

REPORT NUMBER: 201U-CAL-10-04

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

**KIA MOTORS CORPORATION
2010 KIA SOUL**

NHTSA NUMBER: CA0502

CALSPAN TEST NUMBER: CC2010-04

CALSPAN
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Test Date: February 24, 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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16. <i>Abstract</i> Compliance tests were conducted on the subject vehicle, a 2010 Kia Soul, 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 Kia Soul, NHTSA No. CA0502, 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 Kia Soul, NHTSA No. CA0502, was tested at various upper interior locations by a 4.54 kg 50th percentile headform. A total of twelve (12) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officer's Technical Representative (COTR). A summary of test results can be found on Data Sheet 2-1, Summary of Upper Interior Head Impact Tests. The twelve (12) area chosen for testing were:

RP1	OP2	URRP	URRSR	BP4
BP1	AP3	AP1	RP2	BP2
URBP	AP2			

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:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09 (SEE CERTIFICATION LABEL)
COLOR:	Silver

TARGET CODE	Target Coordinates						Approach Angles (degrees)		Velocity (kph)	FMH HIC	HIC(d)
	Driver Side			Passenger Side			Horizontal	Vertical			
	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Z(mm)					
AP1	1025.328	-538.521	1208.772	1035.514	539.966	1210.927	Relocated 1 circle		-	-	-
AP1 R1	1032.929	-546.915	1189.700	1049.223	547.767	1196.463	117	26	18.31	244.5	350.9
AP2	946.792	-575.297	1122.754	948.983	580.318	1123.290	216	34	18.75	194.1	312.9
AP3	811.284	-605.983	1022.739	812.493	610.004	1022.936	139	37	18.83	273.5	372.8
BP1	1577.806	-494.849	1249.894	1581.158	497.292	1252.482	90	9	18.76	283.9	380.6
BP2	1546.721	-599.385	985.197	1551.161	602.675	980.929	270	2	23.55	381.7	454.4
BP3	1504.151	-608.611	1034.830	1510.908	610.303	1033.259	-	-	-	-	-
BP4	1602.294	-649.469	927.404	1606.287	648.896	927.930	146	-7	23.48	735.9	721.6
FH1	919.456	-434.145	1223.938	927.918	436.076	1228.089	-	-	-	-	-
FH2	875.559	-291.888	1227.584	884.594	290.271	1233.124	-	-	-	-	-
OP1	2362.403	-490.622	1236.793	2363.469	493.052	1238.232	-	-	-	-	-
OP2	2394.520	-587.577	1047.826	2396.535	590.689	1047.362	90	0	23.77	296.6	390.1
RH	2727.782	-355.892	1206.099	2731.630	355.033	1205.376	-	-	-	-	-
RP1	2719.122	-507.379	1165.351	2720.756	508.312	1169.274	55	7	23.83	415.0	479.5
RP2	2642.364	-582.151	1039.254	2645.228	585.928	1037.388	270	-3	23.62	388.2	459.2
SR1	1176.454	-513.436	1232.157	1186.194	518.073	1234.553	Relocated 2 circles		-	-	-
SR1 R2	1139.744	-536.578	1207.750	1152.056	539.238	1210.086	-	-	-	-	-
SR2A	1326.403	-512.970	1242.565	1336.748	517.580	1241.074	Relocated 2 circles		-	-	-
SR2A R2	1327.207	-540.494	1205.872	1313.058	543.982	1205.709	-	-	-	-	-
SR2B	1278.826	-512.028	1243.880	1280.521	517.538	1242.370	Relocated 2 circles		-	-	-
SR2B R2	1276.787	-537.730	1209.350	1269.803	542.812	1207.357	-	-	-	-	-
SR3F	1879.813	-511.910	1197.939	1880.916	515.833	1197.784	-	-	-	-	-
SR3R	2031.979	-512.585	1192.789	2040.224	518.924	1190.325	-	-	-	-	-
URAP	1232.320	-372.217	1279.419	1243.972	371.112	1283.729	-	-	-	-	-
URBP	1577.583	-351.464	1287.085	1582.217	360.147	1289.819	270	50	23.83	445.8	502.7
URFSR	1340.893	-364.991	1290.365	1381.557	363.255	1293.971	-	-	-	-	-
UROB	2360.770	-355.705	1284.691	2361.507	371.510	1283.294	-	-	-	-	-
URRP	2525.368	-371.323	1275.870	2537.994	379.842	1274.296	90	50	23.79	344.1	426.0
URRSR	2029.653	-358.076	1290.911	1967.830	391.897	1290.003	90	38	23.71	484.0	531.5

*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:				2010 Kia Soul					
VIN:				KNDJT2A29A7085226					
Month & Year of Manufacture:				07/09 (SEE CERTIFICATION LABEL)					
Vehicle Body Color:				Silver					
Engine Data:	4	Cylinders;	-	CID;	2.0	Liters;	-	cc	
Engine Placement:		x	Longitudinal;	or		-	Lateral		
Transmission:	5	Speed;	x	Manual;	-	Automatic;	x	Overdrive	
Final Drive:	-	Rear Wheel Drive;	x	Front Wheel Drive;	-	Four Wheel Drive			
Odometer Reading:		42	km						
Options:	x	A/C;	x	Power Steering;	x	Pwr.Brakes;	x	Pwr. Windows	
Interior Trim Information :									
1.Adjustable seat belt anchorages on B-Pillar									
2.Non-adjustable seat belt anchorages on Rear Pillar									
3. Front and second row side rail grab handles									

DATA FROM TIRE PLACARD:									
Tire Pressure (at capacity);				230		kPa FRONT			
				230		kPa REAR			
Recommended Tire Size:				P205/55R16					
Tires on Test Vehicle:		P205/55R16			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)=				385		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.)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:					
Left Front =	397.0	kg	Left Rear =	243.5	kg
Right Front =	388.5	kg	Right Rear =	255.0	kg
TOTAL FRONT =	785.5	kg	TOTAL REAR =	498.5	kg
% of Total Weight =	61.2%	%	% of Total Weight =	38.8%	%
TOTAL WEIGHT =	1284.0		kg		

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:		
Total Test Vehicle Delivered Weight=	1284.0	kg (A)
+ Rated Cargo/Luggage Weight =	45	kg (B)
TEST VEHICLE TARGET WEIGHT =	1329.0	kg (A+B)

WEIGHT OF TEST VEHICLE (FULLY LOADED):					
Left Front =	402.0	kg	Left Rear =	266.0	kg
Right Front =	385.0	kg	Right Rear =	268.0	kg
TOTAL FRONT =	787.0	kg	TOTAL REAR =	534.0	kg
% of Total Weight =	59.6%	%	% of Total Weight =	40.4%	%
TOTAL TEST WEIGHT =	1321.0				
Weight of vehicle secured in test vehicles cargo area =	38.0		kg		

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	711	Left Rear	731
	Right Front	714	Right Rear	730
FULLY LOADED:	Left Front	707	Left Rear	722
	Right Front	710	Right Rear	722
Test Vehicle Wheelbase:	⊗) S%		millimeters	

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.6↓	Front Bumper	↑0.1↓
	Right Door Sill	↓0.6↑	Rear Bumper	0.0
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.4↓	Front Bumper	↑0.2↓
	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	0.0

DATA SHEET 2-3

APPROACH ANGLE LIMITS

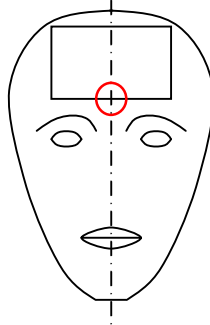
Target Code	Left Side				Target Code	Right Side			
	Horizontal Angles (deg.)		Vertical Angles (deg.)			Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	201	250	-5	26	AP1	110	159	-5	26
AP2	201	250	-5	34	AP2	110	159	-5	34
AP3	201	250	-5	37	AP3	110	159	-5	37
BP1	201	280	-10	9	BP1	80	159	-10	9
BP2	ANY		0	2	BP2	ANY		0	2
BP3	201	280	-10	-2	BP3	80	159	-10	-2
BP4	201	280	-10	-7	BP4	80	159	-10	-7
OP1	270		-10	10	OP1	90		-10	10
OP2	270		-10	0	OP2	90		-10	0
RP1	270	345	-10	7	RP1	15	90	-10	7
RP2	270	345	-10	-3	RP2	15	90	-10	-3
FH1	180		0	50	FH1	180		0	50
FH2	180		0	50	FH2	180		0	50
RH	360		0	50	RH	0		0	50
SR1	270		0	23	SR1	90		0	23
SR2A	270		0	26	SR2A	90		0	26
SR2B	270		0	38	SR2B	90		0	38
SR3F	270		0	19	SR3F	90		0	19
SR3R	270		0	22	SR3R	90		0	22
URAP	ANY		0	50	URAP	ANY		0	50
URBP	ANY		0	50	URBP	ANY		0	50
URRP	ANY		0	50	URRP	ANY		0	50
URRSR	ANY		0	38	URRSR	ANY		0	38

Note : BP2 and RP2 target location – Seat belt anchorage. Target RP2 is a seat belt anchorage location treated as a pillar target with respect to the approach angle limits of Table 1 (S8.13.4).

DATA SHEET 2-4

SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver



ã RIGHT SIDE OF FACE

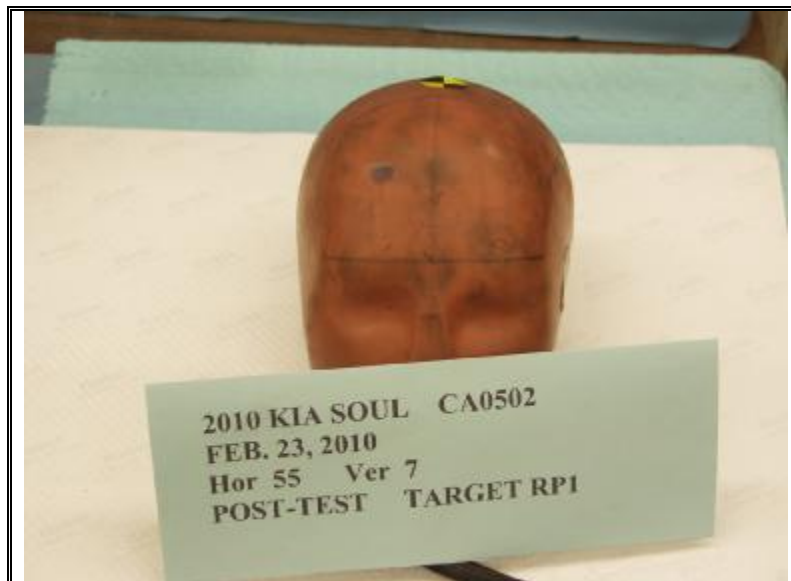
TARGET	Distance Above Point 0 (mm)	Distance Over From Pt. O (mm)
RP1	42	25R
OP2	18	5L
URRP	36	4L
URRSR	48	5L
BP4	19	14L
BP1	48	7R
AP3	6	6R
AP1	22	24R
RP2	15	8R
BP2	8	5L
URBP	39	0
AP2	18	6R

SECTION 3
SUMMARY OF TEST RESULTS AND DATA PLOTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	01
Test Date:	02/23/10
Target Location:	REAR PILLAR
Target Code:	RP1
Horizontal Impact Angle:	55
Vertical Impact Angle:	7
Ambient Temperature:	20°C
Relative Humidity:	27
Time of Impact:	9:30
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	25	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	42				mm up



POST-IMPACT RP1 HEADFORM

Free Motion HIC	415.0
HIC(d)	479.5
Impact Velocity (kph)	23.83
HIC T1 (msec)	2.(
HIC T2 (msec)	12.8

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FMH Headform 0062

Location: RP1

Test Date: February 23, 2010

Work File: RP1

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

Lab Temperature: 20 C

HICd: 479.5

Lab Humidity: 27 %

HIC (36ms): 415.0

Velocity at Impact: 23.83 KPH

t1: 2.4 msec

t2: 12.8 msec

Free Flight Distance: 222.08 mm

Duration: 10.4 msec

Average Acceleration: 8.6 g

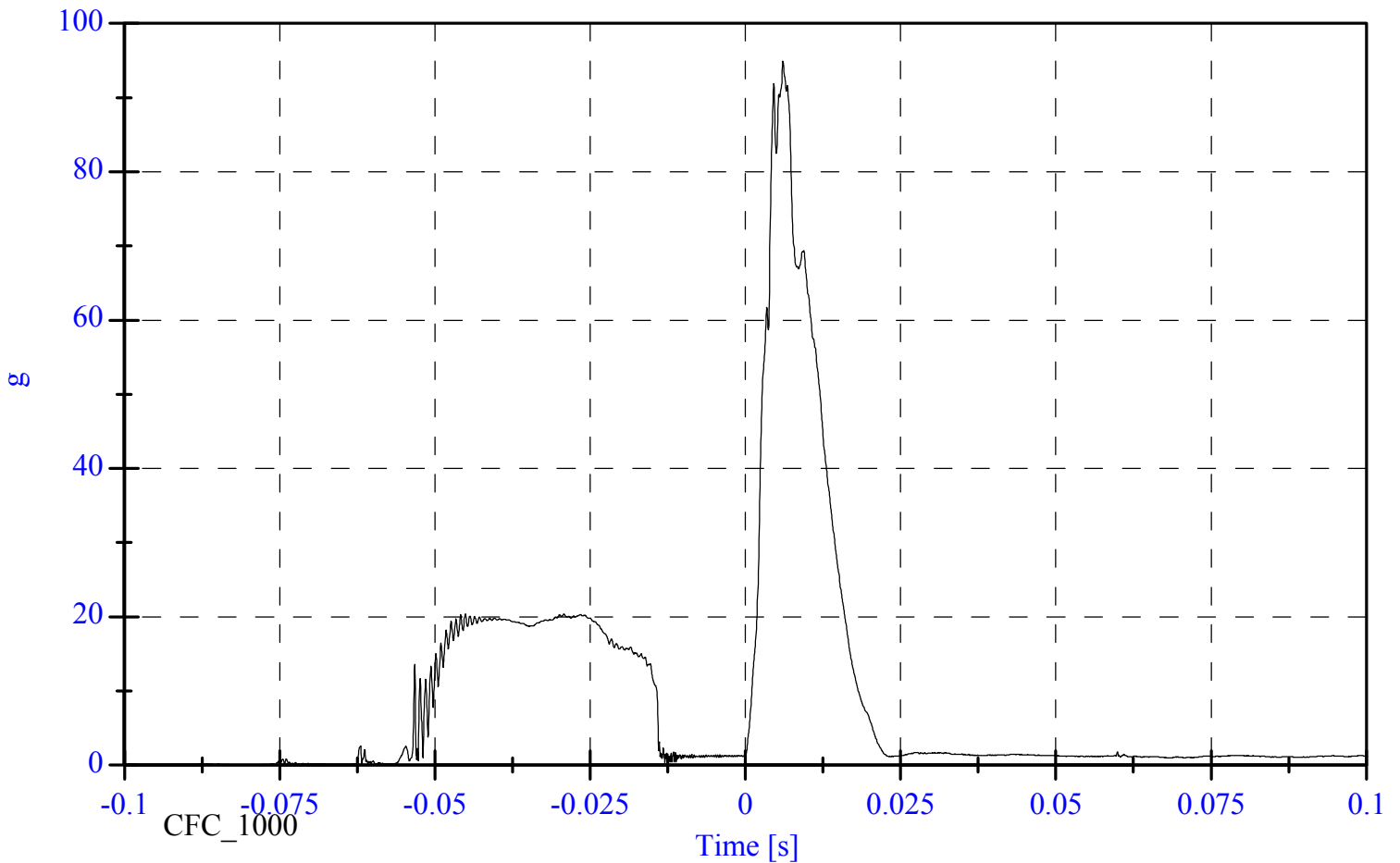
Maximum: 94.9 g

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Headform Resultant

Max: 94.9 [g] at 0.006 [s]

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



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Headform X Acceleration

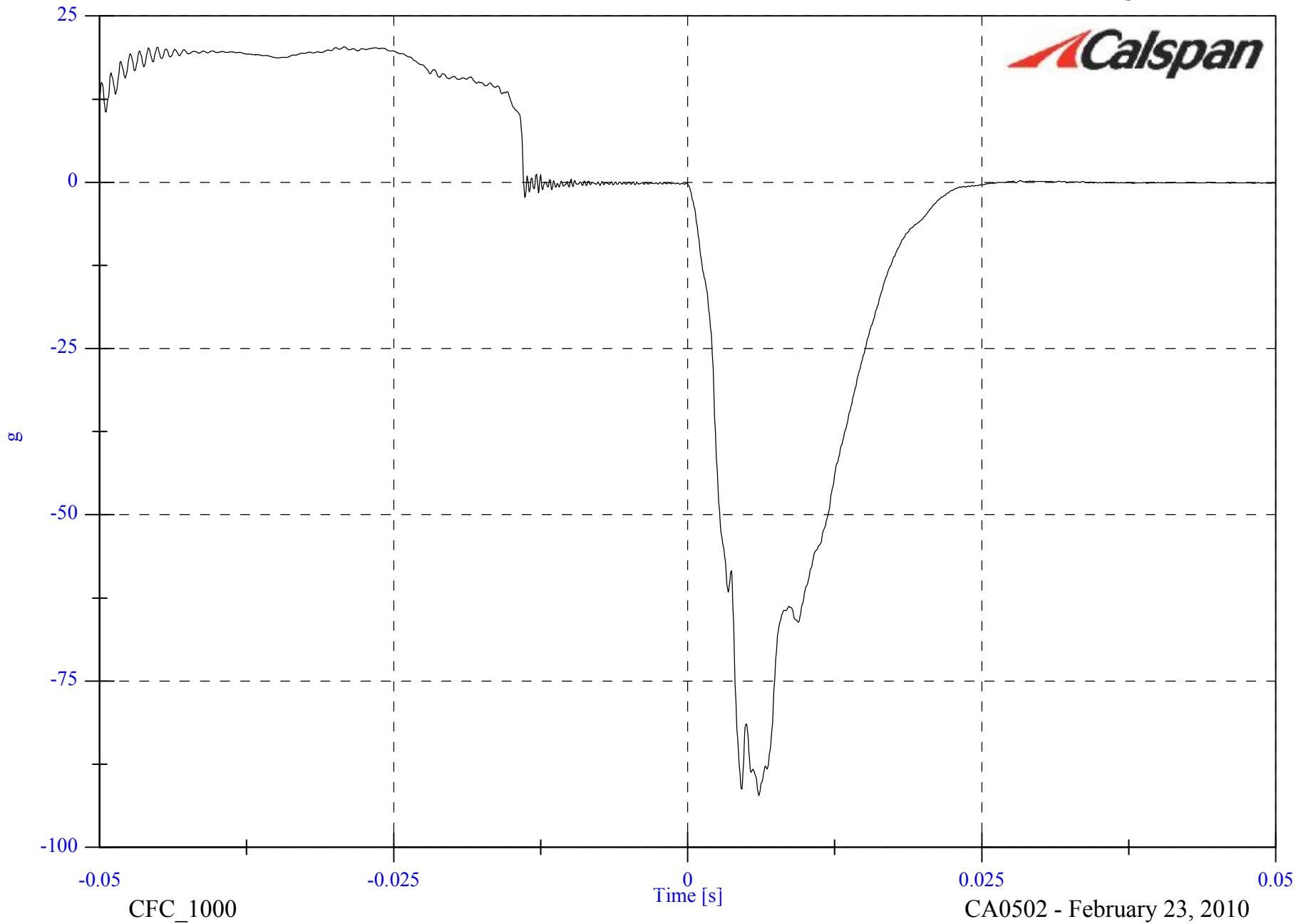
Max: 20.4 [g] at -0.029 [s]

Min: -92.3 [g] at 0.006 [s]



CA0502 PASSENGER SIDE RP1 IMPACT PLOT #1

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

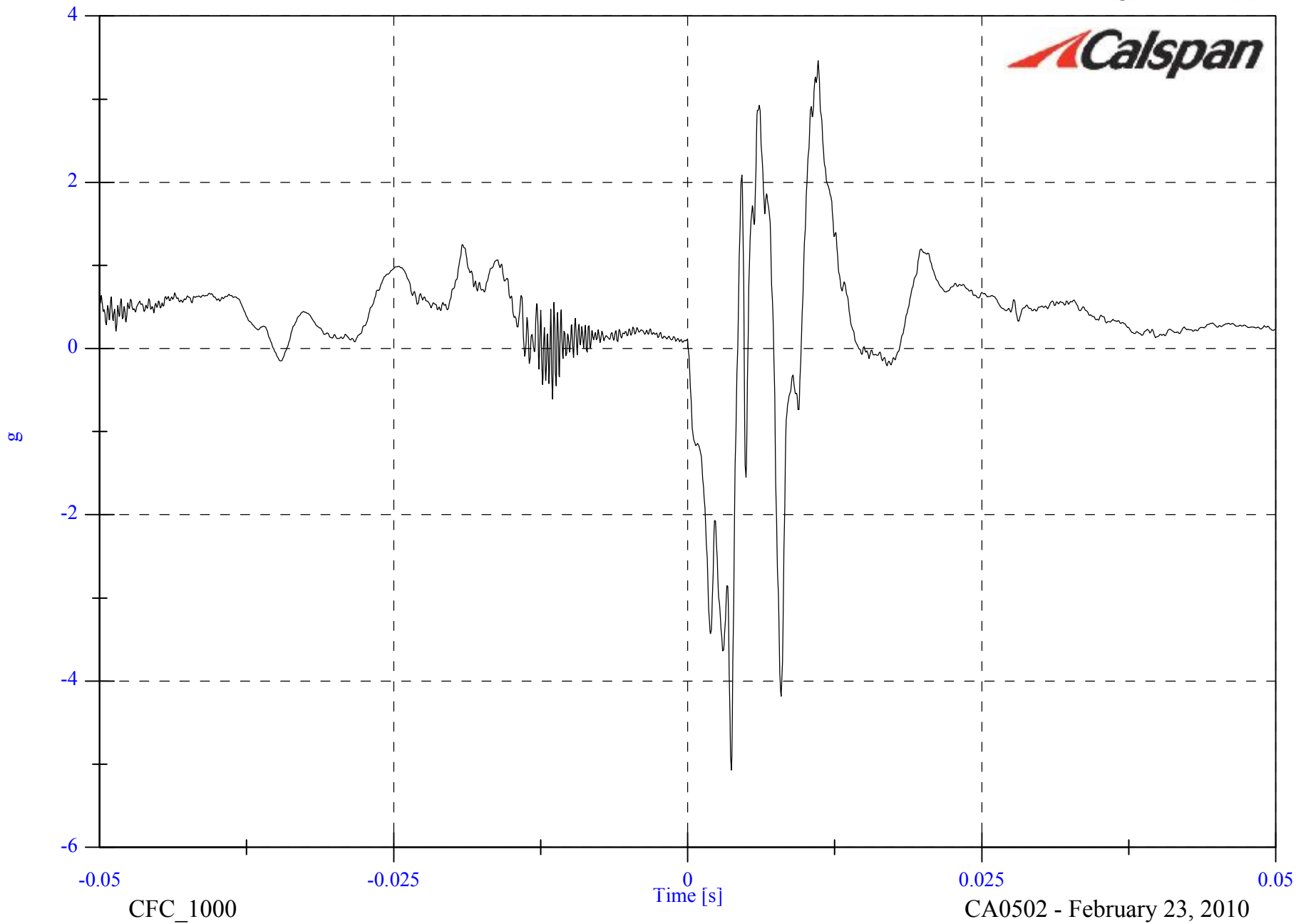
Max: 3.5 [g] at 0.011 [s]

Min: -5.1 [g] at 0.004 [s]



CA0502 PASSENGER SIDE RP1 IMPACT PLOT #2

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

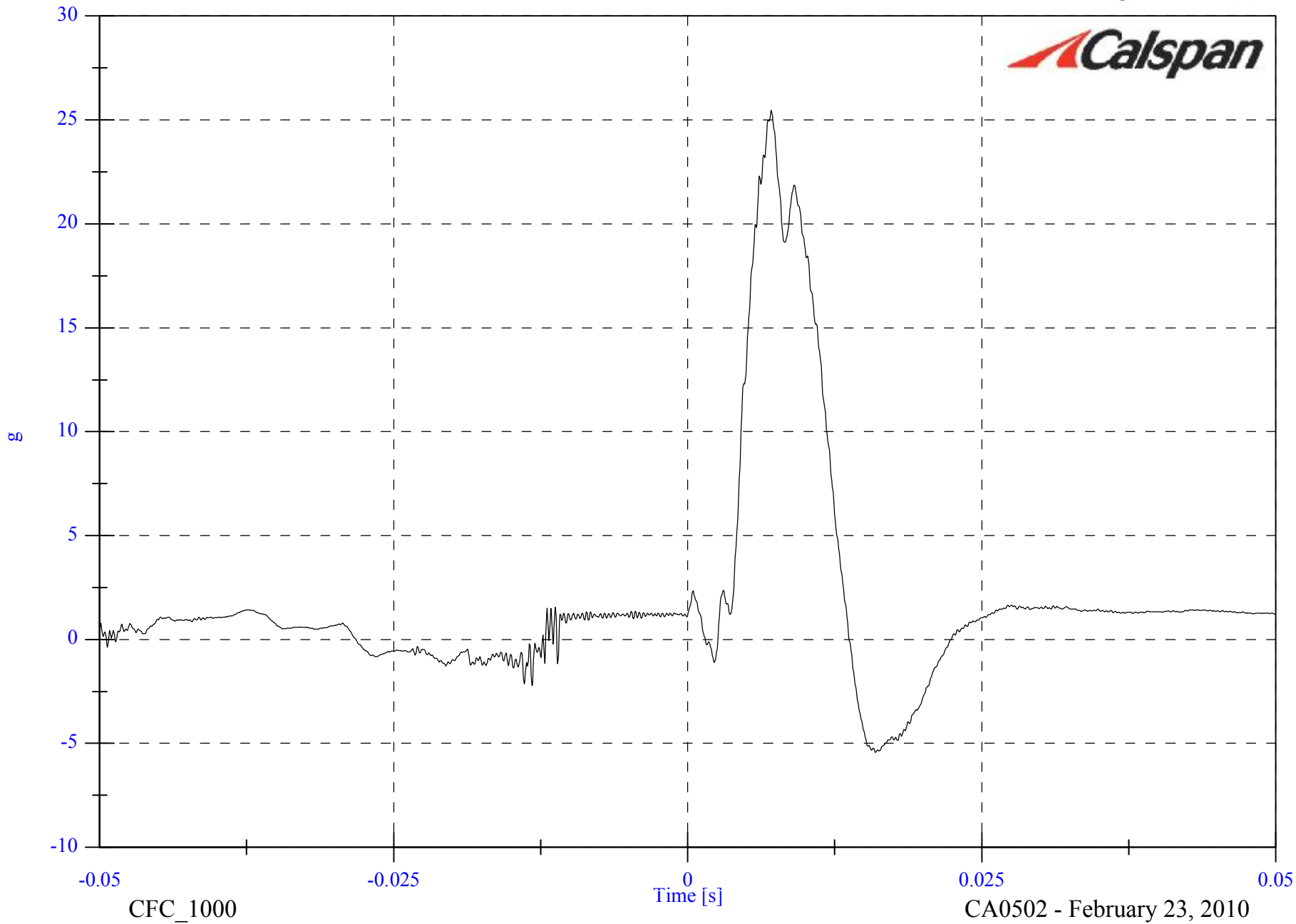
Max: 25.5 [g] at 0.007 [s]

Min: -5.4 [g] at 0.016 [s]



CA0502 PASSENGER SIDE RP1 IMPACT PLOT #3

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Resultant

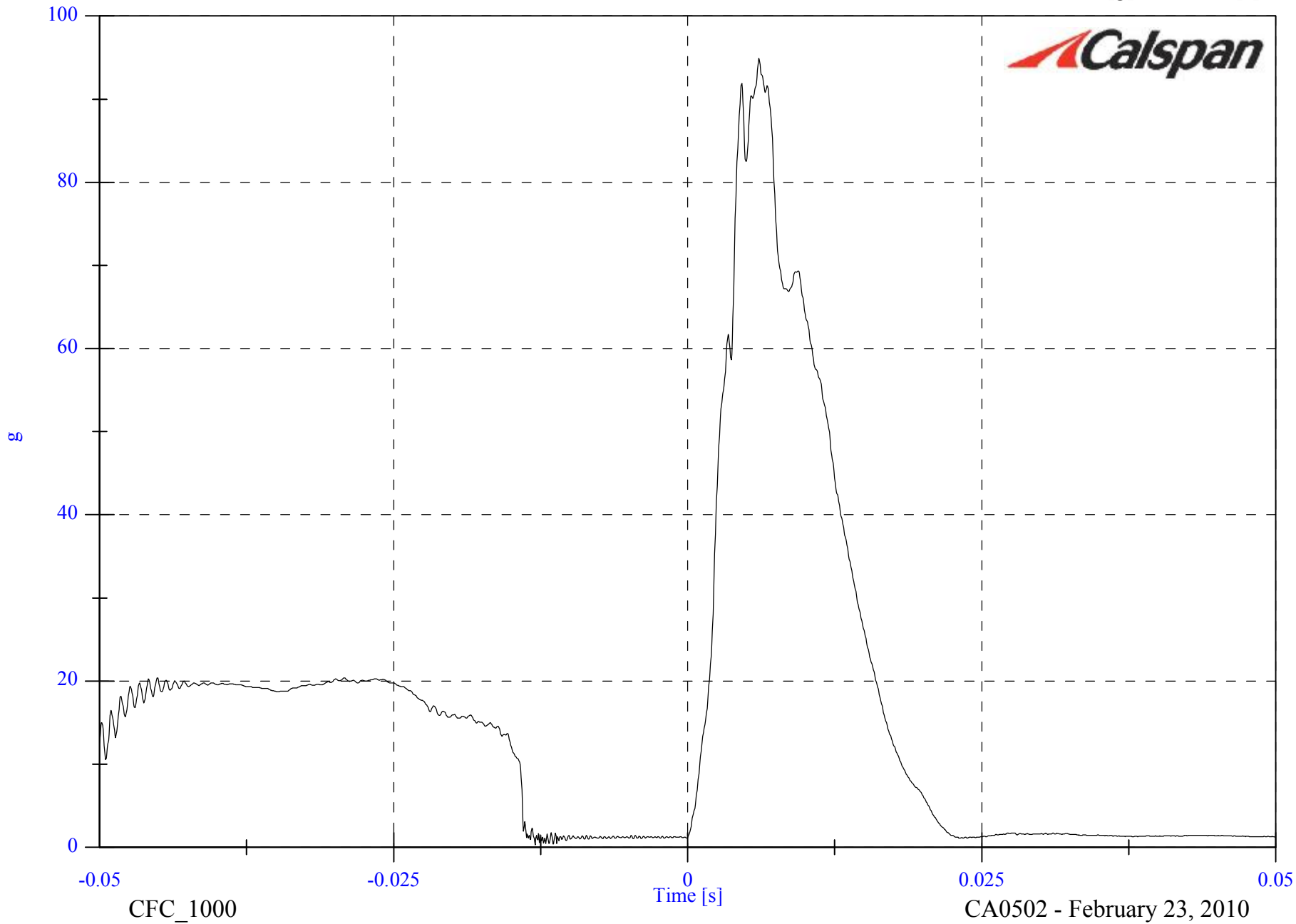
Max: 94.9 [g] at 0.006 [s]

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



CA0502 PASSENGER SIDE RP1 IMPACT PLOT #4

CC2010-04

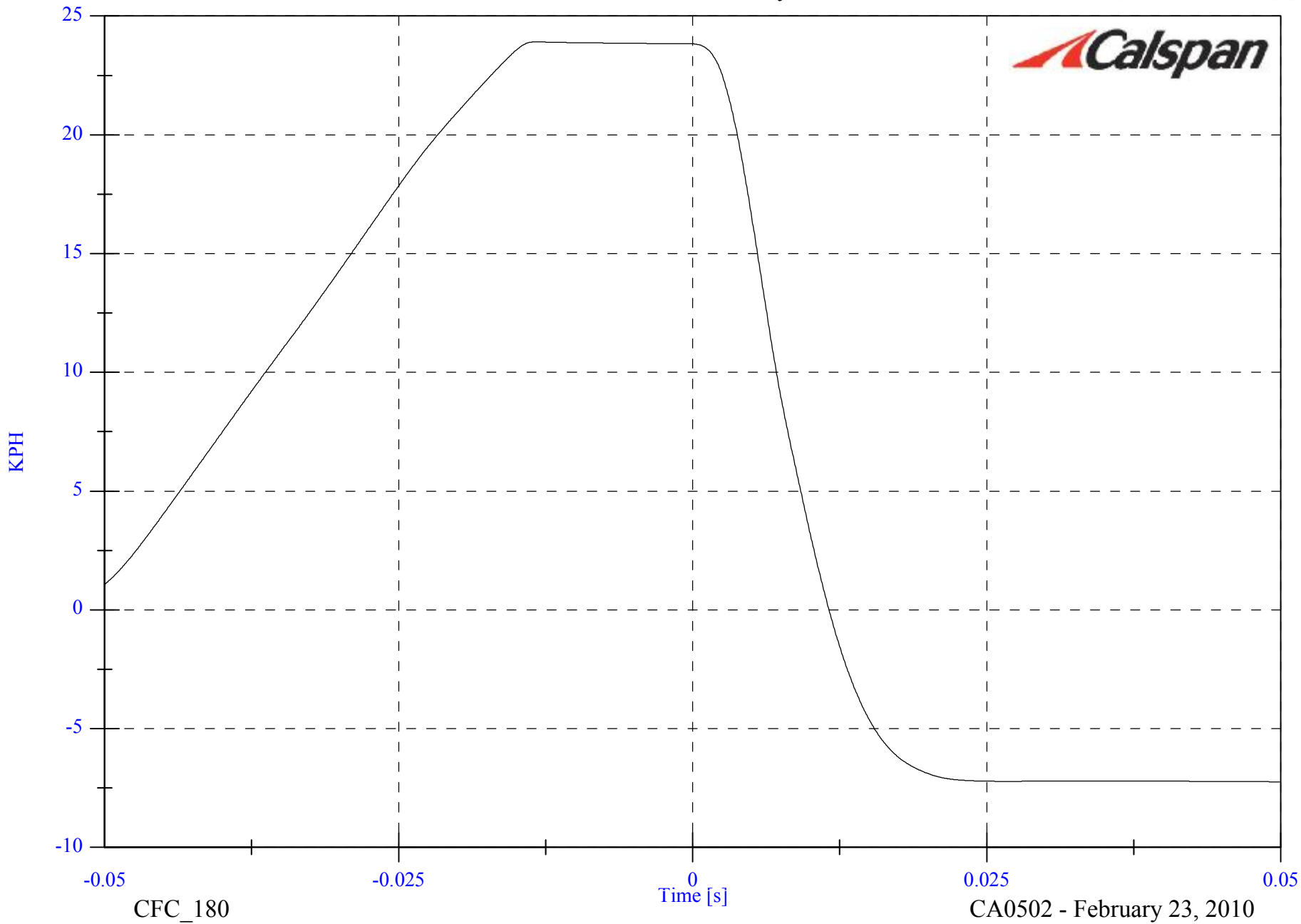


FMVSS 201U 2010 KIA SOUL

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

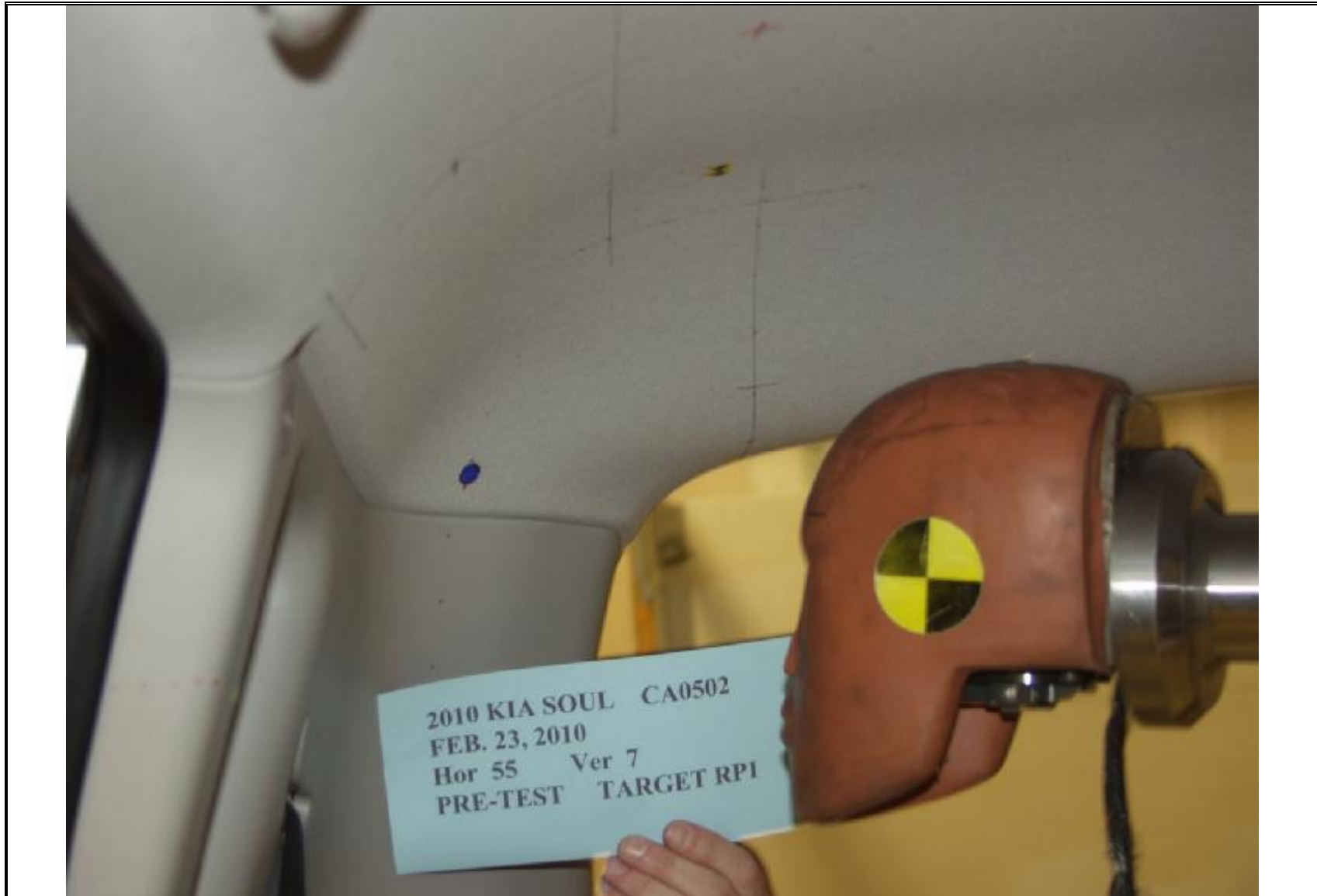
Min: -7.2 [KPH] at 0.050 [s]

Headform Velocity



CA0502 PASSENGER SIDE RP1 IMPACT PLOT #5

CC2010-04



PRE-IMPACT RPI

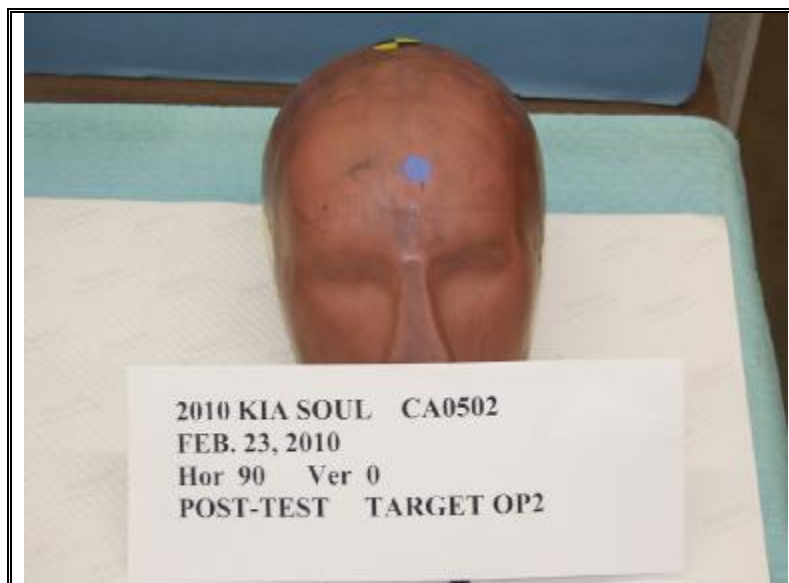


POST-IMPACT RPI

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	02
Test Date:	02/23/10
Target Location:	OTHER PILLAR
Target Code:	OP2
Horizontal Impact Angle:	90
Vertical Impact Angle:	0
Ambient Temperature:	20°C
Relative Humidity:	27
Time of Impact:	10:15
Headform Number:	0805

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	18				mm up



POST-IMPACT OP2 HEADFORM

Free Motion HIC	296.6
HIC(d)	390.1
Impact Velocity (kph)	23.77
HIC T1 (msec)	0.5
HIC T2 (msec)	14.0%

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FMH Headform 0805

Location: OP2

Test Date: February 23, 2010

Work File: OP2

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

Lab Temperature: 20 C

HICd: 390.1

Lab Humidity: 27 %

HIC (36ms): 296.6

Velocity at Impact: 23.77 KPH

t1: 0.5 msec

t2: 14.1 msec

Free Flight Distance: 222.43 mm

Duration: 13.6 msec

Average Acceleration: 8.4 g

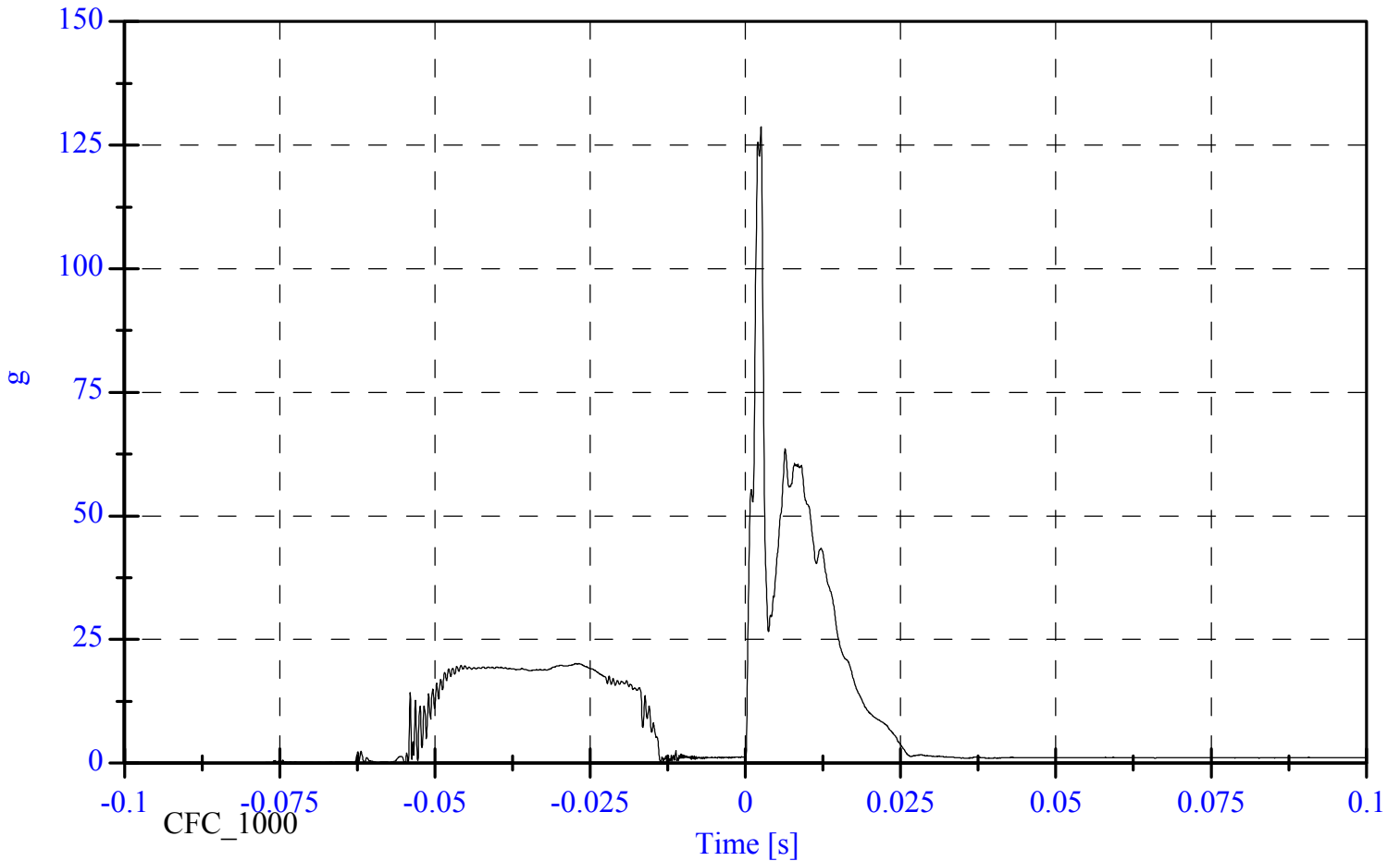
Maximum: 128.7 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 128.7 [g] at 0.003 [s]

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

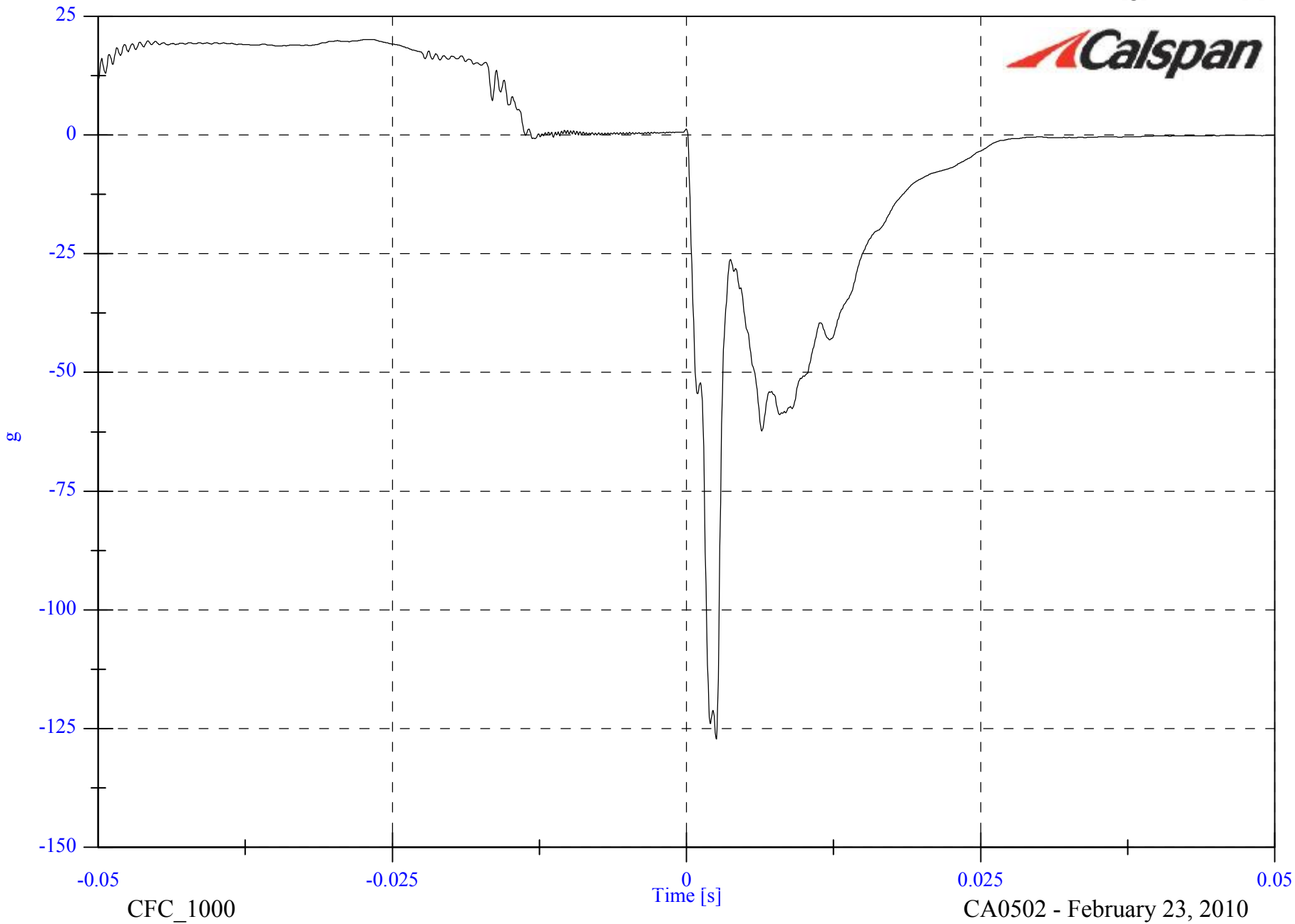


FMVSS 201U 2010 KIA SOUL

Max: 20.1 [g] at -0.027 [s]

Min: -127.2 [g] at 0.003 [s]

Headform X Acceleration



CA0502 PASSENGER SIDE OP2 IMPACT PLOT #1

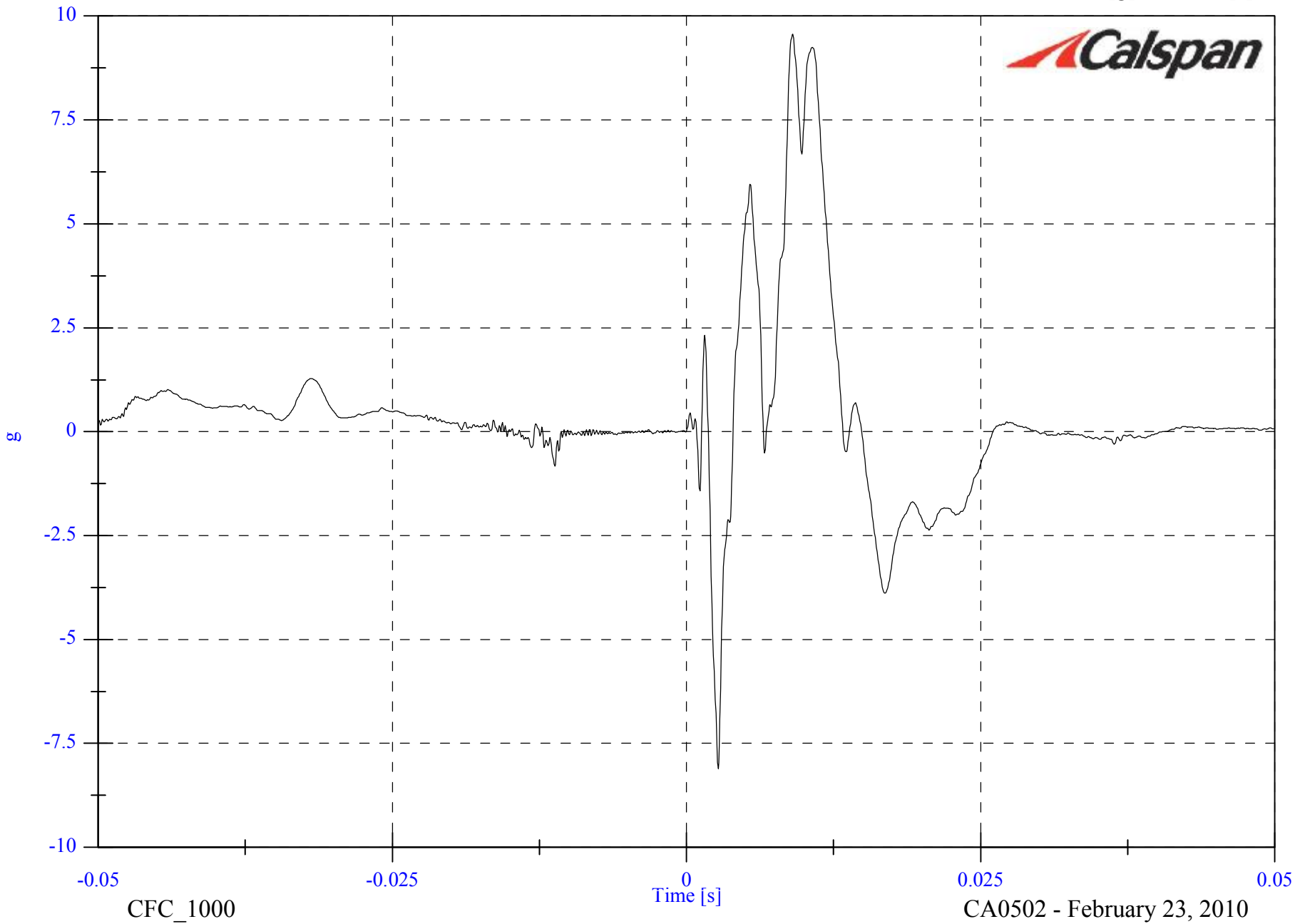
CC2010-04

FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

Max: 9.6 [g] at 0.009 [s]

Min: -8.1 [g] at 0.003 [s]



CA0502 PASSENGER SIDE OP2 IMPACT PLOT #2

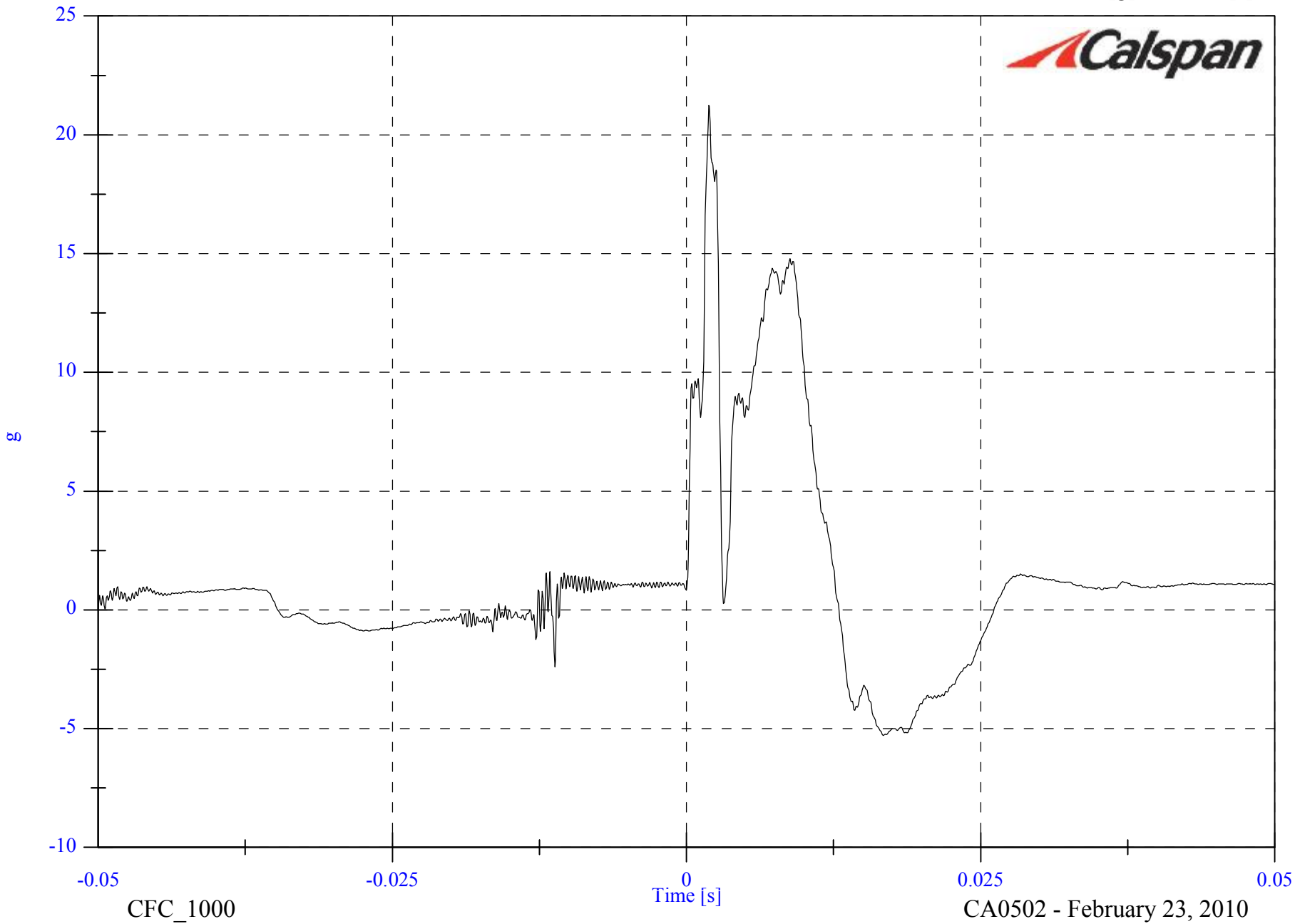
CC2010-04

FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

Max: 21.2 [g] at 0.002 [s]

Min: -5.3 [g] at 0.017 [s]



CA0502 PASSENGER SIDE OP2 IMPACT PLOT #3

CC2010-04

Headform Resultant

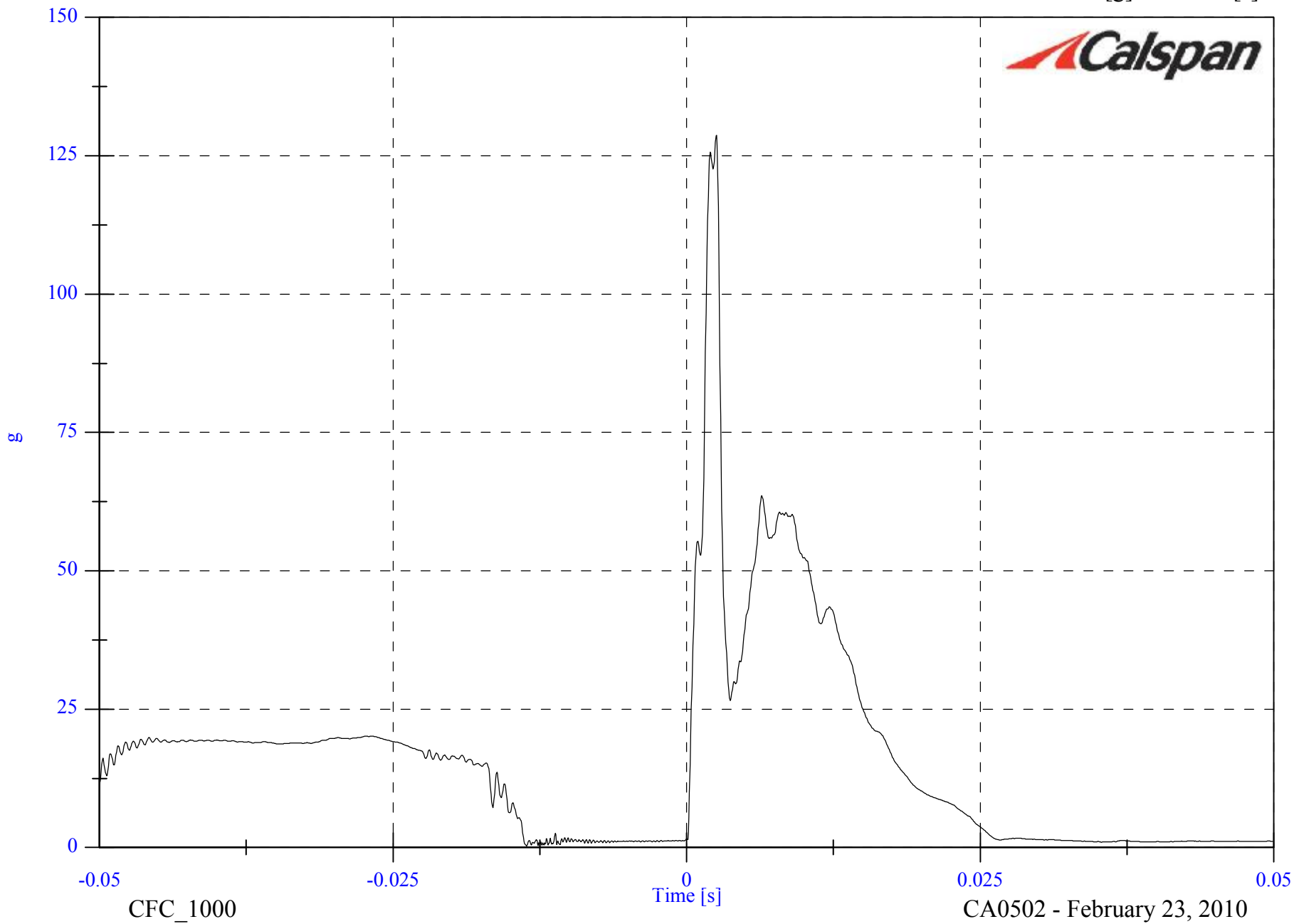
Max: 128.7 [g] at 0.003 [s]

Min: 0.2 [g] at -0.013 [s]



CA0502 PASSENGER SIDE OP2 IMPACT PLOT #4

CC2010-04

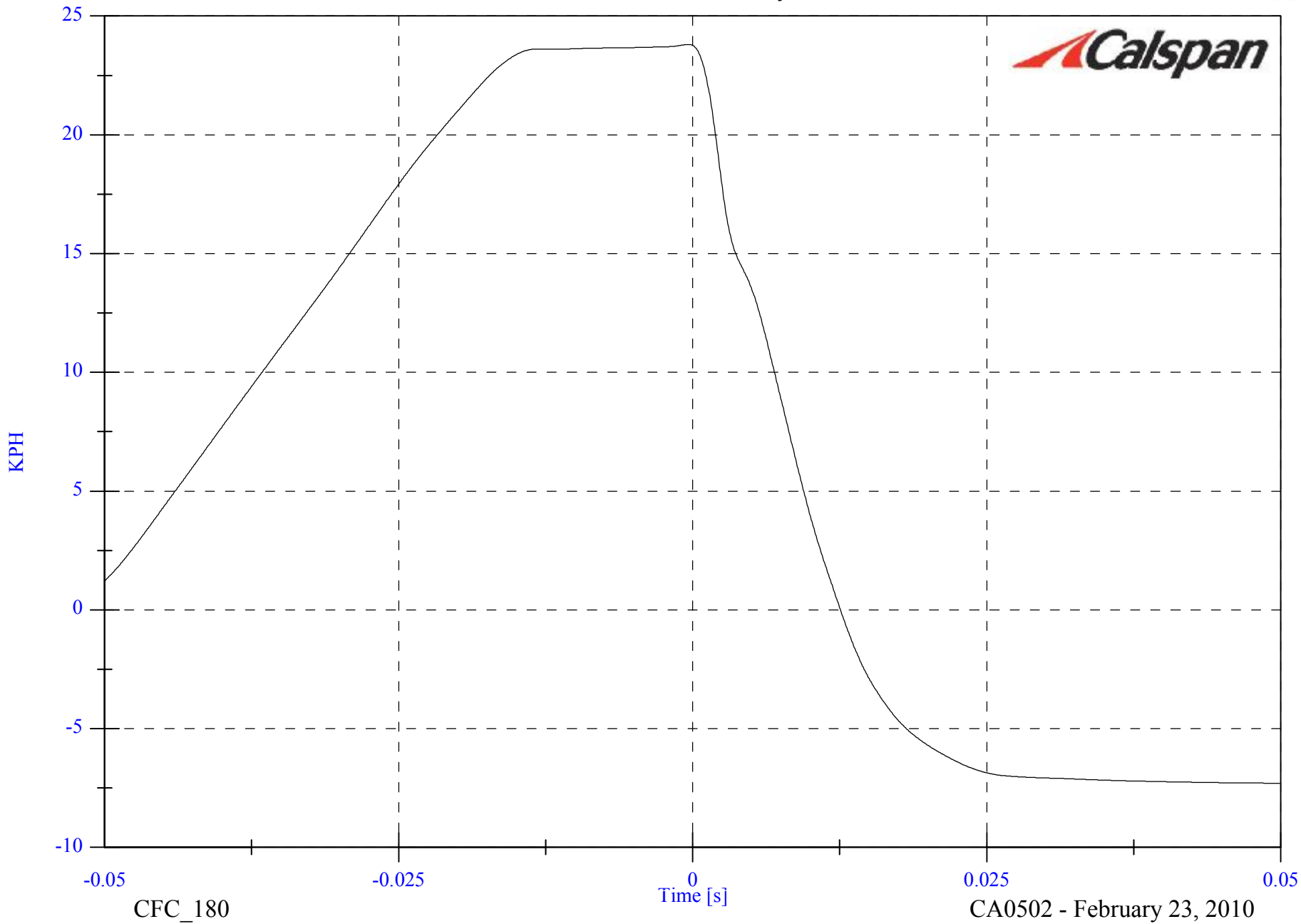


FMVSS 201U 2010 KIA SOUL

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

Min: -7.3 [KPH] at 0.050 [s]

Headform Velocity

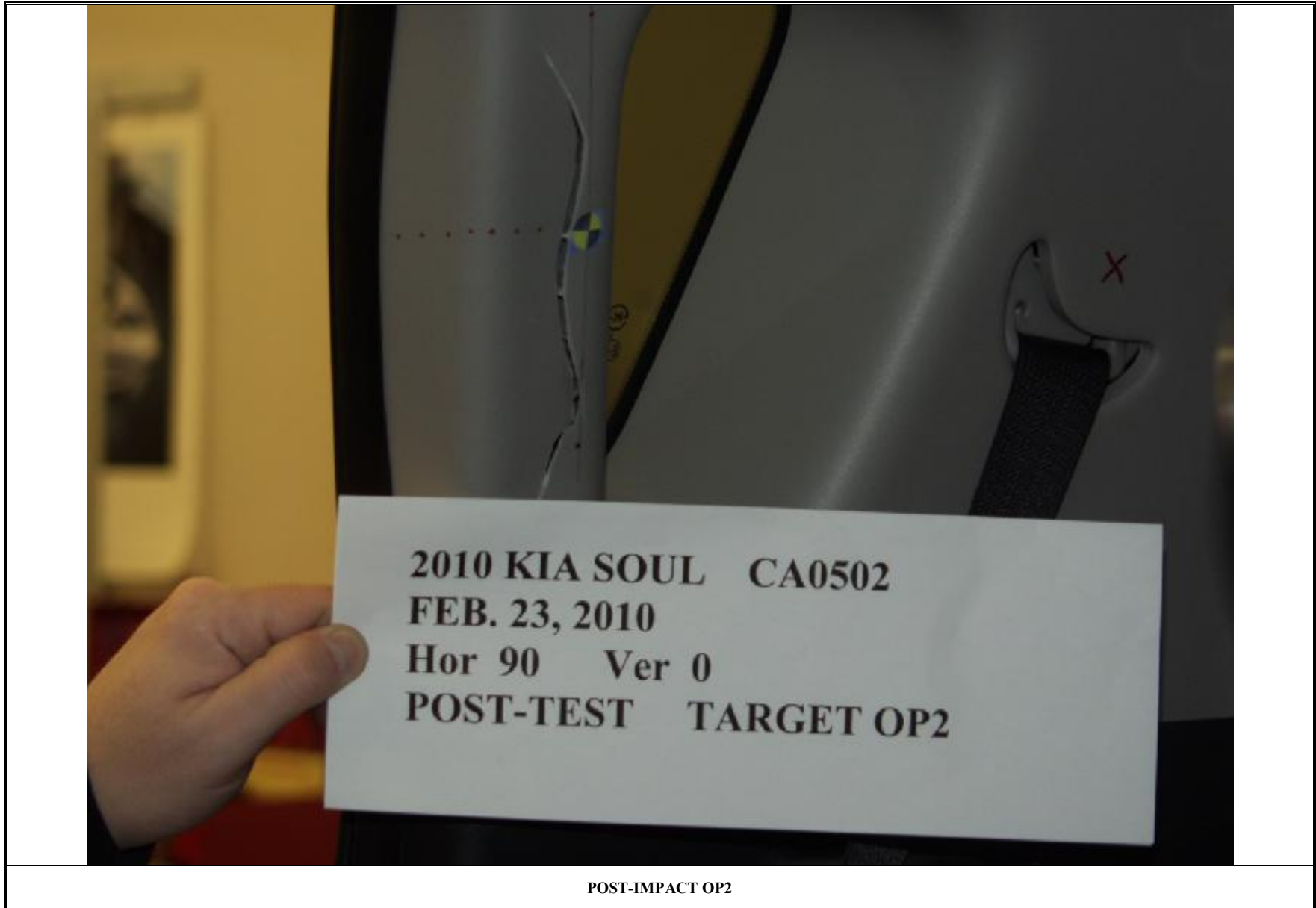


CA0502 PASSENGER SIDE OP2 IMPACT PLOT #5

CC2010-04



PRE-IMPACT OP2

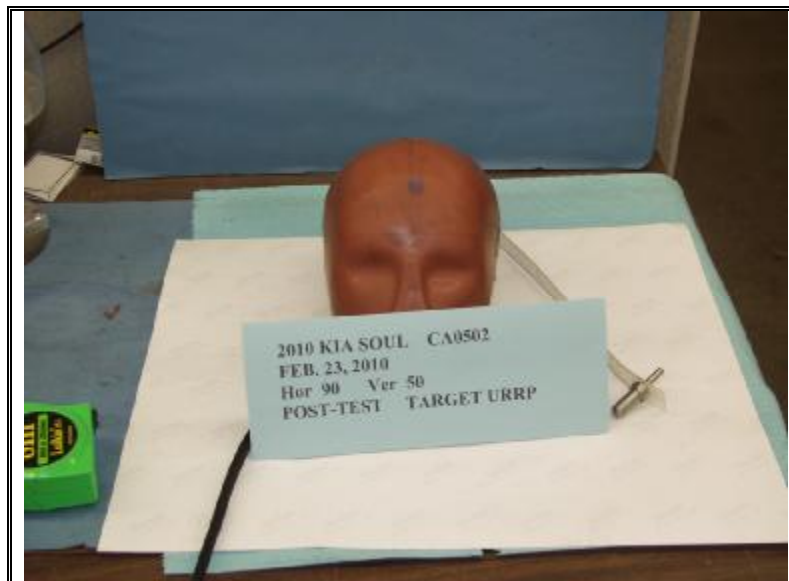


POST-IMPACT OP2

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	03
Test Date:	02/23/10
Target Location:	UPPER ROOF
Target Code:	URRP
Horizontal Impact Angle:	90
Vertical Impact Angle:	50
Ambient Temperature:	20°C
Relative Humidity:	27
Time of Impact:	10:45
Headform Number:	355

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	36		mm up



POST-IMPACT URRP HEADFORM

Free Motion HIC	344.1
HIC(d)	426.0
Impact Velocity (kph)	23.79
HIC T1 (msec)	2.4
HIC T2 (msec)	15.1

FMVSS 201U 2010 KIA SOUL CA0502 - URRP

FMH Headform 0355

Location: URRP

Test Date: February 23, 2010

Work File: URRP

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

Lab Temperature: 20 C

HICd: 426.0

Lab Humidity: 27 %

HIC (36ms): 344.1

Velocity at Impact: 23.79 KPH

t1: 2.4 msec

t2: 15.1 msec

Free Flight Distance: 229.92 mm

Duration: 12.6 msec

Average Acceleration: 9.1 g

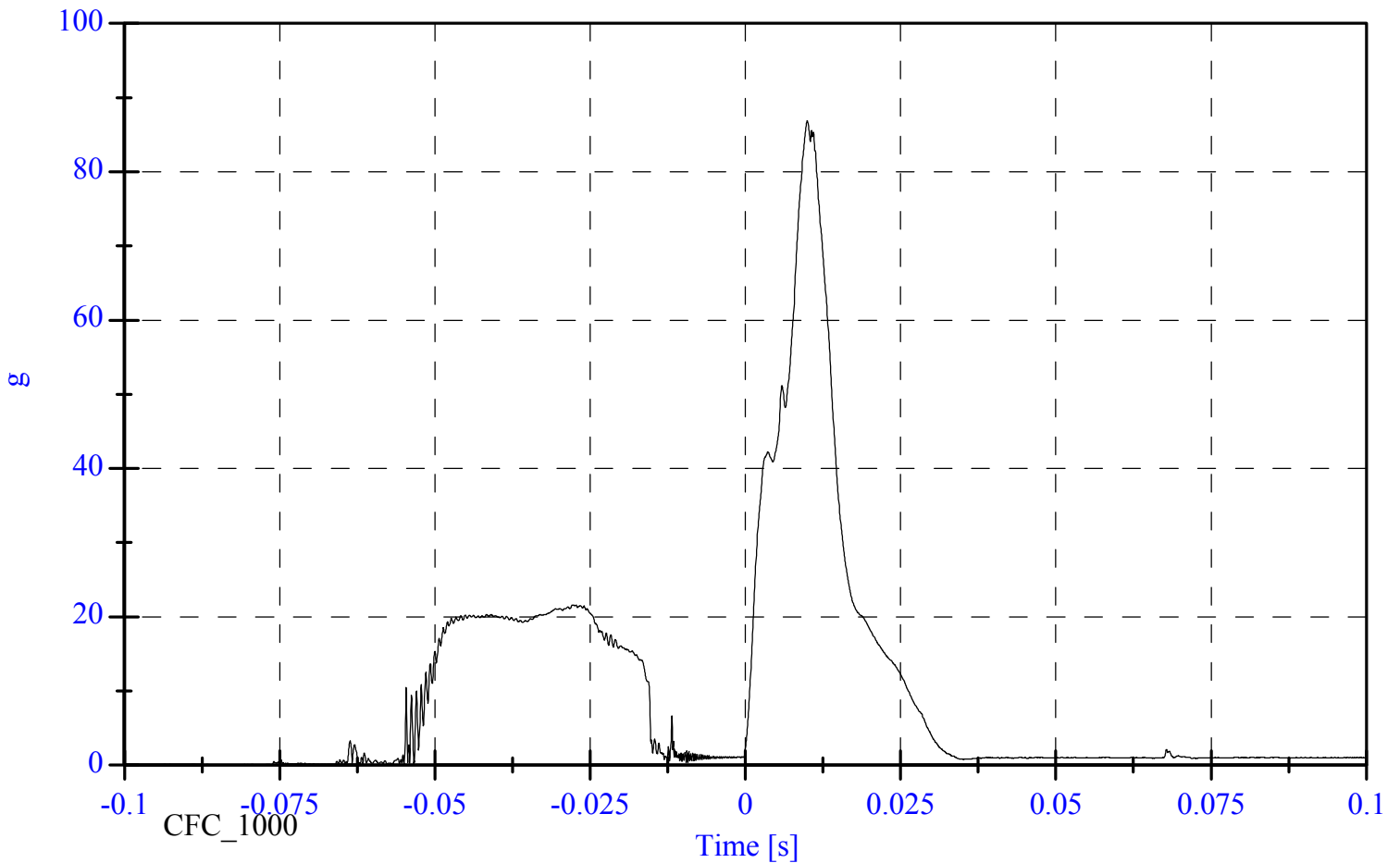
Maximum: 86.9 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 86.9 [g] at 0.010 [s]

Min: 0.0 [g] at -0.083 [s]



FMVSS 201U 2010 KIA SOUL

Headform X Acceleration

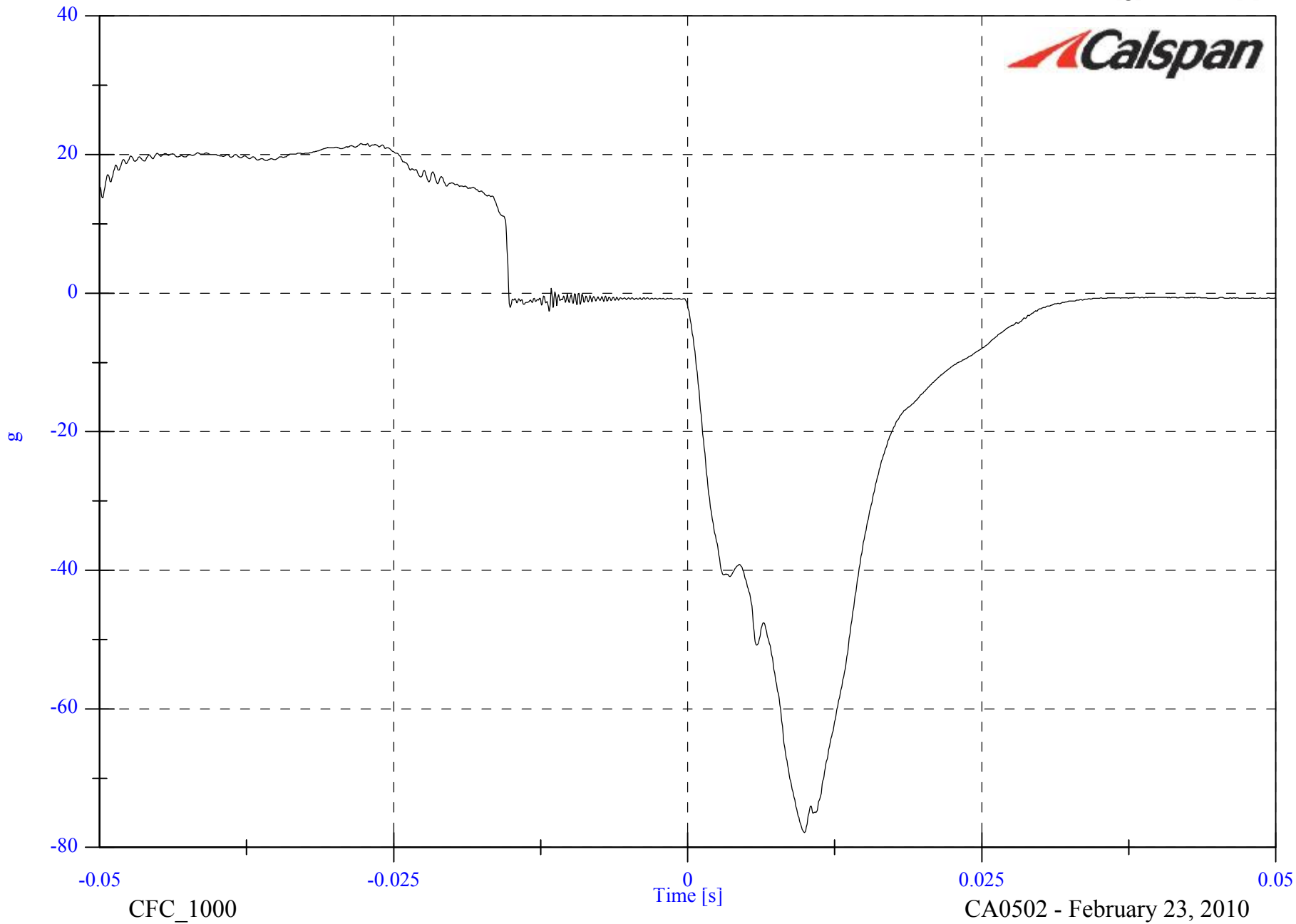
Max: 21.6 [g] at -0.028 [s]

Min: -77.8 [g] at 0.010 [s]



CA0502 PASSENGER SIDE URRP IMPACT PLOT #1

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

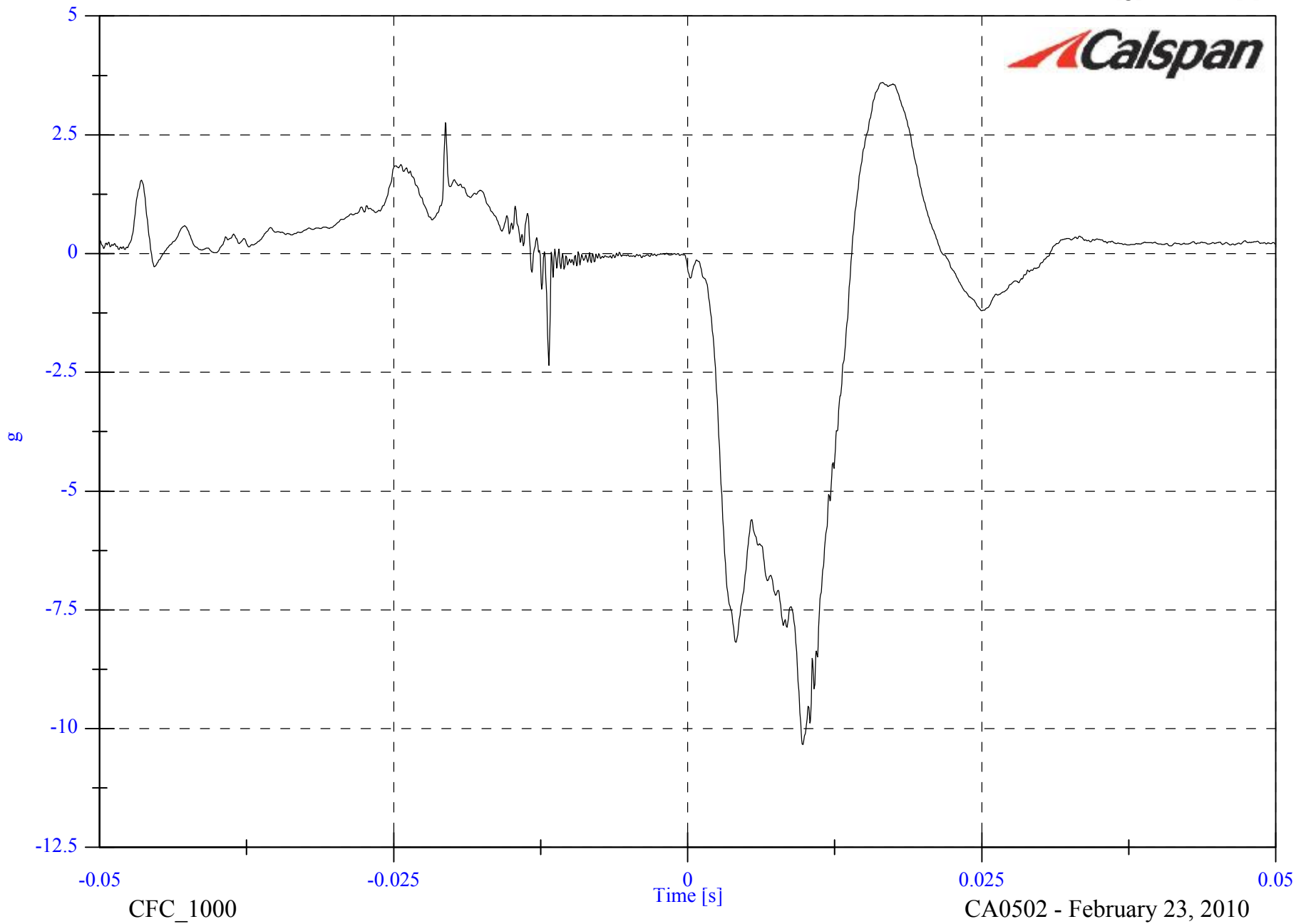
Max: 3.6 [g] at 0.017 [s]

Min: -10.3 [g] at 0.010 [s]



CA0502 PASSENGER SIDE URRP IMPACT PLOT #2

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

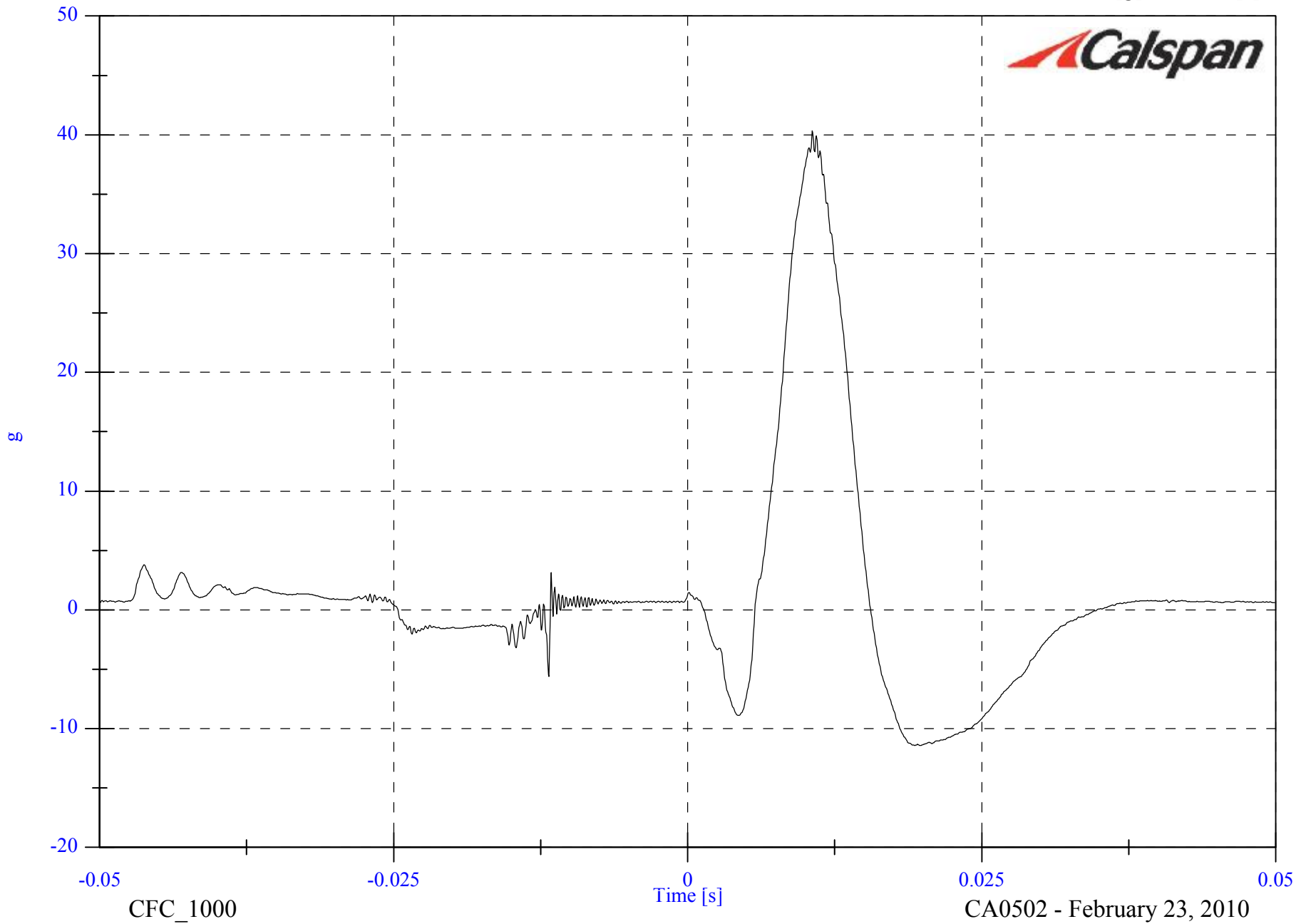
Max: 40.3 [g] at 0.011 [s]

Min: -11.4 [g] at 0.020 [s]



CA0502 PASSENGER SIDE URRP IMPACT PLOT #3

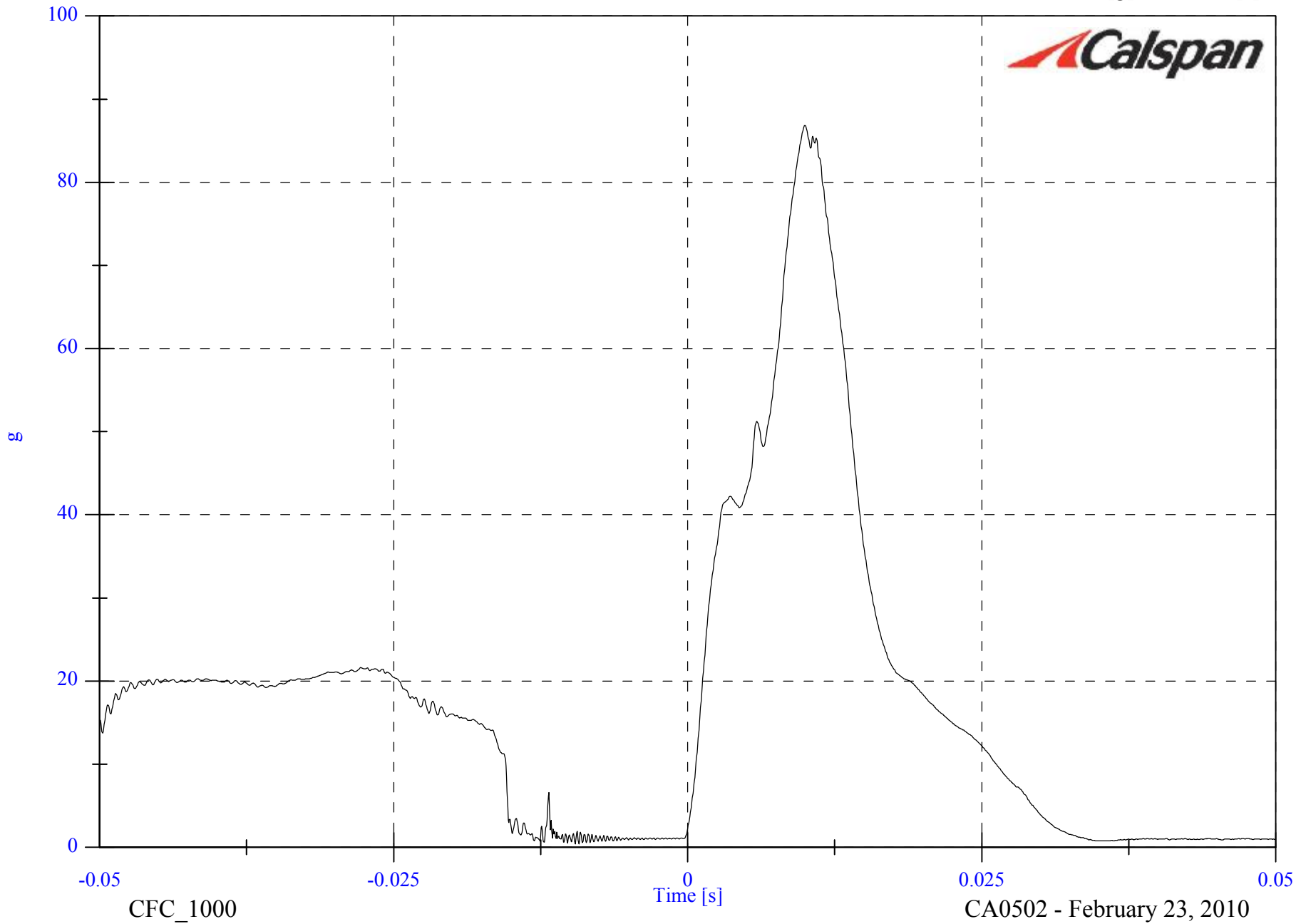
CC2010-04





CA0502 PASSENGER SIDE URRP IMPACT PLOT #4

CC2010-04

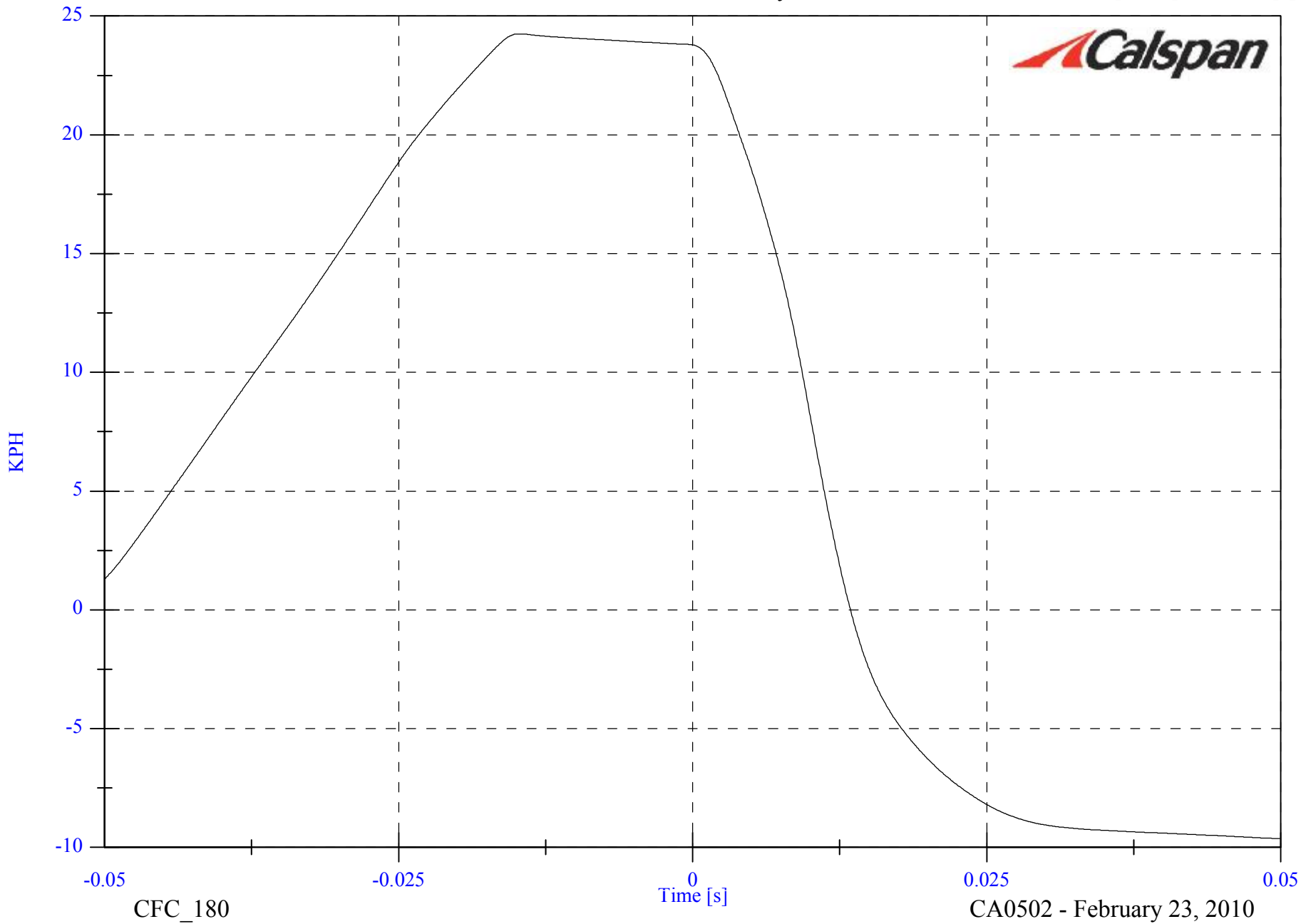


FMVSS 201U 2010 KIA SOUL

Max: 24.3 [KPH] at -0.015 [s]

Min: -9.6 [KPH] at 0.050 [s]

Headform Velocity

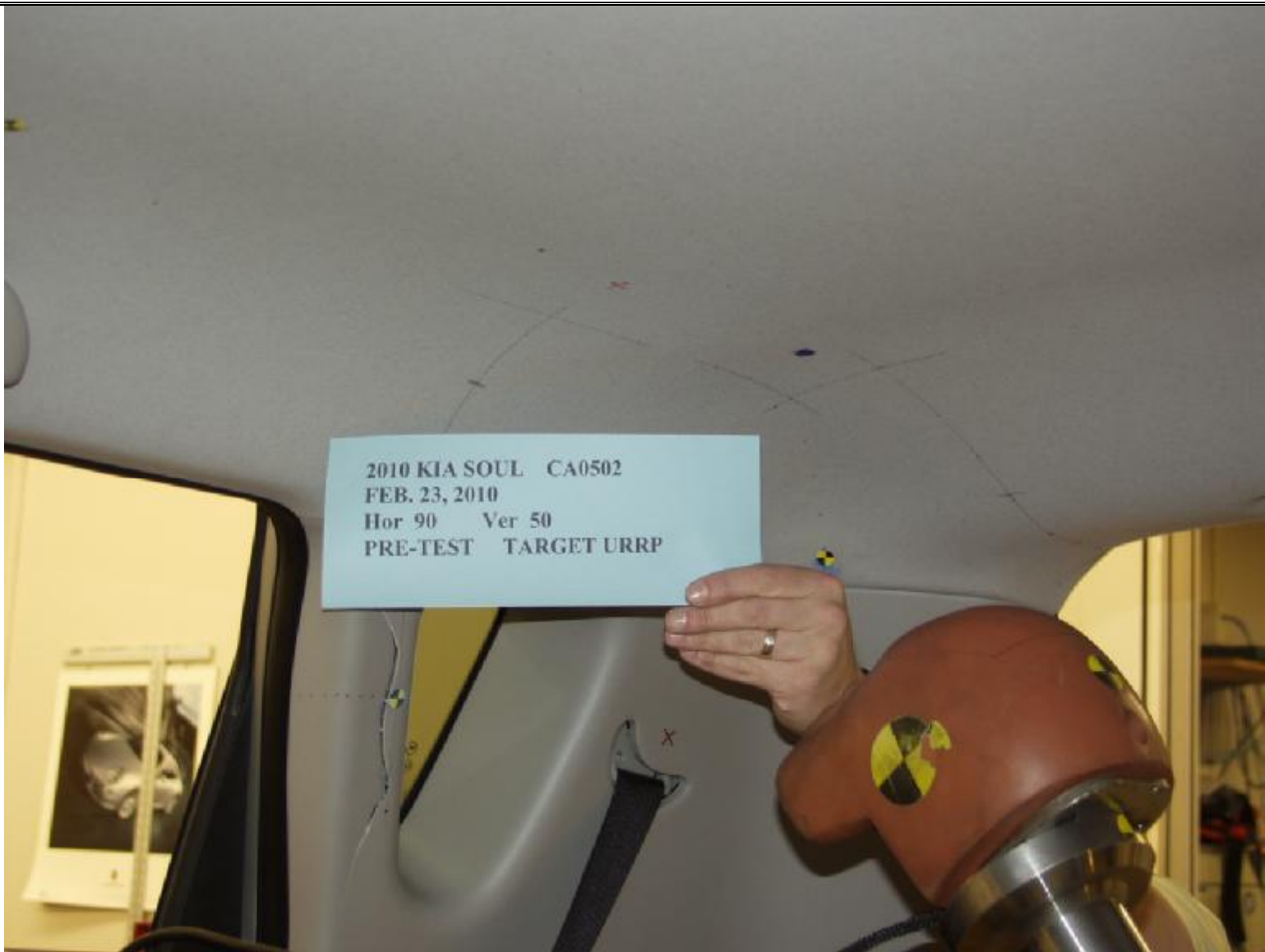


CA0502 PASSENGER SIDE URRP IMPACT PLOT #5

CC2010-04

CFC_180

CA0502 - February 23, 2010



PRE-IMPACT URRP

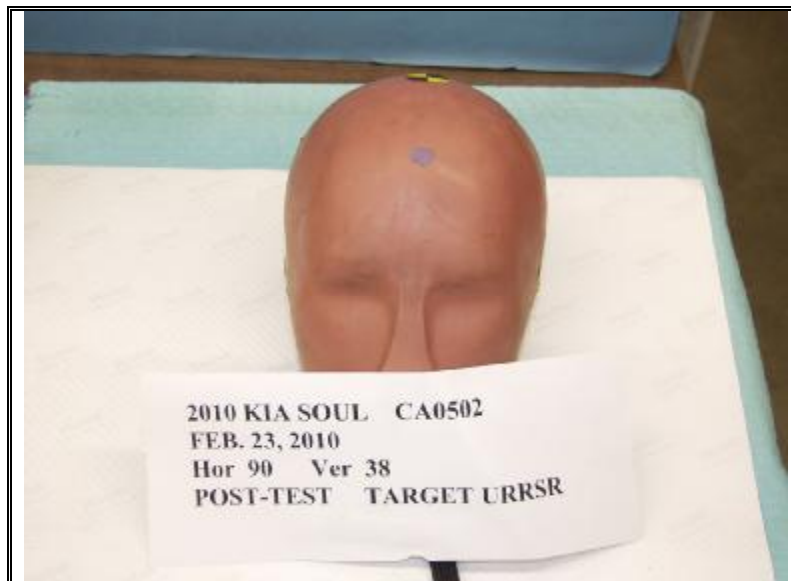


POST-IMPACT URRP

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	04
Test Date:	02/23/10
Target Location:	UPPER ROOF
Target Code:	URRSR
Horizontal Impact Angle:	90
Vertical Impact Angle:	38
Ambient Temperature:	20°C
Relative Humidity:	27
Time of Impact:	11:30
Headform Number:	1142

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	48				mm up



POST-IMPACT URRSR HEADFORM

Free Motion HIC	484.0
HIC(d)	531.5
Impact Velocity (kph)	23.71
HIC T1 (msec)	3.8
HIC T2 (msec)	15.2

FMVSS 201U 2010 KIA SOUL CA0502 - URRSR

FMH Headform 1142

Location: URRSR

Test Date: February 23, 2010

Work File: URRSR

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

Lab Temperature: 20 C

HICd: 531.5

Lab Humidity: 27 %

HIC (36ms): 484.0

Velocity at Impact: 23.71 KPH

t1: 3.8 msec

t2: 15.2 msec

Free Flight Distance: 219.80 mm

Duration: 11.4 msec

Average Acceleration: 10.1 g

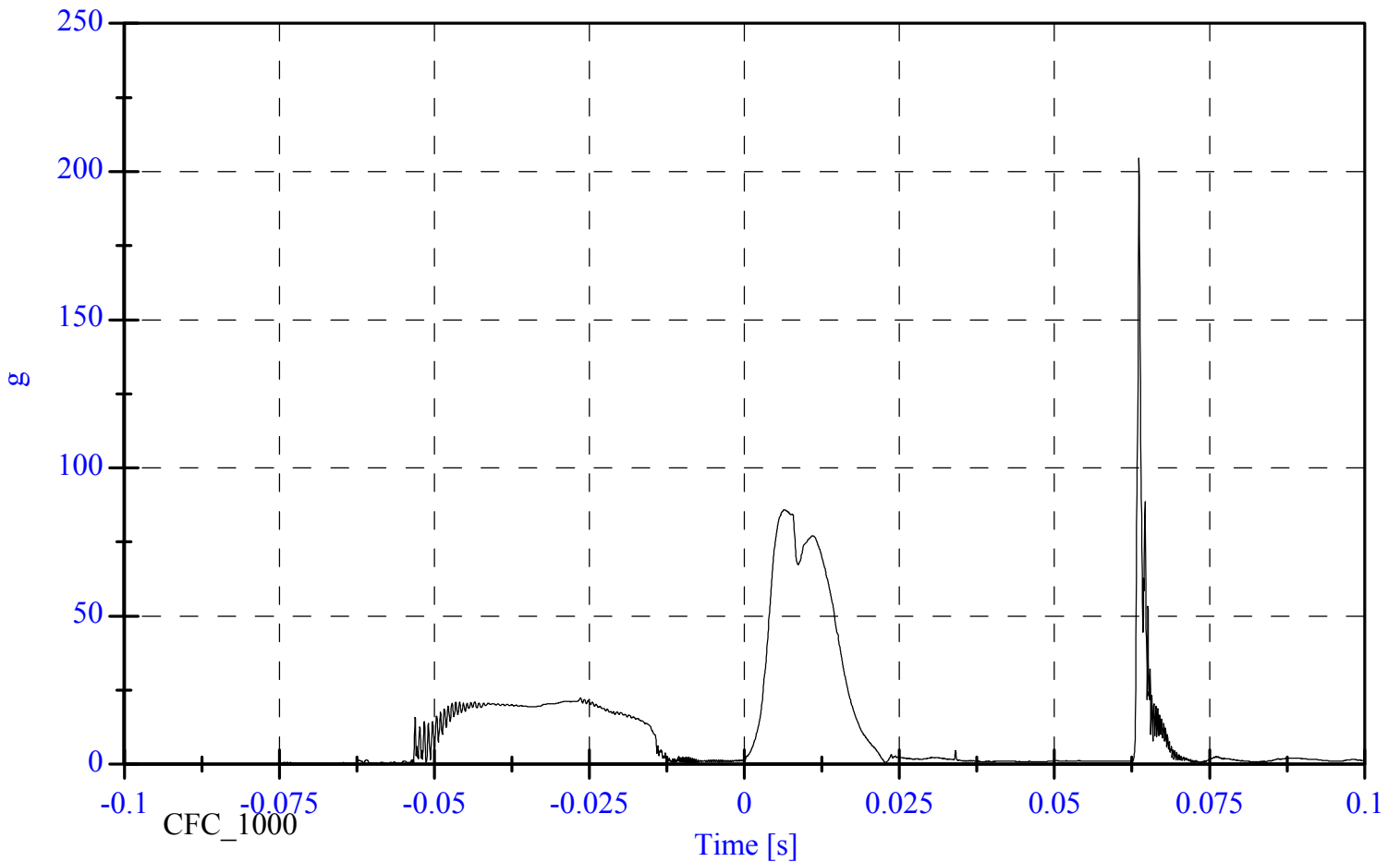
Maximum: 85.9 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 85.9 [g] at 0.006 [s]

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



FMVSS 201U 2010 KIA SOUL

Max: 22.4 [g] at -0.026 [s]

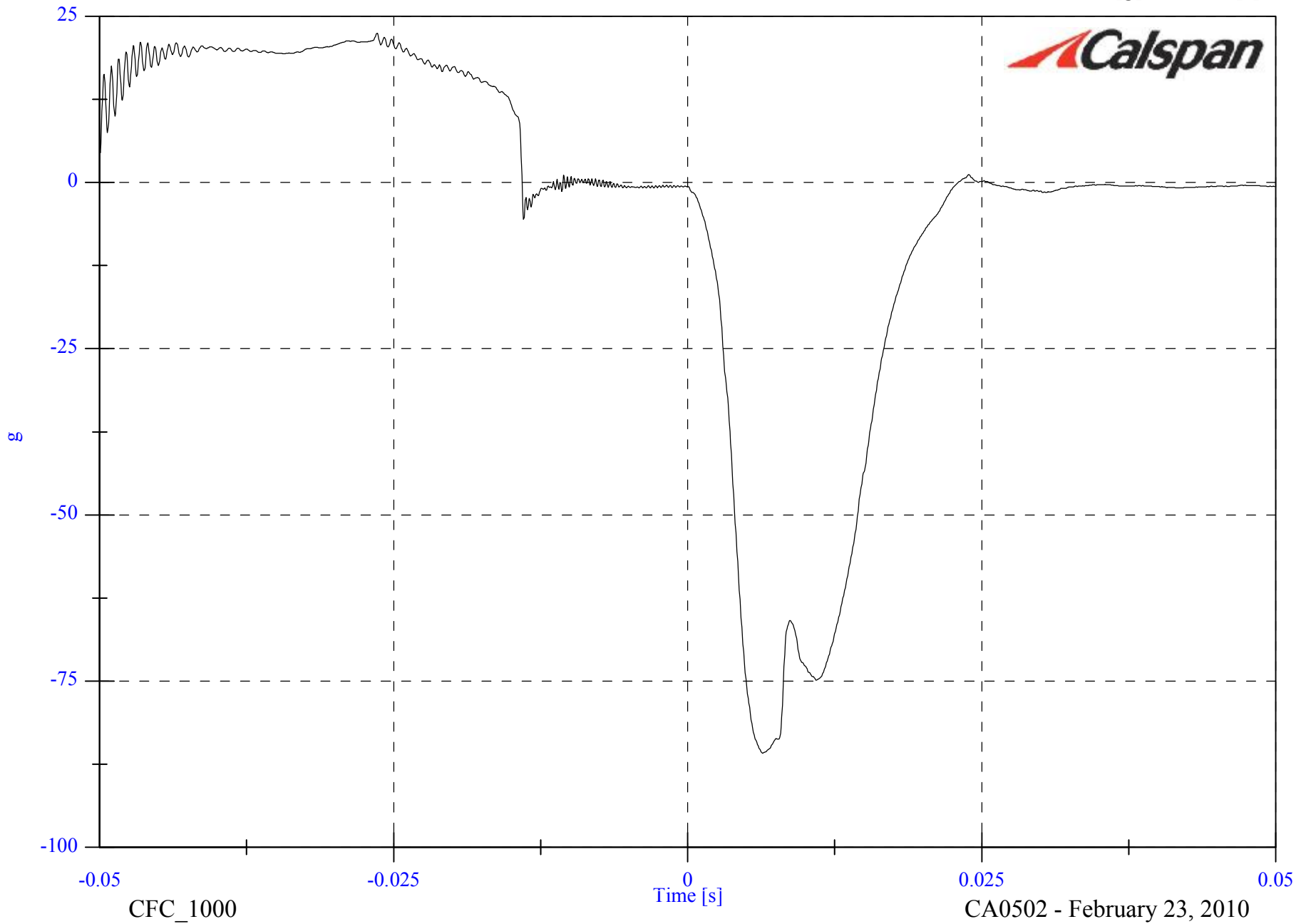
Min: -85.8 [g] at 0.006 [s]

Headform X Acceleration



CA0502 PASSENGER SIDE URRSR IMPACT PLOT #1

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

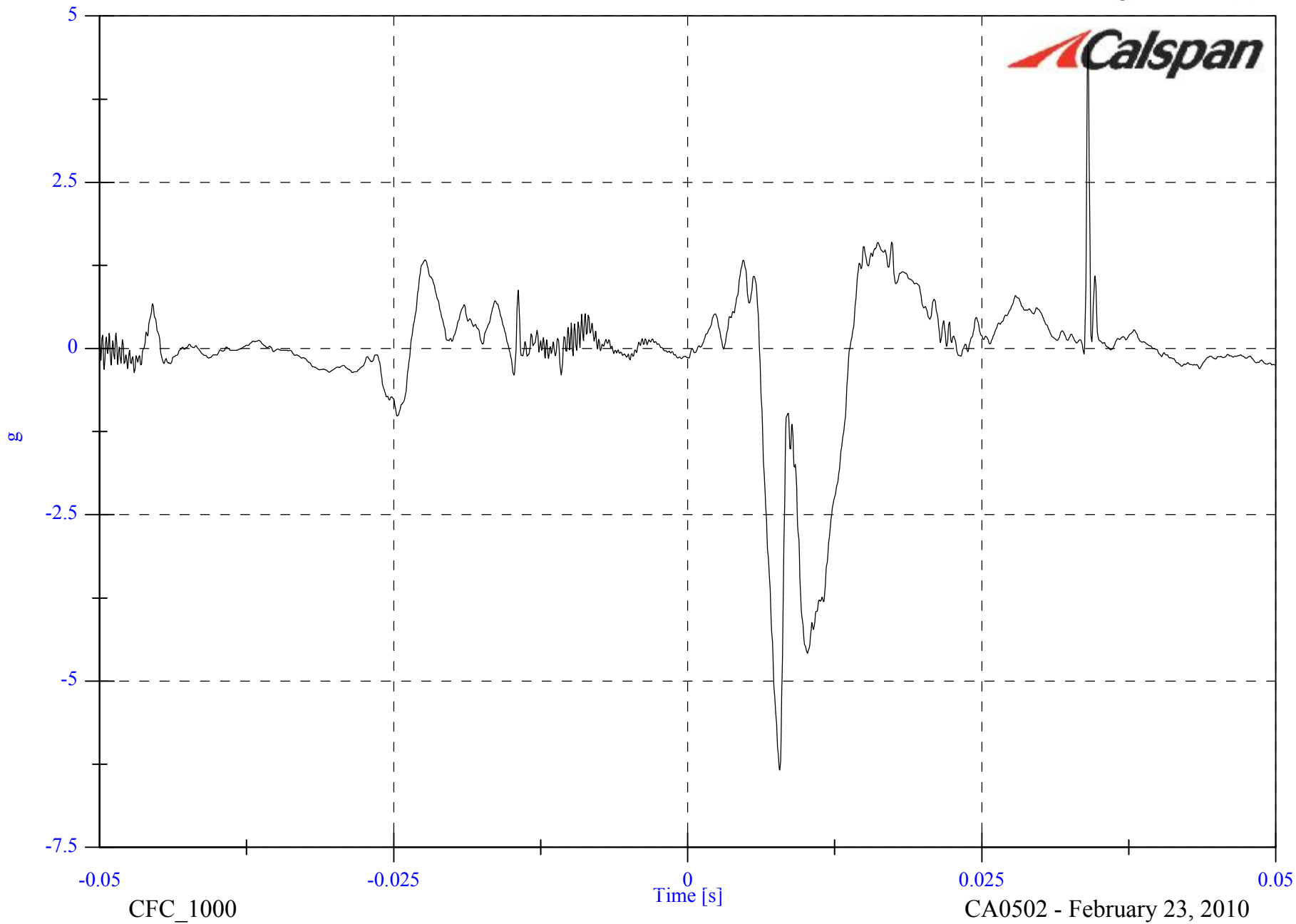
Max: 4.6 [g] at 0.034 [s]

Min: -6.3 [g] at 0.008 [s]



CA0502 PASSENGER SIDE URRSR IMPACT PLOT #2

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

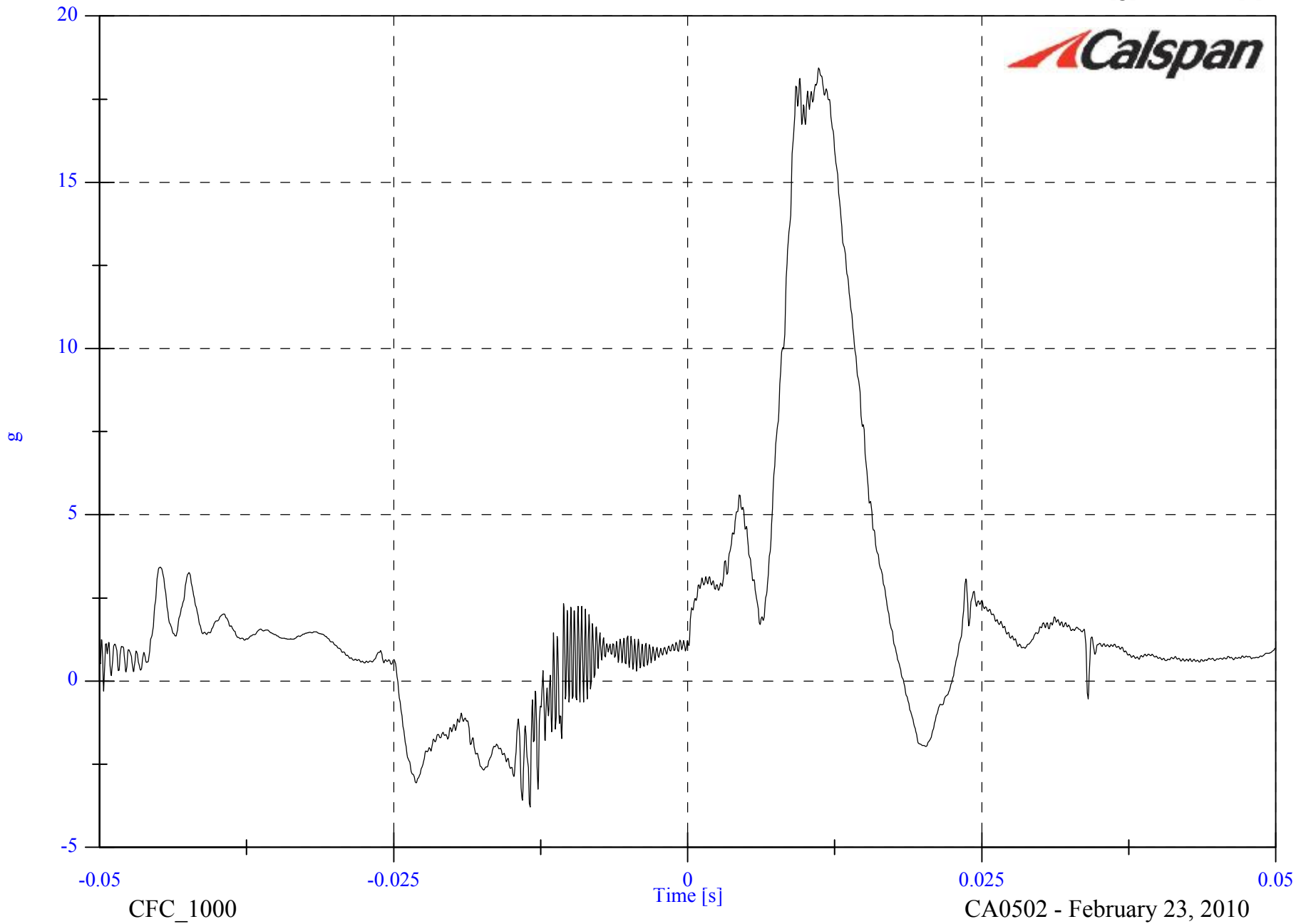
Max: 18.4 [g] at 0.011 [s]

Min: -3.8 [g] at -0.013 [s]



CA0502 PASSENGER SIDE URRSR IMPACT PLOT #3

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Resultant

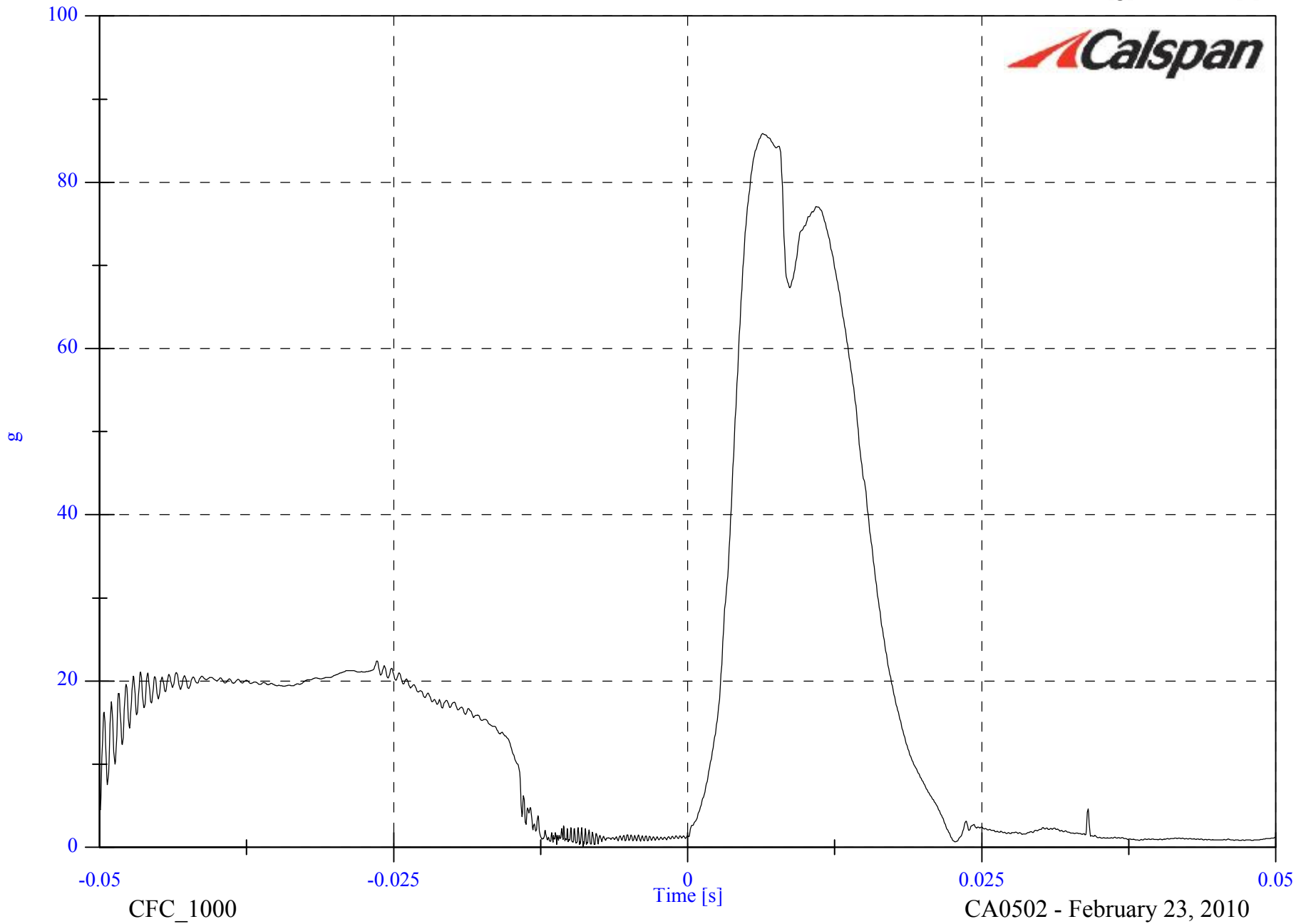
Max: 85.9 [g] at 0.006 [s]

Min: 0.2 [g] at -0.009 [s]



CA0502 PASSENGER SIDE URRSR IMPACT PLOT #4

CC2010-04

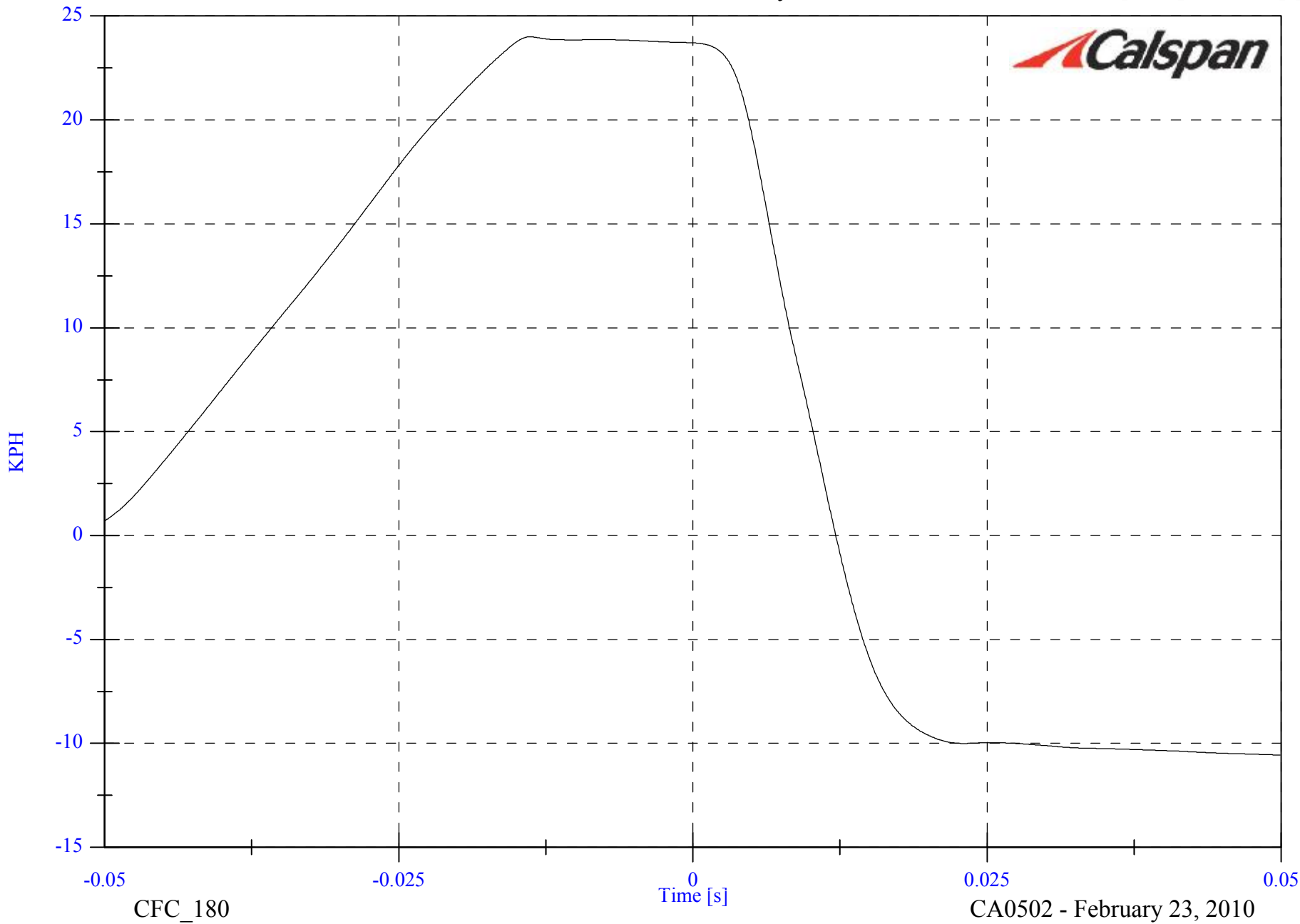


FMVSS 201U 2010 KIA SOUL

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

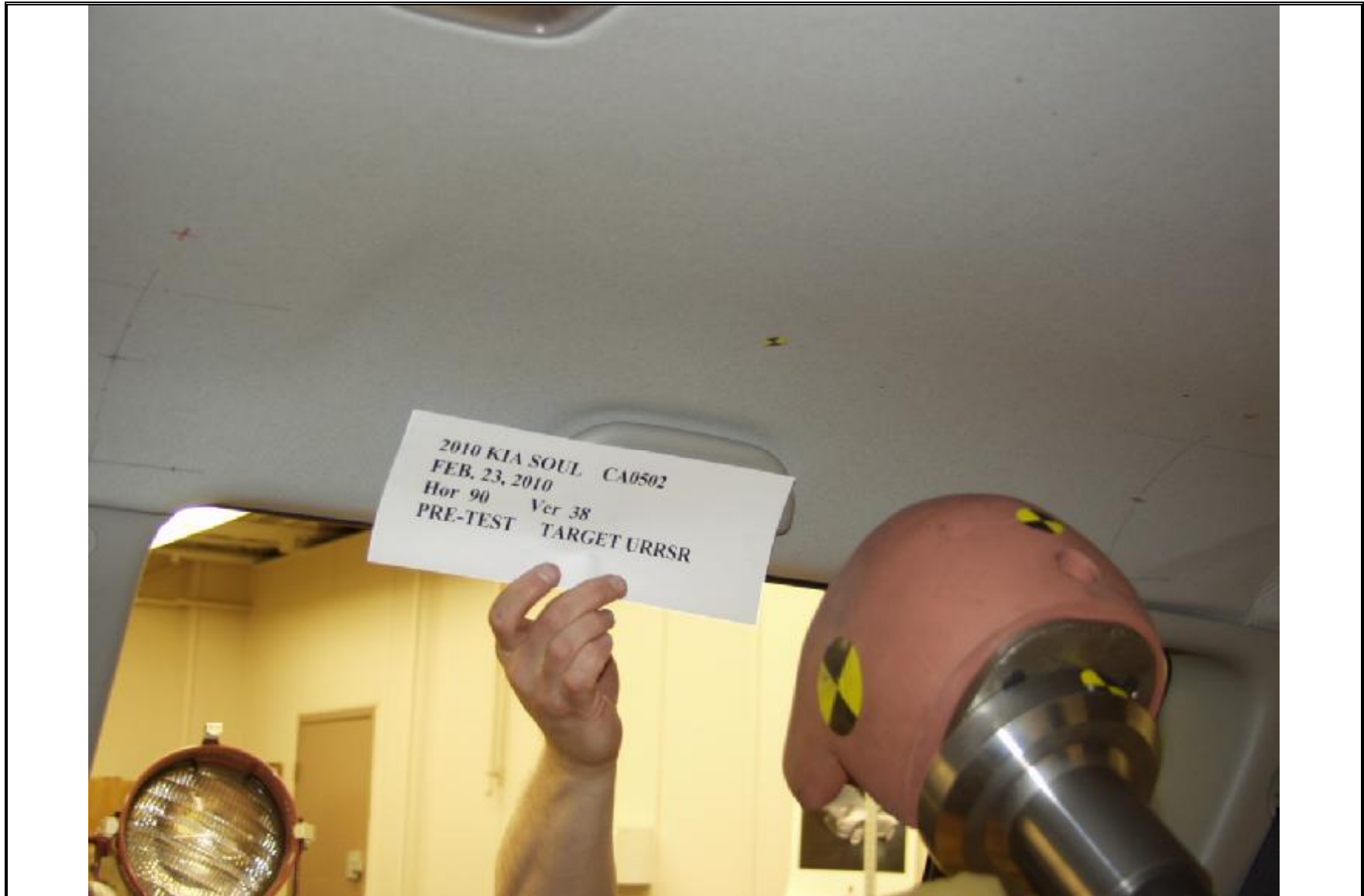
Min: -10.6 [KPH] at 0.050 [s]

Headform Velocity



CA0502 PASSENGER SIDE URRSR IMPACT PLOT #5

CC2010-04



PRE-IMPACT URRSR

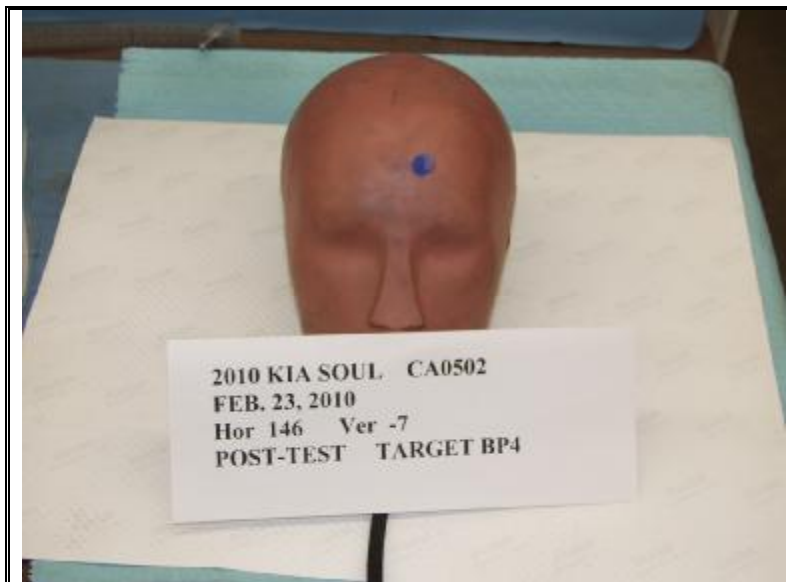


POST-IMPACT URRSR

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	05
Test Date:	02/23/10
Target Location:	B-PILLAR
Target Code:	BP4
Horizontal Impact Angle:	146
Vertical Impact Angle:	-7
Ambient Temperature:	20°C
Relative Humidity:	27
Time of Impact:	12:55
Headform Number:	1140

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	14	<input type="checkbox"/>	mm right	<input checked="" type="checkbox"/>	mm left
On Centerline	19				mm up



POST-IMPACT BP4 HEADFORM

Free Motion HIC	735.9
HIC(d)	721.6
Impact Velocity (kph)	23.48
HIC T1 (msec)	&S
HIC T2 (msec)	10.1

FMVSS 201U 2010 KIA SOUL CA0502 - BP4

FMH Headform 1140

Location: BP4

Test Date: February 23, 2010

Work File: BP4

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

Lab Temperature: 20 C

HICd: 721.6

Lab Humidity: 27 %

HIC (36ms): 735.9

Velocity at Impact: 23.48 KPH

t1: 2.0 msec

t2: 10.1 msec

Free Flight Distance: 221.96 mm

Duration: 8.1 msec

Average Acceleration: 10.8 g

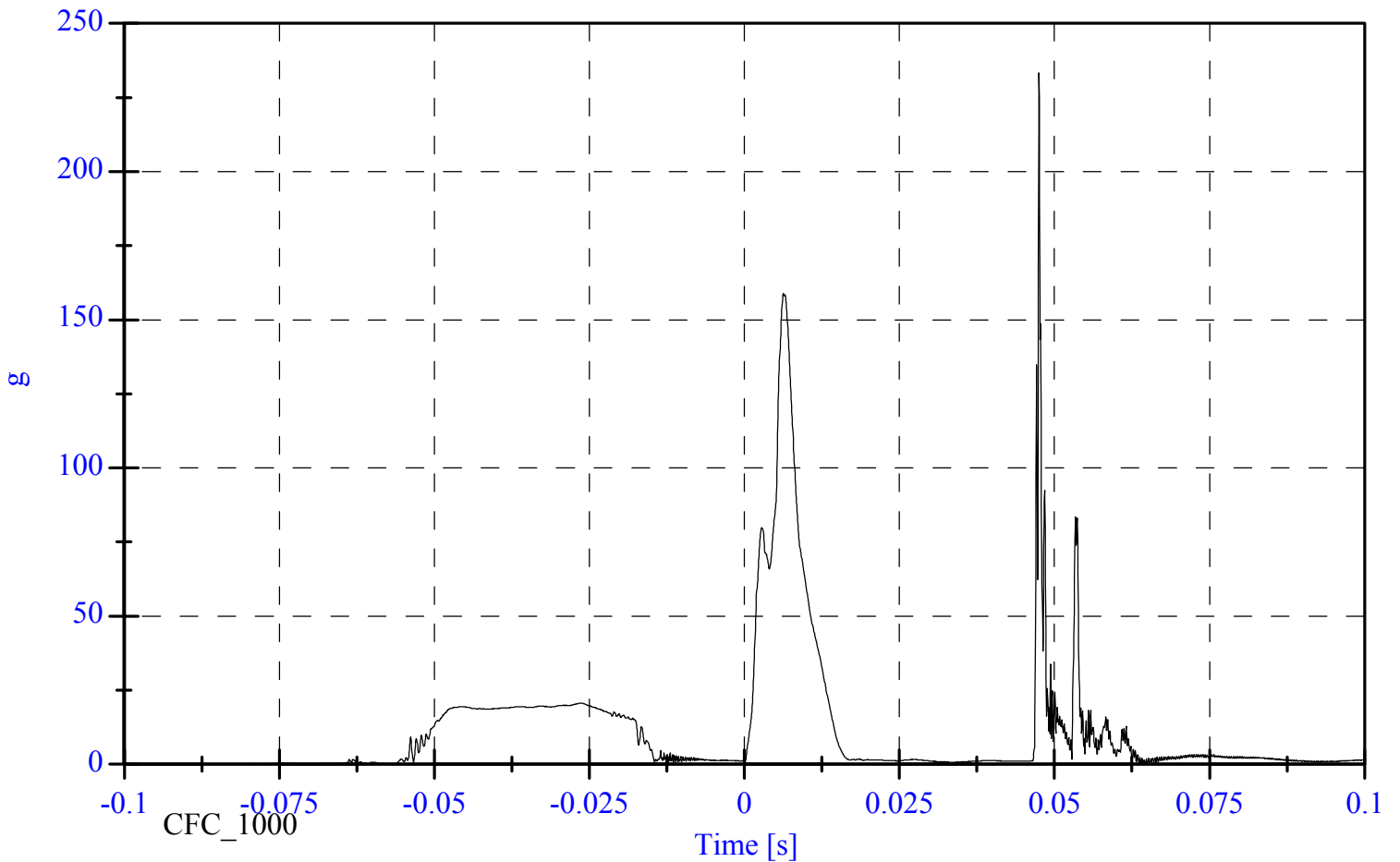
Maximum: 158.8 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 158.8 [g] at 0.006 [s]

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



FMVSS 201U 2010 KIA SOUL

Headform X Acceleration

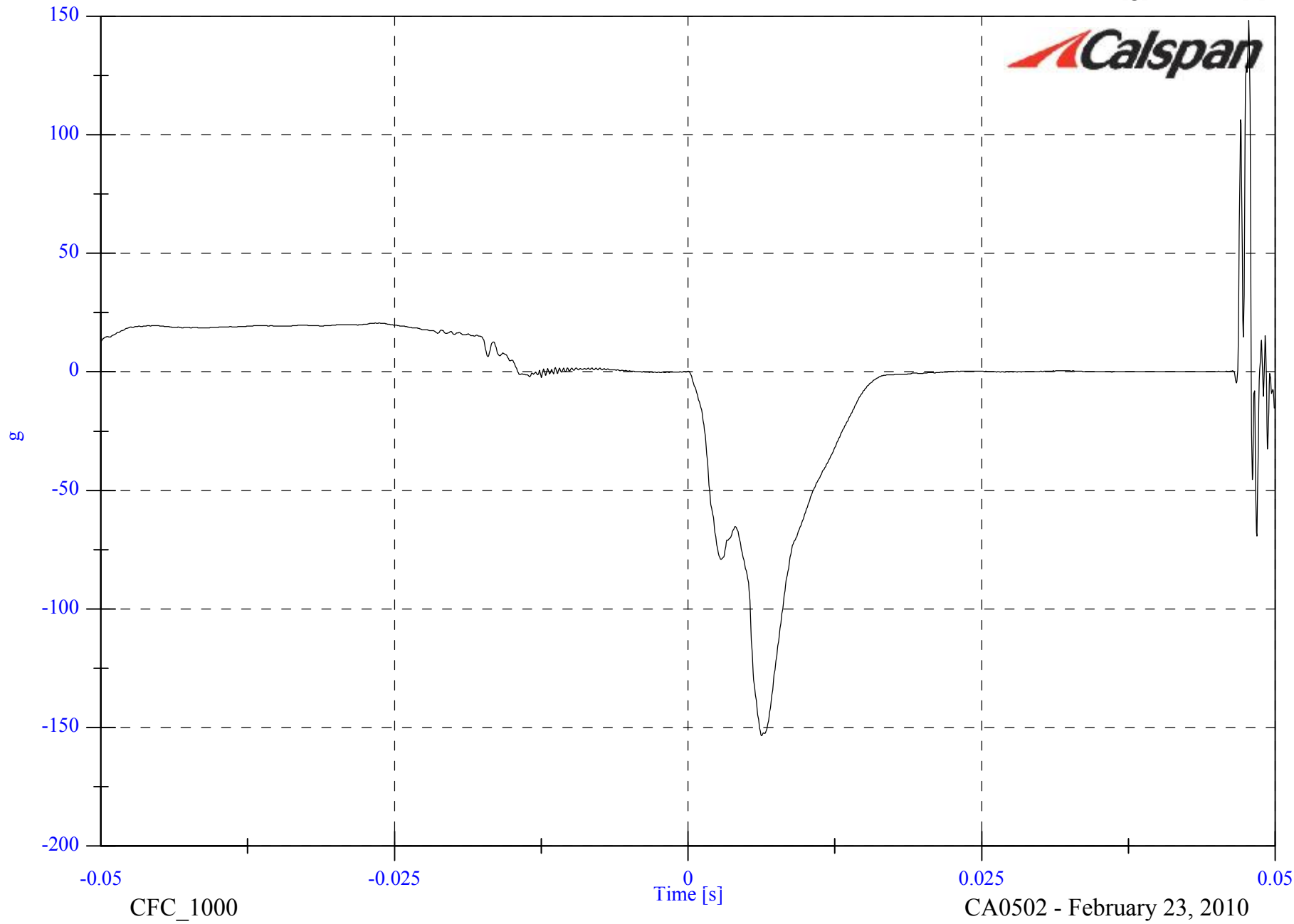
Max: 148.2 [g] at 0.048 [s]

Min: -153.5 [g] at 0.006 [s]



CA0502 PASSENGER SIDE BP4 IMPACT PLOT #1

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

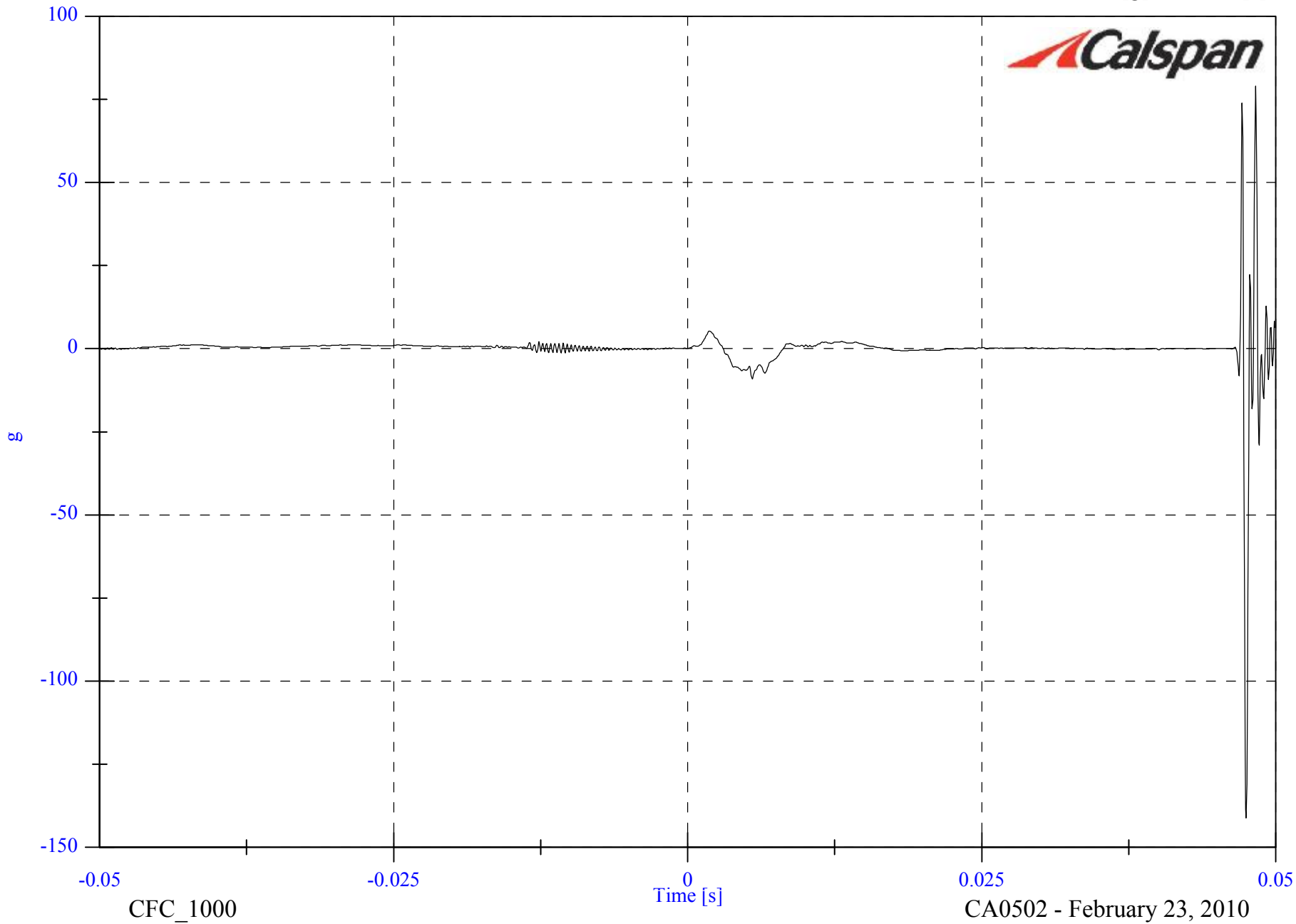
Max: 79.0 [g] at 0.048 [s]

Min: -141.2 [g] at 0.048 [s]



CA0502 PASSENGER SIDE BP4 IMPACT PLOT #2

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

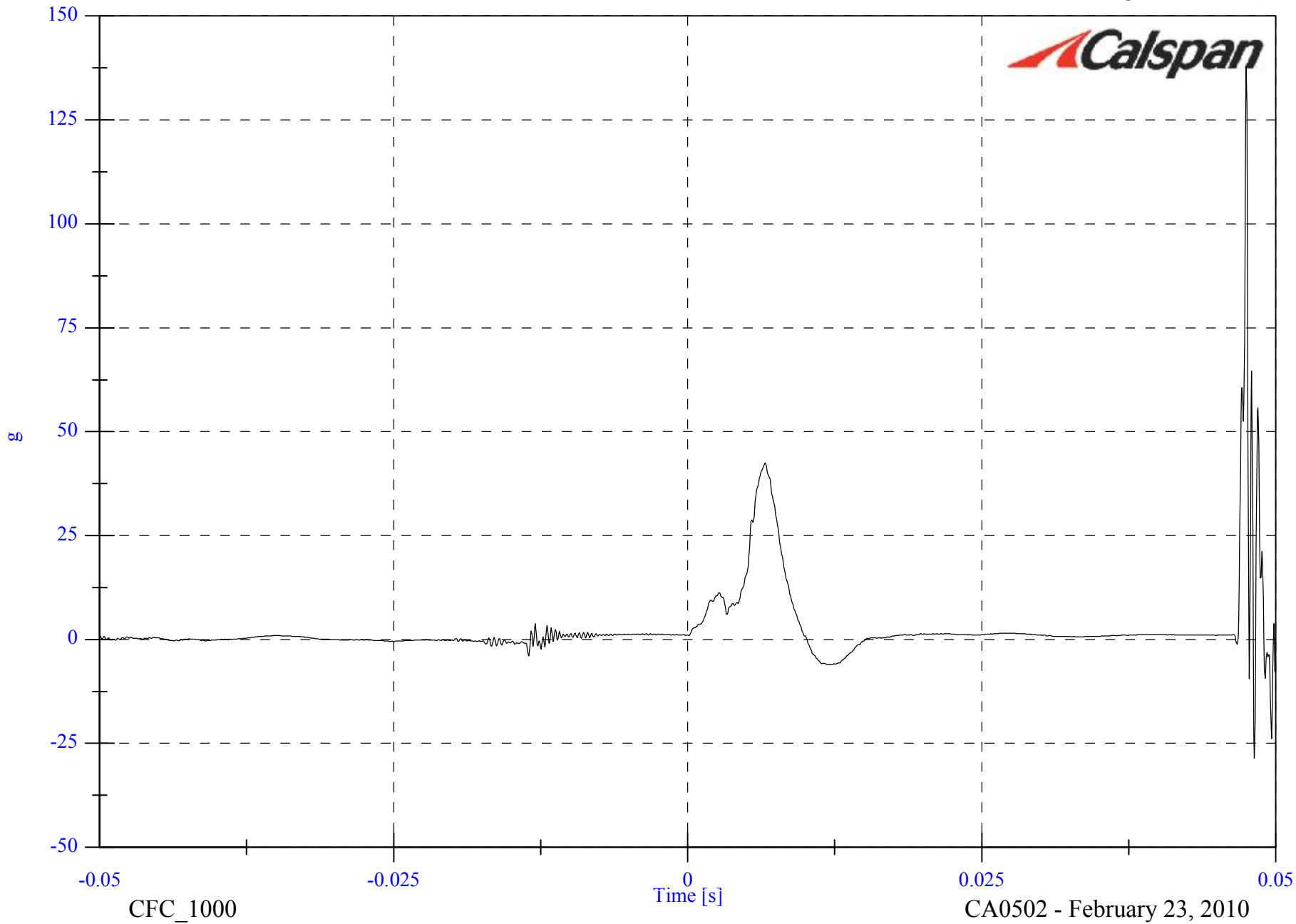
Max: 137.9 [g] at 0.048 [s]

Min: -28.5 [g] at 0.048 [s]



CA0502 PASSENGER SIDE BP4 IMPACT PLOT #3

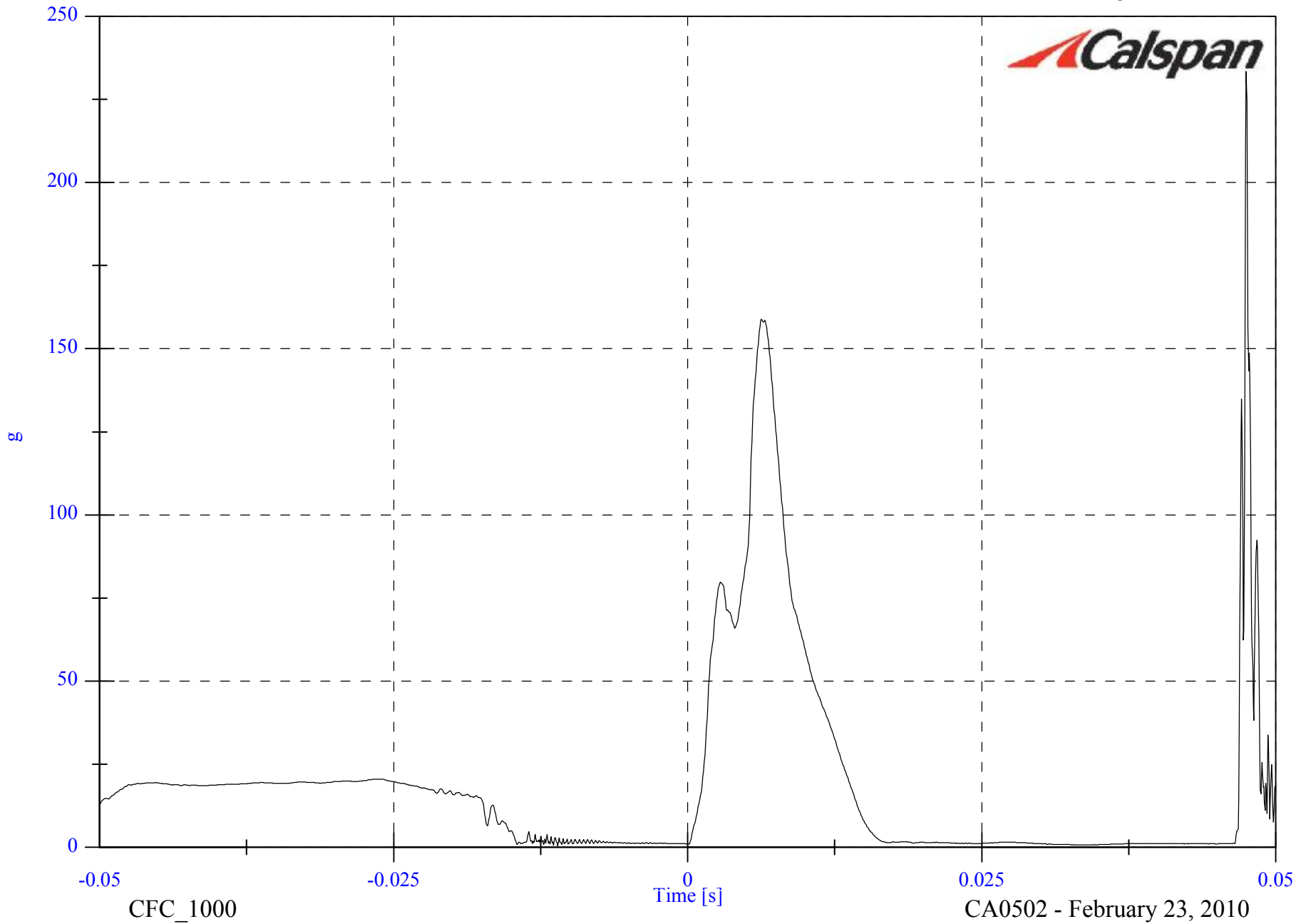
CC2010-04





CA0502 PASSENGER SIDE BP4 IMPACT PLOT #4

CC2010-04

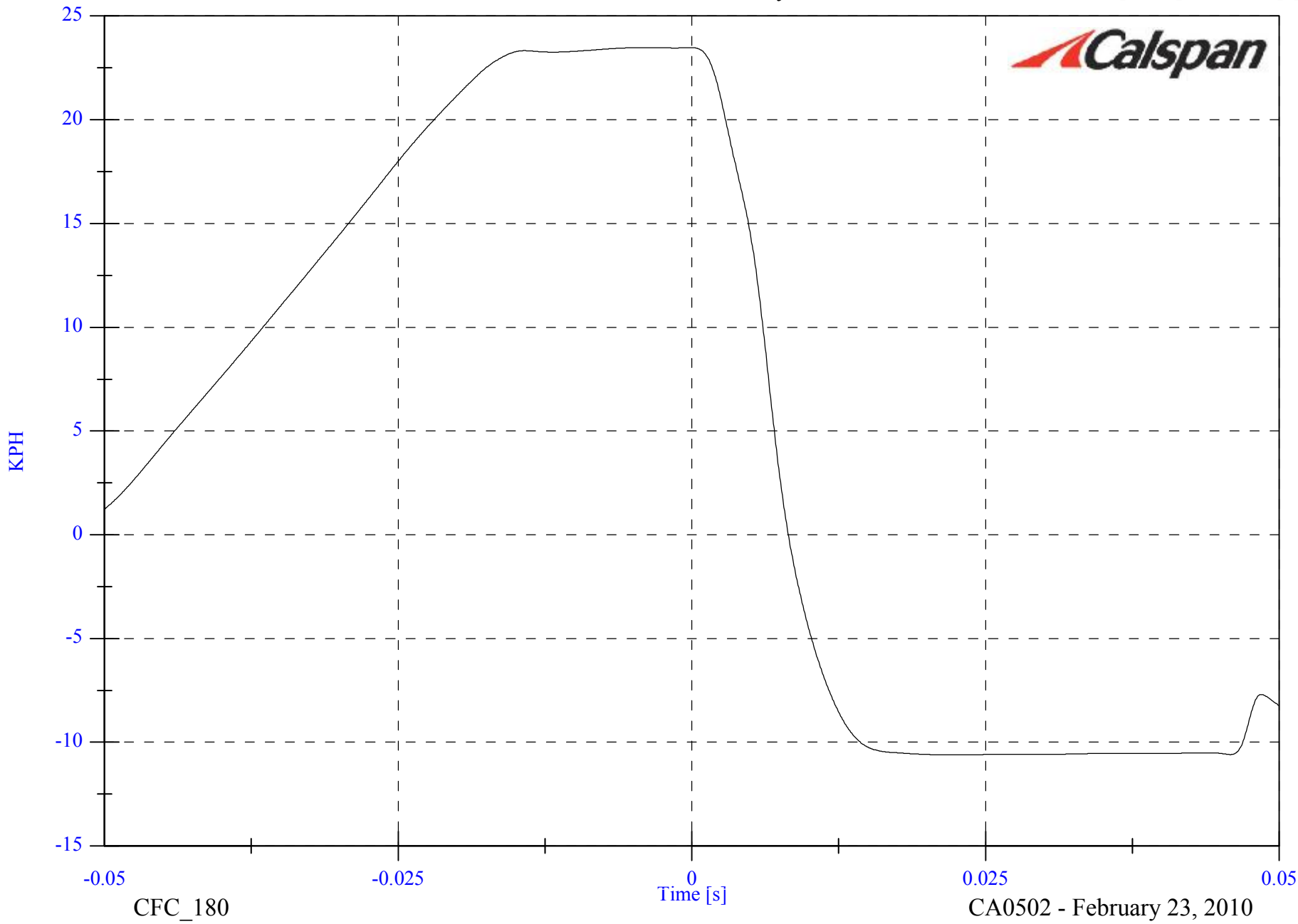


FMVSS 201U 2010 KIA SOUL

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

Min: -10.6 [KPH] at 0.022 [s]

Headform Velocity



CA0502 PASSENGER SIDE BP4 IMPACT PLOT #5

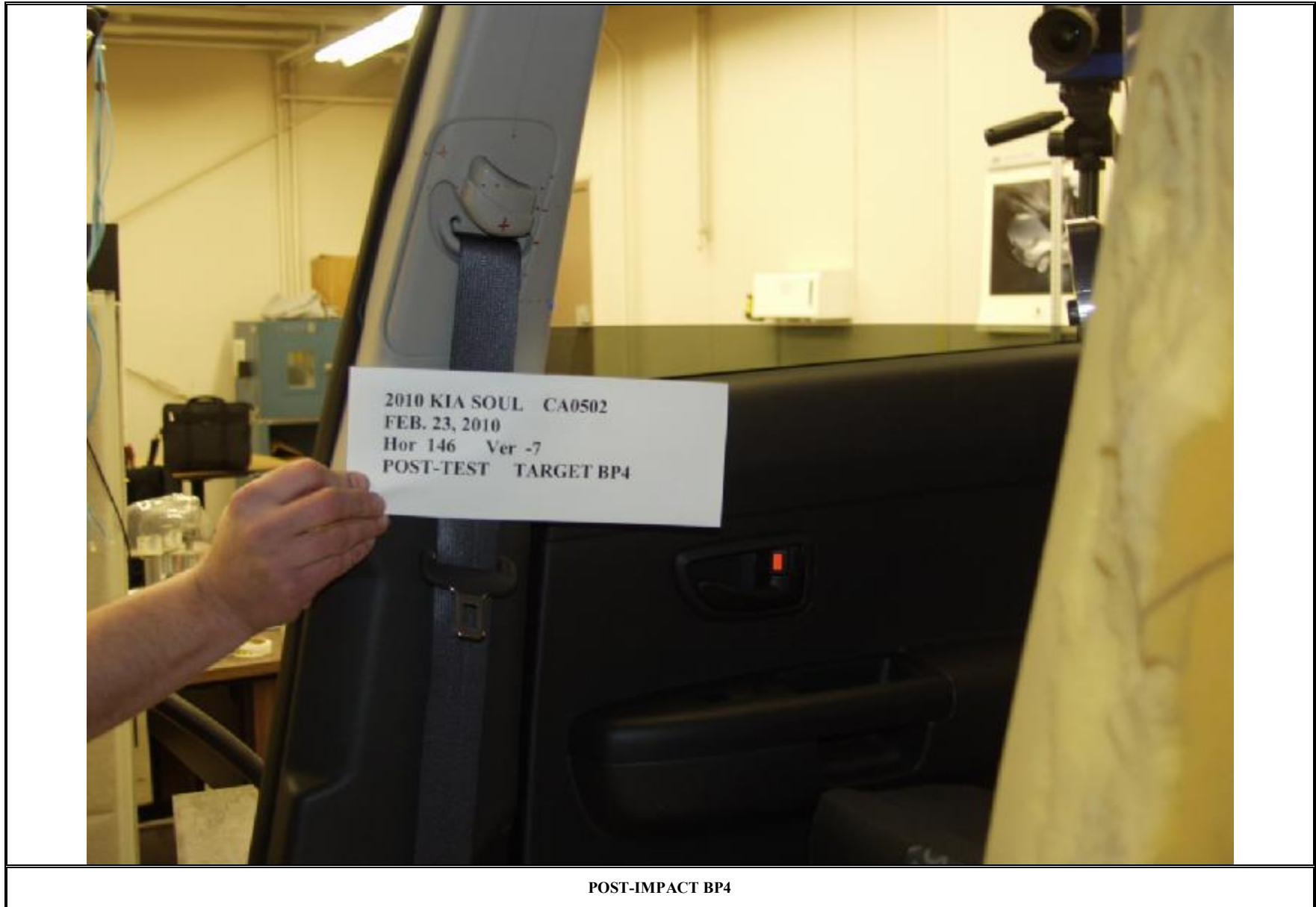
CC2010-04

CFC_180

CA0502 - February 23, 2010



PRE-IMPACT BP4



POST-IMPACT BP4

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	06
Test Date:	02/23/10
Target Location:	B-PILLAR
Target Code:	BP1
Horizontal Impact Angle:	90
Vertical Impact Angle:	9
Ambient Temperature:	20°C
Relative Humidity:	27
Time of Impact:	13:50
Headform Number:	0062

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	7	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	48				mm up



POST-IMPACT BP1 HEADFORM

Free Motion HIC	28'.9
HIC(d)	380.6
Impact Velocity (kph)	18.76
HIC T1 (msec)	5.7
HIC T2 (msec)	14.2

FMVSS 201U 2010 KIA SOUL CA0502 - BP1

FMH Headform 0062

Location: BP1

Test Date: February 23, 2010

Work File: BP1

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

Lab Temperature: 20 C

HICd: 380.6

Lab Humidity: 27 %

HIC (36ms): 283.9

Velocity at Impact: 18.76 KPH

t1: 5.7 msec

t2: 14.2 msec

Free Flight Distance: 212.12 mm

Duration: 8.5 msec

Average Acceleration: 7.1 g

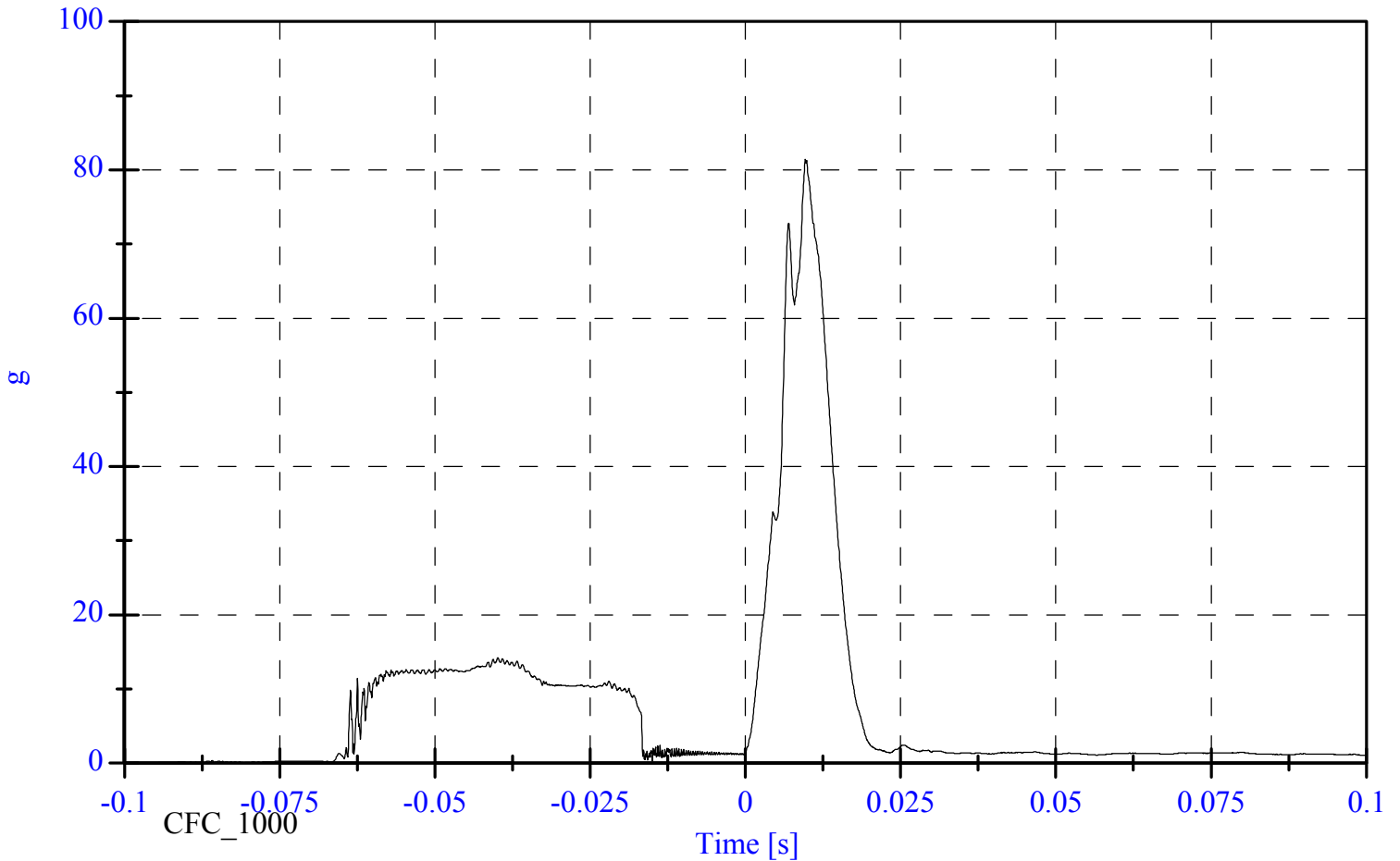
Maximum: 81.4 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 81.4 [g] at 0.010 [s]

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



FMVSS 201U 2010 KIA SOUL

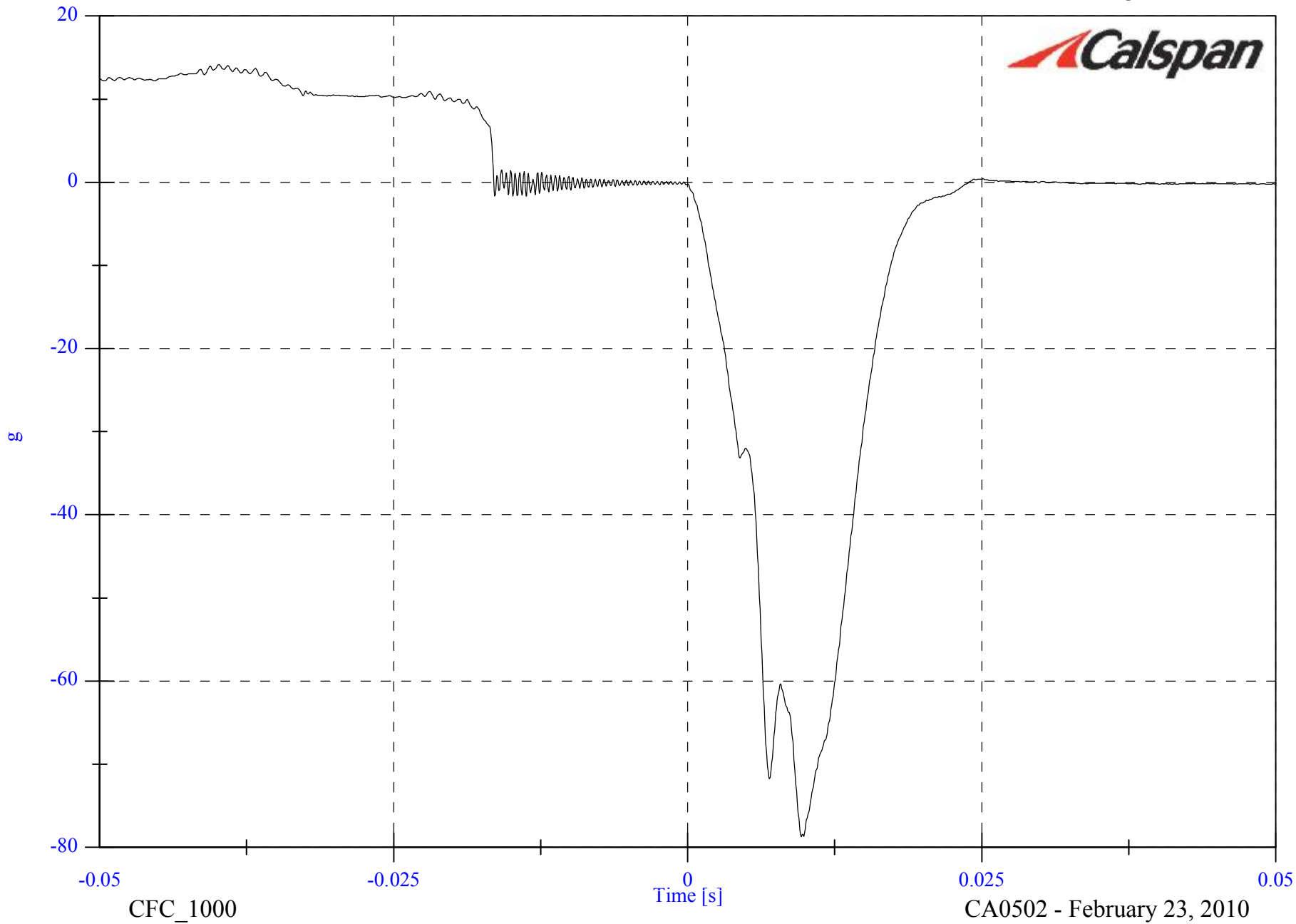
Headform X Acceleration

Max: 14.2 [g] at -0.040 [s]

Min: -78.7 [g] at 0.010 [s]



CA0502 PASSENGER SIDE BP1 IMPACT PLOT #1



FMVSS 201U 2010 KIA SOUL

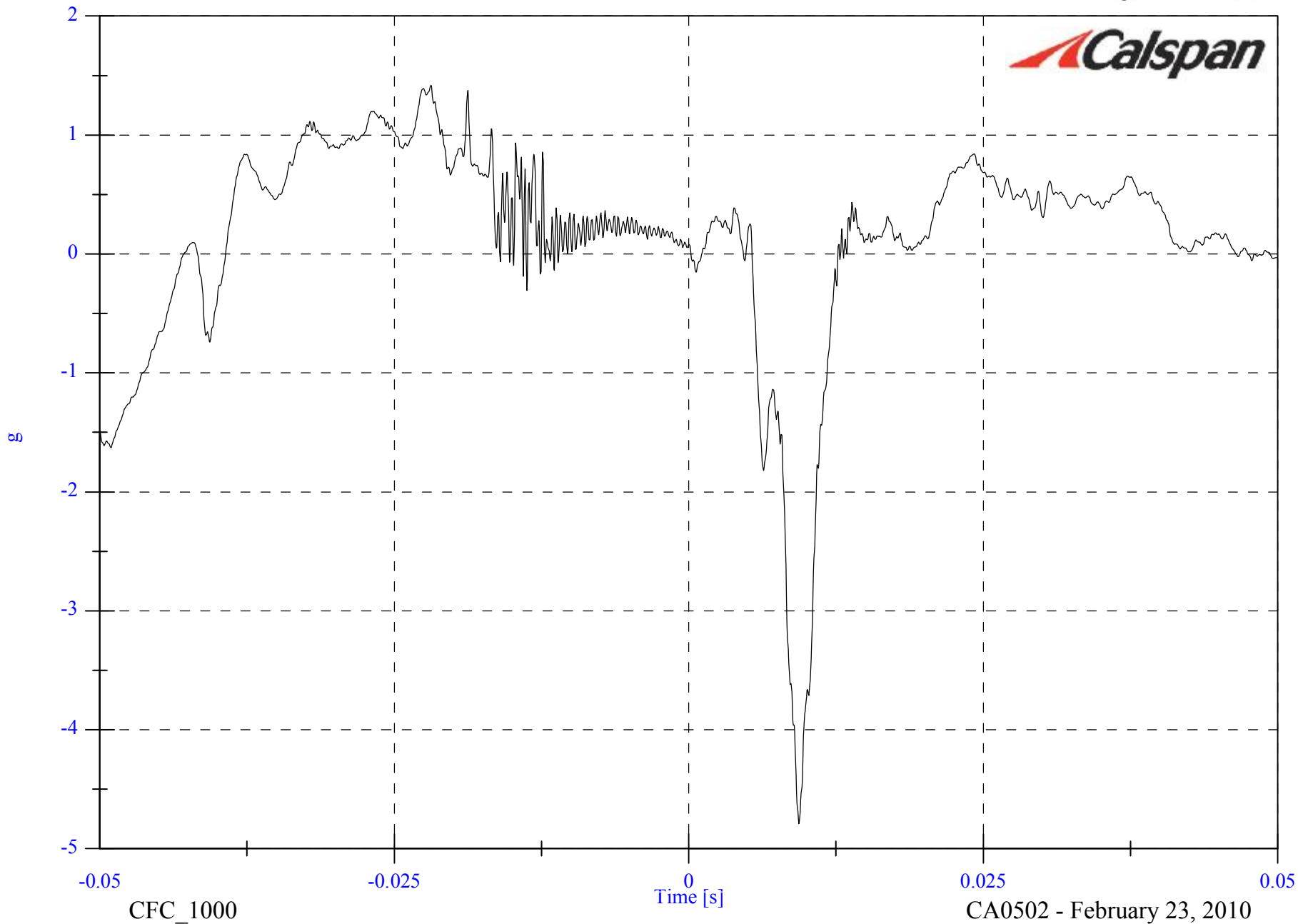
Headform Y Acceleration

Max: 1.4 [g] at -0.022 [s]

Min: -4.8 [g] at 0.009 [s]



CA0502 PASSENGER SIDE BP1 IMPACT PLOT #2



FMVSS 201U 2010 KIA SOUL

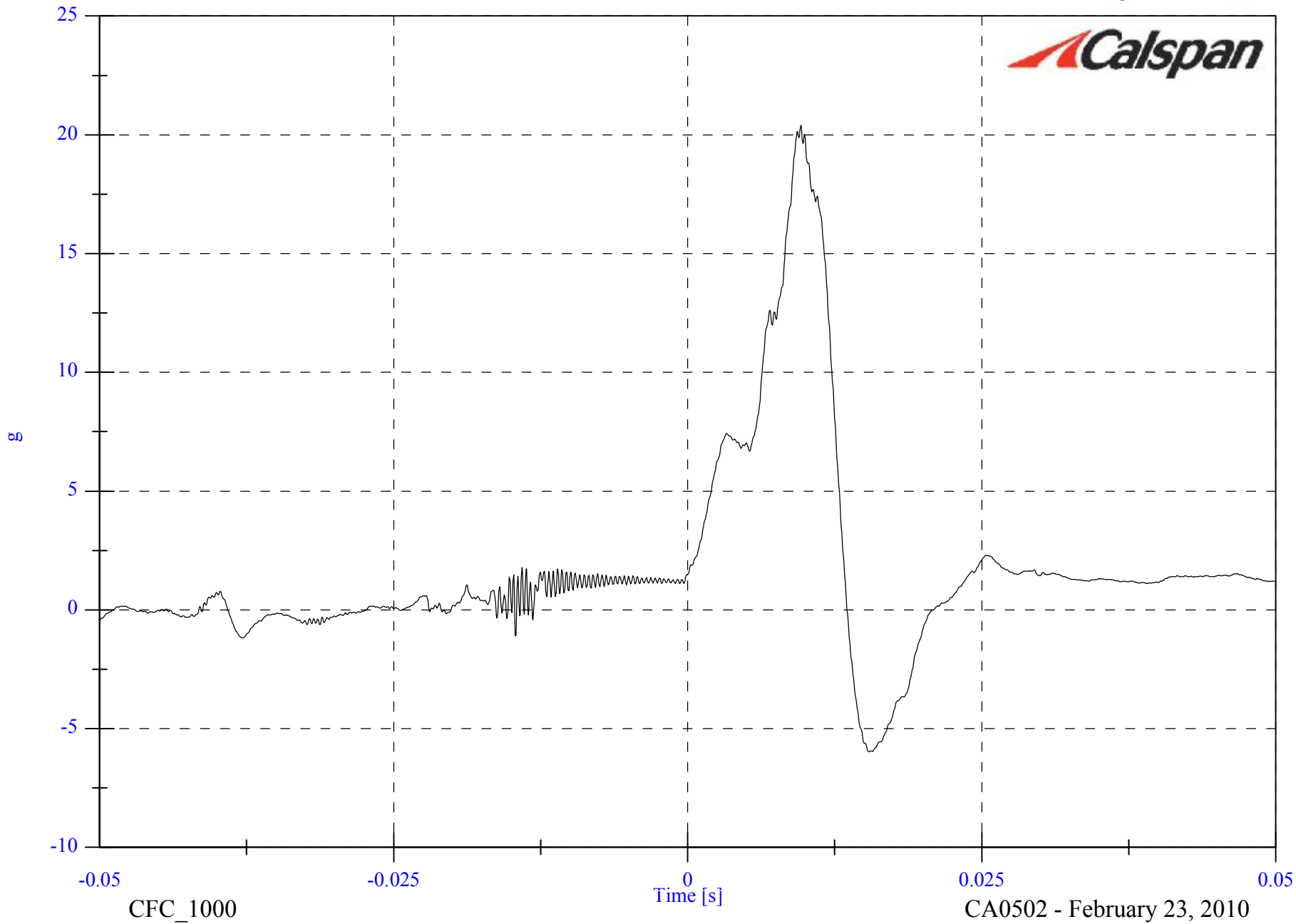
Headform Z Acceleration

Max: 20.4 [g] at 0.010 [s]

Min: -6.0 [g] at 0.015 [s]



CA0502 PASSENGER SIDE BP1 IMPACT PLOT #3



FMVSS 201U 2010 KIA SOUL

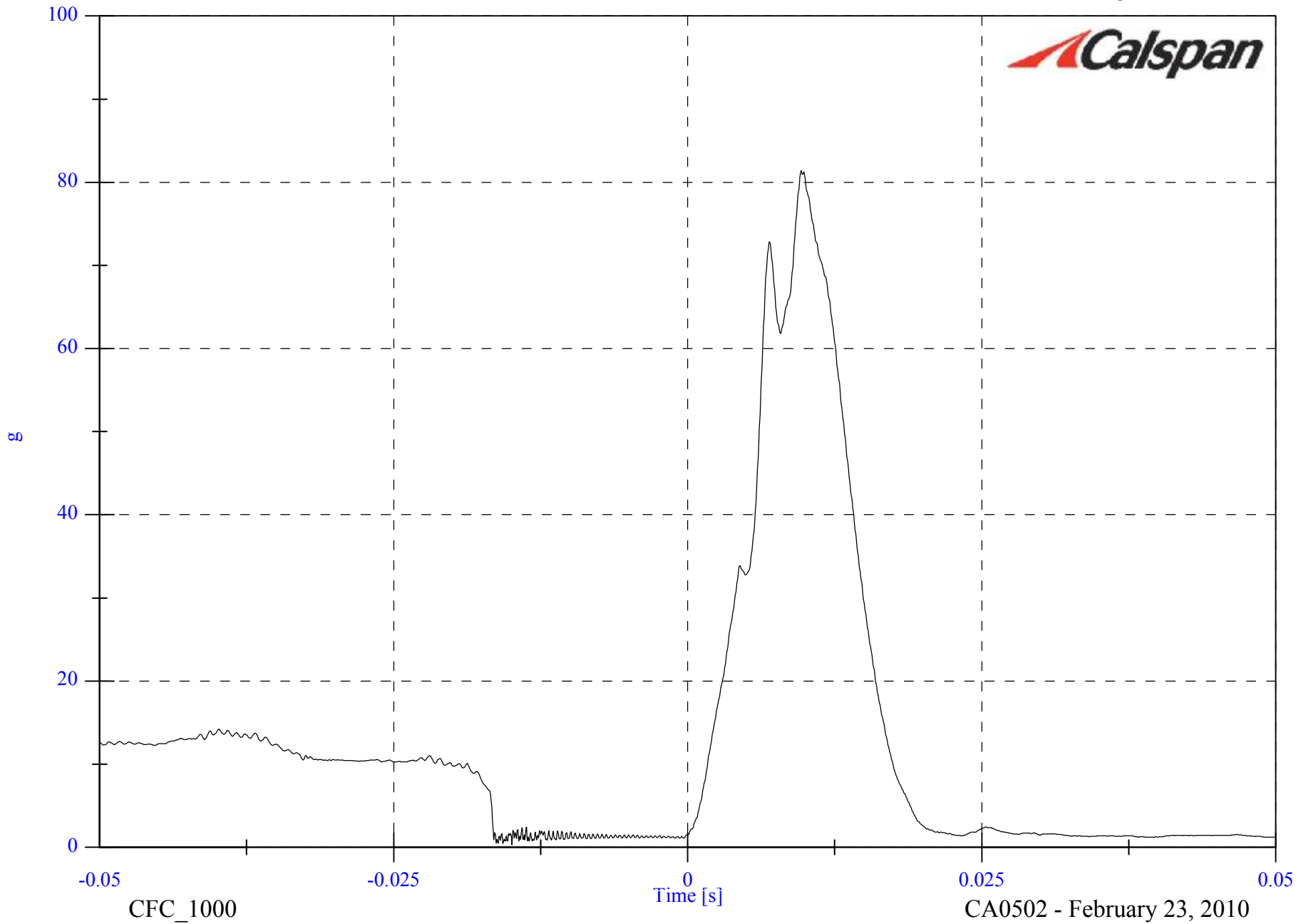
Headform Resultant

Max: 81.4 [g] at 0.010 [s]

Min: 0.3 [g] at -0.015 [s]



CA0502 PASSENGER SIDE BP1 IMPACT PLOT #4

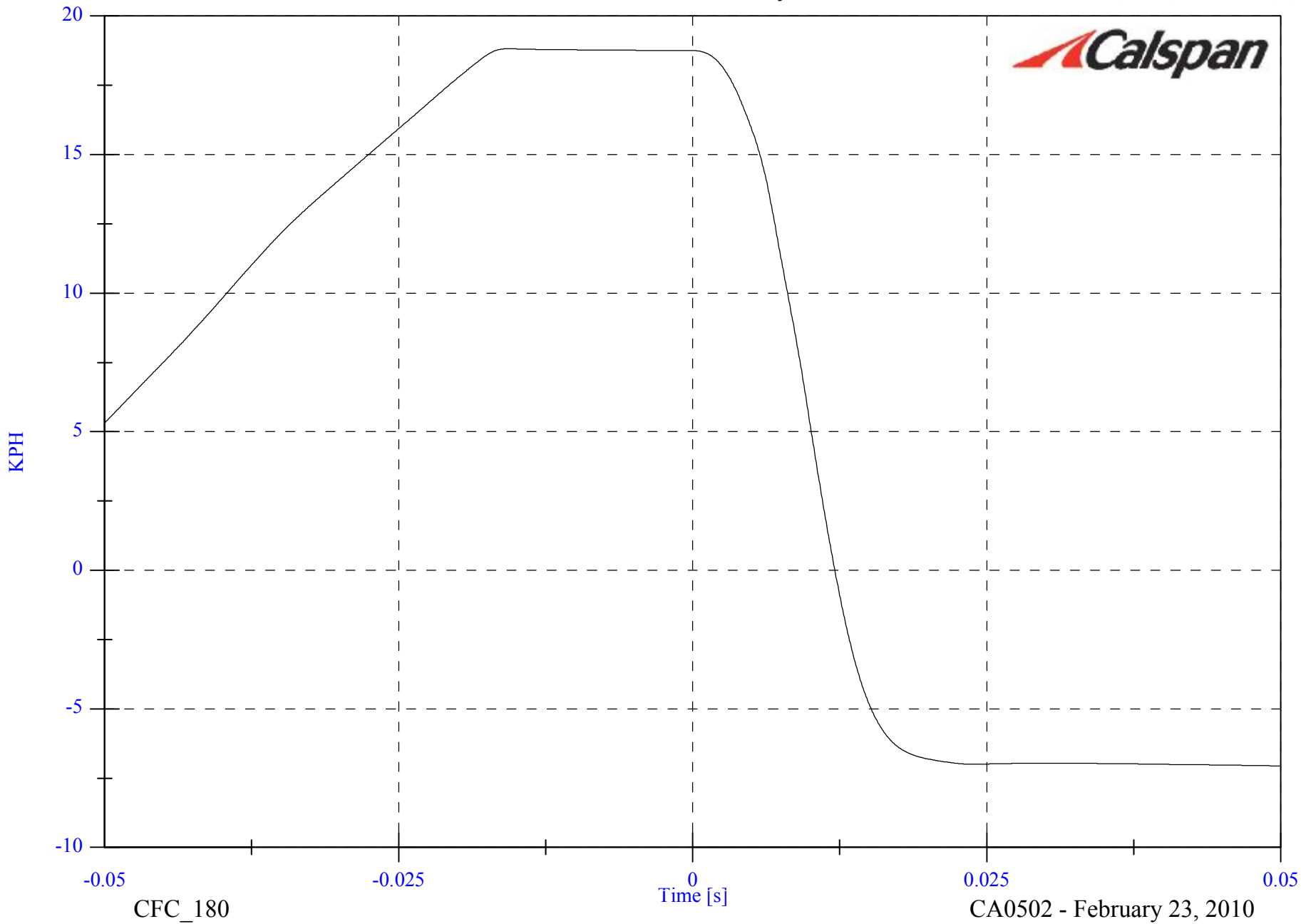


FMVSS 201U 2010 KIA SOUL

Max: 18.8 [KPH] at -0.016 [s]

Min: -7.1 [KPH] at 0.050 [s]

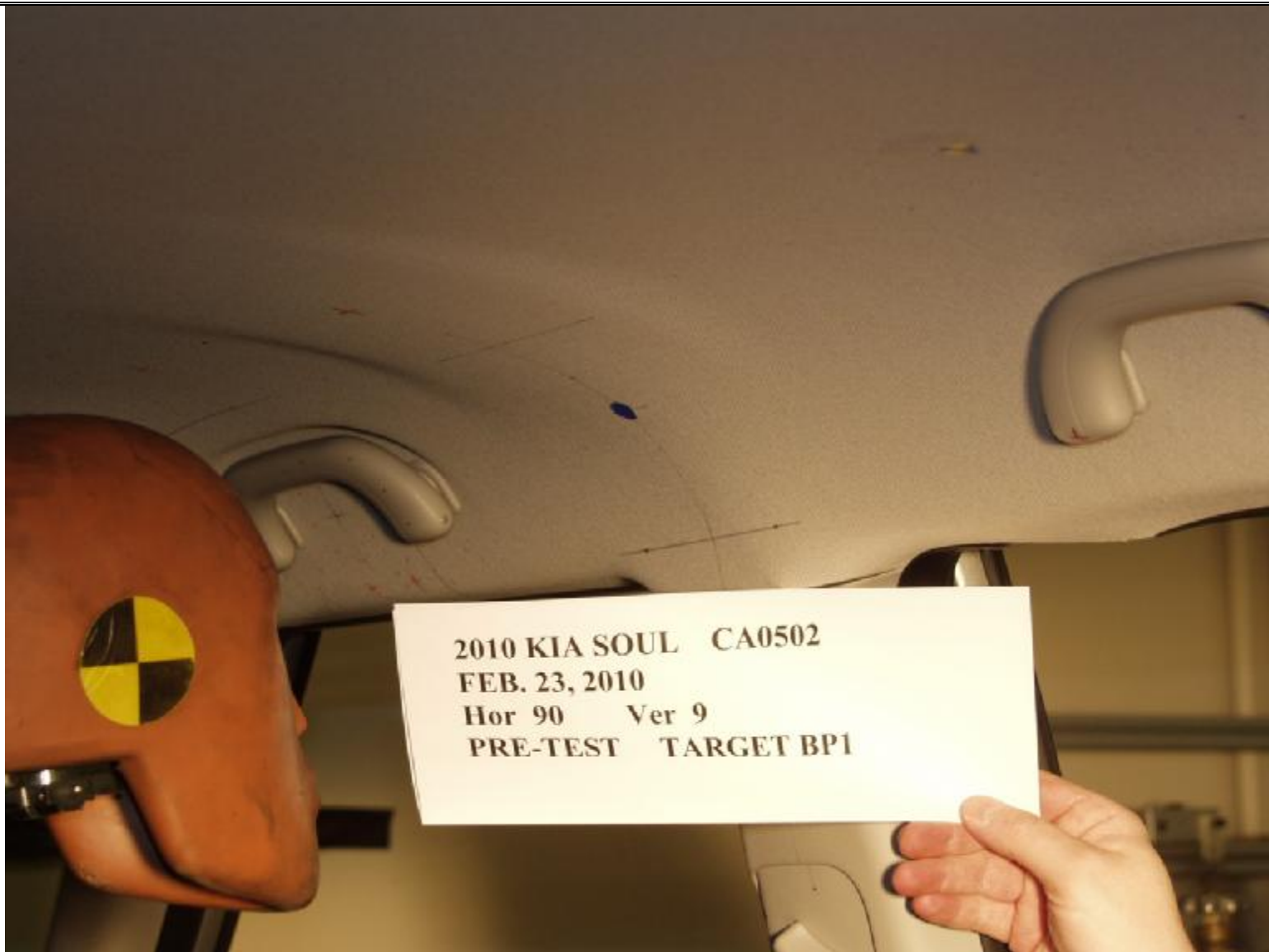
Headform Velocity



CA0502 PASSENGER SIDE BP1 IMPACT PLOT #5

CFC_180

CA0502 - February 23, 2010



PRE-IMPACT BP1

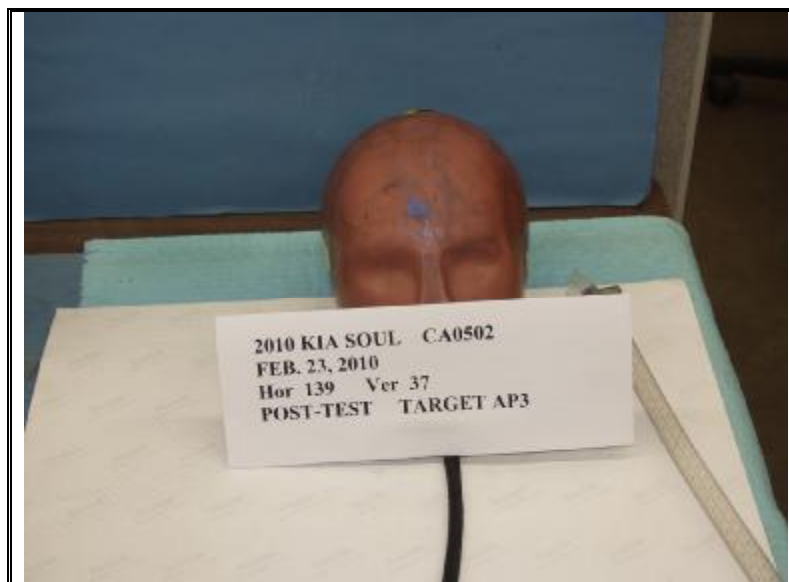


POST-IMPACT BPI

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	07
Test Date:	02/23/10
Target Location:	A-PILLAR
Target Code:	AP3
Horizontal Impact Angle:	139
Vertical Impact Angle:	37
Ambient Temperature:	20°C
Relative Humidity:	27
Time of Impact:	14:30
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	6	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	6				mm up



POST-IMPACT AP3 HEADFORM

Free Motion HIC	273.5
HIC(d)	372.8
Impact Velocity (kph)	18.83
HIC T1 (msec)	1.,
HIC T2 (msec)	14.0

FMVSS 201U 2010 KIA SOUL CA0502 - AP3

FMH Headform 0805

Location: AP3

Test Date: February 23, 2010

Work File: AP3

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

Lab Temperature: 20 C

HICd: 372.8

Lab Humidity: 27 %

HIC (36ms): 273.5

Velocity at Impact: 18.83 KPH

t1: 1.8 msec

t2: 14.0 msec

Free Flight Distance: 224.70 mm

Duration: 12.1 msec

Average Acceleration: 9.9 g

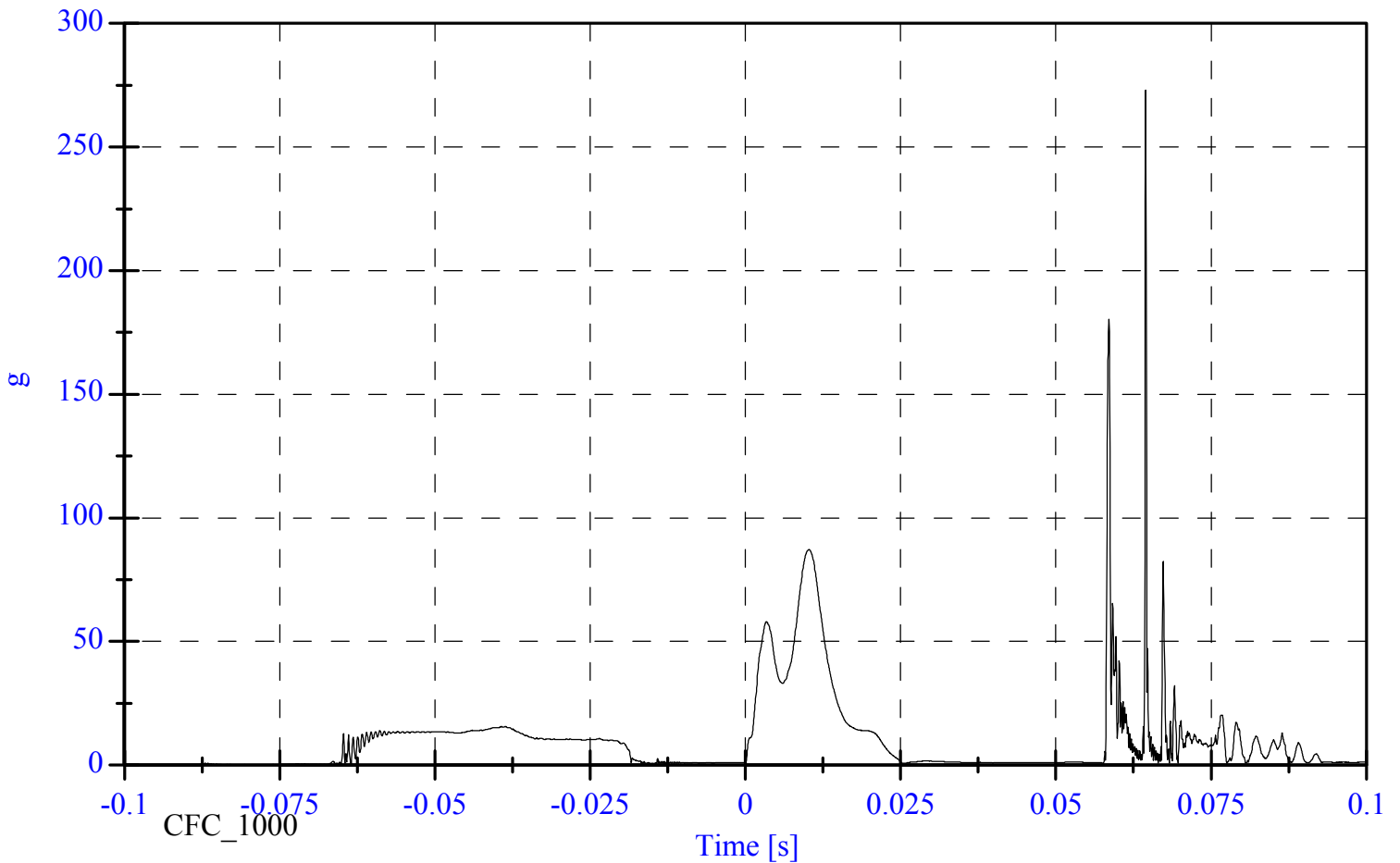
Maximum: 87.2 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 87.2 [g] at 0.010 [s]

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



FMVSS 201U 2010 KIA SOUL

Headform X Acceleration

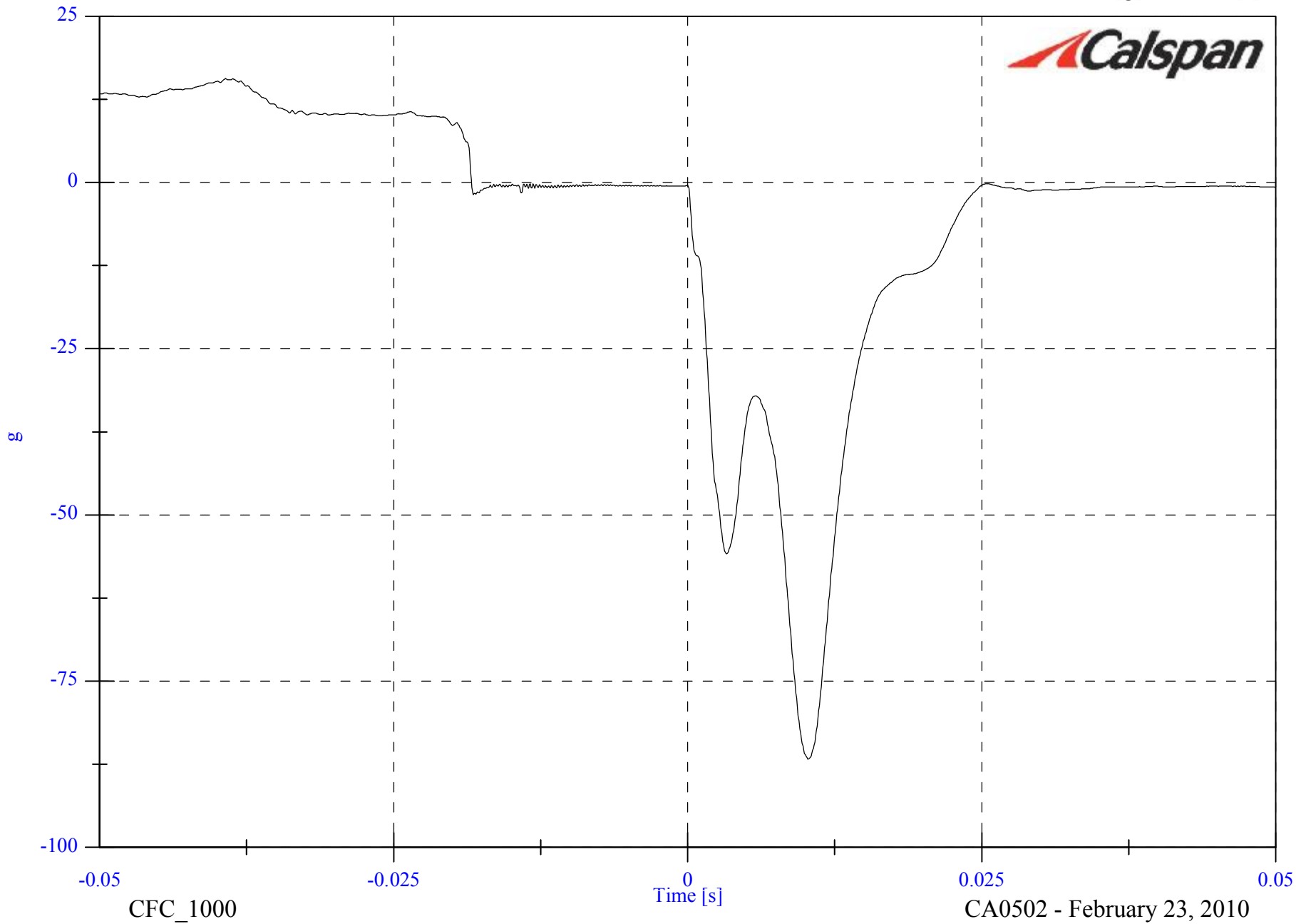
Max: 15.6 [g] at -0.039 [s]

Min: -86.8 [g] at 0.010 [s]



CA0502 PASSENGER SIDE AP3 IMPACT PLOT #1

CC2010-04

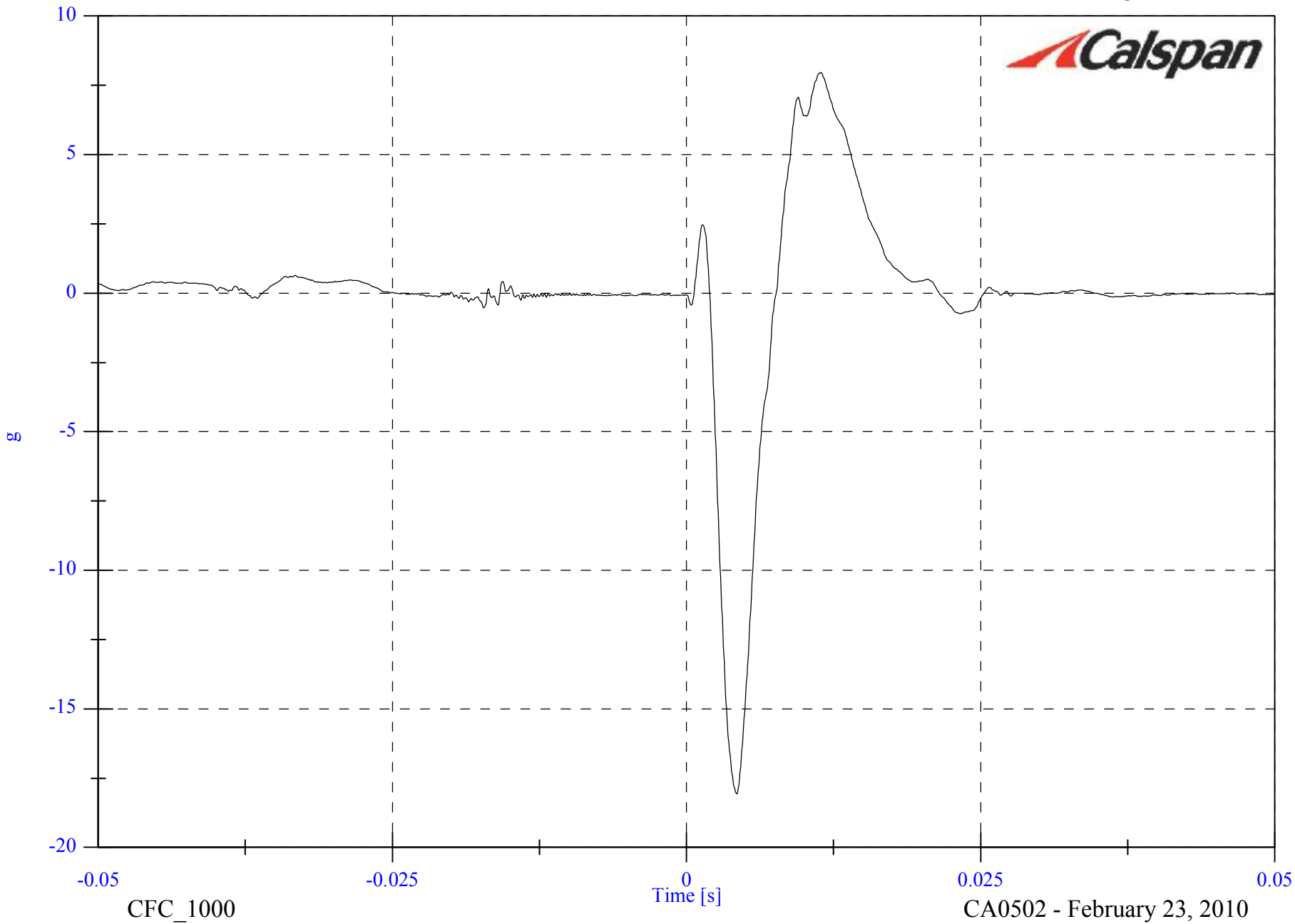


FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

Max: 8.0 [g] at 0.011 [s]

Min: -18.1 [g] at 0.004 [s]



CA0502 PASSENGER SIDE AP3 IMPACT PLOT #2

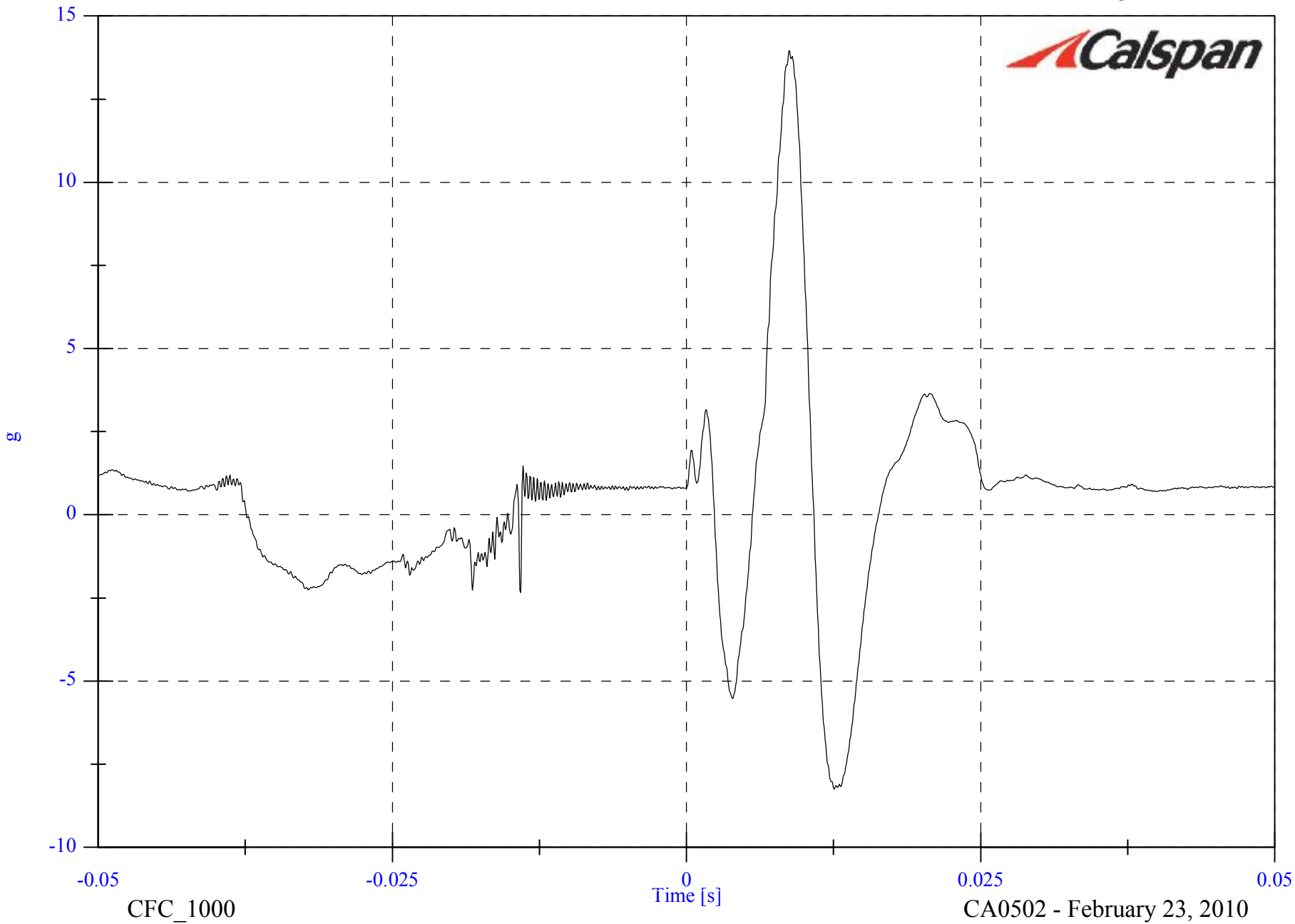
CC2010-04

FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

Max: 14.0 [g] at 0.009 [s]

Min: -8.2 [g] at 0.013 [s]



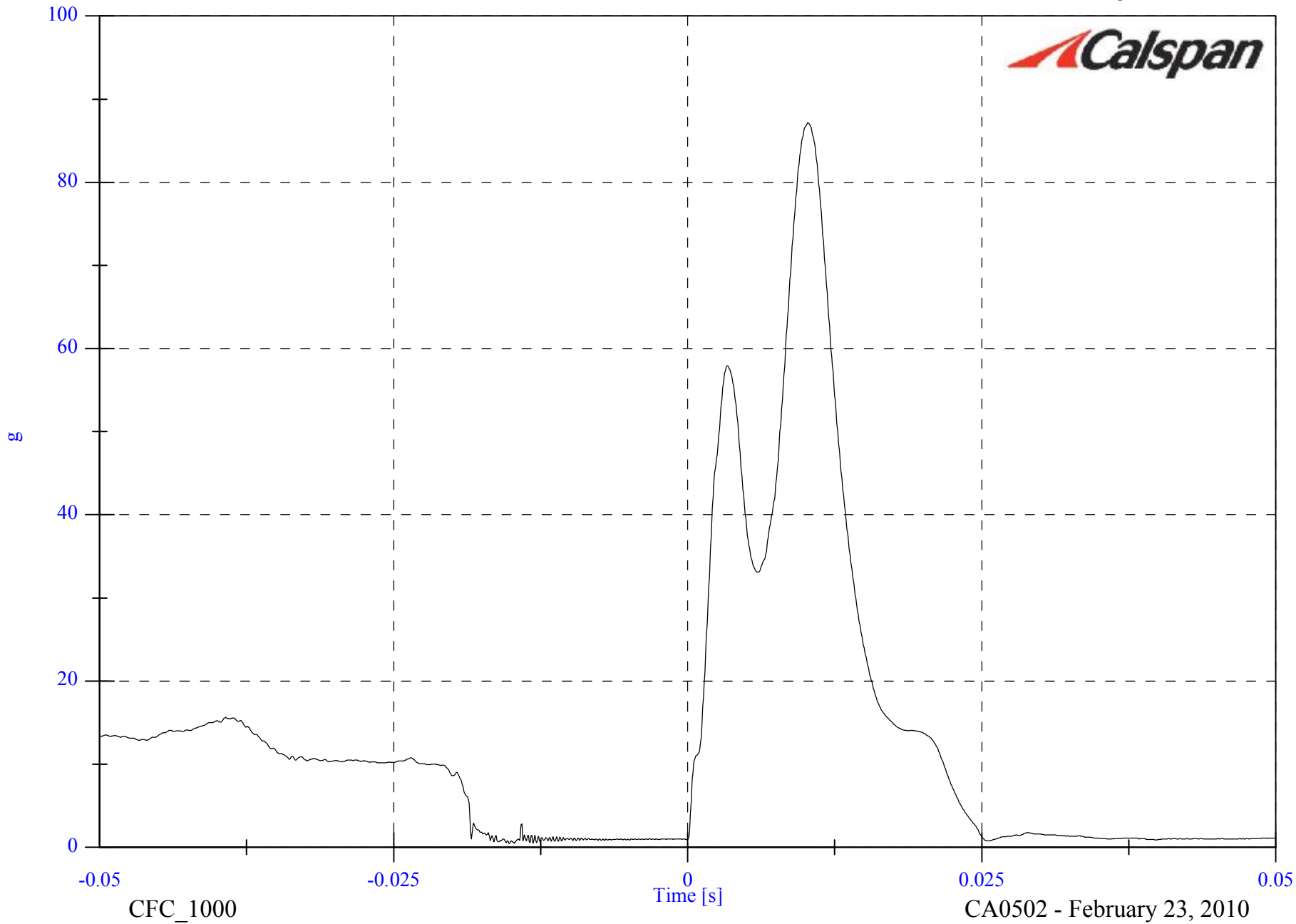
CA0502 PASSENGER SIDE AP3 IMPACT PLOT #3

CC2010-04



CA0502 PASSENGER SIDE AP3 IMPACT PLOT #4

CC2010-04

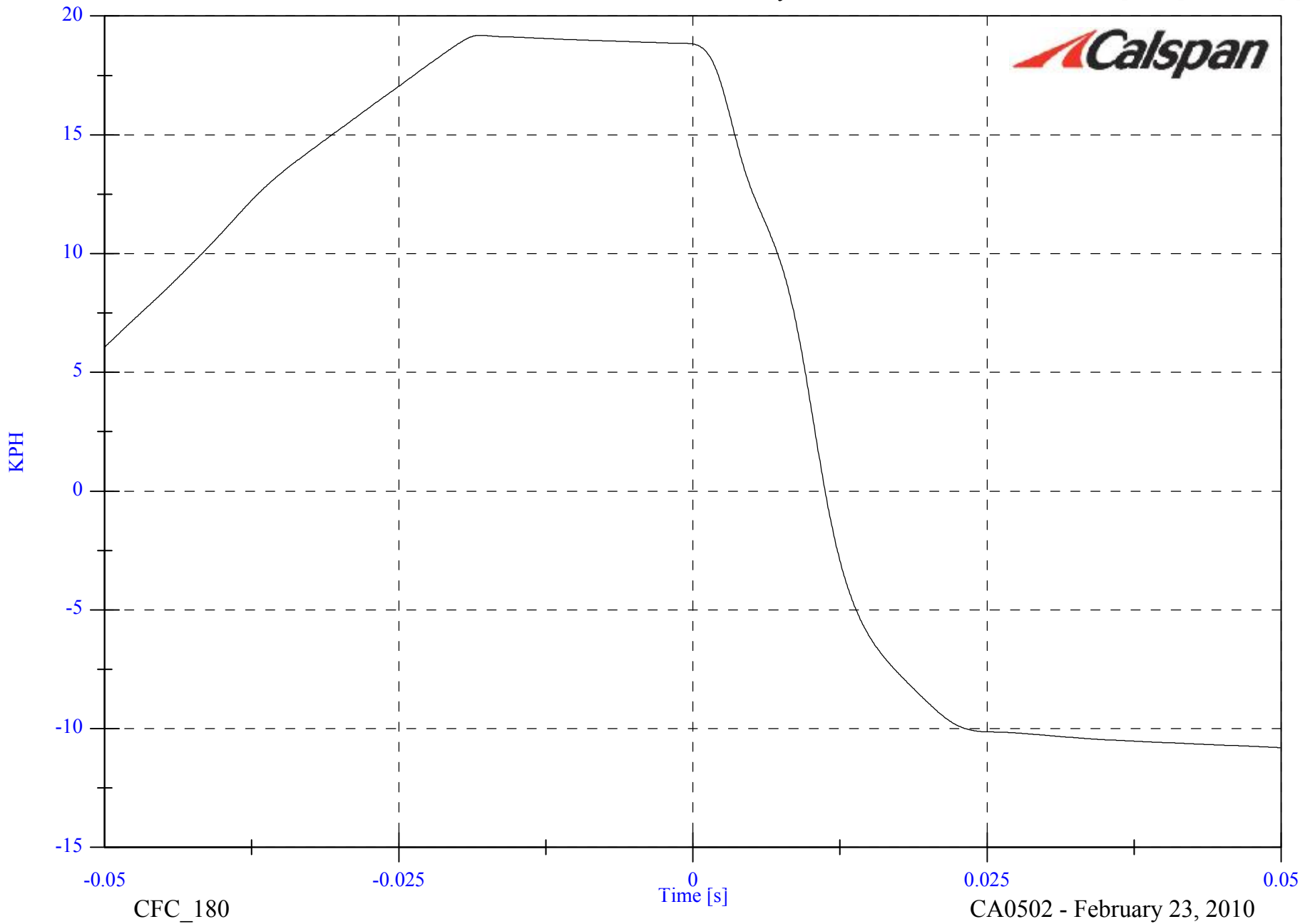


FMVSS 201U 2010 KIA SOUL

Max: 19.2 [KPH] at -0.018 [s]

Min: -10.8 [KPH] at 0.050 [s]

Headform Velocity

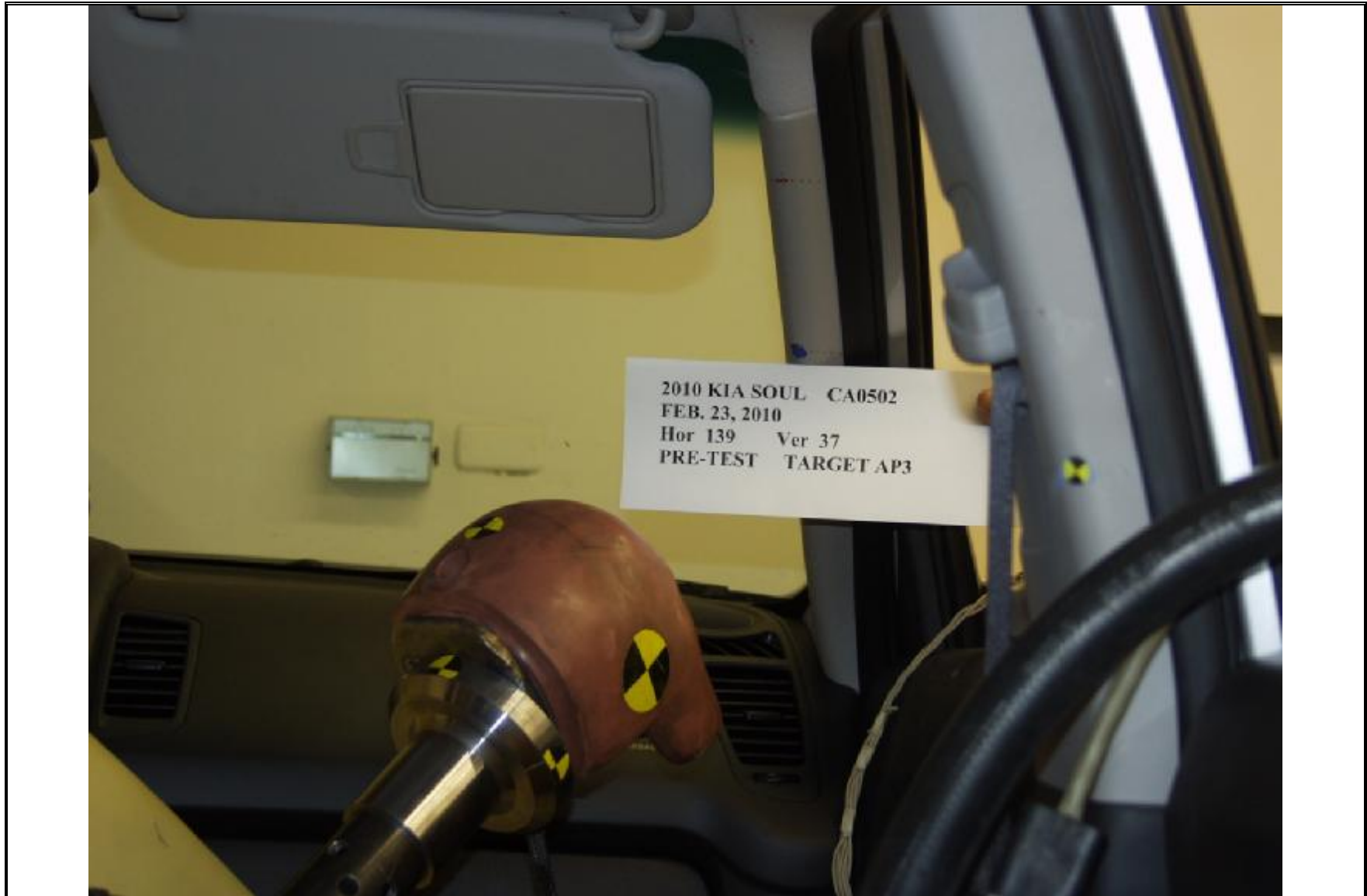


CA0502 PASSENGER SIDE AP3 IMPACT PLOT #5

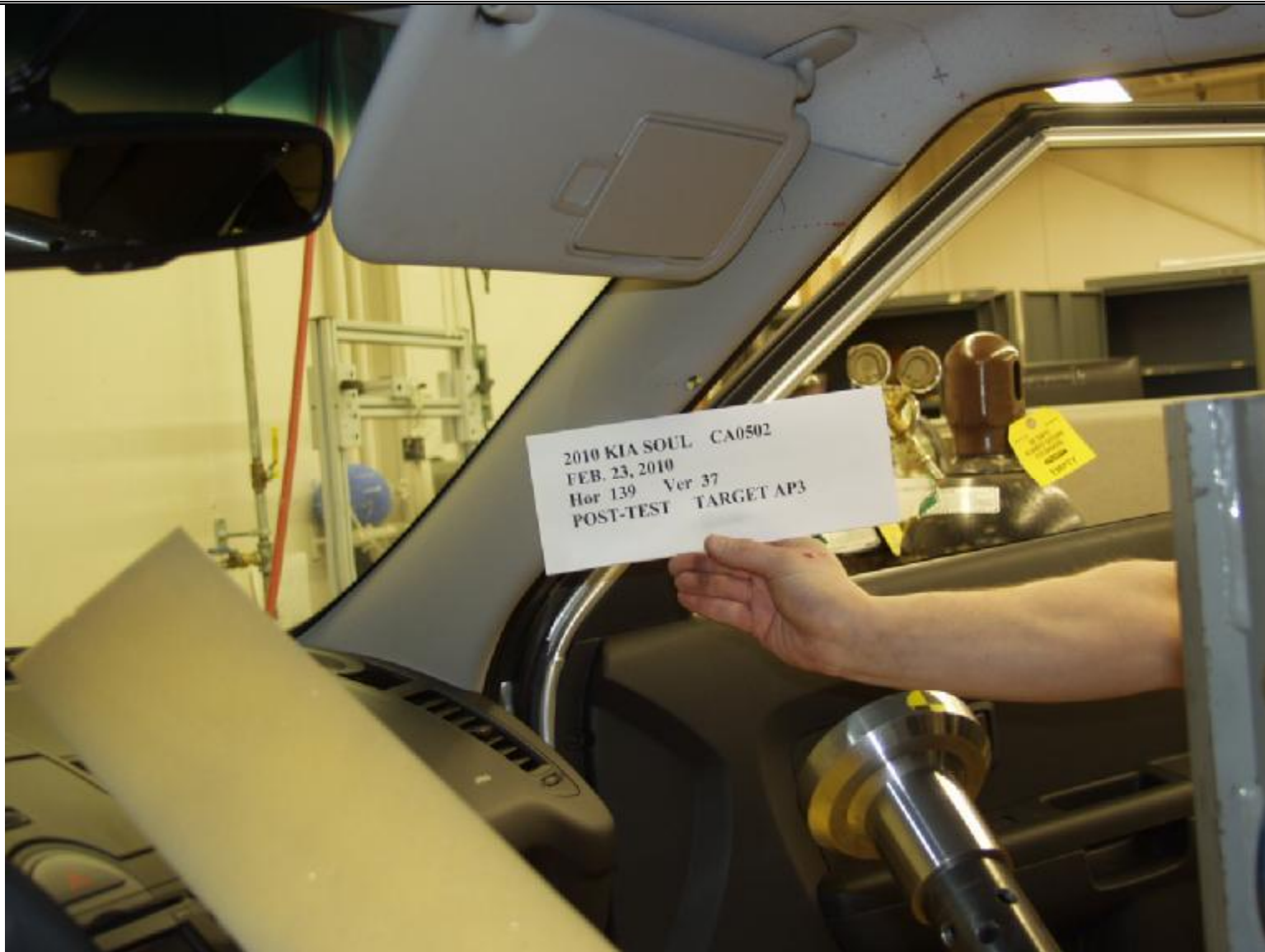
CC2010-04

CFC_180

CA0502 - February 23, 2010



PRE-IMPACT AP3

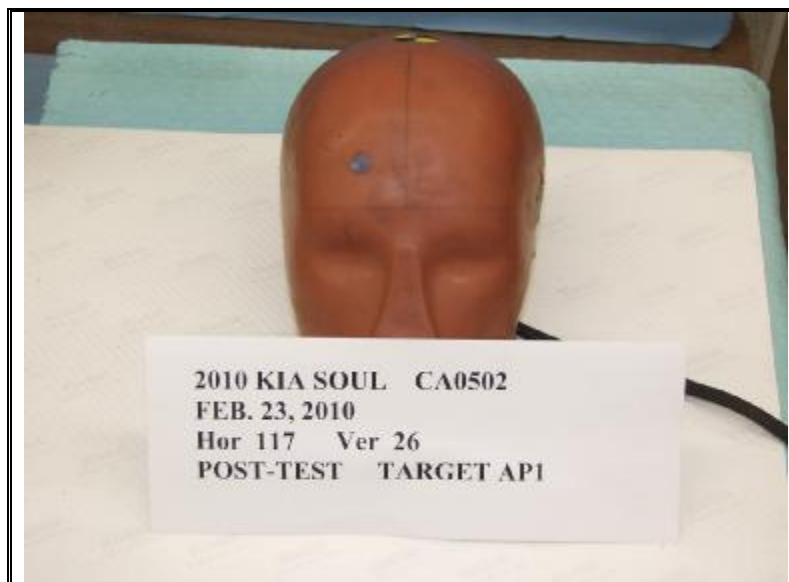


POST-IMPACT AP3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	08
Test Date:	02/23/10
Target Location:	A-PILLAR
Target Code:	AP1
Horizontal Impact Angle:	117
Vertical Impact Angle:	26
Ambient Temperature:	20°C
Relative Humidity:	27
Time of Impact:	15:00
Headform Number:	0355

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	24	X	mm right		mm left
On Centerline	22				mm up



POST-IMPACT AP1 HEADFORM

Free Motion HIC	244.5
HIC(d)	350.9
Impact Velocity (kph)	18.31
HIC T1 (msec)	1
HIC T2 (msec)	13.3

FMVSS 201U 2010 KIA SOUL CA0502 - AP1

FMH Headform 0355

Location: AP1

Test Date: February 23, 2010

Work File: AP1

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

Lab Temperature: 20 C

HICd: 350.9

Lab Humidity: 27 %

HIC (36ms): 244.5

Velocity at Impact: 18.31 KPH

t1: 3.9 msec

t2: 13.3 msec

Free Flight Distance: 226.57 mm

Duration: 9.3 msec

Average Acceleration: 6.9 g

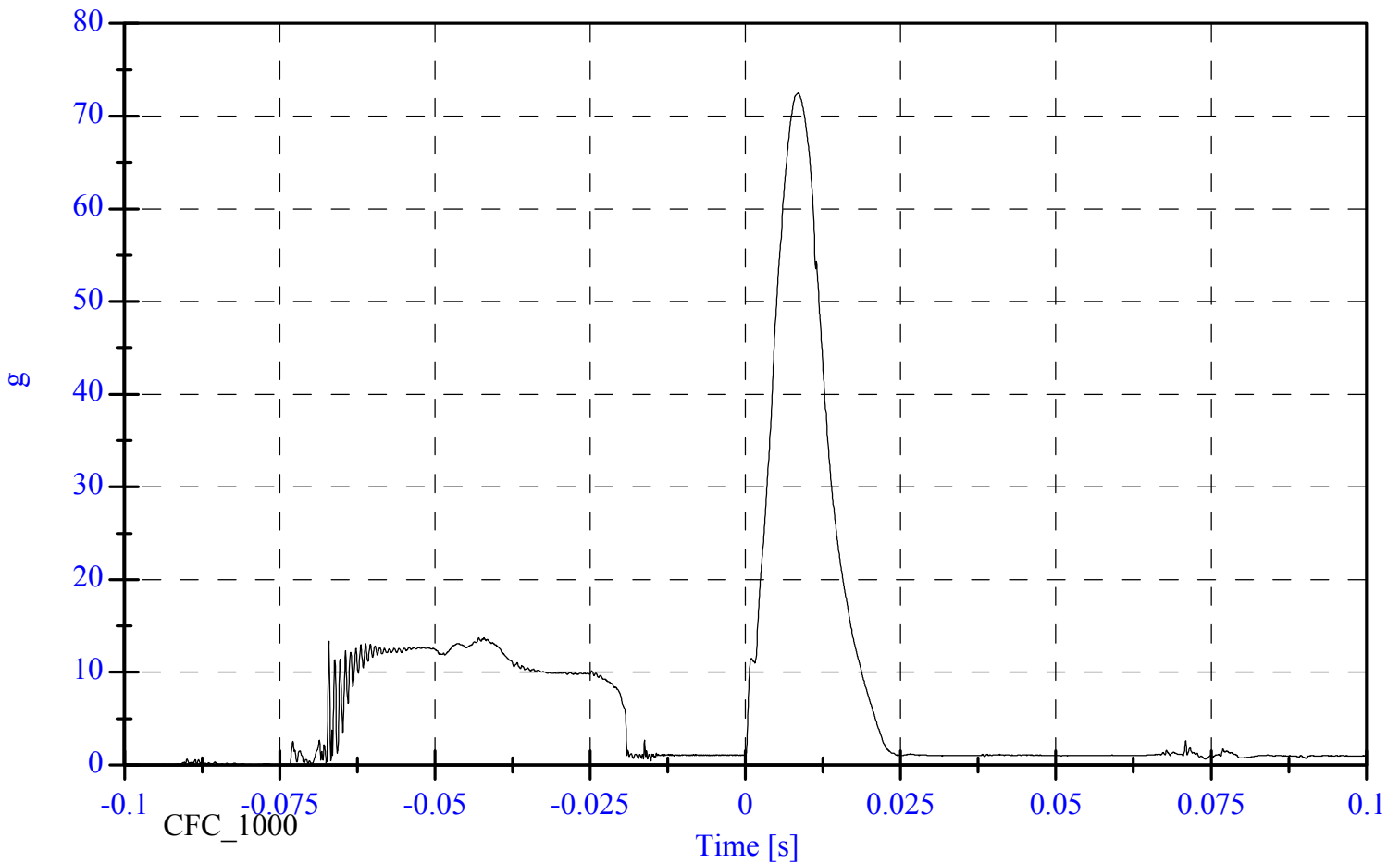
Maximum: 72.5 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 72.5 [g] at 0.009 [s]

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



FMVSS 201U 2010 KIA SOUL

Headform X Acceleration

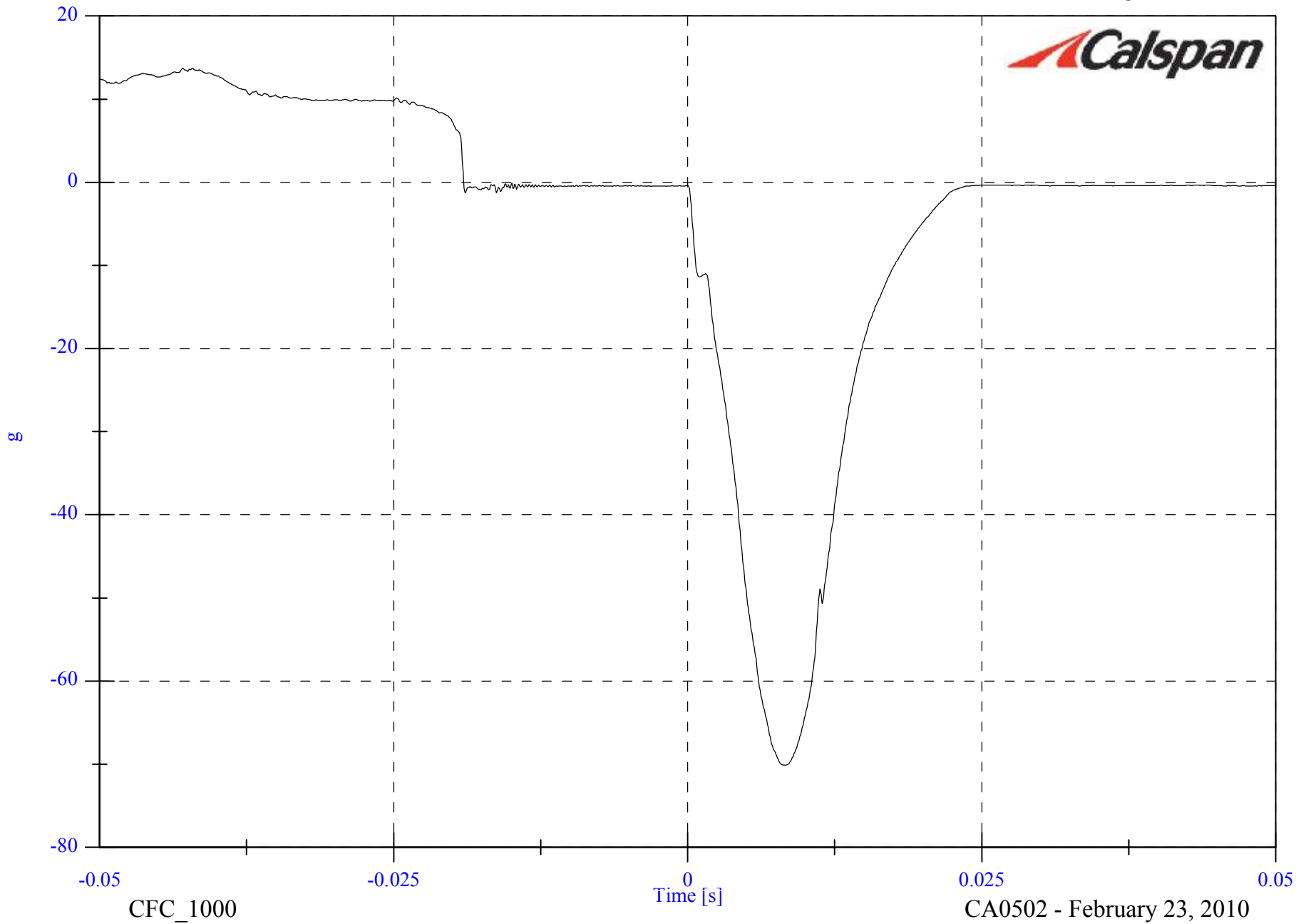
Max: 13.7 [g] at -0.042 [s]

Min: -70.1 [g] at 0.008 [s]



CA0502 PASSENGER SIDE AP1 IMPACT PLOT #1

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

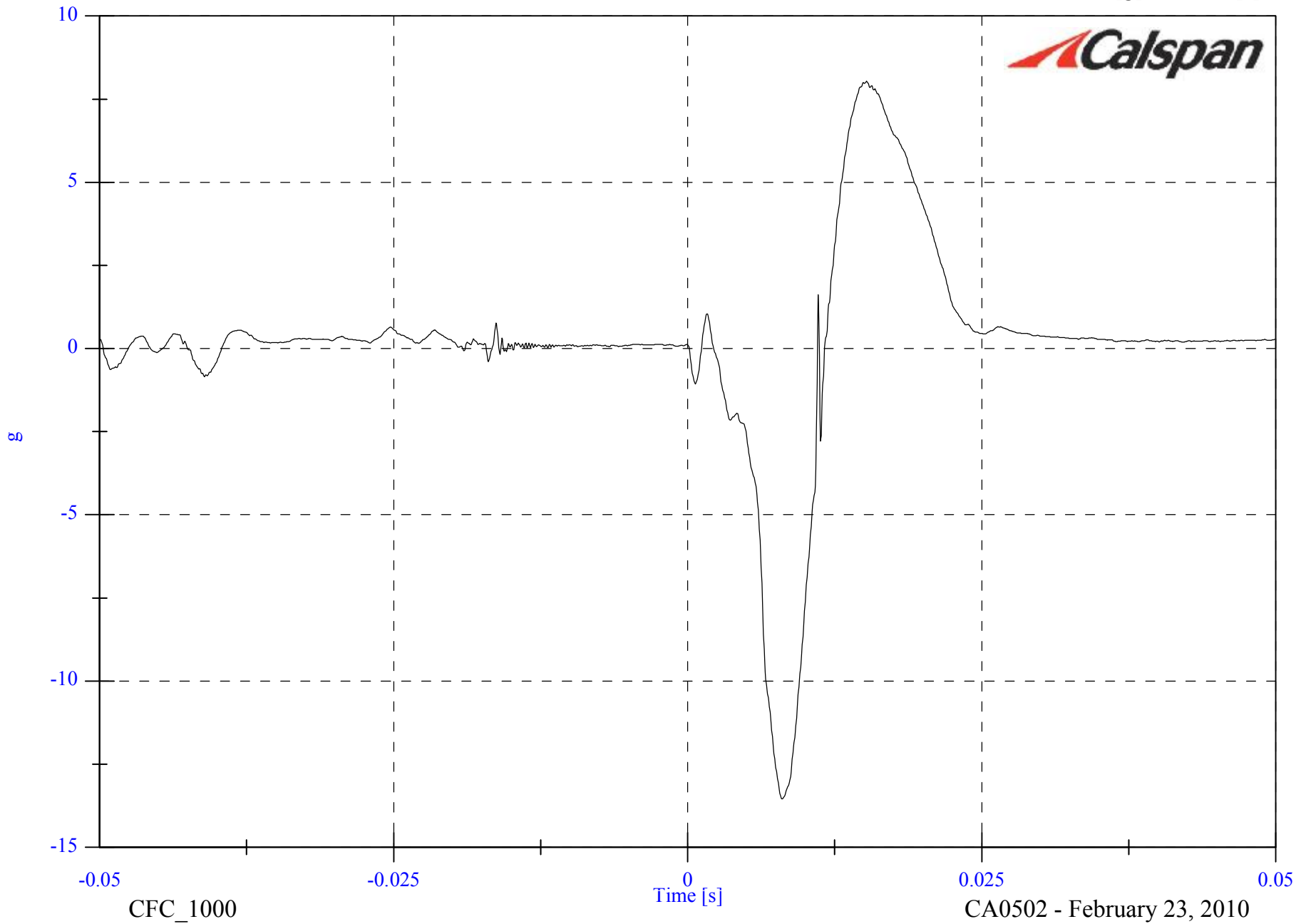
Max: 8.0 [g] at 0.015 [s]

Min: -13.5 [g] at 0.008 [s]



CA0502 PASSENGER SIDE AP1 IMPACT PLOT #2

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

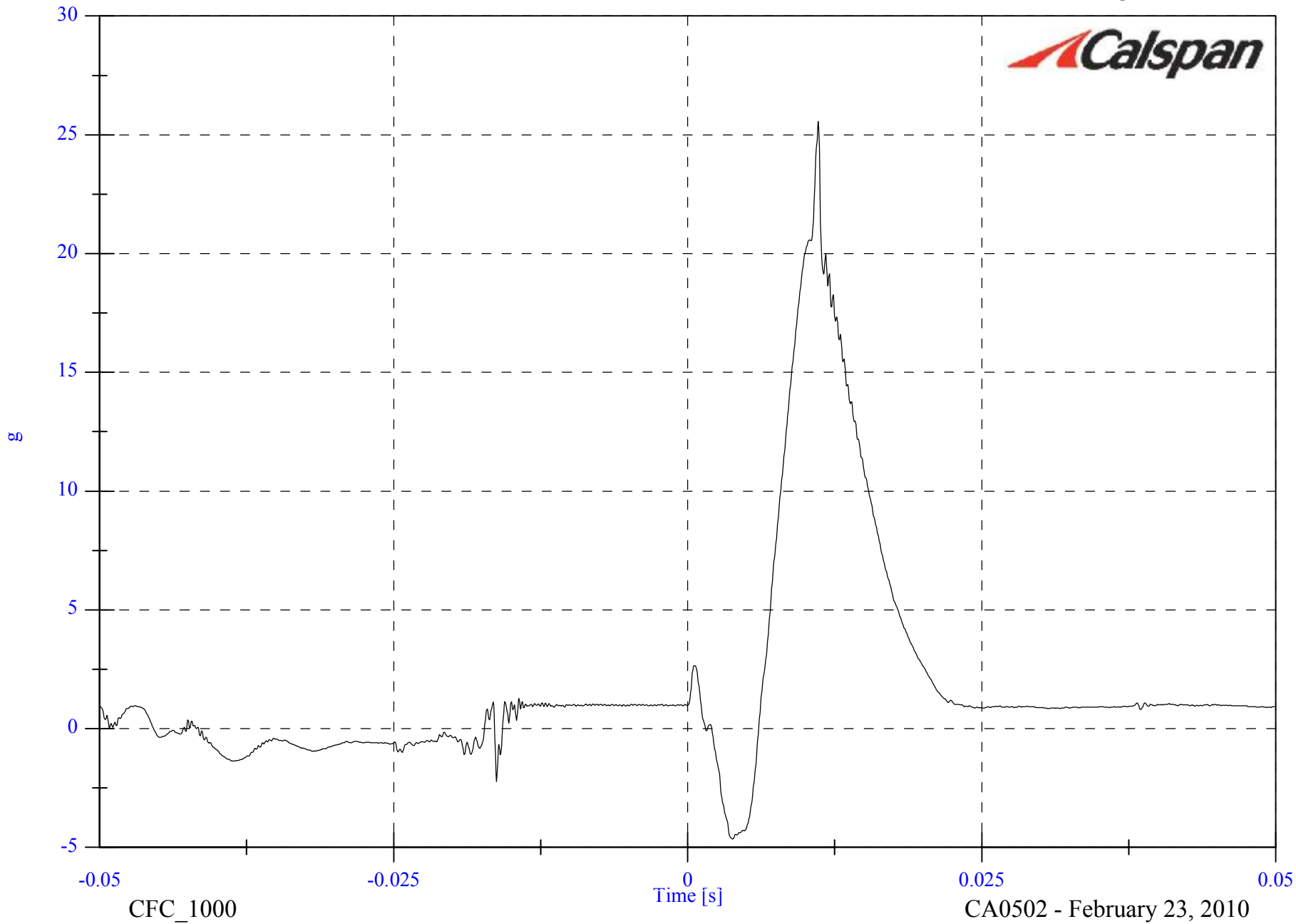
Max: 25.6 [g] at 0.011 [s]

Min: -4.7 [g] at 0.004 [s]



CA0502 PASSENGER SIDE AP1 IMPACT PLOT #3

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Resultant

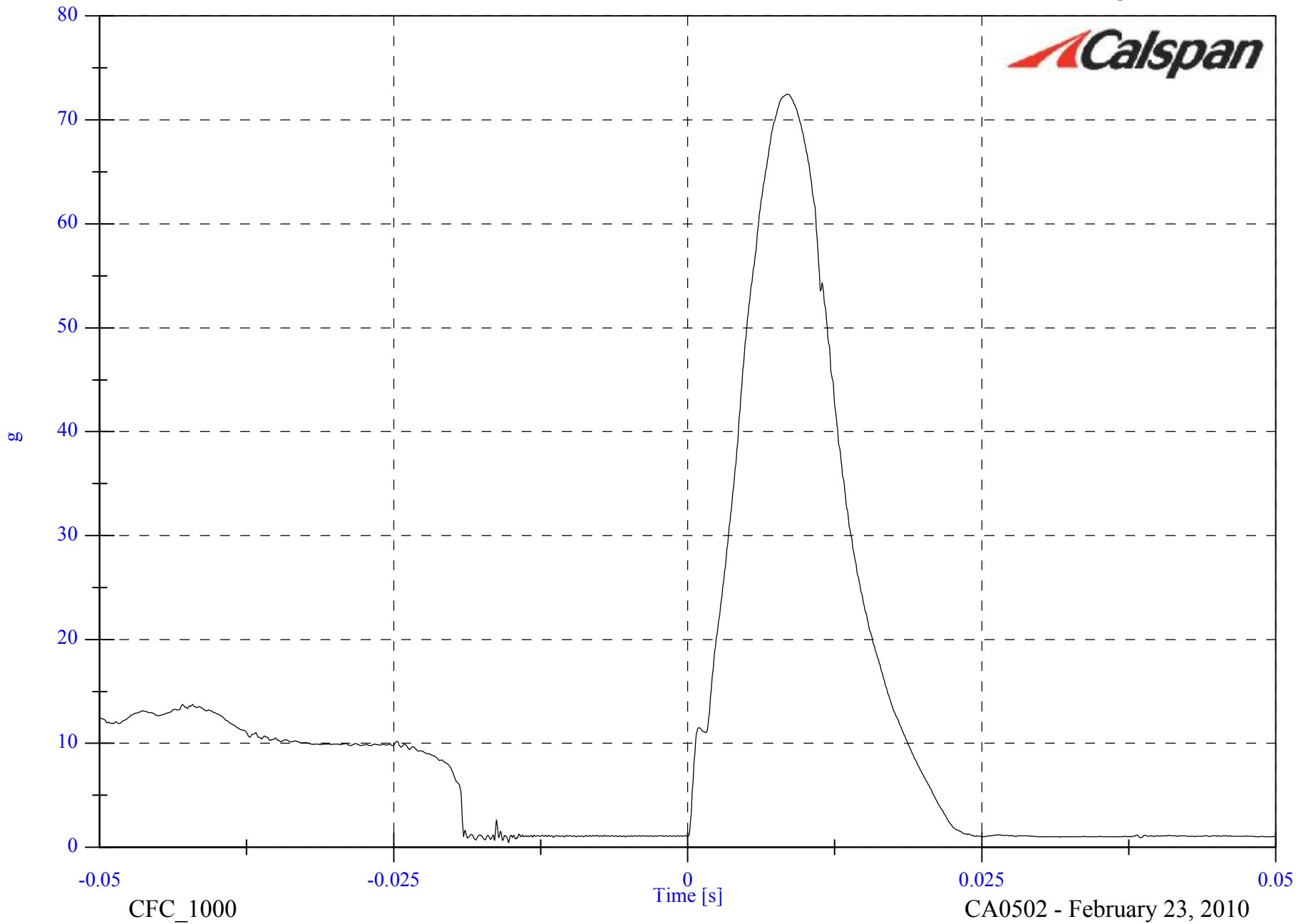
Max: 72.5 [g] at 0.009 [s]

Min: 0.5 [g] at -0.015 [s]



CA0502 PASSENGER SIDE AP1 IMPACT PLOT #4

CC2010-04

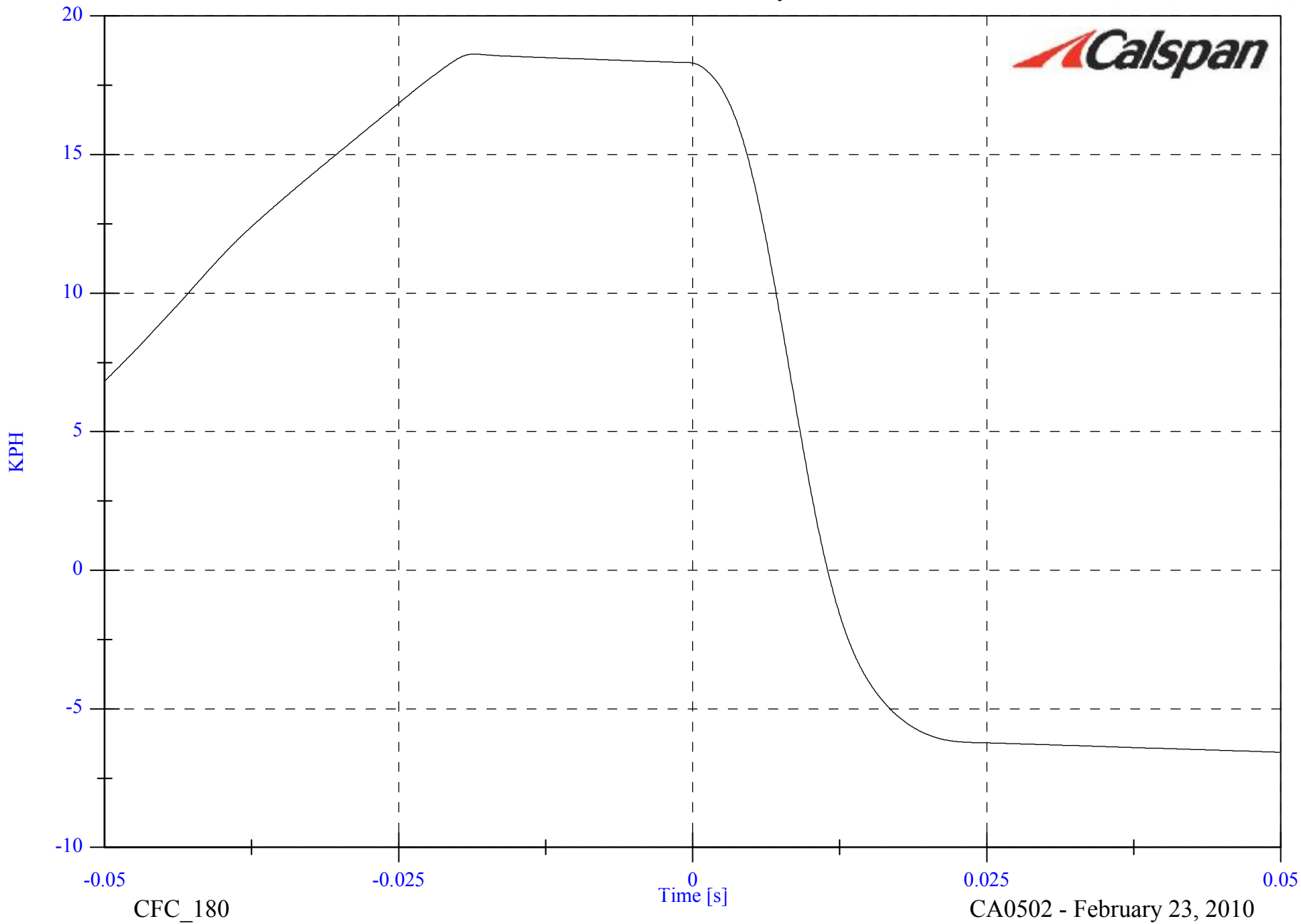


FMVSS 201U 2010 KIA SOUL

Max: 18.6 [KPH] at -0.019 [s]

Min: -6.6 [KPH] at 0.050 [s]

Headform Velocity

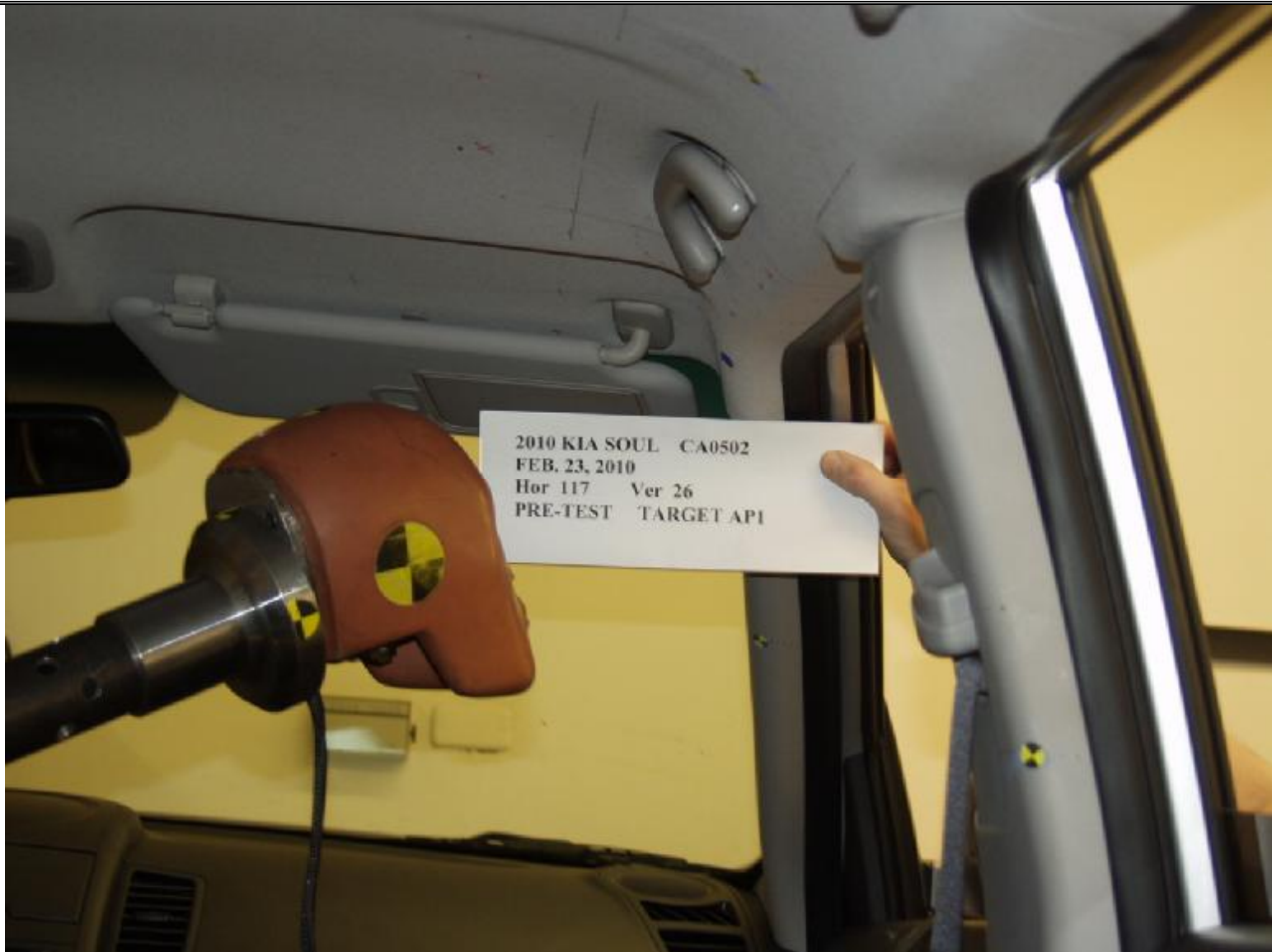


CA0502 PASSENGER SIDE AP1 IMPACT PLOT #5

CC2010-04

CFC_180

CA0502 - February 23, 2010



PRE-IMPACT API

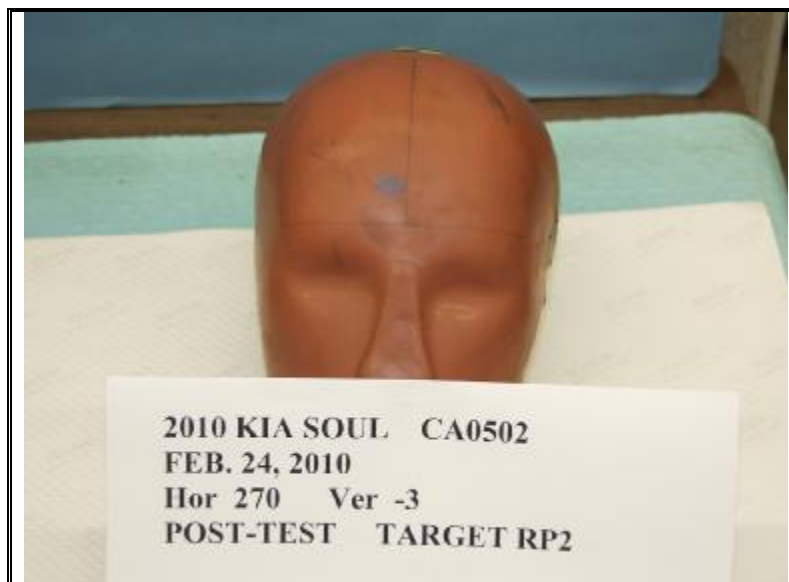
PHOTO NOT AVAILABLE

POST-IMPACT AP1

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	09
Test Date:	02/24/10
Target Location:	REAR PILLAR
Target Code:	RP2
Horizontal Impact Angle:	270
Vertical Impact Angle:	-3
Ambient Temperature:	20°C
Relative Humidity:	24
Time of Impact:	9:15
Headform Number:	355

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	8	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	15				mm up



POST-IMPACT RP2 HEADFORM

Free Motion HIC	388.2
HIC(d)	459.2
Impact Velocity (kph)	23.62
HIC T1 (msec)	0.8
HIC T2 (msec)	13.3

FMVSS 201U 2010 KIA SOUL CA0502 - RP2

FMH Headform 0355

Location: RP2

Test Date: February 24, 2010

Work File: RP2

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

Lab Temperature: 20 C

HICd: 459.3

Lab Humidity: 24 %

HIC (36ms): 388.2

Velocity at Impact: 23.62 KPH

t1: 0.8 msec

t2: 13.3 msec

Free Flight Distance: 219.99 mm

Duration: 12.5 msec

Average Acceleration: 8.7 g

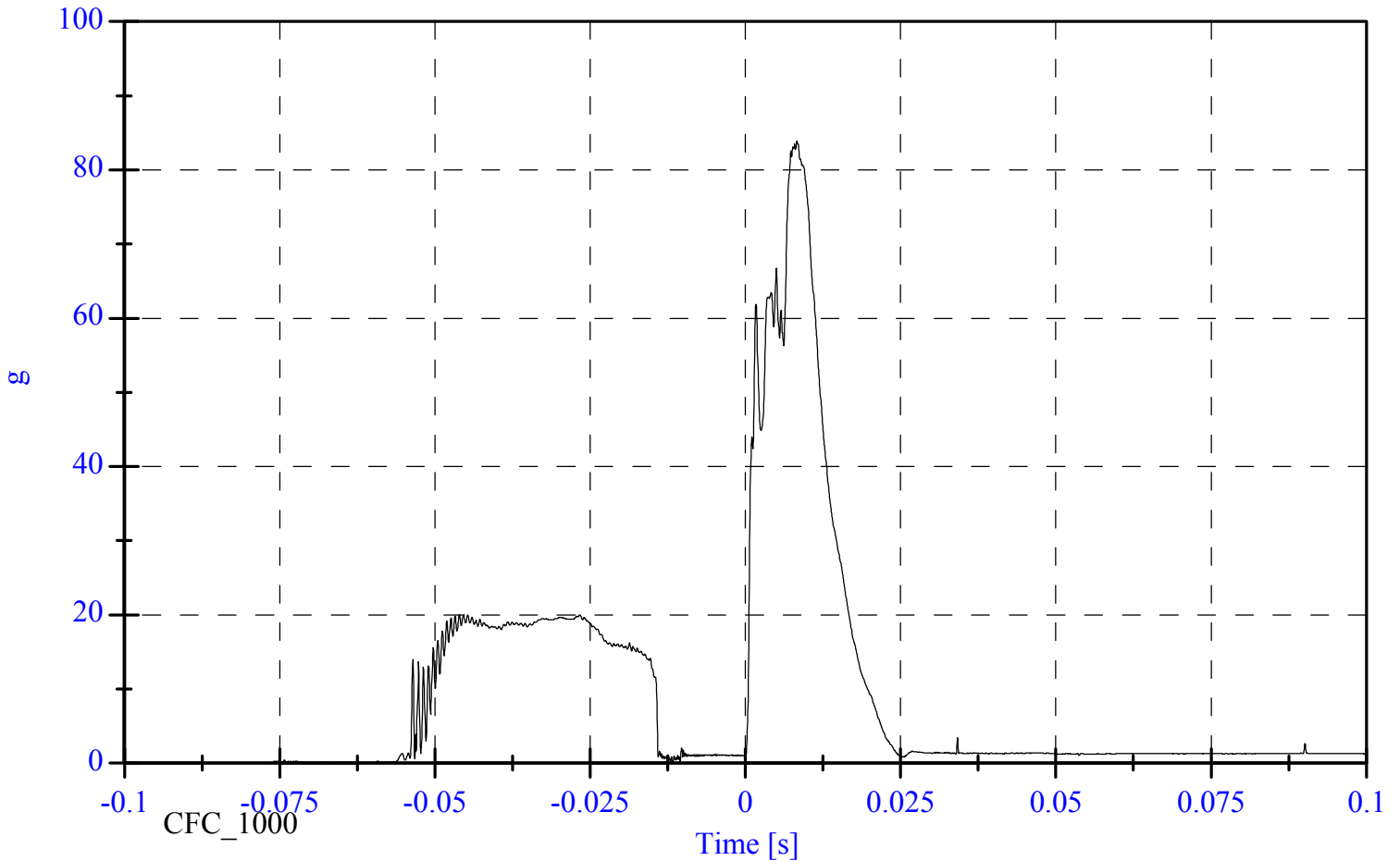
Maximum: 83.9 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 83.9 [g] at 0.008 [s]

Min: 0.0 [g] at -0.082 [s]

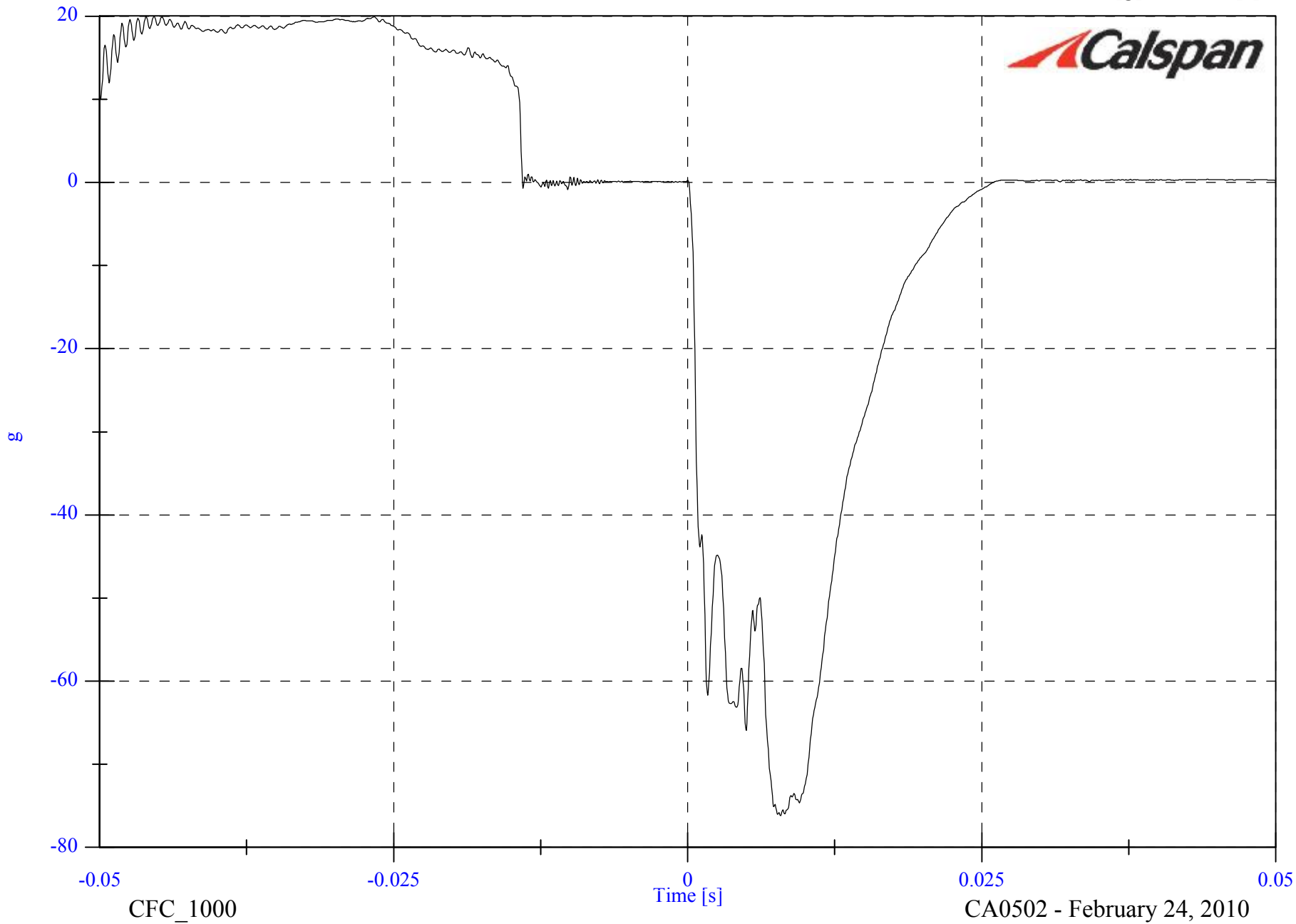


FMVSS 201U 2010 KIA SOUL

Max: 20.0 [g] at -0.046 [s]

Min: -76.2 [g] at 0.008 [s]

Headform X Acceleration



CA0502 DRIVER SIDE RP2 IMPACT PLOT #1

CC2010-04

FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

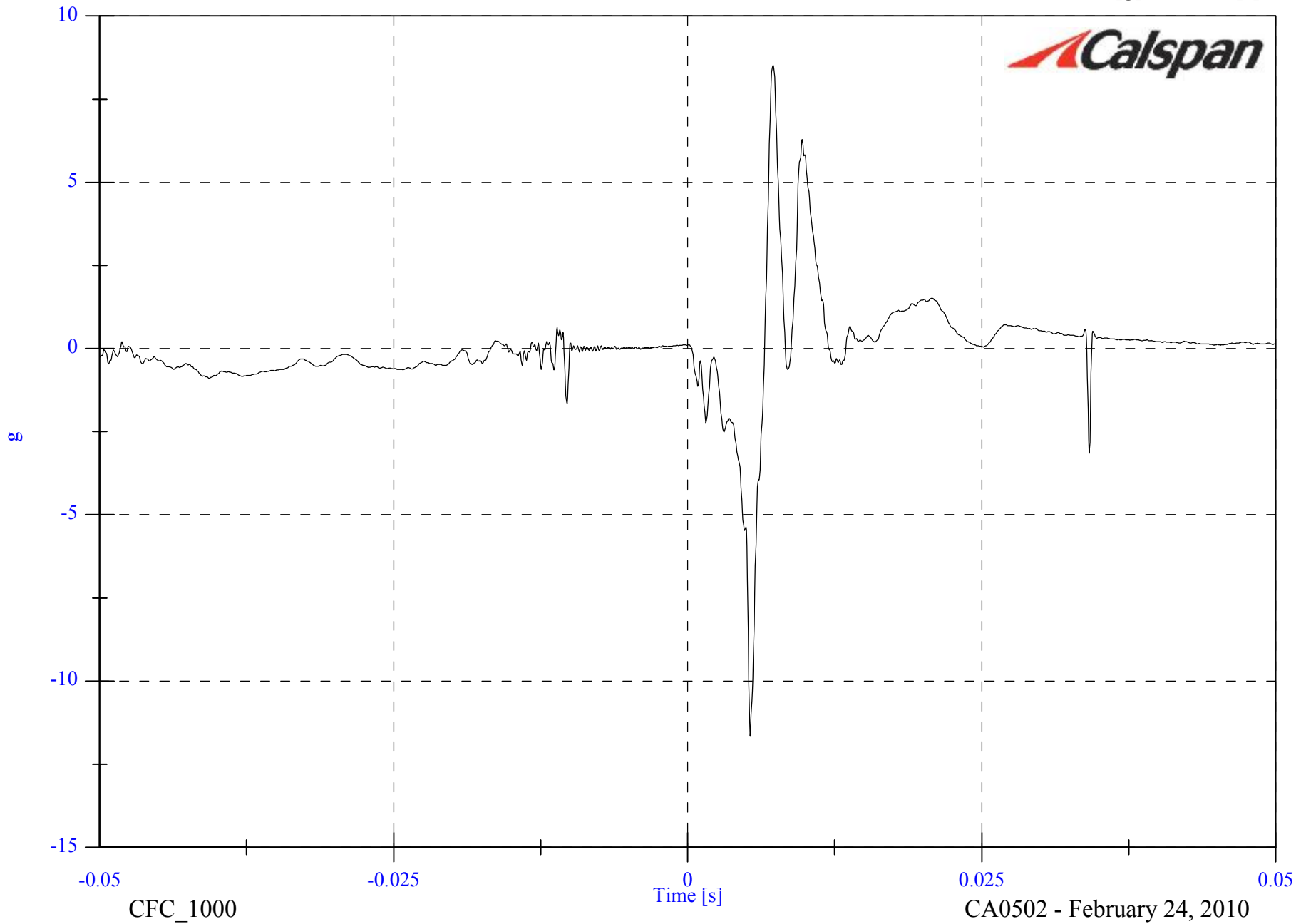
Max: 8.5 [g] at 0.007 [s]

Min: -11.7 [g] at 0.005 [s]



CA0502 DRIVER SIDE RP2 IMPACT PLOT #2

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

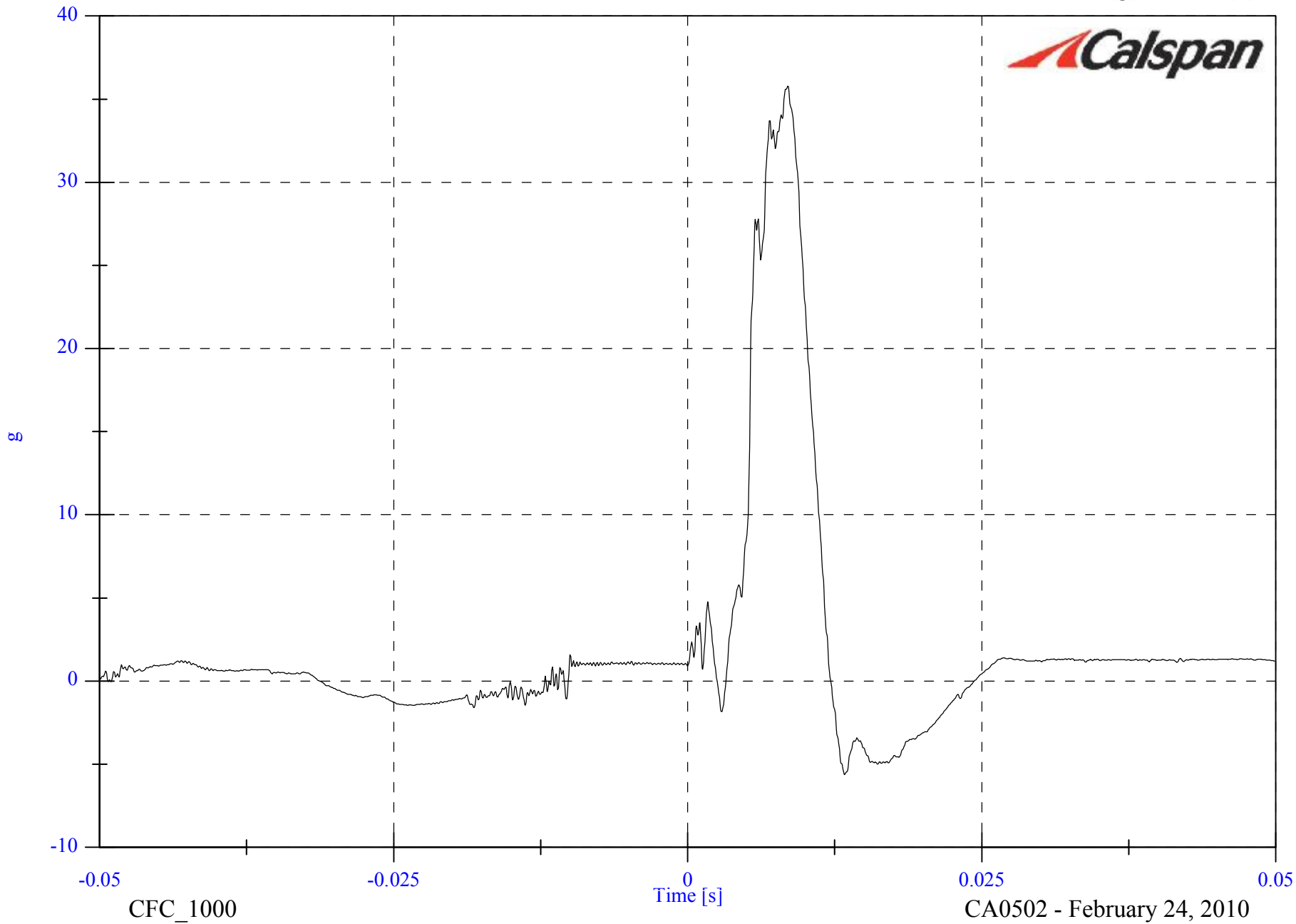
Max: 35.8 [g] at 0.008 [s]

Min: -5.6 [g] at 0.013 [s]



CA0502 DRIVER SIDE RP2 IMPACT PLOT #3

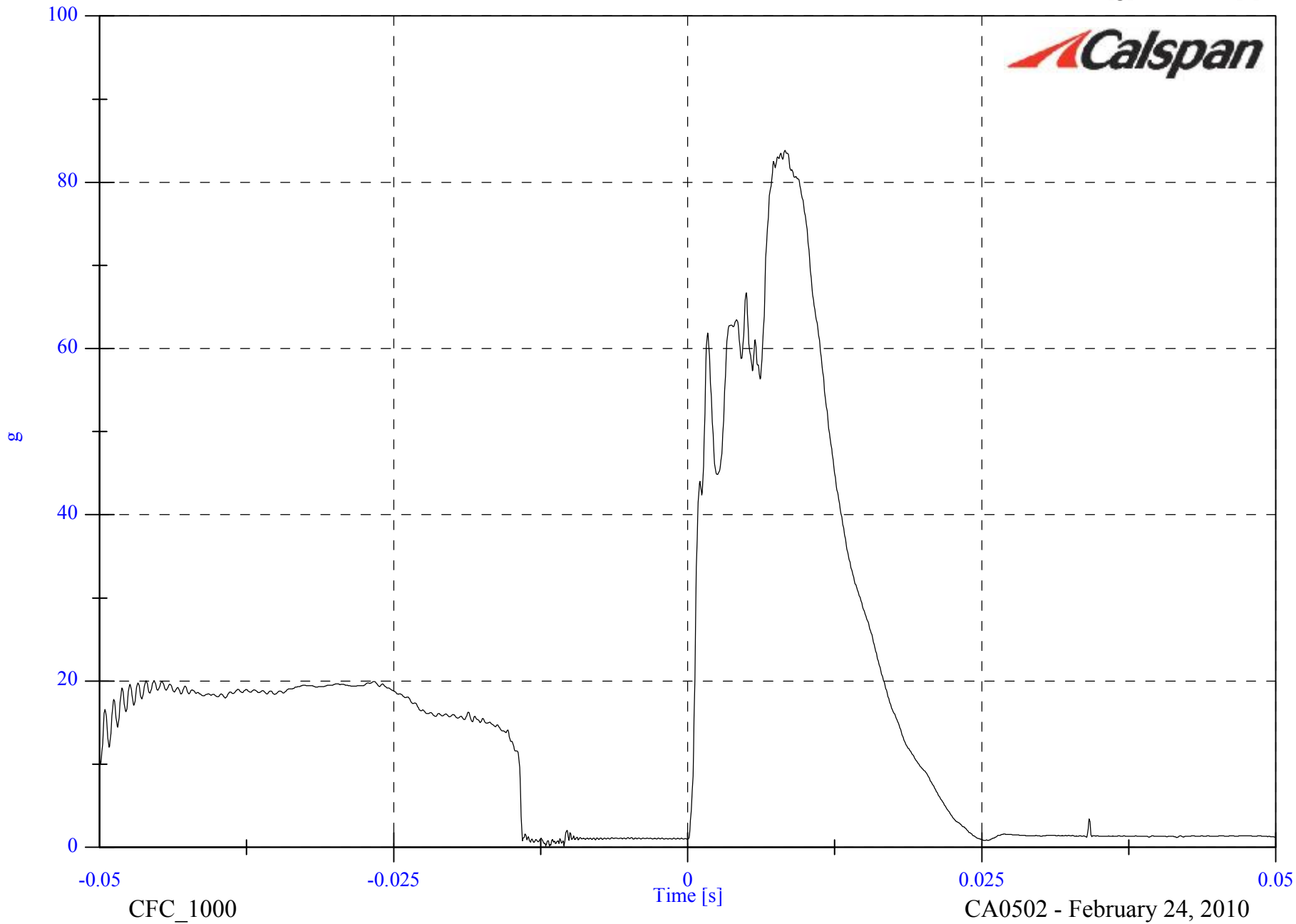
CC2010-04





CA0502 DRIVER SIDE RP2 IMPACT PLOT #4

CC2010-04

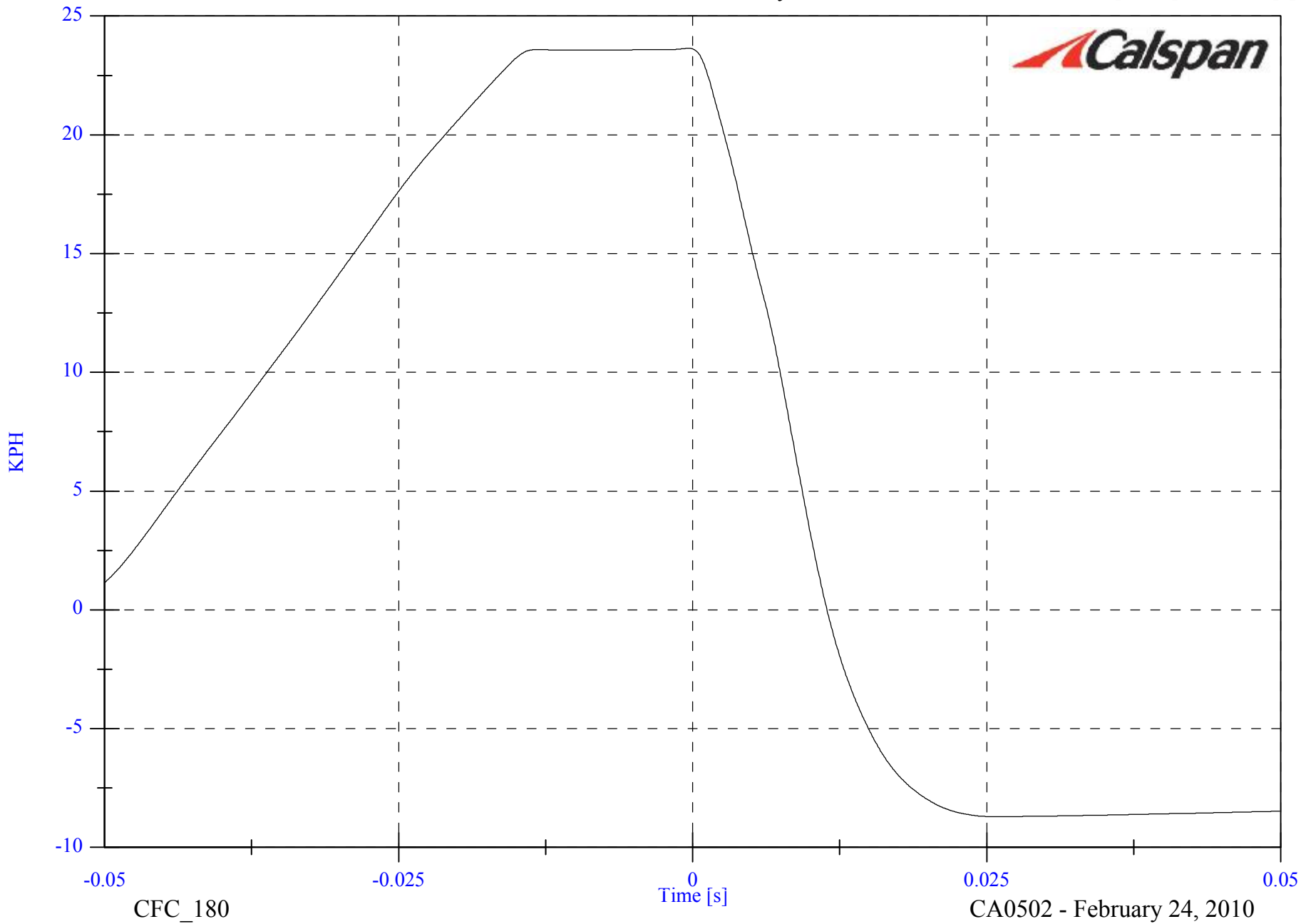


FMVSS 201U 2010 KIA SOUL

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

Min: -8.7 [KPH] at 0.026 [s]

Headform Velocity

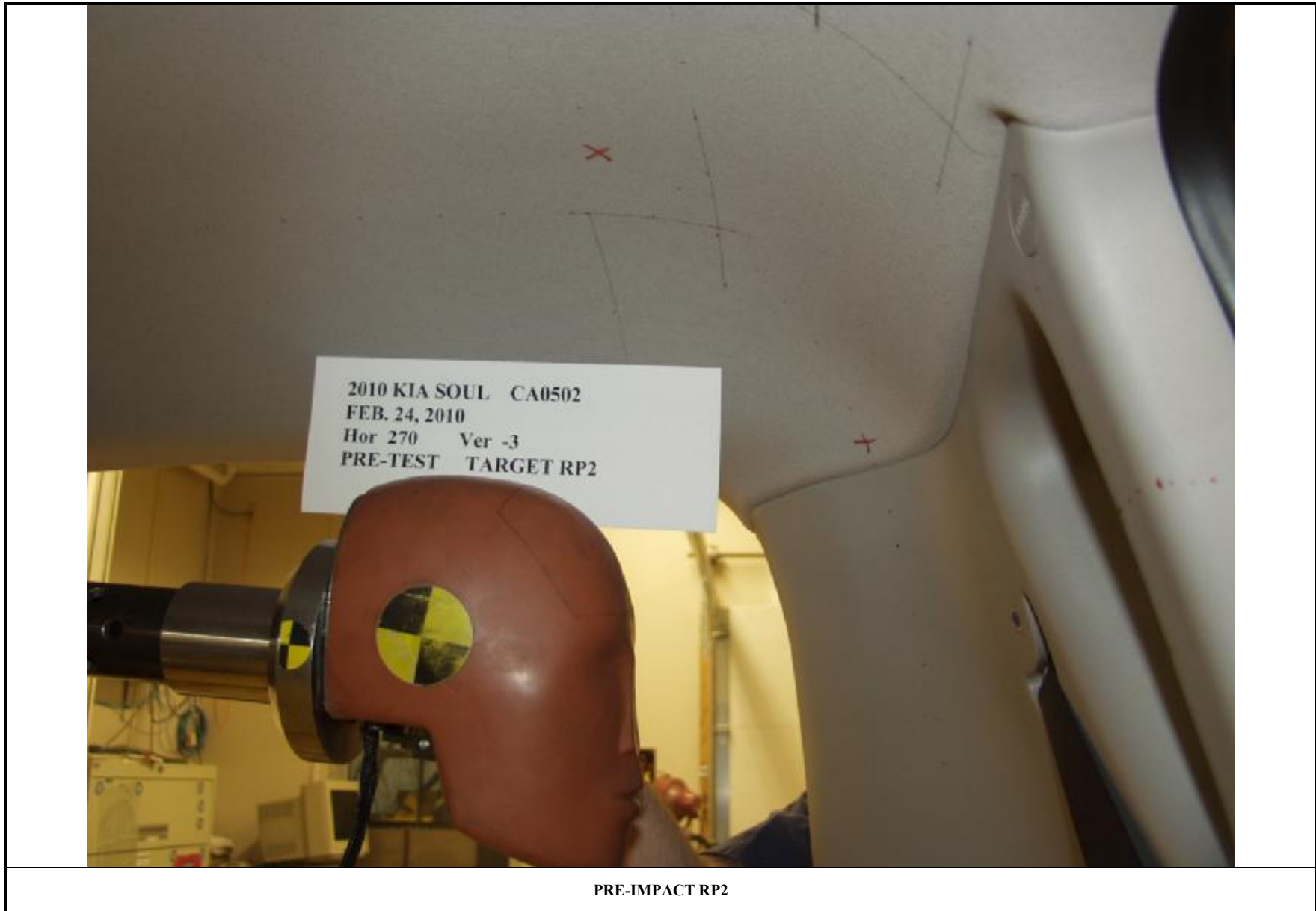


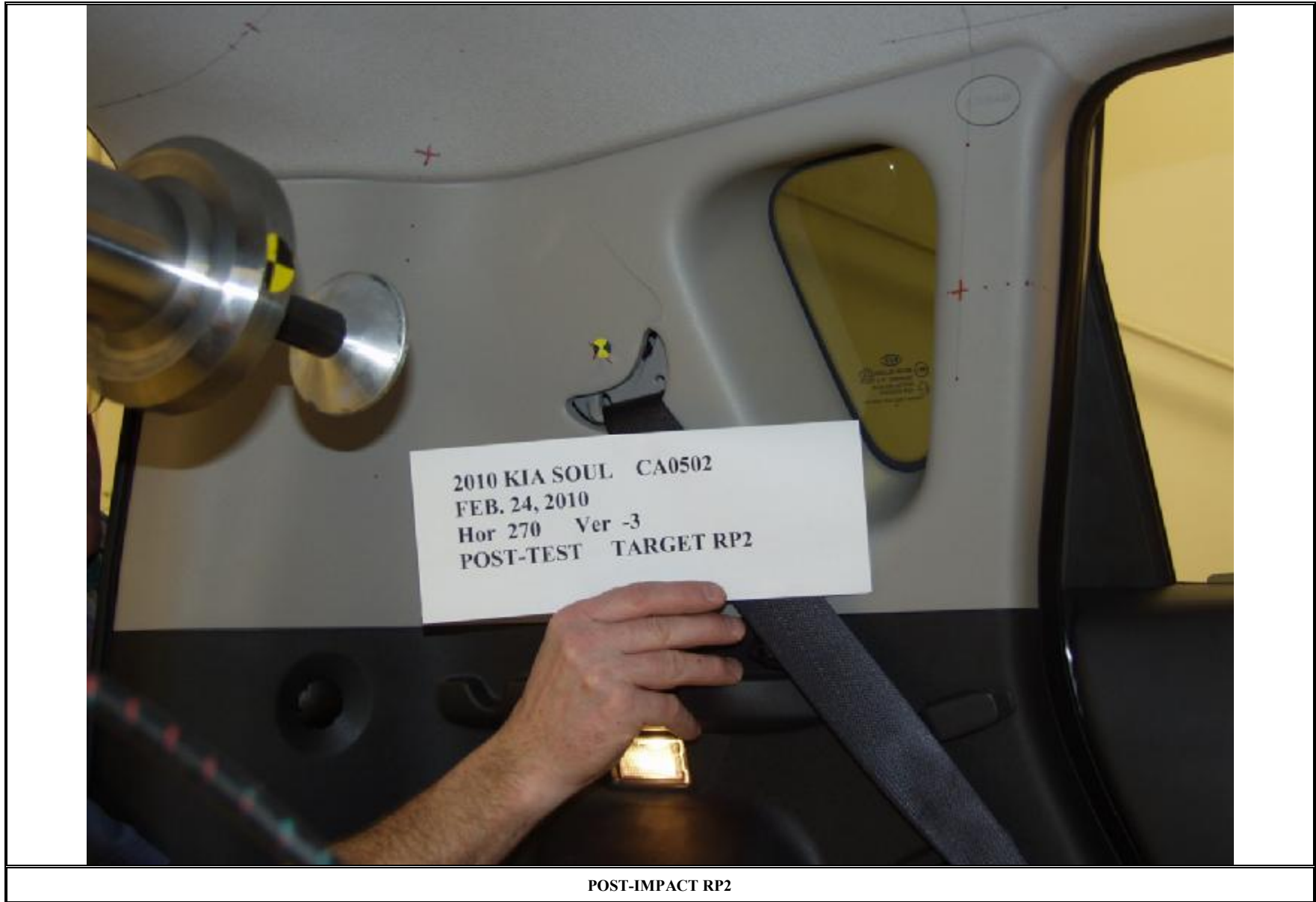
CA0502 DRIVER SIDE RP2 IMPACT PLOT #5

CC2010-04

CFC_180

CA0502 - February 24, 2010



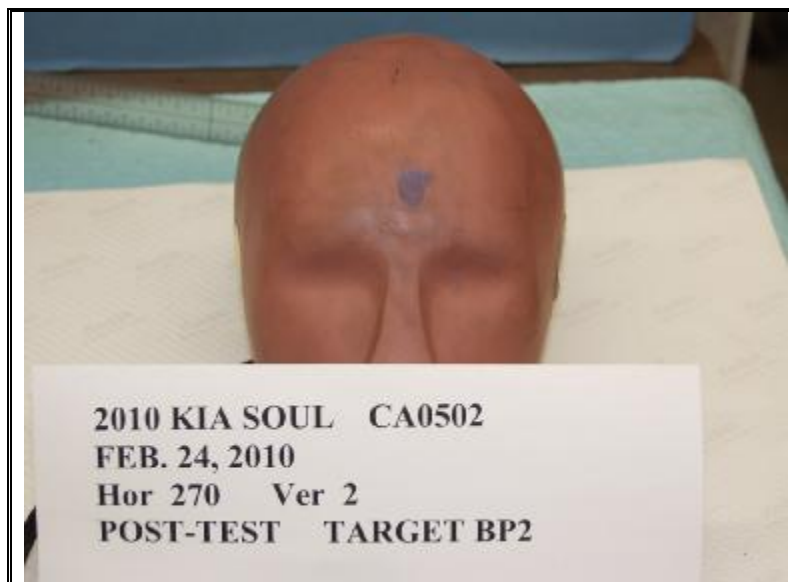


POST-IMPACT RP2

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	10
Test Date:	02/24/10
Target Location:	B-PILLAR
Target Code:	BP2
Horizontal Impact Angle:	270
Vertical Impact Angle:	2
Ambient Temperature:	20°C
Relative Humidity:	24
Time of Impact:	10:00
Headform Number:	1140

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	8				mm up



POST-IMPACT BP2 HEADFORM

Free Motion HIC	381.7
HIC(d)	454.4
Impact Velocity (kph)	23.55
HIC T1 (msec)	1.4
HIC T2 (msec)	13.%

FMVSS 201U 2010 KIA SOUL CA0502 - BP2

FMH Headform 1140

Location: BP2

Test Date: February 24, 2010

Work File: BP2

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

Lab Temperature: 20 C

HICd: 454.4

Lab Humidity: 24 %

HIC (36ms): 381.7

Velocity at Impact: 23.55 KPH

t1: 1.4 msec

t2: 13.1 msec

Free Flight Distance: 223.58 mm

Duration: 11.7 msec

Average Acceleration: 8.7 g

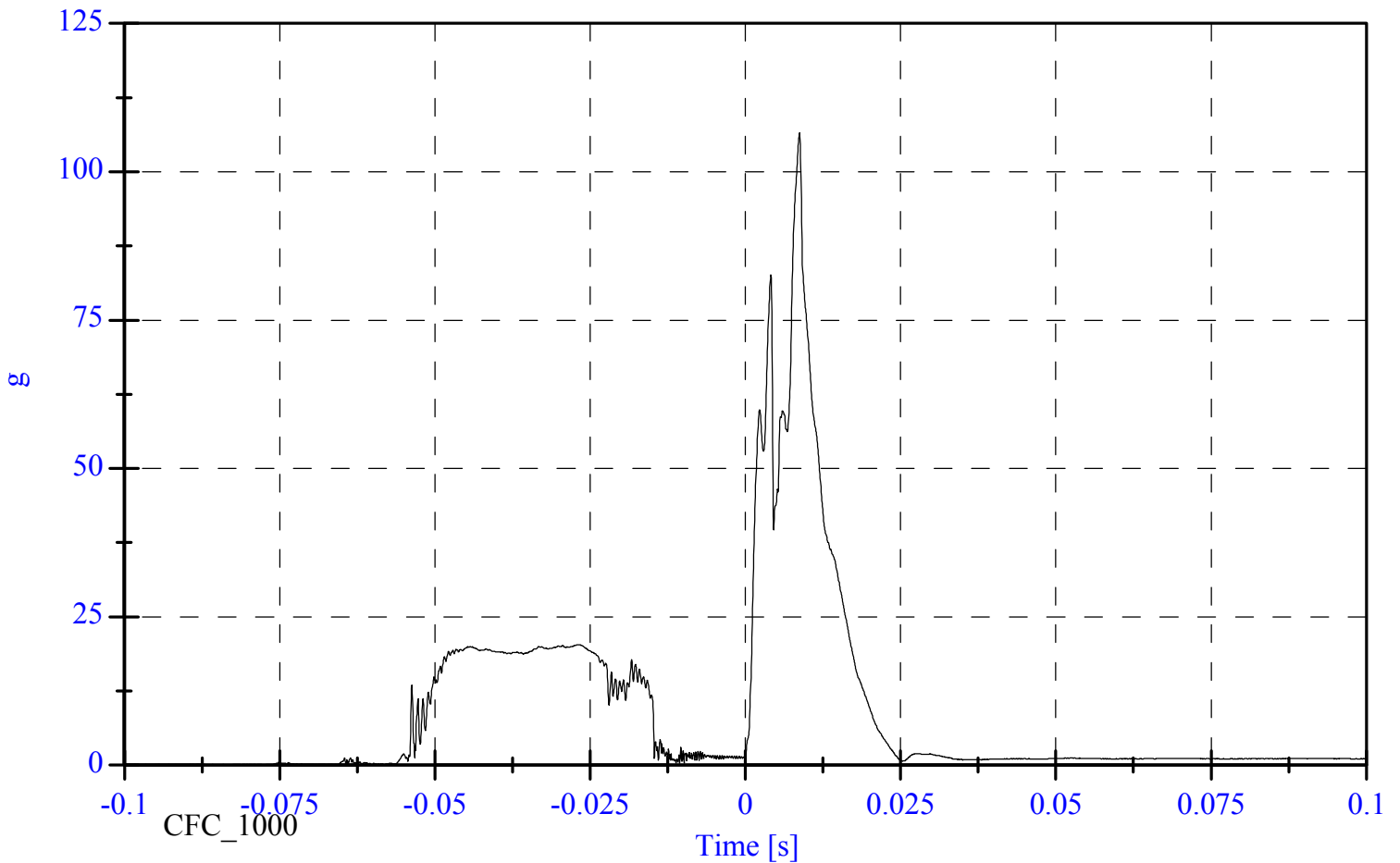
Maximum: 106.5 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 106.5 [g] at 0.009 [s]

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

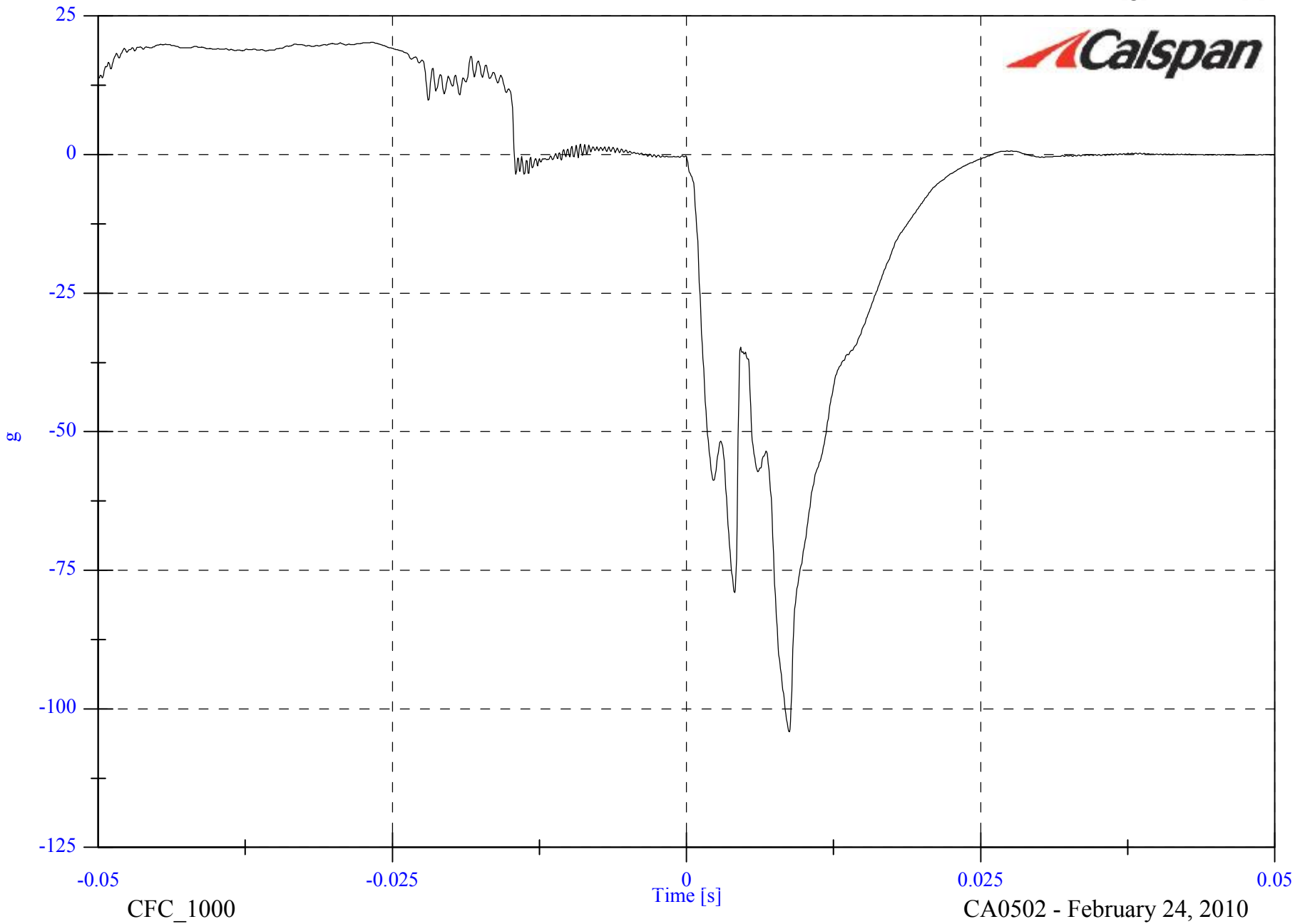


FMVSS 201U 2010 KIA SOUL

Headform X Acceleration

Max: 20.3 [g] at -0.027 [s]

Min: -104.2 [g] at 0.009 [s]



CA0502 DRIVER SIDE BP2 IMPACT PLOT #1

CC2010-04

FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

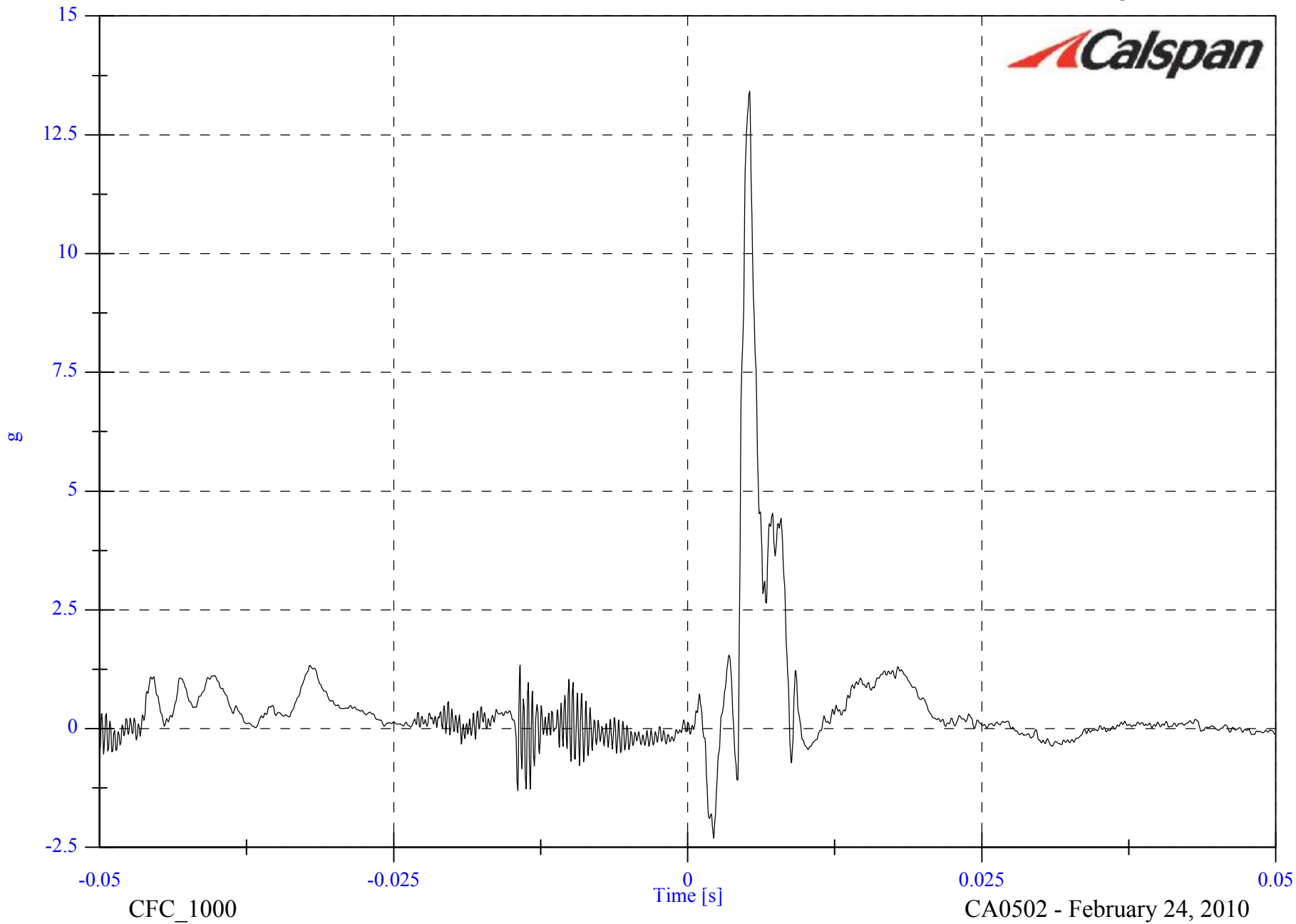
Max: 13.4 [g] at 0.005 [s]

Min: -2.3 [g] at 0.002 [s]



CA0502 DRIVER SIDE BP2 IMPACT PLOT #2

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

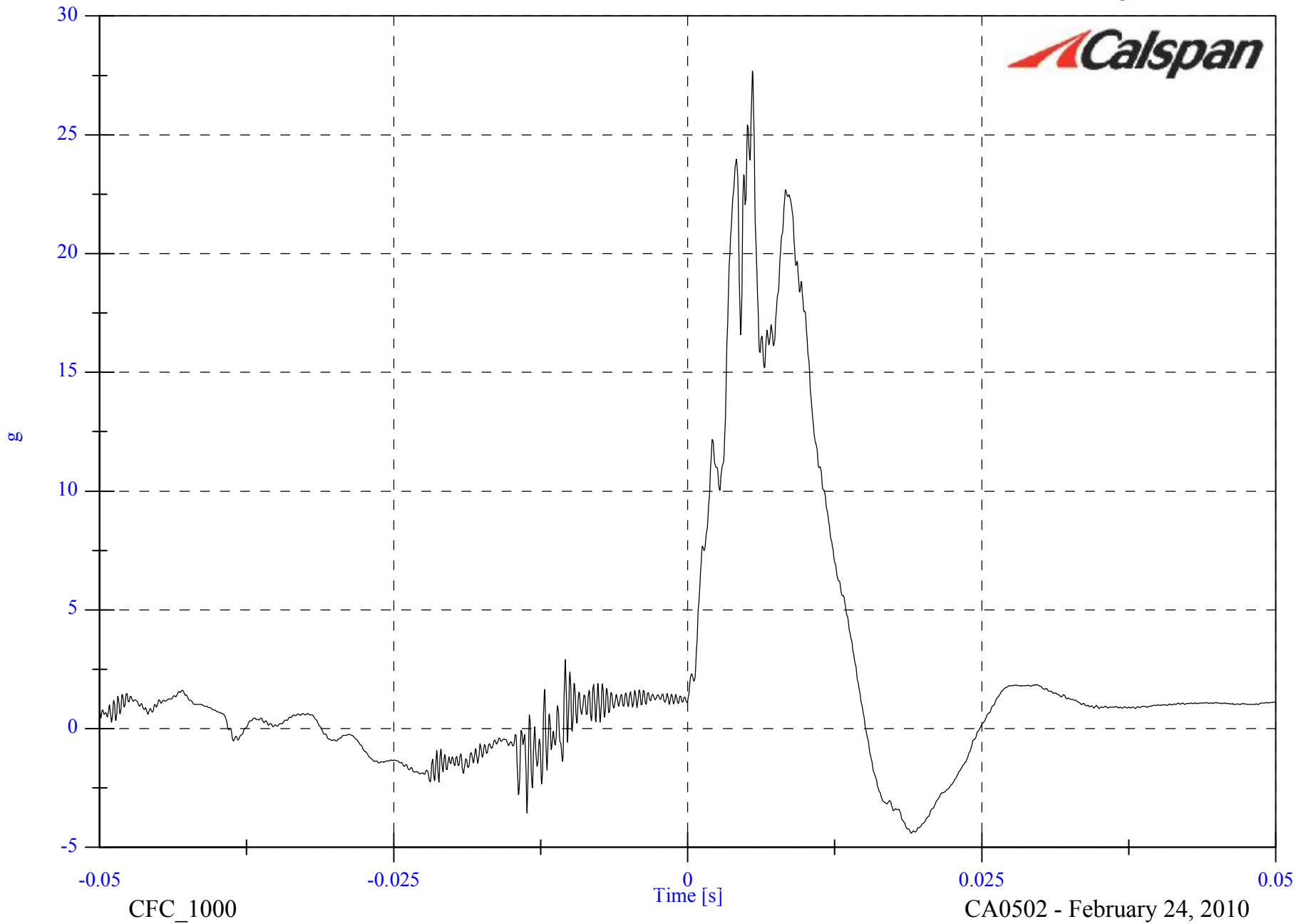
Max: 27.7 [g] at 0.006 [s]

Min: -4.4 [g] at 0.019 [s]



CA0502 DRIVER SIDE BP2 IMPACT PLOT #3

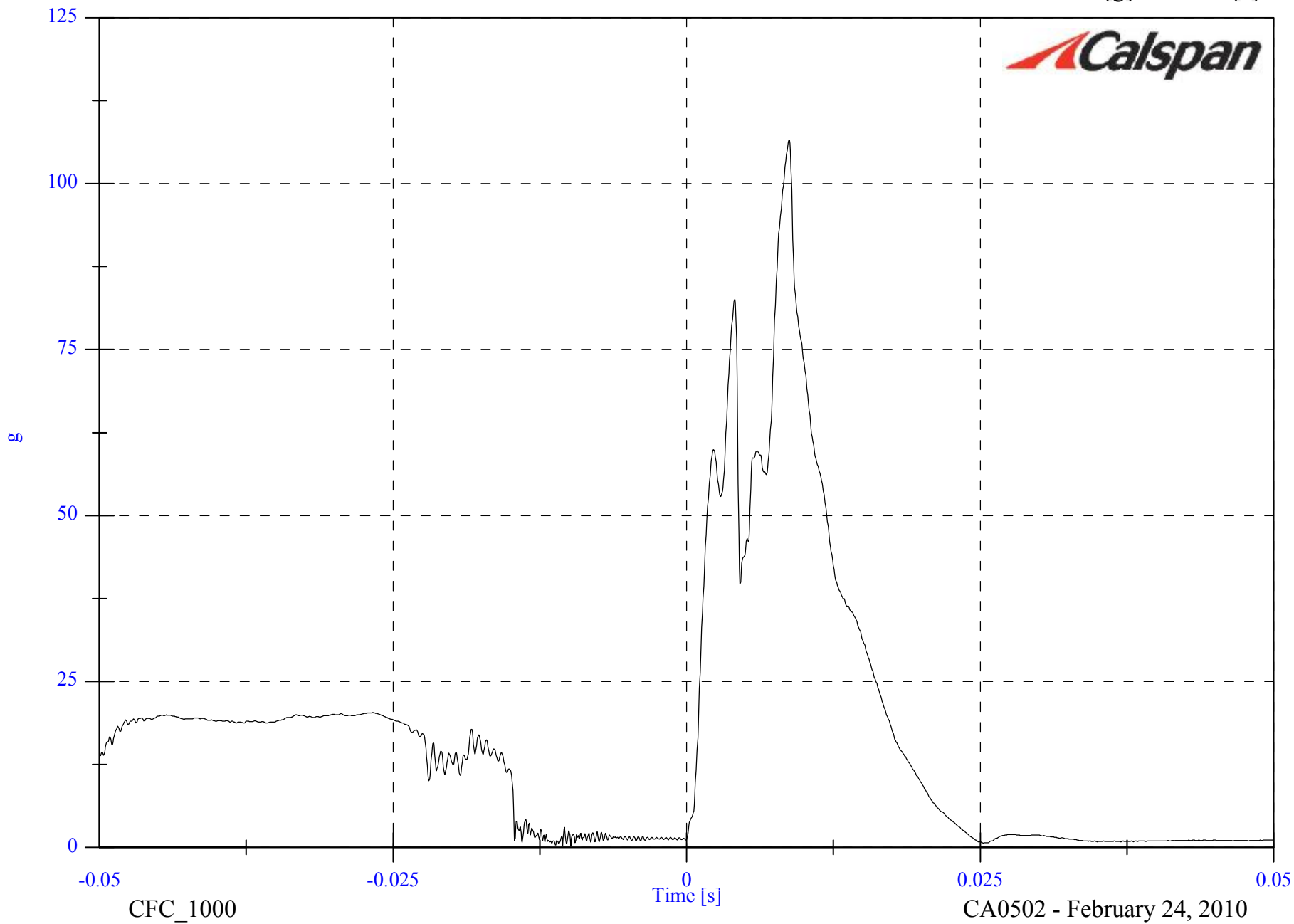
CC2010-04





CA0502 DRIVER SIDE BP2 IMPACT PLOT #4

CC2010-04

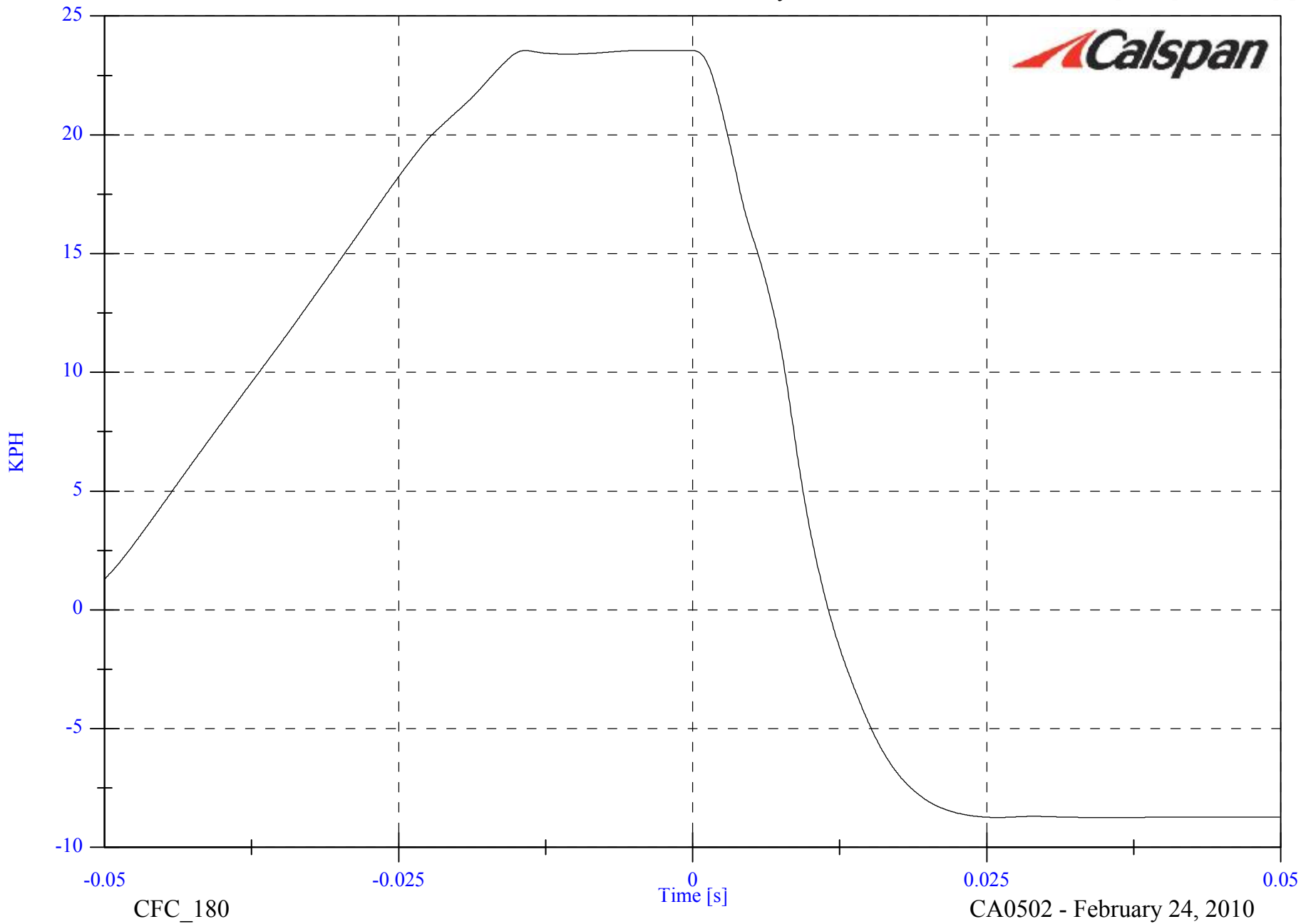


FMVSS 201U 2010 KIA SOUL

Max: 23.6 [KPH] at -0.004 [s]

Min: -8.7 [KPH] at 0.036 [s]

Headform Velocity



CA0502 DRIVER SIDE BP2 IMPACT PLOT #5

CC2010-04

CFC_180

CA0502 - February 24, 2010



PRE-IMPACT BP2



POST-IMPACT BP2

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	11
Test Date:	02/24/10
Target Location:	UPPER ROOF
Target Code:	URBP
Horizontal Impact Angle:	270
Vertical Impact Angle:	50
Ambient Temperature:	20°C
Relative Humidity:	24
Time of Impact:	10:50
Headform Number:	62

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	0	<input type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	39				mm up



POST-IMPACT URBPHEADFORM

Free Motion HIC	445.8
HIC(d)	502.7
Impact Velocity (kph)	23.83
HIC T1 (msec)	4.%
HIC T2 (msec)	13.7

FMVSS 201U 2010 KIA SOUL CA0502 - URBP

FMH Headform 0062

Location: URBP

Test Date: February 24, 2010

Work File: URBP

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

Lab Temperature: 20 C

HICd: 502.7

Lab Humidity: 24 %

HIC (36ms): 445.8

Velocity at Impact: 23.83 KPH

t1: 4.1 msec

t2: 13.7 msec

Free Flight Distance: 217.98 mm

Duration: 9.6 msec

Average Acceleration: 9.0 g

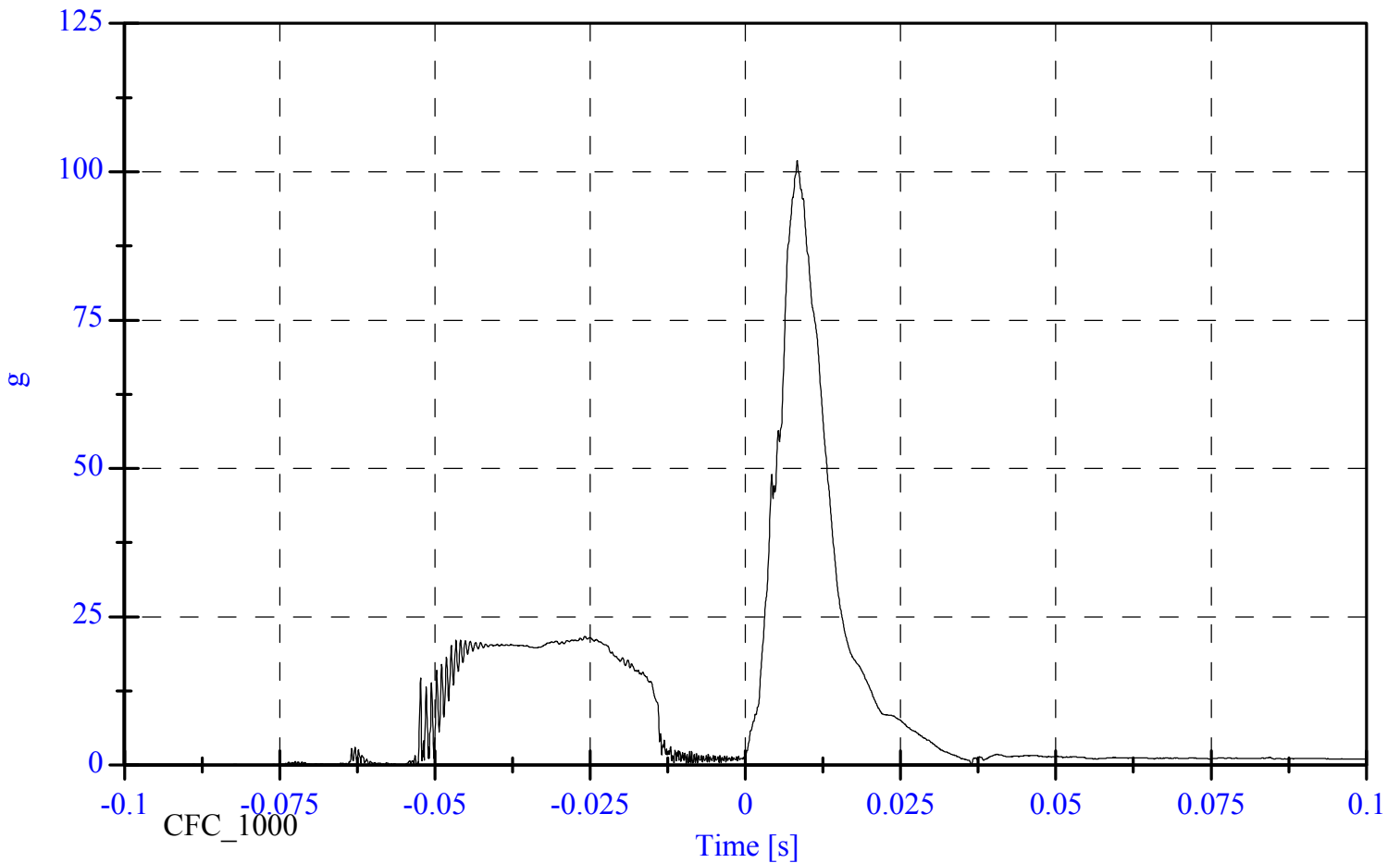
Maximum: 101.9 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 101.9 [g] at 0.008 [s]

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



FMVSS 201U 2010 KIA SOUL

Headform X Acceleration

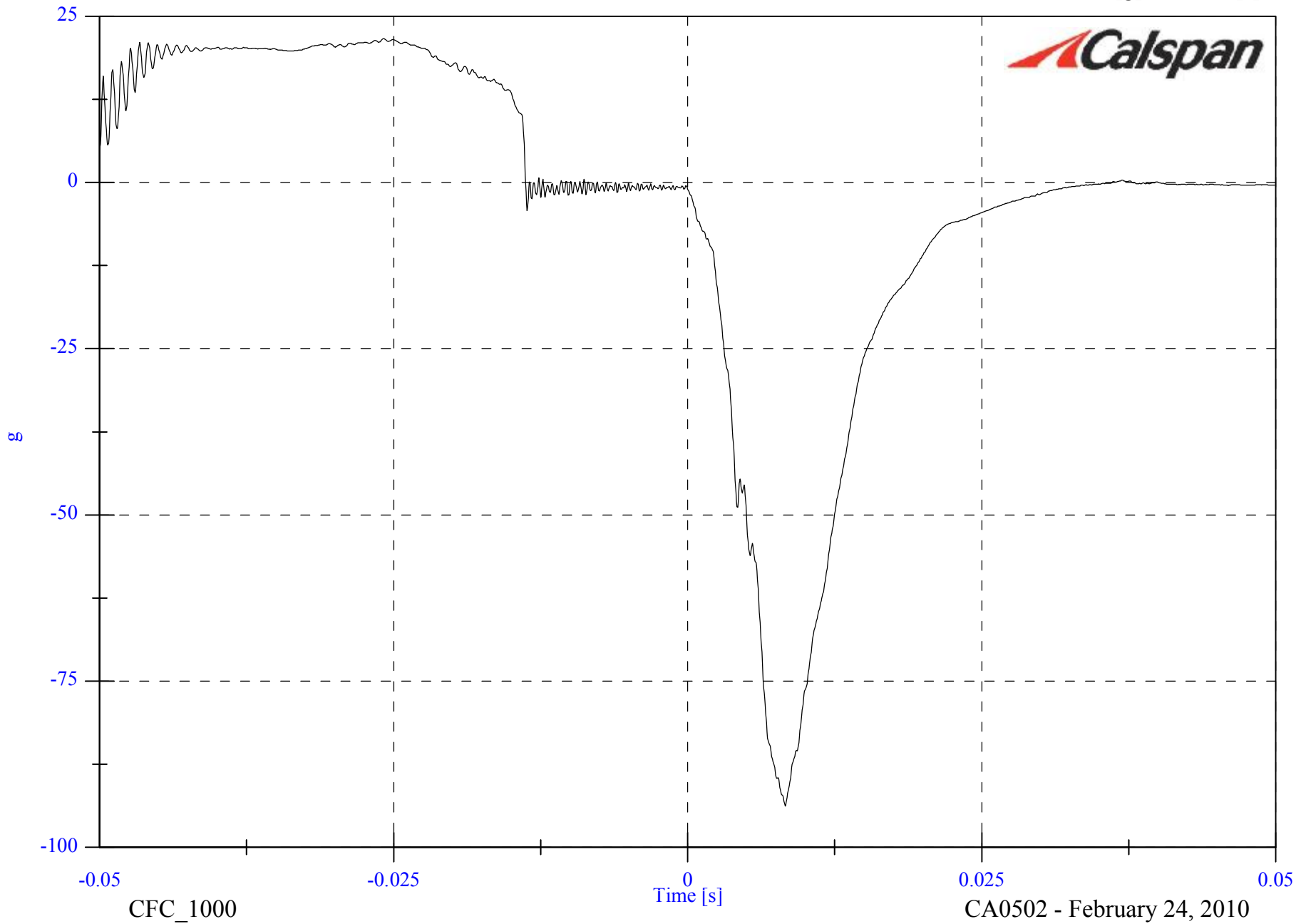
Max: 21.6 [g] at -0.026 [s]

Min: -93.8 [g] at 0.008 [s]



CA0502 DRIVER SIDE URBP IMPACT PLOT #1

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

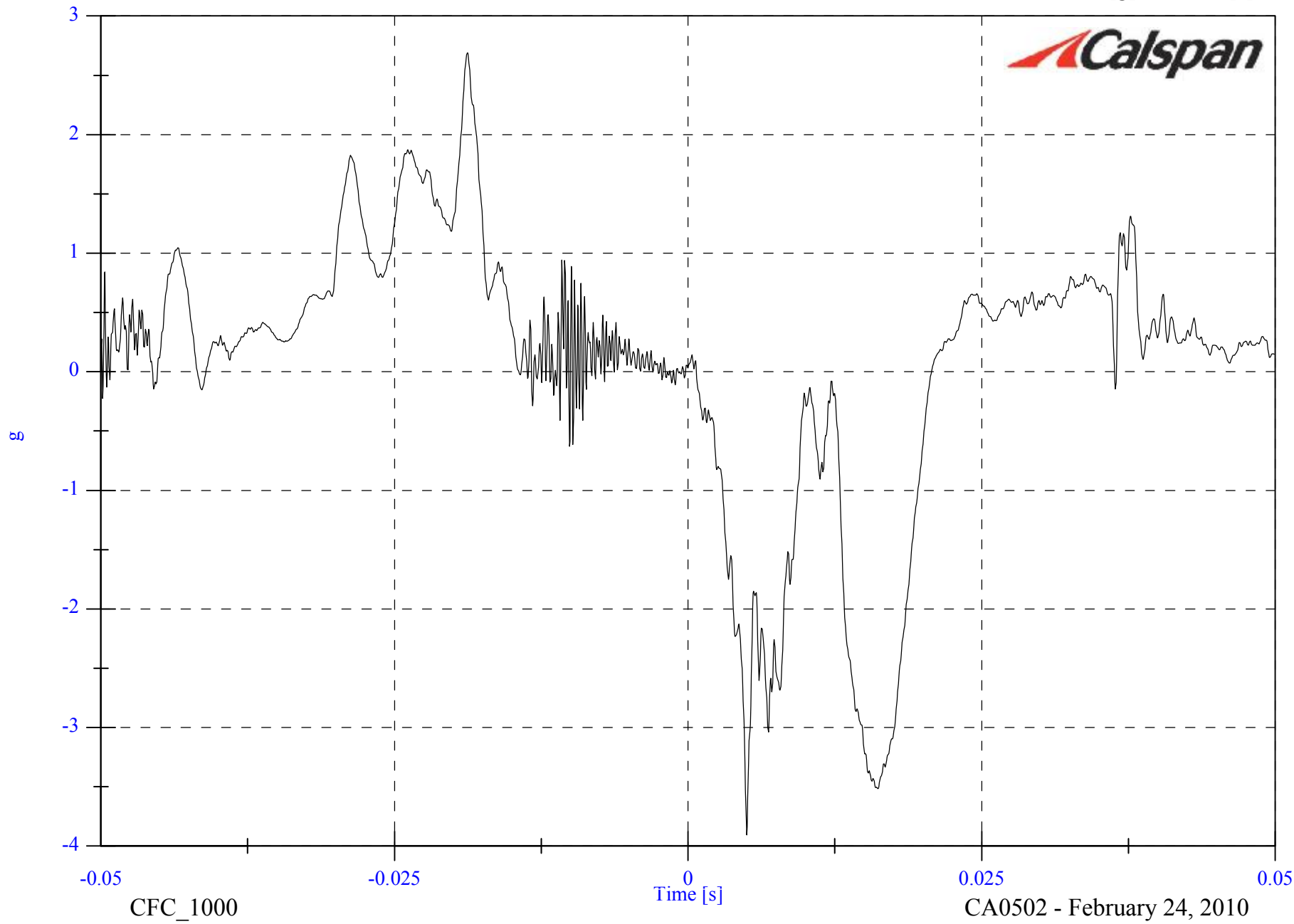
Max: 2.7 [g] at -0.019 [s]

Min: -3.9 [g] at 0.005 [s]



CA0502 DRIVER SIDE URBP IMPACT PLOT #2

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Z Acceleration

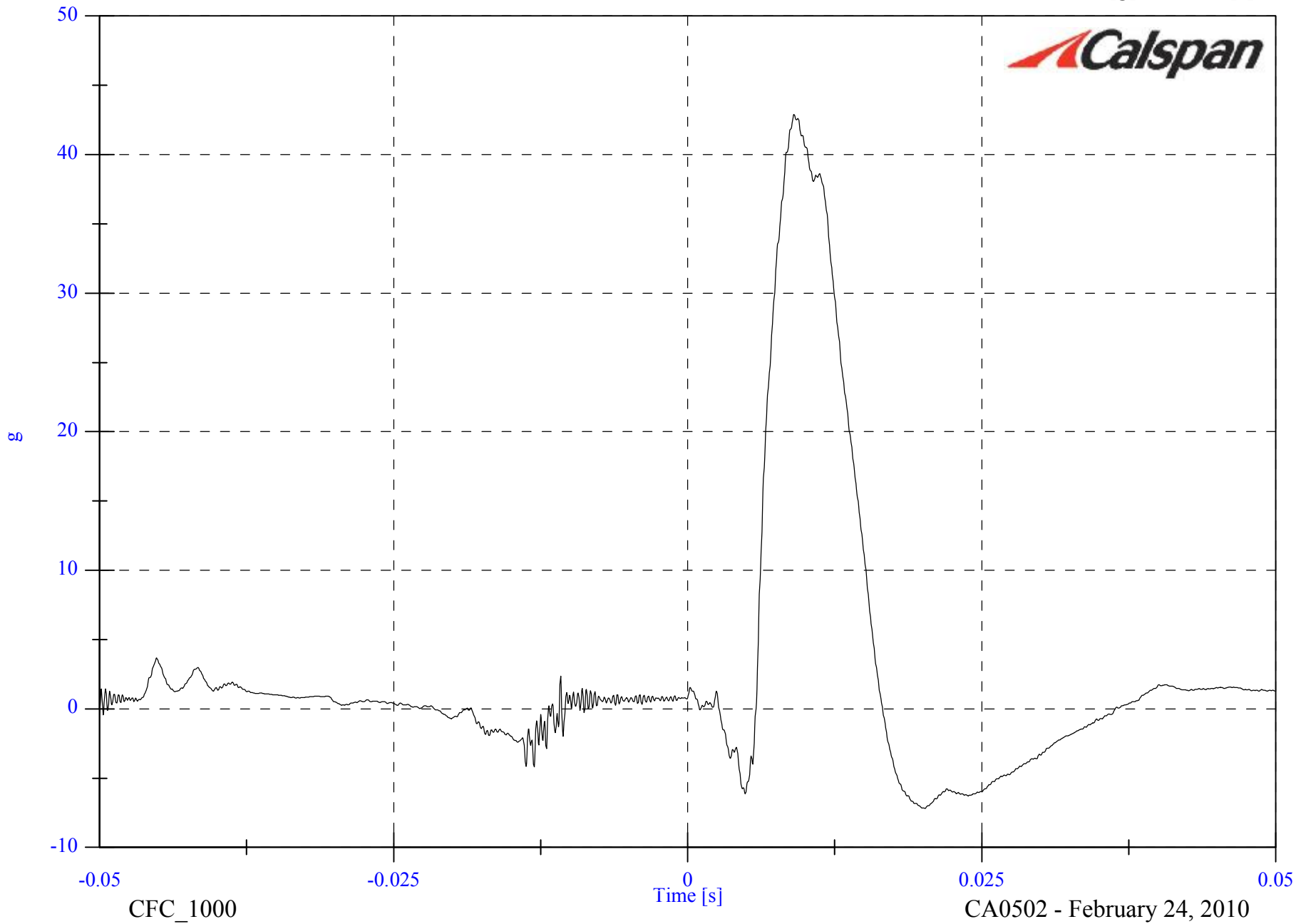
Max: 42.9 [g] at 0.009 [s]

Min: -7.2 [g] at 0.020 [s]



CA0502 DRIVER SIDE URBP IMPACT PLOT #3

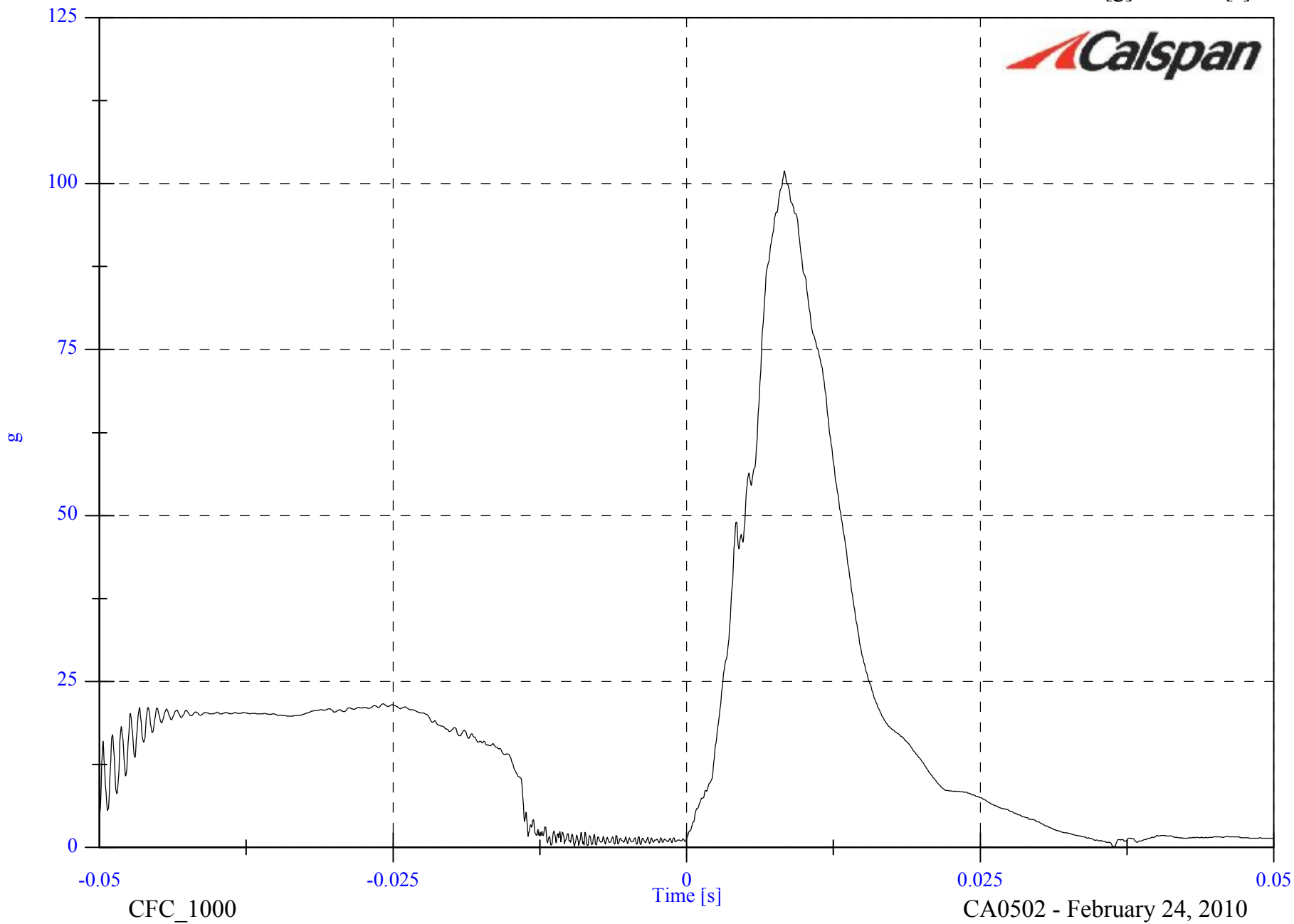
CC2010-04





CA0502 DRIVER SIDE URBP IMPACT PLOT #4

CC2010-04

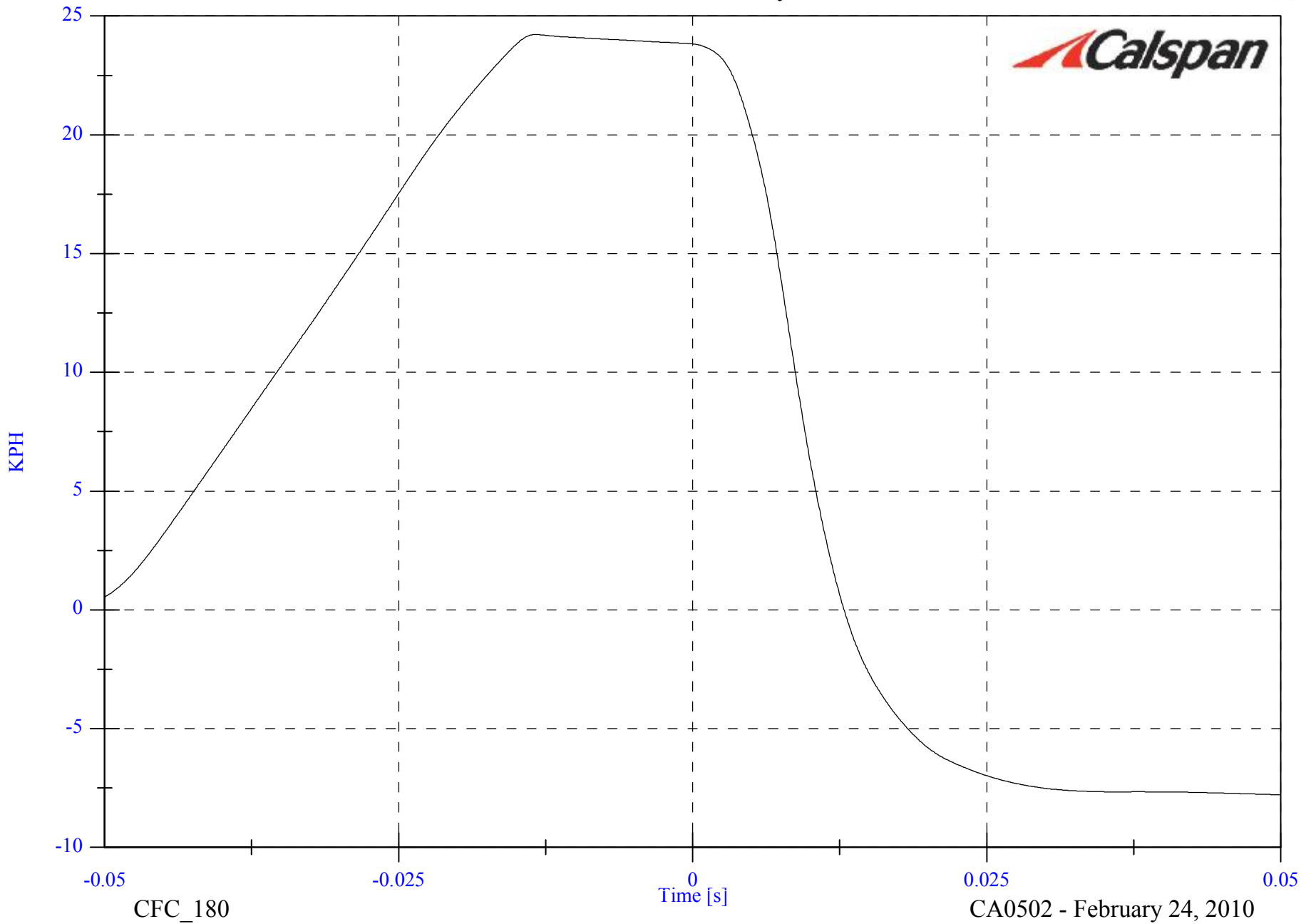


FMVSS 201U 2010 KIA SOUL

Max: 24.2 [KPH] at -0.013 [s]

Min: -7.8 [KPH] at 0.050 [s]

Headform Velocity



CA0502 DRIVER SIDE URBP IMPACT PLOT #5

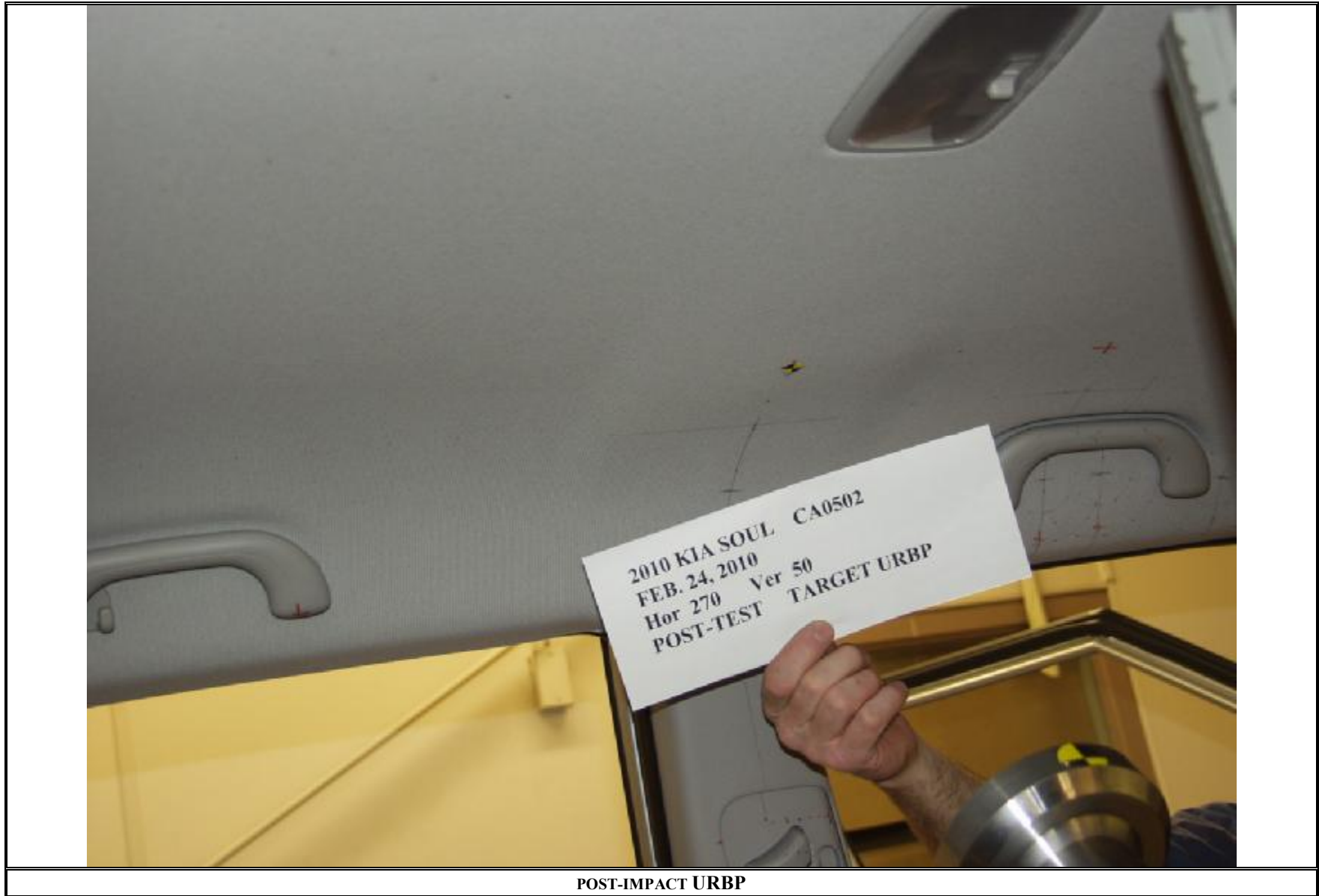
CC2010-04

CFC_180

CA0502 - February 24, 2010



PRE-IMPACT URBP

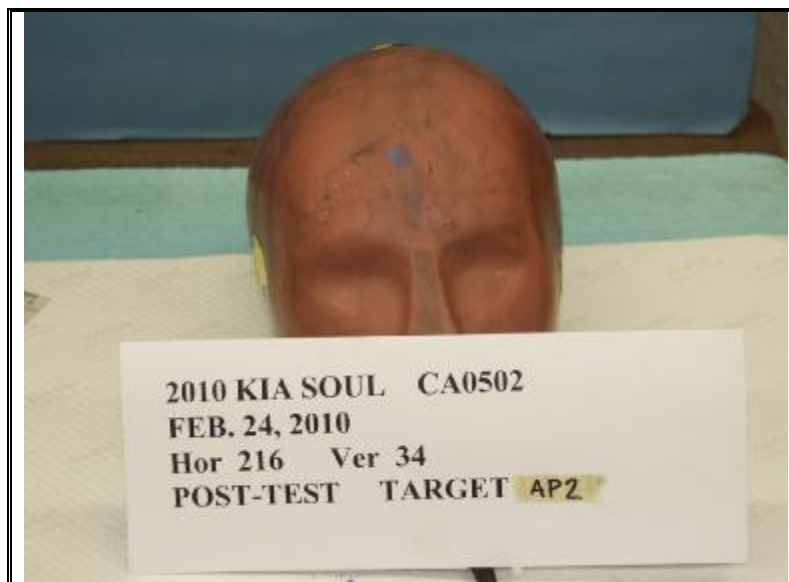


POST-IMPACT URBP

VEHICLE YEAR/MAKE/MODEL/STYLE:	2010 Kia Soul
VIN:	KNDJT2A29A7085226
DATE OF MANUFACTURE:	07/09(SEE CERTIFICATION LABEL)
COLOR:	Silver

Test Number:	12
Test Date:	02/24/10
Target Location:	A-PILLAR
Target Code:	AP2
Horizontal Impact Angle:	216
Vertical Impact Angle:	34
Ambient Temperature:	20°C
Relative Humidity:	24
Time of Impact:	11:15
Headform Number:	0805

Impact Point Description (from lower midpoint on midsagittal line)					
On Centerline	6	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/>	mm left
On Centerline	18				mm up



POST-IMPACT AP2 HEADFORM

Free Motion HIC	194.1
HIC(d)	312.9
Impact Velocity (kph)	18.75
HIC T1 (msec)	1.)
HIC T2 (msec)	15.8

FMVSS 201U 2010 KIA SOUL CA0502 - AP2

FMH Headform 0805

Location: AP2

Test Date: February 24, 2010

Work File: AP2

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

Lab Temperature: 20 C

HICd: 312.9

Lab Humidity: 24 %

HIC (36ms): 194.1

Velocity at Impact: 18.75 KPH

t1: 1.5 msec

t2: 15.8 msec

Free Flight Distance: 222.96 mm

Duration: 14.3 msec

Average Acceleration: 7.2 g

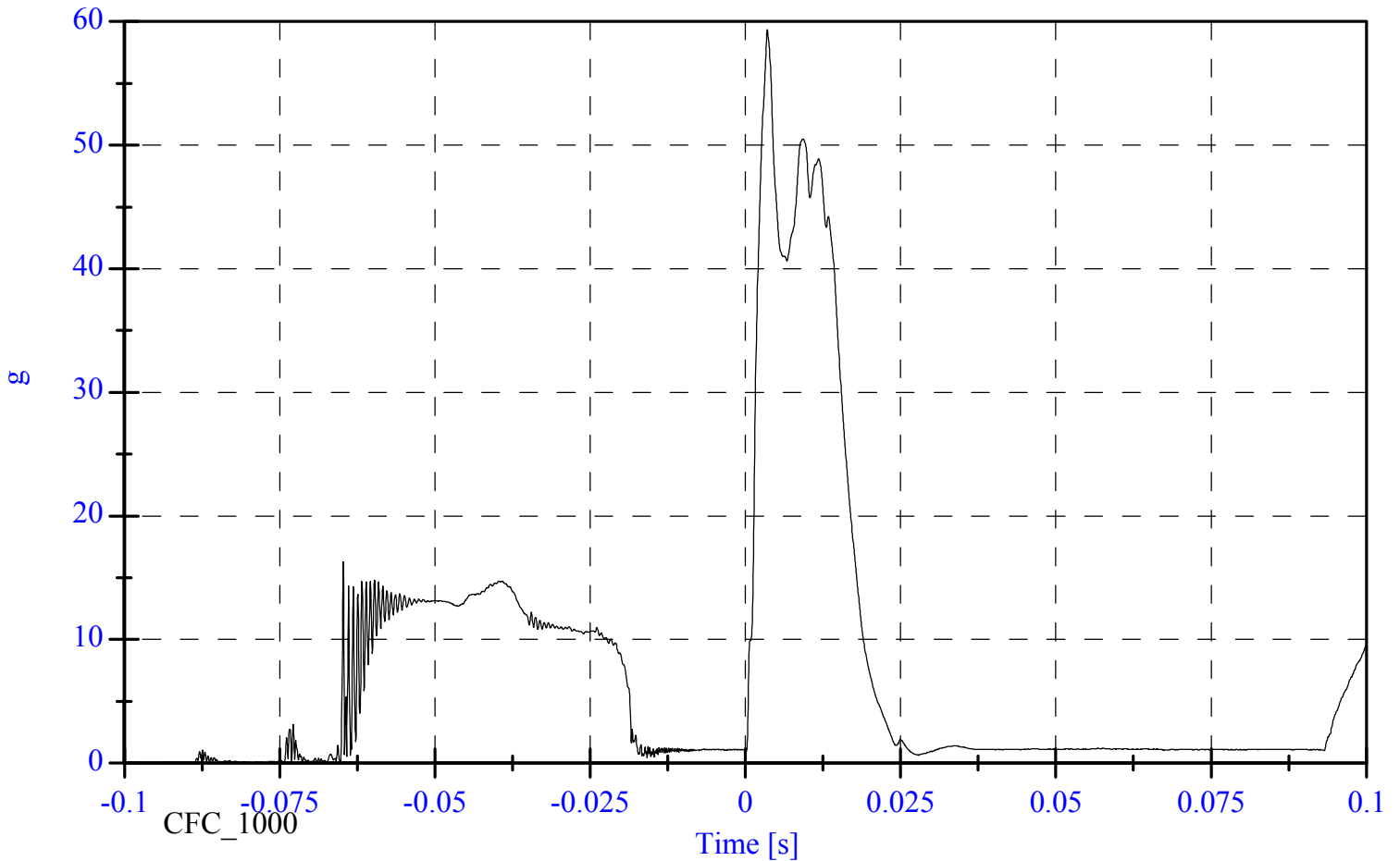
Maximum: 59.3 g

FMVSS 201U 2010 KIA SOUL

Headform Resultant

Max: 59.3 [g] at 0.004 [s]

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



FMVSS 201U 2010 KIA SOUL

Headform X Acceleration

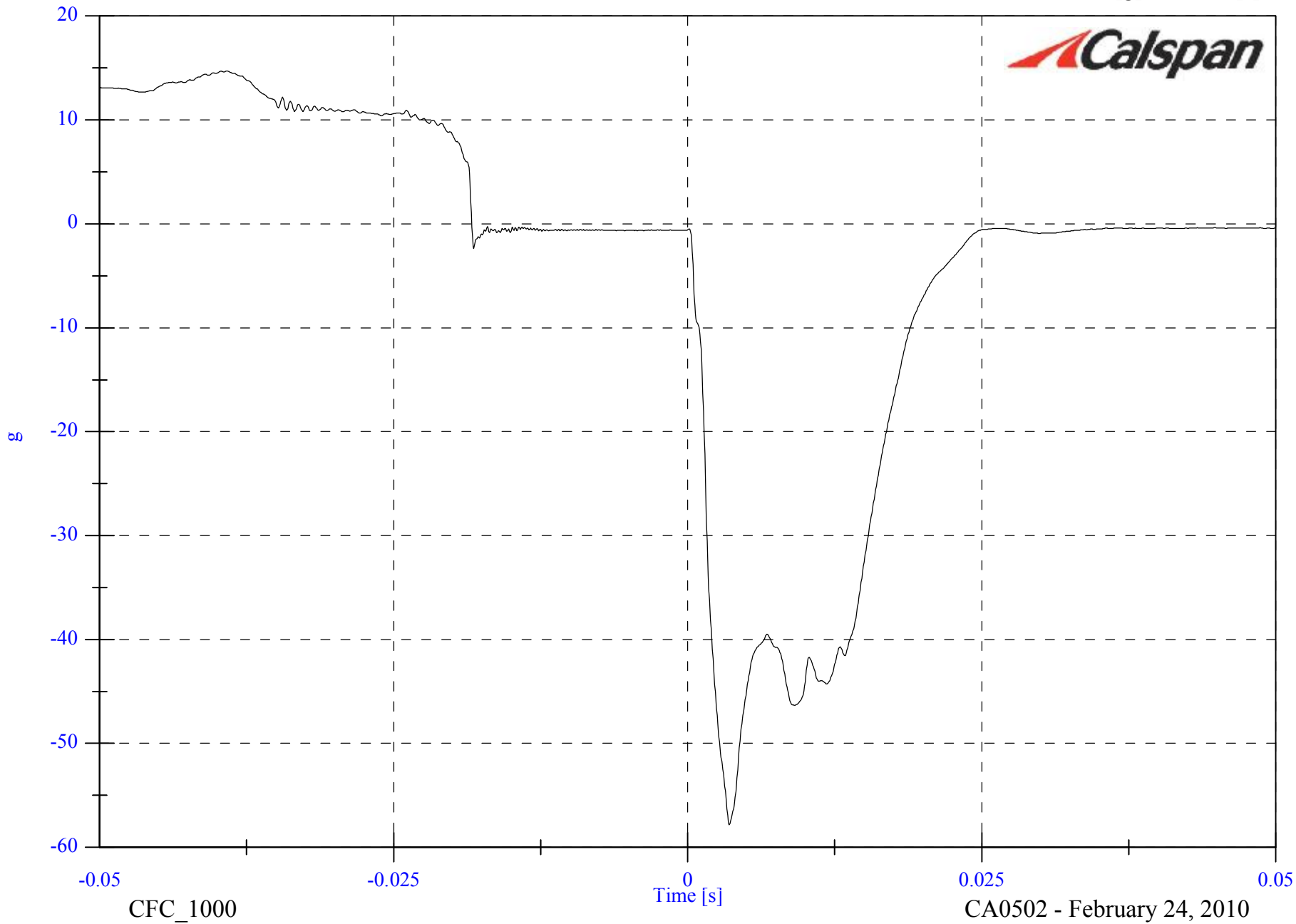
Max: 14.7 [g] at -0.039 [s]

Min: -57.8 [g] at 0.004 [s]



CA0502 DRIVER SIDE AP2 IMPACT PLOT #1

CC2010-04



FMVSS 201U 2010 KIA SOUL

Headform Y Acceleration

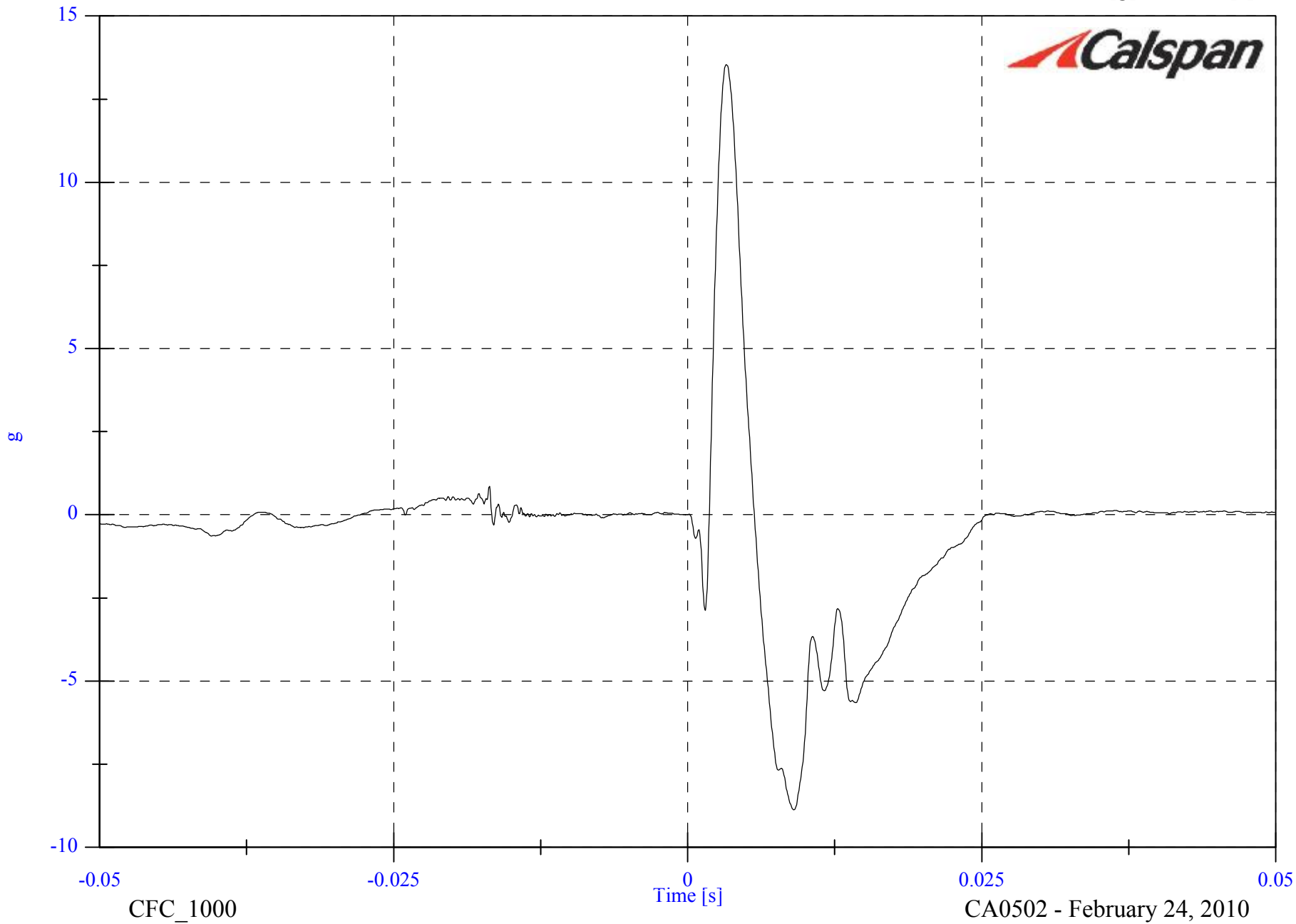
Max: 13.5 [g] at 0.003 [s]

Min: -8.9 [g] at 0.009 [s]



CA0502 DRIVER SIDE AP2 IMPACT PLOT #2

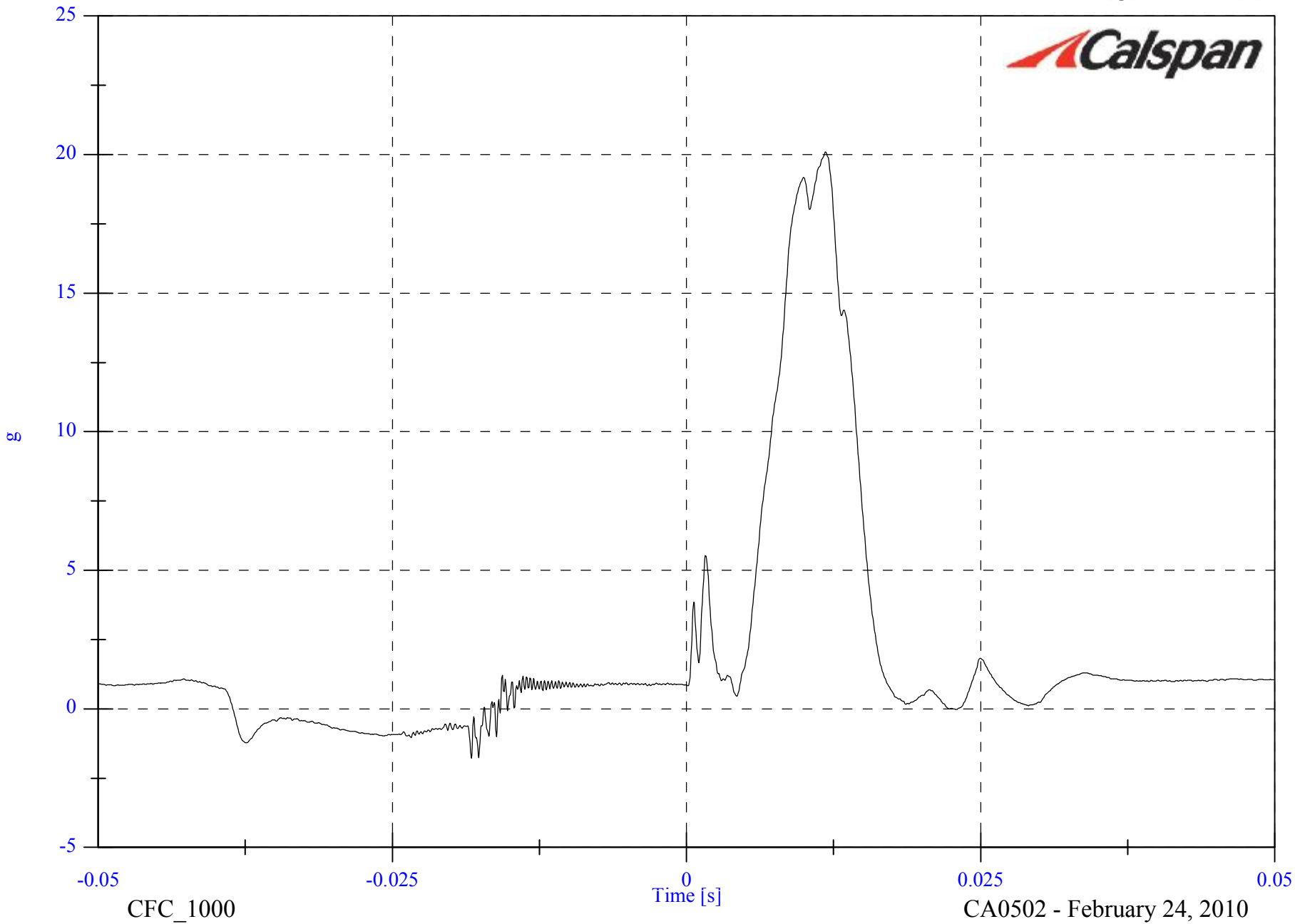
CC2010-04



Headform Z Acceleration

Max: 20.1 [g] at 0.012 [s]

Min: -1.8 [g] at -0.018 [s]



CA0502 DRIVER SIDE AP2 IMPACT PLOT #3

CC2010-04

Headform Resultant

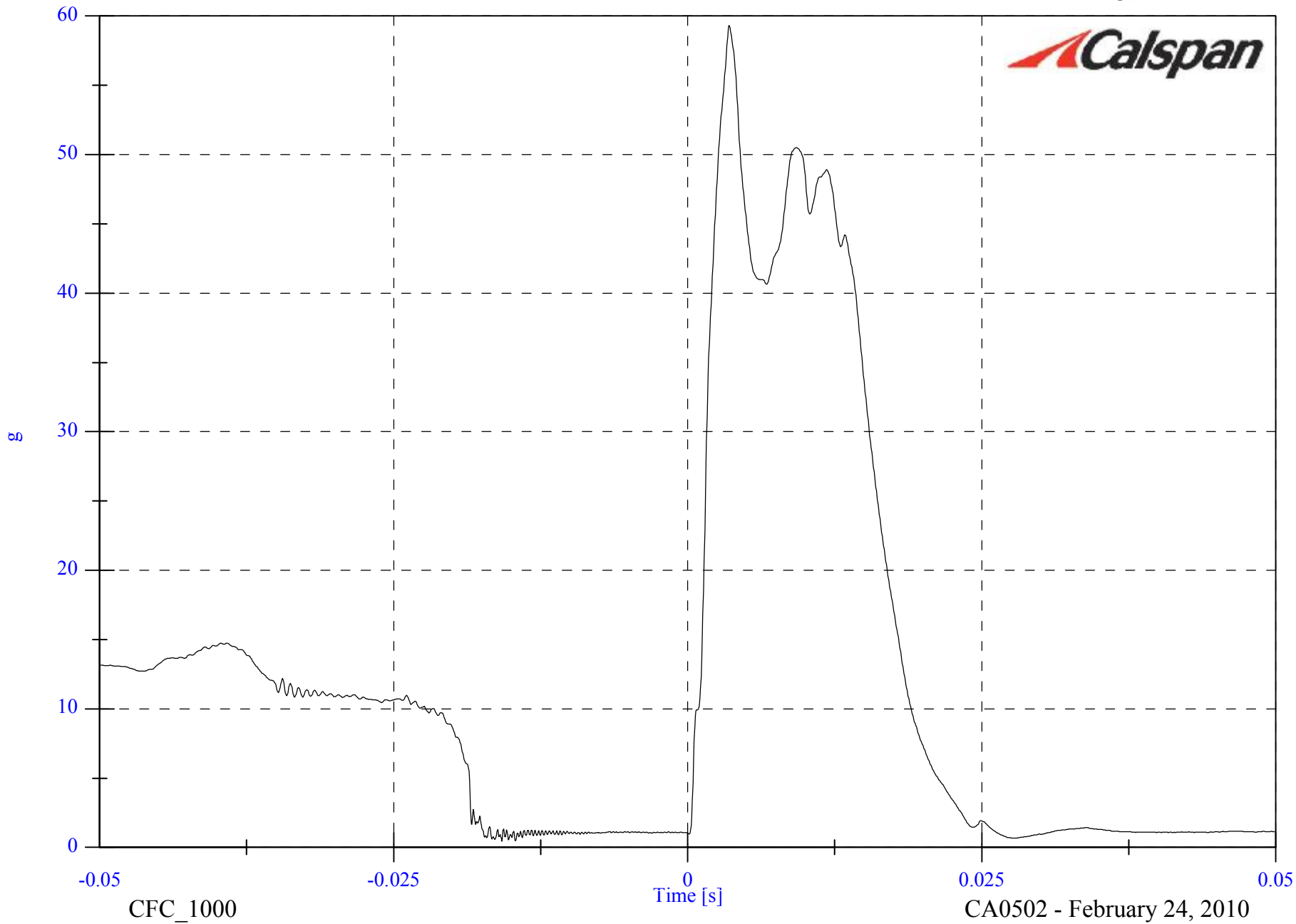
Max: 59.3 [g] at 0.004 [s]

Min: 0.4 [g] at -0.016 [s]



CA0502 DRIVER SIDE AP2 IMPACT PLOT #4

CC2010-04

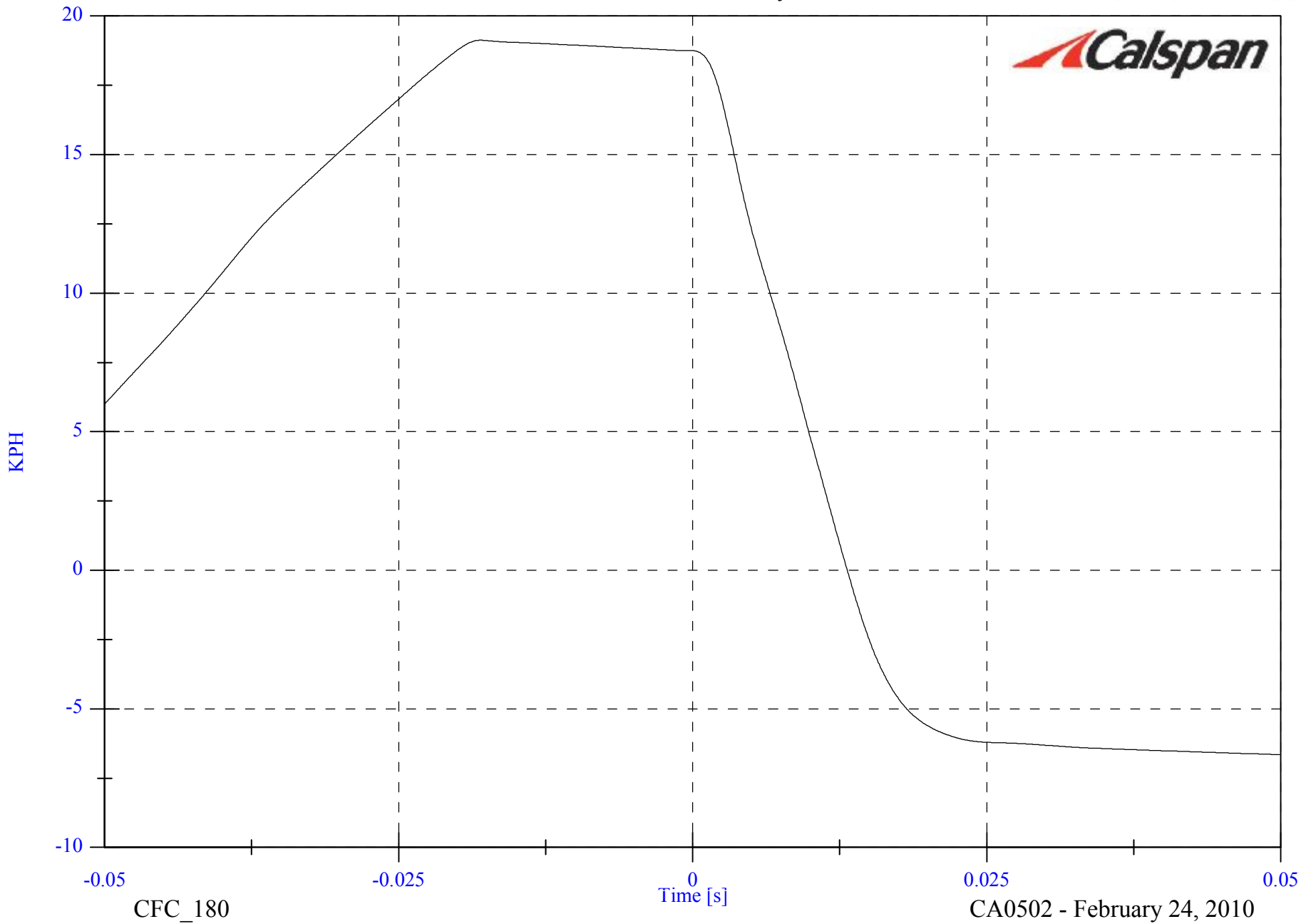


FMVSS 201U 2010 KIA SOUL

Max: 19.1 [KPH] at -0.018 [s]

Min: -6.7 [KPH] at 0.050 [s]

Headform Velocity



CA0502 DRIVER SIDE AP2 IMPACT PLOT #5

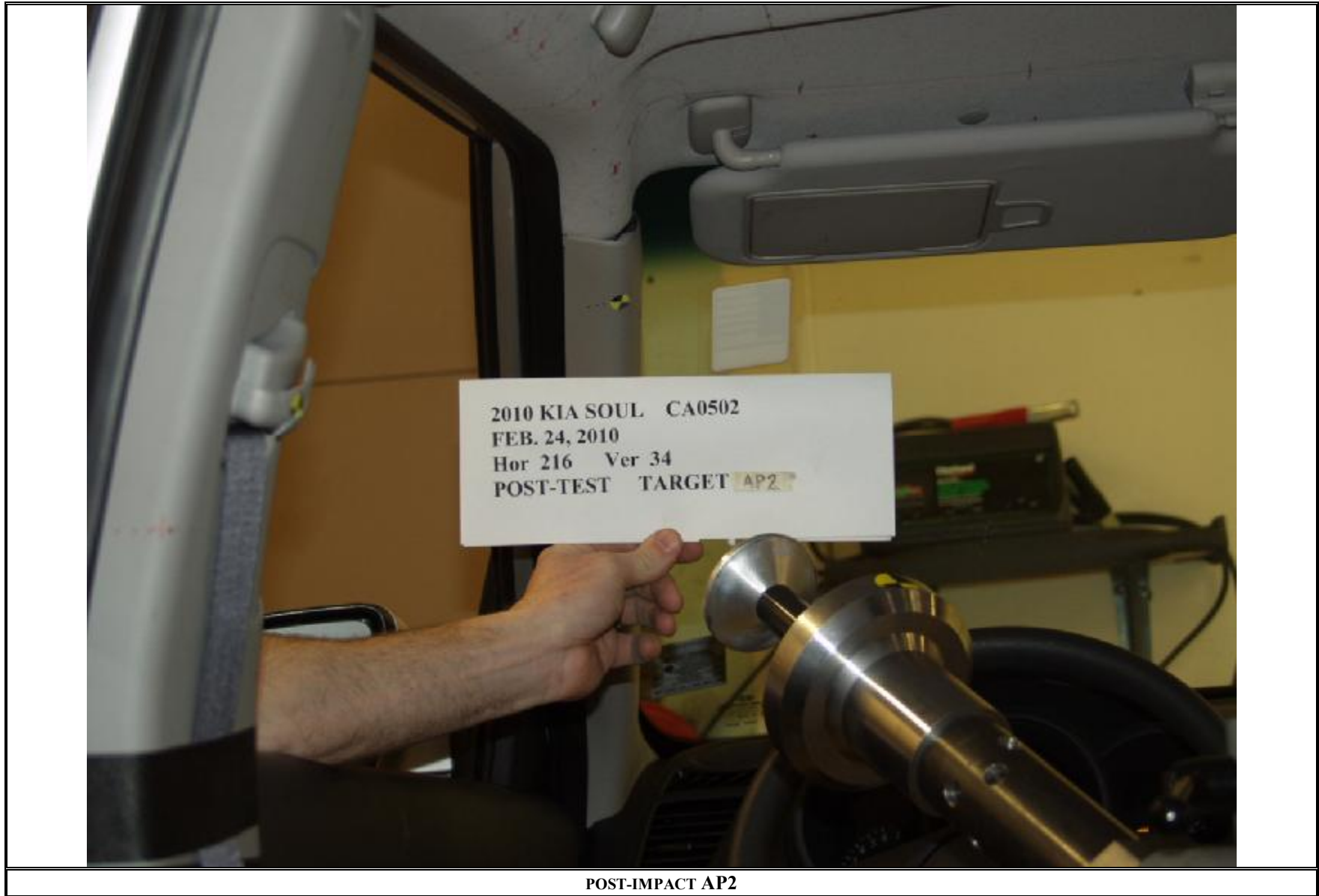
CC2010-04

CFC_180

CA0502 - February 24, 2010



PRE-IMPACT AP2



POST-IMPACT AP2

APPENDIX A

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PHOTOGRAPHS

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Figure A-1 : LEFT SIDE VIEW OF VEHICLE



Figure A-2 : 3/4 FRONTAL VIEW FROM RIGHT SIDE 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

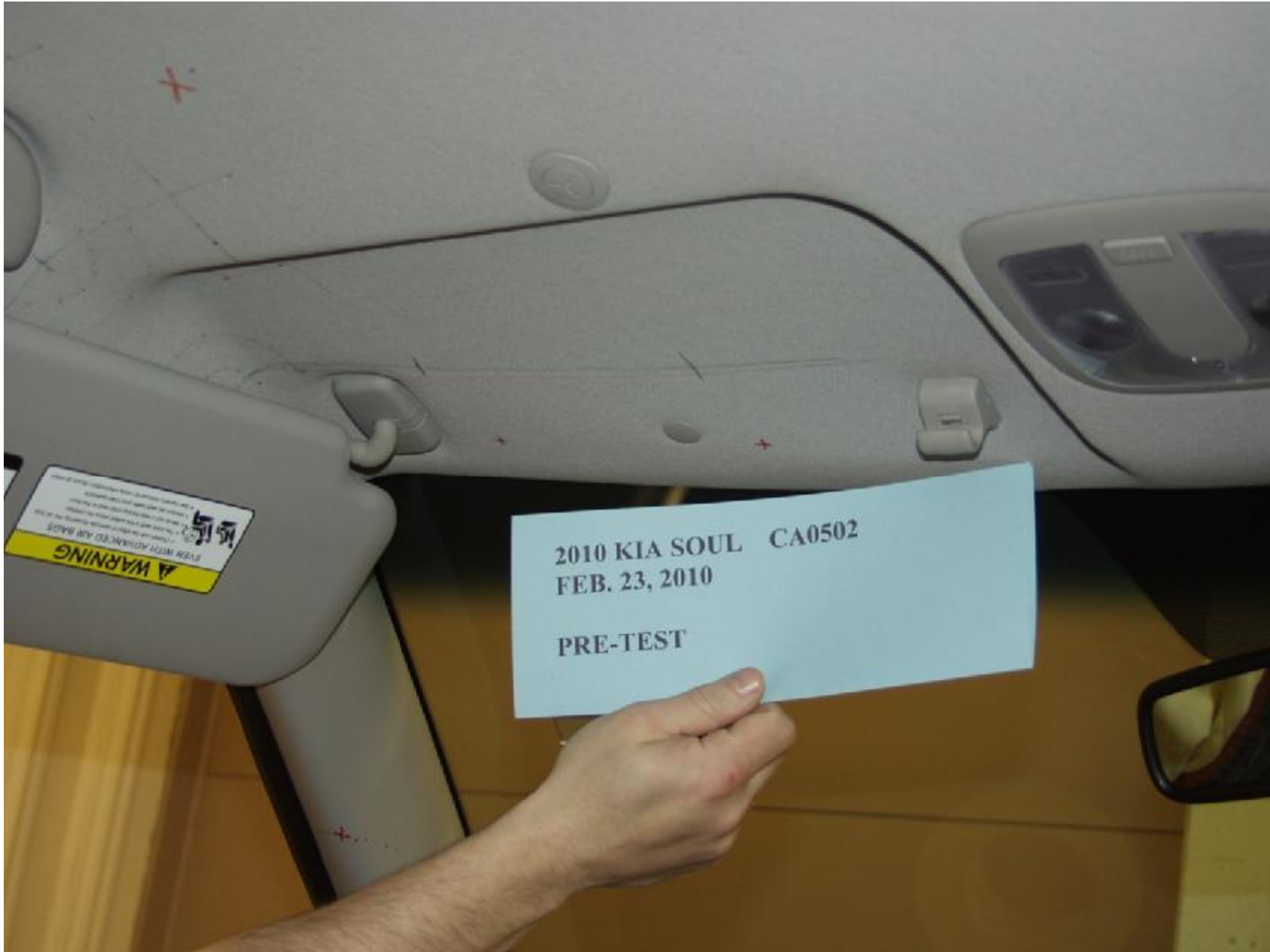


Figure A-8 : PRE-TEST DRIVER SIDE FRONT HEADER

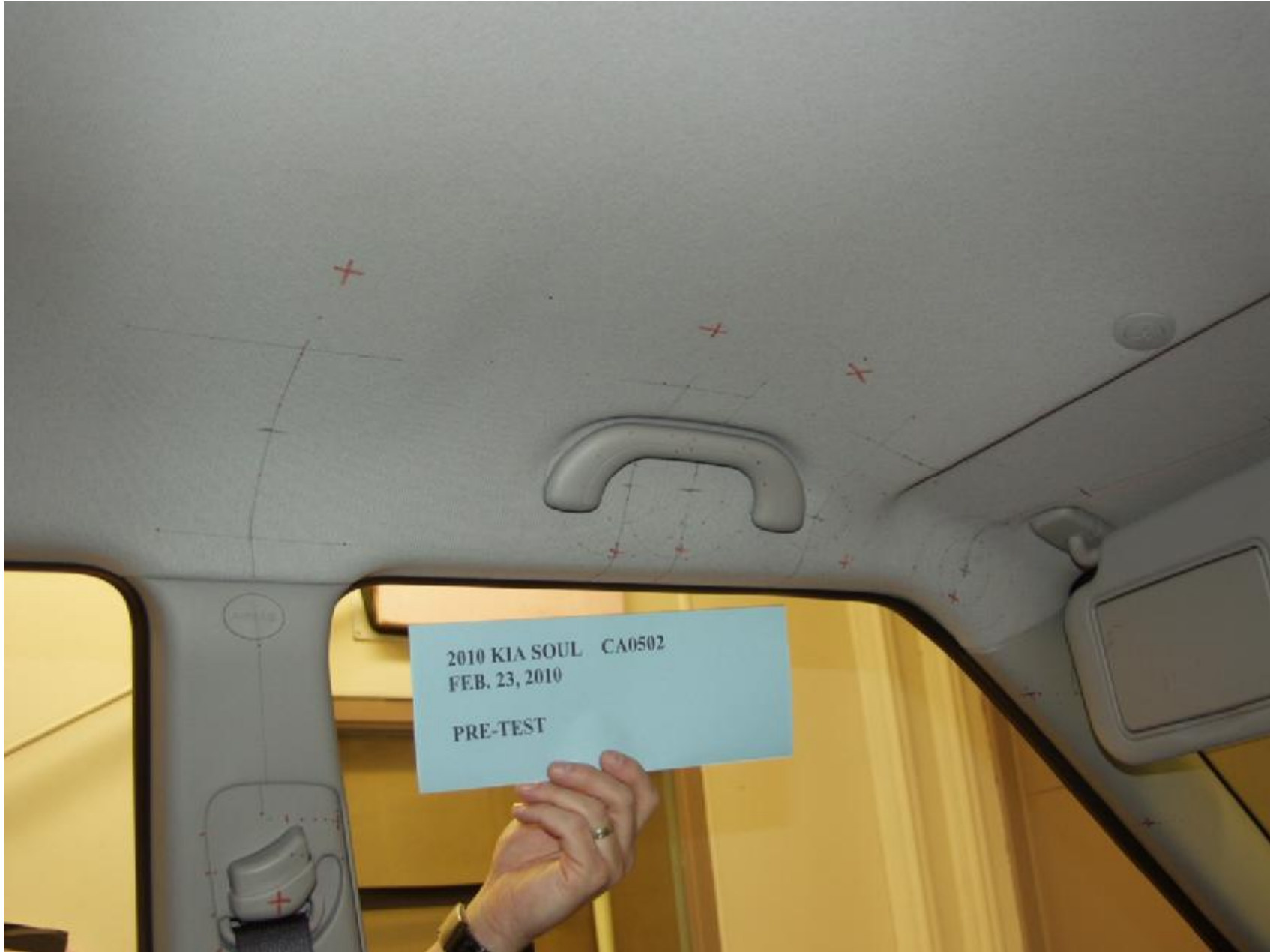


Figure A-9 : PRE-TEST DRIVER SIDE SIDE RAIL

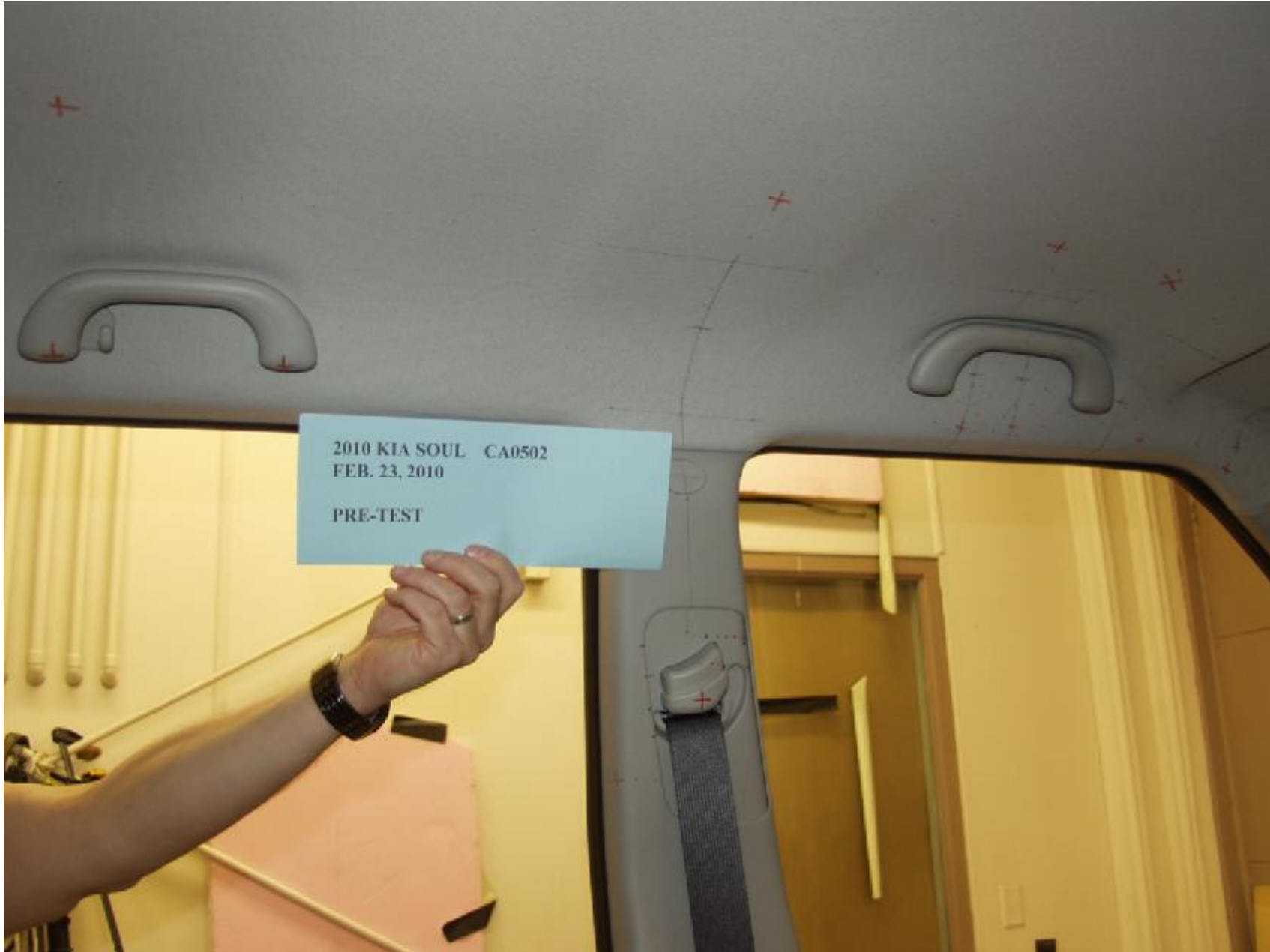


Figure A-10 : PRE-TEST DRIVER SIDE B-PILLAR



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



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



Figure A-13 : PRE-TEST DRIVER SIDE REAR PILLAR



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



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

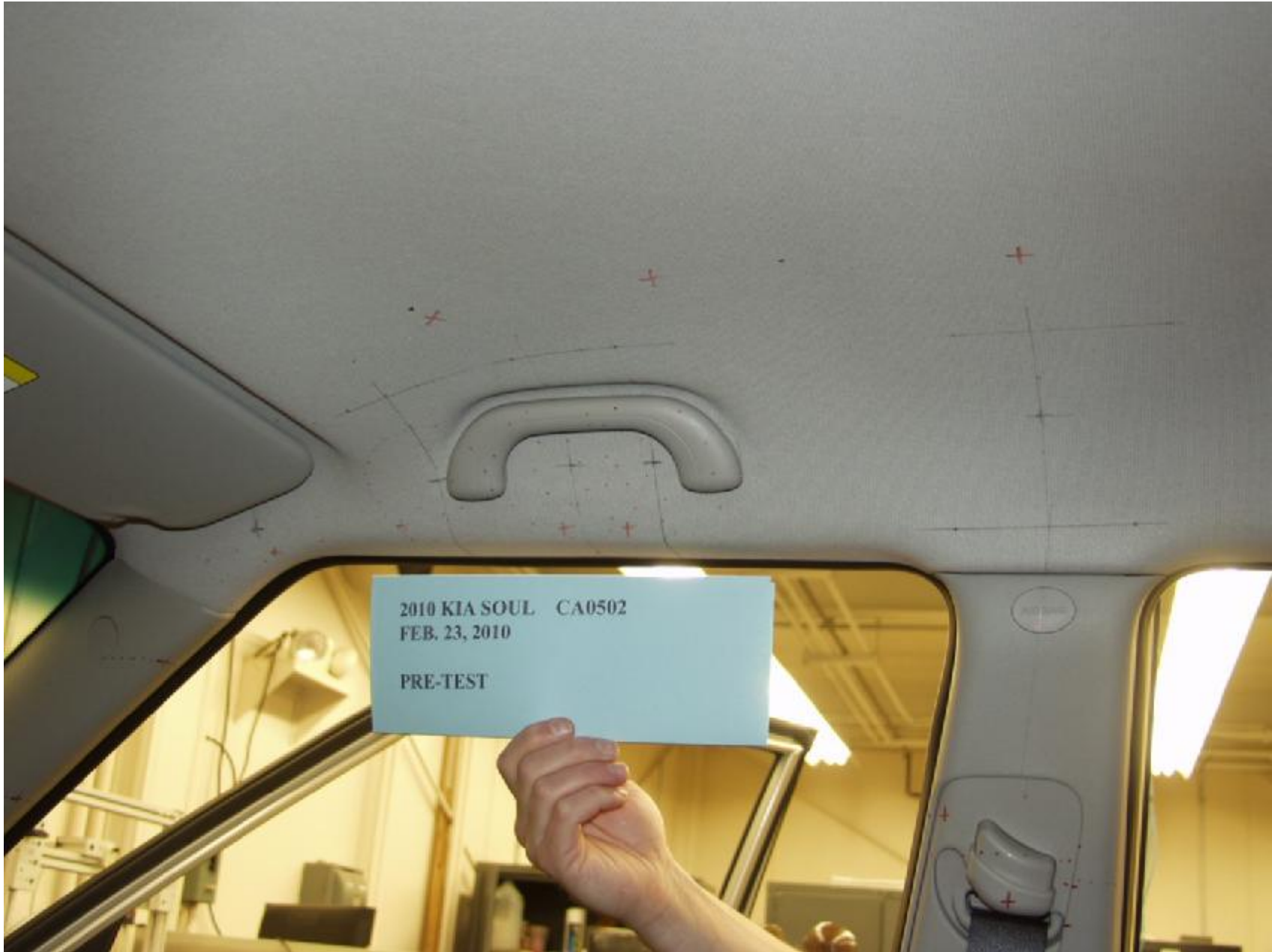


Figure A-16 : PRE-TEST PASSENGER SIDE SIDE RAIL



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

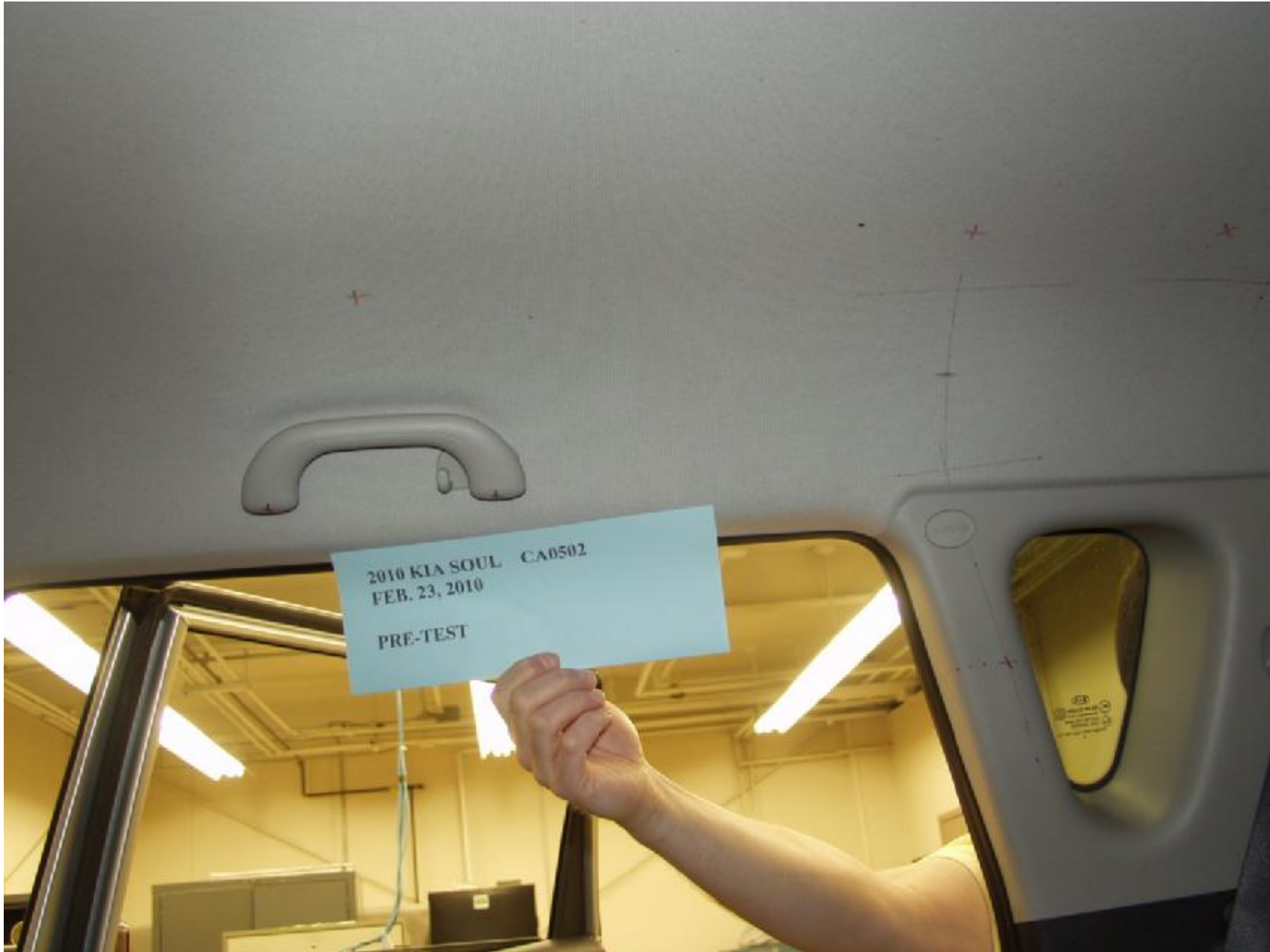


Figure A-18 : PRE-TEST PASSENGER SIDE REAR SIDE RAIL



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



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



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



Figure A-22 : POST-TEST DRIVER SIDE FRONT HEADER



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



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

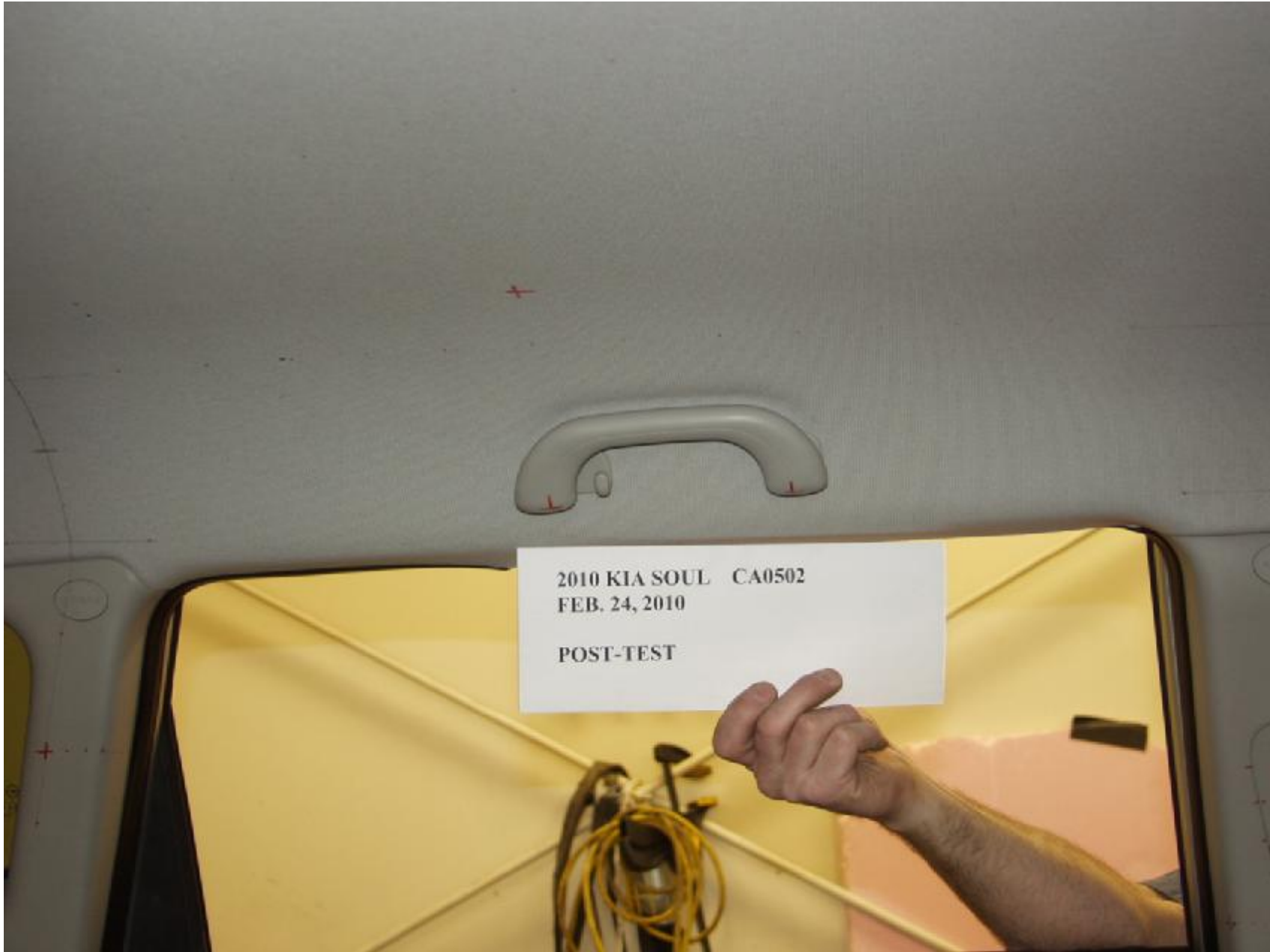


Figure A-25 : POST-TEST DRIVER SIDE REAR SIDE RAIL



Figure A-26 : POST-TEST DRIVER SIDE OTHER PILLAR

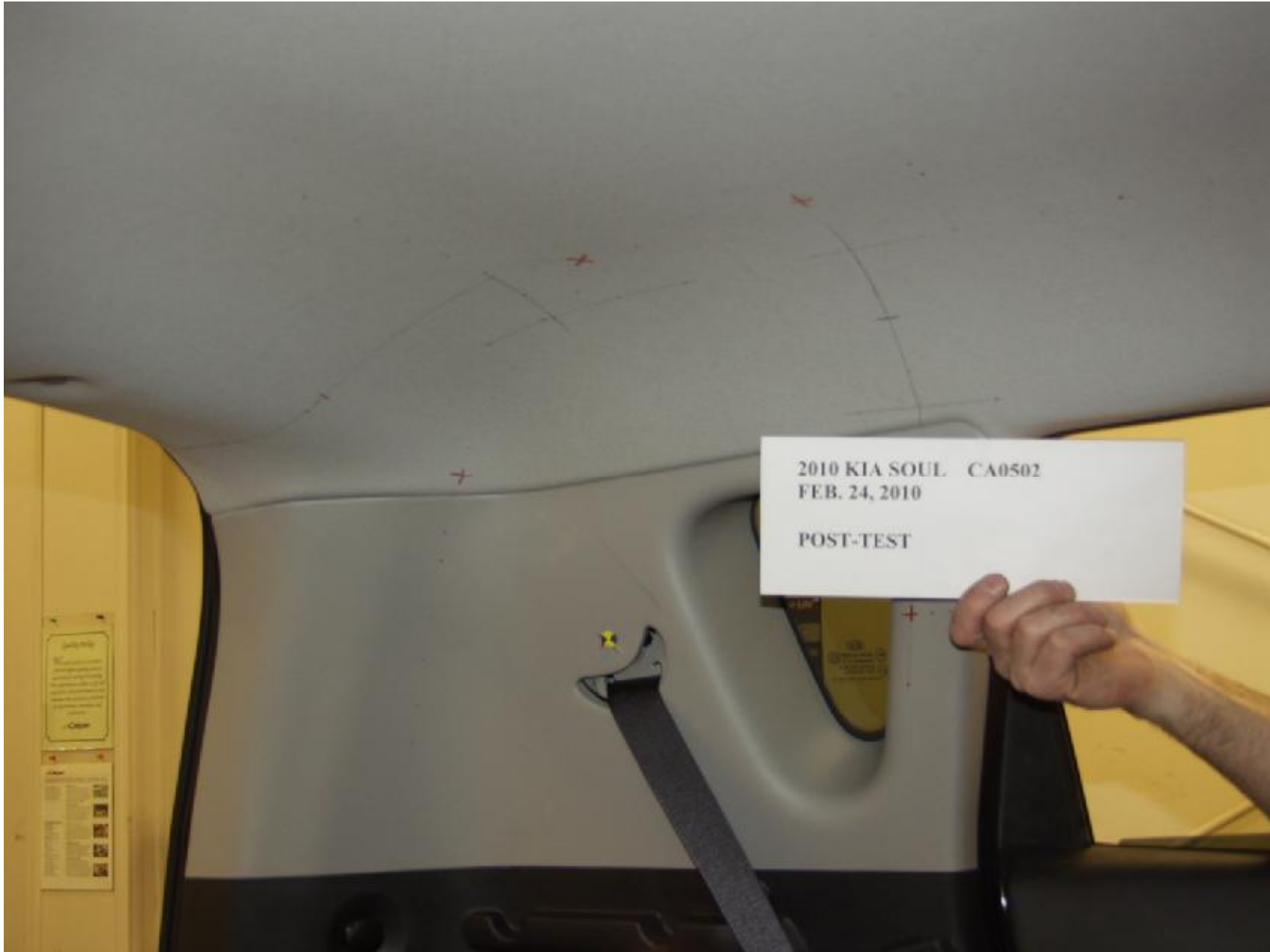


Figure A-27 : POST-TEST DRIVER SIDE REAR PILLAR



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



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



Figure A-30 : POST-TEST PASSENGER SIDE SIDE RAIL



Figure A-31 : POST-TEST PASSENGER SIDE B-PILLAR

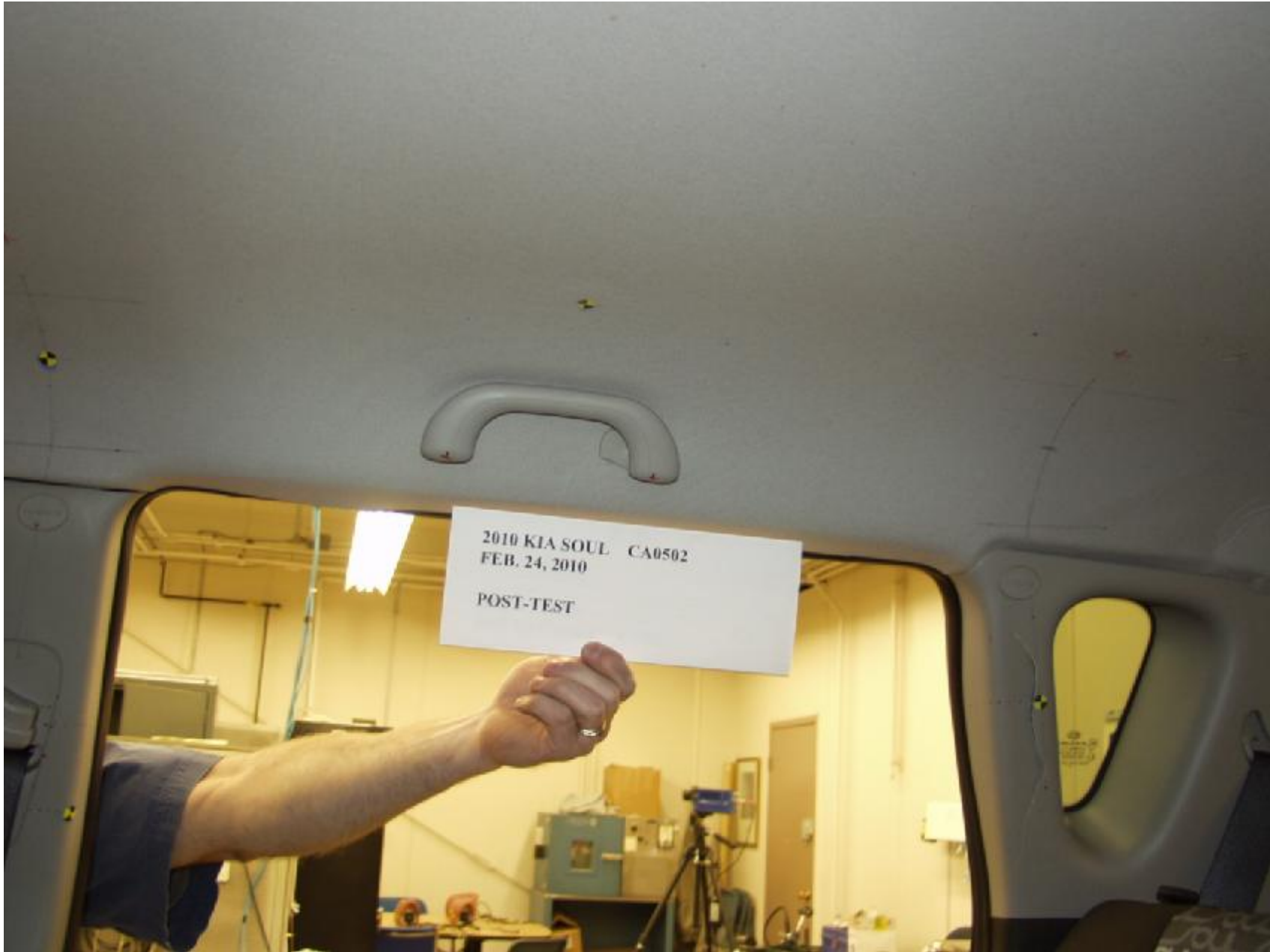


Figure A-32 : POST-TEST PASSENGER SIDE REAR SIDE RAIL



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



Figure A-34 : 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**

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1142	
CALIBRATION DATE:		February 11,2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20	
RELATIVE HUMIDITY	10% to 70%	24	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	257.9	
PEAK LATERAL ACCELERATION	15 Gs Maximum	13.5	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

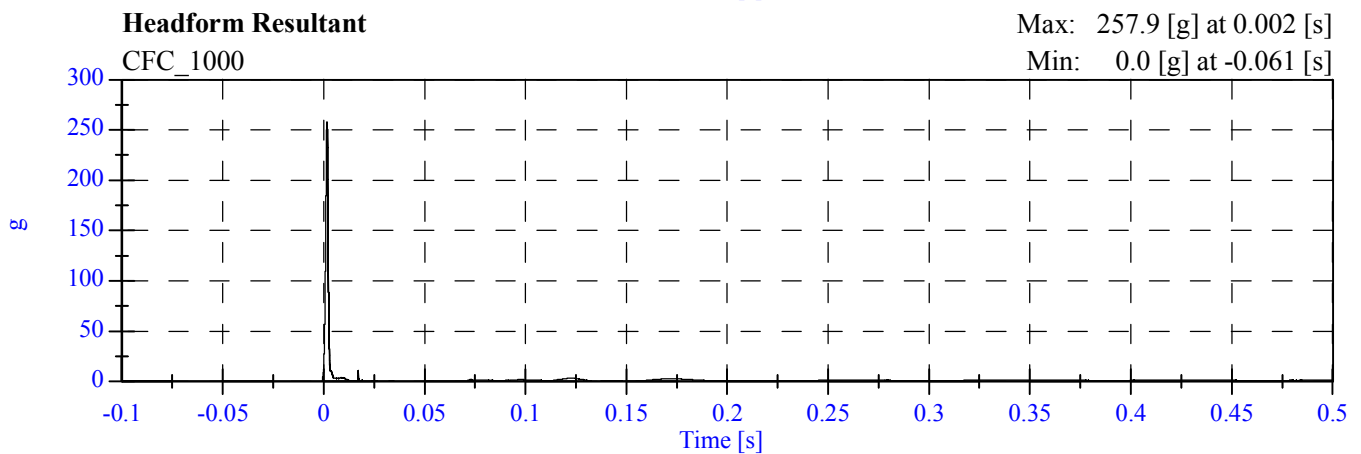
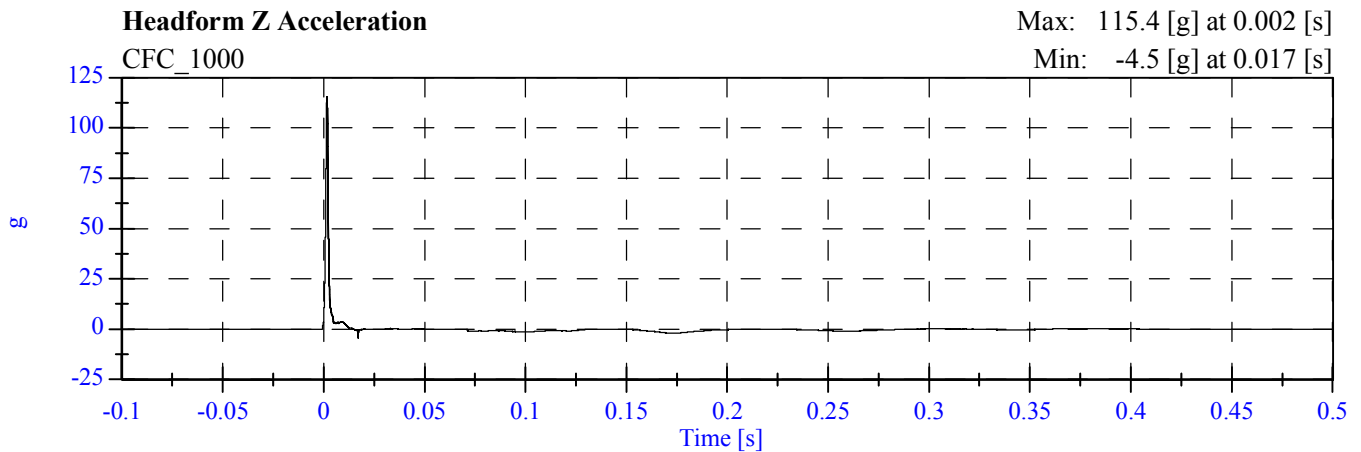
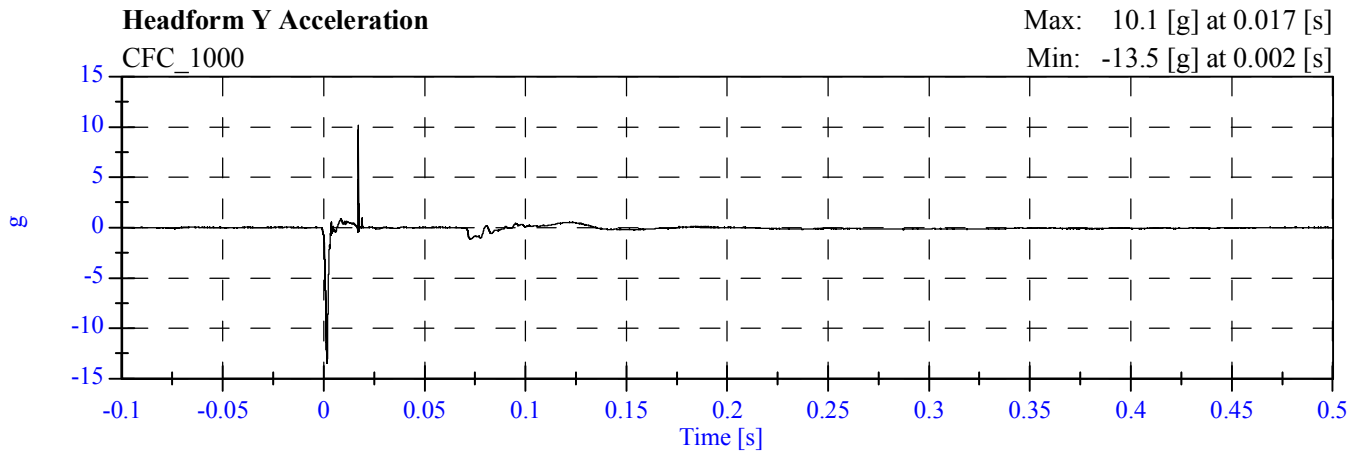
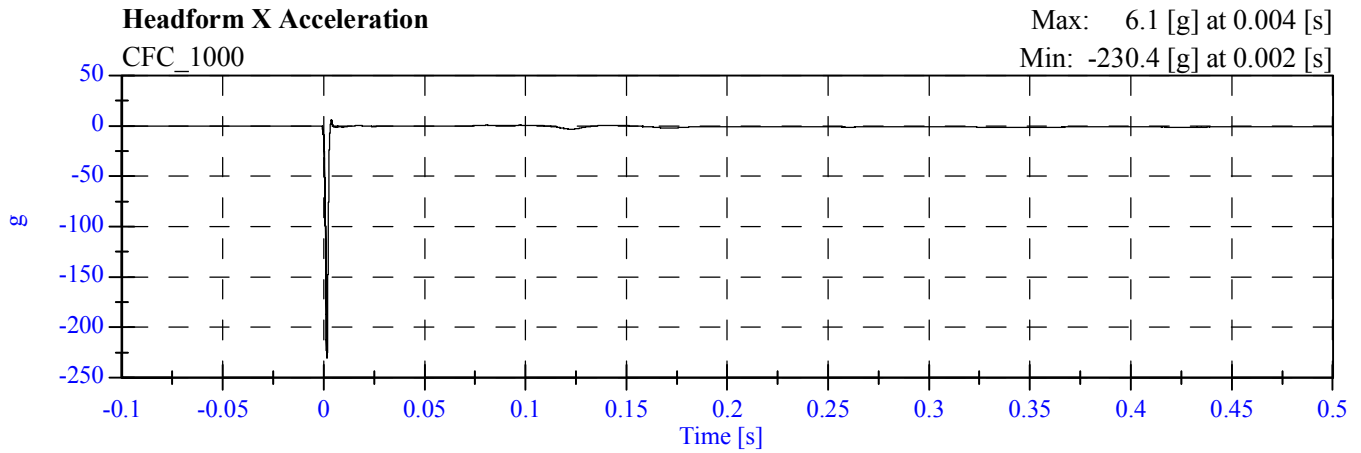
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	9/17/2009	3/17/2010
2 - LATERAL	ENDEVCO	7264-2000T	J33030	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

CA0502 - February 11, 2010



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

MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		February 11,2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20	
RELATIVE HUMIDITY	10% to 70%	24	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	269.6	
PEAK LATERAL ACCELERATION	15 Gs Maximum	12.6	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

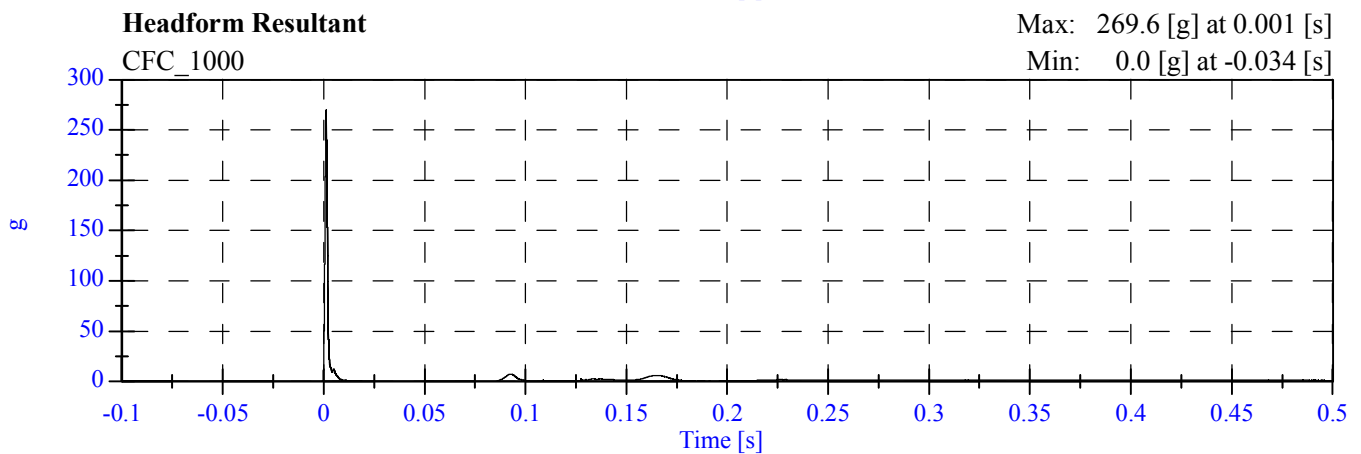
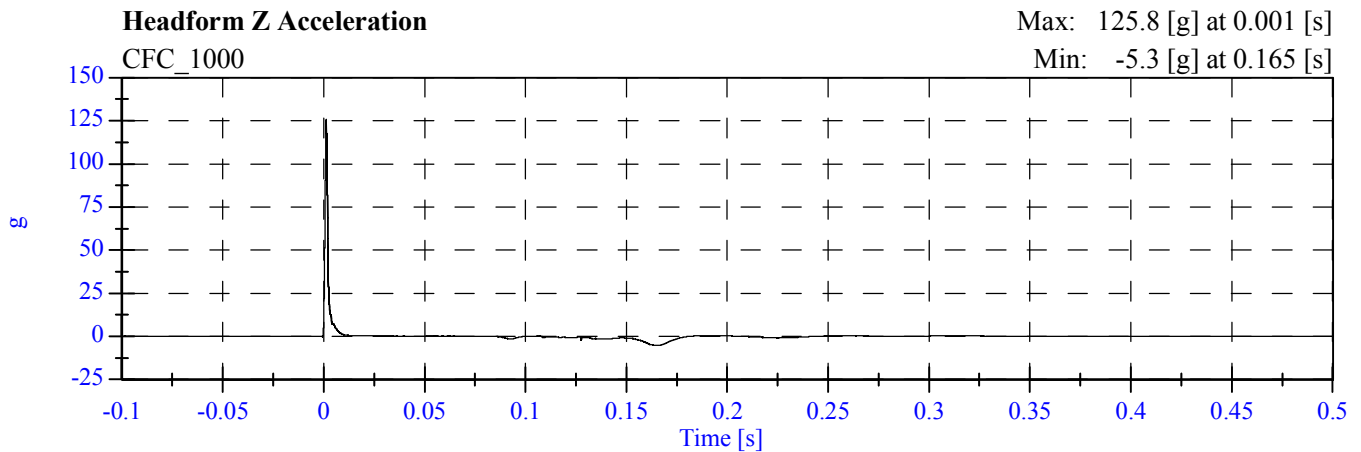
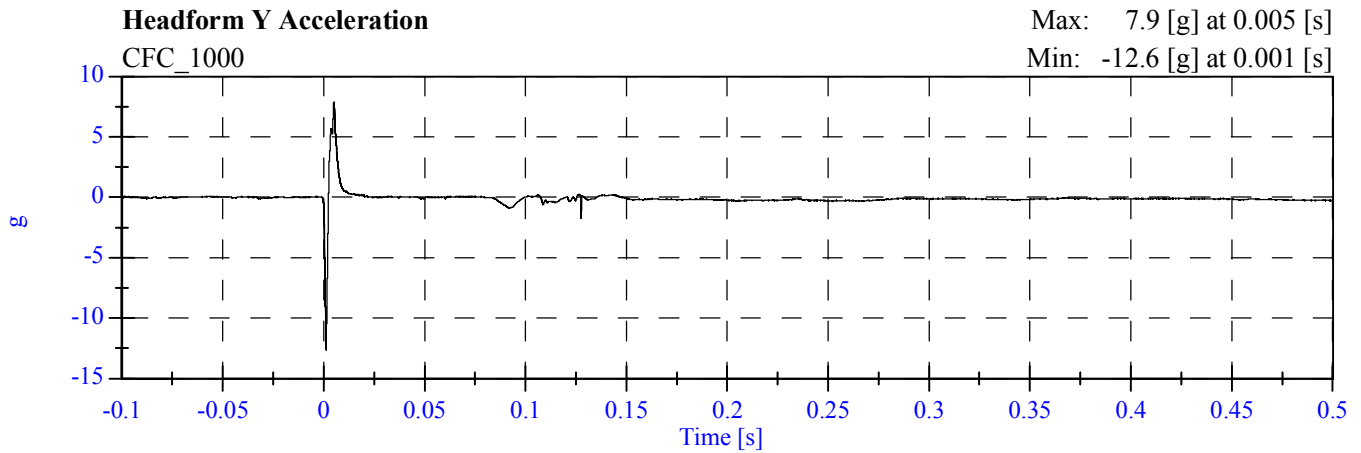
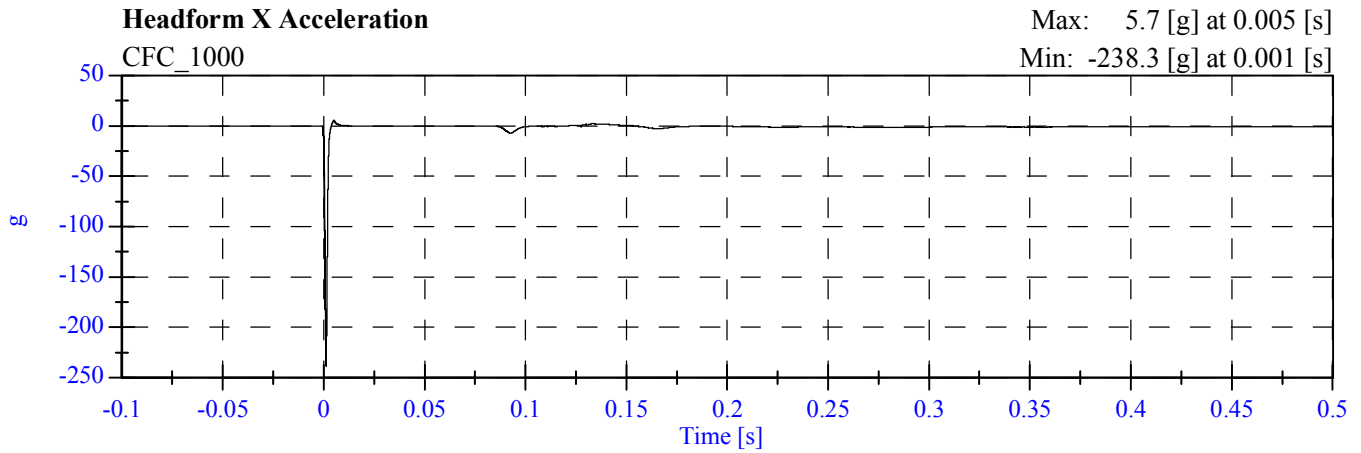
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J33127	9/17/2009	3/17/2010
2 - LATERAL	ENDEVCO	7264-2000T	J33019	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

CA0502 - February 11, 2010



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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		February 11,2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20	
RELATIVE HUMIDITY	10% to 70%	24	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	270.3	
PEAK LATERAL ACCELERATION	15 Gs Maximum	4.1	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

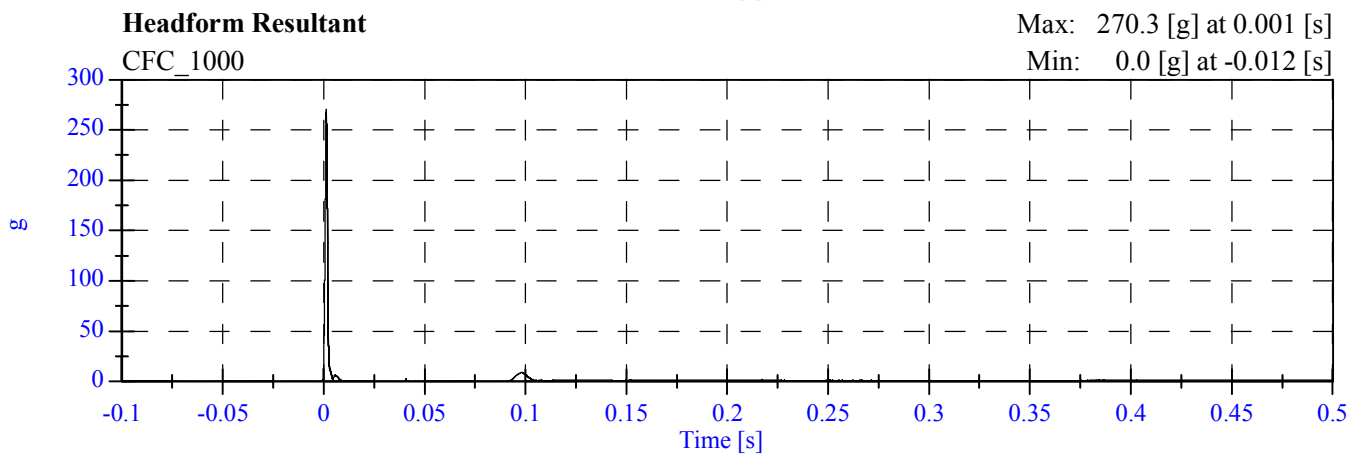
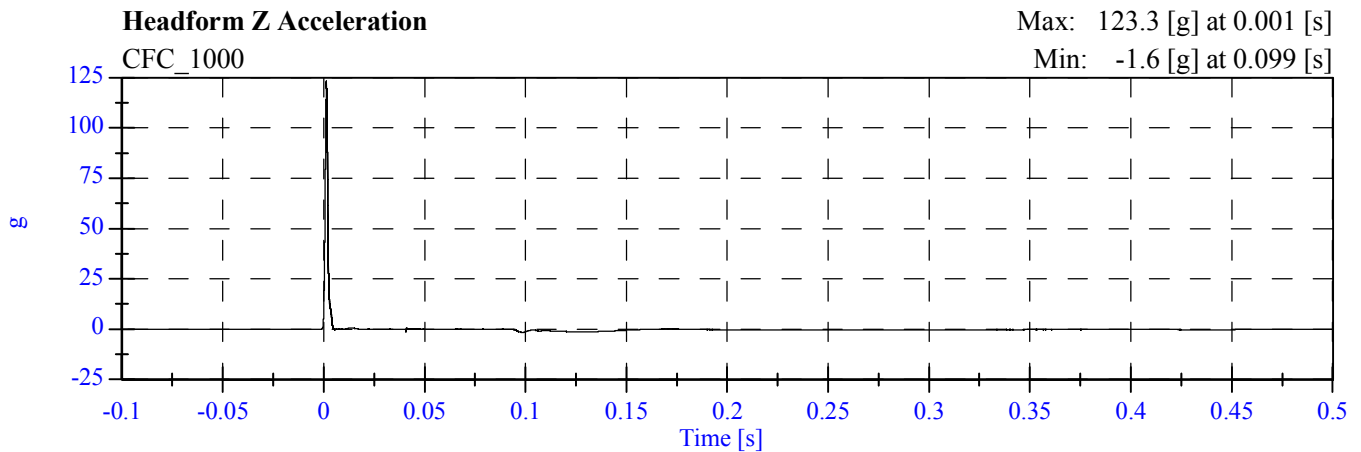
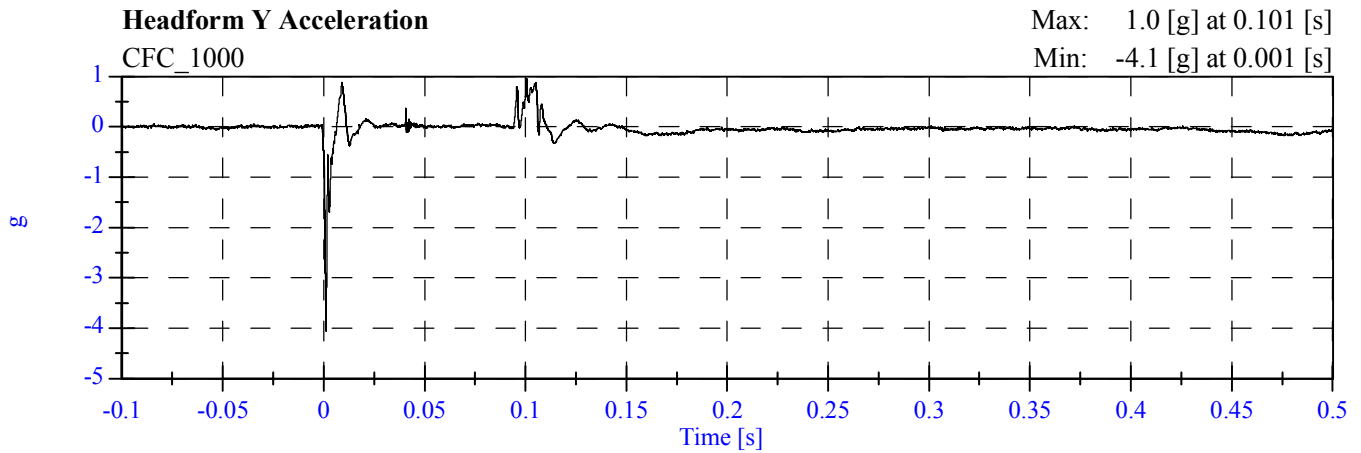
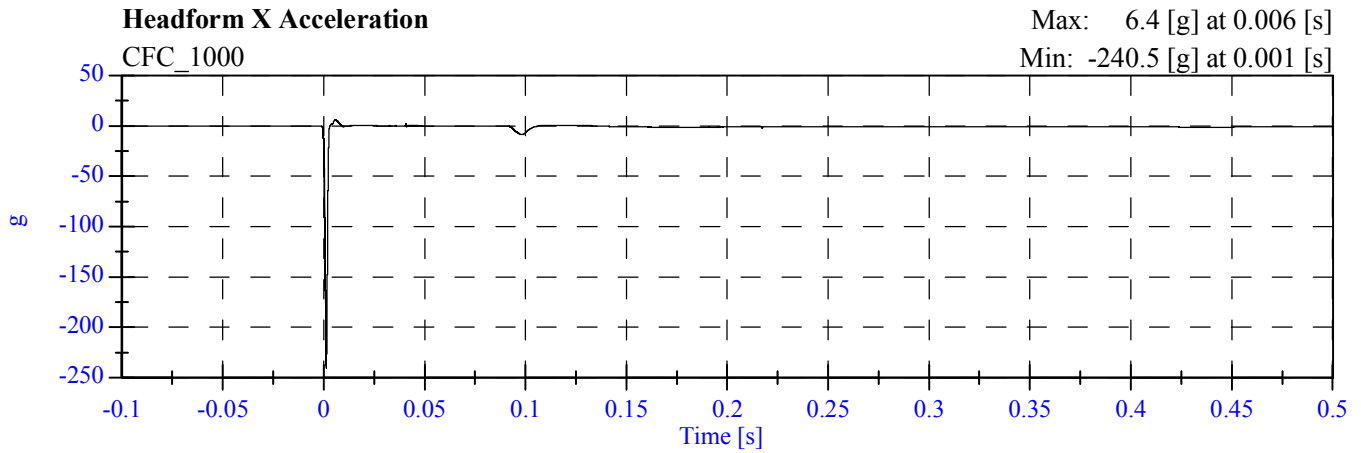
HEAD ACCELEROMETER CALIBRATION INFORMATION

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1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41004	9/17/2009	3/17/2010
2 - LATERAL	ENDEVCO	7264-2000T	J37496	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J41016	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

CA0502 - February 11, 2010



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

MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		February 11,2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20	
RELATIVE HUMIDITY	10% to 70%	24	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	262.8	
PEAK LATERAL ACCELERATION	15 Gs Maximum	4.7	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

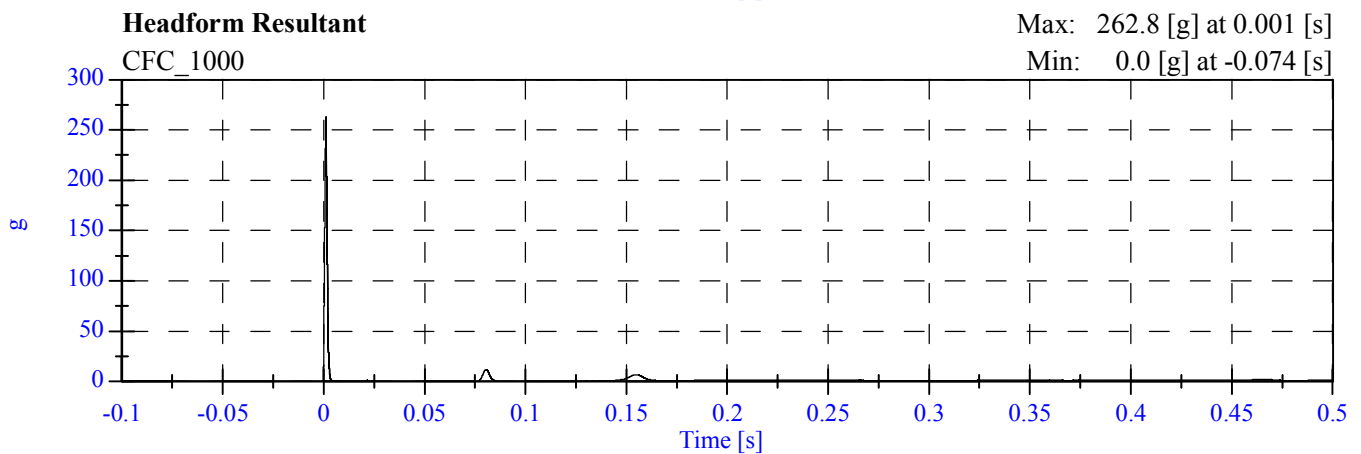
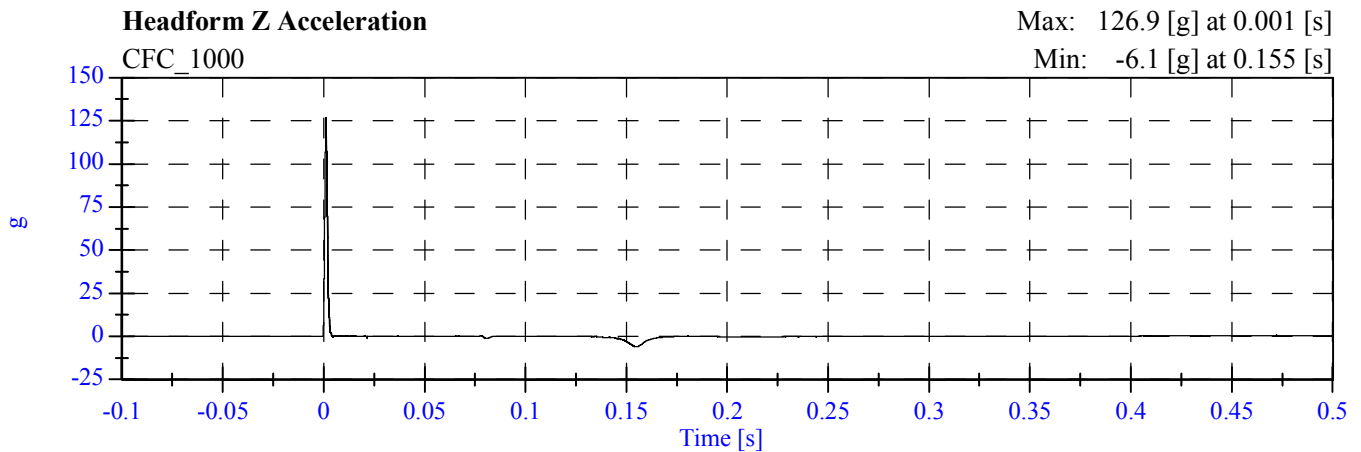
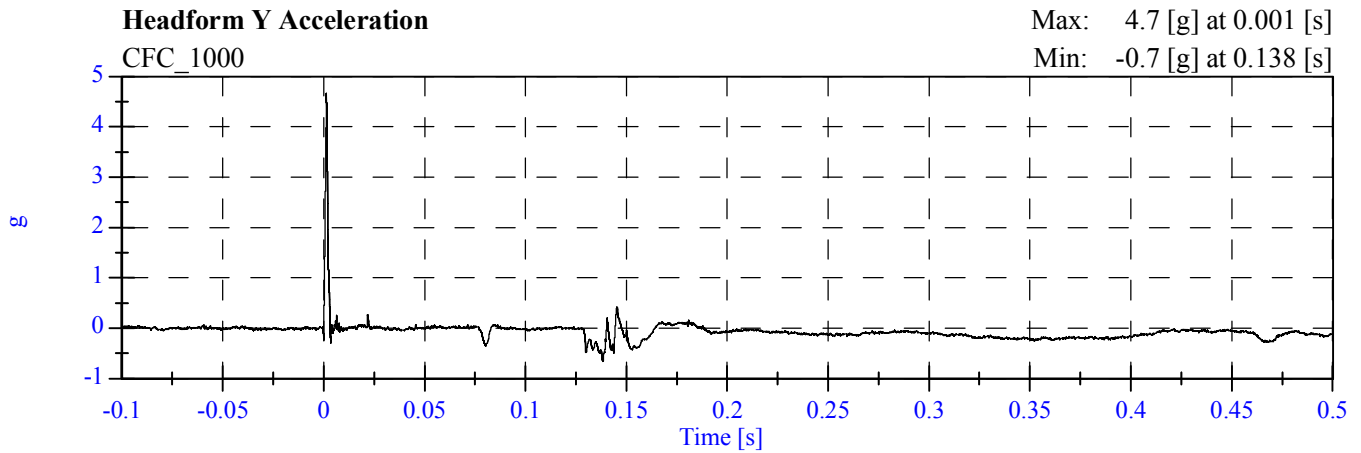
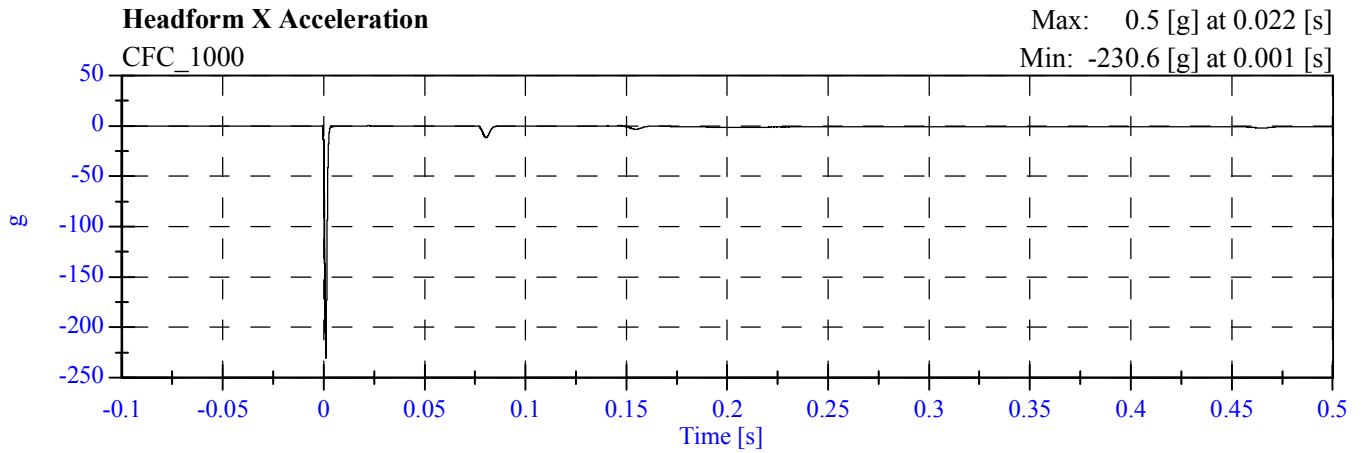
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2 - LATERAL	ENDEVCO	7264-2000T	J32779	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

CA0502 - February 11, 2010



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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1140	
CALIBRATION DATE:		February 11,2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	20	
RELATIVE HUMIDITY	10% to 70%	24	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	263.2	
PEAK LATERAL ACCELERATION	15 Gs Maximum	7.4	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

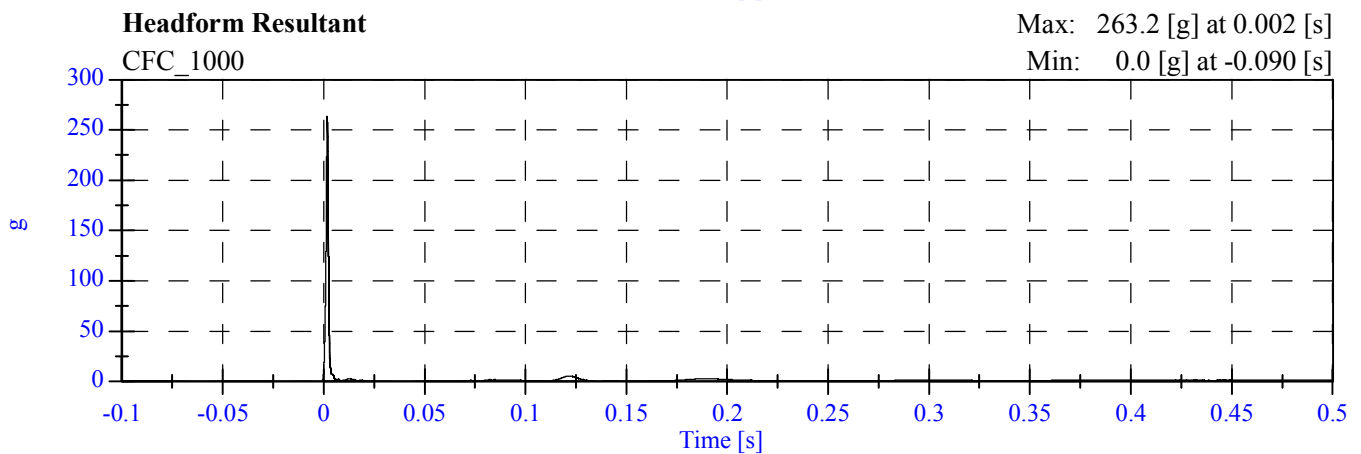
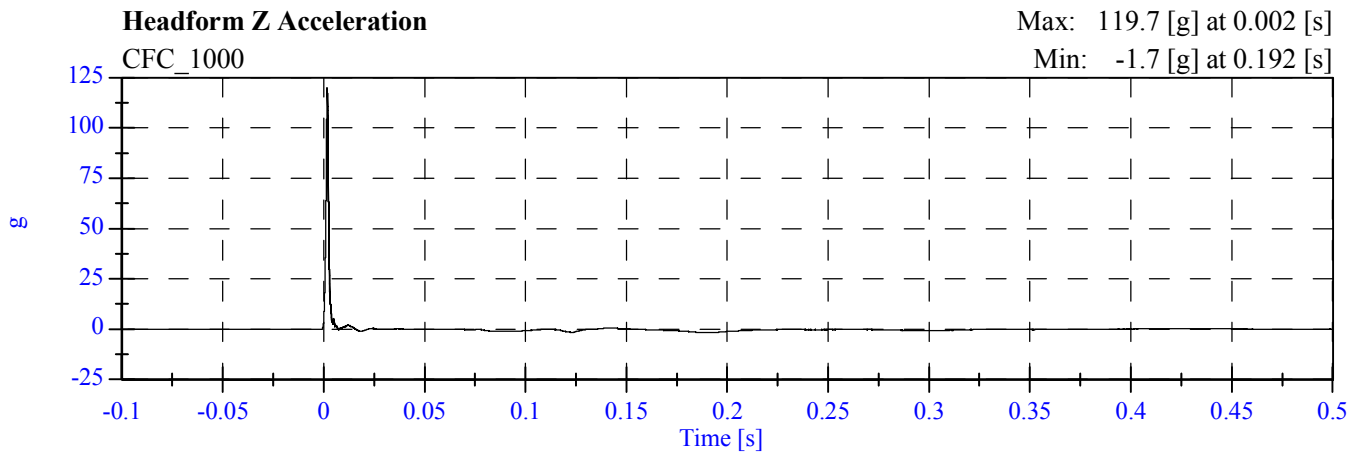
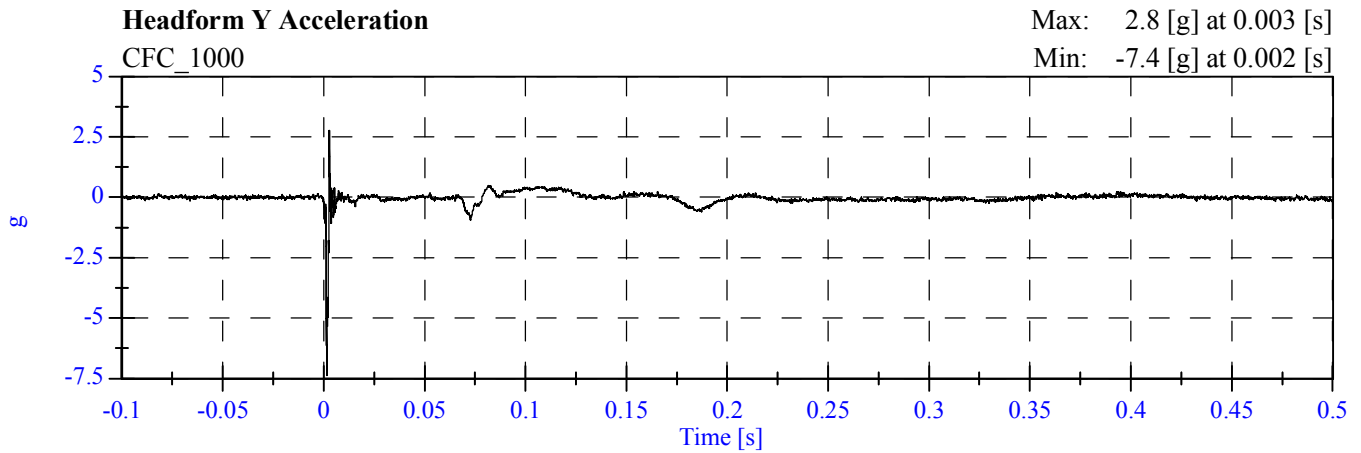
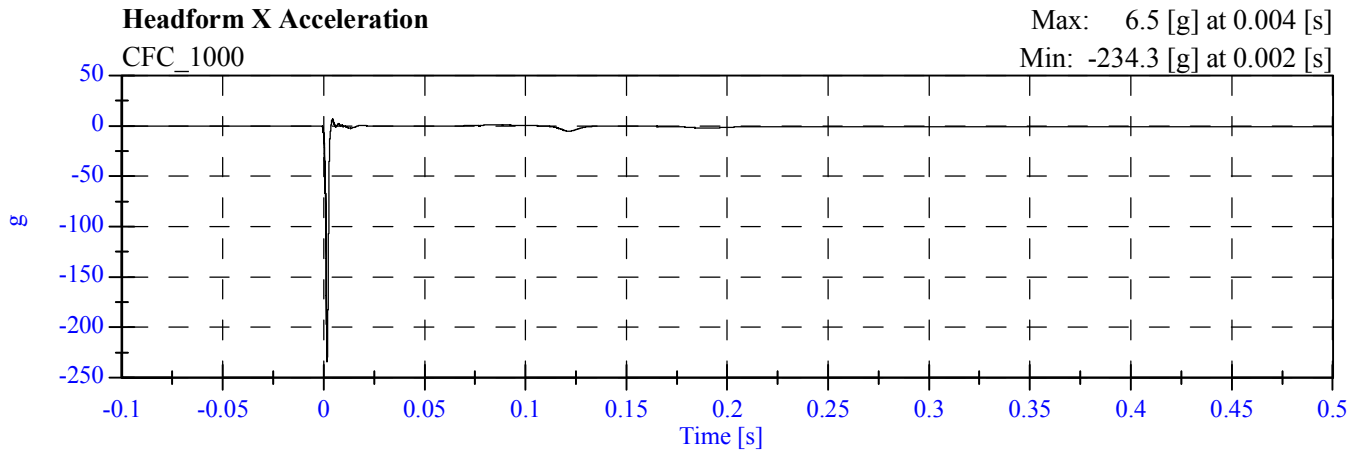
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
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2 - LATERAL	ENDEVCO	7264-2000T	J40994	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

CA0502 - February 11, 2010



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

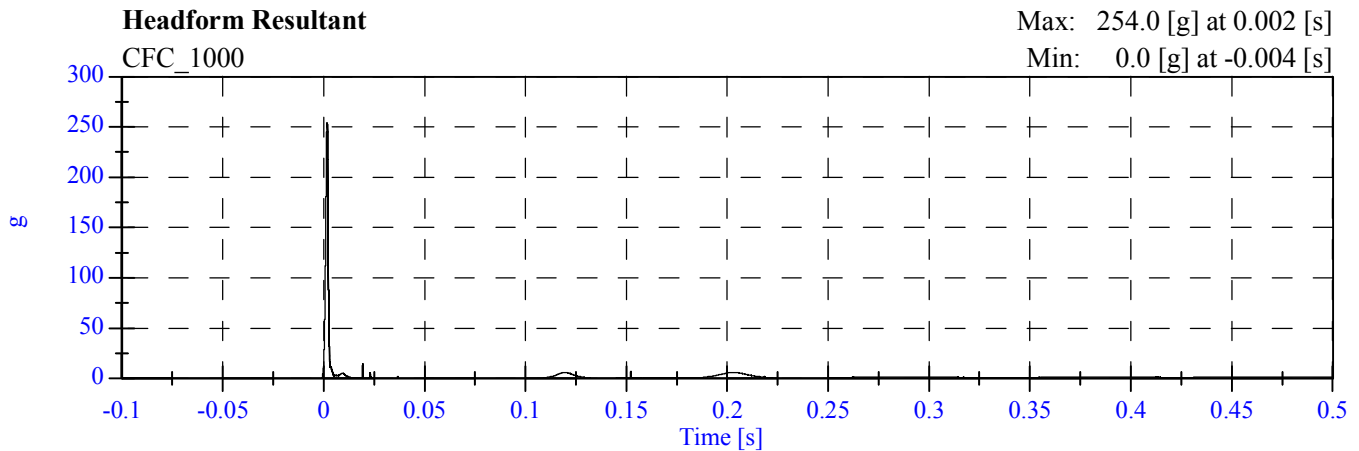
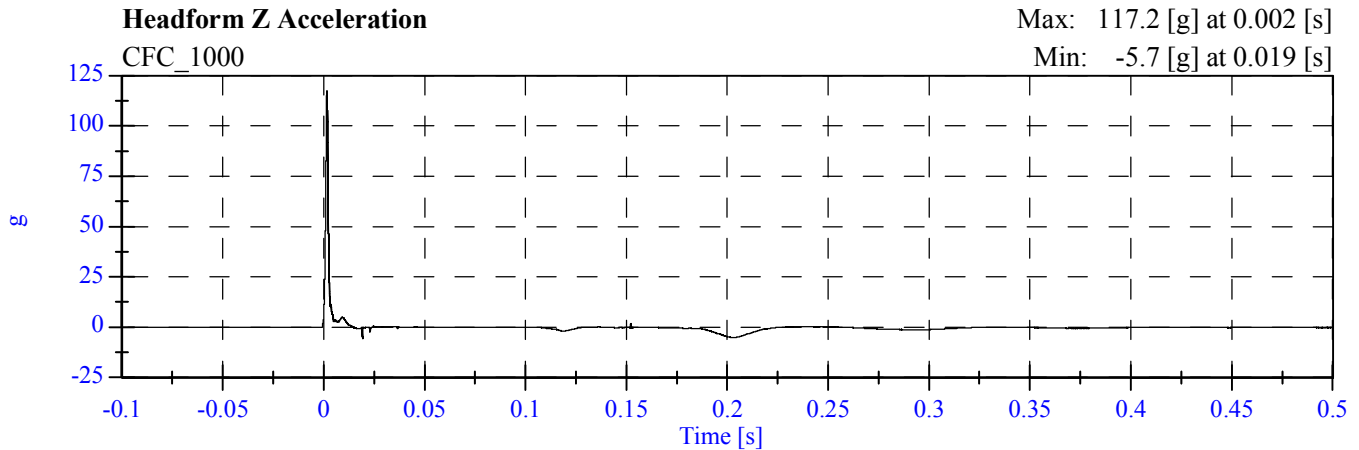
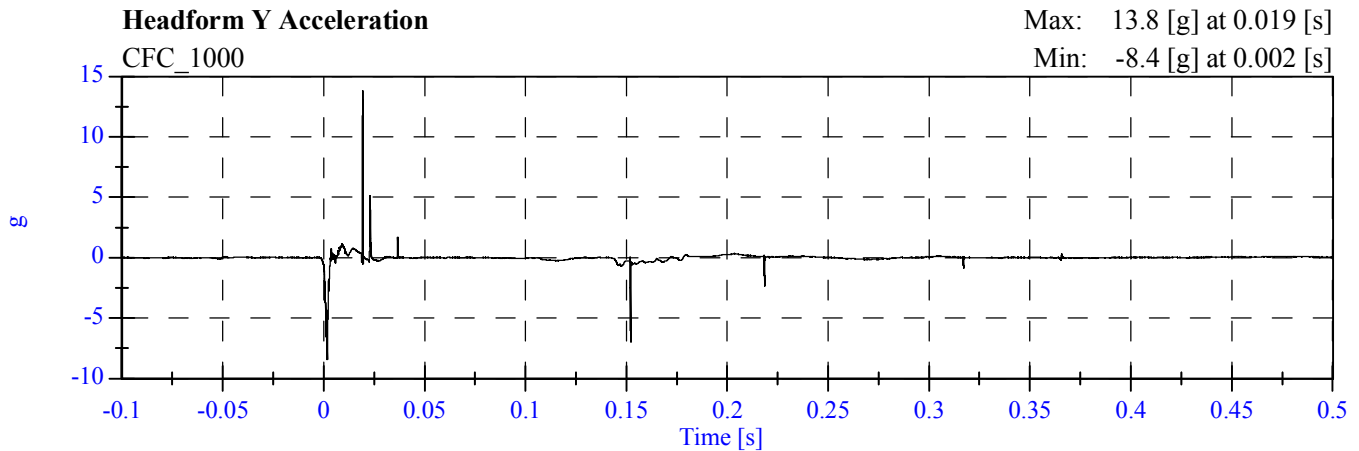
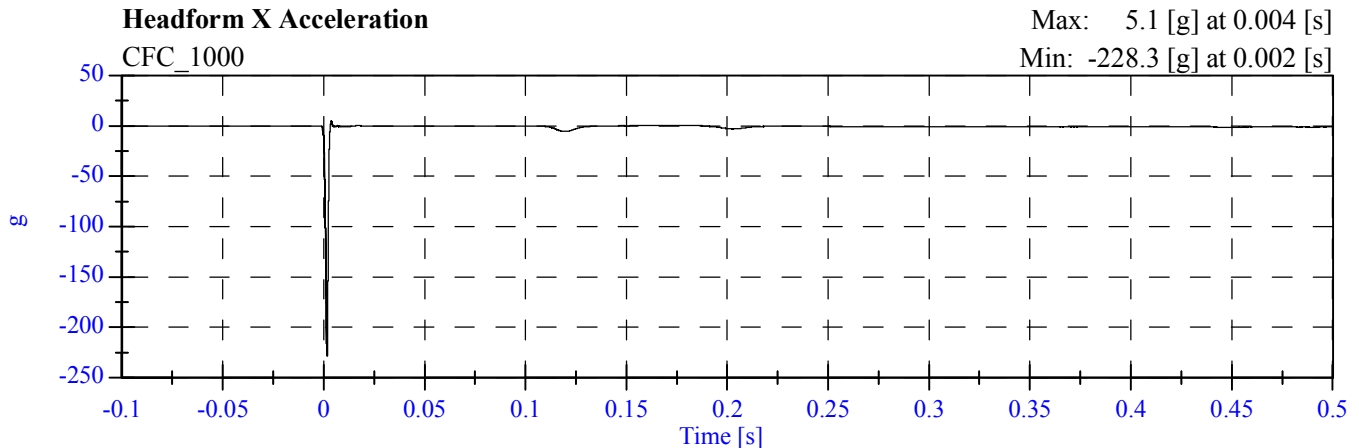
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SERIAL NUMBER:		1142	
CALIBRATION DATE:		March 1, 2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	21	
RELATIVE HUMIDITY	10% to 70%	28	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	254.0	
PEAK LATERAL ACCELERATION	15 Gs Maximum	13.8	
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	J24876	9/17/2009	3/17/2010
2 - LATERAL	ENDEVCO	7264-2000T	J33030	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops CA0502 - March 01, 2010



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

MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		March 1, 2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	21	
RELATIVE HUMIDITY	10% to 70%	28	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	255.9	
PEAK LATERAL ACCELERATION	15 Gs Maximum	10.0	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

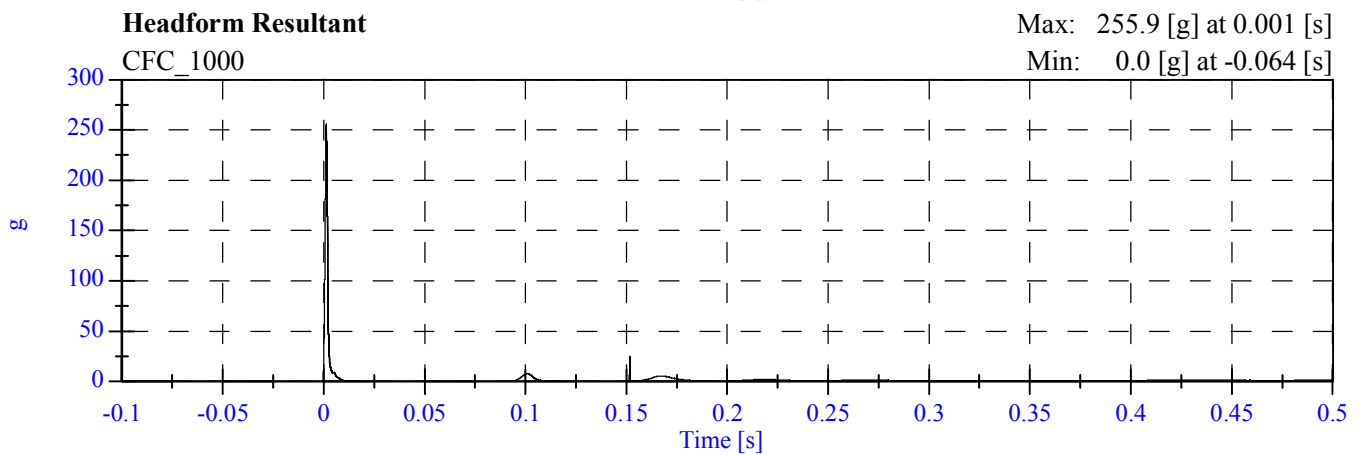
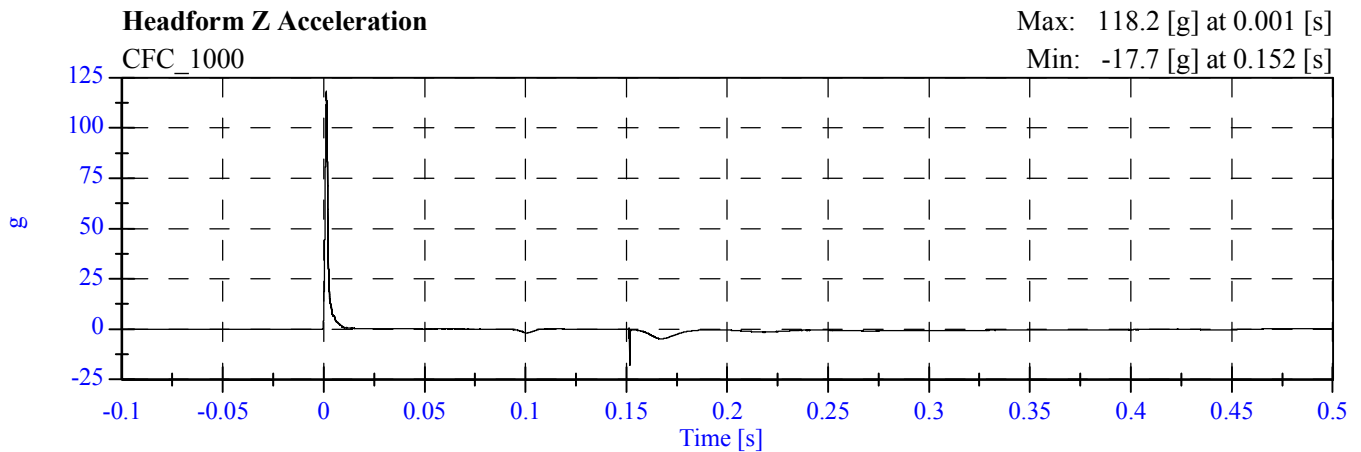
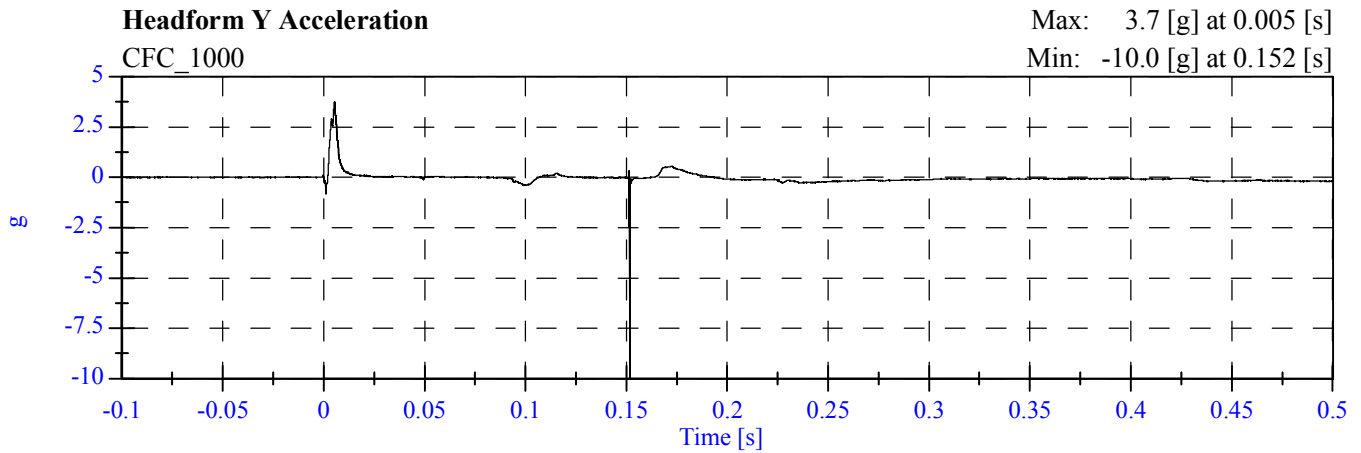
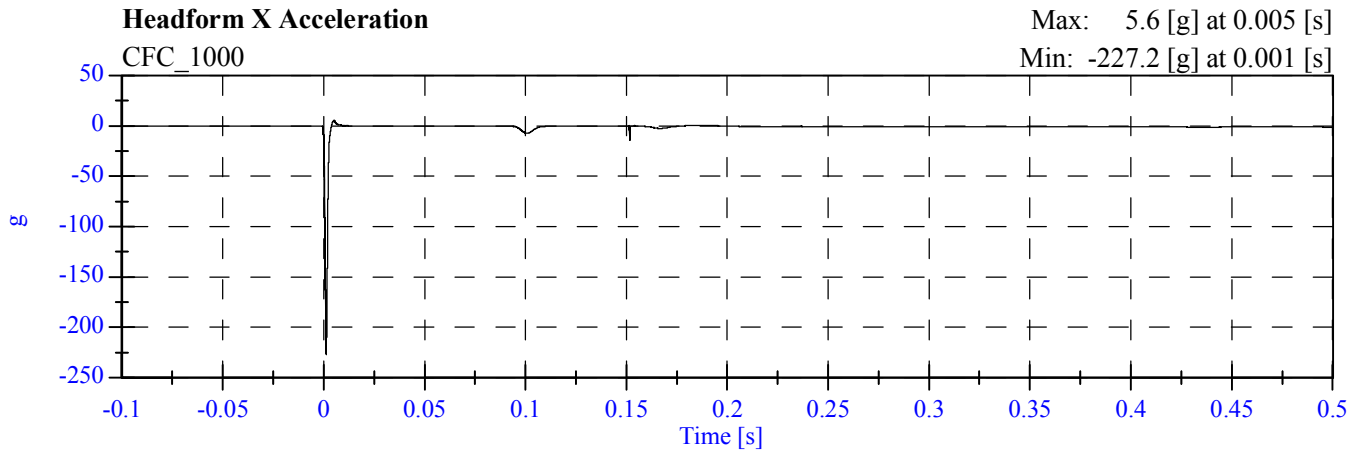
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	9/17/2009	3/17/2010
2 - LATERAL	ENDEVCO	7264-2000T	J33019	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

CA0502 - March 01, 2010



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

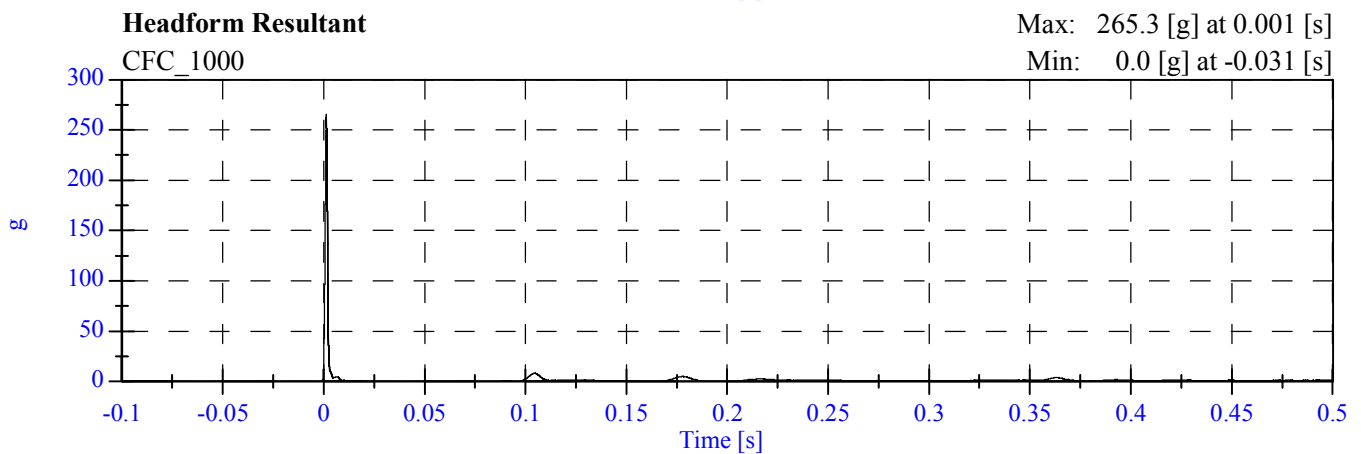
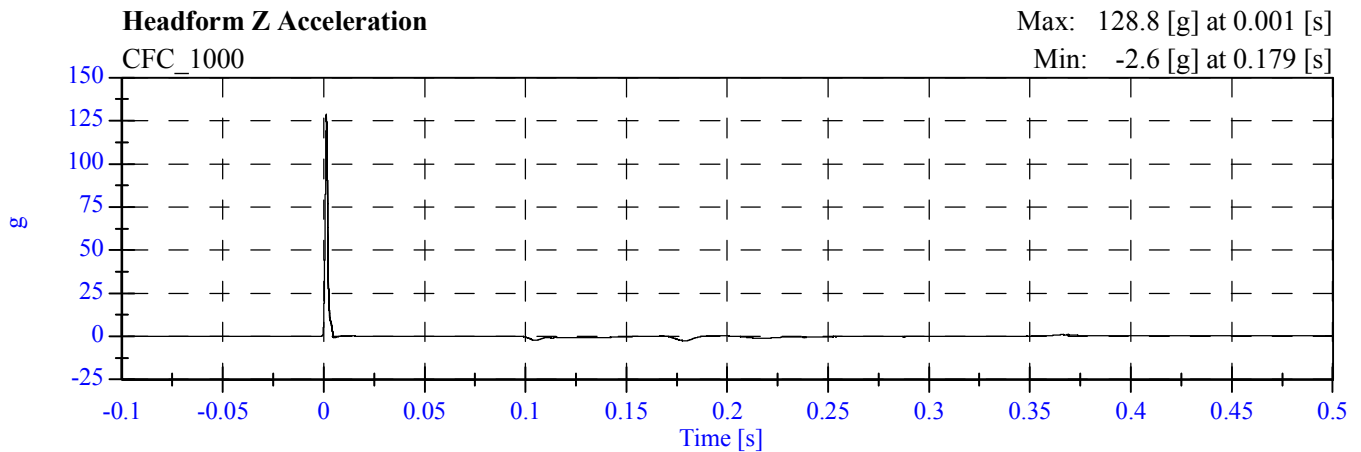
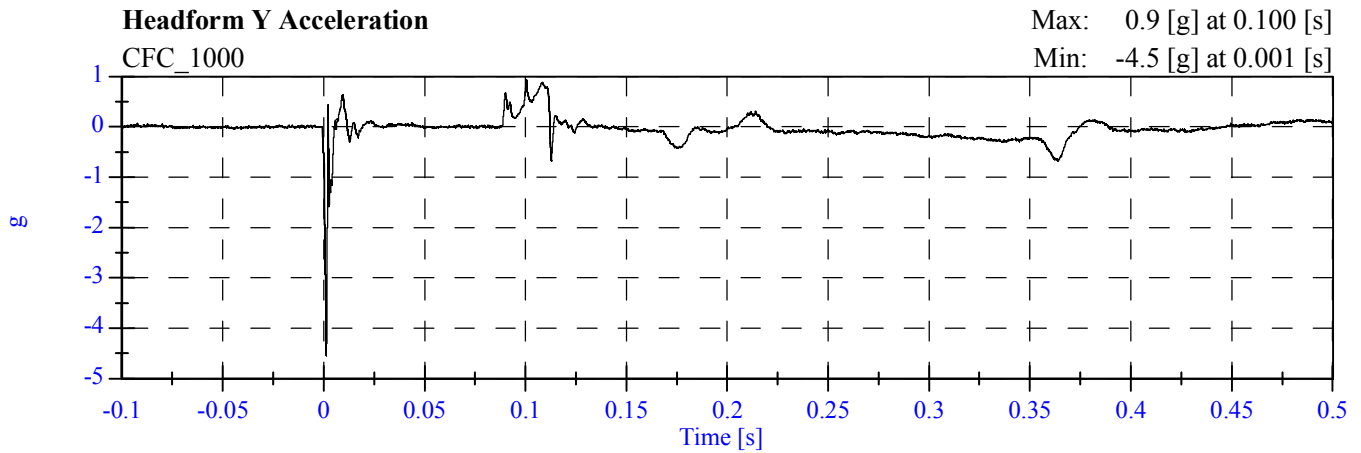
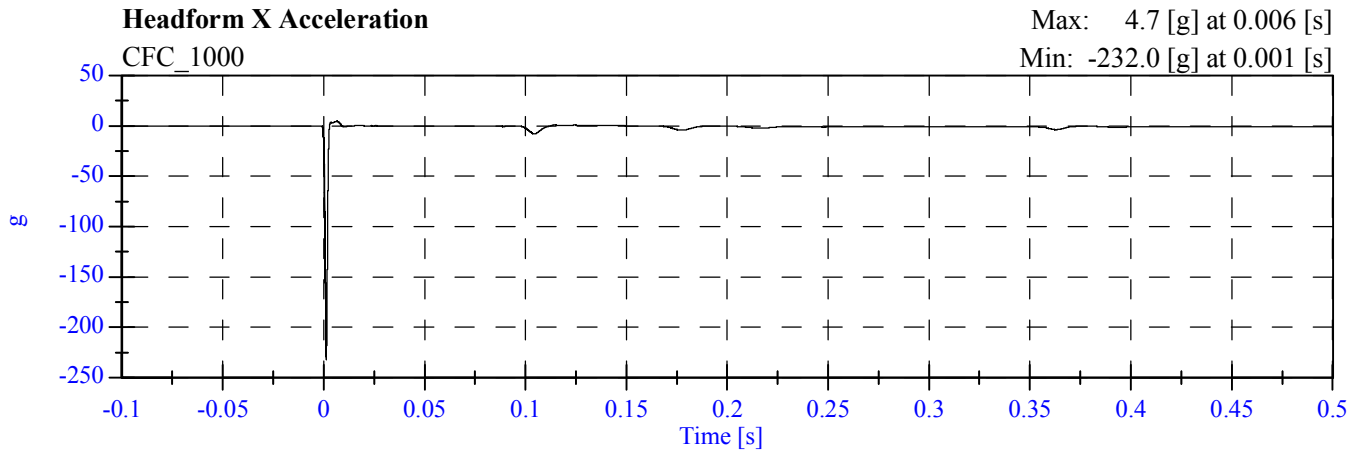
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SERIAL NUMBER:		805	
CALIBRATION DATE:		March 1, 2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	21	
RELATIVE HUMIDITY	10% to 70%	28	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	265.3	
PEAK LATERAL ACCELERATION	15 Gs Maximum	4.5	
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	J41004	9/17/2009	3/17/2010
2 - LATERAL	ENDEVCO	7264-2000T	J37496	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J41016	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops CA0502 - March 01, 2010



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

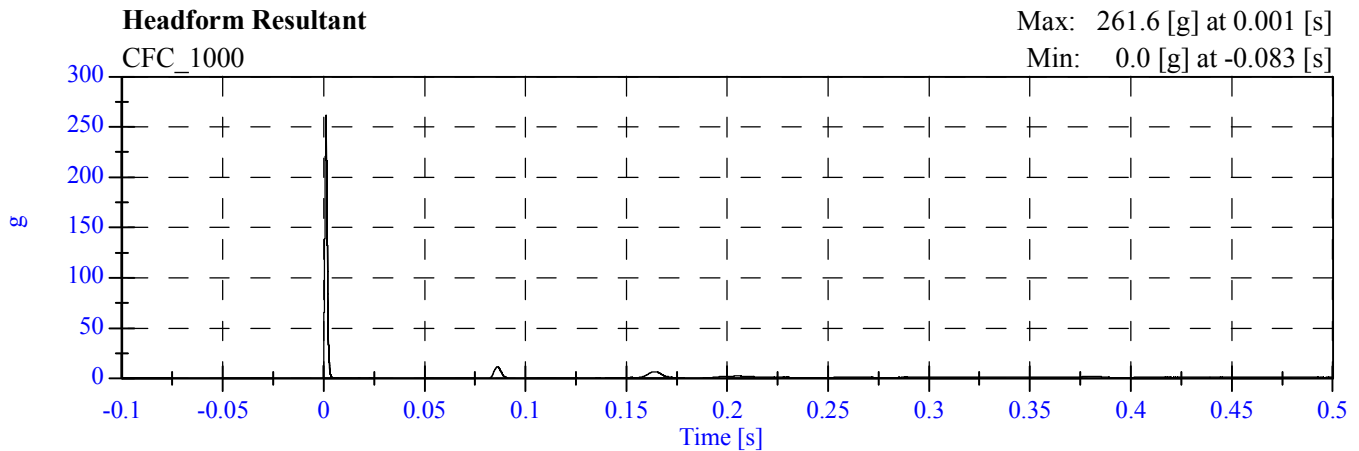
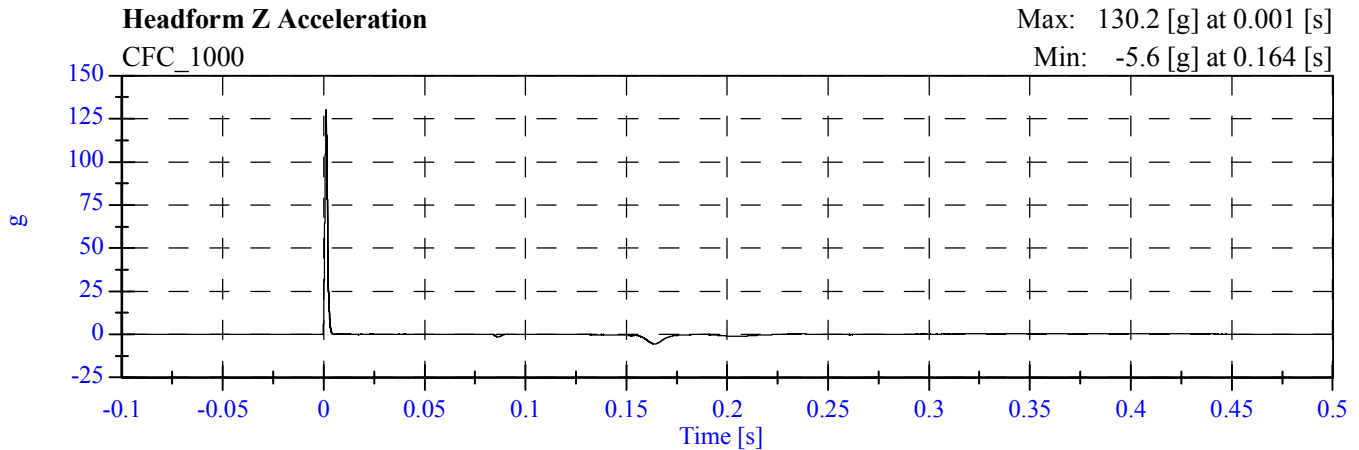
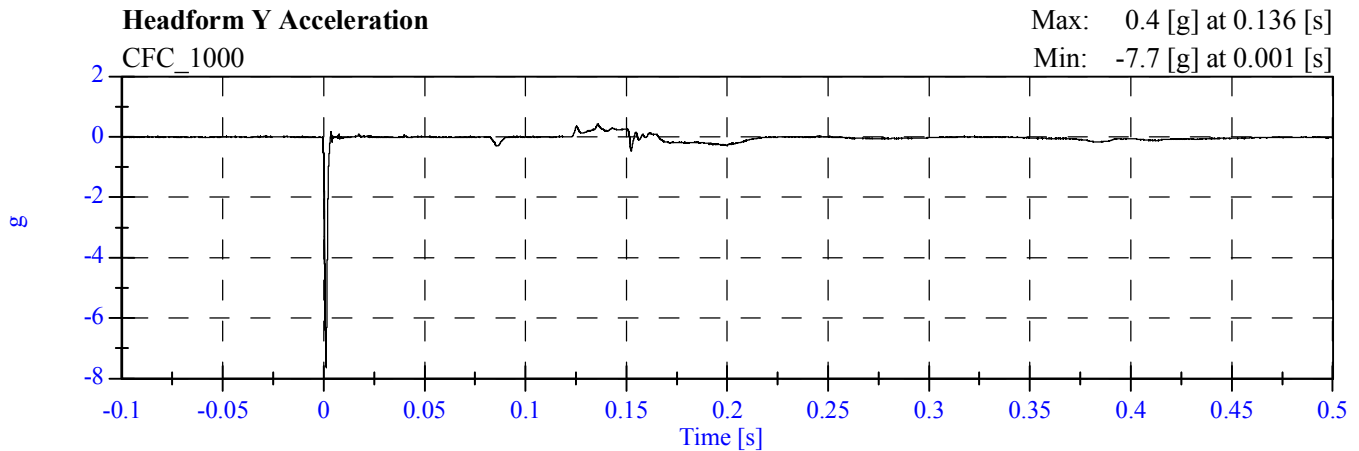
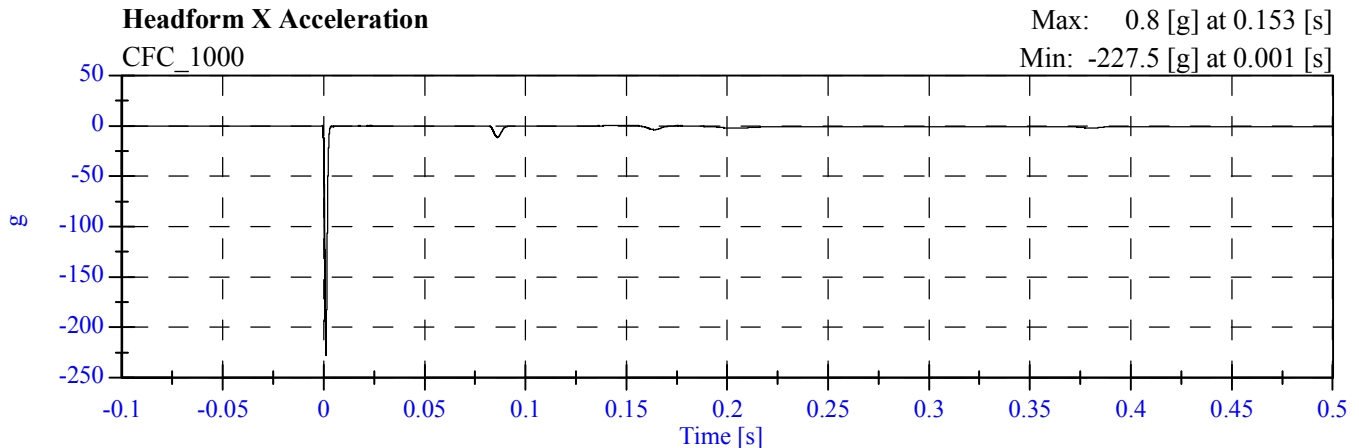
MANUFACTURER:		DENTON ATD INC.	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		March 1, 2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	21	
RELATIVE HUMIDITY	10% to 70%	28	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	261.6	
PEAK LATERAL ACCELERATION	15 Gs Maximum	7.7	
IS ACCELERATION 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	J28671	9/17/2009	3/17/2010
2 - LATERAL	ENDEVCO	7264-2000T	J32779	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops CA0502 - March 01, 2010



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

MANUFACTURER:		FIRST TECHNOLOGY SAFETY SYSTEMS	
SERIAL NUMBER:		1140	
CALIBRATION DATE:		March 1, 2010	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	21	
RELATIVE HUMIDITY	10% to 70%	28	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	247.7	
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	J41006	9/17/2009	3/17/2010
2 - LATERAL	ENDEVCO	7264-2000T	J40994	9/17/2009	3/17/2010
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	9/17/2009	3/17/2010

REMARKS:

FMVSS 201U - Headform Calibration Drops

CA0502 - March 01, 2010

