

REPORT NUMBER: 201UI-CAL-07-07

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

**General Motors Corporation
2007 Pontiac Torrent**

NHTSA NUMBER: C70108

CALSPAN TEST NUMBER: 8826-FMH-07

CALSPAN
TRANSPORTATION SCIENCES CENTER
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BUFFALO, NEW YORK 14225



Test Date: August 29, 2007

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
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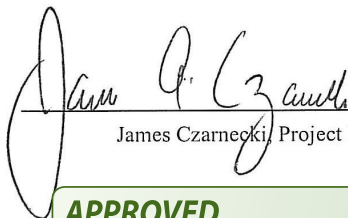
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16. Abstract Compliance tests were conducted on the subject vehicle, a 2007 Pontiac Torrent, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows in the table below:					
Target Point	Horizontal	Vertical	Velocity	HIC	HICd
API	210°	50°	23.42	1179.2	1056.2
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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. DTNH22-04-C-01027. The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2007 Pontiac Torrent, NHTSA No. C70108, 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 2007 Pontiac Torrent , NHTSA No. C70108 , was tested at various upper interior locations 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, Summary of Upper Interior Head Impact Tests. The twelve (12) area chosen for testing were:

AP3	AP1 PASS	SR2B	BP3	BP4
BP1	OP1	UROP	BP2	URBP
SR3	AP1 DRIV			

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201 with the exception of the Driver Side AP1 location.

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 had an orthogonal tri-axis accelerometer pack mounted at the headform's center of gravity (c.g.).

A total of three (3) channels of data for each test were recorded on a Keyser-Threde data acquisition system. Data plots, along with still images, can be found in Section 3, Summary of Test Results and Data Plots.

To document each target area impact test, a Weinberger high-speed video camera was placed at an appropriate location to record the headform contact with the selected target area.

DATA SHEET 2-1
SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06 (SEE CERTIFICATION LABEL)
COLOR:	Silver

TARGET CODE	Target Coordinates						Approach Angles (degrees)		Velocity (kph)	FMH HIC	HIC(d)**
	Driver Side			Passenger Side			Horizontal	Vertical			
	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Z(mm)					
AP1	2816.807	-566.294	1423.495	2818.814	559.460	1423.787	150°	50°	*	*	*
							210°	50°	23.42	1179.2	1056.2
AP2	2604.762	-593.984	1333.057	2607.063	588.653	1333.921	-	-	-	-	-
AP3	2468.285	-618.926	1249.569	2473.568	613.391	1250.737	144°	36°	23.35	596.6	616.5
FH1	2757.920	-467.229	1440.435	2755.779	462.443	1437.009	Relocated 3 circles		-	-	-
FH1R3	2750.269	-397.609	1464.130	2746.059	391.311	1460.936	-	-	-	-	-
FH2	2751.990	-317.001	1467.906	2737.641	312.755	1463.105	-	-	-	-	-
SR1	2968.906	-498.864	1475.554	2970.343	494.303	1478.723	-	-	-	-	-
SR2A	3116.446	-486.119	1501.278	3119.462	484.423	1500.452	-	-	-	-	-
SR2B	3035.240	-491.334	1491.256	3031.002	491.513	1488.297	90°	25°	23.61	363.3	440.5
SR3	3486.481	-479.546	1517.421	3479.779	479.519	1517.653	270°	22°	23.71	425.9	487.7
BP1	3333.831	-486.435	1504.432	3329.664	486.224	1502.874	90°	28°	23.67	580.9	604.7
BP2	3323.541	-580.532	1289.853	3319.845	580.031	1289.427	270°	3°	23.58	762.4	789.9
BP3	3265.802	-619.900	1274.550	3267.245	618.490	1273.865	90°	-9°	23.82	730.6	717.6
BP4	3362.184	-644.116	1160.329	3361.093	642.102	1161.100	152°	-10°	23.53	589.9	611.4
OPR	4134.330	-469.843	1536.743	4130.803	471.611	1537.879	-	-	-	-	-
OP1	4292.688	-593.956	1323.901	4287.865	594.649	1324.471	90°	7°	23.66	478.6	527.5
OP2	4299.633	-593.307	1329.418	4294.401	592.498	1331.391	-	-	-	-	-
RP1	4614.745	-500.053	1459.977	4609.796	495.174	1463.098	-	-	-	-	-
URAP	3006.521	-400.573	1512.052	2998.692	402.314	1510.251	-	-	-	-	-
URBP	3336.774	-381.550	1563.197	3327.983	385.914	1564.234	270°	40°	23.5	272.8	372.2
URRSR	3755.855	-380.425	1593.079	3646.331	381.669	1592.587	-	-	-	-	-
UROPP	4134.609	-375.561	1596.244	4132.547	374.335	1597.376	90°	34°	23.55	188.3	308.5
URRP	4433.711	-376.928	1583.551	4434.878	376.639	1583.503	-	-	-	-	-

* Passenger side AP1 target location – X accelerometer was damaged during the free-flight resulting in no velocity, FMH HIC, or HIC(d)

** 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:				2007 Pontiac Torrent					
VIN:				2CKDL63FX76073219					
Month & Year of Manufacture:				11/06 (SEE CERTIFICATION LABEL)					
Vehicle Body Color:				Silver					
Engine Data:	6	Cylinders;	-	CID;	3.4	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:		301	km						
Options:	x	A/C;	x	Power Steering;	x	Pwr.Brakes;	x	Pwr. Windows	
Interior Trim Information :									
1. No grab handles on side rails									
2. Adjustable seat belt anchorages on both B-Pillars									
3. Non-adjustable seat belt anchorages on both Other Pillars									

DATA FROM TIRE PLACARD:									
Tire Pressure (at capacity);				210			kPa FRONT		
				210			kPa REAR		
Recommended Tire Size:				P235/65R16					
Tires on Test Vehicle:		P235/65R16			Manufacturer:		-		
Vehicle Capacity Data:									
Number of Occupants:	2	Front;	3	Rear;	-	3rd Seat;	5	Total	
Type of Front Seats:	x	Bucket;	-	Bench;	-	Split Bench			
Type of Front Seat Back:	-	Fixed;	x	Adjustable with	x	Lever or	-	Knob	
Vehicle Capacity Weight (VCW)=				572			kg (A)		
No. of Occupants x 68 kg. =				340			kg (B)		
Rated Cargo/Luggage Weight (RCLW) =				232			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	=	488	kg	Left Rear	= 365 kg
Right Front	=	482	kg	Right Rear	= 346 kg
TOTAL FRONT	=	970.0	kg	TOTAL REAR	= 711.0 kg
% of Total Weight	=	57.7%	%	% of Total Weight	= 42.3% %
TOTAL WEIGHT	=	1681.0		kg	

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:		
Total Test Vehicle Delivered Weight=	1681.0	kg (A)
+ Rated Cargo/Luggage Weight =	136.0	kg (B)
TEST VEHICLE TARGET WEIGHT =	1817.0	kg (A+B)

WEIGHT OF TEST VEHICLE (FULLY LOADED):					
Left Front	=	494	kg	Left Rear	= 435 kg
Right Front	=	473	kg	Right Rear	= 409 kg
TOTAL FRONT	=	967.0	kg	TOTAL REAR	= 844.0 kg
% of Total Weight	=	53.4%	%	% of Total Weight	= 46.6% %
TOTAL TEST WEIGHT	=	1811.0			
Weight of vehicle secured in test vehicles cargo area	=	130.0		kg	

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	837	Left Rear	857
	Right Front	845	Right Rear	865
FULLY LOADED:	Left Front	839	Left Rear	841
	Right Front	847	Right Rear	845
Test Vehicle Wheelbase:	2850		millimeters	

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.4↓	Front Bumper	↓0.2↑
	Right Door Sill	↓0.5↑	Rear Bumper	↓0.1↑
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.0	Front Bumper	↓0.2↑
	Right Door Sill	↓0.1↑	Rear Bumper	↓0.1↑
AS TESTED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.3↓	Front Bumper	↓0.2↑
	Right Door Sill	↓0.4↑	Rear Bumper	↓0.1↑

DATA SHEET 2-3

APPROACH ANGLE LIMITS

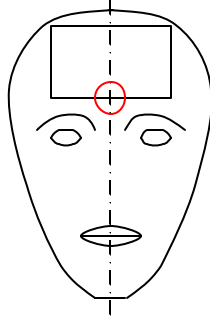
Target Code	Left Side				Target Code	Right Side			
	Horizontal Angles (deg.)		Vertical Angles (deg.)			Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	202	244	-5	50	AP1	116	158	-5	50
AP2	202	244	-5	36	AP2	116	158	-5	36
AP3	202	244	-5	36	AP3	116	158	-5	36
BP1	199	271	-10	28	BP1	89	161	-10	28
BP2	ANY		0	3	BP2	ANY		0	3
BP3	199	271	-10	-9	BP3	89	161	-10	-9
BP4	199	271	-10	-10	BP4	89	161	-10	-10
OP1	ANY		0	7	OP1	ANY		0	7
OP2	ANY		0	7	OP2	ANY		0	7
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	24	SR1	90		0	24
SR2A	270		0	25	SR2A	90		0	25
SR2B	270		0	25	SR2B	90		0	25
SR3	270		0	23	SR3	90		0	23
URAP	ANY		0	50	URAP	ANY		0	50
URBP	ANY		0	40	URBP	ANY		0	40
UROP	ANY		0	34	UROP	ANY		0	34
URRP	ANY		0	45	URRP	ANY		0	50

Note : BP2 target location – Adjustable Seat Belt Anchorage
 OP1 and OP2 target location – Non-adjustable Seat Belt Anchorage
 ** Target exempt from testing per S6.3(b).

DATA SHEET 2-4

SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver



≅ RIGHT SIDE OF FACE

TARGET	Distance Above Point 0 (mm)	Distance Over From Pt. O (mm)
AP3	15	6L
AP1 PASS	*	*
SR2B	22	2L
BP3	25	5R
BP4	13	13R
BP1	8	0
OP1	14	3L
UROP	53	7L
BP2	4	6L
URBP	49	9L
SR3	16	8L
AP1 DRIV	34	4R

SECTION 3

SUMMARY OF TEST RESULTS AND DATA PLOTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	01
Test Date:	08/28/07
Target Location:	A-PILLAR
Target Code:	AP3
Horizontal Impact Angle:	144°
Vertical Impact Angle:	36°
Ambient Temperature:	22.3 C°
Relative Humidity:	53.2
Time of Impact:	10:45
Headform Number:	0805

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



POST-IMPACT AP3 HEADFORM

Free Motion HIC	596.6
HIC(d)	616.5
Impact Velocity (kph)	23.35
HIC T1 (msec)	1.5
HIC T2 (msec)	11.5

FMVSS 201U 2007 Pontiac Torrent C70108 - AP3

FMH Headform 0805

Location: AP3

Test Date: August 28, 2007

Work File: AP3

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

Lab Temperature: 22.3 C

HICd: 616.5

Lab Humidity: 53.2 %

HIC (36ms): 596.6

Velocity at Impact: 23.35 KPH

t1: 1.5 msec

t2: 11.5 msec

Free Flight Distance: 221.13 mm

Duration: 9.9 msec

Average Acceleration: 11.6 g

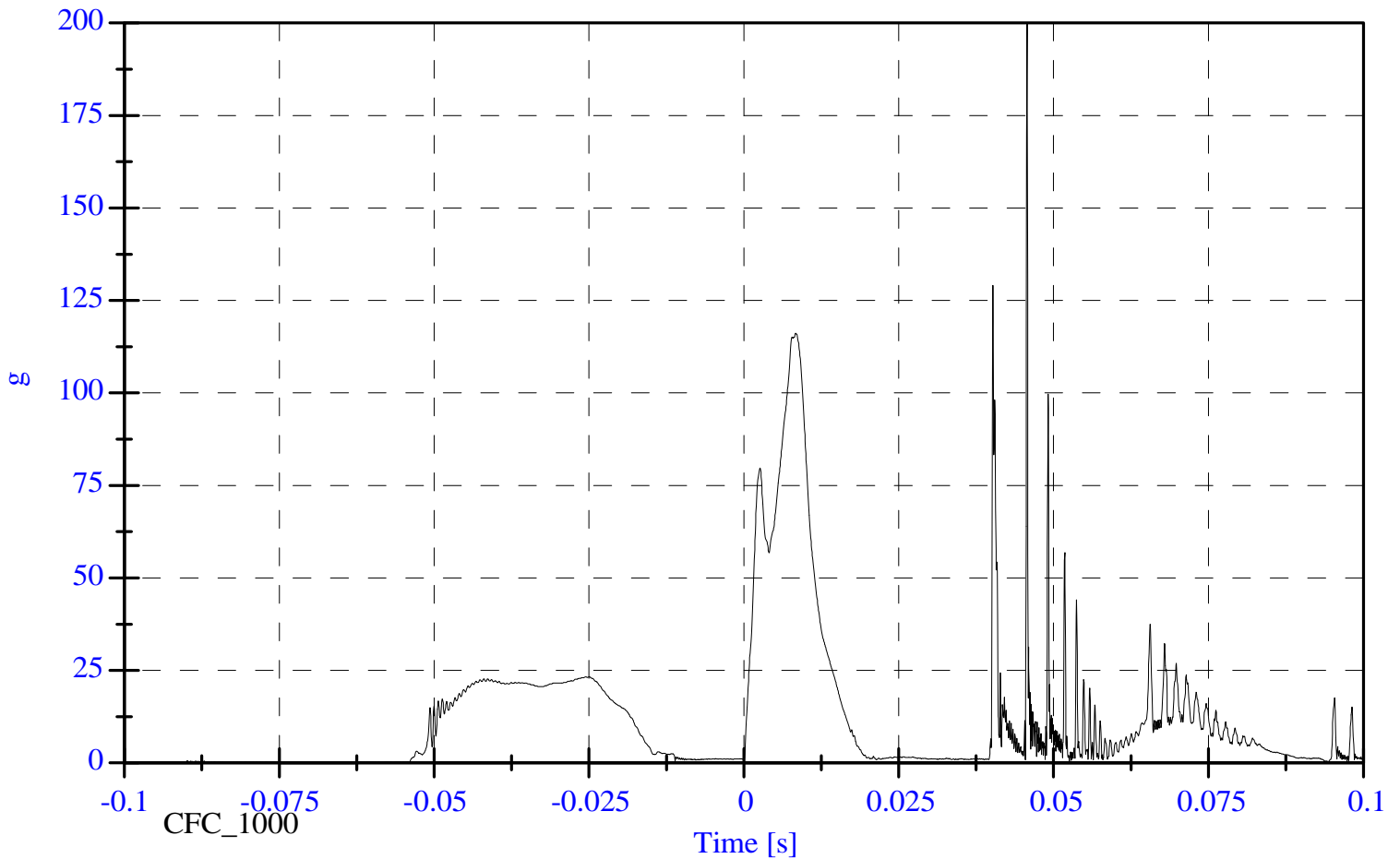
Maximum: 116.2 g

FMVSS 201U 2007 Pontiac Torrent

Headform Resultant

Max: 116.2 [g] at 0.008 [s]

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



FMVSS 201U 2007 Pontiac Torrent

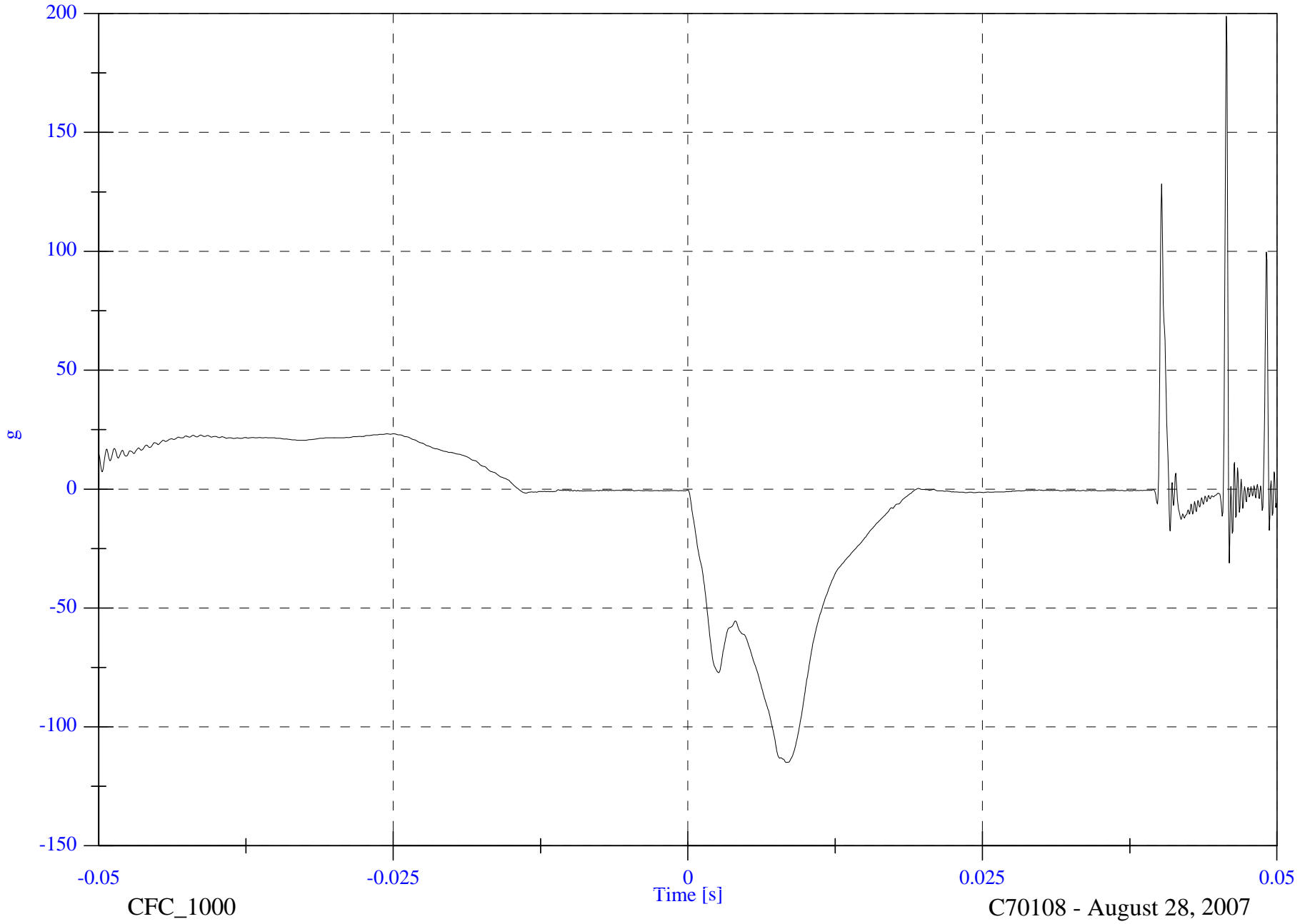
Headform X Acceleration

Max: 198.8 [g] at 0.046 [s]

Min: -115.0 [g] at 0.008 [s]

C70108 PASSENGER SIDE AP3 IMPACT PLOT #1

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

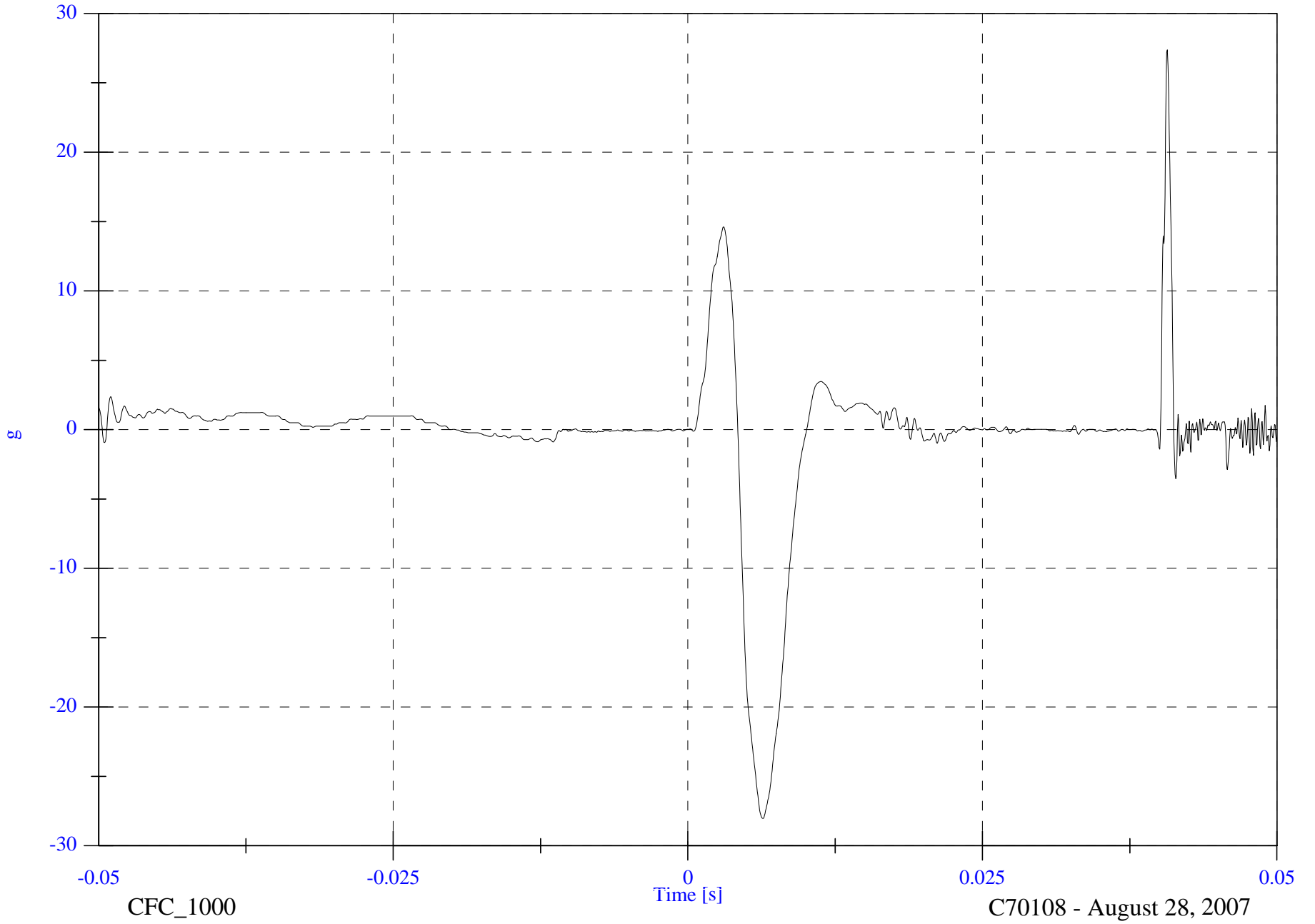
Headform Y Acceleration

Max: 27.4 [g] at 0.041 [s]

Min: -28.0 [g] at 0.006 [s]

C70108 PASSENGER SIDE AP3 IMPACT PLOT #2

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

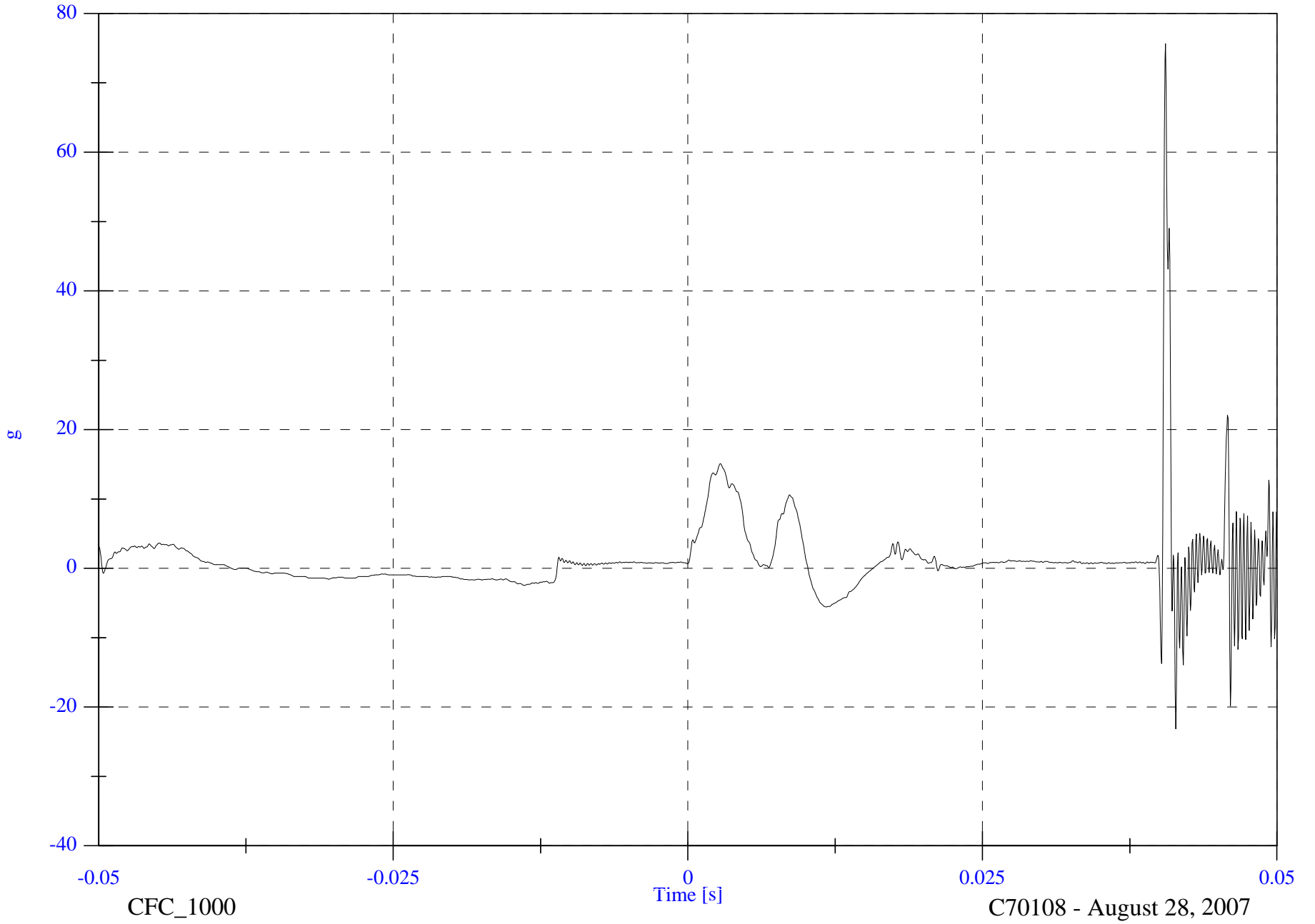
Headform Z Acceleration

Max: 75.7 [g] at 0.041 [s]

Min: -23.2 [g] at 0.041 [s]

C70108 PASSENGER SIDE AP3 IMPACT PLOT #3

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

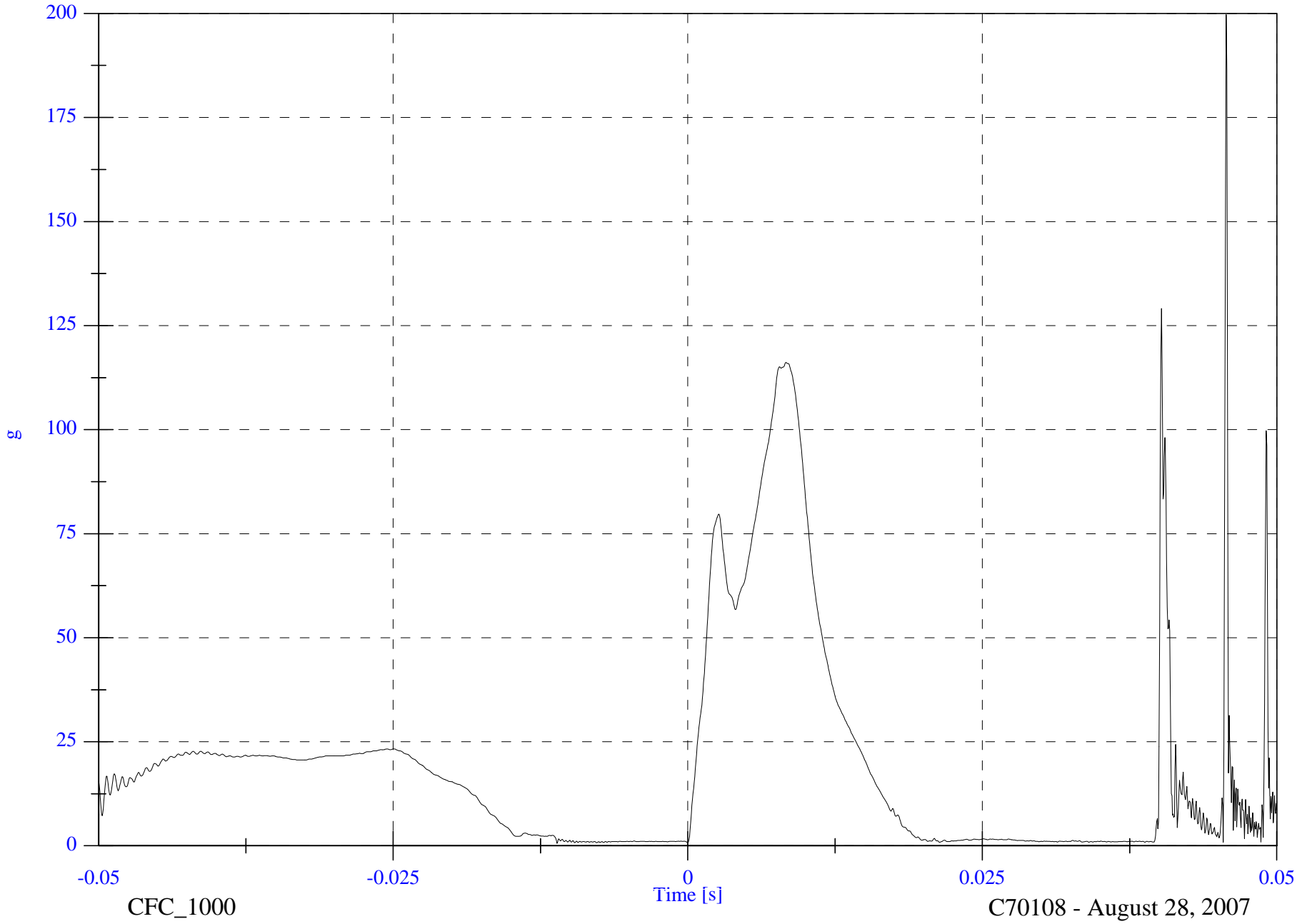
Headform Resultant

Max: 199.7 [g] at 0.046 [s]

Min: 0.6 [g] at -0.011 [s]

C70108 PASSENGER SIDE AP3 IMPACT PLOT #4

8826-FMH-07

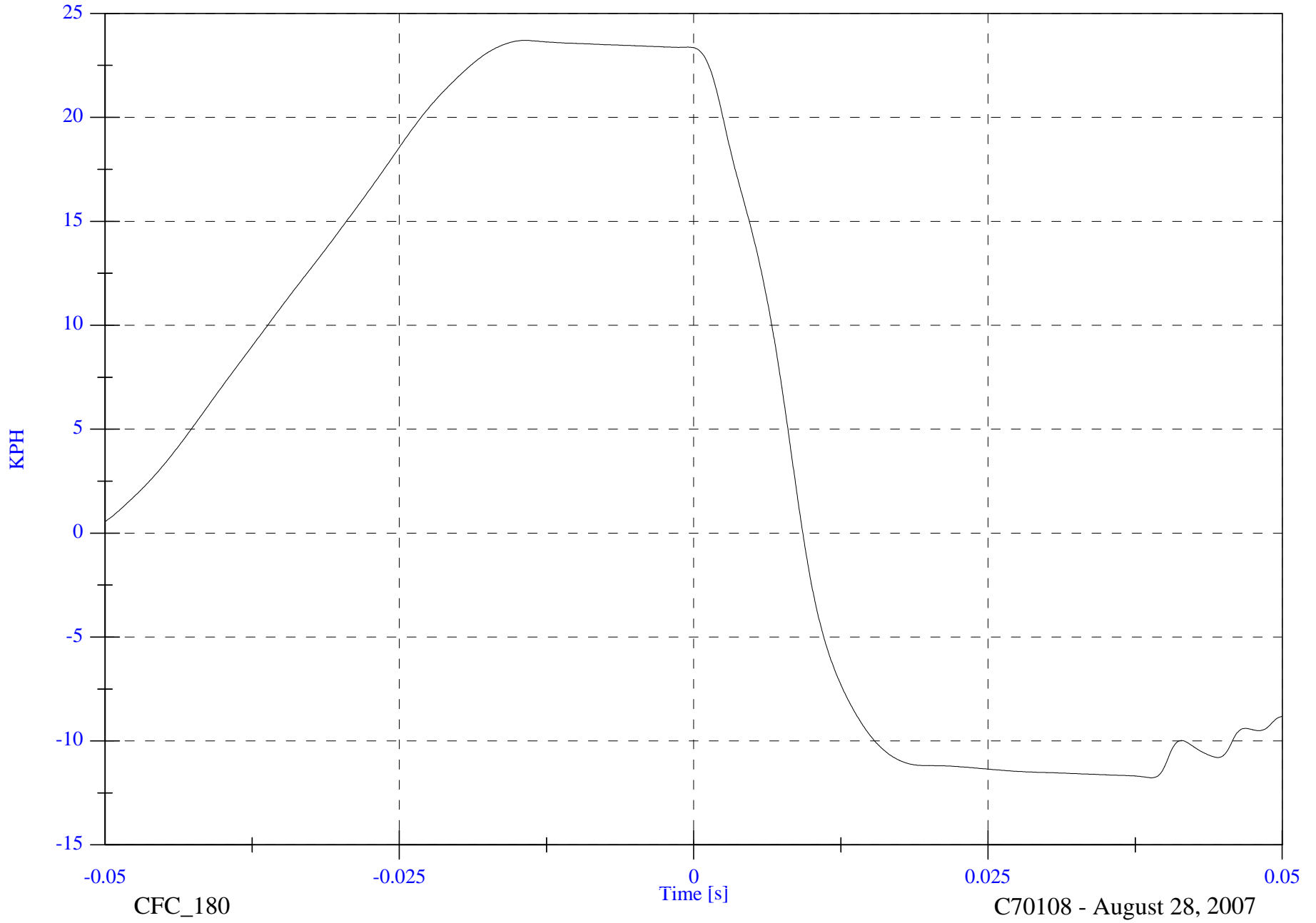


FMVSS 201U 2007 Pontiac Torrent

Headform Velocity

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

Min: -11.8 [KPH] at 0.039 [s]



C70108 PASSENGER SIDE AP3 IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 28, 2007



PRE-IMPACT AP3

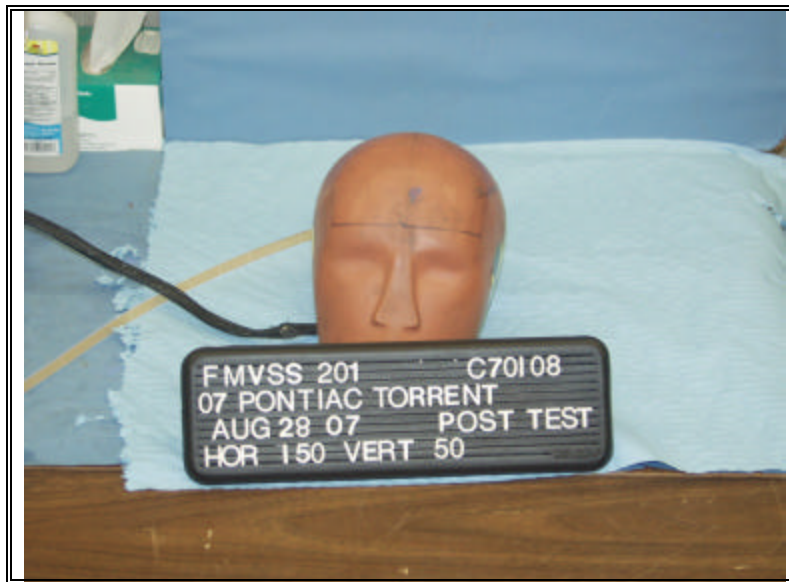


POST-IMPACT AP3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	02
Test Date:	08/28/07
Target Location:	A-PILLAR
Target Code:	AP1 PASS
Horizontal Impact Angle:	150°
Vertical Impact Angle:	50°
Ambient Temperature:	21.1 C°
Relative Humidity:	47.4
Time of Impact:	11:15
Headform Number:	0062

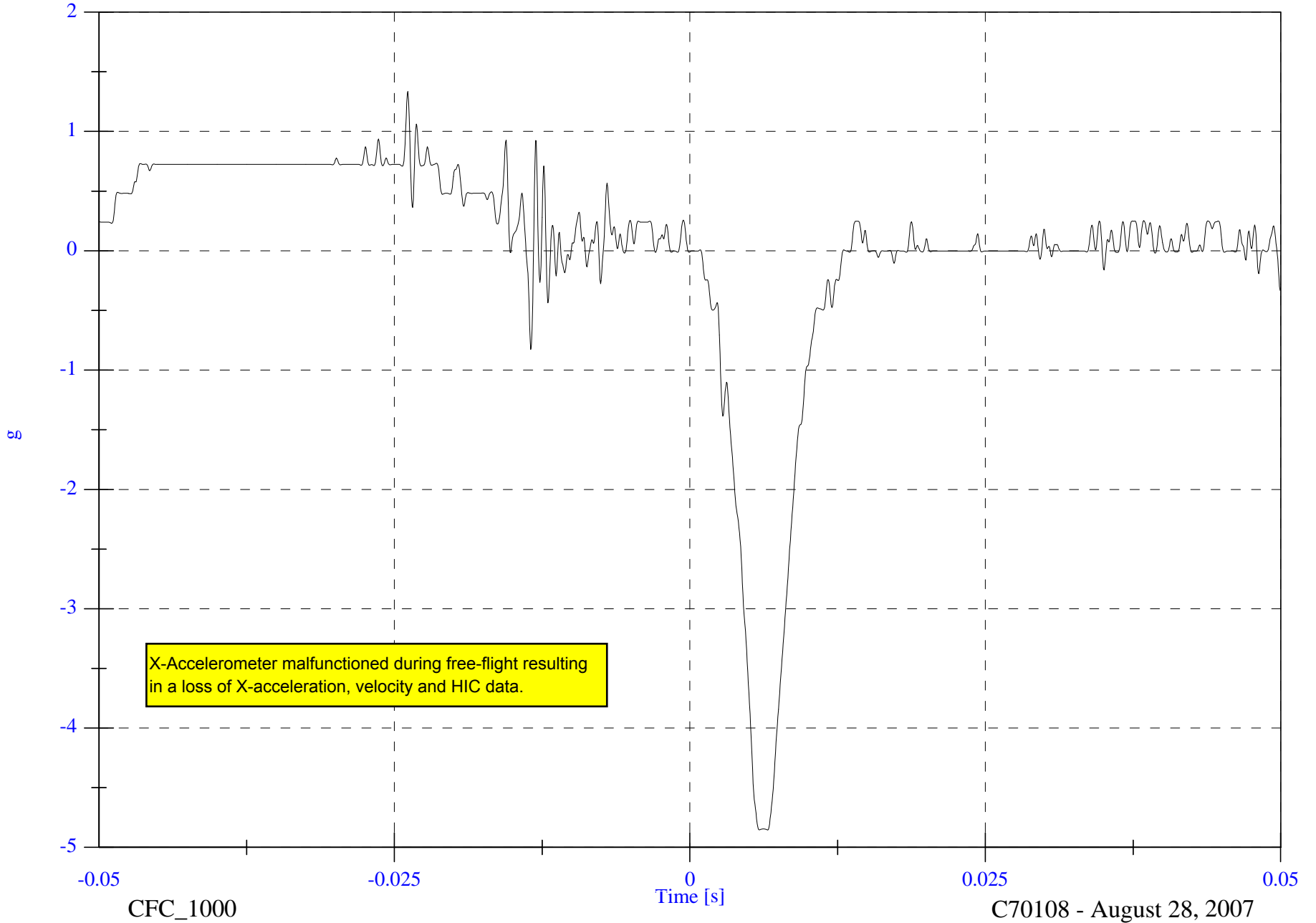
Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	*	<input type="checkbox"/>	mm right <input type="checkbox"/> mm left
On Centerline	*		mm up



POST-IMPACT AP1 PASS HEADFORM

Free Motion HIC	*
HIC(d)	*
Impact Velocity (kph)	*
HIC T1 (msec)	*
HIC T2 (msec)	*

Headform X Acceleration



C70108 PASSENGER SIDE AP1 IMPACT PLOT #1

8826-FMH-07



PRE-IMPACT AP1 PASS



POST-IMPACT API PASS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	03
Test Date:	08/28/07
Target Location:	SIDE RAIL
Target Code:	SR2B
Horizontal Impact Angle:	90°
Vertical Impact Angle:	25°
Ambient Temperature:	20.6 C°
Relative Humidity:	47.1
Time of Impact:	12:45
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	2	mm right	x mm left
On Centerline	22		mm up



POST-IMPACT SR2B HEADFORM

Free Motion HIC	363.3
HIC(d)	440.5
Impact Velocity (kph)	23.61
HIC T1 (msec)	14.5
HIC T2 (msec)	19.0

FMVSS 201UI 2007 Pontiac Torrent C70108 - SR2B

FMH Headform 0355

Location: SR2B

Test Date: August 28, 2007

Work File: SR2B

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

Lab Temperature: 20.6 C

HICd: 440.5

Lab Humidity: 47.1 %

HIC (36ms): 363.3

Velocity at Impact: 23.61 KPH

t1: 14.5 msec

t2: 19.0 msec

Free Flight Distance: 228.51 mm

Duration: 4.5 msec

Average Acceleration: 8.5 g

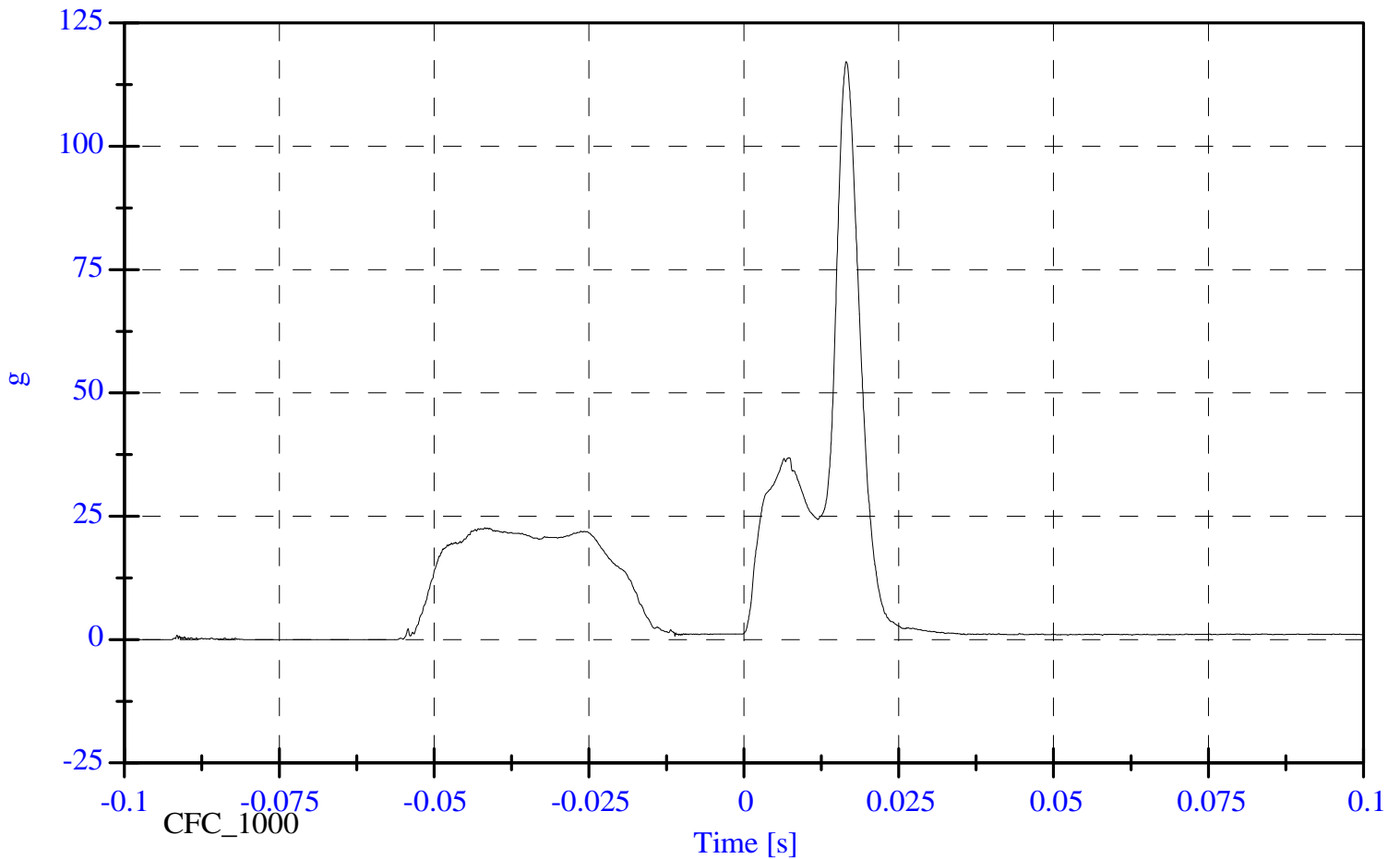
Maximum: 117.2 g

FMVSS 201UI 2007 Pontiac Torrent

Headform Resultant

Max: 117.2 [g] at 0.016 [s]

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



FMVSS 201UI 2007 Pontiac Torrent

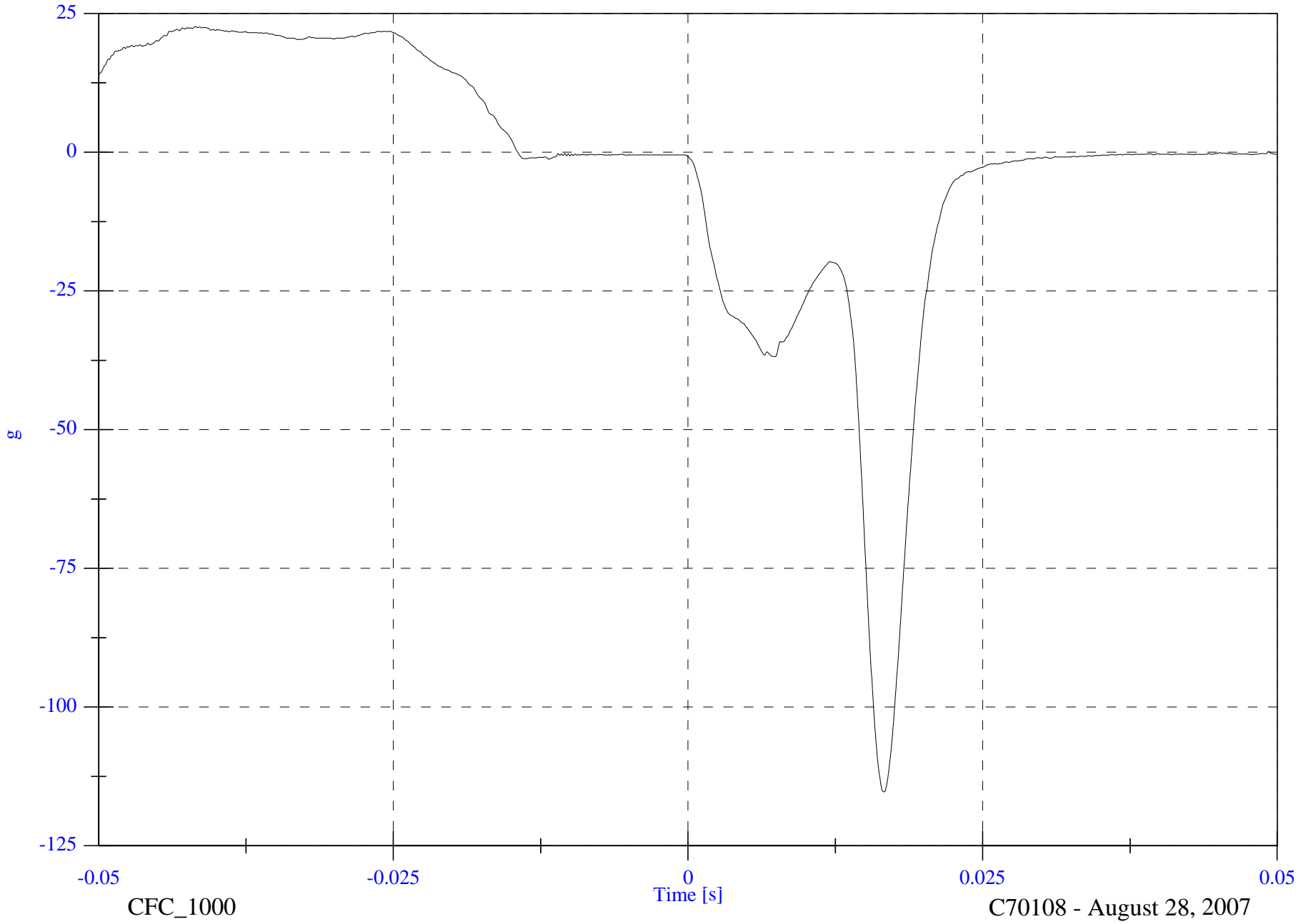
Headform X Acceleration

Max: 22.6 [g] at -0.042 [s]

Min: -115.3 [g] at 0.017 [s]

C70108 PASSENGER SIDE SR2B IMPACT PLOT #1

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201UI 2007 Pontiac Torrent

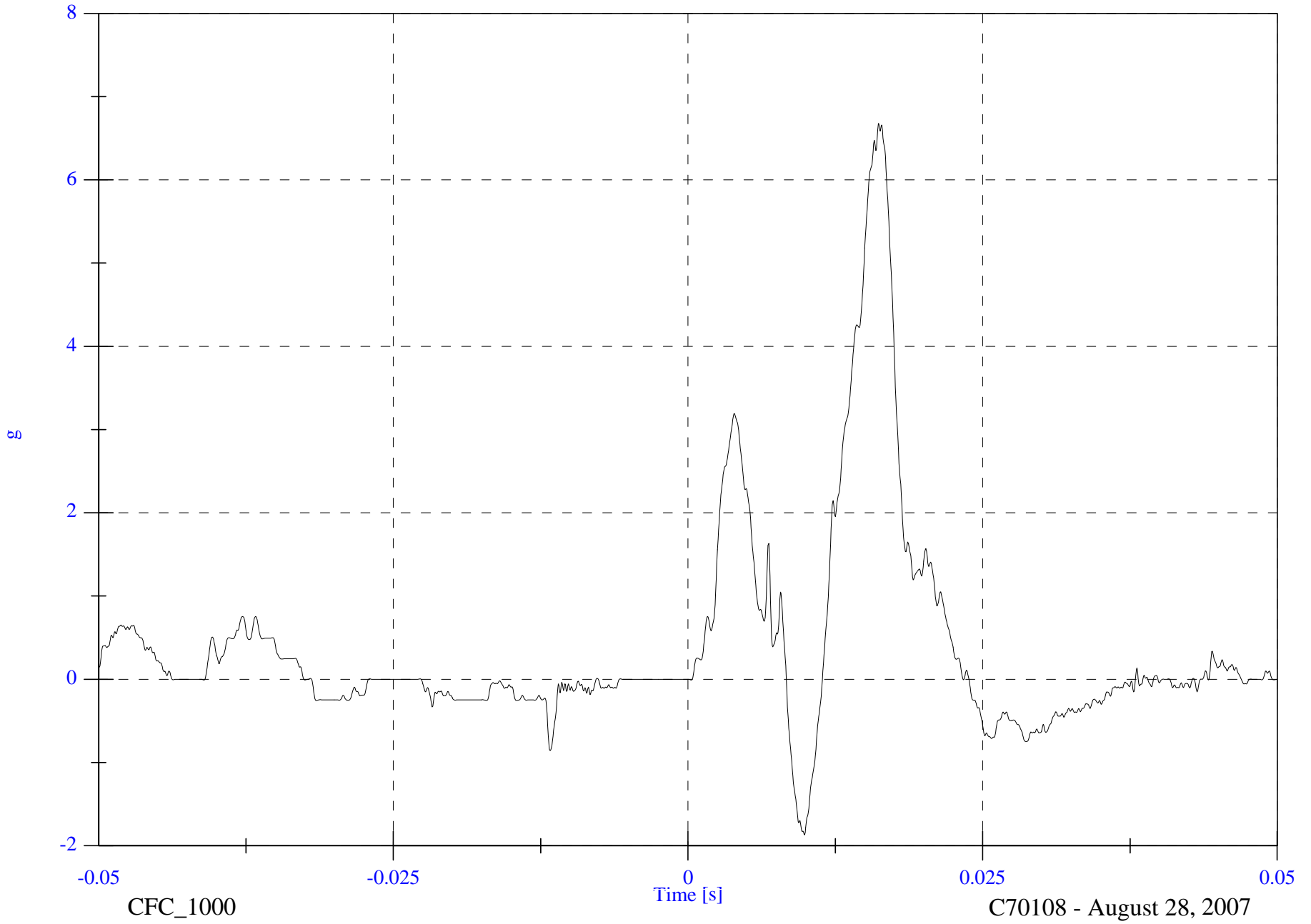
Headform Y Acceleration

Max: 6.7 [g] at 0.016 [s]

Min: -1.9 [g] at 0.010 [s]

C70108 PASSENGER SIDE SR2B IMPACT PLOT #2

8826-FMH-07



FMVSS 201UI 2007 Pontiac Torrent

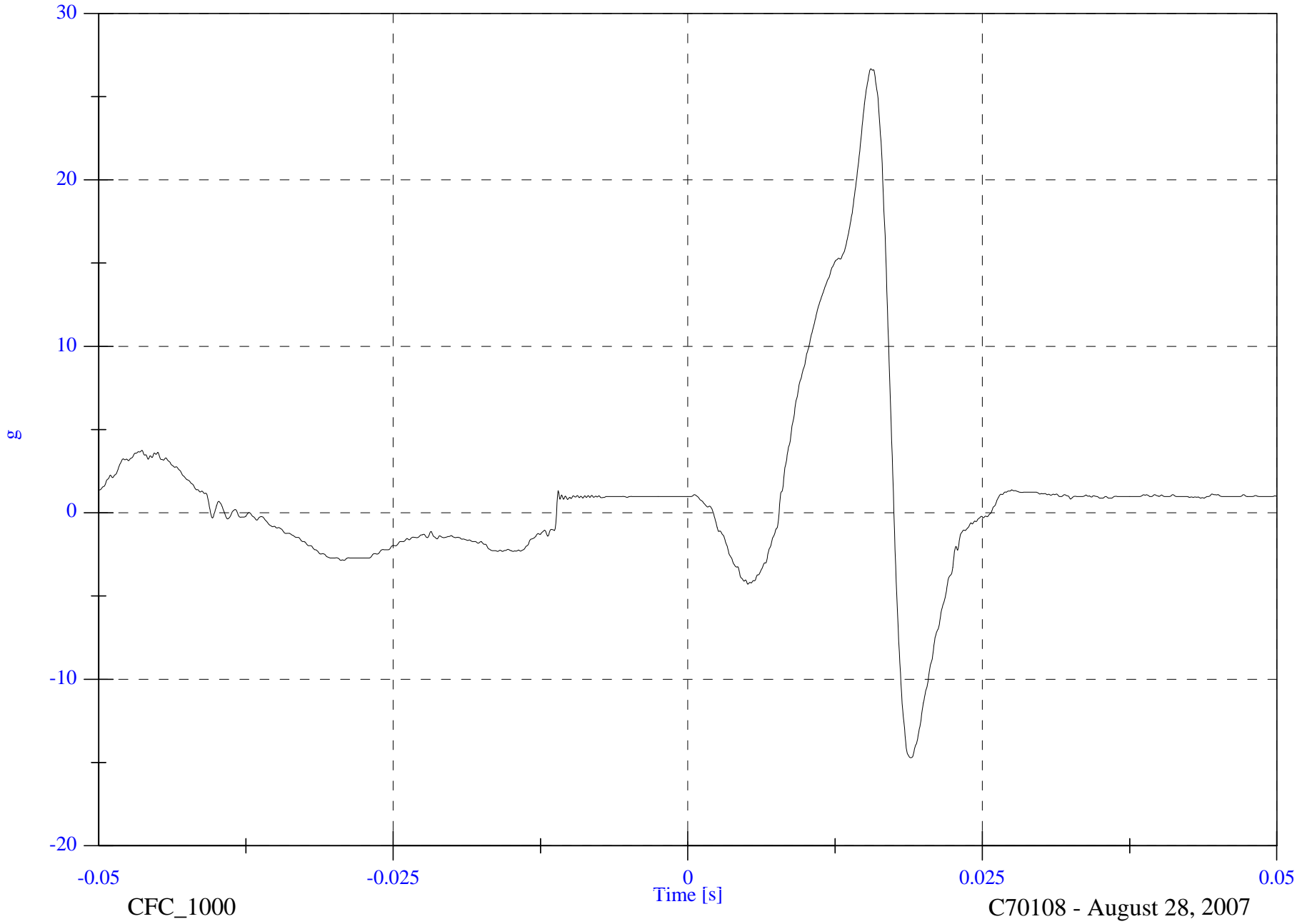
Headform Z Acceleration

Max: 26.7 [g] at 0.016 [s]

Min: -14.7 [g] at 0.019 [s]

C70108 PASSENGER SIDE SR2B IMPACT PLOT #3

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201UI 2007 Pontiac Torrent

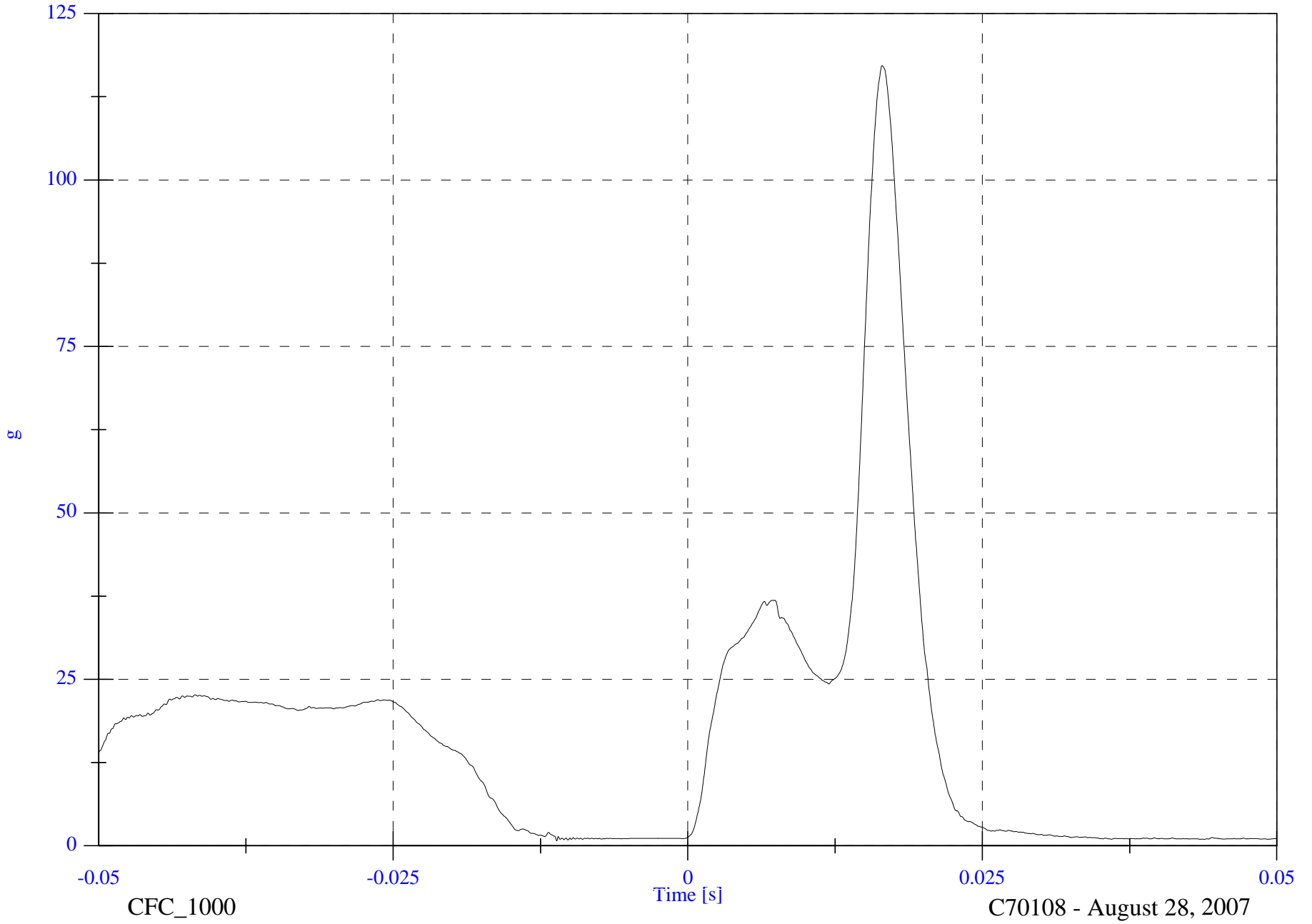
Headform Resultant

Max: 117.2 [g] at 0.016 [s]

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

C70108 PASSENGER SIDE SR2B IMPACT PLOT #4

8826-FMH-07

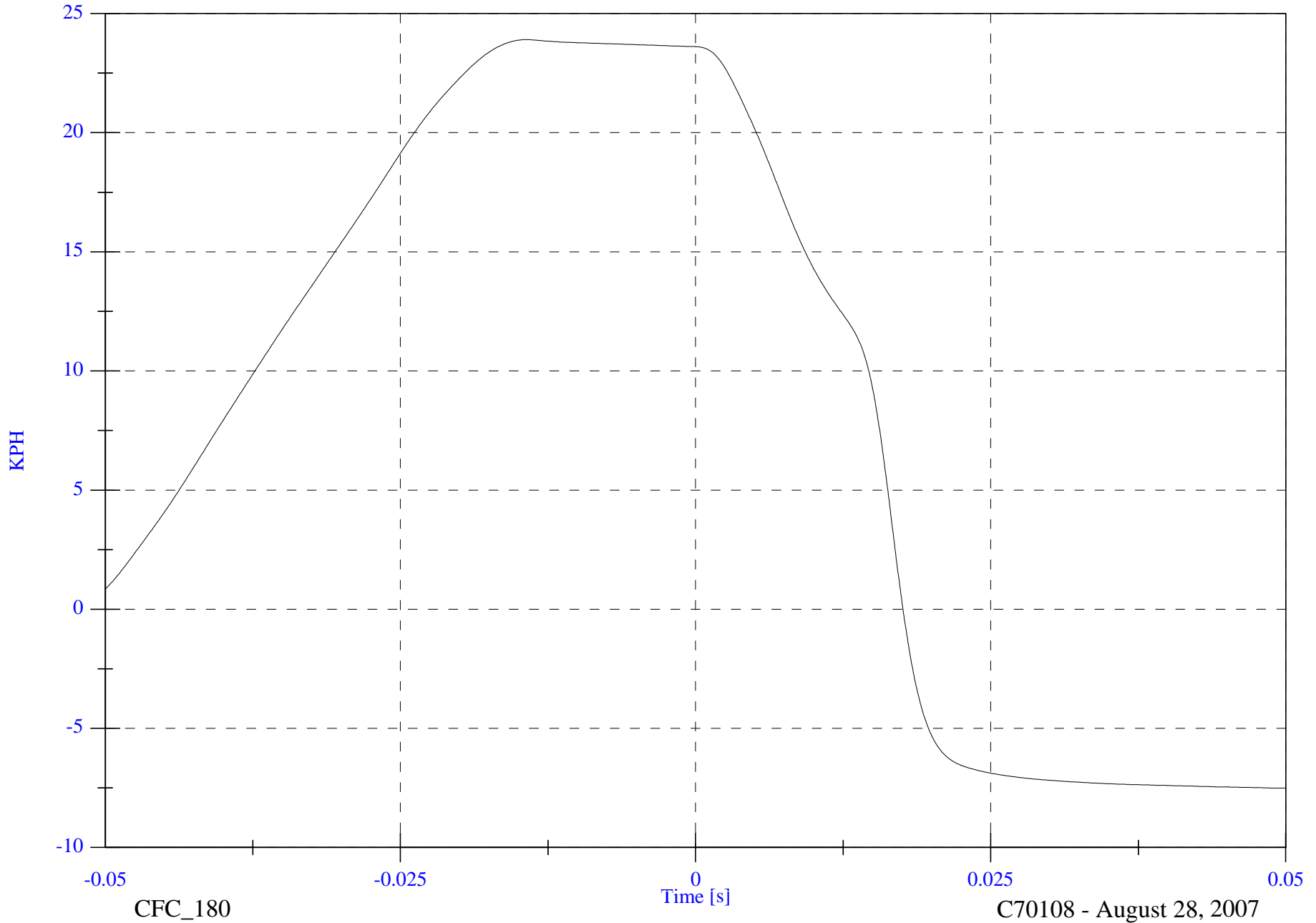


FMVSS 201UI 2007 Pontiac Torrent

Max: 23.9 [KPH] at -0.014 [s]

Min: -7.5 [KPH] at 0.050 [s]

Headform Velocity



C70108 PASSENGER SIDE SR2B IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 28, 2007



PRE-IMPACT SR2B

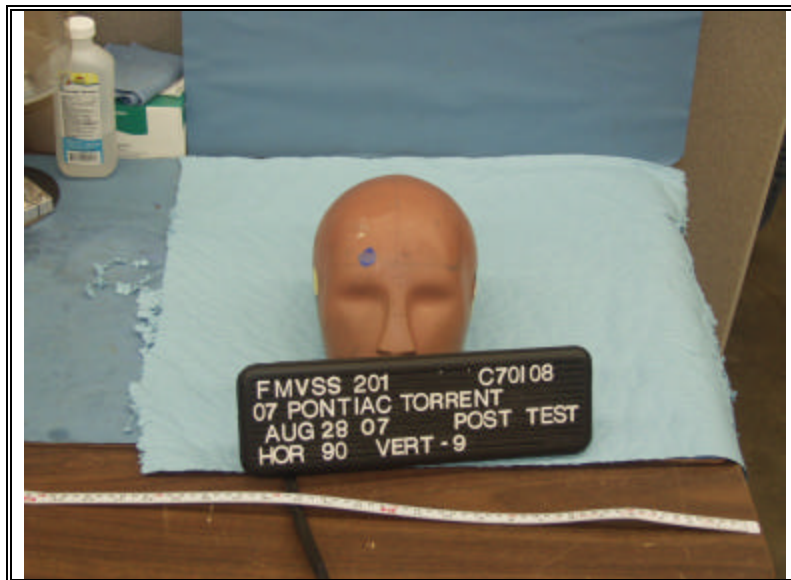


POST-IMPACT SR2B

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	04
Test Date:	08/28/07
Target Location:	B-PILLAR
Target Code:	BP3
Horizontal Impact Angle:	90°
Vertical Impact Angle:	-9°
Ambient Temperature:	20.6 C°
Relative Humidity:	47.6
Time of Impact:	13:15
Headform Number:	0642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	5	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	25	mm up	



POST-IMPACT BP3 HEADFORM

Free Motion HIC	730.6
HIC(d)	717.6
Impact Velocity (kph)	23.82
HIC T1 (msec)	4.6
HIC T2 (msec)	9.8

FMVSS 201UI 2007 Pontiac Torrent C70108 - BP3

FMH Headform 0642

Location: BP3

Test Date: August 28, 2007

Work File: BP3

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

Lab Temperature: 20.6 C

HICd: 717.6

Lab Humidity: 47.6 %

HIC (36ms): 730.6

Velocity at Impact: 23.82 KPH

t1: 4.6 msec

t2: 9.8 msec

Free Flight Distance: 217.03 mm

Duration: 5.2 msec

Average Acceleration: 8.8 g

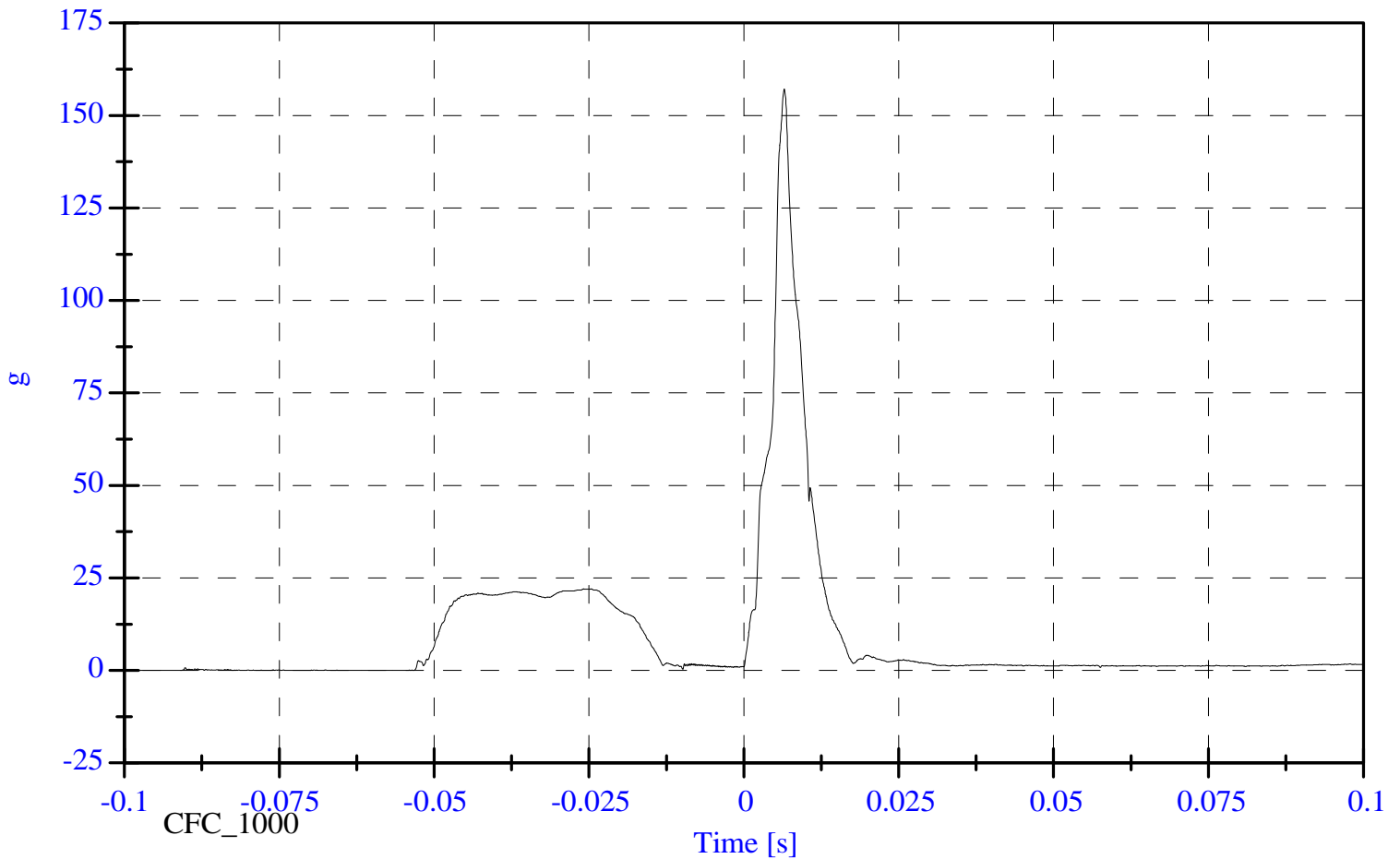
Maximum: 157.1 g

FMVSS 201UI 2007 Pontiac Torrent

Headform Resultant

Max: 157.1 [g] at 0.007 [s]

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



FMVSS 201UI 2007 Pontiac Torrent

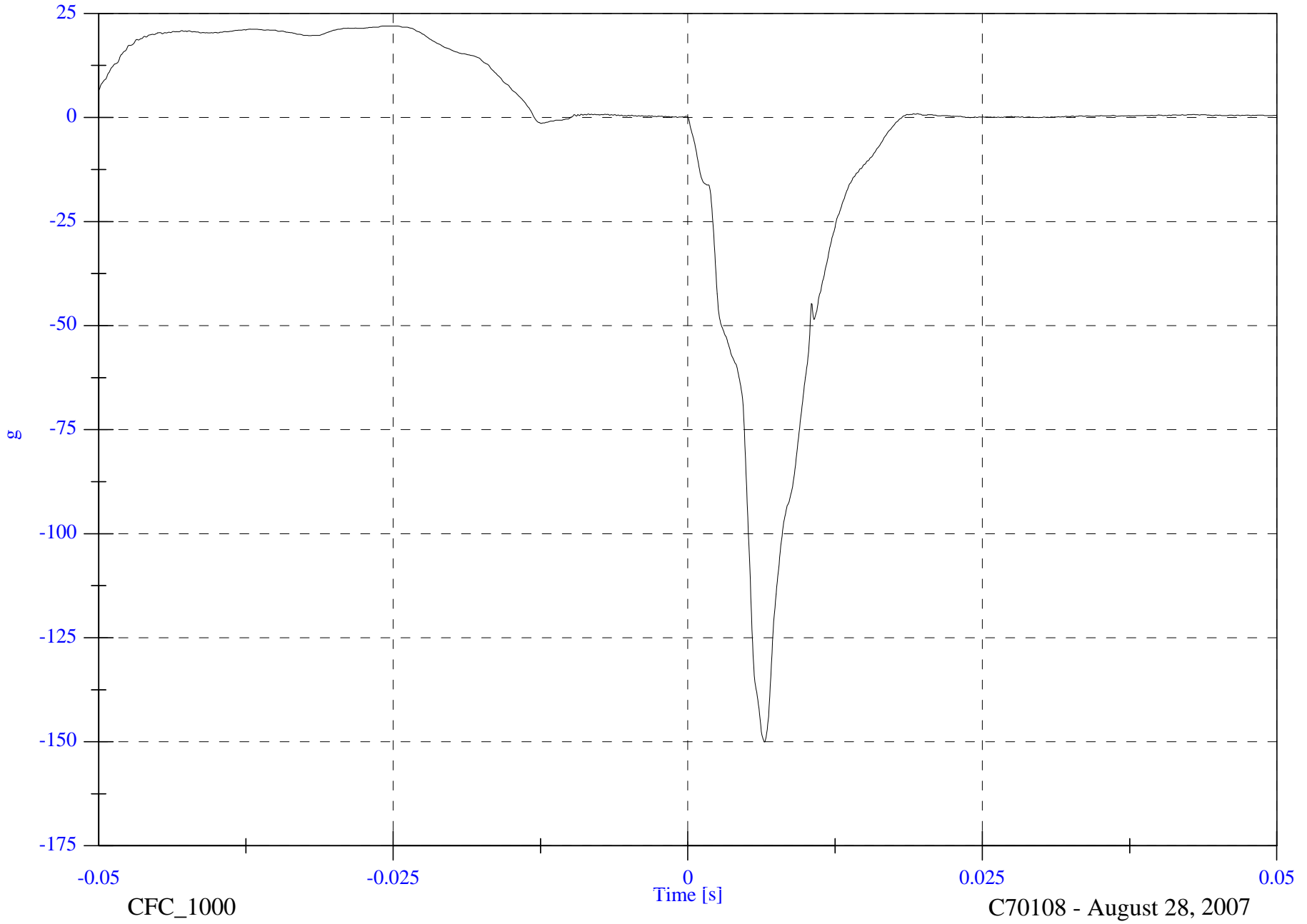
Headform X Acceleration

Max: 22.0 [g] at -0.025 [s]

Min: -150.0 [g] at 0.006 [s]

C70108 PASSENGER SIDE BP3 IMPACT PLOT #1

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201UI 2007 Pontiac Torrent

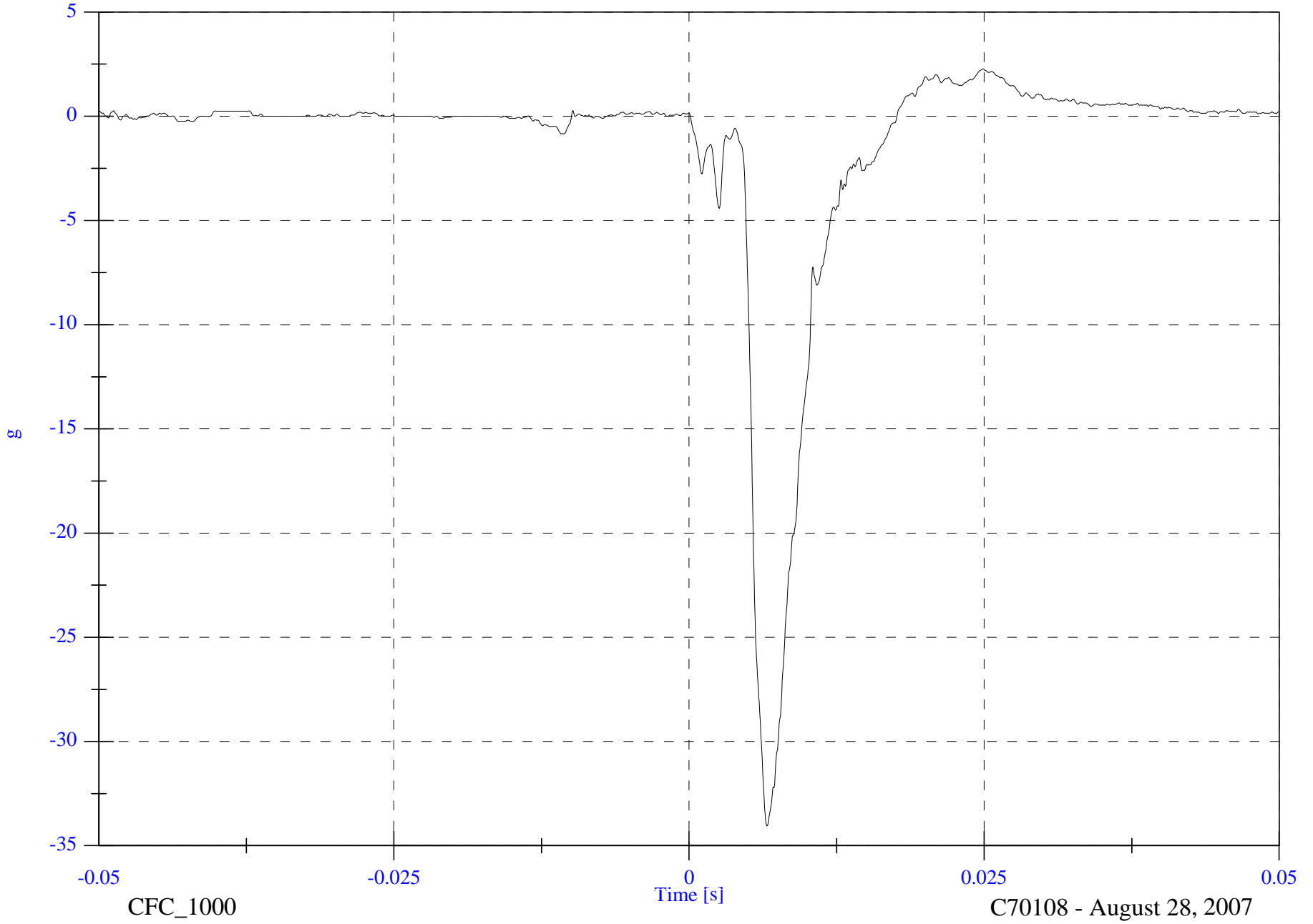
Headform Y Acceleration

Max: 2.3 [g] at 0.025 [s]

Min: -34.0 [g] at 0.007 [s]

C70108 PASSENGER SIDE BP3 IMPACT PLOT #2

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201UI 2007 Pontiac Torrent

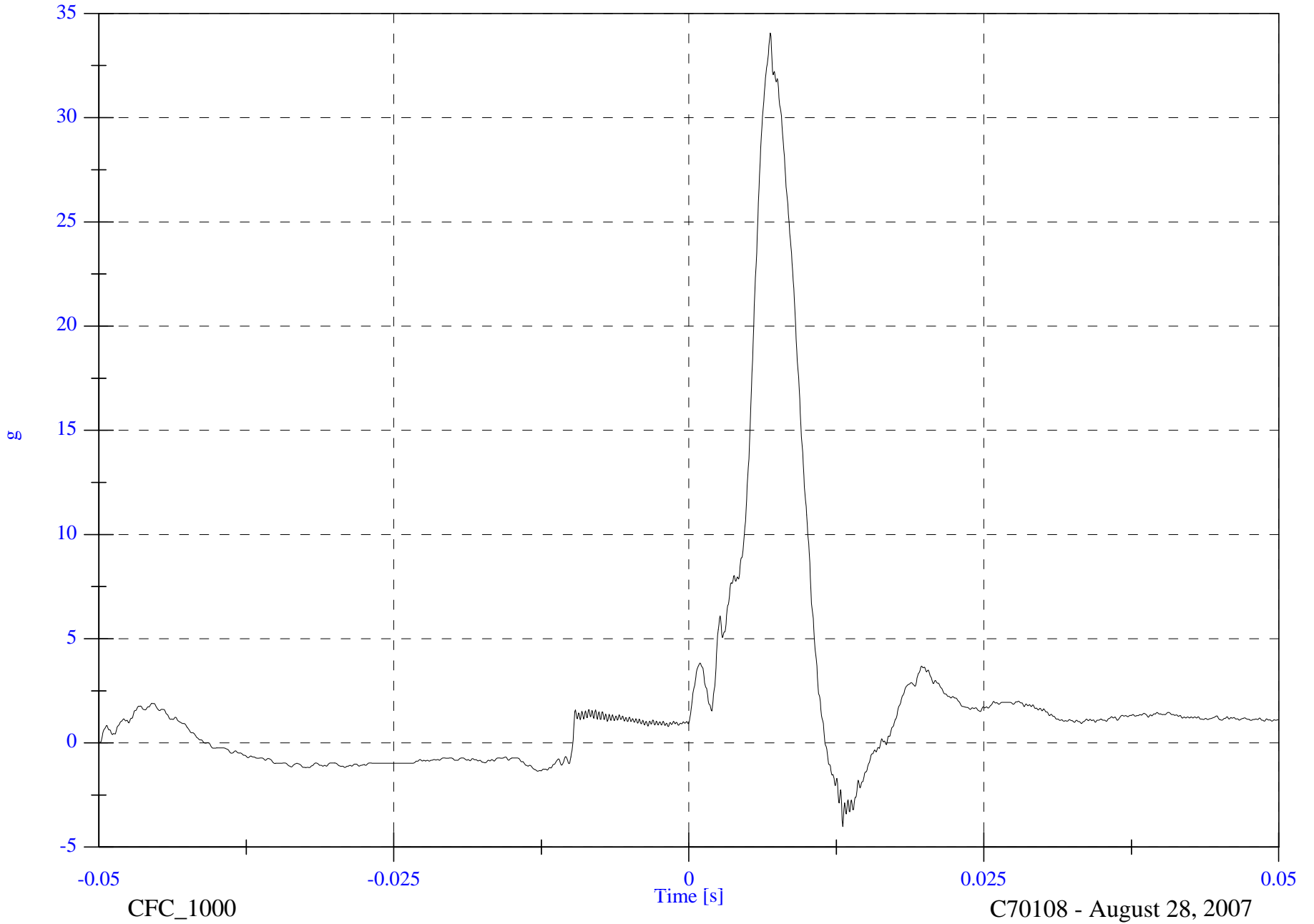
Headform Z Acceleration

Max: 34.1 [g] at 0.007 [s]

Min: -4.0 [g] at 0.013 [s]

C70108 PASSENGER SIDE BP3 IMPACT PLOT #3

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201UI 2007 Pontiac Torrent

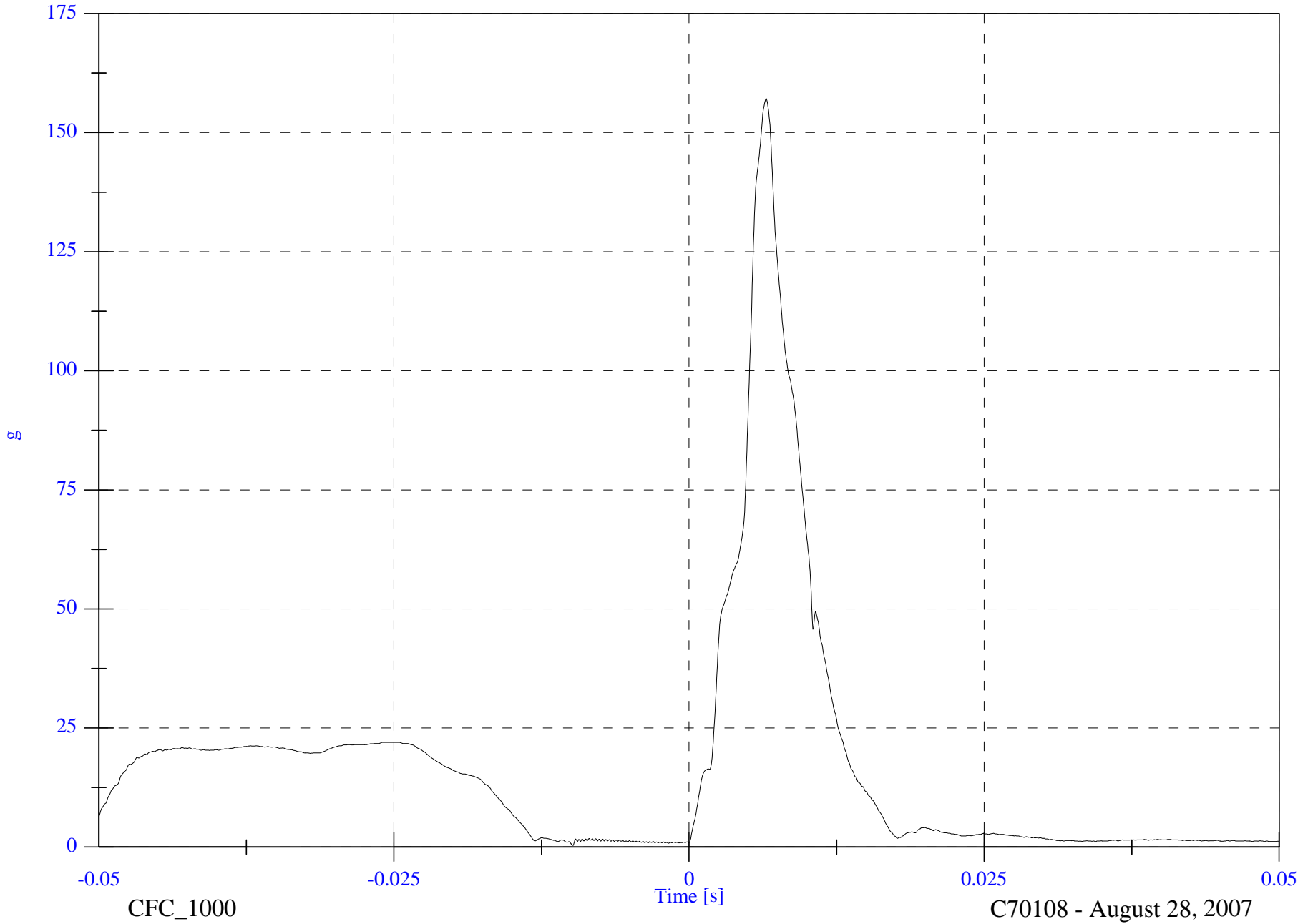
Headform Resultant

Max: 157.1 [g] at 0.007 [s]

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

C70108 PASSENGER SIDE BP3 IMPACT PLOT #4

8826-FMH-07



CFC_1000

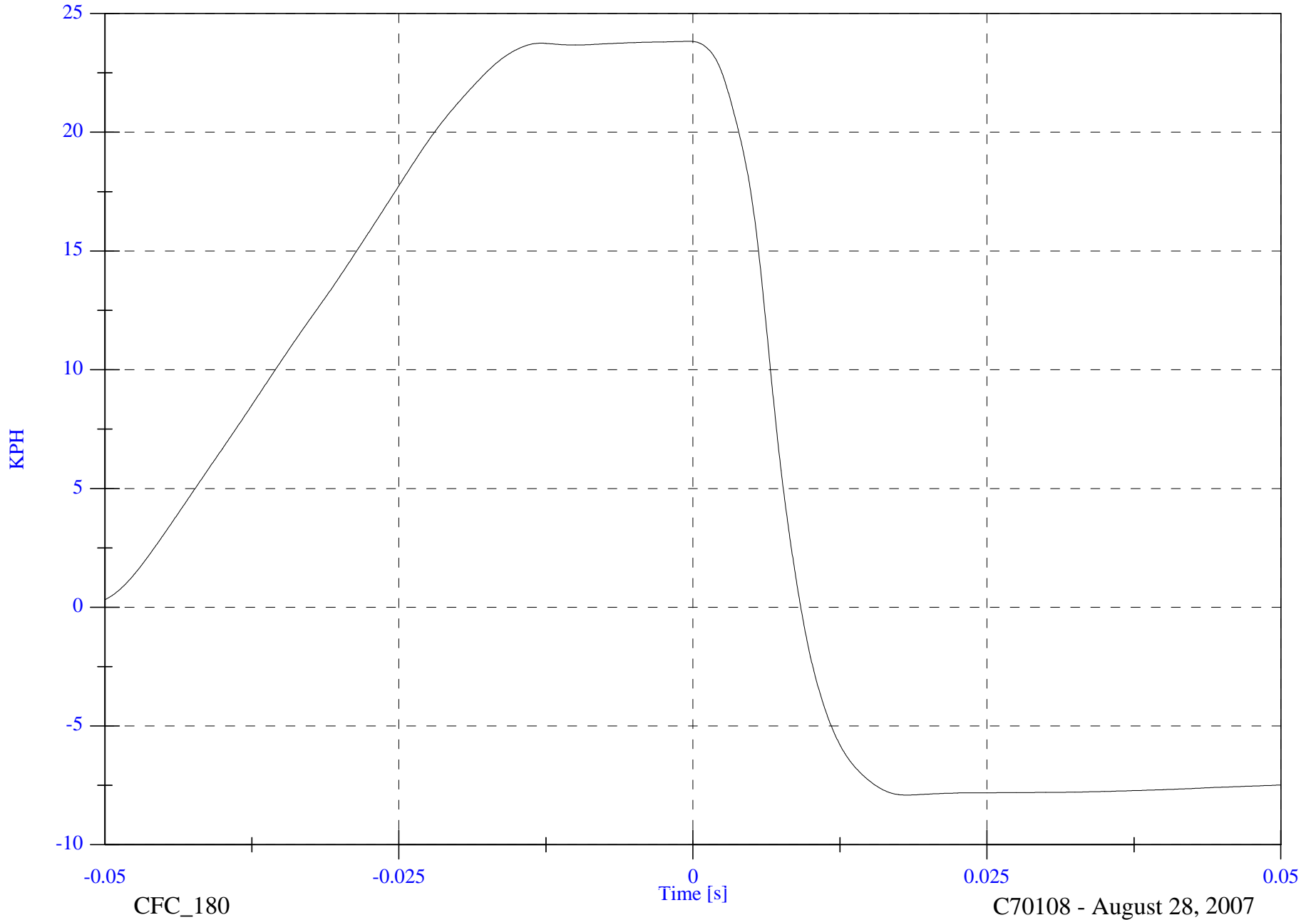
C70108 - August 28, 2007

FMVSS 201UI 2007 Pontiac Torrent

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

Min: -7.9 [KPH] at 0.018 [s]

Headform Velocity



C70108 PASSENGER SIDE BP3 IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 28, 2007



PRE-IMPACT BP3

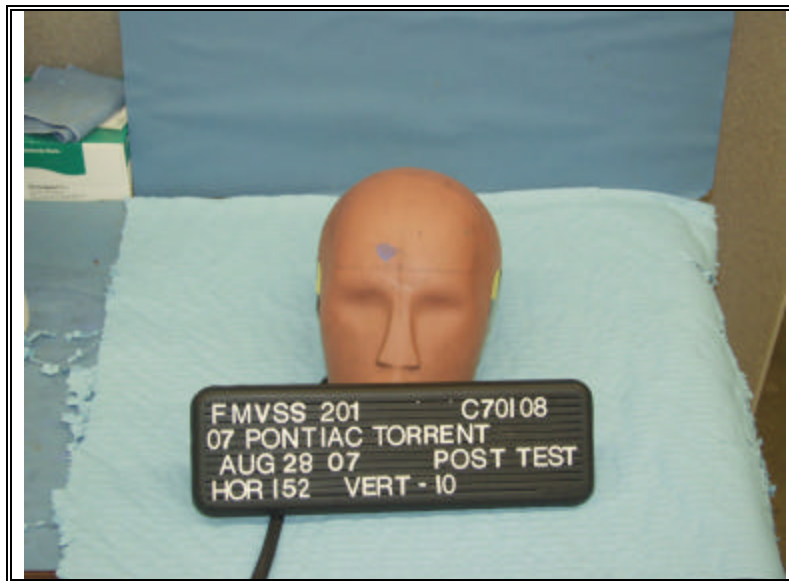


POST-IMPACT BP3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	05
Test Date:	08/28/07
Target Location:	B-PILLAR
Target Code:	BP4
Horizontal Impact Angle:	152°
Vertical Impact Angle:	-10°
Ambient Temperature:	20.7 C°
Relative Humidity:	49
Time of Impact:	14:00
Headform Number:	1255

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



POST-IMPACT BP4 HEADFORM

Free Motion HIC	589.9
HIC(d)	611.4
Impact Velocity (kph)	23.53
HIC T1 (msec)	2.2
HIC T2 (msec)	10.4

FMVSS 201U 2007 Pontiac Torrent C70108 - BP4

FMH Headform 1255

Location: BP4

Test Date: August 28, 2007

Work File: BP4

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

Lab Temperature: 20.7 C

HICd: 611.4

Lab Humidity: 49.0 %

HIC (36ms): 589.9

Velocity at Impact: 23.53 KPH

t1: 2.2 msec

t2: 10.4 msec

Free Flight Distance: 218.61 mm

Duration: 8.2 msec

Average Acceleration: 8.9 g

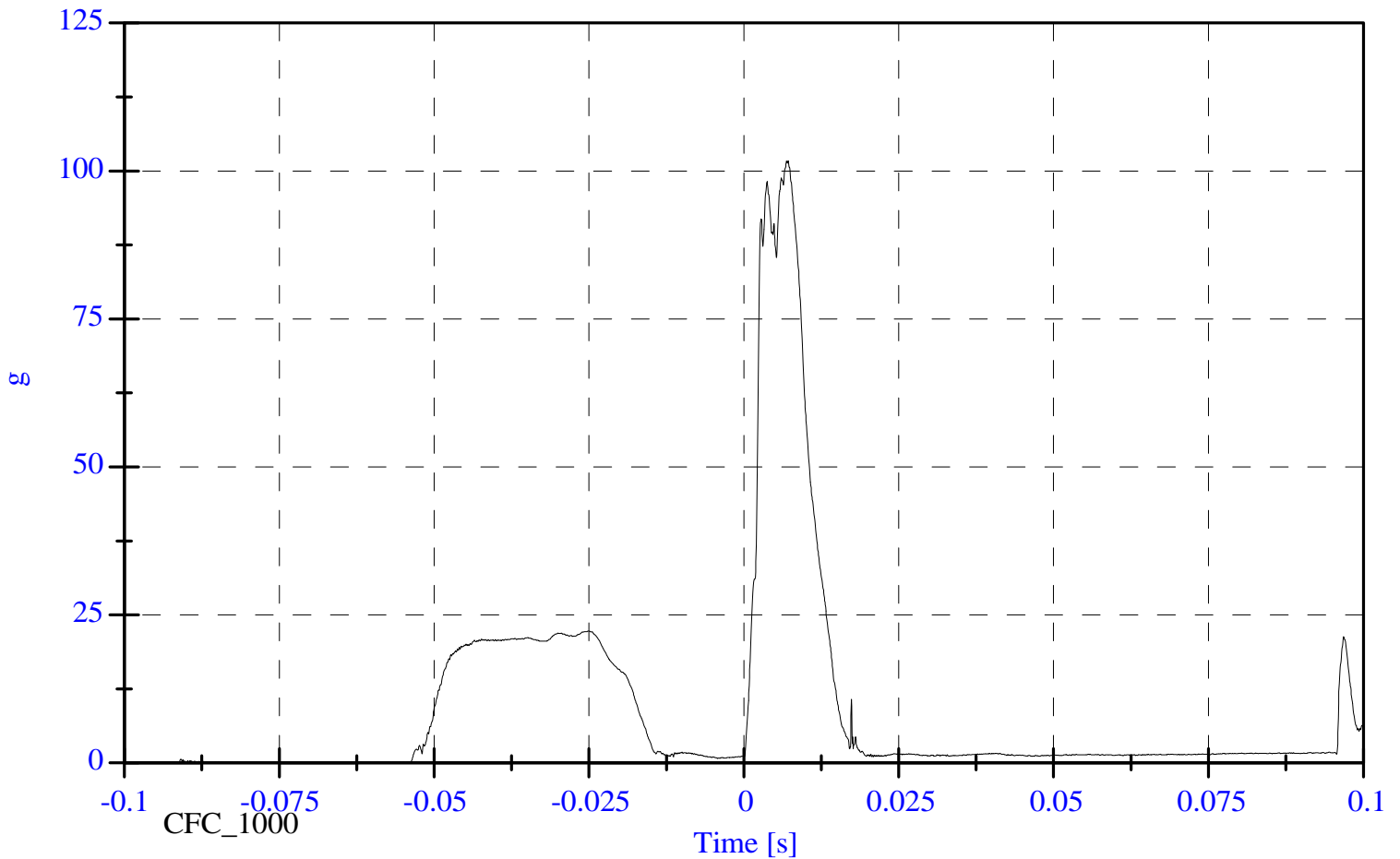
Maximum: 101.7 g

FMVSS 201U 2007 Pontiac Torrent

Headform Resultant

Max: 101.7 [g] at 0.007 [s]

Min: 0.0 [g] at -0.094 [s]



FMVSS 201U 2007 Pontiac Torrent

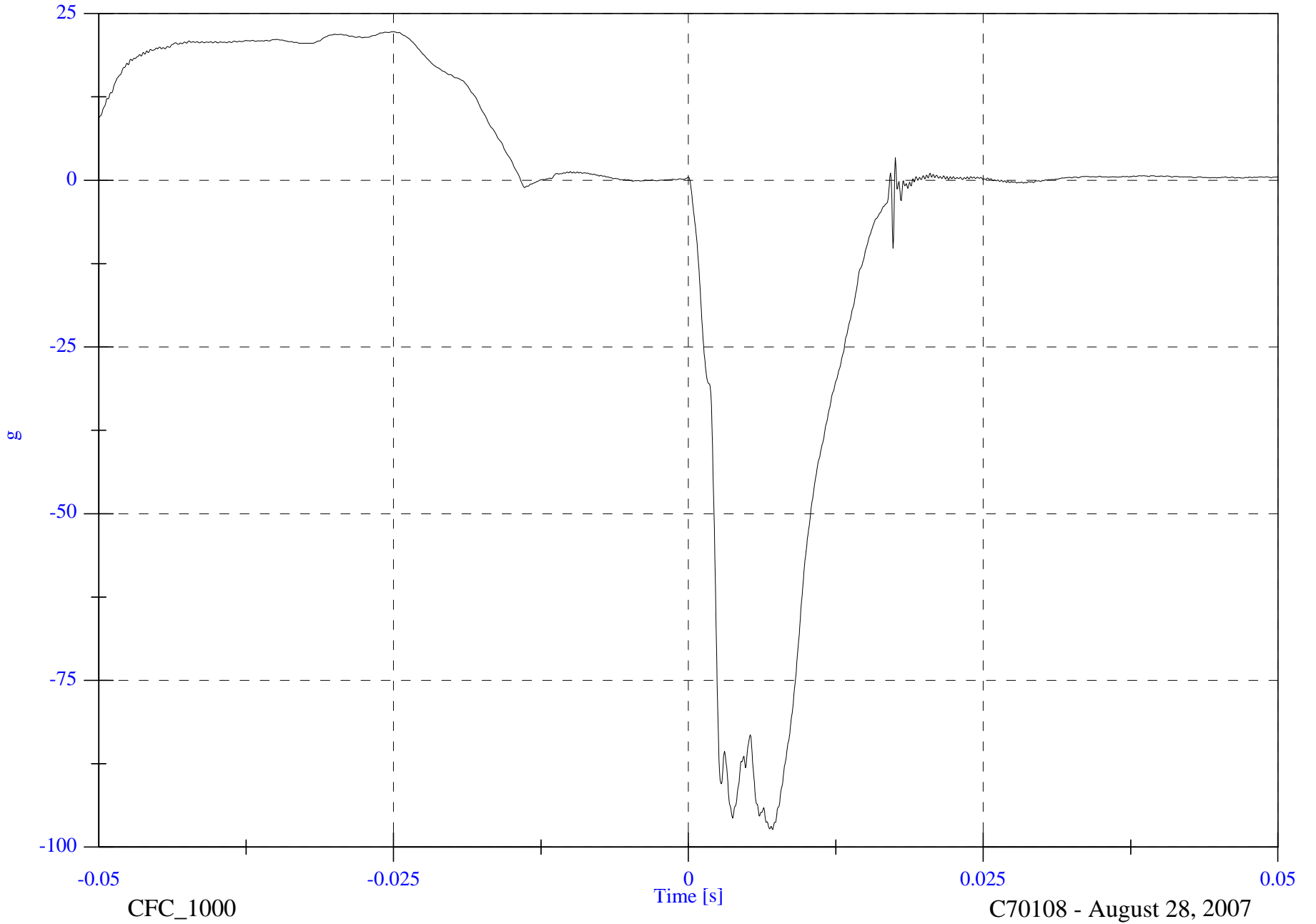
Headform X Acceleration

Max: 22.3 [g] at -0.025 [s]

Min: -97.4 [g] at 0.007 [s]

C70108 PASSENGER SIDE BP4 IMPACT PLOT #1

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

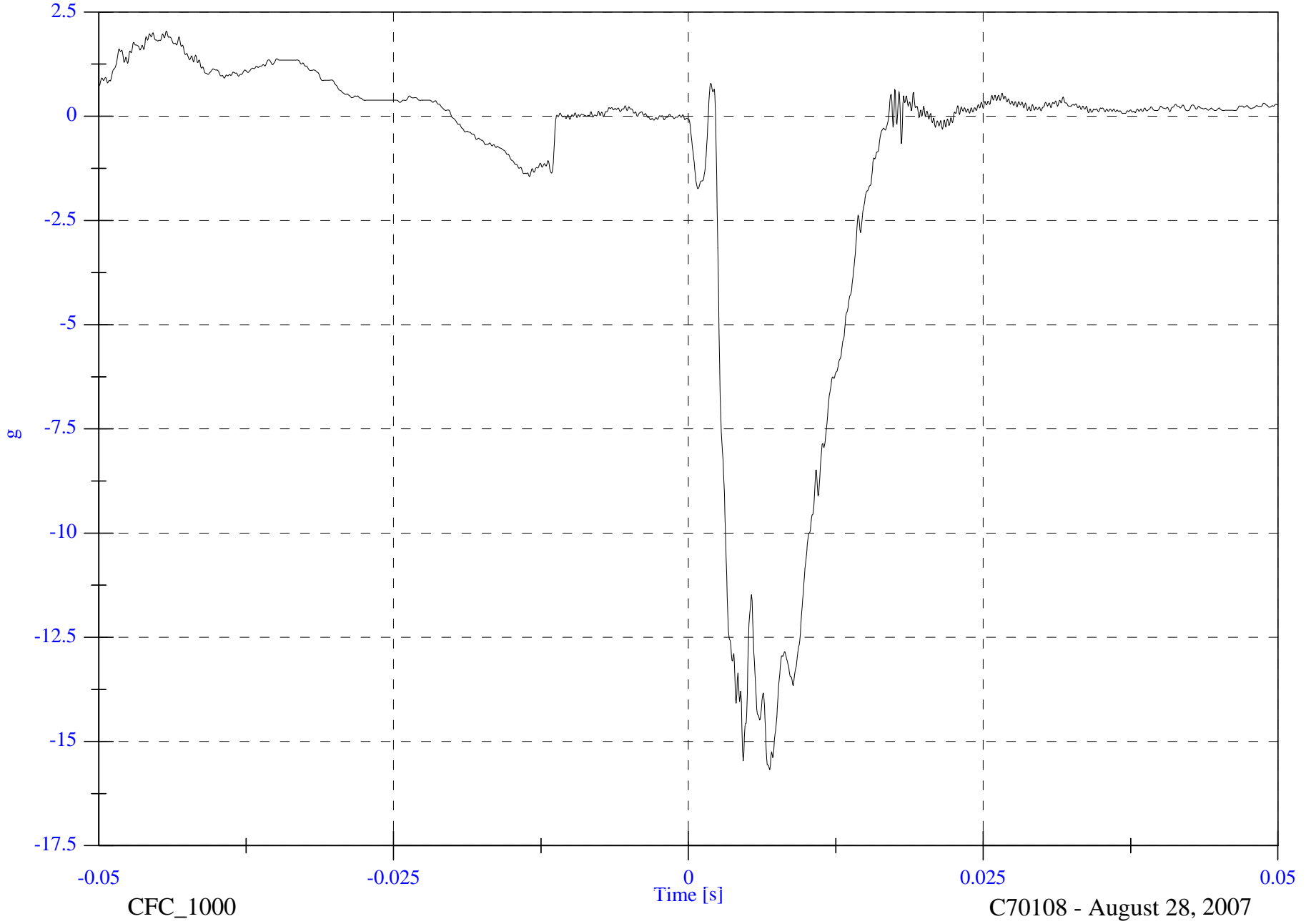
FMVSS 201U 2007 Pontiac Torrent

Headform Y Acceleration

Max: 2.0 [g] at -0.044 [s]
Min: -15.7 [g] at 0.007 [s]

C70108 PASSENGER SIDE BP4 IMPACT PLOT #2

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

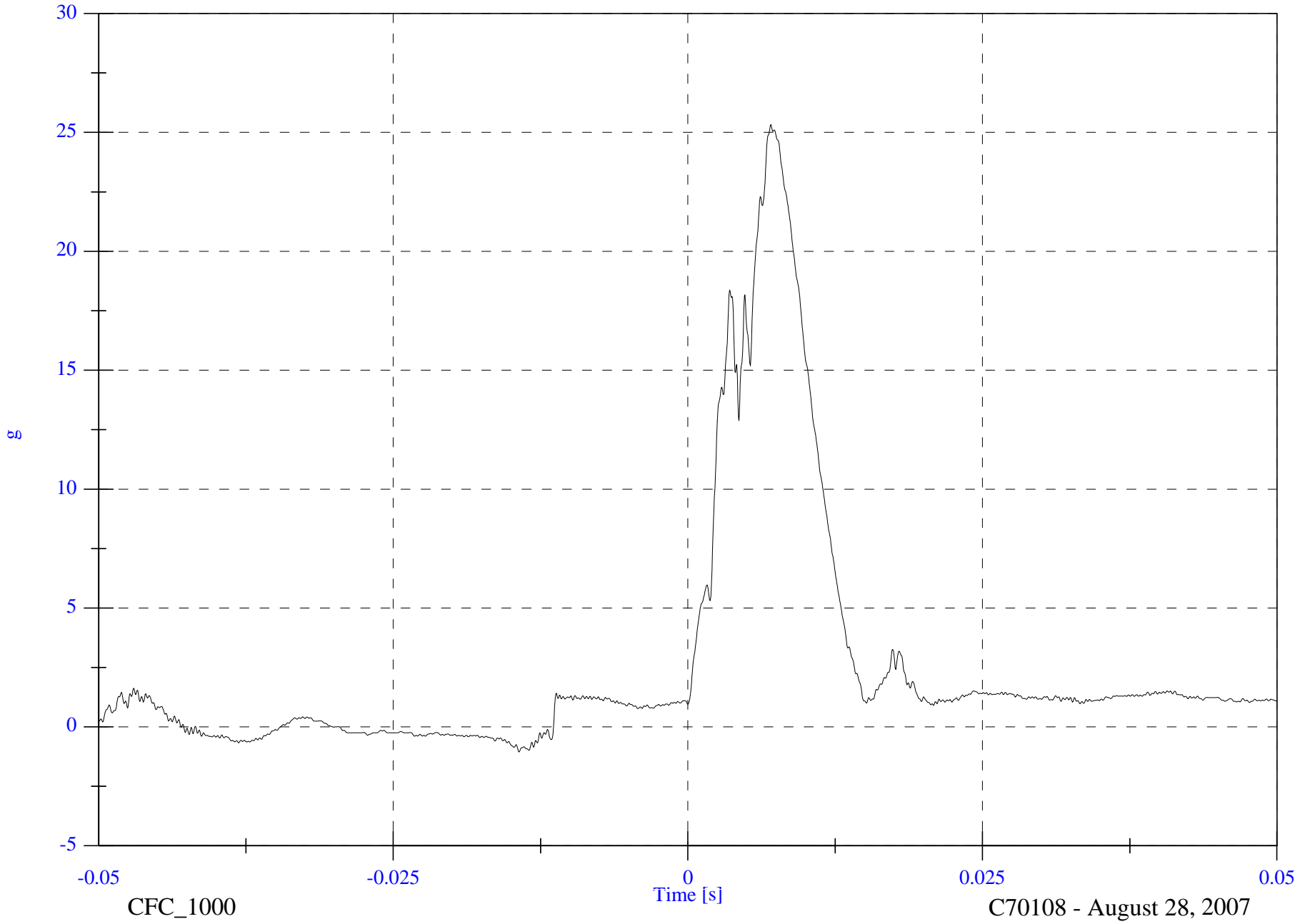
Headform Z Acceleration

Max: 25.3 [g] at 0.007 [s]

Min: -1.1 [g] at -0.014 [s]

C70108 PASSENGER SIDE BP4 IMPACT PLOT #3

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

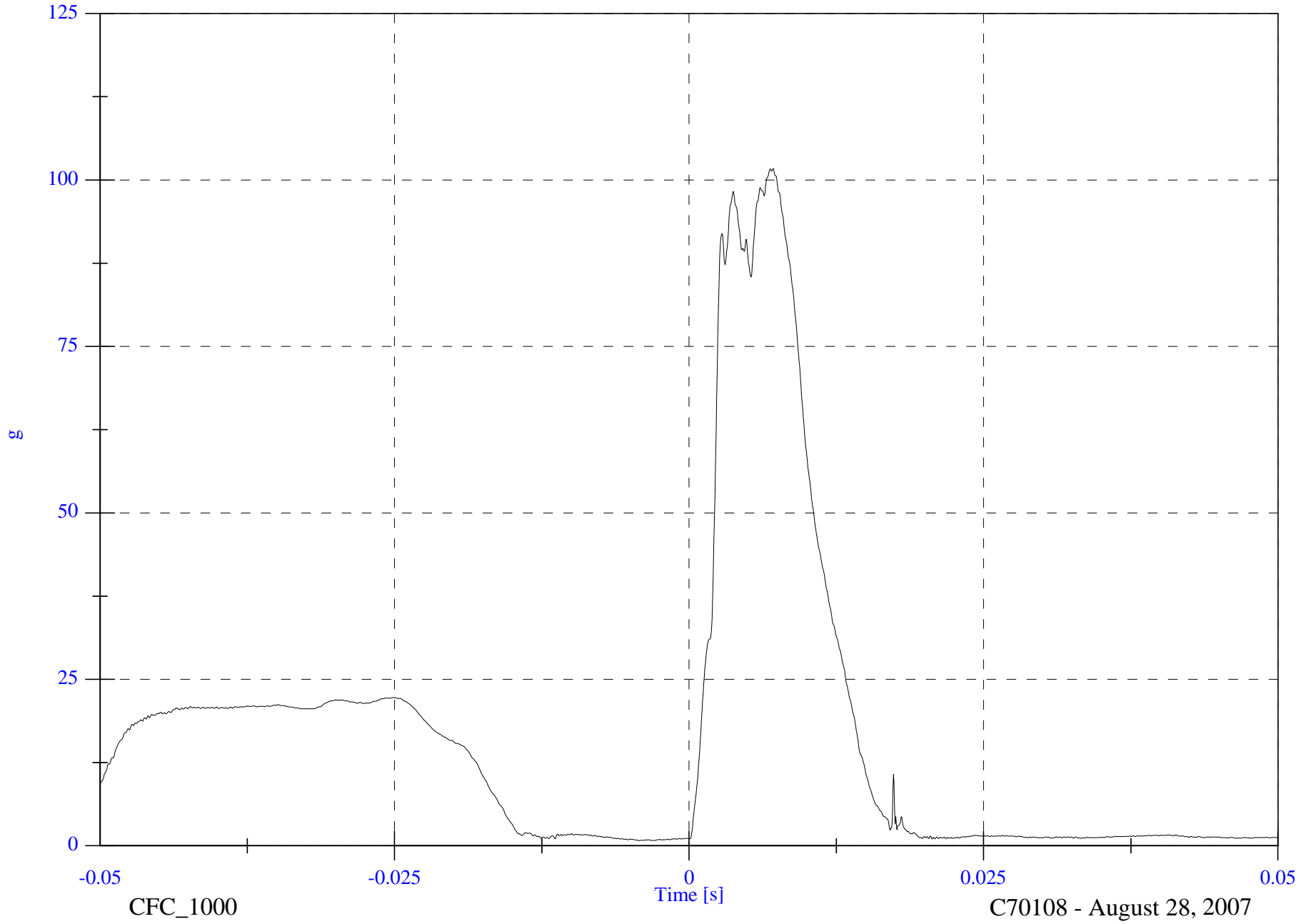
Headform Resultant

Max: 101.7 [g] at 0.007 [s]

Min: 0.8 [g] at -0.004 [s]

C70108 PASSENGER SIDE BP4 IMPACT PLOT #4

8826-FMH-07



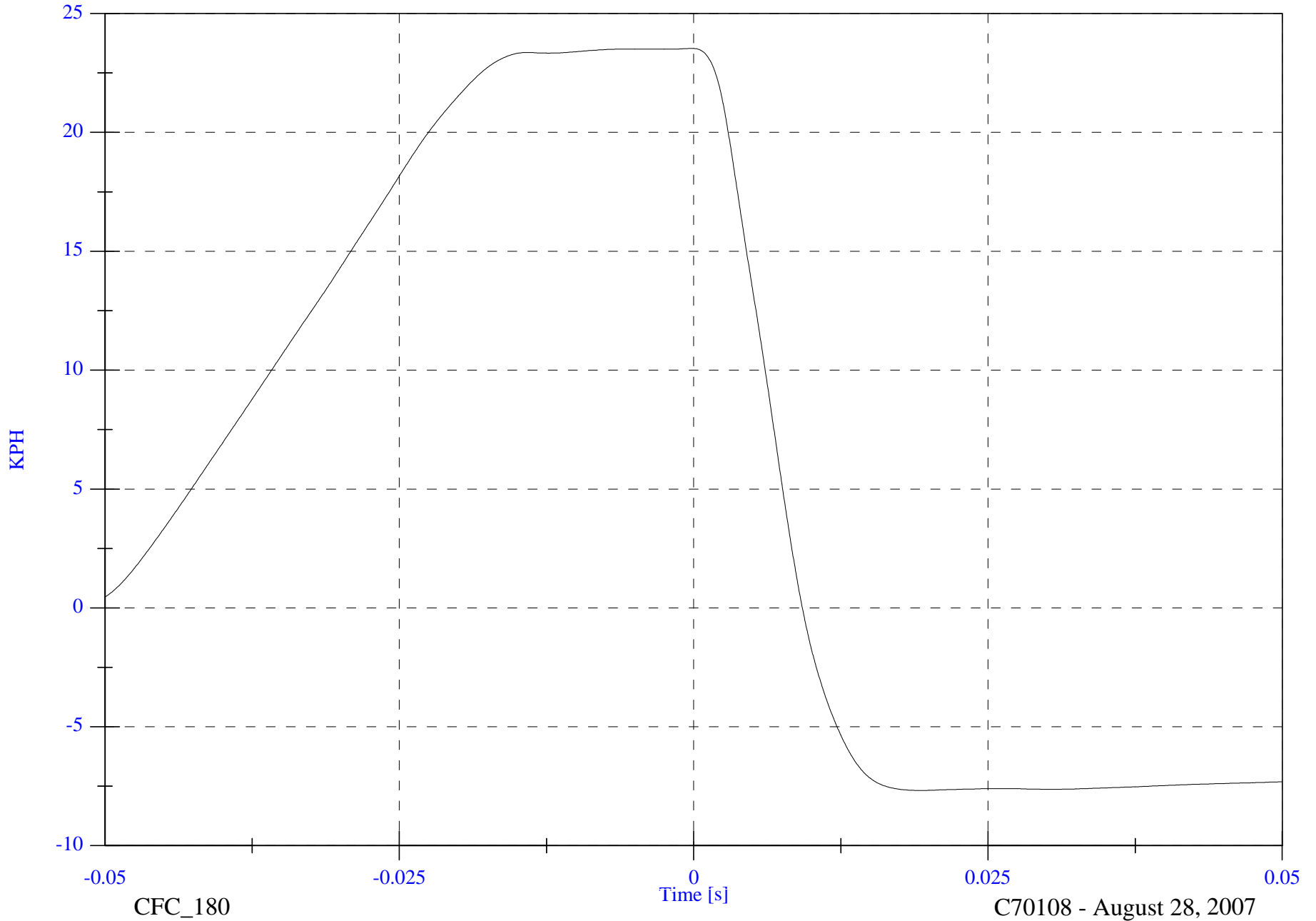
C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

Max: 23.5 [KPH] at -0.000 [s]

Min: -7.7 [KPH] at 0.019 [s]

Headform Velocity

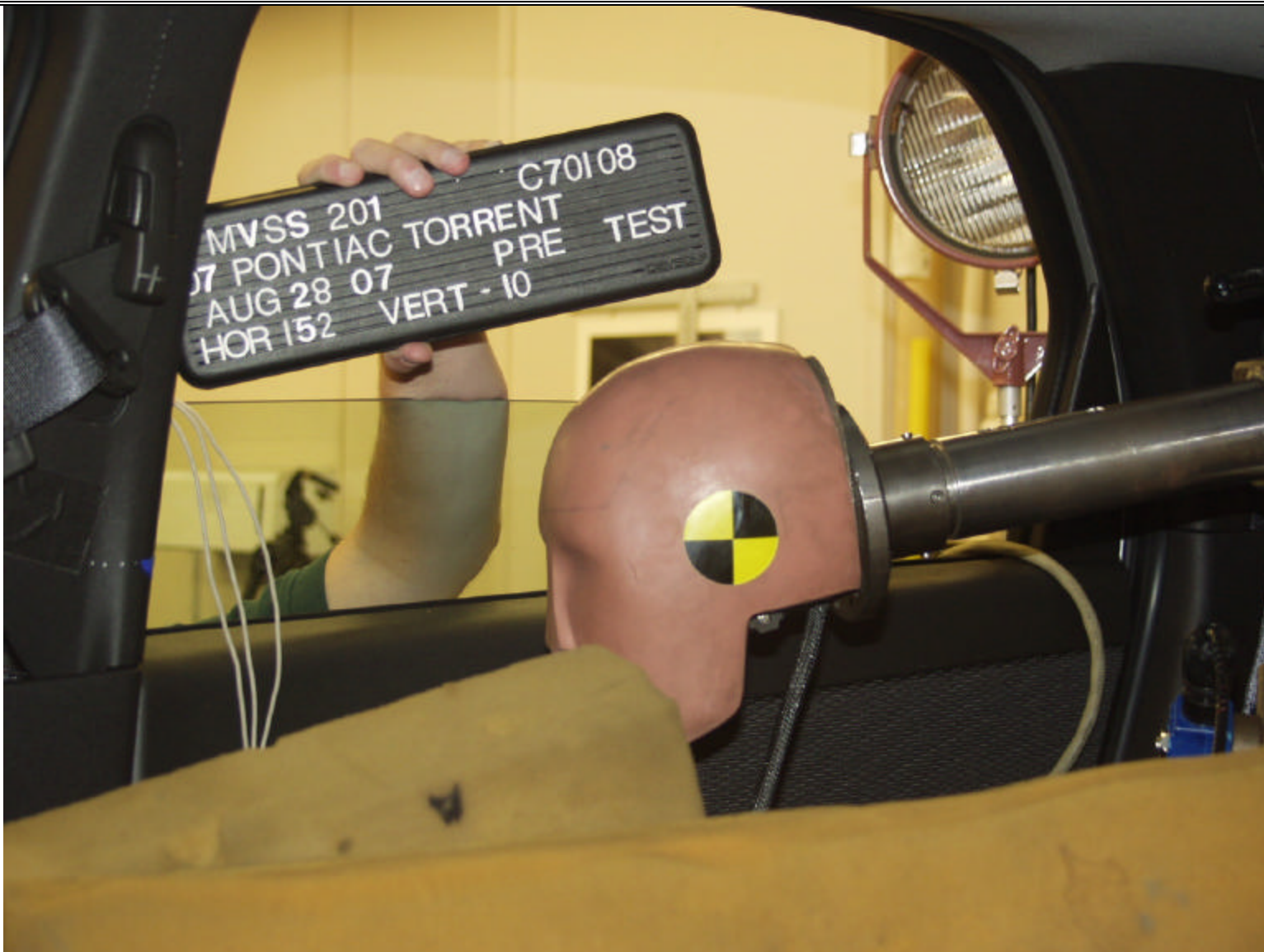


C70108 PASSENGER SIDE BP4 IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 28, 2007



PRE-IMPACT BP4

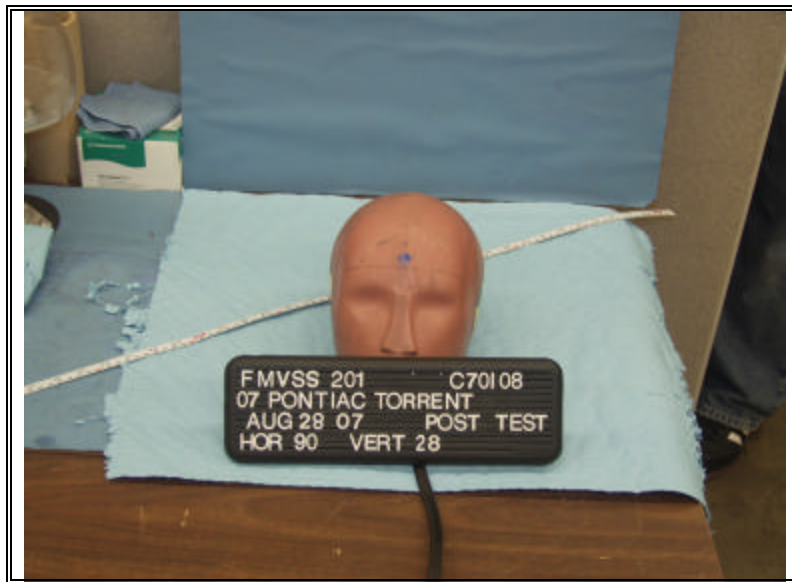


POST-IMPACT BP4

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	06
Test Date:	08/28/07
Target Location:	B-PILLAR
Target Code:	BP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	28°
Ambient Temperature:	20.7 C°
Relative Humidity:	50.1
Time of Impact:	14:30
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	0	<input type="checkbox"/>	mm right <input type="checkbox"/> mm left
On Centerline	8		mm up



POST-IMPACT BP1 HEADFORM

Free Motion HIC	580.9
HIC(d)	604.7
Impact Velocity (kph)	23.67
HIC T1 (msec)	6.2
HIC T2 (msec)	13.8

FMVSS 201U 2007 Pontiac Torrent C70108 - BP1

FMH Headform 805

Location: BP1

Test Date: August 28, 2007

Work File: BP1

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

Lab Temperature: 20.7 C

HICd: 604.7

Lab Humidity: 50.1 %

HIC (36ms): 580.9

Velocity at Impact: 23.67 KPH

t1: 6.2 msec

t2: 13.8 msec

Free Flight Distance: 223.43 mm

Duration: 7.5 msec

Average Acceleration: 11.3 g

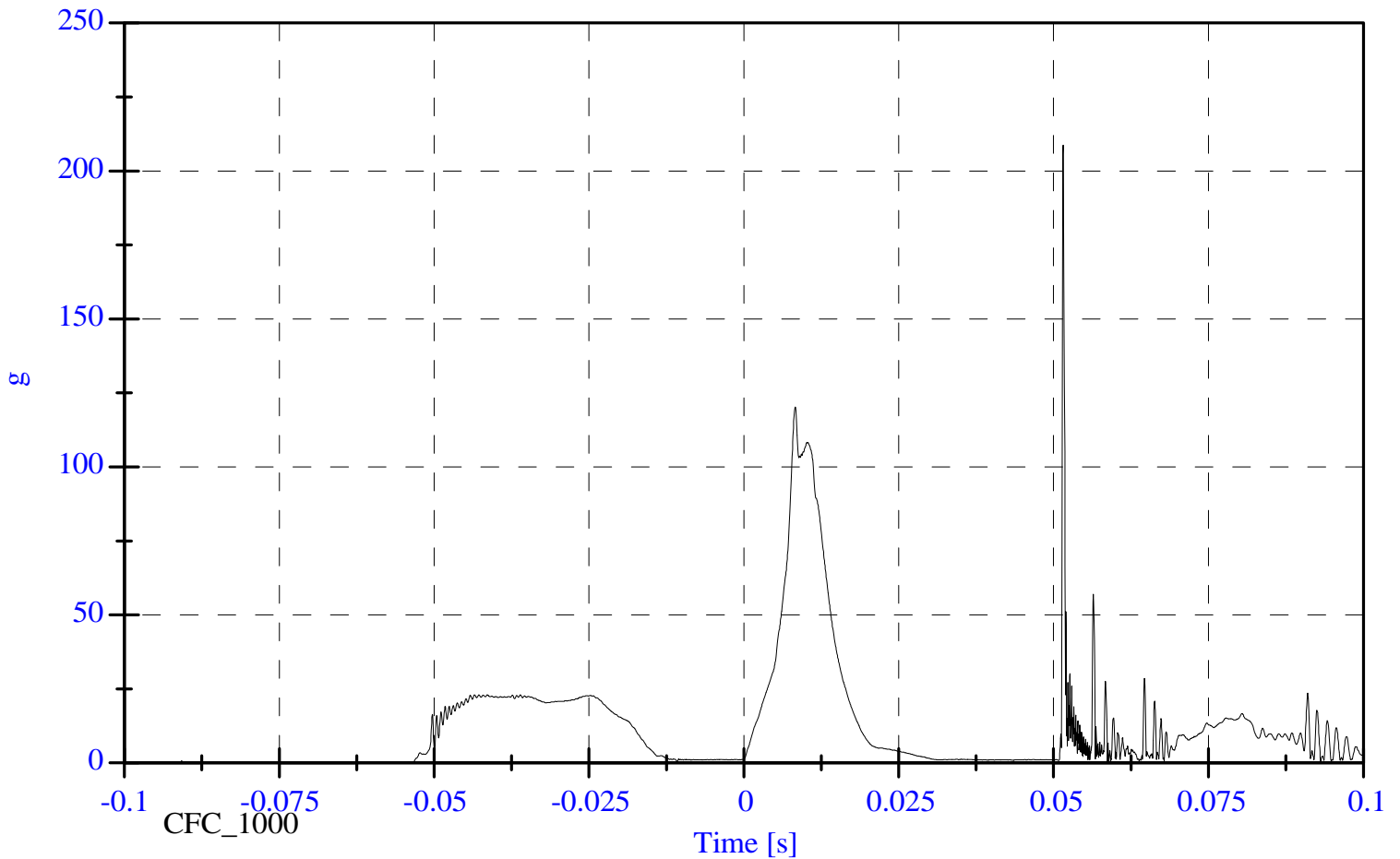
Maximum: 120.3 g

FMVSS 201U 2007 Pontiac Torrent

Headform Resultant

Max: 120.3 [g] at 0.008 [s]

Min: 0.0 [g] at -0.061 [s]



FMVSS 201U 2007 Pontiac Torrent

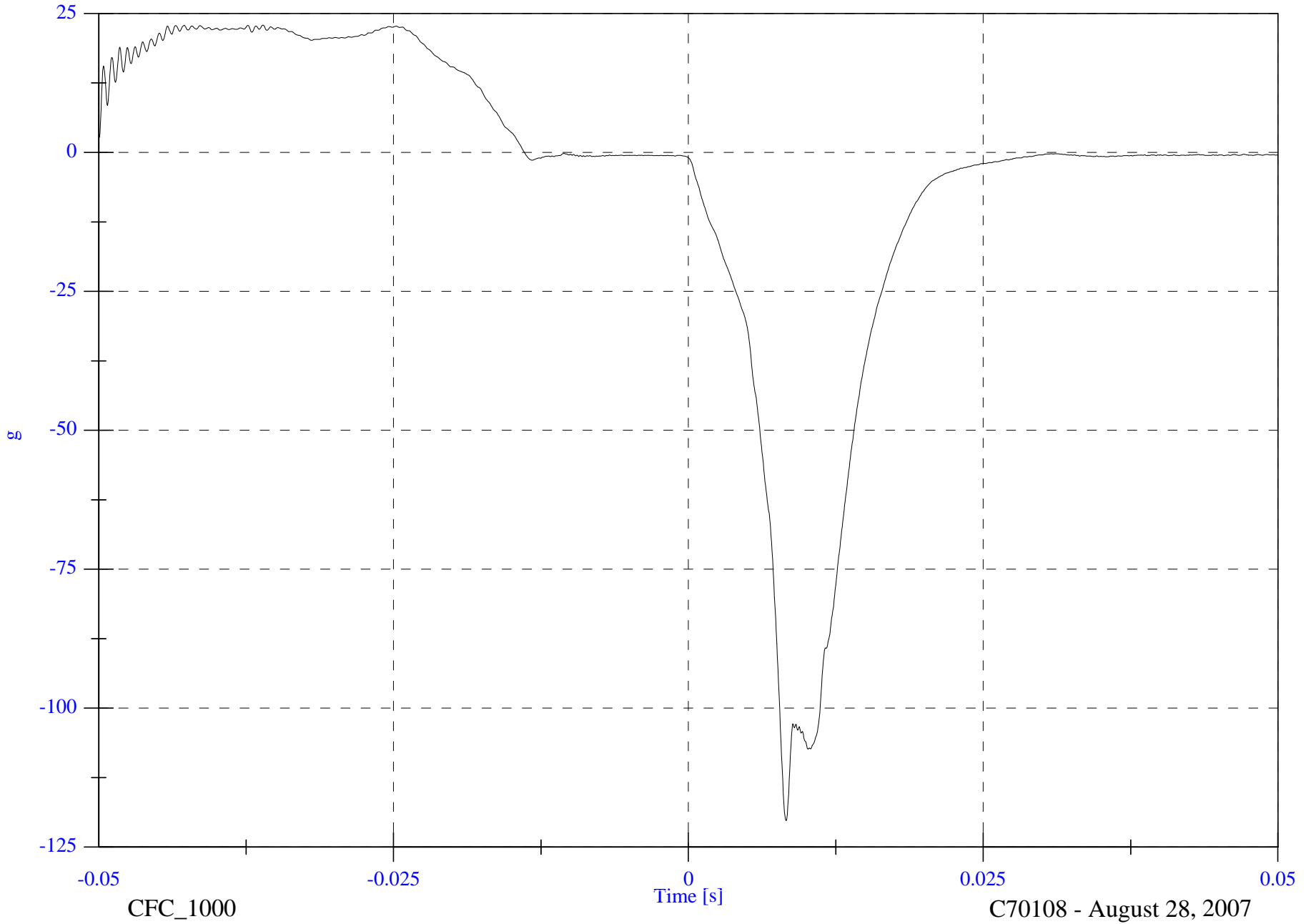
Headform X Acceleration

Max: 22.9 [g] at -0.036 [s]

Min: -120.3 [g] at 0.008 [s]

C70108 PASSENGER SIDE BPI IMPACT PLOT #1

8826-FMH-07



CFC_1000

Time [s]

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

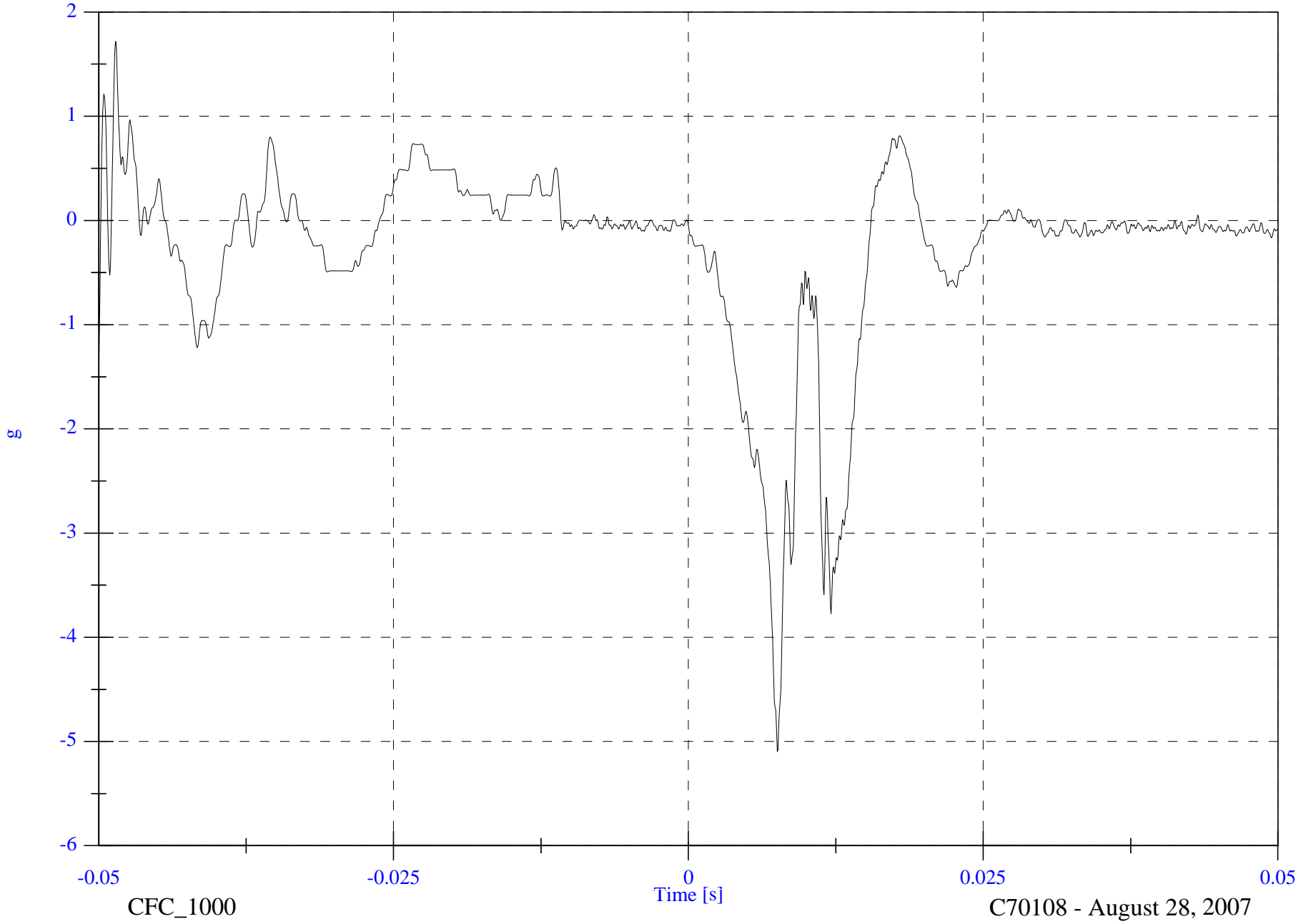
Headform Y Acceleration

Max: 1.7 [g] at -0.049 [s]

Min: -5.1 [g] at 0.008 [s]

C70108 PASSENGER SIDE BP1 IMPACT PLOT #2

8826-FMH-07



FMVSS 201U 2007 Pontiac Torrent

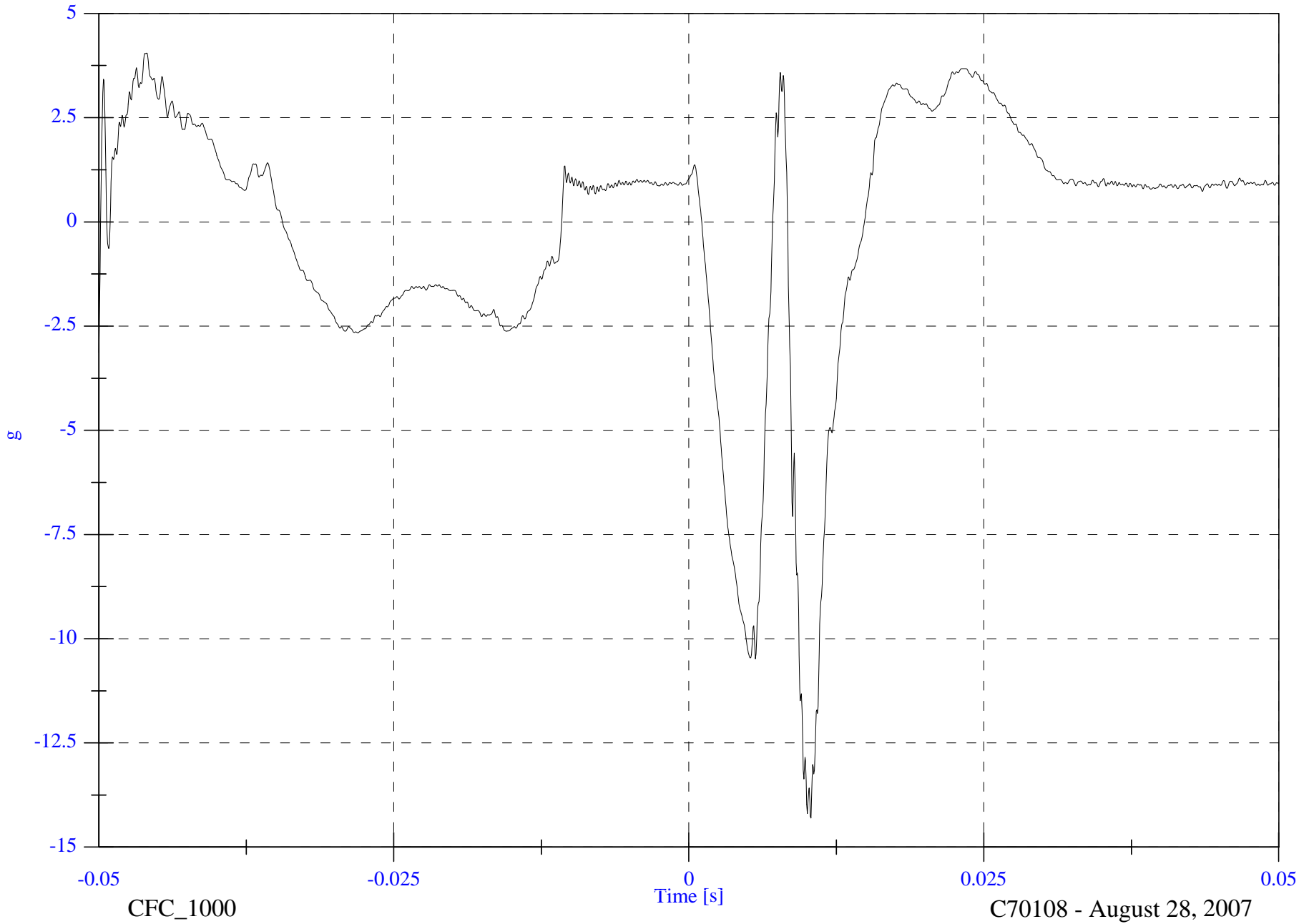
Max: 4.1 [g] at -0.046 [s]

Headform Z Acceleration

Min: -14.3 [g] at 0.010 [s]

C70108 PASSENGER SIDE BPI IMPACT PLOT #3

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

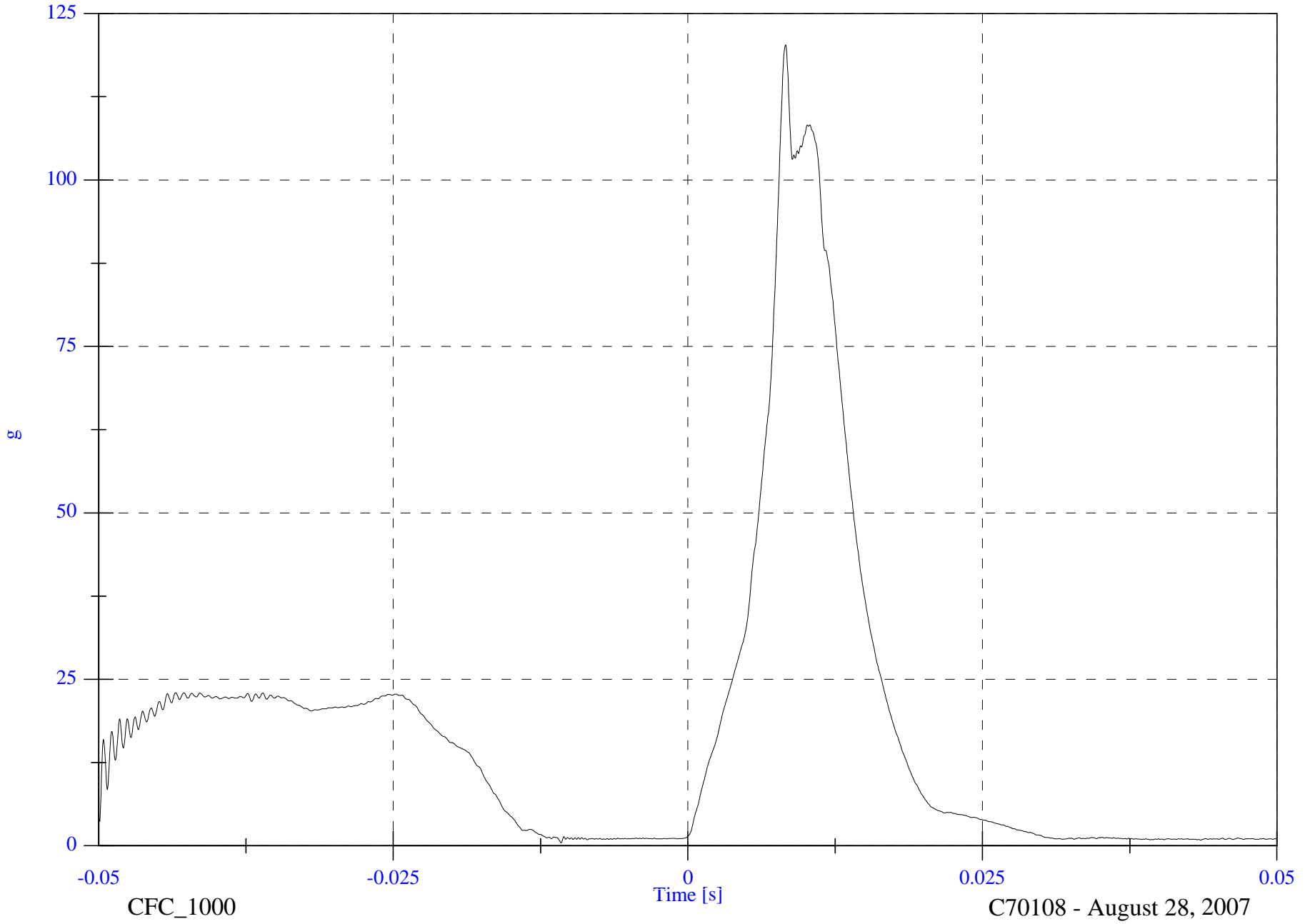
Headform Resultant

Max: 120.3 [g] at 0.008 [s]

Min: 0.4 [g] at -0.011 [s]

C70108 PASSENGER SIDE BPI IMPACT PLOT #4

8826-FMH-07



CFC_1000

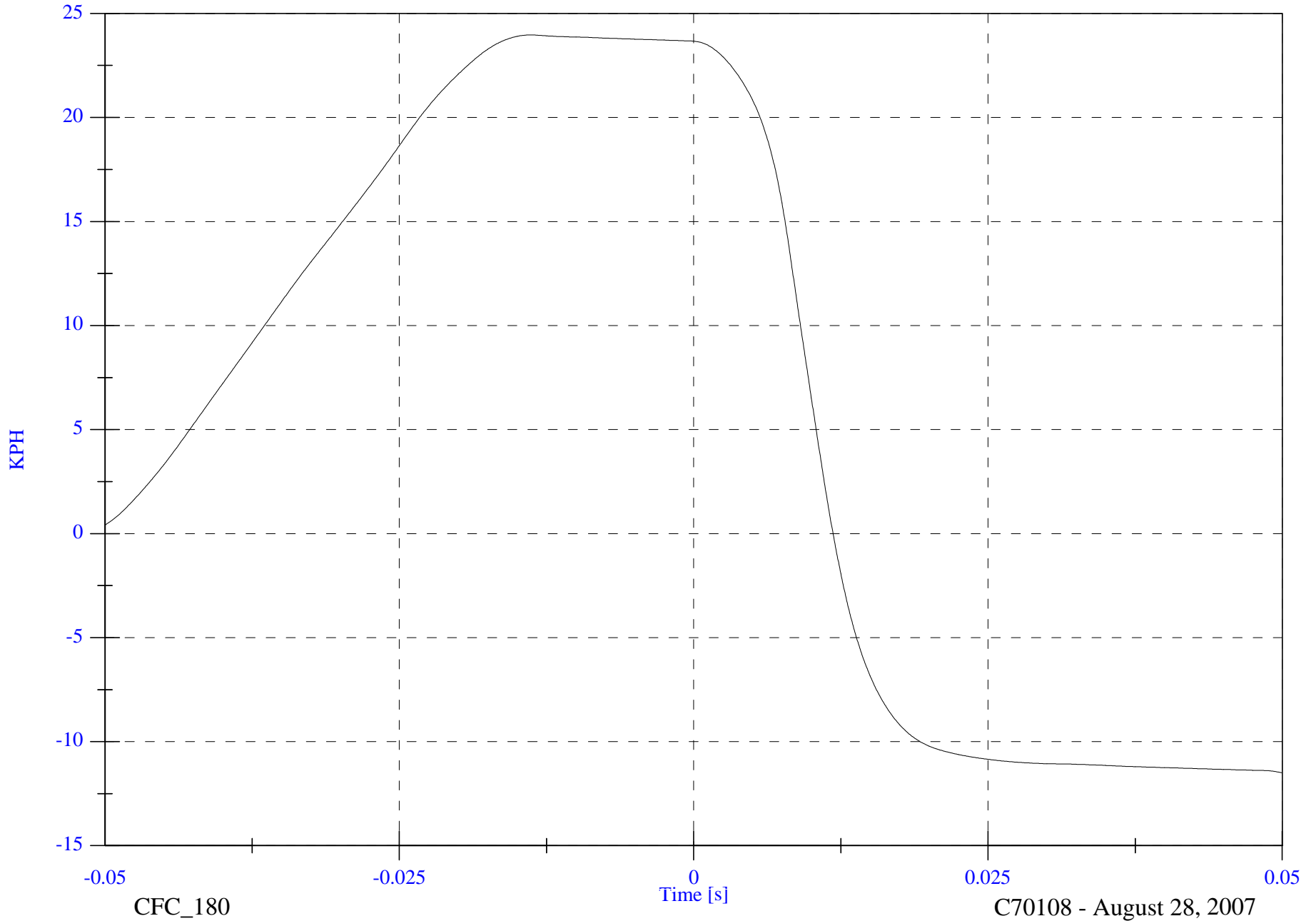
C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

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

Min: -11.5 [KPH] at 0.050 [s]

Headform Velocity



C70108 PASSENGER SIDE BPI IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 28, 2007



PRE-IMPACT BP1

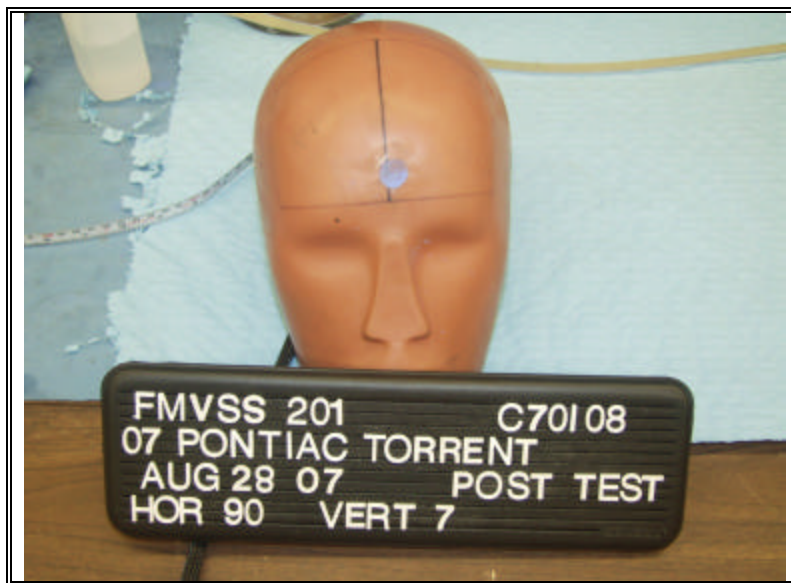


POST-IMPACT BP1

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	07
Test Date:	08/28/07
Target Location:	OTHER PILLAR
Target Code:	OP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	7°
Ambient Temperature:	20.6 C°
Relative Humidity:	50.9
Time of Impact:	15:50
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	3	mm right	x mm left
On Centerline	14	mm up	



POST-IMPACT OP1 HEADFORM

Free Motion HIC	478.6
HIC(d)	527.5
Impact Velocity (kph)	23.66
HIC T1 (msec)	1.0
HIC T2 (msec)	11.0

FMVSS 201U 2007 Pontiac Torrent C70108 - OP1

FMH Headform 0355

Location: OP1

Test Date: August 28, 2007

Work File: OP1

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

Lab Temperature: 20.6 C

HICd: 527.5

Lab Humidity: 50.9 %

HIC (36ms): 478.6

Velocity at Impact: 23.66 KPH

t1: 1.0 msec

t2: 11.0 msec

Free Flight Distance: 227.18 mm

Duration: 10.0 msec

Average Acceleration: 8.4 g

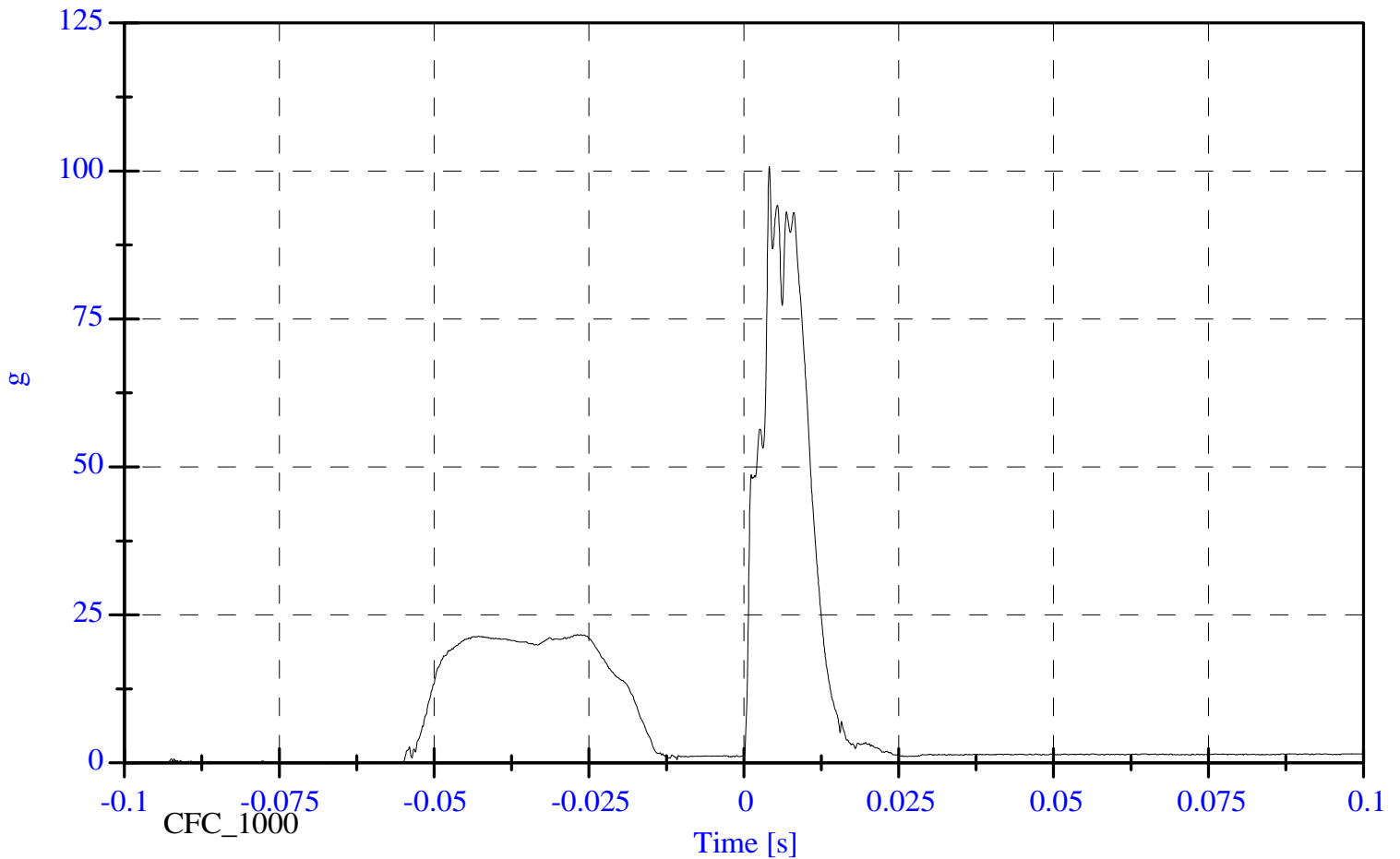
Maximum: 100.8 g

FMVSS 201U 2007 Pontiac Torrent

Headform Resultant

Max: 100.8 [g] at 0.004 [s]

Min: 0.0 [g] at -0.065 [s]



FMVSS 201U 2007 Pontiac Torrent

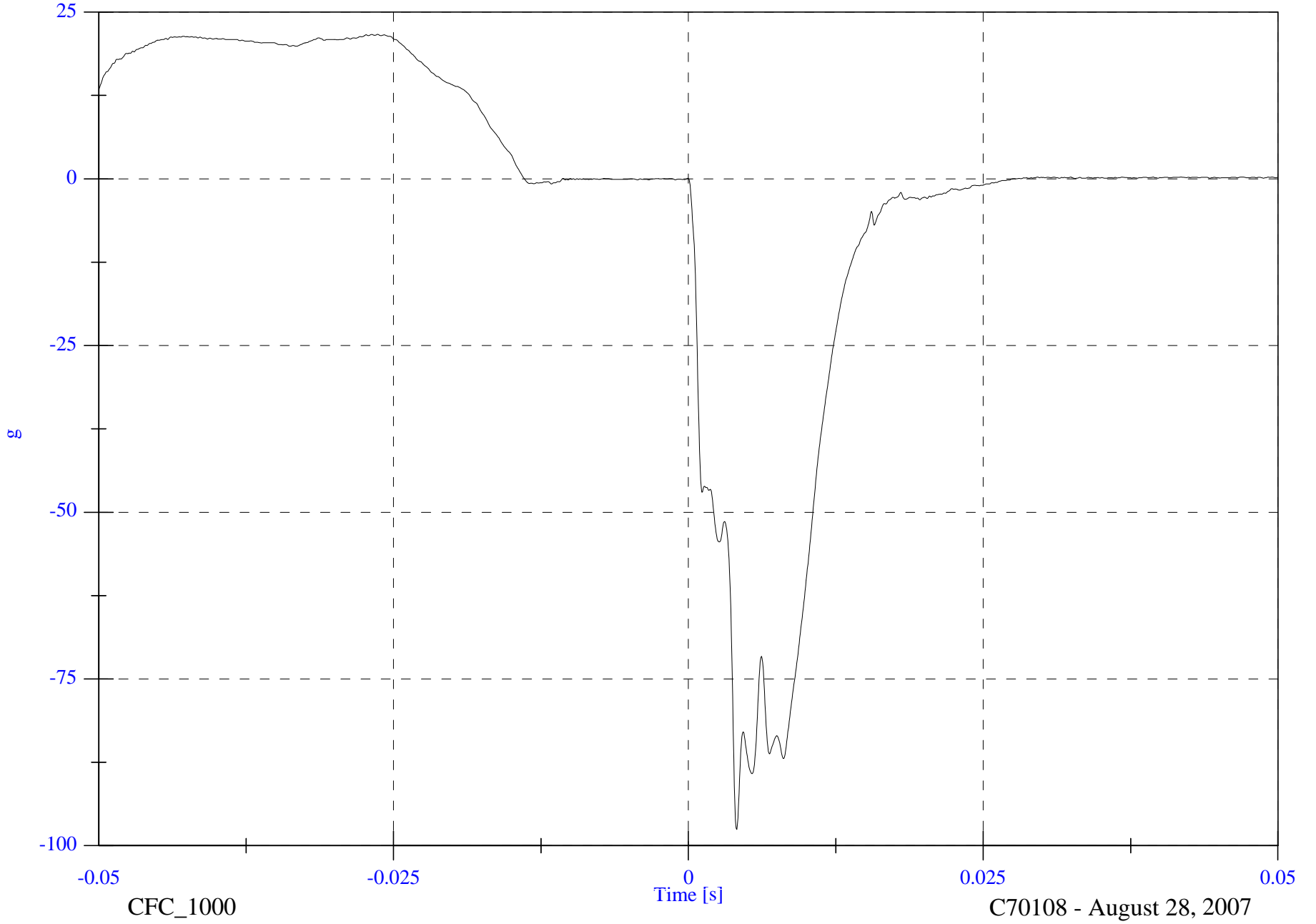
Headform X Acceleration

Max: 21.6 [g] at -0.026 [s]

Min: -97.6 [g] at 0.004 [s]

C70108 PASSENGER SIDE OP1 IMPACT PLOT #1

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

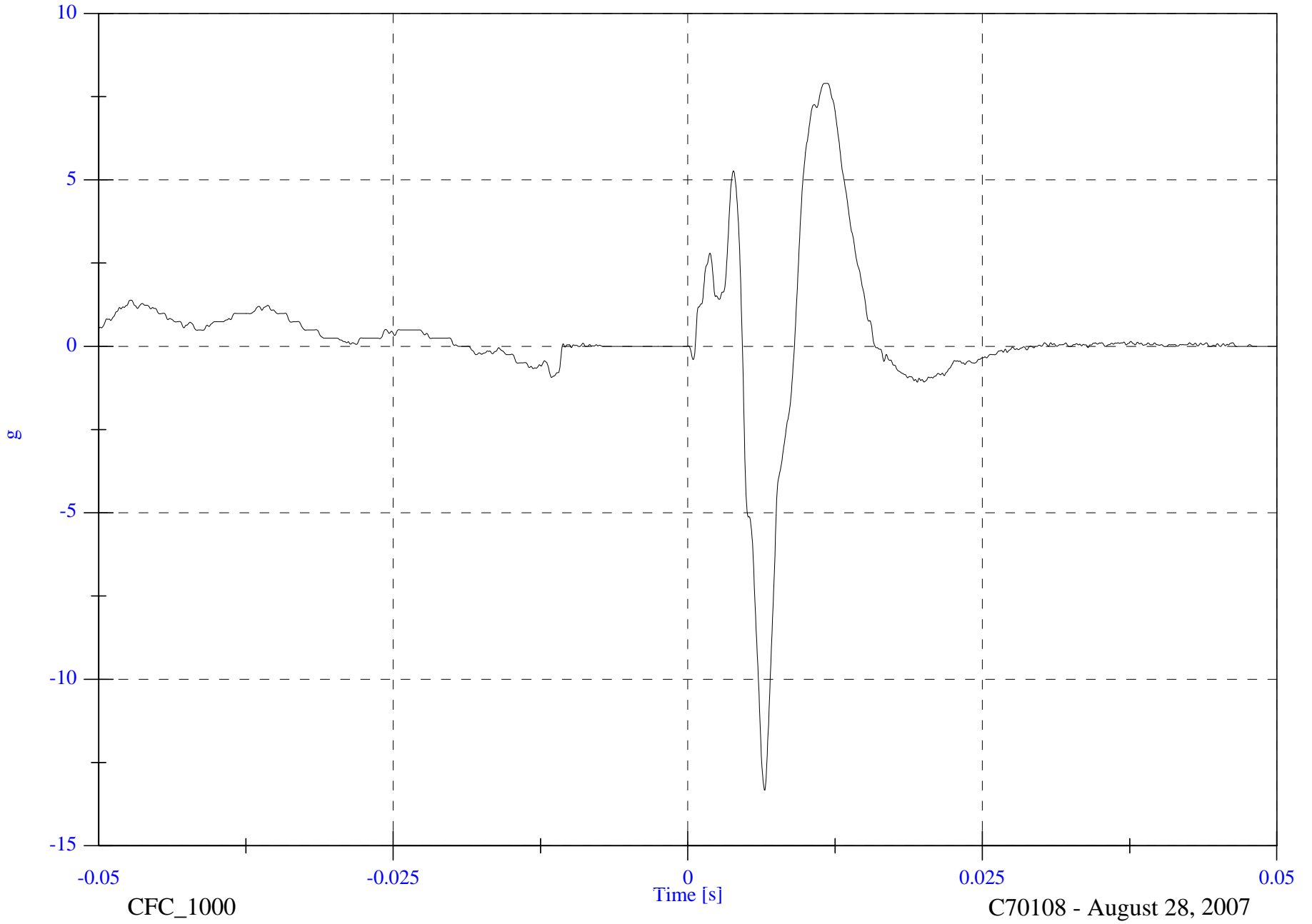
Headform Y Acceleration

Max: 7.9 [g] at 0.012 [s]

Min: -13.3 [g] at 0.007 [s]

C70108 PASSENGER SIDE OP1 IMPACT PLOT #2

8826-FMH-07



FMVSS 201U 2007 Pontiac Torrent

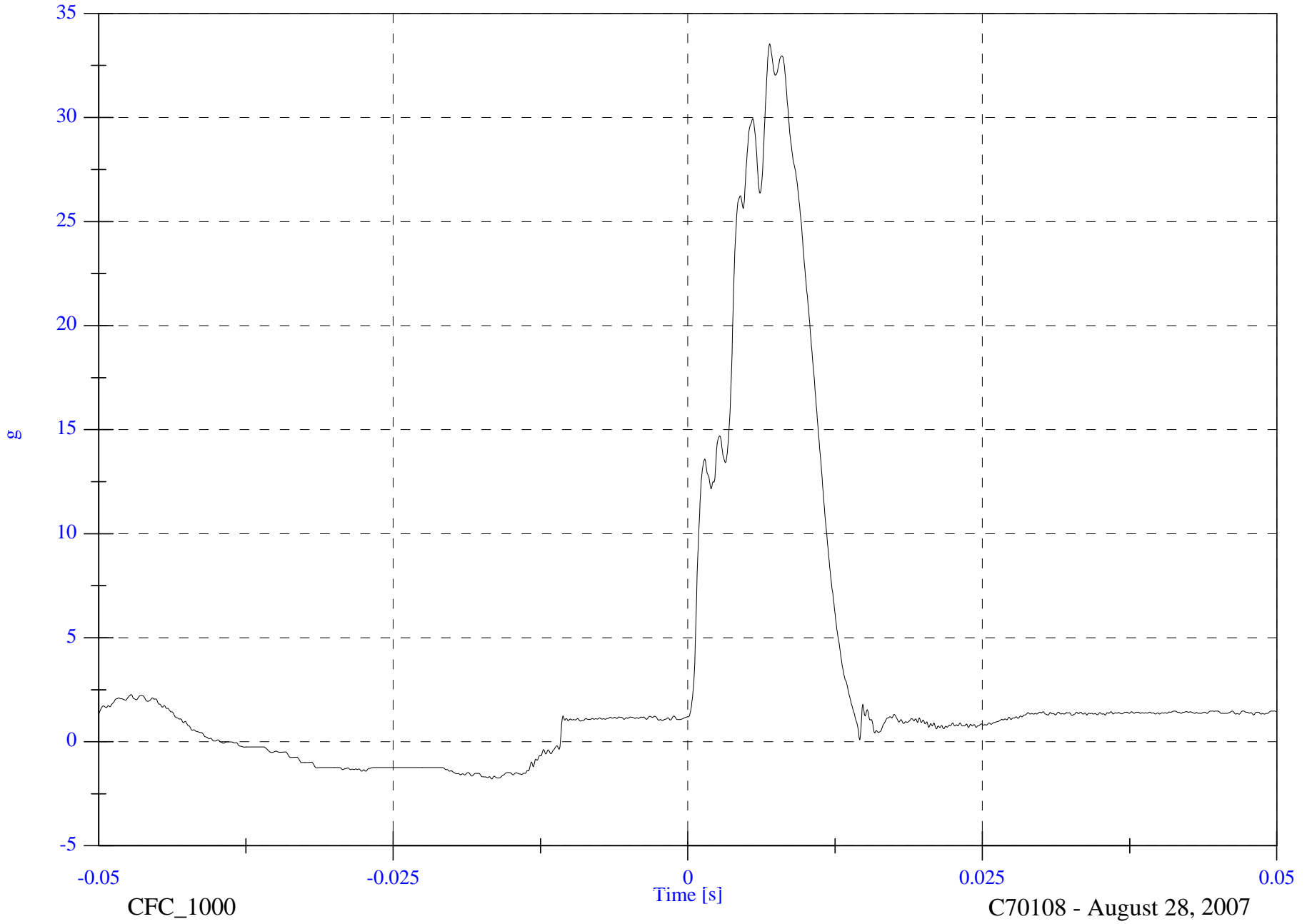
Headform Z Acceleration

Max: 33.5 [g] at 0.007 [s]

Min: -1.8 [g] at -0.017 [s]

C70108 PASSENGER SIDE OP1 IMPACT PLOT #3

8826-FMH-07



FMVSS 201U 2007 Pontiac Torrent

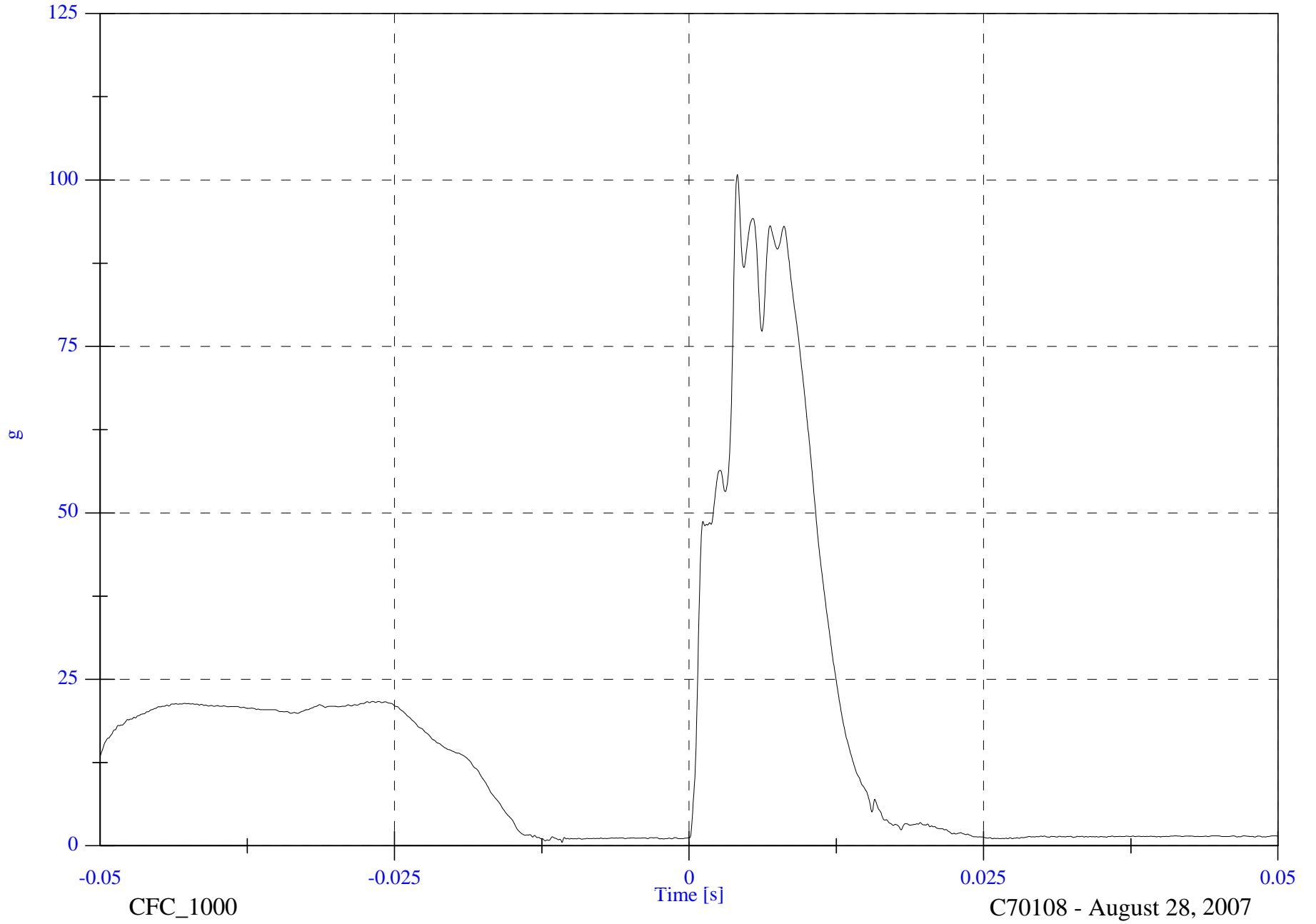
Headform Resultant

Max: 100.8 [g] at 0.004 [s]

Min: 0.5 [g] at -0.011 [s]

C70108 PASSENGER SIDE OP1 IMPACT PLOT #4

8826-FMH-07



CFC_1000

C70108 - August 28, 2007

FMVSS 201U 2007 Pontiac Torrent

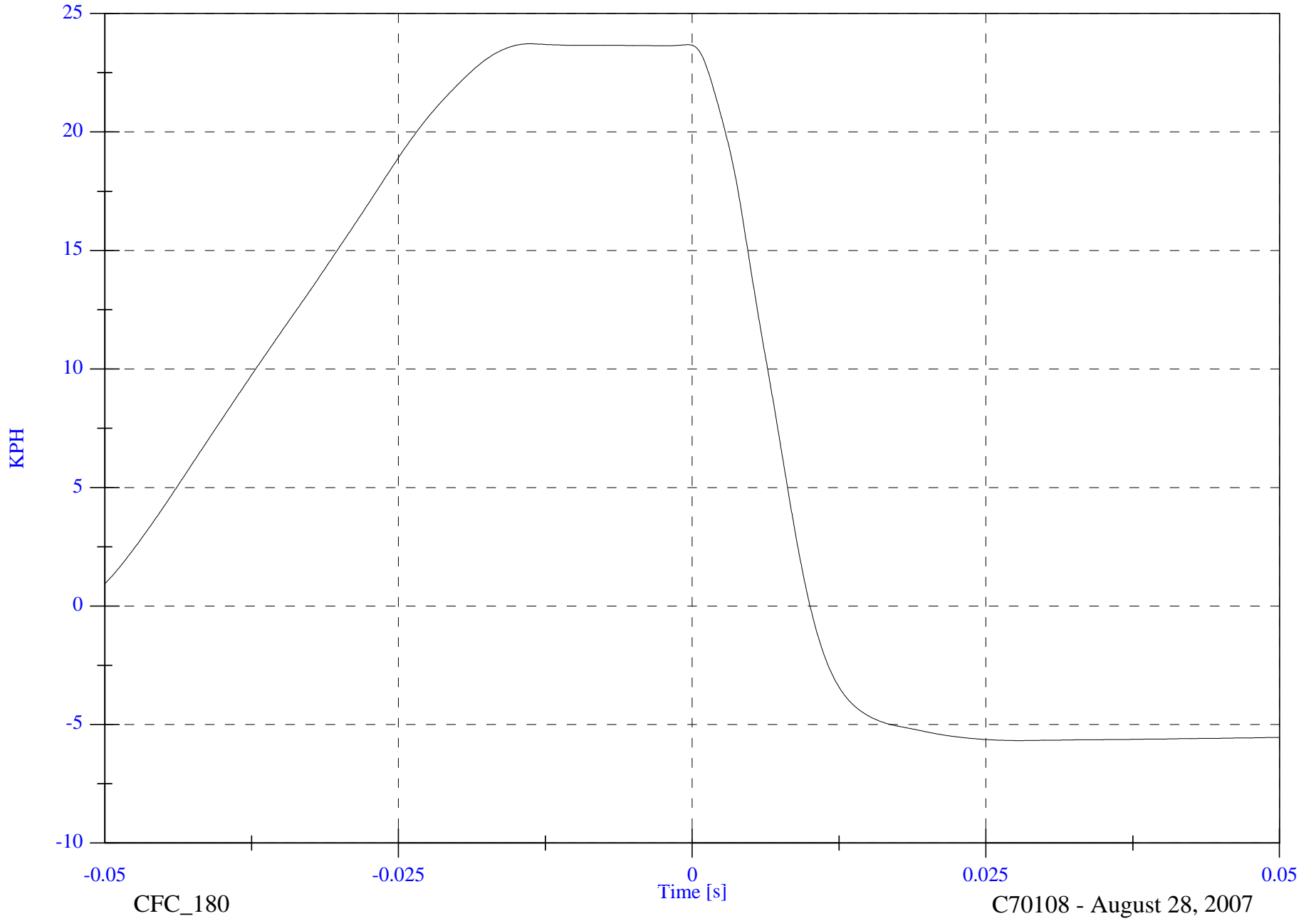
Headform Velocity

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

Min: -5.7 [KPH] at 0.028 [s]

C70108 PASSENGER SIDE OP1 IMPACT PLOT #5

8826-FMH-07



CFC_180

C70108 - August 28, 2007



PRE-IMPACT OP1



POST-IMPACT OP1

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	08
Test Date:	08/29/07
Target Location:	UPPER ROOF
Target Code:	UROP
Horizontal Impact Angle:	90°
Vertical Impact Angle:	34°
Ambient Temperature:	20.8 C°
Relative Humidity:	45
Time of Impact:	8:45
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	7	mm right	x mm left
On Centerline	53		mm up



POST-IMPACT UROP HEADFORM

Free Motion HIC	188.3
HIC(d)	308.5
Impact Velocity (kph)	23.55
HIC T1 (msec)	4.2
HIC T2 (msec)	28.4

FMVSS 201UI 2007 Pontiac Torrent C70108 - UROP

FMH Headform 0355

Location: UROP

Test Date: August 29, 2007

Work File: UROP

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

Lab Temperature: 20.8 C

HICd: 308.5

Lab Humidity: 45.0 %

HIC (36ms): 188.3

Velocity at Impact: 23.55 KPH

t1: 4.2 msec

t2: 28.4 msec

Free Flight Distance: 216.08 mm

Duration: 24.1 msec

Average Acceleration: 8.9 g

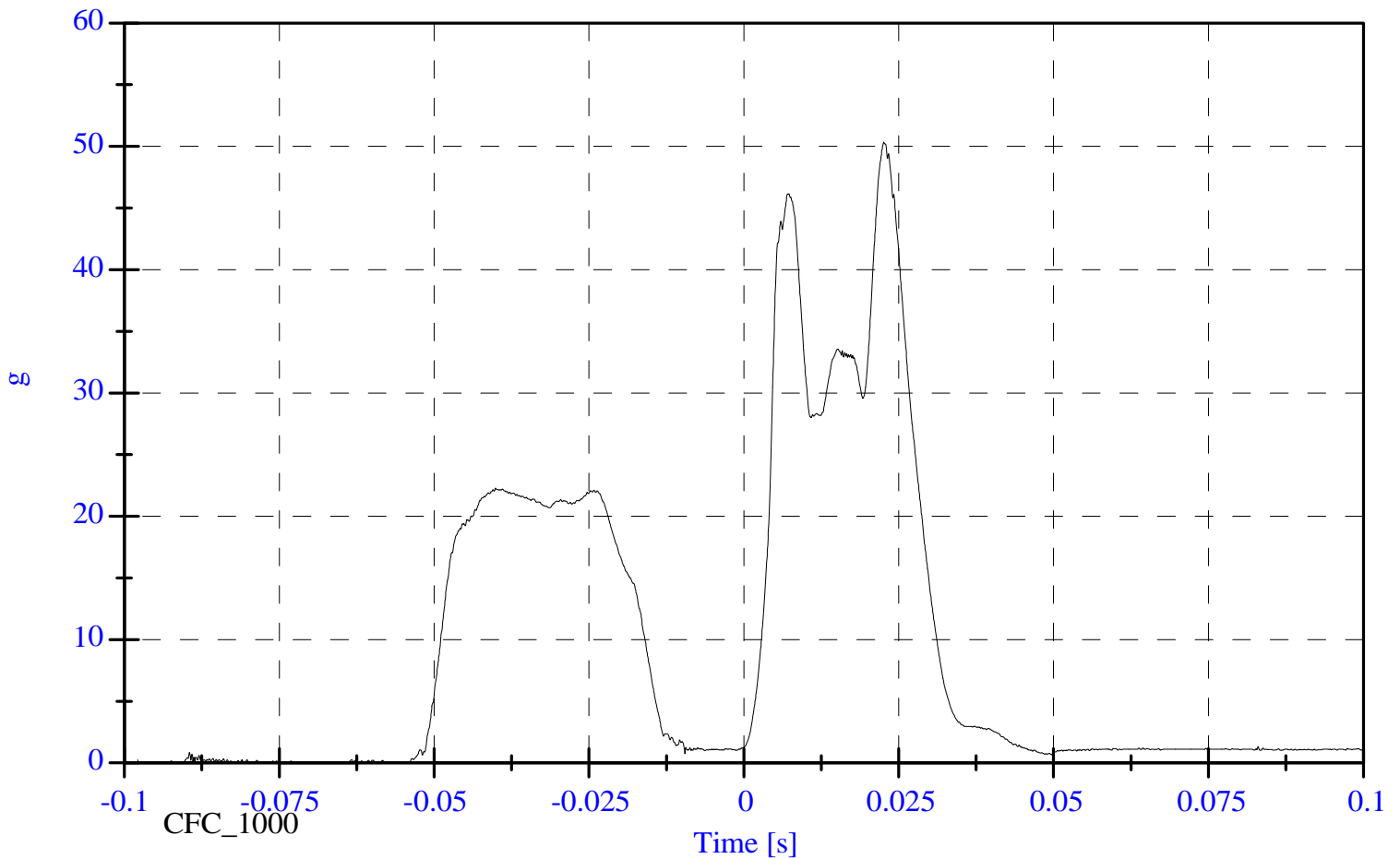
Maximum: 50.3 g

FMVSS 201UI 2007 Pontiac Torrent

Headform Resultant

Max: 50.3 [g] at 0.023 [s]

Min: 0.0 [g] at -0.080 [s]



FMVSS 201UI 2007 Pontiac Torrent

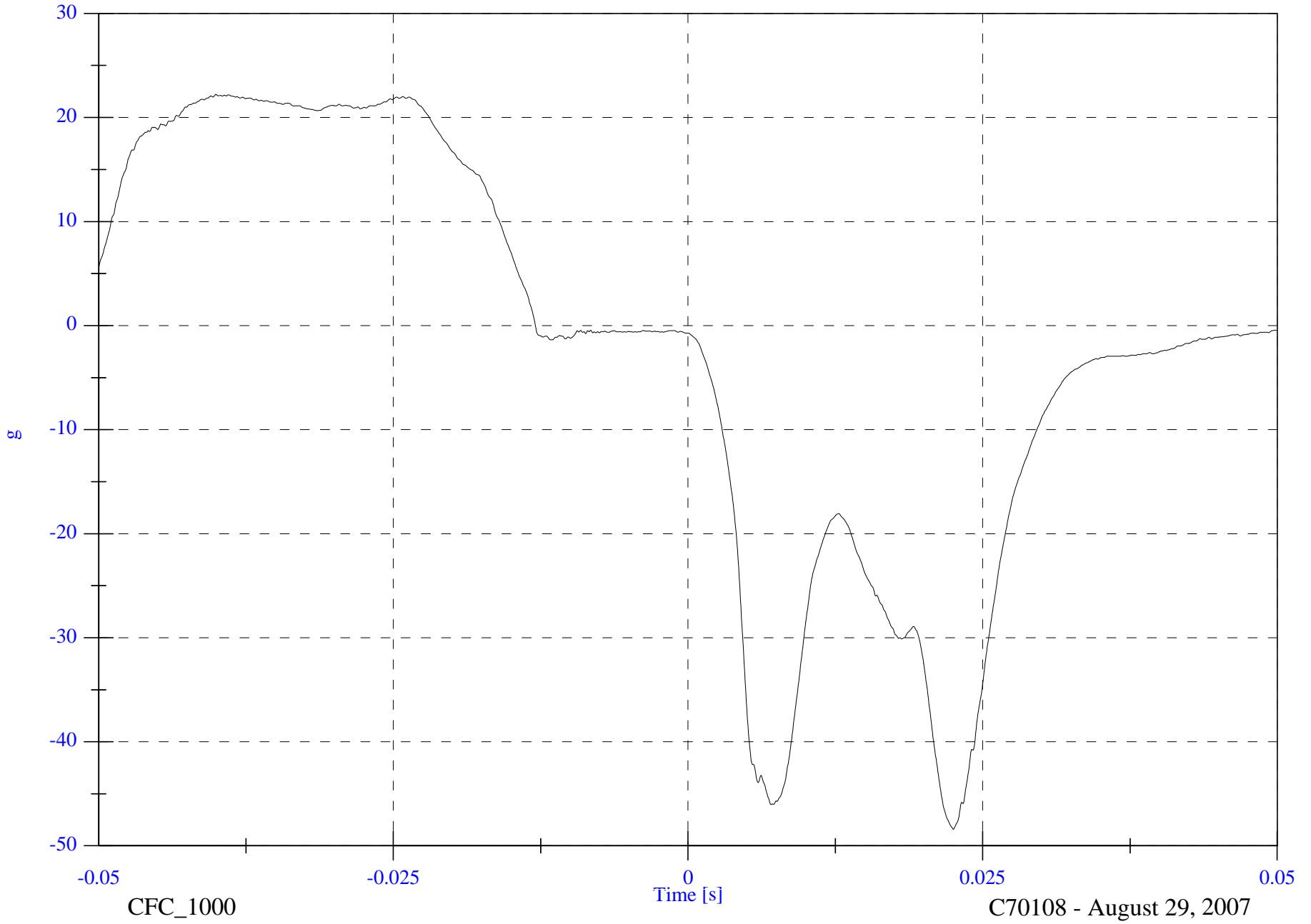
Headform X Acceleration

Max: 22.2 [g] at -0.040 [s]

Min: -48.4 [g] at 0.023 [s]

C70108 PASSENGER SIDE UROP IMPACT PLOT #1

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

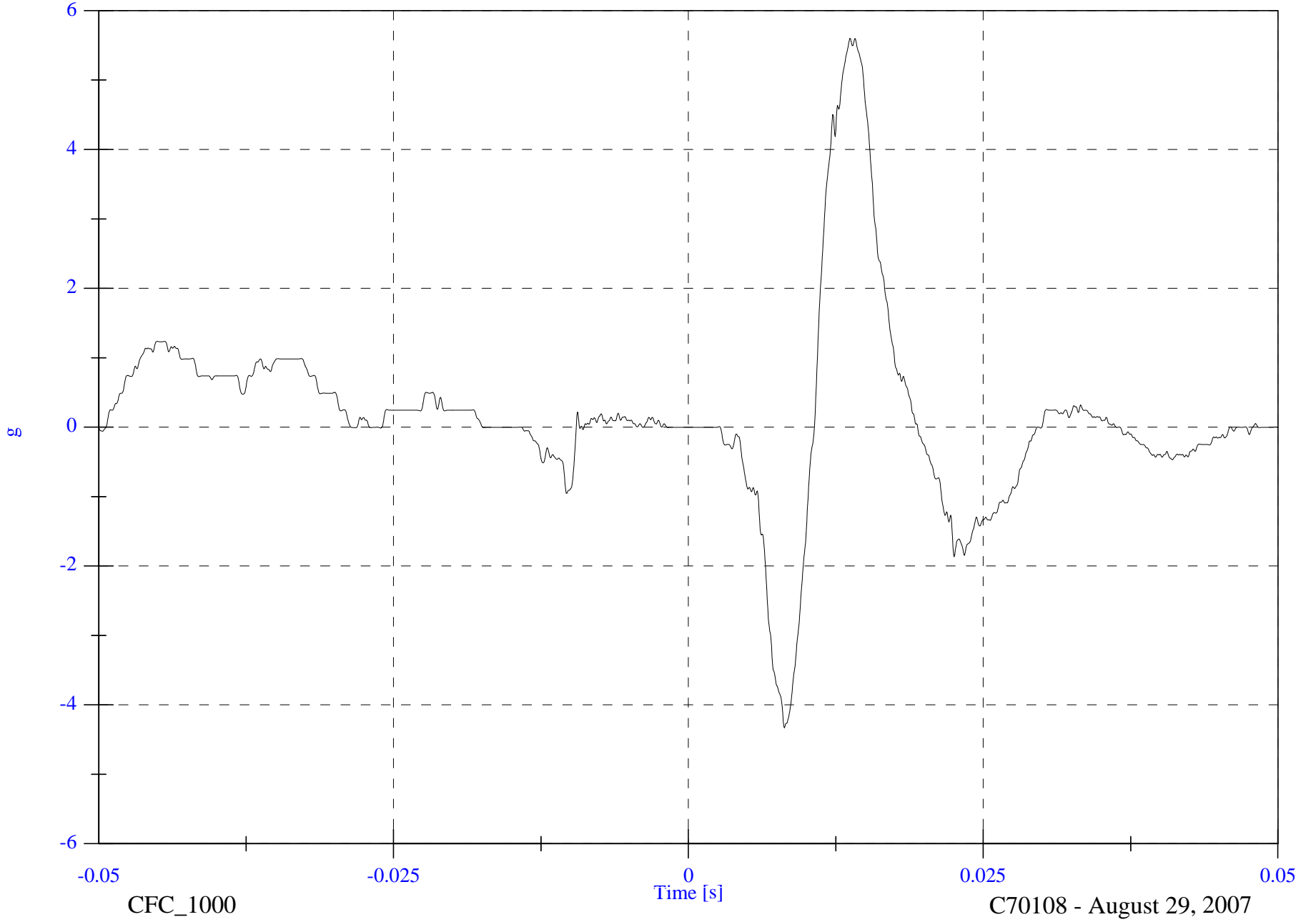
Headform Y Acceleration

Max: 5.6 [g] at 0.014 [s]

Min: -4.3 [g] at 0.008 [s]

C70108 PASSENGER SIDE UROP IMPACT PLOT #2

8826-FMH-07



CFC_1000

Time [s]

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

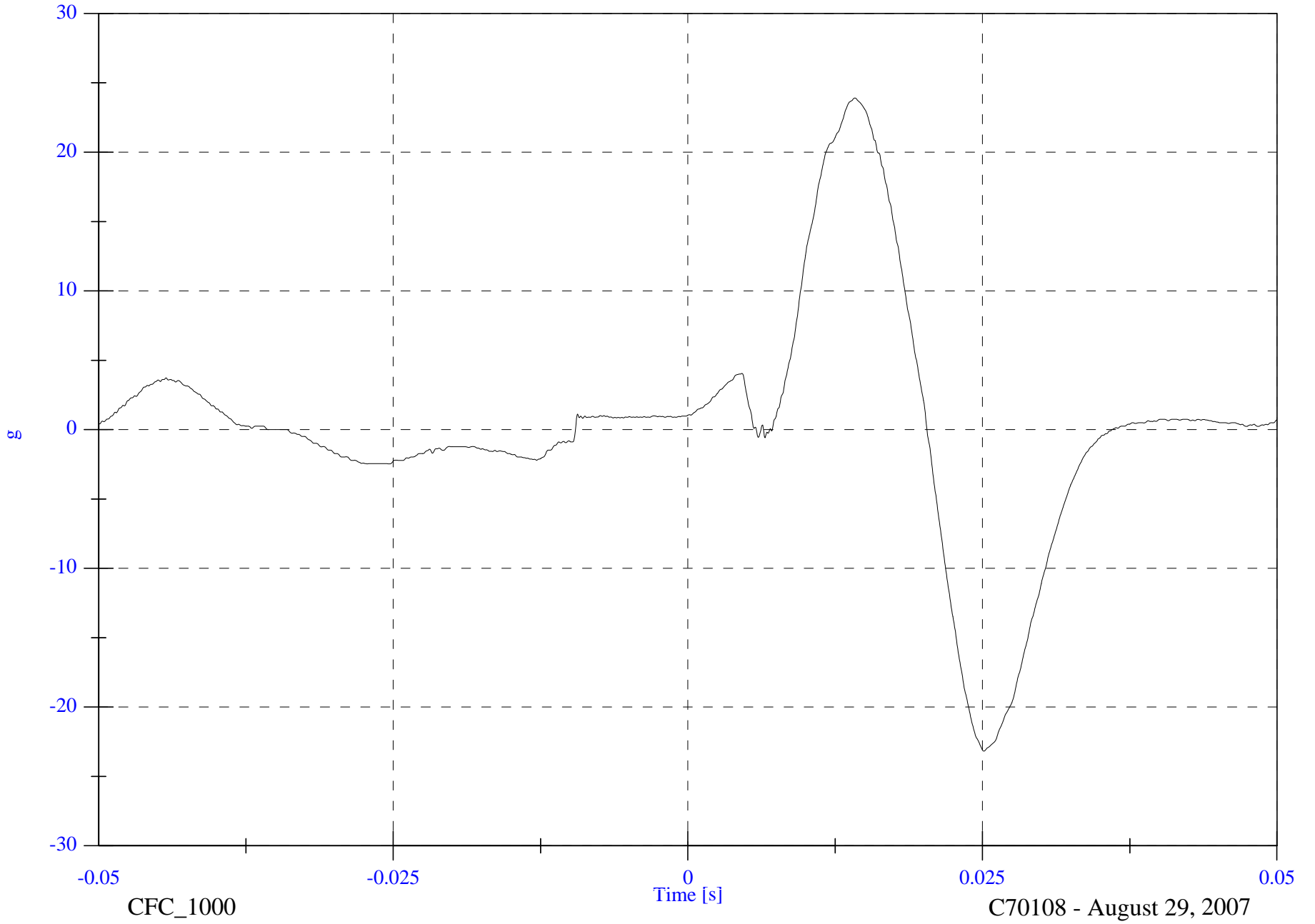
Headform Z Acceleration

Max: 23.9 [g] at 0.014 [s]

Min: -23.2 [g] at 0.025 [s]

C70108 PASSENGER SIDE UROP IMPACT PLOT #3

8826-FMH-07



FMVSS 201UI 2007 Pontiac Torrent

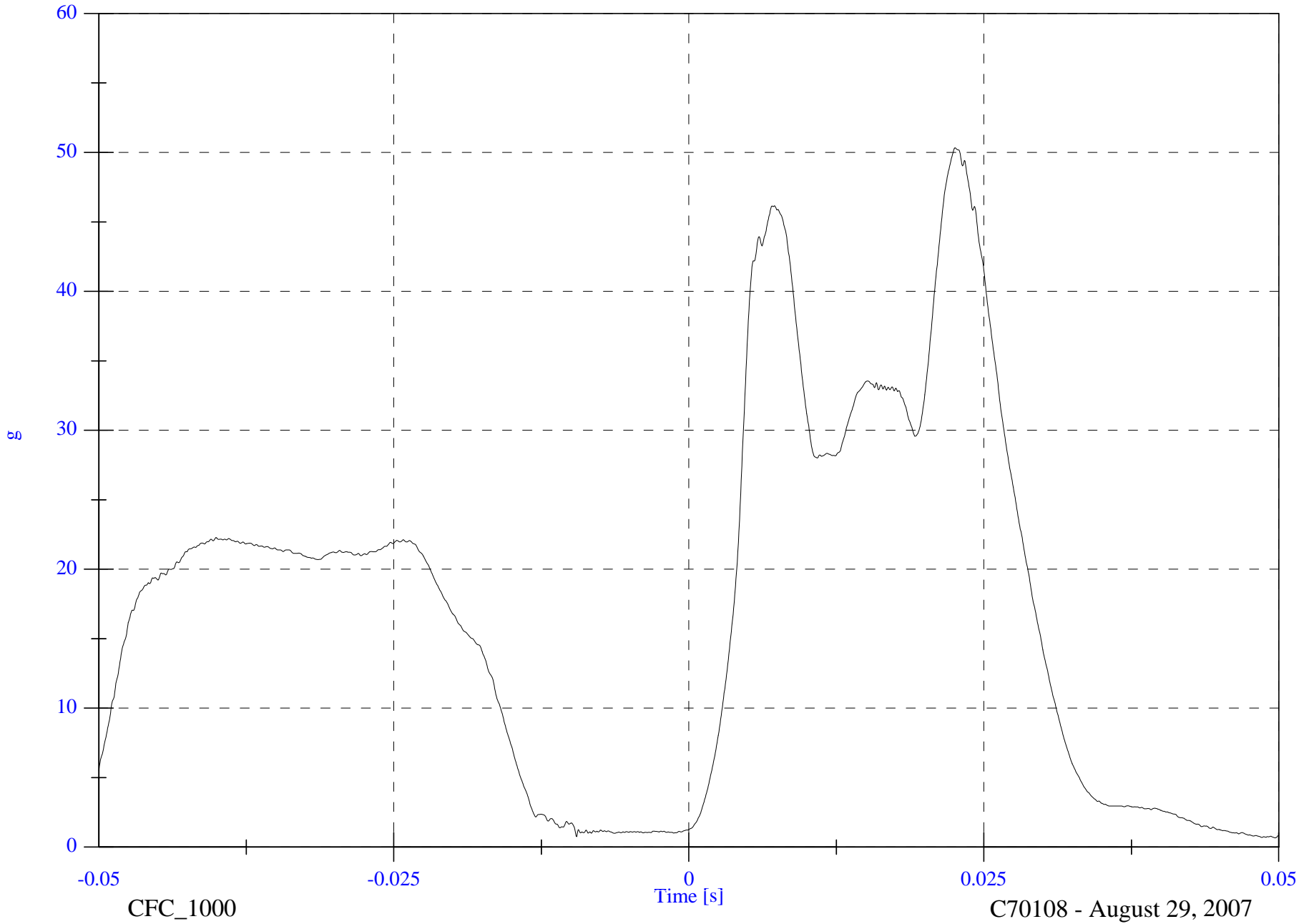
Headform Resultant

Max: 50.3 [g] at 0.023 [s]

Min: 0.7 [g] at 0.050 [s]

C70108 PASSENGER SIDE UROP IMPACT PLOT #4

8826-FMH-07



FMVSS 201UI 2007 Pontiac Torrent

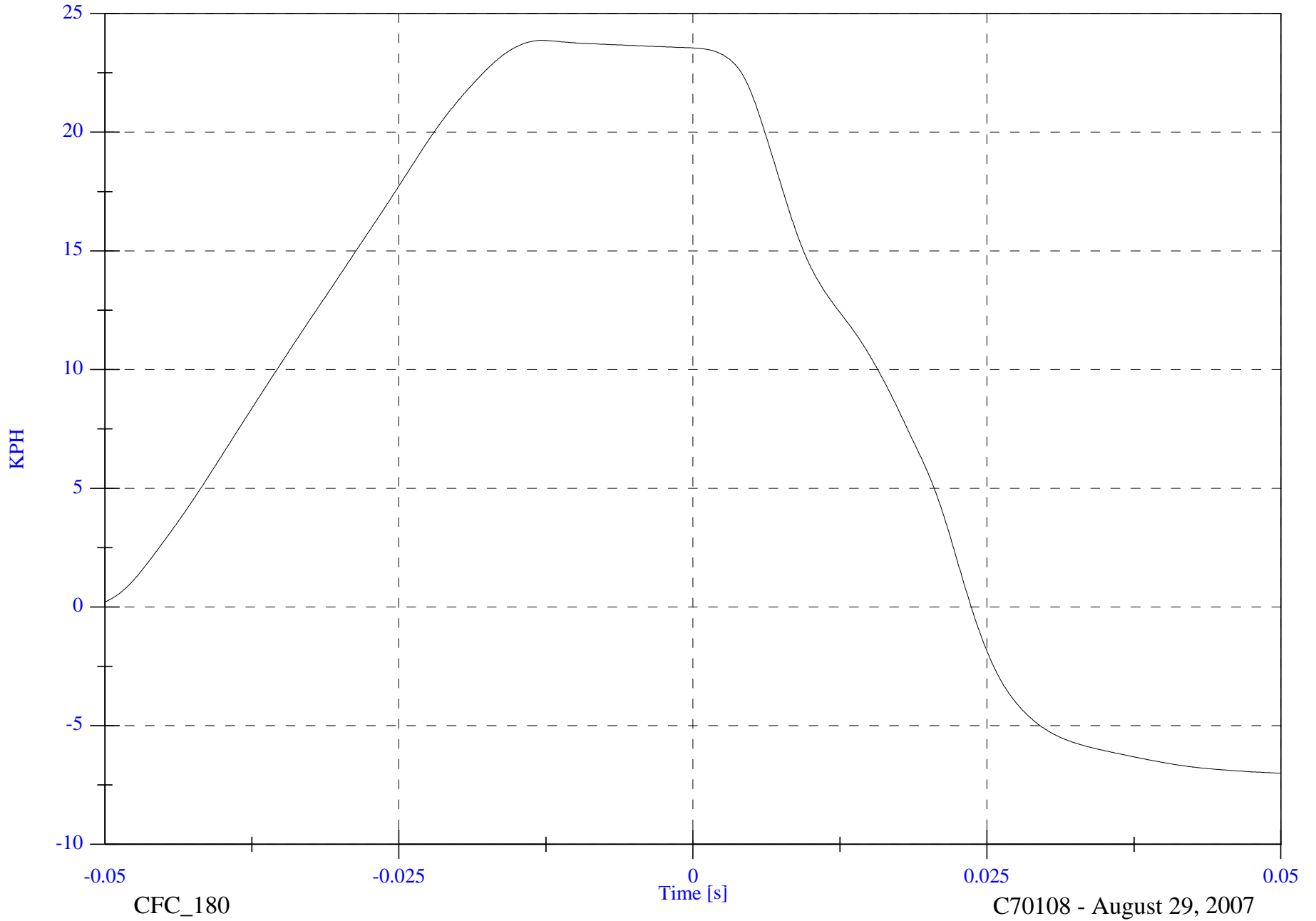
Max: 23.9 [KPH] at -0.013 [s]

Min: -7.0 [KPH] at 0.050 [s]

Headform Velocity

C70108 PASSENGER SIDE UROP IMPACT PLOT #5

8826-FMH-07



CFC_180

C70108 - August 29, 2007



PRE-IMPACT UROP



POST-IMPACT UROP

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	09
Test Date:	08/29/07
Target Location:	B-PILLAR
Target Code:	BP2
Horizontal Impact Angle:	270°
Vertical Impact Angle:	3°
Ambient Temperature:	21.8 C°
Relative Humidity:	59.2
Time of Impact:	10:00
Headform Number:	0642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	6	mm right	x mm left
On Centerline	4	mm up	



POST-IMPACT BP2 HEADFORM

Free Motion HIC	762.4
HIC(d)	789.9
Impact Velocity (kph)	23.58
HIC T1 (msec)	1.9
HIC T2 (msec)	7.7

FMVSS 201UI 2007 Pontiac Torrent C70108 - BP2

FMH Headform 0642

Location: BP2

Test Date: August 29, 2007

Work File: BP2

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

Lab Temperature: 21.8 C

HICd: 762.4

Lab Humidity: 59.2 %

HIC (36ms): 789.9

Velocity at Impact: 23.58 KPH

t1: 1.9 msec

t2: 7.7 msec

Free Flight Distance: 220.19 mm

Duration: 5.8 msec

Average Acceleration: 8.5 g

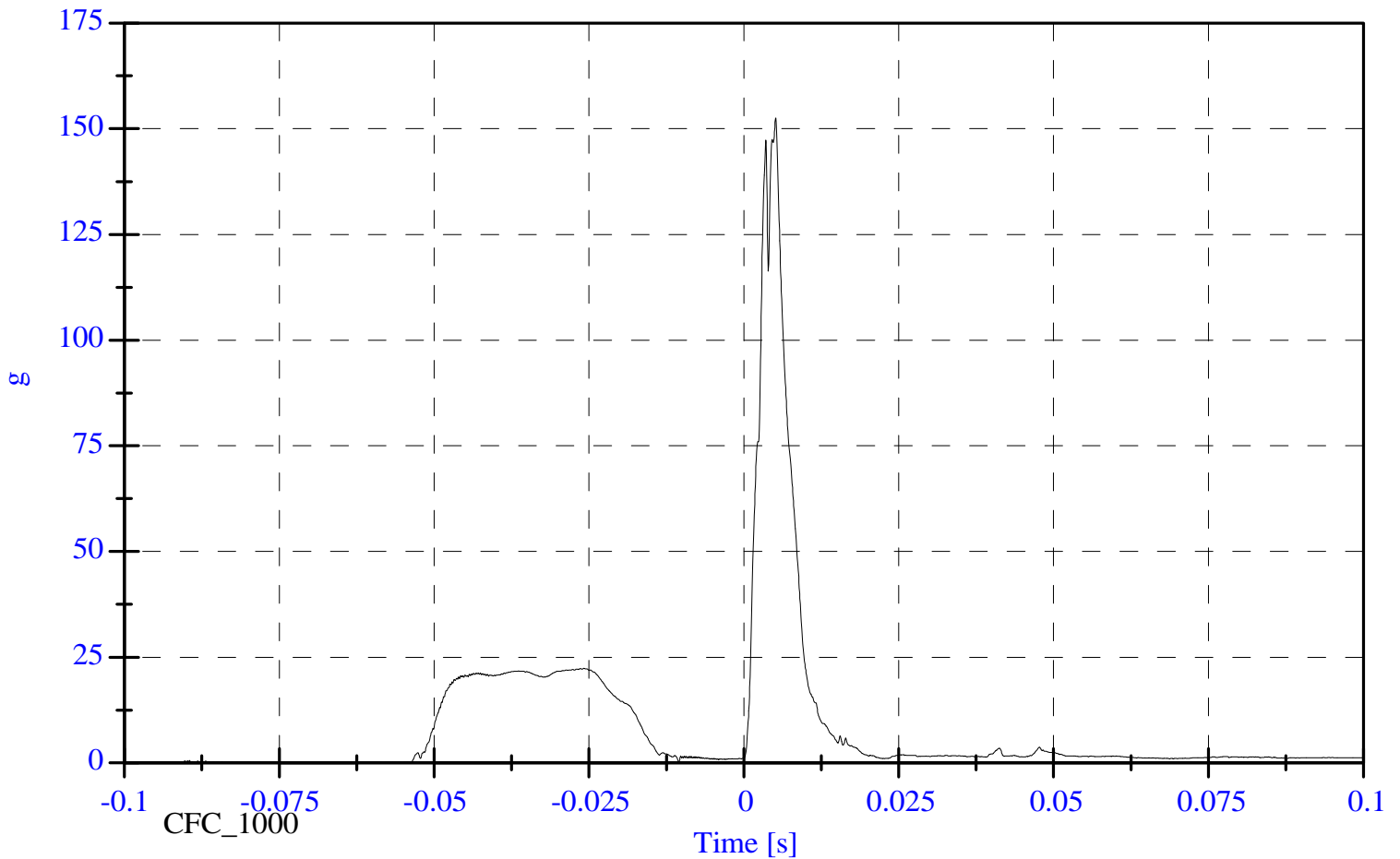
Maximum: 152.5 g

FMVSS 201UI 2007 Pontiac Torrent

Headform Resultant

Max: 152.5 [g] at 0.005 [s]

Min: 0.0 [g] at -0.078 [s]



FMVSS 201UI 2007 Pontiac Torrent

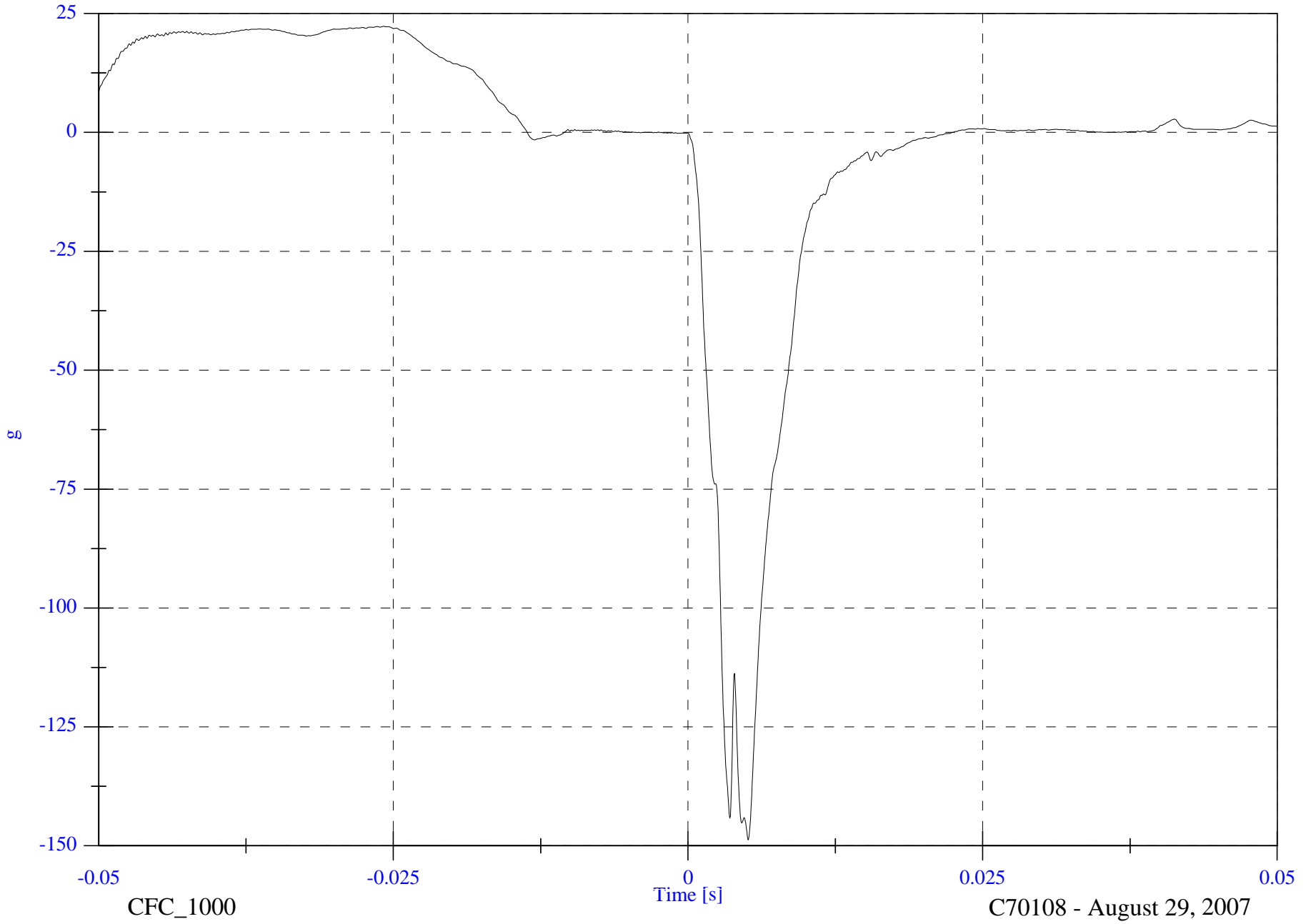
Headform X Acceleration

Max: 22.3 [g] at -0.026 [s]

Min: -148.8 [g] at 0.005 [s]

C70108 DRIVER SIDE BP2 IMPACT PLOT #1

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

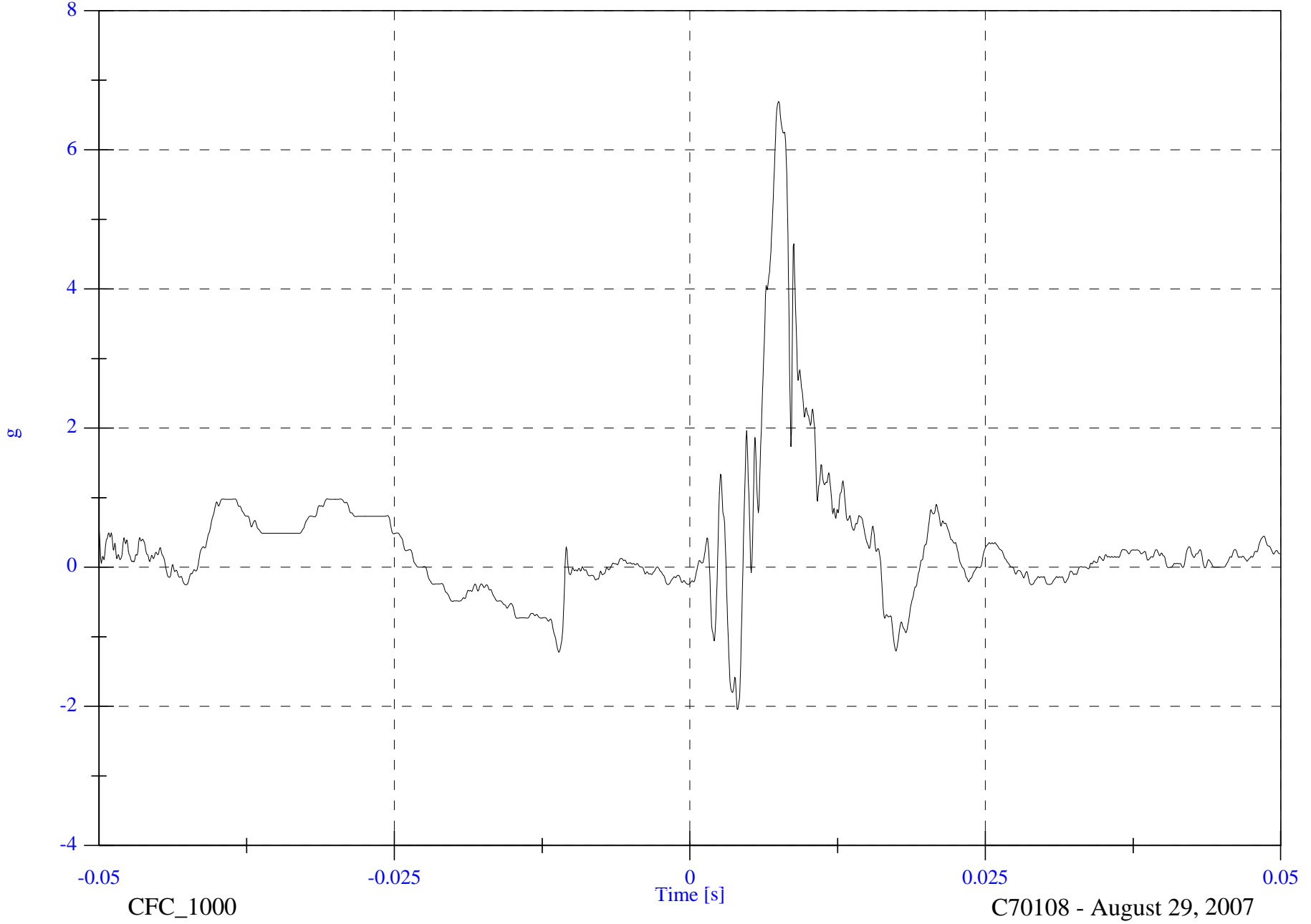
Headform Y Acceleration

Max: 6.7 [g] at 0.008 [s]

Min: -2.0 [g] at 0.004 [s]

C70108 DRIVER SIDE BP2 IMPACT PLOT #2

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

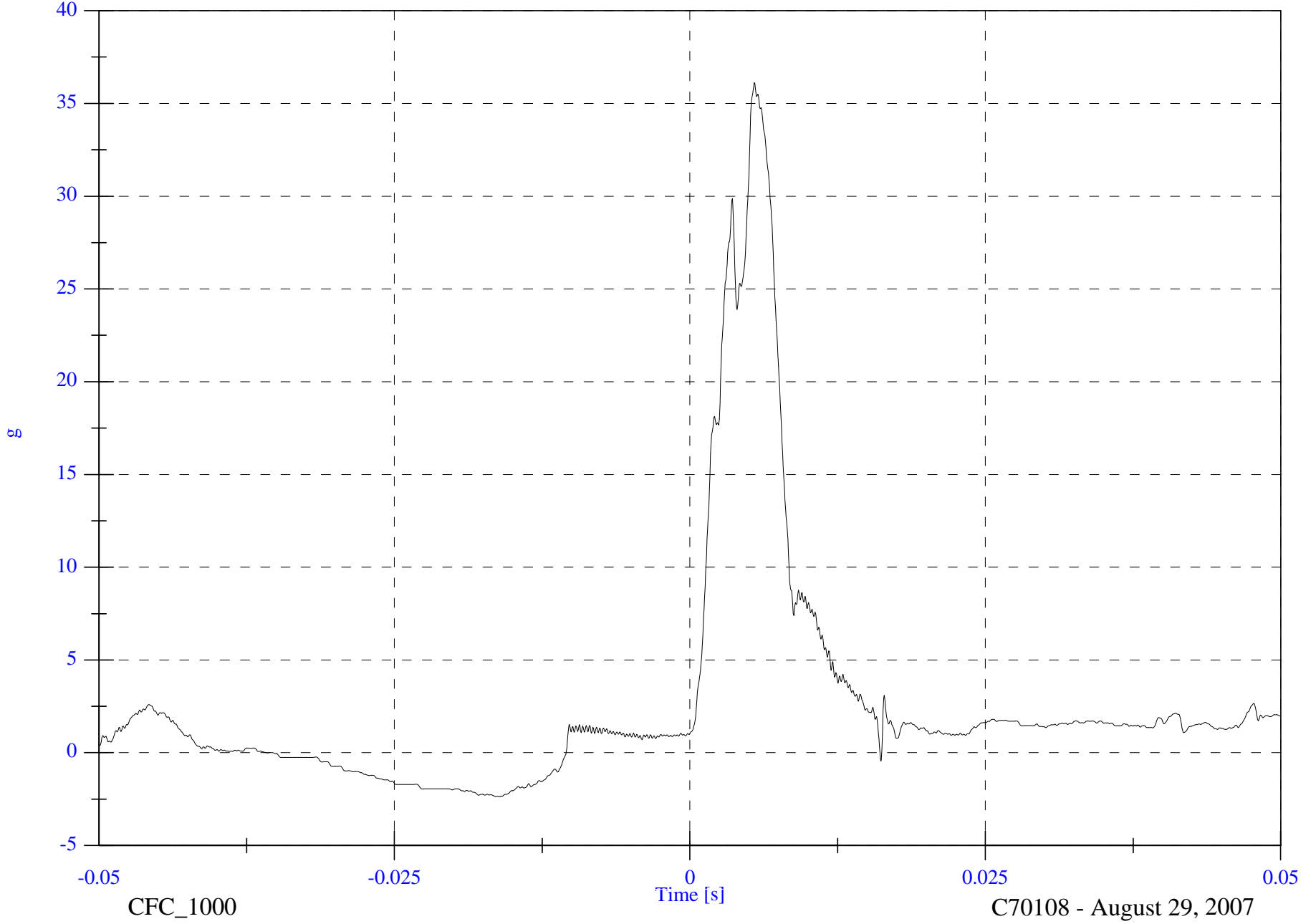
Headform Z Acceleration

Max: 36.1 [g] at 0.005 [s]

Min: -2.4 [g] at -0.016 [s]

C70108 DRIVER SIDE BP2 IMPACT PLOT #3

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

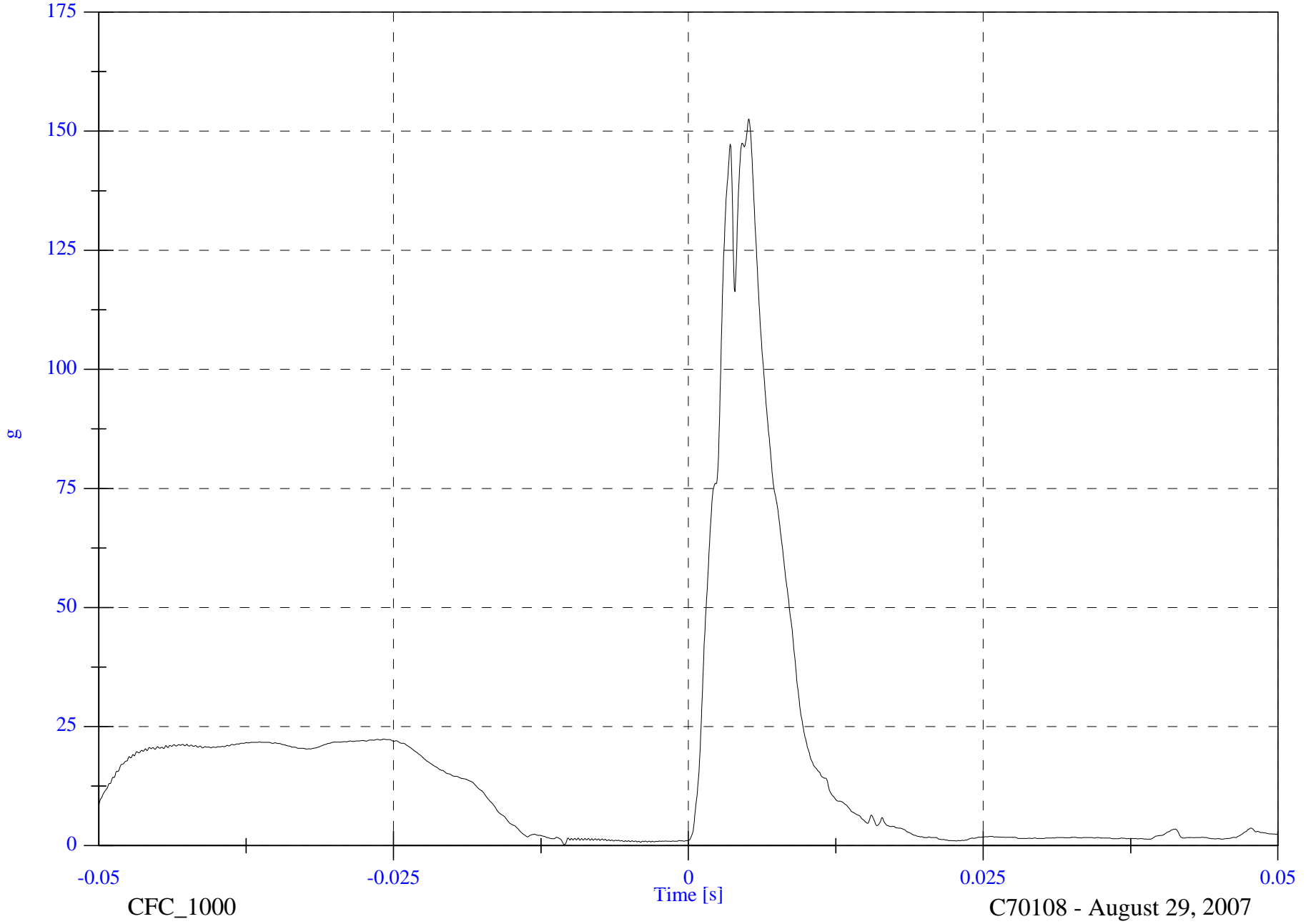
Headform Resultant

Max: 152.5 [g] at 0.005 [s]

Min: 0.2 [g] at -0.011 [s]

C70108 DRIVER SIDE BP2 IMPACT PLOT #4

8826-FMH-07



CFC_1000

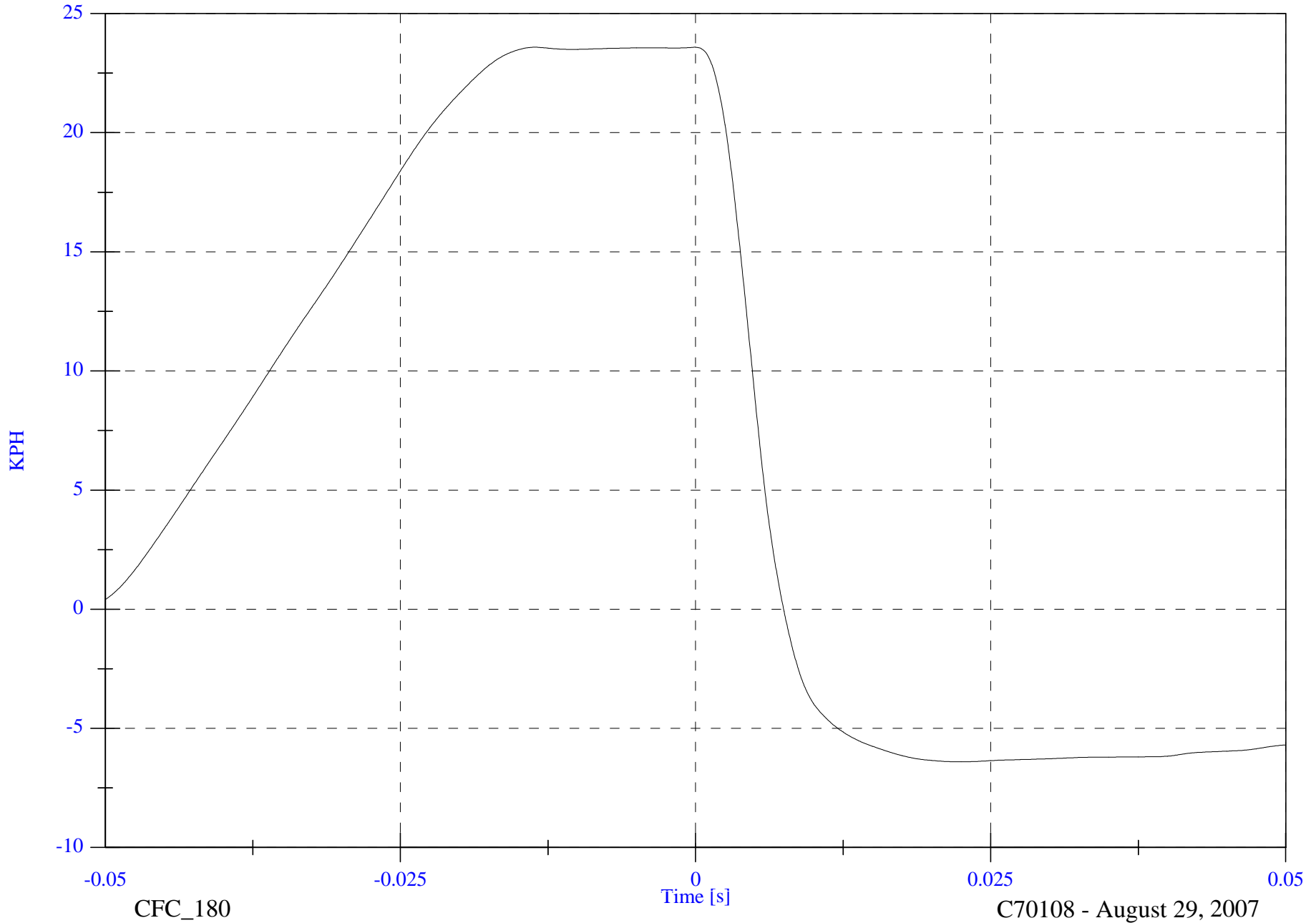
C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

Max: 23.6 [KPH] at -0.014 [s]

Min: -6.4 [KPH] at 0.022 [s]

Headform Velocity

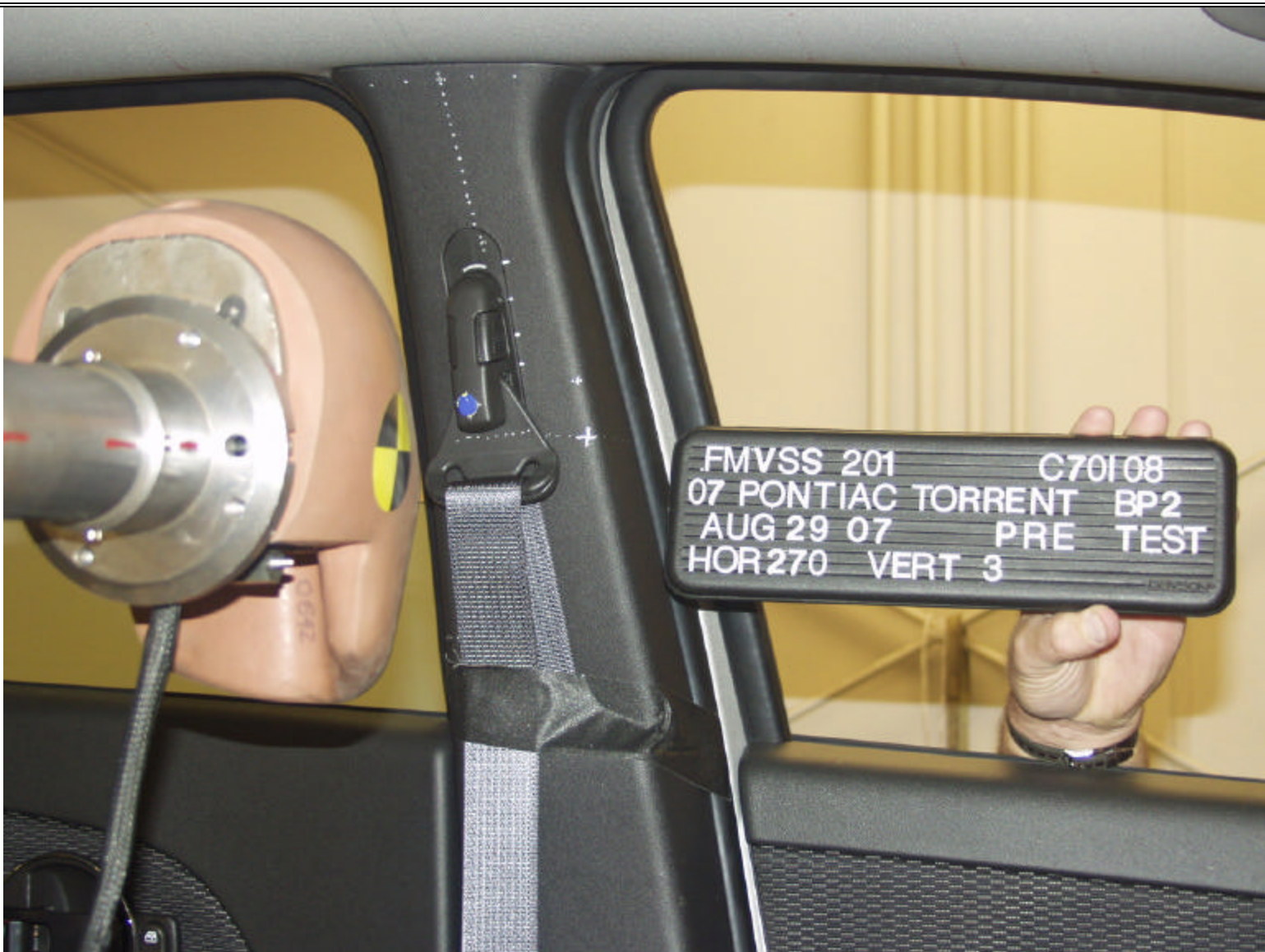


C70108 DRIVER SIDE BP2 IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 29, 2007



PRE-IMPACT BP2



POST-IMPACT BP2

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	10
Test Date:	08/29/07
Target Location:	UPPER ROOF
Target Code:	URBP
Horizontal Impact Angle:	270°
Vertical Impact Angle:	40°
Ambient Temperature:	21.3 C°
Relative Humidity:	56.7
Time of Impact:	10:25
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	9	mm right	x mm left
On Centerline	49	mm up	



POST-IMPACT URBP HEADFORM

Free Motion HIC	272.8
HIC(d)	372.2
Impact Velocity (kph)	23.5
HIC T1 (msec)	4.3
HIC T2 (msec)	16.1

FMVSS 201UI 2007 Pontiac Torrent C70108 - URBP

FMH Headform 805

Location: URBP

Test Date: August 29, 2007

Work File: URBP

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

Lab Temperature: 21.3 C

HICd: 372.2

Lab Humidity: 56.7 %

HIC (36ms): 272.8

Velocity at Impact: 23.50 KPH

t1: 4.3 msec

t2: 16.1 msec

Free Flight Distance: 222.48 mm

Duration: 11.7 msec

Average Acceleration: 9.2 g

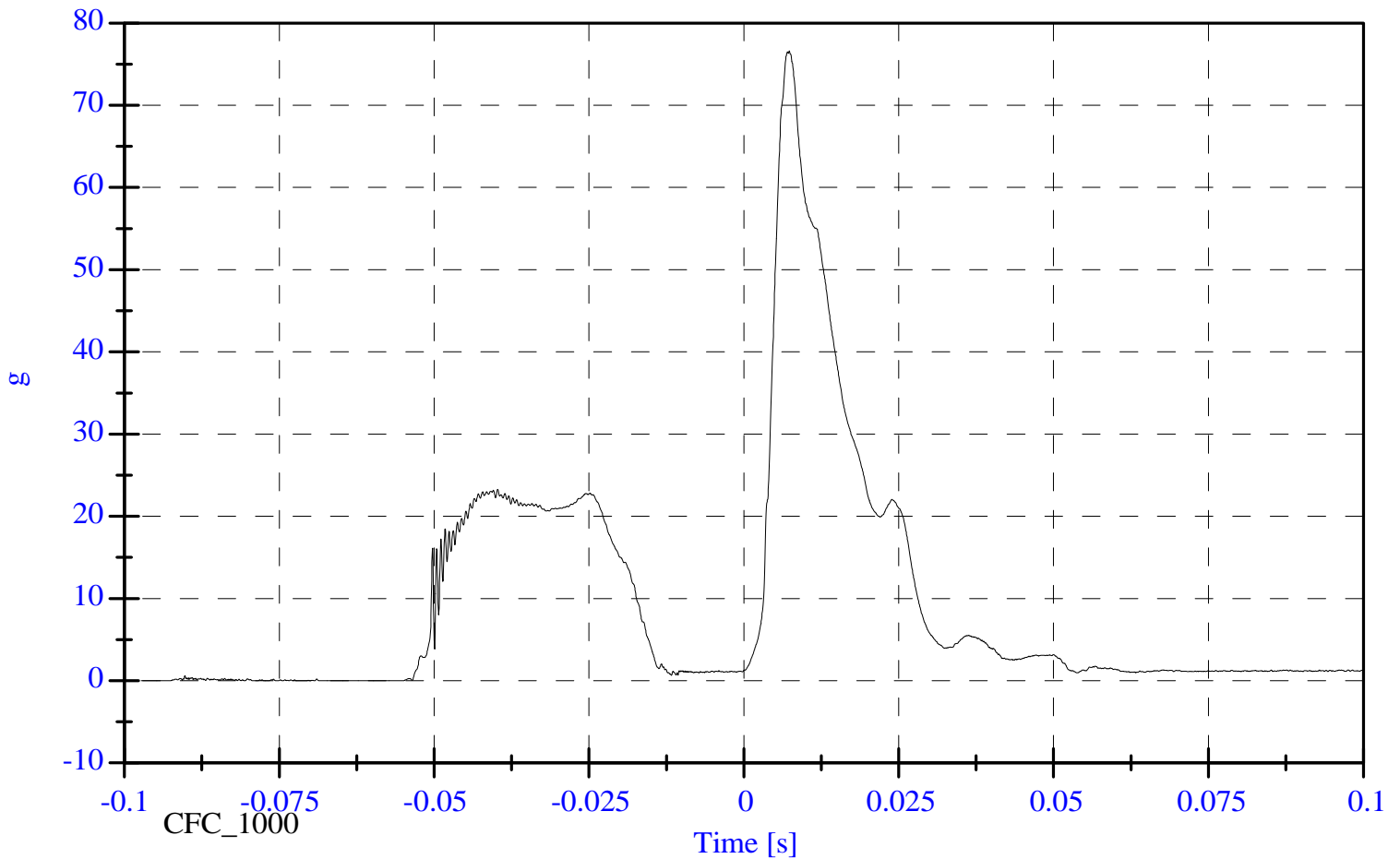
Maximum: 76.6 g

FMVSS 201UI 2007 Pontiac Torrent

Headform Resultant

Max: 76.6 [g] at 0.007 [s]

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



FMVSS 201UI 2007 Pontiac Torrent

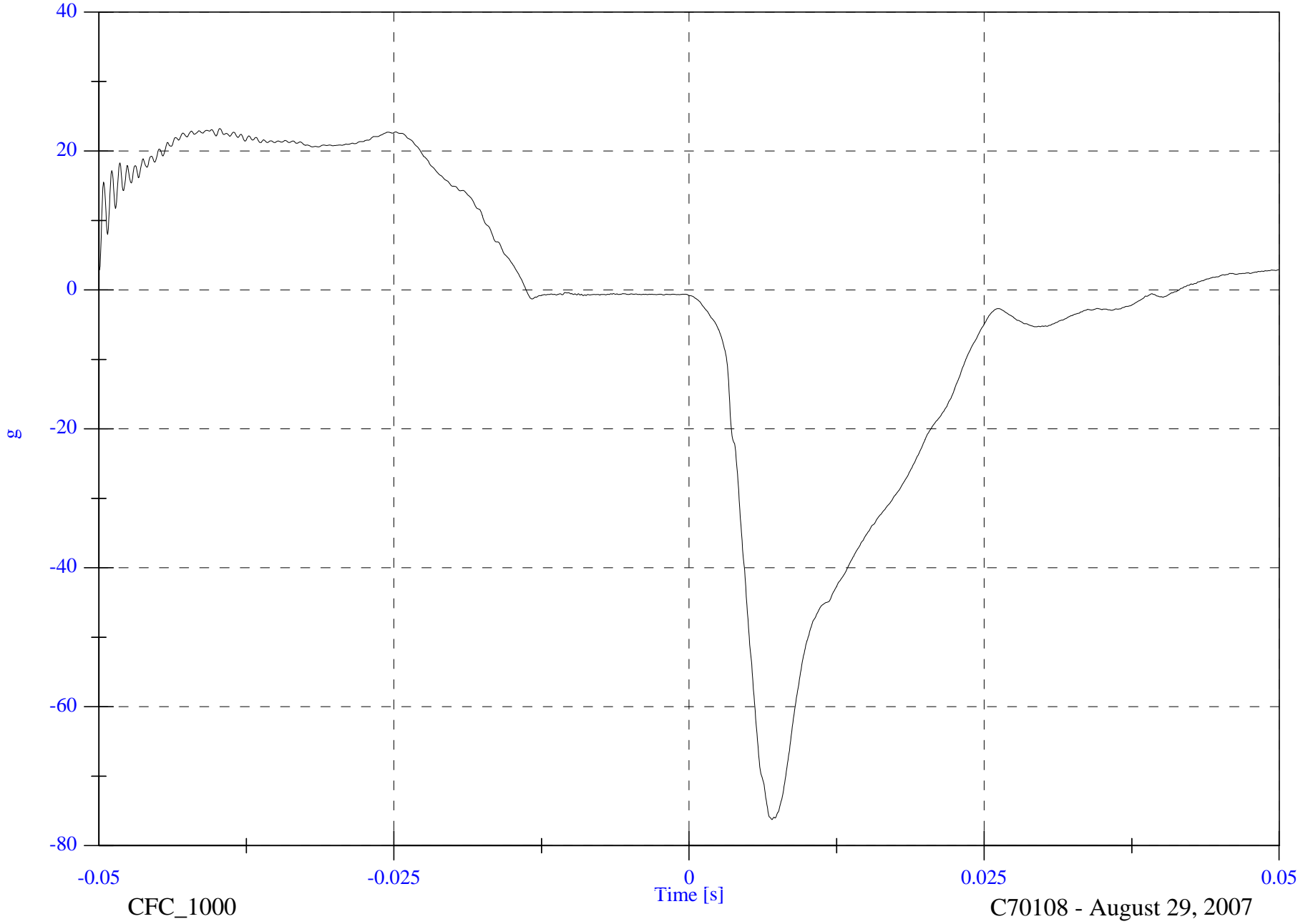
Headform X Acceleration

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

Min: -76.2 [g] at 0.007 [s]

C70108 DRIVER SIDE URBP IMPACT PLOT #1

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

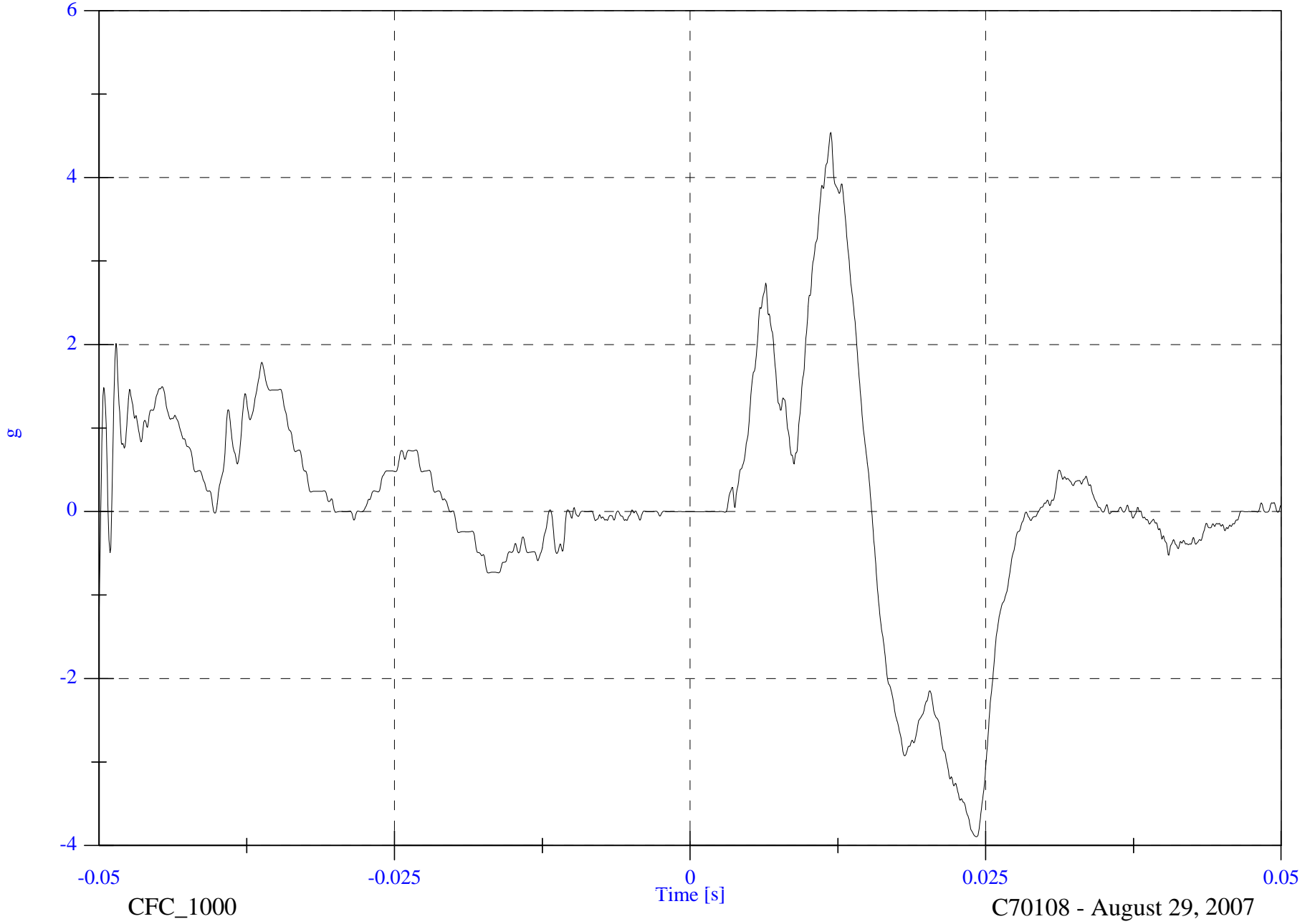
Headform Y Acceleration

Max: 4.5 [g] at 0.012 [s]

Min: -3.9 [g] at 0.024 [s]

C70108 DRIVER SIDE URBP IMPACT PLOT #2

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

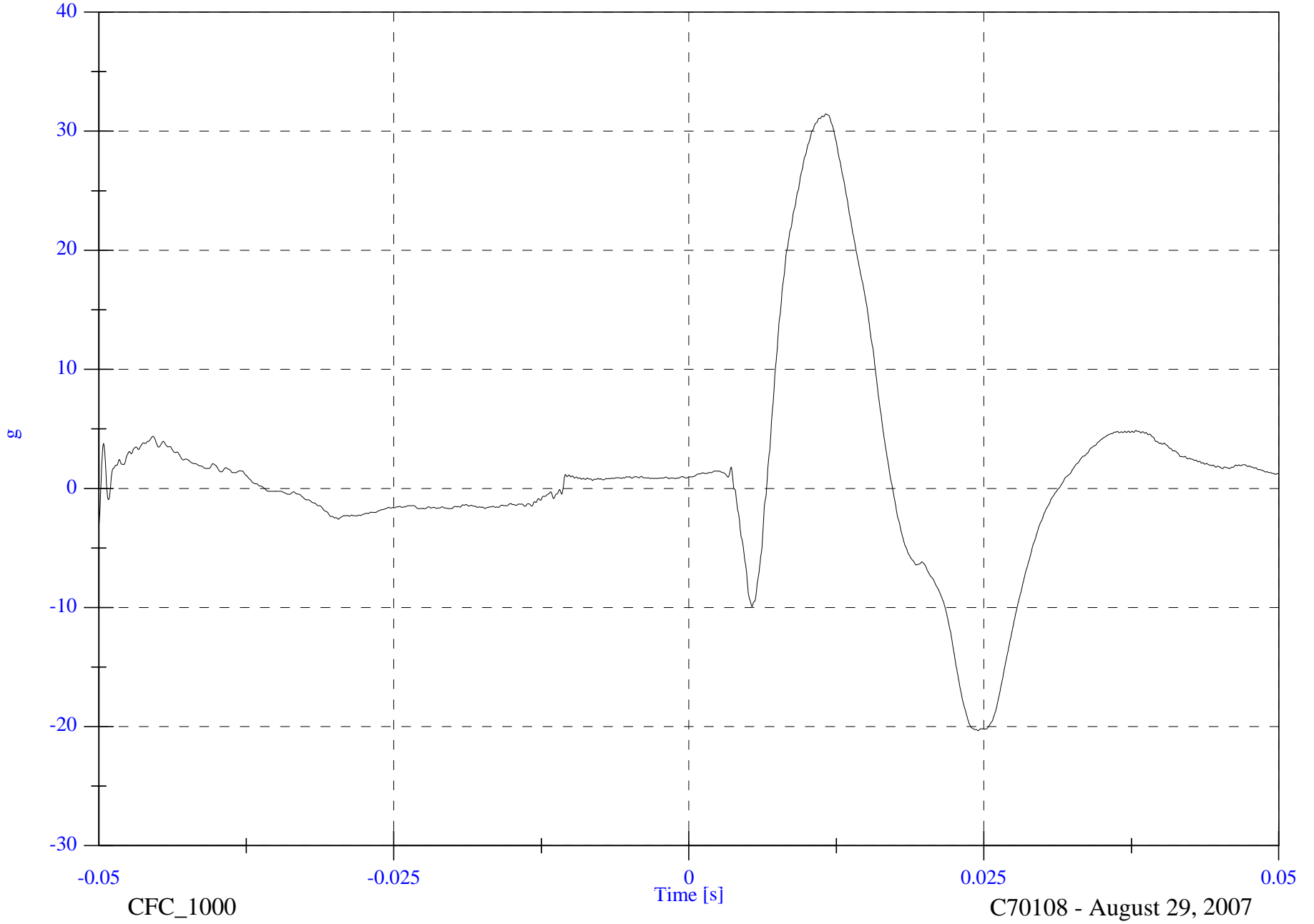
Headform Z Acceleration

Max: 31.5 [g] at 0.012 [s]

Min: -20.3 [g] at 0.025 [s]

C70108 DRIVER SIDE URBP IMPACT PLOT #3

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

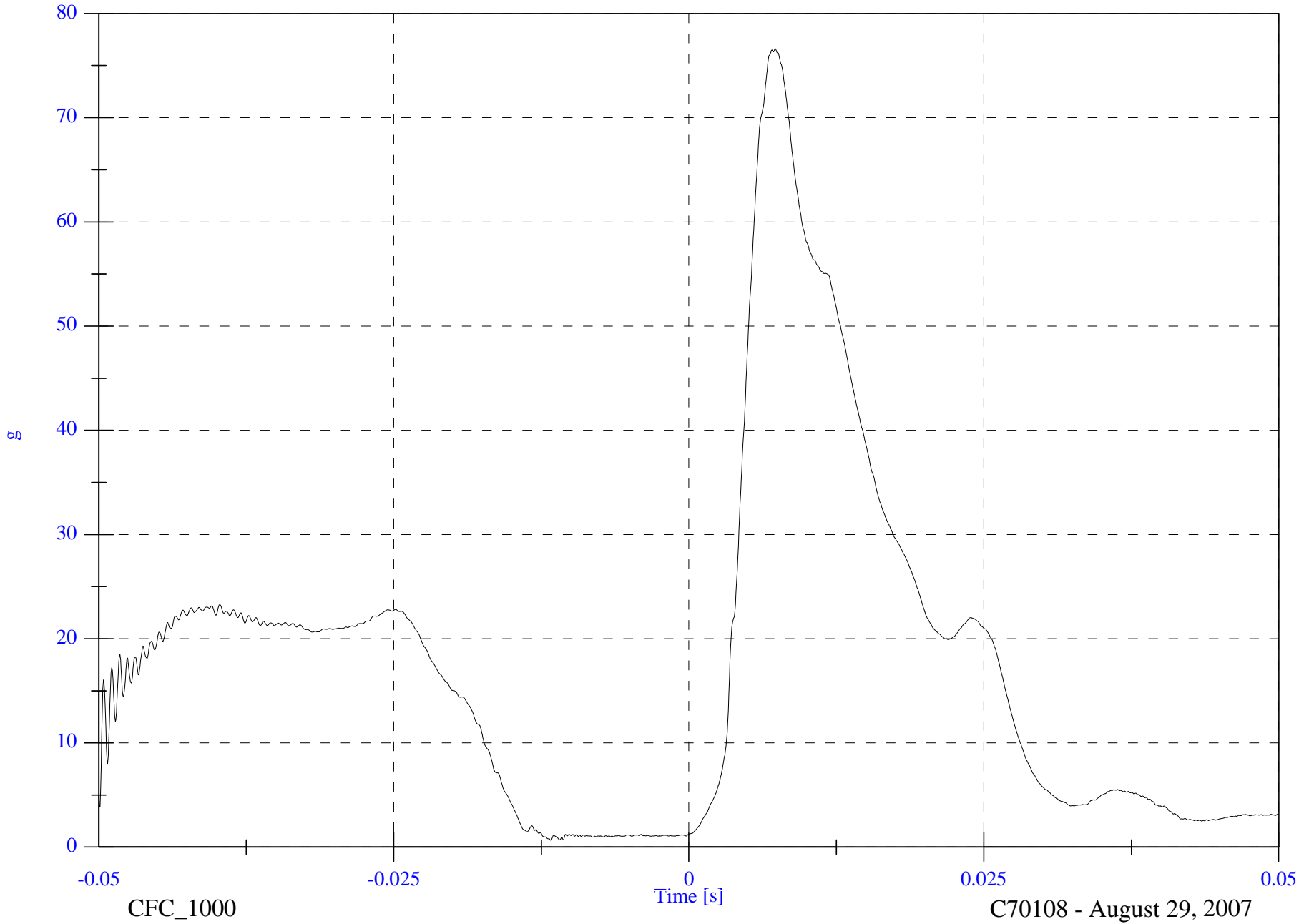
Headform Resultant

Max: 76.6 [g] at 0.007 [s]

Min: 0.6 [g] at -0.012 [s]

C70108 DRIVER SIDE URBP IMPACT PLOT #4

8826-FMH-07



CFC_1000

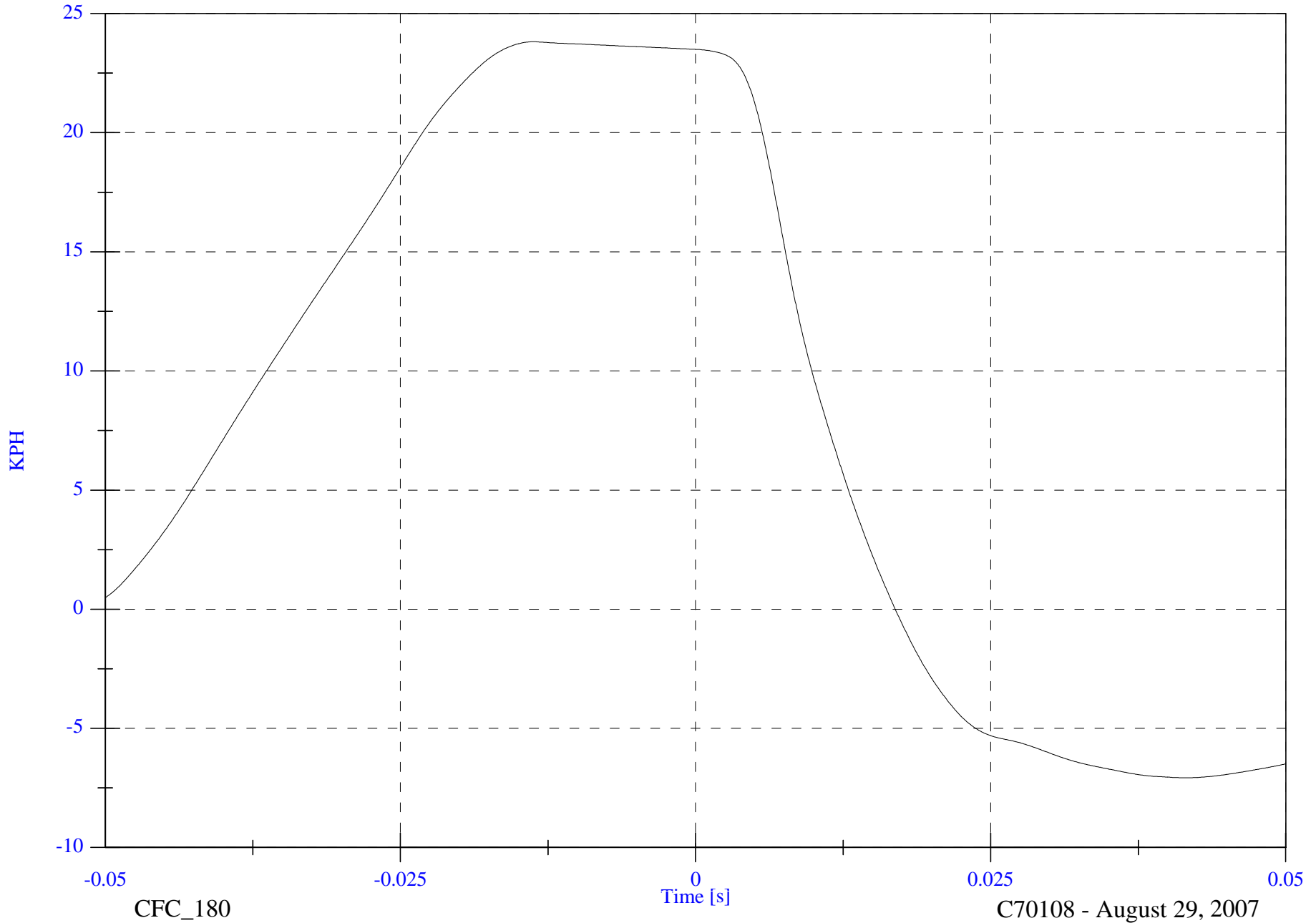
C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

Max: 23.8 [KPH] at -0.014 [s]

Min: -7.1 [KPH] at 0.042 [s]

Headform Velocity



C70108 DRIVER SIDE URBP IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 29, 2007



PRE-IMPACT URBP

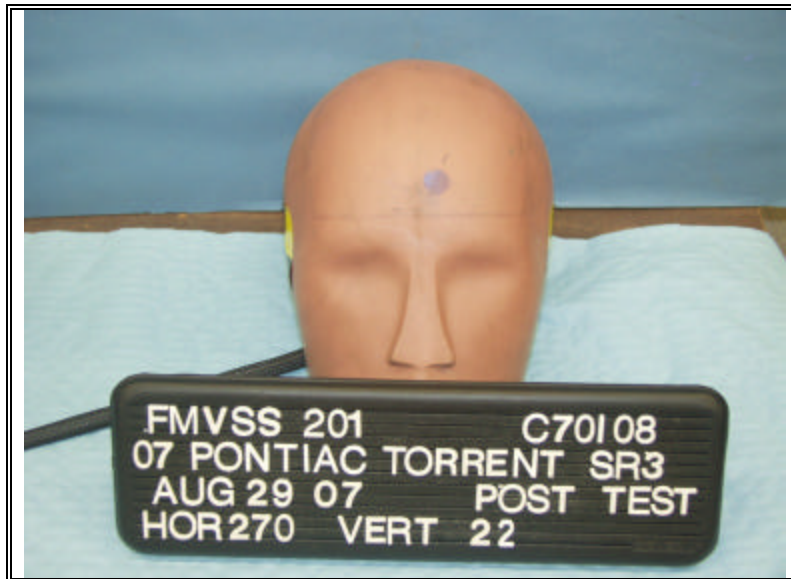


POST-IMPACT URBP

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	11
Test Date:	08/29/07
Target Location:	SIDE RAIL
Target Code:	SR3
Horizontal Impact Angle:	270°
Vertical Impact Angle:	22°
Ambient Temperature:	21.3 C°
Relative Humidity:	56.3
Time of Impact:	10:55
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	8	mm right	x mm left
On Centerline	16	mm up	



POST-IMPACT SR3HEADFORM

Free Motion HIC	425.9
HIC(d)	487.7
Impact Velocity (kph)	23.71
HIC T1 (msec)	16.0
HIC T2 (msec)	19.5

FMVSS 201UI 2007 Pontiac Torrent C70108 - SR3

FMH Headform 1255

Location: SR3

Test Date: August 29, 2007

Work File: SR3

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

Lab Temperature: 21.3 C

HICd: 487.7

Lab Humidity: 56.3 %

HIC (36ms): 425.9

Velocity at Impact: 23.71 KPH

t1: 16.0 msec

t2: 19.5 msec

Free Flight Distance: 220.90 mm

Duration: 3.5 msec

Average Acceleration: 8.8 g

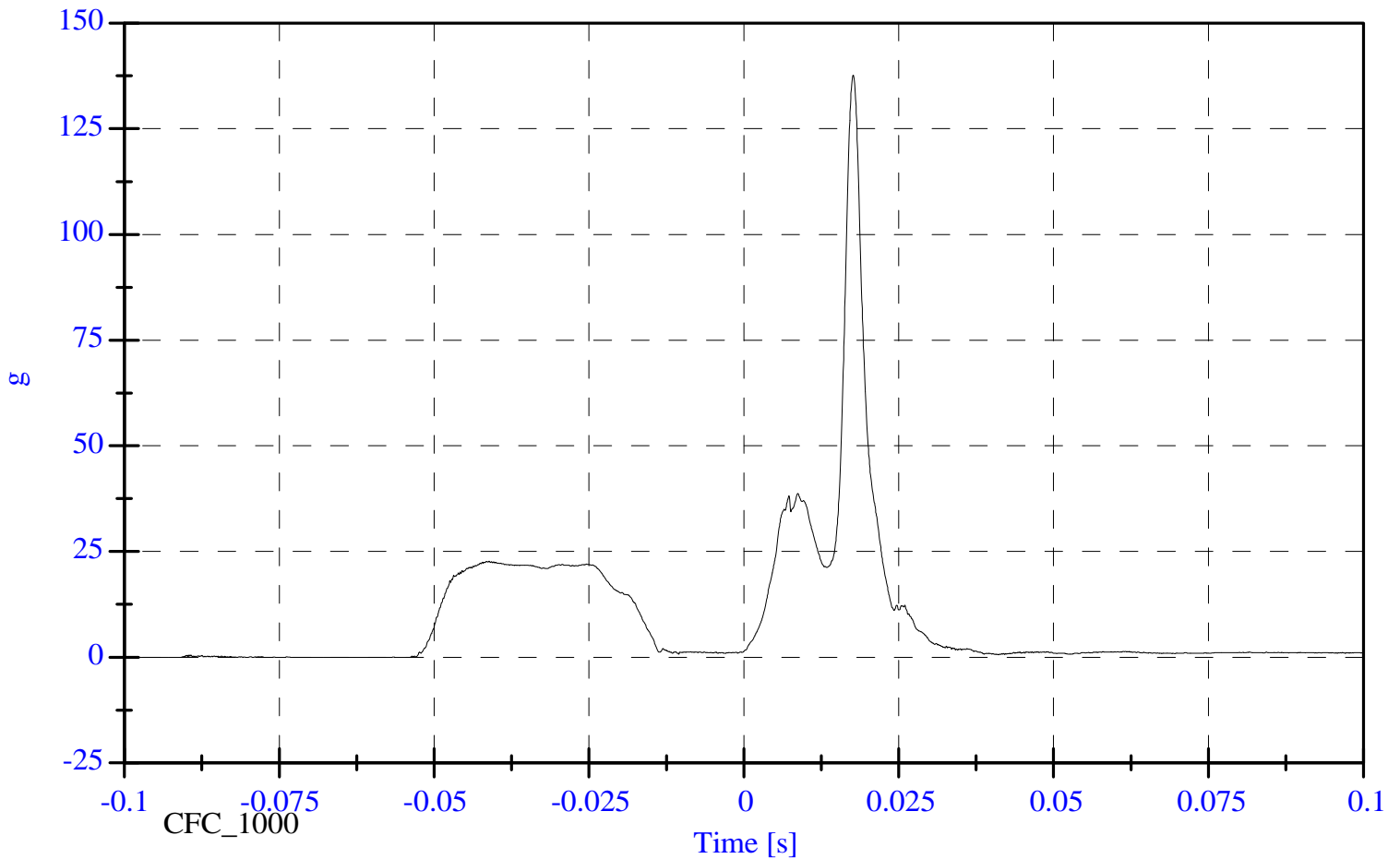
Maximum: 137.7 g

FMVSS 201UI 2007 Pontiac Torrent

Headform Resultant

Max: 137.7 [g] at 0.018 [s]

Min: -0.0 [g] at -0.098 [s]

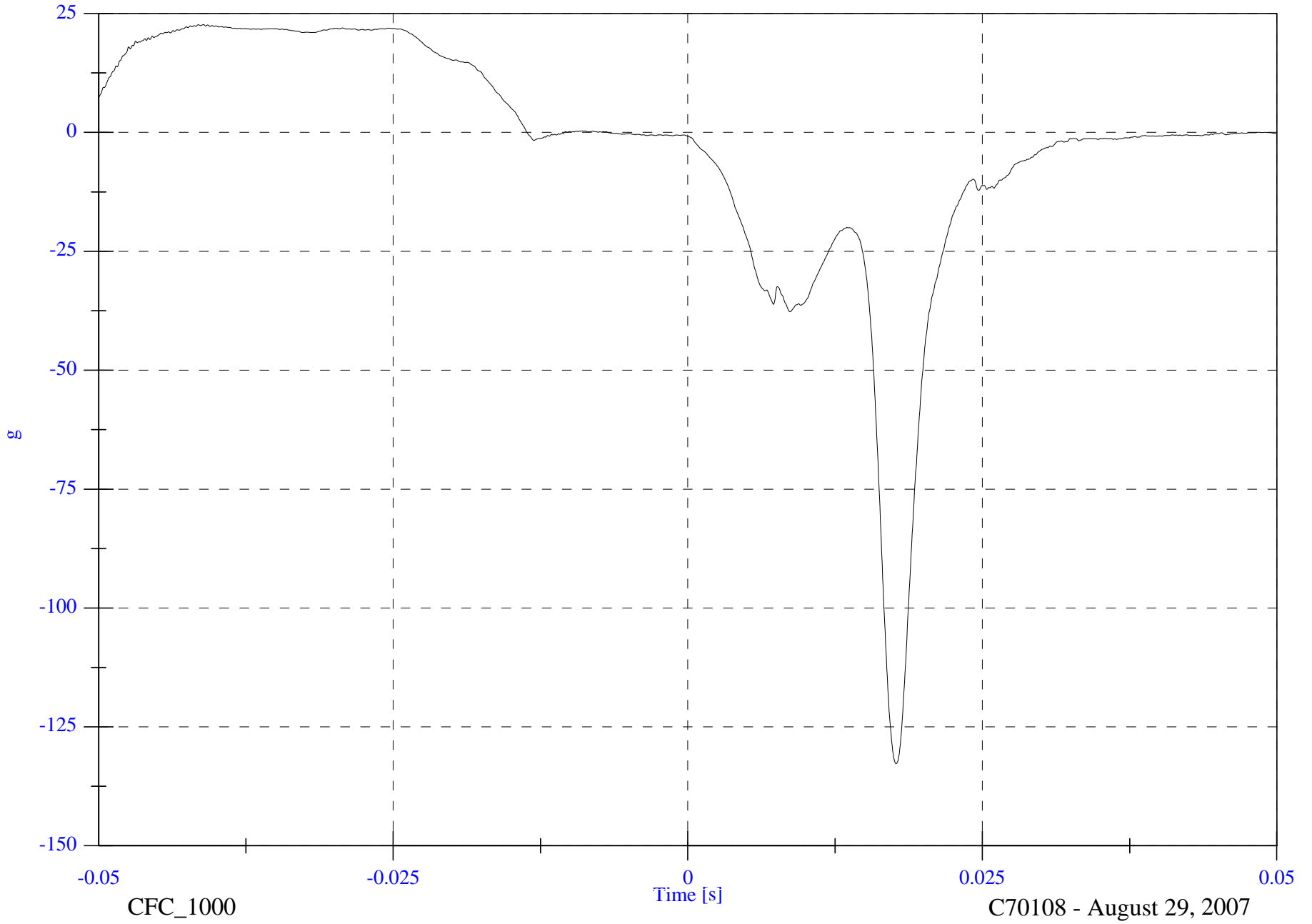


FMVSS 201UI 2007 Pontiac Torrent

Headform X Acceleration

Max: 22.7 [g] at -0.041 [s]

Min: -132.8 [g] at 0.018 [s]



C70108 DRIVER SIDE SR3 IMPACT PLOT #1

8826-FMH-07

CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

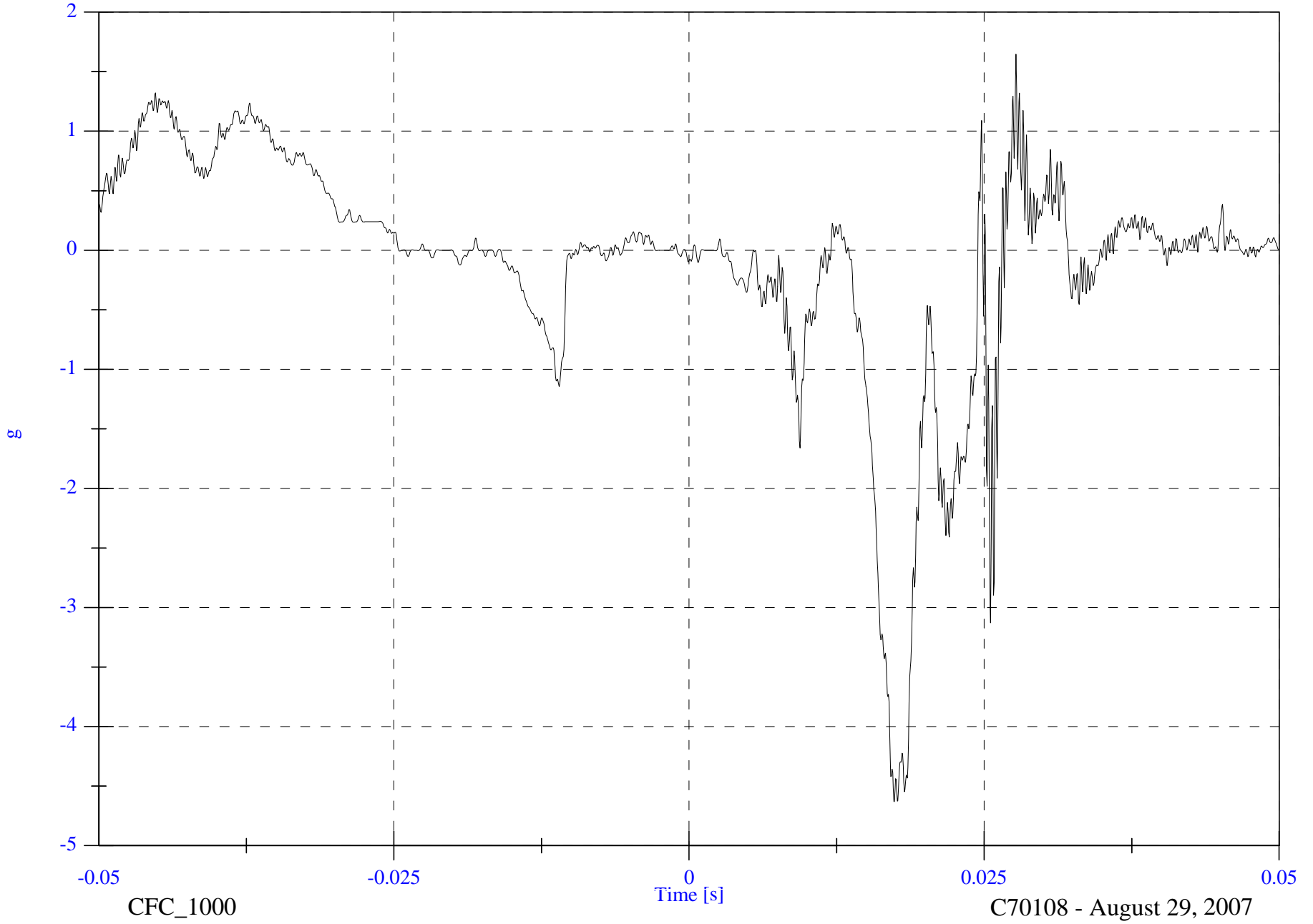
Headform Y Acceleration

Max: 1.6 [g] at 0.028 [s]

Min: -4.6 [g] at 0.017 [s]

C70108 DRIVER SIDE SR3 IMPACT PLOT #2

8826-FMH-07



FMVSS 201UI 2007 Pontiac Torrent

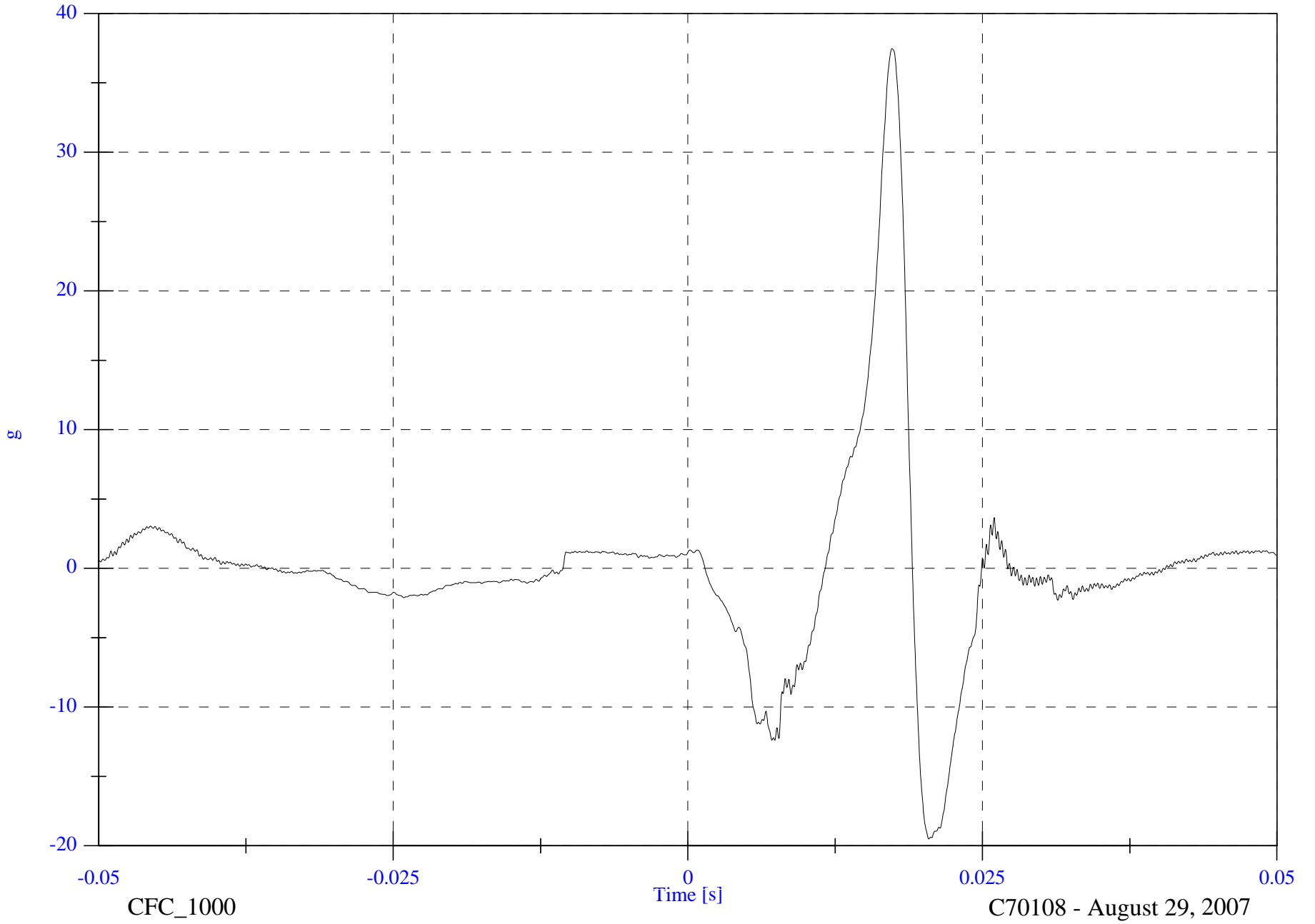
Headform Z Acceleration

Max: 37.5 [g] at 0.017 [s]

Min: -19.5 [g] at 0.020 [s]

C70108 DRIVER SIDE SR3 IMPACT PLOT #3

8826-FMH-07



FMVSS 201UI 2007 Pontiac Torrent

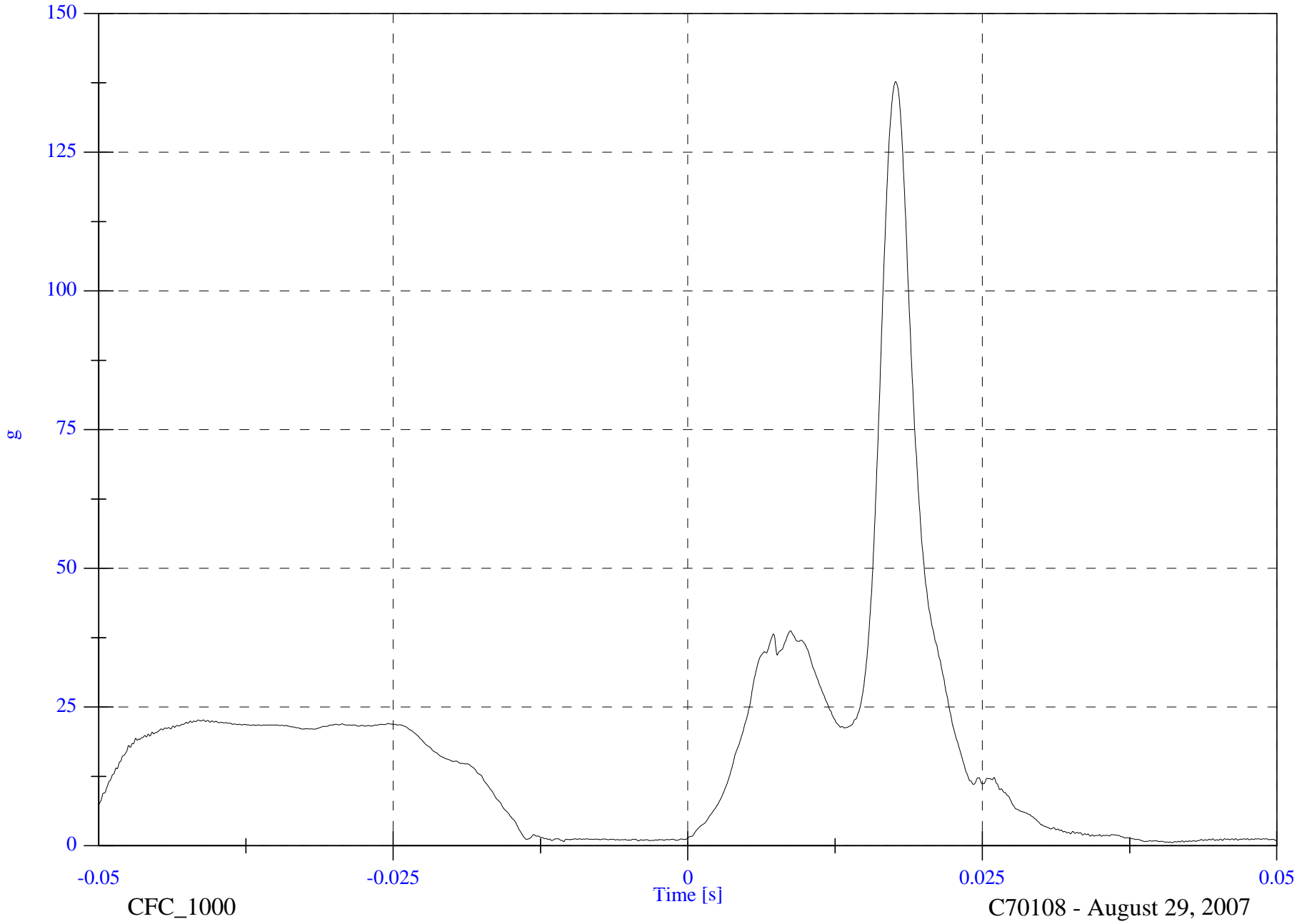
Headform Resultant

Max: 137.7 [g] at 0.018 [s]

Min: 0.5 [g] at 0.041 [s]

C70108 DRIVER SIDE SR3 IMPACT PLOT #4

8826-FMH-07

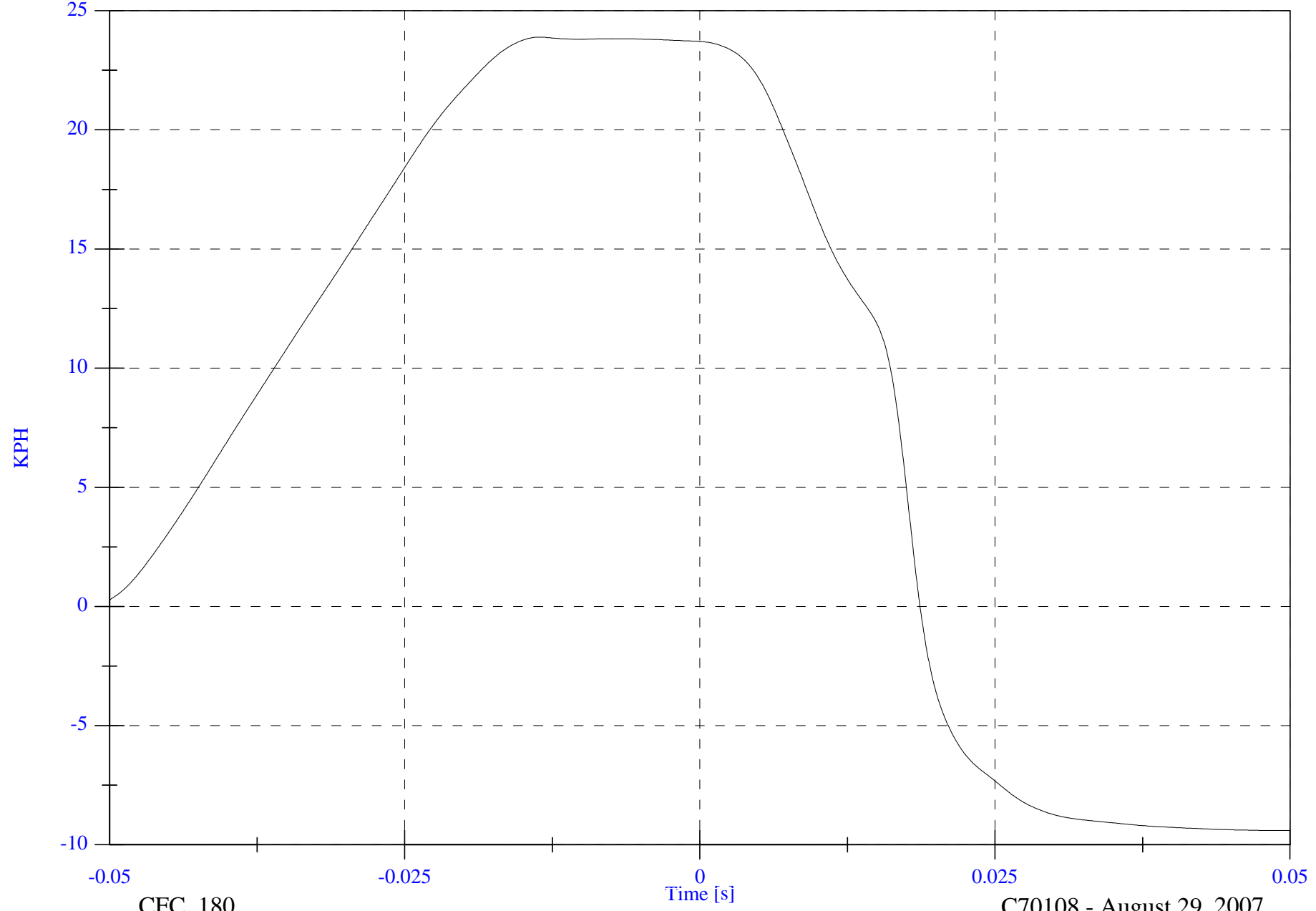


FMVSS 201UI 2007 Pontiac Torrent

Max: 23.9 [KPH] at -0.014 [s]

Min: -9.4 [KPH] at 0.050 [s]

Headform Velocity



C70108 DRIVER SIDE SR3 IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 29, 2007



PRE-IMPACT SR3

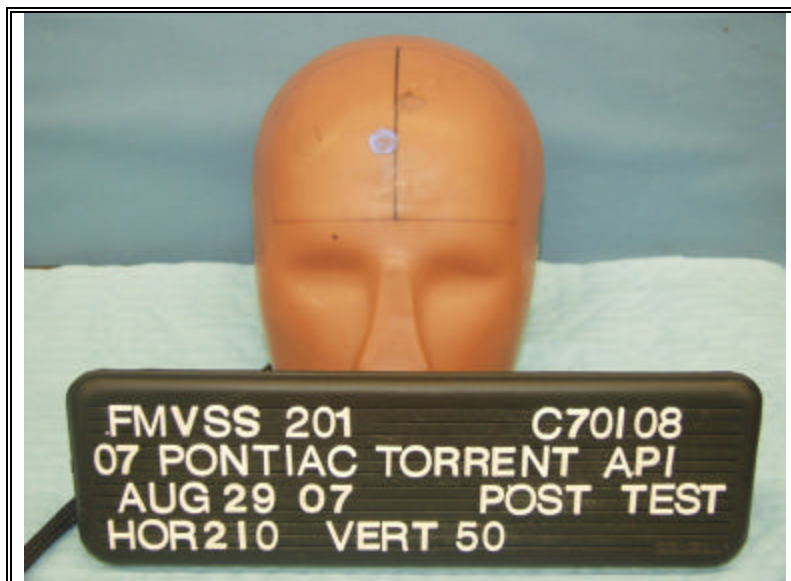


POST-IMPACT SR3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2007 Pontiac Torrent
VIN:	2CKDL63FX76073219
DATE OF MANUFACTURE:	11/06(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	12
Test Date:	08/29/07
Target Location:	A-PILLAR
Target Code:	API DRIV
Horizontal Impact Angle:	210°
Vertical Impact Angle:	50°
Ambient Temperature:	22.6 C°
Relative Humidity:	57.8
Time of Impact:	13:49
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	4	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	34	mm up	



POST-IMPACT API DRIV HEADFORM

Free Motion HIC	1179.2
HIC(d)	1056.2
Impact Velocity (kph)	23.42
HIC T1 (msec)	3.1
HIC T2 (msec)	7.4

FMVSS 201UI 2007 Pontiac Torrent C70108 - AP1

FMH Headform 0355

Location: AP1

Test Date: August 29, 2007

Work File: AP1

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

Lab Temperature: 22.6 C

HICd: 1056.2

Lab Humidity: 57.8 %

HIC (36ms): 1179.4

Velocity at Impact: 23.41 KPH

t1: 3.1 msec

t2: 7.4 msec

Free Flight Distance: 230.02 mm

Duration: 4.3 msec

Average Acceleration: 10.2 g

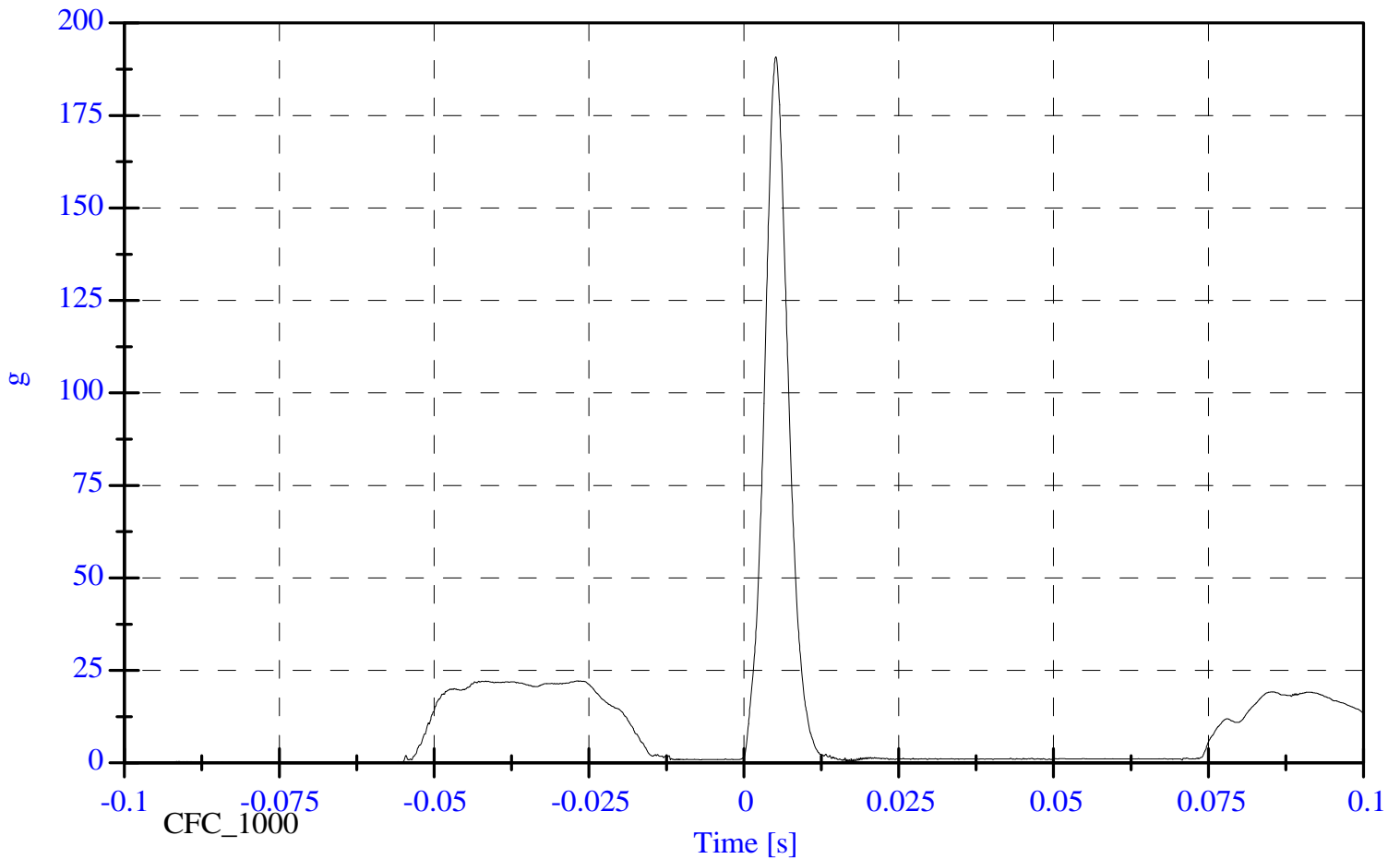
Maximum: 190.9 g

FMVSS 201UI 2007 Pontiac Torrent

Headform Resultant

Max: 190.9 [g] at 0.005 [s]

Min: 0.0 [g] at -0.068 [s]

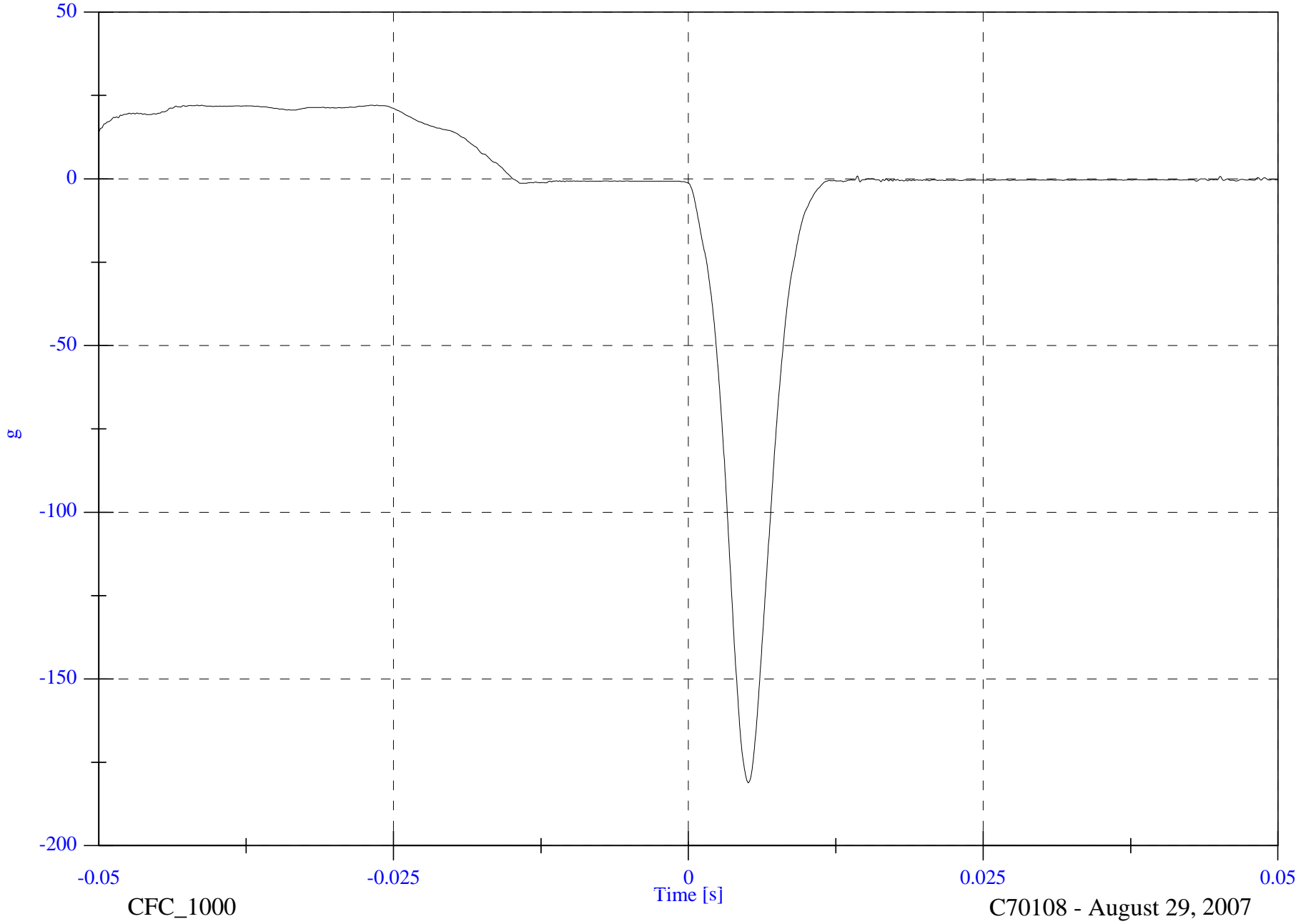


FMVSS 201UI 2007 Pontiac Torrent

Headform X Acceleration

Max: 22.1 [g] at -0.027 [s]

Min: -181.1 [g] at 0.005 [s]



C70108 DRIVER SIDE AP1 IMPACT PLOT #1

8826-FMH-07

CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

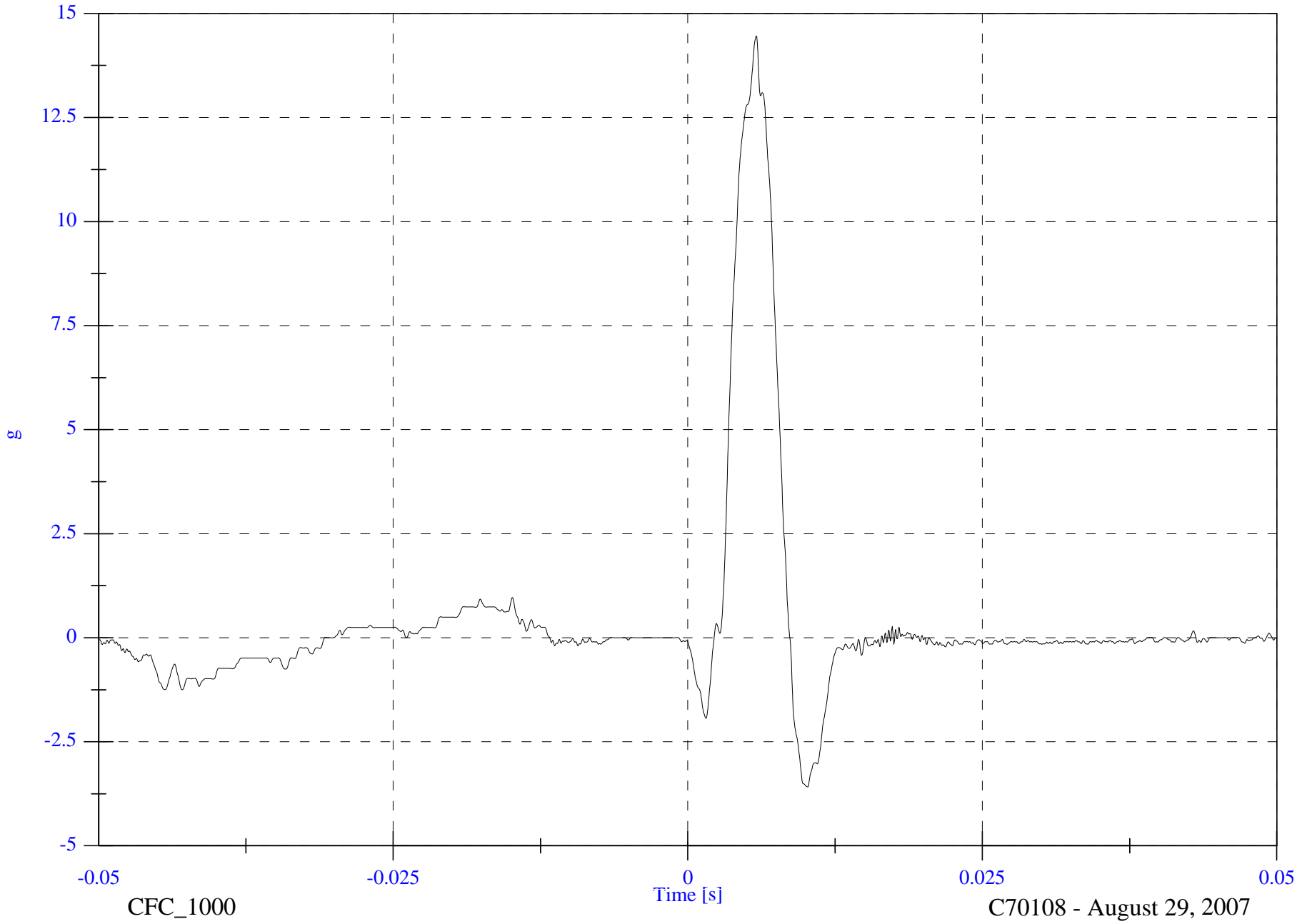
Headform Y Acceleration

Max: 14.5 [g] at 0.006 [s]

Min: -3.6 [g] at 0.010 [s]

C70108 DRIVER SIDE AP1 IMPACT PLOT #2

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

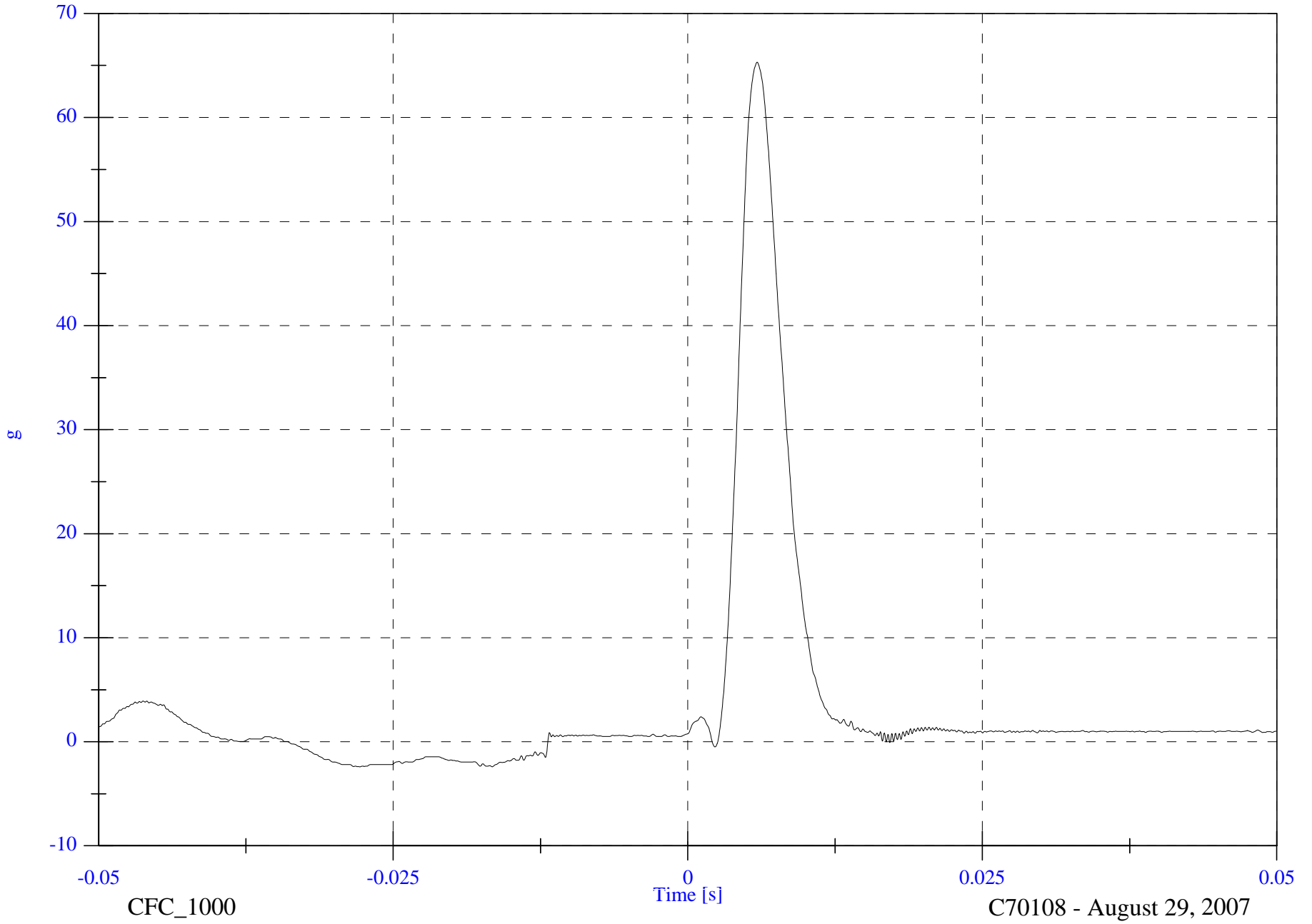
Headform Z Acceleration

Max: 65.3 [g] at 0.006 [s]

Min: -2.4 [g] at -0.028 [s]

C70108 DRIVER SIDE AP1 IMPACT PLOT #3

8826-FMH-07



CFC_1000

C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

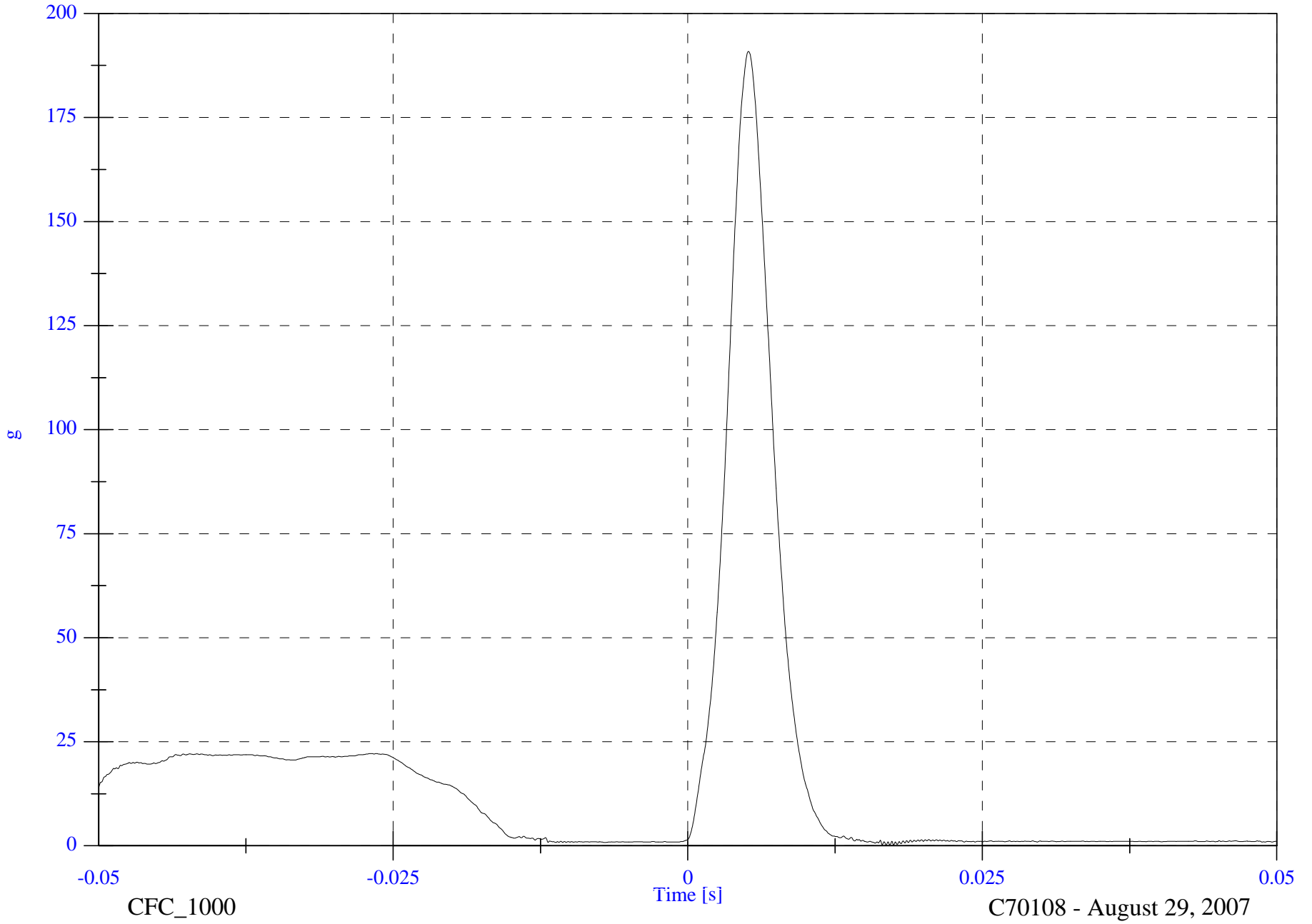
Headform Resultant

Max: 190.9 [g] at 0.005 [s]

Min: 0.1 [g] at 0.017 [s]

C70108 DRIVER SIDE AP1 IMPACT PLOT #4

8826-FMH-07



CFC_1000

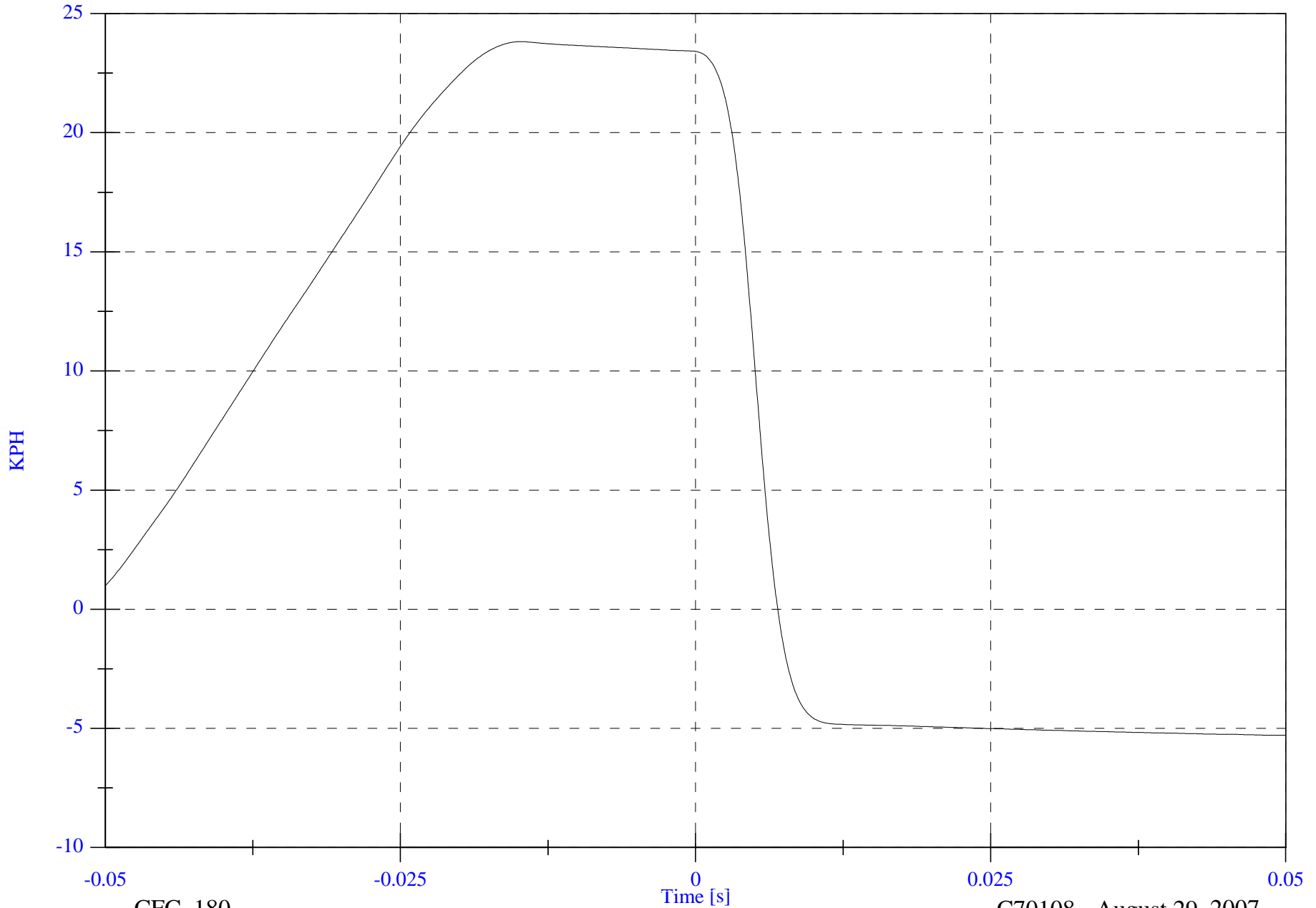
C70108 - August 29, 2007

FMVSS 201UI 2007 Pontiac Torrent

Max: 23.8 [KPH] at -0.015 [s]

Min: -5.3 [KPH] at 0.050 [s]

Headform Velocity

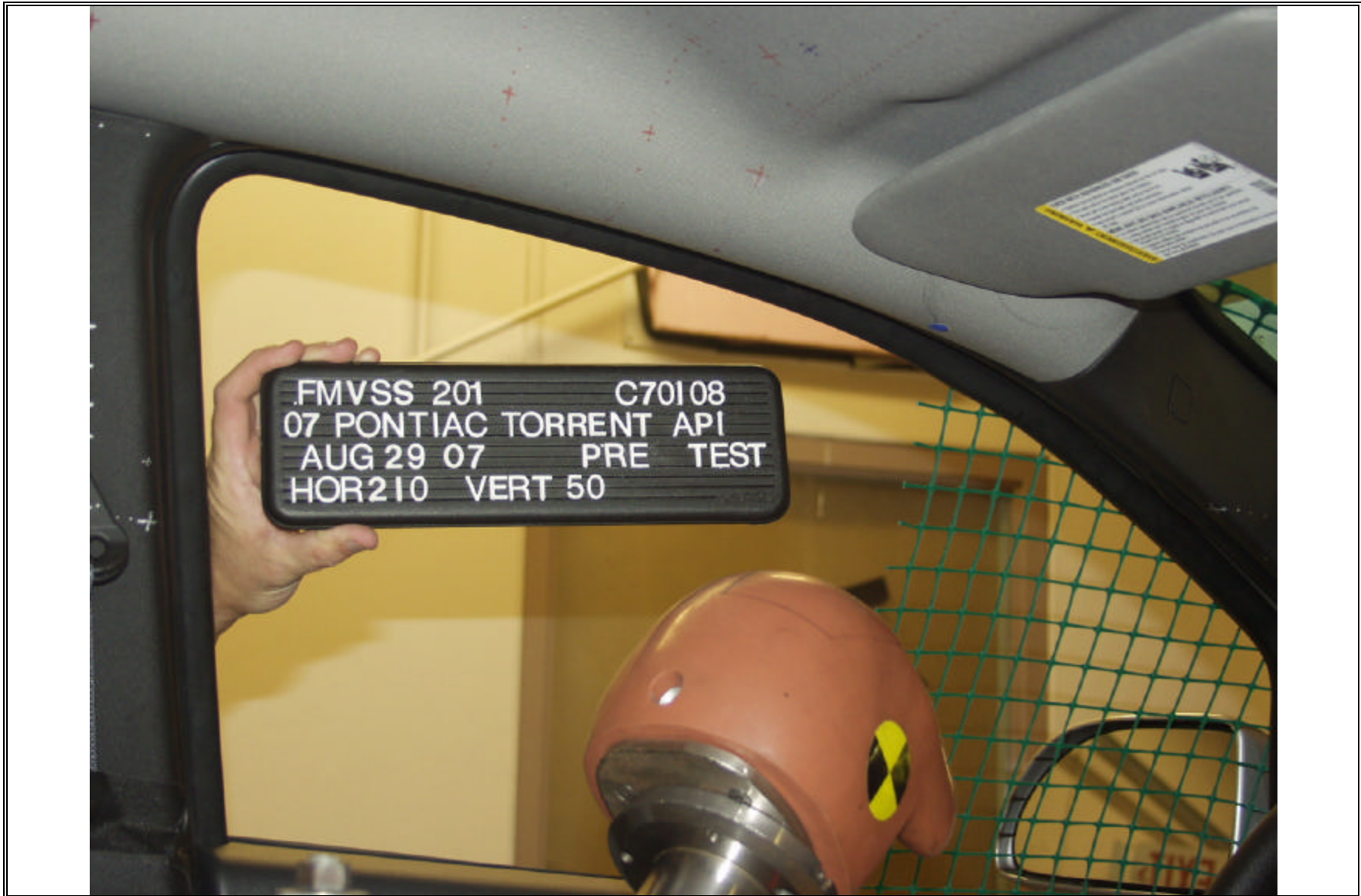


C70108 DRIVER SIDE AP1 IMPACT PLOT #5

8826-FMH-07

CFC_180

C70108 - August 29, 2007



PRE-IMPACT API DRIV



POST-IMPACT AP1 DRIV

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPHS

FIGURE	VIEW	PAGE
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A-4	3/4 REAR VIEW FROM LEFT SIDE OF VEHICLE	A-6
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A-9	PRE-TEST DRIVER SIDE SIDE RAIL	A-11
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A-17	PRE-TEST PASSENGER SIDE OTHER PILLAR	A-19
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A-19	POST-TEST DRIVER SIDE A-PILLAR	A-21
A-20	POST-TEST DRIVER SIDE FRONT HEADER	A-22
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A-22	POST-TEST DRIVER SIDE B-PILLAR	A-24
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A-25	POST-TEST PASSENGER SIDE A-PILLAR	A-27
A-26	POST-TEST PASSENGER SIDE FRONT HEADER	A-28
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A-28	POST-TEST PASSENGER SIDE B-PILLAR	A-30
A-29	POST-TEST PASSENGER SIDE OTHER PILLAR	A-31
A-30	POST-TEST PASSENGER SIDE REAR PILLAR	A-32



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



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

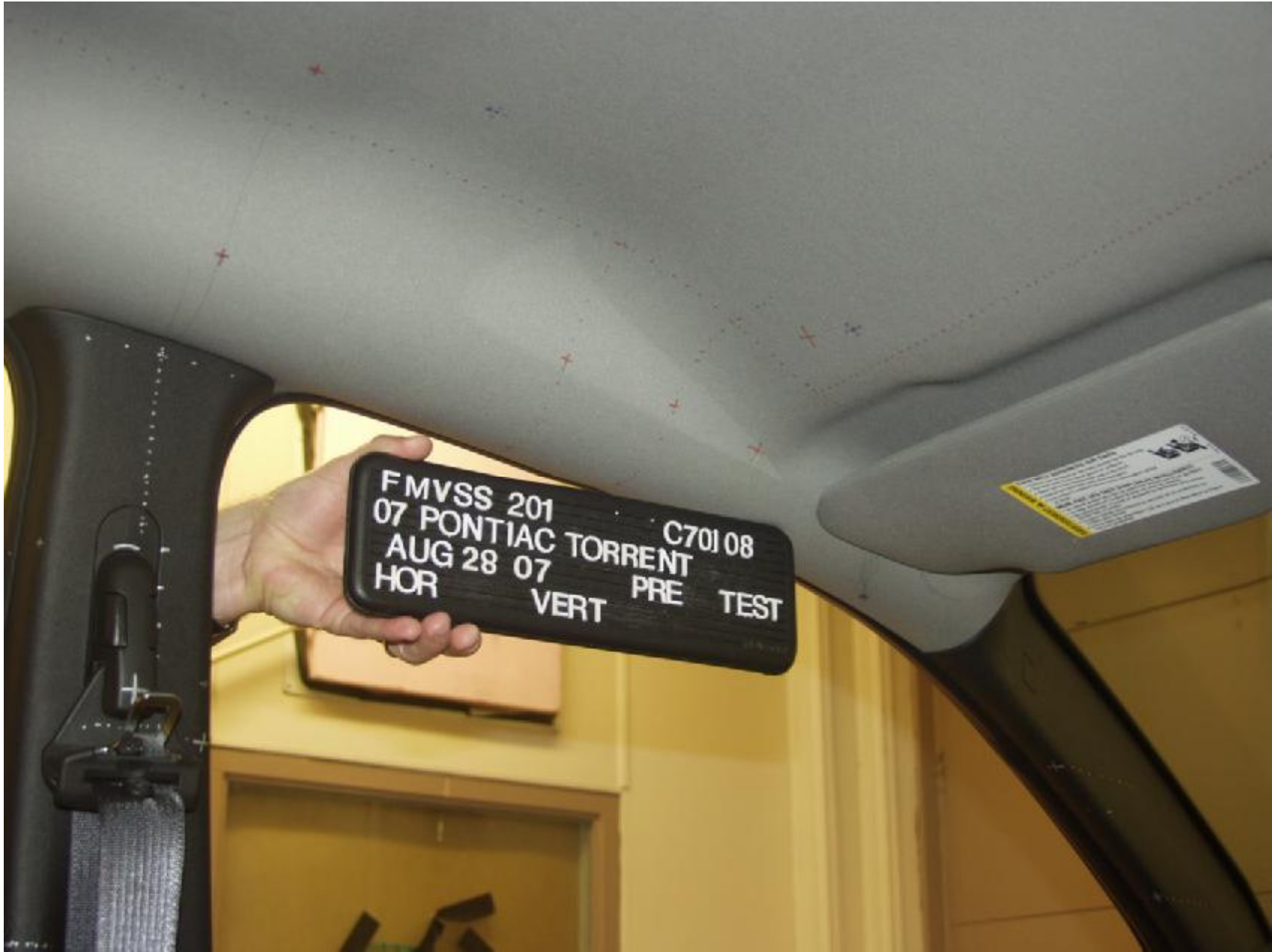


Figure A-9 : PRE-TEST DRIVER SIDE SIDE RAIL



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



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



Figure A-12 : PRE-TEST DRIVER SIDE REAR PILLAR



Figure A-13 : PRE-TEST PASSENGER SIDE A-PILLAR



Figure A-14 : PRE-TEST PASSENGER SIDE FRONT HEADER



Figure A-15 : PRE-TEST PASSENGER SIDE SIDE RAIL



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



Figure A-17 : PRE-TEST PASSENGER SIDE OTHER PILLAR



Figure A-18 : PRE-TEST PASSENGER SIDE REAR PILLAR



Figure A-19 : POST-TEST DRIVER SIDE A-PILLAR



Figure A-20 : POST-TEST DRIVER SIDE FRONT HEADER



Figure A-21 : POST-TEST DRIVER SIDE SIDE RAIL



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



Figure A-23 : POST-TEST DRIVER SIDE OTHER PILLAR



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



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



Figure A-26 : POST-TEST PASSENGER SIDE FRONT HEADER



Figure A-27 : POST-TEST PASSENGER SIDE SIDE RAIL



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



Figure A-29 : POST-TEST PASSENGER SIDE OTHER PILLAR



Figure A-30 : POST-TEST PASSENGER 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 Calspan Corporation. A summary of the test results are included in this Appendix.

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

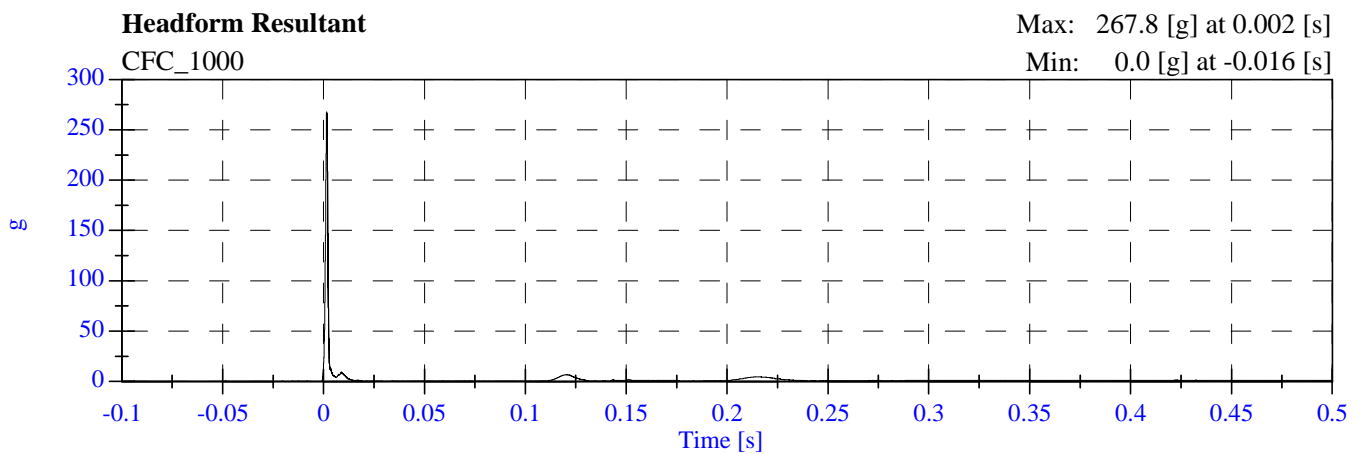
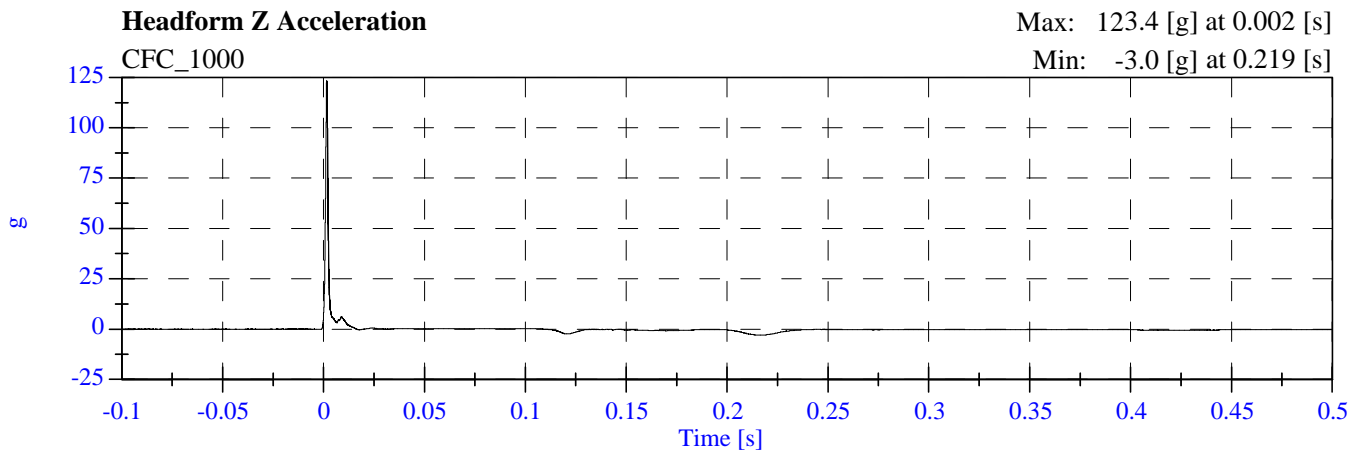
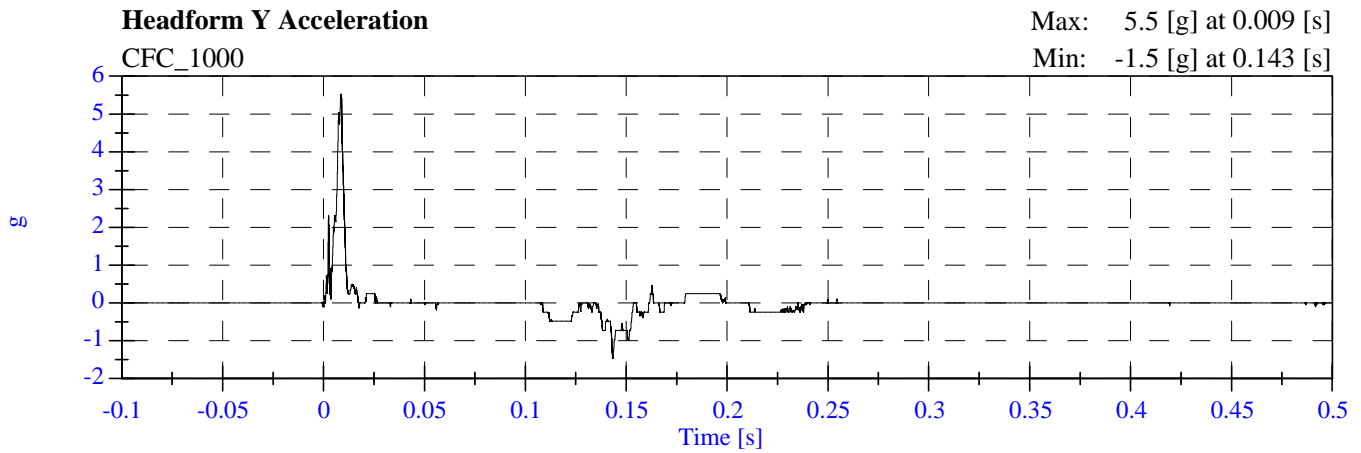
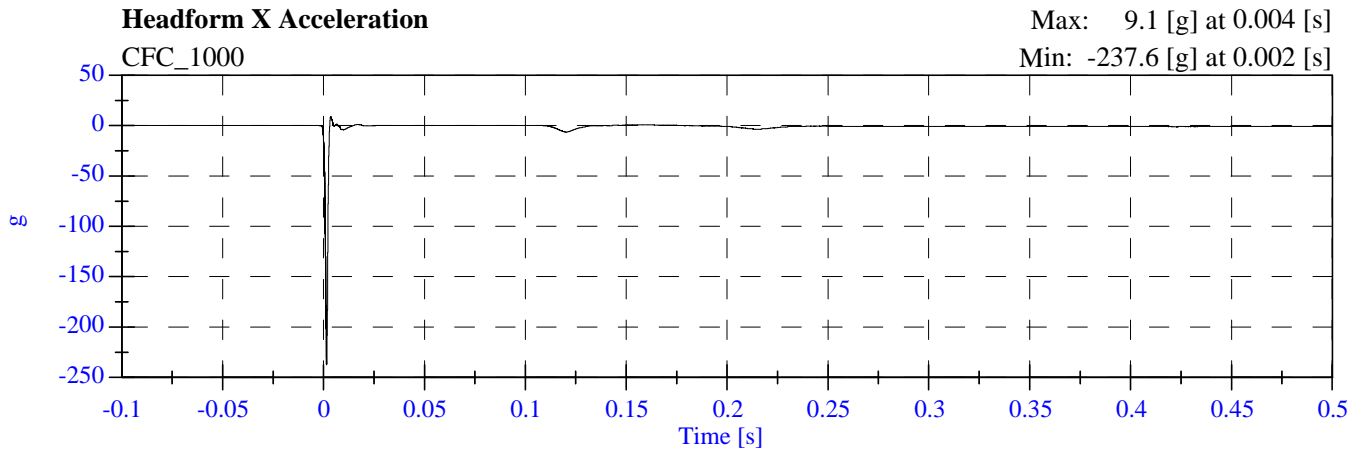
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SERIAL NUMBER:		0642	
CALIBRATION DATE:		AUGUST 9, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20.8	
RELATIVE HUMIDITY	10% to 70%	61	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	267.8	
PEAK LATERAL ACCELERATION	15 Gs Maximum	5.5	
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	J24876	7/10/2007	1/11/2008
2 - LATERAL	ENDEVCO	7264-2000T	J33030	7/10/2007	1/11/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	7/10/2007	1/11/2008

REMARKS:

FMVSS 201UI - Headform 0642 Calibration Pre-Test C70108 - August 09, 2007



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

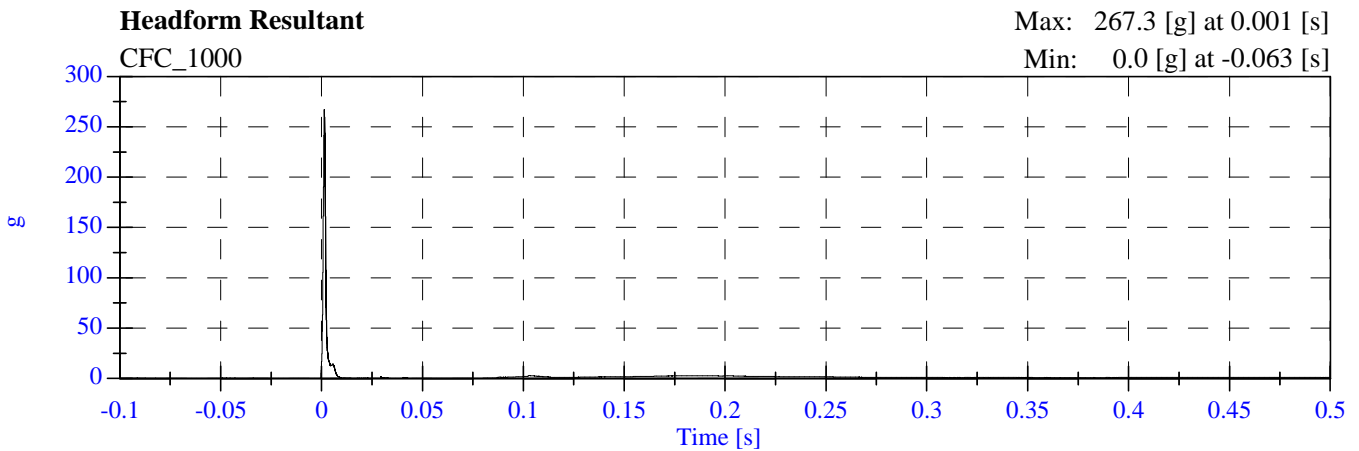
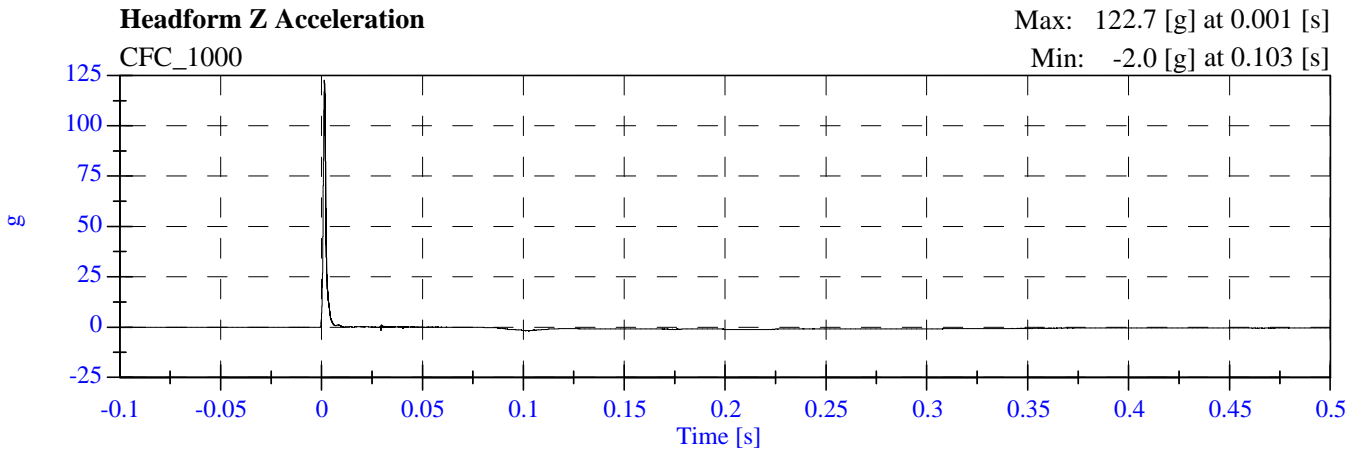
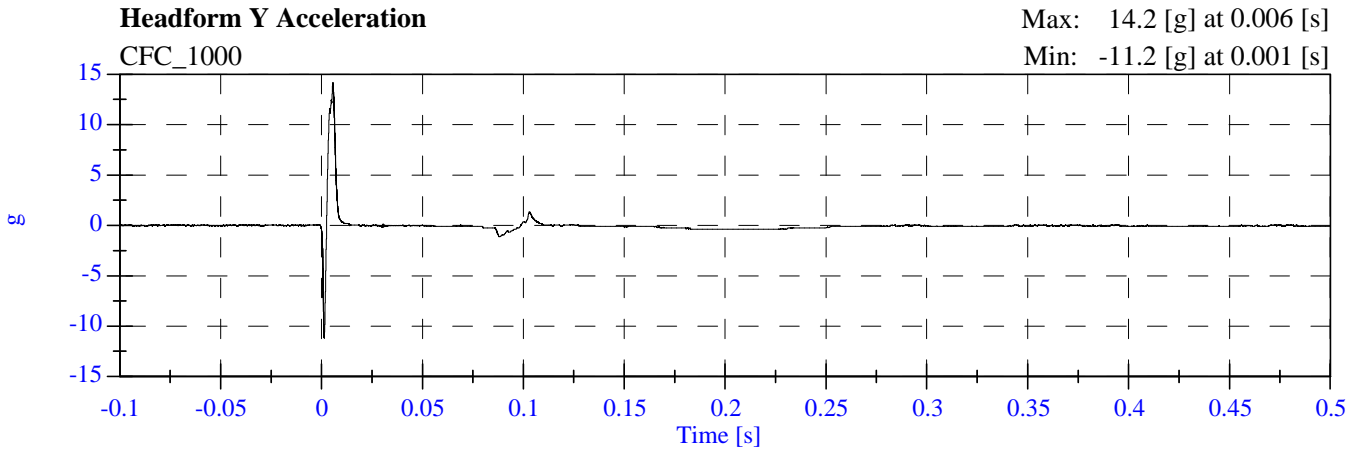
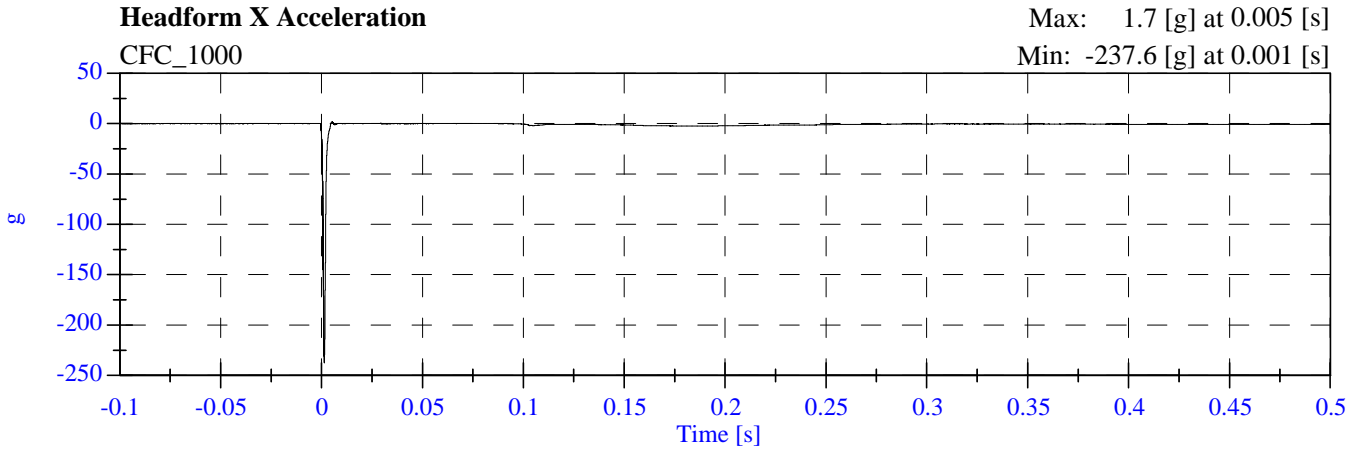
MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		AUGUST 9, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20.8	
RELATIVE HUMIDITY	10% to 70%	61	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	267.3	
PEAK LATERAL ACCELERATION	15 Gs Maximum	14.2	
IS ACCELERATION 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	J33127	7/10/2007	1/11/2008
2 - LATERAL	ENDEVCO	7264-2000T	J33019	7/10/2007	1/11/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	7/10/2007	1/11/2008

REMARKS:

FMVSS 201UI - Headform 0062 Calibration Pre-Test C70108 - August 09, 2007



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

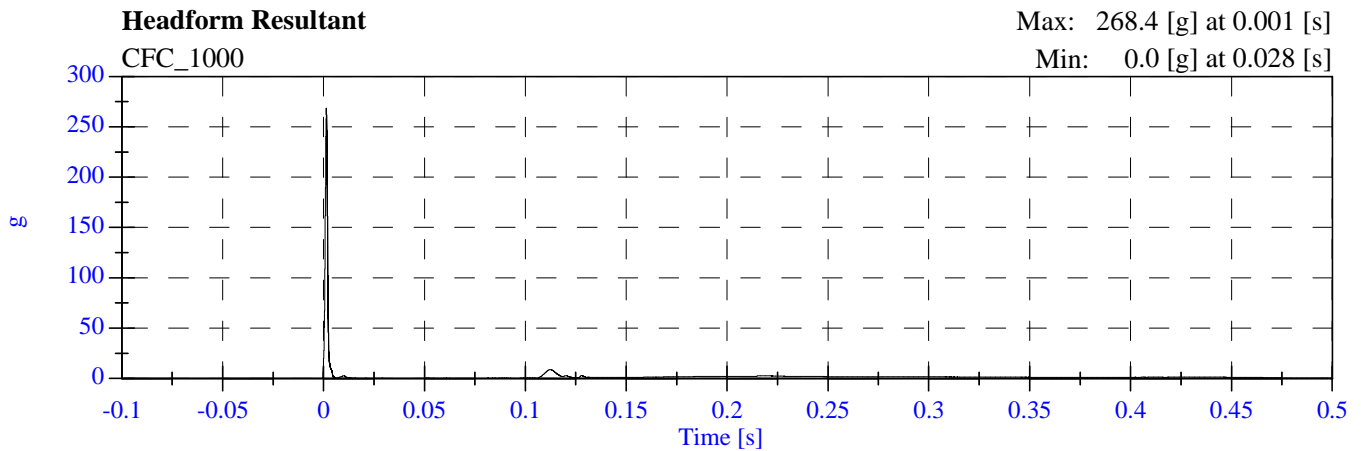
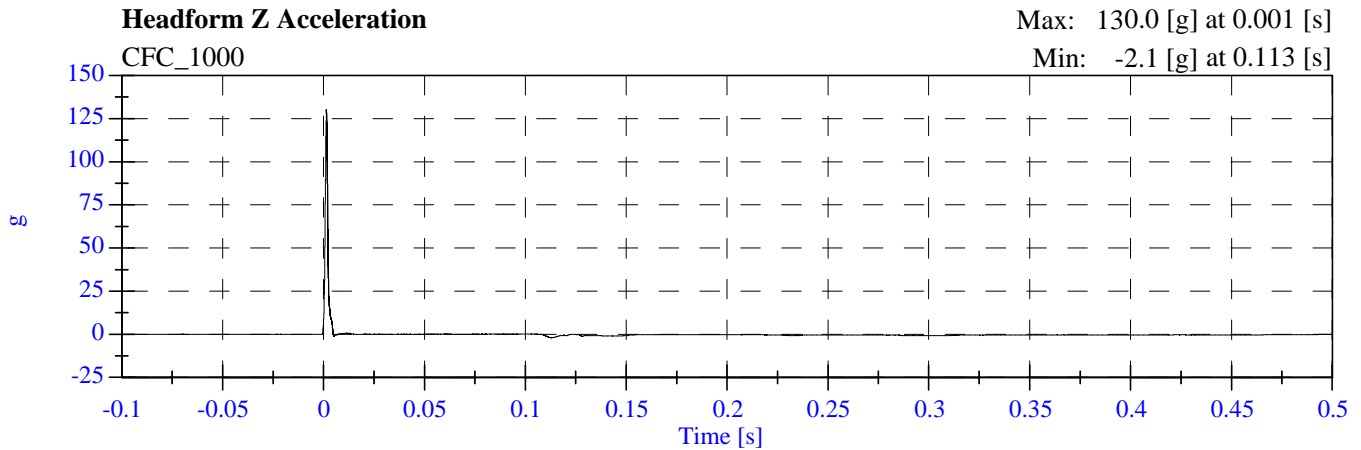
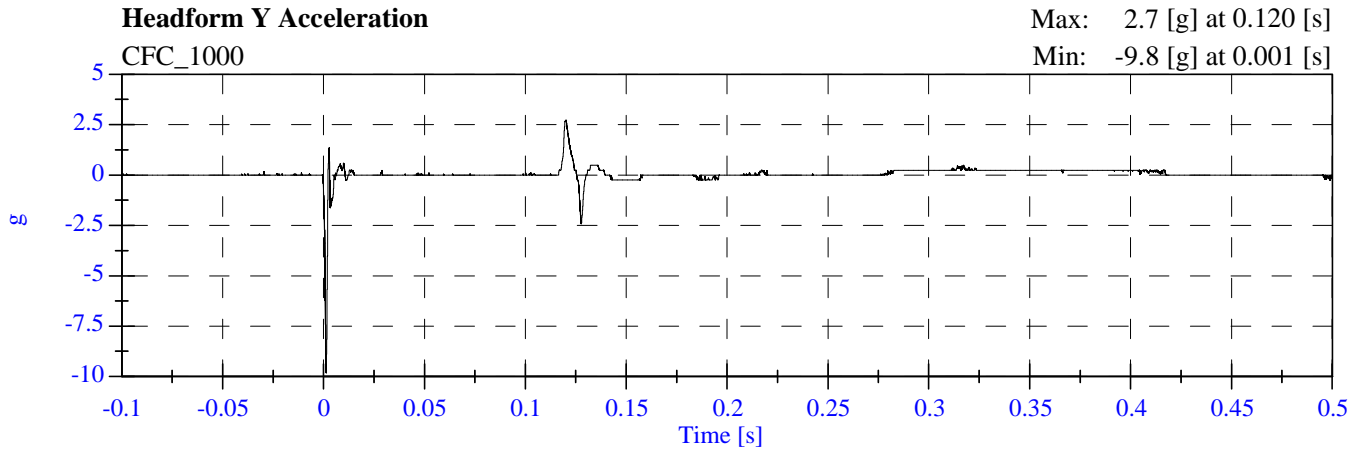
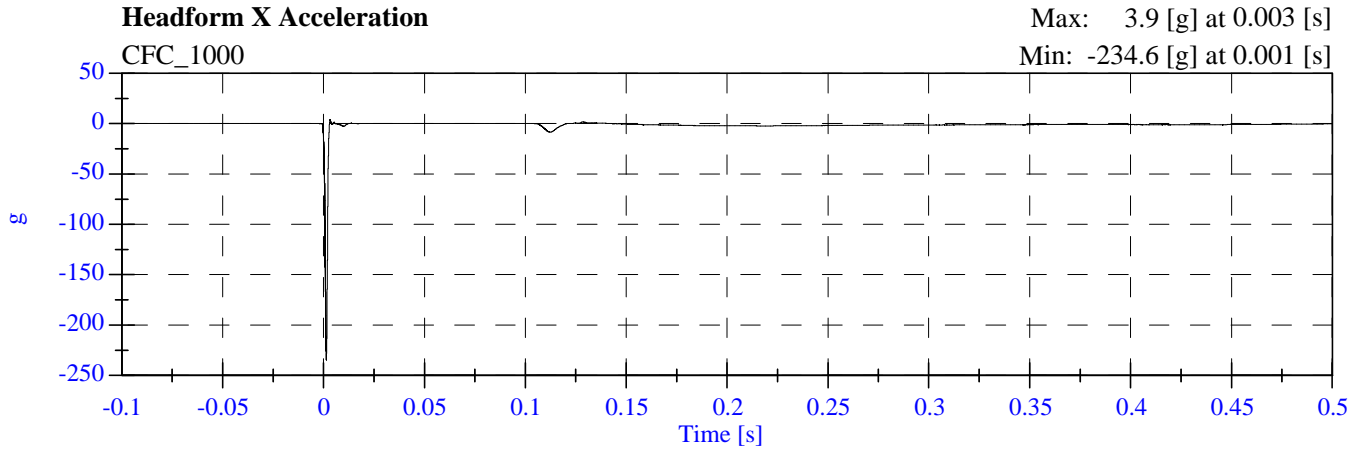
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SERIAL NUMBER:		805	
CALIBRATION DATE:		AUGUST 9, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20.8	
RELATIVE HUMIDITY	10% to 70%	61	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	268.4	
PEAK LATERAL ACCELERATION	15 Gs Maximum	9.8	
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	J41004	7/10/2007	1/11/2008
2 - LATERAL	ENDEVCO	7264-2000T	J37496	7/10/2007	1/11/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J41016	7/10/2007	1/11/2008

REMARKS:

FMVSS 201UI - Headform 0805 Calibration Pre-Test C70108 - August 09, 2007



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

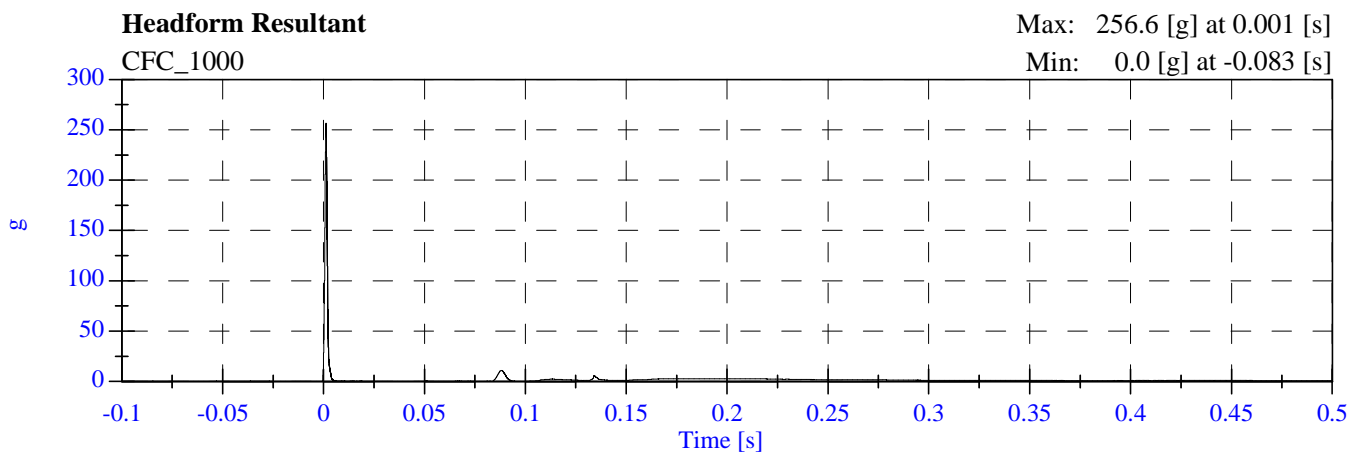
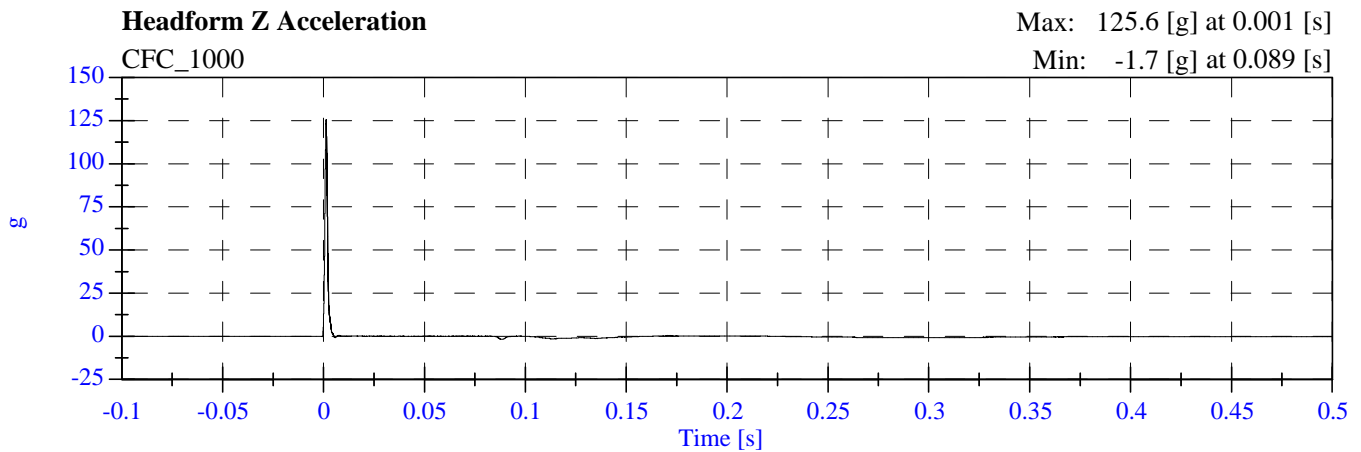
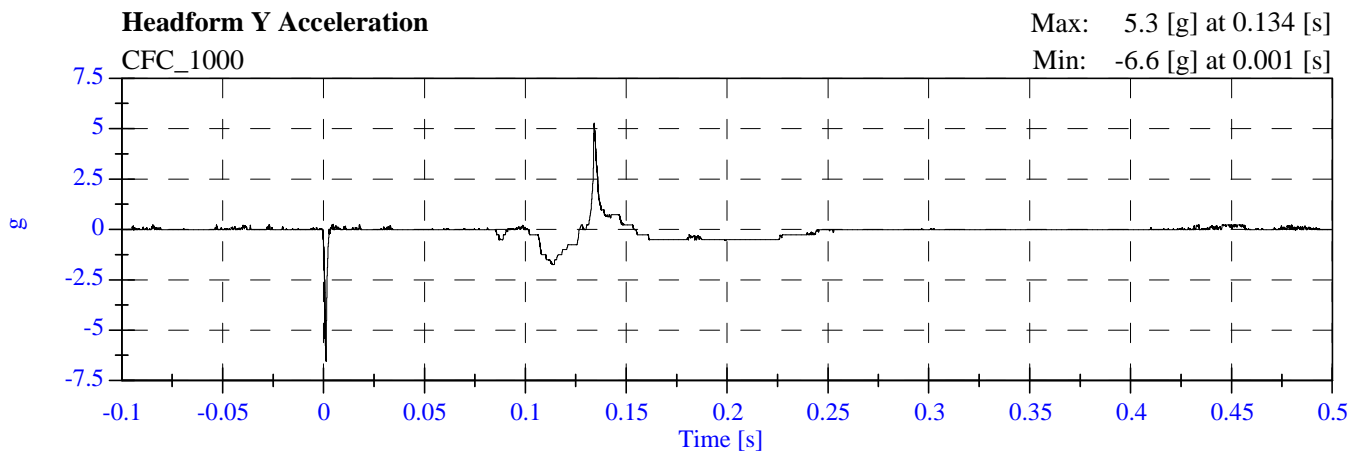
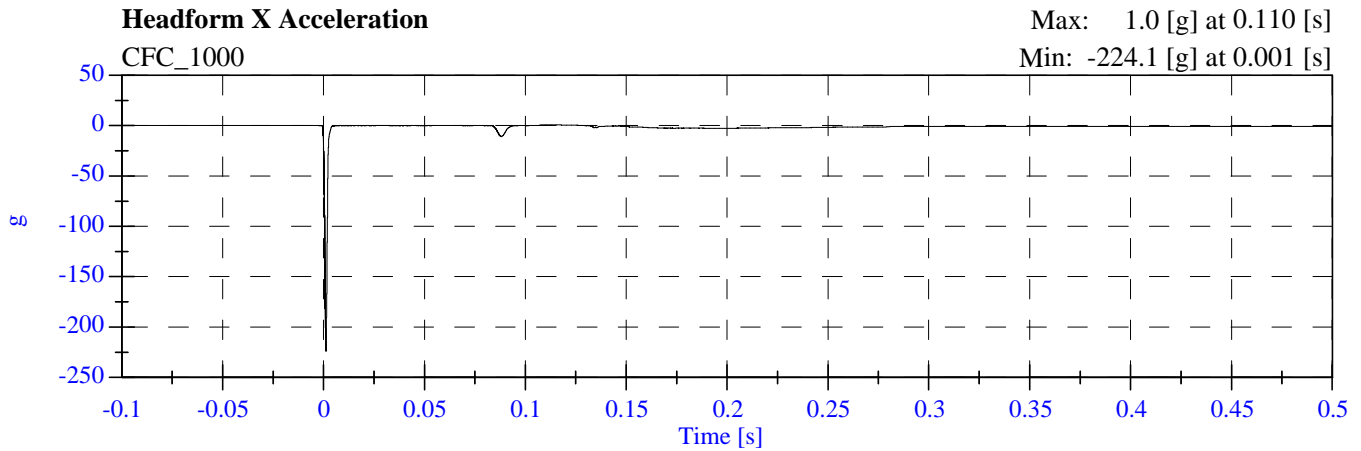
MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		AUGUST 9, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20.8	
RELATIVE HUMIDITY	10% to 70%	61	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	256.6	
PEAK LATERAL ACCELERATION	15 Gs Maximum	6.6	
IS ACCELERATION 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	7/18/2007	1/19/2008
2 - LATERAL	ENDEVCO	7264-2000T	J32779	7/18/2007	1/19/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	7/18/2007	1/19/2008

REMARKS:

FMVSS 201UI - Headform 0355 Calibration Pre Test C70108 - August 09, 2007



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

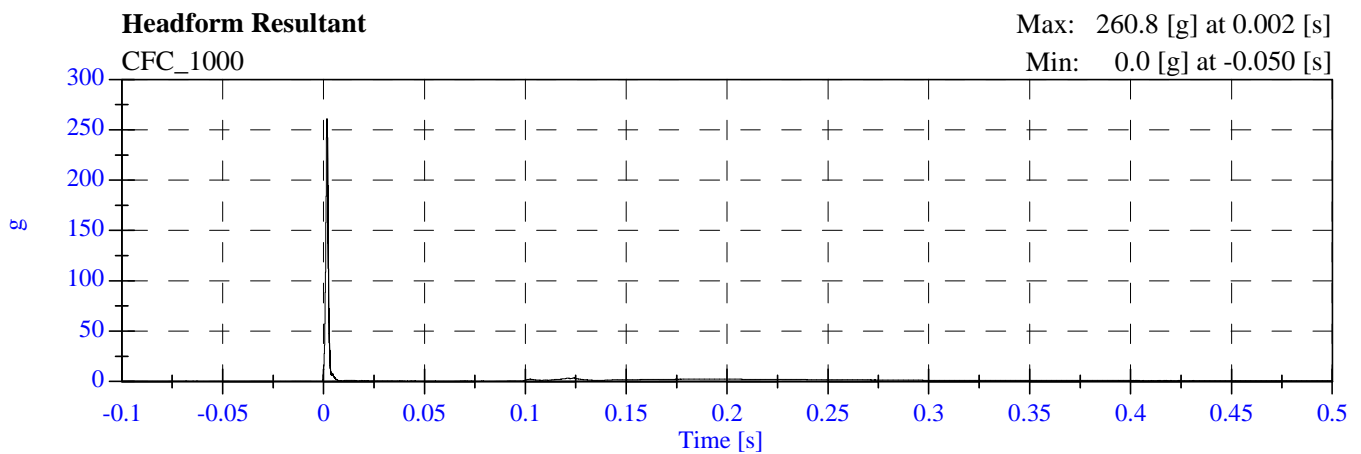
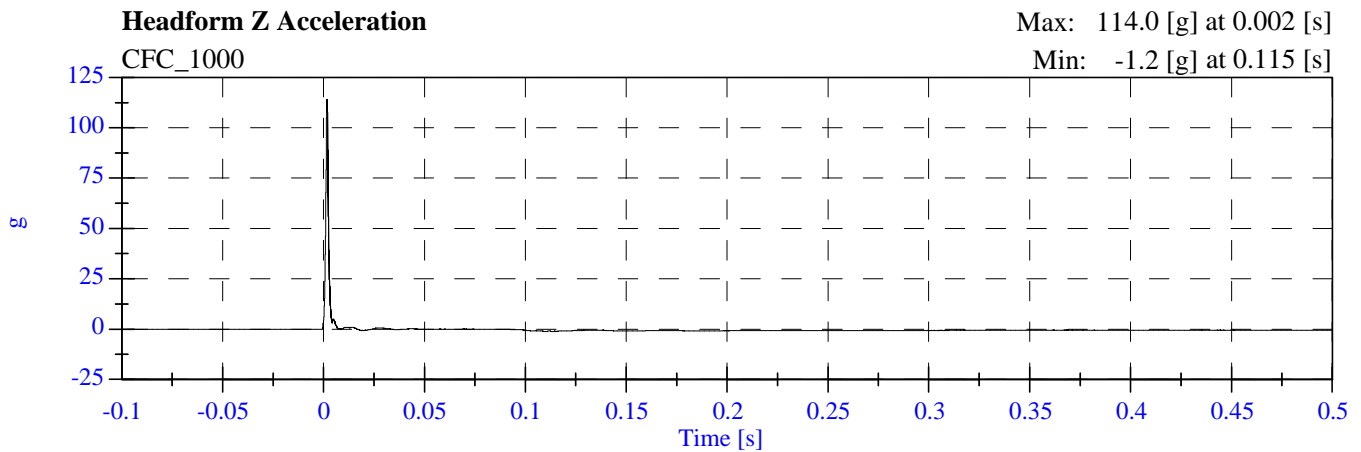
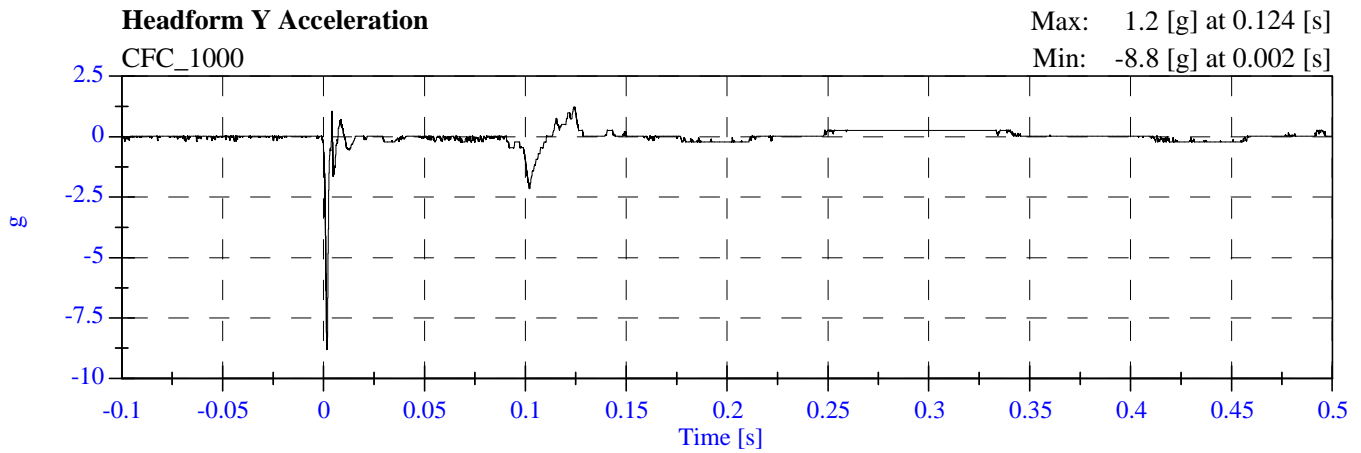
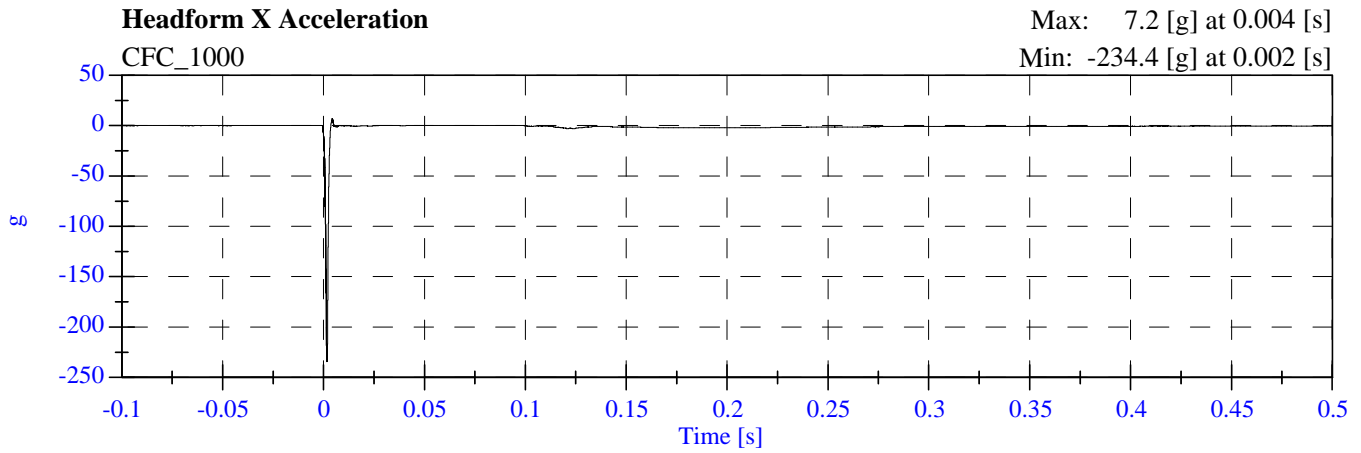
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SERIAL NUMBER:		1255	
CALIBRATION DATE:		AUGUST 9, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20.8	
RELATIVE HUMIDITY	10% to 70%	61	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	260.8	
PEAK LATERAL ACCELERATION	15 Gs 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	J41006	7/10/2007	1/11/2008
2 - LATERAL	ENDEVCO	7264-2000T	J40994	7/10/2007	1/11/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	7/10/2007	1/11/2008

REMARKS:

FMVSS 201UI - Headform 1255 Calibration PreTest C70108 - August 09, 2007



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

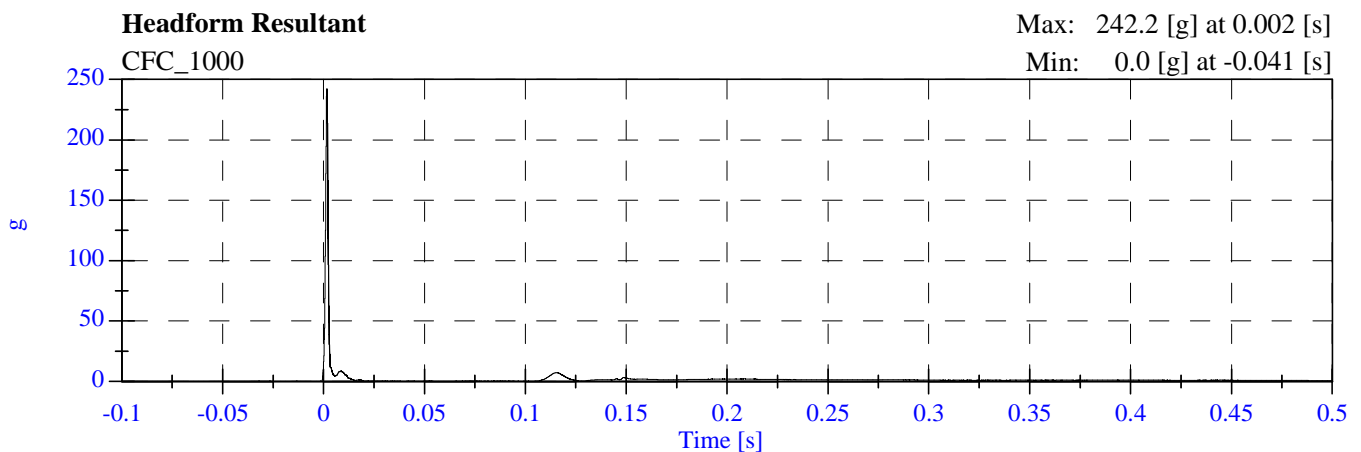
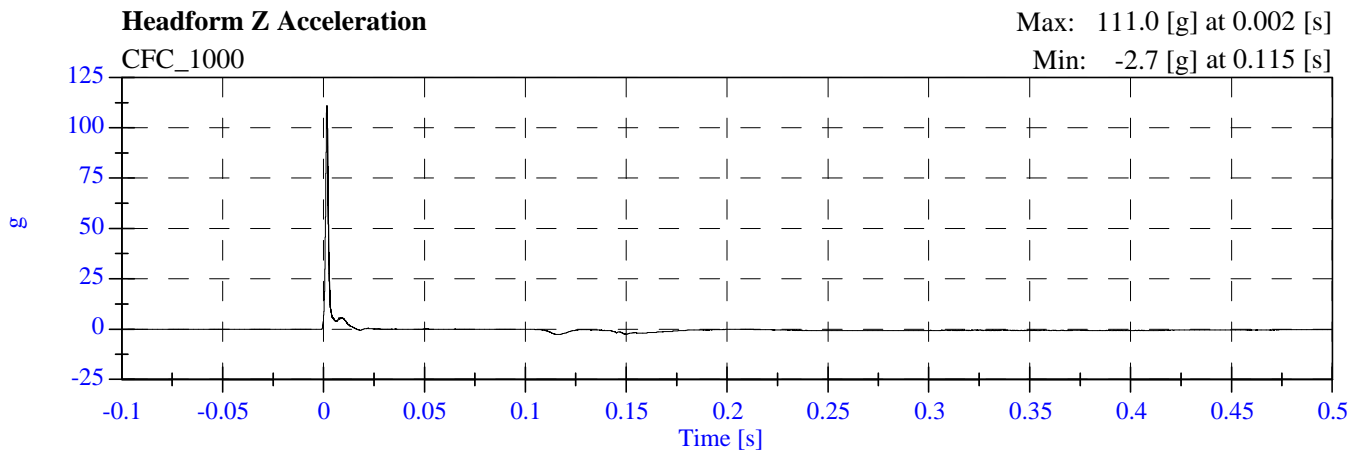
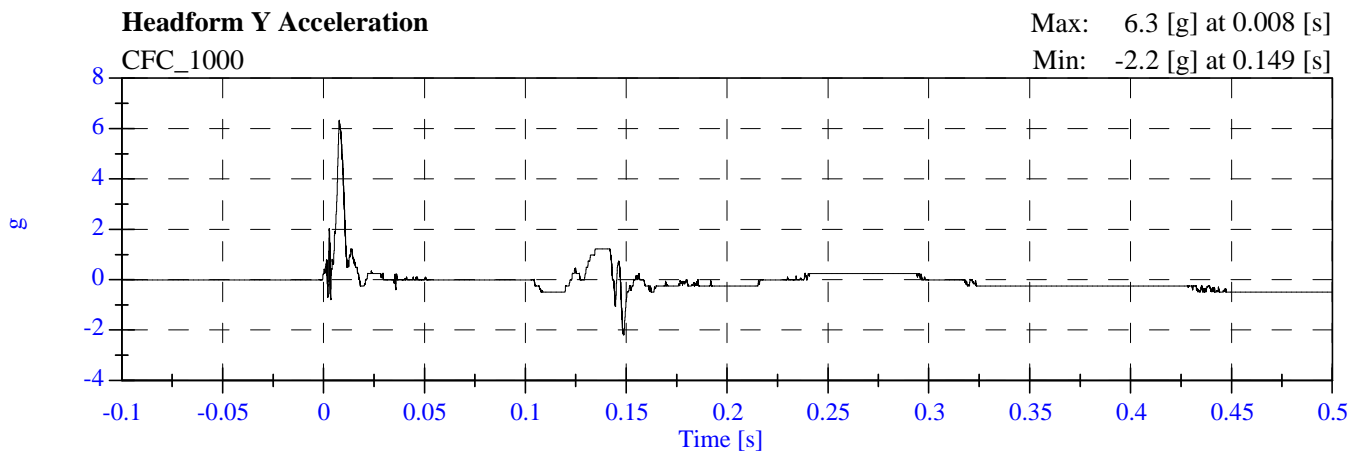
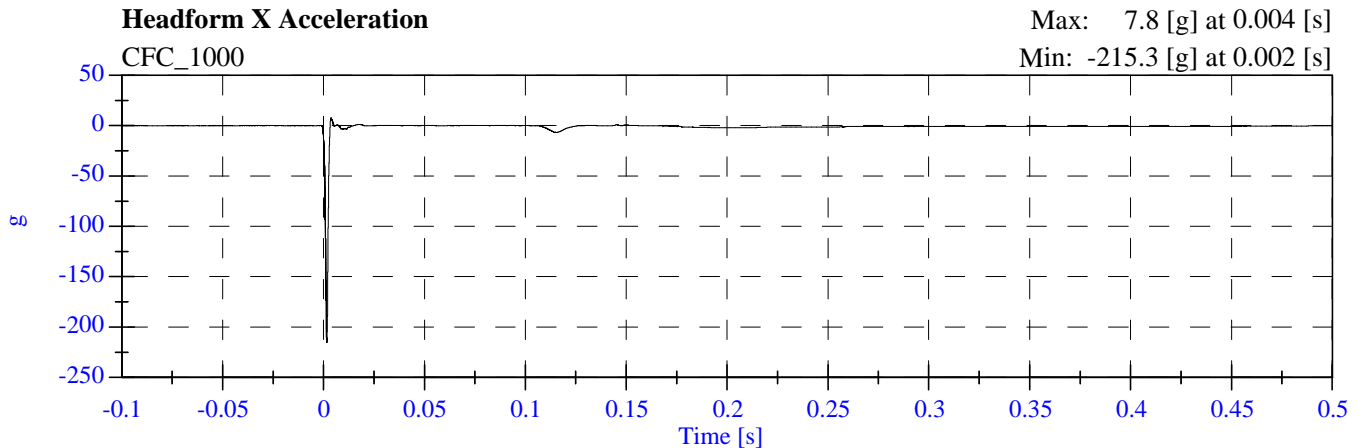
MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		0642	
CALIBRATION DATE:		AUGUST 30, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	64	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	242.2	
PEAK LATERAL ACCELERATION	15 Gs Maximum	6.3	
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	7/10/2007	1/11/2008
2 - LATERAL	ENDEVCO	7264-2000T	J33030	7/10/2007	1/11/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	7/10/2007	1/11/2008

REMARKS:

FMVSS 201U - Headform 0642 Calibration Post-Test C70108 - August 30, 2007



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

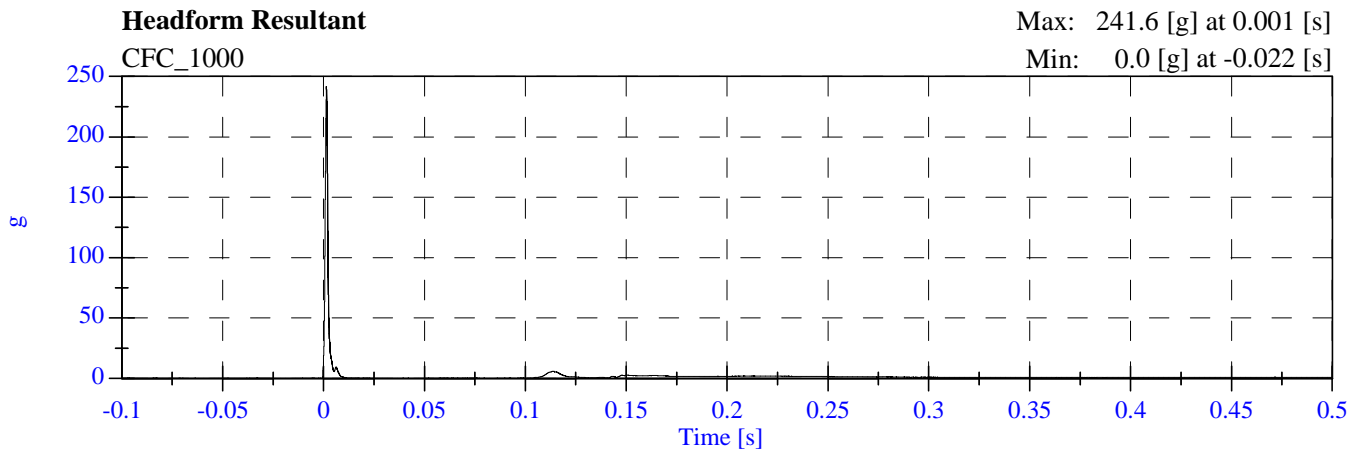
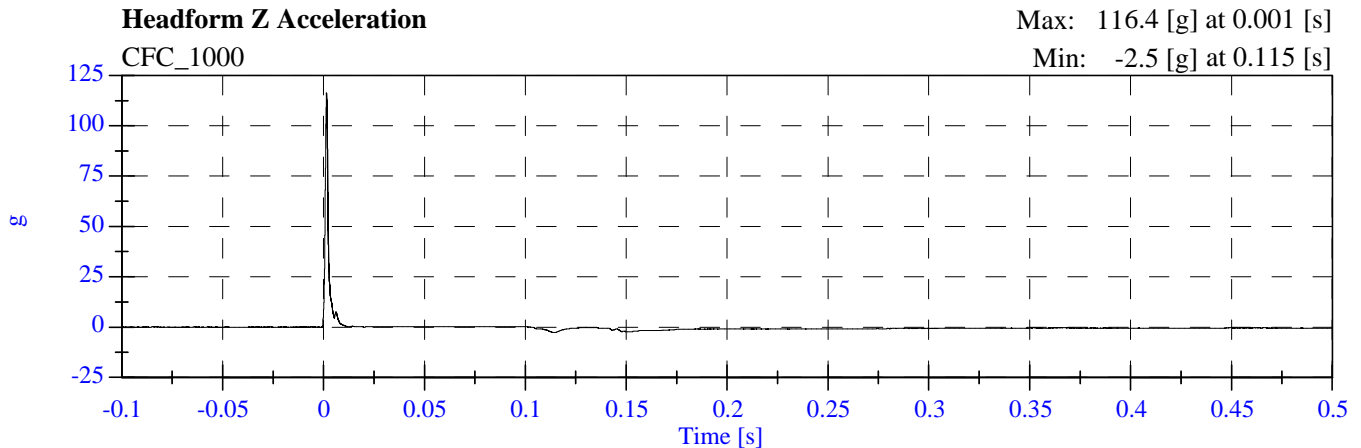
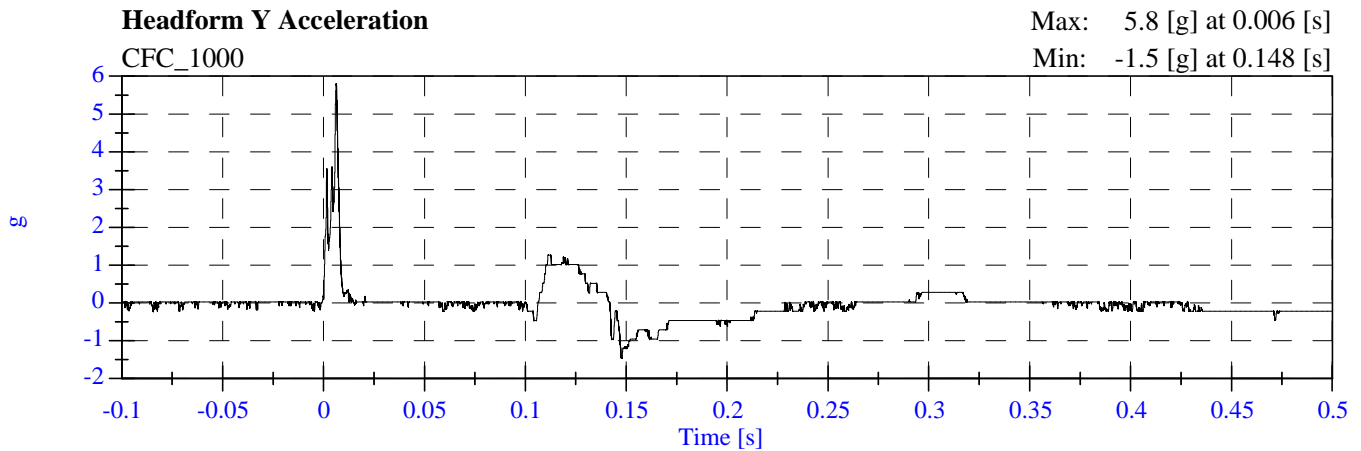
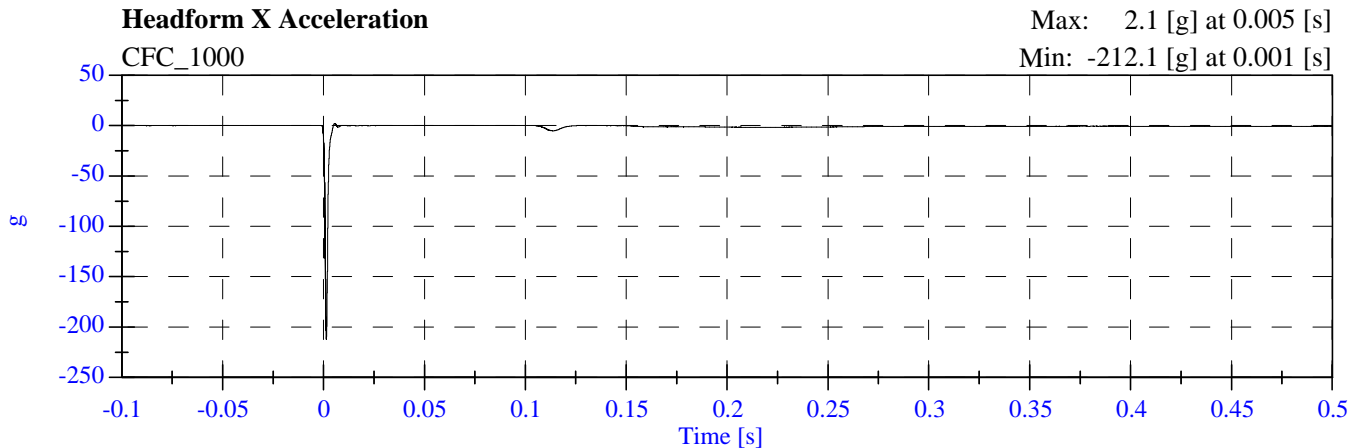
MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		AUGUST 30, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	64	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	241.6	
PEAK LATERAL ACCELERATION	15 Gs Maximum	5.8	
IS ACCELERATION 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	J41003	7/10/2007	1/11/2008
2 - LATERAL	ENDEVCO	7264-2000T	J33019	7/10/2007	1/11/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	7/10/2007	1/11/2008

REMARKS:

FMVSS 201UI - Headform 0062 Calibration Pre-Test C70108 - August 30, 2007



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

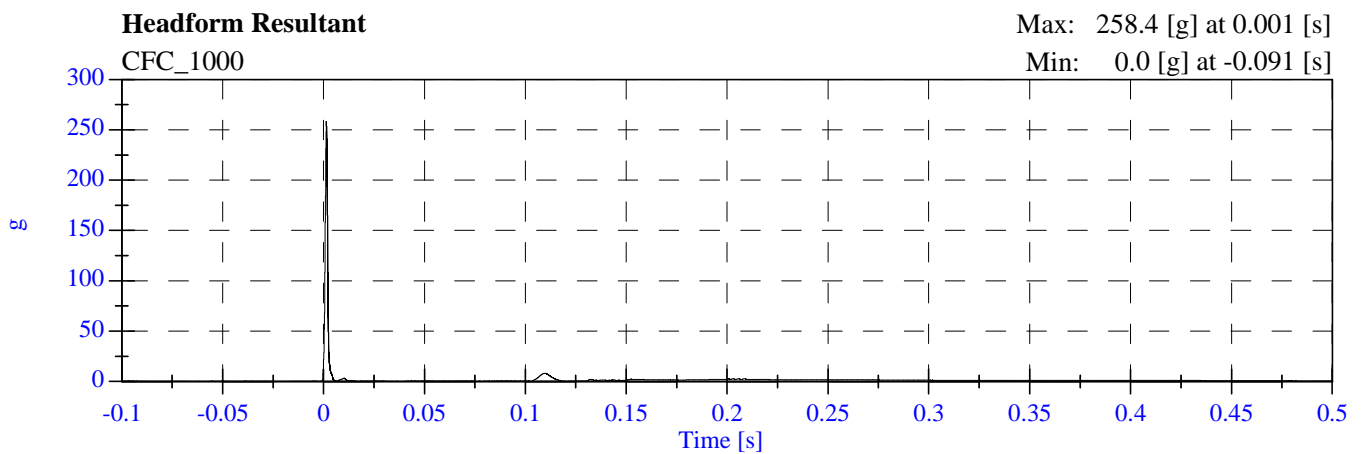
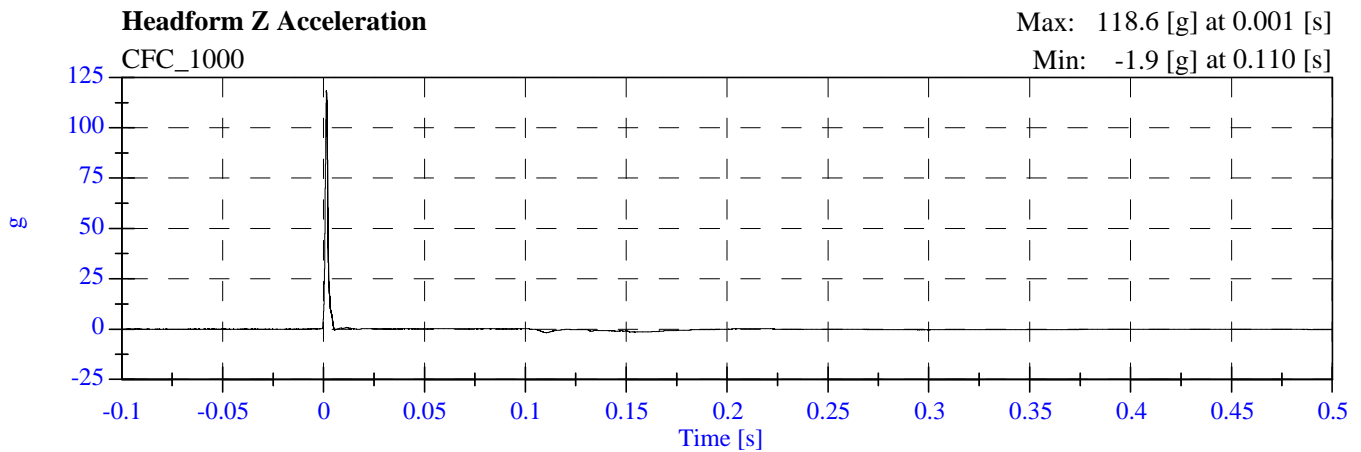
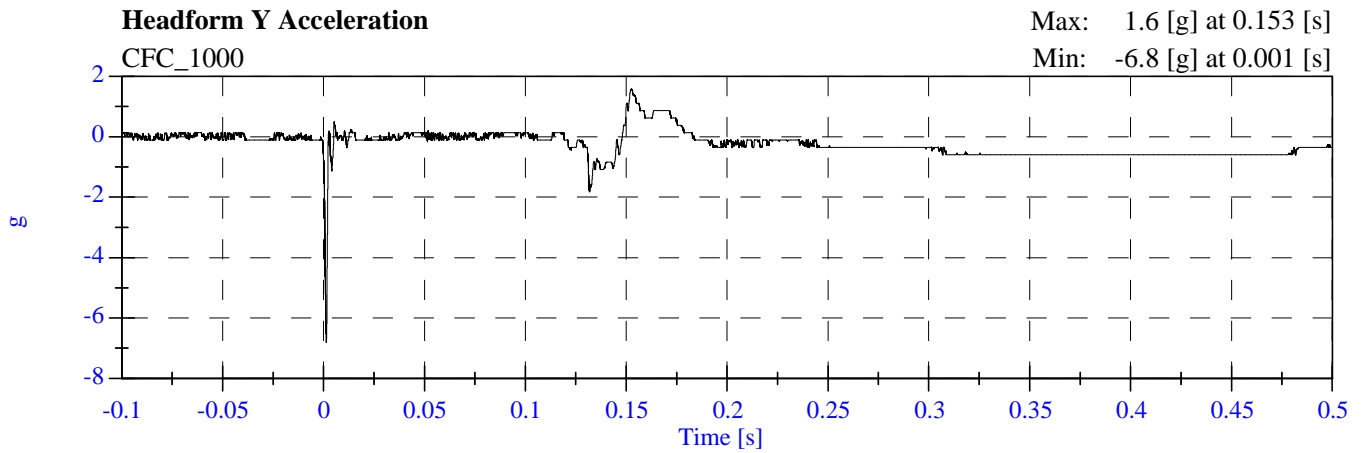
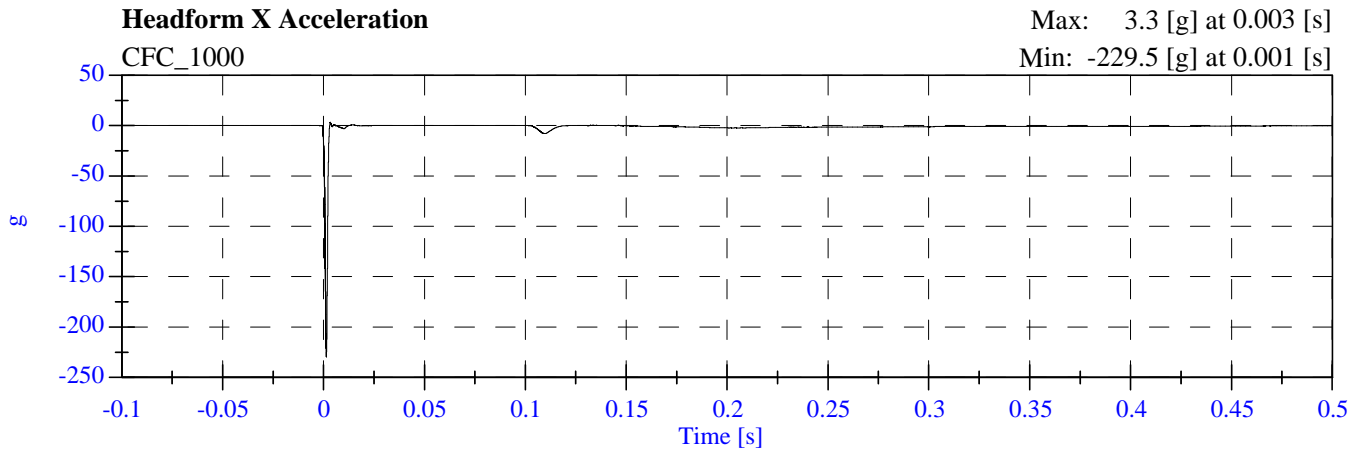
MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		AUGUST 30, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	64	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	258.4	
PEAK LATERAL ACCELERATION	15 Gs Maximum	6.8	
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	J41004	7/10/2007	1/11/2008
2 - LATERAL	ENDEVCO	7264-2000T	J37496	7/10/2007	1/11/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J41016	7/10/2007	1/11/2008

REMARKS:

FMVSS 201UI - Headform 0805 Calibration Post-Test C70108 - August 30, 2007



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

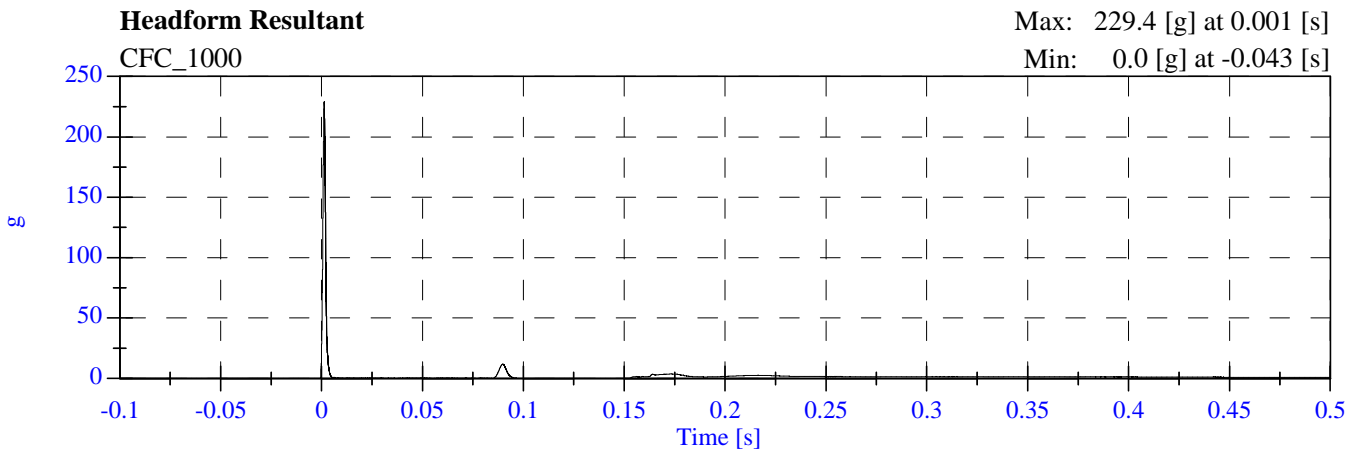
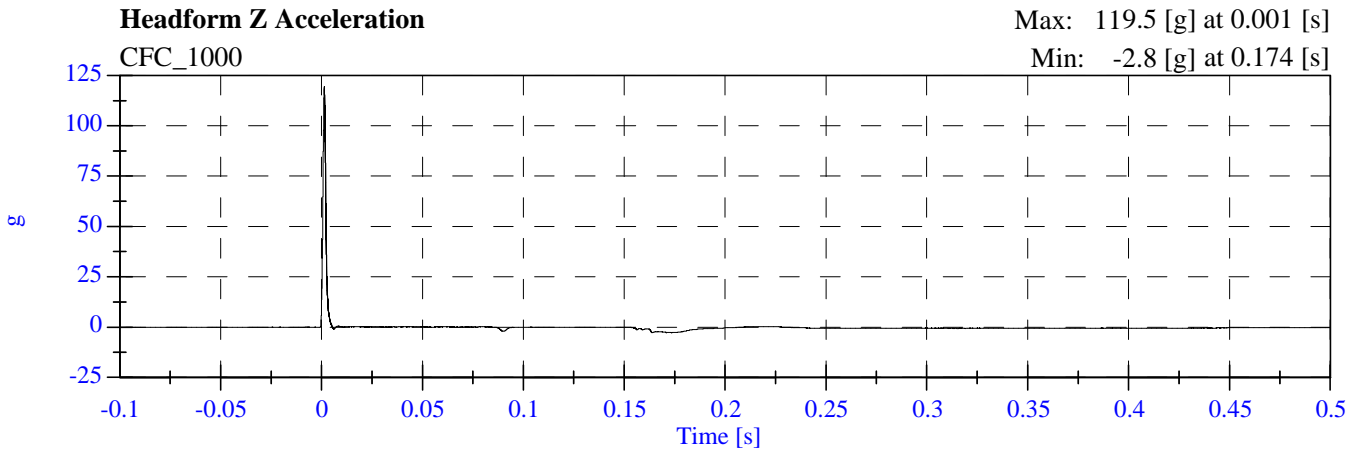
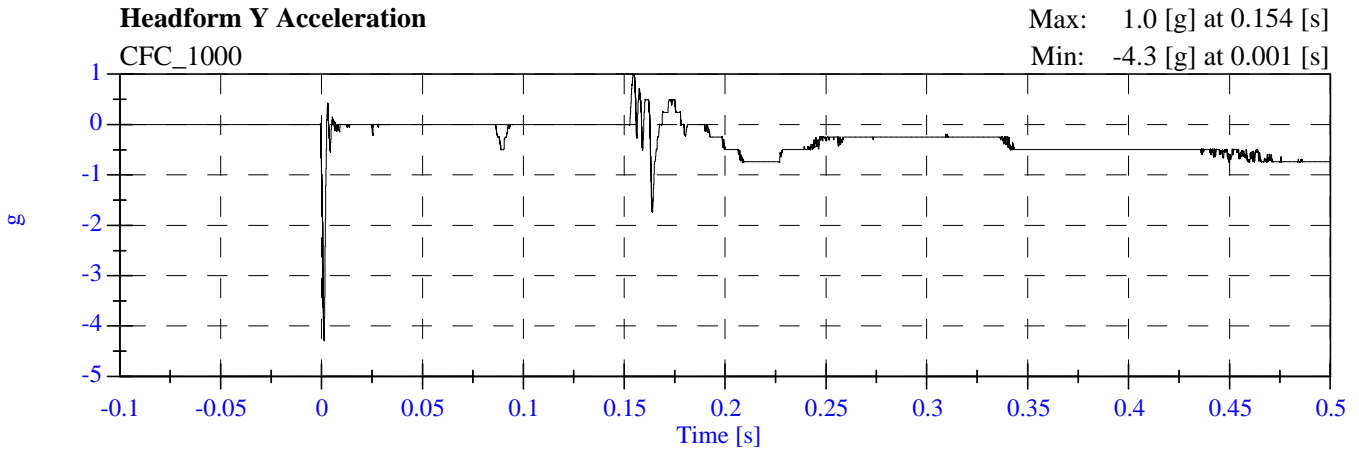
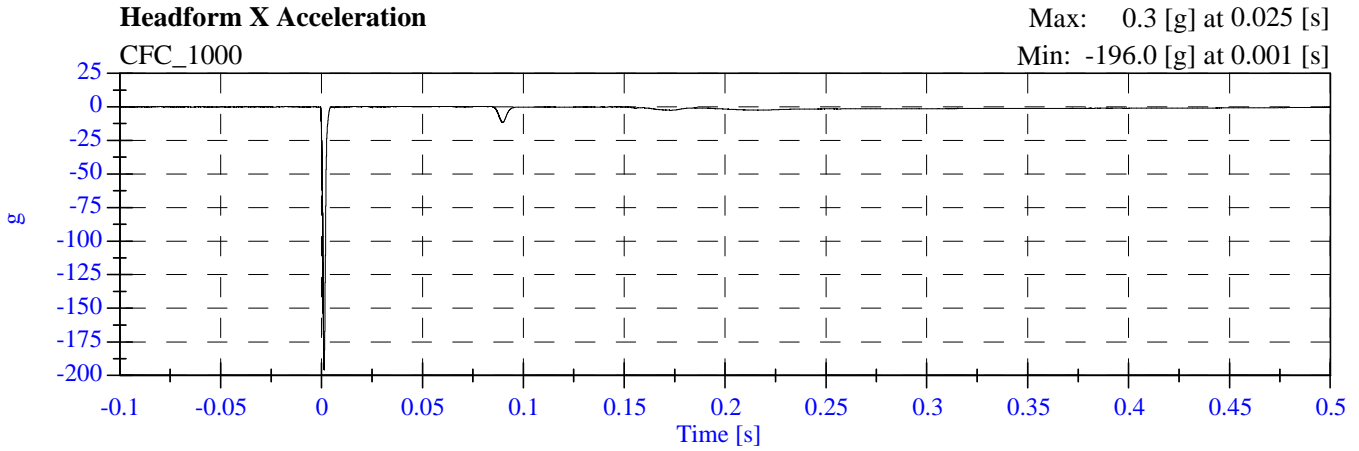
MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		AUGUST 30, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	64	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	229.4	
PEAK LATERAL ACCELERATION	15 Gs Maximum	4.3	
IS ACCELERATION 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	7/18/2007	1/19/2008
2 - LATERAL	ENDEVCO	7264-2000T	J32779	7/18/2007	1/19/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	7/18/2007	1/19/2008

REMARKS:

FMVSS 201UI - Headform 0355 Calibration Post-Test C70108 - August 30, 2007



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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1255	
CALIBRATION DATE:		AUGUST 30, 2007	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	64	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	253.1	
PEAK LATERAL ACCELERATION	15 Gs Maximum	3.7	
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	J41006	7/10/2007	1/11/2008
2 - LATERAL	ENDEVCO	7264-2000T	J40994	7/10/2007	1/11/2008
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	7/10/2007	1/11/2008

REMARKS:

FMVSS 201U - Headform 1255 Calibration Post-Test C70108 - August 30, 2007

