

REPORT NUMBER: 201U-CAL-10-09

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

**HONDA OF AMERICA MANUFACTURING COMPANY, INC.  
2010 Honda Crosstour**

NHTSA NUMBER: CA5303

CALSPAN TEST NUMBER: CC2010-09

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



Test Date: May 11, 2010

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Enforcement  
Office of Vehicle Safety Compliance  
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1200 New Jersey Avenue, SE  
Washington, DC 20590

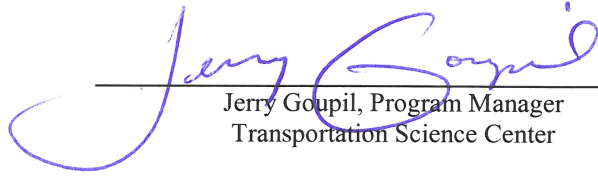
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15. <i>Supplementary Notes</i>						
16. <i>Abstract</i>  Compliance tests were conducted on the subject vehicle, 2010 Honda Crosstour, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows in the table below:						
Target Point		Horizontal	Vertical	Velocity	HIC	HICd
None		-	-	-	-	-
None		-	-	-	-	-
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## **SECTION 1**

### **PURPOSE AND TEST PROCEDURE**

This head impact compliance test is part of the FMVSS 201 Upper Interior Head Impact Protection Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-09-D-00130. The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2010 Honda Crosstour, NHTSA No. CA5303, 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 2010 Honda Crosstour, NHTSA No. CA5303, was tested at various upper interior locations by a 4.54 kg 50<sup>th</sup> 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:

AP1	BP2	OP2	SR3
AP2	BP4	SR1	URBP
AP3	FH1	SR2B	UROP

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  $4.54 \pm 0.5$  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:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

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	1208.7	-533.84	1058.11	1208.40	534.40	1057.12	108	32	18.48	374.8	449.2
AP2	1089.35	-600.17	972.93	1083.44	600.42	969.03	229	44	18.77	581.6	605.2
AP3	940.52	-638.34	892.34	940.73	638.82	889.90	150	45	18.69	392.8	463.5
FH1	1114.50	-421.65	1082.10	1117.40	426.40	1081.31	180	50	23.51	567.6	594.7
FH2	1088.28	-278.20	1085.72	1090.55	278.72	1085.43	-	-	-	-	-
SR1	1357.89	-501.14	1083.05	1357.07	499.06	1084.31	270	42	18.54	189.2	309.2
SR2A	1506.90	-493.55	1103.94	1506.75	496.21	1101.30	Relocated 1 circle		-	-	-
SR2A R1	1526.90	-494.85	1099.11	1521.11	493.99	1099.50	-	-	-	-	-
SR2B	1418.49	-504.20	1114.13	1418.47	499.72	1116.76	Relocated 2 circle		-	-	-
SR2B R2	1418.78	-465.91	1111.33	1420.18	465.77	1110.75	90	45	18.96	217.1	330.2
BP1	1720.32	-478.39	1127.53	1719.06	480.69	1127.98	Relocated 3 circle		-	-	-
BP1 R3	1720.30	-522.49	1085.62	1717.10	524.21	1086.05	-	-	-	-	-
BP2	1691.06	-607.17	883.86	1689.08	607.80	884.47	90	11	23.37	598.6	618.0
BP3	1635.15	-627.67	921.91	1633.78	628.40	921.45	Relocated 1 circle		-	-	-
BP3 R1	1643.03	-611.16	934.46	1639.80	614.15	933.84	-	-	-	-	-
BP4	1741.28	-663.08	819.14	1740.47	664.76	819.46	218	-9	23.35	476.7	526.0
URBP	1922.18	-337.29	1144.23	1922.29	336.53	1145.11	90	50	23.88	319.2	407.2
SR3	2111.37	-485.15	1093.80	2114.97	487.93	1094.83	90	45	18.84	169.4	294.2
UROP	1922.18	-337.29	1144.23	2405.90	332.21	1151.24	12	50	23.57	129.7	264.3
RP1	2760.21	-504.66	984.94	2763.59	507.89	986.36	Relocated 3 circle		-	-	-
RP1 R3	2715.18	-457.96	1017.19	2724.66	455.03	1019.37	-	-	-	-	-
RH	2734.17	-357.99	1037.15	2744.91	365.16	1036.79	-	-	-	-	-
OP1	2400.17	-459.47	1117.98	2401.63	463.51	1120.28	-	-	-	-	-
OP2	2491.12	-600.06	946.66	2491.84	605.61	945.35	270	3	23.81	634.3	645.0



**DATA SHEET 2-2**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

<b>TEST VEHICLE INFORMATION:</b>									
Year/Make/Model/Body Style:				2010 Honda Crosstour					
VIN:				5J6TF1H3XAL001277					
Month & Year of Manufacture:				11/09 (SEE CERTIFICATION LABEL)					
Vehicle Body Color:				Grey					
Engine Data:	4	Cylinders;		CID;	3.5	Liters;	-	cc	
Engine Placement:		Longitudinal;		or		X	Lateral		
Transmission:	4	Speed;		Manual;	X	Automatic;	X	Overdrive	
Final Drive:		Rear Wheel Drive;		Front Wheel Drive;		Four Wheel Drive			
Odometer Reading:		306	km						
Options:	X	A/C;	X	Power Steering;	X	Pwr.Brakes;	X	Pwr. Windows	
Interior Trim Information :									
1.									
2.									
3.									

<b>DATA FROM TIRE PLACARD:</b>										
Tire Pressure (at capacity);				220		kPa FRONT				
				220		kPa REAR				
Recommended Tire Size:										
Tires on Test Vehicle:			P225/65R17			Manufacturer:		Bridgestone		
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)=				385.0		kg (A)				
No. of Occupants x 68 kg. =				340		kg (B)				
Rated Cargo/Luggage Weight (RCLW) =				45		kg (A-B) Max. RCLW = 136 kg.				

**DATA SHEET 2-2**

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

<b>TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:</b>							
Left Front	=	521.5	kg	Left Rear	=	359.0	kg
Right Front	=	507.0	kg	Right Rear	=	350.5	kg
TOTAL FRONT	=	1028.5	kg	TOTAL REAR	=	709.5	kg
% of Total Weight	=	59.2	%	% of Total Weight	=	40.8	%
TOTAL WEIGHT	=	1738.0					kg

<b>CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:</b>		
Total Test Vehicle Delivered Weight=	1738.0	kg (A)
+ Rated Cargo/Luggage Weight =	45	kg (B)
TEST VEHICLE TARGET WEIGHT =	1783	kg (A+B)

<b>WEIGHT OF TEST VEHICLE (FULLY LOADED):</b>							
Left Front	=	522.5	kg	Left Rear	=	376.5	kg
Right Front	=	504.0	kg	Right Rear	=	372.0	kg
TOTAL FRONT	=	1026.5	kg	TOTAL REAR	=	748.5	kg
% of Total Weight	=	57.8	%	% of Total Weight	=	42.2	%
TOTAL TEST WEIGHT	=	1775.0					
Weight of vehicle secured in test vehicles cargo area	=	39					kg

<b>TEST VEHICLE ATTITUDE (all dimensions in millimeters):</b>				
AS DELIVERED:	Left Front	799	Left Rear	810
	Right Front	805	Right Rear	810
FULLY LOADED:	Left Front	797	Left Rear	803
	Right Front	803	Right Rear	802
Test Vehicle Wheelbase:	2797		millimeters	

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

DATA SHEET 2-3

APPROACH ANGLE LIMITS

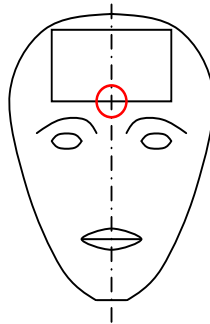
Left Side					Right Side				
Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)		Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	204*	249*	-5	32	AP1	108*	157*	-5	32
AP2	204*	249*	-5	44	AP2	108*	157*	-5	44
AP3	204*	249*	-5	45	AP3	108*	157*	-5	45
BP1	203*	284*	-10	N/A	BP1	80*	157*	-10	N/A
BP2	Any		0	11	BP2	Any		0	11
BP3	203*	284*	-10	N/A	BP3	80*	157*	-10	N/A
BP4	203*	284*	-10	-9	BP4	80*	157*	-10	-9
OP1	270		-10	N/A	OP1	90		-10	N/A
OP2	270		-10	3	OP2	90		-10	3
RP1	270	345	-10	N/A	RP1	15	90	-10	N/A
RP2	270	345	-10	N/A	RP2	15	90	-10	N/A
FH1	180		0	50	FH1	180		0	50
FH2	180		0	N/A	FH2	180		0	N/A
RH	360		0	N/A	RH	0		0	N/A
SR1	270		0	42	SR1	90		0	42
SR2A	270		0	44	SR2A	90		0	44
SR2B	270		0	45	SR2B	90		0	45
SR3	270		0	45	SR3	90		0	45
SR3GH	270		0	44	SR3GH	90		0	44
URAP	ANY		0	50	URAP	ANY		0	50
URBP	ANY		0	50	URBP	ANY		0	50
URRP	ANY		0	50	URRP	ANY		0	50

Note: BP2 target location – Seat belt anchorage  
 \* Estimated value based on FARO measurements  
 N/A – Not Available

**DATA SHEET 2-4**

**SUMMARY TARGET IMPACT LOCATION ON FMH**

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey



↖ RIGHT SIDE OF FACE

TARGET	Distance Above Point 0 (mm)	Distance Over From Pt. O (mm)
SR3	5	3R
BP2	16	13R
URBP	54	2R
AP3	14	10R
AP1	17	16R
UROP	66	-2L
OP2	27	2R
BP4	35	9R
AP2	12	-4L
SR1	29	-8L
FH1	46	-1L
SR2B	32	-5L

**SECTION 3**

**SUMMARY OF TEST RESULTS AND DATA PLOTS**

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	01
Test Date:	11 May 2010
Target Location:	SR3 RH
Target Code:	SR3 RH
Horizontal Impact Angle:	90
Vertical Impact Angle:	45
Ambient Temperature:	20
Relative Humidity:	27.4%
Time of Impact:	10:43
Headform Number:	1142

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	3	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	5				mm up



POST-IMPACT SR3 RH HEADFORM

Free Motion HIC	169.4
HIC(d)	294.2
Impact Velocity (kph)	18.84
HIC T1 (msec)	1.9
HIC T2 (msec)	13.7

# SR3 RH Side CA5303 - SR3 RH

FMH Headform 1142

Location: SR3 RH

Test Date: May 11, 2010

Work File: fmh

## -----TEST RESULTS-----

Lab Temperature: 20 C

HICd: 294.2

Lab Humidity: 27.4 %

HIC (36ms): 169.4

Velocity at Impact: 18.84 KPH

t1: 1.9 msec

t2: 13.7 msec

Free Flight Distance: 220.61 mm

Duration: 11.8 msec

Maximum: 65.4 g

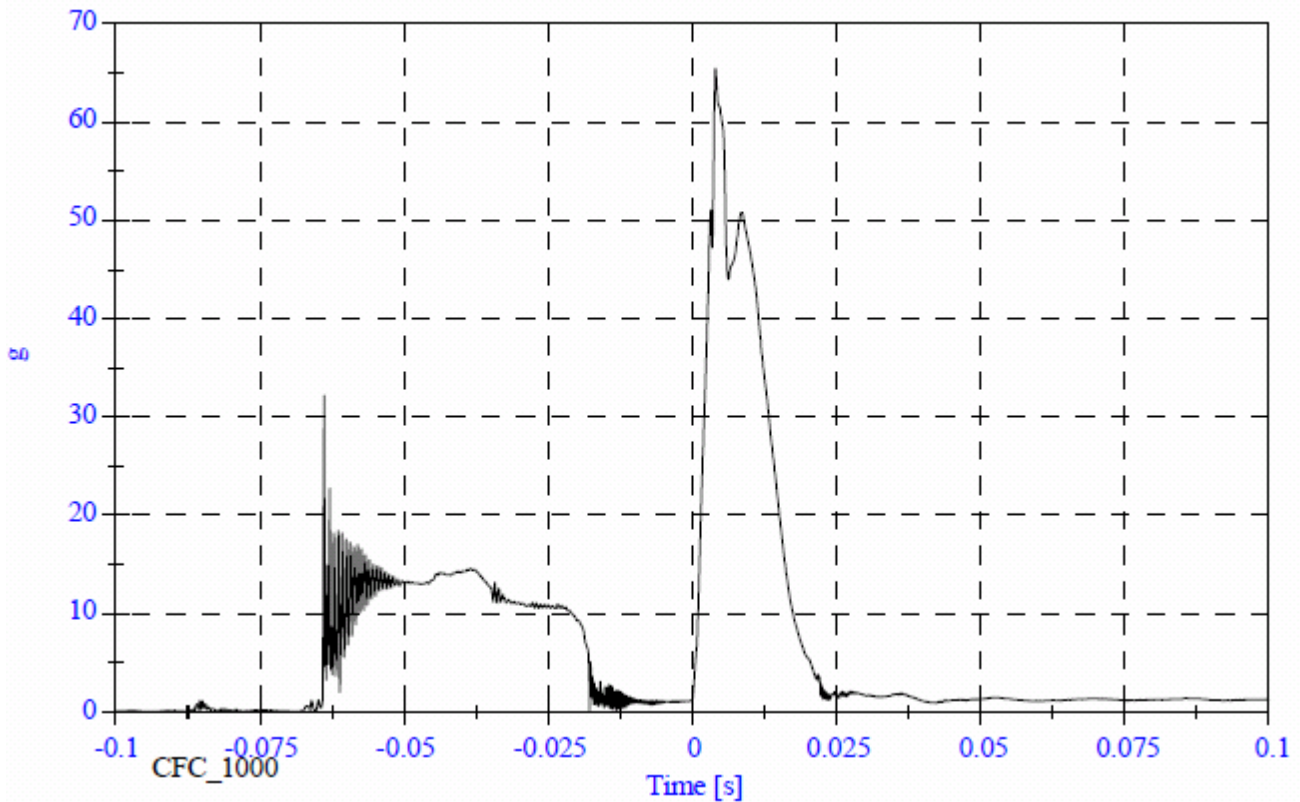
Average Acceleration: 6.8 g

SR3 RH Side

Max: 65.4 [g] at 0.004 [s]

Headform Resultant

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

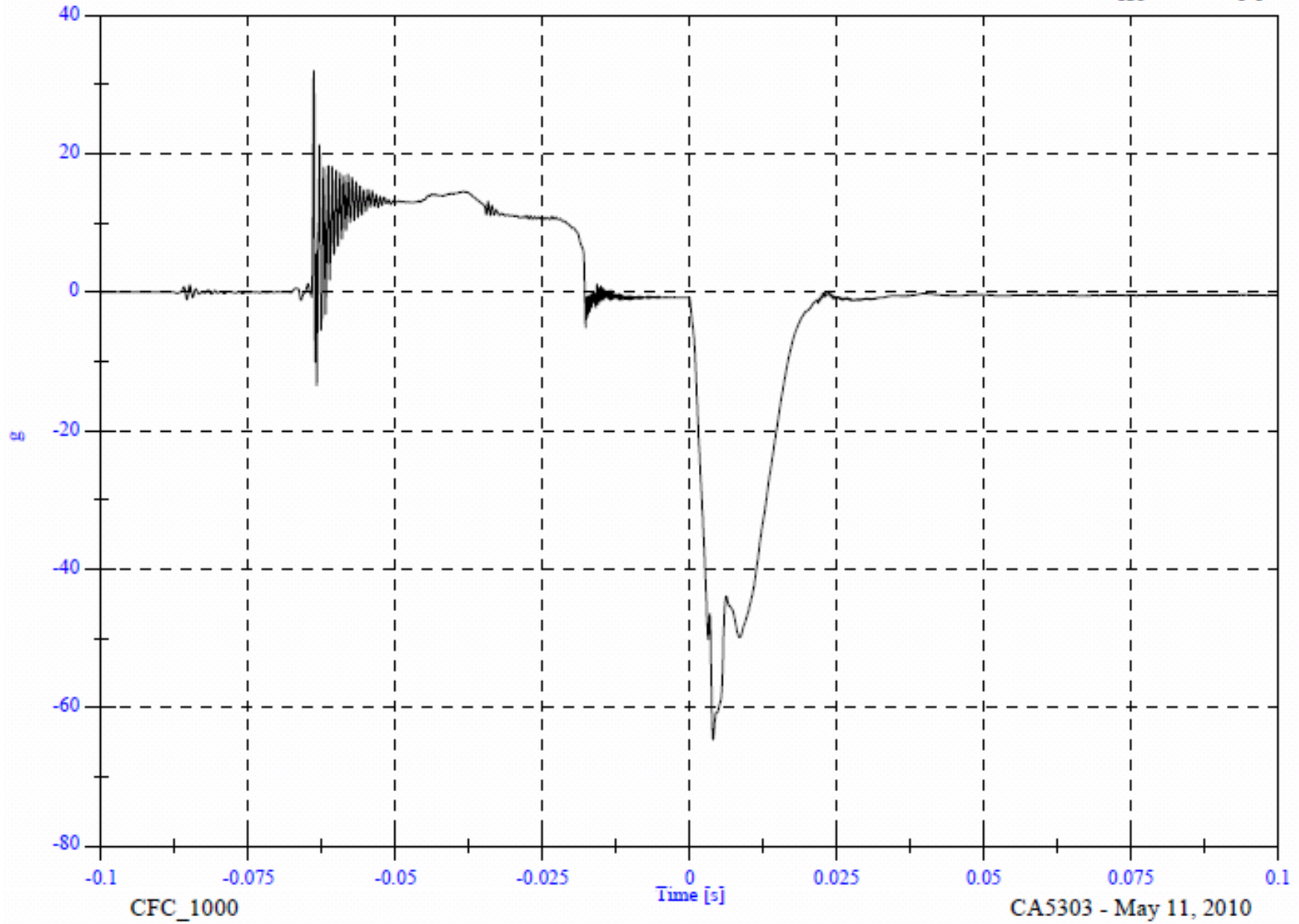


SR3 RH Side

Headform X Acceleration

Max: 32.0 [g] at -0.064 [s]

Min: -64.6 [g] at 0.004 [s]

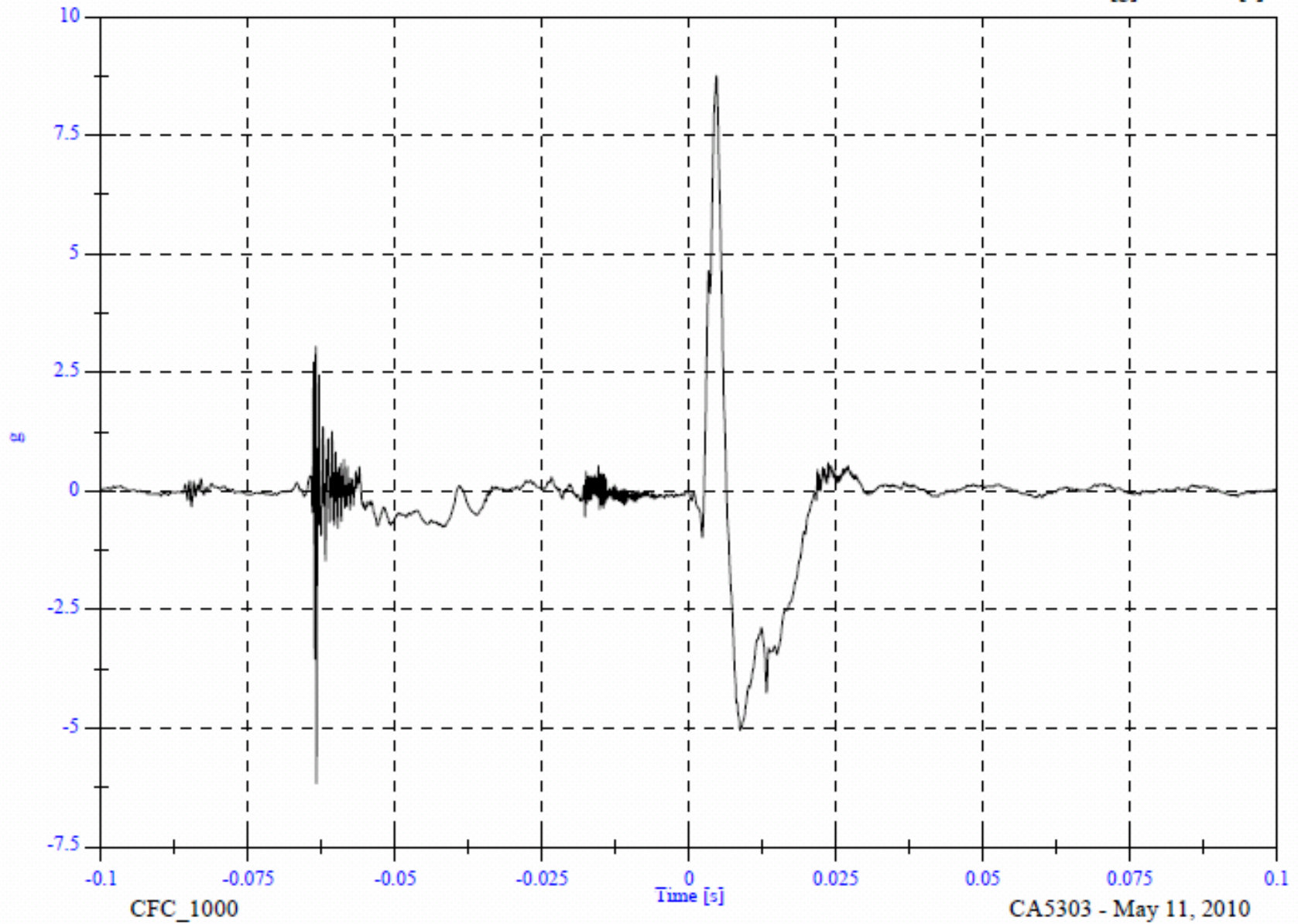




SR3 RH Side

Headform Y Acceleration

Max: 8.8 [g] at 0.005 [s]  
Min: -6.2 [g] at -0.063 [s]

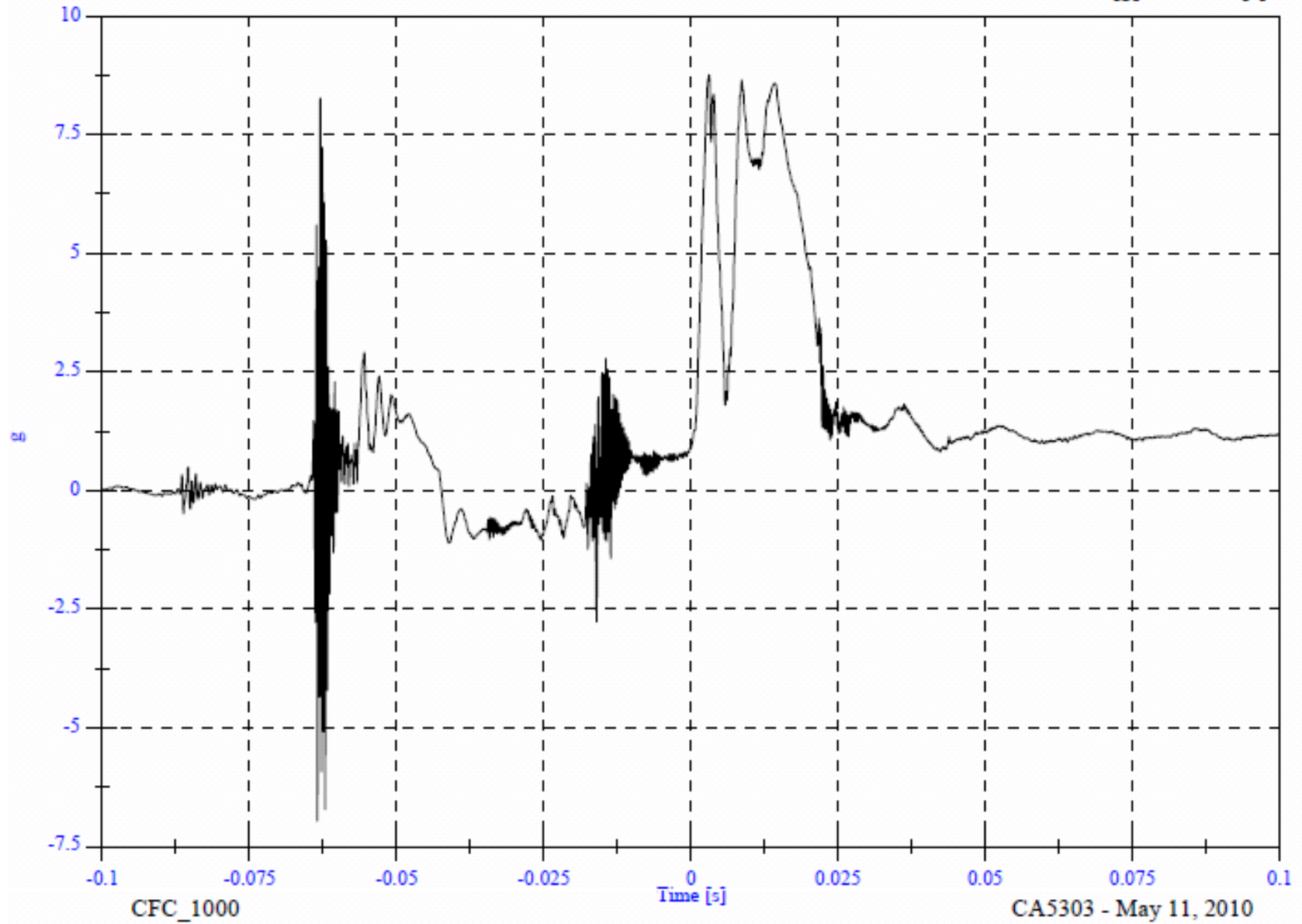


SR3 RH Side

Headform Z Acceleration

Max: 8.8 [g] at 0.003 [s]

Min: -7.0 [g] at -0.063 [s]

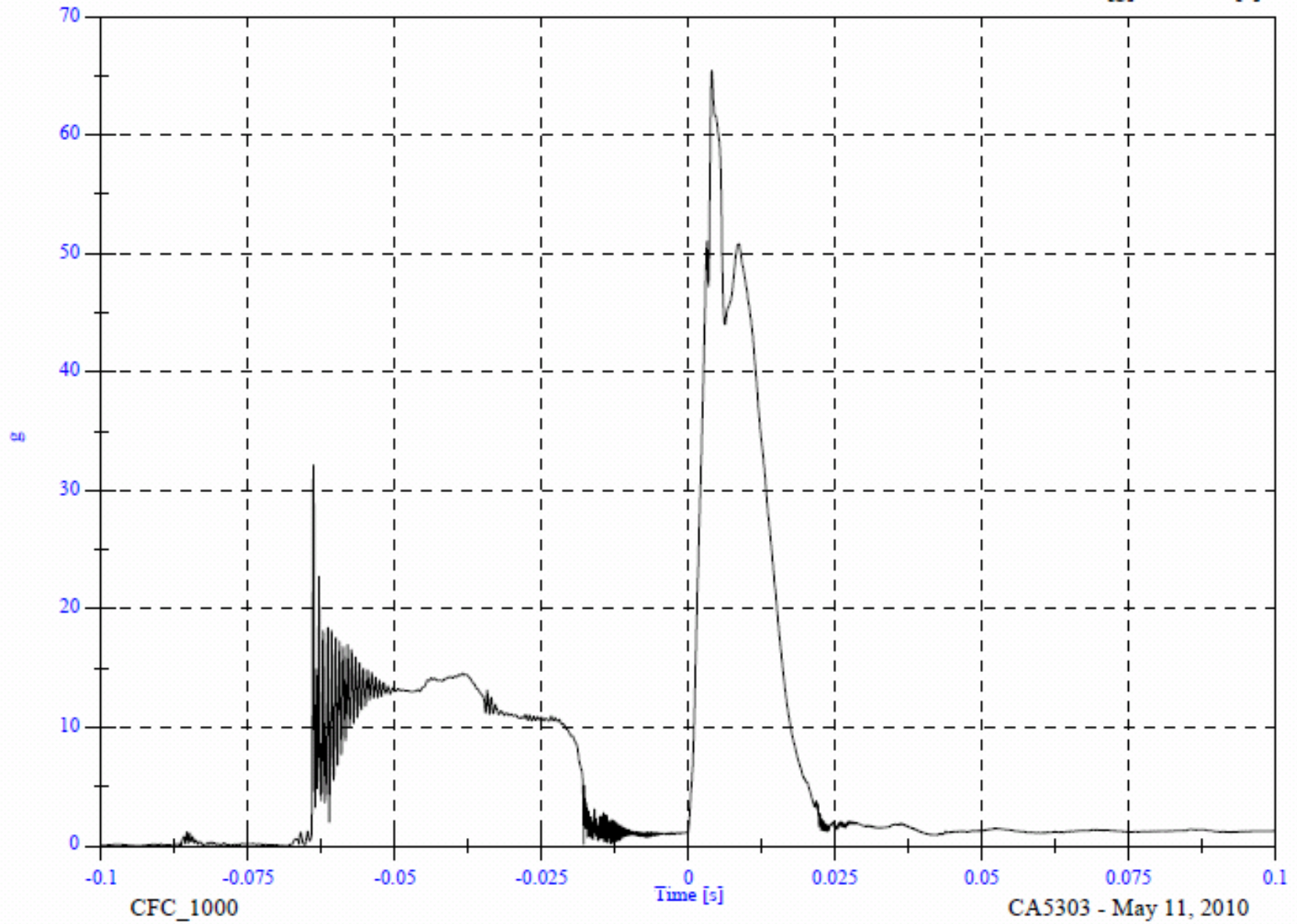


SR3 RH Side

Headform Resultant

Max: 65.4 [g] at 0.004 [s]

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

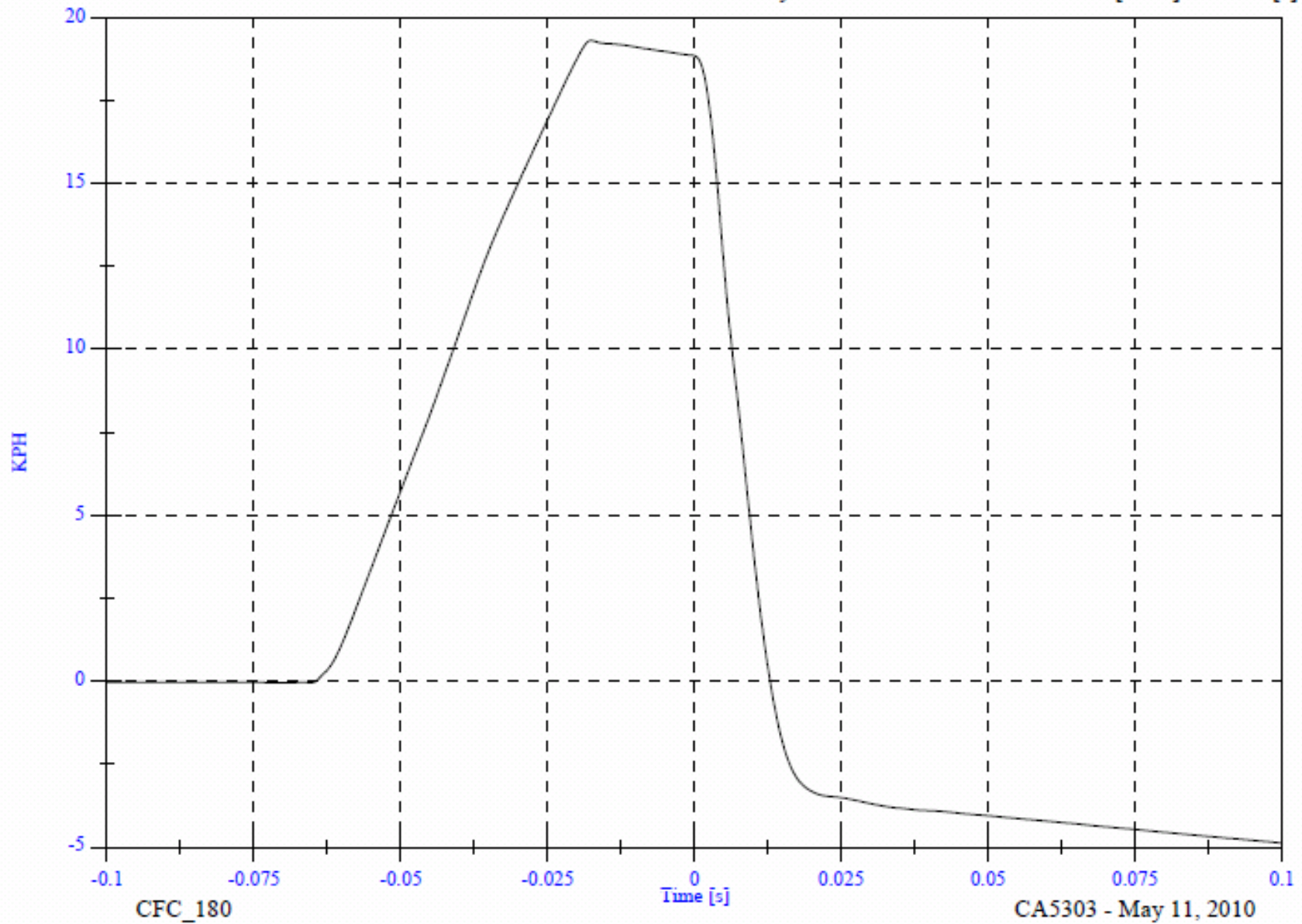


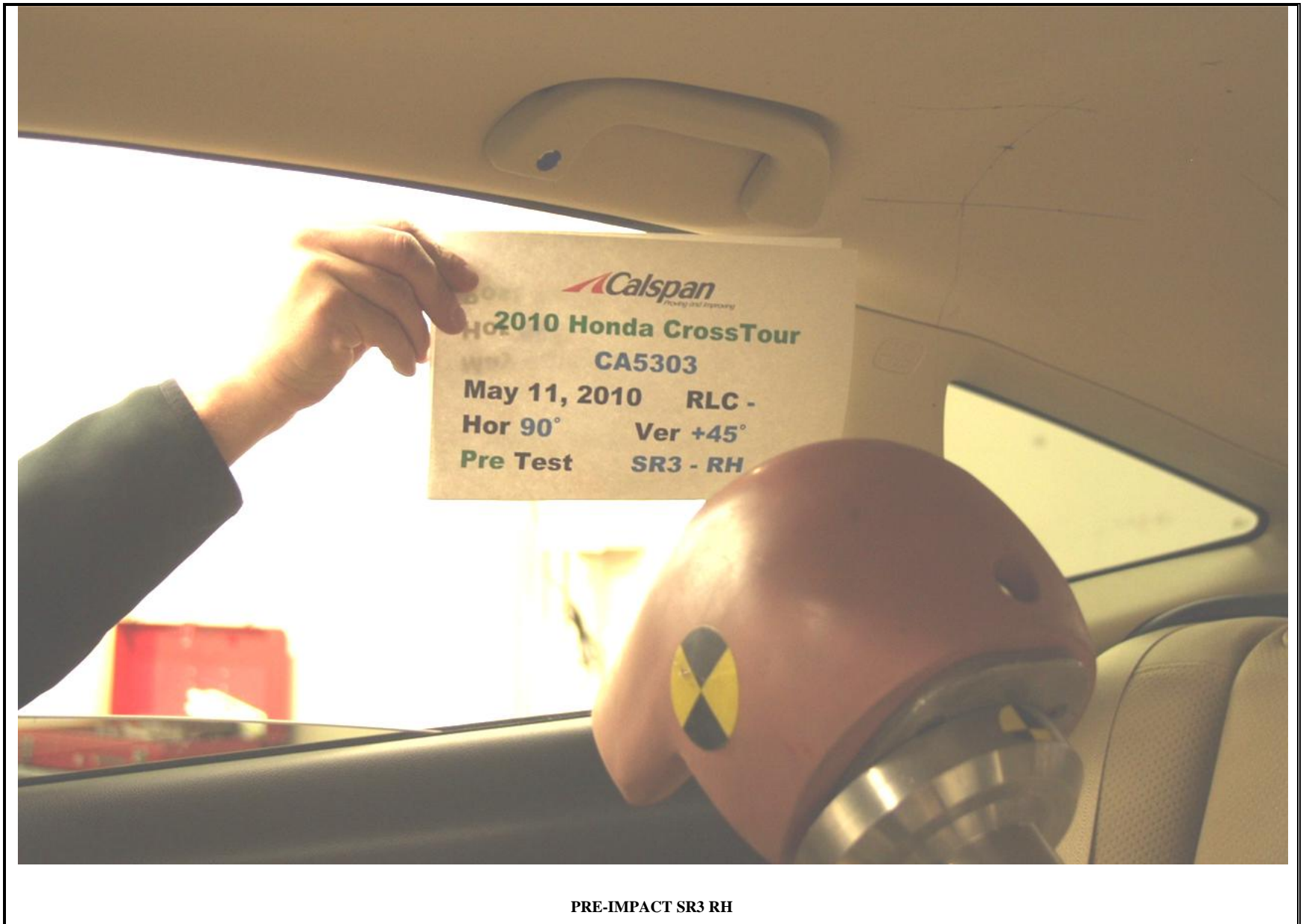
SR3 RH Side

Headform Velocity

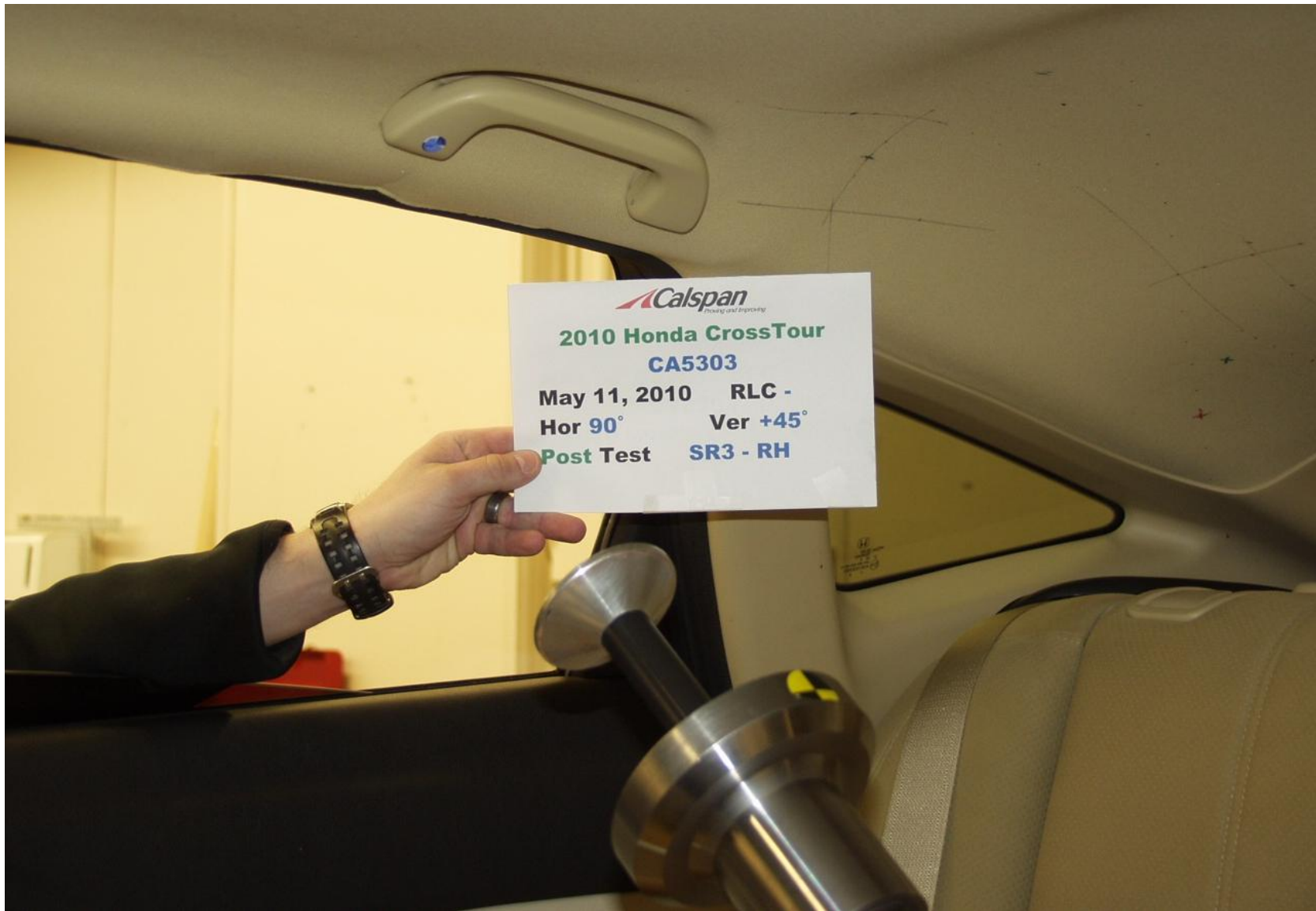
Max: 19.3 [KPH] at -0.018 [s]

Min: -4.9 [KPH] at 0.100 [s]





PRE-IMPACT SR3 RH



POST-IMPACT SR3 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	02
Test Date:	11 May 2010
Target Location:	BP2 RH
Target Code:	BP2 RH
Horizontal Impact Angle:	90
Vertical Impact Angle:	11
Ambient Temperature:	21
Relative Humidity:	27.7%
Time of Impact:	11:27
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	13	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	16				mm up



POST-IMPACT BP2 RH HEADFORM

Free Motion HIC	598.6
HIC(d)	618.0
Impact Velocity (kph)	2.37
HIC T1 (msec)	2.1
HIC T2 (msec)	10.2

# BP2 RH Side CA5303 - BP2 RH

FMH Headform 0355

Location: BP2 RH

Test Date: May 11, 2010

Work File: fmh

## TEST RESULTS

Lab Temperature: 21 C

HICd: 618.0

Lab Humidity: 27.7 %

HIC (36ms): 598.6

Velocity at Impact: 23.37 KPH

t1: 2.1 msec

t2: 10.2 msec

Free Flight Distance: 221.19 mm

Duration: 8.1 msec

Maximum: 106.0 g

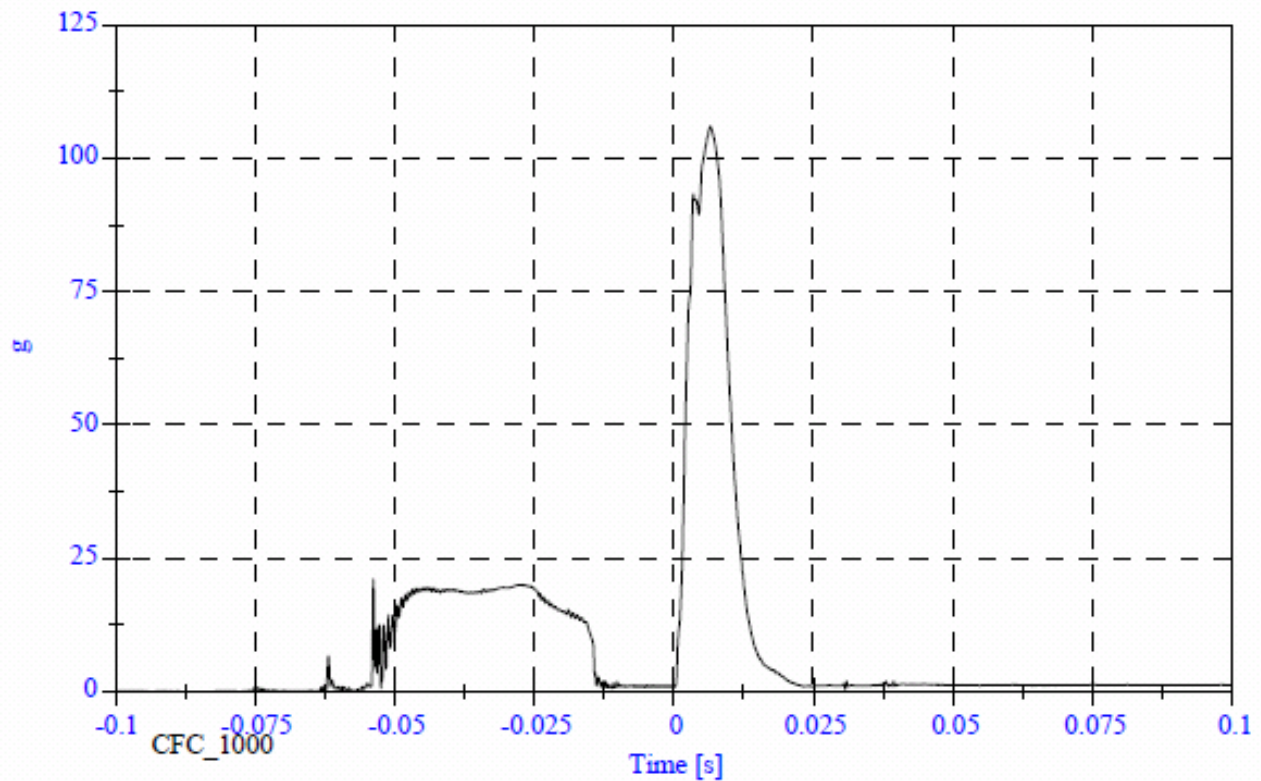
Average Acceleration: 8.4 g

BP2 RH Side

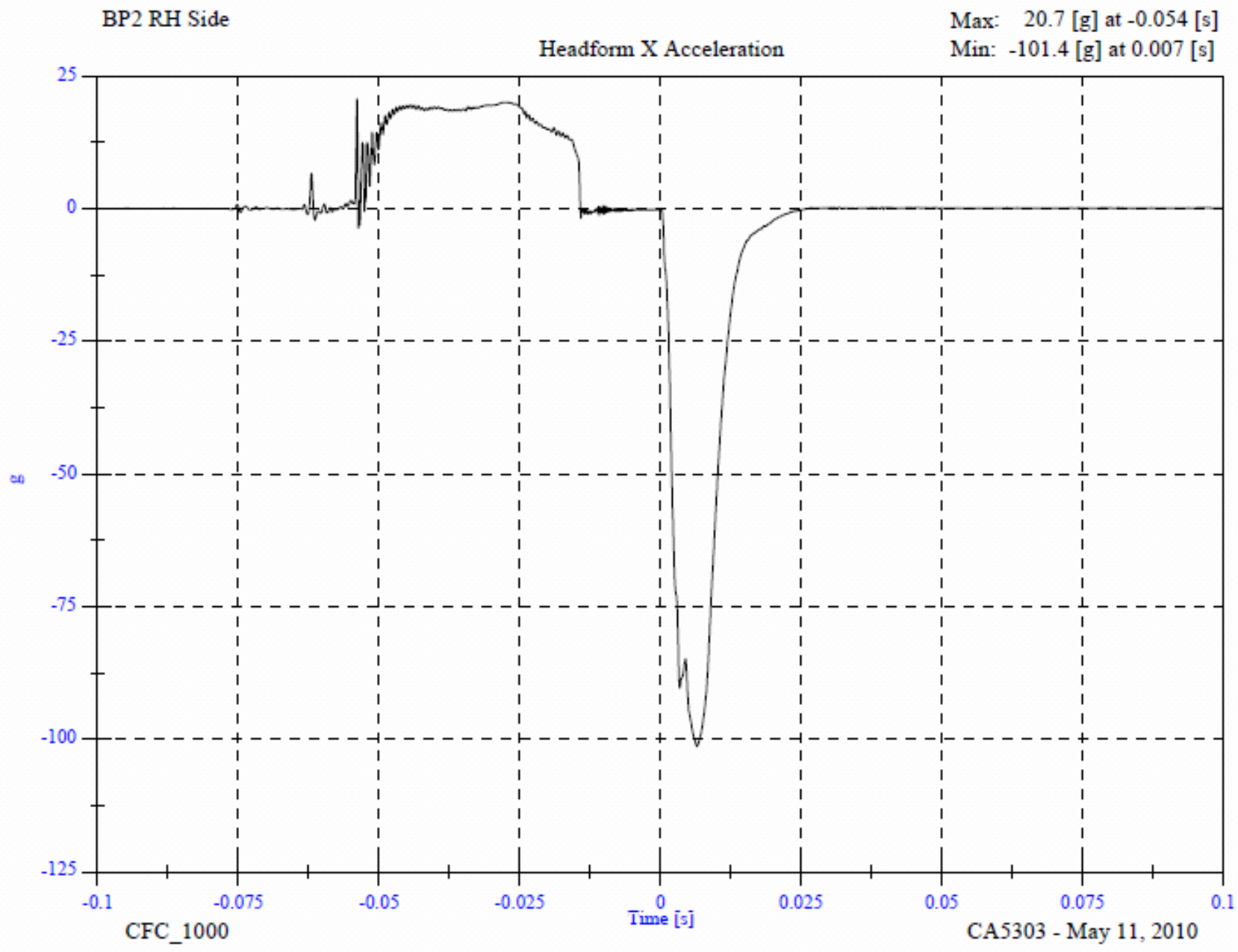
Max: 106.0 [g] at 0.007 [s]

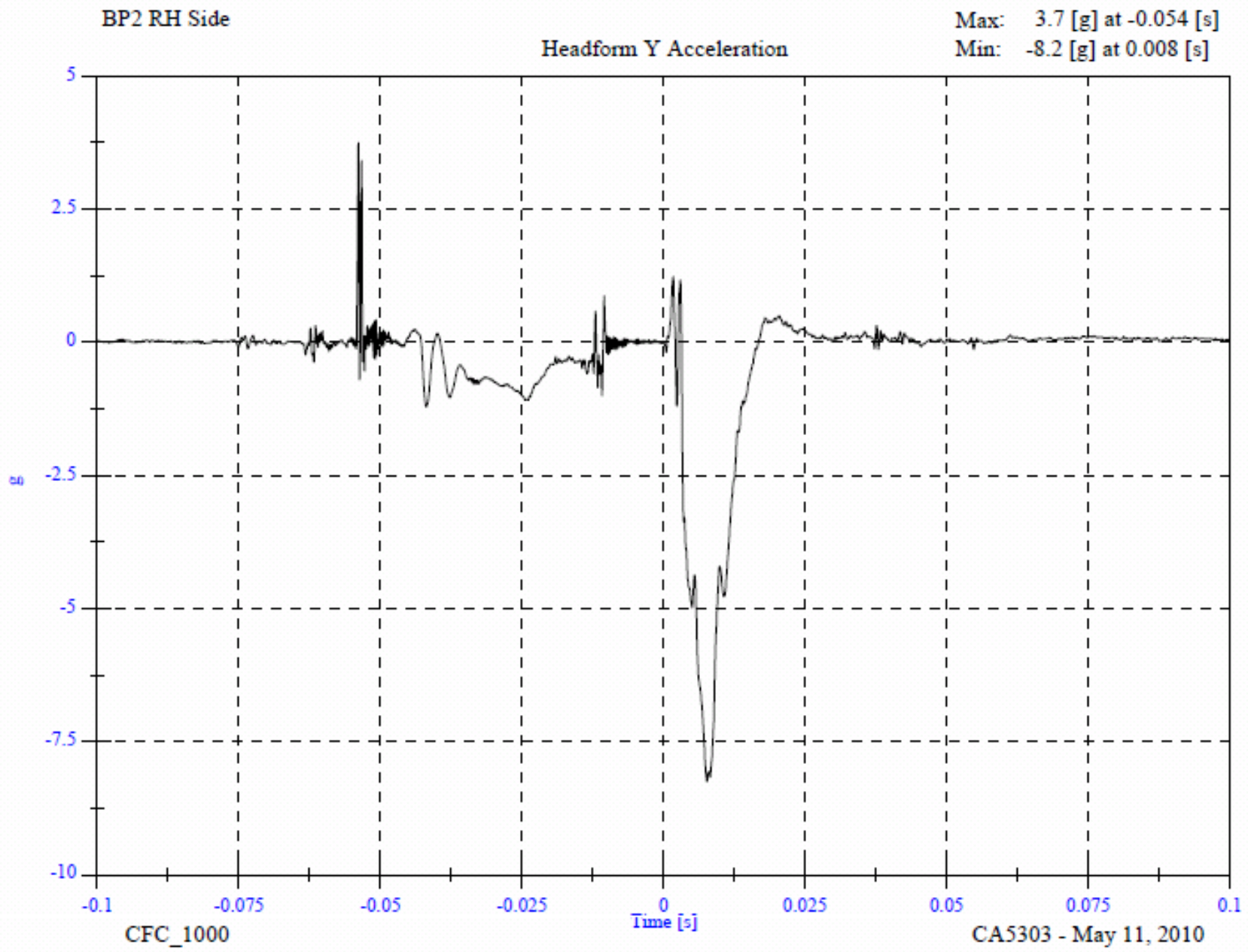
Headform Resultant

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







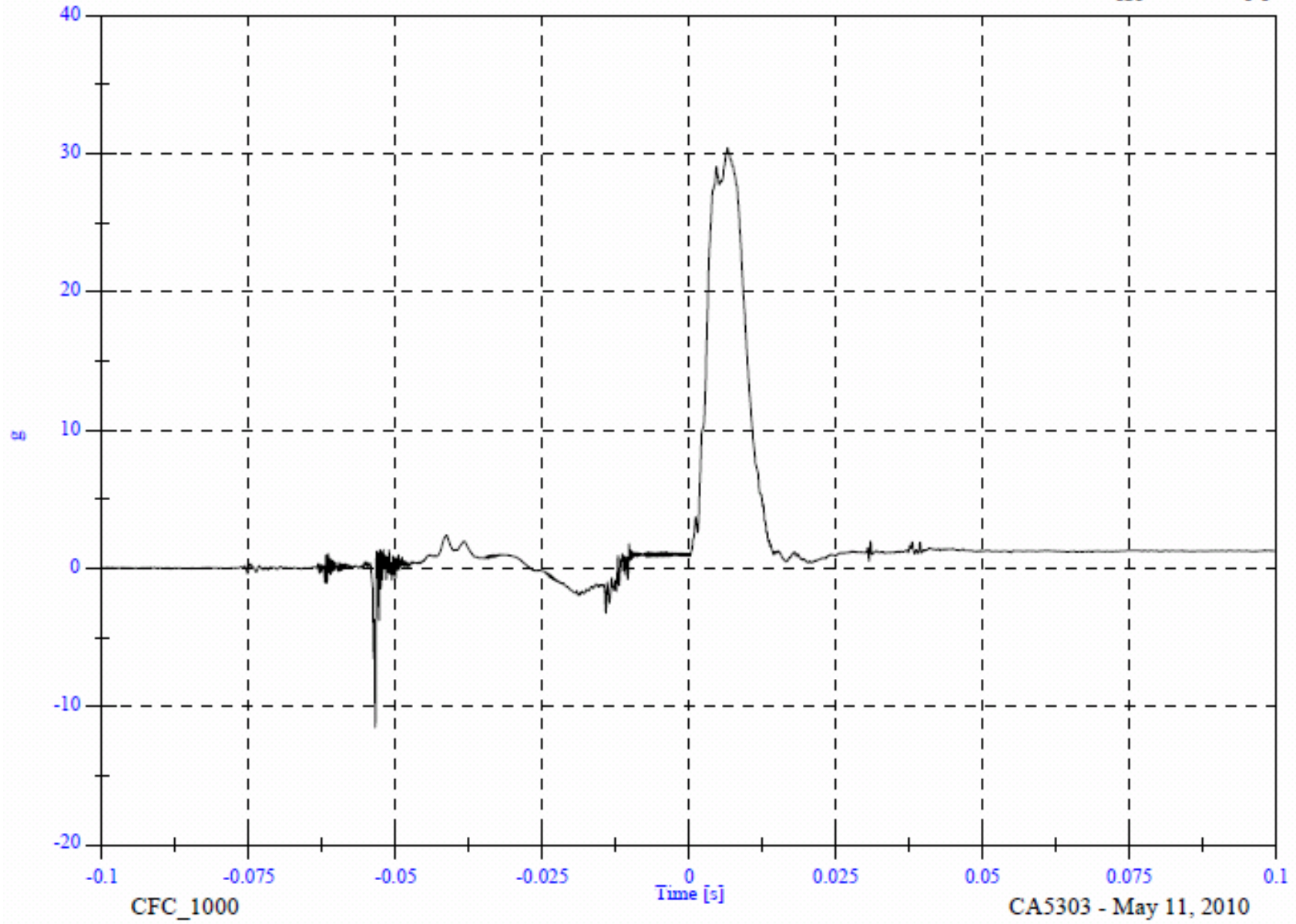


BP2 RH Side

Headform Z Acceleration

Max: 30.4 [g] at 0.007 [s]

Min: -11.5 [g] at -0.053 [s]

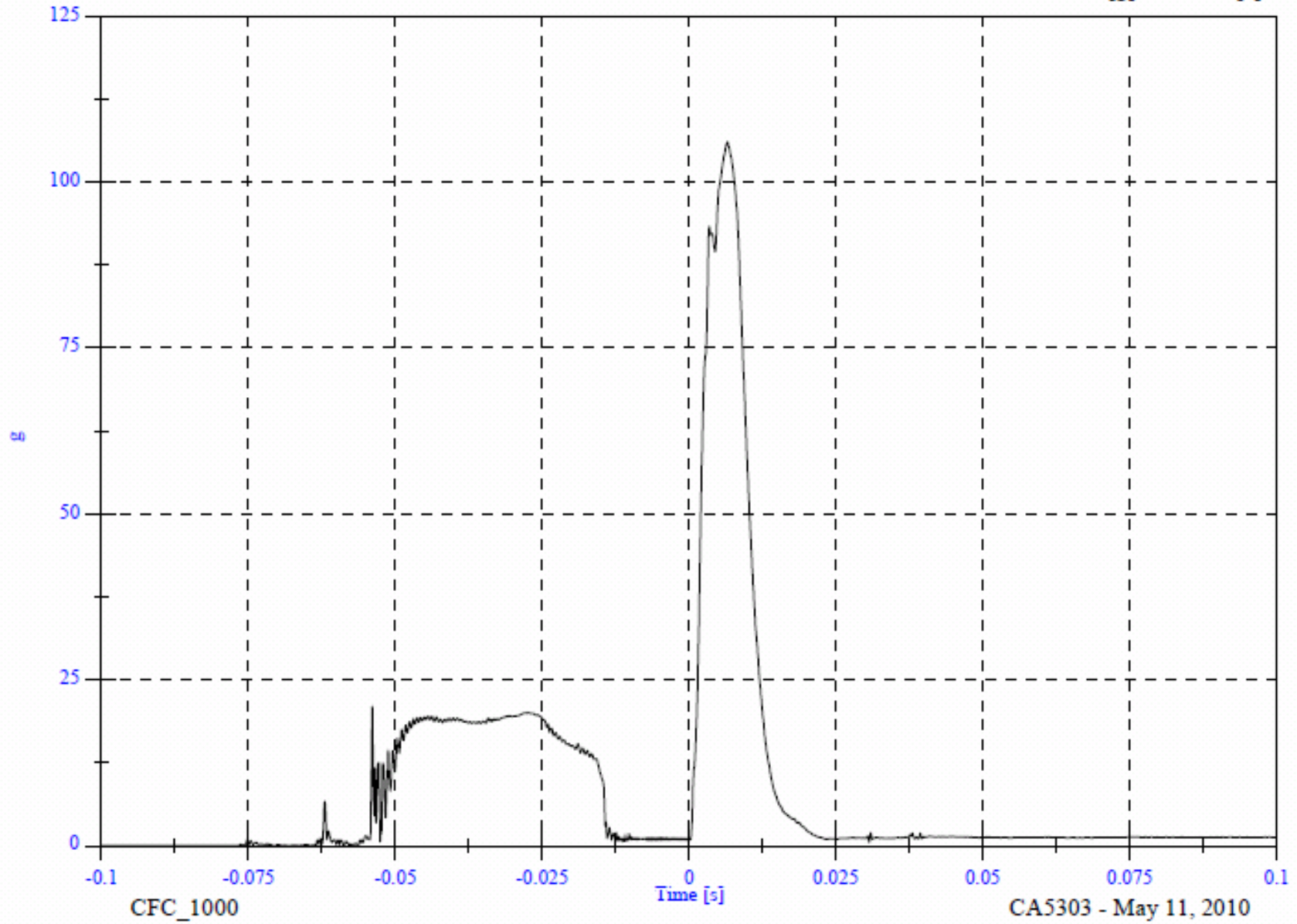


BP2 RH Side

Headform Resultant

Max: 106.0 [g] at 0.007 [s]

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

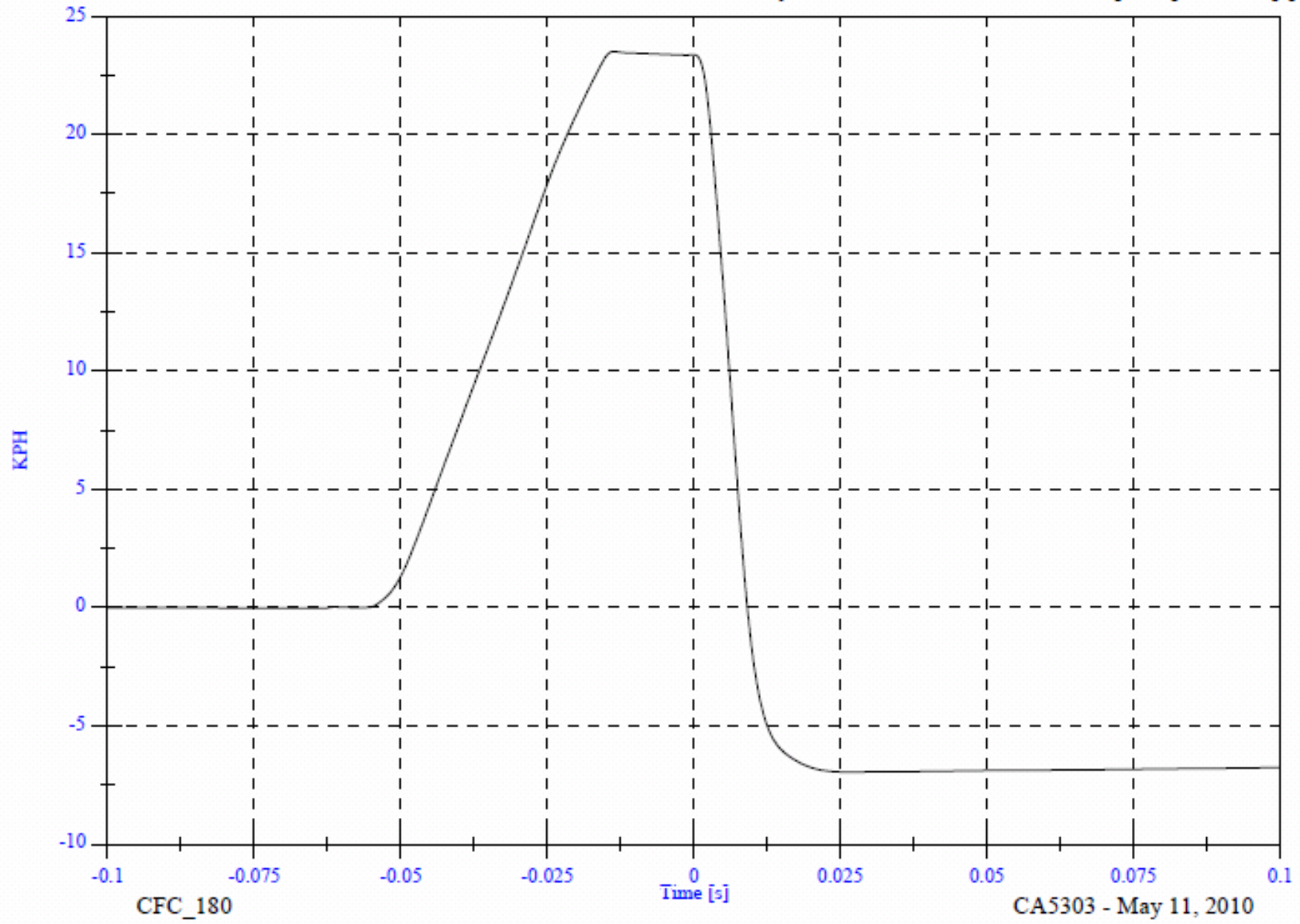


BP2 RH Side

Headform Velocity

Max: 23.5 [KPH] at -0.014 [s]

Min: -6.9 [KPH] at 0.026 [s]



CFC\_180

CA5303 - May 11, 2010



PRE-IMPACT BP2 RH

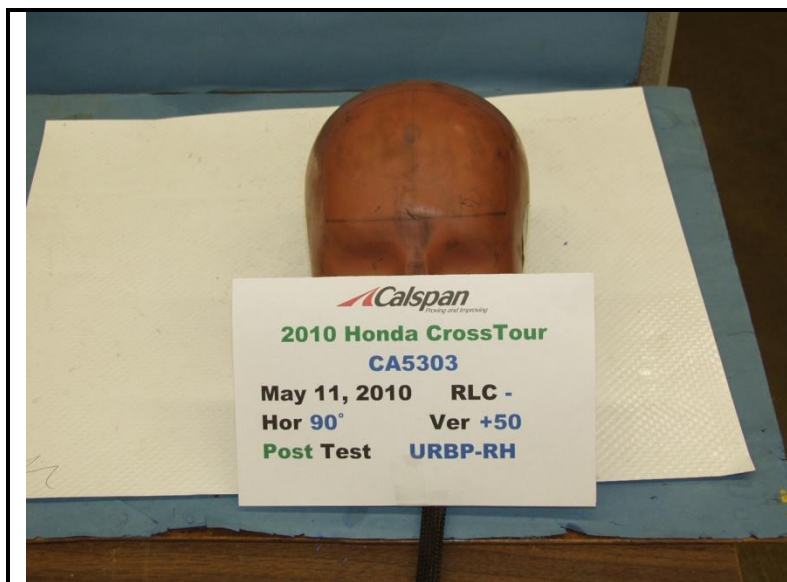


POST-IMPACT BP2 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	03
Test Date:	11 May 2010
Target Location:	URBP RH
Target Code:	URBP RH
Horizontal Impact Angle:	90
Vertical Impact Angle:	50
Ambient Temperature:	21
Relative Humidity:	27.5 %
Time of Impact:	12:12
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	2	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	54	mm up	



POST-IMPACT URBP RH HEADFORM

Free Motion HIC	319.2
HIC(d)	407.2
Impact Velocity (kph)	23.88
HIC T1 (msec)	3.8
HIC T2 (msec)	14.0



# URBP RH Side CA5303 - URBP RH

FMH Headform 0062

Location: URBP RH

Test Date: May 11, 2010

Work File: fmh

## -----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 407.2

Lab Humidity: 27.5 %

HIC (36ms): 319.2

Velocity at Impact: 23.88 KPH

t1: 3.8 msec

t2: 14.0 msec

Free Flight Distance: 228.07 mm

Duration: 10.2 msec

Maximum: 103.0 g

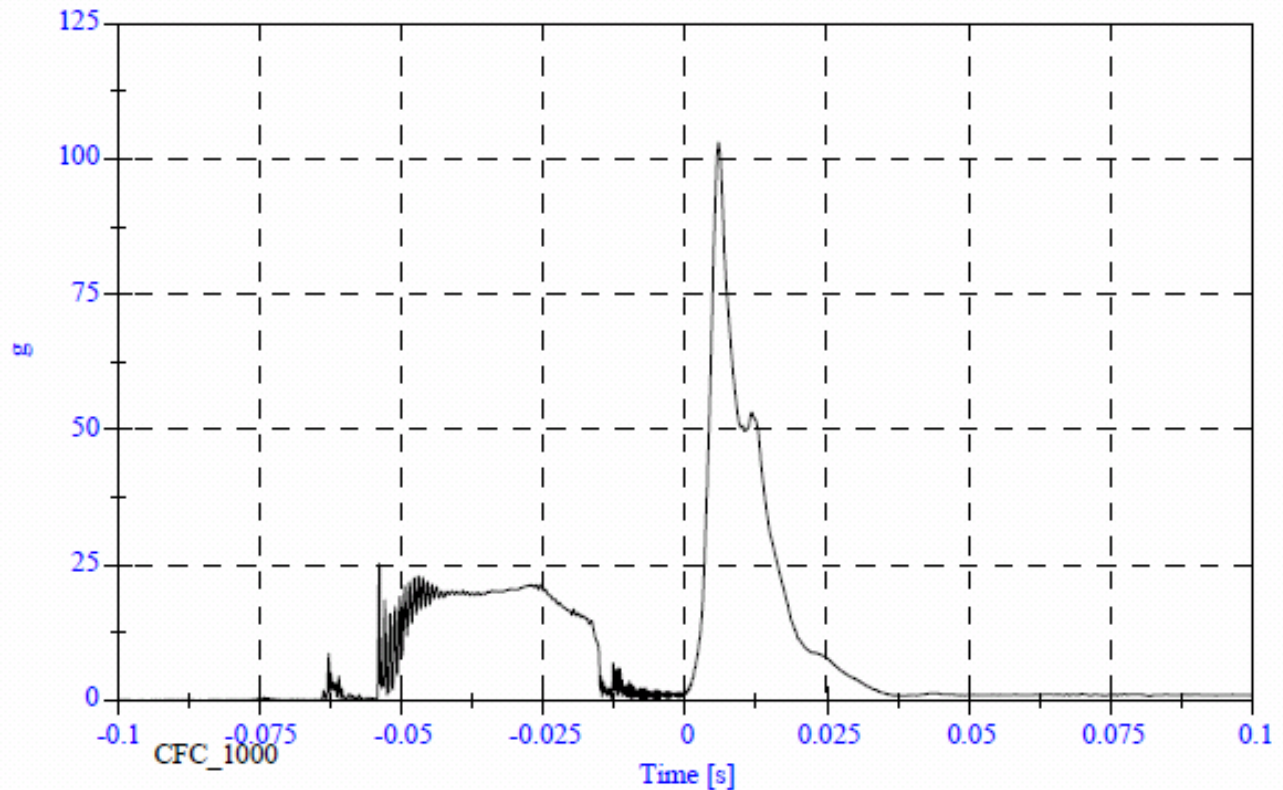
Average Acceleration: 8.6 g

URBP RH Side

Headform Resultant

Max: 103.0 [g] at 0.006 [s]

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

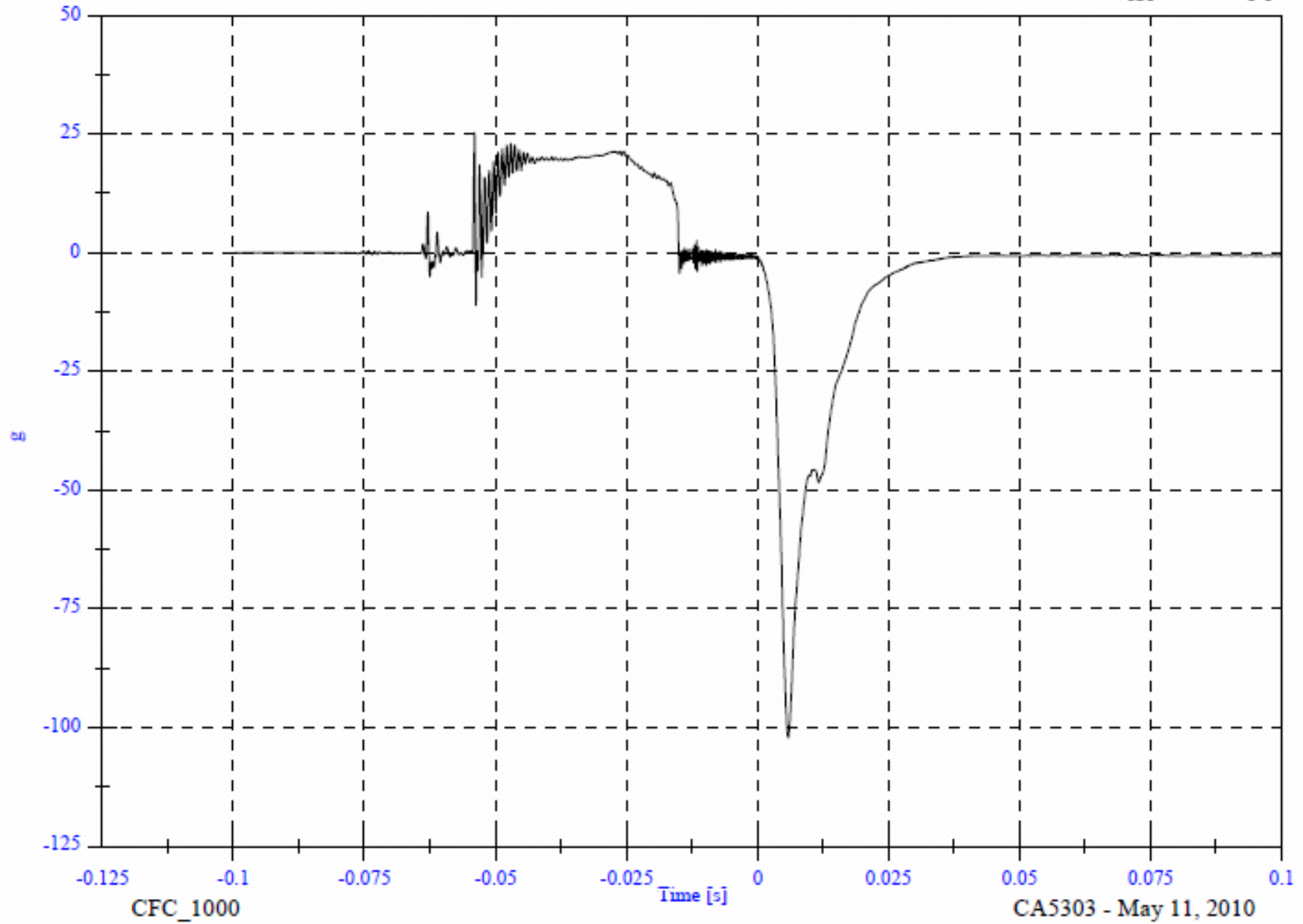


URBP RH Side

Headform X Acceleration

Max: 25.3 [g] at -0.054 [s]

Min: -102.1 [g] at 0.006 [s]

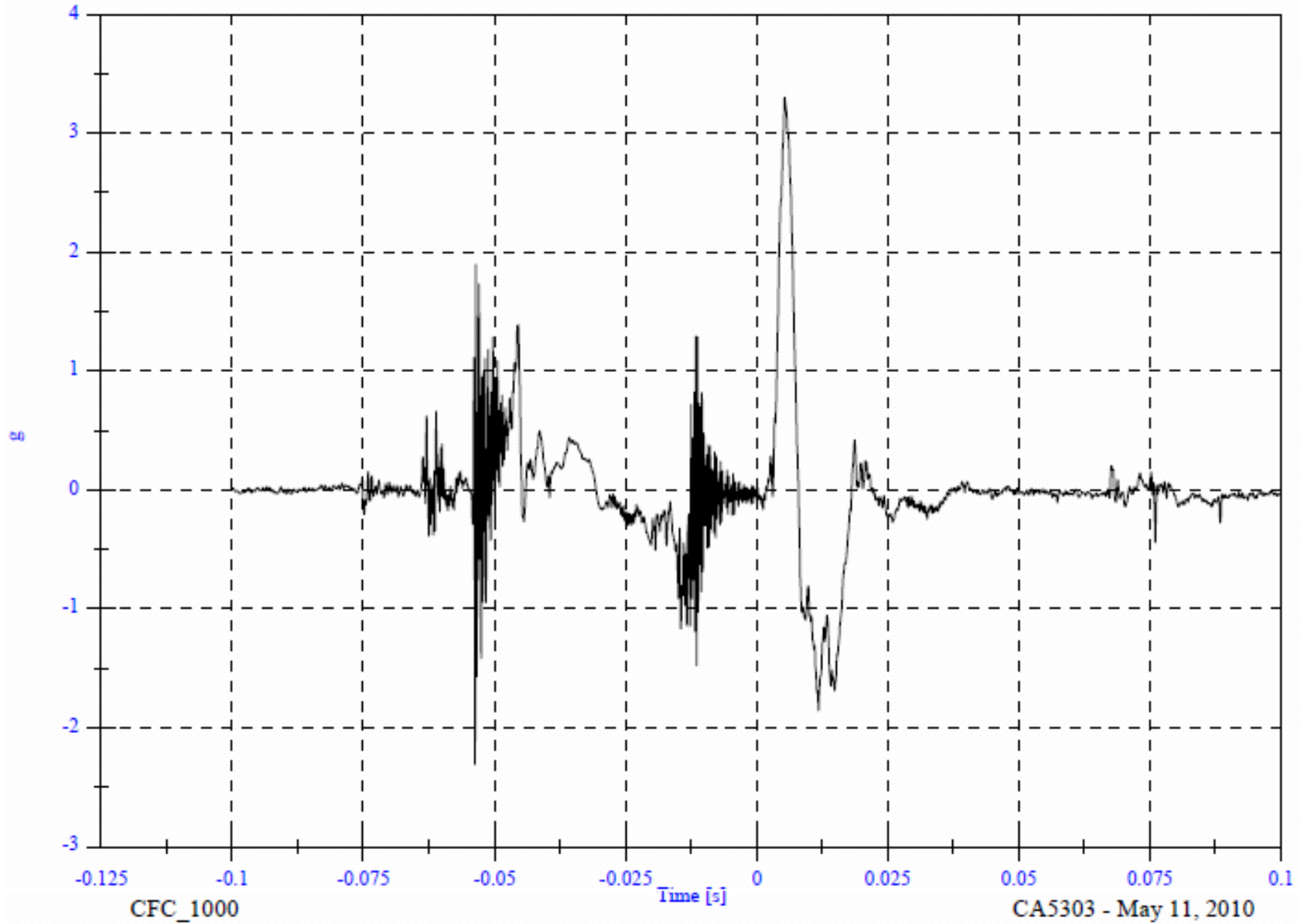


URBP RH Side

Headform Y Acceleration

Max: 3.3 [g] at 0.005 [s]

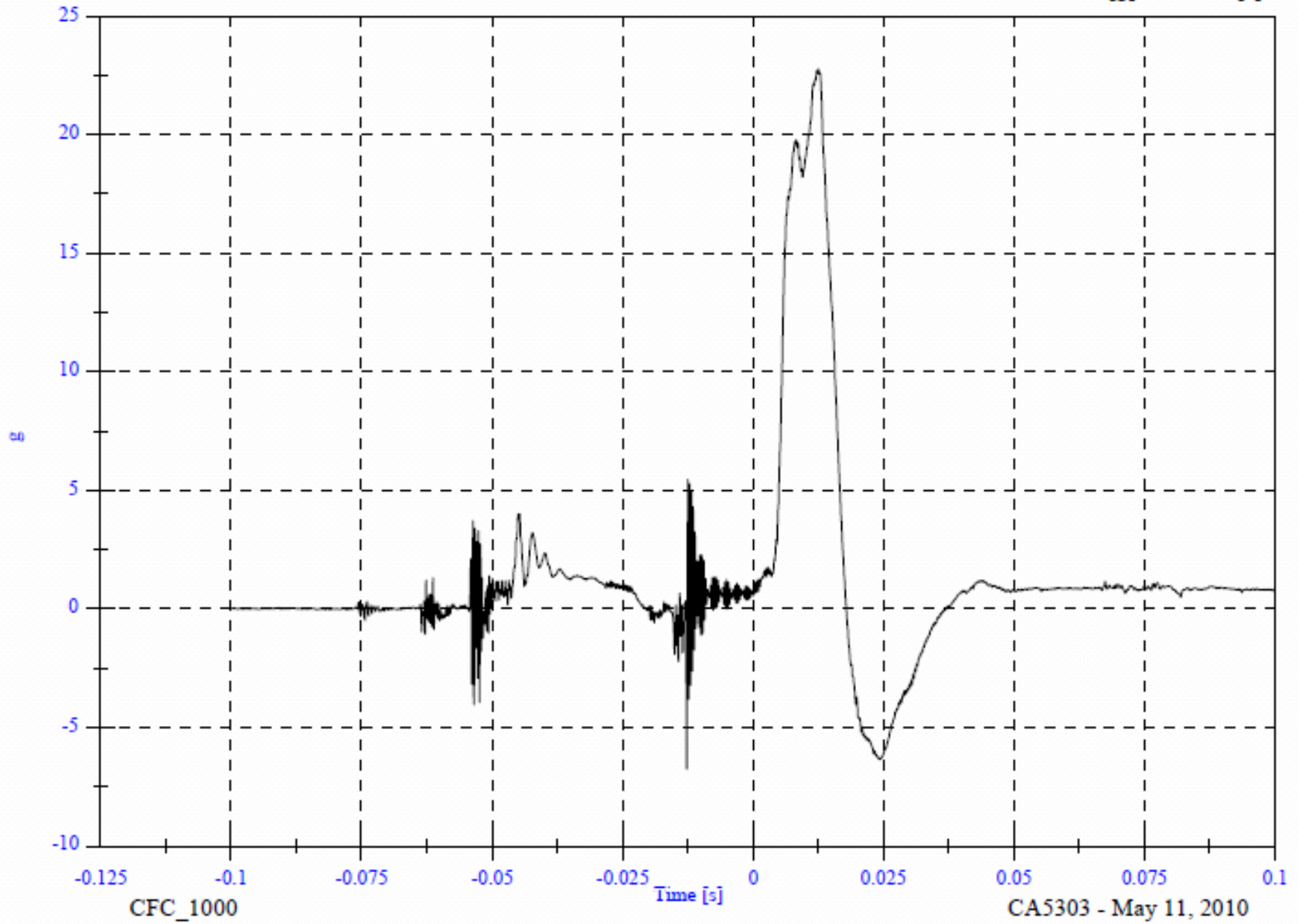
Min: -2.3 [g] at -0.054 [s]



URBP RH Side

Headform Z Acceleration

Max: 22.8 [g] at 0.013 [s]  
Min: -6.7 [g] at -0.013 [s]

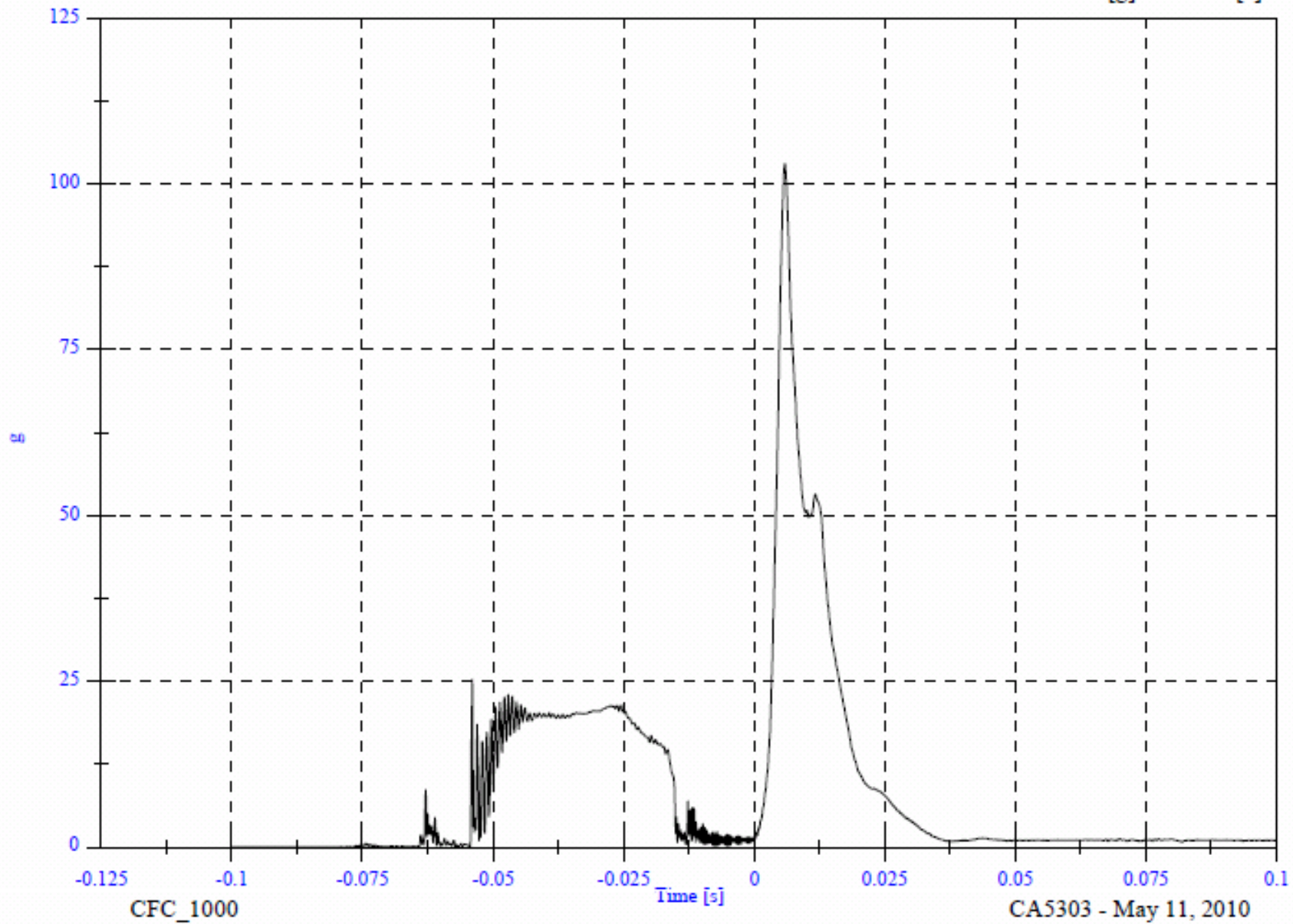


URBP RH Side

Headform Resultant

Max: 103.0 [g] at 0.006 [s]

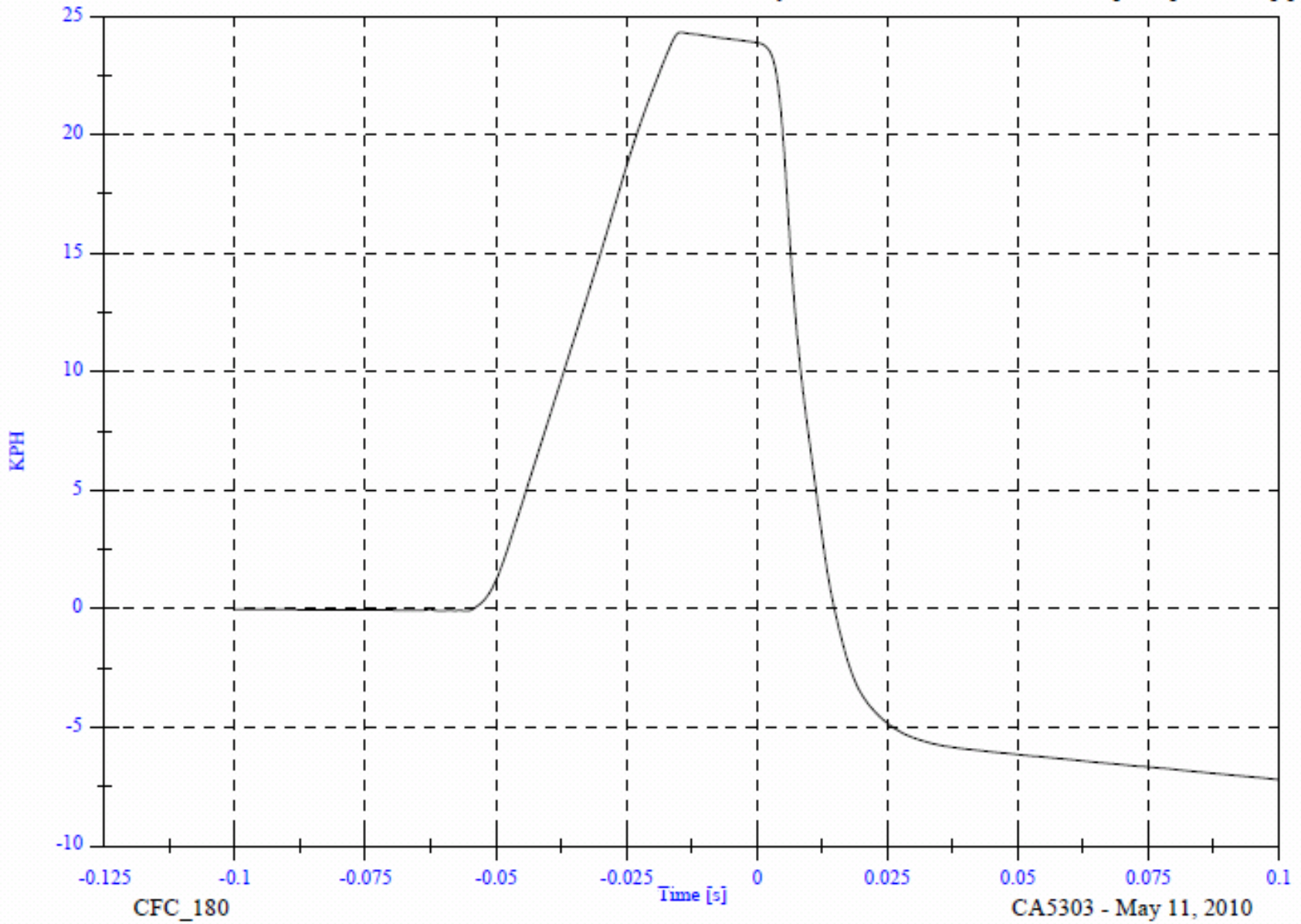
Min: 0.0 [g] at -0.097 [s]

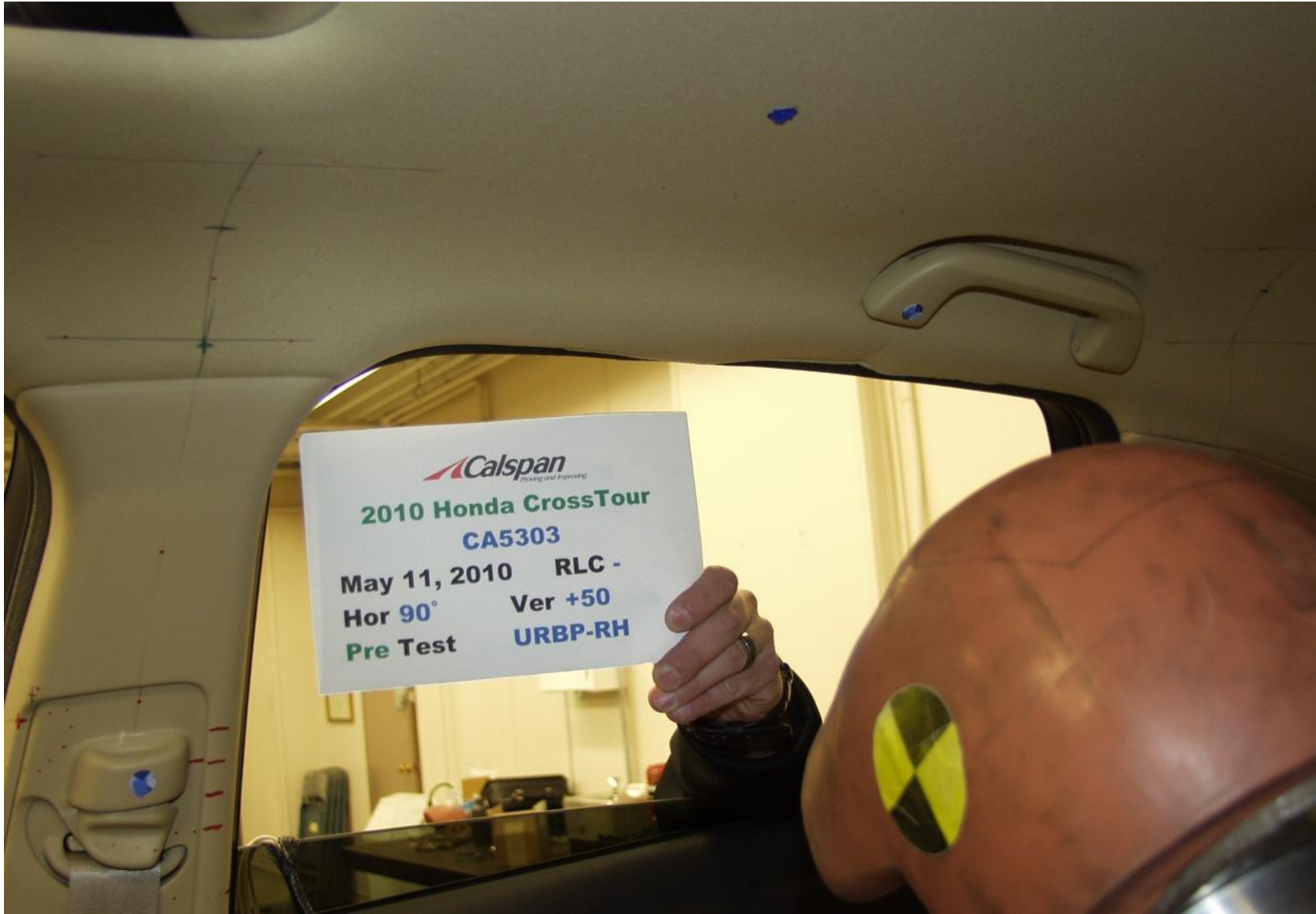


URBP RH Side

Headform Velocity

Max: 24.3 [KPH] at -0.015 [s]  
Min: -7.2 [KPH] at 0.100 [s]





PRE-IMPACT URBP RH



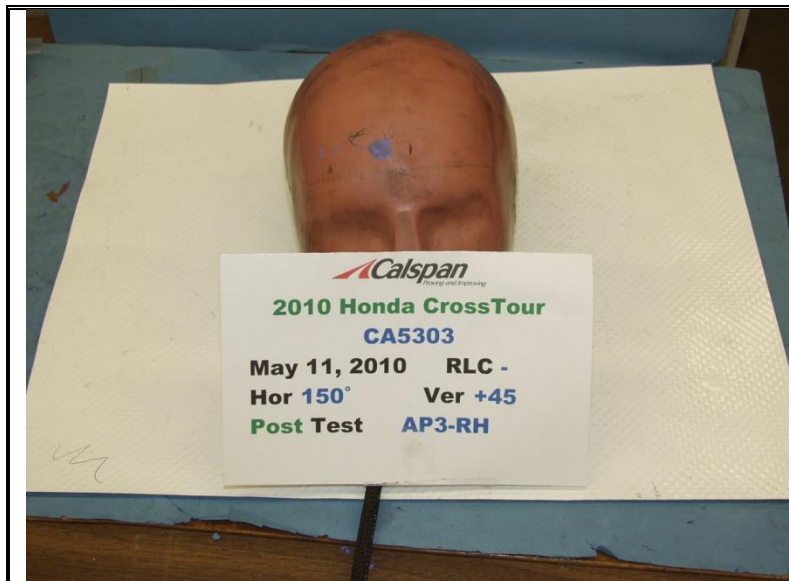
POST-IMPACT URBP RH



VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	04
Test Date:	11 May 2010
Target Location:	AP3 RH
Target Code:	AP3 RH
Horizontal Impact Angle:	150
Vertical Impact Angle:	45
Ambient Temperature:	21
Relative Humidity:	26.0%
Time of Impact:	2:13
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	10	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	14				mm up



POST-IMPACT AP3 RH HEADFORM

Free Motion HIC	393.8
HIC(d)	463.5
Impact Velocity (kph)	18.69
HIC T1 (msec)	4.3
HIC T2 (msec)	10.3

# AP3 RH Side CA5303 - AP3 RH

FMH Headform 0805

Location: AP3 RH

Test Date: May 11, 2010

Work File: fmh

## -----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 463.5

Lab Humidity: 26 %

HIC (36ms): 393.8

Velocity at Impact: 18.69 KPH

t1: 4.3 msec

t2: 10.3 msec

Free Flight Distance: 220.35 mm

Duration: 6.1 msec

Maximum: 107.4 g

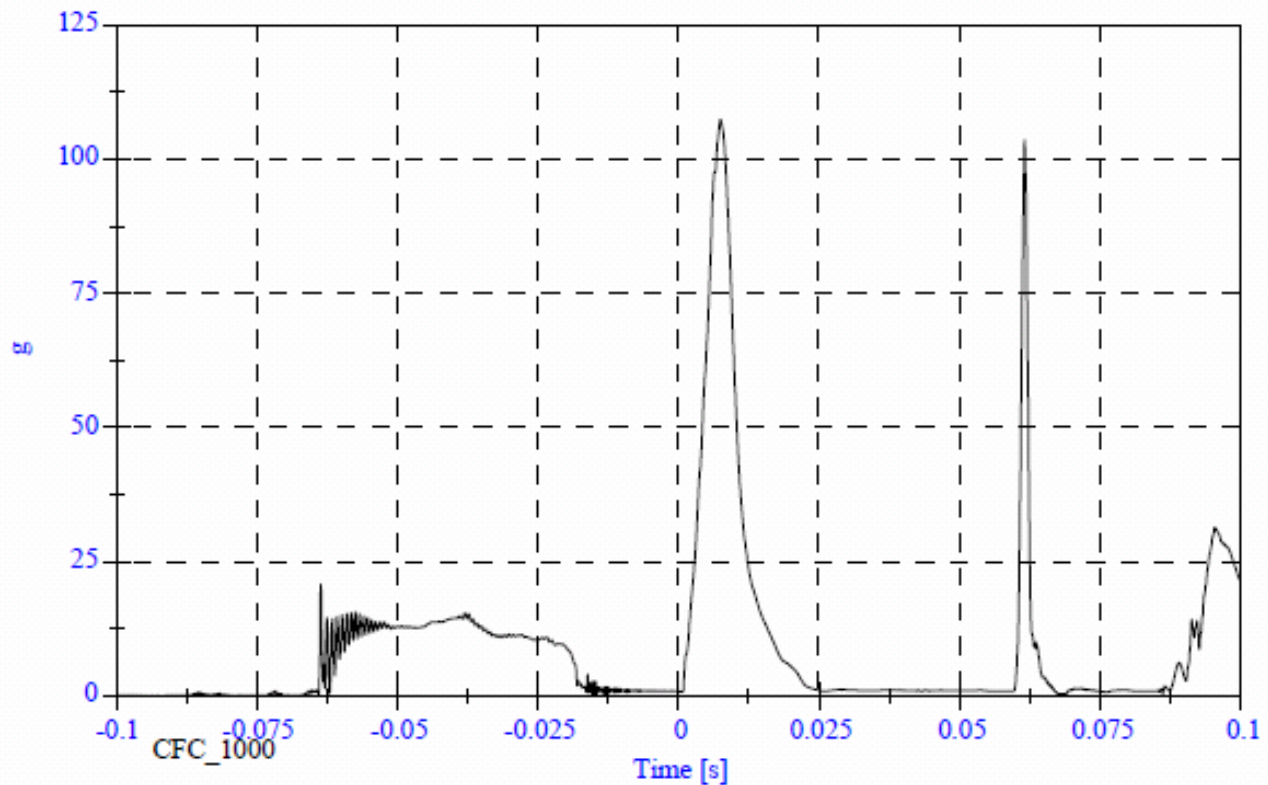
Average Acceleration: 8.9 g

AP3 RH Side

Max: 107.4 [g] at 0.007 [s]

Headform Resultant

Min: 0.0 [g] at -0.073 [s]

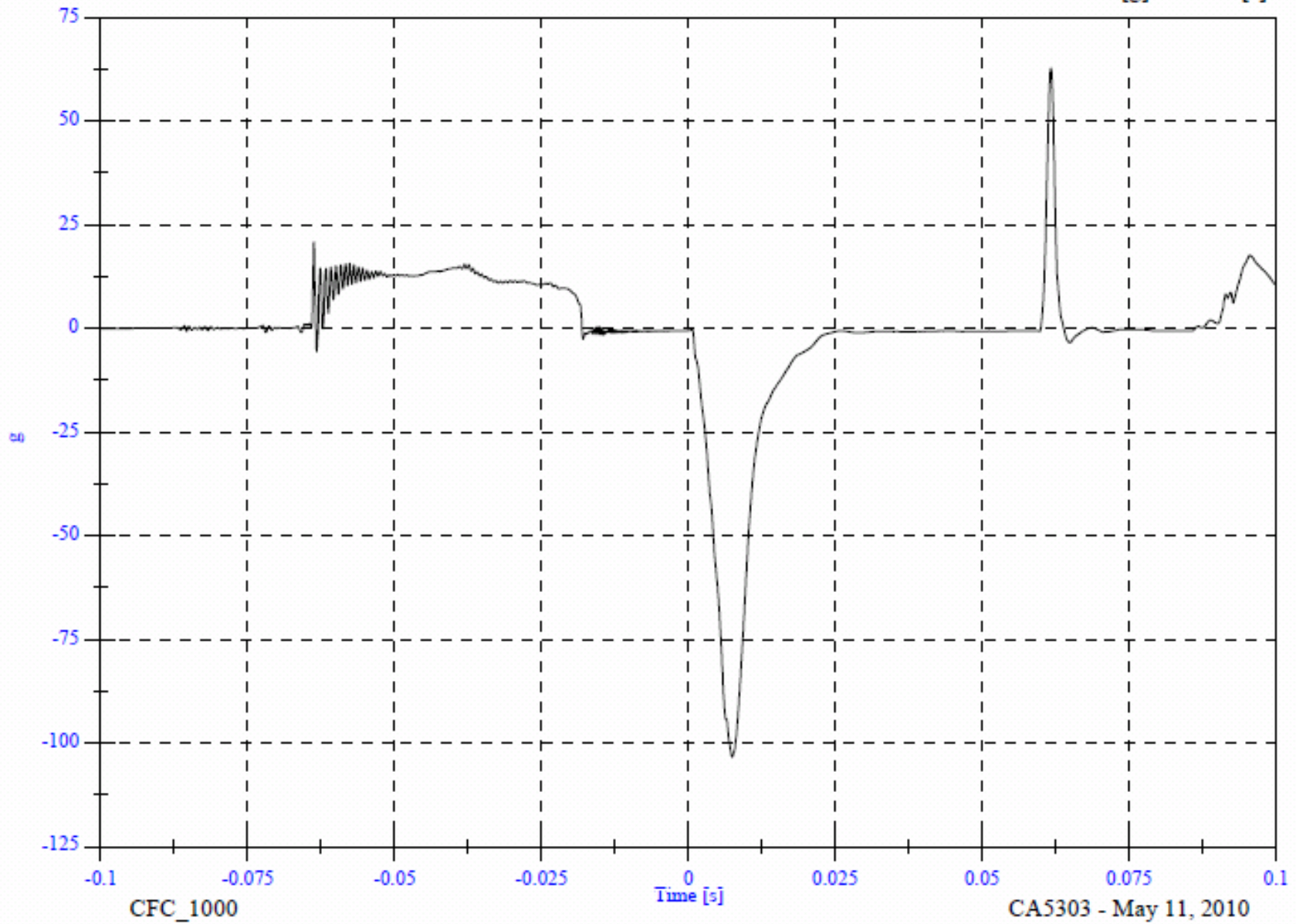


AP3 RH Side

Headform X Acceleration

Max: 62.7 [g] at 0.062 [s]

Min: -103.4 [g] at 0.007 [s]

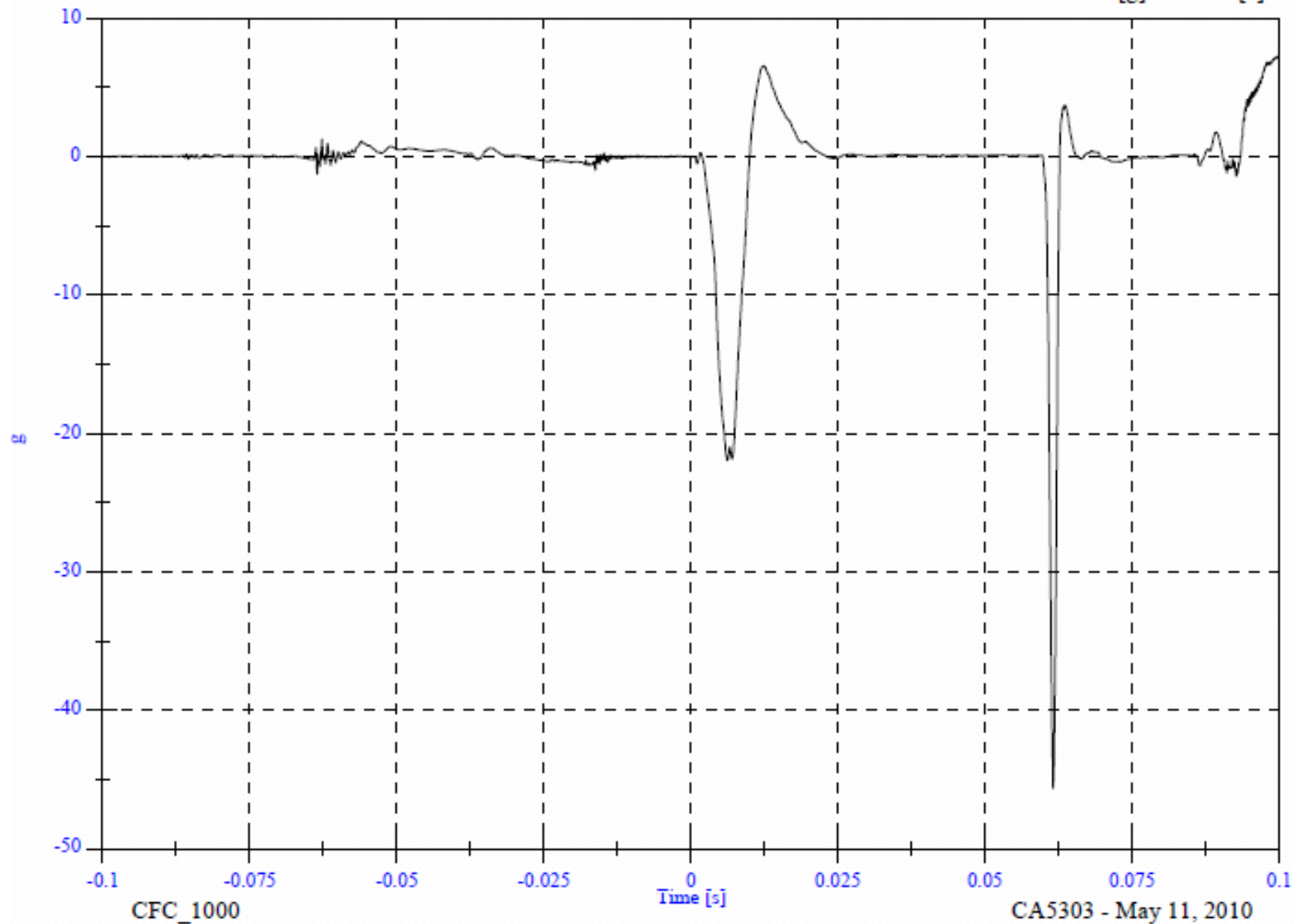


AP3 RH Side

Headform Y Acceleration

Max: 7.2 [g] at 0.100 [s]

Min: -45.7 [g] at 0.062 [s]

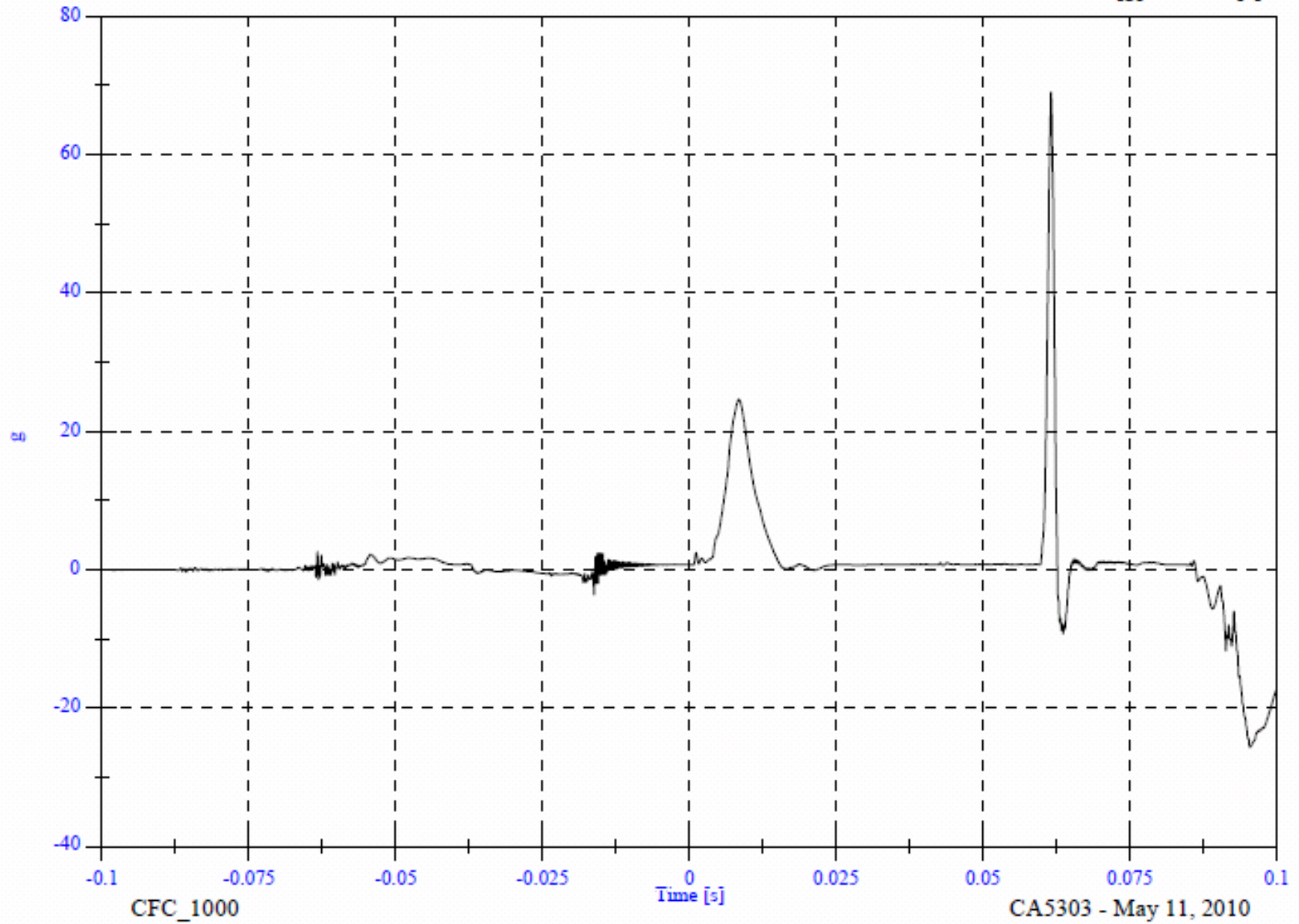


AP3 RH Side

Headform Z Acceleration

Max: 69.0 [g] at 0.062 [s]

Min: -25.7 [g] at 0.096 [s]

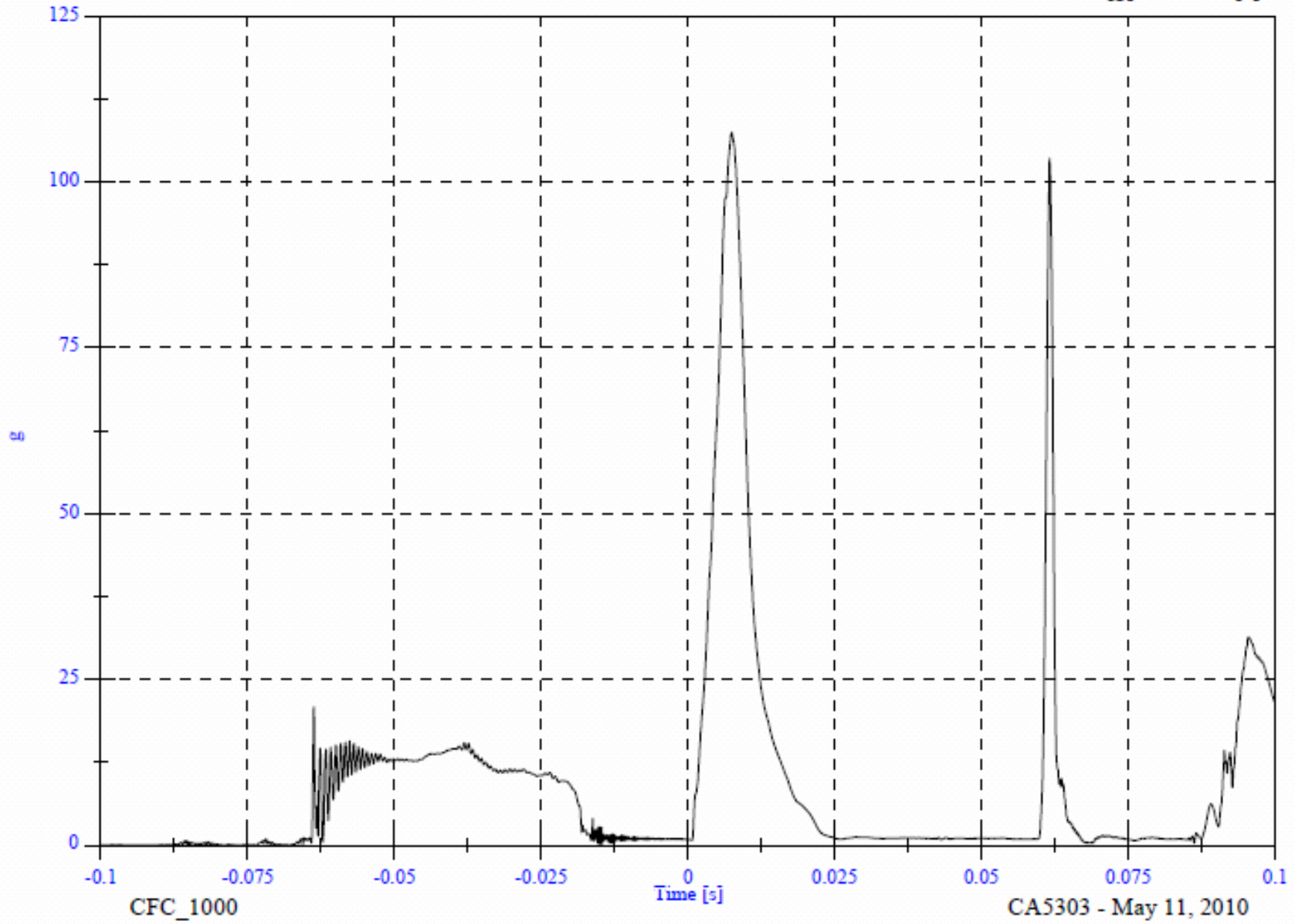


AP3 RH Side

Headform Resultant

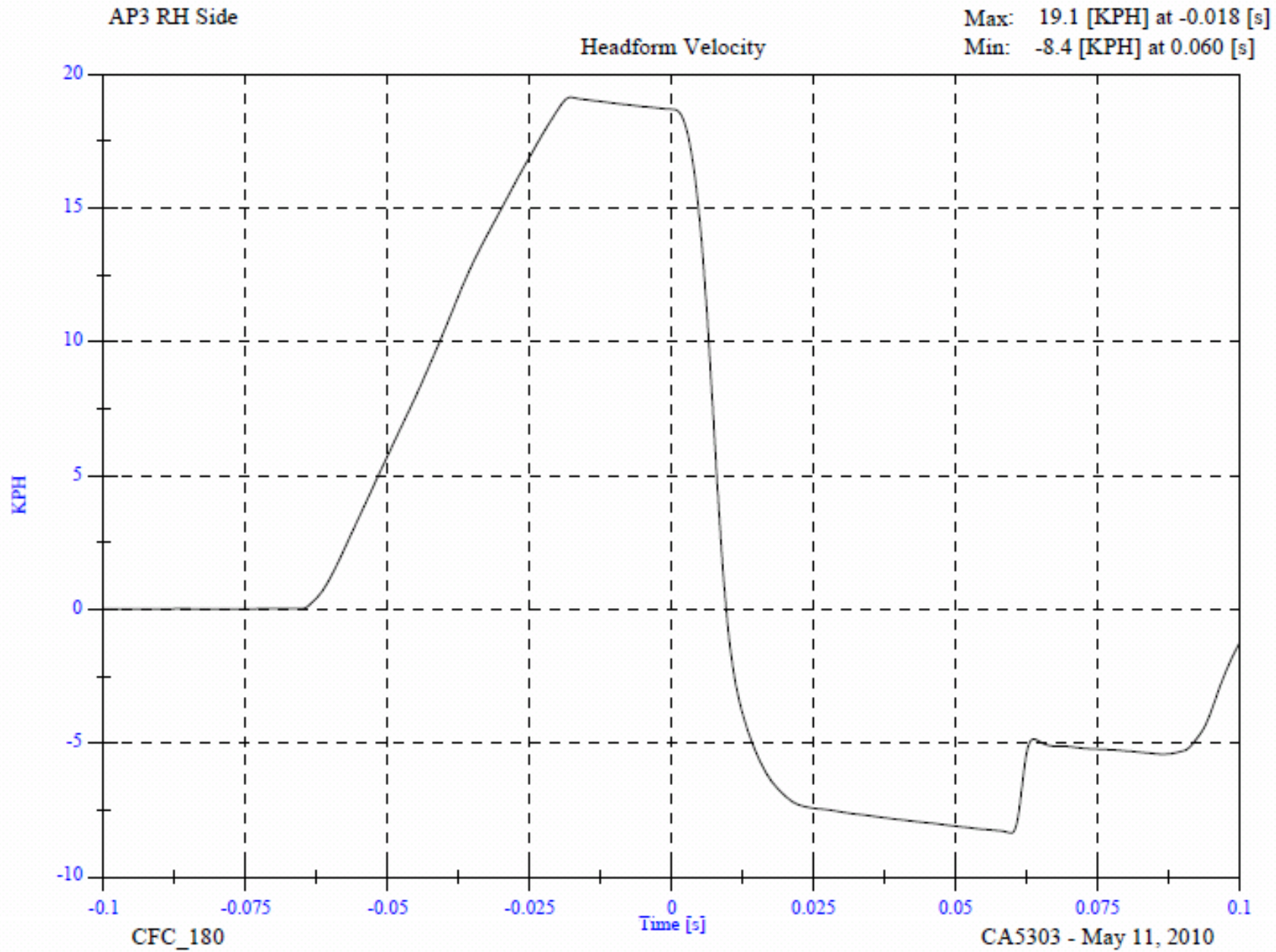
Max: 107.4 [g] at 0.007 [s]

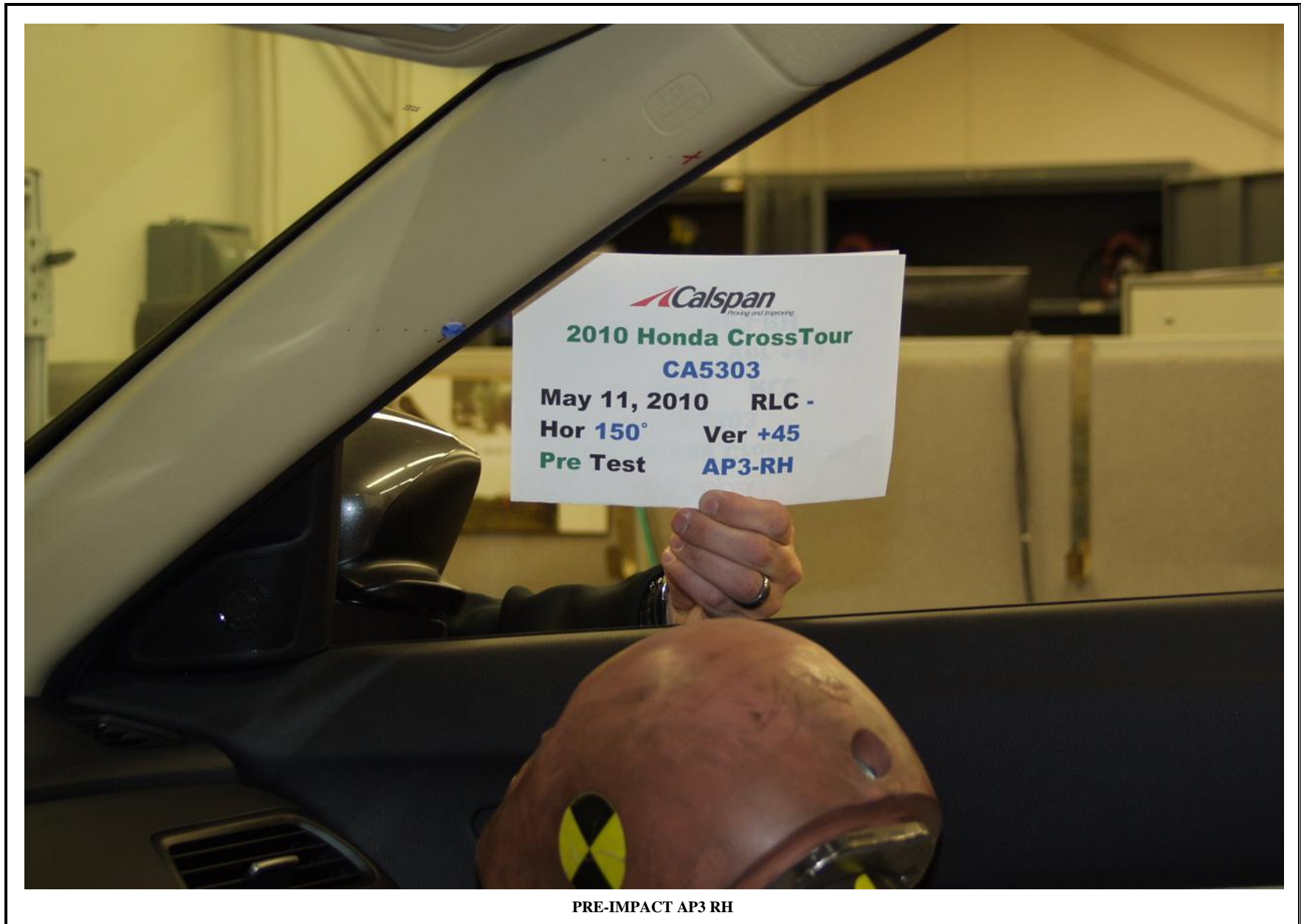
Min: 0.0 [g] at -0.073 [s]



CFC\_1000

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PRE-IMPACT AP3 RH



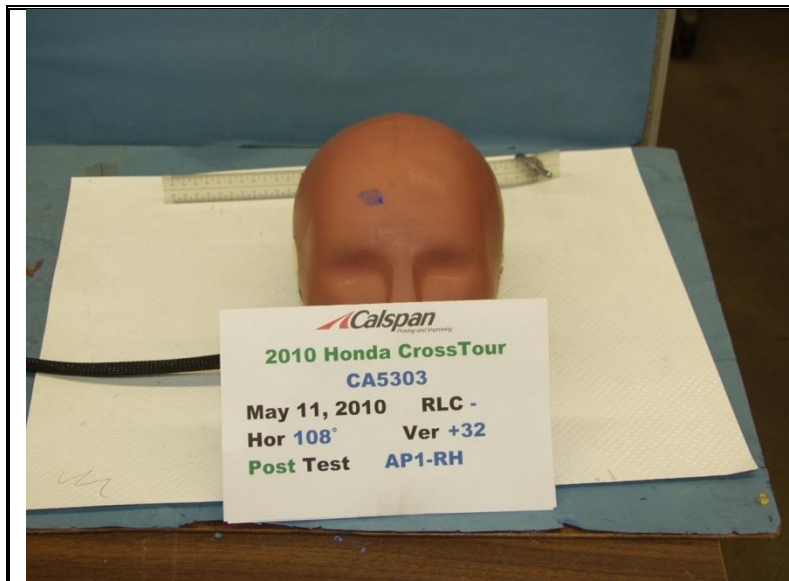


POST-IMPACT AP3 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	05
Test Date:	11 May 2010
Target Location:	AP1 RH
Target Code:	AP1 RH
Horizontal Impact Angle:	108
Vertical Impact Angle:	32
Ambient Temperature:	21
Relative Humidity:	26.7%
Time of Impact:	2.48
Headform Number:	1142

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	16	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	17				mm up



POST-IMPACT AP1 RH HEADFORM

Free Motion HIC	374.8
HIC(d)	449.2
Impact Velocity (kph)	18.48
HIC T1 (msec)	4.6
HIC T2 (msec)	10.8

## AP1 RH Side CA5303 - AP1 RH

FMH Headform 1142

Location: AP1 RH

Test Date: May 11, 2010

Work File: fmh

### -----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 449.2

Lab Humidity: 26.7 %

HIC (36ms): 374.8

Velocity at Impact: 18.48 KPH

t1: 4.6 msec

t2: 10.8 msec

Free Flight Distance: 224.37 mm

Duration: 6.2 msec

Average Acceleration: 7.2 g

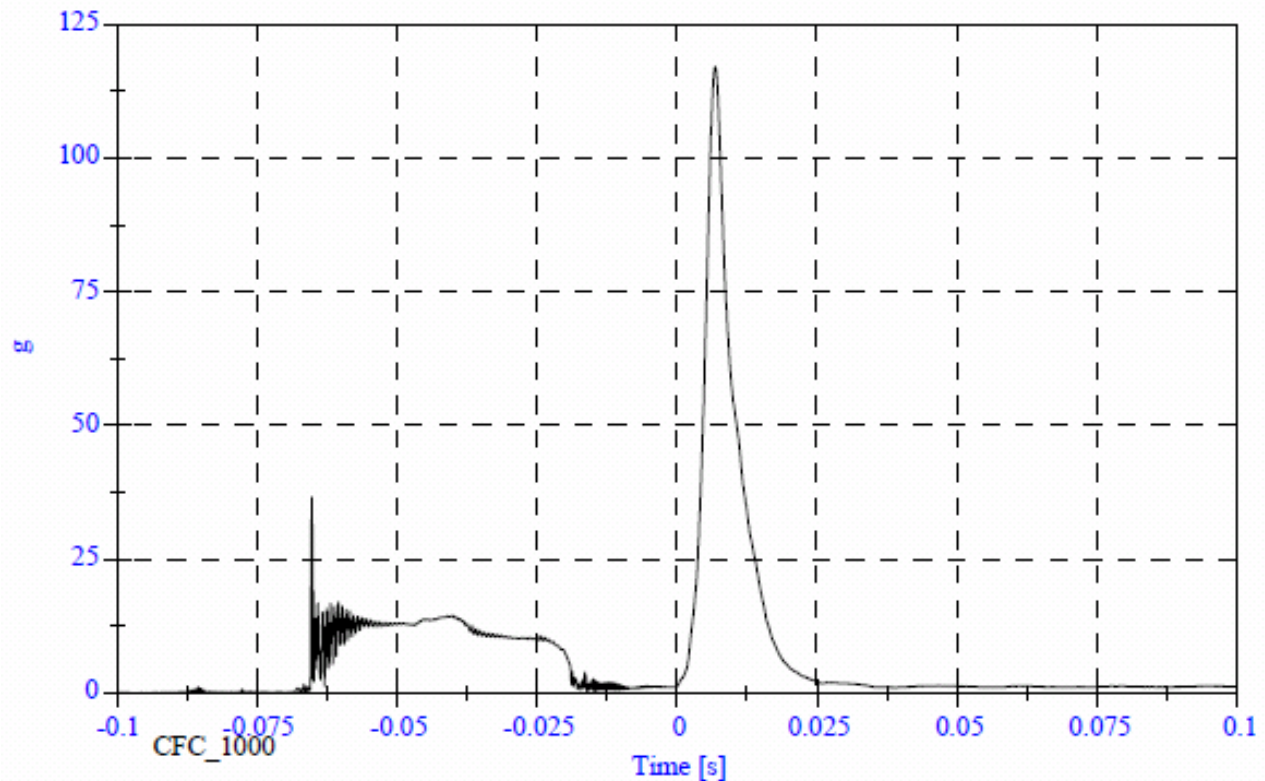
Maximum: 117.0 g

AP1 RH Side

Max: 117.0 [g] at 0.007 [s]

Headform Resultant

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

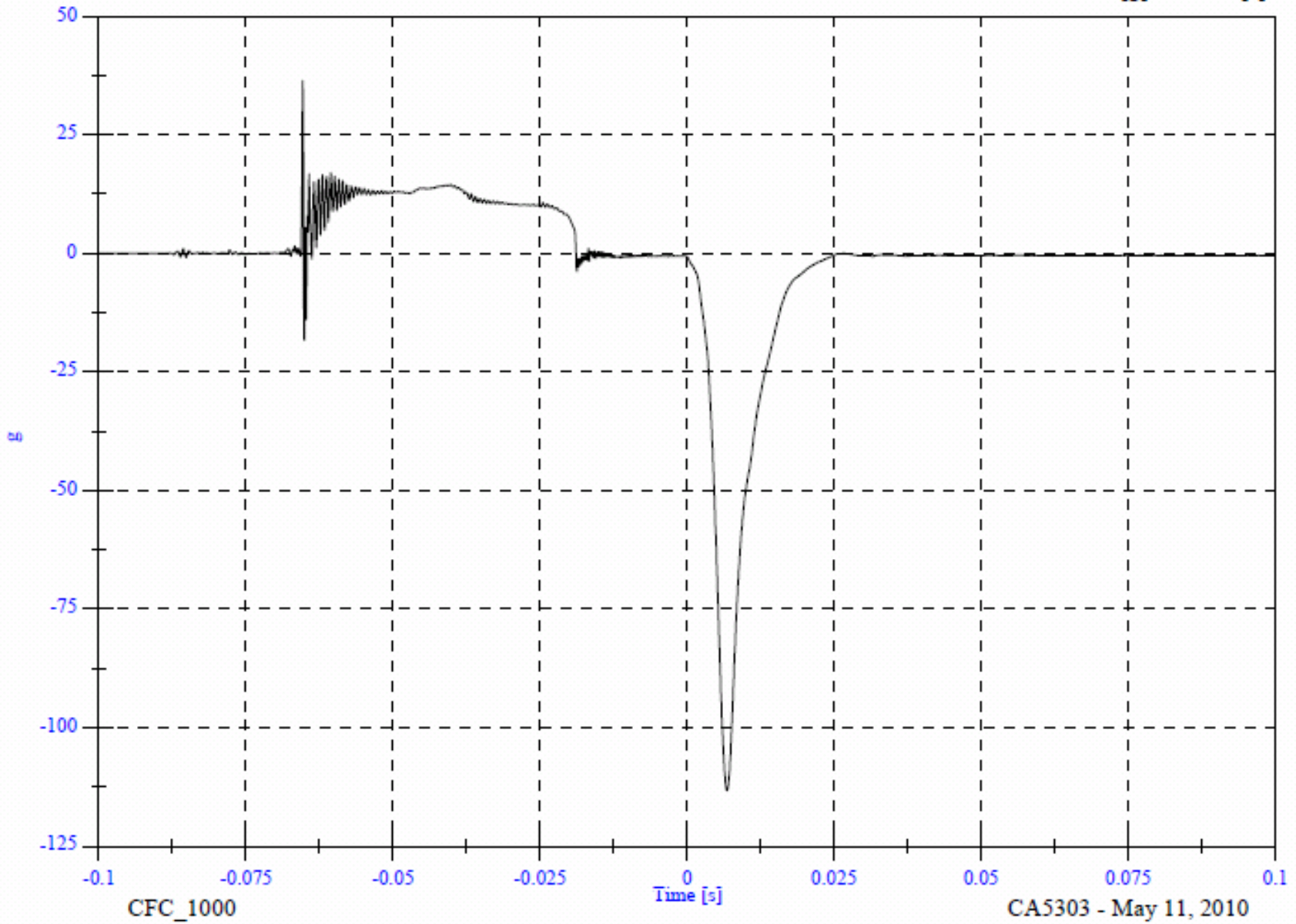


AP1 RH Side

Headform X Acceleration

Max: 36.4 [g] at -0.065 [s]

Min: -113.3 [g] at 0.007 [s]

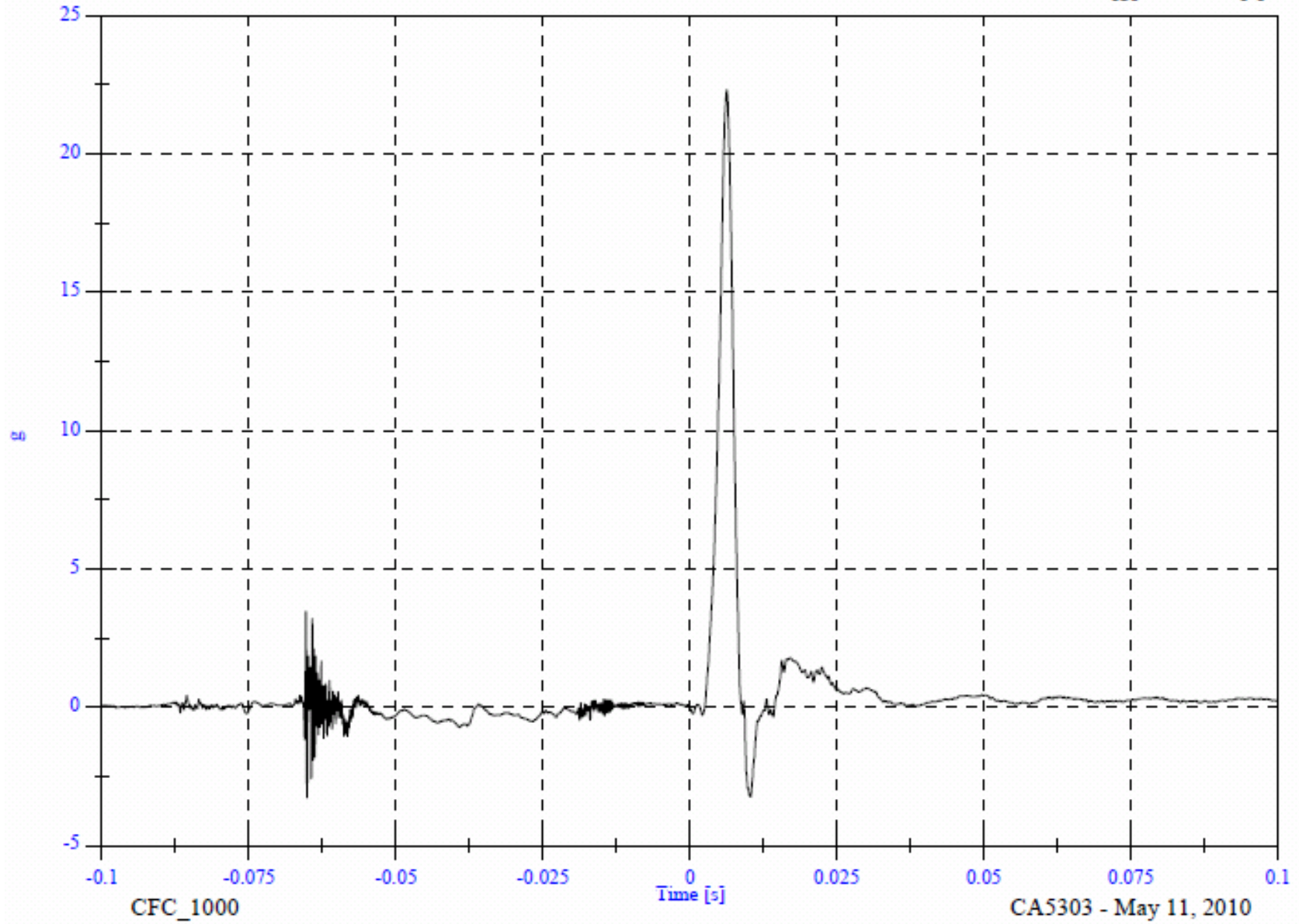


AP1 RH Side

Headform Y Acceleration

Max: 22.3 [g] at 0.006 [s]

Min: -3.3 [g] at -0.065 [s]

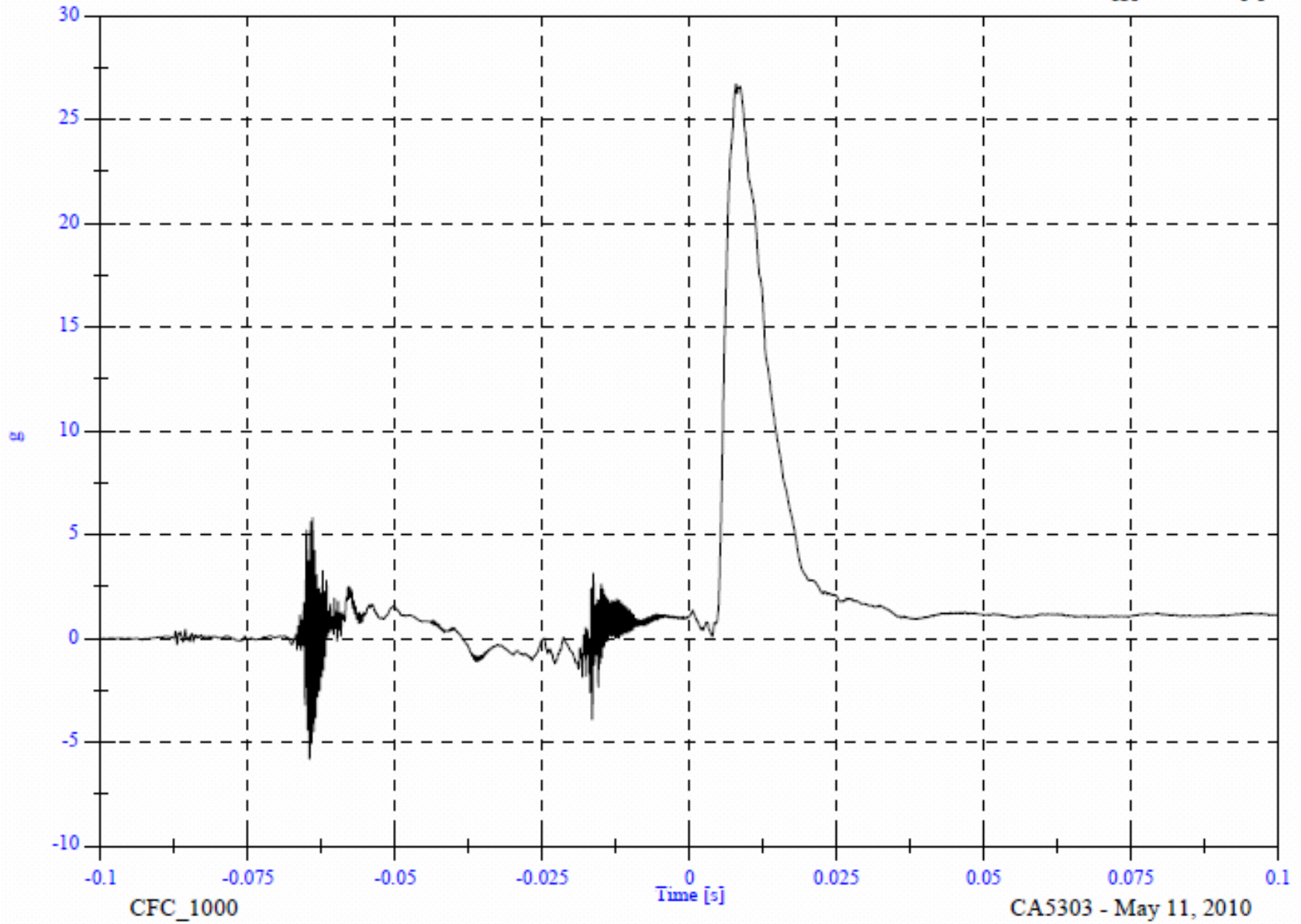


AP1 RH Side

Headform Z Acceleration

Max: 26.7 [g] at 0.008 [s]

Min: -5.8 [g] at -0.064 [s]

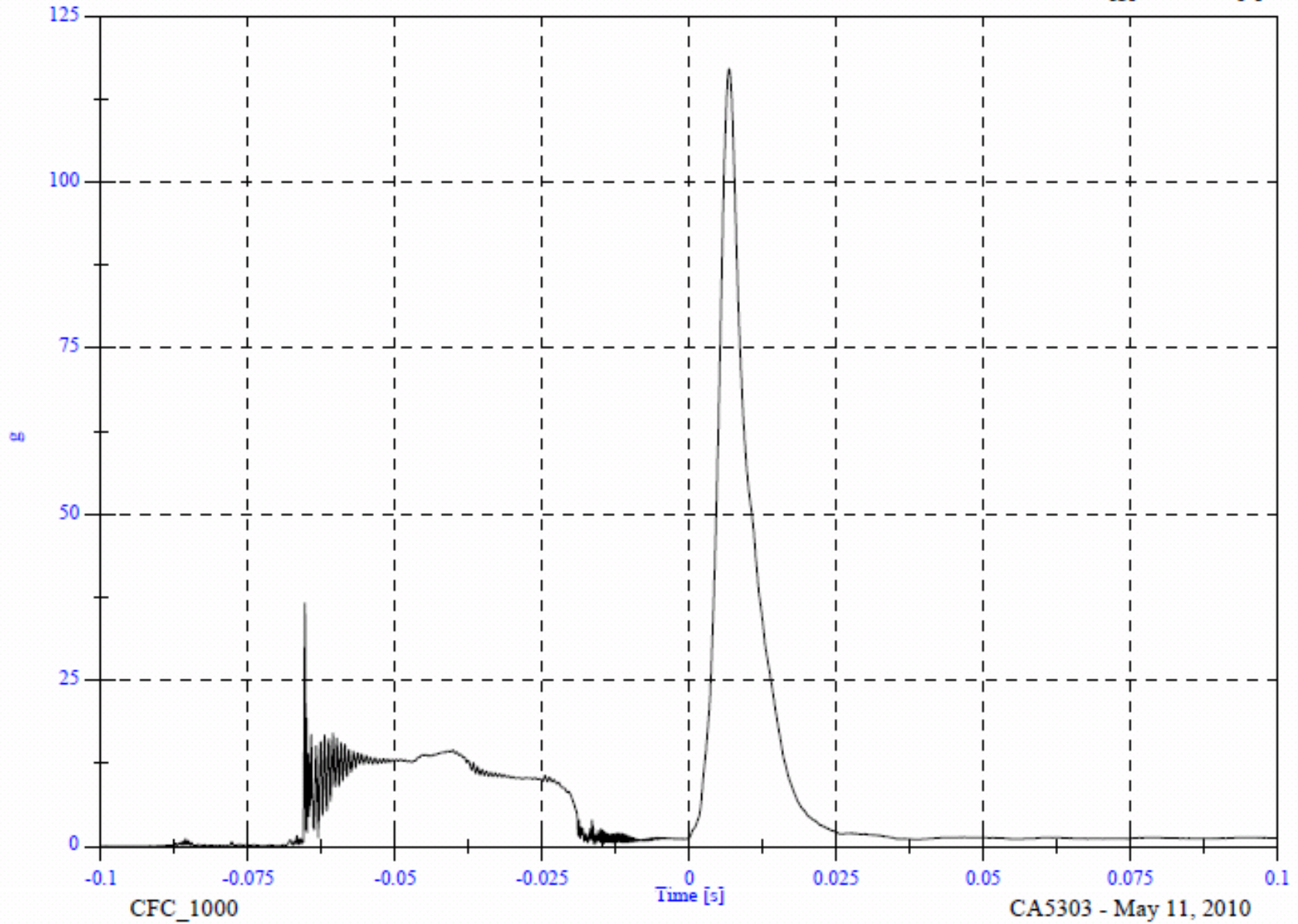


AP1 RH Side

Headform Resultant

Max: 117.0 [g] at 0.007 [s]

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



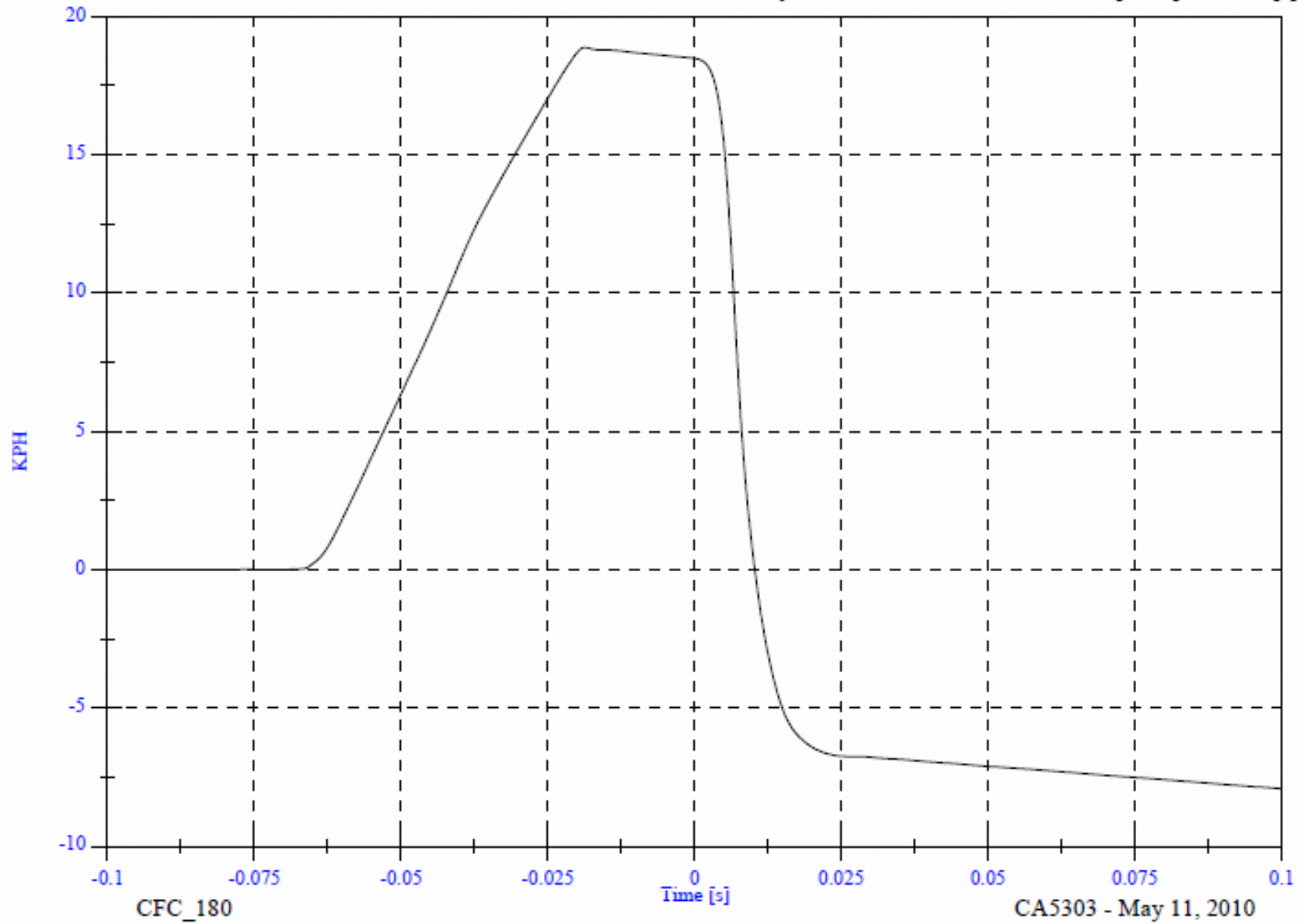
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API RH Side

Headform Velocity

Max: 18.9 [KPH] at -0.019 [s]  
Min: -7.9 [KPH] at 0.100 [s]







PRE-IMPACT AP1 RH



POST-IMPACT AP1 RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	06
Test Date:	11 May 2010
Target Location:	UROP RH
Target Code:	UROP RH
Horizontal Impact Angle:	12
Vertical Impact Angle:	50
Ambient Temperature:	21
Relative Humidity:	27.0%
Time of Impact:	3:23
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-2	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	66		mm up



POST-IMPACT UROP RH HEADFORM

Free Motion HIC	129.7
HIC(d)	264.3
Impact Velocity (kph)	23.57
HIC T1 (msec)	3.4
HIC T2 (msec)	29.6

# UROP RH Side CA5303 - UROP RH

FMH Headform 0355

Location: UROP RH

Test Date: May 11, 2010

Work File: fmh

## -----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 264.3

Lab Humidity: 27 %

HIC (36ms): 129.7

Velocity at Impact: 23.57 KPH

t1: 3.4 msec

t2: 29.6 msec

Free Flight Distance: 236.78 mm

Duration: 26.3 msec

Average Acceleration: 8.4 g

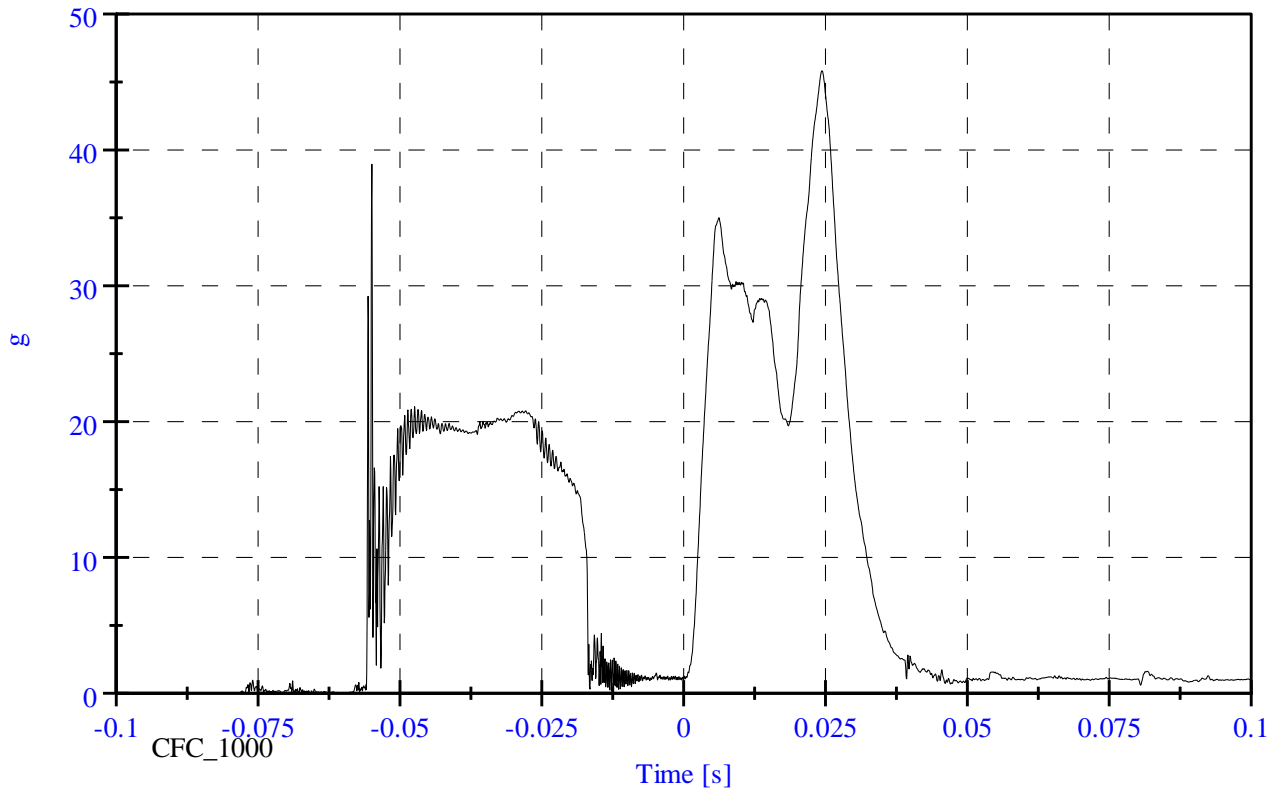
Maximum: 45.8 g

UROP RH Side

Headform Resultant

Max: 45.8 [g] at 0.024 [s]

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

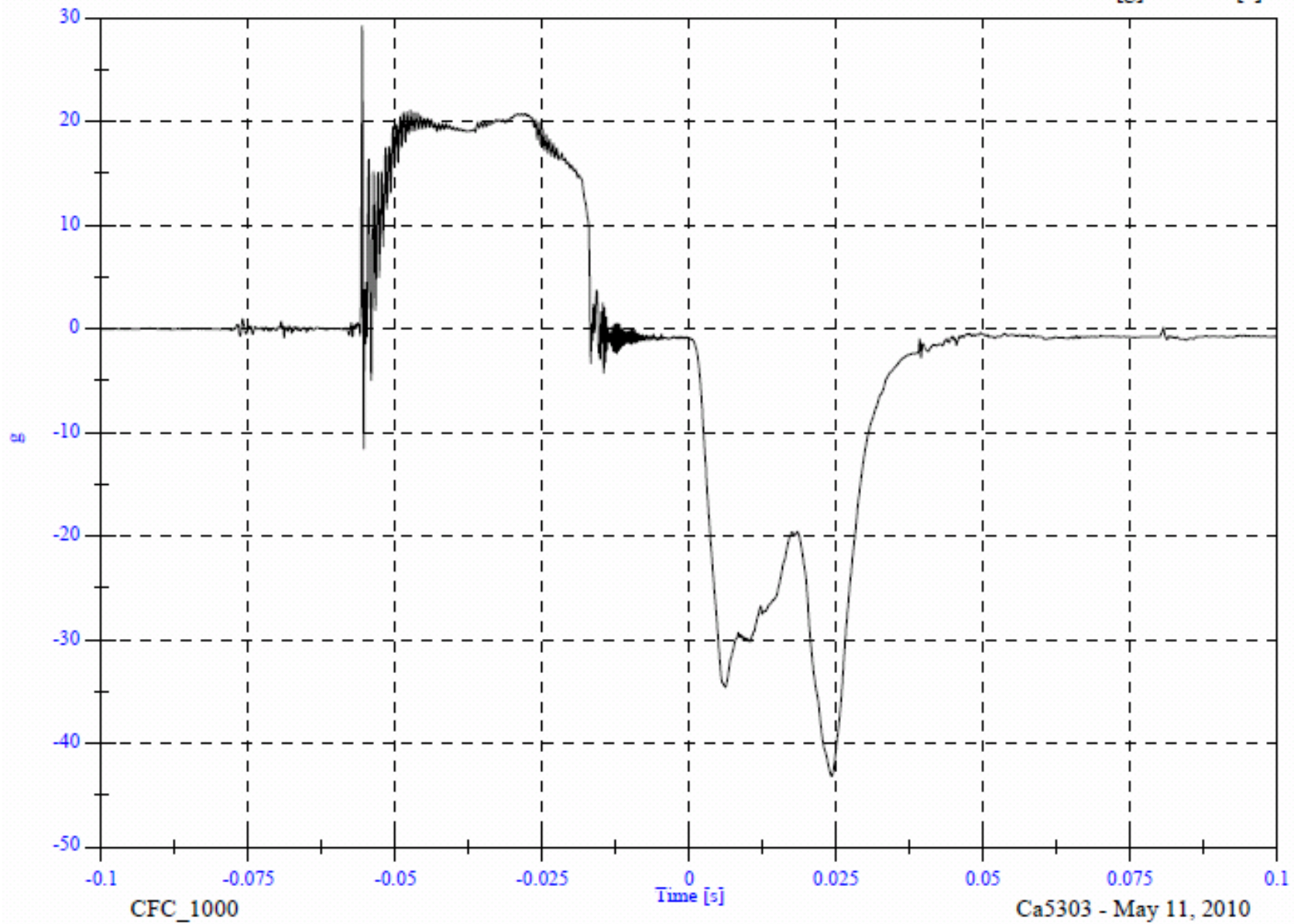


UROP RH Side

Headform X Acceleration

Max: 29.2 [g] at -0.056 [s]

Min: -43.2 [g] at 0.024 [s]

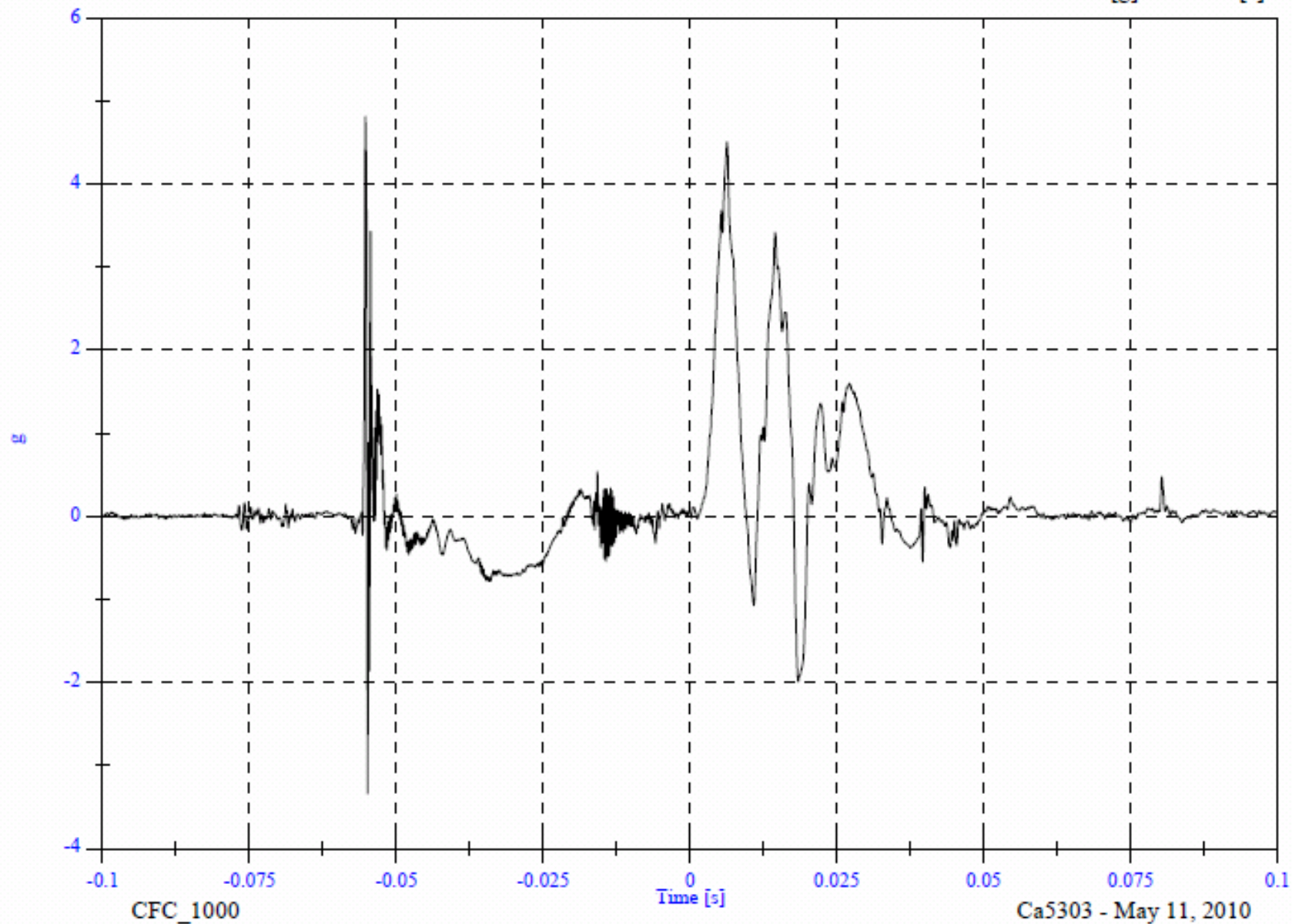


UROP RH Side

Headform Y Acceleration

Max: 4.8 [g] at -0.055 [s]

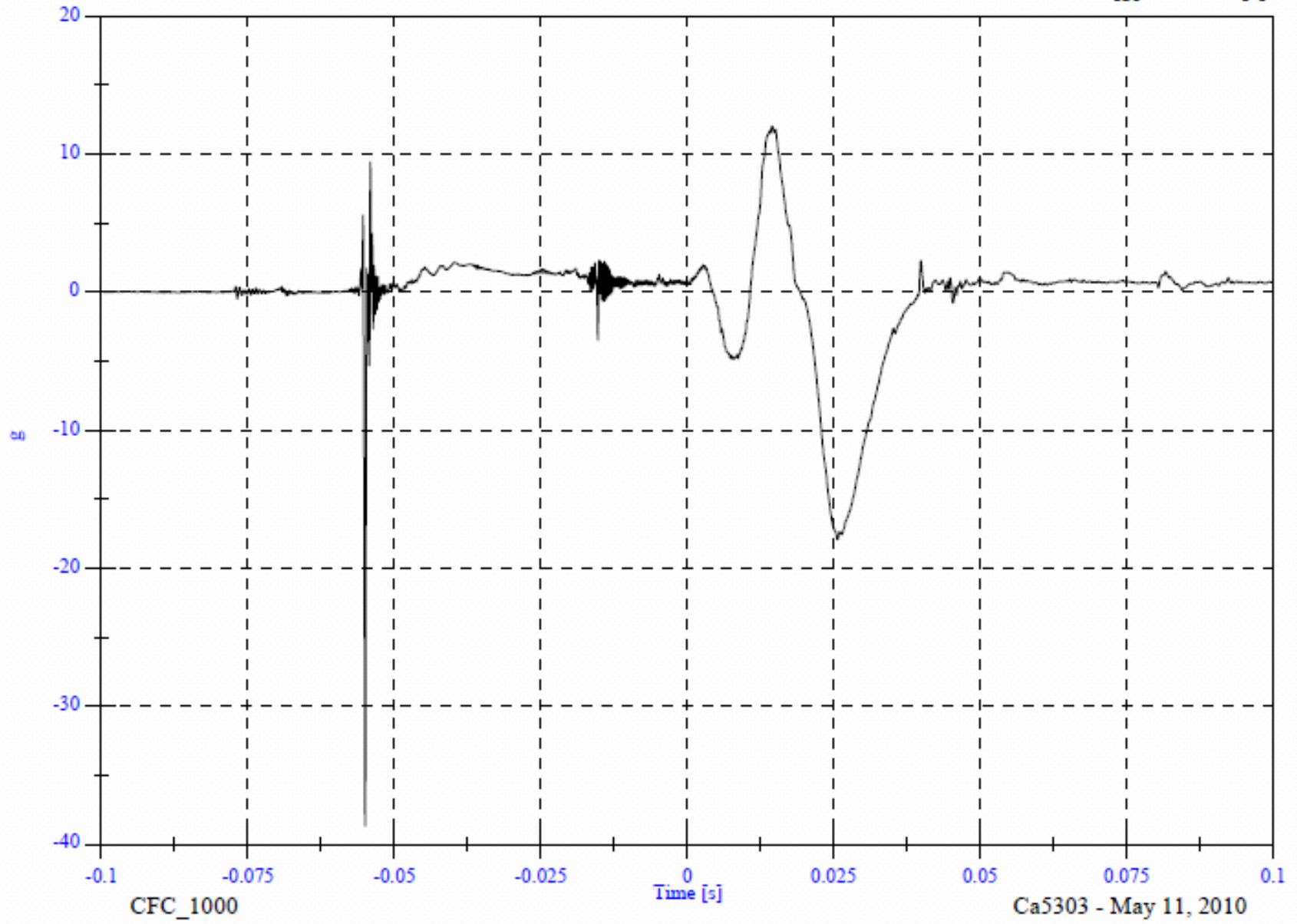
Min: -3.3 [g] at -0.055 [s]



UROP RH Side

Headform Z Acceleration

Max: 12.0 [g] at 0.015 [s]  
Min: -38.7 [g] at -0.055 [s]

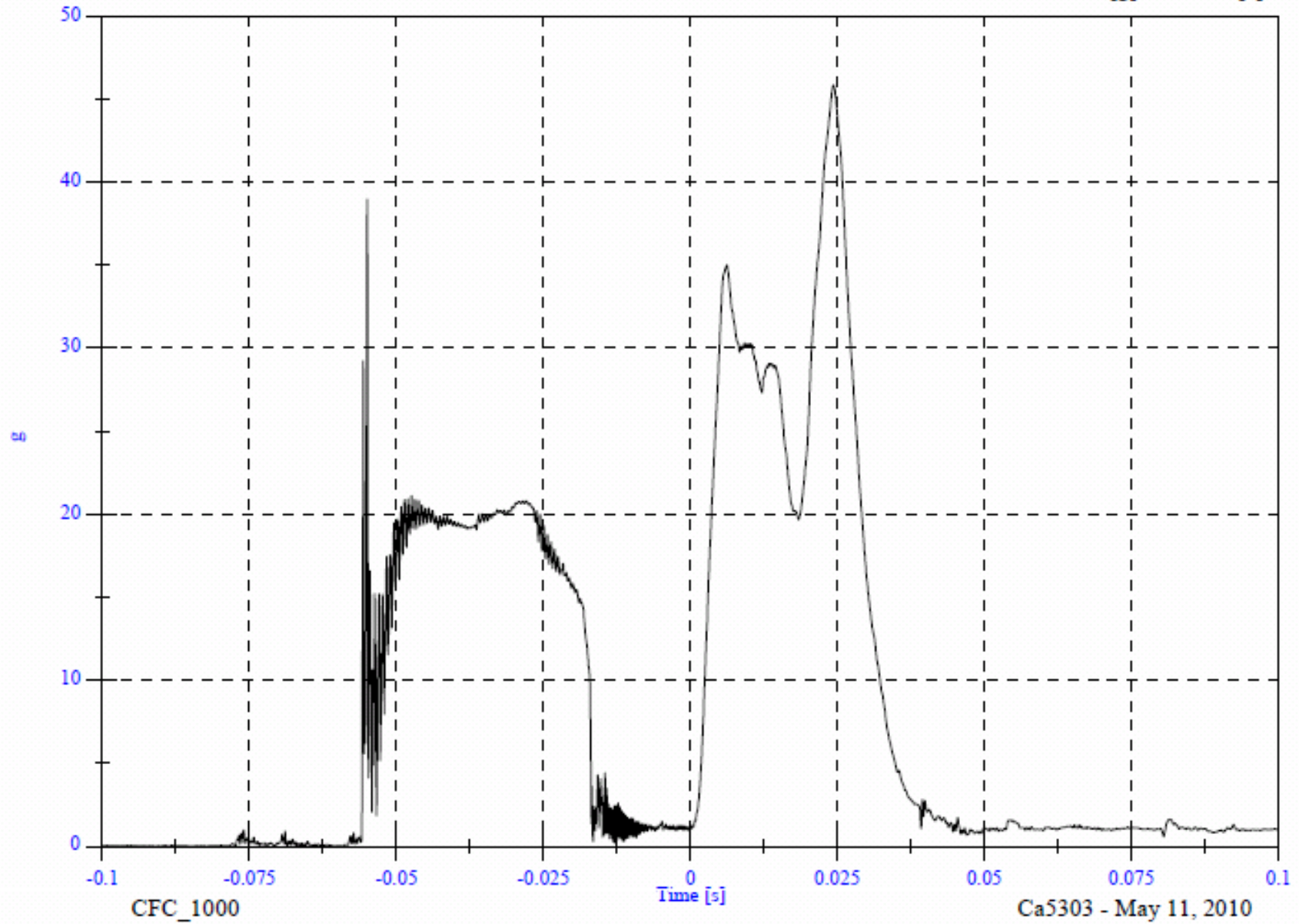


UROP RH Side

Headform Resultant

Max: 45.8 [g] at 0.024 [s]

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



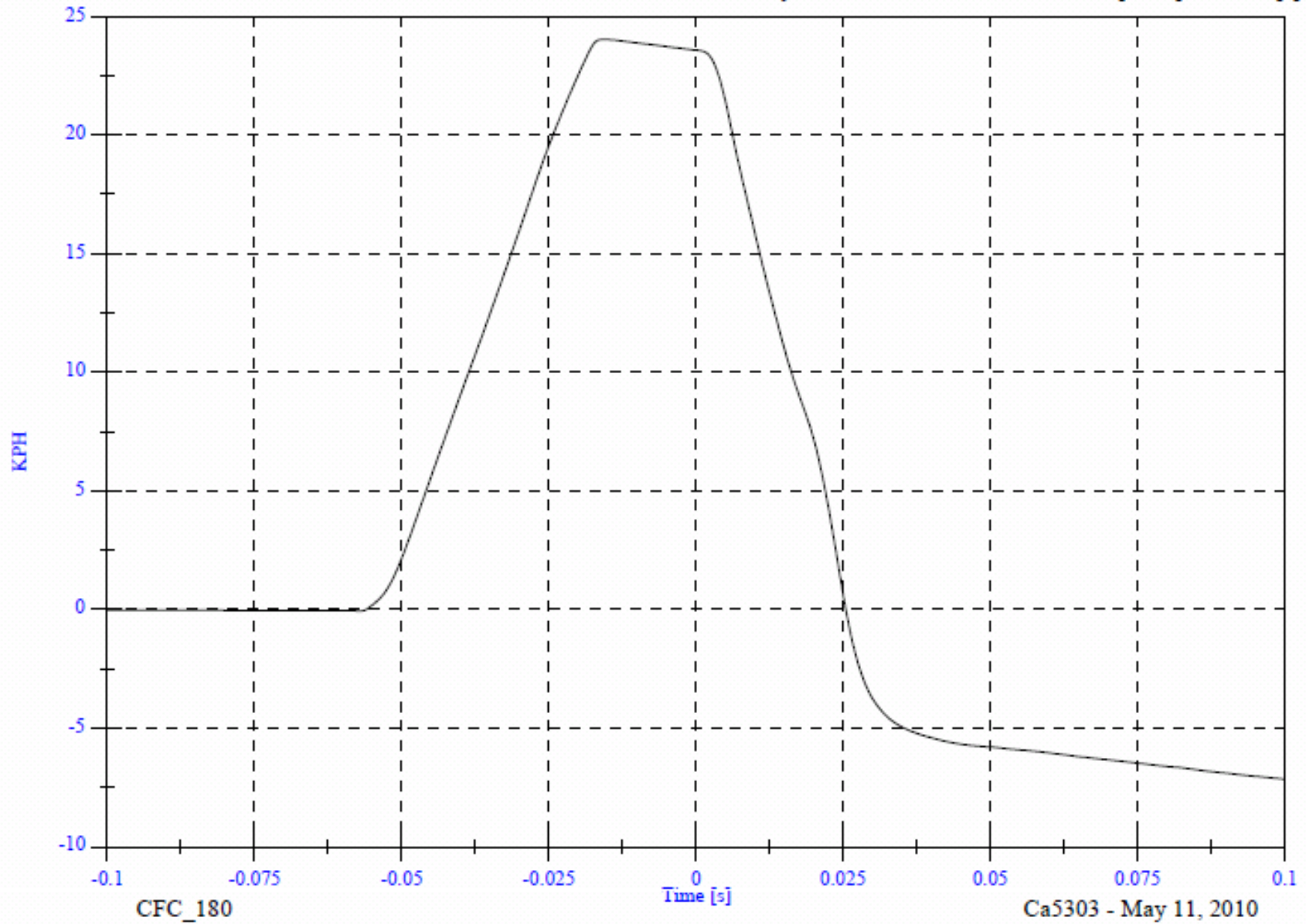


UROP RH Side

Headform Velocity

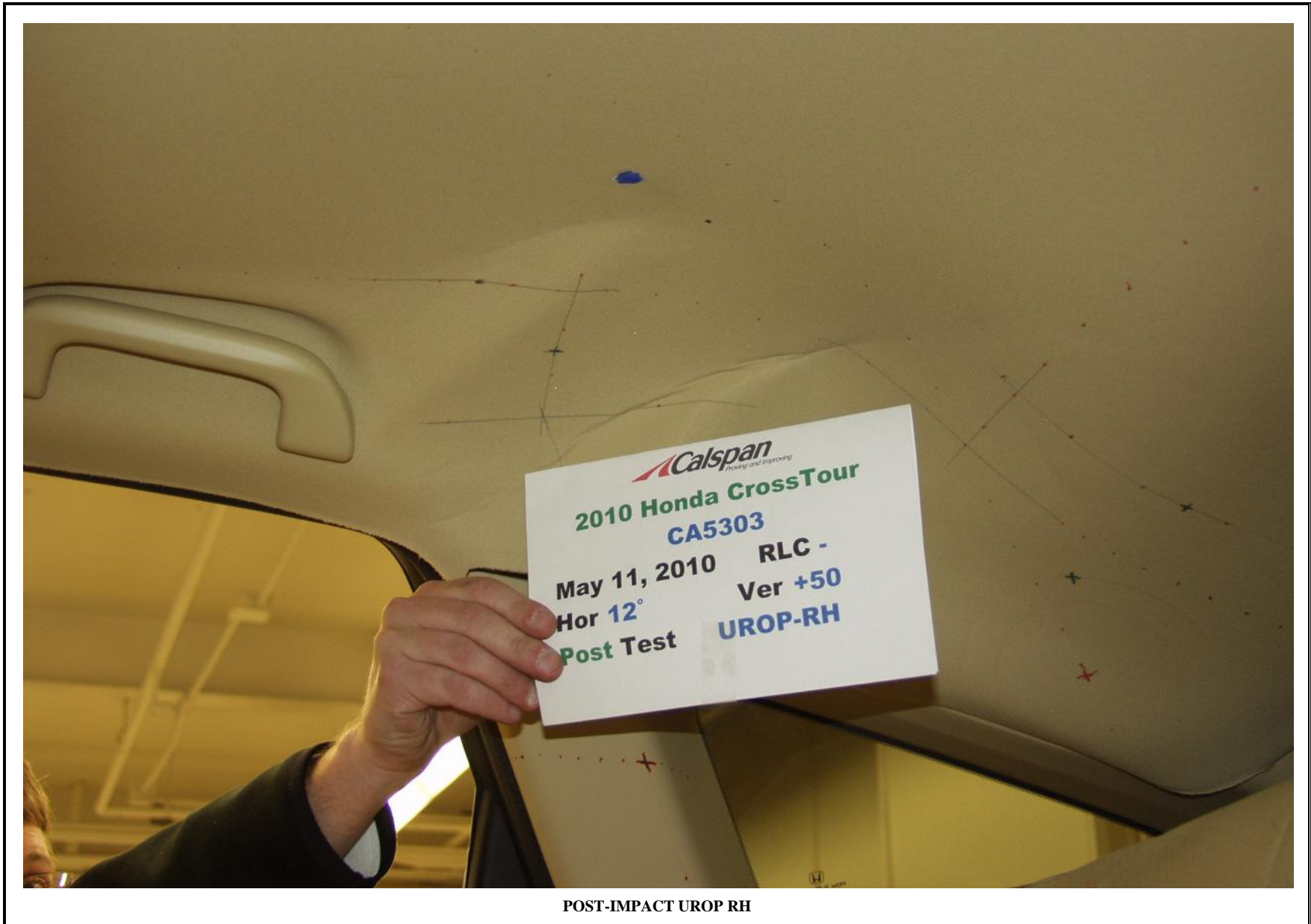
Max: 24.0 [KPH] at -0.016 [s]

Min: -7.2 [KPH] at 0.100 [s]





PRE-IMPACT UROP RH

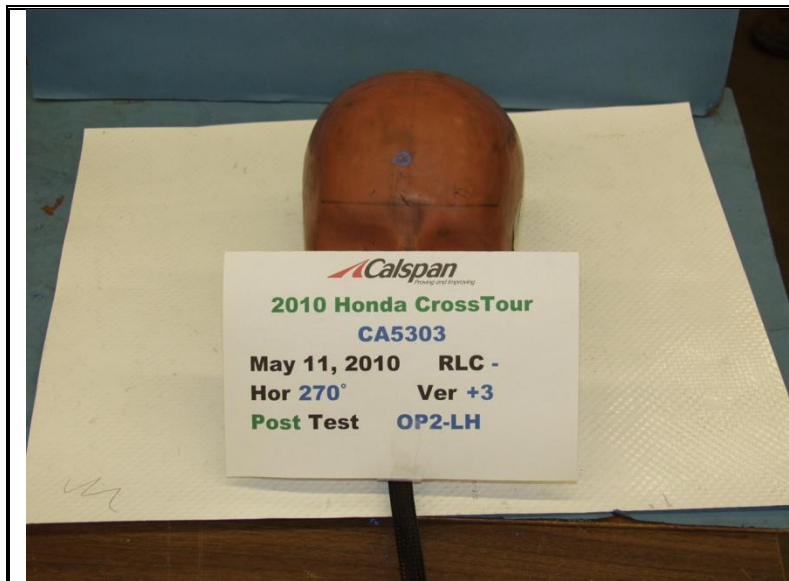


POST-IMPACT UROP RH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	07
Test Date:	11 May 2010
Target Location:	OP2 LH
Target Code:	OP2 LH
Horizontal Impact Angle:	270
Vertical Impact Angle:	3
Ambient Temperature:	21
Relative Humidity:	25.3%
Time of Impact:	4:35
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	2	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	27				mm up



POST-IMPACT OP2 LH HEADFORM

Free Motion HIC	634.3
HIC(d)	645.0
Impact Velocity (kph)	23.81
HIC T1 (msec)	4.7
HIC T2 (msec)	10.3

# OP2 LH Side CA5303 - OP2 LH

FMH Headform 62

Location: OP2 LH

Test Date: May 11, 2010

Work File: fmh

## TEST RESULTS

Lab Temperature: 21 C

HICd: 645.0

Lab Humidity: 25.3 %

HIC (36ms): 634.3

Velocity at Impact: 23.81 KPH

t1: 4.7 msec

t2: 10.3 msec

Free Flight Distance: 223.41 mm

Duration: 5.7 msec

Average Acceleration: 8.8 g

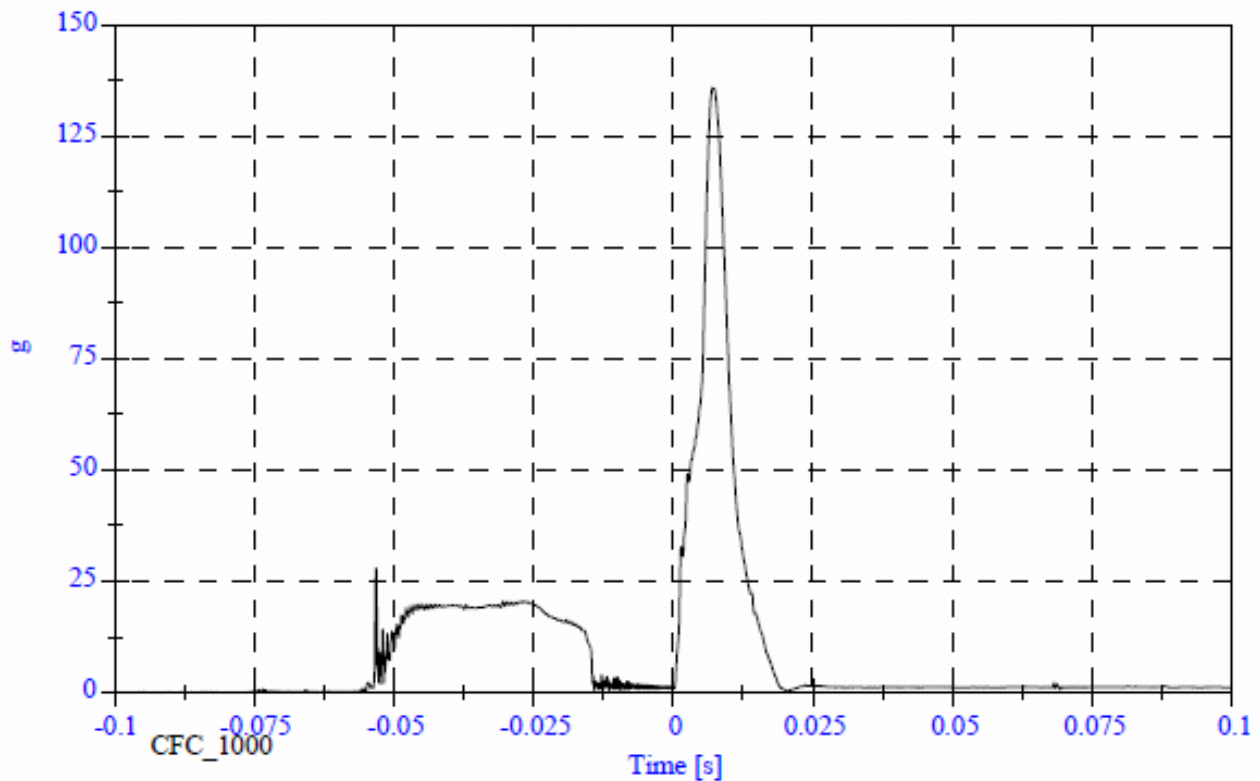
Maximum: 135.9 g

OP2 LH Side

Max: 135.9 [g] at 0.007 [s]

Headform Resultant

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

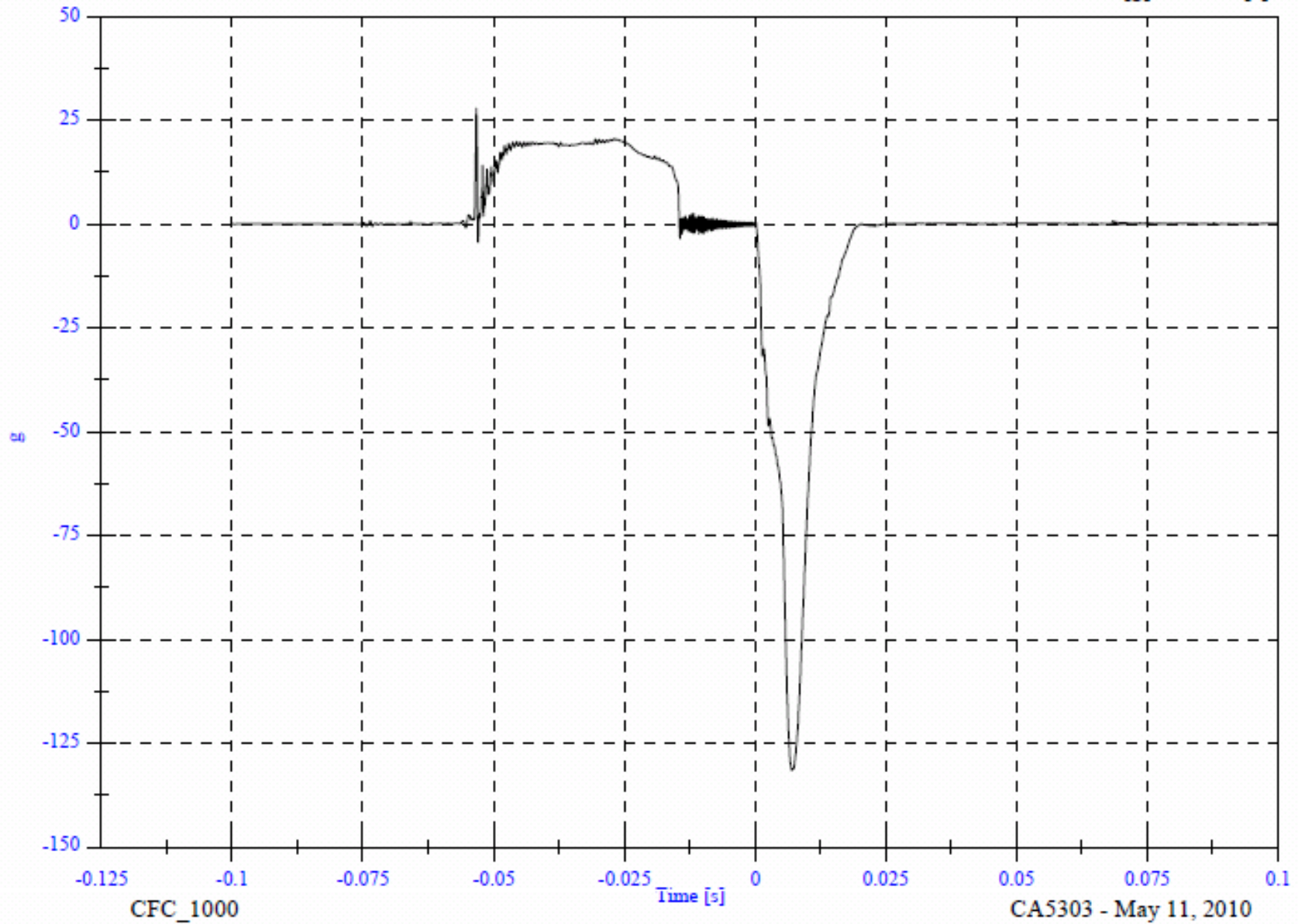


OP2 LH Side

Headform X Acceleration

Max: 27.8 [g] at -0.053 [s]

Min: -131.5 [g] at 0.007 [s]

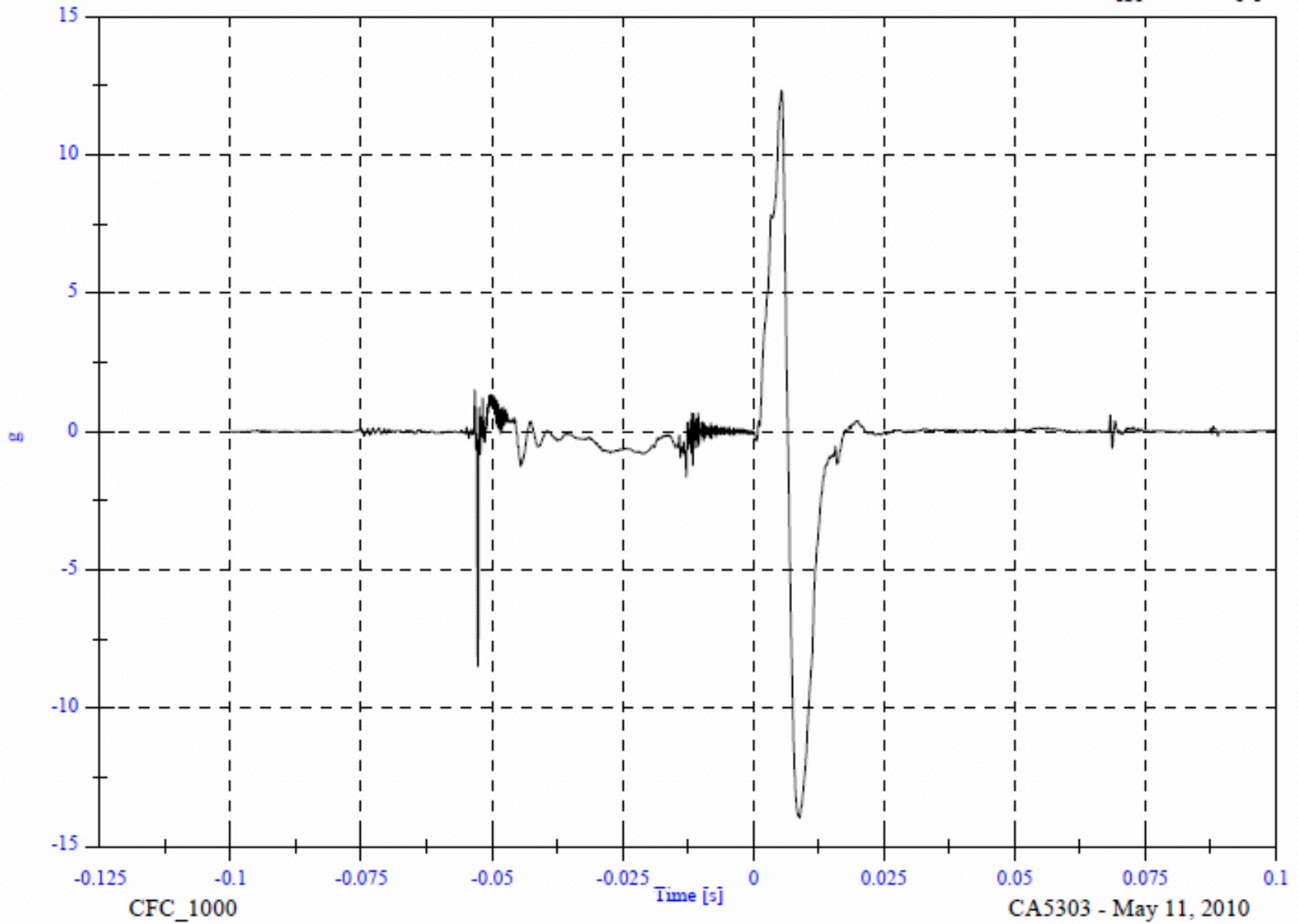


OP2 LH Side

Headform Y Acceleration

Max: 12.3 [g] at 0.005 [s]

Min: -14.0 [g] at 0.009 [s]

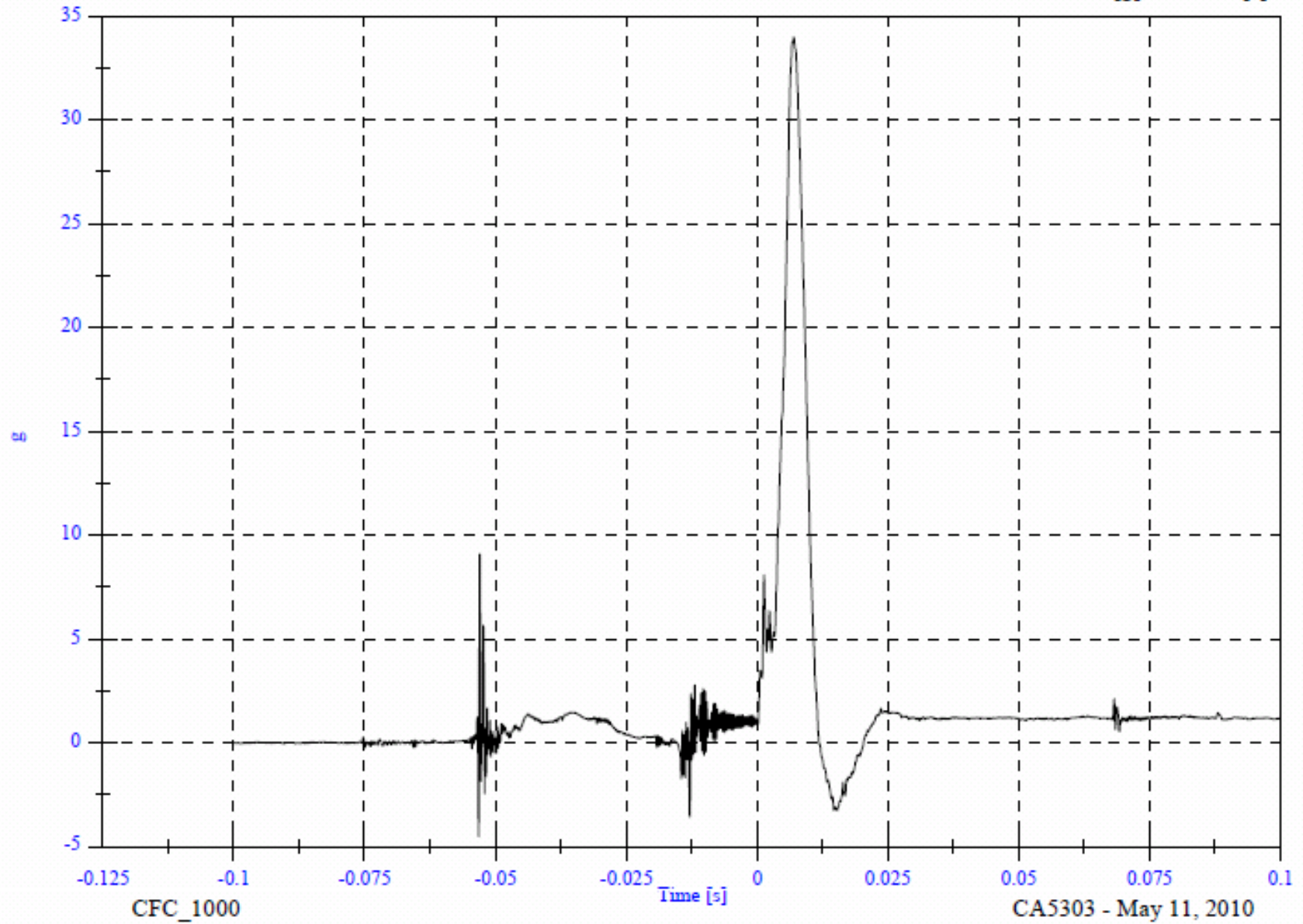


OP2 LH Side

Headform Z Acceleration

Max: 34.0 [g] at 0.007 [s]

Min: -4.5 [g] at -0.053 [s]



CFC\_1000

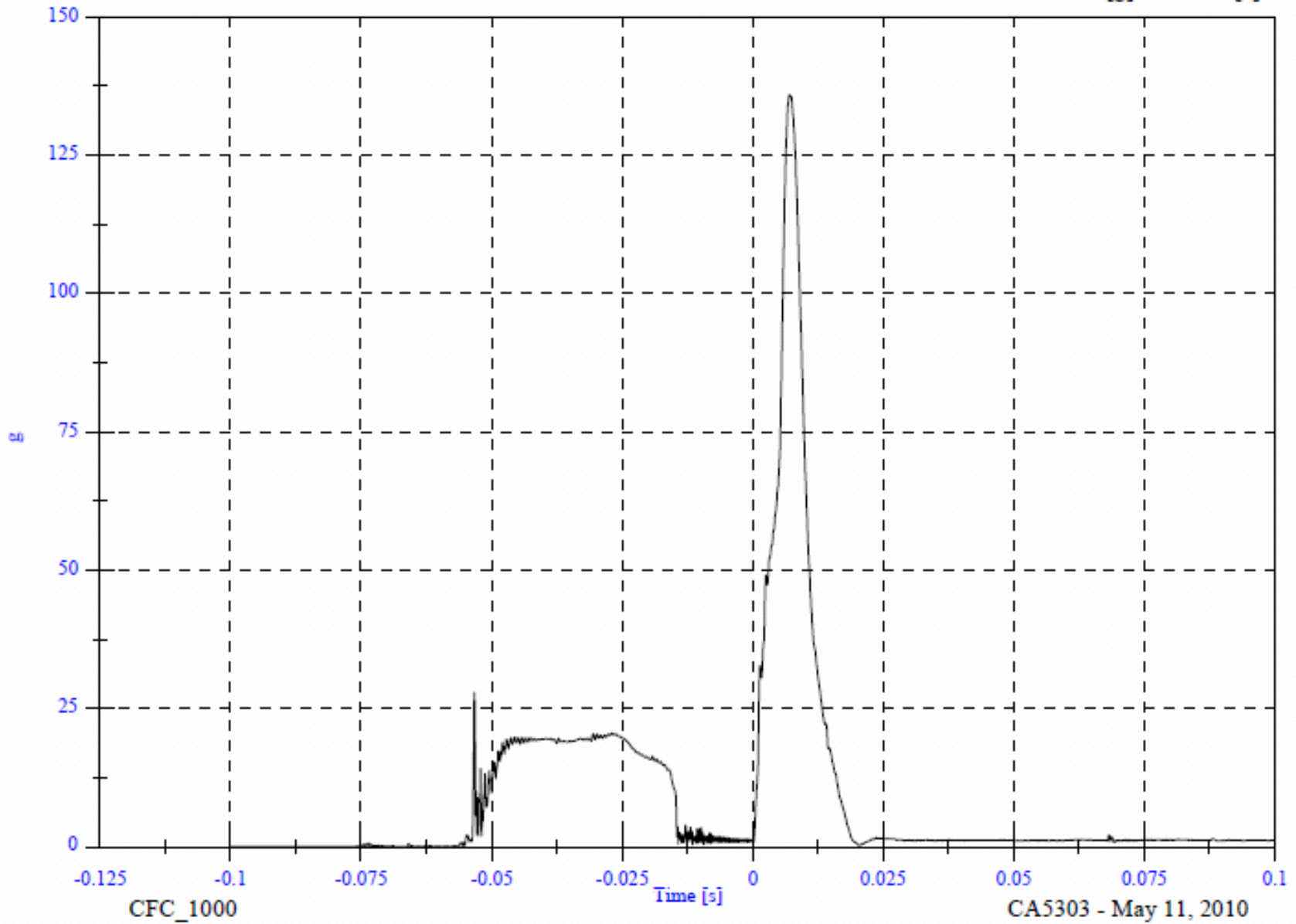
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OP2 LH Side

Headform Resultant

Max: 135.9 [g] at 0.007 [s]  
Min: 0.0 [g] at -0.076 [s]

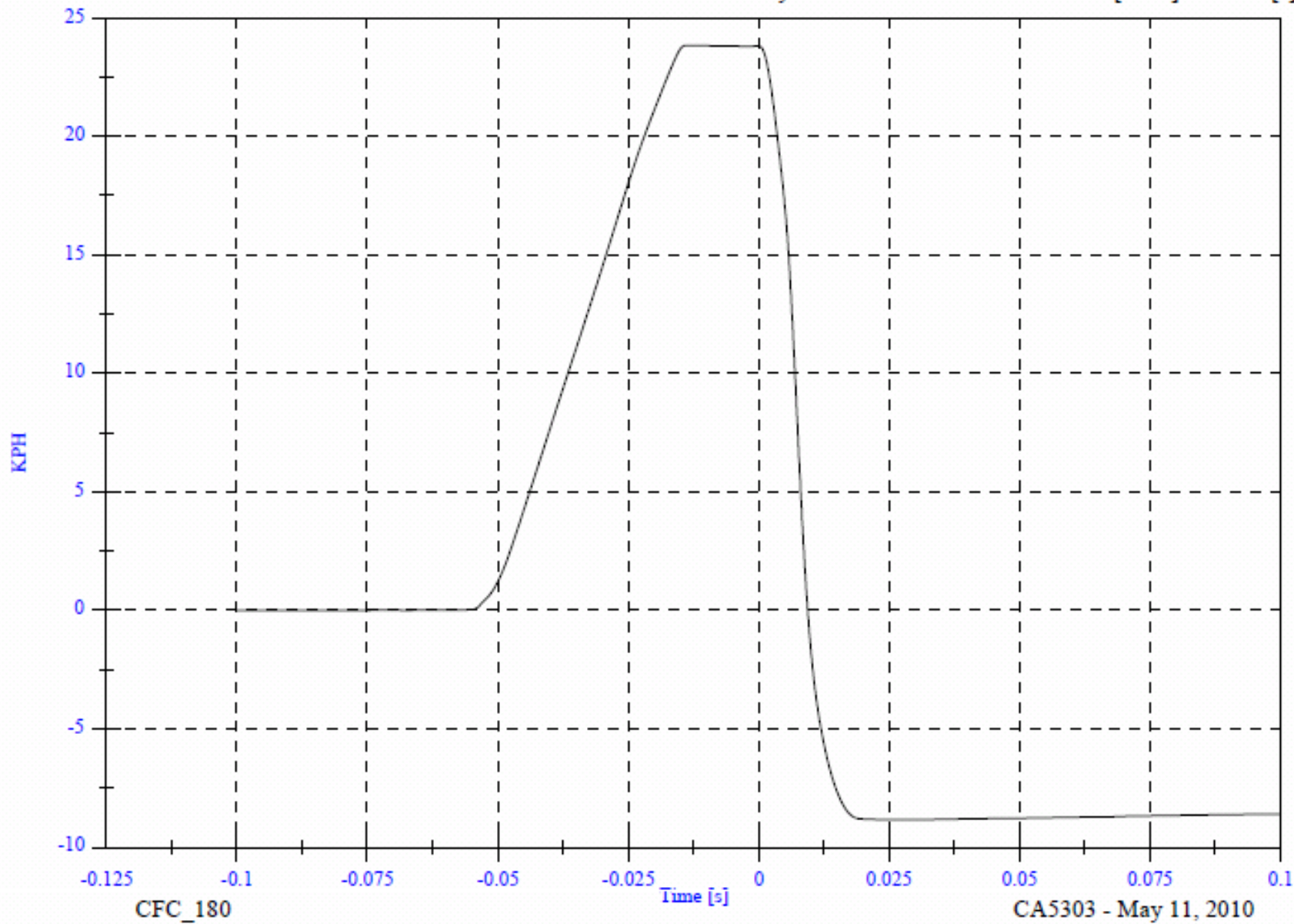


OP2 LH Side

Headform Velocity

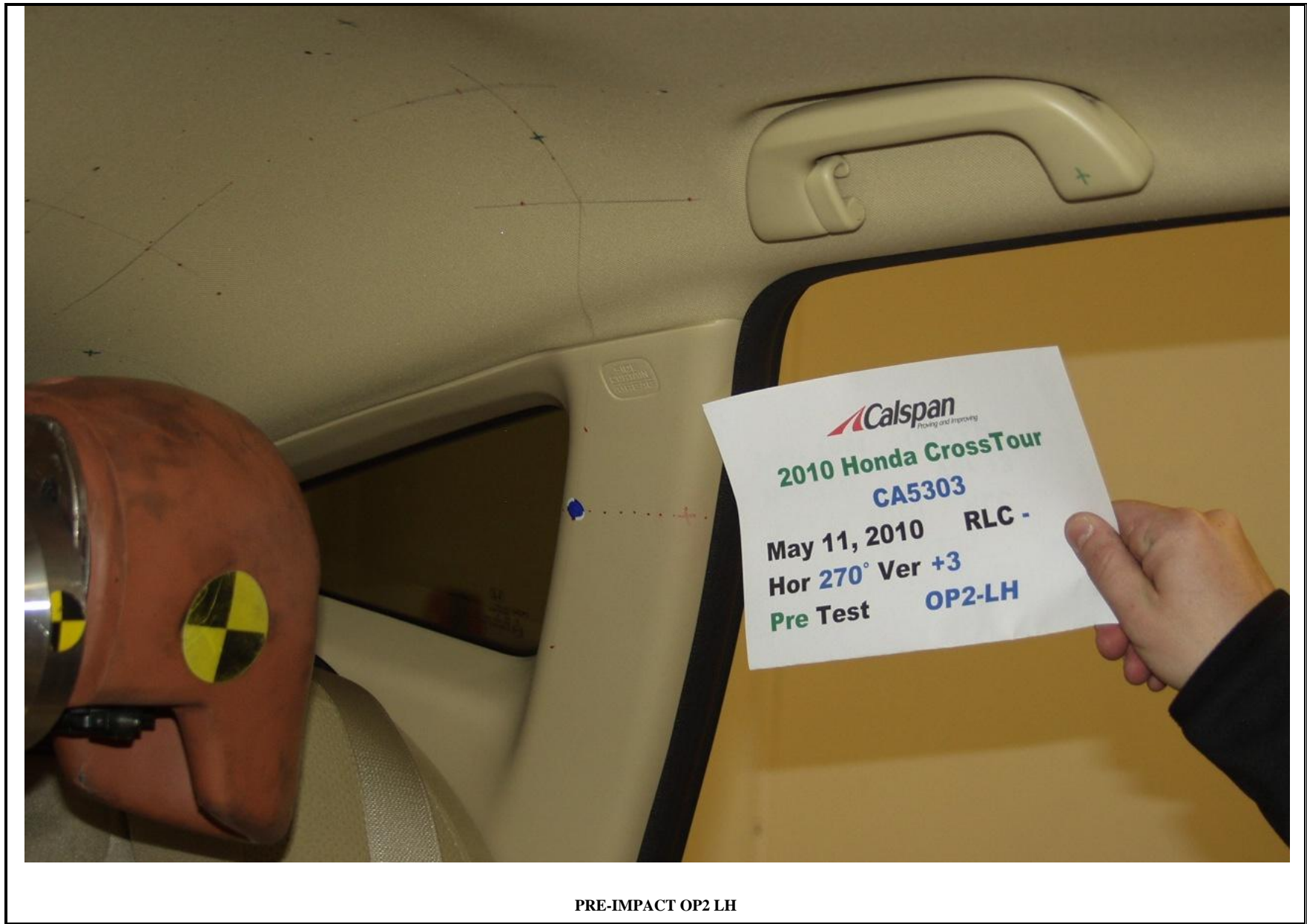
Max: 23.8 [KPH] at -0.014 [s]

Min: -8.8 [KPH] at 0.025 [s]



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PRE-IMPACT OP2 LH

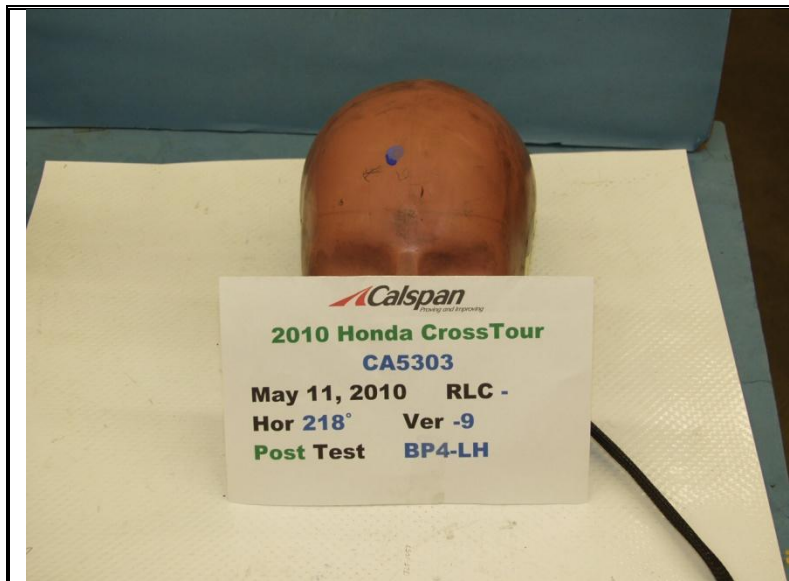


POST-IMPACT OP2 LH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	08
Test Date:	11 May 2010
Target Location:	BP4 LH
Target Code:	BP4 LH
Horizontal Impact Angle:	218
Vertical Impact Angle:	-9
Ambient Temperature:	22
Relative Humidity:	25.4%
Time of Impact:	5:08
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	9	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	35				mm up



POST-IMPACT BP4 LH HEADFORM

Free Motion HIC	476.7
HIC(d)	526.0
Impact Velocity (kph)	23.35
HIC T1 (msec)	6.0
HIC T2 (msec)	10.3

# BP4 LH Side CA5303 - BP4 LH

FMH Headform 805

Location: BP4 LH

Test Date: May 11, 2010

Work File: fmh

## TEST RESULTS

Lab Temperature: 22 C

HICd: 526.0

Lab Humidity: 25.4 %

HIC (36ms): 476.7

Velocity at Impact: 23.35 KPH

t1: 6.0 msec

t2: 10.3 msec

Free Flight Distance: 217.13 mm

Duration: 4.3 msec

Maximum: 142.0 g

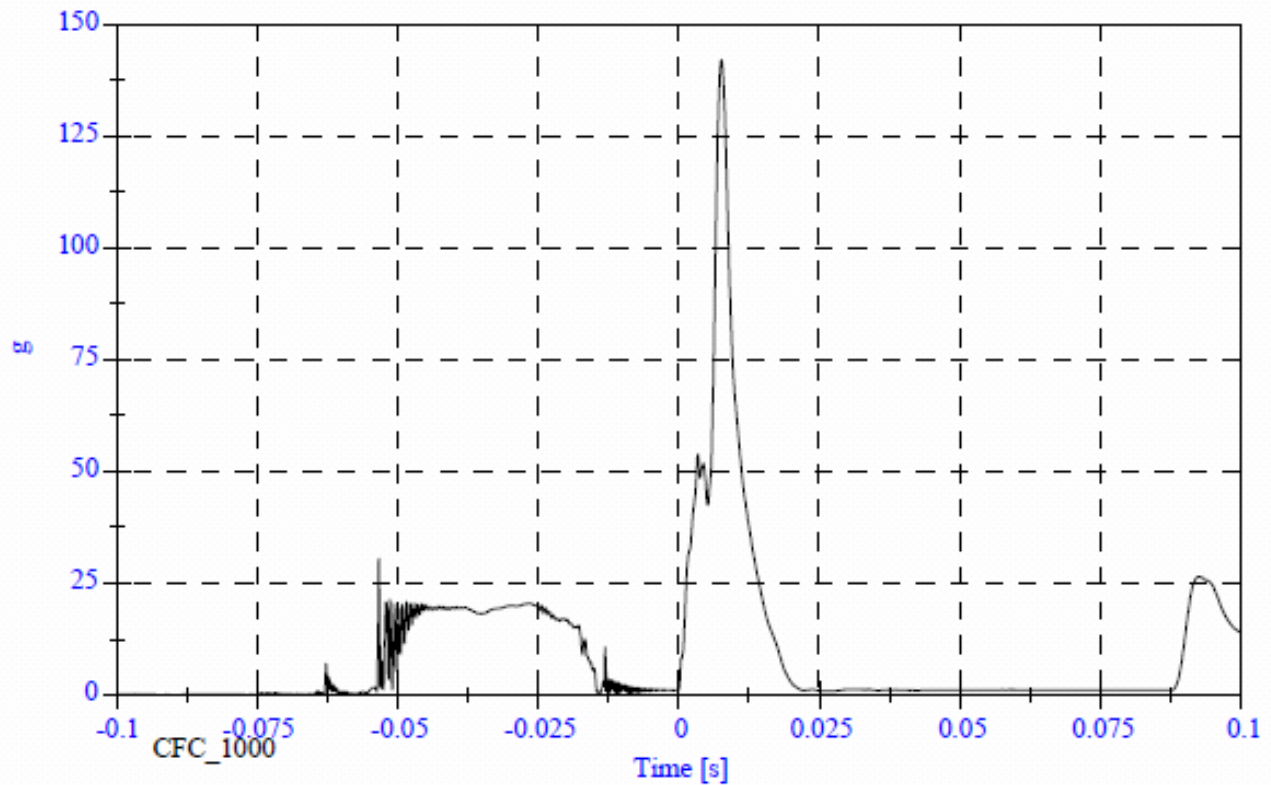
Average Acceleration: 9.5 g

BP4 LH Side

Max: 142.0 [g] at 0.008 [s]

Headform Resultant

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

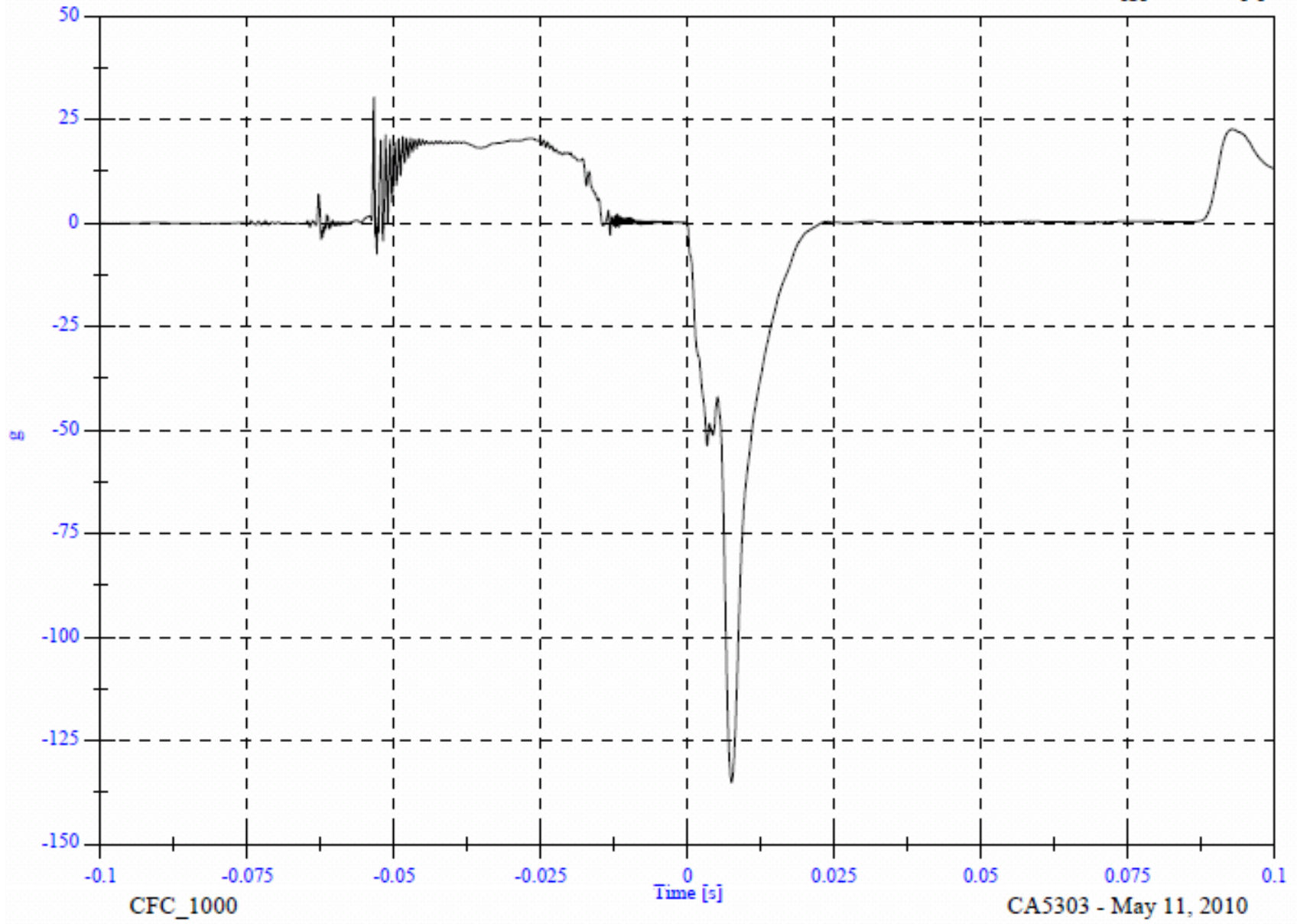


BP4 LH Side

Headform X Acceleration

Max: 30.4 [g] at -0.053 [s]

Min: -135.1 [g] at 0.008 [s]

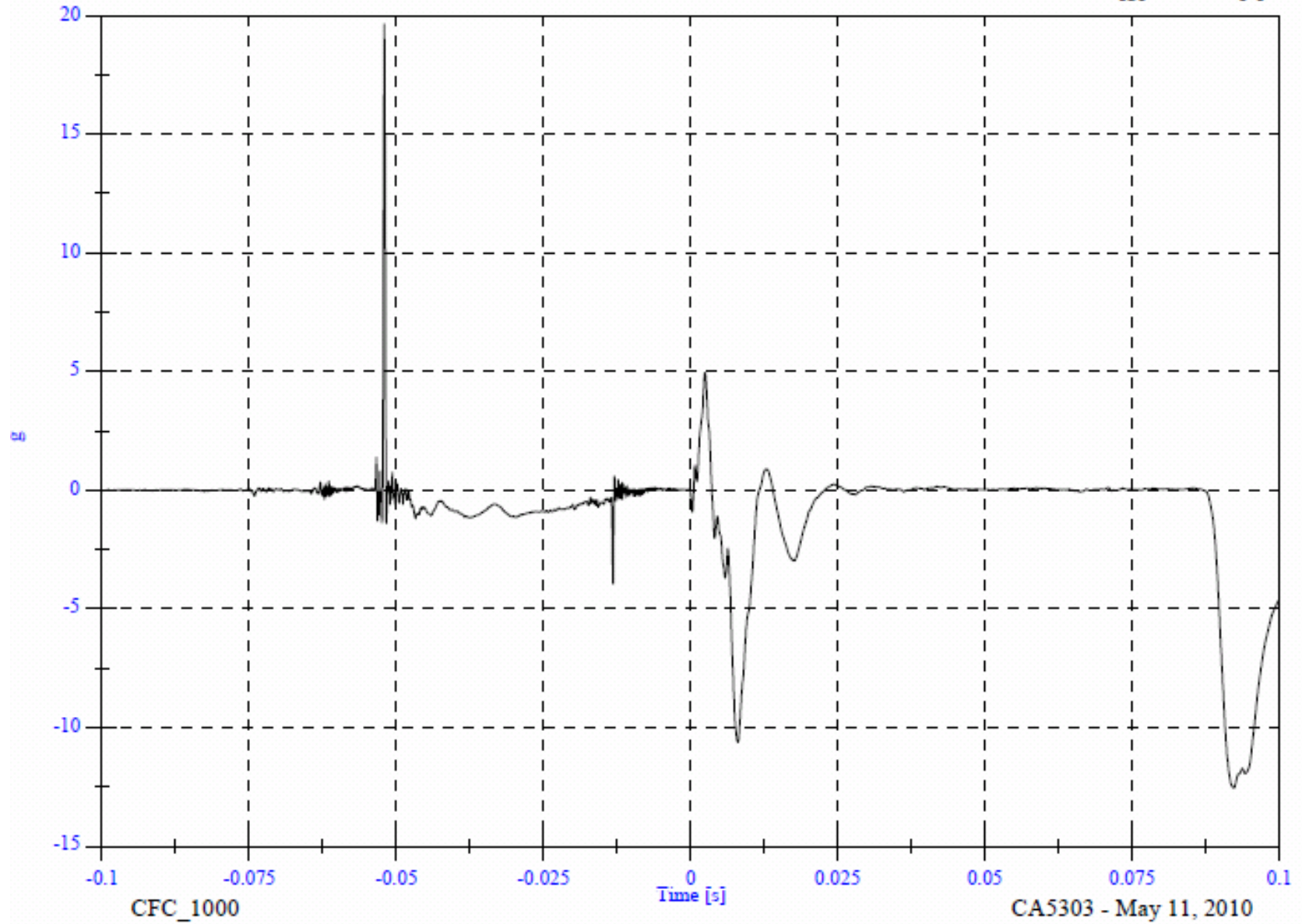


BP4 LH Side

Headform Y Acceleration

Max: 19.6 [g] at -0.052 [s]

Min: -12.5 [g] at 0.092 [s]



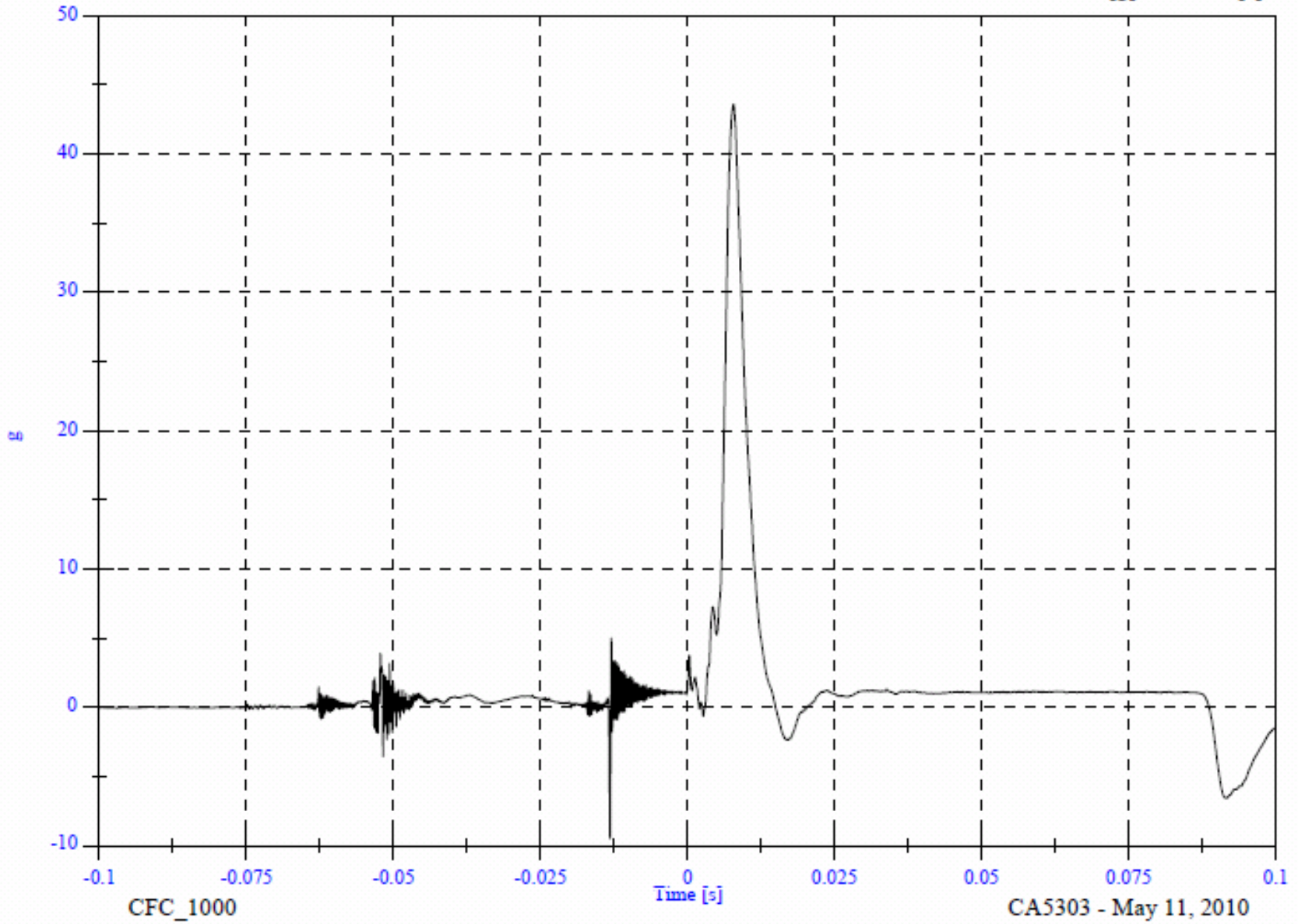


BP4 LH Side

Headform Z Acceleration

Max: 43.6 [g] at 0.008 [s]

Min: -9.5 [g] at -0.013 [s]

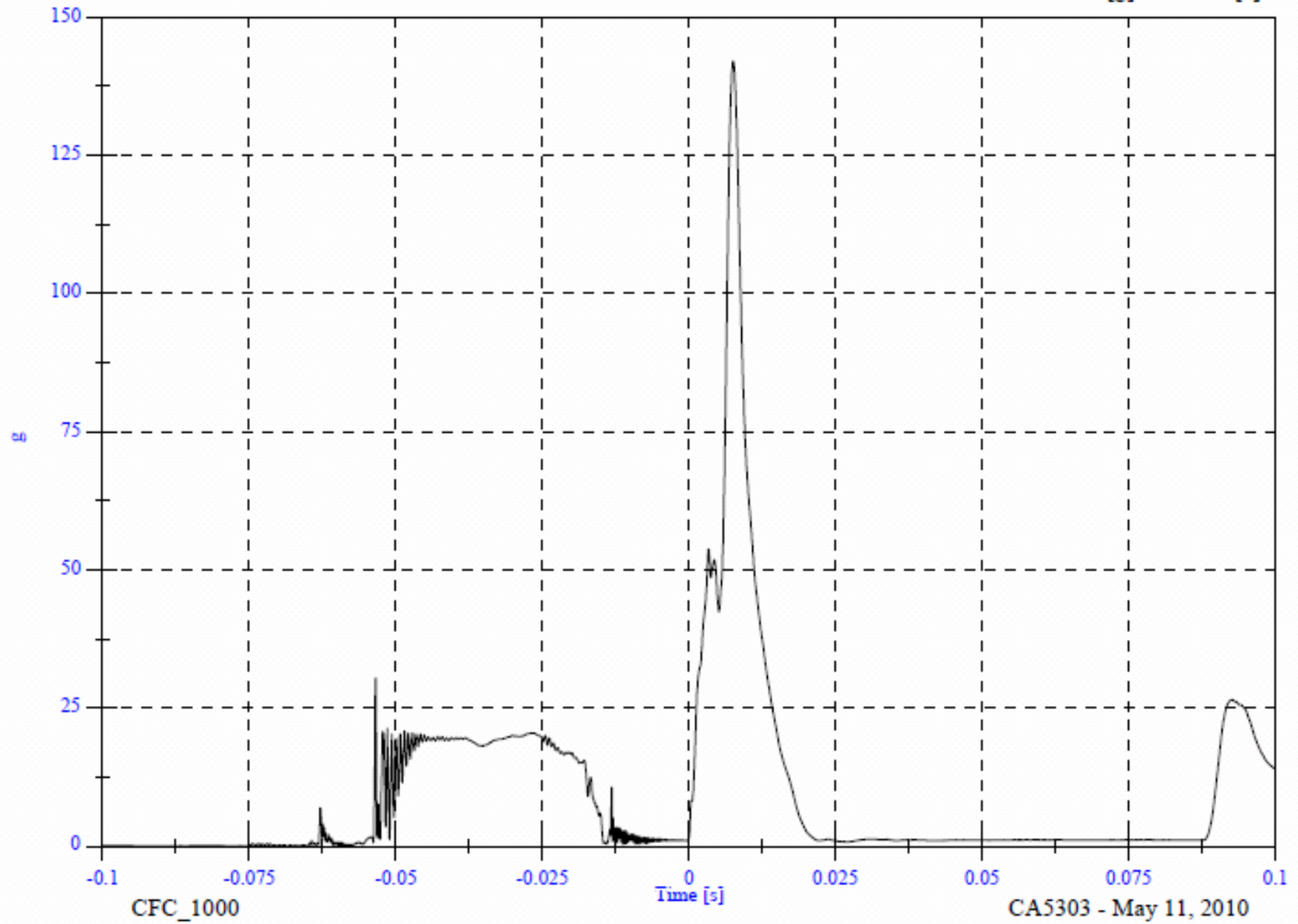


BP4 LH Side

Headform Resultant

Max: 142.0 [g] at 0.008 [s]

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



CFC\_1000

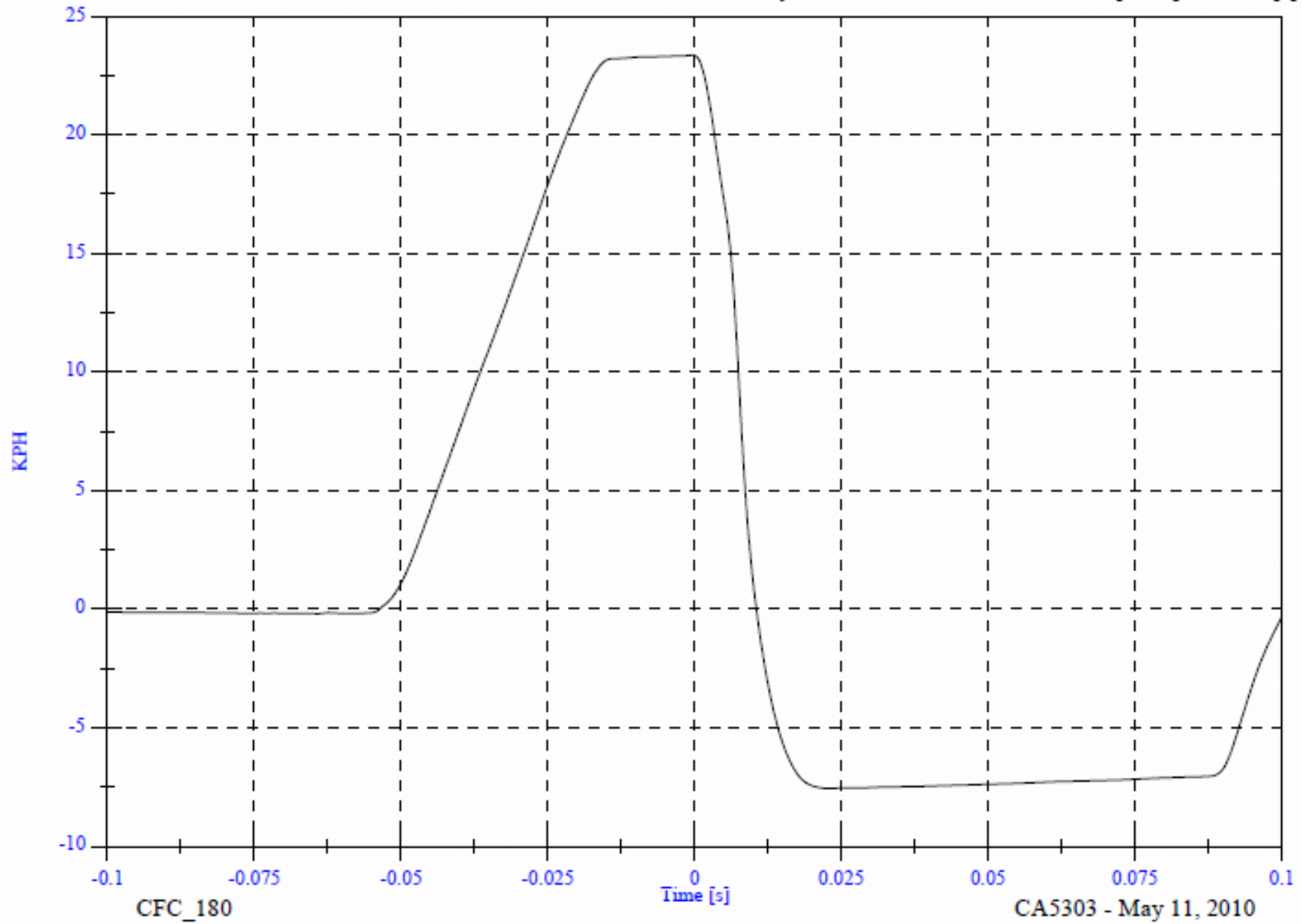
CA5303 - May 11, 2010

BP4 LH Side

Headform Velocity

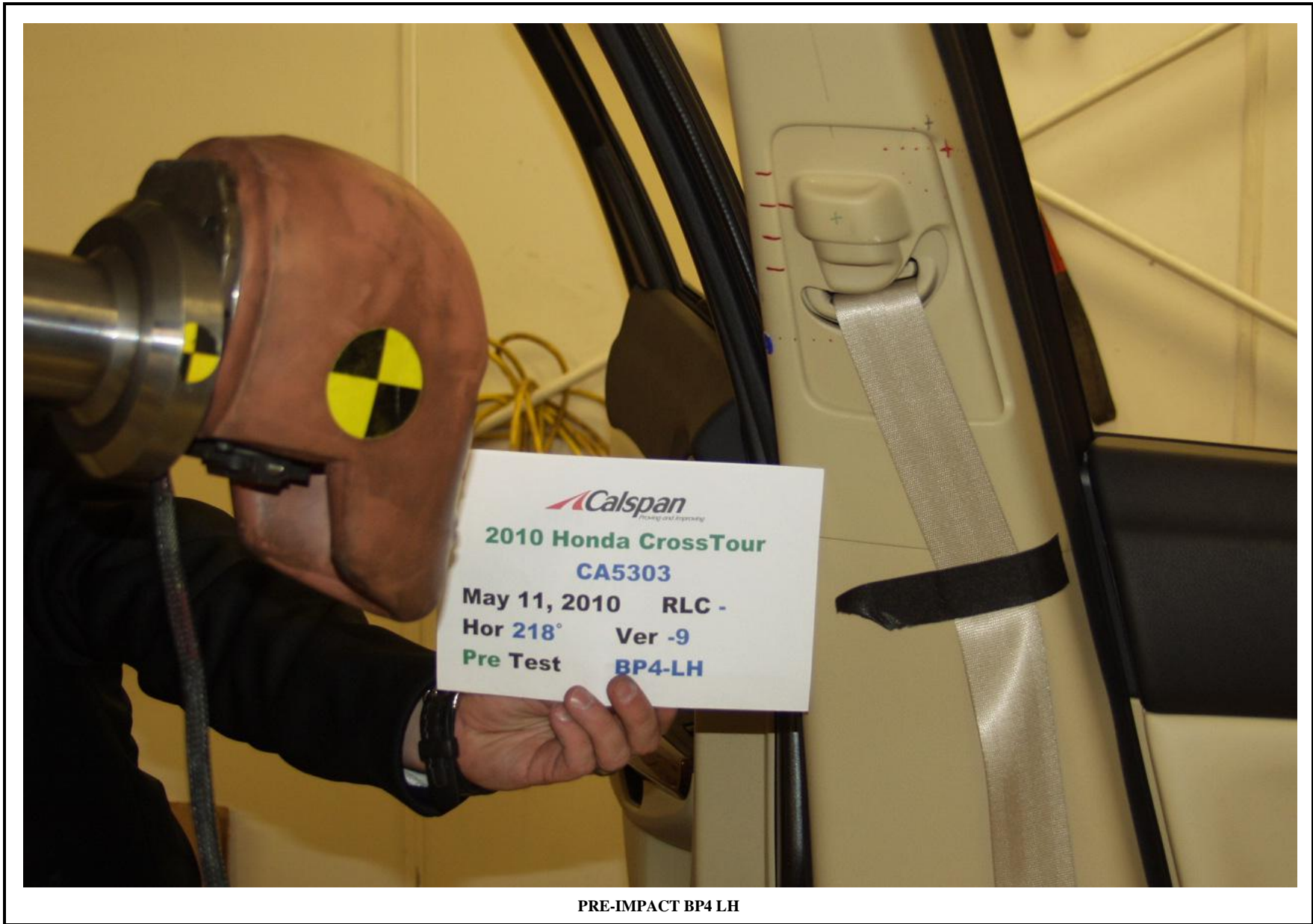
Max: 23.4 [KPH] at -0.000 [s]

Min: -7.6 [KPH] at 0.023 [s]



CFC\_180

CA5303 - May 11, 2010



PRE-IMPACT BP4 LH

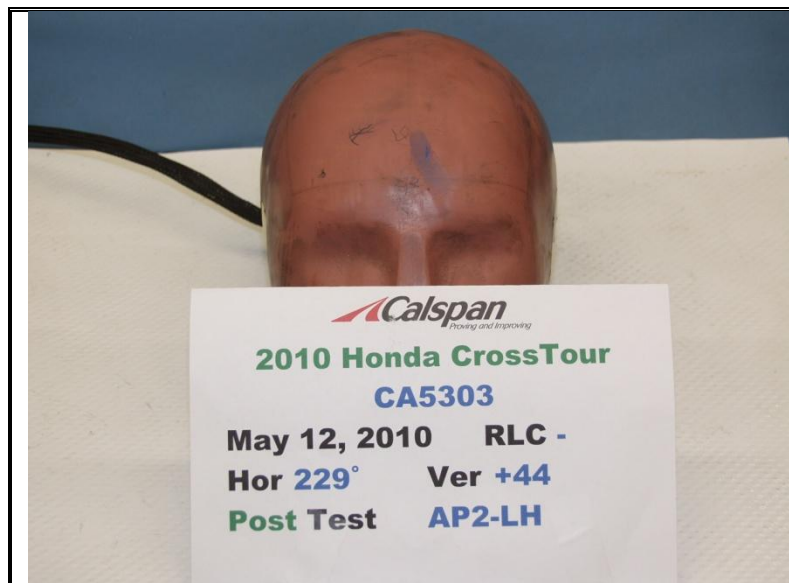


POST-IMPACT BP4 LH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	09
Test Date:	12 May 2010
Target Location:	AP2 LH
Target Code:	AP2 LH
Horizontal Impact Angle:	229
Vertical Impact Angle:	44
Ambient Temperature:	21
Relative Humidity:	32.4%
Time of Impact:	9:50
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-4	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	12		mm up



POST-IMPACT AP2 LH HEADFORM

Free Motion HIC	581.6
HIC(d)	605.2
Impact Velocity (kph)	18.77
HIC T1 (msec)	4.8
HIC T2 (msec)	9.1

# AP2 LH Side CA5303 - AP2 LH

FMH Headform 805

Location: AP2 LH

Test Date: May 12, 2010

Work File: fmh

## TEST RESULTS

Lab Temperature: 21 C

HICd: 605.2

Lab Humidity: 32.4 %

HIC (36ms): 581.6

Velocity at Impact: 18.77 KPH

t1: 4.8 msec

t2: 9.1 msec

Free Flight Distance: 226.05 mm

Duration: 4.3 msec

Maximum: 145.3 g

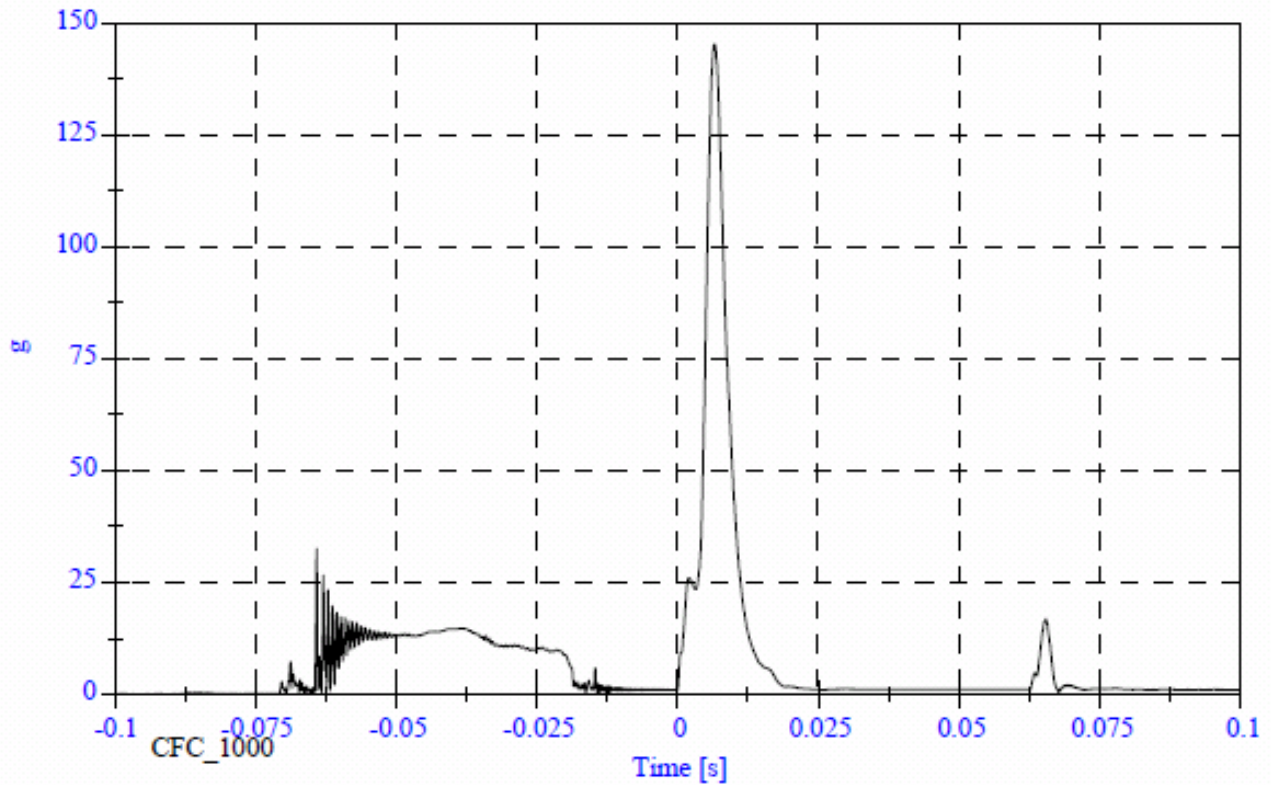
Average Acceleration: 7.4 g

AP2 LH Side

Max: 145.3 [g] at 0.007 [s]

Headform Resultant

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

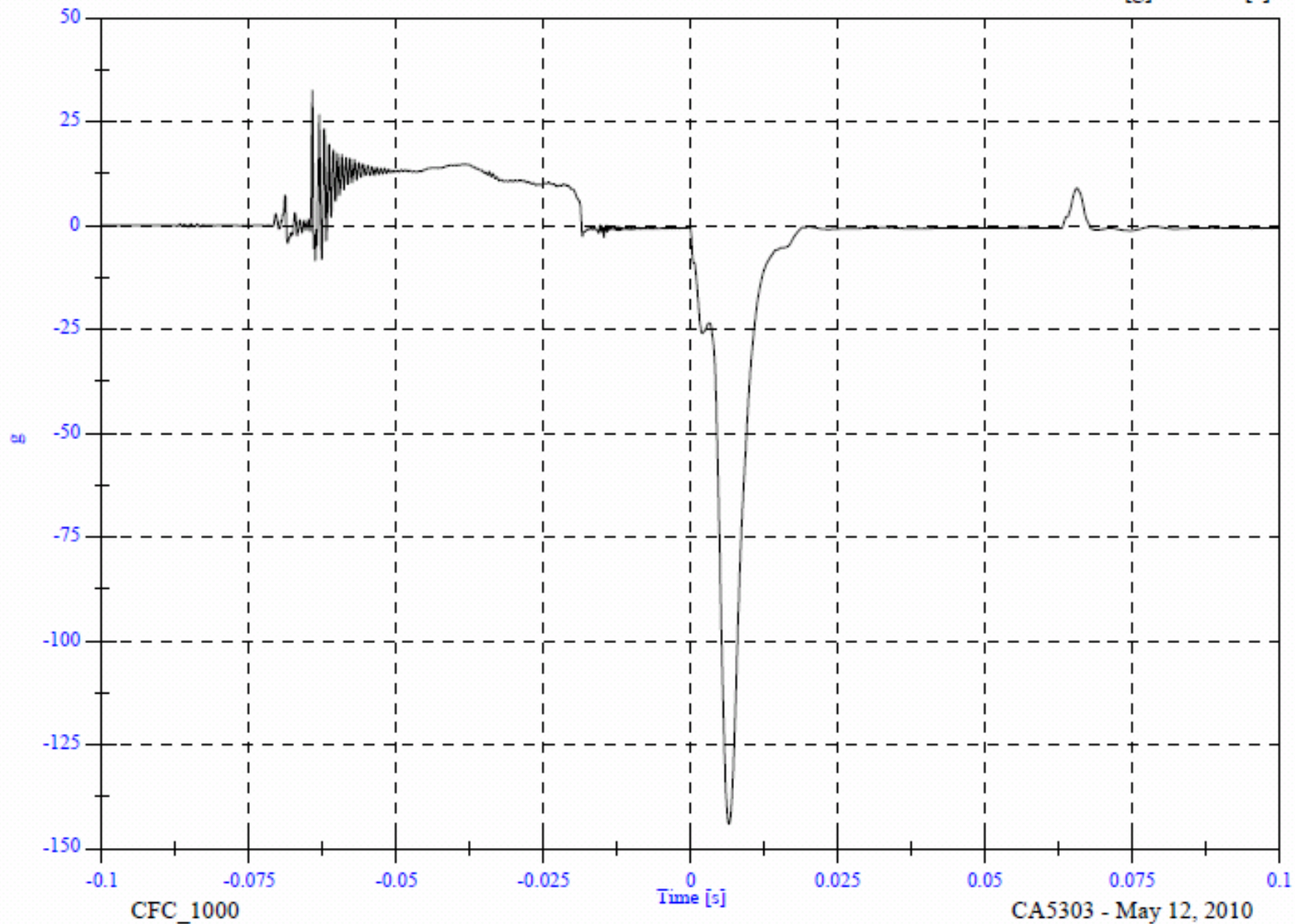


AP2 LH Side

Headform X Acceleration

Max: 32.5 [g] at -0.064 [s]

Min: -144.1 [g] at 0.007 [s]



CFC\_1000

CA5303 - May 12, 2010

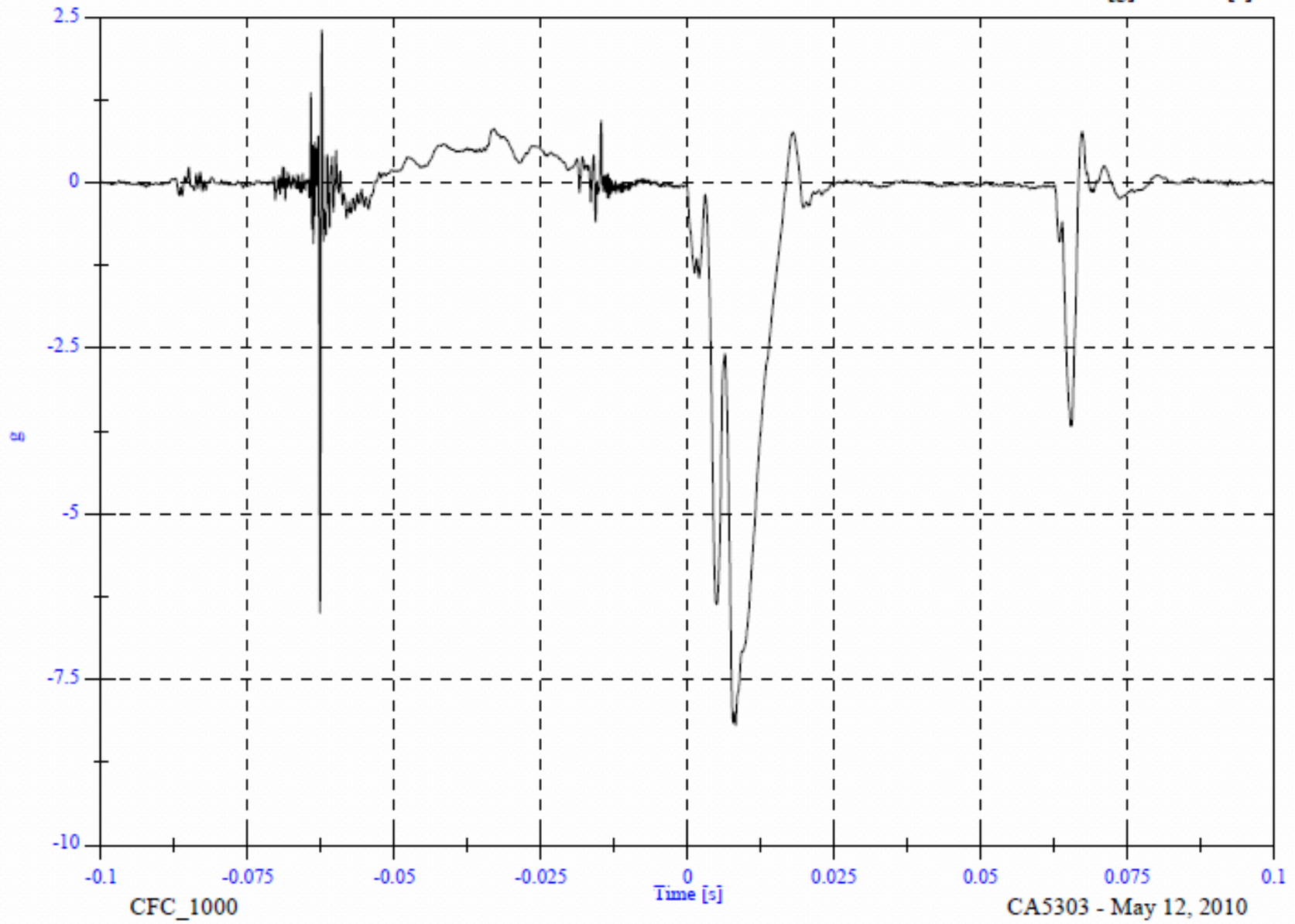


AP2 LH Side

Headform Y Acceleration

Max: 2.3 [g] at -0.062 [s]

Min: -8.2 [g] at 0.008 [s]

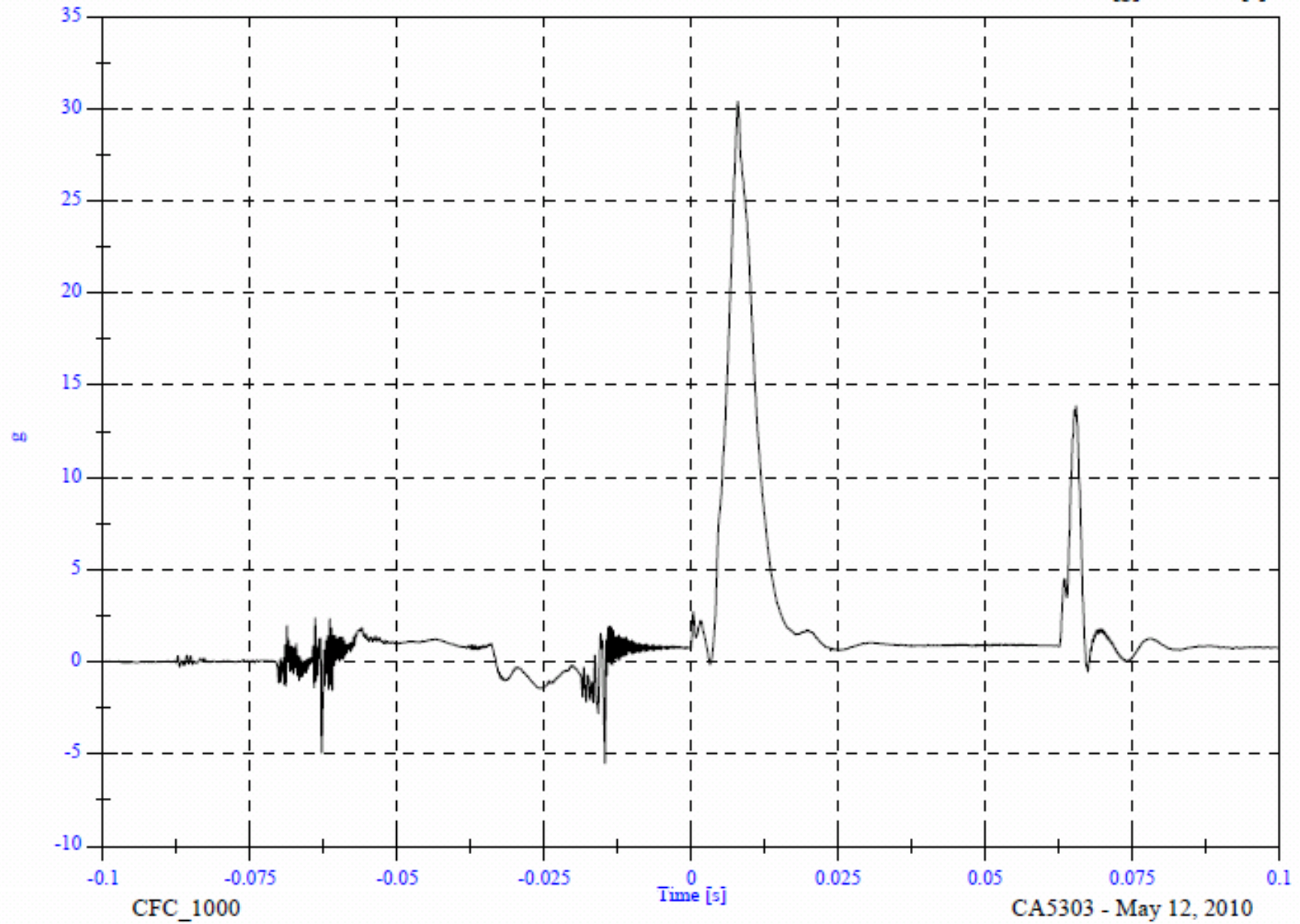


AP2 LH Side

Headform Z Acceleration

Max: 30.4 [g] at 0.008 [s]

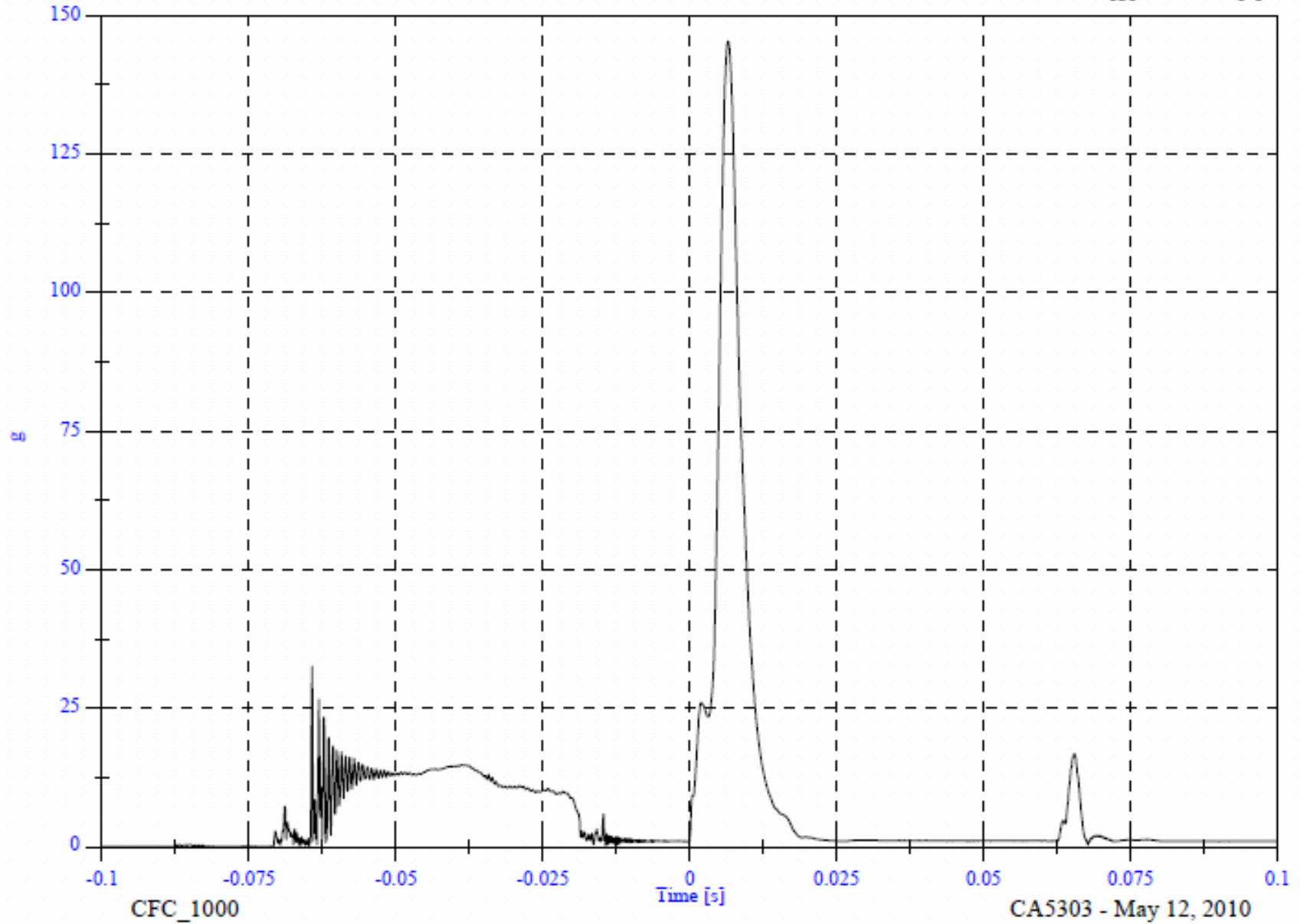
Min: -5.5 [g] at -0.015 [s]

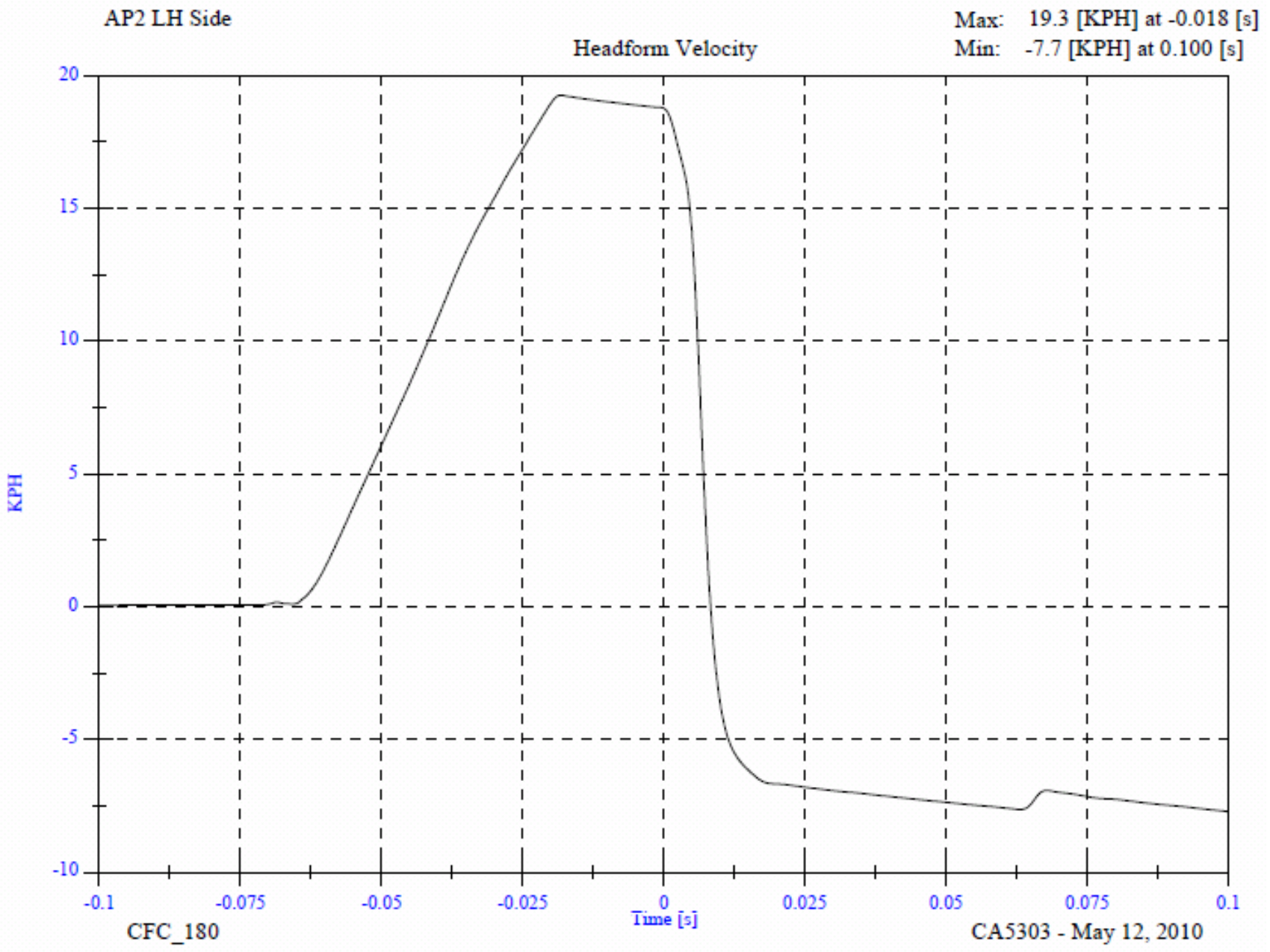


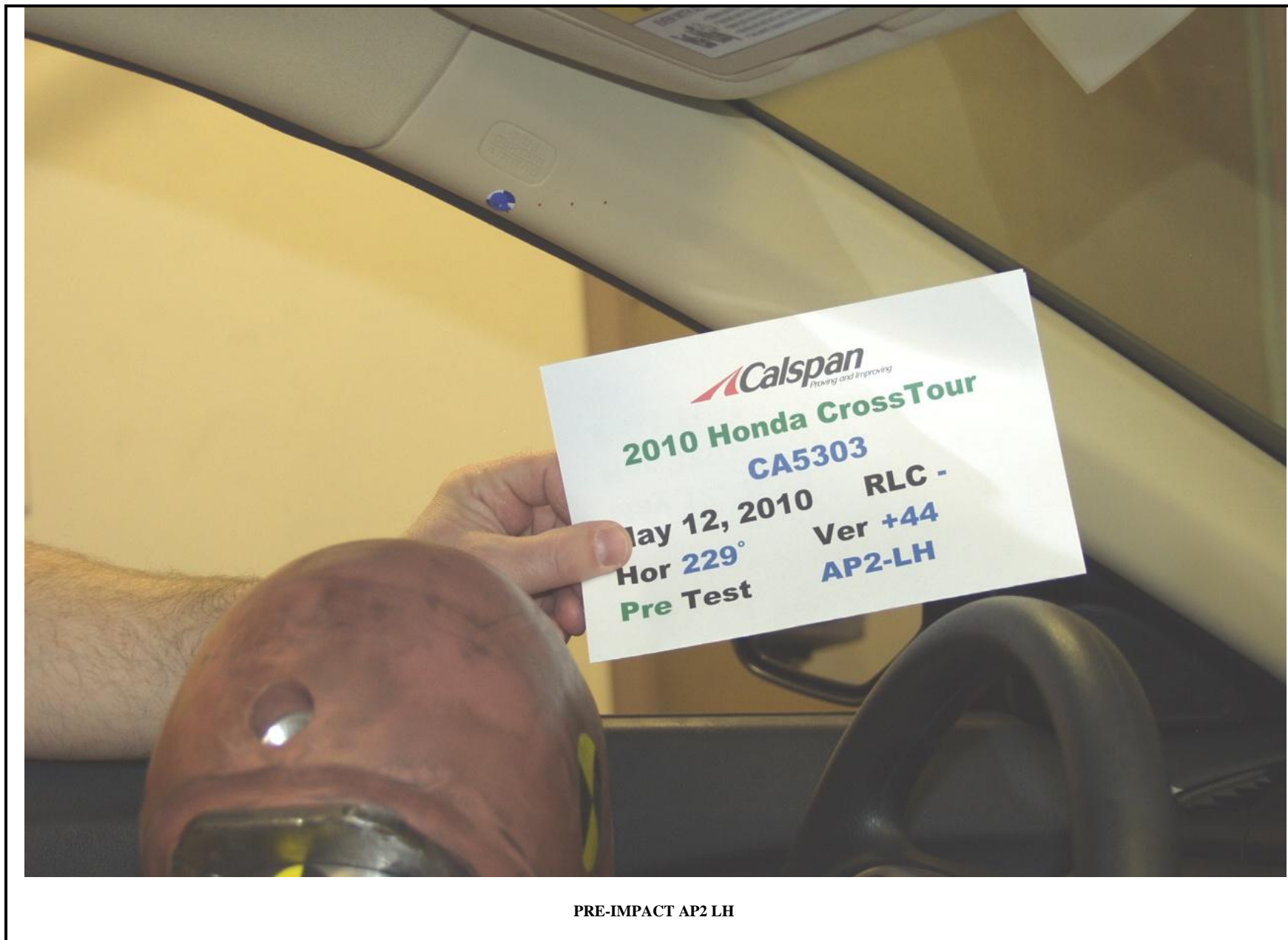
AP2 LH Side

Headform Resultant

Max: 145.3 [g] at 0.007 [s]  
Min: 0.0 [g] at -0.081 [s]







PRE-IMPACT AP2 LH



POST-IMPACT AP2 LH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	10
Test Date:	12 May 2010
Target Location:	SR1 LH
Target Code:	SR1 LH
Horizontal Impact Angle:	270
Vertical Impact Angle:	42
Ambient Temperature:	21
Relative Humidity:	32.4%
Time of Impact:	10:37
Headform Number:	1142

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-8	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	29		mm up



POST-IMPACT SR1 LH HEADFORM

Free Motion HIC	189.2
HIC(d)	309.2
Impact Velocity (kph)	18.54
HIC T1 (msec)	2.5
HIC T2 (msec)	11.2

## SR1 LH Side CA5303 - SR1 LH

FMH Headform 1142

Location: SR1 LH

Test Date: May 12, 2010

Work File: fmh

### -----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 309.2

Lab Humidity: 33.4 %

HIC (36ms): 189.2

Velocity at Impact: 18.54 KPH

t1: 2.5 msec

t2: 11.2 msec

Free Flight Distance: 222.62 mm

Duration: 8.7 msec

Maximum: 67.3 g

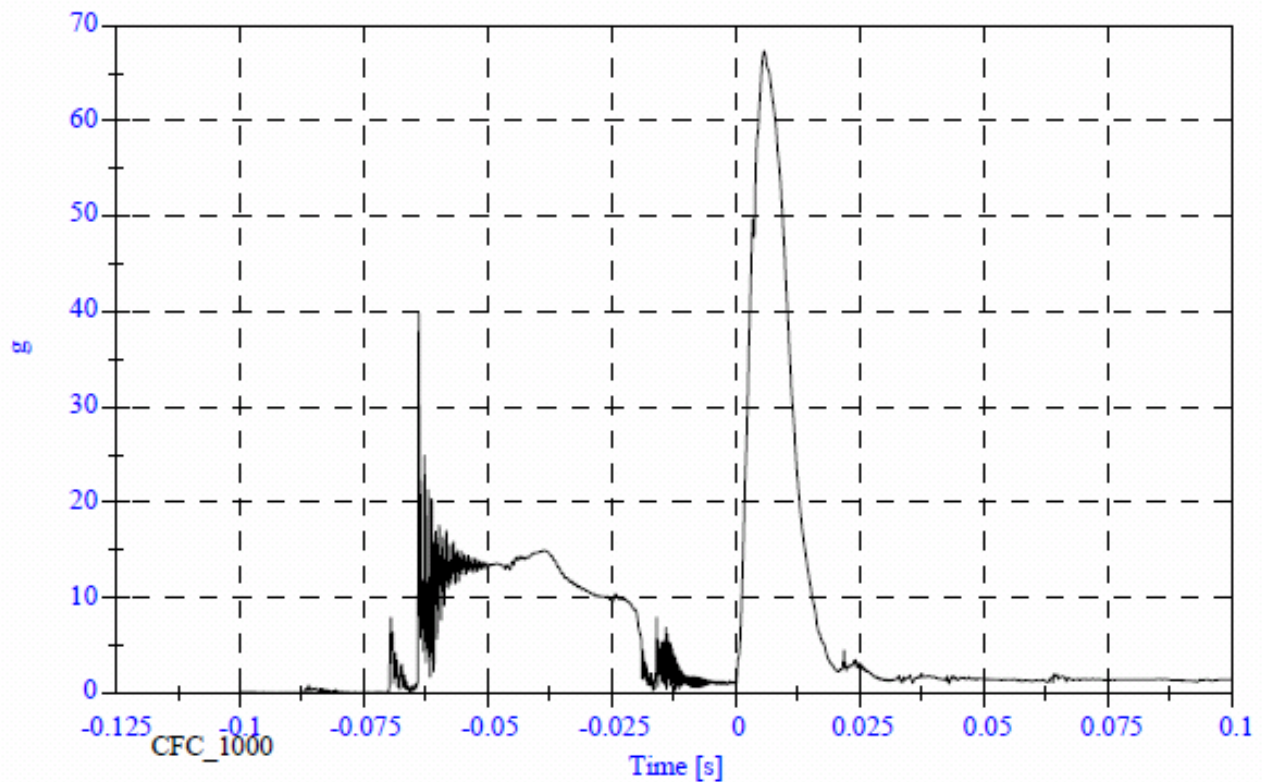
Average Acceleration: 6.7 g

SR1 LH Side

Headform Resultant

Max: 67.3 [g] at 0.006 [s]

Min: 0.0 [g] at -0.093 [s]



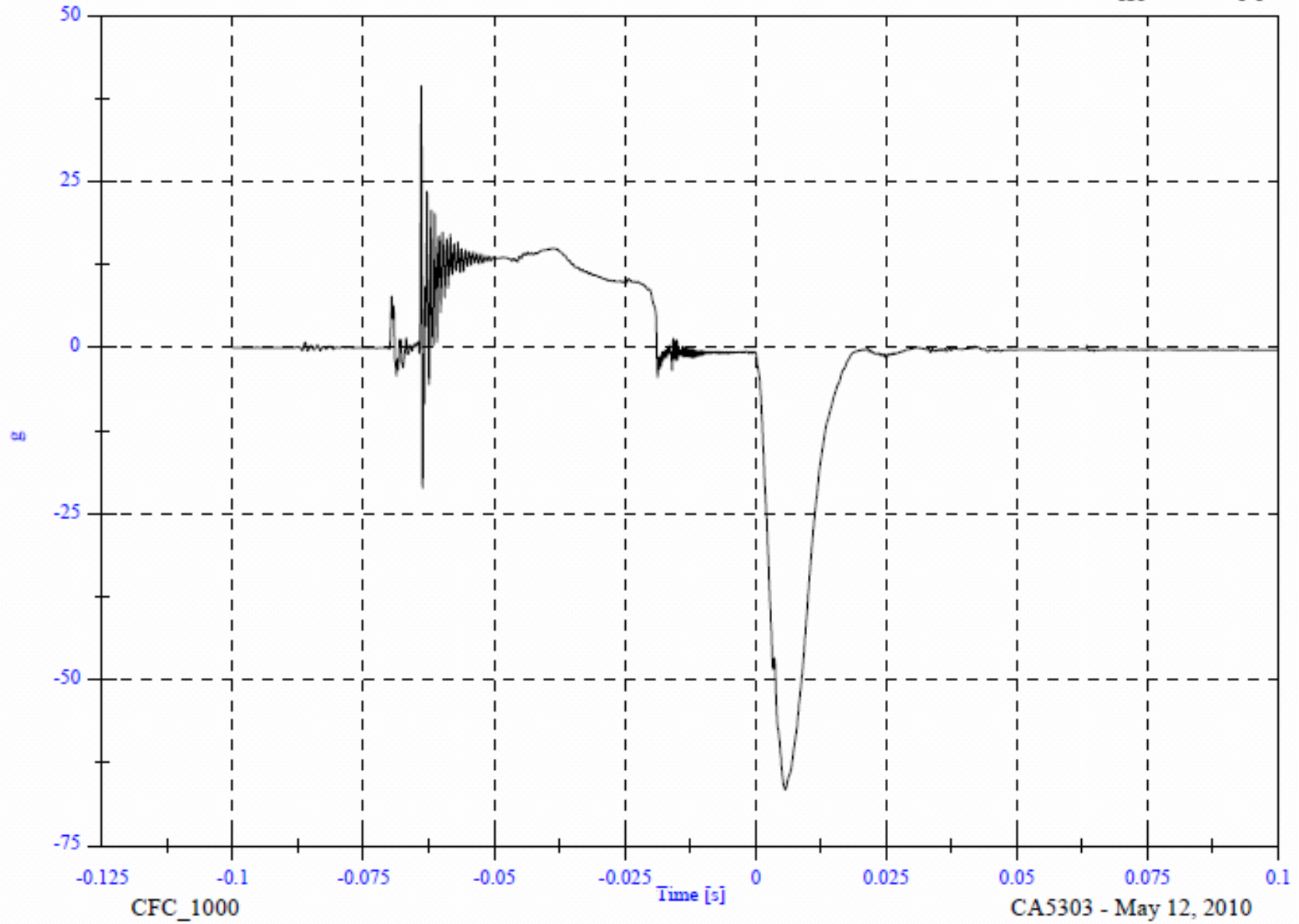


SR1 LH Side

Headform X Acceleration

Max: 39.4 [g] at -0.064 [s]

Min: -66.6 [g] at 0.006 [s]

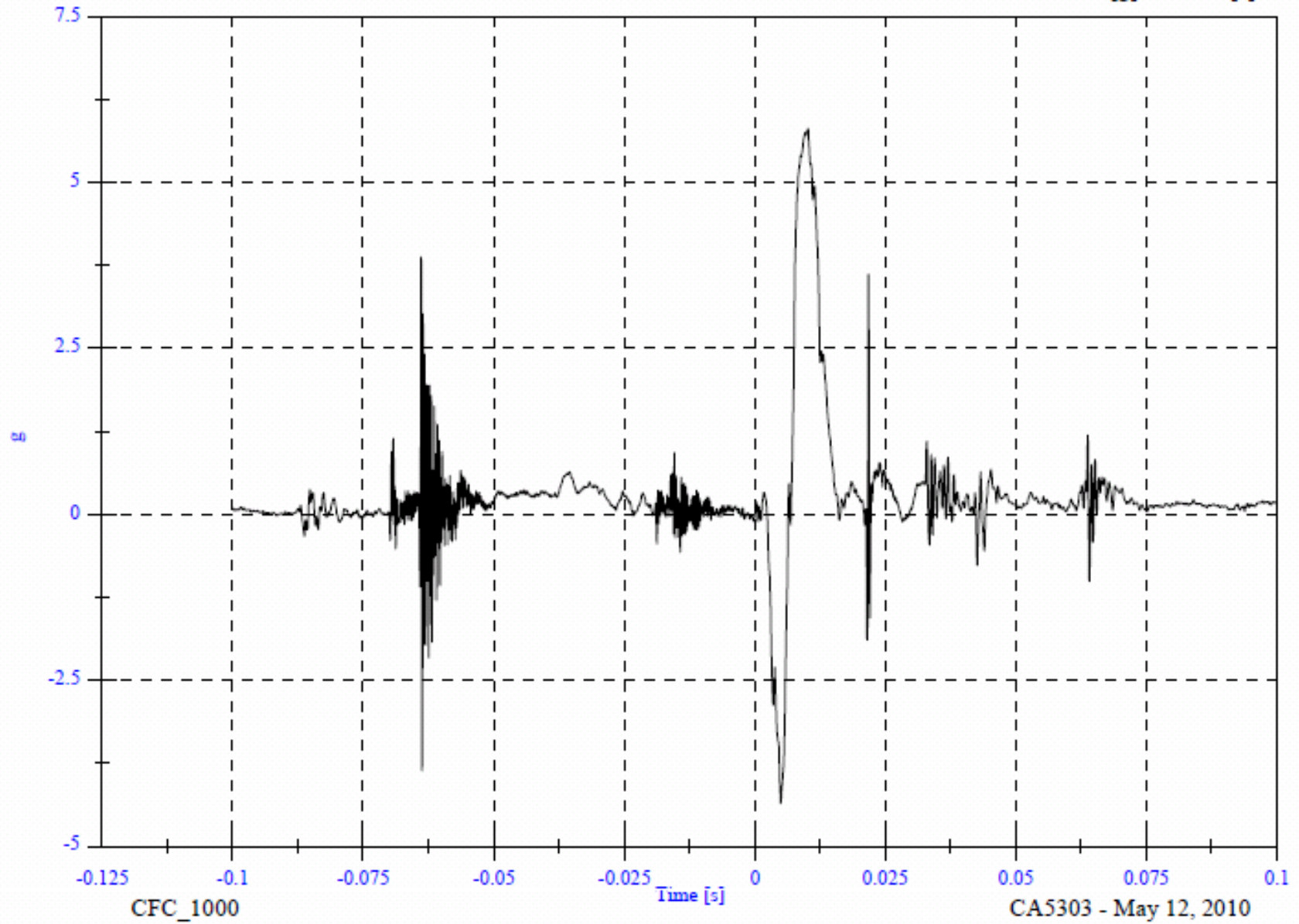


SR1 LH Side

Headform Y Acceleration

Max: 5.8 [g] at 0.010 [s]

Min: -4.4 [g] at 0.005 [s]

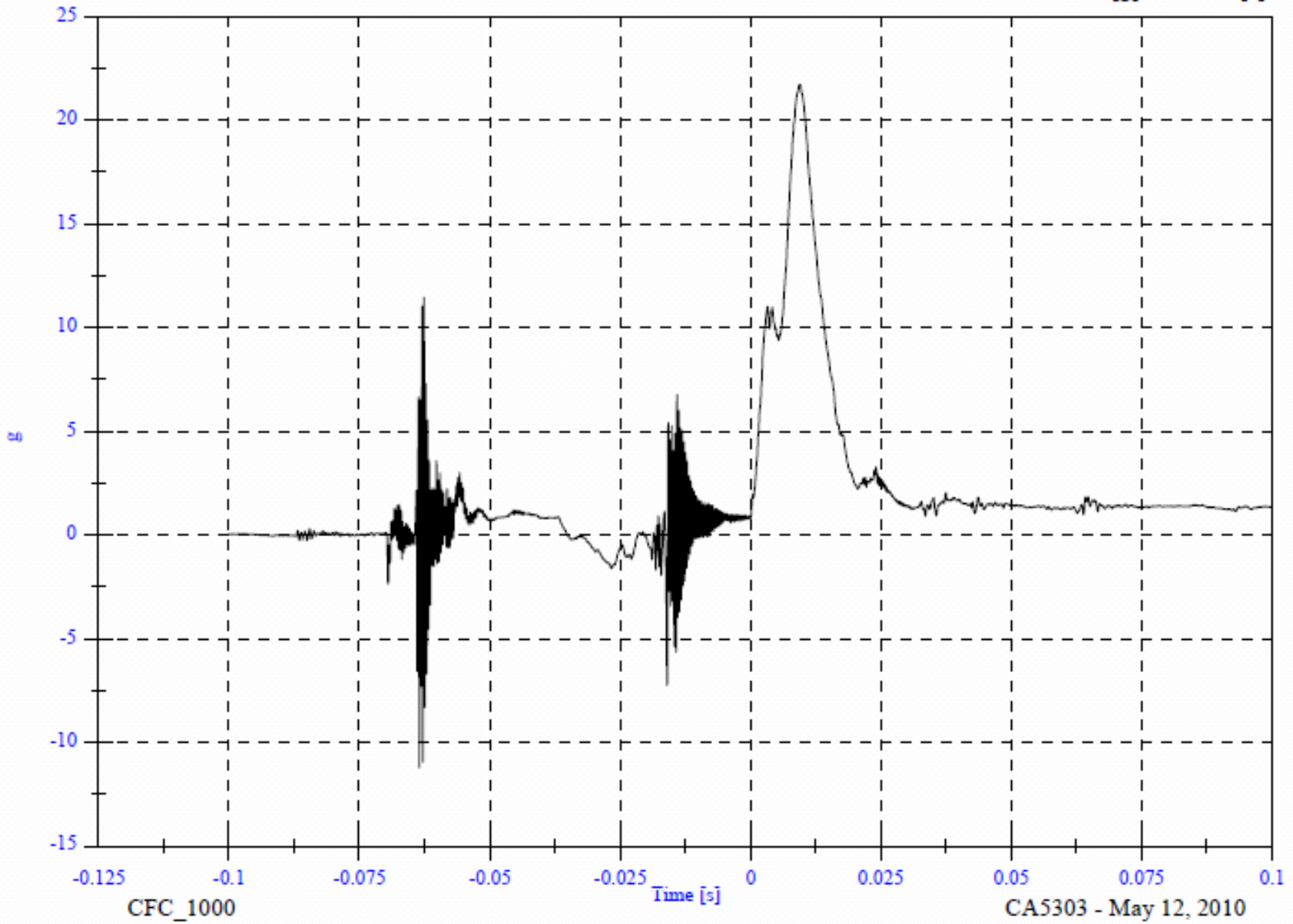


SR1 LH Side

Headform Z Acceleration

Max: 21.7 [g] at 0.009 [s]

Min: -11.2 [g] at -0.063 [s]

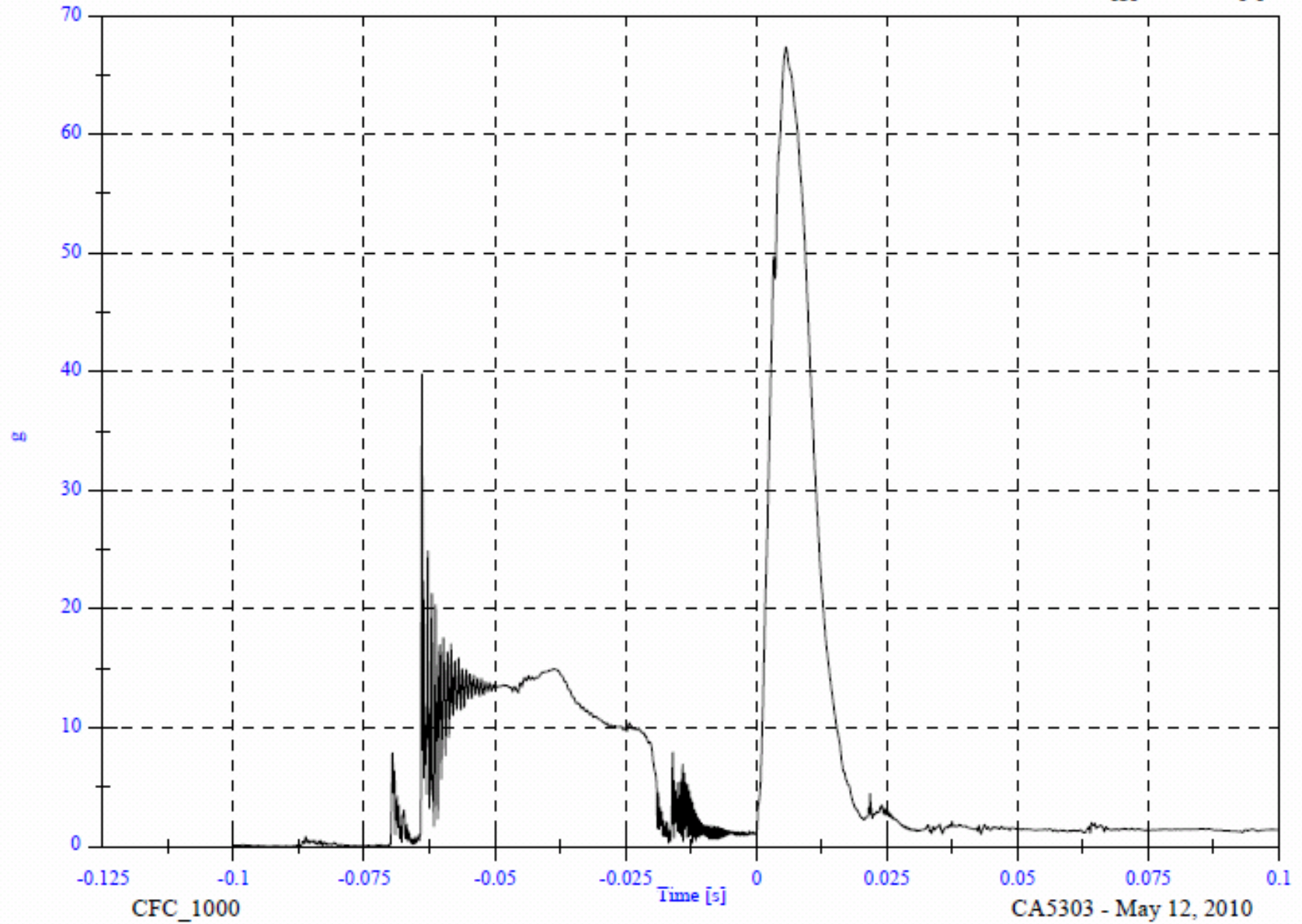


SR1 LH Side

Headform Resultant

Max: 67.3 [g] at 0.006 [s]

Min: 0.0 [g] at -0.093 [s]

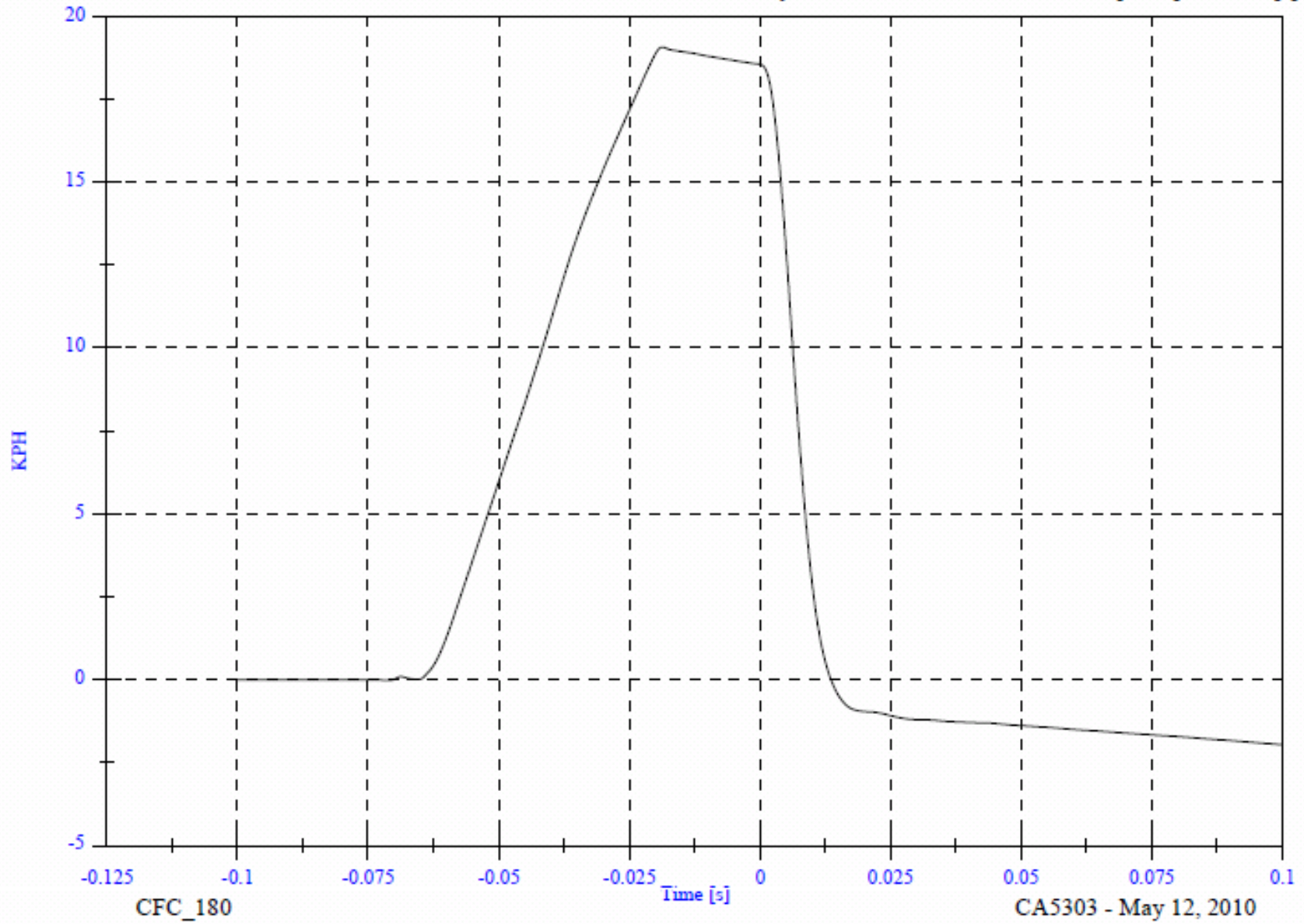


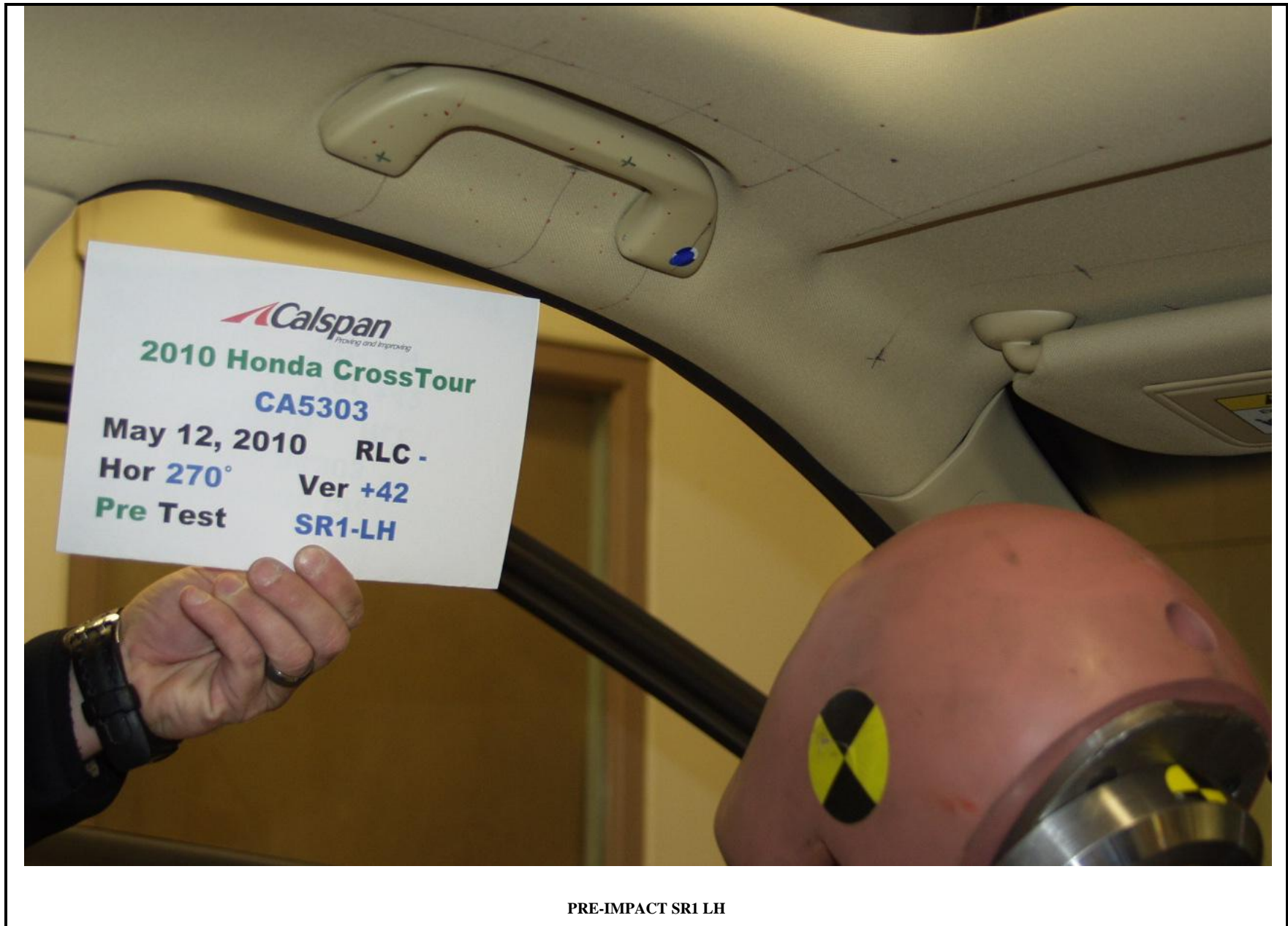
SR1 LH Side

Headform Velocity

Max: 19.1 [KPH] at -0.019 [s]

Min: -2.0 [KPH] at 0.100 [s]





PRE-IMPACT SR1 LH



POST-IMPACT SR1 LH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	11
Test Date:	12 May 2010
Target Location:	FH1 LH
Target Code:	FH1 LH
Horizontal Impact Angle:	180
Vertical Impact Angle:	50
Ambient Temperature:	21
Relative Humidity:	33.5%
Time of Impact:	11:07
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-1	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	46		mm up



POST-IMPACT FH1 LH HEADFORM

Free Motion HIC	567.6
HIC(d)	594.7
Impact Velocity (kph)	23.51
HIC T1 (msec)	1.7
HIC T2 (msec)	12.6



# FH1 LH Side CA5303 - FH1 LH

FMH Headform 355

Location: FH1 LH

Test Date: May 12, 2010

Work File: fmh

## TEST RESULTS

Lab Temperature: 21 C

HICd: 594.7

Lab Humidity: 33.5 %

HIC (36ms): 567.6

Velocity at Impact: 23.51 KPH

t1: 1.7 msec

t2: 12.6 msec

Free Flight Distance: 237.70 mm

Duration: 10.9 msec

Maximum: 108.6 g

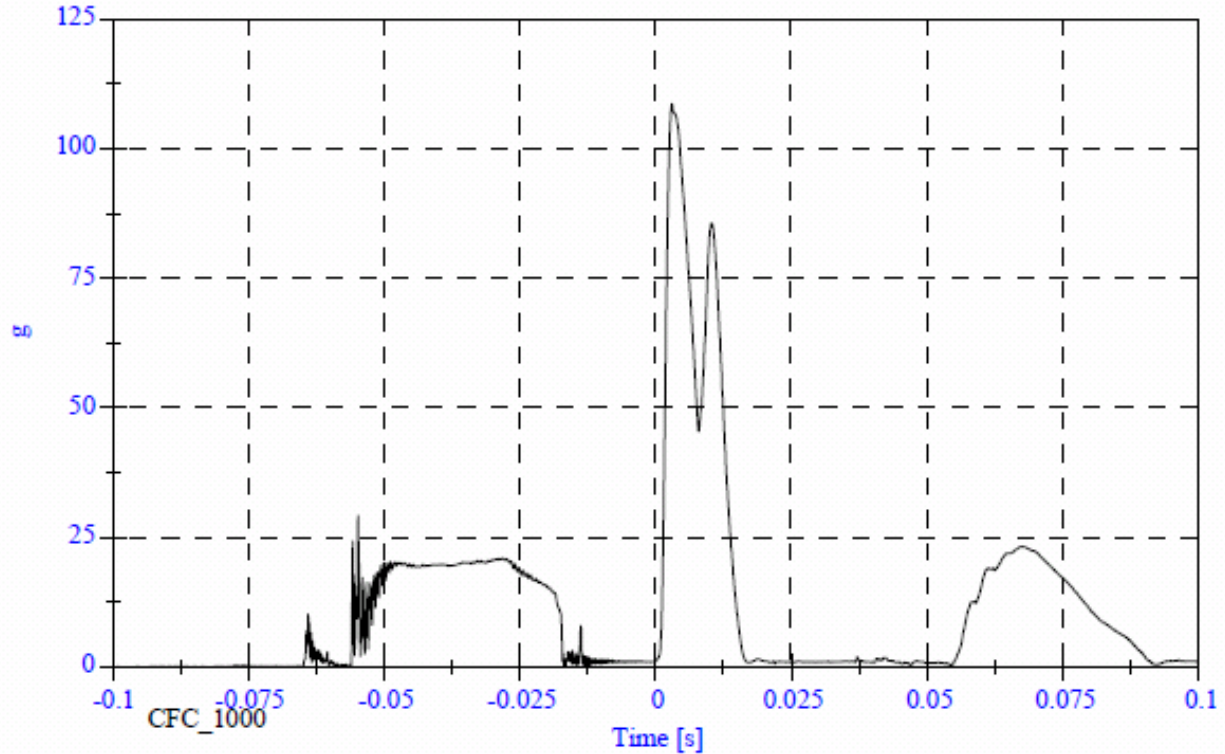
Average Acceleration: 11.1 g

FH1 LH Side

Headform Resultant

Max: 108.6 [g] at 0.003 [s]

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

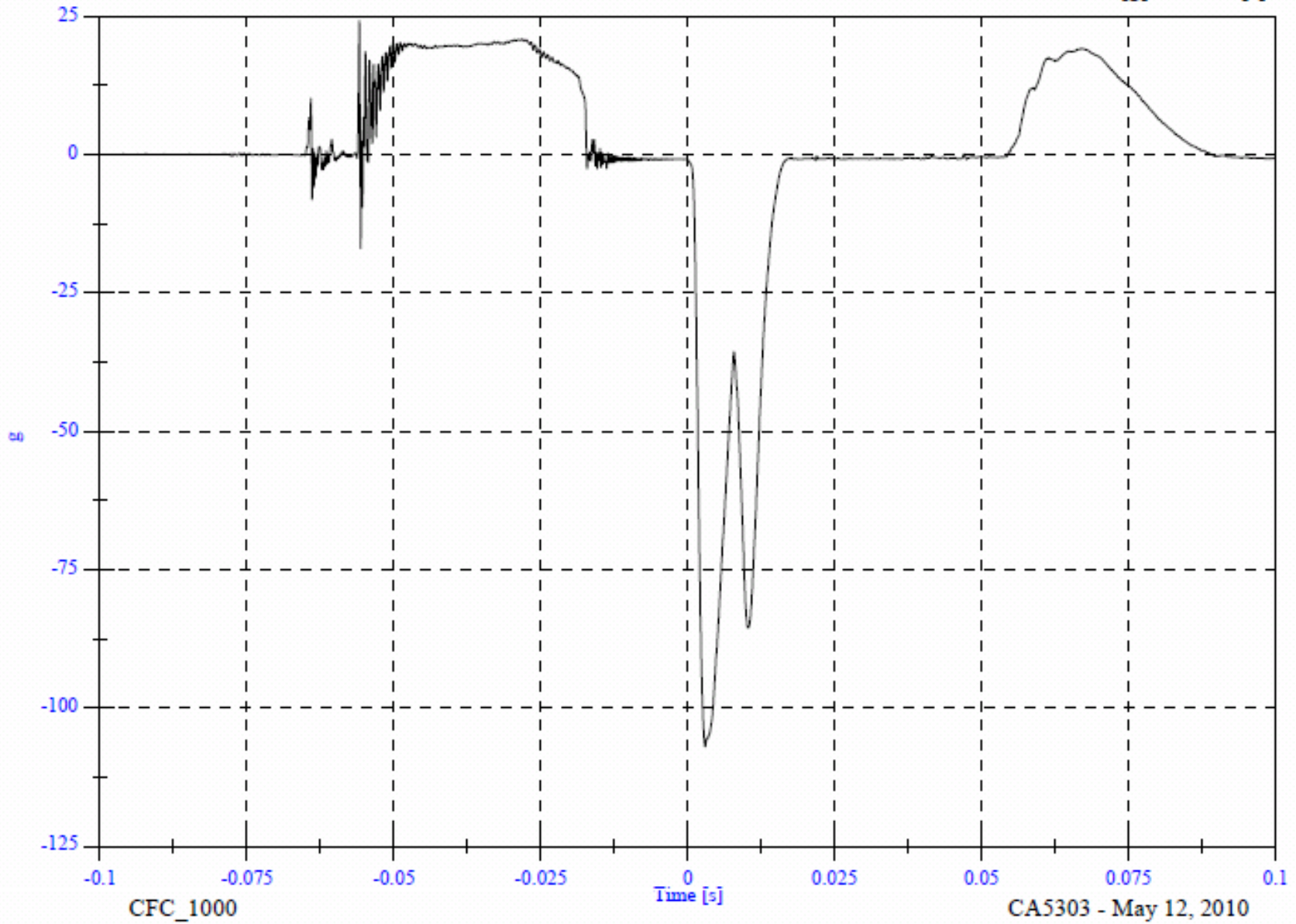


FH1 LH Side

Headform X Acceleration

Max: 24.1 [g] at -0.056 [s]

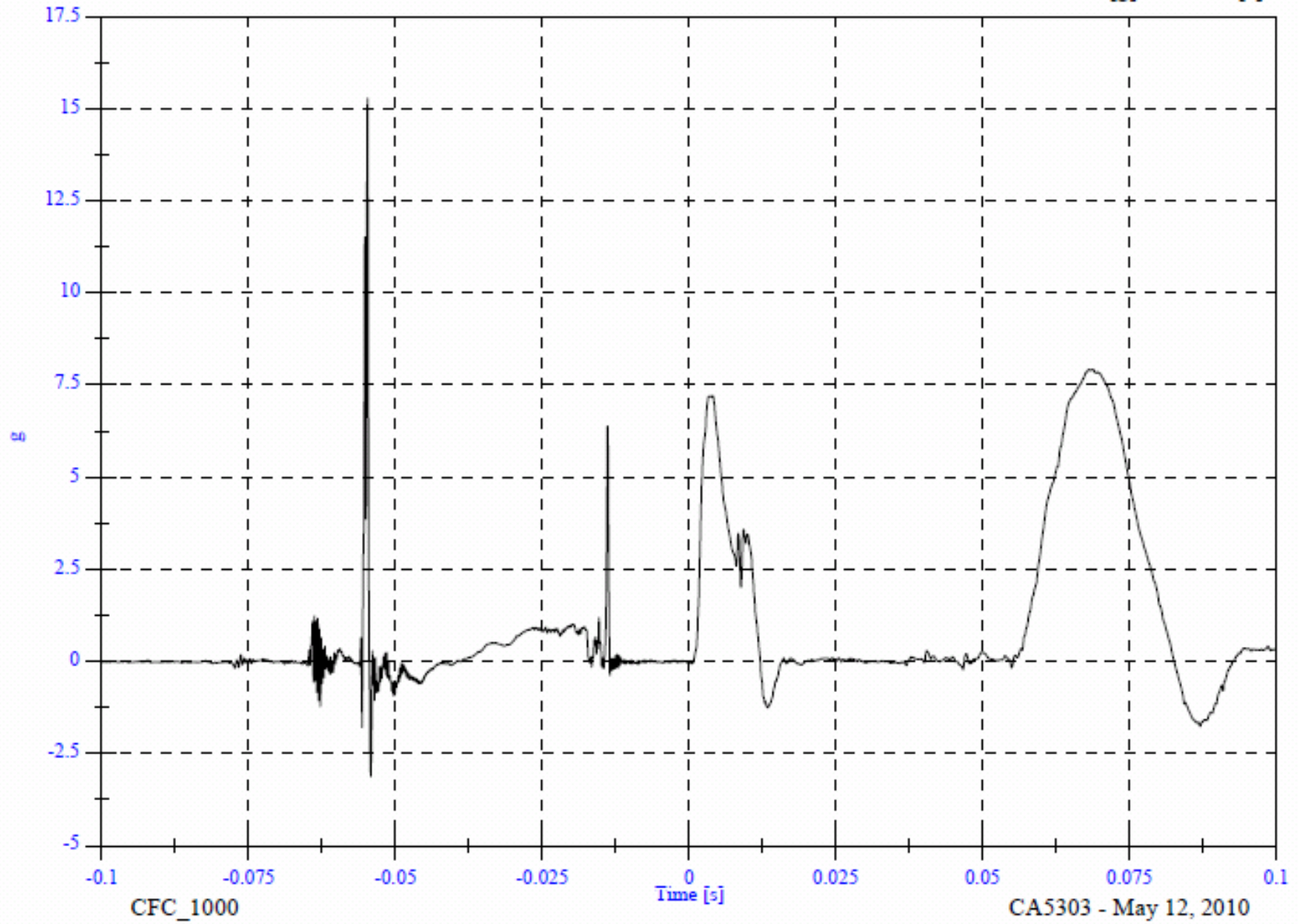
Min: -107.0 [g] at 0.003 [s]



FH1 LH Side

Headform Y Acceleration

Max: 15.3 [g] at -0.055 [s]  
Min: -3.1 [g] at -0.054 [s]

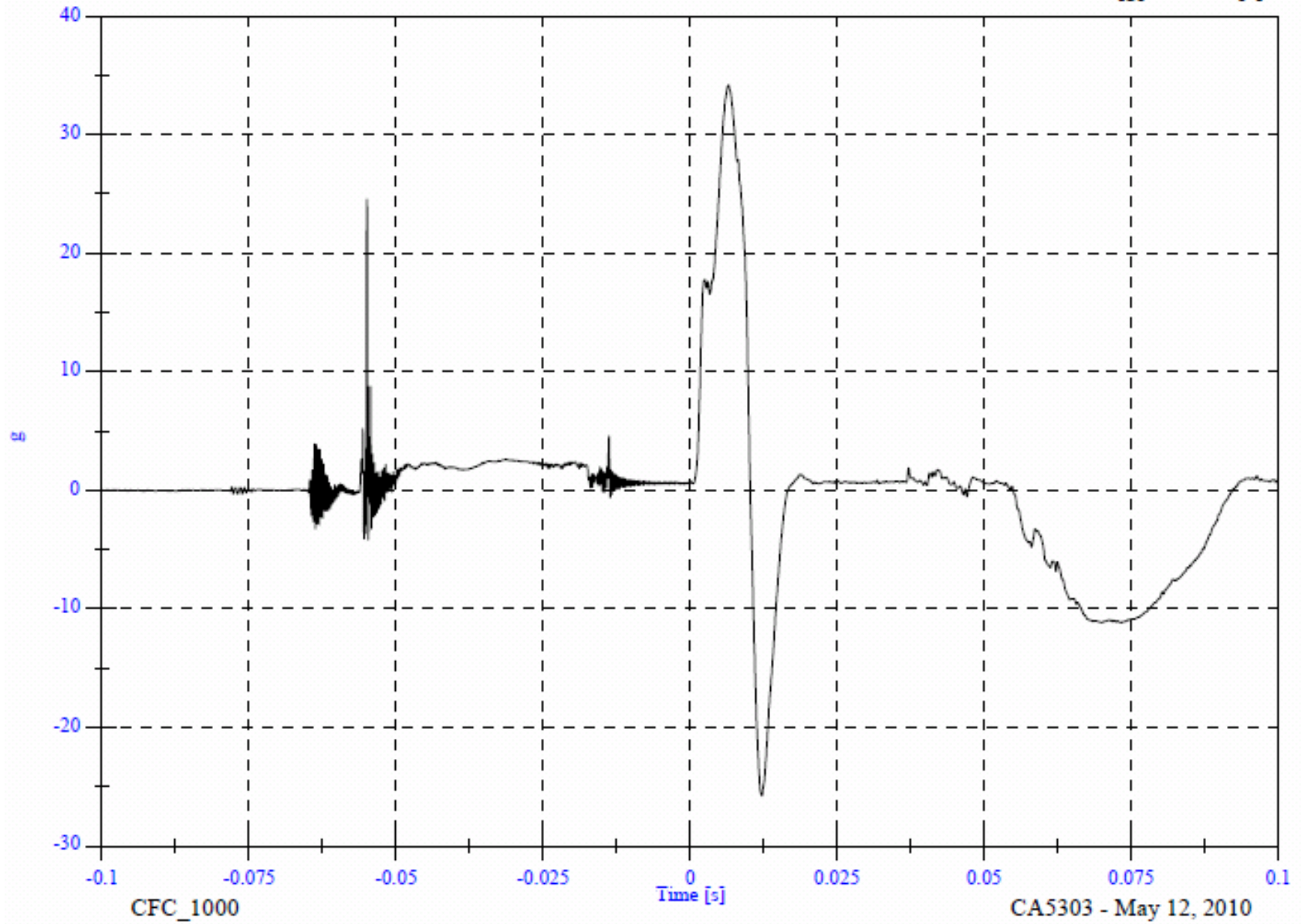


FH1 LH Side

Headform Z Acceleration

Max: 34.2 [g] at 0.007 [s]

Min: -25.8 [g] at 0.012 [s]

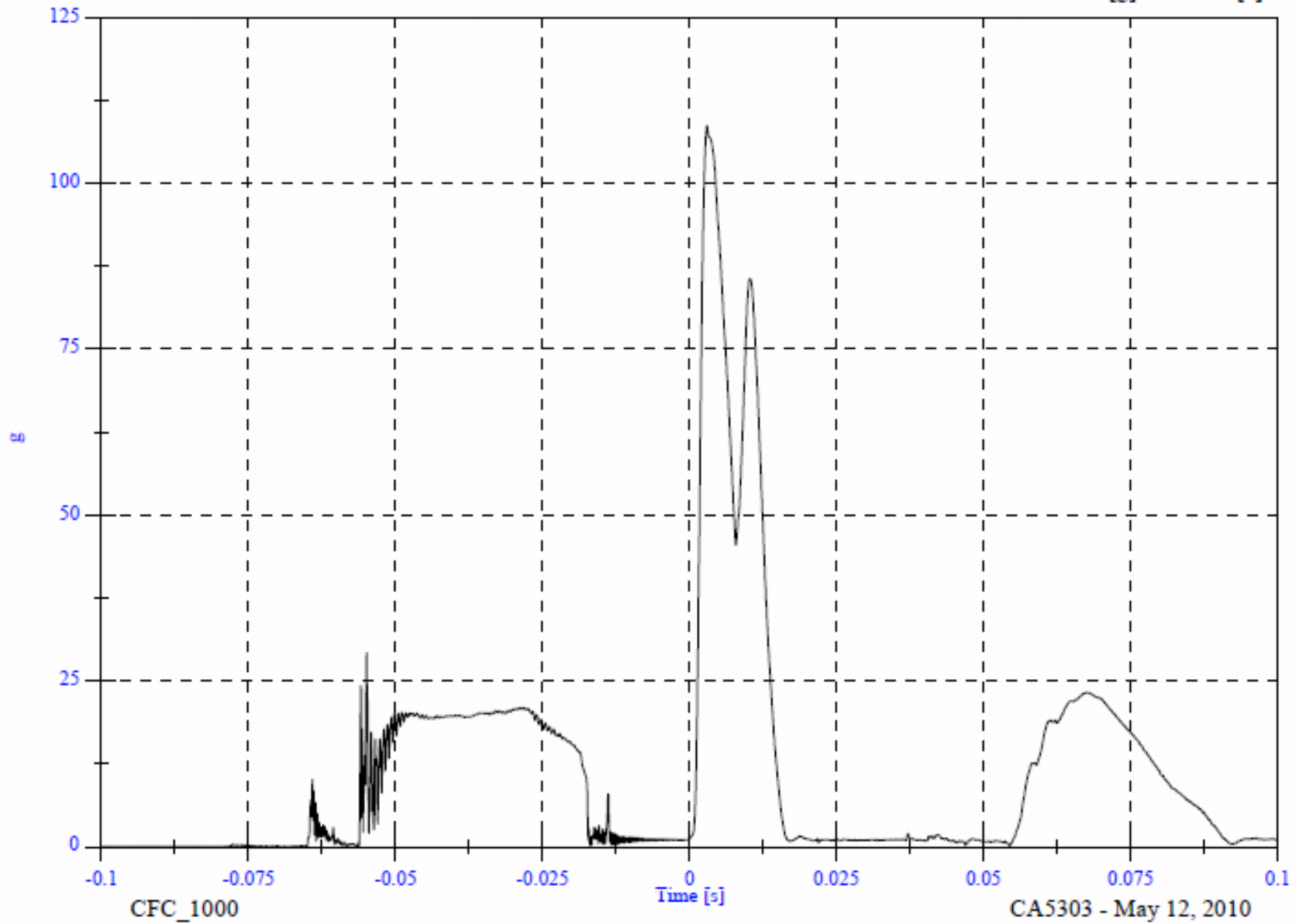


FH1 LH Side

Headform Resultant

Max: 108.6 [g] at 0.003 [s]

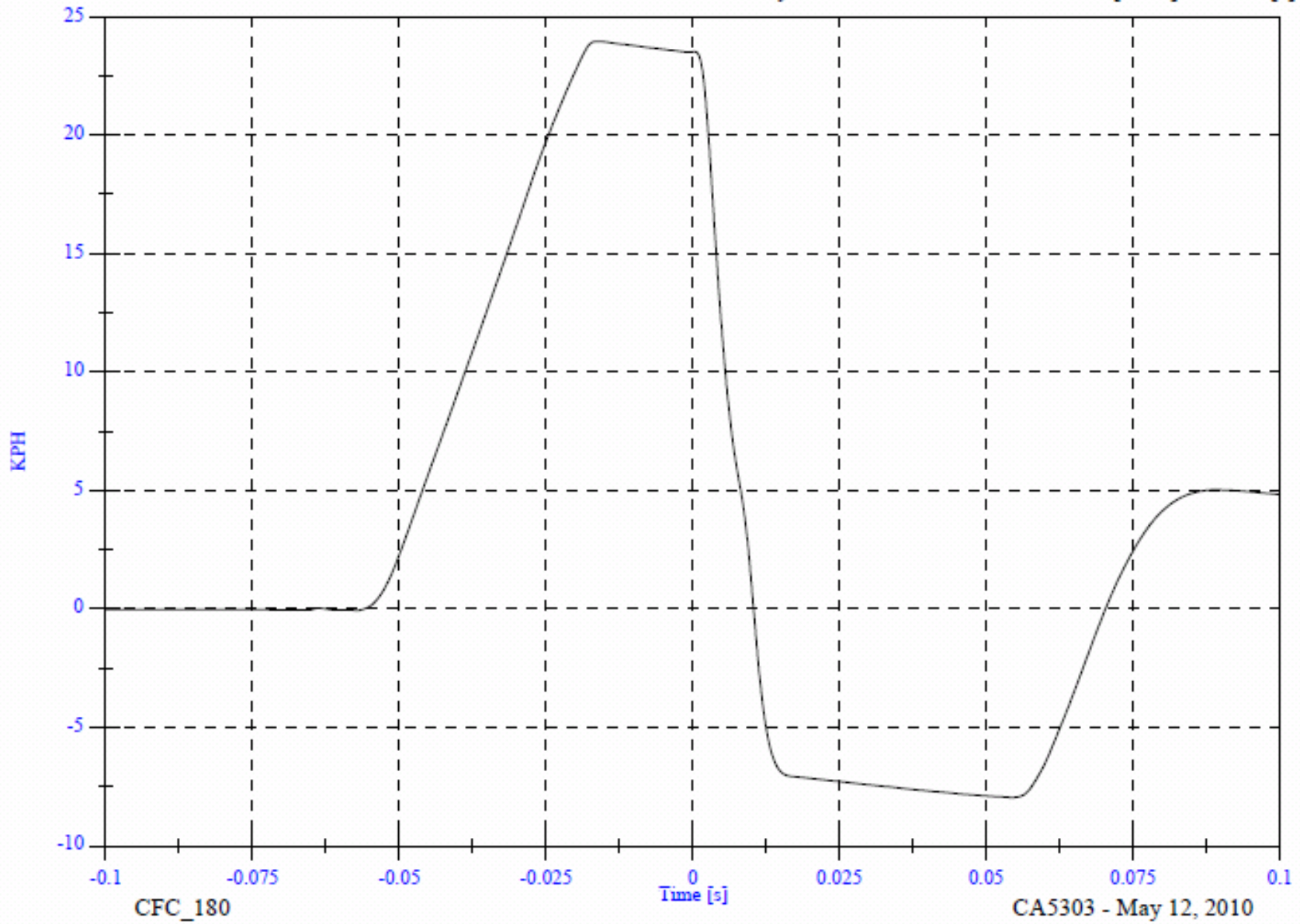
Min: 0.0 [g] at -0.097 [s]

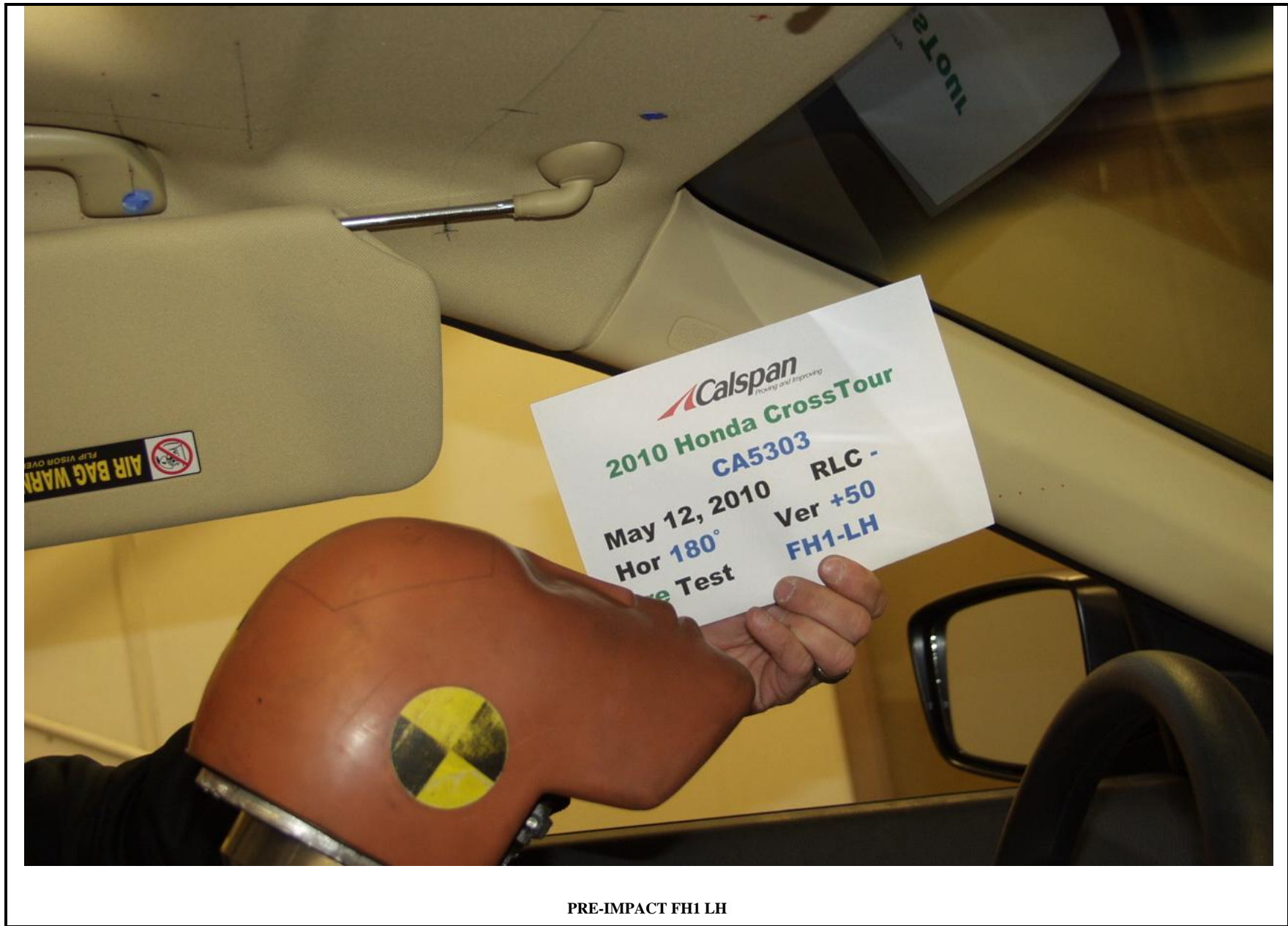


FH1 LH Side

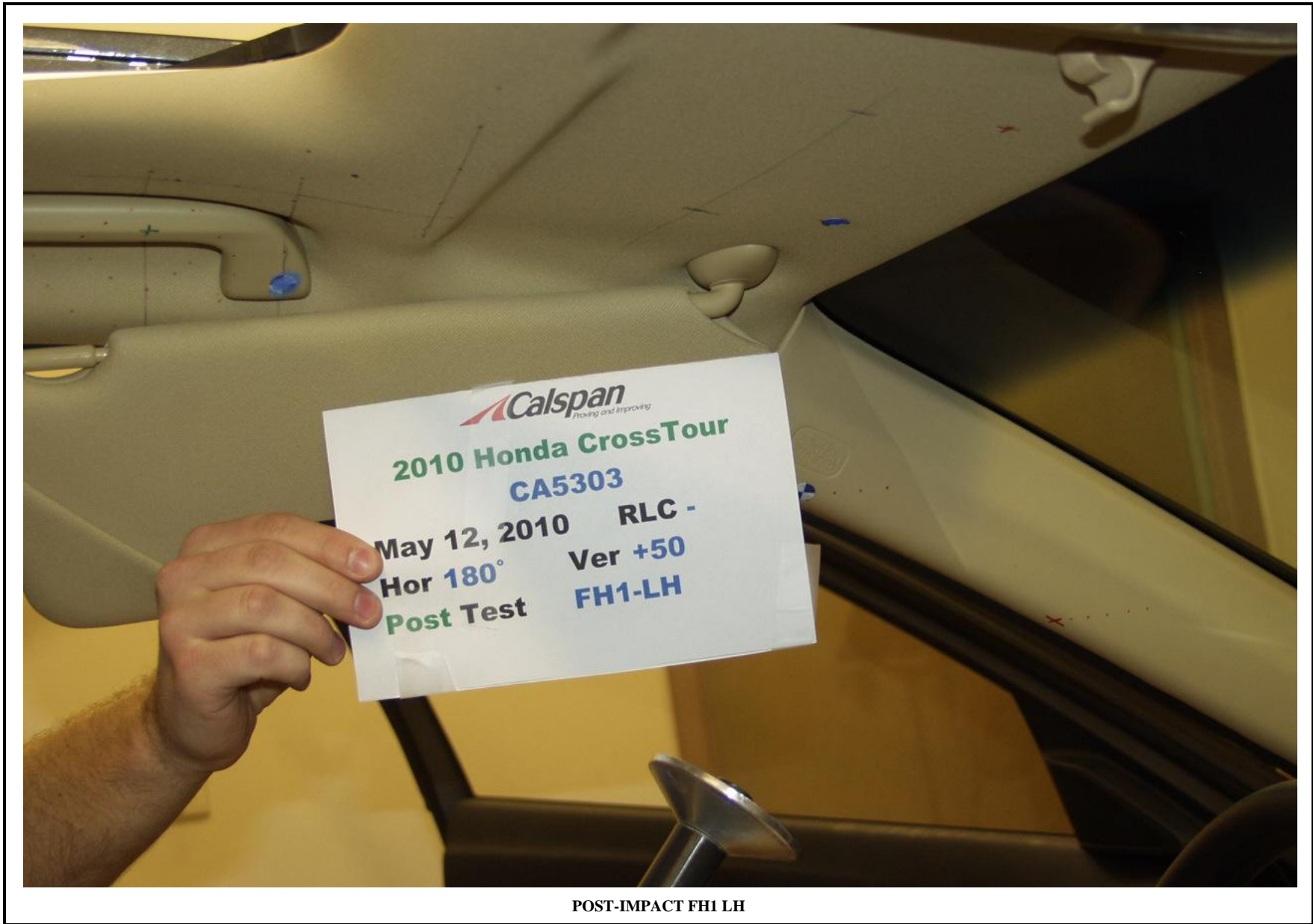
Headform Velocity

Max: 23.9 [KPH] at -0.016 [s]  
Min: -8.0 [KPH] at 0.054 [s]





PRE-IMPACT FH1 LH



POST-IMPACT FH1 LH



VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Honda Crosstour
VIN:	5J6TF1H3XAL001277
DATE OF MANUFACTURE:	11/09 (SEE CERTIFICATION LABEL)
COLOR:	Grey

Test Number:	12
Test Date:	12 May 2010
Target Location:	SR2B RH Relocated x2
Target Code:	SR2B RH
Horizontal Impact Angle:	90
Vertical Impact Angle:	45
Ambient Temperature:	21
Relative Humidity:	33.8%
Time of Impact:	12:05
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	-5	<input type="checkbox"/>	mm right <input checked="" type="checkbox"/> mm left
On Centerline	32		mm up



POST-IMPACT SR2B RH HEADFORM

Free Motion HIC	217.1
HIC(d)	330.2
Impact Velocity (kph)	18.96
HIC T1 (msec)	3.5
HIC T2 (msec)	15.8

# SR2B RH Side CA5303 - SR2B RH

FMH Headform 62

Location: SR2B RH

Test Date: May 12, 2010

Work File: fmh

## TEST RESULTS

Lab Temperature: 21 C

HICd: 330.2

Lab Humidity: 33.8 %

HIC (36ms): 217.1

Velocity at Impact: 18.96 KPH

t1: 3.5 msec

t2: 15.8 msec

Free Flight Distance: 227.14 mm

Duration: 12.3 msec

Maximum: 65.5 g

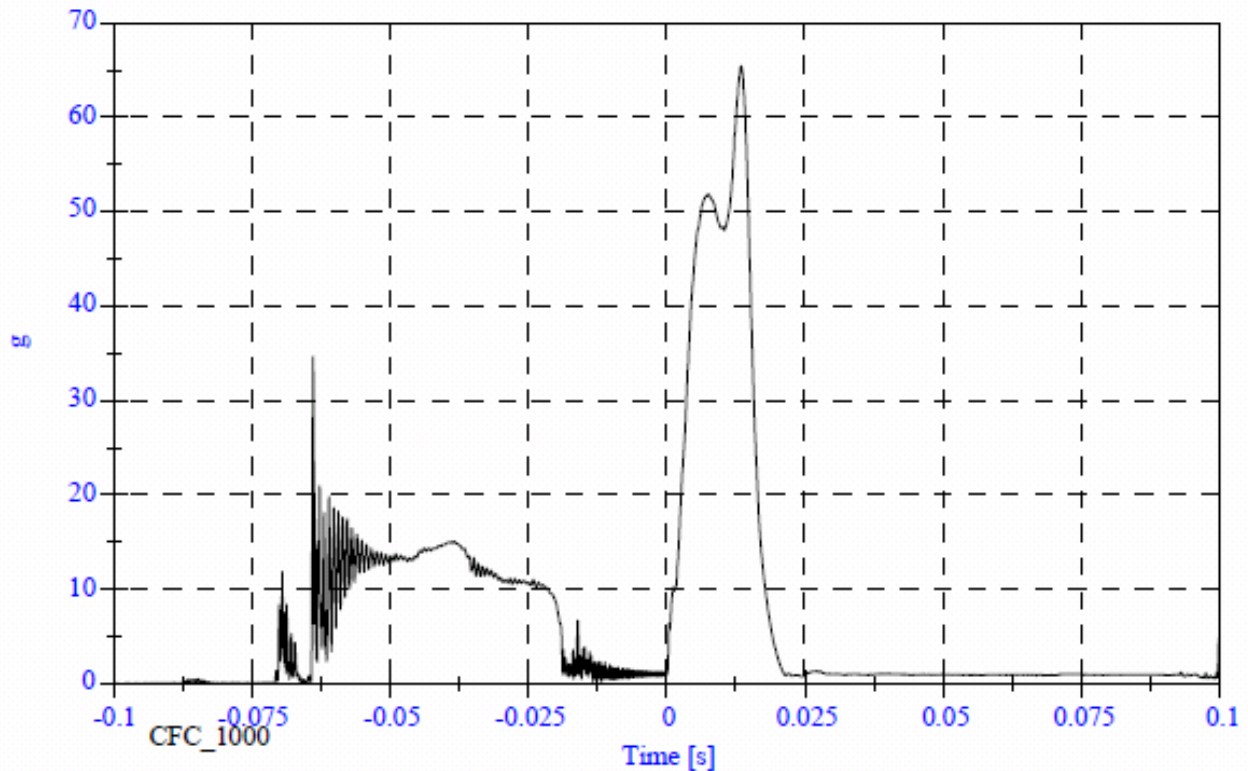
Average Acceleration: 7.0 g

SR2B RH Side

Max: 65.5 [g] at 0.013 [s]

Headform Resultant

Min: 0.0 [g] at -0.095 [s]

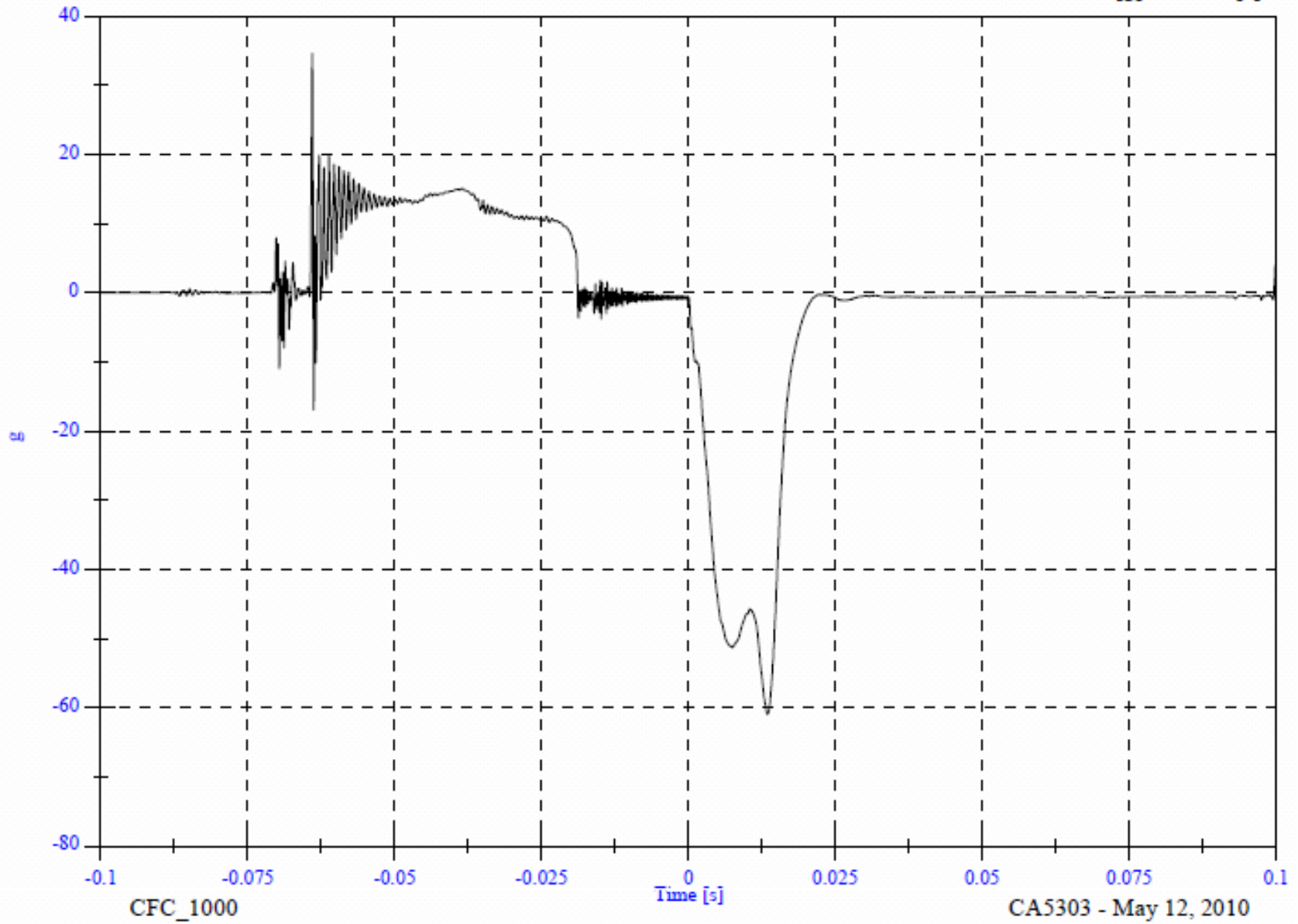


SR2B RH Side

Headform X Acceleration

Max: 34.6 [g] at -0.064 [s]

Min: -61.0 [g] at 0.013 [s]

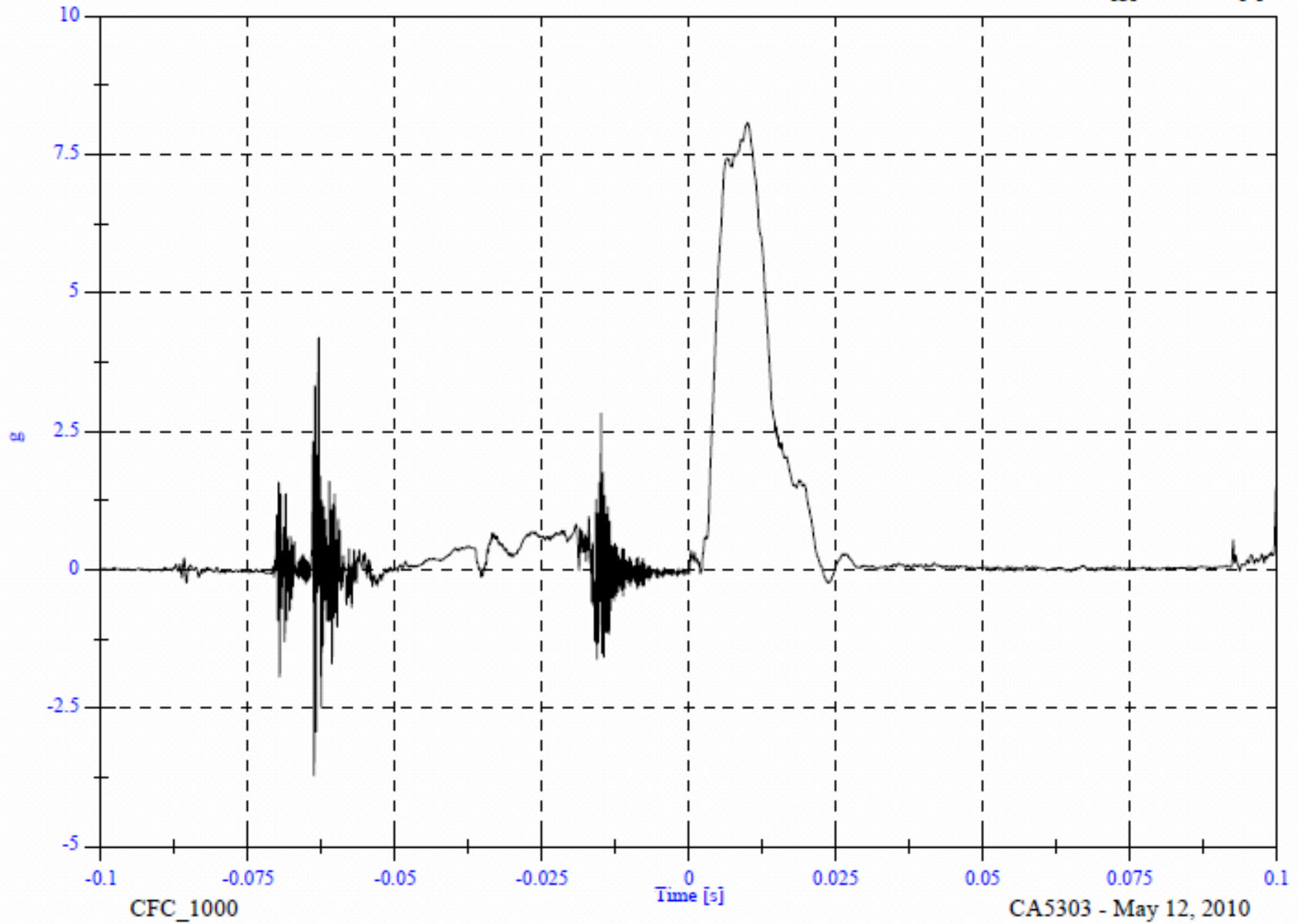


SR2B RH Side

Headform Y Acceleration

Max: 8.1 [g] at 0.010 [s]

Min: -3.7 [g] at -0.064 [s]

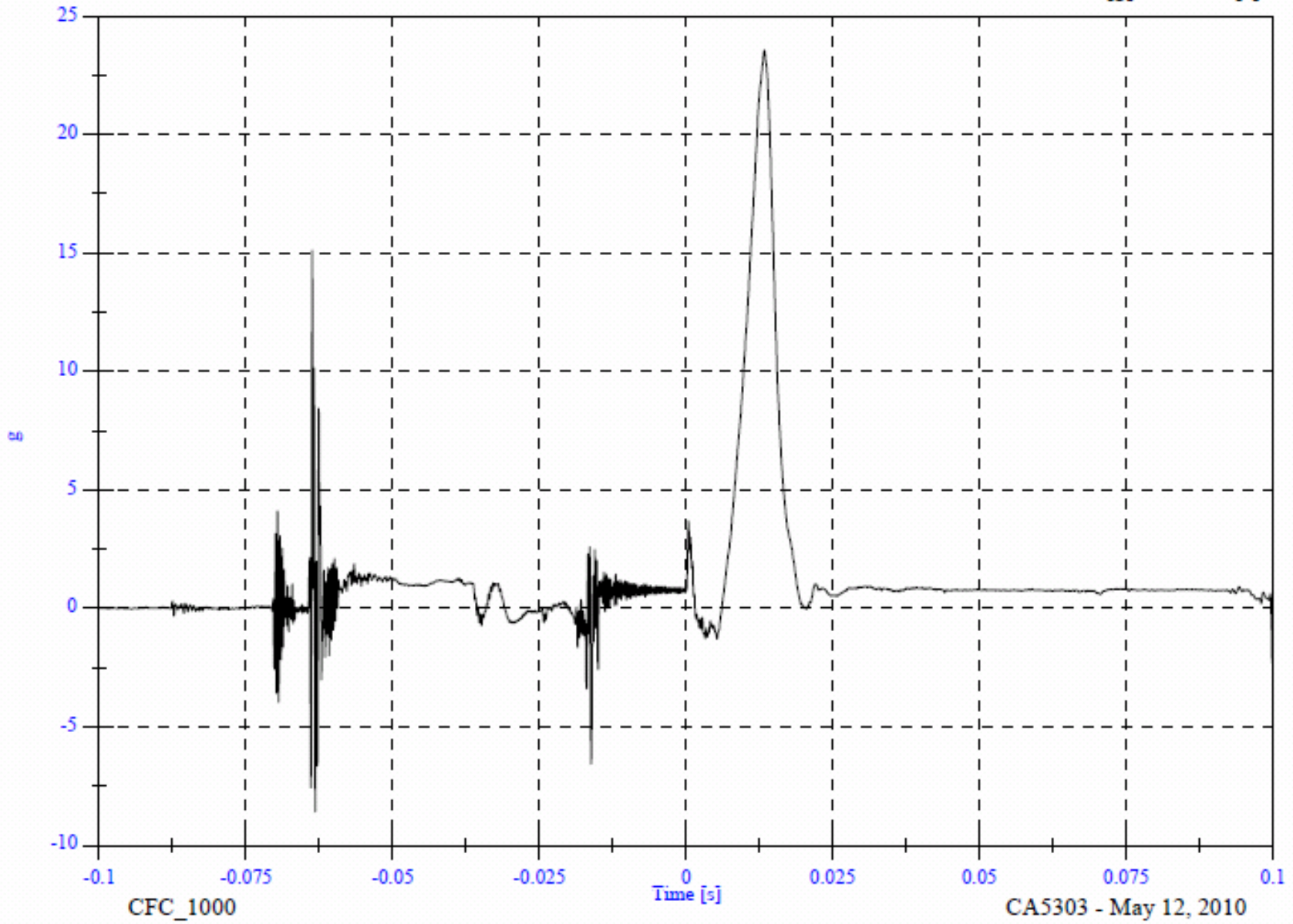


SR2B RH Side

Headform Z Acceleration

Max: 23.6 [g] at 0.013 [s]

Min: -8.6 [g] at -0.063 [s]

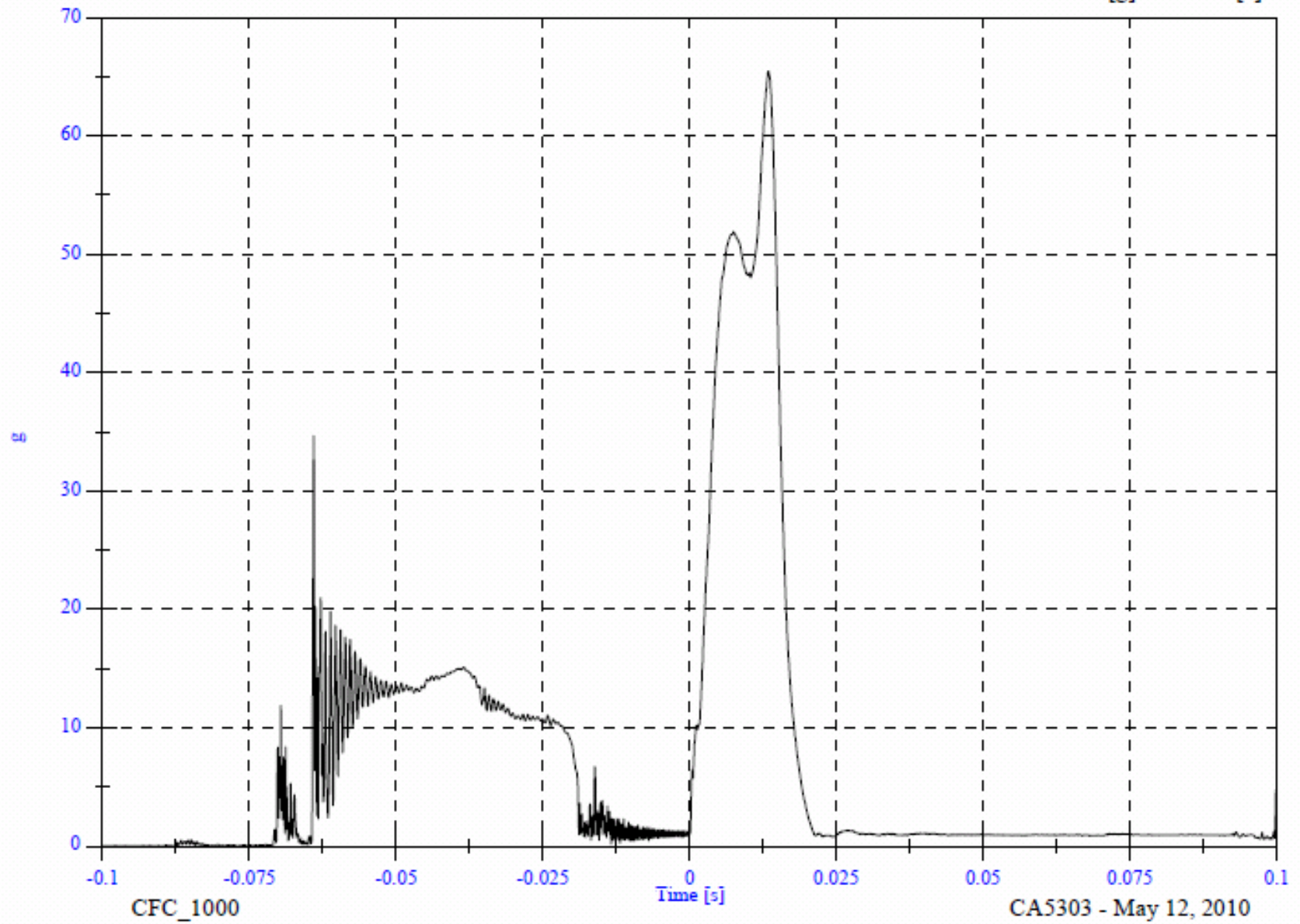


SR2B RH Side

Headform Resultant

Max: 65.5 [g] at 0.013 [s]

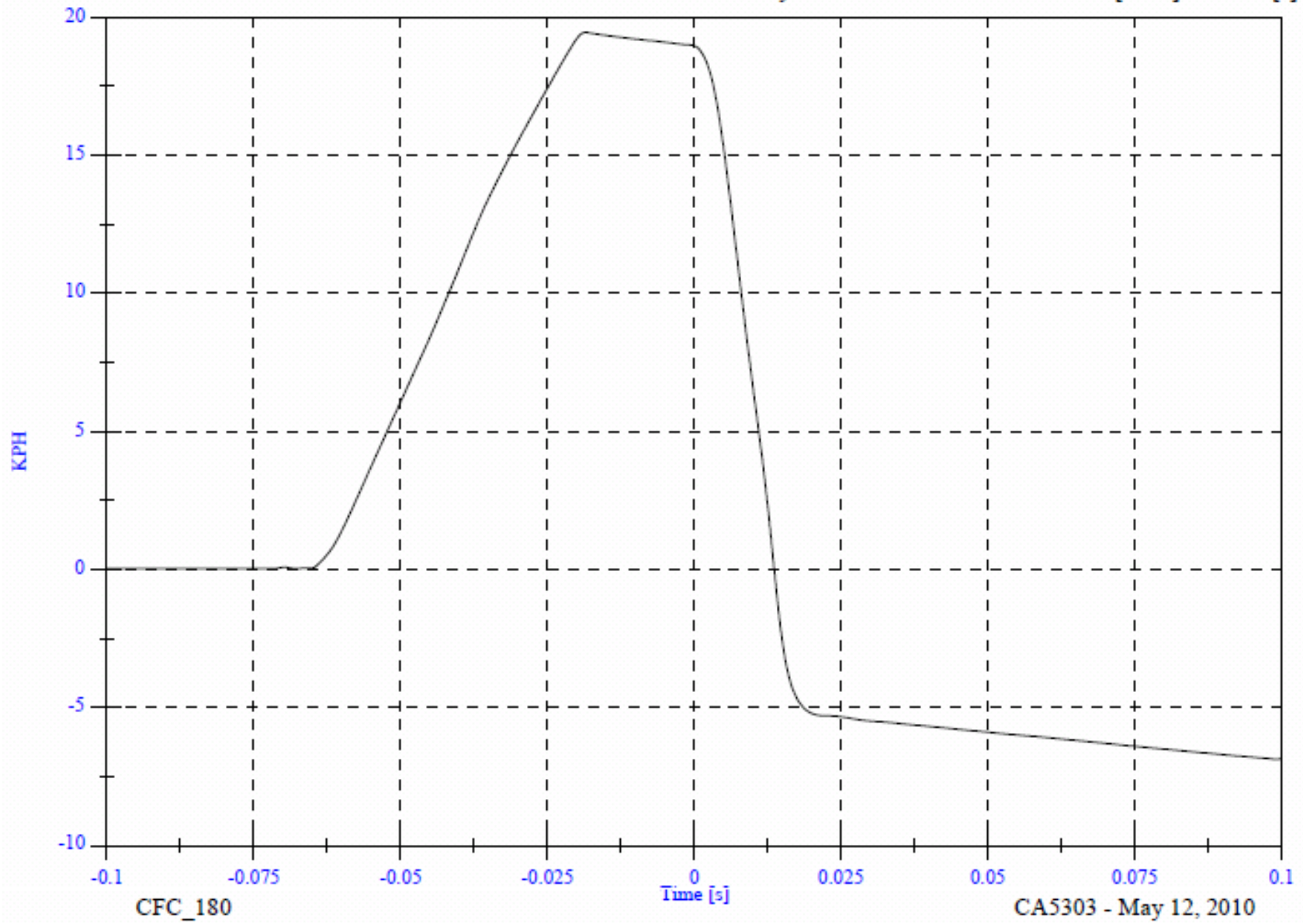
Min: 0.0 [g] at -0.095 [s]



SR2B RH Side

Max: 19.4 [KPH] at -0.019 [s]  
Min: -6.9 [KPH] at 0.099 [s]

Headform Velocity





PRE-IMPACT SR2B RH





POST-IMPACT SR2B RH

**APPENDIX A**

**PHOTOGRAPHS**

## PHOTOGRAPHS

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Figure A-1 : LEFT SIDE VIEW OF VEHICLE



Figure A-2 : RIGHT SIDE VIEW OF VEHICLE



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



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

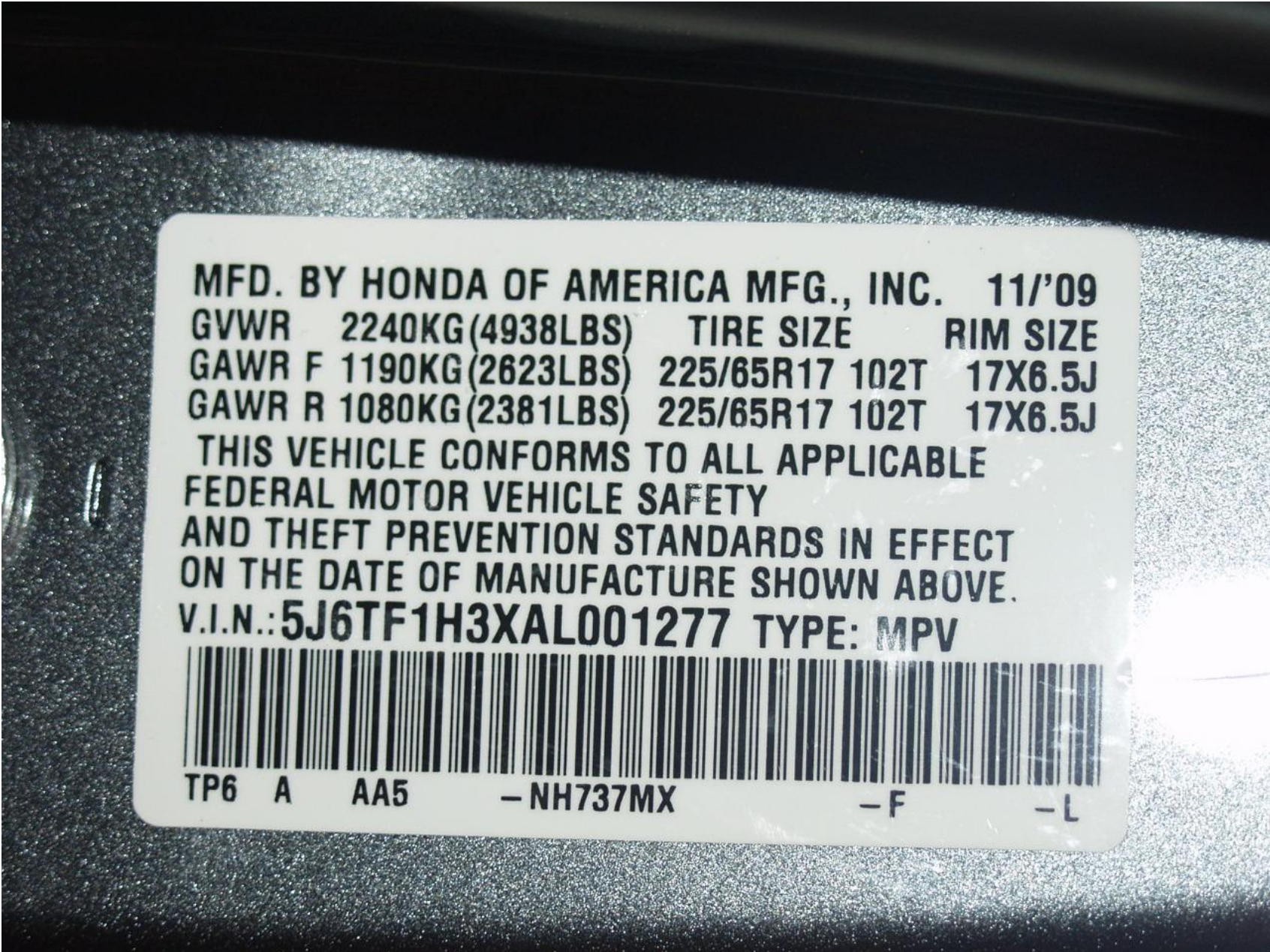


Figure A-5: VEHICLE'S CERTIFICATION LABEL





Figure A-6 : VEHICLE'S TIRE INFORMATION LABEL

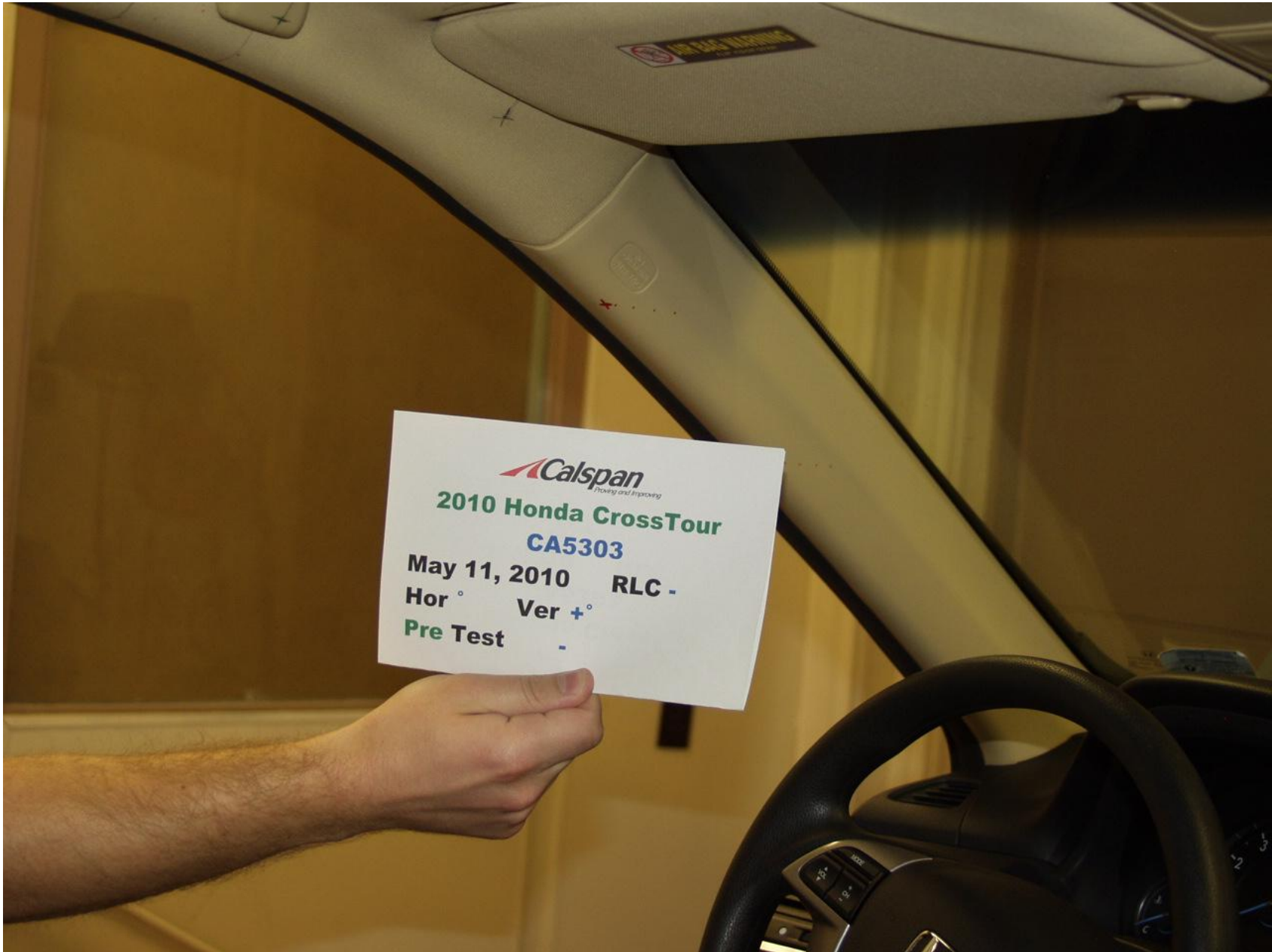


Figure A-7 : PRE-TEST DRIVER SIDE A-PILLAR

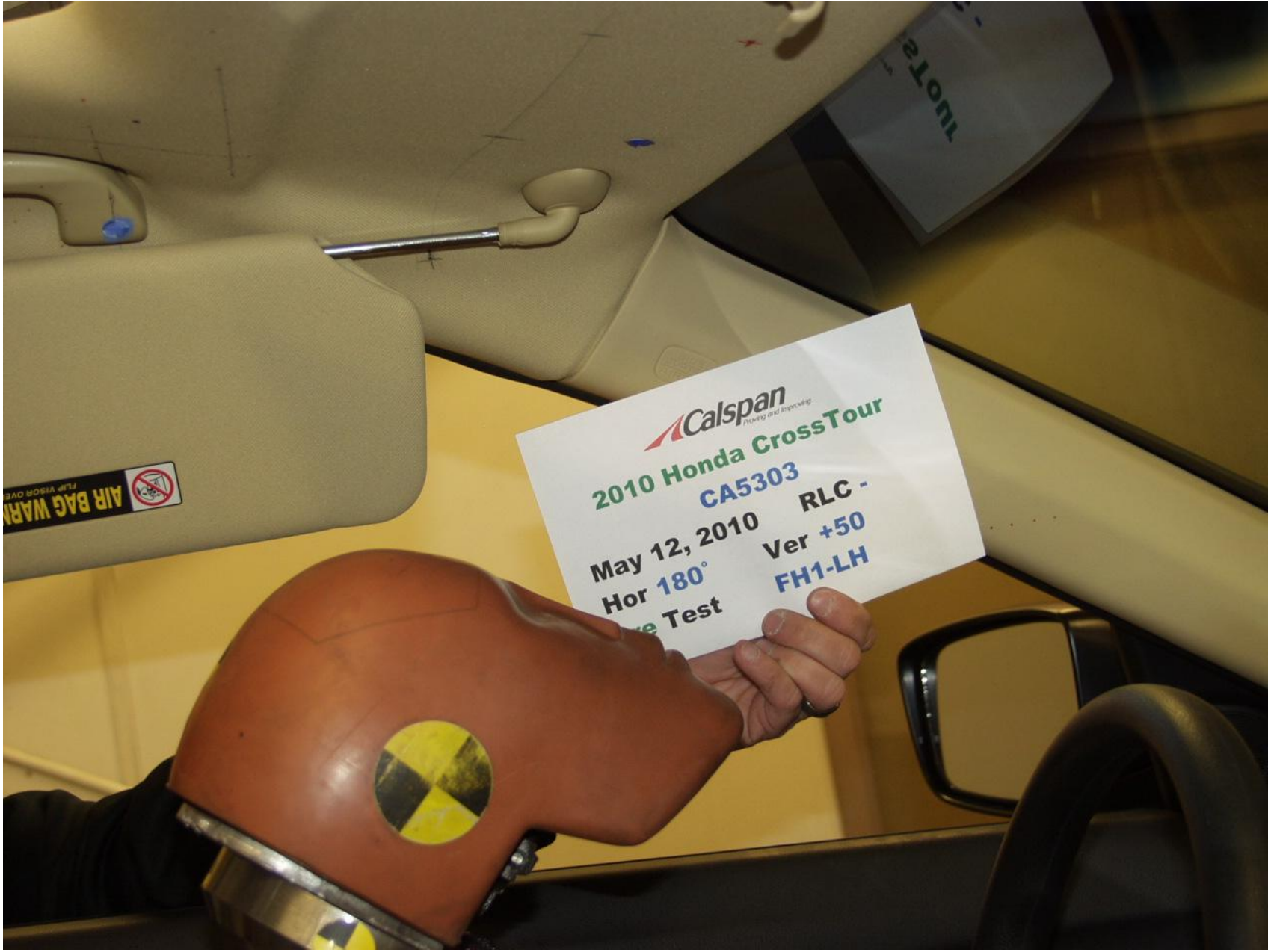


Figure A-8 : PRE-TEST DRIVER SIDE FRONT HEADER\*  
\*Note: Pre-test picture before impactor was placed in vehicle was not available.

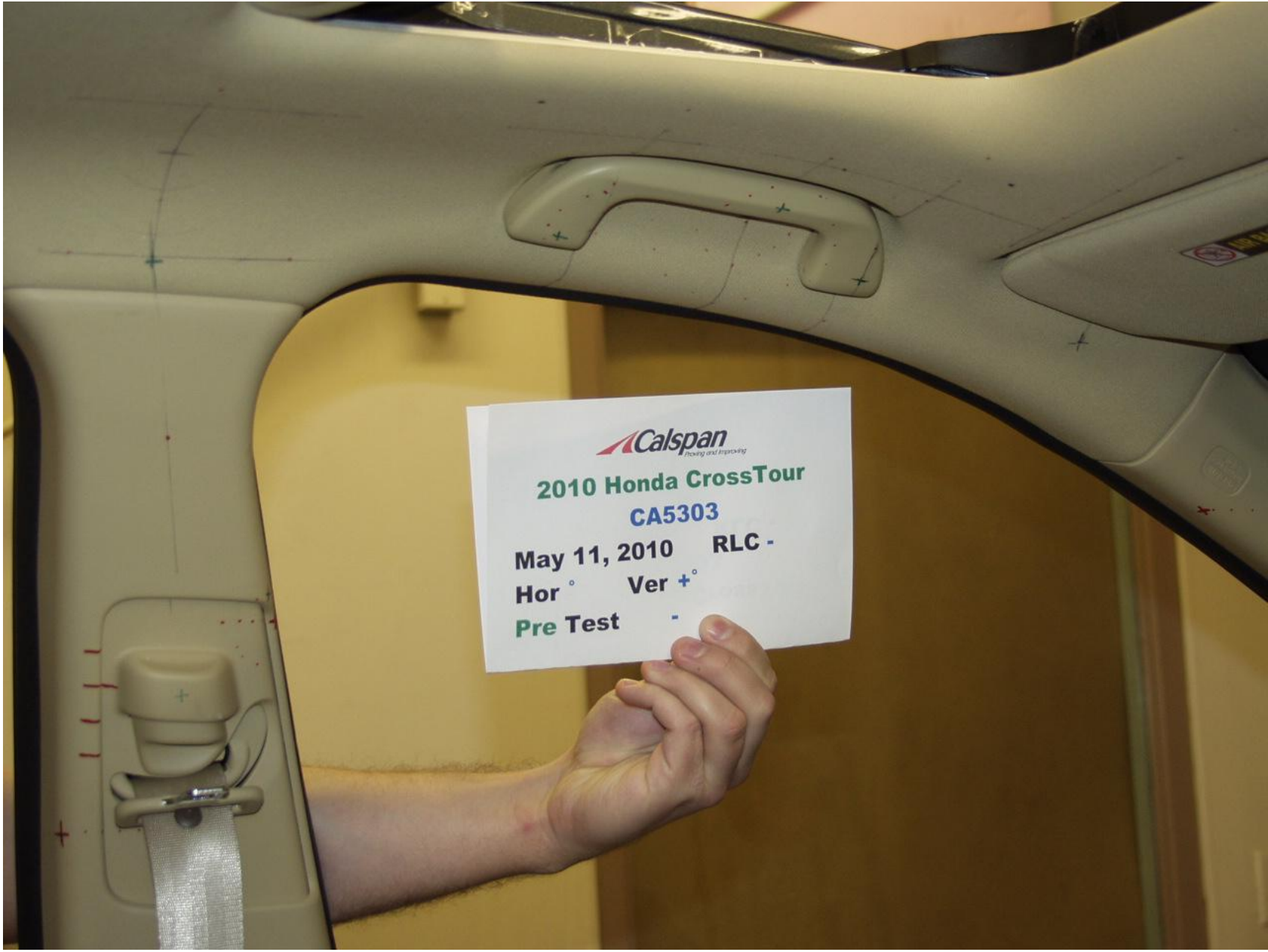


Figure A-9 : PRE-TEST DRIVER SIDE SIDE RAIL

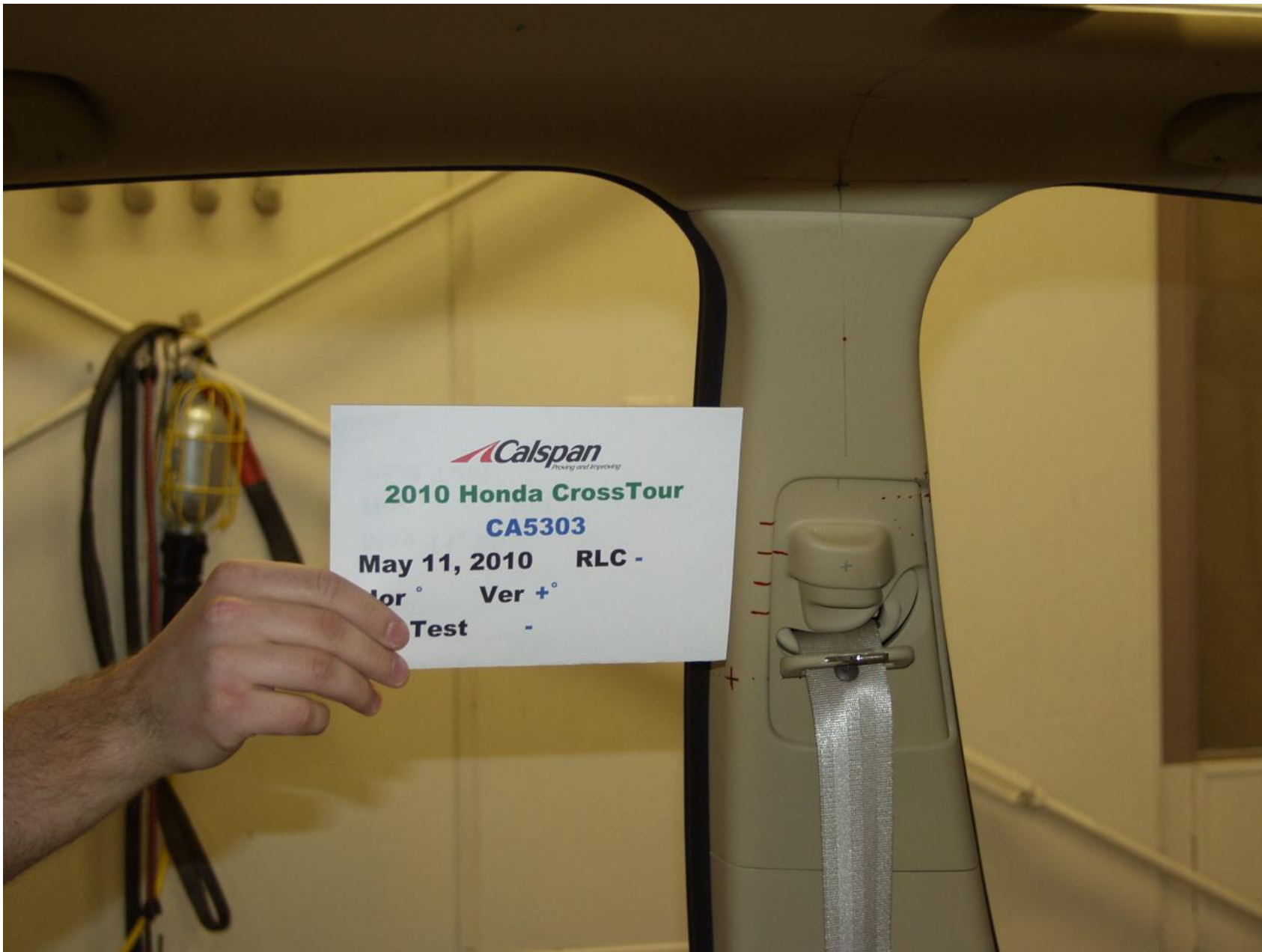


Figure A-10 : PRE-TEST DRIVER SIDE B-PILLAR

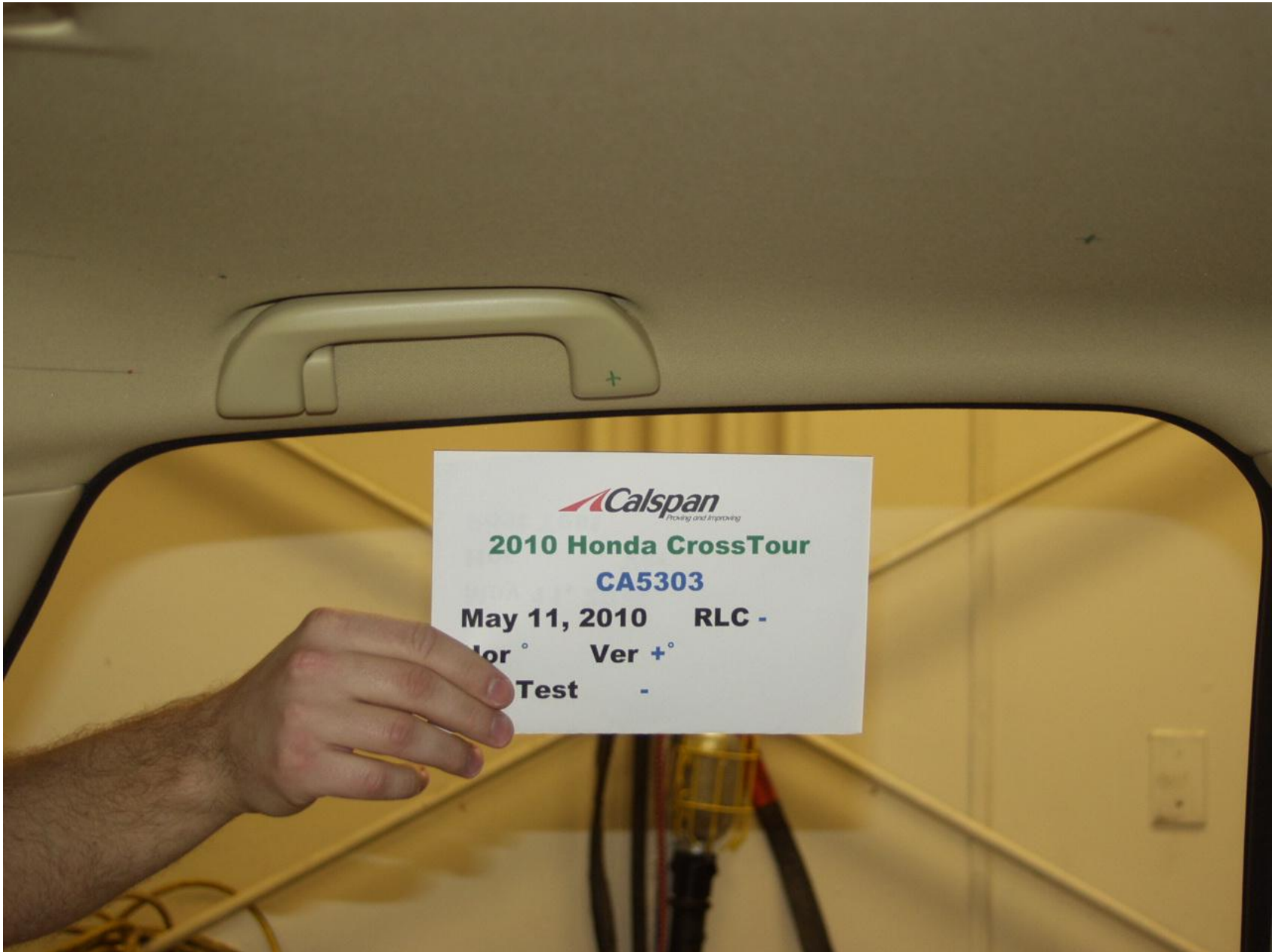


Figure A-11 : PRE-TEST DRIVER SIDE OTHER SIDE RAIL



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

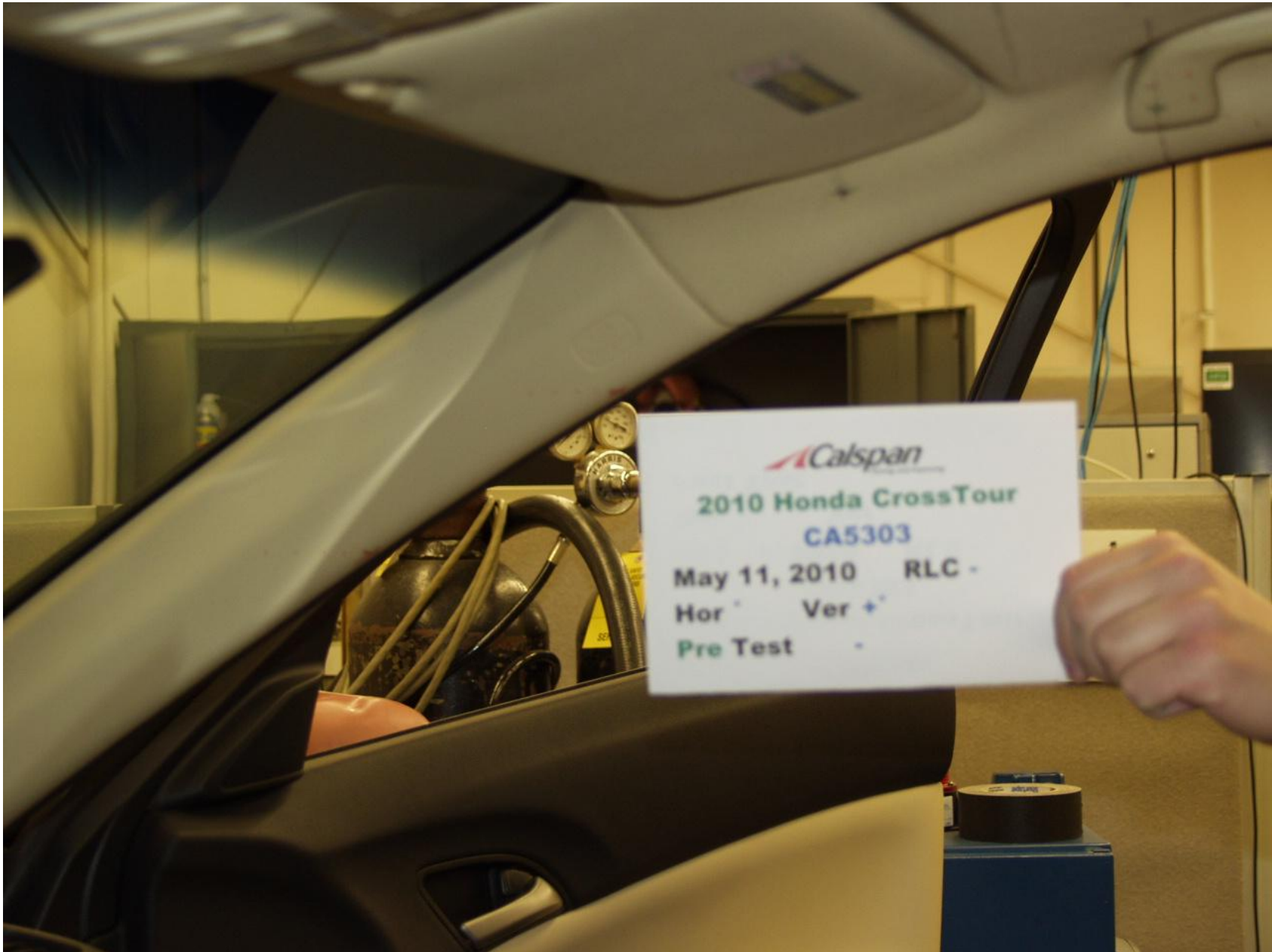


Figure A-13 : PRE-TEST PASSENGER SIDE A-PILLAR



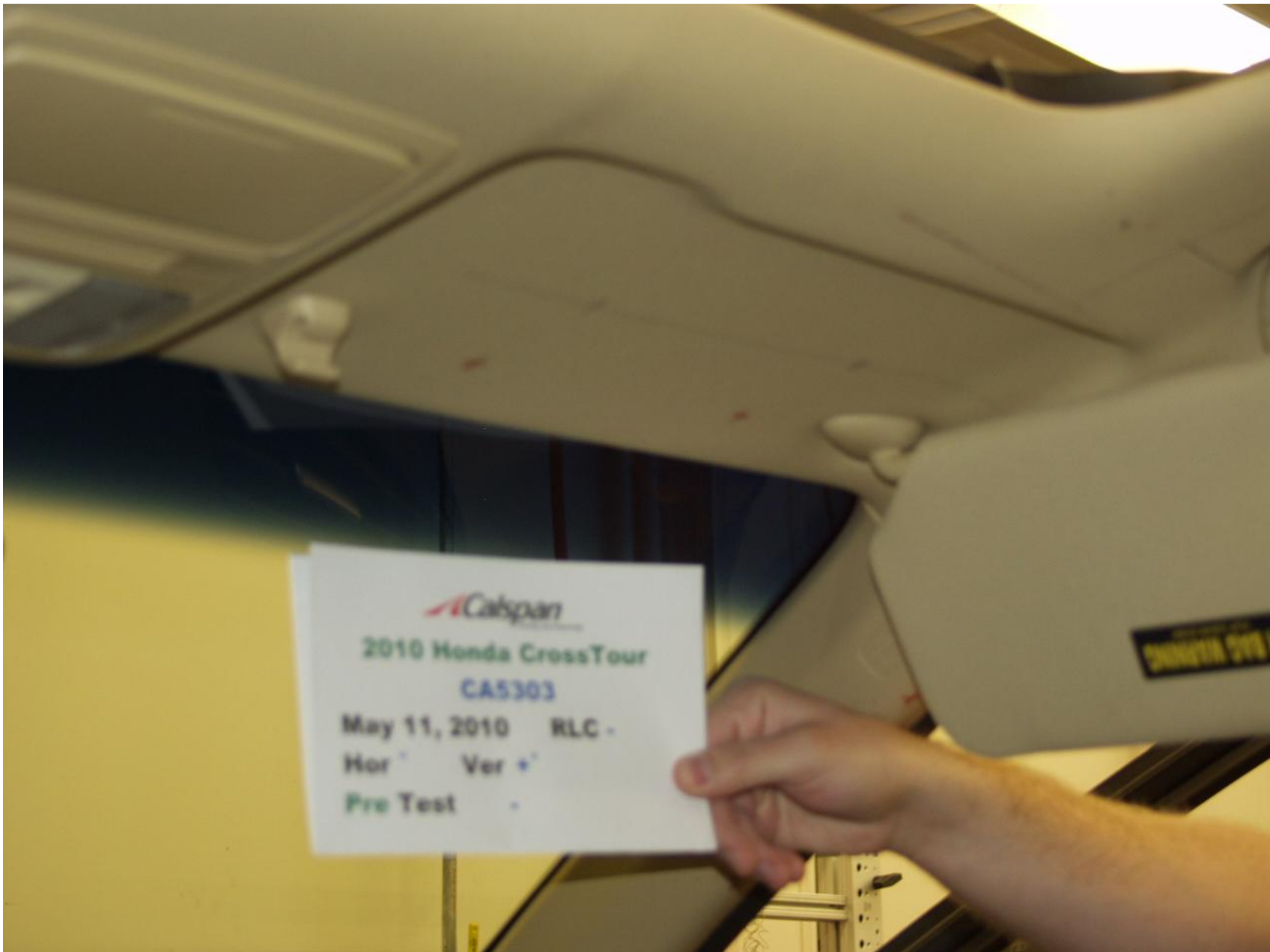


Figure A-14 : PRE-TEST PASSENGER SIDE FRONT HEADER

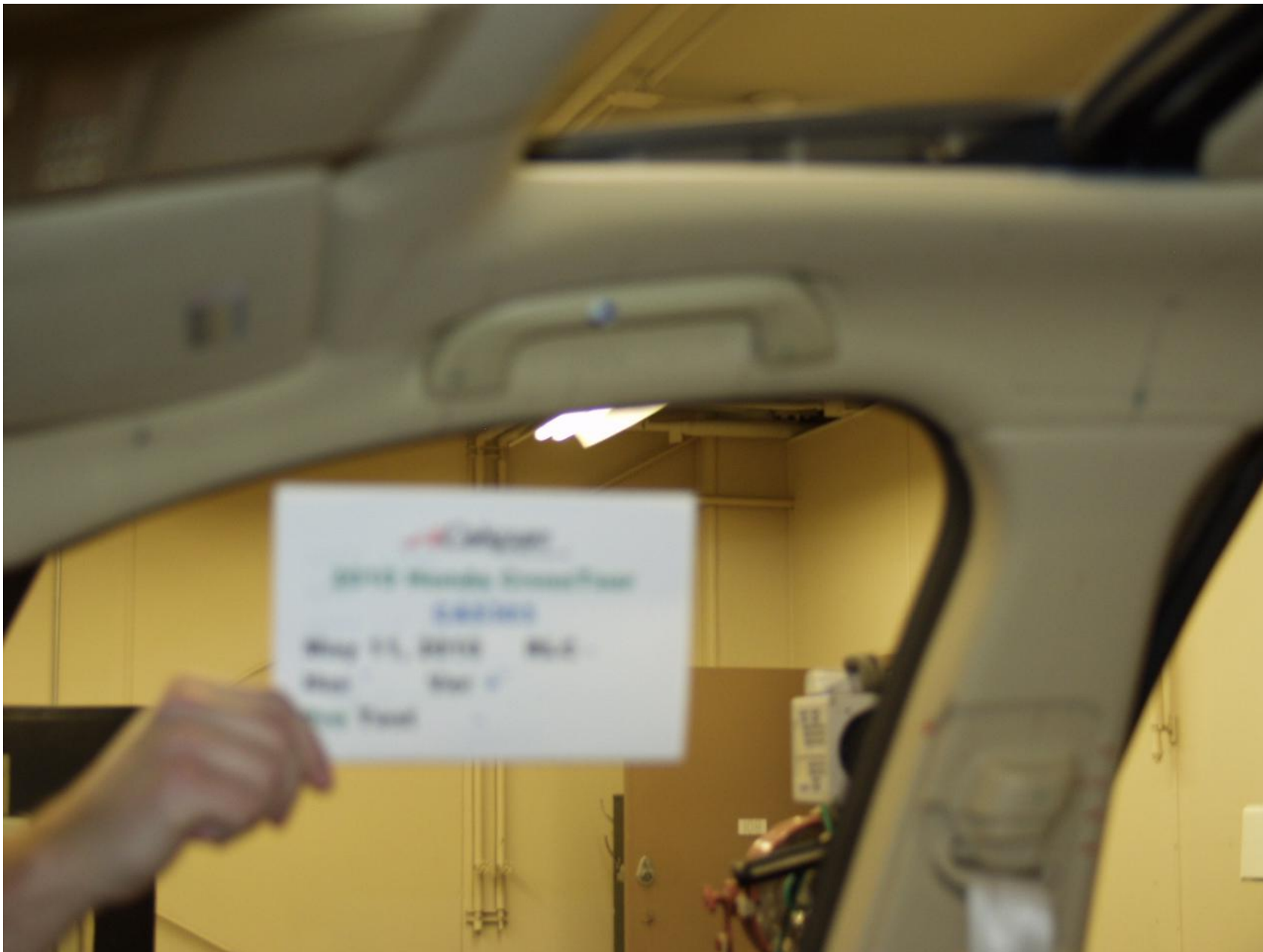


Figure A-15 : PRE-TEST PASSENGER SIDE SIDE RAIL

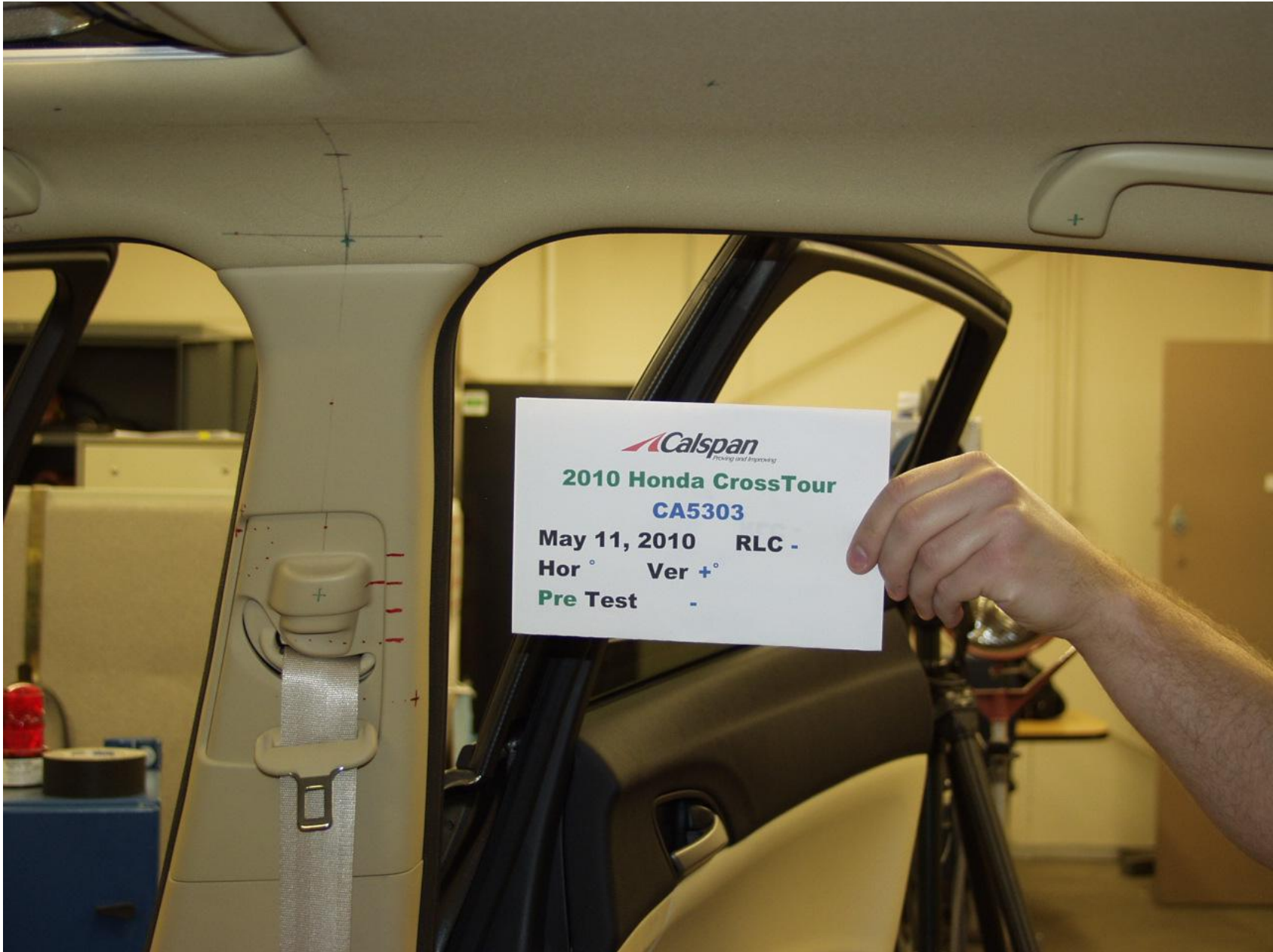


Figure A-16 : PRE-TEST PASSENGER SIDE B-PILLAR

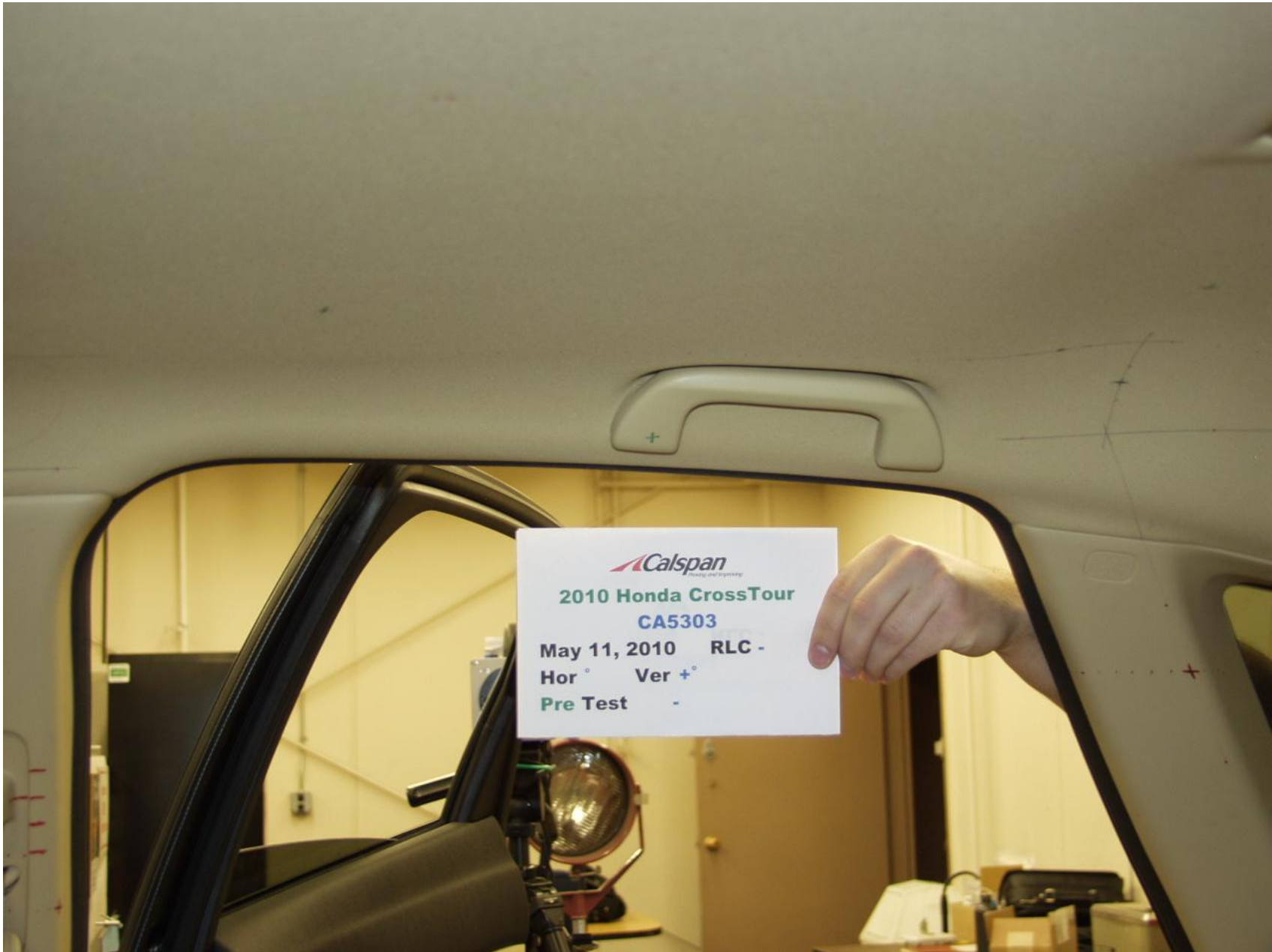


Figure A-17 : PRE-TEST PASSENGER SIDE OTHER SIDE RAIL



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

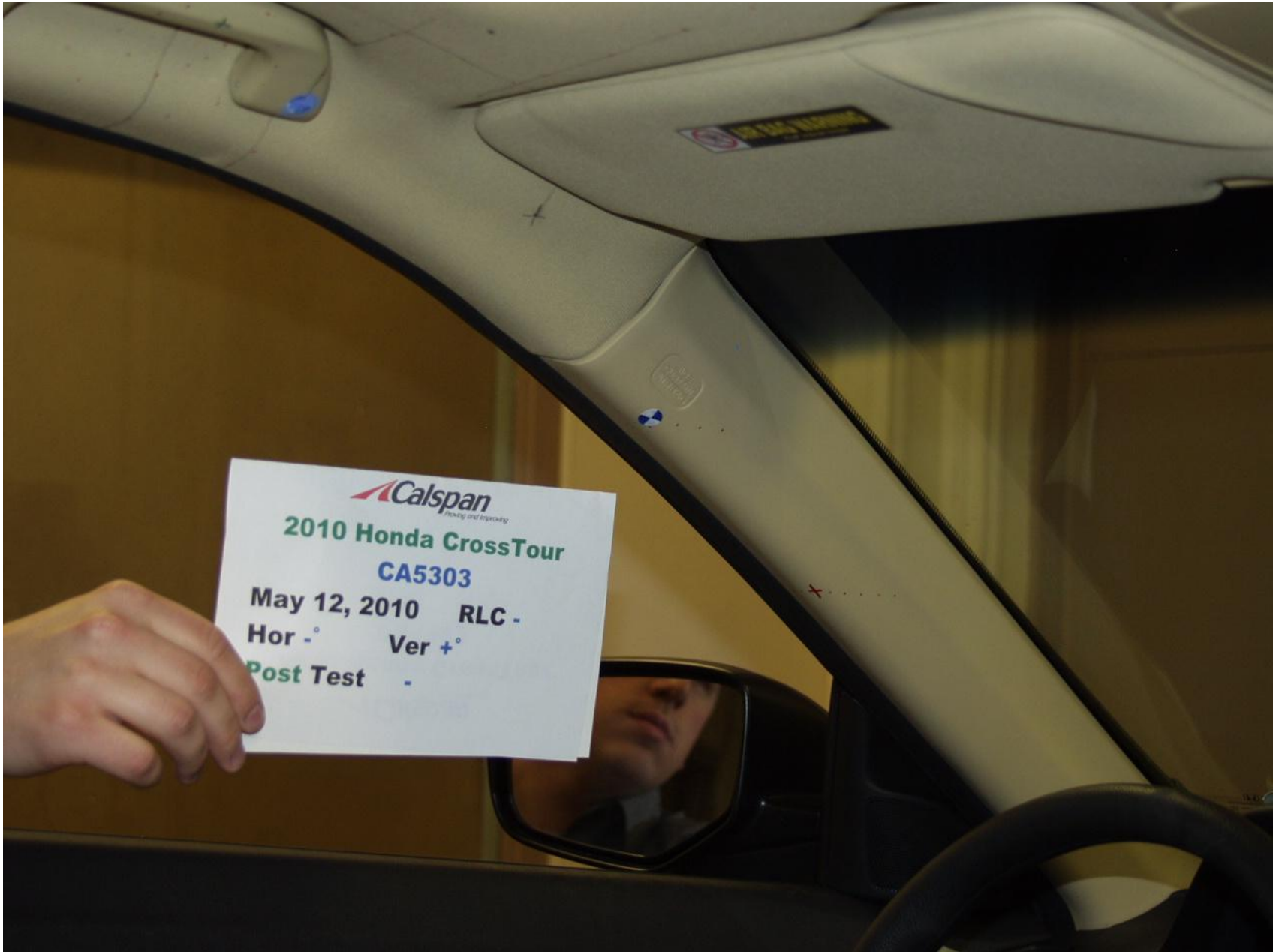


Figure A-19 : POST-TEST DRIVER SIDE A-PILLAR

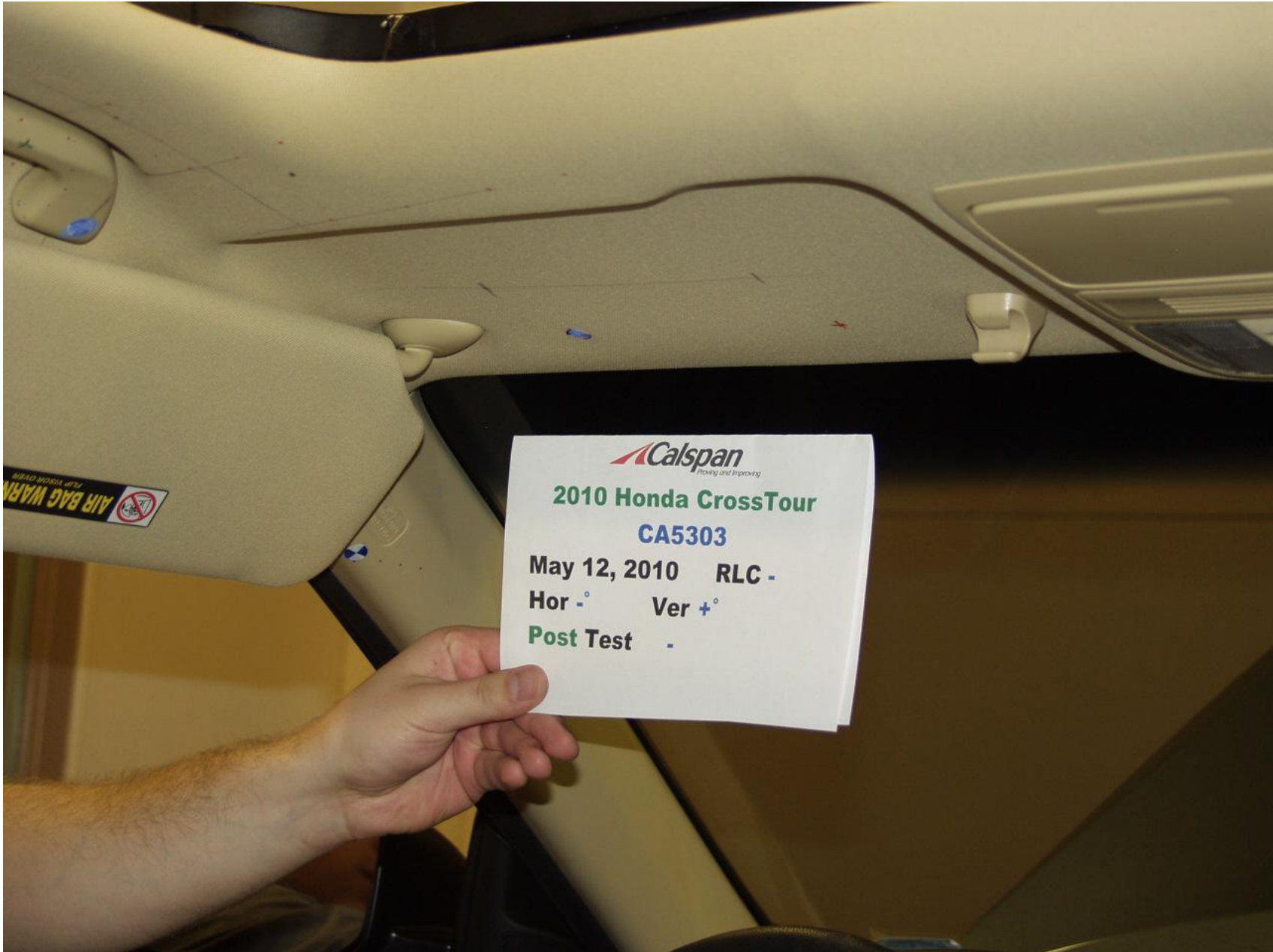


Figure A-20 : POST-TEST DRIVER SIDE FRONT HEADER

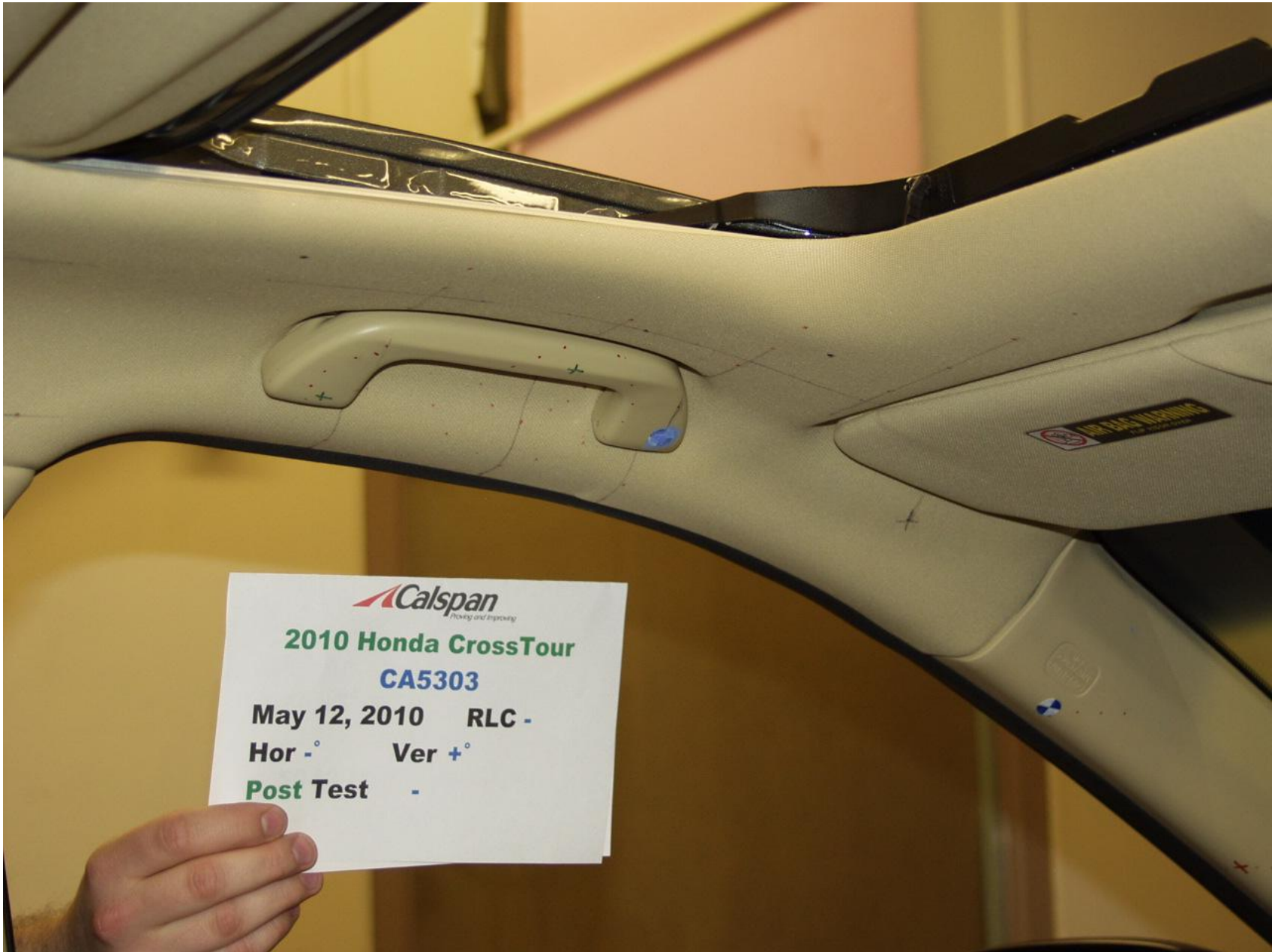


Figure A-21 : POST-TEST DRIVER SIDE SIDE RAIL



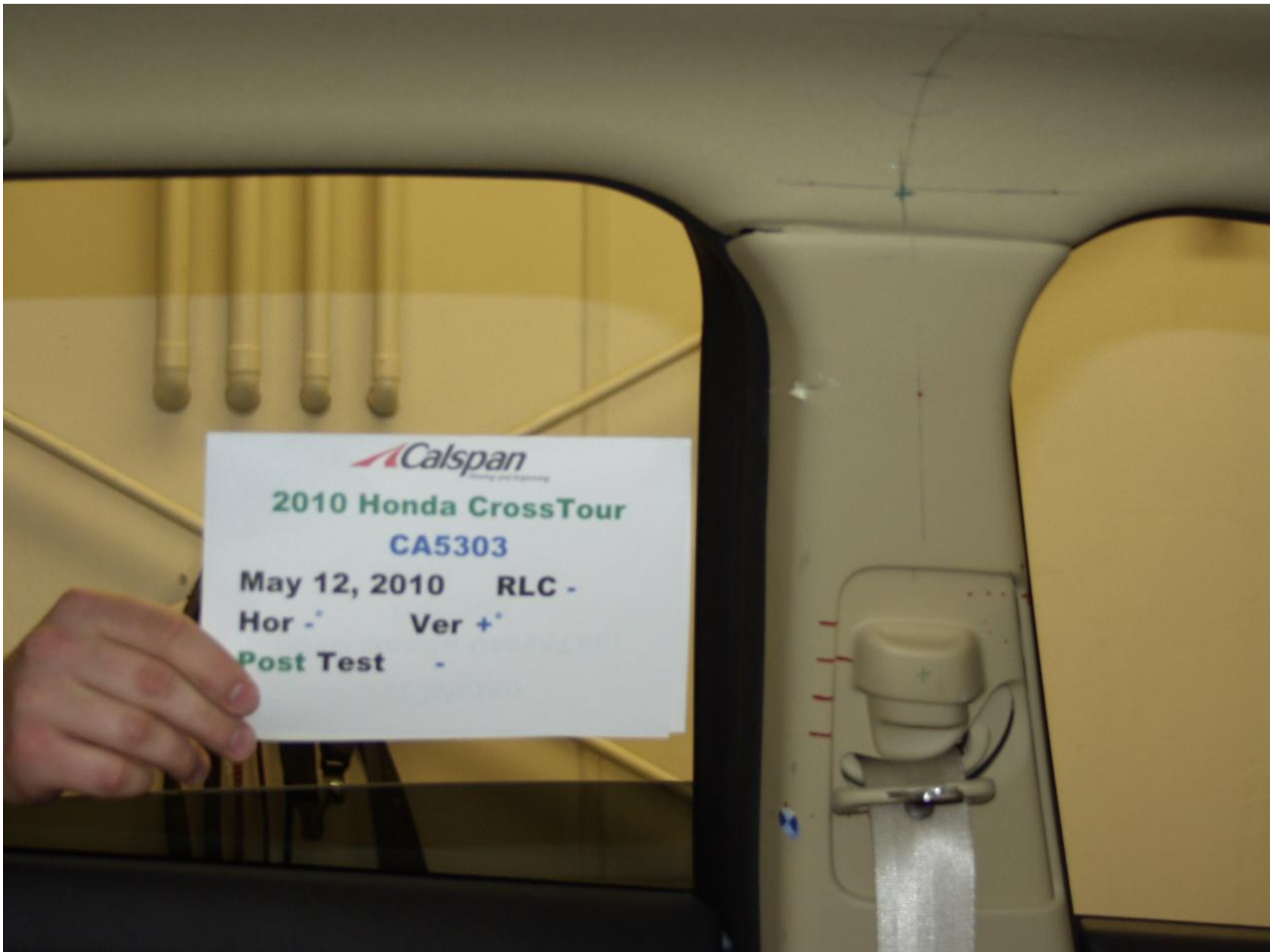


Figure A-22 : POST-TEST DRIVER SIDE B-PILLAR

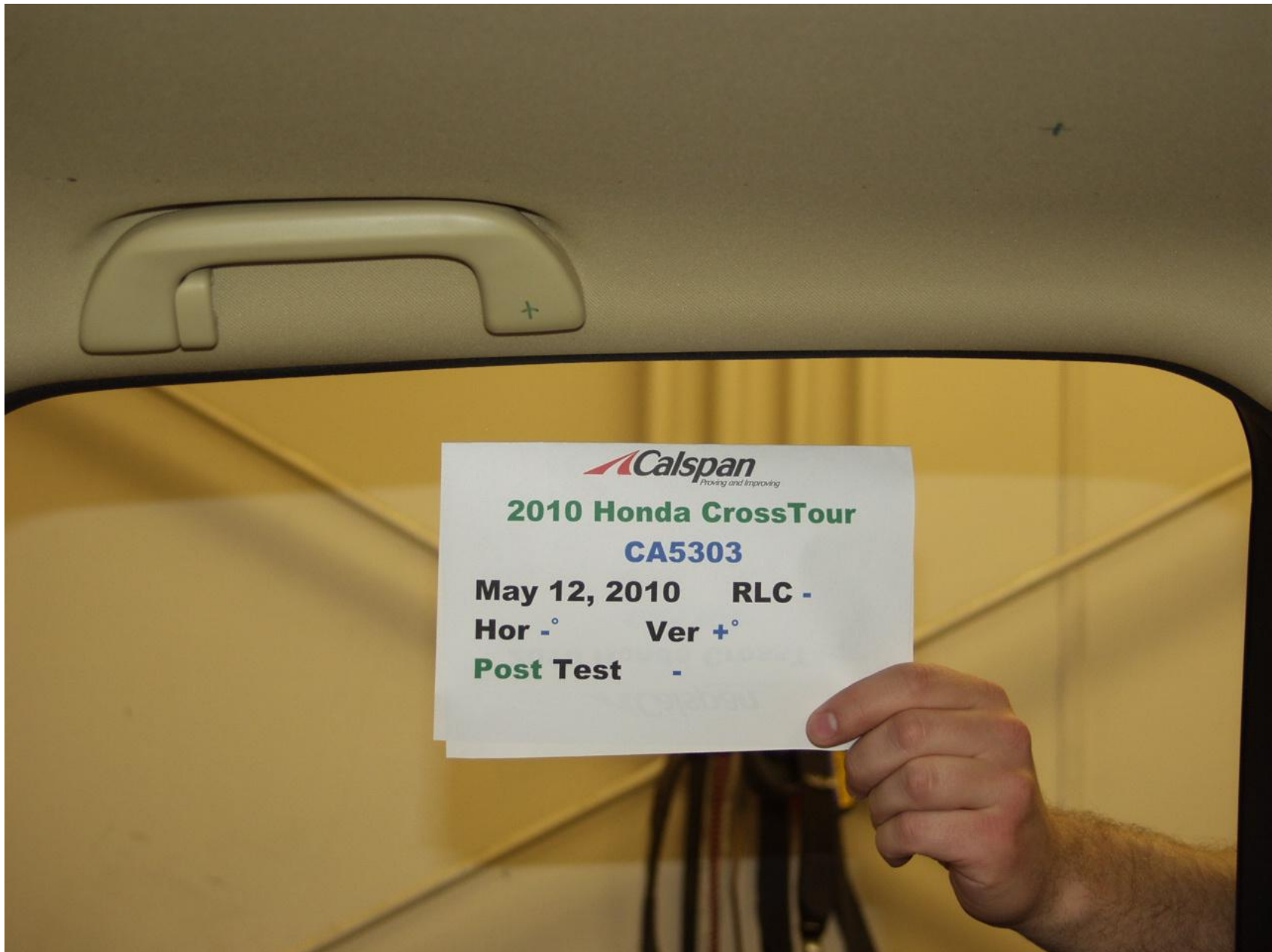


Figure A-23 : POST-TEST DRIVER SIDE OTHER SIDE RAIL

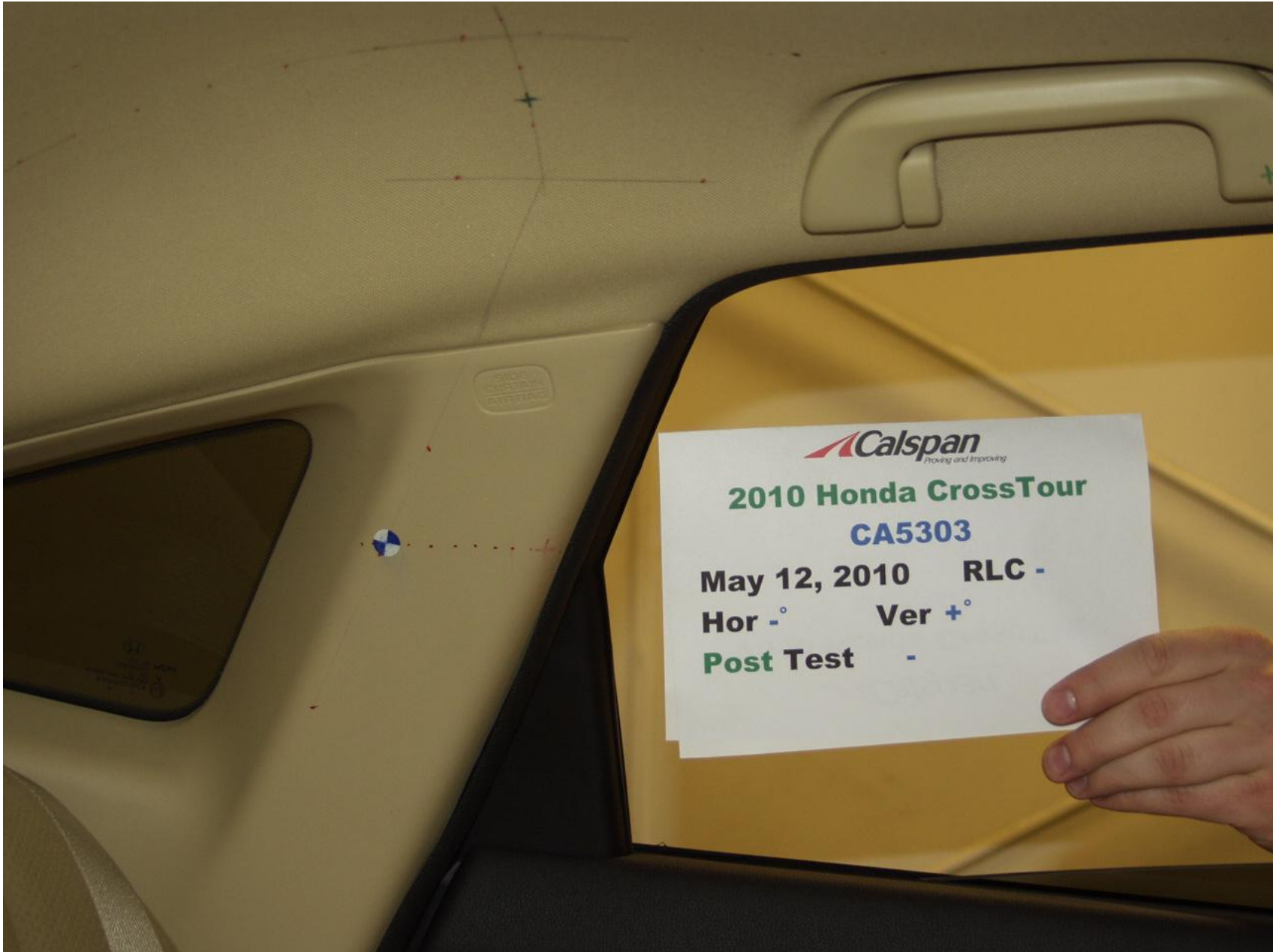


Figure A-24 : POST-TEST DRIVER SIDE REAR PILLAR

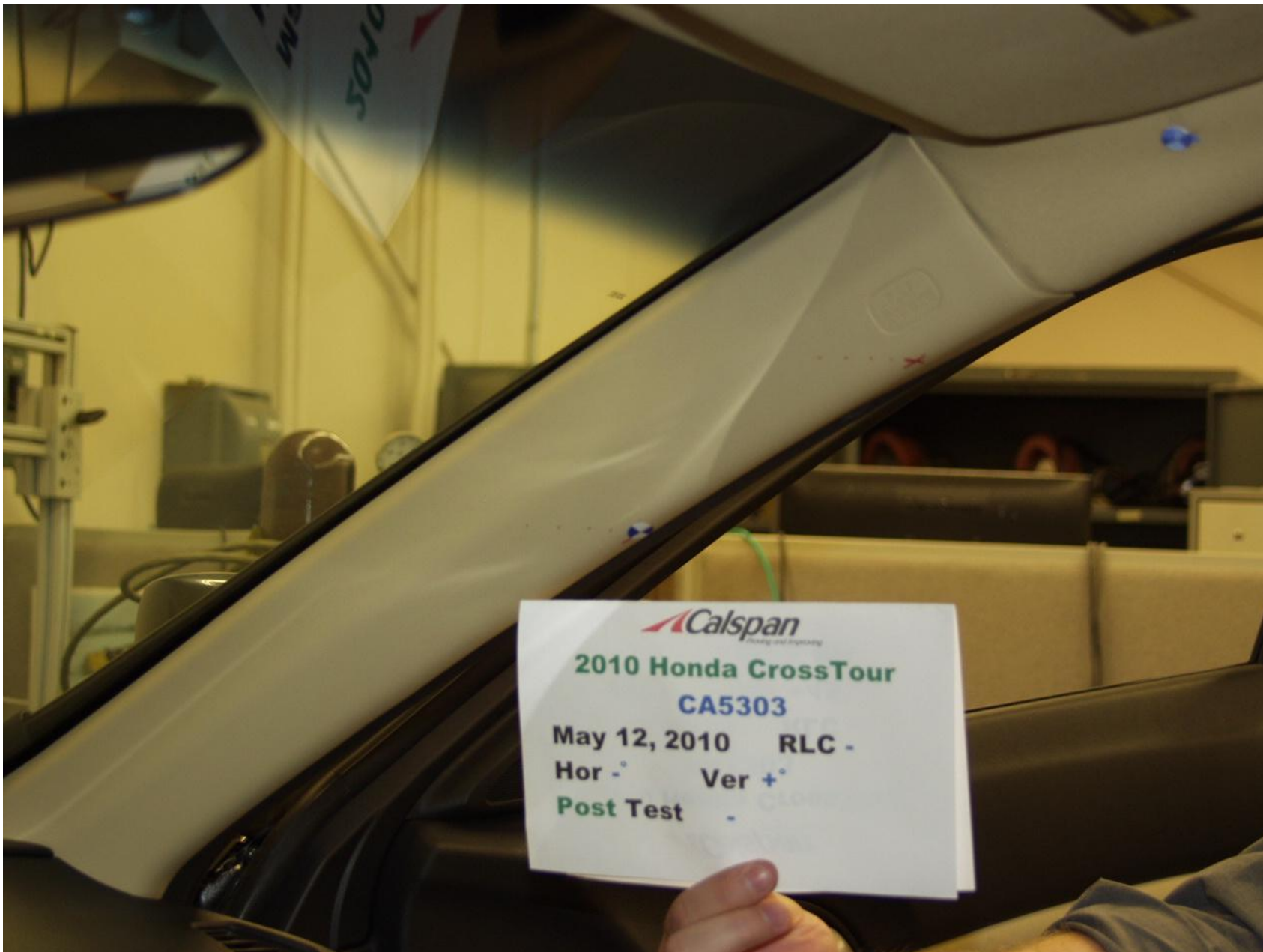


Figure A-25 : POST-TEST PASSENGER SIDE A-PILLAR

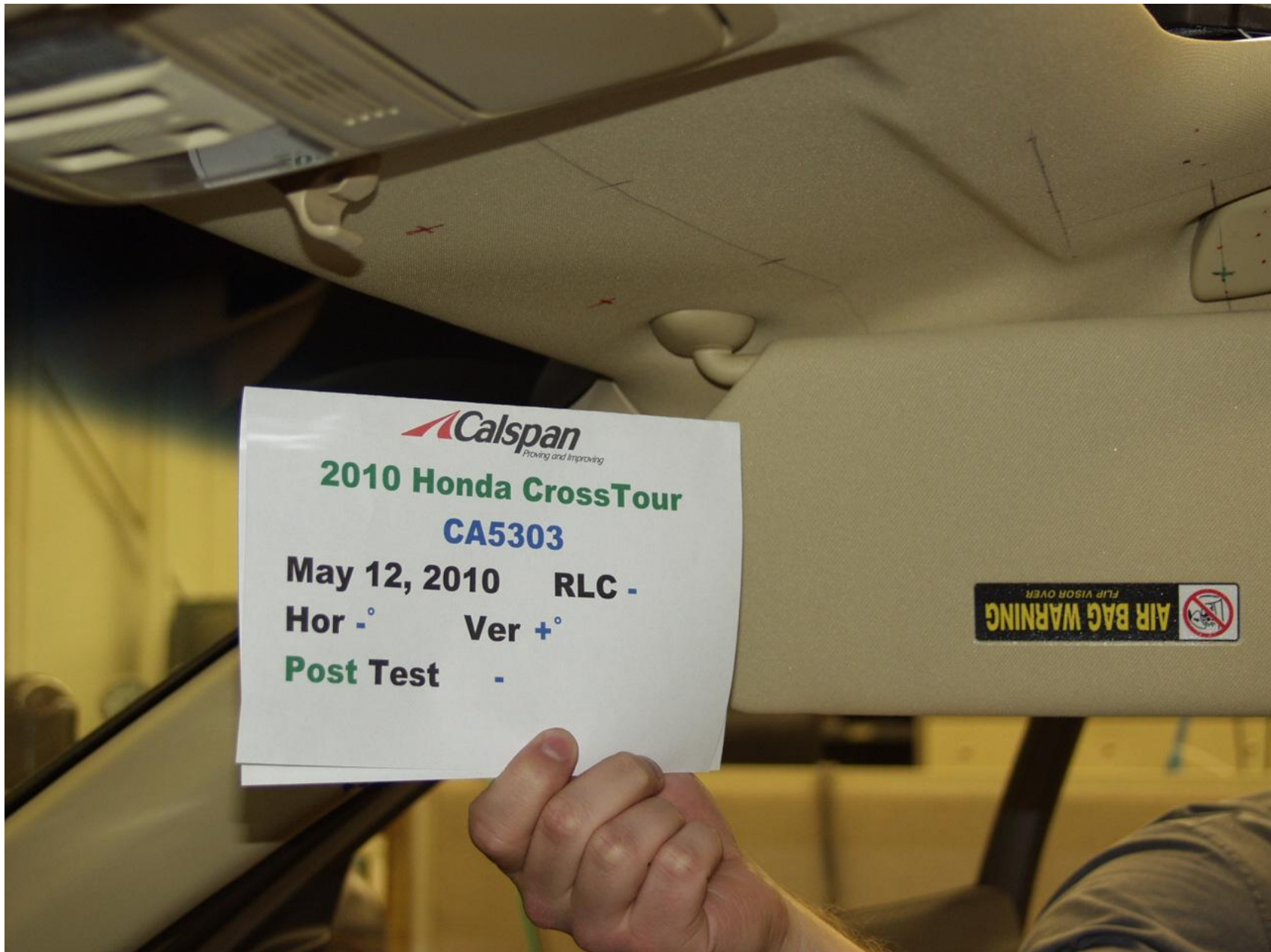


Figure A-26 : POST-TEST PASSENGER SIDE FRONT HEADER

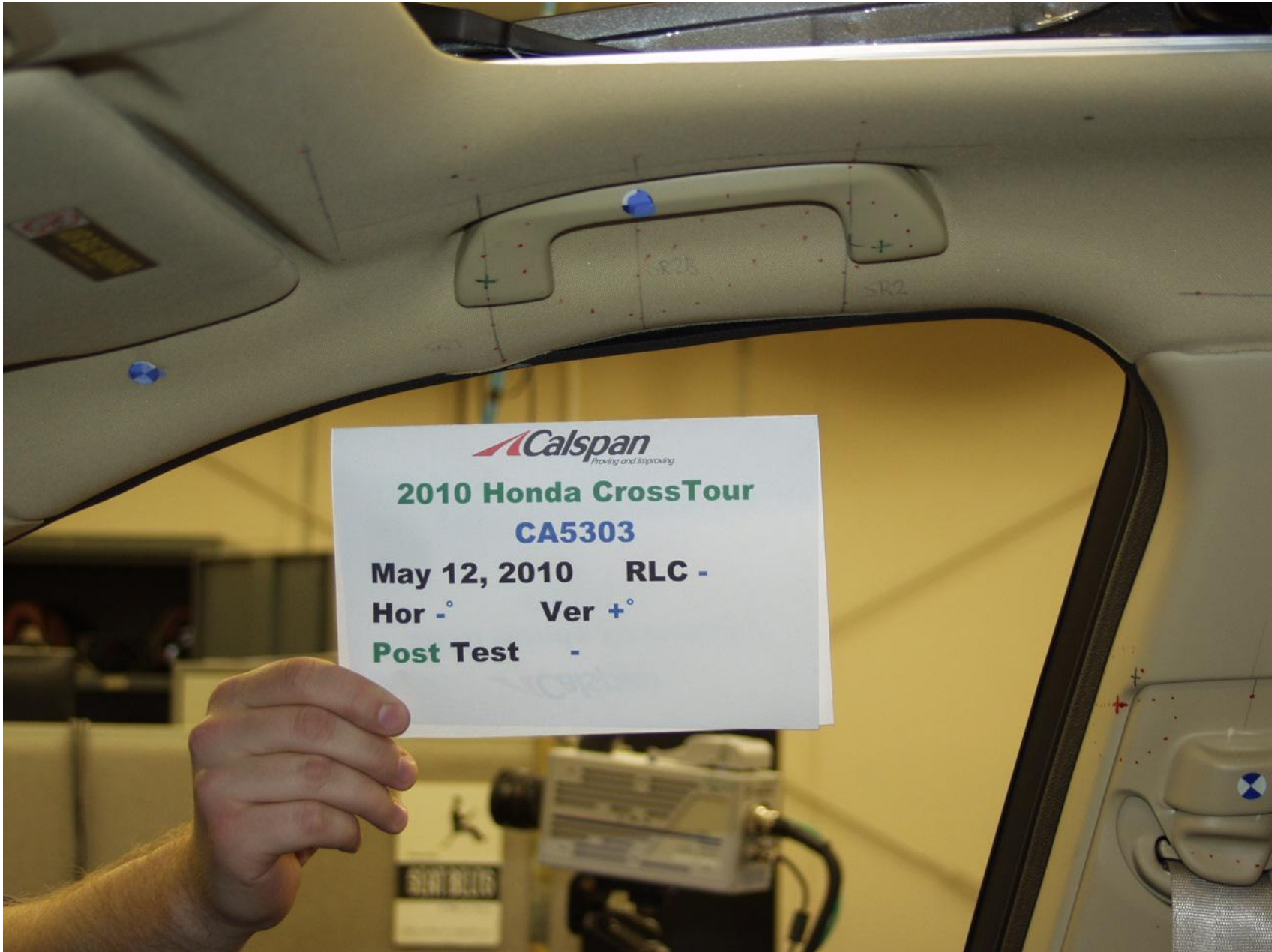


Figure A-27 : POST-TEST PASSENGER SIDE SIDE RAIL



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

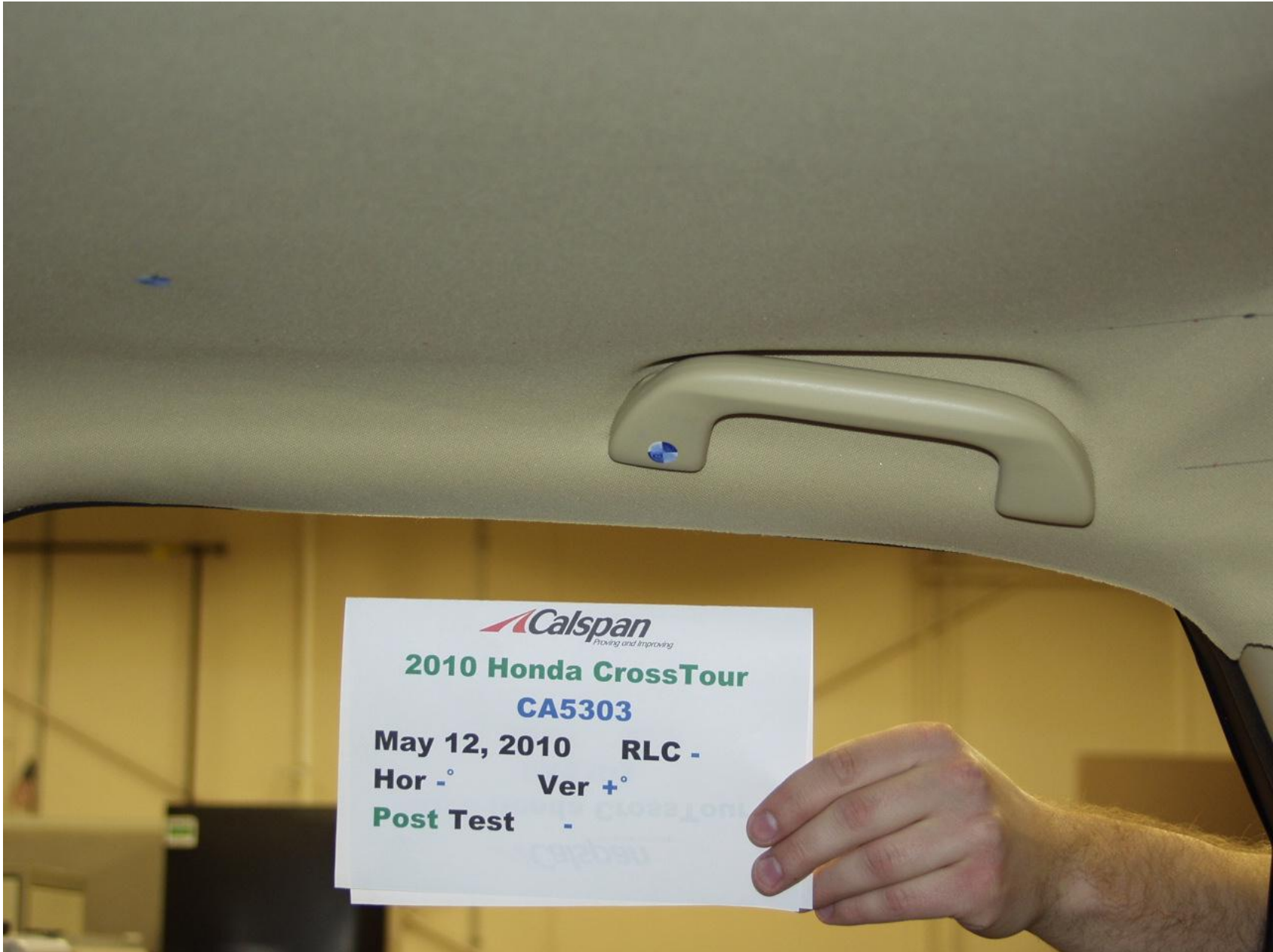


Figure A-29 : POST-TEST PASSENGER SIDE OTHER SIDE RAIL



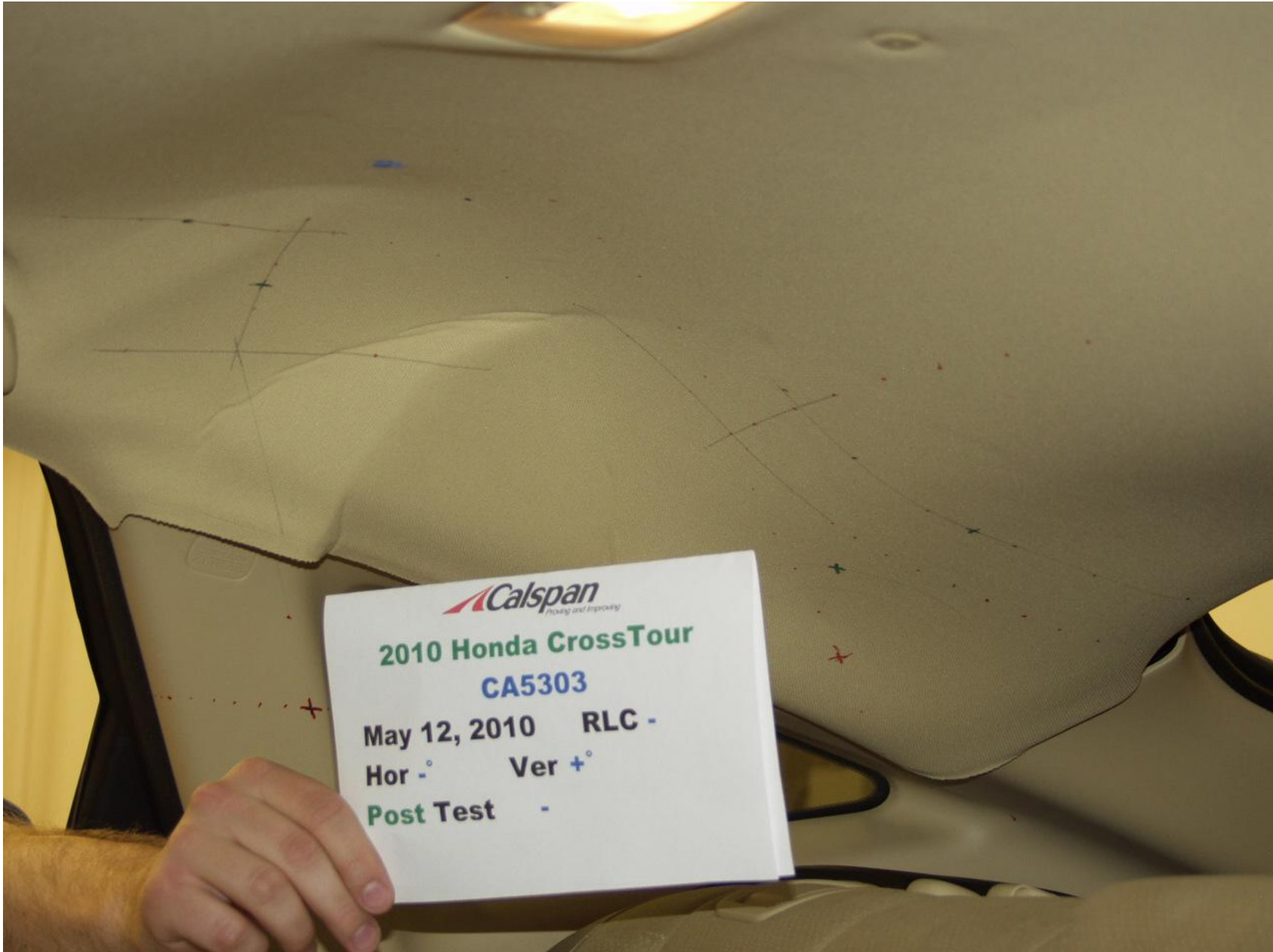


Figure A-30 : POST-TEST PASSENGER SIDE REAR PILLAR

## **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**

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>	
<b>SERIAL NUMBER:</b>		<b>0062</b>	
<b>CALIBRATION DATE:</b>		<b>May 10, 2010</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>21 °C</b>	
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>24%</b>	
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>244.6 Gs</b>	
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>14.7 Gs</b>	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>I.D. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J45546</b>	<b>3/30/2010</b>	<b>9/30/2010</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J45485</b>	<b>3/30/2010</b>	<b>9/30/2010</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J45406</b>	<b>3/30/2010</b>	<b>9/30/2010</b>

**REMARKS:**

## FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: May 10, 2010

Serial No: 0062

Work File: fmh

### -----TEST RESULTS-----

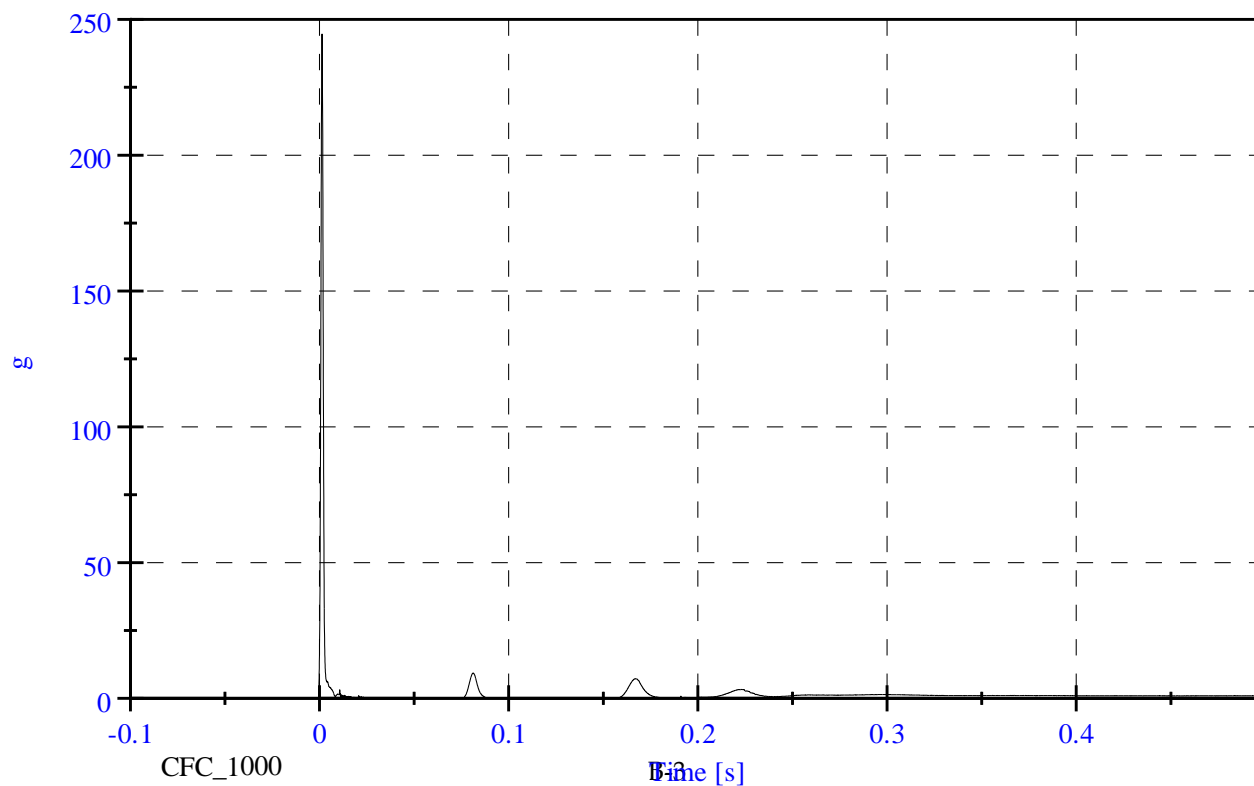
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	21.1 C	Passed
Lab Humidity	10-70 %	24.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	244.60 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	14.65 Gs	Passed
Curve Percent NonModal:	< 10%	3.81 %	Passed

FMVSS 201U - Headform Calibration Drops

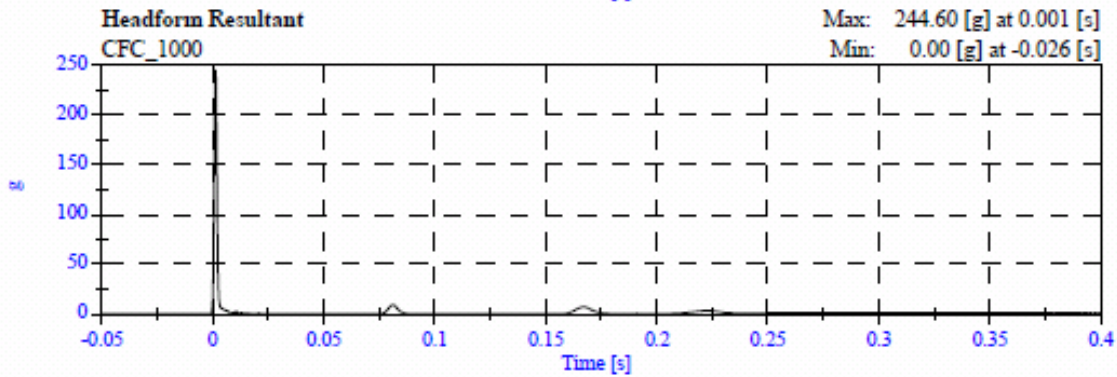
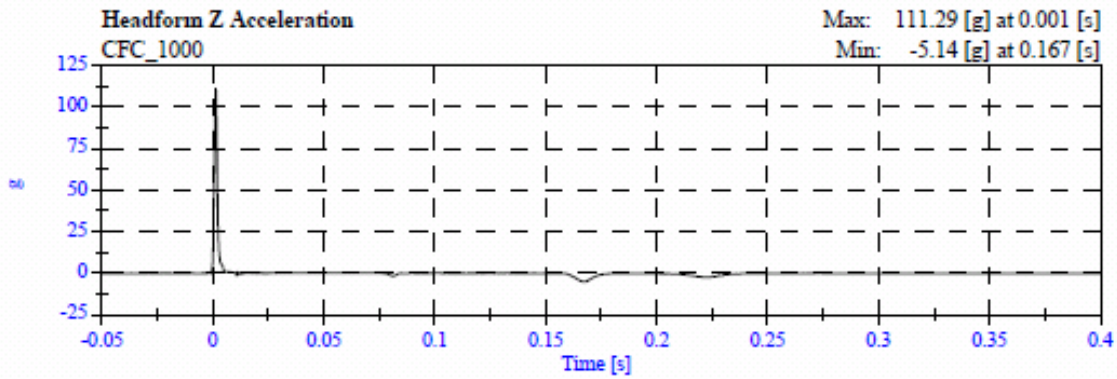
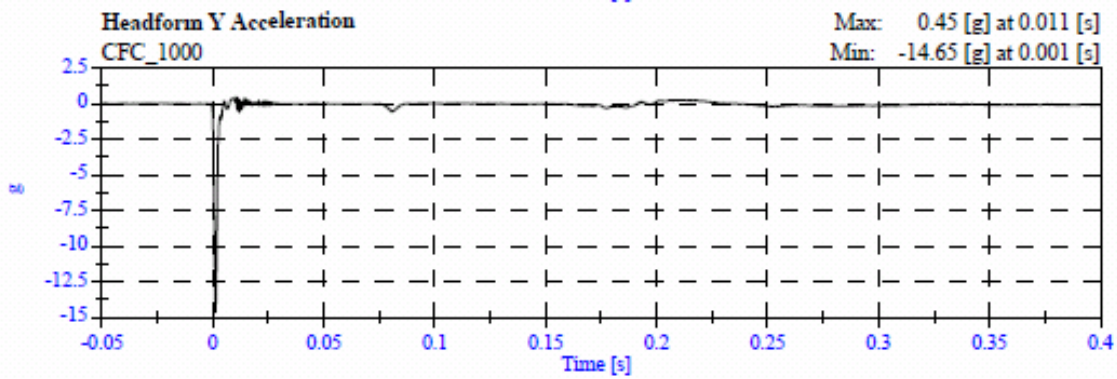
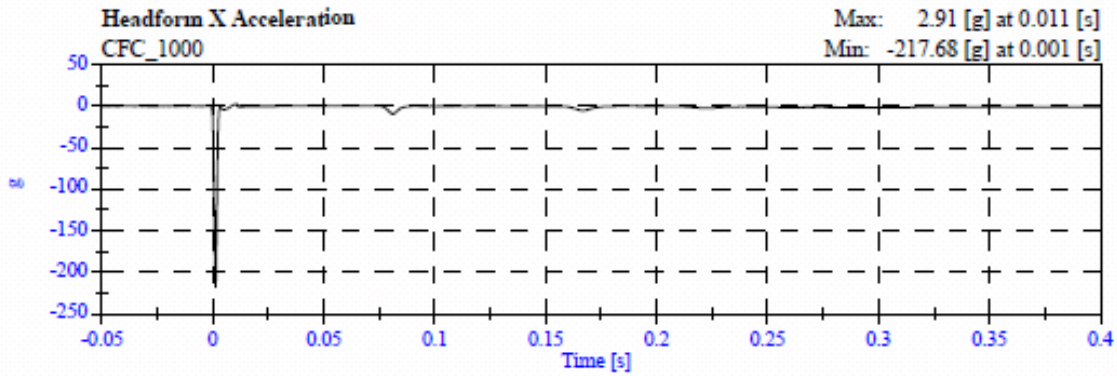
Headform Resultant

Max: 244.6 [g] at 0.001 [s]

Min: 0.0 [g] at -0.026 [s]



# FMVSS 201U - Headform Calibration Drops CA5303 - May 10, 2010



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

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>	
<b>SERIAL NUMBER:</b>		<b>805</b>	
<b>CALIBRATION DATE:</b>		<b>May 10, 2010</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>21 °C</b>	
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>24%</b>	
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>252.3 Gs</b>	
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>11.2 Gs</b>	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>I.D. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J25854</b>	<b>3/2/2010</b>	<b>9/2/2010</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J37496</b>	<b>3/2/2010</b>	<b>9/2/2010</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J41016</b>	<b>3/2/2010</b>	<b>9/2/2010</b>

**REMARKS:**

## FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: May 10, 2010

Serial No: 0805

Work File: fmh

### -----TEST RESULTS-----

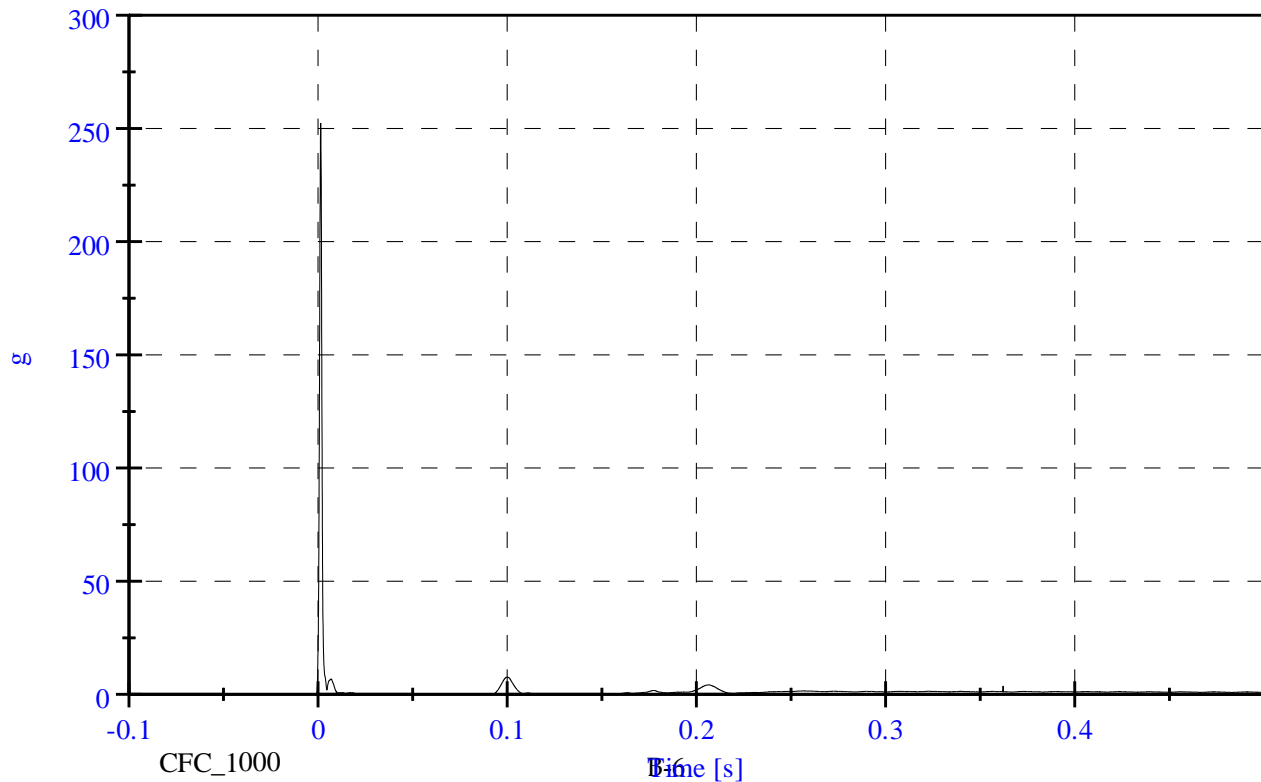
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	21.1 C	Passed
Lab Humidity	10-70 %	24.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	252.26 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	11.21 Gs	Passed
Curve Percent NonModal:	< 10%	3.04 %	Passed

FMVSS 201U - Headform Calibration Drops

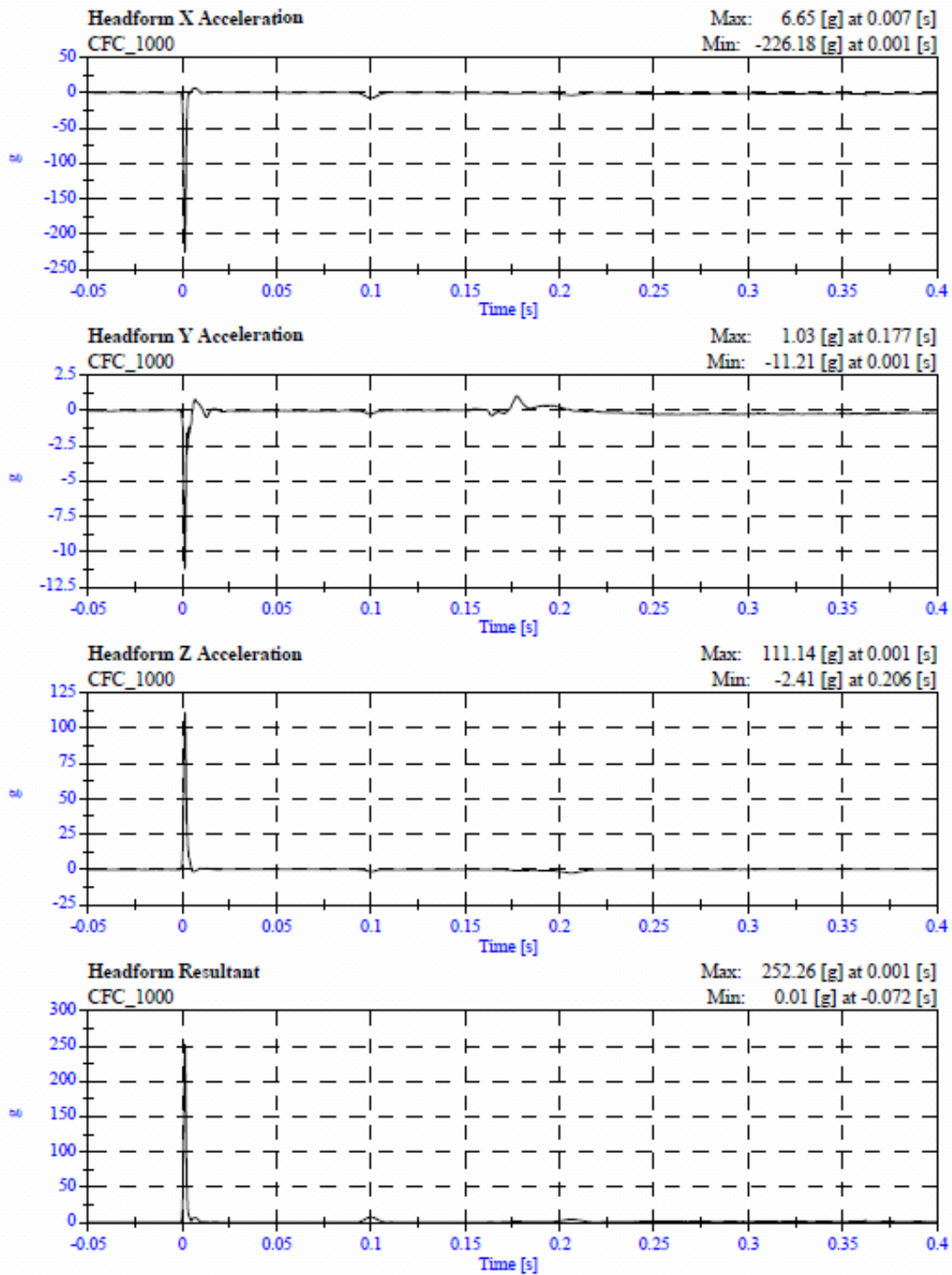
Headform Resultant

Max: 252.3 [g] at 0.001 [s]

Min: 0.0 [g] at -0.072 [s]



# FMVSS 201U - Headform Calibration Drops CA5303 - May 10, 2010





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

<b>MANUFACTURER:</b>		<b>DENTON ATD INC.</b>	
<b>SERIAL NUMBER:</b>		<b>0355</b>	
<b>CALIBRATION DATE:</b>		<b>May 10, 2010</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>20 °C</b>	
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>25%</b>	
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>250.8 Gs</b>	
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>8.8 Gs</b>	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>I.D. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J28671</b>	<b>3/2/2010</b>	<b>9/2/2010</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J32779</b>	<b>3/2/2010</b>	<b>9/2/2010</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J31020</b>	<b>3/2/2010</b>	<b>9/2/2010</b>

**REMARKS:**

## FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: May 10, 2010

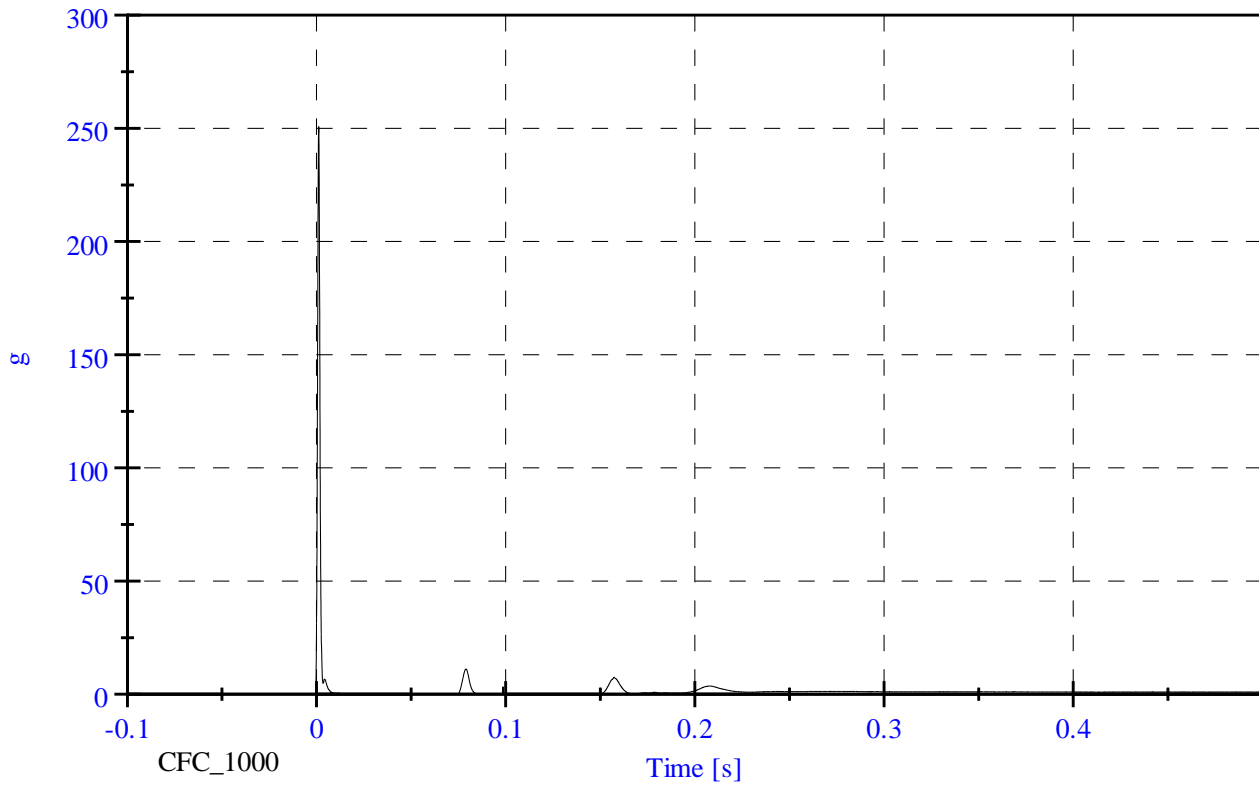
Serial No: 0355

Work File: fmh

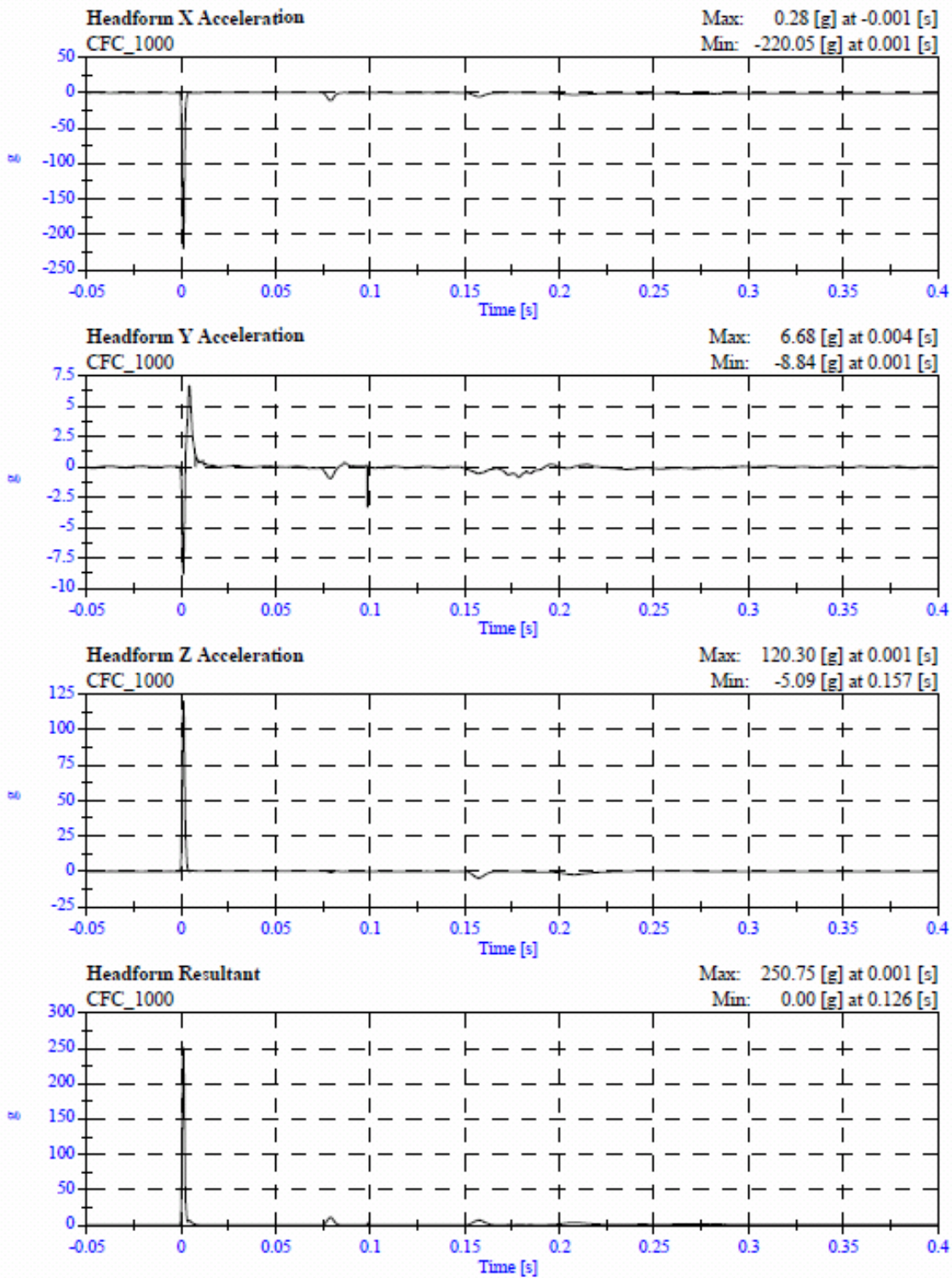
### -----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	20.0 C	Passed
Lab Humidity	10-70 %	25.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	250.75 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	8.84 Gs	Passed
Curve Percent NonModal:	< 10%	4.45 %	Passed

FMVSS 201U - Headform Calibration Drops      Headform Resultant      Max: 250.8 [g] at 0.001 [s]  
 Min: 0.0 [g] at 0.126 [s]



# FMVSS 201U - Headform Calibration Drops CA5303 - May 10, 2010



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

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>	
<b>SERIAL NUMBER:</b>		<b>1142</b>	
<b>CALIBRATION DATE:</b>		<b>May 10, 2010</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>21 °C</b>	
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>25%</b>	
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>255.9 Gs</b>	
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>10.1 Gs</b>	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>I.D. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J41006</b>	<b>4/8/2010</b>	<b>10/8/2010</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J33030</b>	<b>4/8/2010</b>	<b>10/8/2010</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J31009</b>	<b>4/8/2010</b>	<b>10/8/2010</b>

**REMARKS:**

# FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: May 10, 2010

Serial No: 1142

Work File: fmh

## -----TEST RESULTS-----

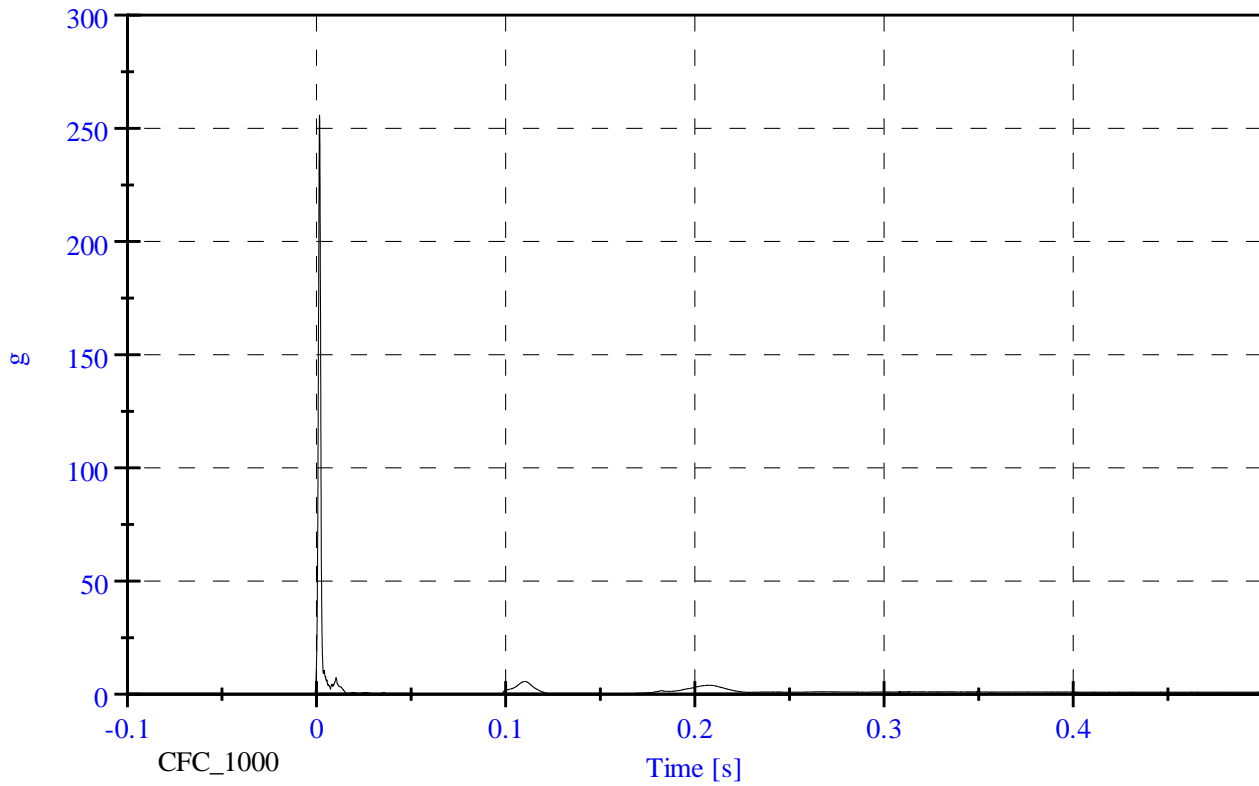
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	20.6 C	Passed
Lab Humidity	10-70 %	25.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	255.89 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	10.12 Gs	Passed
Curve Percent NonModal:	< 10%	4.13 %	Passed

FMVSS 201U - Headform Calibration Drops

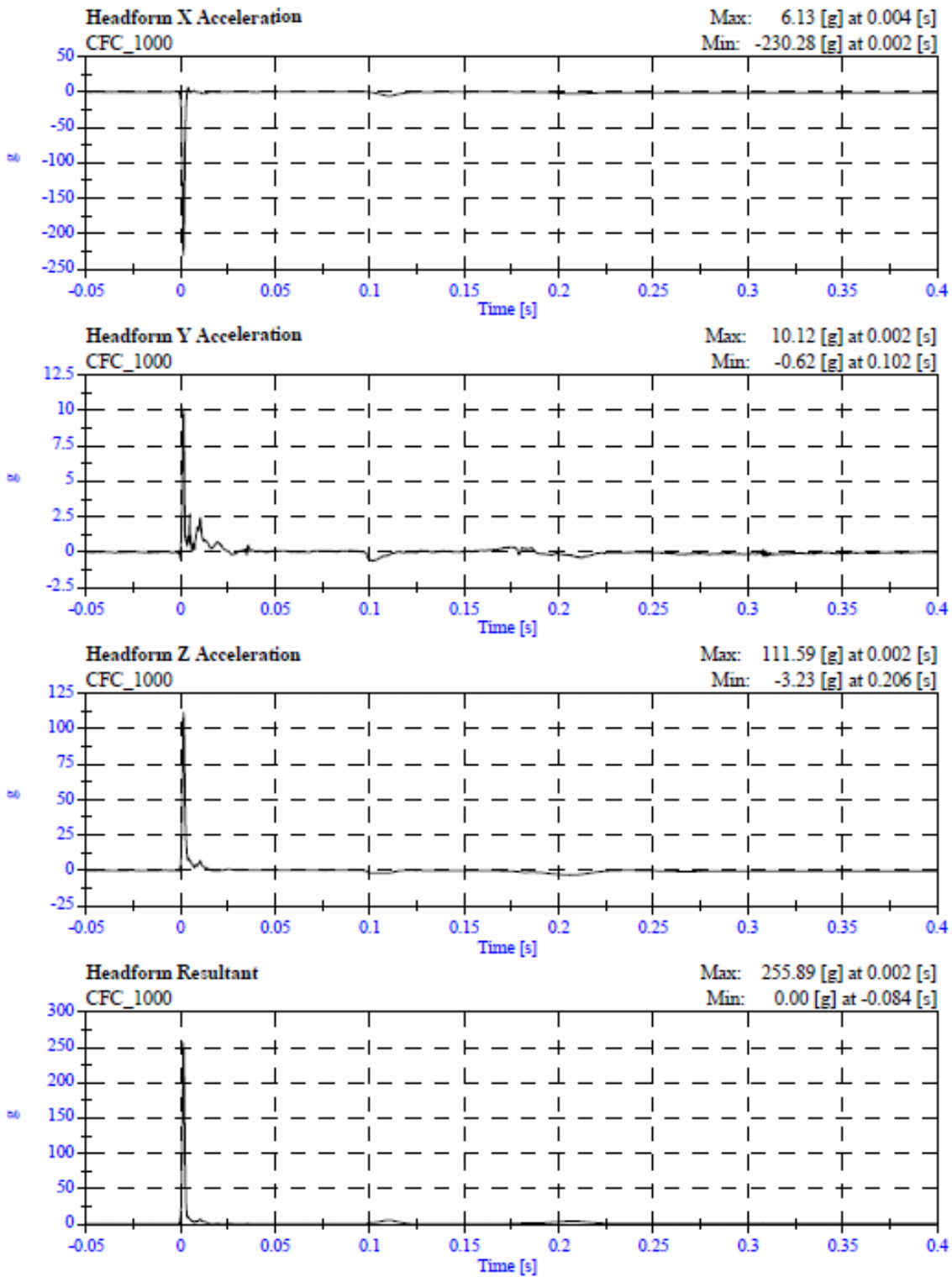
Headform Resultant

Max: 255.9 [g] at 0.002 [s]

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



# FMVSS 201U - Headform Calibration Drops CA5303 - May 10, 2010



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

<b>MANUFACTURER:</b>		<b>DENTON ATD INC.</b>	
<b>SERIAL NUMBER:</b>		<b>0062</b>	
<b>CALIBRATION DATE:</b>		<b>May 13, 2010</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>23 °C</b>	
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>35%</b>	
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>252.3 Gs</b>	
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>2.3 Gs</b>	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>I.D. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J45546</b>	<b>3/30/2010</b>	<b>9/30/2010</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J45485</b>	<b>3/30/2010</b>	<b>9/30/2010</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J45406</b>	<b>3/30/2010</b>	<b>9/30/2010</b>

**REMARKS:**

## FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: May 13, 2010

Serial No: 0062

Work File: fmh

### -----TEST RESULTS-----

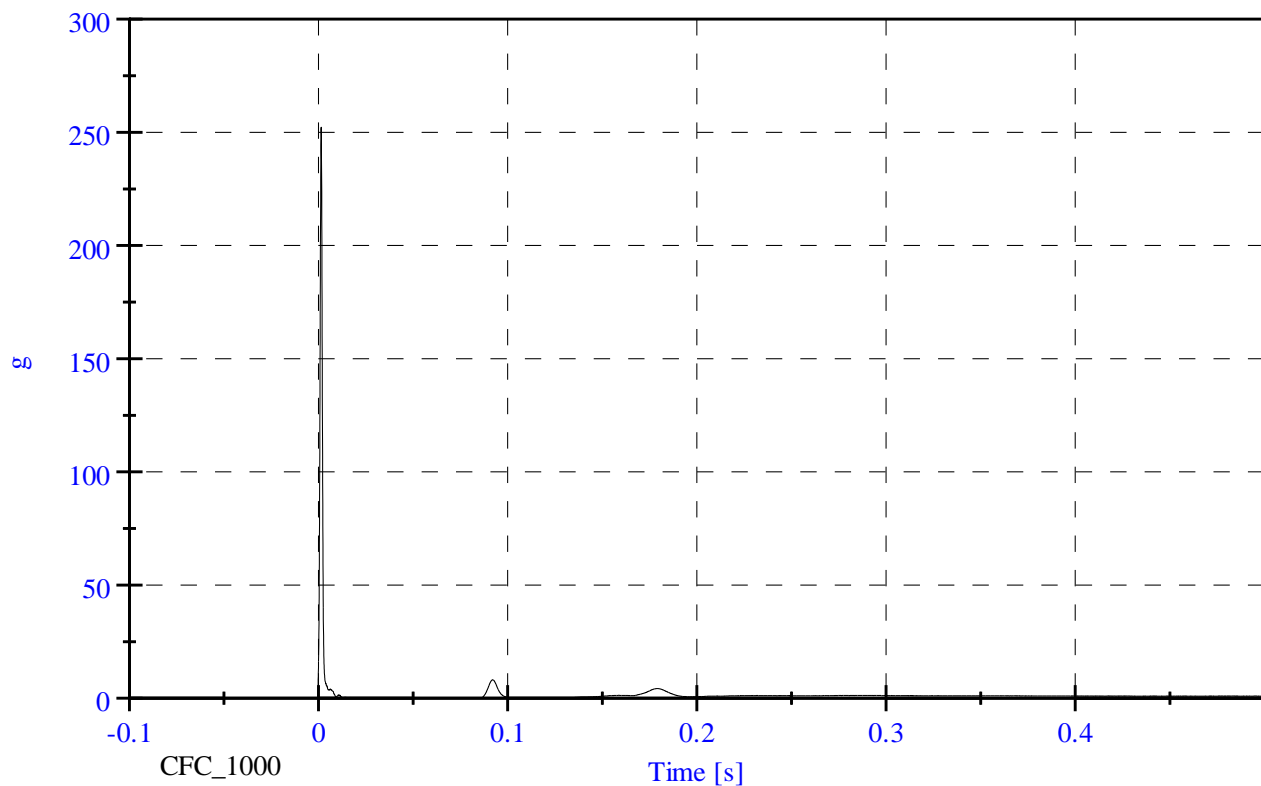
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	22.8 C	Passed
Lab Humidity	10-70 %	35.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	252.28 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	2.31 Gs	Passed
Curve Percent NonModal:	< 10%	3.23 %	Passed

FMVSS 201U - Headform Calibration Drops

Headform Resultant

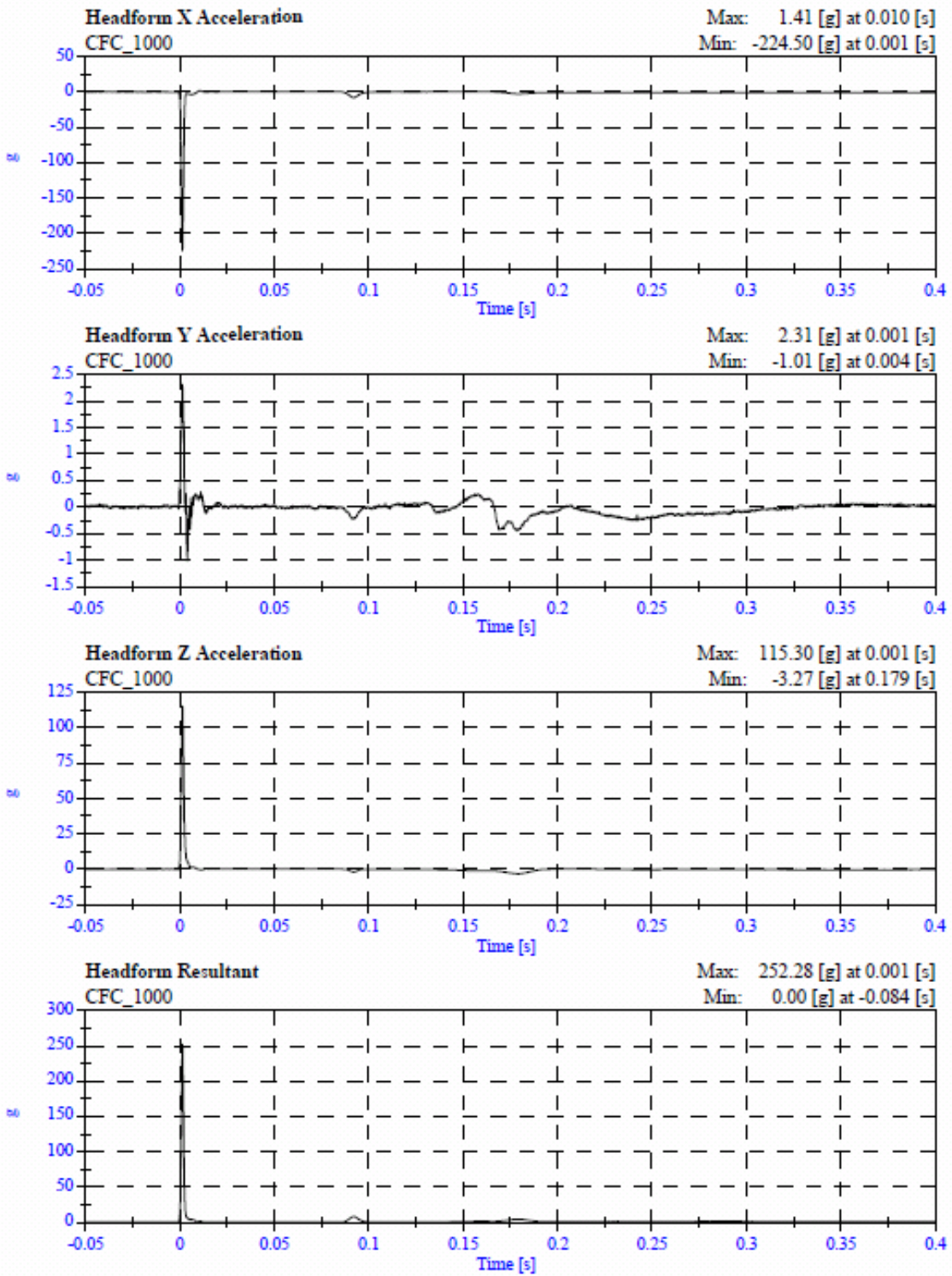
Max: 252.3 [g] at 0.001 [s]

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





# FMVSS 201U - Headform Calibration Drops CA5303 - May 13, 2010



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

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>	
<b>SERIAL NUMBER:</b>		<b>805</b>	
<b>CALIBRATION DATE:</b>		<b>May 13, 2010</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>23 °C</b>	
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>35%</b>	
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>271.8 Gs</b>	
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>4.4 Gs</b>	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>I.D. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J25854</b>	<b>3/2/2010</b>	<b>9/2/2010</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J37496</b>	<b>3/2/2010</b>	<b>9/2/2010</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J41016</b>	<b>3/2/2010</b>	<b>9/2/2010</b>

**REMARKS:**

# FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: May 13, 2010

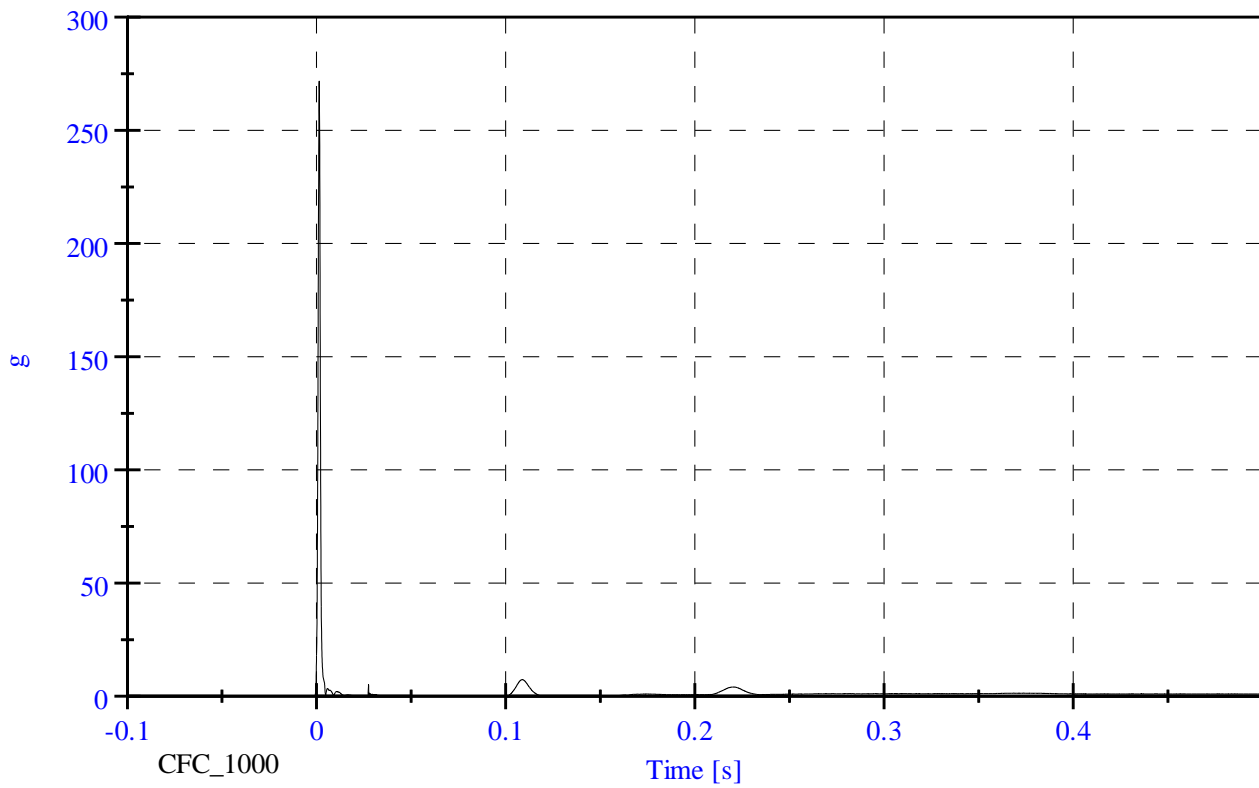
Serial No: 0805

Work File: fmh

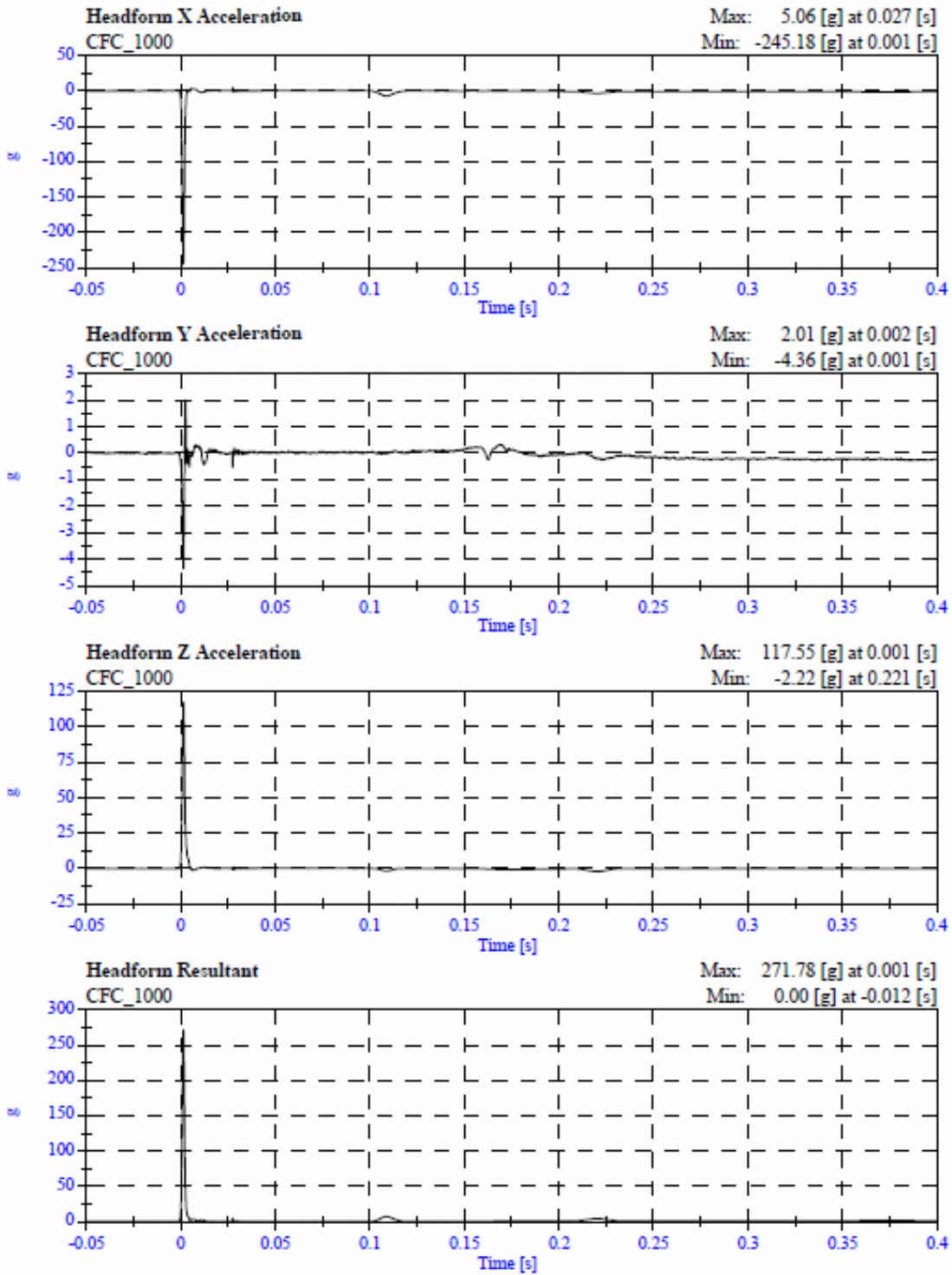
## -----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	22.8 C	Passed
Lab Humidity	10-70 %	35.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	271.78 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	4.36 Gs	Passed
Curve Percent NonModal:	< 10%	2.71 %	Passed

FMVSS 201U - Headform Calibration Drops      Headform Resultant      Max: 271.8 [g] at 0.001 [s]  
Min: 0.0 [g] at -0.012 [s]



# FMVSS 201U - Headform Calibration Drops CA5303 - May 13, 2010



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

<b>MANUFACTURER:</b>		<b>DENTON ATD INC.</b>	
<b>SERIAL NUMBER:</b>		<b>0355</b>	
<b>CALIBRATION DATE:</b>		<b>May 13, 2010</b>	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	<b>19°C to 26°C</b>	<b>23 °C</b>	
<b>RELATIVE HUMIDITY</b>	<b>10% to 70%</b>	<b>36%</b>	
<b>PEAK RESULTANT ACCELERATION</b>	<b>225 Gs to 275 Gs</b>	<b>235.7 Gs</b>	
<b>PEAK LATERAL ACCELERATION</b>	<b>15 Gs Maximum</b>	<b>4.7 Gs</b>	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	<b>YES</b>	<b>YES</b>	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>I.D. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J28671</b>	<b>3/2/2010</b>	<b>9/2/2010</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J32779</b>	<b>3/2/2010</b>	<b>9/2/2010</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J31020</b>	<b>3/2/2010</b>	<b>9/2/2010</b>

**REMARKS:**

# FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: May 13, 2010

Serial No: 0355

Work File: fmh

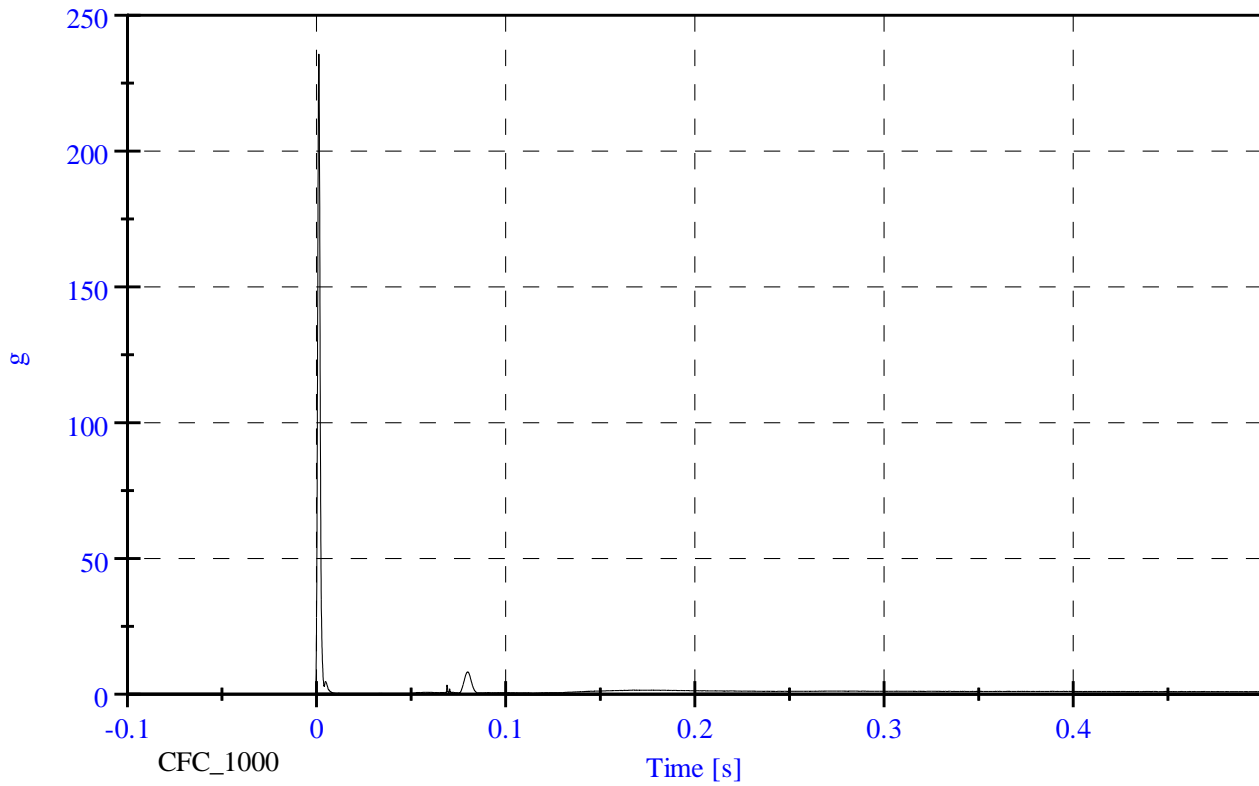
## -----TEST RESULTS-----

<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	23.3 C	Passed
Lab Humidity	10-70 %	36.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	235.65 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	4.67 Gs	Passed
Curve Percent NonModal:	< 10%	3.49 %	Passed

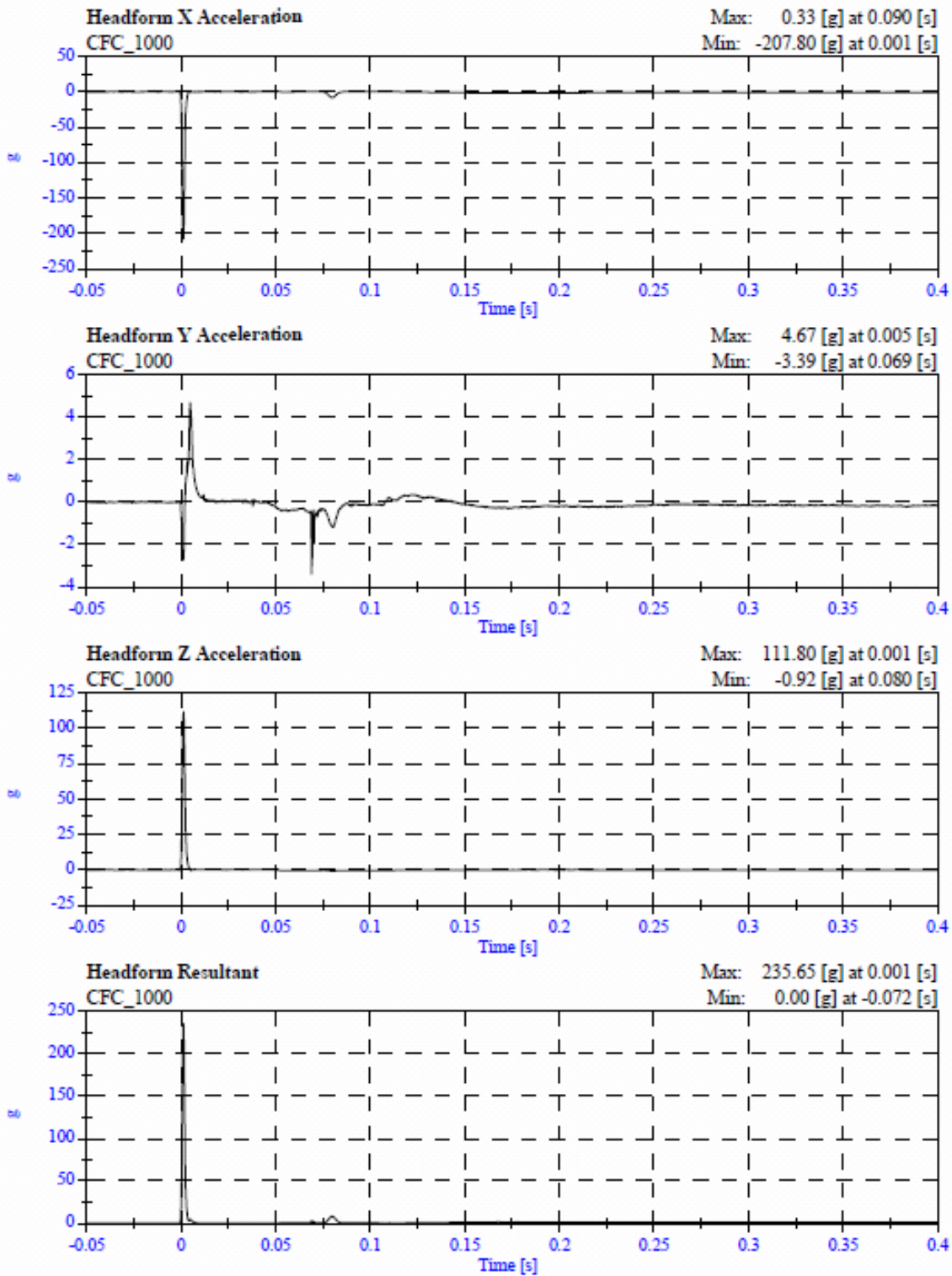
FMVSS 201U - Headform Calibration Drops Headform Resultant

Max: 235.7 [g] at 0.001 [s]

Min: 0.0 [g] at -0.072 [s]



# FMVSS 201U - Headform Calibration Drops CA5303 - May 13, 2010



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

<b>MANUFACTURER:</b>		<b>FIRST TECHNOLOGY SAFETY SYSTEMS</b>	
<b>SERIAL NUMBER:</b>		1142	
<b>CALIBRATION DATE:</b>		May 13, 2010	
<b>TEST PARAMETER</b>	<b>SPECIFICATION</b>	<b>TEST RESULTS</b>	
<b>TEMPERATURE</b>	19°C to 26°C	23 °C	
<b>RELATIVE HUMIDITY</b>	10% to 70%	35%	
<b>PEAK RESULTANT ACCELERATION</b>	225 Gs to 275 Gs	271.0 Gs	
<b>PEAK LATERAL ACCELERATION</b>	15 Gs Maximum	4.7 Gs	
<b>IS ACCELERATION CURVE UNIMODAL?</b>	YES	YES	

**HEAD ACCELEROMETER CALIBRATION INFORMATION**

<b>I.D. NUMBER</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>DATE OF LAST CALIBRATION</b>	<b>DATE OF NEXT CALIBRATION</b>
<b>1 - LONGITUDINAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J41006</b>	<b>4/8/2010</b>	<b>10/8/2010</b>
<b>2 - LATERAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J33030</b>	<b>4/8/2010</b>	<b>10/8/2010</b>
<b>3 - VERTICAL</b>	<b>ENDEVCO</b>	<b>7264-2000T</b>	<b>J31009</b>	<b>4/8/2010</b>	<b>10/8/2010</b>

**REMARKS:**



## FMVSS 201U - Headform Calibration Drops

Part 572E Head Drop

Calibration Date: May 13, 2010

Serial No: 1142

Work File: fmh

### -----TEST RESULTS-----

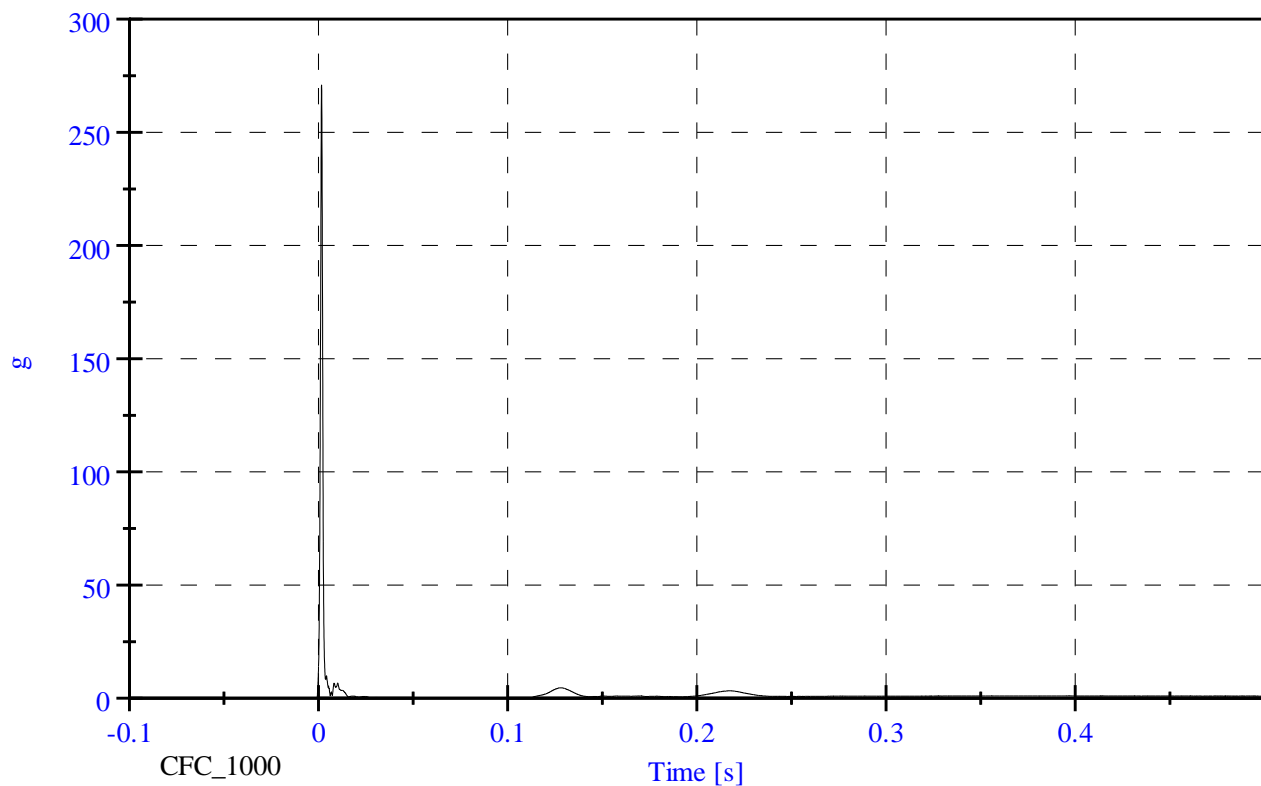
<u>TEST CONDITION</u>	<u>PARAMETERS</u>	<u>RESULTS</u>	<u>STATUS</u>
Lab Temperature:	19-26 C	22.8 C	Passed
Lab Humidity	10-70 %	35.00 %	Passed
Peak Resultant Accel.:	225-275 Gs	270.95 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	4.72 Gs	Passed
Curve Percent NonModal:	< 10%	3.68 %	Passed

FMVSS 201U - Headform Calibration Drops

Headform Resultant

Max: 270.9 [g] at 0.002 [s]

Min: 0.0 [g] at -0.044 [s]



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# FMVSS 201U - Headform Calibration Drops CA5303 - May 13, 2010

