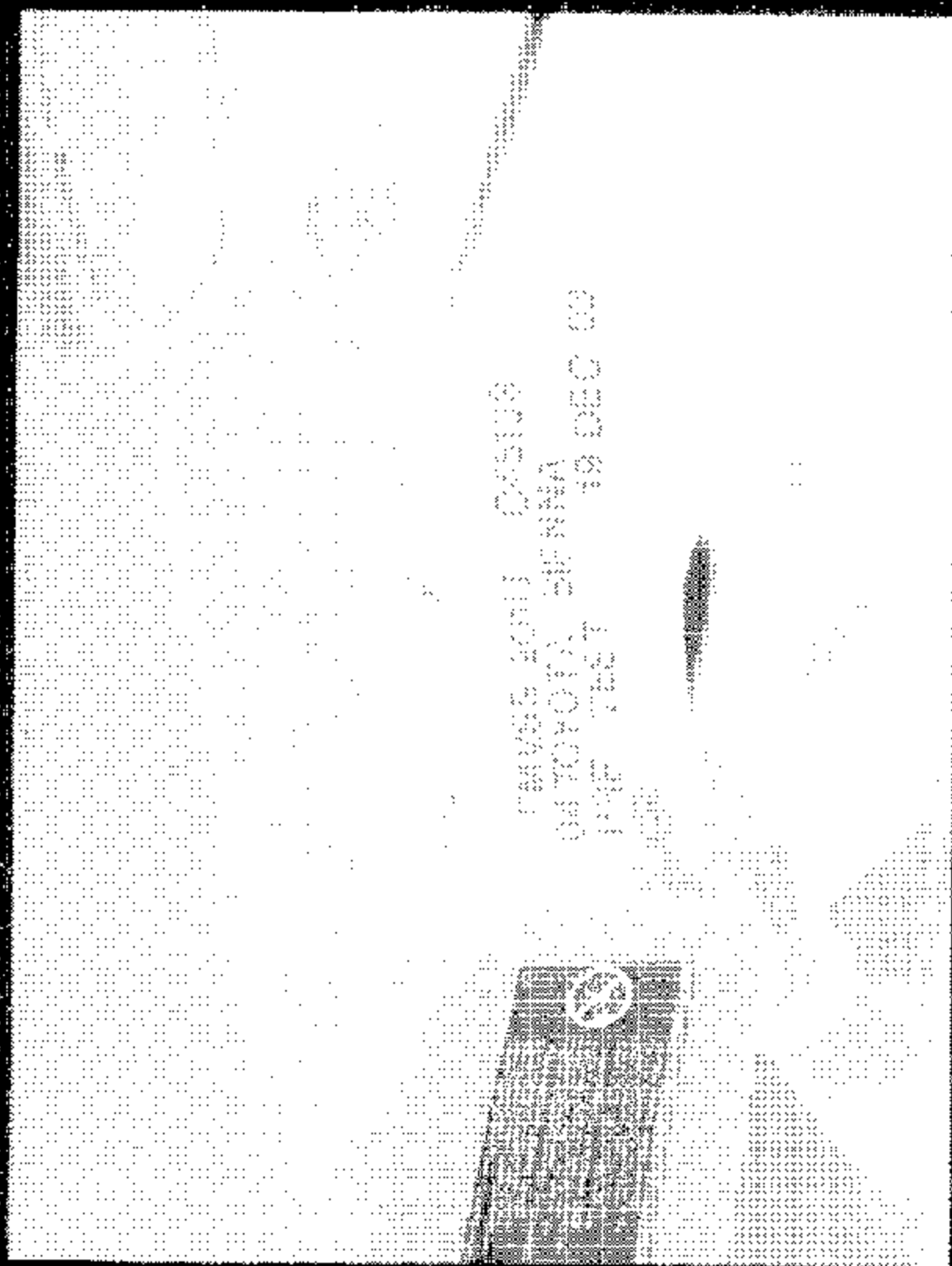


Figure A-8: PAB-TEST DRIVER SIDE FRONT HEADER



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

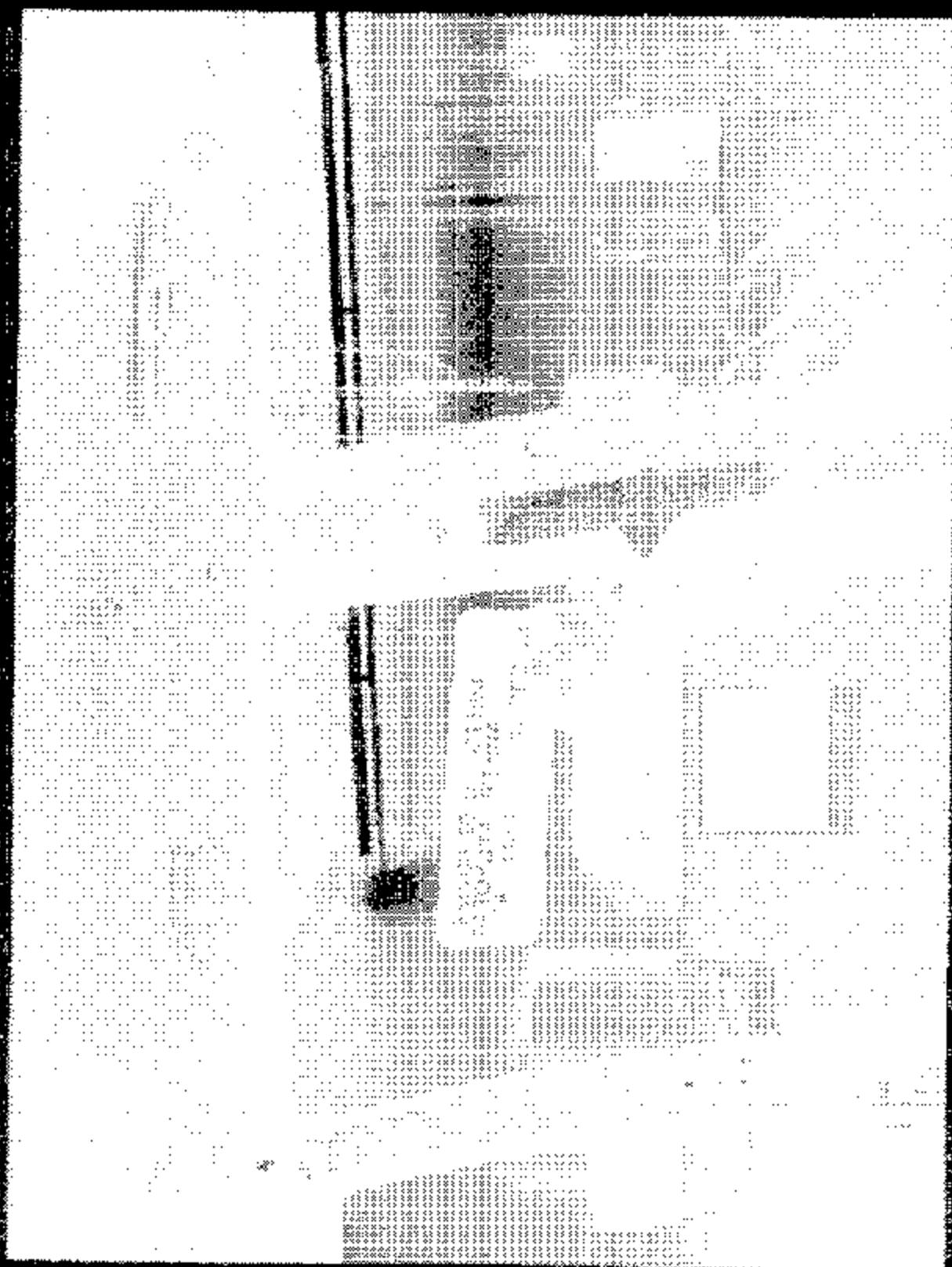


Figure A-10: PRE-TEST DRIVER SIDE B-PILLAR



Figure A-11: PRE-TEST DRIVER SIDE SLIDING DOOR

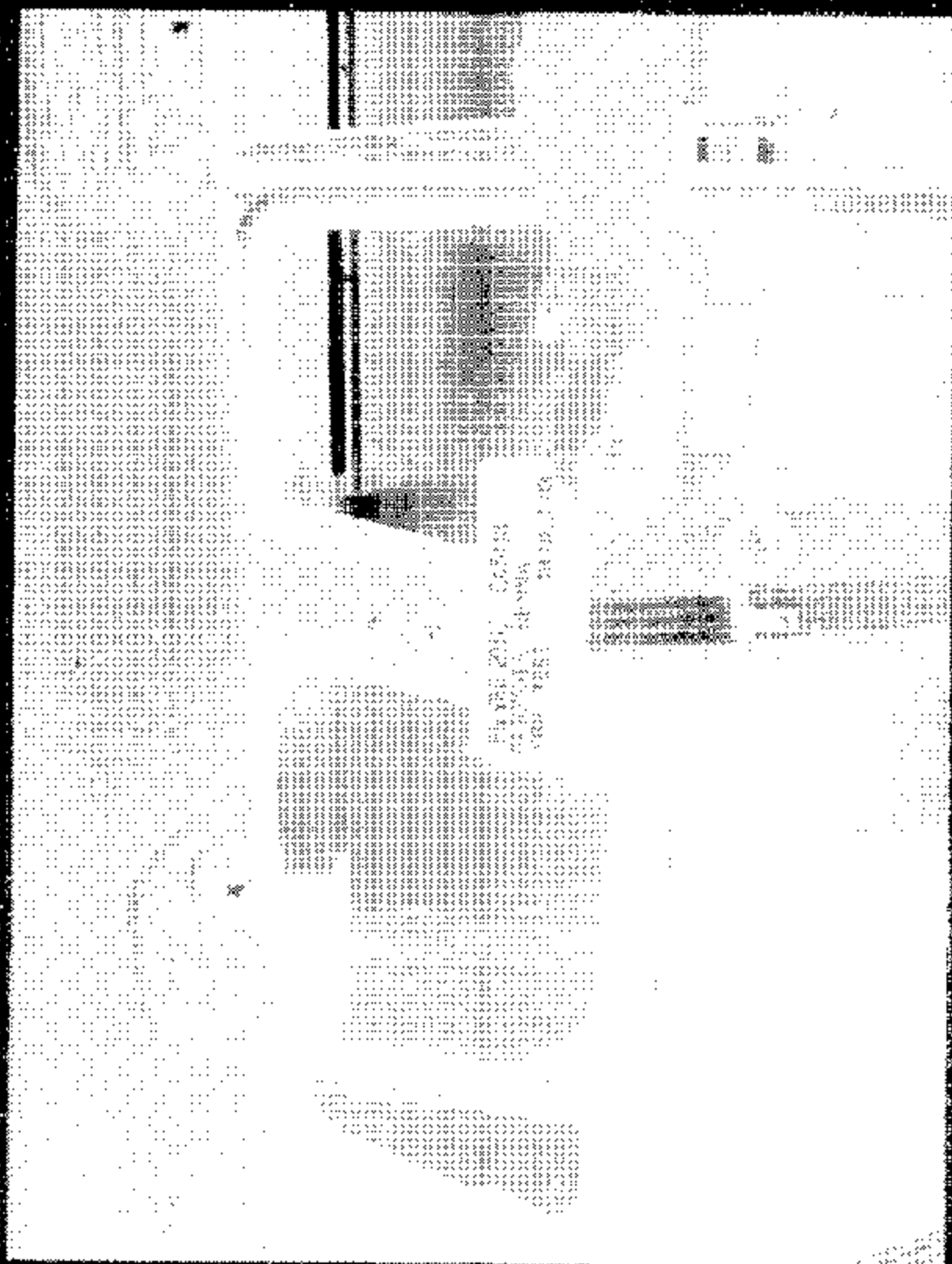


Figure A-12 : PRE-TEST DRIVER SIDE OTHER HILLAR



Figure A-13 : PUL-TST DRIVER SIDE REAR PILLAR

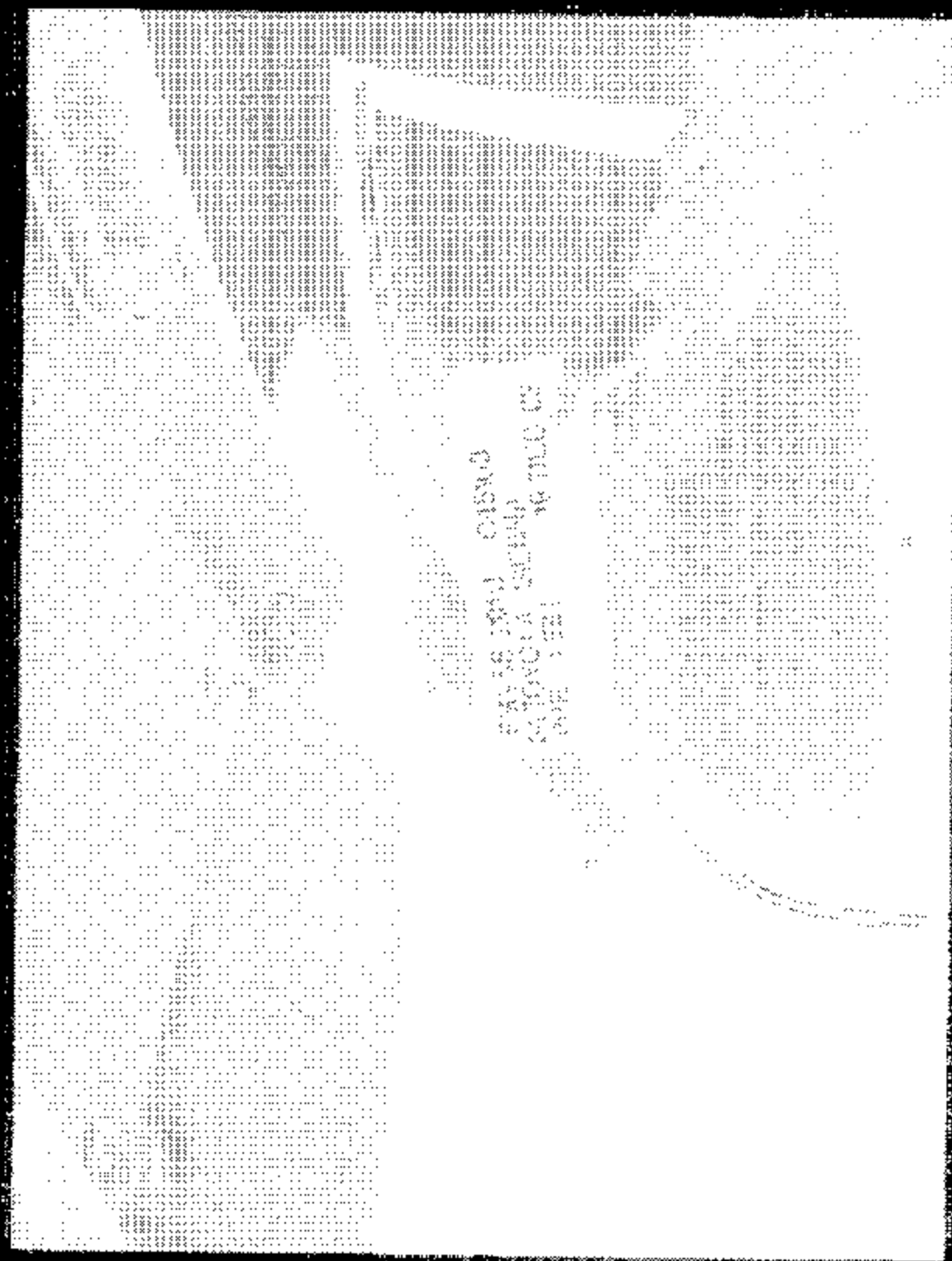


Figure A-14 PRE-TEST PASSENGER SIDE A-PILLAR



Figure A-15. PRE-TEST PASSENGER SIDE FRONT HEADER

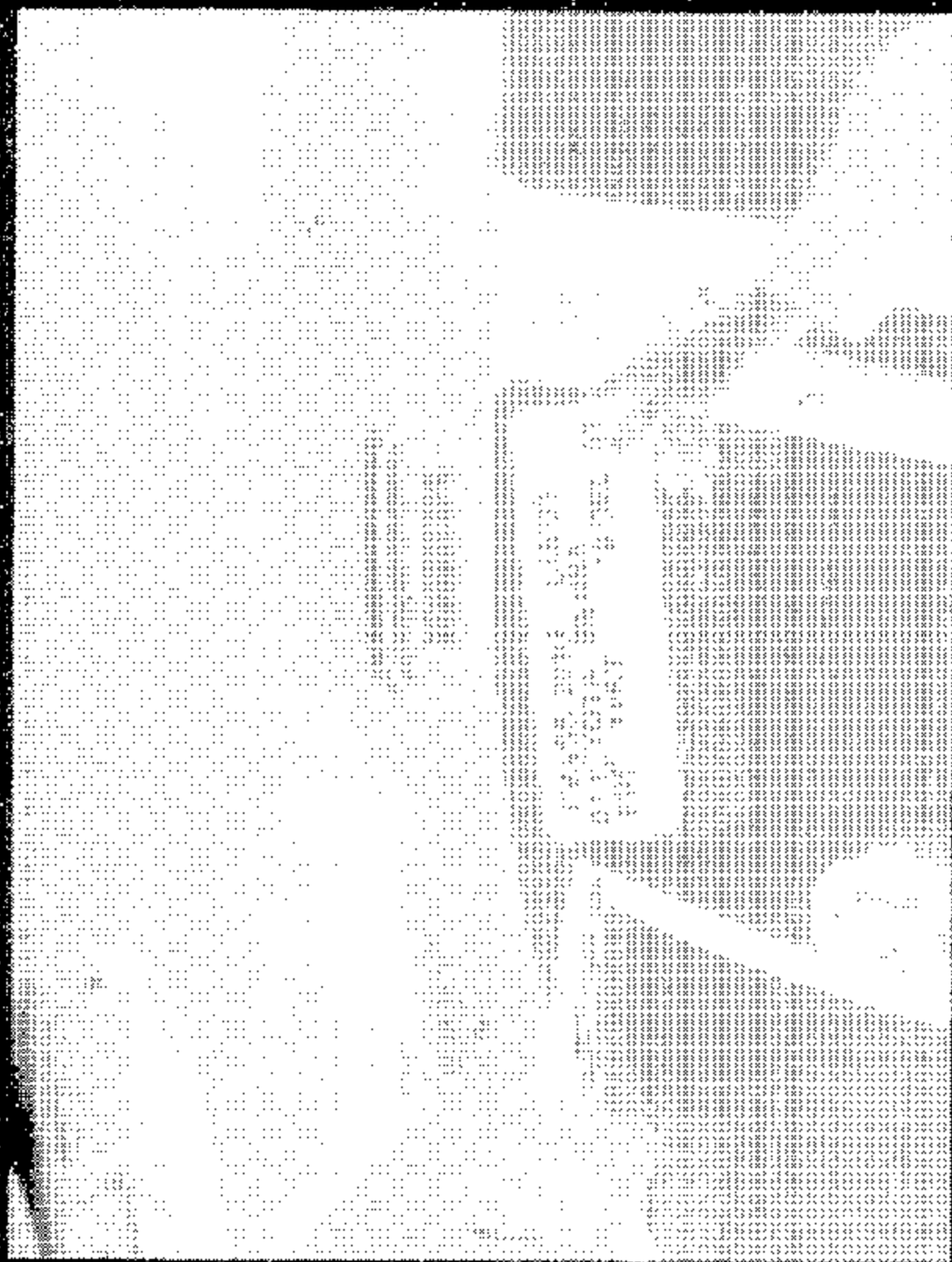


Figure A-16 PRE-TEST PASSENGER SIDE SIDE RAIL



Figure A-17 PRE-TEST PASSENGER SIDE B-PILLAR

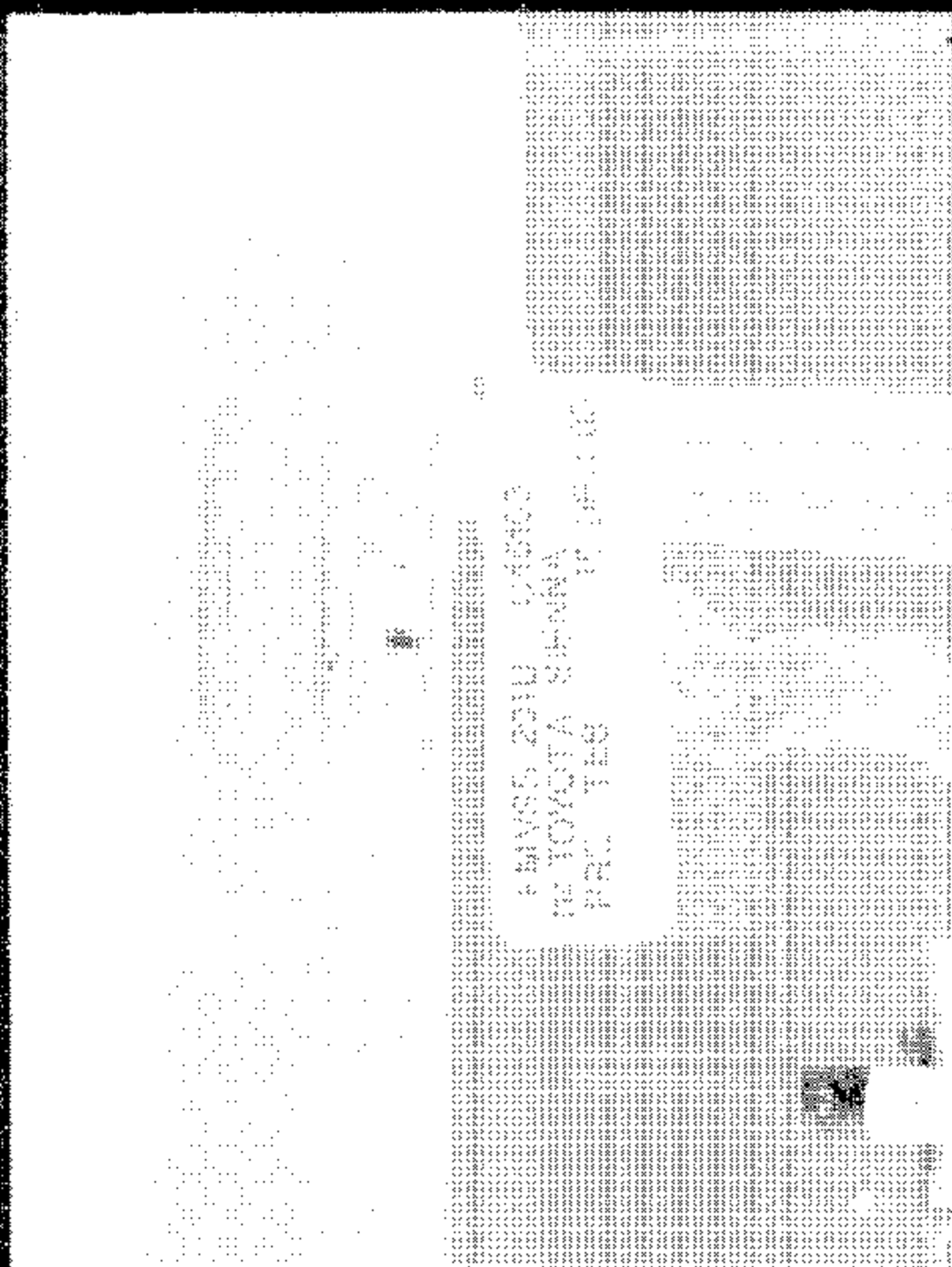


Figure A-18: PRE-TEST PASSENGER SIDE SLIDING DOOR

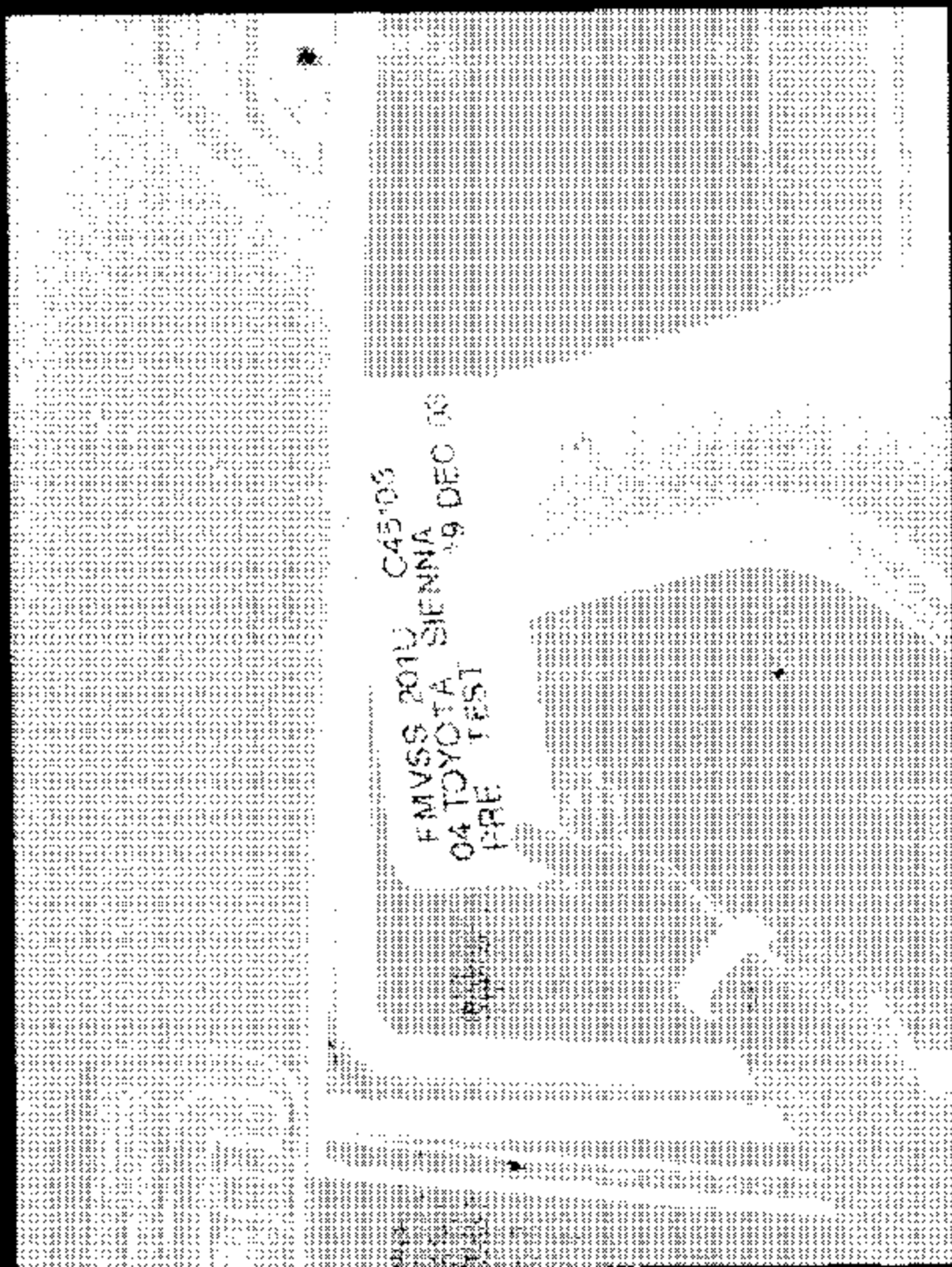


Figure A-19: PRE-TEST PASSENGER SIDE OTHER PILLAR

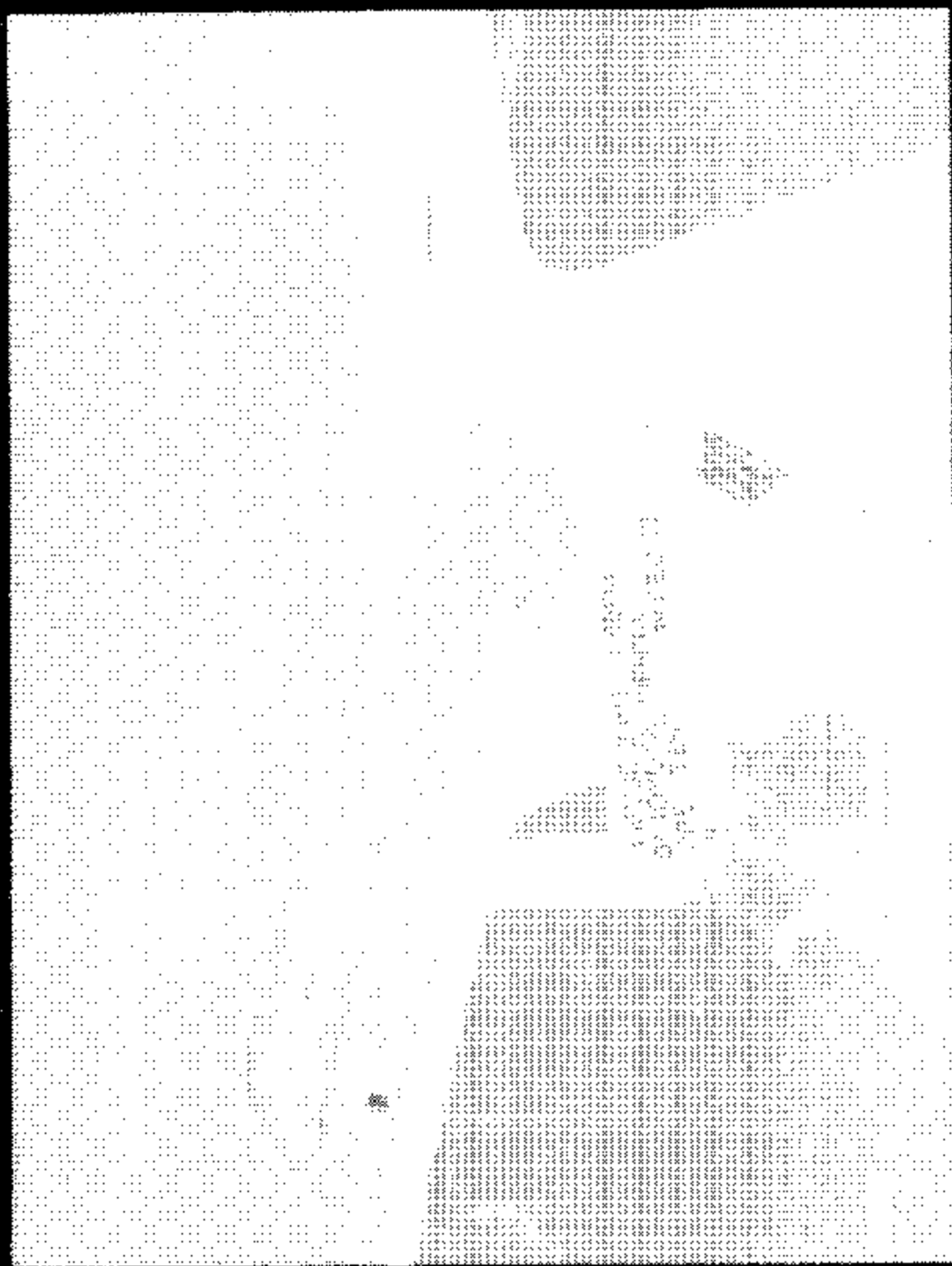


Figure A-20 : PRE-TEST PASSENGER SIDE REAR PILLAR

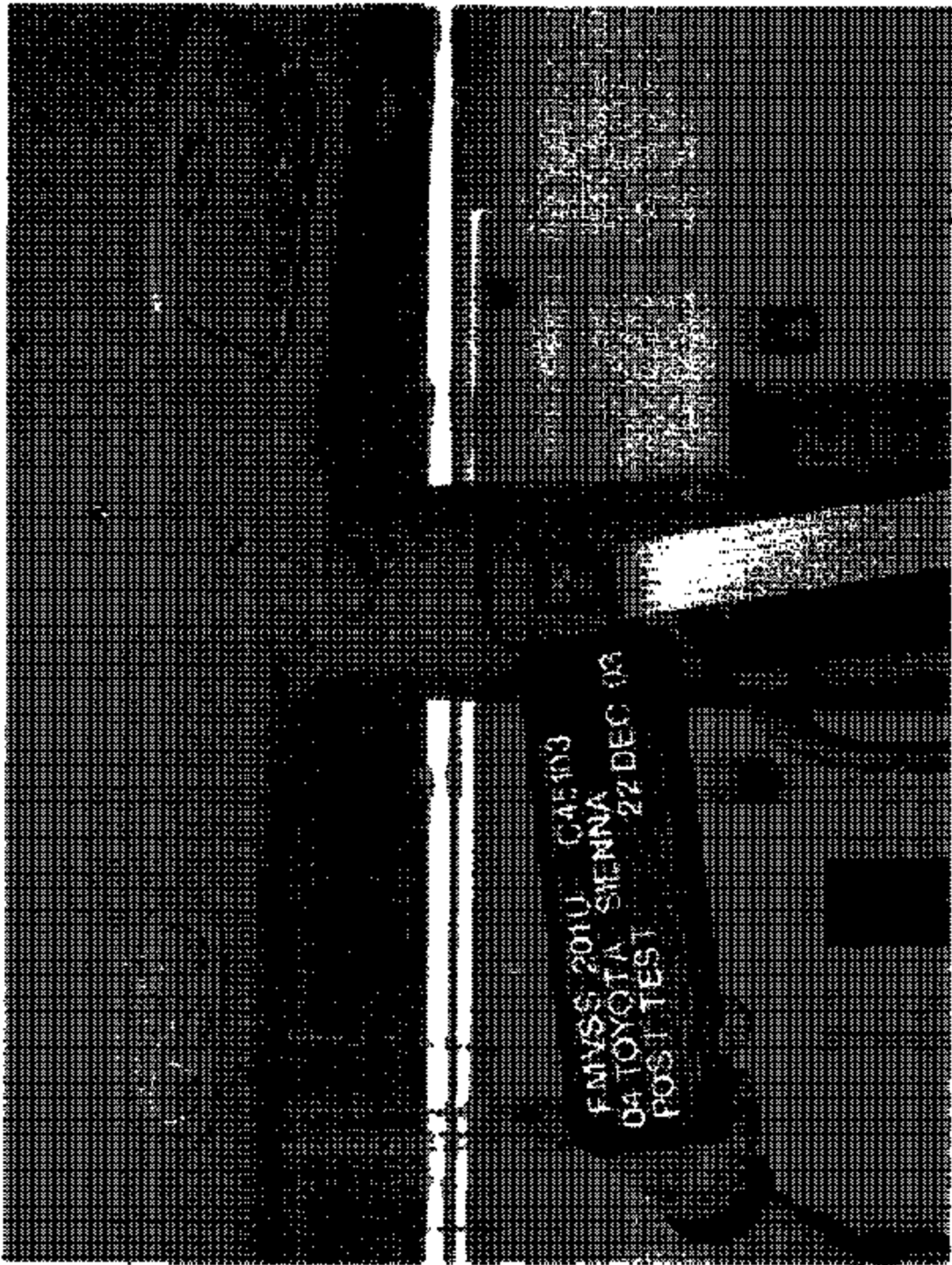


Figure A-24: POST-TEST DRIVER SIDE B-PILLAR

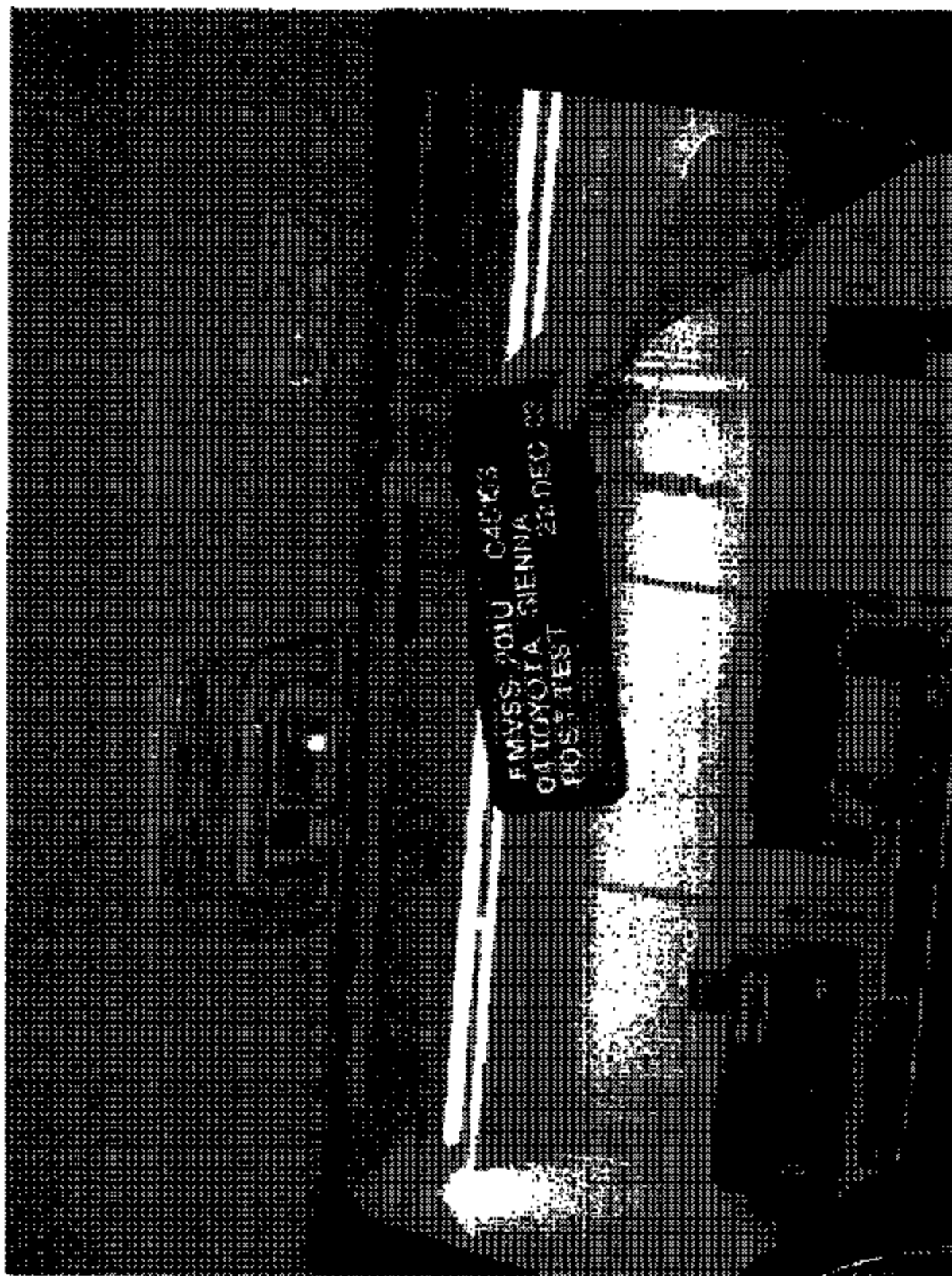


Figure A-25. POST-TEST DRIVER SIDE SLIDING DOOR

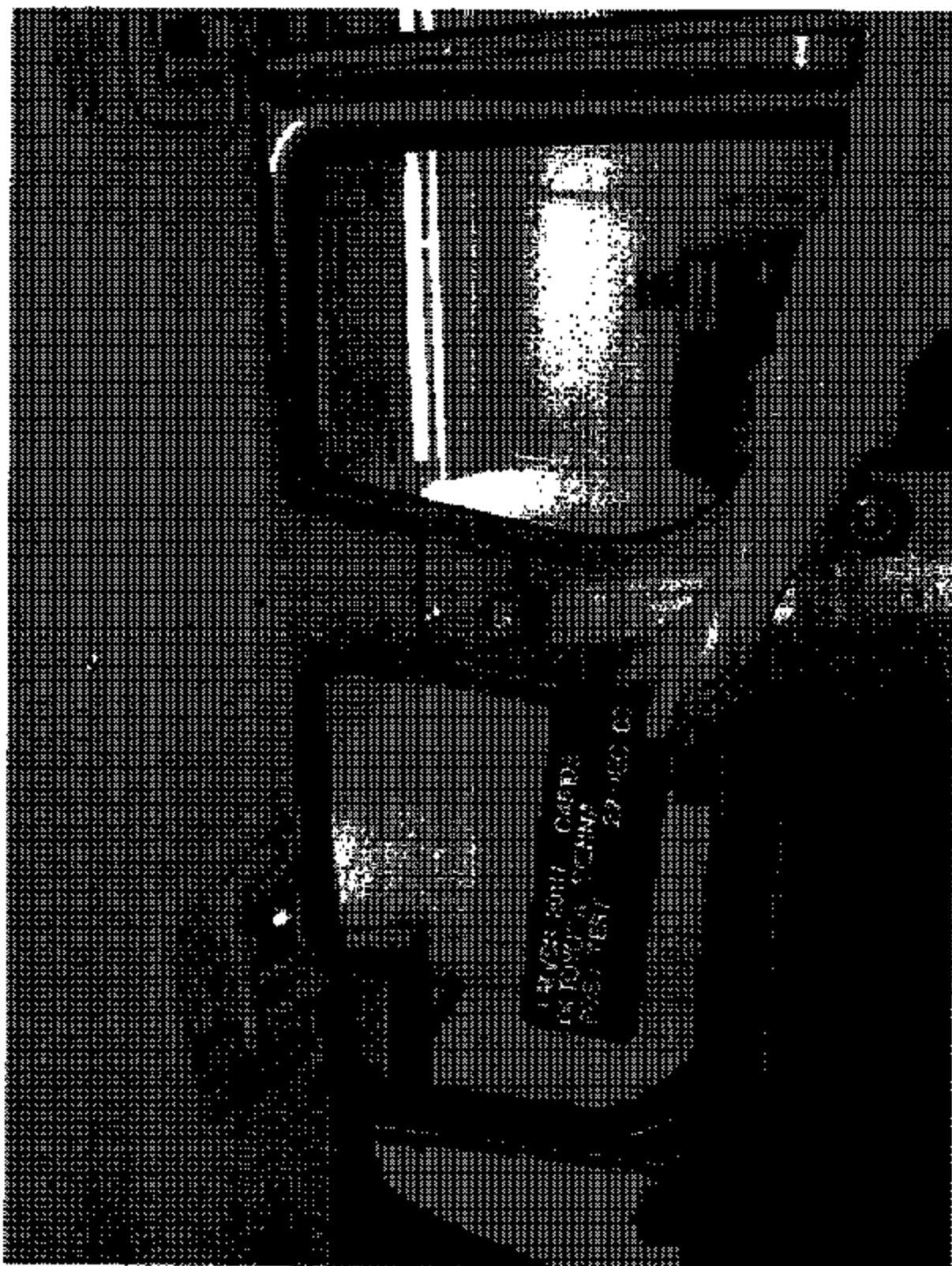


Figure A-26. PORT-TEST DRIVER SIDE OTHER PILLAR



Figure A-27 : POST-TEST DRIVER SIDE REAR PILLAR



Figure A-28 : POST-TEST PASSENGER SIDE A-PILLAR

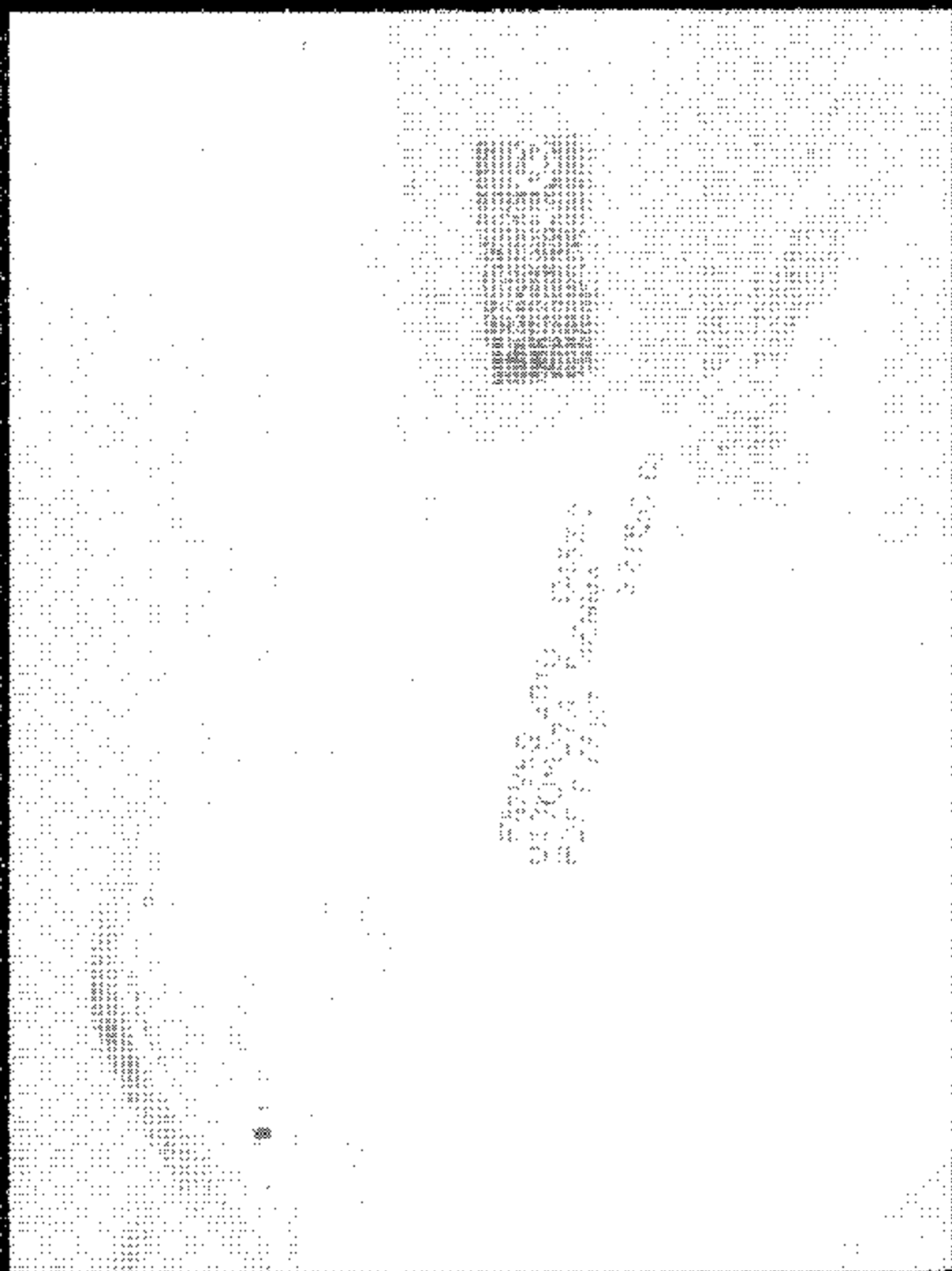


Figure A-29. POST-TEST PASSENGER SIDE FRONT HEADER



Figure A-31 POST-FIRE PASSENGER SIDE B-PILLAR

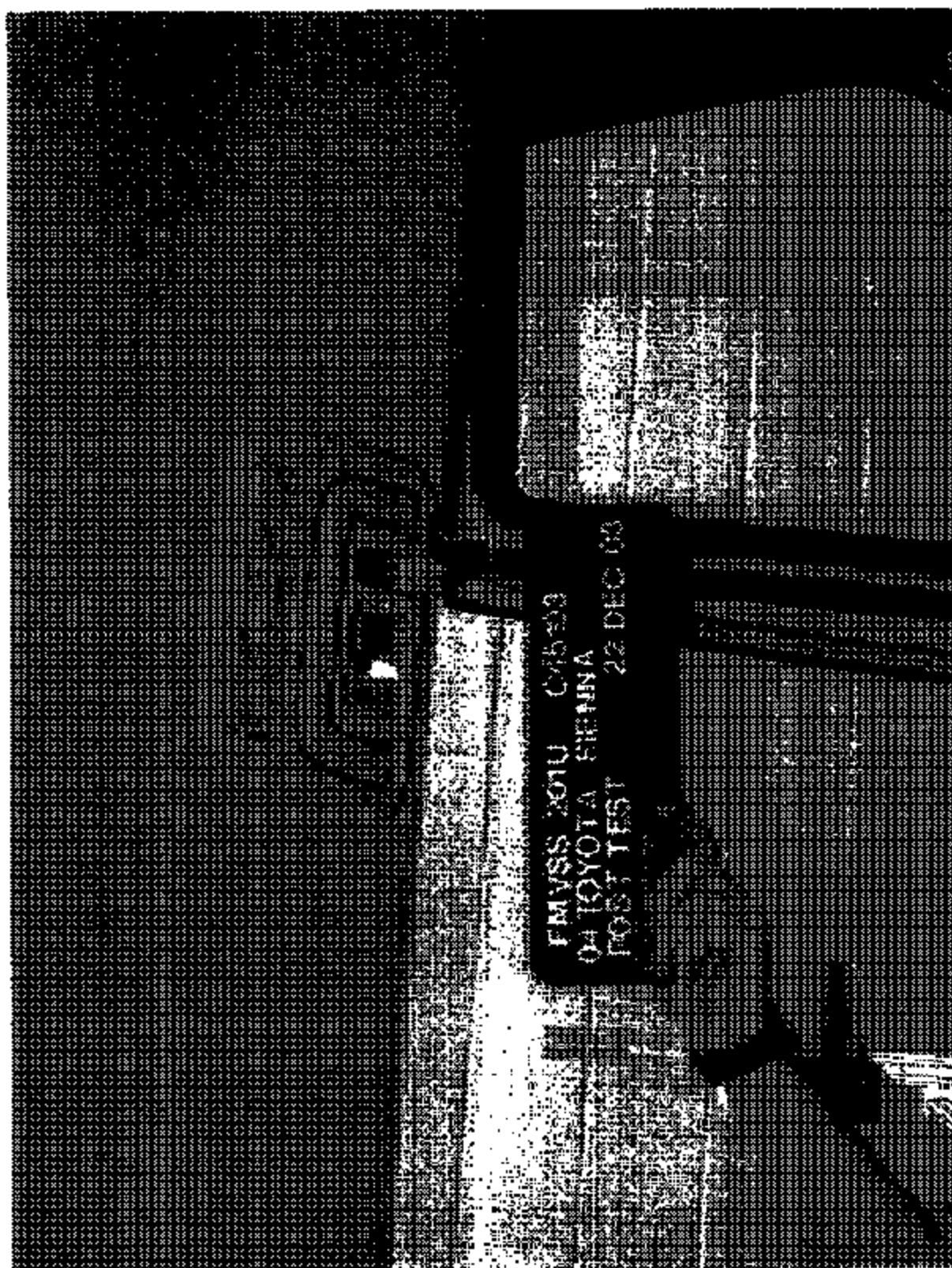


Figure A-32 POST-TEST PASSENGER SIDE SLIDING DOOR



Figure A-33. POST-TEST PASSENGER SIDE OTHER PILLAR

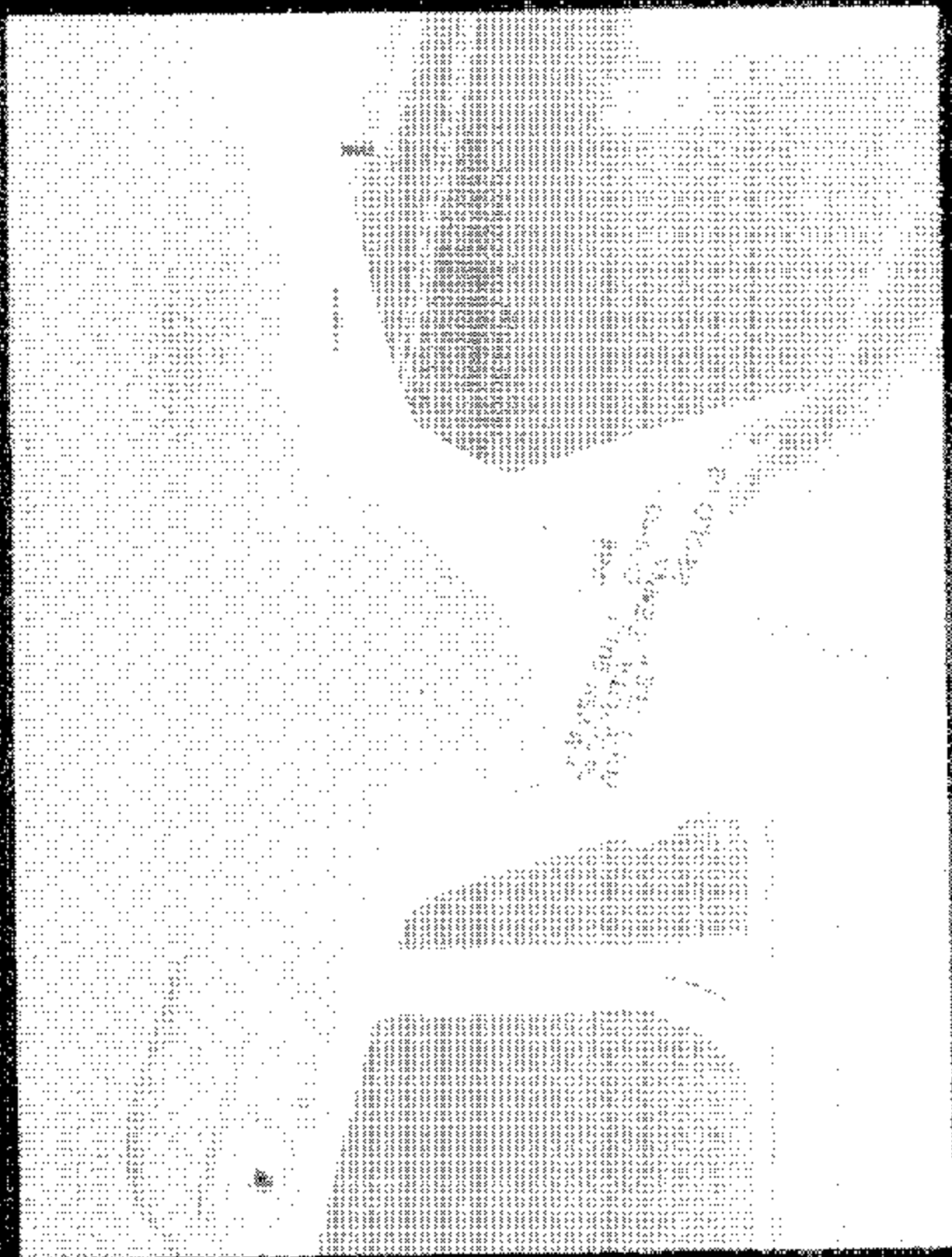


Figure A-34 POST-FIRE PASSING IN SIDE REAR PILLAR

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 5721.
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS
SERIAL NUMBER:		0642
CALIBRATION DATE:		December 15, 2003
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	239.5
PEAK LATERAL ACCELERATION	15 Gs Maximum	24
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

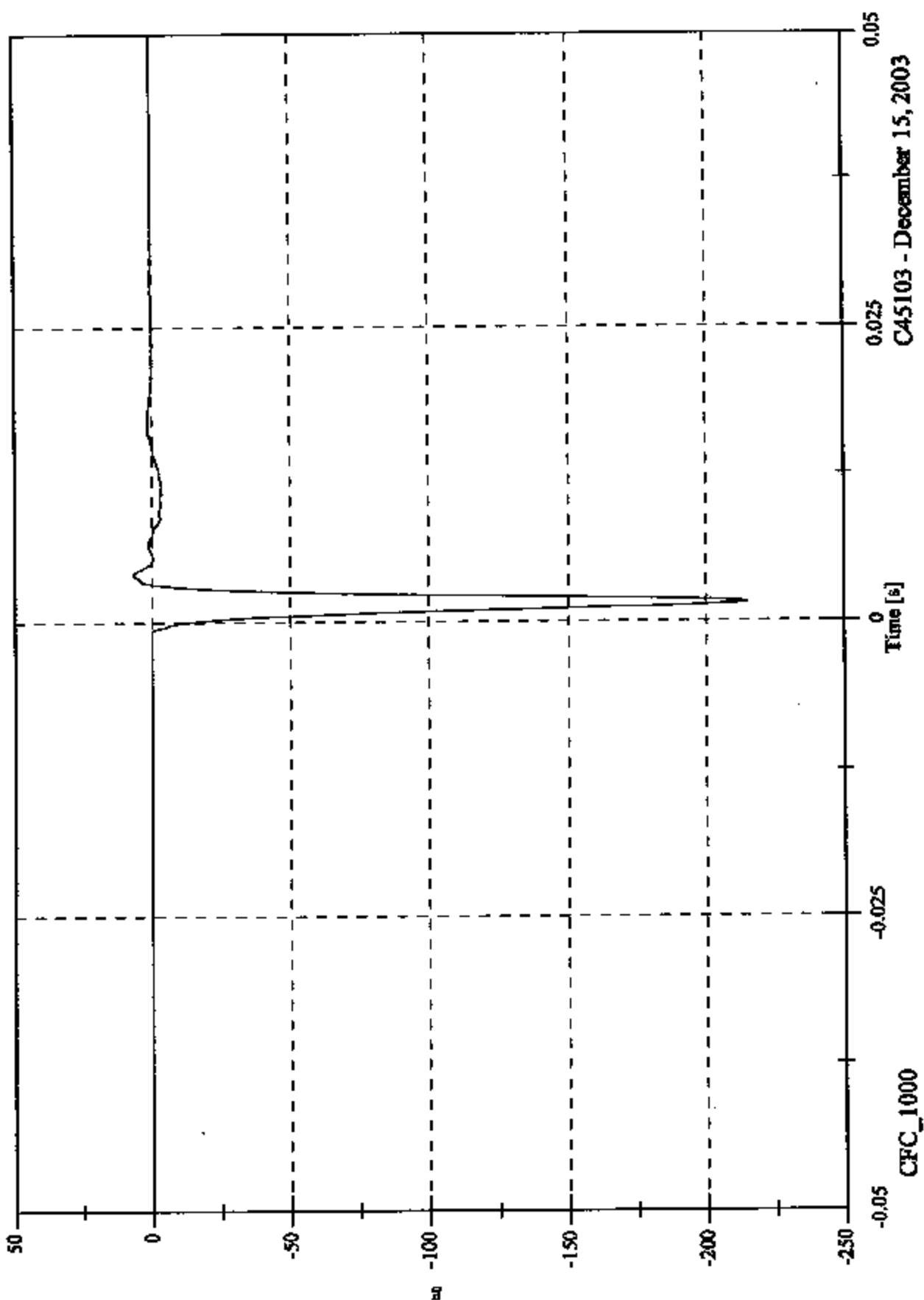
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7264-2000T	J33038	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7264-2000T	J33069	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 6.7 [g] at 0.004 [s]
Min: -214.7 [g] at 0.002 [s]

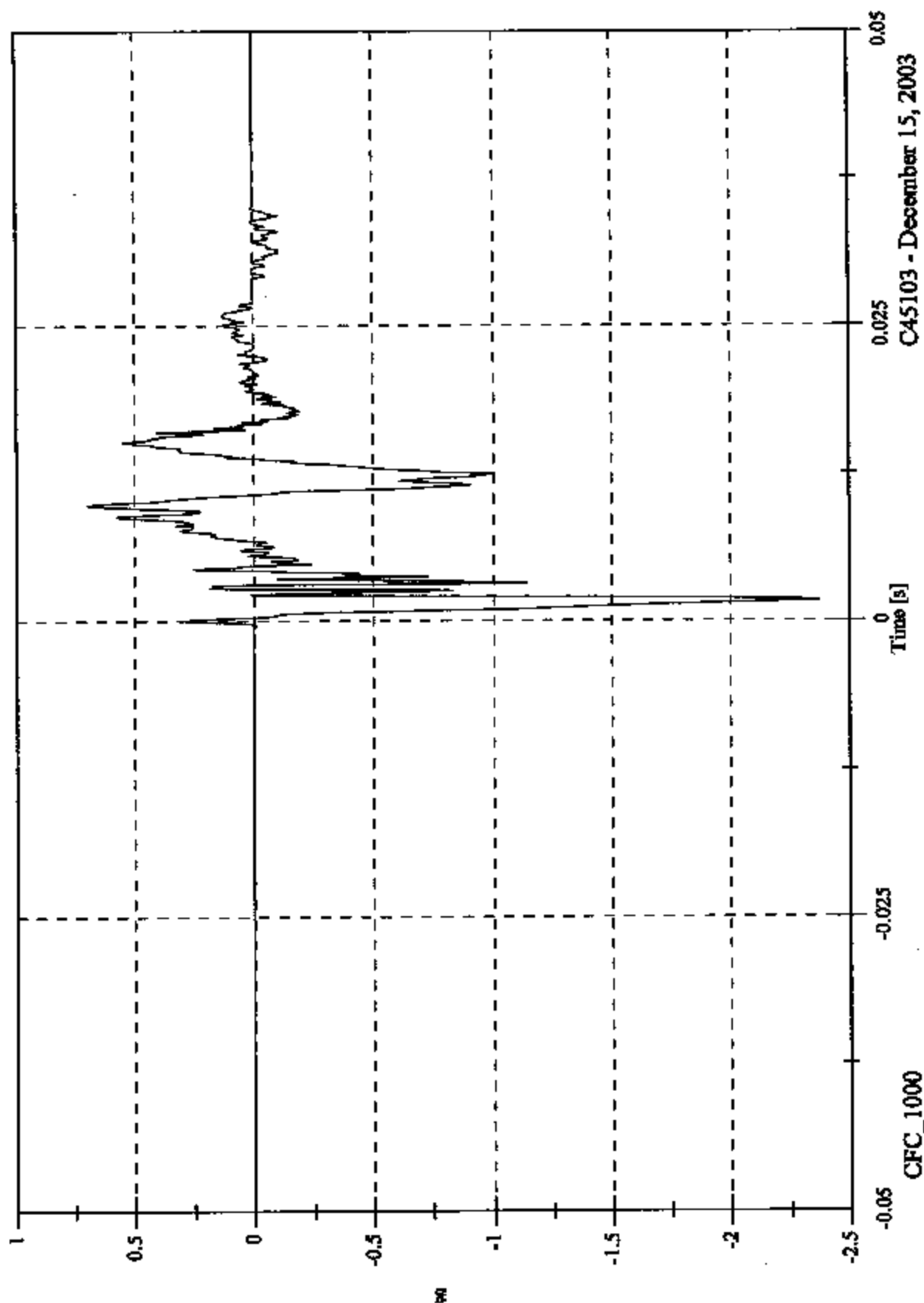
Headform X Acceleration



FMVSS 201U - Headform Calibration Drops

Max: 0.7 [g] at 0.010 [s]
Min: -2.4 [g] at 0.002 [s]

Headform Y Acceleration

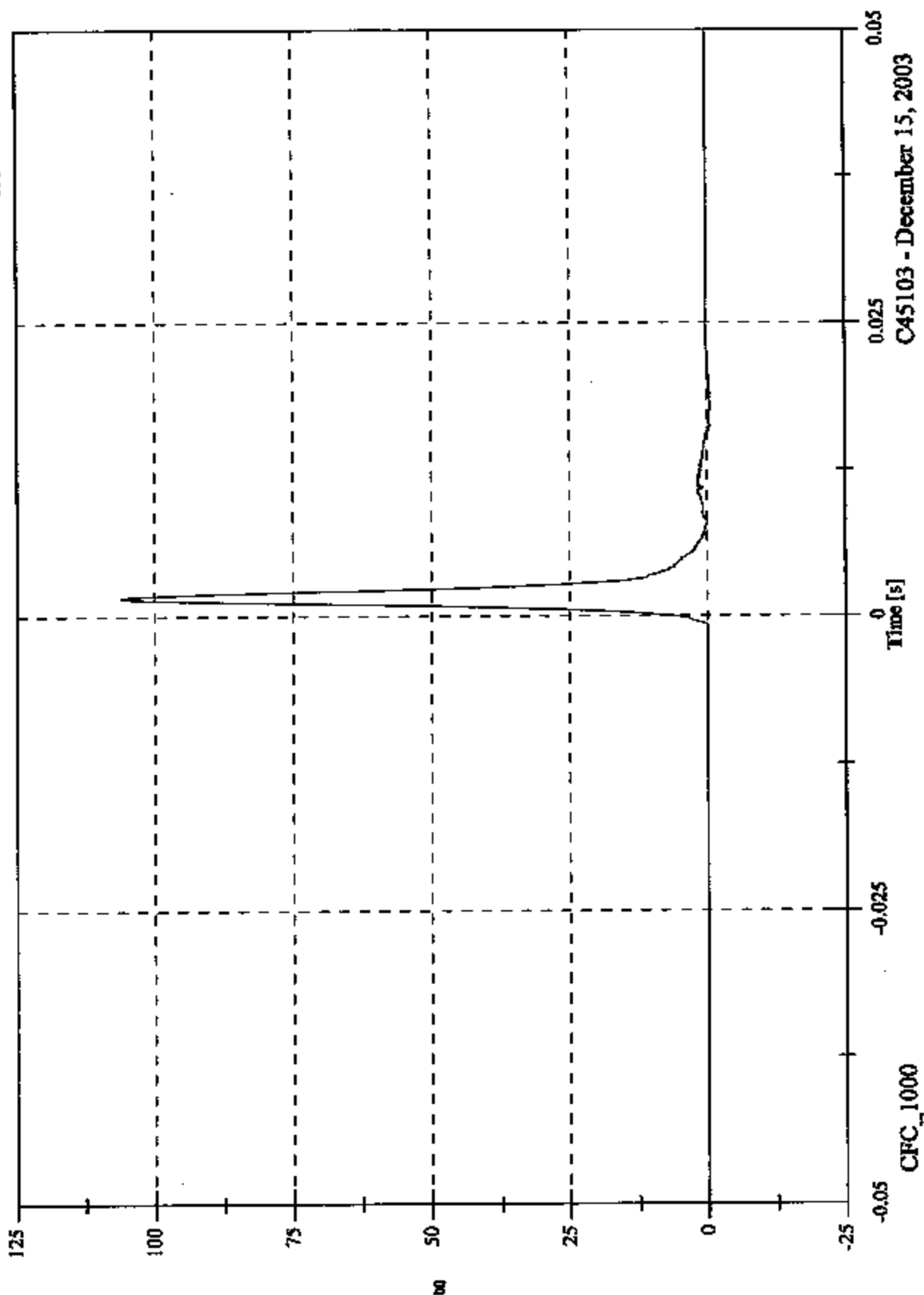


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FMVSS 201U - Headform Calibration Drops

Max: 106.1 [g] at 0.002 [s]
Min: -0.6 [g] at 0.016 [s]

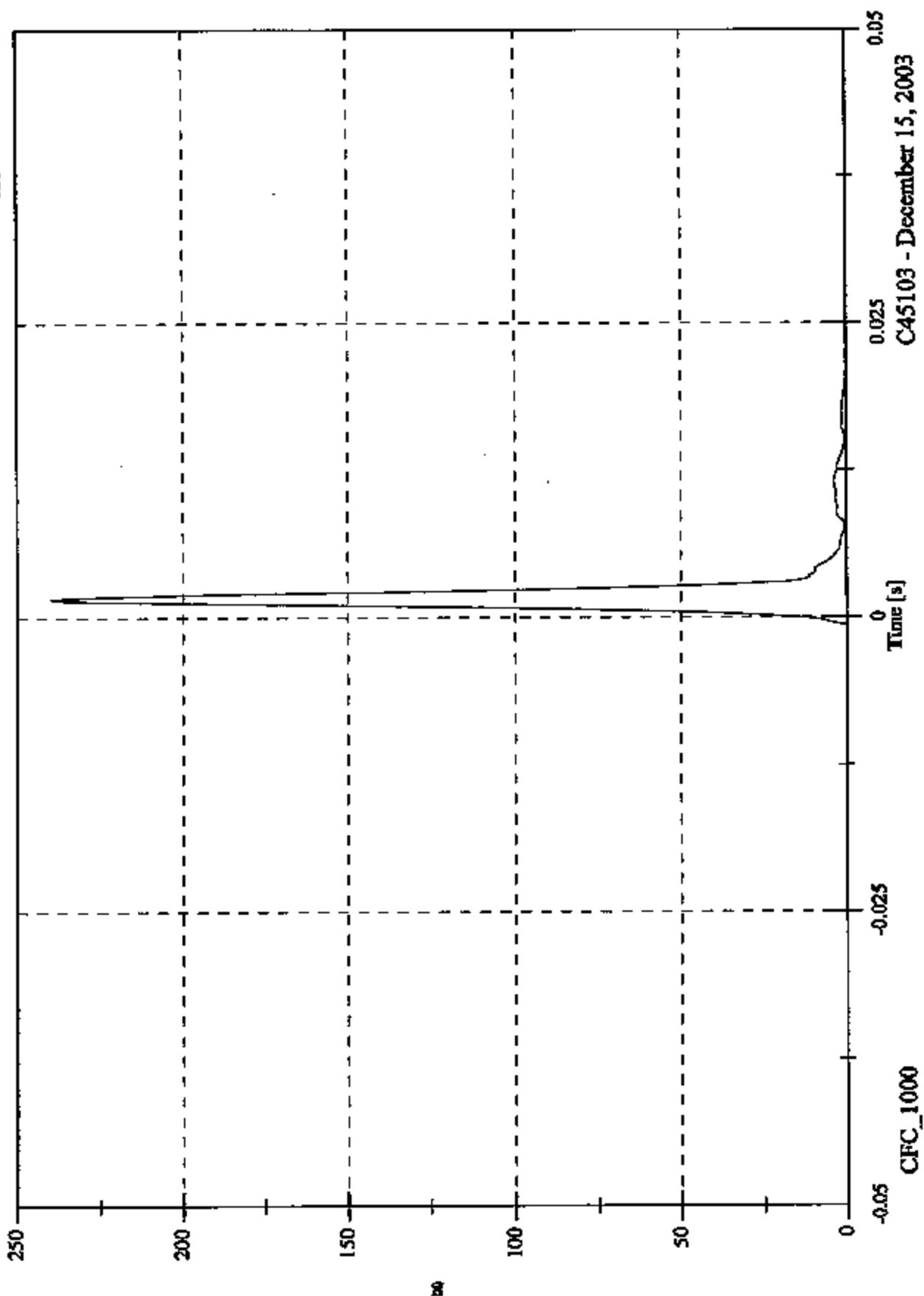
Headform Z Acceleration



FMVSS 201U - Headform Calibration Drops

Max: 239.5 [g] at 0.002 [s]
Min: 0.0 [g] at 0.036 [s]

Headform Resultant



C45103 - December 15, 2003

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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS
SERIAL NUMBER:		0062
CALIBRATION DATE:		December 15, 2003
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	23
PEAK RESULTANT ACCELERATION	215 Gs to 275 Gs	246.8
PEAK LATERAL ACCELERATION	15 Gs Maximum	7.3
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

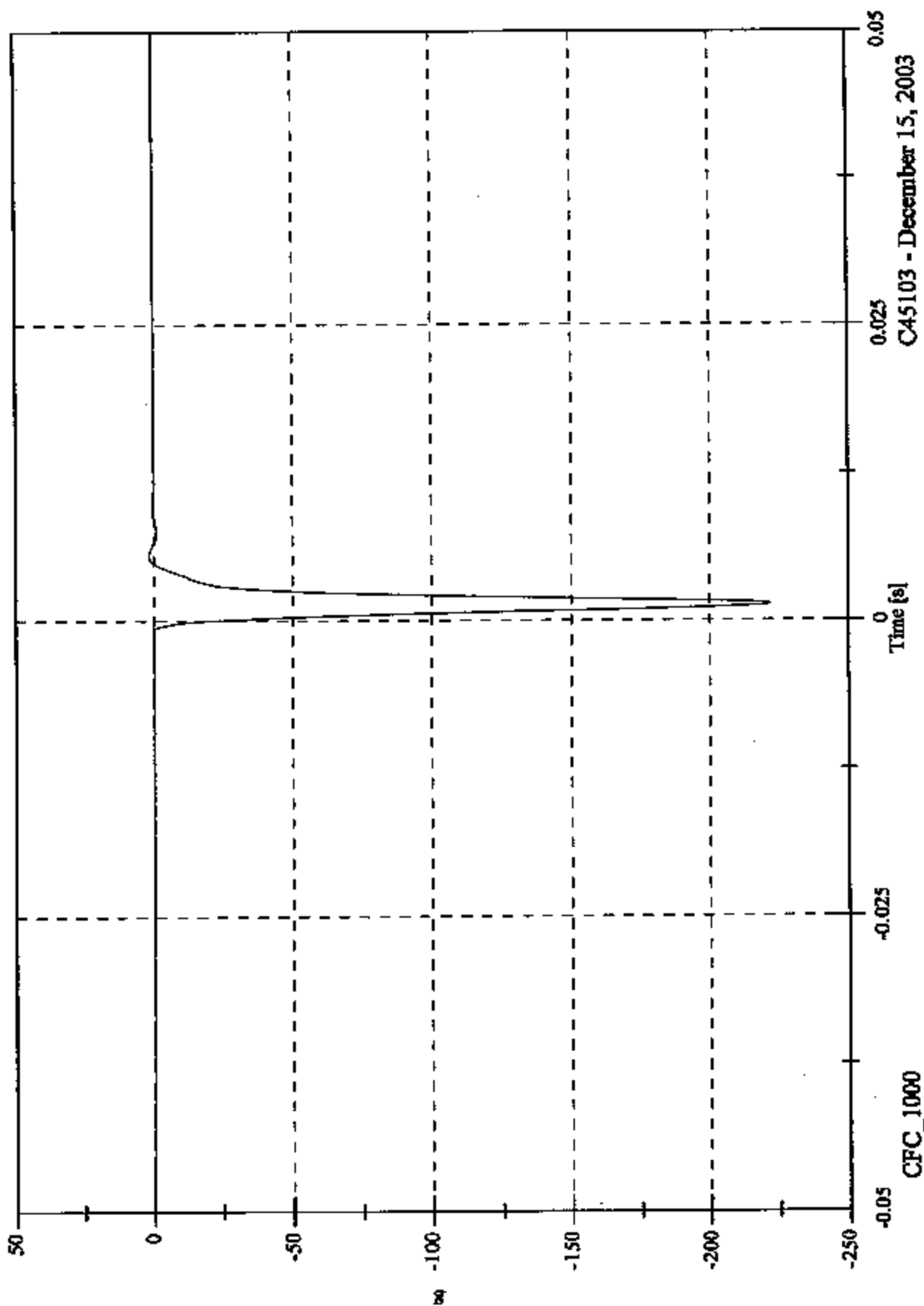
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7264-2000T	J33019	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 1.7 [g] at 0.005 [s]
Min: -221.9 [g] at 0.001 [s]

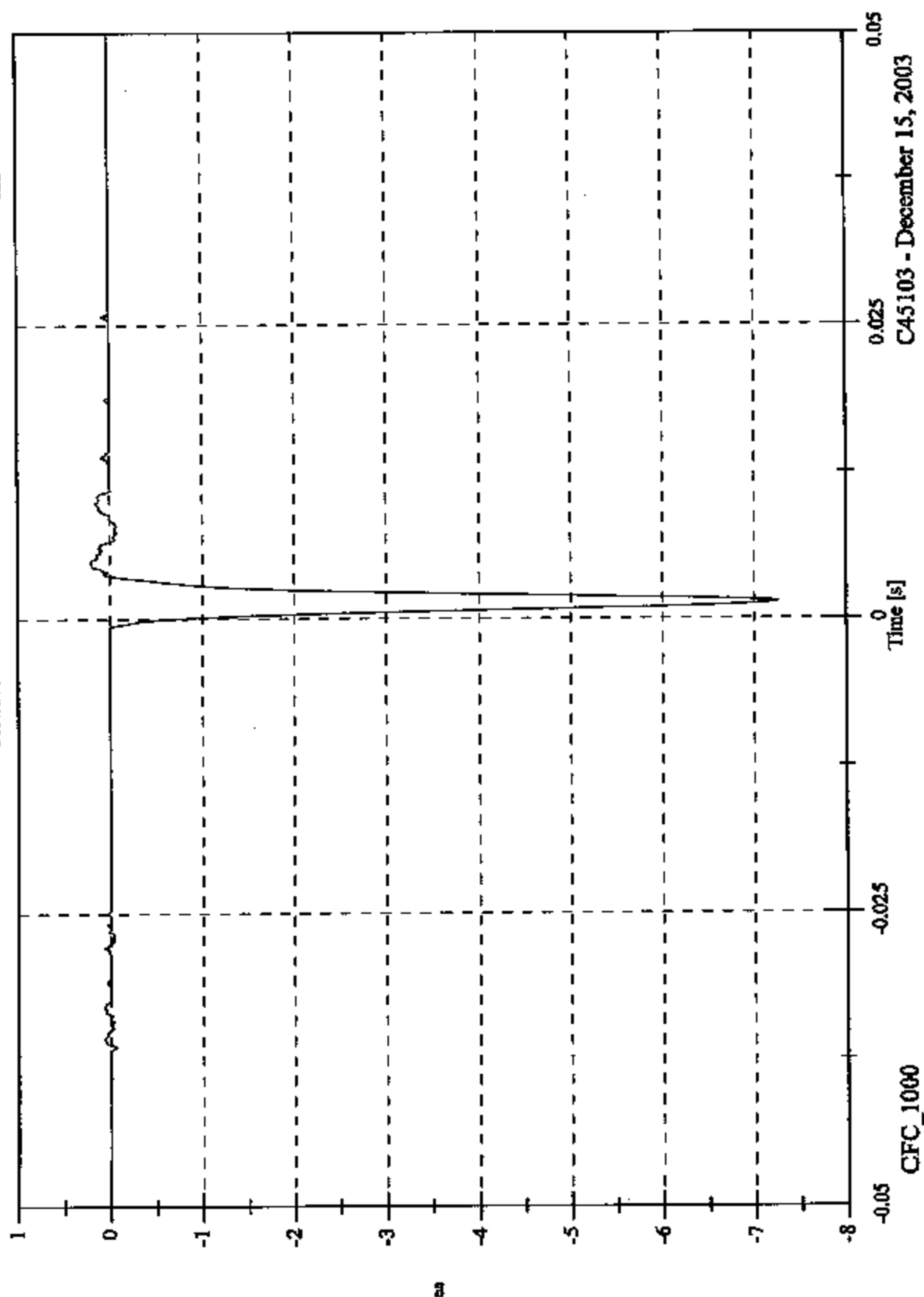
Headform X Acceleration



FMVSS 201U - Headform Calibration Drops

Max: 0.2 [g] at 0.005 [s]
Min: -7.3 [g] at 0.001 [s]

Headform Y Acceleration

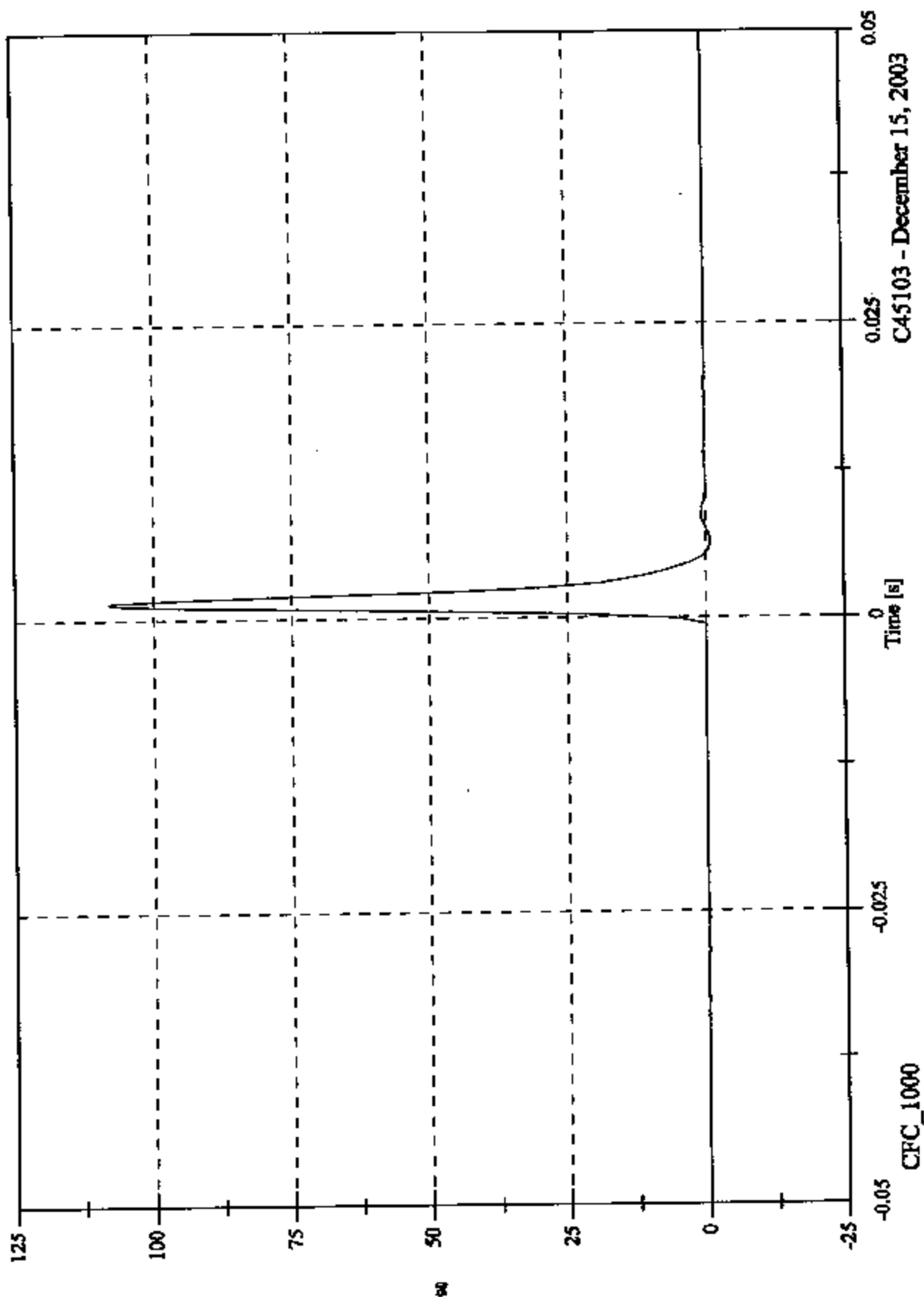


CFC_1000

FMVSS 201U - Headform Calibration Drops

Max: 108.1 [g] at 0.001 [s]
Min: -0.9 [g] at 0.006 [s]

Headform Z Acceleration

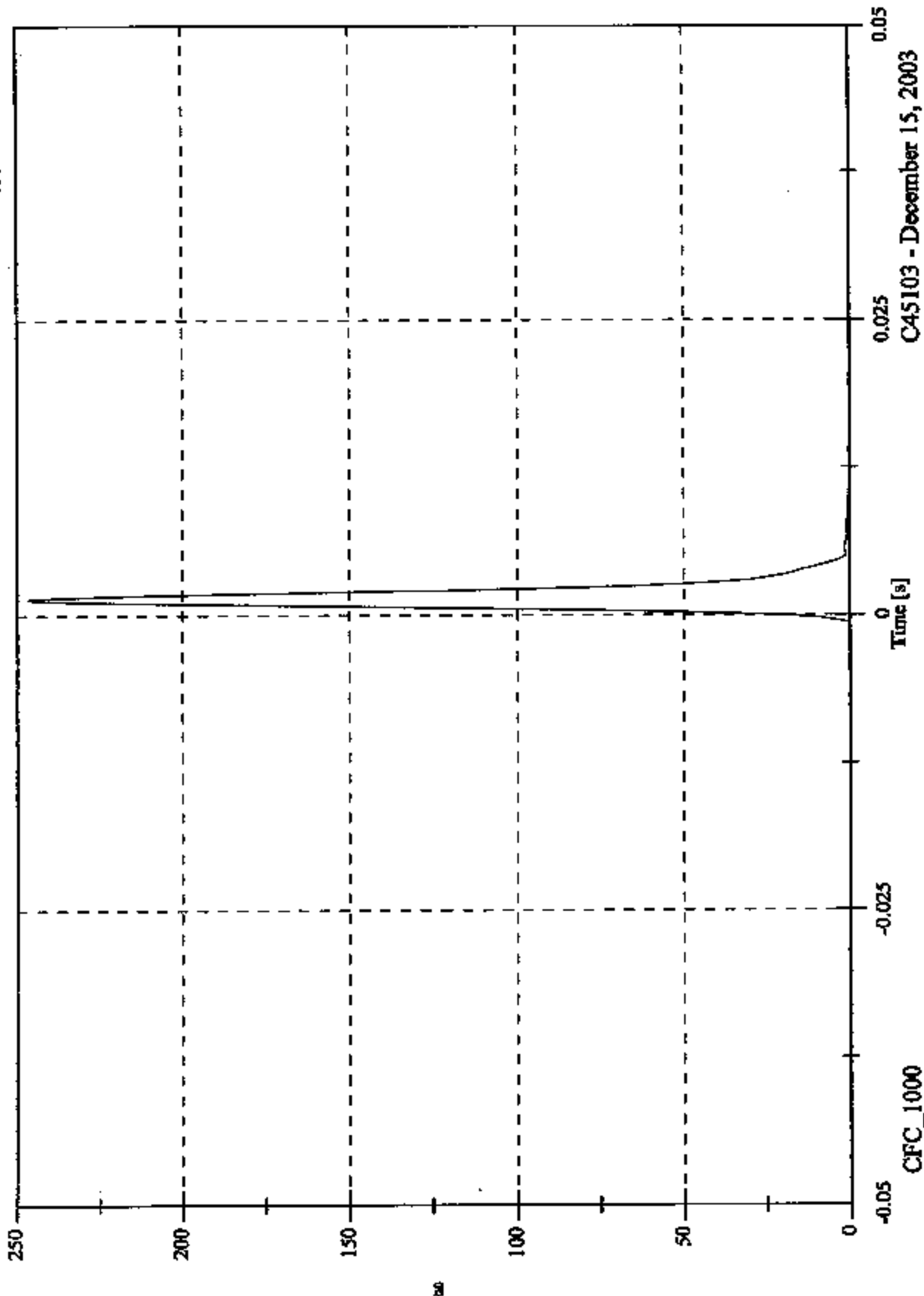


CFC_1000

FMVSS 201U - Headform Calibration Drops

Max: 246.8 [g] at 0.001 [s]
 Min: 0.0 [g] at -0.021 [s]

Headform Resultant



C45103 - December 15, 2003

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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		886	
CALIBRATION DATE:		December 15, 2003	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21
RELATIVE HUMIDITY	10% to 70%		23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		255.8
PEAK LATERAL ACCELERATION	15 Gs Maximum		6.9
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

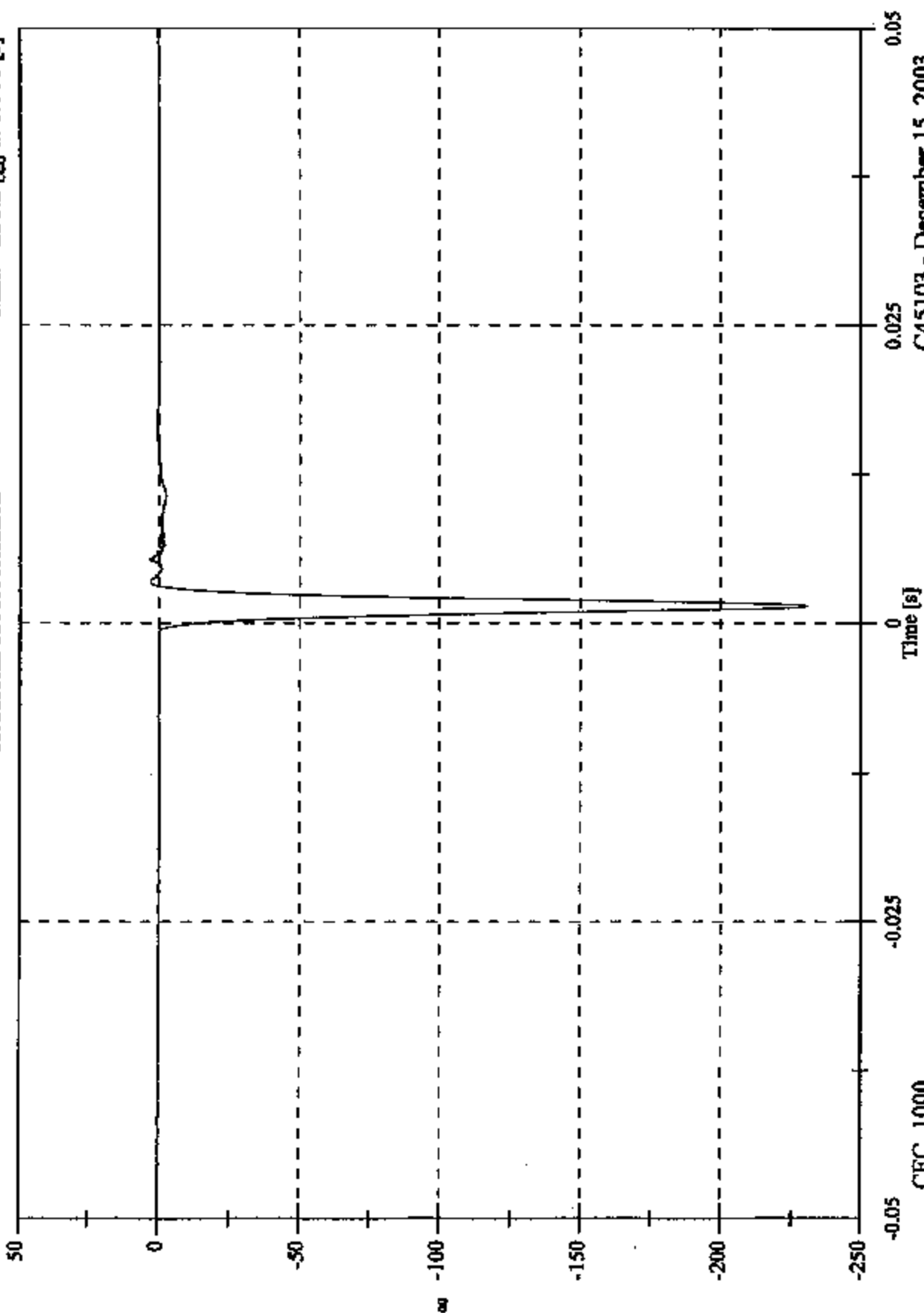
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7164-2000T	J38127	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7164-2000T	J37988	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7164-2000T	J37854	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 3.4 [g] at 0.005 [s]
Min: -231.2 [g] at 0.001 [s]

Headform X Acceleration

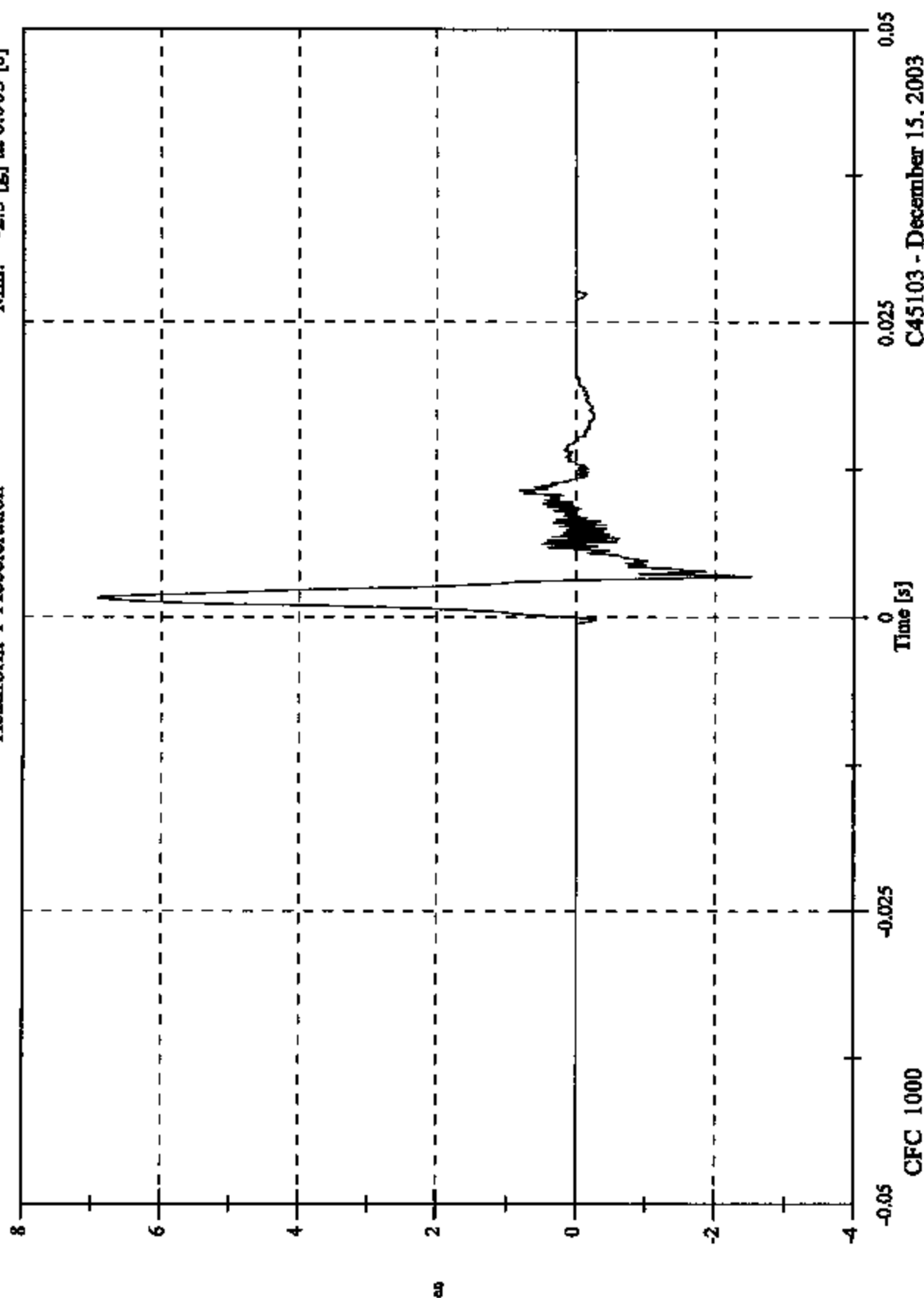


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FMVSS 201U - Headform Calibration Drops

Max: 6.9 [g] at 0.002 [s]
Min: -2.5 [g] at 0.003 [s]

Headform Y Acceleration

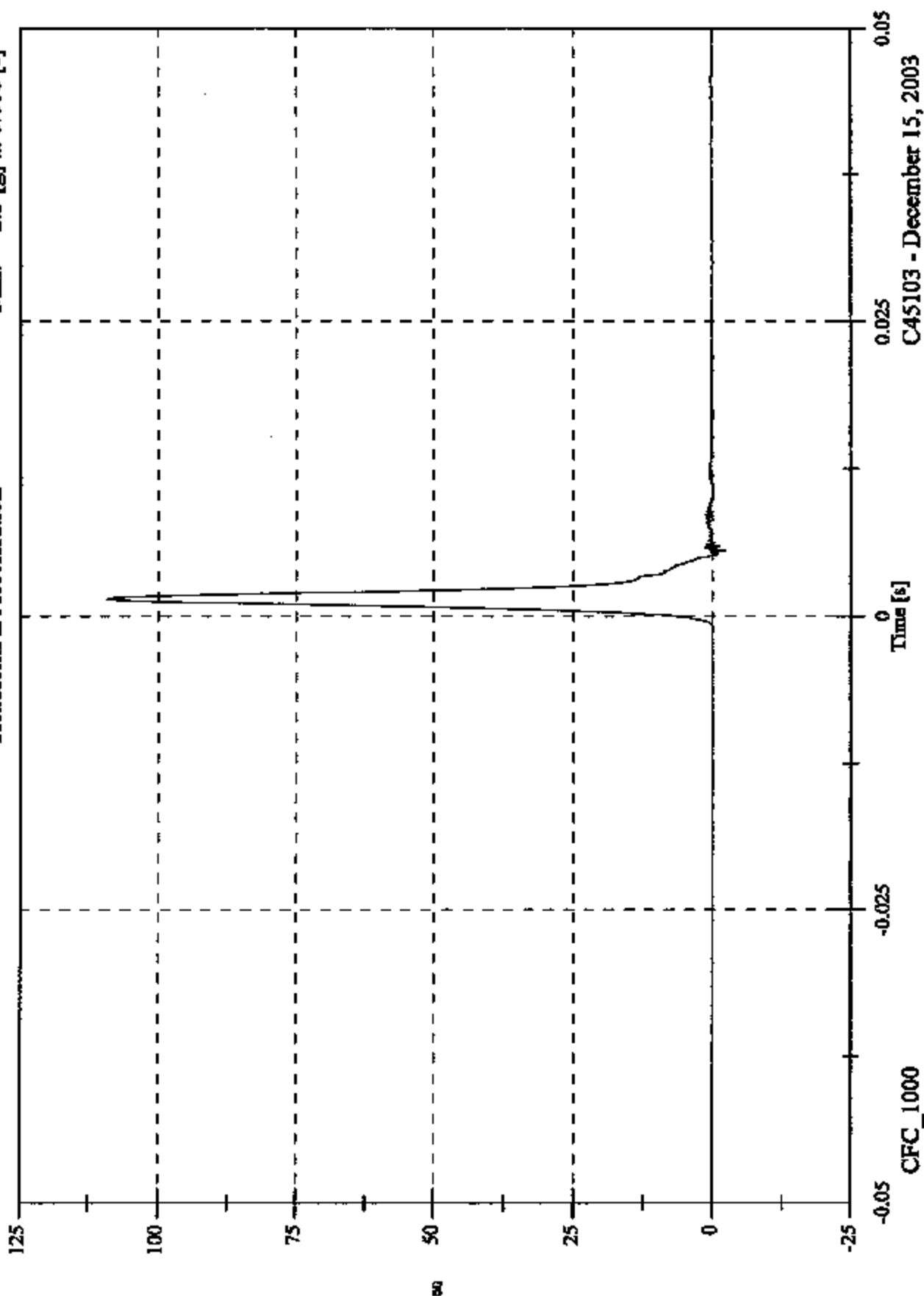


C45103 - December 15, 2003

FMVSS 201U - Headform Calibration Drops

Max: 109.3 [g] at 0.001 [s]
Min: -2.3 [g] at 0.006 [s]

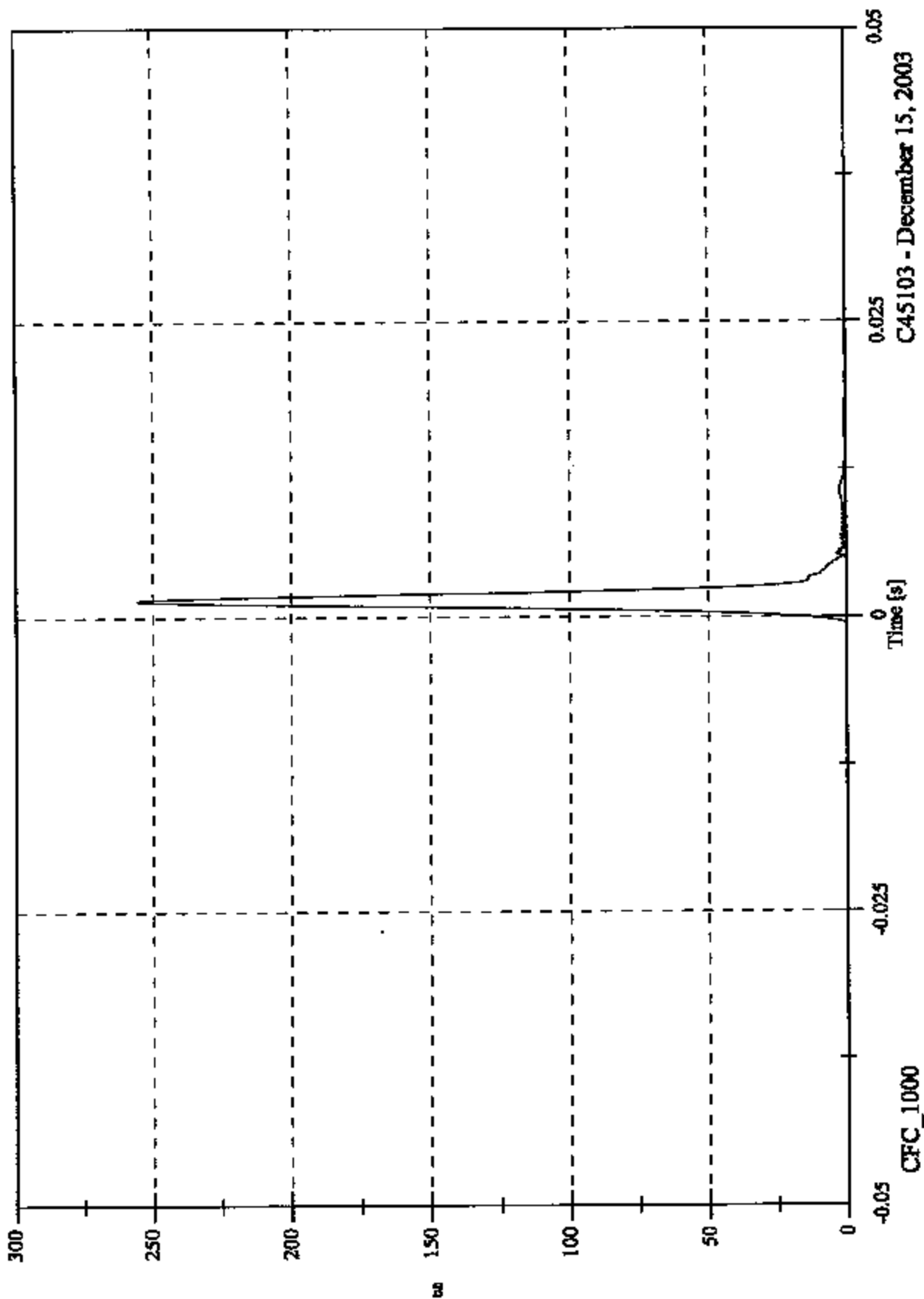
Headform Z Acceleration



FMVSS 201U - Headform Calibration Drops

Max: 255.8 [g] at 0.001 [s]
Min: 0.0 [g] at -0.020 [s]

Headform Resultant



C45103 - December 15, 2003

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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS
SERIAL NUMBER:		0355
CALIBRATION DATE:		December 15, 2003
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	237.0
PEAK LATERAL ACCELERATION	15 Gs Maximum	12.1
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

ID 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	J28854	08/22/03	02/23/04

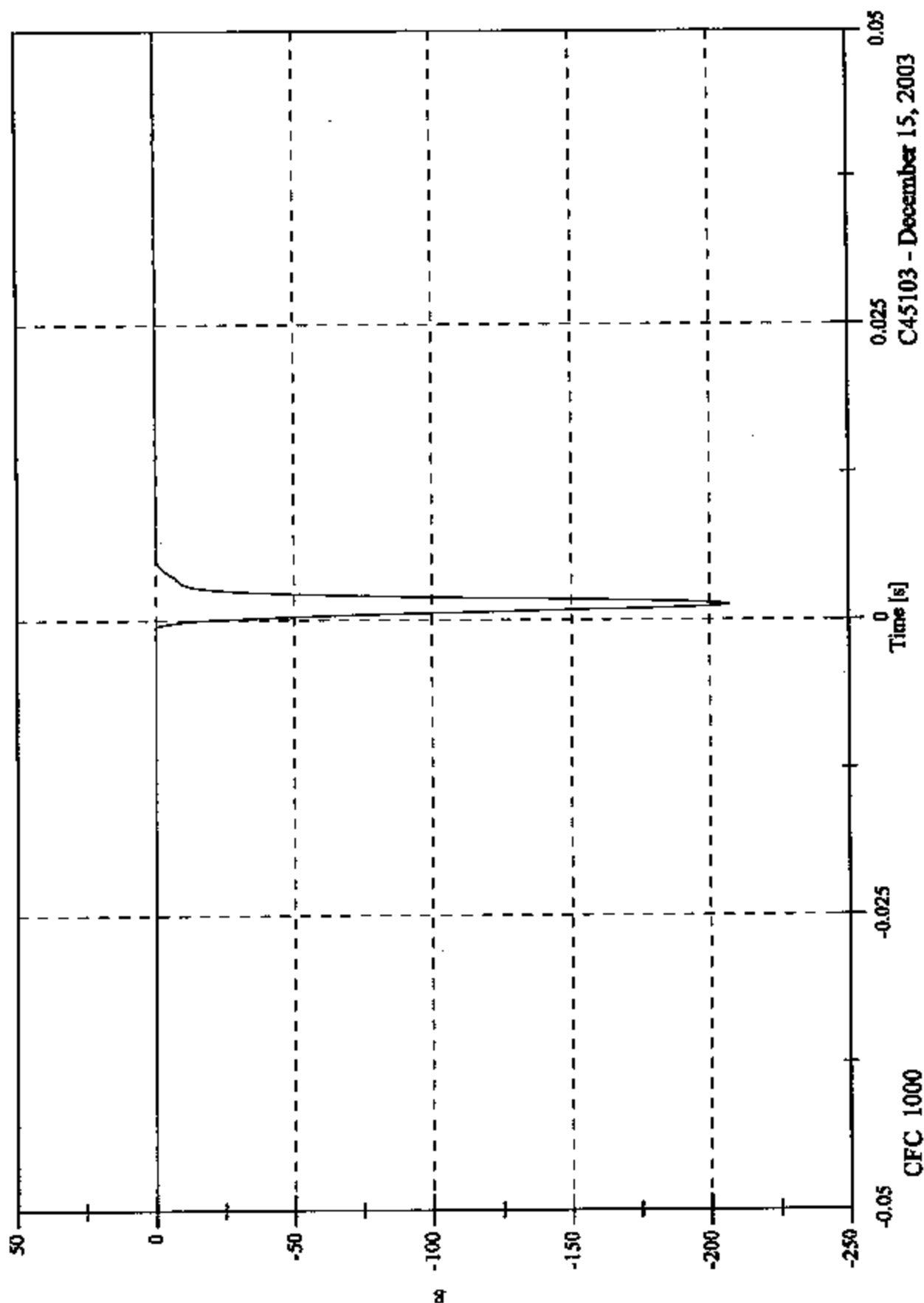
REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 0.2 [g] at 0.041 [s]

Min: -206.6 [g] at 0.001 [s]

Headform X Acceleration

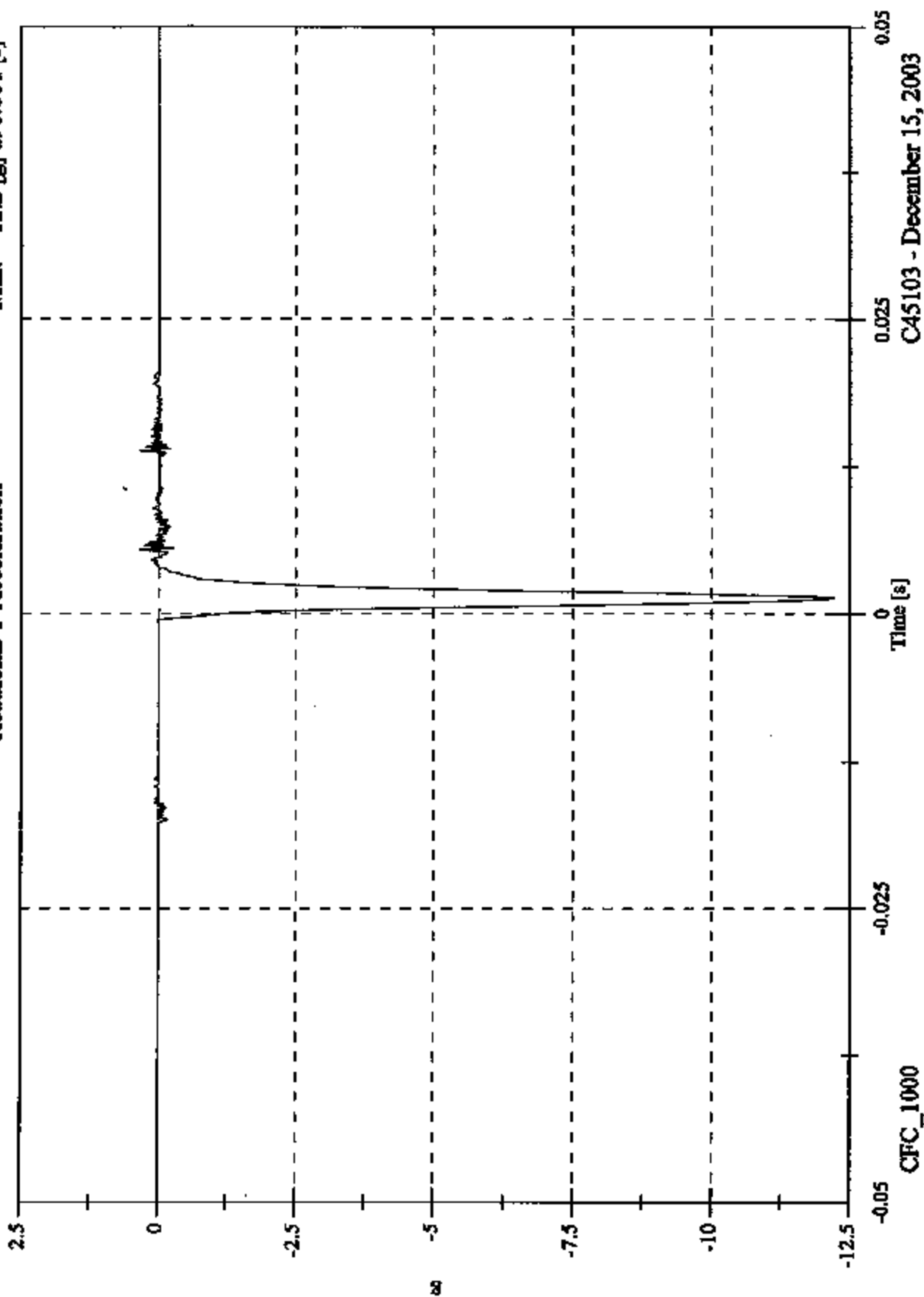


CFC_1000

FMVSS 201U - Headform Calibration Drops

Headform Y Acceleration

Max: 0.3 [g] at 0.005 [s]
Min: -12.2 [g] at 0.001 [s]

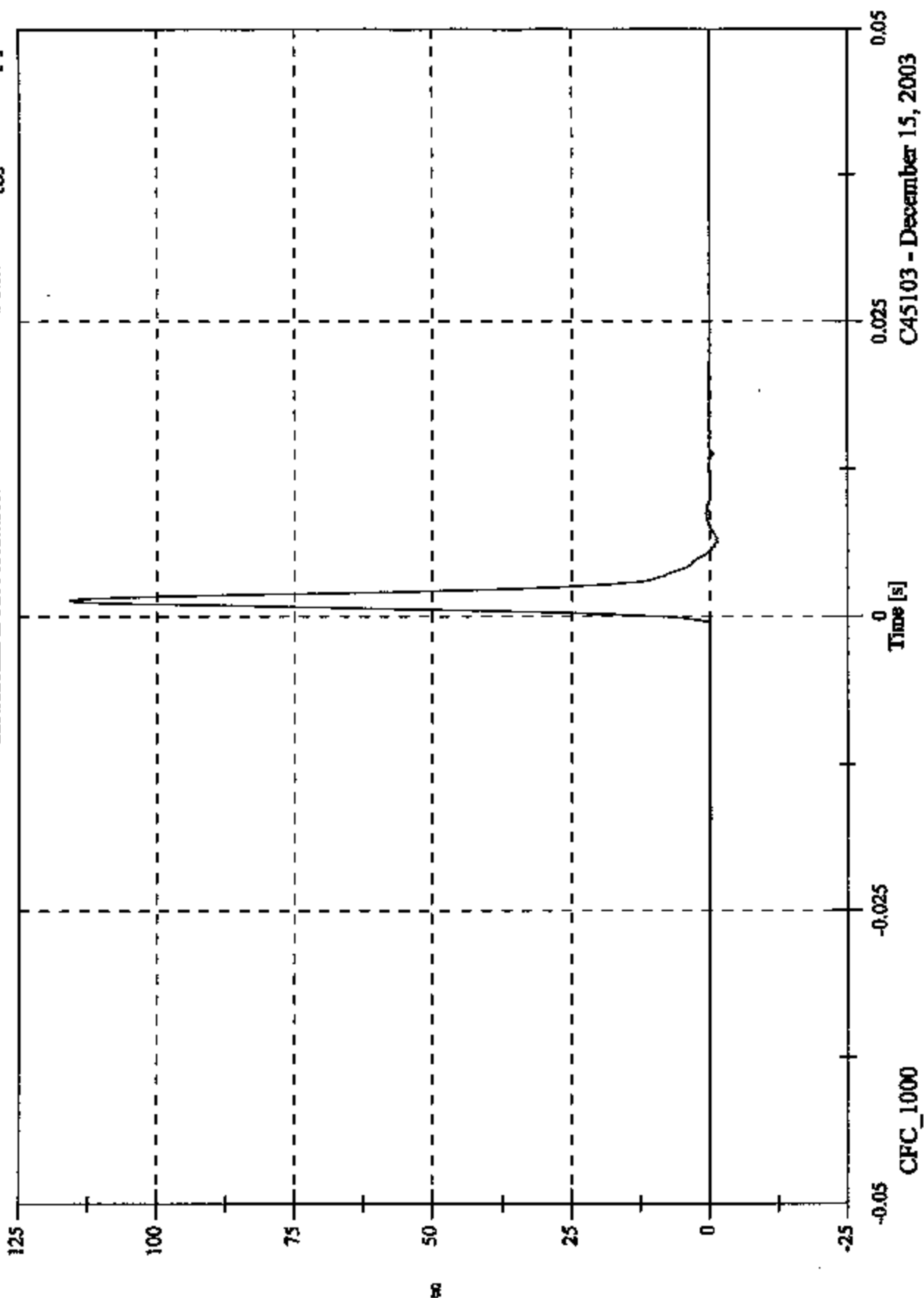


C45103 - December 15, 2003

FMVSS 201U - Headform Calibration Drops

Max: 115.9 [g] at 0.001 [s]
Min: -1.4 [g] at 0.006 [s]

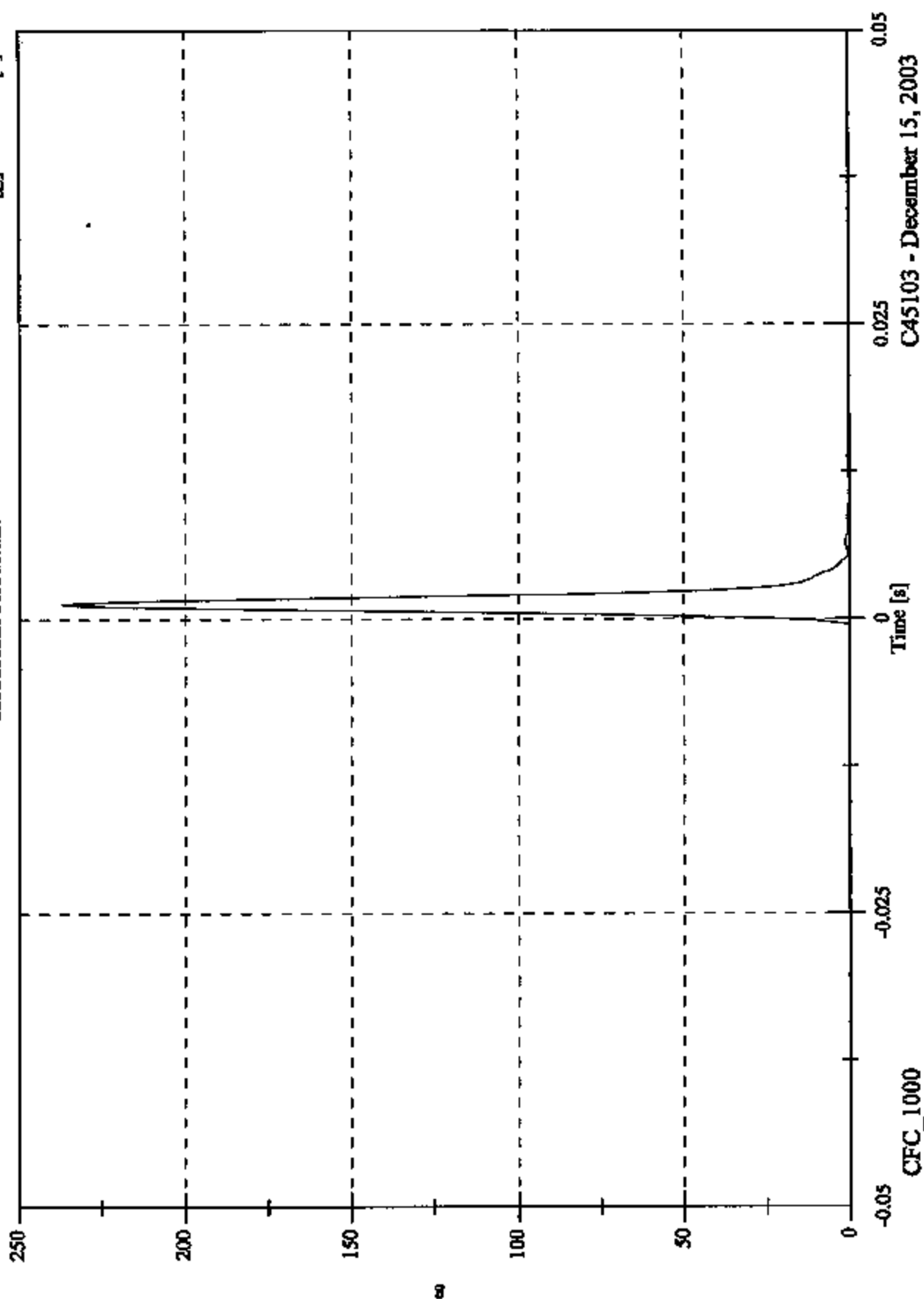
Headform Z Acceleration



FMVSS 201U - Headform Calibration Drops

Max: 237.0 [g] at 0.001 [s]
Min: 0.0 [g] at 0.031 [s]

Headform Resultant



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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS
SERIAL NUMBER:		1255
CALIBRATION DATE:		December 15, 2003
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	264.0
PEAK LATERAL ACCELERATION	15 Gs Maximum	6.6
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

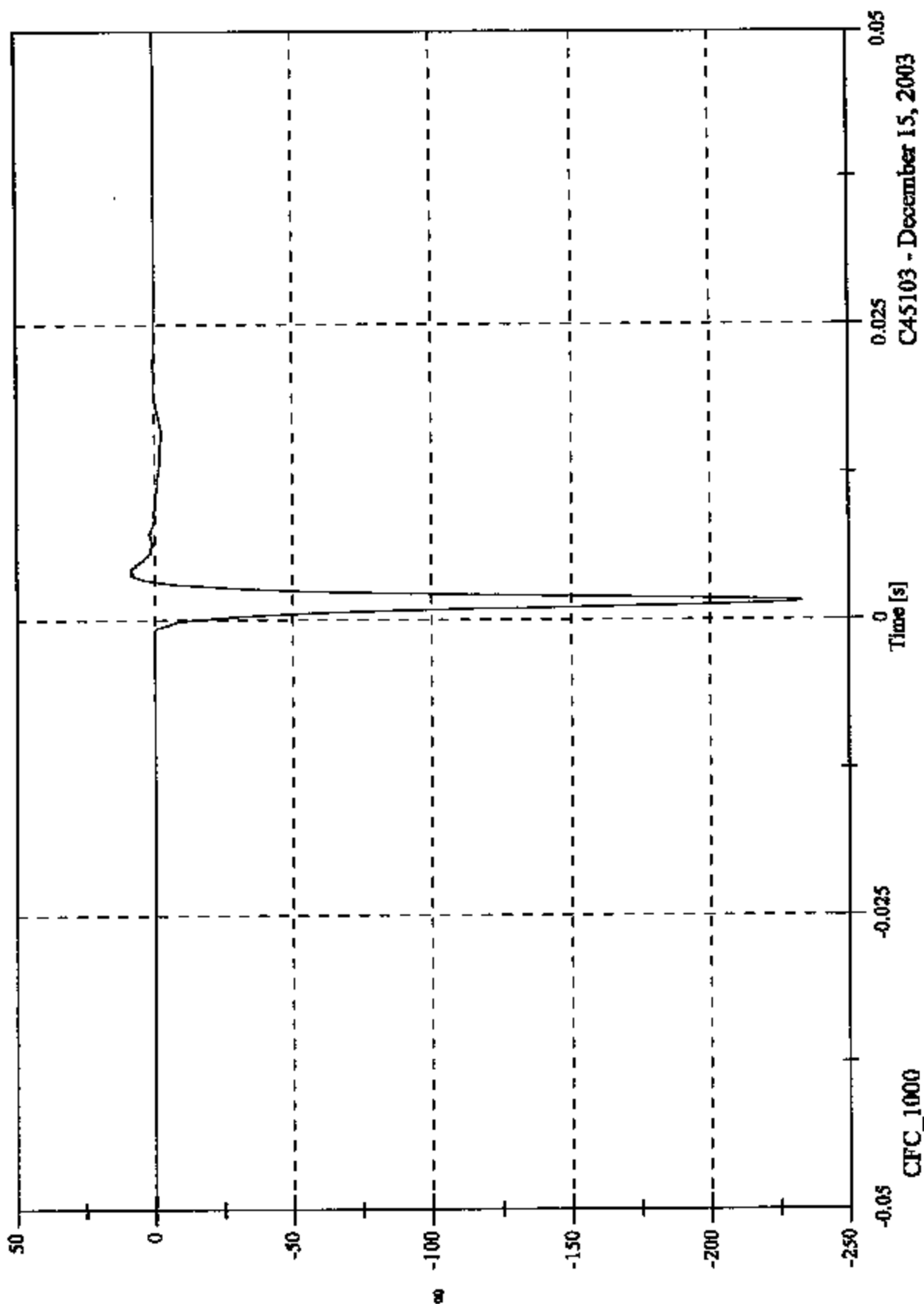
I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7264-2000T	J40994	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 8.9 [g] at 0.004 [s]
Min: -232.9 [g] at 0.001 [s]

Headform X Acceleration

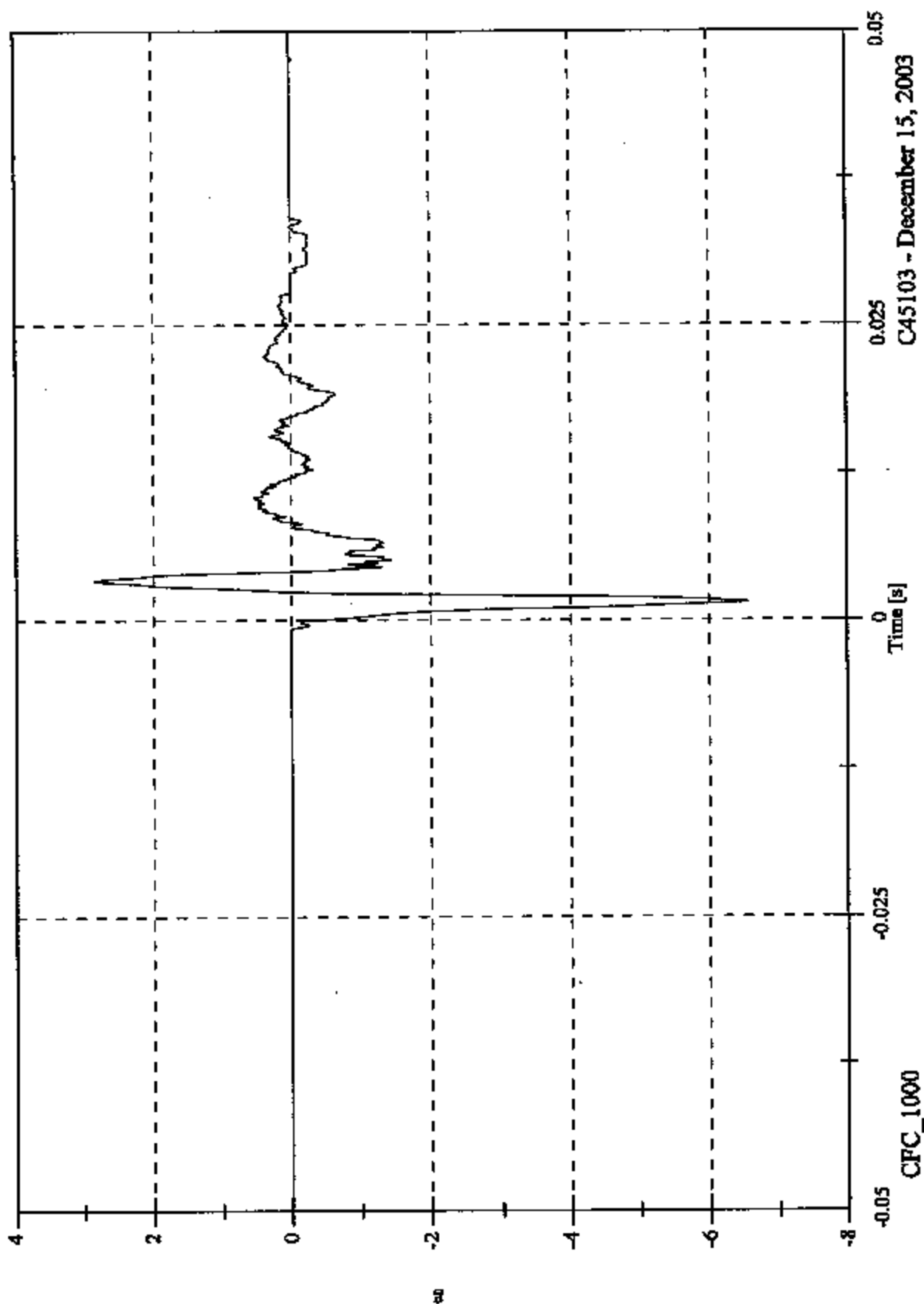


CFC_1000

FMVSS 201U - Headform Calibration Drops

Max: 2.8 [g] at 0.003 [s]
Min: -6.6 [g] at 0.001 [s]

Headform Y Acceleration

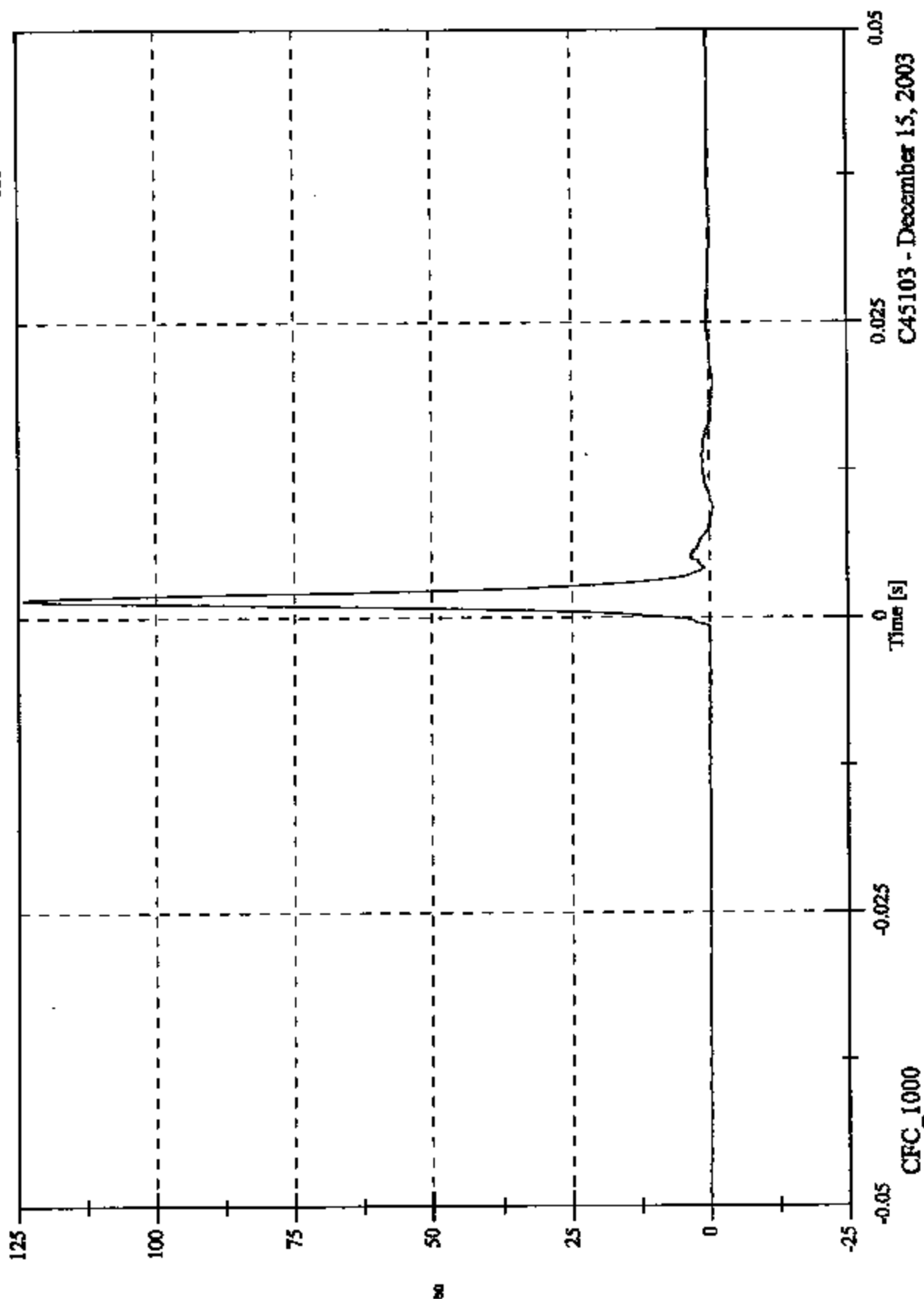


C45103 - December 15, 2003

FMVSS 201U - Headform Calibration Drops

Max: 124.1 [g] at 0.001 [s]
Min: -0.7 [g] at 0.009 [s]

Headform Z Acceleration

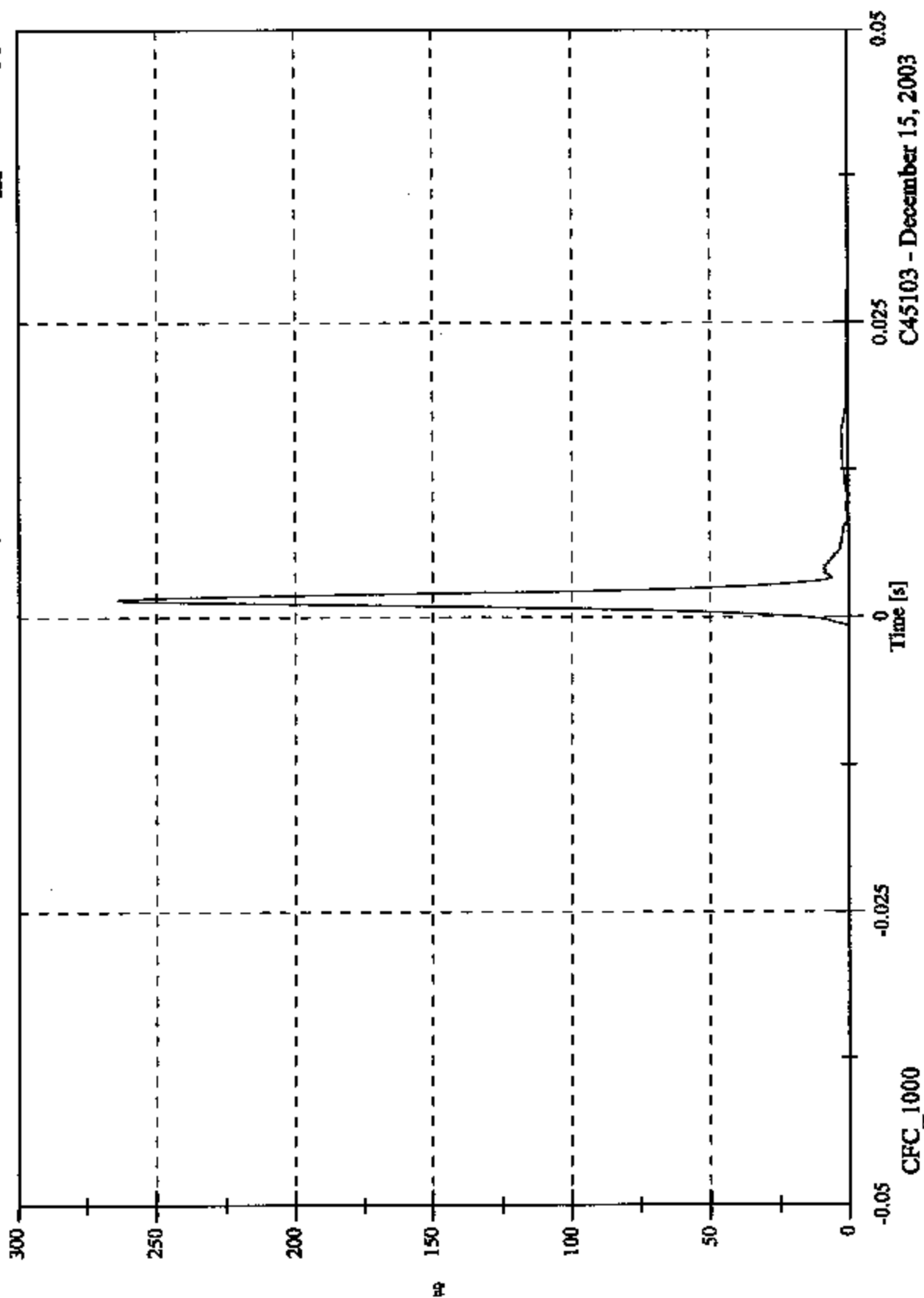


C45103 - December 15, 2003

FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 264.0 [g] at 0.001 [s]
Min: 0.0 [g] at -0.033 [s]



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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS
SERIAL NUMBER:		0642
CALIBRATION DATE:		January 7, 2004
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	10% to 70%	23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	270.6
PEAK LATERAL ACCELERATION	15 Gs Maximum	4.1
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

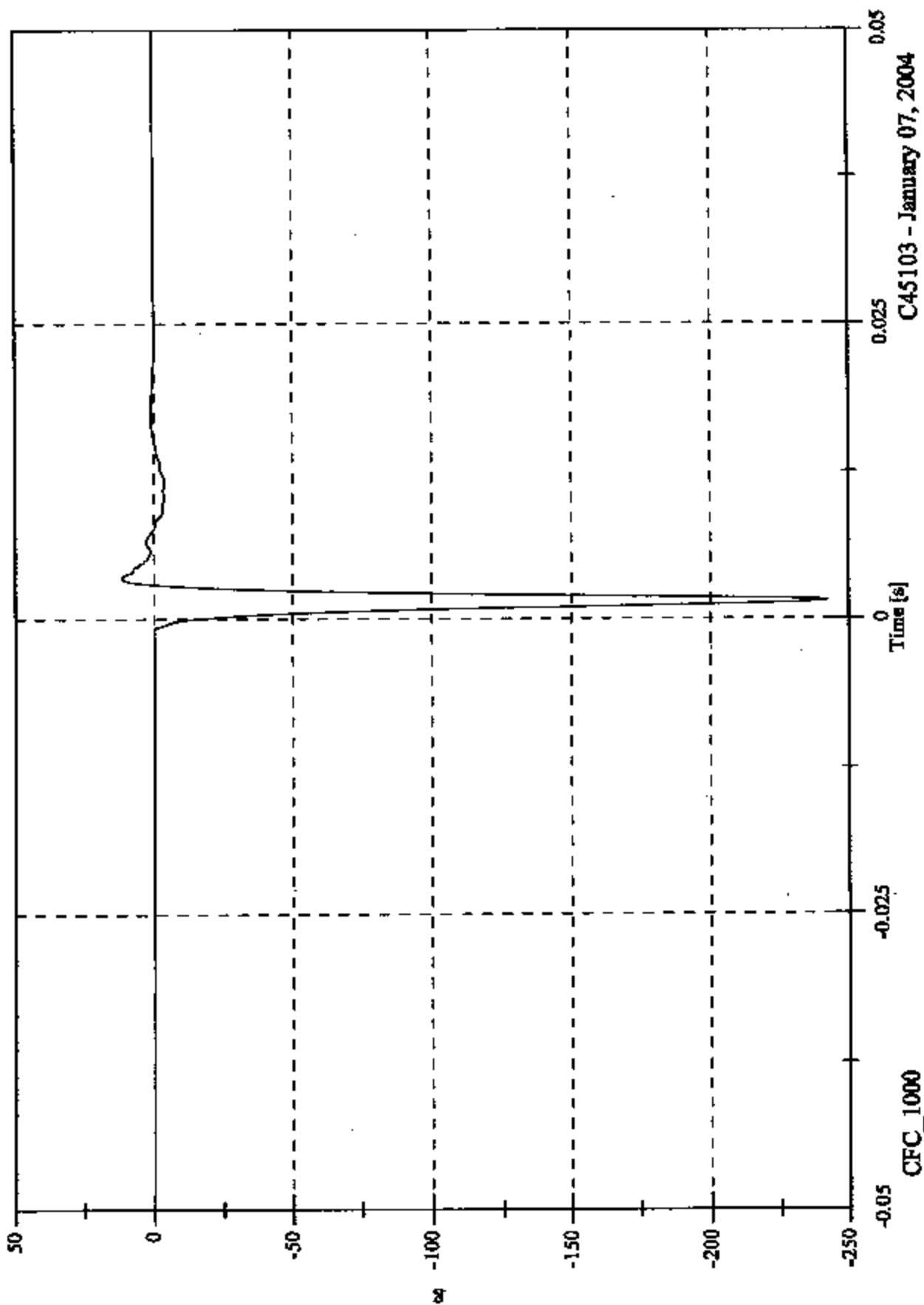
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7264-2000T	J33030	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 11.7 [g] at 0.003 [s]
Min: -242.3 [g] at 0.001 [s]

Headform X Acceleration



CFC_1000

Time [s]

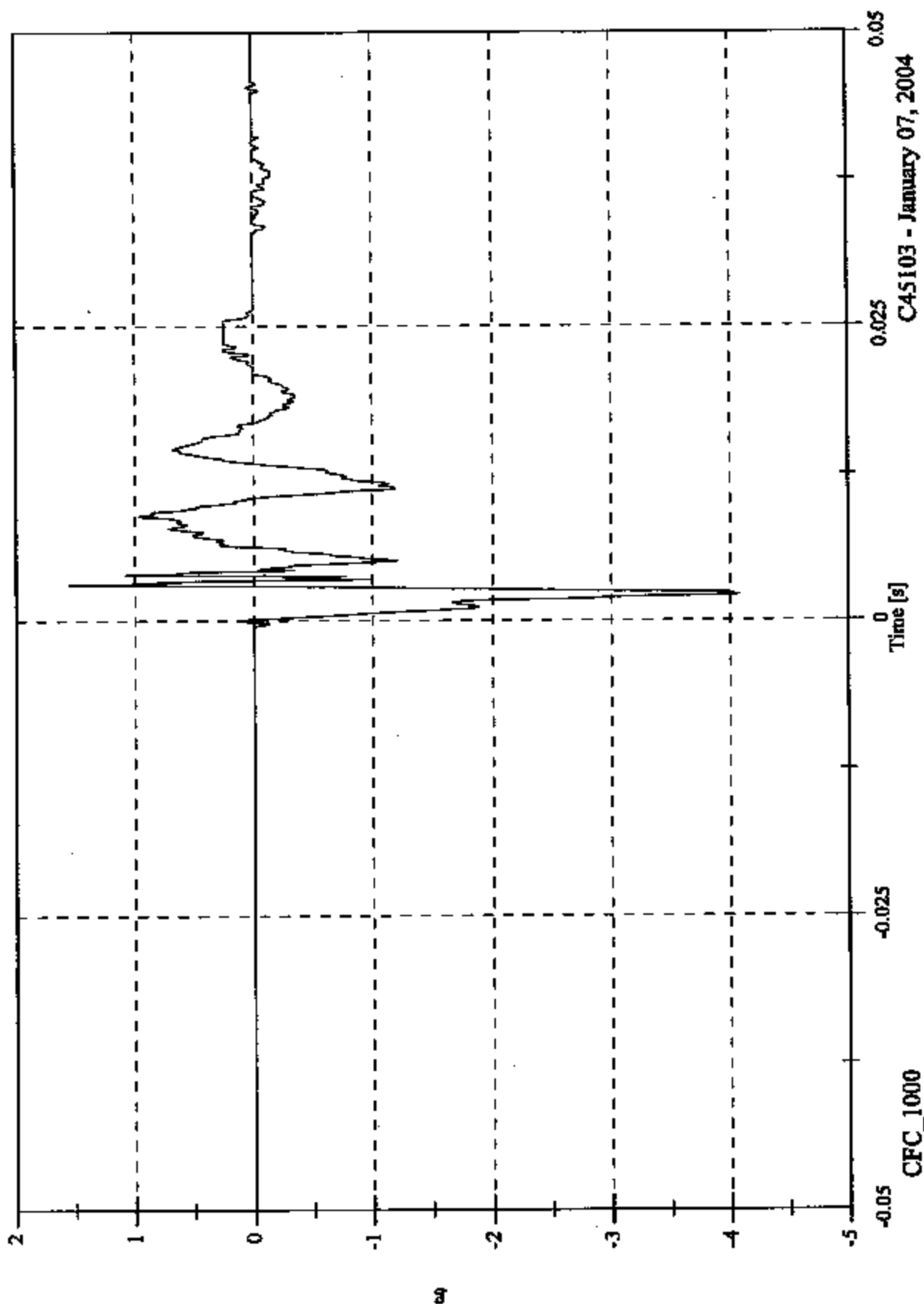
0.025

C45103 - January 07, 2004

FMVSS 201U - Headform Calibration Drops

Max: 1.6 [g] at 0.003 [s]
Min: -4.1 [g] at 0.002 [s]

Headform Y Acceleration

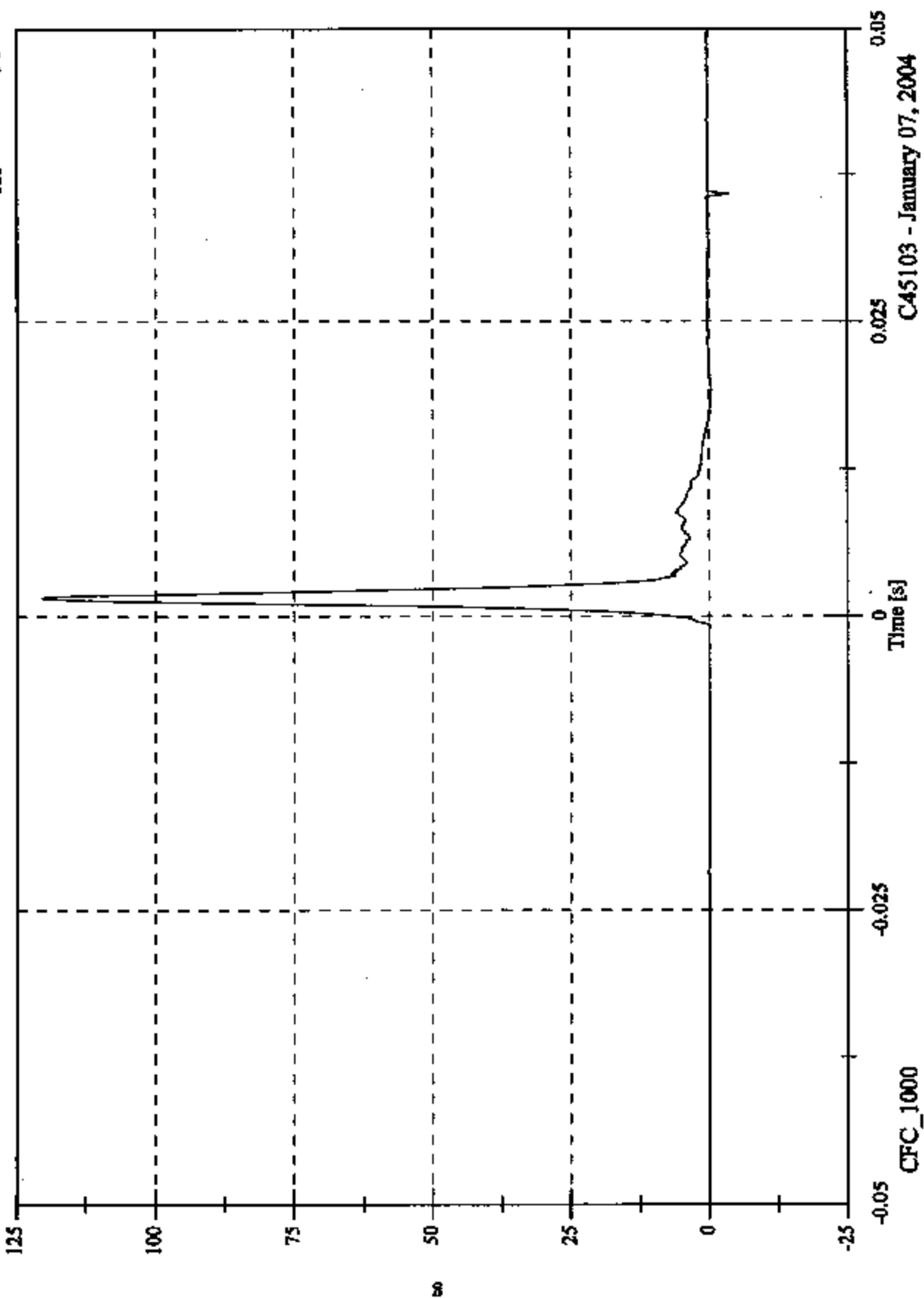


CFC_1000

FMVSS 201U - Headform Calibration Drops

Max: 120.5 [g] at 0.001 [s]
Min: -3.7 [g] at 0.036 [s]

Headform Z Acceleration

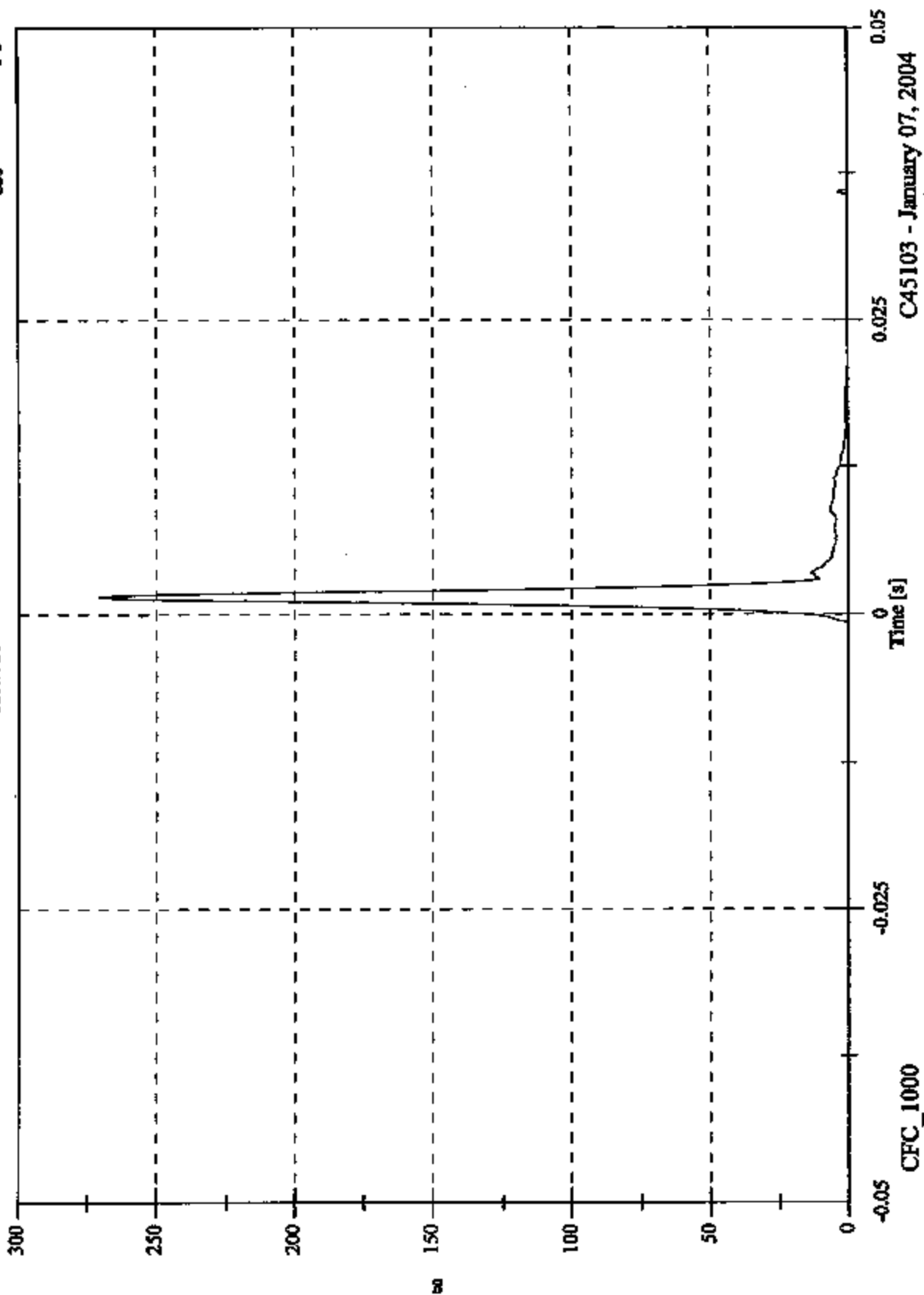


C45103 - January 07, 2004

FMVSS 201U - Headform Calibration Drops

Max: 270.6 [g] at 0.001 [s]
Min: 0.0 [g] at -0.045 [s]

Headform Resultant



C45103 - January 07, 2004

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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS
SERIAL NUMBER:		0062
CALIBRATION DATE:		January 7, 2004
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	10% to 70%	23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	259.6
PEAK LATERAL ACCELERATION	15 Gs Maximum	2.0
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

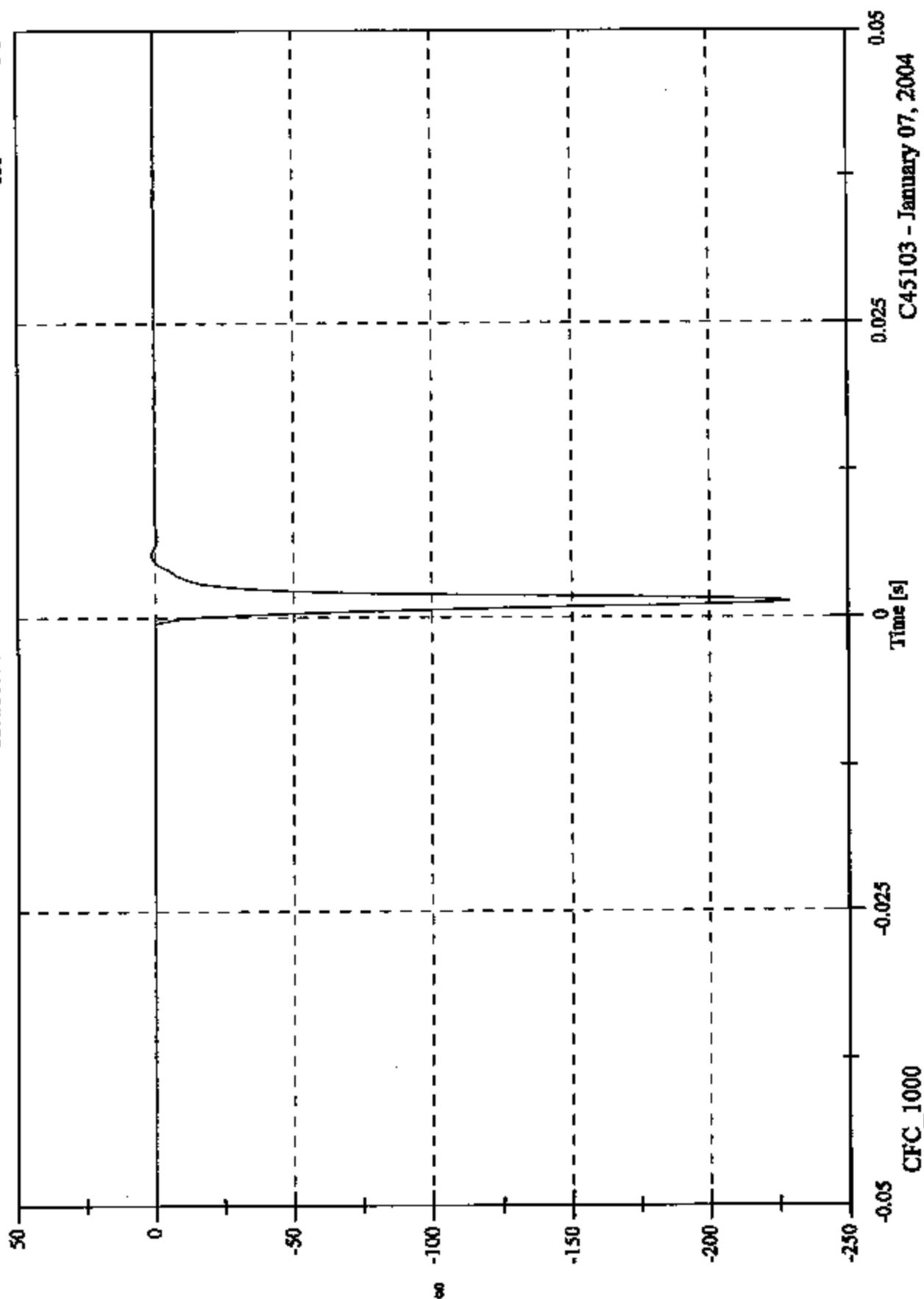
I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	I33127	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7264-2000T	I33019	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7264-2000T	I32782	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Headform X Acceleration

Max: 1.4 [g] at 0.005 [s]
Min: -228.5 [g] at 0.001 [s]

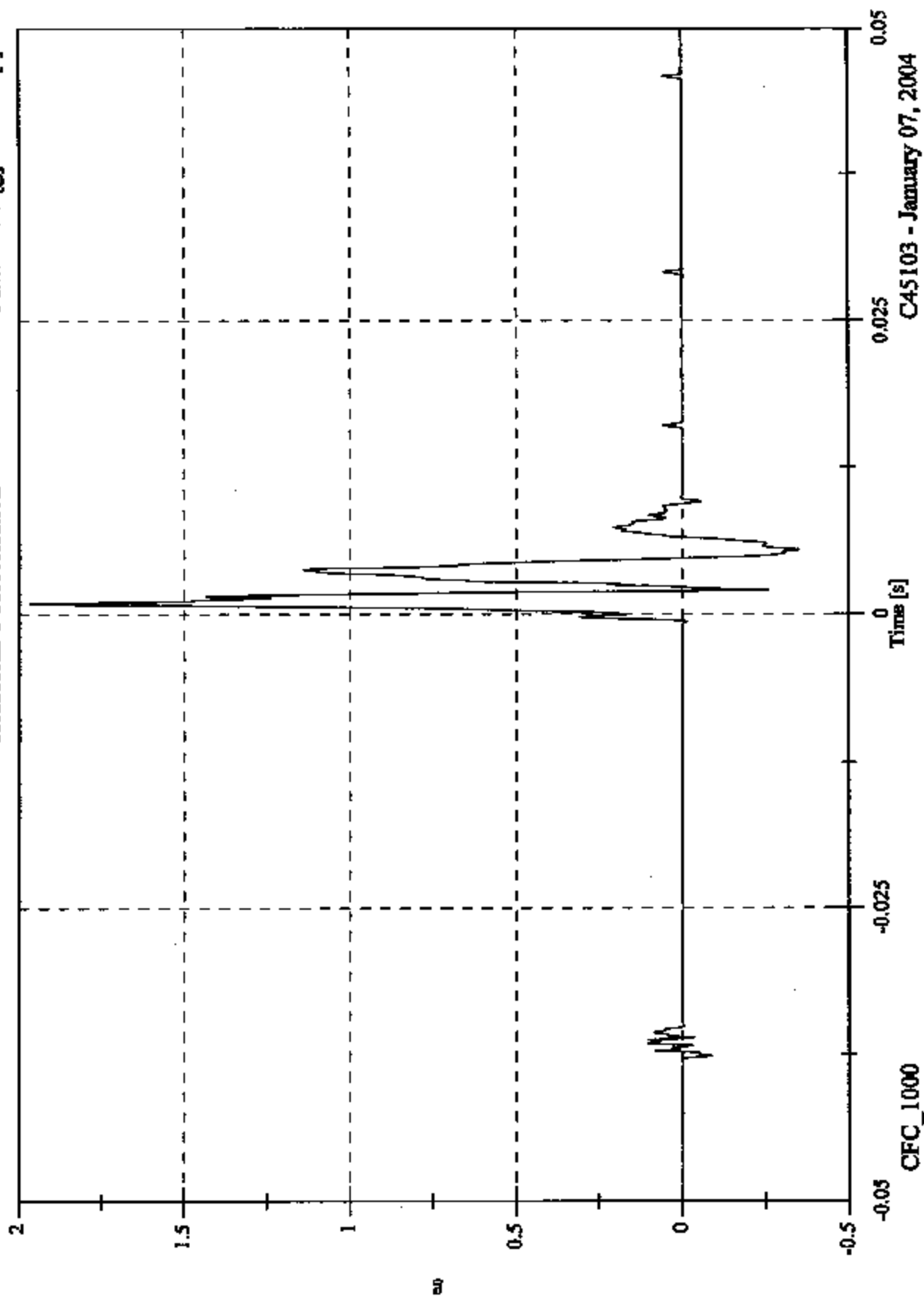


C45103 - January 07, 2004

FMVSS 201U - Headform Calibration Drops

Max: 2.0 [g] at 0.001 [s]
Min: -0.3 [g] at 0.005 [s]

Headform Y Acceleration

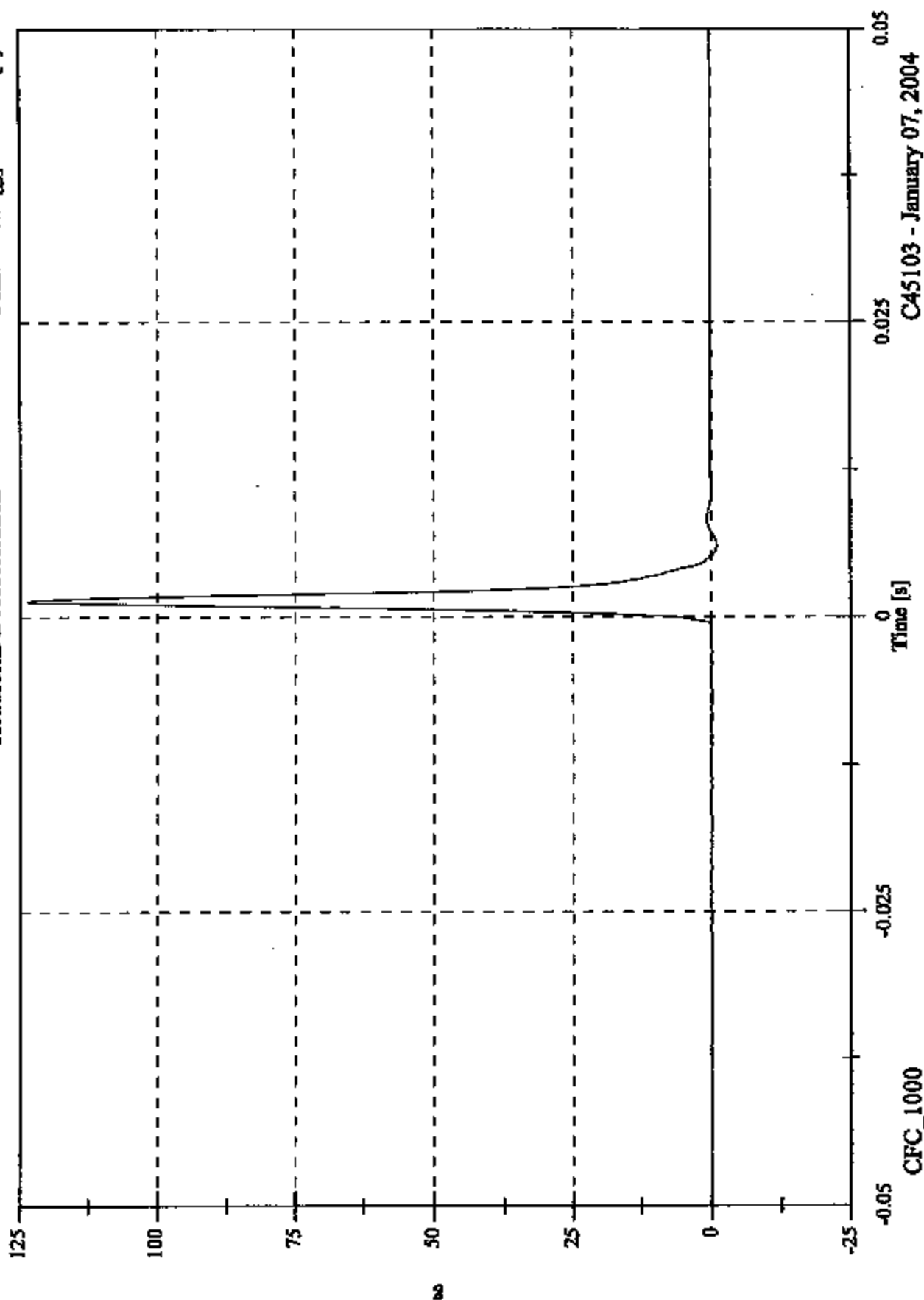


C45103 - January 07, 2004

FMVSS 201U - Headform Calibration Drops

Max: 123.6 [g] at 0.001 [s]
Min: -0.9 [g] at 0.006 [s]

Headform Z Acceleration

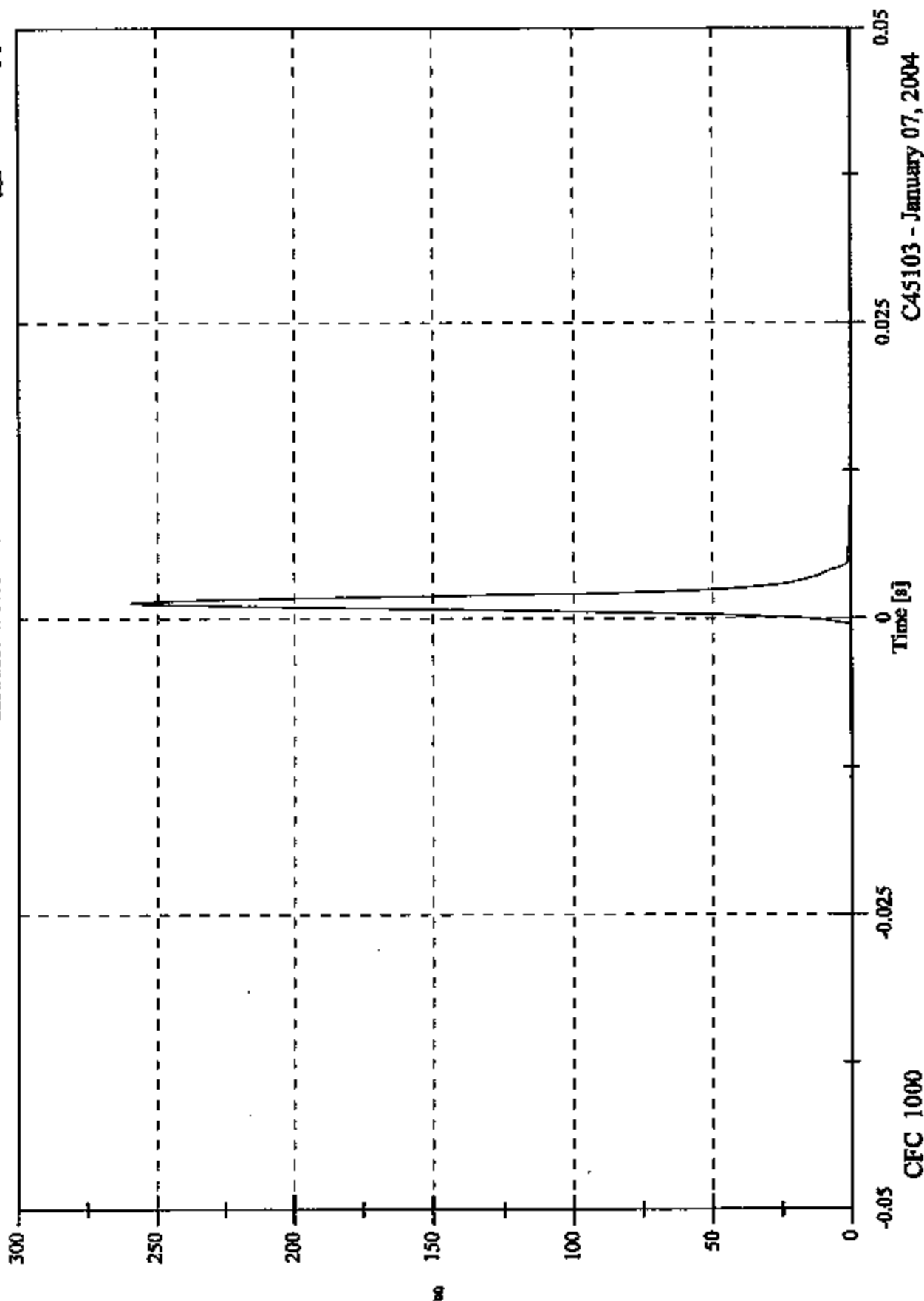


C45103 - January 07, 2004

FMVSS 201U - Headform Calibration Drops

Max: 259.6 [g] at 0.001 [s]
Min: 0.0 [g] at -0.032 [s]

Headform Resultant



C45103 - January 07, 2004

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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		January 7, 2004	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		22
RELATIVE HUMIDITY	10% to 70%		23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		246.7
PEAK LATERAL ACCELERATION	15 Gs Maximum		1.6
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

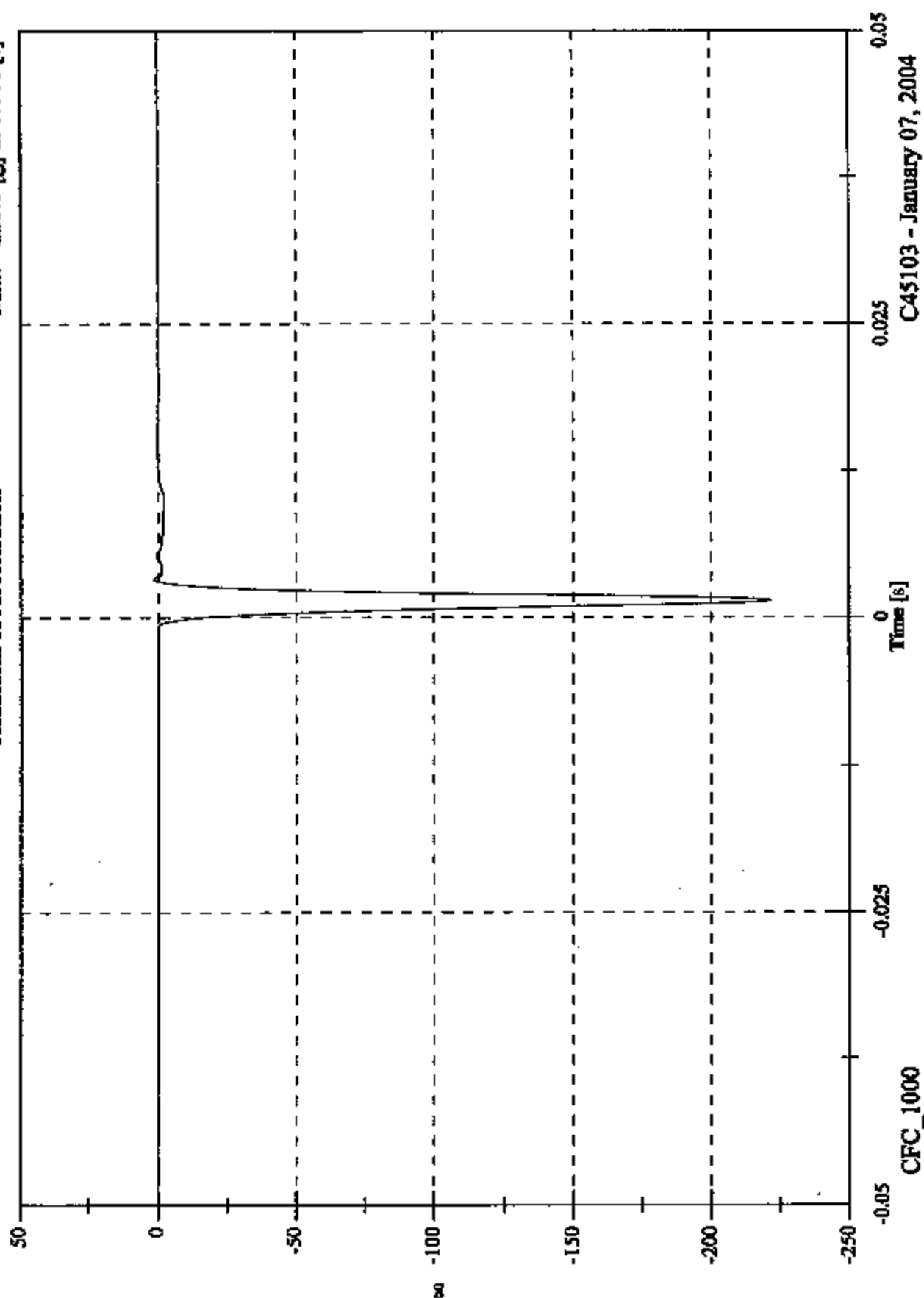
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7264-2000T	J37980	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 1.7 [g] at 0.003 [s]
Min: -221.6 [g] at 0.001 [s]

Headform X Acceleration

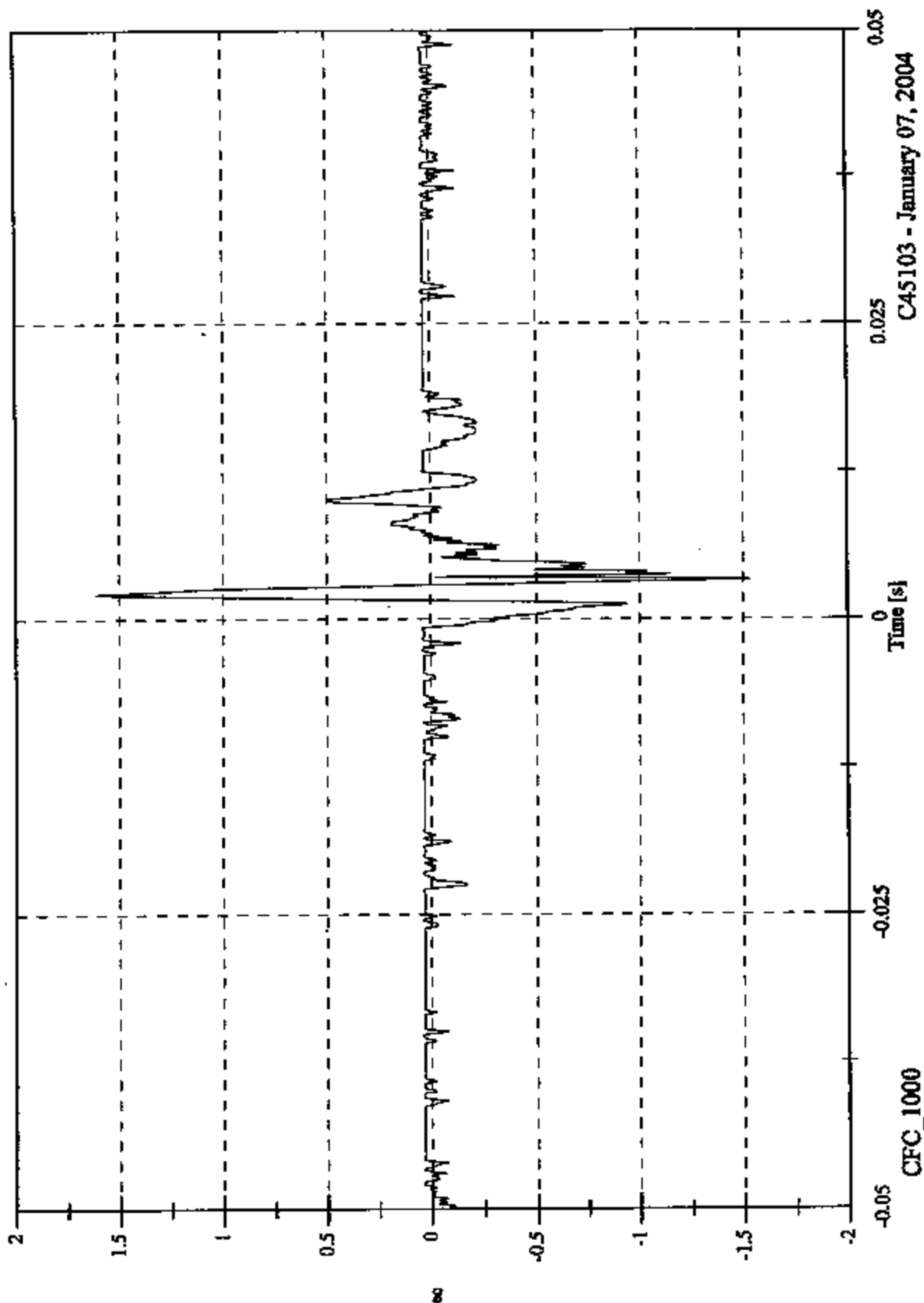


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FMVSS 201U - Headform Calibration Drops

Max: 1.6 [g] at 0.002 [s]
Min: -1.5 [g] at 0.003 [s]

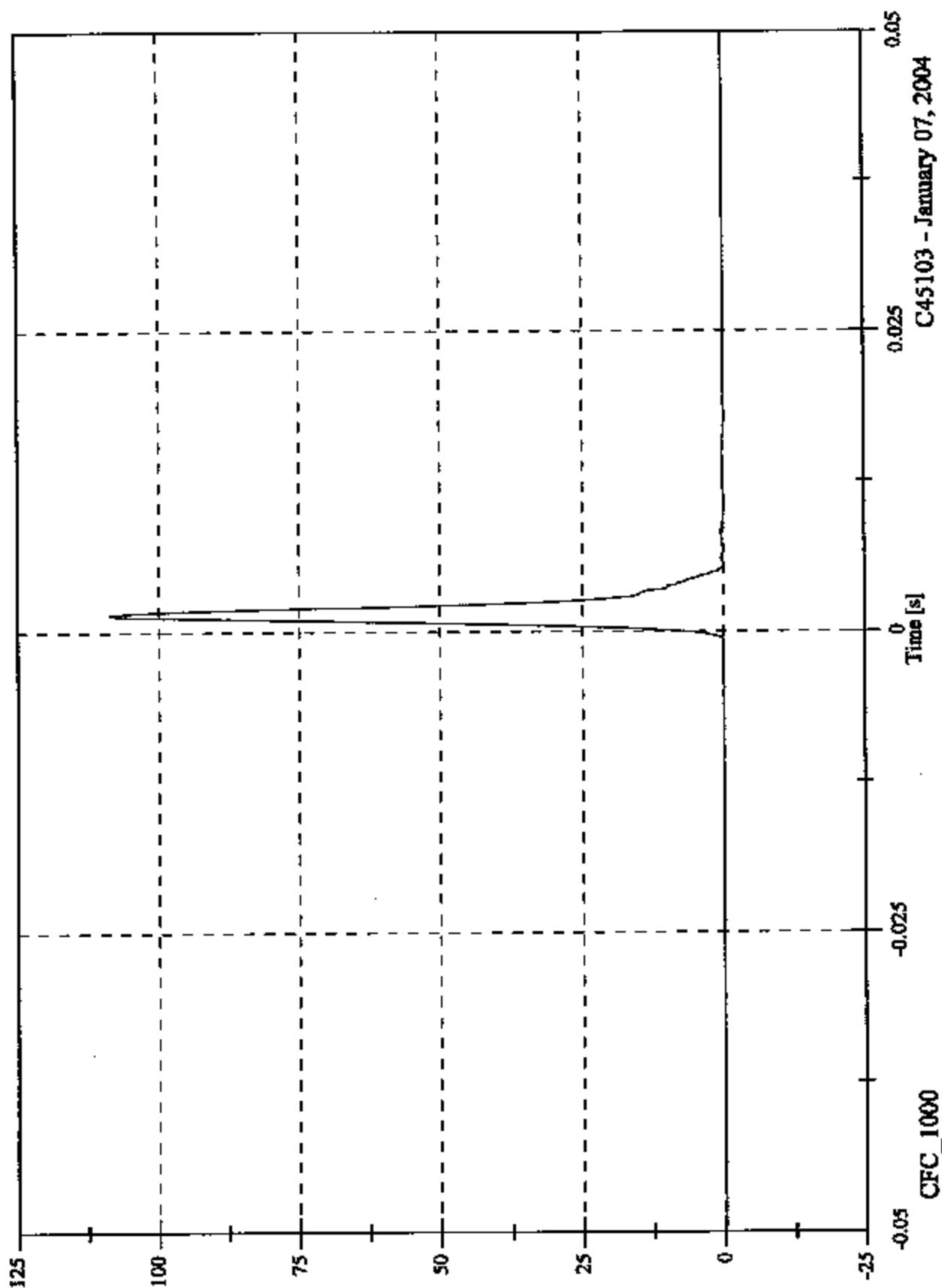
Headform Y Acceleration



FMVSS 201U - Headform Calibration Drops

Max: 108.7 [g] at 0.001 [s]
Min: -0.2 [g] at 0.018 [s]

Headform Z Acceleration



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-0.025

0.025

0.05

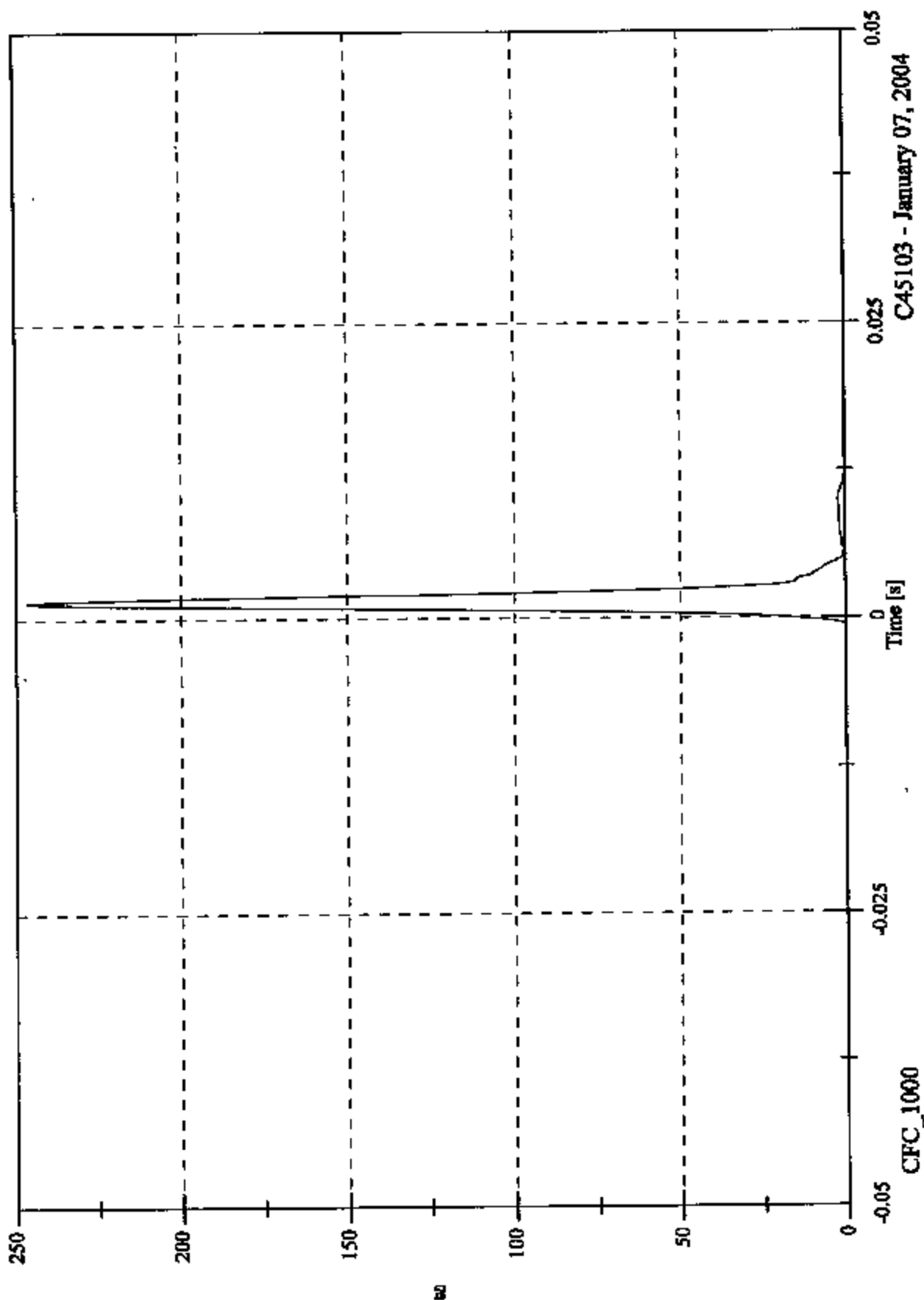
Time [s]

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FMVSS 201U - Headform Calibration Drops

Max: 246.7 [g] at 0.001 [s]
Min: 0.0 [g] at -0.039 [s]

Headform Resultant



CFC_1000

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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS
SERIAL NUMBER:		0385
CALIBRATION DATE:		January 7, 2004
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	10% to 70%	23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	245.3
PEAK LATERAL ACCELERATION	15 Gs Maximum	12.5
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

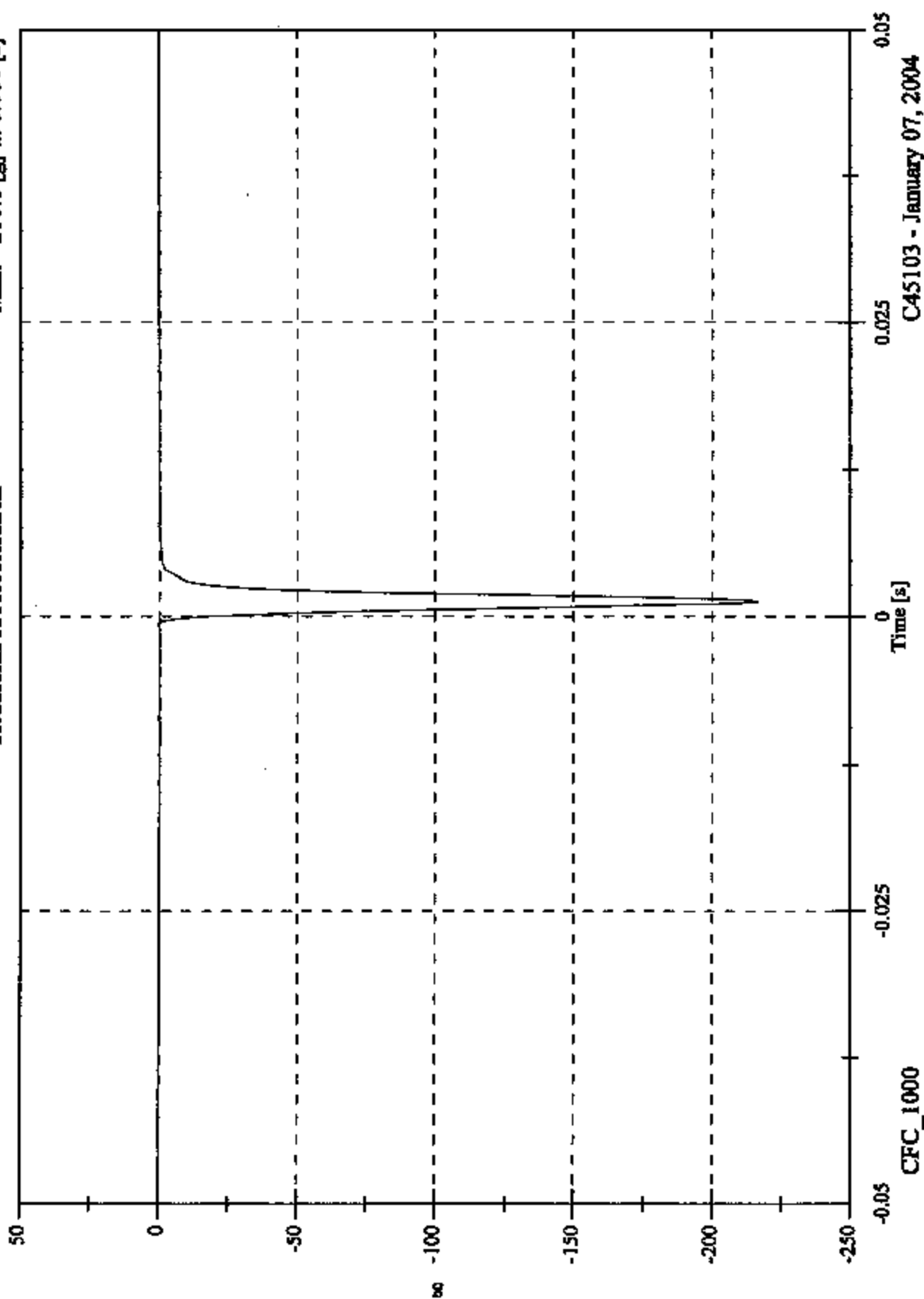
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J28671	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7264-2000T	J32779	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7264-2000T	J28854	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 0.5 [g] at -0.041 [s]
Min: -216.1 [g] at 0.001 [s]

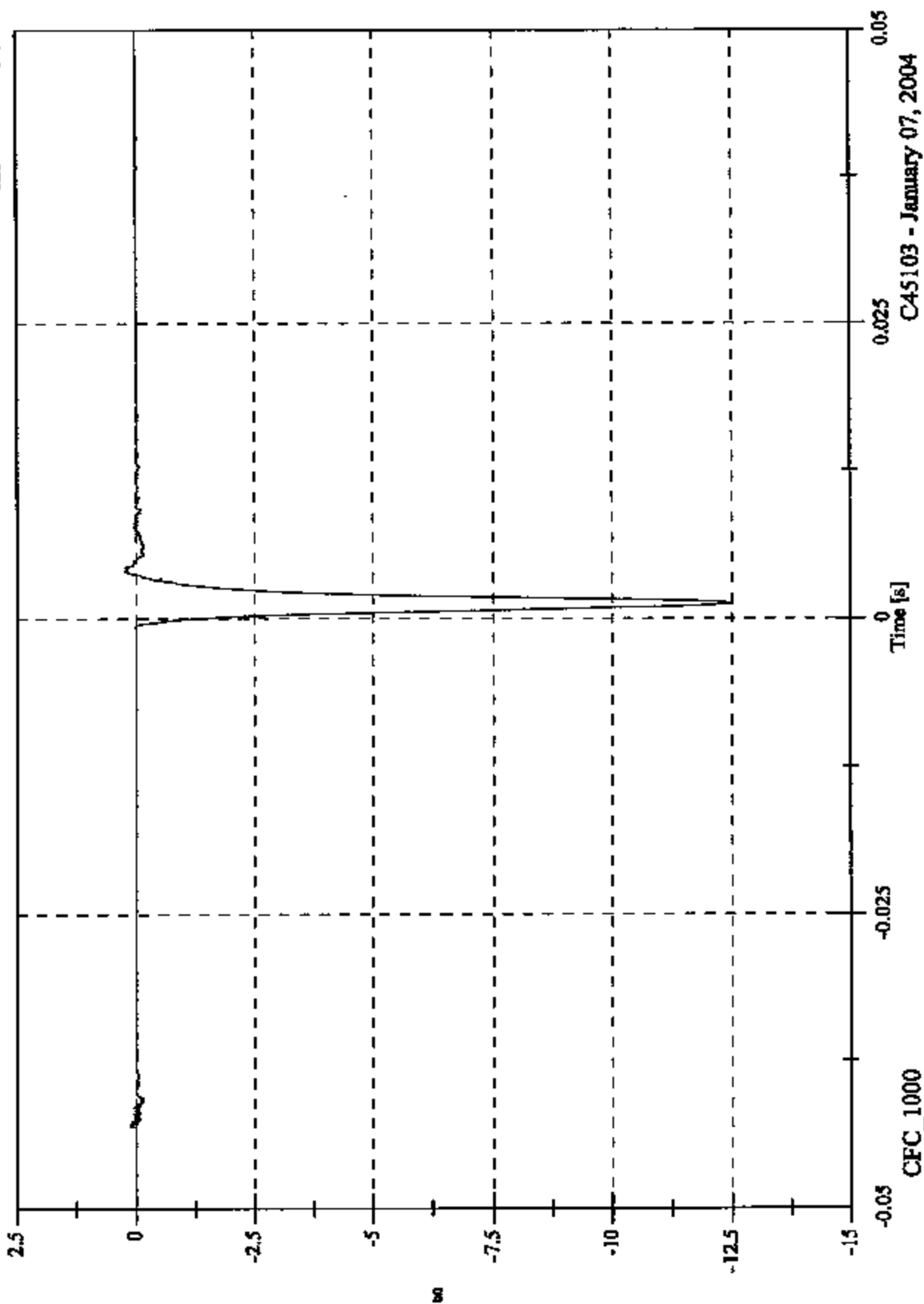
Headform X Acceleration



FMVSS 201U - Headform Calibration Drops

Max: 0.2 [g] at 0.004 [s]
Min: -12.5 [g] at 0.001 [s]

Headform Y Acceleration

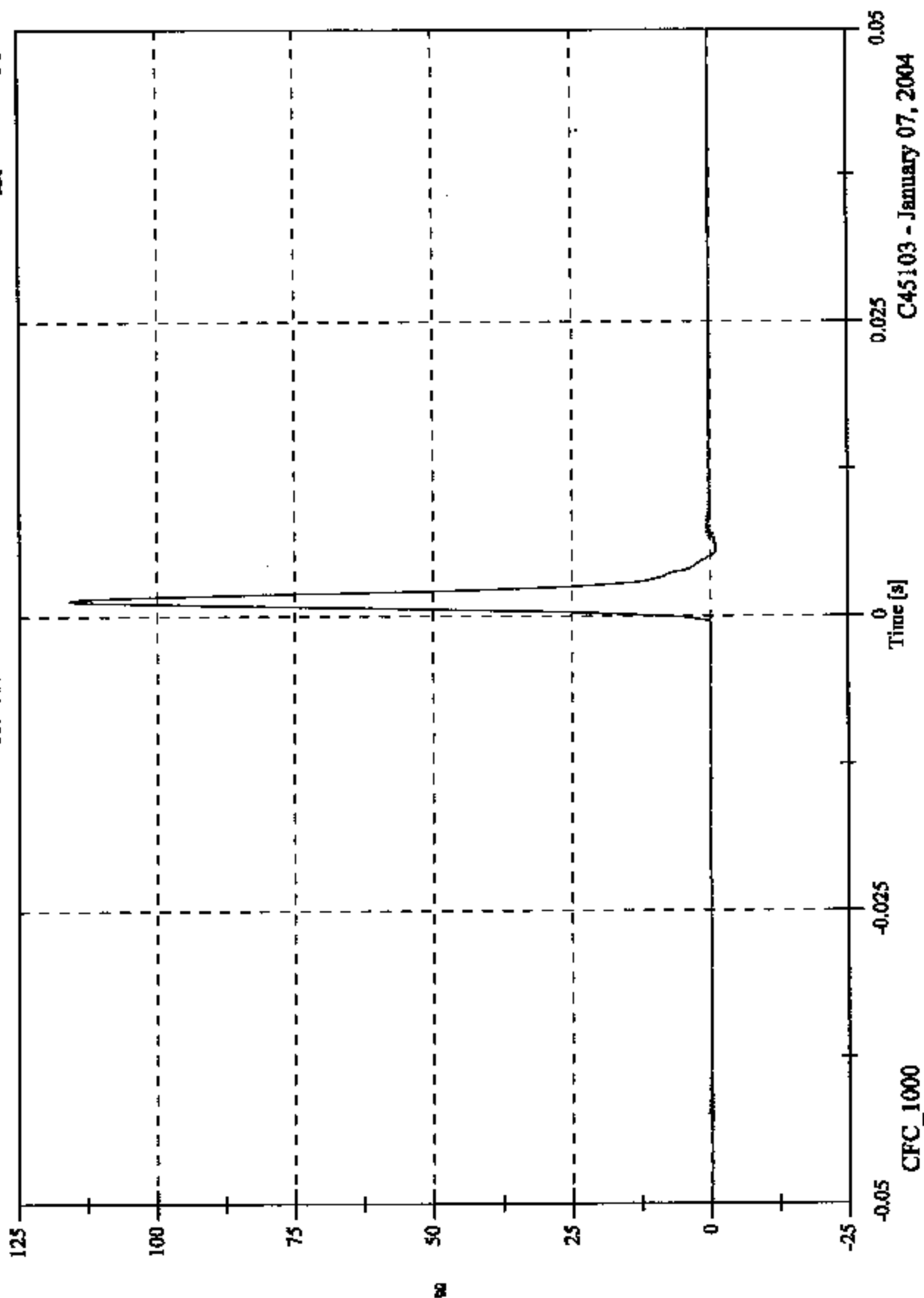


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FMVSS 201U - Headform Calibration Drops

Max: 115.8 [g] at 0.001 [s]
Min: -0.9 [g] at 0.006 [s]

Headform Z Acceleration

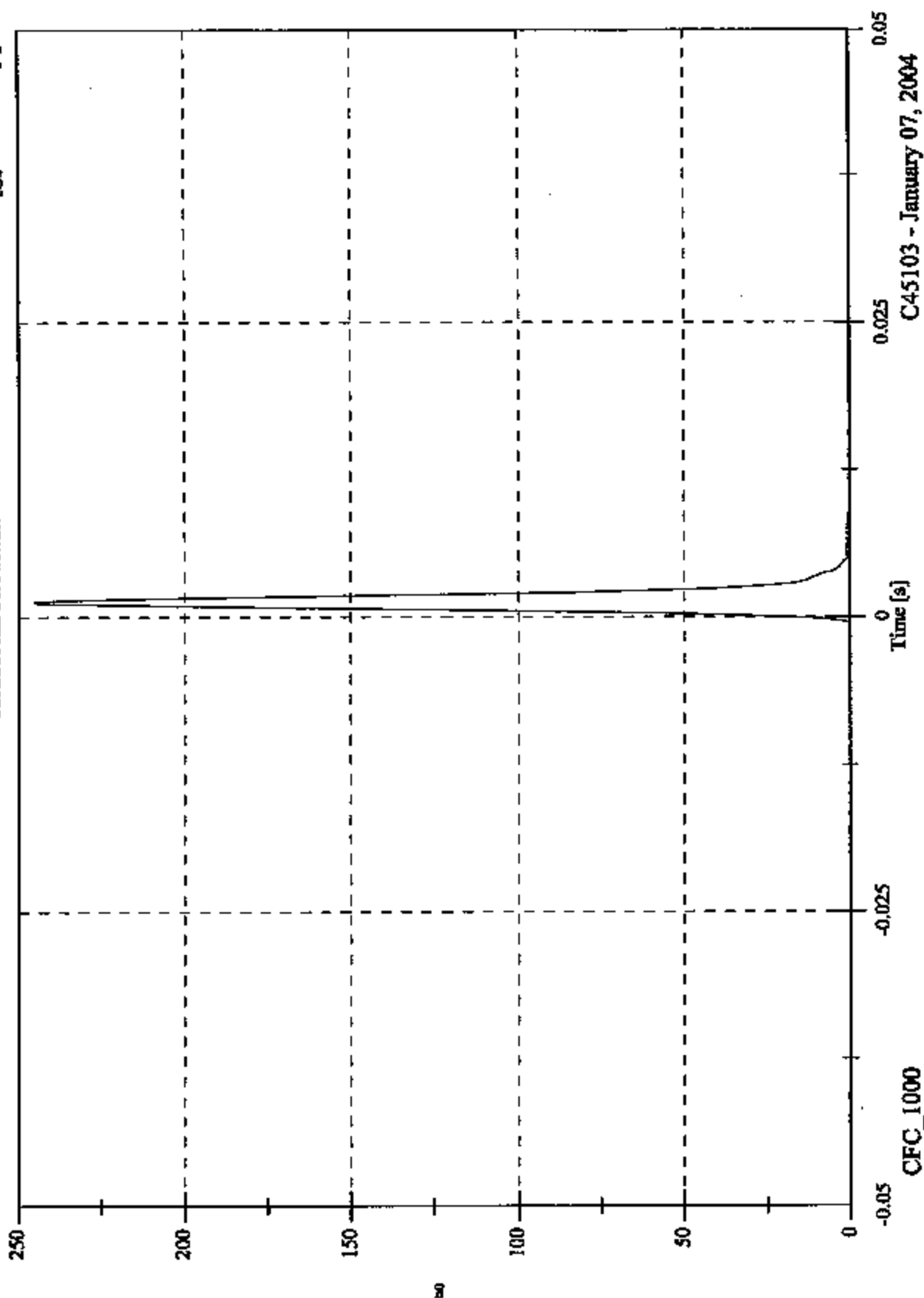


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FMVSS 201U - Headform Calibration Drops

Max: 245.3 [g] at 0.001 [s]
Min: 0.0 [g] at -0.002 [s]

Headform Resultant



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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS
SERIAL NUMBER:		1255
CALIBRATION DATE:		January 7, 2004
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	18% to 70%	23
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	237.7
PEAK LATERAL ACCELERATION	15 Gs Maximum	11.0
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

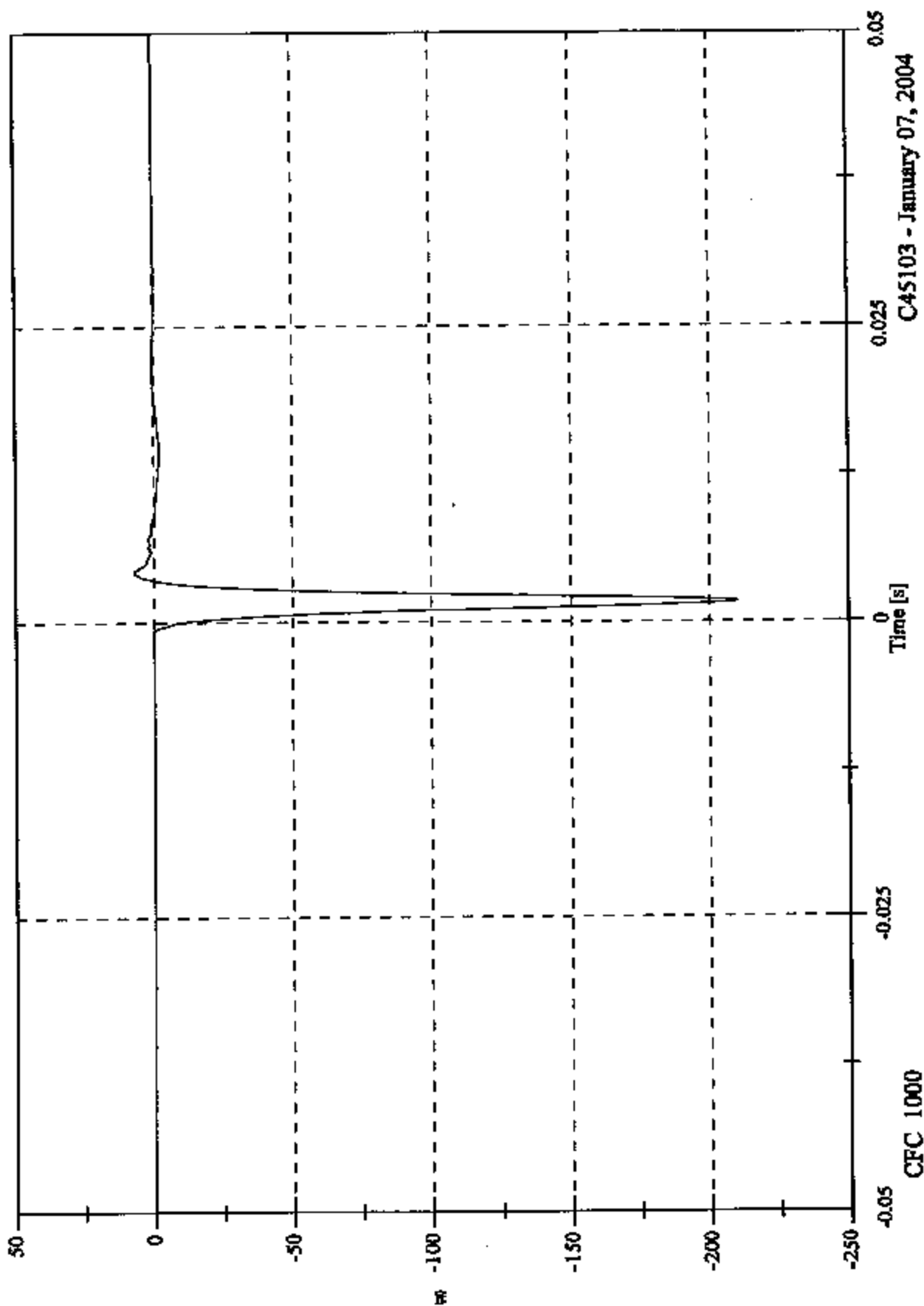
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41806	08/22/03	02/23/04
2 - LATERAL	ENDEVCO	7264-2000T	J40794	08/22/03	02/23/04
3 - VERTICAL	ENDEVCO	7264-2000T	J41807	08/22/03	02/23/04

REMARKS:

FMVSS 201U - Headform Calibration Drops

Max: 6.8 [g] at 0.004 [s]
Min: -210.2 [g] at 0.002 [s]

Headform X Acceleration

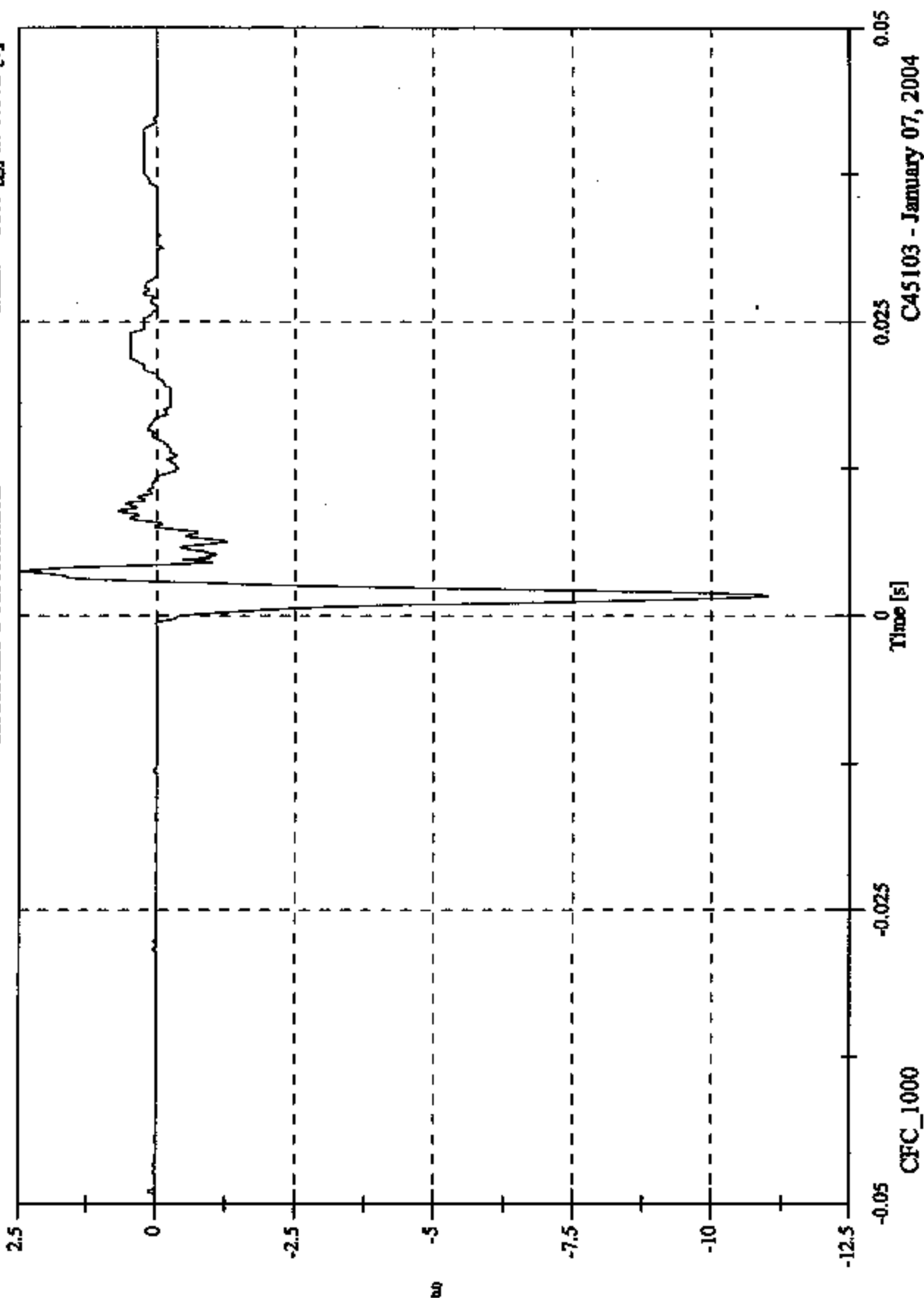


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FMVSS 201U - Headform Calibration Drops

Max: 2.5 [g] at 0.004 [s]
Min: -11.0 [g] at 0.002 [s]

Headform Y Acceleration

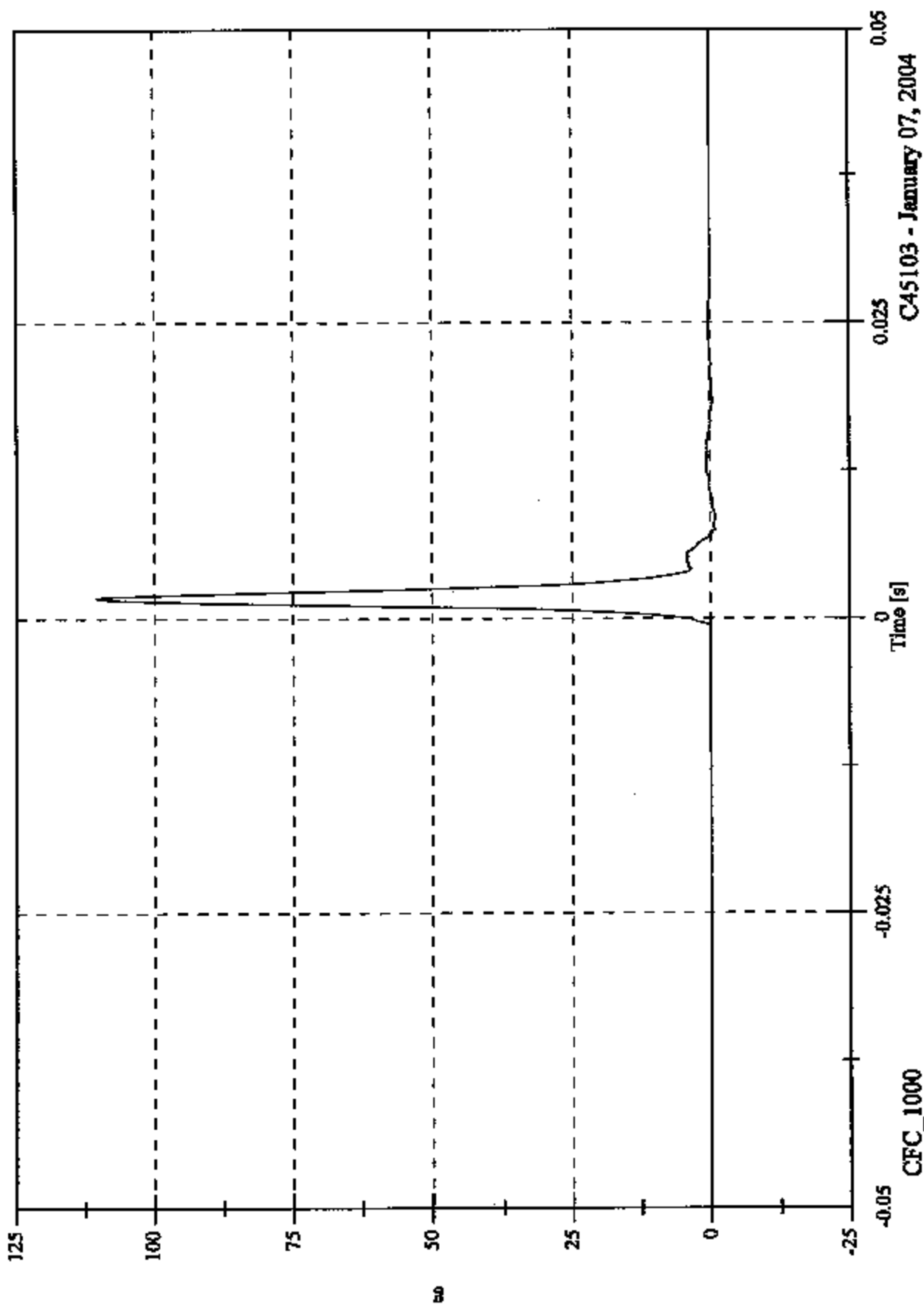


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FMVSS 201U - Headform Calibration Drops

Headform Z Acceleration

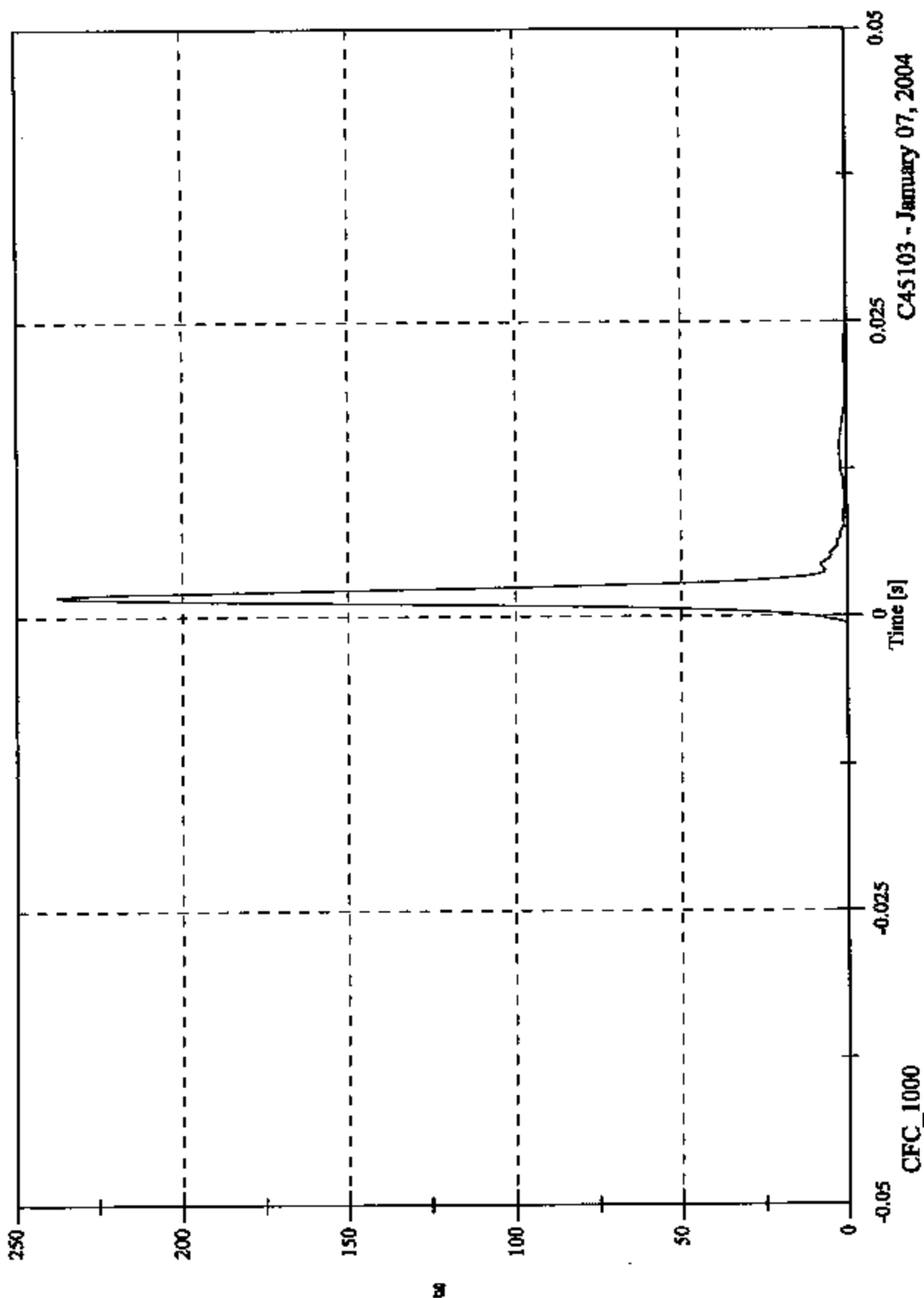
Max: 110.4 [g] at 0.002 [s]
Min: -0.9 [g] at 0.008 [s]



FMVSS 201U - Headform Calibration Drops

Max: 237.7 [g] at 0.002 [s]
Min: 0.0 [g] at -0.031 [s]

Headform Resultant



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