REPORT NUMBER: 201P-CAL-09-02

SAFETY COMPLIANCE TESTING FOR FMVSS 201
RIGID POLE SIDE IMPACT TEST

MAZDA MOTOR CORPORATION
2009 MAZDA 6
SEDAN

NHTSA NUMBER: C95403

CALSPAN TEST NUMBER: 8880-02

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

Test Date: May 8, 2009

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
1200 New Jersey Avenue, SE
Washington, DC 20590

This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by:	James Czarnecki, Project Engineer
Approved by:	David J. Travale, Program Manager Transportation Science Center
Approval Date:	APPROVED By James.Czarnecki at 11:40 am, 7/9/09

TECHNICAL REPORT STANDARD TITLE PAGE

1. *Report No.* 201P-CAL-09-02	*2. Government Accession No.*	*3. Recipient's Catalog No.*
4. Title and Subtitle Final Report of FMVSS 201 Safety Compliance Rigid Pole Side Impact Test of a 2009 Mazda 6 Sedan, NHTSA No: C95403		*5. Report Date* May 8, 2009
		6. Performing Organization Code CAL
7. Author(s) David J. Travale, Program Manager James Czarnecki, Project Engineer		*8. Performing Organization Report No.* 8880-02
9. Performing Organization Name and Address Calspan 4455 Genesee Street Buffalo, New York 14225		*10. Work Unit No.*
		11. Contract or Grant No. DTNH22-06-D-00031
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance Mail Code: NVS-220, West building 4th Floor 1200 New Jersey Avenue, SE Washington, D.C. 20590		*13. Type of Report and Period Covered* Final Report May 2009
		14. Sponsoring Agency Code NVS-220

15. Supplementary Notes

16. Abstract

A rigid pole side impact test was conducted on the subject 2009 Mazda 6 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 May 8, 2009
The impact velocity of the vehicle was 28.0 kph, and the ambient temperature at the struck side (driver) of the target vehicle at the time of impact was 70ºC. The post test maximum crush was 347 mm at level 3. The test vehicle's performance follows:

Measurement Description	**Threshold**	**P1 (269)**
Head Injury Criteria (HIC- 36 ms)	1000	301

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		
19. Security Classif. (of this report) UNCLASSIFIED	*20. Security Classif. (of this page)* UNCLASSIFIED	*21. No. of Pages*	*22. Price*

Form DOT F1700.7 (8-69)

TABLE OF CONTENTS

LIST OF DATA SHEETS

SECTION 1

PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 2009 FMVSS 201 “Occupant protection in interior impact” compliance test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract No. DTNH22-06-D-00031. The purpose of this test was to evaluate the dynamic head protection system in a 2009 Mazda 6 Sedan, NHTSA Number: C95403. 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 2009 Mazda 6 Sedan. The subject vehicle was towed into the rigid pole at a velocity of 28.0 kph. The test was conducted by Calspan in Buffalo, New York, on May 8, 2009.

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 (269)
HIC (≤1000)	301
TTI (g)	36
Pelvic (g)	39
Neck X Force (N)[1]	-269.2
Neck Y Force (N)[1]	539.8
Neck Z Force (N)[1]	981.6
Neck X Moment (N-m)[1]	-86.8
Neck Y Moment (N-m)[1]	-25.1
Neck Z Moment (N-m)[1]	-29.8

[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: Mazda Motor Corporation

Year/Make/Model/Body Style: 2009 Mazda 6 Sedan

Vehicle Body Color: _____ VIN: 1YVHP80A995M30674

Vehicle NHTSA No.: C95403 Month & Year of Manufacture: 10/08

Engine Data: 4 Cylinders; - CID; 2.5 Liters; - cc

Engine Placement: - Longitudinal; or x Lateral

Transmission: 6 Speed; x Manual; - 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); 220 kPa FRONT

220 kPa REAR

Recommended Tire Size: P205/65R16

Tires on Test Vehicle: P205/65R16 ; Manufacturer: Michelin

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 = 385 kg (A)

No. of Occupants x 68.04 kg. = 340 kg (B)

Vehicle Cargo Capacity = 45 kg (A-B)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

	LEFT SIDE (kg)	RIGHT SIDE (kg)	TOTAL (kg)	PERCENT
FRONT =	450.5	433.5	884.0	60.1%
REAR=	286.0	302.0	588.0	39.9%

TOTAL DELIVERED WEIGHT (UDW) : 1472.0 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	=	1472.0	kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	45.0	kg (B)
Weight of instrumented SID/HIII (81.2 kg)	=	81.0	kg (C)
TEST VEHICLE TARGET WEIGHT:	=	1598.0	kg (A+B+C)

FULLY LOADED TEST VEHICLE (UDW + SID/HIII + CARGO):

	LEFT SIDE	RIGHT SIDE (kg)	TOTAL (kg)	PERCENT
FRONT =	476.0	447.5	923.5	58.0%
REAR=	340.0	329.5	669.5	42.0%

TOTAL FULLY LOADED WEIGHT : 1593.0 kg

AS TESTED WEIGHT OF TEST VEHICLE (1 SID/HIII + CARGO + EQUIPMENT INSTRUMENTATION):

	LEFT SIDE	RIGHT SIDE (kg)	TOTAL (kg)	PERCENT
FRONT =	462.0	452.0	914.0	57.5%
REAR=	346.0	330.0	676.0	42.5%

TOTAL TEST WEIGHT: 1590.0 kg

TEST VEHICLE ATTITUDE;

	As Delivered	Fully Loaded	Ready for Test
Left Front (mm)	732	722	727
Left Rear (mm)	752	731	732
Right Front (mm)	733	726	732
Right Rear (mm)	743	732	734
Front Bumper Angle	↑0.1↓	0.0	0.0
Left Door Sill Angle	↑0.3↓	↑0.2↓	↑0.2↓
Rear Bumper Angle	↓0.1↑	↓0.1↑	↓0.1↑
Right Door Sill	↓0.3↑	↓0.2↑	↓0.2↑

Test Vehicle Wheelbase: 2790 millimeters

C.G. = 1186.2 millimeters rearward of front wheel centerline

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

TOTAL VEHICLE LENGTH: (Pre Test)

Right Side = 4733 mm
Centerline = 4915 mm
Left Side = 4745 mm

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel = 272 mm
Total Number of Adjustment Positions or Detents = 0 to 24

As-Tested Position:

Detent: N/A
Distance from full forward: 136 mm

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Torso Angle = 10.7 degrees

As-Tested Position:

Seat Back Torso Angle = 10.7 degrees

ADJUSTABLE STEERING COLUMN POSITION:

Telescopic Travel: N/A
Test Angle: 23.0 degrees

WINDOW POSITIONS:

Right Front= Open Right Rear= Removed
Left Front = Open Left Rear = Fixed

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Capacity= 70.0 L
Test Volume = 65.1 L (92% to 94% of Useable Capacity)

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

Wheelbase = 2790 mm
Impact Reference Line is 1440 mm rearward of front axle centerline

DATA SHEET 2
TEST VEHICLE SUMMARY OF RESULTS

VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 2009 Mazda 6

Body Style: Sedan VIN: 1YVHP80A995M30674

NHTSA No.: C95403 Test Date: May 8, 2009

Overall Length = 4915 millimeters; Overall Width = 1860 millimeters

VEHICLE TEST WEIGHT (Pre-Test):

Left Front	=	462 kg	Left Rear	=	346 kg
Right Front	=	452 kg	Right Rear	=	330 kg
TOTAL FRONT	=	914.0 kg	TOTAL REAR	=	676.0 kg

TOTAL VEHICLE WEIGHT 1590.0 kg

Wheelbase = 2790 millimeters

Longitudinal C.G. from Center of Front Axle = 1186.2 millimeters

Impact Angle with Respect to Impactor = 90 degrees

ACTUAL IMPACT POINT

Actual Impact Point is 3 mm fwd of nominal impact ref. line (Lateral)

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (	252 mm above ground)	=	201 millimeters
2. LEVEL 2 (	494 mm above ground)	=	342 millimeters
3. LEVEL 3 (	623 mm above ground)	=	347 millimeters
4. LEVEL 4 (	898 mm above ground)	=	311 millimeters
5. LEVEL 5 (	1397 mm above ground)	=	54 millimeters

Maximum Post-Test Intrusion = 347 millimeters

OCCUPANTS: Front Passenger:

Dummy Identification 269

Restraints Used 3-point belt system, Curtain airbag, Seat side Torso airbag

INSTRUMENTATION:

Number of Vehicle Data Channels:		=	21
Number of Cameras:	Onboard	=	3
	Offboard	=	10
	TOTAL	=	13

DATA SHEET 3
POST TEST OBSERVATIONS

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403

VISIBLE DUMMY CONTACT POINTS:

	SID/HIII
Head:	Curtain / Back of head to head restraint
Upper Torso:	Seat Airbag
Lower Torso:	Arm Rest
Left Knee:	Door Trim
Right Knee:	Left Knee

DOOR OPENING:

	LEFT DOOR	RIGHT DOOR
Front:	Closed / Inoperable	Closed / Operable
Rear:	N/A	N/A

ARM REST LOCATIONS:

Front: Intact

Rear: Intact

SEAT MOVEMENT:

Front: None

Rear: None

GLAZING DAMAGE:

Windshield: Cracked in front driver

Window: Shattered inside door

PILLAR PERFORMANCE:

INTACT

SILL SEPARATION:

NONE

AIR BAG DEPLOYMENT STATUS:

	DRIVER	FRONT PASSENGER	REAR PASSENGER
FRONT	NO	NO	N/A
SIDE	YES	NO	N/A

OTHER NOTABLE IMPACT EFFECTS:

None

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 4
SID/HIII INSTRUMENTATION DATA

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403

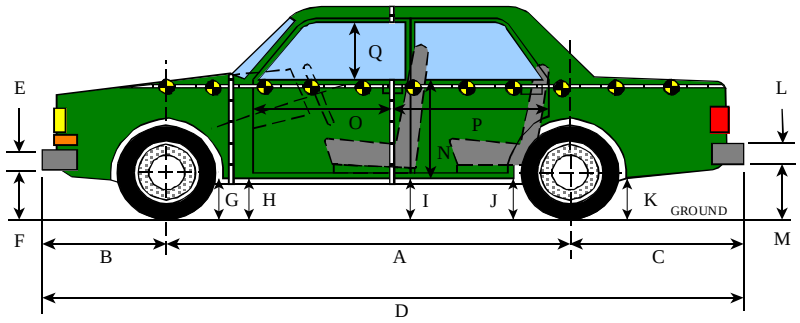
	Front Dummy ID# 269			
	Pos. Direction		Neg. Direction	
	Max	Time	Max	Time
HEAD ACCELERATIONS:	(g)	(msec)	(g)	(msec)
Longitudinal X	10.0	97	-15.4	68
Lateral Y	56.8	61	-9.9	119
VerticalZ	6.5	81	-10.8	63
Resultant R	59.0	62	0.2	14
HIC	301.2			
NECK LOADS:	(N)	(msec)	(N)	(msec)
Longitudinal X	4.6	-50	-269.2	65
Lateral Y	539.8	61	-185.8	199
Vertical Z	981.6	46	-239.1	63
Resultant R	1005.4	46	10.7	18
NECK MOMENTS:	(N-m)	(msec)	(N-m)	(msec)
Longitudinal X	11.2	271	-86.8	60
Lateral Y	14.3	46	-25.1	65
Vertical Z	8.5	228	-29.8	144
Resultant R	89.4	60	0.4	17
RIB ACCELERATIONS:	(g)	(msec)	(g)	(msec)
Upper Rib Lateral Y	39.4	47	-3.7	106
Upper Rib Lateral Y(R)	38.4	47	-4.0	106
Lower Rib Lateral Y	32.7	49	-2.8	101
Lower Rib Lateral Y(R)	32.8	49	-2.9	92
SPINE ACCELERATIONS:	(g)	(msec)	(g)	(msec)
Lower Lateral Y	31.9	39	-3.3	82
Lower Lateral Y(R)	32.1	39	-3.3	82
PELVIC ACCELERATIONS:	(g)	(msec)	(g)	(msec)
Lateral Y	38.7	36	-6.8	67
Lateral Y(R)	38.7	36	-6.7	67

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 PRE- and POST-TEST VEHICLE MEASUREMENTS

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403



LEFT SIDE VIEW

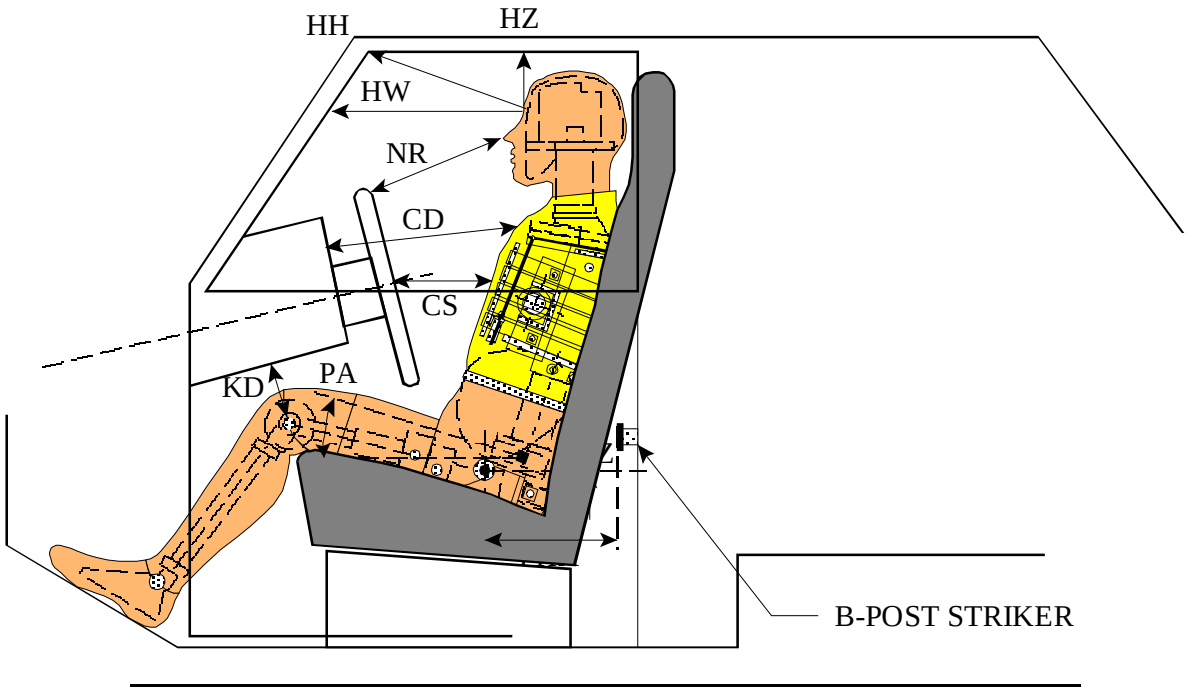
NOTE: all dimensions are in millimeters with tolerance of ±3 mm

	PRE-TEST (as delivered)	PRE-TEST (as tested)	POST-TEST (as tested)	∇ CHANGE
A	2790	2790	2740	-50
B	987	981	1019	38
C	1138	1144	1145	1
D	4915	-	4904	-11
E	85	-	85	0
F	418	412	433	21
G	188	177	171	-6
H	192	180	171	-9
I	202	188	205	17
J1	193	173	200	27
J2	200	182	209	27
K	238	221	261	40
L	120	-	120	0
M	386	367	381	14
N	692	-	699	7
O	1009	-	1000	-9
P	1021	-	1014	-7
Q	465	-	409	-56
R	4733	-	4746	13
S	4745	-	4704	-41
T	1850	-	1605	-245

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: 2009 Mazda 6 Sedan NHTSA No. C95403



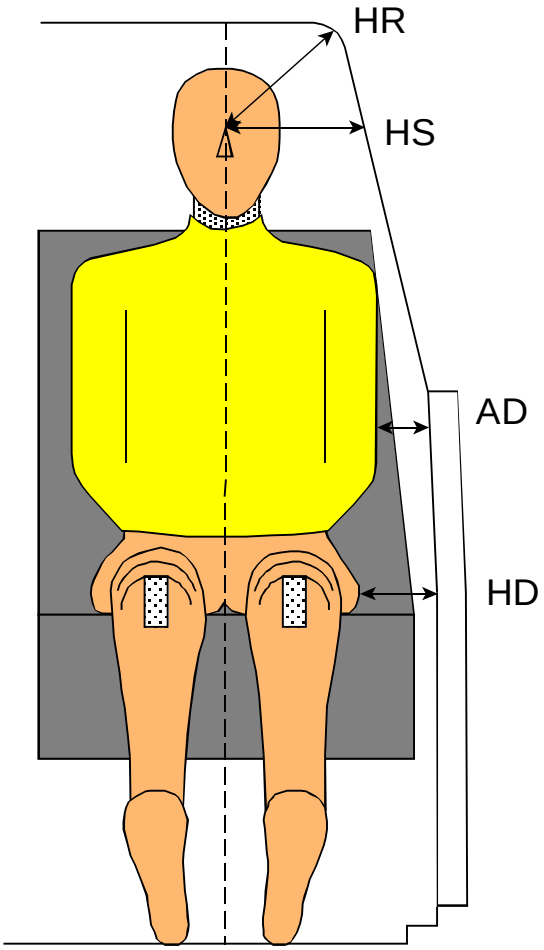
LEFT SIDE VIEW

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

	SID/HIII ID# 269
HH	315
HW	571
HZ	165
NR/NB	425
CD/CB	510
CS	279
KDL(KDA°)/KBL(KDA°)	163 / (24.5°)
KDR(KBA°)/KBR(KBA°)	145 / (24.4°)
PA°	23.5 °
PHX	257 / +2
PHZ	204 / -5

DATA SHEET 7
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403



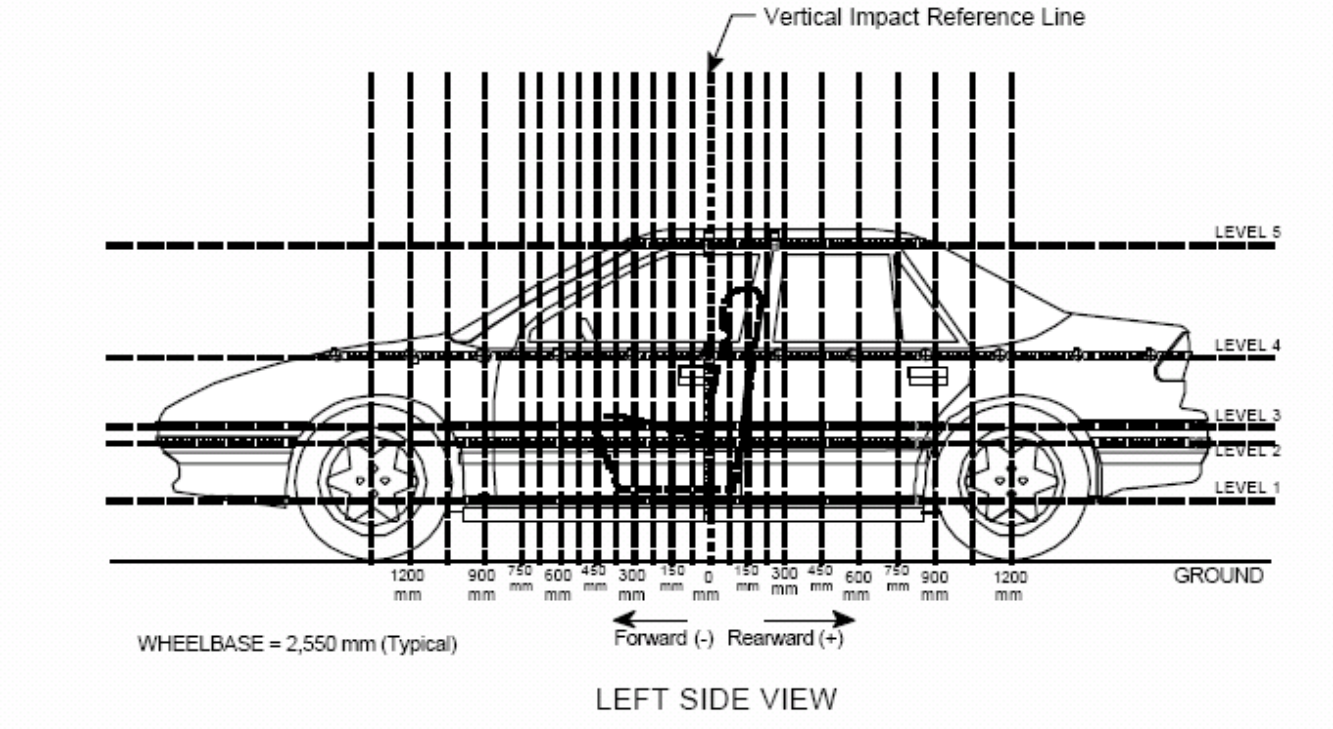
NOTE: All dimensions are in millimeters with tolerance of ±3 mm

	SID/HIII ID # 269			
HR	182			
HS	266			
AD*	LOWER:	110	UPPER:	110
HD	160			

* Lower measurement is taken laterally at the center of the lower rib accelerometer height from the arm to the closest part of the vehicle side. Upper measurement is taken laterally at the center of the upper rib accelerometer height from the arm to the closest part of the vehicle side.

DATA SHEET 8
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403



LEFT SIDE VIEW

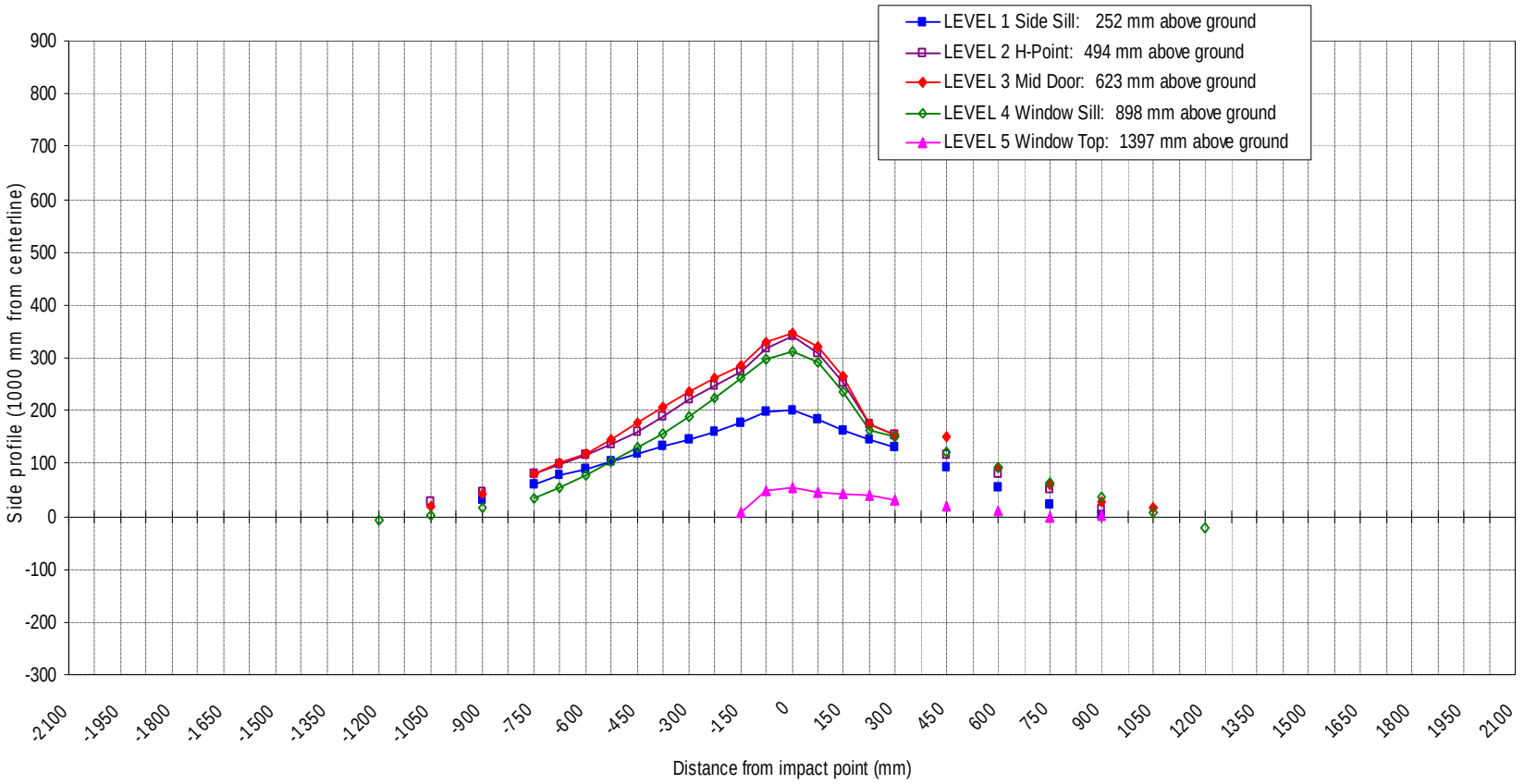
MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION.

Measurements Along the Vertical 0 mm Line Shown Above:

Level 5 @ Window Top	=	1397	millimeters
Level 4 @ Window Sill	=	898	millimeters
Level 3 @ Mid Door	=	623	millimeters
Level 2 @ Occupant H-Point	=	494	millimeters
Level 1 @ Sill Top Height	=	252	millimeters

DATA SHEET 9
VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403



DATA SHEET 9 (Continued)
VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403

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

DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT

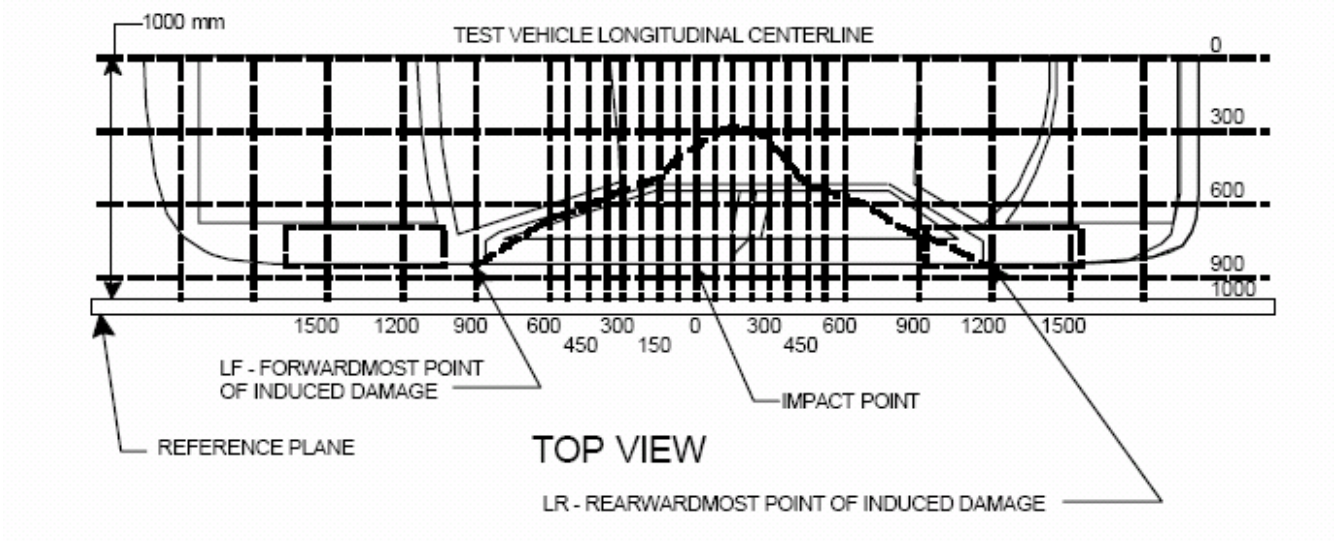
LEVEL	HEIGHT (mm)		-2100	-2025	-1950	-1875	-1800	-1725	-1650	-1575	-1500	-1425	-1350	-1275	-1200	-1125	-1050	-975
LEVEL 1	252	PRE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SIDE		POST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILL		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 2	494	PRE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	84	--
H		POST	--	--	--	--	--	--	--	--	--	--	--	--	--	111	111	--
POINT		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	N/A	N/A	27	N/A
LEVEL 3	623	PRE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	85	--
MID		POST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	105	--
DOOR		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	N/A	N/A	20	N/A
LEVEL 4	898	PRE	--	--	--	--	--	--	--	--	--	--	--	--	213	--	188	--
WINDOW		POST	--	--	--	--	--	--	--	--	--	--	--	--	207	--	189	--
SILL		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	-6	N/A	1	N/A
LEVEL 5	1397	PRE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WINDOW		POST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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	N/A	N/A	N/A	N/A

LEVEL	HEIGHT (mm)		-900	-825	-750	-675	-600	-525	-450	-375	-300	-225	-150	-75	0
LEVEL 1	252	PRE	125	--	128	128	129	130	131	131	132	131	132	132	132
SIDE		POST	157	--	189	205	219	234	249	263	278	291	308	331	333
SILL		CRUSH	32	N/A	61	77	90	104	118	132	146	160	176	199	201
LEVEL 2	494	PRE	92	--	90	88	86	84	83	81	80	79	78	78	77
H		POST	138	--	170	185	202	219	242	270	300	325	352	395	419
POINT		CRUSH	46	N/A	80	97	116	135	159	189	220	246	274	317	342
LEVEL 3	623	PRE	93	--	87	84	81	79	77	76	75	73	73	72	72
MID		POST	135	--	168	185	201	224	253	281	312	336	359	400	419
DOOR		CRUSH	42	N/A	81	101	120	145	176	205	237	263	286	328	347
LEVEL 4	898	PRE	170	--	158	153	149	144	139	135	130	126	122	117	115
WINDOW		POST	185	--	192	207	226	247	269	292	318	350	384	413	426
SILL		CRUSH	15	N/A	34	54	77	103	130	157	188	224	262	296	311
LEVEL 5	1397	PRE	--	--	--	--	--	--	--	--	--	--	525	426	417
WINDOW		POST	--	--	--	--	--	--	--	--	--	--	531	473	471
TOP		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	47	54

LEVEL	HEIGHT (mm)		75	150	225	300	375	450	525	600	675	750	825	900	975	1050	1125	1200	1275	1350	1425	1500	1575	1650	1725	1800	1875	1950	2025	2100
LEVEL 1	252	PRE	132	132	133	134	--	134	--	132	--	128	--	112	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SIDE		POST	316	295	279	263	--	225	--	187	--	151	--	113	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SILL		CRUSH	184	163	146	129	N/A	91	N/A	55	N/A	23	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 2	494	PRE	77	77	77	78	--	79	--	81	--	83	--	81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
H		POST	387	330	252	232	--	196	--	162	--	133	--	93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
POINT		CRUSH	310	253	175	154	N/A	117	N/A	81	N/A	50	N/A	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 3	623	PRE	71	71	72	73	--	74	--	75	--	78	--	79	--	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MID		POST	391	335	245	226	--	226	--	166	--	138	--	107	--	85	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DOOR		CRUSH	320	264	173	153	N/A	152	N/A	91	N/A	60	N/A	28	N/A	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 4	898	PRE	110	107	105	102	--	99	--	99	--	101	--	103	--	117	--	110	--	--	--	--	--	--	--	--	--	--	--	--
WINDOW		POST	402	343	268	252	--	221	--	192	--	165	--	139	--	124	--	88	--	--	--	--	--	--	--	--	--	--	--	--
SILL		CRUSH	292	236	163	150	N/A	122	N/A	93	N/A	64	N/A	36	N/A	7	N/A	-22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 5	1397	PRE	411	408	407	406	--	409	--	414	--	426	--	487	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WINDOW		POST	456	451	446	437	--	427	--	423	--	424	--	488	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOP		CRUSH	45	43	39	31	N/A	18	N/A	9	N/A	-2	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

DATA SHEET 10
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403



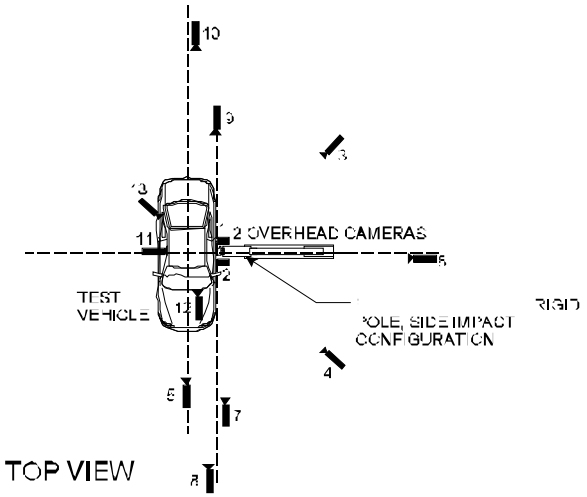
MEASUREMENT CONVENTIONS:
Forward of the impact point (towards front of vehicle) is considered negative (-).
Rearward of the impact point (toward rear of vehicle) is considered positive (+).

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

DPD MEASUREMENTS (mm)		POST TEST (mm)	PRETEST (mm)	STATIC CRUSH (mm)
1 (LR)	600	0	0	158
2	285	236	78	158
3	-30	411	72	339
4	-345	293	76	217
5	-660	188	83	105
6 (LF)	-975	0	0	0

DATA SHEET 11
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2009 Mazda 6 Sedan NHTSA No. C95403



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	3004	2850	1249	4.0	24	1000
4	Left side 45° – forward pole view	2017	2370	1852	13.9	24	1000
5	Real time (30 fps) film coverage of test	-	-	-	-	-	30
6	Left side – rear pole view	1010	1605	2205	31.2	24	1000
7	Front ground level – vehicle/pole impact	8721	453	1152	2.3	50	1000
8	Front ground level – vehicle roof targets and vehicle/pole impact	8181	816	894	1.7	28	1000
9	Rear ground level – vehicle/pole impact	9308	303	1201	4.0	50	1000
10	Rear ground level – view of rear roof tragets	7885	644	963	2.6	24	1000
11	Test vehicle onboard -- side view of SID/HIII	1737	165	1032	4.4	12.5	1000
12	Test vehicle onboard– front view of SID/HIII	549	1537	1263	7.0	25	1000
13	Test vehicle onboard– 3/4 rear view of SID/HIII	1709	737	1145	2.5	12.5	1000

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

+X = Forward
+Y = To Right
+Z = Down

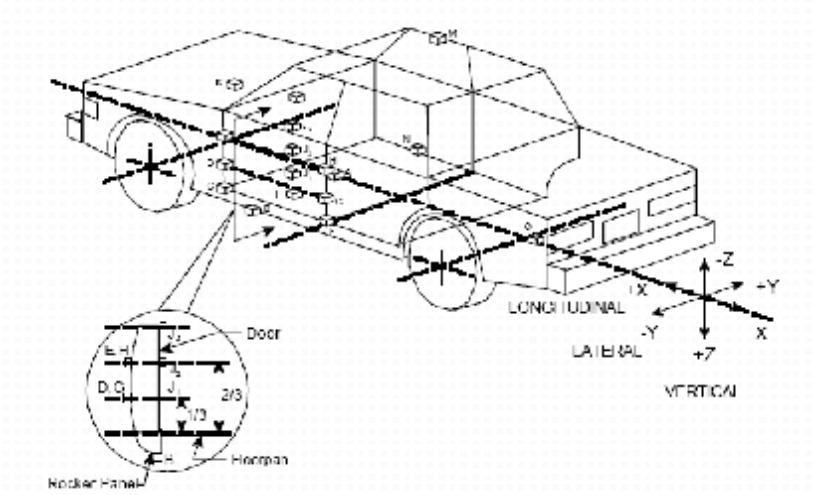
DATA SHEET 12
DUMMY DAMAGE CHECKLIST – SID/HIII

Dummy Serial No. 269 Date: May 9, 2009

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: 2009 Mazda 6 Sedan NHTSA No. C95403



Accelerometer Location		Pre-Test (mm)		
		X	Y	Z
A	Vehicle CG X,Y,Z	2751	10	-450
B	Struck Side Front Sill Y	3161	-687	-299
C	Struck Side A-Pillar Sill Y	3427	-619	-372
D	Struck Side Lower A-Pillar Y	3415	-620	-521
E	Struck Side Middle A-Pillar Y	3287	-662	-989
F	Struck Side B-Pillar Sill Y	2425	-687	-342
G	Struck Side Lower B-Pillar Y	2325	-709	-723
H	Struck Side Middle B-Pillar Y	2264	-677	-943
I	Front Outboard Seat Track Y at H-point X	2509	-557	-294
J	Front Door Y (3) – 480 mm forward of impact	2966	-786	-542
K	Top of Engine X,Y	4062	133	-831
L	Center of Firewall Y	3778	7	-846
M	Unstruck Side Roof Rail Y at impact line	2485	549	-1412
N	Unstuck Side Floor Sill Y at impact line	2504	678	-371
O	Rear Axle Floorpan X,Y	1229	29	-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: 2009 Mazda 6 Sedan NHTSA No. C95403

		Longitudinal		Lateral		Vertical		Resultant	
Accelerometer		Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
A	Pos.	21.4	49	57.5	57	15.4	33	58.4	57
	Neg.	-12.9	54	-23.1	45	-15.7	38	0.1	210
B	Pos.	-	-	27.0	22	-	-	-	-
	Neg.	-	-	-0.8	243	-	-	-	-
C	Pos.	-	-	34.1	55	-	-	-	-
	Neg.	-	-	-6.2	50	-	-	-	-
D	Pos.	-	-	21.6	52	-	-	-	-
	Neg.	-	-	-10.2	32	-	-	-	-
E	Pos.	-	-	19.4	55	-	-	-	-
	Neg.	-	-	-9.8	39	-	-	-	-
F	Pos.	-	-	84.8	16	-	-	-	-
	Neg.	-	-	-47.3	21	-	-	-	-
G	Pos.	-	-	82.7	8	-	-	-	-
	Neg.	-	-	-27.0	67	-	-	-	-
H	Pos.	-	-	81.7	8	-	-	-	-
	Neg.	-	-	-25.4	31	-	-	-	-
I	Pos.	-	-	39.7	37	-	-	-	-
	Neg.	-	-	-4.7	56	-	-	-	-
J1, J2, J3	Pos.	95.9	89	57.5	9	82.5	17	-	-
All lateral	Neg.	-116.9	16	-57.9	67	-66.6	21	-	-
K	Pos.	5.2	80	13.5	76	-	-	-	-
	Neg.	-4.3	53	-2.0	193	-	-	-	-
L*	Pos.	-	-	0.4	66	-	-	-	-
	Neg.	-	-	-7.7	85	-	-	-	-
M	Pos.	-	-	16.4	63	-	-	-	-
	Neg.	-	-	-1.4	231	-	-	-	-
N	Pos.	-	-	37.4	85	-	-	-	-
	Neg.	-	-	-33.8	58	-	-	-	-
O	Pos.	2.9	50	13.2	31	-	-	-	-
	Neg.	-1.9	95	-1.0	169	-	-	-	-

***Data did not record properly**

SECTION 5

FMVSS NO. 301 DATA

DATA SHEET 14
SUMMARY OF FMVSS NO. 301 DATA

NHTSA TEST No.: C95403 TEST DATE: May 8, 2009

VEHICLE MAKE/MODEL: 2009 Mazda 6 Sedan

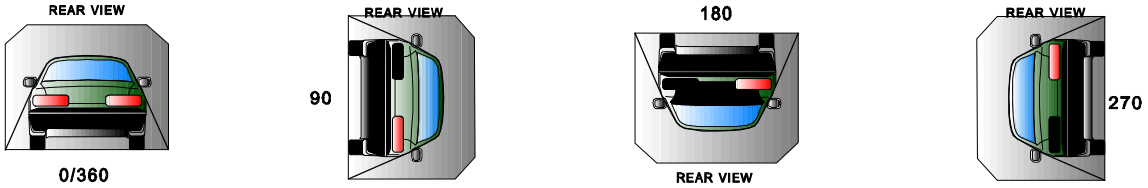
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

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	03	seconds	5	minutes	6	minutes	3	seconds	7	minutes
90º - 180º	0	minutes	59	seconds	5	minutes	5	minutes	59	seconds	6	minutes
180º-270º	1	minutes	06	seconds	5	minutes	6	minutes	6	seconds	7	minutes
270º-360º	1	minutes	04	seconds	5	minutes	6	minutes	4	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	N/A	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

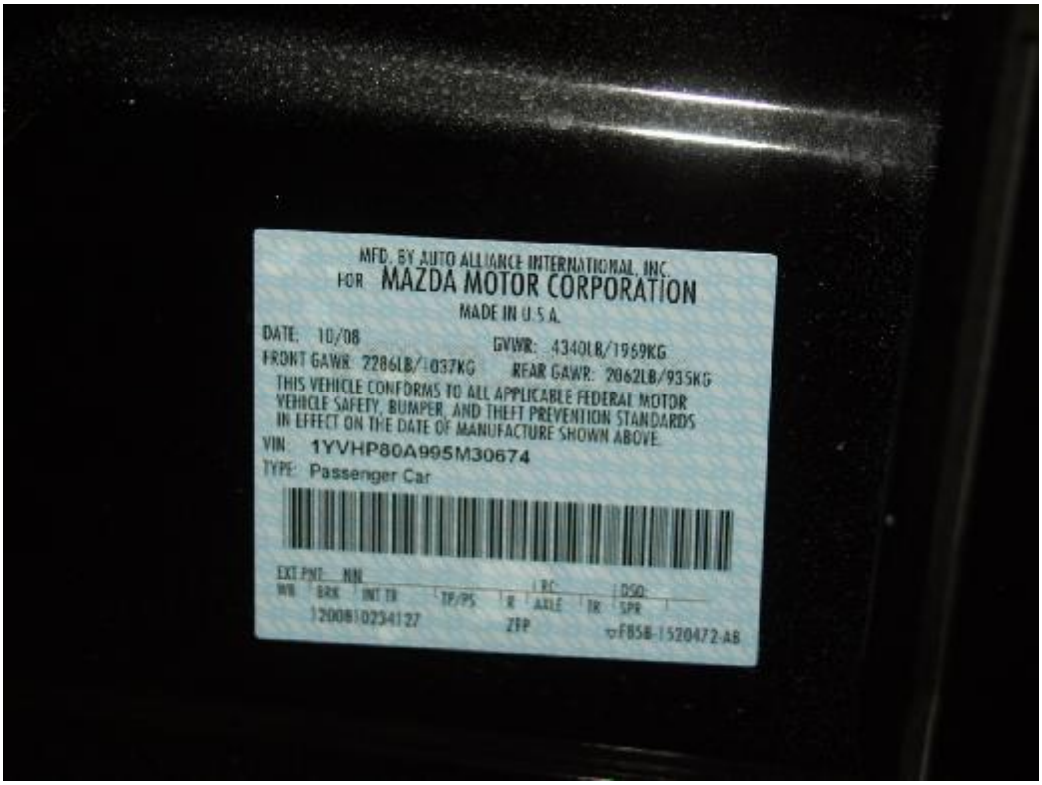


Figure A-3: Vehicle Certification Label

Figure A-4: Vehicle Tire Placard Label

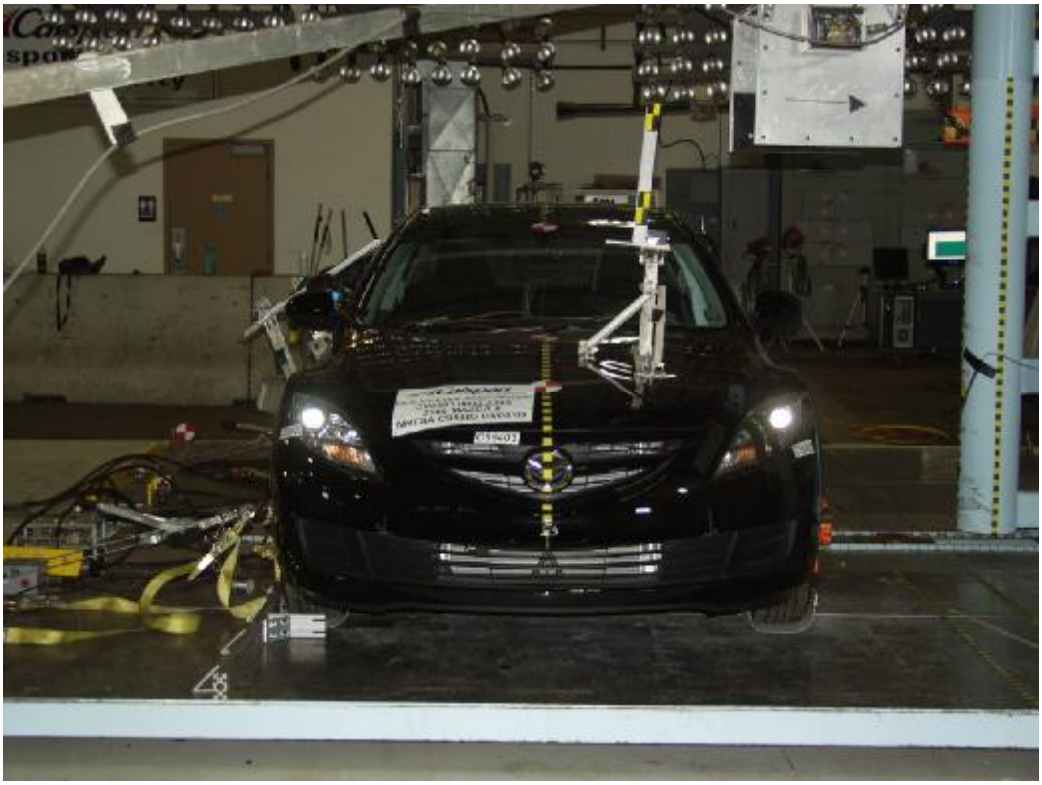


Figure A-5: Pre-Test Front View

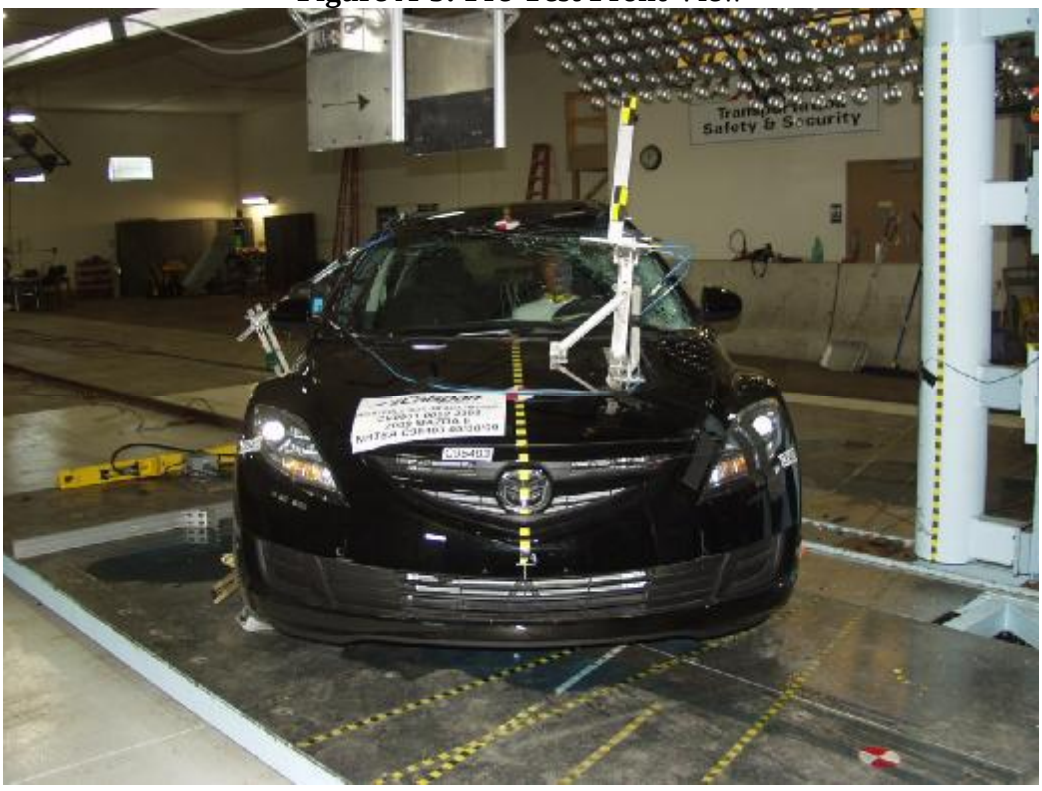


Figure A-6: Post-Test Front View

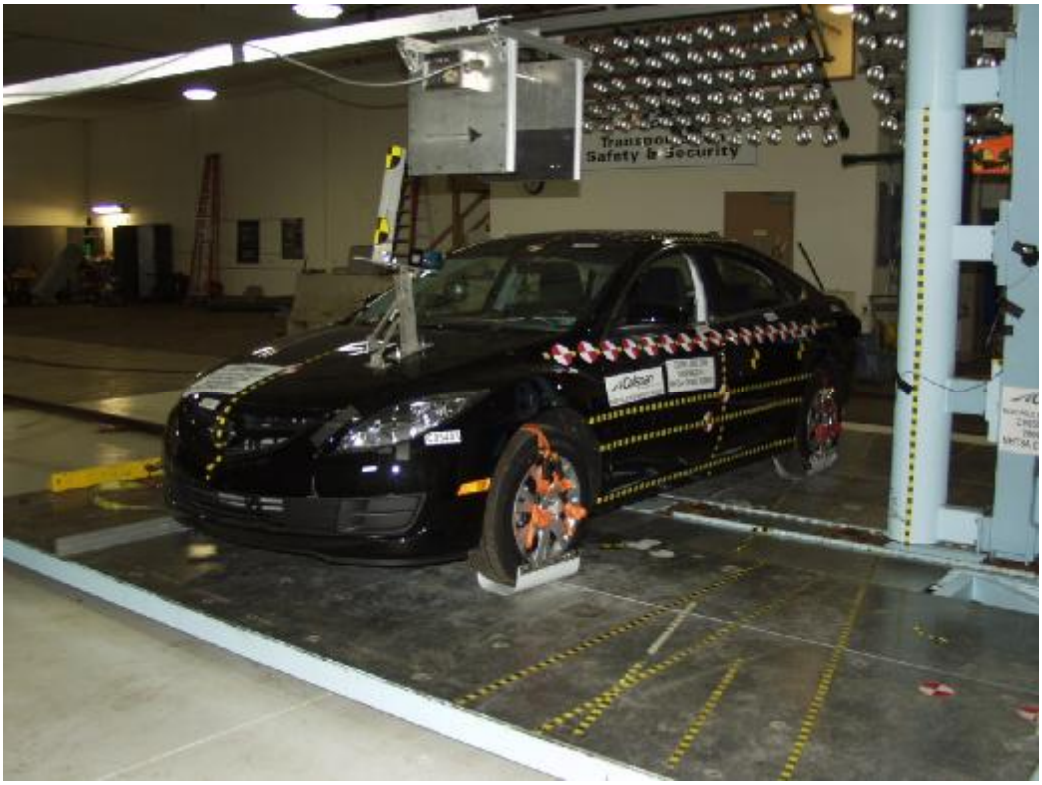


Figure A-7: Pre-Test Left Front ¾ View

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

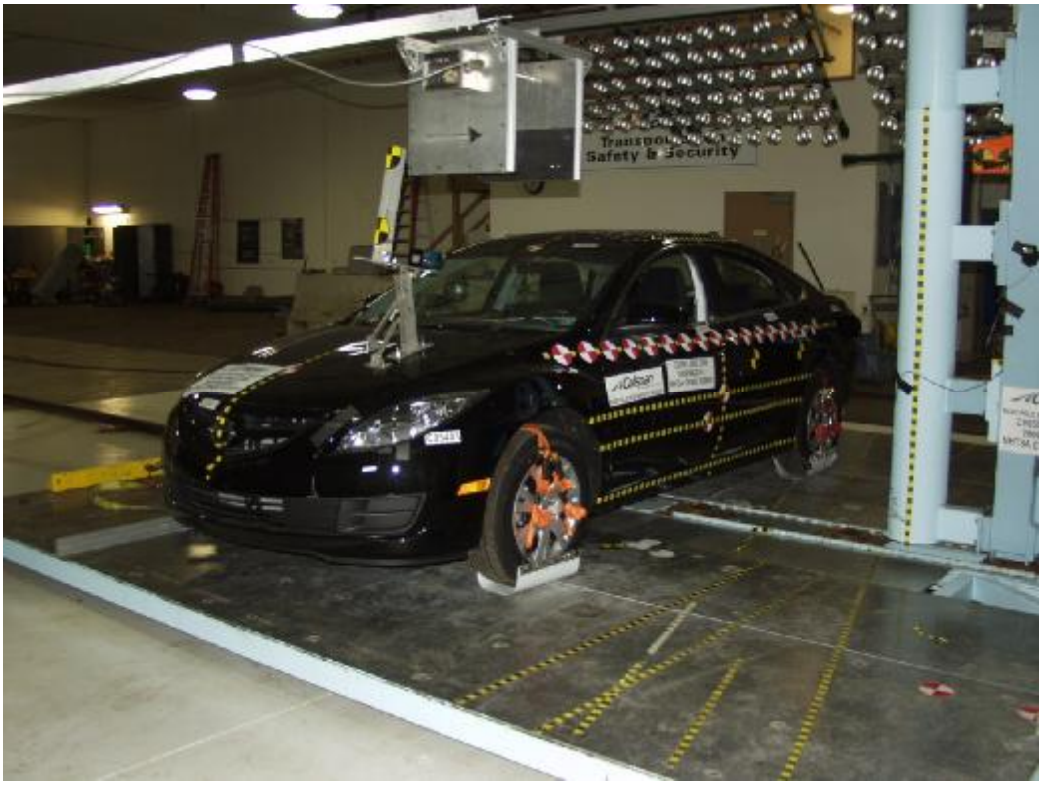


Figure A-21: Pre-Test Left Side View of Aligned Vehicle and Pole

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

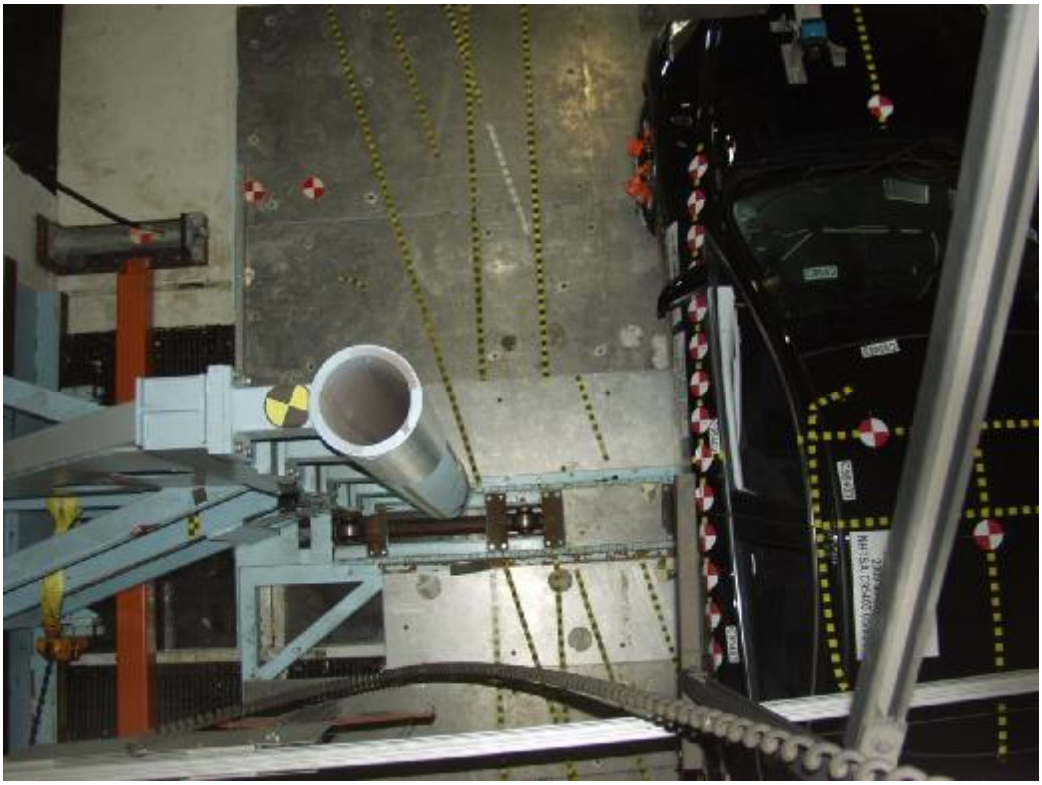


Figure A-23: Pre-Test Overhead View of Aligned Vehicle and Pole

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

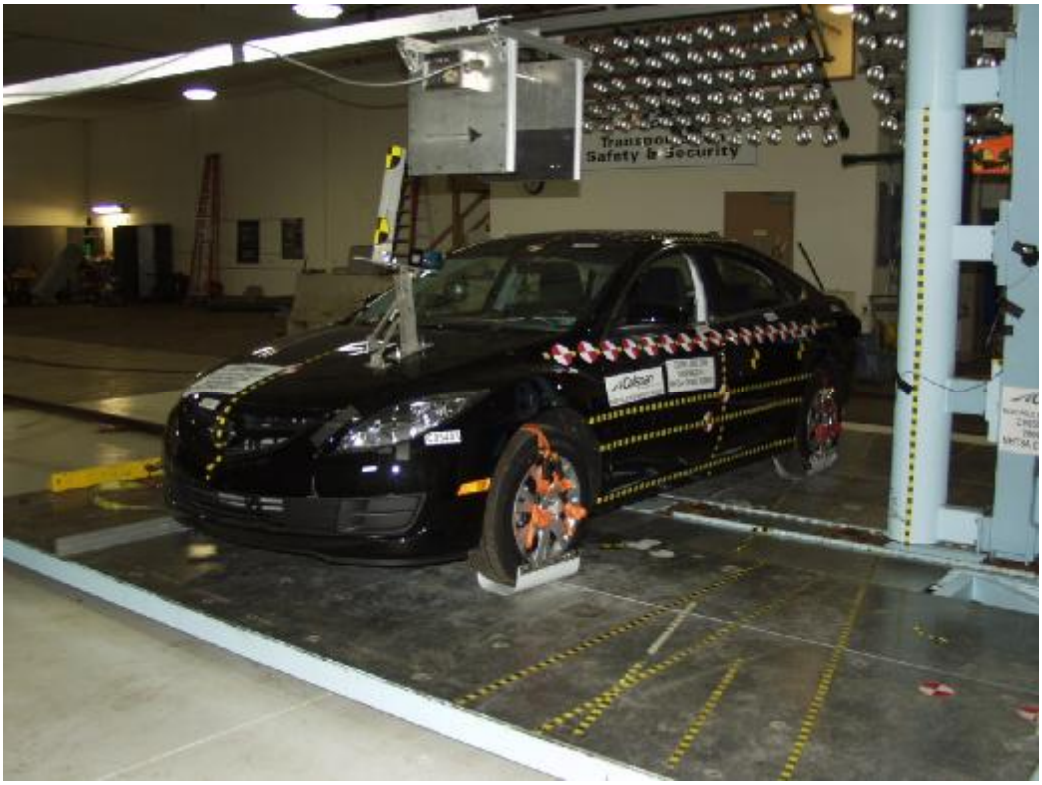


Figure A-36: Pre-Test Left Front ¾ View of Impact Zone

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

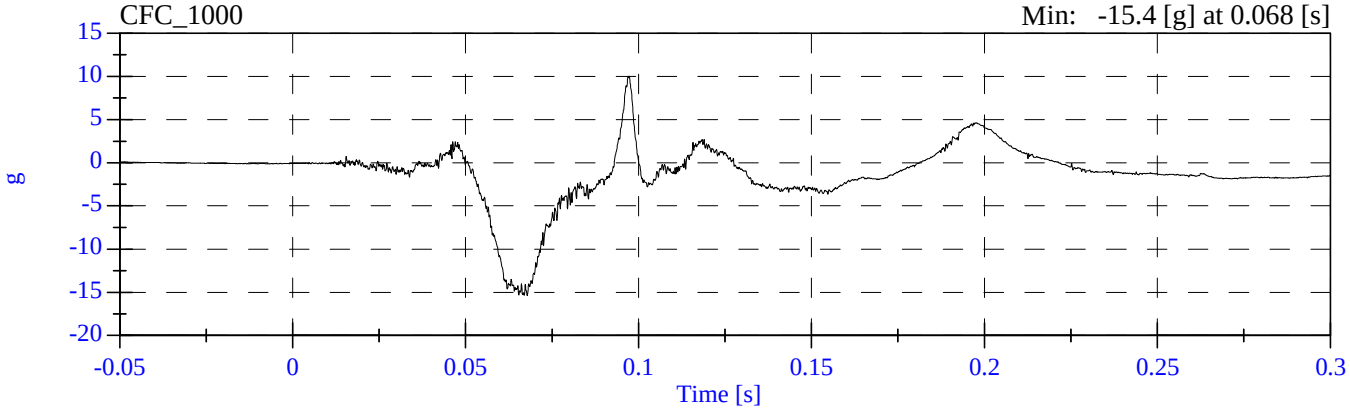
Prefix	Suffix
V1 = Vehicle 1 (Test Vehicle)	Ax = Acceleration, X-direction
P1 = Left Front Seating Position (Driver)	Ay = Acceleration, Y-direction
A1-A17 = Accelerometer Location Number	Az = Acceleration, Z-direction
	Fx = Force, X-direction
	Fy = Force, Y-direction
	Fz = Force, Z-direction
	Mx = Moment 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

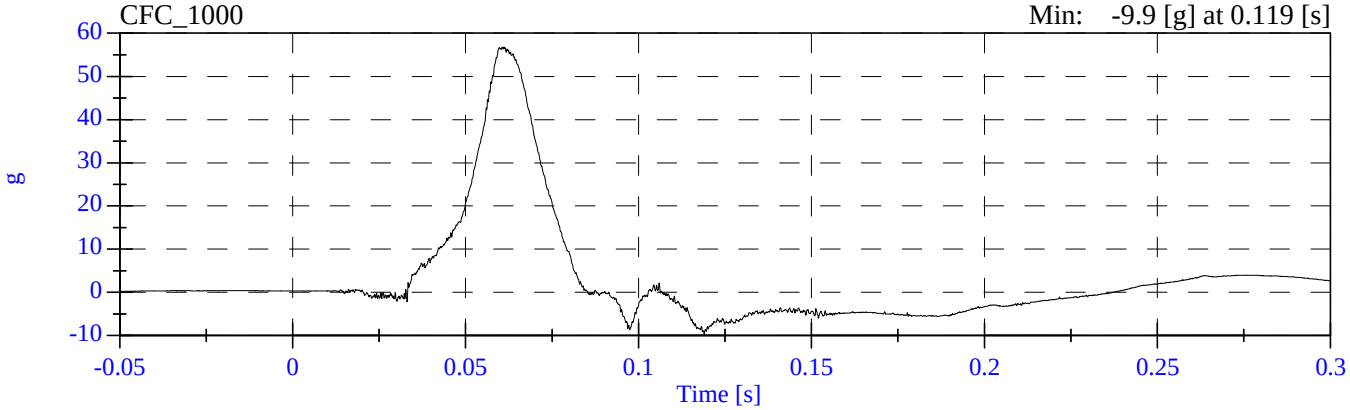
TABLE OF DATA PLOTS (continued)

201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

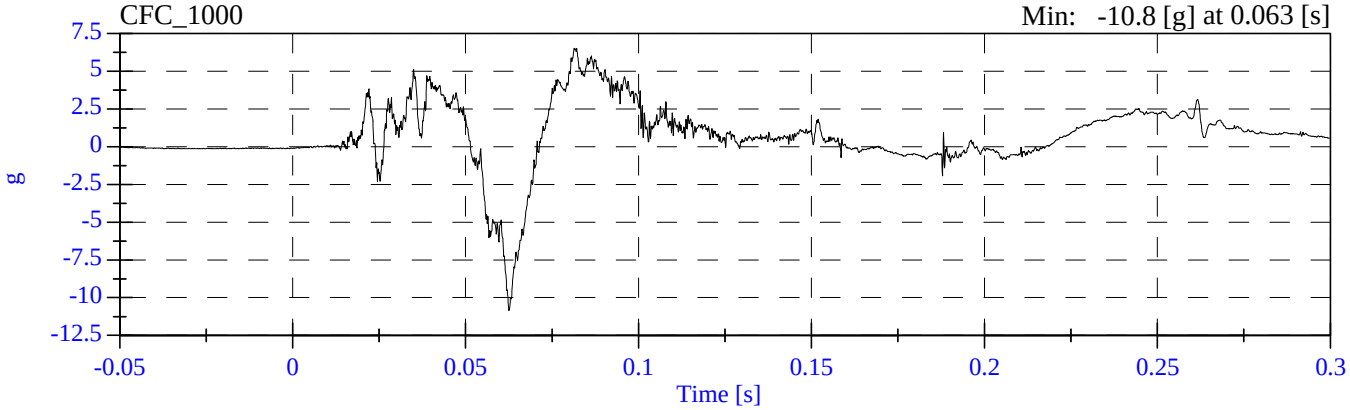
V1P1 Head x
CFC_1000
Max: 10.0 [g] at 0.097 [s]
Min: -15.4 [g] at 0.068 [s]



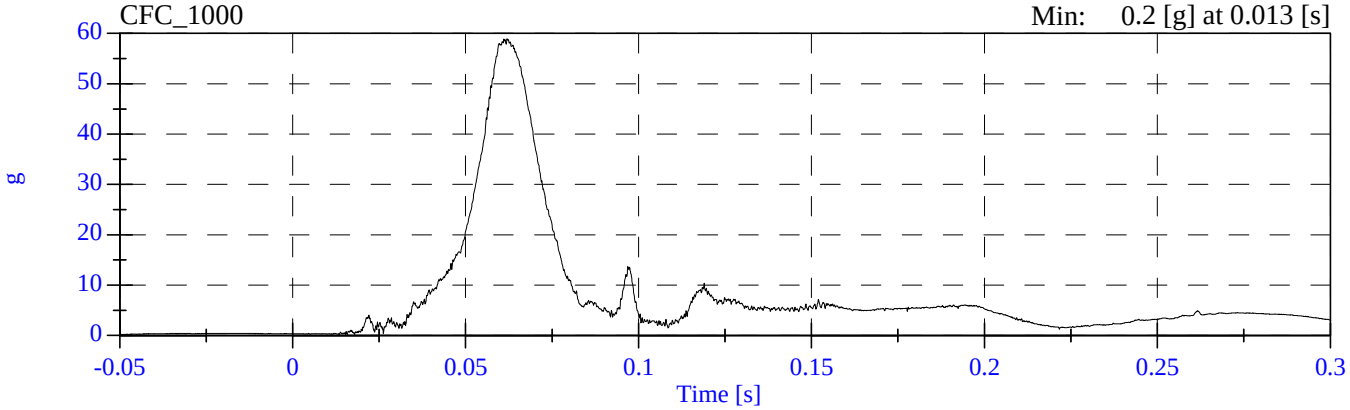
V1P1 Head y
CFC_1000
Max: 56.8 [g] at 0.061 [s]
Min: -9.9 [g] at 0.119 [s]



V1P1 Head z
CFC_1000
Max: 6.5 [g] at 0.081 [s]
Min: -10.8 [g] at 0.063 [s]

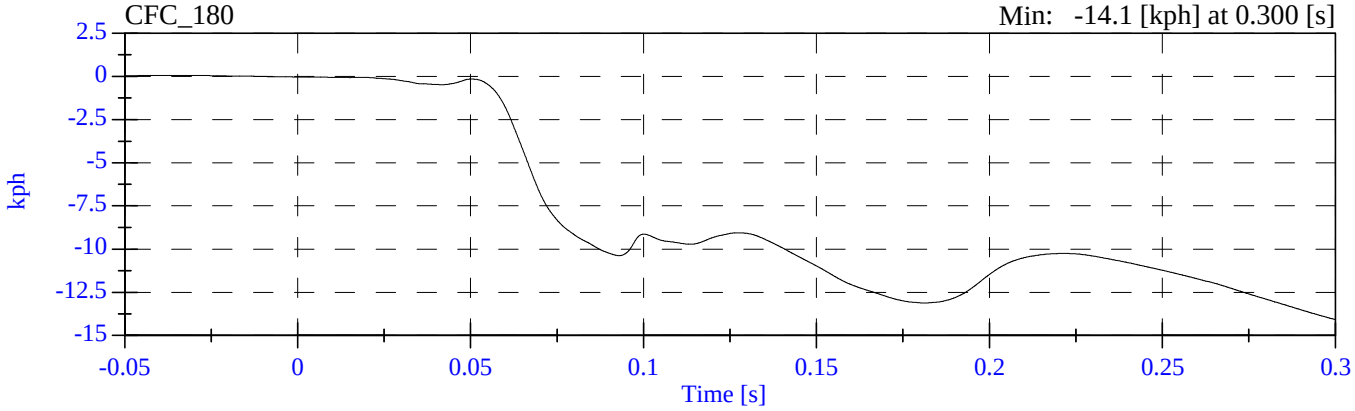


V1P1 Head Resultant
CFC_1000
Max: 59.0 [g] at 0.062 [s]
Min: 0.2 [g] at 0.013 [s]

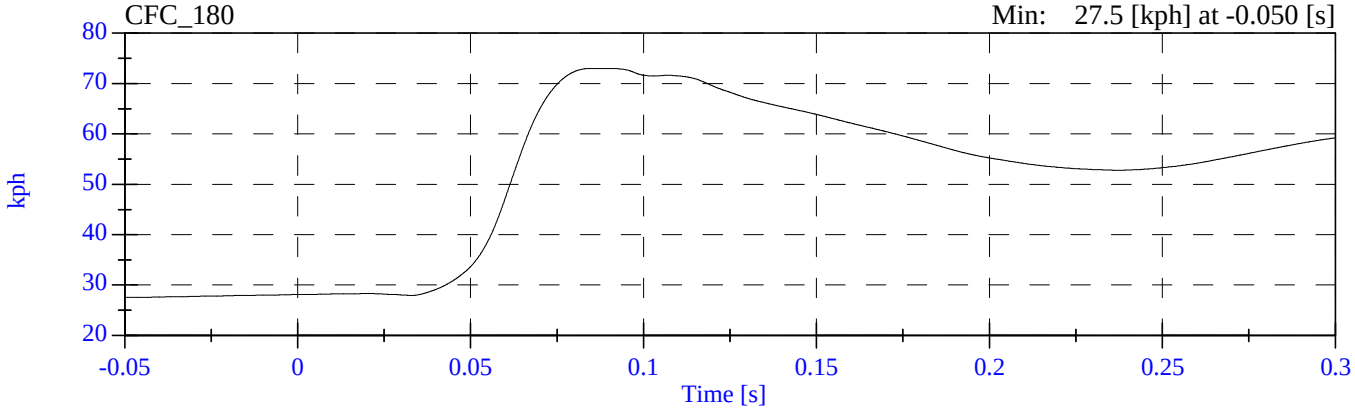


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

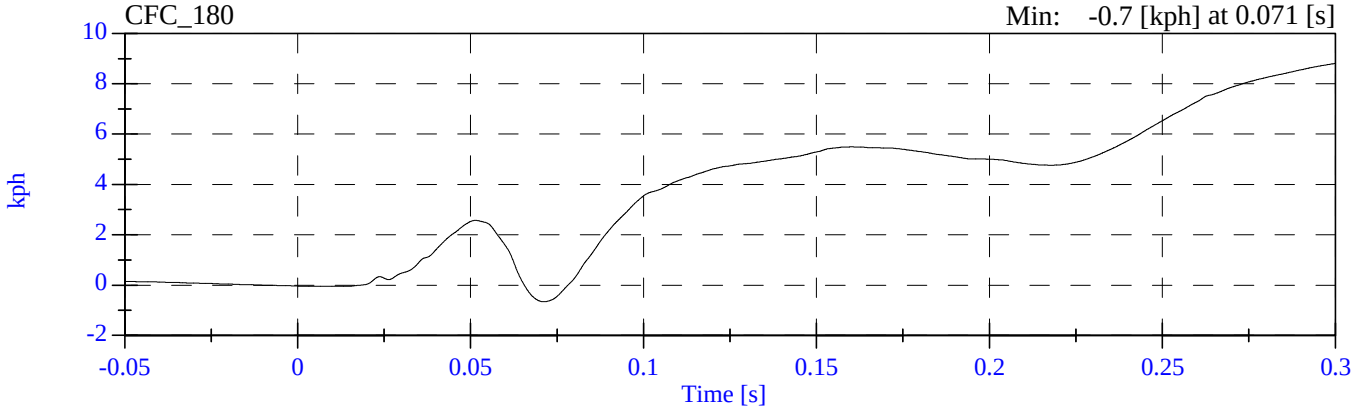
V1P1 Head x Velocity
CFC_180
Max: 0.1 [kph] at -0.038 [s]
Min: -14.1 [kph] at 0.300 [s]



V1P1 Head y Velocity
CFC_180
Max: 73.0 [kph] at 0.085 [s]
Min: 27.5 [kph] at -0.050 [s]

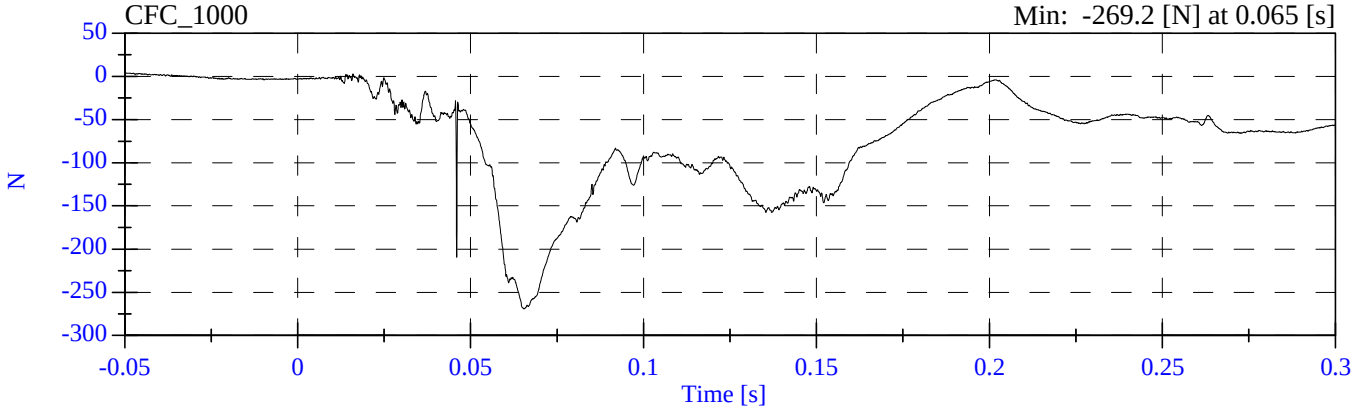


V1P1 Head z Velocity
CFC_180
Max: 8.8 [kph] at 0.300 [s]
Min: -0.7 [kph] at 0.071 [s]

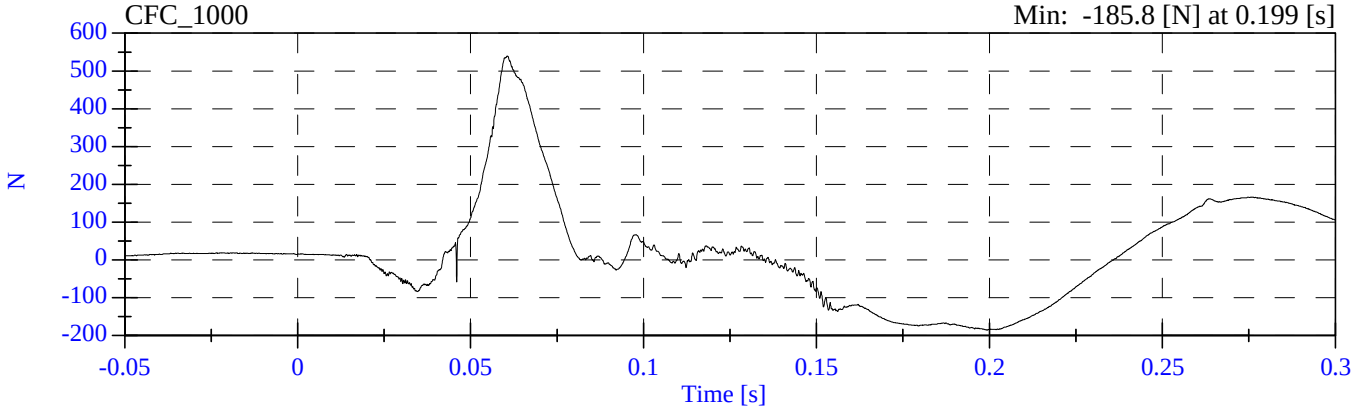


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

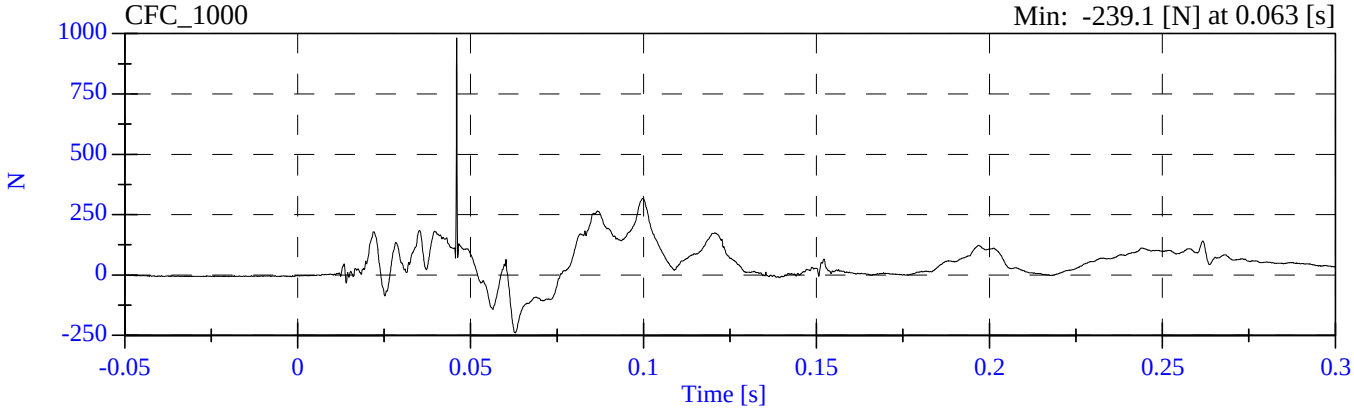
V1P1 Upper Neck Fx
CFC_1000
Max: 4.6 [N] at -0.050 [s]
Min: -269.2 [N] at 0.065 [s]



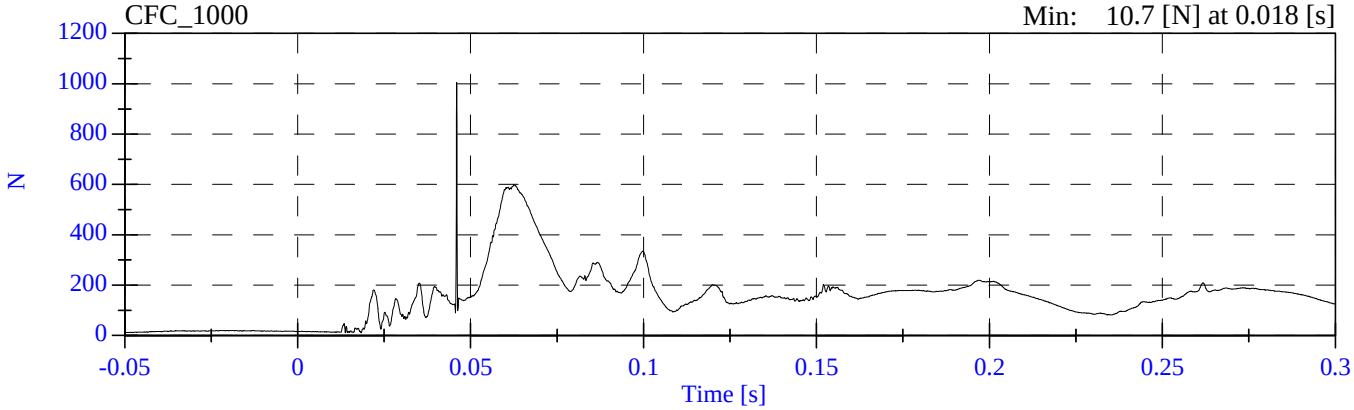
V1P1 Upper Neck Fy
CFC_1000
Max: 539.8 [N] at 0.061 [s]
Min: -185.8 [N] at 0.199 [s]



V1P1 Upper Neck Fz
CFC_1000
Max: 981.6 [N] at 0.046 [s]
Min: -239.1 [N] at 0.063 [s]

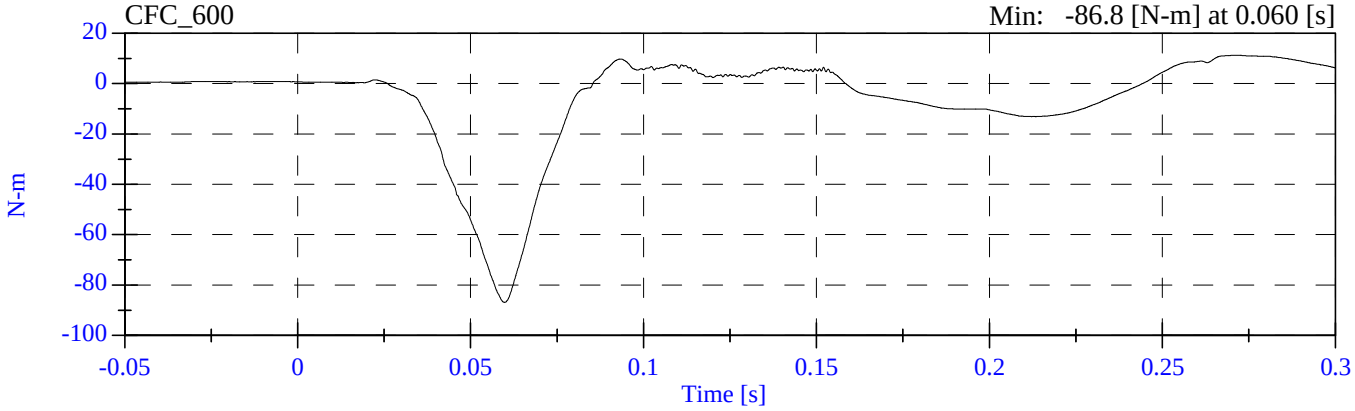


V1P1 Upper Neck F Resultant
CFC_1000
Max: 1005.4 [N] at 0.046 [s]
Min: 10.7 [N] at 0.018 [s]

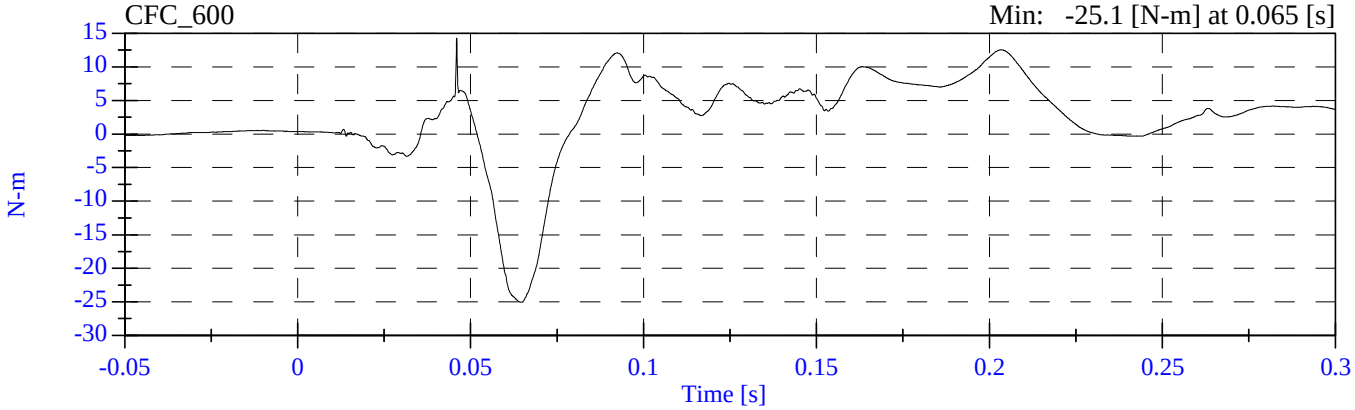


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

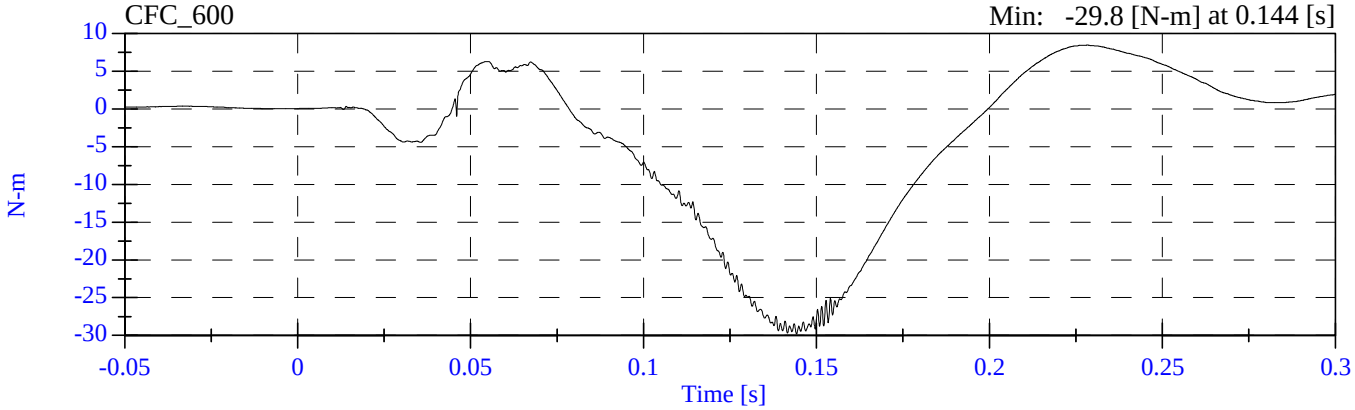
V1P1 Upper Neck Mx
CFC_600
Max: 11.2 [N-m] at 0.271 [s]
Min: -86.8 [N-m] at 0.060 [s]



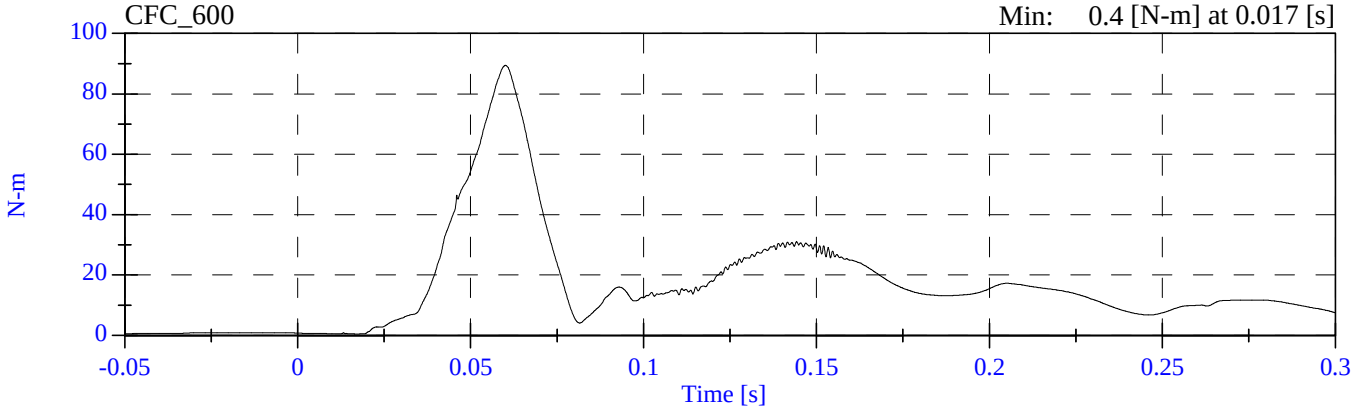
V1P1 Upper Neck My
CFC_600
Max: 14.3 [N-m] at 0.046 [s]
Min: -25.1 [N-m] at 0.065 [s]



V1P1 Upper Neck Mz
CFC_600
Max: 8.5 [N-m] at 0.228 [s]
Min: -29.8 [N-m] at 0.144 [s]

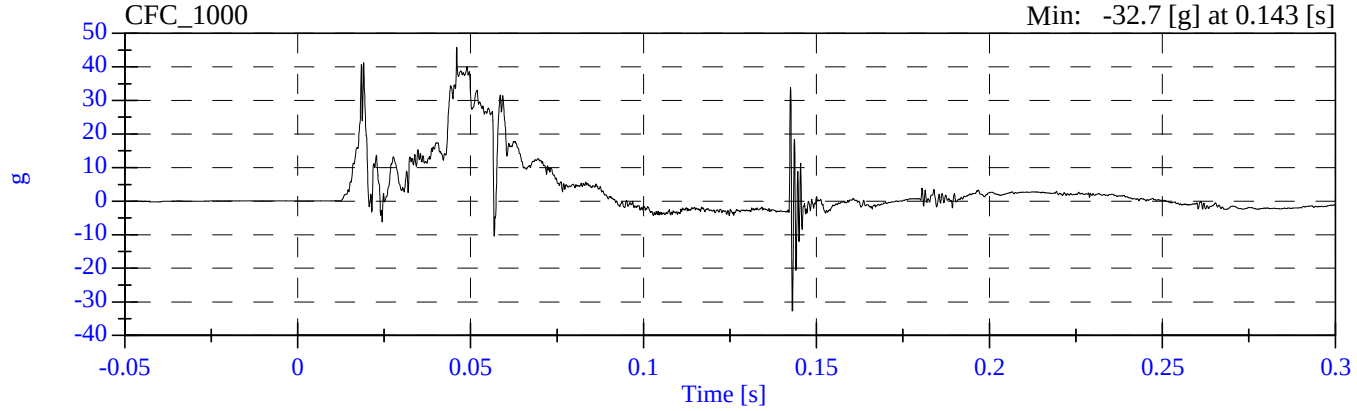


V1P1 Upper Neck M Resultant
CFC_600
Max: 89.4 [N-m] at 0.060 [s]
Min: 0.4 [N-m] at 0.017 [s]

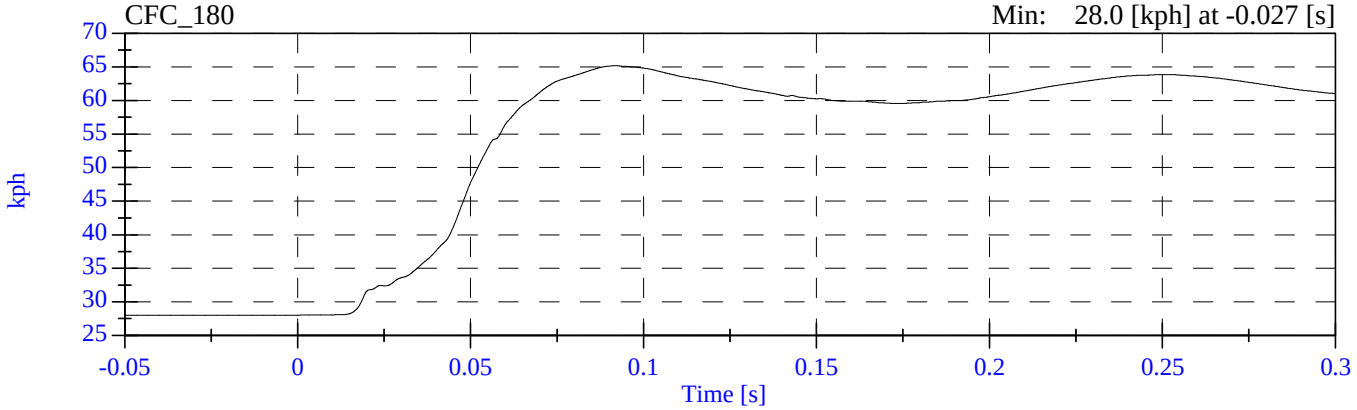


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

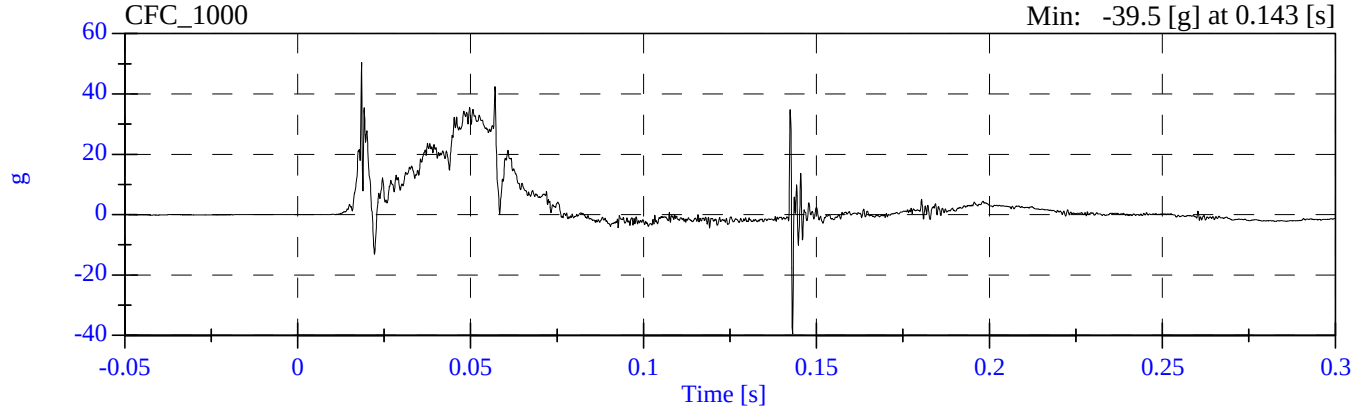
V1P1 Upper Rib y
CFC_1000
Max: 45.8 [g] at 0.046 [s]
Min: -32.7 [g] at 0.143 [s]



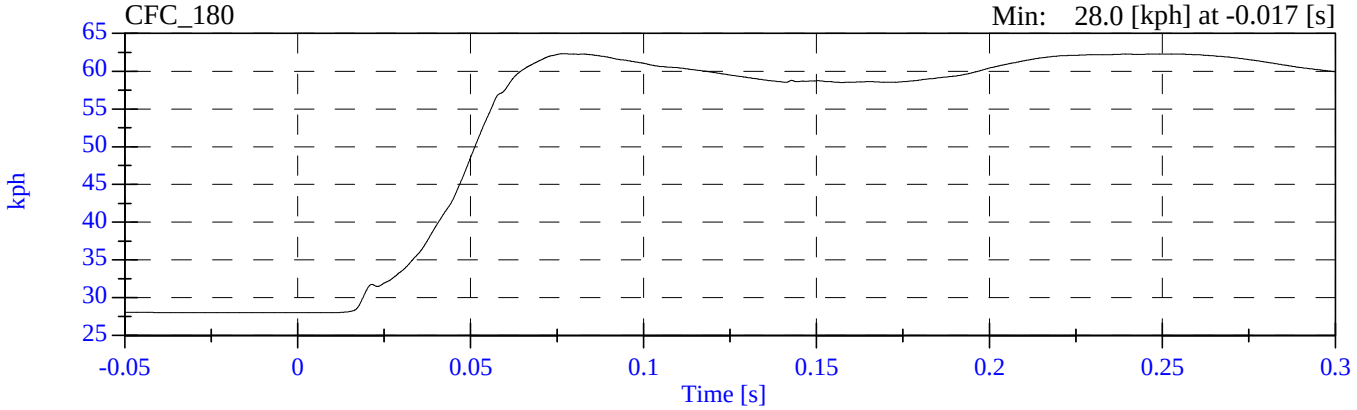
V1P1 Upper Rib y Velocity
CFC_180
Max: 65.2 [kph] at 0.092 [s]
Min: 28.0 [kph] at -0.027 [s]



V1P1 Lower Rib y
CFC_1000
Max: 50.4 [g] at 0.018 [s]
Min: -39.5 [g] at 0.143 [s]

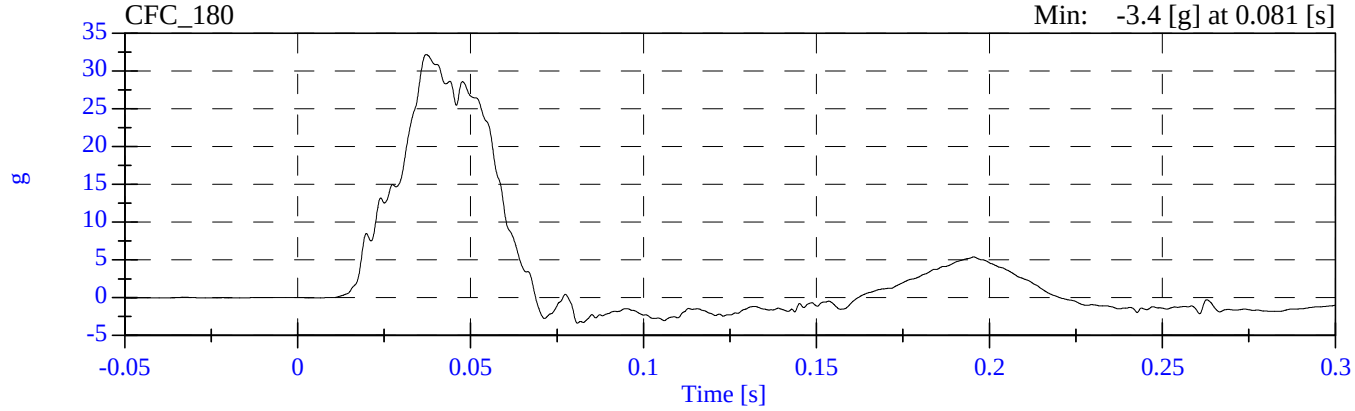


V1P1 Lower Rib y Velocity
CFC_180
Max: 62.3 [kph] at 0.076 [s]
Min: 28.0 [kph] at -0.017 [s]

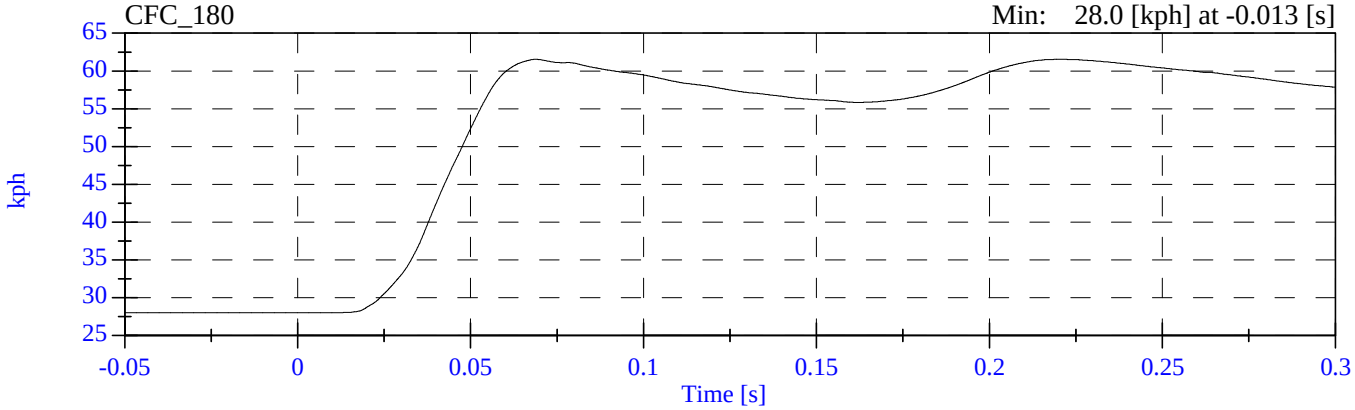


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

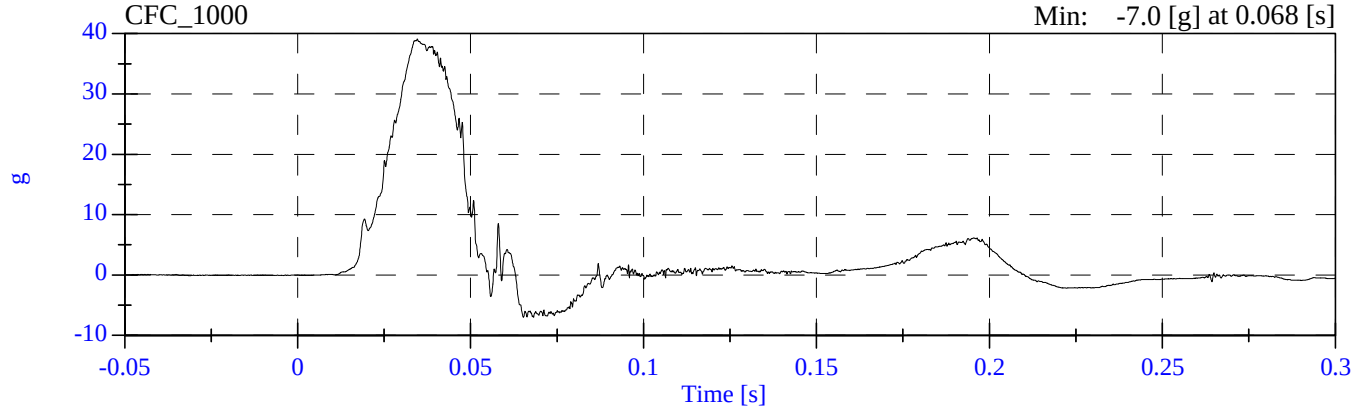
V1P1 Lower Spine y
CFC_180
Max: 32.2 [g] at 0.037 [s]
Min: -3.4 [g] at 0.081 [s]



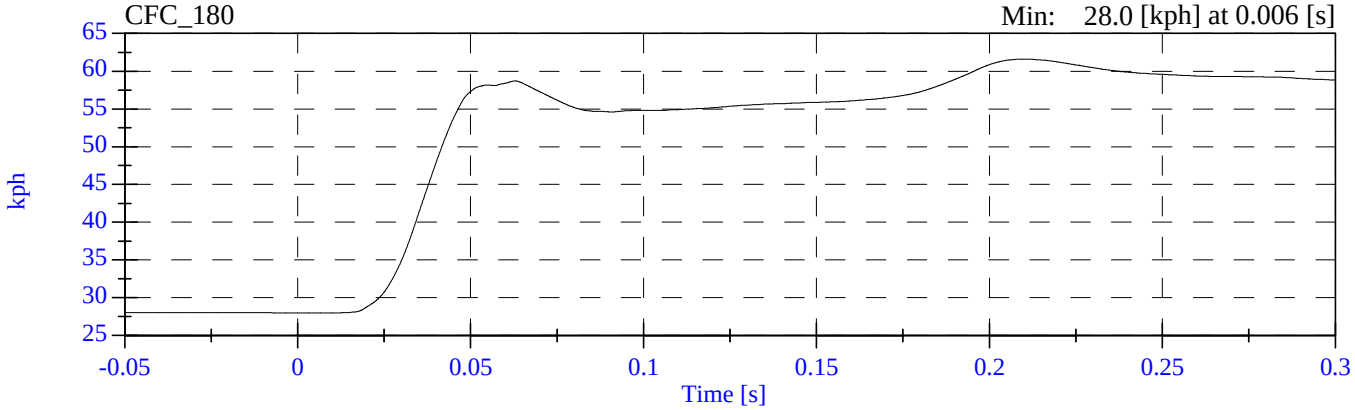
V1P1 Lower Spine y Velocity
CFC_180
Max: 61.6 [kph] at 0.069 [s]
Min: 28.0 [kph] at -0.013 [s]



V1P1 Pelvic y
CFC_1000
Max: 39.1 [g] at 0.035 [s]
Min: -7.0 [g] at 0.068 [s]

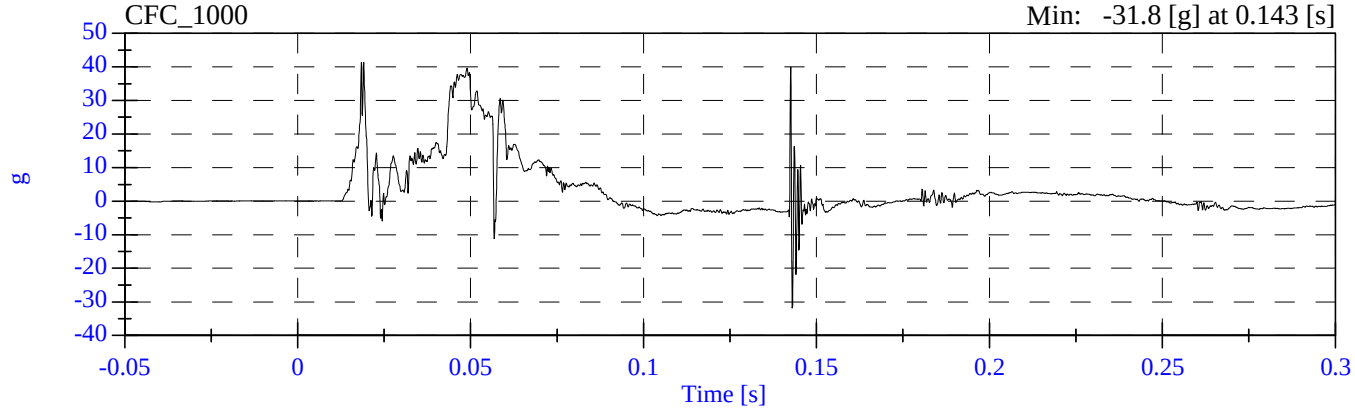


V1P1 Pelvic y Velocity
CFC_180
Max: 61.6 [kph] at 0.210 [s]
Min: 28.0 [kph] at 0.006 [s]

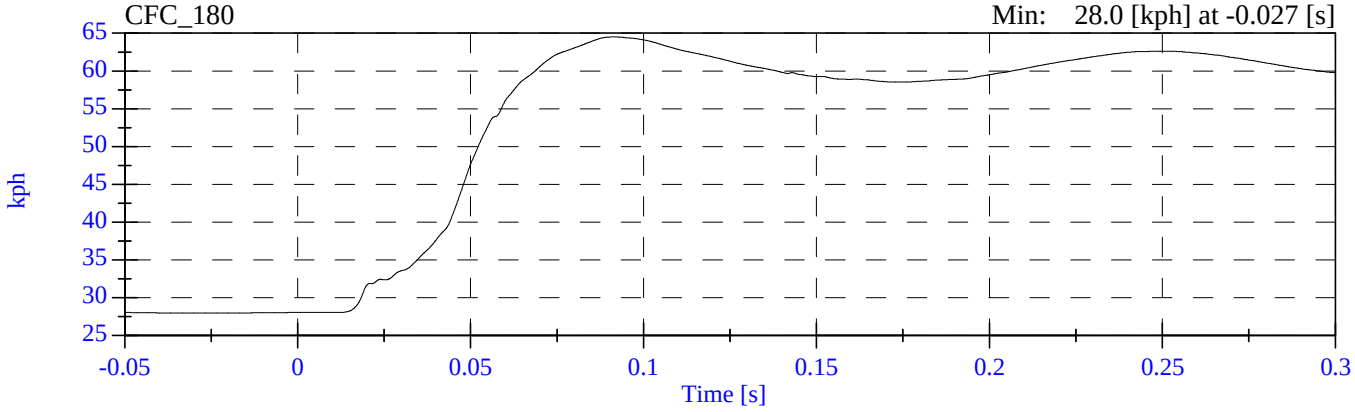


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

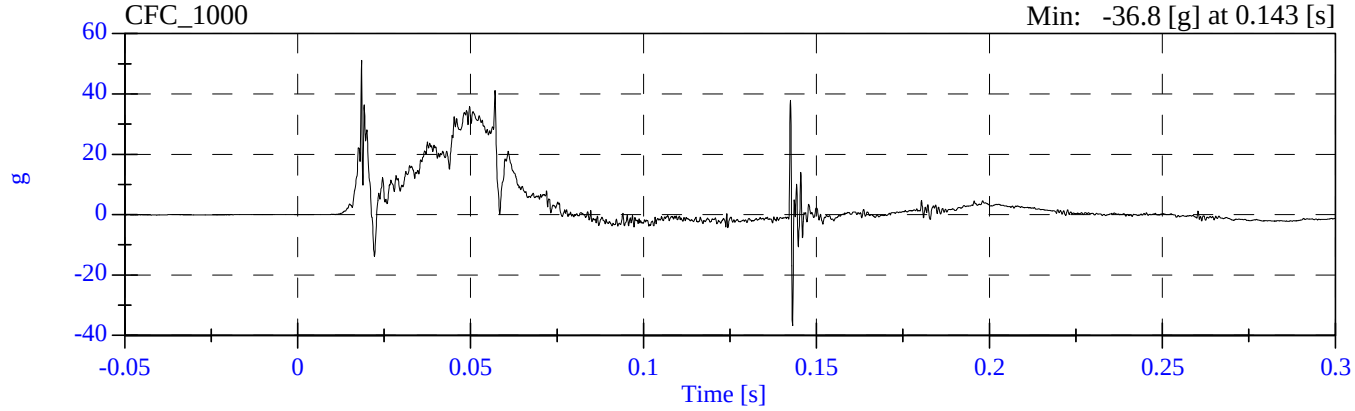
V1P1 Upper Rib Ry
CFC_1000
Max: 41.3 [g] at 0.018 [s]
Min: -31.8 [g] at 0.143 [s]



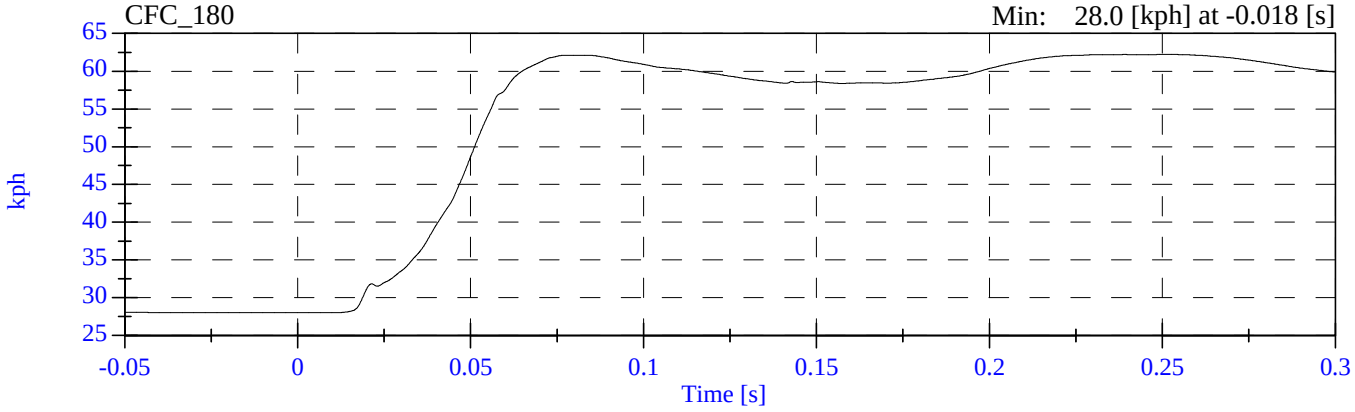
V1P1 Upper Rib Ry Velocity
CFC_180
Max: 64.5 [kph] at 0.091 [s]
Min: 28.0 [kph] at -0.027 [s]



V1P1 Lower Rib Ry
CFC_1000
Max: 51.0 [g] at 0.018 [s]
Min: -36.8 [g] at 0.143 [s]

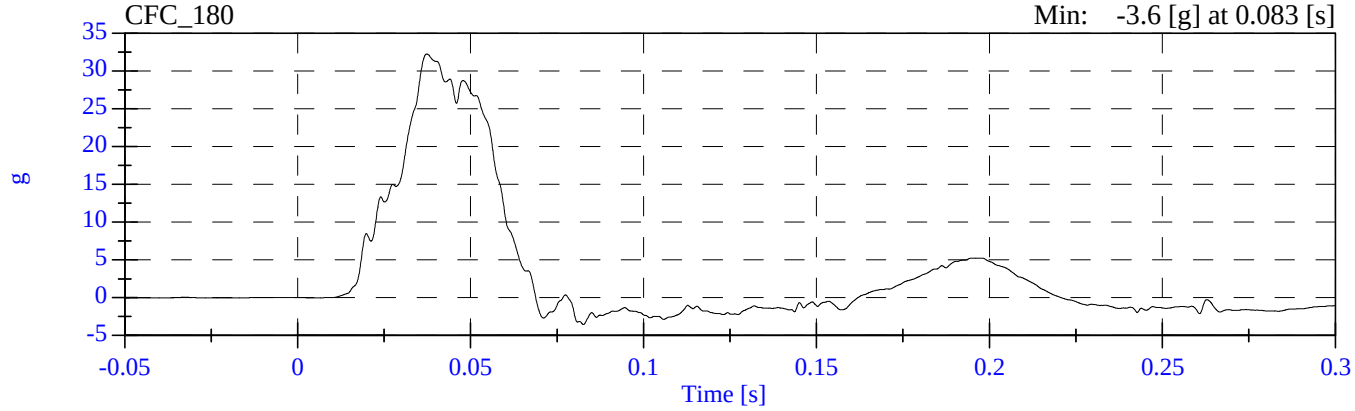


V1P1 Lower Rib Ry Velocity
CFC_180
Max: 62.2 [kph] at 0.253 [s]
Min: 28.0 [kph] at -0.018 [s]

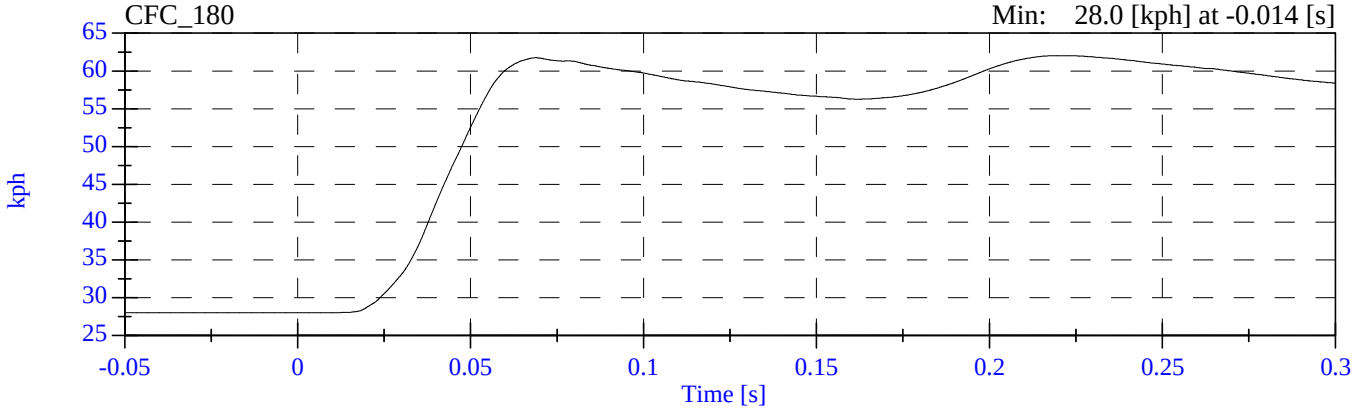


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

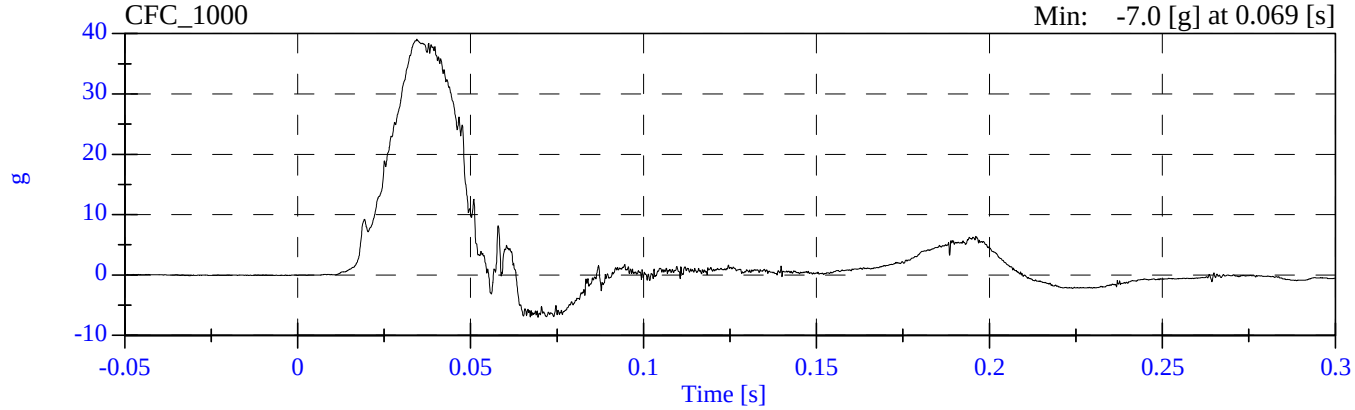
V1P1 Lower Spine Ry
CFC_180
Max: 32.2 [g] at 0.037 [s]
Min: -3.6 [g] at 0.083 [s]



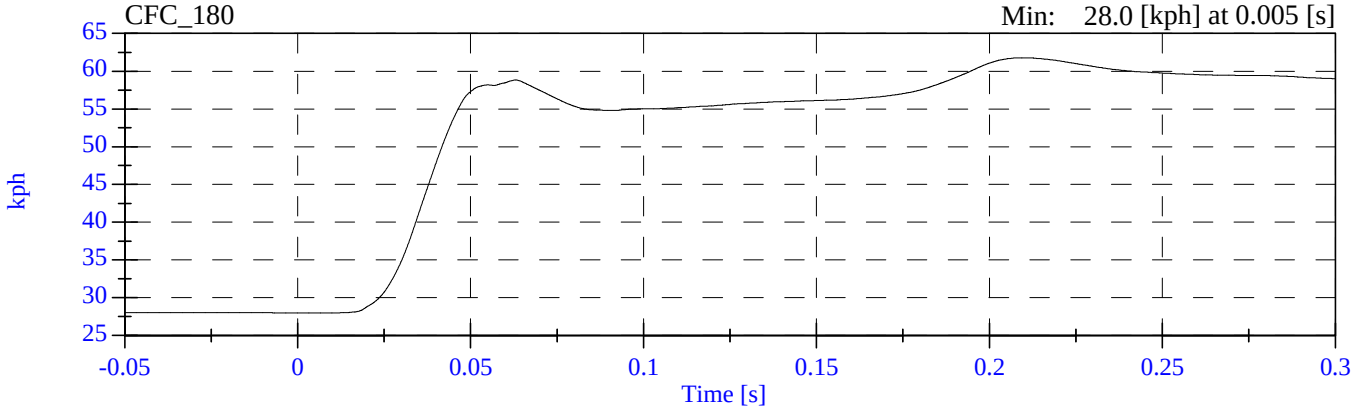
V1P1 Lower Spine Ry Velocity
CFC_180
Max: 62.1 [kph] at 0.221 [s]
Min: 28.0 [kph] at -0.014 [s]



V1P1 Pelvic Ry
CFC_1000
Max: 39.1 [g] at 0.034 [s]
Min: -7.0 [g] at 0.069 [s]

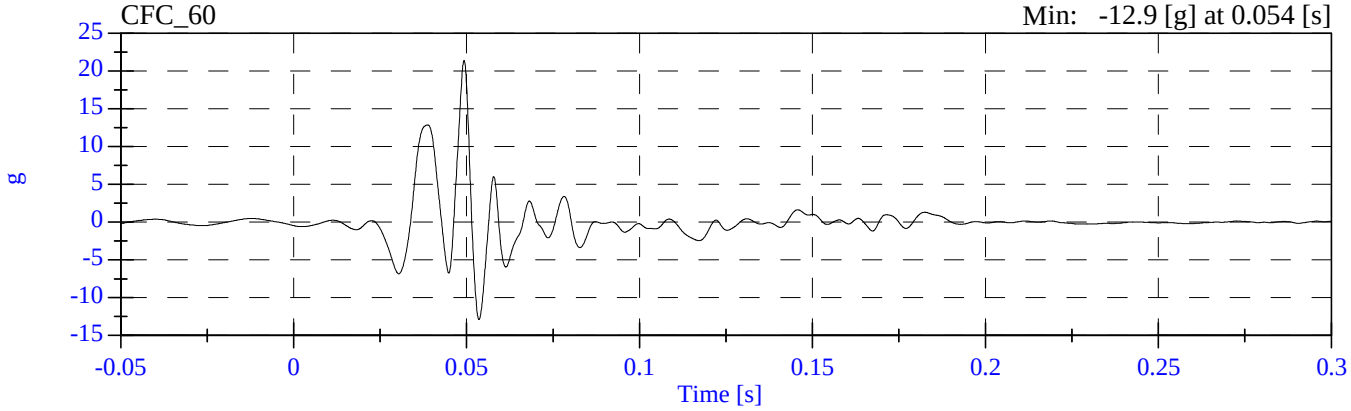


V1P1 Pelvic Ry Velocity
CFC_180
Max: 61.8 [kph] at 0.210 [s]
Min: 28.0 [kph] at 0.005 [s]

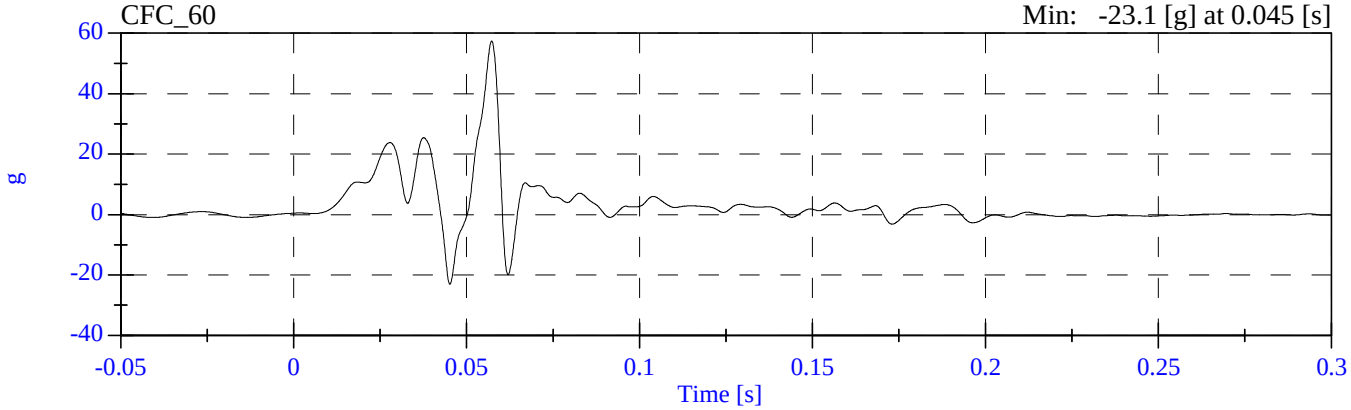


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

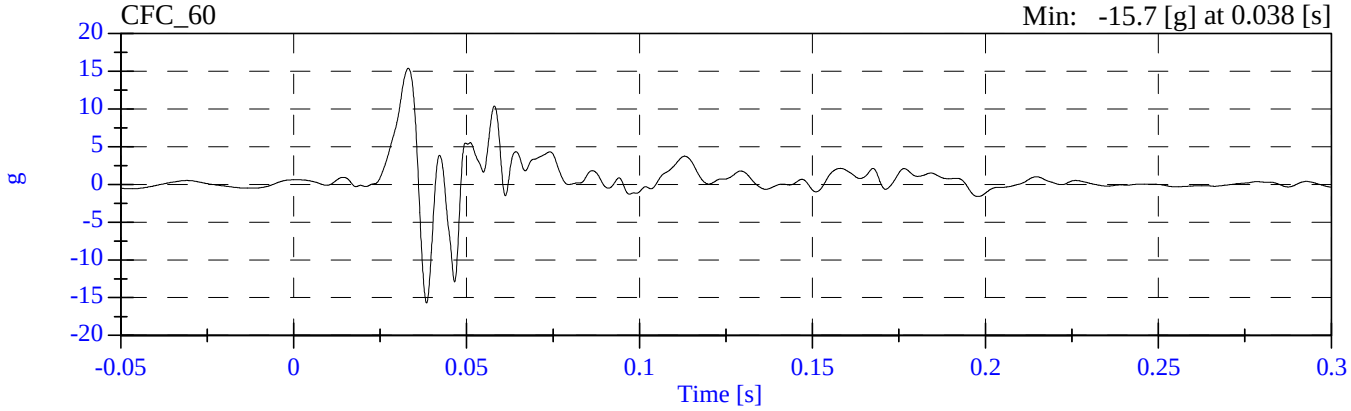
V1 A1 Vehicle CG x
CFC_60
Max: 21.4 [g] at 0.049 [s]
Min: -12.9 [g] at 0.054 [s]



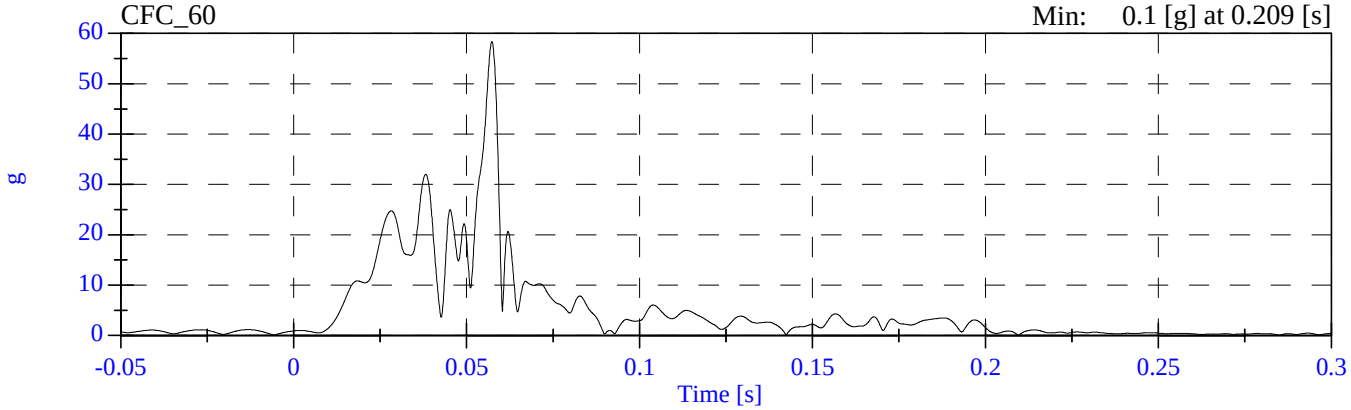
V1 A1 Vehicle CG y
CFC_60
Max: 57.5 [g] at 0.057 [s]
Min: -23.1 [g] at 0.045 [s]



V1 A1 Vehicle CG z
CFC_60
Max: 15.4 [g] at 0.033 [s]
Min: -15.7 [g] at 0.038 [s]

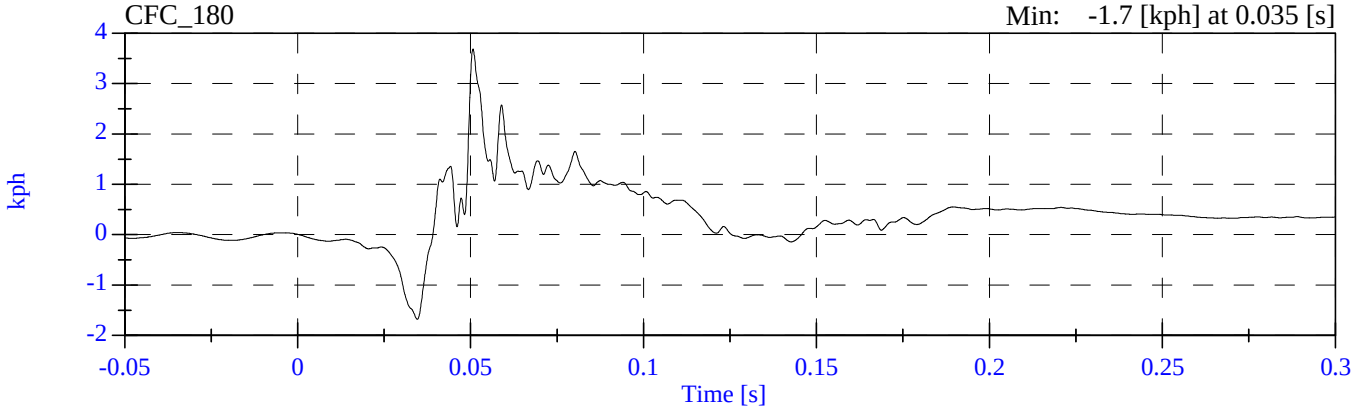


V1 A1 Vehicle CG Resultant
CFC_60
Max: 58.4 [g] at 0.057 [s]
Min: 0.1 [g] at 0.209 [s]

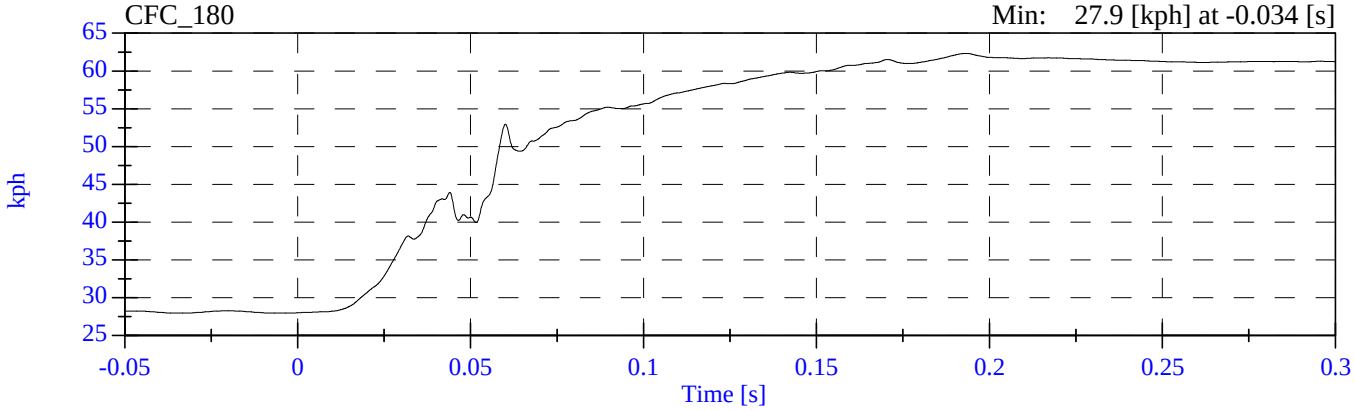


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

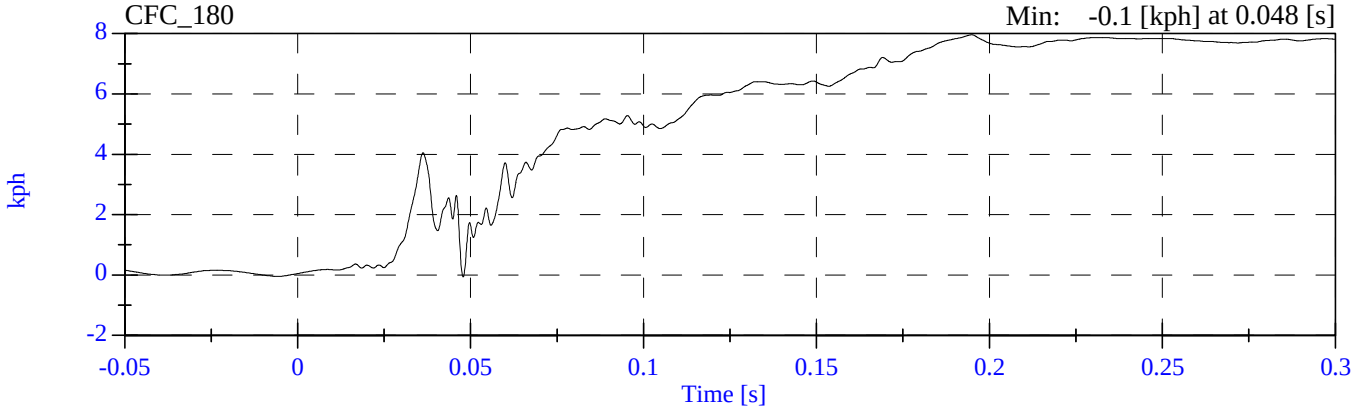
V1 A1 Vehicle CG x Velocity
CFC_180
Max: 3.7 [kph] at 0.051 [s]
Min: -1.7 [kph] at 0.035 [s]



V1 A1 Vehicle CG y Velocity
CFC_180
Max: 62.3 [kph] at 0.193 [s]
Min: 27.9 [kph] at -0.034 [s]

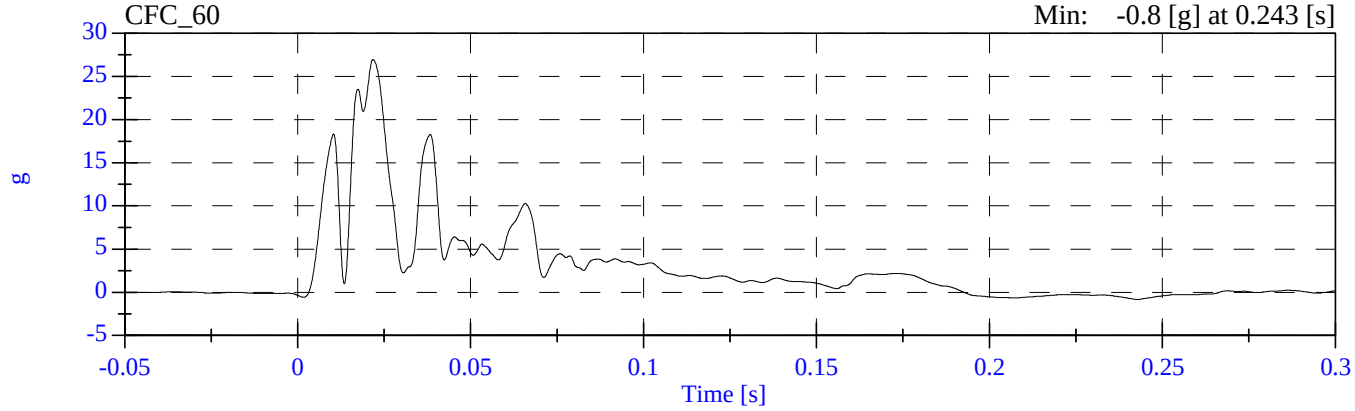


V1 A1 Vehicle CG z Velocity
CFC_180
Max: 8.0 [kph] at 0.195 [s]
Min: -0.1 [kph] at 0.048 [s]

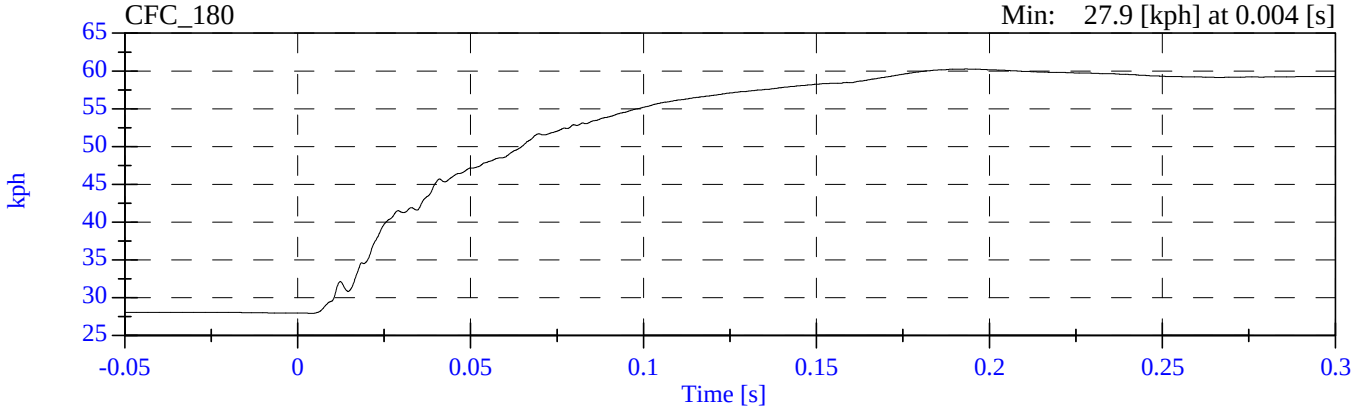


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

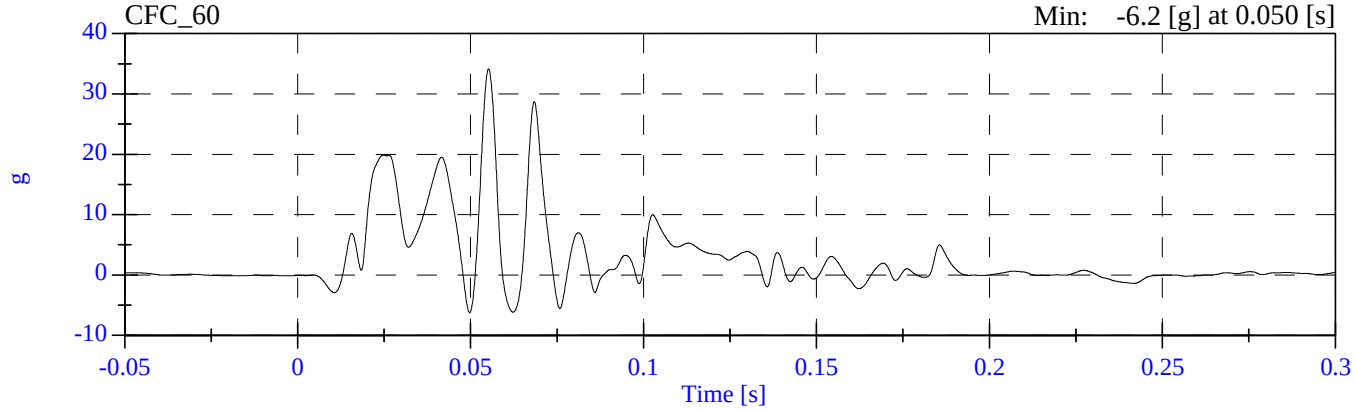
V1 A3 Left Sill y
CFC_60
Max: 27.0 [g] at 0.022 [s]
Min: -0.8 [g] at 0.243 [s]



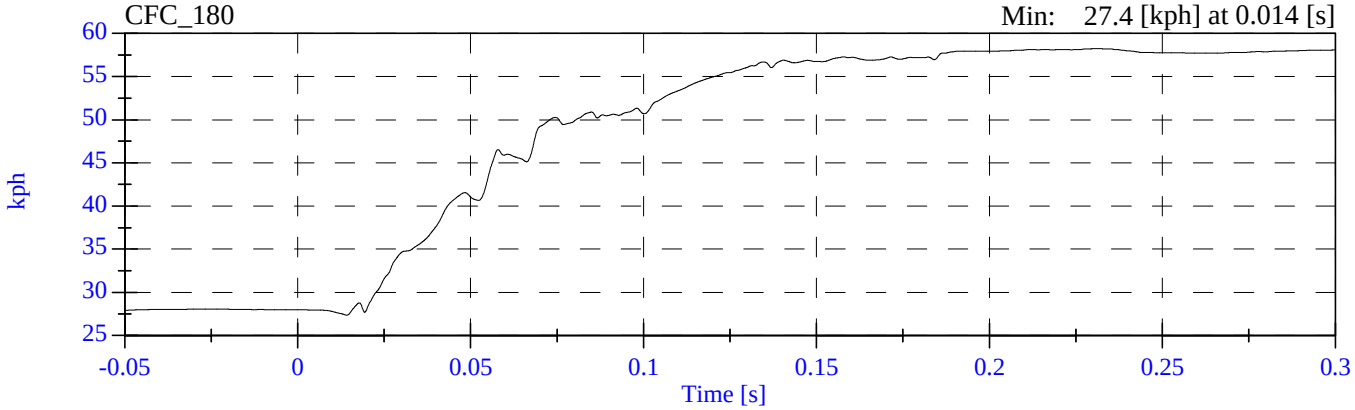
V1 A3 Left Sill y Velocity
CFC_180
Max: 60.3 [kph] at 0.193 [s]
Min: 27.9 [kph] at 0.004 [s]



V1 A4 Left Sill A Pillar y
CFC_60
Max: 34.1 [g] at 0.055 [s]
Min: -6.2 [g] at 0.050 [s]

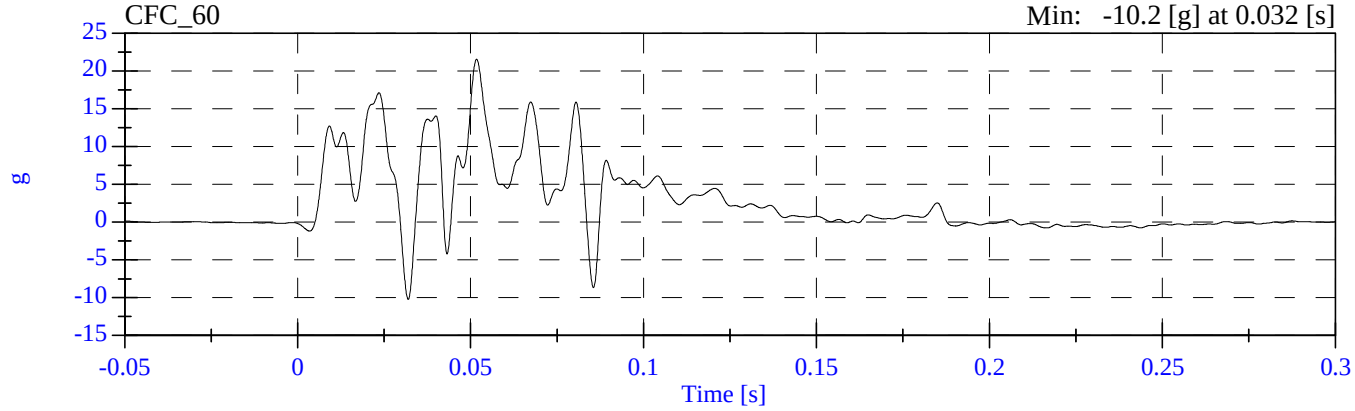


V1 A4 Left Sill A Pillar y Velocity
CFC_180
Max: 58.3 [kph] at 0.231 [s]
Min: 27.4 [kph] at 0.014 [s]

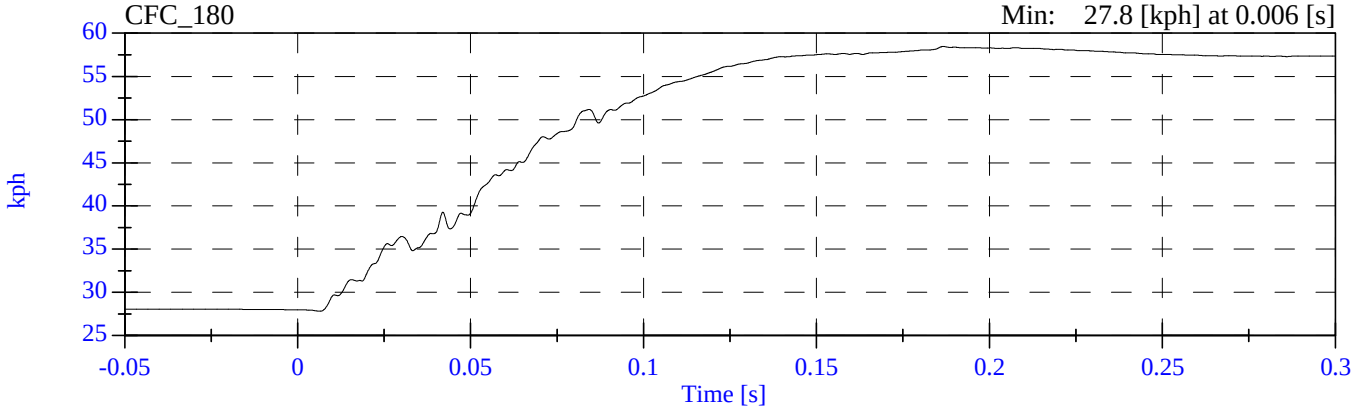


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

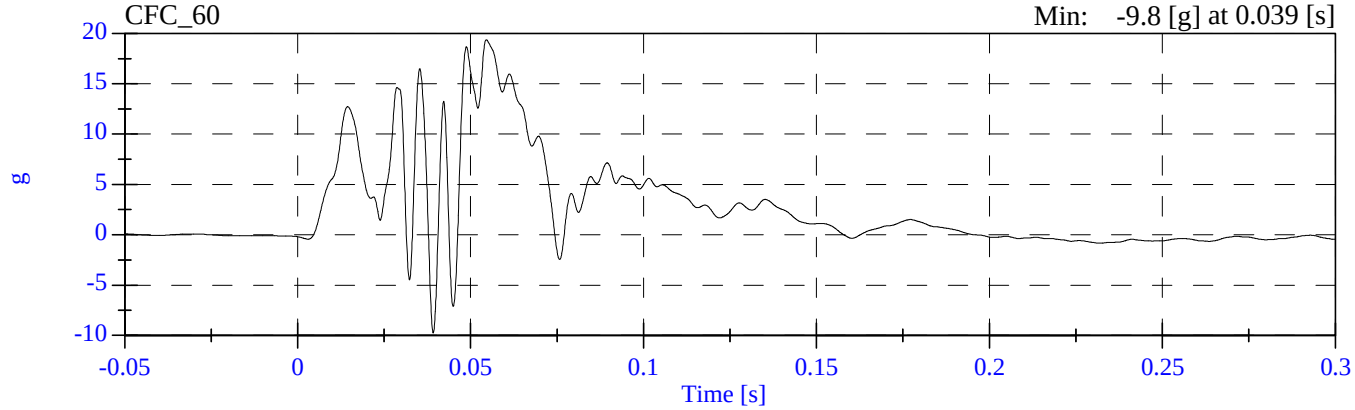
V1 A5 Left Lower A Pillar y
CFC_60
Max: 21.6 [g] at 0.052 [s]
Min: -10.2 [g] at 0.032 [s]



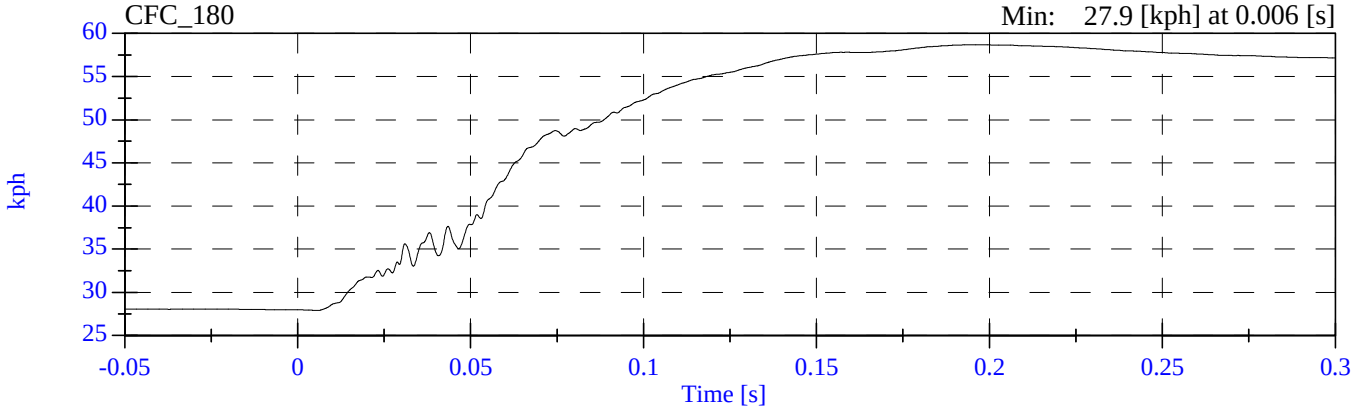
V1 A5 Left Lower A Pillar y Velocity
CFC_180
Max: 58.5 [kph] at 0.187 [s]
Min: 27.8 [kph] at 0.006 [s]



V1 A6 Left Mid A Pillar y
CFC_60
Max: 19.4 [g] at 0.055 [s]
Min: -9.8 [g] at 0.039 [s]

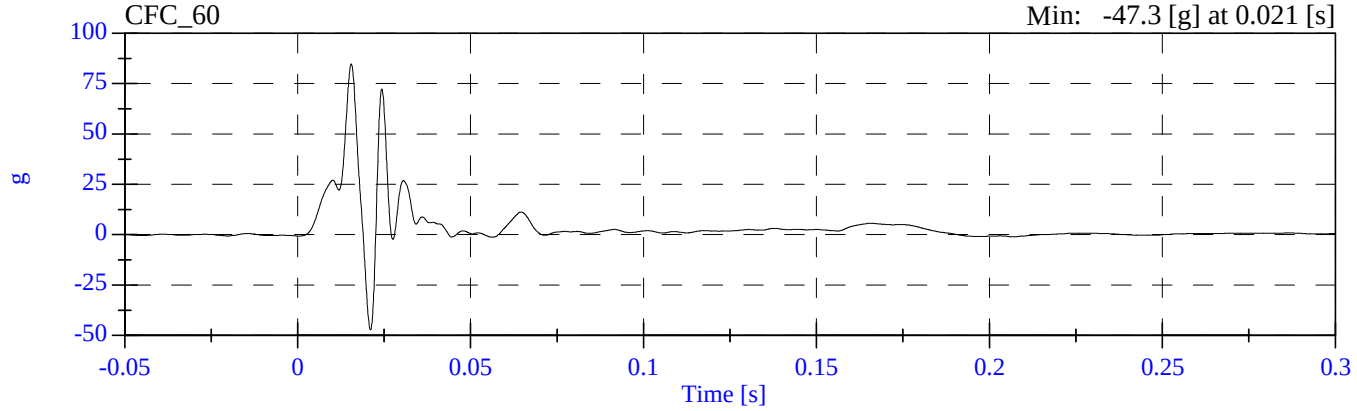


V1 A6 Left Mid A Pillar y Velocity
CFC_180
Max: 58.7 [kph] at 0.195 [s]
Min: 27.9 [kph] at 0.006 [s]

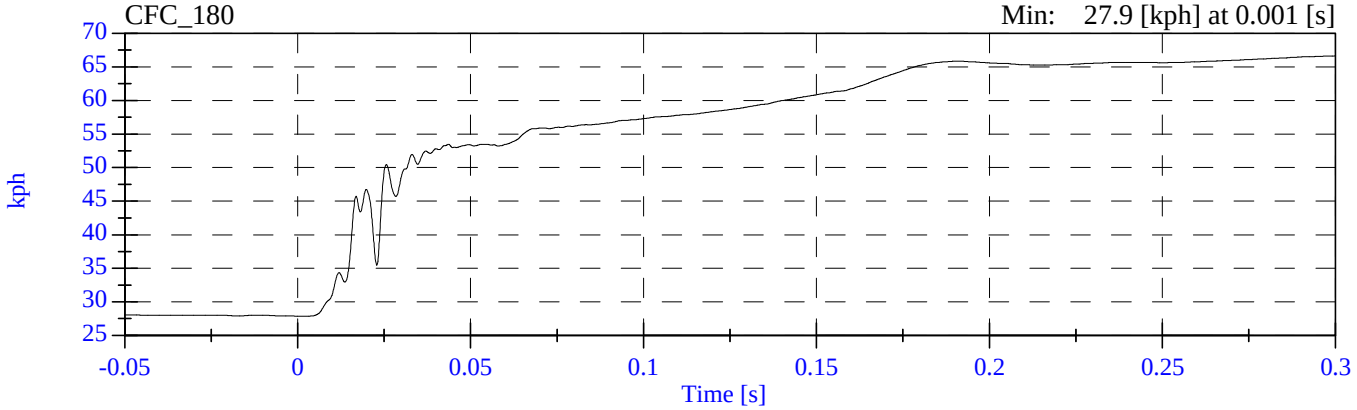


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

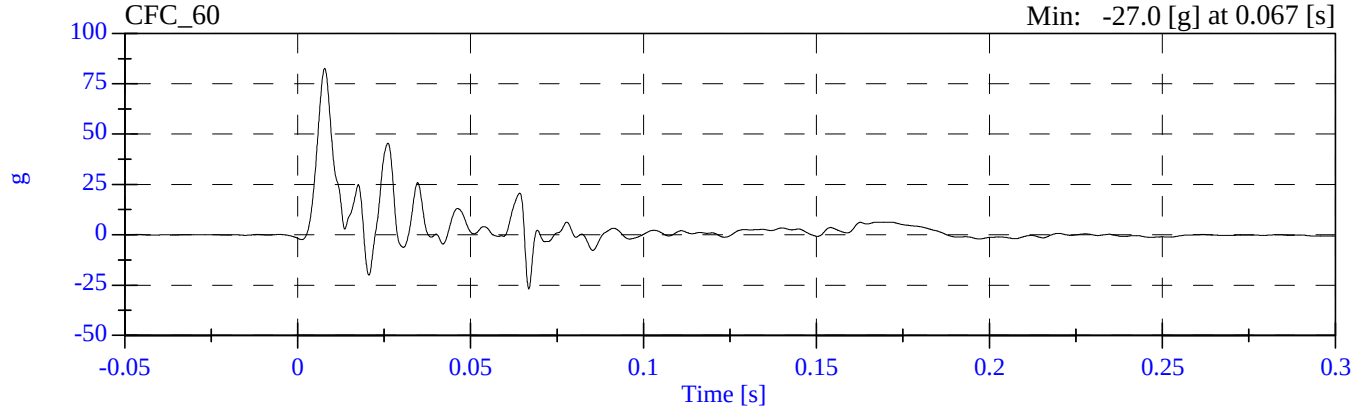
V1 A7 B Pillar Sill y
CFC_60
Max: 84.8 [g] at 0.015 [s]
Min: -47.3 [g] at 0.021 [s]



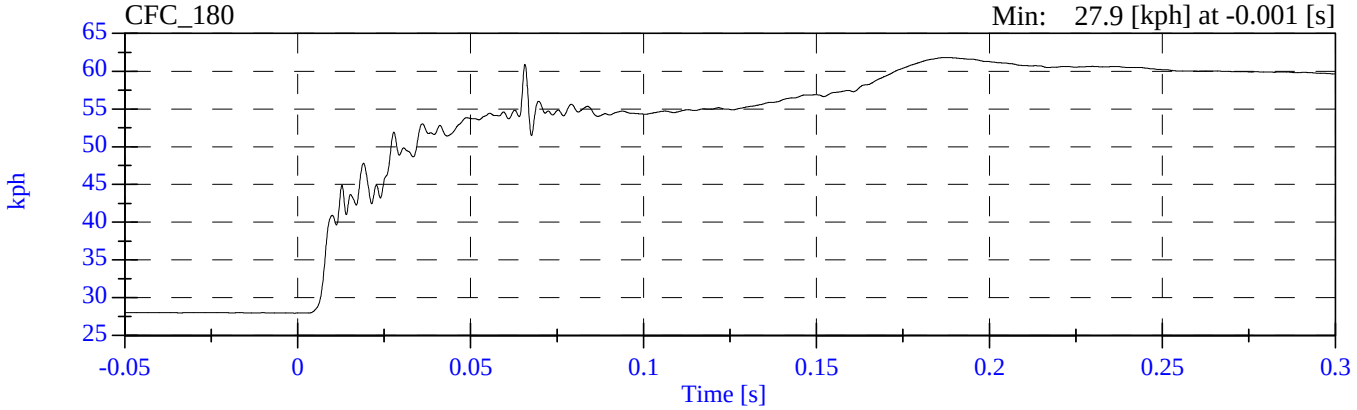
V1 A7 B Pillar Sill y Velocity
CFC_180
Max: 66.6 [kph] at 0.300 [s]
Min: 27.9 [kph] at 0.001 [s]



V1 A8 B Pillar Lower y
CFC_60
Max: 82.7 [g] at 0.008 [s]
Min: -27.0 [g] at 0.067 [s]

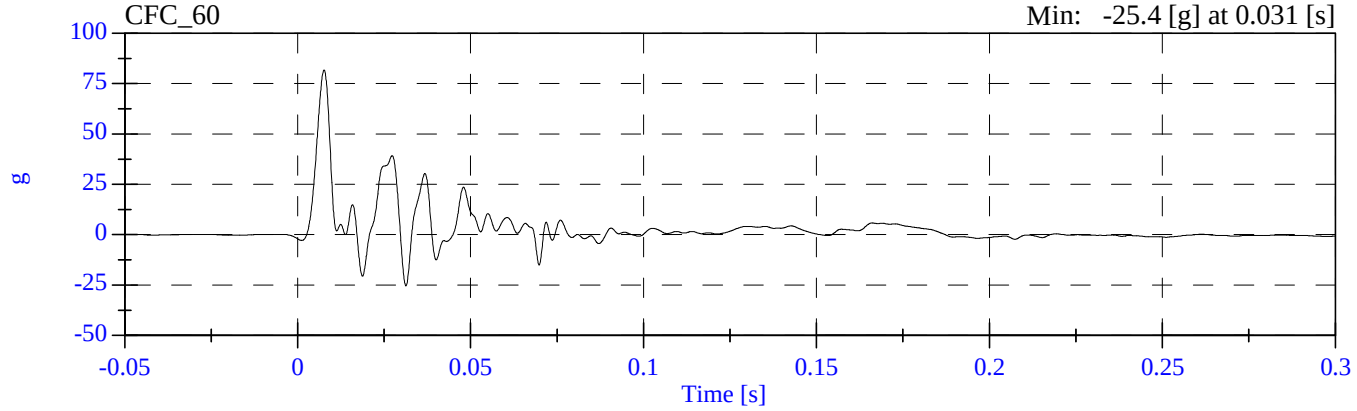


V1 A8 B Pillar Lower y Velocity
CFC_180
Max: 61.8 [kph] at 0.187 [s]
Min: 27.9 [kph] at -0.001 [s]

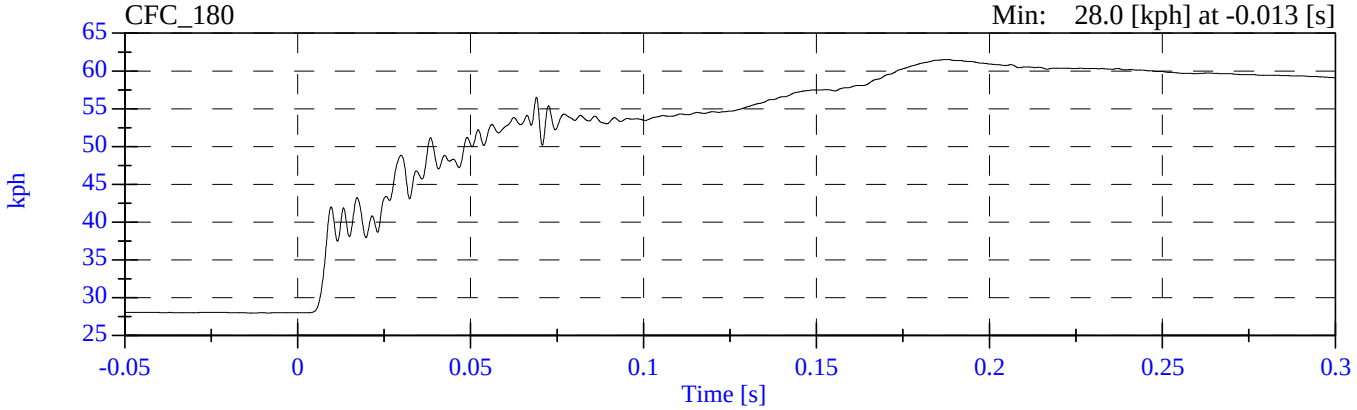


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

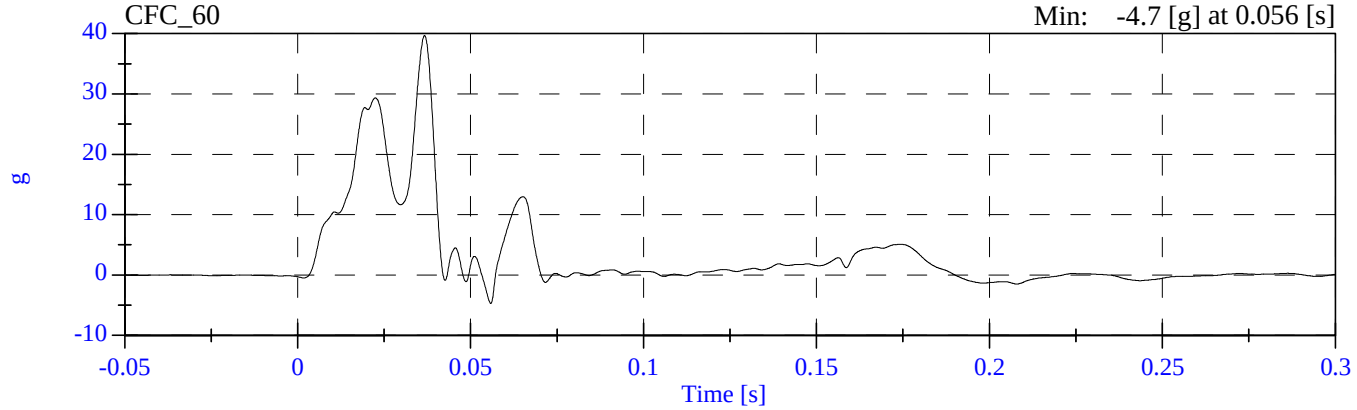
V1 A9 B Pillar Mid y
CFC_60
Max: 81.7 [g] at 0.008 [s]
Min: -25.4 [g] at 0.031 [s]



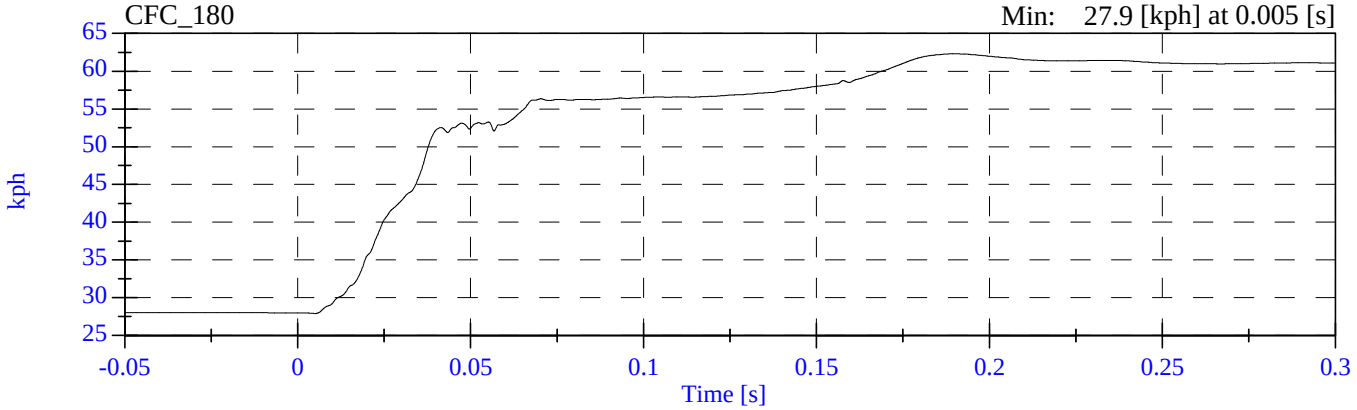
V1 A9 B Pillar Mid y Velocity
CFC_180
Max: 61.5 [kph] at 0.188 [s]
Min: 28.0 [kph] at -0.013 [s]



V1 A10 Driver Seat y
CFC_60
Max: 39.7 [g] at 0.037 [s]
Min: -4.7 [g] at 0.056 [s]

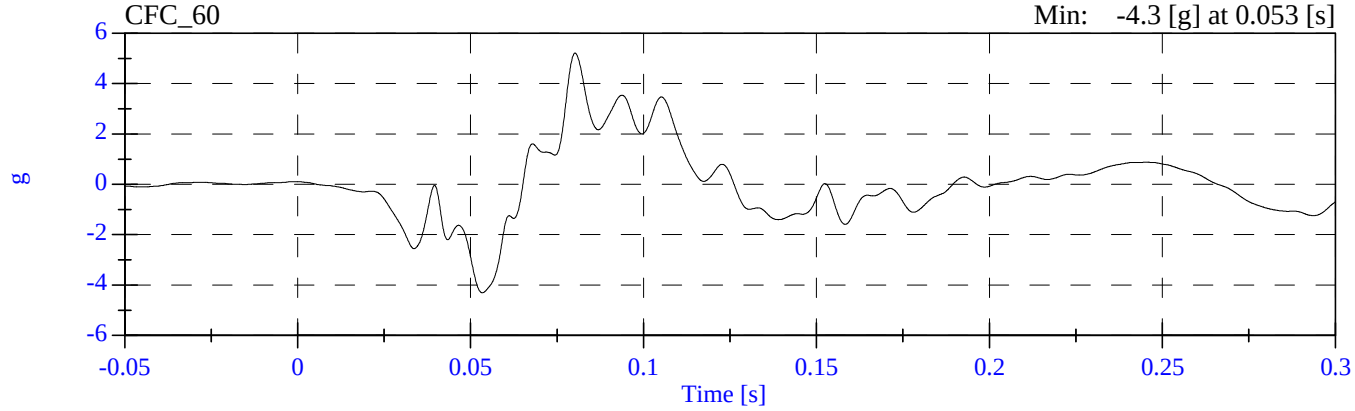


V1 A10 Driver Seat y Velocity
CFC_180
Max: 62.3 [kph] at 0.190 [s]
Min: 27.9 [kph] at 0.005 [s]

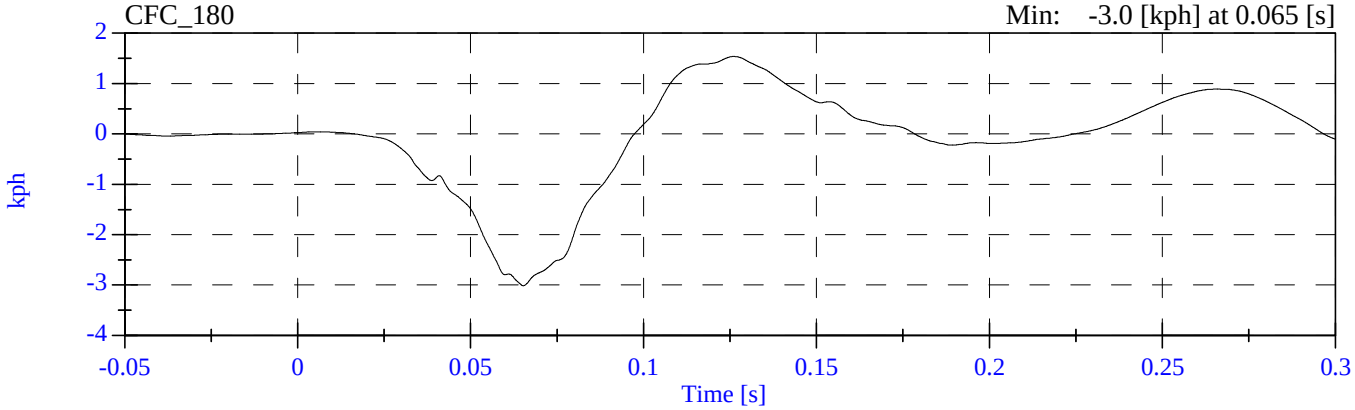


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

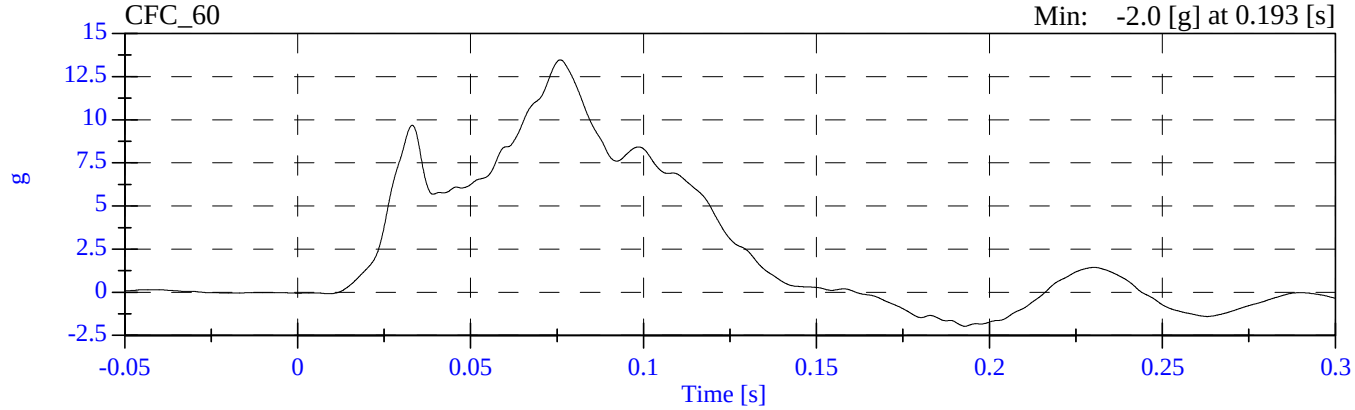
V1 A11 Engine Top x
CFC_60
Max: 5.2 [g] at 0.080 [s]
Min: -4.3 [g] at 0.053 [s]



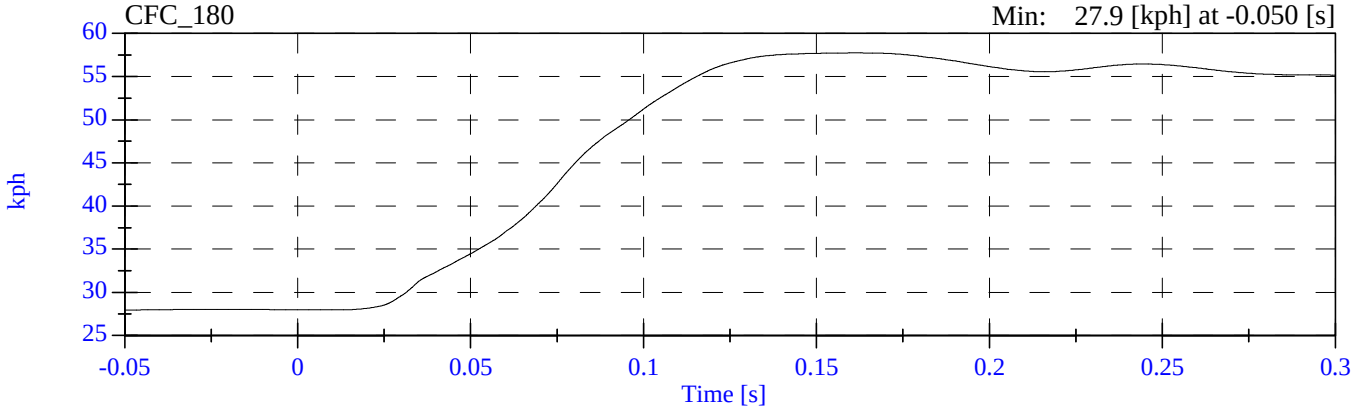
V1 A11 Engine Top x Velocity
CFC_180
Max: 1.5 [kph] at 0.126 [s]
Min: -3.0 [kph] at 0.065 [s]



V1 A11 Engine Top y
CFC_60
Max: 13.5 [g] at 0.076 [s]
Min: -2.0 [g] at 0.193 [s]

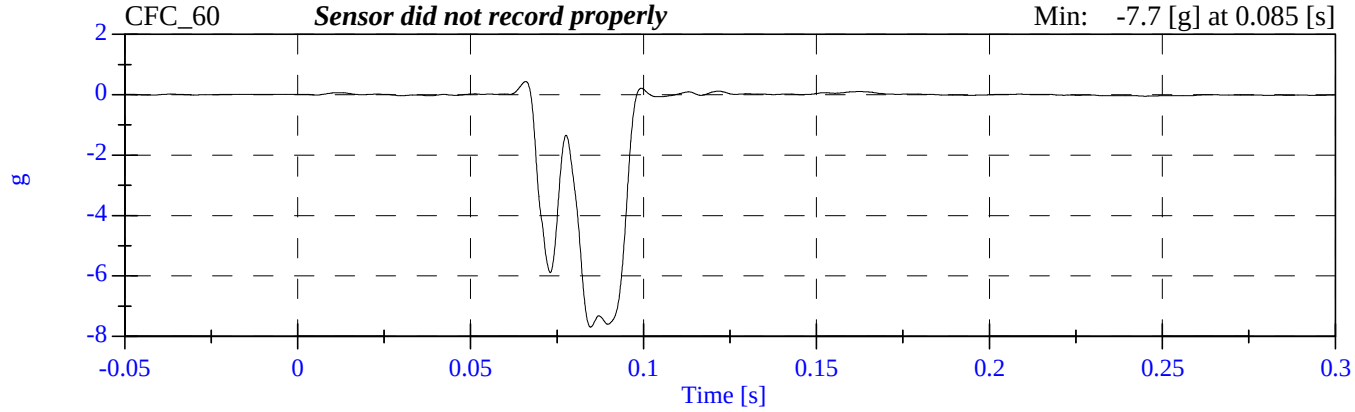


V1 A11 Engine Top y Velocity
CFC_180
Max: 57.8 [kph] at 0.161 [s]
Min: 27.9 [kph] at -0.050 [s]

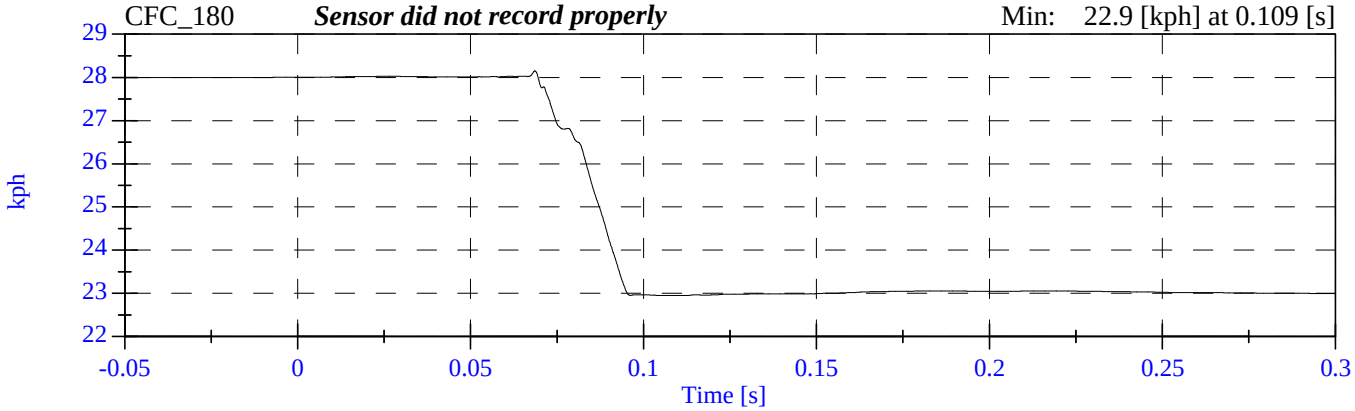


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

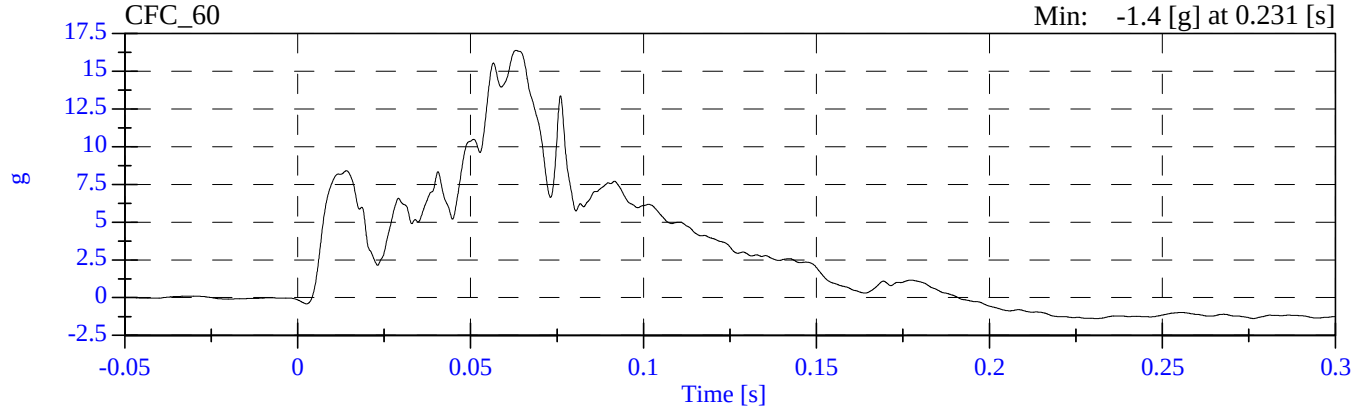
V1 A12 Firewall Center y
CFC_60 ***Sensor did not record properly***
Max: 0.4 [g] at 0.066 [s]
Min: -7.7 [g] at 0.085 [s]



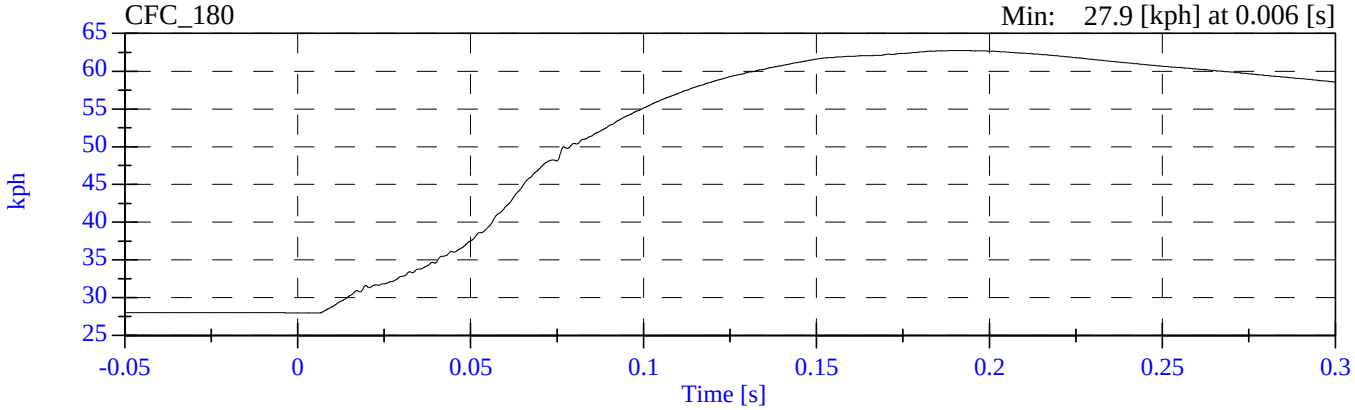
V1 A12 Firewall Center y Velocity
CFC_180 ***Sensor did not record properly***
Max: 28.2 [kph] at 0.069 [s]
Min: 22.9 [kph] at 0.109 [s]



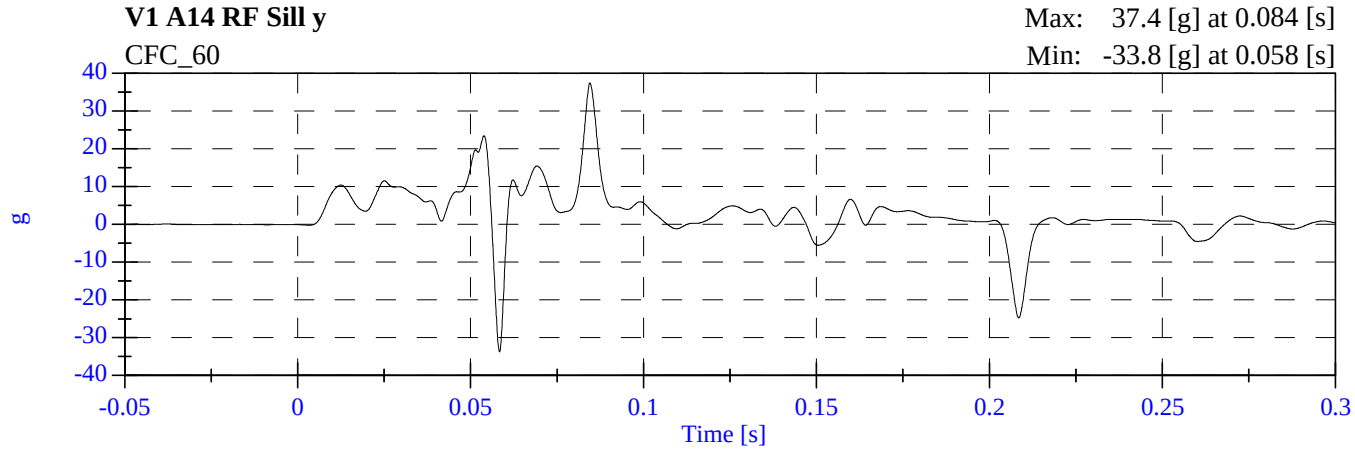
V1 A13 Right Roof y
CFC_60
Max: 16.4 [g] at 0.063 [s]
Min: -1.4 [g] at 0.231 [s]

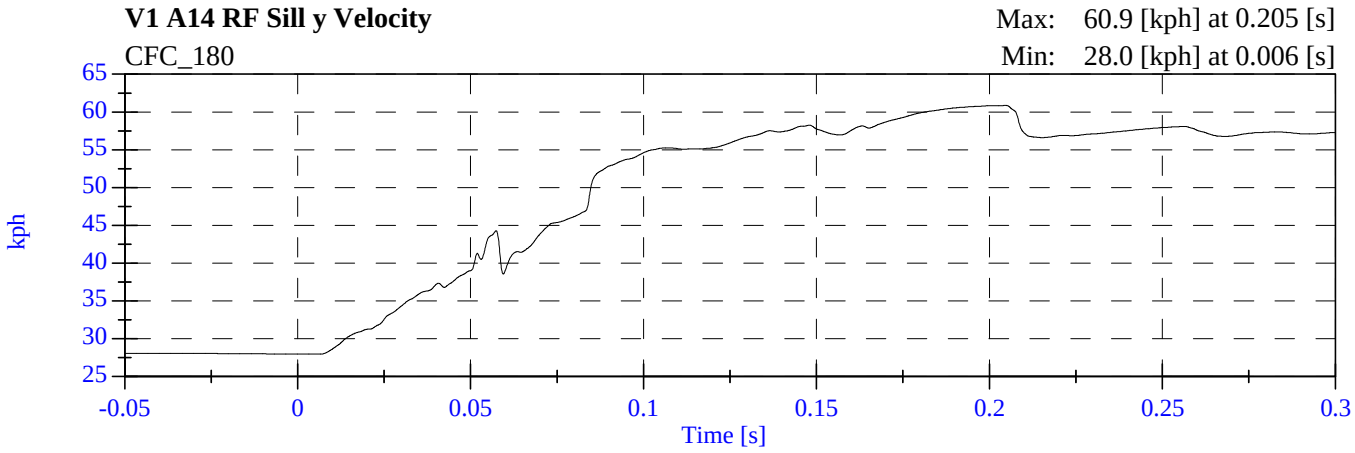


V1 A13 Right Roof y Velocity
CFC_180
Max: 62.8 [kph] at 0.191 [s]
Min: 27.9 [kph] at 0.006 [s]



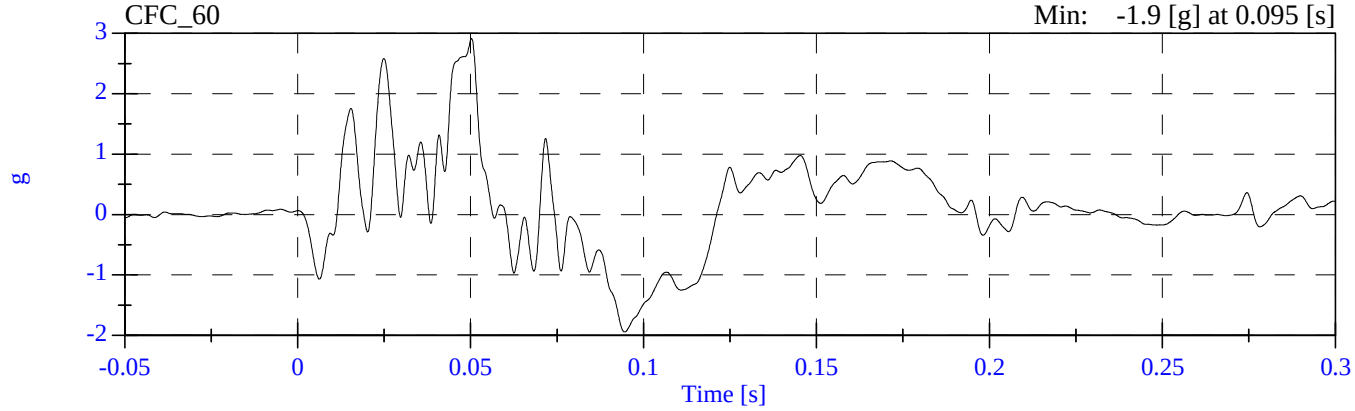
201P Test 2 2009 Mazda 6
C95403 - May 08, 2009



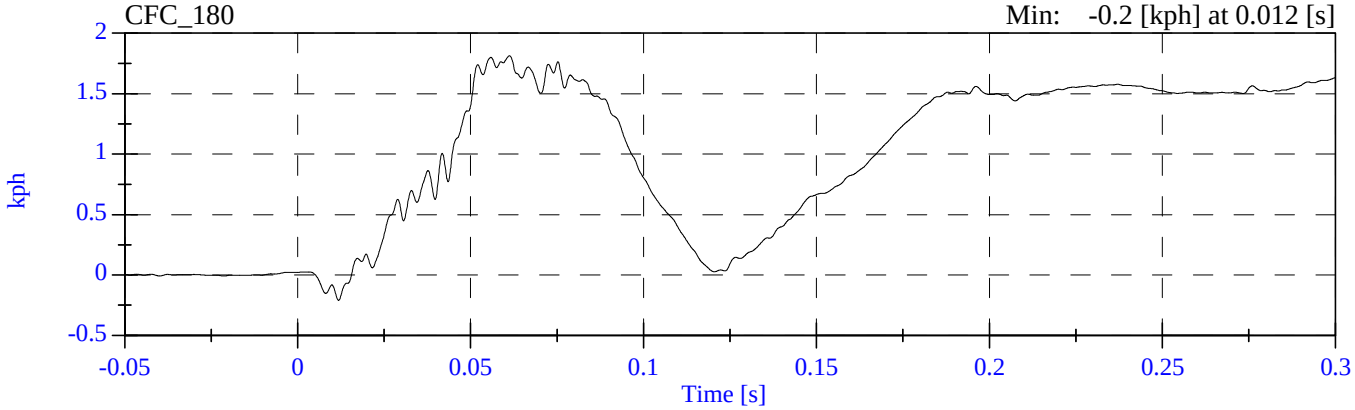


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

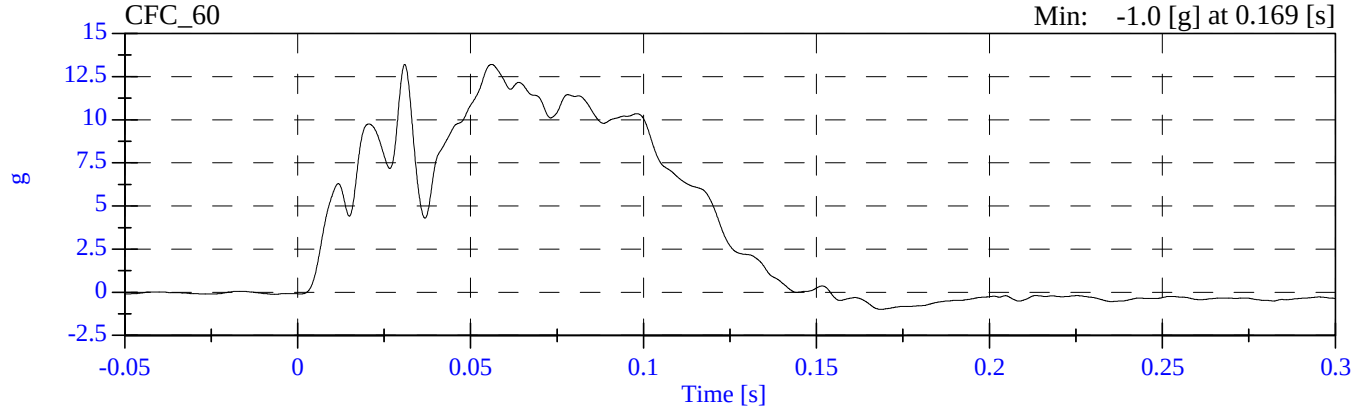
V1 A15 Rear Deck x
CFC_60
Max: 2.9 [g] at 0.050 [s]
Min: -1.9 [g] at 0.095 [s]



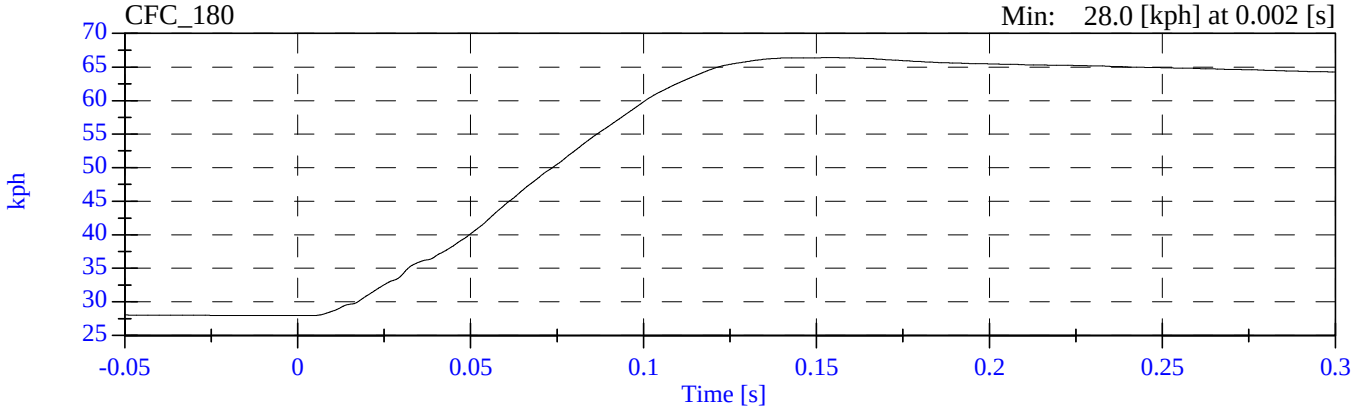
V1 A15 Rear Deck x Velocity
CFC_180
Max: 1.8 [kph] at 0.061 [s]
Min: -0.2 [kph] at 0.012 [s]



V1 A15 Rear Deck y
CFC_60
Max: 13.2 [g] at 0.031 [s]
Min: -1.0 [g] at 0.169 [s]

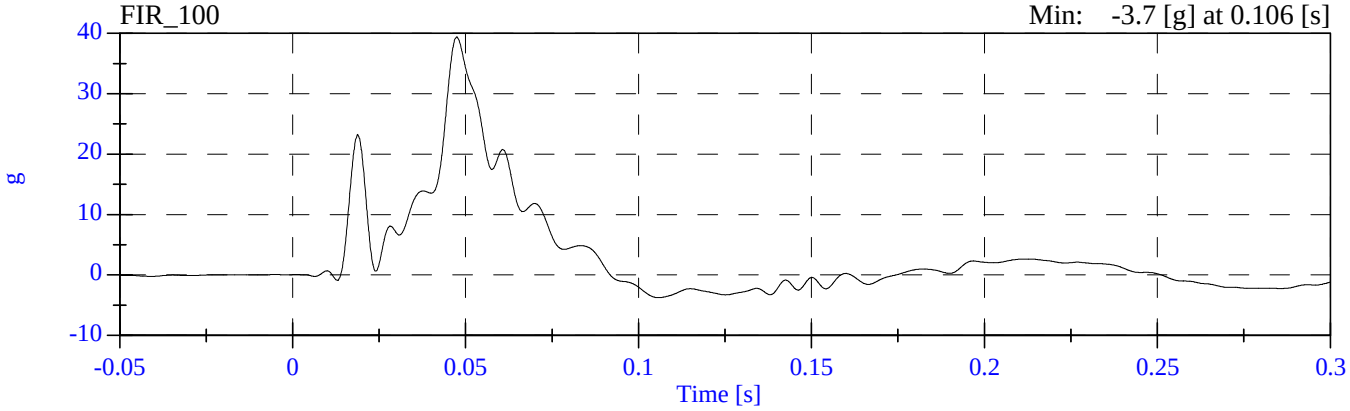


V1 A15 Rear Deck y Velocity
CFC_180
Max: 66.4 [kph] at 0.154 [s]
Min: 28.0 [kph] at 0.002 [s]

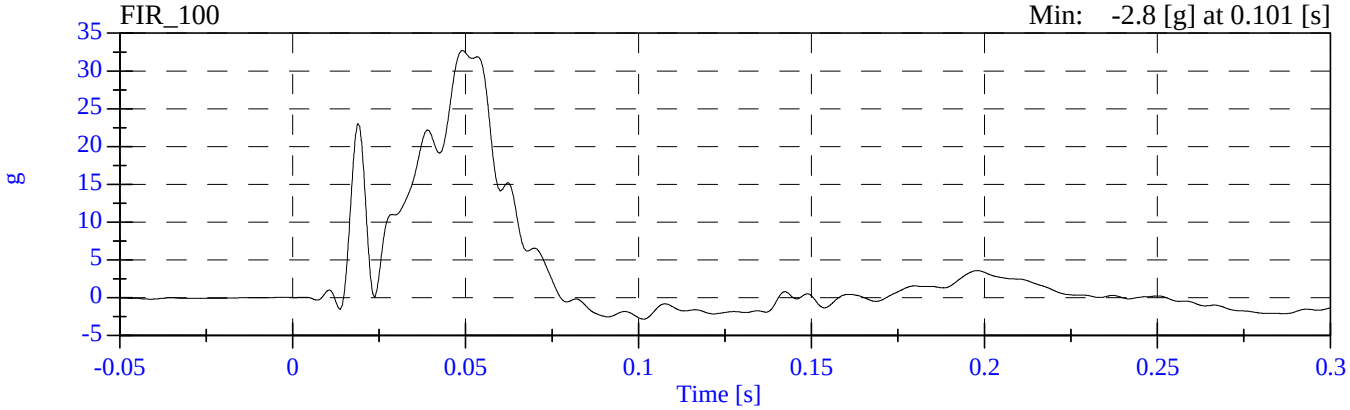


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

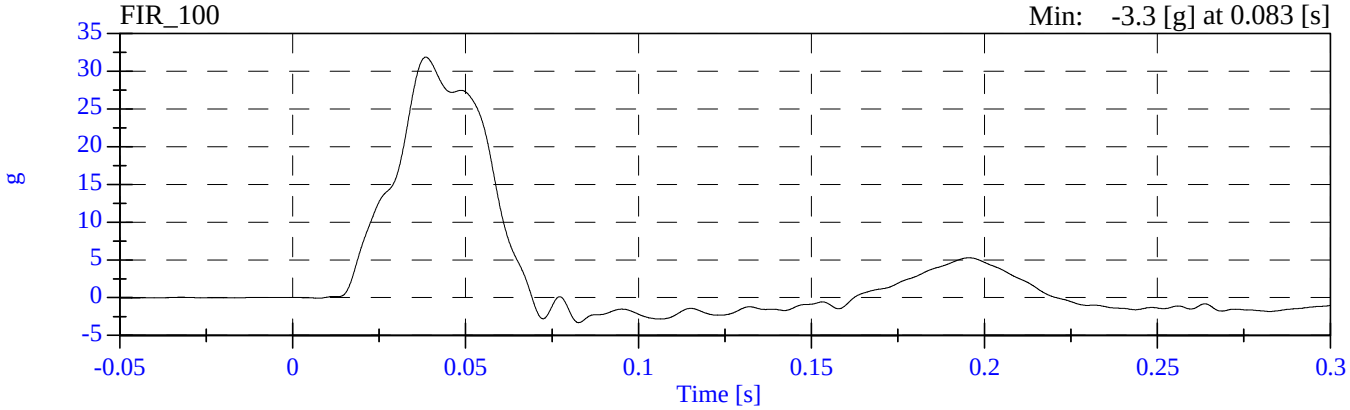
V1P1 Upper Rib y
FIR_100
Max: 39.4 [g] at 0.047 [s]
Min: -3.7 [g] at 0.106 [s]



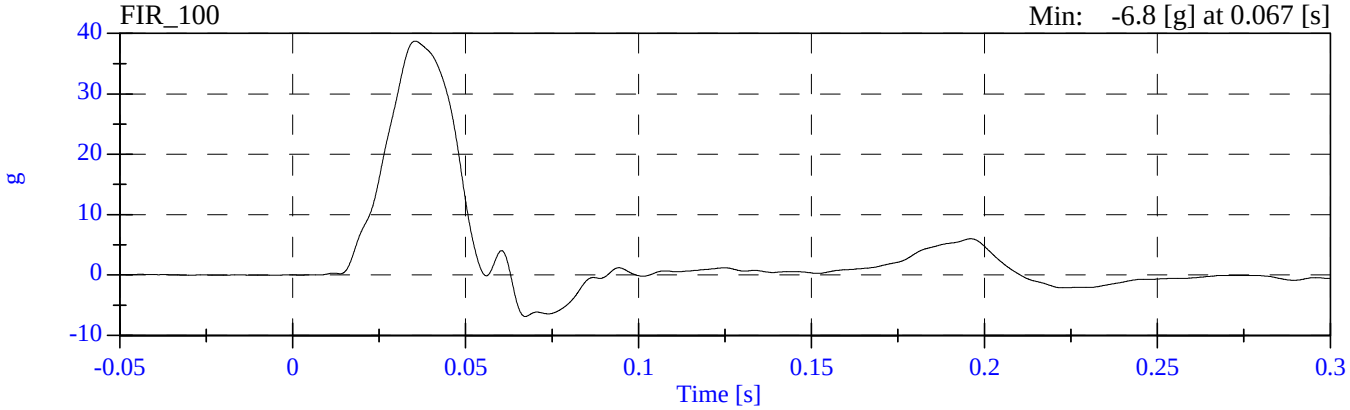
V1P1 Lower Rib y
FIR_100
Max: 32.7 [g] at 0.049 [s]
Min: -2.8 [g] at 0.101 [s]



V1P1 Lower Spine y
FIR_100
Max: 31.9 [g] at 0.039 [s]
Min: -3.3 [g] at 0.083 [s]

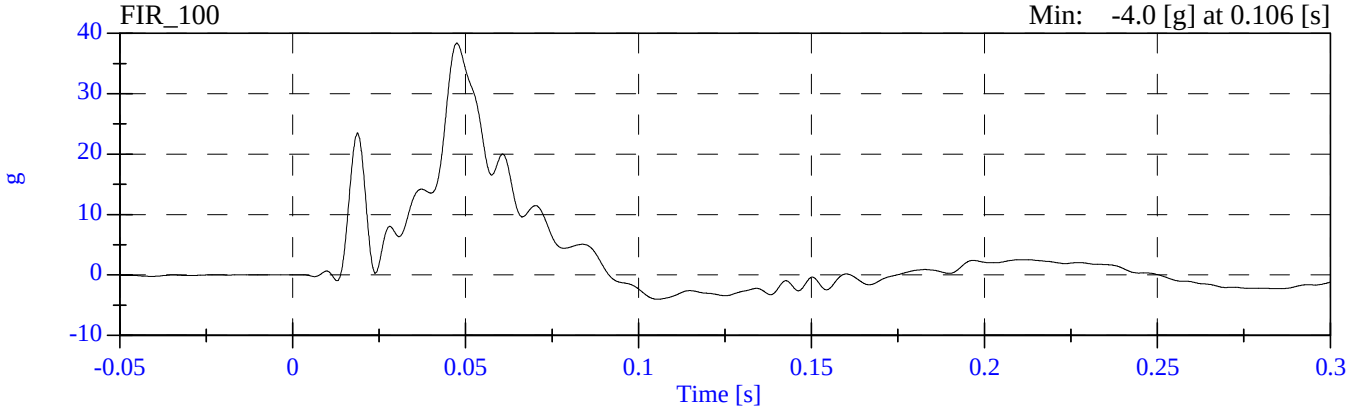


V1P1 Pelvic y
FIR_100
Max: 38.7 [g] at 0.036 [s]
Min: -6.8 [g] at 0.067 [s]

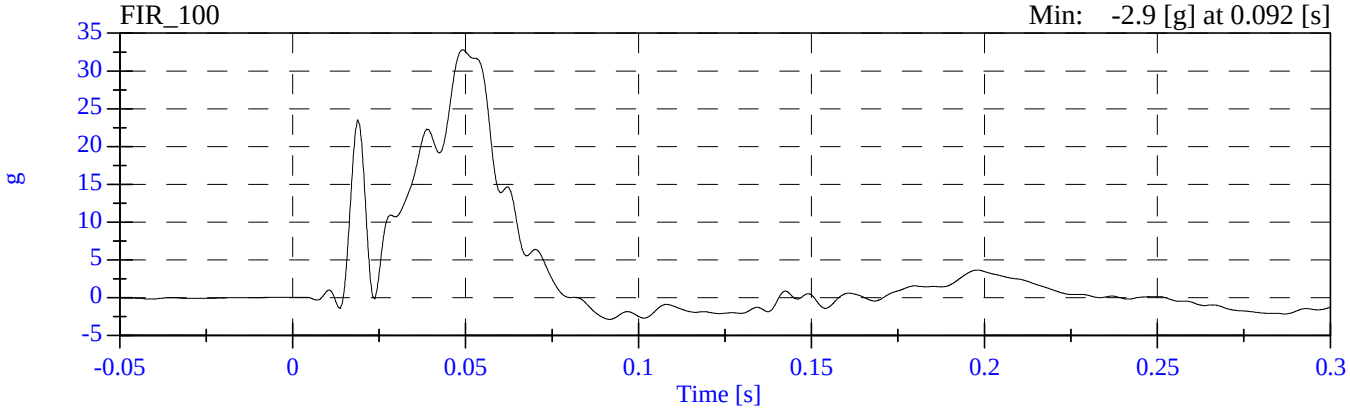


201P Test 2 2009 Mazda 6
C95403 - May 08, 2009

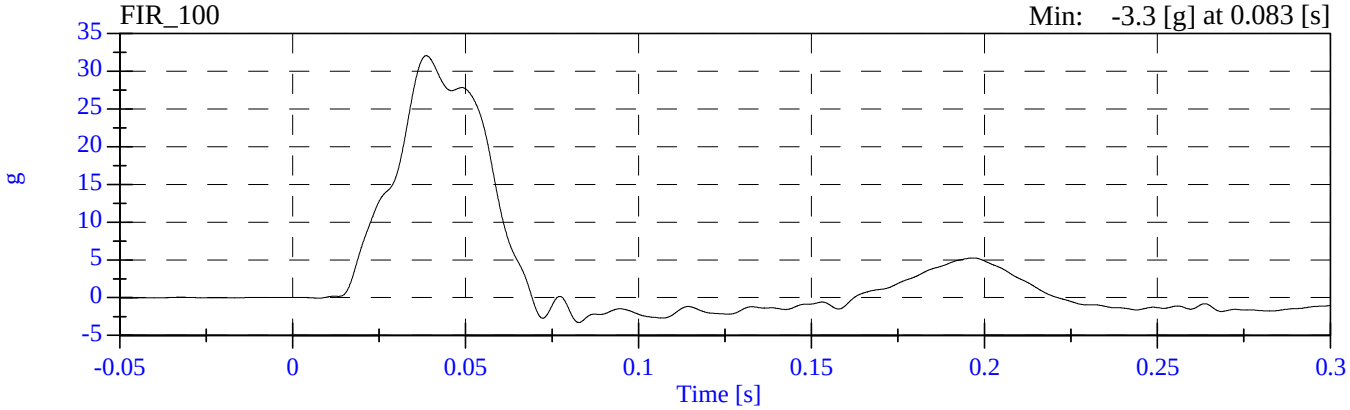
V1P1 Upper Rib Ry
FIR_100
Max: 38.4 [g] at 0.047 [s]
Min: -4.0 [g] at 0.106 [s]



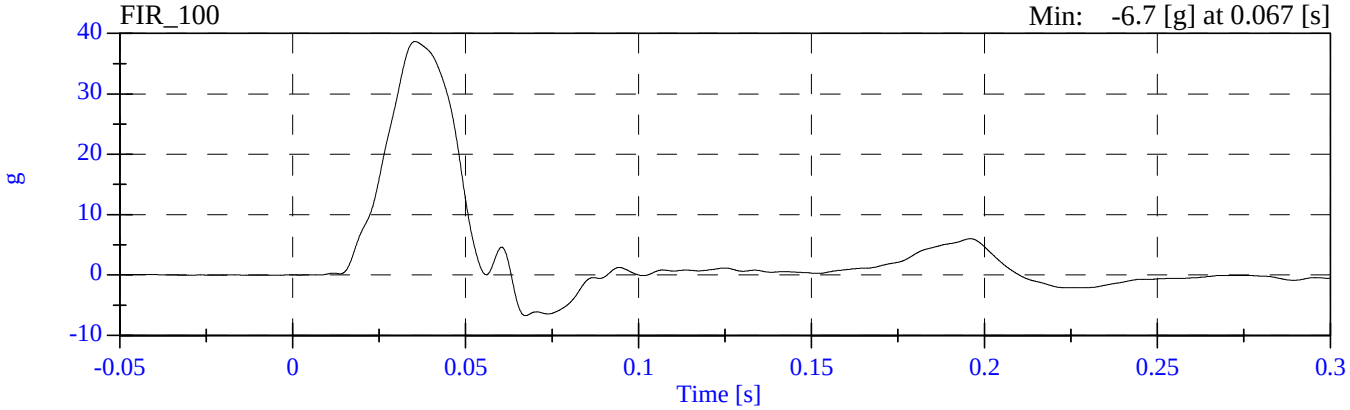
V1P1 Lower Rib Ry
FIR_100
Max: 32.8 [g] at 0.049 [s]
Min: -2.9 [g] at 0.092 [s]



V1P1 Lower Spine Ry
FIR_100
Max: 32.1 [g] at 0.039 [s]
Min: -3.3 [g] at 0.083 [s]



V1P1 Pelvic Ry
FIR_100
Max: 38.7 [g] at 0.036 [s]
Min: -6.7 [g] at 0.067 [s]



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SUMMARY
SID/HIII PRE & POST TEST CALIBRATION
CONFIGURED FOR LEFT SIDE IMPACT

Date: 4/7/09 & 5/21/09 Sequential Test Number: 1 & 2
Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	SID/HIII NO.:	269
		PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	899	898
RH- Rib Height (mm)	501 - 521	506	507
HP- Hip Pivot Height (mm)	99 ref.	99	99
RD- Rib from Back Line (mm)	229 - 241	234	233
KV- Knee Pivot from Back Line (mm)	511 - 526	516	516
SW- Knee Pivot to Floor (mm)	490 - 505	495	496
HW- Hip Width (mm)	356 - 391	381	381
THORAX IMPACTS			
TEMPERATURE (C)	18.9 - 25.5	21.7	21.7
RELATIVE. HUMIDITY (%)	10 -70	22.0	28.0
PROBE SPEED (m/s)	4.21 - 4.33	4.31	4.30
UPPER RIB (g's)	37 - 46	39.26	39.25
LOWER RIB (g's)	37 - 46	39.33	39.03
LOWER SPINE (g's)	15 -22	17.48	17.94
PELVIS IMPACT			
TEMPERATURE (C)	18.9 - 25.5	21.7	21.7
RELATIVE HUMIDITY (%)	10 - 70	21.0	21.0
PROBE SPEED (m/s)	4.21 - 4.33	4.31	4.30
PELVIS (g's)	40 -60	54.58	42.36
HEAD DROP			
TEMPERATURE (C)	18.9 - 25.6	21.7	22.2
RELATIVE. HUMIDITY (%)	10 -70	34.0	24.0
PEAK RESULTANT ACCELERATION.	120-150 Gs	139.35	133.90
PEAK LONGITUDINAL ACCELERATION	15 Gs Max	8.2	10.3
CURVE PERCENT NONMODAL	< 15%	2.42	2.48

NECK TEST			
TEMPERATURE (C^o)	20.6 – 22.2	21.7	21.7
HUMIDITY (%)	10-70%	24.0	25.0
IMPACT VELOCITY (m/s)	6.89-7.13	6.99	7.00
PENDULUM DELTA V			
DELTA V at 10 ms.	1.96-2.55 m/s	2.30	2.34
DELTA V at 20 ms.	4.12-5.10 m/s	4.65	4.79
DELTA V at 30 ms.	5.73-7.01 m/s	6.57	6.69
DELTA V between 40-70 ms.	6.27-7.64 m/s	7.59	7.01
D PLANE ROTATION			
MAXIMUM ROTATION (deg.)	66.0-82.0	70.79	72.48
ROTATION ANGLE DECAY	58.0-67.0 ms	59.40	60.90
MOMENT ABOUT THE OCCIPITAL CONDYLE			
MAX OCCIPITAL MOMENT	73.0-88.0 N-m	78.12	76.43
OCCIPITAL MOMENT DECAY	49.0-64.0 ms	53.90	58.10
HEAD ROTATION TIME WITH RESPECT TO OCCIPITAL CONDYLE MOMENT			
MOMENT TO ROTATION PEAK	2.0-16.0 ms	12.00	12.40

REMARKS: None

CALIBRATION TEST RESULTS

PRE-TEST

SID/HIII NO.: 269

CONFIGURED FOR LEFT **SIDE IMPACT**

CALIBRATION TEST RESULTS SUMMARY
PRE-TEST

CONFIGURED FOR LEFT **SIDE IMPACT**

SID/HIII Serial No.: 269 Sequential Test Number: 1
Date: 4.7.09 Laboratory Technician: B. Swiecicki

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/HIII Serial No.: 269 Sequential Test Number: 1
Date: 4/7/09 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 – 909	899
RH- Rib Height (mm)	502 – 520	506
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	516
KV- Knee Pivot to Floor (mm)	490 – 505	495
HW- Hip Width (mm)	356 - 391	381

REMARKS: None

Shock Test Low (3.05 m/s)

PRE TEST

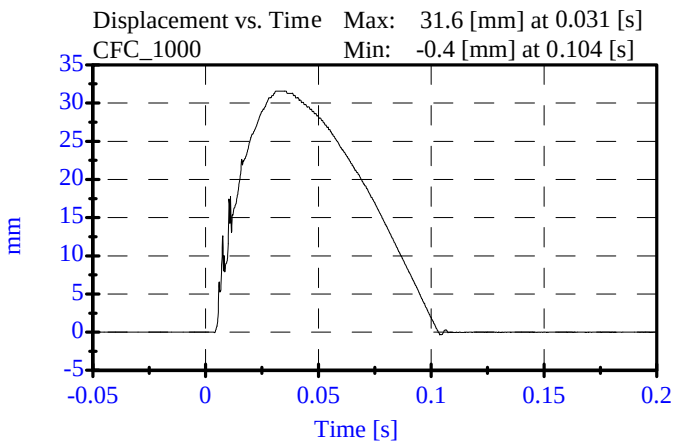
CONFIGURED FOR LEFT SIDE IMPACT

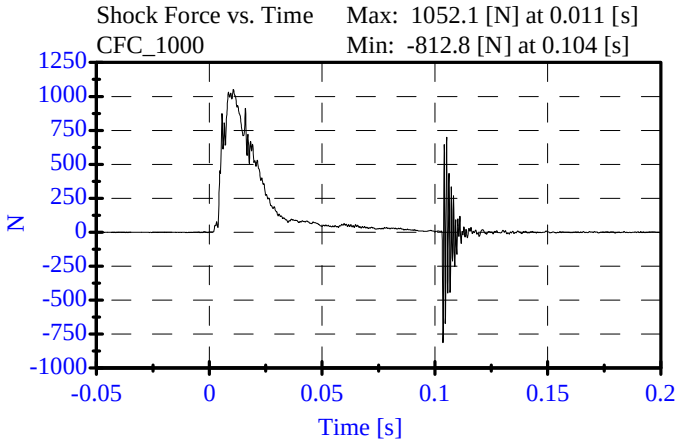
ATD Serial No: 269 Sequential Test Number: 1 File: 269SL 04-06-09

Date: 04-06-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Displacement:	30.00-35.00 mm	31.59 mm	Passed
Maximum Force:	836.00-1125.00 N	1052.06 N	Passed

Impact Test Velocity: 3.05 m/s
Damper Identification: 269
Damper Setting: 5





Shock Test Medium (4.27 m/s)

PRE TEST

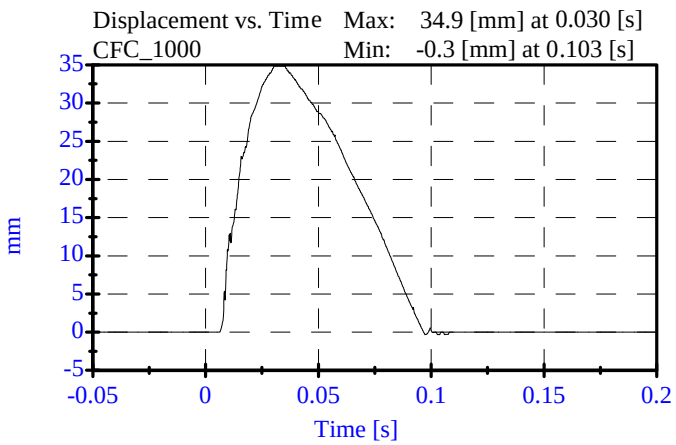
CONFIGURED FOR LEFT SIDE IMPACT

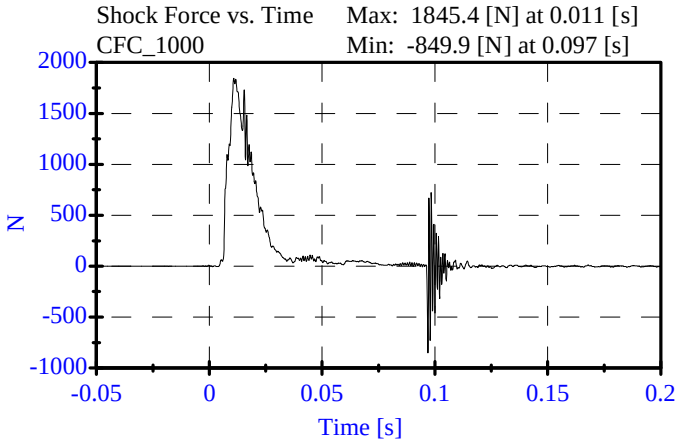
ATD Serial No: 269 Sequential Test Number: 1 File: 269SM 04-06-09

Date: 04-06-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Displacement:	32.00-37.00 mm	34.85 mm	Passed
Maximum Force:	1730.00-2099.00 N	1845.37 N	Passed

Impact Test Velocity: 4.27 m/s
Damper Identification: 269
Damper Setting: 5





Shock Test High (6.10 m/s)

PRE TEST

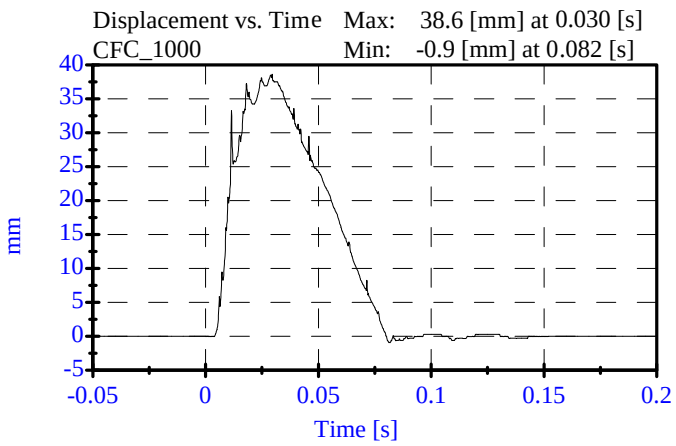
CONFIGURED FOR LEFT SIDE IMPACT

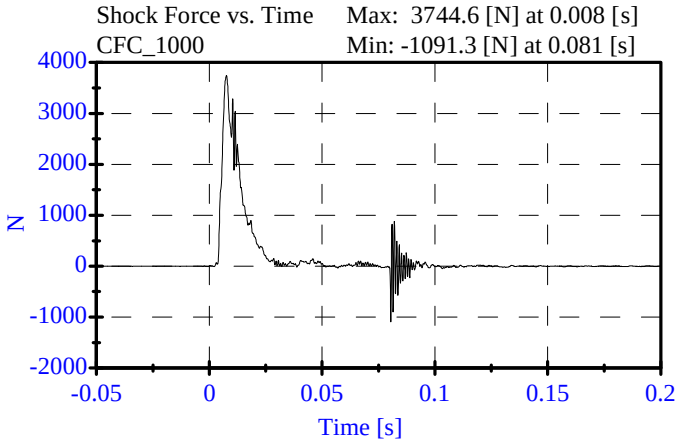
ATD Serial No: 269 Sequential Test Number: 1 File: 269SH 04-06-09

Date: 04-06-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Displacement:	33.00-40.00 mm	38.65 mm	Passed
Maximum Force:	3741.00-4448.00 N	3744.61 N	Passed

Impact Test Velocity: 6.10 m/s
Damper Identification: 269
Damper Setting: 5





Thorax Impact Test

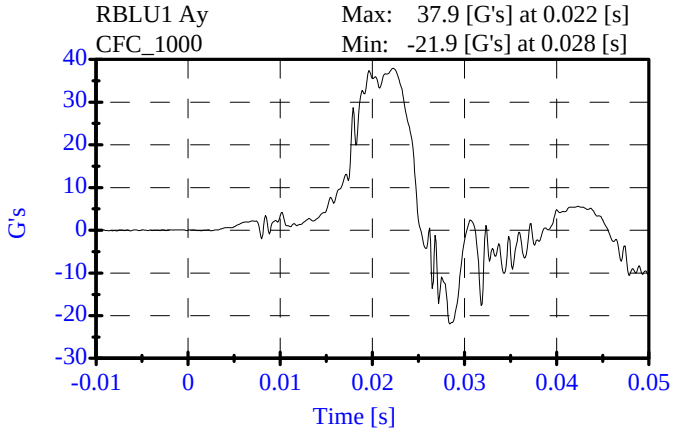
Pre-Test

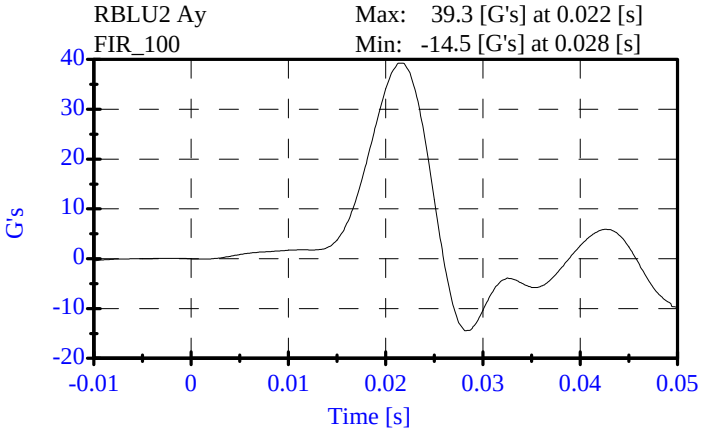
CONFIGURED FOR LEFT SIDE IMPACT

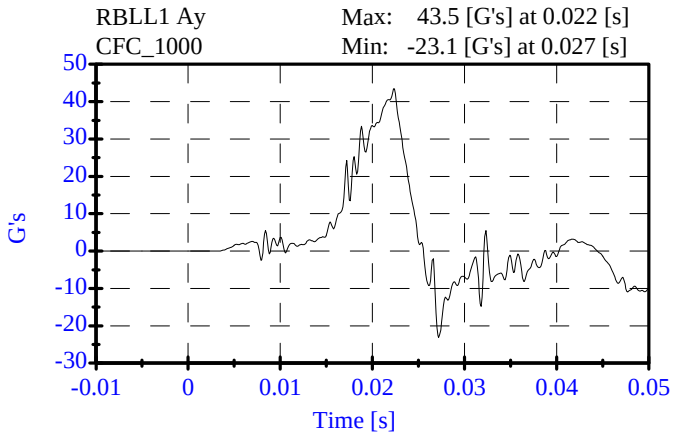
ATD Serial No: 269 Sequential Test Number: 1 File: 269T 04-07-09

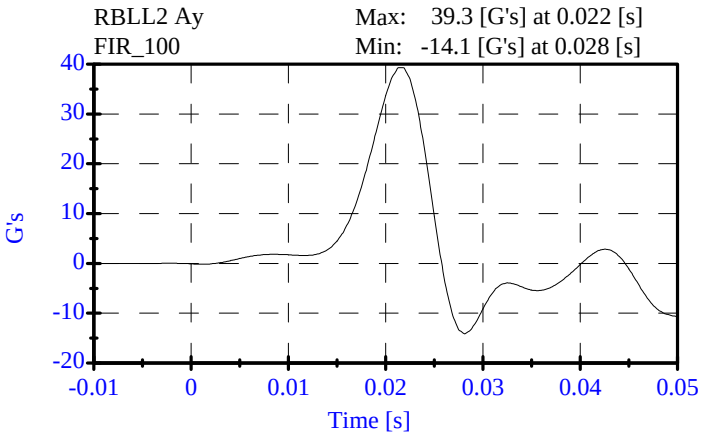
Date: 04-07-09 Laboratory Technician: A. Rudniski

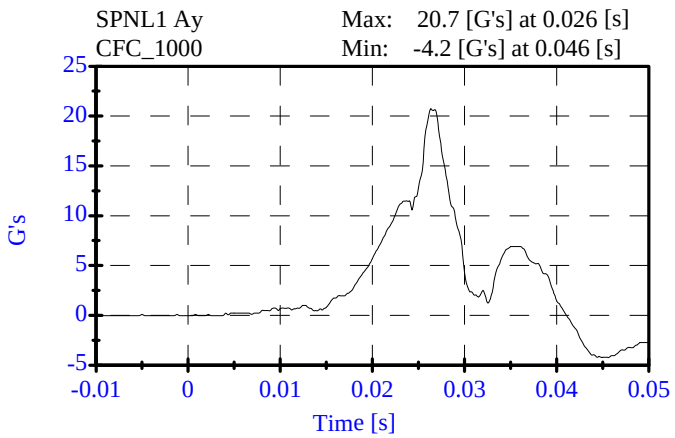
TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	22.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.31 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	39.26 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	39.33 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	17.48 G's	Passed

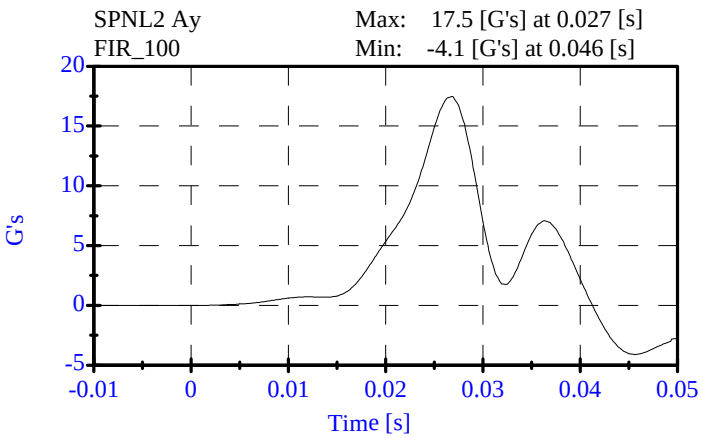












Pelvis Impact Test

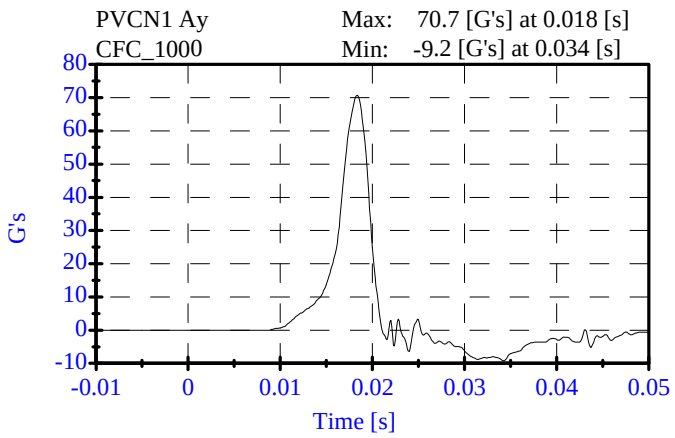
Pre-Test

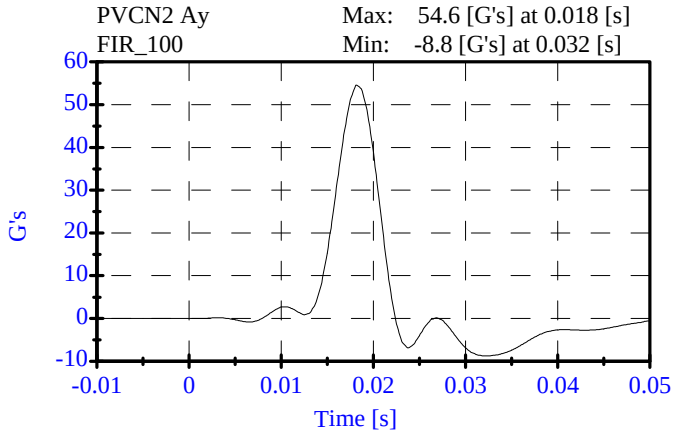
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269 Sequential Test Number: 1 File: 269P1 04-07-09

Date: 04-07-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	21.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.31 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	54.58 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	5.7 ms	Passed





Head Drop Test

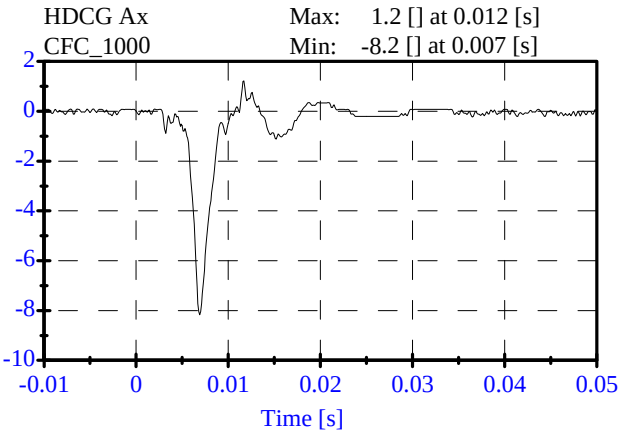
Pre-Test

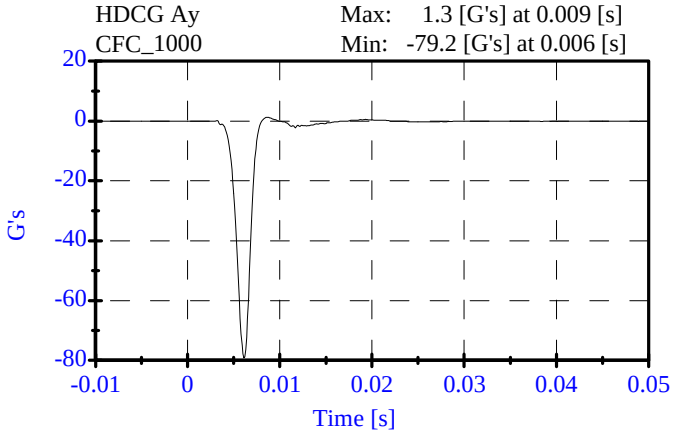
CONFIGURED FOR LEFT SIDE IMPACT

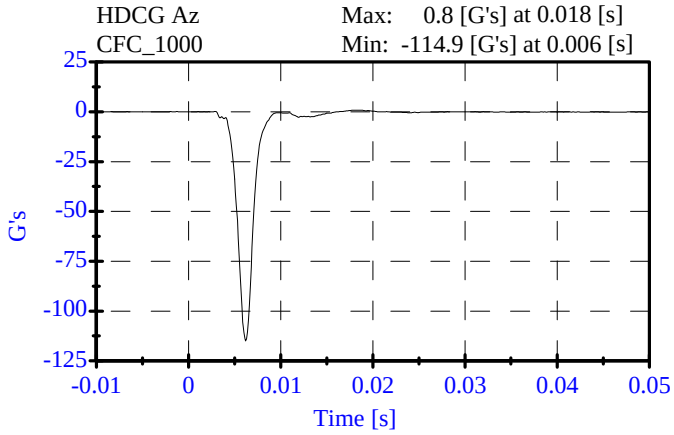
ATD Serial No: 269 Sequential Test Number: 1 File: 269H 04-01-09

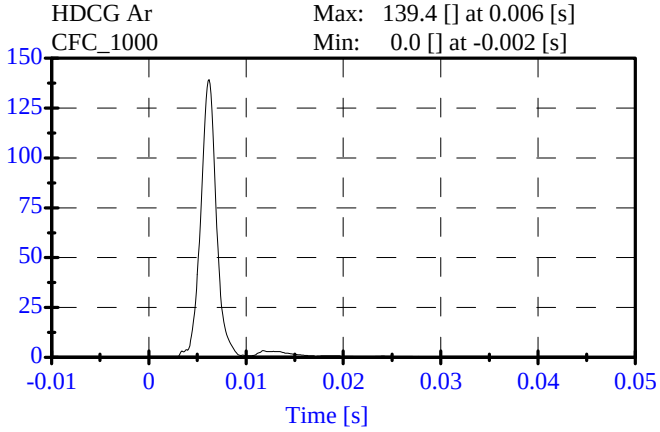
Date: 04-01-09 Laboratory Technician: A.Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.7 C	Passed
Lab Humidity:	10-70 %	34.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	139.35 Gs	Passed
Peak Long. Accel.	15 Gs Max	8.2	Passed
Curve PerCent NonModal:	< 15%	2.42 %	Passed









Neck Test

Pre-Test

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269 Sequential Test Number: 1 File: 269N 04-02-09

Date: 04-02-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	20.6-22.2 C	21.7 C	Passed
Lab Humidity:	10-70 %	24.00 %	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	2.30 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.65 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.57 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.59 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	70.79 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	59.40 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 N-m	78.12 N-m	Passed
Occiptal Moment Decay:	49.0-64.0 ms	53.90 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	12.00 ms	Passed

Neck Test

Pre-Test

CONFIGURED FOR LEFT SIDE IMPACT

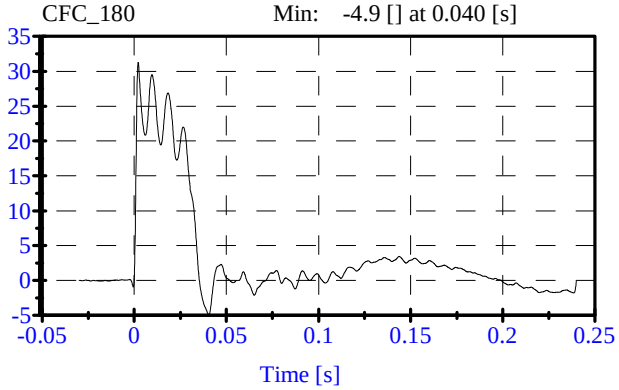
ATD Serial No: 269

Sequential Test Number: 1 File: 269N 04-02-09

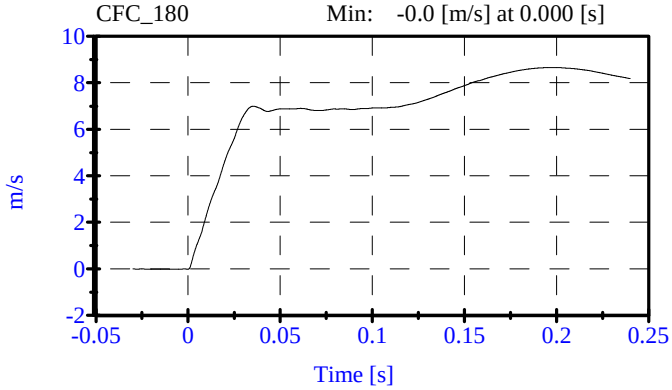
Date: 04-02-09

Laboratory Technician: A. Rudniski

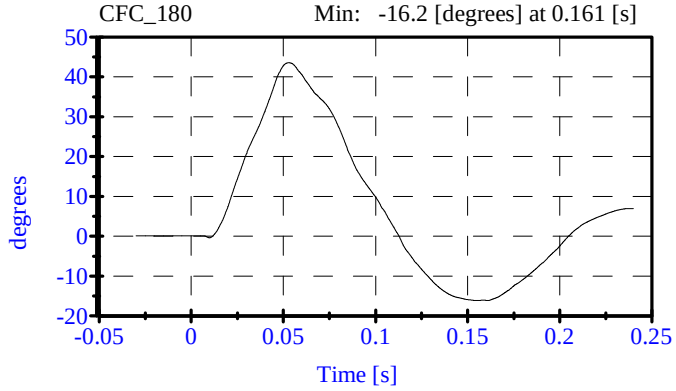
Pend Ax Max: 31.3 [] at 0.002 [s]
CFC_180 Min: -4.9 [] at 0.040 [s]



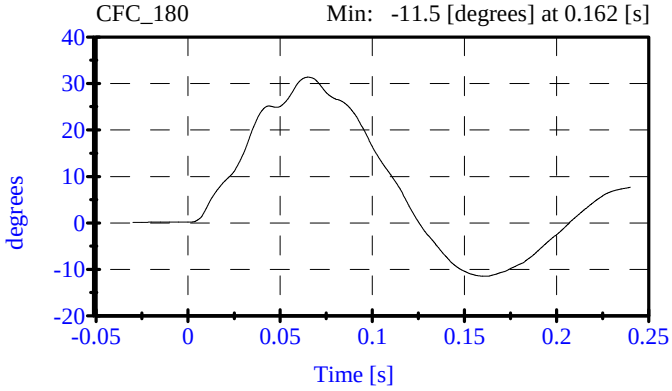
Pend Vx Max: 8.7 [m/s] at 0.199 [s]
CFC_180 Min: -0.0 [m/s] at 0.000 [s]



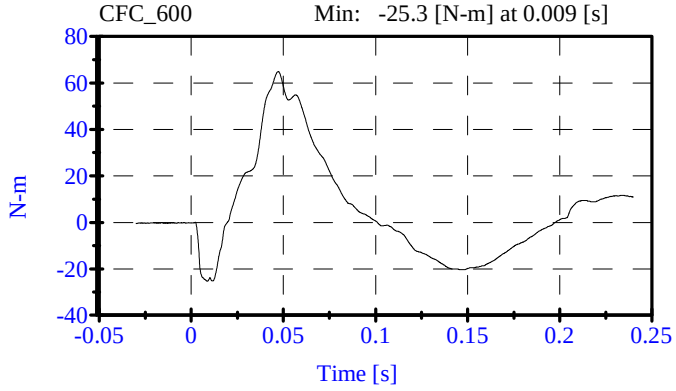
Head Rot Max: 43.5 [degrees] at 0.053 [s]
CFC_180 Min: -16.2 [degrees] at 0.161 [s]



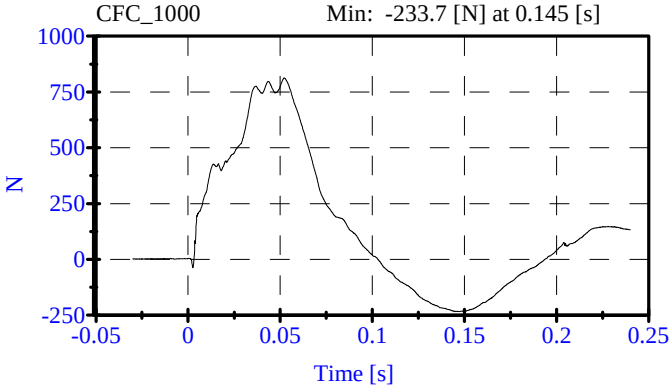
Arm Rot Max: 31.3 [degrees] at 0.065 [s]
CFC_180 Min: -11.5 [degrees] at 0.162 [s]



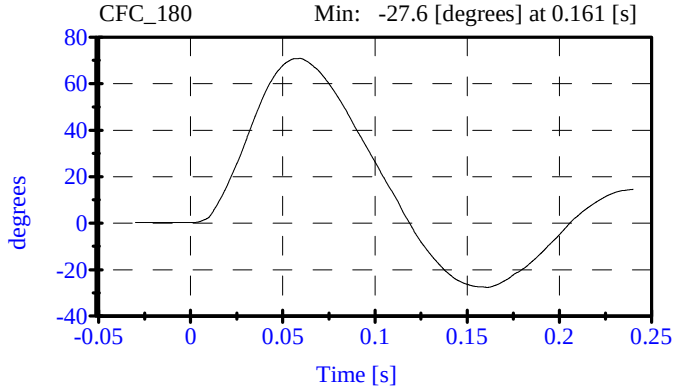
Neck Mx Max: 64.9 [N-m] at 0.047 [s]
CFC_600 Min: -25.3 [N-m] at 0.009 [s]



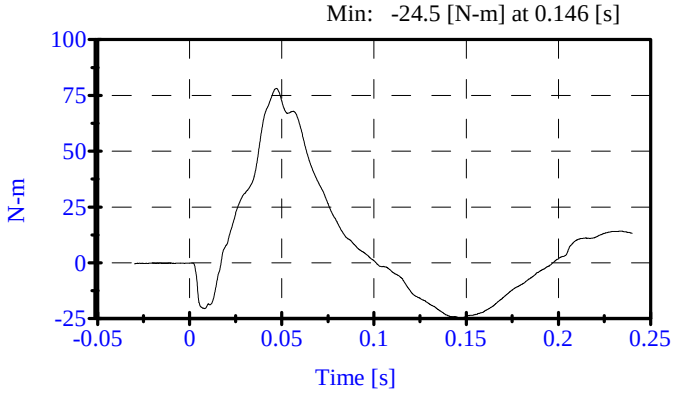
Neck Fy Max: 814.2 [N] at 0.052 [s]
CFC_1000 Min: -233.7 [N] at 0.145 [s]



Tot Rot Max: 70.8 [degrees] at 0.059 [s]
CFC_180 Min: -27.6 [degrees] at 0.161 [s]



MOCX Max: 78.1 [N-m] at 0.047 [s]
Min: -24.5 [N-m] at 0.146 [s]



Abdominal Compression Test

Pre-Test

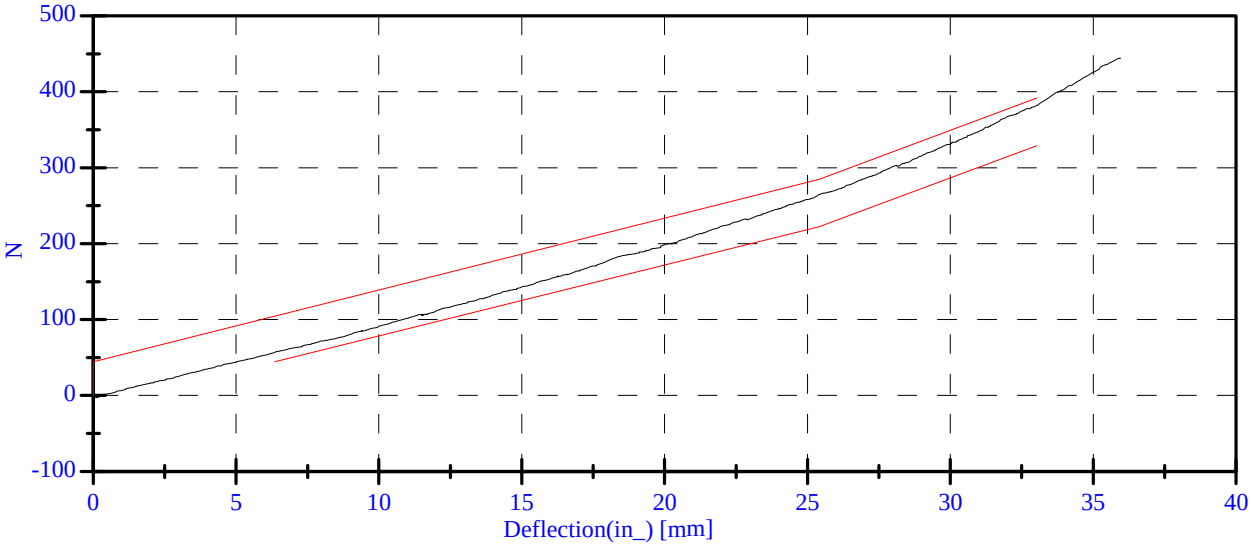
CONFIGURED FOR LEFT SIDE IMPACT

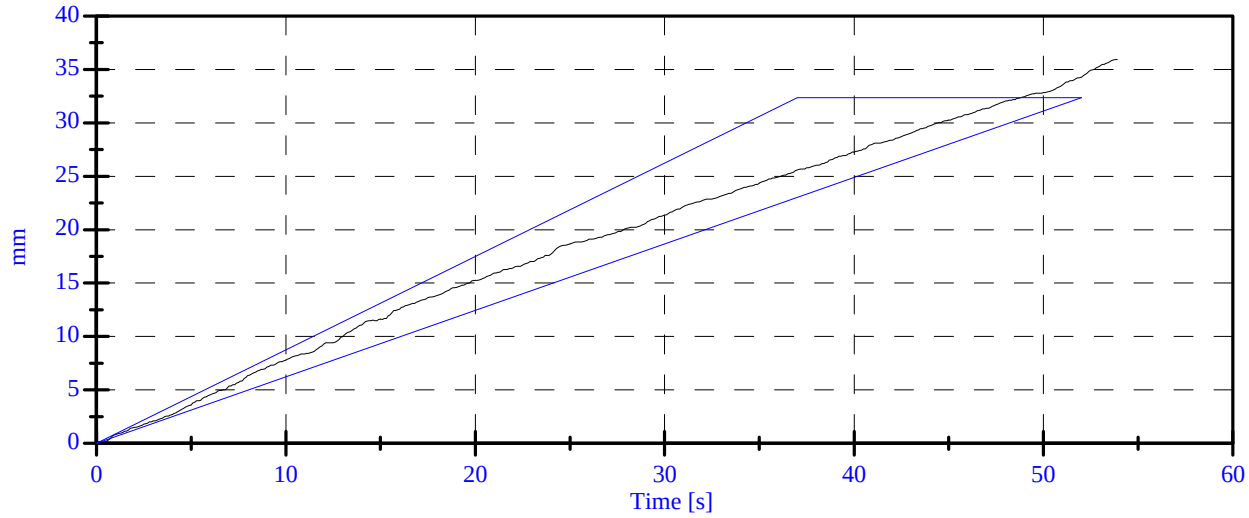
ATD Serial No: 269 Sequential Test Number: 1 File: 269Ab 04-02-09

Date: 04-02-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	24.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	120.99 N	Passed
Force at 19.05 mm :	162.98-220.99 N	187.43 N	Passed
Force at 25.40 mm :	221.97-280.02 N	264.45 N	Passed
Force at 33.02 mm :	324.99-391.00 N	381.63 N	Passed

ABDOMINAL COMPRESSION TEST





Lumbar Spine Test
Pre-Test

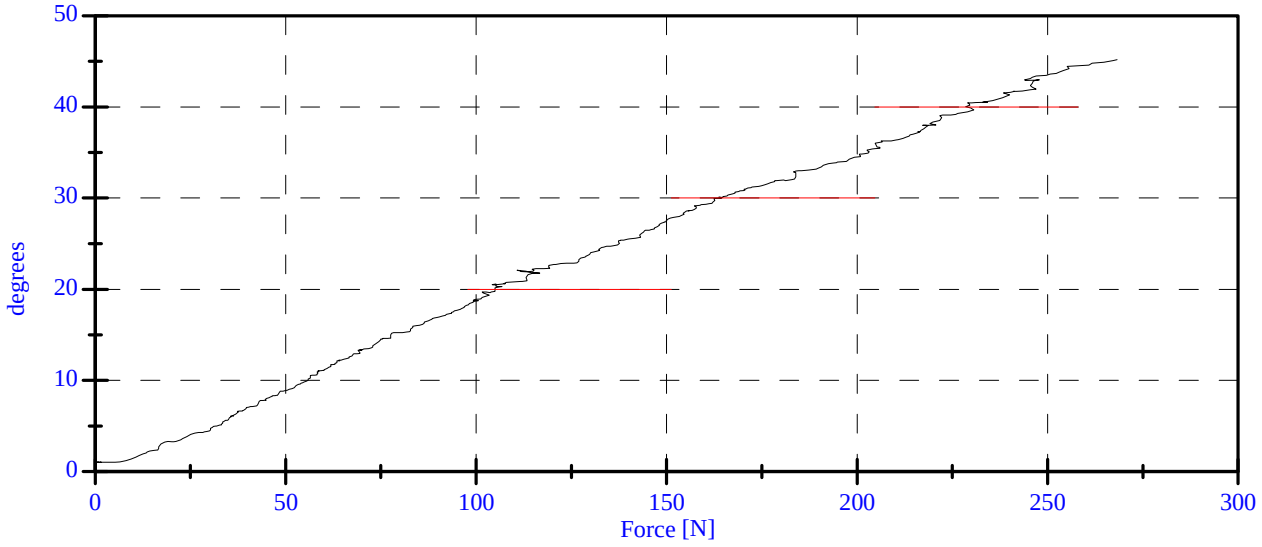
CONFIGURED FOR LEFT SIDE IMPACT

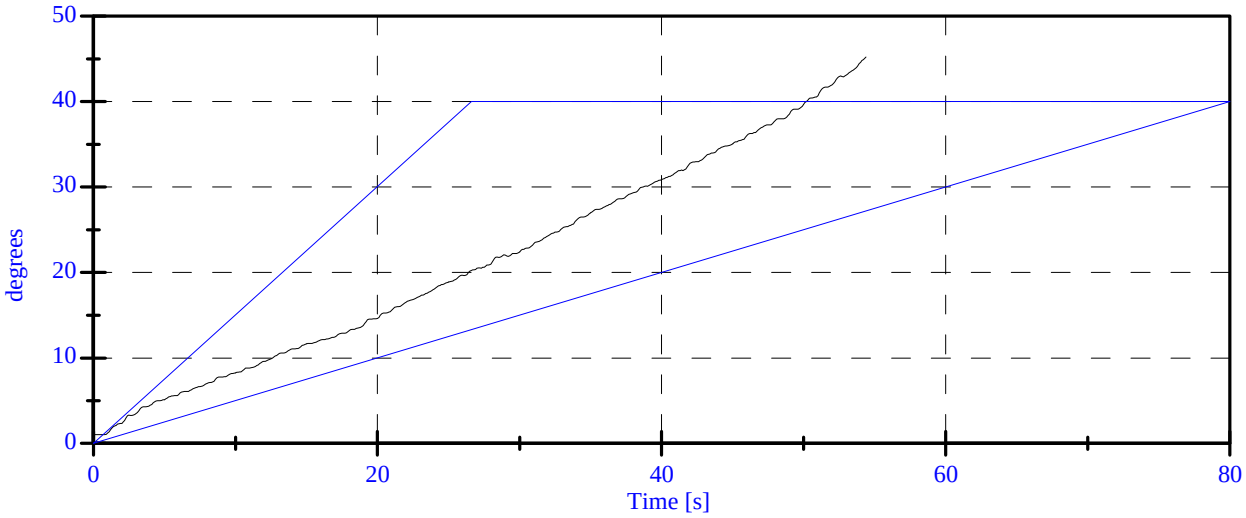
ATD Serial No: 269
Date: 04-03-09

Sequential Test Number: 1 File: 269Spine 04-03-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	41.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	0.26 N	Passed
Force at 20 Deg:	97.86-151.24 N	104.98 N	Passed
Force at 30 Deg	151.24-204.62 N	164.26 N	Passed
Force at 40 Deg	204.62-258.00 N	228.51 N	Passed
Return Angle	12 Deg Max	8.67 deg	Passed

LUMBAR SPINE FLEXION TEST





PRE-TEST DUMMY INSPECTION LIST

CONFIGURED FOR LEFT **SIDE IMPACT**

SID/HIII Serial No.: 269 Sequential Test Number: 1
Date: 4/7/09 Laboratory Technician: B. Swiecicki

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/HIII NO.: 269

CONFIGURED FOR LEFT **SIDE IMPACT**

CALIBRATION TEST RESULTS SUMMARY
POST TEST

CONFIGURED FOR LEFT **SIDE IMPACT**

SID/HIII Serial No.: 269 Sequential Test Number: 2
Date: 5/21/09 Laboratory Technician: B. Swiecicki

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/HIII Serial No.: 269 Sequential Test Number: 2
Date: 5/21/09 Laboratory Technician: B. Swiecicki

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	898
RH- Rib Height (mm)	502 - 520	507
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	233
KH- Knee Pivot from Back Line (mm)	511 - 526	516
KV- Knee Pivot to Floor (mm)	490 - 505	496
HW- Hip Width (mm)	356 - 391	381

REMARKS: None

Thorax Impact Test

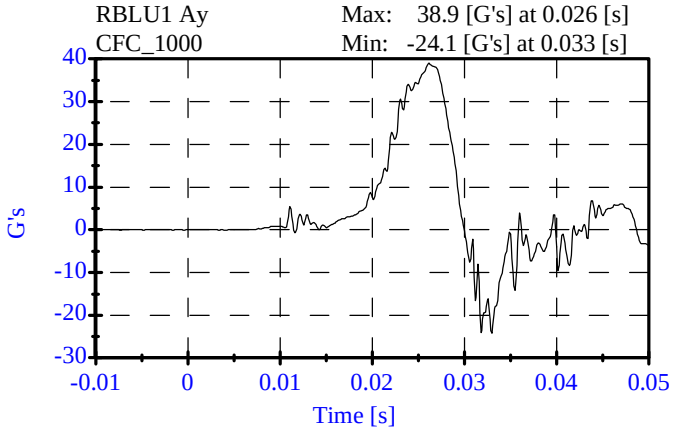
Post-Test

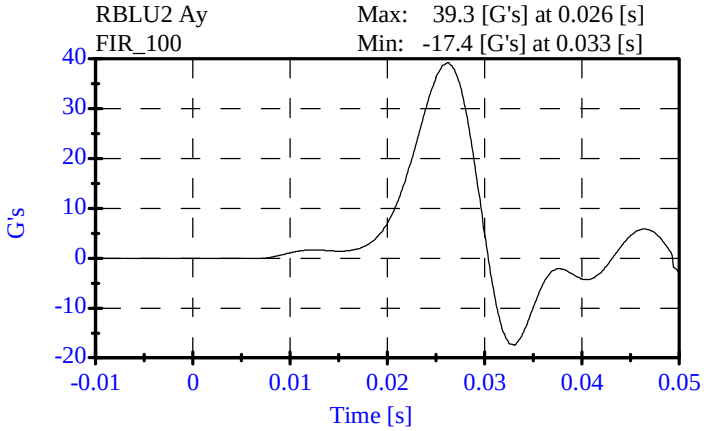
CONFIGURED FOR LEFT SIDE IMPACT

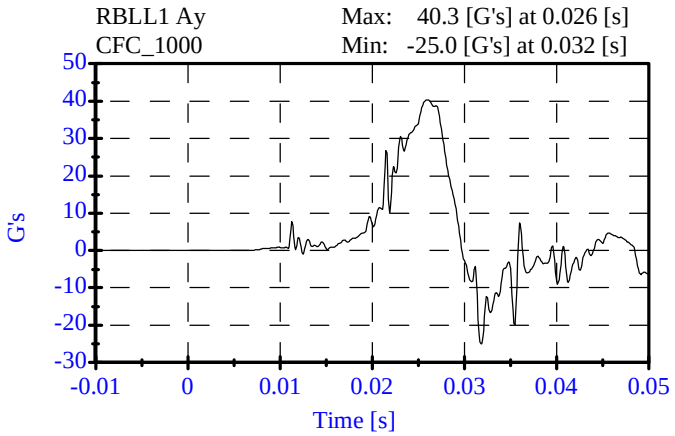
ATD Serial No: 269 Sequential Test Number: 1 File: 269T1 05-21-09

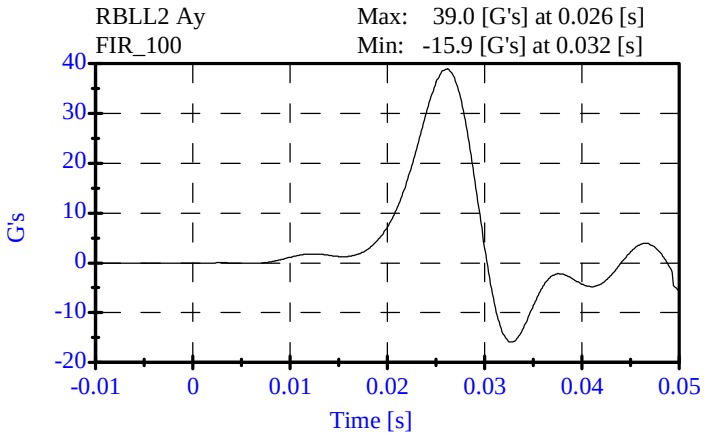
Date: 05-21-09 Laboratory Technician: A. Rudniski

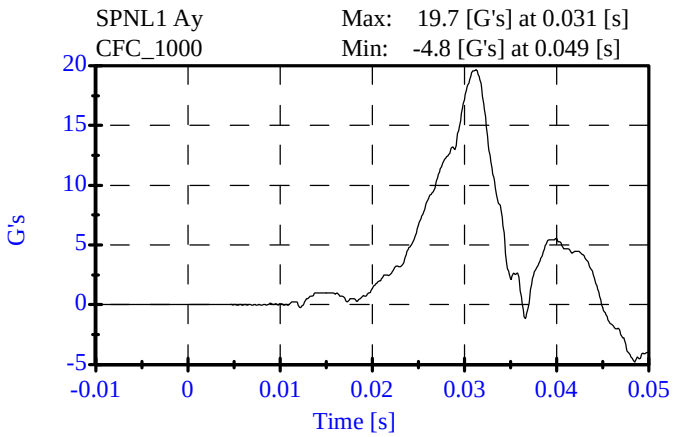
TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.30 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	39.25 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	39.03 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	17.94 G's	Passed

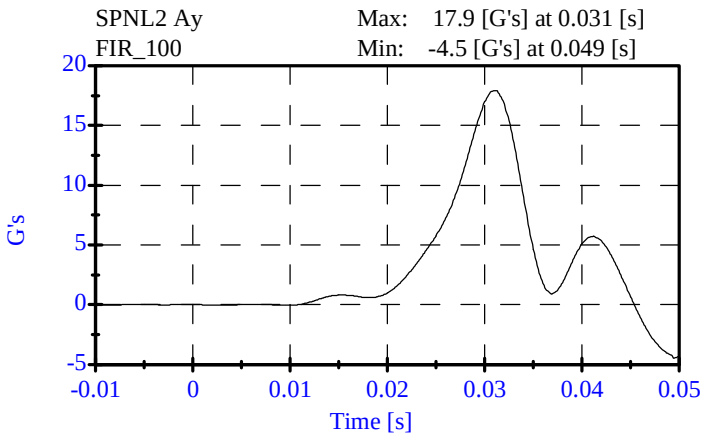












Pelvis Impact Test

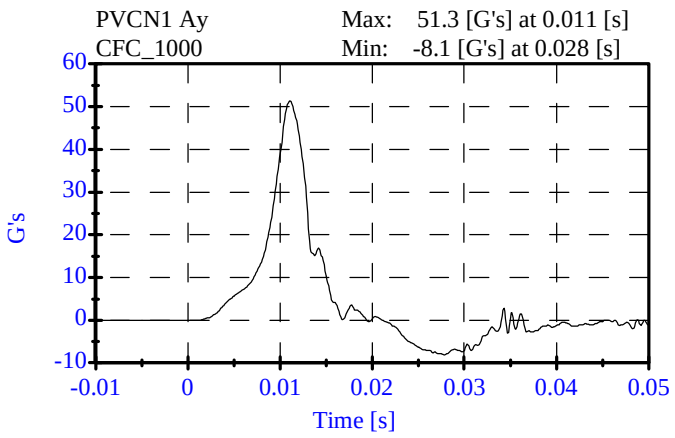
Post-Test

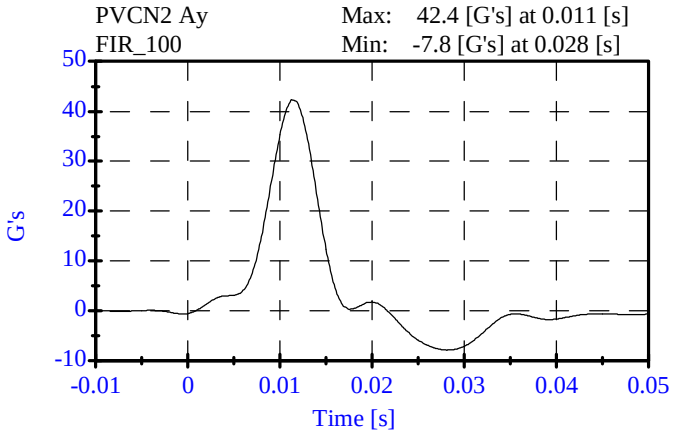
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269 Sequential Test Number: 1 File: 269P 05-21-09

Date: 05-21-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	21.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.30 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	42.36 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	5.8 ms	Passed





Head Drop Test

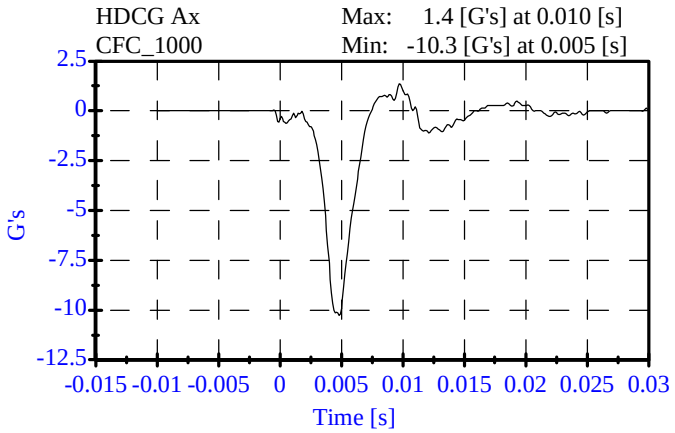
Post-Test

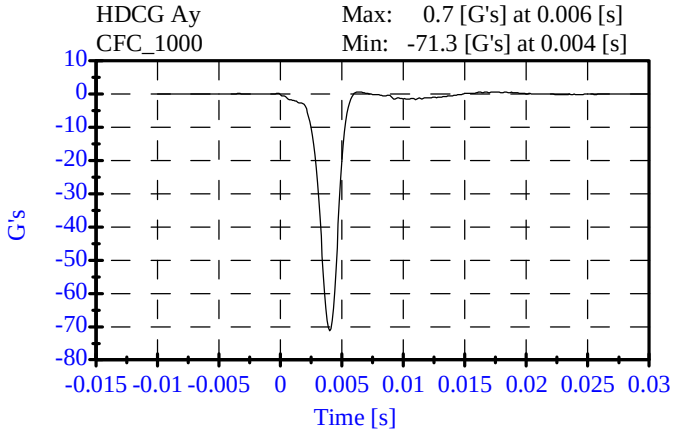
CONFIGURED FOR LEFT SIDE IMPACT

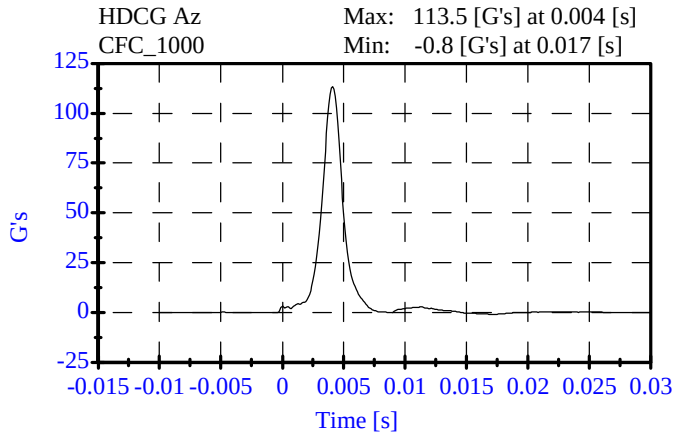
ATD Serial No: 269 Sequential Test Number: 1 File: 269H1 05-20-09

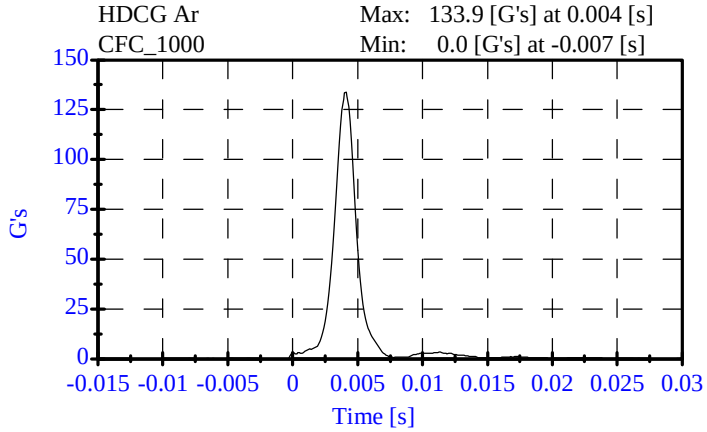
Date: 05-20-09 Laboratory Technician: A.Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	22.2 C	Passed
Lab Humidity:	10-70 %	24.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	133.90 Gs	Passed
Peak Long. Accel.	15 Gs Max	10.3 G	Passed
Curve PerCent NonModal:	< 15%	2.48 %	Passed









Neck Flexion Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269 Sequential Test Number: 1 File: 269N 05-20-09

Date: 05-20-09 Laboratory Technician: A. Rudnski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	20.6-22.2 C	21.7 C	Passed
Lab Humidity:	10-70 %	25.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	7.00 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.34 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.79 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.69 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.01 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	72.48 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	60.90 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 N-m	76.43 N-m	Passed
Occiptal Moment Decay:	49.0-64.0 ms	58.10 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	12.40 ms	Passed

Neck Flexion Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

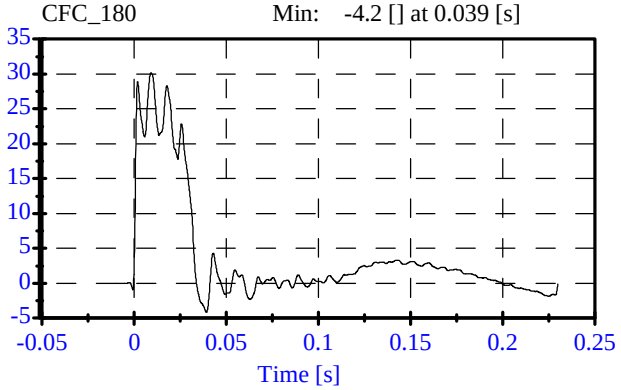
ATD Serial No: 269

Date: 05-20-09

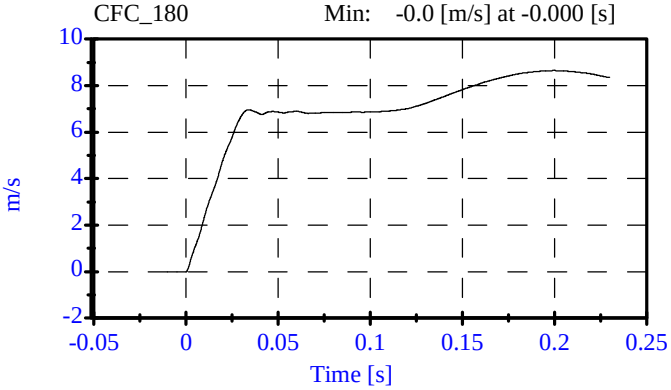
Sequential Test Number: 1 File: 269N 05-20-09

Laboratory Technician: A. Rudniski

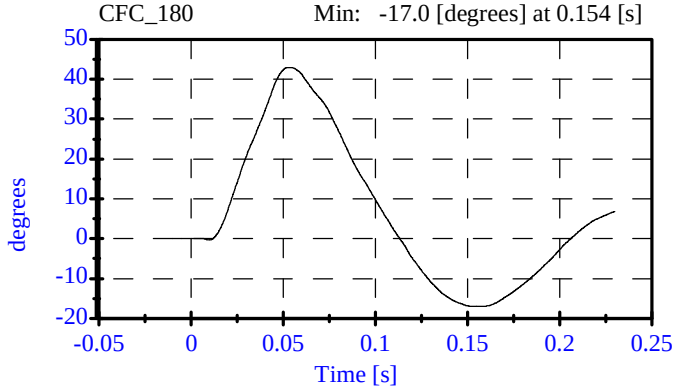
Pend Ax
CFC_180
Max: 30.2 [] at 0.009 [s]
Min: -4.2 [] at 0.039 [s]



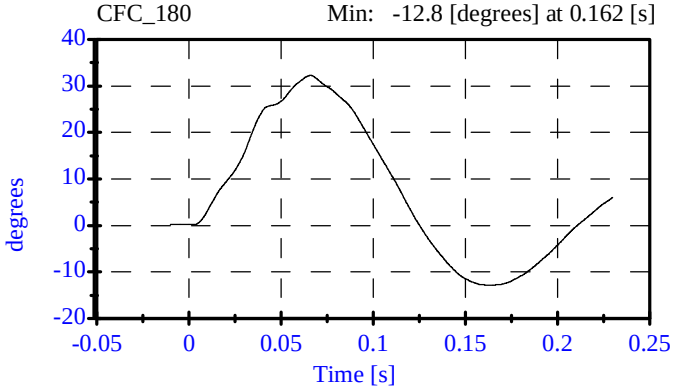
Pend Vx
CFC_180
Max: 8.6 [m/s] at 0.200 [s]
Min: -0.0 [m/s] at -0.000 [s]



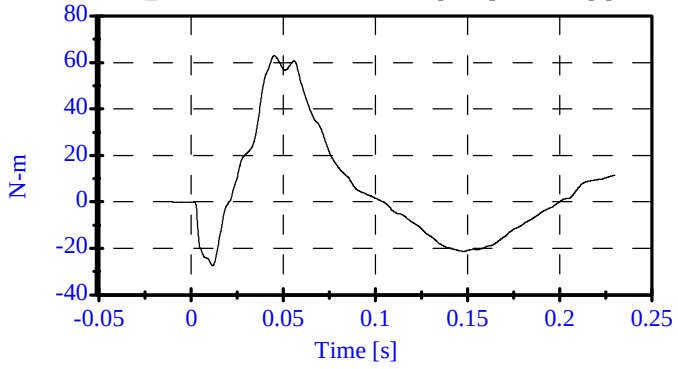
Head Rot
CFC_180
Max: 43.0 [degrees] at 0.053 [s]
Min: -17.0 [degrees] at 0.154 [s]



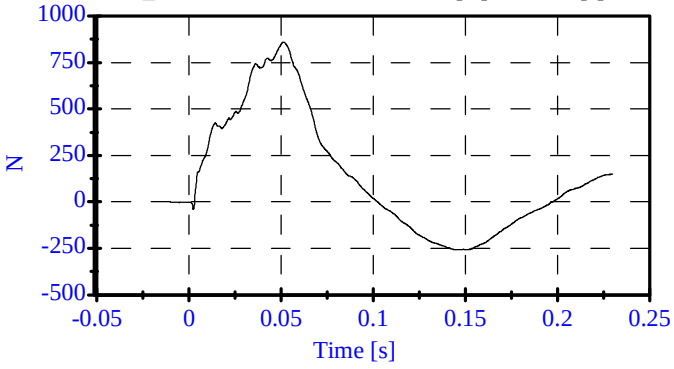
Arm Rot
CFC_180
Max: 32.3 [degrees] at 0.066 [s]
Min: -12.8 [degrees] at 0.162 [s]



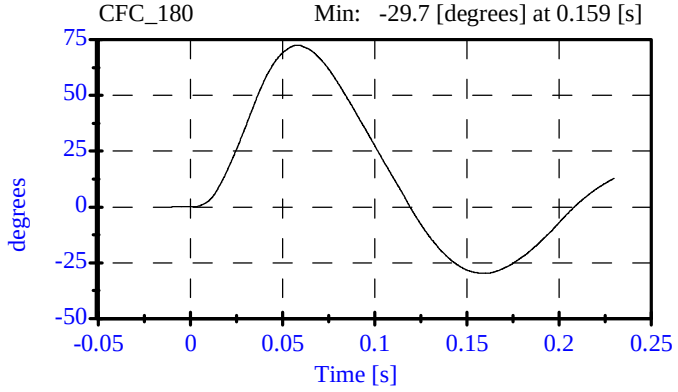
Neck Mx
CFC_600
Max: 62.8 [N-m] at 0.046 [s]
Min: -27.5 [N-m] at 0.012 [s]



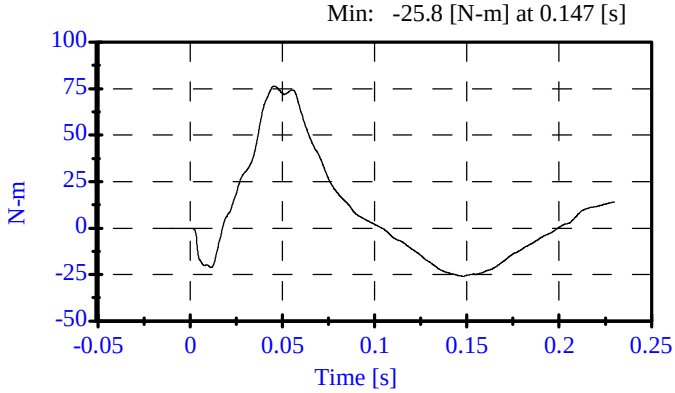
Neck Fy
CFC_1000
Max: 859.0 [N] at 0.051 [s]
Min: -257.6 [N] at 0.150 [s]



Tot Rot
CFC_180
Max: 72.5 [degrees] at 0.058 [s]
Min: -29.7 [degrees] at 0.159 [s]



MOCX
Max: 76.4 [N-m] at 0.046 [s]
Min: -25.8 [N-m] at 0.147 [s]



Abdominal Compression Test

Post-Test

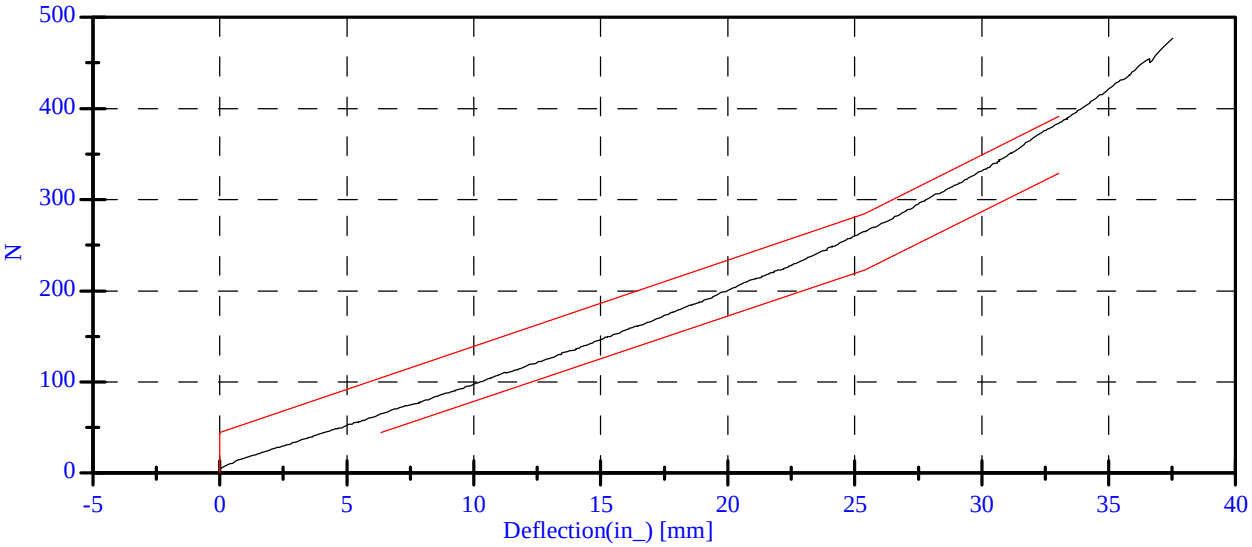
CONFIGURED FOR LEFT SIDE IMPACT

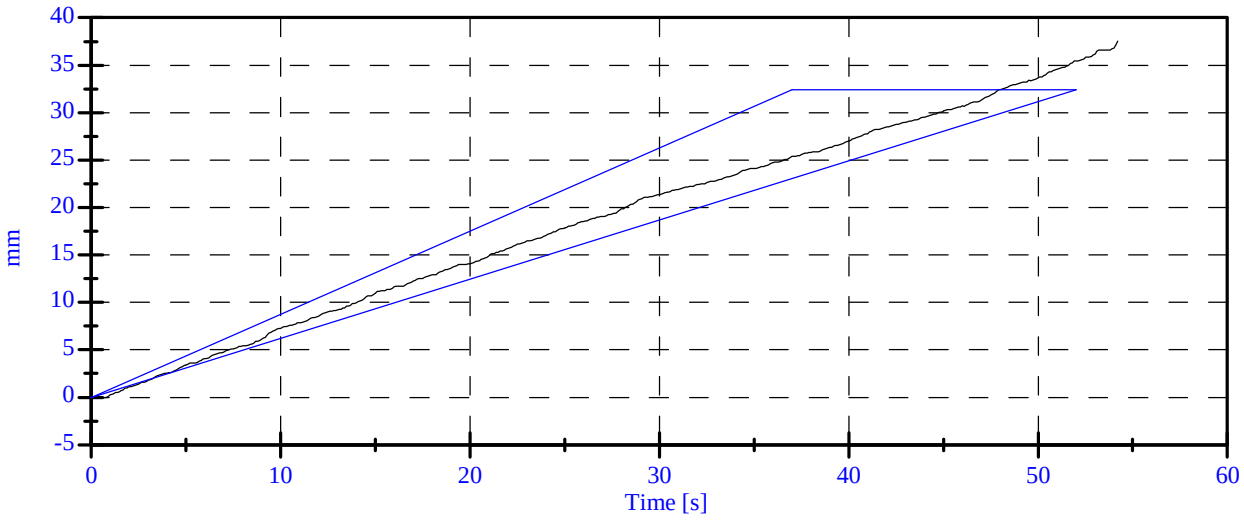
ATD Serial No: 269 Sequential Test Number: 1 File: 269Ab 05-21-09

Date: 05-21-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	125.04 N	Passed
Force at 19.05 mm :	162.98-220.99 N	188.47 N	Passed
Force at 25.40 mm :	221.97-280.02 N	265.03 N	Passed
Force at 33.02 mm :	324.99-391.00 N	383.87 N	Passed

ABDOMINAL COMPRESSION TEST





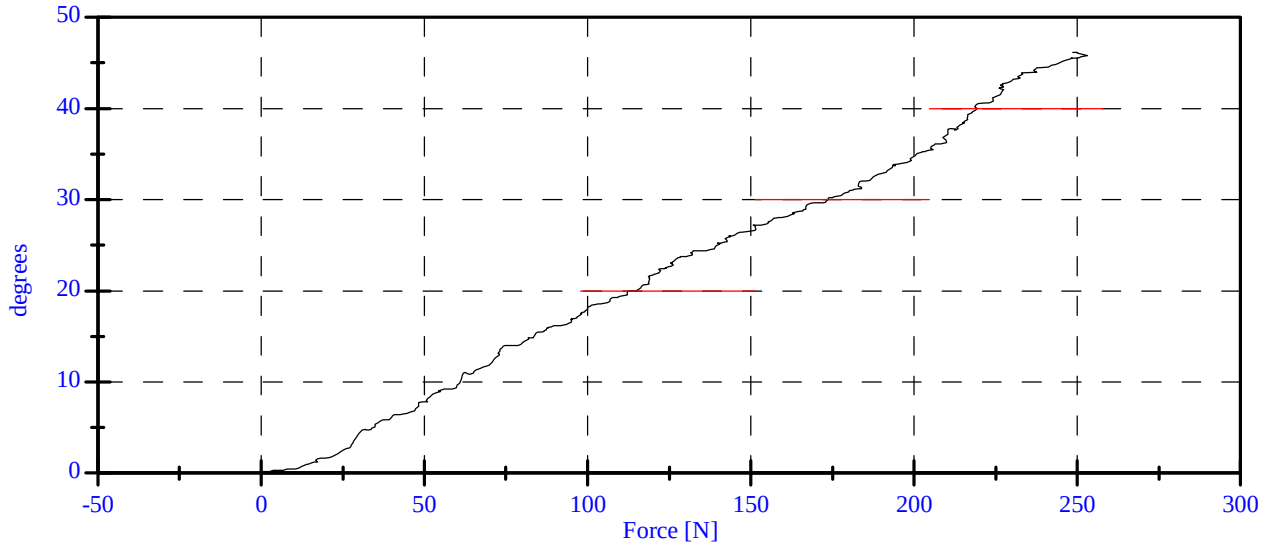
Lumbar Spine Test
Post-Test

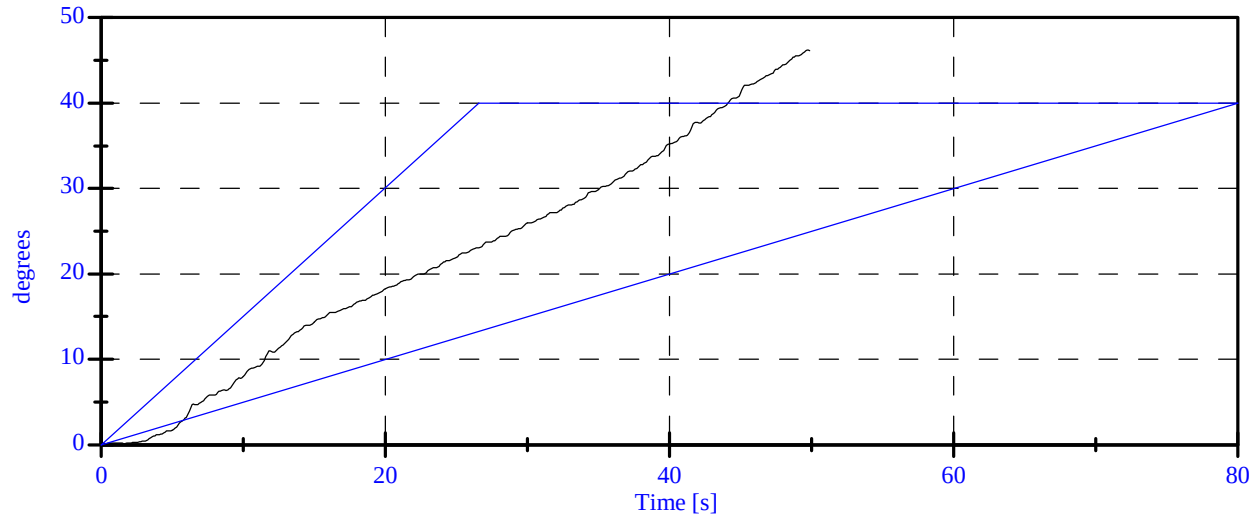
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269 Sequential Test Number: 1 File: 269 Spine 05-26-09
Date: 05-26-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	24.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	5.74 N	Passed
Force at 20 Deg:	97.86-151.24 N	114.64 N	Passed
Force at 30 Deg	151.24-204.62 N	173.67 N	Passed
Force at 40 Deg	204.62-258.00 N	219.37 N	Passed
Return Angle	12 Deg Max	6.81 deg	Passed

LUMBAR SPINE FLEXION TEST





POST TEST DUMMY INSPECTION LIST

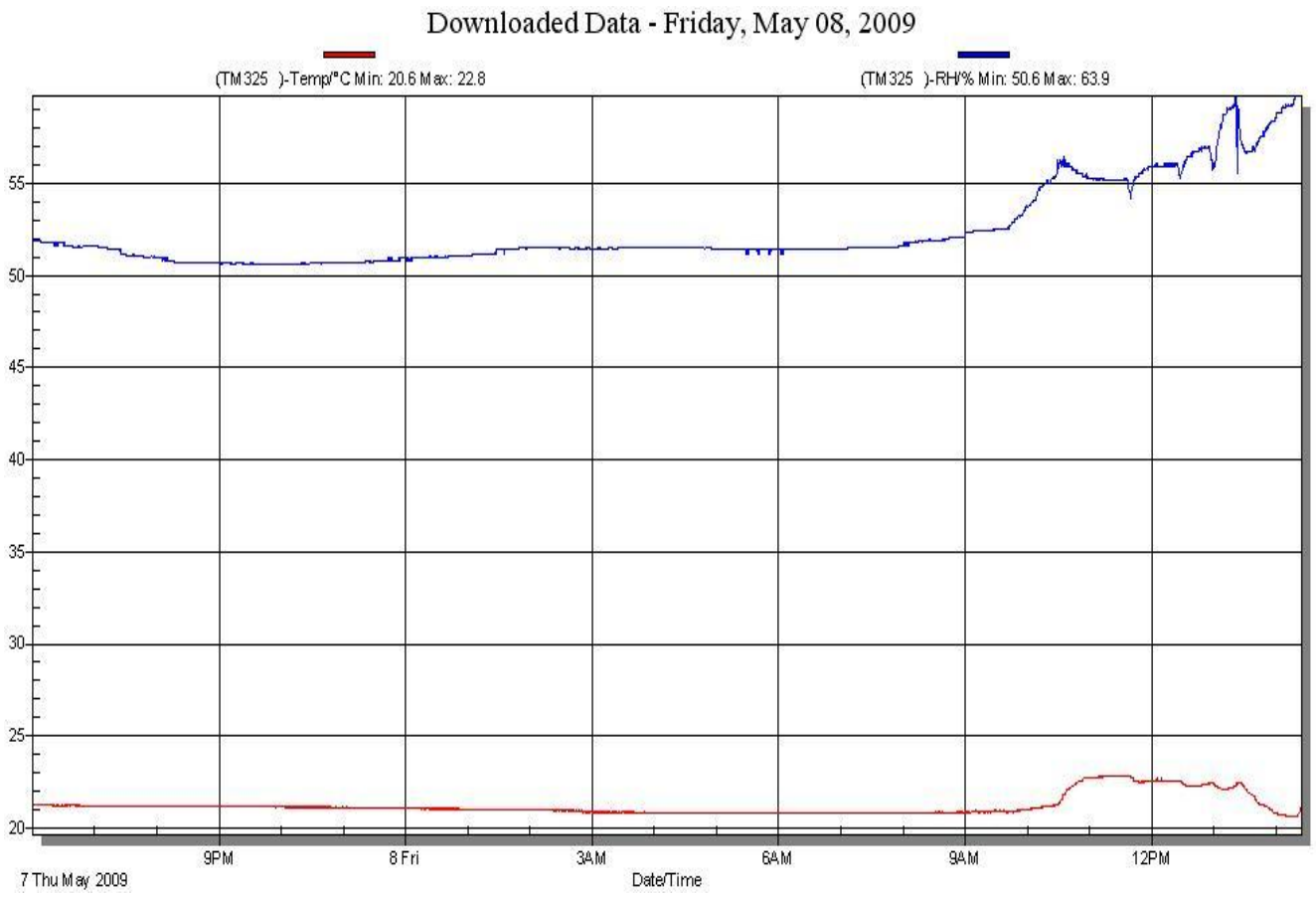
CONFIGURED FOR LEFT **SIDE IMPACT**

SID/HIII Serial No.: 269 Sequential Test Number: 2
Date: 5/21/09 Laboratory Technician: B. Swiecicki

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.: 269		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	P52088	ENDEVCO	02/20/09
HEAD AY	P52095	ENDEVCO	02/20/09
HEAD AZ	P58986	ENDEVCO	02/19/09
UPPER NECK FX	810Fx	DENTON	12/08/08
UPPER NECK FY	810Fy	DENTON	12/08/08
UPPER NECK FZ	810Fz	DENTON	12/08/08
UPPER NECK MX	810Mx	DENTON	12/08/08
UPPER NECK MY	810My	DENTON	12/08/08
UPPER NECK MZ	810Mz	DENTON	12/08/08
UPPER RIB	P49192	ENDEVCO	12/02/08
LOWER RIB	P51734	ENDEVCO	02/19/09
LOWER SPINE	P51689	ENDEVCO	02/19/09
PELVIS	P58762	ENDEVCO	02/19/09
UPPER RIB REDUNDANT	P51713	ENDEVCO	02/19/09
LOWER RIB REDUNDANT	P59020	ENDEVCO	02/19/09
LOWER SPINE REDUNDANT	P58776	ENDEVCO	02/19/09
PELVIS REDUNDANT	P58905	ENDEVCO	02/19/09

REMARKS: None

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE INSTRUMENTATION

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
VEHICLE CG (AX)	A13829	ENDEVCO	04/03/09
VEHICLE CG (AY)	P35793	ENDEVCO	04/03/09
VEHICLE CG (AZ)	P16841	ENDEVCO	04/03/09
VEHICLE CG RATE (VX)	323	ATA	10/05/08
VEHICLE CG RATE (VY)	336	ATA	10/05/08
VEHICLE CG RATE (VZ)	321	ATA	10/05/08
STRUCK SIDE SILL (AY)	P23788	ENDEVCO	03/03/09
A-PILLAR SILL (AY)	P21516	ENDEVCO	11/21/08
A-PILLAR LOWER (AY)	P26259	ENDEVCO	03/25/09
A-PILLAR MIDDLE (AY)	P38132	ENDEVCO	11/21/08
B-PILLAR SILL (AY)	P17283	ENDEVCO	03/03/09
B-PILLAR LOWER (AY)	P39731	ENDEVCO	02/27/09
B-PILLAR MIDDLE (AY)	P23926	ENDEVCO	03/02/09
SEAT TRACK HP (AY)	P32197	ENDEVCO	11/19/08
DOOR LOWER (AY)	J38127	ENDEVCO	03/03/09
DOOR MIDDLE (AY)	P23960	ENDEVCO	03/02/09
DOOR UPPER (AY)	P23899	ENDEVCO	02/27/09
ENGINE (AX)	P23993	ENDEVCO	03/03/09
ENGINE (AY)	P23164	ENDEVCO	03/24/09
FIREWALL (AY)	P24145	ENDEVCO	03/03/09
OPPOSITE SIDE ROOF (AY)	P18639	ENDEVCO	03/02/09
OPPOSITE SIDE SILL (AY)	P17539	ENDEVCO	03/03/09
TRUNK (AX)	P21399	ENDEVCO	03/03/09
TRUNK (AY)	P35757	ENDEVCO	03/02/09

REMARKS: None