REPORT NUMBER: 201P-CAL-08-02

SAFETY COMPLIANCE TESTING FOR FMVSS 201
RIGID POLE SIDE IMPACT TEST

GENERAL MOTORS CORPORATION
2008 CHEVROLET IMPALA
4-DOOR SEDAN

NHTSA NUMBER: C80108

CALSPAN TEST NUMBER: 8863-F201P-02

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

Test Date: 7/08/08

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
Mail Code: NVS-220, West Building 4th Floor
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Prepared by: Vincent M. Paolini, Project Engineer

Approved by: David J. Travale, Program Manager
Transportation Science Center

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15. Supplementary Notes

16. Abstract

A rigid pole side impact test was conducted on the subject 2008 Chevrolet Impala 4-door Sedan in accordance with FMVSS 201, "Occupant Protection in Interior Impact, S6.2(b)(3) and the Office of Vehicle Safety Compliance Test Procedure No. TP-201-02 "Rigid Pole Side Impact Test". The test was conducted at the Calspan's facility in Buffalo, New York on July 8, 2008.

The impact velocity of the vehicle was 28.42 kph, and the ambient temperature at the struck side (Driver) of the target vehicle at the time of impact was 22°C. The post test maximum crush was 351 mm at level 3. The test vehicle's performance follows:

Measurement Description	**Threshold**	**P1 (270)**
Head Injury Criteria (HIC- 36 ms)	1000	224.0

Test Failures: None

The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event.

17. Key Words Compliance Testing Rigid Pole Side Impact Test FMVSS 201	*18. Distribution Statement* Copies of this report are available from: NHTSA Technical Information Services National Highway Traffic Safety Admin. 1200 New Jersey Avenue, SE Washington, DC 20590		
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SECTION 1

PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY FMVSS 201 “Occupant protection in interior impact” compliance test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract No. DTNH22-06-C-00031. The purpose of this test was to evaluate the dynamic head protection system in a 2008 Chevrolet Impala 4-door Sedan, NHTSA Number: C80108. The rigid pole side impact test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-201P-02, dated October 21, 2001).

SECTION 2

SUMMARY OF RIGID POLE SIDE IMPACT TEST

A rigid pole side impact test was conducted on a 2008 Chevrolet Impala 4-door Sedan. The subject vehicle was towed into the rigid pole at a velocity of 28.42 kph. The test was conducted by Calspan in Buffalo, New York, on July 8, 2008.

Pretest and post test photographs of the test vehicle, and the side impact dummy (SID/HIII) are included in Appendix A of this report.

One SID/HIII was placed in the LEFT front outboard designated seating position according to instructions specified in TP201P-02 dated (October 21, 2001). The side impact event was documented by thirteen (13) cameras. Camera locations and other pertinent camera information are included in this report.

The SID/HIII was instrumented with the following accelerometers:

1. Head CG triaxial accelerometers
2. Upper neck 6 channel load cell (X,Y and Z force and moment)
3. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
4. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
5. Lower Thoracic Spine (T12) uniaxial accelerometer (Y-direction)
6. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

Appendix B contains the vehicle and dummy response data traces. A summary of the side impact dummy (SID/HIII) configuration and performance verification test data is shown in Appendix C. Dummy and vehicle calibration data can be found in Appendix D of this report.

The following table summarizes the results of the test.

INJURY CRITERIA	P1 SID/HIII (270)
HIC (≤1000)	224.0
TTI (g) [1]	81
Pelvic (g) [1]	68
Neck X Force (N)[1]	-375.7
Neck Y Force (N)[1]	-342.0
Neck Z Force (N)[1]	-628.1
Neck X Moment (N-m)[1]	-77.9
Neck Y Moment (N-m)[1]	-33.4
Neck Z Moment (N-m)[1]	299.2

[1] Information purposes only.

SECTION 3

SIDE IMPACT DUMMY (SID/HIII) AND VEHICLE TEST DATA

DATA SHEET 1
GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Vehicle Manufacturer: General Motors Corporation

Year/Make/Model/Body Style: 2008 Chevrolet Impala 4-door Sedan

Vehicle Body Color: Brown VIN: 2G1WB58K381222404

Vehicle NHTSA No.: C80108 Month & Year of Manufacture: 02/08

Engine Data: 6 Cylinders; - CID; 3.5 Liters; - cc

Engine Placement: - Longitudinal; or X Lateral

Transmission: 4 Speed; - Manual; X Automatic; - Overdrive

Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive

Odometer Reading km

Options: X A/C; X Power Steering; X Power Brakes; X Power Windows

DATA FROM TIRE PLACARD

Tire Pressure* (at capacity); 210 kPa FRONT

210 kPa REAR

Recommended Tire Size: P225/60R16

Tires on Test Vehicle: P225/60R16 ; Manufacturer: Goodyear

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 Max Capacity Loading = 428.0 kg (A)

No. of Occupants x 68.04 kg. = 340.20 kg (B)

Vehicle Cargo Capacity = 87.80 kg (A-B)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

	LEFT SIDE (kg)	RIGHT SIDE (kg)	TOTAL (kg)	PERCENT
FRONT =	490.0	508.0	998.0	62.0%
REAR=	304.0	308.0	612.0	38.0%

TOTAL DELIVERED WEIGHT (UDW) : 1610.0 kg

* Tire pressure used in test.

DATA SHEET 1
GENERAL TEST AND VEHICLE PARAMETER DATA (Continued)

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Max. Fluids	=	1610	kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	87.8	kg (B)
Weight of instrumented SID H3 (81.2 kg)	=	81.2	kg (C)
TEST VEHICLE TARGET WEIGHT:	=	1779.0	kg (A+B+C)

FULLY LOADED TEST VEHICLE (UDVW + SID H3 + CARGO):

	LEFT SIDE	RIGHT SIDE (kg)	TOTAL (kg)	PERCENT
FRONT =	522.0	518.0	1040.0	58.3%
REAR=	378.0	365.0	743.0	41.7%

TOTAL FULLY LOADED WEIGHT : 1783.0 kg

AS TESTED WEIGHT OF TEST VEHICLE (1 SID H3 + CARGO + EQUIPMENT & INSTRUMENTION

	LEFT SIDE	RIGHT SIDE (kg)	TOTAL (kg)	PERCENT
FRONT =	520.5	519.0	1039.5	58.7%
REAR=	370.5	360.5	731.0	41.3%

TOTAL TEST WEIGHT: 1770.5 kg

TEST VEHICLE ATTITUDE;

	As Delivered	Fully Loaded	Ready for Test
Left Front (mm)	756	745	755
Left Rear (mm)	765	727	734
Right Front (mm)	755	725	754
Right Rear (mm)	755	749	749
Front Bumper Angle	-0.2 deg	0.1 deg	0.1 deg
Left Door Sill Angle	-0.3 deg	0.3 deg	0.2 deg
Rear Bumper Angle	0.5 deg	0.2 deg	0.2 deg
Right Door Sill	0.1 deg	-0.4 deg	-0.2 deg

Test Vehicle Wheelbase: 2810 millimeters

C.G. = 1160.2 millimeters rearward of front wheel centerline

DATA SHEET 1
GENERAL TEST AND VEHICLE PARAMETER DATA (Continued)

TOTAL VEHICLE LENGTH: (Pre Test)

Right Side = 4969 mm
Centerline = 5098 mm
Left Side = 4971 mm

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel = 286 mm
Total Number of Adjustment Positions or Detents = N/A (Power seat)

As-Tested Position:

Detent: Mid-position
Distance from full forward: 143 mm

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Torso Angle = 15.2* degrees

As-Tested Position:

Seat Back Torso Angle = 15.2* degrees

** Seat back was reclined 15.2 degrees from full forward position. Measurement was taken from the head restraint post*

ADJUSTABLE STEERING COLUMN POSITION:

Detent: **
Test Angle: 23.4 deg

** 4th detent from uppermost position (uppermost position = 0)

WINDOW POSITIONS:

Right Front= Open Right Rear= Open
Left Front = Open Left Rear = Open

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Capacity= 66.24 L
Test Volume = 60.94 L (92% to 94% of Useable Capacity)

LOCATION OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:

Wheelbase = 2810 mm
Impact Reference Line is 1408 mm rearward of front axle centerline

DATA SHEET 2
TEST VEHICLE SUMMARY OF RESULTS

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 2008 Chevrolet Impala

Body Style: 4-door Sedan VIN: 2G1WB58K381222404

NHTSA No.: 2G1WB58K381222404 Test Date: 7/08/08

Overall Length = 5098 millimeters; Overall Width = 1836 millimeters

VEHICLE TEST WEIGHT (Pre-Test):

Left Front	=	520.5 kg	Left Rear	=	370.5 kg
Right Front	=	519.0 kg	Right Rear	=	360.5 kg
TOTAL FRONT	=	1039.5 kg	TOTAL REAR	=	731.0 kg

TOTAL VEHICLE WEIGHT 1770.5 kg

Wheelbase = 2810 millimeters

Longitudinal C.G. from Center of Front Axle = 1160.2 millimeters

Impact Angle with Respect to Impactor = 90 degrees

ACTUAL IMPACT POINT

Actual Impact Point is 10 mm forward of nominal impact ref. line (Lateral)

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (	250 mm above ground)	=	267 millimeters
2. LEVEL 2 (	501 mm above ground)	=	337 millimeters
3. LEVEL 3 (	620 mm above ground)	=	351 millimeters
4. LEVEL 4 (	875 mm above ground)	=	330 millimeters
5. LEVEL 5 (	1398 mm above ground)	=	134 millimeters

Maximum Post-Test Intrusion = 351 millimeters

OCCUPANTS: Left Front:

Dummy Identification 270

Restraints Used 3-Point, SRS Side Curtain, SRS Torso Airbag, Head Restraint

INSTRUMENTATION:

Number of Data Channels:		=	42
Number of Cameras:	Onboard	=	3
	Offboard	=	10
	TOTAL	=	13

DATA SHEET 3
POST TEST OBSERVATIONS

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108

VISIBLE DUMMY CONTACT POINTS:

	SID HIII
Head:	Side Curtain Airbag
Upper Torso:	Seat Torso Airbag / Left Side Door
Lower Torso:	Seat Torso Airbag / Left Side Door
Left Knee:	Left Side Door / Armrest
Right Knee:	Left Knee

DOOR OPENING:

	LEFT DOOR	RIGHT DOOR
Front:	Closed, Tools required	Closed, Operable, No tools required
Rear:	Closed, Tools required	Closed, Operable, No tools required

ARM REST LOCATIONS:

Front: Inboard

Rear: Inboard

SEAT MOVEMENT:

Front: Lateral movement

Rear: None

GLAZING DAMAGE:

Windshield: Severe cracking on left side

Window: Not Applicable

PILLAR PERFORMANCE:

No Separation

SILL SEPARATION:

No Separation

AIR BAG DEPLOYMENT STATUS:

	DRIVER	FRONT PASSENGER	REAR PASSENGER
FRONT	Did not Deploy	Did not Deploy	Not Applicable
SIDE	Deployed	Deployed	Deployed

OTHER NOTABLE IMPACT EFFECTS:

The non-struck side side curtain airbag deployed during test event

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 4
SID/HIII INSTRUMENTATION DATA

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108

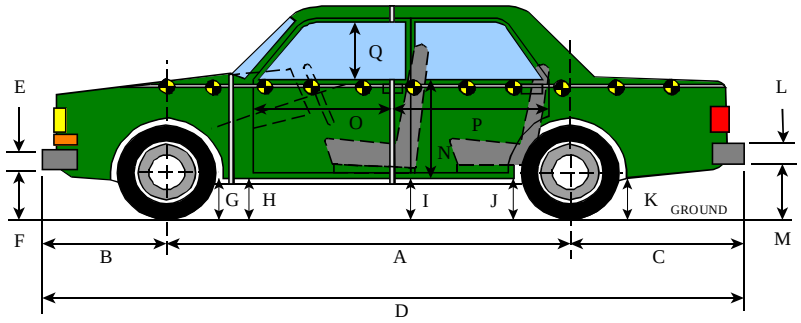
	Front Dummy ID# 270			
	Pos. Direction		Neg. Direction	
	Max	Time	Max	Time
HEAD ACCELERATIONS:	(g)	(msec)	(g)	(msec)
Longitudinal X	9.4	23.3	-15.1	60
Lateral Y	48.4	52.9	-9.4	177.8
Vertical Z	12.4	43.2	-16.9	55.3
Resultant R	51.9	54.3	0.1	18.6
HIC	224.0			
NECK LOADS:	(N)	(msec)	(N)	(msec)
Longitudinal X	410.7	173.2	-375.7	59.3
Lateral Y	166.7	54.0	-426.6	173.2
Vertical Z	6266.8	173.3	-5746	172.9
Resultant R	6286.9	173.3	5.0	-55.1
NECK MOMENTS:	(N-m)	(msec)	(N-m)	(msec)
Longitudinal X	15.3	32.0	-77.9	53.3
Lateral Y	21.3	100.6	-33.4	58.3
Vertical Z	299.2	60.3	-93.1	118.8
Resultant R	301.9	60.2	0.6	-59.2
RIB ACCELERATIONS:	(g)	(msec)	(g)	(msec)
Upper Rib Lateral Y	86.5	40.6	-11.8	145.6
Upper Rib Lateral Y(R)	87.9	40.6	-12.0	88.7
Lower Rib Lateral Y	71.1	43.1	-11.8	88.7
Lower Rib Lateral Y(R)	70	43.1	-12.4	88.7
SPINE ACCELERATIONS:	(g)	(msec)	(g)	(msec)
Lower Lateral Y	76.4	45.0	-16.5	81.2
Lower Lateral Y(R)	76.8	45.0	-16.3	81.2
PELVIC ACCELERATIONS:	(g)	(msec)	(g)	(msec)
Lateral Y	68.4	40.6	-6.6	66.9
Lateral Y(R)	68.5	40.6	-6.9	66.9

REFERENCE: Positive Direction –
Longitudinal (X) = forward
Lateral (Y) = to right
Vertical (Z) = down

Note: Above data has been FIR filtered, Y(R) denotes redundant Y direction accelerometer.
Head Accelerations are filtered at SAE Class 1000, Neck Force uses Class 1000, Neck Moment uses Class 600

DATA SHEET 5
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108



LEFT SIDE VIEW

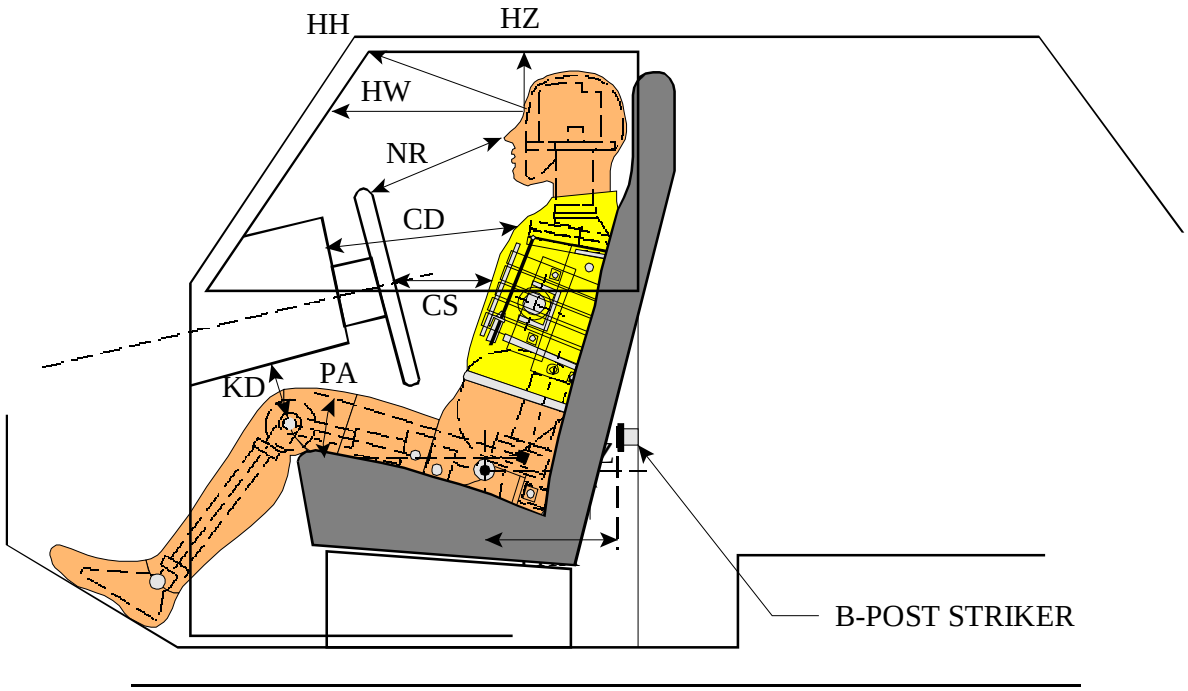
NOTE: all dimensions are in millimeters with tolerance of ±3 mm

	PRE-TEST (as delivered)	PRE-TEST (as tested)	POST-TEST (as tested)	CHANGE
A	2808	2810	2713	-97
B	1085	1085	1077	-8
C	1202	1202	1208	6
D	5098	5098	5048	-50
E	85	85	85	0
F	483	483	490	7
G	212	197	206	9
H	212	194	205	11
I	222	197	191	-6
J1	221	191	231	40
J2	227	195	241	46
K	298	257	305	48
L	125	125	125	0
M	372	330	347	17
N	696	696	441	-255
O	918	918	902	-16
P	1052	1052	1041	-11
Q	441	441	445	4
R	4969	4969	4952	-17
S	4971	4971	4887	-84
T	1836	1836	1593	-243

D = Length at Centerline E&L = Bumper Thickness R = Right Side Length S = Left Side Length
T = Width at B-Pillar J1 = To Pinch Weld J2 = To Sill

DATA SHEET 6
SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108



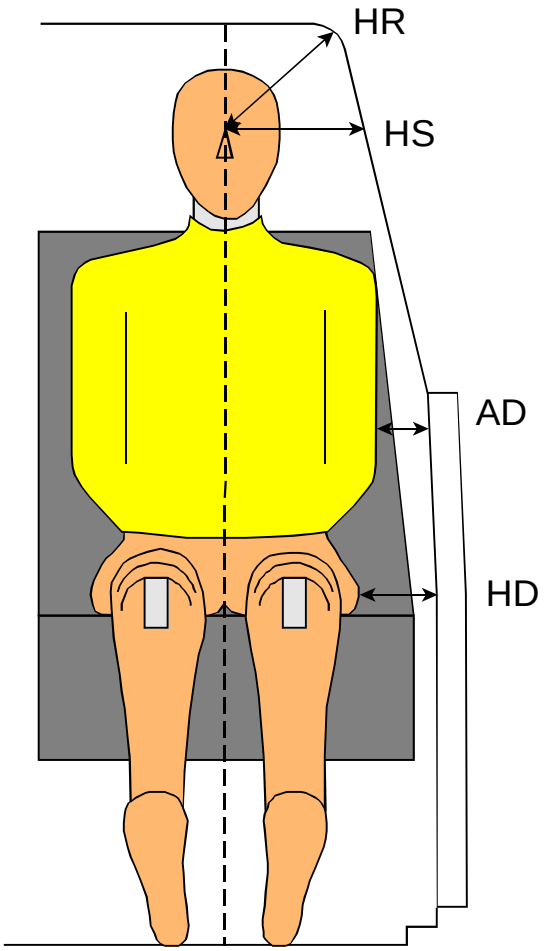
LEFT SIDE VIEW

NOTE: All dimensions are in millimeters with tolerance of ±3 mm

	SID/HIII ID# 270
HH	309
HW	612
HZ	155
NR/NB	381
CD/CB	533
CS	294
KDL(KDA°)/KBL(KDA°)	213 / (39 °)
KDR(KBA°)/KBR(KBA°)	204 / (42 °)
PA°	23.3 °
PHX	185
PHZ	115

DATA SHEET 7
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108

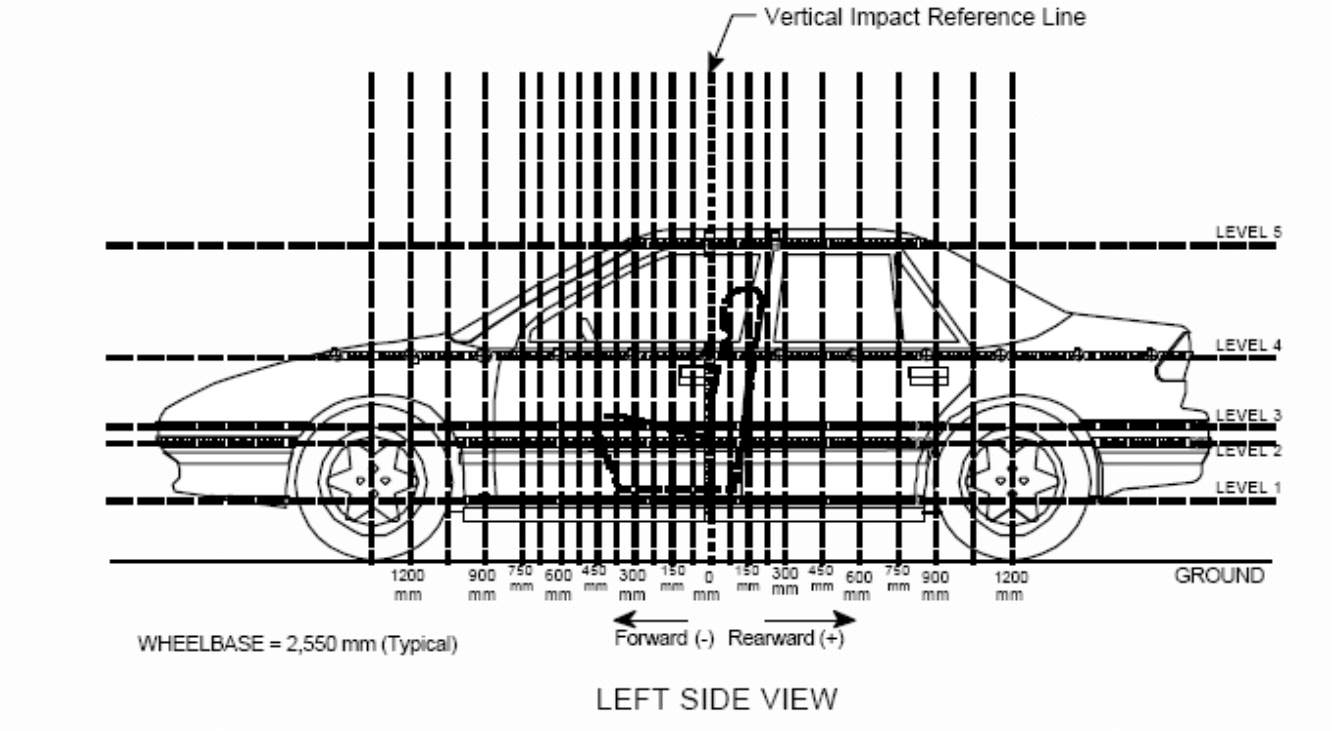


NOTE: All dimensions are in millimeters with tolerance of ±3 mm

	SID HIII ID # 270
HR	185
HS	328
AD*	122
HD	168

DATA SHEET 8
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108



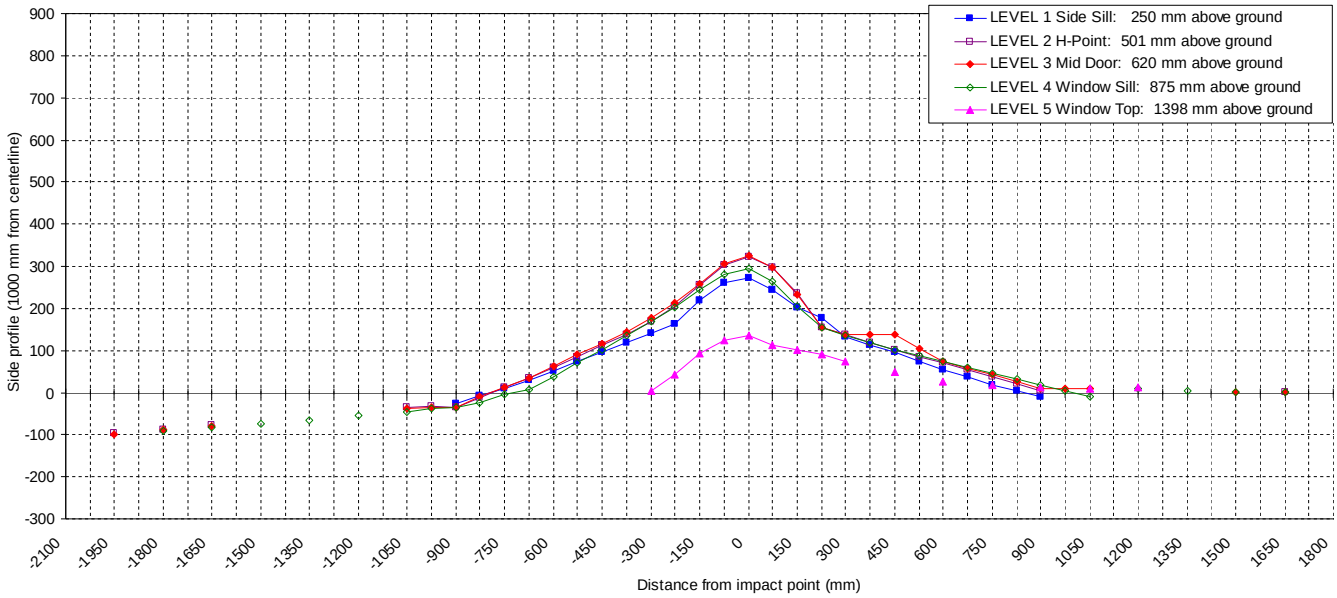
MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION.

Measurements Along the Vertical 0 mm Line Shown Above:

Level 5 @ Window Top	=	1398	millimeters
Level 4 @ Window Sill	=	875	millimeters
Level 3 @ Mid Door	=	620	millimeters
Level 2 @ Occupant H-Point	=	501	millimeters
Level 1 @ Sill Top Height	=	250	millimeters

DATA SHEET 9
VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

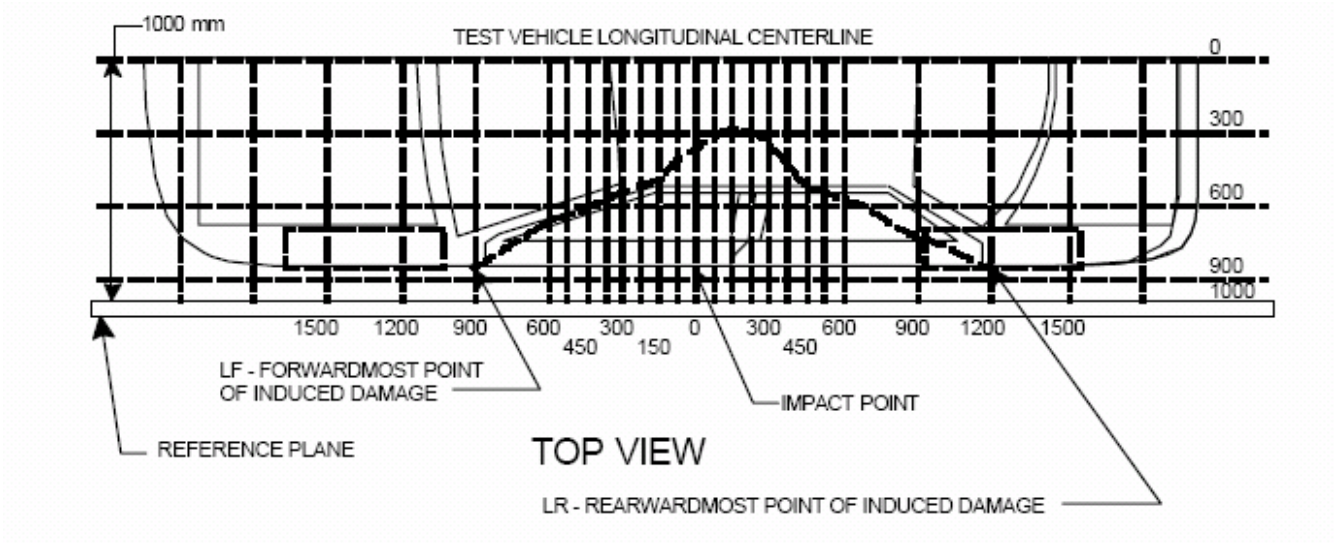
Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108



			DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT																														
LEVEL	HEIGHT (mm)		-1050	-975	-900	-825	-750	-675	-600	-525	-450	-375	-300	-225	-150	-75	0	75	150	225	300	375	450	525	600	675	750	825	900	975	1050	1125	1200
LEVEL 1		PRE	--	--	143	--	146	146	146	146	145	145	145	144	143	142	141	141	142	142	142	--	143	--	145	--	146	--	141	--	--	--	--
SIDE	250	POST	--	--	103	--	141	164	186	213	239	267	294	324	359	409	402	356	319	286	259	--	209	--	172	--	148	--	131	--	--	--	--
SILL		CRUSH	N/A	N/A	-40	N/A	-5	18	40	67	94	122	149	180	216	267	261	215	177	144	117	N/A	66	N/A	27	N/A	2	N/A	-10	N/A	N/A	N/A	N/A
LEVEL 2		PRE	--	--	90	--	93	93	93	92	91	90	89	89	89	88	88	88	88	88	89	--	90	--	91	--	92	--	90	--	--	--	--
H	501	POST	--	--	52	--	107	133	158	182	206	235	270	316	374	408	425	388	333	240	222	--	188	--	155	--	123	--	85	--	--	--	--
POINT		CRUSH	N/A	N/A	-38	N/A	14	40	65	90	115	145	181	227	285	320	337	300	245	152	133	N/A	98	N/A	64	N/A	31	N/A	-5	N/A	N/A	N/A	N/A
LEVEL 3		PRE	78	--	87	--	89	89	88	87	86	85	85	84	83	83	82	82	82	83	83	--	83	--	84	--	86	--	86	--	82	--	--
MID	620	POST	28	--	47	--	102	129	154	179	207	250	287	323	376	419	433	397	334	244	227	--	227	--	163	--	132	--	99	--	56	--	--
DOOR		CRUSH	-50	N/A	-40	N/A	13	40	66	92	121	165	202	239	293	336	351	315	252	161	144	N/A	144	N/A	79	N/A	46	N/A	13	N/A	-26	N/A	N/A
LEVEL 4		PRE	144	--	135	--	129	128	125	124	121	120	118	116	115	115	114	112	112	111	111	--	110	--	110	--	109	--	109	--	88	--	107
WINDOW	875	POST	86	--	88	--	114	134	164	196	230	267	305	347	396	437	444	422	354	285	268	--	236	--	204	--	172	--	144	--	85	--	118
SILL		CRUSH	-58	N/A	-47	N/A	-15	6	39	72	109	147	187	231	281	322	330	310	242	174	157	N/A	126	N/A	94	N/A	63	N/A	35	N/A	-3	N/A	11
LEVEL 5		PRE	--	--	--	--	--	--	--	--	--	--	--	--	399	387	384	384	385	385	386	--	386	--	387	--	389	--	395	--	424	--	--
WINDOW	1398	POST	--	--	--	--	--	--	--	--	--	--	--	--	485	482	496	502	519	496	485	--	465	--	447	--	430	--	420	--	432	--	--
TOP		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	86	95	112	118	134	111	99	N/A	79	N/A	60	N/A	41	N/A	25	N/A	8	N/A	N/A

DATA SHEET 10
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108



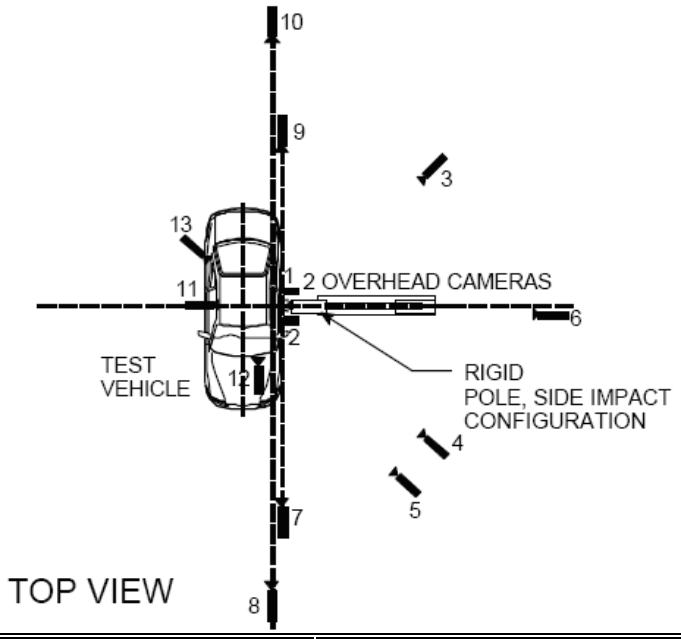
MEASUREMENT CONVENTIONS:
Forward of the impact point (towards front of vehicle) is considered positive (-).
Rearward of the impact point (toward rear of vehicle) is considered negative (+).

NOTE: All dimensions are in millimeters with tolerance of ±3 mm.

DPD MEASUREMENTS (mm)		POST TEST (mm)	PRETEST (mm)	STATIC CRUSH (mm)
1 (LR)	900	210	192	18
2	585	234	155	79
3	270	332	182	150
4	-45	465	152	313
5	-360	303	154	149
6 (LF)	-675	193	157	36

DATA SHEET 11
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead view of test vehicle	970	180	-4375	90	8	1000
2	Overhead closeup view of impact plane	390	180	-4375	90	28	1000
3	Left side 45° – rearward pole view	2241	2509	1241	-6	24	1000
4	Left side 45° – forward pole view	2669	2989	1333	-5	24	1000
5	Real time (30 fps) film coverage of test	-	-	-	-	-	30
6	Left side – rear pole view	615	1736	2030	-22	24	1000
7	Front ground level – vehicle/pole impact	9508	120	910	-2	50	1000
8	Front ground level – vehicle roof targets and vehicle/pole impact	9708	410	1080	-2	24	1000
9	Rear ground level – vehicle/pole impact	7259	665	924	-3	50	1000
10	Rear ground level – view of rear roof targets	7548	348	927	-1	28	1000
11	Test vehicle onboard -- side view of SID H3	1722	261	1069	5	12	1000
12	Test vehicle onboard– front view of SID H3	471	1561	1249	9.5	25	1000
13	Test vehicle onboard– 3/4 rear view of SID H3	1753	661	1141	7	12.5	1000

* Reference (from point of impact); all measurements accurate to within ±6 mm.

+X = Film plane to impact location
+Y = Film plane to monorail centerline
+Z = film plane to ground (excluding moving cart height)

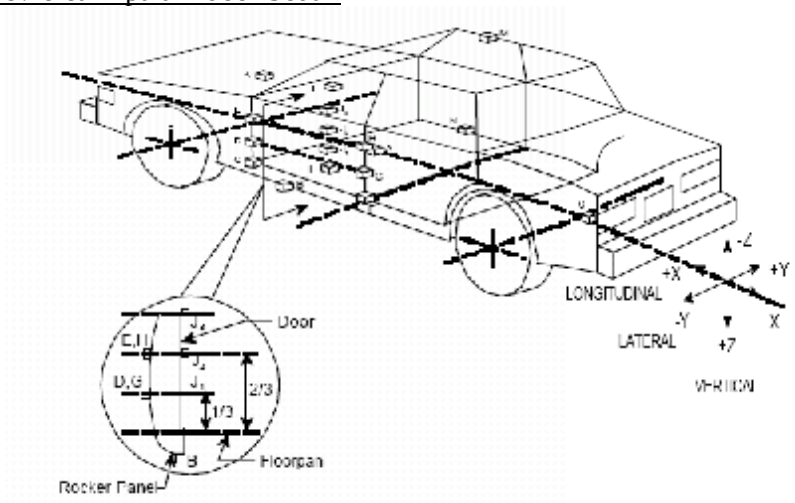
DATA SHEET 12
DUMMY DAMAGE CHECKLIST – SID/HIII

Dummy Serial No. 270 Date: July 8, 2008

OK	Damaged	(Begin with general cleaning)
X	-	Outer skin on entire dummy (gashes, rips, etc.)
X	-	Head - Check that ballast is secure
X	-	Gashes, rips, general appearances, etc
X	-	Neck - Broken or cracks in rubber
X	-	Check that upper neck bracket is firmly attached to lower neck
X	-	Check for looseness at the condyle joint
X	-	Nodding blocks – cracked or out of position
X	-	Spine - Broken or cracks in rubber
X	-	Ribs - Check all ribs and rib supports for damage (bent or broken)
X	-	Check damping material or separation or cracks
X	-	Three rubber bumpers in place
X	-	Lateral Shock Absorber - Bent or broken
X	-	Transducer Leads - Torn cables
X	-	Accelerometer Mountings - (head, ribs, spine, and pelvis) - Check for secure mounting).
X	-	Knees- Check outer skin, insert and casting (without removing insert)
X	-	Limbs- Check for normal movement and adjustment
X	-	Head / Neck bracket attachment - Check to see if cracked or broken

DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108



Accelerometer Location		Pre-Test (mm)			Post Test (mm)		
		X	Y	Z	X	Y	Z
A	Vehicle CG X,Y,Z	2756	-25	470	2706	28	411
B	Struck Side Front Sill Y	2756	-25	470	2706	28	411
C	Struck Side A-Pillar Sill Y	3229	-702	288	-	-	-
D	Struck Side Lower A-Pillar Y	3491	-706	349	-	-	-
E	Struck Side Middle A-Pillar Y	3495	-713	523	-	-	-
F	Struck Side B-Pillar Sill Y	3340	-663	1031	-	-	-
G	Struck Side Lower B-Pillar Y	2395	-714	390	-	-	-
H	Struck Side Middle B-Pillar Y	2400	-714	595	2344	-569	597
I	Front Outboard Seat Track Y at H-point X	2370	-714	886	2339	-564	868
J	Front Door Y (3) – 480 mm forward of impact	-	-	-	-	-	-
K	Top of Engine X,Y	4378	105	756	4338	-20	729
L	Center of Firewall Y	3895	75	855	3853	1	829
M	Unstruck Side Roof Rail Y at impact line	2599	585	1417	2593	568	1414
N	Unstuck Side Floor Sill Y at impact line	2561	714	418	-	-	-
O	Rear Axle Floorpan X,Y	1483	-3	500	1453	-4	524

*Reference: X - Rear Bumper (Positve Forward)
Y - Vehicle Centerline (Positive To Right)
Z - Ground Level (Positive Up)

DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY (Continued)

Test Vehicle: 2008 Chevrolet Impala 4-door Sedan NHTSA No. C80108

		Longitudinal		Lateral		Vertical		Resultant	
Accelerometer		Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
A	Pos.	28.4	85.5	64.4	28.2	23.3	29.3	68.4	28.4
	Neg.	-24.2	60.4	-58.4	102	-23.8	85.3	-	-
B	Pos.	-	-	16.8	28.5	-	-	-	-
	Neg.	-	-	-4	37.4	-	-	-	-
C	Pos.	-	-	14.6	25.5	-	-	-	-
	Neg.	-	-	-2.8	11.1	-	-	-	-
D	Pos.	-	-	17.3	52.2	-	-	-	-
	Neg.	-	-	-2.4	11.4	-	-	-	-
E	Pos.	-	-	28.1	37.7	-	-	-	-
	Neg.	-	-	-15.8	30.8	-	-	-	-
F	Pos.	-	-	88.9	22.2	-	-	-	-
	Neg.	-	-	-14.9	27.9	-	-	-	-
G	Pos.	-	-	49.7	13.6	-	-	-	-
	Neg.	-	-	-87.1	26.6	-	-	-	-
H	Pos.	-	-	80.8	16.7	-	-	-	-
	Neg.	-	-	-155.5	23.1	-	-	-	-
I	Pos.	-	-	49.5	20.5	-	-	-	-
	Neg.	-	-	-75.1	72.6	-	-	-	-
J	Pos.	-	-	-	-	-	-	-	-
	Neg.	-	-	-	-	-	-	-	-
K	Pos.	3.3	94.9	21.6	65.6	-	-	-	-
	Neg.	-4.5	72.4	-1.9	234.1	-	-	-	-
L	Pos.	-	-	11.1	46.5	-	-	-	-
	Neg.	-	-	-0.8	326.1	-	-	-	-
M	Pos.	-	-	14.6	53.1	-	-	-	-
	Neg.	-	-	-3.4	26.3	-	-	-	-
N	Pos.	-	-	14	48.8	-	-	-	-
	Neg.	-	-	-0.7	164.7	-	-	-	-
O	Pos.	-0.7	164.7	13.4	64.2	-	-	-	-
	Neg.	-5.9	60.9	-1.7	189.2	-	-	-	-

SECTION 5

FMVSS NO. 301 DATA

DATA SHEET 14
SUMMARY OF FMVSS NO. 301 DATA

NHTSA TEST No.: C80108 TEST DATE: 7/08/08

VEHICLE MAKE/MODEL: 2008 Chevrolet Impala 4-door Sedan

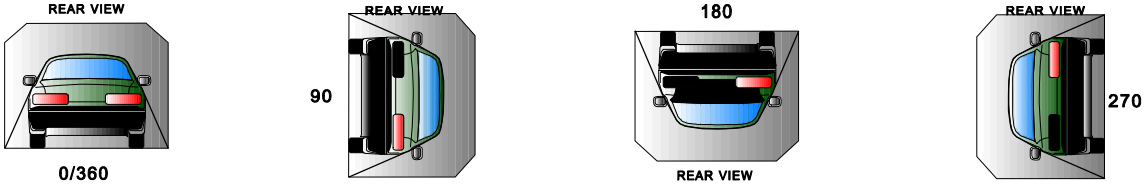
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

FUEL SPILLAGE MEASUREMENT:

Time Interval	Amount	Maximum Allowable Spillage
Impact Until Motion Ceases	0	**28 g**
First Five Minutes Following Impact	0	**142 g**
Next 25 Minutes	0	**28 g / 1 minute**

SOLVENT SPILLAGE DETAILS: None

FMVSS 301 STATIC ROLLOVER DATA



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0º - 90º	1	minutes	07	seconds	5	minutes	6	minutes	7	seconds	7	minutes
90º - 180º	1	minutes	04	seconds	5	minutes	6	minutes	4	seconds	7	minutes
180º-270º	1	minutes	06	seconds	5	minutes	6	minutes	6	seconds	7	minutes
270º-360º	1	minutes	10	seconds	5	minutes	6	minutes	10	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0º - 90º	0	0	0	N/A
90º - 180º	0	0	0	N/A
180º-270º	0	0	0	N/A
270º-360º	0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

Rollover Stage	Spillage Location
0º - 90º	None
90º - 180º	None
180º-270º	None
270º-360º	None

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (continued)

Figure A-1: As Received Left Front ¾ View

Figure A-2: As Received Right Rear ¾ View

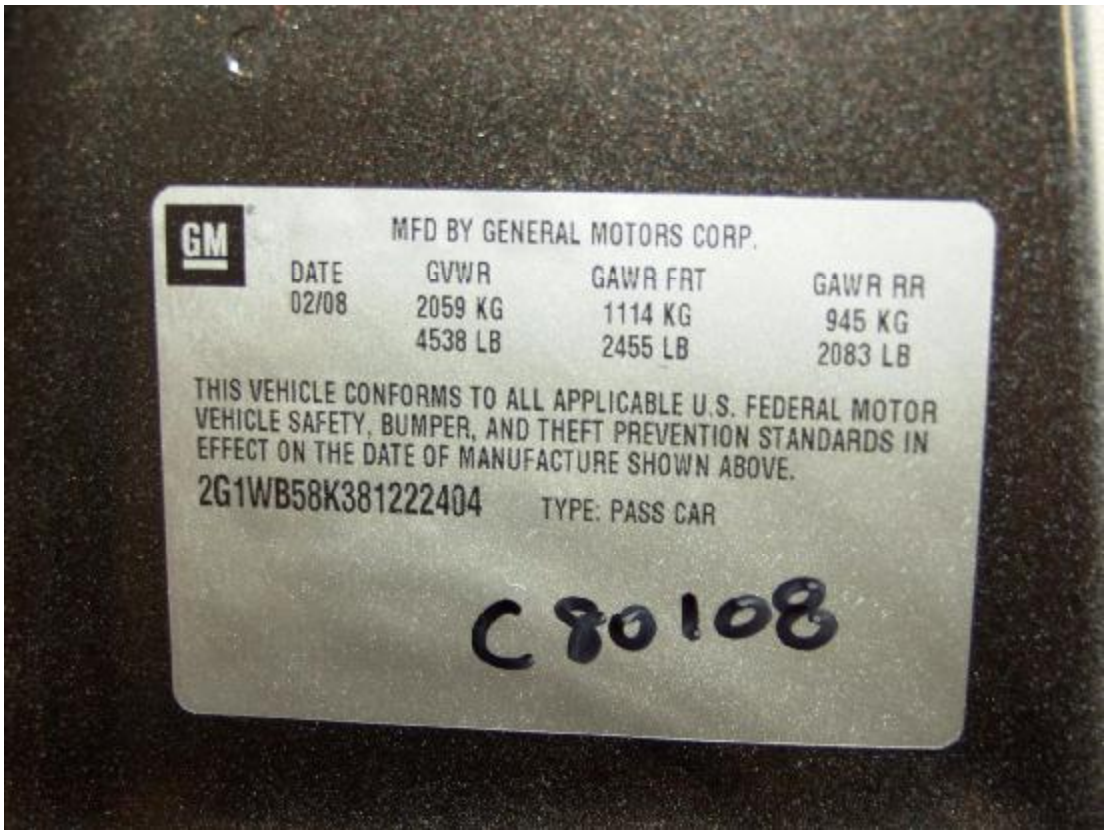


Figure A-3: Vehicle Certification Label

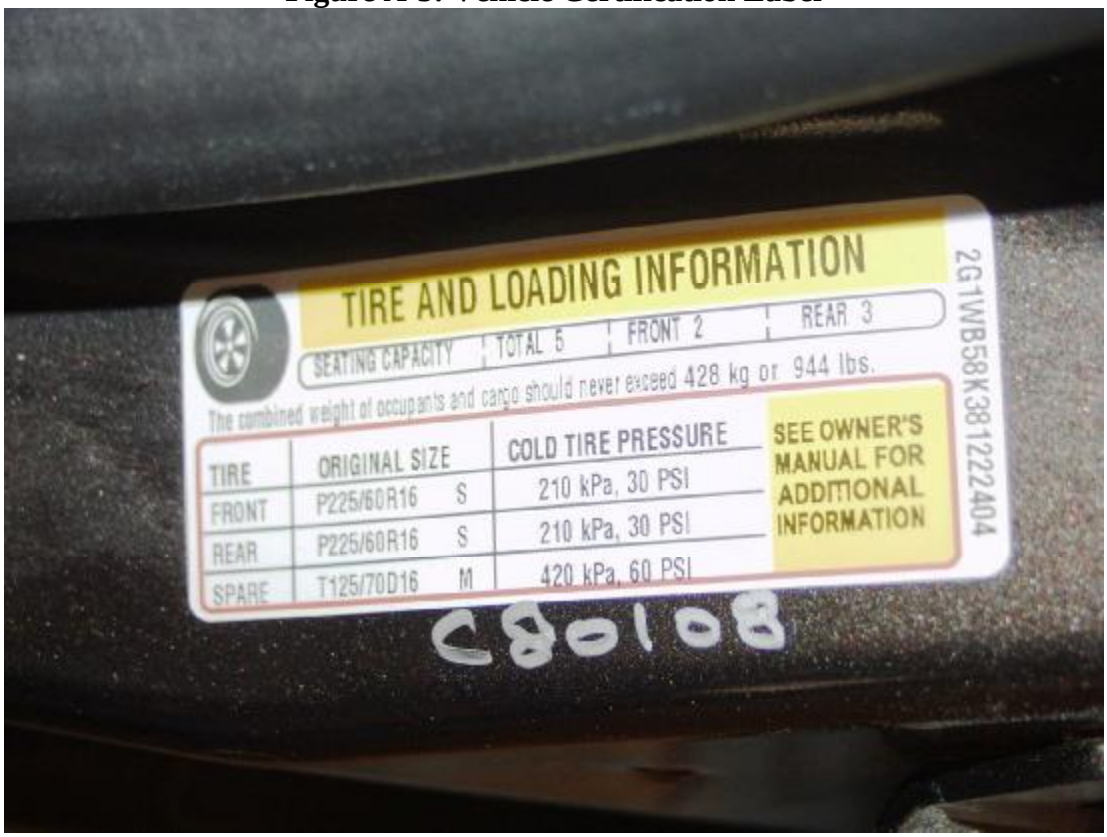


Figure A-4: Vehicle Tire Placard Label

Figure A-5: Pre-Test Front View

Figure A-6: Post-Test Front View

Figure A-7: Pre-Test Left Front ¾ View

Figure A-8: Post-Test Left Front ¾ View

Figure A-9: Pre-Test Left Side View

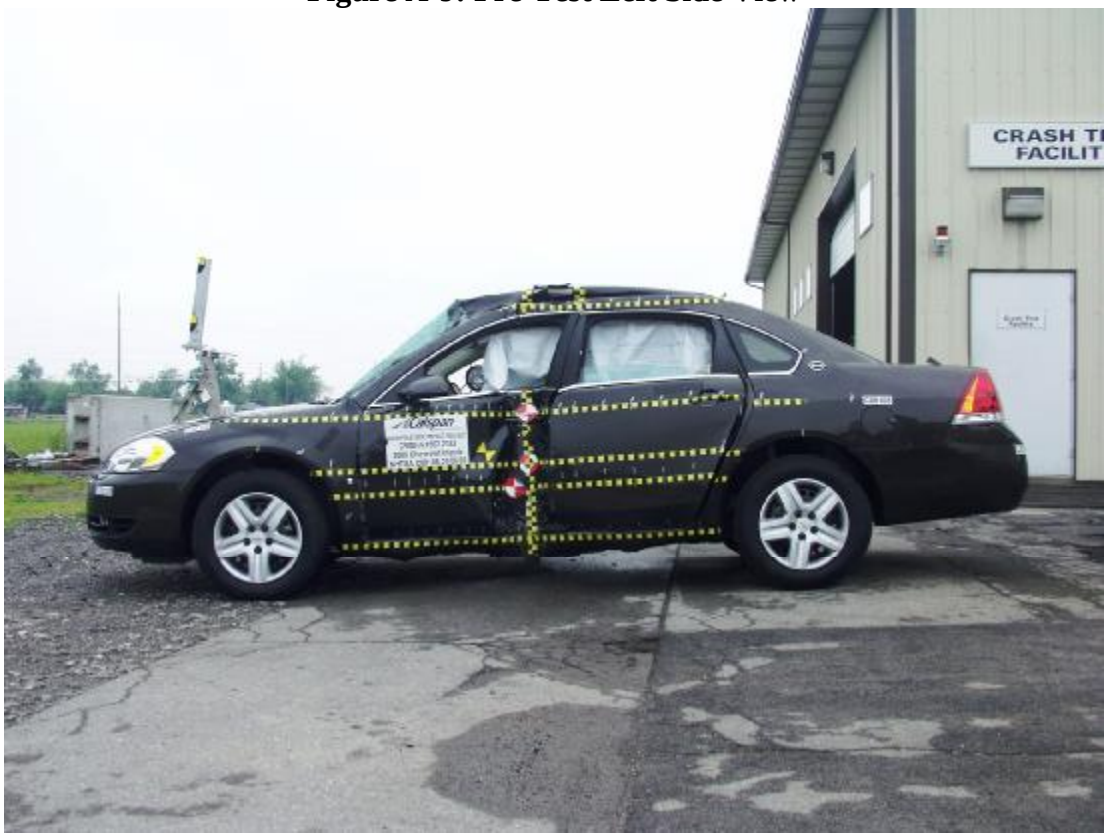


Figure A-10: Post-Test Left Side View

Figure A-11: Pre-Test Left Rear ¾ View

Figure A-12: Post-Test Left Rear ¾ View

Figure A-13: Pre-Test Rear View

Figure A-14: Post-Test Rear View

Figure A-15: Pre-Test Right Rear ¾ View

Figure A-16: Post-Test Right Rear ¾ View

Figure A-17: Pre-Test Right Side View

Figure A-18: Post-Test Right Side View

Figure A-19: Pre-Test Right Front ¾ View

Figure A-20: Post-Test Right Front ¾ View

Figure A-21: Pre-Test Left Side View of Aligned Vehicle and Pole

Figure A-22: Pre-Test Right Side View of Aligned Vehicle and Pole

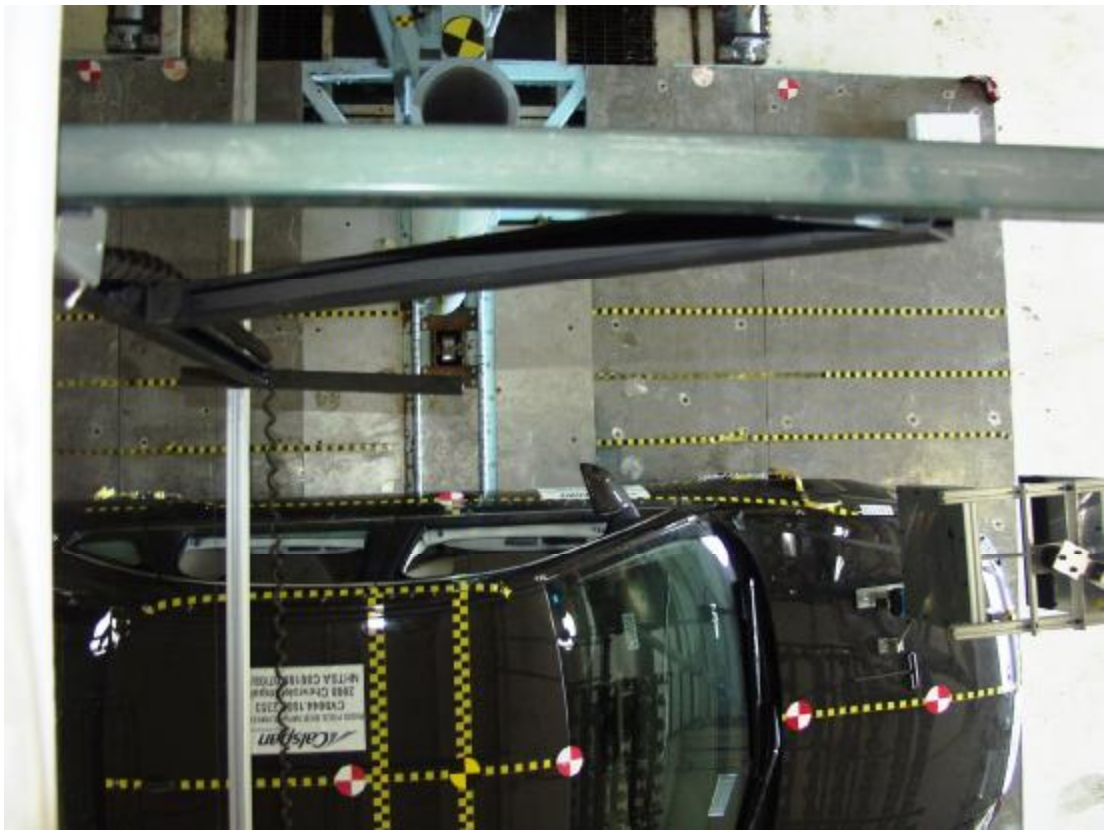


Figure A-23: Pre-Test Overhead View of Aligned Vehicle and Pole

Figure A-24: Post-Test Overhead View of Vehicle and Pole

Figure A-25: Pre-Test Close-Up View of Impact Point Target

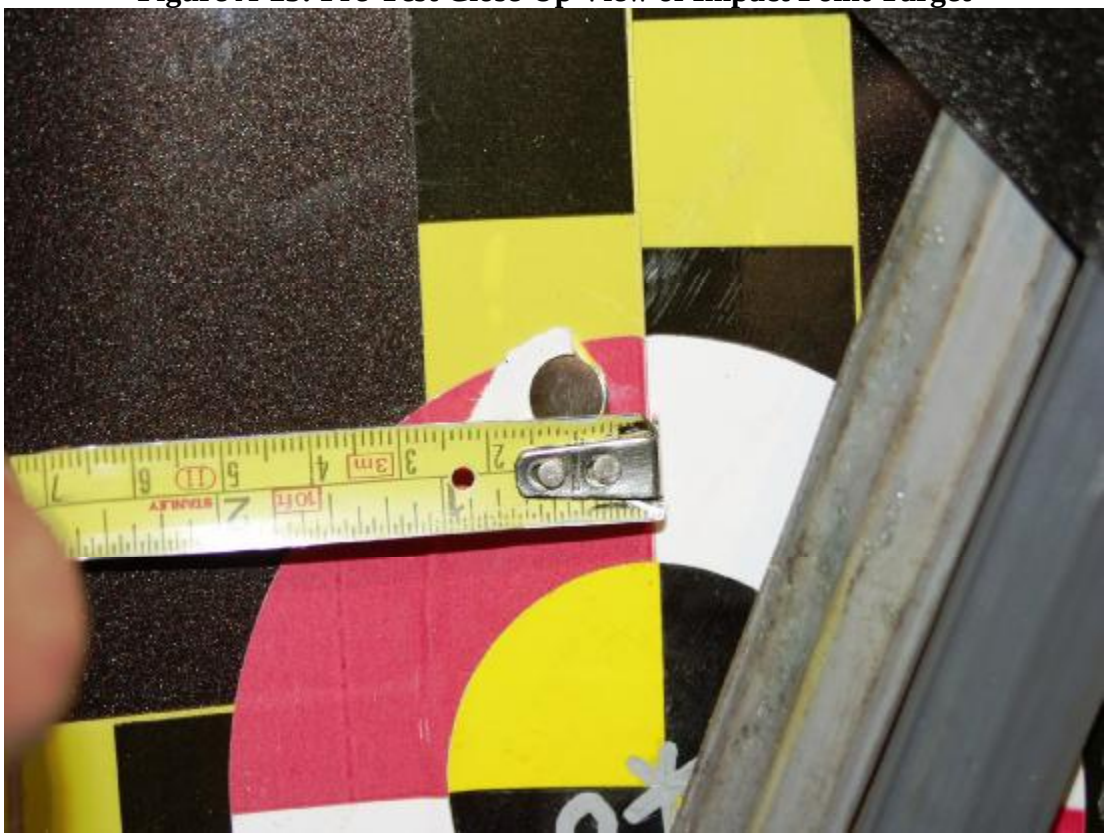


Figure A-26: Post-Test Close-Up View of Impact Point Target

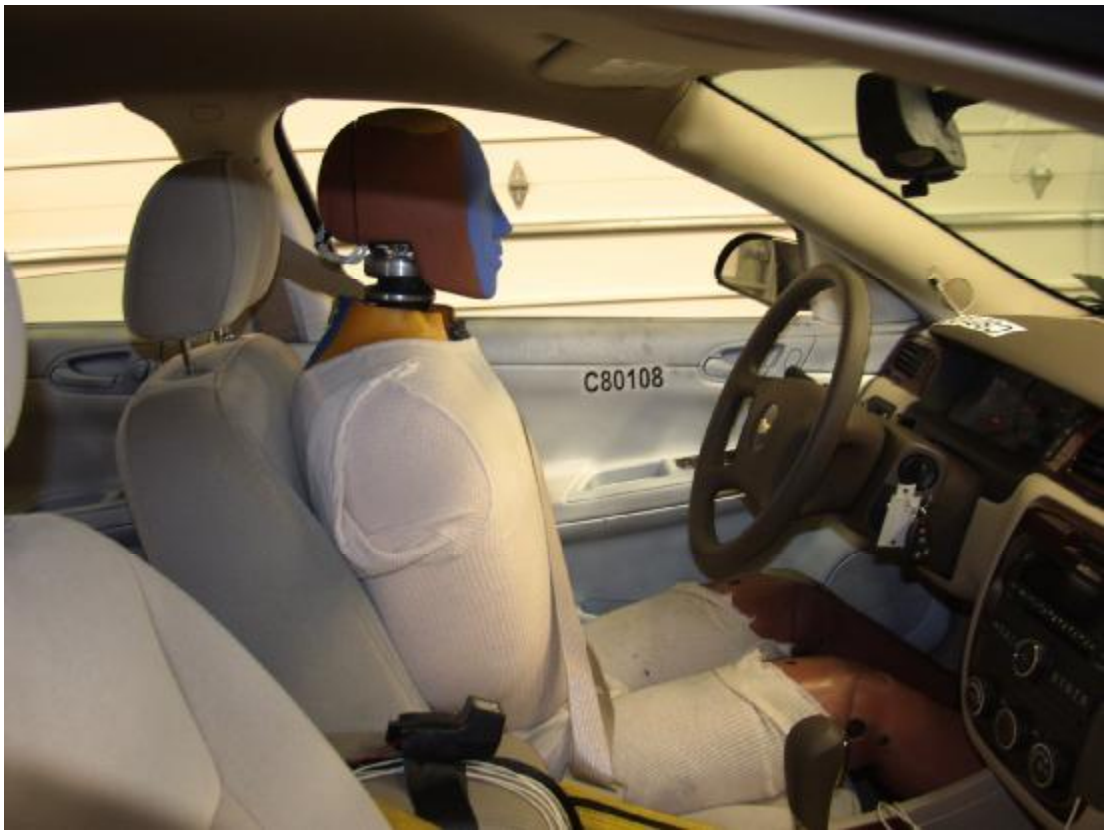


Figure A-27: Pre-Test Opposite Side View of SID HIII

Figure A-28: Post-Test Opposite Side View of SID HIII

Figure A-29: Pre-Test Impact Side View of SID HIII with Door Open

Figure A-30: Pre-Test Impact Side View of SID HIII

Figure A-31: Post-Test Impact Side View of SID HIII

Figure A-32: Pre-Test Dummy Shoulder and Door Top View

Figure A-33: Post-Test Dummy Shoulder and Door Top View

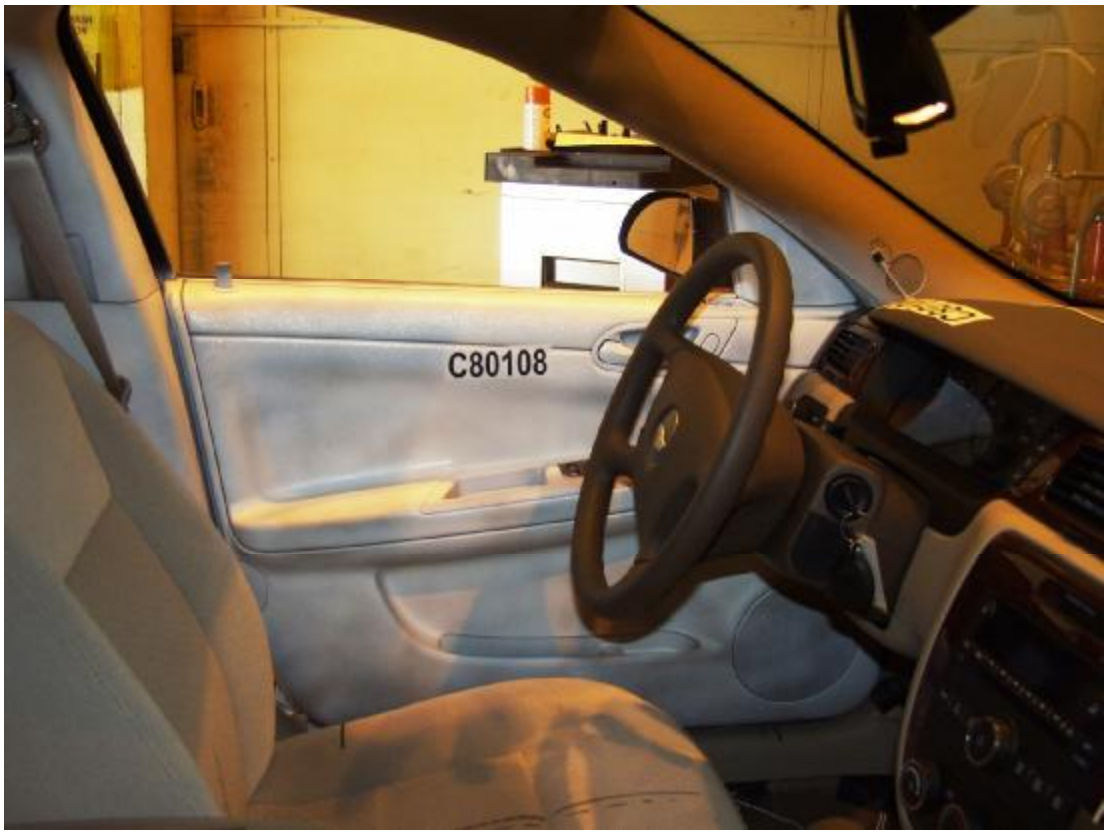


Figure A-34: Pre-Test Impact Side Front Interior Trim

Figure A-35: Post-Test Impact Side Front Interior Trim

Figure A-36: Pre-Test Left Front ¾ View of Impact Zone

Figure A-37: Post-Test Left Front ¾ View of Impact Zone

Figure A-38: Pre-Test Left Rear ¾ View of Impact Zone

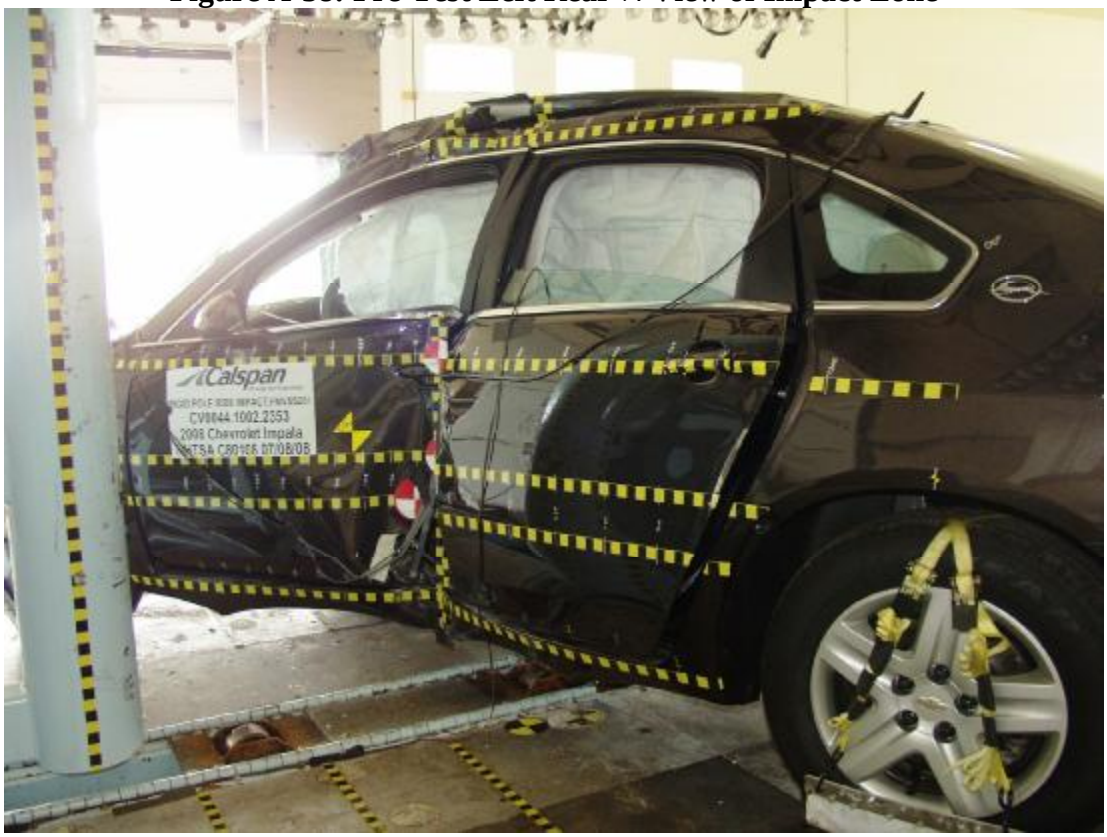


Figure A-39: Post-Test Left Rear ¾ View of Impact Zone

Figure A-40: Rollover 90 Degrees

Figure A-41: Rollover 180 Degrees

Figure A-42: Rollover 270 Degrees

Figure A-43: Rollover 360 Degrees

Figure A-44: Impact Photo

APPENDIX B

SID/HIII AND VEHICLE RESPONSE DATA

(SAE sign convention)

DATA CHANNEL FILTER CLASS SUMMARY

Data Type	SAE Filter Class
Dummy Head Accelerations	CFC 1000
Rib Accelerations	FIR 100
Spine Accelerations	FIR 100
Pelvis Accelerations	FIR 100

DATA CHANNEL TITLE KEY

Prefix	Suffix
	Ax = Acceleration, X-direction
V1 = Vehicle 1 (Test Vehicle)	Ay = Acceleration, Y-direction
P1 = Left Front Seating Position (Driver)	Az = Acceleration, Z-direction
P2 = Left Front Seating Position (Passenger)	Fx = Force, X-direction
A1-A17 = Accelerometer Location Number	Fy = Force, Y-direction
	Fz = Force, Z-direction
	Mx = Moment about X
	My = Moment about Y
	Mz = Moment about Z
	Vx = Velocity, X-direction
	Vy = Velocity, Y-direction
	Vz = Velocity, Z-direction
	R = Redundant

TABLE OF DATA PLOTS

TABLE OF DATA PLOTS (continued)

2009 FMVSS 201P Test 3 2008 Chevrolet Impala
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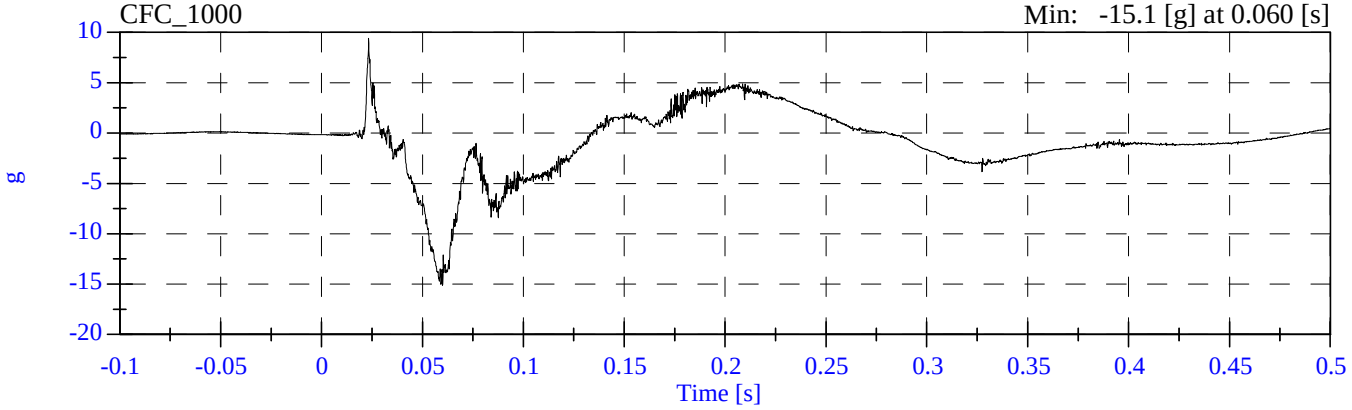
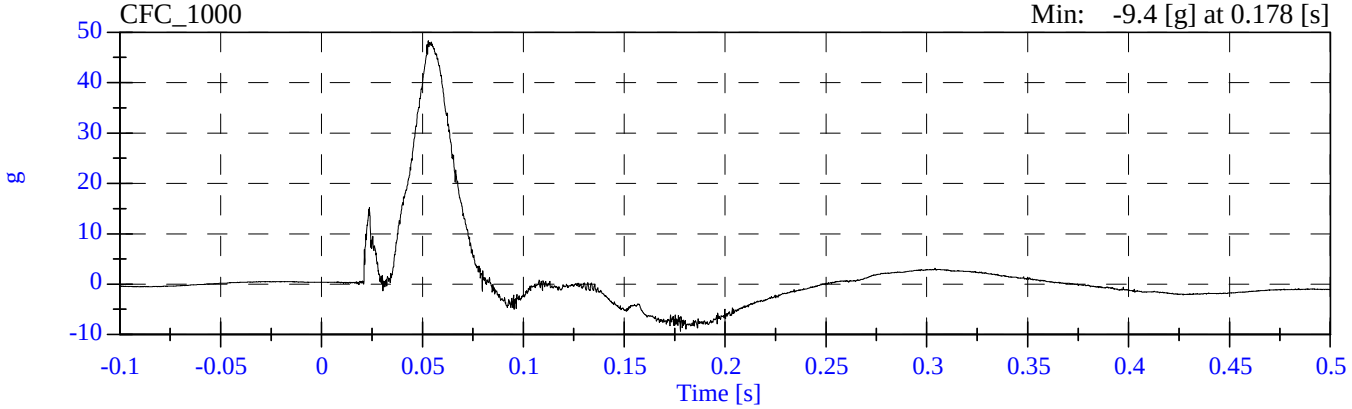
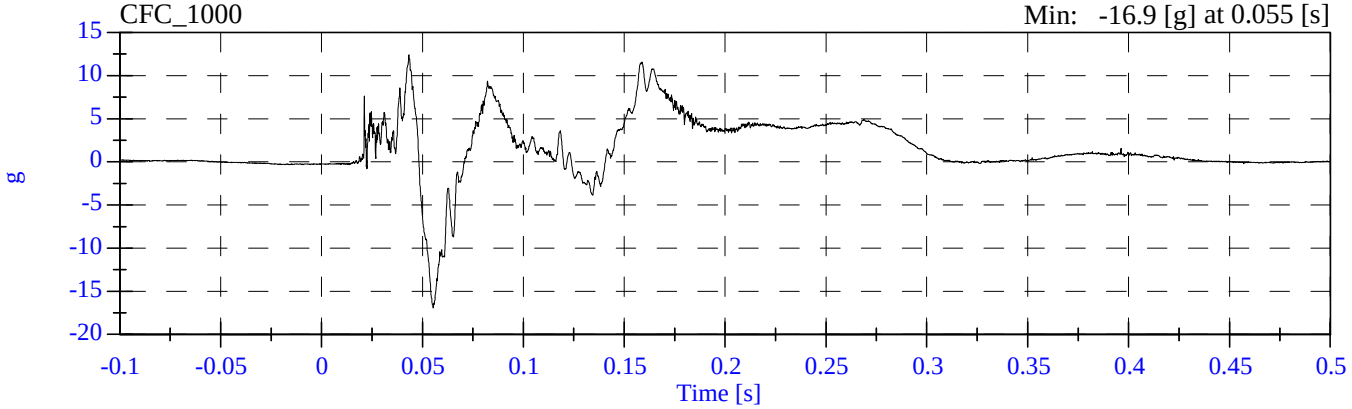
V1P1 Head x
CFC_1000
Max: 9.4 [g] at 0.023 [s]
Min: -15.1 [g] at 0.060 [s]



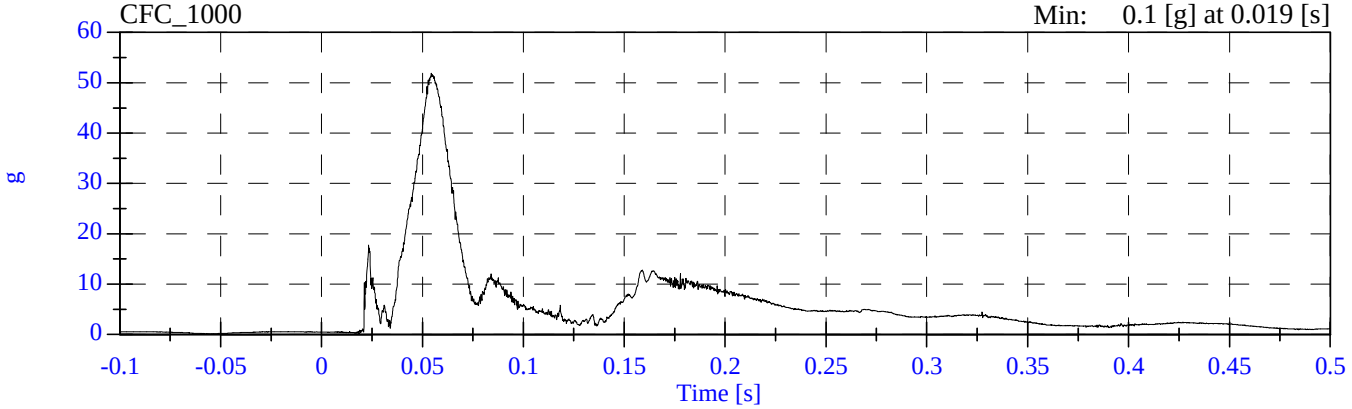
V1P1 Head y
CFC_1000
Max: 48.4 [g] at 0.053 [s]
Min: -9.4 [g] at 0.178 [s]



V1P1 Head z
CFC_1000
Max: 12.4 [g] at 0.043 [s]
Min: -16.9 [g] at 0.055 [s]



V1P1 Head Resultant
CFC_1000
Max: 51.9 [g] at 0.054 [s]
Min: 0.1 [g] at 0.019 [s]



2009 FMVSS 201P Test 3 2008 Chevrolet Impala
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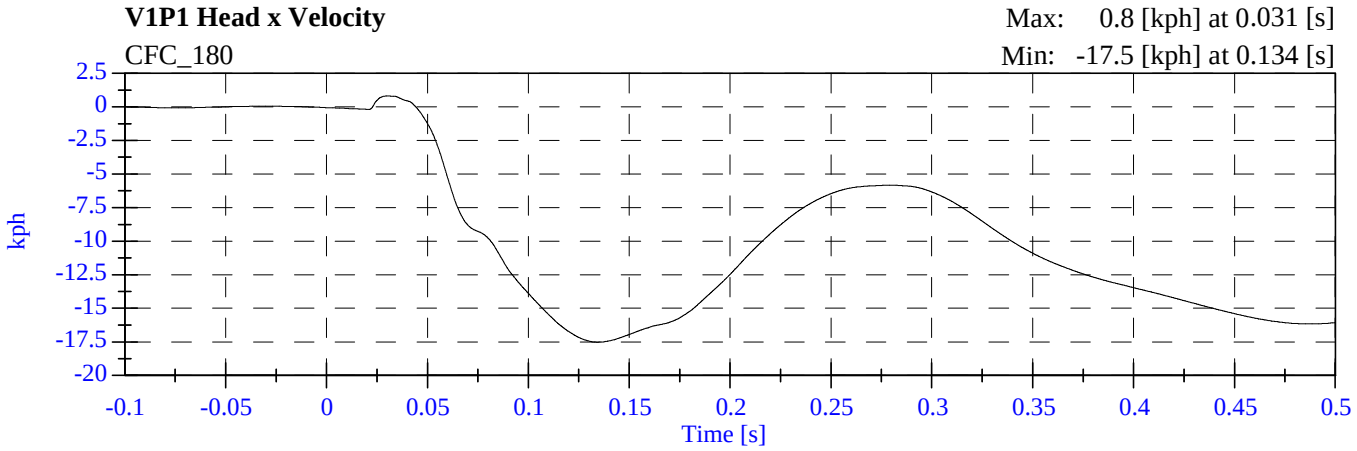

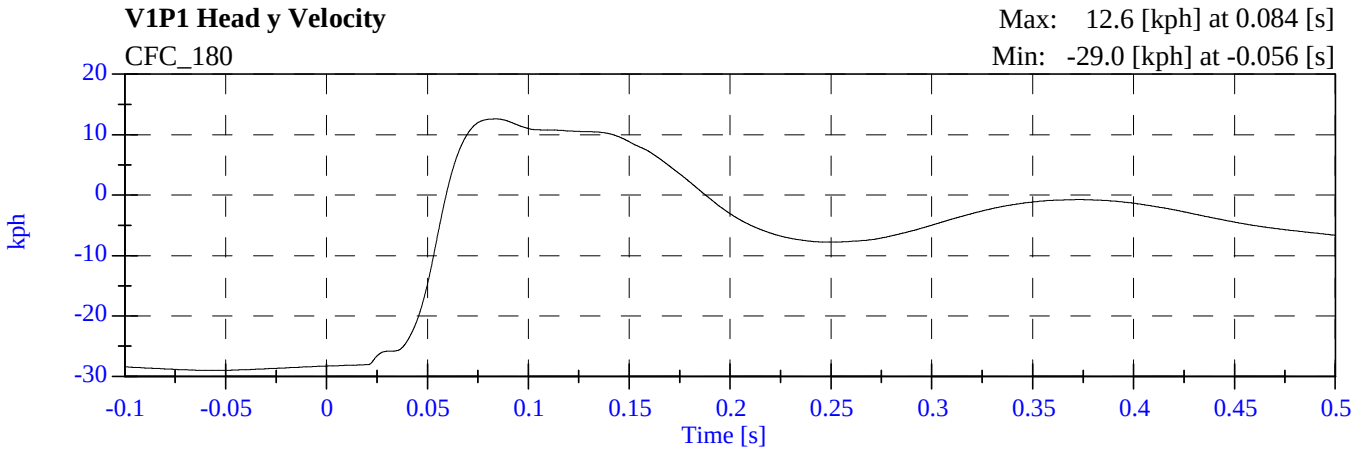

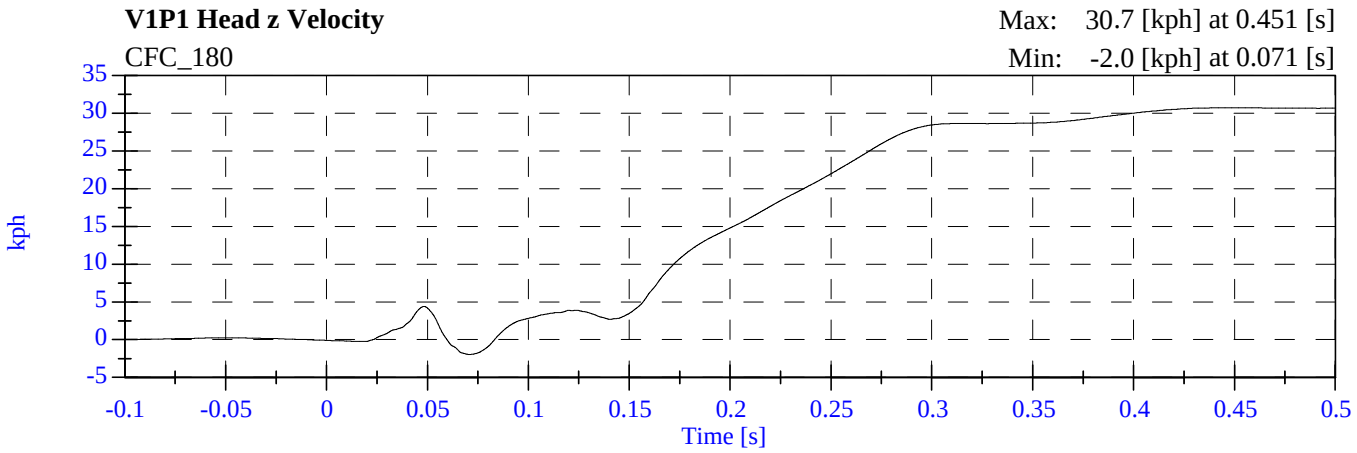

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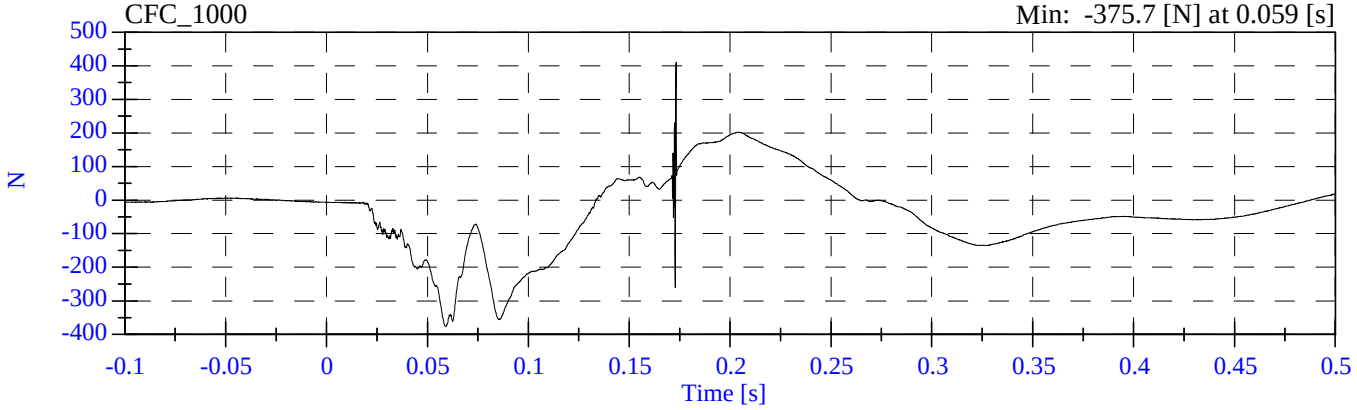
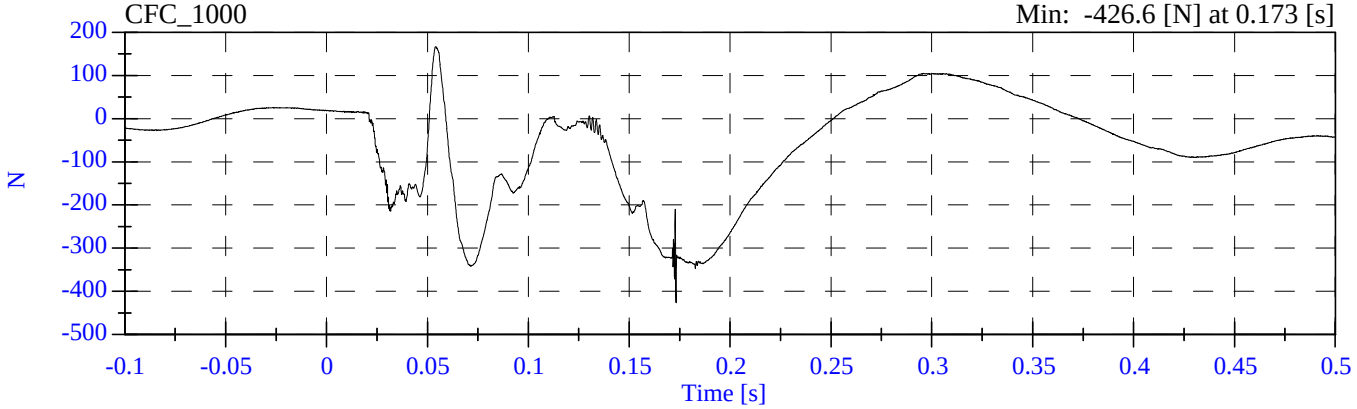
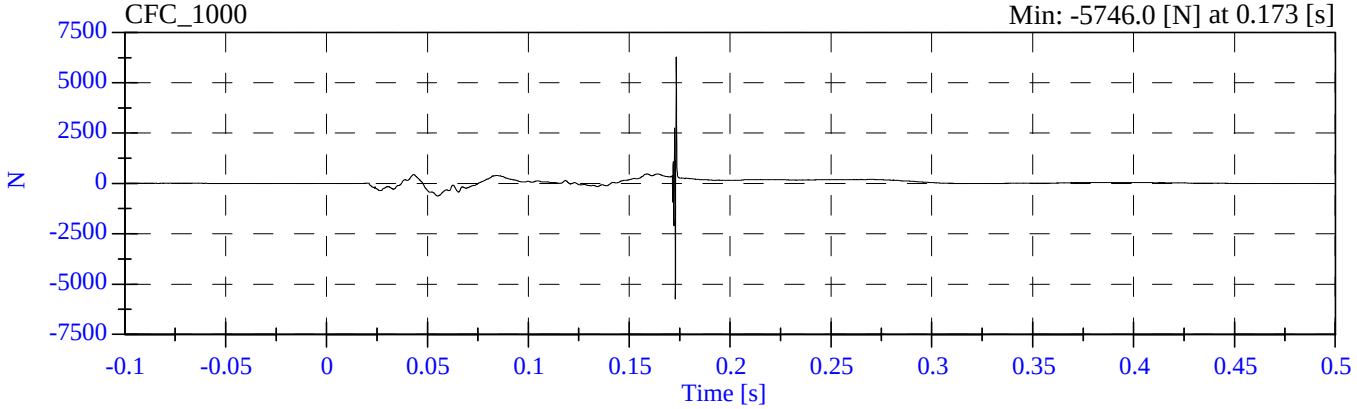
V1P1 Upper Neck Fx
CFC_1000
Max: 410.7 [N] at 0.173 [s]
Min: -375.7 [N] at 0.059 [s]



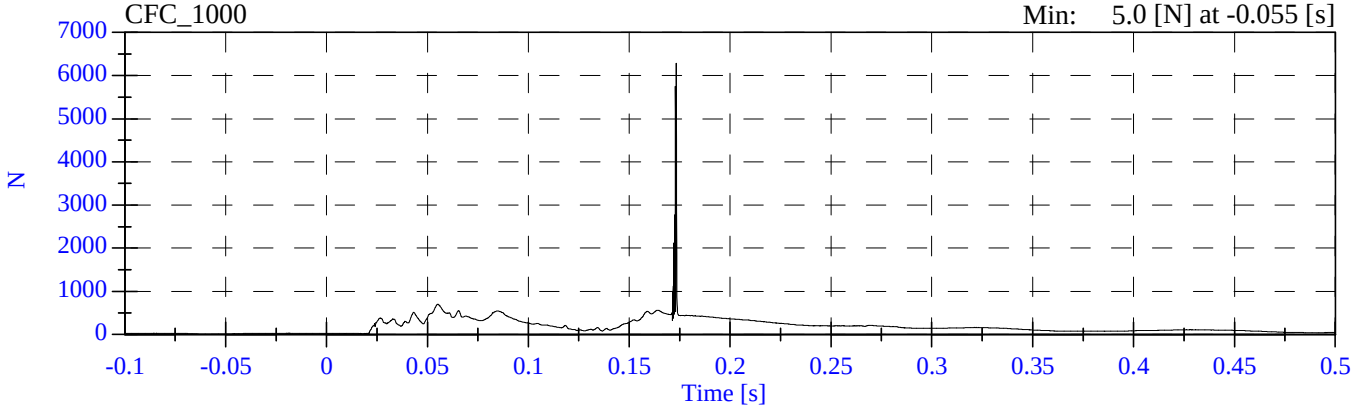
V1P1 Upper Neck Fy
CFC_1000
Max: 166.7 [N] at 0.054 [s]
Min: -426.6 [N] at 0.173 [s]



V1P1 Upper Neck Fz
CFC_1000
Max: 6266.8 [N] at 0.173 [s]
Min: -5746.0 [N] at 0.173 [s]



V1P1 Upper Neck F Resultant
CFC_1000
Max: 6286.9 [N] at 0.173 [s]
Min: 5.0 [N] at -0.055 [s]



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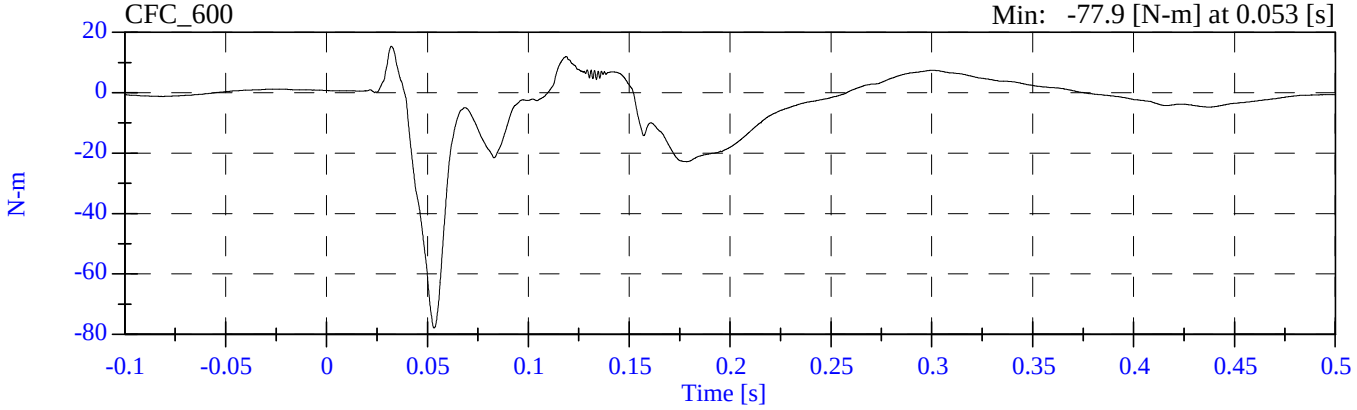
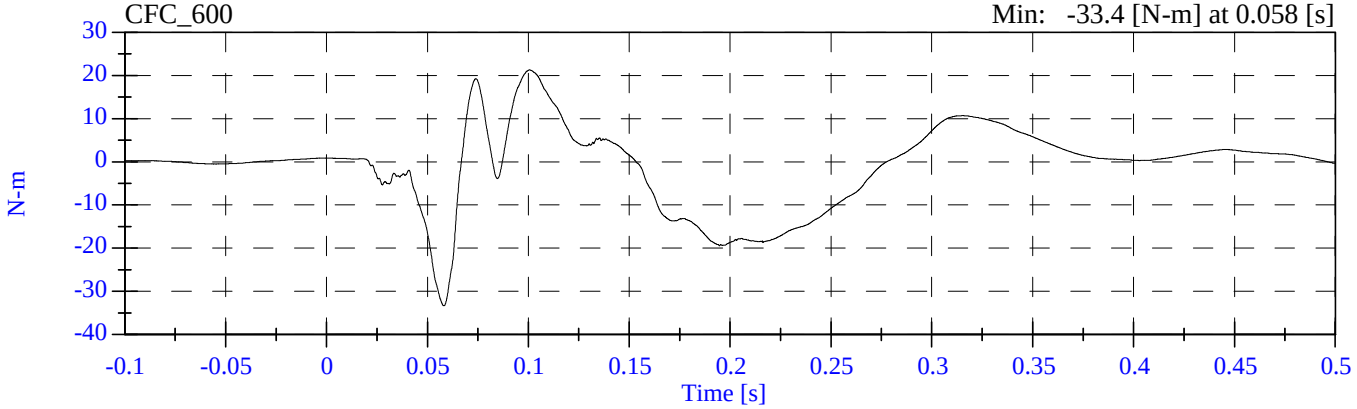
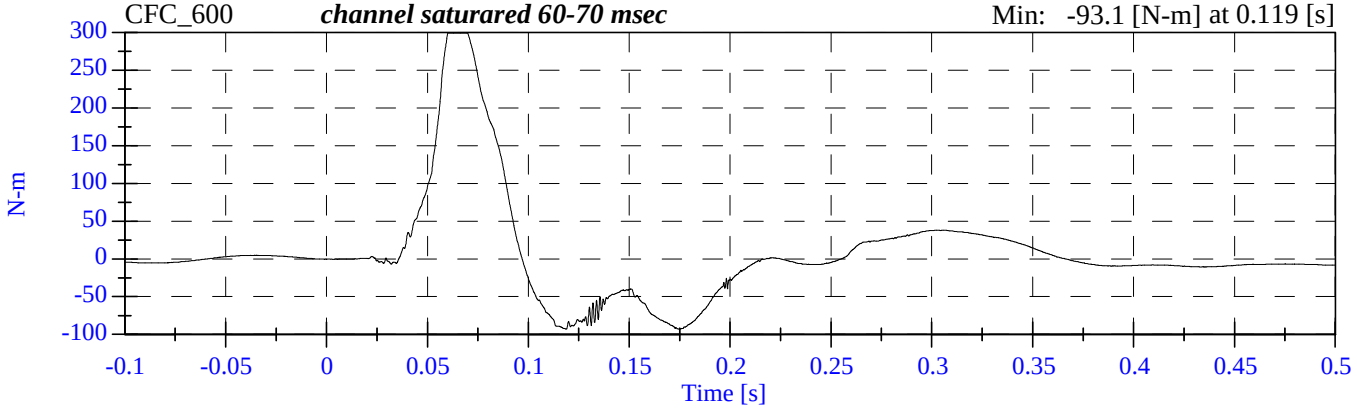
V1P1 Upper Neck Mx
CFC_600
Max: 15.3 [N-m] at 0.032 [s]
Min: -77.9 [N-m] at 0.053 [s]



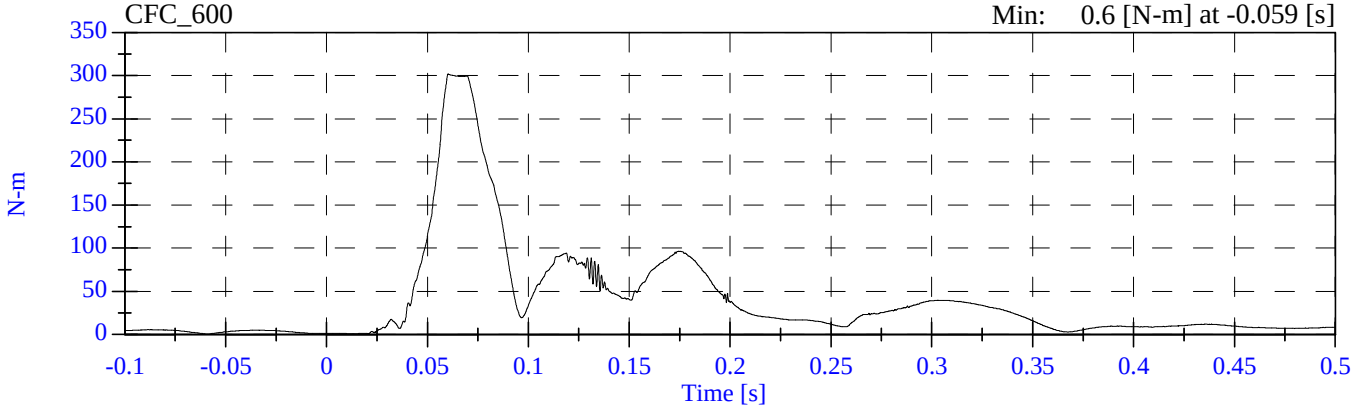
V1P1 Upper Neck My
CFC_600
Max: 21.3 [N-m] at 0.101 [s]
Min: -33.4 [N-m] at 0.058 [s]



V1P1 Upper Neck Mz
CFC_600 ***channel saturared 60-70 msec***
Max: 299.2 [N-m] at 0.060 [s]
Min: -93.1 [N-m] at 0.119 [s]



V1P1 Upper Neck M Resultant
CFC_600
Max: 301.9 [N-m] at 0.060 [s]
Min: 0.6 [N-m] at -0.059 [s]



2009 FMVSS 201P Test 3 2008 Chevrolet Impala
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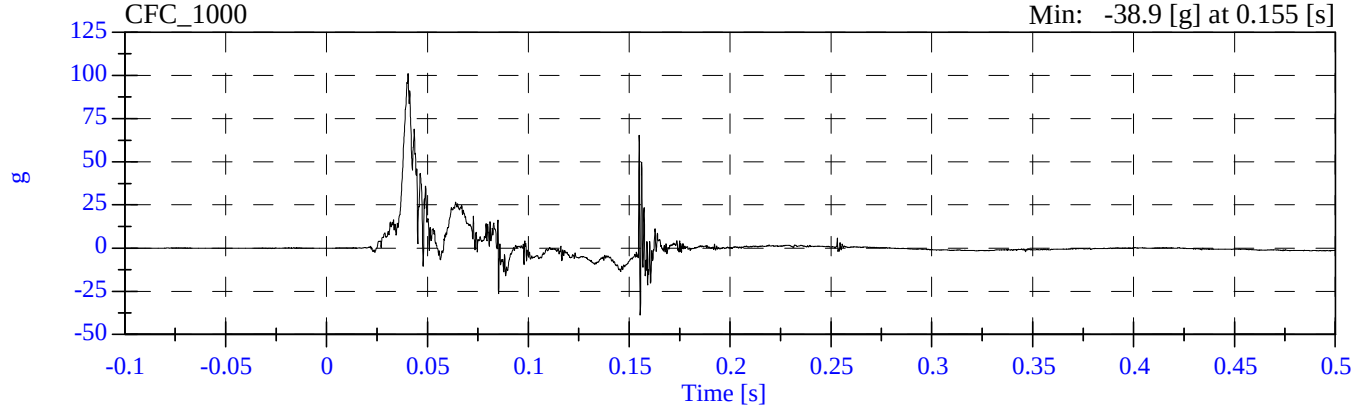
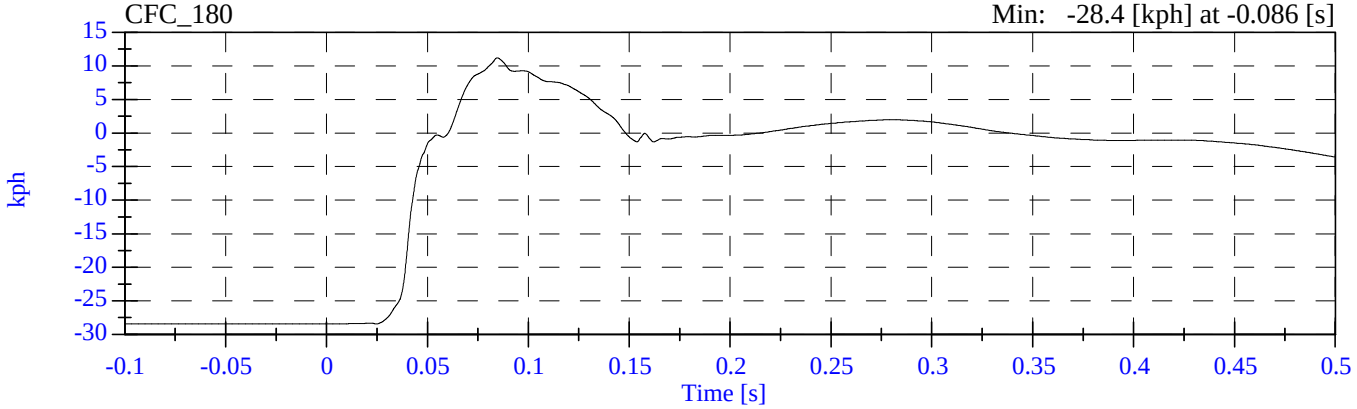
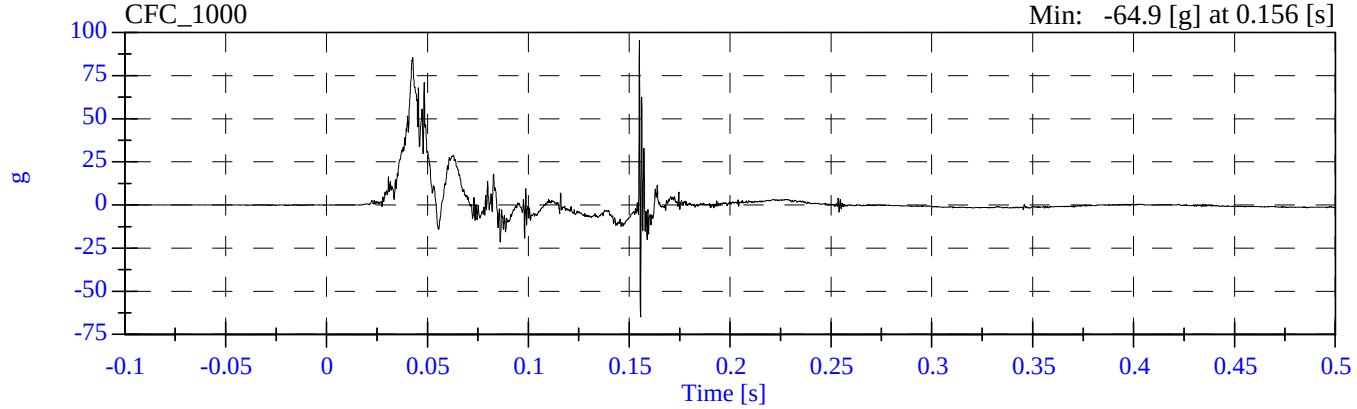
V1P1 Upper Rib y
CFC_1000
Max: 101.2 [g] at 0.040 [s]
Min: -38.9 [g] at 0.155 [s]



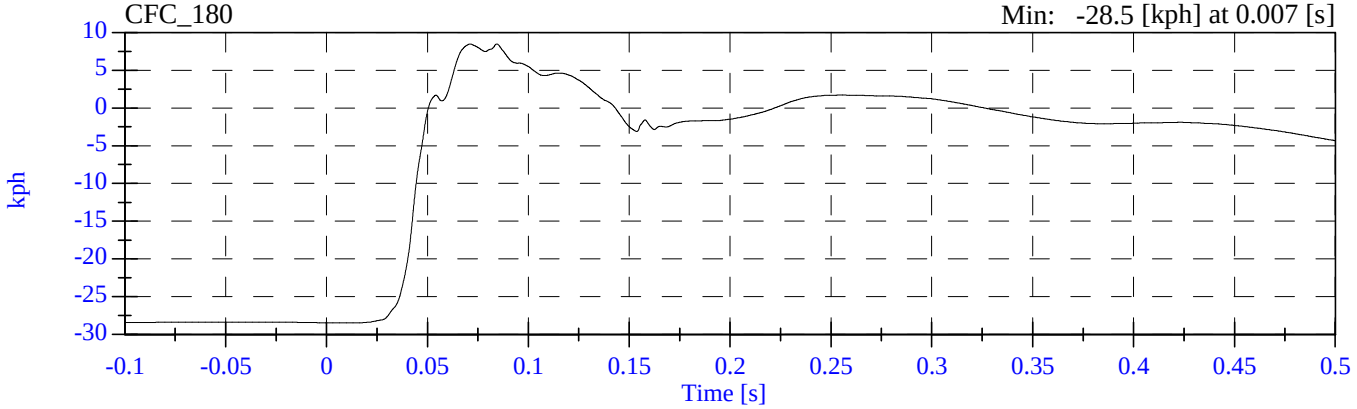
V1P1 Upper Rib y Velocity
CFC_180
Max: 11.2 [kph] at 0.085 [s]
Min: -28.4 [kph] at -0.086 [s]



V1P1 Lower Rib y
CFC_1000
Max: 95.3 [g] at 0.155 [s]
Min: -64.9 [g] at 0.156 [s]



V1P1 Lower Rib y Velocity
CFC_180
Max: 8.5 [kph] at 0.084 [s]
Min: -28.5 [kph] at 0.007 [s]



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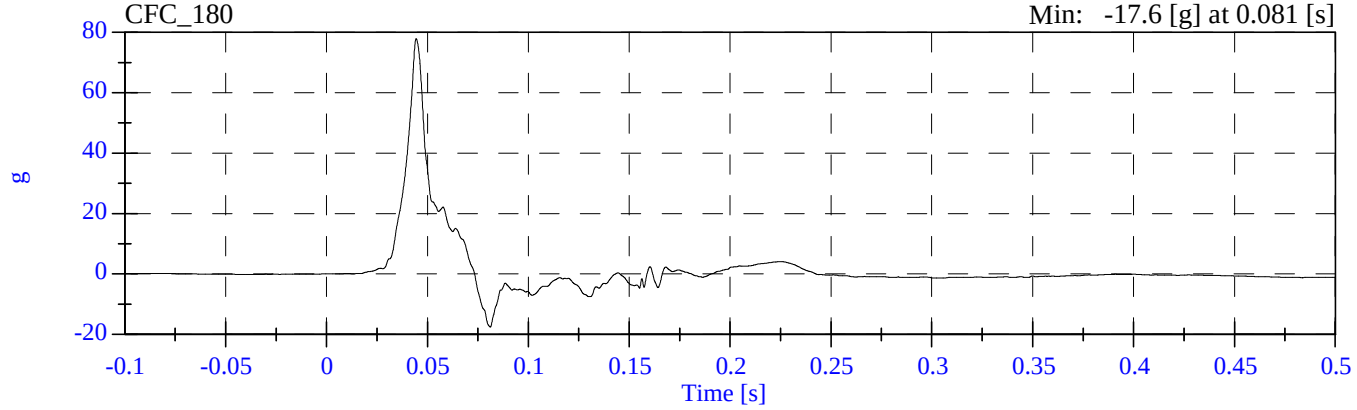
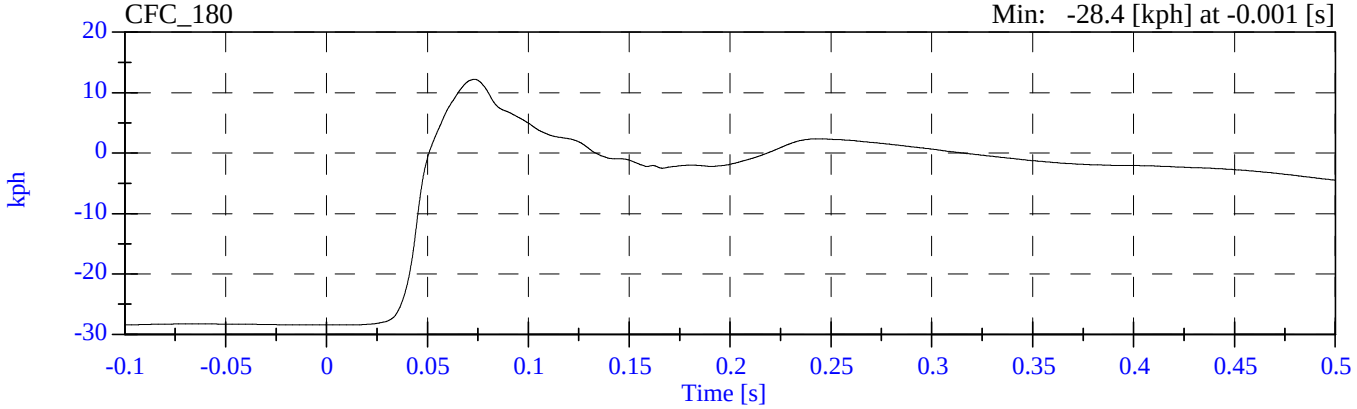
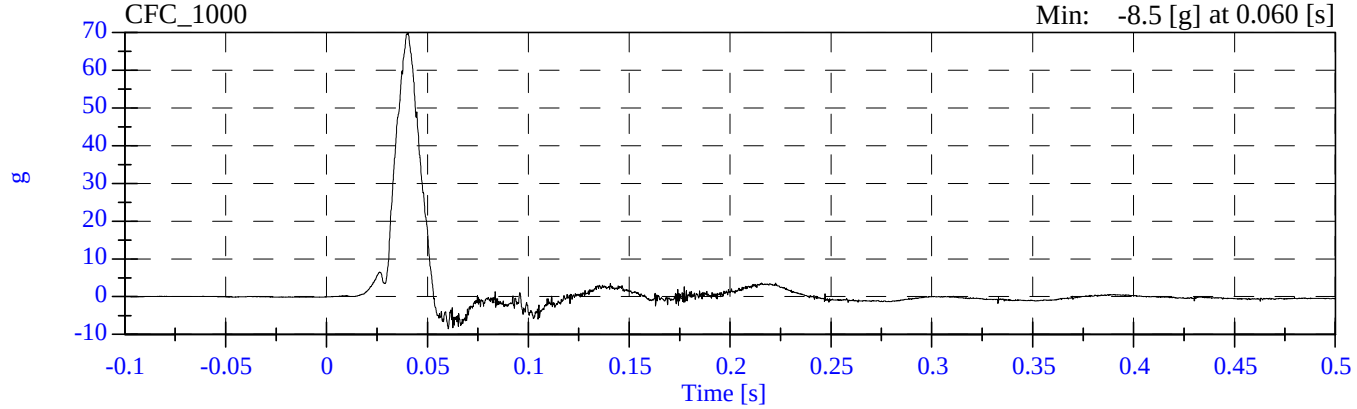
V1P1 Lower Spine y
CFC_180
Max: 77.9 [g] at 0.044 [s]
Min: -17.6 [g] at 0.081 [s]



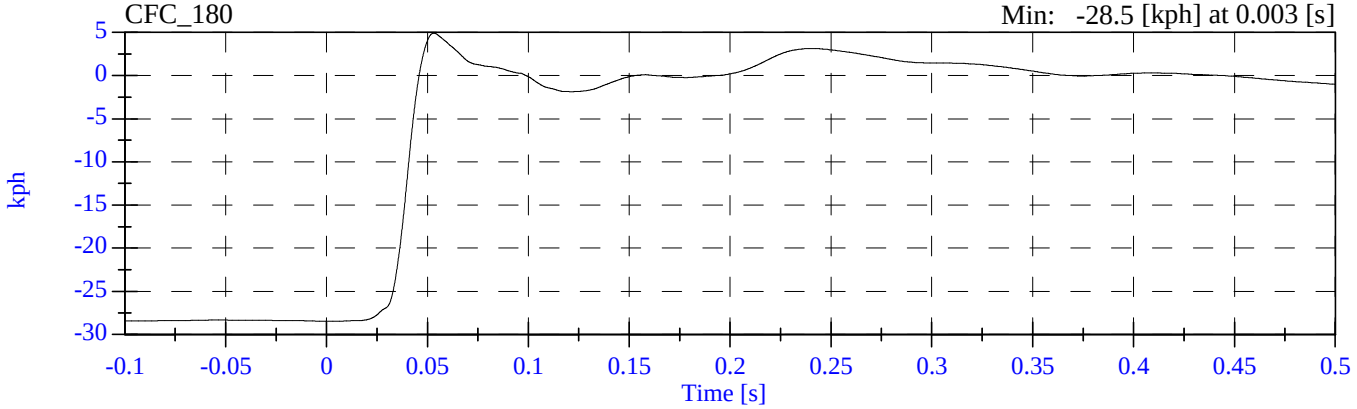
V1P1 Lower Spine y Velocity
CFC_180
Max: 12.2 [kph] at 0.073 [s]
Min: -28.4 [kph] at -0.001 [s]



V1P1 Pelvic y
CFC_1000
Max: 69.8 [g] at 0.040 [s]
Min: -8.5 [g] at 0.060 [s]



V1P1 Pelvic y Velocity
CFC_180
Max: 4.9 [kph] at 0.053 [s]
Min: -28.5 [kph] at 0.003 [s]



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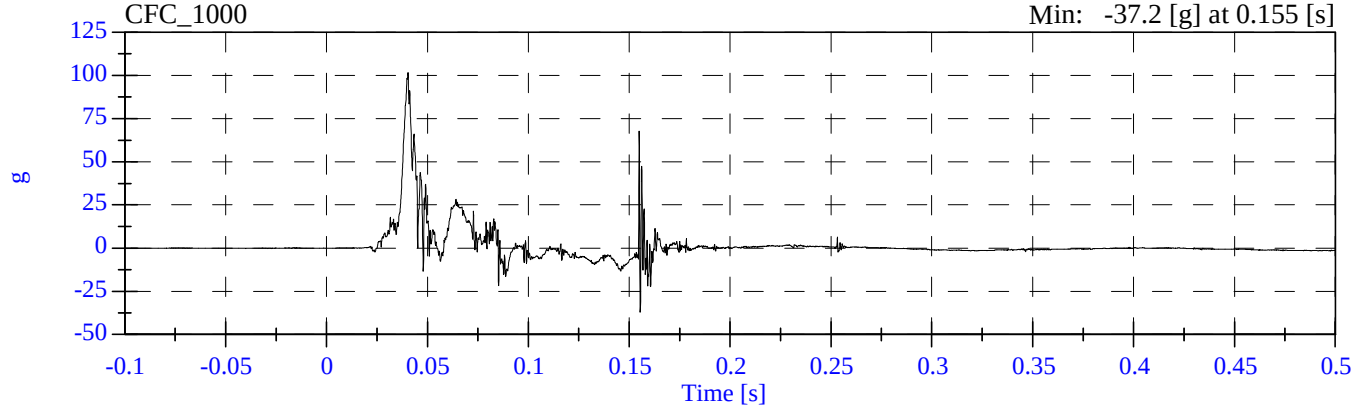
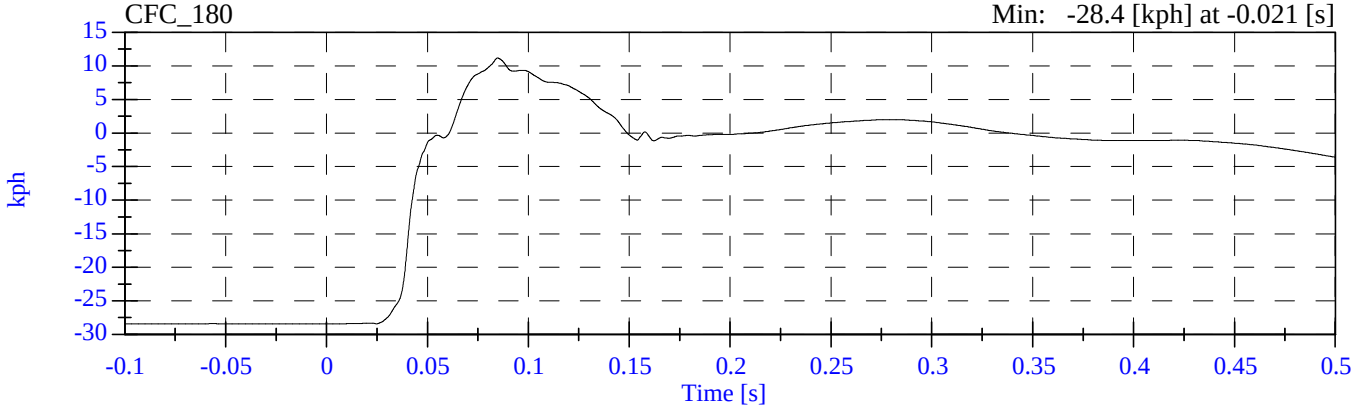
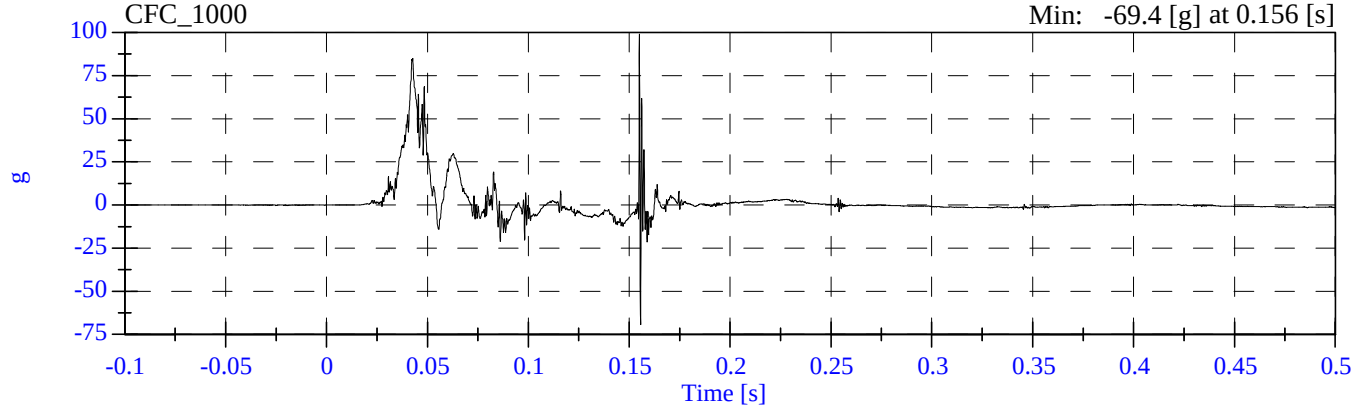
V1P1 Upper Rib Ry
CFC_1000
Max: 101.7 [g] at 0.040 [s]
Min: -37.2 [g] at 0.155 [s]



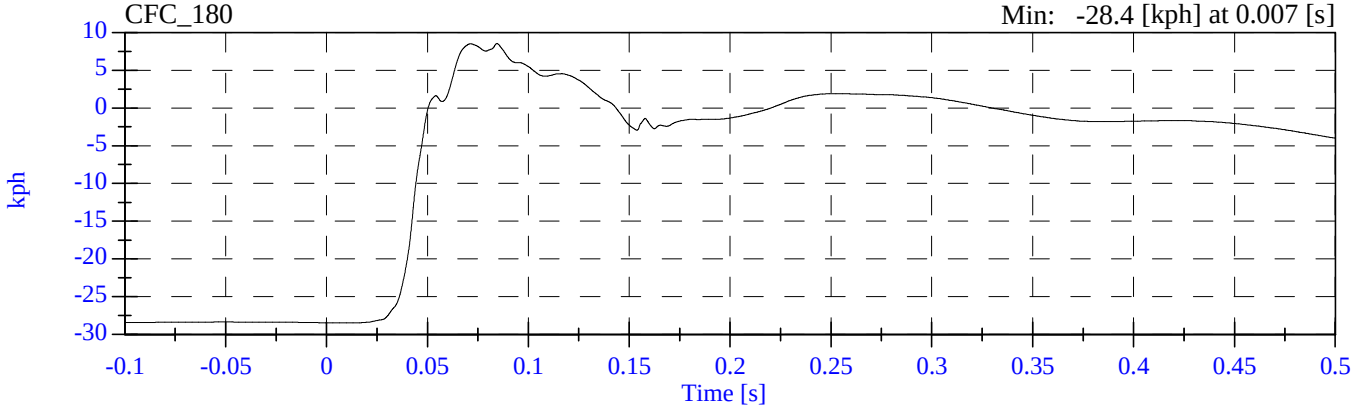
V1P1 Upper Rib Ry Velocity
CFC_180
Max: 11.2 [kph] at 0.085 [s]
Min: -28.4 [kph] at -0.021 [s]



V1P1 Lower Rib Ry
CFC_1000
Max: 99.0 [g] at 0.155 [s]
Min: -69.4 [g] at 0.156 [s]



V1P1 Lower Rib Ry Velocity
CFC_180
Max: 8.5 [kph] at 0.084 [s]
Min: -28.4 [kph] at 0.007 [s]



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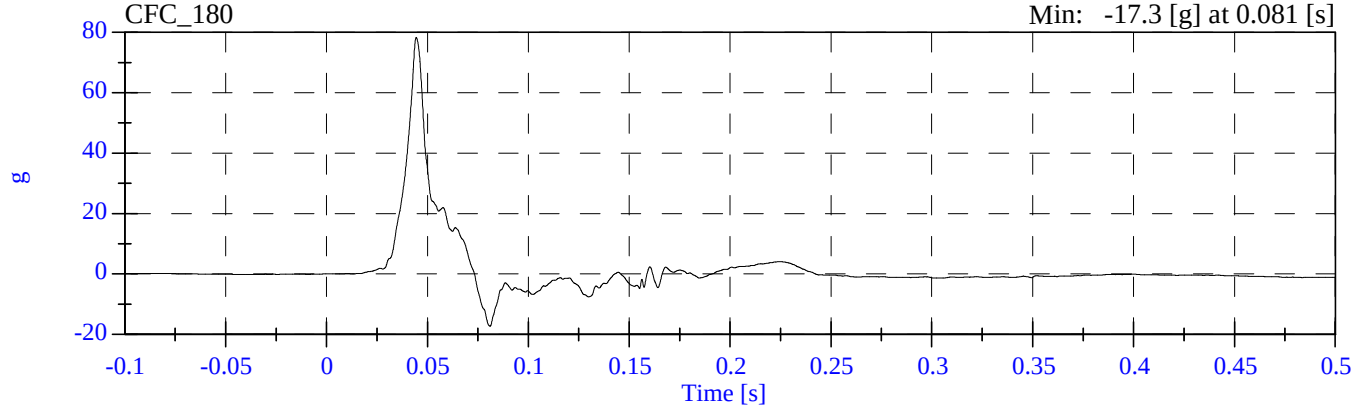
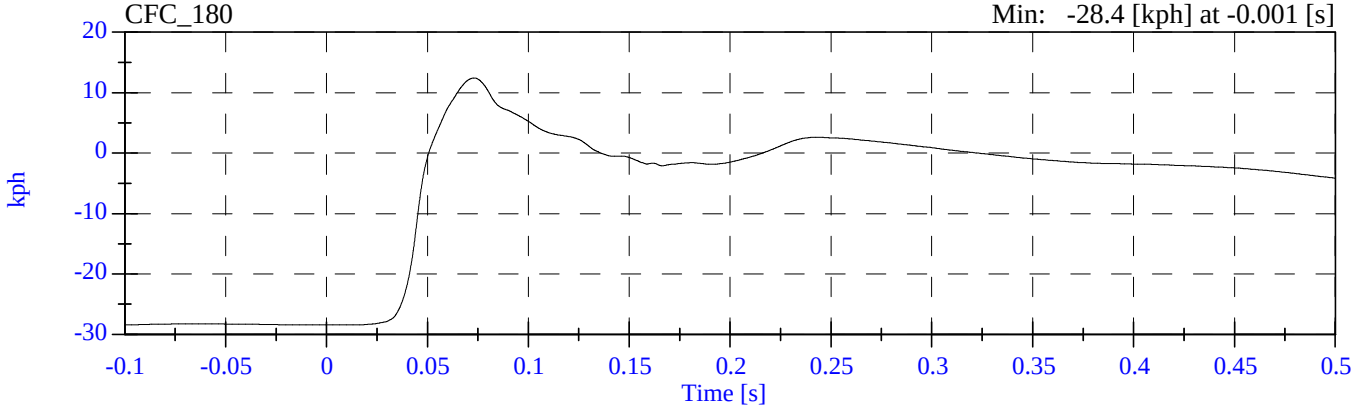
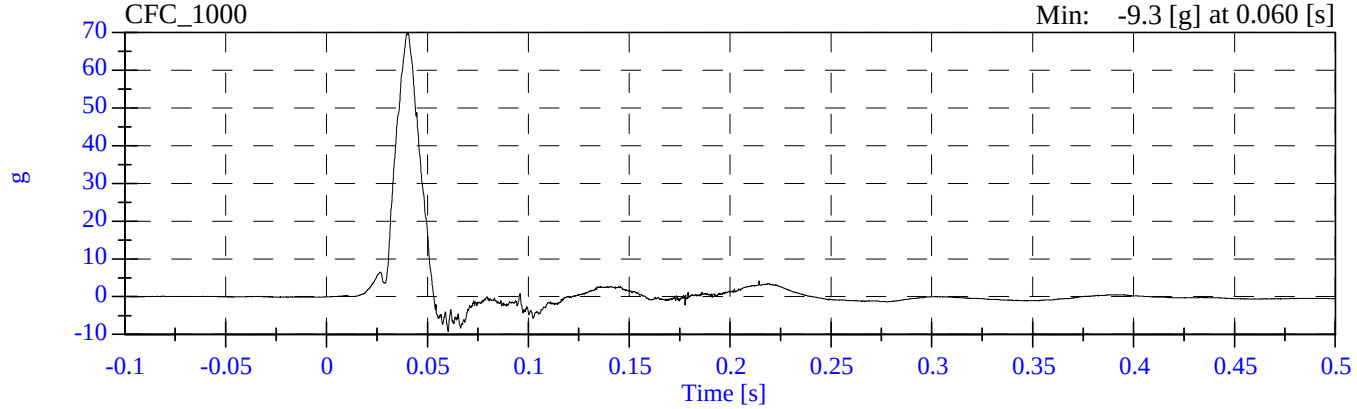
V1P1 Lower Spine Ry
CFC_180
Max: 78.3 [g] at 0.044 [s]
Min: -17.3 [g] at 0.081 [s]



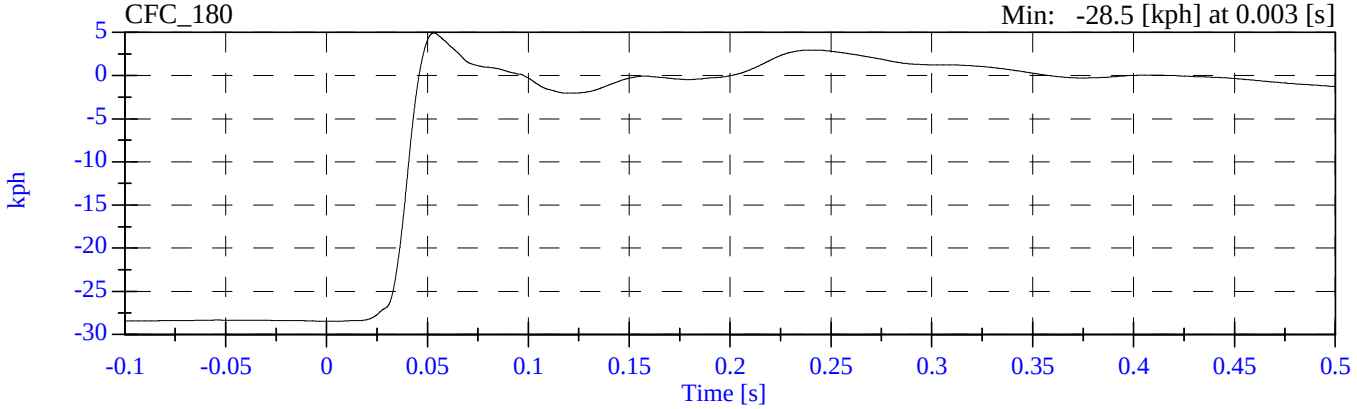
V1P1 Lower Spine Ry Velocity
CFC_180
Max: 12.4 [kph] at 0.073 [s]
Min: -28.4 [kph] at -0.001 [s]



V1P1 Pelvic Ry
CFC_1000
Max: 69.8 [g] at 0.040 [s]
Min: -9.3 [g] at 0.060 [s]



V1P1 Pelvic Ry Velocity
CFC_180
Max: 4.9 [kph] at 0.053 [s]
Min: -28.5 [kph] at 0.003 [s]



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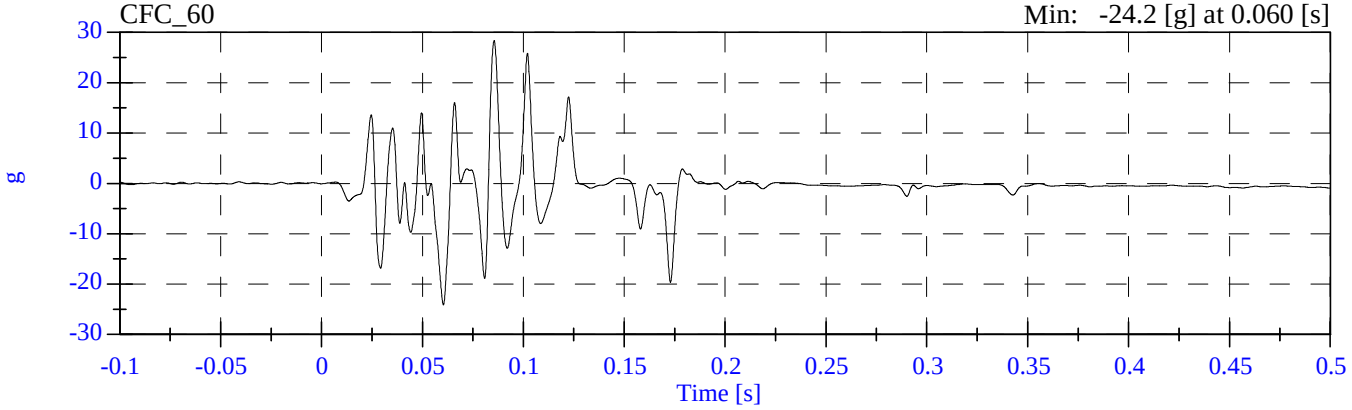
V1 A1 Vehicle CG x

CFC_60

Max: 28.4 [g] at 0.086 [s]

Min: -24.2 [g] at 0.060 [s]

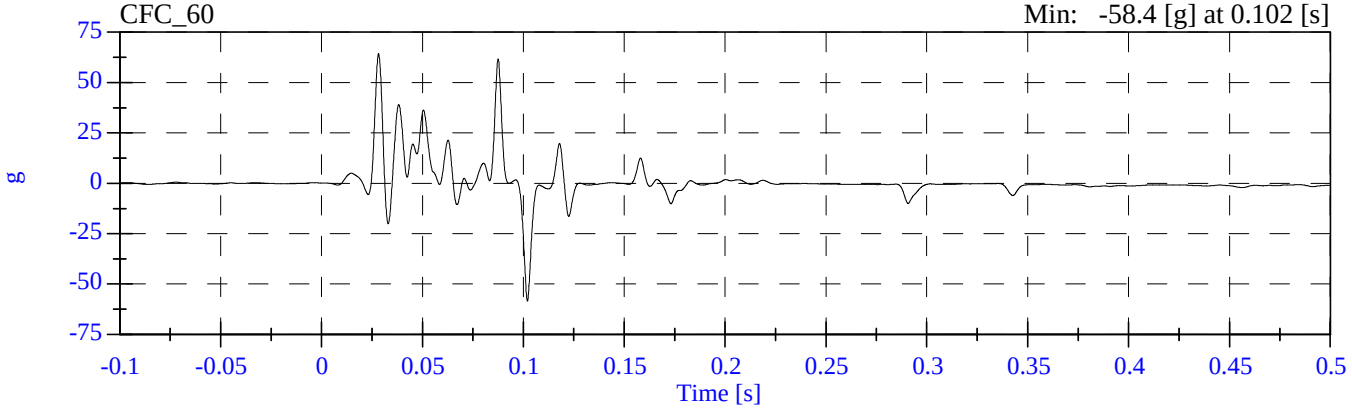


V1 A1 Vehicle CG y

CFC_60

Max: 64.4 [g] at 0.028 [s]

Min: -58.4 [g] at 0.102 [s]

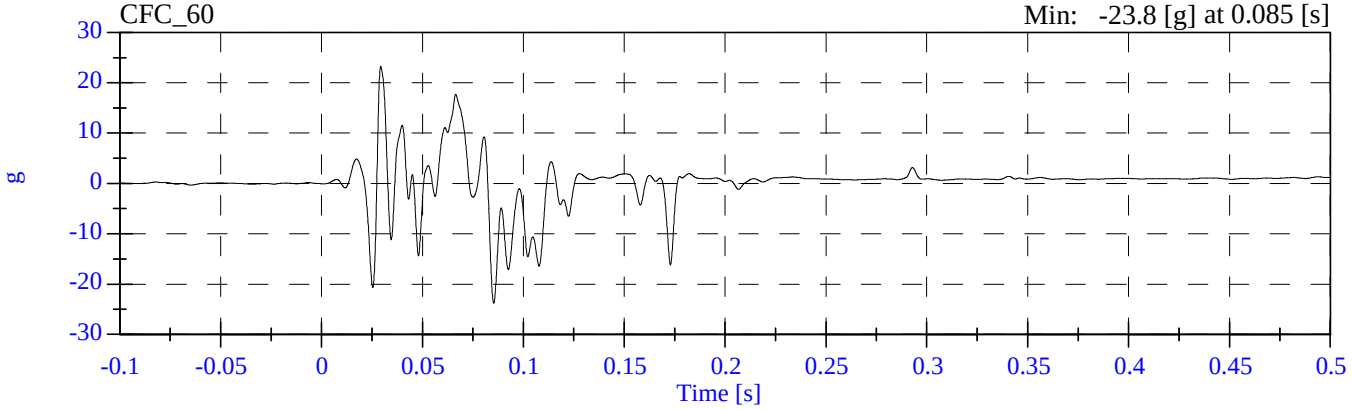


V1 A1 Vehicle CG z

CFC_60

Max: 23.3 [g] at 0.029 [s]

Min: -23.8 [g] at 0.085 [s]

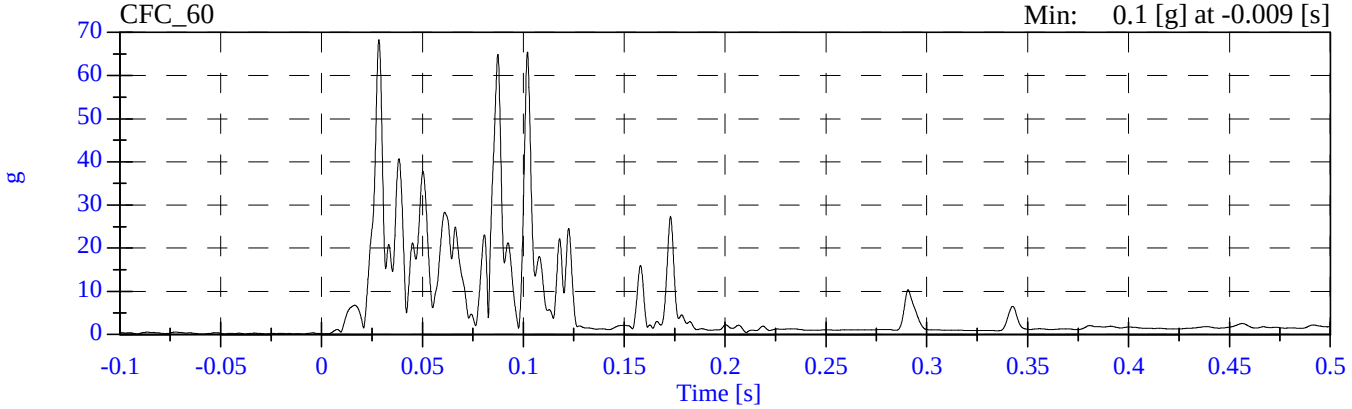


V1 A1 Vehicle CG Resultant

CFC_60

Max: 68.4 [g] at 0.028 [s]

Min: 0.1 [g] at -0.009 [s]



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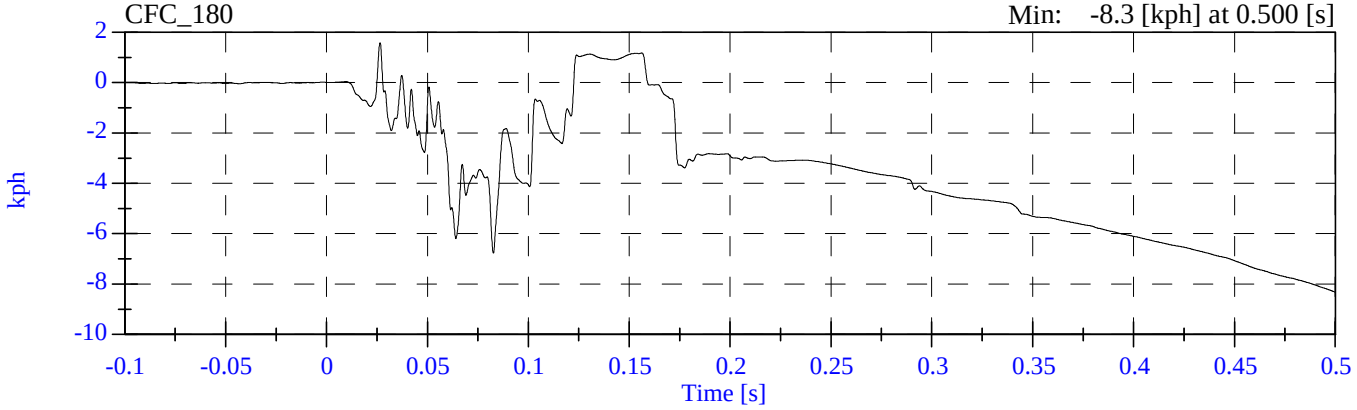
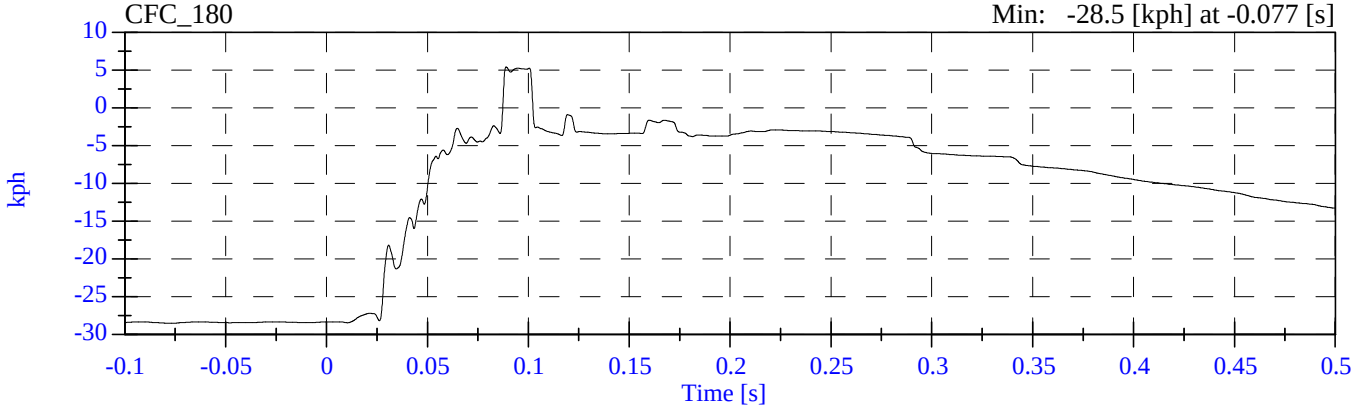
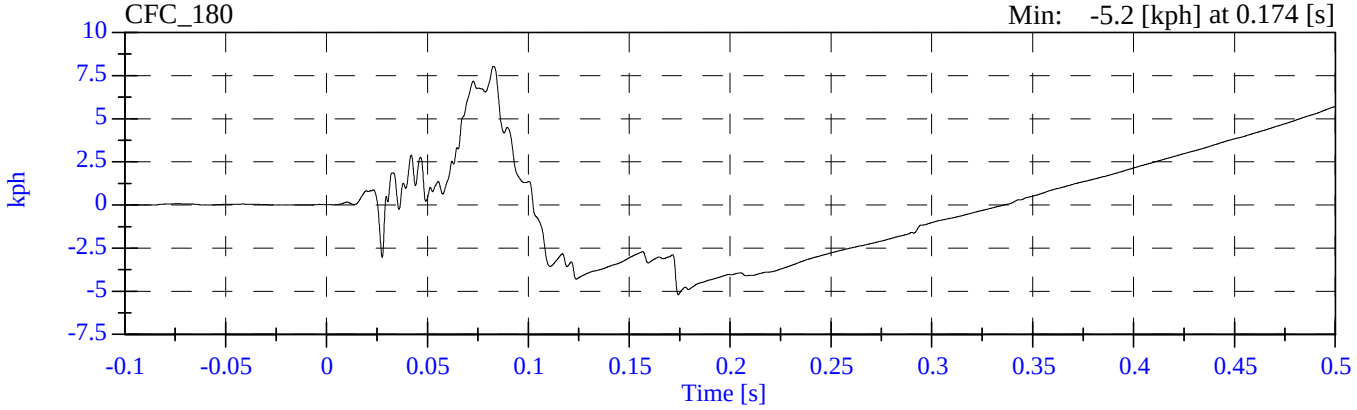
V1 A1 Vehicle CG x Velocity
CFC_180
Max: 1.6 [kph] at 0.027 [s]
Min: -8.3 [kph] at 0.500 [s]



V1 A1 Vehicle CG y Velocity
CFC_180
Max: 5.4 [kph] at 0.089 [s]
Min: -28.5 [kph] at -0.077 [s]



V1 A1 Vehicle CG z Velocity
CFC_180
Max: 8.0 [kph] at 0.083 [s]
Min: -5.2 [kph] at 0.174 [s]



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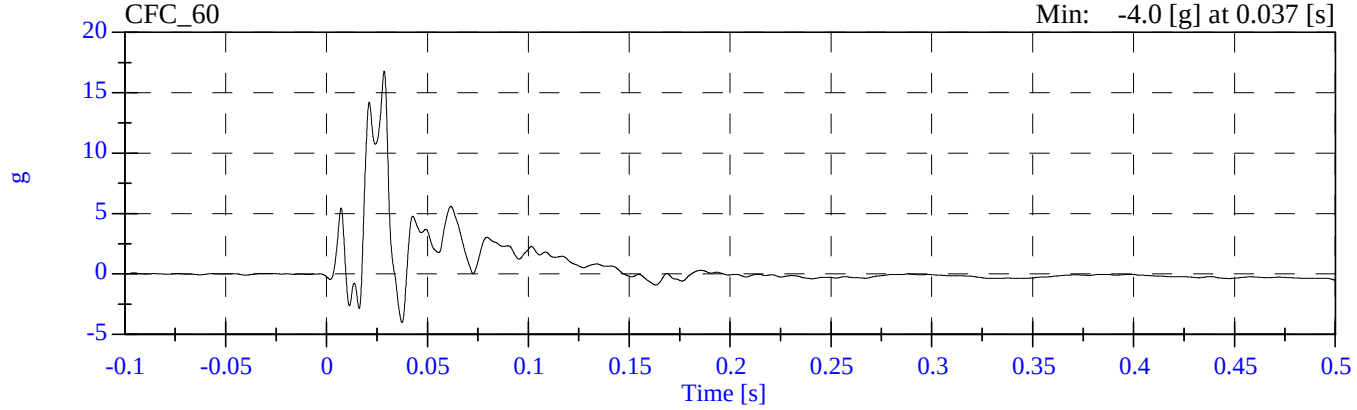
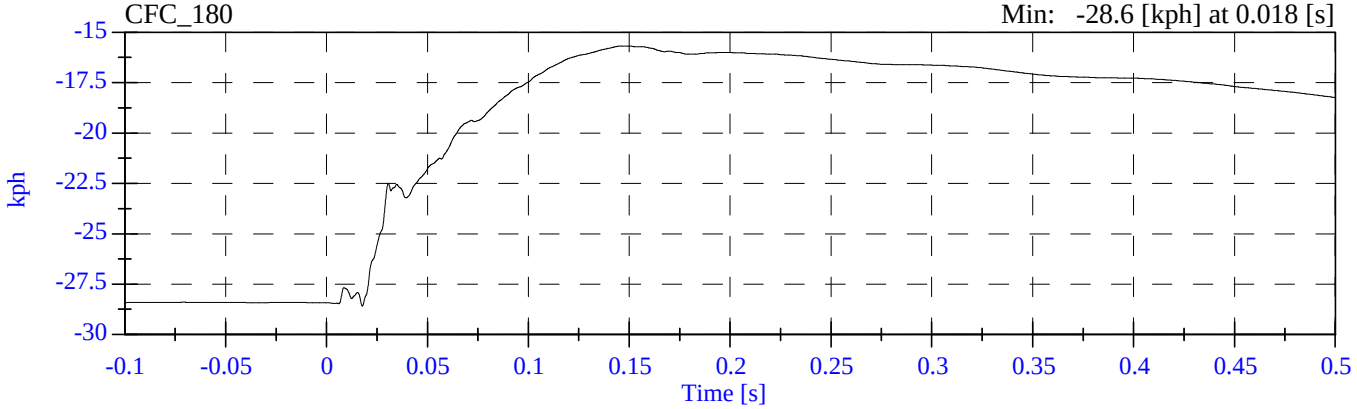
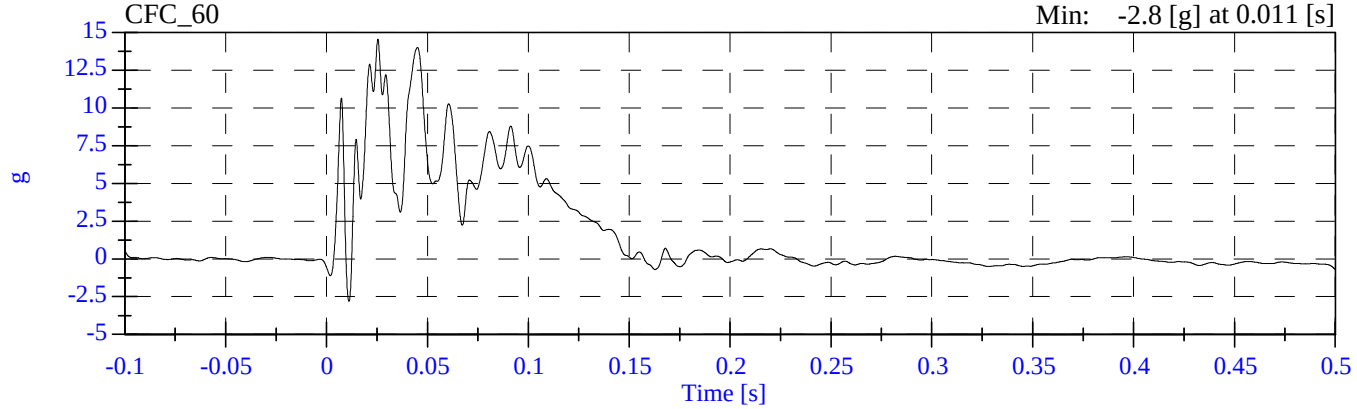
V1 A3 Left Sill y
CFC_60
Max: 16.8 [g] at 0.029 [s]
Min: -4.0 [g] at 0.037 [s]



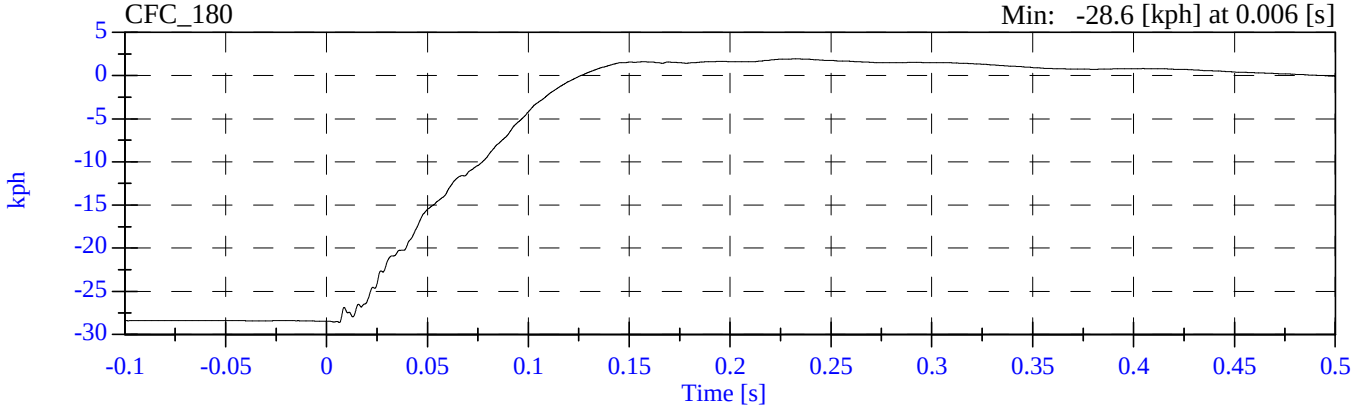
V1 A3 Left Sill y Velocity
CFC_180
Max: -15.7 [kph] at 0.147 [s]
Min: -28.6 [kph] at 0.018 [s]



V1 A4 Left Sill A Pillar y
CFC_60
Max: 14.6 [g] at 0.025 [s]
Min: -2.8 [g] at 0.011 [s]



V1 A4 Left Sill A Pillar y Velocity
CFC_180
Max: 1.9 [kph] at 0.233 [s]
Min: -28.6 [kph] at 0.006 [s]



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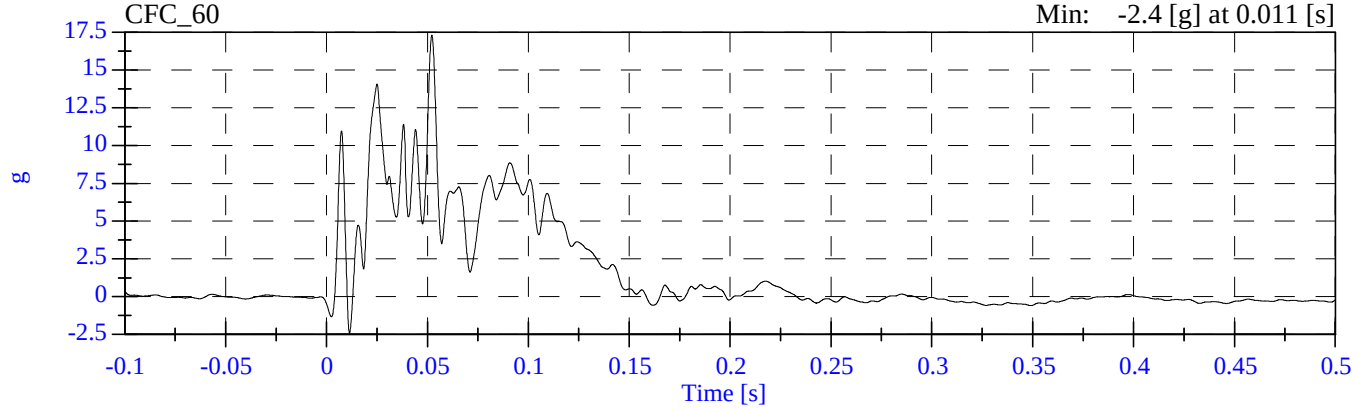
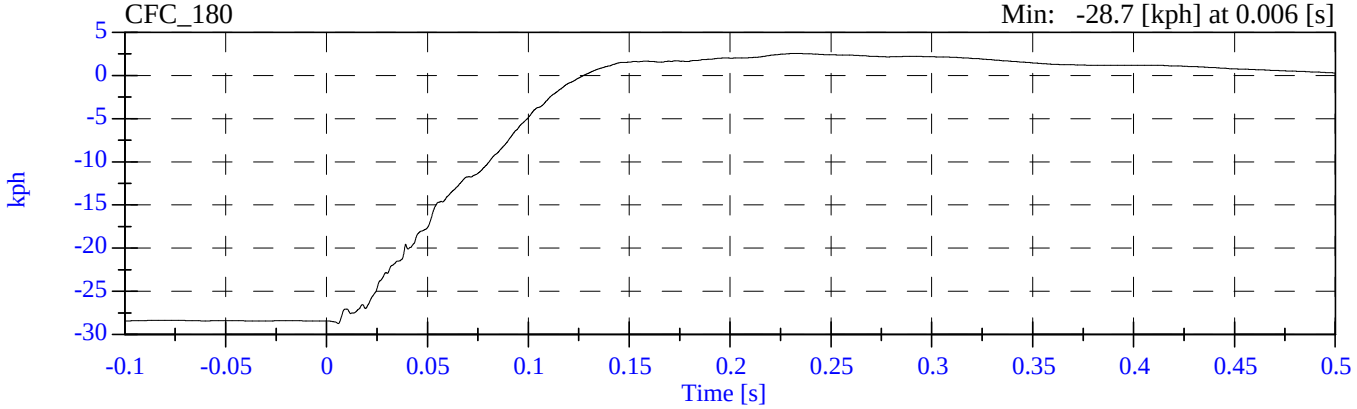
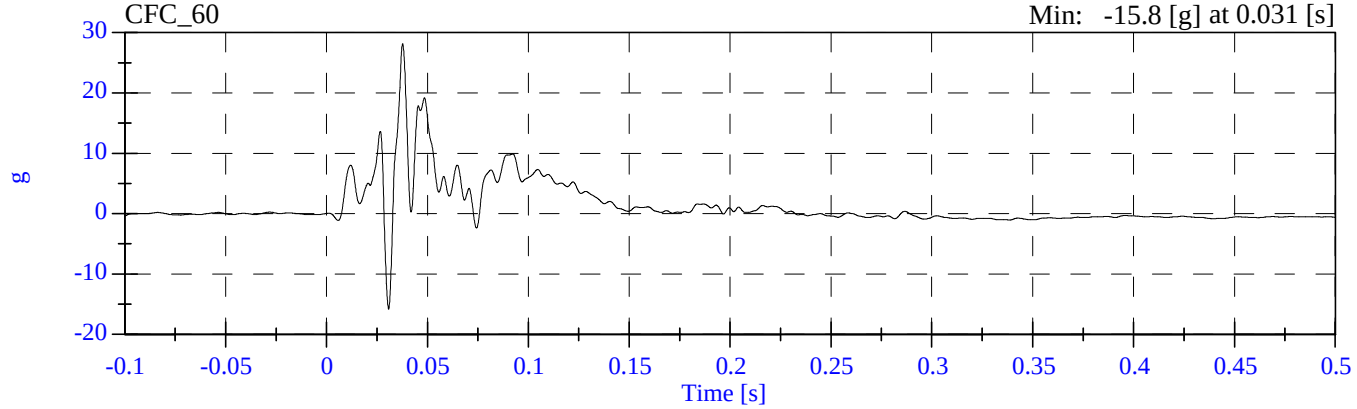
V1 A5 Left Lower A Pillar y
CFC_60
Max: 17.3 [g] at 0.052 [s]
Min: -2.4 [g] at 0.011 [s]



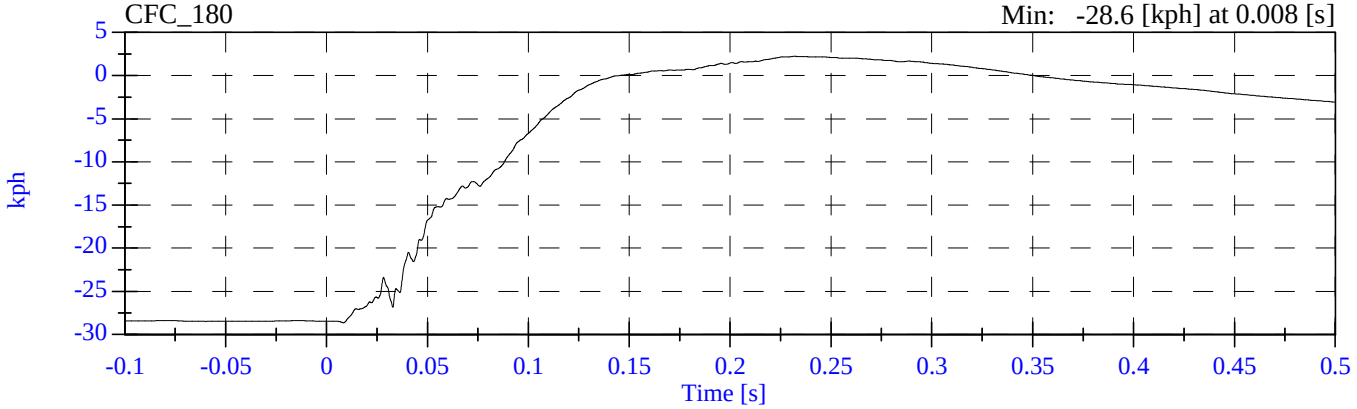
V1 A5 Left Lower A Pillar y Velocity
CFC_180
Max: 2.5 [kph] at 0.233 [s]
Min: -28.7 [kph] at 0.006 [s]



V1 A6 Left Mid A Pillar y
CFC_60
Max: 28.1 [g] at 0.038 [s]
Min: -15.8 [g] at 0.031 [s]



V1 A6 Left Mid A Pillar y Velocity
CFC_180
Max: 2.3 [kph] at 0.232 [s]
Min: -28.6 [kph] at 0.008 [s]



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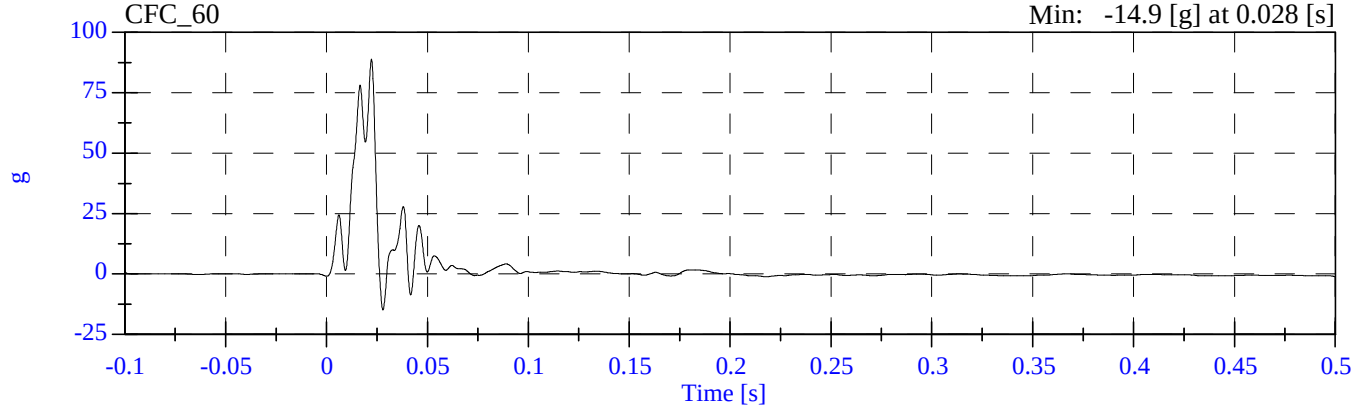
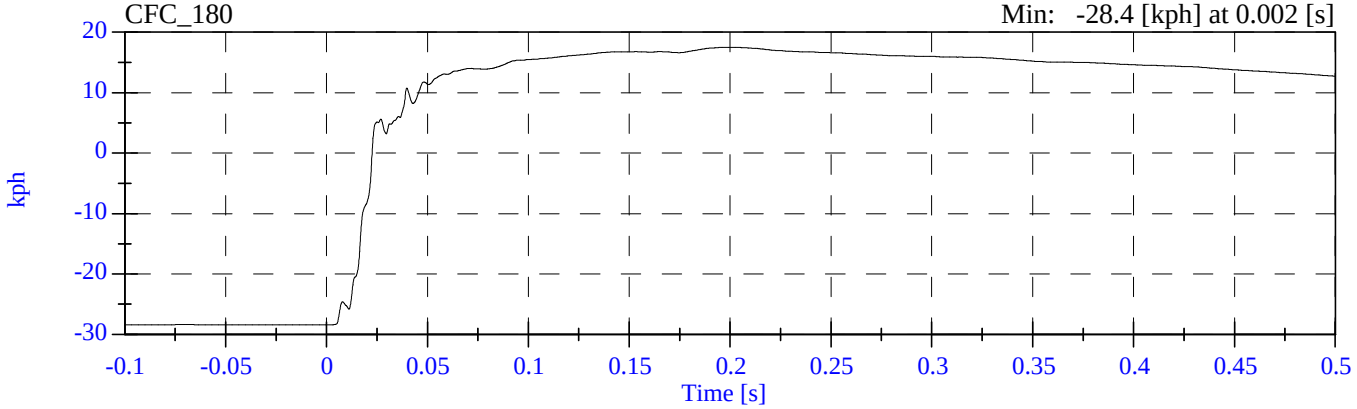
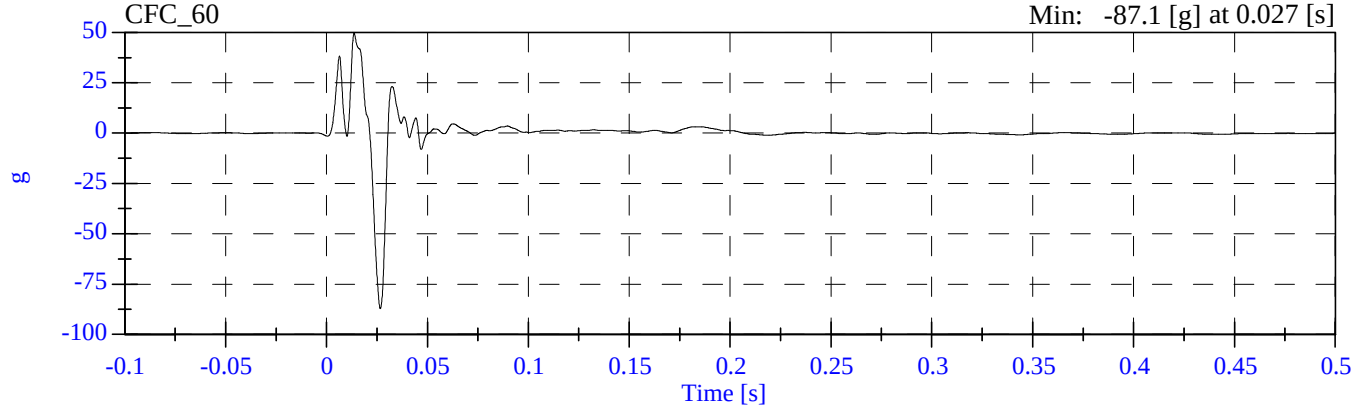
V1 A7 B Pillar Sill y
CFC_60
Max: 88.9 [g] at 0.022 [s]
Min: -14.9 [g] at 0.028 [s]



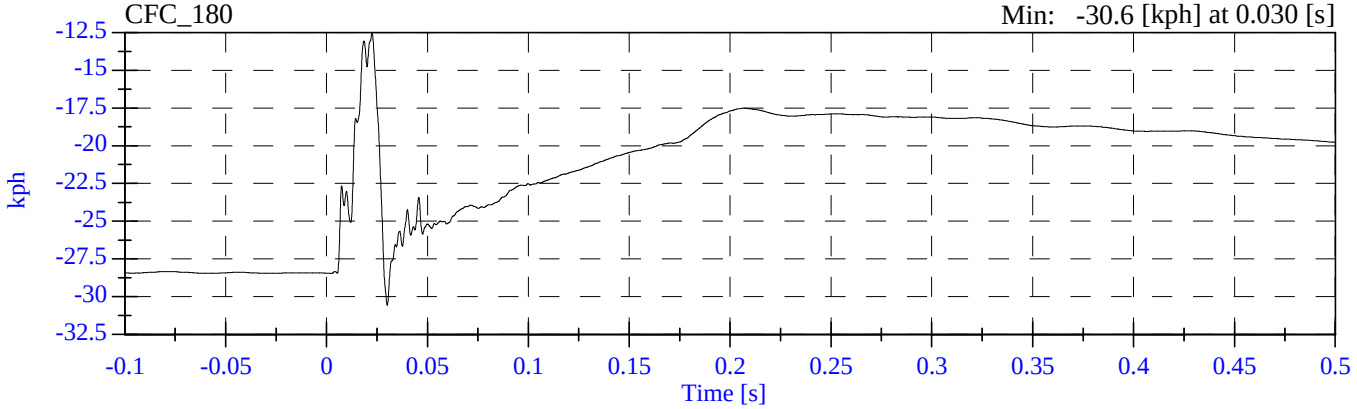
V1 A7 B Pillar Sill y Velocity
CFC_180
Max: 17.5 [kph] at 0.202 [s]
Min: -28.4 [kph] at 0.002 [s]



V1 A8 B Pillar Lower y
CFC_60
Max: 49.7 [g] at 0.014 [s]
Min: -87.1 [g] at 0.027 [s]



V1 A8 B Pillar Lower y Velocity
CFC_180
Max: -12.6 [kph] at 0.023 [s]
Min: -30.6 [kph] at 0.030 [s]



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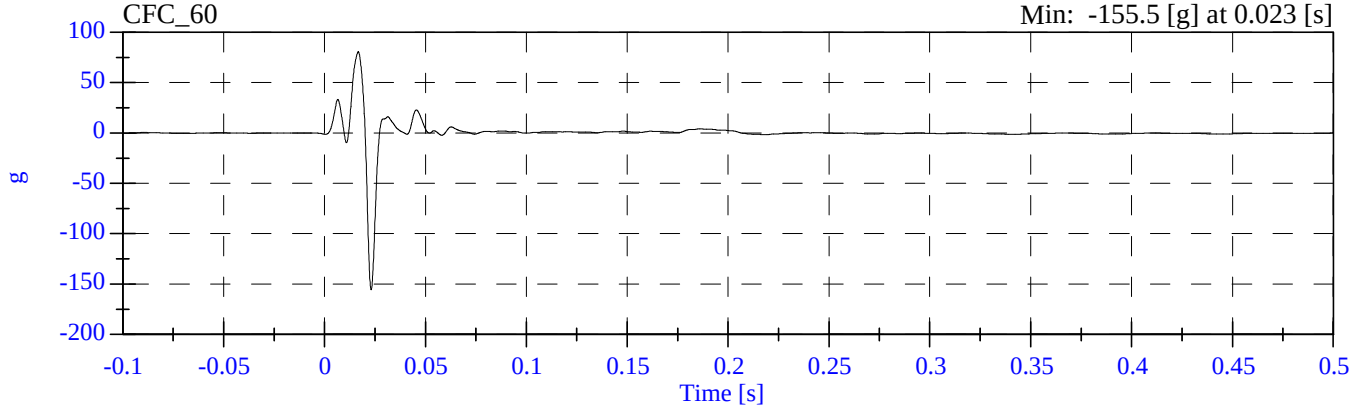
V1 A9 B Pillar Mid y

CFC_60

Max: 80.8 [g] at 0.017 [s]

Min: -155.5 [g] at 0.023 [s]

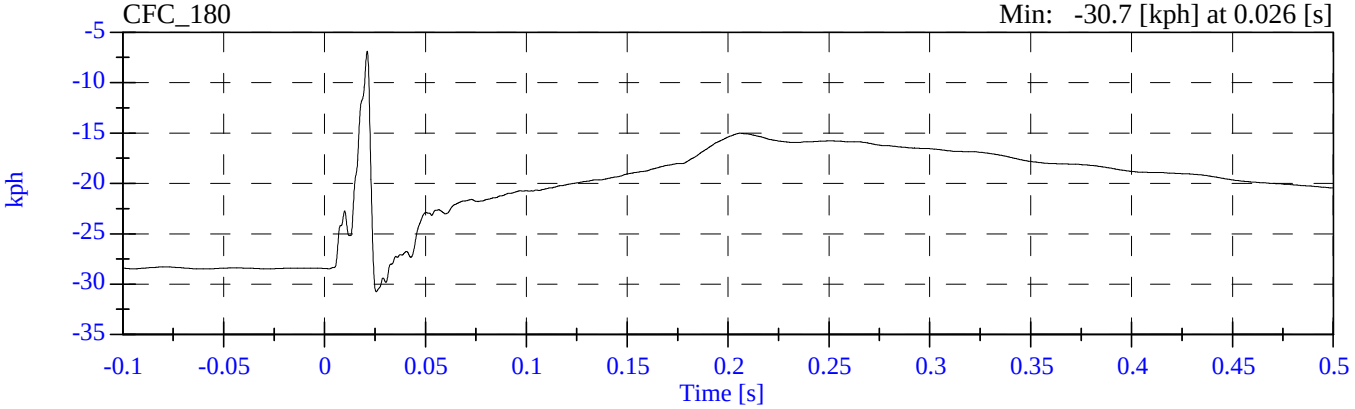


V1 A9 B Pillar Mid y Velocity

CFC_180

Max: -6.9 [kph] at 0.021 [s]

Min: -30.7 [kph] at 0.026 [s]

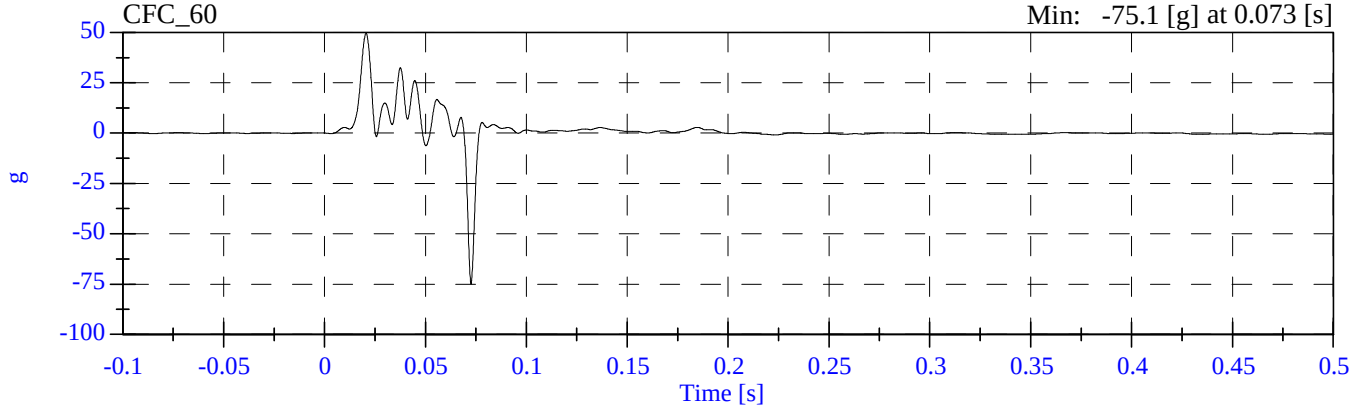


V1 A10 Driver Seat y

CFC_60

Max: 49.5 [g] at 0.021 [s]

Min: -75.1 [g] at 0.073 [s]

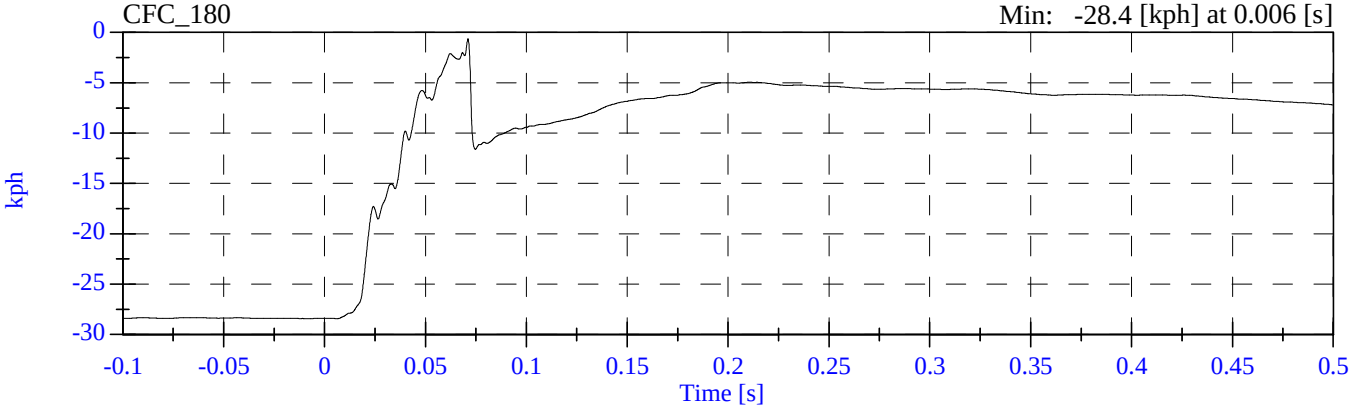


V1 A10 Driver Seat y Velocity

CFC_180

Max: -0.6 [kph] at 0.071 [s]

Min: -28.4 [kph] at 0.006 [s]



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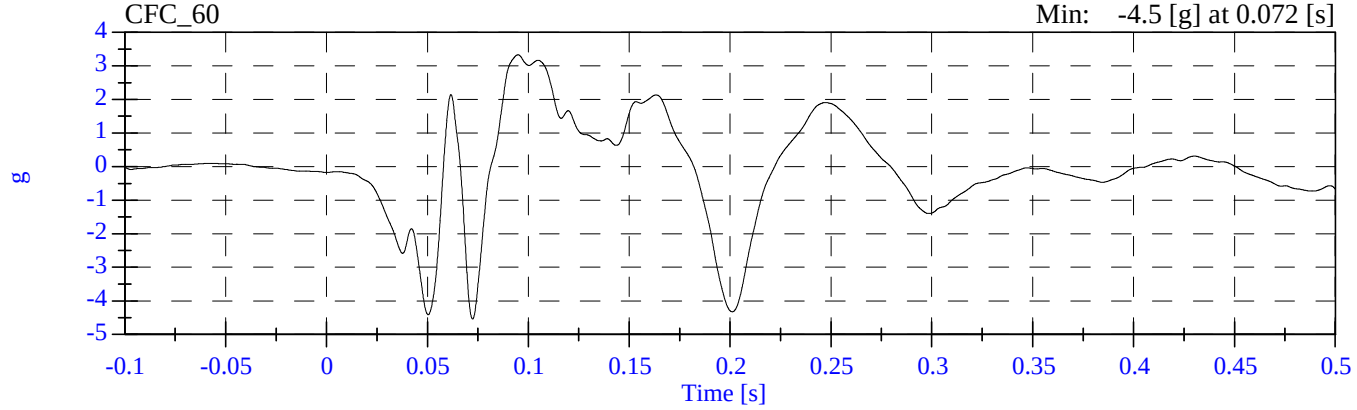
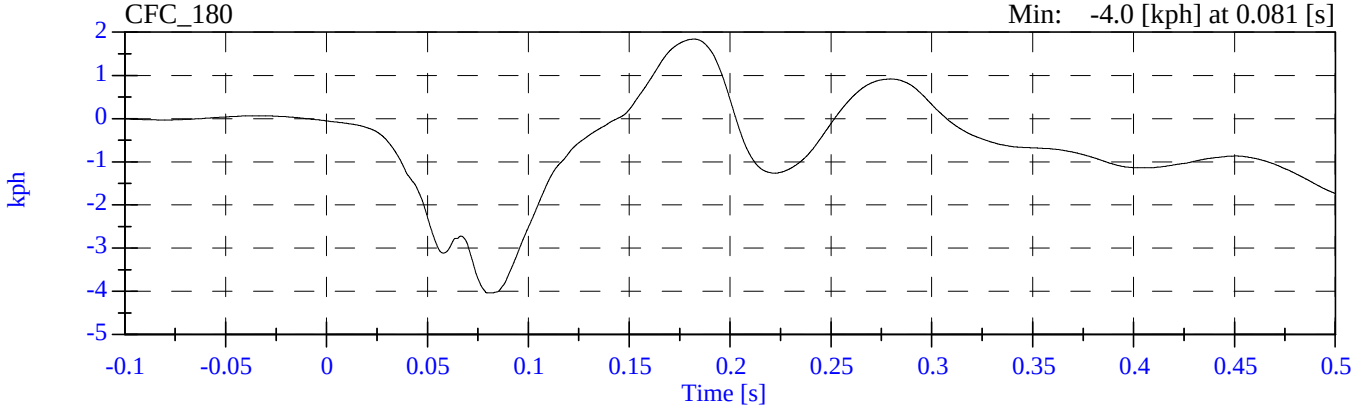
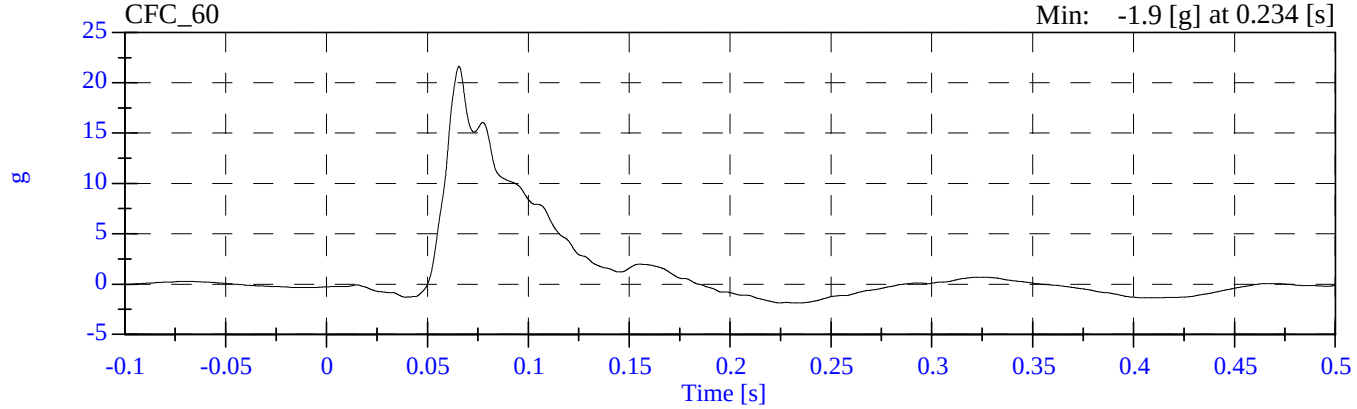
V1 A11 Engine Top x
CFC_60
Max: 3.3 [g] at 0.095 [s]
Min: -4.5 [g] at 0.072 [s]



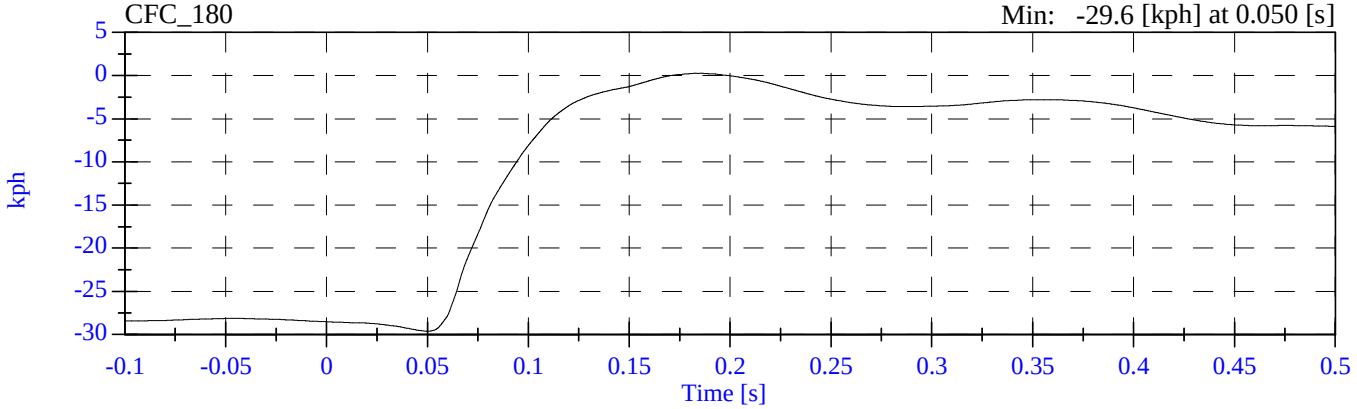
V1 A11 Engine Top x Velocity
CFC_180
Max: 1.8 [kph] at 0.182 [s]
Min: -4.0 [kph] at 0.081 [s]



V1 A11 Engine Top y
CFC_60
Max: 21.6 [g] at 0.066 [s]
Min: -1.9 [g] at 0.234 [s]



V1 A11 Engine Top y Velocity
CFC_180
Max: 0.3 [kph] at 0.183 [s]
Min: -29.6 [kph] at 0.050 [s]



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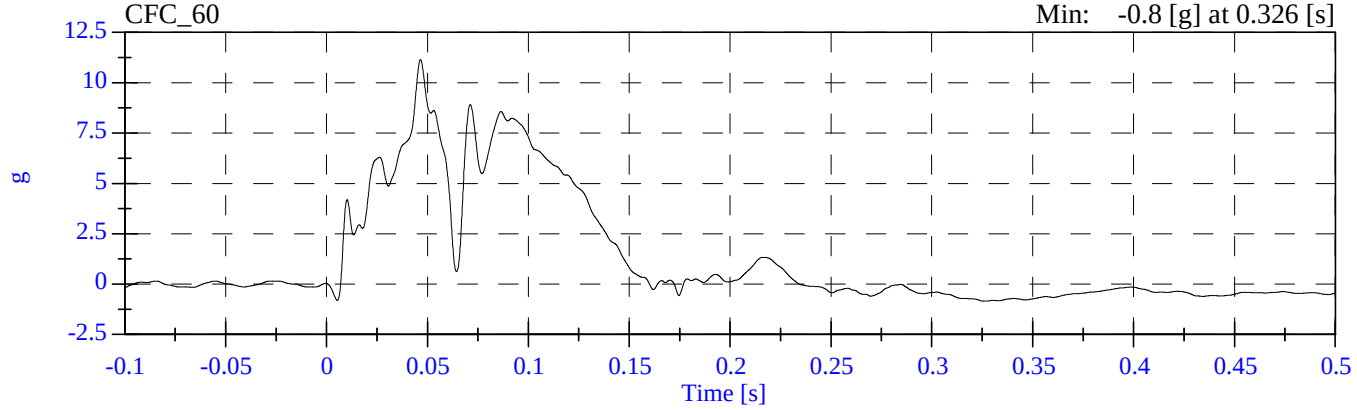
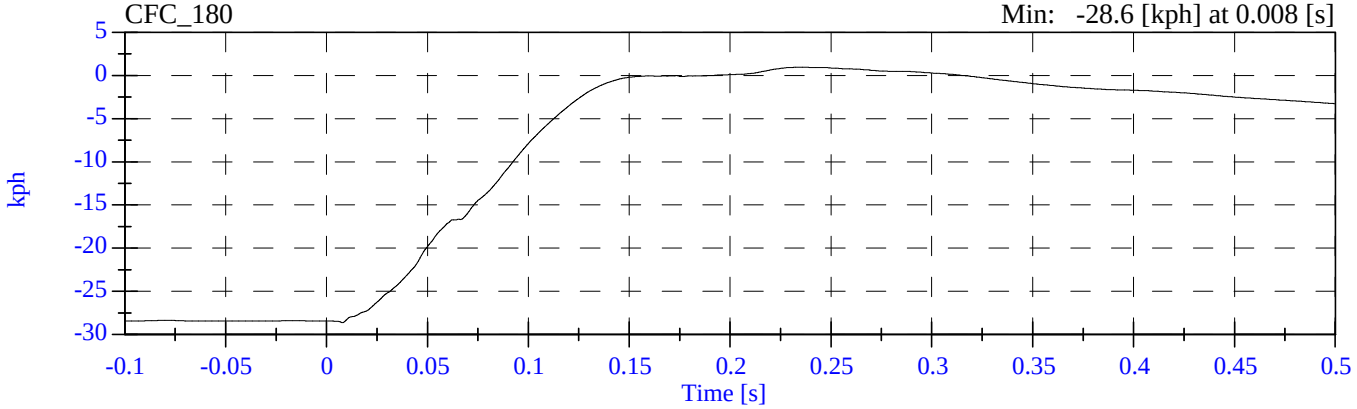
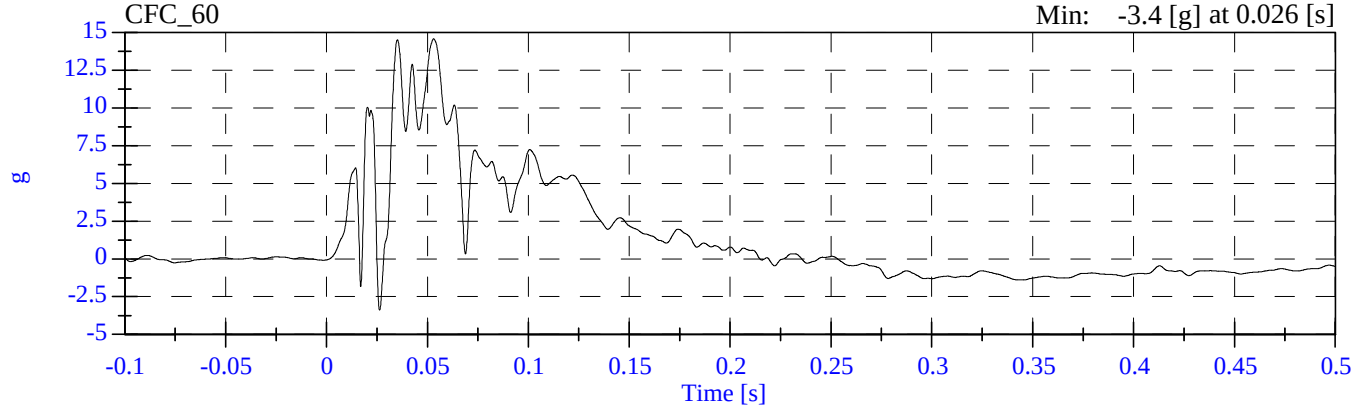
V1 A12 Firewall Center y
CFC_60
Max: 11.1 [g] at 0.046 [s]
Min: -0.8 [g] at 0.326 [s]



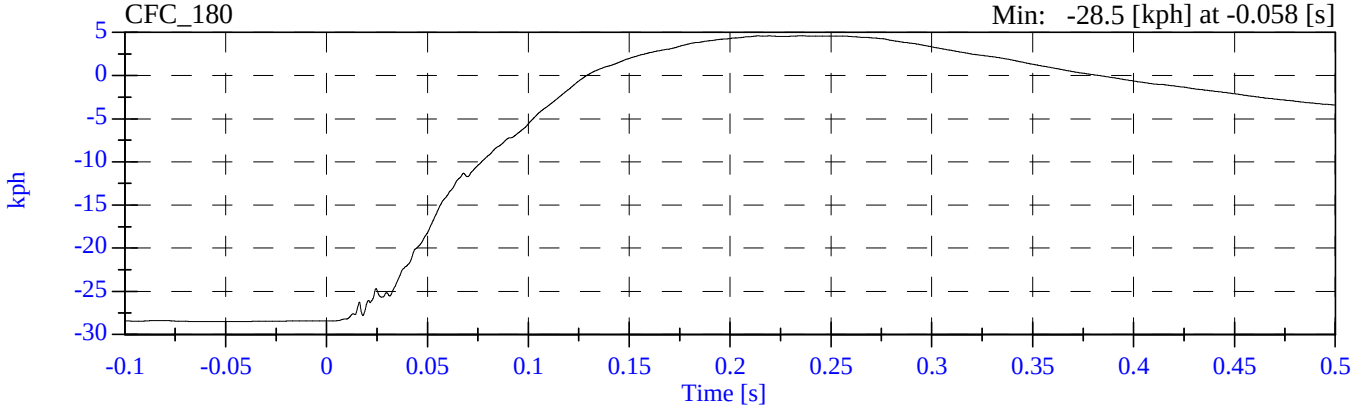
V1 A12 Firewall Center y Velocity
CFC_180
Max: 0.9 [kph] at 0.234 [s]
Min: -28.6 [kph] at 0.008 [s]



V1 A13 Right Roof y
CFC_60
Max: 14.6 [g] at 0.053 [s]
Min: -3.4 [g] at 0.026 [s]



V1 A13 Right Roof y Velocity
CFC_180
Max: 4.6 [kph] at 0.236 [s]
Min: -28.5 [kph] at -0.058 [s]



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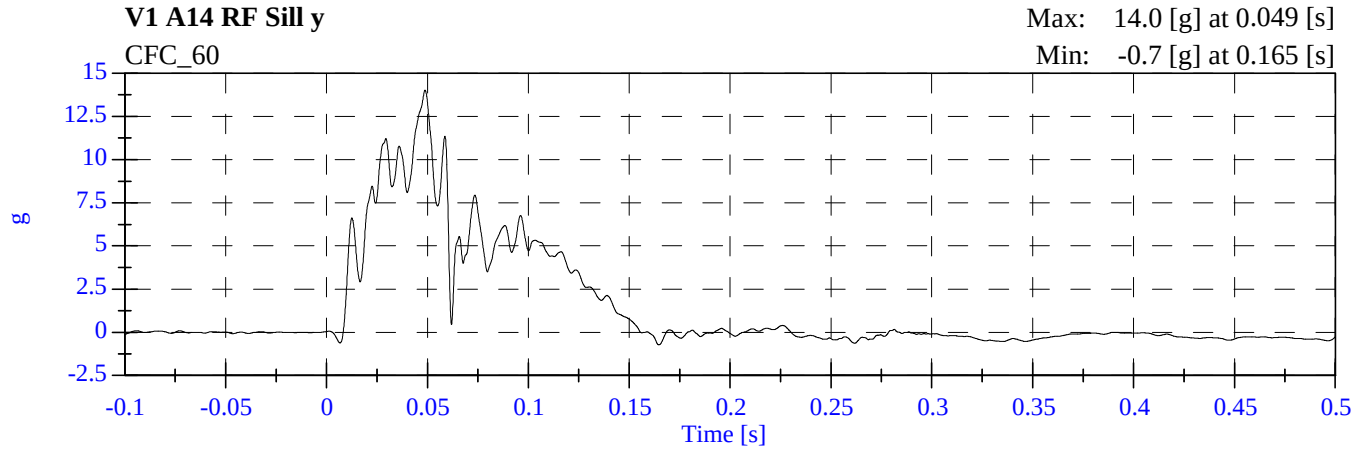

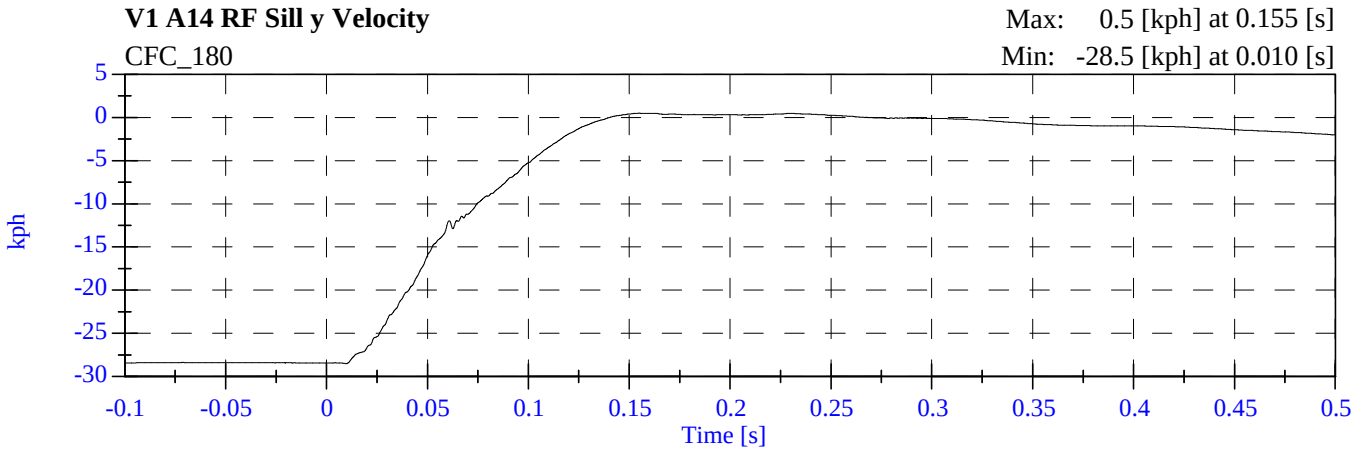

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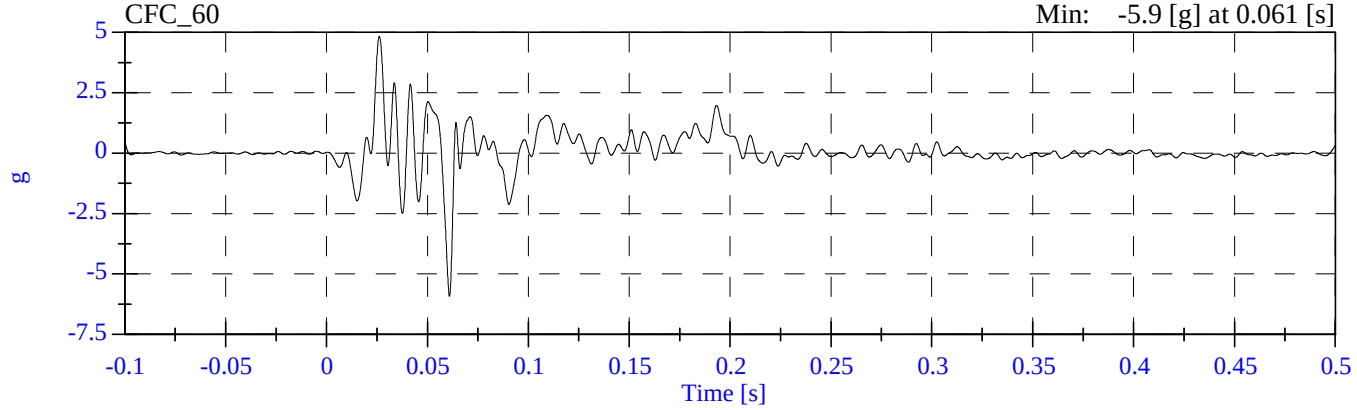
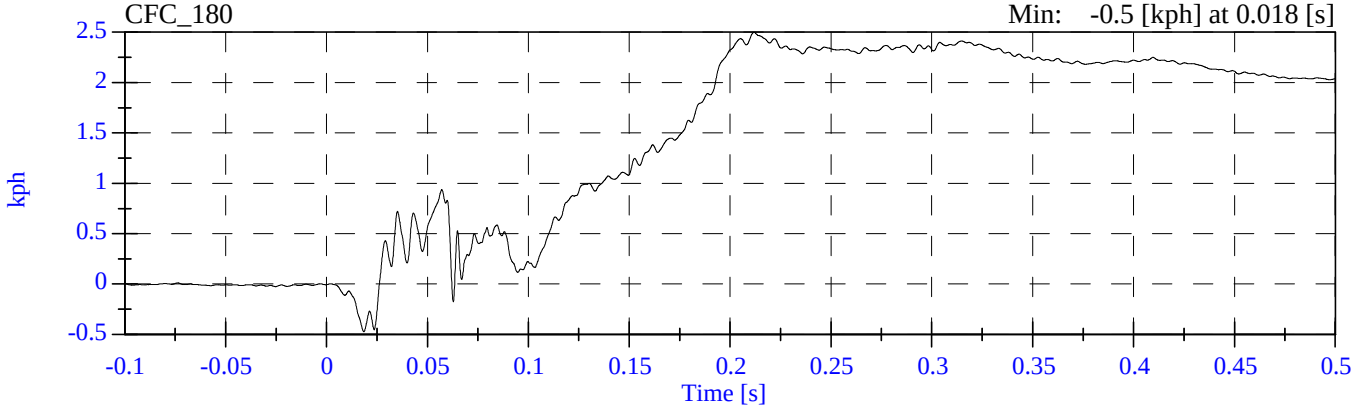
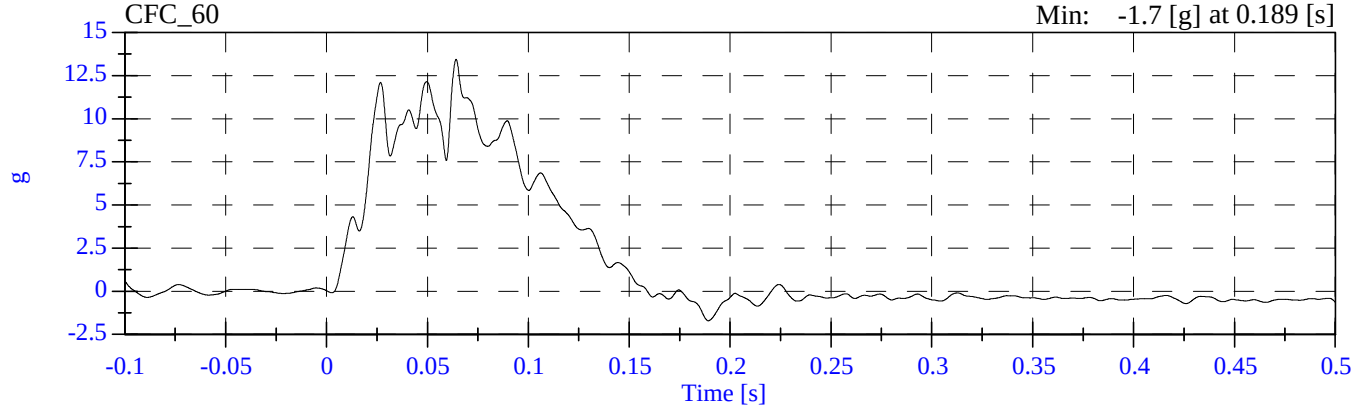
V1 A15 Rear Deck x
CFC_60
Max: 4.8 [g] at 0.026 [s]
Min: -5.9 [g] at 0.061 [s]



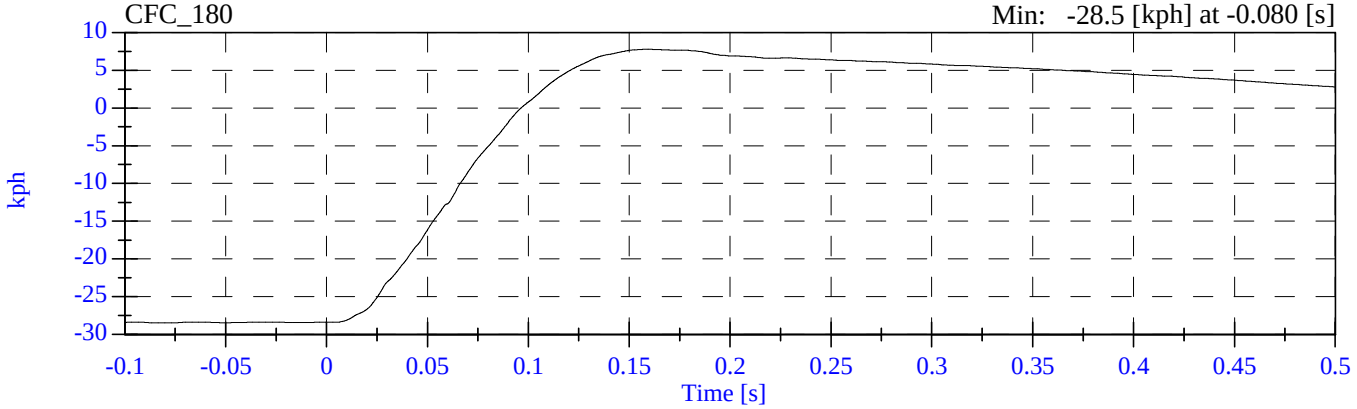
V1 A15 Rear Deck x Velocity
CFC_180
Max: 2.5 [kph] at 0.212 [s]
Min: -0.5 [kph] at 0.018 [s]



V1 A15 Rear Deck y
CFC_60
Max: 13.4 [g] at 0.064 [s]
Min: -1.7 [g] at 0.189 [s]



V1 A15 Rear Deck y Velocity
CFC_180
Max: 7.8 [kph] at 0.160 [s]
Min: -28.5 [kph] at -0.080 [s]



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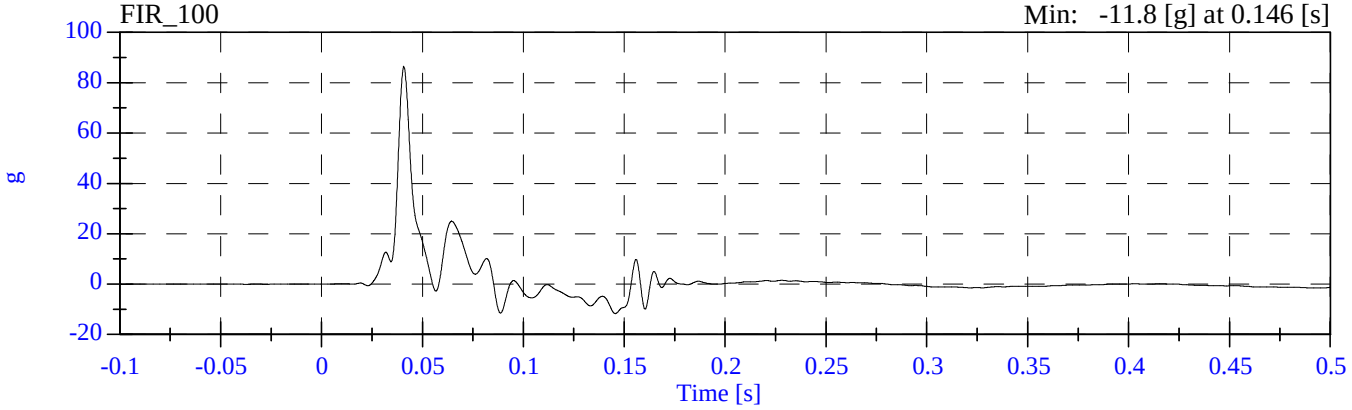
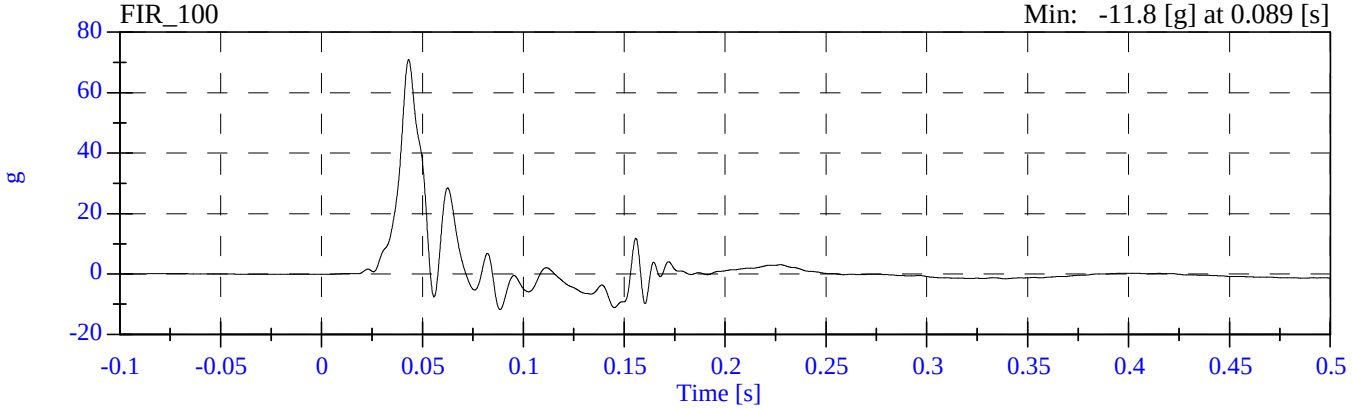
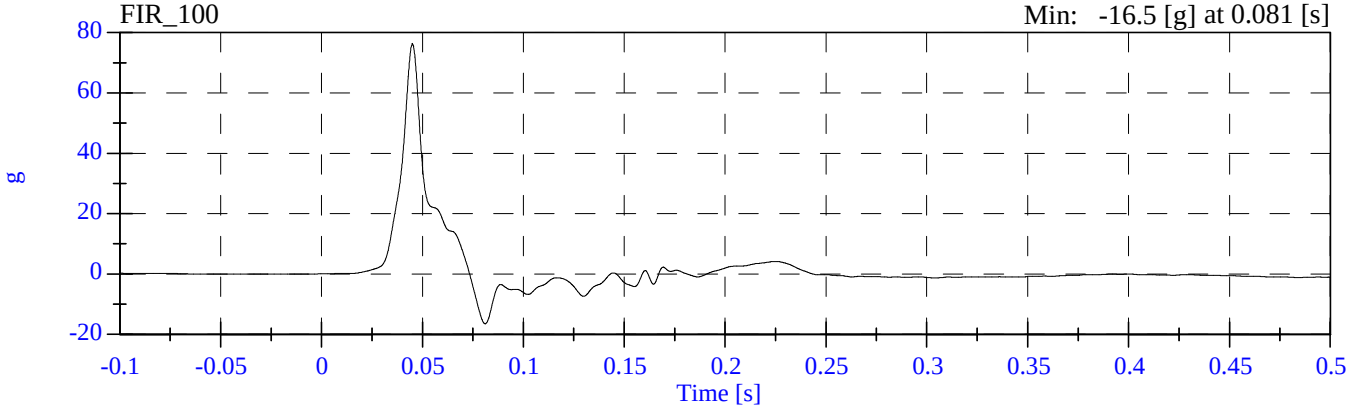
V1P1 Upper Rib y
FIR_100
Max: 86.5 [g] at 0.041 [s]
Min: -11.8 [g] at 0.146 [s]



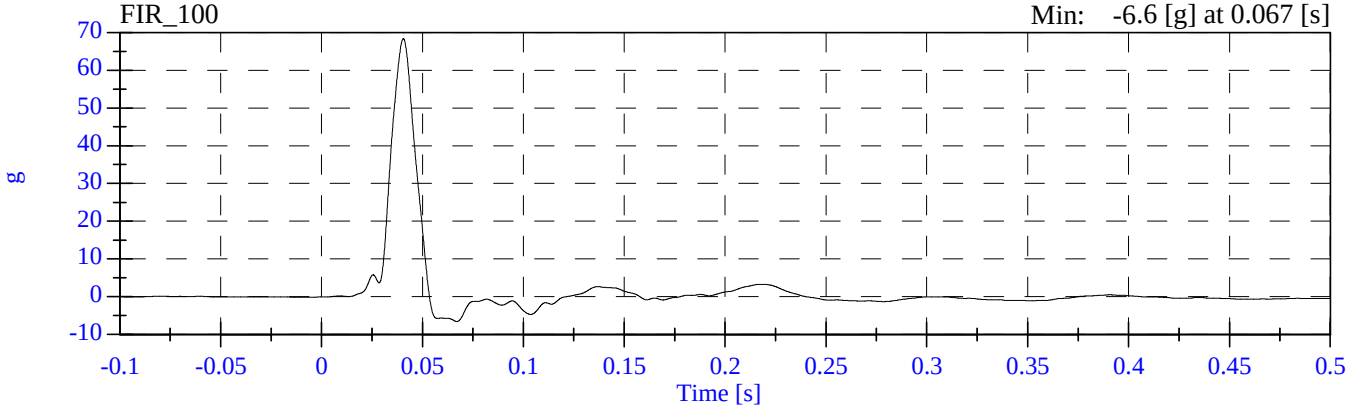
V1P1 Lower Rib y
FIR_100
Max: 71.1 [g] at 0.043 [s]
Min: -11.8 [g] at 0.089 [s]



V1P1 Lower Spine y
FIR_100
Max: 76.4 [g] at 0.045 [s]
Min: -16.5 [g] at 0.081 [s]

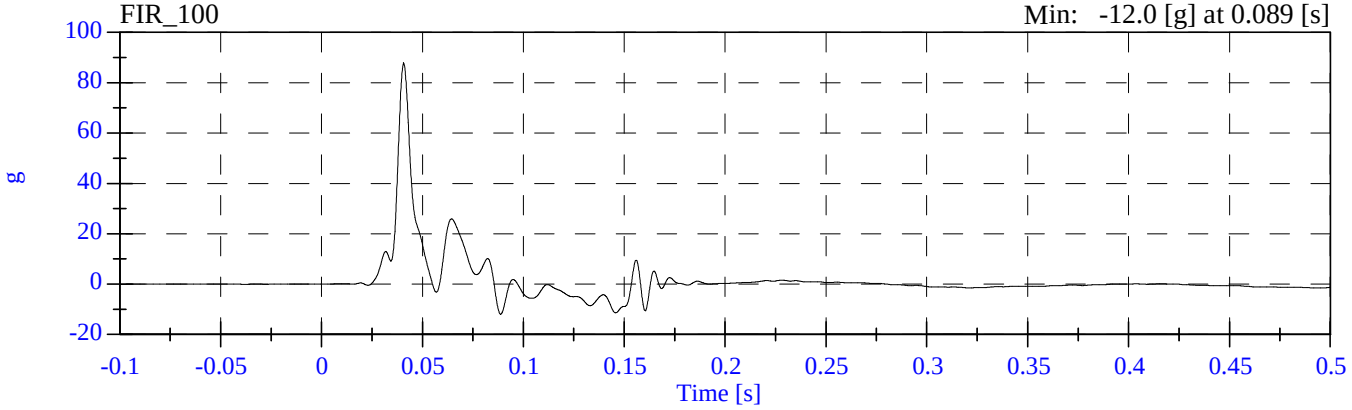


V1P1 Pelvic y
FIR_100
Max: 68.4 [g] at 0.041 [s]
Min: -6.6 [g] at 0.067 [s]

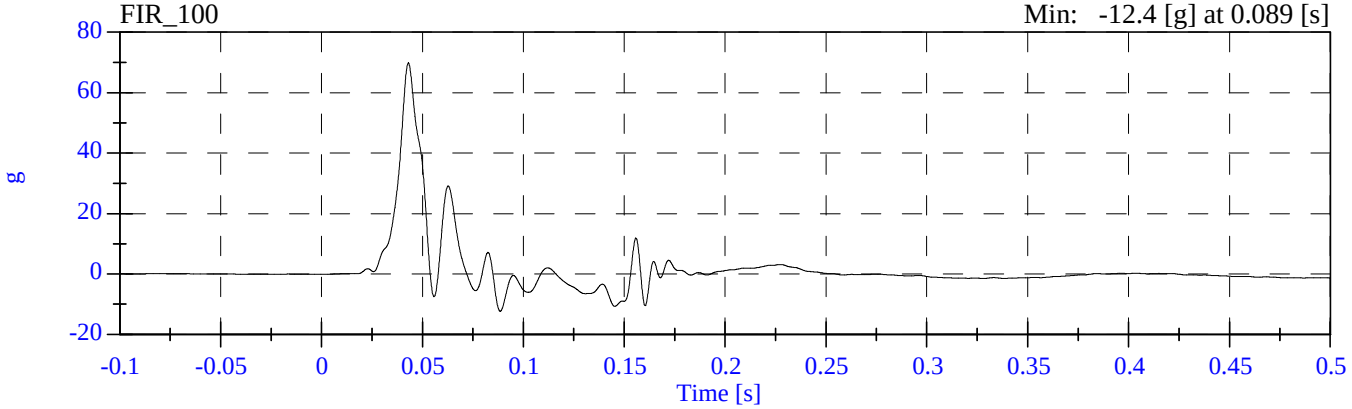


2009 FMVSS 201P Test 3 2008 Chevrolet Impala
C80108 - July 08, 2008

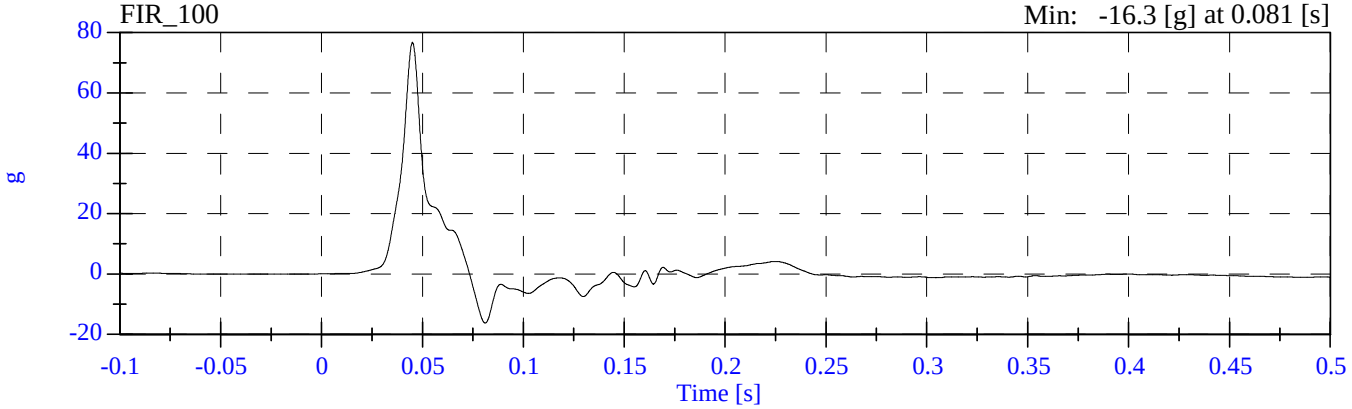
V1P1 Upper Rib Ry
FIR_100
Max: 87.9 [g] at 0.041 [s]
Min: -12.0 [g] at 0.089 [s]



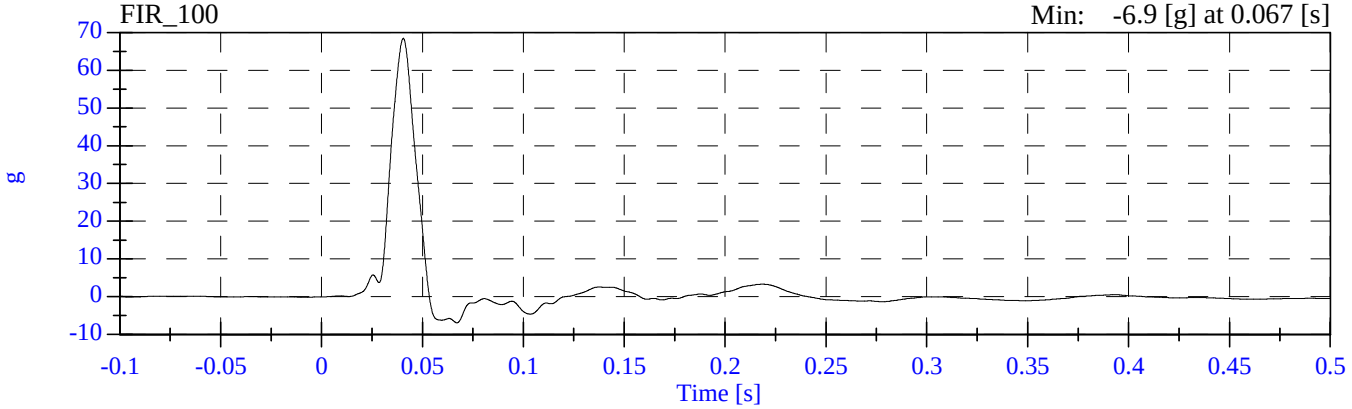
V1P1 Lower Rib Ry
FIR_100
Max: 70.0 [g] at 0.043 [s]
Min: -12.4 [g] at 0.089 [s]



V1P1 Lower Spine Ry
FIR_100
Max: 76.8 [g] at 0.045 [s]
Min: -16.3 [g] at 0.081 [s]



V1P1 Pelvic Ry
FIR_100
Max: 68.5 [g] at 0.041 [s]
Min: -6.9 [g] at 0.067 [s]



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SUMMARY
SID H3 PRE & POST TEST CALIBRATION

CONFIGURED FOR LEFT SIDE IMPACT

Date: 6/30/08; 7/16/08 Sequential Test Number: 1
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	SID H3 NO.: 270	SID H3 NO.: 270
		PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	899	899
RH- Rib Height (mm)	501 - 520	505	505
HP- Hip Pivot Height (mm)	99 ref.	99	99
RD- Rib from Back Line (mm)	229 - 241	230	234
KH- Knee Pivot from Back Line (mm)	511 - 526	518	518
KV- Knee Pivot to Floor (mm)	490 - 505	495	495
HW- Hip Width (mm)	356 - 391	394	384
HEAD DROP			
TEMPERATURE (C)	18.9 - 25.6	21.7	21.7
RELATIVE. HUMIDITY (%)	10 -70	65.00	52.00
PEAK RESULTANT ACCELERATION.	120-150 Gs	128.03	128.92
PEAK LATERAL ACCELERATION	15 Gs Max	3.89	0.47
CURVE PERCENT NONMODAL	< 15%	2.75	2.87
NECK TEST			
TEMPERATURE (C^o)	20.6 – 22.2	21.7	21.7
HUMIDITY (%)	10-70%	65.00	53.00
IMPACT VELOCITY (m/s)	6.89-7.13	7.02	6.99
PENDULUM DELTA V			
DELTA V at 10 ms.	1.96-2.55 m/s	2.24	2.12
DELTA V at 20 ms.	4.12-5.10 m/s	4.49	4.34
DELTA V at 30 ms.	5.73-7.01 m/s	6.35	6.19
DELTA V between 40-70 ms.	6.27-7.64 m/s	6.96	7.03

SUMMARY (cont'd)
SID H3 PRE & POST TEST CALIBRATION

D PLANE ROTATION			
MAXIMUM ROTATION (deg.)	66.0-82.0	72.41	71.10
ROTATION ANGLE DECAY	58.0-67.0 ms	60.60	60.00
MOMENT ABOUT THE OCCIPITAL CONDYLE			
MAX OCCIPITAL MOMENT	73.0-88.0 N-m	83.62	83.48
OCCIPITAL MOMENT DECAY	49.0-64.0 ms	53.40	54.80
HEAD ROTATION TIME WITH RESPECT TO OCCIPITAL CONDYLE MOMENT			
MOMENT TO ROTATION PEAK	2.0-16.0 ms	9.30	8.90
THORAX IMPACTS			
TEMPERATURE (C)	18.9 - 25.5	21.7	21.7
RELATIVE. HUMIDITY (%)	10 -70	65.00	50.00
PROBE SPEED (m/s)	4.27 - 4.33	4.31	4.31
UPPER RIB (g's)	37 - 46	39.84	42.93
LOWER RIB (g's)	37 - 46	41.15	39.27
LOWER SPINE (g's)	15 -22	21.37	20.32
PELVIS IMPACT			
TEMPERATURE (C)	18.9 - 25.5	21.7	21.7
RELATIVE HUMIDITY (%)	10 - 70	65.00	51.00
PROBE SPEED (m/s)	4.27 - 4.33	4.29	4.30
PELVIS (g's)	40 -60	47.33	43.11

REMARKS: None

CALIBRATION TEST RESULTS

PRE-TEST

SID H3 NO.: 270

CONFIGURED FOR LEFT **SIDE IMPACT**

CALIBRATION TEST RESULTS SUMMARY
PRE-TEST

CONFIGURED FOR LEFT **SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1

Date: 6-30-08 Laboratory Technician: A. Rudniski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
THORACIC SHOCK ABSORBER TEST	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST	Passed all requirements.
LATERAL NECK BEND TEST	Passed all requirements.
ABDOMINAL COMPRESSION TEST	Passed all requirements.
LUMBAR FLEXION TEST	Passed all requirements.

REMARKS: None

EXTERNAL DIMENSIONS
PRE-TEST

CONFIGURED FOR LEFT **SIDE IMPACT**

SID H3 Serial No.:	270	Sequential Test Number:	1
Date:	6-30-08	Laboratory Technician:	A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 – 909	899
RH- Rib Height (mm)	502 – 520	505
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 – 241	230
KH- Knee Pivot from Back Line (mm)	511 – 526	518
KV- Knee Pivot to Floor (mm)	490 – 505	495
HW- Hip Width (mm)	356 - 391	394

REMARKS: None

Shock Test Low (3.05 m/s)

PRE TEST

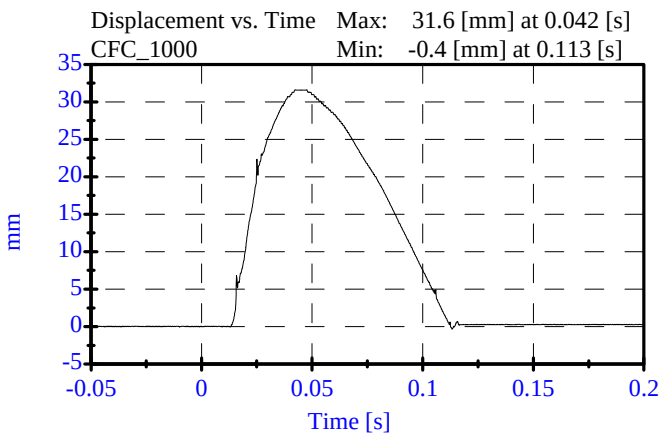
CONFIGURED FOR LEFT SIDE IMPACT

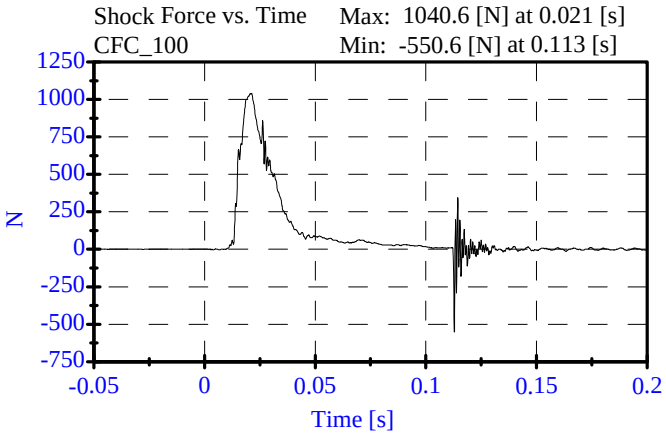
ATD Serial No: 270 Sequential Test Number: 1 File: 270 Shock Low 02-04-08

Date: 02-04-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	18.00 %	Passed
Displacement:	30.00-35.00 mm	31.63 mm	Passed
Maximum Force:	836.00-1125.00 N	1040.57 N	Passed

Impact Test Velocity: 3.05 m/s
Damper Identification: 270
Damper Setting: 5





Shock Test Medium (4.27 m/s)

PRE TEST

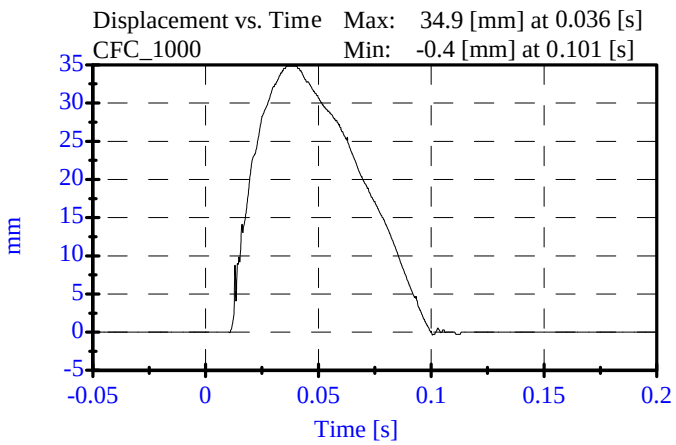
CONFIGURED FOR LEFT SIDE IMPACT

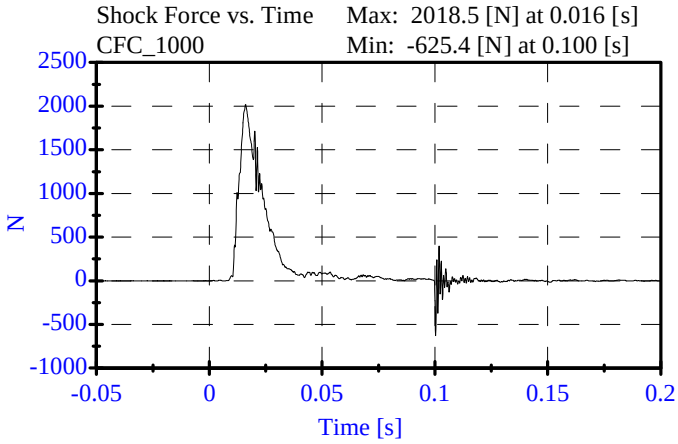
ATD Serial No: 270 Sequential Test Number: 1 File: 270 Shock Med 02-04-(

Date: 02-04-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	19.00 %	Passed
Displacement:	32.00-37.00 mm	34.87 mm	Passed
Maximum Force:	1730.00-2099.00 N	2018.50 N	Passed

Impact Test Velocity: 4.27 m/s
Damper Identification: 270
Damper Setting: 5





Shock Test High (6.10 m/s)

PRE TEST

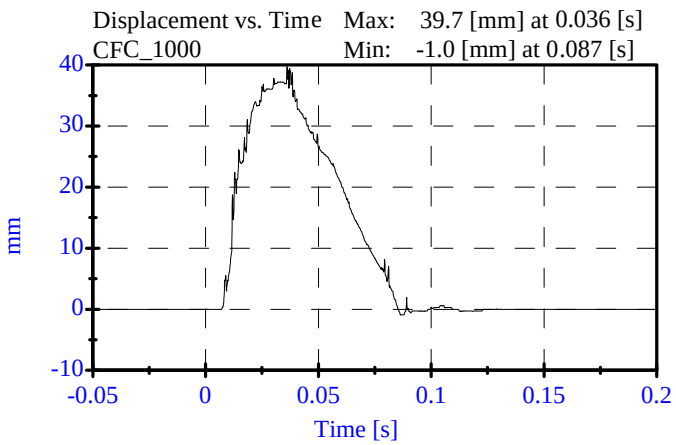
CONFIGURED FOR LEFT SIDE IMPACT

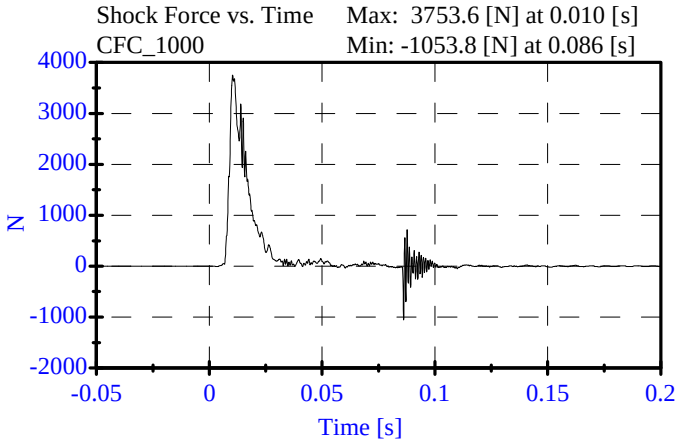
ATD Serial No: 270 Sequential Test Number: 1 File: 270 Shock High2 02-04

Date: 02-04-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	19.00 %	Passed
Displacement:	33.00-40.00 mm	39.70 mm	Passed
Maximum Force:	3741.00-4448.00 N	3753.63 N	Passed

Impact Test Velocity: 6.10 m/s
Damper Identification: 270
Damper Setting: 5





Thorax Impact

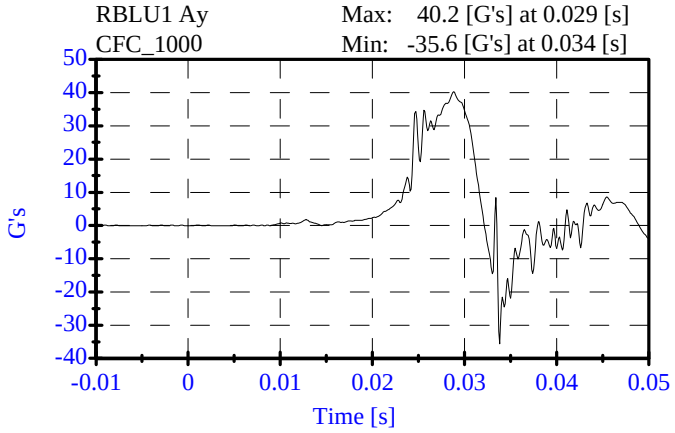
Pre-Test

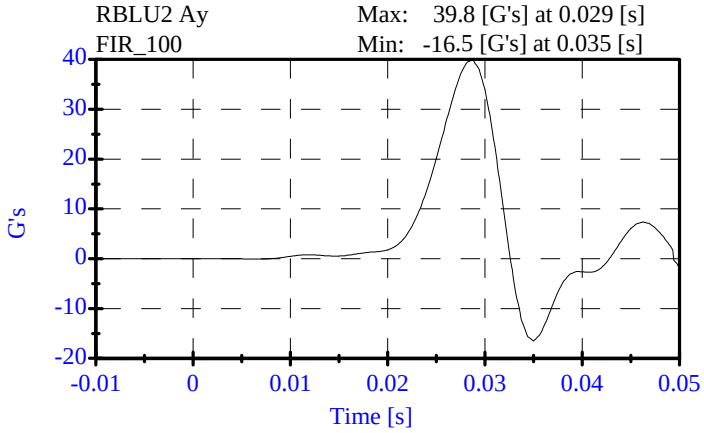
CONFIGURED FOR LEFT SIDE IMPACT

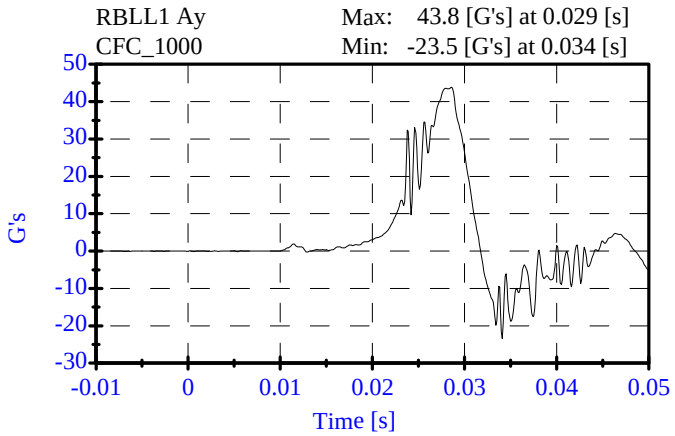
ATD Serial No: 270 Sequential Test Number: 1 File: 270T 06-30-08

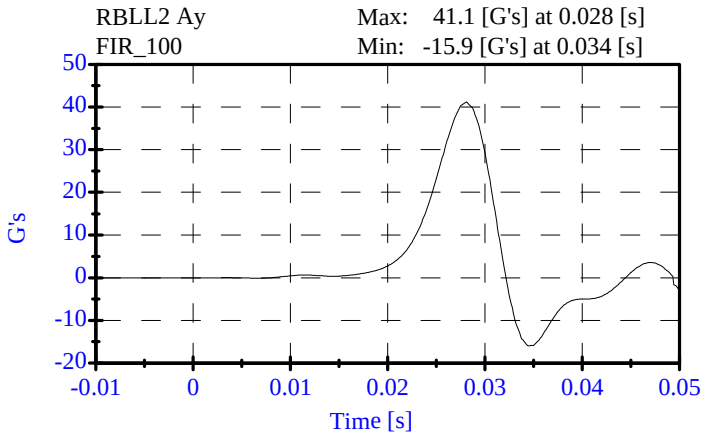
Date: 06-30-08 Laboratory Technician: B. Swiecicki

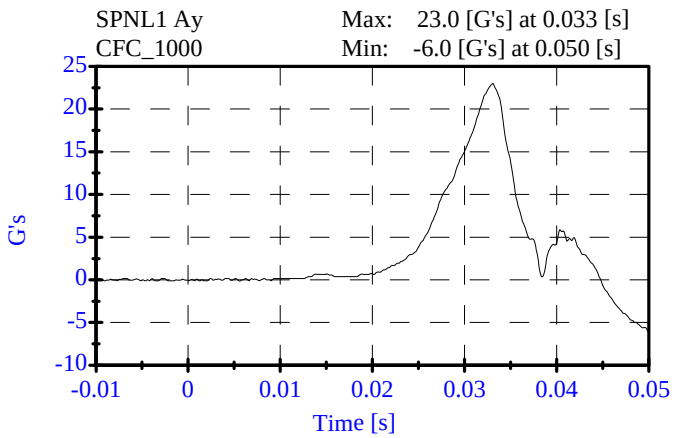
TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	65.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.31 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	39.84 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	41.15 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	21.37 G's	Passed

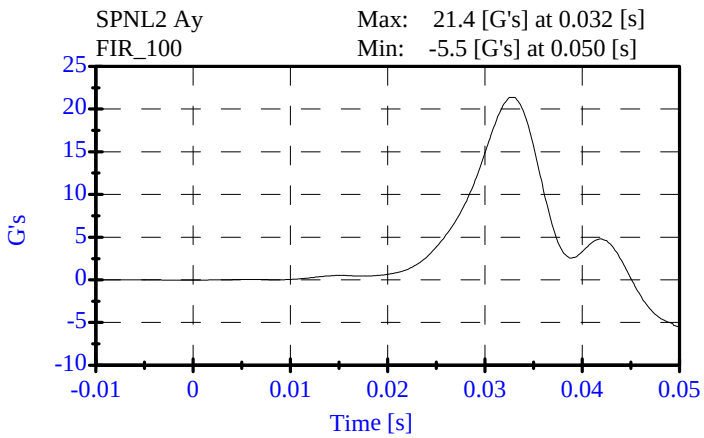












Pelvis Impact

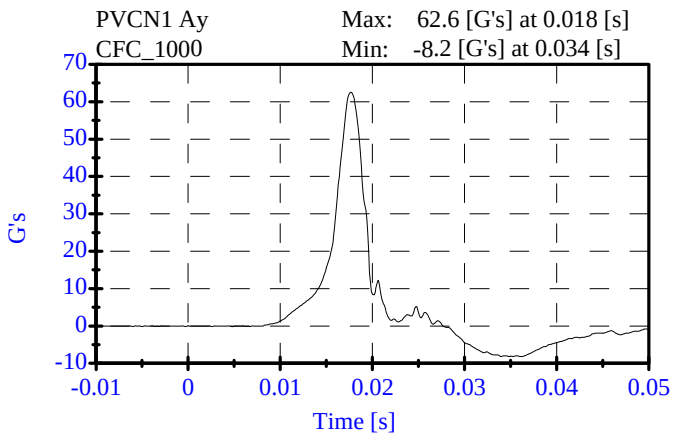
Pre-Test

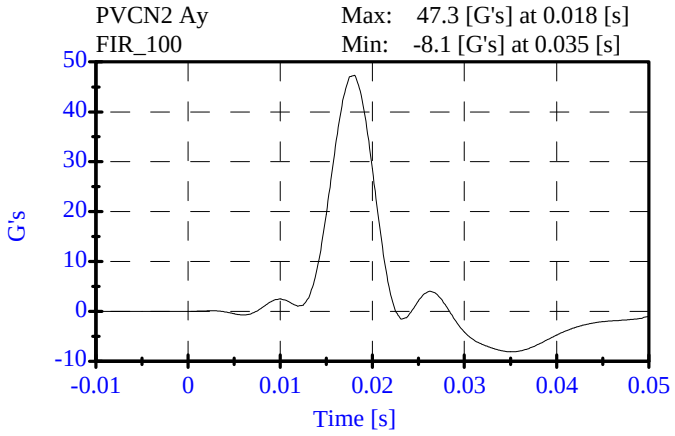
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270 Sequential Test Number: 1 File: 270P 06-30-08

Date: 06-30-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	65.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.29 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	47.33 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	5.5 ms	Passed





Head Drop

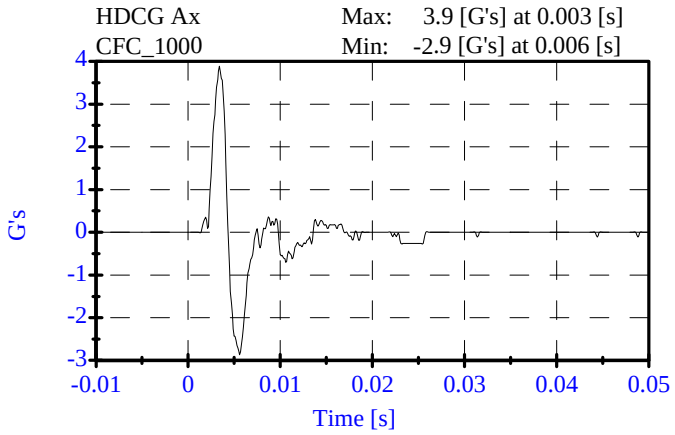
Pre-Test

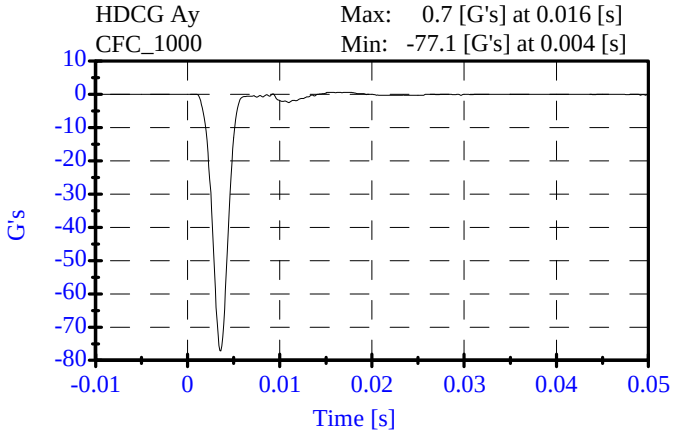
CONFIGURED FOR LEFT SIDE IMPACT

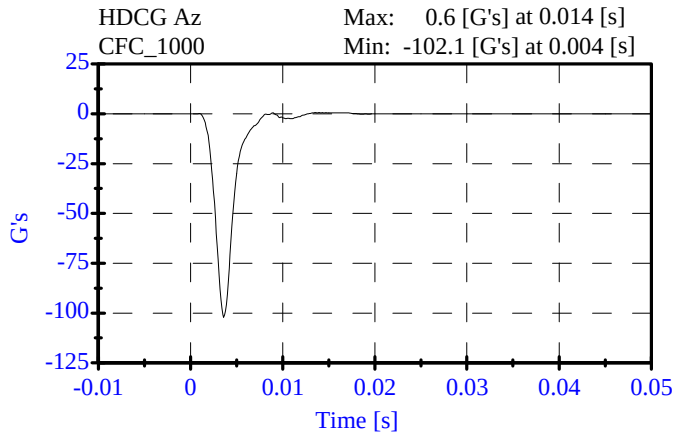
ATD Serial No: 270 Sequential Test Number: 1 File: 270H 06-30-08

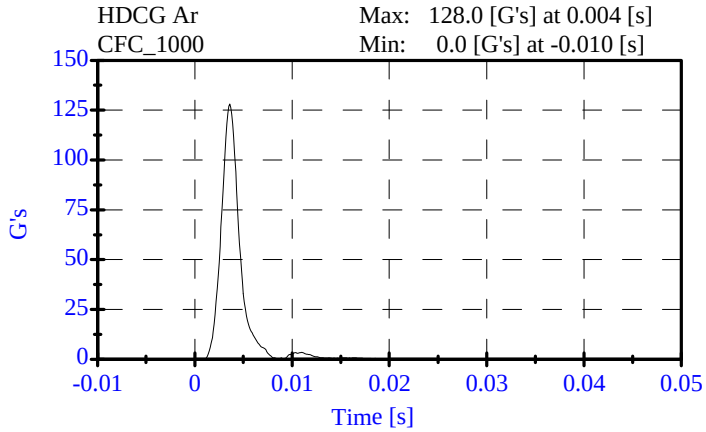
Date: 06-30-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.7 C	Passed
Lab Humidity:	10-70 %	65.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	128.03 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	3.89 Gs	Passed
Curve PerCent NonModal:	< 15%	2.75 %	Passed









Neck Test

Pre-Test

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270 Sequential Test Number: 1 File: 270N 06-30-08

Date: 06-30-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	20.6-22.2 C	21.7 C	Passed
Lab Humidity:	10-70 %	65.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	7.02 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.24 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.49 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.35 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	6.96 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	72.41 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	60.60 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 N-m	83.62 N-m	Passed
Occiptal Moment Decay:	49.0-64.0 ms	53.40 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	9.30 ms	Passed

Neck Test

Pre-Test

CONFIGURED FOR LEFT SIDE IMPACT

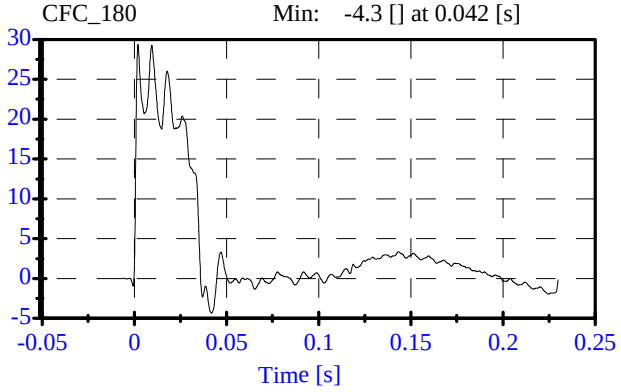
ATD Serial No: 270

Sequential Test Number: 1 File: 270N 06-30-08

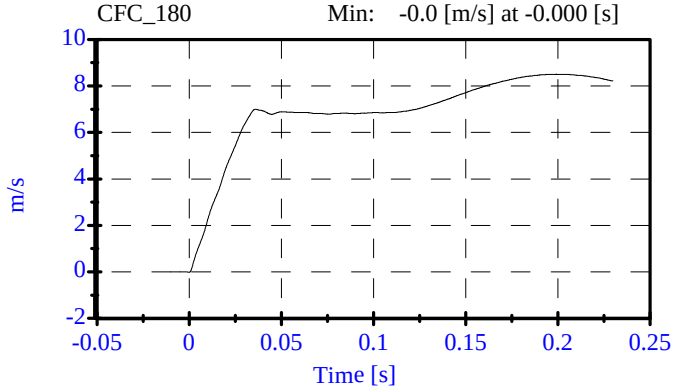
Date: 06-30-08

Laboratory Technician: B. Swiecicki

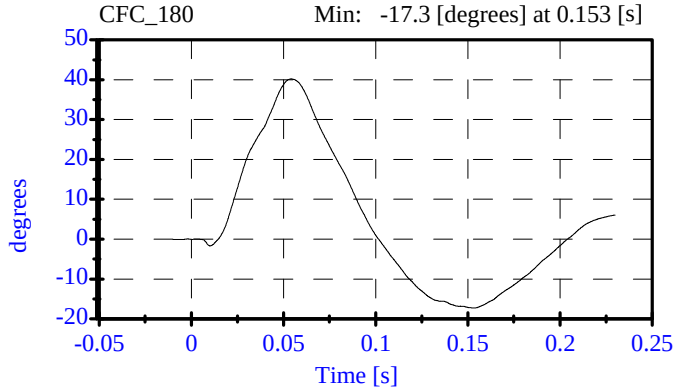
Pend Ax
CFC_180
Max: 29.4 [] at 0.002 [s]
Min: -4.3 [] at 0.042 [s]



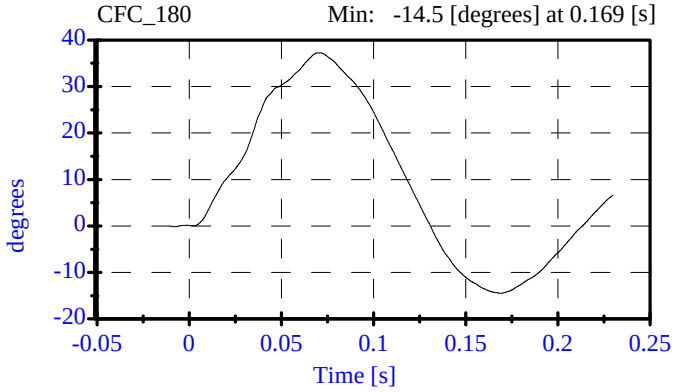
Pend Vx
CFC_180
Max: 8.5 [m/s] at 0.199 [s]
Min: -0.0 [m/s] at -0.000 [s]



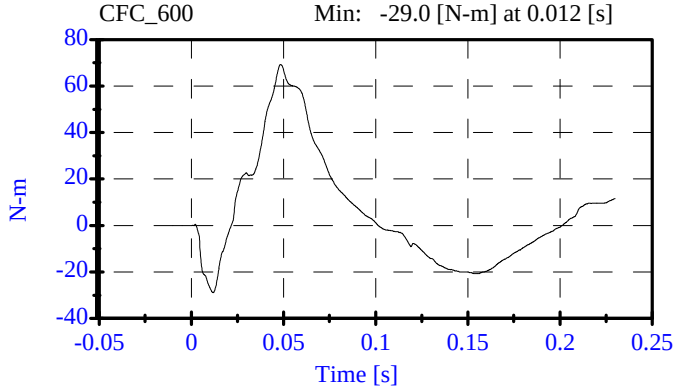
Head Rot
CFC_180
Max: 40.2 [degrees] at 0.054 [s]
Min: -17.3 [degrees] at 0.153 [s]



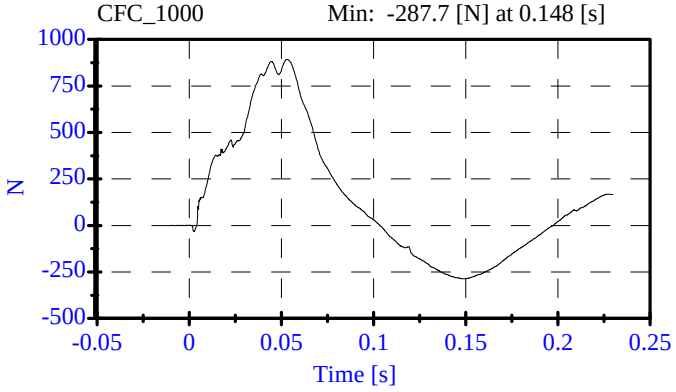
Arm Rot
CFC_180
Max: 37.3 [degrees] at 0.070 [s]
Min: -14.5 [degrees] at 0.169 [s]



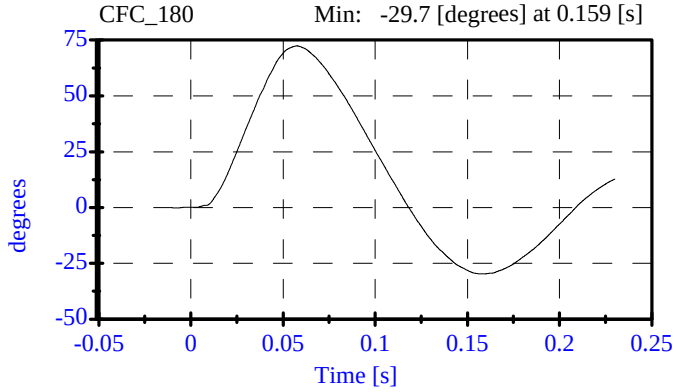
Neck Mx
CFC_600
Max: 69.2 [N-m] at 0.048 [s]
Min: -29.0 [N-m] at 0.012 [s]



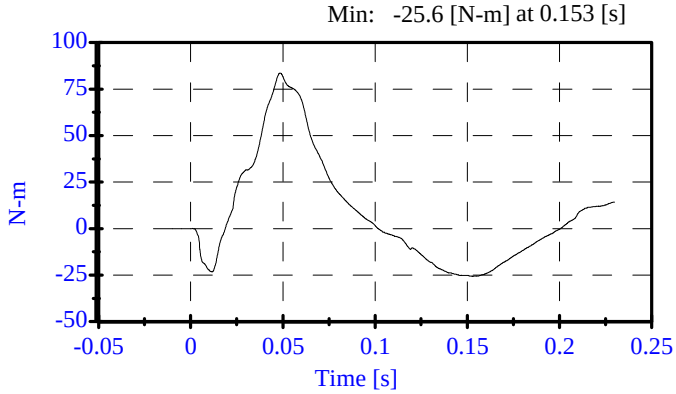
Neck Fy
CFC_1000
Max: 892.8 [N] at 0.053 [s]
Min: -287.7 [N] at 0.148 [s]



Tot Rot
CFC_180
Max: 72.4 [degrees] at 0.058 [s]
Min: -29.7 [degrees] at 0.159 [s]



MOCX
Max: 83.6 [N-m] at 0.048 [s]
Min: -25.6 [N-m] at 0.153 [s]



Abdominal Compression Test

Pre-Test

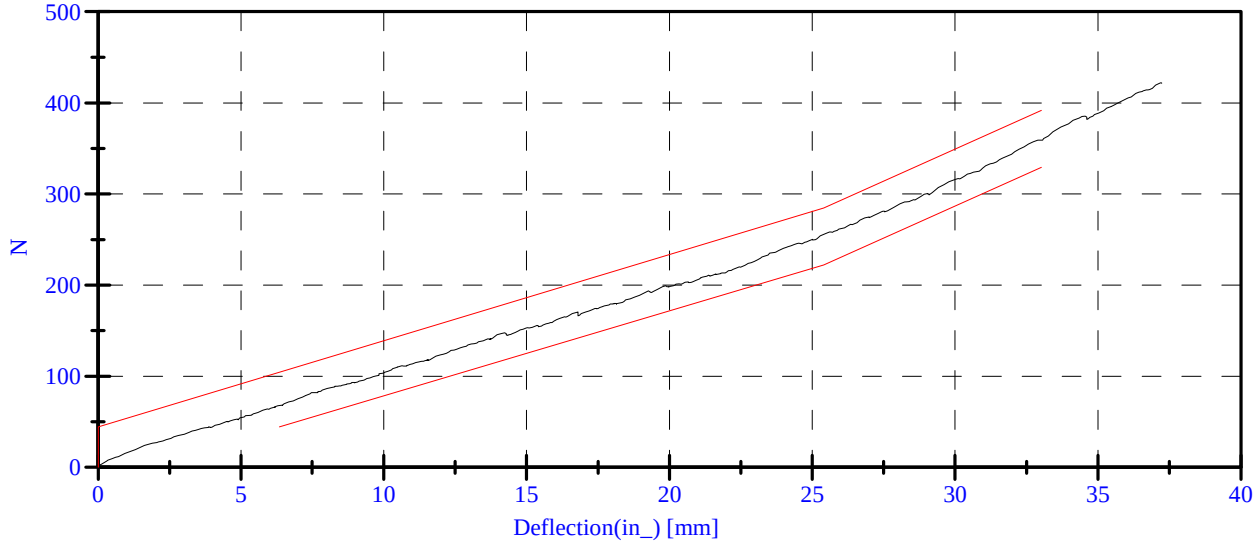
CONFIGURED FOR LEFT SIDE IMPACT

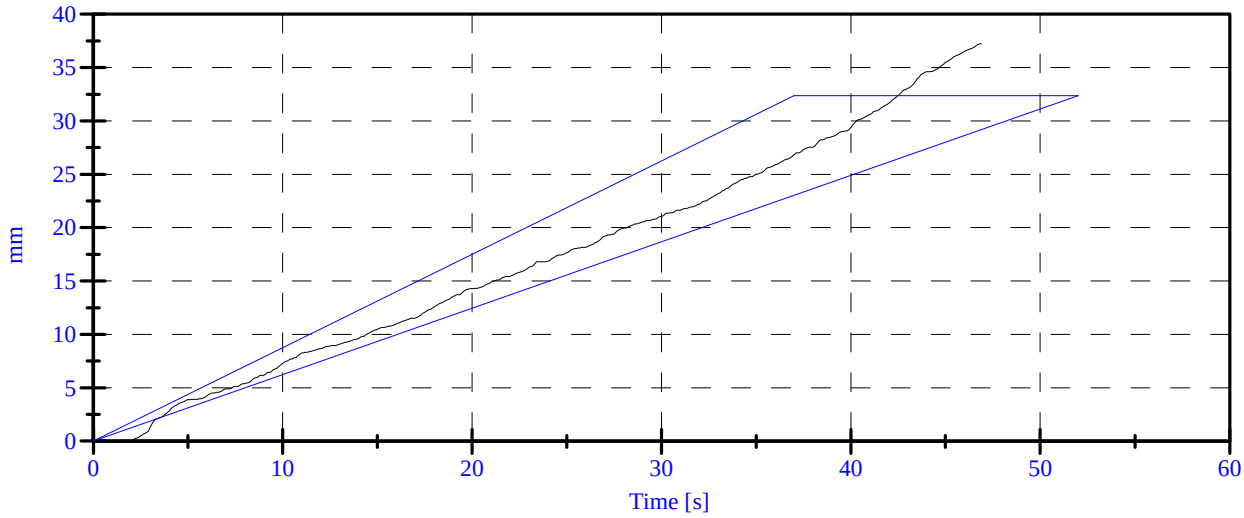
ATD Serial No: 270 Sequential Test Number: 1 File: 270 Ab 07-01-08

Date: 07-01-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	64.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	134.28 N	Passed
Force at 19.05 mm :	162.98-220.99 N	191.19 N	Passed
Force at 25.40 mm :	221.97-280.02 N	256.80 N	Passed
Force at 33.02 mm :	324.99-391.00 N	359.02 N	Passed

ABDOMINAL COMPRESSION TEST





Lumbar Spine Test
Pre-Test

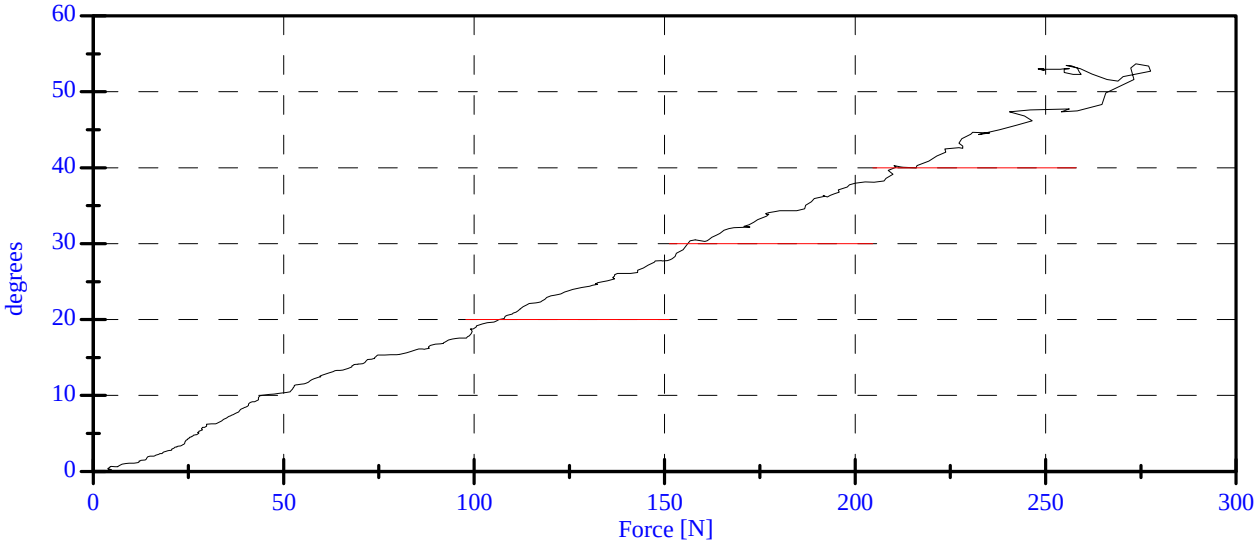
CONFIGURED FOR LEFT SIDE IMPACT

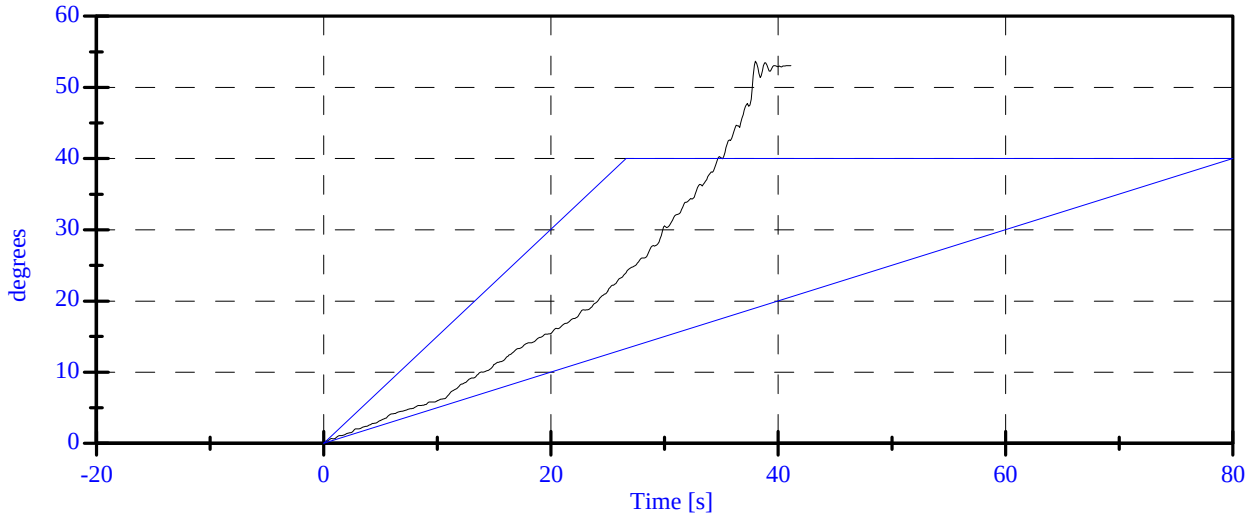
ATD Serial No: 270
Date: 06-30-08

Sequential Test Number: 1 File: 270 Spine 06-30-08
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	65.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	4.70 N	Passed
Force at 20 Deg:	97.86-151.24 N	106.55 N	Passed
Force at 30 Deg	151.24-204.62 N	155.91 N	Passed
Force at 40 Deg	204.62-258.00 N	215.97 N	Passed
Return Angle	12 Deg Max	5.53 deg	Passed

LUMBAR SPINE FLEXION TEST





PRE-TEST DUMMY INSPECTION LIST

CONFIGURED FOR LEFT **SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 6-30-08 Laboratory Technician: A. Rudniski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

CALIBRATION TEST RESULTS

POST TEST

SID H3 NO.: 270

CONFIGURED FOR LEFT **SIDE IMPACT**

CONFIGURED FOR LEFT **SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 7-16-08 Laboratory Technician: A. Rudniski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST	Passed all requirements.
LATERAL NECK BEND TEST	Passed all requirements.
ABDOMINAL COMPRESSION TEST	Passed all requirements.
LUMBAR FLEXION TEST	Passed all requirements.

REMARKS: None

EXTERNAL DIMENSIONS
POST TEST

CONFIGURED FOR LEFT **SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 7-16-08 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	899
RH- Rib Height (mm)	502 - 520	505
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	234
KH- Knee Pivot from Back Line (mm)	511 - 526	518
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	384

REMARKS: None

Thorax Impact

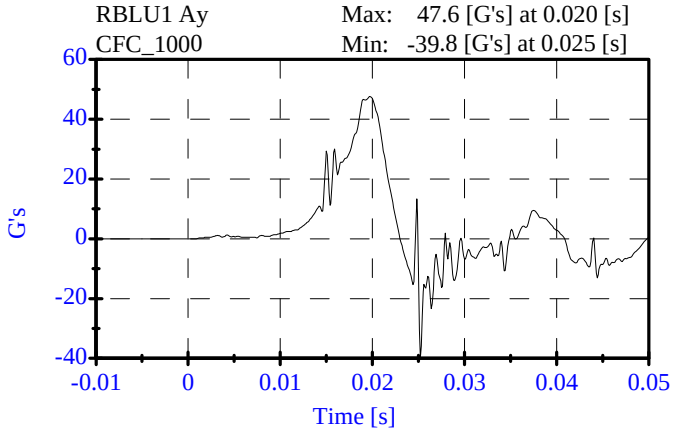
Post-Test

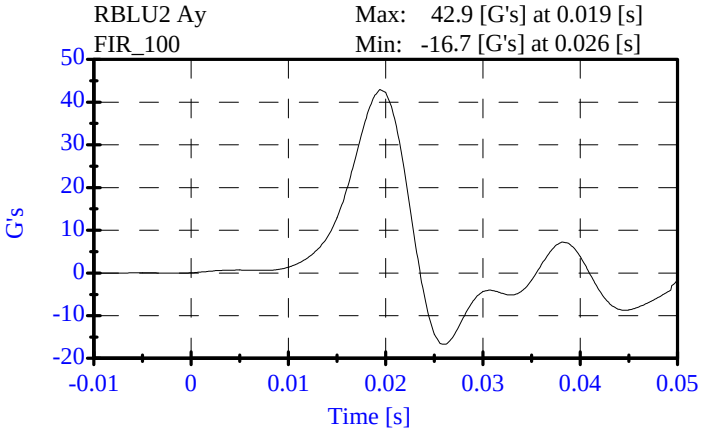
CONFIGURED FOR LEFT SIDE IMPACT

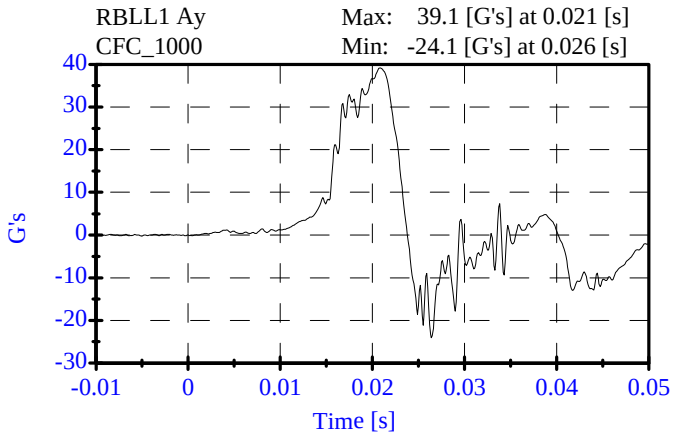
ATD Serial No: 270 Sequential Test Number: 1 File: 270T 07-15-08

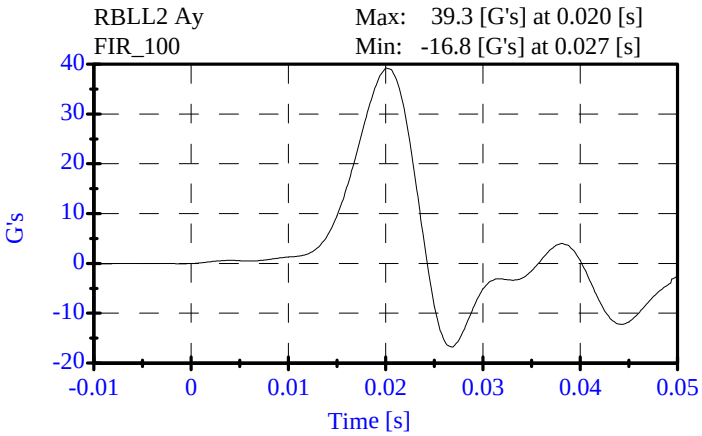
Date: 07-15-08 Laboratory Technician: B. Swiecicki

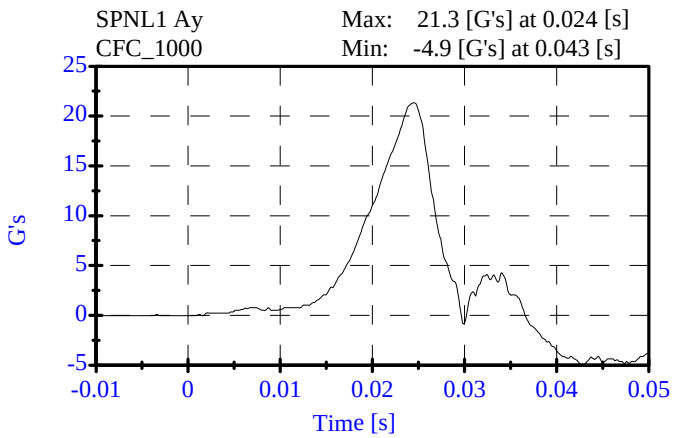
TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	50.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.31 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	42.93 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	39.27 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	20.32 G's	Passed

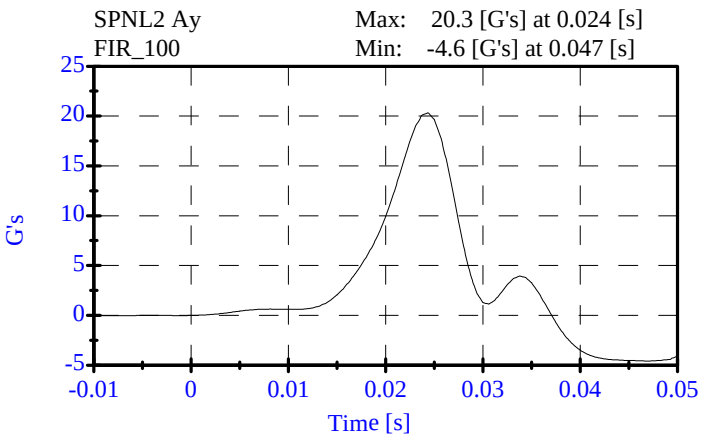












Pelvis Impact

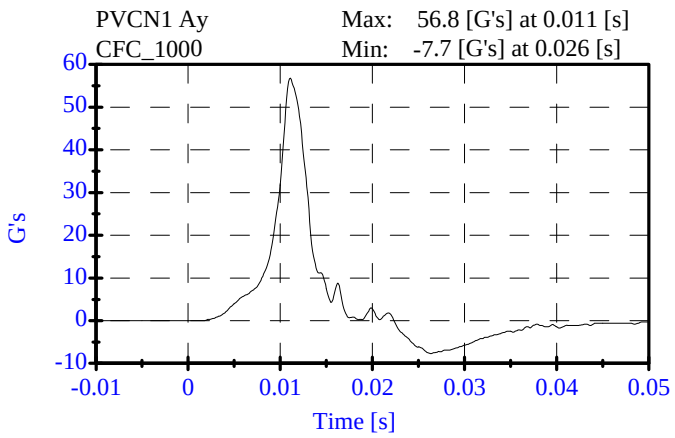
Post-Test

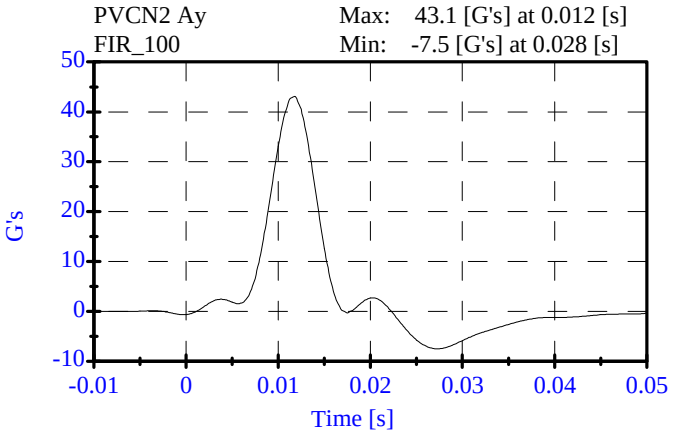
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270 Sequential Test Number: 1 File: 270P 07-15-08

Date: 07-15-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	51.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.30 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	43.11 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	5.5 ms	Passed





Head Drop

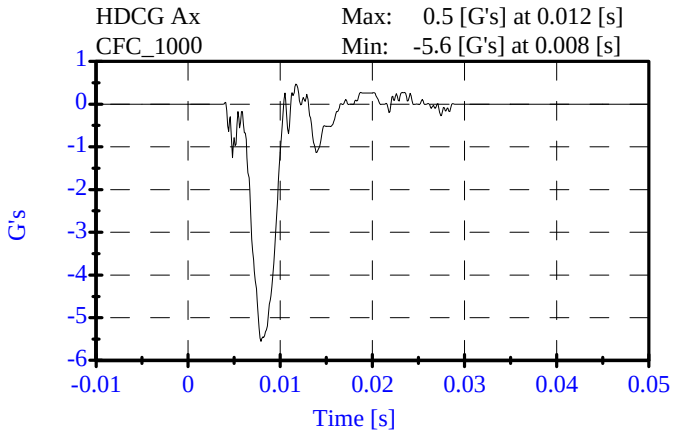
Post-Test

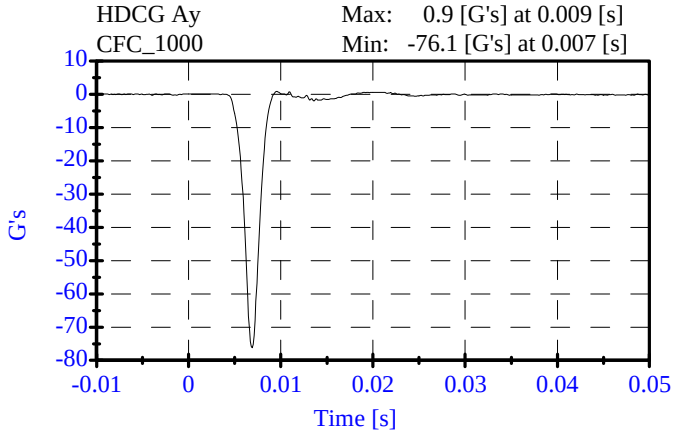
CONFIGURED FOR LEFT SIDE IMPACT

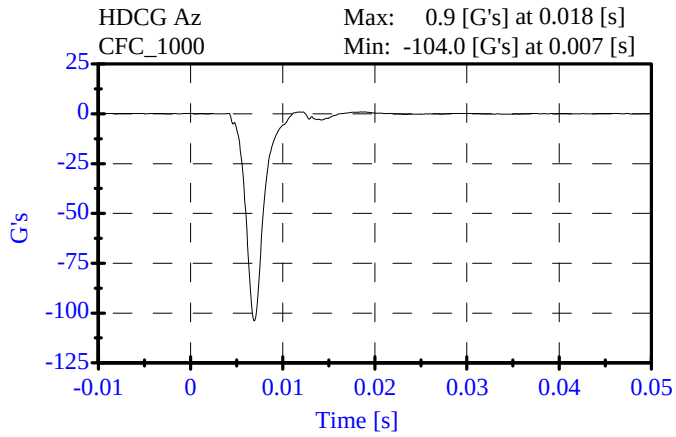
ATD Serial No: 270 Sequential Test Number: 1 File: 270H 07-14-08

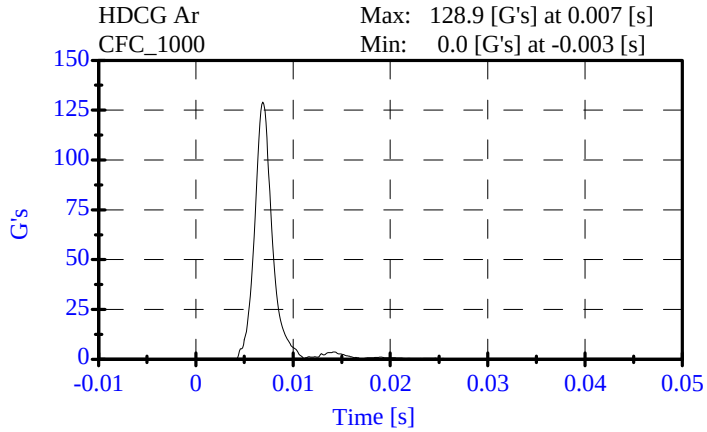
Date: 07-14-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.7 C	Passed
Lab Humidity:	10-70 %	52.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	128.92 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	0.47 Gs	Passed
Curve PerCent NonModal:	< 15%	2.87 %	Passed









Neck Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270 Sequential Test Number: 1 File: 270N1 07-15-08

Date: 07-15-08 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	20.6-22.2 C	21.7 C	Passed
Lab Humidity:	10-70 %	53.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	6.99 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.12 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.34 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.19 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.03 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	71.10 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	60.00 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 N-m	83.48 N-m	Passed
Occiptal Moment Decay:	49.0-64.0 ms	54.80 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	8.90 ms	Passed

Neck Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

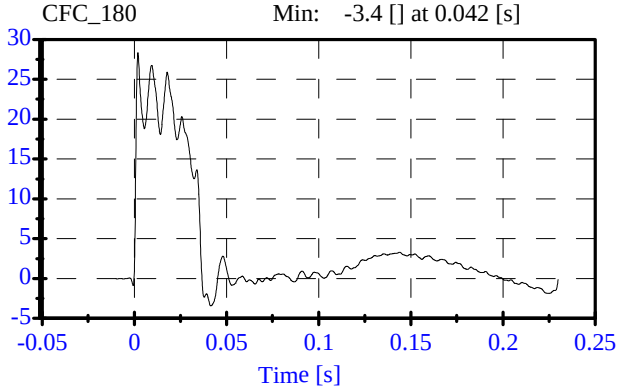
ATD Serial No: 270

Sequential Test Number: 1 File: 270N1 07-15-08

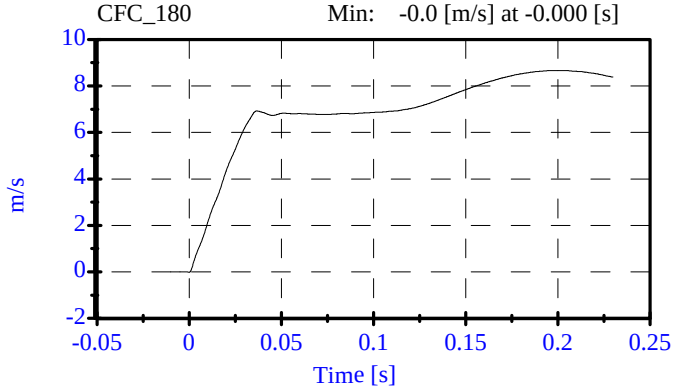
Date: 07-15-08

Laboratory Technician: B. Swiecicki

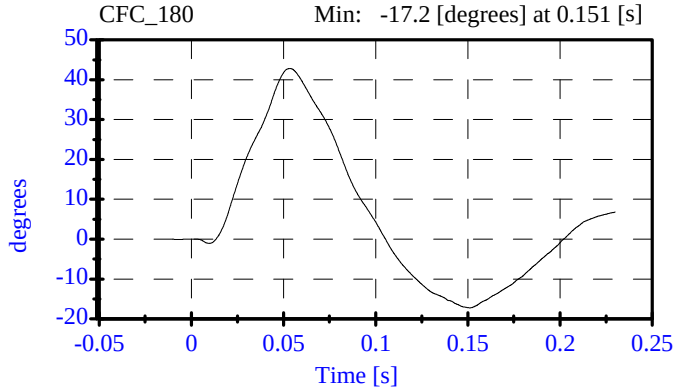
Pend Ax
CFC_180
Max: 28.3 [] at 0.002 [s]
Min: -3.4 [] at 0.042 [s]



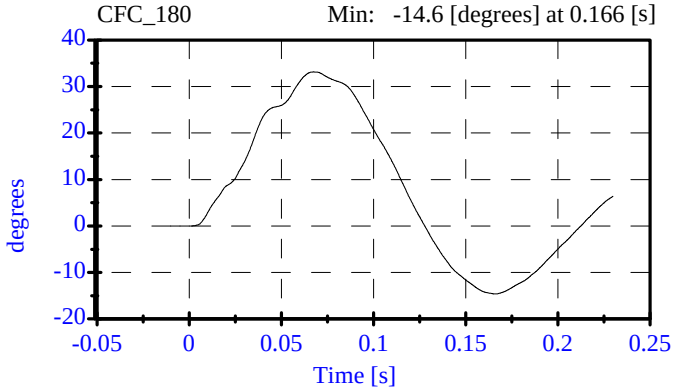
Pend Vx
CFC_180
Max: 8.7 [m/s] at 0.200 [s]
Min: -0.0 [m/s] at -0.000 [s]



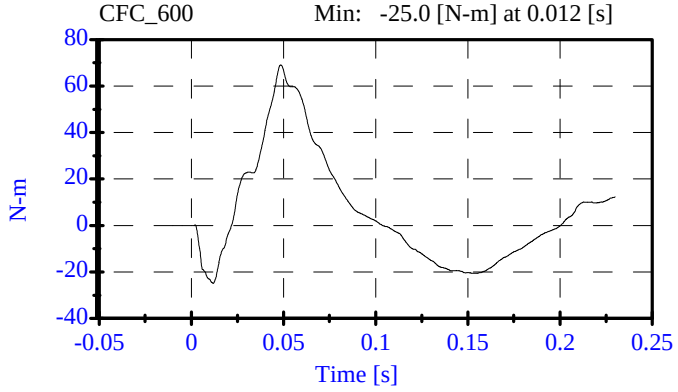
Head Rot
CFC_180
Max: 42.8 [degrees] at 0.054 [s]
Min: -17.2 [degrees] at 0.151 [s]



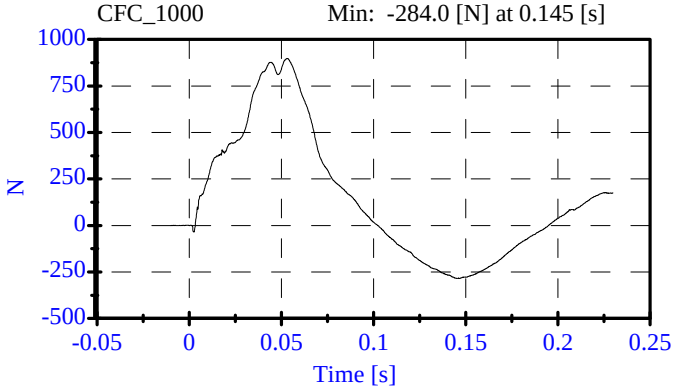
Arm Rot
CFC_180
Max: 33.1 [degrees] at 0.067 [s]
Min: -14.6 [degrees] at 0.166 [s]



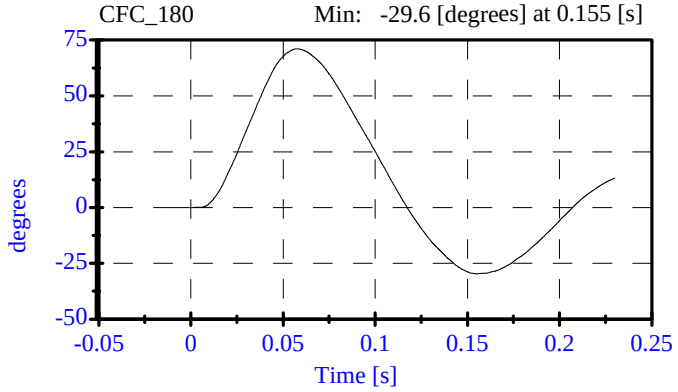
Neck Mx
CFC_600
Max: 69.0 [N-m] at 0.049 [s]
Min: -25.0 [N-m] at 0.012 [s]



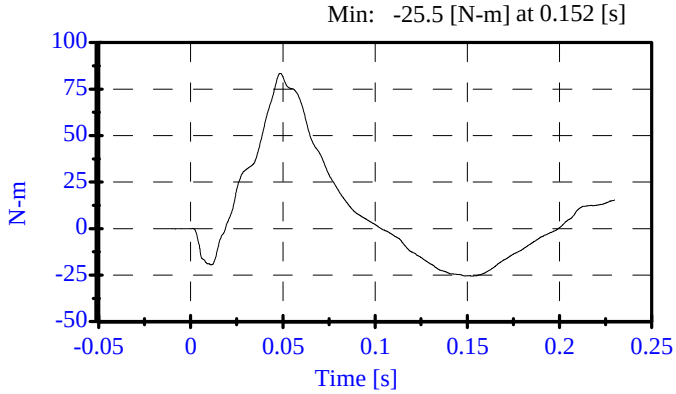
Neck Fy
CFC_1000
Max: 897.7 [N] at 0.053 [s]
Min: -284.0 [N] at 0.145 [s]



Tot Rot
CFC_180
Max: 71.1 [degrees] at 0.057 [s]
Min: -29.6 [degrees] at 0.155 [s]



MOCX
Max: 83.5 [N-m] at 0.049 [s]
Min: -25.5 [N-m] at 0.152 [s]



Abdominal Compression Test
Post-Test

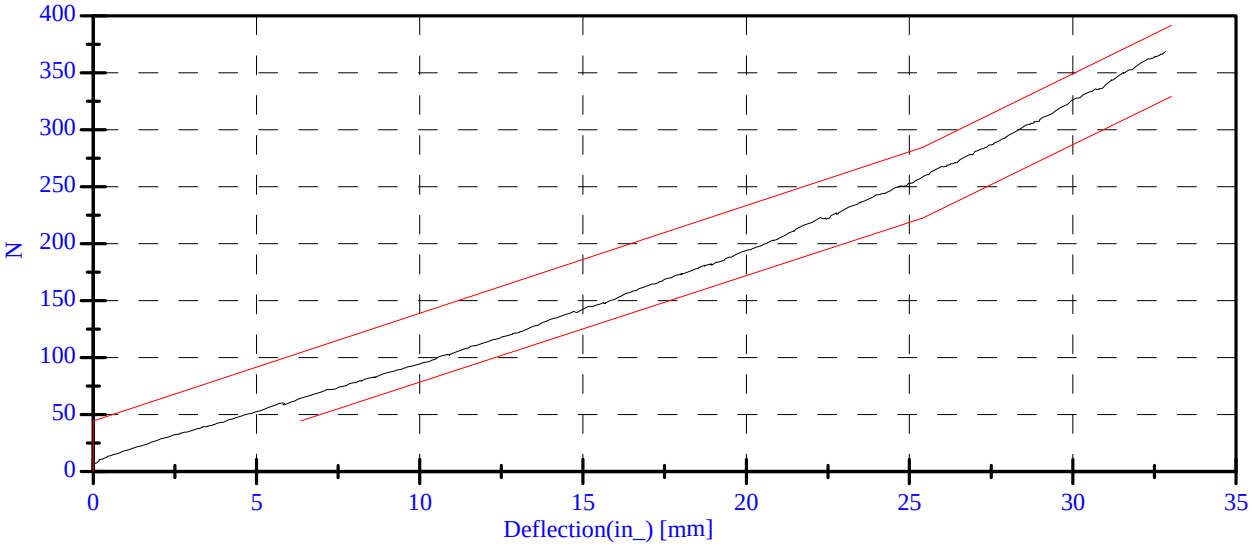
CONFIGURED FOR LEFT SIDE IMPACT

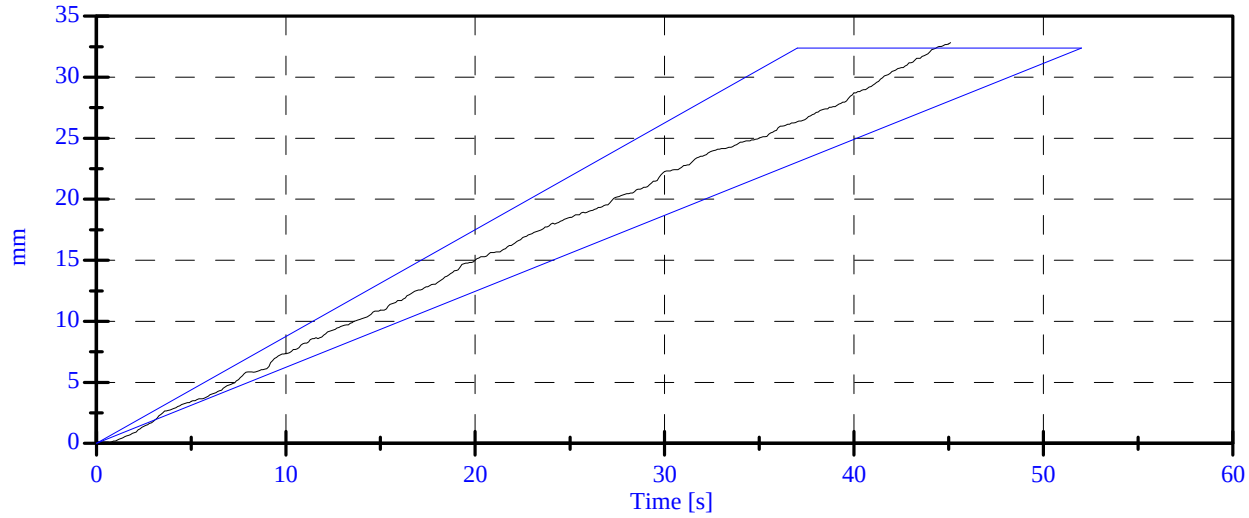
ATD Serial No: 270
Date: 07-16-08

Sequential Test Number: 1 File: 270 Ab 07-16-08
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	56.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	121.72 N	Passed
Force at 19.05 mm :	162.98-220.99 N	183.78 N	Passed
Force at 25.40 mm :	221.97-280.02 N	259.34 N	Passed
Force at 33.02 mm :	324.99-391.00 N	368.49 N	Passed

ABDOMINAL COMPRESSION TEST





Lumbar Spine Test
Post-Test

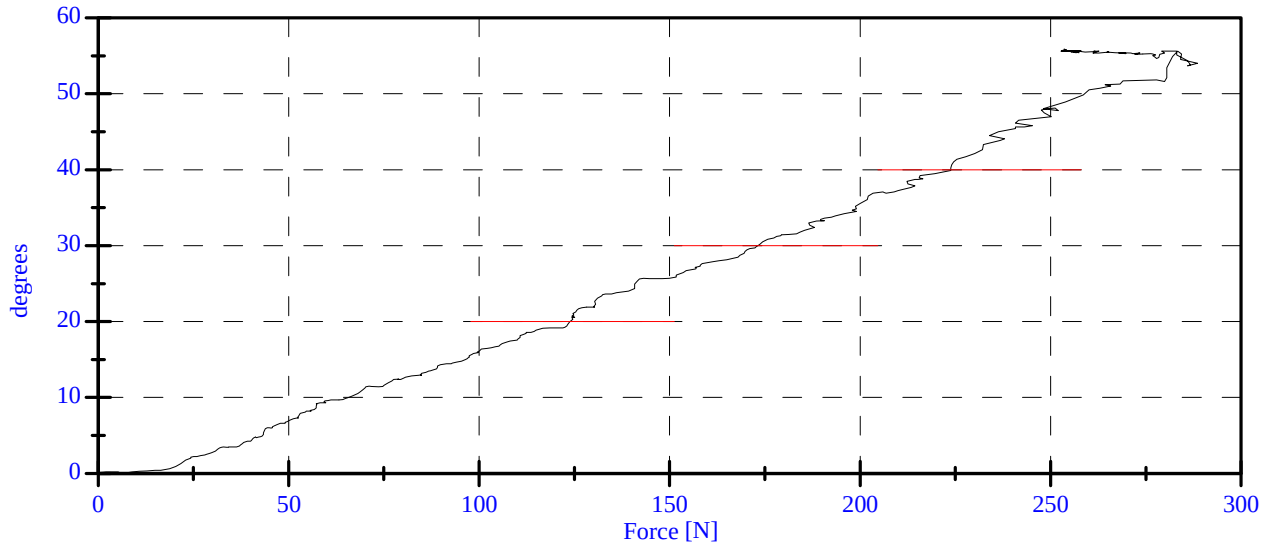
CONFIGURED FOR LEFT SIDE IMPACT

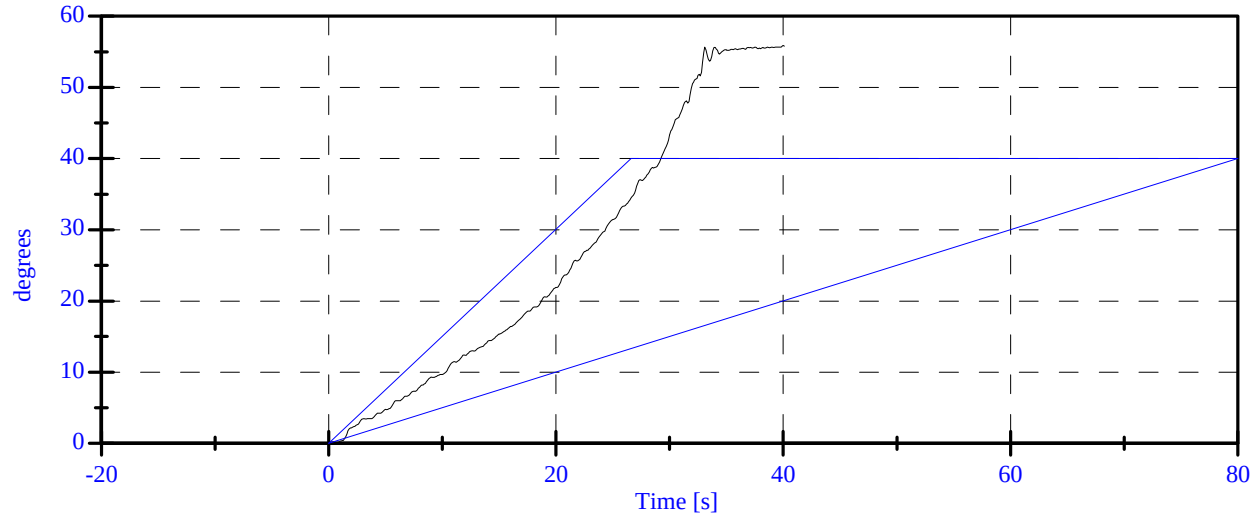
ATD Serial No: 270
Date: 07-16-08

Sequential Test Number: 1 File: 270 Spine 07-16-08
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	56.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	2.87 N	Passed
Force at 20 Deg:	97.86-151.24 N	123.79 N	Passed
Force at 30 Deg	151.24-204.62 N	173.67 N	Passed
Force at 40 Deg	204.62-258.00 N	223.81 N	Passed
Return Angle	12 Deg Max	7.03 deg	Passed

LUMBAR SPINE FLEXION TEST





POST TEST DUMMY INSPECTION LIST

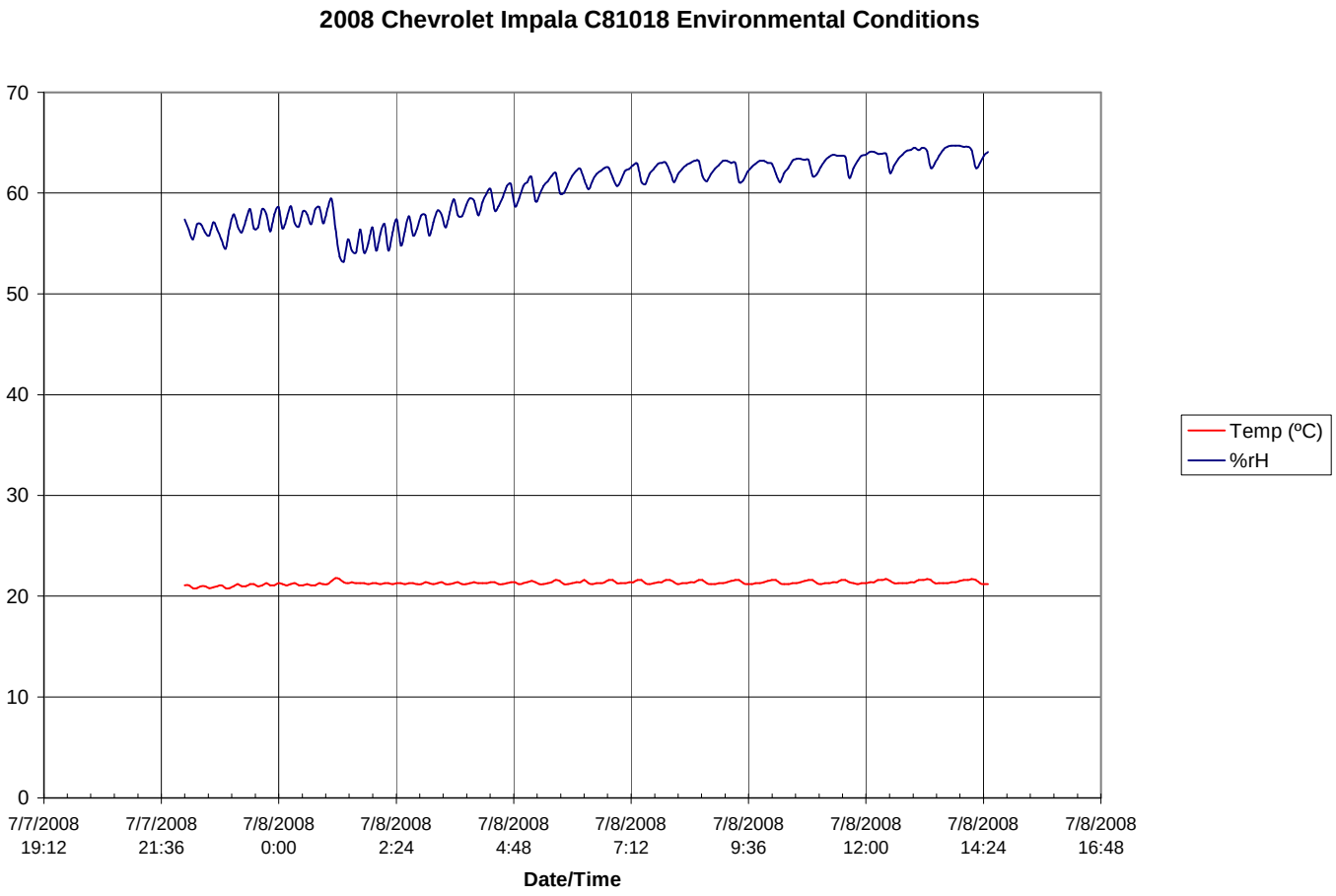
CONFIGURED FOR LEFT **SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 7-16-08 Laboratory Technician: A. Rudniski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

TEMPERATURE TRACE



APPENDIX D

TEST EQUIPMENT AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

SID/HIII INSTRUMENTATION

	SID/HIII NO.: 270		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-P58998	ENDEVCO	07-Mar-08
HEAD AY	AC-P58909	ENDEVCO	07-Mar-08
HEAD AZ	AC-P51279	ENDEVCO	01-Apr-08
HEAD AX REDUNDANT	AC-P58780	ENDEVCO	06-Mar-08
HEAD AY REDUNDANT	AC-P58997	ENDEVCO	07-Mar-08
HEAD AZ REDUNDANT	AC-P58912	ENDEVCO	07-Mar-08
UPPER NECK FX	LC-498Fx	DENTON	03-Apr-08
UPPER NECK FY	LC-498Fy	DENTON	03-Apr-08
UPPER NECK FZ	LC-498Fz	DENTON	03-Apr-08
UPPER NECK MX	LC-498Mx	DENTON	03-Apr-08
UPPER NECK MY	LC-498My	DENTON	03-Apr-08
UPPER NECK MZ	LC-498Mz	DENTON	03-Apr-08
UPPER RIB	AC-P51969	ENDEVCO	01-Apr-08
LOWER RIB	AC-P51969	ENDEVCO	01-Apr-08
LOWER SPINE	AC-P51959	ENDEVCO	04-Apr-08
PELVIS	AC-P51970	ENDEVCO	01-Apr-08
UPPER RIB REDUNDANT	AC-P51946	ENDEVCO	01-Apr-08
LOWER RIB REDUNDANT	AC-P51948	ENDEVCO	01-Apr-08
LOWER SPINE REDUNDANT	AC-P51238	ENDEVCO	01-Apr-08
PELVIS REDUNDANT	AC-P51965	ENDEVCO	01-Apr-08

REMARKS: None

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE INSTRUMENTATION

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
VEHICLE CG (AX)	AC-P32455	ENDEVCO	01-Feb-08
VEHICLE CG (AY)	AC-P32464	ENDEVCO	28-Feb-08
VEHICLE CG (AZ)	AC-P32139	ENDEVCO	01-Feb-08
VEHICLE CG RATE (VX)	ARS-0323	ATA	05-Oct-07
VEHICLE CG RATE (VY)	ARS-0336	ATA	05-Oct-07
VEHICLE CG RATE (VZ)	ARS-0321	ATA	05-Oct-07
STRUCK SIDE SILL (AY)	AC-P23156	ENDEVCO	16-Jun-08
A-PILLAR SILL (AY)	AC-P16576	ENDEVCO	07-Mar-08
A-PILLAR LOWER (AY)	AC-P39740	ENDEVCO	16-Jun-08
A-PILLAR MIDDLE (AY)	AC-P19222	ENDEVCO	16-Jun-08
B-PILLAR SILL (AY)	AC-P32204	ENDEVCO	01-May-08
B-PILLAR LOWER (AY)	AC-P13323	ENDEVCO	25-Mar-08
B-PILLAR MIDDLE (AY)	AC-P23873	ENDEVCO	03-Mar-08
SEAT TRACK HP (AY)	AC-P22639	ENDEVCO	07-Mar-08
DOOR LOWER (AY)	AC-P23993	ENDEVCO	01-Feb-08
DOOR MIDDLE (AY)	AC-P23164	ENDEVCO	01-Feb-08
DOOR UPPER (AY)	AC-P24145	ENDEVCO	11-Apr-08
ENGINE (AX)	AC-P39731	ENDEVCO	07-Feb-08
ENGINE (AY)	AC-P38132	ENDEVCO	16-Jun-08
FIREWALL (AY)	AC-P32455	ENDEVCO	01-Feb-08
OPPOSITE SIDE ROOF (AY)	AC-P32464	ENDEVCO	28-Feb-08
OPPOSITE SIDE SILL (AY)	AC-P32139	ENDEVCO	01-Feb-08
TRUNK (AX)	AC-P23134	ENDEVCO	01-Jul-08
TRUNK (AY)	AC-P18792	ENDEVCO	01-Jul-08

REMARKS: None