REPORT NUMBER: TO12-MGA-2003-002

FULL SCALE SIDE IMPACT TESTS OF BASELINE VEHICLES

Task Order #T0008 / RFP #0012

Ford Motor Company
2001 Ford Focus 4 door
NHTSA No. # R11314

PREPARED BY:
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BURLINGTON, WI 53105

March 6, 2003

FINAL REPORT SUBMITTED: August 15, 2003

PREPARED FOR:
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This final test report was prepared for the U.S. Department of Transportation, Volpe National Transportation System Center, under Contract No. DTRS57-98-D-00041.

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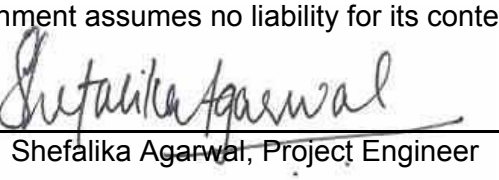
Prepared by:  Date: 3/25/2003

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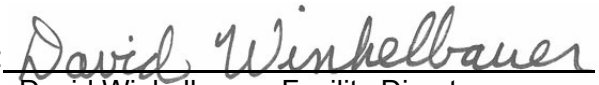
Reviewed by:  Date: 3/25/2003

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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test was conducted as part of Contract No. DTRS57-98-D-00041, Task Order T0008, RFP 0012, sponsored by the U.S. Department of Transportation, Volpe National Transportation System Center. The purpose of this test was to compare the response of the standard ES-2 dummy with a modified version of the ES-2 with production rib extensions and a modified backplate.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 2
SUMMARY OF SIDE IMPACT TEST

A 2001 Ford Focus 4 door was impacted on the left side by a Moving Deformable Barrier (MDB) which was moving forward in a 26.8 degree position to the tow road guidance system at a velocity of 52.6 kph (32.7 mph). The target vehicle was stationary and positioned at an angle of 63 degrees to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, WI on March 6, 2003. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies are included in Appendix A.

Two ES-2 side impact dummies were placed in the left front and left rear designated seating positions according to instructions specified in the NHTSA Office of Vehicle Safety Compliance Laboratory Test Procedure TP-214D-06, dated July 26, 2001. The side impact event was documented by ten high speed cameras. Camera locations and other pertinent camera information can be found in this report.

Appendix B contains the vehicle and dummy response data traces. A summary of the side impact dummy (ES-2) 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.

Appendix E contains the ES-2 peak responses, and Appendix F contains the ES-2 sign conventions.

The following table summarizes the results of the Left Side Impact Test:

		Left Front	Left Rear
1) Head Performance Criteria			
< 1000	T1 (msec)	46	41.8
	T2 (msec)	82	62.2
	HPC	137	174
2) Thorax Performance Criteria			
2.1) Chest Deflection < 42 mm	Upper Rib Deflection	36	20
	Mid Rib Deflection	25	10
	Lower Rib Deflection	20	3
2.2) Viscous Criteria < 1.0 m/sec	Upper Rib	0.7	0.1
	Mid Rib	0.3	0.04
	Lower Rib	0.2	0.01
3) Abdominal Protection Criterion			
Sum < 2500 N	Front Abdominal Force	370	573
	Mid Abdominal Force	555	426
	Rear Abdominal Force	771	206
	Sum of Abdominal Force	1648	1121
4) Pelvis Performance Criterion			
< 6000 N	Pubic Symphysis Force	-2833	-2759

		Left Front	Left Rear
HIC	T1 (msec)	46	41.8
	T2 (msec)	82	62.2
	T2-T1 (msec)	36	20.4
	HIC	137	174

FIR Filtered (g's)	Left Front	Left Rear
Upper Rib Y	97.8	49.8
Mid Rib Y	105.3	54.8
Lower Rib Y	111.2	62.9
Lower Spine Y	56.6	55.2
Pelvis Y	79.9	69.6
TTI	83.9	59.0

Contacts (msec)	Left Front	Left Rear
Head	no contact	24.6
Arm	18.0	21.8
Rib	35.5	no contact
Pelvis	14.8	23.2

TEST NOTES

Both ES-2 dummies contained production rib extensions.

There was no valid data collected for the Driver Lower Neck MZ.

SECTION 3
SIDE IMPACT DUMMY (ES-2) AND VEHICLE TEST DATA

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

TEST VEHICLE INFORMATION

Make / Model	Ford / Focus
Body Style	4 door
NHTSA No.	R11314
VIN	1FAFP34301W182198
Odometer Reading	22789
Transmission	Manual
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	2.0
Engine Placement	Lateral

TEST VEHICLE OPTIONS

Front Airbag	Yes
Side Airbags	No
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
AM/FM	Yes
Cruise Control	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	11/00

GVWR (kg)	1646
GAWR Front (kg)	895
GAWR Rear (kg)	791

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	221	221
Cold / Test Pressure (kPa)	221	221
Recommended Tire Size	P195/60R15	P195/60R15
Tire Size on Vehicle	P195/60R15	P195/60R15
Tire Manufacturer	Goodyear	Goodyear

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contour		
Number Of Occupants x 68.04 kg.	2	3		340
Capacity Wt. (VCW) (kg)				375
Cargo Wt. (RCLW) (kg)				35

DATA SHEET NO. 1... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	364.7	245.4		416.0	320.7	
Right	kg	366.1	245.4		393.7	296.7	
Ratio	%	59.8	40.2		56.7	43.3	
Totals	kg	730.8	490.8	1221.6	809.7	617.4	1427.1

Weight of Ballast in Vehicle = 0

TARGET TEST WEIGHT

Measured Parameter	Units	Value
Vehicle Target Weight (TVTW)*	kg	1427.1

* = matches previous vehicle tests

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	661	663	665	674	1051
As Tested	mm	645	651	631	644	1132
Fully Loaded	mm	645	657	624	641	

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2616
Target Impact Point Aft of Front Axle	mm	368
Actual Impact Point Aft of Front Axle	mm	357

DATA SHEET NO. 1… (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

NORMAL DESIGN RIDING POSITION

Driver seat back angle: 16 degrees from full forward

Rear passenger seat back angle: non adjustable

SEAT FORE/AFT POSITIONS

Driver seat fore/aft total travel: 17 positions

Rear passenger seat fore/aft total travel: non adjustable

Driver seat fore/aft position: 9th position, 1st as one

Rear passenger seat fore/aft position: non adjustable

SEAT BELT UPPER ANCHORAGE

The D ring was placed in the full up position.

STEERING COLUMN ADJUSTMENT

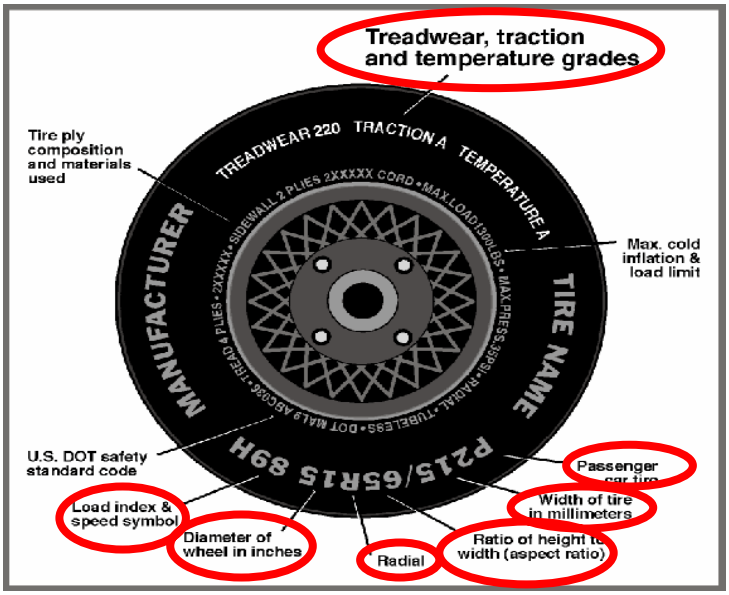
The steering column was placed in the mid position.

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2001 Ford Focus Test Date: March 6, 2003

Vehicle Year	2002	Vehicle Make	Ford
Vin	1FAFP34301W182198	Vehicle Model	Focus



	Front	Rear
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Eagle RSA	Eagle RSA
Tire Type	P	P
Tire Width (mm)	195	195
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	87T	87T
Treadwear	260	260
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2590
C.G. Location aft of Front Axle	1127

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	457.7	235.1	
Right	kg	328.1	342.6	
Ratio	%	55.6	42.4	
Totals	kg	758.8	577.7	1363.5

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	52.1 to 53.7	52.6
Trap No. 2 Velocity (Redundant)	km/h	52.1 to 53.7	52.6
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.8

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush
Level	Description	Height	Distance	Direction	
1	Center of Bumper (mm)	432	800	Left	127
2	Top of Bumper (mm)	533	800	Left	76
3	Mid Level (mm)	686	800	Left	59
4	Top of Stack (mm)	813	800	Right	86

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 4

POST TEST OBSERVATIONS

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat	Rear Seat
Dummy Type / Serial No.	ESII	ESII
Head Contact	Back of head contacted B-Pillar	Seat post and drivers head rest
Upper Torso Contact	Door Panel	Door panel
Lower Torso Contact	Doorpanel, doorpanel below armrest.	Armrest
Left Knee Contact	Door panel below arm rest	Door panel below arm rest
Right Knee Contact	Left knee	Left knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Remained closed and latched	Remained closed and latched
Right Side Door Opening	Remained closed and latched	Remained closed and latched
Left Side Seat Movement	None	None
Left Side Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No failures
Sill Separation	None
Windshield Damage	Yes
Window Damage	Left side broke
Other Notable Effects	None

AIRBAG DEPLOYMENT

	Driver	Front Passenger	Rear Passenger
Front	Yes	Yes	
Side			

MDB LEFT EDGE IMPACT POINT DATA

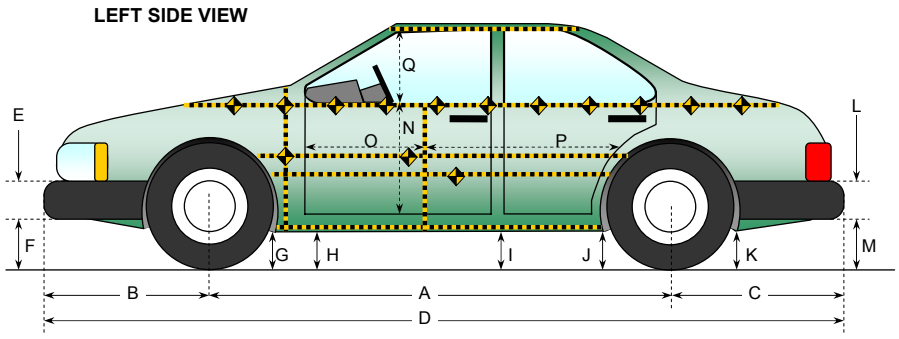
Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	11 forward
Vertical Offset	mm	+/-20	3 down

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003



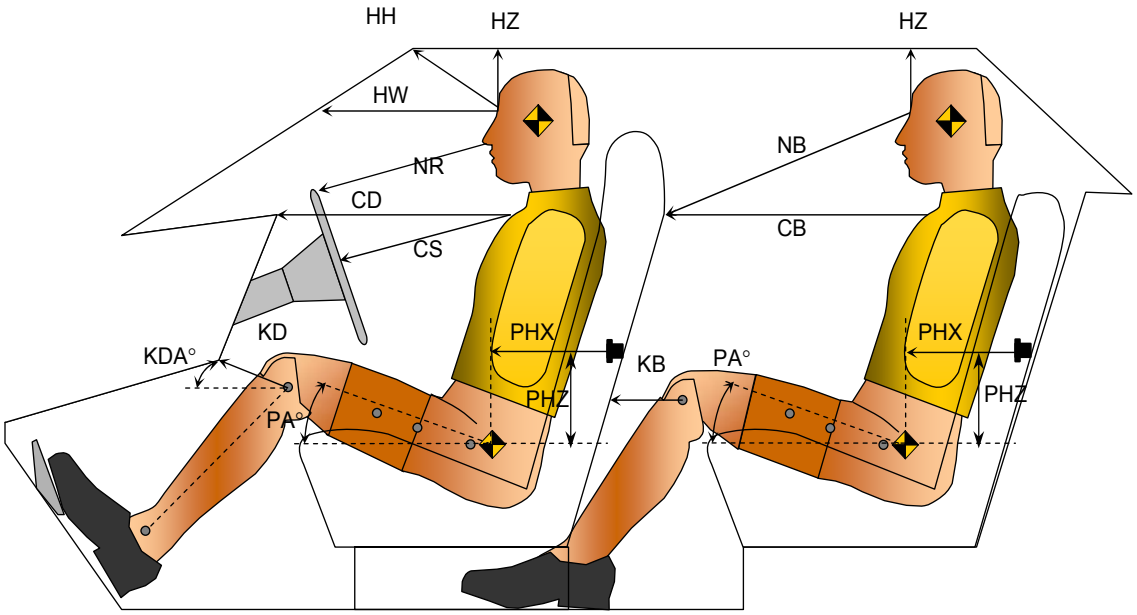
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2616	2569	47
B	Front Axle to FSOV	870	838	32
C	Rear Axle to RSOV	925	919	6
D	Total Length at Centerline	4411	4326	85
E	Front Bumper Thickness	175	175	0
F	Front Bumper Bottom to Ground	397	403	-6
G	Sill Height at Front Wheel Well	150	157	-7
H	Sill Height at Front Door Leading Edge	150	163	-13
I	Sill Height at "B" Pillar	148	178	-30
J1	Sill Height at Rear Wheel Well	150	157	-7
J2	Pinch Weld Height at Rear Wheel Well	144	159	-15
K	Sill Height Aft of Rear Wheel Well	250	254	-4
L	Rear Bumper Thickness	272	272	0
M	Rear Bumper Bottom to Ground	406	416	-10
N	Sill Height to Window Bottom Sill	688	639	49
O	Front Door Leading Edge to Impact CL	737	736	1
P	Rear Door Trailing Edge to Impact CL	1201	1158	43
Q	Front Window Opening	444	432	12
R	Right Side Length	3737	3745	-8
S	Left Side Length	3756	3700	56
T	Vehicle Width at "B" Post	1695	1450	245

DATA SHEET NO. 6

ES-2 LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

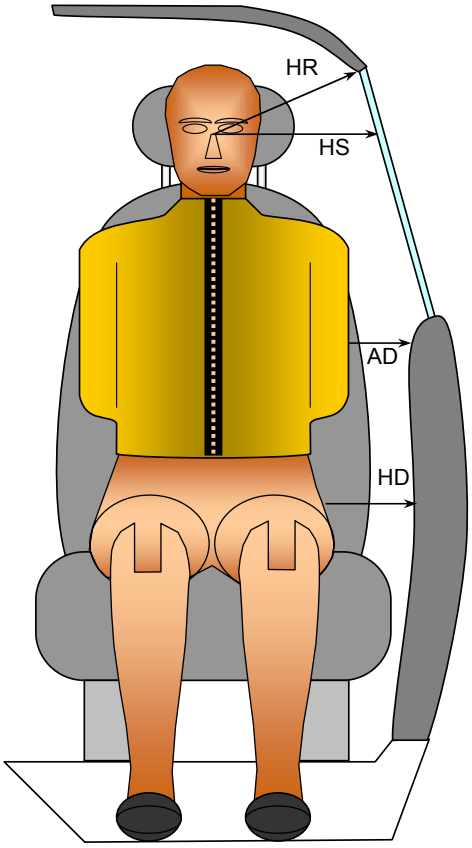


Driver Code	Pass. Code	Measurement Description	Left Front 009		Left Rear 010	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	347			
HW		Head to Windshield	584			
HZ	HZ	Head to Roof	161		142	
NR	NB	Nose to Rim/Nose to Seatback	484		554	
CD	CB	Chest to Dash or Seatback	551		475	
CS		Chest to Steering Wheel	350			
KDL	KBL	Left Knee to Dash or Seatback	176	0	194	0
KDR	KBR	Right Knee to Dash or Seatback	197	0	186	0
PA	PA	Pelvic Angle (longitudinal)		23.9		23.0
PA	PA	Pelvic Angle (lateral)		0		0.2
SA	SA	Spine Angle (longitudinal)		25.1		26.6
SA	SA	Spine Angle (lateral)		0.5		0.4
PHX	PHX	H-Point to Striker (X-Axis)	188		227	
PHZ	PHZ	H-Point to Striker (Z-Axis)	110		280	

DATA SHEET NO. 7

ES-2 LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003



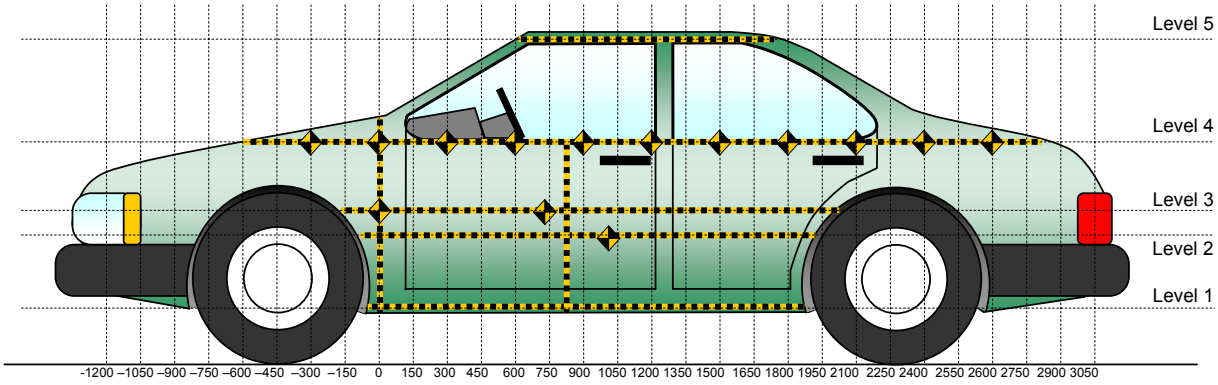
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Left Front 009	Left Rear 010
HR	Head to Side Header	mm	178	145
HS	Head to Side Window	mm	273	255
AD	Arm to Door	mm	67	69
HD	H-Point to Door	mm	96	124

DATA SHEET NO. 8

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.
Measurements along the vertical 800 mm.
All measurements below in mm.

Level	Measurement Description	Height Above Ground
5	Window	1359
4	Window Sill	900
3	Mid Door	569
2	Occupant H-Point	515
1	Sill Top	244

DATA SHEET NO. 9

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1050															
-900															
-750															
-600				366					372					6	
-450				357					369					12	
-300				336					353					17	
-150				323					343					20	
0		254	253	312			354	359	344			100	106	32	
150	293	257	257	306		393	515	502	379		100	258	245	73	
300	296	253	257	303		412	522	508	324		116	269	251	21	
450	302	251	255	299		429	522	503	431		127	271	248	132	
600	301	250	254	297		440	522	497	439		139	272	243	142	
750	300	249	253	298	521	446	519	490	453	550	146	270	237	155	29
900	300	248	253	298	522	455	513	495	470	471	155	265	242	172	-51
1050	301	248	253	300	522	471	512	495	483	492	170	264	242	183	-30
1200	302	252	253	301	524	481	526	517	496	516	179	274	264	195	-8
1350	303	249	254	304	525	453	511	510	483	540	150	262	256	179	15
1500	305	251	254	306	526	438	476	474	474	523	133	225	220	168	-3
1650	301	252	256	310	526	403	441	452	454	505	102	189	196	144	-21
1800	287	259	258	314	526	359	402	398	408	488	72	143	140	94	-38
1950		258	257	320	529		290	300	349	551		32	43	29	22
2100			254	327				294	357				40	30	
2250				332					361				0	29	
2400			254	340				277	359				23	19	
2550			269	345				278	360				9	15	
2700			281	353				283	361				2	8	
2850			296	365				292	367				-4	2	
3000			317					215					-102		
3150															
3300															

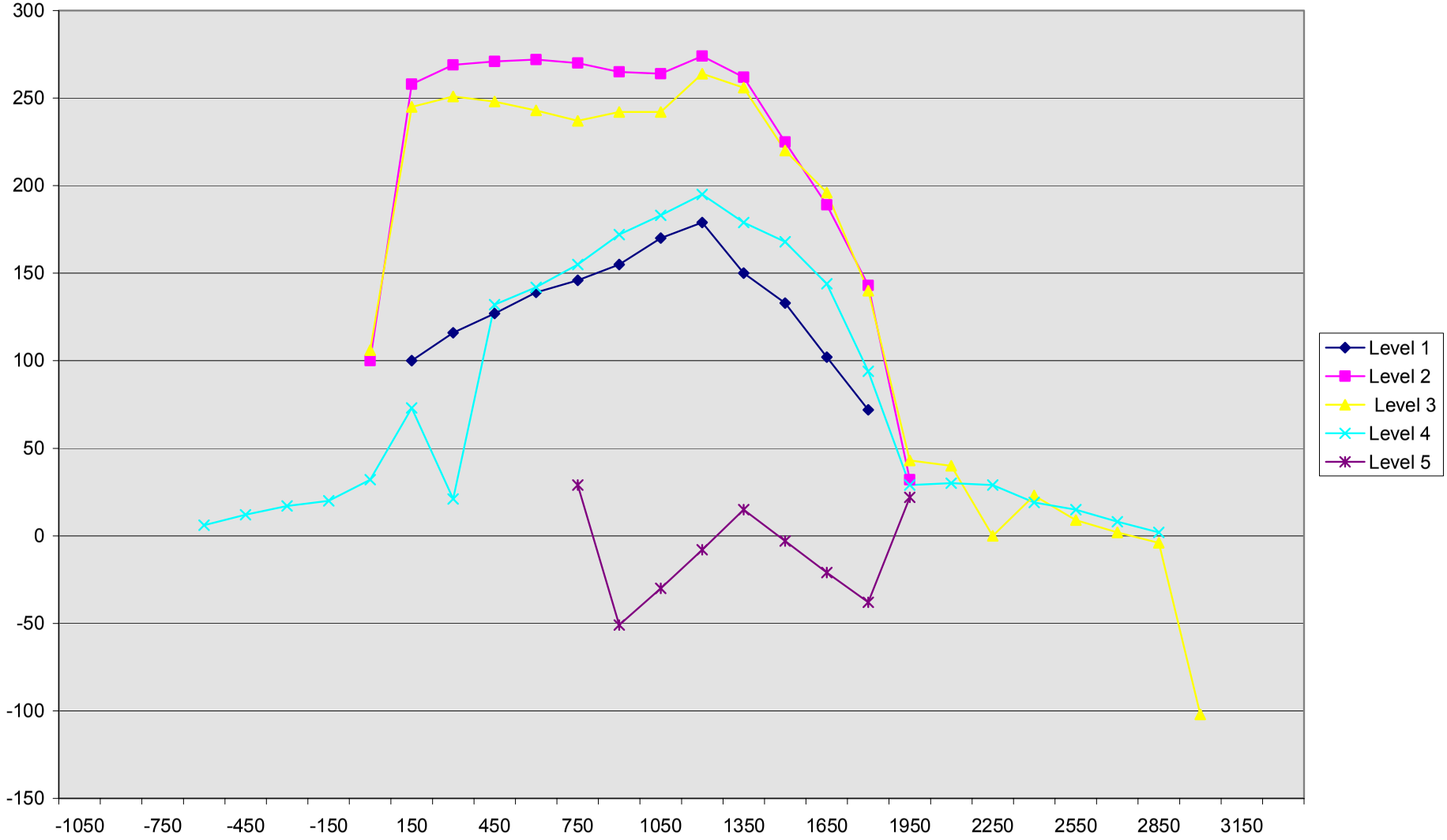
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

DATA SHEET NO. 9... (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

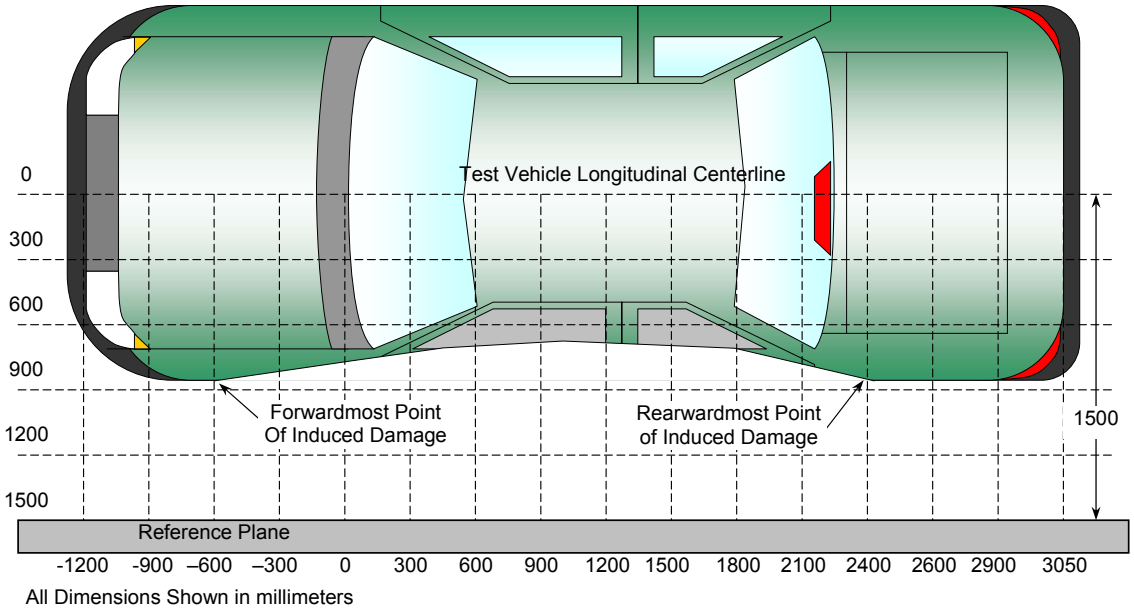


Measurement in mm.

DATA SHEET NO. 10

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003



TOP VIEW

Damage Profile Distances

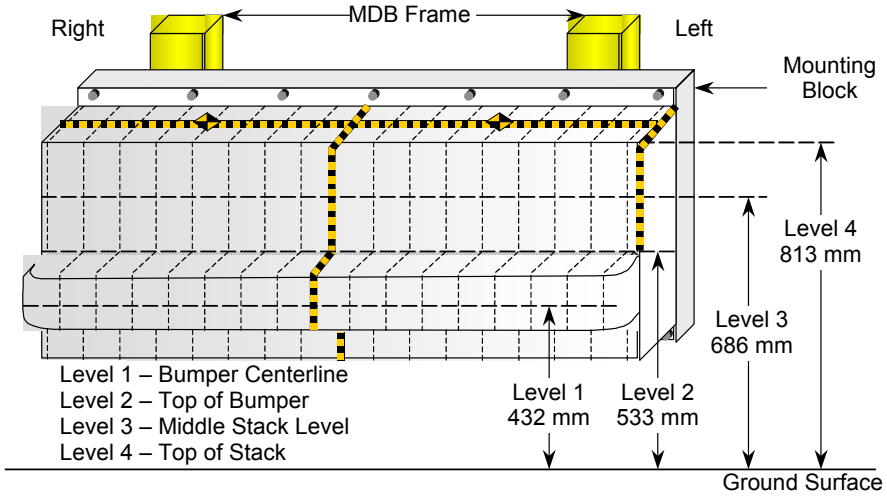
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2850 mm	4	365	367	2
2	2171 mm	4	335	361	26
3	1458 mm	2	250	496	246
4	768 mm	2	248	539	291
5	88 mm	2	255	422	167
6	-600 mm	4	366	372	6

Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body.

DATA SHEET NO. 11

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003



DEFORMABLE BARRIER STATIC CRUSH

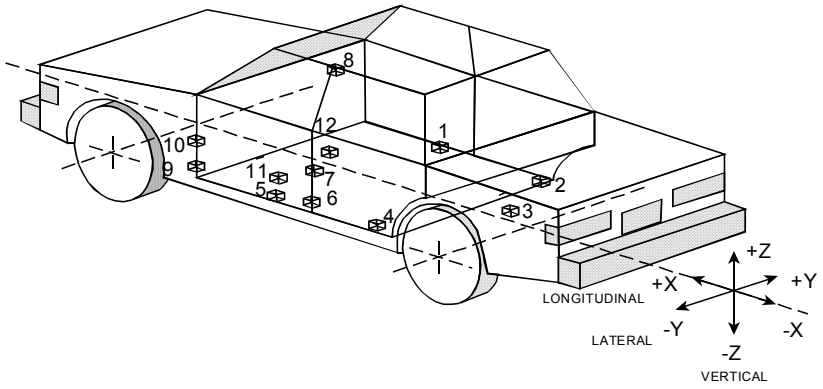
Stack Level	Distance Right of Center								C_L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	35	6	7	8	6	2	6	9	11	9	6	9	15	23	38	69	127
2	15	2	2	2	1	0	0	0	3	4	6	7	9	10	13	39	76
3	54	39	33	28	29	30	29	30	35	33	33	36	36	39	42	49	59
4	86	64	47	39	38	44	40	41	42	43	45	46	48	52	62	81	84

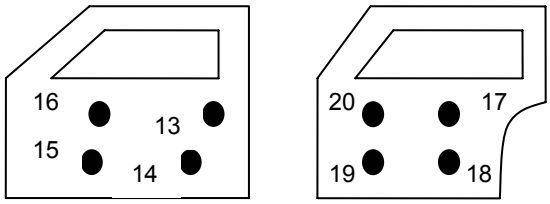
All Dimensions in mm

DATA SHEET NO. 12

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003





No.	Location
1	Right Sill at Front Seat
2	Right Sill at Rear Seat
3	Rear Floorpan Above Axle
4	Left Sill at Rear Door
5	Left Sill at Front Door
6	Left Lower B Post
7	Left Mid B Post
8	Left Upper B Post
9	Left Lower A Post
10	Left Mid A Post
11	Driver Seat Track
12	Vehicle CG

No.	Location
13	Left Front Door @ Mid Rib
14	Left Front Door @ Pelvis
15	Left Front Door @ Knee
16	Left Front Door @ Arm
17	Left Rear Door @ Mid Rib
18	Left Rear Door @ Pelvis
19	Left Rear Door @ Knee
20	Left Rear Door @ Arm
21	Left Driver Seat Frame
22	Right Driver Seat Frame
23	Right Rear Occupant Compartment

DATA SHEET NO. 12... (continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

VEHICLE ACCELEROMETER PEAK DATA

Loc. No.	Accelerometer Location	Longitudinal (X) Maximum (g's) (CFC 60)		Lateral (Y) Maximum (g's) (CFC 60)		Vertical (Z) Maximum (g's) (CFC 60)		Result. (g's) (CFC 60)
		Pos	Neg	Pos	Neg	Pos	Neg	Max
1	Right Sill at Front Seat	3.1	-6.1	20.9	-5.7	5.2	-6.4	21.3
2	Right Sill at Rear Seat	3.6	-6.5	24.3	-3.7	5.4	-5.6	24.8
3	Rear Floorpan Above Axle	1.8	-8.2	17.5	-39.8	21.4	-30.7	41.0
4	Left Sill at Rear Door			78.5	-28.8			
5	Left Sill at Front Door			61.4	-16.8			
6	Left Lower B Post			72.5	-20.2			
7	Left Mid B Post			167.5	-37.1			
8	Left Upper B Post			25.8	-20.8			
9	Left Lower A Post			61.6	-24.1			
10	Left Mid A Post			81.9	-33.0			
11	Driver Seat Track			69.3	-24.4			
12	Vehicle CG	5.3	-8.4	25.4	-4.1	9.0	-5.2	25.6
13	Left Front Door @ Mid Rib			115.6	-118.0			
14	Left Front Door @ Pelvis			150.1	-66.6			
15	Left Front Door @ Knee			228.5	-81.3			
16	Left Front Door @ Arm			124.6	-100.2			
17	Left Rear Door @ Mid Rib			122.6	-75.6			
18	Left Rear Door @ Pelvis			137.1	-89.5			
19	Left Rear Door @ Knee			172.4	-234.3			
20	Left Rear Door @ Arm			156.1	-108.2			
21	Left Driver Seat Frame			94.0	-29.0			
22	Right Driver Seat Frame			89.4	-26.7			
23	Right Rear Occupant Compartment			33.6	-5.2			

DATA SHEET NO. 12... (continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

VEHICLE ACCELEROMETER COORDINATES

Loc. No.	Description	Coordinates (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2482	658	191
2	Right Sill at Rear Seat	1634	682	200
3	Rear Floorpan Above Axle	1041	0	501
4	Left Sill at Rear Door	1360	-700	211
5	Left Sill at Front Door	2323	-700	194
6	Left Lower B Post	1956	-658	266
7	Left Mid B Post	1954	-698	976
8	Left Upper B Post	1934	-493	1435
9	Left Lower A Post	2999	-673	467
10	Left Mid A Post	2997	-753	963
11	Driver Seat Track	2174	-552	366
12	Vehicle CG	2419	0	230
13	Left Front Door @ Mid Rib	2189	-714	956
14	Left Front Door @ Pelvis	2276	-732	424
15	Left Front Door @ Knee	2643	-712	688
16	Left Front Door @ Arm	2444	-725	944
17	Left Rear Door @ Mid Rib	1306	-730	994
18	Left Rear Door @ Pelvis	1563	-726	454
19	Left Rear Door @ Knee	1778	-721	692
20	Left Rear Door @ Arm	1550	-718	951
21	Left Driver Seat Frame	1924	-510	768
22	Right Driver Seat Frame	1924	-165	783
23	Right Rear Occupant Compartment	1798	358	428

Reference Points X – Rear Bumper (+forward)

Y – Vehicle Centerline (+ right)

Z – Ground Level (+ up)

DATA SHEET NO. 13

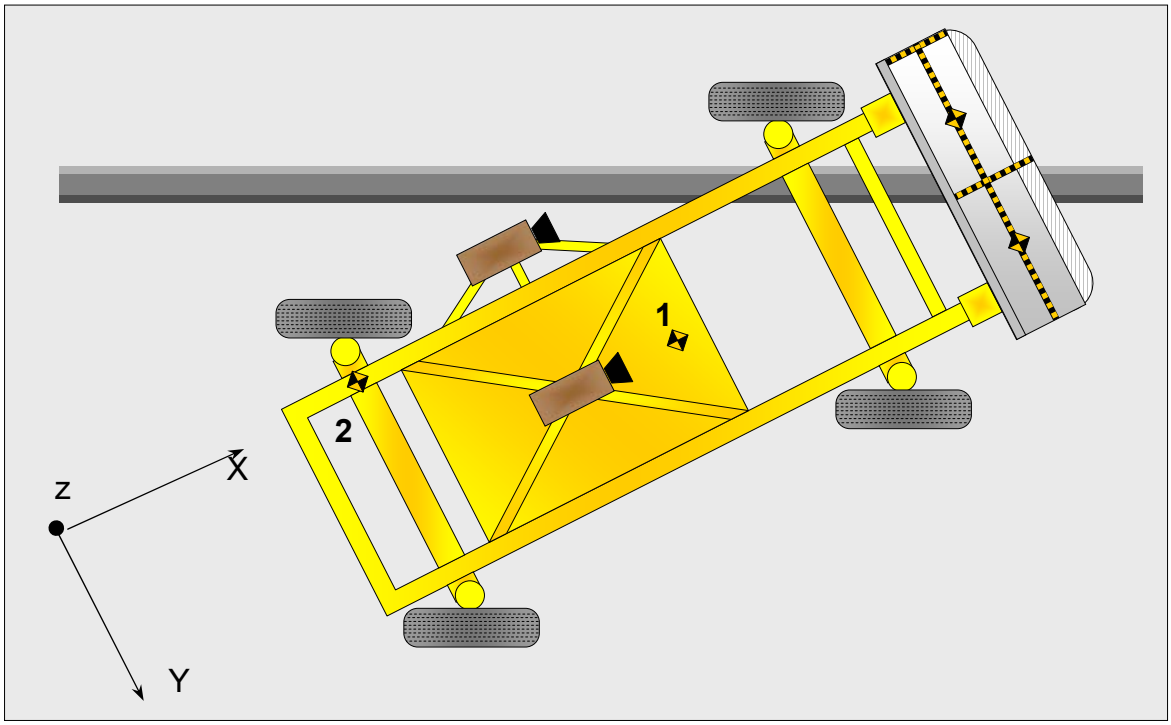
MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003

MDB ACCELEROMETER PEAK DATA AND LOCATIONS

Loc. No.	Accelerometer Location	Measurement (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	-1092	0	483	X	1.2	104.0	-17.3	33.1
					Y	2.4	51.7	-7.7	30.2
					Z	27.8	52.9	-16.2	59.2
					RES	29.9	52.9		
2	MDB Rear	-2591	-625	622	X	1.3	191.3	-21.3	32.4
					Y	1.0	220.9	-3.4	26.5

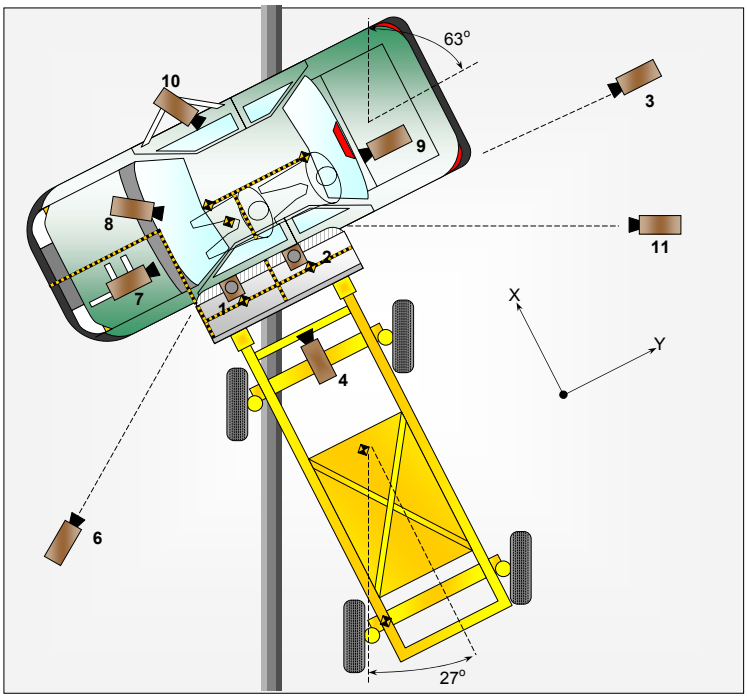
Reference Points X - MDB Front Axle (+ forward)
Y - MDB Centerline (+ to right)
Z - Ground Plane (+ down)



DATA SHEET NO. 14

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 6, 2003



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall				8	1093
2	Overhead Close-up				25	976
3	MDB Onboard, Impact Point Close-up				35	1053
4	MDB Onboard, Centerline of Impact				13	1005
6	Front Impact				13	NT
7	Vehicle Onboard Front SID, Front				13	526
8	Vehicle Onboard Front SID, Hip				13	521
9	Vehicle Onboard Rear SID, Hip				13	503
10	Vehicle Onboard Rear SID, Rear				25	503
11	Real Time Coverage				13	510

Reference Points X - + Forward of Impact Line
Y - MDB Left Edge Impact Point (+ right)
Z - Ground Plane (+ up)

Measurements not recorded

APPENDIX A

PHOTOGRAPHS

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Pre-Test Front View of Test Vehicle

Post-Test Front View of Test Vehicle

Pre-Test Rear View of Test Vehicle

Post-Test Rear View of Test Vehicle

Pre-Test Left Side View of Test Vehicle

Post-Test Left Side View of Test Vehicle

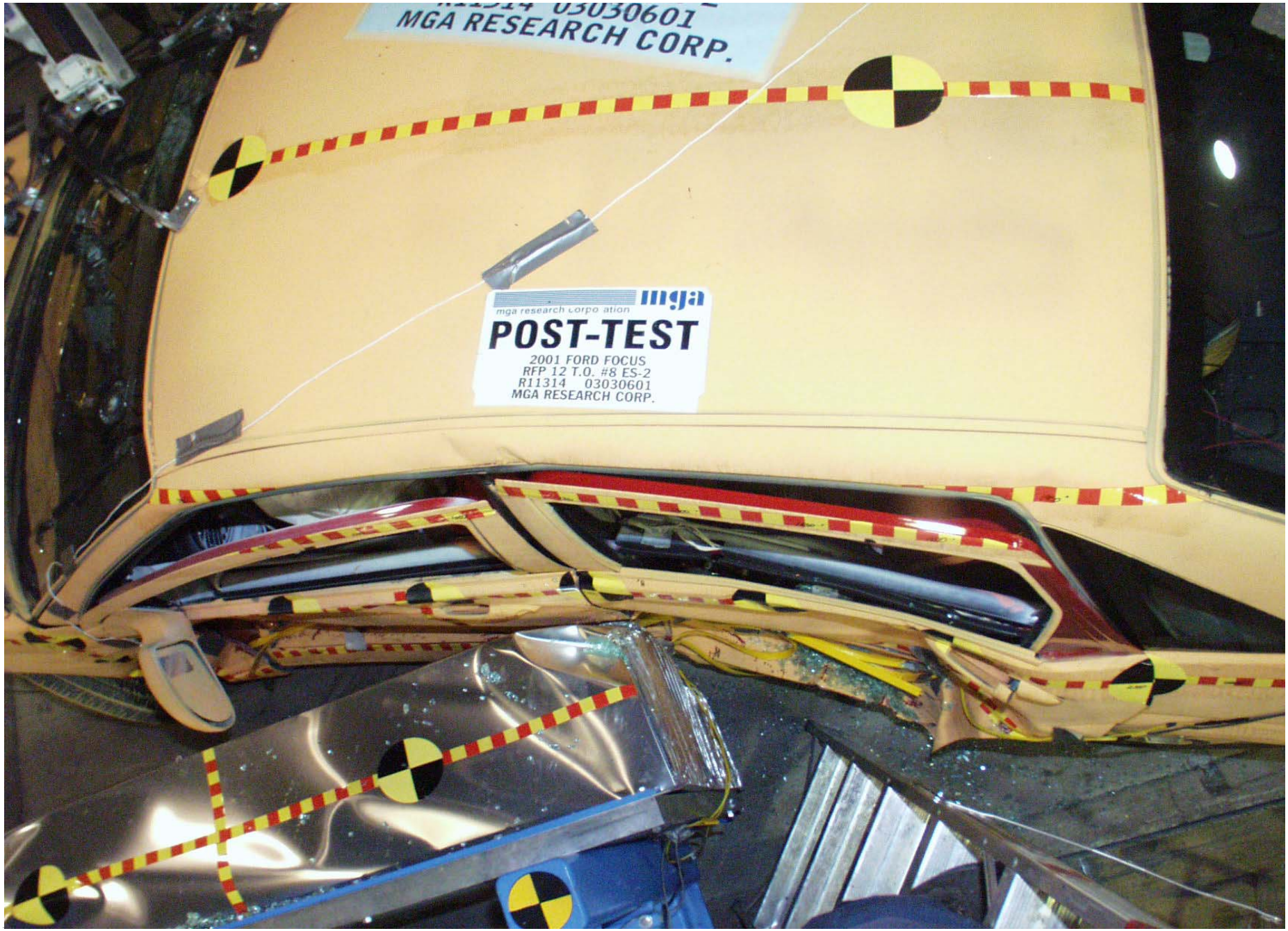
Pre-Test MDB Positioned Against Vehicle (right side)

Pre-Test MDB Positioned Against Vehicle (left side)

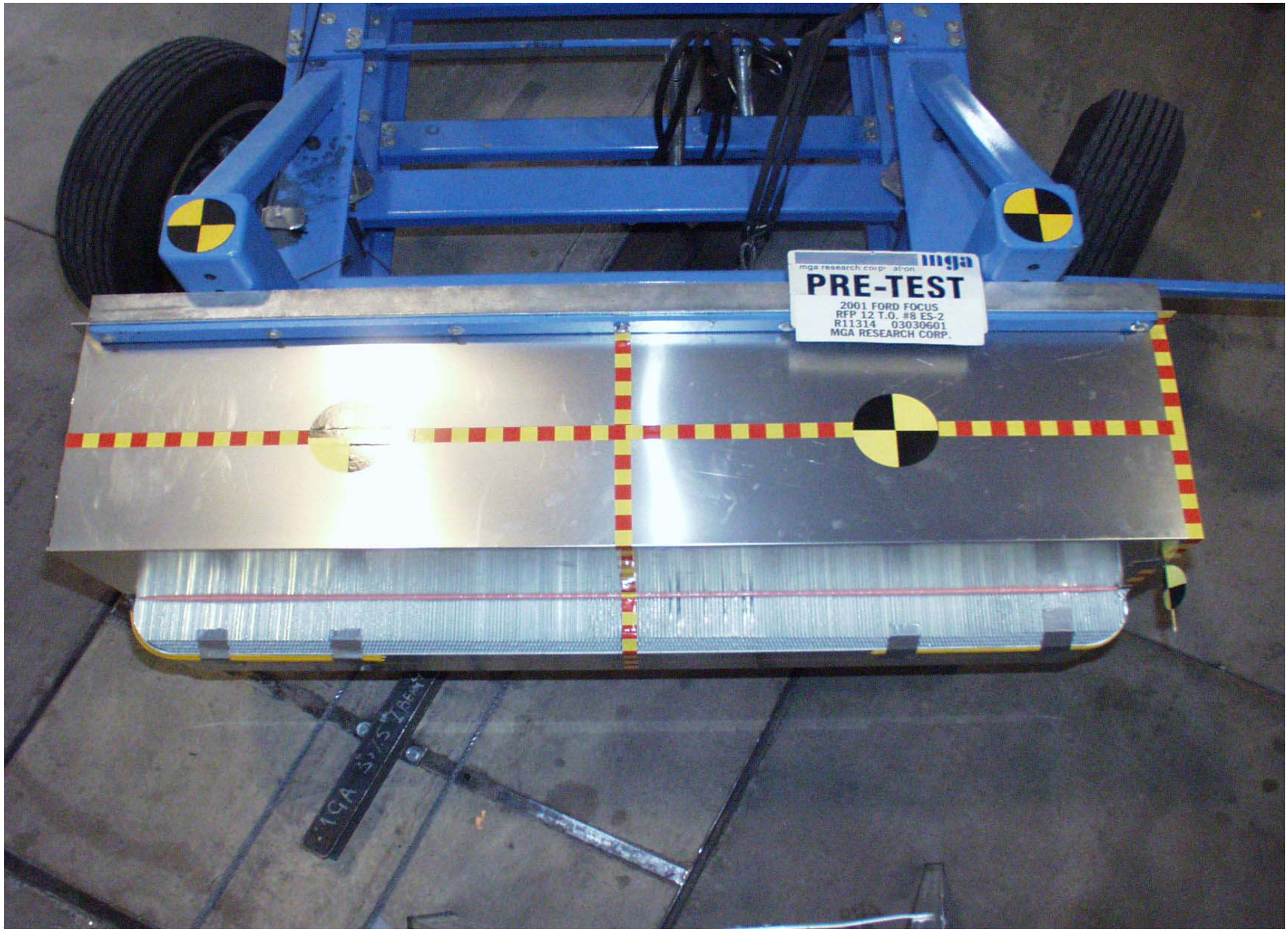
Pre-Test MDB Positioned Against Vehicle (overhead view)

Post-Test MDB and Vehicle (right side)

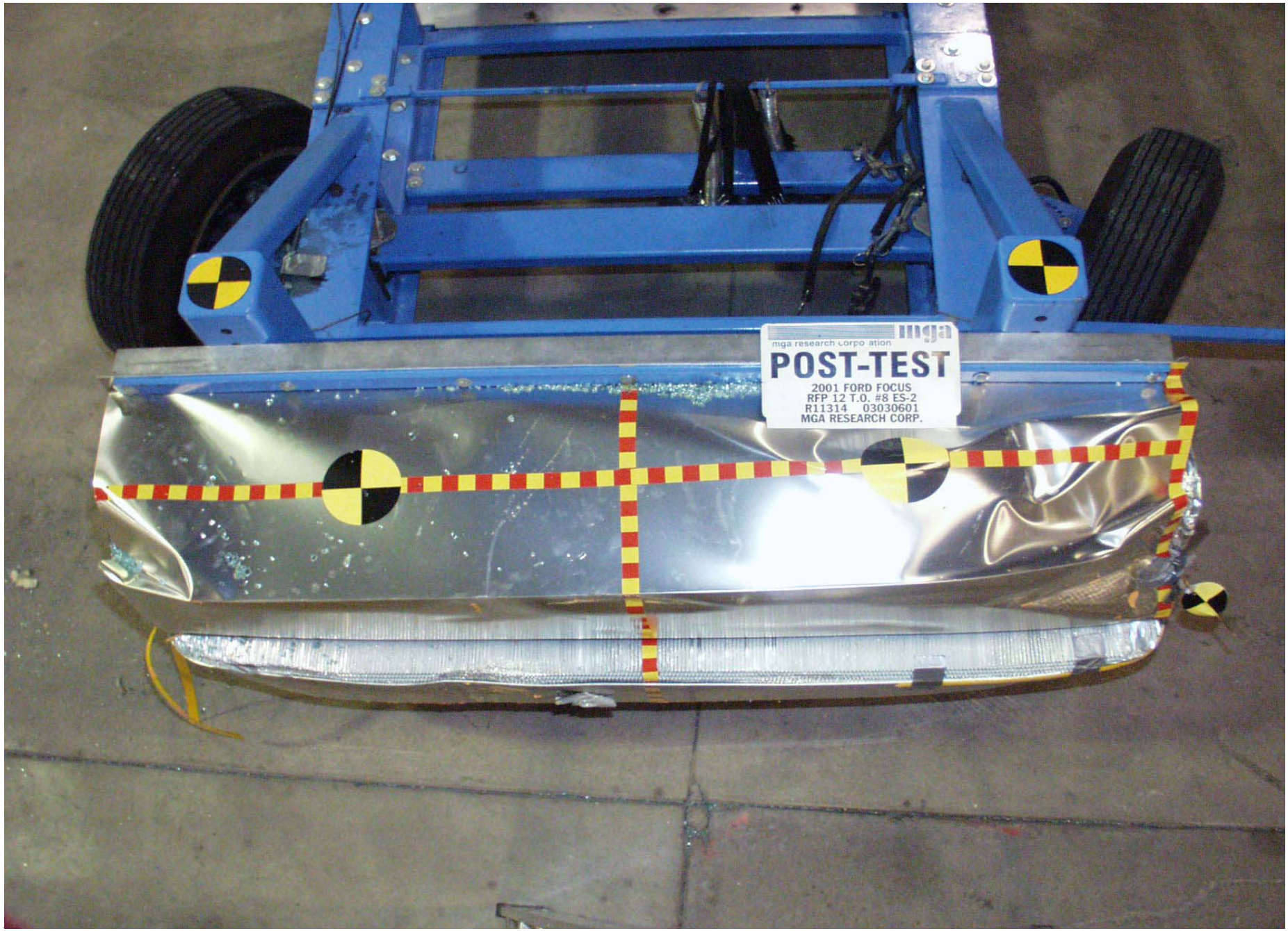
Post-Test MDB and Vehicle (left side)



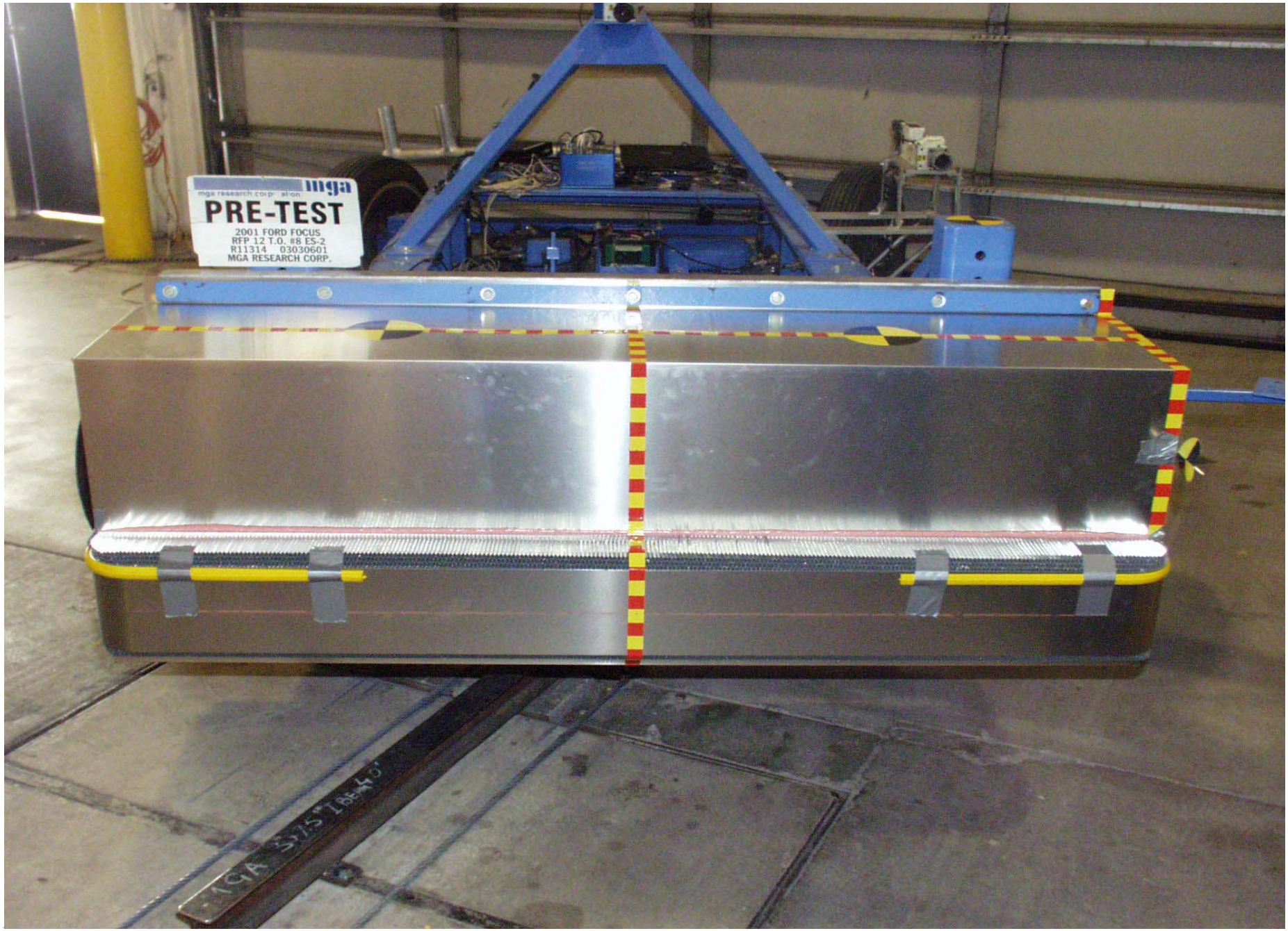
Post-Test MDB and Vehicle (overhead view)



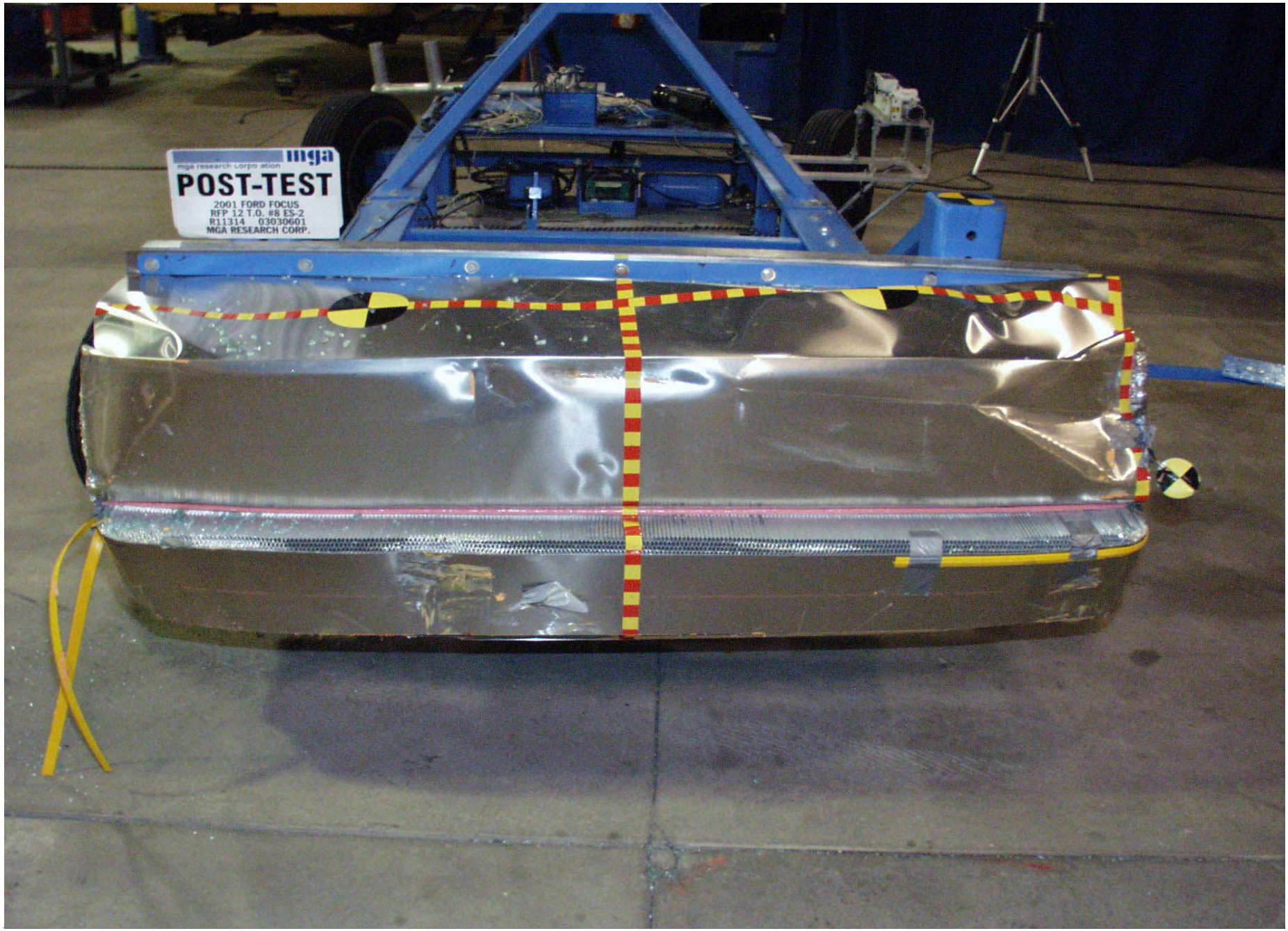
Pre-Test MDB Top View



Post-Test MDB Top View



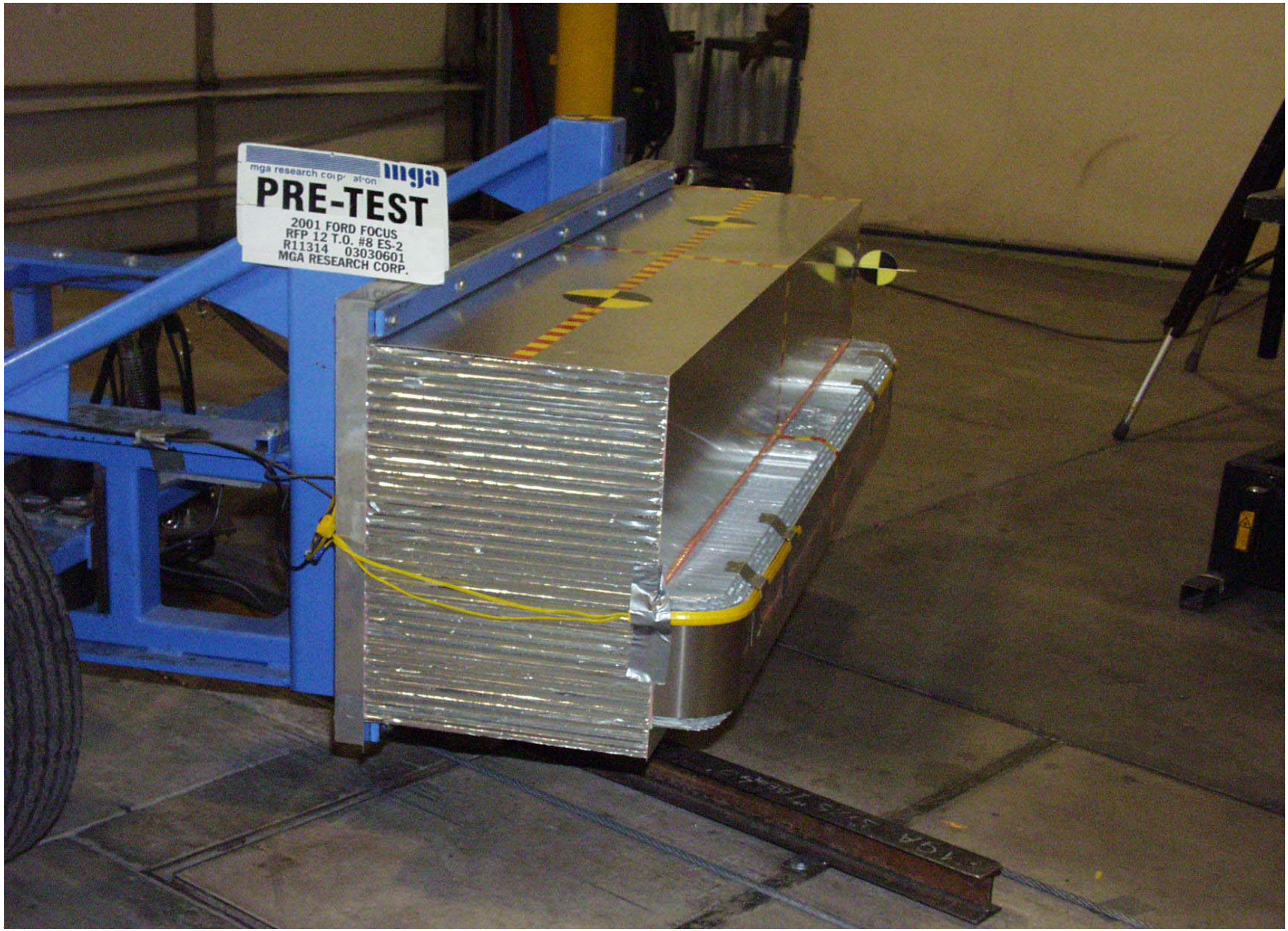
Pre-Test MDB Front View



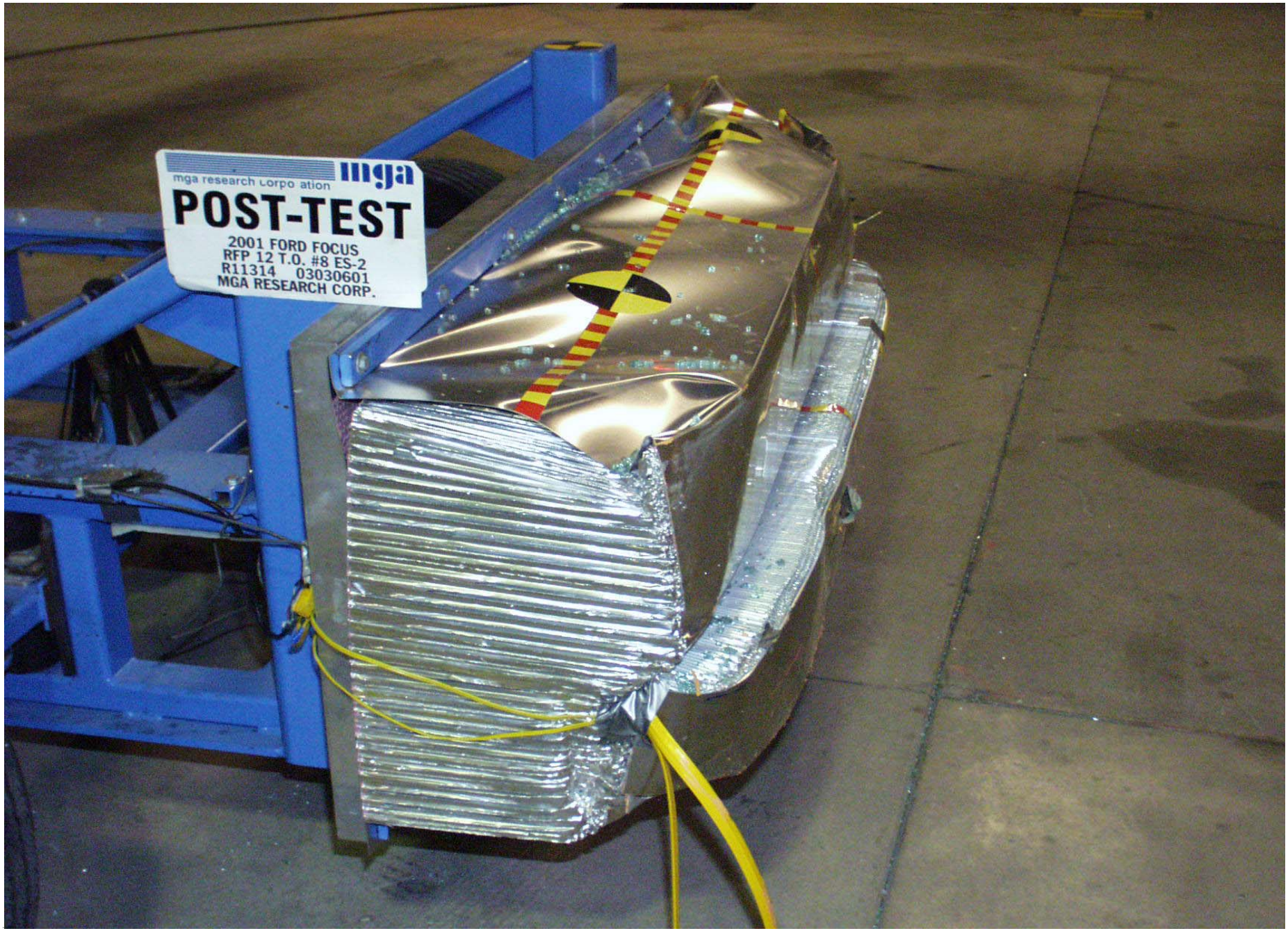
Post-Test MDB Front View

Pre-Test MDB Left Side View

Post-Test MDB Left Side View



Pre-Test MDB Right Side View



Post-Test MDB Right Side View

Pre-Test Driver Dummy Left Side View

Post-Test Driver Dummy Left Side View

Pre-Test Driver Dummy Left Side View (Door open)

Pre-Test Driver Dummy Right Side View

Post-Test Driver Dummy Right Side View

Pre-Test Driver Dummy Shoulder and Door Top View

Post-Test Driver Dummy Shoulder and Door Top View

Pre-Test Passenger Dummy Left Side View

Post-Test Passenger Dummy Left Side View

Pre-Test Passenger Dummy Left Side View (Door open)

Pre-Test Passenger Dummy Right Side View

Post-Test Passenger Dummy Right Side View

Post-Test Passenger Dummy Shoulder and Door Top View

Post-Test Driver Dummy Head Contact

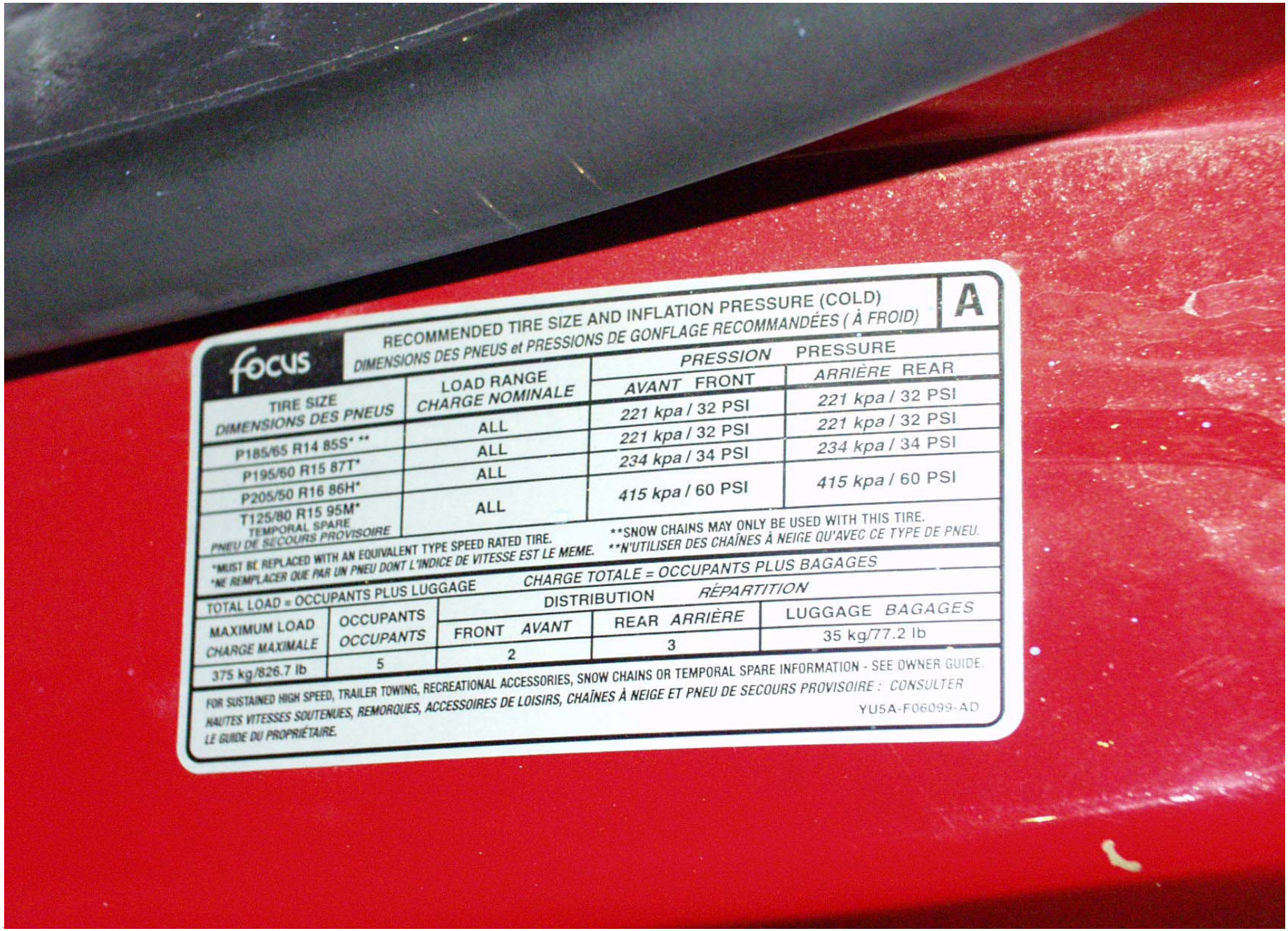
Post-Test Driver Dummy Lower Body Contact

Post-Test Passenger Dummy Head Contact

Post-Test Passenger Dummy Lower Body Contact

Pre-Test Impact Point on Vehicle

Post-Test Impact Point on Vehicle



Tire Placard

Vehicle Certification

Impact

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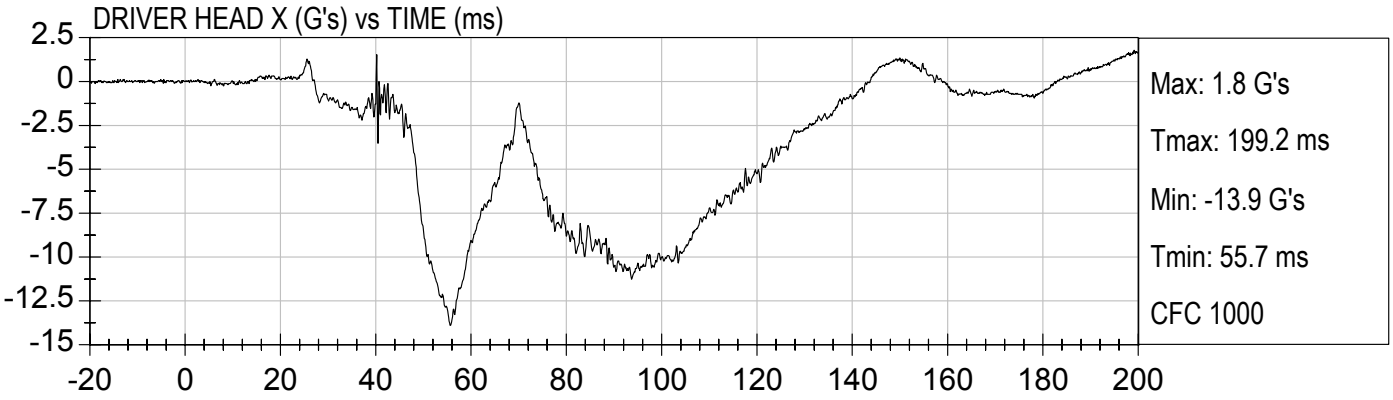
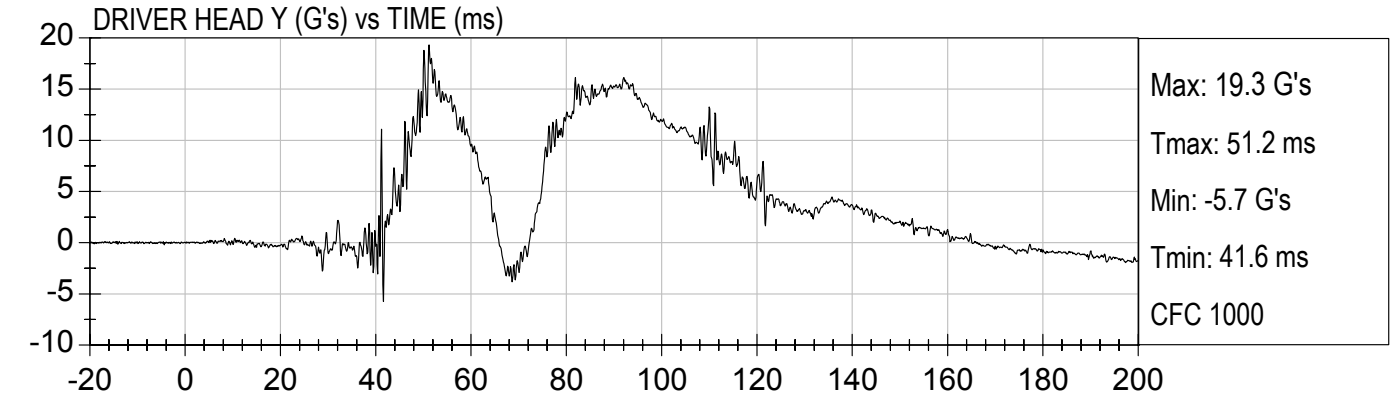
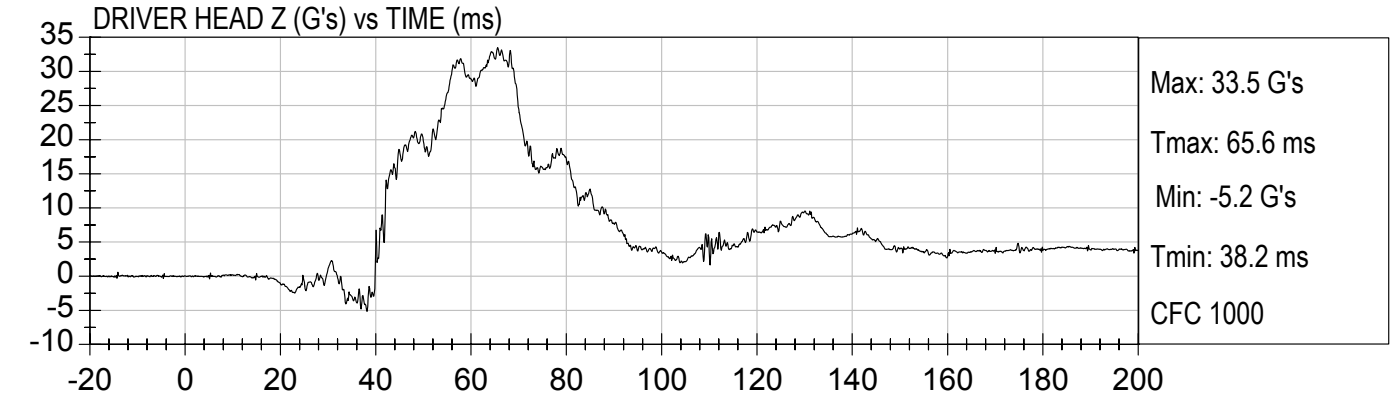
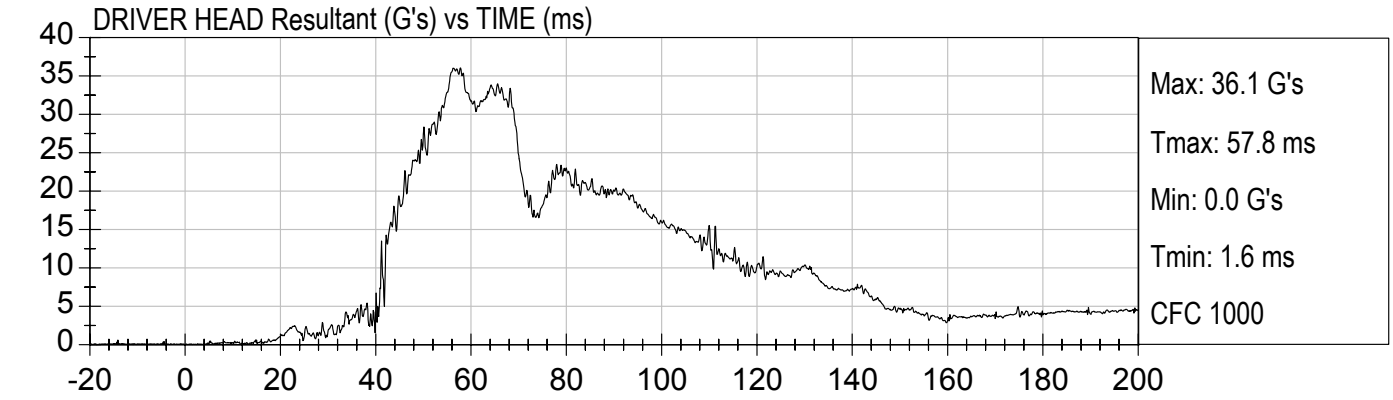
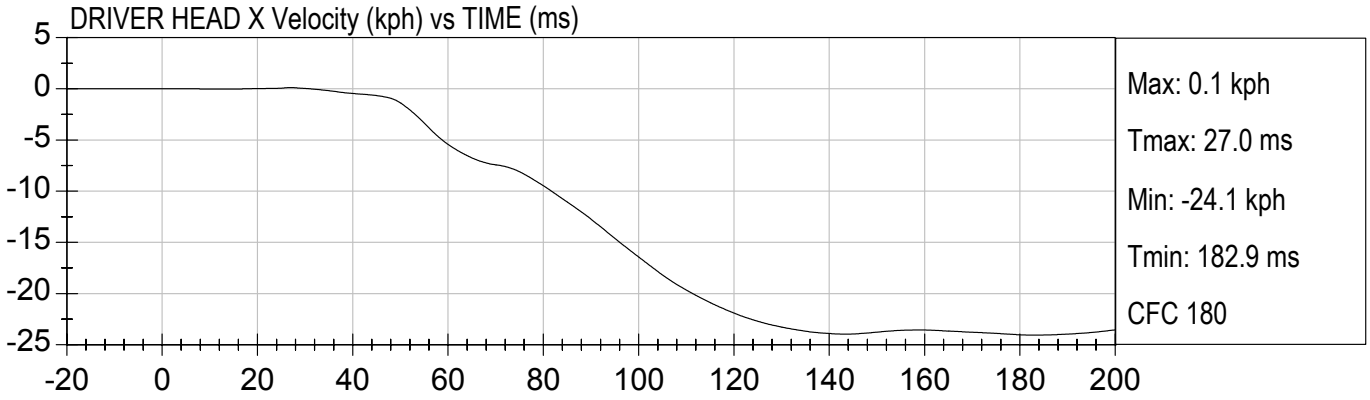
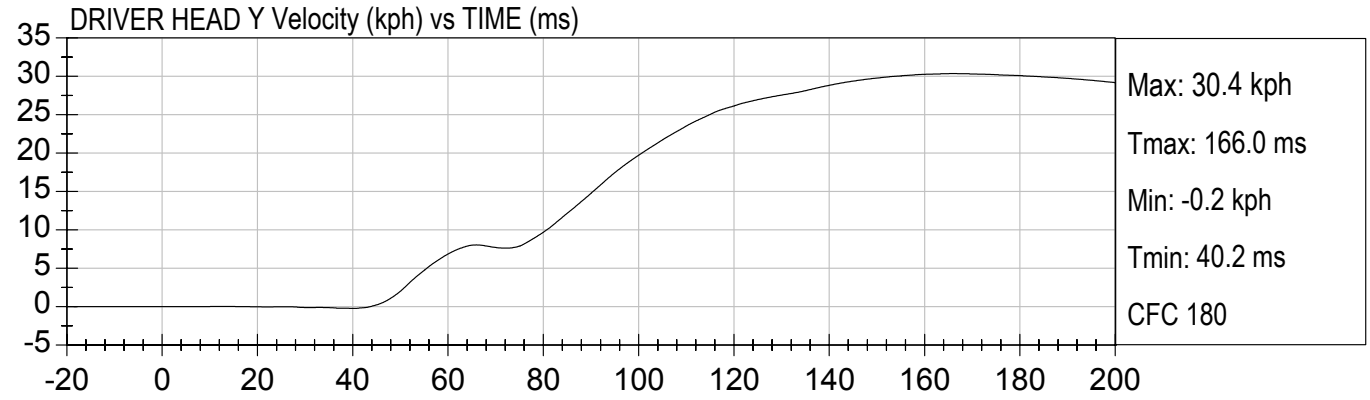


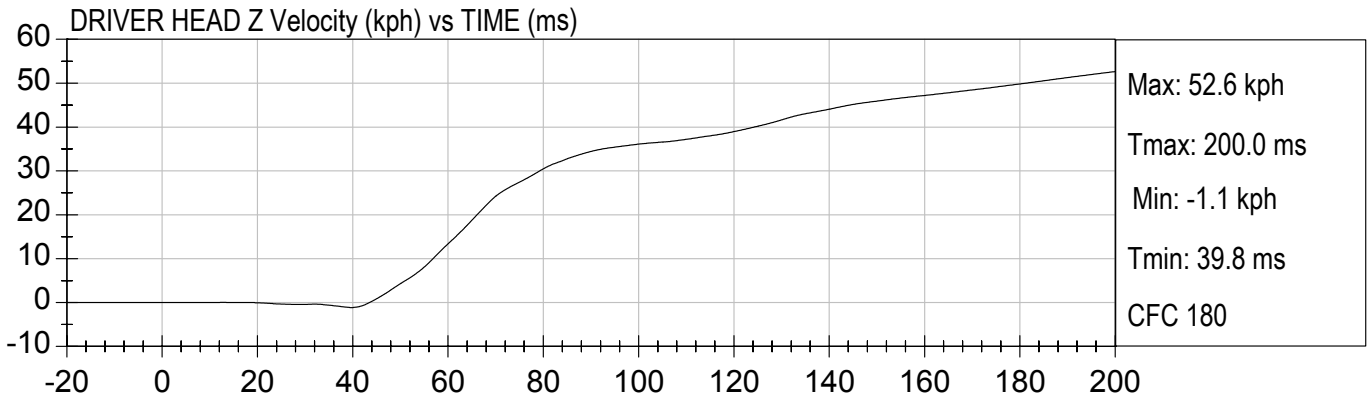







DRIVER HEAD X Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.1 kph
Tmax: 27.0 ms
Min: -24.1 kph
Tmin: 182.9 ms
CFC 180


DRIVER HEAD Y Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 30.4 kph
Tmax: 166.0 ms
Min: -0.2 kph
Tmin: 40.2 ms
CFC 180


DRIVER HEAD Z Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 52.6 kph
Tmax: 200.0 ms
Min: -1.1 kph
Tmin: 39.8 ms
CFC 180

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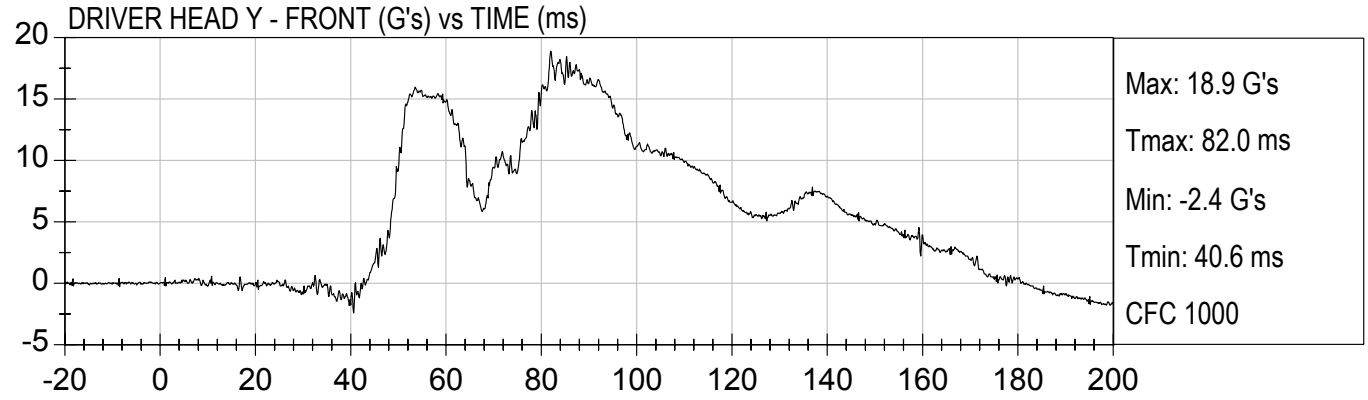

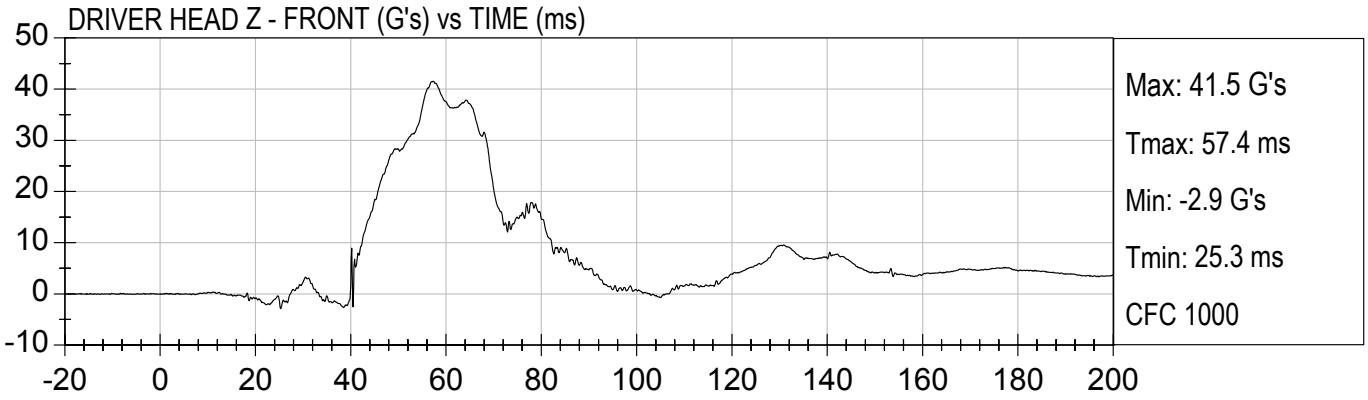

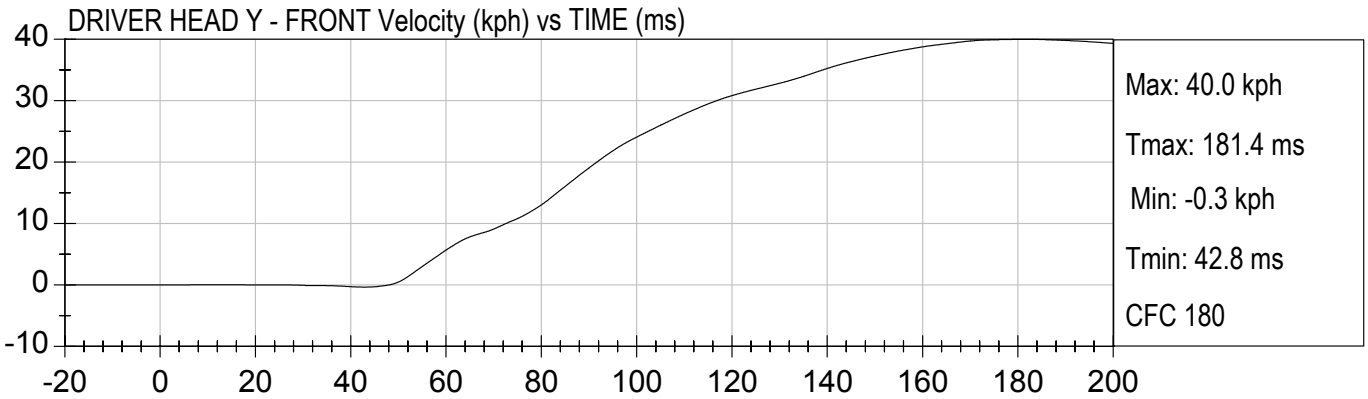

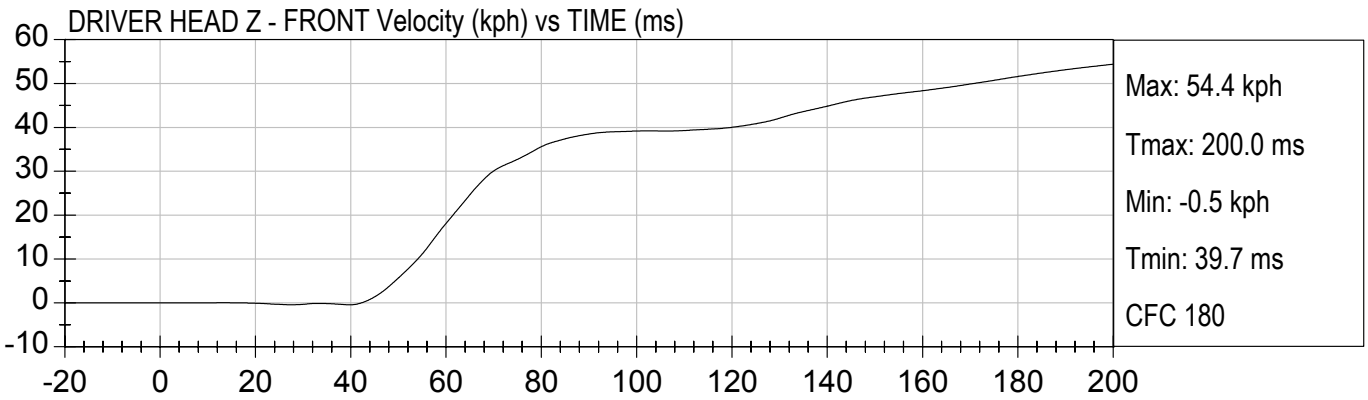

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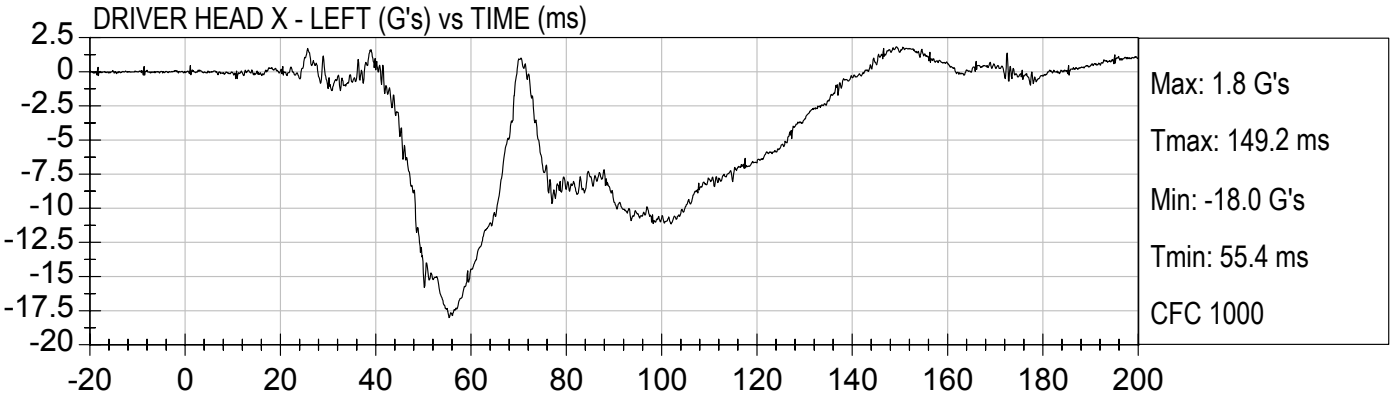

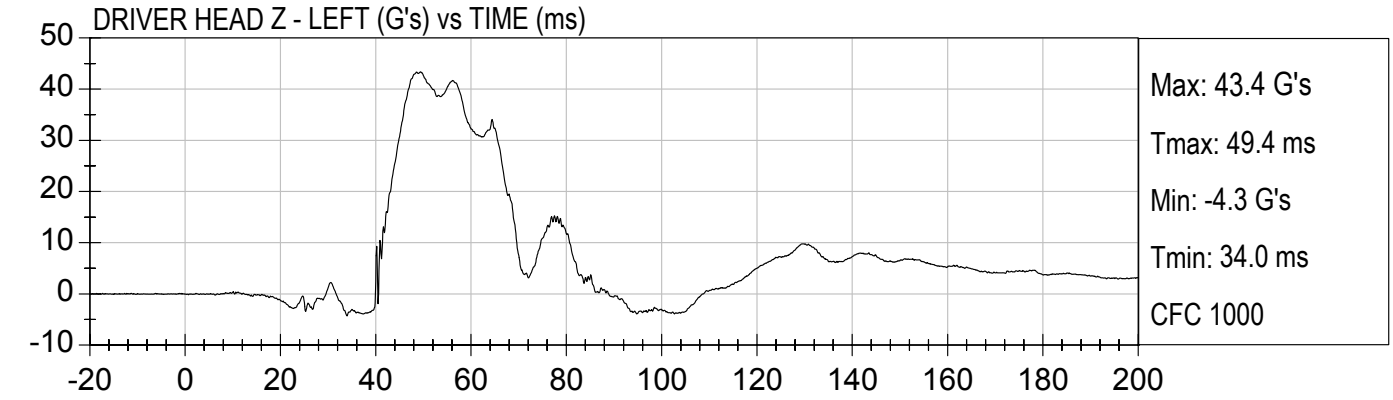

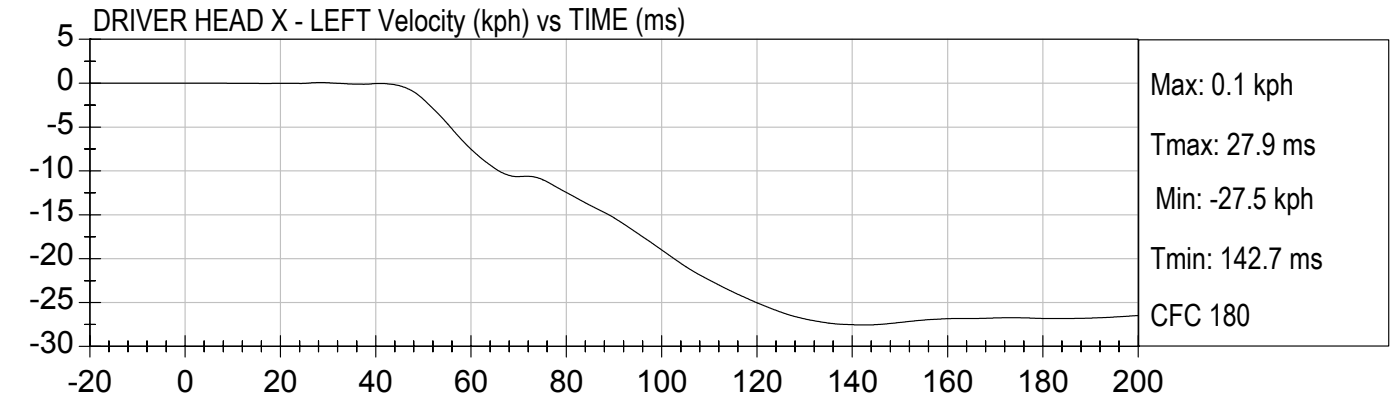

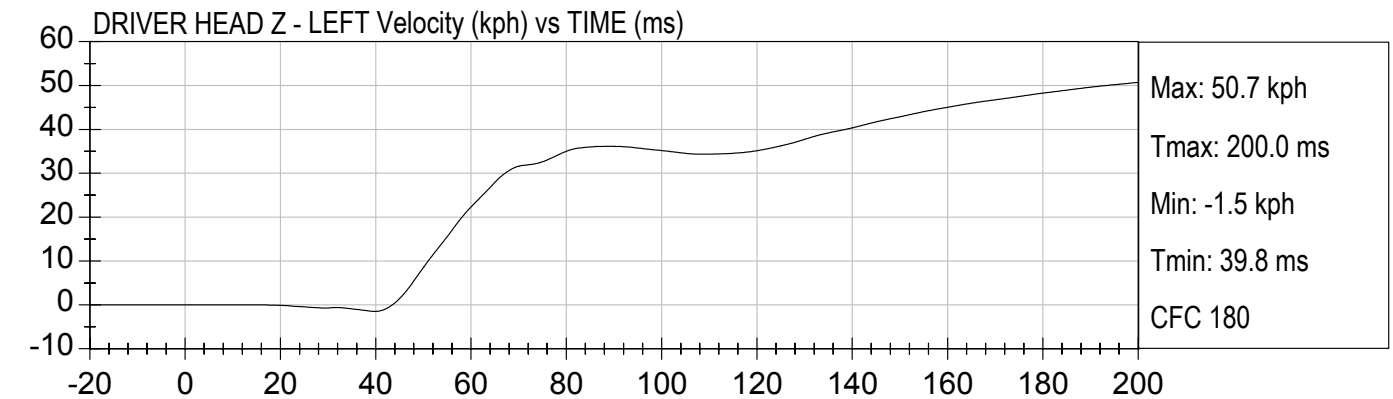

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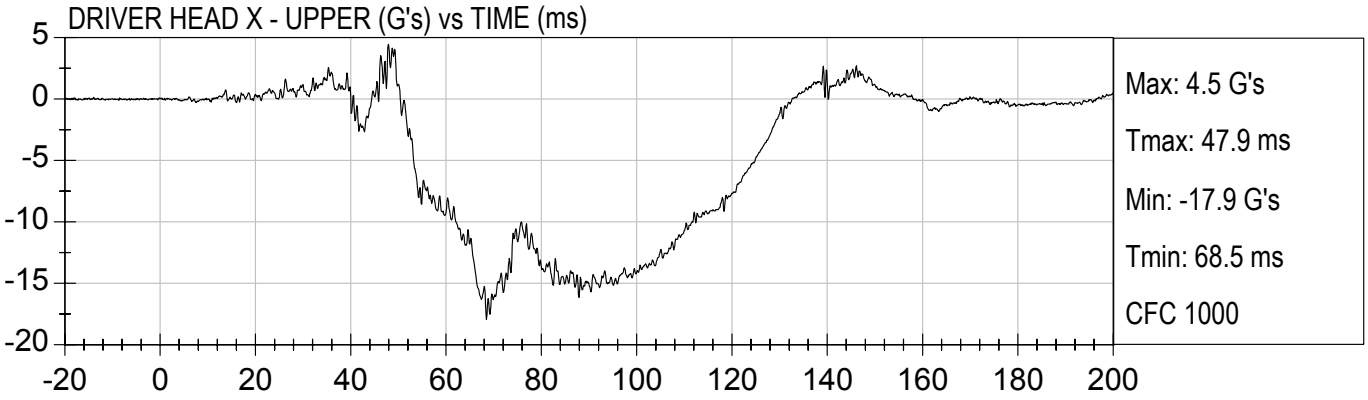

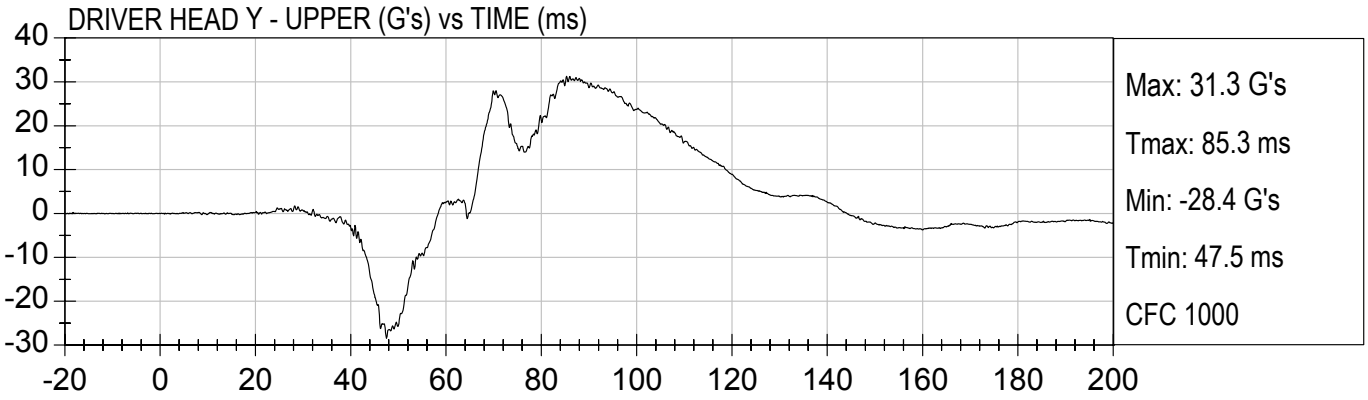

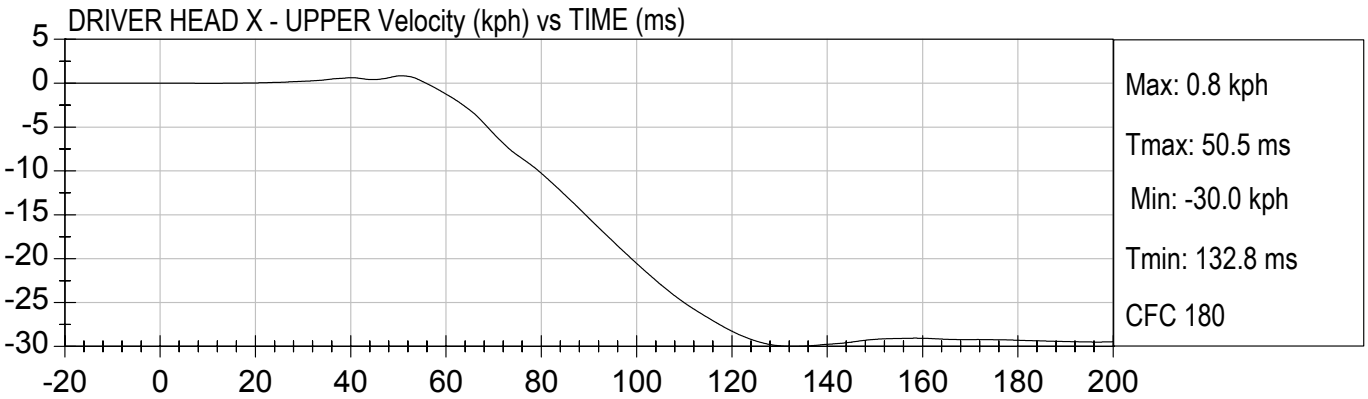

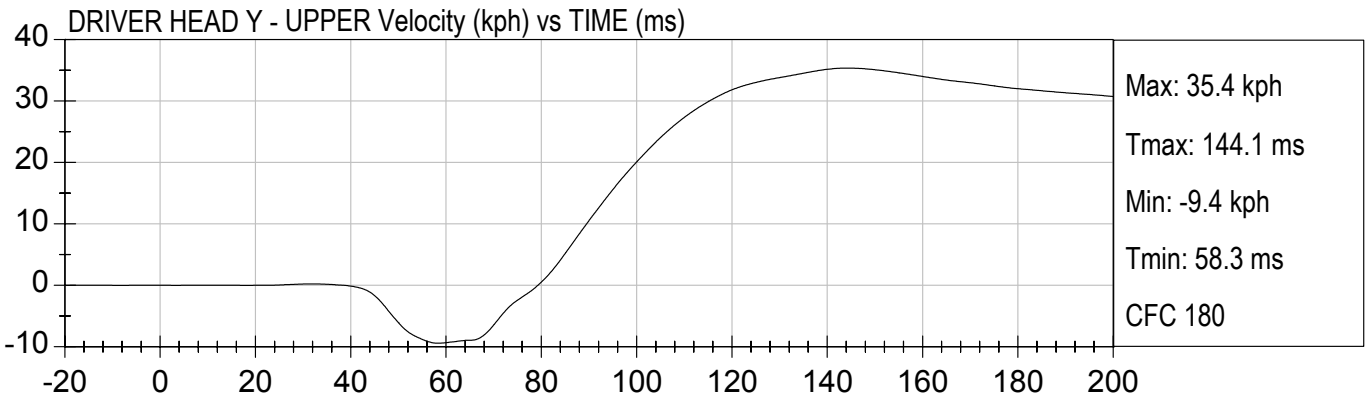

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FMVSS 214

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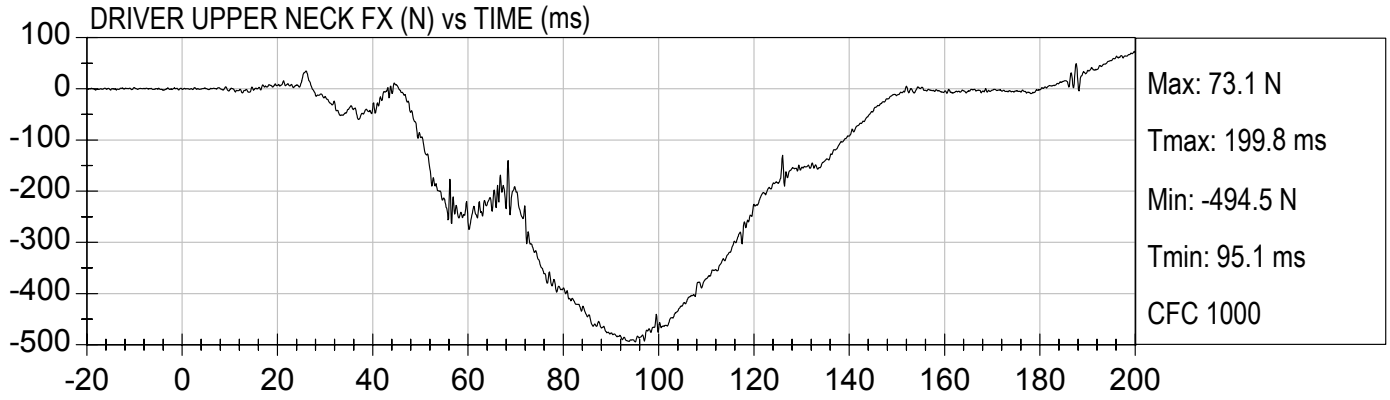

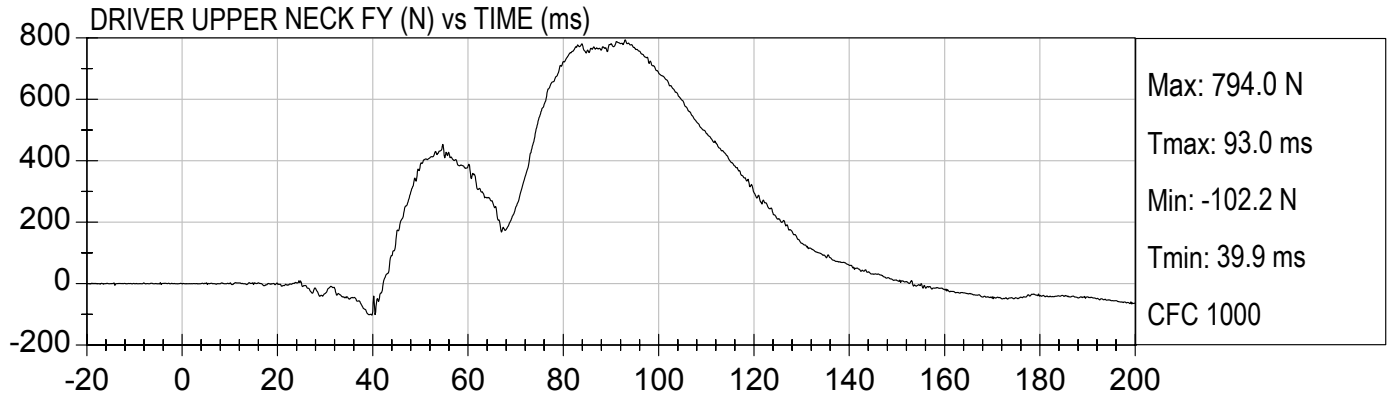

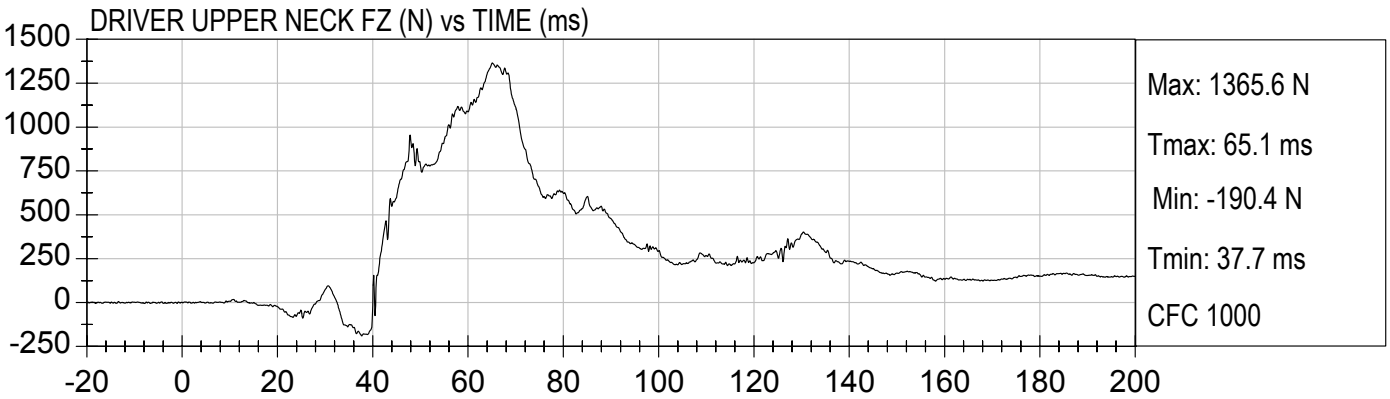

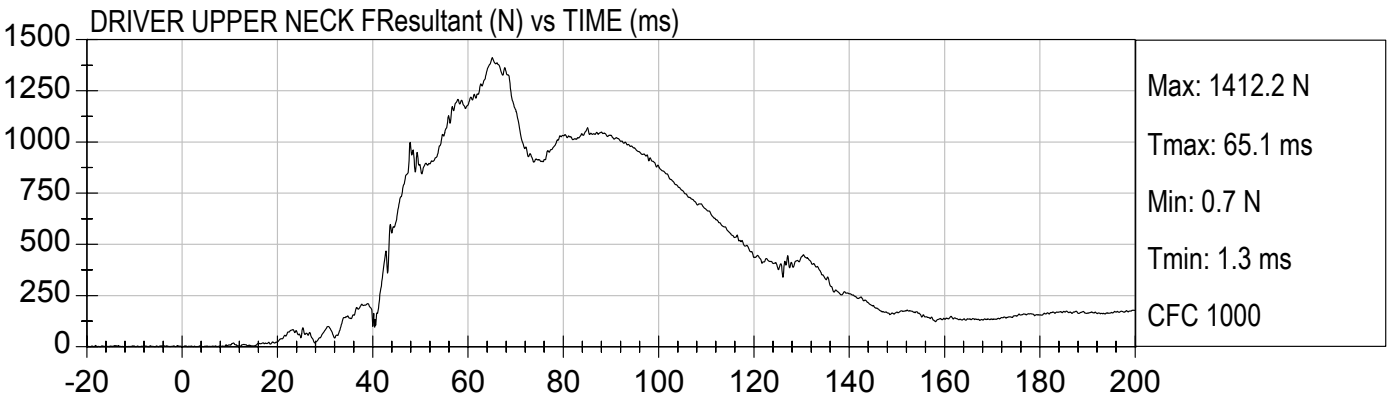

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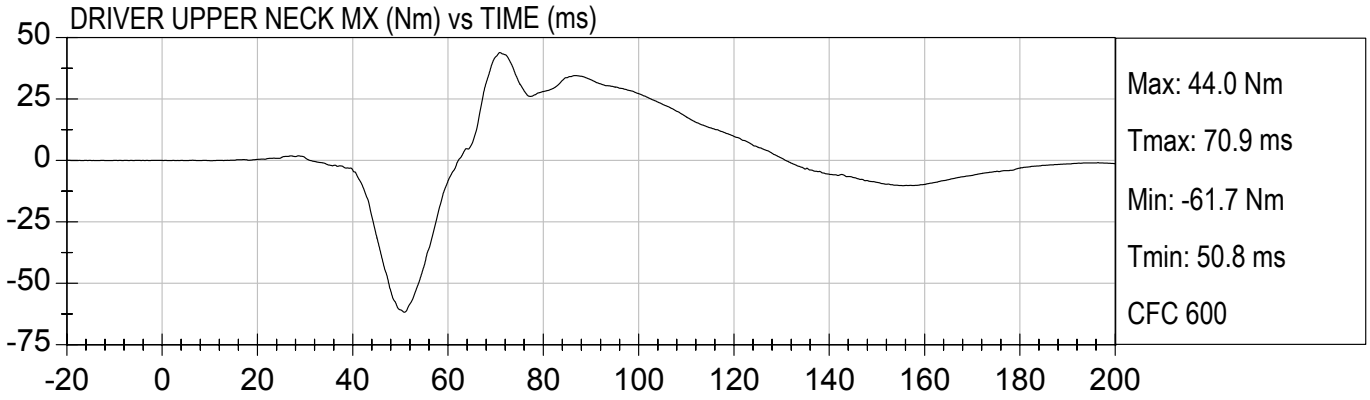
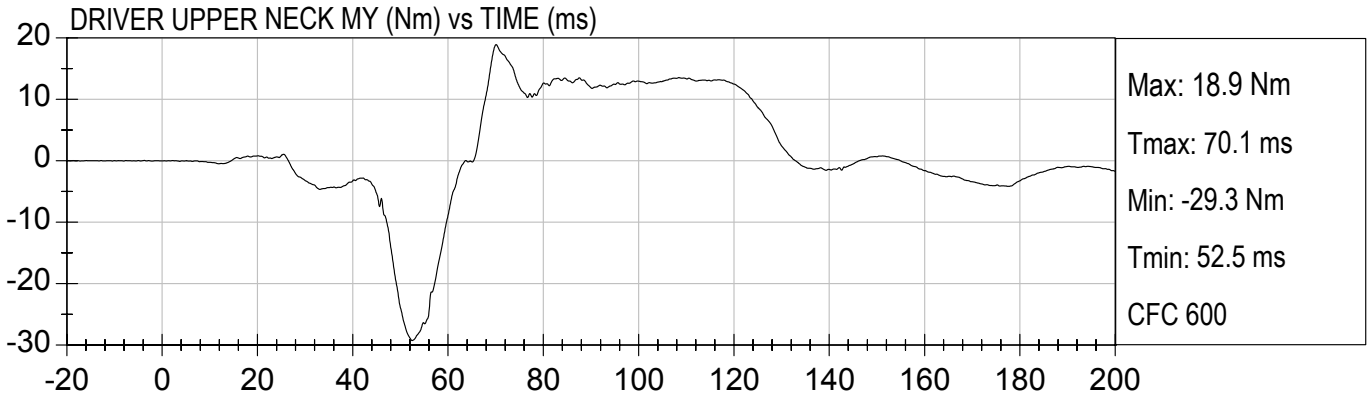
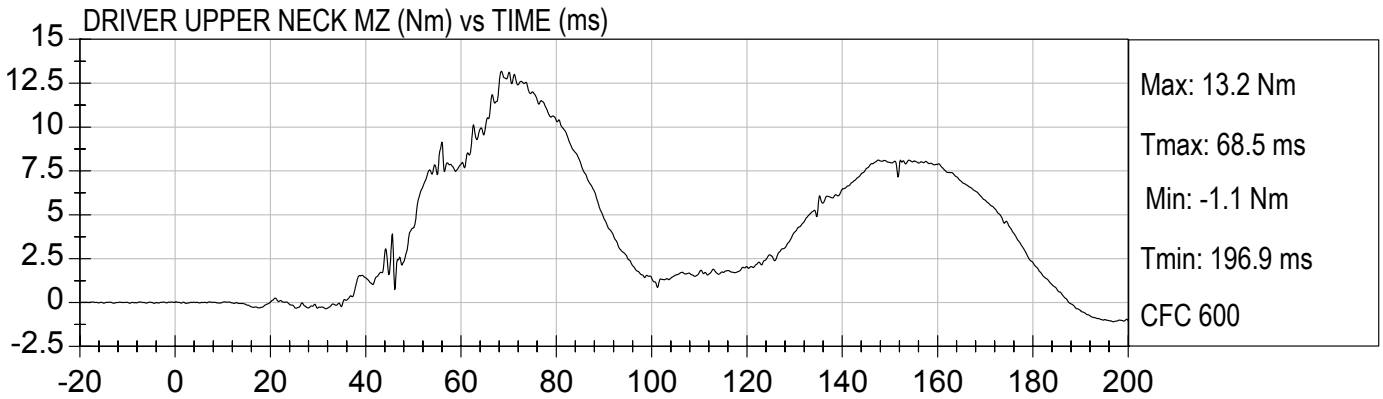
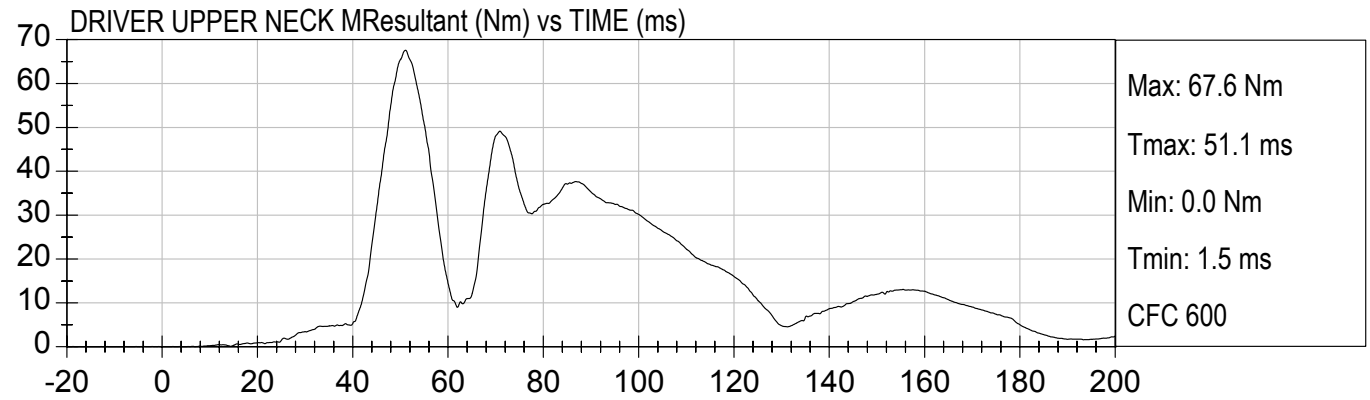


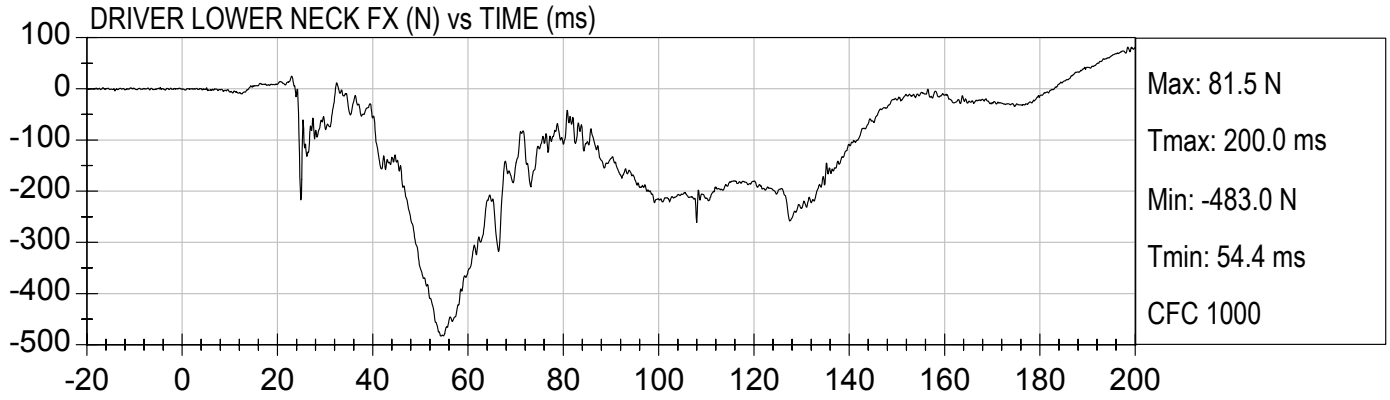


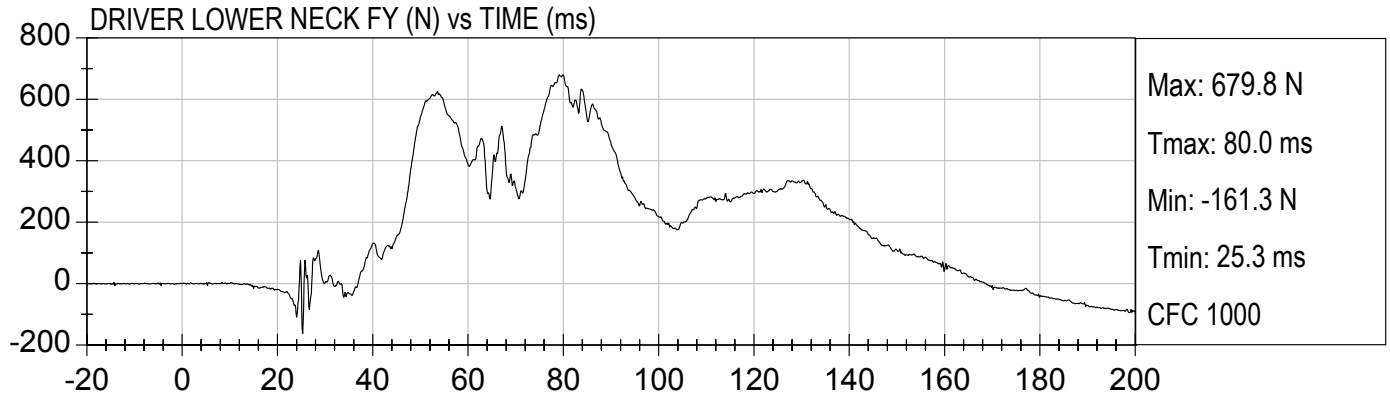


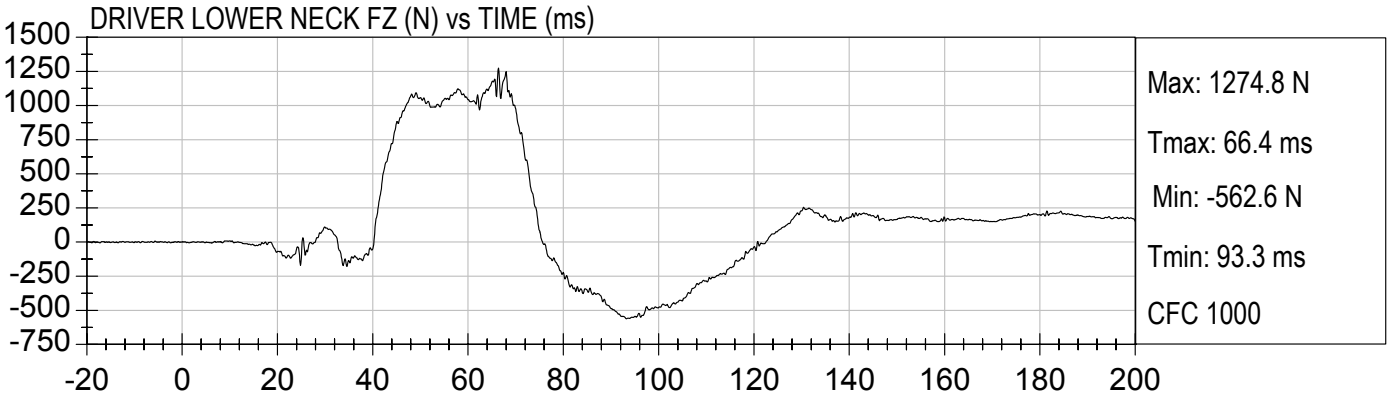


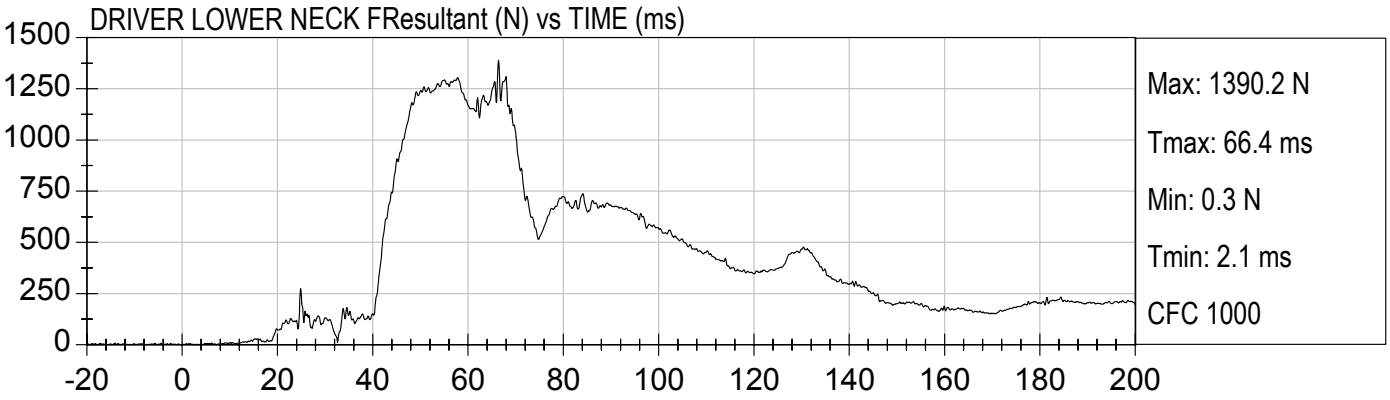
2001 FORD FOCUS
FMVSS 214

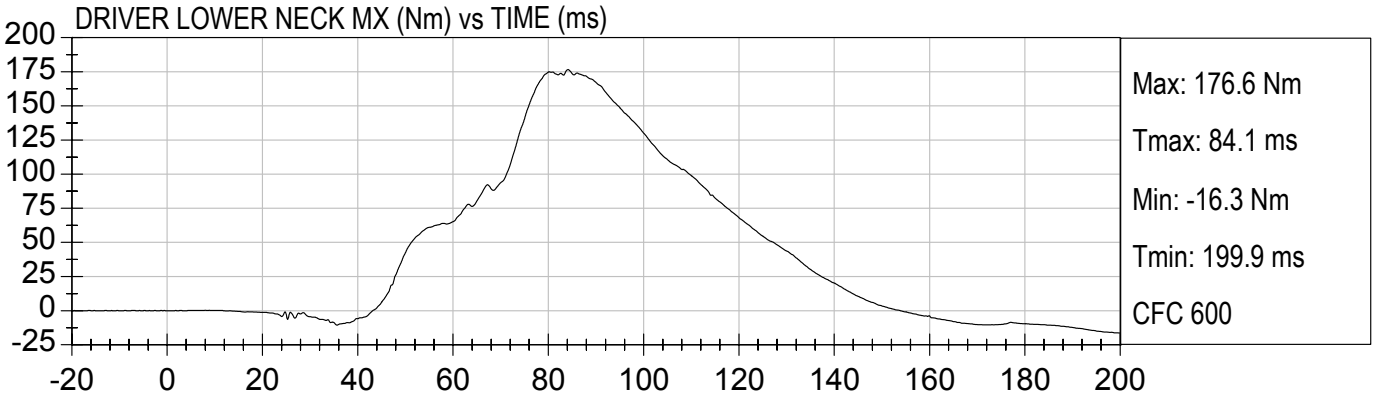
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

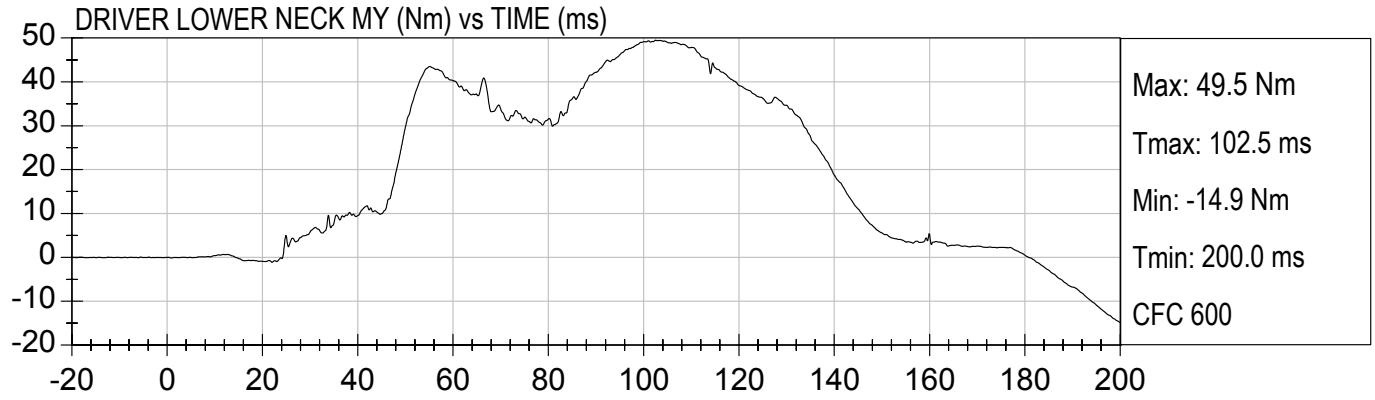






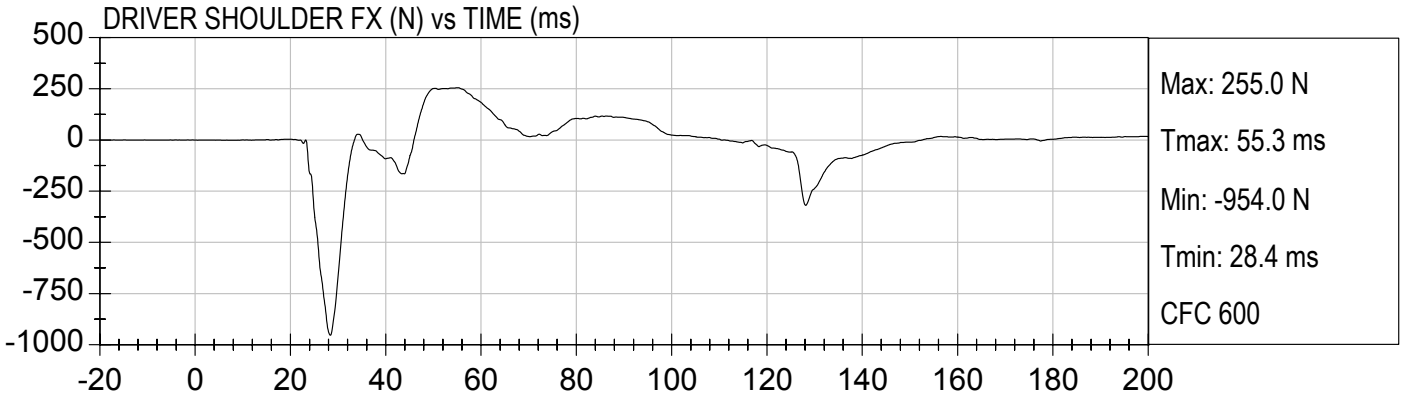


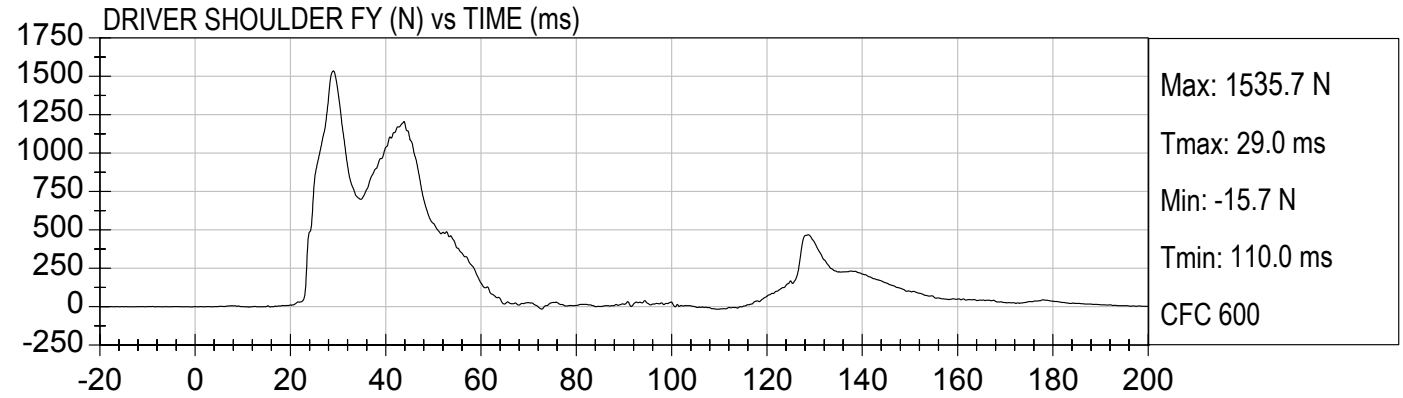

DRIVER LOWER NECK MX (Nm) vs TIME (ms)
200
175
150
125
100
75
50
25
0
-25
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 176.6 Nm
Tmax: 84.1 ms
Min: -16.3 Nm
Tmin: 199.9 ms
CFC 600

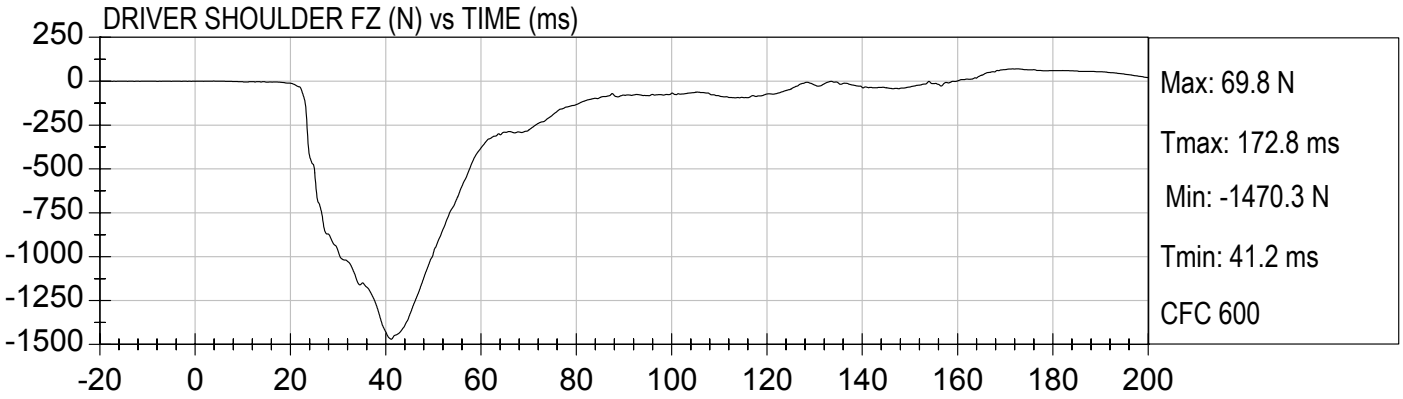

DRIVER LOWER NECK MY (Nm) vs TIME (ms)
50
40
30
20
10
0
-10
-20
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 49.5 Nm
Tmax: 102.5 ms
Min: -14.9 Nm
Tmin: 200.0 ms
CFC 600

2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

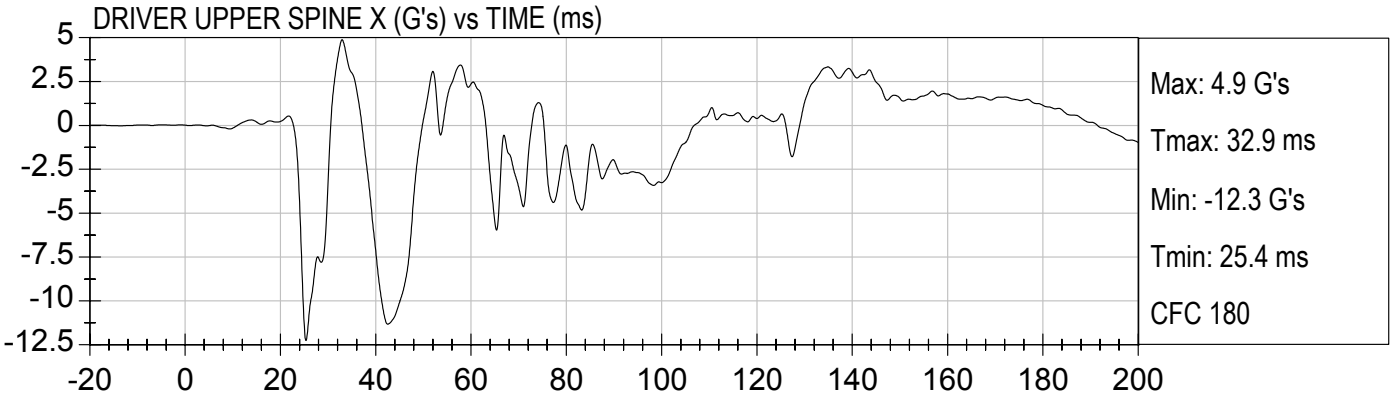


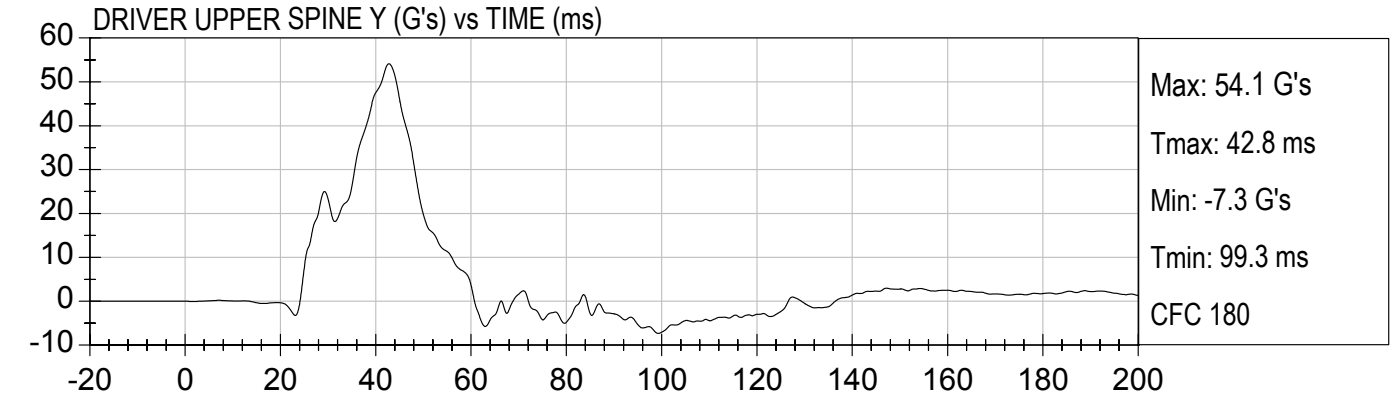


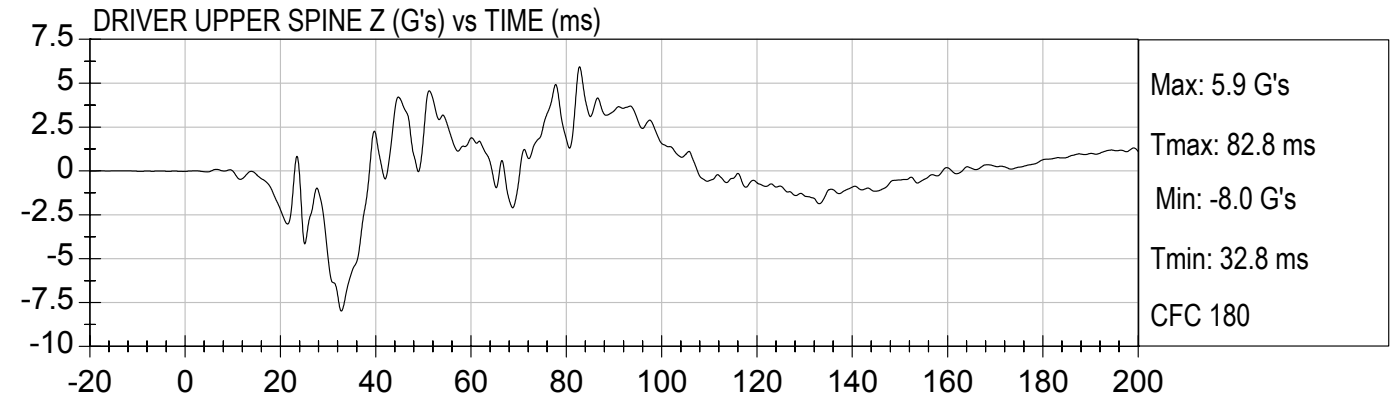


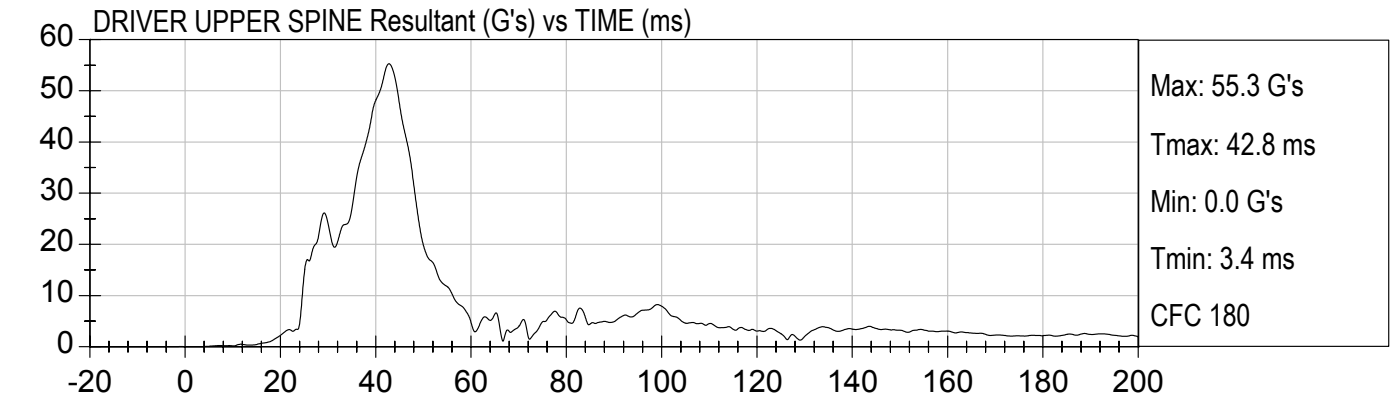
2001 FORD FOCUS
FMVSS 214

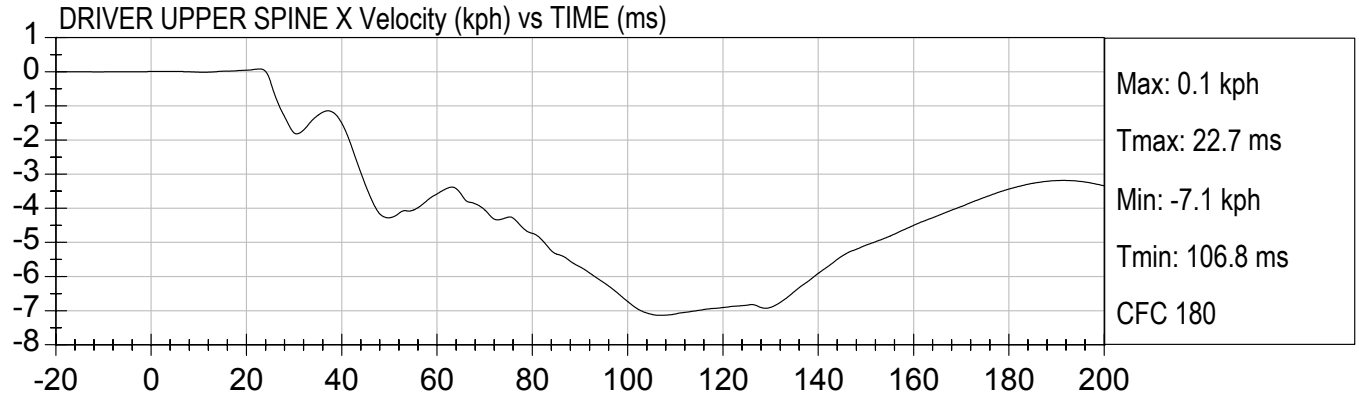
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

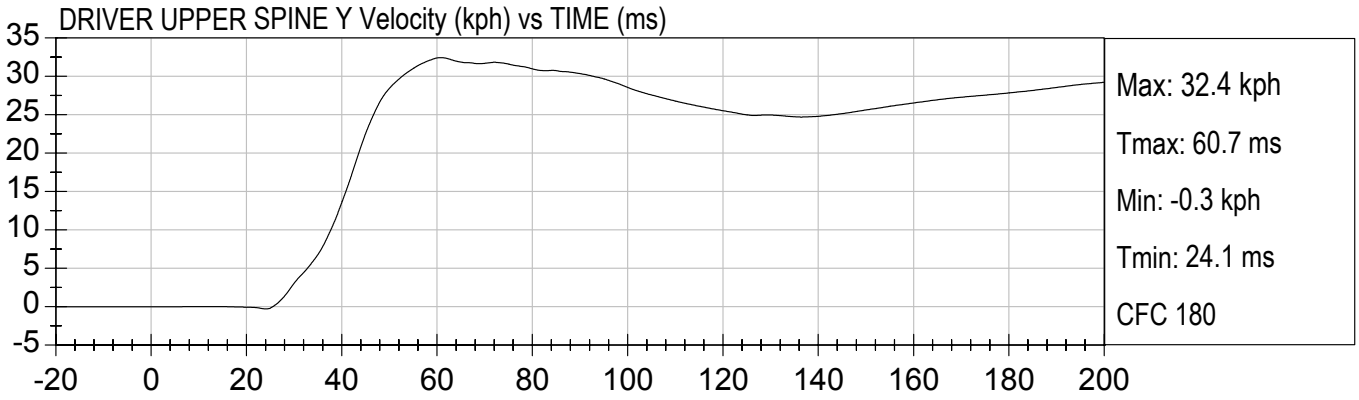


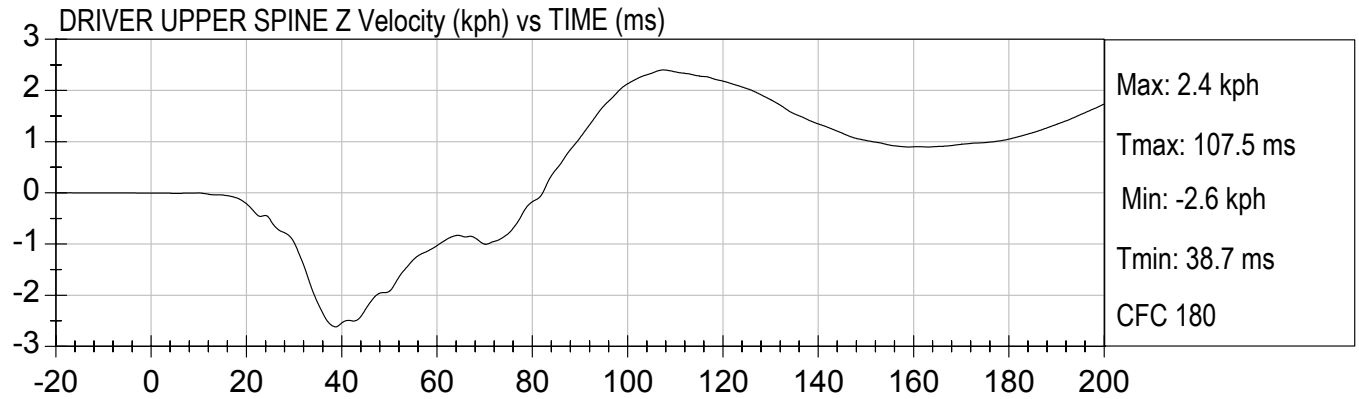


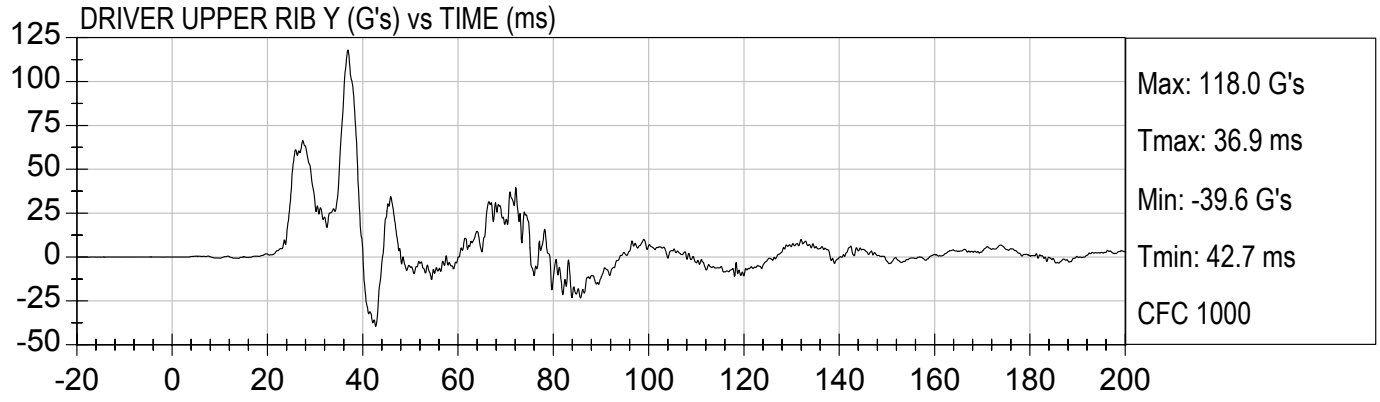


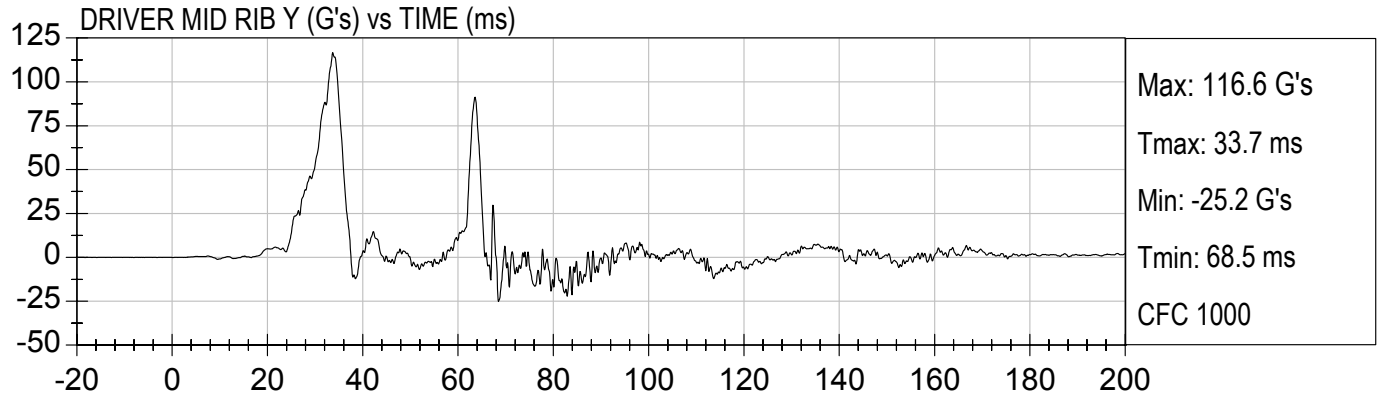


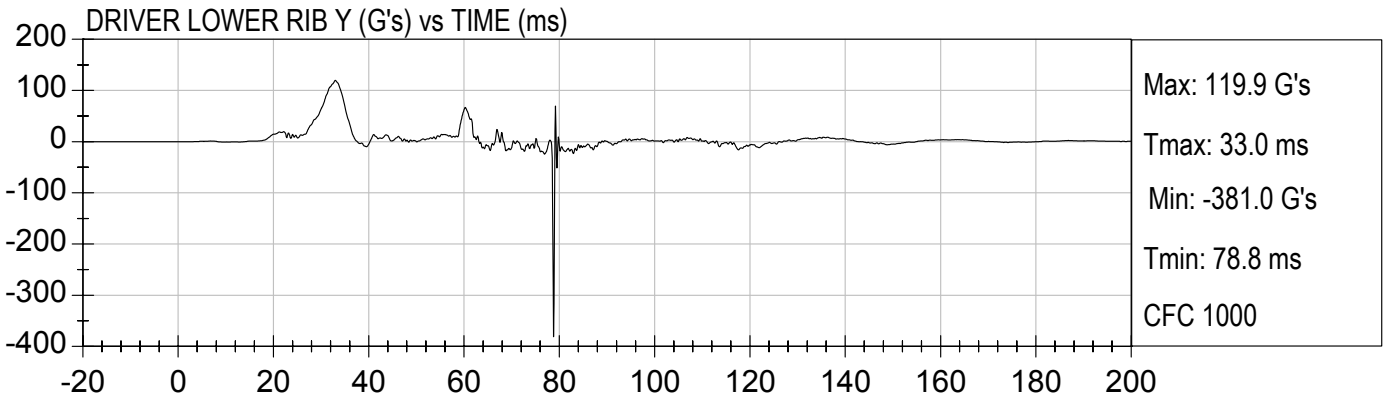

DRIVER UPPER SPINE X Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.1 kph
Tmax: 22.7 ms
Min: -7.1 kph
Tmin: 106.8 ms
CFC 180


DRIVER UPPER SPINE Y Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 32.4 kph
Tmax: 60.7 ms
Min: -0.3 kph
Tmin: 24.1 ms
CFC 180


DRIVER UPPER SPINE Z Velocity (kph) vs TIME (ms)
3
2
1
0
-1
-2
-3
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 2.4 kph
Tmax: 107.5 ms
Min: -2.6 kph
Tmin: 38.7 ms
CFC 180


DRIVER UPPER RIB Y (G's) vs TIME (ms)
125
100
75
50
25
0
-25
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 118.0 G's
Tmax: 36.9 ms
Min: -39.6 G's
Tmin: 42.7 ms
CFC 1000


DRIVER MID RIB Y (G's) vs TIME (ms)
125
100
75
50
25
0
-25
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 116.6 G's
Tmax: 33.7 ms
Min: -25.2 G's
Tmin: 68.5 ms
CFC 1000


DRIVER LOWER RIB Y (G's) vs TIME (ms)
200
100
0
-100
-200
-300
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 119.9 G's
Tmax: 33.0 ms
Min: -381.0 G's
Tmin: 78.8 ms
CFC 1000

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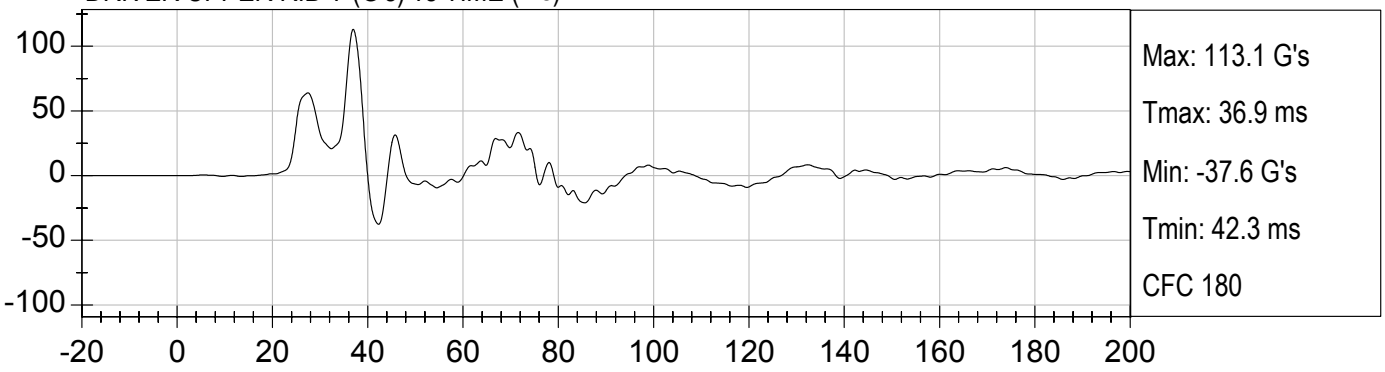
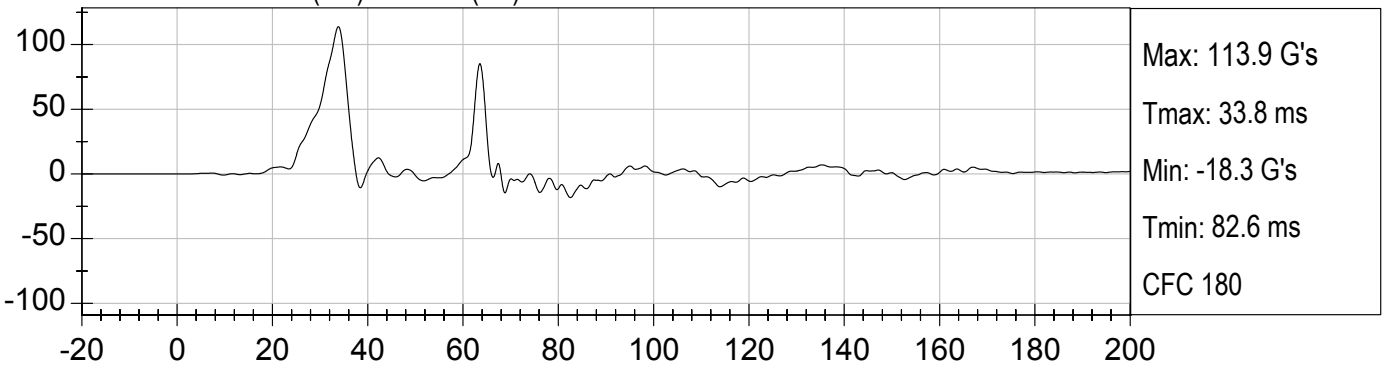
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

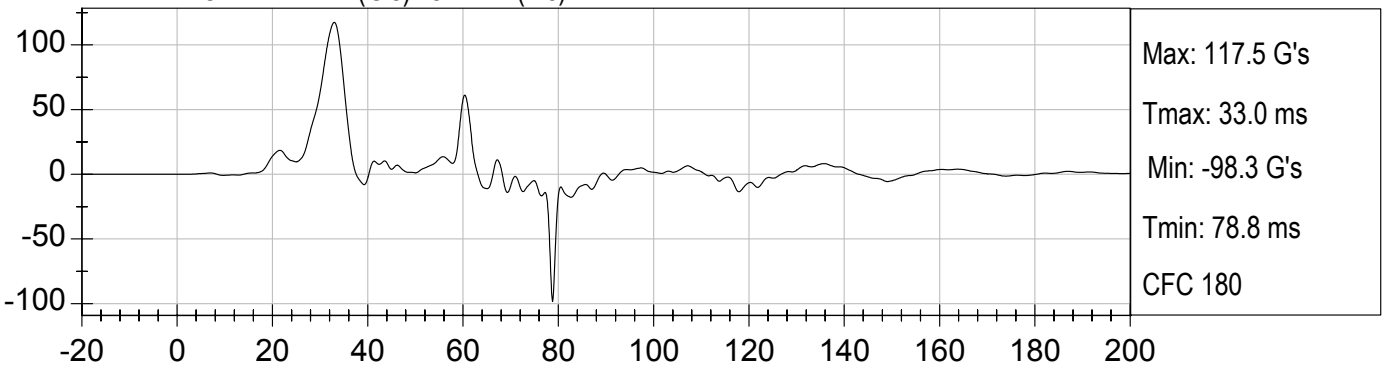
DRIVER UPPER RIB Y (G's) vs TIME (ms)

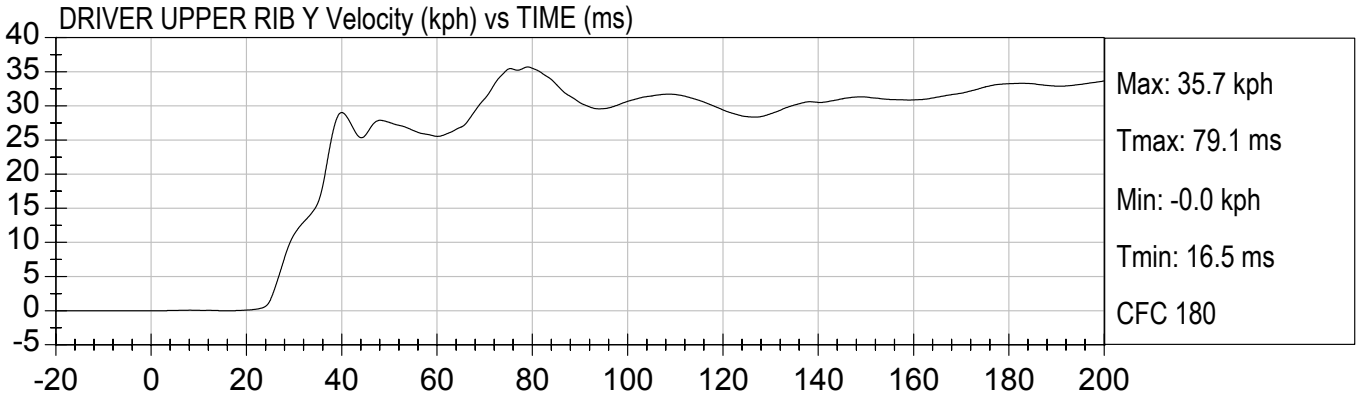


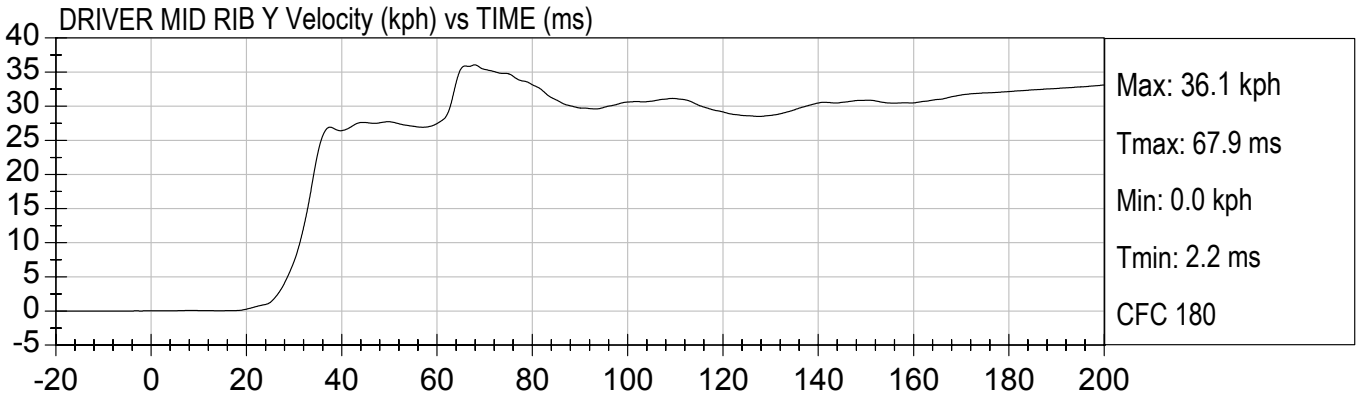
DRIVER MID RIB Y (G's) vs TIME (ms)

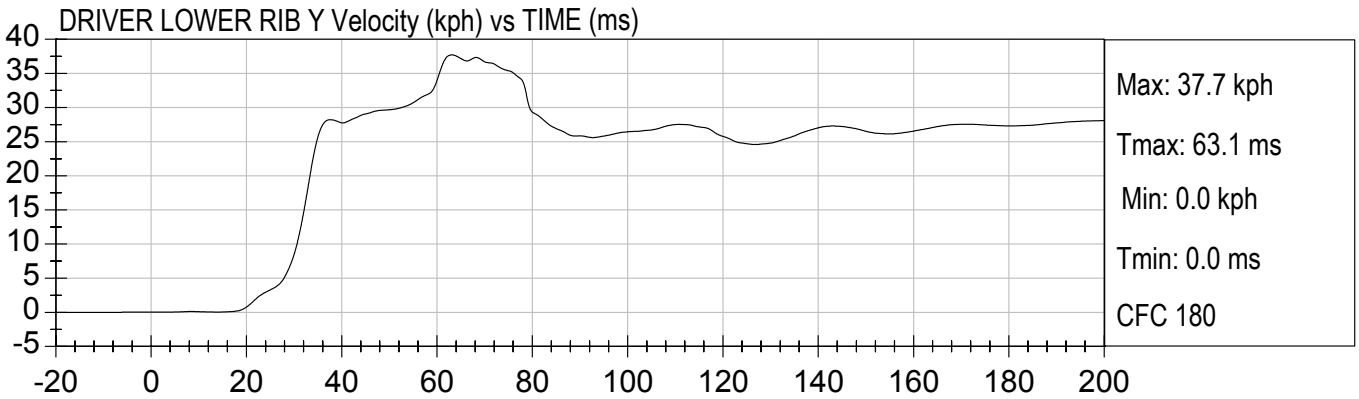


DRIVER LOWER RIB Y (G's) vs TIME (ms)

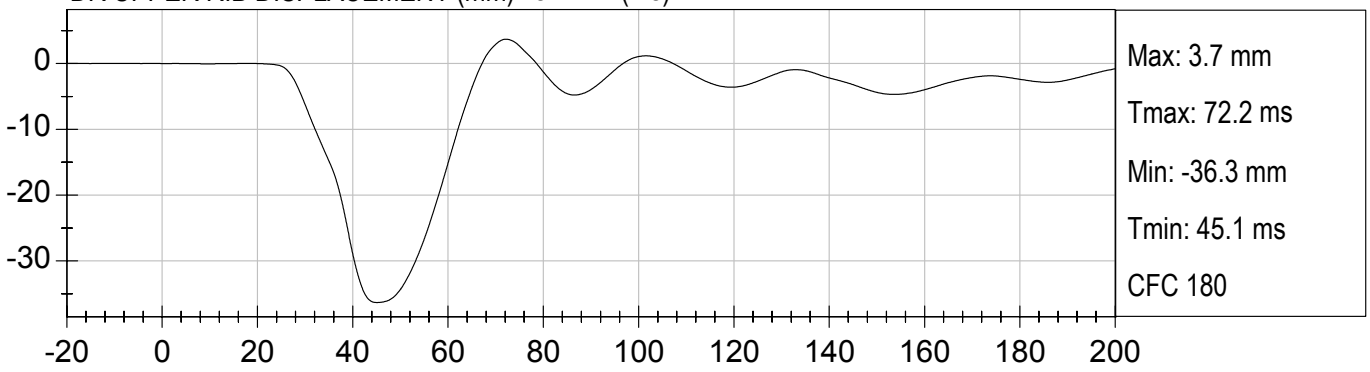



DRIVER UPPER RIB Y Velocity (kph) vs TIME (ms)
40
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 35.7 kph
Tmax: 79.1 ms
Min: -0.0 kph
Tmin: 16.5 ms
CFC 180

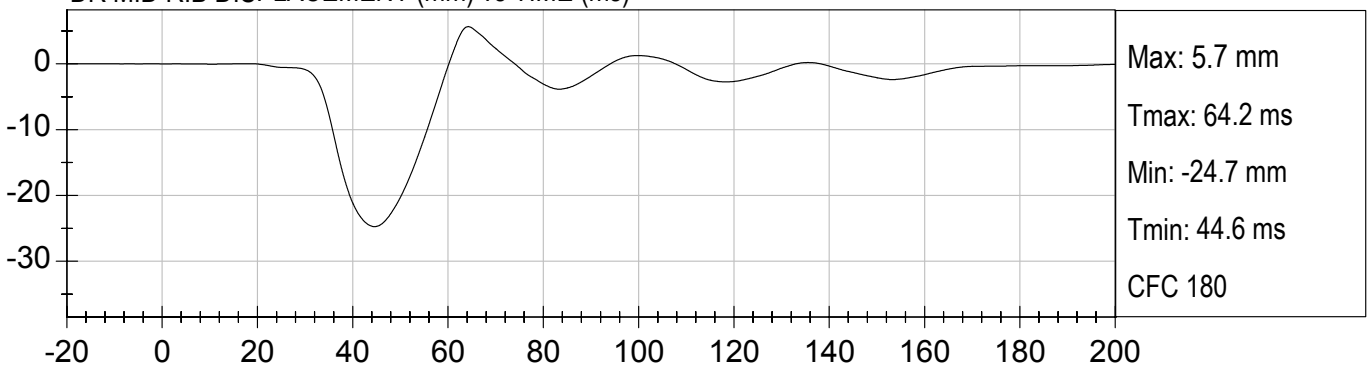

DRIVER MID RIB Y Velocity (kph) vs TIME (ms)
40
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 36.1 kph
Tmax: 67.9 ms
Min: 0.0 kph
Tmin: 2.2 ms
CFC 180


DRIVER LOWER RIB Y Velocity (kph) vs TIME (ms)
40
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 37.7 kph
Tmax: 63.1 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

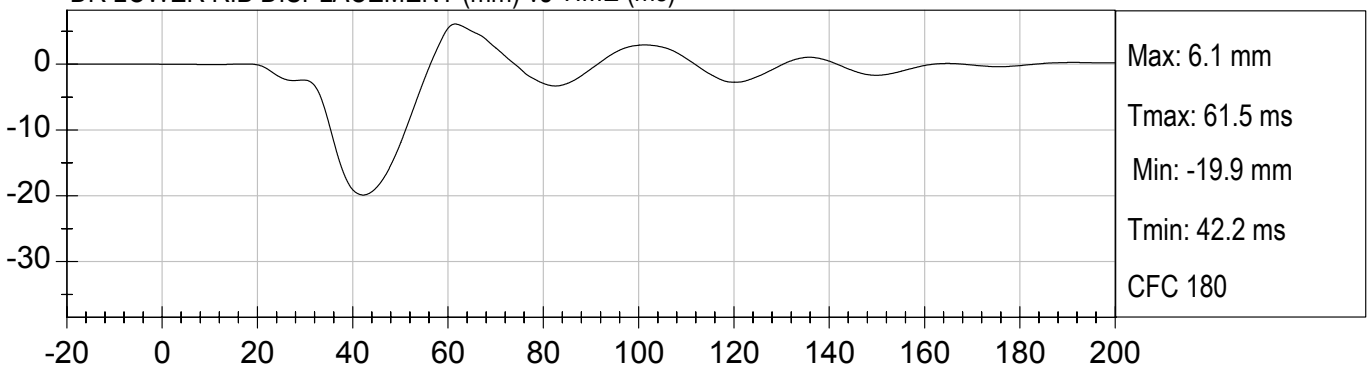
DR UPPER RIB DISPLACEMENT (mm) vs TIME (ms)

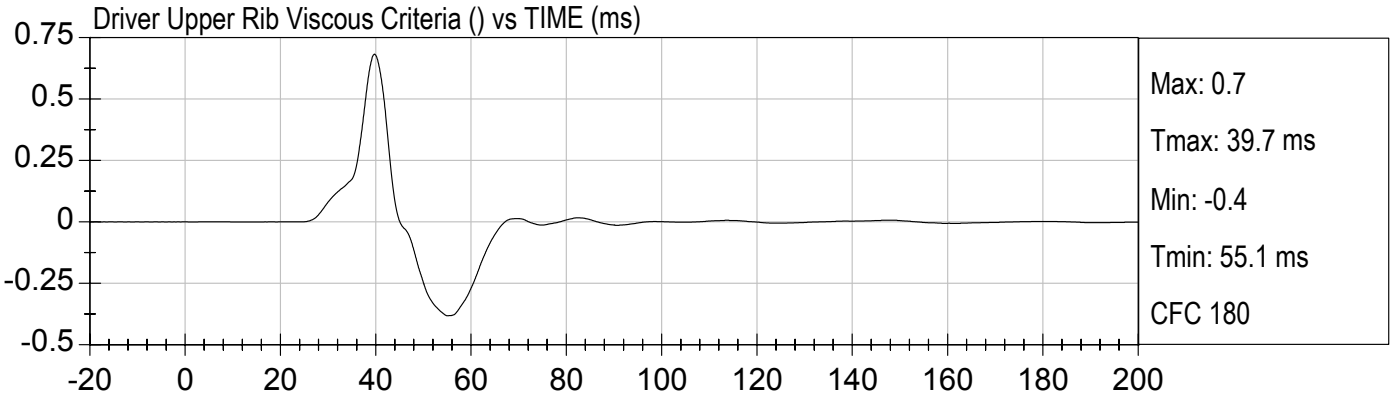


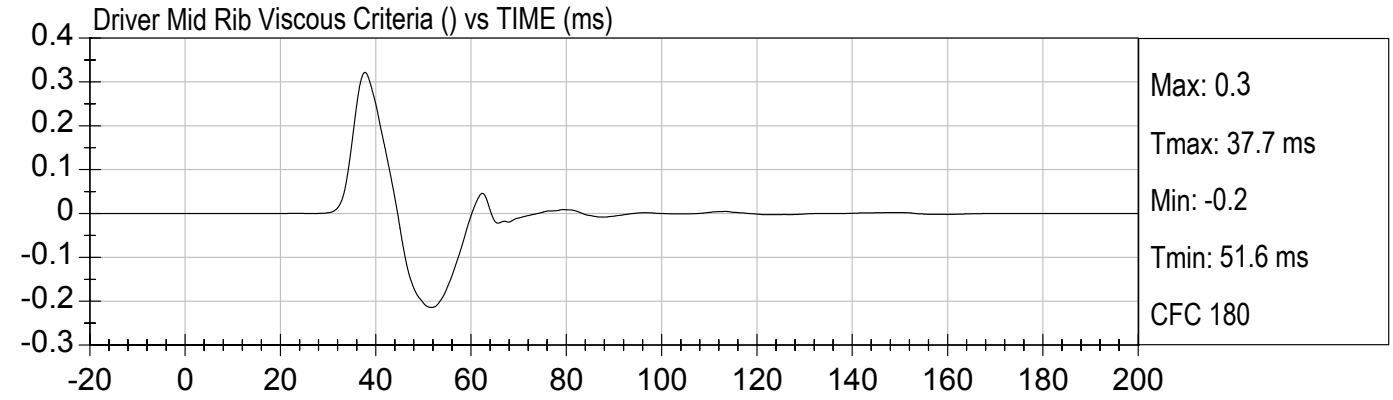
DR MID RIB DISPLACEMENT (mm) vs TIME (ms)

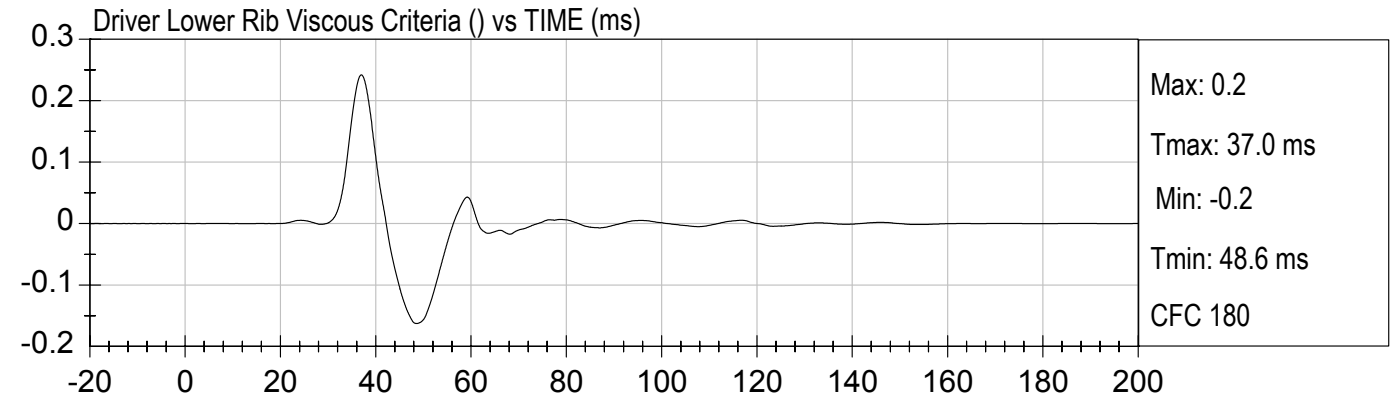


DR LOWER RIB DISPLACEMENT (mm) vs TIME (ms)




Driver Upper Rib Viscous Criteria () vs TIME (ms)
0.75
0.5
0.25
0
-0.25
-0.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.7
Tmax: 39.7 ms
Min: -0.4
Tmin: 55.1 ms
CFC 180


Driver Mid Rib Viscous Criteria () vs TIME (ms)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.3
Tmax: 37.7 ms
Min: -0.2
Tmin: 51.6 ms
CFC 180


Driver Lower Rib Viscous Criteria () vs TIME (ms)
0.3
0.2
0.1
0
-0.1
-0.2
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.2
Tmax: 37.0 ms
Min: -0.2
Tmin: 48.6 ms
CFC 180

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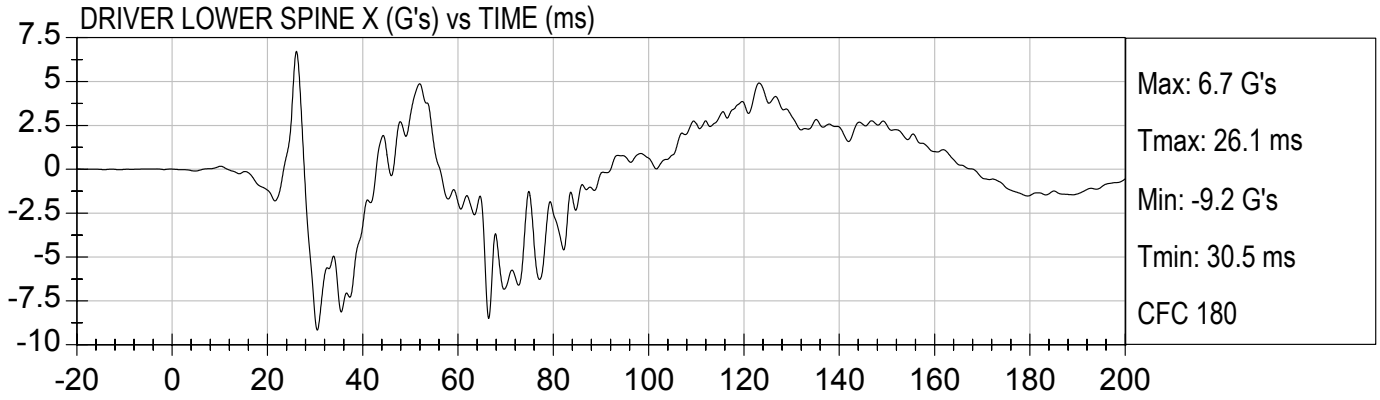
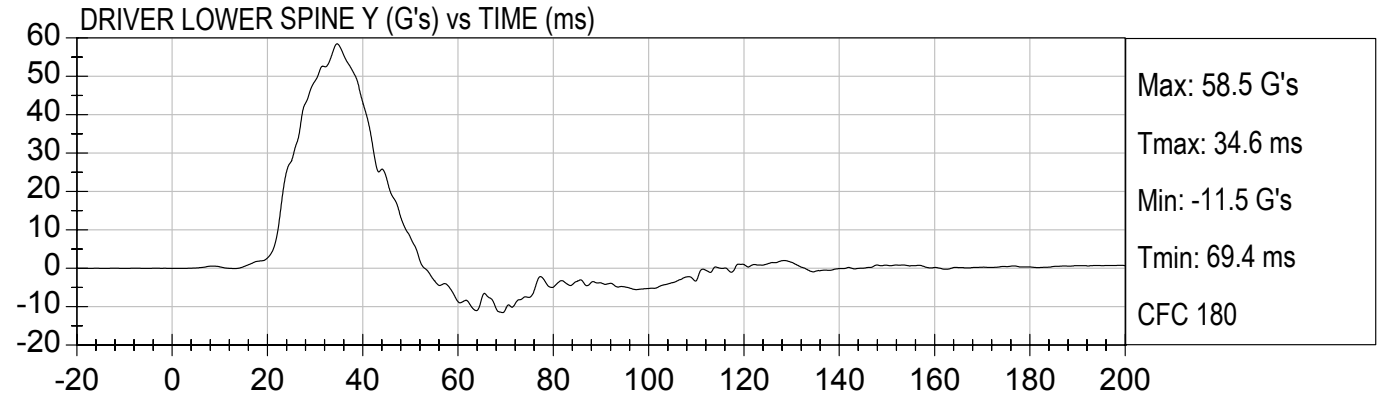
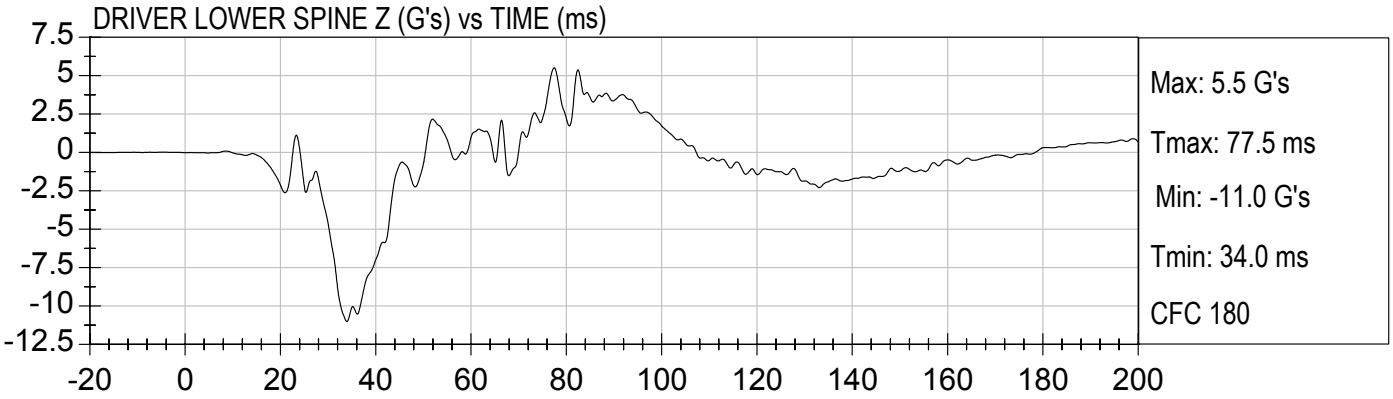
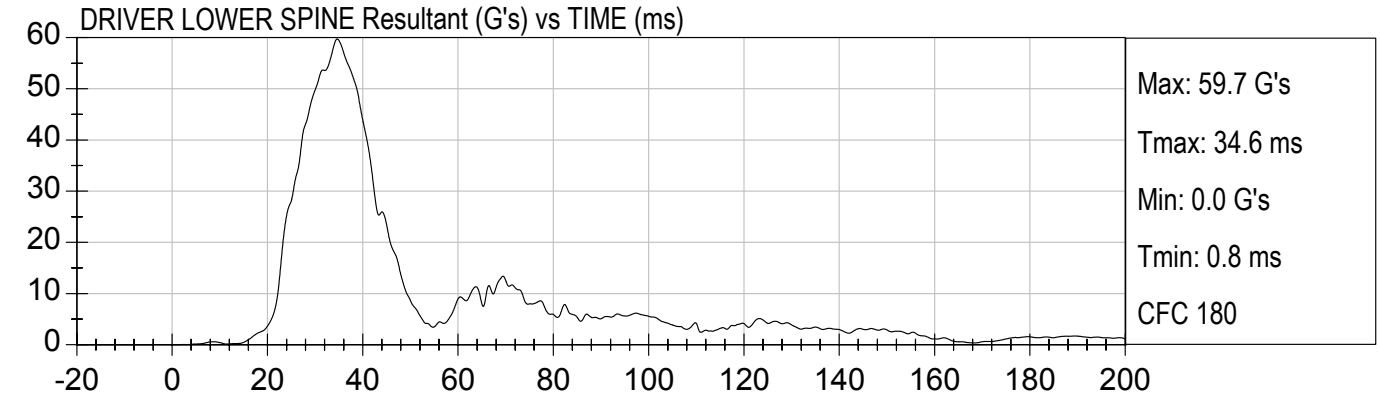
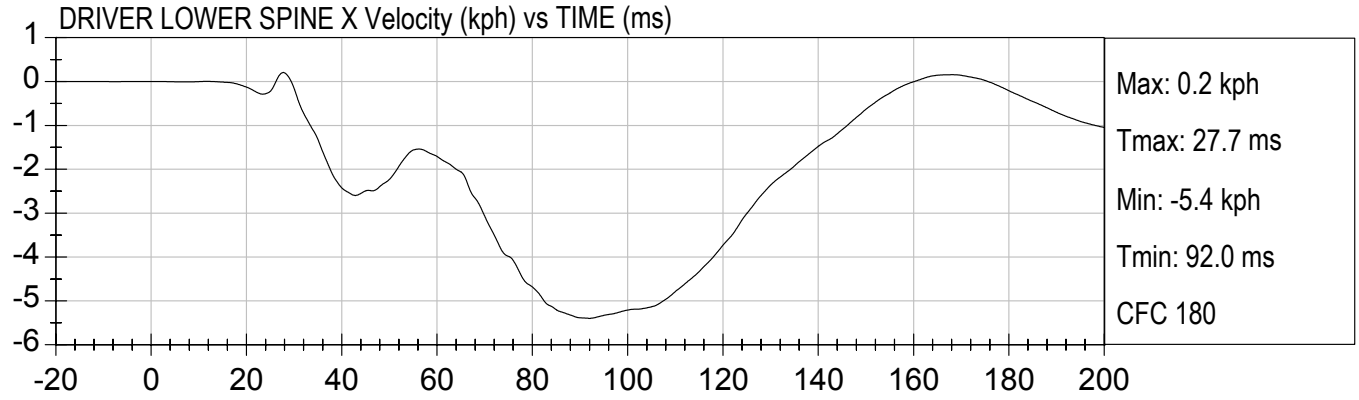
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

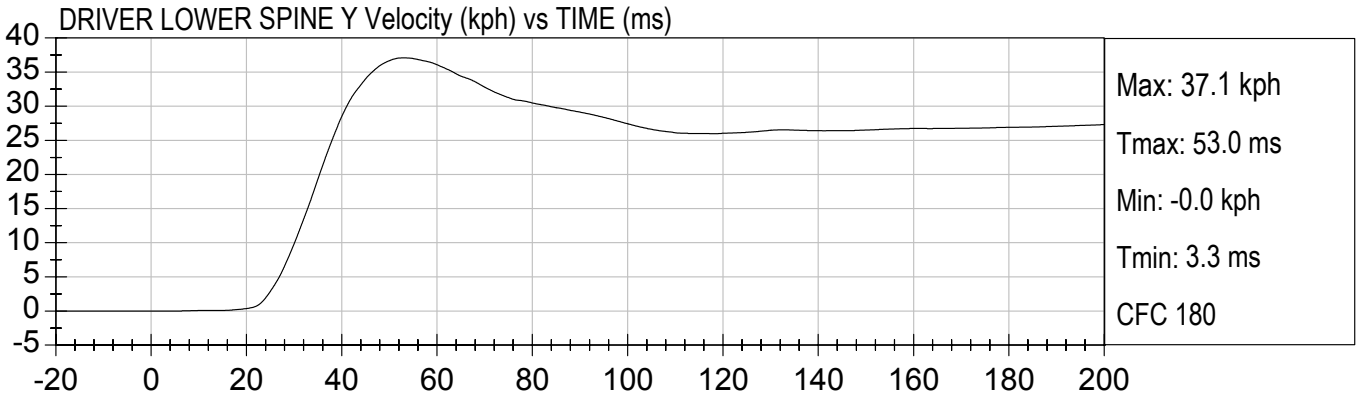


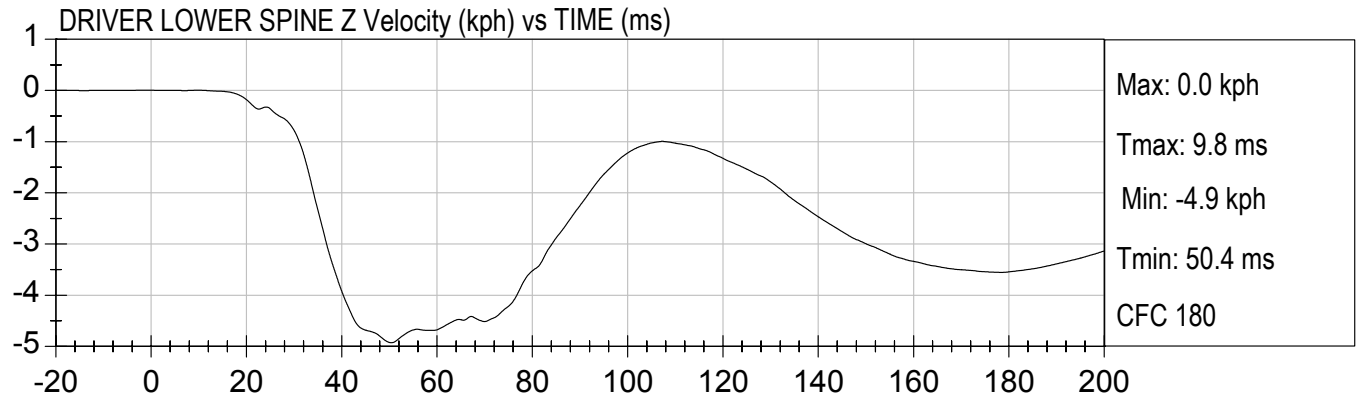






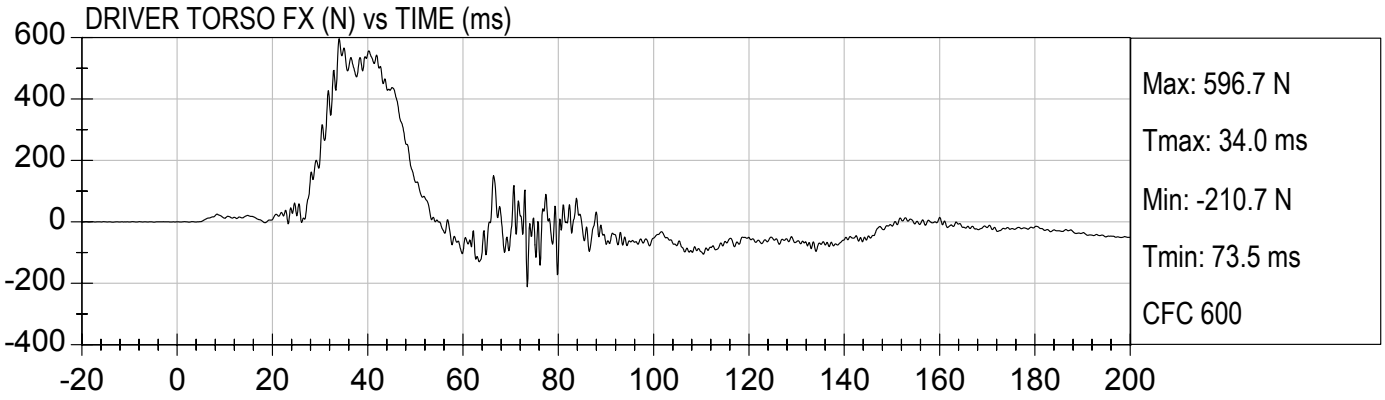

DRIVER LOWER SPINE X Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.2 kph
Tmax: 27.7 ms
Min: -5.4 kph
Tmin: 92.0 ms
CFC 180

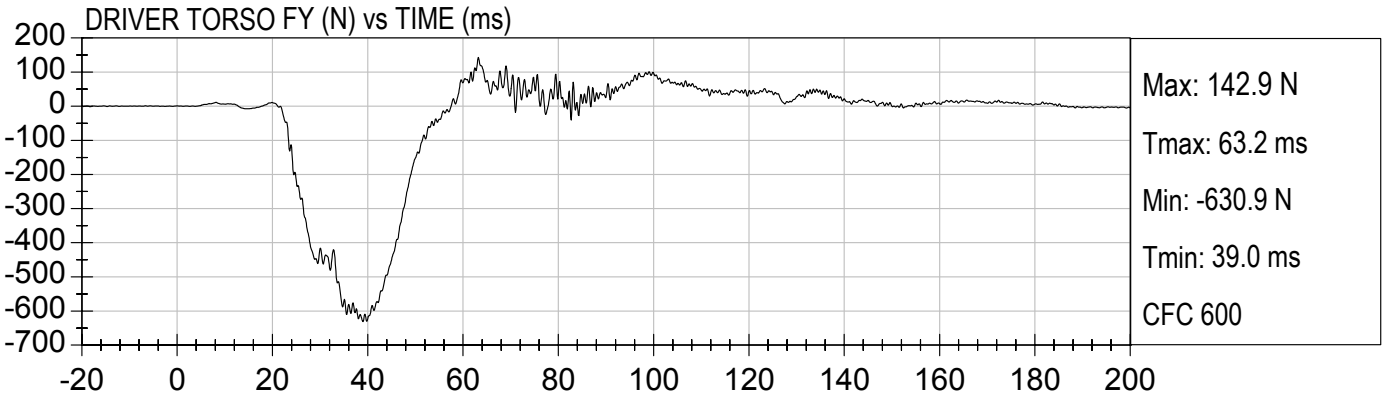

DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)
40
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 37.1 kph
Tmax: 53.0 ms
Min: -0.0 kph
Tmin: 3.3 ms
CFC 180

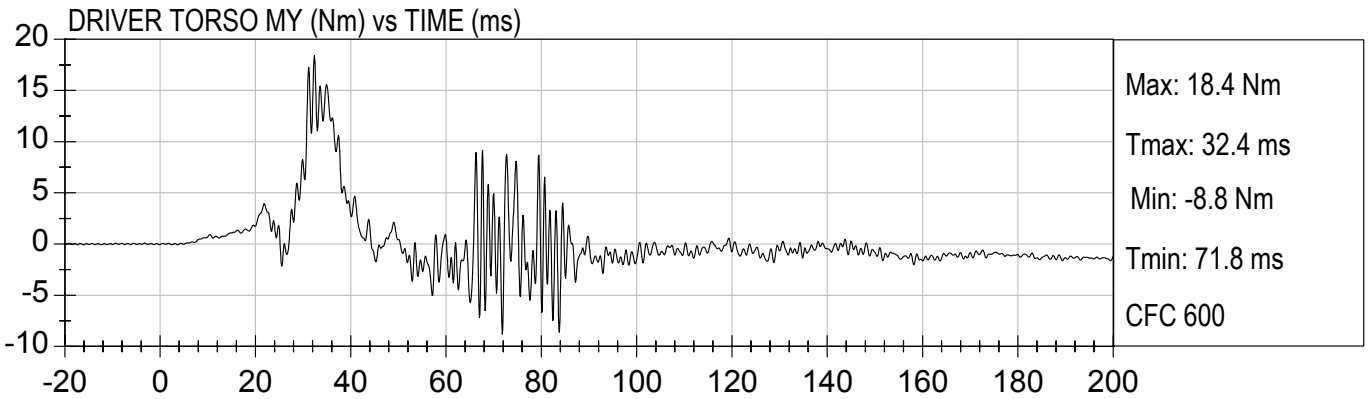

DRIVER LOWER SPINE Z Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.0 kph
Tmax: 9.8 ms
Min: -4.9 kph
Tmin: 50.4 ms
CFC 180

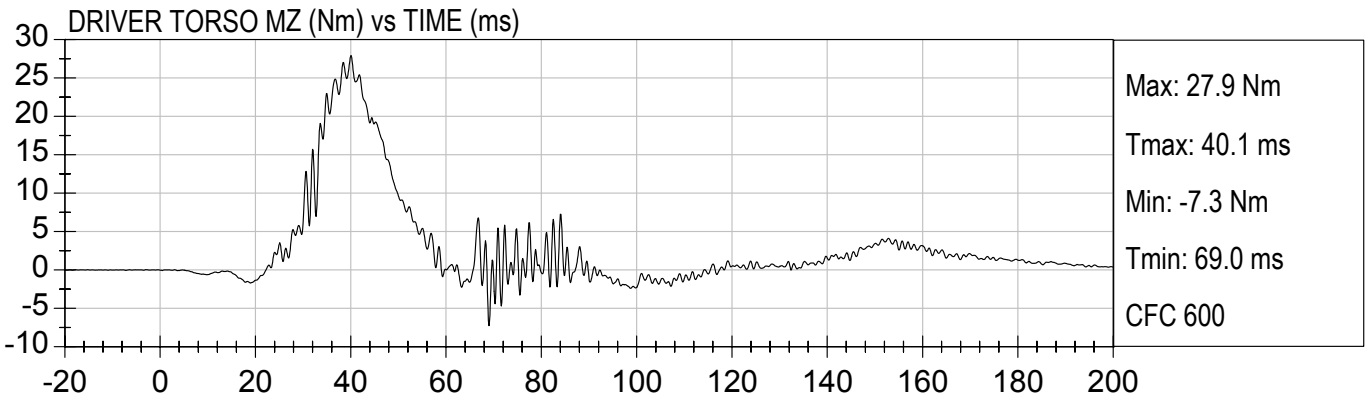
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



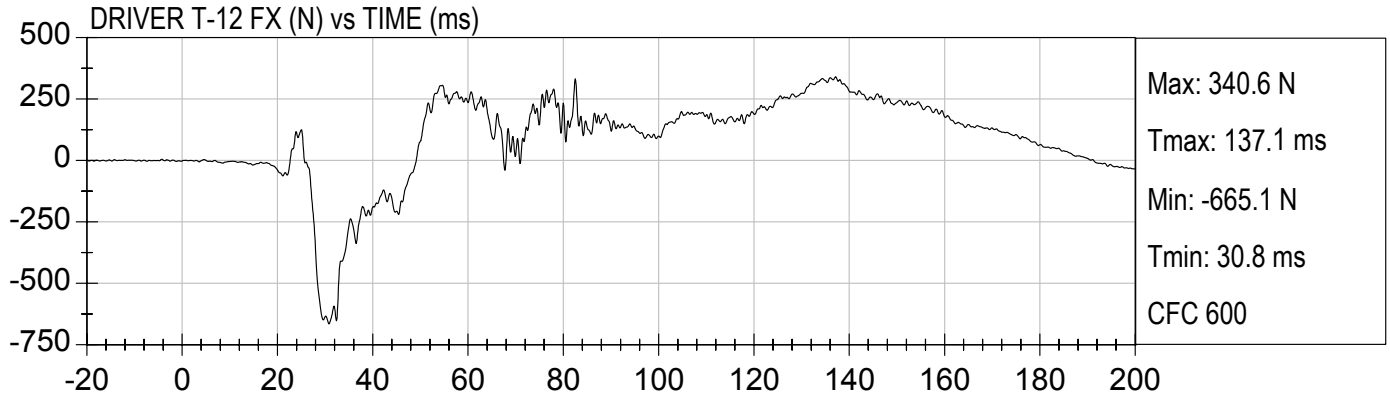


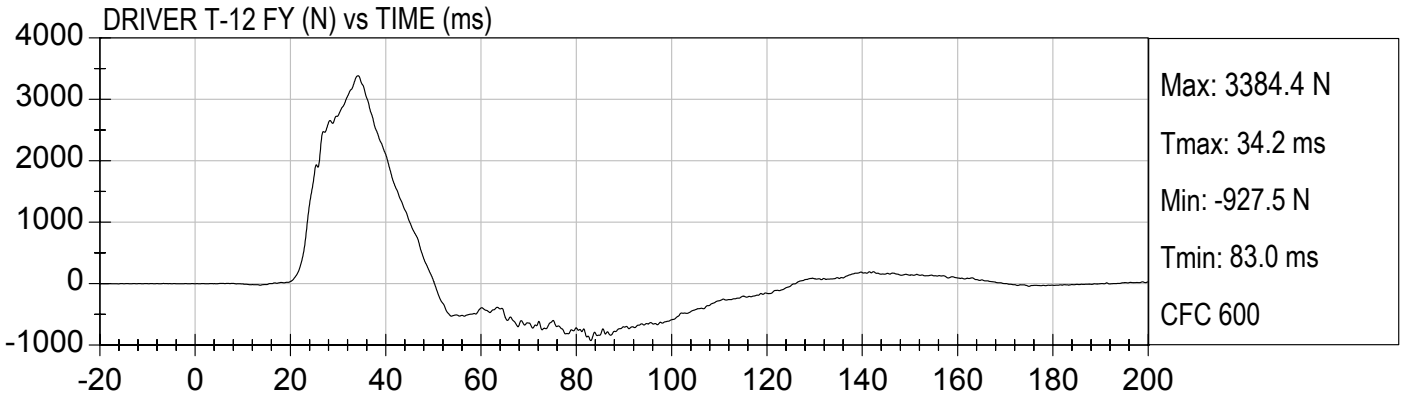


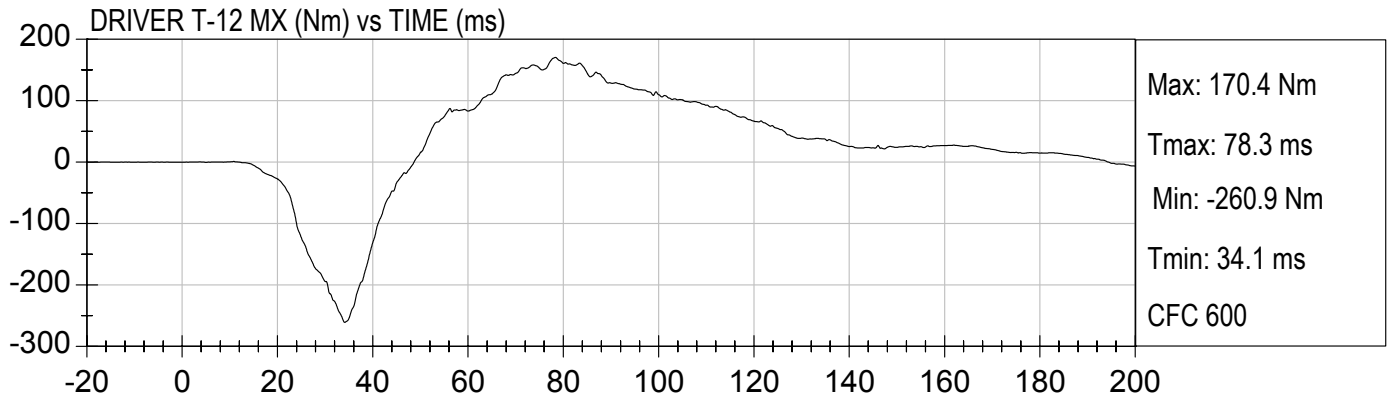


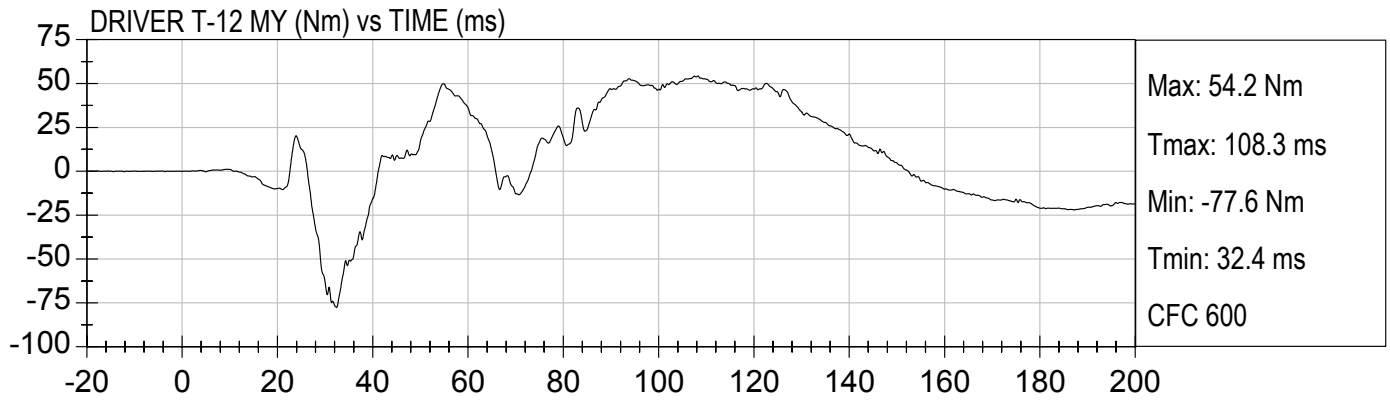
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



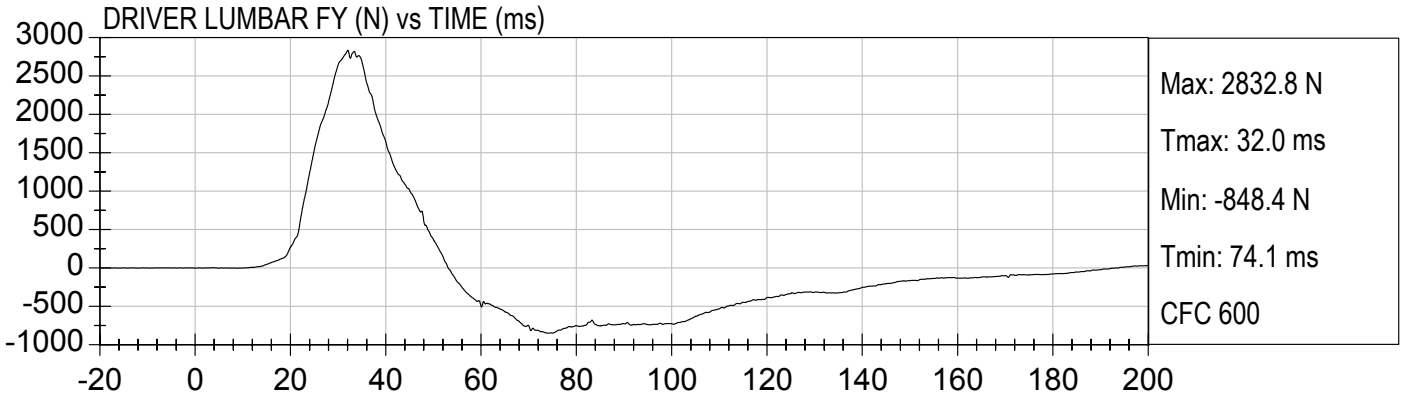


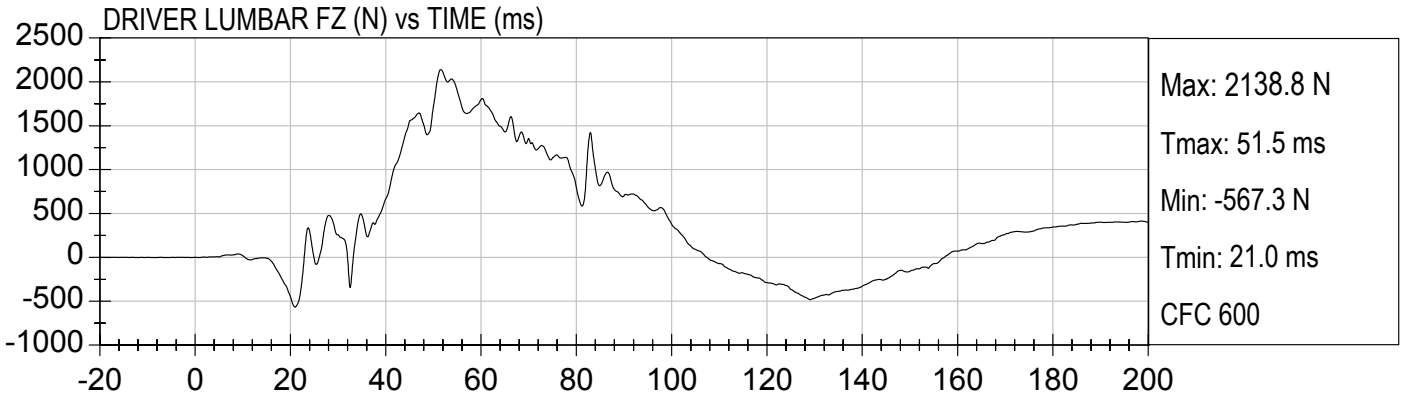


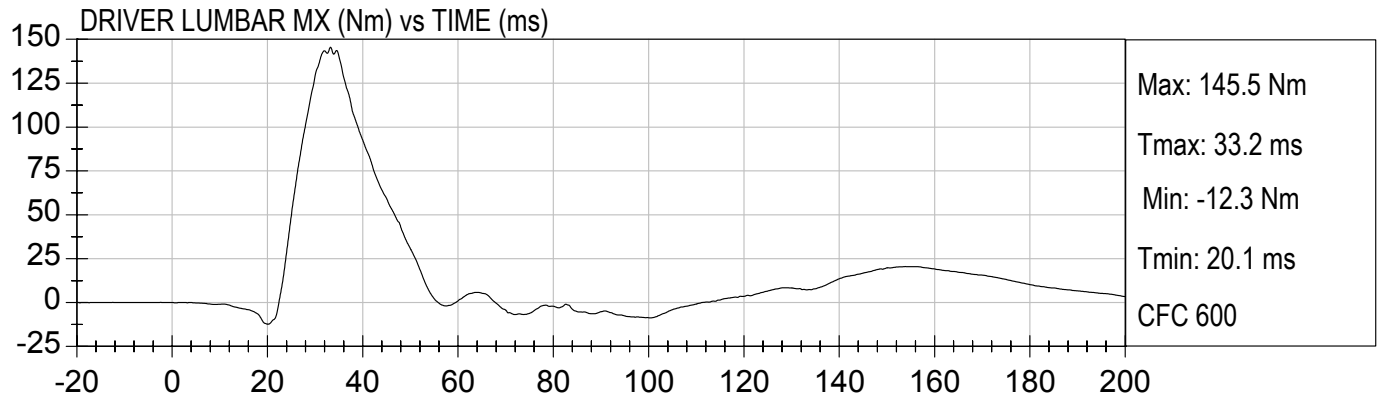


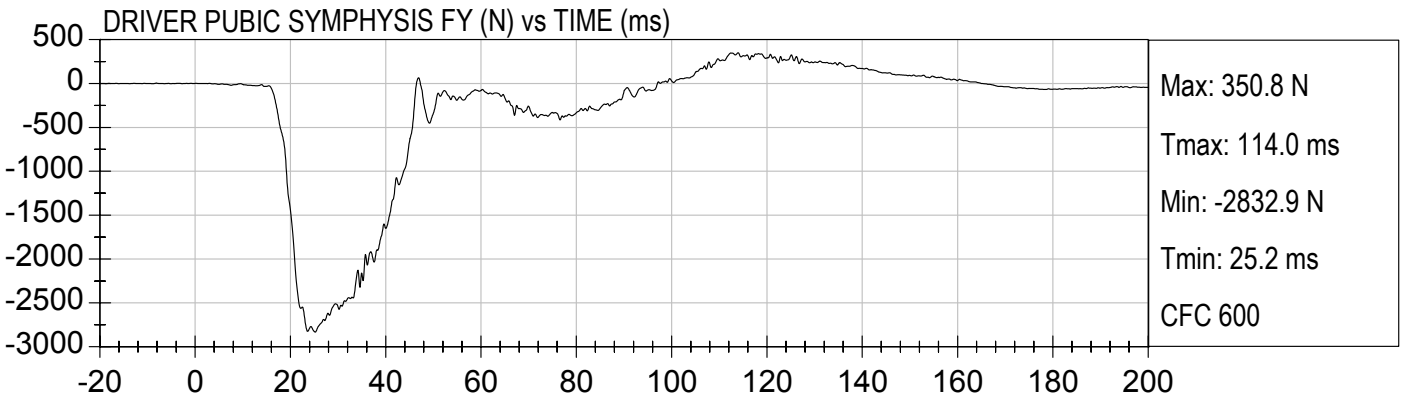
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)





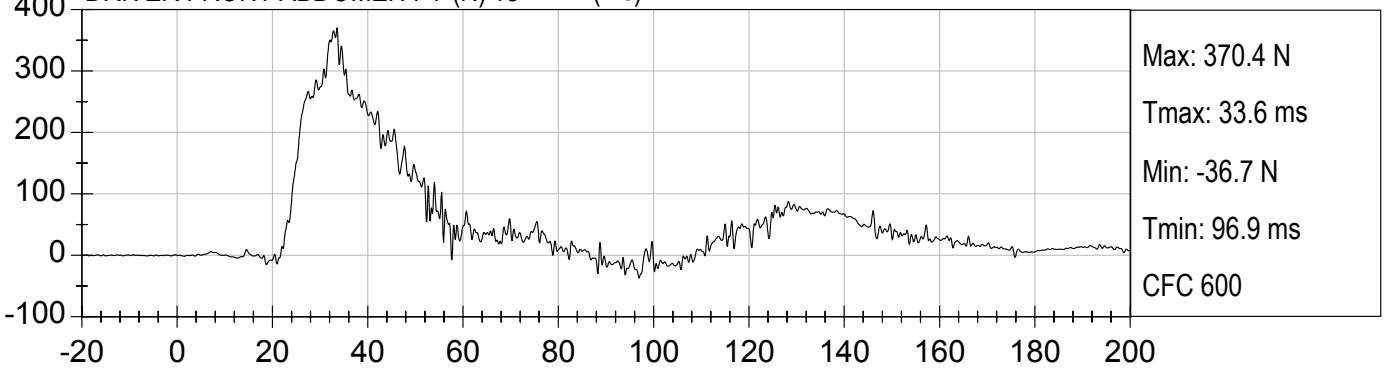




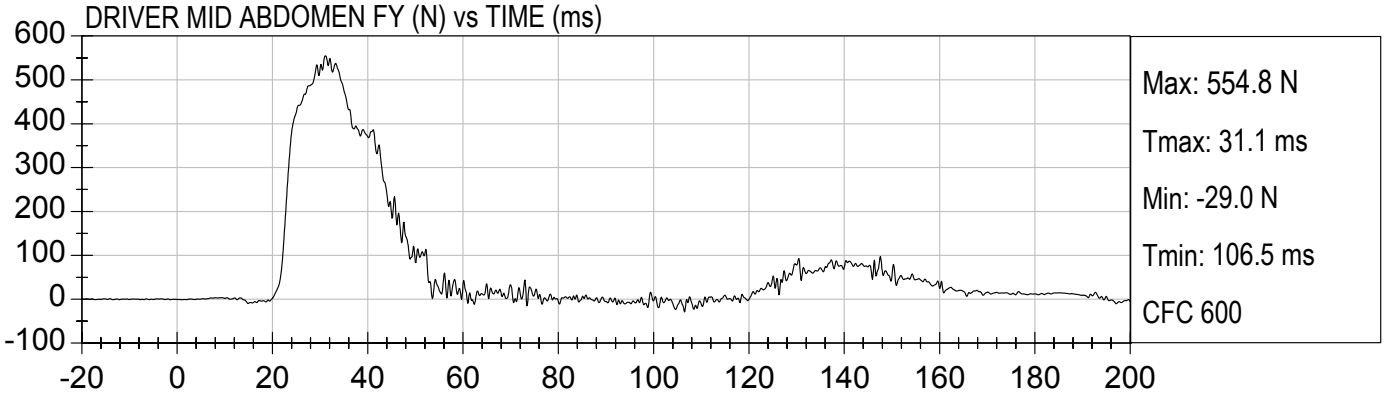
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

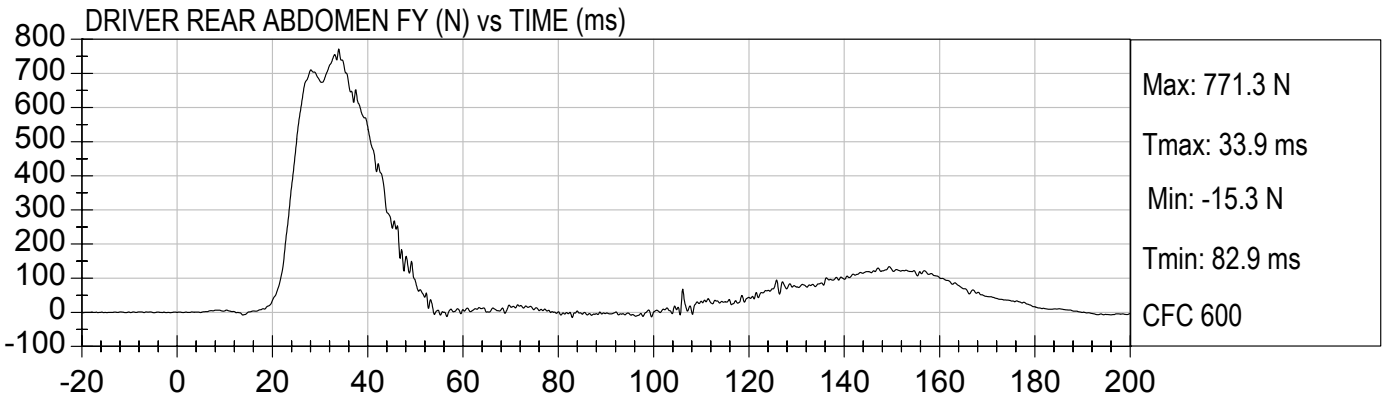
DRIVER FRONT ABDOMEN FY (N) vs TIME (ms)



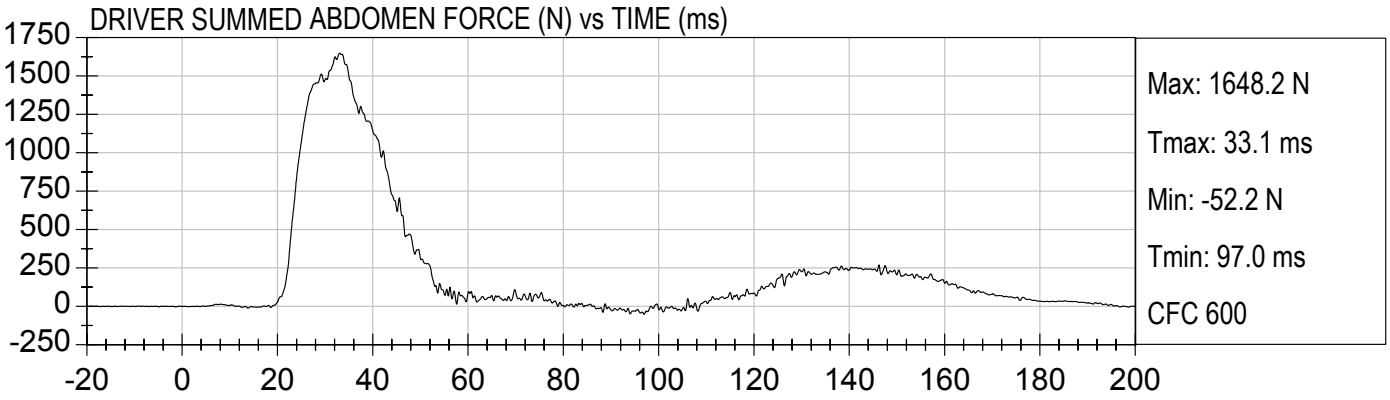
DRIVER MID ABDOMEN FY (N) vs TIME (ms)



DRIVER REAR ABDOMEN FY (N) vs TIME (ms)

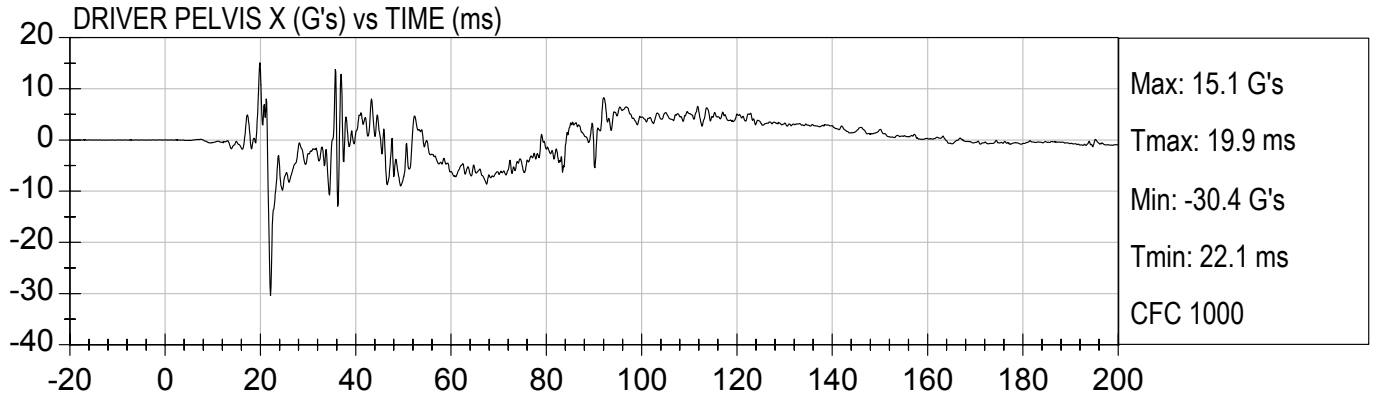


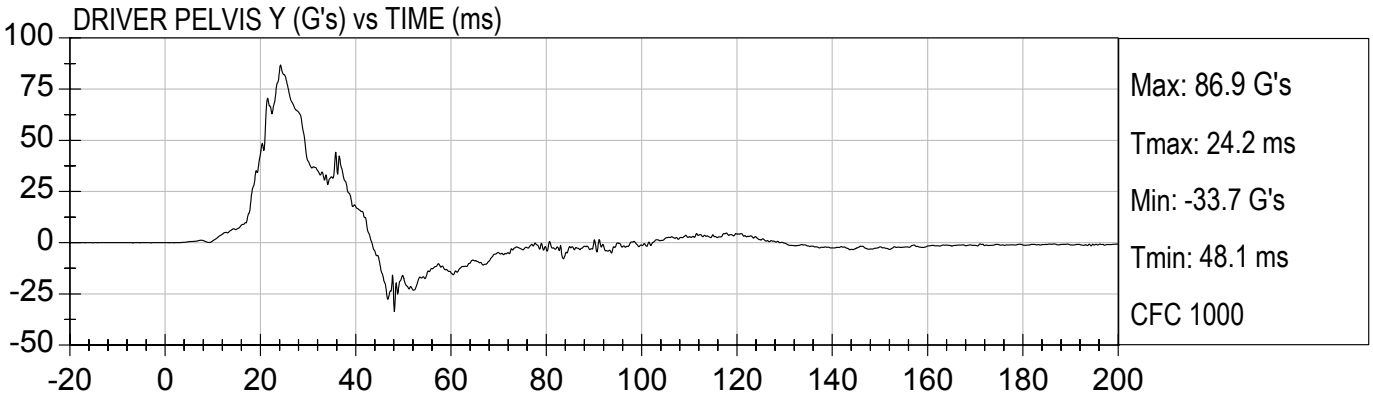
DRIVER SUMMED ABDOMEN FORCE (N) vs TIME (ms)

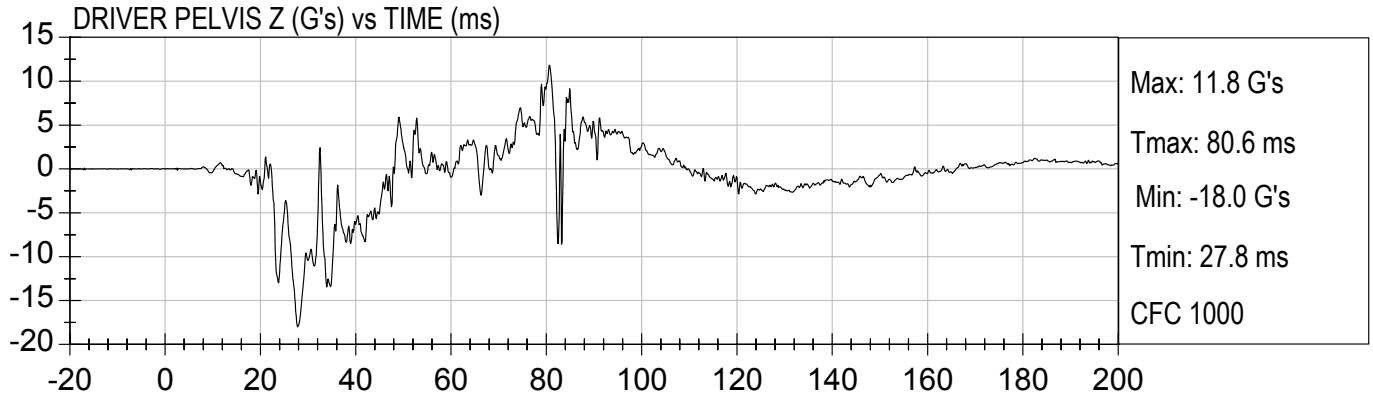


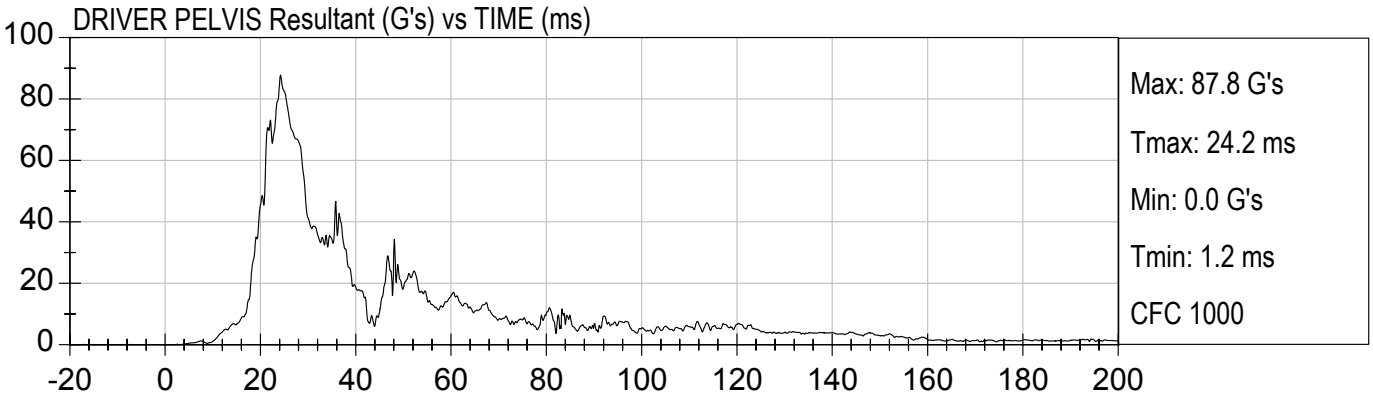
2001 FORD FOCUS
FMVSS 214

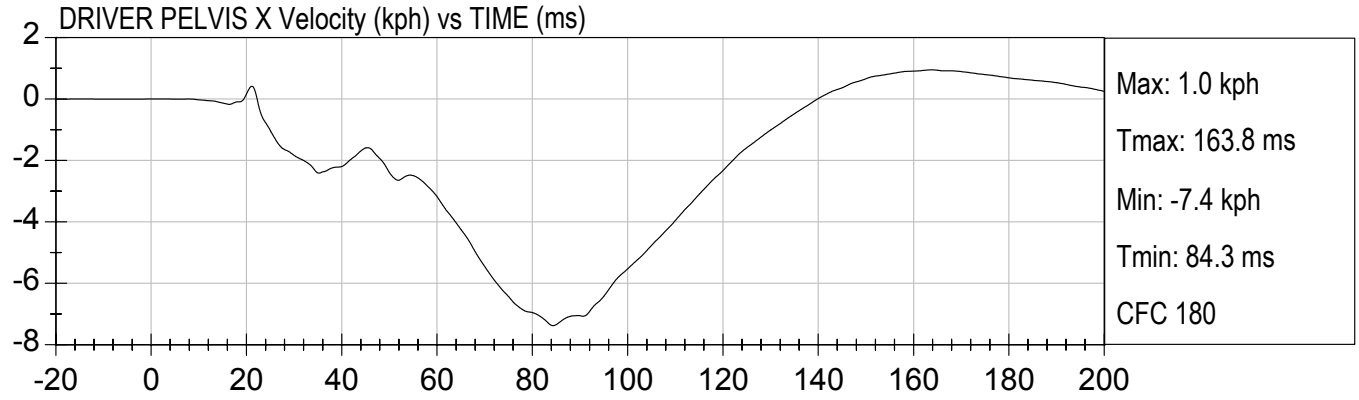
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

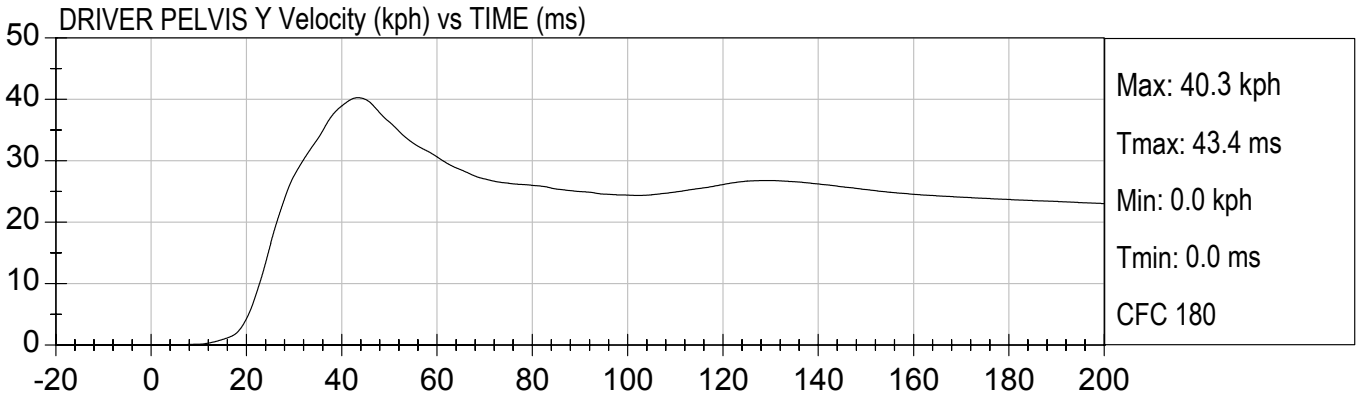


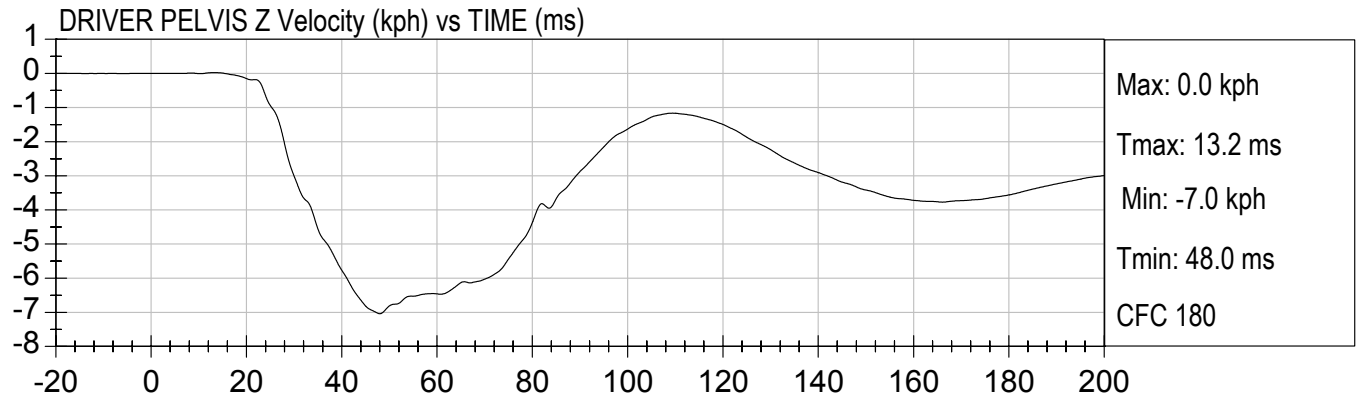






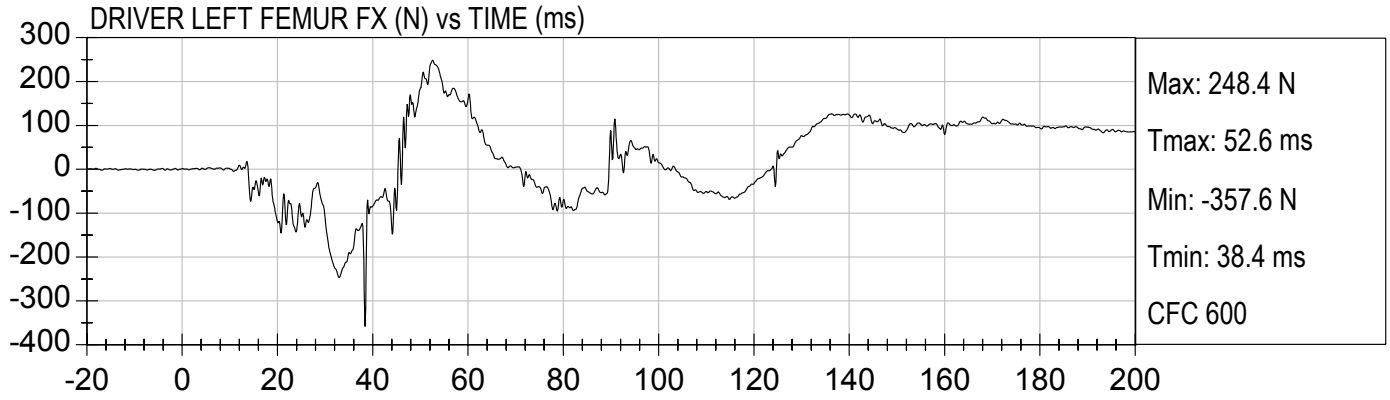

DRIVER PELVIS X Velocity (kph) vs TIME (ms)
2
0
-2
-4
-6
-8
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 1.0 kph
Tmax: 163.8 ms
Min: -7.4 kph
Tmin: 84.3 ms
CFC 180

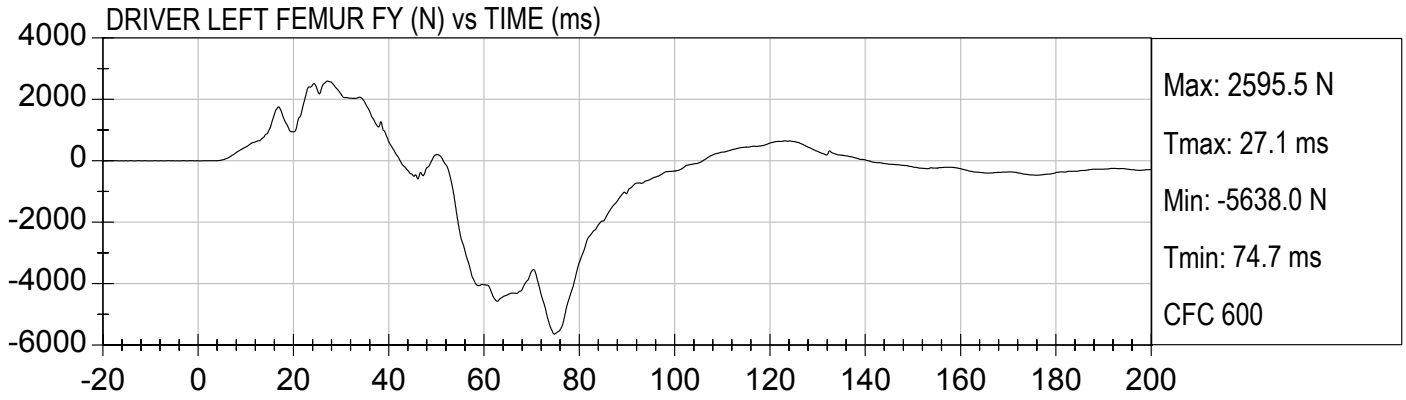

DRIVER PELVIS Y Velocity (kph) vs TIME (ms)
50
40
30
20
10
0
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 40.3 kph
Tmax: 43.4 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

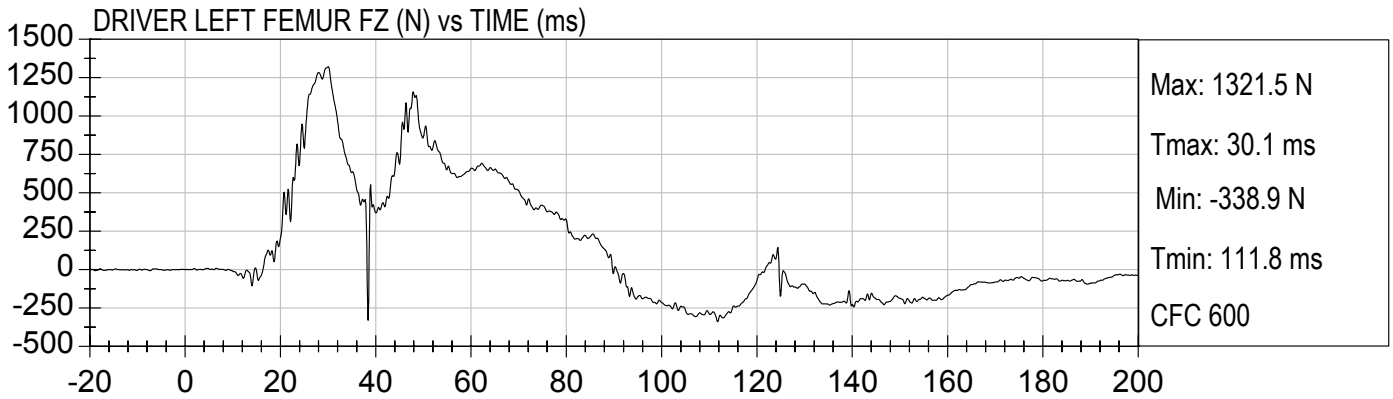

DRIVER PELVIS Z Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.0 kph
Tmax: 13.2 ms
Min: -7.0 kph
Tmin: 48.0 ms
CFC 180

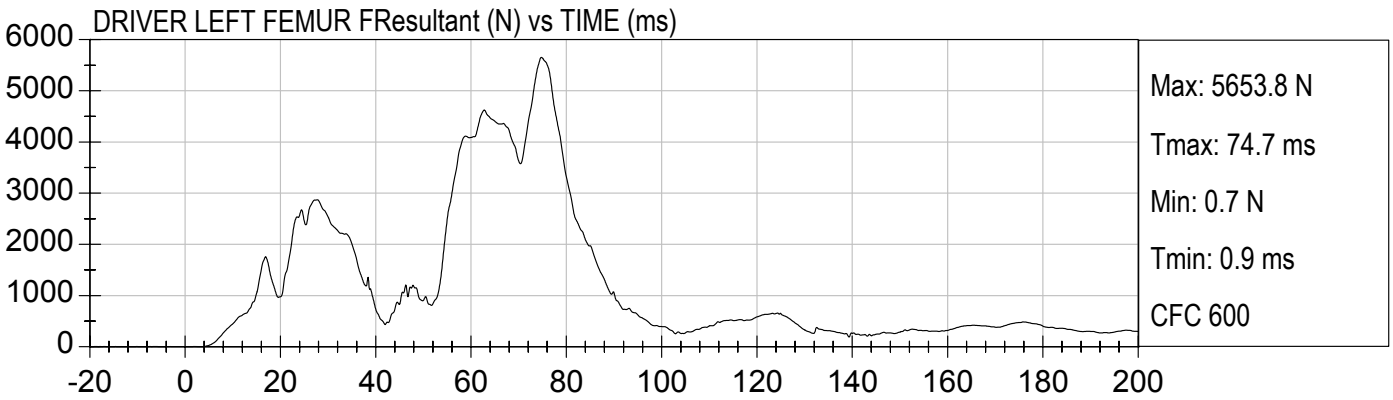
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



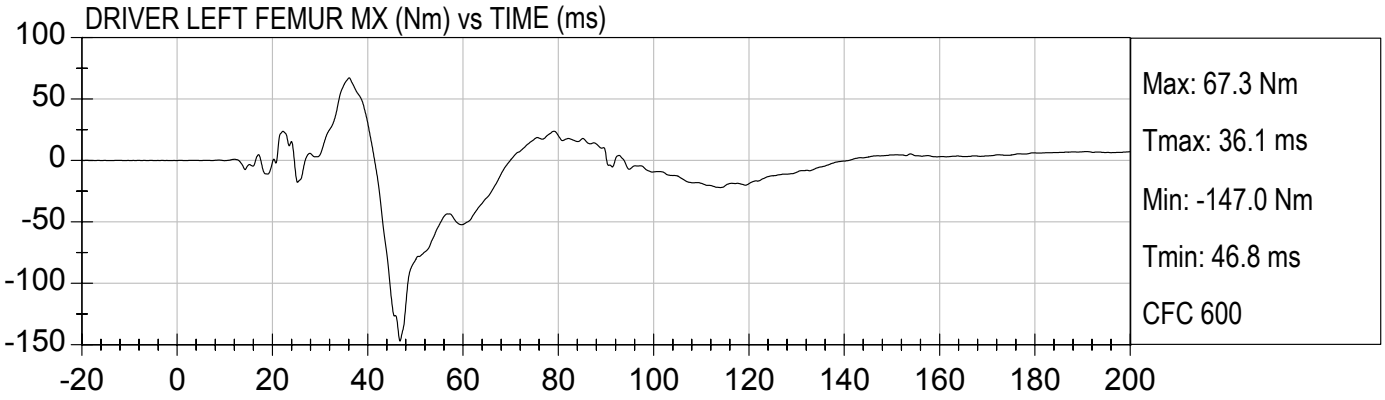


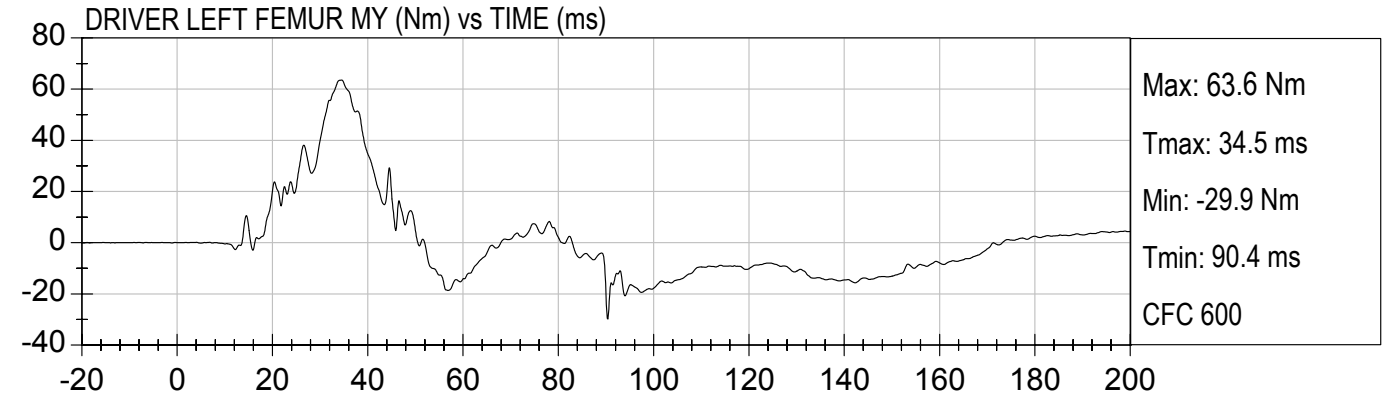


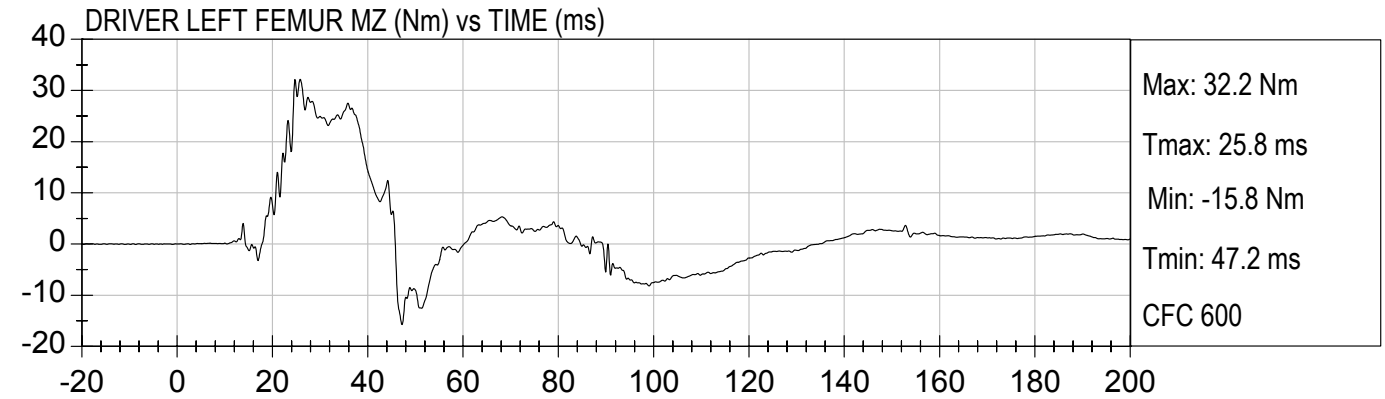


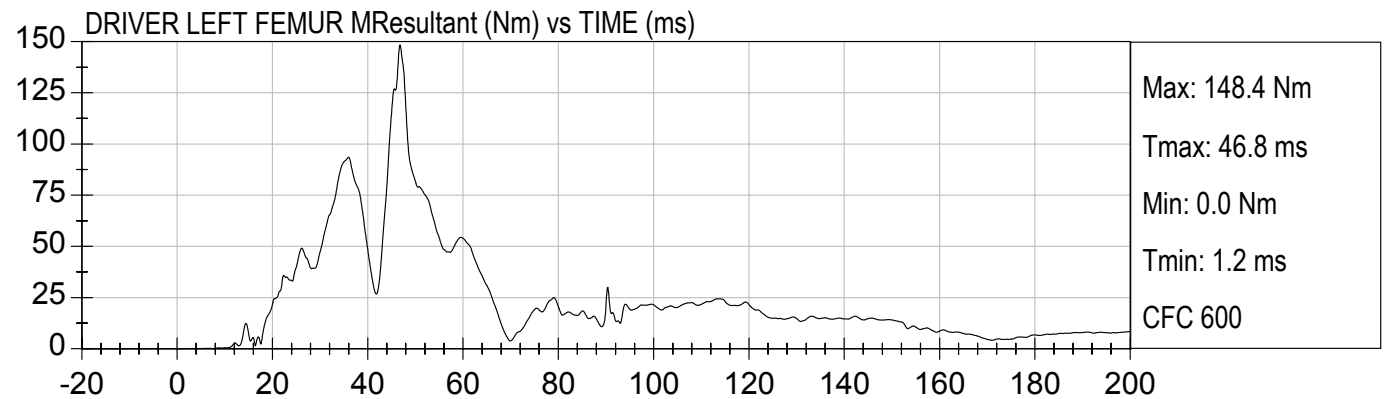
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



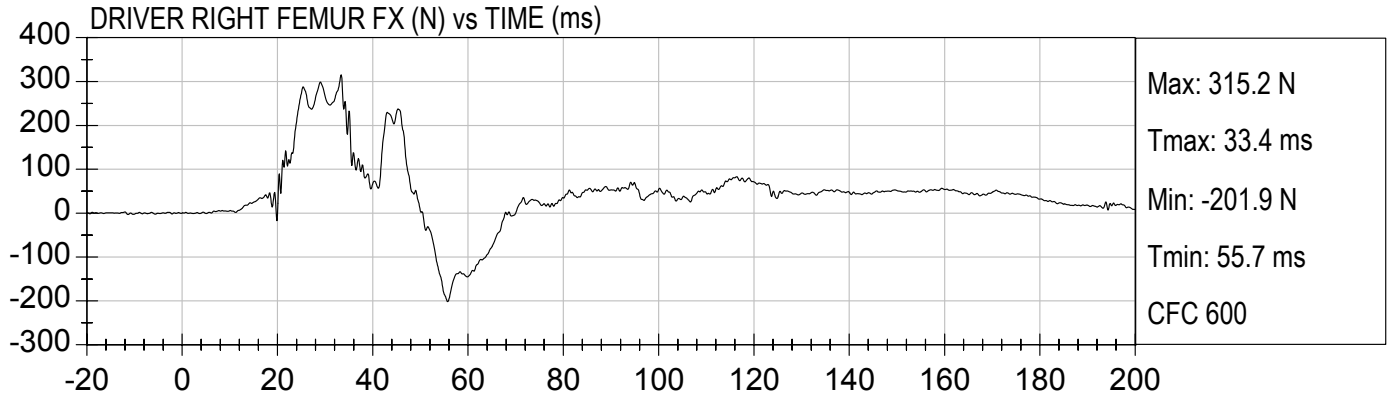


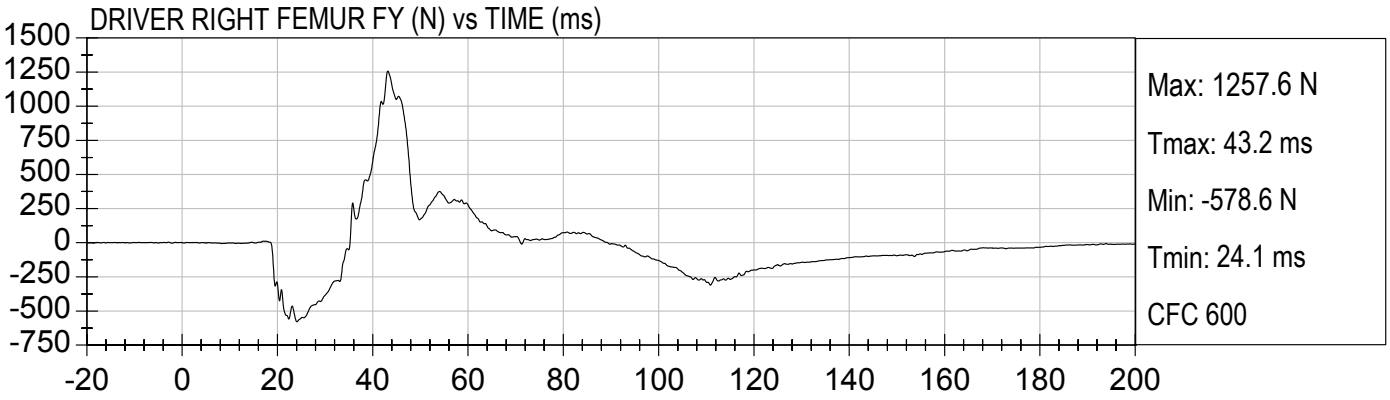


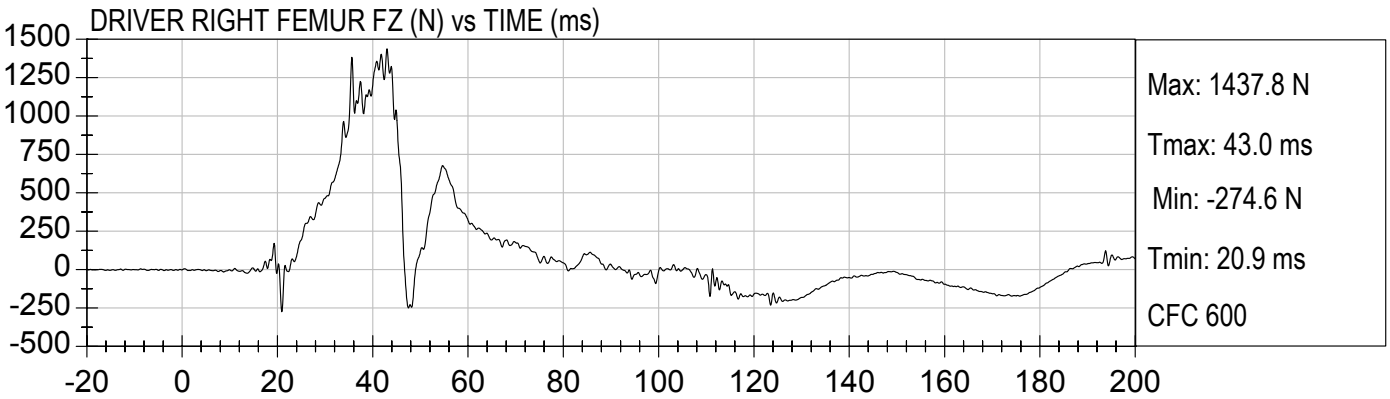


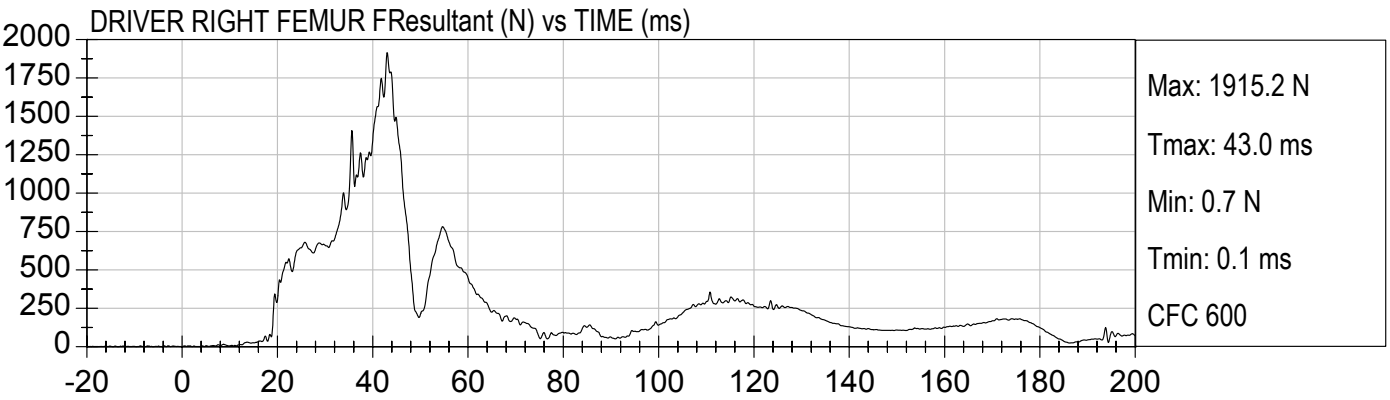
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



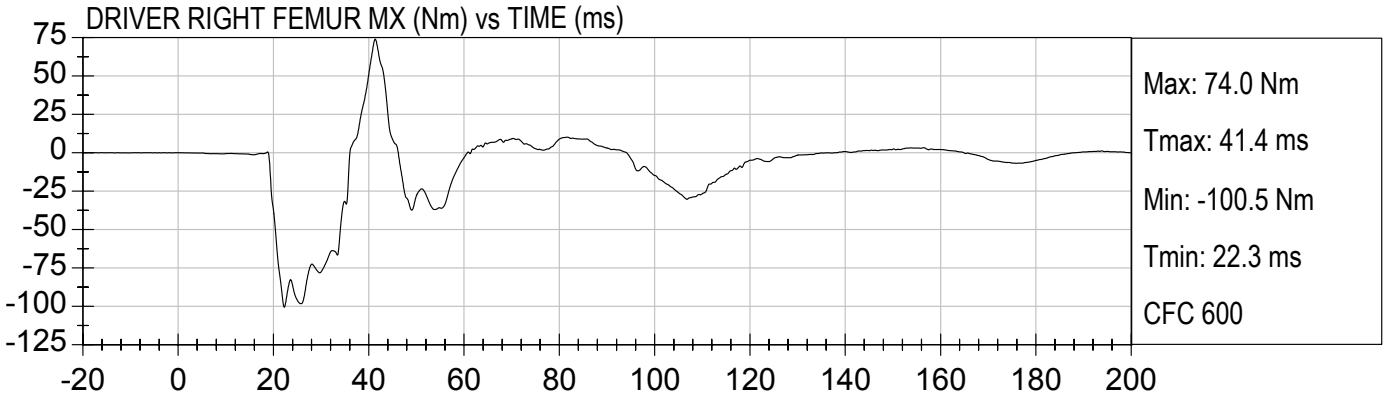


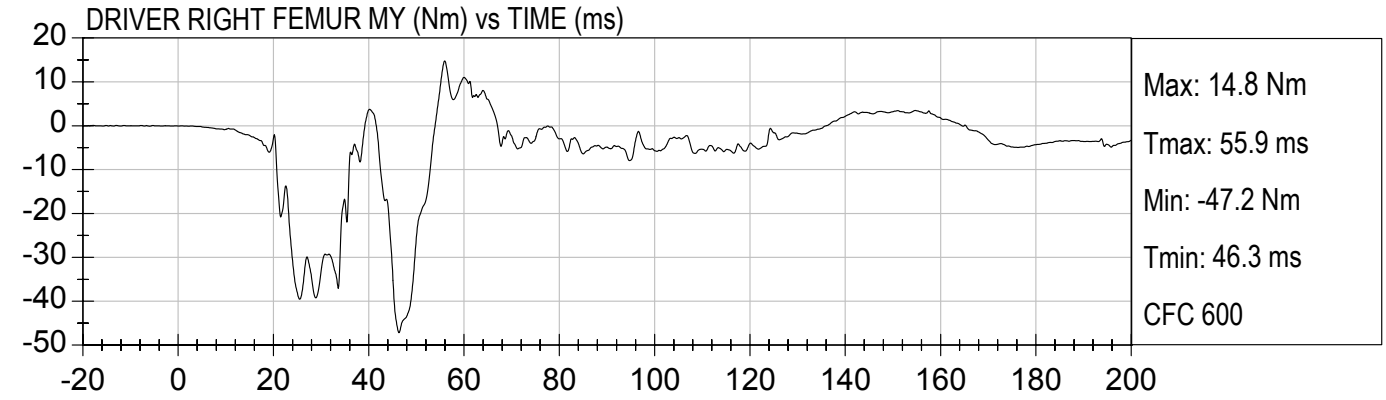


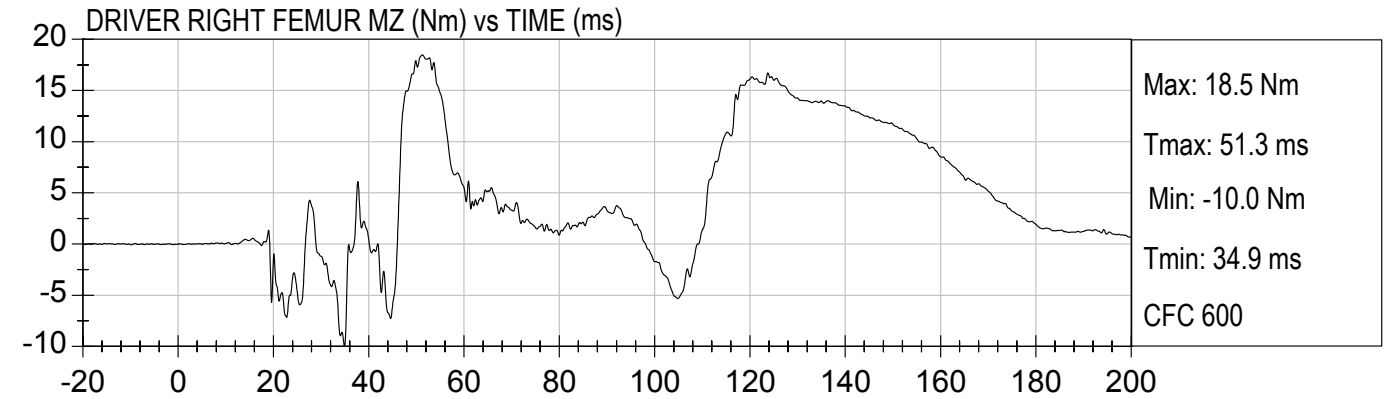


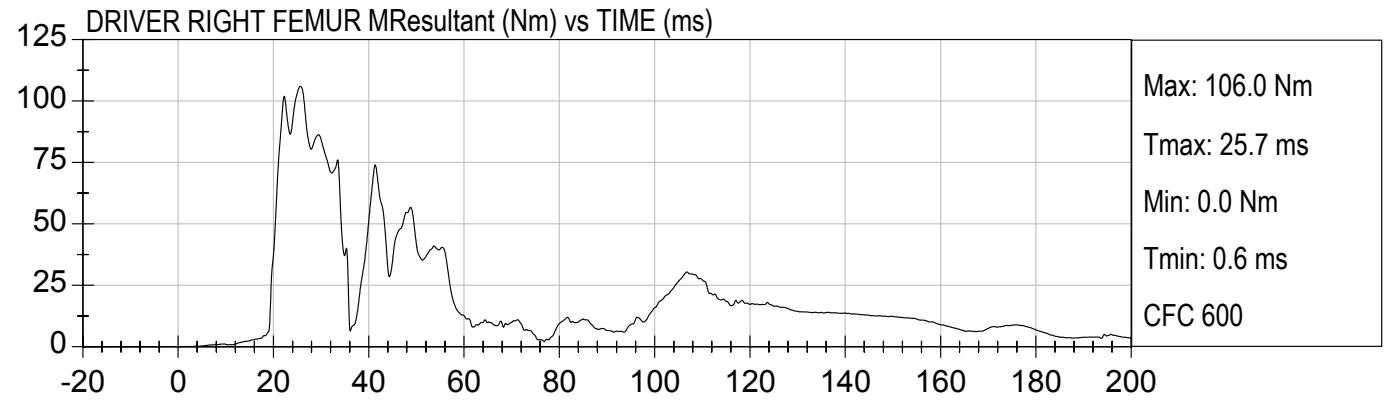
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



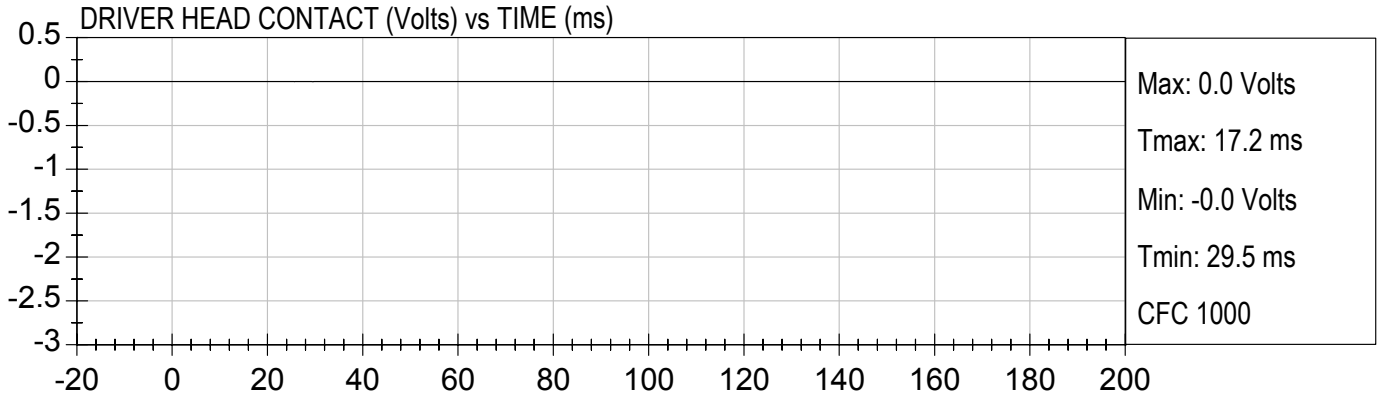


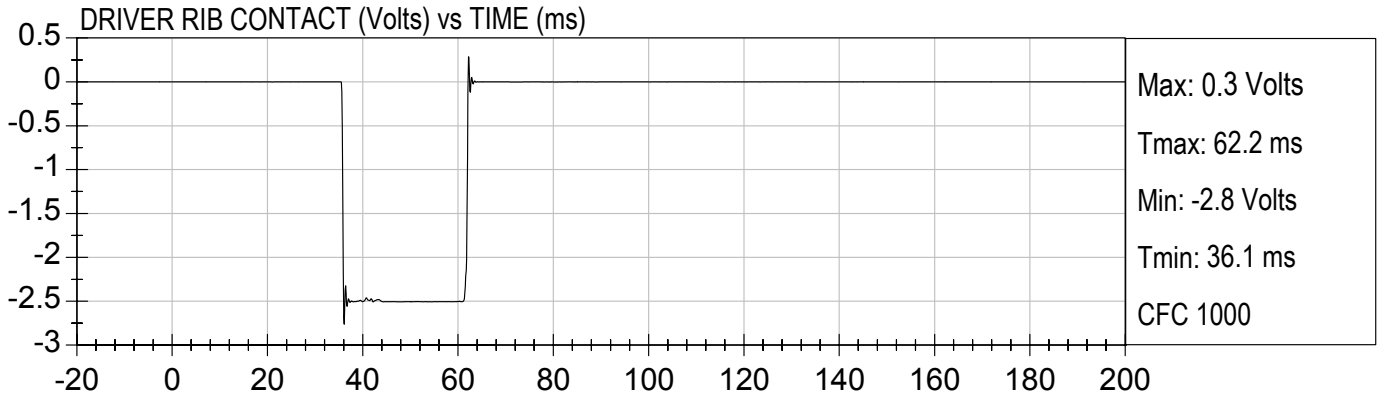


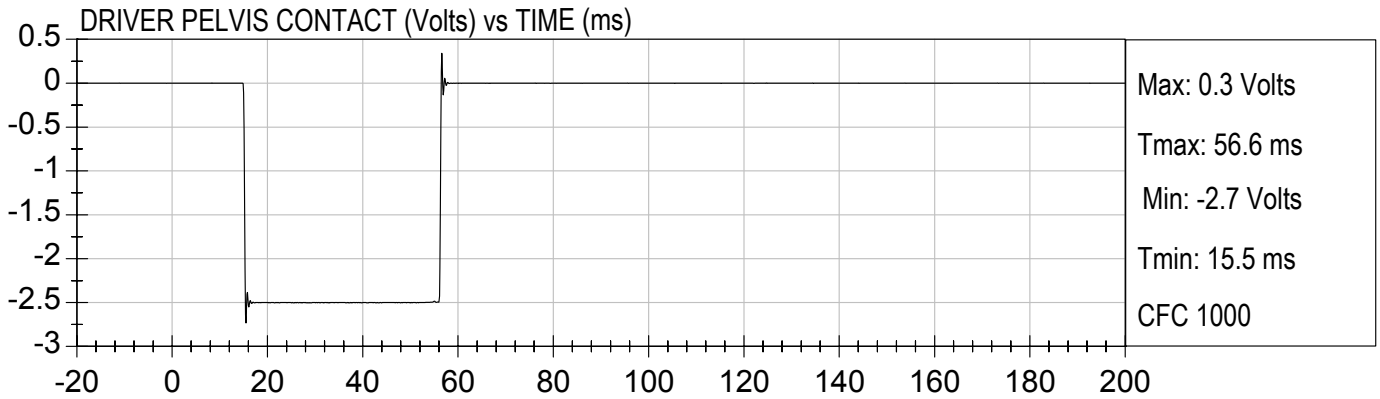


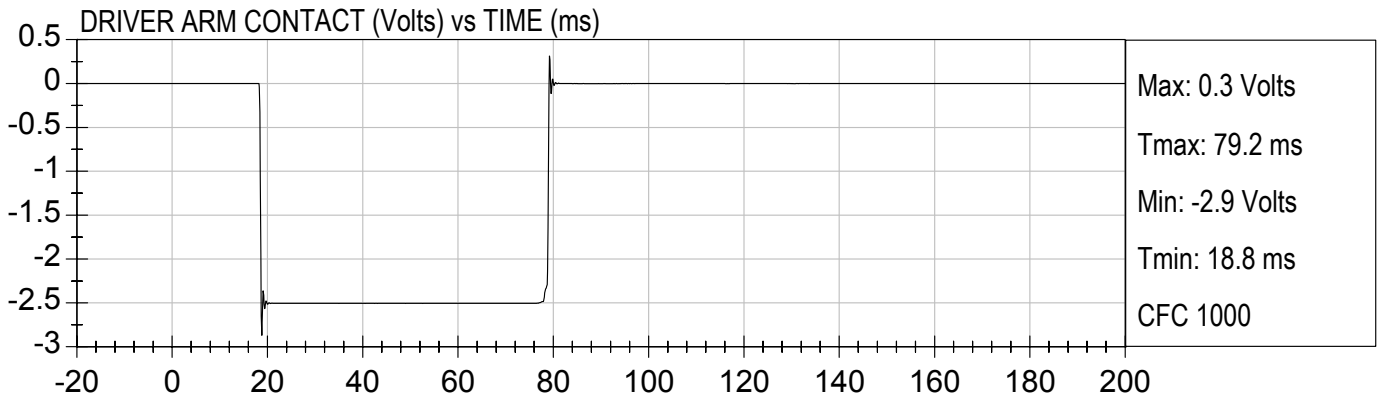
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



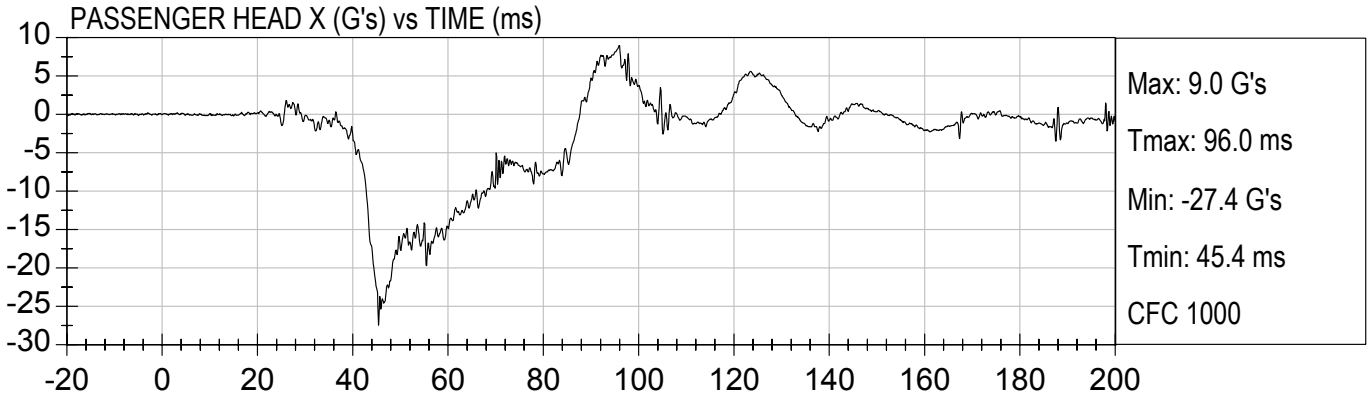


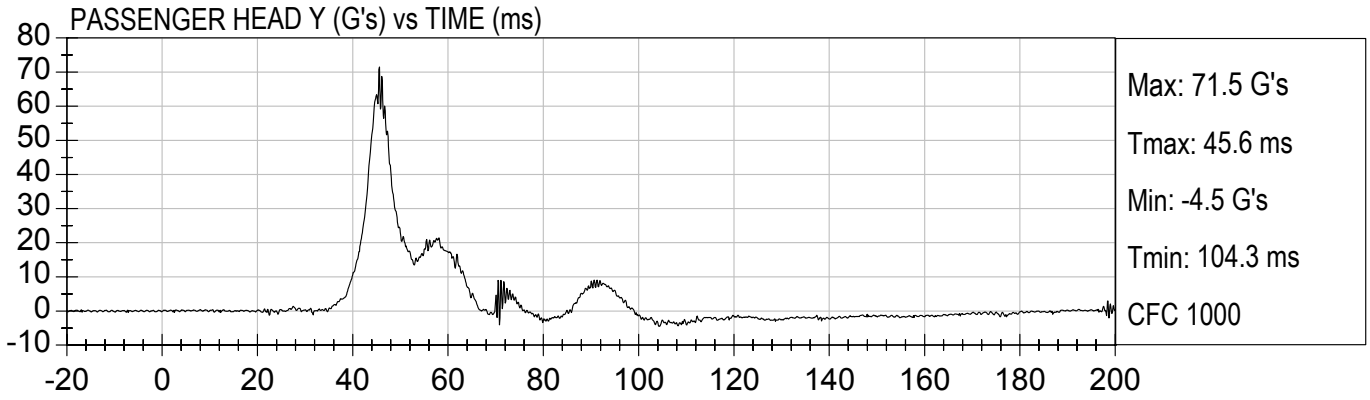


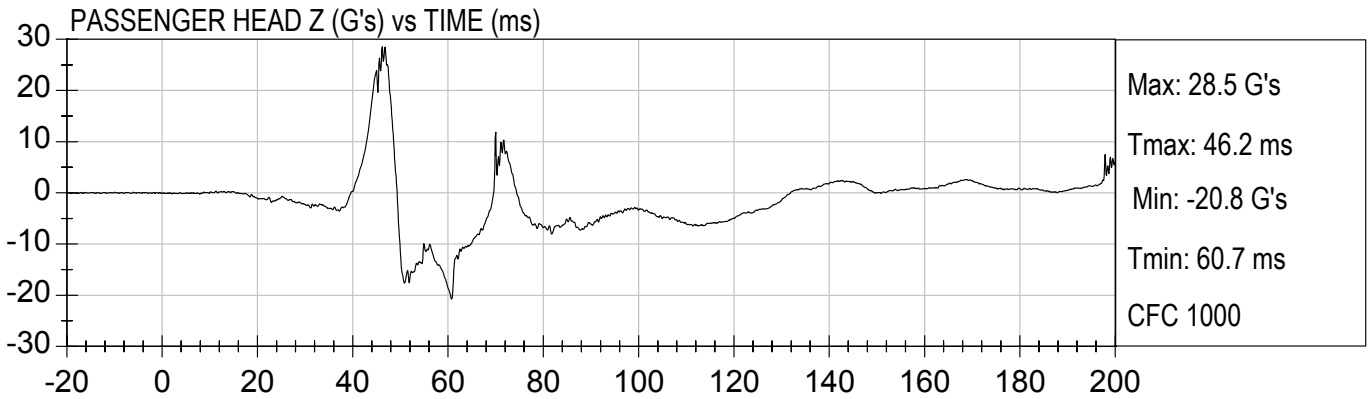


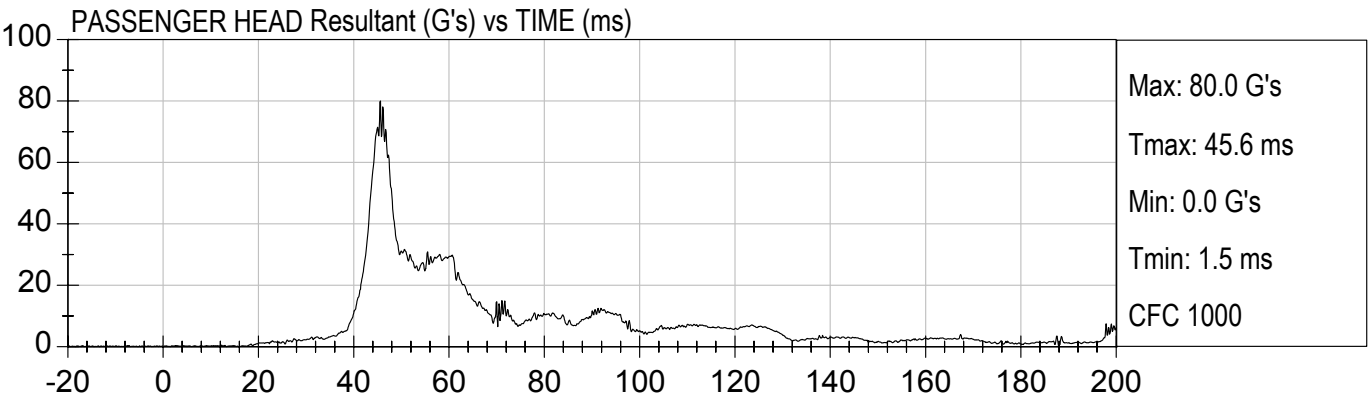
2001 FORD FOCUS
FMVSS 214

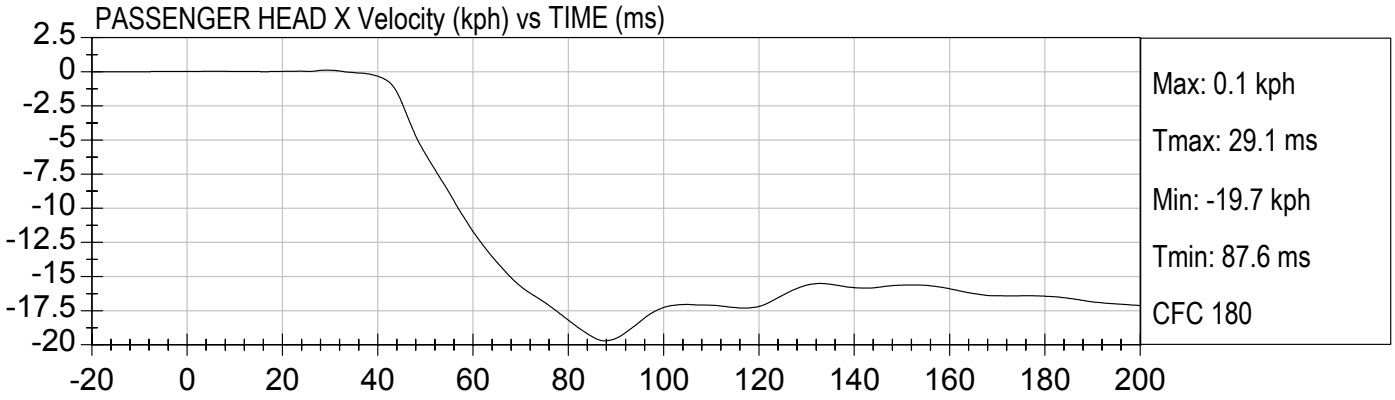
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

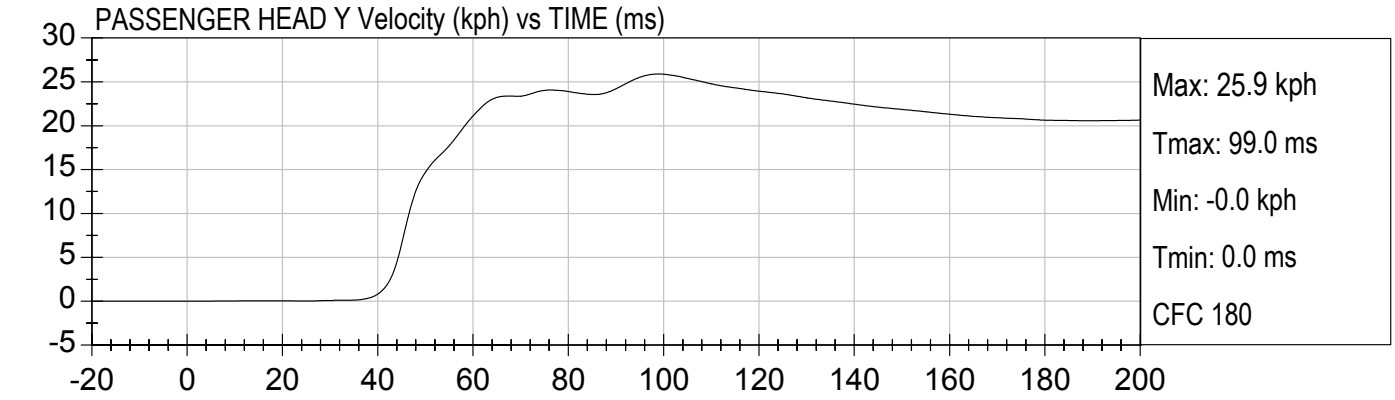


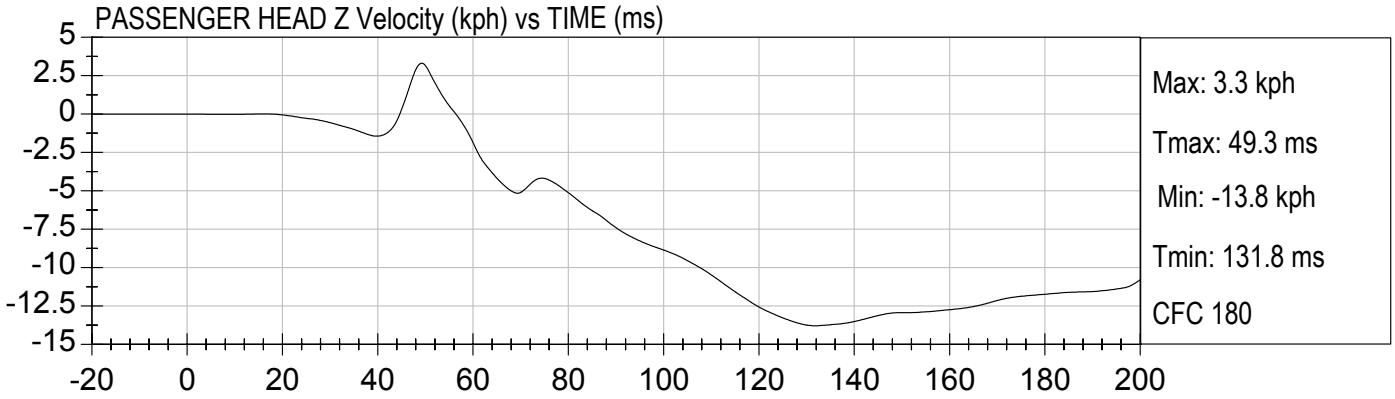






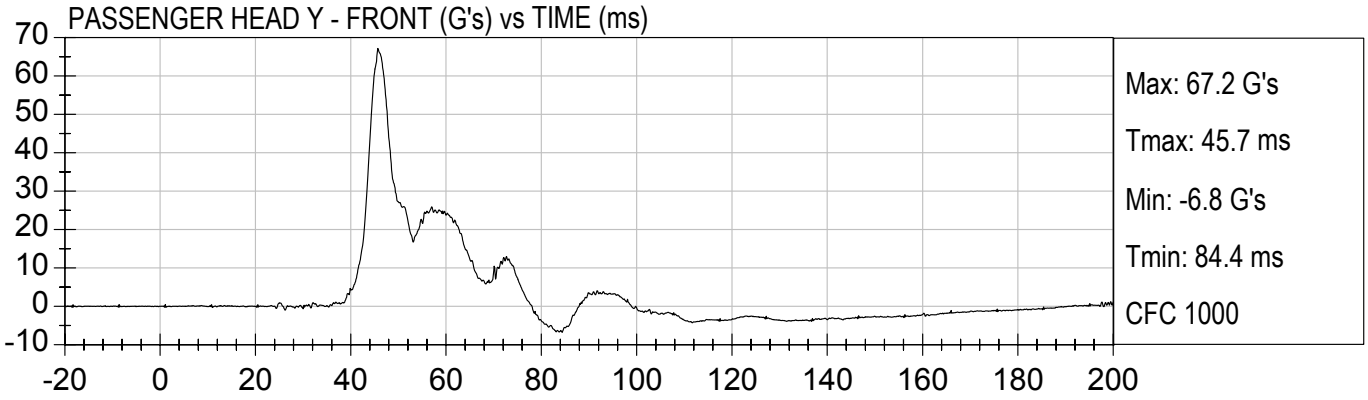

PASSENGER HEAD X Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-15
-17.5
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.1 kph
Tmax: 29.1 ms
Min: -19.7 kph
Tmin: 87.6 ms
CFC 180

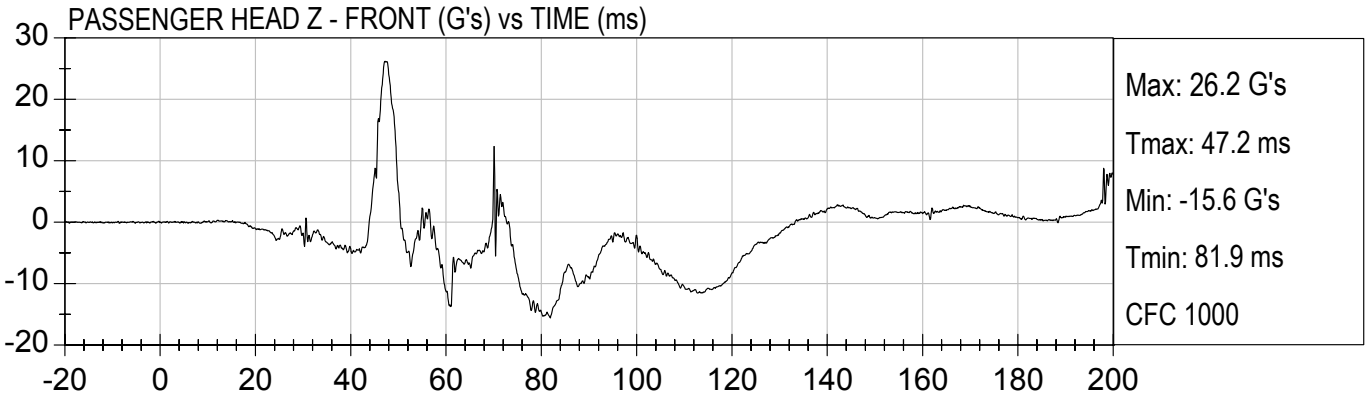

PASSENGER HEAD Y Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 25.9 kph
Tmax: 99.0 ms
Min: -0.0 kph
Tmin: 0.0 ms
CFC 180

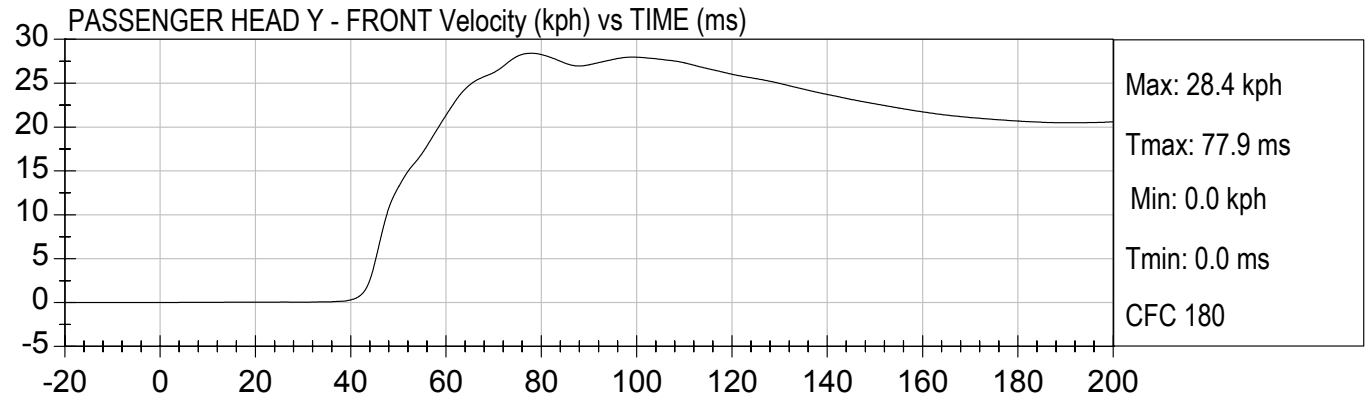

PASSENGER HEAD Z Velocity (kph) vs TIME (ms)
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
-15
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 3.3 kph
Tmax: 49.3 ms
Min: -13.8 kph
Tmin: 131.8 ms
CFC 180

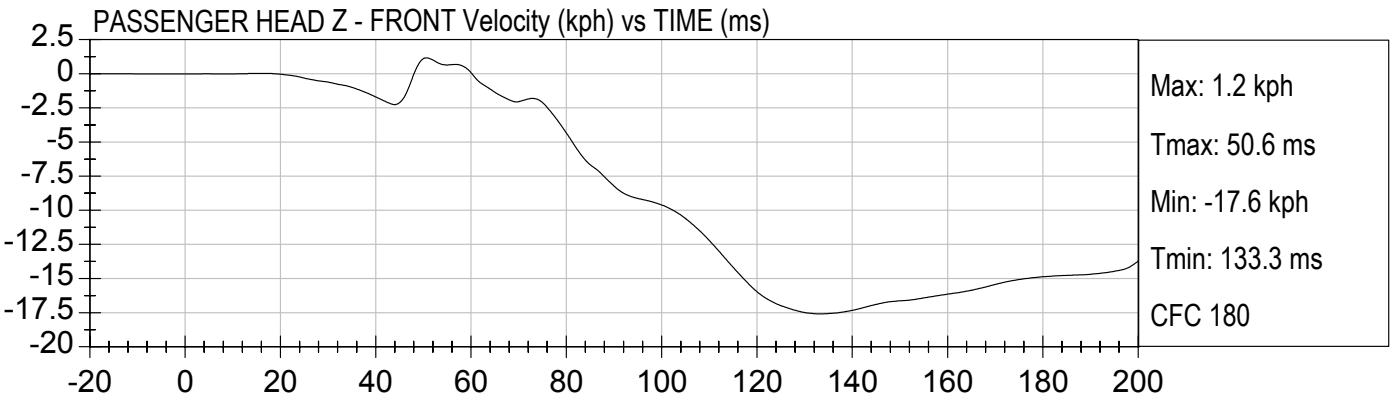
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



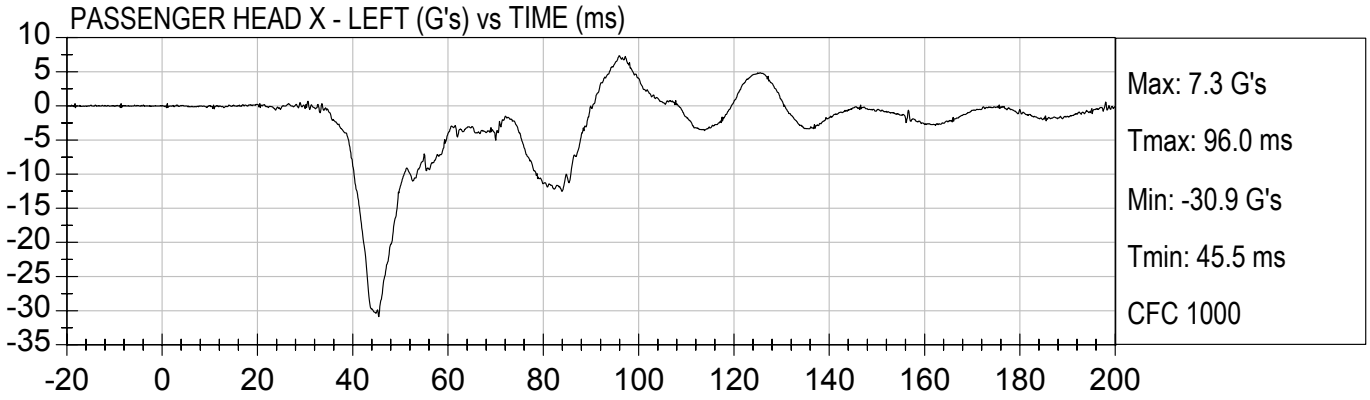


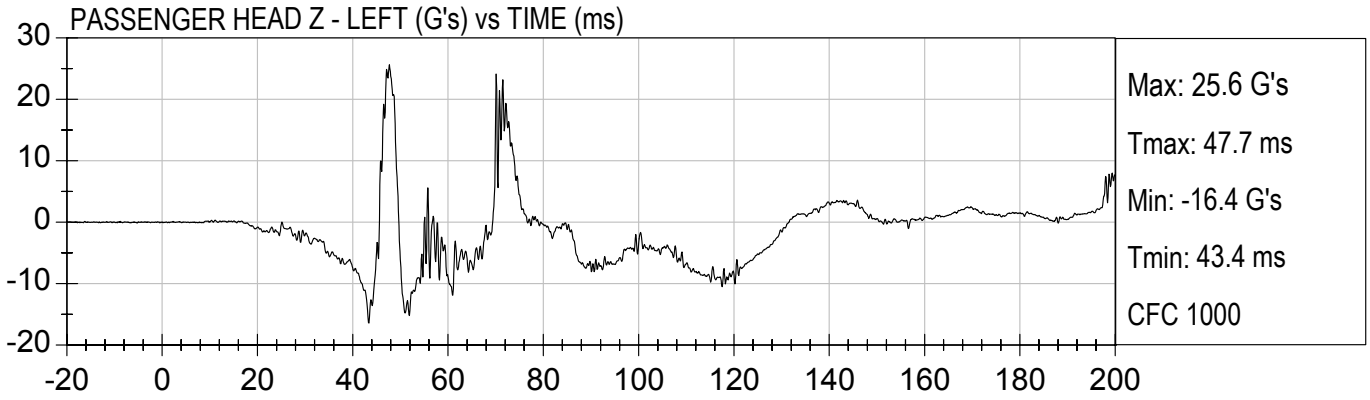


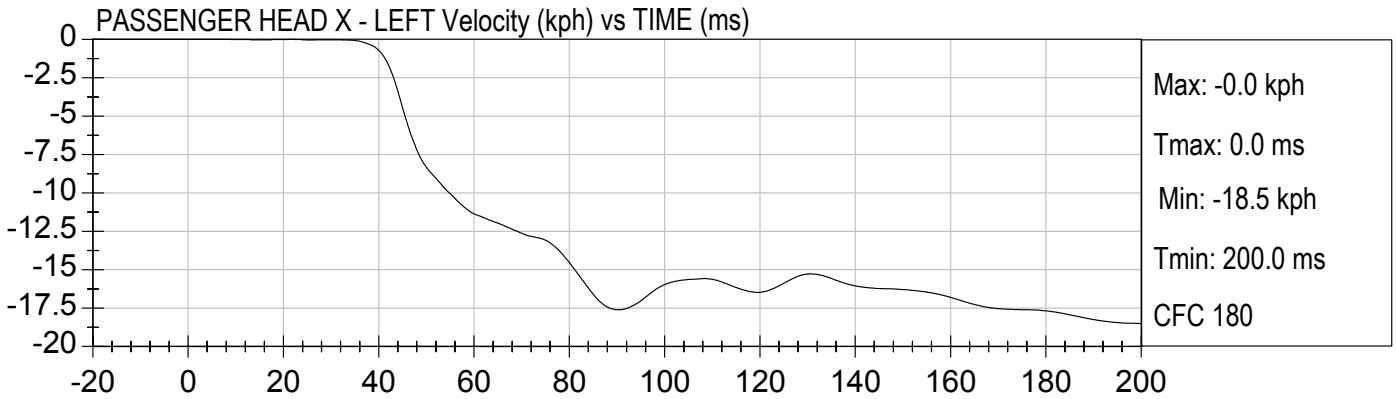


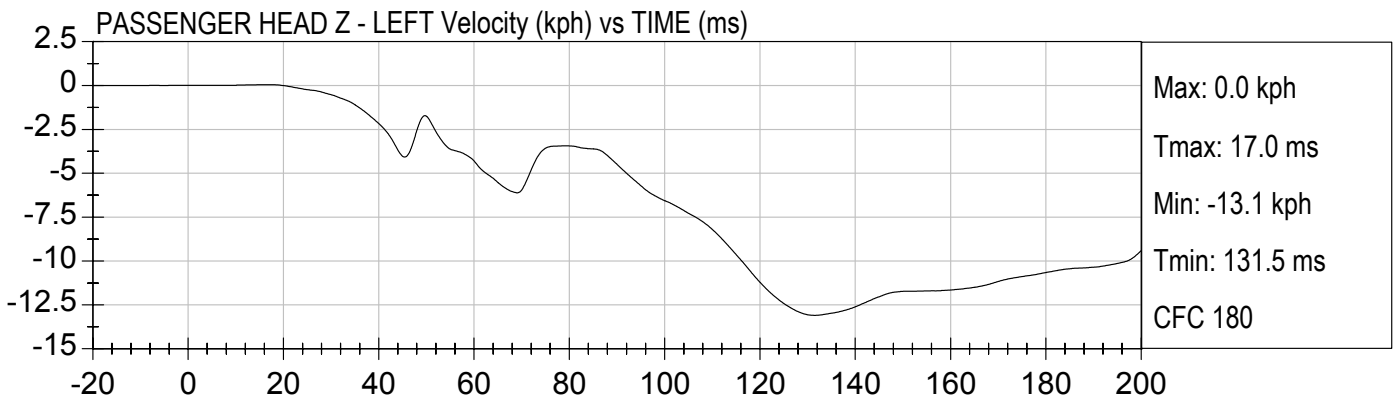
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



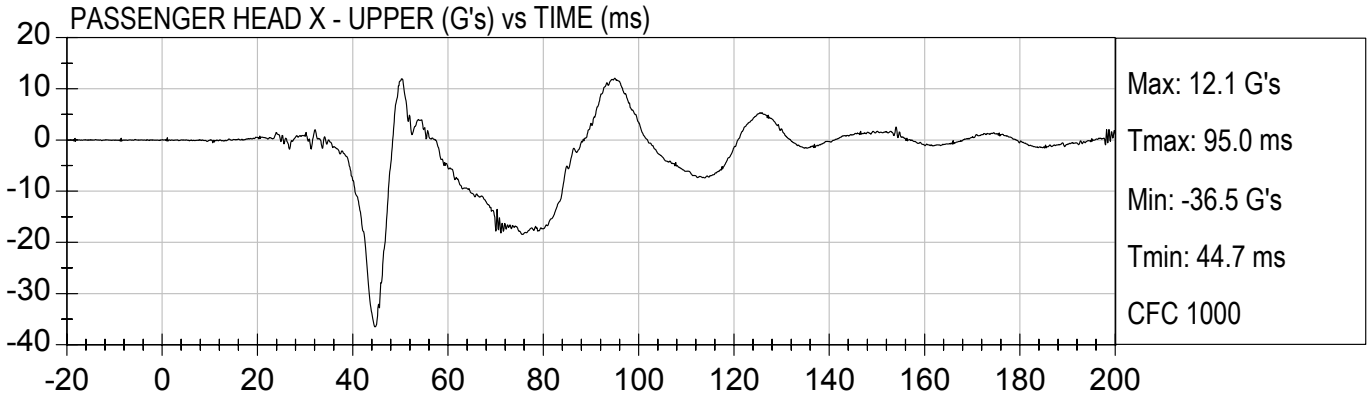


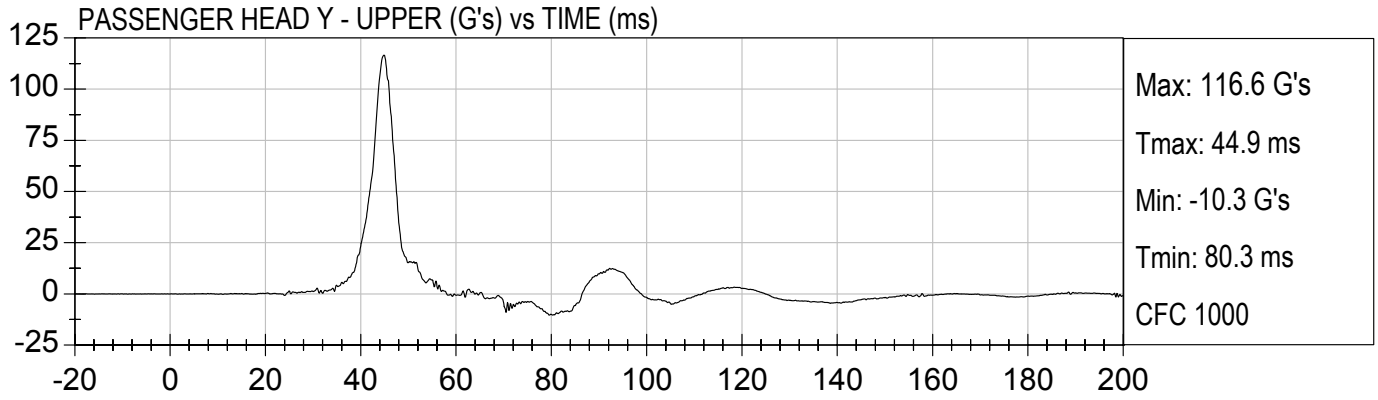


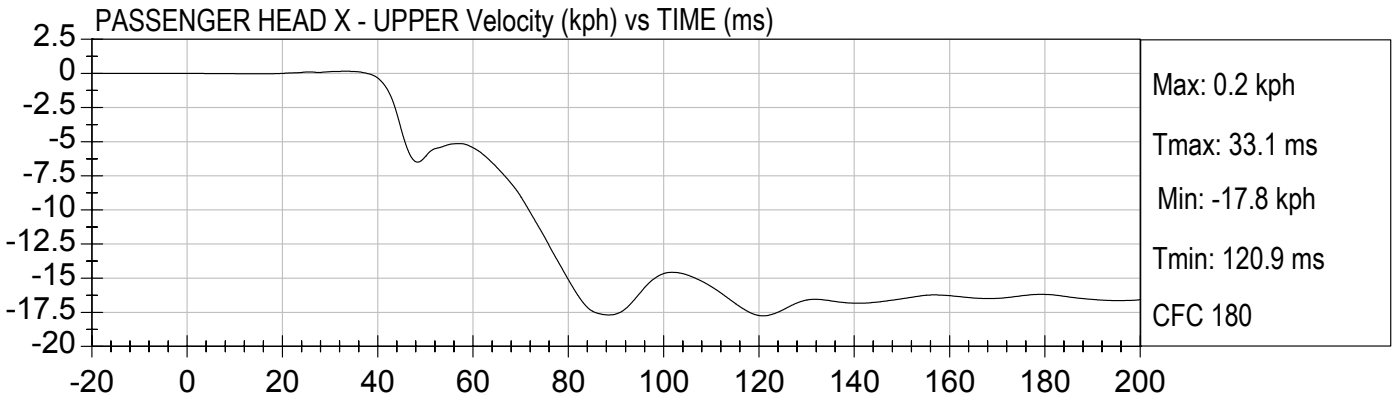


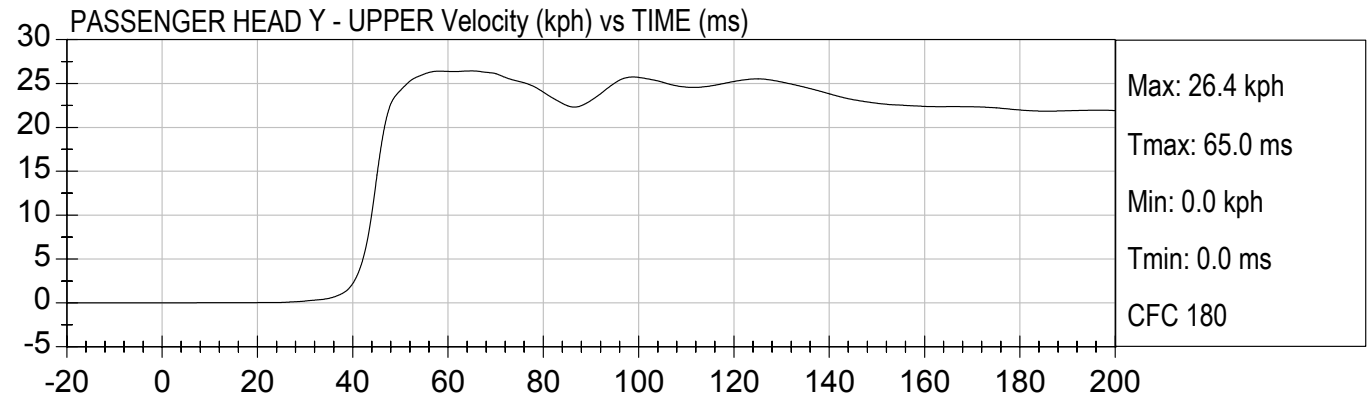
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



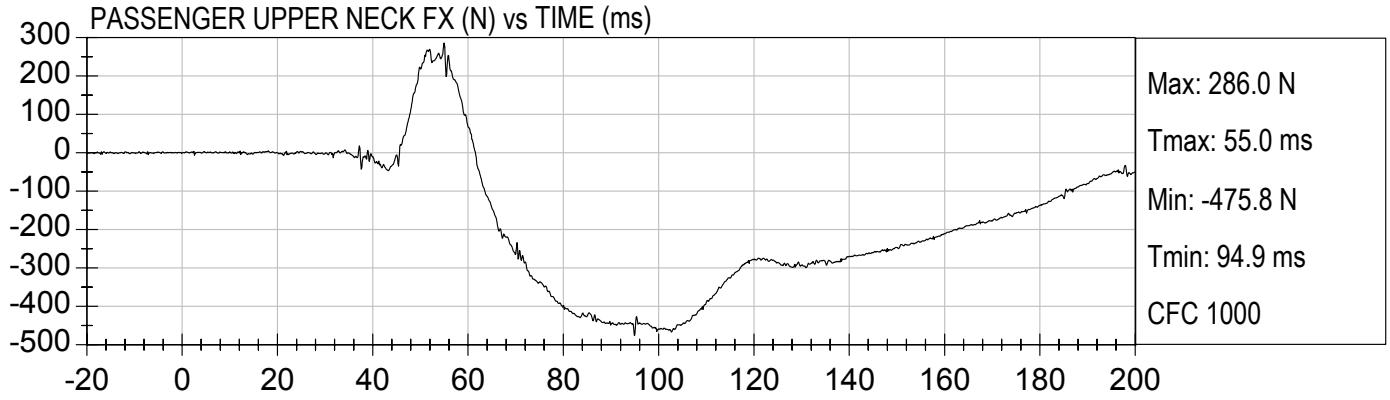


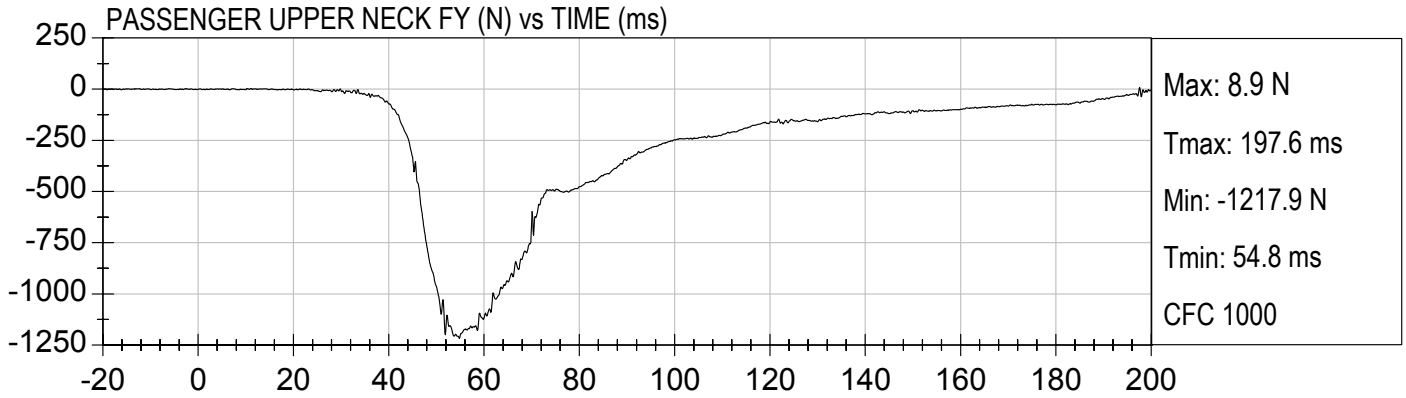


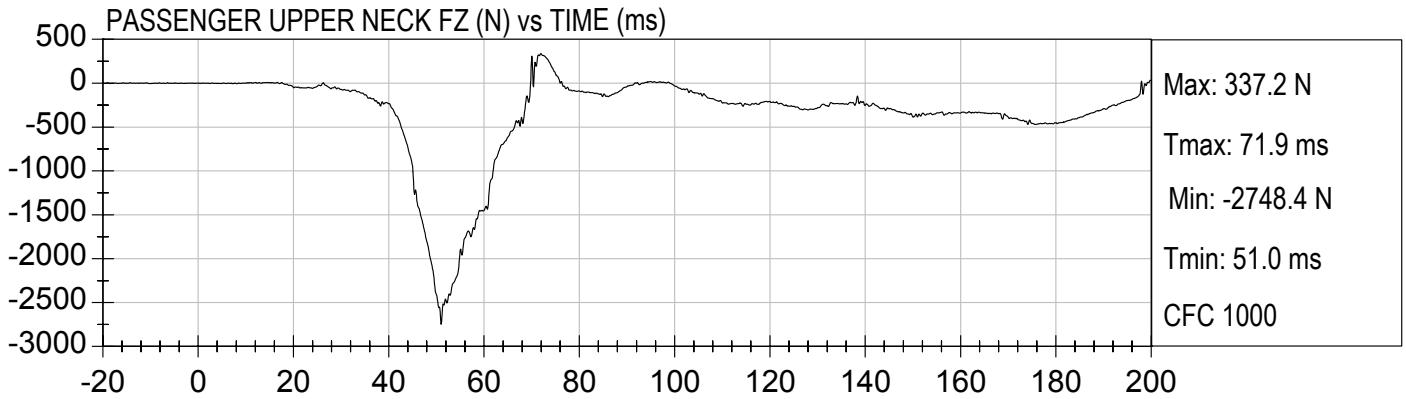


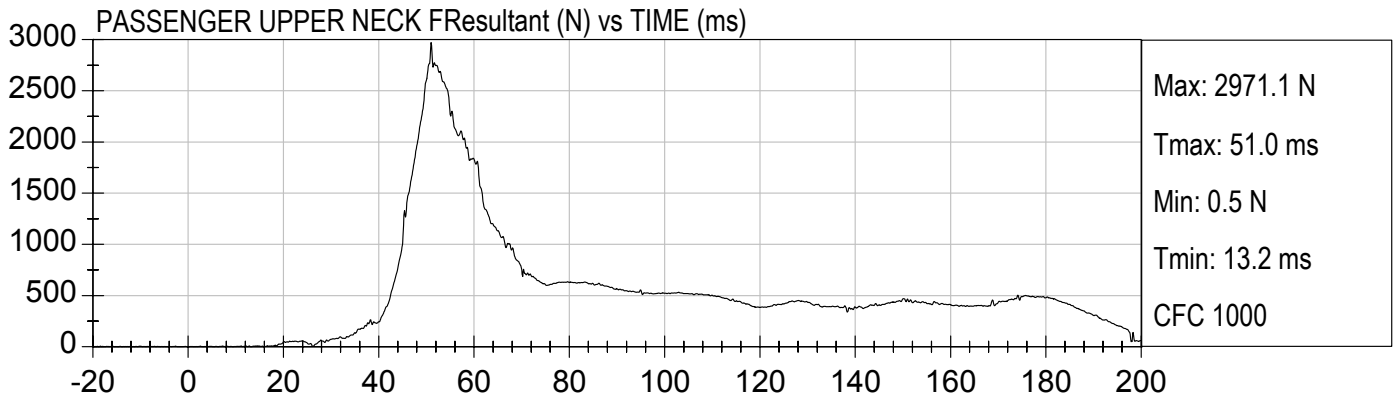
2001 FORD FOCUS
FMVSS 214

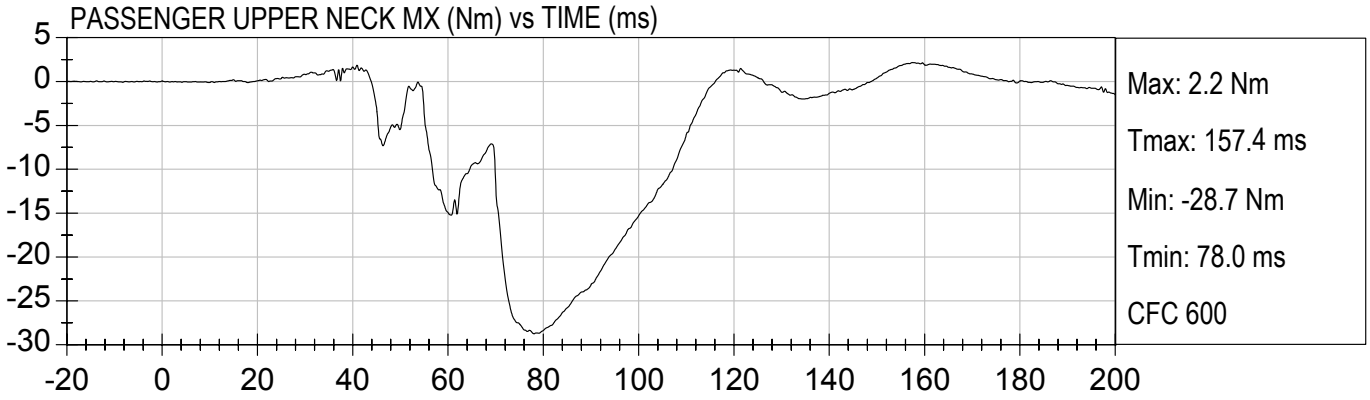
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

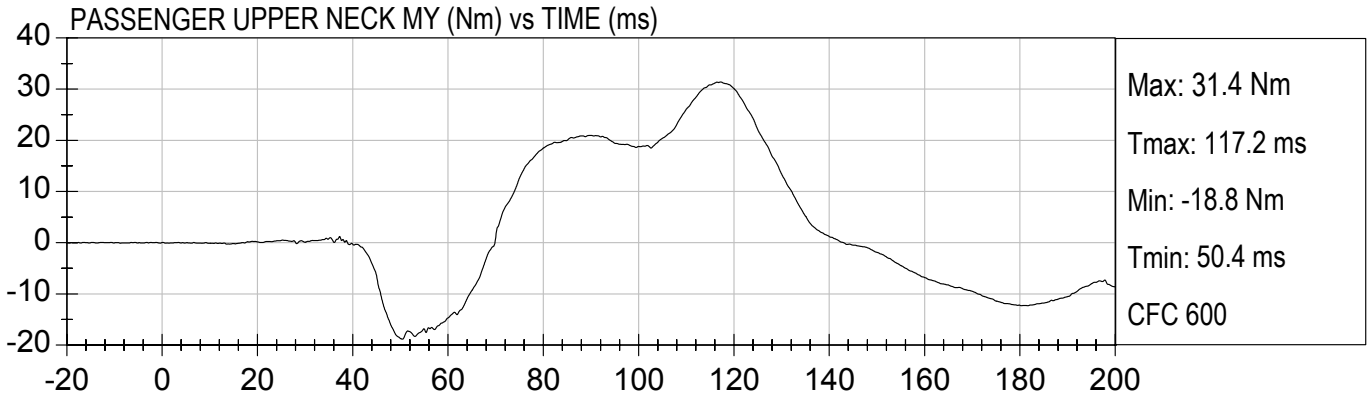


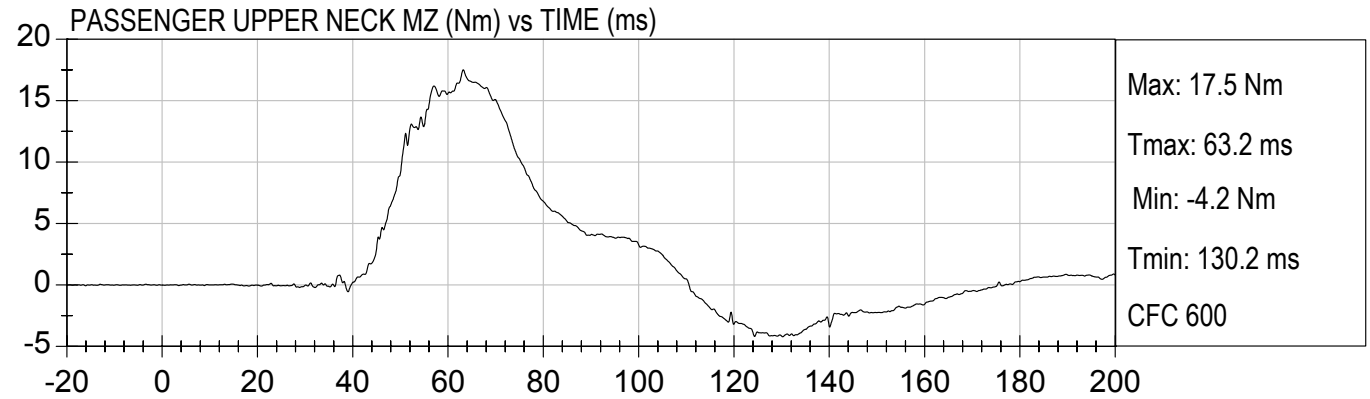


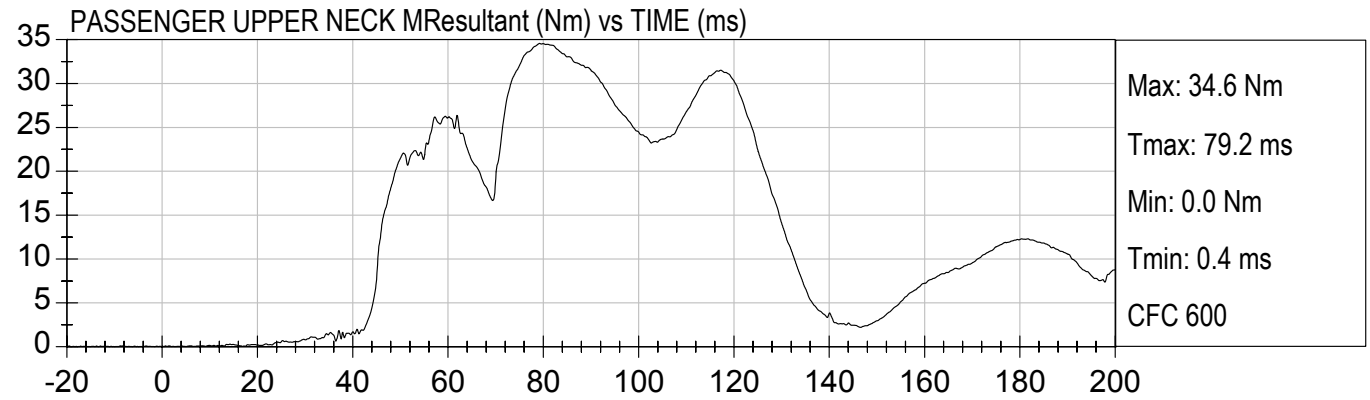





PASSENGER UPPER NECK MX (Nm) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 2.2 Nm
Tmax: 157.4 ms
Min: -28.7 Nm
Tmin: 78.0 ms
CFC 600

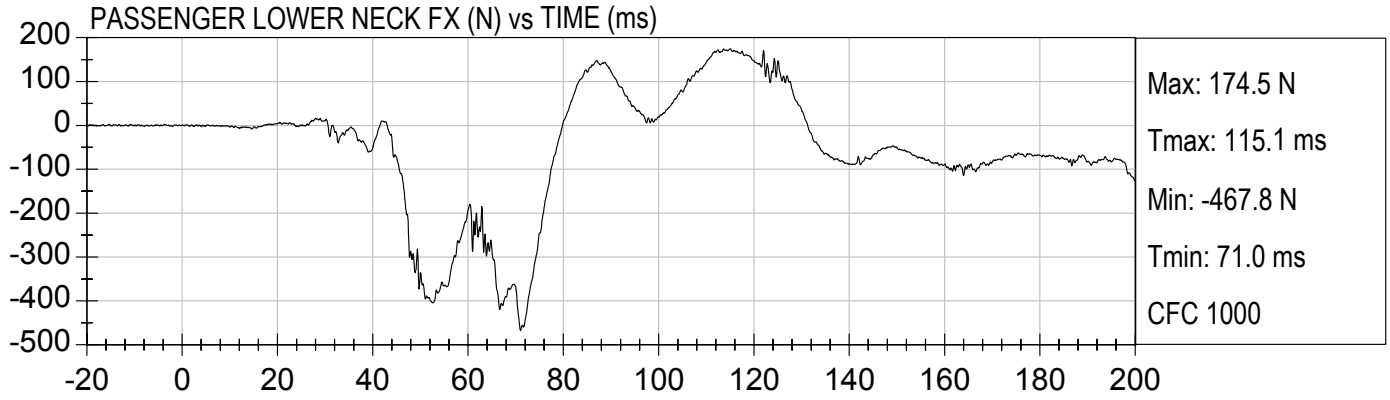

PASSENGER UPPER NECK MY (Nm) vs TIME (ms)
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 31.4 Nm
Tmax: 117.2 ms
Min: -18.8 Nm
Tmin: 50.4 ms
CFC 600

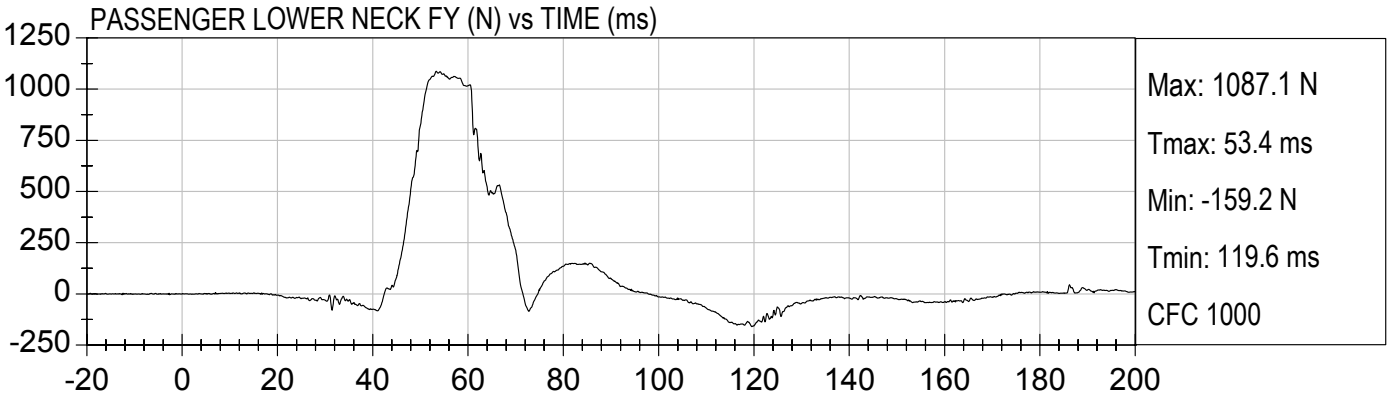

PASSENGER UPPER NECK MZ (Nm) vs TIME (ms)
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 17.5 Nm
Tmax: 63.2 ms
Min: -4.2 Nm
Tmin: 130.2 ms
CFC 600

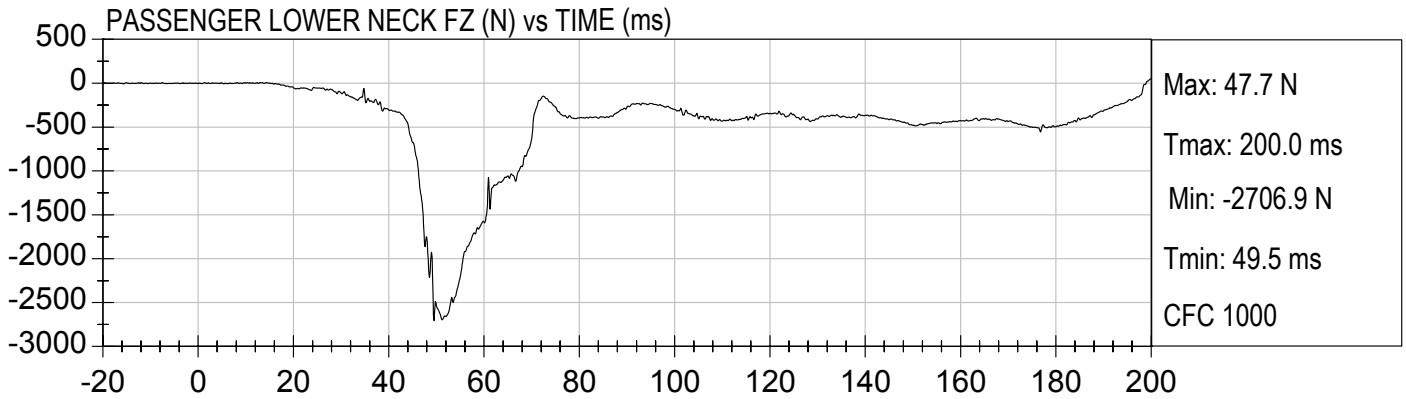

PASSENGER UPPER NECK MResultant (Nm) vs TIME (ms)
35
30
25
20
15
10
5
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 34.6 Nm
Tmax: 79.2 ms
Min: 0.0 Nm
Tmin: 0.4 ms
CFC 600

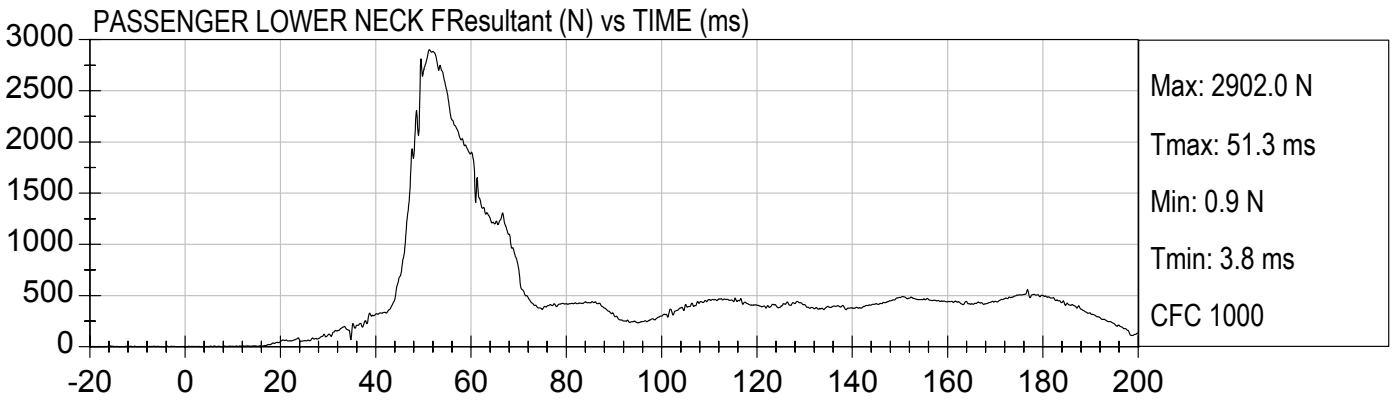
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



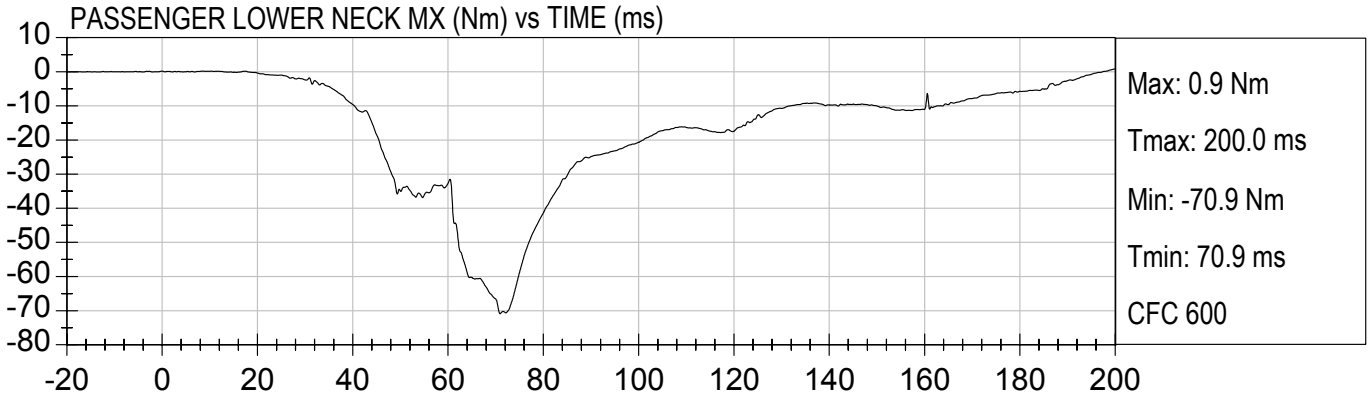


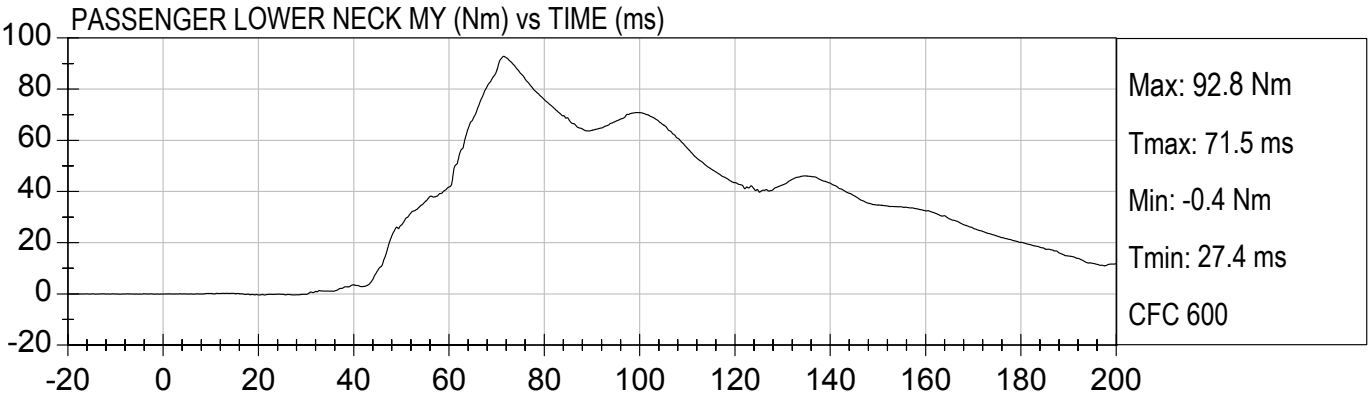


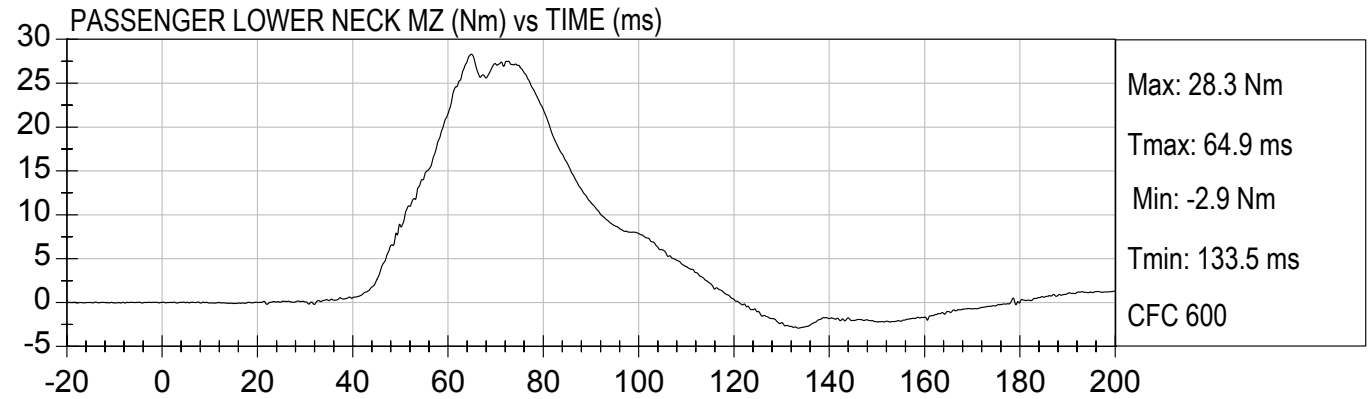


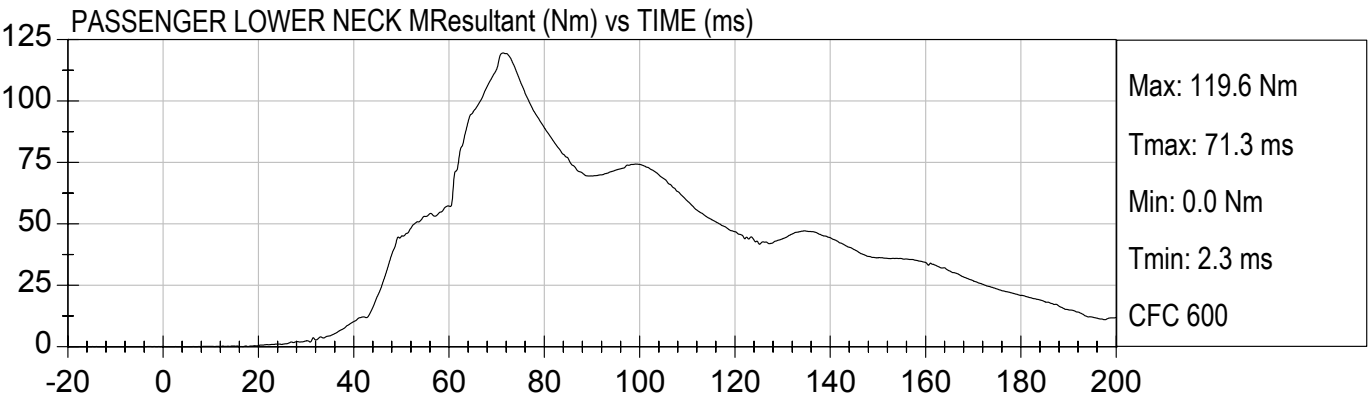
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



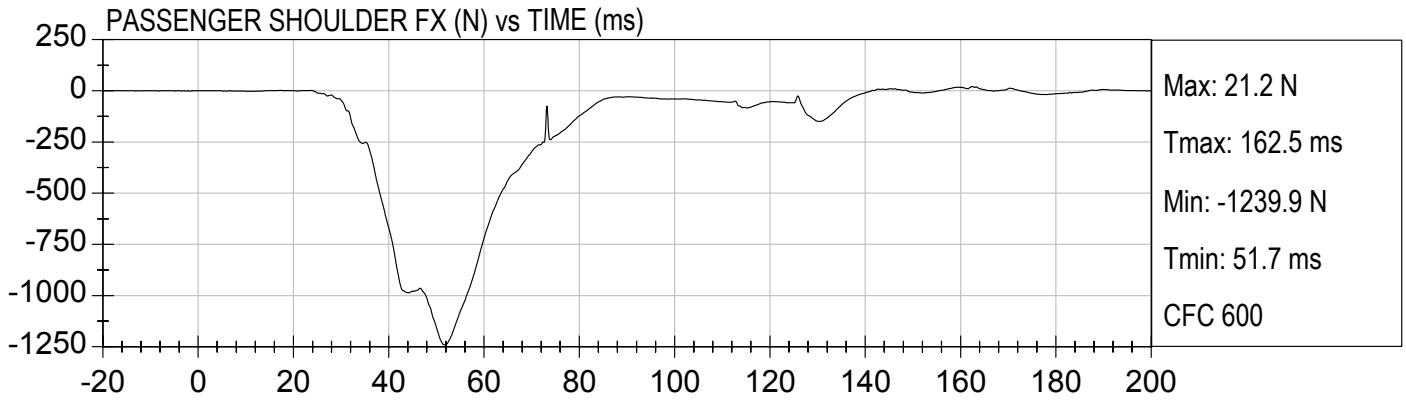


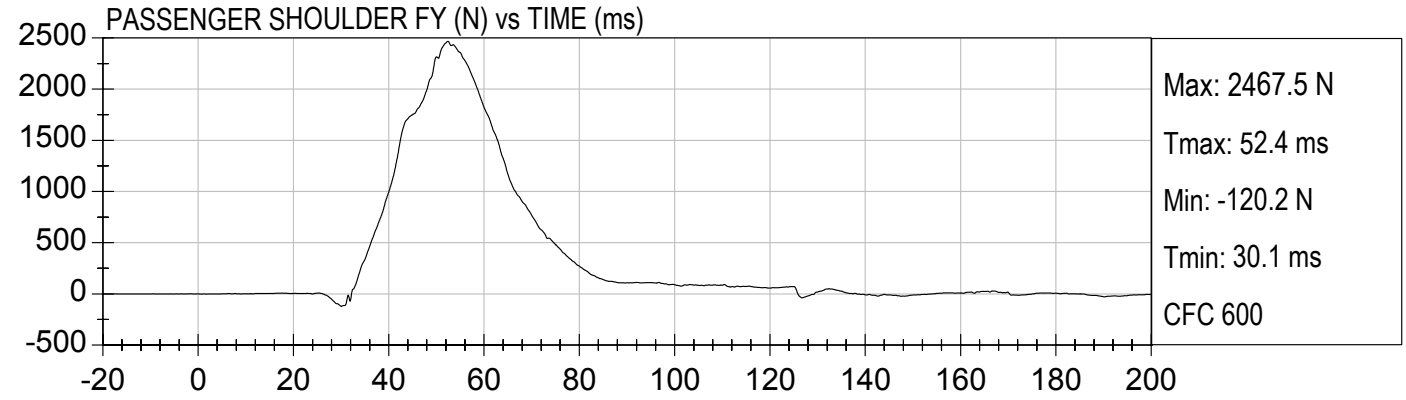


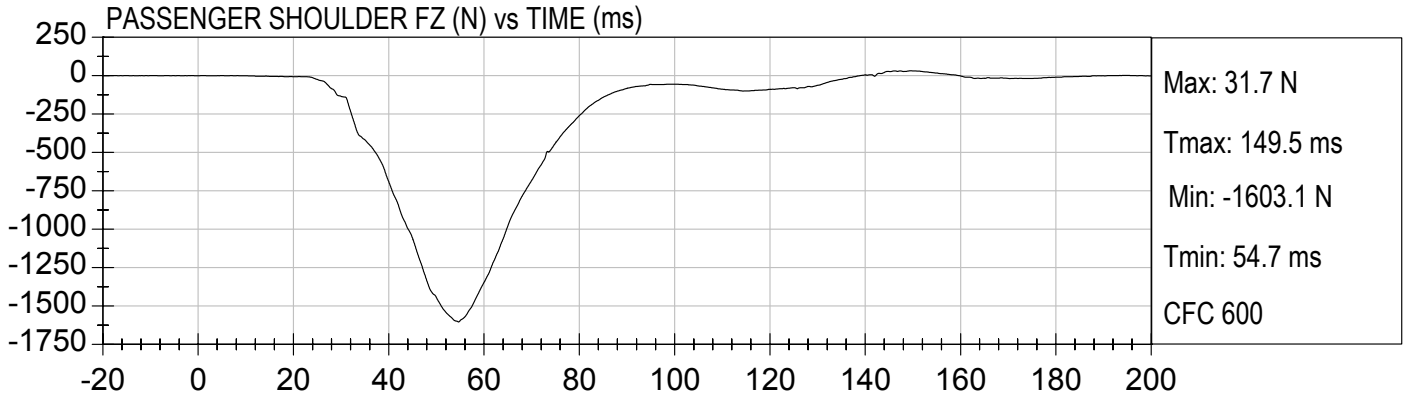


2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

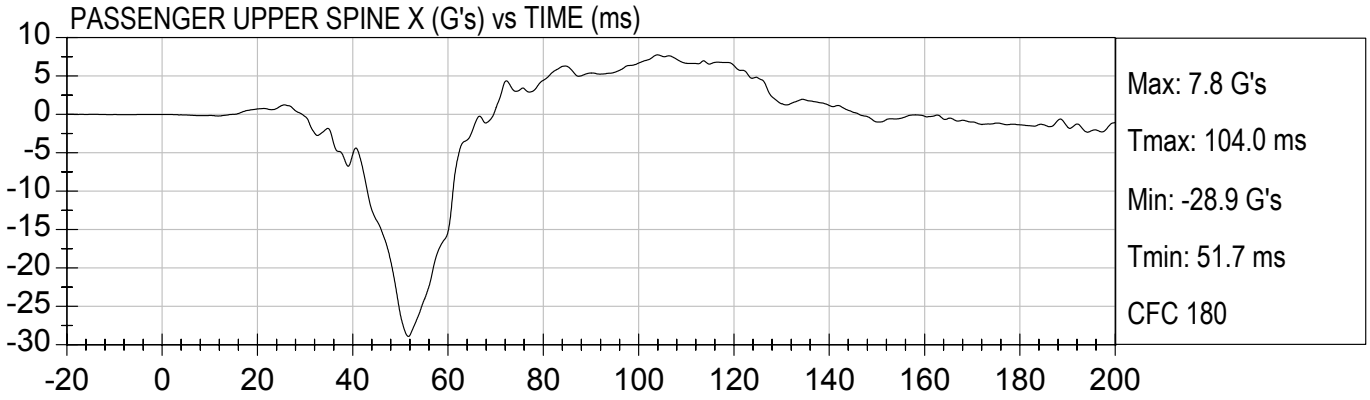


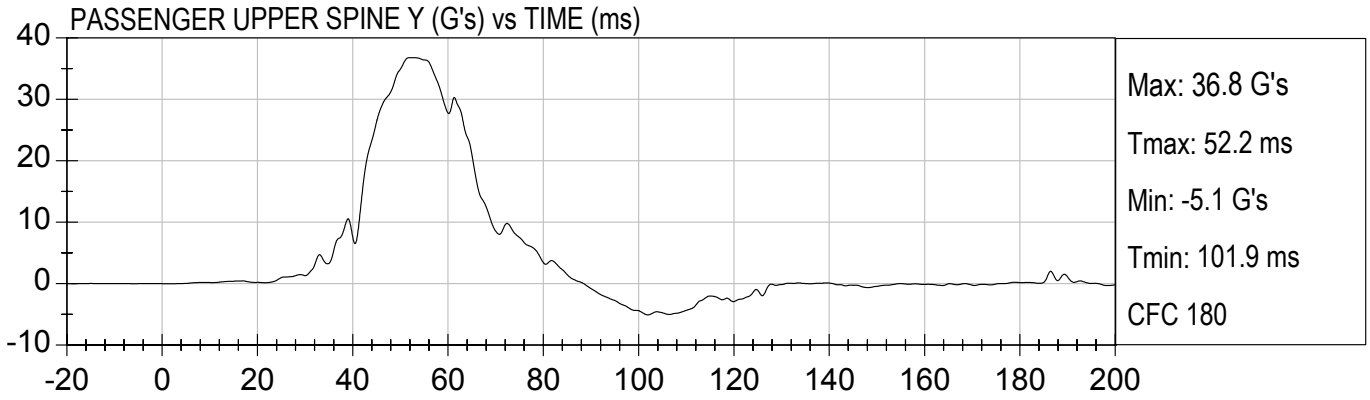


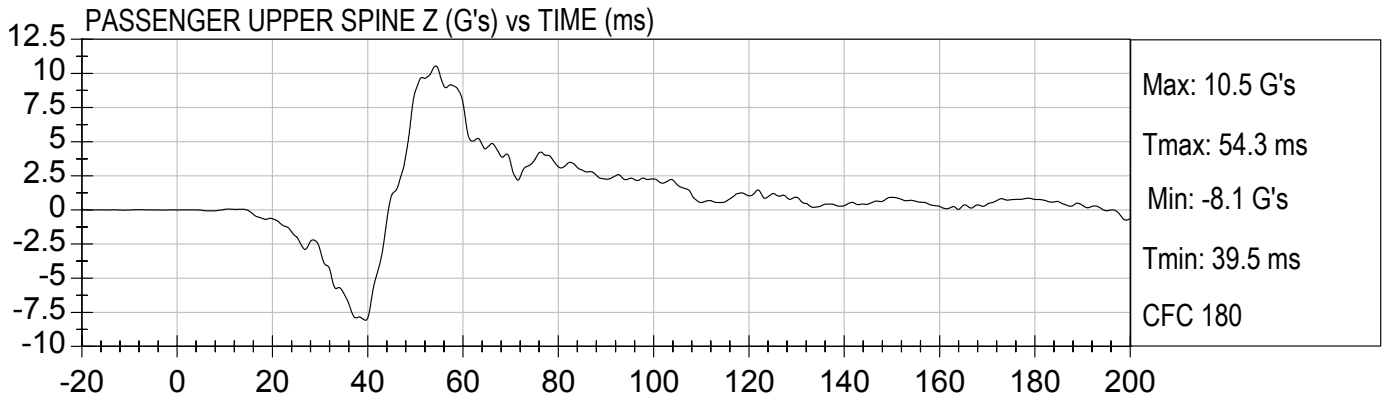


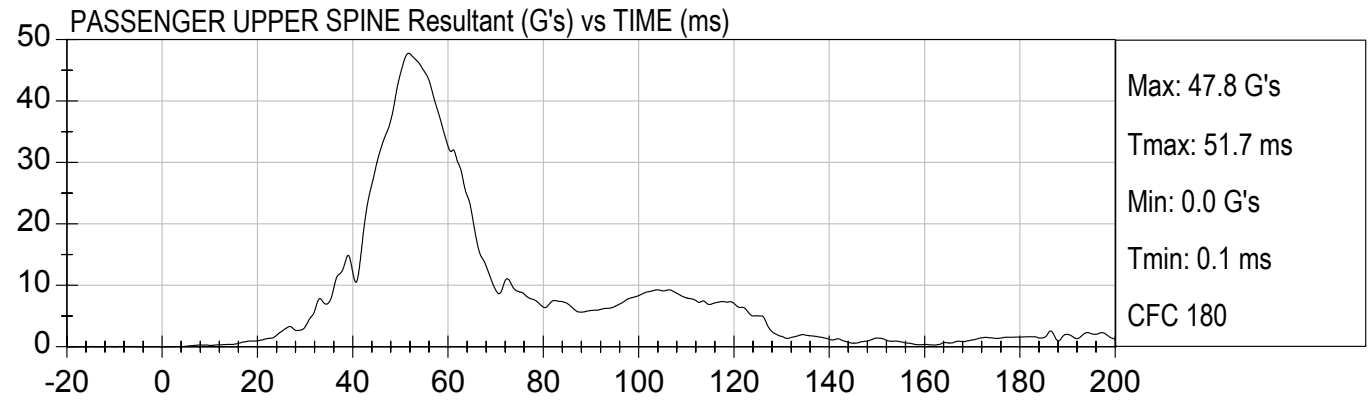
2001 FORD FOCUS
FMVSS 214

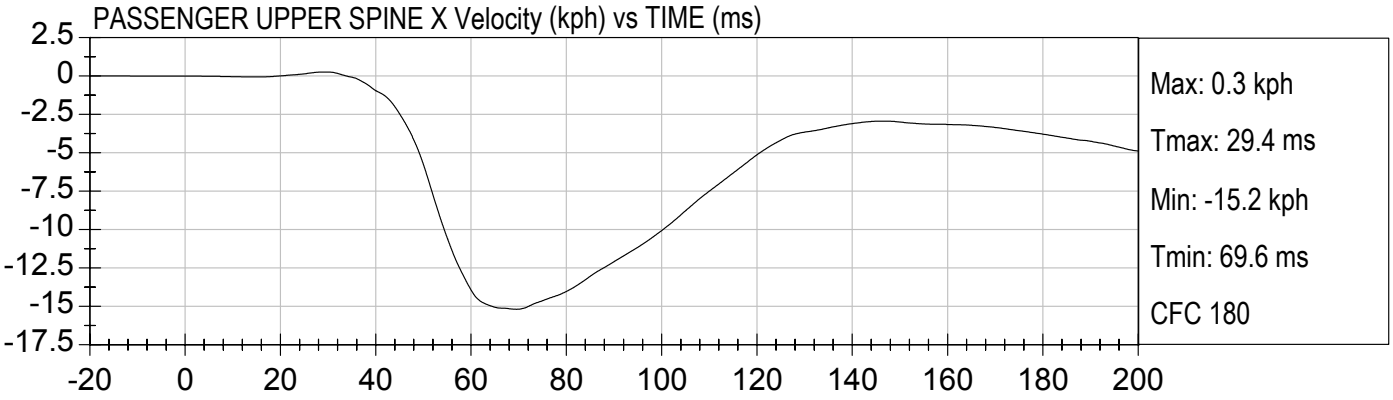
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

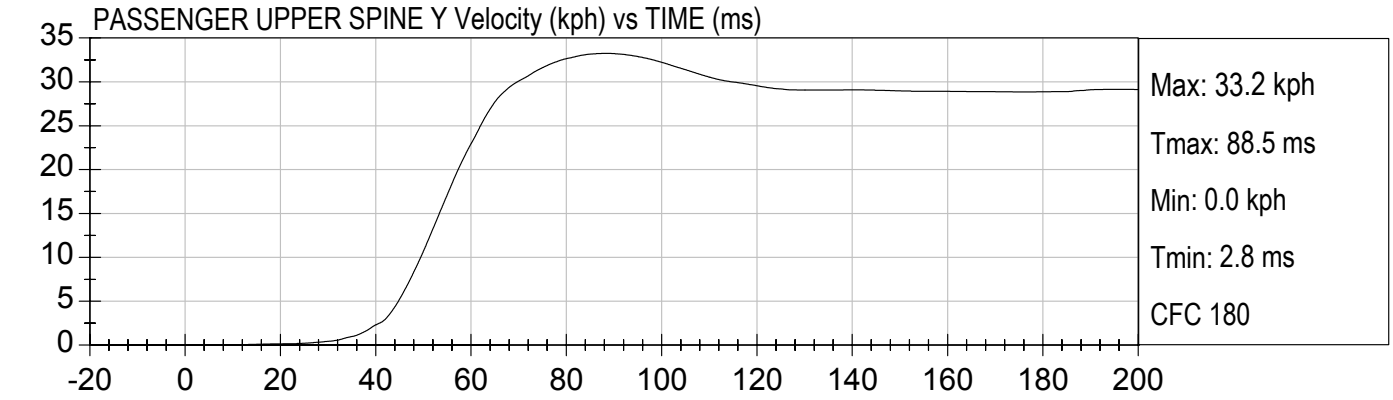


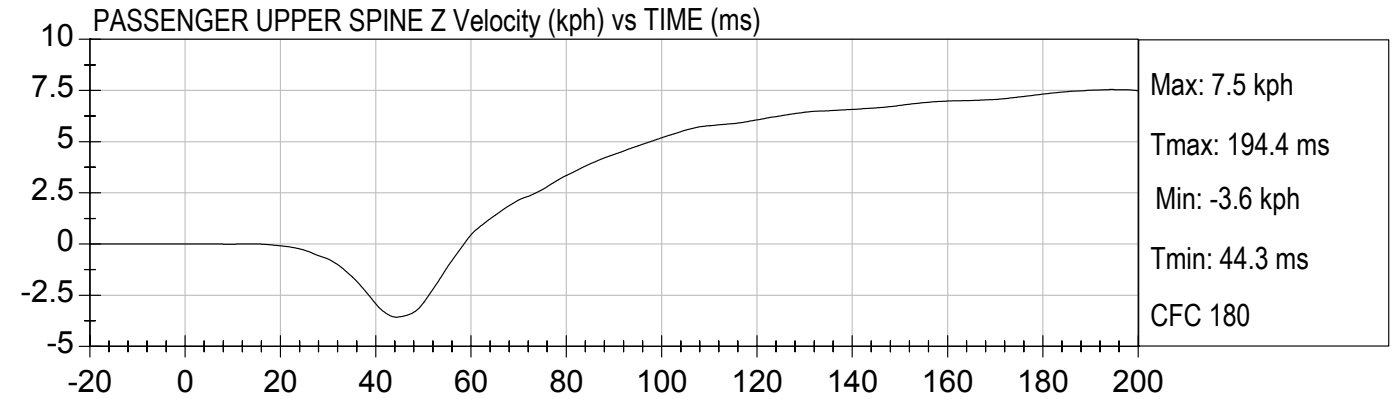


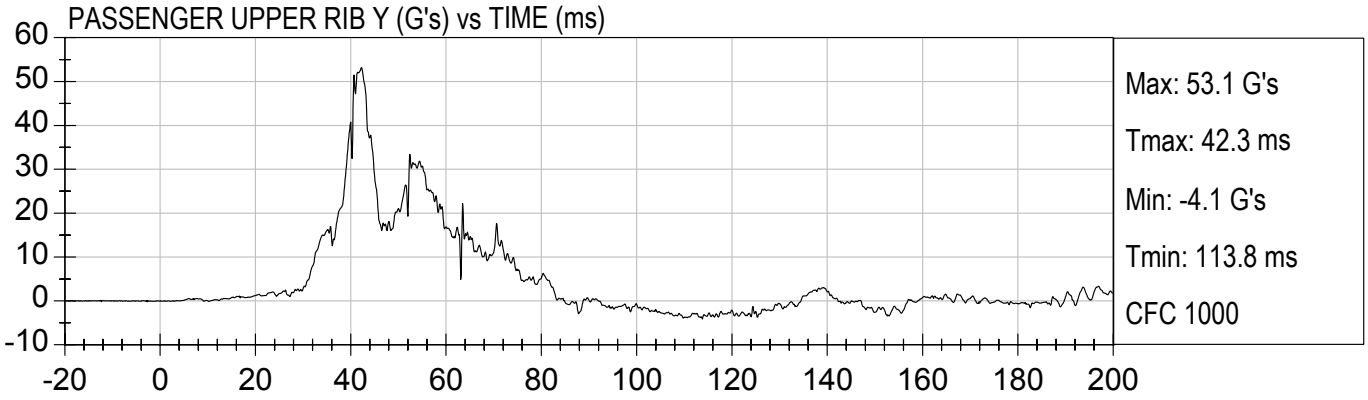


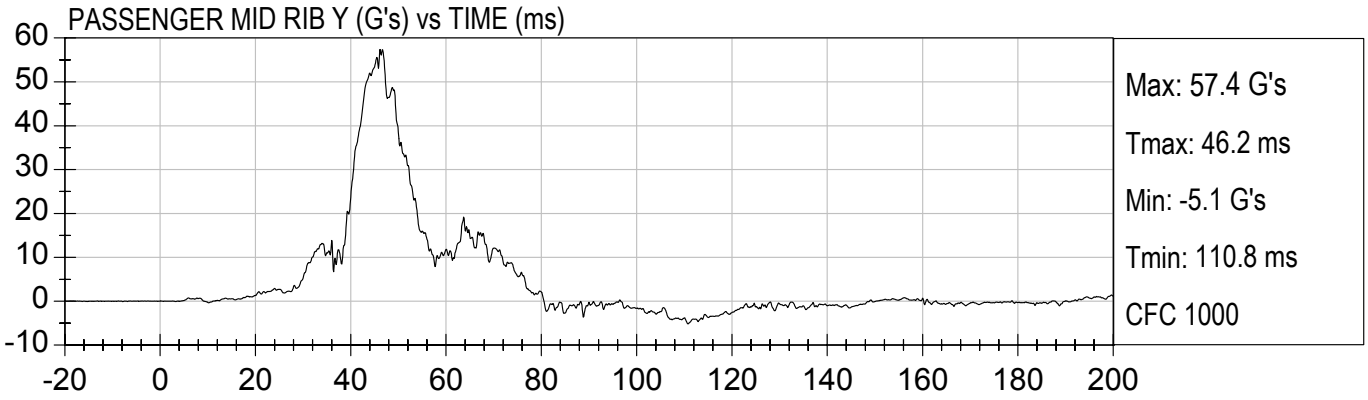


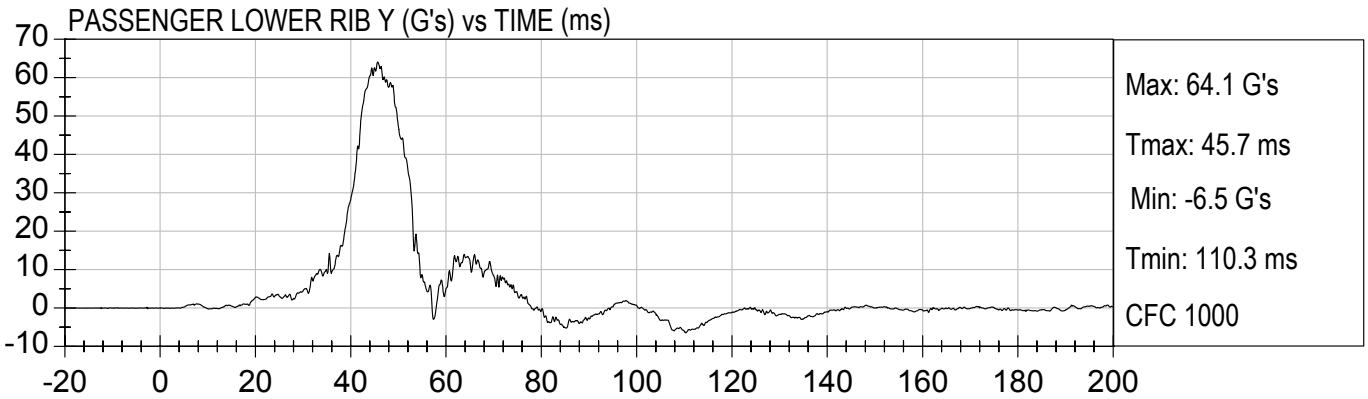

PASSENGER UPPER SPINE X Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-15
-17.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.3 kph
Tmax: 29.4 ms
Min: -15.2 kph
Tmin: 69.6 ms
CFC 180


PASSENGER UPPER SPINE Y Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 33.2 kph
Tmax: 88.5 ms
Min: 0.0 kph
Tmin: 2.8 ms
CFC 180

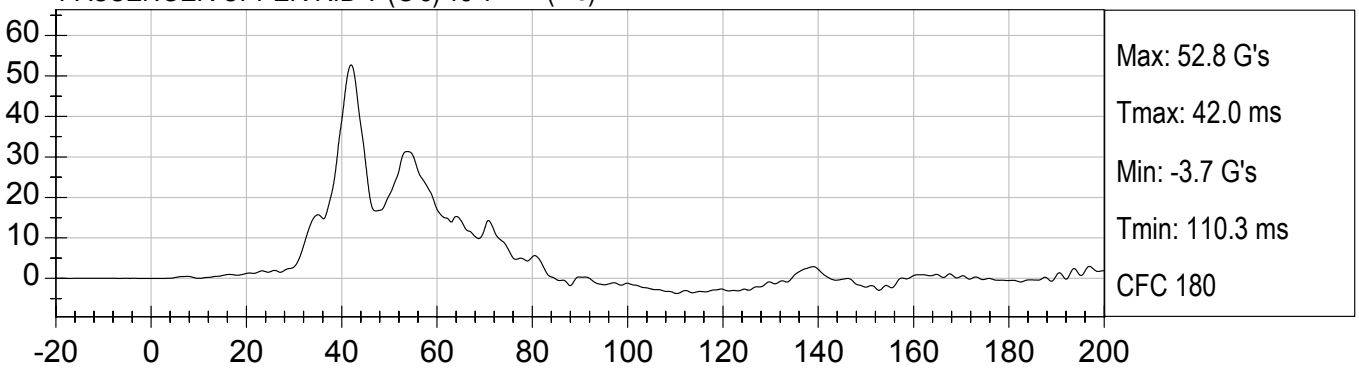

PASSENGER UPPER SPINE Z Velocity (kph) vs TIME (ms)
10
7.5
5
2.5
0
-2.5
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 7.5 kph
Tmax: 194.4 ms
Min: -3.6 kph
Tmin: 44.3 ms
CFC 180


PASSENGER UPPER RIB Y (G's) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 53.1 G's
Tmax: 42.3 ms
Min: -4.1 G's
Tmin: 113.8 ms
CFC 1000

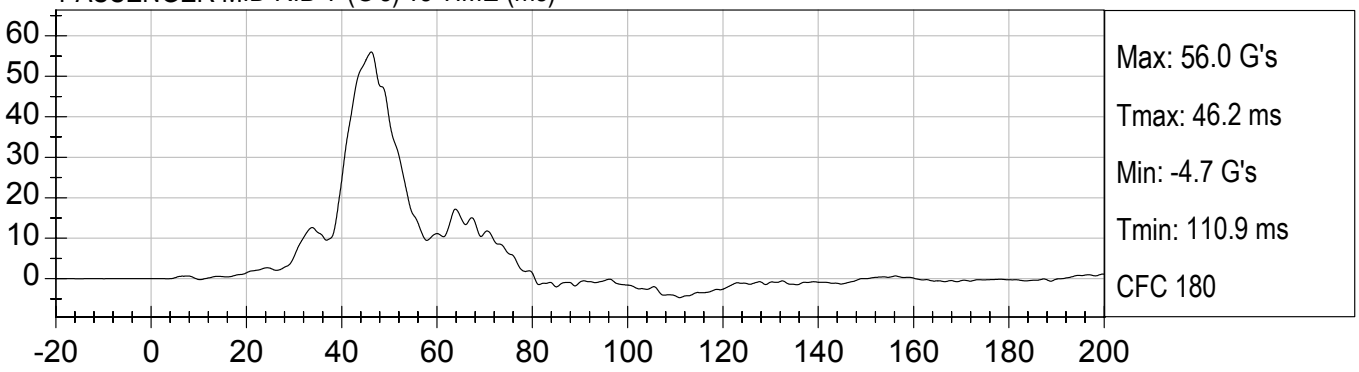

PASSENGER MID RIB Y (G's) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 57.4 G's
Tmax: 46.2 ms
Min: -5.1 G's
Tmin: 110.8 ms
CFC 1000


PASSENGER LOWER RIB Y (G's) vs TIME (ms)
70
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 64.1 G's
Tmax: 45.7 ms
Min: -6.5 G's
Tmin: 110.3 ms
CFC 1000

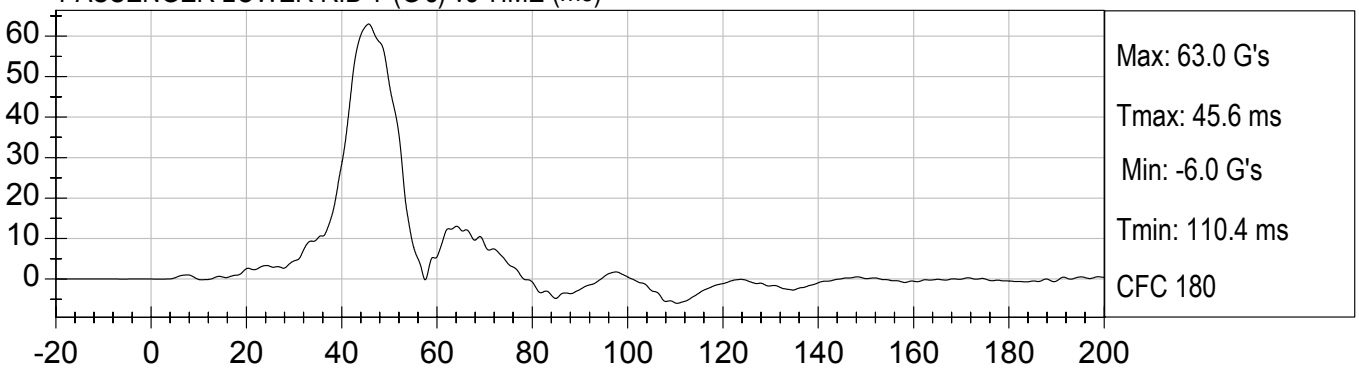
PASSENGER UPPER RIB Y (G's) vs TIME (ms)

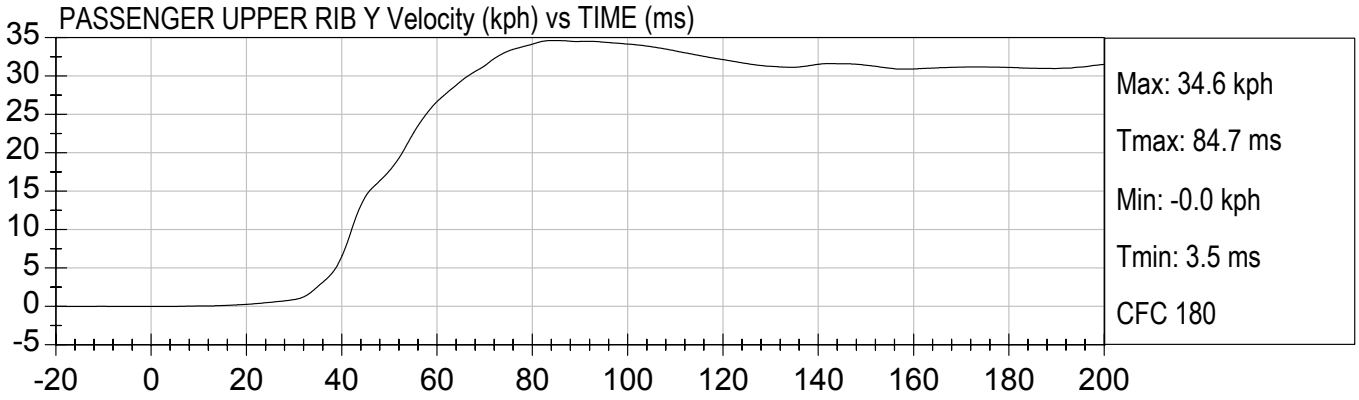


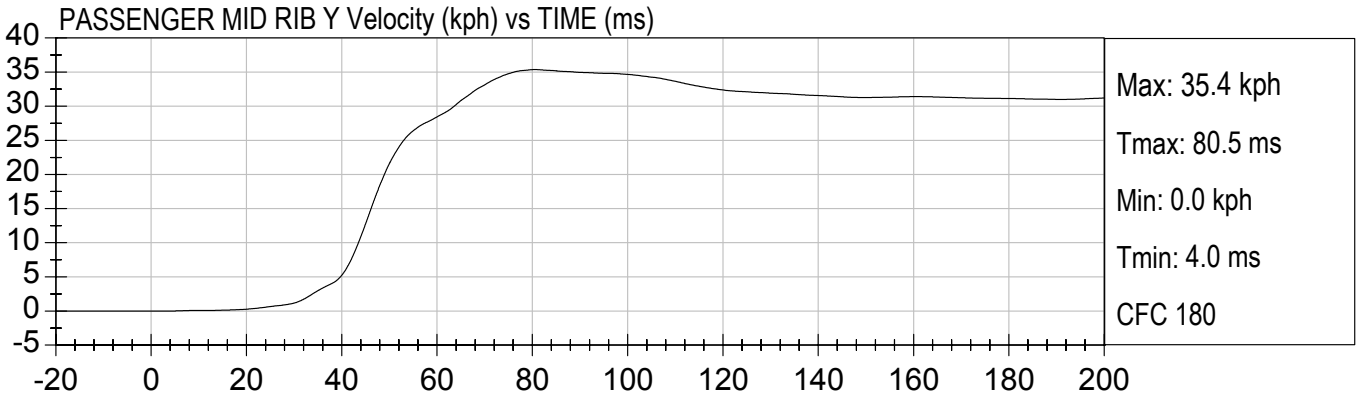
PASSENGER MID RIB Y (G's) vs TIME (ms)

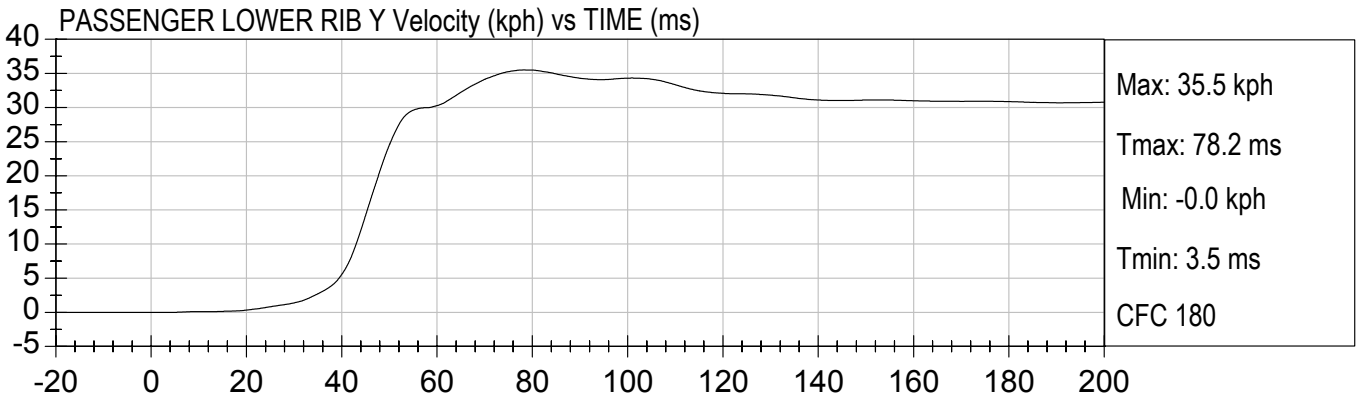


PASSENGER LOWER RIB Y (G's) vs TIME (ms)

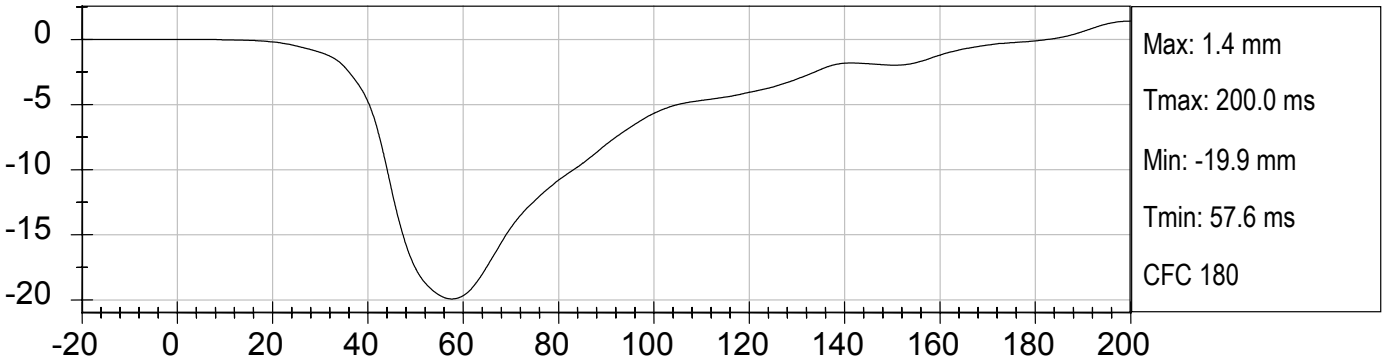



PASSENGER UPPER RIB Y Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 34.6 kph
Tmax: 84.7 ms
Min: -0.0 kph
Tmin: 3.5 ms
CFC 180

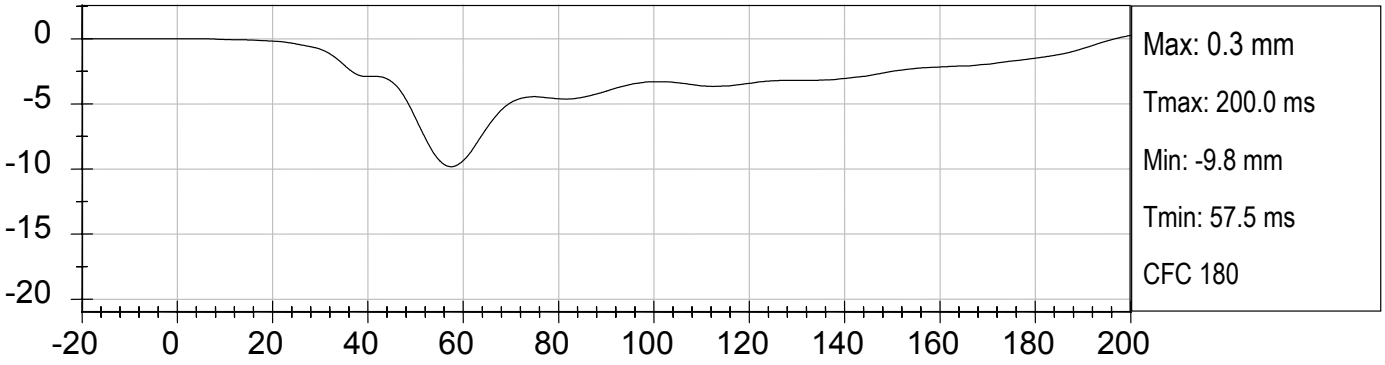

PASSENGER MID RIB Y Velocity (kph) vs TIME (ms)
40
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 35.4 kph
Tmax: 80.5 ms
Min: 0.0 kph
Tmin: 4.0 ms
CFC 180


PASSENGER LOWER RIB Y Velocity (kph) vs TIME (ms)
40
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 35.5 kph
Tmax: 78.2 ms
Min: -0.0 kph
Tmin: 3.5 ms
CFC 180

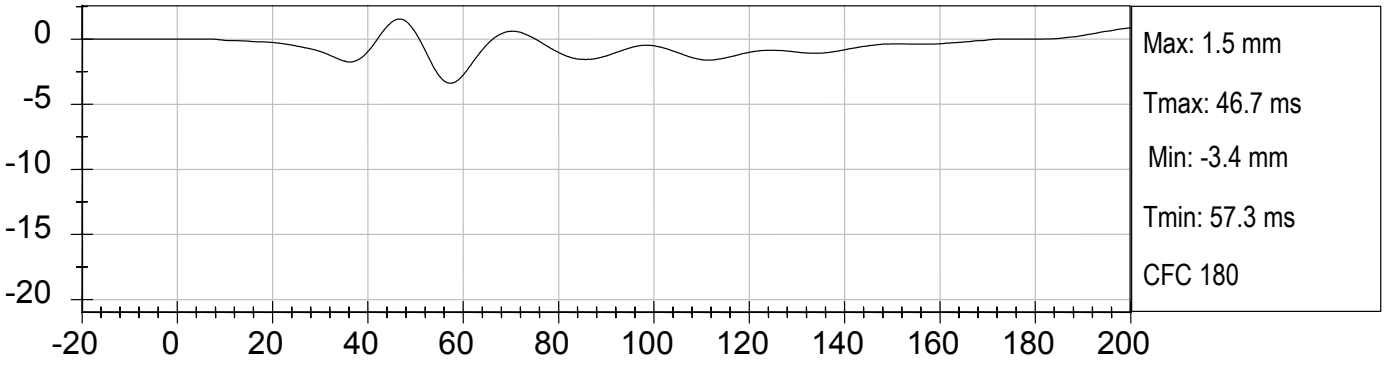
PASS UPPER RIB DISPLACEMENT (mm) vs TIME (ms)

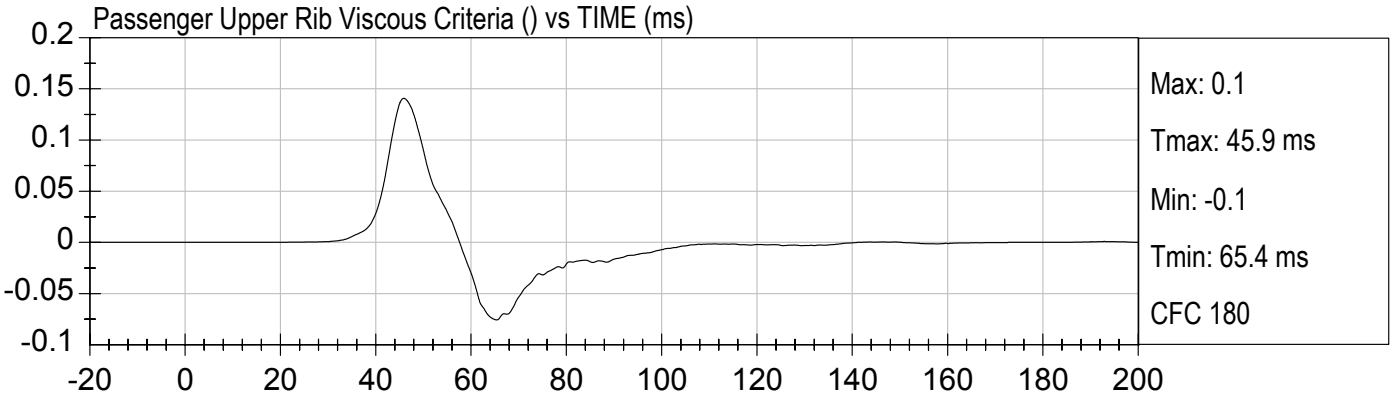


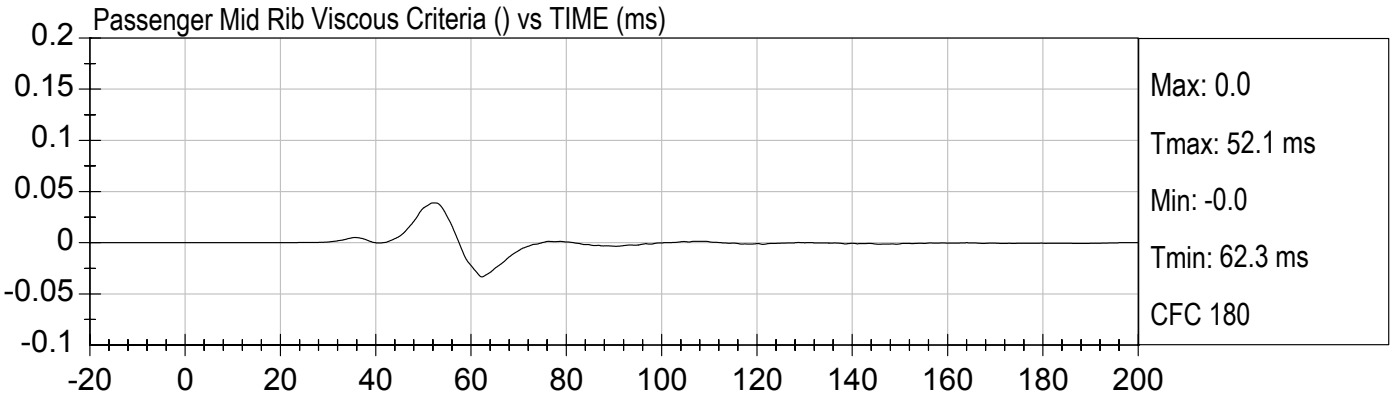
PASS MID RIB DISPLACEMENT (mm) vs TIME (ms)

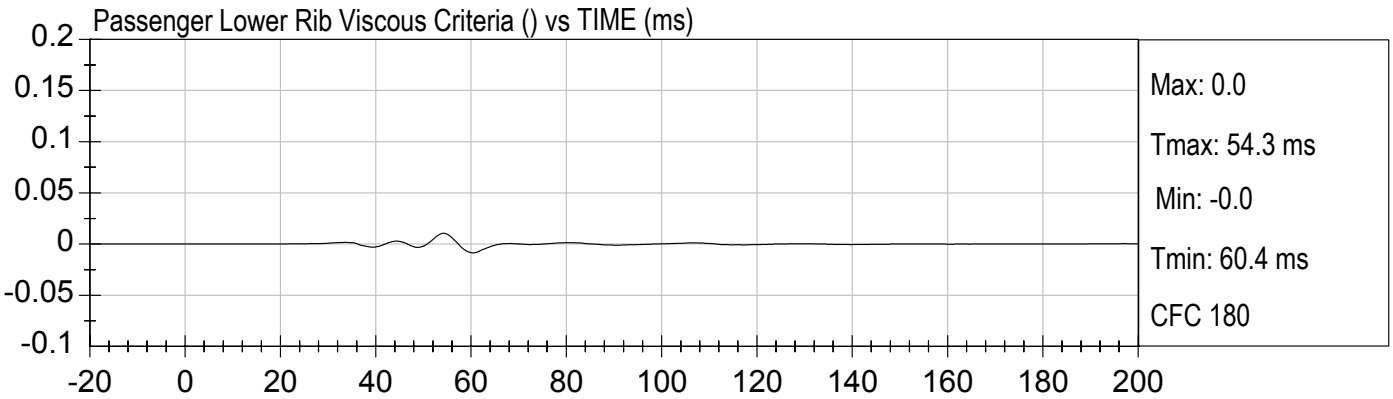


PASS LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



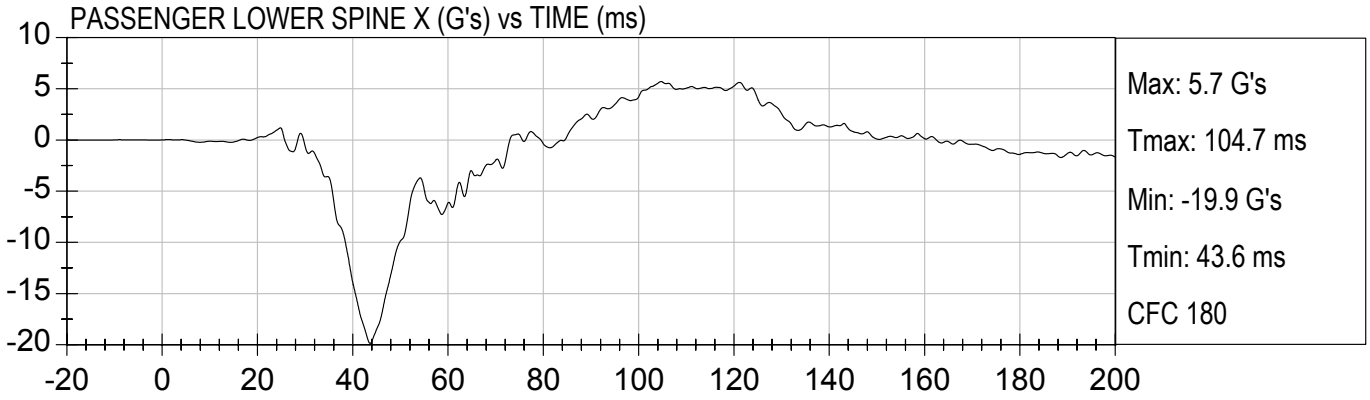

Passenger Upper Rib Viscous Criteria () vs TIME (ms)
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.1
Tmax: 45.9 ms
Min: -0.1
Tmin: 65.4 ms
CFC 180

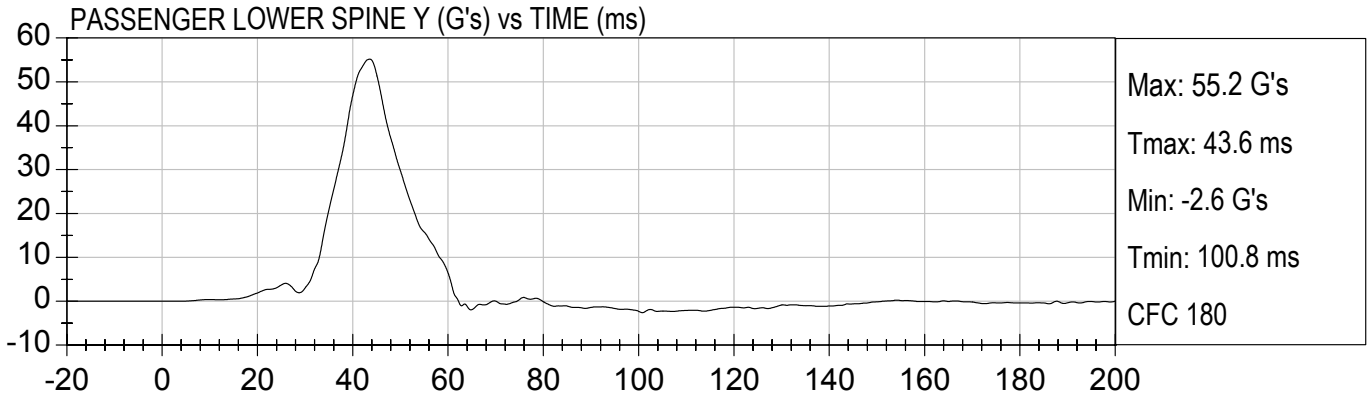

Passenger Mid Rib Viscous Criteria () vs TIME (ms)
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.0
Tmax: 52.1 ms
Min: -0.0
Tmin: 62.3 ms
CFC 180

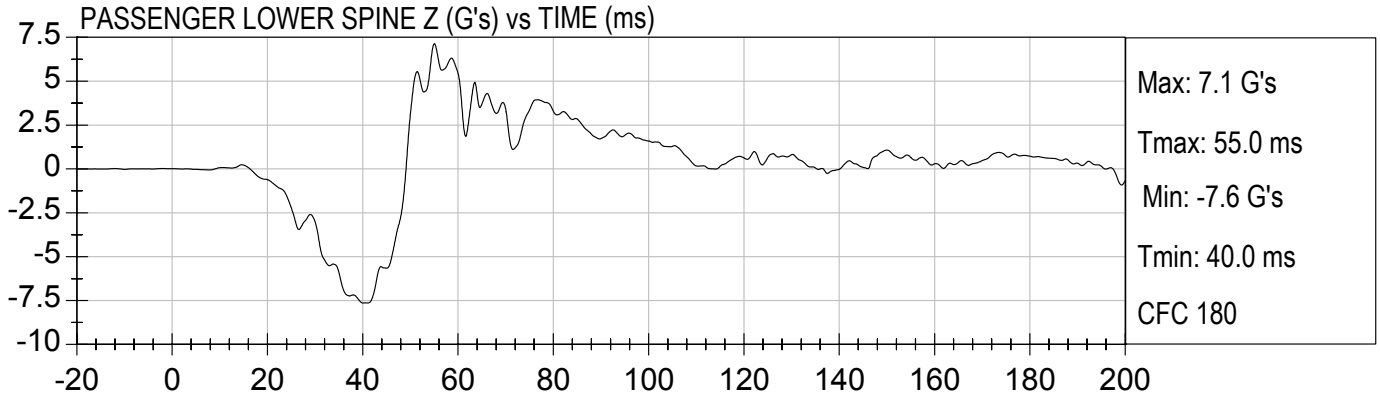

Passenger Lower Rib Viscous Criteria () vs TIME (ms)
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.0
Tmax: 54.3 ms
Min: -0.0
Tmin: 60.4 ms
CFC 180

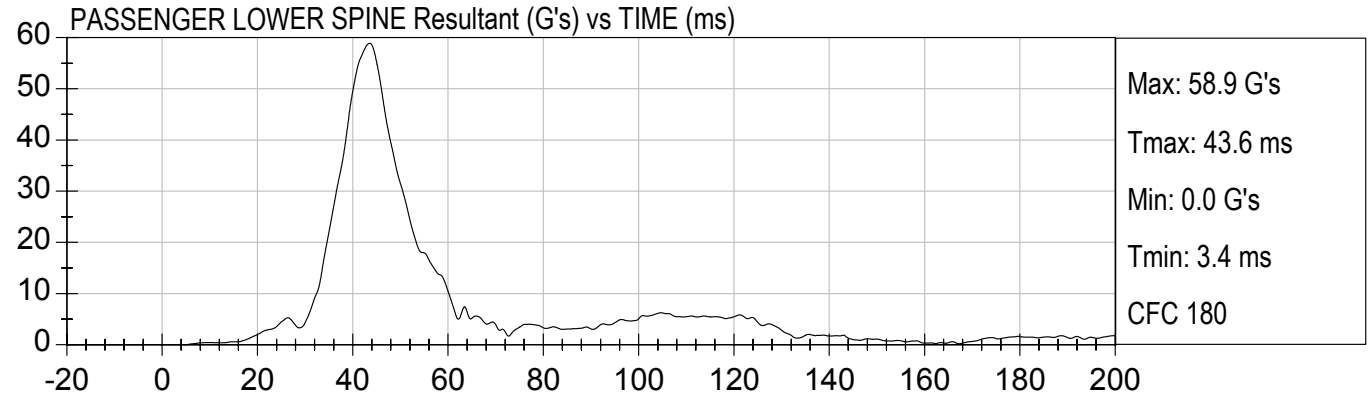
2001 FORD FOCUS
FMVSS 214

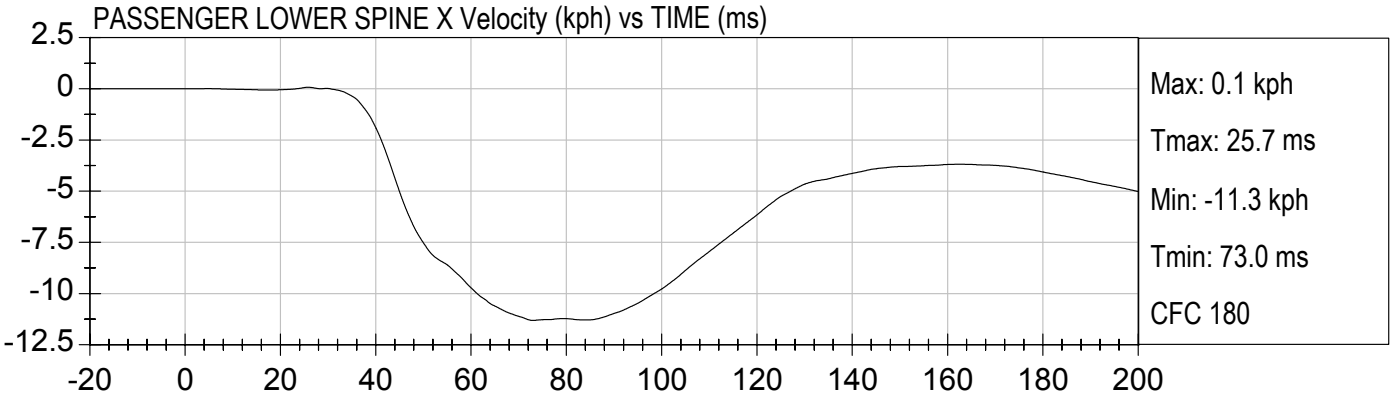
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

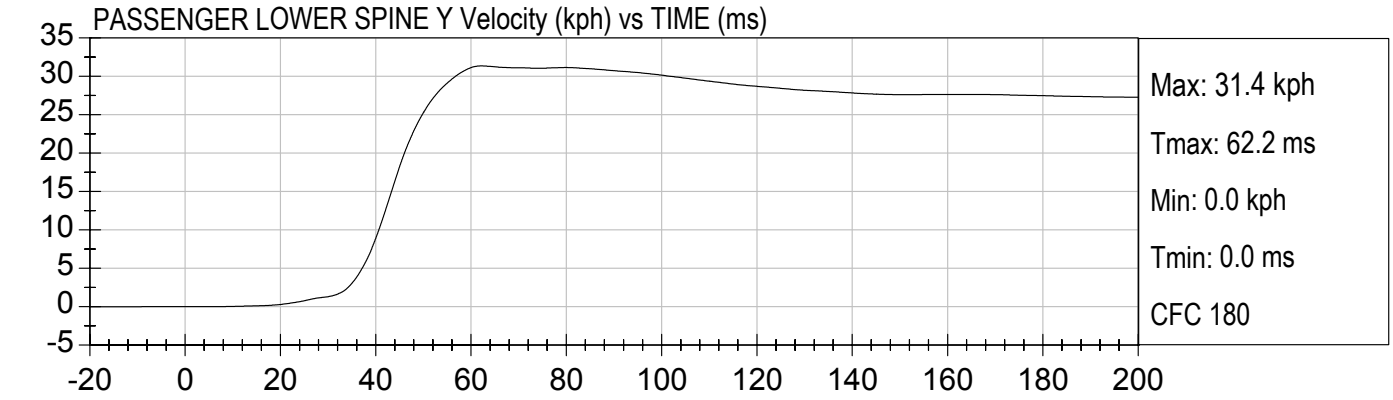


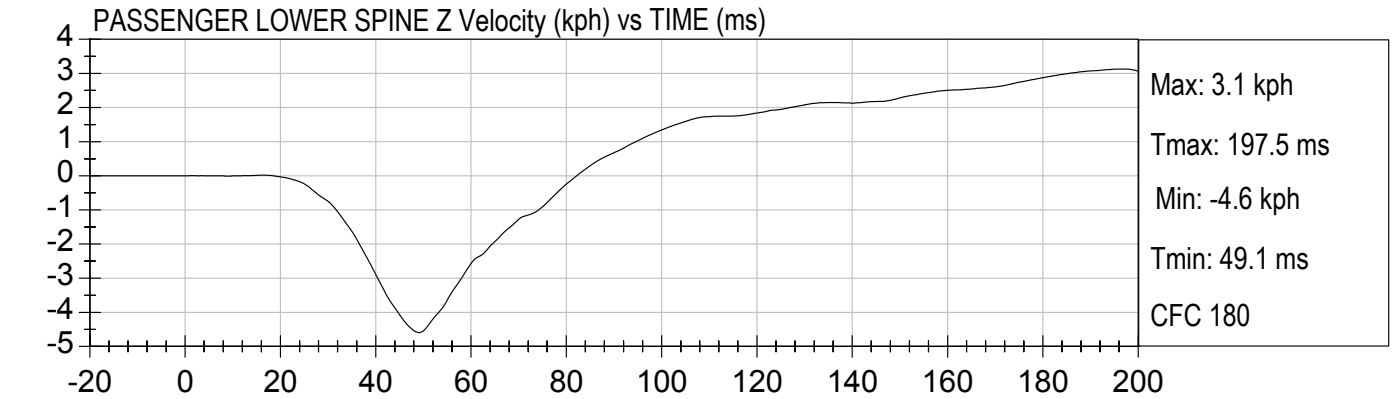






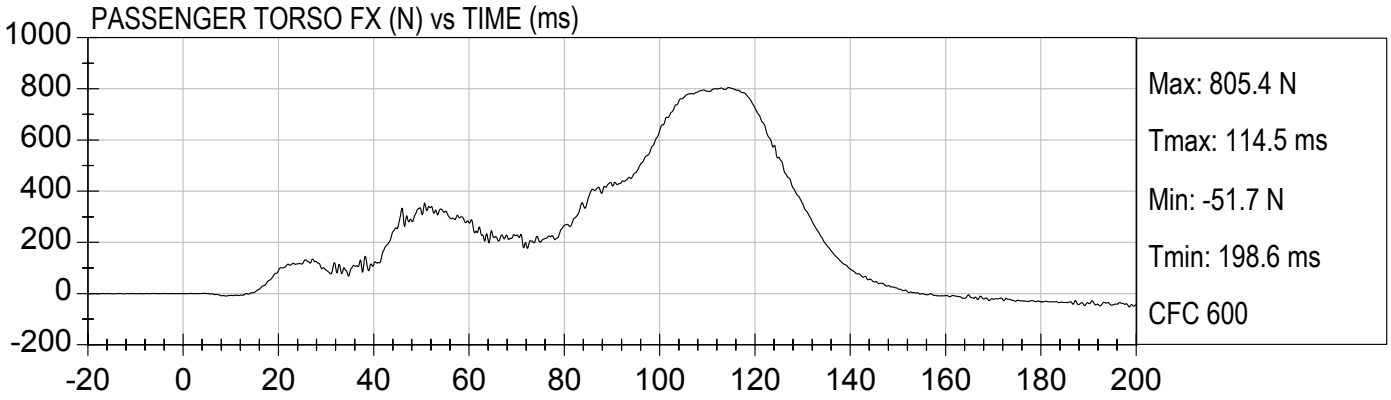

PASSENGER LOWER SPINE X Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.1 kph
Tmax: 25.7 ms
Min: -11.3 kph
Tmin: 73.0 ms
CFC 180

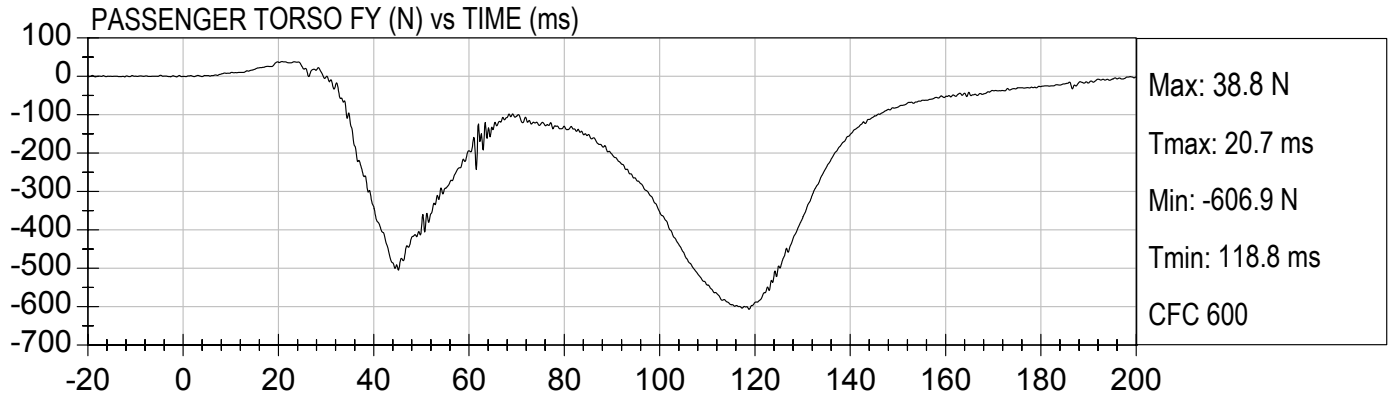

PASSENGER LOWER SPINE Y Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 31.4 kph
Tmax: 62.2 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

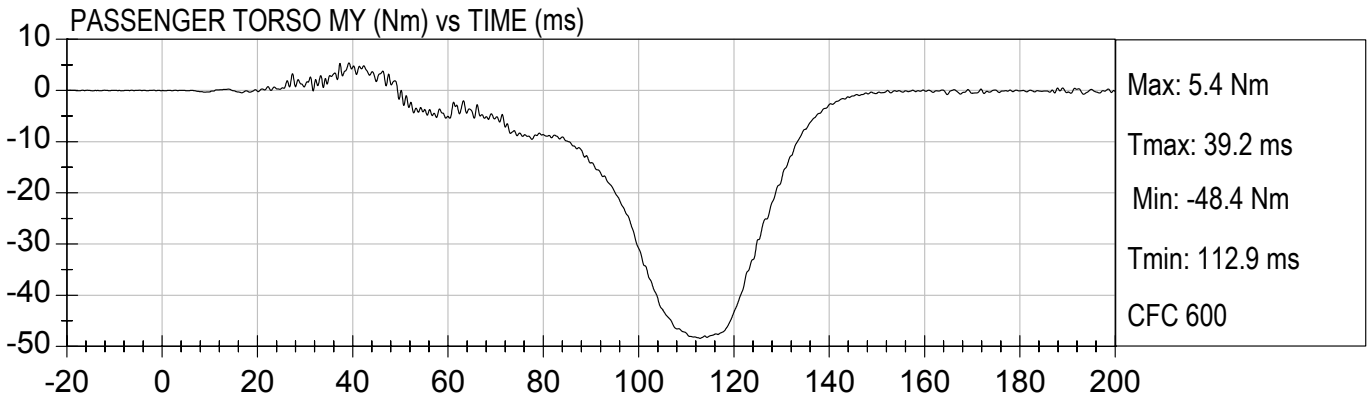

PASSENGER LOWER SPINE Z Velocity (kph) vs TIME (ms)
4
3
2
1
0
-1
-2
-3
-4
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 3.1 kph
Tmax: 197.5 ms
Min: -4.6 kph
Tmin: 49.1 ms
CFC 180

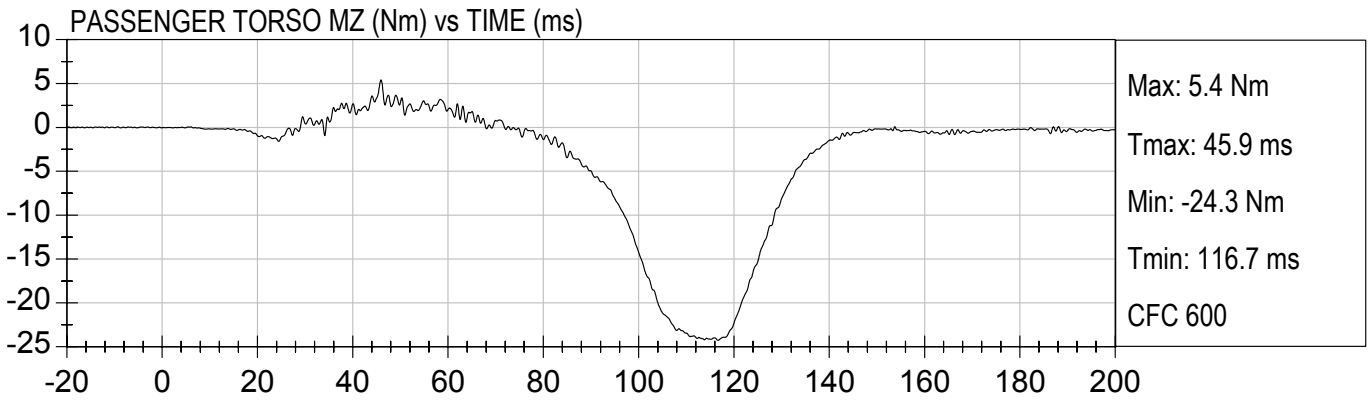
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



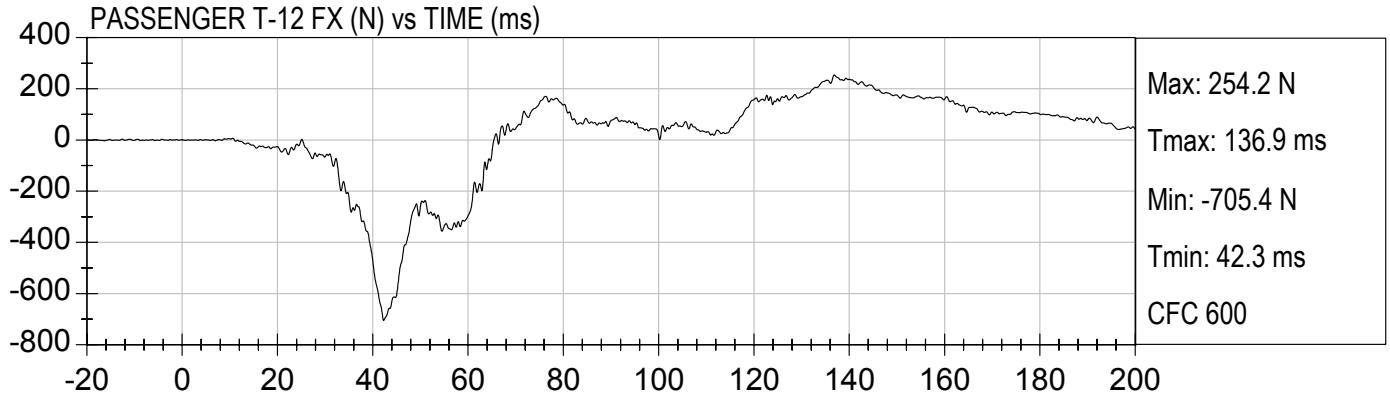


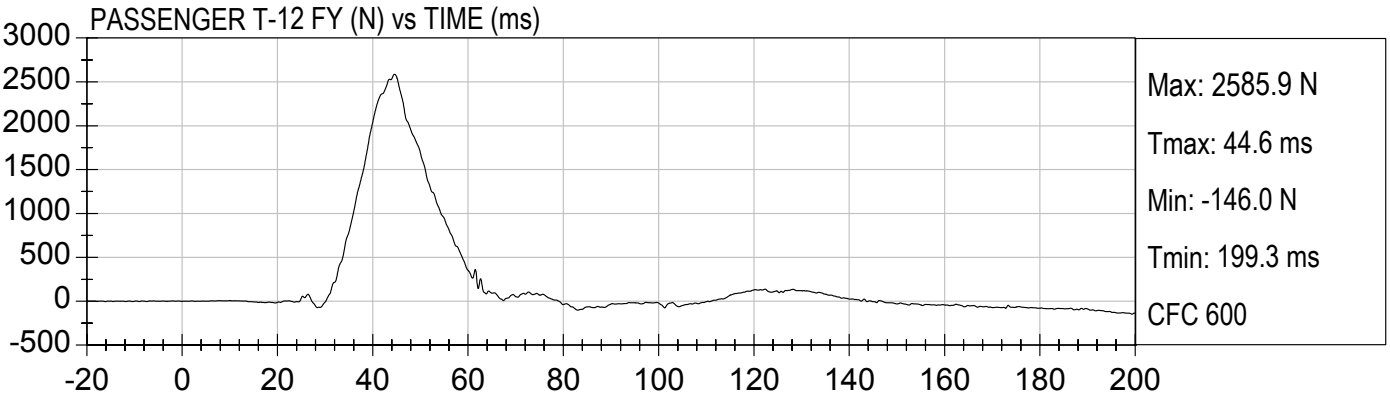


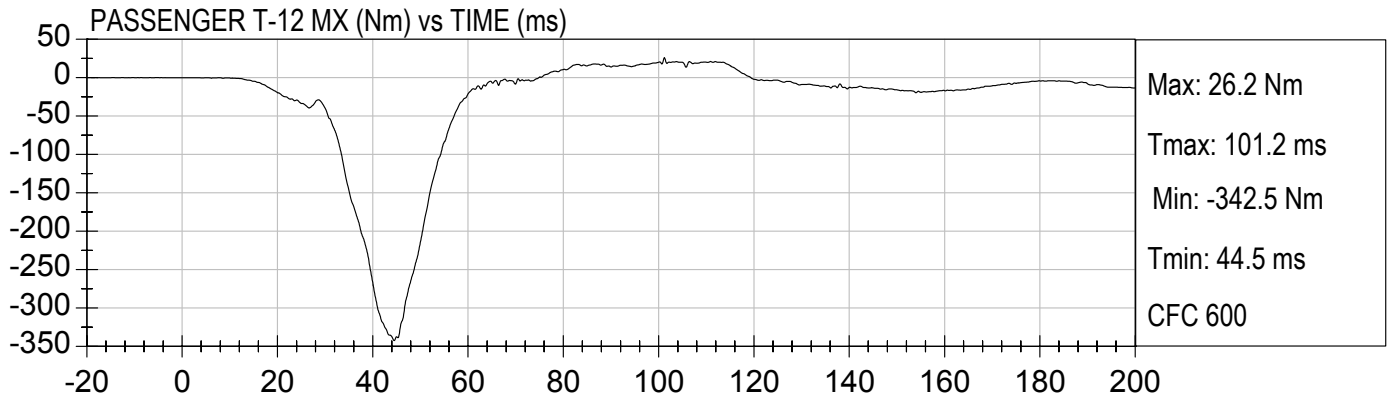


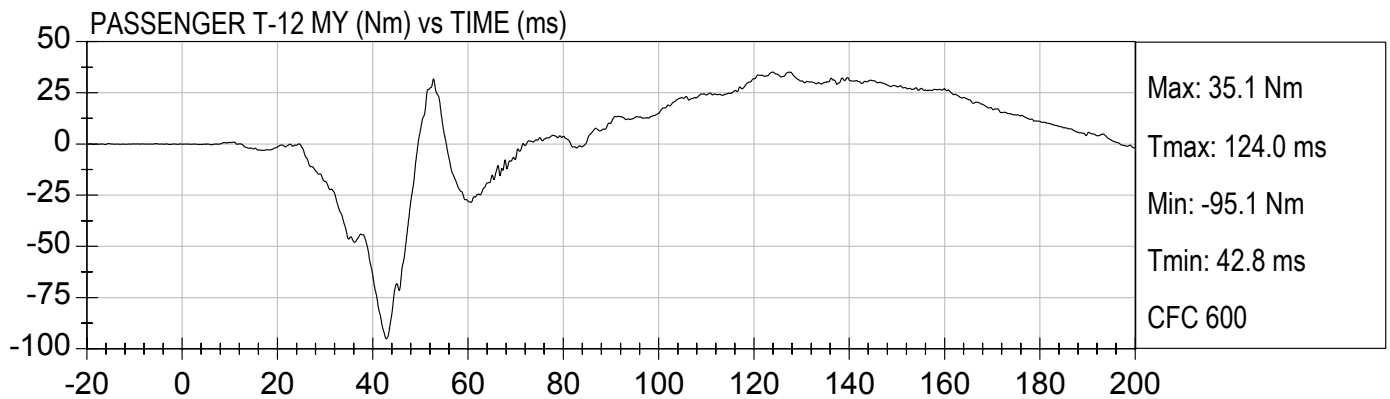
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



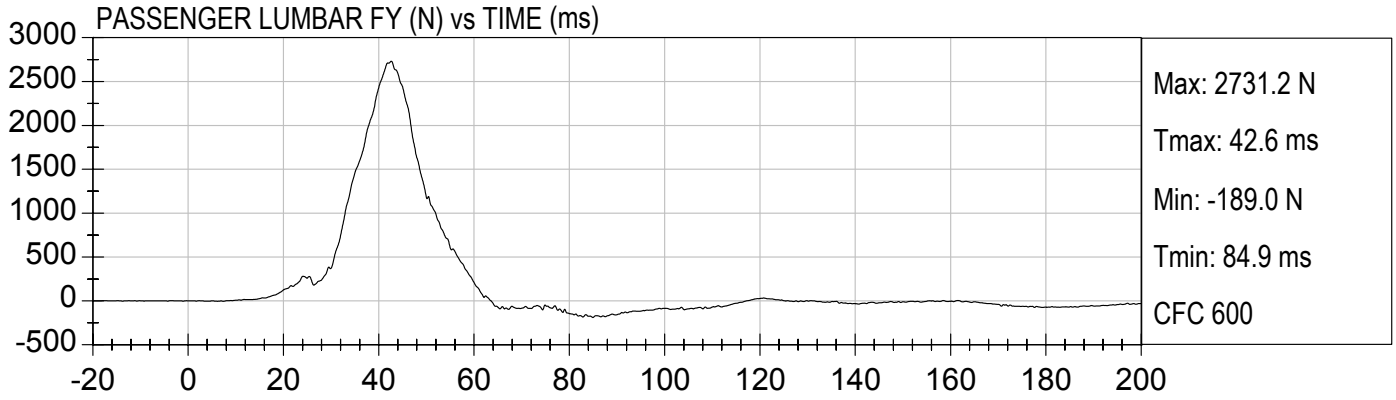


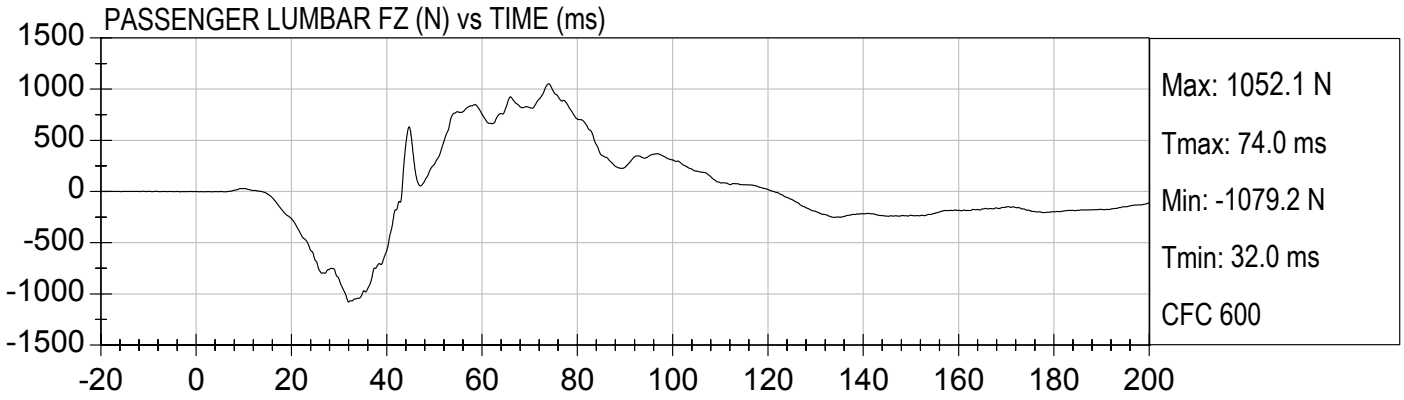


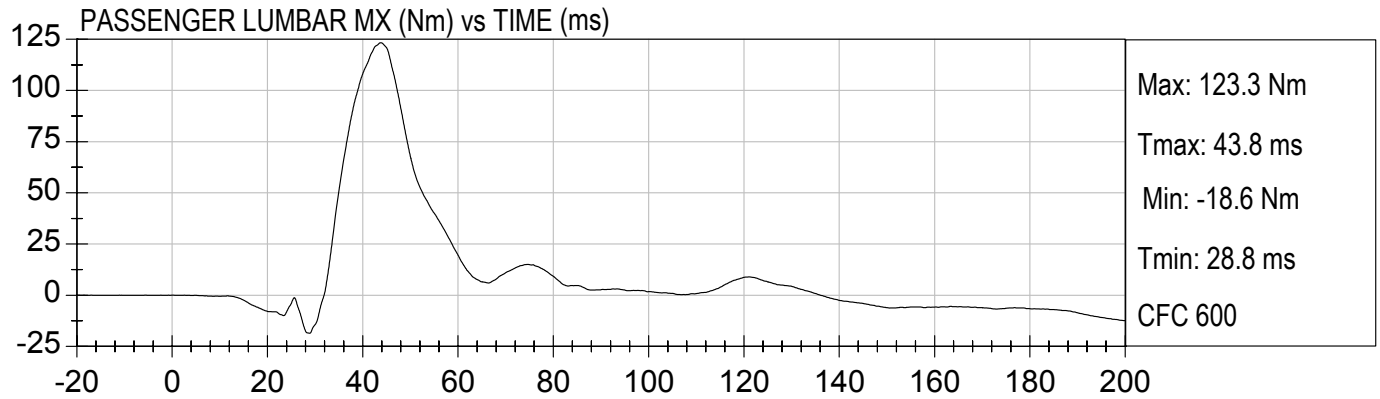


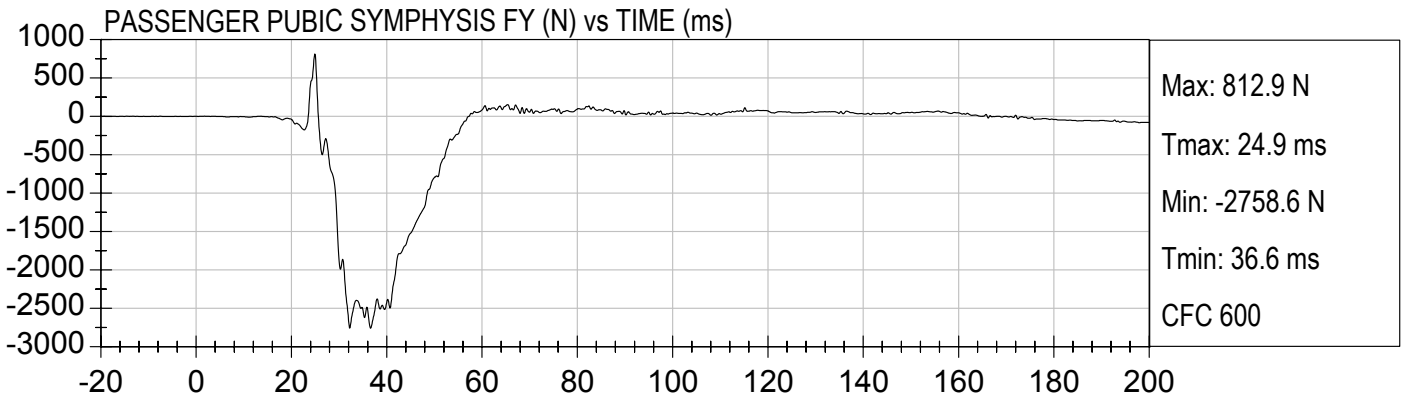
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)





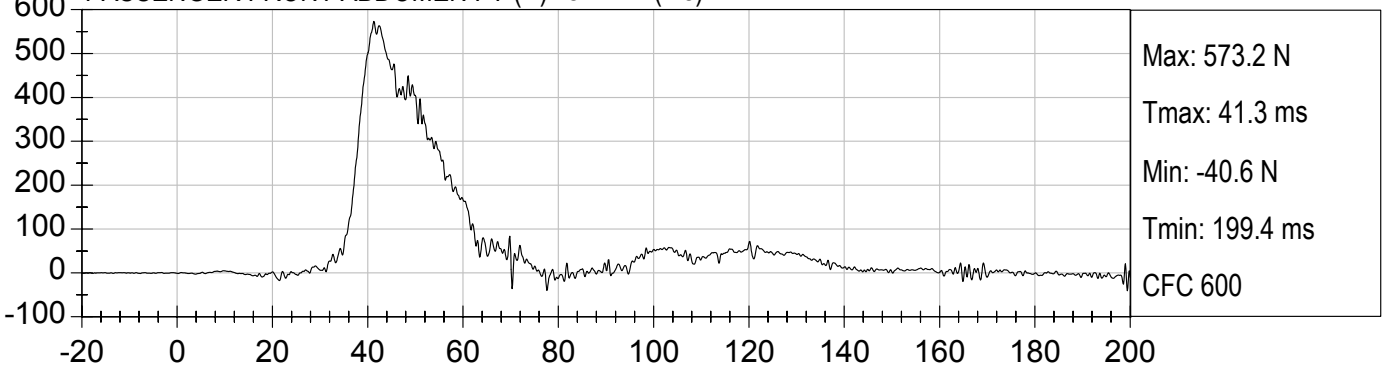




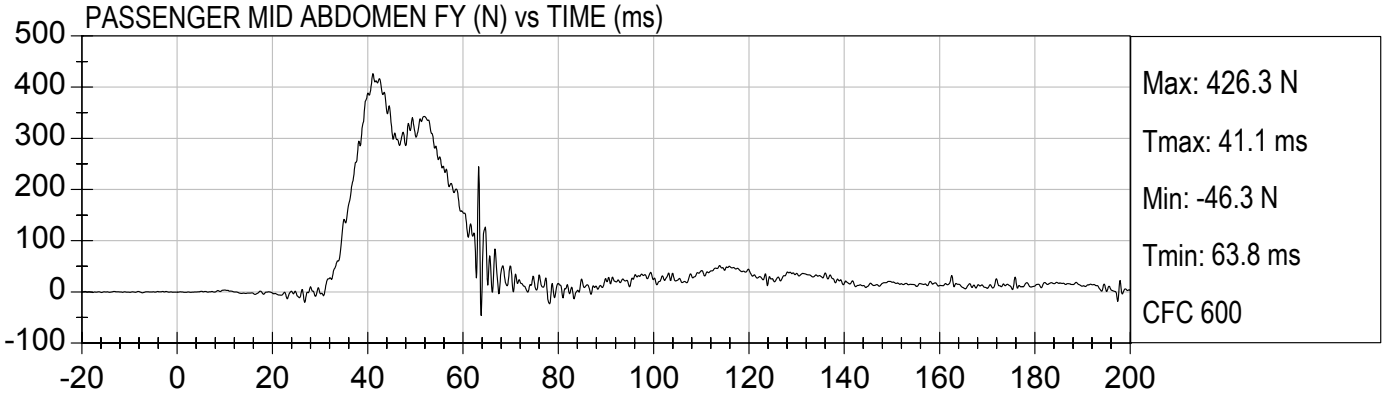
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

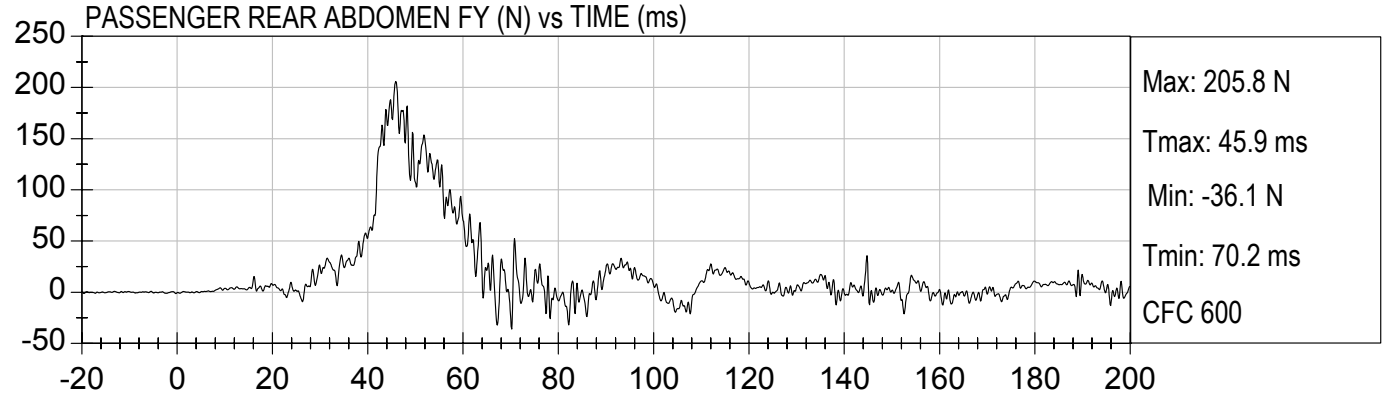
PASSENGER FRONT ABDOMEN FY (N) vs TIME (ms)



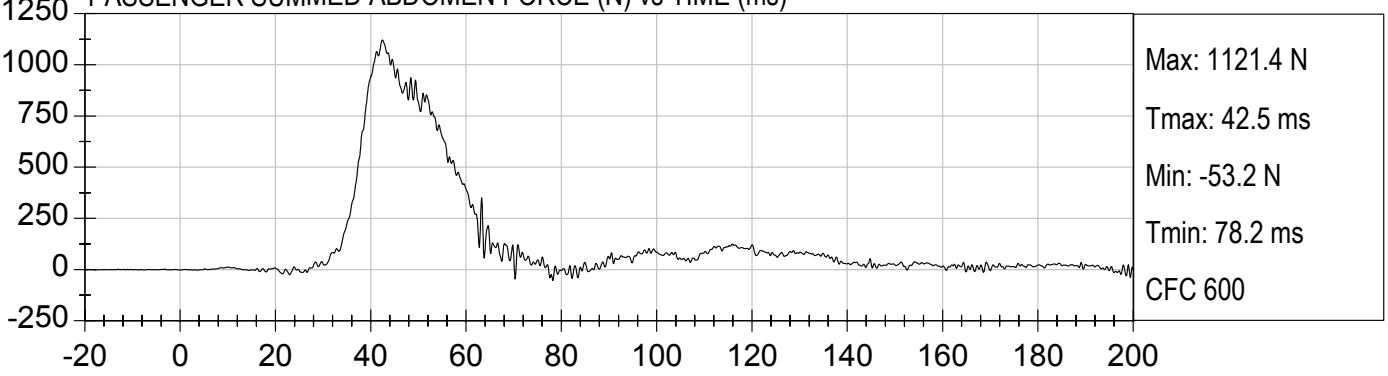
PASSENGER MID ABDOMEN FY (N) vs TIME (ms)



PASSENGER REAR ABDOMEN FY (N) vs TIME (ms)

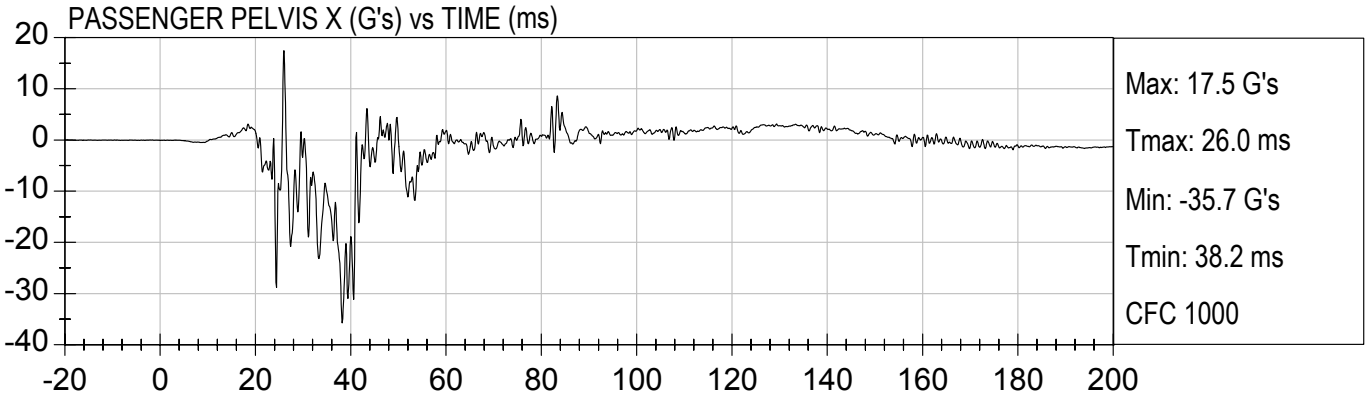


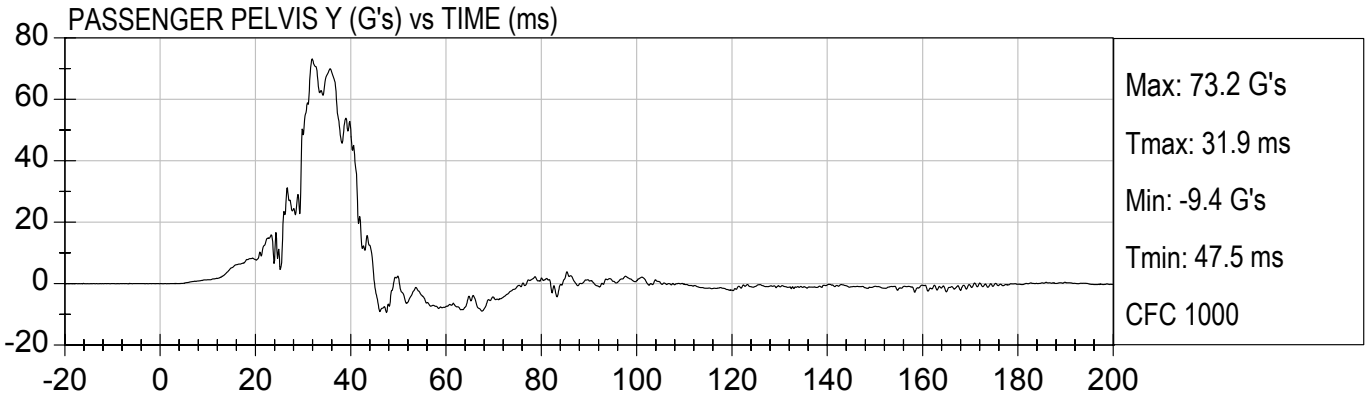
PASSENGER SUMMED ABDOMEN FORCE (N) vs TIME (ms)

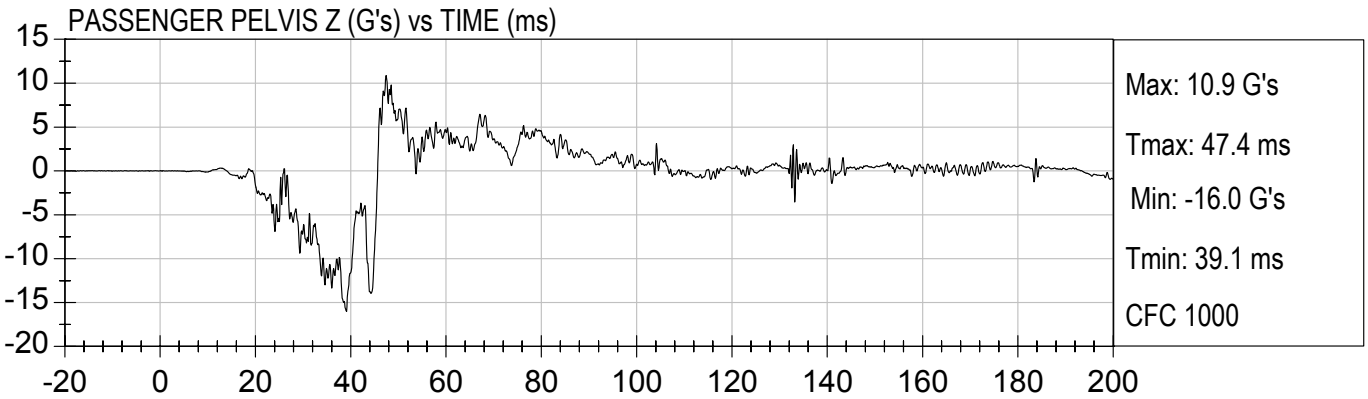


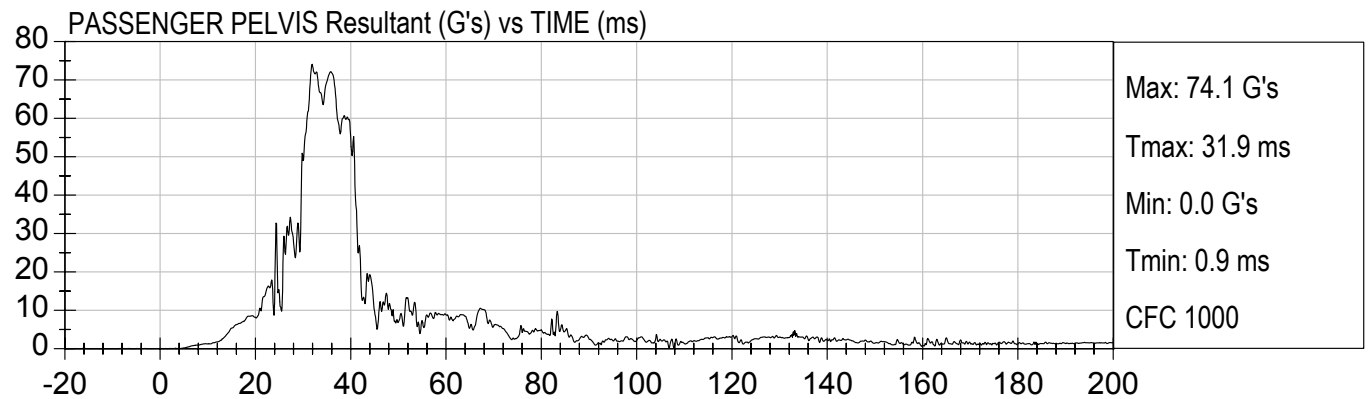
2001 FORD FOCUS
FMVSS 214

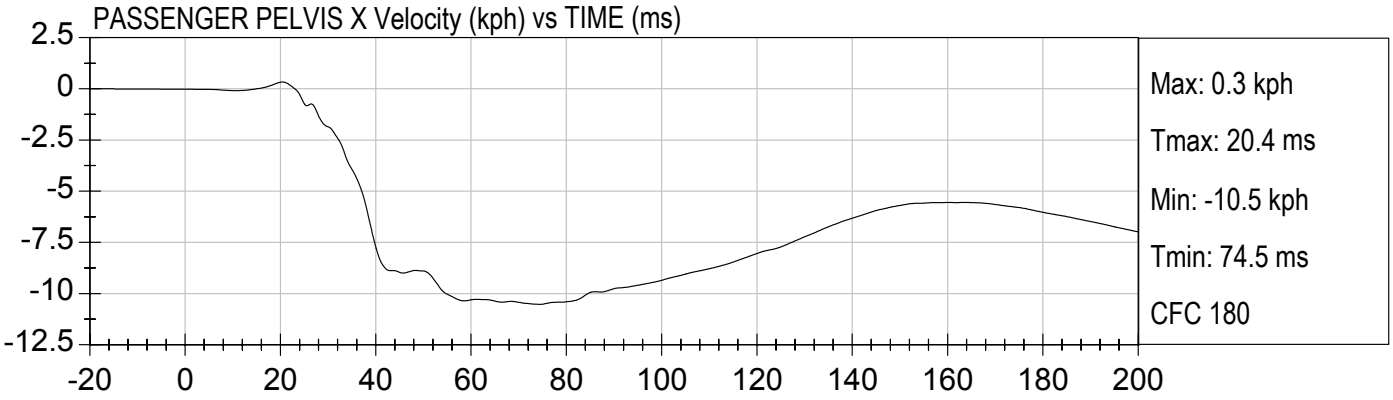
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

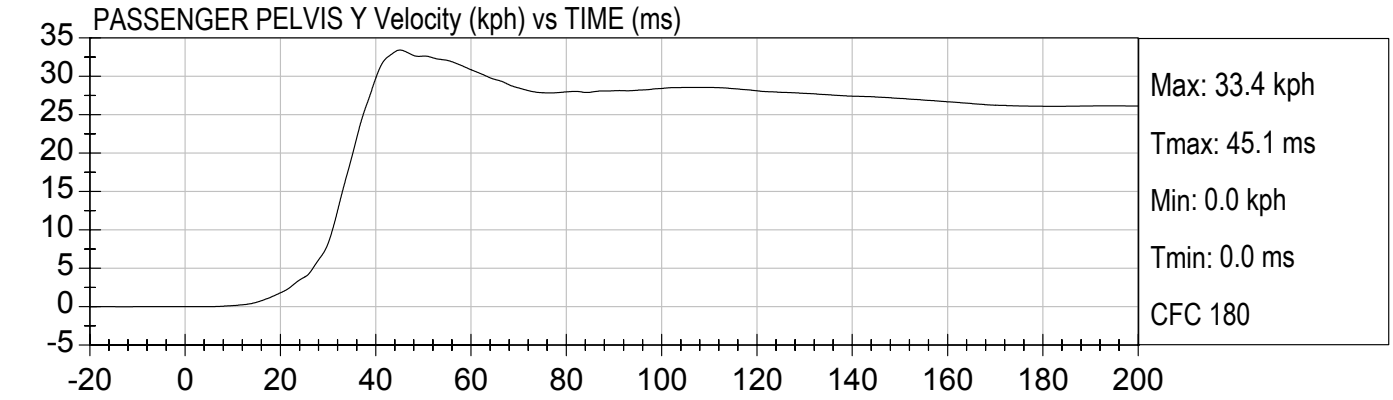


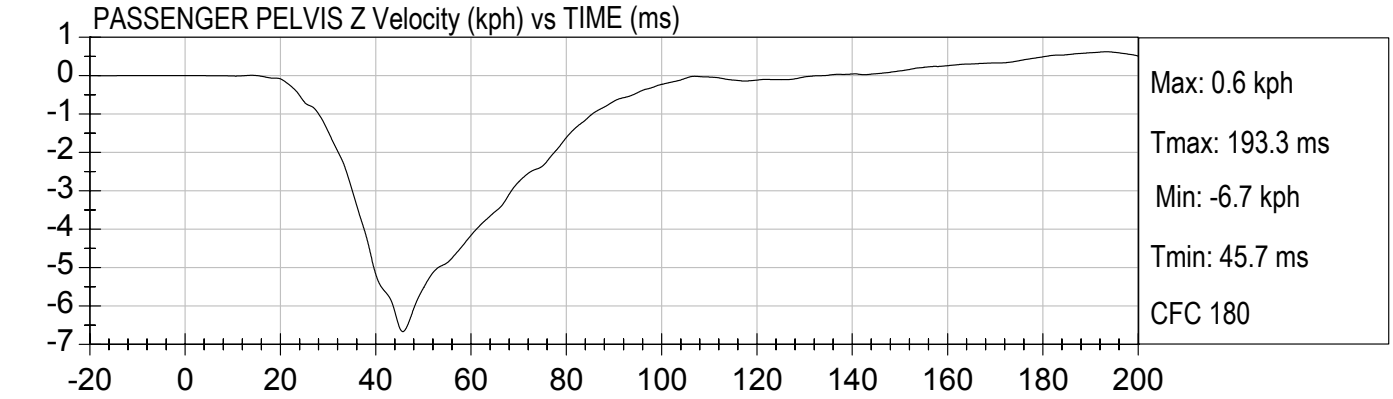






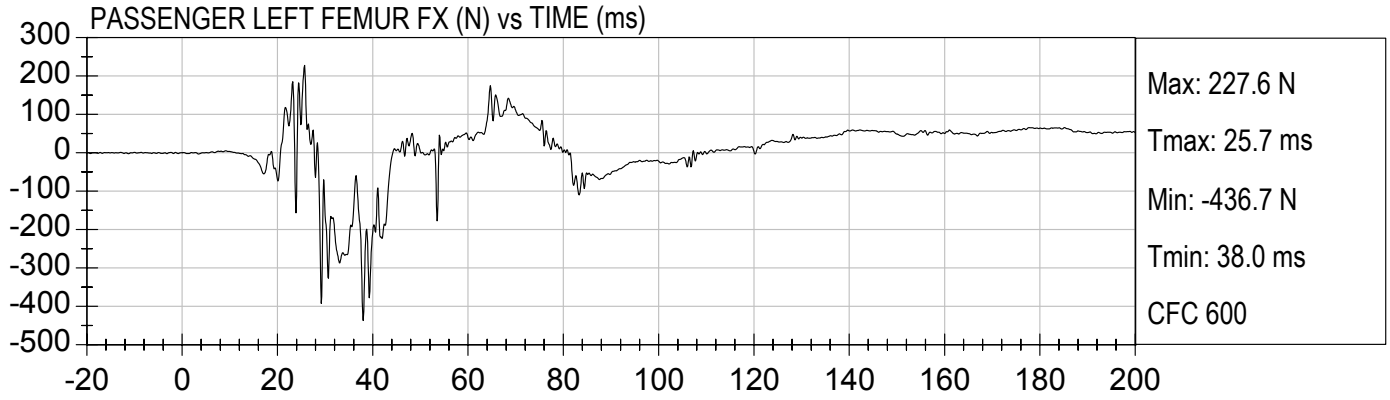

PASSENGER PELVIS X Velocity (kph) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.3 kph
Tmax: 20.4 ms
Min: -10.5 kph
Tmin: 74.5 ms
CFC 180

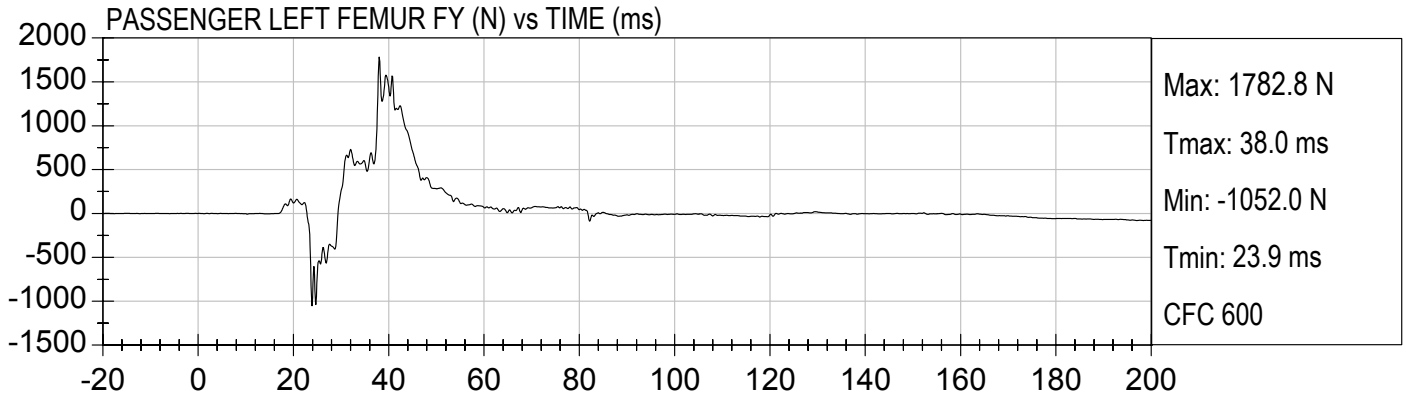

PASSENGER PELVIS Y Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 33.4 kph
Tmax: 45.1 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

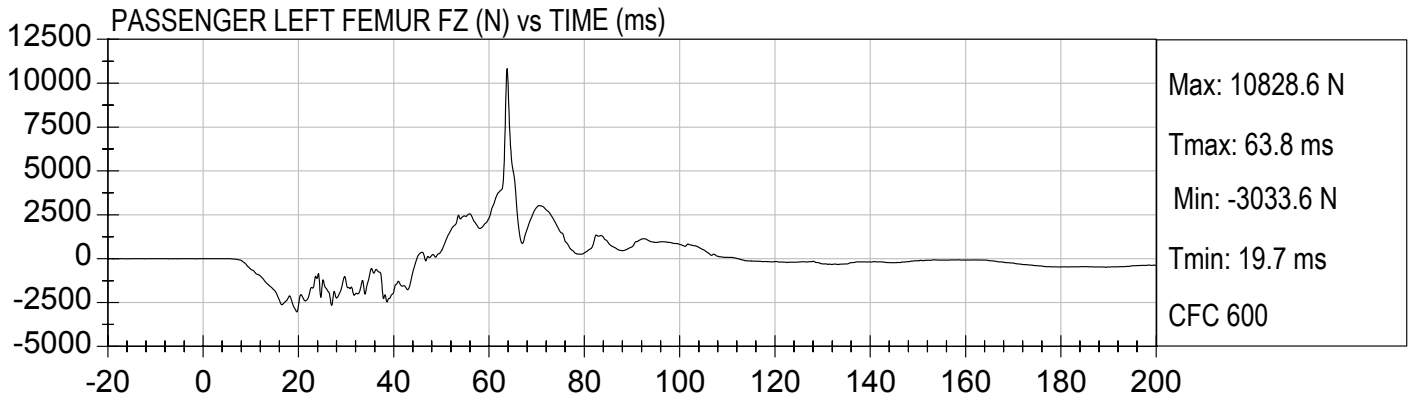

PASSENGER PELVIS Z Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.6 kph
Tmax: 193.3 ms
Min: -6.7 kph
Tmin: 45.7 ms
CFC 180

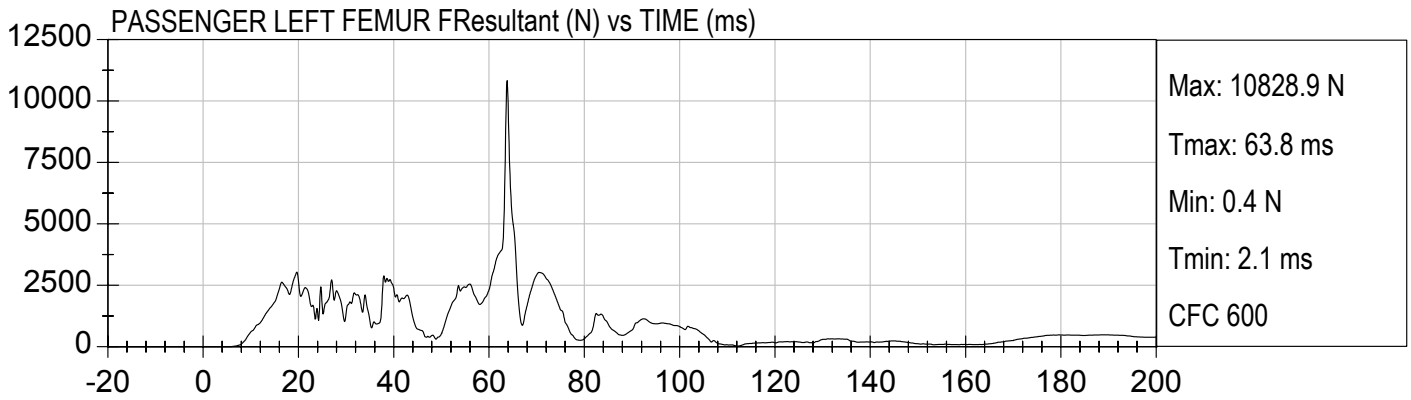
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



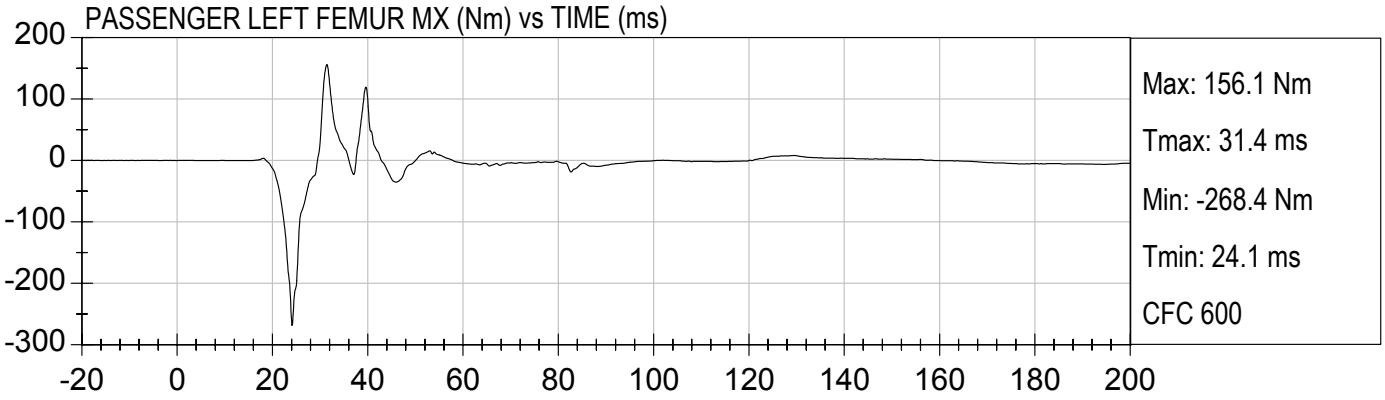


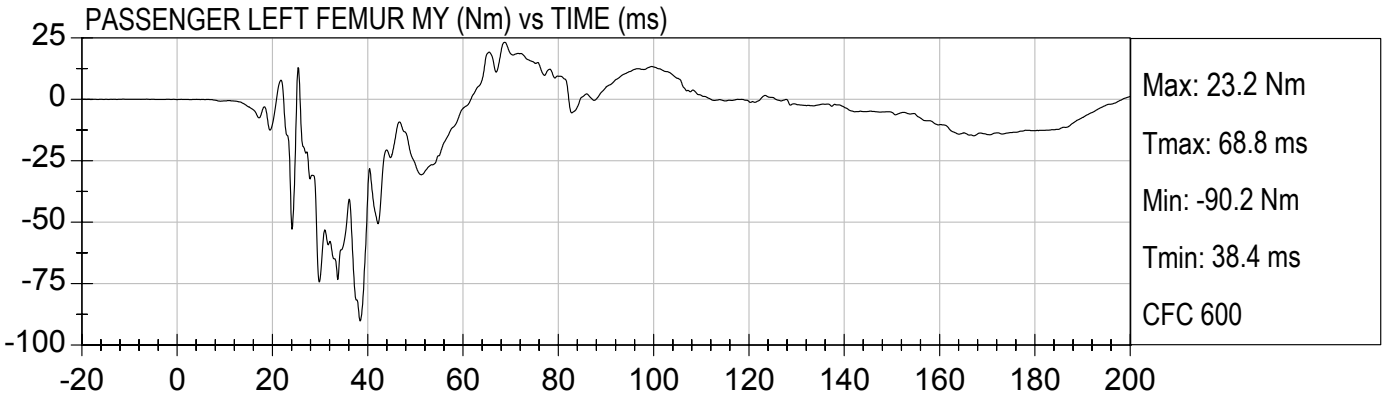


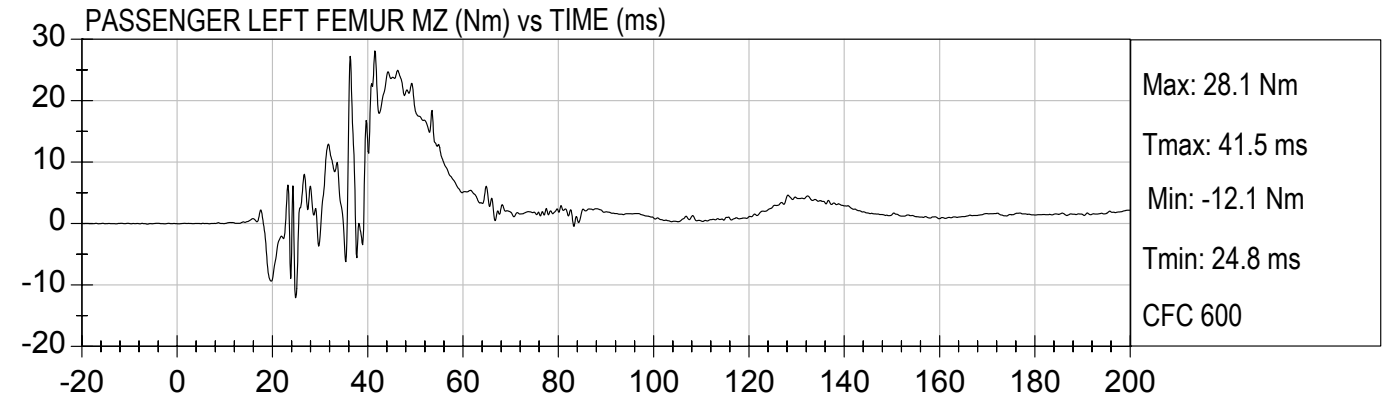


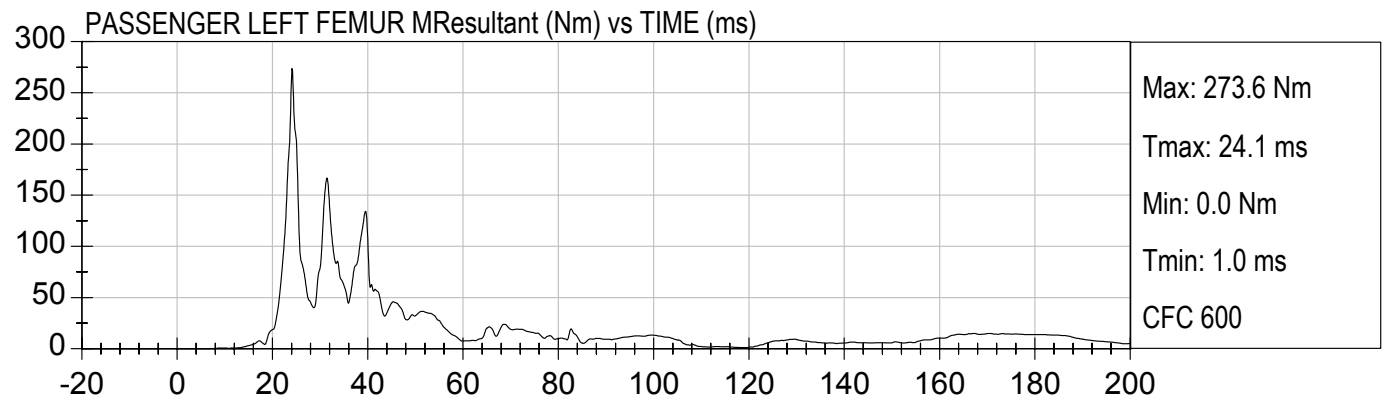
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



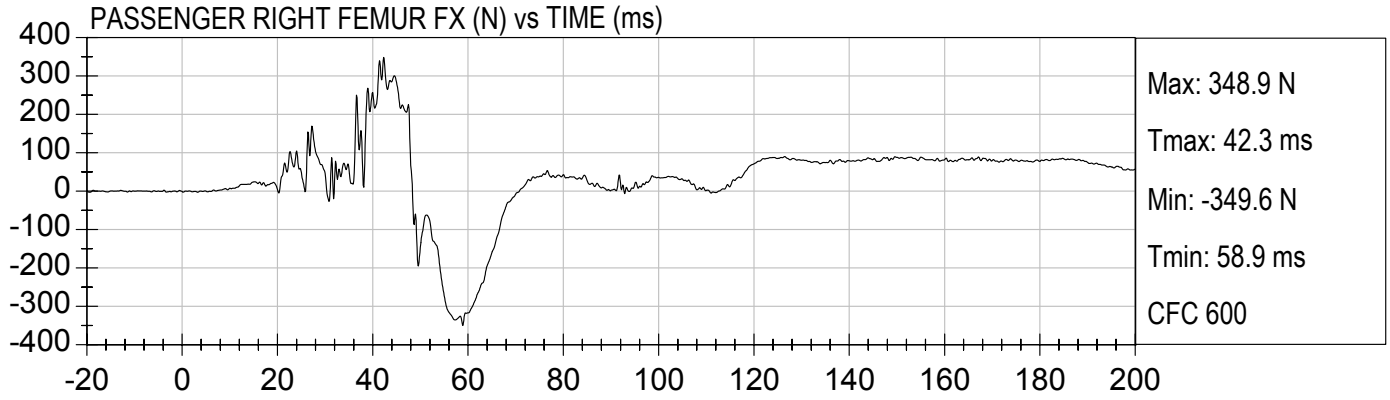


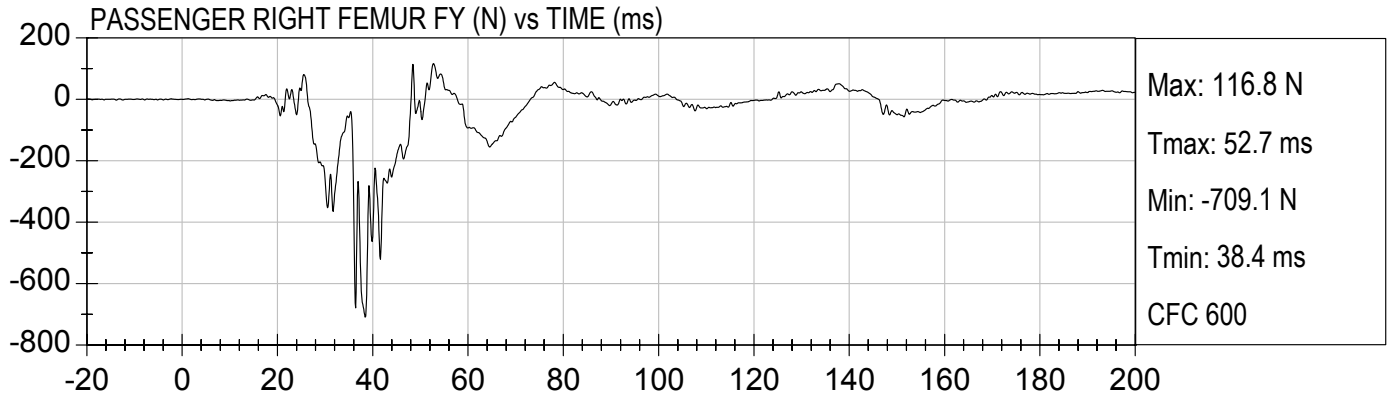


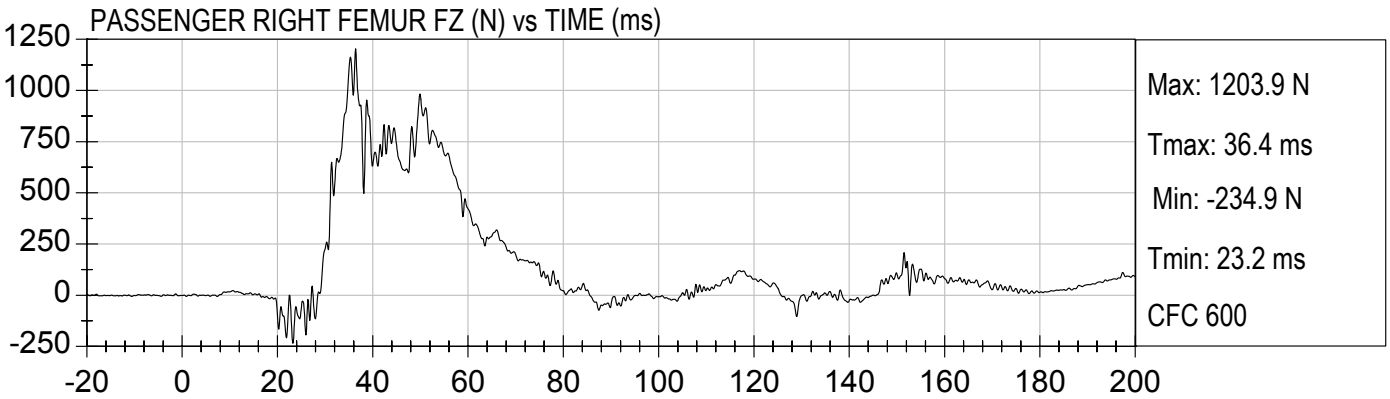


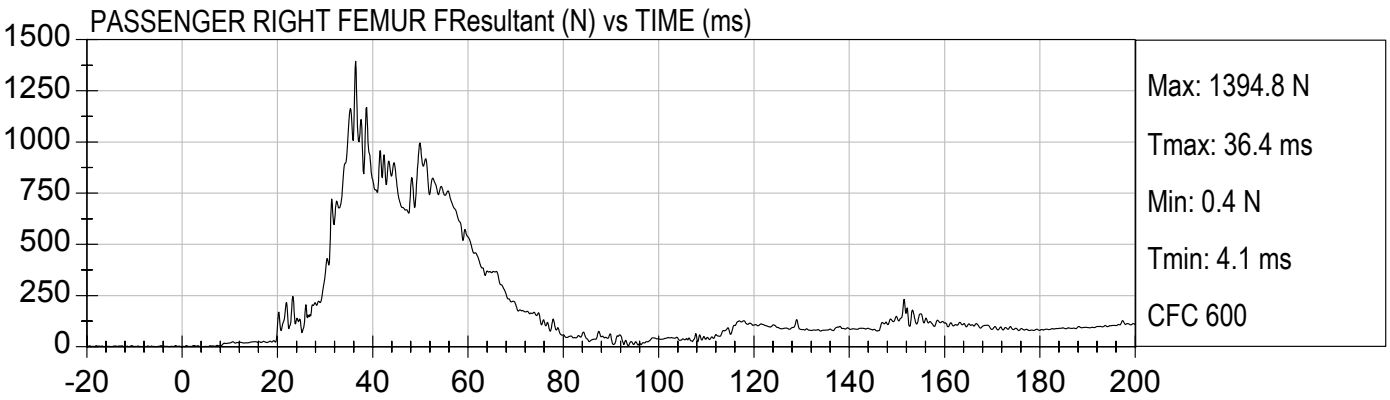
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



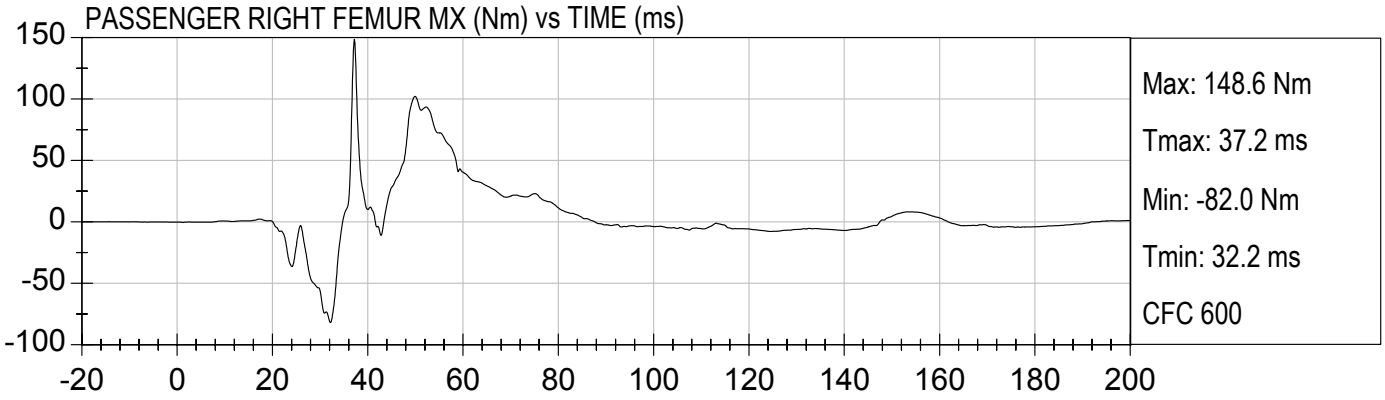


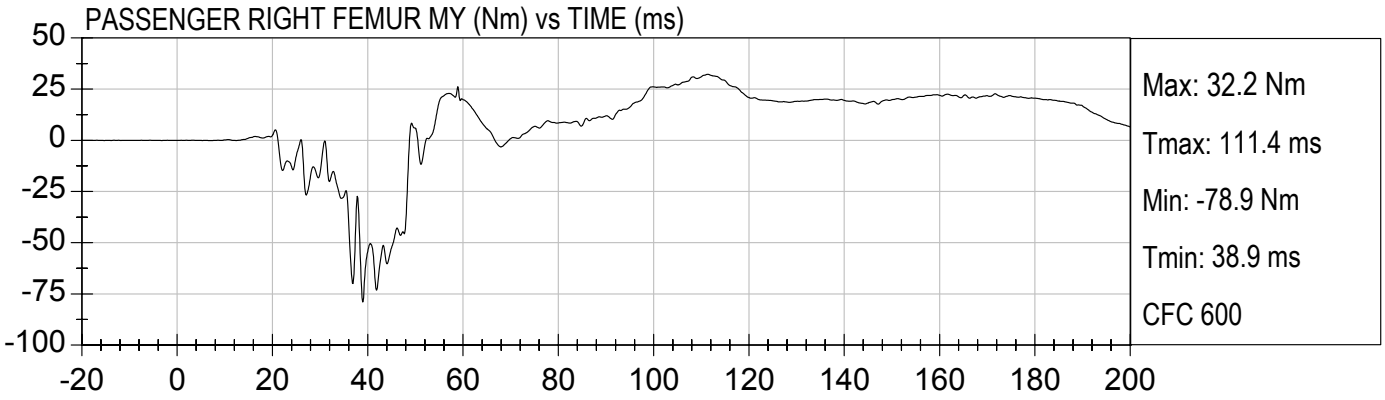


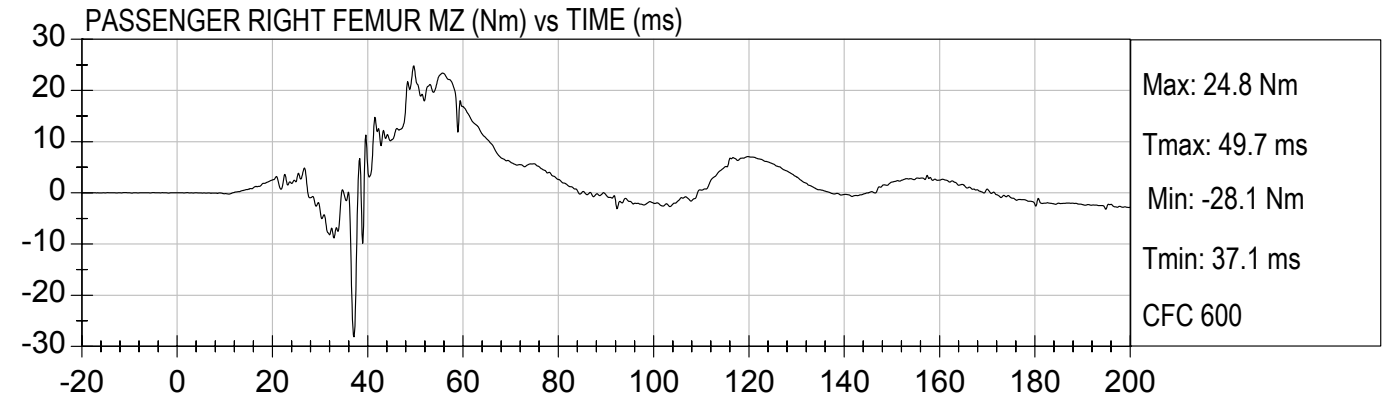


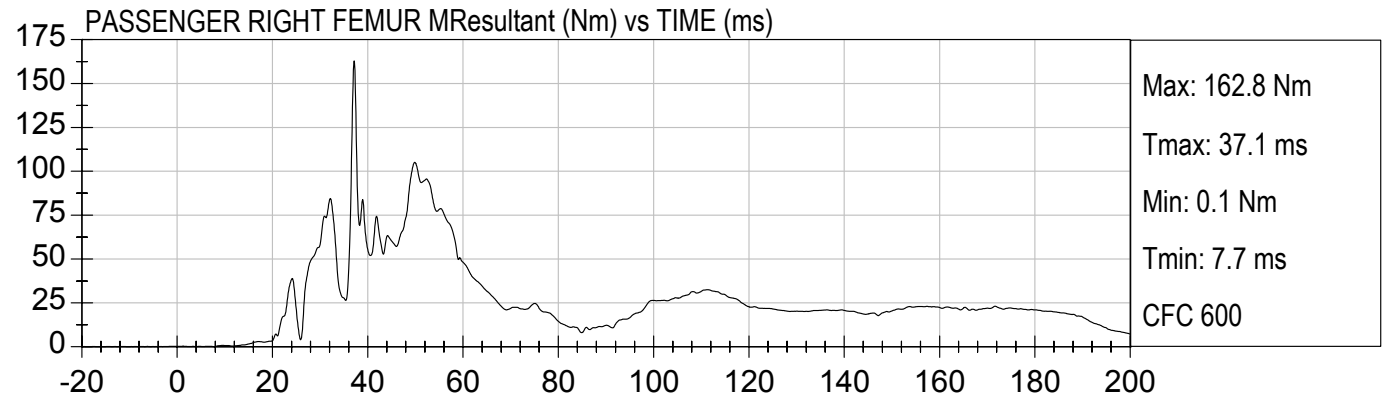
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



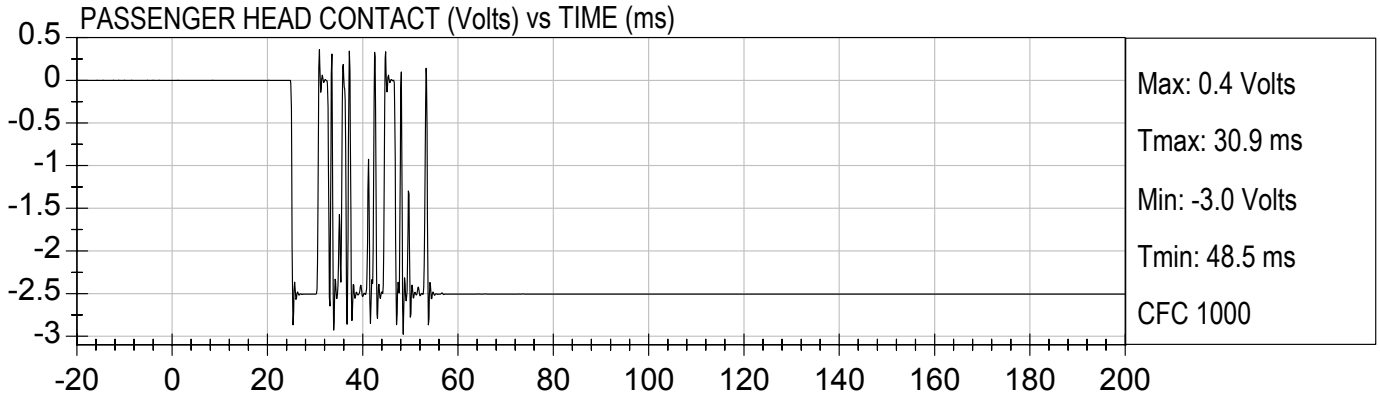


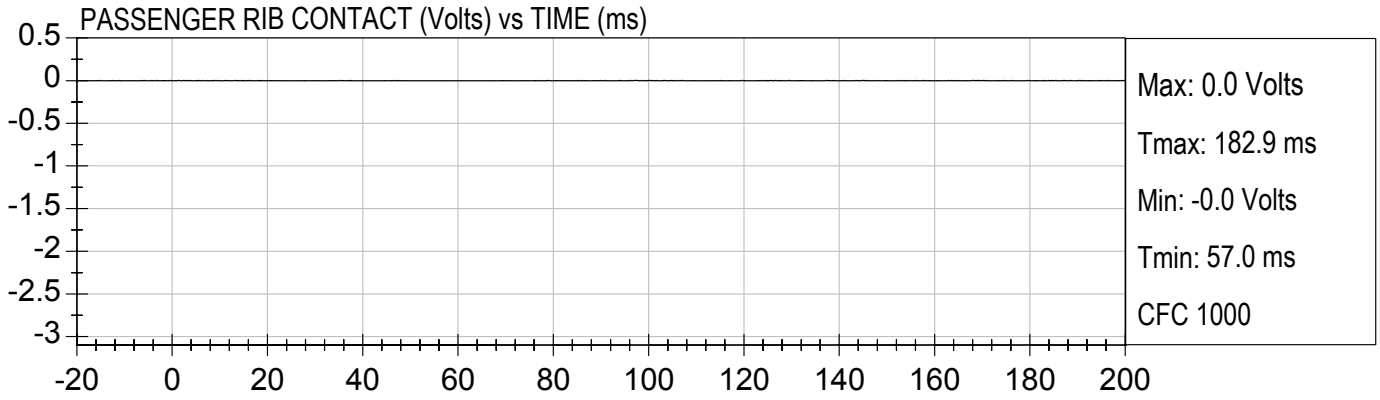


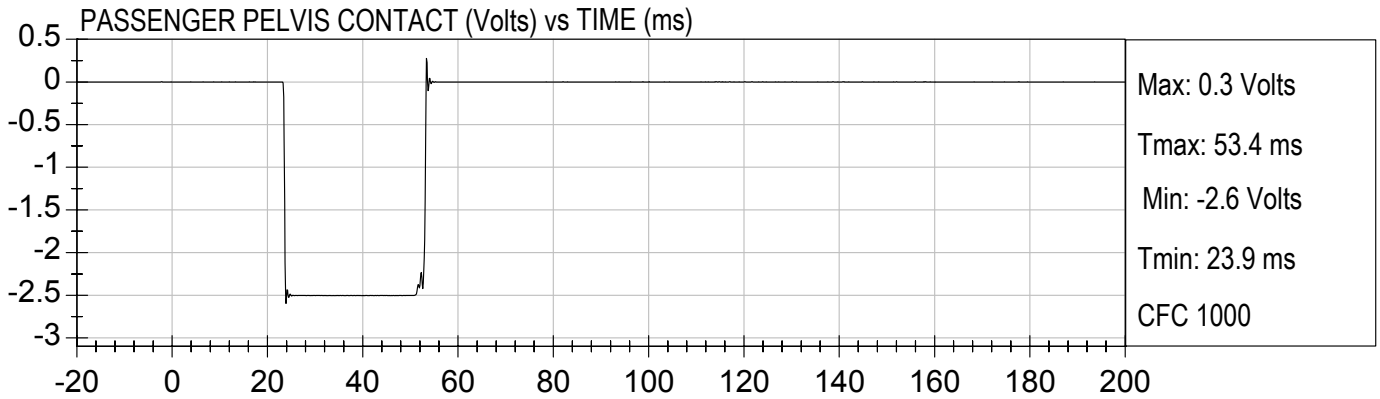


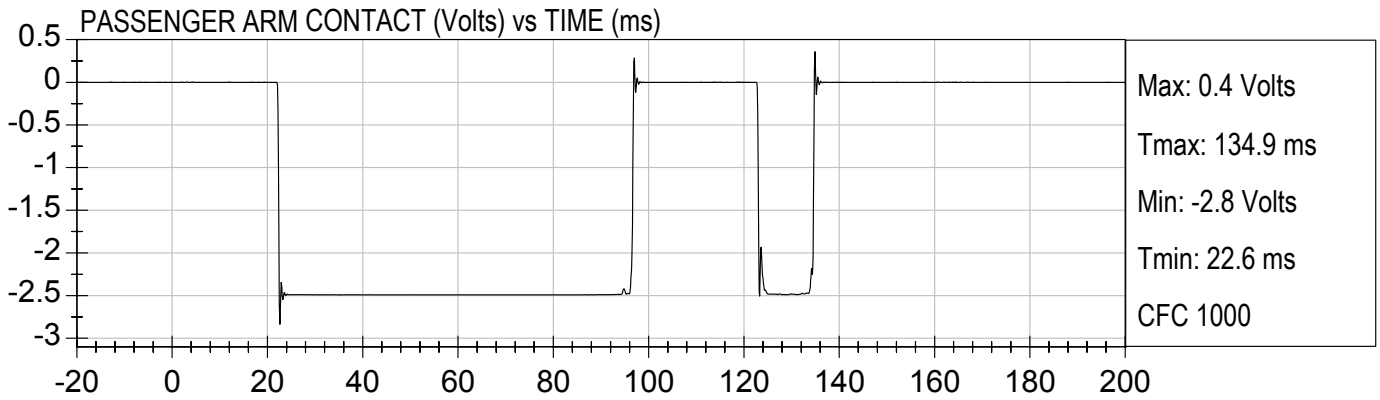
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



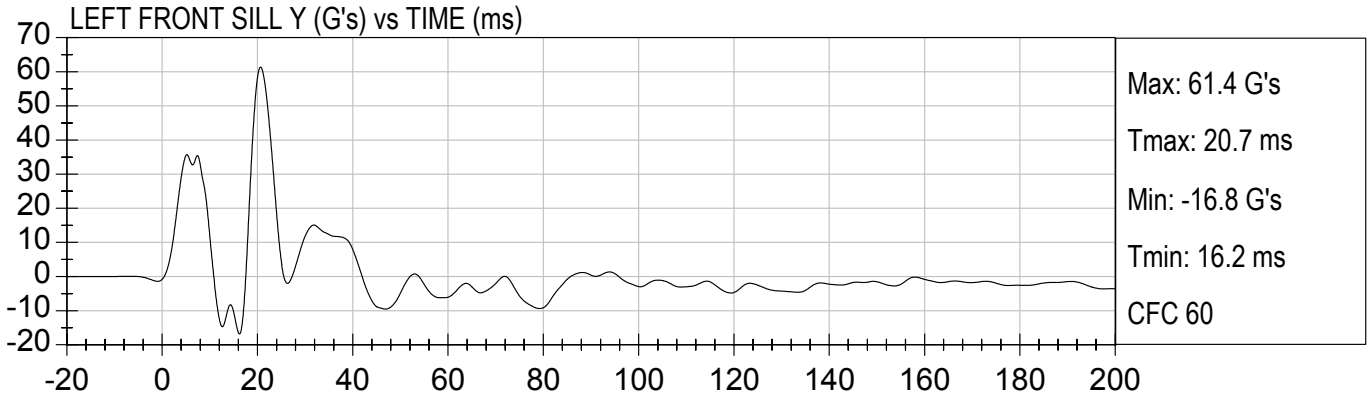


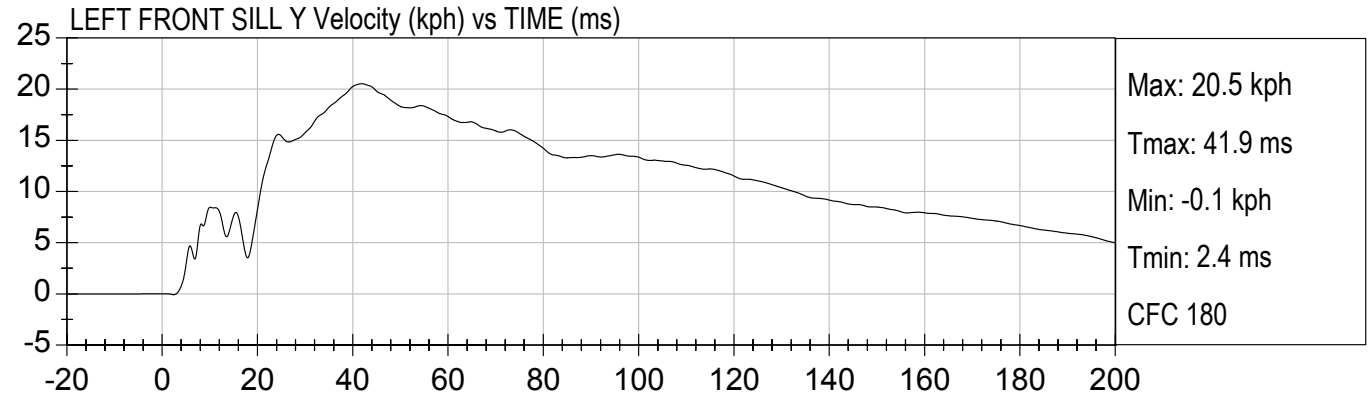


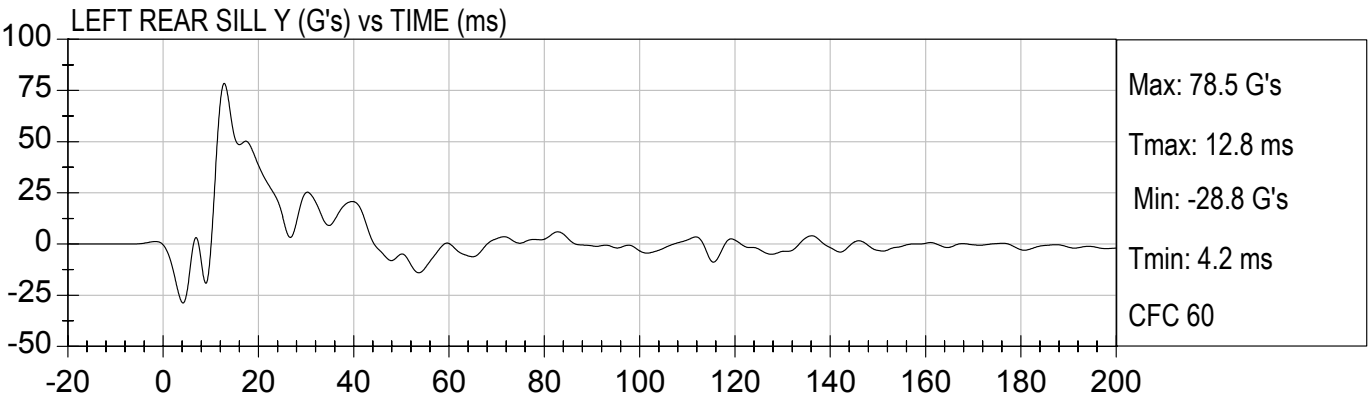


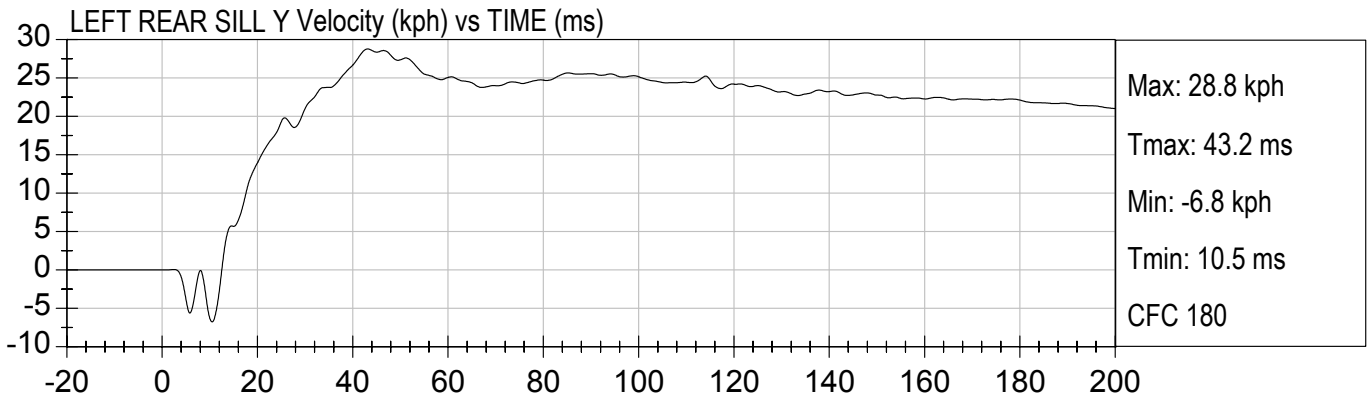
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



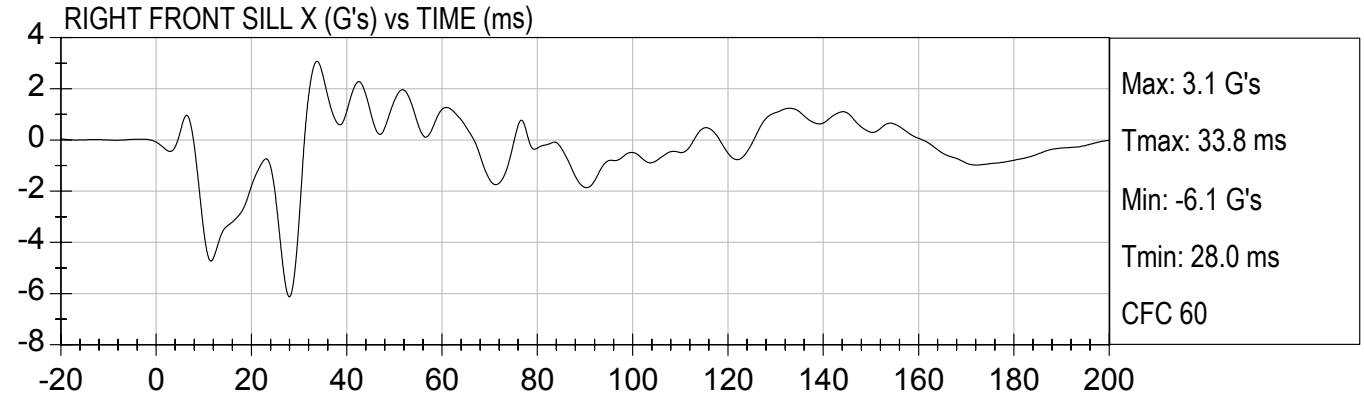


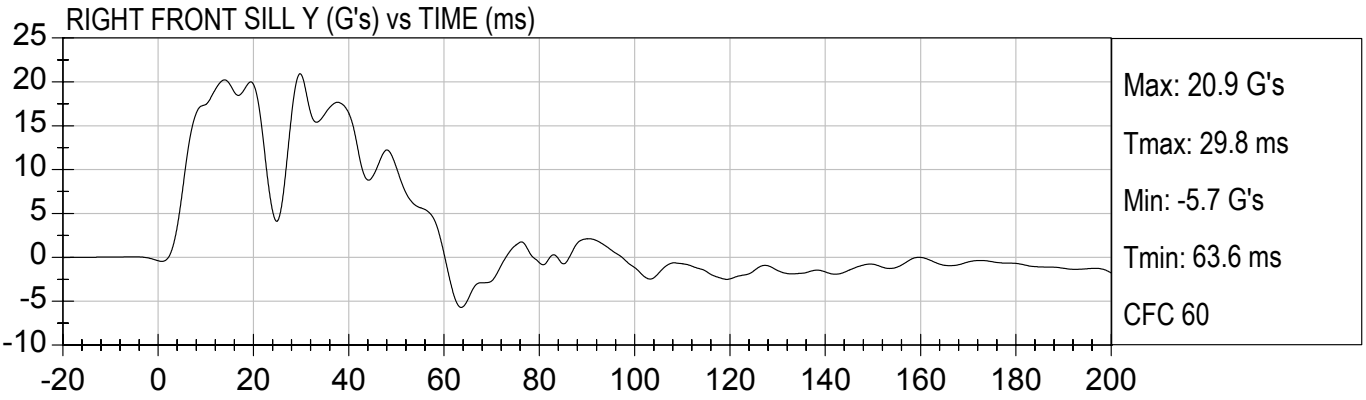


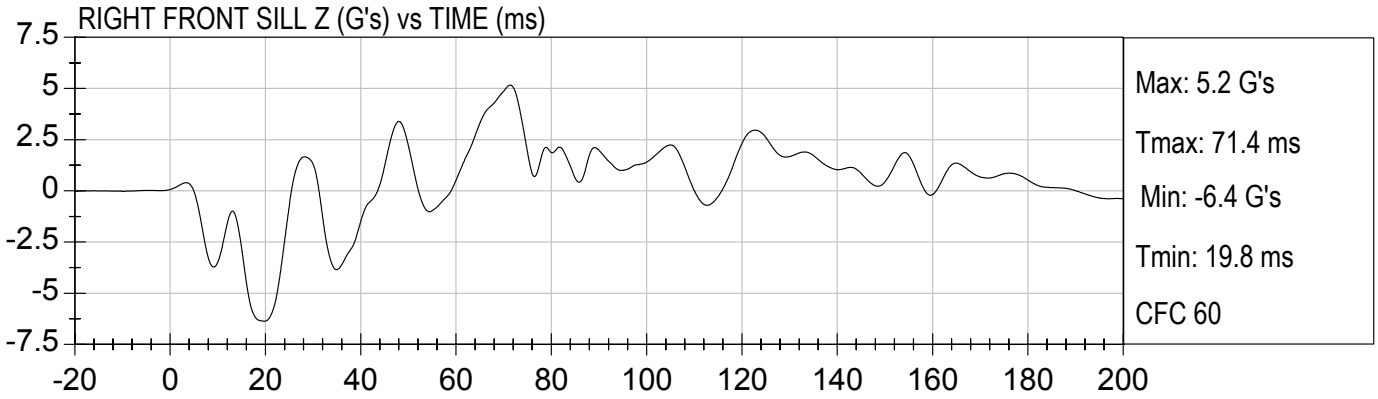


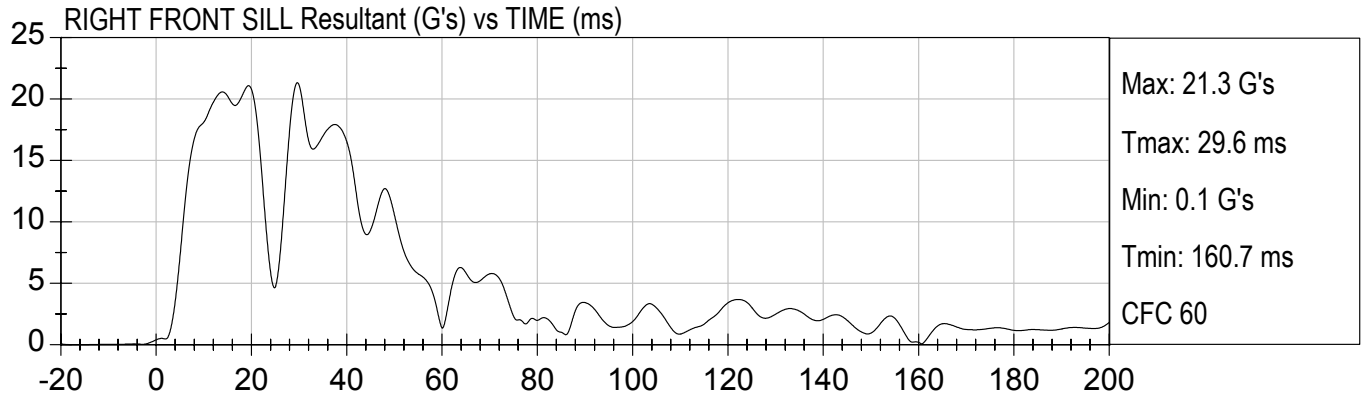
2001 FORD FOCUS
FMVSS 214

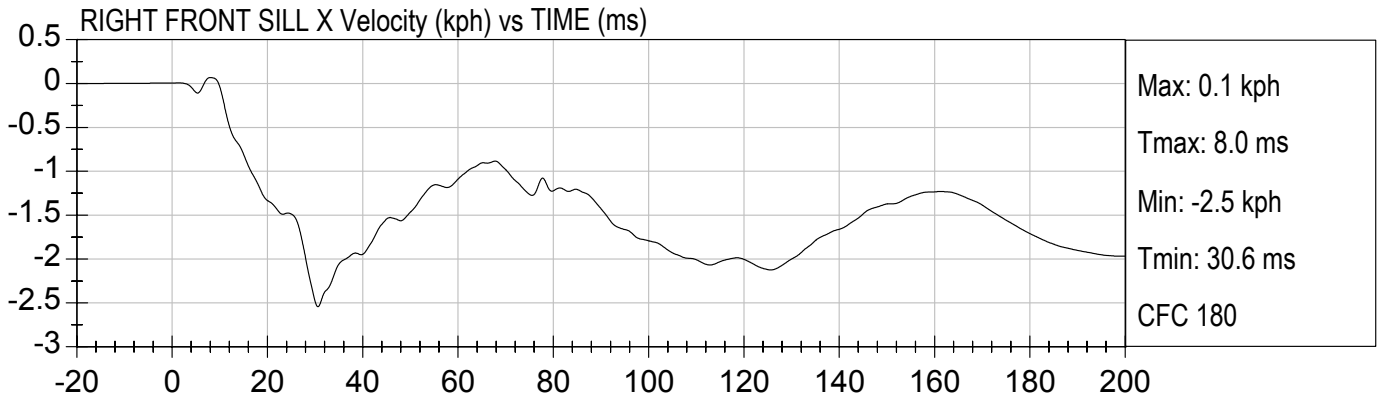
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

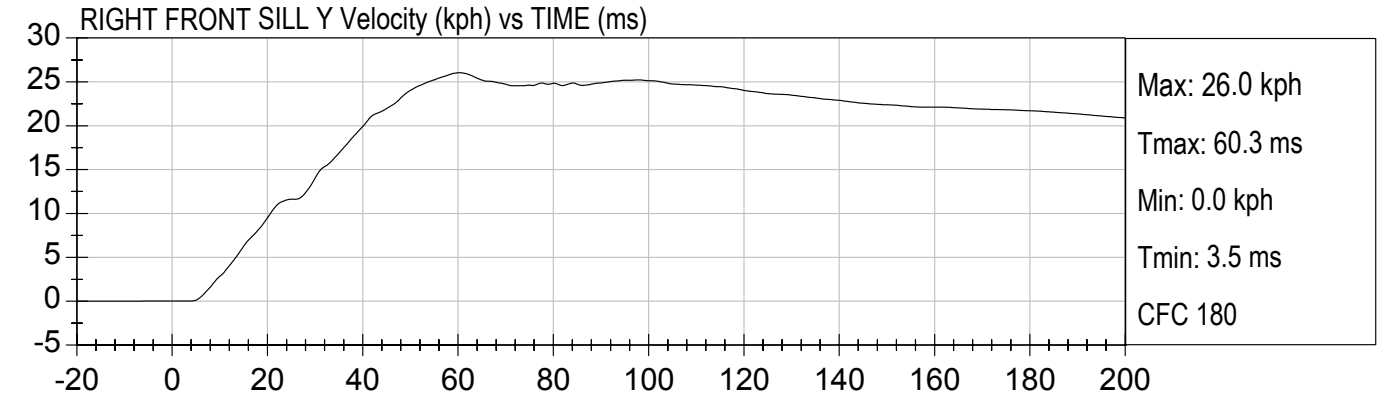


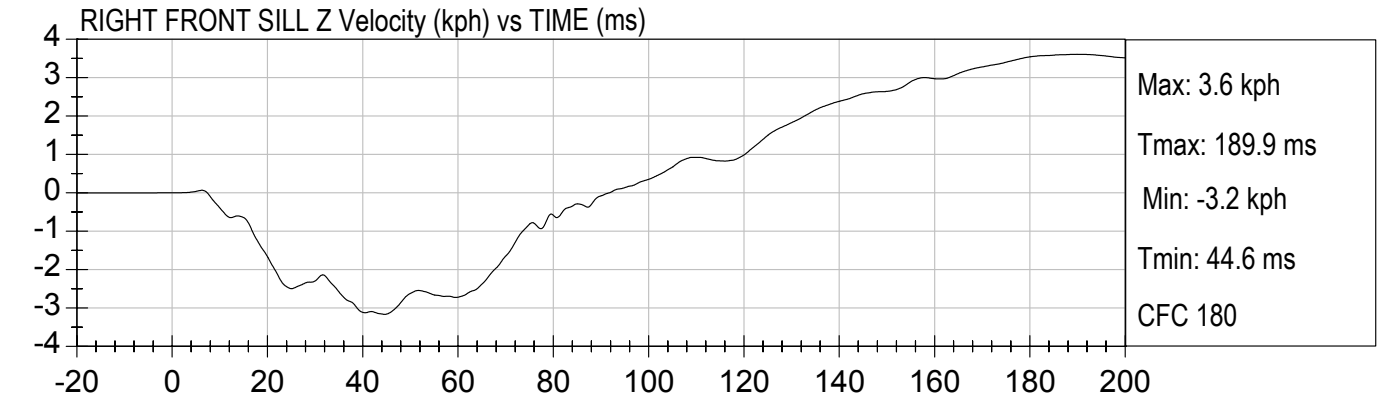






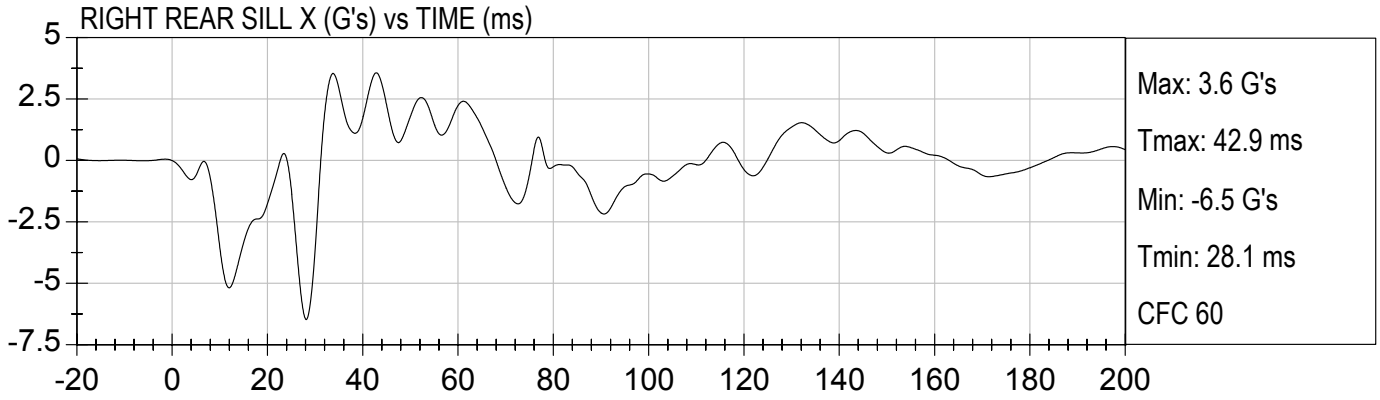

RIGHT FRONT SILL X Velocity (kph) vs TIME (ms)
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.1 kph
Tmax: 8.0 ms
Min: -2.5 kph
Tmin: 30.6 ms
CFC 180

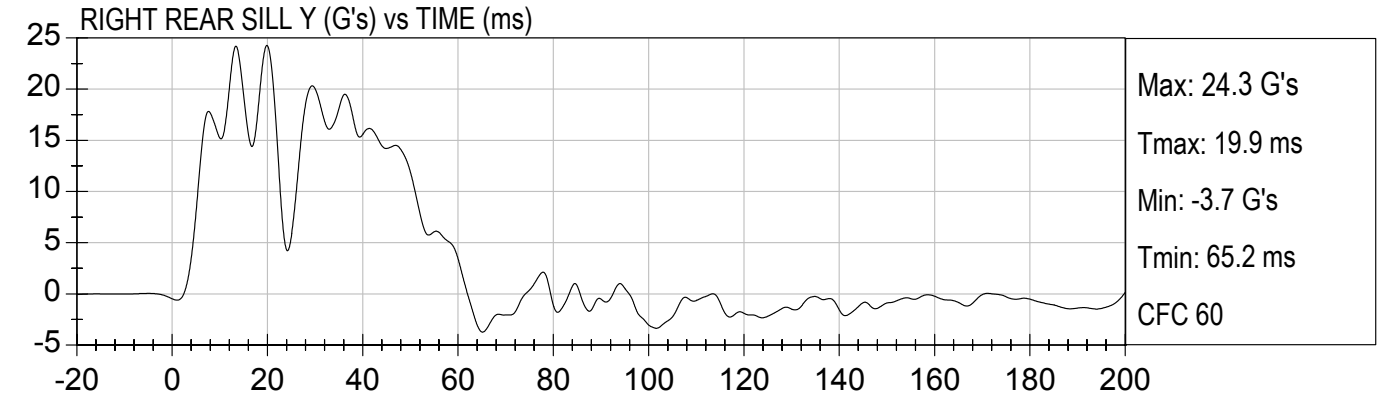

RIGHT FRONT SILL Y Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 26.0 kph
Tmax: 60.3 ms
Min: 0.0 kph
Tmin: 3.5 ms
CFC 180

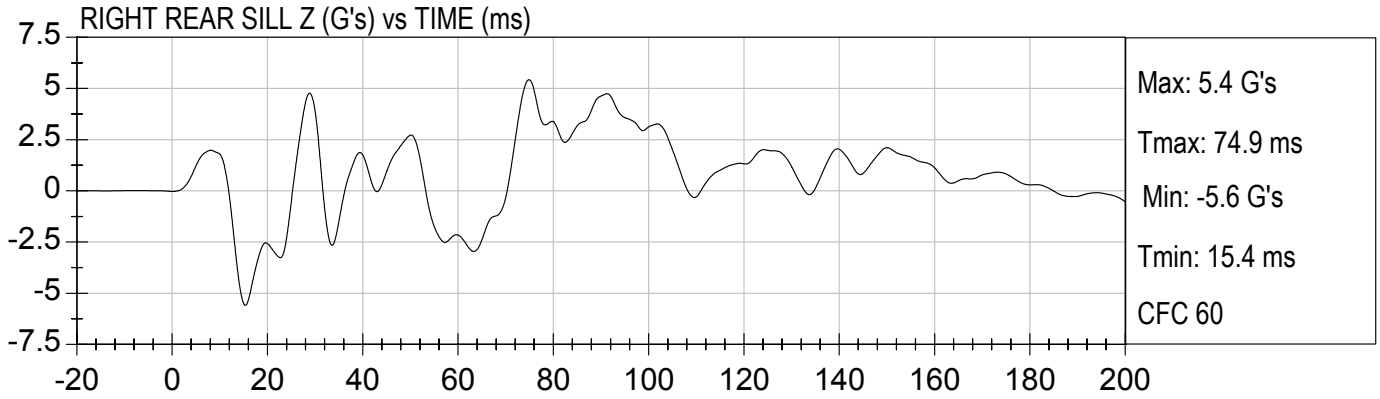

RIGHT FRONT SILL Z Velocity (kph) vs TIME (ms)
4
3
2
1
0
-1
-2
-3
-4
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 3.6 kph
Tmax: 189.9 ms
Min: -3.2 kph
Tmin: 44.6 ms
CFC 180

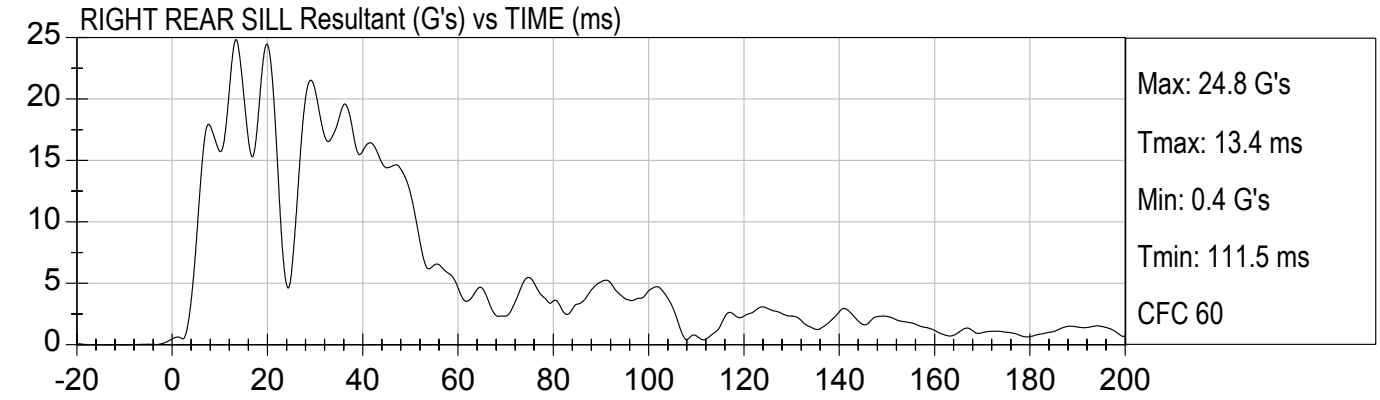
2001 FORD FOCUS
FMVSS 214

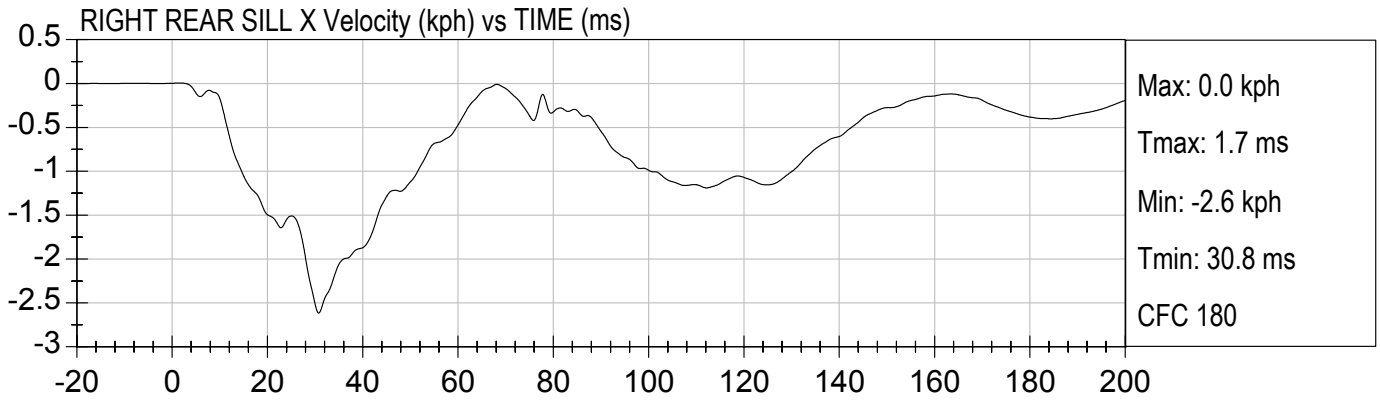
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

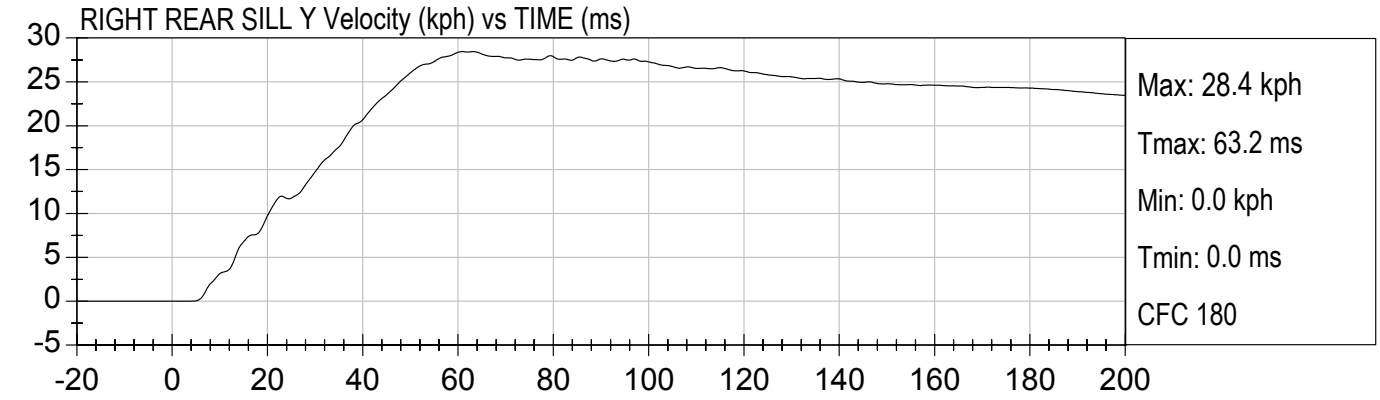


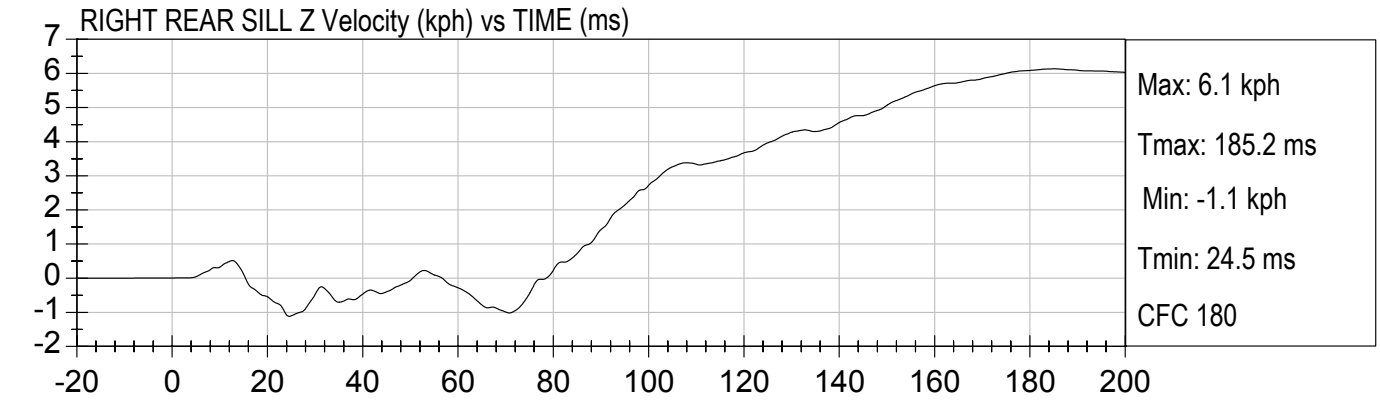


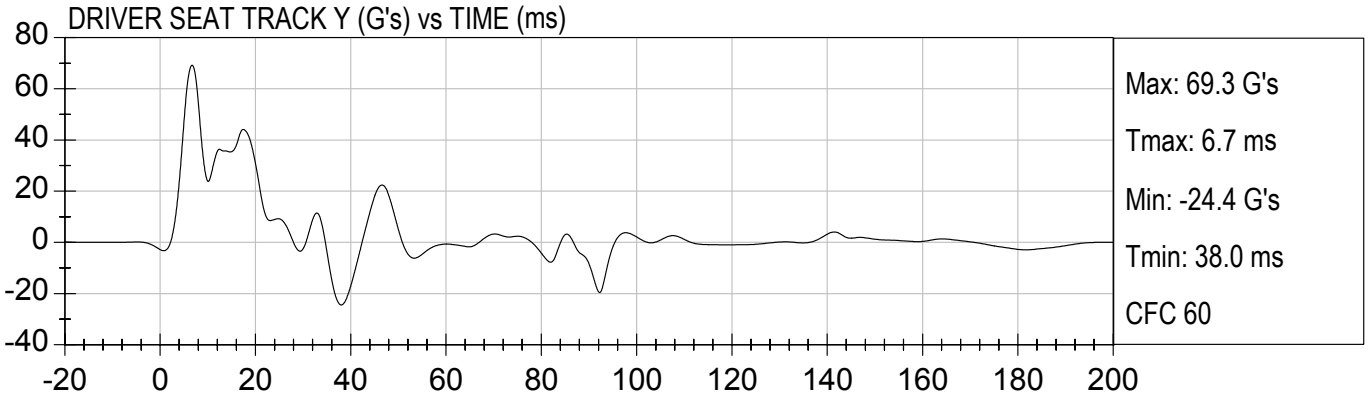


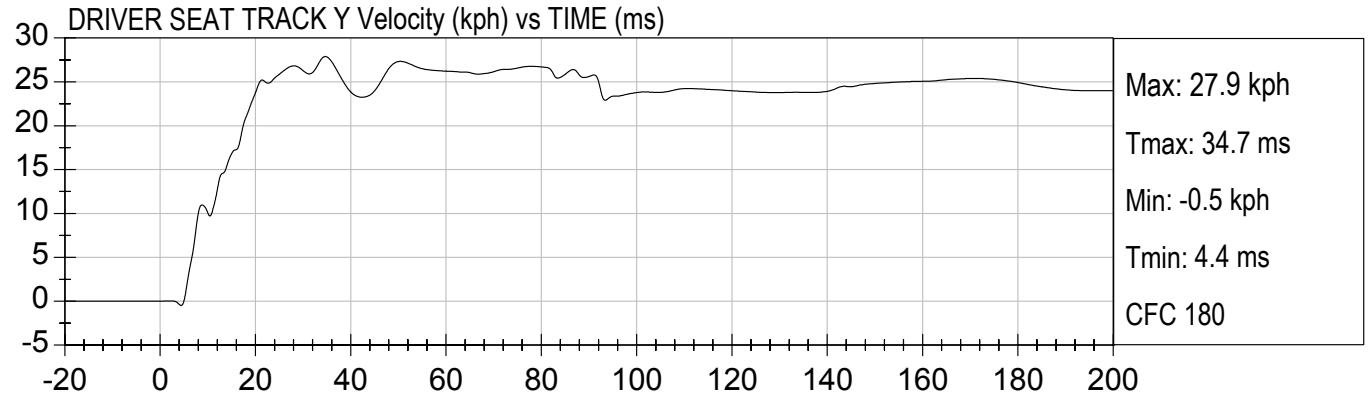



RIGHT REAR SILL X Velocity (kph) vs TIME (ms)
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.0 kph
Tmax: 1.7 ms
Min: -2.6 kph
Tmin: 30.8 ms
CFC 180


RIGHT REAR SILL Y Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 28.4 kph
Tmax: 63.2 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

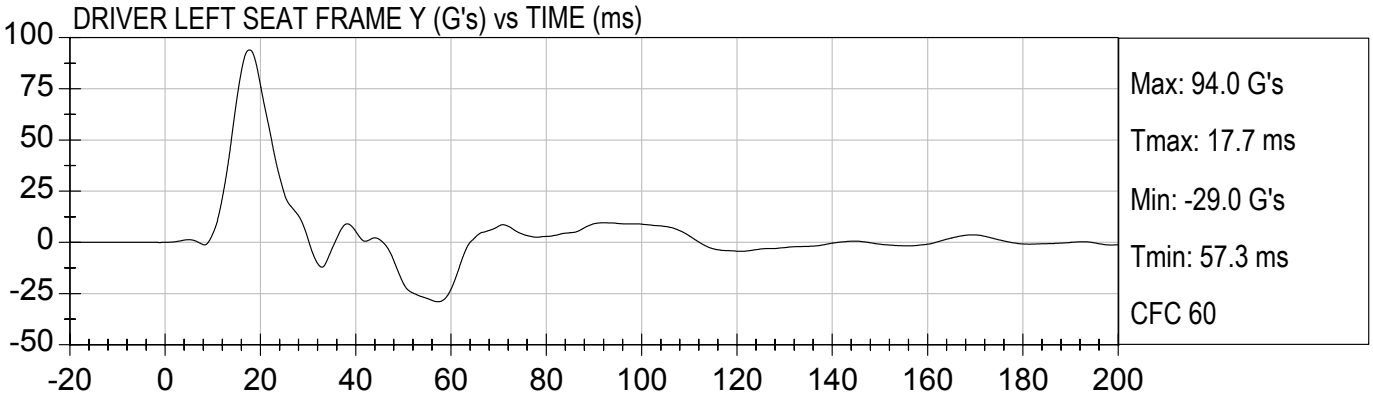

RIGHT REAR SILL Z Velocity (kph) vs TIME (ms)
7
6
5
4
3
2
1
0
-1
-2
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 6.1 kph
Tmax: 185.2 ms
Min: -1.1 kph
Tmin: 24.5 ms
CFC 180

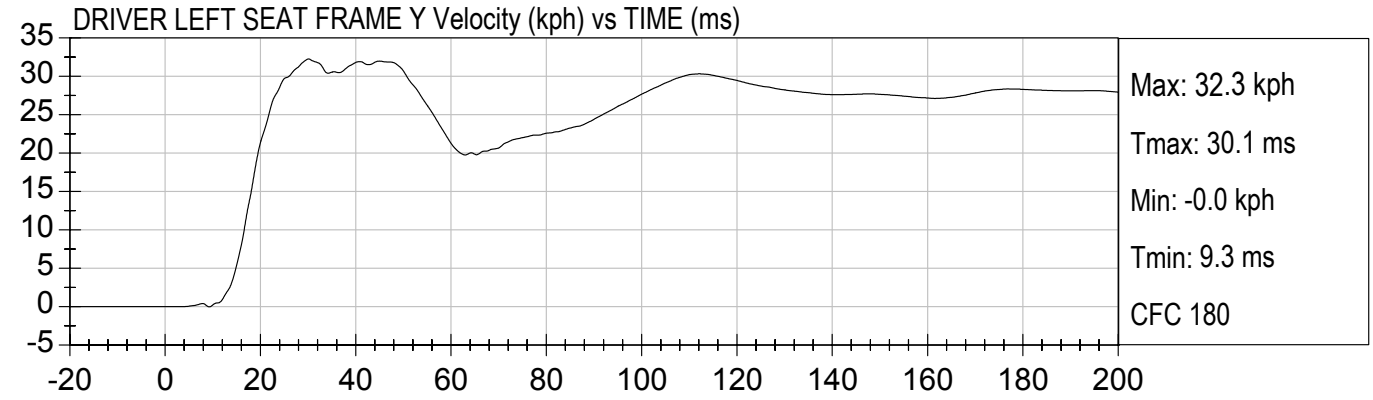

DRIVER SEAT TRACK Y (G's) vs TIME (ms)
80
60
40
20
0
-20
-40
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 69.3 G's
Tmax: 6.7 ms
Min: -24.4 G's
Tmin: 38.0 ms
CFC 60

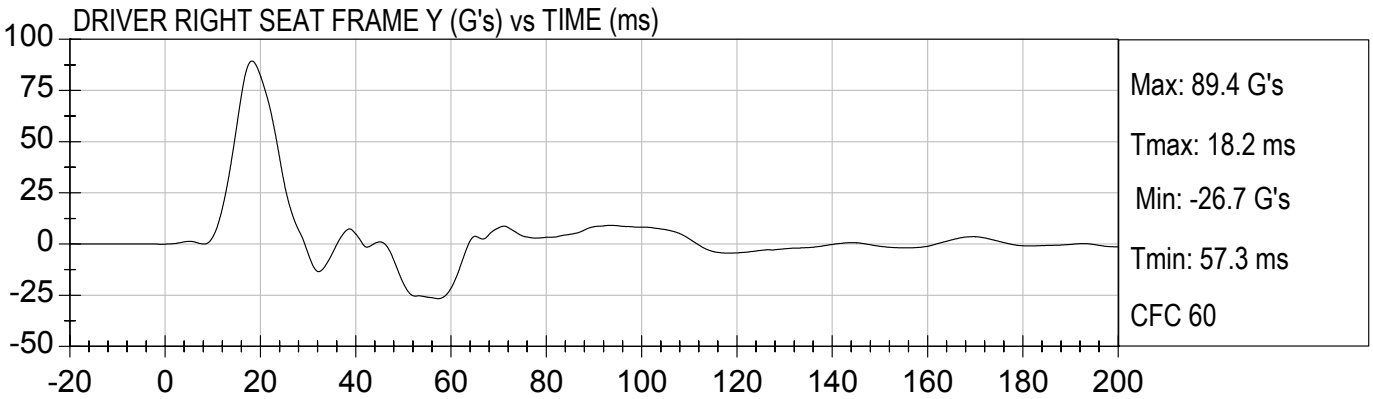

DRIVER SEAT TRACK Y Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 27.9 kph
Tmax: 34.7 ms
Min: -0.5 kph
Tmin: 4.4 ms
CFC 180

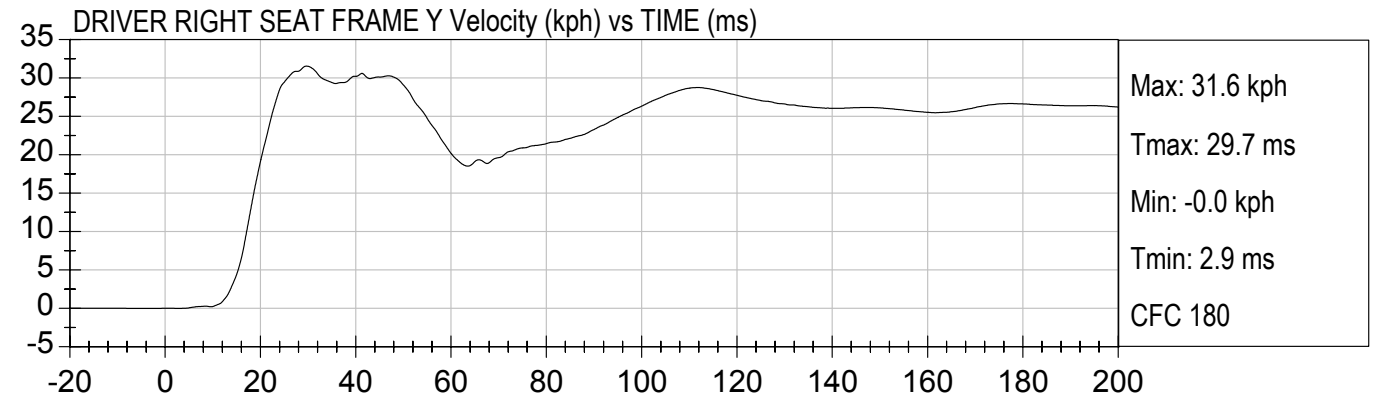
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



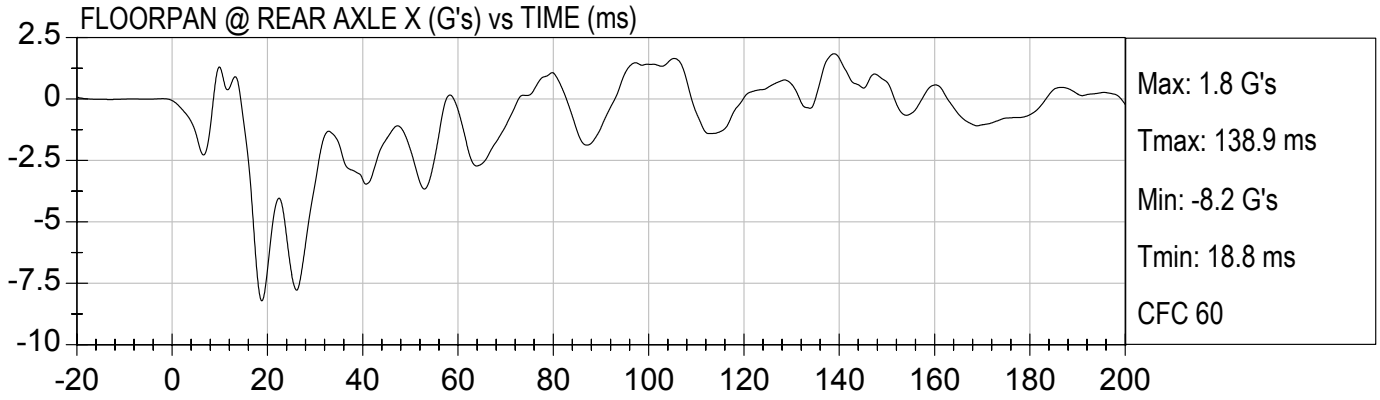


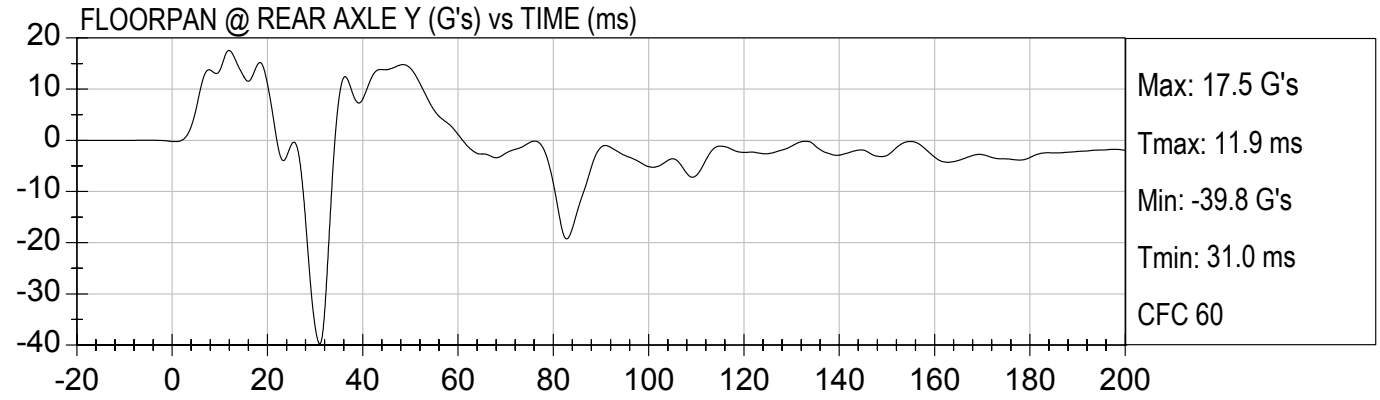


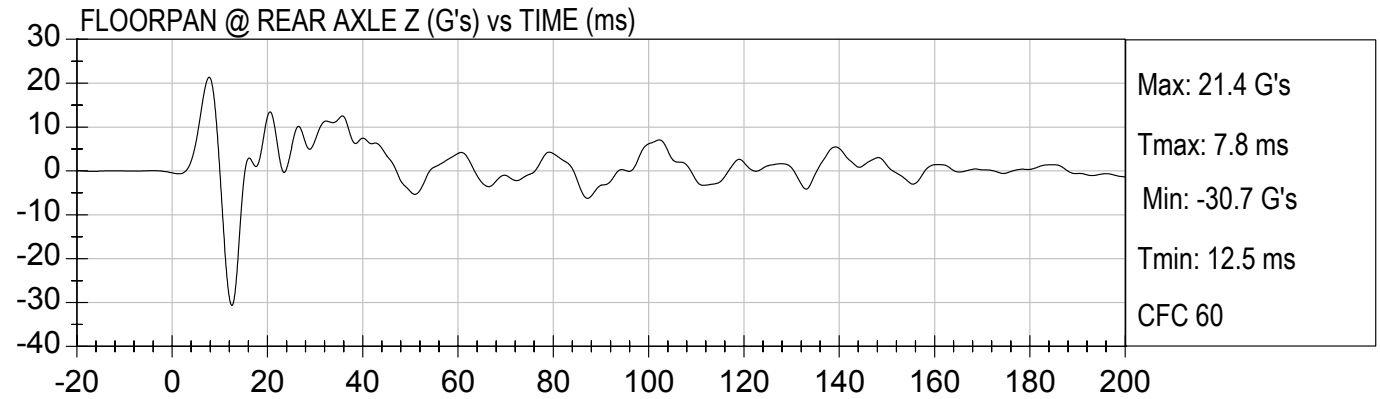


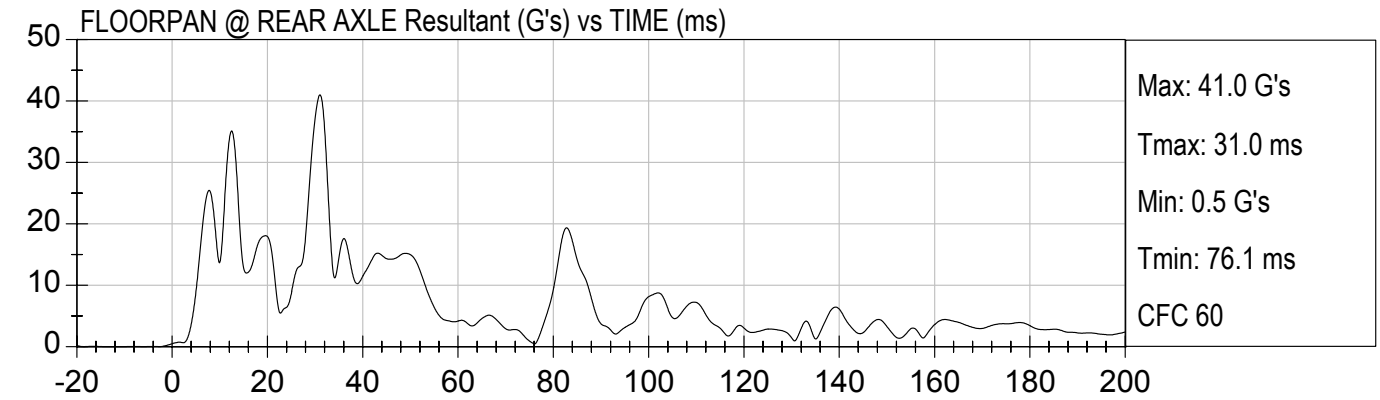
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



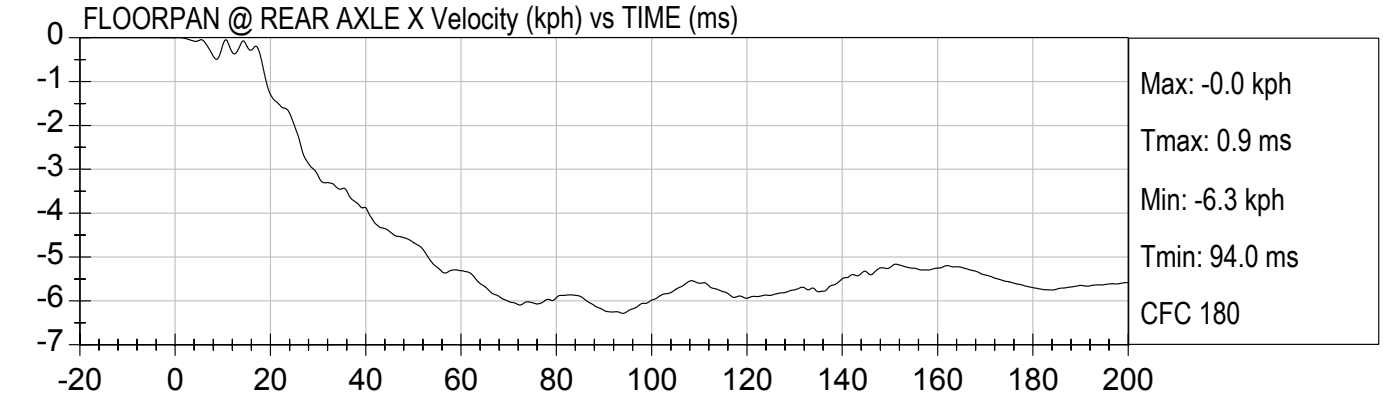


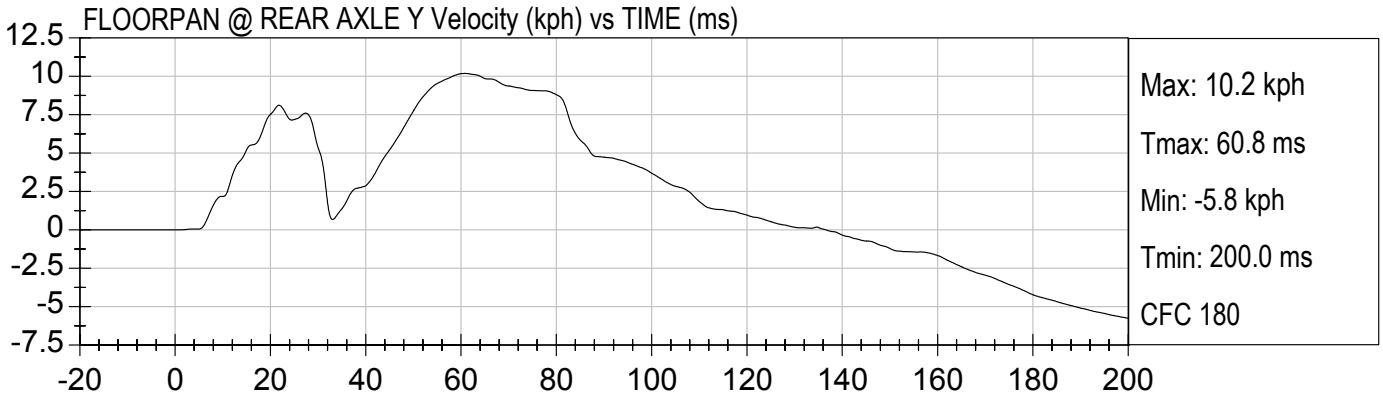


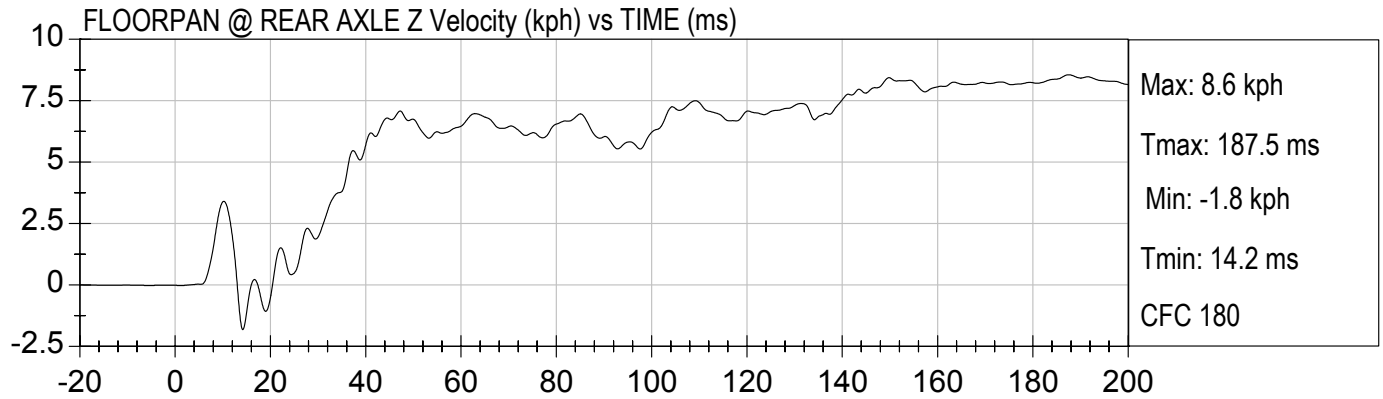


2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

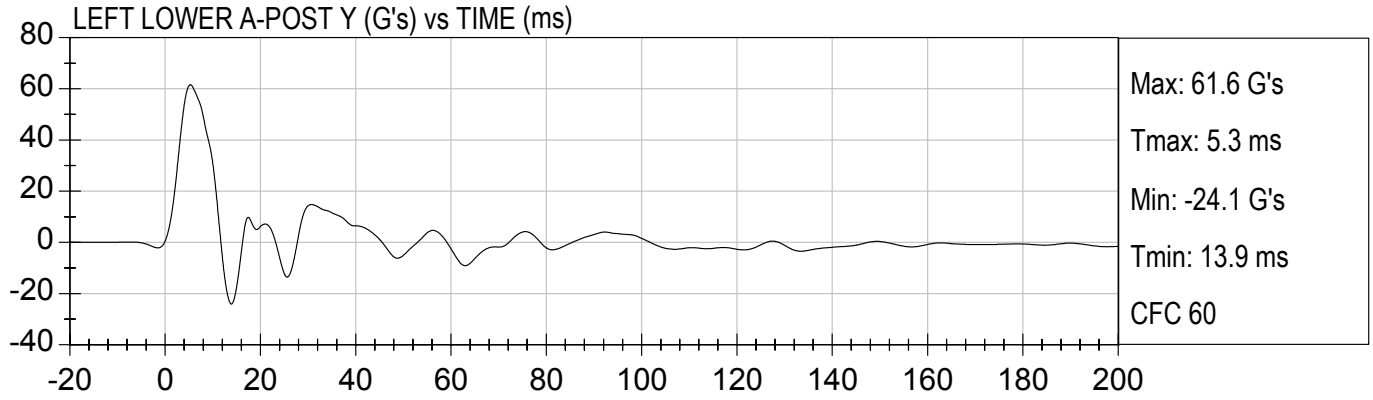


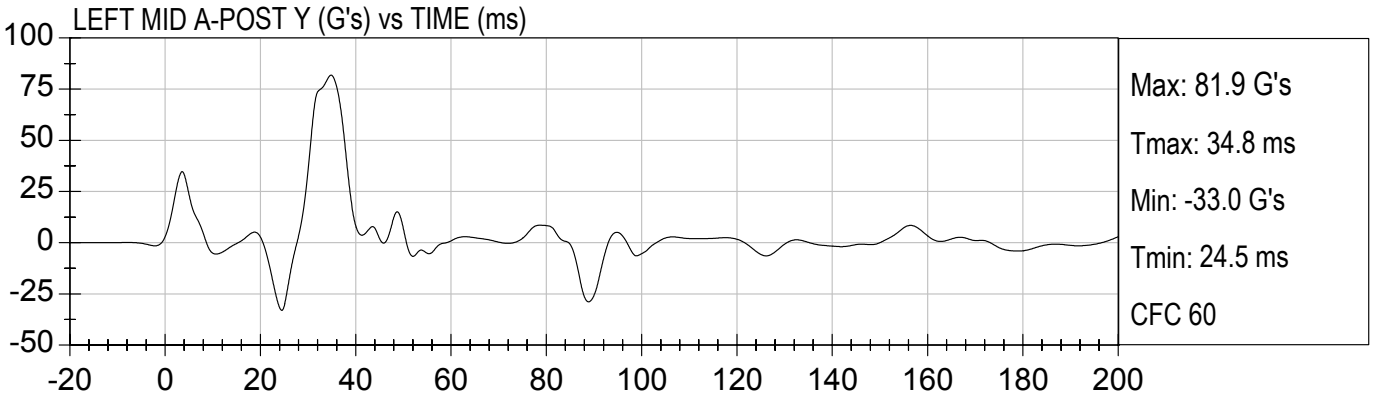


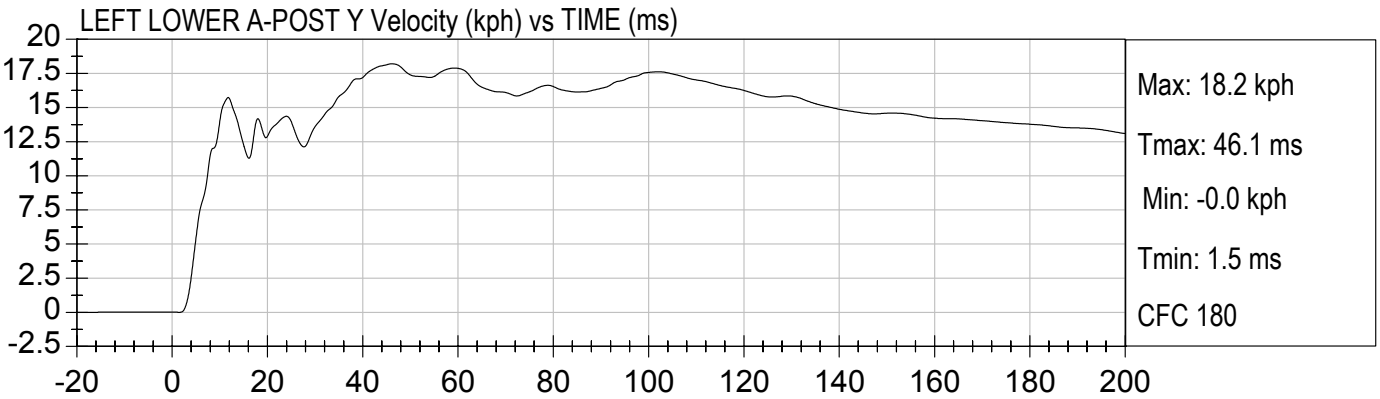


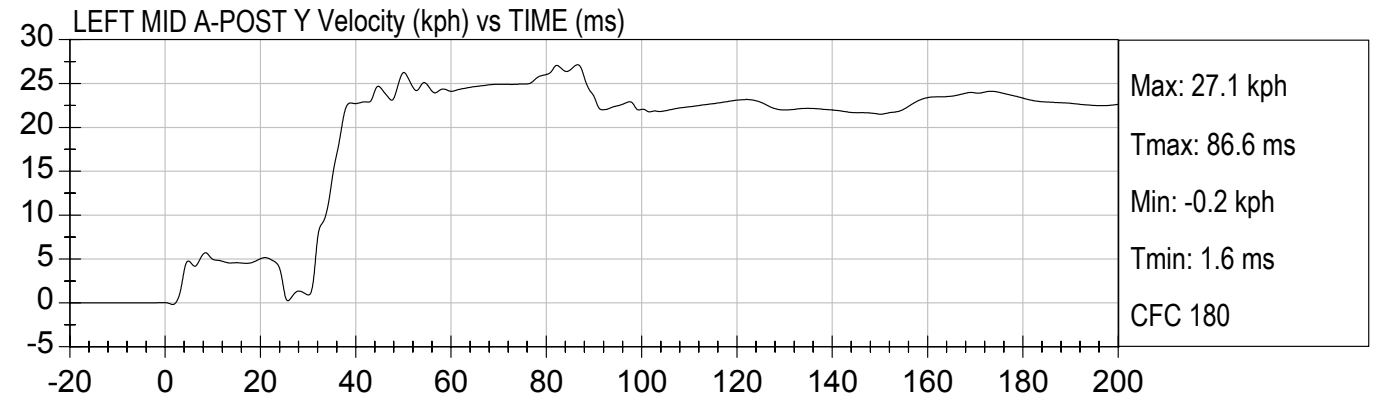
2001 FORD FOCUS
FMVSS 214

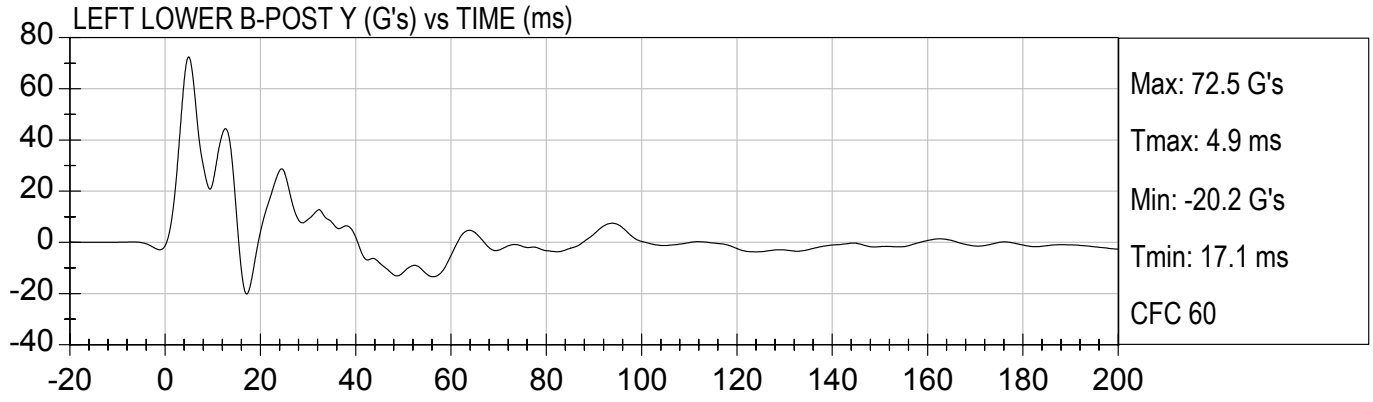
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

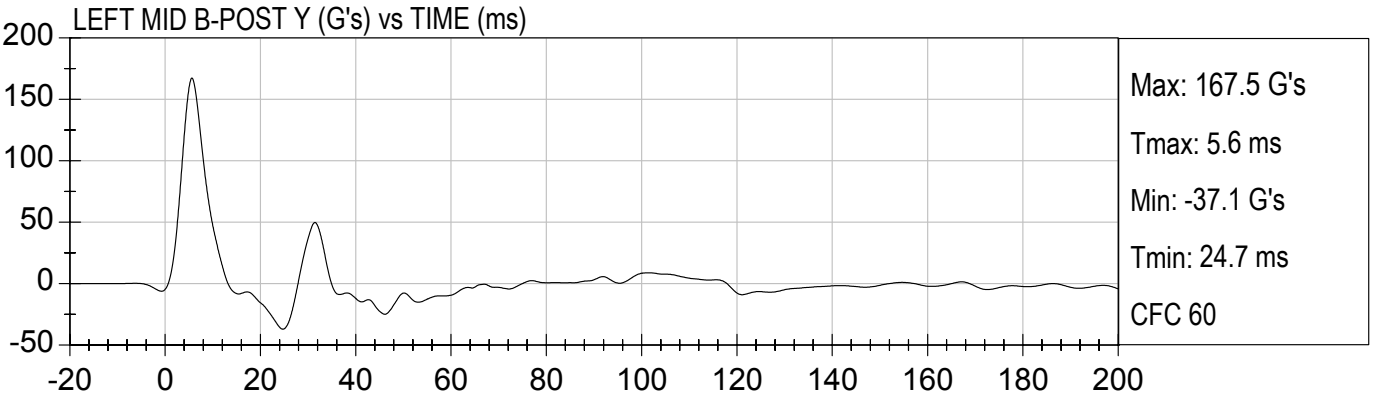


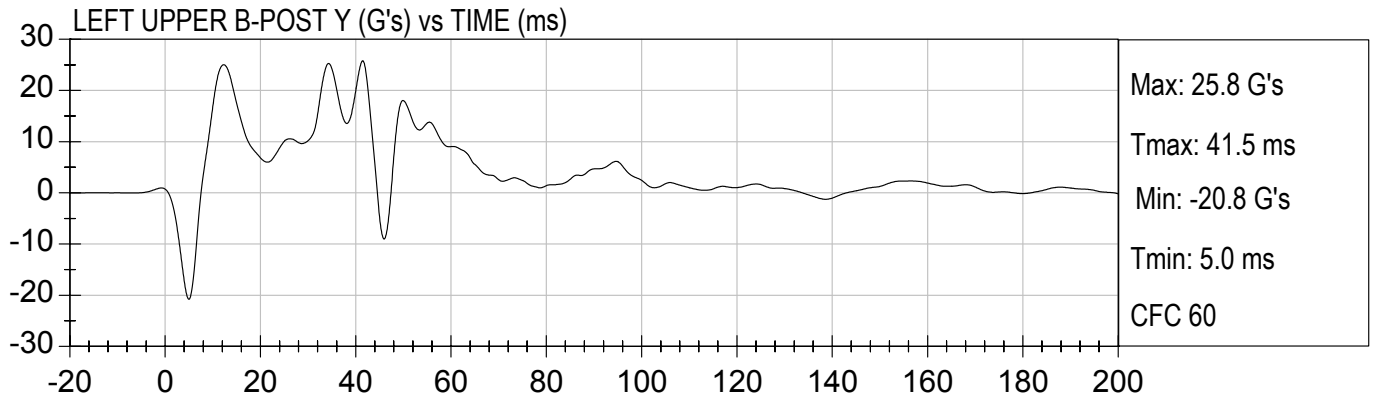


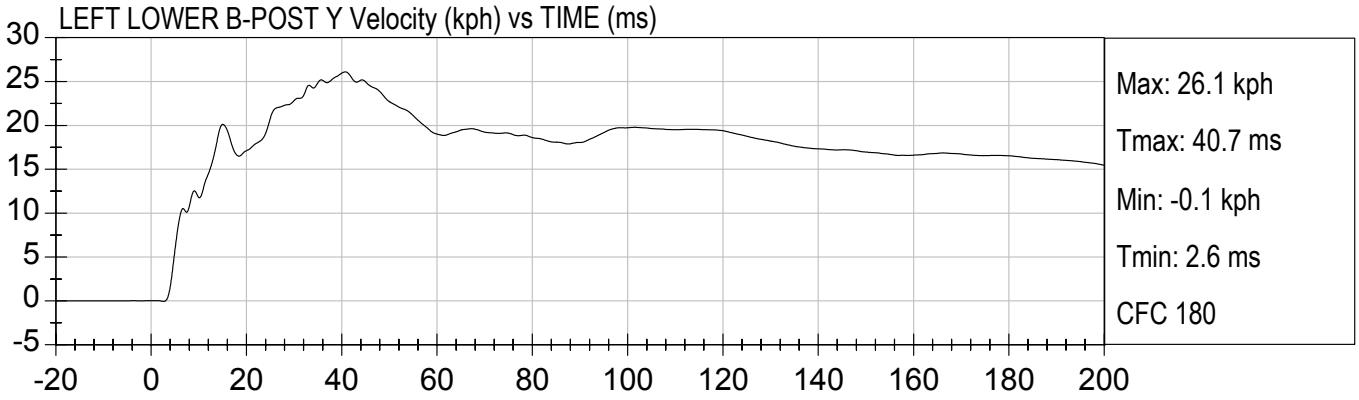


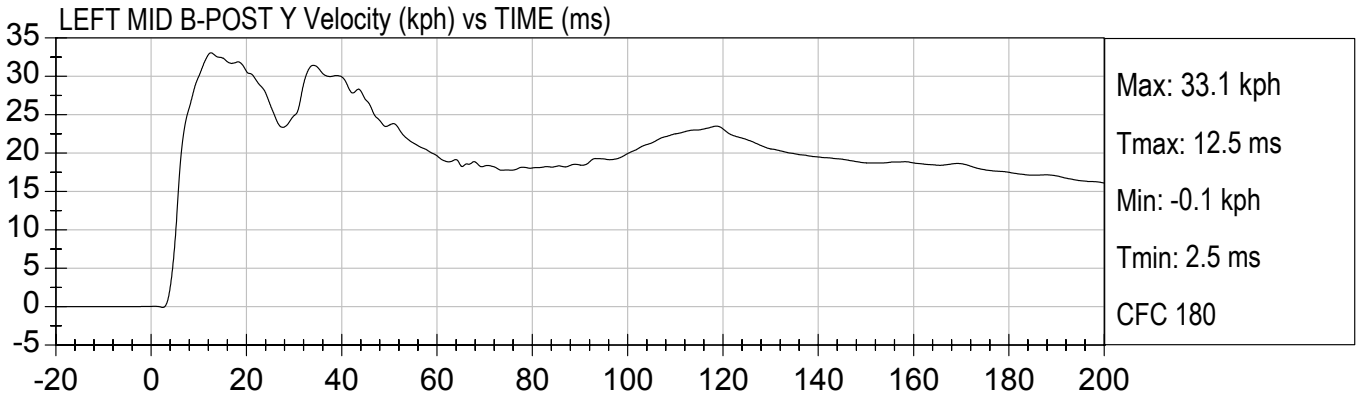


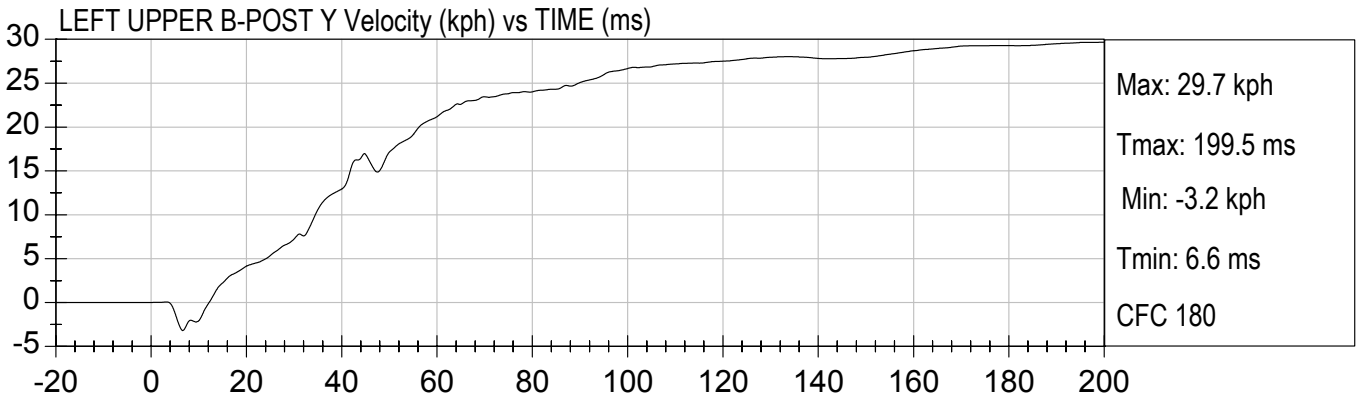

LEFT LOWER B-POST Y (G's) vs TIME (ms)
80
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 72.5 G's
Tmax: 4.9 ms
Min: -20.2 G's
Tmin: 17.1 ms
CFC 60


LEFT MID B-POST Y (G's) vs TIME (ms)
200
150
100
50
0
-50
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 167.5 G's
Tmax: 5.6 ms
Min: -37.1 G's
Tmin: 24.7 ms
CFC 60


LEFT UPPER B-POST Y (G's) vs TIME (ms)
30
20
10
0
-10
-20
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 25.8 G's
Tmax: 41.5 ms
Min: -20.8 G's
Tmin: 5.0 ms
CFC 60

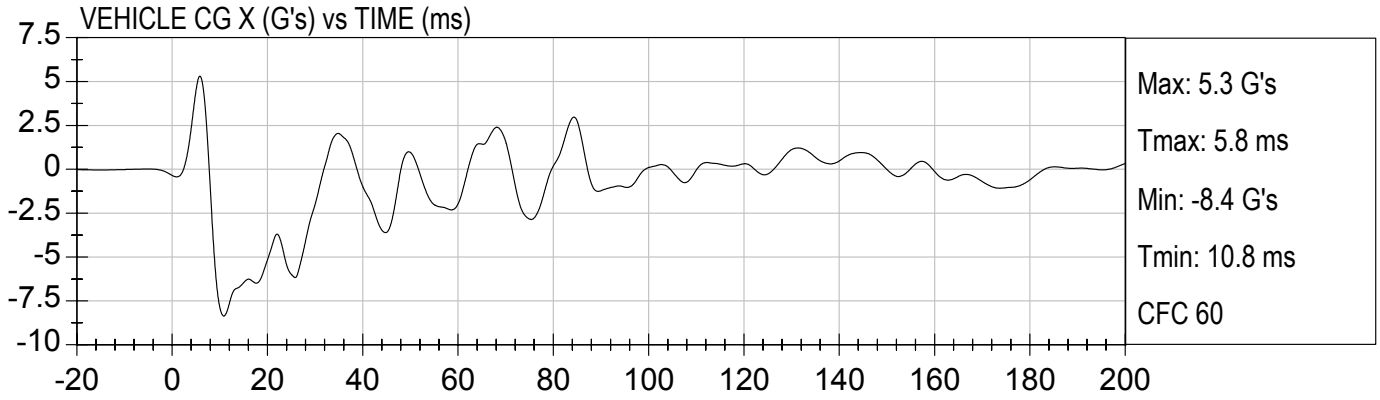

LEFT LOWER B-POST Y Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 26.1 kph
Tmax: 40.7 ms
Min: -0.1 kph
Tmin: 2.6 ms
CFC 180

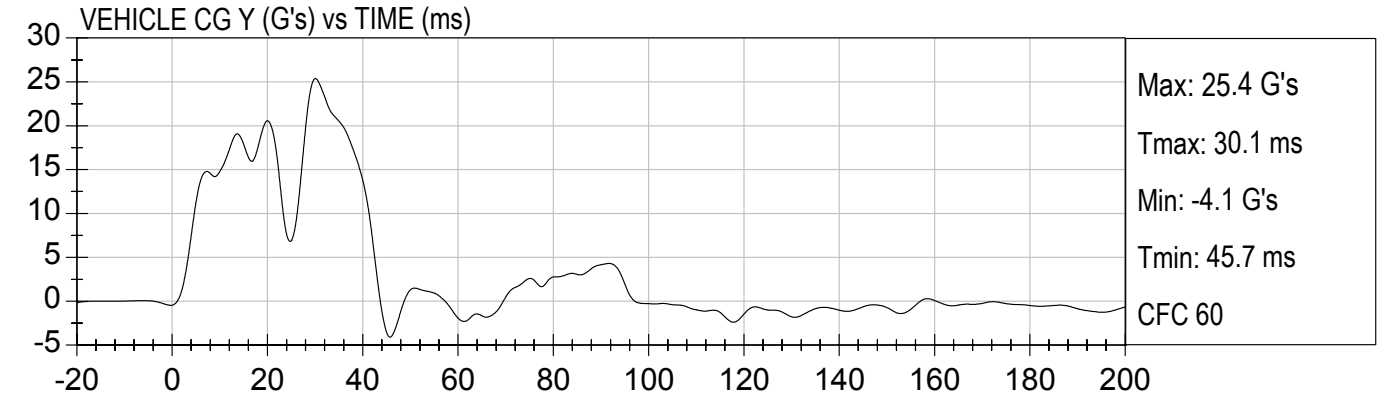

LEFT MID B-POST Y Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 33.1 kph
Tmax: 12.5 ms
Min: -0.1 kph
Tmin: 2.5 ms
CFC 180

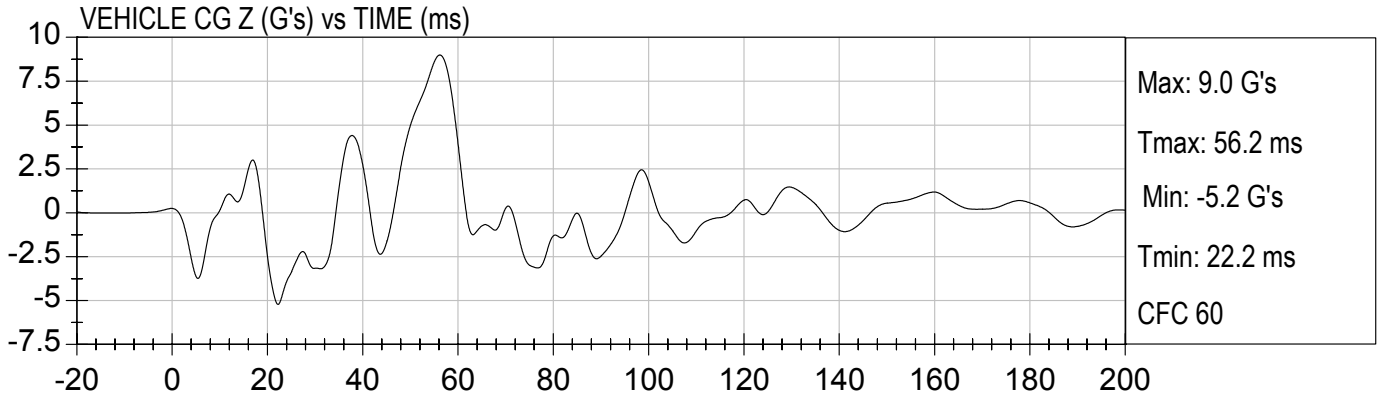

LEFT UPPER B-POST Y Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 29.7 kph
Tmax: 199.5 ms
Min: -3.2 kph
Tmin: 6.6 ms
CFC 180

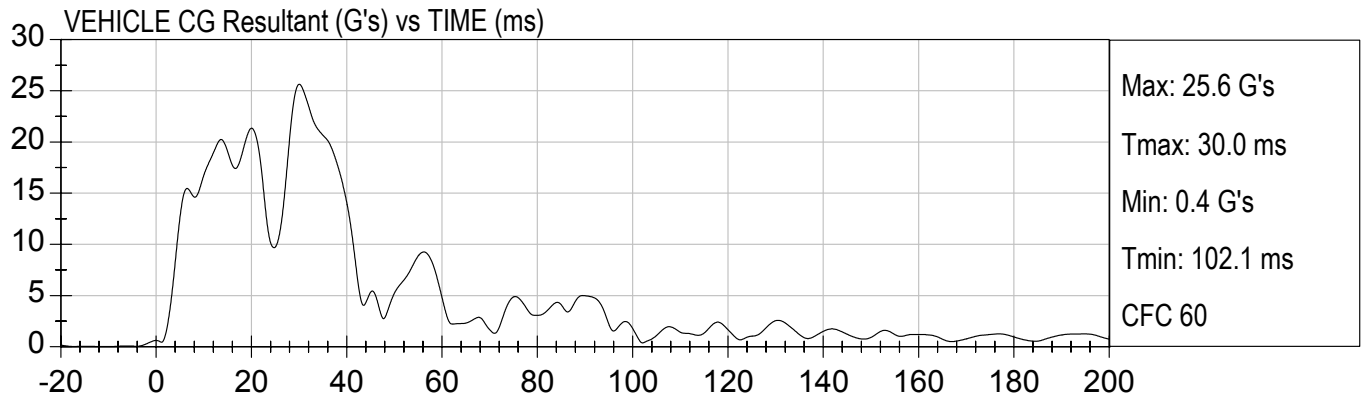
2001 FORD FOCUS
FMVSS 214

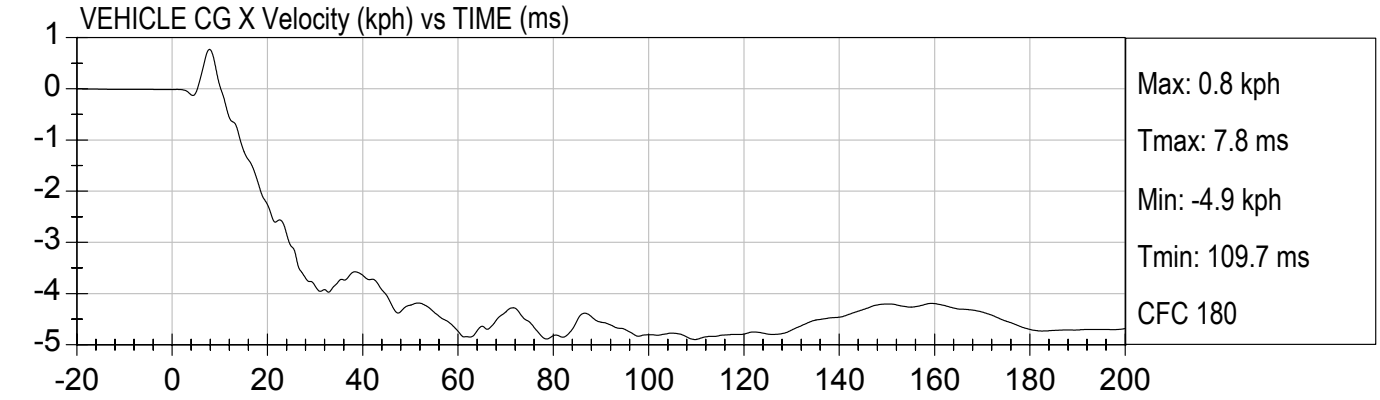
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

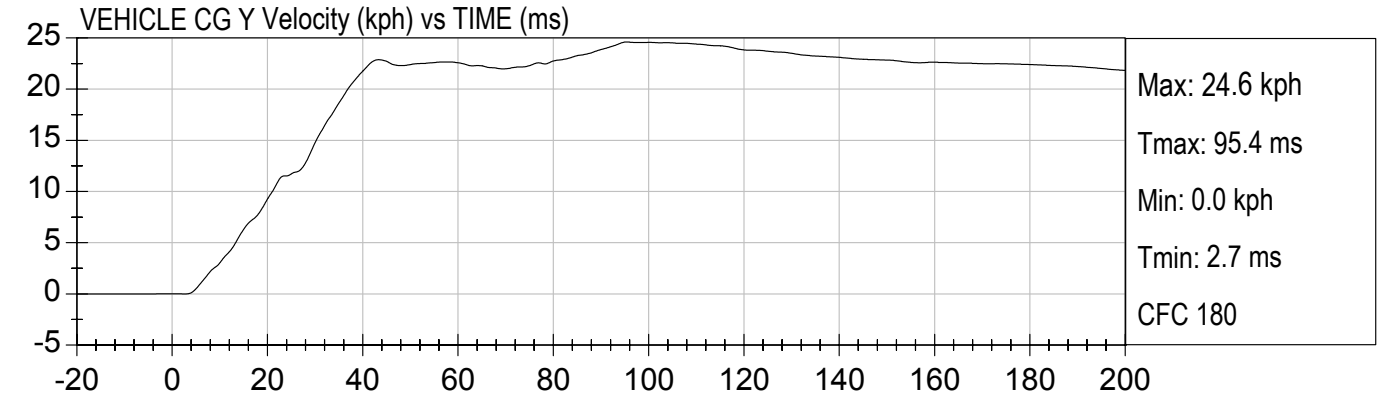


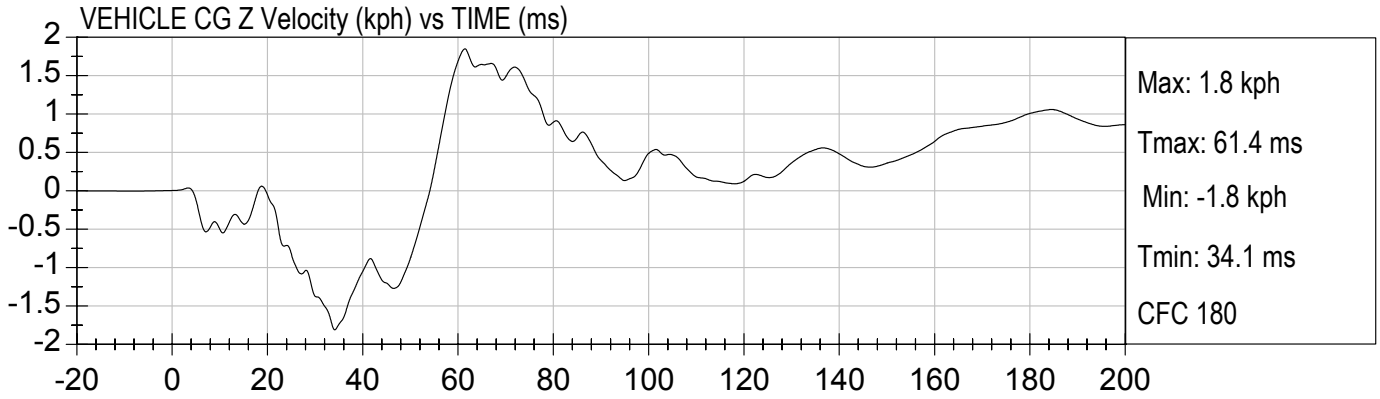






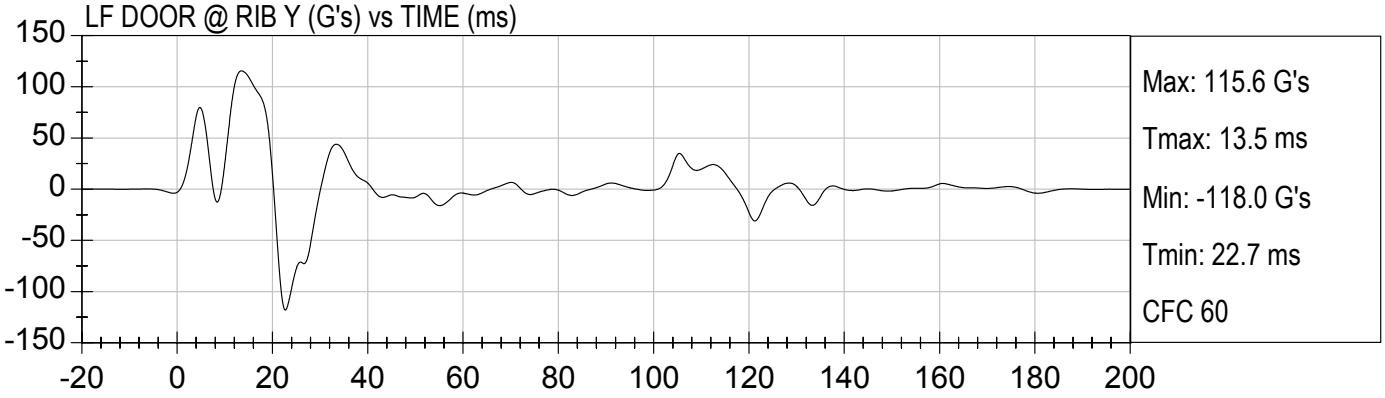

VEHICLE CG X Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 0.8 kph
Tmax: 7.8 ms
Min: -4.9 kph
Tmin: 109.7 ms
CFC 180

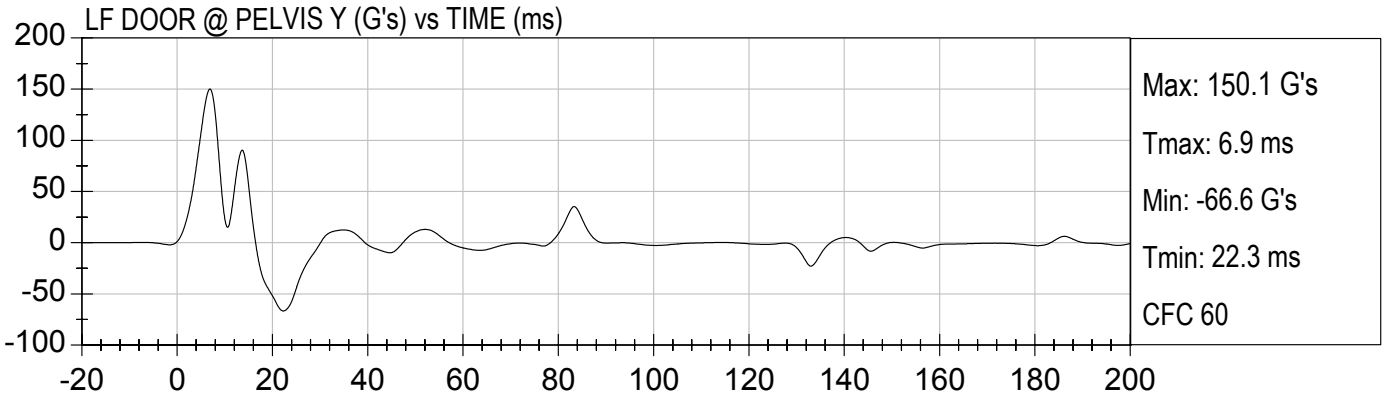

VEHICLE CG Y Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 24.6 kph
Tmax: 95.4 ms
Min: 0.0 kph
Tmin: 2.7 ms
CFC 180

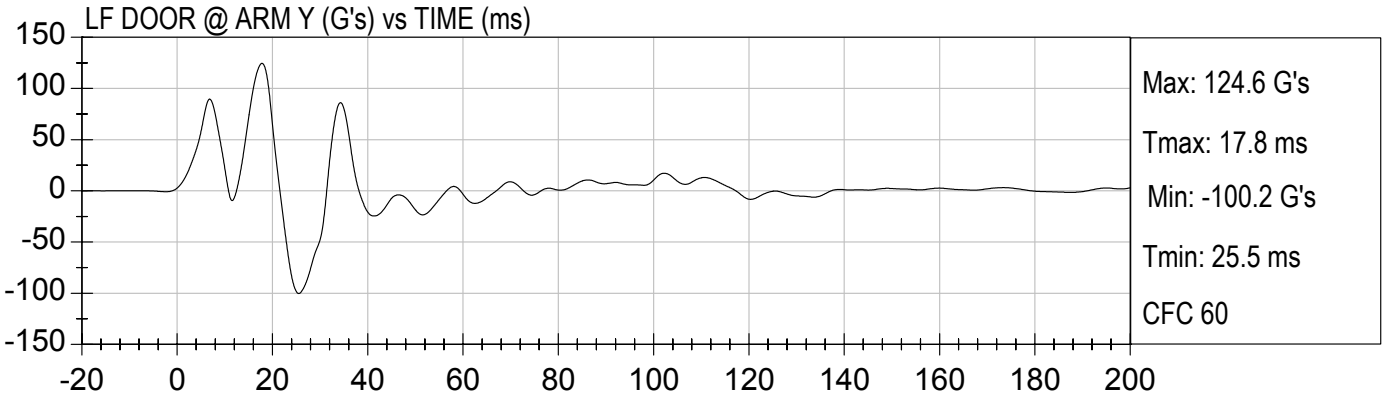

VEHICLE CG Z Velocity (kph) vs TIME (ms)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 1.8 kph
Tmax: 61.4 ms
Min: -1.8 kph
Tmin: 34.1 ms
CFC 180

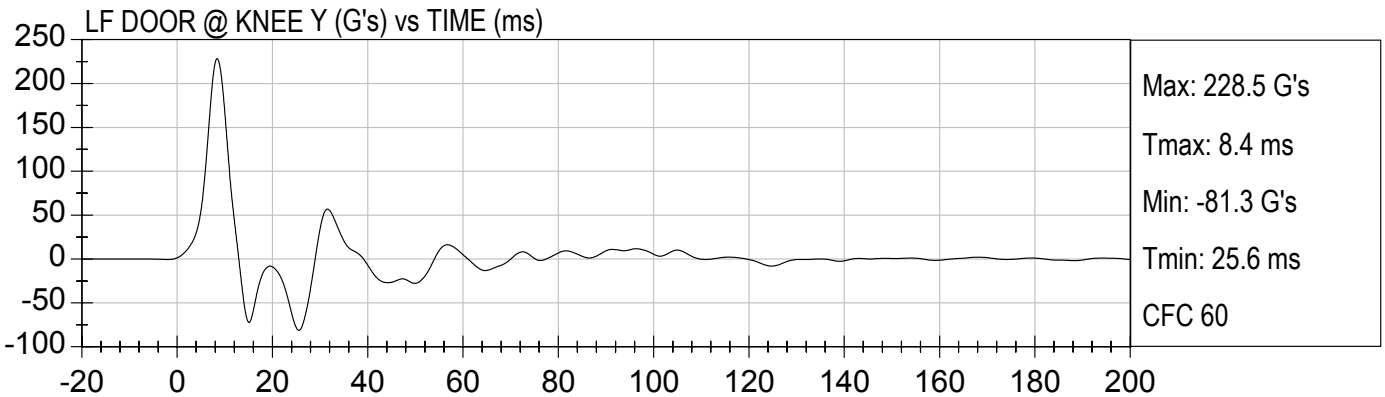
2001 FORD FOCUS
FMVSS 214

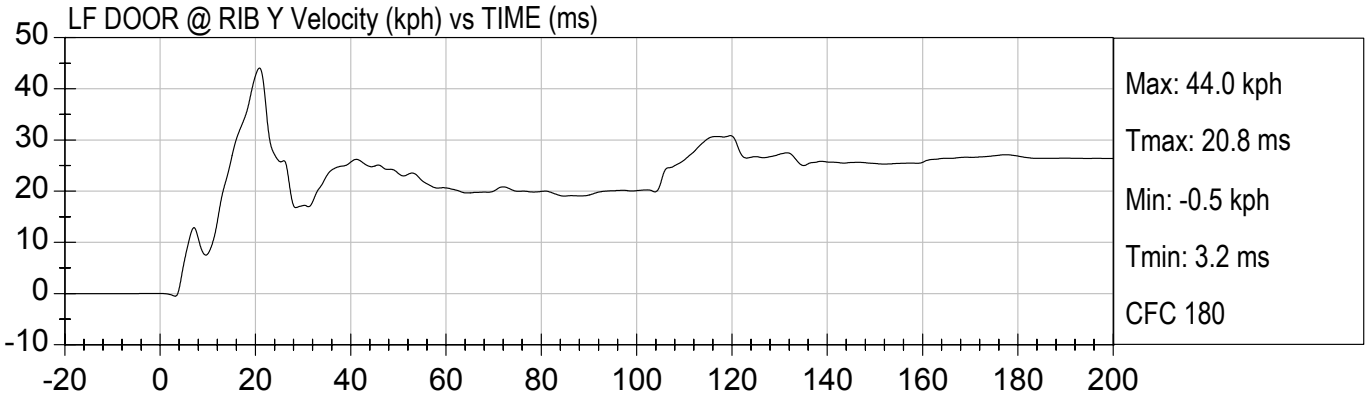
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

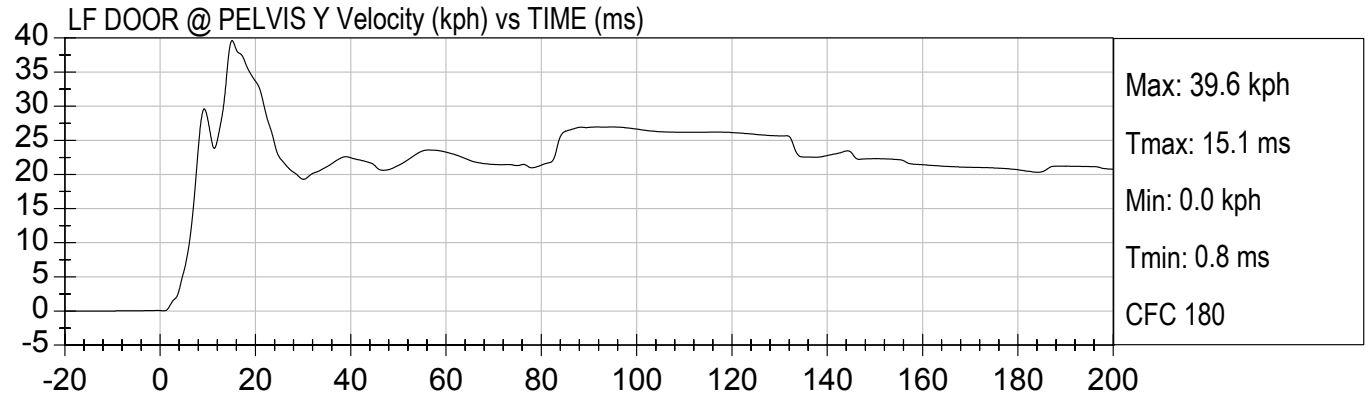


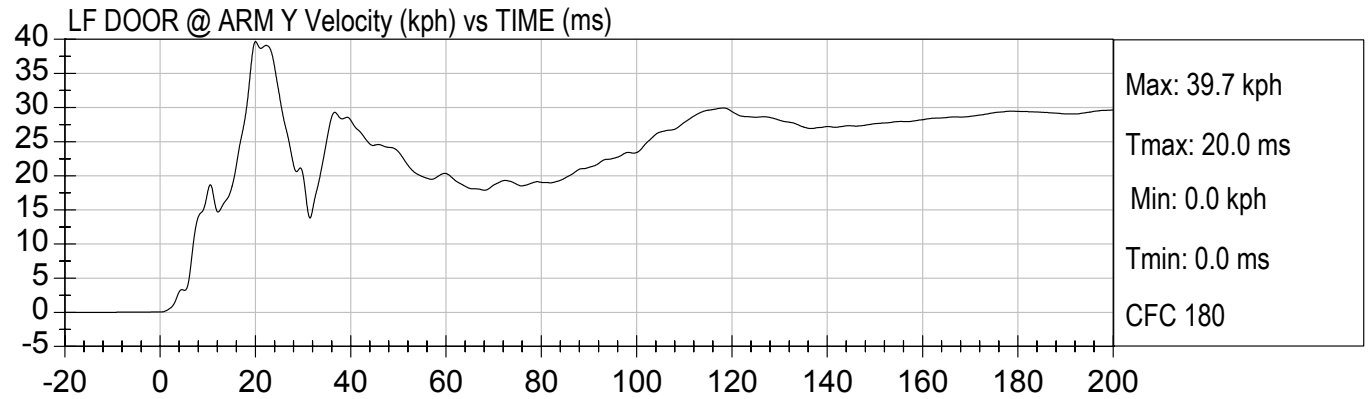


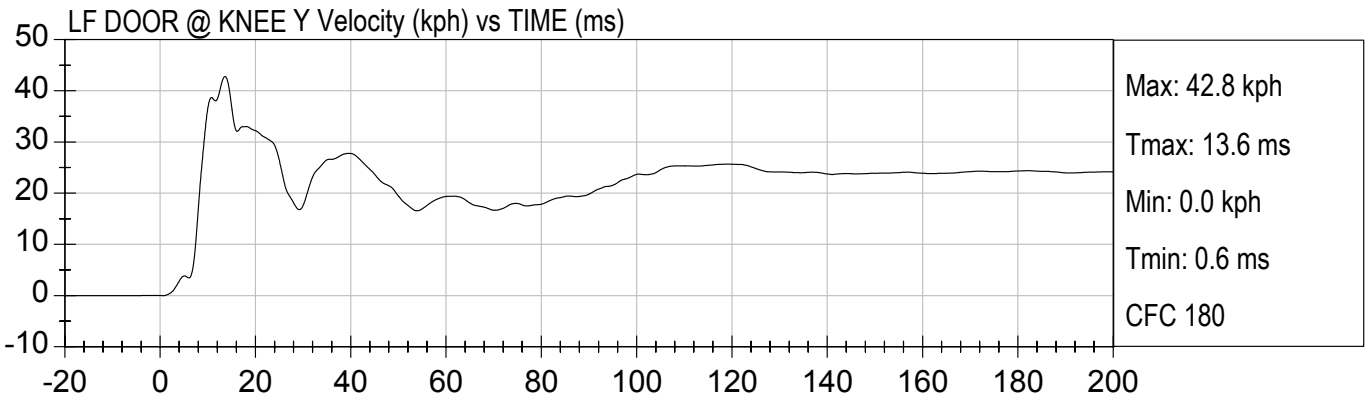





LF DOOR @ RIB Y Velocity (kph) vs TIME (ms)
Max: 44.0 kph
Tmax: 20.8 ms
Min: -0.5 kph
Tmin: 3.2 ms
CFC 180

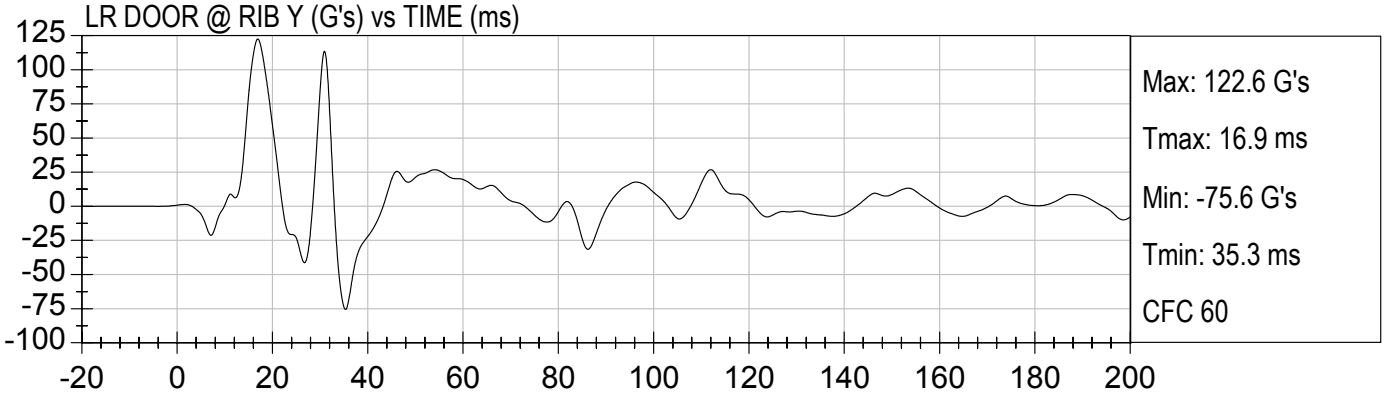

LF DOOR @ PELVIS Y Velocity (kph) vs TIME (ms)
Max: 39.6 kph
Tmax: 15.1 ms
Min: 0.0 kph
Tmin: 0.8 ms
CFC 180

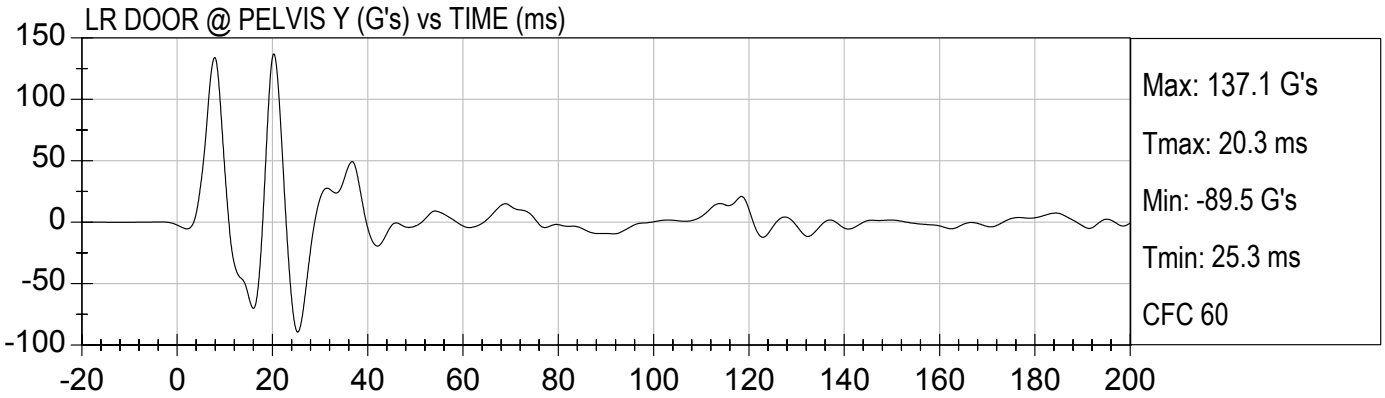

LF DOOR @ ARM Y Velocity (kph) vs TIME (ms)
Max: 39.7 kph
Tmax: 20.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

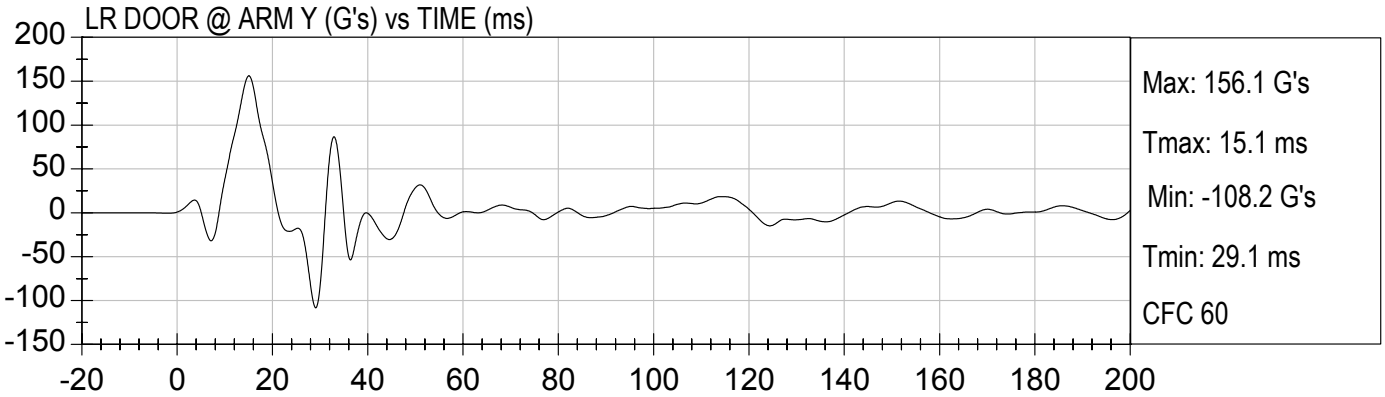

LF DOOR @ KNEE Y Velocity (kph) vs TIME (ms)
Max: 42.8 kph
Tmax: 13.6 ms
Min: 0.0 kph
Tmin: 0.6 ms
CFC 180

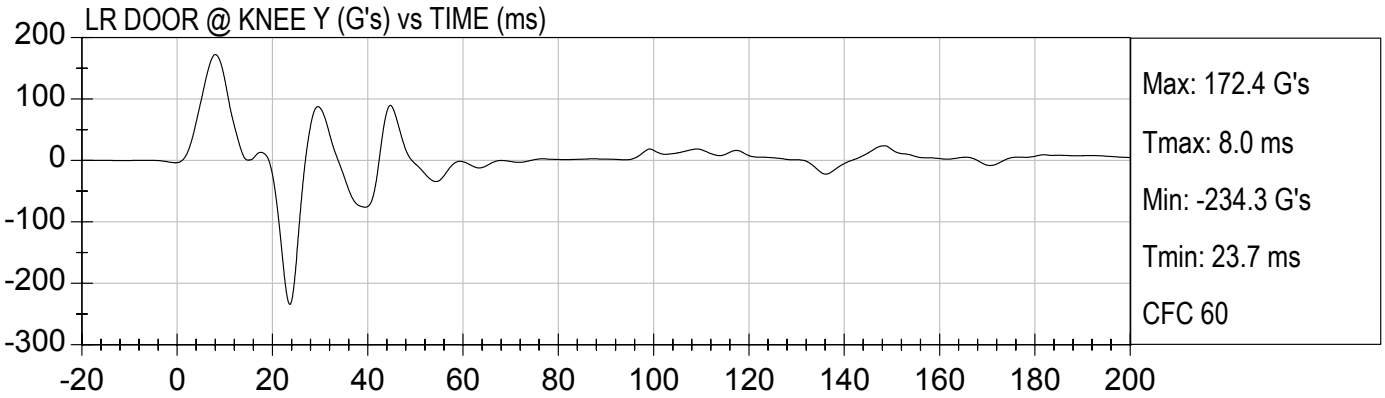
2001 FORD FOCUS
FMVSS 214

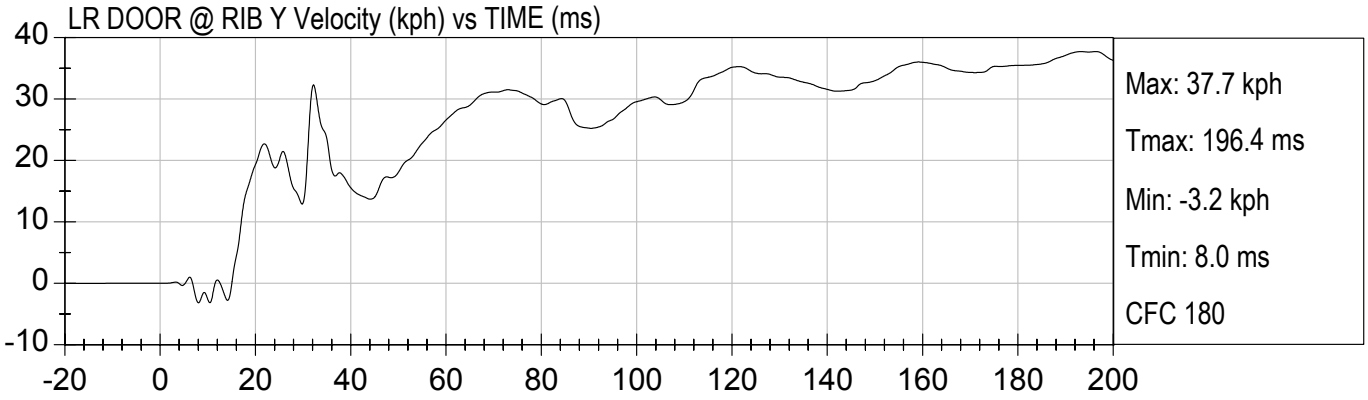
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

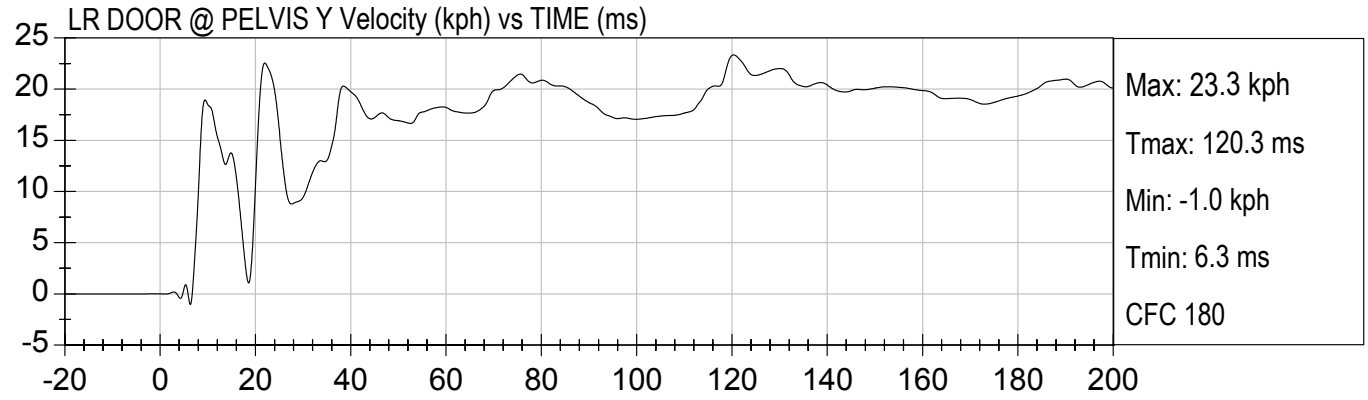


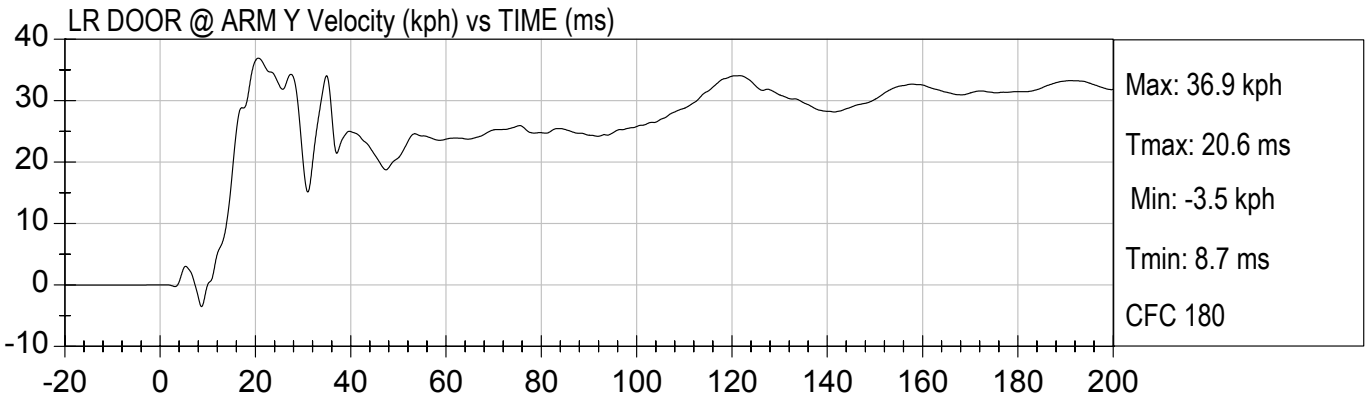


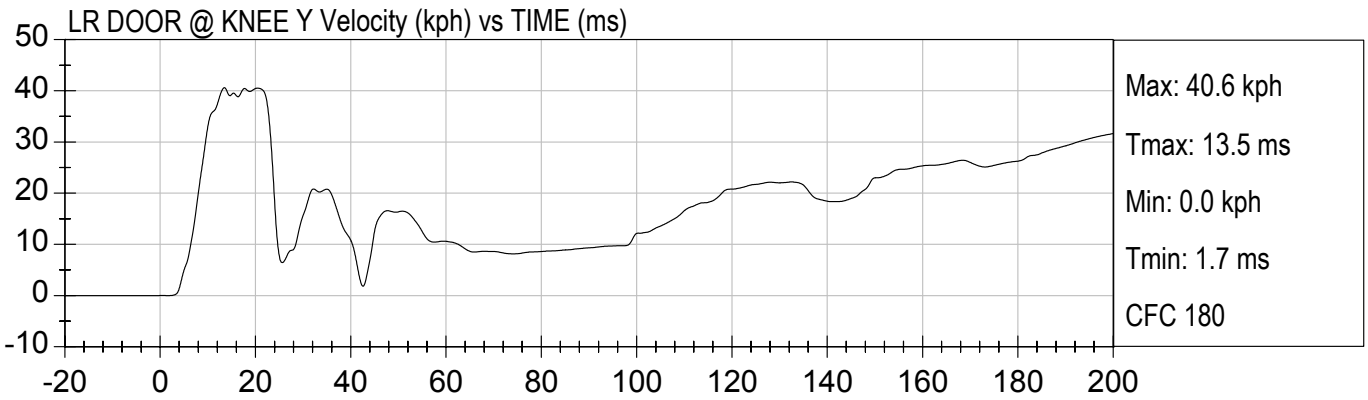


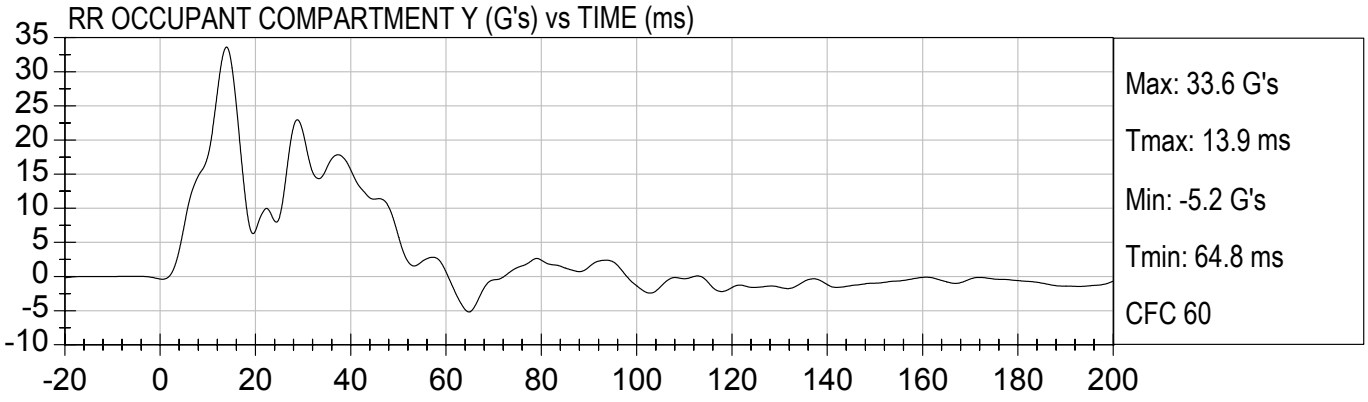


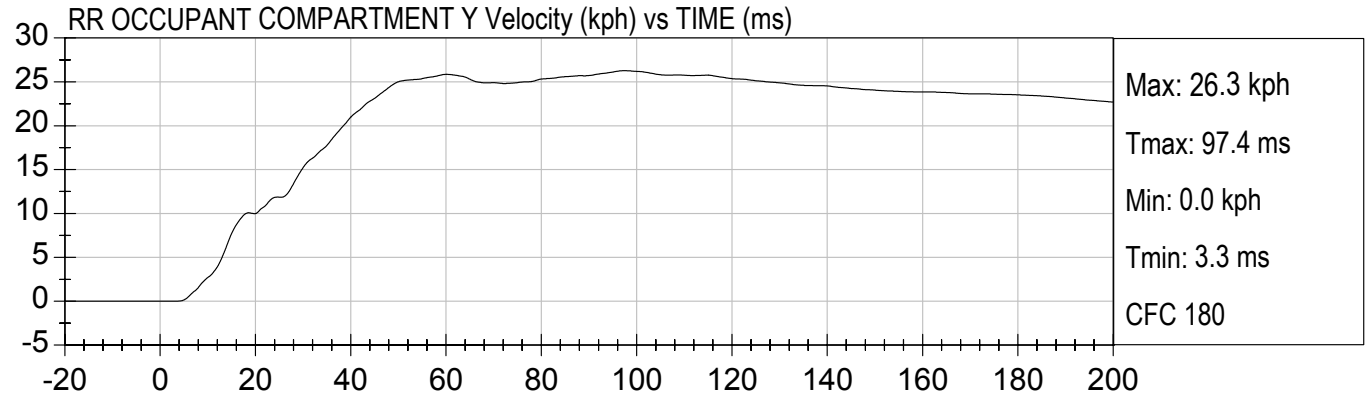

LR DOOR @ RIB Y Velocity (kph) vs TIME (ms)
Max: 37.7 kph
Tmax: 196.4 ms
Min: -3.2 kph
Tmin: 8.0 ms
CFC 180


LR DOOR @ PELVIS Y Velocity (kph) vs TIME (ms)
Max: 23.3 kph
Tmax: 120.3 ms
Min: -1.0 kph
Tmin: 6.3 ms
CFC 180


LR DOOR @ ARM Y Velocity (kph) vs TIME (ms)
Max: 36.9 kph
Tmax: 20.6 ms
Min: -3.5 kph
Tmin: 8.7 ms
CFC 180

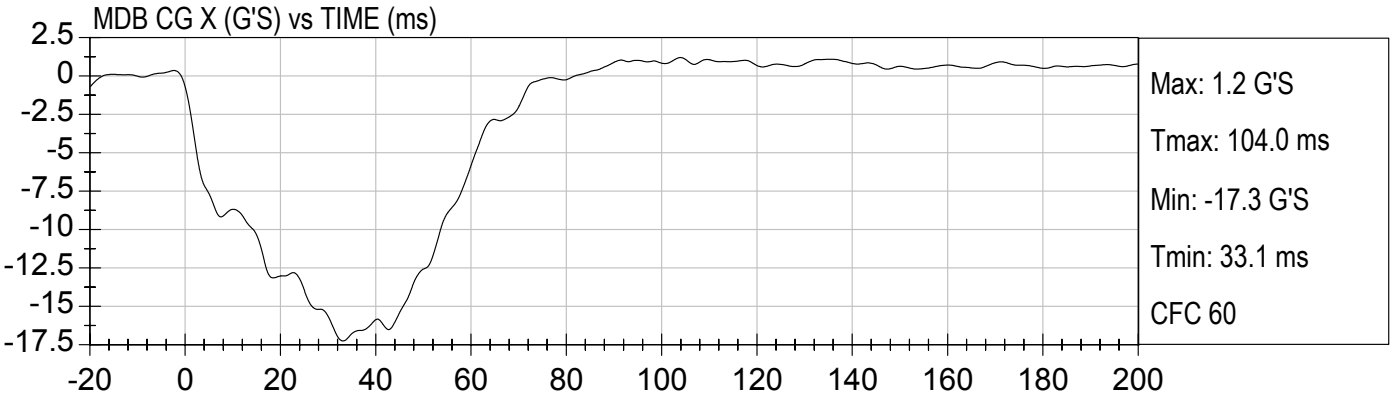

LR DOOR @ KNEE Y Velocity (kph) vs TIME (ms)
Max: 40.6 kph
Tmax: 13.5 ms
Min: 0.0 kph
Tmin: 1.7 ms
CFC 180

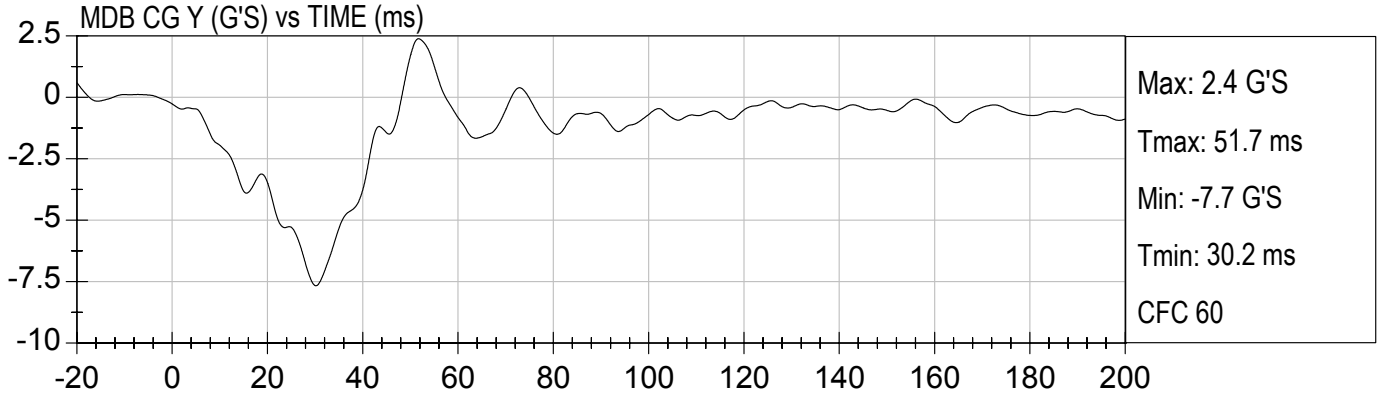

RR OCCUPANT COMPARTMENT Y (G's) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 33.6 G's
Tmax: 13.9 ms
Min: -5.2 G's
Tmin: 64.8 ms
CFC 60

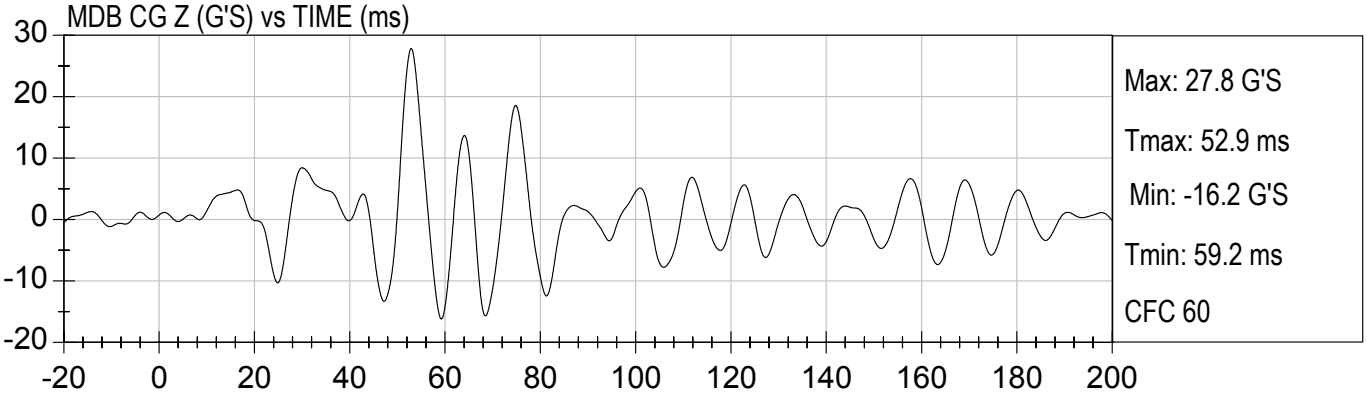

RR OCCUPANT COMPARTMENT Y Velocity (kph) vs TIME (ms)
30
25
20
15
10
5
0
-5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 26.3 kph
Tmax: 97.4 ms
Min: 0.0 kph
Tmin: 3.3 ms
CFC 180

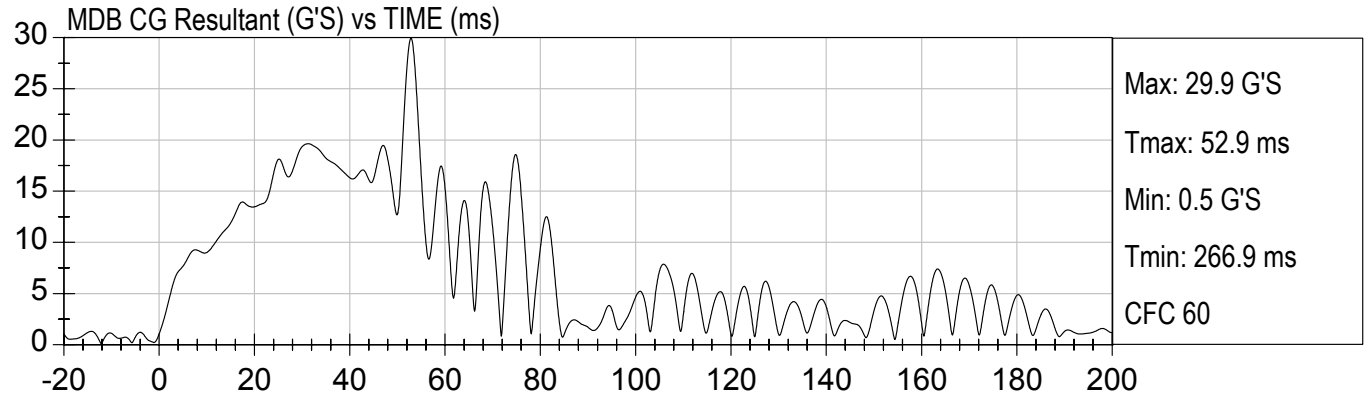
2001 FORD FOCUS
FMVSS 214

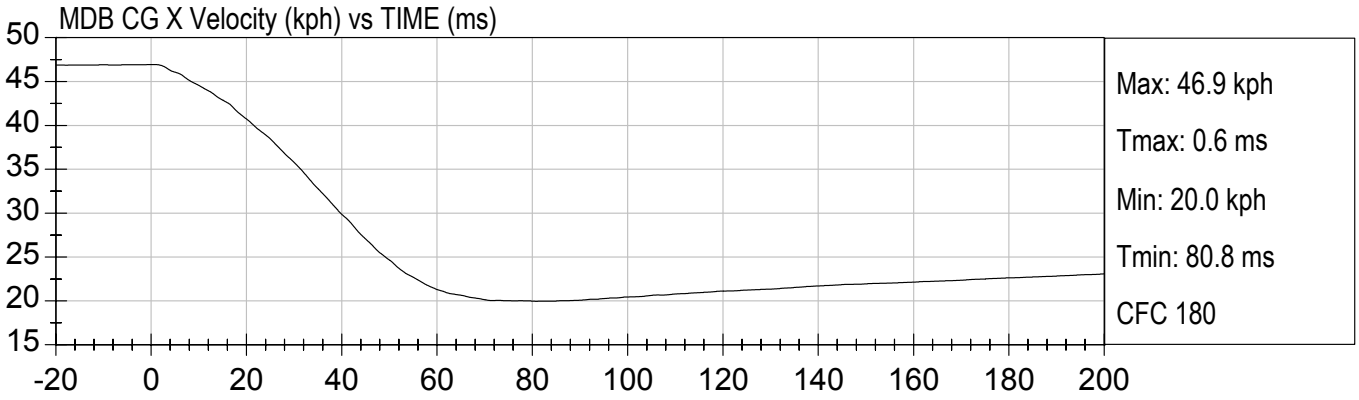
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

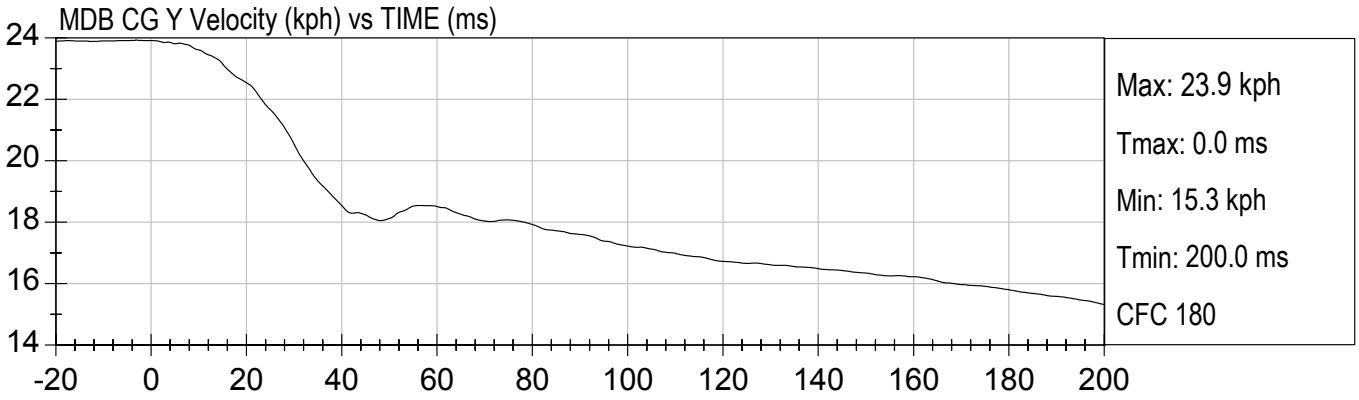


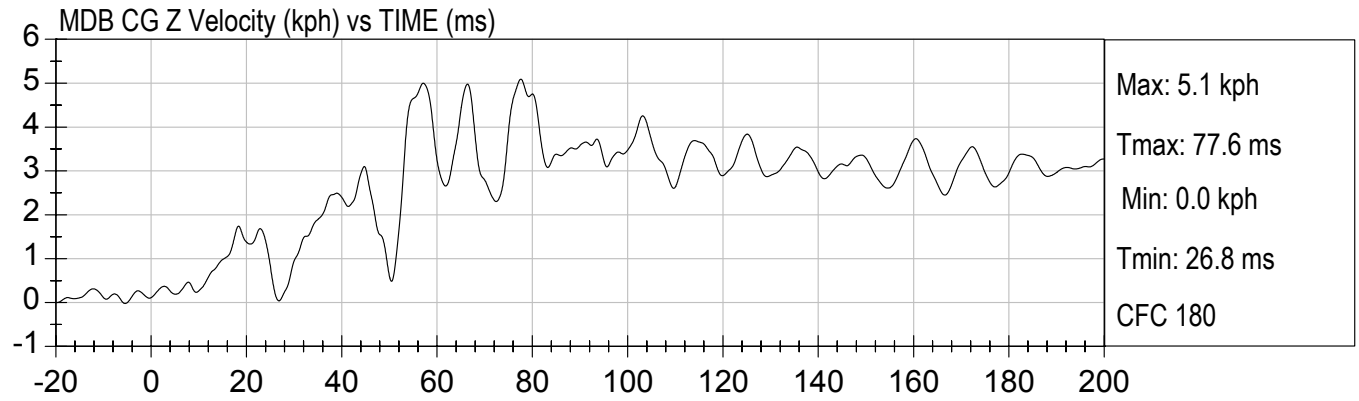






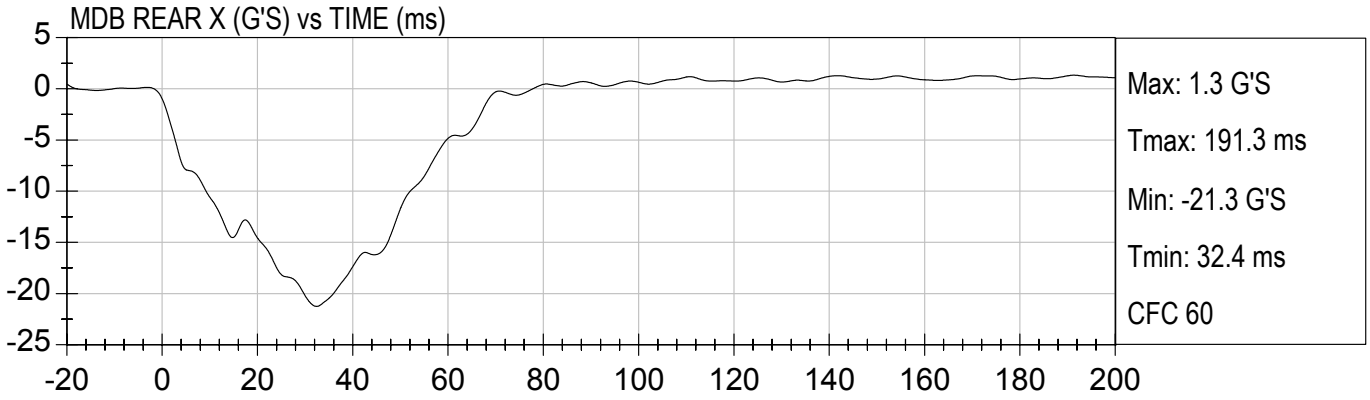

MDB CG X Velocity (kph) vs TIME (ms)
50
45
40
35
30
25
20
15
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 46.9 kph
Tmax: 0.6 ms
Min: 20.0 kph
Tmin: 80.8 ms
CFC 180

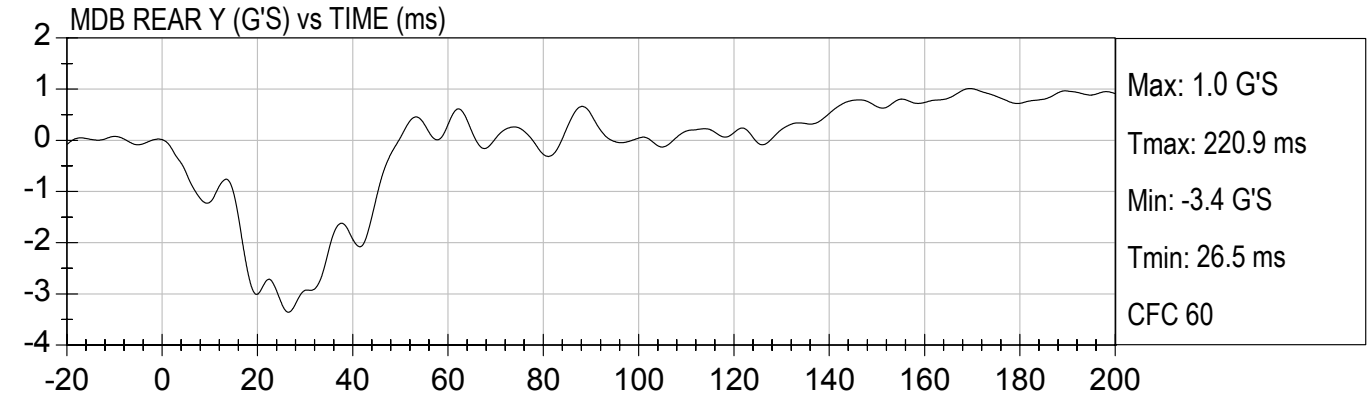

MDB CG Y Velocity (kph) vs TIME (ms)
24
22
20
18
16
14
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 23.9 kph
Tmax: 0.0 ms
Min: 15.3 kph
Tmin: 200.0 ms
CFC 180

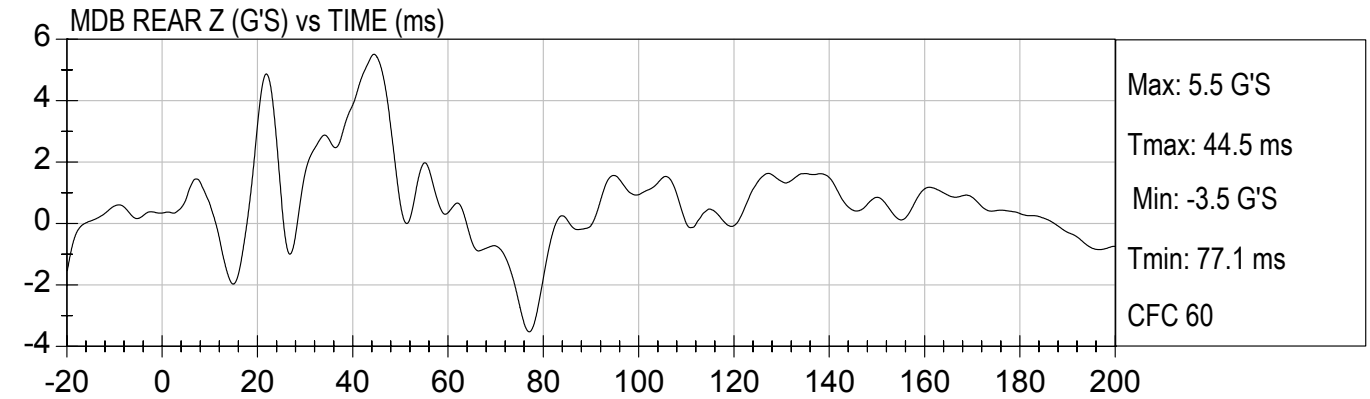

MDB CG Z Velocity (kph) vs TIME (ms)
6
5
4
3
2
1
0
-1
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 5.1 kph
Tmax: 77.6 ms
Min: 0.0 kph
Tmin: 26.8 ms
CFC 180

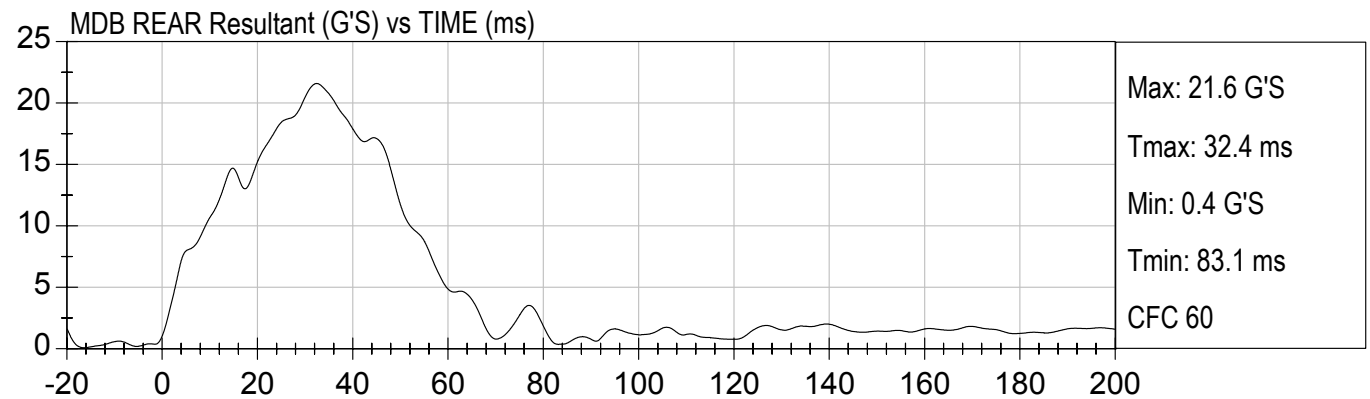
2001 FORD FOCUS
FMVSS 214

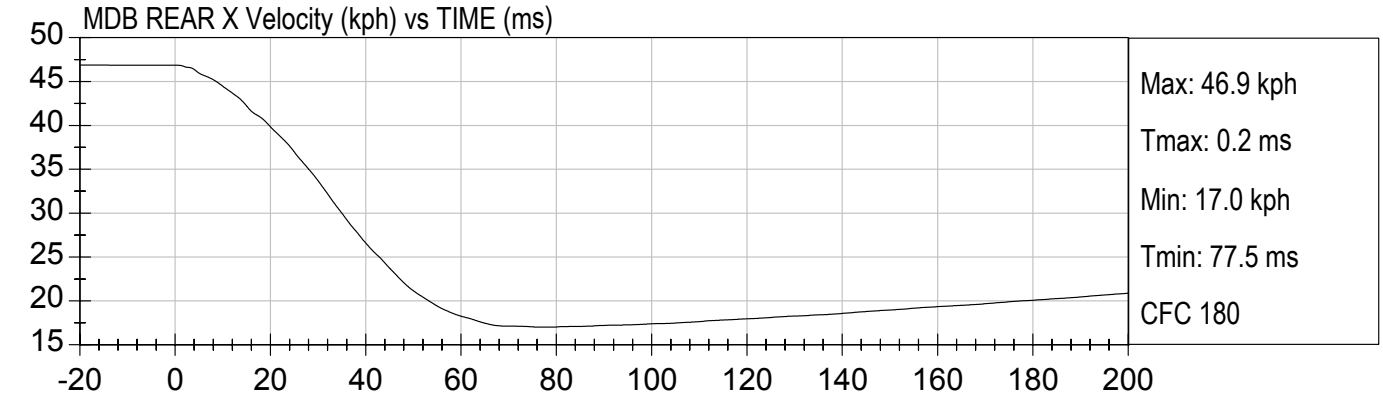
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

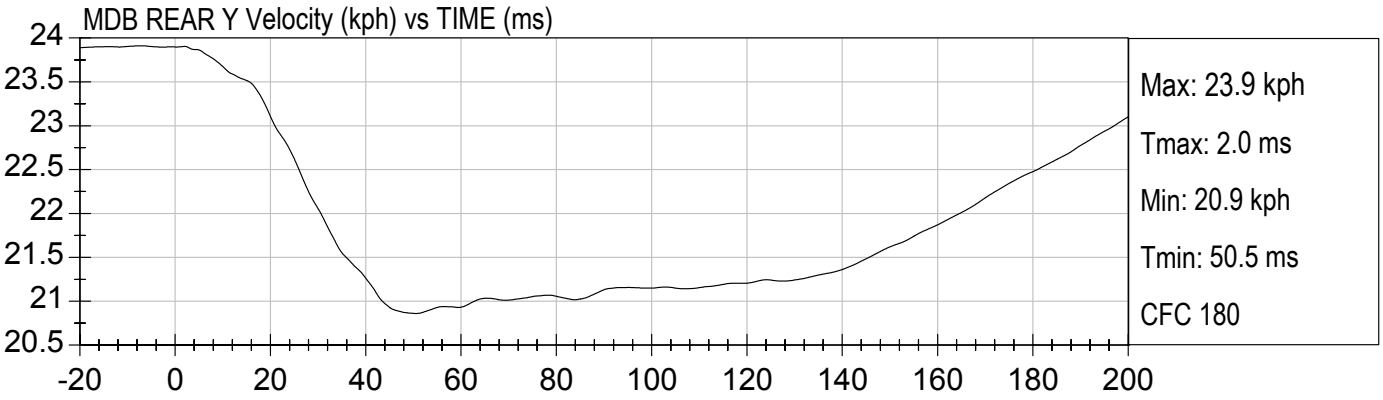


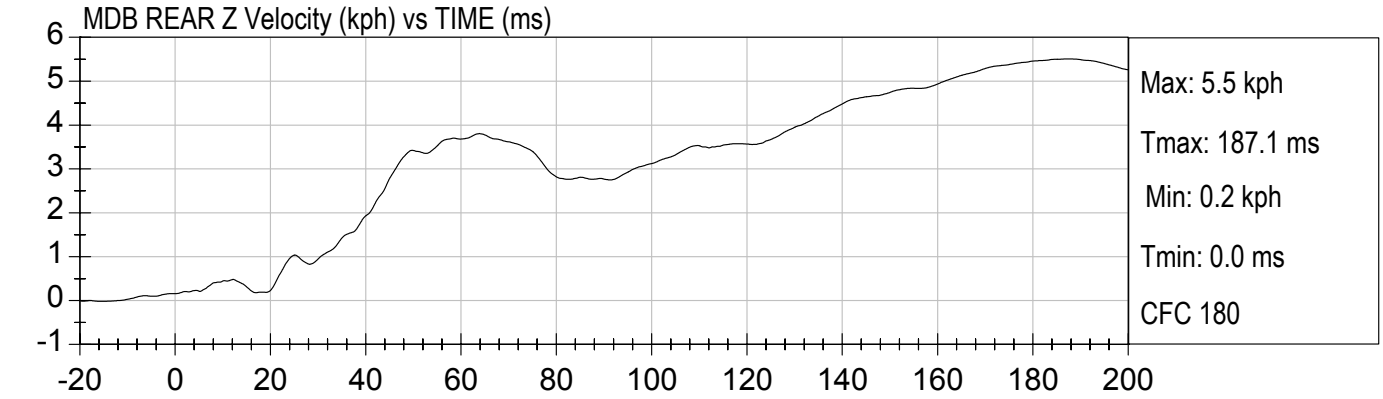






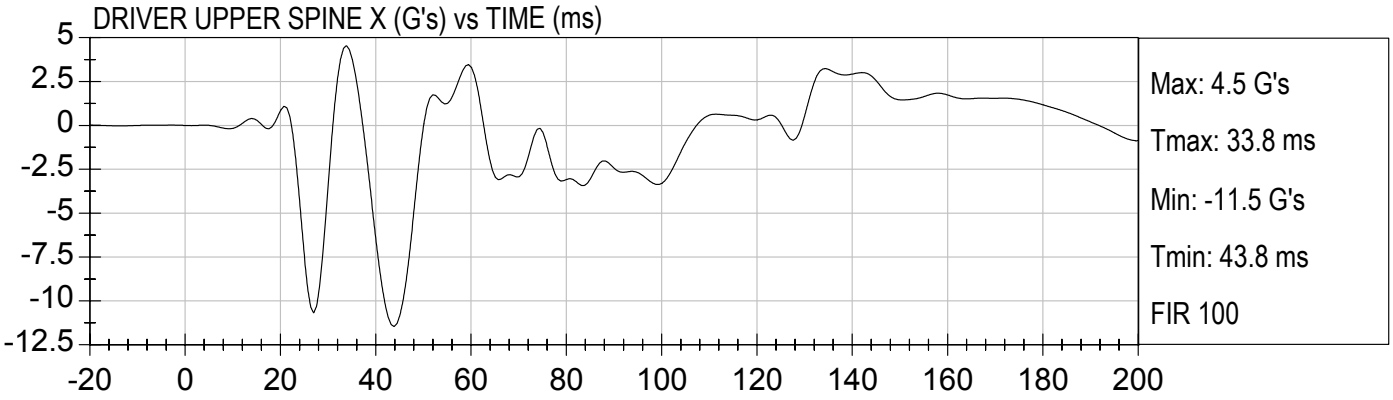

MDB REAR X Velocity (kph) vs TIME (ms)
50
45
40
35
30
25
20
15
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 46.9 kph
Tmax: 0.2 ms
Min: 17.0 kph
Tmin: 77.5 ms
CFC 180

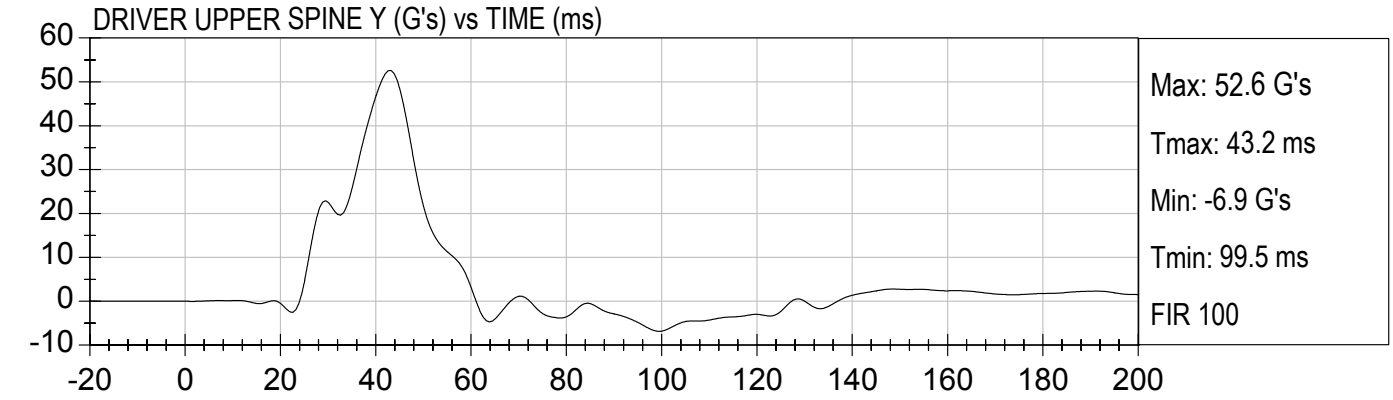

MDB REAR Y Velocity (kph) vs TIME (ms)
24
23.5
23
22.5
22
21.5
21
20.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 23.9 kph
Tmax: 2.0 ms
Min: 20.9 kph
Tmin: 50.5 ms
CFC 180

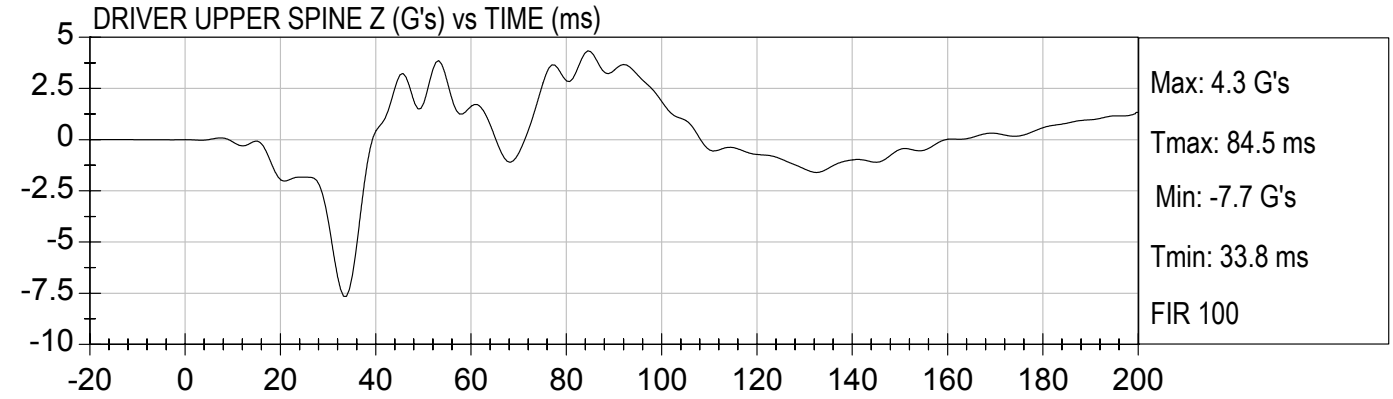

MDB REAR Z Velocity (kph) vs TIME (ms)
6
5
4
3
2
1
0
-1
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 5.5 kph
Tmax: 187.1 ms
Min: 0.2 kph
Tmin: 0.0 ms
CFC 180

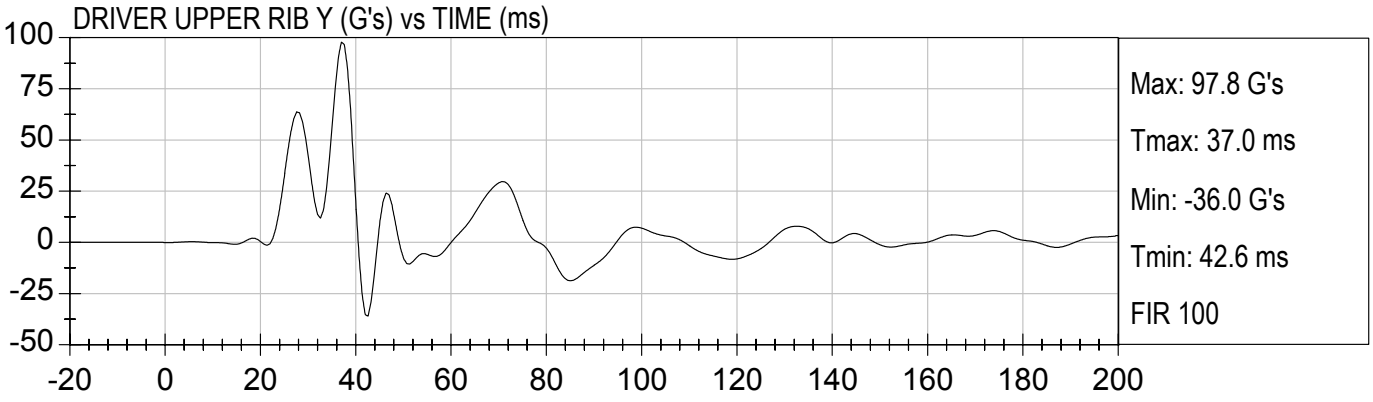
2001 FORD FOCUS
FMVSS 214

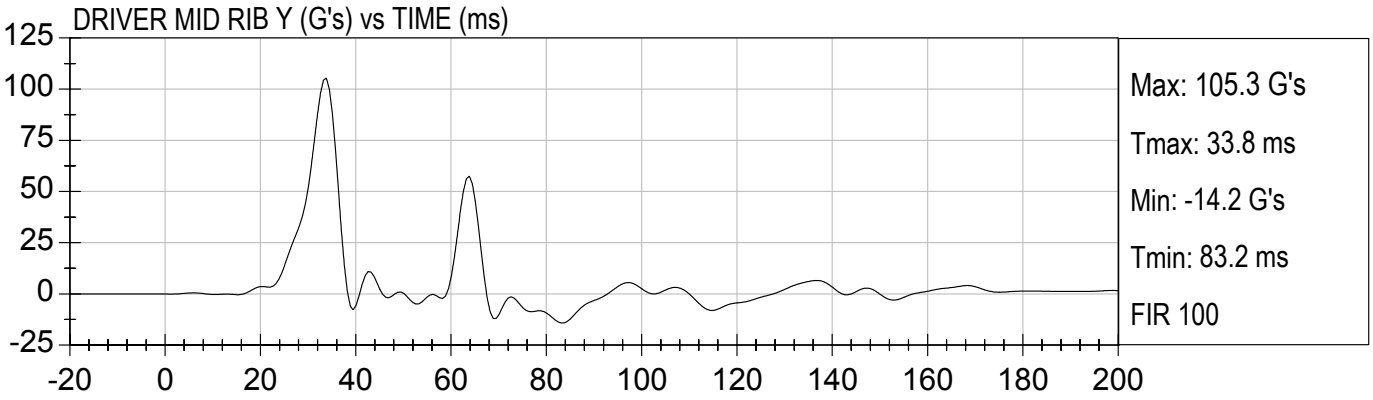
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

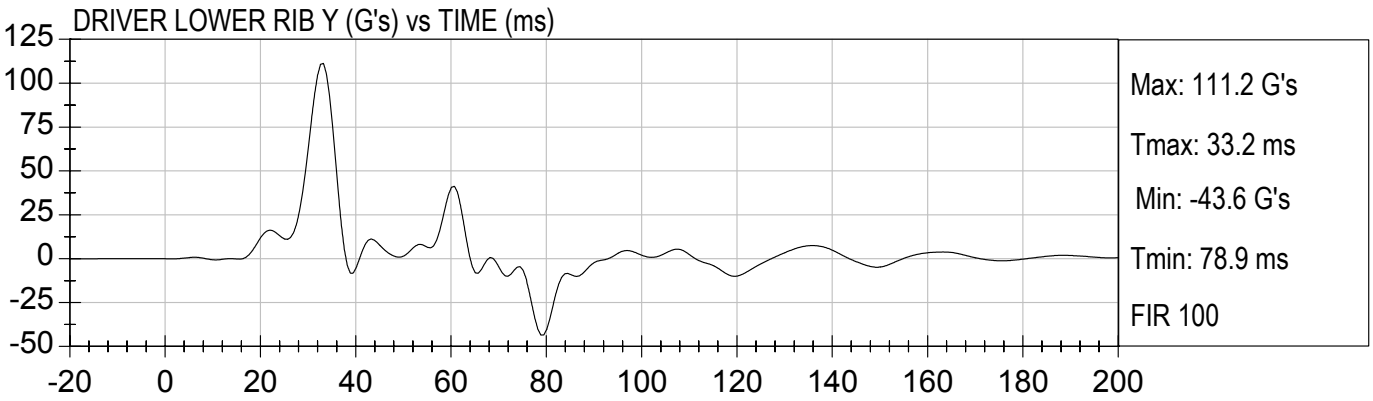






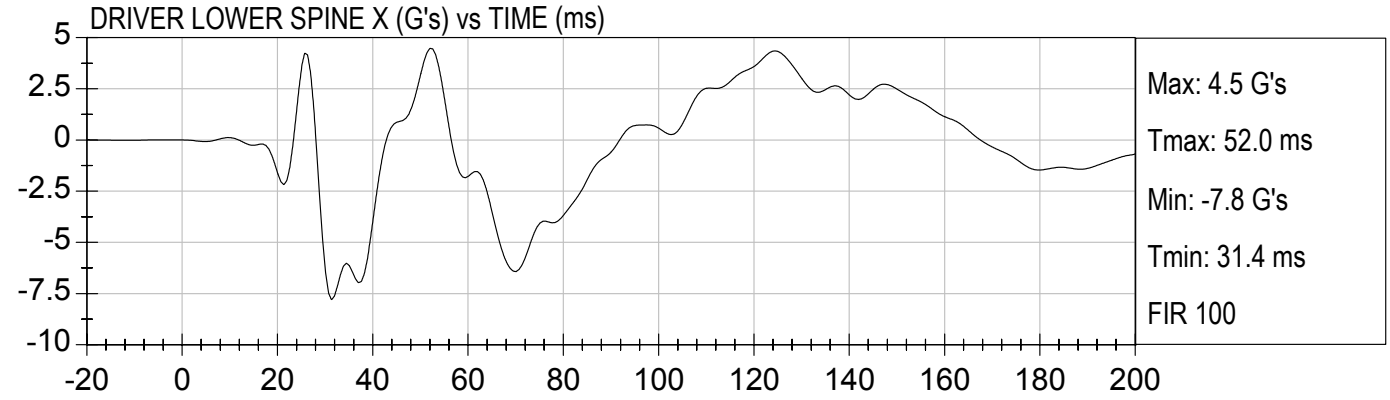

DRIVER UPPER RIB Y (G's) vs TIME (ms)
100
75
50
25
0
-25
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 97.8 G's
Tmax: 37.0 ms
Min: -36.0 G's
Tmin: 42.6 ms
FIR 100

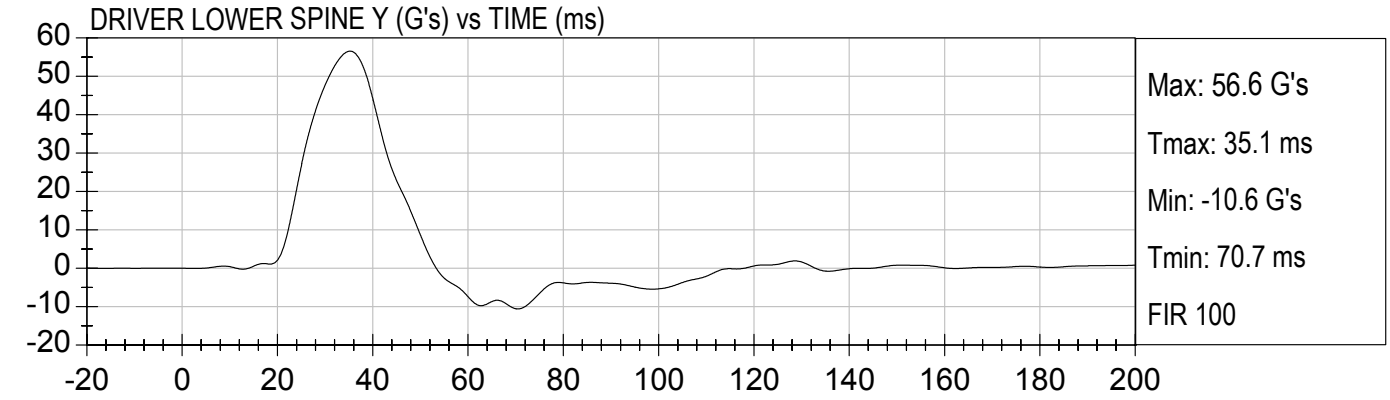

DRIVER MID RIB Y (G's) vs TIME (ms)
125
100
75
50
25
0
-25
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 105.3 G's
Tmax: 33.8 ms
Min: -14.2 G's
Tmin: 83.2 ms
FIR 100

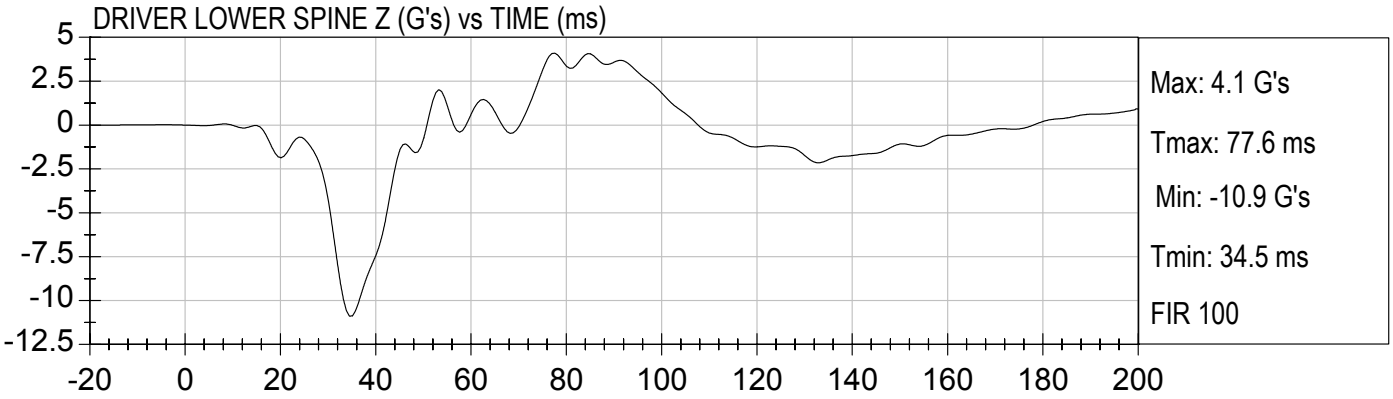

DRIVER LOWER RIB Y (G's) vs TIME (ms)
125
100
75
50
25
0
-25
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 111.2 G's
Tmax: 33.2 ms
Min: -43.6 G's
Tmin: 78.9 ms
FIR 100

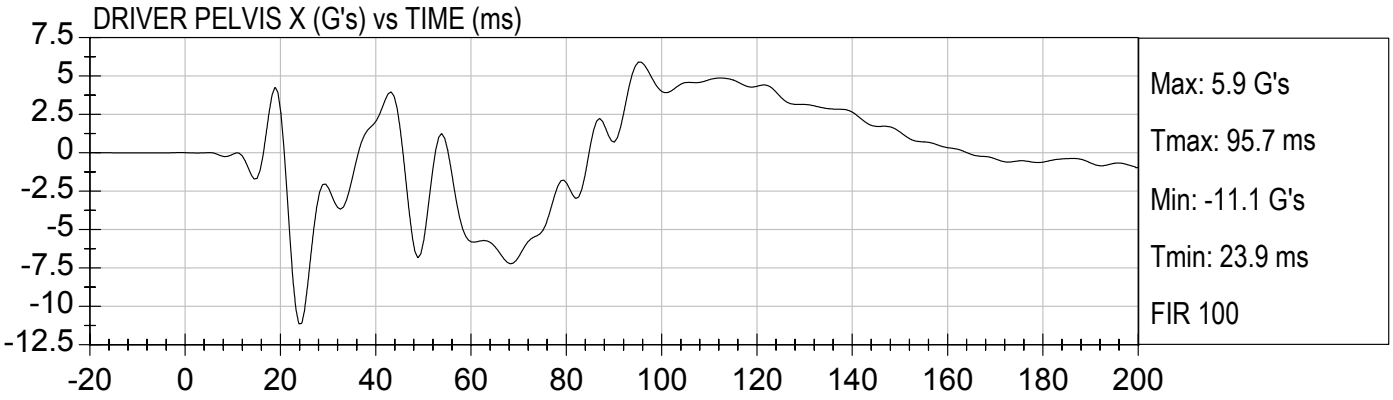
2001 FORD FOCUS
FMVSS 214

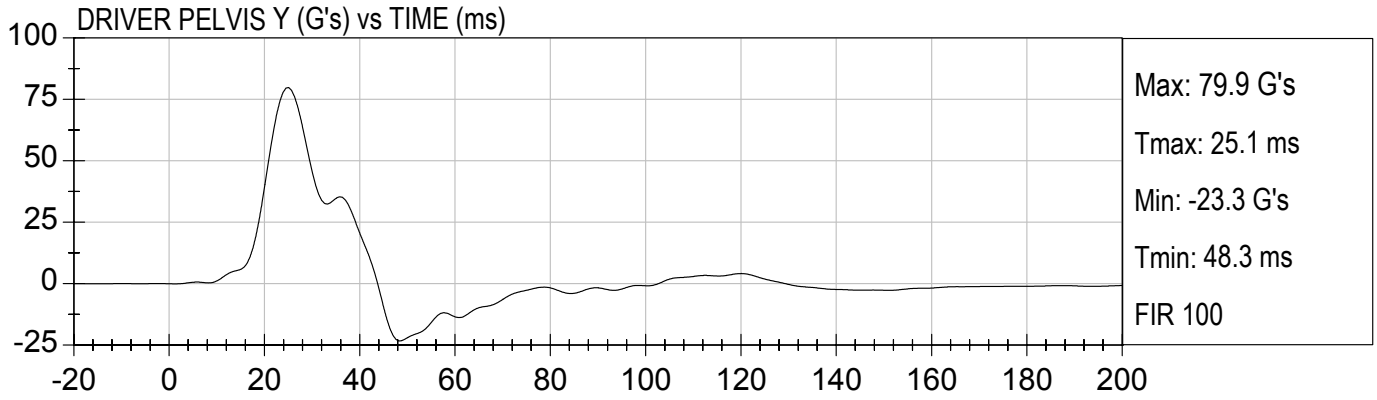
Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)

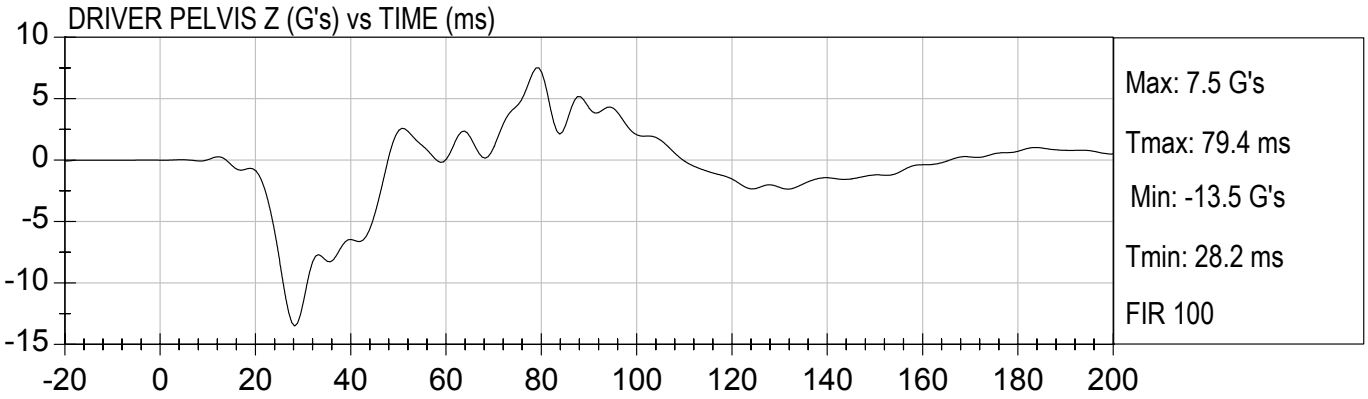


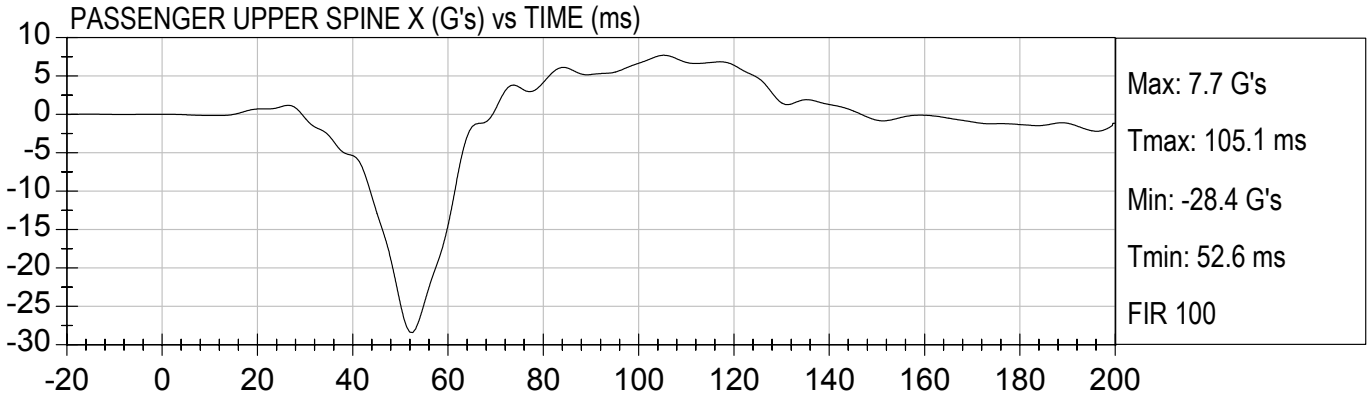


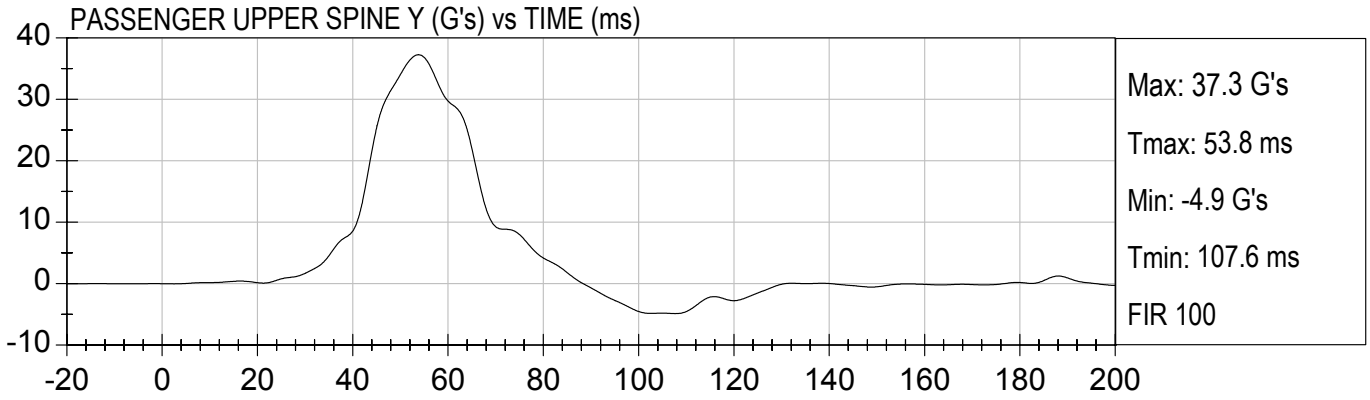


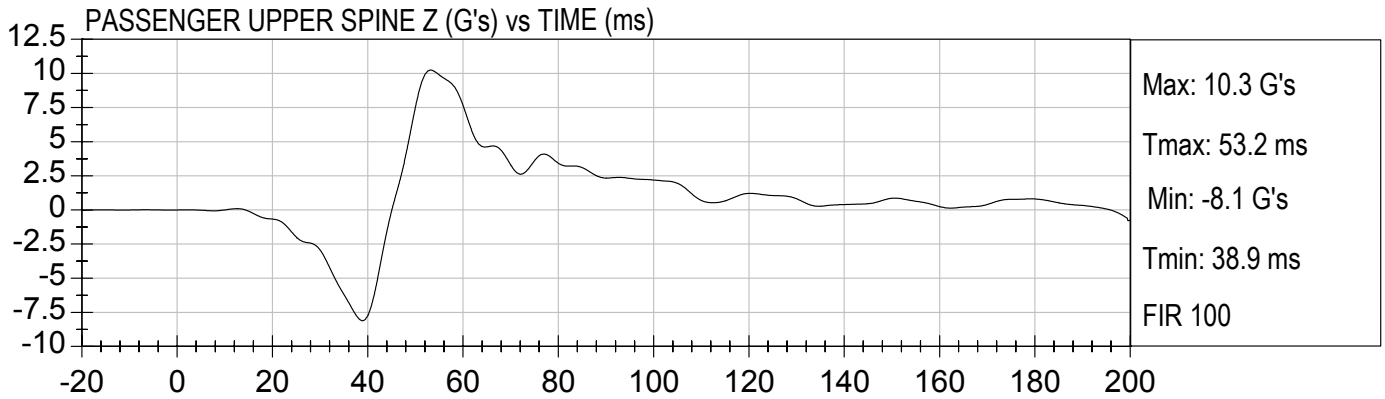

DRIVER PELVIS X (G's) vs TIME (ms)
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 5.9 G's
Tmax: 95.7 ms
Min: -11.1 G's
Tmin: 23.9 ms
FIR 100

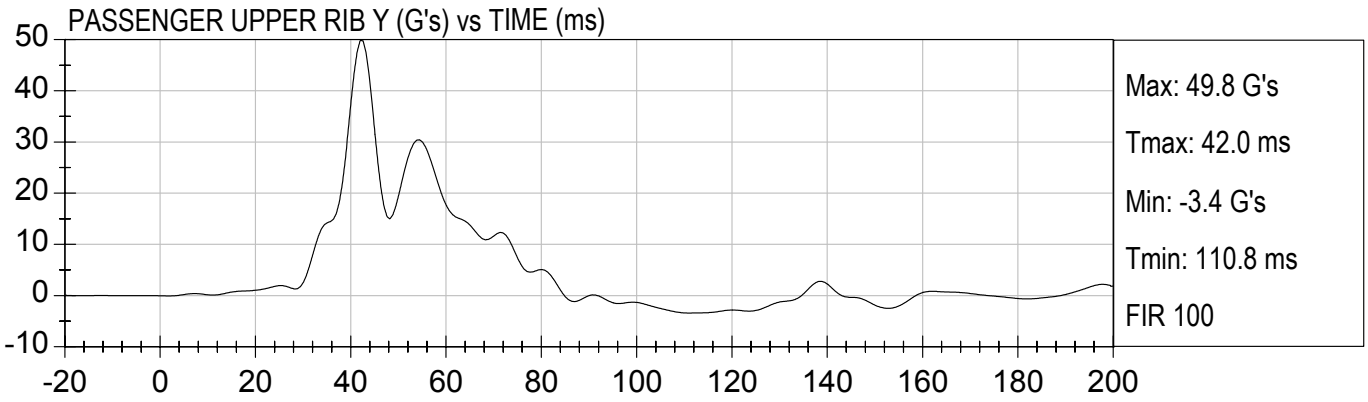

DRIVER PELVIS Y (G's) vs TIME (ms)
100
75
50
25
0
-25
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 79.9 G's
Tmax: 25.1 ms
Min: -23.3 G's
Tmin: 48.3 ms
FIR 100

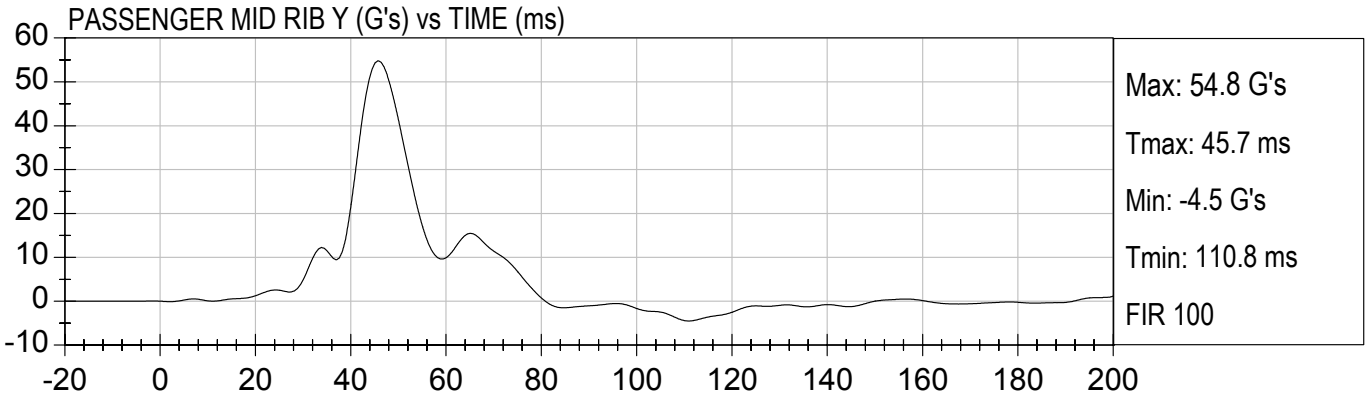

DRIVER PELVIS Z (G's) vs TIME (ms)
10
5
0
-5
-10
-15
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 7.5 G's
Tmax: 79.4 ms
Min: -13.5 G's
Tmin: 28.2 ms
FIR 100

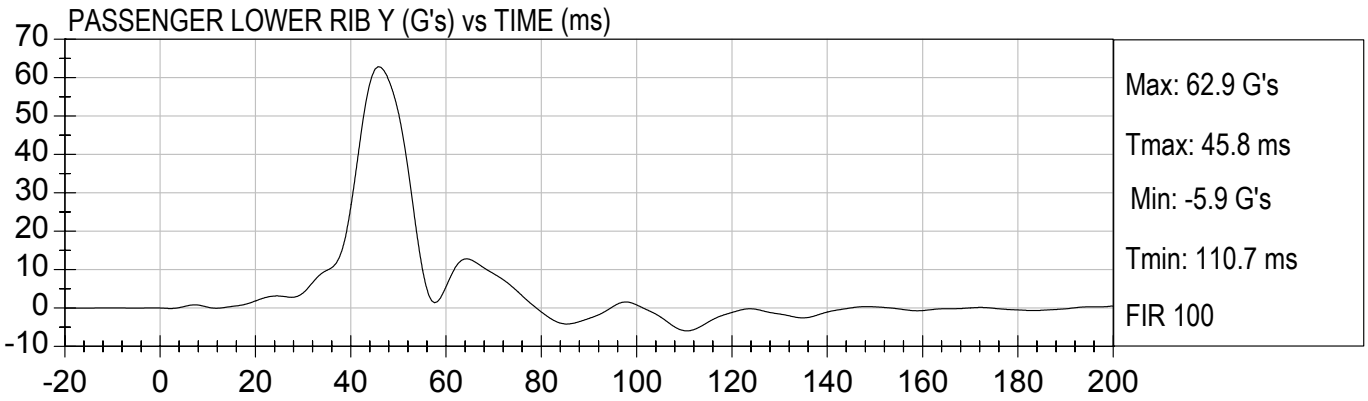

PASSENGER UPPER SPINE X (G's) vs TIME (ms)
10
5
0
-5
-10
-15
-20
-25
-30
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 7.7 G's
Tmax: 105.1 ms
Min: -28.4 G's
Tmin: 52.6 ms
FIR 100

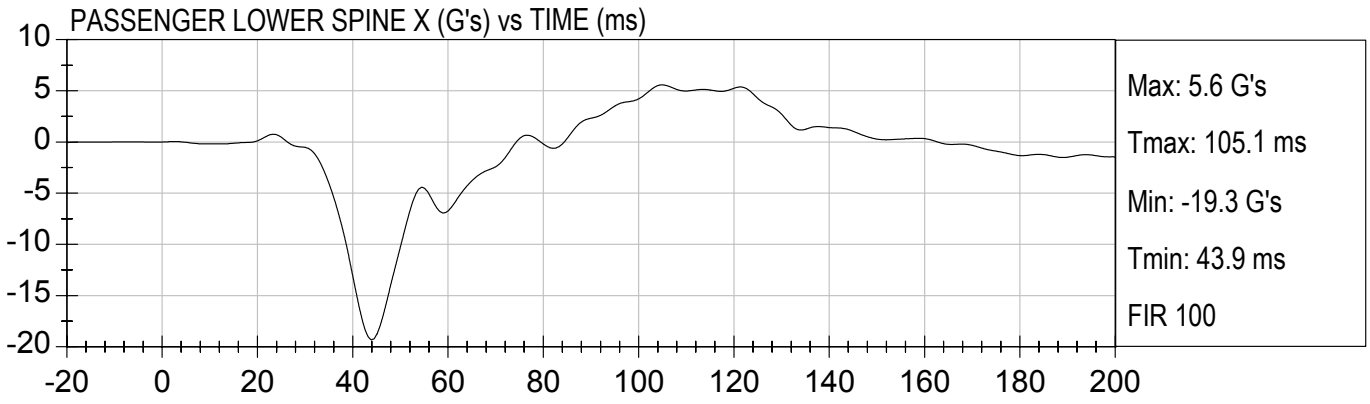

PASSENGER UPPER SPINE Y (G's) vs TIME (ms)
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 37.3 G's
Tmax: 53.8 ms
Min: -4.9 G's
Tmin: 107.6 ms
FIR 100

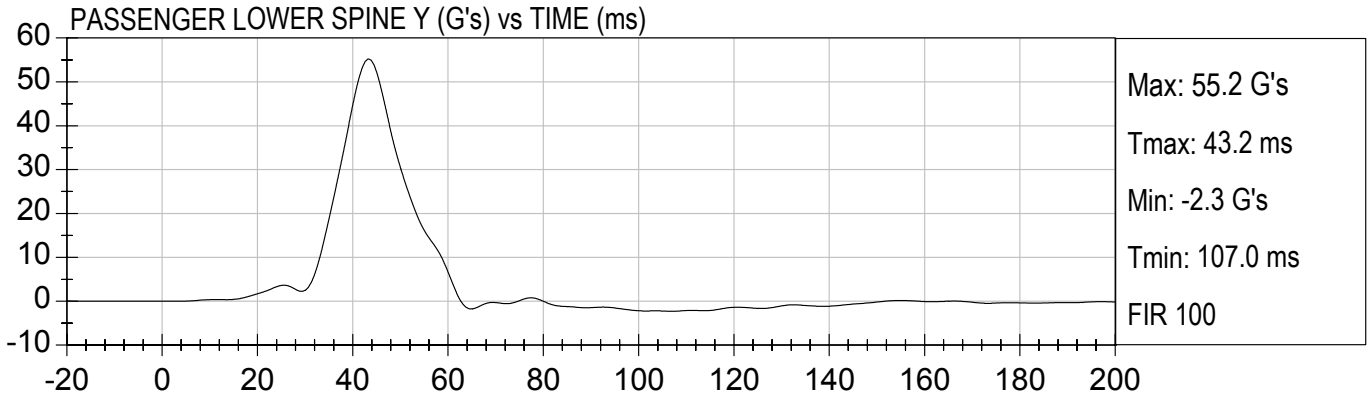

PASSENGER UPPER SPINE Z (G's) vs TIME (ms)
12.5
10
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 10.3 G's
Tmax: 53.2 ms
Min: -8.1 G's
Tmin: 38.9 ms
FIR 100

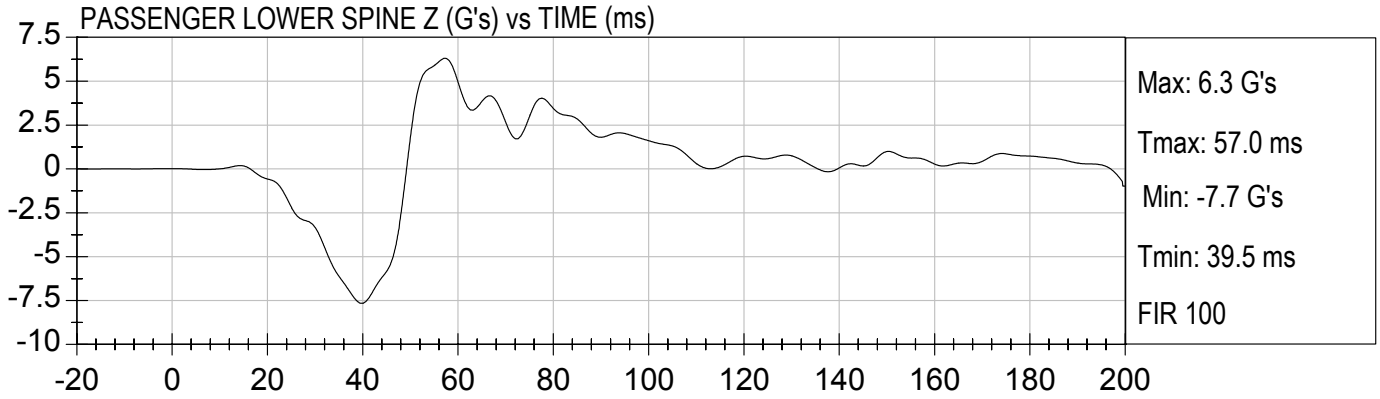

PASSENGER UPPER RIB Y (G's) vs TIME (ms)
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 49.8 G's
Tmax: 42.0 ms
Min: -3.4 G's
Tmin: 110.8 ms
FIR 100

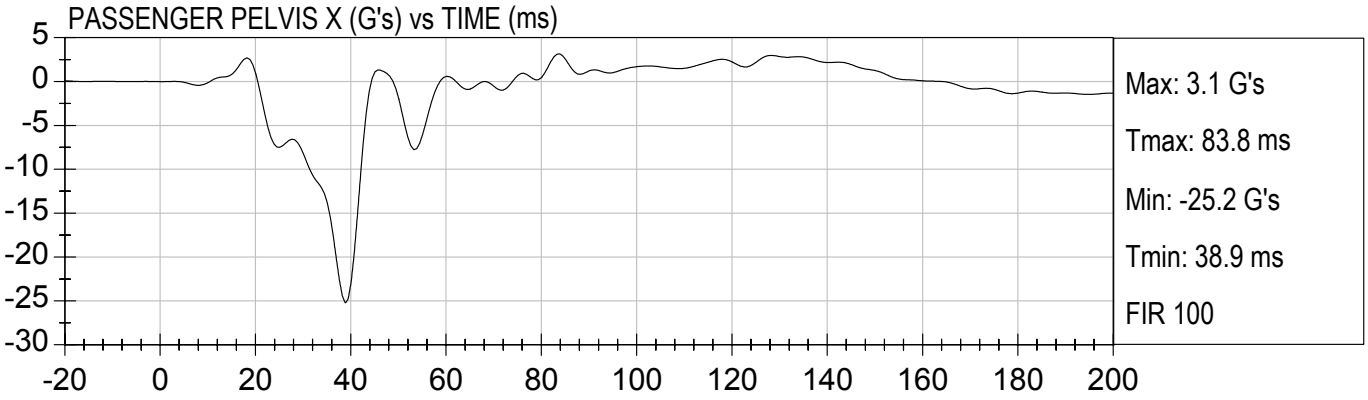

PASSENGER MID RIB Y (G's) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 54.8 G's
Tmax: 45.7 ms
Min: -4.5 G's
Tmin: 110.8 ms
FIR 100

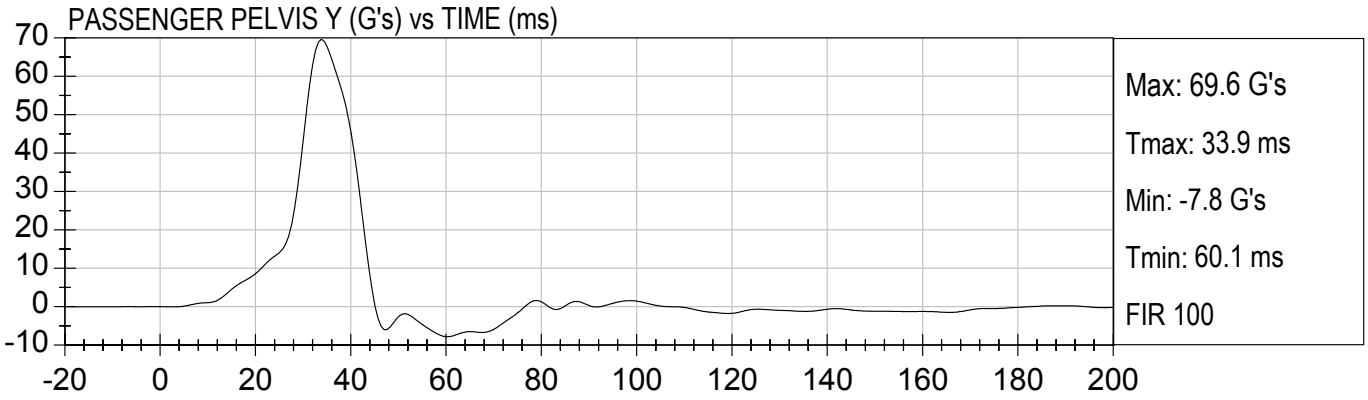

PASSENGER LOWER RIB Y (G's) vs TIME (ms)
70
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 62.9 G's
Tmax: 45.8 ms
Min: -5.9 G's
Tmin: 110.7 ms
FIR 100

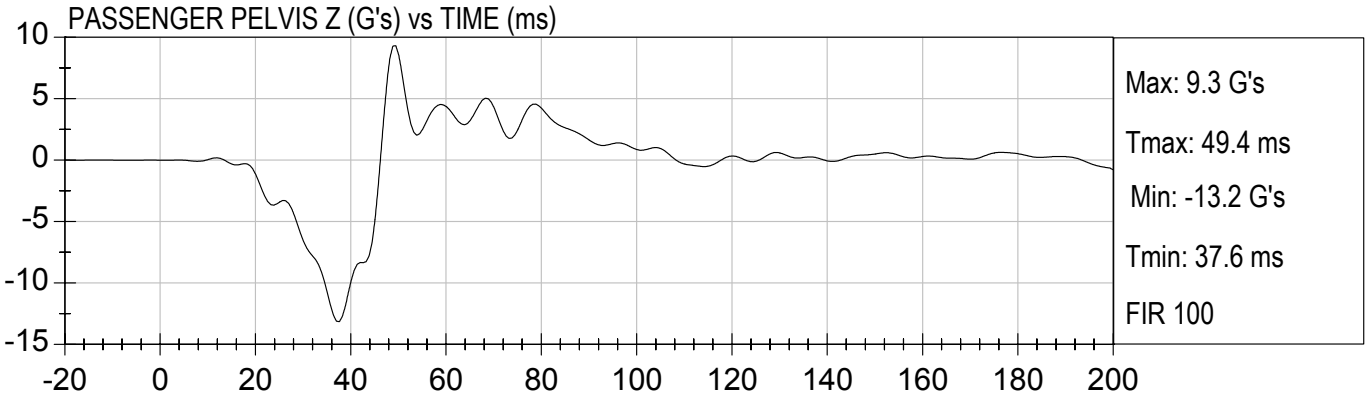

PASSENGER LOWER SPINE X (G's) vs TIME (ms)
10
5
0
-5
-10
-15
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 5.6 G's
Tmax: 105.1 ms
Min: -19.3 G's
Tmin: 43.9 ms
FIR 100


PASSENGER LOWER SPINE Y (G's) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 55.2 G's
Tmax: 43.2 ms
Min: -2.3 G's
Tmin: 107.0 ms
FIR 100


PASSENGER LOWER SPINE Z (G's) vs TIME (ms)
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 6.3 G's
Tmax: 57.0 ms
Min: -7.7 G's
Tmin: 39.5 ms
FIR 100

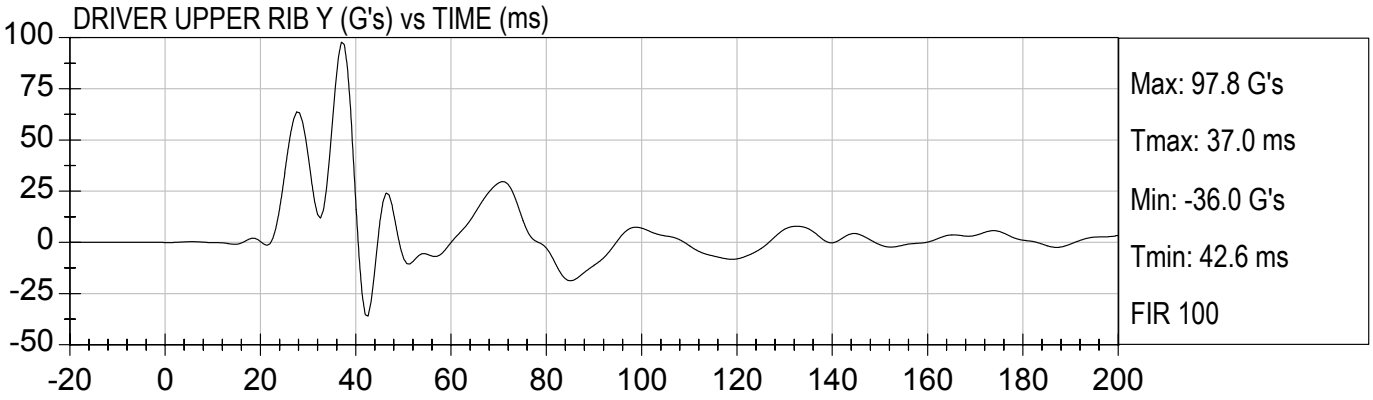

PASSENGER PELVIS X (G's) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 3.1 G's
Tmax: 83.8 ms
Min: -25.2 G's
Tmin: 38.9 ms
FIR 100

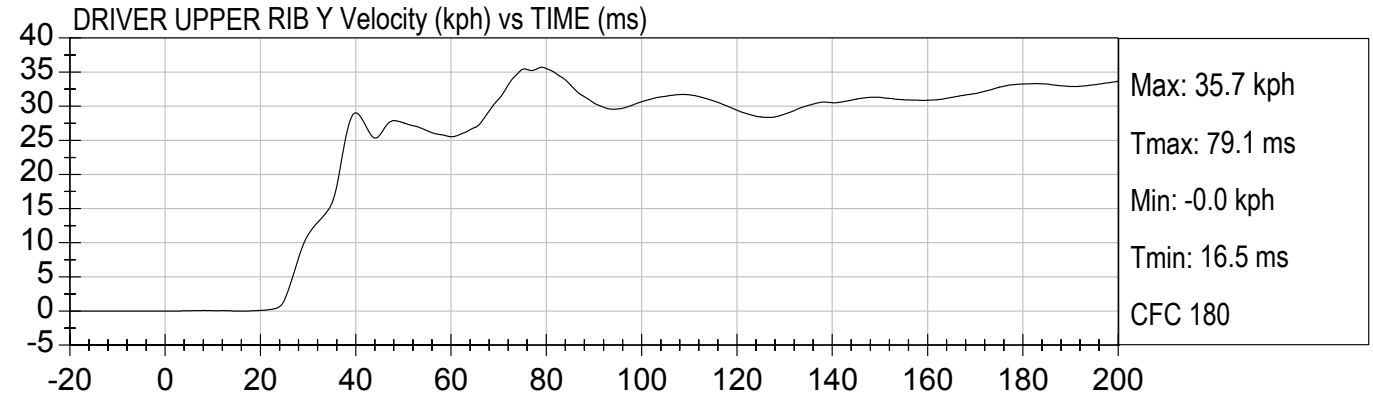

PASSENGER PELVIS Y (G's) vs TIME (ms)
70
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 69.6 G's
Tmax: 33.9 ms
Min: -7.8 G's
Tmin: 60.1 ms
FIR 100

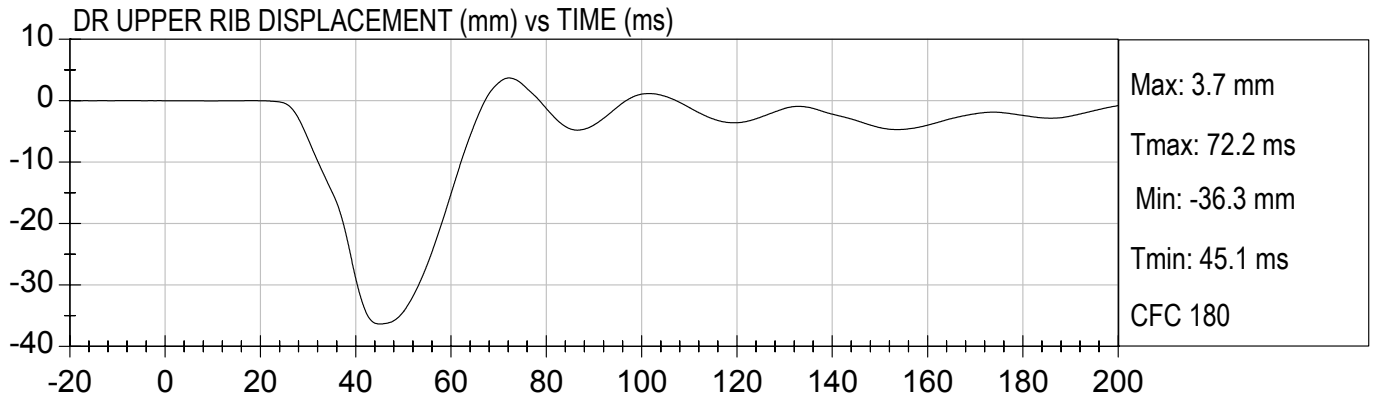

PASSENGER PELVIS Z (G's) vs TIME (ms)
10
5
0
-5
-10
-15
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 9.3 G's
Tmax: 49.4 ms
Min: -13.2 G's
Tmin: 37.6 ms
FIR 100

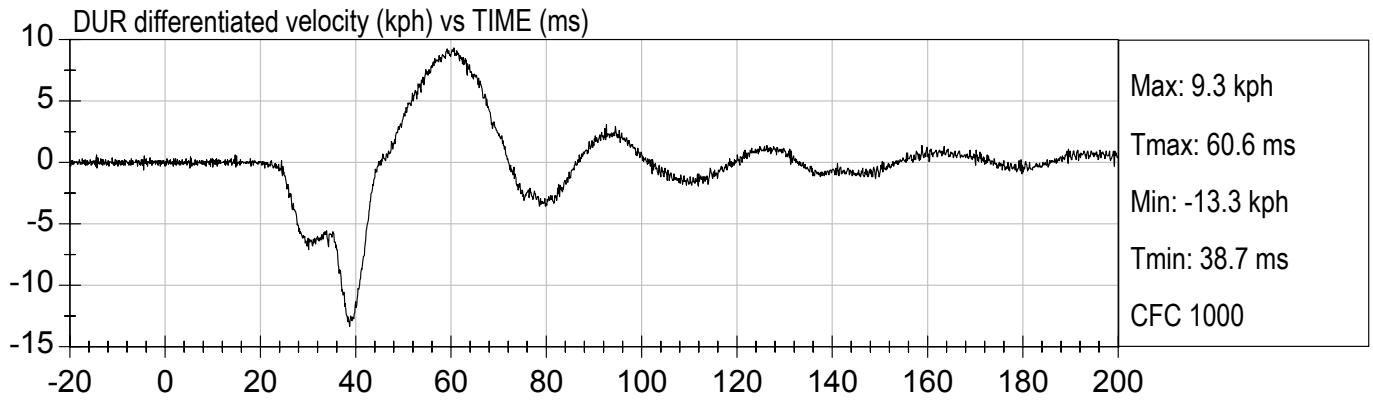
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



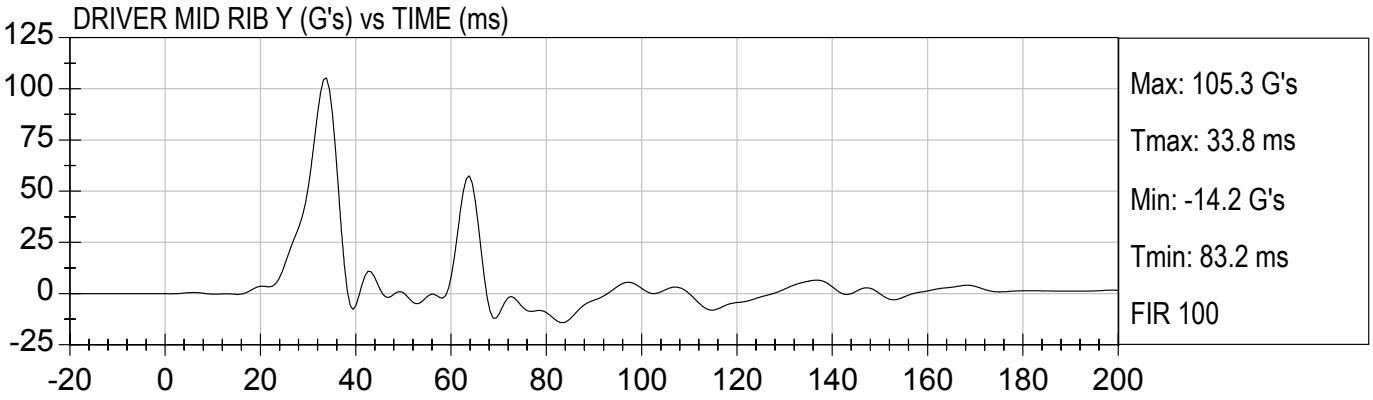


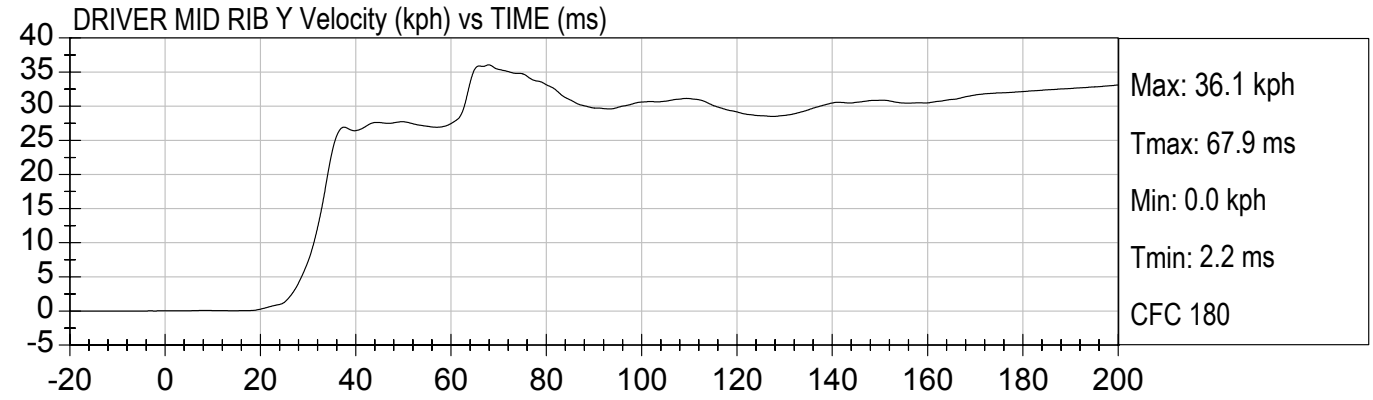


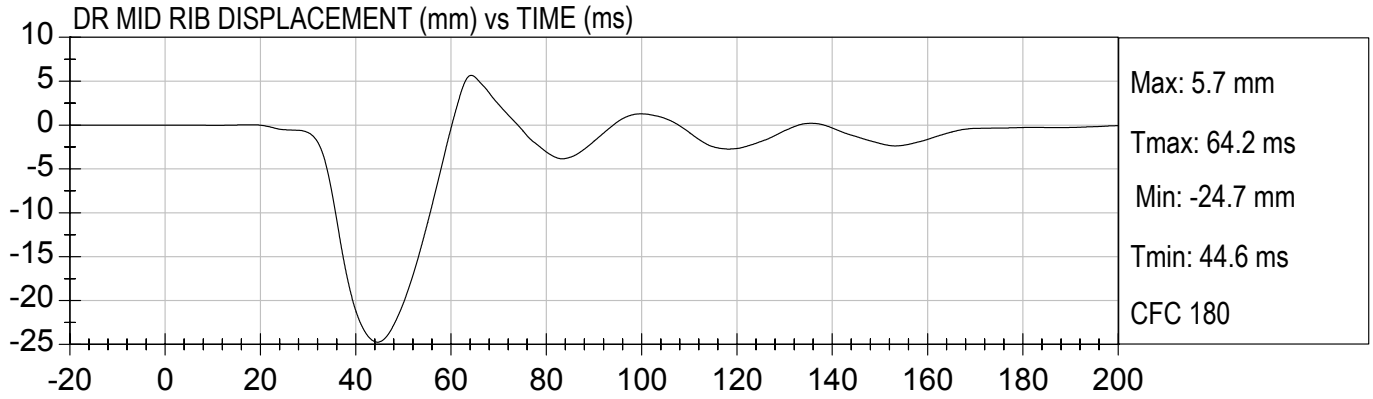


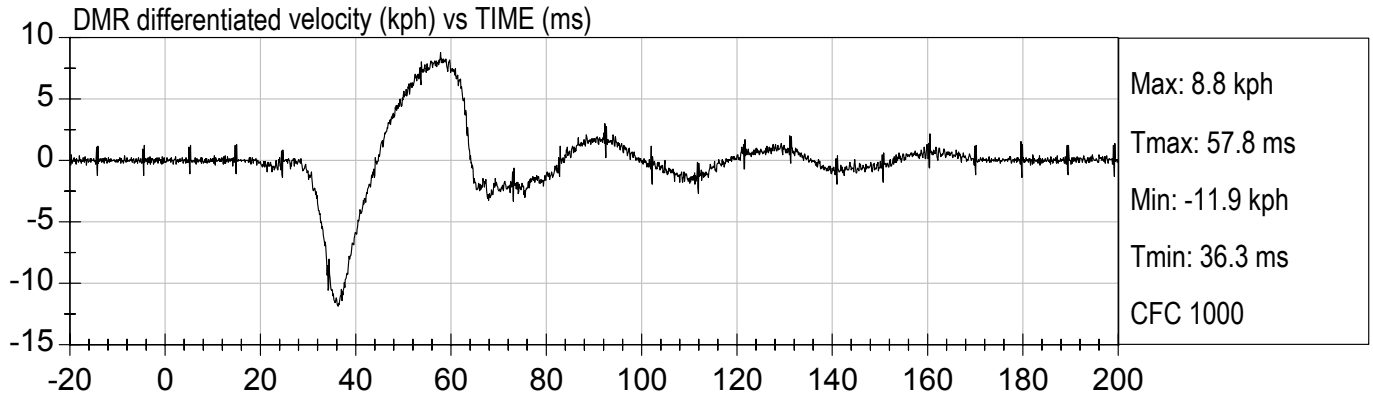
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



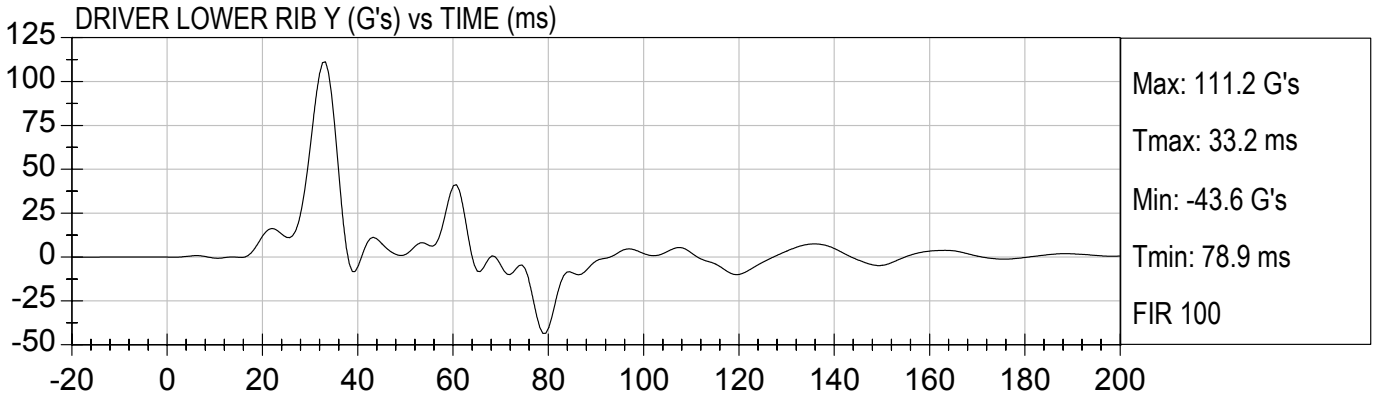


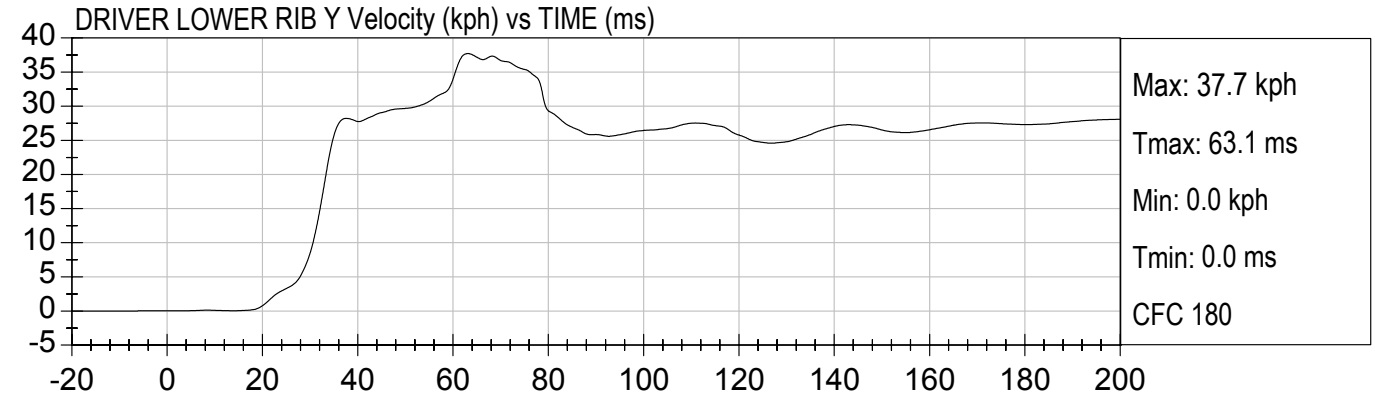


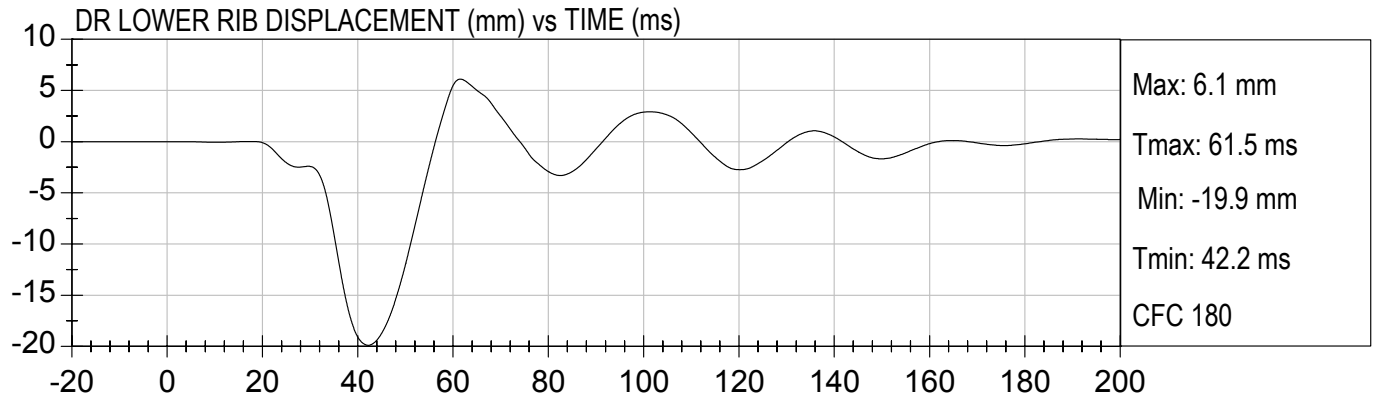


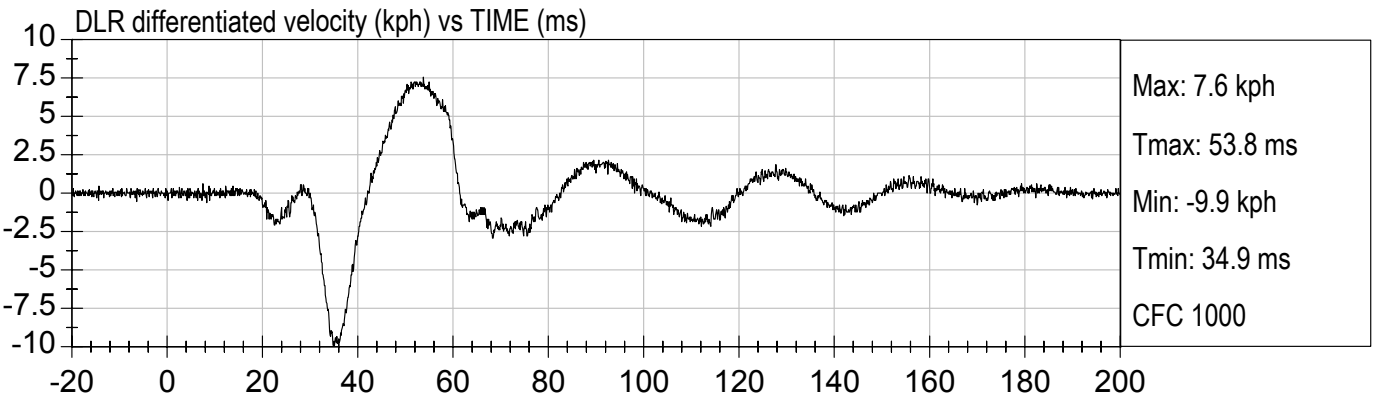
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



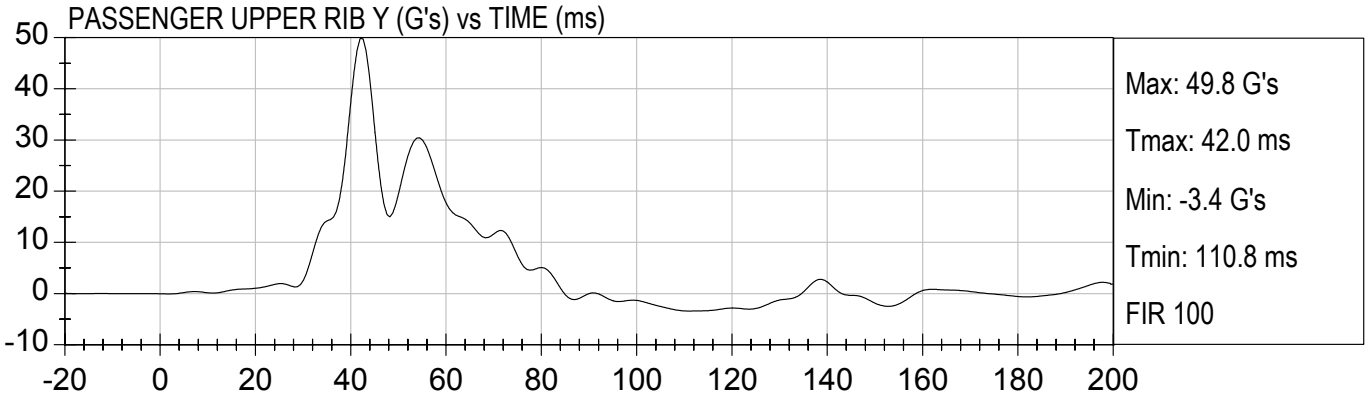


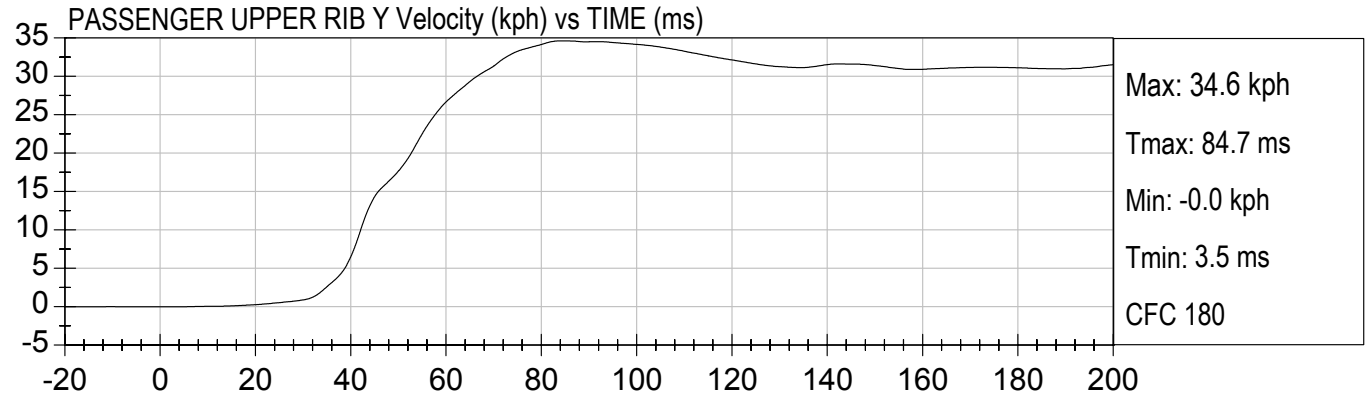


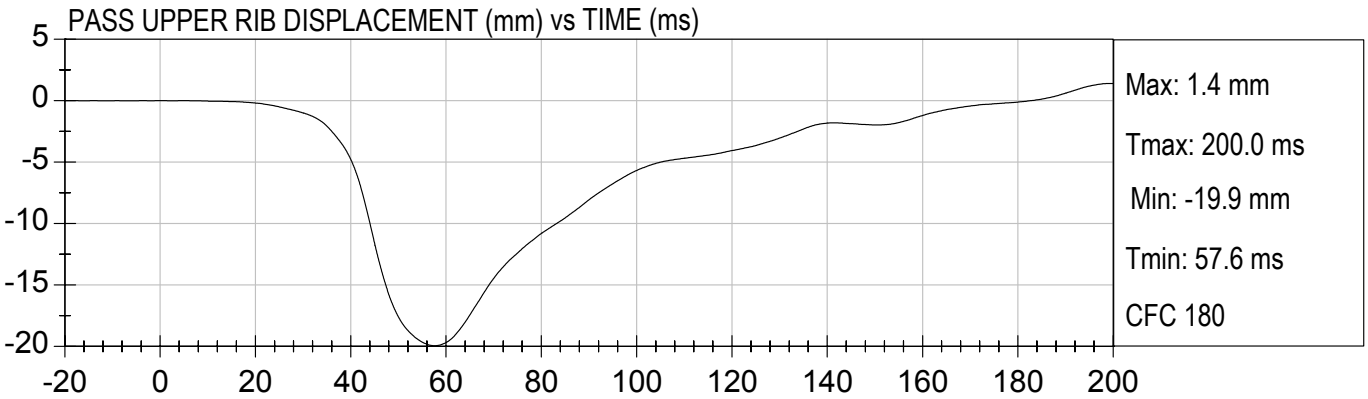


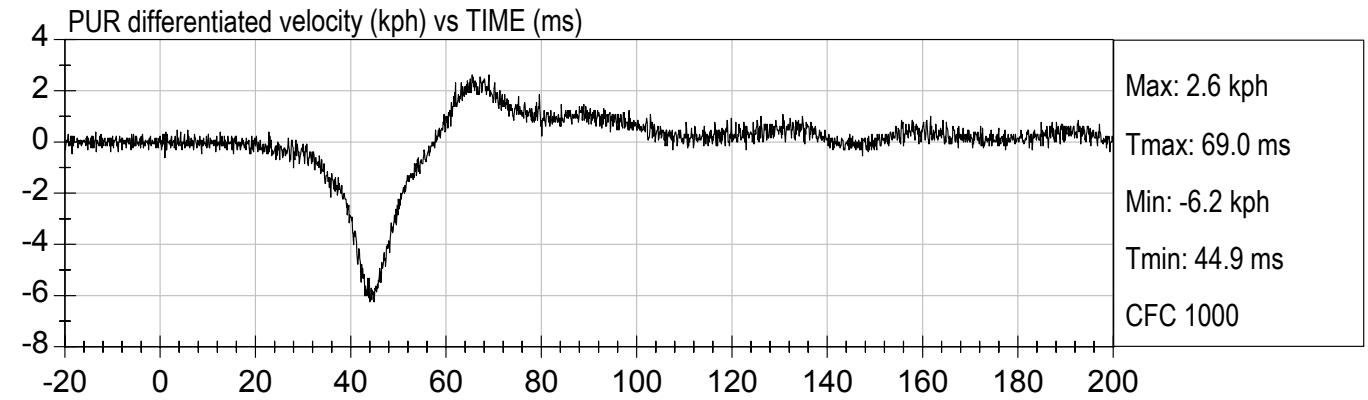
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



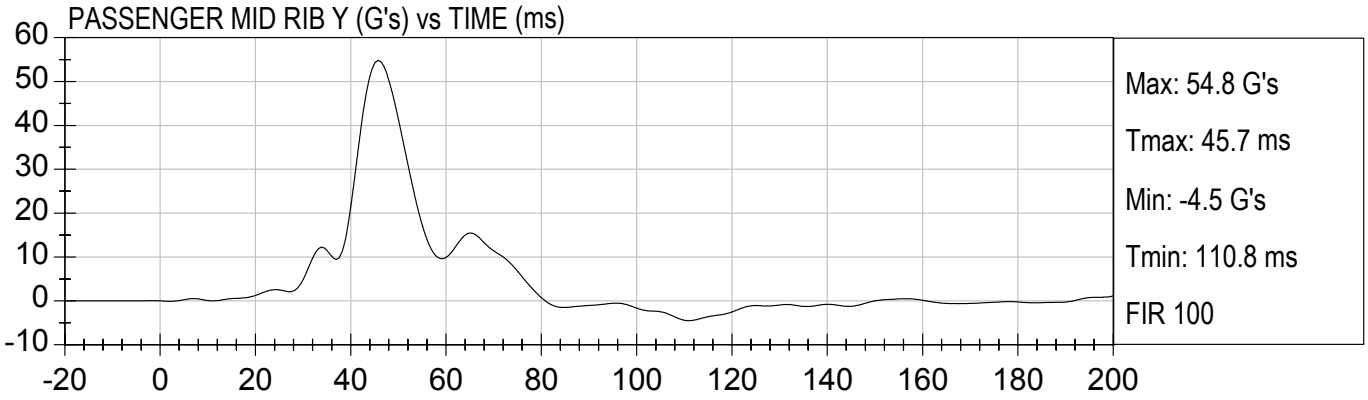


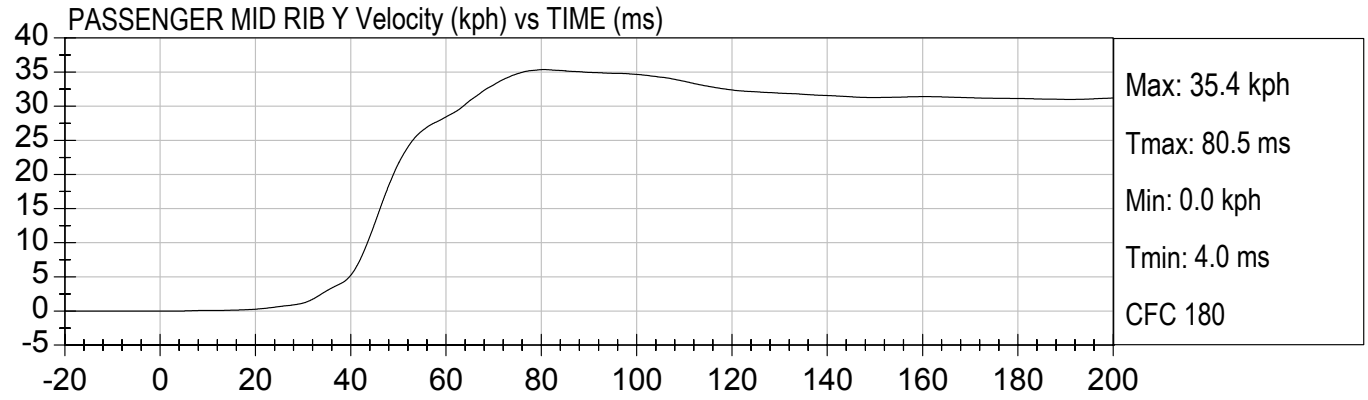


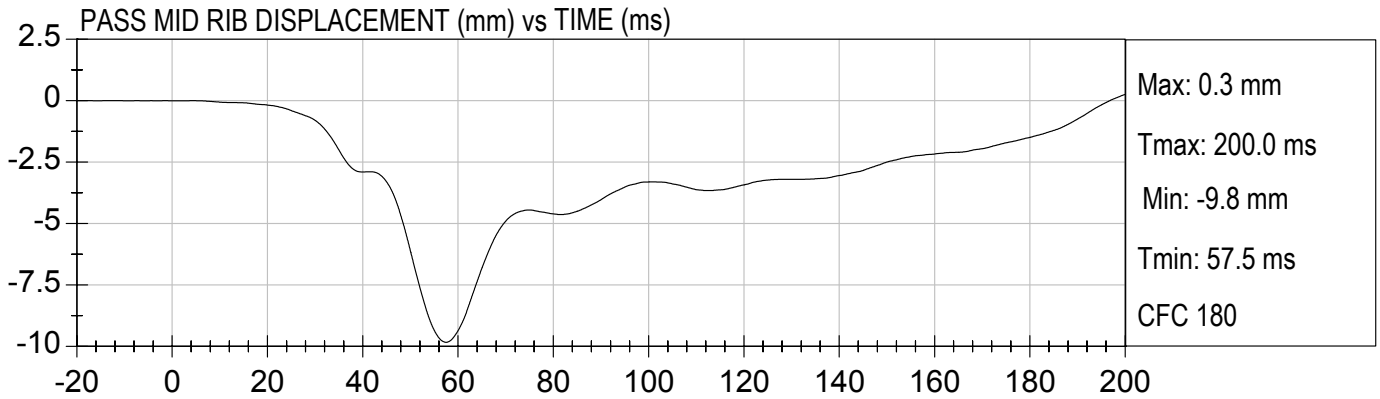


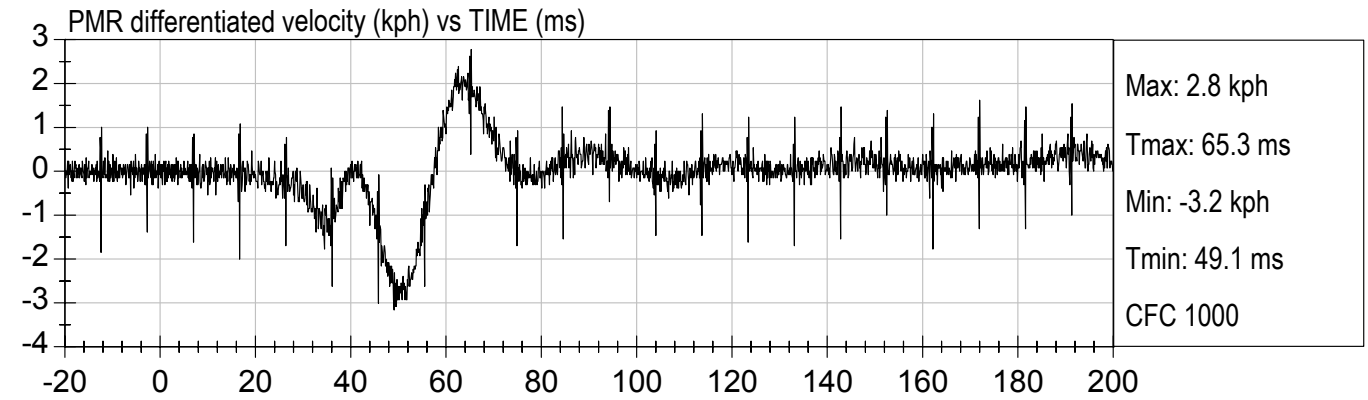
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)



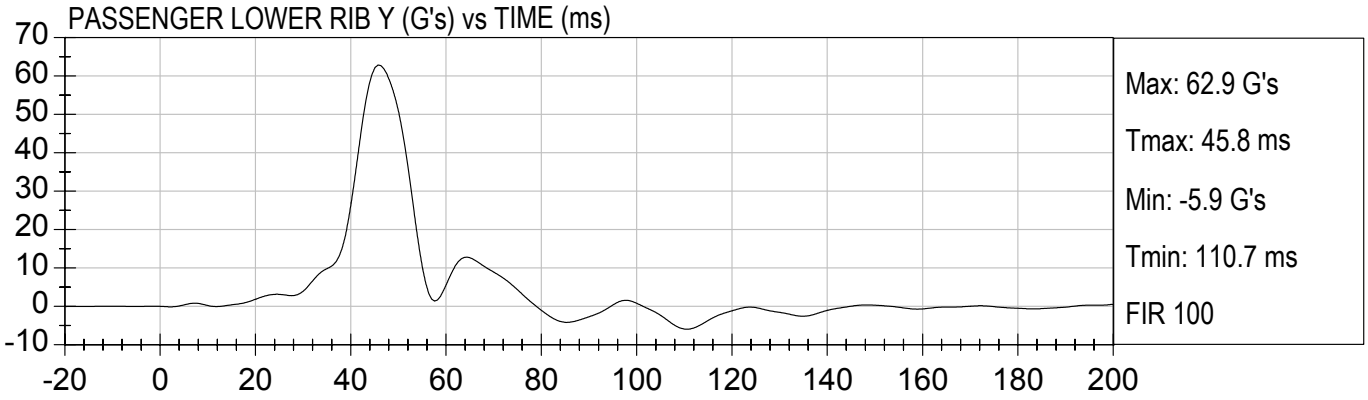


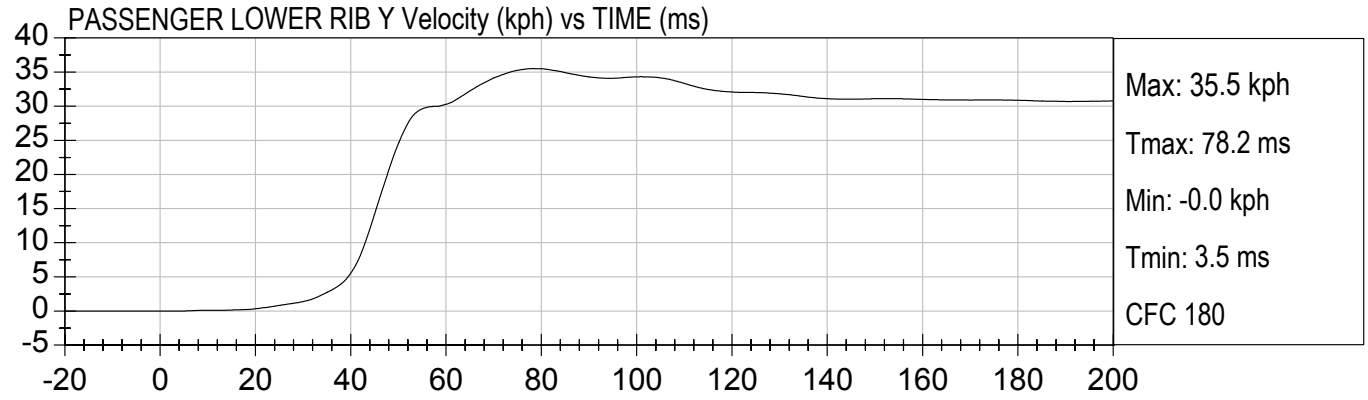


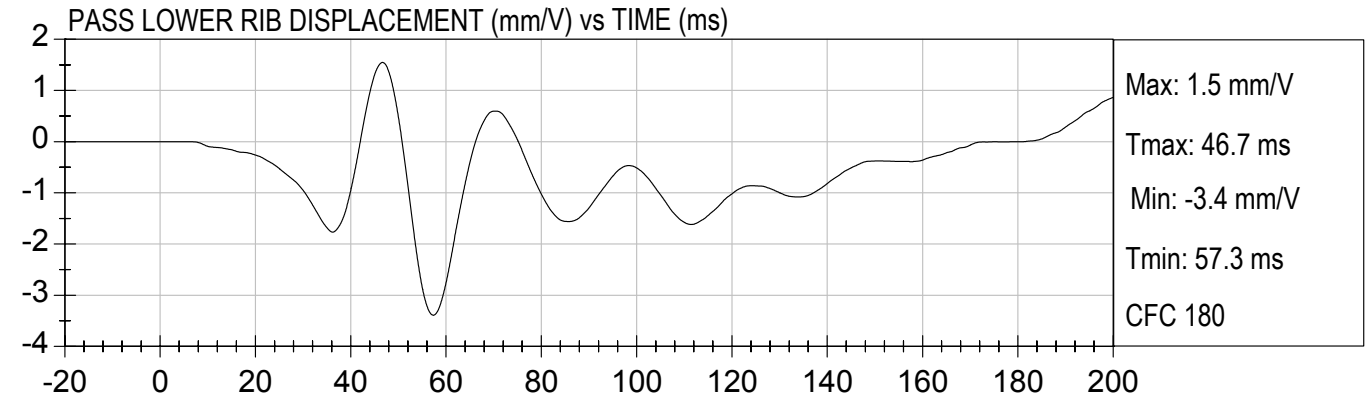


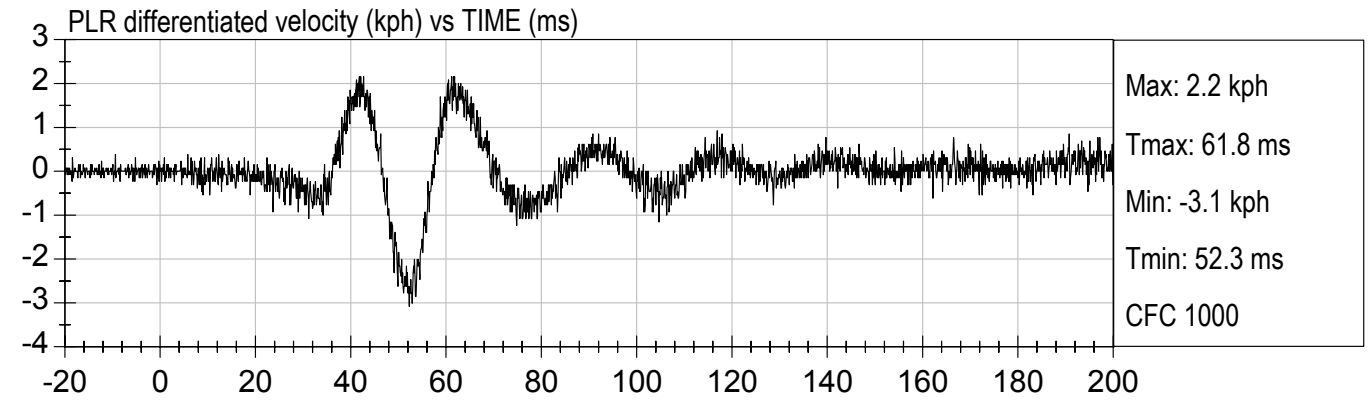
2001 FORD FOCUS
FMVSS 214

Test Date: 03/06/03
Speed: 32.7 mph (52.6 km/h)









APPENDIX C

ES-2 CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CERTIFICATION DATA

Dummy Serial Number: 009

Calibration Test Results Summary

Dummy Serial Number: 009

Pre-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Rib Tests:	All ribs passed all impact test requirements.
Abdomen Test:	The abdomen passed all impact test requirements.
Lumbar Spine Test:	The lumbar spine passed all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

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HEAD DROP TEST

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 009

Test Number: D03241

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.6
Relative Humidity (%)	10 – 70	21
Peak Resultant Acceleration	100 – 150 g's	129
Time of Max. Res. Acceleration	msec	25.5

TEST MEETS SPECIFICATIONS

Technician: _____

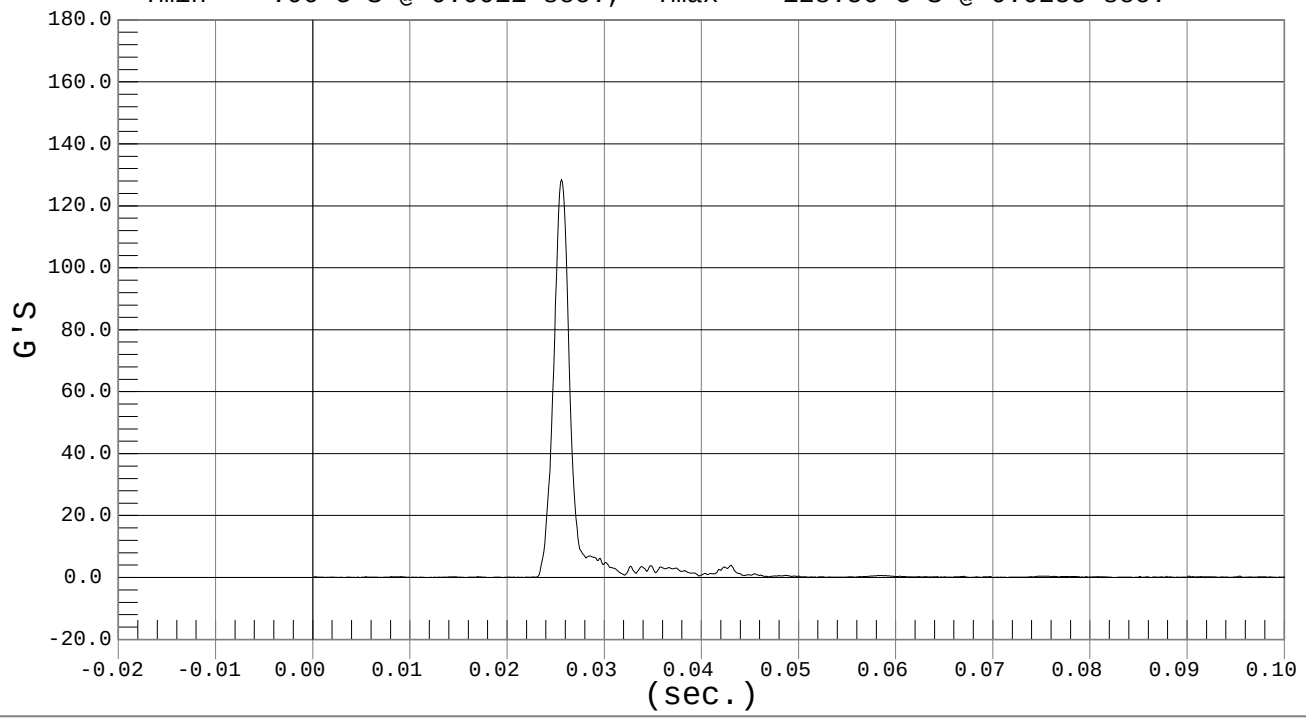
Approved By: _____

PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #009

Test Date: 03-04-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .06 G'S @ 0.0011 sec., Ymax = 128.56 G'S @ 0.0255 sec.



MGA RESEARCH CORPORATION

NECK PENDULUM TEST

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 009

Test Number: D03242

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	20.7
Relative Humidity (%)		10 – 70	23
Pendulum Speed		3.3 - 3.5	3.3
Pendulum Deceleration	3 msec	¯.25 - ¯.53 m/sec	-.35
	8 msec	¯1.59 - ¯2.04 m/sec	-1.75
	14 msec	¯3.20 - ¯3.85 m/sec	-3.42
Maximum Flexion Angle		49.0 – 59.0 deg	58.1
Time of Max. Flexion Angle		54.0 – 66.0 ms	57.7
Maximum Angle Theta (A)		32.0 – 37.0 deg	35.9
Time of Max. Theta (A)		53.0 – 63.0 ms	54.3
Maximum Angle Theta (B)		30.83 – 33.33 deg	32.88
Time of Max. Theta (B)		54.0 – 64.0 ms	59.3

TEST MEETS SPECIFICATIONS

Technician: _____

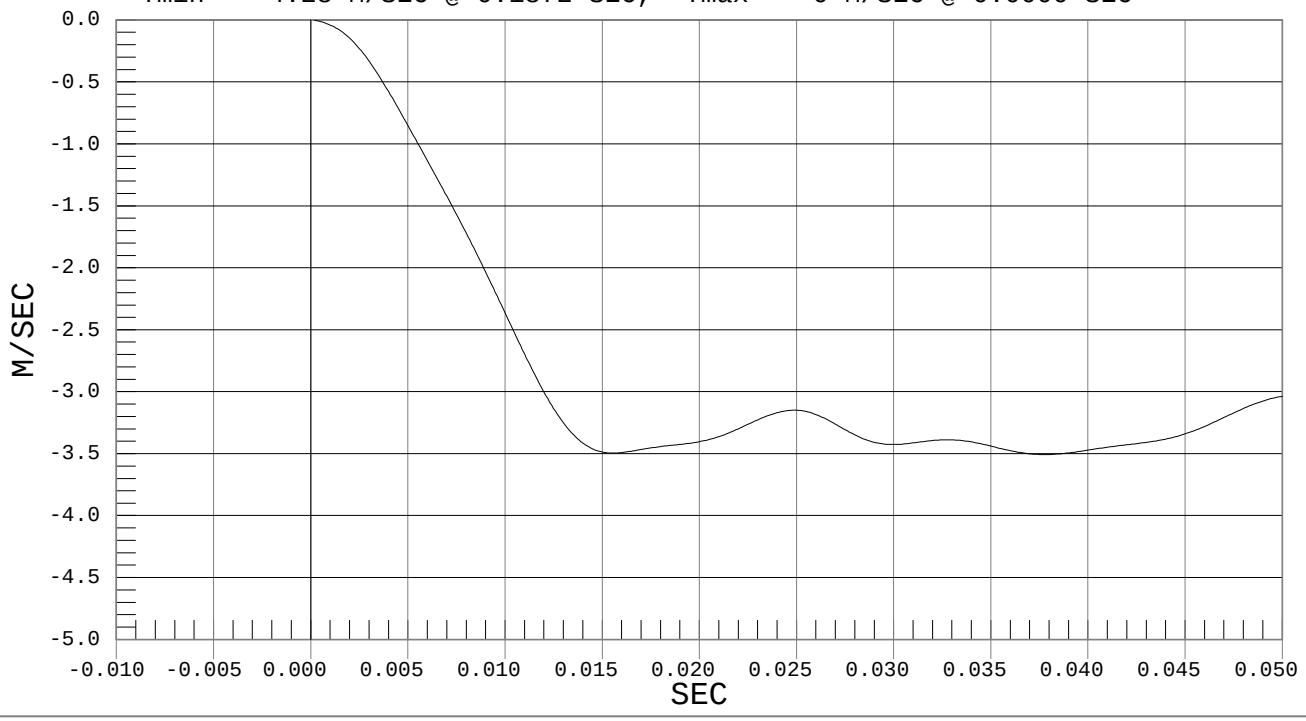
Approved By: _____

PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #009

Test Date: 03-04-03
Speed: 11.0 fps, 3.34 M/s

Ymin = -4.28 M/SEC @ 0.1872 SEC, Ymax = 0 M/SEC @ 0.0000 SEC

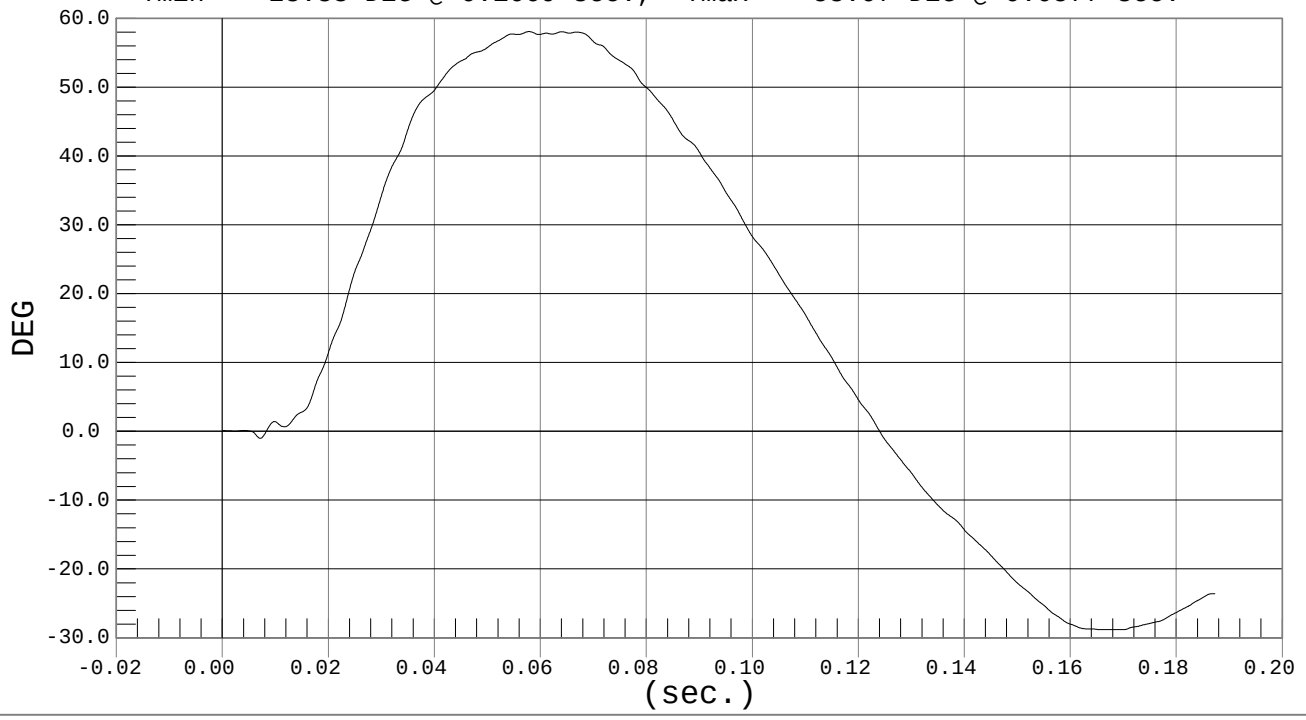


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #009

Test Date: 03-04-03
Speed: 11.0 fps, 3.34 M/s

Ymin = -28.83 DEG @ 0.1669 sec., Ymax = 58.07 DEG @ 0.0577 sec.

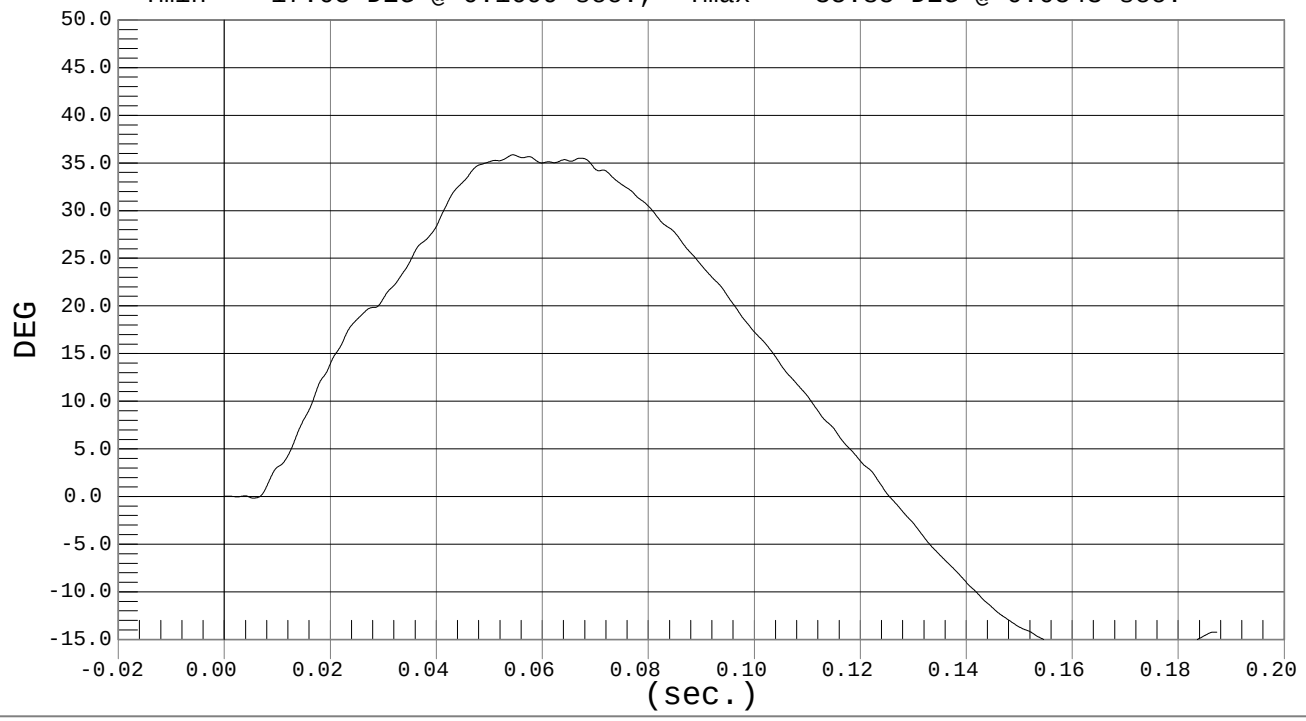


THETA A

Test Desc.: Neck Bending
Component: Dummy #009

Test Date: 03-04-03
Speed: 11.0 fps, 3.34 M/s

Ymin = -17.05 DEG @ 0.1699 sec., Ymax = 35.85 DEG @ 0.0543 sec.

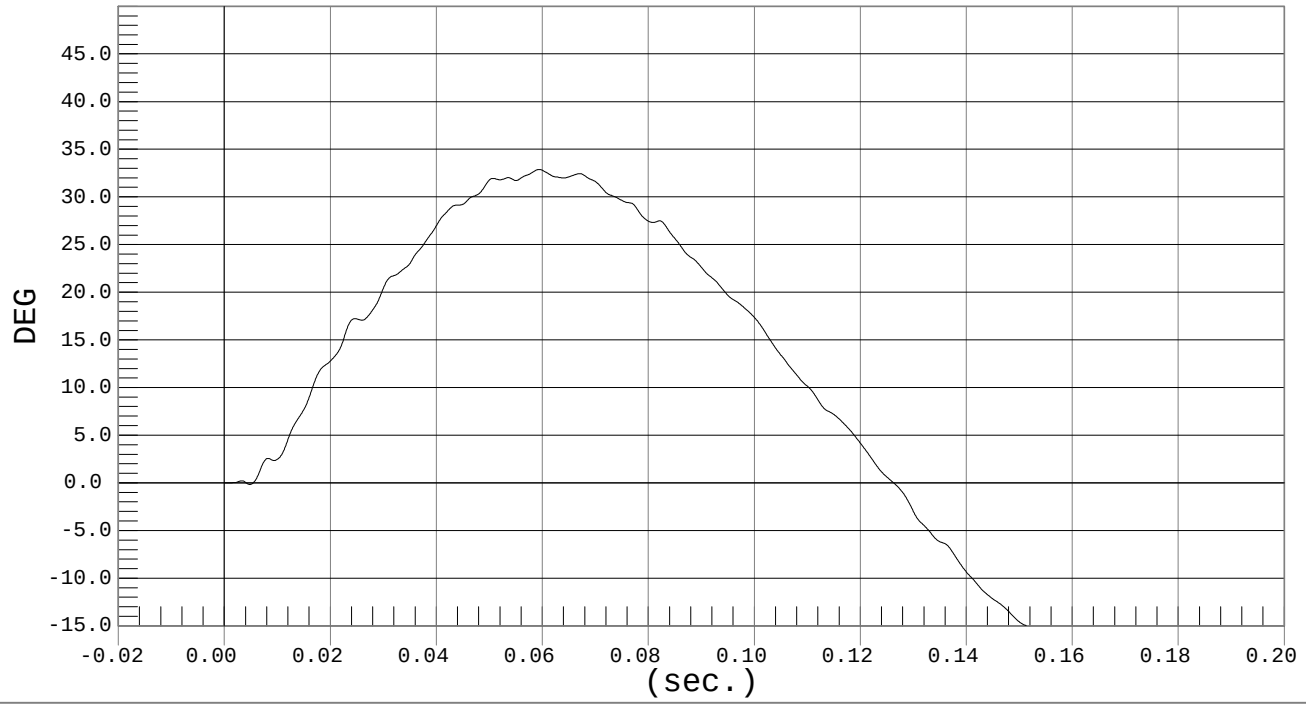


THETA B

Test Desc.: Neck Bending
Component: Dummy #009

Test Date: 03-04-03
Speed: 11.0 fps, 3.34 M/s

Ymin = -18.71 DEG @ 0.1698 sec., Ymax = 32.88 DEG @ 0.0593 sec.



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SHOULDER IMPACT TEST

EUROSID 2 DUMMY

Date: 3/3/03

Dummy Serial Number: 009

Test Number: D03243

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.2
Relative Humidity (%)	10 – 70	17
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	9.3
Time of Max. Pendulum Acceleration	msec	11.1

TEST MEETS SPECIFICATIONS

Technician: _____

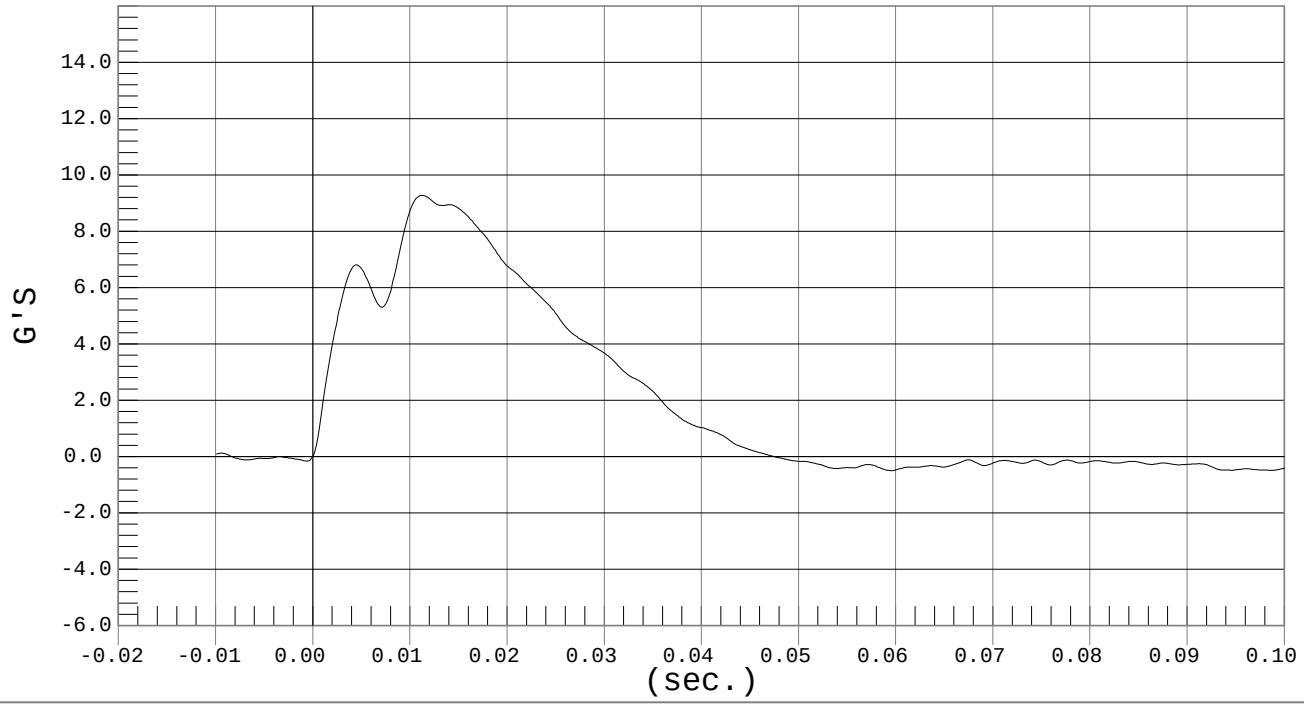
Approved By: _____

SHOULDER ACCELERATION

Test Desc.: Shoulder Impact
Component: Dummy #009

Test Date: 03-03-03
Speed: 14.0 fps, 4.28 M/s

Ymin = -.82 G'S @ 0.1770 sec., Ymax = 9.27 G'S @ 0.0111 sec.



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UPPER/MIDDLE/LOWER RIB TESTS

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 009

Test Number: D03244/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	20
Displacement at 2 m/s	23.5 – 27.5 mm	26.9
Displacement at 3 m/s	36.0 – 40.0 mm	39.2
Displacement at 4 m/s	46.0 – 51.0 mm	50.7

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	20
Displacement at 2 m/s	23.5 – 27.5 mm	25.4
Displacement at 3 m/s	36.0 – 40.0 mm	37.1
Displacement at 4 m/s	46.0 – 51.0 mm	48.7

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	208
Relative Humidity (%)	10 – 70	20
Displacement at 2 m/s	23.5 – 27.5 mm	26.1
Displacement at 3 m/s	36.0 – 40.0 mm	37.7
Displacement at 4 m/s	46.0 – 51.0 mm	49.0

TEST MEETS SPECIFICATIONS

Technician: _____

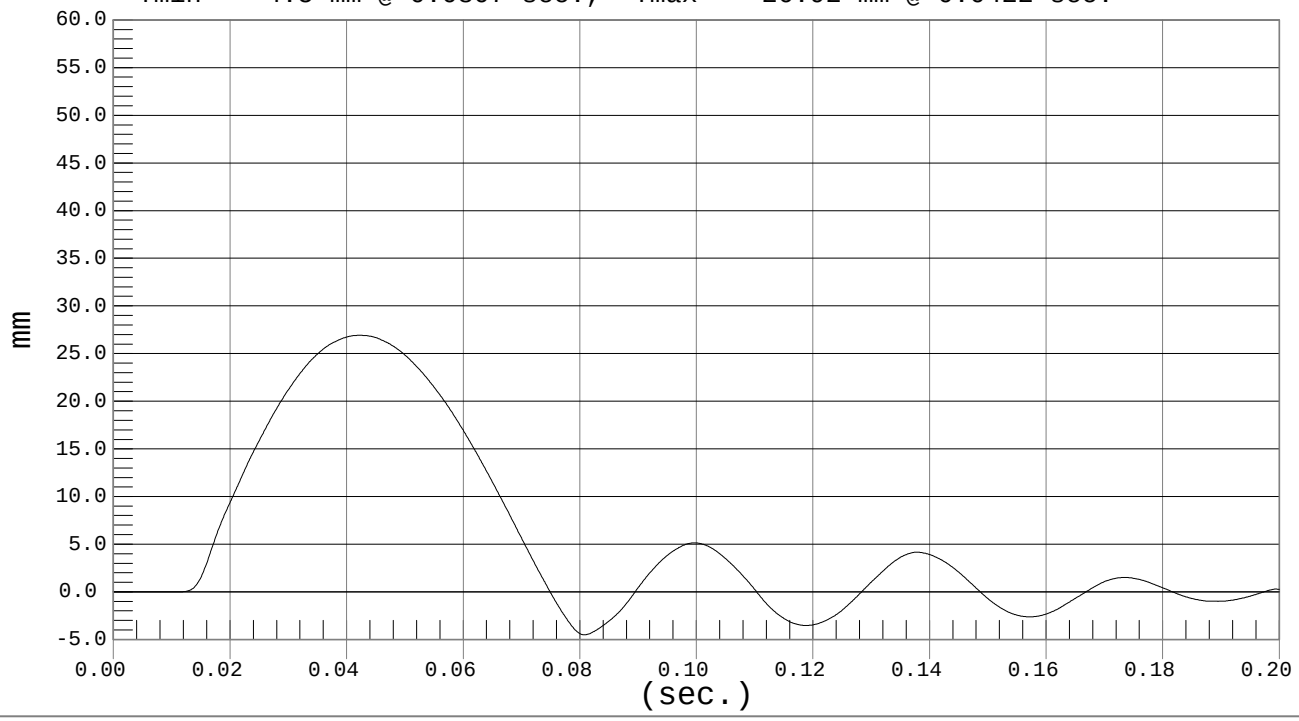
Approved By: _____

UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -4.5 mm @ 0.0807 sec., Ymax = 26.92 mm @ 0.0422 sec.

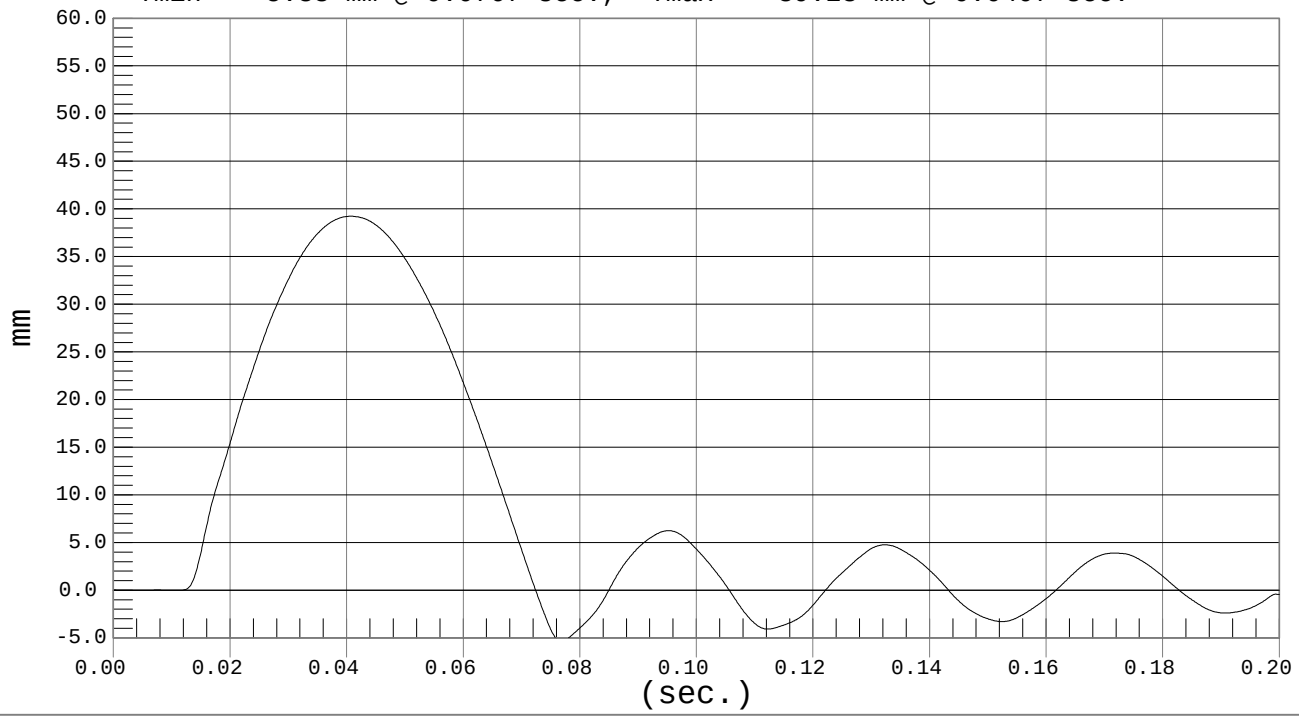


UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -5.33 mm @ 0.0767 sec., Ymax = 39.23 mm @ 0.0407 sec.

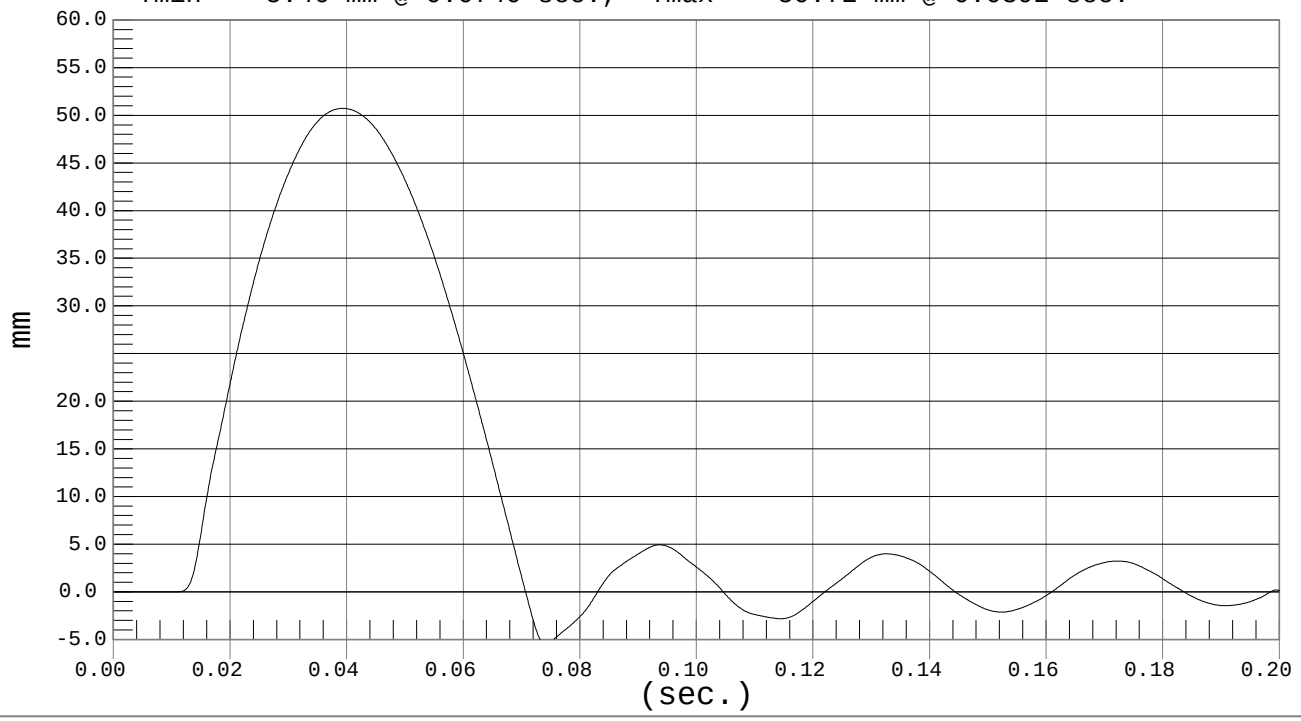


UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -5.46 mm @ 0.0740 sec., Ymax = 50.72 mm @ 0.0392 sec.

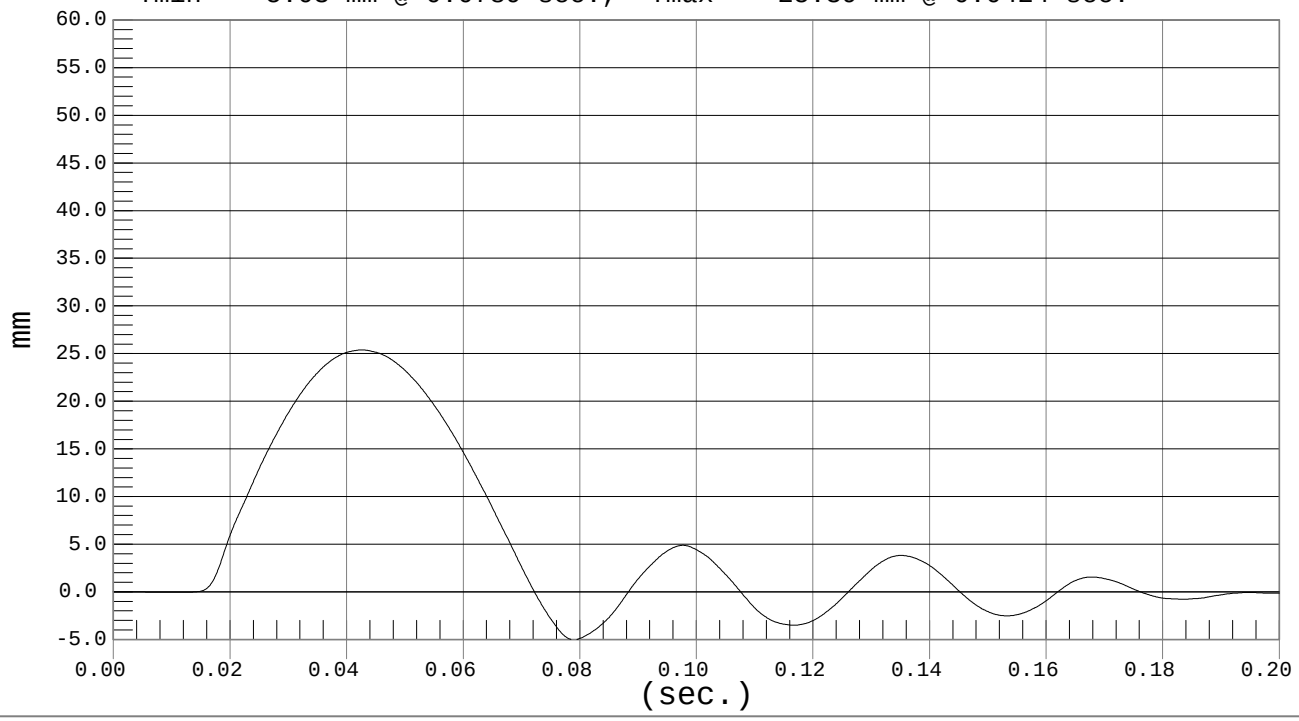


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -5.03 mm @ 0.0789 sec., Ymax = 25.39 mm @ 0.0424 sec.

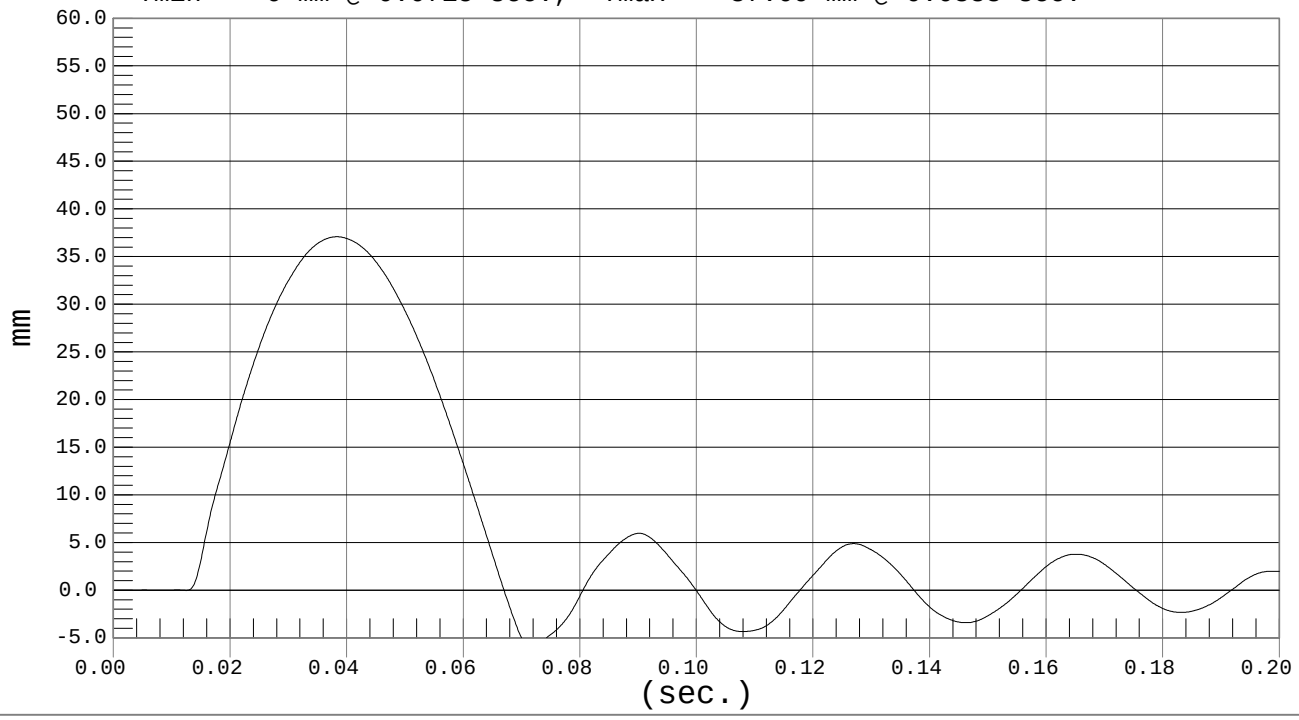


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -6 mm @ 0.0715 sec., Ymax = 37.09 mm @ 0.0383 sec.

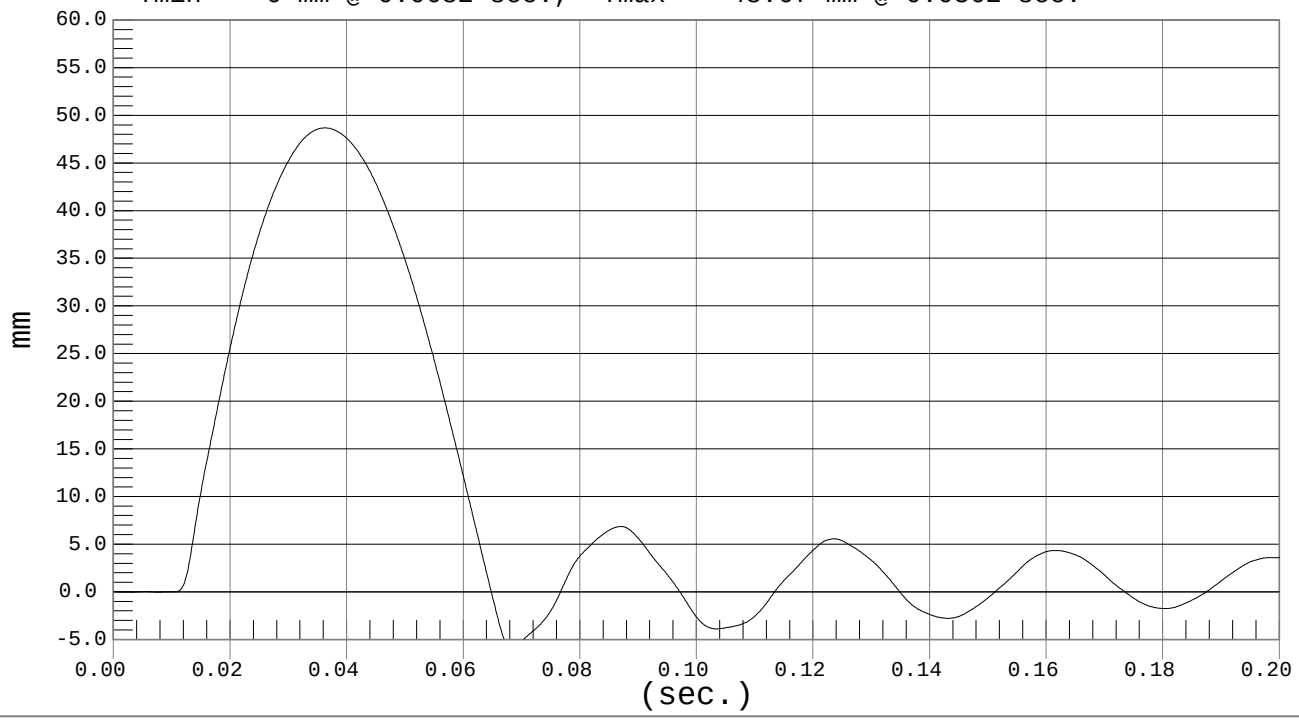


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -6 mm @ 0.0682 sec., Ymax = 48.67 mm @ 0.0362 sec.

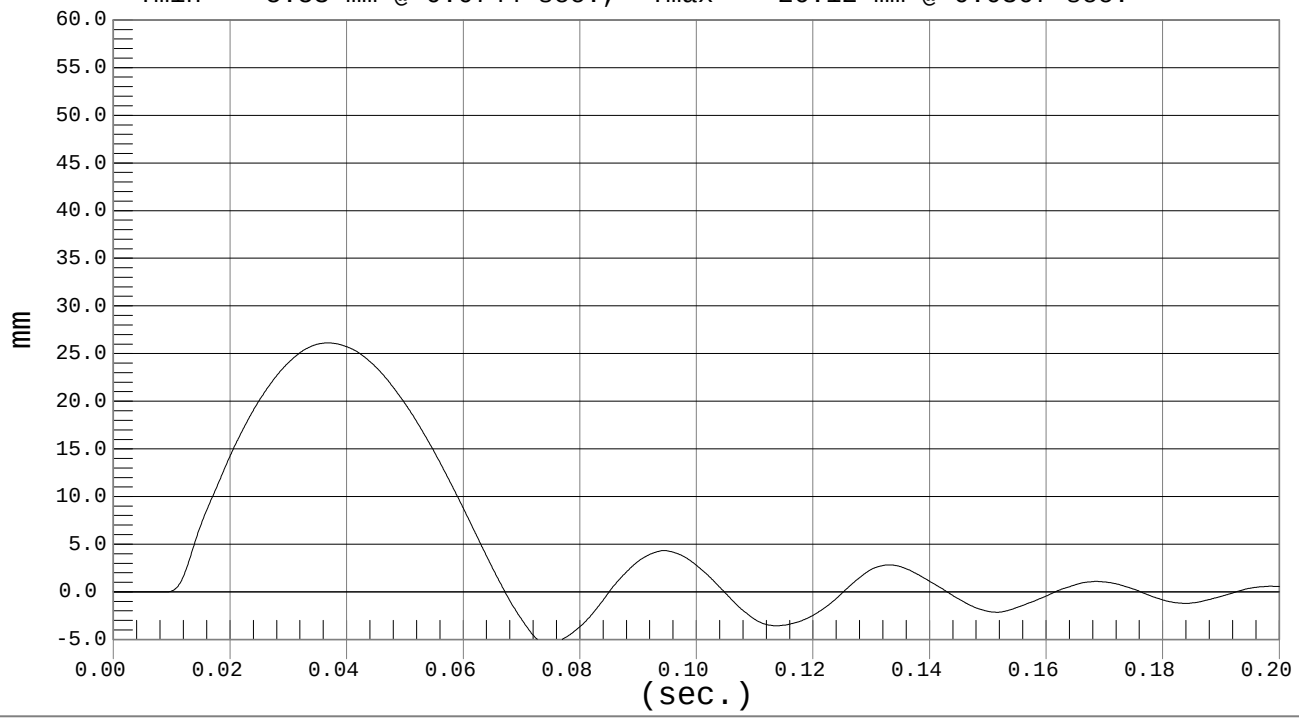


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -5.53 mm @ 0.0744 sec., Ymax = 26.12 mm @ 0.0367 sec.

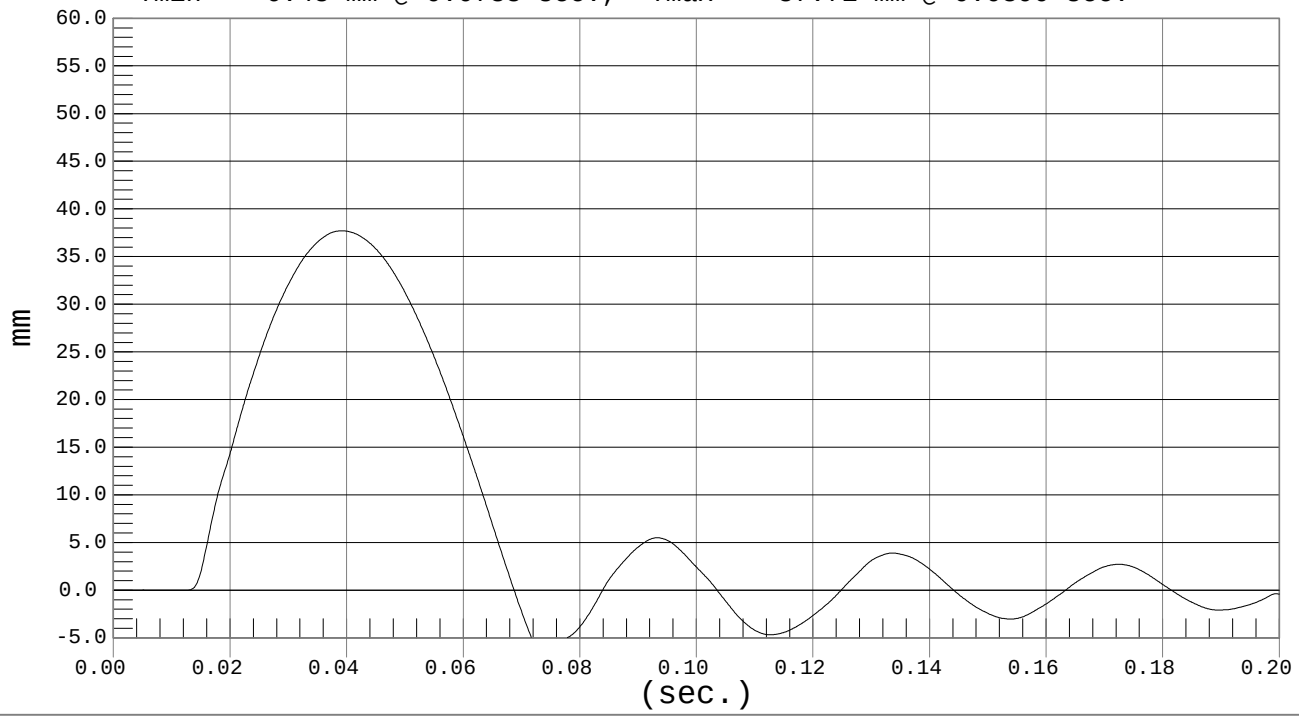


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -6.48 mm @ 0.0738 sec., Ymax = 37.71 mm @ 0.0390 sec.

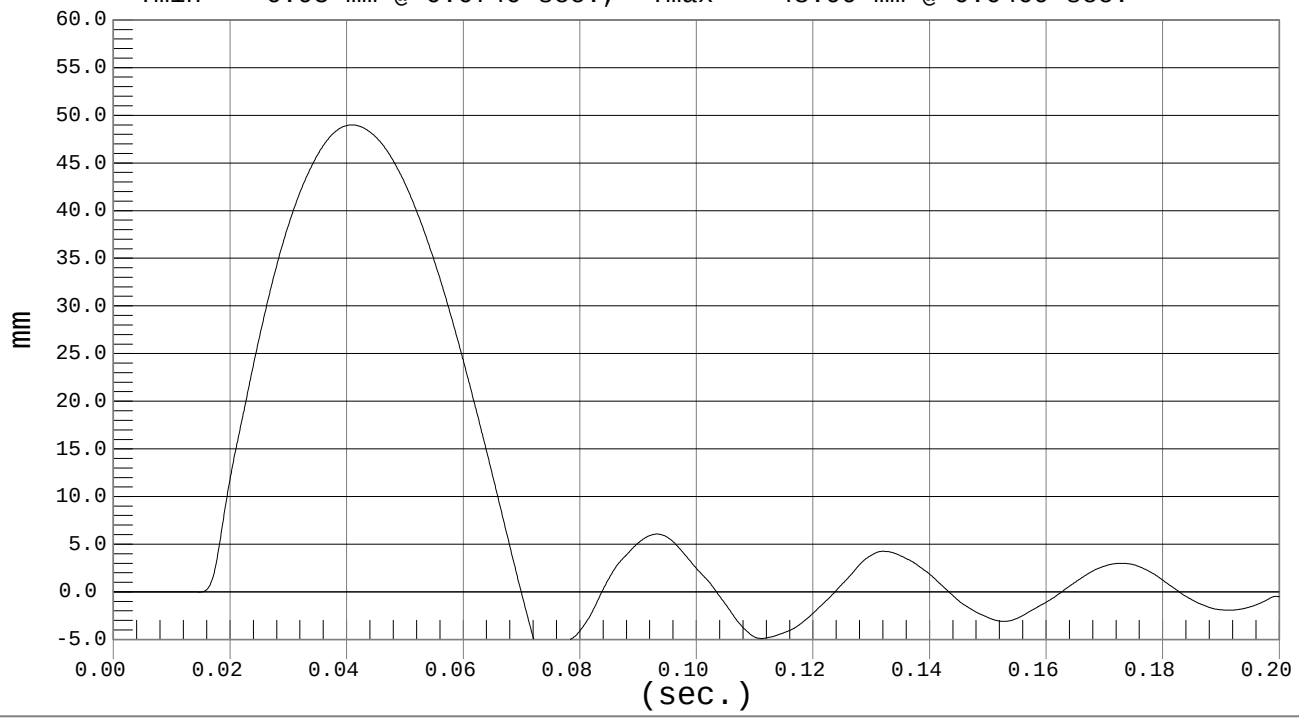


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-04-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -6.95 mm @ 0.0740 sec., Ymax = 48.99 mm @ 0.0409 sec.



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ABDOMEN TEST

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 009

Test Number: D03247

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	21
Probe Speed (m/s)	3.90 – 4.10	4.10
Maximum Impact Force	4.00 – 4.80 kN	4.57
Time of Maximum Force	10.60 – 13.00 ms	10.90
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.46
Time of Max. Total Force	10.00 – 12.30 ms	10.50

TEST MEETS SPECIFICATIONS

Technician: _____

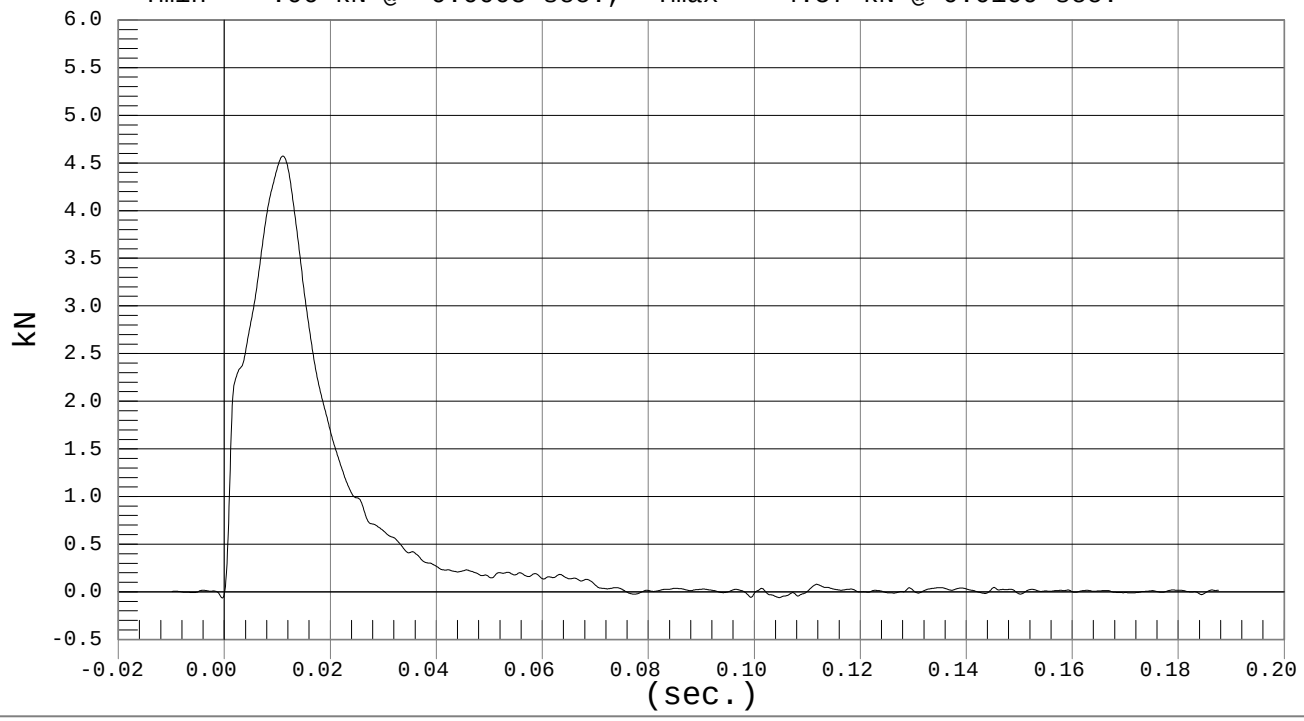
Approved By: _____

IMPACTOR FORCE

Test Desc.: Abdomen Impact
Component: Dummy #009

Test Date: 03-04-03
Speed: 13.4 fps, 4.10 M/s

Ymin = -.06 kN @ -0.0005 sec., Ymax = 4.57 kN @ 0.0109 sec.

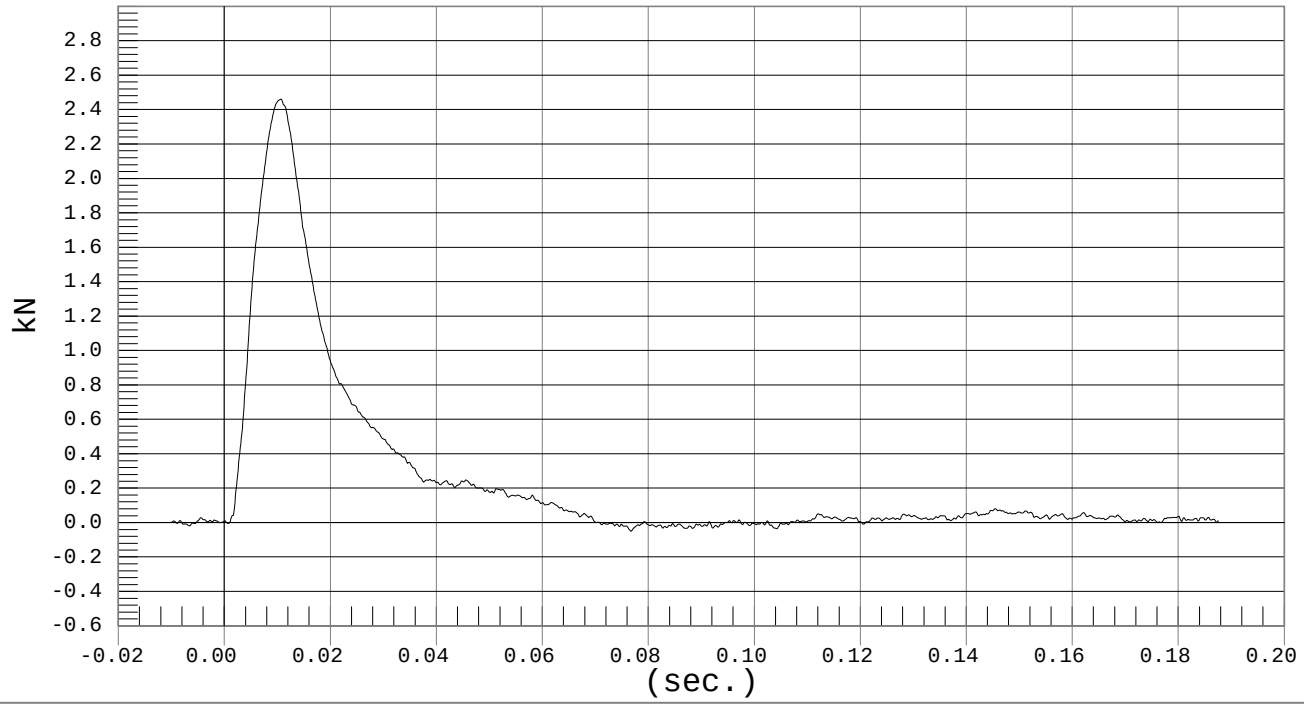


ABDOMEN FORCE

Test Desc.: Abdomen Impact
Component: Dummy #009

Test Date: 03-04-03
Speed: 13.4 fps, 4.10 M/s

Ymin = -.05 kN @ 0.0767 sec., Ymax = 2.46 kN @ 0.0105 sec.



MGA RESEARCH CORPORATION

LUMBAR SPINE TEST

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 009

Test Number: D03248

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	20.7
Relative Humidity (%)		10 – 70	21
Pendulum Speed		5.95 – 6.15	6.05
Pendulum Deceleration	10 msec	-2.46 - -1.59 m/sec	-1.84
	20 msec	-5.25 - -4.07 m/sec	-4.25
	25 msec	-6.64 - -5.30 m/sec	-5.33
	30 msec	≥ -6.5 m/sec	-6.17
Maximum Flexion Angle		45.0 – 55.0 deg	54.1
Time of Max. Flexion Angle		39.0 – 53.0 ms	46.1
Maximum Angle Theta (A)		31.0 – 35.0 deg	34.1
Time of Max. Theta (A)		44.0 – 52.0 ms	46.3
Maximum Angle Theta (B)		29.28– 31.78 deg	29.80
Time of Max. Theta (B)		44.0 – 52.0 ms	48.7

TEST MEETS SPECIFICATIONS

Technician: _____

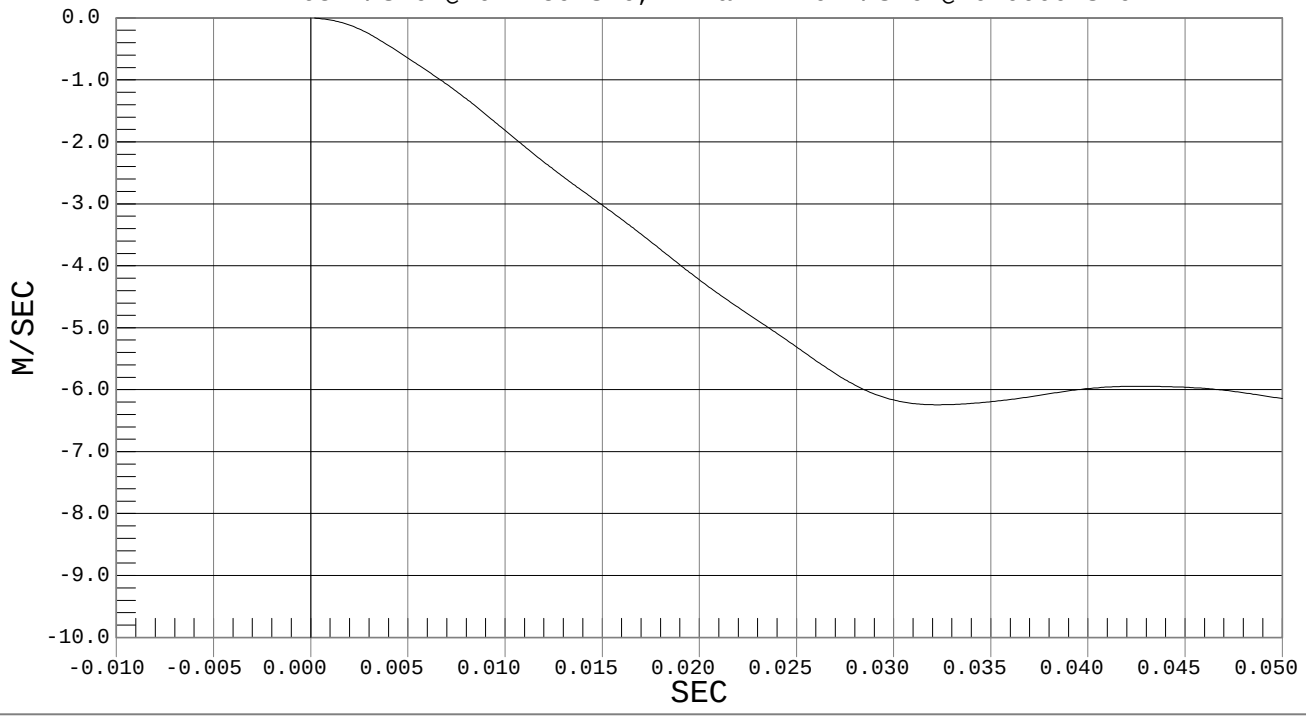
Approved By: _____

PENDULUM DECELERATION

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-04-03
Speed: 19.9 fps, 6.05 M/s

Ymin = -7.63 M/SEC @ 0.1459 SEC, Ymax = 0 M/SEC @ 0.0000 SEC

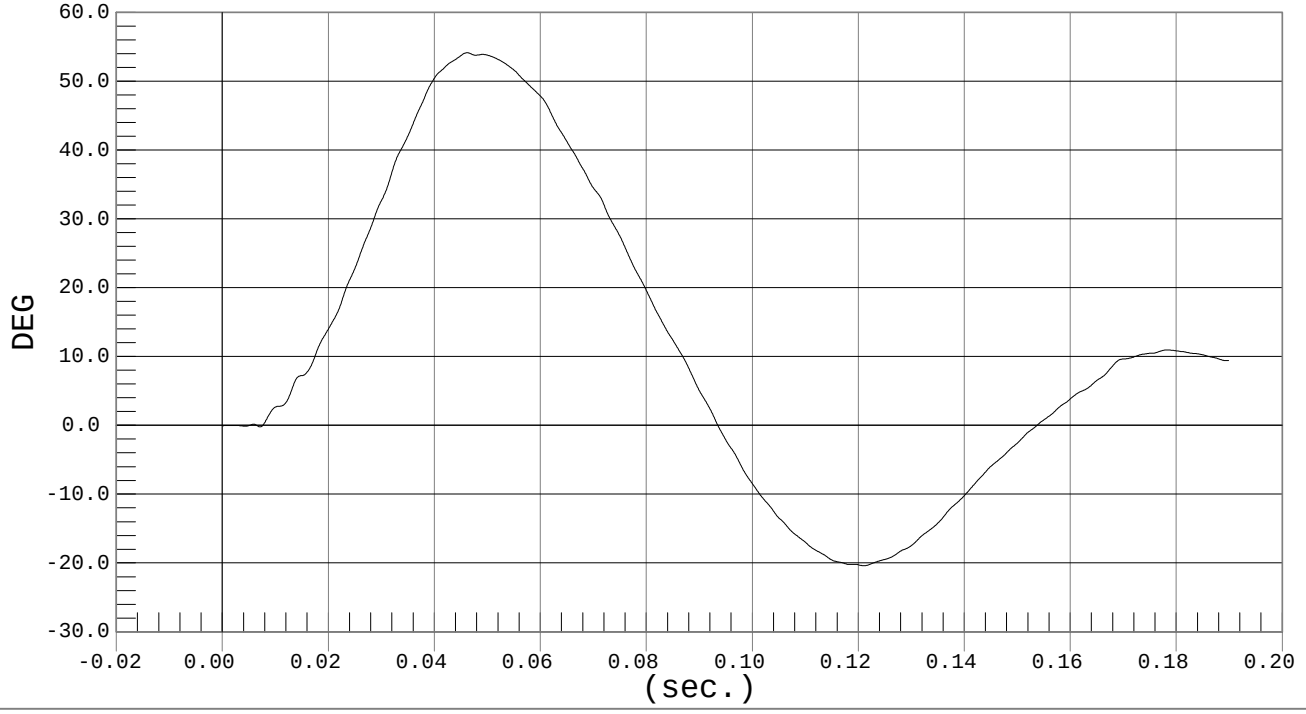


FLEXION ANGLE

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-04-03
Speed: 19.9 fps, 6.05 M/s

Ymin = -20.41 DEG @ 0.1210 sec., Ymax = 54.13 DEG @ 0.0461 sec.

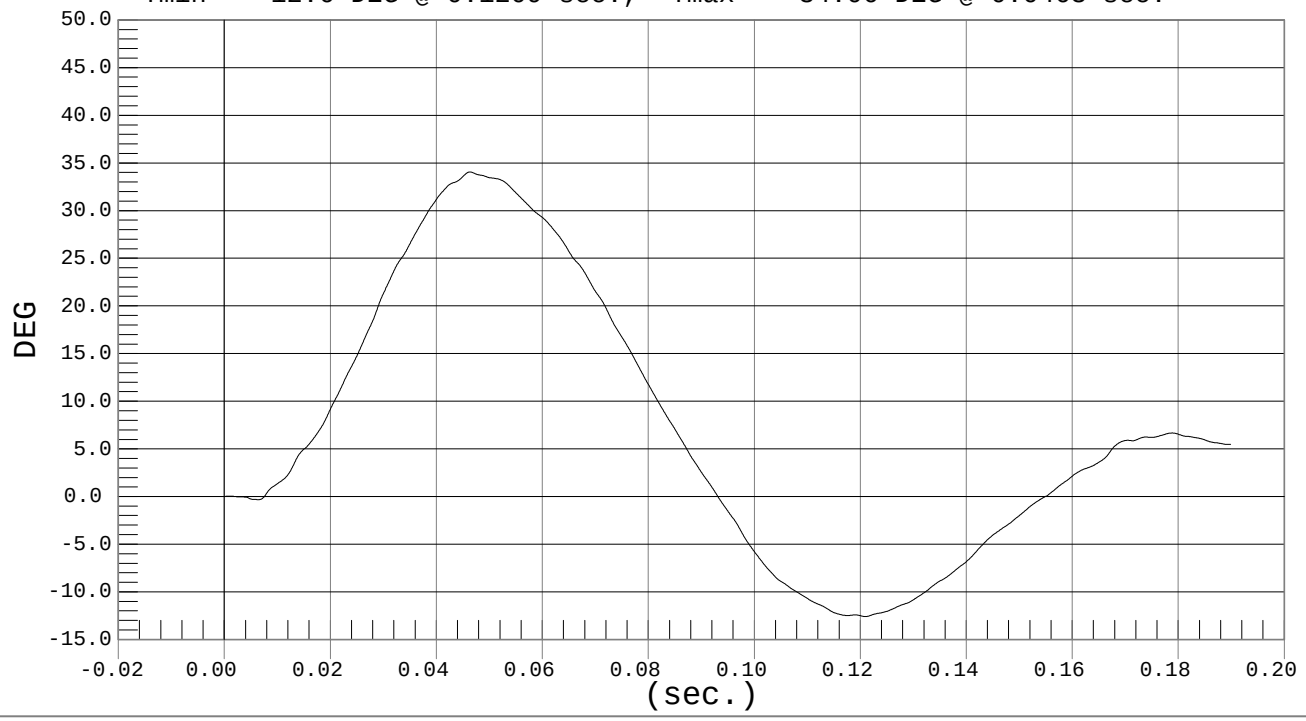


THETA A

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-04-03
Speed: 19.9 fps, 6.05 M/s

Ymin = -12.6 DEG @ 0.1209 sec., Ymax = 34.06 DEG @ 0.0463 sec.

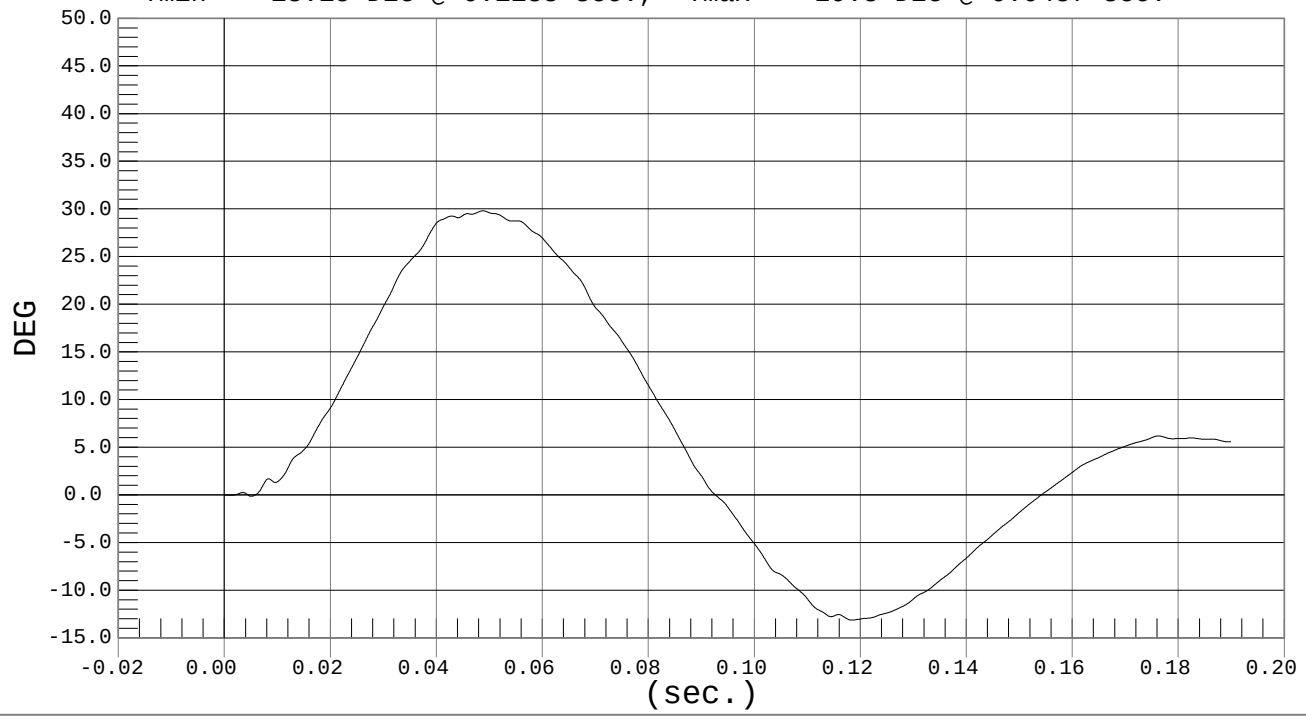


THETA B

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-04-03
Speed: 19.9 fps, 6.05 M/s

Ymin = -13.15 DEG @ 0.1183 sec., Ymax = 29.8 DEG @ 0.0487 sec.



MGA RESEARCH CORPORATION

PELVIS TEST

EUROSID 2 DUMMY

Date: 3/3/03

Dummy Serial Number: 009

Test Number: D03249

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.3
Relative Humidity (%)	10 – 70	16
Pendulum Speed	4.20 – 4.40 m/s	4.28
Maximum Impactor Force	4.40 – 5.40 kN	4.72
Time of Max. Impactor Force	10.30 – 15.50 ms	14.60
Maximum Pubic Force	1.04 – 1.64 kN	1.34
Time of Max. Pubic Force	9.90 – 15.90 ms	13.50

TEST MEETS SPECIFICATIONS

Technician: _____

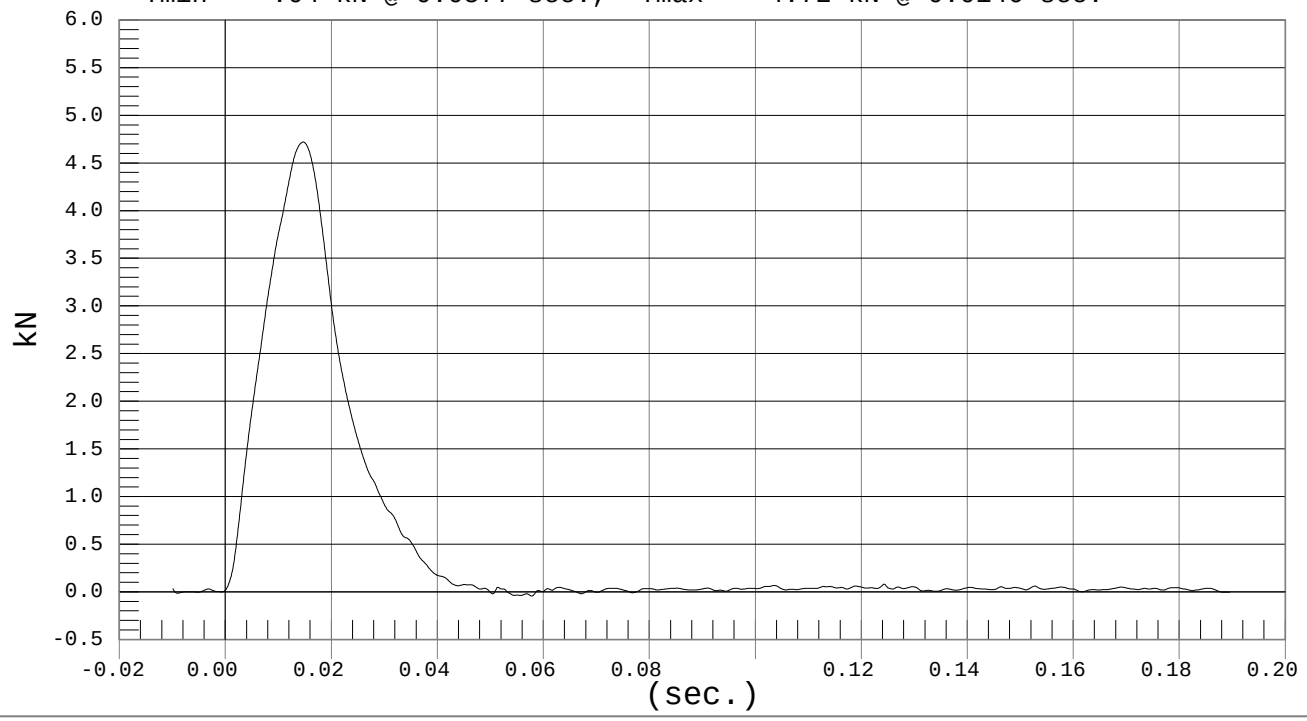
Approved By: _____

IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #009

Test Date: 03-03-03
Speed: 14.1 fps, 4.28 M/s

Ymin = -.04 kN @ 0.0577 sec., Ymax = 4.72 kN @ 0.0146 sec.

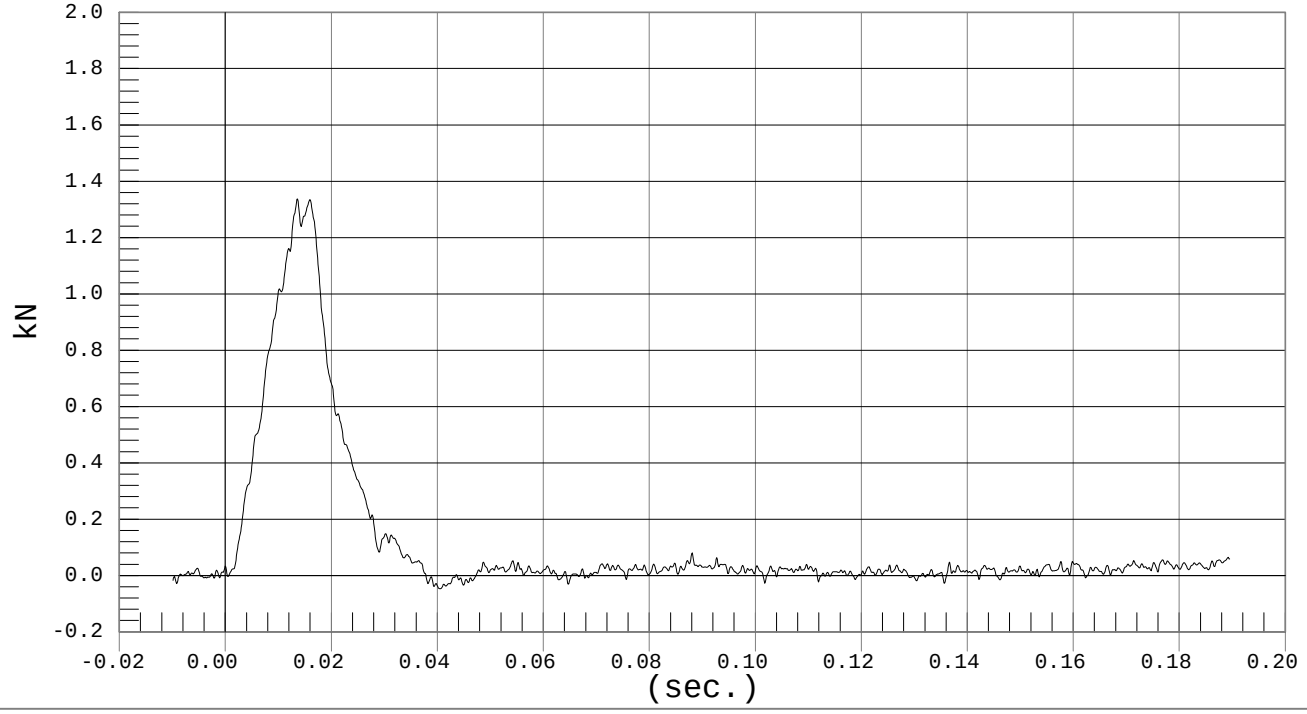


PUBIC FORCE

Test Desc.: Pelvis Impact
Component: Dummy #009

Test Date: 03-03-03
Speed: 14.1 fps, 4.28 M/s

Ymin = -.05 kN @ 0.0404 sec., Ymax = 1.34 kN @ 0.0135 sec.



CERTIFICATION DATA

Dummy Serial Number: 010

Calibration Test Results Summary

Dummy Serial Number: 010

Pre-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Rib Tests:	All ribs passed all impact test requirements.
Abdomen Test:	The abdomen passed all impact test requirements.
Lumbar Spine Test:	The lumbar spine passed all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION

HEAD DROP TEST

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 010

Test Number: D03251

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.6
Relative Humidity (%)	10 – 70	22
Peak Resultant Acceleration	100 – 150 g's	141
Time of Max. Res. Acceleration	msec	22.1

TEST MEETS SPECIFICATIONS

Technician: _____

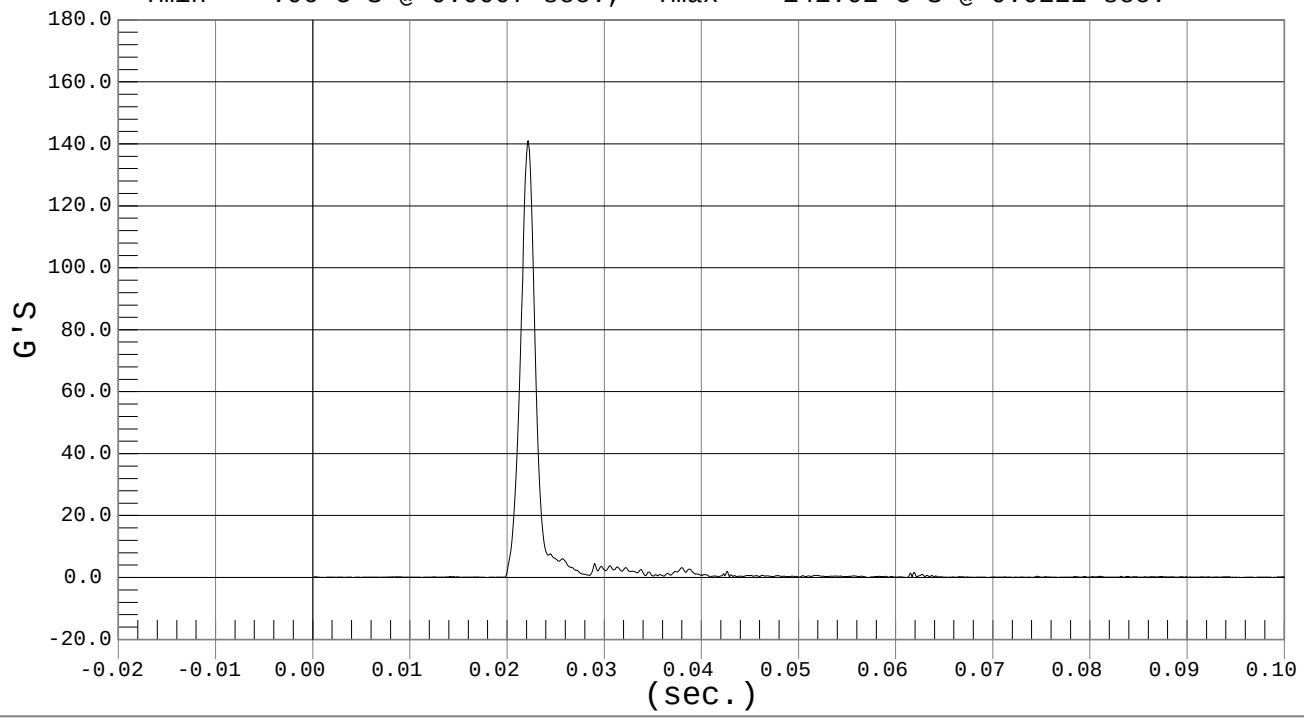
Approved By: _____

PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #010

Test Date: 03-04-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .06 G'S @ 0.0007 sec., Ymax = 141.02 G'S @ 0.0221 sec.



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NECK PENDULUM TEST

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 010

Test Number: D03252

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	20.7
Relative Humidity (%)		10 – 70	23
Pendulum Speed		3.3 - 3.5	3.4
Pendulum Deceleration	3 msec	¯.25 - ¯.53 m/sec	-.32
	8 msec	¯1.59 - ¯2.04 m/sec	-1.61
	14 msec	¯3.20 - ¯3.85 m/sec	-3.28
Maximum Flexion Angle		49.0 – 59.0 deg	57.0
Time of Max. Flexion Angle		54.0 – 66.0 ms	57.2
Maximum Angle Theta (A)		32.0 – 37.0 deg	34.5
Time of Max. Theta (A)		53.0 – 63.0 ms	54.2
Maximum Angle Theta (B)		29.70 – 32.20 deg	31.65
Time of Max. Theta (B)		54.0 – 64.0 ms	59.9

TEST MEETS SPECIFICATIONS

Technician: _____

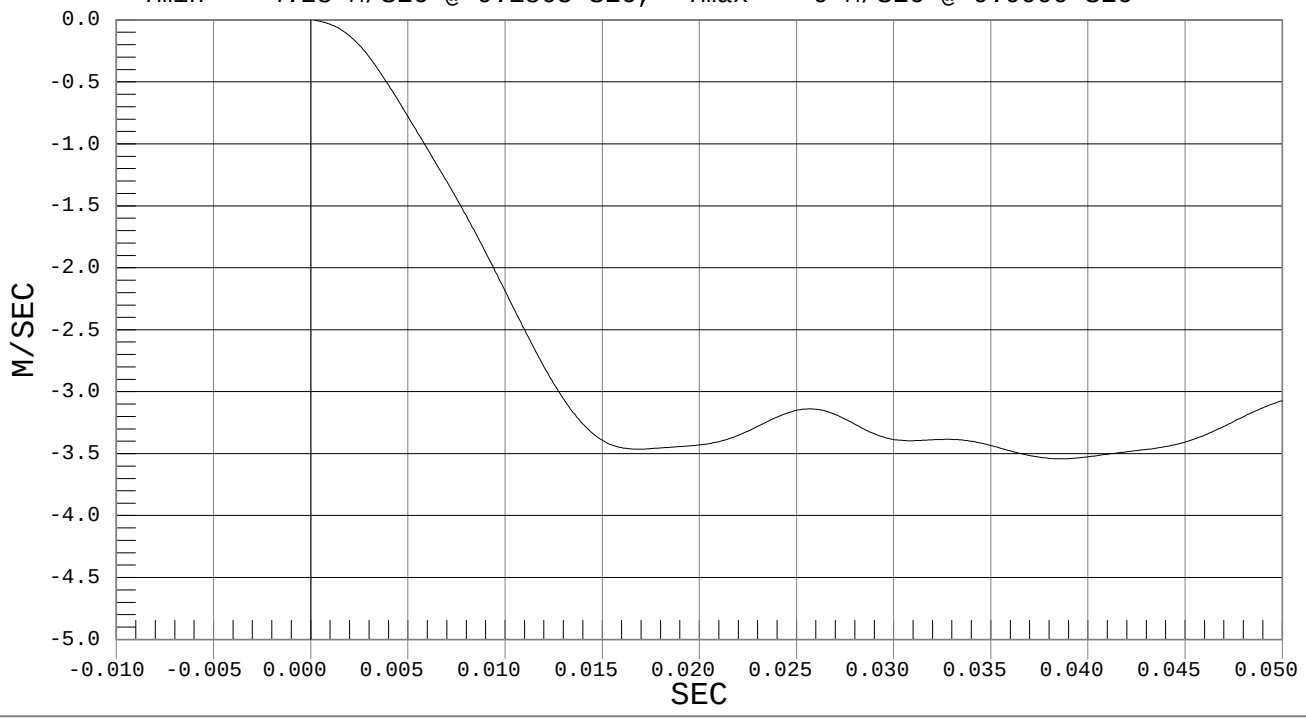
Approved By: _____

PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #010

Test Date: 03-04-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -4.28 M/SEC @ 0.1863 SEC, Ymax = 0 M/SEC @ 0.0000 SEC

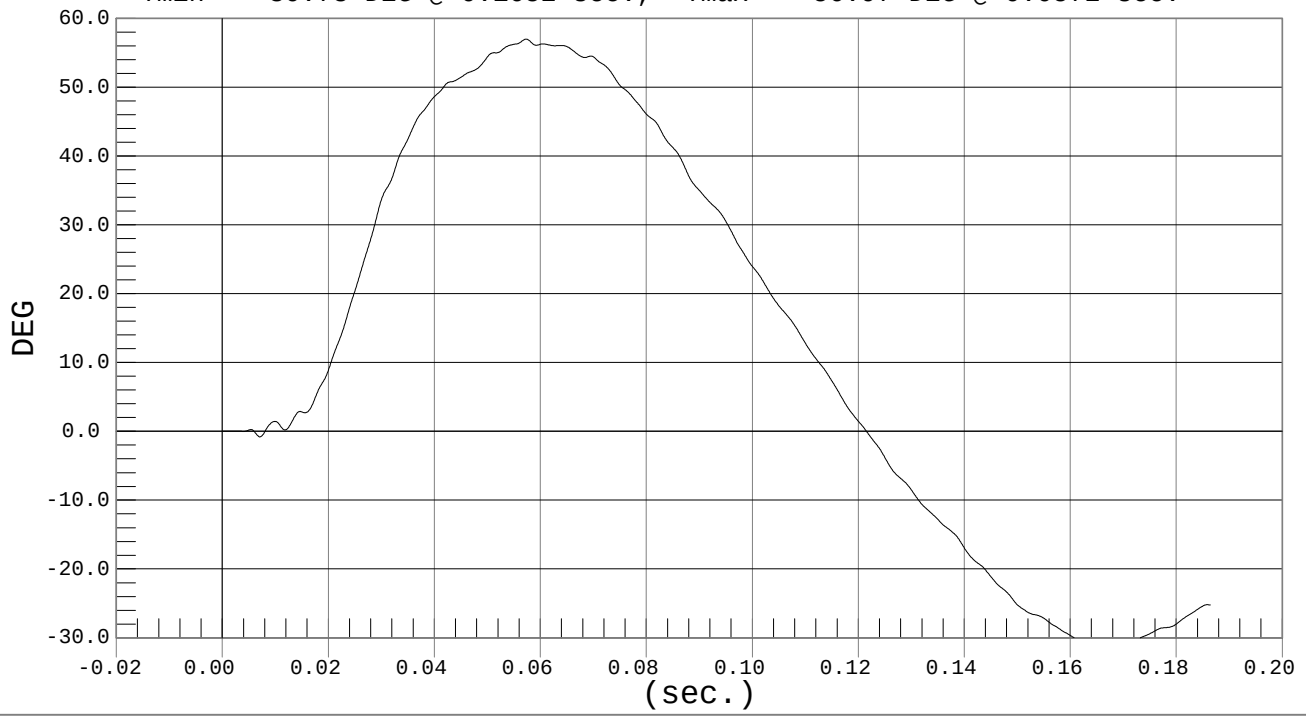


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #010

Test Date: 03-04-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -30.78 DEG @ 0.1652 sec., Ymax = 56.97 DEG @ 0.0572 sec.

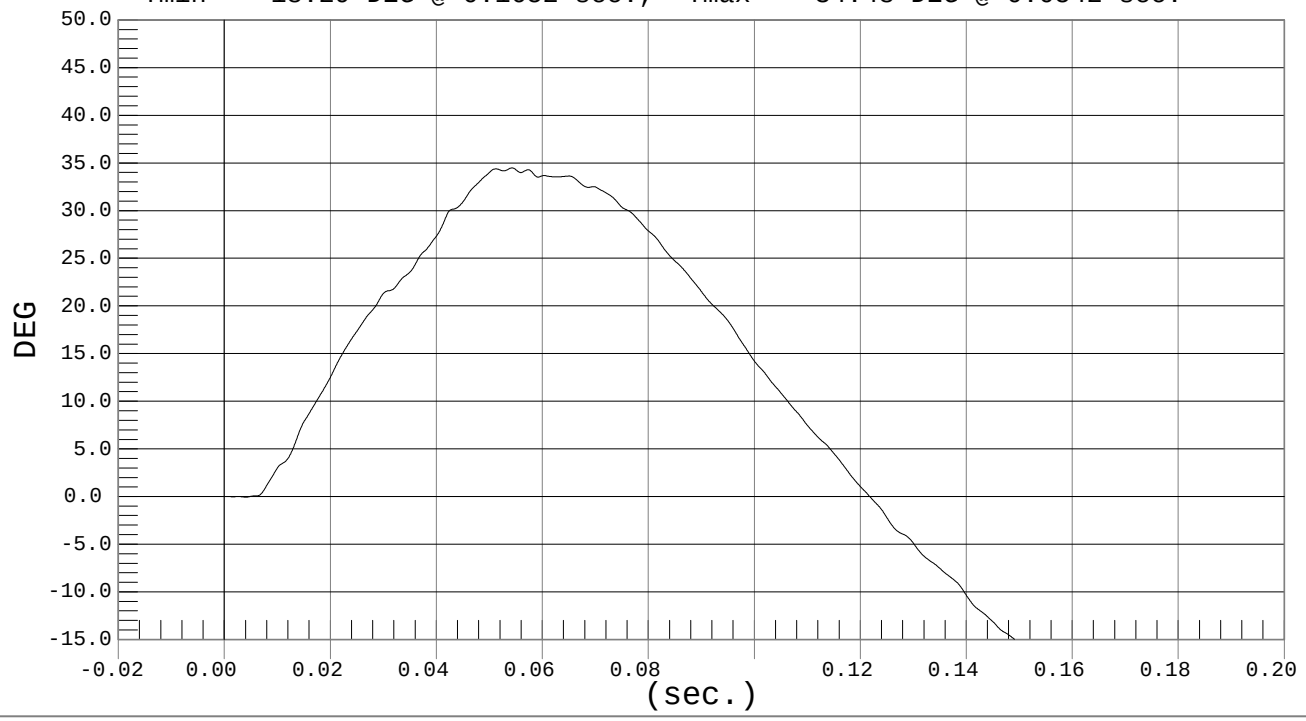


THETA A

Test Desc.: Neck Bending
Component: Dummy #010

Test Date: 03-04-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -18.29 DEG @ 0.1652 sec., Ymax = 34.48 DEG @ 0.0542 sec.

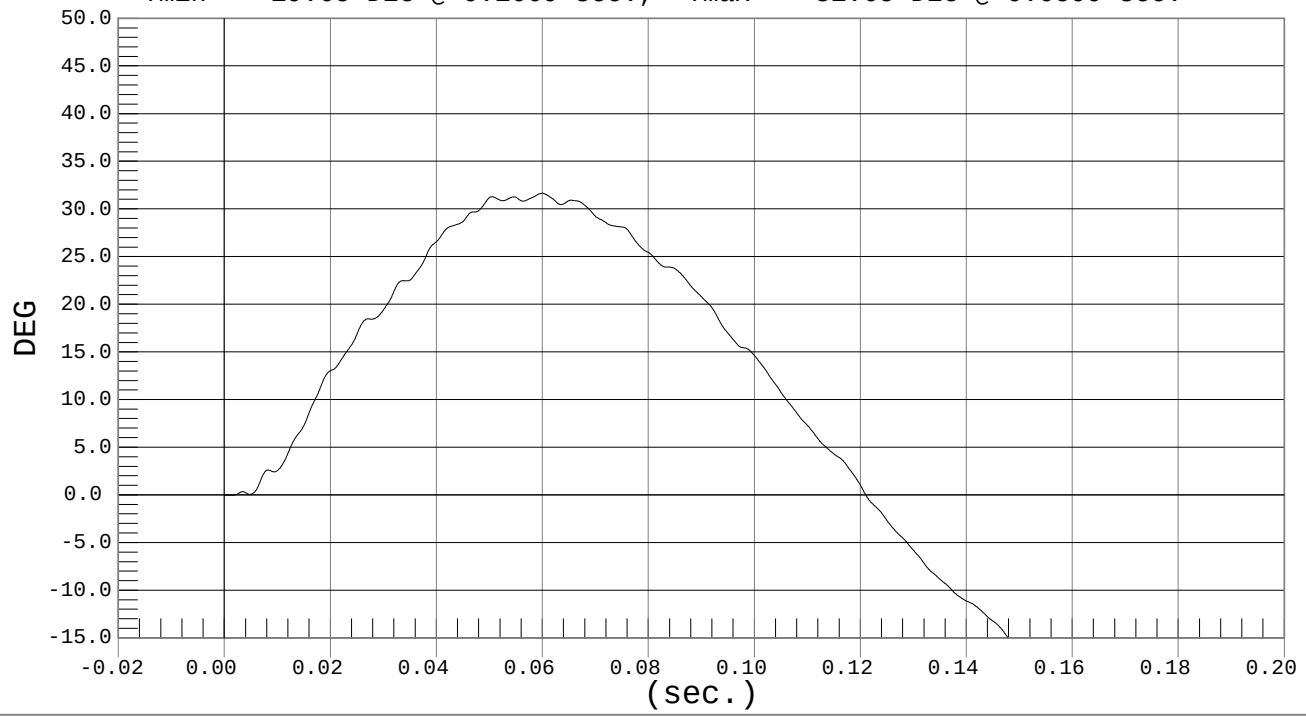


THETA B

Test Desc.: Neck Bending
Component: Dummy #010

Test Date: 03-04-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -19.65 DEG @ 0.1669 sec., Ymax = 31.65 DEG @ 0.0599 sec.



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

EUROSID 2 DUMMY

Date: 3/5/03

Dummy Serial Number: 010

Test Number: D03253

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	19
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	10.1
Time of Max. Pendulum Acceleration	msec	10.9

TEST MEETS SPECIFICATIONS

Technician: _____

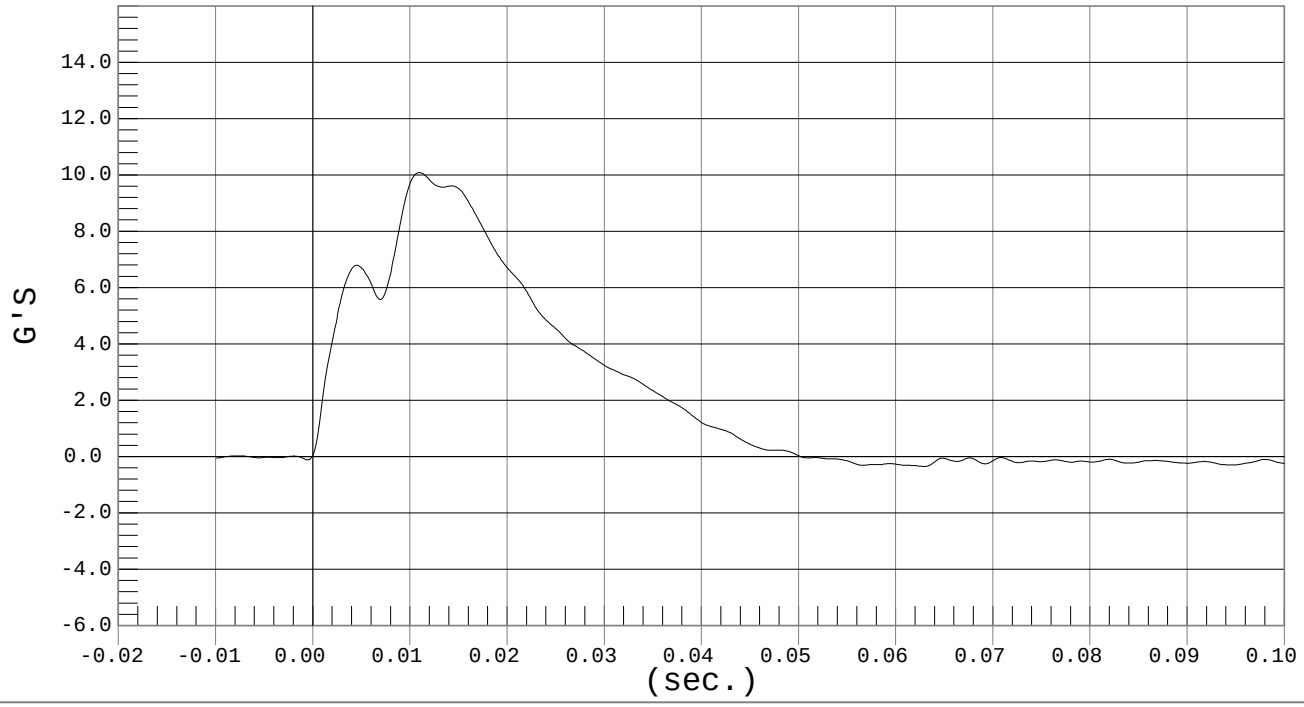
Approved By: _____

SHOULDER ACCELERATION

Test Desc.: Shoulder Impact
Component: Dummy #010

Test Date: 03-05-03
Speed: 14.1 fps, 4.29 M/s

Ymin = -.4 G'S @ 0.1141 sec., Ymax = 10.09 G'S @ 0.0109 sec.



MGA RESEARCH CORPORATION

UPPER/MIDDLE/LOWER RIB TESTS

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 010

Test Number: D03254/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	20
Displacement at 2 m/s	23.5 – 27.5 mm	26.3
Displacement at 3 m/s	36.0 – 40.0 mm	38.9
Displacement at 4 m/s	46.0 – 51.0 mm	49.2

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	20
Displacement at 2 m/s	23.5 – 27.5 mm	25.9
Displacement at 3 m/s	36.0 – 40.0 mm	38.5
Displacement at 4 m/s	46.0 – 51.0 mm	49.4

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	20
Displacement at 2 m/s	23.5 – 27.5 mm	26.5
Displacement at 3 m/s	36.0 – 40.0 mm	38.9
Displacement at 4 m/s	46.0 – 51.0 mm	50.4

TEST MEETS SPECIFICATIONS

Technician: _____

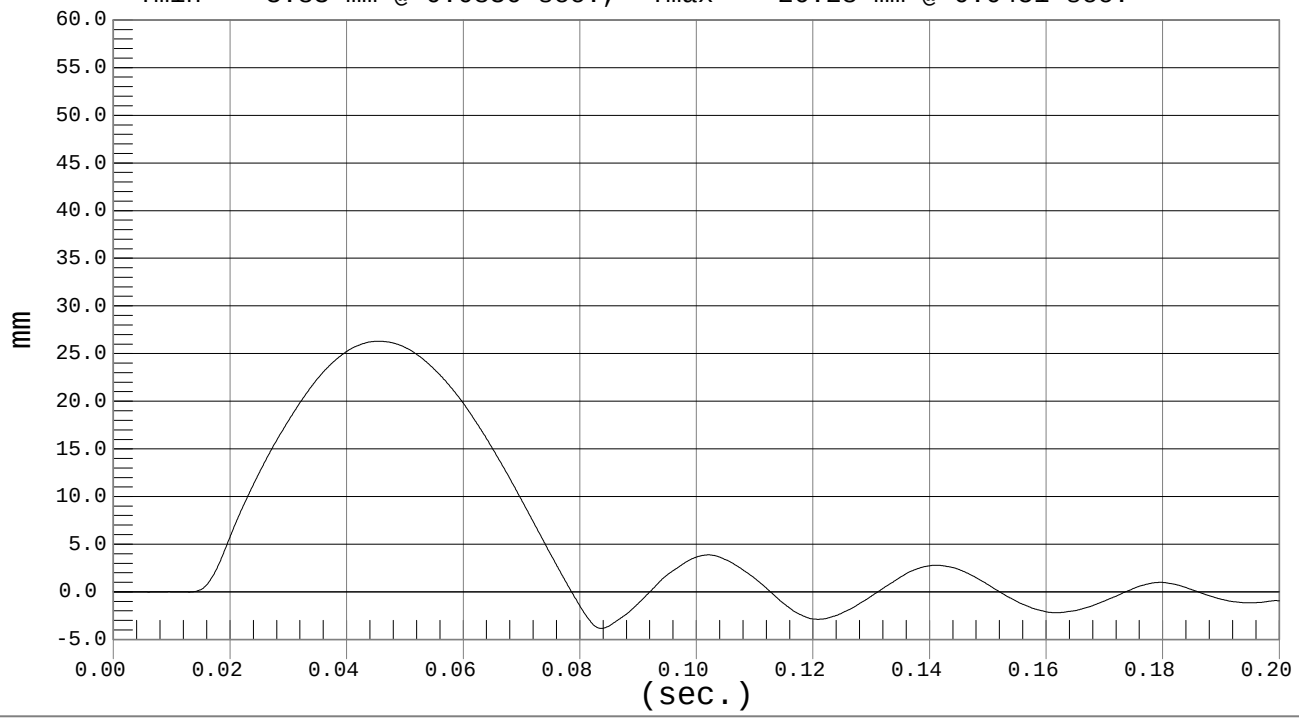
Approved By: _____

UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 6.5 fps, 1.98 M/s

Ymin = -3.83 mm @ 0.0836 sec., Ymax = 26.28 mm @ 0.0451 sec.

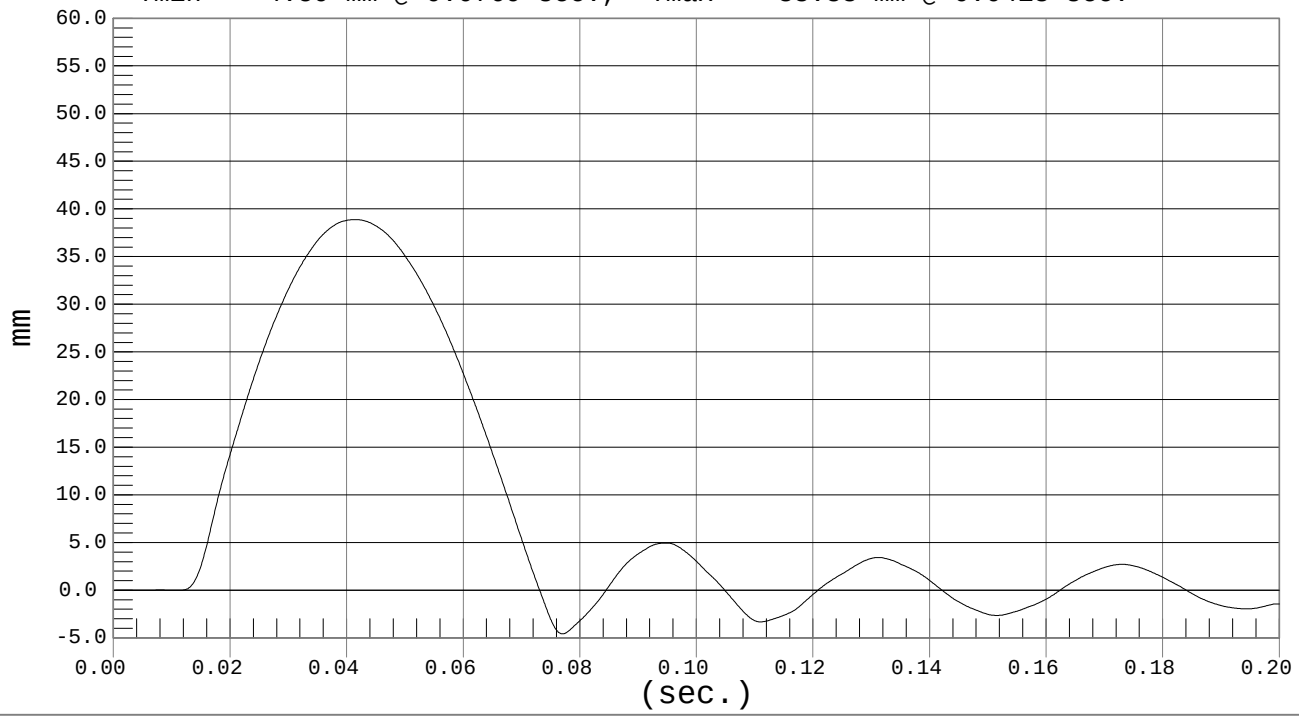


UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -4.59 mm @ 0.0769 sec., Ymax = 38.88 mm @ 0.0413 sec.

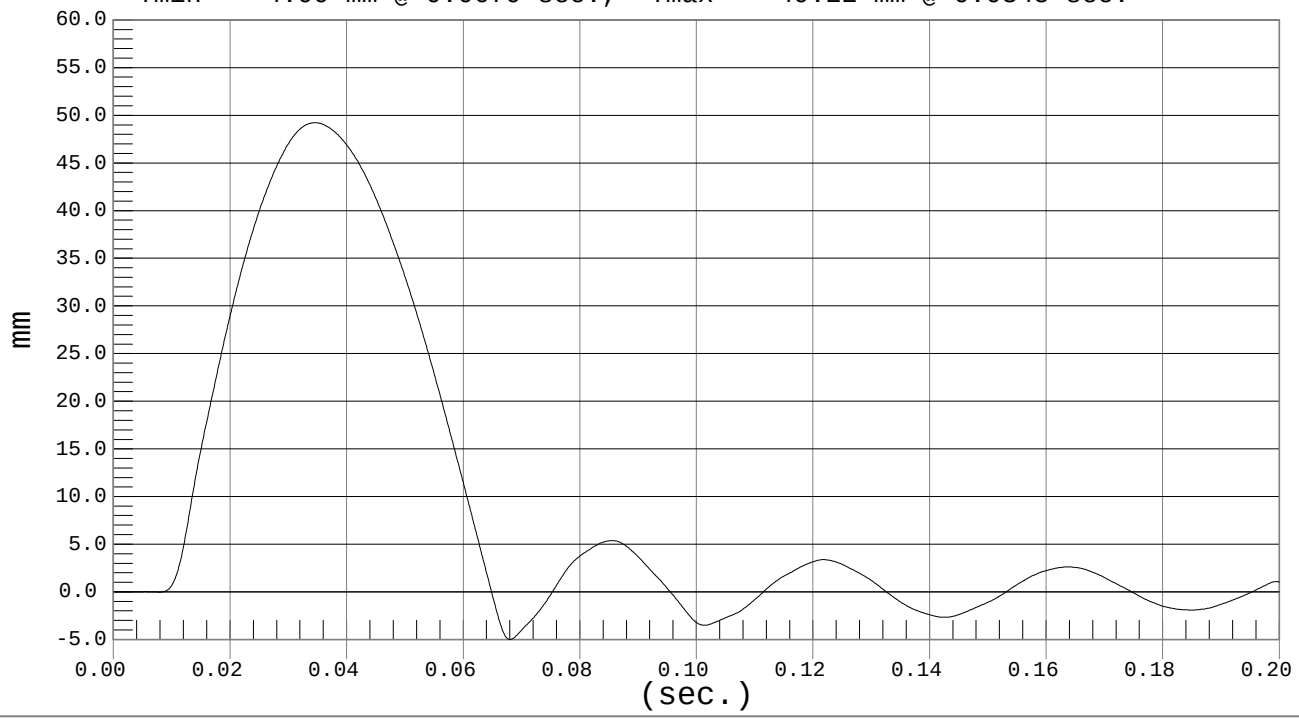


UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -4.99 mm @ 0.0679 sec., Ymax = 49.22 mm @ 0.0345 sec.

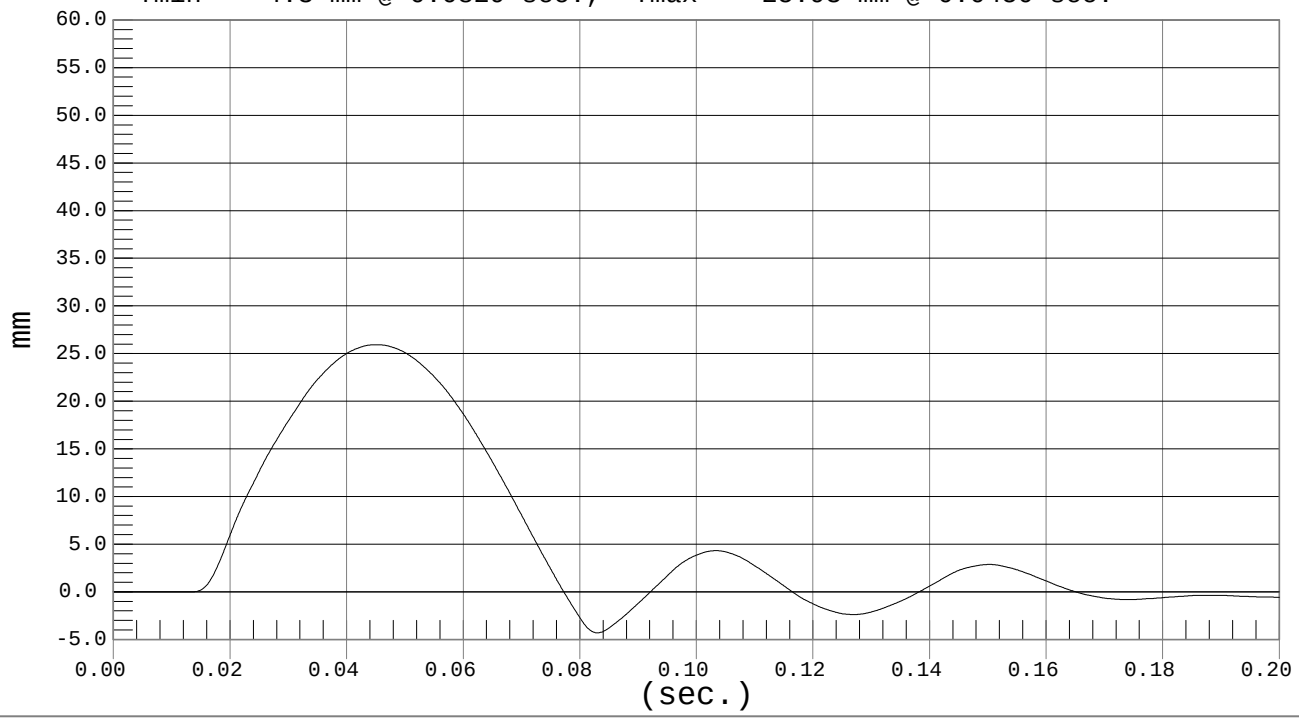


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -4.3 mm @ 0.0829 sec., Ymax = 25.93 mm @ 0.0450 sec.

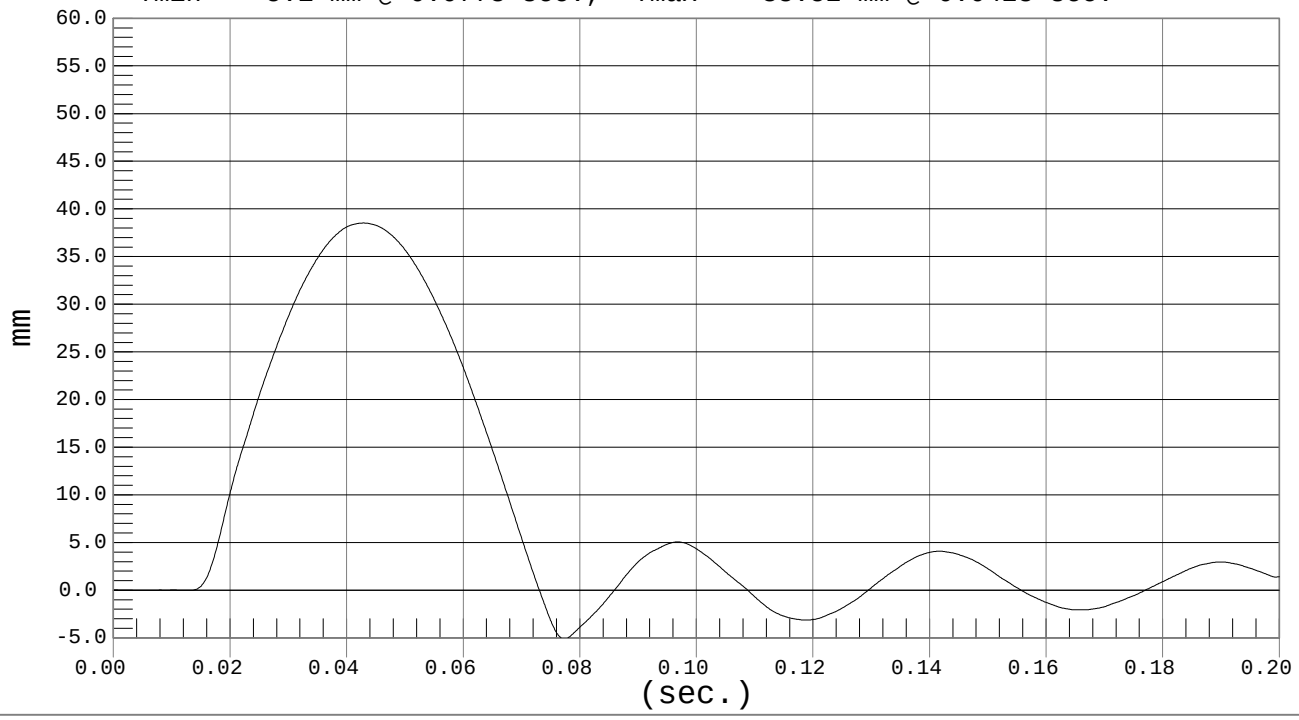


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -5.1 mm @ 0.0773 sec., Ymax = 38.52 mm @ 0.0428 sec.

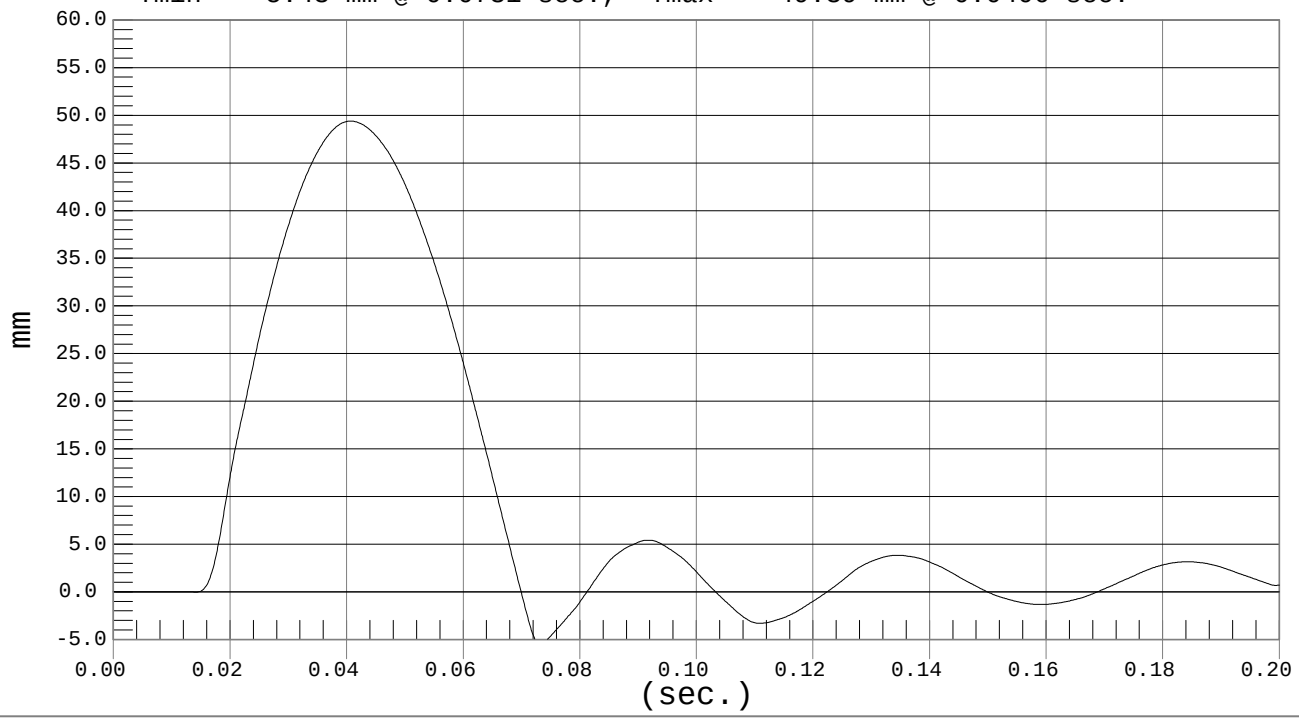


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -5.43 mm @ 0.0731 sec., Ymax = 49.39 mm @ 0.0406 sec.

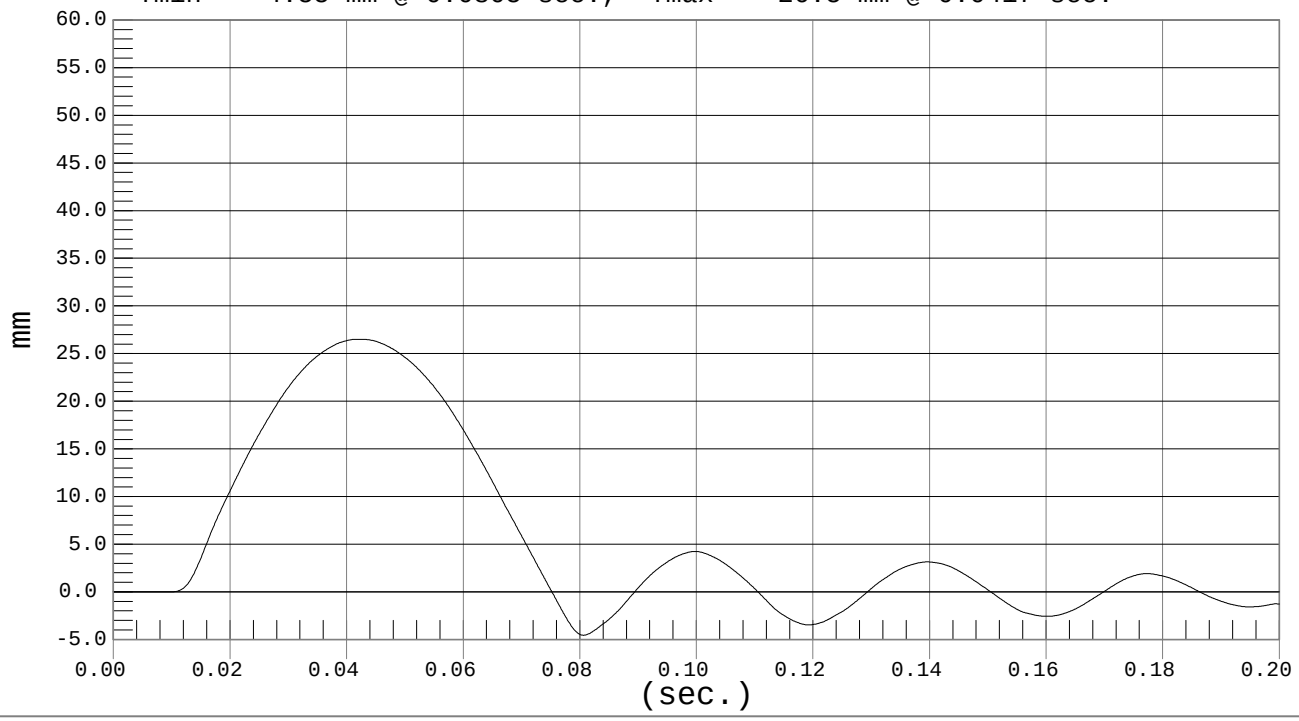


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -4.55 mm @ 0.0805 sec., Ymax = 26.5 mm @ 0.0417 sec.

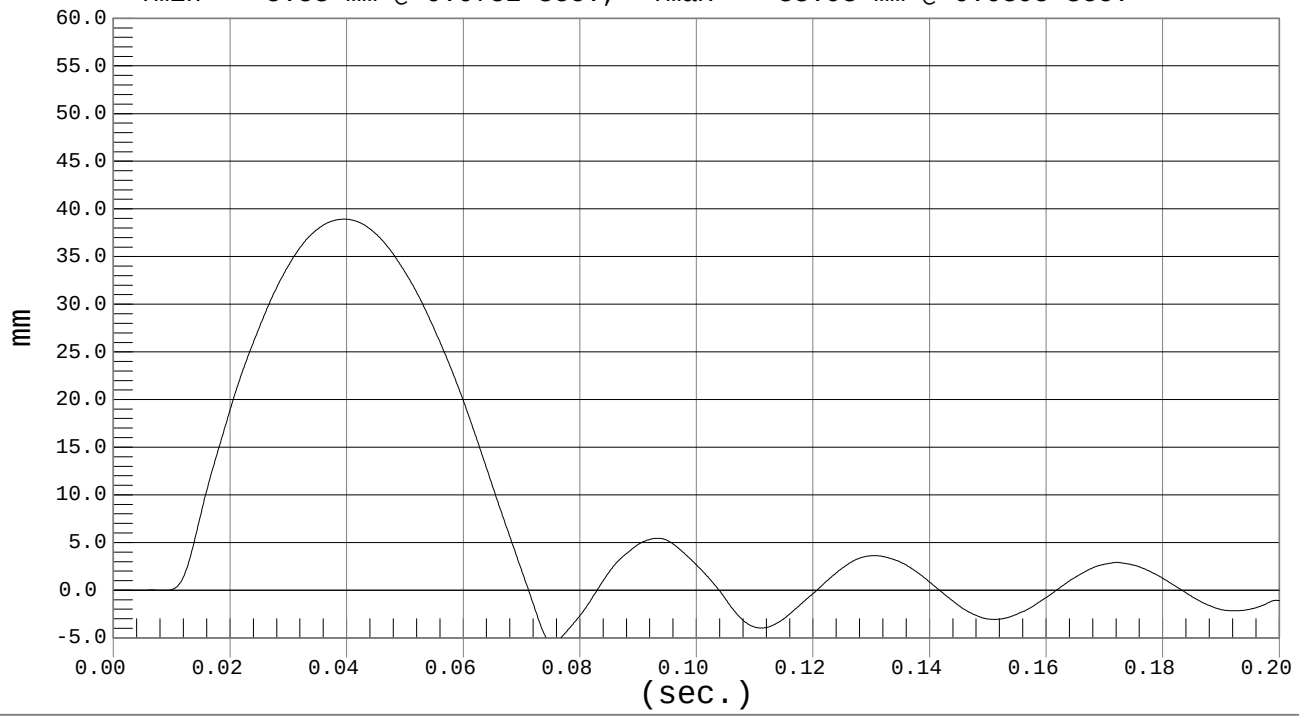


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -5.53 mm @ 0.0752 sec., Ymax = 38.93 mm @ 0.0395 sec.

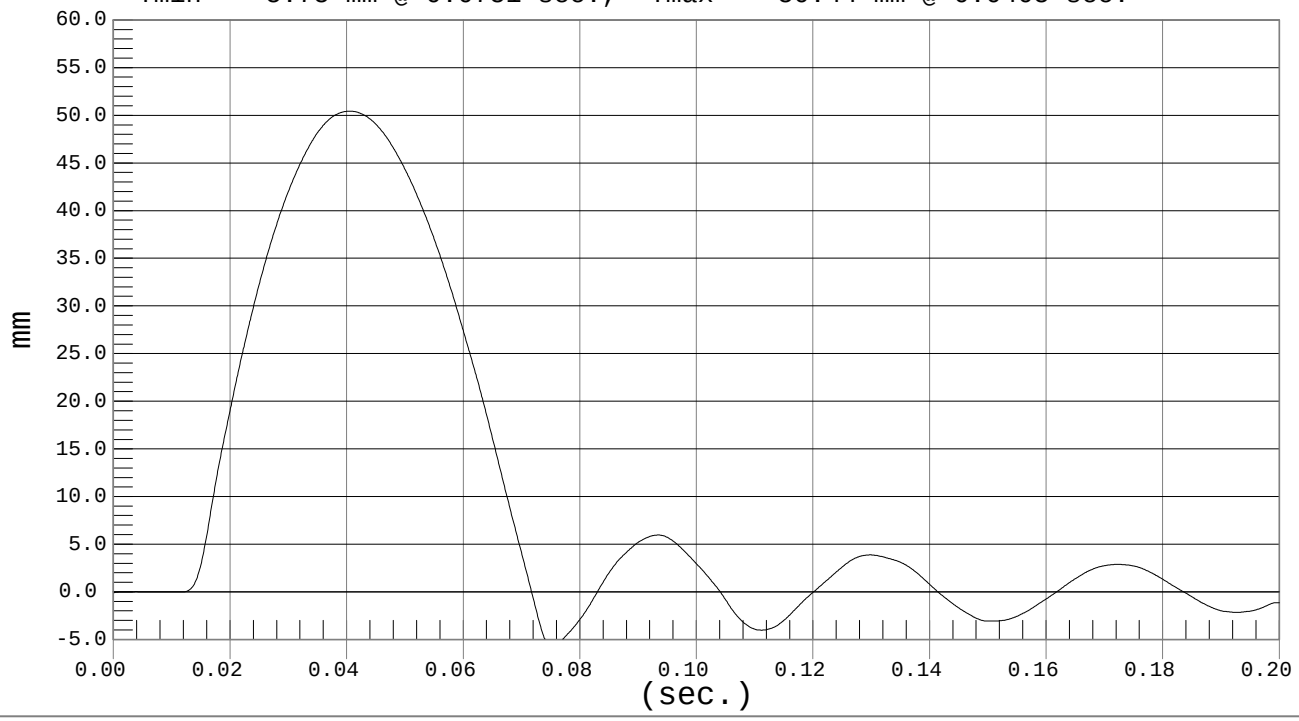


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-04-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -5.75 mm @ 0.0751 sec., Ymax = 50.44 mm @ 0.0405 sec.



MGA RESEARCH CORPORATION

ABDOMEN TEST

EUROSID 2 DUMMY

Date: 3/5/03

Dummy Serial Number: 010

Test Number: D03257

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.7
Relative Humidity (%)	10 – 70	20
Probe Speed (m/s)	3.90 – 4.10	4.07
Maximum Impact Force	4.00 – 4.80 kN	4.52
Time of Maximum Force	10.60 – 13.00 ms	10.60
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.60
Time of Max. Total Force	10.00 – 12.30 ms	10.80

TEST MEETS SPECIFICATIONS

Technician: _____

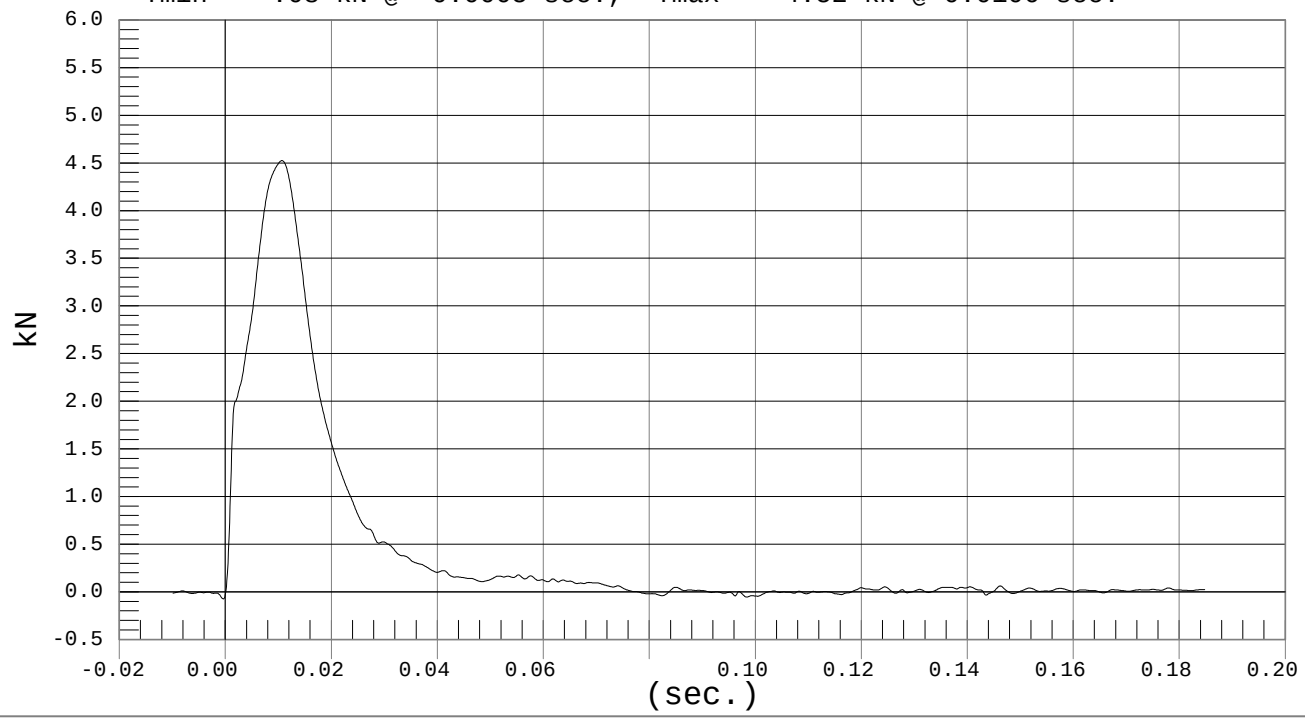
Approved By: _____

IMPACTOR FORCE

Test Desc.: Abdomen Impact
Component: Dummy #010

Test Date: 03-05-03
Speed: 13.3 fps, 4.07 M/s

Ymin = -.08 kN @ -0.0005 sec., Ymax = 4.52 kN @ 0.0106 sec.

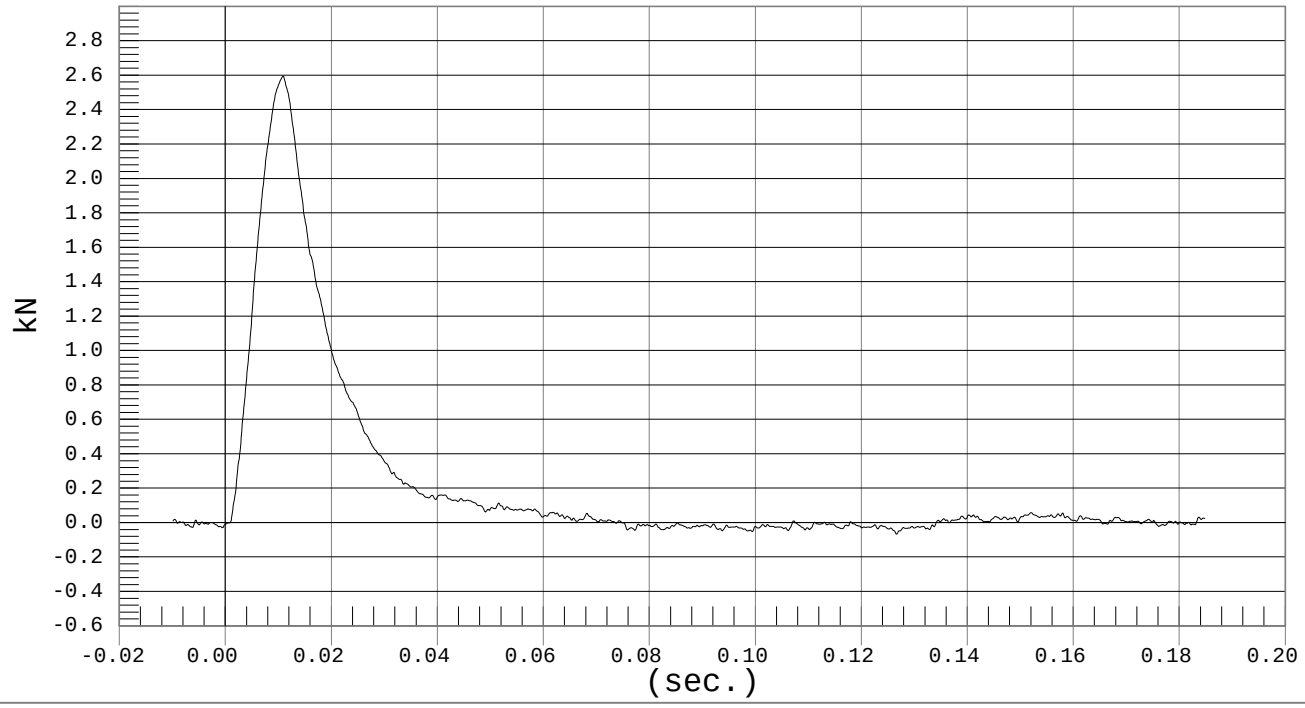


ABDOMEN FORCE

Test Desc.: Abdomen Impact
Component: Dummy #010

Test Date: 03-05-03
Speed: 13.3 fps, 4.07 M/s

Ymin = -.07 kN @ 0.1266 sec., Ymax = 2.6 kN @ 0.0108 sec.



MGA RESEARCH CORPORATION

LUMBAR SPINE TEST

EUROSID 2 DUMMY

Date: 3/4/03

Dummy Serial Number: 010

Test Number: D03258

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	20.7
Relative Humidity (%)		10 – 70	22
Pendulum Speed		5.95 – 6.15	6.11
Pendulum Deceleration	10 msec	-2.46 - -1.59 m/sec	-1.81
	20 msec	-5.25 - -4.07 m/sec	-4.07
	25 msec	-6.64 - -5.30 m/sec	-5.31
	30 msec	≥ -6.5 m/sec	-5.97
Maximum Flexion Angle		45.0 – 55.0 deg	51.7
Time of Max. Flexion Angle		39.0 – 53.0 ms	48.7
Maximum Angle Theta (A)		31.0 – 35.0 deg	32.7
Time of Max. Theta (A)		44.0 – 52.0 ms	48.7
Maximum Angle Theta (B)		28.16– 30.66 deg	30.16
Time of Max. Theta (B)		44.0 – 52.0 ms	48.6

TEST MEETS SPECIFICATIONS

Technician: _____

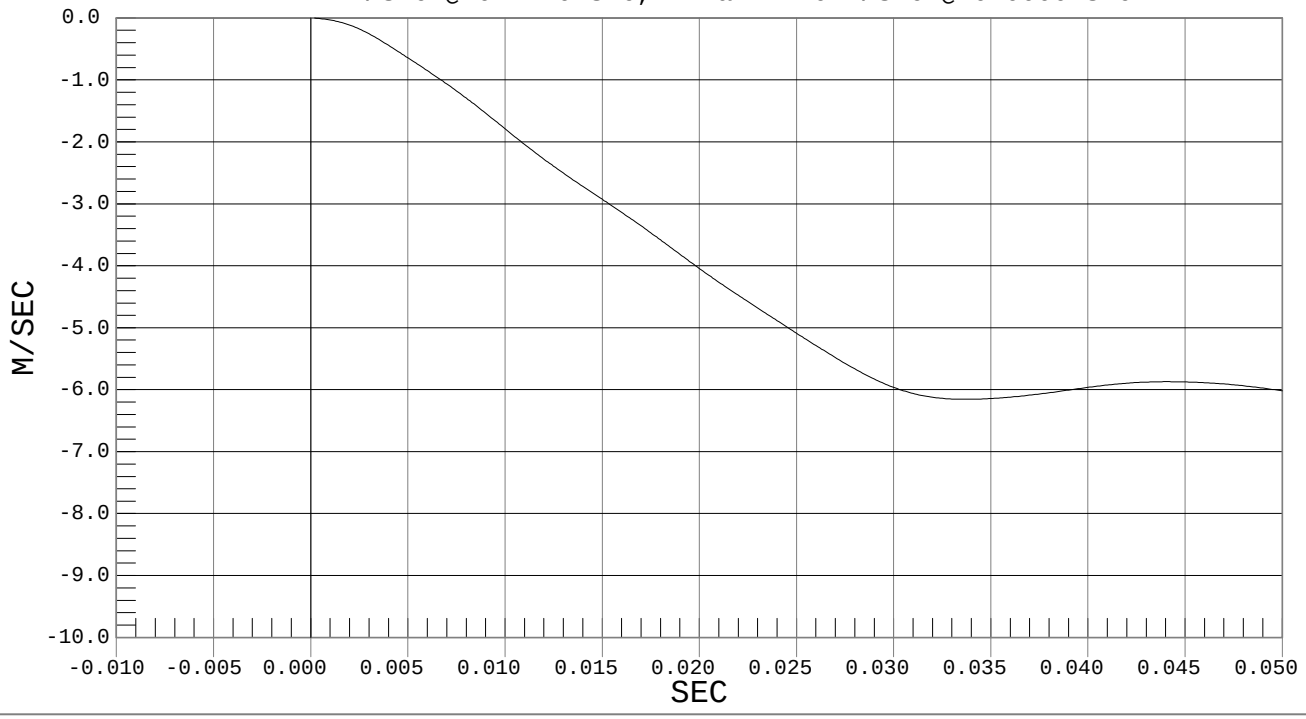
Approved By: _____

PENDULUM DECELERATION

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-04-03
Speed: 20.0 fps, 6.11 M/s

Ymin = -7.47 M/SEC @ 0.1470 SEC, Ymax = 0 M/SEC @ 0.0000 SEC

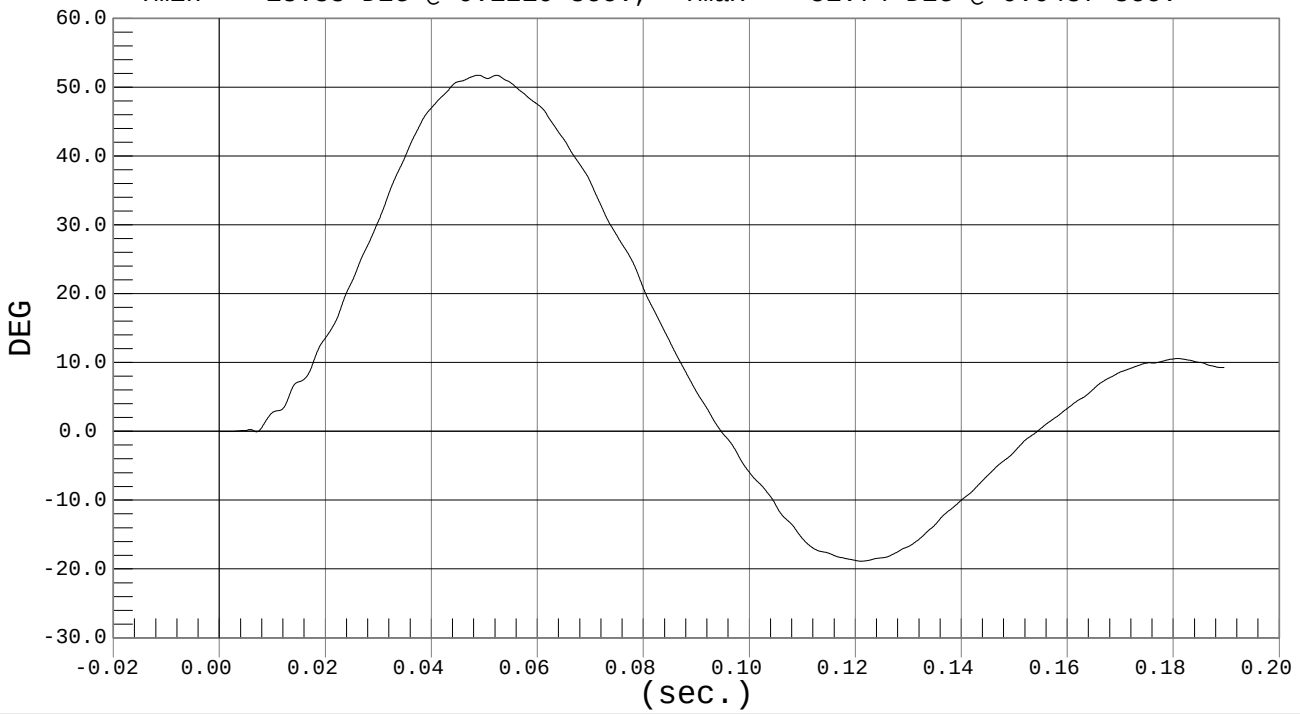


FLEXION ANGLE

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-04-03
Speed: 20.0 fps, 6.11 M/s

Ymin = -18.88 DEG @ 0.1210 sec., Ymax = 51.74 DEG @ 0.0487 sec.

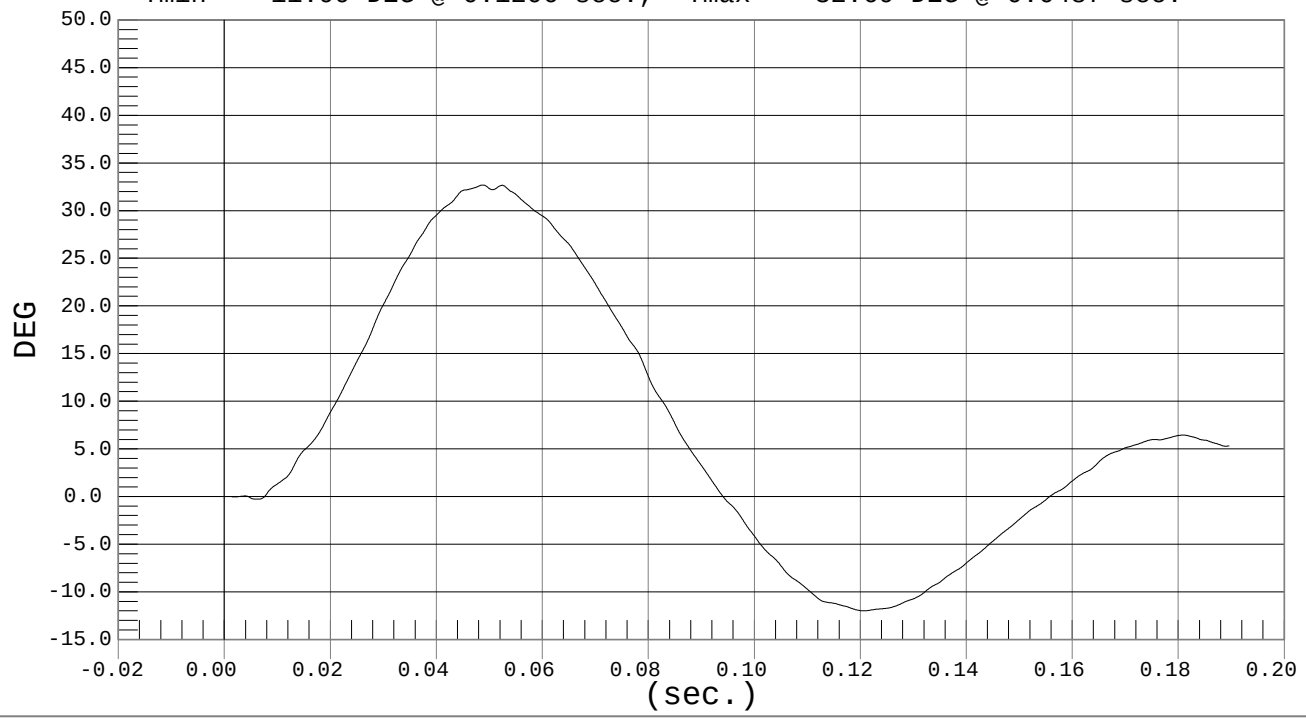


THETA A

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-04-03
Speed: 20.0 fps, 6.11 M/s

Ymin = -11.99 DEG @ 0.1206 sec., Ymax = 32.69 DEG @ 0.0487 sec.

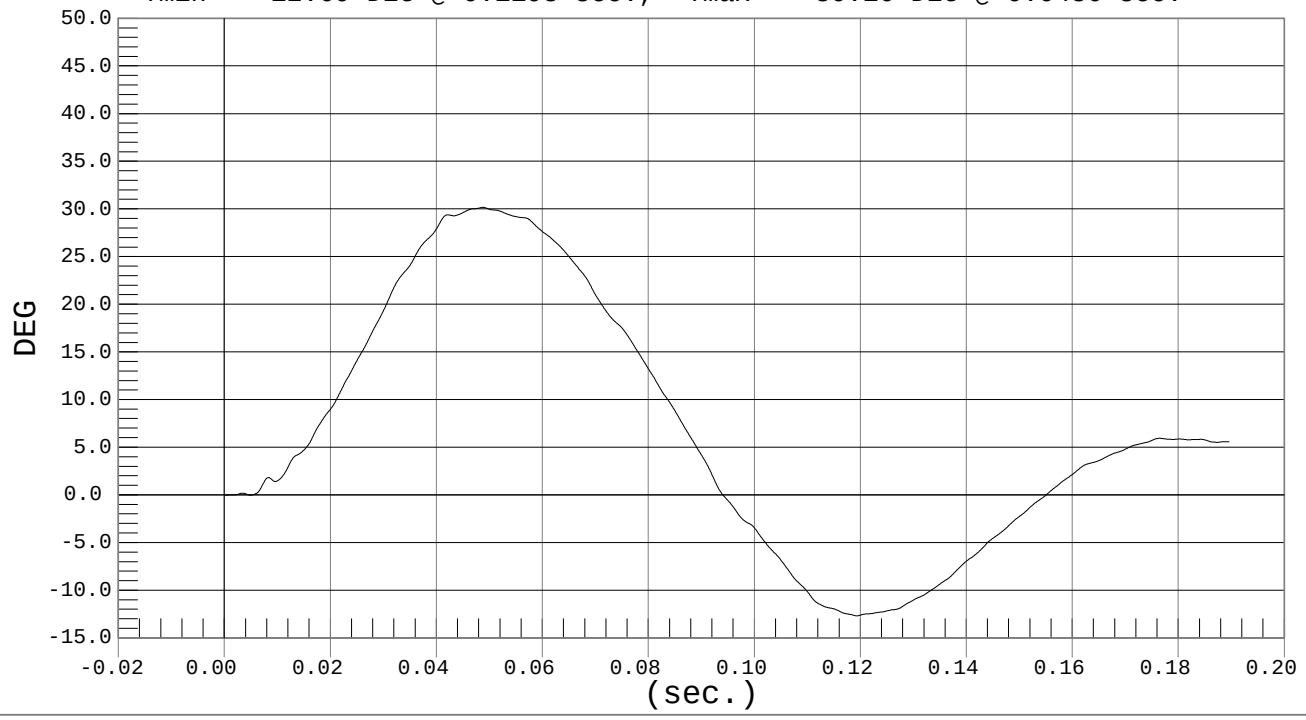


THETA B

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-04-03
Speed: 20.0 fps, 6.11 M/s

Ymin = -12.69 DEG @ 0.1193 sec., Ymax = 30.16 DEG @ 0.0486 sec.



MGA RESEARCH CORPORATION

PELVIS TEST

EUROSID 2 DUMMY

Date: 3/5/03

Dummy Serial Number: 010

Test Number: D03259

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	20
Pendulum Speed	4.20 – 4.40 m/s	4.30
Maximum Impactor Force	4.40 – 5.40 kN	4.81
Time of Max. Impactor Force	10.30 – 15.50 ms	13.00
Maximum Pubic Force	1.04 – 1.64 kN	1.37
Time of Max. Pubic Force	9.90 – 15.90 ms	14.10

TEST MEETS SPECIFICATIONS

Technician: _____

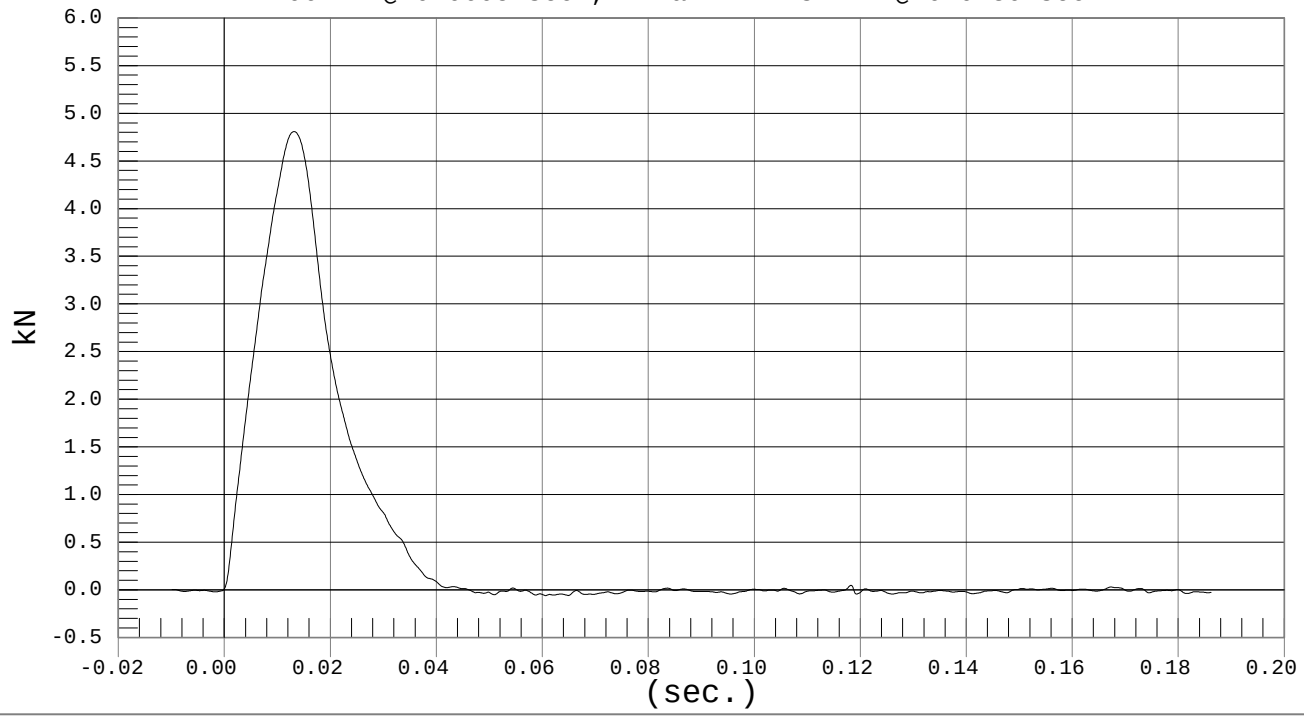
Approved By: _____

IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #010

Test Date: 03-05-03
Speed: 14.1 fps, 4.30 M/s

Ymin = -.06 kN @ 0.0605 sec., Ymax = 4.81 kN @ 0.0130 sec.

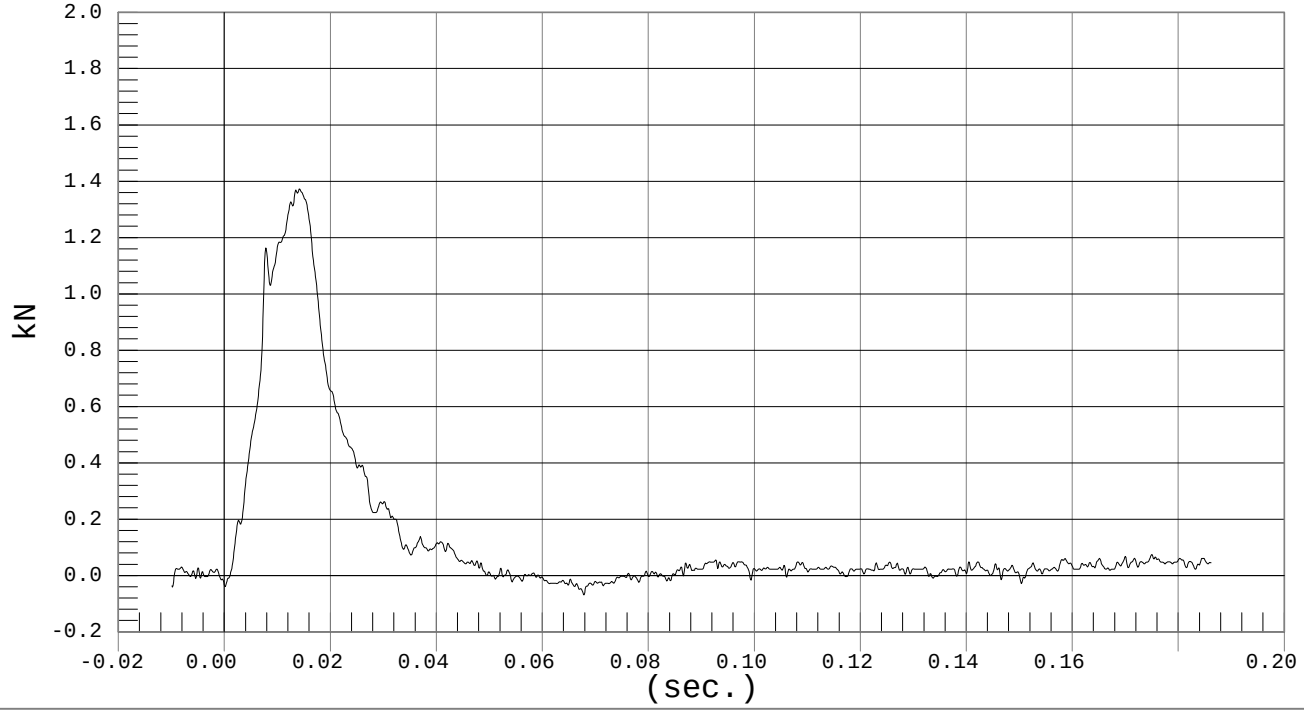


PUBIC FORCE

Test Desc.: Pelvis Impact
Component: Dummy #010

Test Date: 03-05-03
Speed: 14.1 fps, 4.30 M/s

Ymin = -.07 kN @ 0.0677 sec., Ymax = 1.37 kN @ 0.0141 sec.



CERTIFICATION DATA

Dummy Serial Number: 009

Calibration Test Results Summary

Dummy Serial Number: 009

Post-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Rib Tests:	All ribs passed all impact test requirements.
Abdomen Test:	The abdomen passed all impact test requirements.
Lumbar Spine Test:	The lumbar spine passed all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION

HEAD DROP TEST

EUROSID 2 DUMMY

Date: 3/9/03

Dummy Serial Number: 009

Test Number: D03261

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.9
Relative Humidity (%)	10 – 70	20
Peak Resultant Acceleration	100 – 150 g's	134
Time of Max. Res. Acceleration	msec	2.5

TEST MEETS SPECIFICATIONS

Technician: _____

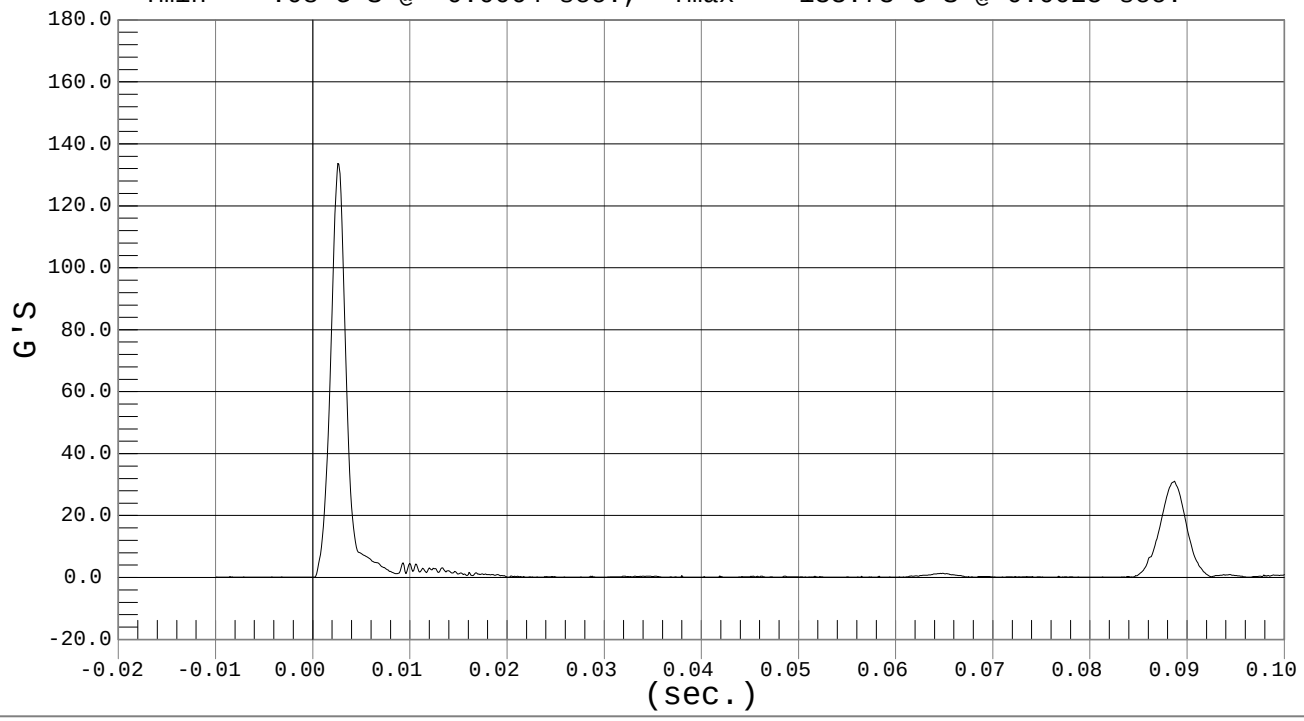
Approved By: _____

PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #009

Test Date: 03-09-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .08 G'S @ -0.0064 sec., Ymax = 133.73 G'S @ 0.0025 sec.



MGA RESEARCH CORPORATION

NECK PENDULUM TEST

EUROSID 2 DUMMY

Date: 3/9/03

Dummy Serial Number: 009

Test Number: D03262

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	20.0
Relative Humidity (%)		10 – 70	13
Pendulum Speed		3.3 - 3.5	3.4
Pendulum Deceleration	3 msec	¯.25 - ¯.53 m/sec	-.35
	8 msec	¯1.59 - ¯2.04 m/sec	-1.72
	14 msec	¯3.20 - ¯3.85 m/sec	-3.39
Maximum Flexion Angle		49.0 – 59.0 deg	58.0
Time of Max. Flexion Angle		54.0 – 66.0 ms	61.4
Maximum Angle Theta (A)		32.0 – 37.0 deg	35.3
Time of Max. Theta (A)		53.0 – 63.0 ms	56.8
Maximum Angle Theta (B)		30.43 – 32.84 deg	32.78
Time of Max. Theta (B)		54.0 – 64.0 ms	59.8

TEST MEETS SPECIFICATIONS

Technician: _____

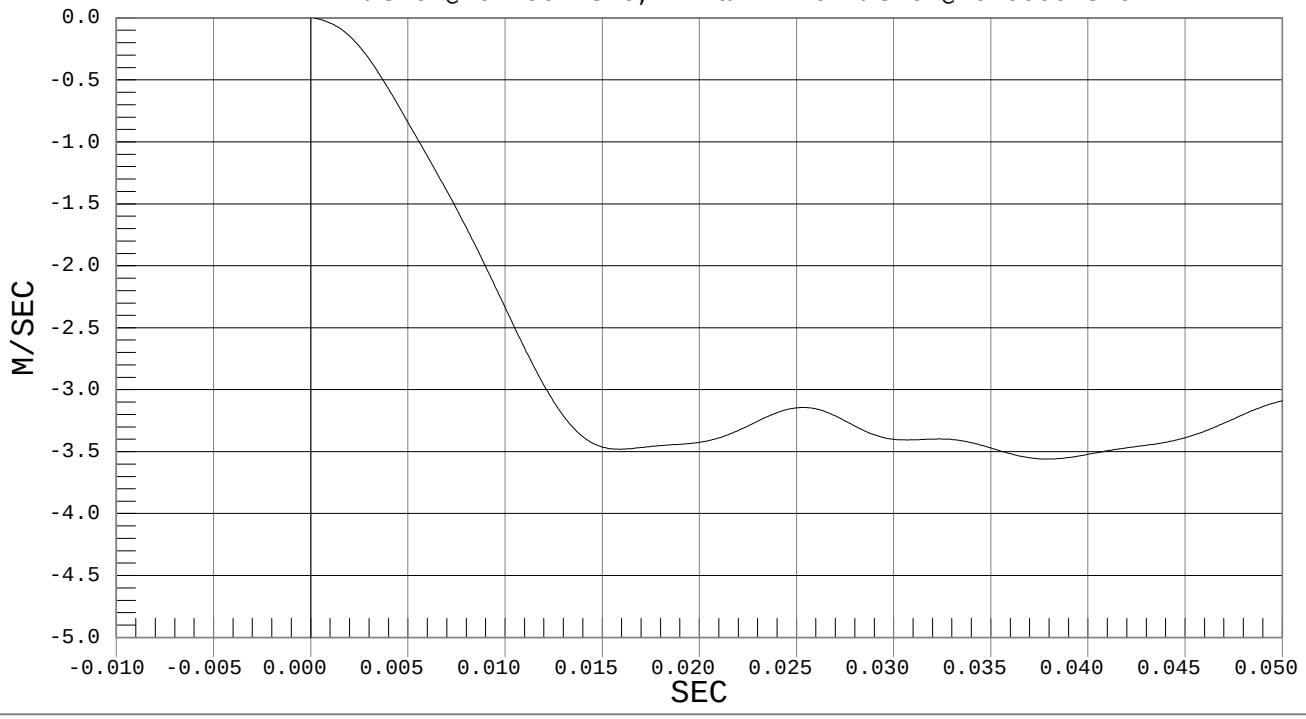
Approved By: _____

PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #009

Test Date: 03-09-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -4.42 M/SEC @ 0.1907 SEC, Ymax = 0 M/SEC @ 0.0000 SEC

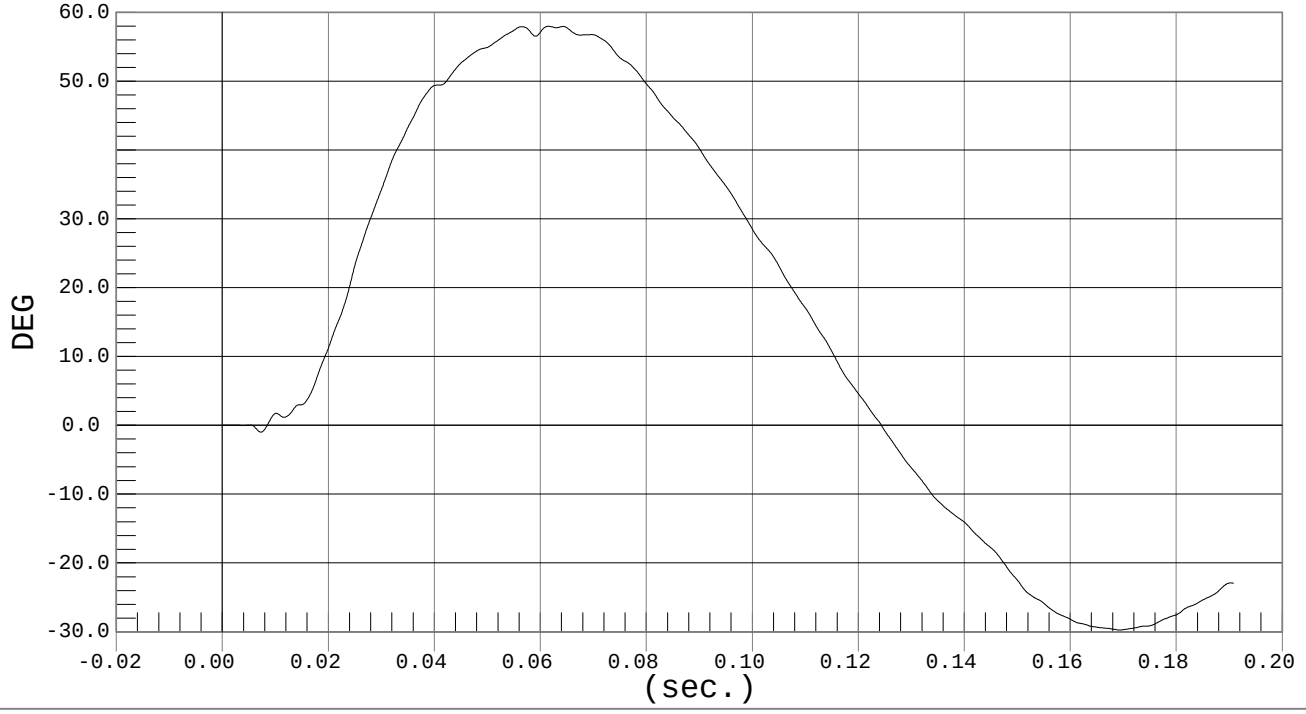


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #009

Test Date: 03-09-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -29.73 DEG @ 0.1691 sec., Ymax = 57.96 DEG @ 0.0614 sec.

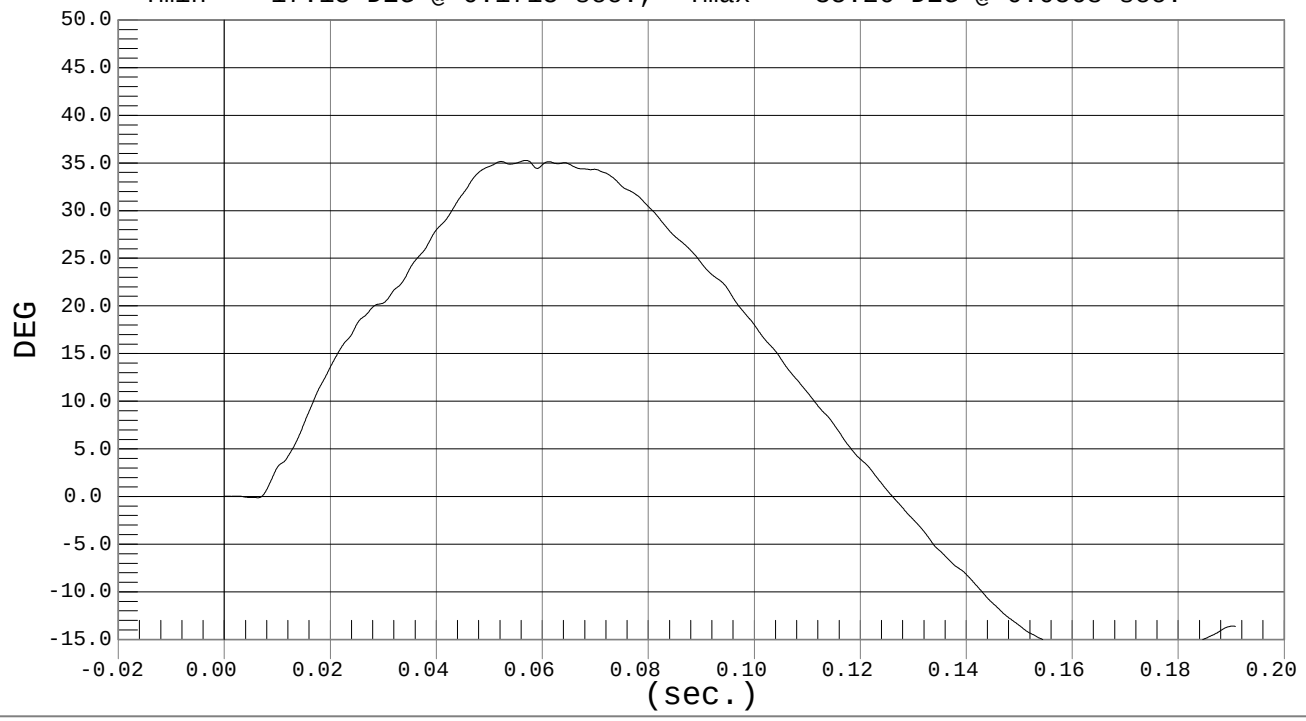


THETA A

Test Desc.: Neck Bending
Component: Dummy #009

Test Date: 03-09-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -17.15 DEG @ 0.1715 sec., Ymax = 35.26 DEG @ 0.0568 sec.

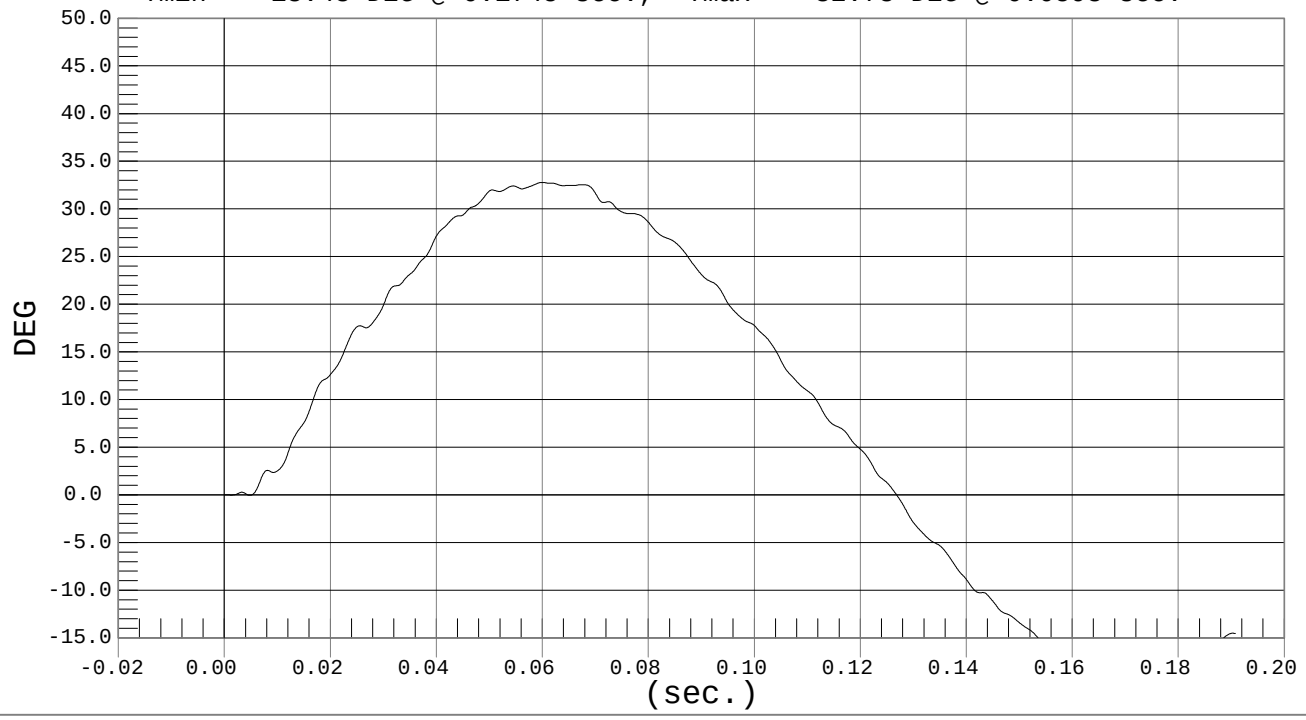


THETA B

Test Desc.: Neck Bending
Component: Dummy #009

Test Date: 03-09-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -18.48 DEG @ 0.1745 sec., Ymax = 32.78 DEG @ 0.0598 sec.



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

EUROSID 2 DUMMY

Date: 3/10/03

Dummy Serial Number: 009

Test Number: D03263

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	19.6
Relative Humidity (%)	10 – 70	19
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	9.7
Time of Max. Pendulum Acceleration	msec	15.7

TEST MEETS SPECIFICATIONS

Technician: _____

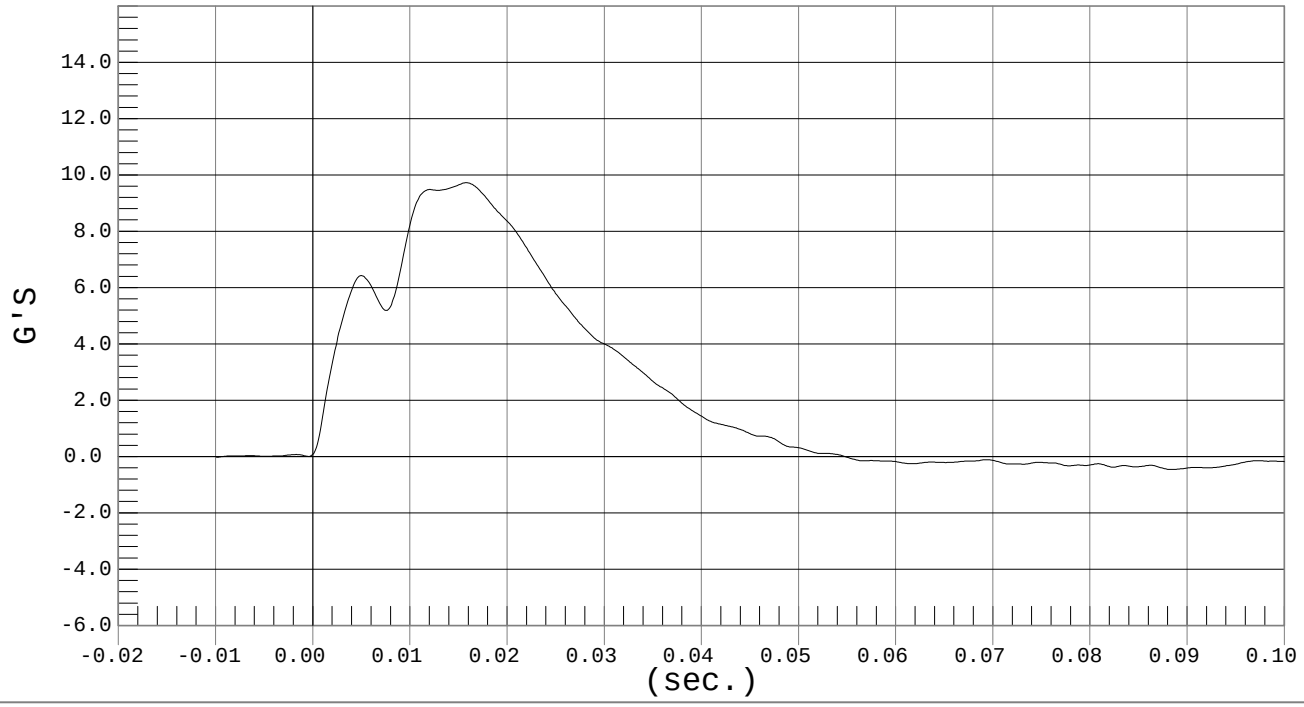
Approved By: _____

SHOULDER ACCELERATION

Test Desc.: Shoulder Impact
Component: Dummy #009

Test Date: 03-10-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -.52 G'S @ 0.1178 sec., Ymax = 9.73 G'S @ 0.0157 sec.



MGA RESEARCH CORPORATION

UPPER/MIDDLE/LOWER RIB TESTS

EUROSID 2 DUMMY

Date: 3/7/03

Dummy Serial Number: 09

Test Number: D03254/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	208
Relative Humidity (%)	10 – 70	15
Displacement at 2 m/s	23.5 – 27.5 mm	27.1
Displacement at 3 m/s	36.0 – 40.0 mm	39.7
Displacement at 4 m/s	46.0 – 51.0 mm	50.7

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	15
Displacement at 2 m/s	23.5 – 27.5 mm	25.4
Displacement at 3 m/s	36.0 – 40.0 mm	37.4
Displacement at 4 m/s	46.0 – 51.0 mm	48.2

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	15
Displacement at 2 m/s	23.5 – 27.5 mm	25.5
Displacement at 3 m/s	36.0 – 40.0 mm	37.7
Displacement at 4 m/s	46.0 – 51.0 mm	49.0

TEST MEETS SPECIFICATIONS

Technician: _____

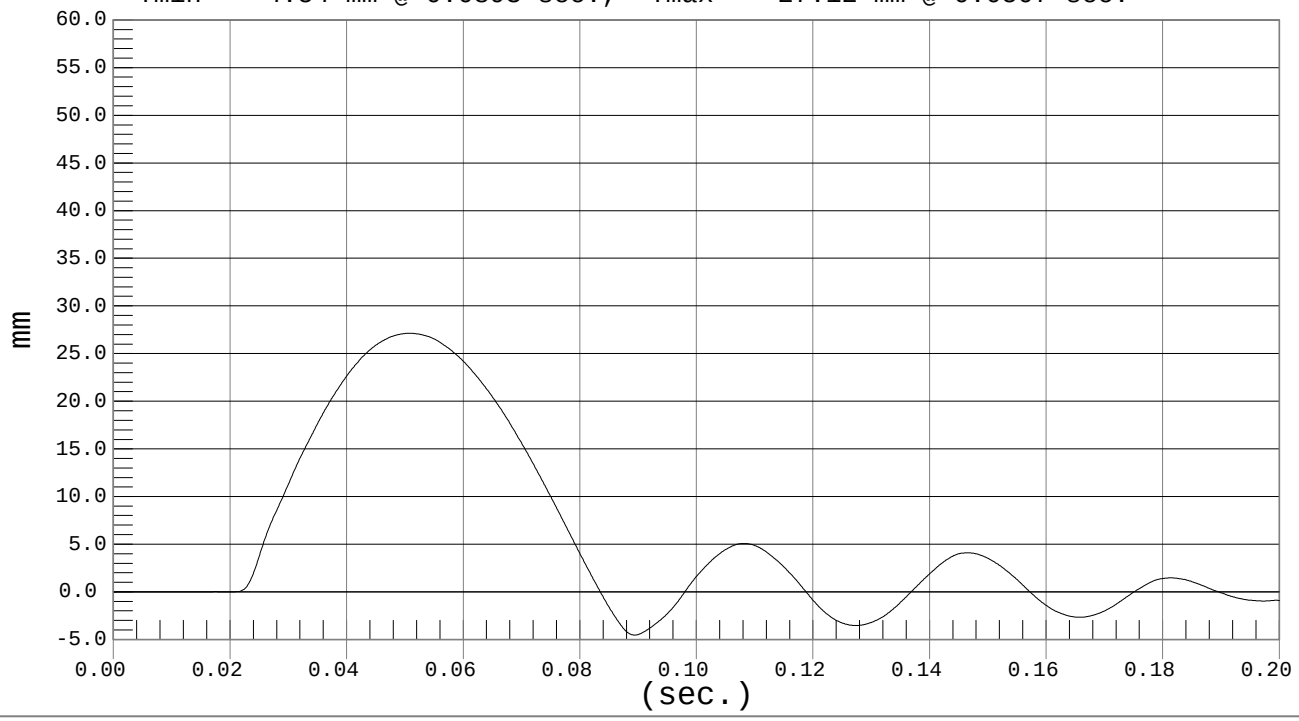
Approved By: _____

UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-07-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -4.54 mm @ 0.0893 sec., Ymax = 27.12 mm @ 0.0507 sec.

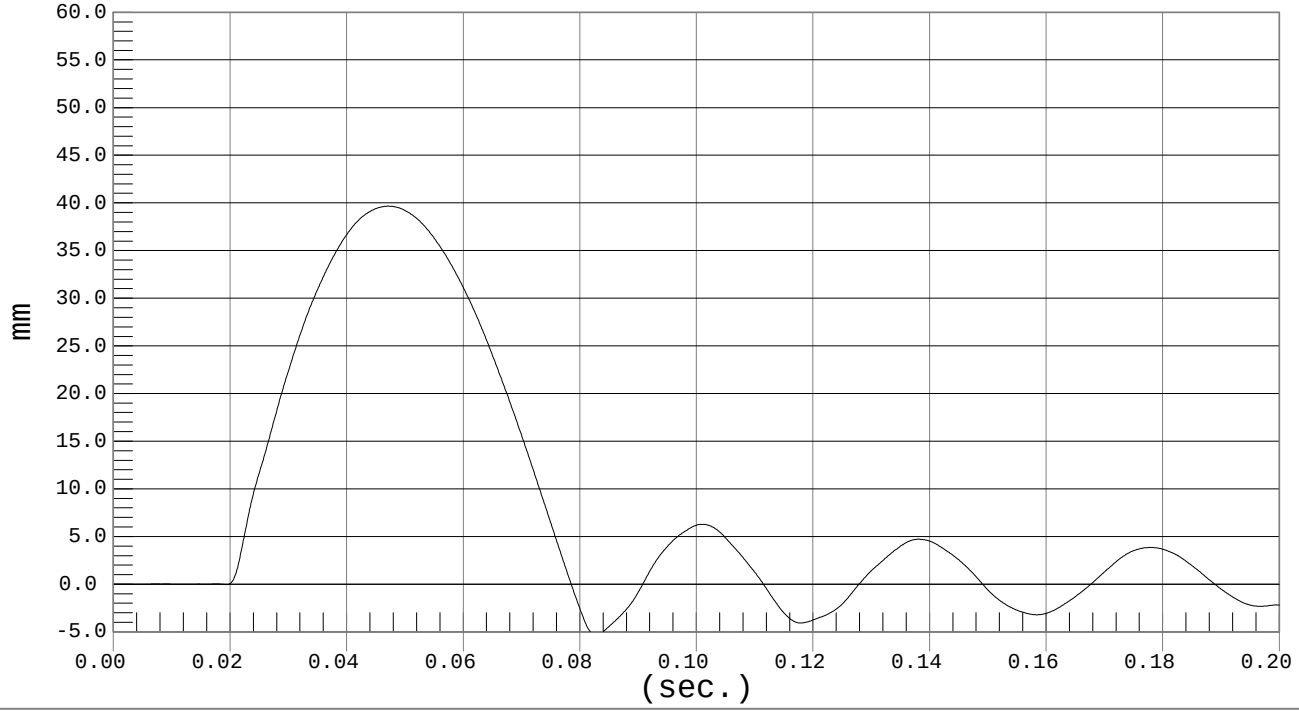


UPPER RIB DISPLACEMENT

Test Desc.: rib module
Component: Dummy #009

Test Date: 03-07-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -5.36 mm @ 0.0827 sec., Ymax = 39.66 mm @ 0.0470 sec.

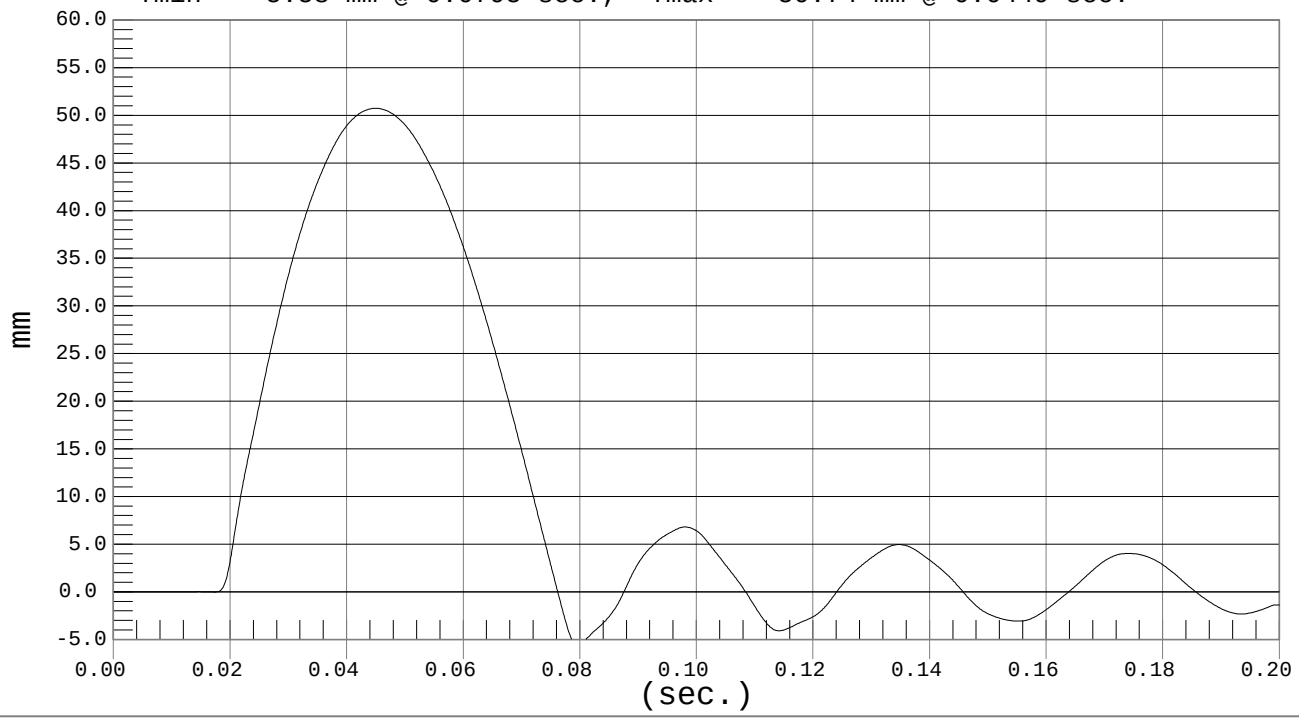


UPPER RIB DISPLACEMENT

Test Desc.: rib module
Component: Dummy #009

Test Date: 03-07-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -5.58 mm @ 0.0795 sec., Ymax = 50.74 mm @ 0.0449 sec.

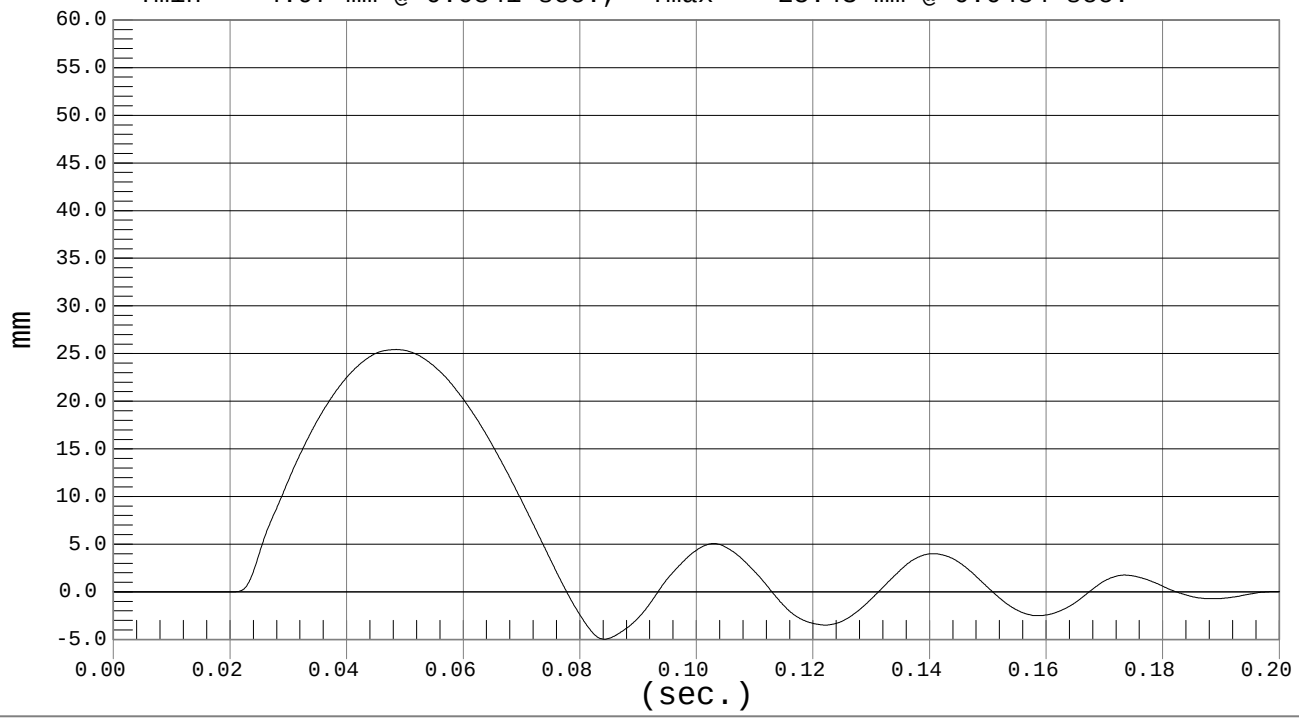


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-07-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -4.97 mm @ 0.0841 sec., Ymax = 25.43 mm @ 0.0484 sec.

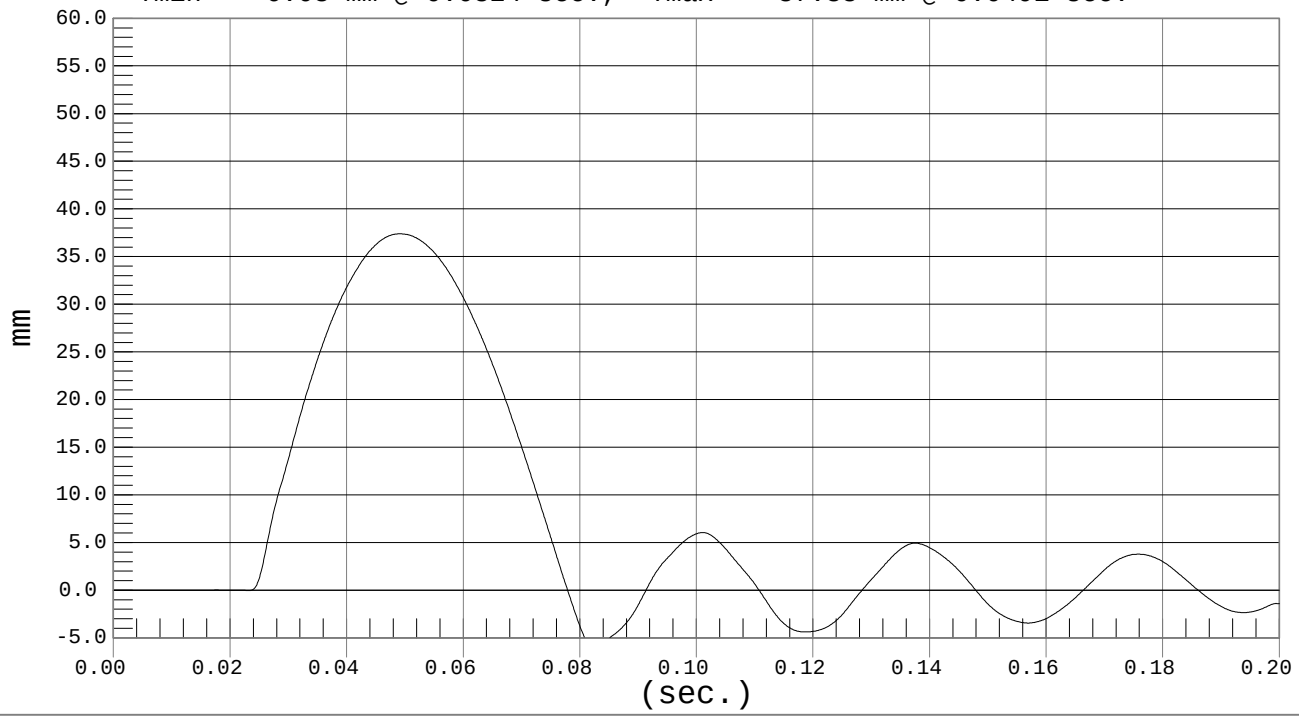


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-07-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -6.03 mm @ 0.0824 sec., Ymax = 37.38 mm @ 0.0491 sec.

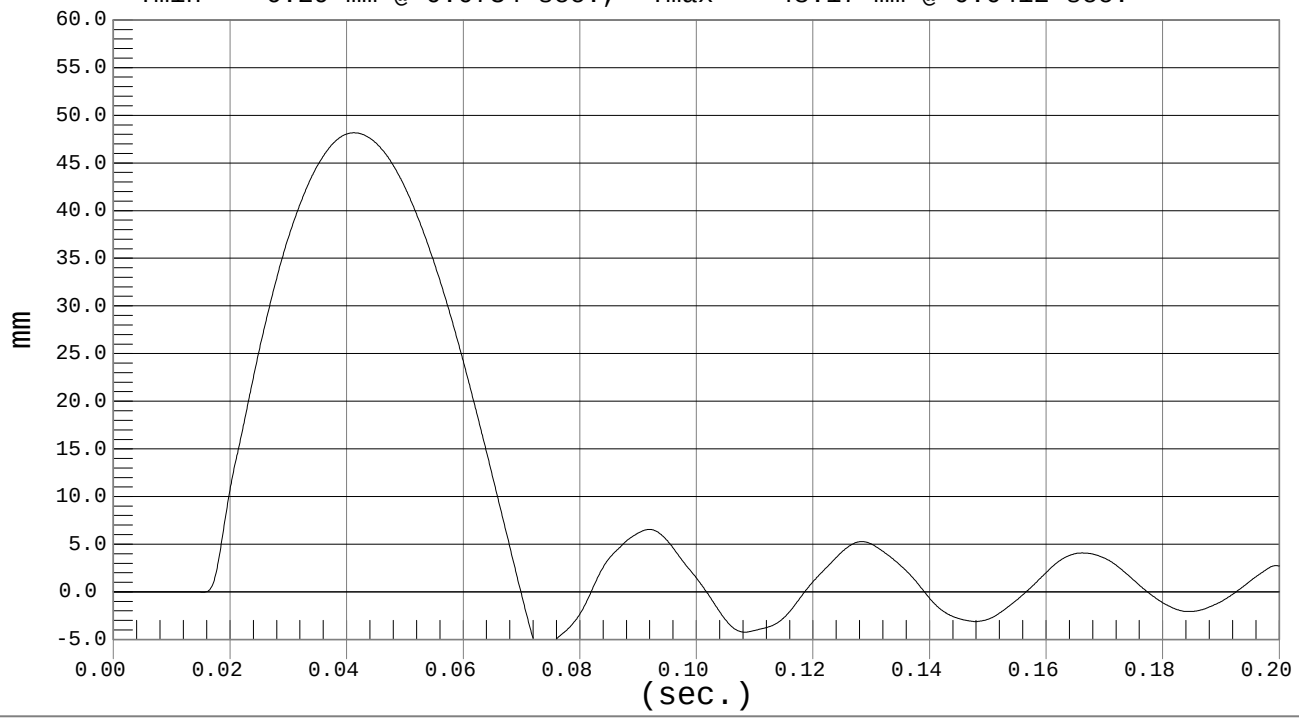


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-07-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -6.29 mm @ 0.0734 sec., Ymax = 48.17 mm @ 0.0412 sec.

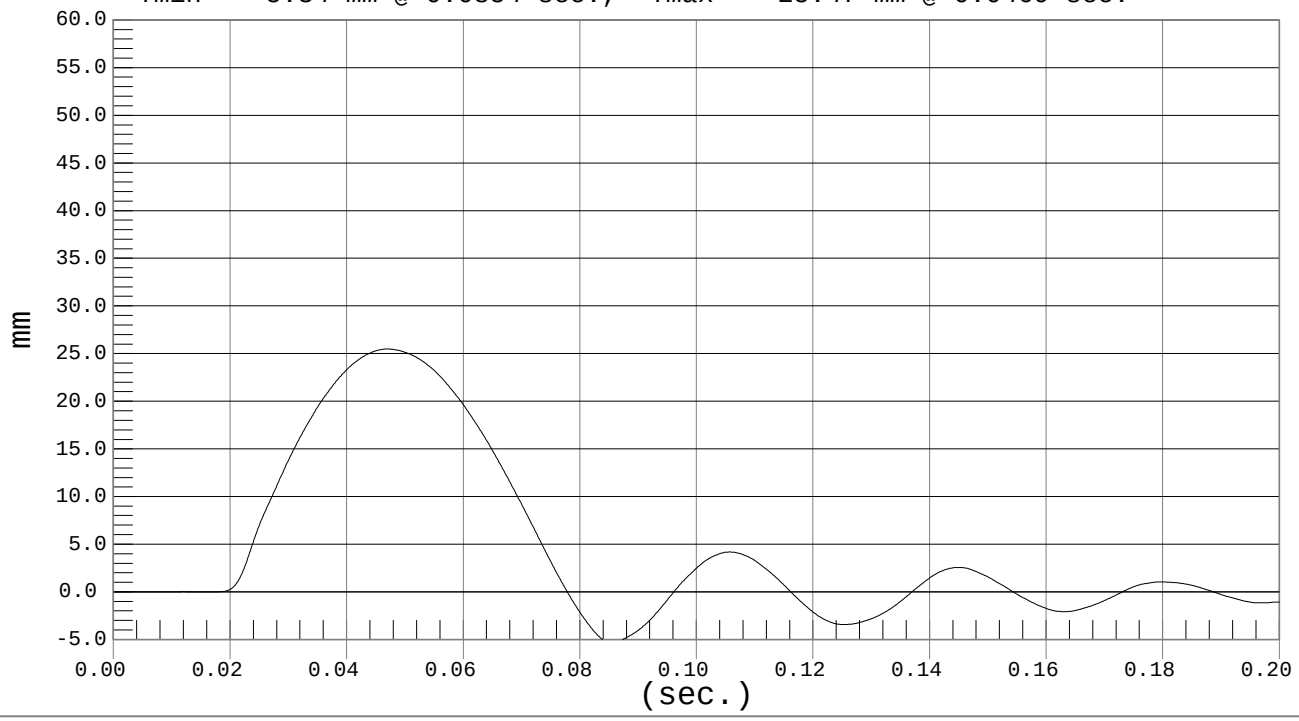


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-07-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -5.34 mm @ 0.0854 sec., Ymax = 25.47 mm @ 0.0469 sec.

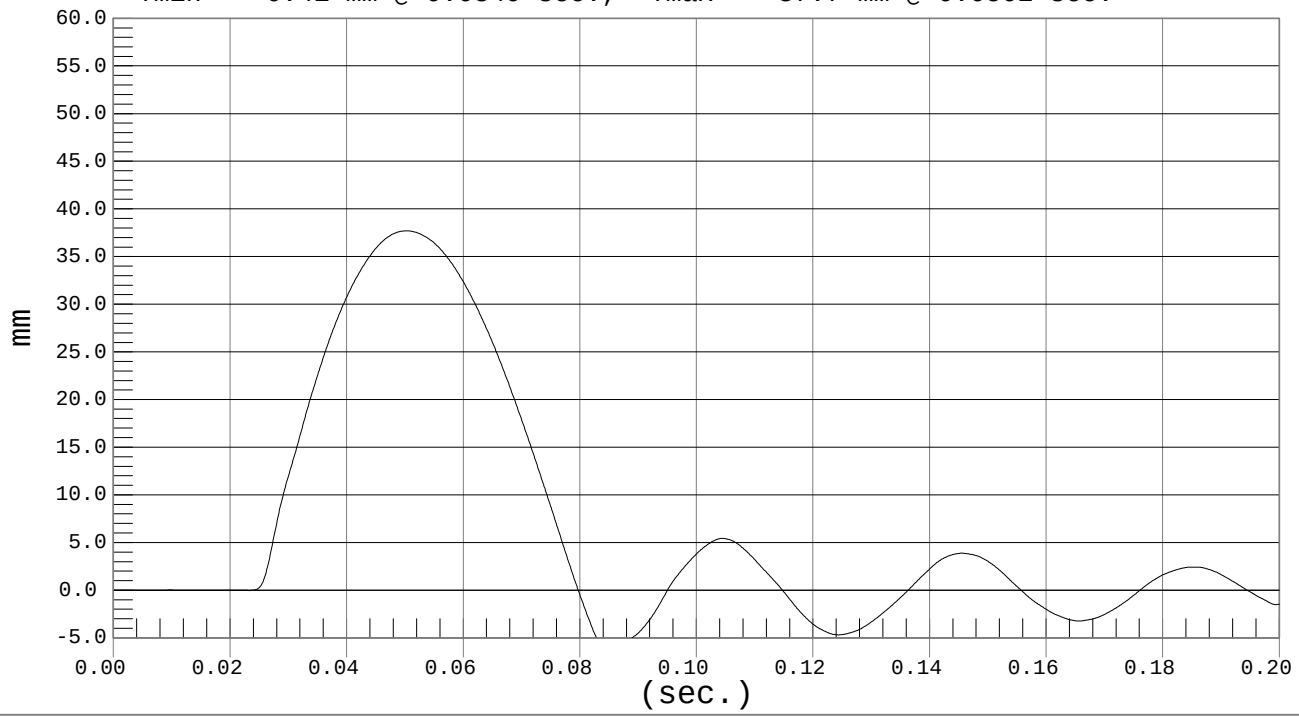


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-07-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -6.41 mm @ 0.0849 sec., Ymax = 37.7 mm @ 0.0502 sec.

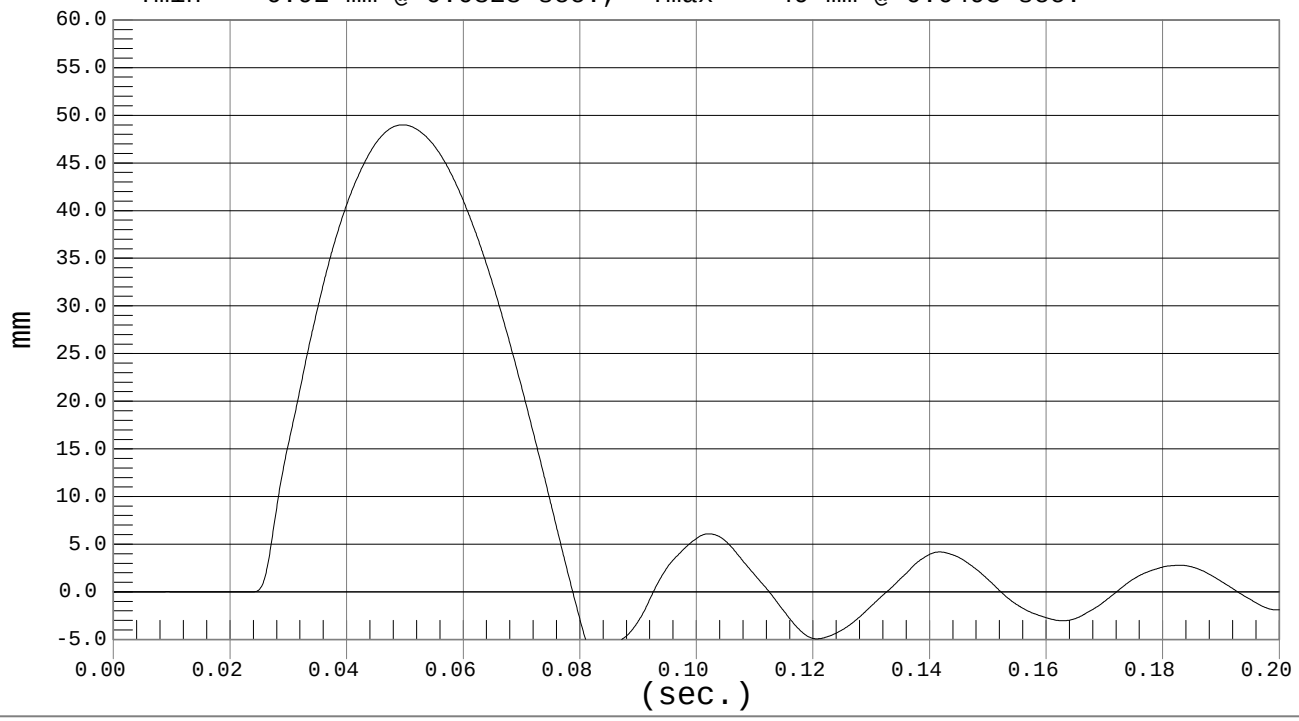


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #009

Test Date: 03-07-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -6.92 mm @ 0.0828 sec., Ymax = 49 mm @ 0.0495 sec.



MGA RESEARCH CORPORATION

ABDOMEN TEST

EUROSID 2 DUMMY

Date: 3/10/03

Dummy Serial Number: 009

Test Number: D03267

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	19.8
Relative Humidity (%)	10 – 70	19
Probe Speed (m/s)	3.90 – 4.10	4.00
Maximum Impact Force	4.00 – 4.80 kN	4.40
Time of Maximum Force	10.60 – 13.00 ms	10.90
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.39
Time of Max. Total Force	10.00 – 12.30 ms	10.20

TEST MEETS SPECIFICATIONS

Technician: _____

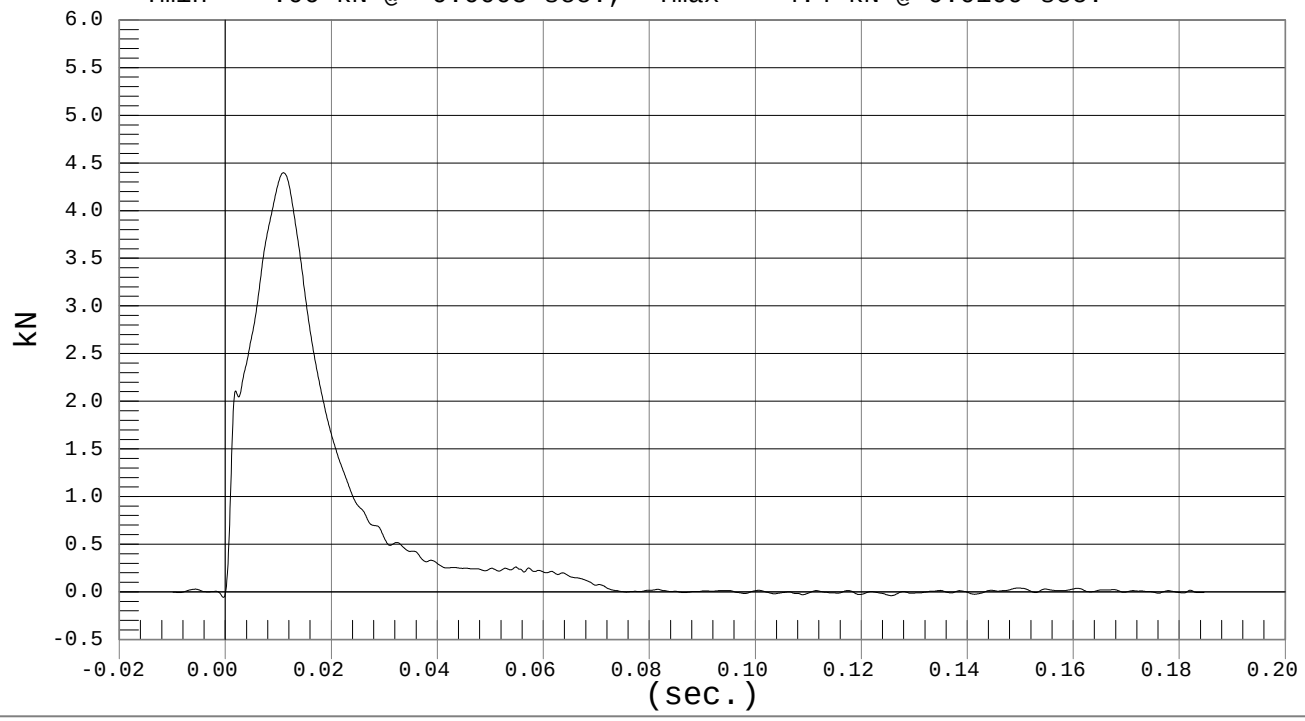
Approved By: _____

IMPACTOR FORCE

Test Desc.: Abdomen Impact
Component: Dummy #009

Test Date: 03-10-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -.06 kN @ -0.0005 sec., Ymax = 4.4 kN @ 0.0109 sec.

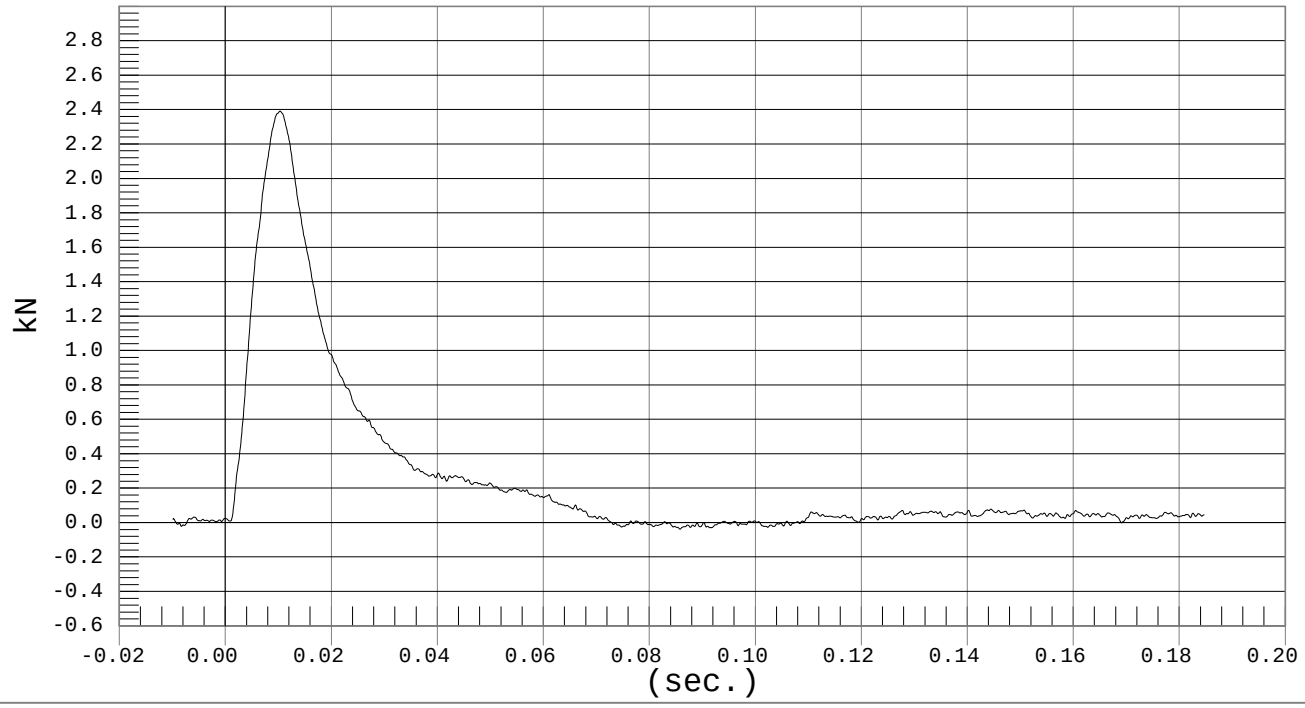


ABDOMEN FORCE

Test Desc.: Abdomen Impact
Component: Dummy #009

Test Date: 03-10-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -.04 kN @ 0.0857 sec., Ymax = 2.39 kN @ 0.0102 sec.



MGA RESEARCH CORPORATION

LUMBAR SPINE TEST

EUROSID 2 DUMMY

Date: 3/9/03

Dummy Serial Number: 009

Test Number: D03268

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	20.0
Relative Humidity (%)		10 – 70	15
Pendulum Speed		5.95 – 6.15	6.03
Pendulum Deceleration	10 msec	-2.46 - -1.59 m/sec	-1.99
	20 msec	-5.25 - -4.07 m/sec	-4.47
	25 msec	-6.64 - -5.30 m/sec	-5.60
	30 msec	≥ -6.5 m/sec	-6.25
Maximum Flexion Angle		45.0 – 55.0 deg	51.3
Time of Max. Flexion Angle		39.0 – 53.0 ms	47.7
Maximum Angle Theta (A)		31.0 – 35.0 deg	33.3
Time of Max. Theta (A)		44.0 – 52.0 ms	47.8
Maximum Angle Theta (B)		28.64– 31.14 deg	30.06
Time of Max. Theta (B)		44.0 – 52.0 ms	46.9

TEST MEETS SPECIFICATIONS

Technician: _____

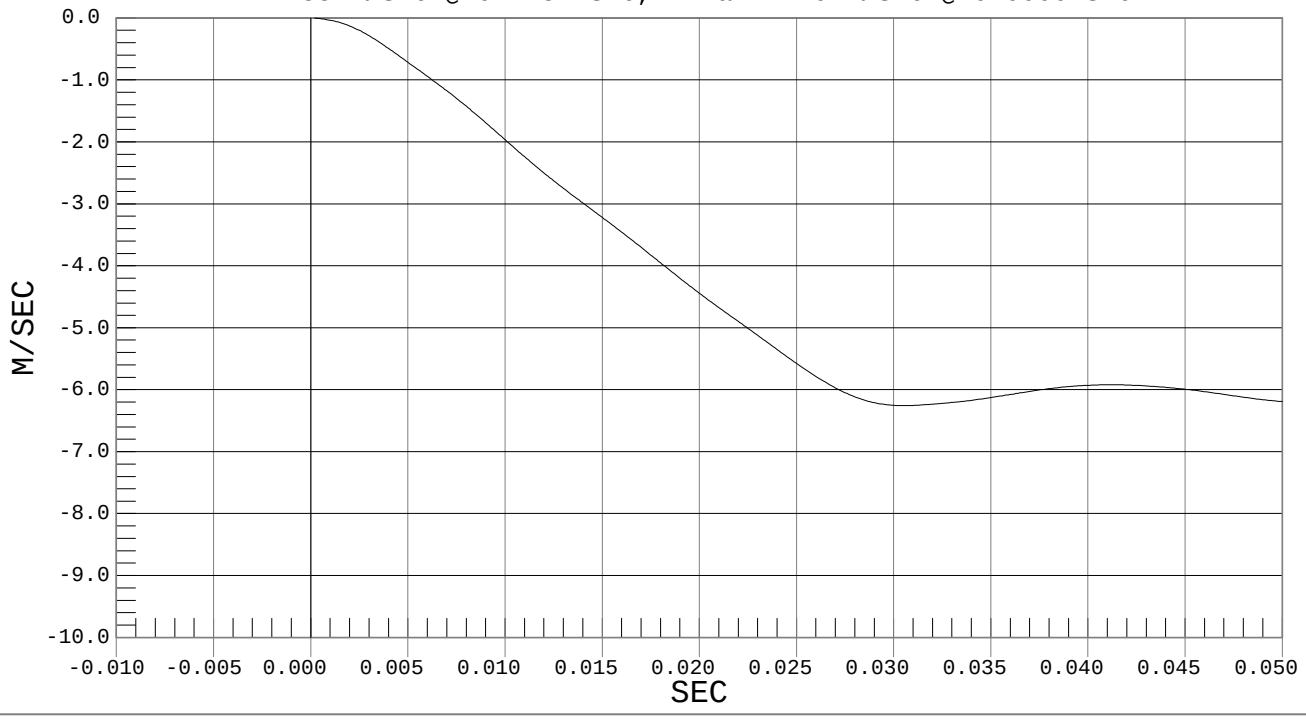
Approved By: _____

PENDULUM DECELERATION

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-09-03
Speed: 19.8 fps, 6.03 M/s

Ymin = -7.55 M/SEC @ 0.1454 SEC, Ymax = 0 M/SEC @ 0.0000 SEC

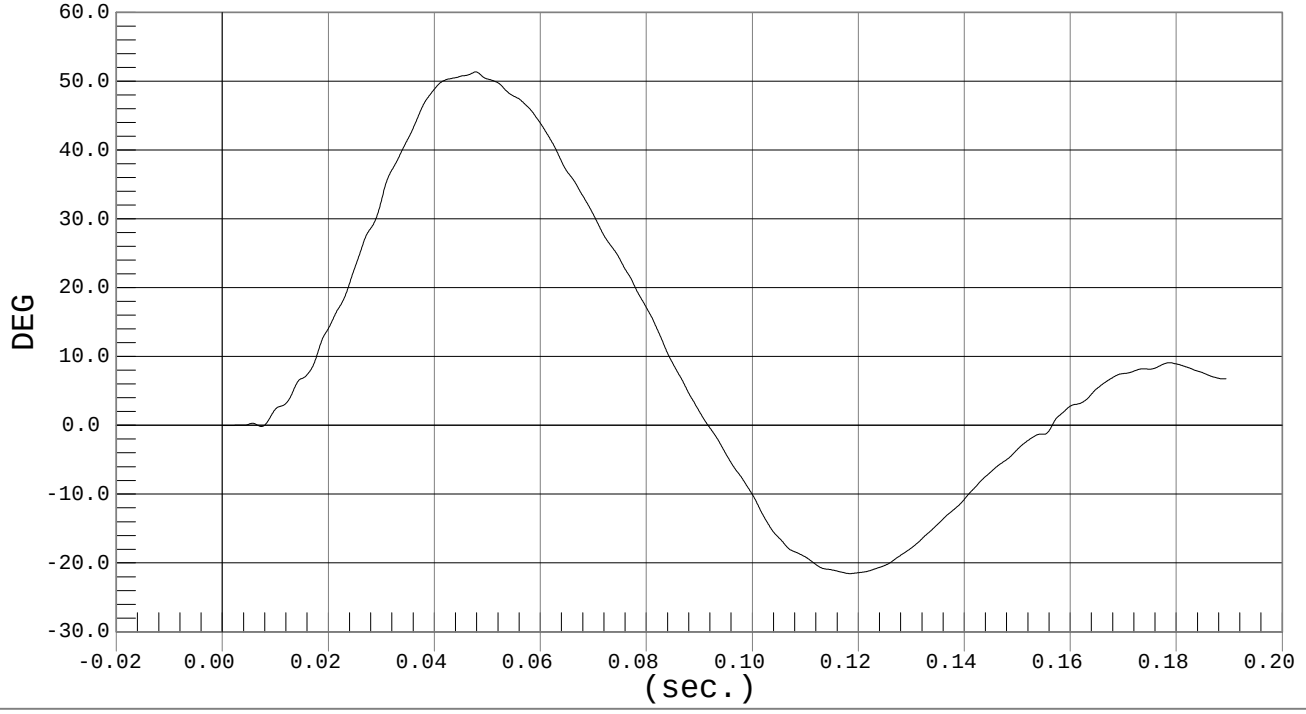


FLEXION ANGLE

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-09-03
Speed: 19.8 fps, 6.03 M/s

Ymin = -21.55 DEG @ 0.1183 sec., Ymax = 51.34 DEG @ 0.0477 sec.

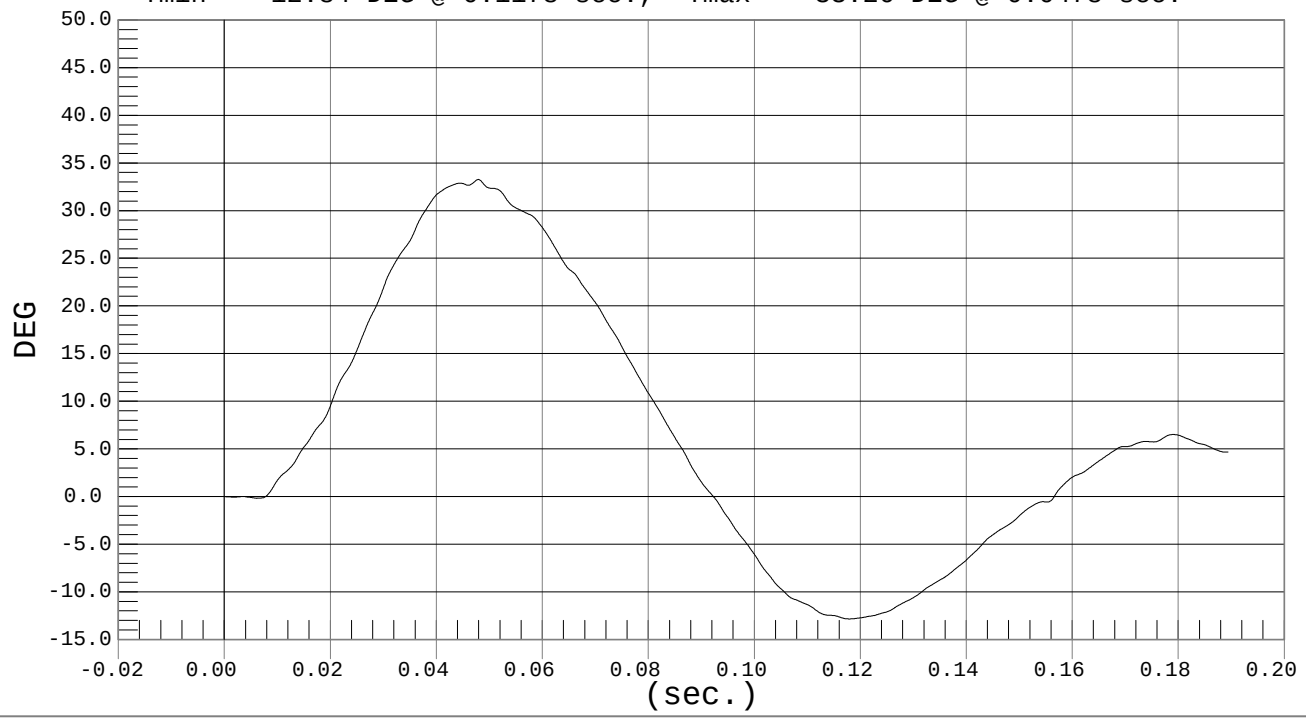


THETA A

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-09-03
Speed: 19.8 fps, 6.03 M/s

Ymin = -12.84 DEG @ 0.1178 sec., Ymax = 33.26 DEG @ 0.0478 sec.

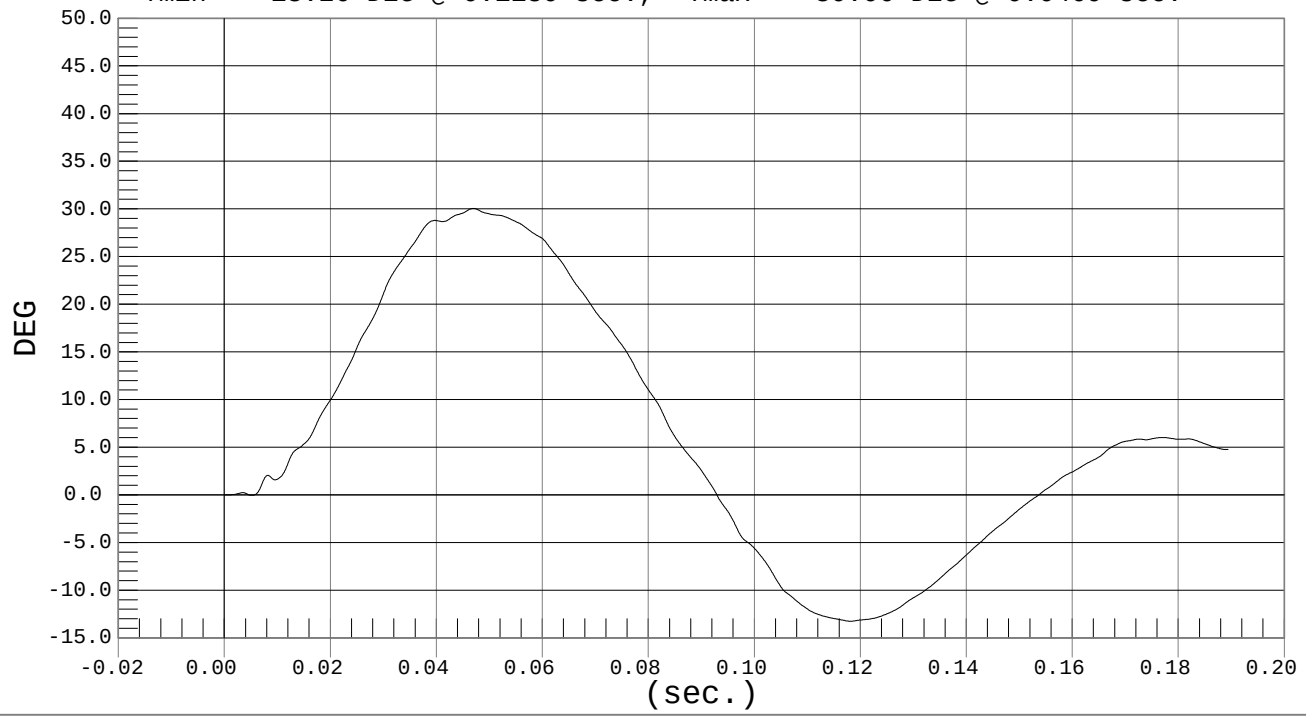


THETA B

Test Desc.: Lumbar Flexion
Component: Dummy #009

Test Date: 03-09-03
Speed: 19.8 fps, 6.03 M/s

Ymin = -13.26 DEG @ 0.1180 sec., Ymax = 30.06 DEG @ 0.0469 sec.



MGA RESEARCH CORPORATION

PELVIS TEST

EUROSID 2 DUMMY

Date: 3/10/03

Dummy Serial Number: 009

Test Number: D03269

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	19.8
Relative Humidity (%)	10 – 70	20
Pendulum Speed	4.20 – 4.40 m/s	4.29
Maximum Impactor Force	4.40 – 5.40 kN	4.54
Time of Max. Impactor Force	10.30 – 15.50 ms	13.90
Maximum Pubic Force	1.04 – 1.64 kN	1.28
Time of Max. Pubic Force	9.90 – 15.90 ms	14.30

TEST MEETS SPECIFICATIONS

Technician: _____

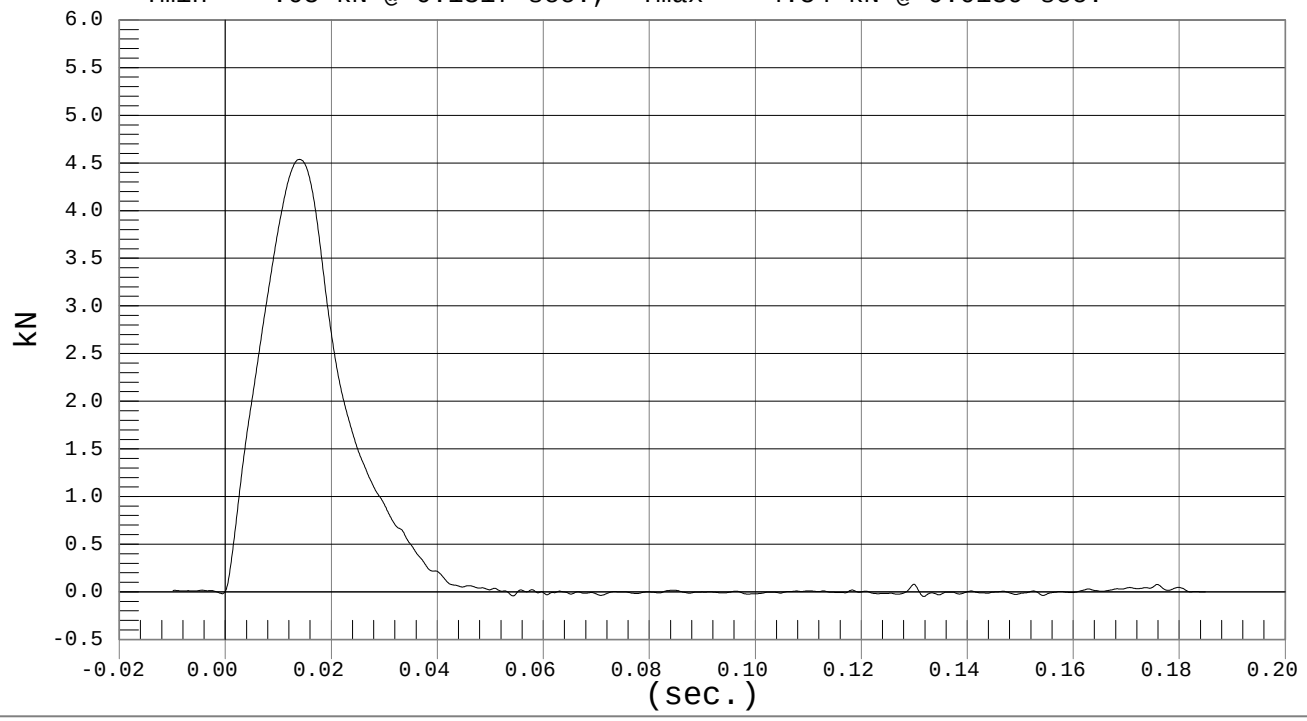
Approved By: _____

IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #009

Test Date: 03-10-03
Speed: 14.1 fps, 4.29 M/s

Ymin = -.05 kN @ 0.1317 sec., Ymax = 4.54 kN @ 0.0139 sec.

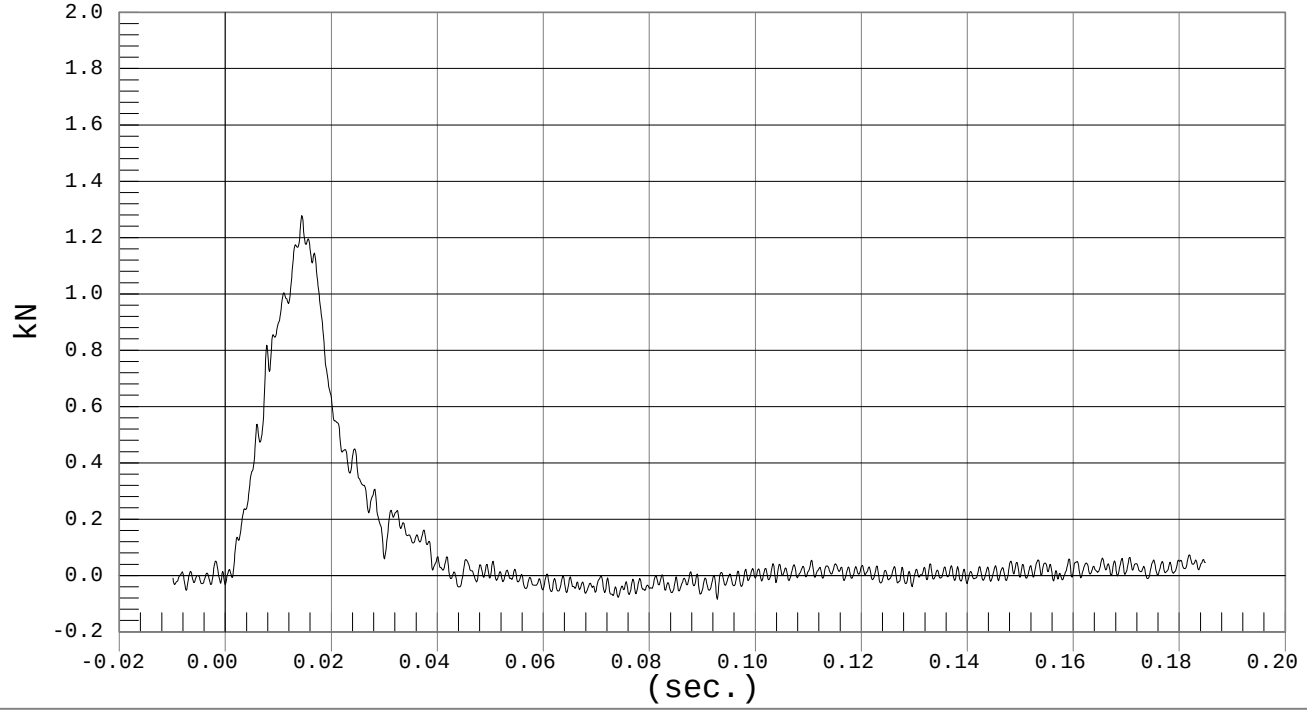


PUBIC FORCE

Test Desc.: Pelvis Impact
Component: Dummy #009

Test Date: 03-10-03
Speed: 14.1 fps, 4.29 M/s

Ymin = -.08 kN @ 0.0927 sec., Ymax = 1.28 kN @ 0.0143 sec.



CERTIFICATION DATA

Dummy Serial Number: 010

Calibration Test Results Summary

Dummy Serial Number: 010

Post-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Rib Tests:	All ribs passed all impact test requirements.
Abdomen Test:	The abdomen passed all impact test requirements.
Lumbar Spine Test:	The lumbar spine passed all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION

HEAD DROP TEST

EUROSID 2 DUMMY

Date: 3/9/03

Dummy Serial Number: 010

Test Number: D03271

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.9
Relative Humidity (%)	10 – 70	20
Peak Resultant Acceleration	100 – 150 g's	147
Time of Max. Res. Acceleration	msec	2.3

TEST MEETS SPECIFICATIONS

Technician: _____

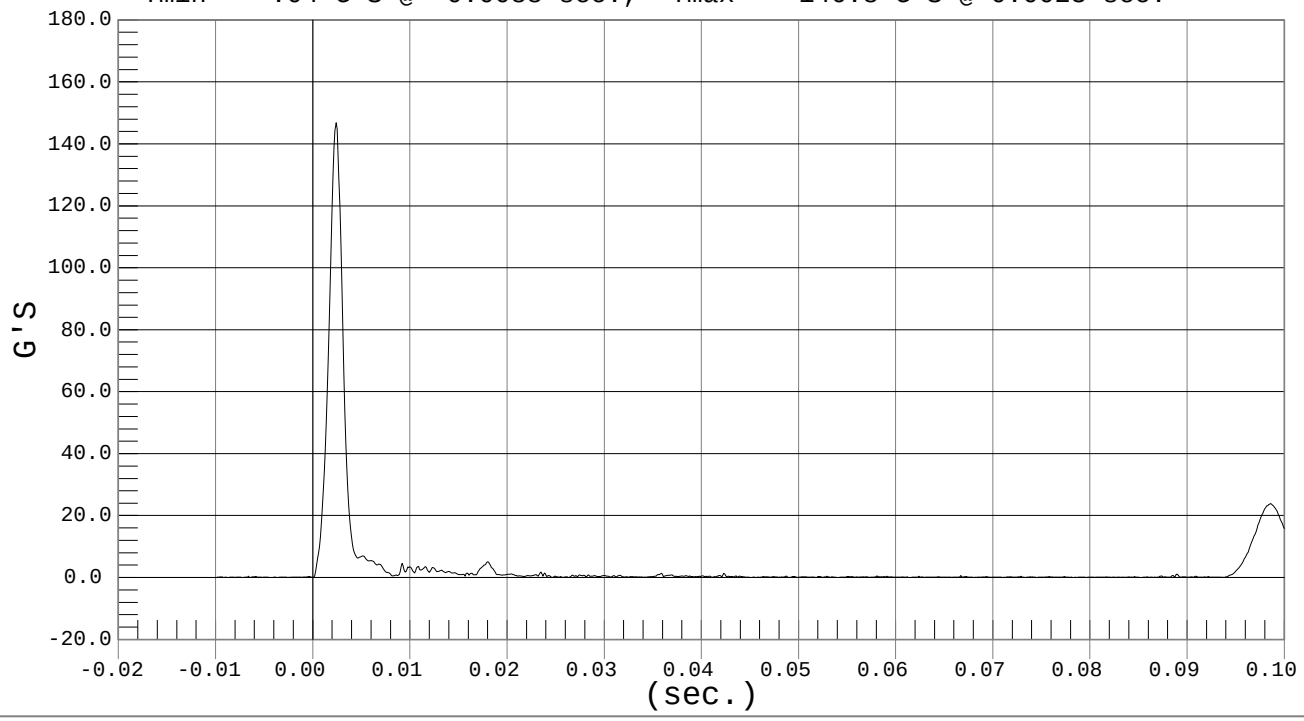
Approved By: _____

PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #010

Test Date: 03-09-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .04 G'S @ -0.0088 sec., Ymax = 146.8 G'S @ 0.0023 sec.



MGA RESEARCH CORPORATION

NECK PENDULUM TEST

EUROSID 2 DUMMY

Date: 3/9/03

Dummy Serial Number: 010

Test Number: D03272

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	20.0
Relative Humidity (%)		10 – 70	14
Pendulum Speed		3.3 - 3.5	3.4
Pendulum Deceleration	3 msec	¯.25 - ¯.53 m/sec	-.32
	8 msec	¯1.59 - ¯2.04 m/sec	-1.70
	14 msec	¯3.20 - ¯3.85 m/sec	-3.41
Maximum Flexion Angle		49.0 – 59.0 deg	57.3
Time of Max. Flexion Angle		54.0 – 66.0 ms	56.4
Maximum Angle Theta (A)		32.0 – 37.0 deg	35.2
Time of Max. Theta (A)		53.0 – 63.0 ms	56.7
Maximum Angle Theta (B)		30.26 – 32.76 deg	31.91
Time of Max. Theta (B)		54.0 – 64.0 ms	59.0

TEST MEETS SPECIFICATIONS

Technician: _____

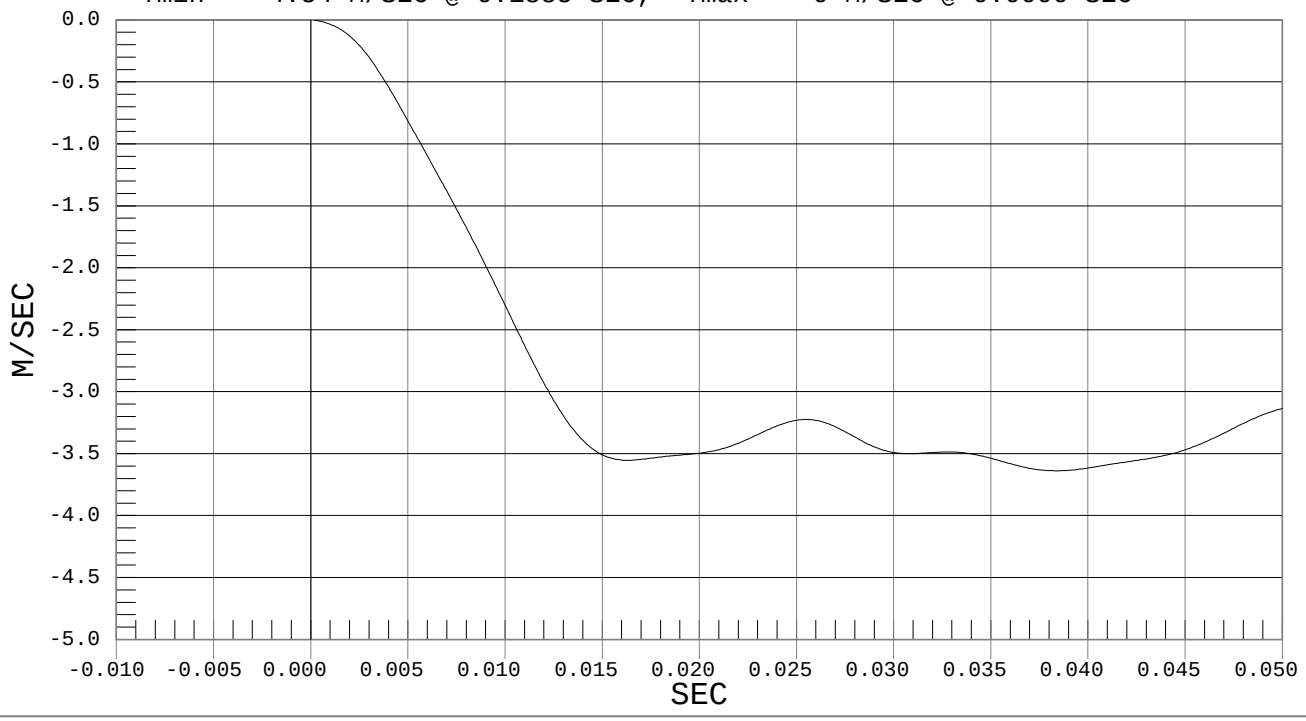
Approved By: _____

PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #010

Test Date: 03-09-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -4.54 M/SEC @ 0.1885 SEC, Ymax = 0 M/SEC @ 0.0000 SEC

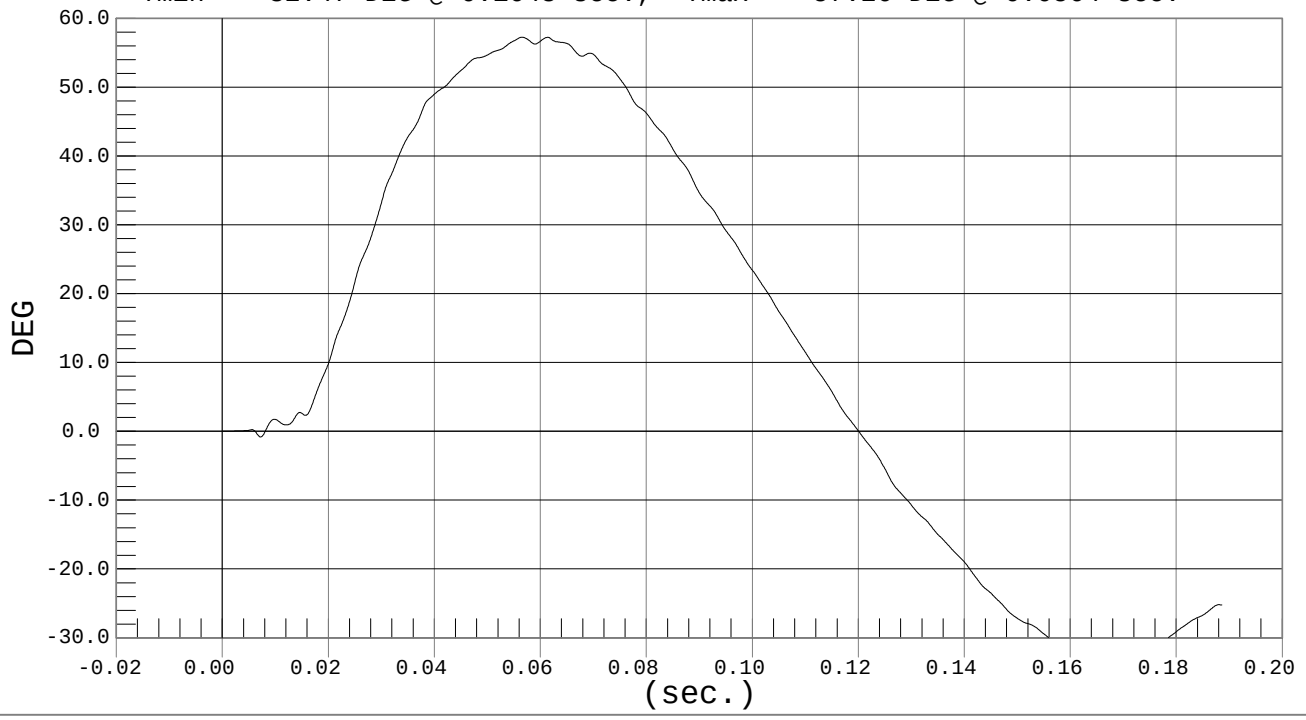


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #010

Test Date: 03-09-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -32.47 DEG @ 0.1648 sec., Ymax = 57.26 DEG @ 0.0564 sec.

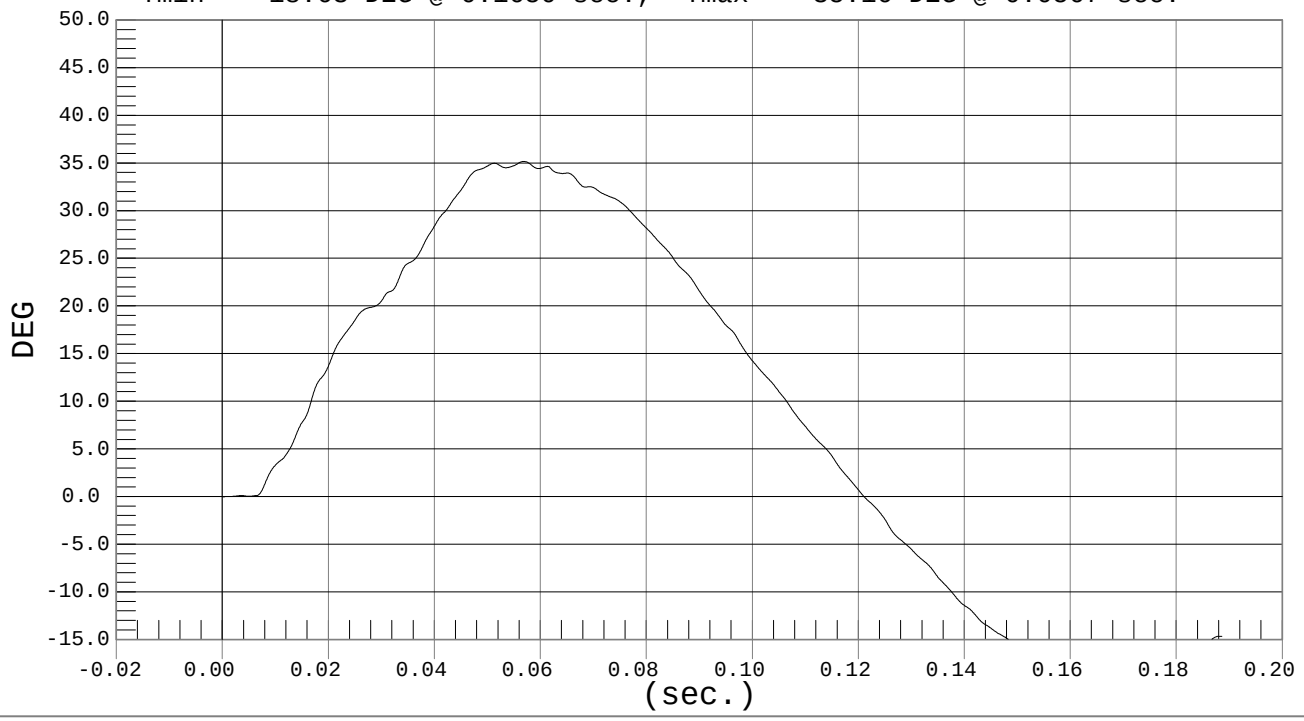


THETA A

Test Desc.: Neck Bending
Component: Dummy #010

Test Date: 03-09-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -18.63 DEG @ 0.1650 sec., Ymax = 35.16 DEG @ 0.0567 sec.

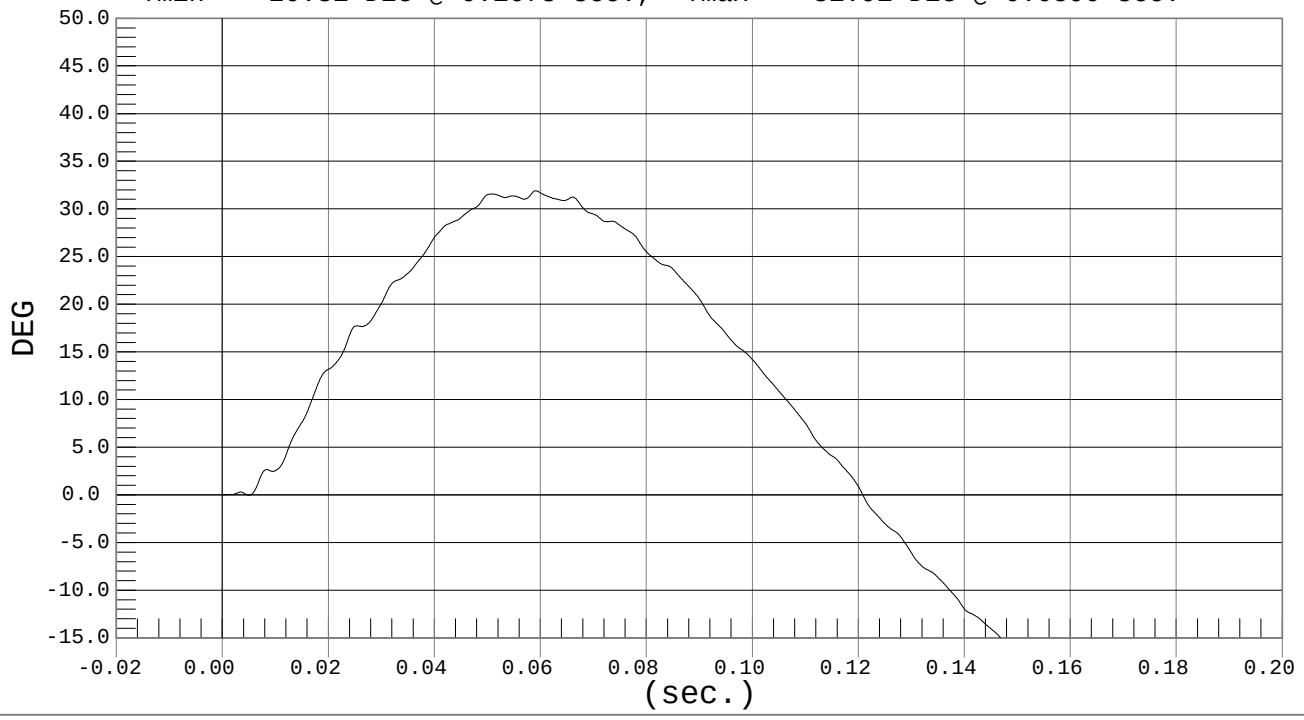


THETA B

Test Desc.: Neck Bending
Component: Dummy #010

Test Date: 03-09-03
Speed: 11.0 fps, 3.36 M/s

Ymin = -20.31 DEG @ 0.1678 sec., Ymax = 31.91 DEG @ 0.0590 sec.



MGA RESEARCH CORPORATION

SHOULDER IMPACT TEST

EUROSID 2 DUMMY

Date: 3/10/03

Dummy Serial Number: 010

Test Number: D03273

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	19.6
Relative Humidity (%)	10 – 70	19
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	9.6
Time of Max. Pendulum Acceleration	msec	11.6

TEST MEETS SPECIFICATIONS

Technician: _____

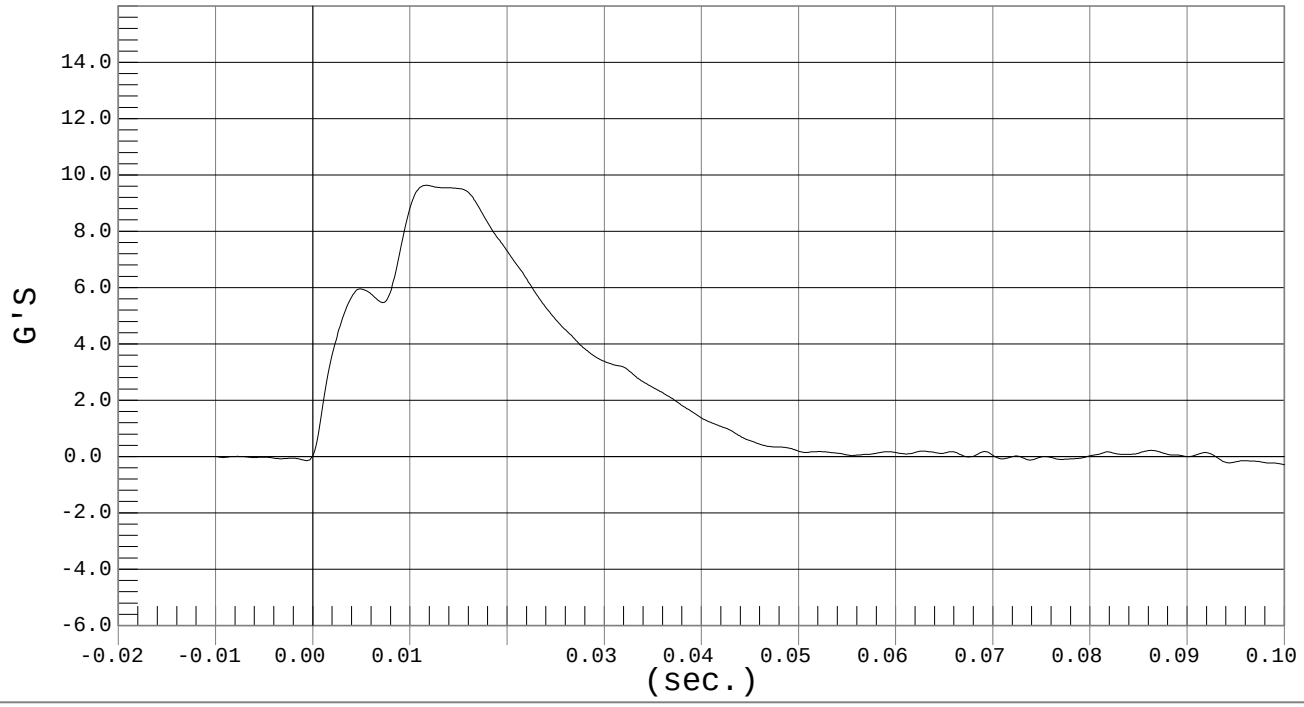
Approved By: _____

SHOULDER ACCELERATION

Test Desc.: Shoulder Impact
Component: Dummy #010

Test Date: 03-10-03
Speed: 14.1 fps, 4.30 M/s

Ymin = -.34 G'S @ 0.1041 sec., Ymax = 9.63 G'S @ 0.0116 sec.



MGA RESEARCH CORPORATION

UPPER/MIDDLE/LOWER RIB TESTS

EUROSID 2 DUMMY

Date: 3/7/03

Dummy Serial Number: 010

Test Number: D03274/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	15
Displacement at 2 m/s	23.5 – 27.5 mm	27.0
Displacement at 3 m/s	36.0 – 40.0 mm	40.0
Displacement at 4 m/s	46.0 – 51.0 mm	48.4

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	15
Displacement at 2 m/s	23.5 – 27.5 mm	25.5
Displacement at 3 m/s	36.0 – 40.0 mm	38.8
Displacement at 4 m/s	46.0 – 51.0 mm	49.4

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.8
Relative Humidity (%)	10 – 70	15
Displacement at 2 m/s	23.5 – 27.5 mm	26.5
Displacement at 3 m/s	36.0 – 40.0 mm	39.0
Displacement at 4 m/s	46.0 – 51.0 mm	50.2

TEST MEETS SPECIFICATIONS

Technician: _____

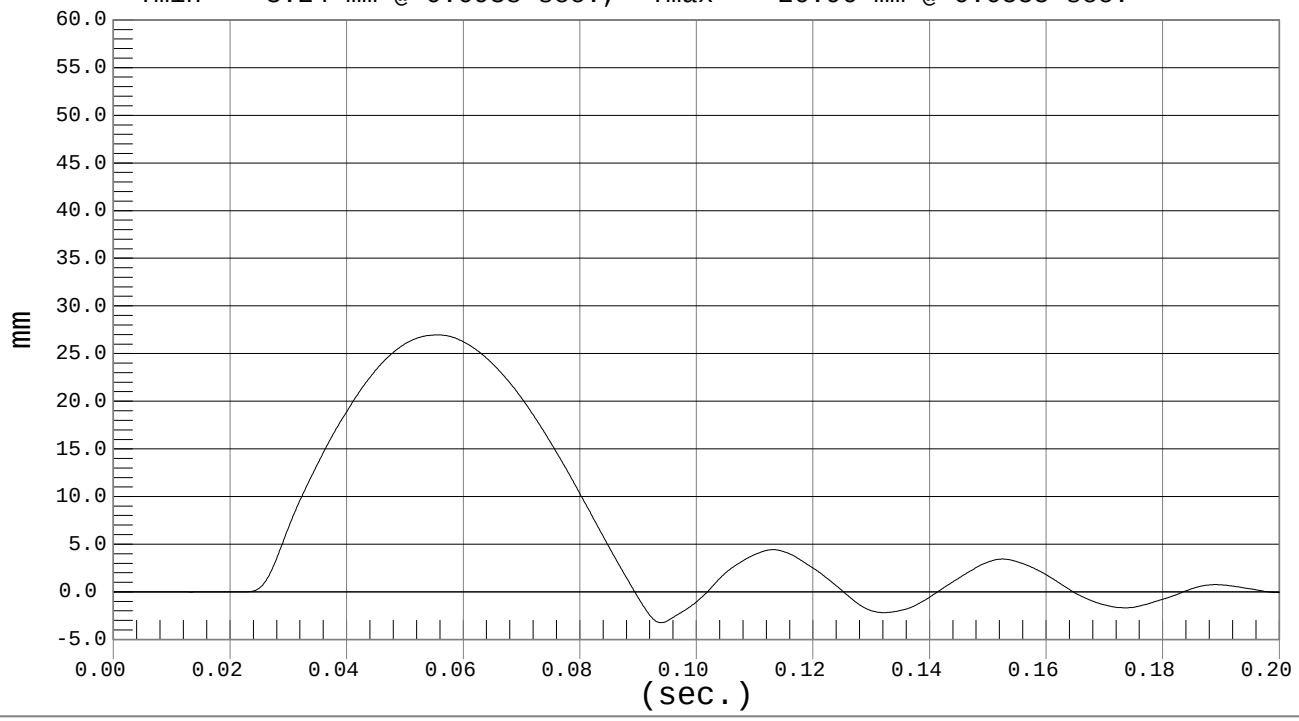
Approved By: _____

UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -3.24 mm @ 0.0938 sec., Ymax = 26.96 mm @ 0.0555 sec.

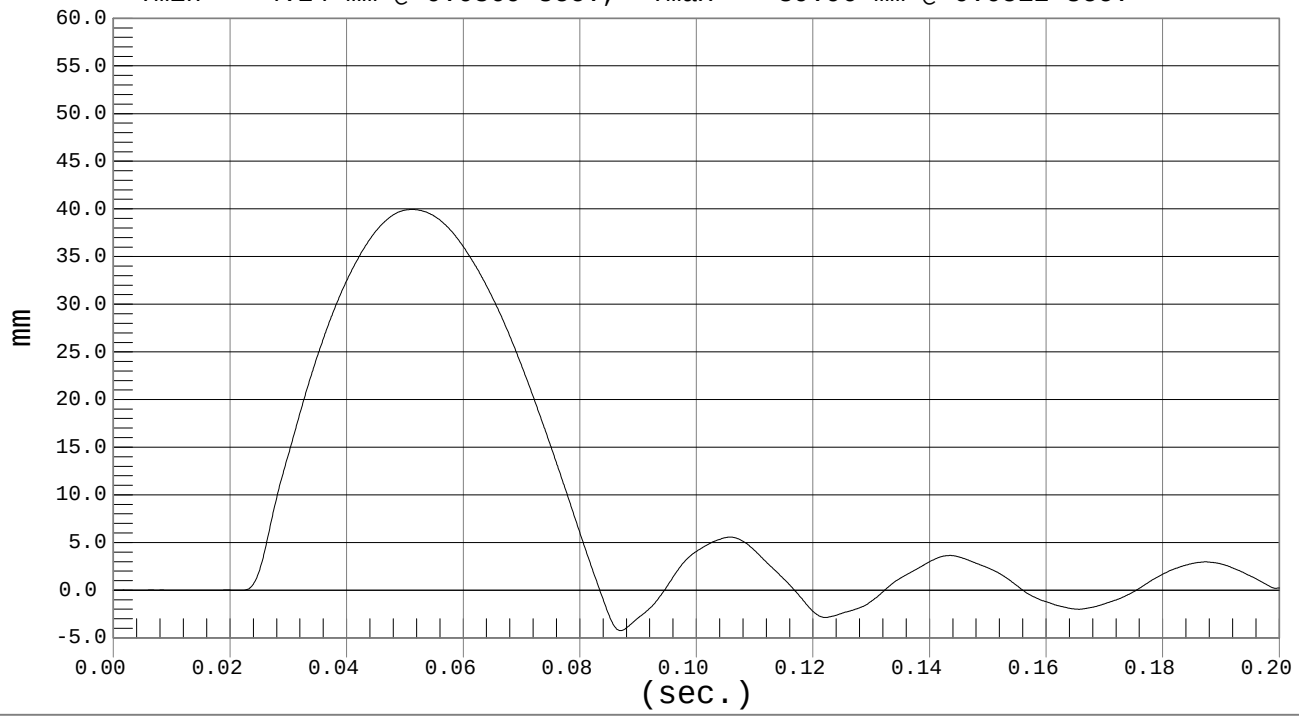


UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -4.24 mm @ 0.0869 sec., Ymax = 39.96 mm @ 0.0512 sec.

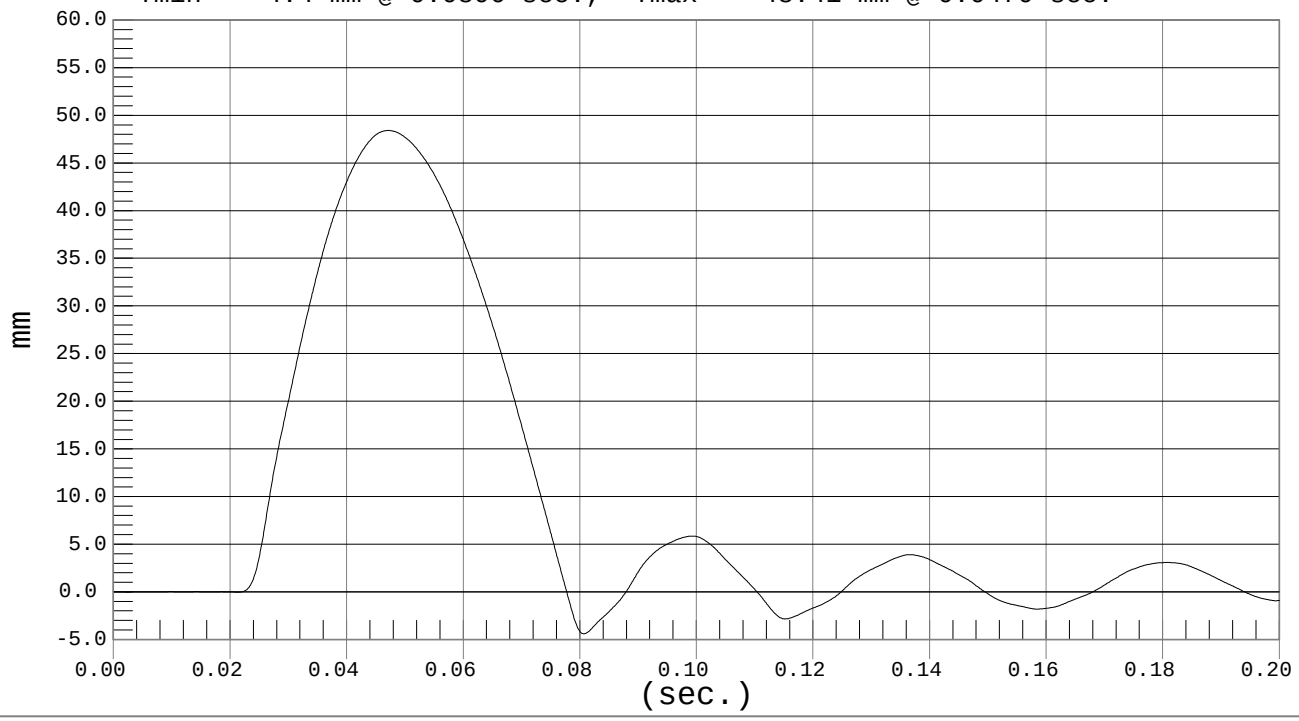


UPPER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -4.4 mm @ 0.0806 sec., Ymax = 48.41 mm @ 0.0470 sec.

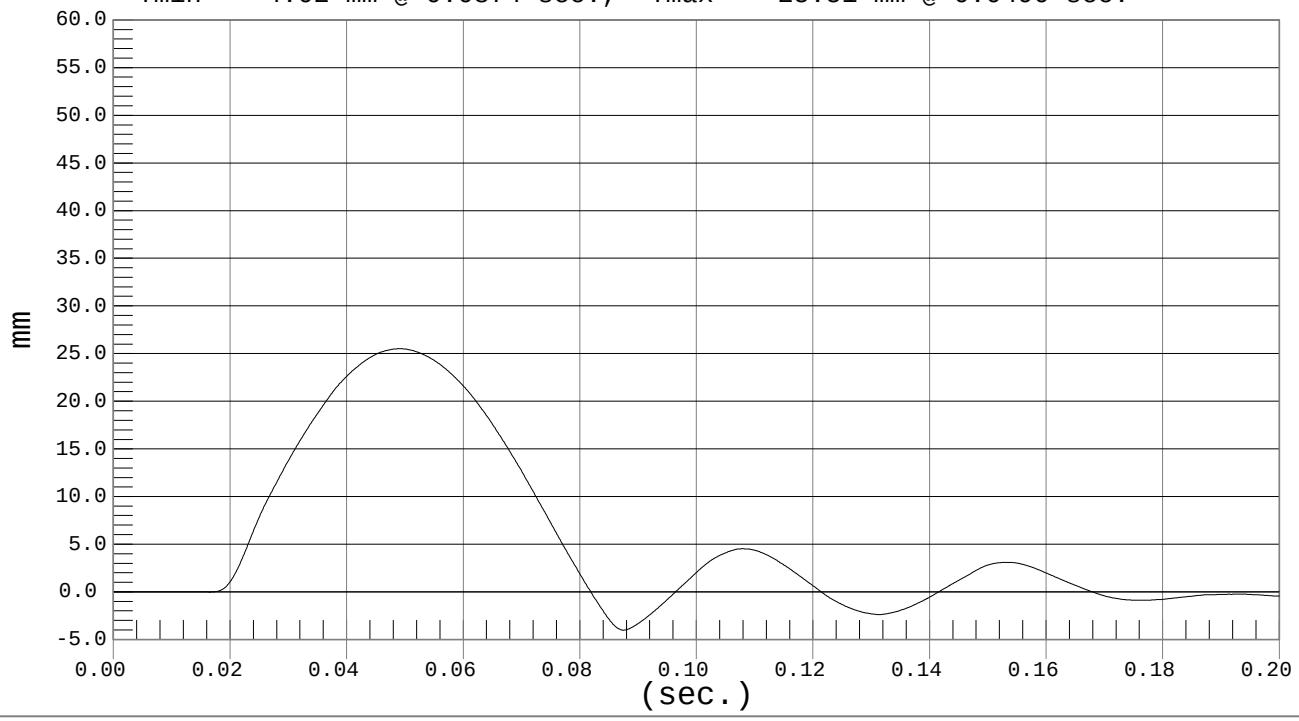


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -4.02 mm @ 0.0874 sec., Ymax = 25.51 mm @ 0.0490 sec.

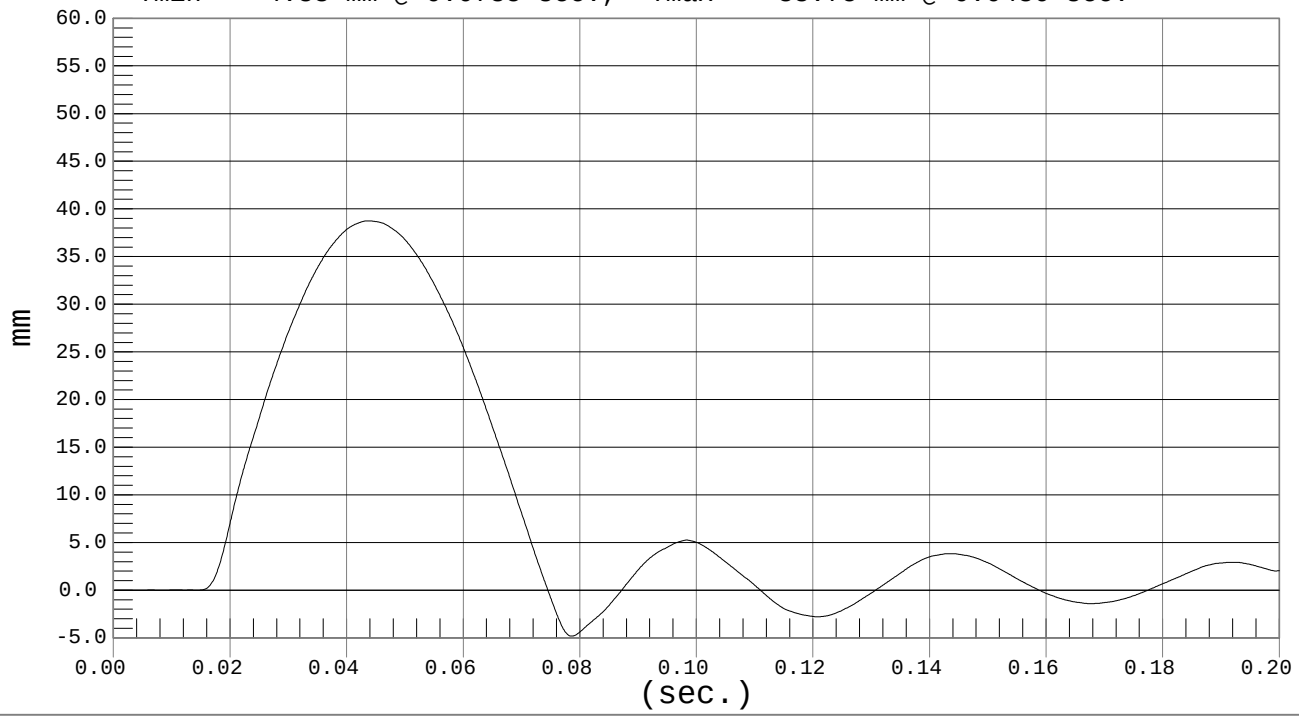


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -4.83 mm @ 0.0785 sec., Ymax = 38.75 mm @ 0.0436 sec.

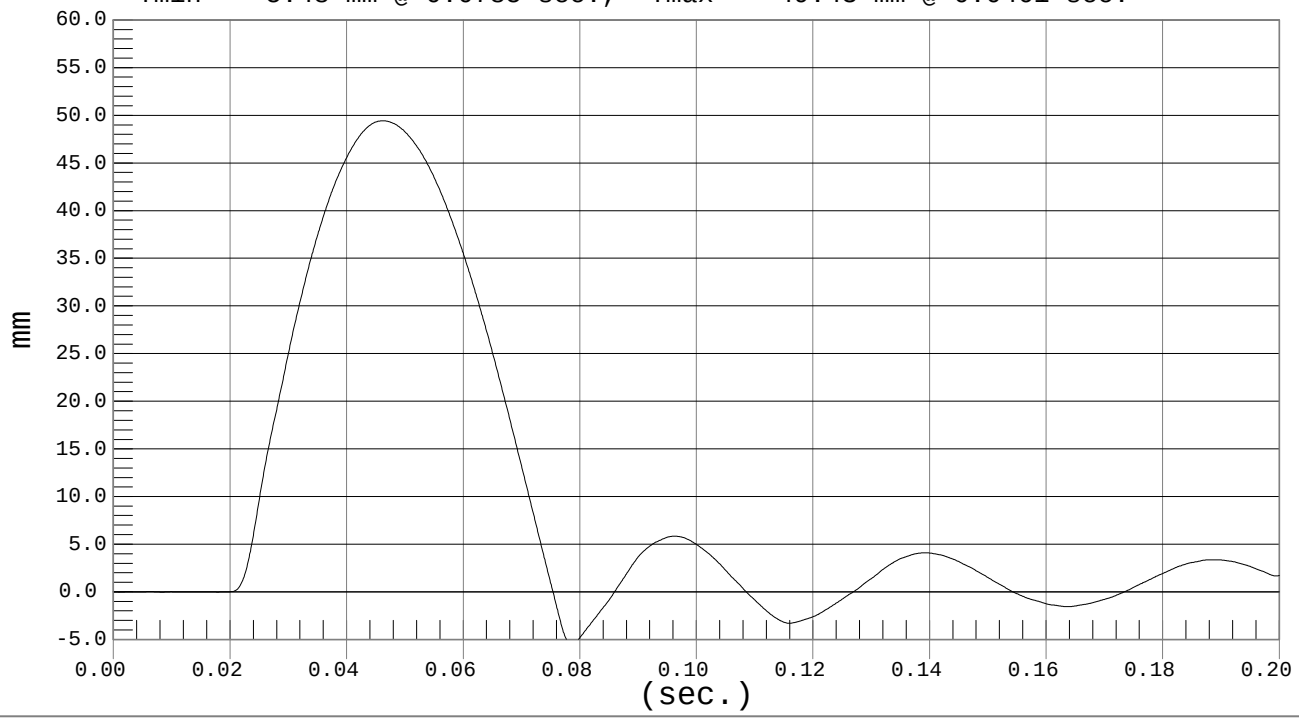


MIDDLE RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -5.48 mm @ 0.0785 sec., Ymax = 49.43 mm @ 0.0461 sec.

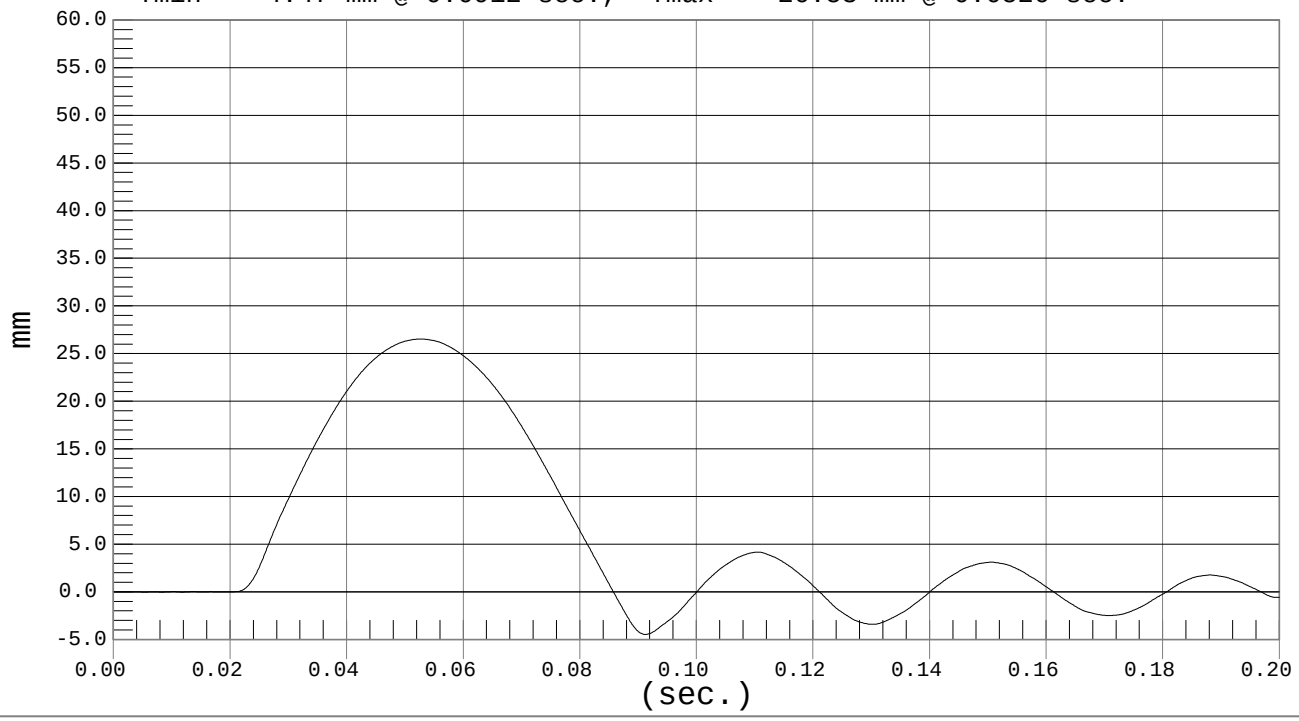


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 6.6 fps, 2.00 M/s

Ymin = -4.47 mm @ 0.0912 sec., Ymax = 26.53 mm @ 0.0526 sec.

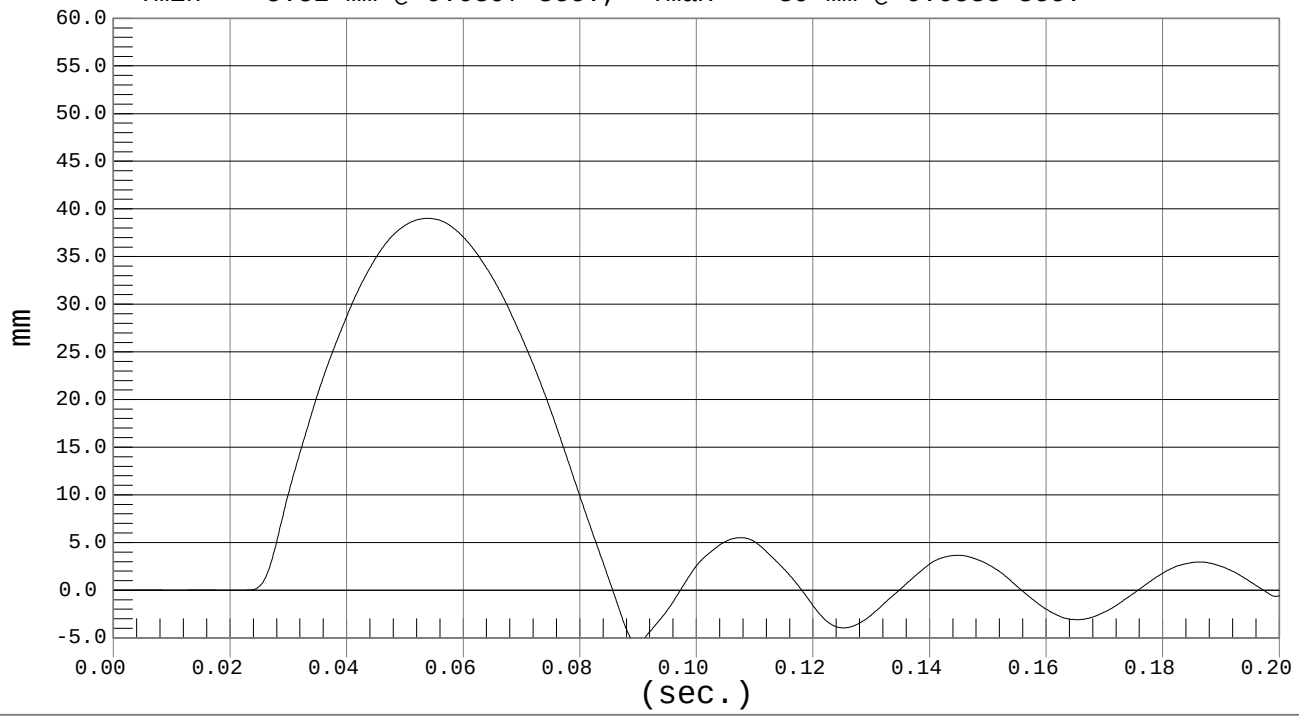


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 9.8 fps, 3.00 M/s

Ymin = -5.52 mm @ 0.0897 sec., Ymax = 39 mm @ 0.0538 sec.

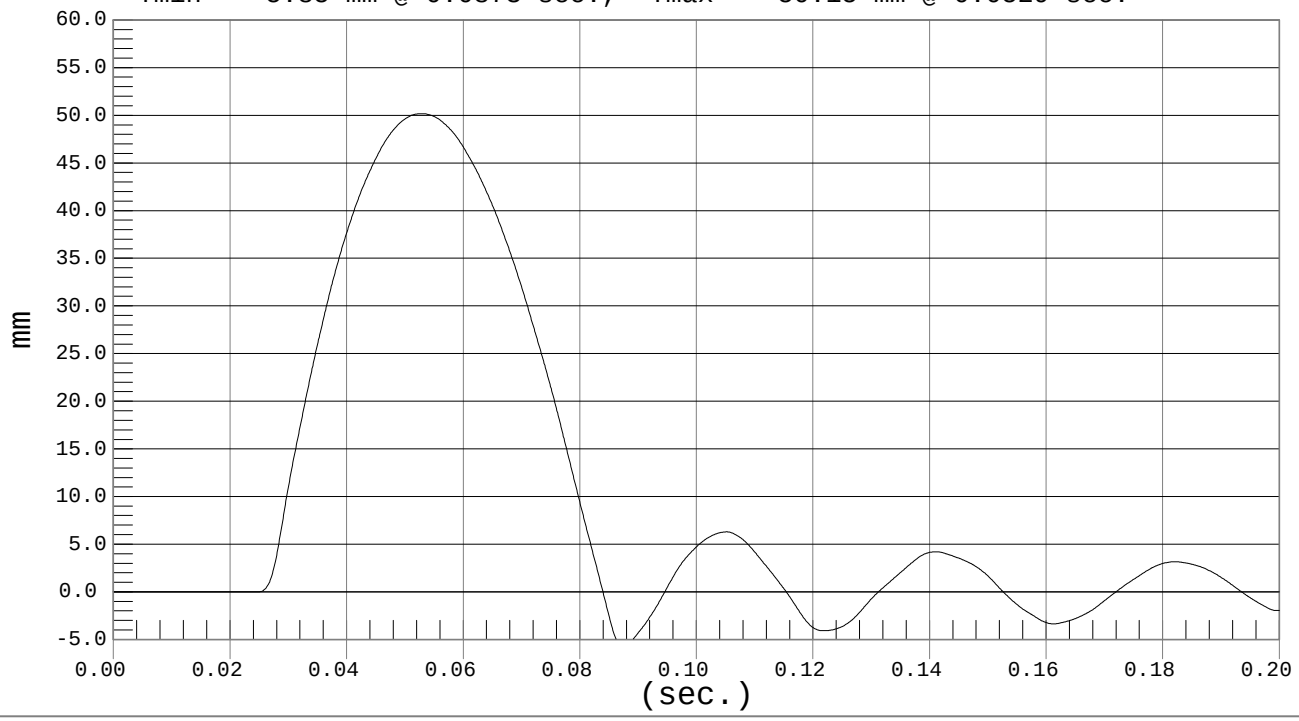


LOWER RIB DISPLACEMENT

Test Desc.: Rib Module
Component: Dummy #010

Test Date: 03-07-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -5.85 mm @ 0.0873 sec., Ymax = 50.15 mm @ 0.0529 sec.



MGA RESEARCH CORPORATION

ABDOMEN TEST

EUROSID 2 DUMMY

Date: 3/10/03

Dummy Serial Number: 010

Test Number: D03277

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	20.0
Relative Humidity (%)	10 – 70	15
Probe Speed (m/s)	3.90 – 4.10	4.00
Maximum Impact Force	4.00 – 4.80 kN	4.32
Time of Maximum Force	10.60 – 13.00 ms	10.80
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.45
Time of Max. Total Force	10.00 – 12.30 ms	10.80

TEST MEETS SPECIFICATIONS

Technician: _____

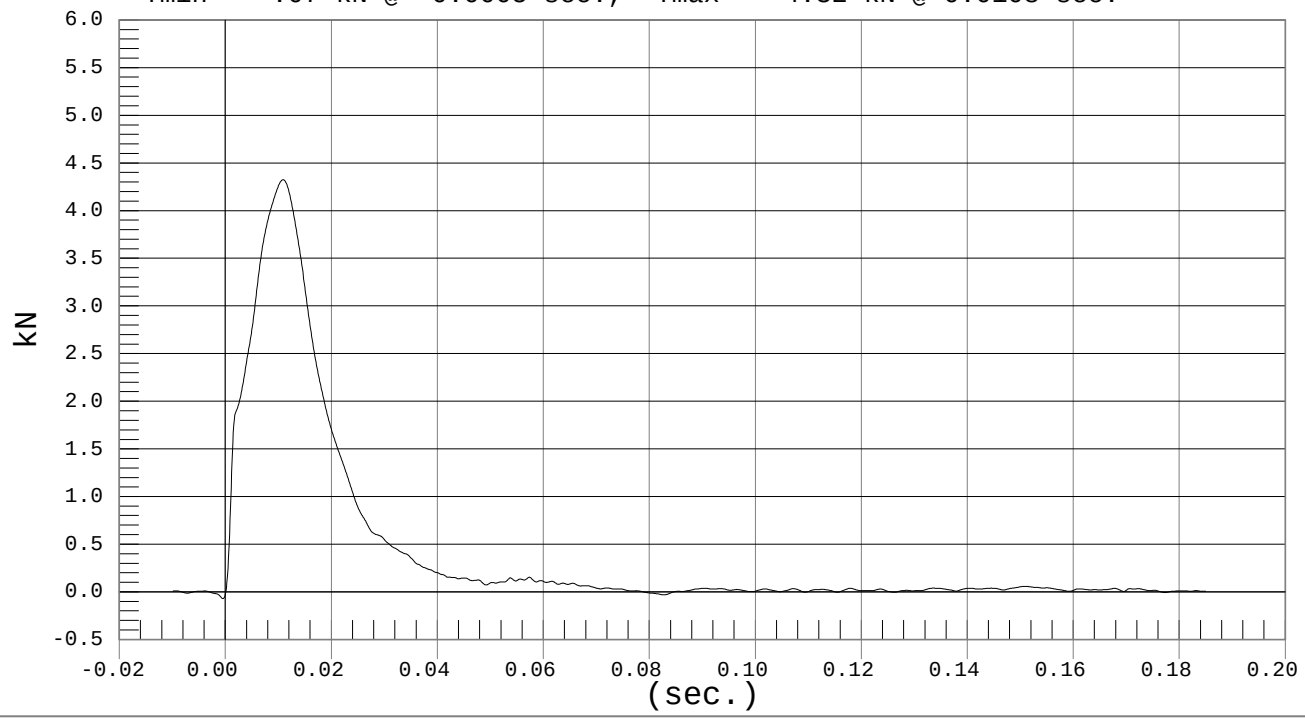
Approved By: _____

IMPACTOR FORCE

Test Desc.: Abdomen Impact
Component: Dummy #010

Test Date: 03-10-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -.07 kN @ -0.0005 sec., Ymax = 4.32 kN @ 0.0108 sec.

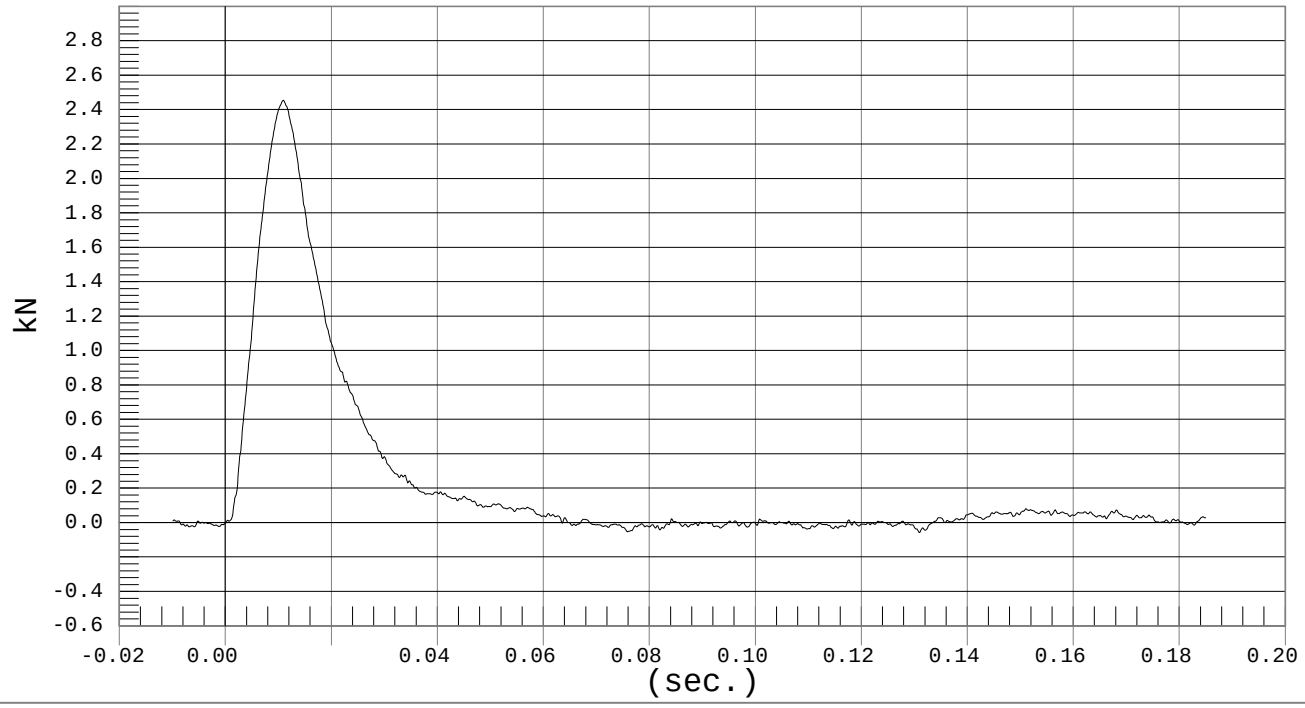


ABDOMEN FORCE

Test Desc.: Abdomen Impact
Component: Dummy #010

Test Date: 03-10-03
Speed: 13.1 fps, 4.00 M/s

Ymin = -.06 kN @ 0.1309 sec., Ymax = 2.45 kN @ 0.0108 sec.



MGA RESEARCH CORPORATION

LUMBAR SPINE TEST

EUROSID 2 DUMMY

Date: 3/9/03

Dummy Serial Number: 010

Test Number: D03278

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	20.0
Relative Humidity (%)		10 – 70	15
Pendulum Speed		5.95 – 6.15	6.01
Pendulum Deceleration	10 msec	-2.46 - -1.59 m/sec	-1.94
	20 msec	-5.25 - -4.07 m/sec	-4.34
	25 msec	-6.64 - -5.30 m/sec	-5.39
	30 msec	≥ -6.5 m/sec	-6.12
Maximum Flexion Angle		45.0 – 55.0 deg	48.0
Time of Max. Flexion Angle		39.0 – 53.0 ms	46.6
Maximum Angle Theta (A)		31.0 – 35.0 deg	31.3
Time of Max. Theta (A)		44.0 – 52.0 ms	46.6
Maximum Angle Theta (B)		27.04– 29.54 deg	28.4
Time of Max. Theta (B)		44.0 – 52.0 ms	44.3

TEST MEETS SPECIFICATIONS

Technician: _____

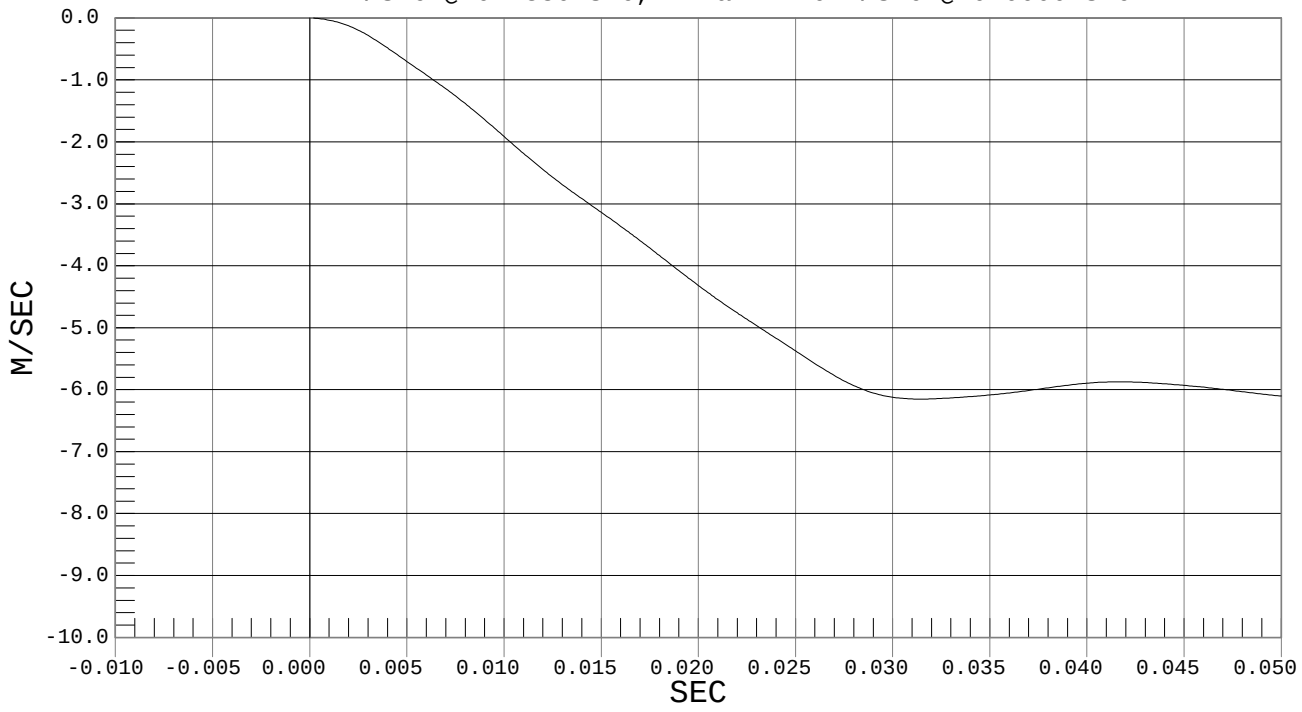
Approved By: _____

PENDULUM DECELERATION

Test Desc.: Lumbar Flexion
Component: Dummy #010

Test Date: 03-09-03
Speed: 19.7 fps, 6.01 M/s

Ymin = -7.42 M/SEC @ 0.1380 SEC, Ymax = 0 M/SEC @ 0.0000 SEC

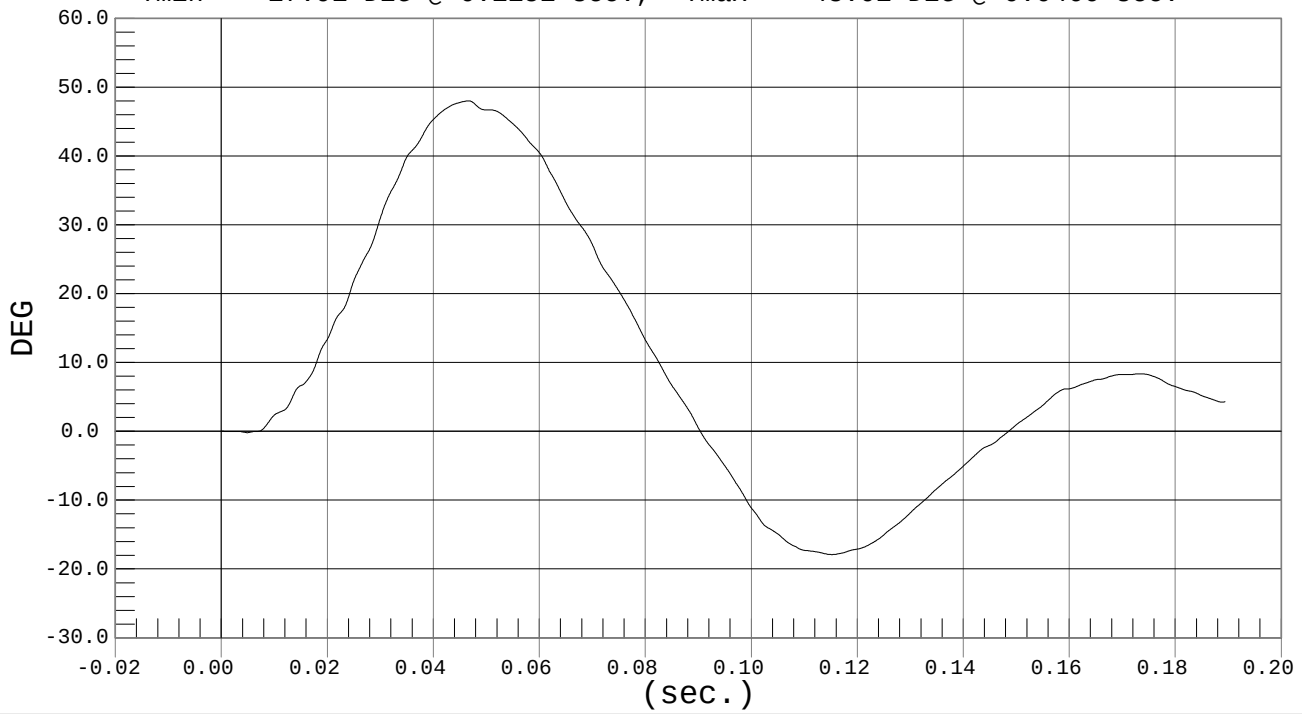


FLEXION ANGLE

Test Desc.: Lumbar Flexion
Component: Dummy #010

Test Date: 03-09-03
Speed: 19.7 fps, 6.01 M/s

Ymin = -17.91 DEG @ 0.1151 sec., Ymax = 48.01 DEG @ 0.0466 sec.

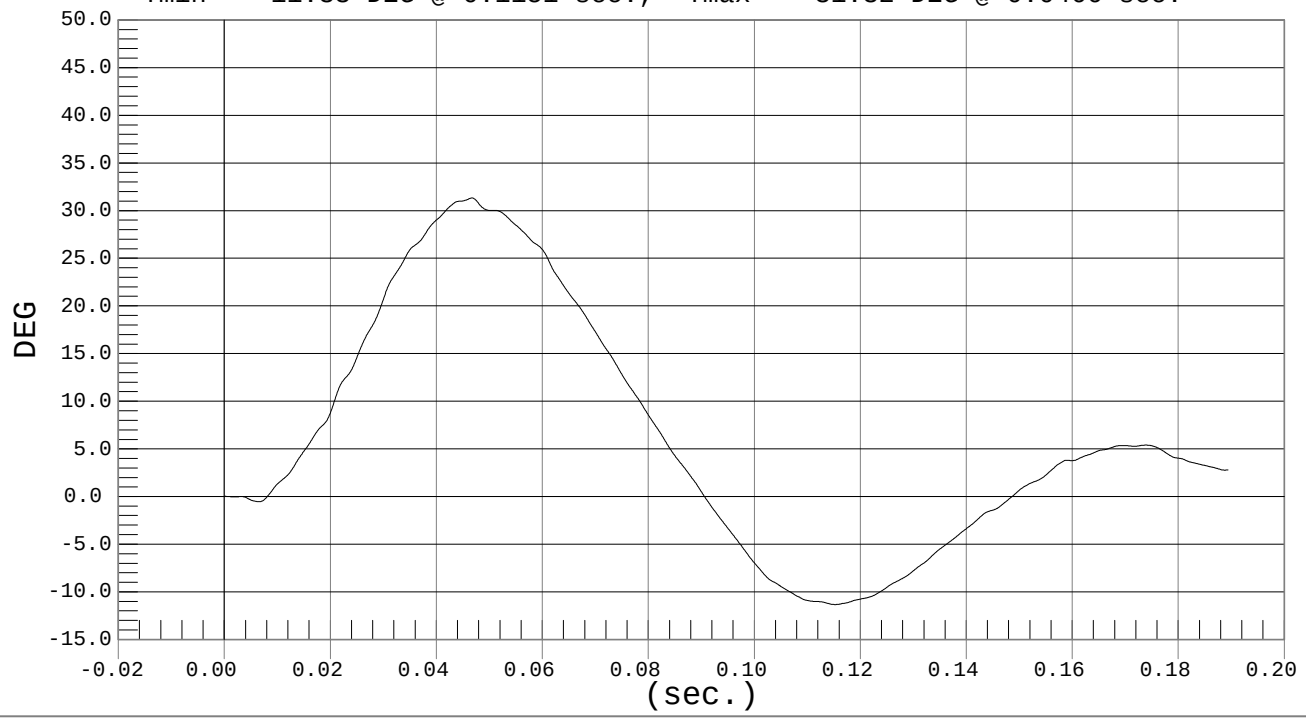


THETA A

Test Desc.: Lumbar Flexion
Component: Dummy #010

Test Date: 03-09-03
Speed: 19.7 fps, 6.01 M/s

Ymin = -11.33 DEG @ 0.1151 sec., Ymax = 31.32 DEG @ 0.0466 sec.

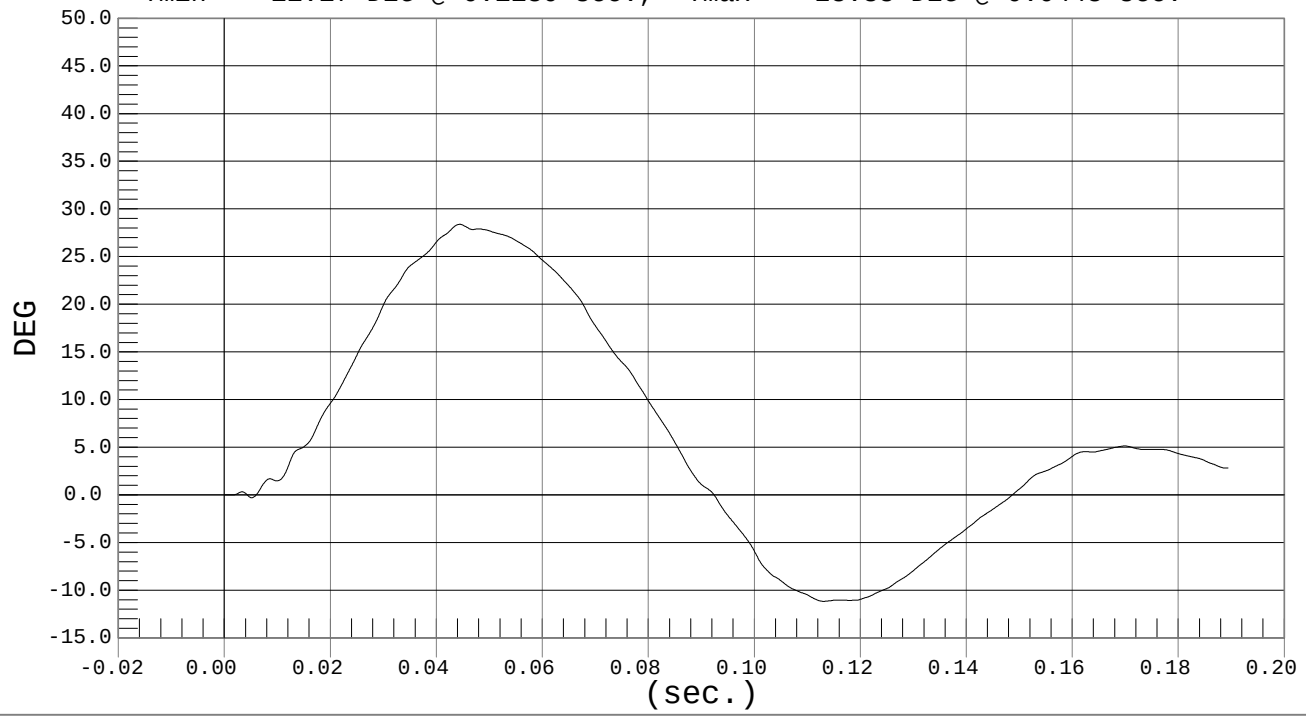


THETA B

Test Desc.: Lumbar Flexion
Component: Dummy #010

Test Date: 03-09-03
Speed: 19.7 fps, 6.01 M/s

Ymin = -11.17 DEG @ 0.1130 sec., Ymax = 28.38 DEG @ 0.0443 sec.



MGA RESEARCH CORPORATION

PELVIS TEST

EUROSID 2 DUMMY

Date: 3/10/03

Dummy Serial Number: 010

Test Number: D03279

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	19.8
Relative Humidity (%)	10 – 70	18
Pendulum Speed	4.20 – 4.40 m/s	4.28
Maximum Impactor Force	4.40 – 5.40 kN	4.82
Time of Max. Impactor Force	10.30 – 15.50 ms	13.10
Maximum Pubic Force	1.04 – 1.64 kN	1.36
Time of Max. Pubic Force	9.90 – 15.90 ms	13.60

TEST MEETS SPECIFICATIONS

Technician: _____

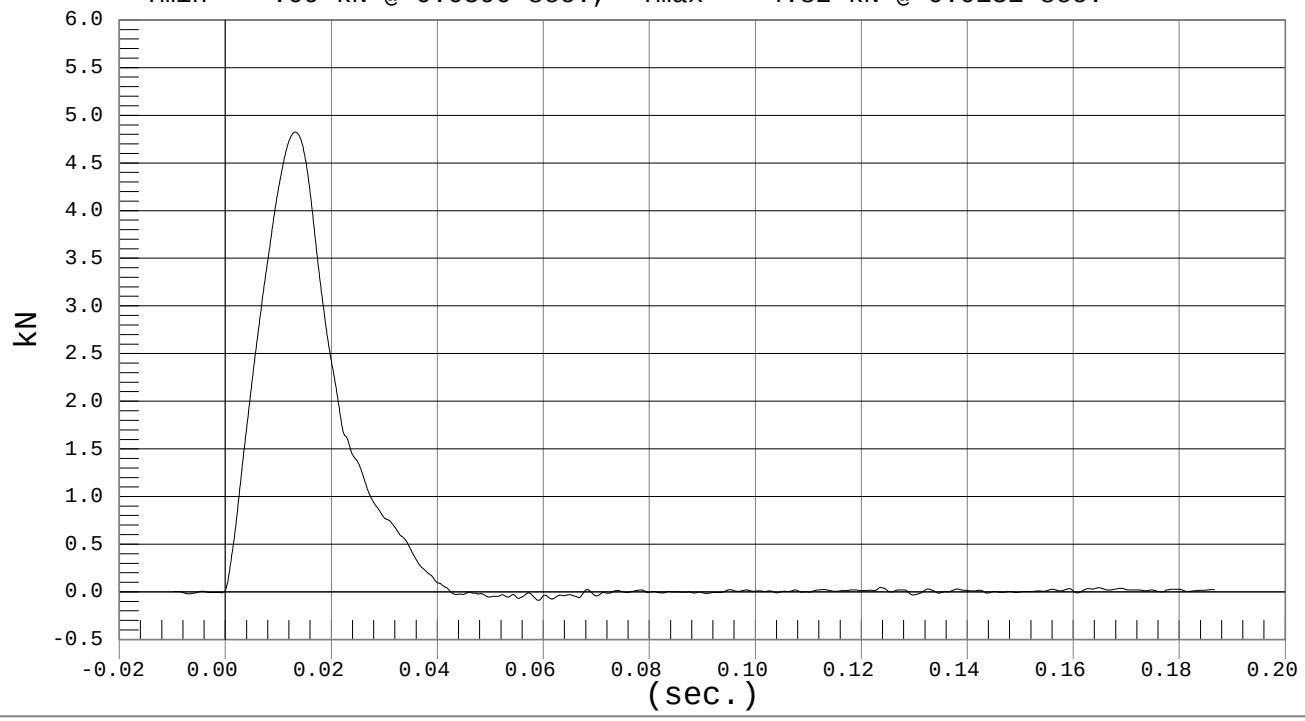
Approved By: _____

IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #010

Test Date: 03-10-03
Speed: 14.1 fps, 4.28 M/s

Ymin = -.09 kN @ 0.0590 sec., Ymax = 4.82 kN @ 0.0131 sec.

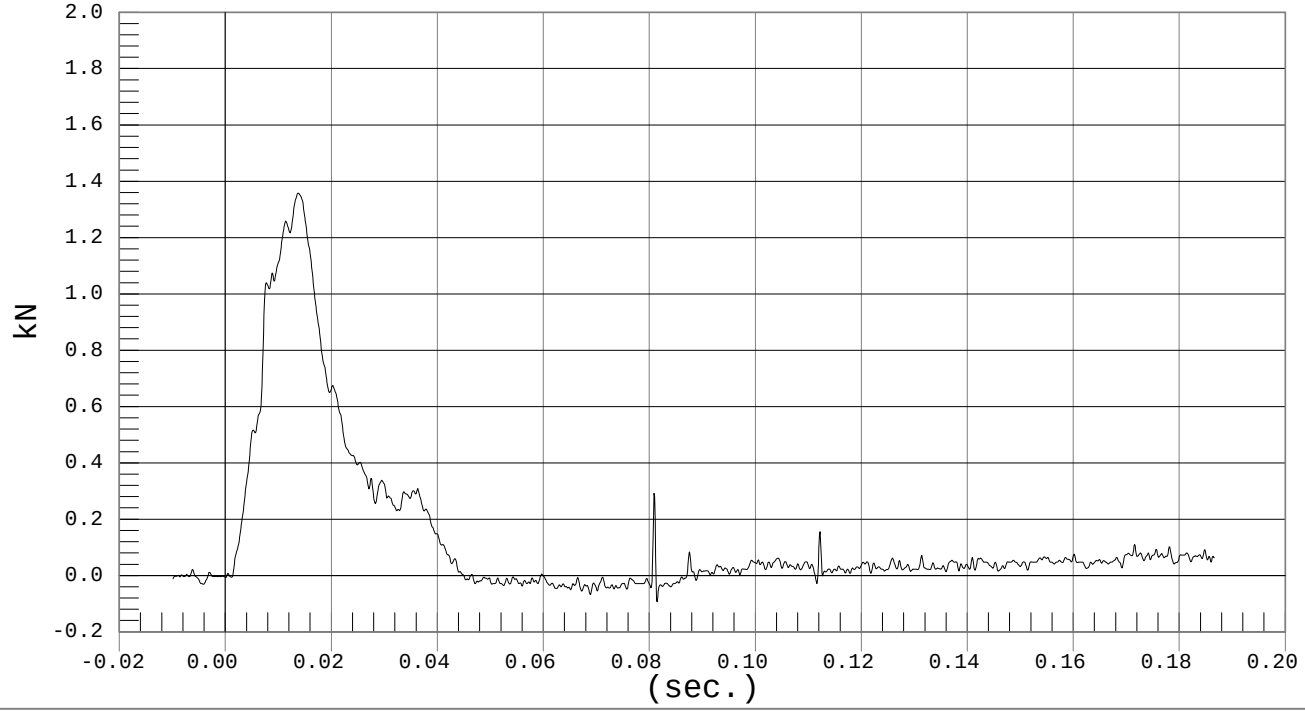


PUBIC FORCE

Test Desc.: Pelvis Impact
Component: Dummy #010

Test Date: 03-10-03
Speed: 14.1 fps, 4.28 M/s

Ymin = -.09 kN @ 0.0814 sec., Ymax = 1.36 kN @ 0.0136 sec.



APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR LEFT FRONT DUMMY NO. 009		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Driver Head X	AHRP5	Endevco	9/6/02
Driver Head Y	ALB87	Endevco	9/6/02
Driver Head Z	AJ9T6	Endevco	9/6/02
Driver Head Y – Front	ALEC1	Endevco	9/9/02
Driver Head Z – Front	J14896	Endevco	1/8/03
Driver Head X – Left	AJ9D9	Endevco	9/6/02
Driver Head Z – Left	AGM47	Endevco	9/6/02
Driver Head X – Upper	ANAN3	Endevco	10/16/02
Driver Head Y – Upper	ANAN6	Endevco	10/16/02
Driver Upper Neck Force Y	N105FY	FTSS	5/13/02
Driver Upper Neck Force Z	N105FZ	FTSS	5/13/02
Driver Upper Neck Moment X	N105MX	FTSS	5/13/02
Driver Upper Neck Moment Y	N105MY	FTSS	5/13/02
Driver Upper Neck Moment Z	N105MZ	FTSS	5/13/02
Driver Lower Neck Force X	N110FX	FTSS	5/16/02
Driver Lower Neck Force Y	N110FY	FTSS	5/16/02
Driver Lower Neck Force Z	N110FZ	FTSS	5/16/02
Driver Lower Neck Moment X	N110MX	FTSS	5/16/02
Driver Lower Neck Moment Y	N110MY	FTSS	5/16/02
Driver Lower Neck Moment Z	N110MZ	FTSS	5/16/02
Driver Shoulder Force X	S119FX	FTSS	5/10/02
Driver Shoulder Force Y	S119FY	FTSS	5/10/02
Driver Shoulder Force Z	S119FZ	FTSS	5/10/02
Driver Upper Spine X	AJ9D8	Endevco	1/8/03
Driver Upper Spine Y	AJ9D6	Endevco	1/8/03
Driver Upper Spine Z	J13772	Endevco	1/15/03
Driver Upper Rib Y	ANAP1	Endevco	9/9/02
Driver Mid Rib Y	AMP12	Endevco	9/9/02
Driver Lower Rib Y	AGWA4	Endevco	9/9/02
Driver Upper Rib Displacement	009U	Honeywell	5/22/02
Driver Mid Rib Displacement	009M	Honeywell	5/22/02
Driver Lower Rib Displacement	009L	Honeywell	5/22/02
Driver Lower Spine X	AKAA	Endevco	9/9/02
Driver Lower Spine Y	ALBA7	Endevco	9/9/02
Driver Lower Spine Z	AP2C4	Endevco	9/9/02
Driver Torso Force X	ET102FX	FTSS	12/6/02
Driver Torso Force Y	ET102FY	FTSS	12/6/02
Driver Torso Moment Y	ET102MY	FTSS	12/6/02
Driver Torso Moment Z	ET102MZ	FTSS	12/6/02
Driver T-12 Force X	LS103FX	FTSS	5/13/02

Driver T-12 Force Y	LS103FY	FTSS	5/13/02
Driver T-12 Moment X	LS103MX	FTSS	5/13/02
Driver T-12 Moment Y	LS103MY	FTSS	5/13/02
Driver Front Abdomen Force	A122FY	FTSS	5/16/02
Driver Mid Abdomen Force	A123FY	FTSS	5/16/02
Driver Rear Abdomen Force	A124FY	FTSS	5/16/02
Driver Pubic Symphysis Force	P115FY	Denton	5/13/02
Driver Pelvis X	J13650	Endevco	9/9/02
Driver Pelvis Y	J13424	Endevco	9/9/02
Driver Pelvis Z	J14007	Endevco	9/9/02
Driver Right Femur Force X	F135FX	FTSS	5/13/02
Driver Right Femur Force Y	F135FY	FTSS	5/13/02
Driver Right Femur Force Z	F135FZ	FTSS	5/13/02
Driver Right Femur Moment X	F135MX	FTSS	5/13/02
Driver Right Femur Moment Y	F135MY	FTSS	5/13/02
Driver Right Femur Moment Z	F135MZ	FTSS	5/13/02
Driver Left Femur Force X	F136FX	FTSS	5/13/02
Driver Left Femur Force Y	F136FY	FTSS	5/13/02
Driver Left Femur Force Z	F136FZ	FTSS	5/13/02
Driver Left Femur Moment X	F136MX	FTSS	5/13/02
Driver Left Femur Moment Y	F136MY	FTSS	5/13/02
Driver Left Femur Moment Z	F136MZ	FTSS	5/13/02
Driver Lumbar Force Y	L104FX	FTSS	5/10/02
Driver Lumbar Force Z	L104FY	FTSS	8/15/02
Driver Lumbar Moment X	L104FZ	FTSS	8/15/02

	INSTRUMENTS FOR LEFT REAR DUMMY NO. 010		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Passenger Head X	J21724	Endevco	11/20/02
Passenger Head Y	AHWK8	Endevco	11/20/02
Passenger Head Z	J21612	Endevco	11/20/02
Passenger Head Y – Front	J33415	Endevco	10/9/02
Passenger Head Z – Front	J33394	Endevco	10/9/02
Passenger Head X – Left	J13628	Endevco	1/24/03
Passenger Head Z – Left	AHYE2	Endevco	10/9/02
Passenger Head X – Upper	J14006	Endevco	1/24/03
Passenger Head Y – Upper	J13652	Endevco	1/24/03
Pass. Upper Neck Force X	N106FX	FTSS	6/5/02
Pass. Upper Neck Force Y	N106FY	FTSS	6/5/02
Passenger Upper Neck Force Z	N106FZ	FTSS	6/5/02
Pass. Upper Neck Moment X	N106MX	FTSS	6/5/02
Pass. Upper Neck Moment Y	N106MY	FTSS	6/5/02
Pass. Upper Neck Moment Z	N106MZ	FTSS	6/5/02
Pass. Lower Neck Force X	N111FX	FTSS	6/5/02
Pass. Lower Neck Force Y	N111FY	FTSS	6/5/02
Passenger Lower Neck Force Z	N111FZ	FTSS	6/5/02
Pass. Lower Neck Moment X	N111MX	FTSS	6/5/02
Pass. Lower Neck Moment Y	N111MY	FTSS	6/2/02
Pass. Lower Neck Moment Z	N111MZ	FTSS	6/2/02
Pass. Shoulder Force X	S120FX	FTSS	5/31/02
Pass. Shoulder Force Y	S120FY	FTSS	5/31/02
Pass. Shoulder Force Z	S120FZ	FTSS	5/31/02
Pass. Upper Spine X	AP1H2	Endevco	1/15/03
Pass. Upper Spine Y	AH0B0	Endevco	1/15/03
Pass. Upper Spine Z	ALE80	Endevco	1/15/03
Pass. Upper Rib Y	J12425	Endevco	1/24/03
Passenger Mid Rib Y	J12462	Endevco	1/24/03
Passenger Lower Rib Y	J12449	Endevco	1/24/03
Pass. Upper Rib Displacement	010U	Honeywell	5/22/02
Pass. Mid Rib Displacement	010M	Honeywell	5/22/02
Pass. Lower Rib Displacement	010L	Honeywell	10/18/02
Passenger Lower Spine X	AJ7A2	Endevco	1/24/03
Passenger Lower Spine Y	AJ819	Endevco	1/24/03
Passenger Lower Spine Z	AJ9J7	Endevco	1/24/03
Passenger Torso Force X	ET104FX	FTSS	12/5/02
Passenger Torso Force Y	ET104FY	FTSS	12/5/02
Passenger Torso Moment Y	ET104MY	FTSS	12/5/02
Passenger Torso Moment Z	ET104MZ	FTSS	12/5/02
Passenger T-12 Force X	LS102FX	FTSS	6/5/02
Passenger T-12 Force Y	LS102FY	FTSS	6/5/02
Passenger T-12 Moment X	LS102MX	FTSS	6/5/02

Passenger T-12 Moment Y	LS102MY	FTSS	6/5/02
Pass. Front Abdomen Force	A119FY	Endevco	6/3/02
Passenger Mid Abdomen Force	A120FY	Endevco	6/3/02
Pass. Rear Abdomen Force	A121FY	Endevco	6/3/02
Pass. Pubic Symphysis Force	P113FY	FTSS	5/16/02
Passenger Pelvis X	AH0A2	Endevco	1/15/03
Passenger Pelvis Y	AJ9P7	Endevco	1/15/03
Passenger Pelvis Z	AJ462	Endevco	1/15/03
Pass. Right Femur Force X	F137FX	FTSS	6/3/02
Pass. Right Femur Force Y	F137FY	FTSS	6/3/02
Pass. Right Femur Force Z	F137FZ	FTSS	6/3/02
Pass. Right Femur Moment X	F137MX	FTSS	6/3/02
Pass. Right Femur Moment Y	F137MY	FTSS	6/3/02
Pass. Right Femur Moment Z	F137MZ	FTSS	6/3/02
Passenger Left Femur Force X	F138FX	FTSS	6/3/02
Passenger Left Femur Force Y	F138FY	FTSS	6/3/02
Passenger Left Femur Force Z	F138FZ	FTSS	6/3/02
Pass. Left Femur Moment X	F138MX	FTSS	6/3/02
Pass. Left Femur Moment Y	F138MY	FTSS	6/3/02
Pass. Left Femur Moment Z	F138MZ	FTSS	6/3/02
Pass.Lumbar Force Y	L105FY	FTSS	5/31/02
Pass.Lumbar Force Z	L105FZ	FTSS	5/31/02
Pass. Lumbar Moment x	L105MX	FTSS	5/31/02

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Mid A-Post Y	K21-N06	ENDEVCO	1/16/03
Left Lower A-Post Y	H14-N06	ENDEVCO	1/24/03
Left Upper B-Post Y	K21-N31	ENTRAN	10/9/02
Left Mid B-Post Y	I12-F10	ENTRAN	2/14/03
Left Lower B-Post Y	F04-N09	ENTRAN	11/19/02
Rear Floorpan Above Axle X	G03-N11	ENTRAN	9/6/02
Rear Floorpan Above Axle Y	F07-A14	ENTRAN	9/6/02
Rear Floorpan Above Axle Z	E03-H24	ENTRAN	9/6/02
Driver Seat Track Y	99F159	ENTRAN	9/13/02
Driver Left Seat Frame	G01-N06	ENTRAN	2/24/03
Driver Right Seat Frame	G01-N23	ENTRAN	2/24/03
Right Side Sill at Front Seat X	H01-N18	ENDEVCO	10/30/02
Right Side Sill at Front Seat Y	C25-A25	ENTRAN	9/6/02
Right Side Sill at Front Seat Z	G13-F15	ENTRAN	1/24/03
Right Side Sill at Rear Seat X	K11-J08	ENTRAN	9/6/02
Right Side Sill at Rear Seat Y	99F15A	ENTRAN	1/16/03
Right Side Sill at Rear Seat Z	A08-A05	ENTRAN	9/6/02
Left Side Sill at Front Seat Y	I25-F15	ENTRAN	1/16/03
Left Side Sill at Rear Seat Y	L23-A09	ENTRAN	1/30/03
Vehicle CG X	A09-N37	ENTRAN	2/24/03
Vehicle CG Y	A08-M11	ENTRAN	2/24/03
Vehicle CG Z	A08-M03	ENTRAN	2/24/03
Left Front Door @ Mid Rib Y	H01-N24	ENTRAN	10/30/02
Left Front Door @ Pelvis Y	H05-F17	ENTRAN	10/31/02
Left Front Door @ Knee Y	H05-F03	ENDEVCO	10/30/02
Left Front Door @ End of Arm Y	H01-N22	ENTRAN	10/30/02
Left Rear Door @ Mid Rib Y	H01-N14	ENTRAN	10/31/02
Left Rear Door @ Pelvis Y	H01-N13	ENTRAN	10/30/02
Left Rear Door @ Knee Y	H01-N12	ENTRAN	10/30/02
Right Rear Occ. Compartment Y	A08-A13	ENTRAN	9/6/02

Note: All Endevco accelerometers are Model No. 7264-2000
All Entran accelerometers are Model No. EGE-72

APPENDIX E
ES-2 PEAK RESPONSES

DRIVER (ES-2) PEAK RESPONSE TABLE

Location	Peak Values								
				2001 Focus 10/5/01 NCAP Side		2001 Focus 12/10/02 NCAP Side		2001 Focus 3/6/03 NCAP Side	
	Class	Axis	Units	Peak	Time (ms)	Peak	Time (ms)	Peak	Time (ms)
Head	1000	X	G	-13.8	84	-15.3	49	-13.9	55.7
	1000	Y	G	23.4	46	25.0	47	19.3	51.2
	1000	Z	G	50.4	57	46.2	50	33.5	65.6
	1000	RES	G	53.2	54	53.1	49	36.1	57.8
Head Injury Criteria (HIC)				299		272		136.7	
t1				43.6		42.7		46	
t2				79.6		78.7		82	
Upper Neck Force	1000	X	N	-655	86	-508	81	-494.5	95.1
	1000	Y	N	832	81	827	77	794	93.0
	1000	Z	N	1885	59	1724.0	58	1365.6	65.1
	1000	RES	N	1953	59	1809	58	1412.2	65.1
Upper Neck Moment	600	X	Nm	-78.9	45	-71.8	45	-61.7	50.8
	600	Y	Nm	15.6	116	-31.3	48	-29.3	52.5
	600	Z	Nm	12.2	69	15.7	63	13.2	68.5
	600	RES	Nm	78.9	45	75.4	45	67.6	51.1
Lower Neck Force	1000	X	N	-673	54	-710	51	-483	54.4
	1000	Y	N	1074	58	1030	58	679.8	80
	1000	Z	N	1744	57	1681	48	1274.8	66.4
	1000	RES	N	2085	57	1929	50	1390.2	66.4
Lower Neck Moment	600	X	Nm	229.5	77	210.5	76	176.6	84.1
	600	Y	Nm	78.7	105	56.7	51	49.5	102.5
	600	Z	Nm	-22.5	108	19.5	72		
	600	RES	Nm	233.8	77	213.5	76		
Shoulder Force	600	X	N	451	26	-1133	25	-954	28.4
	600	Y	N	867	27	1929	26	1535.7	29.0
	600	Z	N	-1061	30	-1382	36	-1470.3	41.2
	600	RES	N						

DRIVER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values								
				2001 Focus 10/5/01 NCAP Side		2001 Focus 12/10/02 NCAP Side		2001 Focus 3/6/03 NCAP Side	
	Class	Axis	Units	Peak	Time (ms)	Peak	Time (ms)	Peak	Time (ms)
Upper Spine	180	X	G	-27.3	25	-14.1	22	-12.3	25.4
	180	Y	G	82.8	36	63.3	36	-54.1	42.8
	180	Z	G	6.6	43	-9.6	29	-8.0	32.8
	180	Res	G	82.8	36	63.4	36	55.3	42.8
Lower Spine	180	X	G	-15.4	30	-8.8	32	-9.2	30.5
	180	Y	G	72.3	30	81.0	31	58.5	34.6
	180	Z	G	8.3	33	-11.1	29	-11.0	69.4
	180	Res	G	73.5	30	81.5	31	59.7	34.6
Upper Rib	180	Y	G	165.5	26	141.9	25	113.1	36.9
Mid Rib	180	Y	G	138.8	25	203.4	27	113.9	33.8
Lower Rib	180	Y	G	154.3	29	144.3	26	117.5	33
Upper Rib Deflection	180	Y	mm			-33.1	63	-36.3	45.1
Mid Rib Deflection	180	Y	mm	-34.5	37	-47.6	43	-24.7	44.6
Lower Rib Deflection	180	Y	mm	-22.0	36	-27.1	36	-19.9	42.2
Upper Rib VC	180	Y	m/sec	1.15	34	0.65	31	0.7	39.7
Mid Rib VC	180	Y	m/sec	0.66	33	0.87	32	0.3	37.7
Lower Rib VC	180	Y	m/sec	0.38	32	0.47	31	0.2	37
Torso Force	600	X	N	434	37	1416	36	596.7	34
	600	Y	N	1214	39	-797	30	-630.9	39
Torso Moment	600	Y	Nm	19.6	40	33.2	29	18.4	32.4
	600	Z	Nm	16.8	37	50.4	36	27.9	40.1
T12 Force	600	X	N	528	65	-666	26	-665.1	30.8
	600	Y	N	NOT COLLECTED		3807	30	3384.4	34.2
T12 Moment	600	X	Nm	NOT COLLECTED		-296.9	29	-260.9	34.1
	600	Y	Nm			-86.7	29	-77.6	32.4

DRIVER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values								
				2001 Focus 10/5/01 NCAP Side		2001 Focus 12/10/02 NCAP Side		2001 Focus 3/6/03 NCAP Side	
	Class	Axis	Units	Peak	Time (ms)	Peak	Time (ms)	Peak	Time (ms)
Abdomen Front Force	600	Y	N	281	30	406	28	370.4	33.6
Abdomen Mid Force	600	Y	N	593	27	656	26	554.8	31.1
Abdomen Rear Force	600	Y	N	960	26	913	25	771.3	33.9
Abdomen Summed Force	600	Y	N	1785	27	1858	27	1648.2	33.1
Pubic Symphysis Force	600	Y	N	-3561	25	-3629	23	-2832.9	25.2
Right Femur Force	600	X	N	317	23	362	33	315.2	33.4
	600	Y	N	1545	38	1517	37	1257.6	43.2
	600	Z	N	1370	32	-2824	57	1437.8	43
	600	RES	N	1877	38	2849	57	1915.2	43
Right Femur Moment	600	X	Nm	-126.9	23	-131.1	24.0	-100.5	22.3
	600	Y	Nm	43.3	23	81.7	105	-47.2	46.3
	600	Z	Nm	42.2	51	45.0	57	18.5	51.3
	600	RES	Nm	134.4	23	135.2	24	106	25.7
Left Femur Force	600	X	N	-406	35	-395	33	-357.6	38.4
	600	Y	N	-771	28	2608	15	-5638	74.7
	600	Z	N	1854	29	2345	43	1321.5	30.1
	600	RES	N	2002	29	2687	64	5653.8	74.7
Left Femur Moment	600	X	Nm	-145.0	44	-180.4	42	-147	46.8
	600	Y	Nm	-70.6	34	77.7	34	63.6	34.5
	600	Z	Nm	38.0	28	37.8	35	32.2	25.8
	600	RES	Nm	145.1	44	180.5	42	148.4	46.8
Pelvis	1000	X	G	28.7	47	20.3	29	-30.4	22.1
	1000	Y	G	96.7	23	107.3	22	86.9	24.2
	1000	Z	G	25.7	31	-25.7	30	-18.0	27.8

PASSENGER (ES-2) PEAK RESPONSE TABLE

Location	Peak Values								
				2001 Focus 10/5/01 NCAP Side		2001 Focus 12/10/02 NCAP Side		2001 Focus 3/6/03 NCAP Side	
	Class	Axis	Units	Peak	Time (ms)	Peak	Time (ms)	Peak	Time (ms)
Head	1000	X	G	22.4	103	-27.4	56	-27.4	45.4
	1000	Y	G	79.5	43	68.5	41	71.5	45.6
	1000	Z	G	15.9	84	-30.1	48	28.5	46.2
	1000	RES	G	81.1	43	72	41	80	45.6
Head Injury Criteria (HIC)				188		236		174.2	
t1				40.3		37.3		41.8	
t2				46.4		58.8		62.2	
Upper Neck Force	1000	X	N	-659	87	-583	86	-475.8	94.9
	1000	Y	N	-957	52	-1126	49	-1217.9	54.8
	1000	Z	N	-1614	47	-2270	48	-2748.4	51.0
	1000	RES	N	1823	49	2511	48	2971.1	51
Upper Neck Moment	600	X	Nm	-57.3	63	-44.0	58	-28.7	78.0
	600	Y	Nm	-33.5	47	-46.8	48	31.4	117.2
	600	Z	Nm	34.4	64	30.5	61	17.5	63.2
	600	RES	Nm	69.0	63	61.1	58	34.6	79.2
Lower Neck Force	1000	X	N	NOT COLLECTED		-632	57	-467.8	71
	1000	Y	N			1165	49	1087.1	53.4
	1000	Z	N			-2372	47	-2706.9	49.5
	1000	RES	N			2625	47	2902.0	51.3
Lower Neck Moment	600	X	Nm	NOT COLLECTED		-43.7	64	-70.9	70.9
	600	Y	Nm			109.5	66	92.8	71.5
	600	Z	Nm			39.0	69	28.3	64.9
	600	RES	Nm			123.3	66	119.6	71.3
Shoulder Force	600	X	N	-1497	35	-1762	34	-1239.9	51.7
	600	Y	N	2127	55	2291	35	2467.5	52.4
	600	Z	N	-1439	55	-1898	49	-1603.1	54.7
	600	RES	N						

PASSENGER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values								
				2001 Focus 10/5/01 NCAP Side		2001 Focus 12/10/02 NCAP Side		2001 Focus 3/6/03 NCAP Side	
	Class	Axis	Units	Peak	Time (ms)	Peak	Time (ms)	Peak	Time (ms)
Upper Spine	180	X	G	-23.2	47	-26.9	48	-28.9	51.7
	180	Y	G	44.1	73	45.2	51	36.8	52.2
	180	Z	G	9.2	51	12.7	48	10.5	54.3
	180	Res	G	46.9	53	53.5	47	47.8	51.7
Lower Spine	180	X	G	-21.0	44	-20.5	41	-19.9	43.6
	180	Y	G	61.3	60	64.7	40	55.2	43.6
	180	Z	G	-8.8	57	-12.3	40	-7.6	40
	180	Res	G	63.4	61	68.5	40	58.9	43.6
Upper Rib	180	Y	G	85.7	33	81.4	34	52.8	42
Mid Rib	180	Y	G	45.8	34	64.5	38	56.0	46.2
Lower Rib	180	Y	G	57.4	41	115	38	63.0	45.6
Upper Rib Deflection	180	Y	mm	-17.5	53	-24.5	55	-19.9	57.6
Mid Rib Deflection	180	Y	mm	-12.7	49	-16.8	51	-9.8	57.5
Lower Rib Deflection	180	Y	mm	-8.0	51	-13.5	49	-3.4	57.3
Upper Rib VC	180	Y	m/sec	0.19	38	0.3	39	0.10	45.9
Mid Rib VC	180	Y	m/sec	0.06	38	0.1	46	0.00	52.1
Lower Rib VC	180	Y	m/sec	-0.03	56	0.1	43	0.00	54.3
Torso Force	600	X	N	-803	97	1033	90	805.4	114.5
	600	Y	N	-492	44	-654	91	-606.9	118.8
Torso Moment	600	Y	Nm	-38.8	99	-57.5	91	-48.4	112.9
	600	Z	Nm	-30.0	100	-32.9	90	-24.3	116.7
T12 Force	600	X	N	-511	35	-830	36	-705.4	42.3
	600	Y	N	2488	45	3013	40	-146.0	199.3
T12 Moment	600	X	Nm	NOT COLLECTED		-405.2	40	-342.5	44.5
	600	Y	Nm	-79.8	38	-119.4	36	-95.1	42.8

PASSENGER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values								
				2001 Focus 10/5/01 NCAP Side		2001 Focus 12/10/02 NCAP Side		2001 Focus 3/6/03 NCAP Side	
	Class	Axis	Units	Peak	Time (ms)	Peak	Time (ms)	Peak	Time (ms)
Abdomen Front Force	600	Y	N	545	37	924	35	573.2	41.3
Abdomen Mid Force	600	Y	N	475	37	760	43	426.3	41.1
Abdomen Rear Force	600	Y	N	262	50	554	40	205.8	45.9
Abdomen Summed Force	600	Y	N	1188	47	2036	44	11211	42.5
Pubic Symphysis Force	600	Y	N	-3678	38	-3725	33	-2758.6	36.6
Right Femur Force	600	X	N	-706	34	381	36	-349.6	58.9
	600	Y	N	-952	34	-1829	31	-709.1	38.4
	600	Z	N	2427	34	1919	31	1203.9	36.4
	600	RES	N	2527	34	2557	31	1394.8	36.4
Right Femur Moment	600	X	Nm	230.9	35	113.6	31	148.6	37.2
	600	Y	Nm	104.5	34	-73.2	36	-78.9	38.9
	600	Z	Nm	32.8	34	28.8	50	-28.1	37.1
	600	RES	Nm	241.7	35	117.5	31	162.8	37.1
Left Femur Force	600	X	N	388	37	-585	28	-436.7	38
	600	Y	N	2526	35	3063	32	1782.8	38
	600	Z	N	1964	34	9111	65	10828.6	63.8
	600	RES	N			9112	65	10828.9	63.8
Left Femur Moment	600	X	Nm	-337.3	23	-358.2	23	-268.4	24.1
	600	Y	Nm	-83.2	36	-98.2	23	-90.2	38.4
	600	Z	Nm	17.8	21	49.5	28	28.1	41.5
	600	RES	Nm	344.9	23	363	23	273.6	24.1
Pelvis	1000	X	G	-71.0	36	-65.8	33	-35.1	38.2
	1000	Y	G	93.3	31	110.7	33	73.2	31.9
	1000	Z	G	-24.4	36	-24.9	33	-16.0	39.1

APPENDIX F
ES-2 POLARITY CHECKLIST

ES-2 POLARITY CHECKLIST

Location	Channel	Dummy Manipulation	Polarity
Upper Neck	Fx	Head Rearward, Chest Forward	+
	Fy	Head Leftward, Chest Rightward	+
	Fz	Head Upward, Chest Downward	+
	Mx	Left Ear Toward Left Shoulder	+
	My	Chin Toward Sternum	+
	Mz	Chin Toward Left Shoulder	+
Lower Neck	Fx	Head Rearward, Chest Forward	+
	Fy	Head Leftward, Chest Rightward	+
	Fz	Head Upward, Chest Downward	+
	Mx	Left Ear Toward Left Shoulder	+
	My	Chin Toward Sternum	+
	Mz	Chin Toward Left Shoulder	+
Shoulder	Fx	Shoulder Forward, Chest Rearward	+
	Fy	Shoulder Rightward, Chest Leftward	+
	Fz	Shoulder Downward, Chest Upward	+
Torso Back Plate	Fx	Push Backplate in the +X Direction	+
	Fy	Push Backplate to the Right (+Y)	+
	My	Push Bottom Half and Pull Top Half of Backplate	+
	Mz	Push Left Half and Pull Right Half of Backplate	+
Thorax Upper Rib	Dy	Push Rib Rightward	+
Thorax Mid Rib	Dy	Push Rib Rightward	+
Thorax Lower Rib	Dy	Push Rib Rightward	+
Pubic Load	Fy	Right H-Point Pad Leftward, Left Pad Rightward	(-)
T12 Load	Fx	Chest Rearward, Pelvis Forward	+
	Fy	Chest Leftward, Pelvis Rightward	+
	Mx	Left Shoulder Toward Left Hip	+
	My	Sternum Toward Front of Legs	+
Left Illiac Load	Fy	Left Illiac Rightward, Chest Leftward	+
Ant. Ab. Load	Fy	Left Side of Abdomen Rightward, Chest Leftward	+
Mid Ab. Load	Fy	Left Side of Abdomen Rightward, Chest Leftward	+
Post. Ab. Load	Fy	Left Side of Abdomen Rightward, Chest Leftward	+
Left Upper Leg Load	Fx	Knee Upward, Upper Femur Downward	+
	Fy	Knee Rightward, Upper Femur Leftward	+
	Fz	Knee Forward, Pelvis Rearward	+
	Mx	Knee Leftward, Hold Upper Femur in Place	+
	My	Knee Upward, Hold Upper Femur in Place	+
	Mz	Tibia Leftward, Hold Pelvis in Place	+

ES-2 POLARITY CHECKLIST (CONTINUED)

Location	Channel	Dummy Manipulation	Polarity
Lumbar Spine	Fx	Knee Upward, Upper Femur Downward	+
	Fy	Knee Rightward, Upper Femur Leftward	+
	Fz	Knee Forward, Pelvis Rearward	+
	Mx	Knee Leftward, Hold Upper Femur in Place	+
	My	Knee Upward, Hold Upper Femur in Place	+
	Mz	Tibia Leftward, Hold Pelvis in Place	+