

REPORT NUMBER: 201UI-CAL-08-03

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

**SAAB AUTOMOBILE AB
2008 SAAB 9-5 WAGON**

NHTSA NUMBER: C80508

CALSPAN TEST NUMBER: 8851-03

CALSPAN
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Test Date: February 21, 2008

FINAL REPORT

PREPARED FOR:

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Enforcement
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15. <i>Supplementary Notes</i>																	
16. <i>Abstract</i> Compliance tests were conducted on the subject vehicle, a 2008 Saab 9-5 Wagon, 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:																	
<table border="1"> <thead> <tr> <th>Target Point</th> <th>Horizontal</th> <th>Vertical</th> <th>Velocity</th> <th>HIC</th> <th>HICd</th> </tr> </thead> <tbody> <tr> <td>AP3</td> <td>135°</td> <td>35°</td> <td>23.73</td> <td>1779.7</td> <td>1509.1</td> </tr> </tbody> </table>						Target Point	Horizontal	Vertical	Velocity	HIC	HICd	AP3	135°	35°	23.73	1779.7	1509.1
Target Point	Horizontal	Vertical	Velocity	HIC	HICd												
AP3	135°	35°	23.73	1779.7	1509.1												
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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 2008 Saab 9-5 Wagon, NHTSA No. C80508, 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 2008 Saab 9-5 Wagon, NHTSA No. C80508, was tested at various upper interior locations by a 4.54 kg 50th percentile headform. A total of nine (9) 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 nine (9) area chosen for testing were:

BP4	OP1	UROP	URRSR	BP2
AP3	BP1	BP3	URBP	

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 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:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07 (SEE CERTIFICATION LABEL)
COLOR:	Gray

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	2953.482	-493.449	1253.460	2945.322	494.723	1255.308	-	-	-	-	-
AP2	2841.818	-573.268	1164.577	2835.109	571.239	1166.223	-	-	-	-	-
AP3	2714.843	-605.843	1089.532	2703.663	604.876	1088.197	135°	35°	23.73	1779.7	1509.1
BP1	3444.359	-471.222	1296.343	3435.379	473.501	1299.814	Relocated 3 circles		-	-	-
BP1_R3	3444.790	-410.037	1307.959	3435.566	-411.322	1309.011	90°	20°	23.59	482.9	530.7
BP2	3410.502	-549.196	1140.439	3398.376	550.609	1145.019	90°	2°	23.53	693.5	689.6
BP3	3372.544	-581.166	1075.796	3367.748	581.511	1079.455	270°	0°	23.8	551.4	582.4
BP4	3437.145	-636.948	965.257	3430.108	638.333	968.918	142°	-2°	23.65	460.8	514
FH1	2815.728	-381.337	1244.182	2809.541	383.315	1245.560	-	-	-	-	-
FH2	2783.534	-237.588	1255.955	2773.558	237.948	1256.108	-	-	-	-	-
OP1	4382.619	-601.645	1059.239	4373.563	602.287	1071.112	90°	-10°	23.56	576.7	601.5
OP2	4411.992	-605.637	1088.574	4403.819	605.840	1095.003	-	-	-	-	-
SR1	3103.017	-494.015	1292.681	3093.872	498.791	1292.010	Relocated 2 circles		-	-	-
SR1_R2	3105.390	-477.346	1268.059	3097.092	480.382	1268.175	-	-	-	-	-
SR2A	3254.365	-494.261	1295.635	3245.944	494.694	1298.388	Relocated 1 circle		-	-	-
SR2A_R1	3247.058	-487.387	1268.741	3241.489	486.719	1273.320	-	-	-	-	-
SR2B	3143.702	-494.593	1294.894	3133.115	497.975	1294.423	Relocated 2 circles		-	-	-
SR2B_R2	3143.786	-474.776	1272.081	3135.644	479.961	1270.481	-	-	-	-	-
SR3F	3773.458	-501.624	1251.522	3763.559	503.682	1256.864	-	-	-	-	-
SR3R	3949.417	-498.086	1247.422	3932.575	500.207	1255.199	-	-	-	-	-
URAP	3038.702	-389.639	1301.136	3031.784	390.847	1301.728	-	-	-	-	-
URBP	3495.921	-292.536	1313.132	3468.326	291.055	1314.865	270°	50°	23.73	176.1	299.3
URFSR	3240.889	-360.060	1312.402	3242.317	360.068	1313.551	-	-	-	-	-
UROF	4210.600	-338.013	1312.489	4224.907	336.579	1321.358	90°	50°	23.88	487.2	533.9
URRSR	3950.948	-302.004	1299.563	3937.924	321.893	1306.186	90°	50°	23.8	637.4	647.3

*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:				2008 Saab 9-5 Wagon					
VIN:				YS3ED59G783503647					
Month & Year of Manufacture:				09/07 (SEE CERTIFICATION LABEL)					
Vehicle Body Color:				Gray					
Engine Data:	4	Cylinders;	-	CID;	2.3	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:		9	km						
Options:	x	A/C;	x	Power Steering;	x	Pwr.Brakes;	x	Pwr. Windows	
Interior Trim Information :									
1. Sun roof in upper interior									
2. Non-adjustable seat belt anchorages on both B-Pillars									
3. Grab handles on all outboard seating position side rails									

DATA FROM TIRE PLACARD:									
Tire Pressure (at capacity);				240		kPa FRONT			
				240		kPa REAR			
Recommended Tire Size:				P235/45R17					
Tires on Test Vehicle:		P235/45R17			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)=				421		kg (A)			
No. of Occupants x 68 kg. =				340		kg (B)			
Rated Cargo/Luggage Weight (RCLW) =				81.0		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	=	499	kg	Left Rear	= 342 kg
Right Front	=	491	kg	Right Rear	= 331 kg
TOTAL FRONT	=	990.0	kg	TOTAL REAR	= 673.0 kg
% of Total Weight	=	59.5%	%	% of Total Weight	= 40.5%
TOTAL WEIGHT	=	1663.0		kg	

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:		
Total Test Vehicle Delivered Weight=	1663.0	kg (A)
+ Rated Cargo/Luggage Weight =	81.0	kg (B)
TEST VEHICLE TARGET WEIGHT =	1744.0	kg (A+B)

WEIGHT OF TEST VEHICLE (FULLY LOADED):					
Left Front	=	495	kg	Left Rear	= 382.5 kg
Right Front	=	489	kg	Right Rear	= 372.5 kg
TOTAL FRONT	=	984.0	kg	TOTAL REAR	= 755.0 kg
% of Total Weight	=	56.6%	%	% of Total Weight	= 43.4%
TOTAL TEST WEIGHT	=	1739.0			
Weight of vehicle secured in test vehicles cargo area =		76.0	kg		

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	699	Left Rear	714
	Right Front	695	Right Rear	718
FULLY LOADED:	Left Front	690	Left Rear	694
	Right Front	694	Right Rear	700
Test Vehicle Wheelbase:			millimeters	

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑1.5↓	Front Bumper	↑0.4↓
	Right Door Sill	↓1.3↑	Rear Bumper	↓0.1↑
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑1.1↓	Front Bumper	↑0.3↓
	Right Door Sill	↓1.0↑	Rear Bumper	↓0.1↑
AS TESTED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑1.3↓	Front Bumper	↑0.4↓
	Right Door Sill	↓1.1↑	Rear Bumper	↓0.1↑

DATA SHEET 2-3

APPROACH ANGLE LIMITS

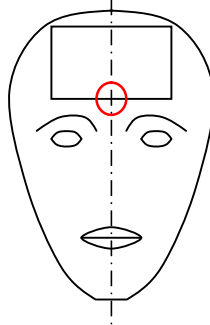
Target Code	Left Side				Target Code	Right Side			
	Horizontal Angles (deg.)		Vertical Angles (deg.)			Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	209	252	-5	36	AP1	108	151	-5	36
AP2	209	252	-5	46	AP2	108	151	-5	46
AP3	209	252	-5	35	AP3	108	151	-5	35
BP1	201	294	-10	20	BP1	76	158	-10	20
BP2	ANY		0	2	BP2	ANY		0	2
BP3	201	294	-10	0	BP3	76	158	-10	0
BP4	201	294	-10	-2	BP4	76	158	-10	-2
OP1	270		-10	-10	OP1	90		-10	-10
OP2	270		-10	-10	OP2	90		-10	-10
RP1	270	345	-10	Excluded	RP1	15	90	-10	Excluded
RP2	270	345	-10	Excluded	RP2	15	90	-10	Excluded
FH1	180		0	50	FH1	180		0	50
FH2	180		0	50	FH2	180		0	50
RH	360		0	Excluded	RH	0		0	Excluded
SR1	270		0	40	SR1	90		0	40
SR2A	270		0	40	SR2A	90		0	40
SR2B	270		0	40	SR2B	90		0	40
SR3	270		0	50	SR3	90		0	50
URAP	ANY		0	50	URAP	ANY		0	50
URBP	ANY		0	50	URBP	ANY		0	50
UROP	ANY		0	50	UROP	ANY		0	50
URRSR	ANY		0	50	URRSR	ANY		0	50

Note : BP2 target location – Seat belt anchorage

DATA SHEET 2-4

SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray



ã RIGHT SIDE OF FACE

TARGET	Distance Above Point 0 (mm)	Distance Over From Pt. O (mm)
BP4	16	5L
OP1	5	15L
UROP	40	0
URRSR	47	9L
BP2	19	5R
AP3	16	1L
BP1	59	3R
BP3	4	40L
URBP	50	10L

SECTION 3

SUMMARY OF TEST RESULTS AND DATA PLOTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	01
Test Date:	02/20/08
Target Location:	B-Pillar
Target Code:	BP4
Horizontal Impact Angle:	142°
Vertical Impact Angle:	-2°
Ambient Temperature:	21.2 C°
Relative Humidity:	14.5
Time of Impact:	11:00
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	5	mm right	x mm left
On Centerline	16	mm up	



POST-IMPACT BP4 HEADFORM

Free Motion HIC	460.8
HIC(d)	514.0
Impact Velocity (kph)	23.65
HIC T1 (msec)	3.7
HIC T2 (msec)	11.4

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FMH Headform 0355

Location: BP4

Test Date: February 20, 2008

Work File: BP4

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

Lab Temperature: 21.2 C

HICd: 514.0

Lab Humidity: 14.5 %

HIC (36ms): 460.8

Velocity at Impact: 23.65 KPH

t1: 3.7 msec

t2: 11.4 msec

Free Flight Distance: 220.98 mm

Duration: 7.7 msec

Average Acceleration: 8.4 g

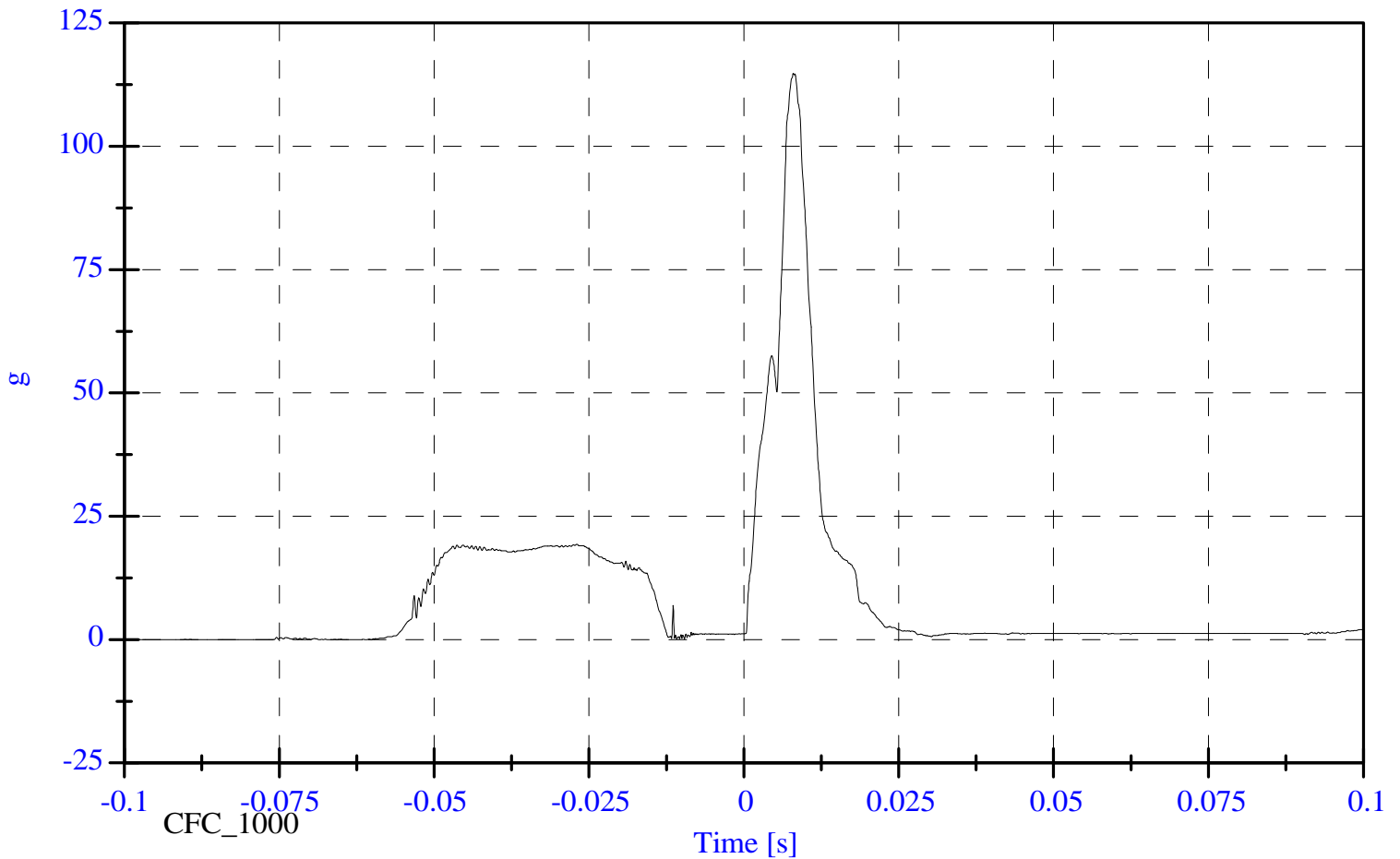
Maximum: 114.8 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 114.8 [g] at 0.008 [s]

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

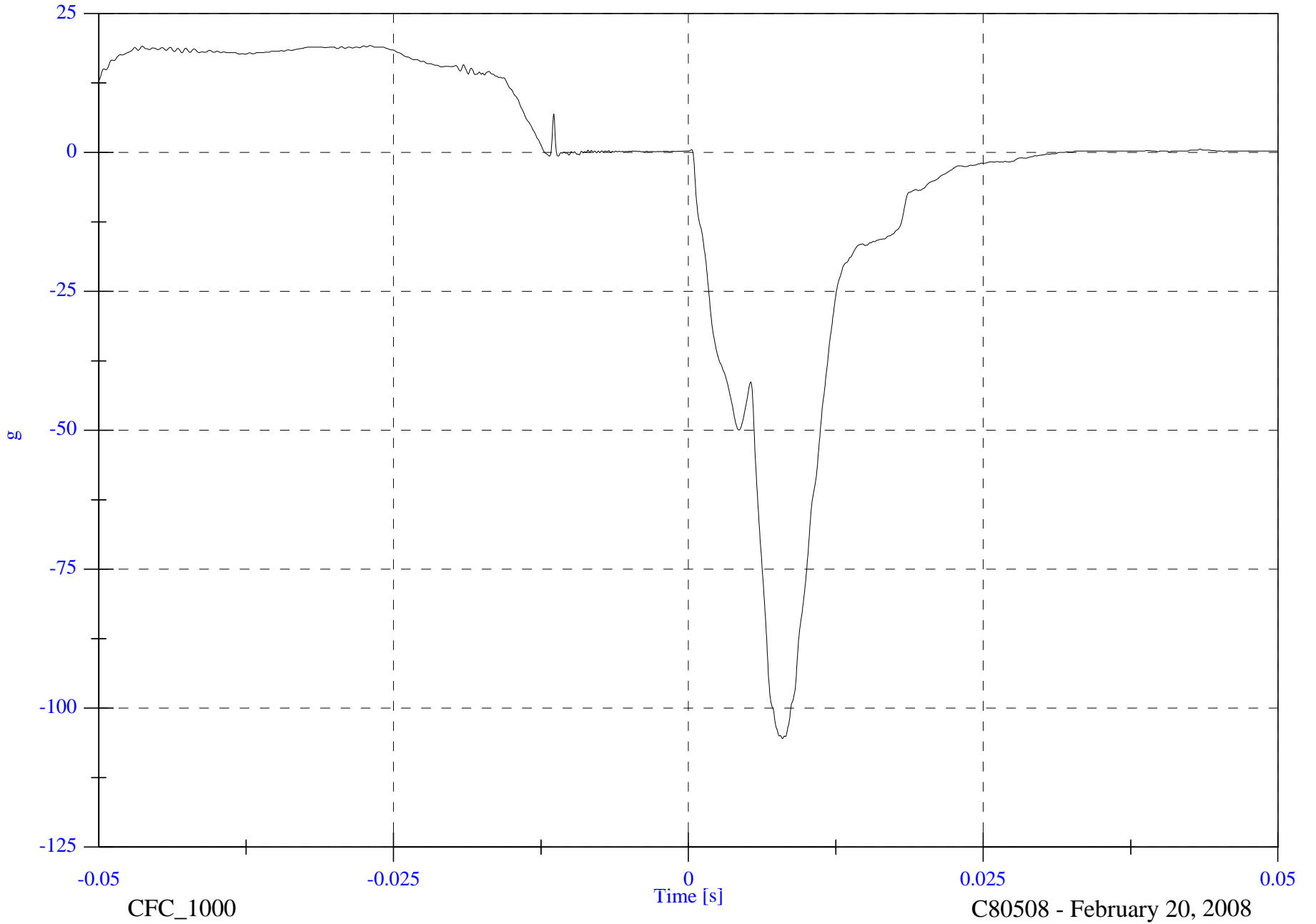


FMVSS 201U 2008 SAAB 9-5

Max: 19.2 [g] at -0.027 [s]

Min: -105.5 [g] at 0.008 [s]

Headform X Acceleration



C80508 PASSENGER SIDE BP4 IMPACT PLOT #2

8851-03

CFC_1000

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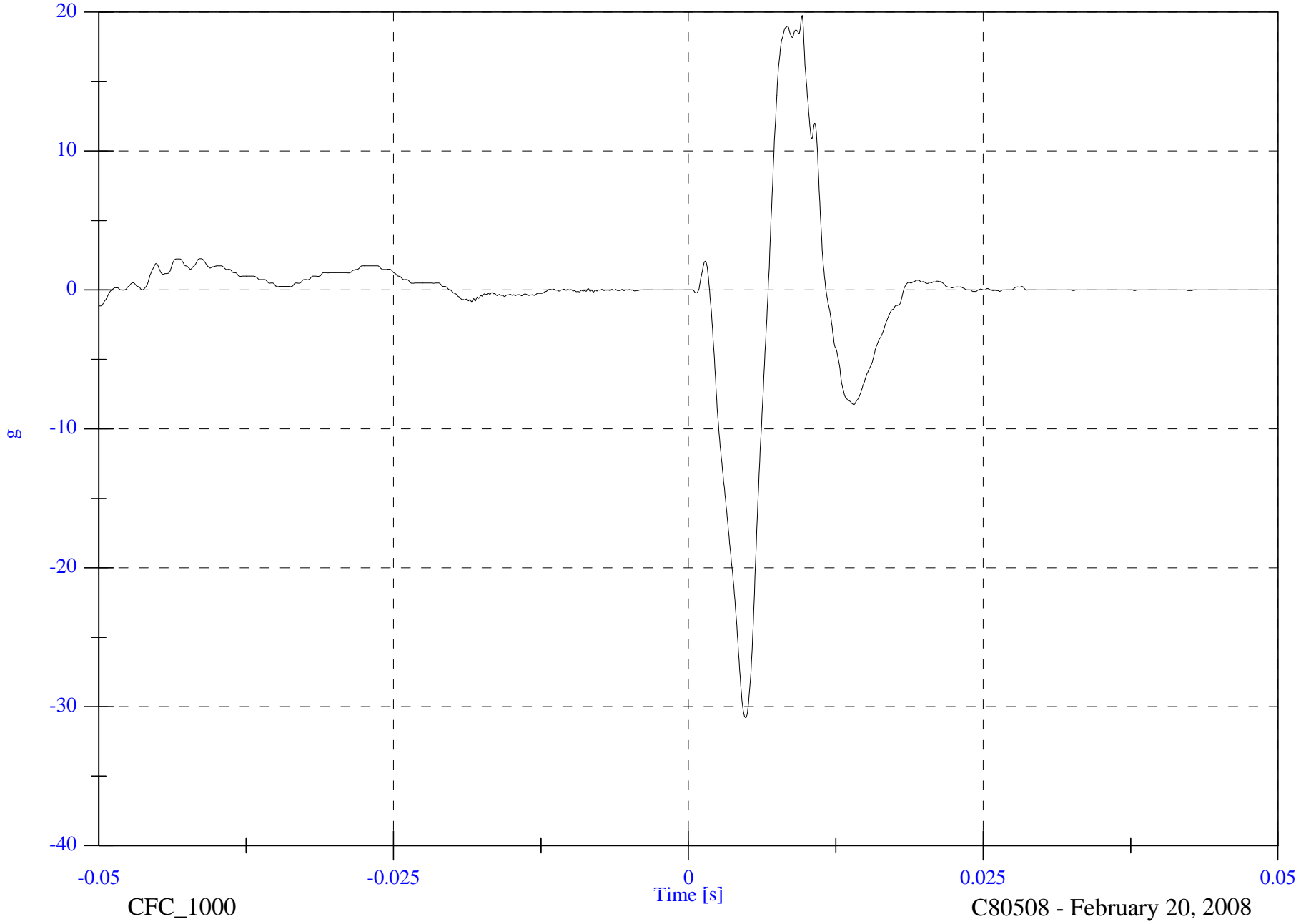
Headform Y Acceleration

Max: 19.7 [g] at 0.010 [s]

Min: -30.8 [g] at 0.005 [s]

C80508 PASSENGER SIDE BP4 IMPACT PLOT #3

8851-03



CFC_1000

C80508 - February 20, 2008

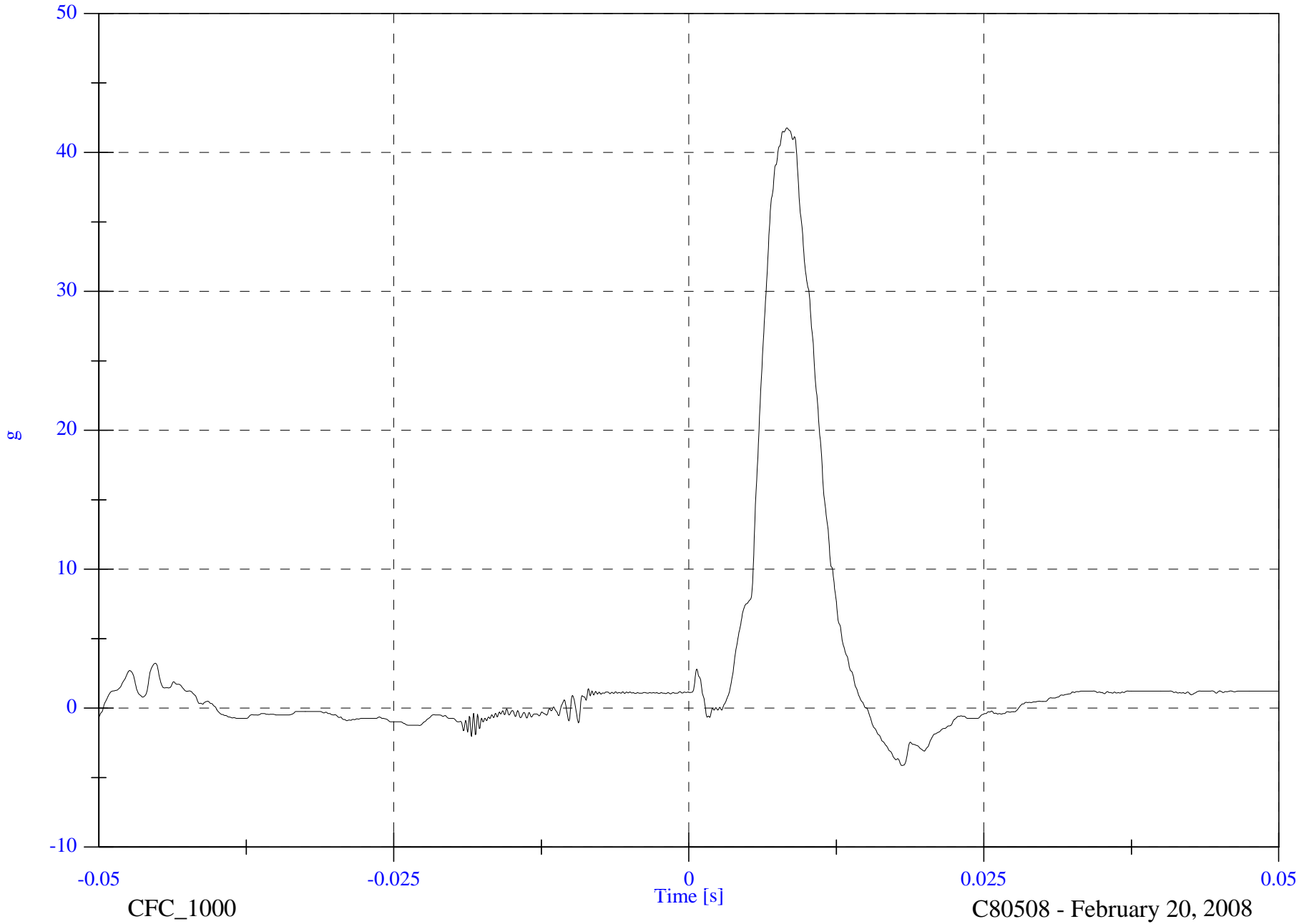
FMVSS 201U 2008 SAAB 9-5

Headform Z Acceleration

Max: 41.8 [g] at 0.008 [s]
Min: -4.1 [g] at 0.018 [s]

C80508 PASSENGER SIDE BP4 IMPACT PLOT #4

8851-03



CFC_1000

C80508 - February 20, 2008

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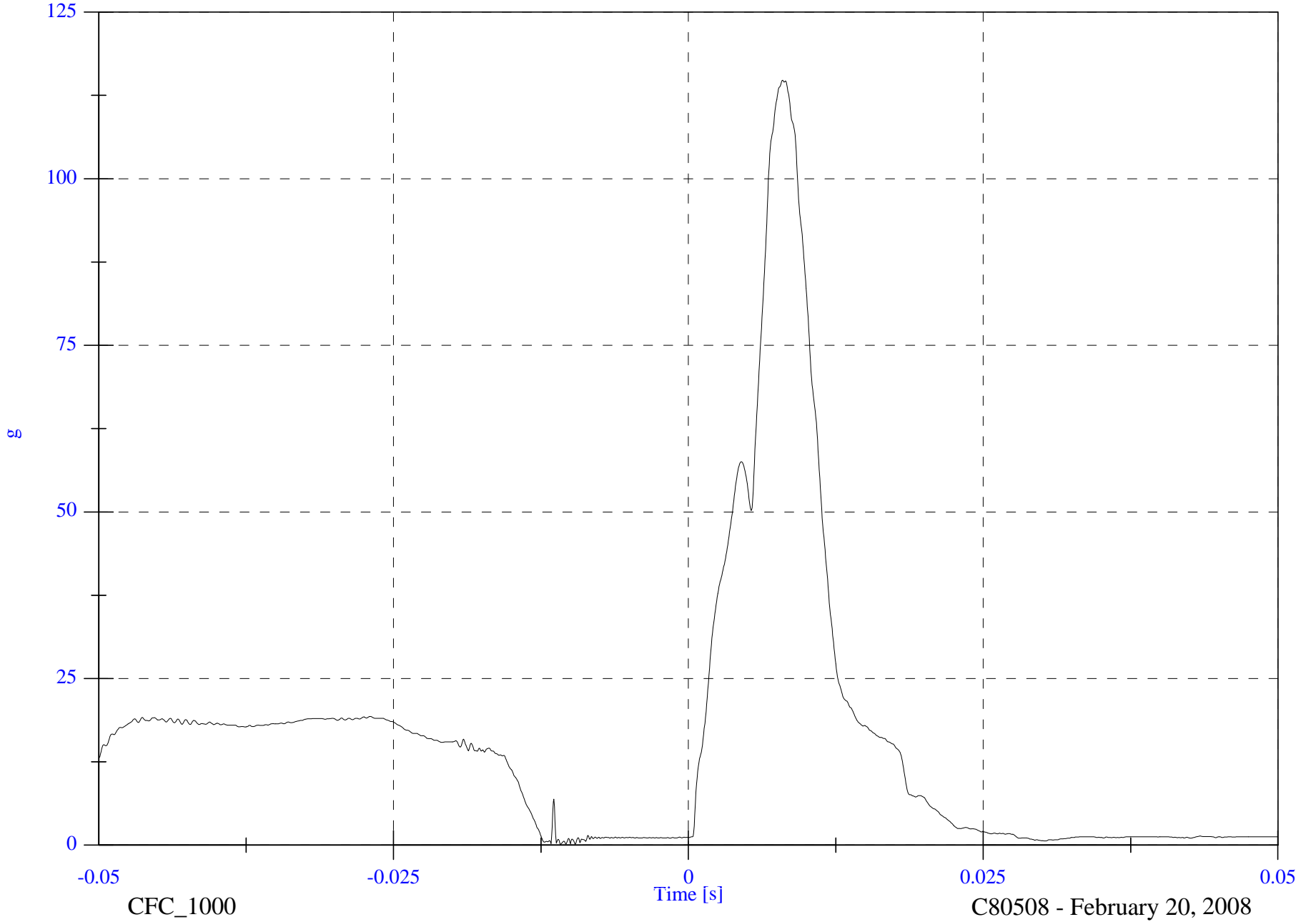
Headform Resultant

Max: 114.8 [g] at 0.008 [s]

Min: 0.1 [g] at -0.011 [s]

C80508 PASSENGER SIDE BP4 IMPACT PLOT #5

8851-03



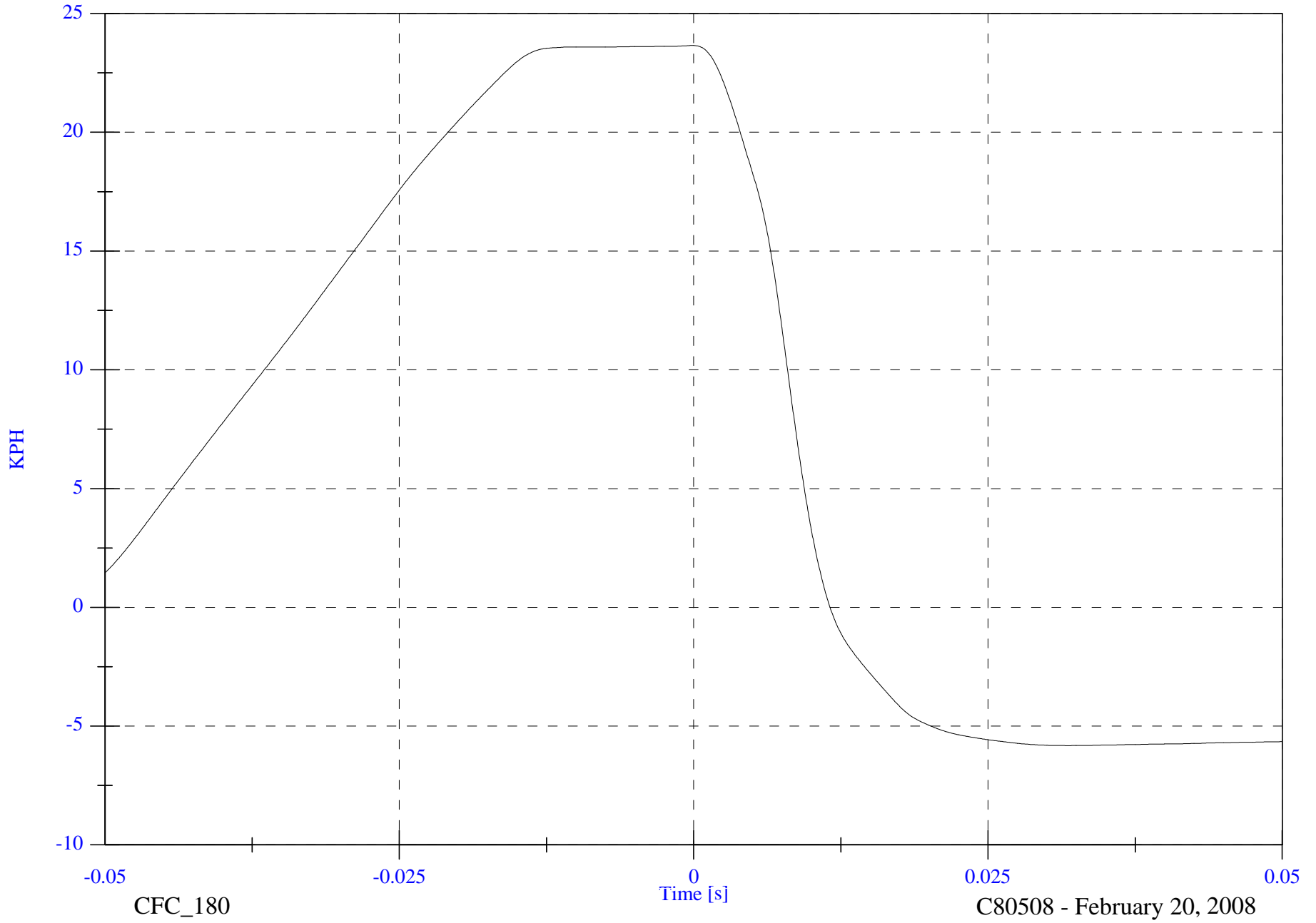
CFC_1000

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Max: 23.7 [KPH] at -0.000 [s]
Min: -5.8 [KPH] at 0.032 [s]

Headform Velocity

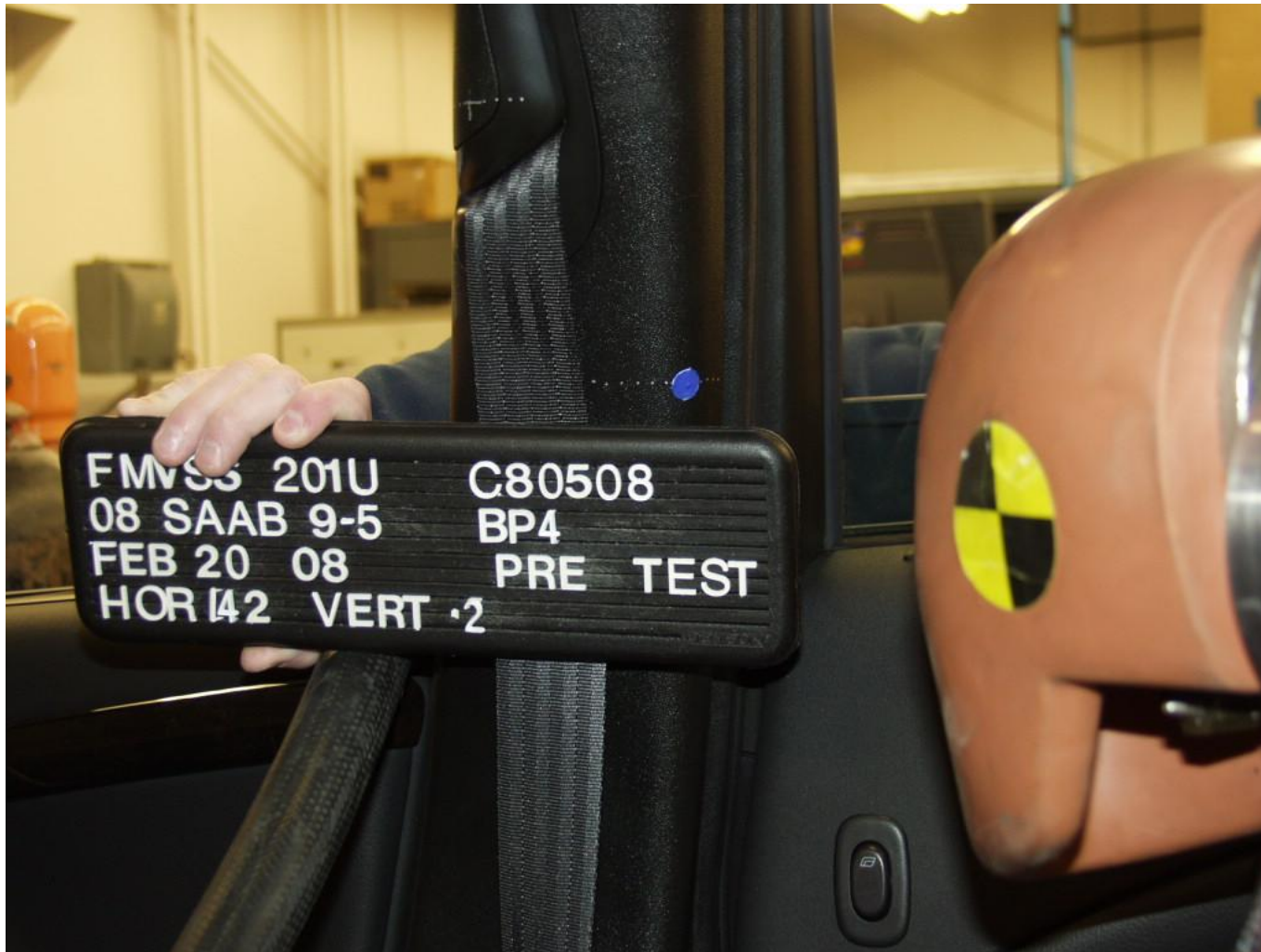


C80508 PASSENGER SIDE BP4 IMPACT PLOT #6

8851-03

CFC_180

C80508 - February 20, 2008



PRE-IMPACT BP4

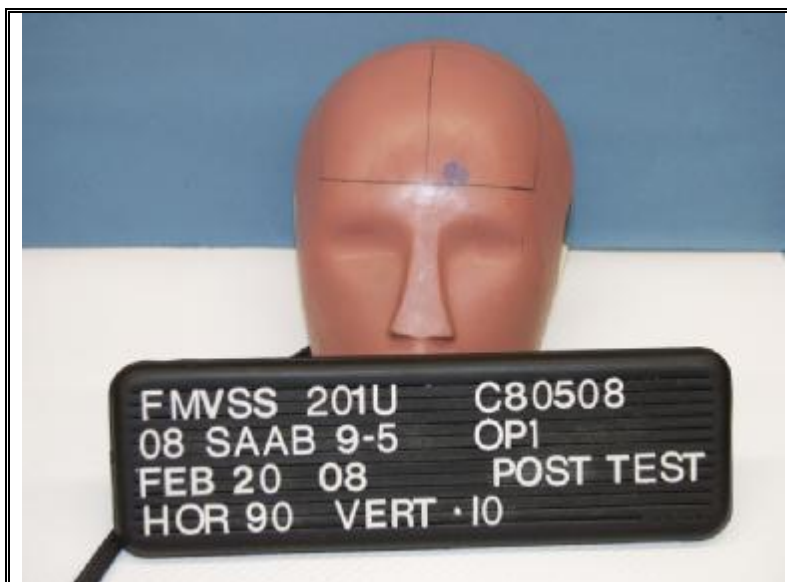


POST-IMPACT BP4

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	02
Test Date:	02/20/08
Target Location:	Other Pillar
Target Code:	OP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	-10°
Ambient Temperature:	21.4 C°
Relative Humidity:	14.7
Time of Impact:	11:40
Headform Number:	1140

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	15	mm right	x mm left
On Centerline	5	mm up	



POST-IMPACT OP1 HEADFORM

Free Motion HIC	576.7
HIC(d)	601.5
Impact Velocity (kph)	23.56
HIC T1 (msec)	5.9
HIC T2 (msec)	13.8

FMVSS 201U 2008 SAAB 9-5 C80508 - OP1

FMH Headform 1140

Location: OP1

Test Date: February 20, 2008

Work File: OP1

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

Lab Temperature: 21.4 C

HICd: 601.5

Lab Humidity: 14.7 %

HIC (36ms): 576.7

Velocity at Impact: 23.56 KPH

t1: 5.8 msec

t2: 13.8 msec

Free Flight Distance: 220.54 mm

Duration: 8.0 msec

Average Acceleration: 8.9 g

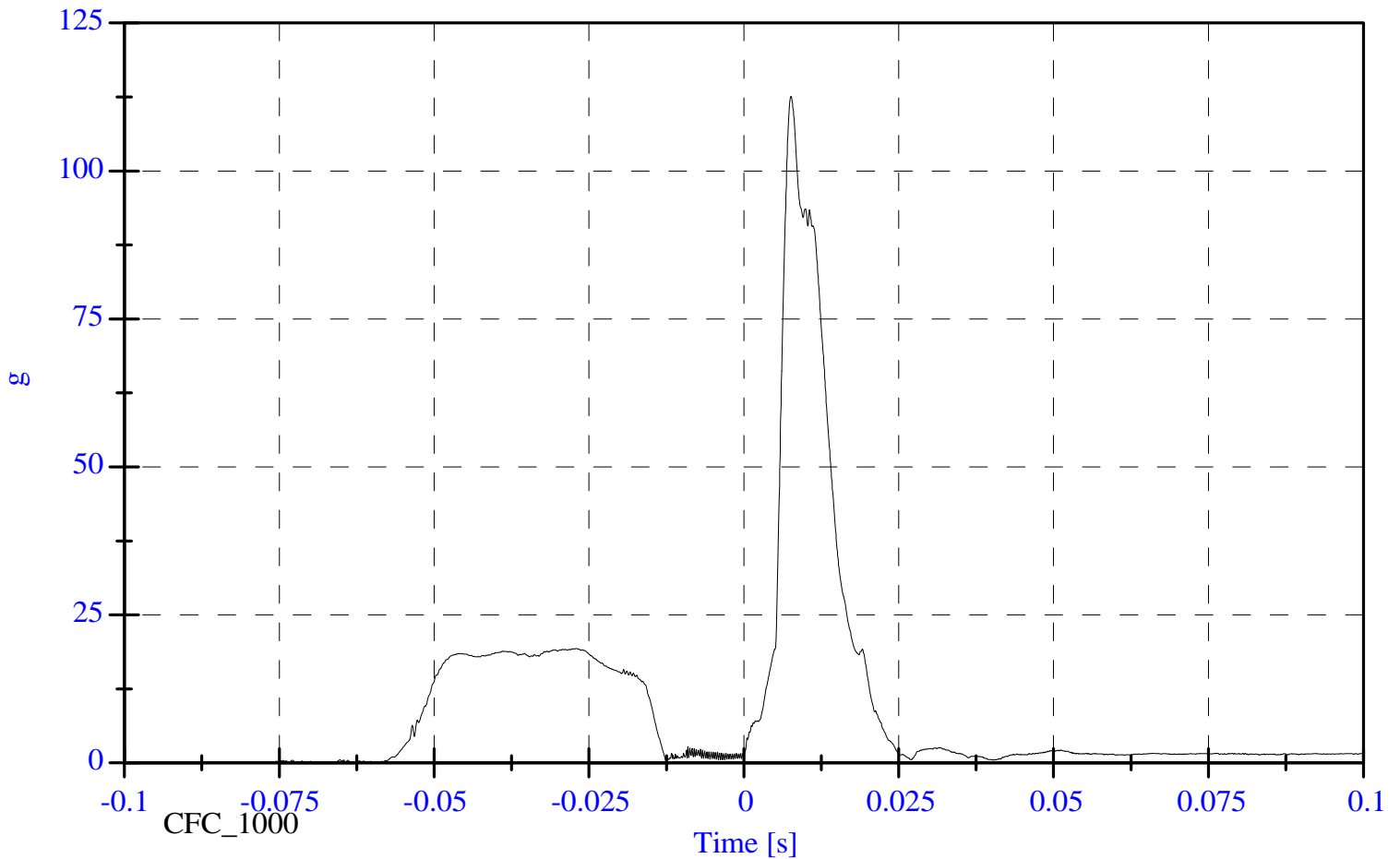
Maximum: 112.6 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 112.6 [g] at 0.008 [s]

Min: 0.0 [g] at -0.081 [s]

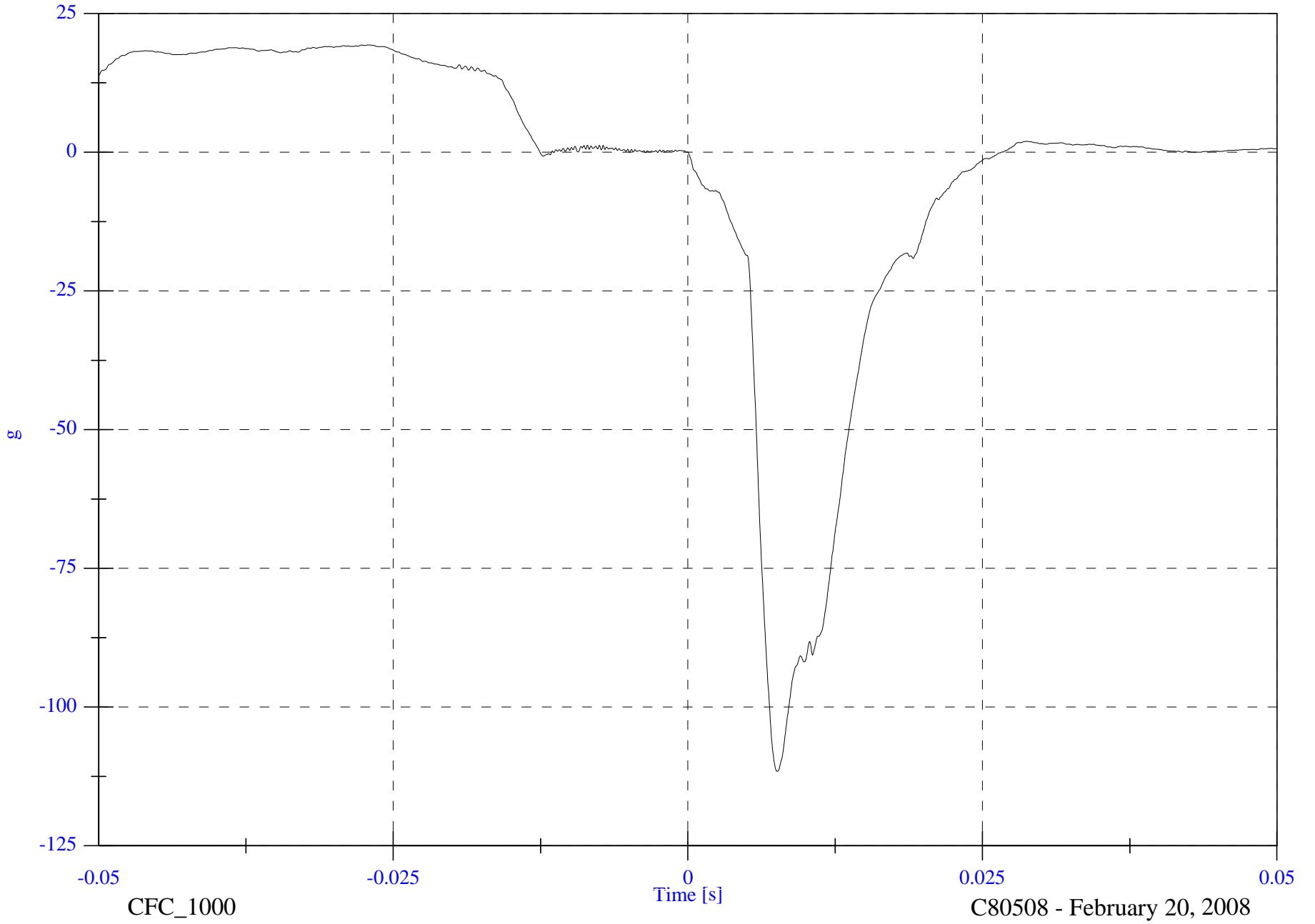


FMVSS 201U 2008 SAAB 9-5

Max: 19.3 [g] at -0.027 [s]

Min: -111.6 [g] at 0.008 [s]

Headform X Acceleration



C80508 PASSENGER SIDE OP1 IMPACT PLOT #2

8851-03

CFC_1000

C80508 - February 20, 2008

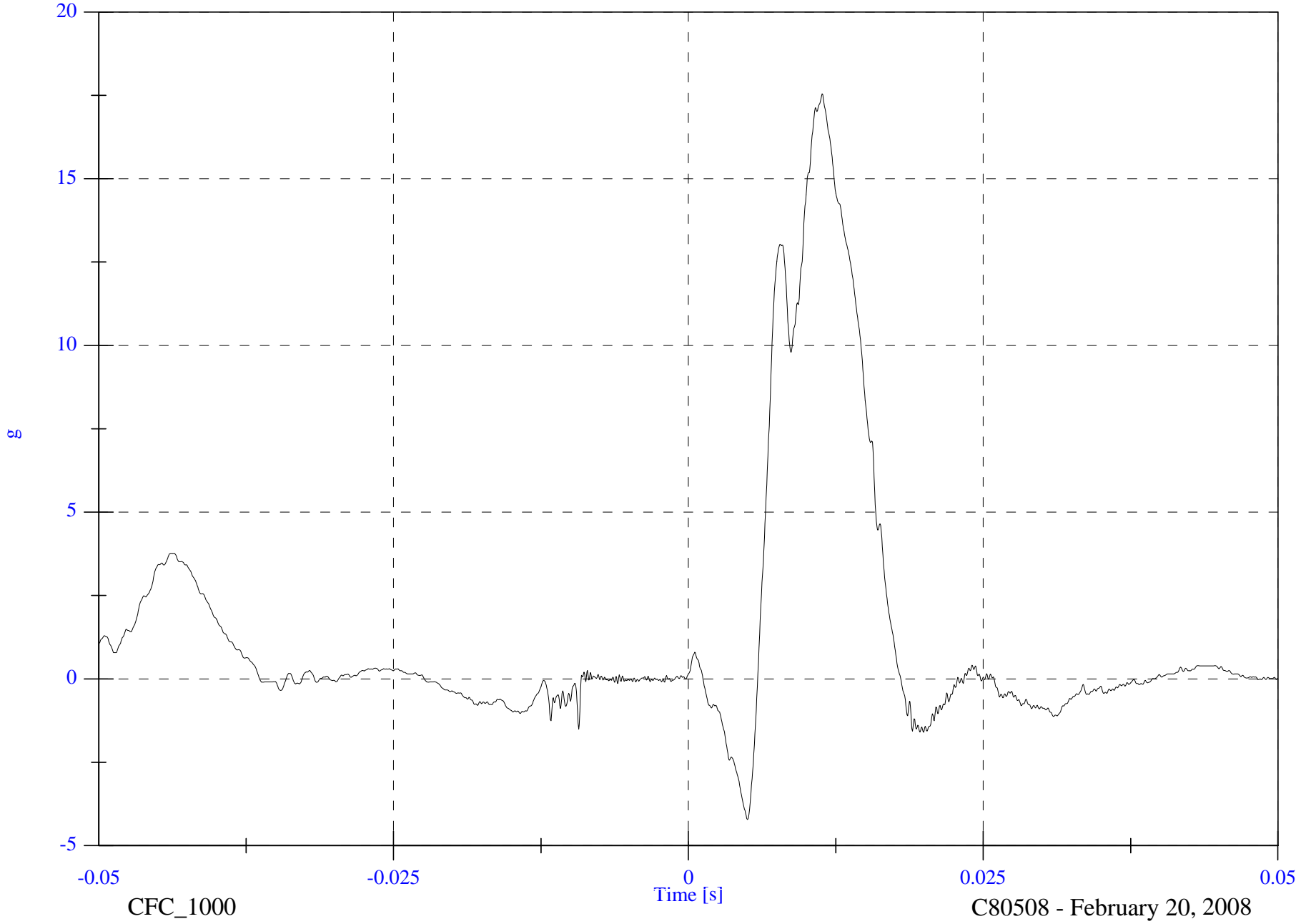
FMVSS 201U 2008 SAAB 9-5

Headform Y Acceleration

Max: 17.6 [g] at 0.011 [s]
Min: -4.2 [g] at 0.005 [s]

C80508 PASSENGER SIDE OP1 IMPACT PLOT #3

8851-03



CFC_1000

C80508 - February 20, 2008

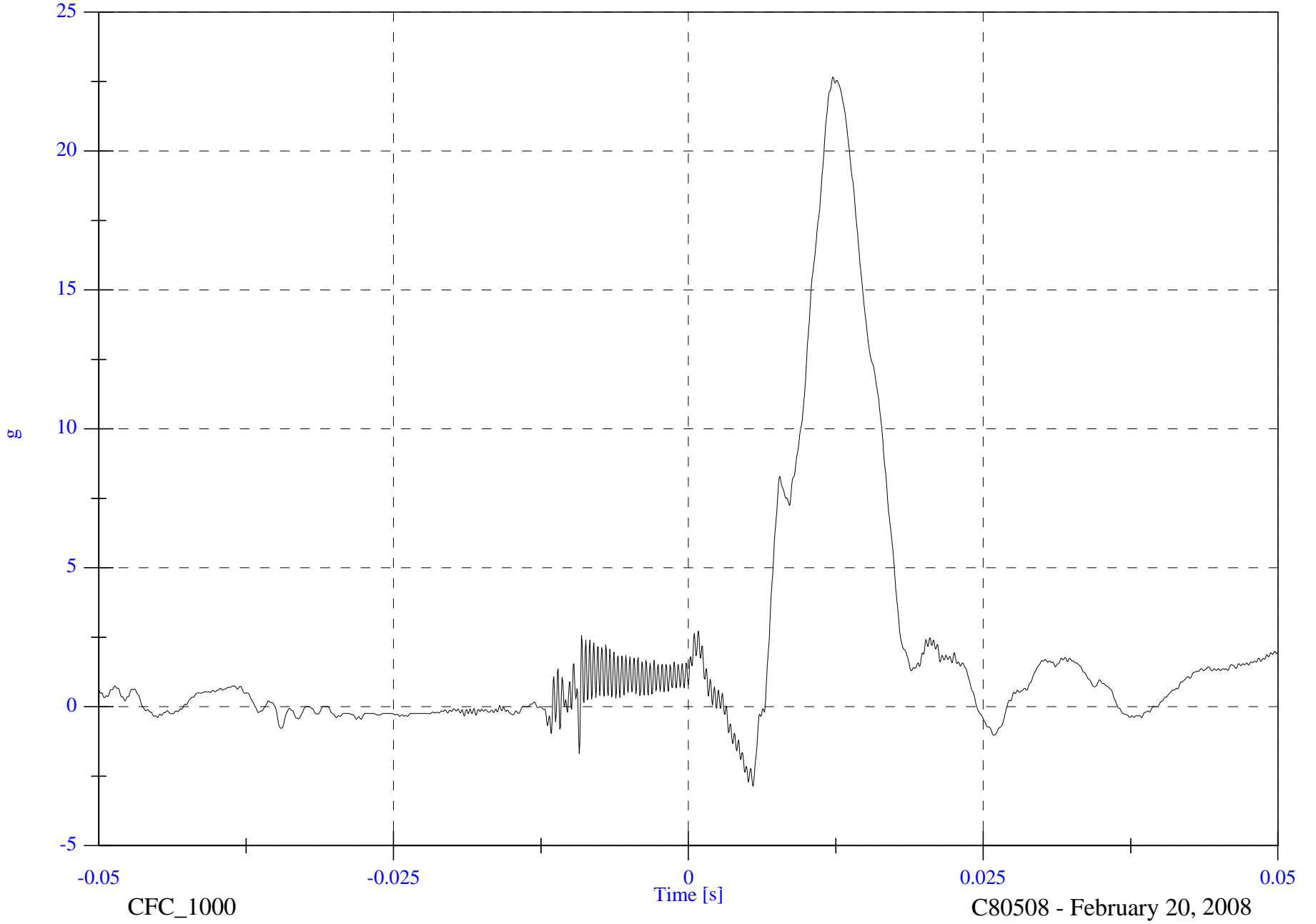
FMVSS 201U 2008 SAAB 9-5

Headform Z Acceleration

Max: 22.7 [g] at 0.012 [s]
Min: -2.9 [g] at 0.006 [s]

C80508 PASSENGER SIDE OP1 IMPACT PLOT #4

8851-03



CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

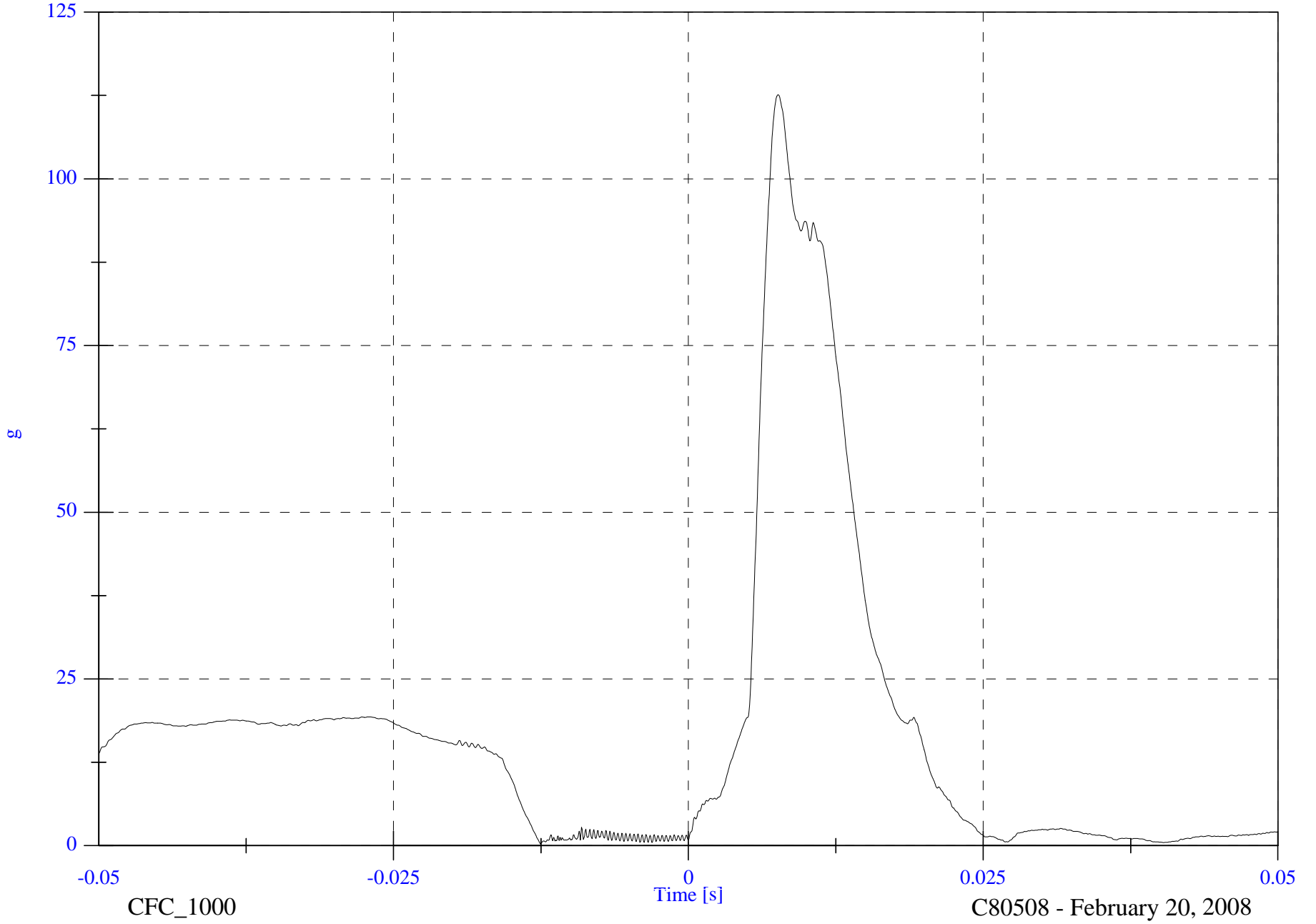
Headform Resultant

Max: 112.6 [g] at 0.008 [s]

Min: 0.3 [g] at -0.013 [s]

C80508 PASSENGER SIDE OP1 IMPACT PLOT #5

8851-03

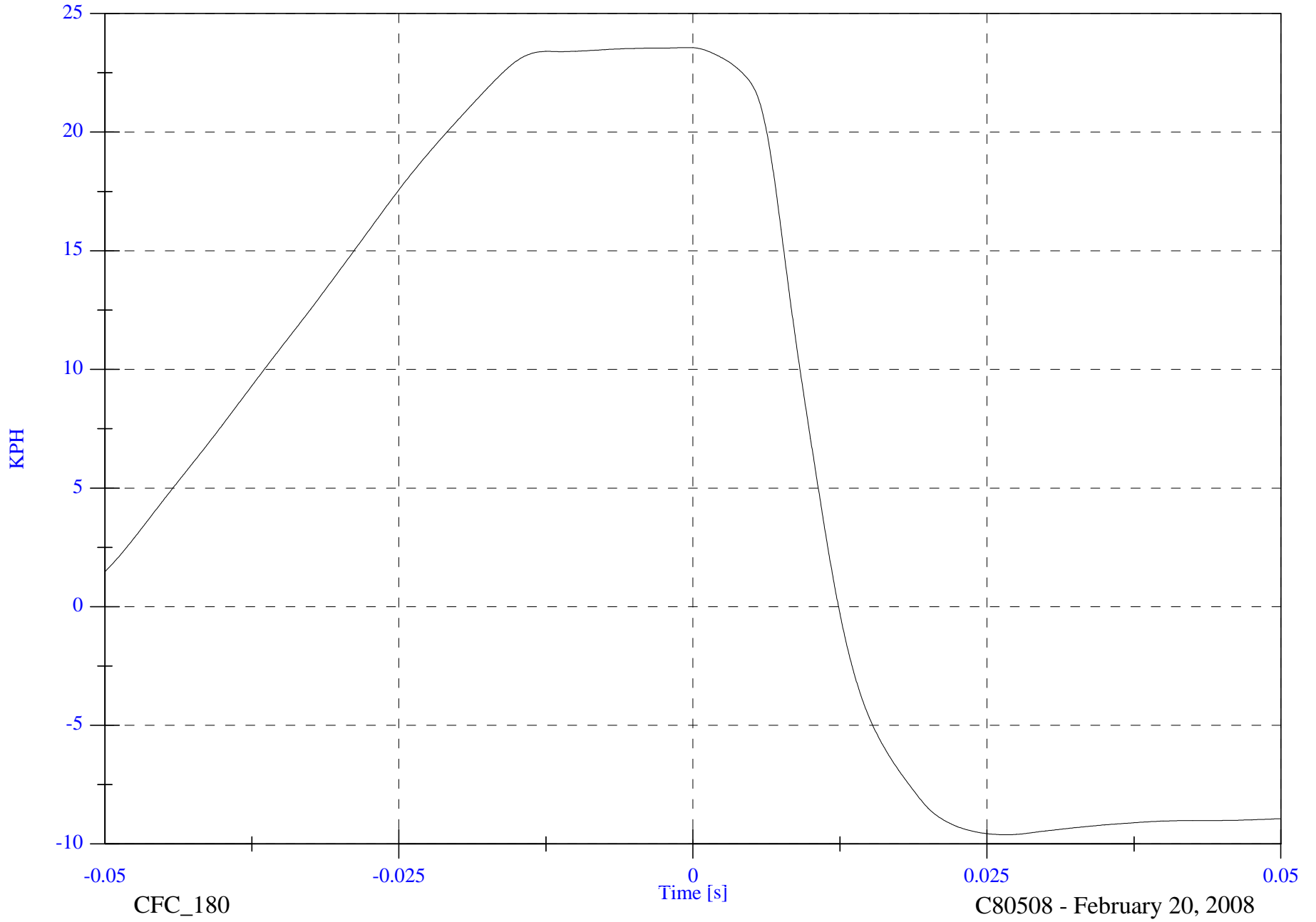


FMVSS 201U 2008 SAAB 9-5

Headform Velocity

Max: 23.6 [KPH] at -0.000 [s]

Min: -9.6 [KPH] at 0.027 [s]



C80508 PASSENGER SIDE OP1 IMPACT PLOT #6

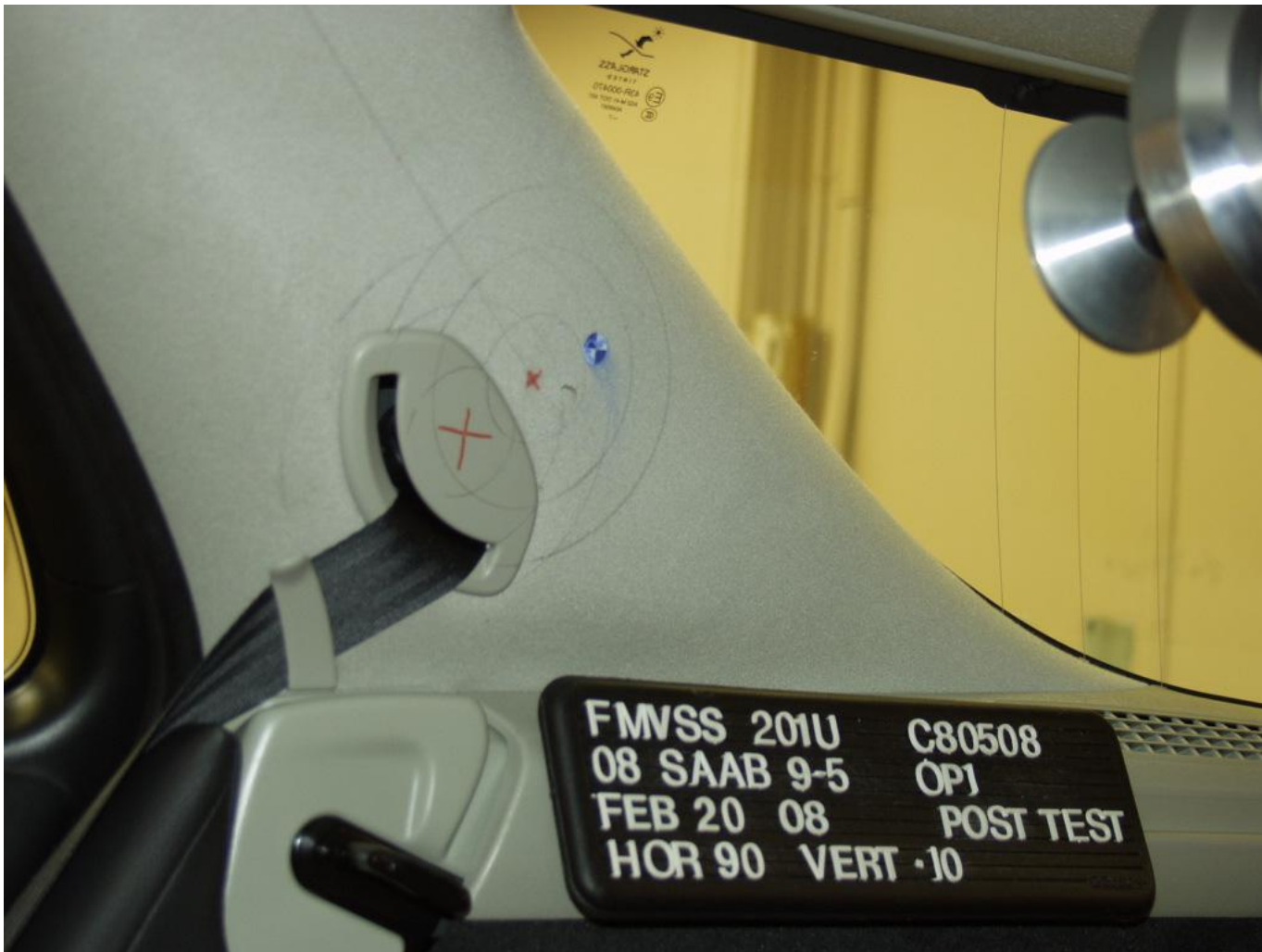
8851-03

CFC_180

C80508 - February 20, 2008



PRE-IMPACT OPI



POST-IMPACT OP1

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	03
Test Date:	02/20/08
Target Location:	Upper Roof
Target Code:	UROP
Horizontal Impact Angle:	90°
Vertical Impact Angle:	50°
Ambient Temperature:	21.6 C°
Relative Humidity:	14.4
Time of Impact:	13:09
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	40		mm up



POST-IMPACT UROP HEADFORM

Free Motion HIC	487.2
HIC(d)	533.9
Impact Velocity (kph)	23.88
HIC T1 (msec)	10.7
HIC T2 (msec)	15.7

FMVSS 201U 2008 SAAB 9-5 C80508 - UROP

FMH Headform 805

Location: UROP

Test Date: February 20, 2008

Work File: UROP

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

Lab Temperature: 21.6 C

HICd: 533.9

Lab Humidity: 14.4 %

HIC (36ms): 487.2

Velocity at Impact: 23.88 KPH

t1: 10.7 msec

t2: 15.7 msec

Free Flight Distance: 221.88 mm

Duration: 5.0 msec

Average Acceleration: 10.1 g

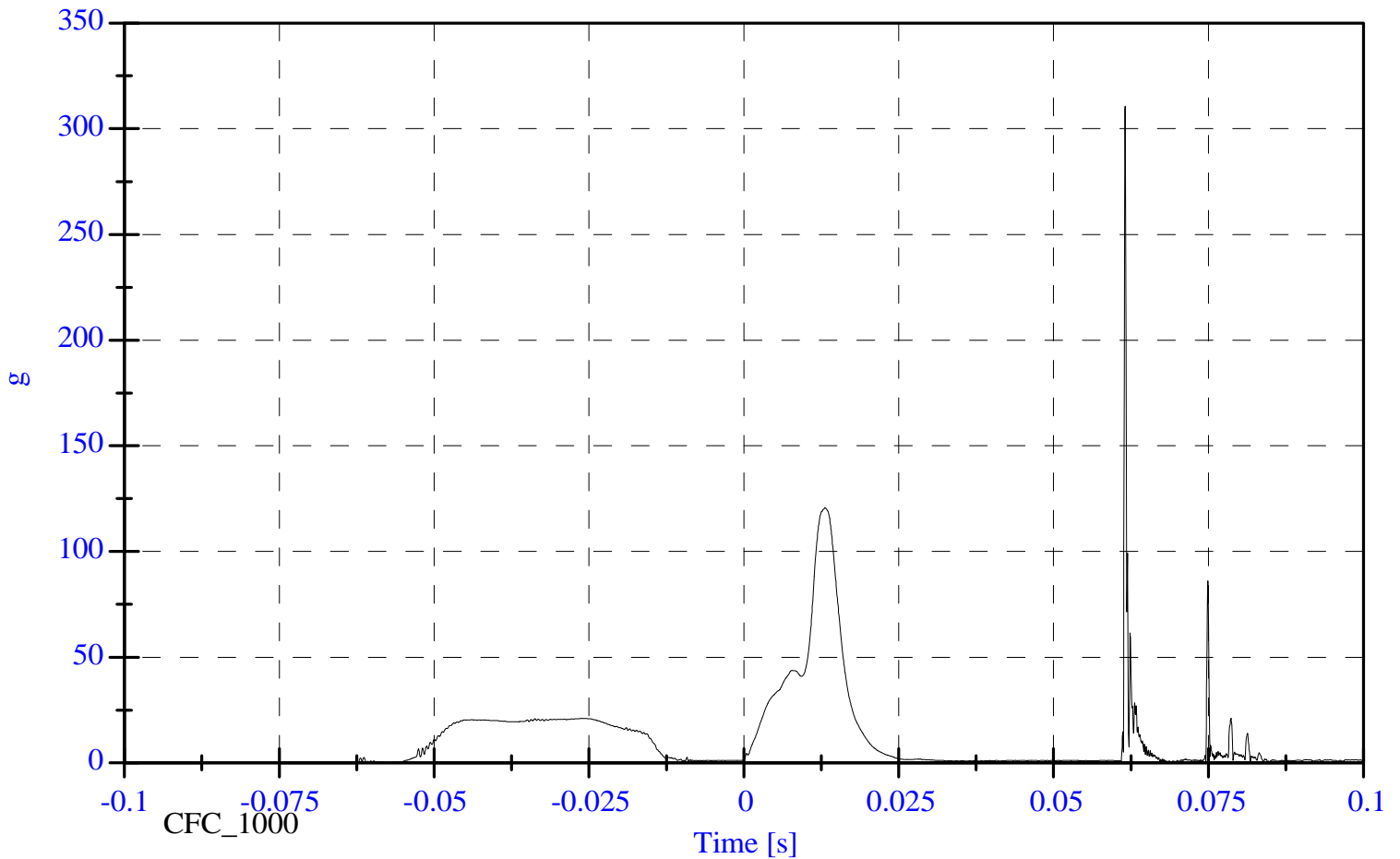
Maximum: 120.7 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 120.7 [g] at 0.013 [s]

Min: 0.0 [g] at -0.076 [s]

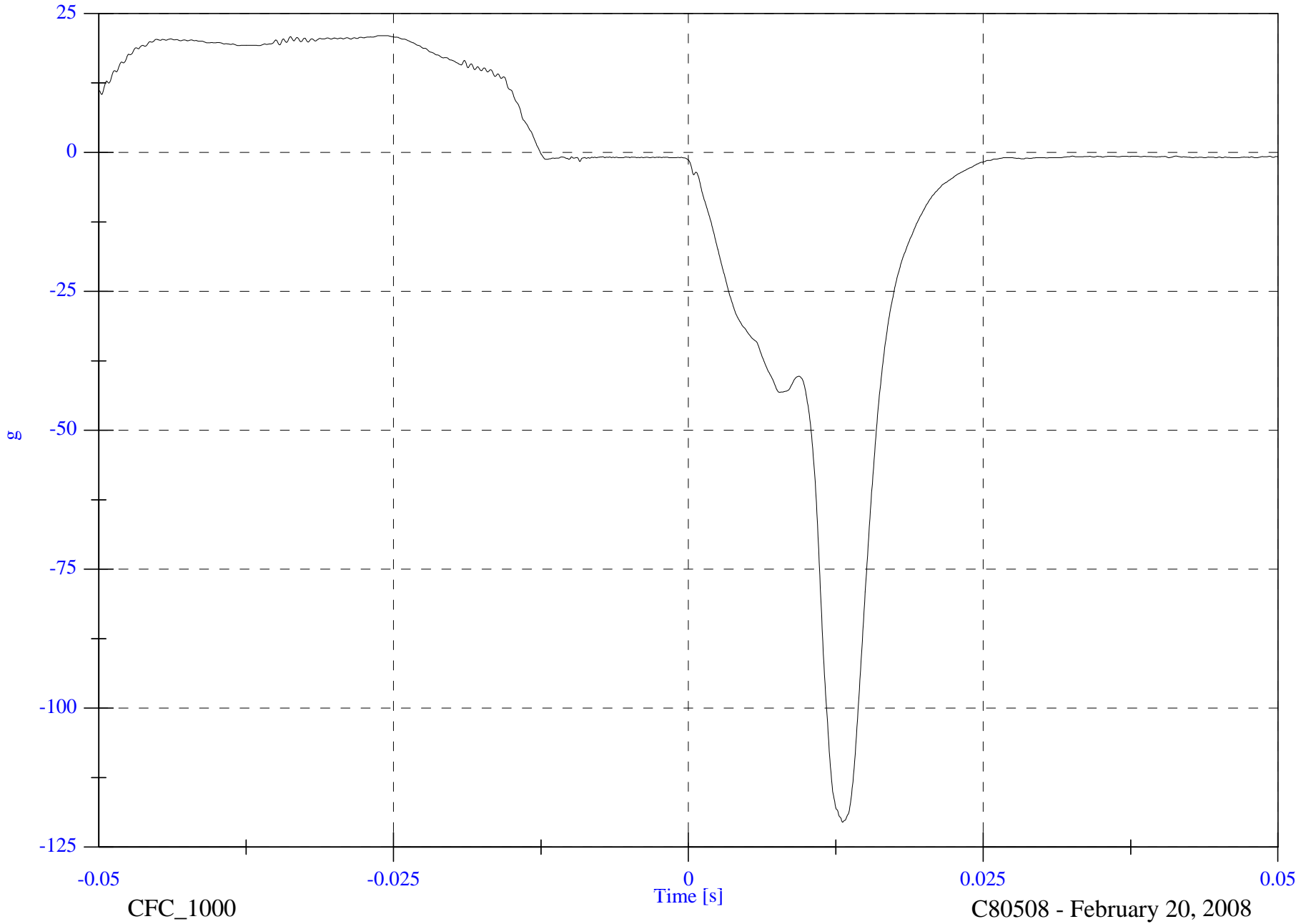


FMVSS 201U 2008 SAAB 9-5

Headform X Acceleration

Max: 21.0 [g] at -0.026 [s]

Min: -120.5 [g] at 0.013 [s]



C80508 PASSENGER SIDE UROP IMPACT PLOT #4

8851-03

CFC_1000

C80508 - February 20, 2008

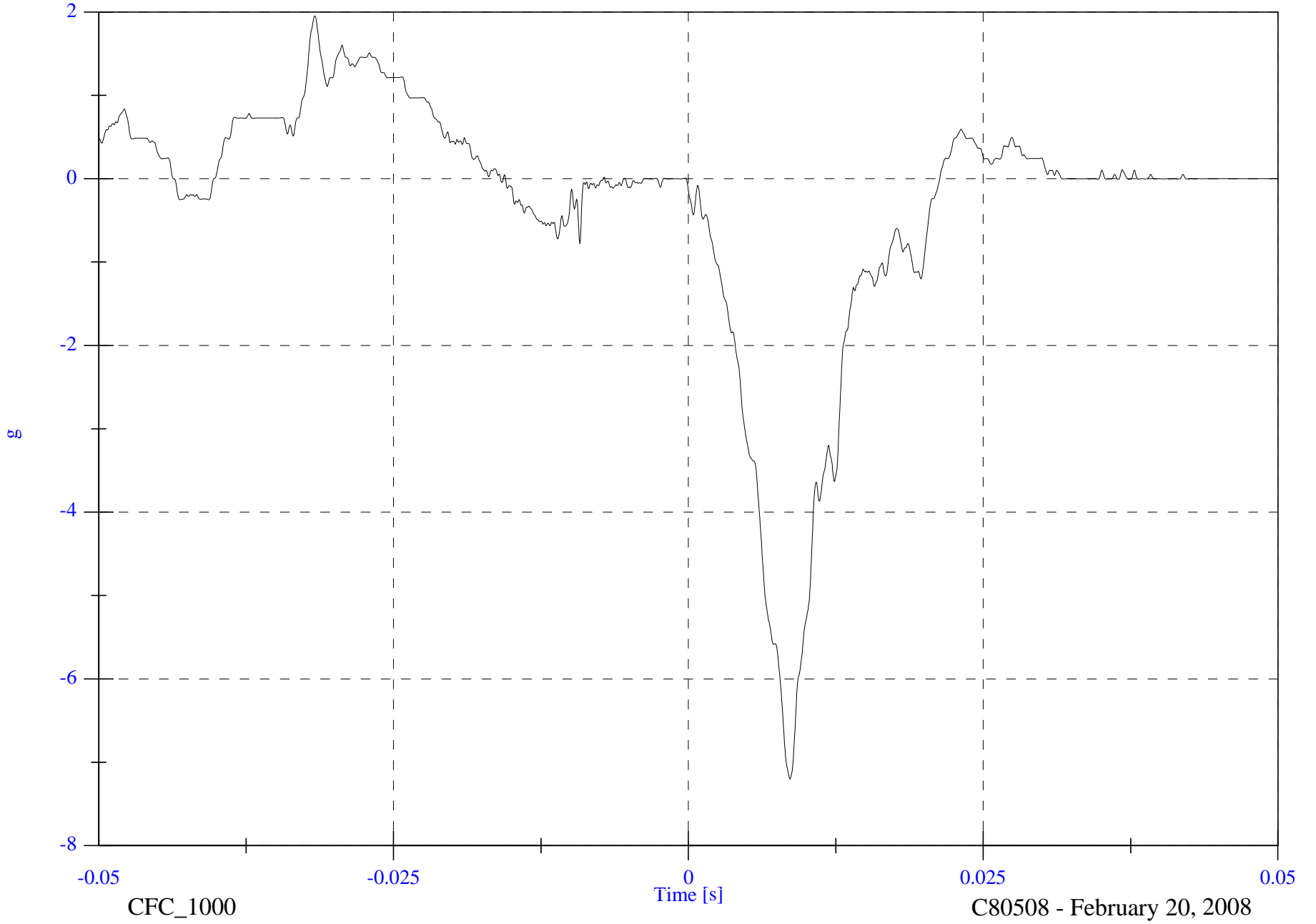
FMVSS 201U 2008 SAAB 9-5

Headform Y Acceleration

Max: 2.0 [g] at -0.032 [s]
Min: -7.2 [g] at 0.009 [s]

C80508 PASSENGER SIDE UROP IMPACT PLOT #5

8851-03



CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

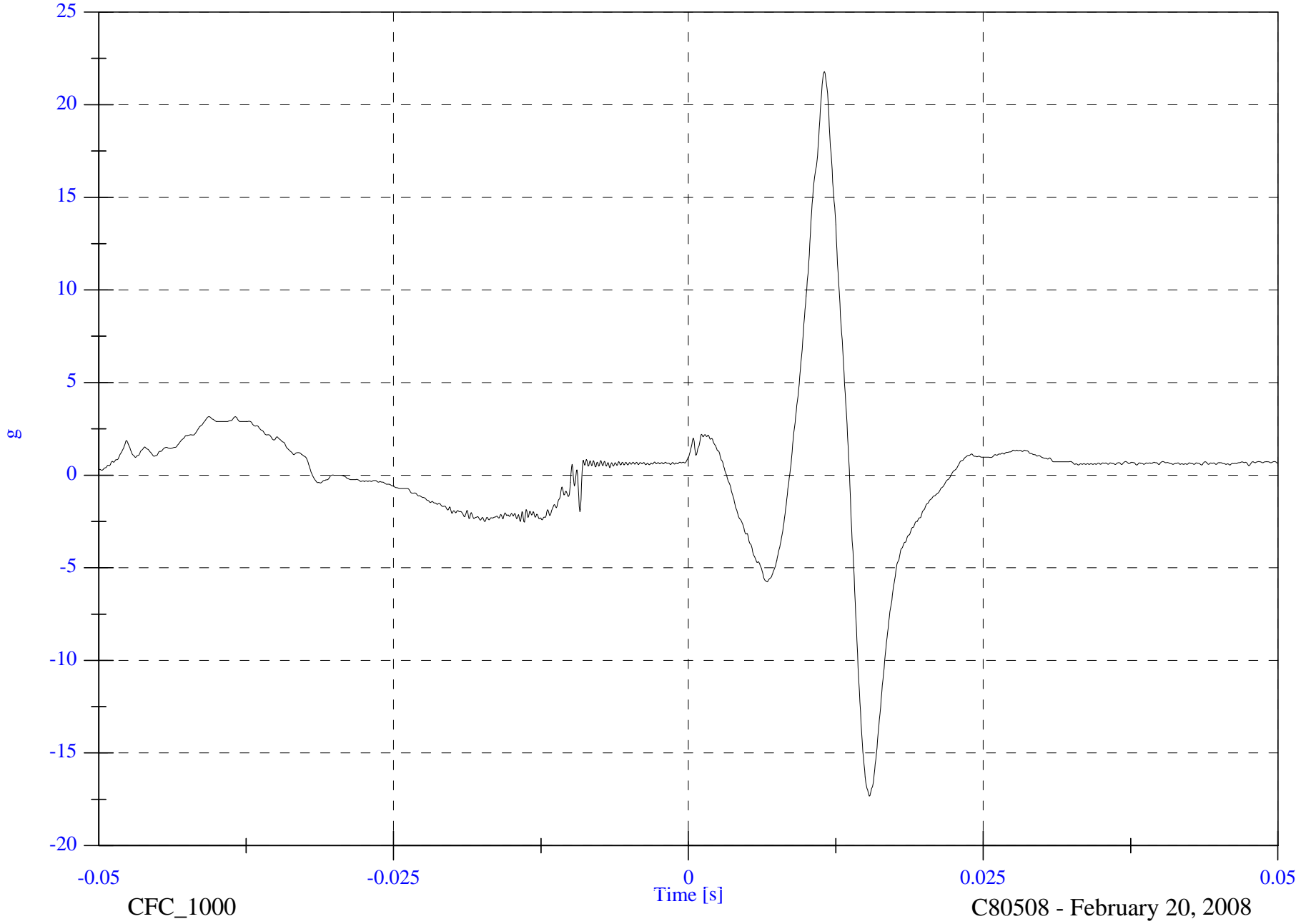
Headform Z Acceleration

Max: 21.8 [g] at 0.012 [s]

Min: -17.3 [g] at 0.015 [s]

C80508 PASSENGER SIDE UROP IMPACT PLOT #6

8851-03



CFC_1000

Time [s]

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

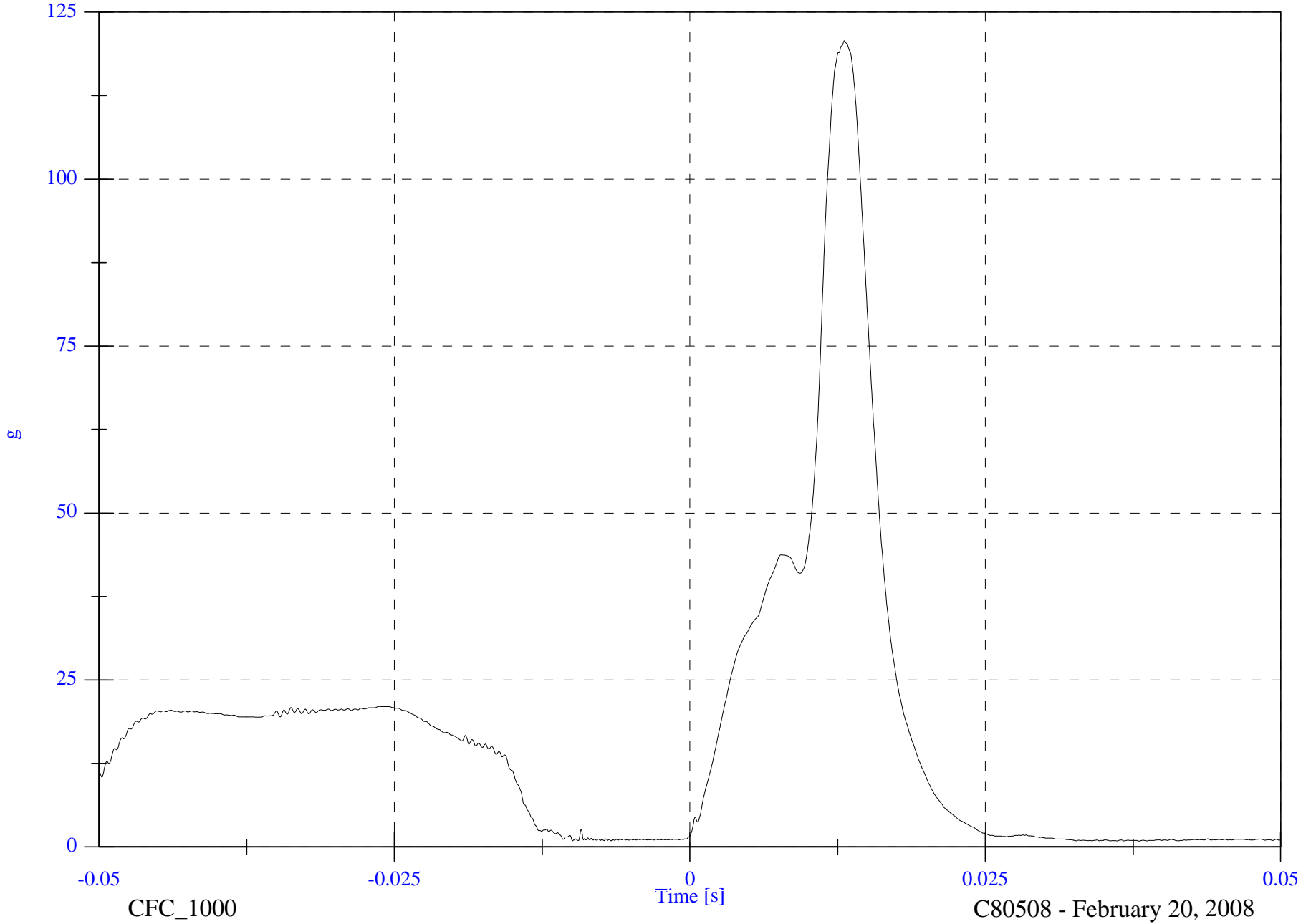
Headform Resultant

Max: 120.7 [g] at 0.013 [s]

Min: 0.9 [g] at 0.038 [s]

C80508 PASSENGER SIDE UROP IMPACT PLOT #7

8851-03



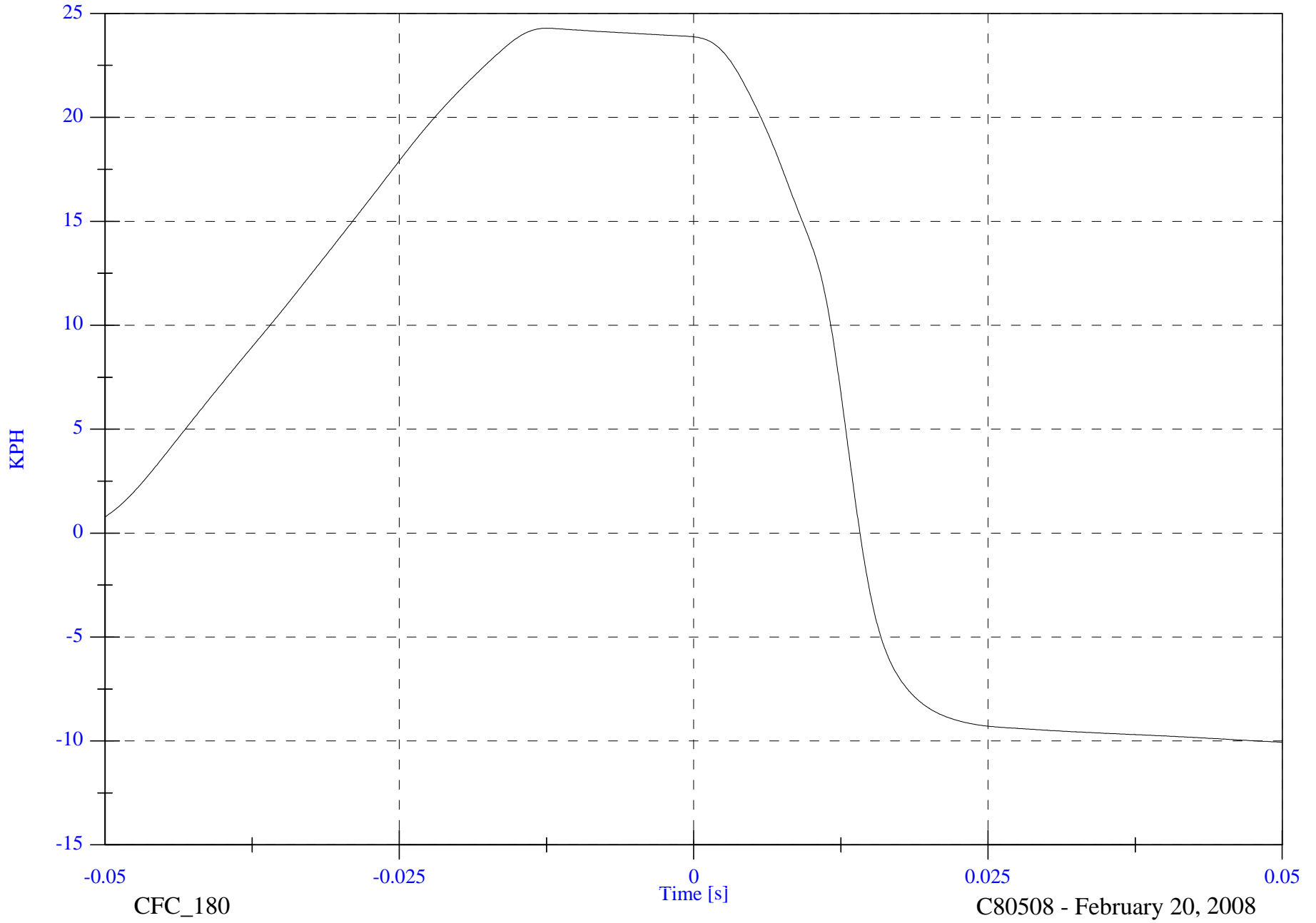
CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

Max: 24.3 [KPH] at -0.012 [s]
Min: -10.1 [KPH] at 0.050 [s]

Headform Velocity



C80508 PASSENGER SIDE UROP IMPACT PLOT #8

8851-03

CFC_180

C80508 - February 20, 2008



PRE-IMPACT UROP



POST-IMPACT UROP

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	04
Test Date:	02/20/08
Target Location:	Upper Roof
Target Code:	URRSR
Horizontal Impact Angle:	90°
Vertical Impact Angle:	50°
Ambient Temperature:	21.8 C°
Relative Humidity:	14.5
Time of Impact:	13:34
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	9	mm right	x mm left
On Centerline	47	mm up	



POST-IMPACT URRSR HEADFORM

Free Motion HIC	637.4
HIC(d)	647.3
Impact Velocity (kph)	23.8
HIC T1 (msec)	5.9
HIC T2 (msec)	14.6

FMVSS 201U 2008 SAAB 9-5 C80508 - URRSR

FMH Headform 0062

Location: URRSR

Test Date: February 20, 2008

Work File: URRSR

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

Lab Temperature: 21.8 C

HICd: 647.3

Lab Humidity: 14.5 %

HIC (36ms): 637.4

Velocity at Impact: 23.80 KPH

t1: 5.9 msec

t2: 14.6 msec

Free Flight Distance: 219.03 mm

Duration: 8.7 msec

Average Acceleration: 9.0 g

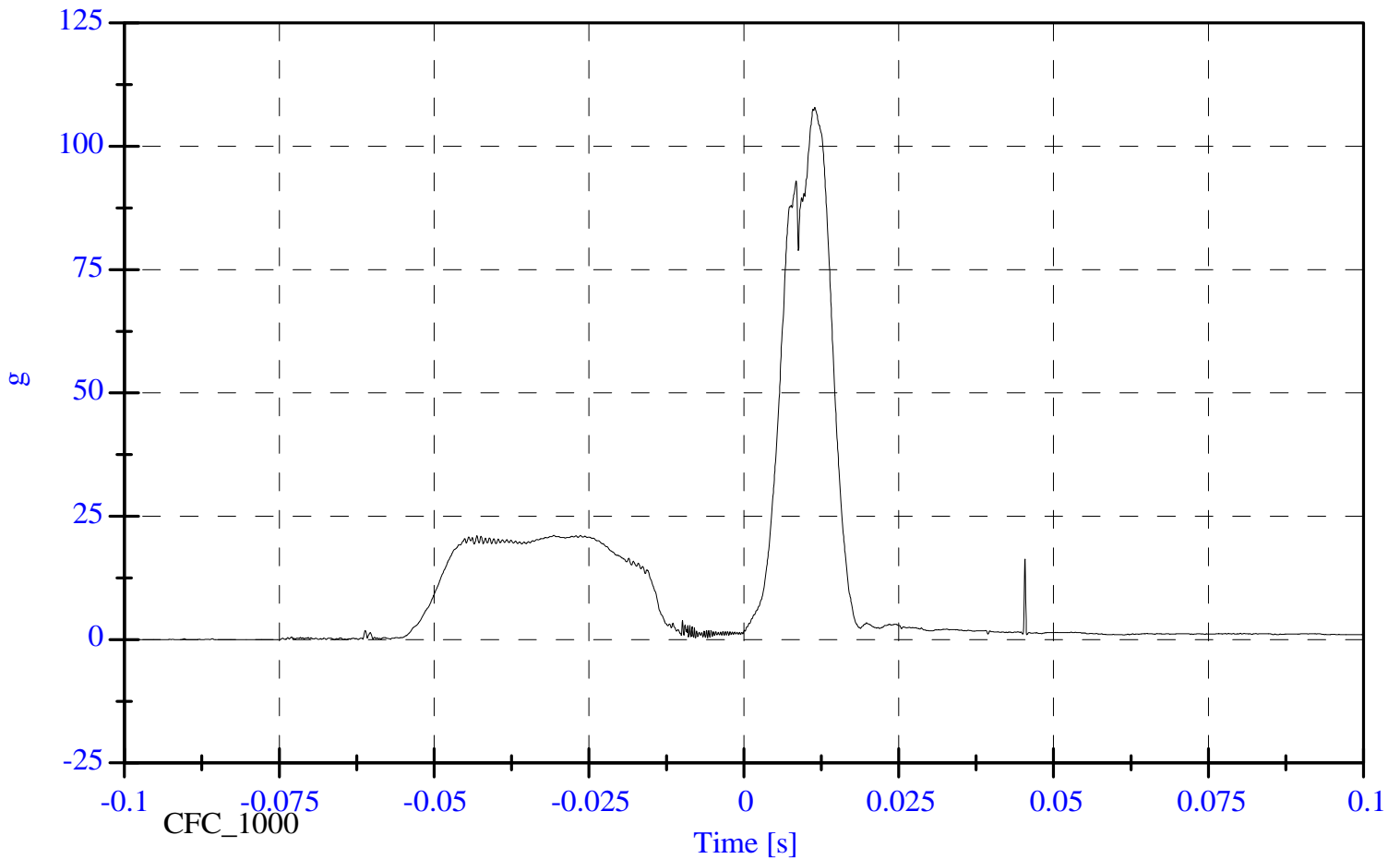
Maximum: 107.9 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 107.9 [g] at 0.011 [s]

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

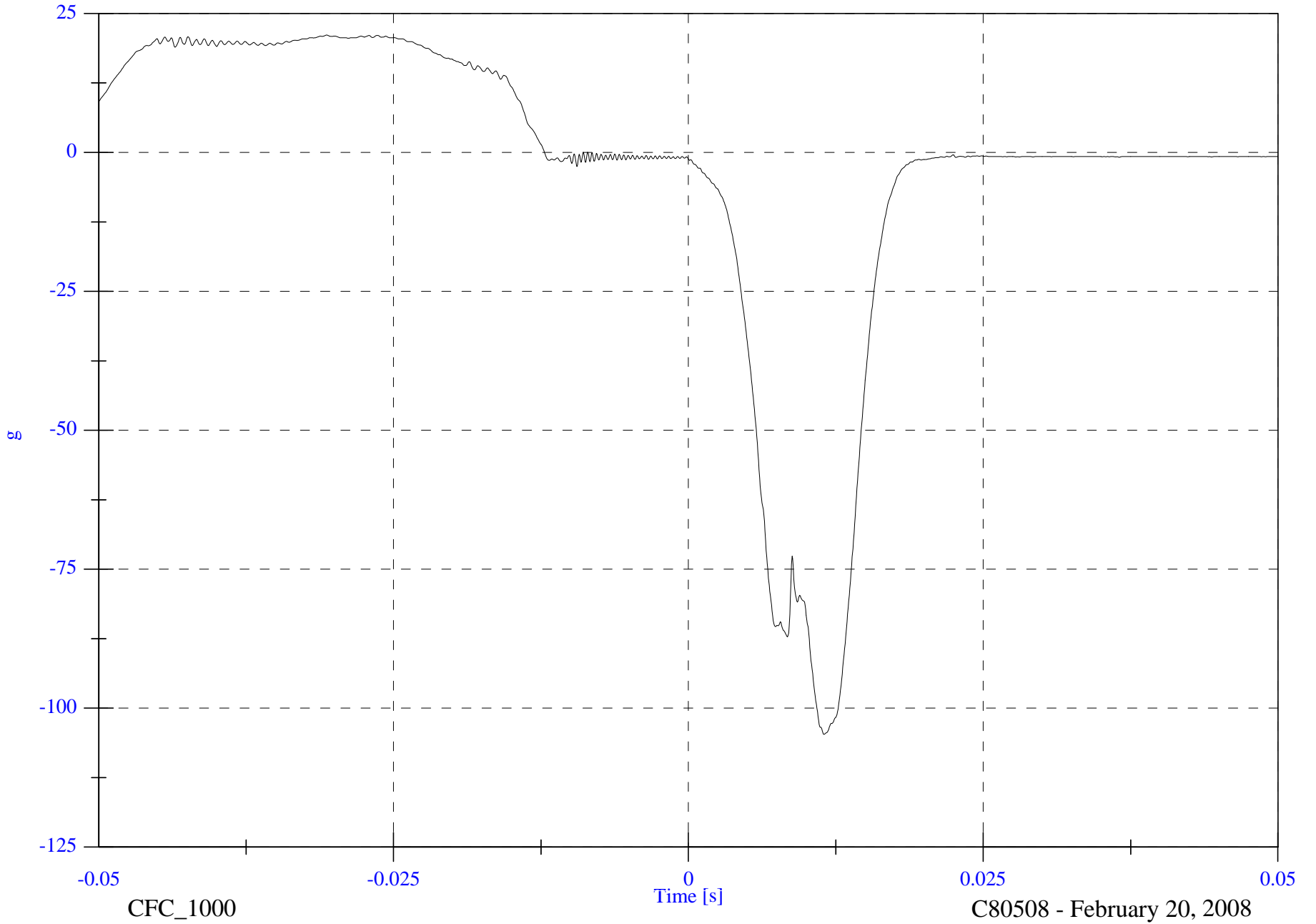


FMVSS 201U 2008 SAAB 9-5

Headform X Acceleration

Max: 21.1 [g] at -0.031 [s]

Min: -104.7 [g] at 0.012 [s]



C80508 PASSENGER SIDE URRSR IMPACT PLOT #2

8851-03

CFC_1000

C80508 - February 20, 2008

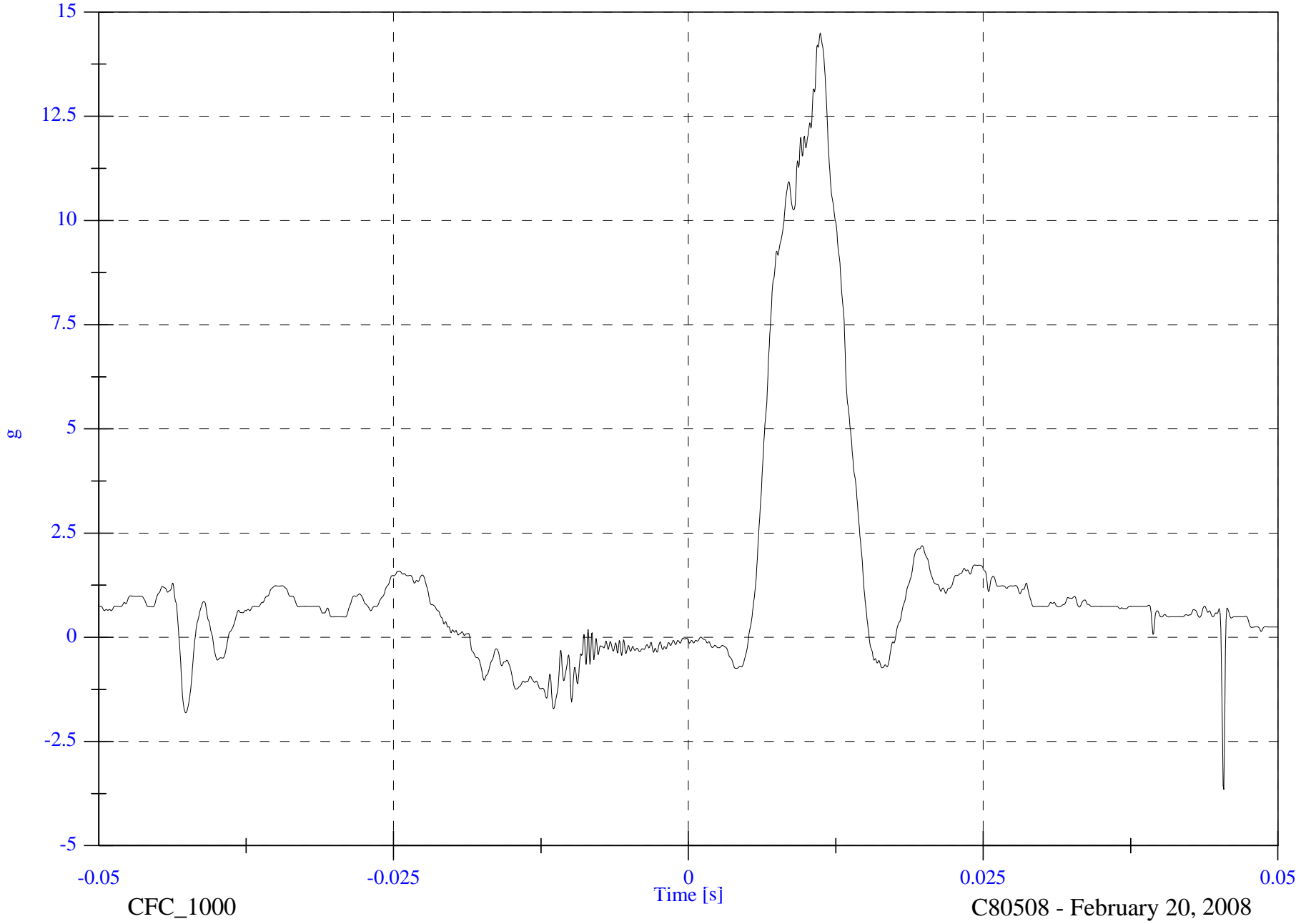
FMVSS 201U 2008 SAAB 9-5

Headform Y Acceleration

Max: 14.5 [g] at 0.011 [s]
Min: -3.7 [g] at 0.045 [s]

C80508 PASSENGER SIDE URRSR IMPACT PLOT #3

8851-03



CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

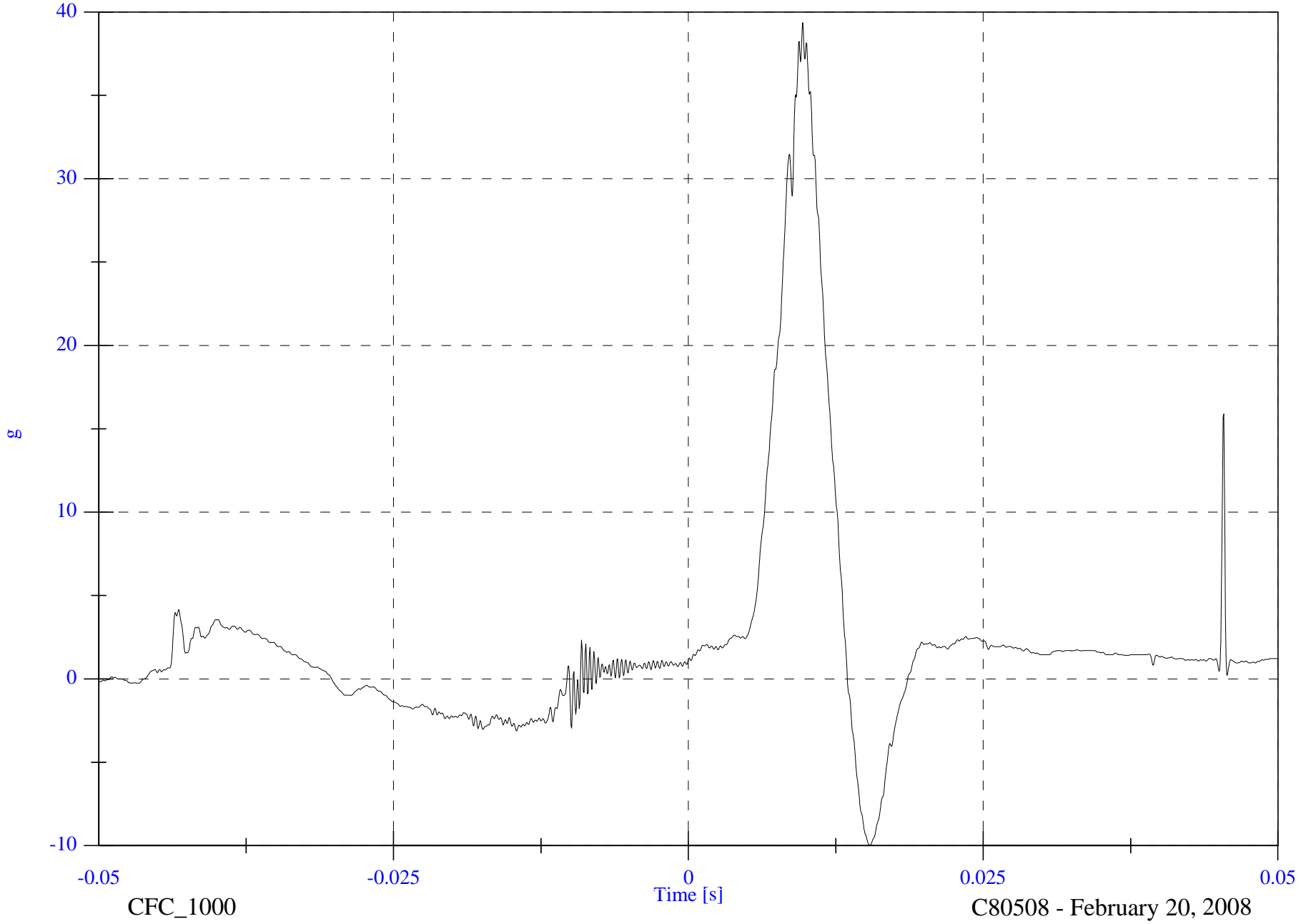
Max: 39.4 [g] at 0.010 [s]

Min: -10.0 [g] at 0.015 [s]

Headform Z Acceleration

C80508 PASSENGER SIDE URRSR IMPACT PLOT #4

8851-03



CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

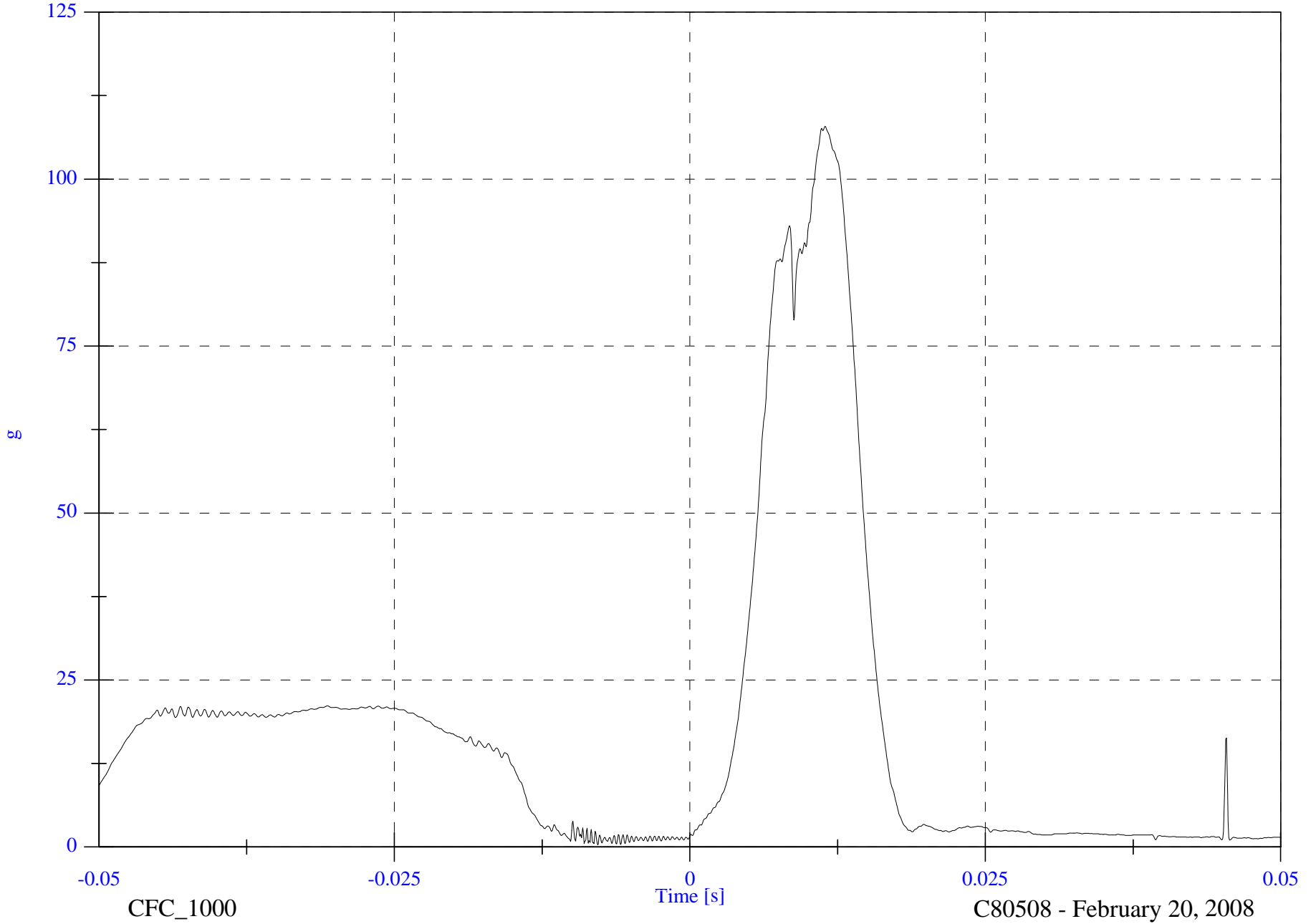
Headform Resultant

Max: 107.9 [g] at 0.011 [s]

Min: 0.3 [g] at -0.008 [s]

C80508 PASSENGER SIDE URRSR IMPACT PLOT #5

8851-03



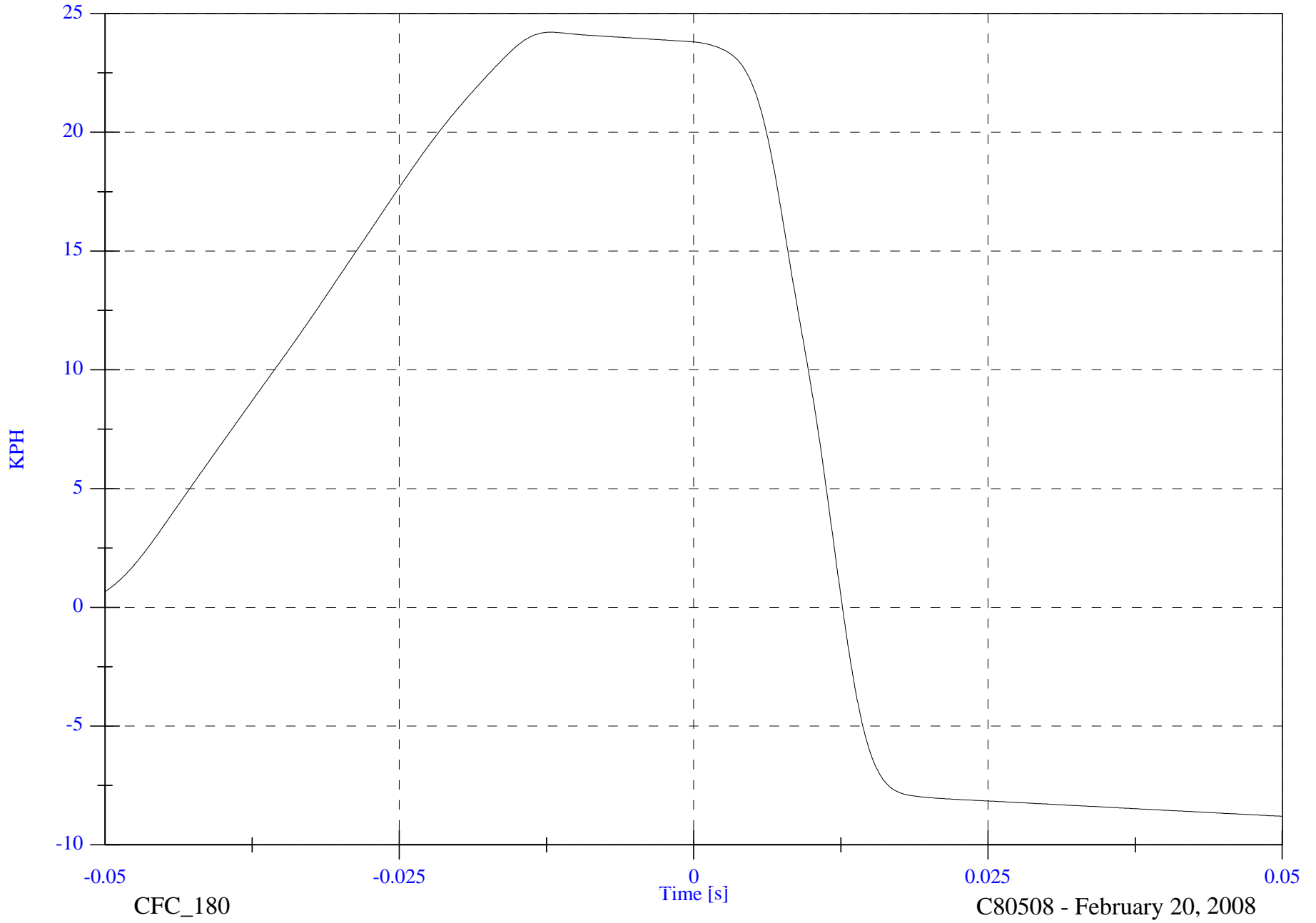
CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

Max: 24.2 [KPH] at -0.012 [s]
Min: -8.8 [KPH] at 0.050 [s]

Headform Velocity



C80508 PASSENGER SIDE URRSR IMPACT PLOT #6

8851-03

CFC_180

C80508 - February 20, 2008



PRE-IMPACT URRSR

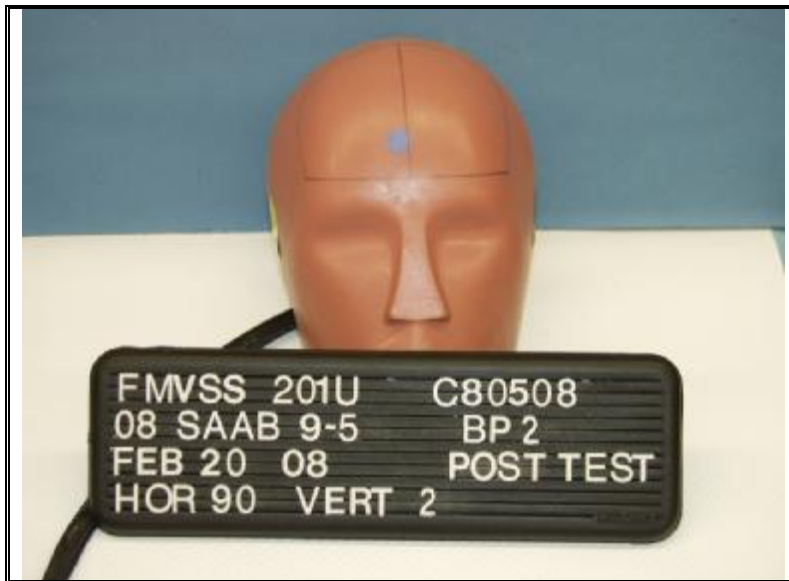


POST-IMPACT URRSR

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	05
Test Date:	02/20/08
Target Location:	B-Pillar
Target Code:	BP2
Horizontal Impact Angle:	90°
Vertical Impact Angle:	2°
Ambient Temperature:	21.9 C°
Relative Humidity:	14.7
Time of Impact:	14:10
Headform Number:	1142

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	19				mm up



POST-IMPACT BP2 HEADFORM

Free Motion HIC	693.5
HIC(d)	689.6
Impact Velocity (kph)	23.53
HIC T1 (msec)	3.8
HIC T2 (msec)	10.6

FMVSS 201U 2008 SAAB 9-5 C80508 - BP2

FMH Headform 1142

Location: BP2

Test Date: February 20, 2008

Work File: BP2

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

Lab Temperature: 21.9 C

HICd: 689.6

Lab Humidity: 14.7 %

HIC (36ms): 693.5

Velocity at Impact: 23.53 KPH

t1: 3.8 msec

t2: 10.6 msec

Free Flight Distance: 218.00 mm

Duration: 6.8 msec

Average Acceleration: 9.0 g

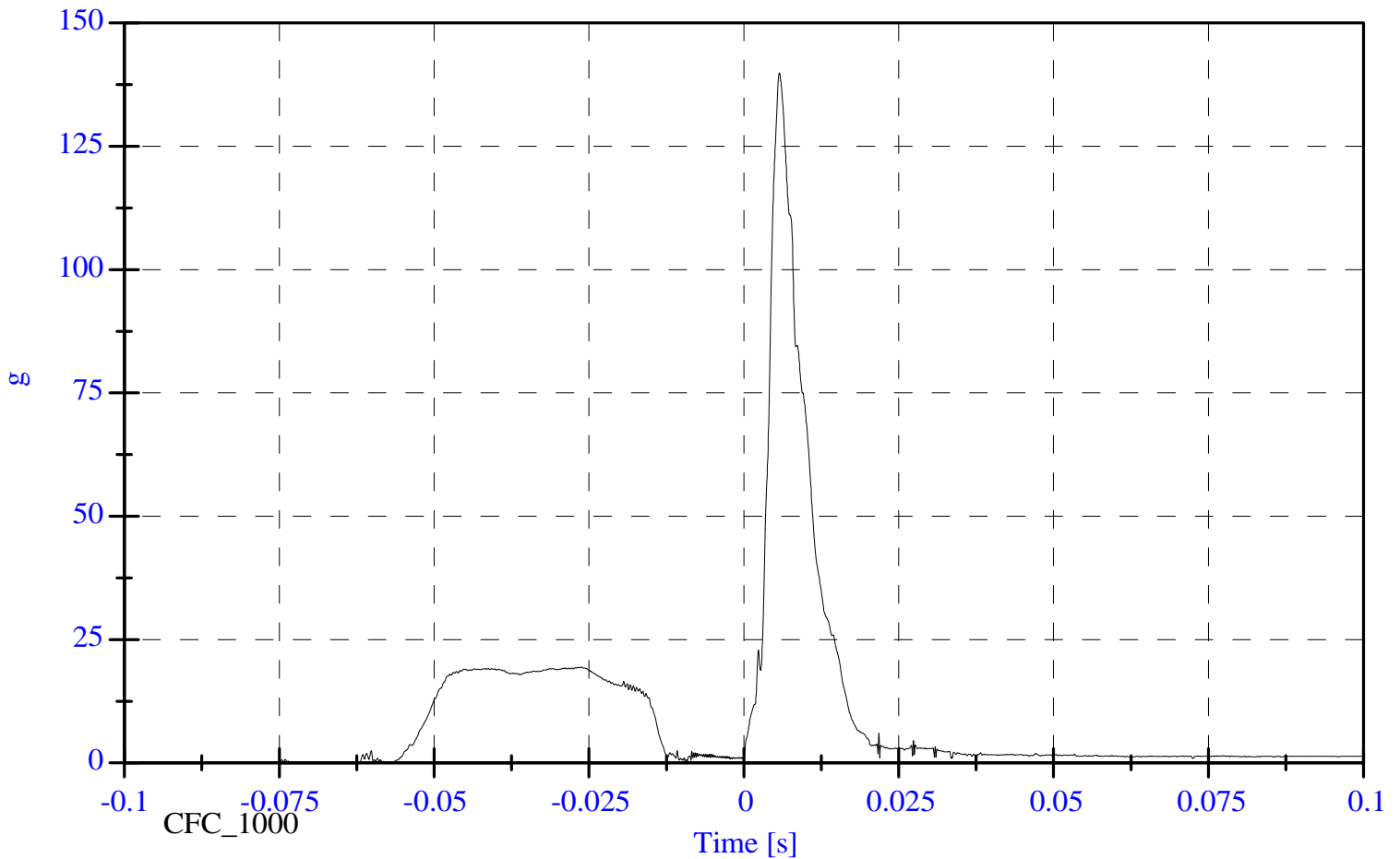
Maximum: 139.9 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 139.9 [g] at 0.006 [s]

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

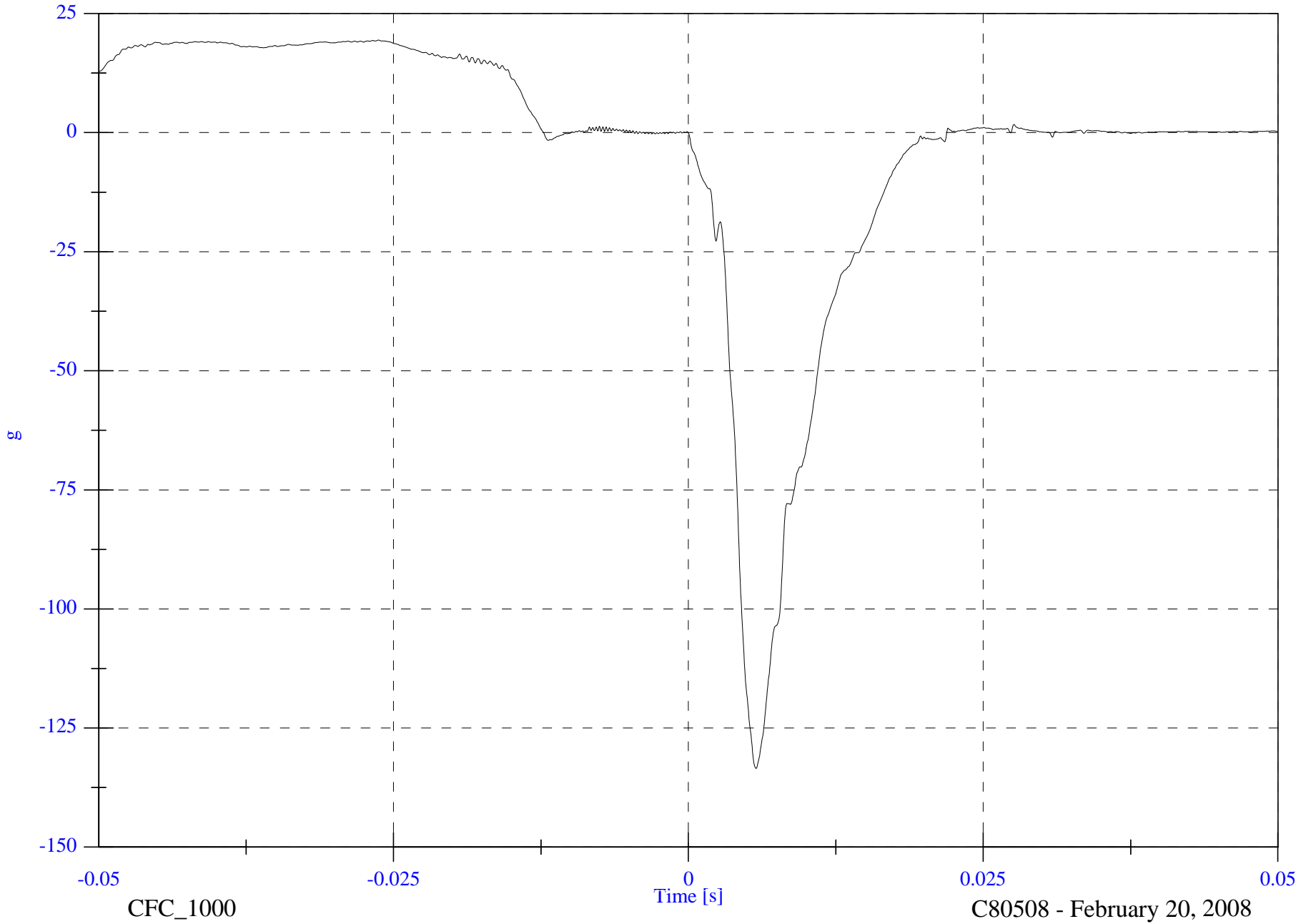


FMVSS 201U 2008 SAAB 9-5

Headform X Acceleration

Max: 19.4 [g] at -0.026 [s]

Min: -133.5 [g] at 0.006 [s]



C80508 PASSENGER SIDE BP2 IMPACT PLOT #2

8851-03

CFC_1000

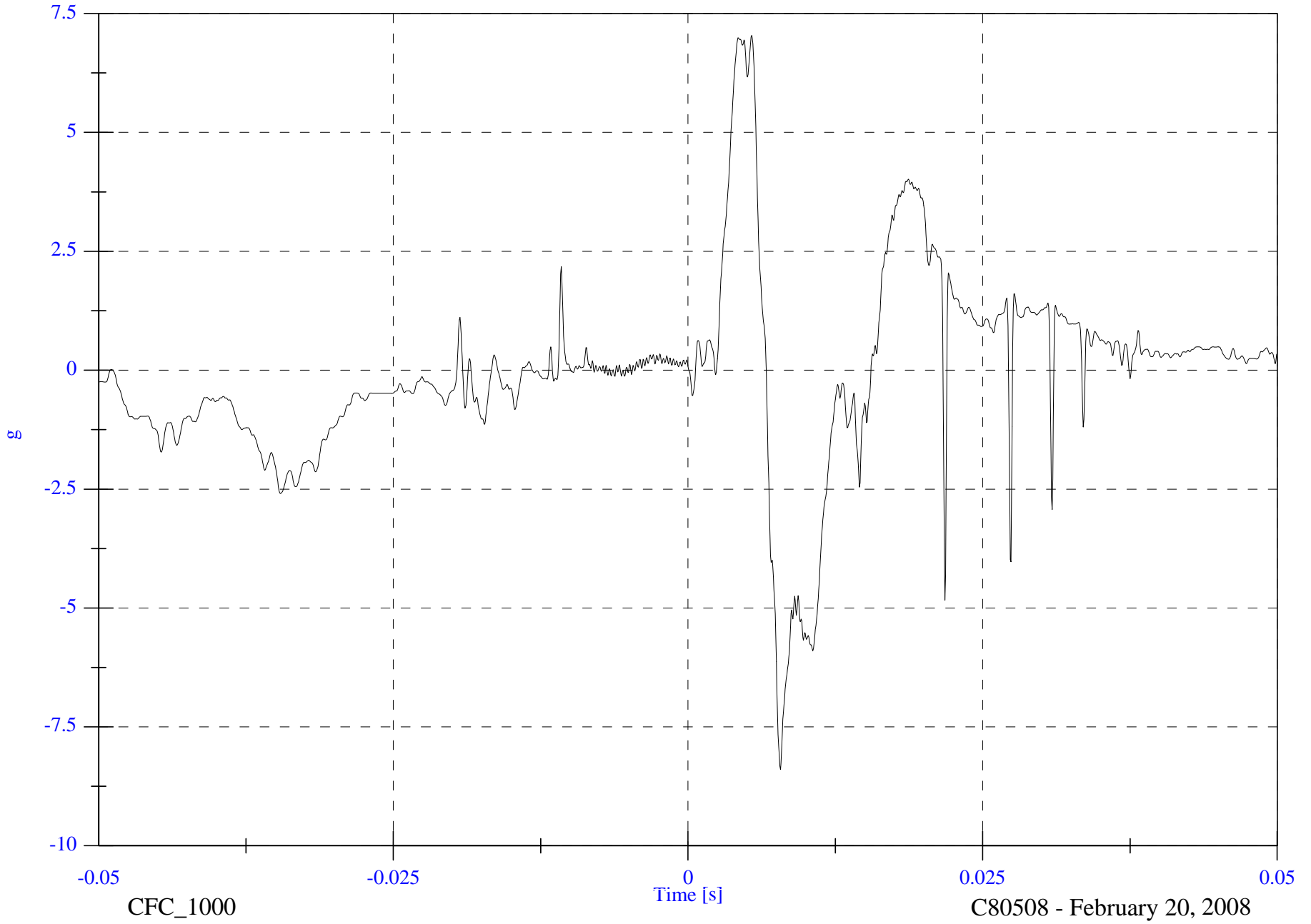
C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

Max: 7.0 [g] at 0.005 [s]

Min: -8.4 [g] at 0.008 [s]

Headform Y Acceleration



C80508 PASSENGER SIDE BP2 IMPACT PLOT #3

8851-03

CFC_1000

C80508 - February 20, 2008

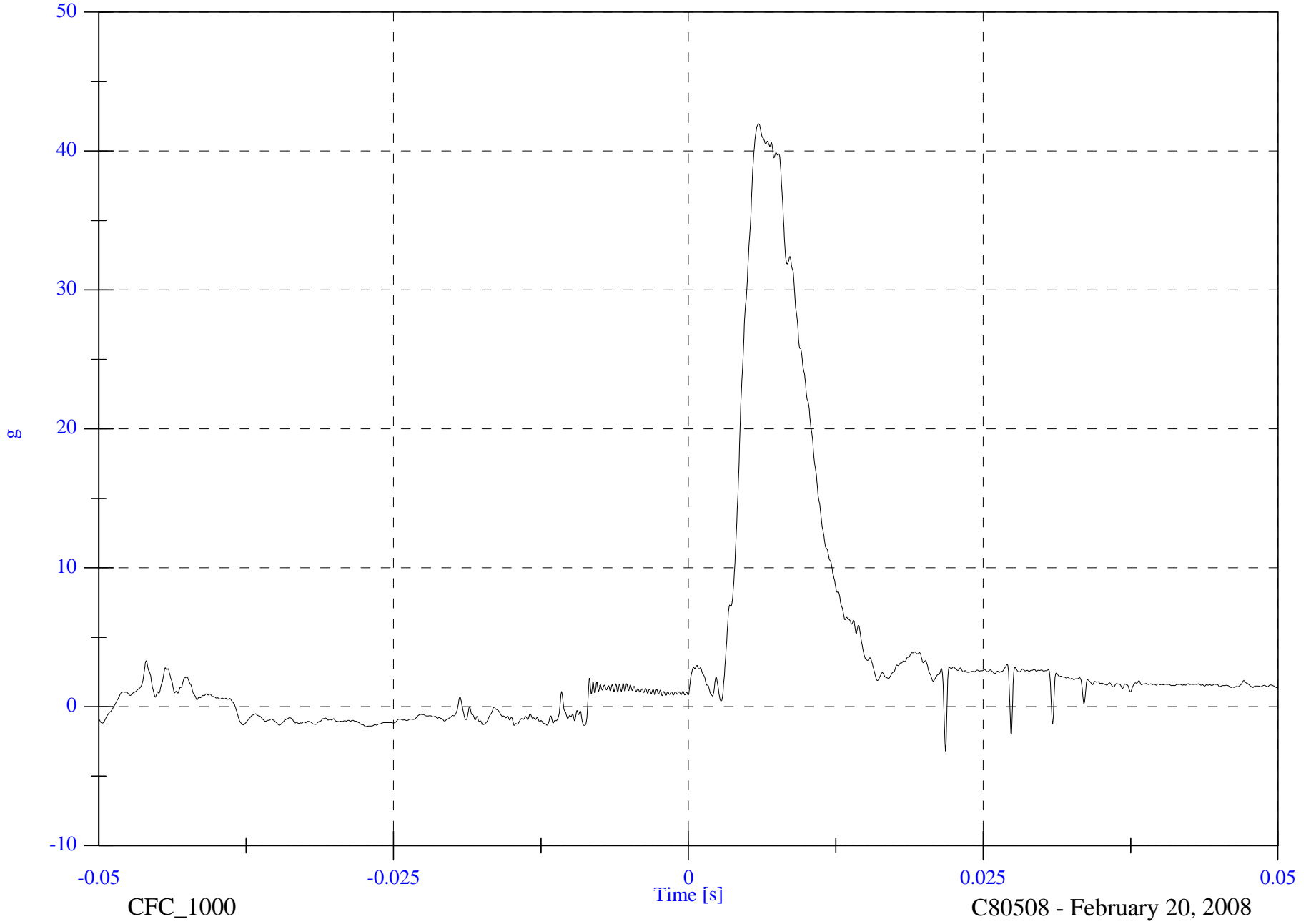
FMVSS 201U 2008 SAAB 9-5

Headform Z Acceleration

Max: 42.0 [g] at 0.006 [s]
Min: -3.2 [g] at 0.022 [s]

C80508 PASSENGER SIDE BP2 IMPACT PLOT #4

8851-03



CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

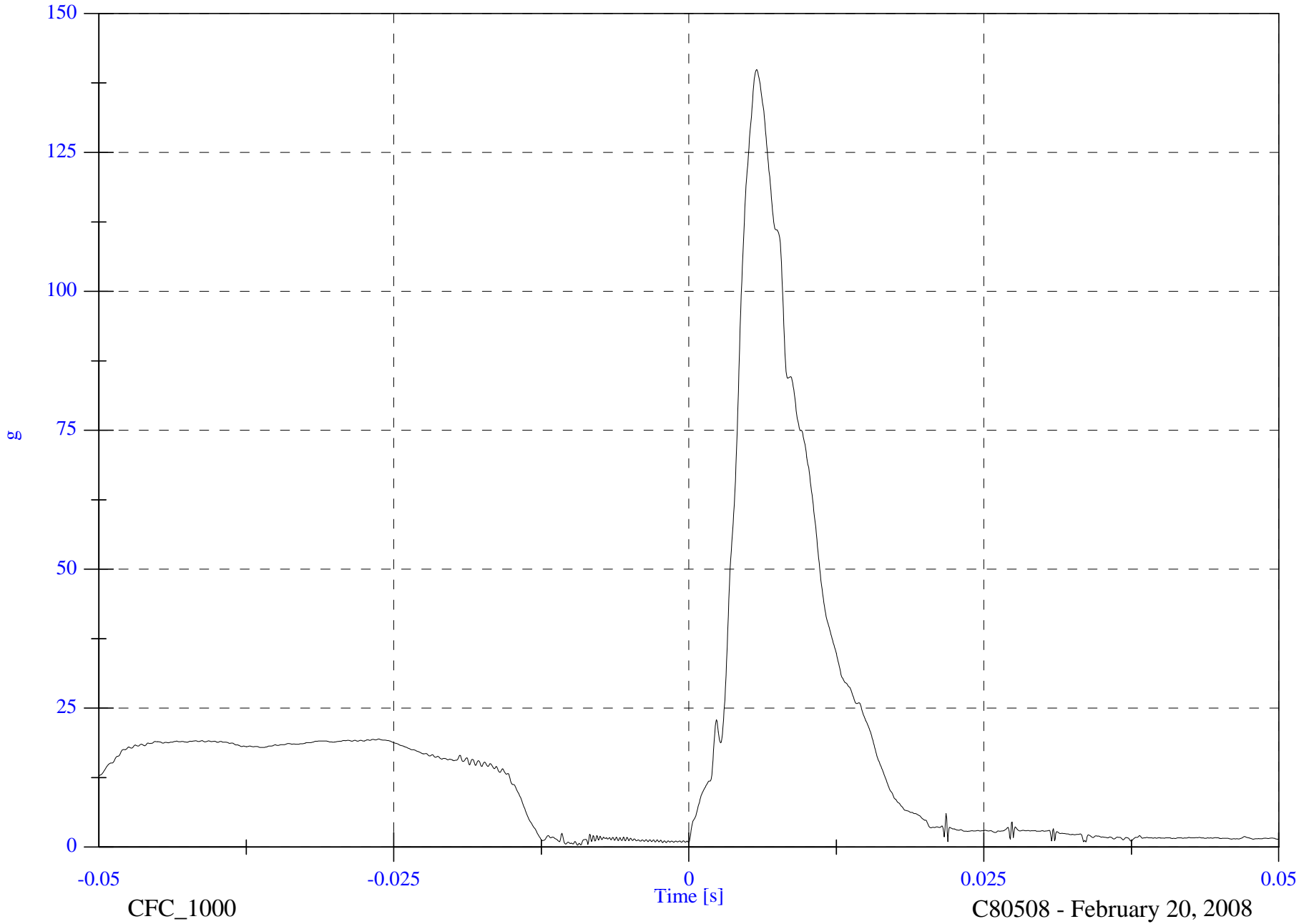
Headform Resultant

Max: 139.9 [g] at 0.006 [s]

Min: 0.3 [g] at -0.009 [s]

C80508 PASSENGER SIDE BP2 IMPACT PLOT #5

8851-03



CFC_1000

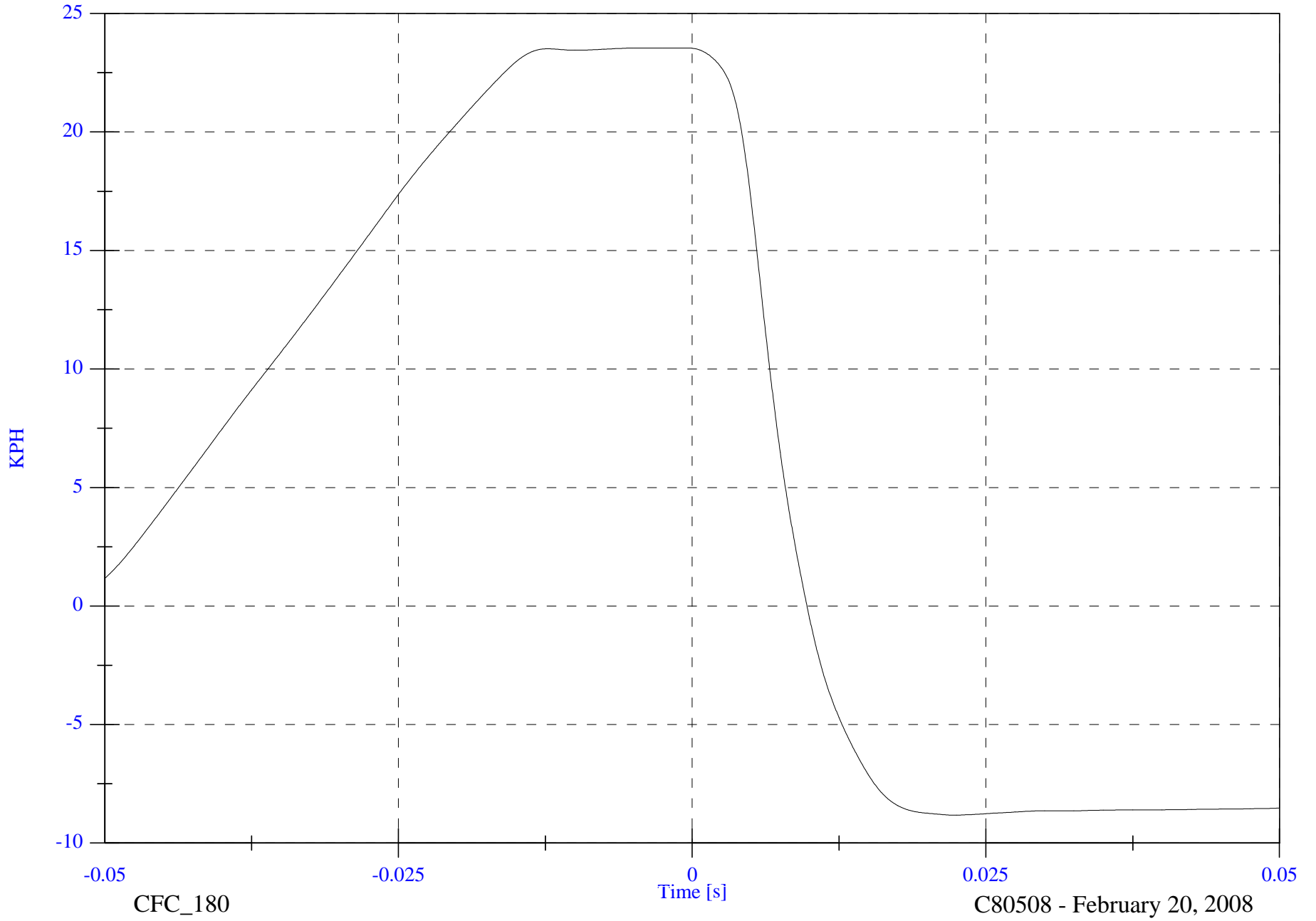
C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

Max: 23.5 [KPH] at -0.004 [s]

Min: -8.8 [KPH] at 0.022 [s]

Headform Velocity



C80508 PASSENGER SIDE BP2 IMPACT PLOT #6

8851-03

CFC_180

C80508 - February 20, 2008



PRE-IMPACT BP2



POST-IMPACT BP2

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	06
Test Date:	02/20/08
Target Location:	A-Pillar
Target Code:	AP3
Horizontal Impact Angle:	135°
Vertical Impact Angle:	35°
Ambient Temperature:	22.0 C°
Relative Humidity:	15.1
Time of Impact:	14:50
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	1	mm right	x mm left
On Centerline	16	mm up	



POST-IMPACT AP3 HEADFORM

Free Motion HIC	1779.7
HIC(d)	1509.1
Impact Velocity (kph)	23.73
HIC T1 (msec)	1.5
HIC T2 (msec)	5.1

FMVSS 201U 2008 SAAB 9-5 C80508 - AP3

FMH Headform 0355

Location: AP3

Test Date: February 20, 2008

Work File: AP3

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

Lab Temperature: 22.0 C

HICd: 1509.1

Lab Humidity: 15.1 %

HIC (36ms): 1779.7

Velocity at Impact: 23.73 KPH

t1: 1.5 msec

t2: 5.1 msec

Free Flight Distance: 223.14 mm

Duration: 3.5 msec

Average Acceleration: 8.7 g

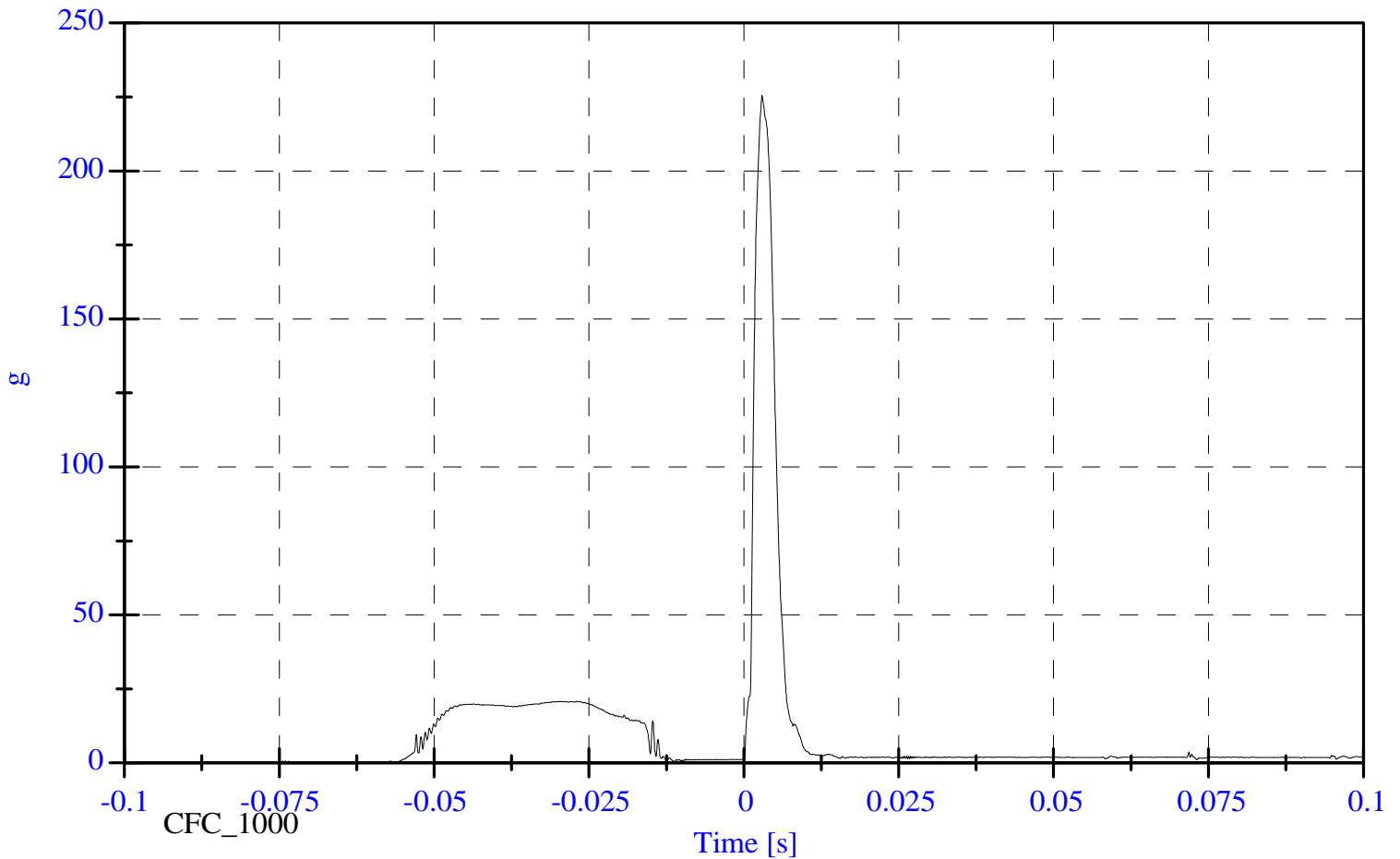
Maximum: 225.5 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 225.5 [g] at 0.003 [s]

Min: 0.0 [g] at -0.077 [s]

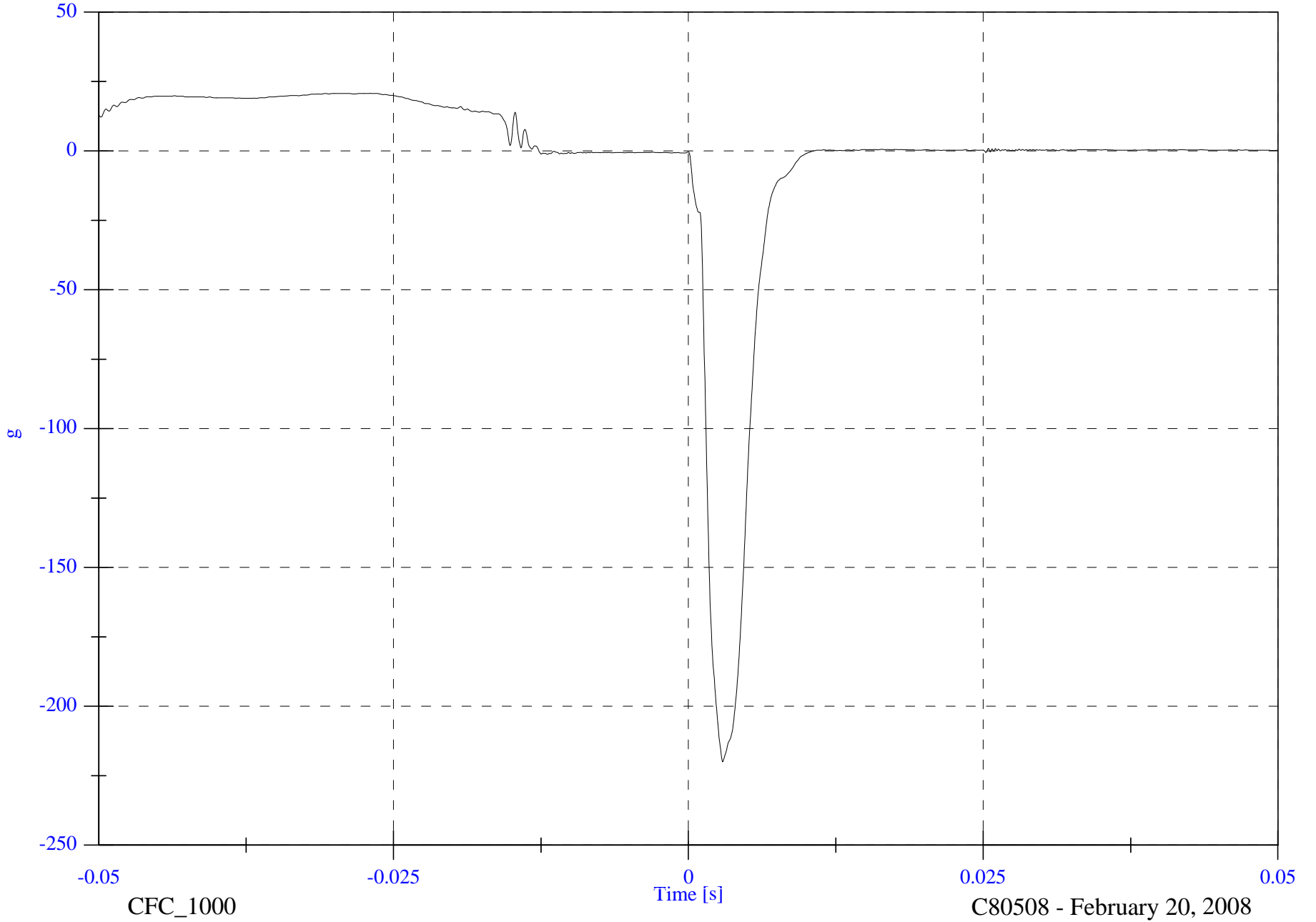


FMVSS 201U 2008 SAAB 9-5

Headform X Acceleration

Max: 20.7 [g] at -0.027 [s]

Min: -220.0 [g] at 0.003 [s]



C80508 PASSENGER SIDE AP3 IMPACT PLOT #2

8851-03

CFC_1000

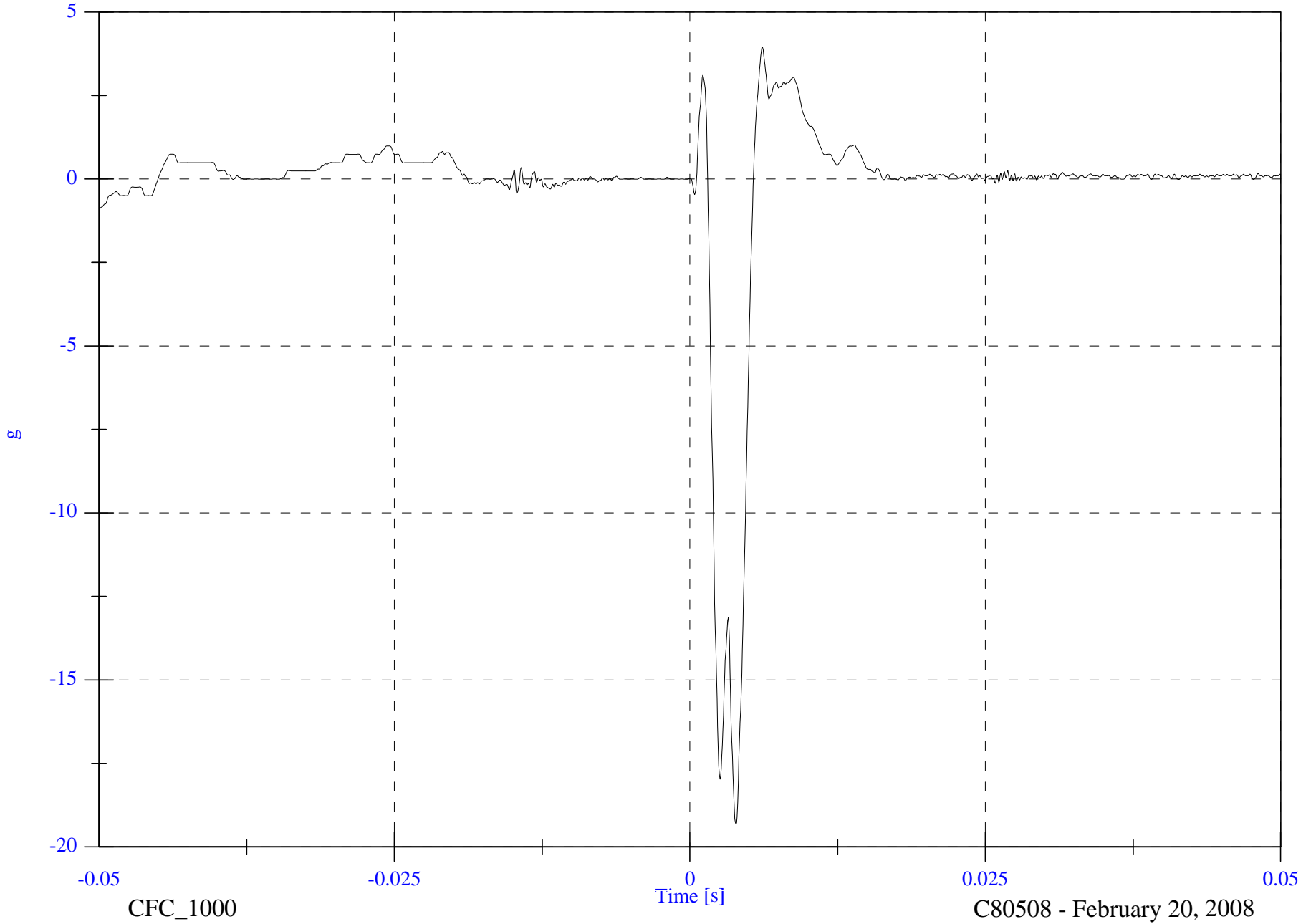
C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

Max: 4.0 [g] at 0.006 [s]

Min: -19.3 [g] at 0.004 [s]

Headform Y Acceleration



C80508 PASSENGER SIDE AP3 IMPACT PLOT #3

8851-03

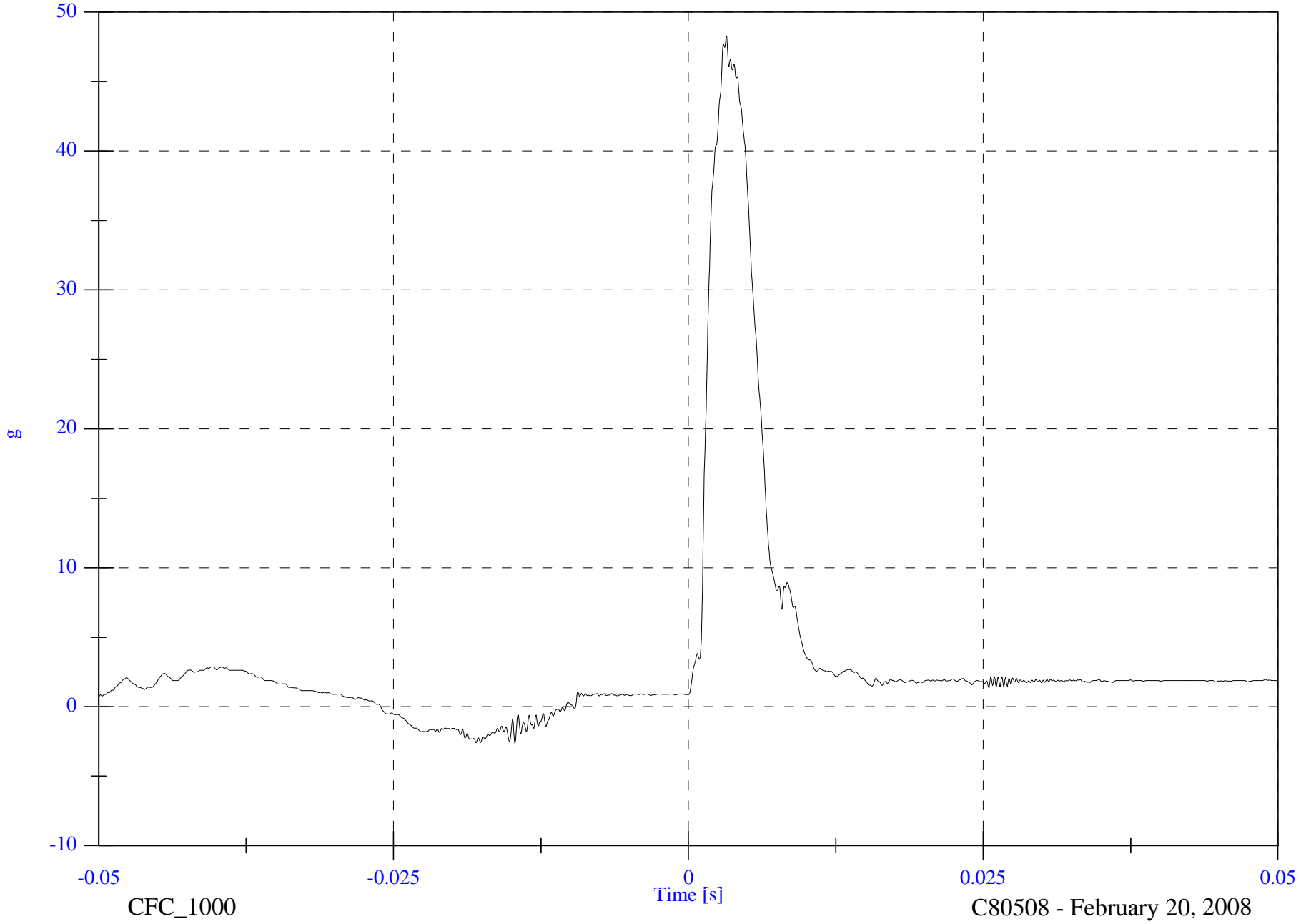
CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

Headform Z Acceleration

Max: 48.3 [g] at 0.003 [s]
Min: -2.7 [g] at -0.015 [s]



C80508 PASSENGER SIDE AP3 IMPACT PLOT #4

8851-03

CFC_1000

C80508 - February 20, 2008

FMVSS 201U 2008 SAAB 9-5

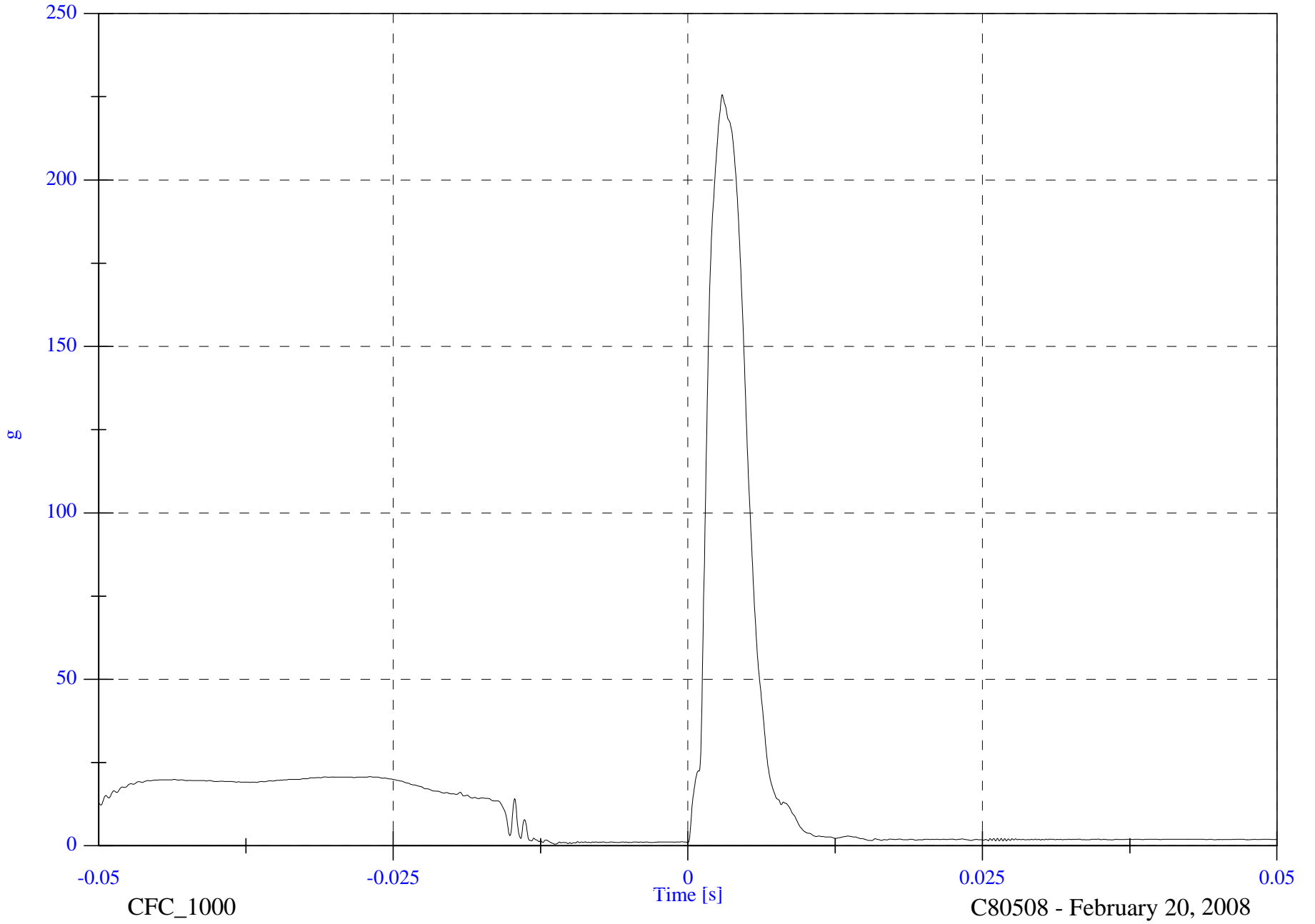
Headform Resultant

Max: 225.5 [g] at 0.003 [s]

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

C80508 PASSENGER SIDE AP3 IMPACT PLOT #5

8851-03

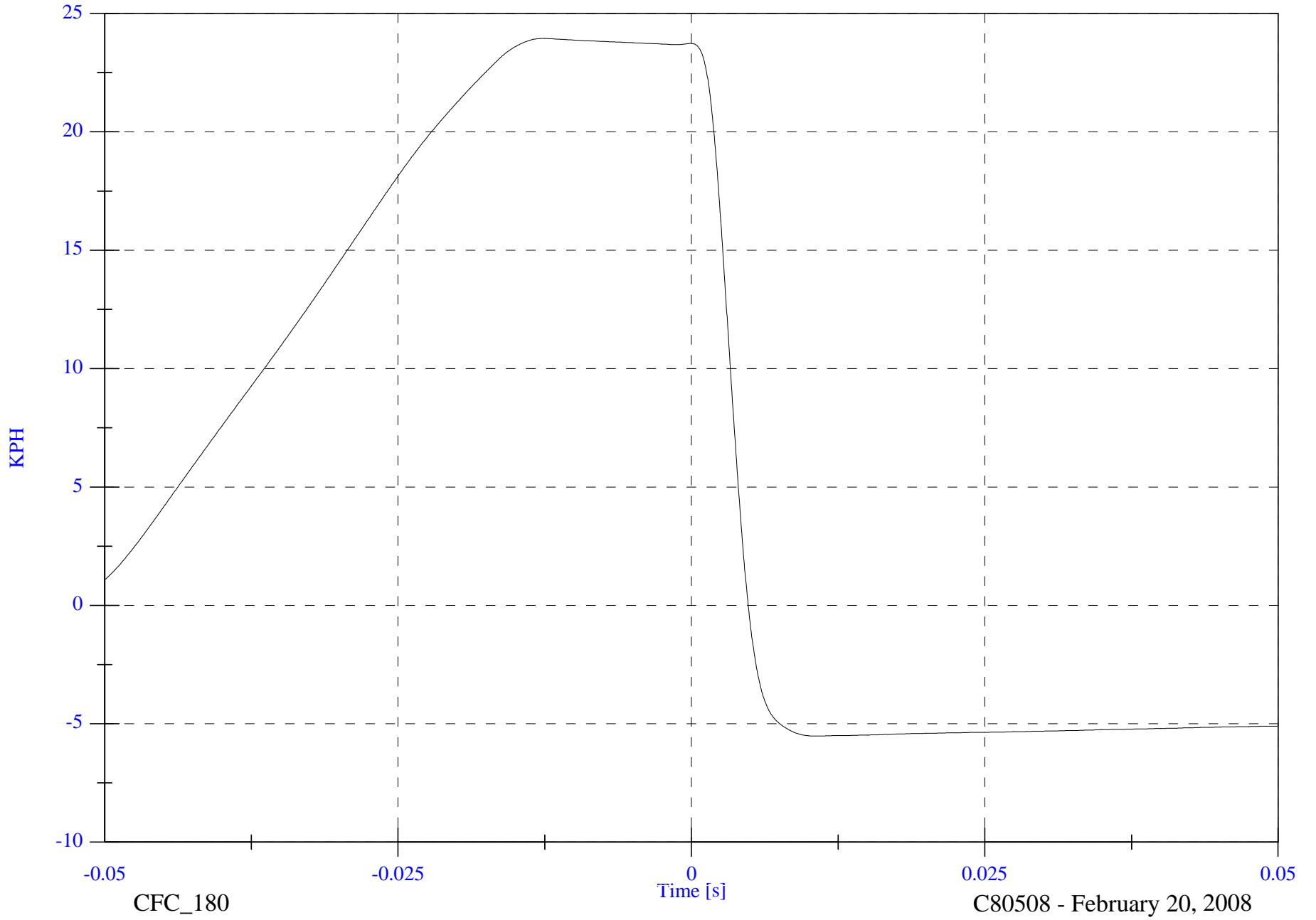


FMVSS 201U 2008 SAAB 9-5

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

Min: -5.5 [KPH] at 0.011 [s]

Headform Velocity



C80508 PASSENGER SIDE AP3 IMPACT PLOT #6

8851-03

CFC_180

C80508 - February 20, 2008



PRE-IMPACT AP3



POST-IMPACT AP3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	07
Test Date:	02/21/08
Target Location:	B-Pillar
Target Code:	BP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	20°
Ambient Temperature:	20.9 C°
Relative Humidity:	11.6
Time of Impact:	9:05
Headform Number:	1140

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	3	x	mm right	mm left
On Centerline	59		mm up	



POST-IMPACT BP1 HEADFORM

Free Motion HIC	482.9
HIC(d)	530.7
Impact Velocity (kph)	23.59
HIC T1 (msec)	4.1
HIC T2 (msec)	14.7

FMVSS 201U 2008 SAAB 9-5 C80508 - BP1

FMH Headform 1140

Location: BP1

Test Date: February 21, 2008

Work File: BP1

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

Lab Temperature: 20.9 C

HICd: 530.7

Lab Humidity: 11.6 %

HIC (36ms): 482.9

Velocity at Impact: 23.59 KPH

t1: 4.1 msec

t2: 14.7 msec

Free Flight Distance: 214.99 mm

Duration: 10.6 msec

Average Acceleration: 9.5 g

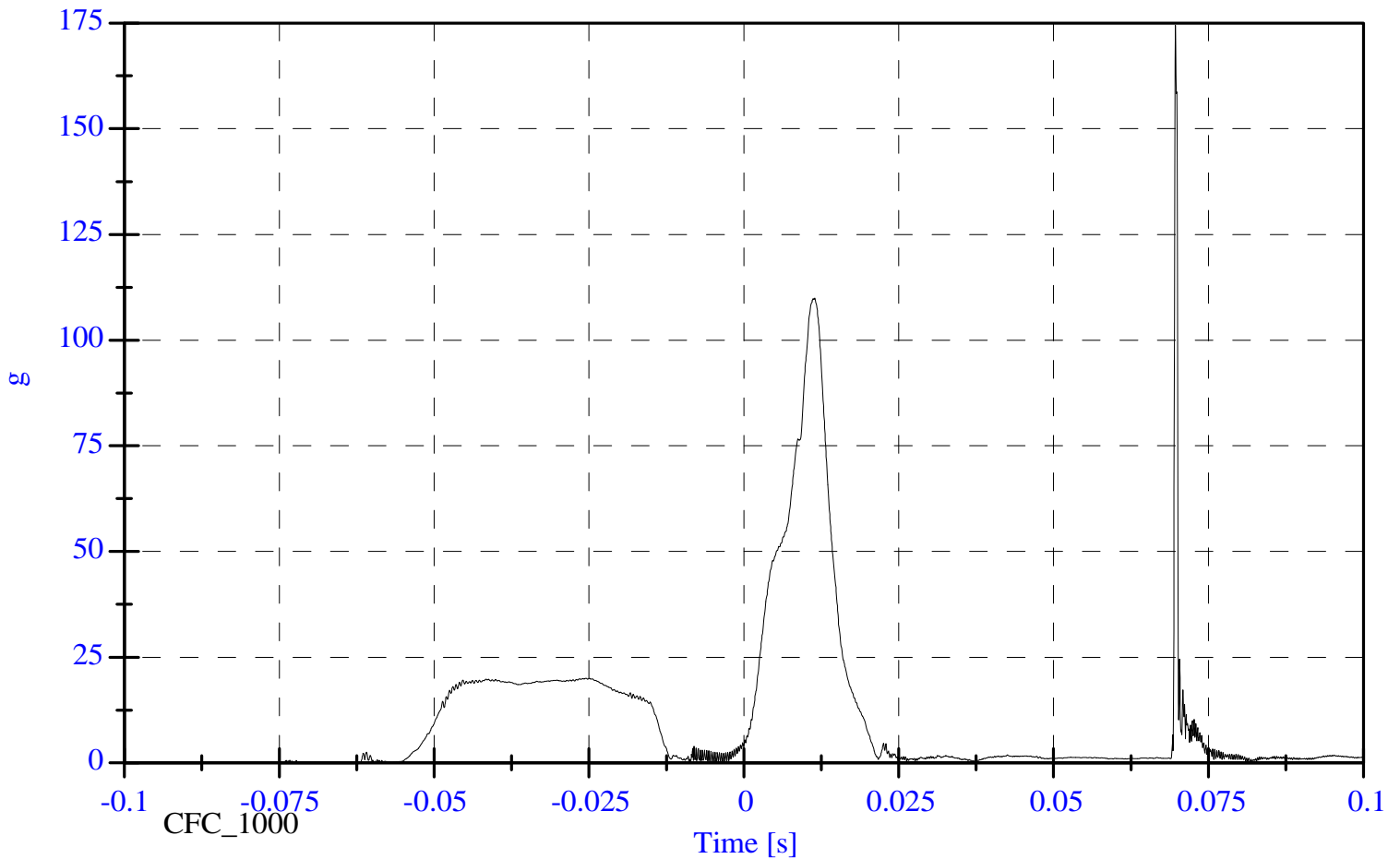
Maximum: 109.9 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 109.9 [g] at 0.011 [s]

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

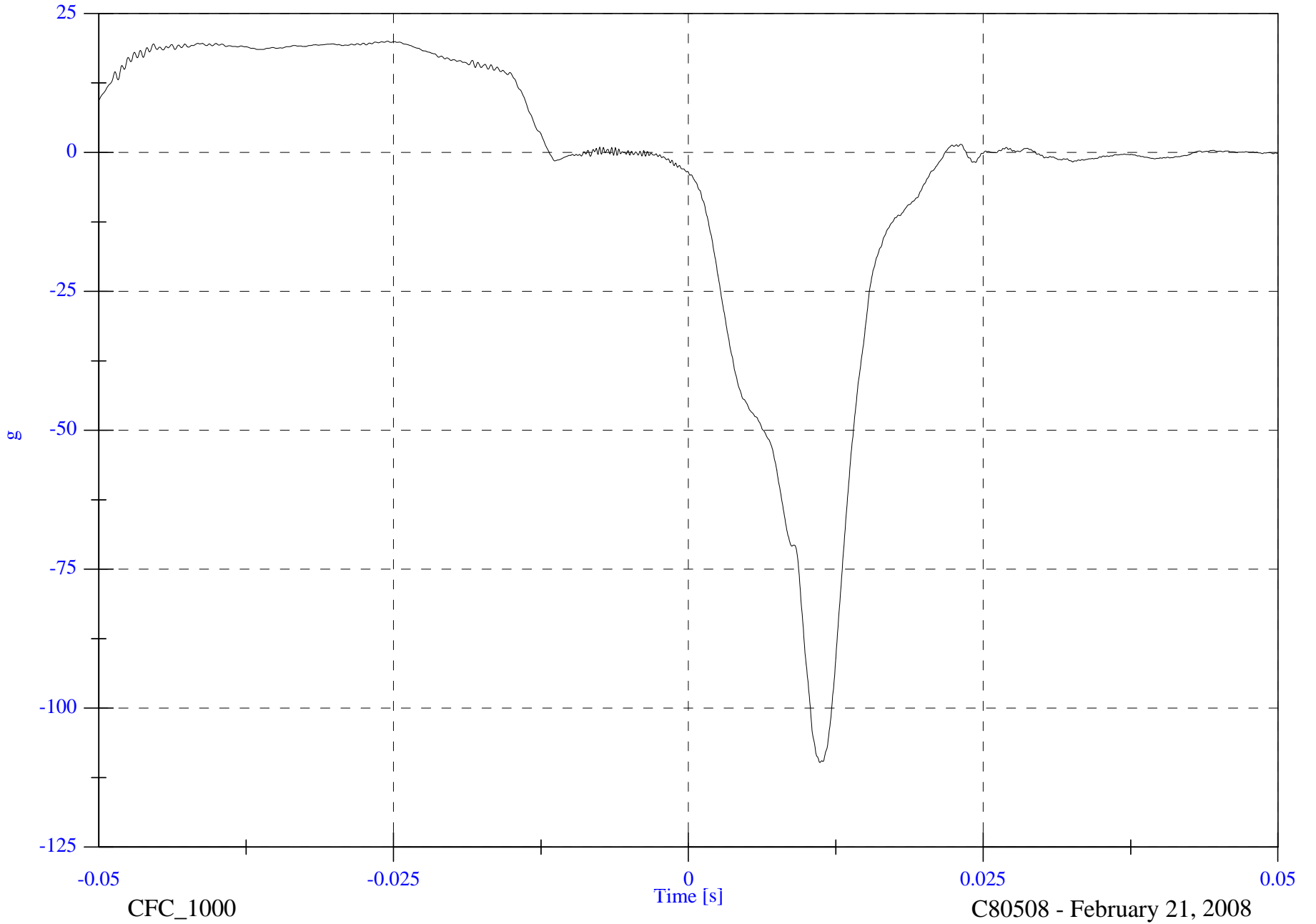


FMVSS 201U 2008 SAAB 9-5

Headform X Acceleration

Max: 20.0 [g] at -0.025 [s]

Min: -109.8 [g] at 0.011 [s]



C80508 DRIVER SIDE BP1 IMPACT PLOT #2

8851-03

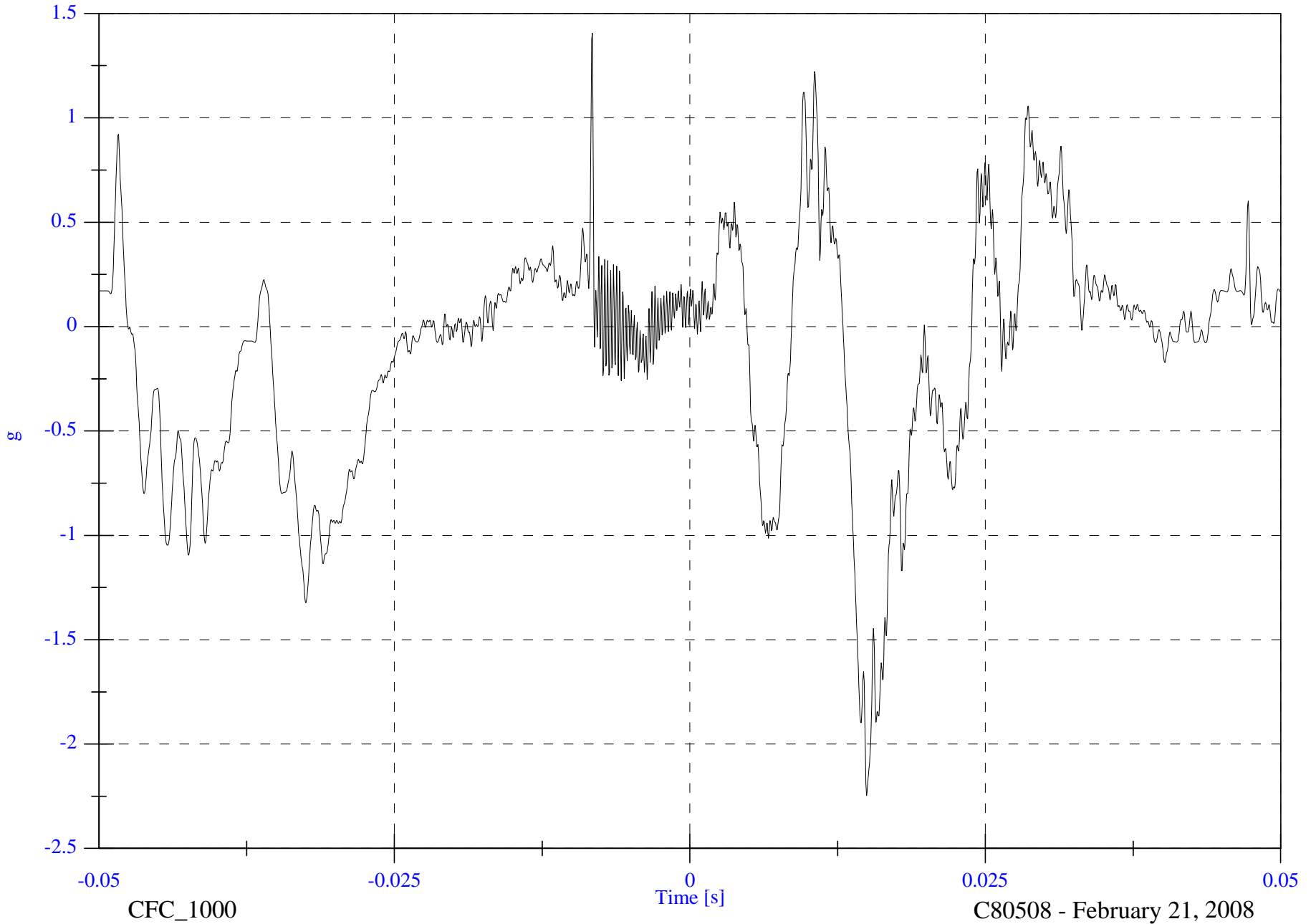
CFC_1000

C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

Max: 1.4 [g] at -0.008 [s]
Min: -2.2 [g] at 0.015 [s]

Headform Y Acceleration



C80508 DRIVER SIDE BP1 IMPACT PLOT #3

8851-03

CFC_1000

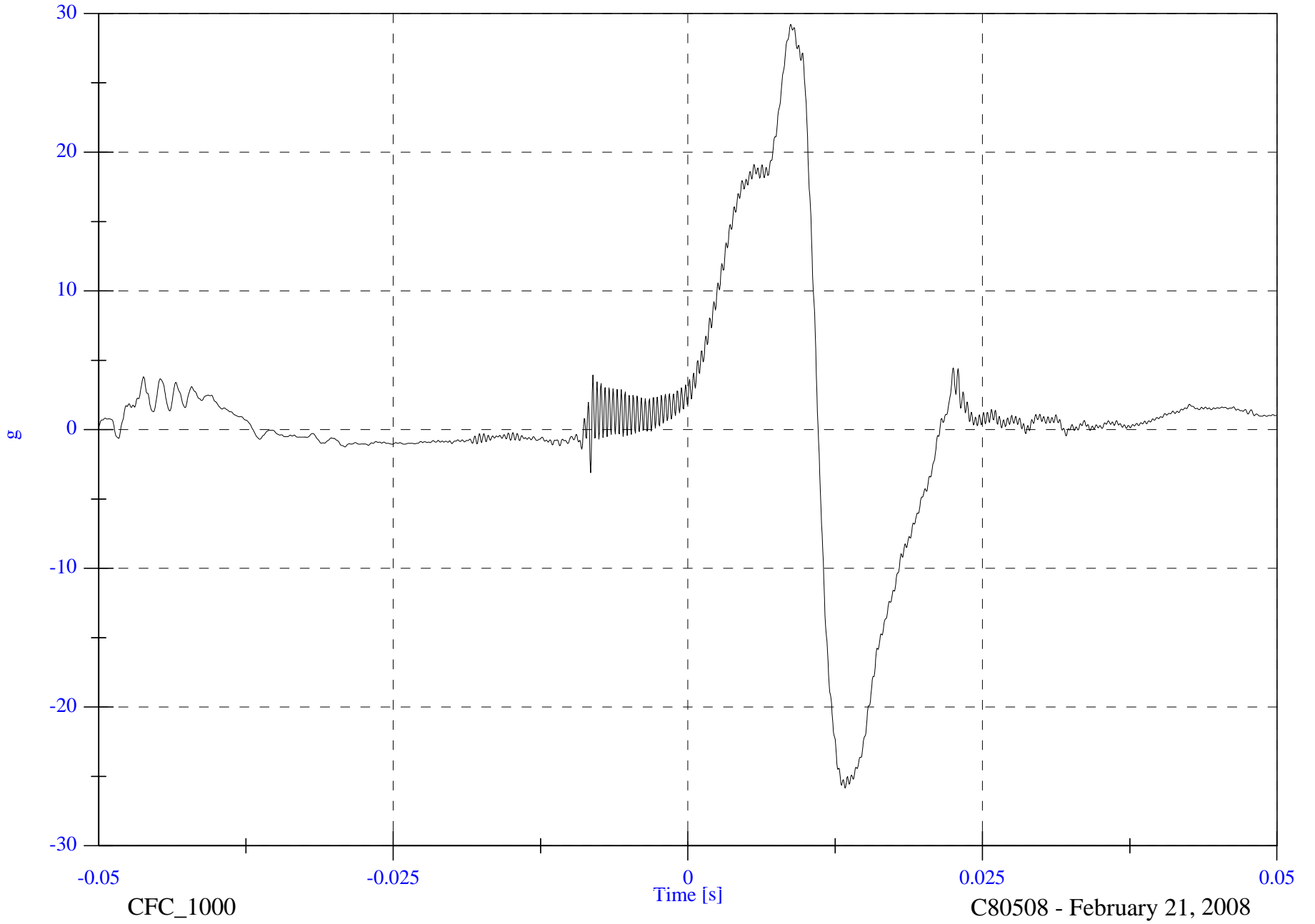
Time [s]

C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

Headform Z Acceleration

Max: 29.2 [g] at 0.009 [s]
Min: -25.8 [g] at 0.013 [s]



C80508 DRIVER SIDE BP1 IMPACT PLOT #4

8851-03

CFC_1000

C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

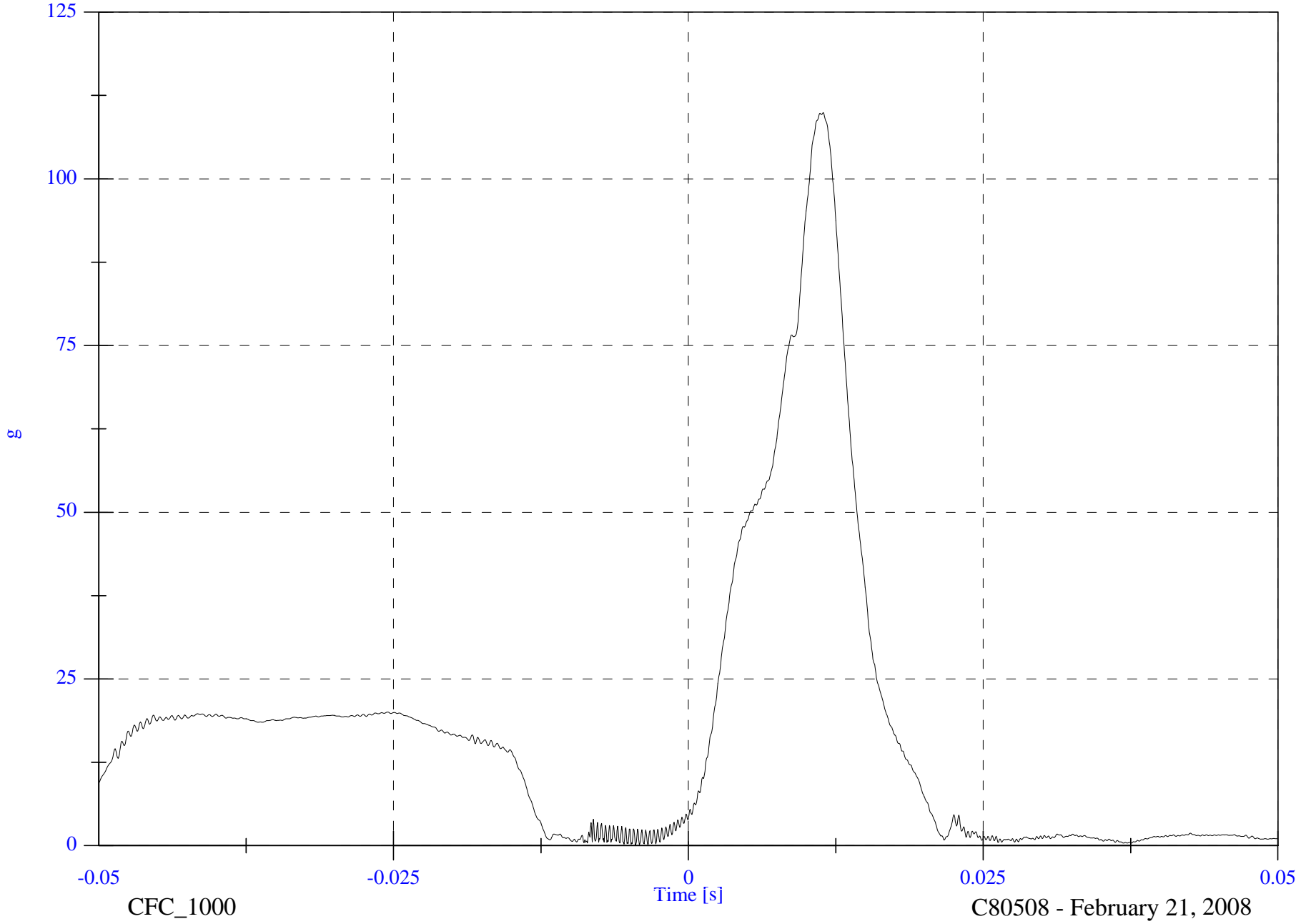
Headform Resultant

Max: 109.9 [g] at 0.011 [s]

Min: 0.0 [g] at -0.004 [s]

C80508 DRIVER SIDE BP1 IMPACT PLOT #5

8851-03

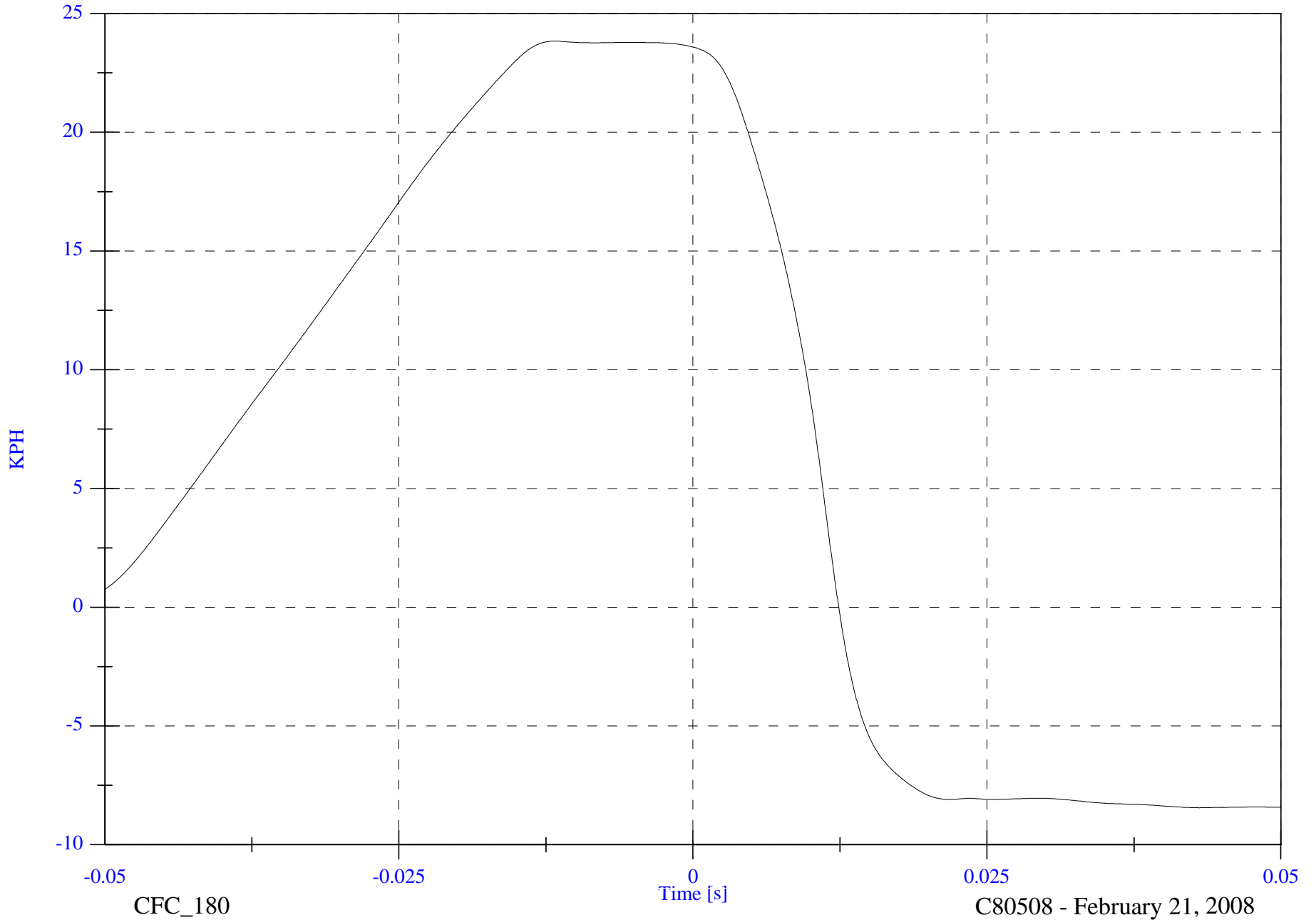


FMVSS 201U 2008 SAAB 9-5

Max: 23.8 [KPH] at -0.012 [s]

Min: -8.4 [KPH] at 0.043 [s]

Headform Velocity



C80508 DRIVER SIDE BP1 IMPACT PLOT #6

8851-03

CFC_180

Time [s]

C80508 - February 21, 2008



PRE-IMPACT BP1

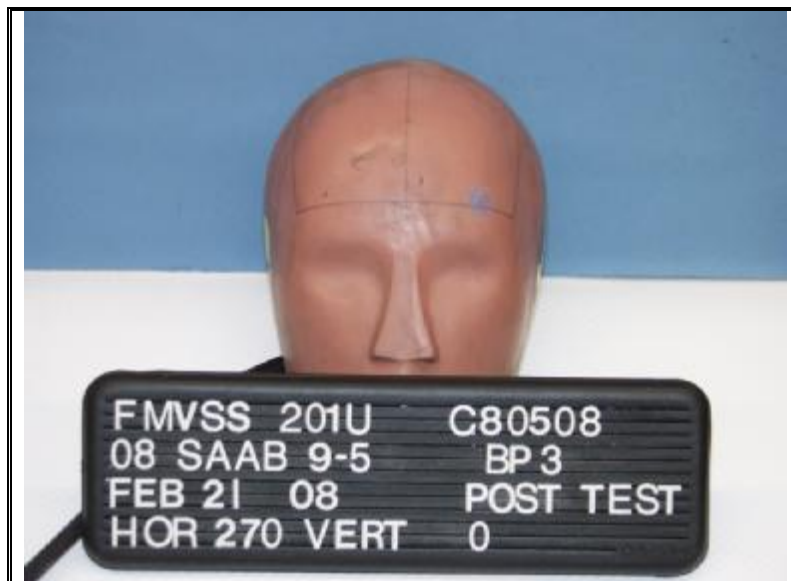


POST-IMPACT BP1

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	08
Test Date:	02/21/08
Target Location:	B-Pillar
Target Code:	BP3
Horizontal Impact Angle:	270°
Vertical Impact Angle:	0°
Ambient Temperature:	20.8 C°
Relative Humidity:	11.6
Time of Impact:	10:30
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	40	mm right	x mm left
On Centerline	4	mm up	



POST-IMPACT BP3 HEADFORM

Free Motion HIC	551.4
HIC(d)	582.4
Impact Velocity (kph)	23.8
HIC T1 (msec)	3.6
HIC T2 (msec)	11.7

FMVSS 201U 2008 SAAB 9-5 C80508 - BP3

FMH Headform 0805

Location: BP3

Test Date: February 21, 2008

Work File: BP3

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

Lab Temperature: 20.8 C

HICd: 582.4

Lab Humidity: 11.6 %

HIC (36ms): 551.4

Velocity at Impact: 23.80 KPH

t1: 3.6 msec

t2: 11.7 msec

Free Flight Distance: 221.16 mm

Duration: 8.1 msec

Average Acceleration: 8.5 g

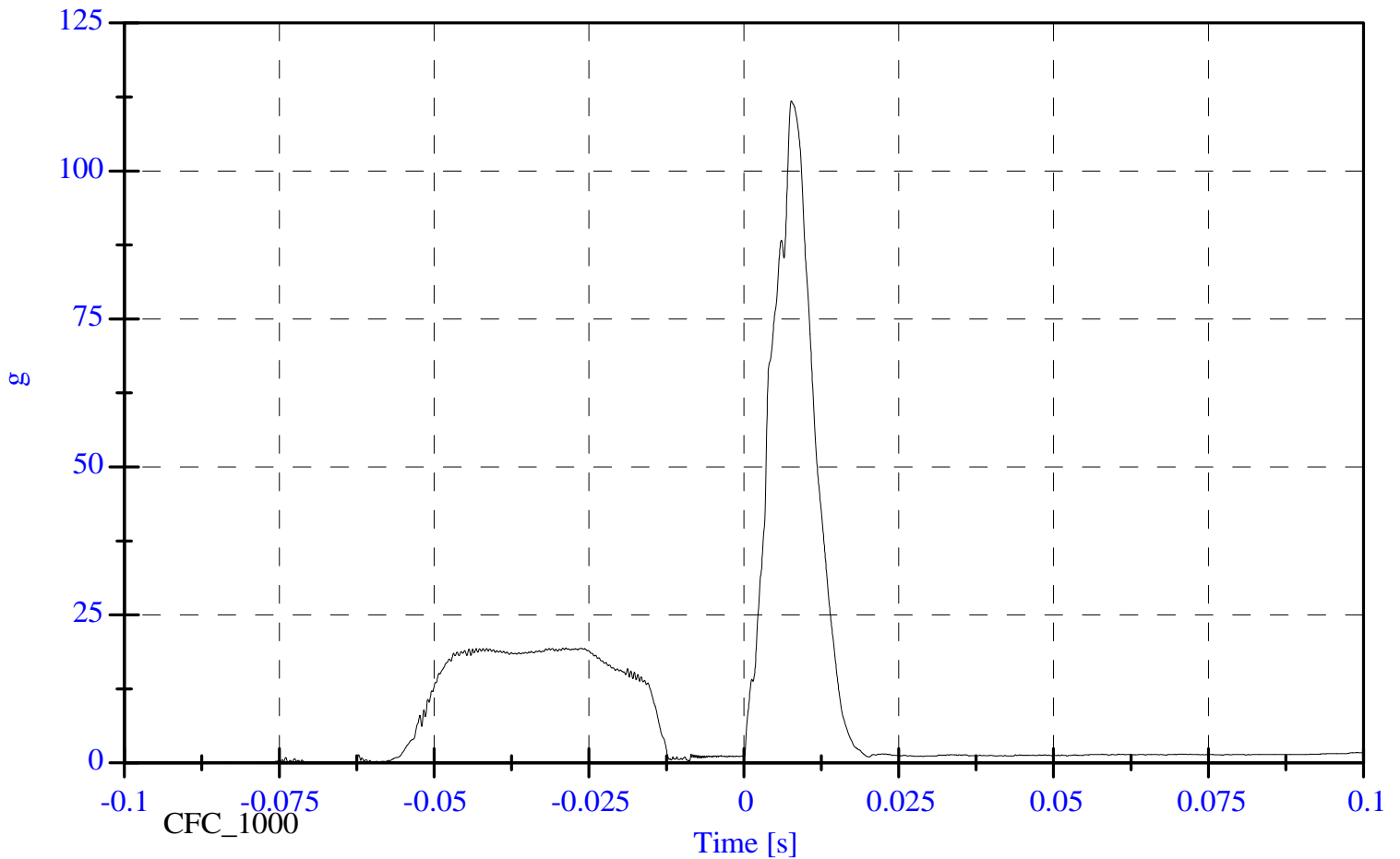
Maximum: 111.9 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 111.9 [g] at 0.008 [s]

Min: 0.0 [g] at -0.077 [s]

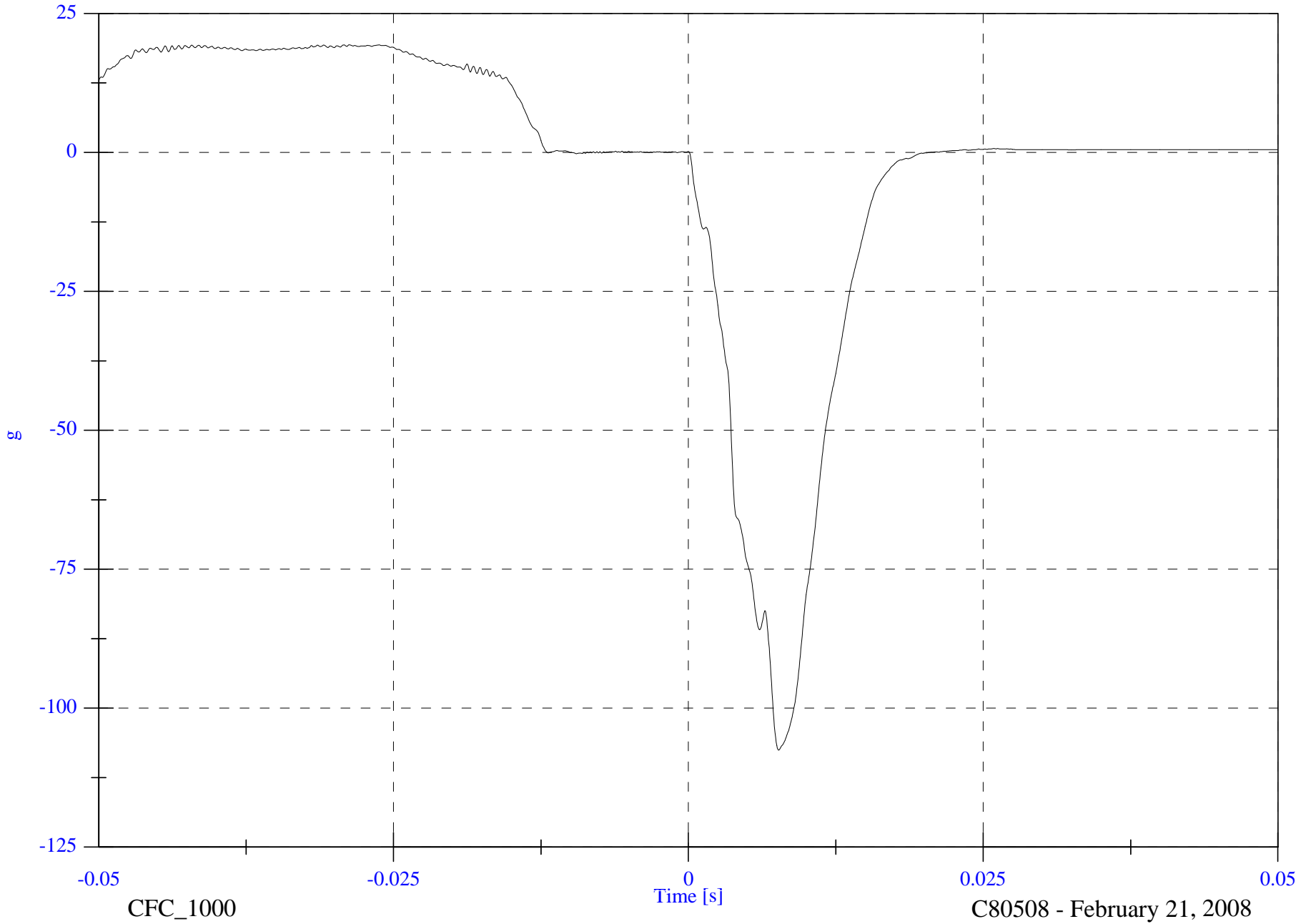


FMVSS 201U 2008 SAAB 9-5

Headform X Acceleration

Max: 19.4 [g] at -0.029 [s]

Min: -107.6 [g] at 0.008 [s]



C80508 DRIVER SIDE BP3 IMPACT PLOT #2

8851-03

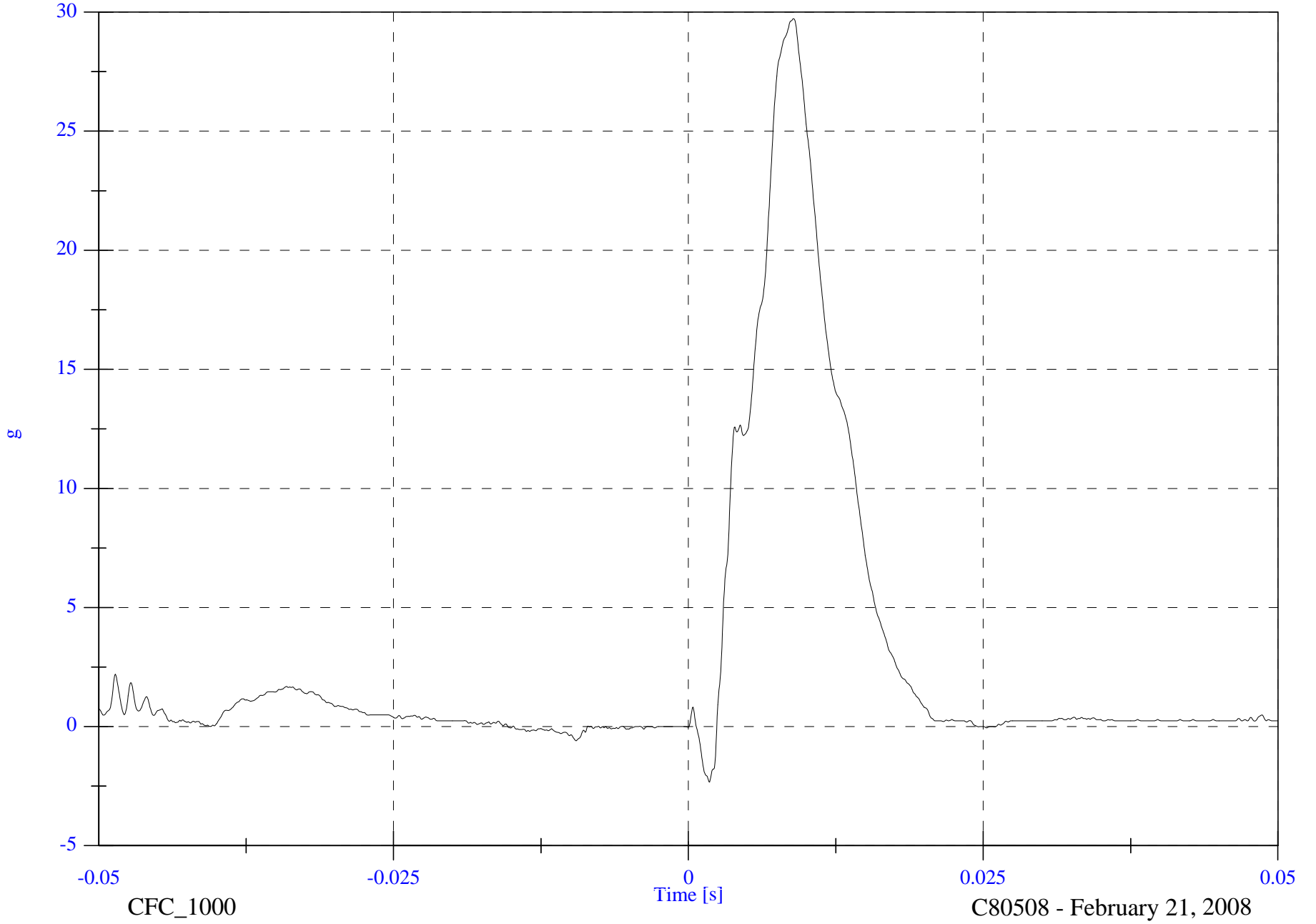
CFC_1000

C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

Headform Y Acceleration

Max: 29.7 [g] at 0.009 [s]
Min: -2.3 [g] at 0.002 [s]



C80508 DRIVER SIDE BP3 IMPACT PLOT #3

8851-03

CFC_1000

C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

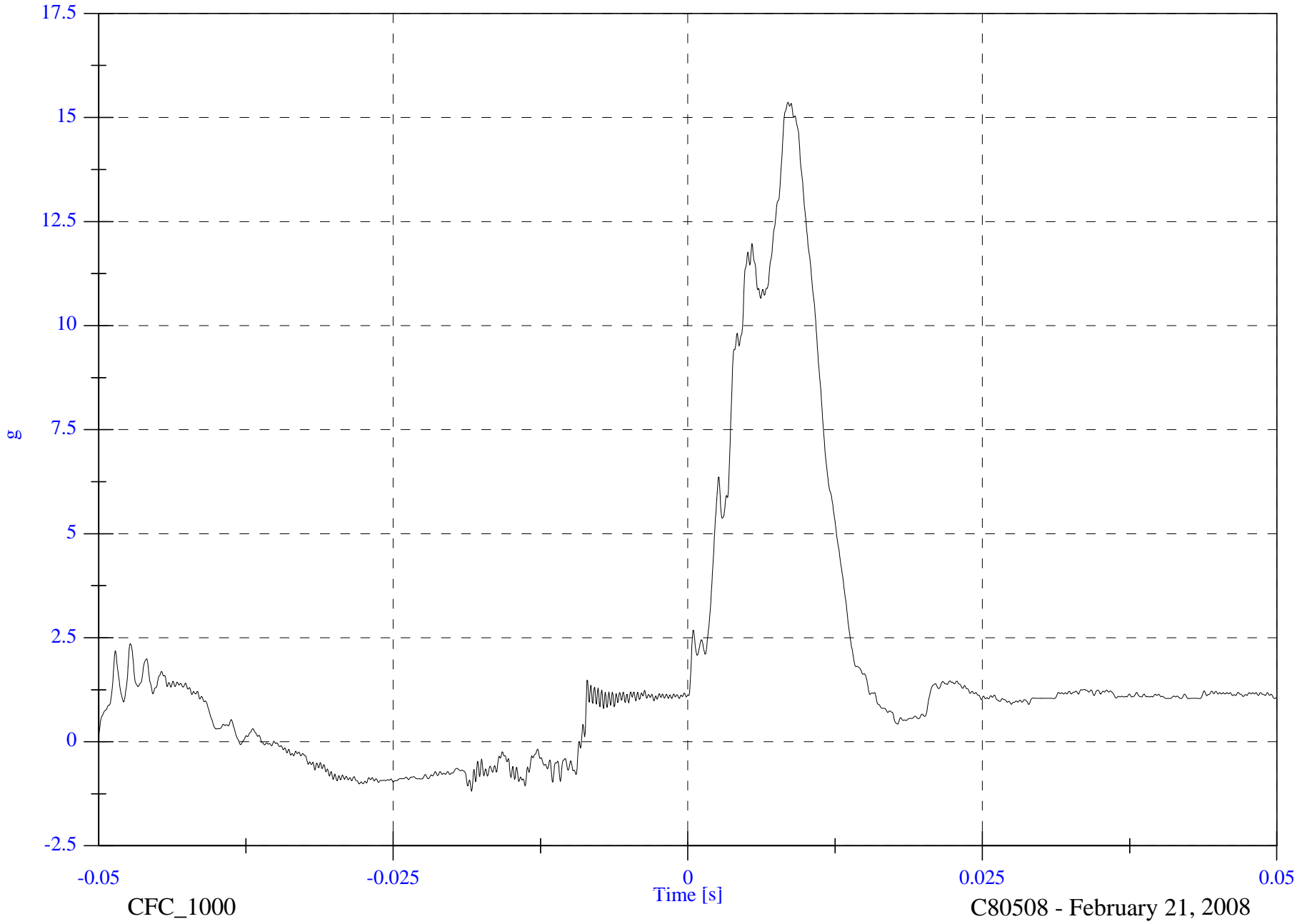
Headform Z Acceleration

Max: 15.4 [g] at 0.009 [s]

Min: -1.2 [g] at -0.018 [s]

C80508 DRIVER SIDE BP3 IMPACT PLOT #4

8851-03



FMVSS 201U 2008 SAAB 9-5

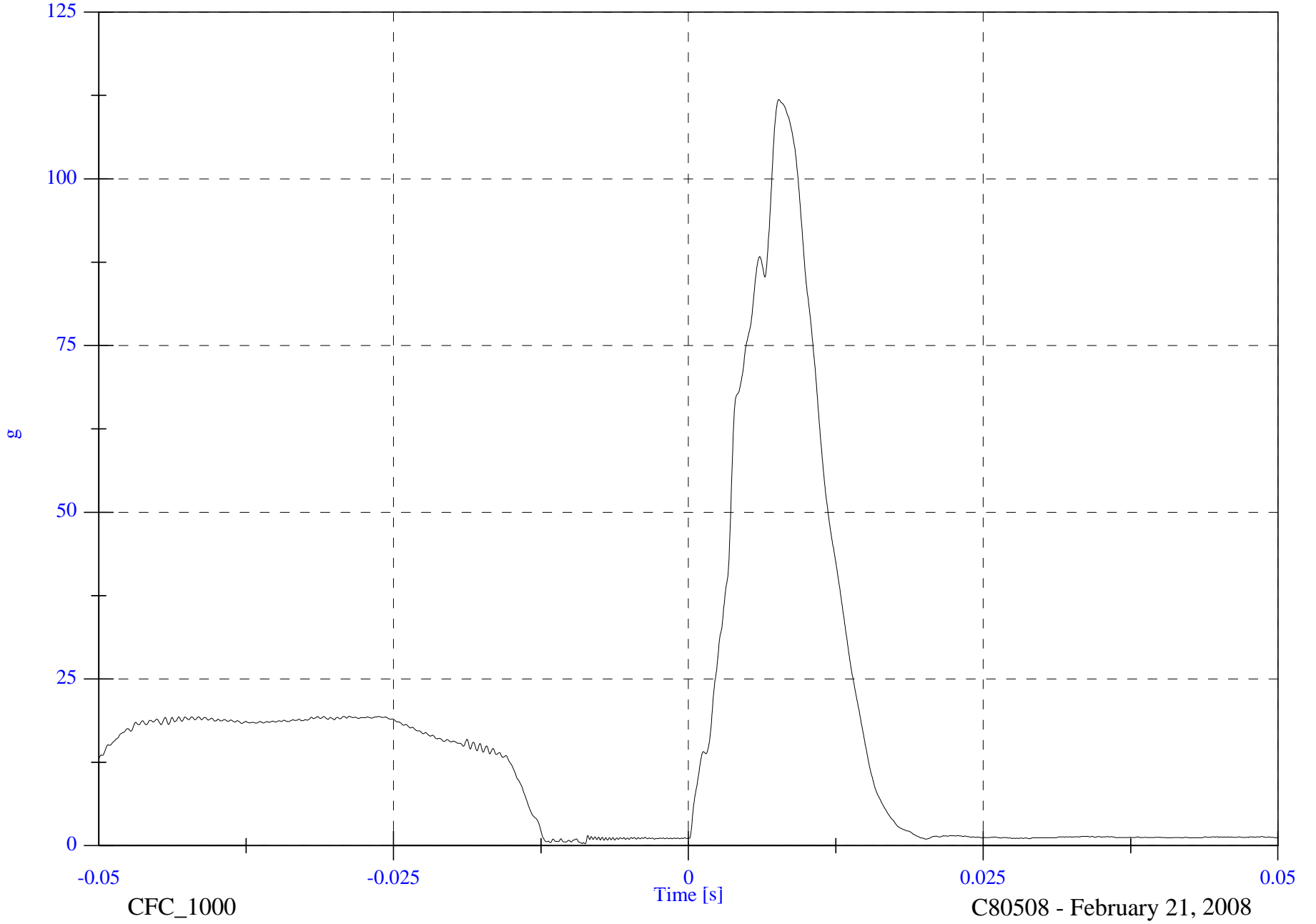
Headform Resultant

Max: 111.9 [g] at 0.008 [s]

Min: 0.3 [g] at -0.009 [s]

C80508 DRIVER SIDE BP3 IMPACT PLOT #5

8851-03

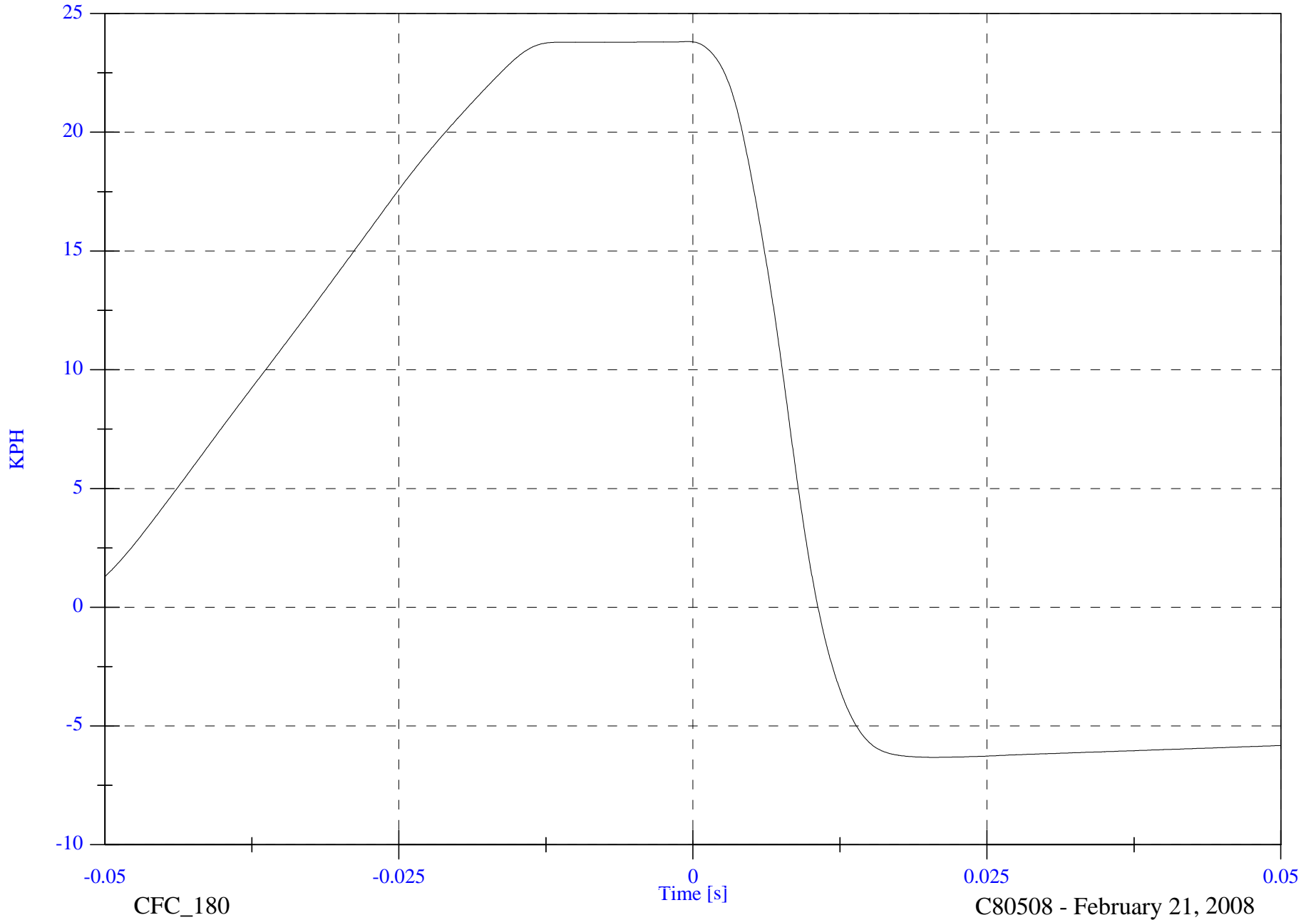


FMVSS 201U 2008 SAAB 9-5

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

Min: -6.3 [KPH] at 0.020 [s]

Headform Velocity



C80508 DRIVER SIDE BP3 IMPACT PLOT #6

8851-03

CFC_180

C80508 - February 21, 2008



PRE-IMPACT BP3



POST-IMPACT BP3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2008 Saab 9-5 Wagon
VIN:	YS3ED59G783503647
DATE OF MANUFACTURE:	09/07(SEE CERTIFICATION LABEL)
COLOR:	Gray

Test Number:	09
Test Date:	02/21/08
Target Location:	Upper Roof
Target Code:	URBP
Horizontal Impact Angle:	270°
Vertical Impact Angle:	50°
Ambient Temperature:	21.0 C°
Relative Humidity:	11.5
Time of Impact:	11:00
Headform Number:	1142

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	10	mm right	x mm left
On Centerline	50	mm up	



POST-IMPACT URBP HEADFORM

Free Motion HIC	176.1
HIC(d)	299.3
Impact Velocity (kph)	23.73
HIC T1 (msec)	2.0
HIC T2 (msec)	21.7

FMVSS 201U 2008 SAAB 9-5 C80508 - URBP

FMH Headform 1142

Location: URBP

Test Date: February 21, 2008

Work File: URBP

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

Lab Temperature: 21.0 C

HICd: 299.3

Lab Humidity: 11.5 %

HIC (36ms): 176.1

Velocity at Impact: 23.73 KPH

t1: 2.0 msec

t2: 21.7 msec

Free Flight Distance: 218.66 mm

Duration: 19.7 msec

Average Acceleration: 8.9 g

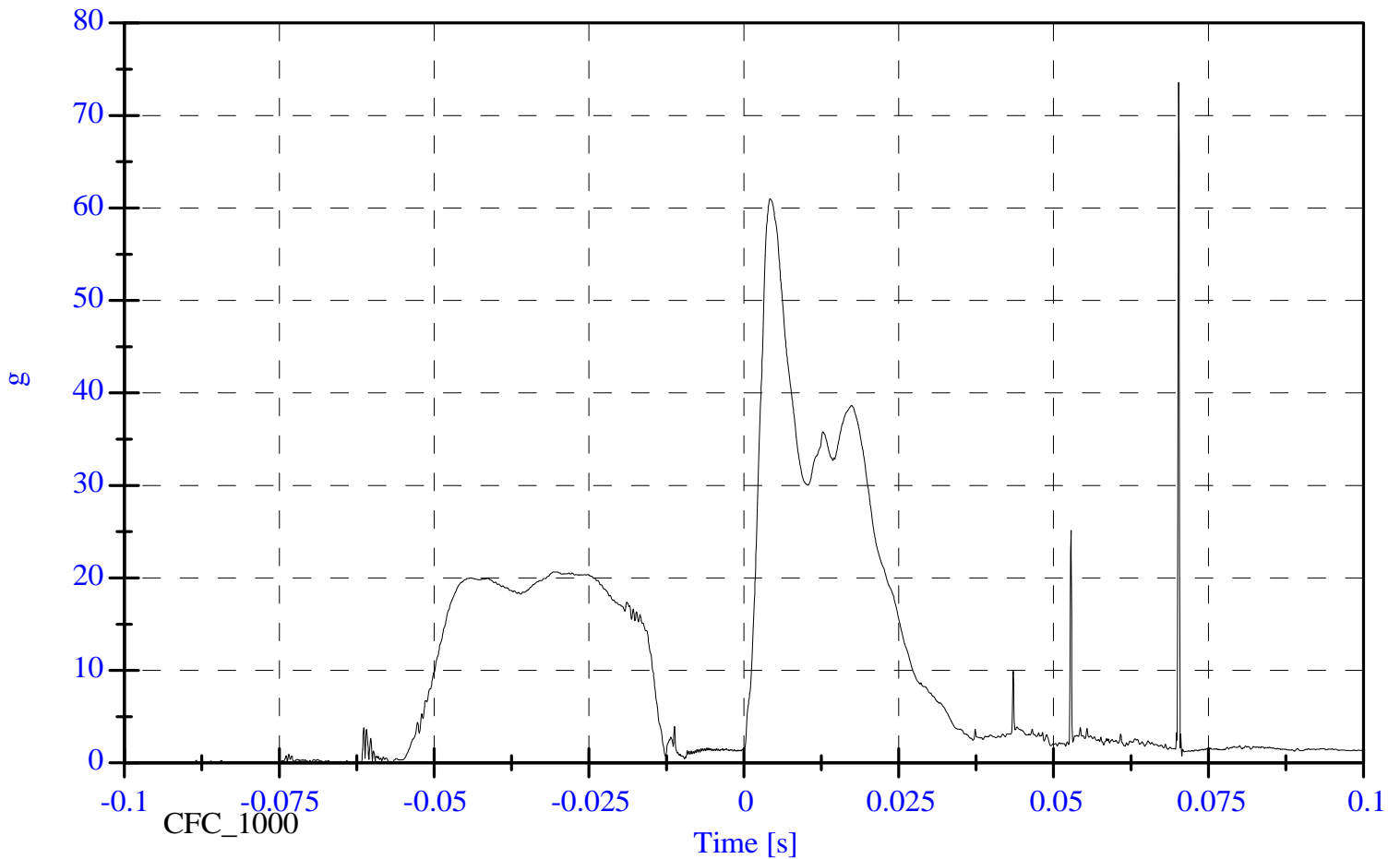
Maximum: 61.0 g

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 61.0 [g] at 0.004 [s]

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



FMVSS 201U 2008 SAAB 9-5

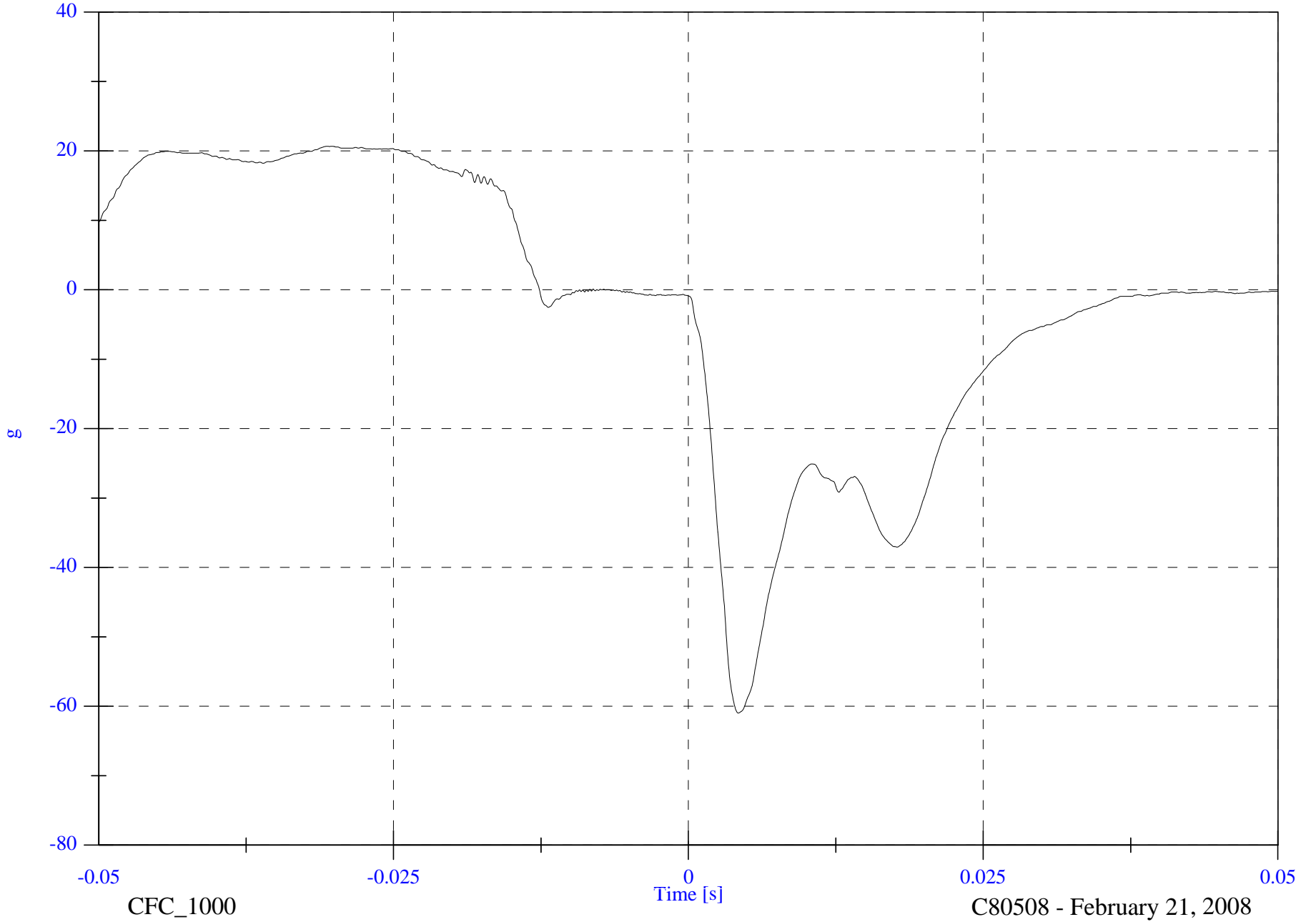
Headform X Acceleration

Max: 20.6 [g] at -0.031 [s]

Min: -61.0 [g] at 0.004 [s]

C80508 DRIVER SIDE URBP IMPACT PLOT #2

8851-03



CFC_1000

C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

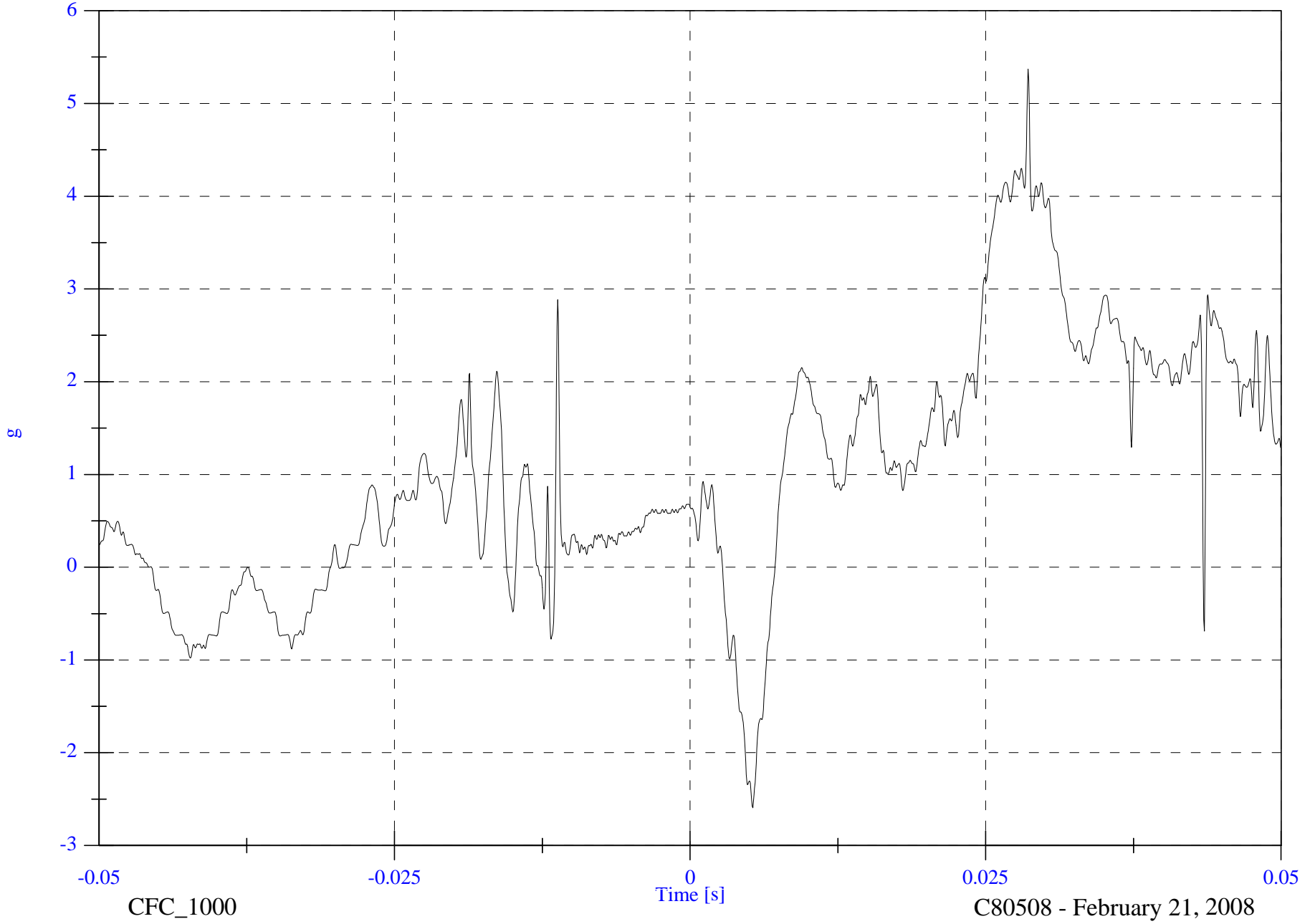
Headform Y Acceleration

Max: 5.4 [g] at 0.029 [s]

Min: -2.6 [g] at 0.005 [s]

C80508 DRIVER SIDE URBP IMPACT PLOT #3

8851-03



CFC_1000

C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

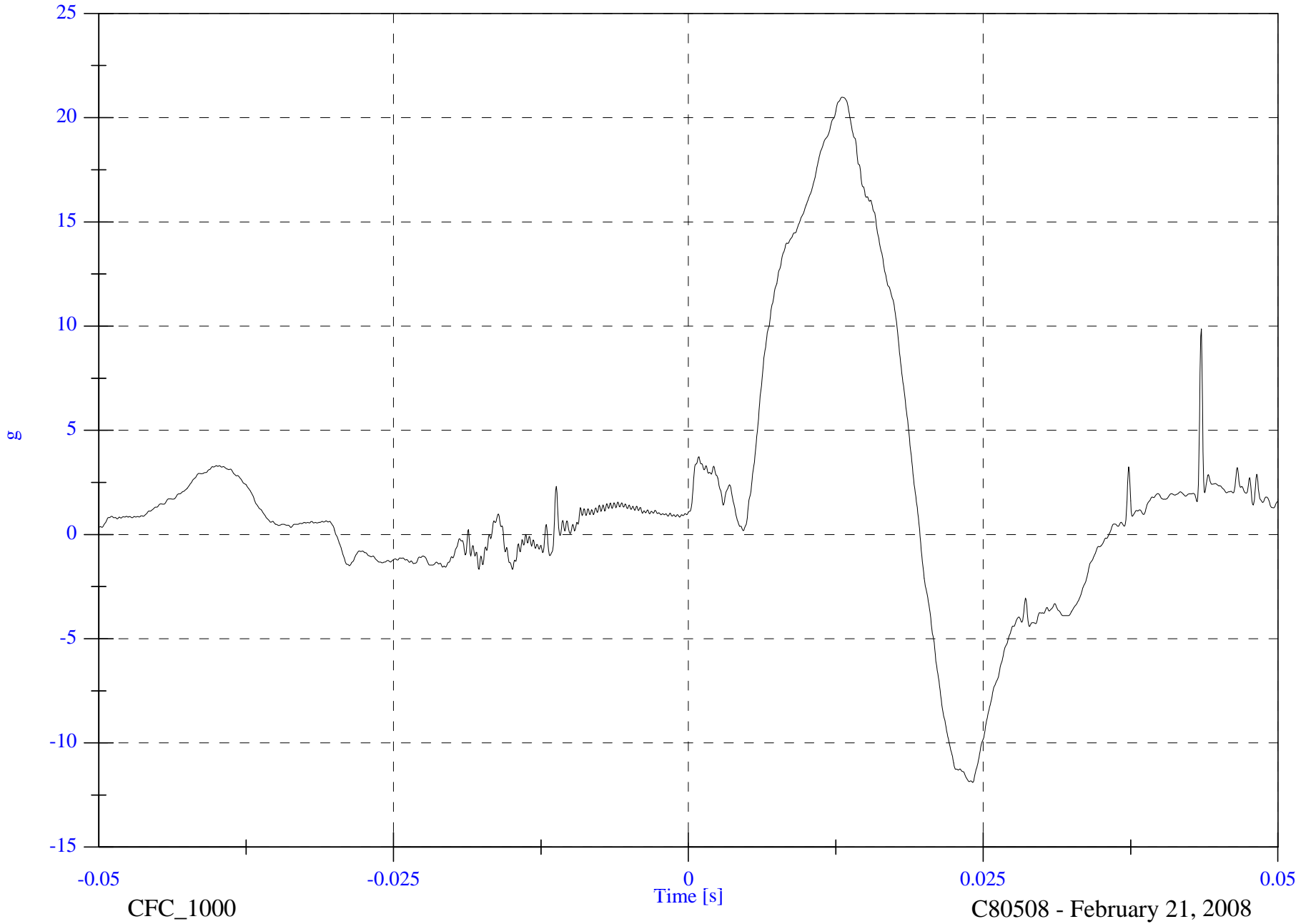
Headform Z Acceleration

Max: 21.0 [g] at 0.013 [s]

Min: -11.9 [g] at 0.024 [s]

C80508 DRIVER SIDE URBP IMPACT PLOT #4

8851-03



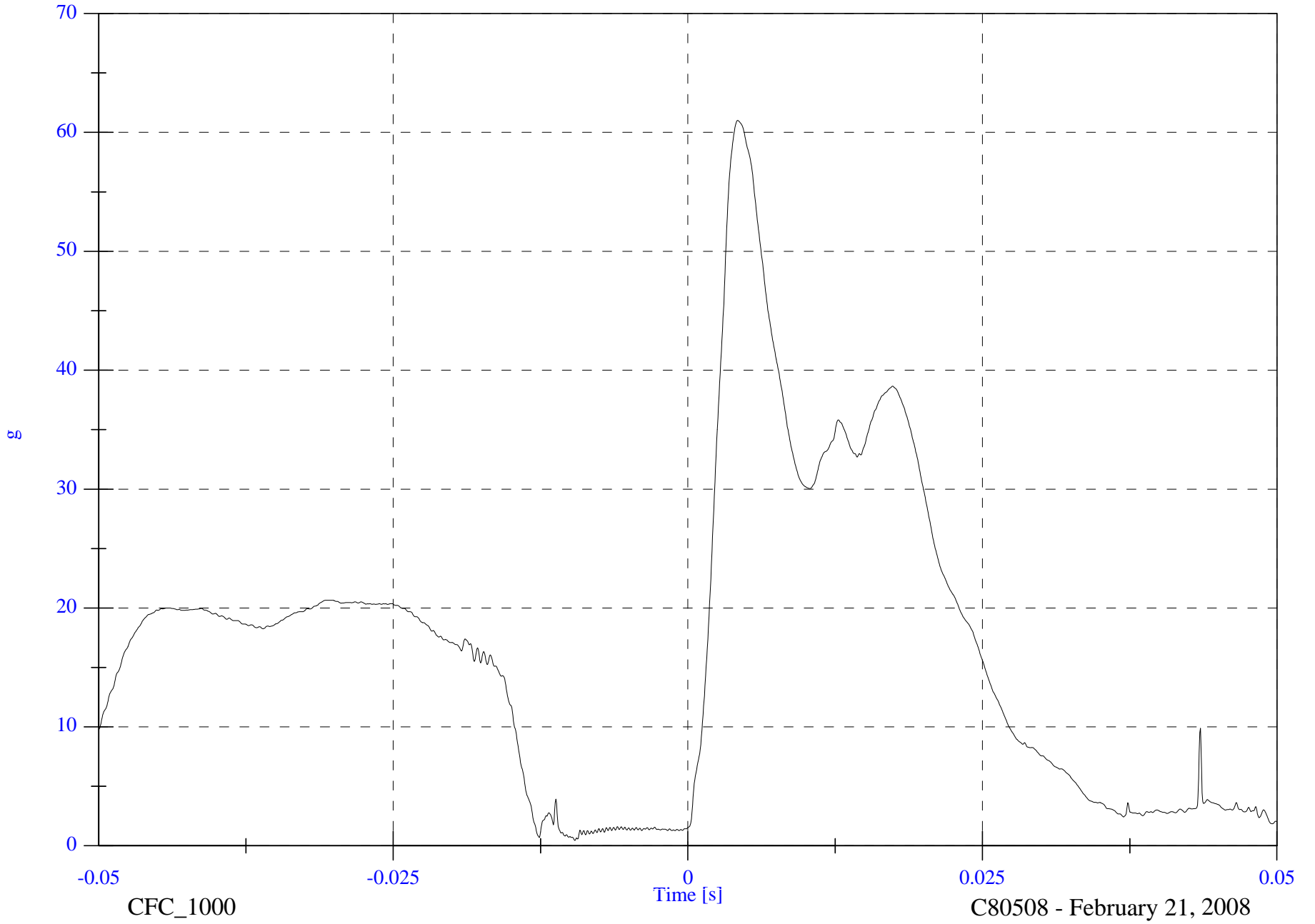
CFC_1000

C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

Headform Resultant

Max: 61.0 [g] at 0.004 [s]
Min: 0.4 [g] at -0.010 [s]



C80508 DRIVER SIDE URBP IMPACT PLOT #5

8851-03

CFC_1000

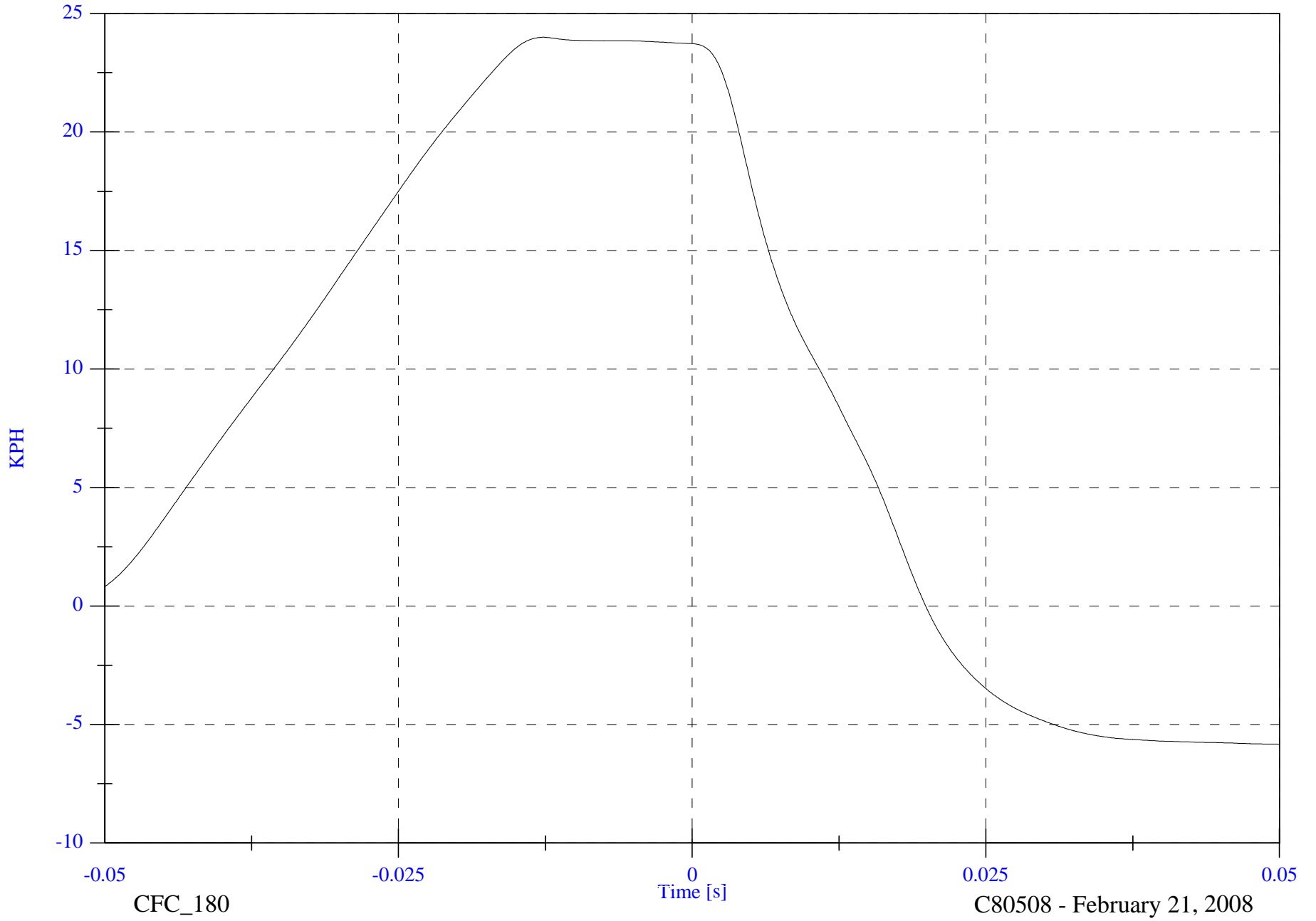
C80508 - February 21, 2008

FMVSS 201U 2008 SAAB 9-5

Max: 24.0 [KPH] at -0.013 [s]

Min: -5.8 [KPH] at 0.050 [s]

Headform Velocity



C80508 DRIVER SIDE URBP IMPACT PLOT #6

8851-03

CFC_180

C80508 - February 21, 2008



PRE-IMPACT URBP



POST-IMPACT URBP

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPHS

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A-1	LEFT SIDE VIEW OF VEHICLE	A-3
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A-4	3/4 REAR VIEW FROM LEFT SIDE OF VEHICLE	A-6
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A-20	POST-TEST DRIVER SIDE FRONT HEADER	A-22
A-21	POST-TEST DRIVER SIDE SIDE RAIL	A-23
A-22	POST-TEST DRIVER SIDE B-PILLAR	A-24
A-23	POST-TEST DRIVER SIDE REAR SIDE RAIL	A-25
A-24	POST-TEST DRIVER SIDE OTHER PILLAR	A-26
A-25	POST-TEST PASSENGER SIDE A-PILLAR	A-27
A-26	POST-TEST PASSENGER SIDE FRONT HEADER	A-28
A-27	POST-TEST PASSENGER SIDE SIDE RAIL	A-29
A-28	POST-TEST PASSENGER SIDE B-PILLAR	A-30
A-29	POST-TEST PASSENGER SIDE REAR SIDE RAIL	A-31
A-30	POST-TEST PASSENGER SIDE OTHER 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

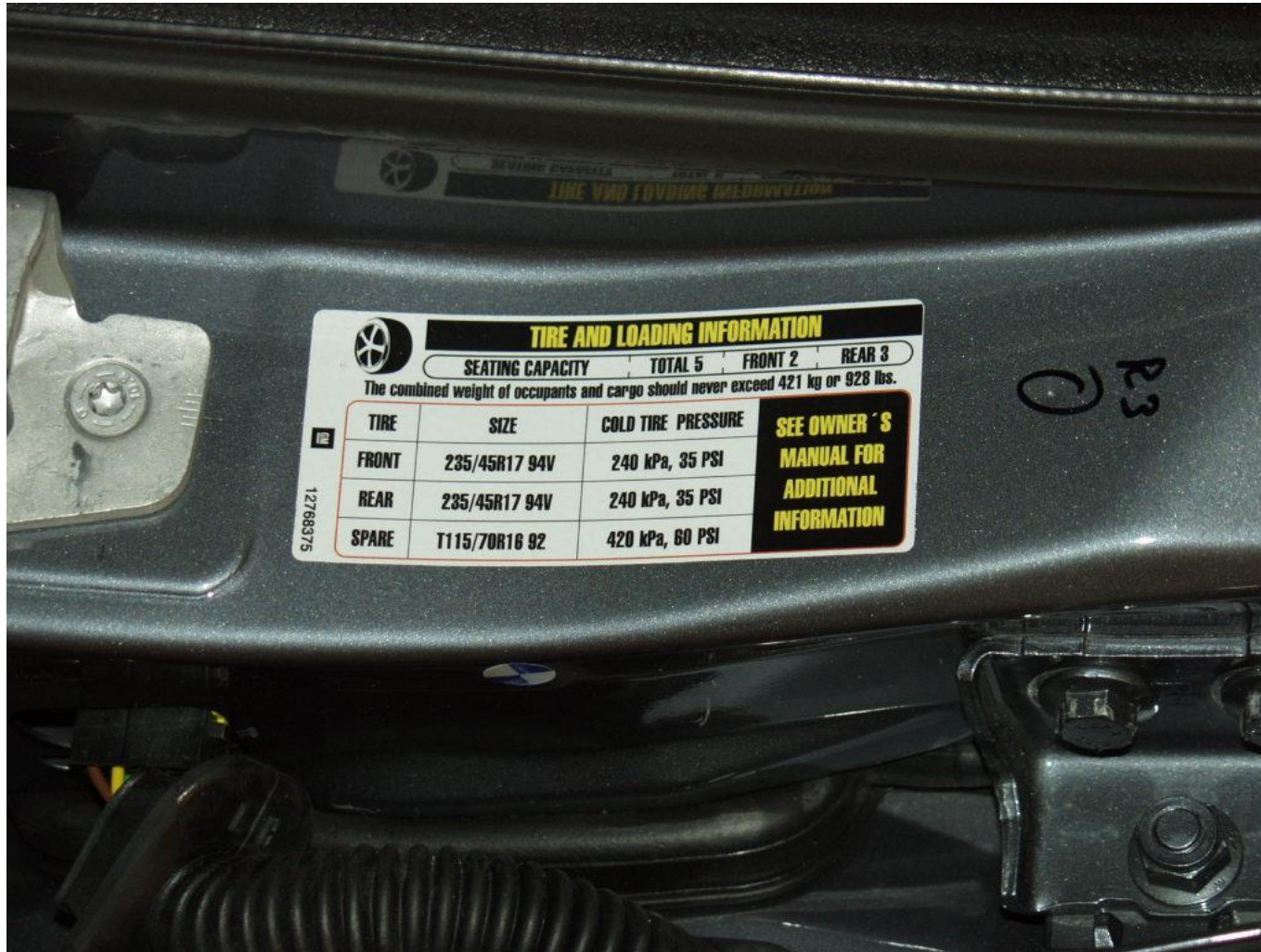


Figure A-6 : VEHICLE'S TIRE INFORMATION LABEL



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 REAR SIDE RAIL



Figure A-12 : PRE-TEST DRIVER SIDE OTHER 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 REAR SIDE RAIL



Figure A-18 : PRE-TEST PASSENGER SIDE OTHER 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 REAR SIDE RAIL



Figure A-24 : POST-TEST DRIVER SIDE OTHER 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 REAR SIDE RAIL



Figure A-30 : POST-TEST PASSENGER SIDE OTHER PILLAR

APPENDIX B

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

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

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

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

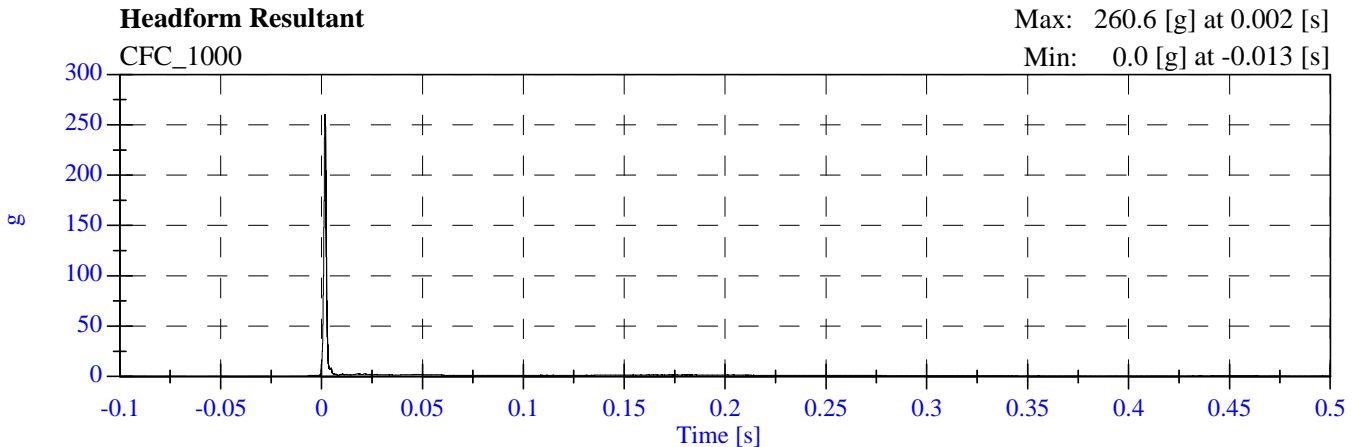
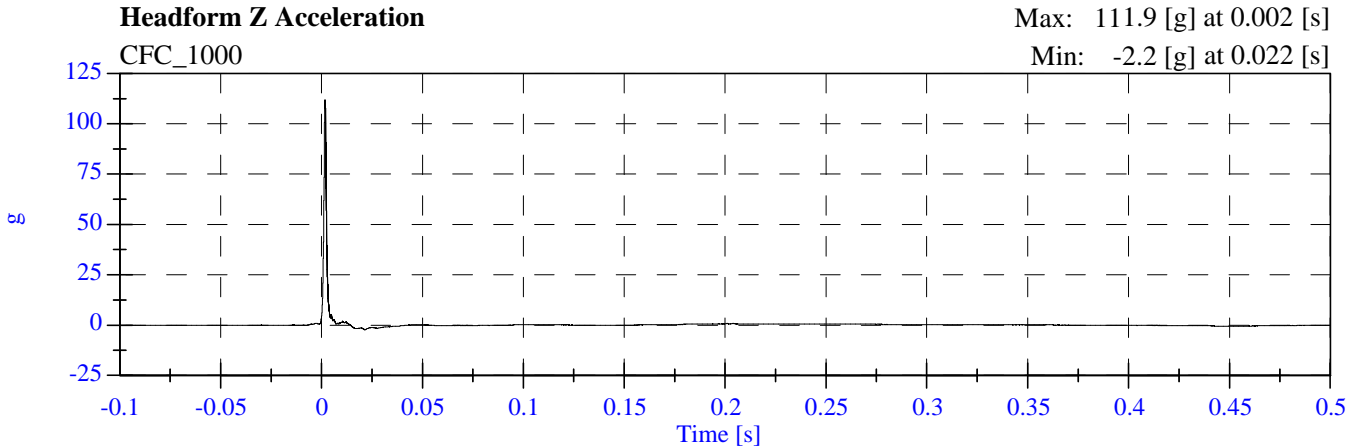
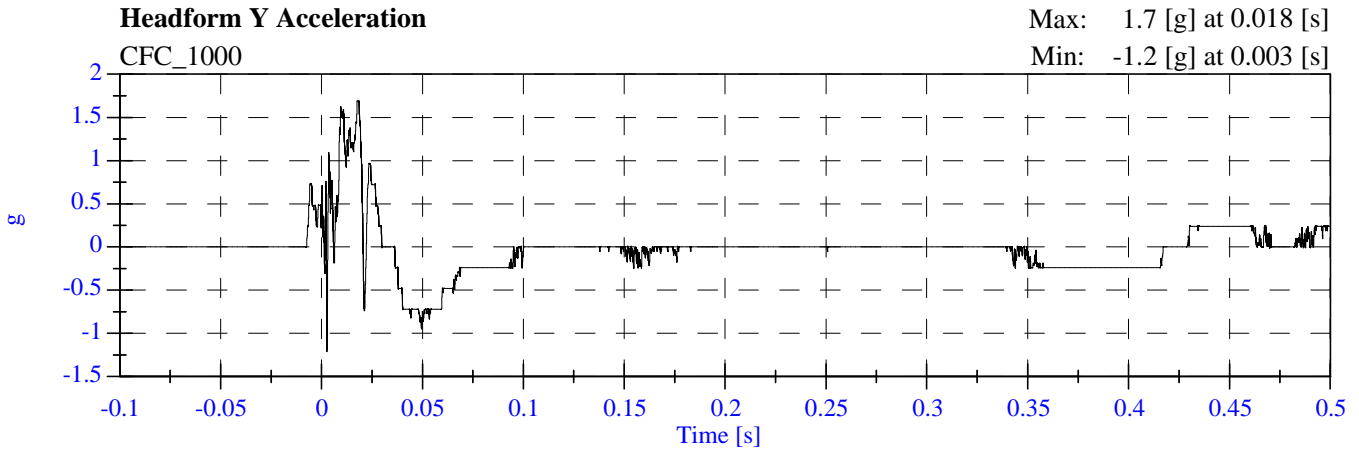
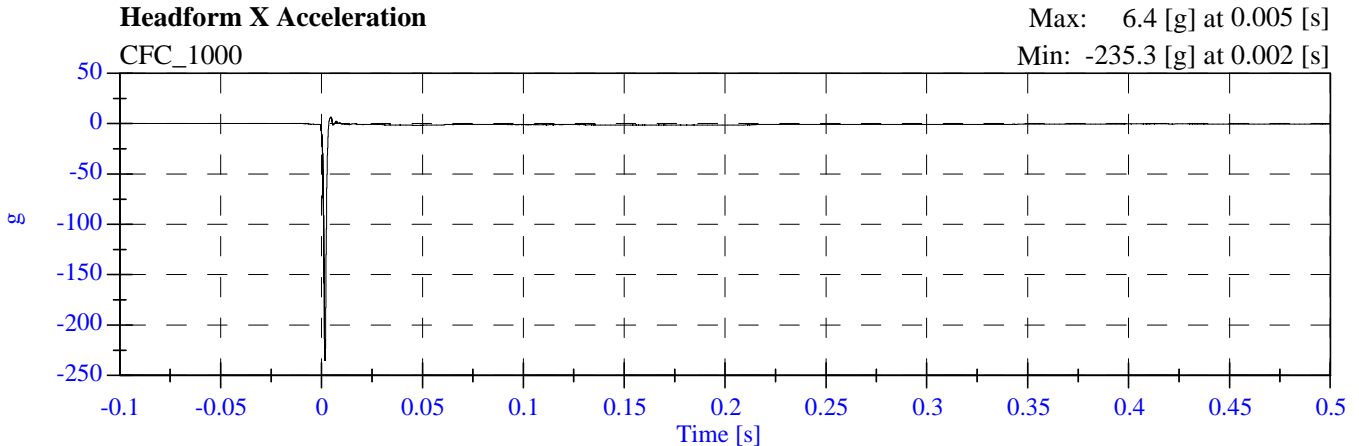
MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1140	
CALIBRATION DATE:		February 1, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	25.0	
RELATIVE HUMIDITY	10% to 70%	22	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	260.6	
PEAK LATERAL ACCELERATION	15 Gs Maximum	1.7	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J33030	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	Jan. 18, 2008	June 18, 2008

REMARKS:

FMVSS 201U - Headform Calibration Drops C80508 - February 01, 2008



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

MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		February 1, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	25.0	
RELATIVE HUMIDITY	10% to 70%	22	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	247.2	
PEAK LATERAL ACCELERATION	15 Gs Maximum	13.6	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

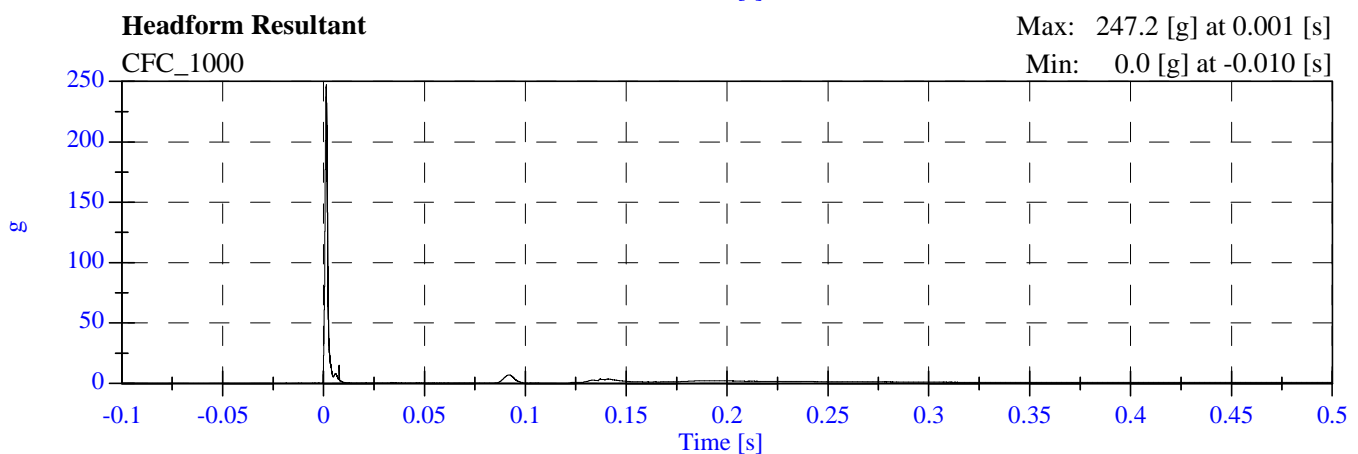
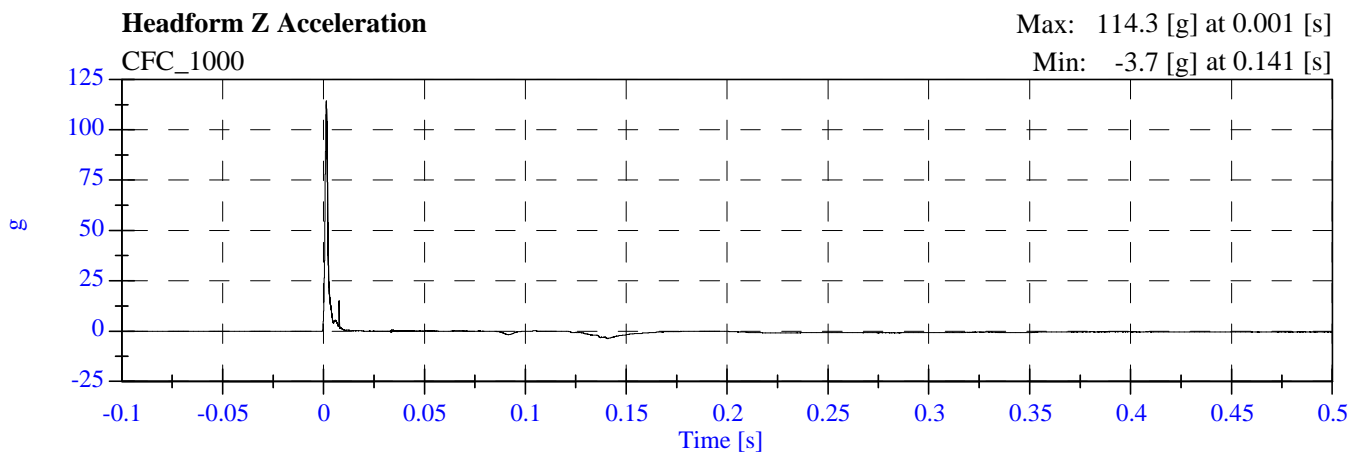
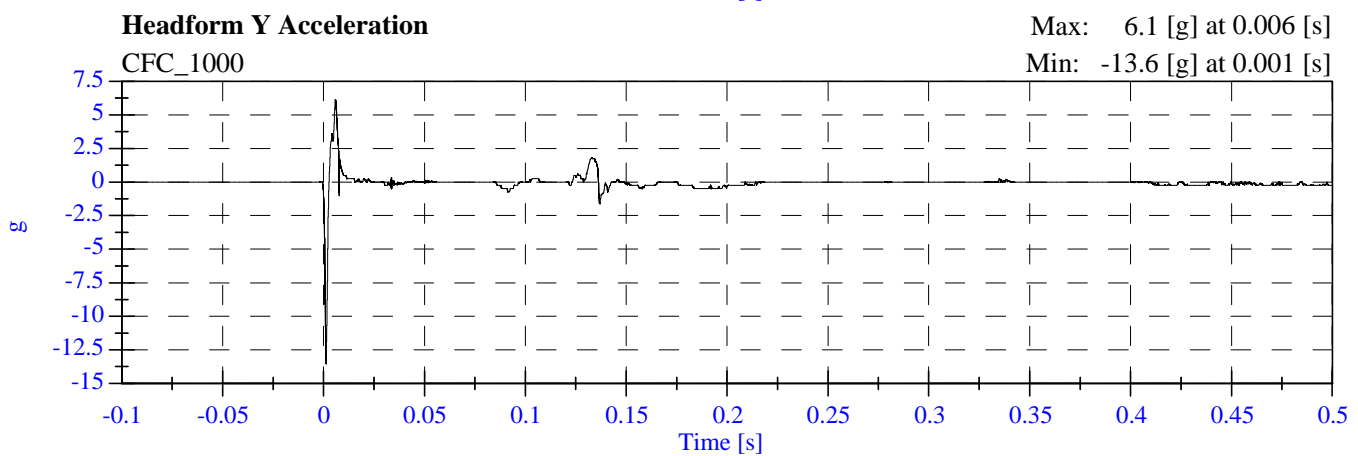
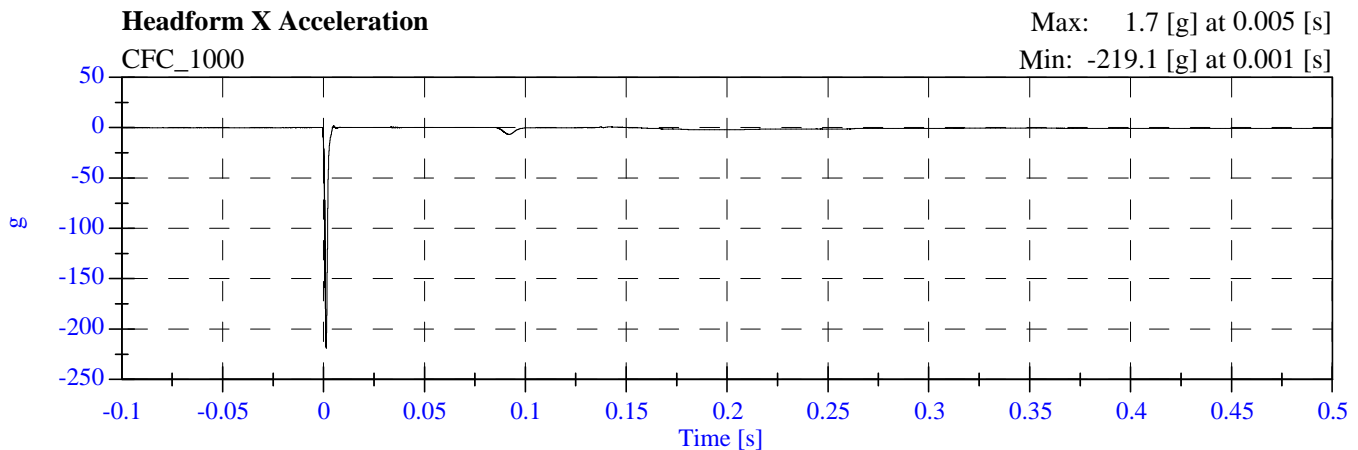
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J33019	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	Jan. 18, 2008	June 18, 2008

REMARKS:

FMVSS 201U - Headform Calibration Drops

C80508 - February 01, 2008



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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		February 4, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	25.0	
RELATIVE HUMIDITY	10% to 70%	22	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	272.1	
PEAK LATERAL ACCELERATION	15 Gs Maximum	3.2	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

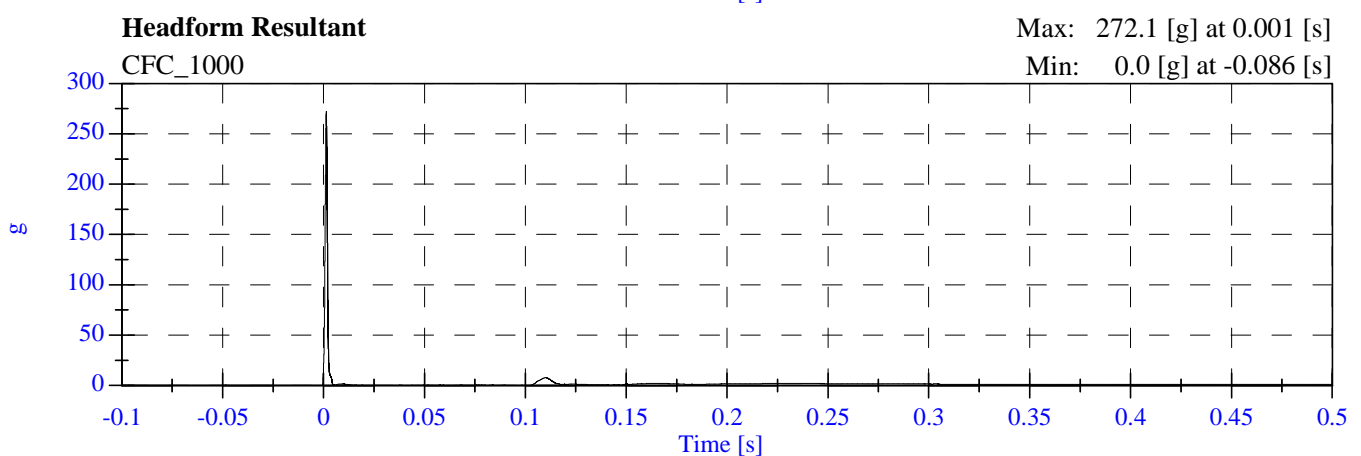
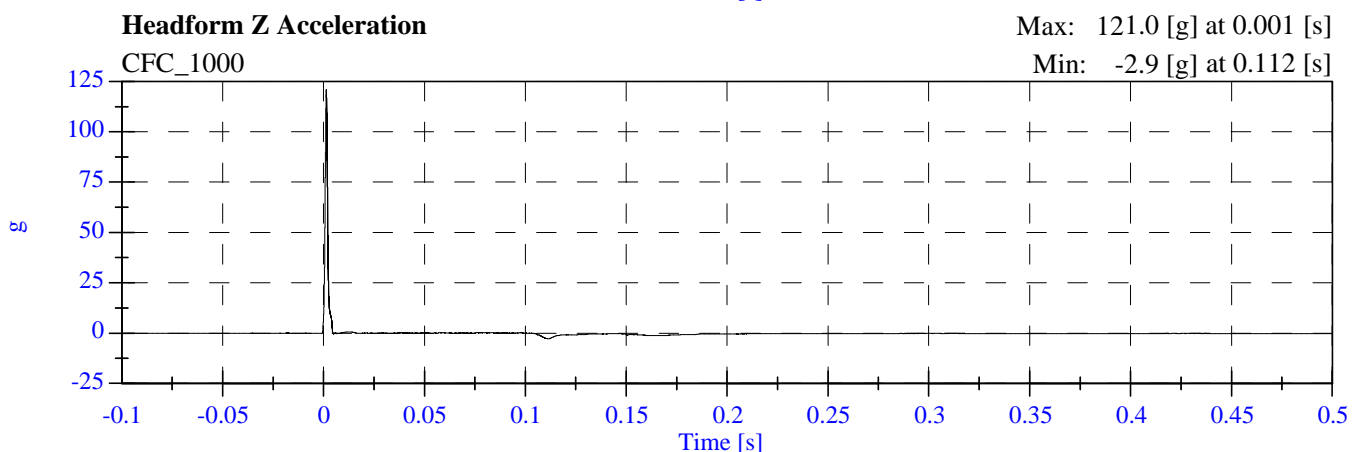
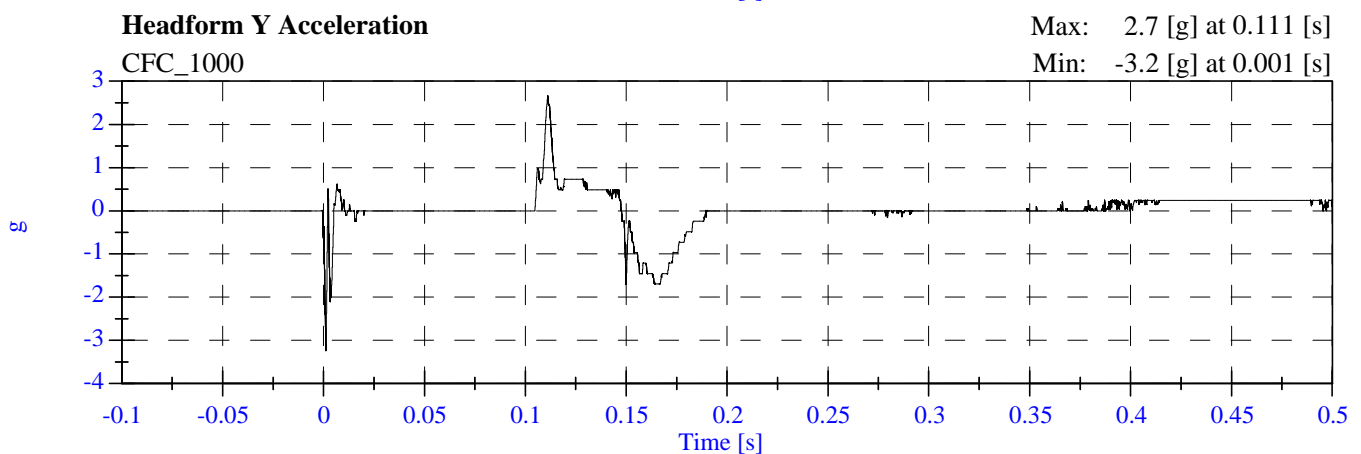
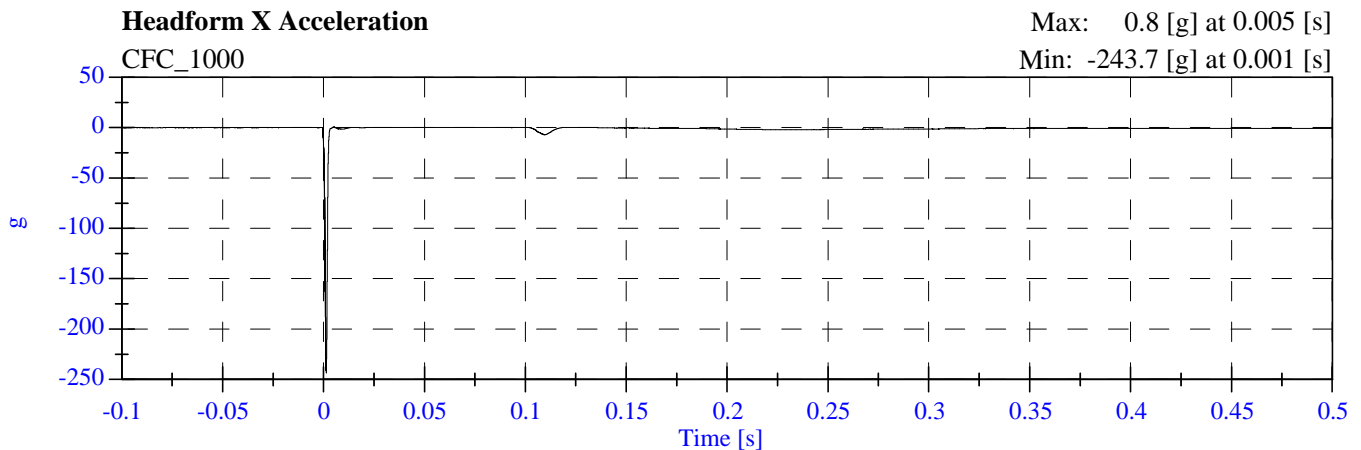
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41004	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J37496	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J41016	Jan. 18, 2008	June 18, 2008

REMARKS:

FMVSS 201U - Headform Calibration Drops

C80508 - February 04, 2008



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

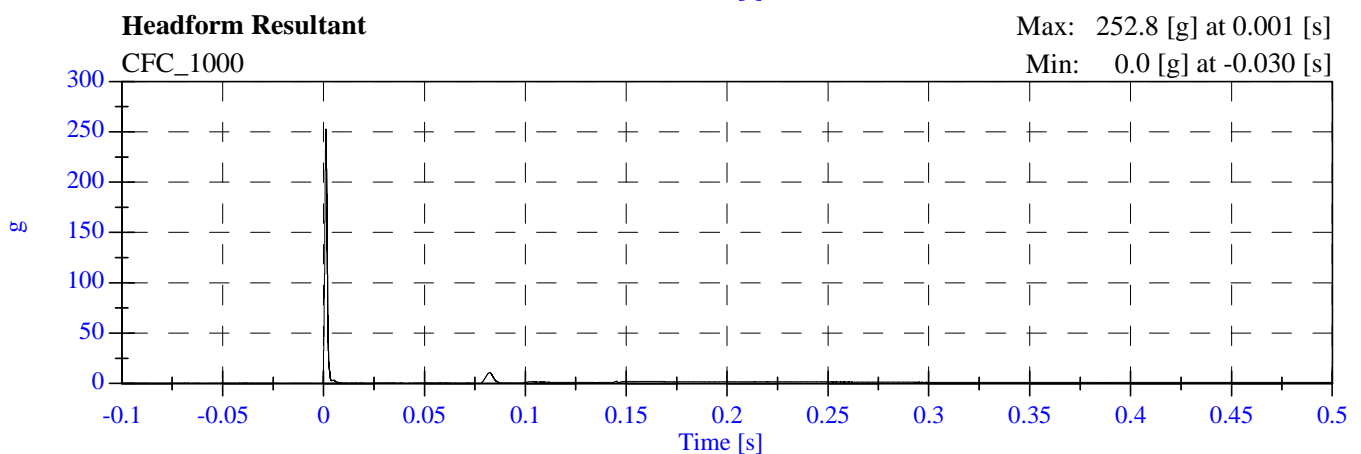
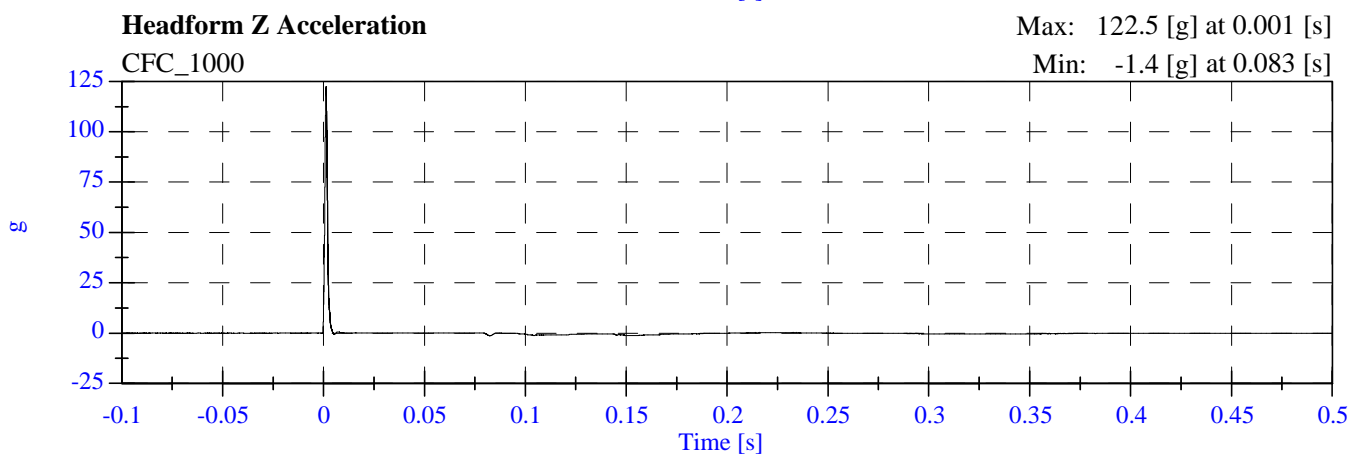
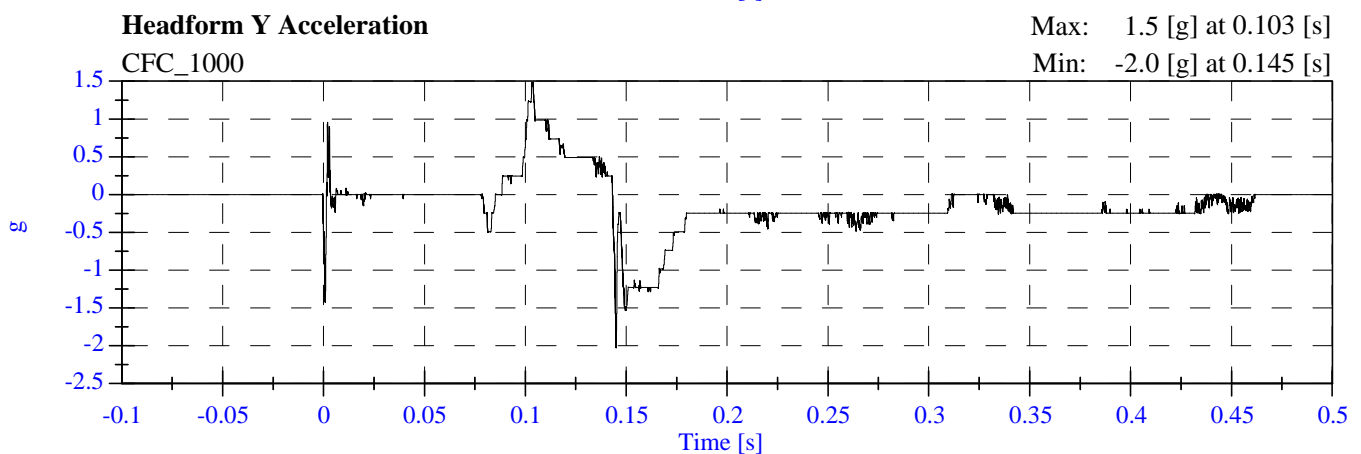
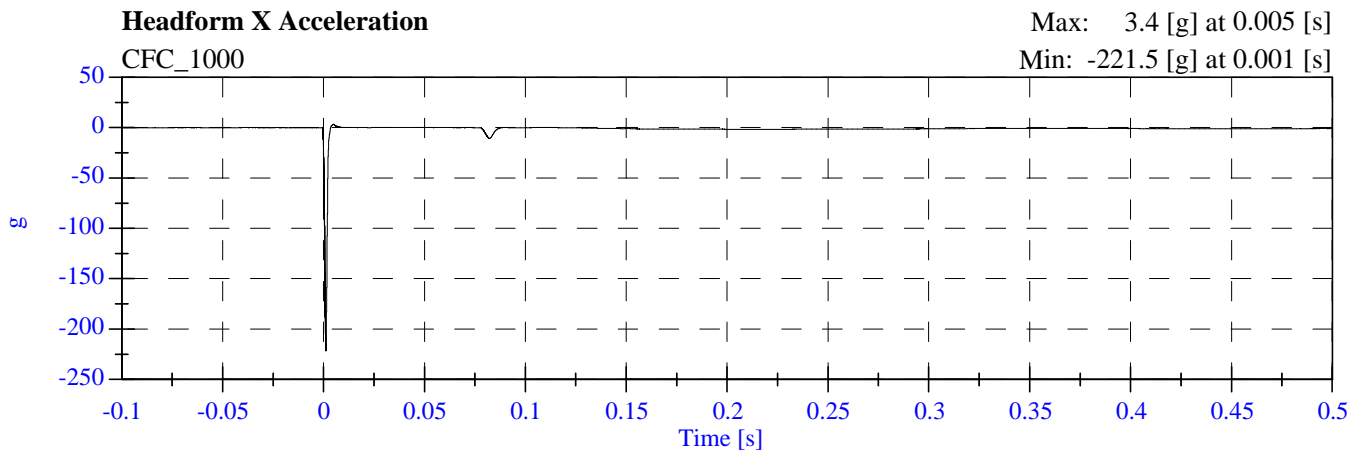
MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		February 1, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	25.0	
RELATIVE HUMIDITY	10% to 70%	22	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	252.8	
PEAK LATERAL ACCELERATION	15 Gs Maximum	2.0	
IS ACCELERATION 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	J28671	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J32779	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	Jan. 18, 2008	June 18, 2008

REMARKS:

FMVSS 201U - Headform Calibration Drops C80508 - February 01, 2008



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

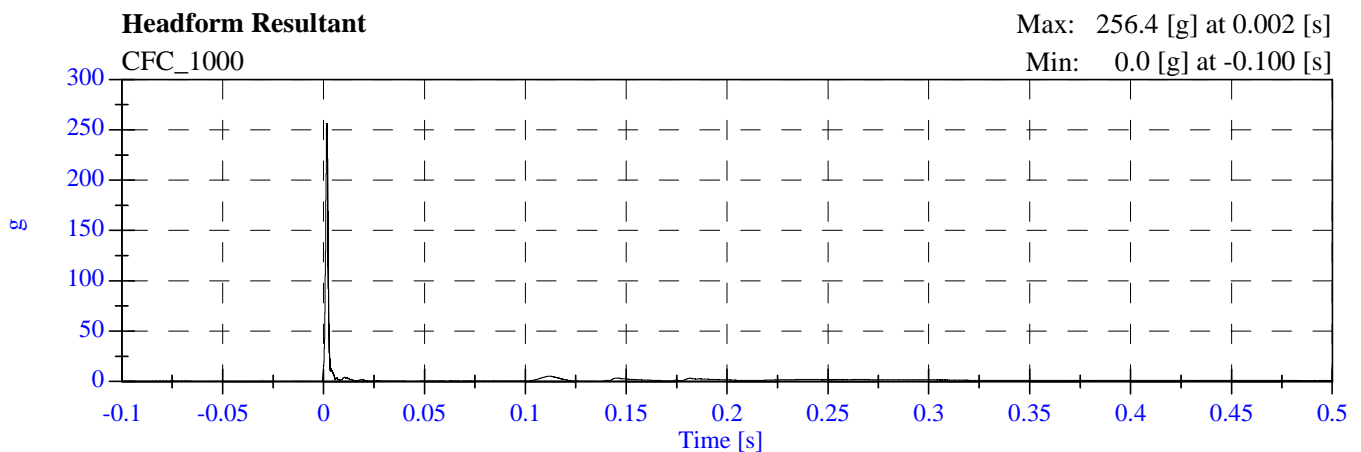
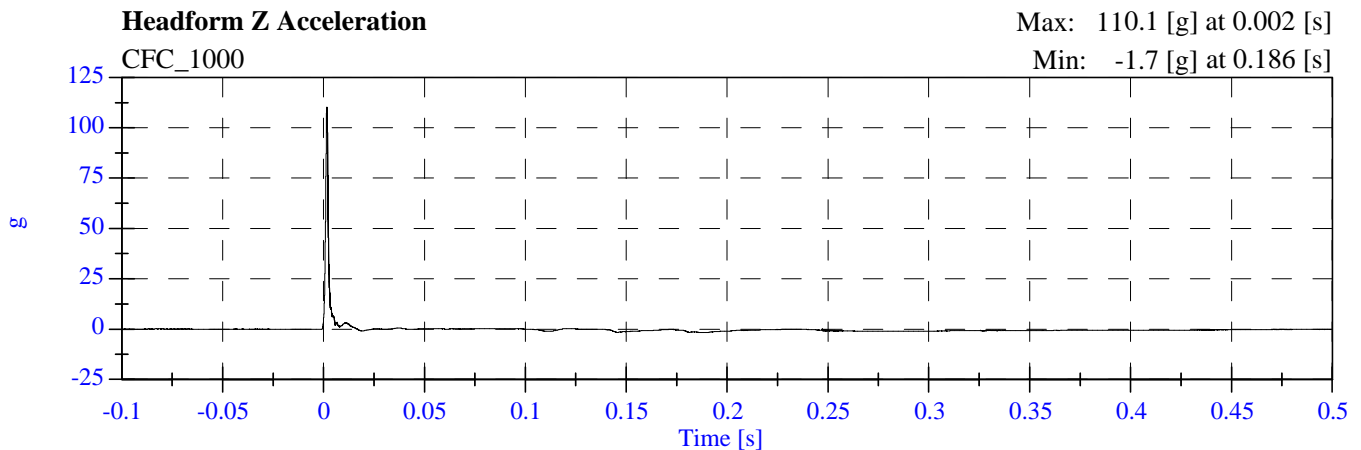
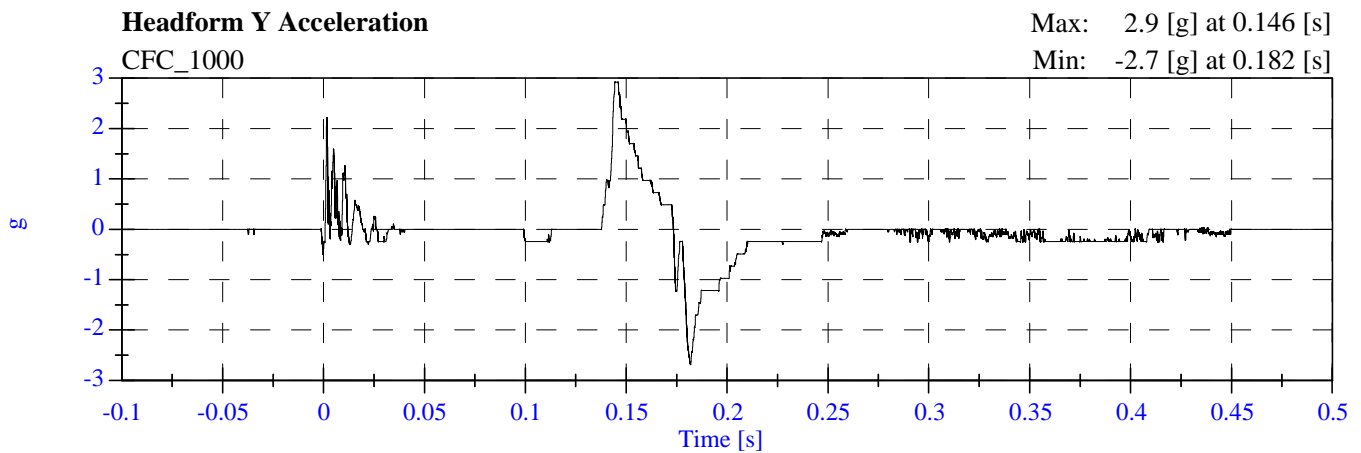
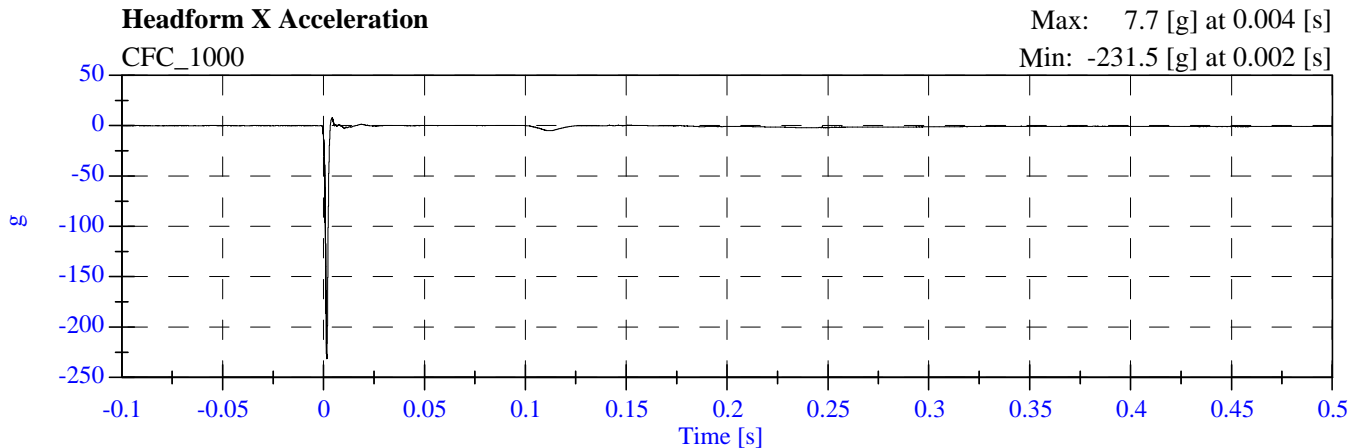
MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1142	
CALIBRATION DATE:		February 1, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	25.0	
RELATIVE HUMIDITY	10% to 70%	22	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	256.4	
PEAK LATERAL ACCELERATION	15 Gs Maximum	2.9	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J40994	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	Jan. 18, 2008	June 18, 2008

REMARKS:

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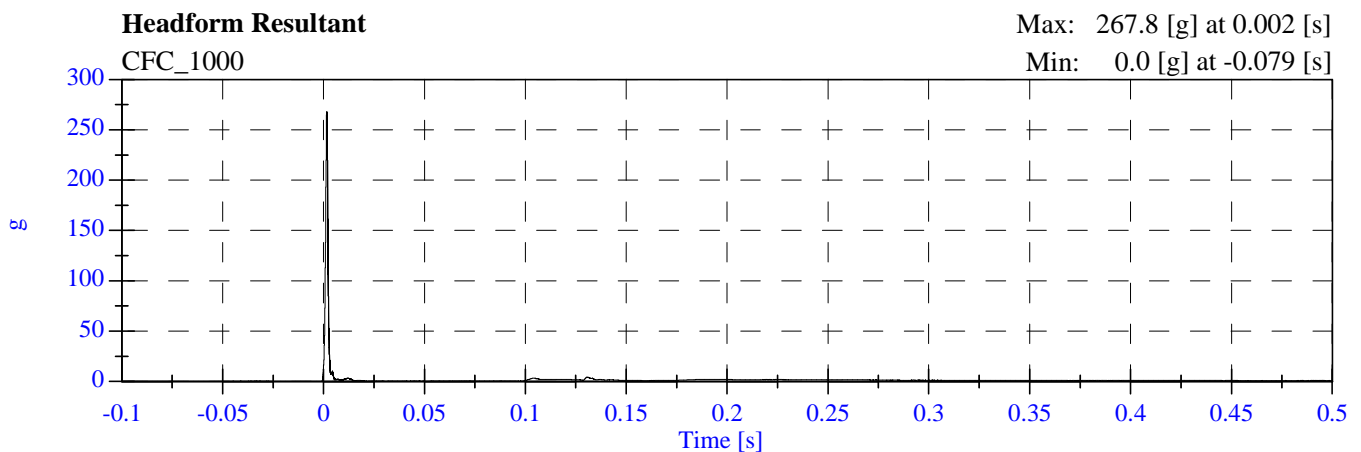
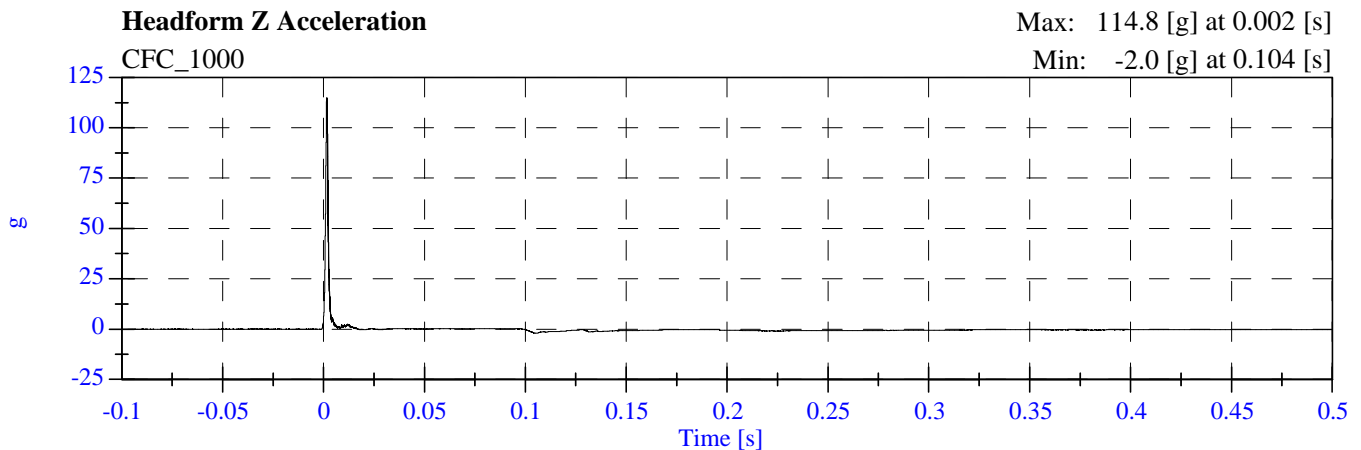
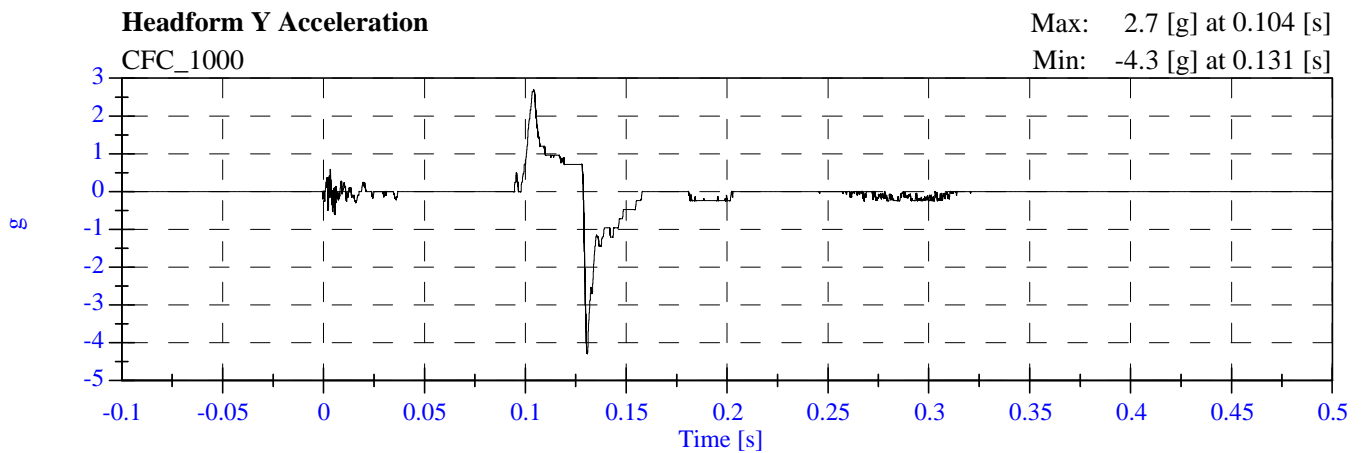
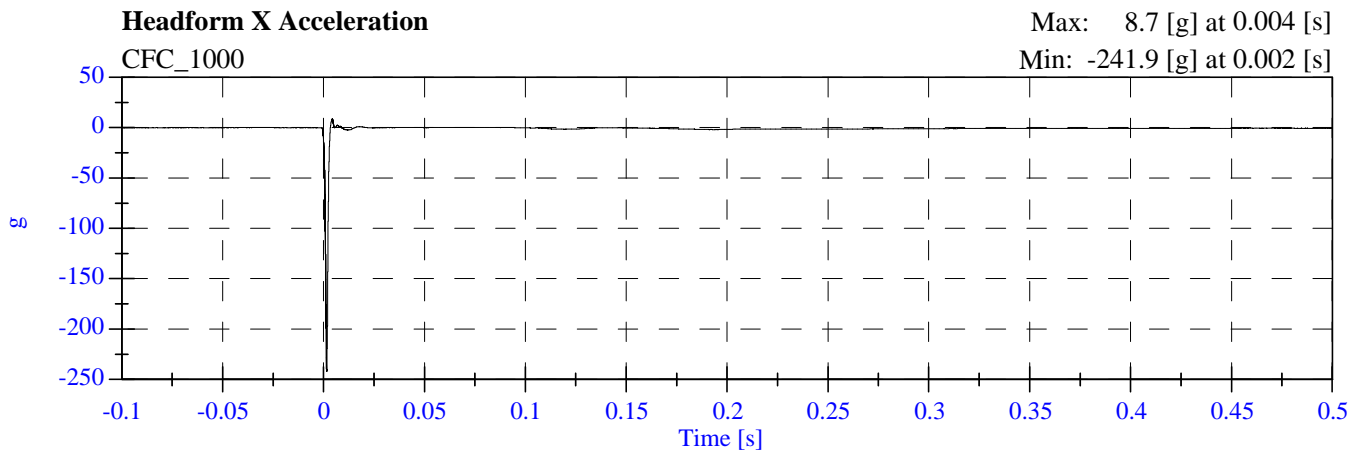
MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1140	
CALIBRATION DATE:		February 21, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	12	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	267.8	
PEAK LATERAL ACCELERATION	15 Gs Maximum	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	J24876	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J33030	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	Jan. 18, 2008	June 18, 2008

REMARKS:

FMVSS 201U - Headform Calibration Drops C80508 - February 21, 2008



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MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		February 21, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	12	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	254.4	
PEAK LATERAL ACCELERATION	15 Gs Maximum	11.0	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

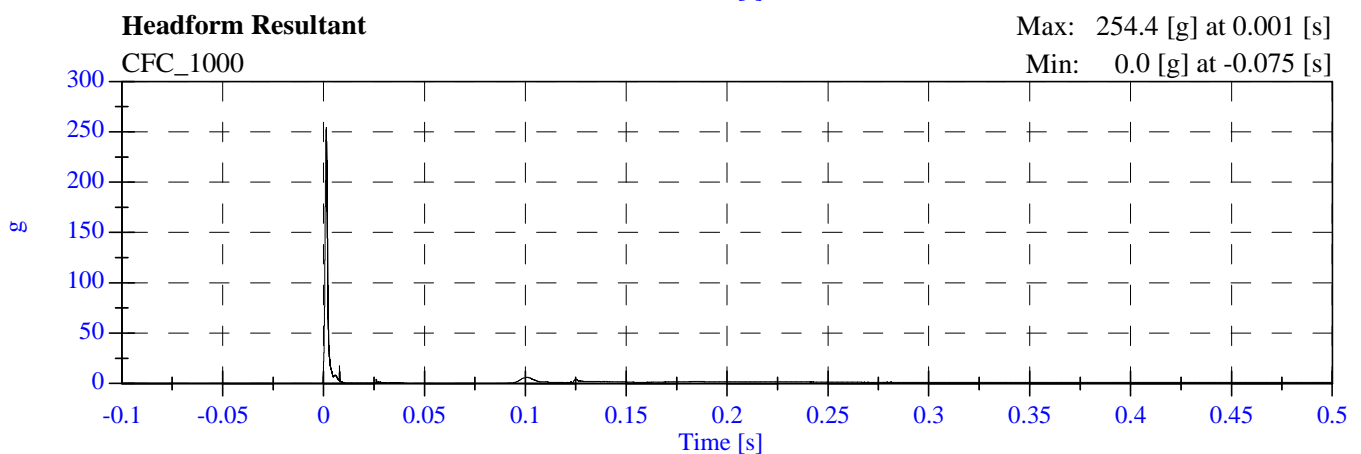
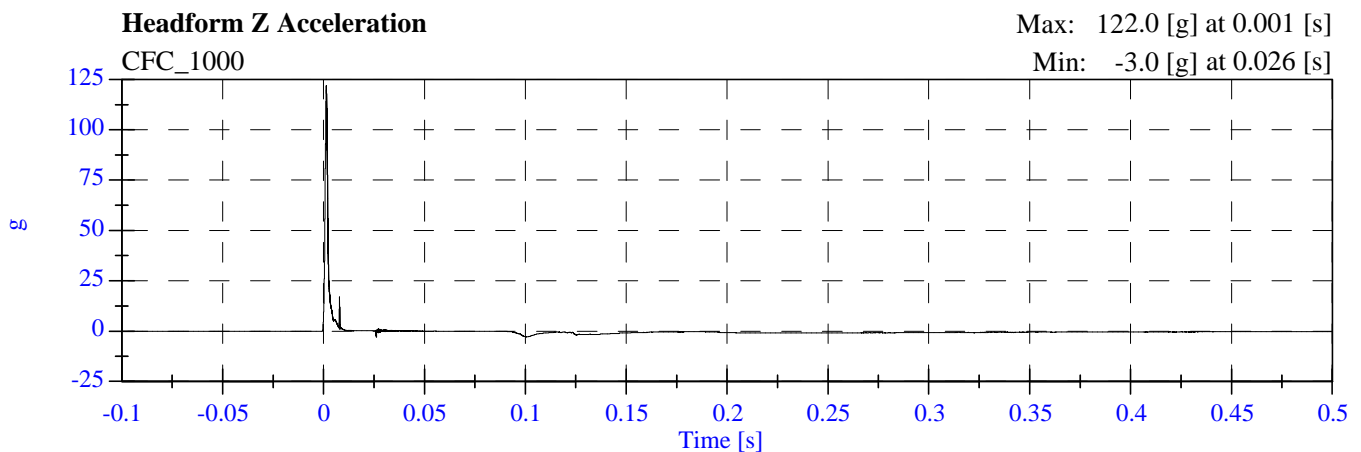
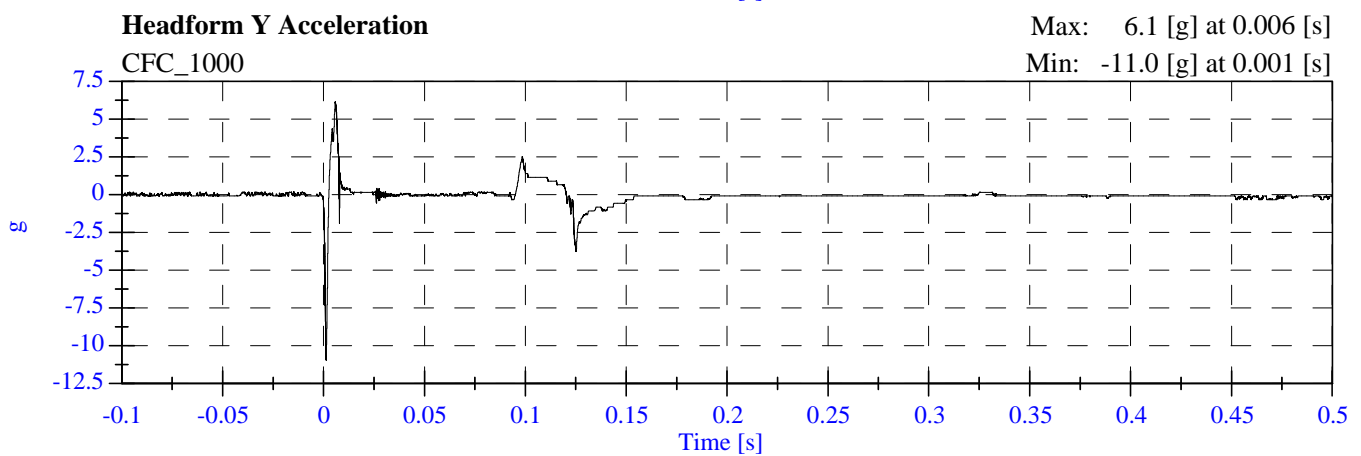
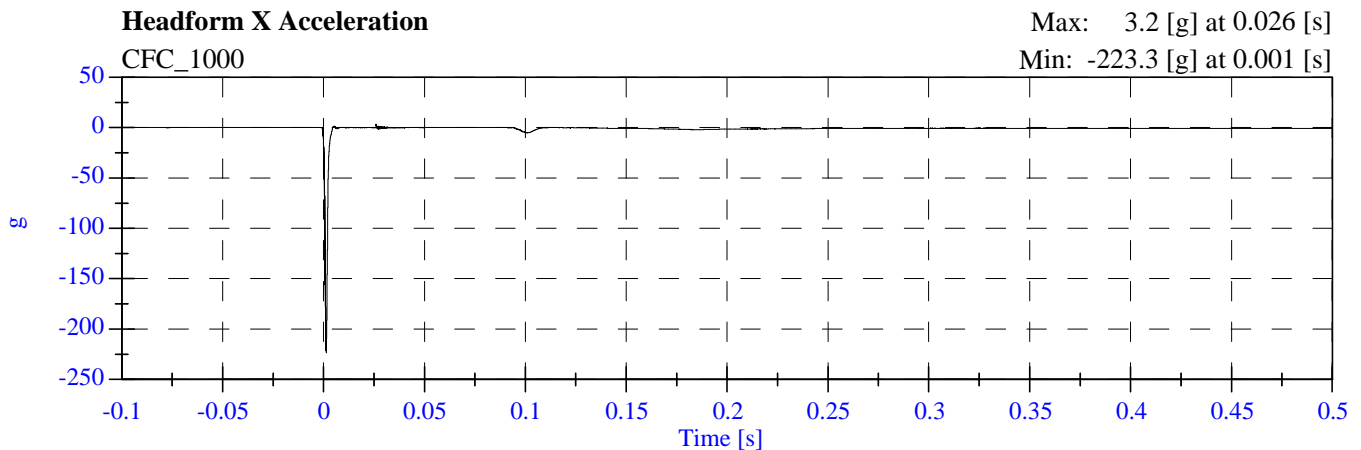
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J33019	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	Jan. 18, 2008	June 18, 2008

REMARKS:

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

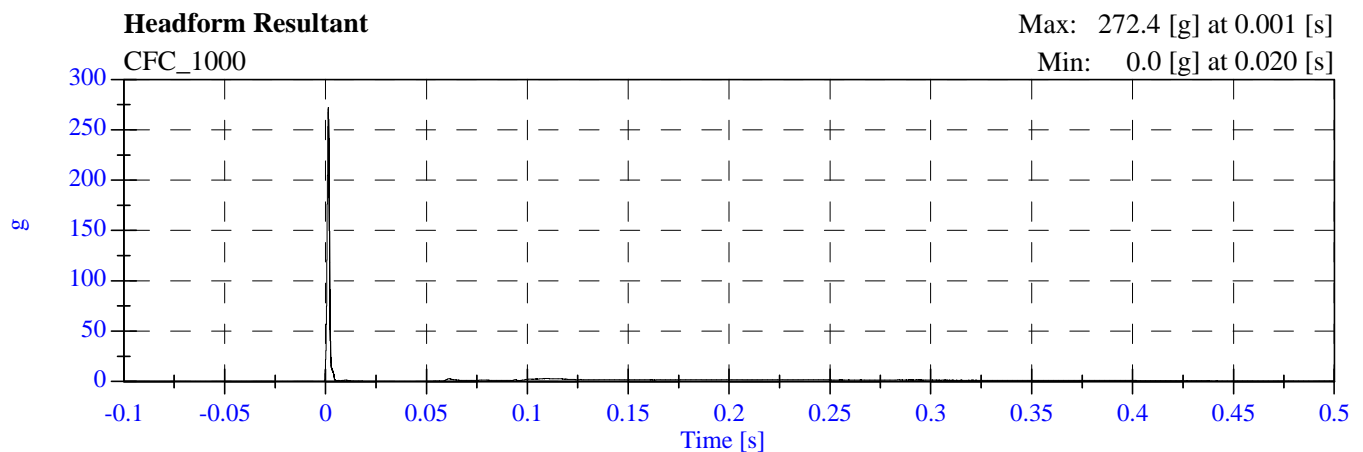
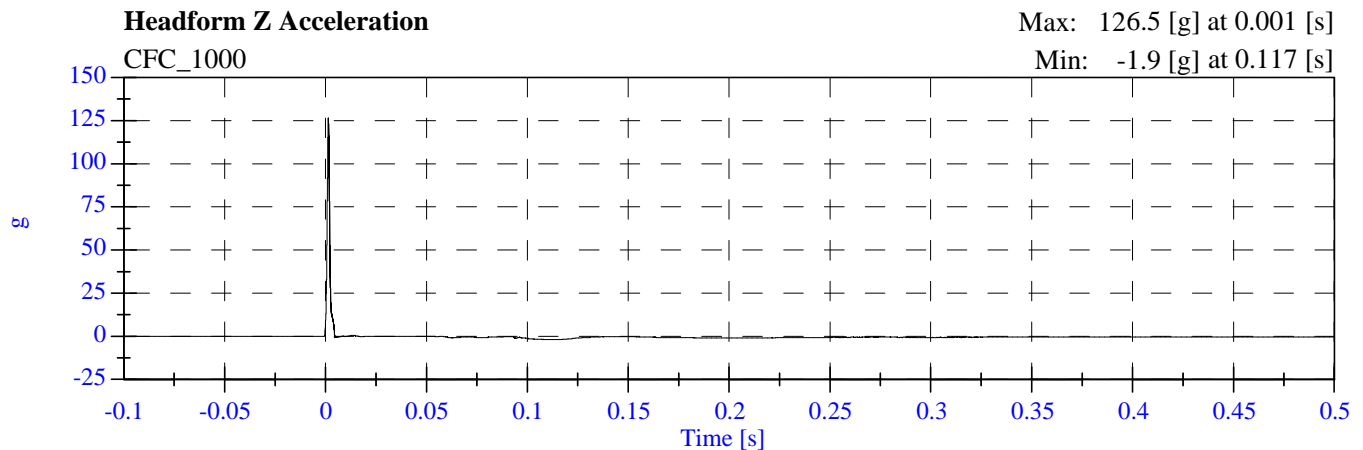
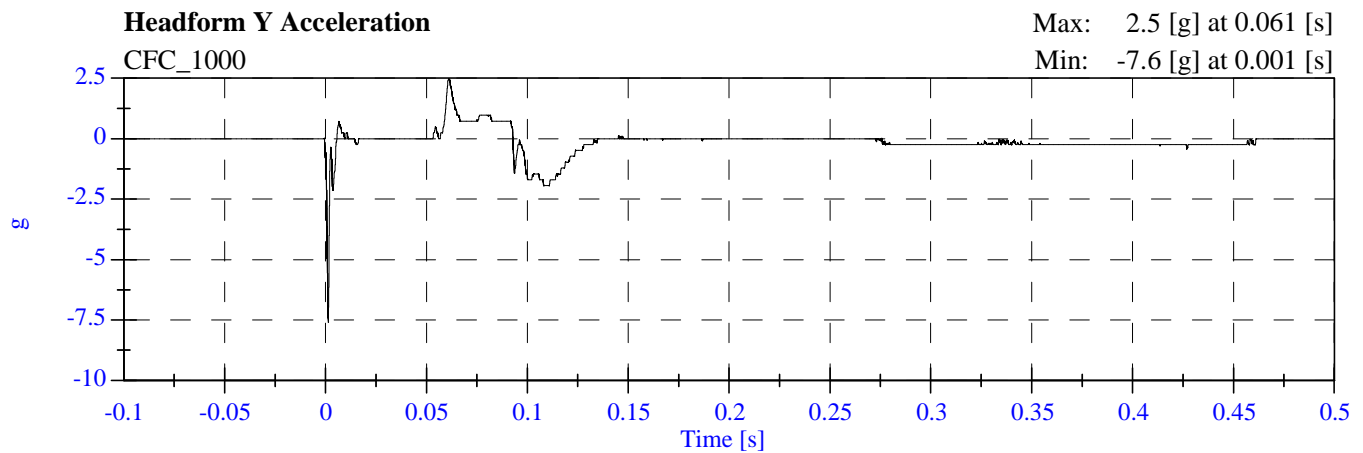
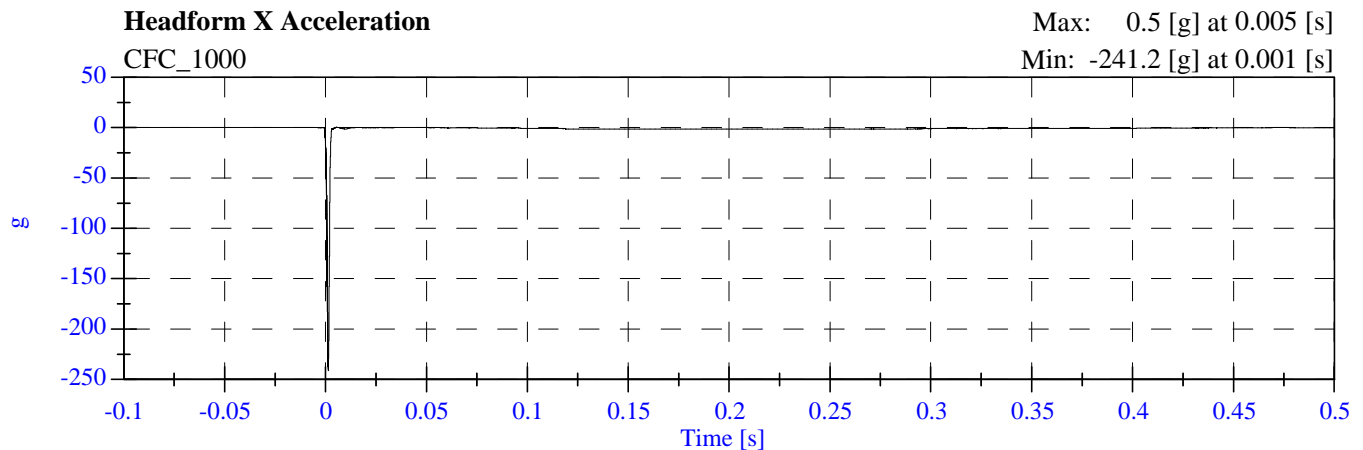
MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		February 21, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	12	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	272.4	
PEAK LATERAL ACCELERATION	15 Gs Maximum	7.6	
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	J41004	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J37496	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J41016	Jan. 18, 2008	June 18, 2008

REMARKS:

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HEAD DROP POST-TEST**

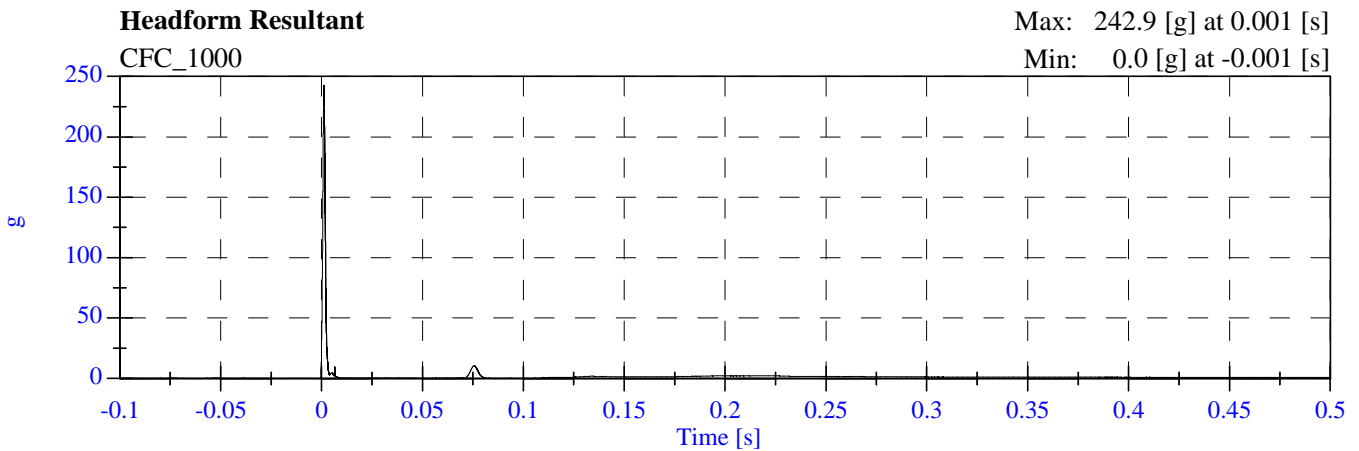
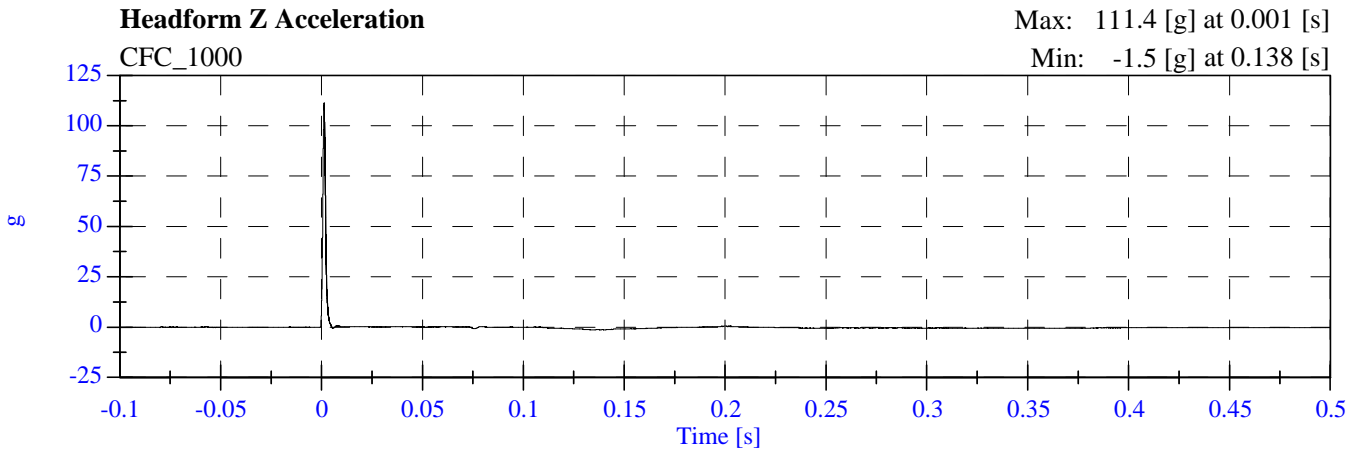
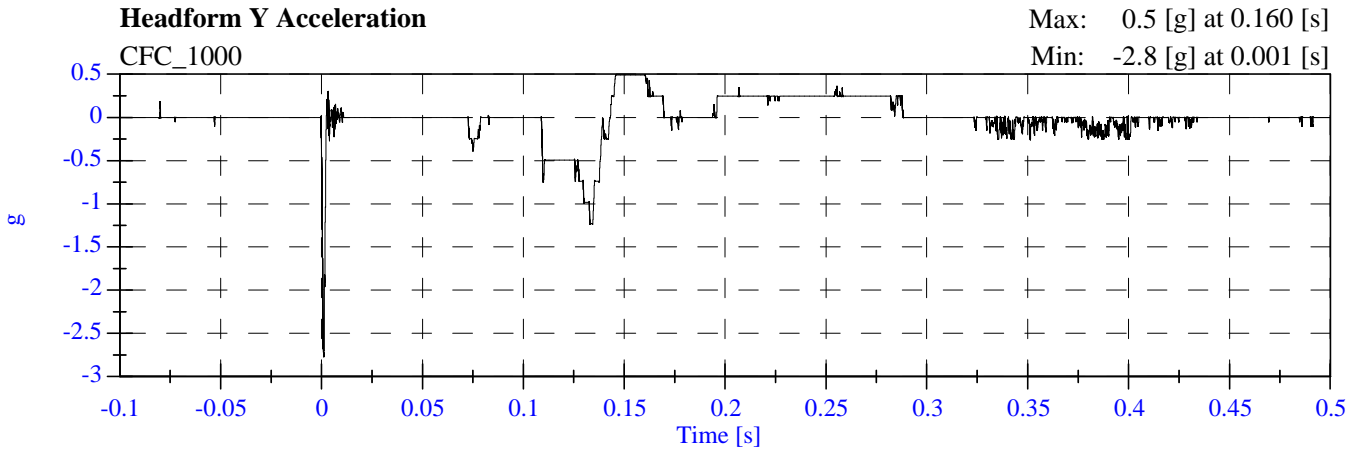
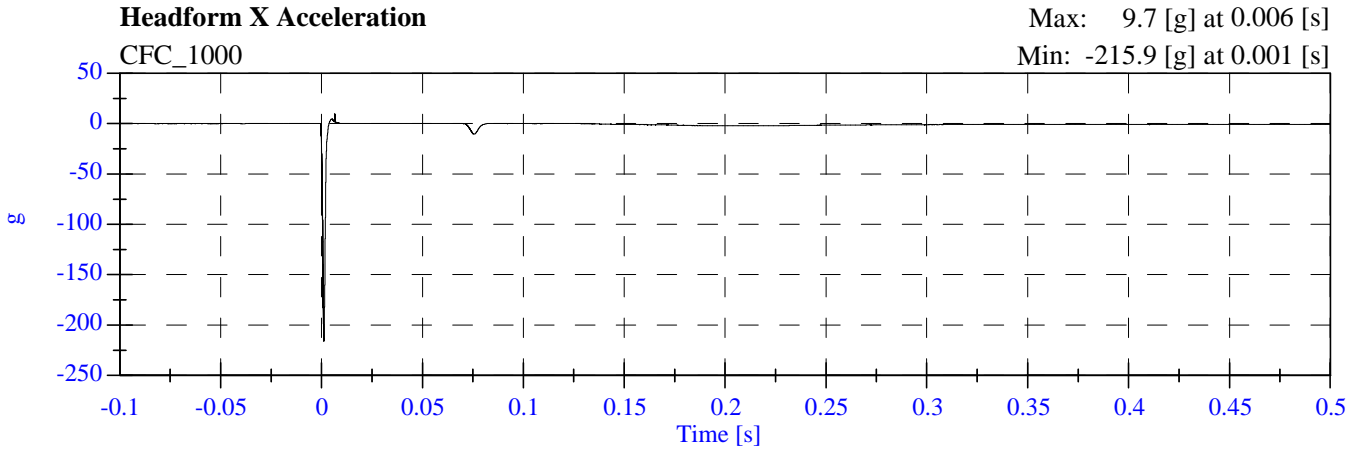
MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		February 21, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	12	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	242.9	
PEAK LATERAL ACCELERATION	15 Gs Maximum	2.8	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J28671	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J32779	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	Jan. 18, 2008	June 18, 2008

REMARKS:

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MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1142	
CALIBRATION DATE:		February 21, 2008	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	22.2	
RELATIVE HUMIDITY	10% to 70%	12	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	255.3	
PEAK LATERAL ACCELERATION	15 Gs Maximum	3.5	
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	J41006	Jan. 18, 2008	June 18, 2008
2 - LATERAL	ENDEVCO	7264-2000T	J40994	Jan. 18, 2008	June 18, 2008
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	Jan. 18, 2008	June 18, 2008

REMARKS:

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