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REPORT NUMBER: 201-MGA-2005-001

SAFETY COMPLIANCE TESTING FOR FMVSS 201
RIGID POLE SIDE IMPACT TEST

Nissan Motor Company
2004 Nissan Titan
NHTSA NUMBER: C45206

PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105

May 19, 2005

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW, ROOM 6111 (NVS-220)
WASHINGTON, D.C. 20590

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-01-D-01033.

Prepared by: Shefalika Naik
Shefalika Naik, Project Engineer
Date: July 26, 2005

Reviewed by: David Winkelbauer
David Winkelbauer, Director of Operations
Date: July 26, 2005

FINAL REPORT ACCEPTED BY:

COTR, Side Impact

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Technical Report Documentation Page

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16. Abstract

A rigid pole side impact test was conducted on a 2004 Nissan Titan in accordance with FMVSS 201, "Occupant Protection in Interior Impact", S6.2(b)(3) and the Office of Vehicle Safety Compliance Test Procedure No. TP-201P-02 "Rigid Pole Side Impact Test". The test was conducted at MGA Research Corporation in Burlington, Wisconsin on May 19, 2005.

The impact velocity of the vehicle was 28.6 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 21°C. The post-test maximum crush was 380 mm at level 3. The test vehicle's occupant performance is as follows:

	REQUIREMENT	DRIVER
HIC	≤ 1000	339.0

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

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PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This rigid pole side impact test is conducted as part of the FY' 2005 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract No. DTNH22-01-D-01033. The purpose of this test was to evaluate occupant protection in interior impact in a 2004 Nissan Titan manufactured by Nissan Motor Company.

1.2 TEST PROCEDURE

The rigid pole side impact test was conducted in accordance with the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC), laboratory test procedure TP-201P-02, dated October 21, 2001 and the corresponding MGA Research Corporation Test Procedure MGA-NHTSA8. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

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

SECTION 2
SUMMARY OF RIGID POLE SIDE IMPACT TEST

2.1 SUMMARY OF RIGID POLE SIDE IMPACT TEST

A rigid pole side impact test was performed on a 2004 Nissan Titan. The subject vehicle was towed into a rigid pole at a velocity of 28.6 km/h. The specified impact velocity range is from 27.2 to 28.8 km/h. The test vehicle was positioned 90° to the line of forward motion. The weight of the vehicle as tested was 2546.1 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on May 19, 2005.

One (1) real-time motion picture camera and eleven (11) high-speed motion picture cameras were used to document the impact event. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and SID/HIII can be found in Appendix A. One SID/HIII was placed in the left front outboard designated seating position according to instructions specified in the TP-201P-02 dated October 21, 2001. The SID/HIII was instrumented in the following locations:

- Head Center of Gravity (CG) tri-axial accelerometers (X, Y, and Z axis)
- Upper Neck 6 channel load cell (X, Y, Z force and moment)
- Left Upper Rib (LUR) uni-axial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uni-axial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uni-axial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uni-axial accelerometer (Y-axis primary and redundant)

The test vehicle was instrumented with twenty (20) structural accelerometers. All data channels were recorded with a fully self contained on-board DTS TDAS Pro. The data was digitally sampled at 10,000 samples per second and processed per Section 12.2 of the Test Procedure.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 380 mm at level 3, at the vertical impact line. The driver SID/HIII, Serial No. 36, was calibrated just prior to this test. The SID/HIII's injury criteria are summarized as follows:

Measurements	Units	Driver
HIC		339.0
TTI*	G's	52.8
Pelvis*	G's	49.4
Neck Force X*	N	-311
Neck Force Y*	N	520
Neck Force Z*	N	921
Neck Moment X*	Nm	-55
Neck Moment Y*	Nm	-18
Neck Moment Z*	Nm	-16

* Information Purposes Only

Test summaries and post-test observations are presented in Section 3. The vehicle, camera, and occupant measurements are presented in Section 4. Appendix A contains the still photograph prints. Appendix B contains the SID/HIII and vehicle data traces. Appendix C contains the SID/HIII's configuration and performance verification data. Appendix D contains the calibration information data.

TEST NOTES

The following channels did not collect any valid data:

Vehicle CG Y after 65ms
Left B-Post @ Sill Y after 40ms
Right Floor Y after 40ms

The following accelerometers were not used for this test:

A Pillar Upper Y
B Pillar Upper Y
Left Roof Y
Right Roof Y

SECTION 3

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

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	English Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressure	lbf/in^2	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

*Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

TEST VEHICLE INFORMATION

Make	Nissan Motor Company
Model	Titan
Body Style	Pick Up
NHTSA No.	C45206
VIN	1N6AA06A74N506862
Color	Silver
Delivery Date	3/17/05
Odometer Reading (mile)	143
Dealer	Ricart Automotive
Transmission	Automatic
Final Drive	Rear Wheel
Number of Cylinders	8
Engine Displacement (L)	5.6
Engine Placement	Longitudinal

TEST VEHICLE OPTIONS

Front Airbag	Yes
Side Airbags	Yes, side & curtain
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	No
Anti-lock Brakes	Yes
AM/FM/CD	Yes
Anti-theft System	Yes
Cruise Control	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Company
Date of Manufacture	12/03

GVWR (kg)	2903
GAWR Front (kg)	1497
GAWR Rear (kg)	1724

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P265/70R18	P265/70R18
Tire Size on Vehicle	P265/70R18	P265/70R18
Tire Manufacturer	GoodYear	GoodYear

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Buckets	Split Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				548
Cargo Wt. (RCLW) (kg)				136.1

DATA SHEET NO. 1... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	674.0	511.2		693.6	616.0	
Right	kg	616.9	534.3		627.3	609.2	
Ratio	%	55.3	44.7		51.9	48.1	
Totals	kg	1290.9	1045.5	2336.4	1320.9	1225.2	2546.1

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2336.4
Weight of SID/HIII Side Impact Dummy	kg	80.7
Rated Cargo/Luggage Weight (RCLW)	kg	136.1
Calculated Vehicle Target Weight (TVTW)	kg	2553.2

TEST VEHICLE ATTITUDES

	Units	As Delivered	Fully Loaded	Ready For Test*
Right Front	mm	899	902	900
Left Front	mm	896	898	897
Right Rear	mm	963	933	940
Left Rear	mm	951	901	931
Right Door Sill Angle	deg	1.2 ND	0.4 ND	1.0 ND
Left Door Sill Angle	deg	1.3 ND	0.6 ND	1.2 ND
Front Bumper Angle	deg	0.5 LD	1.0 LD	0.5 LD
Rear Bumper Angle	deg	0.1 LD	0.5 LD	0.3 LD

ND = NOSE DOWN, BD = BACK DOWN, LD = LEFT DOWN, RD = RIGHT DOWN

* on wheel dollies

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	3560
Total Vehicle Length at Left Side	mm	4774
Total Vehicle Length at Centerline	mm	5706
Total Vehicle Length at Right Side	mm	4776
Total Vehicle Width at B-Post	mm	2013
Weight of Ballast in Cargo Area	kg	111.1
Amount of Stoddard Solvent in Fuel Tank	liters	99.6

DATA SHEET NO. 1... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

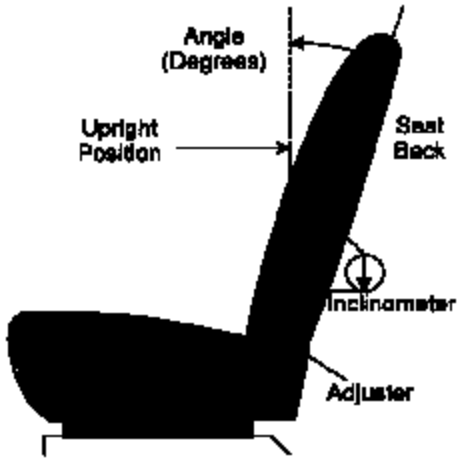
Test Vehicle: 2004 Nissan Titan NHTSA No. C45206
Test Program: FMVSS 201P Test Date: May 19, 2005

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Target Impact Point Aft of Front Axle	mm	1532
Actual Impact Point Aft of Front Axle	mm	1536

NORMAL DESIGN RIDING POSITION

The driver's seat back is positioned to the manufacturer's designated angle. The procedure for the seat is as follows: Adjust the seat back by the recliner switch to the upright initial position. Recline the seat back rearward until the inclinometer reads 10.0° at seat head rest post.



FRONT SEAT ASSEMBLY

Driver seat back angle: Initial – 10.0 deg. on headrest post Final – 8.1 deg. on headrest post

SEAT FORE/AFT POSITIONS

The manufacturer's procedure is as follows: Adjust seat track slide to full forward and mark position. Adjust seat track slide to full rearward and mark position (240mm). Adjust seat track to mid-position (120mm). The fore/aft was set to the middle position for the driver's seat.

Driver seat fore/aft total travel: 240mm
Driver seat fore/aft position: 120 of 240 mm

SEAT BELT UPPER ANCHORAGE

The test vehicle is equipped with adjustable "D" ring anchorage for the driver's seat position. The driver's "D" ring anchorage was placed in the uppermost position.

DATA SHEET NO. 1... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

FUEL TANK CAPACITY DATA

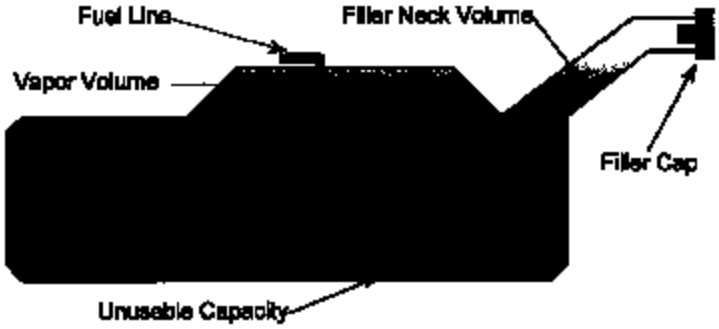
The "Usable Capacity" of the standard equipment fuel tank is: 105.8 liters

The "Usable Capacity" of any optional equipment fuel tank is: n/a liters

92-94% of "Usable Capacity" for certification to FMVSS 301 requirements: 97.5 – 99.6 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 99.6 liters

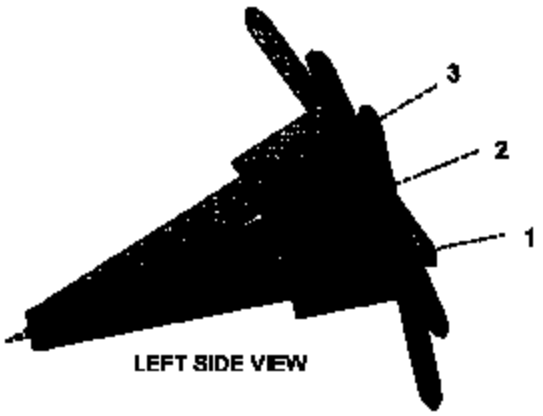
The fuel pump will pump fuel for 5 seconds after the ignition is switched to on, while the engine is running and for 1.5 seconds after the engine stops running.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes, when it is moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, and inclinometer is placed onto the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

The steering column angle was set to 26° (3rd notch from upper most notch being 0)

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	674.0	511.2		693.6	616.0	
Right	kg	616.9	534.3		627.3	609.2	
Weight Ratio	%	55.3	44.7		51.9	48.1	
Totals	kg	1290.9	1045.5	2336.4	1320.9	1225.2	2546.1

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	330	455
Level 2	Occupant H-Point	mm	375	825
Level 3	Mid Door	mm	380	903
Level 4	Window Sill	mm	343	1202
Level 5	Window Top	mm	205	1860
N/A	Maximum Penetration	mm	380	903

INSTRUMENTATION

SID/HIII Instrumentation	17
Vehicle Structure Accelerometers	20
Total	37

CAMERAS

Onboard Vehicle	3
Offboard Vehicle	8
Total	11

IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 38	4 rearward

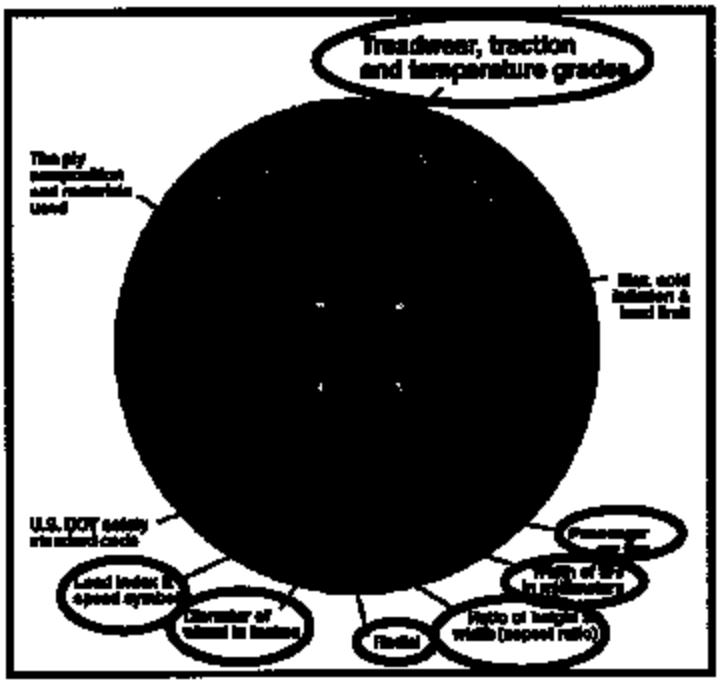
DATA SHEET NO. 3

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

Vehicle Year	2004	Vehicle Make	Nissan
VIN	1N6AA06A74N506862	Vehicle Model	Titan



	Front	Rear
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Wrangler SR-A	Wrangler SR-A
Tire Type	M+S	M+S
Tire Width (mm)	265	265
Ratio of Height to Width (aspect ratio)	70	70
Radial	R	R
Wheel Diameter	18	18
Load Index & Speed Symbol	114S	114S
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 4

POST TEST OBSERVATIONS

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Left Front Seating Position
Dummy Type / Serial No.	SID/HIII / 036
Head Contact	Curtain Airbag, Roof Liner
Upper Torso Contact	Door Panel, Side Airbag
Lower Torso Contact	Side Airbag
Left Knee Contact	Door Trim Panel
Right Knee Contact	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Door remained closed and latched	Door remained closed and latched
Right Side Door Opening	Door remained closed and latched	Door remained closed and latched
Seat Movement	0	0
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	Cracked
Window Damage	Left Side Windows Down For Test
Other Notable Effects	None

AIRBAG DEPLOYMENT

	Driver
Front	No
Side	Yes
Curtain	Yes

ARMREST LOCATION AND SEAT CRUSH

	Driver
Front Armrest (from bottom of window)	150
Front Seat Back Crush	25
Front Seat Cushion Crush	155

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5

SID/HIII INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

THORAX AND PELVIS PEAK ACCELERATIONS (FIR 100 Filtered)

Location	Axis	Units	Driver			
			Max	Time	Min	Time
Upper Rib (LUR)	Y	G's	52.2	42	-12.0	153
Upper Rib (LUR) (R)	Y	G's	51.4	42	-11.8	152
Lower Rib (LLR)	Y	G's	56.2	41	-26.5	146
Lower Rib (LLR) (R)	Y	G's	53.8	41	-10.9	152
Lower Spine (T_{12})	Y	G's	49.3	46	-10.9	98
Lower Spine (T_{12}) (R)	Y	G's	50.5	46	-10.7	97
Pelvis (PEV)	Y	G's	49.4	55	-10.3	95
Pelvis (PEV) (R)	Y	G's	49.5	55	-10.2	95

THORACIC TRAUMA INDEX (TTI) AND PELVIC ACCELERATION (FIR 100 Filtered)

Location	Driver			
	LLR	T_{12}	TTI(g)	PEV(g)
Rib, Spine, and Pelvis	56.2	49.3	52.8	49.4
Rib, Spine, and Pelvis (R)	53.8	50.5	52.2	49.5

UPPER NECK FORCES AND MOMENTS (SAE CLASS 1000/600 Filtered)

Location	Axis	Units	Driver			
			Max	Time	Min	Time
Neck Force	X	N	69	120	-311	83
Neck Force	Y	N	520	62	-481	178
Neck Force	Z	N	921	55	-154	89
Neck Moment	X	Nm	8.2	121	-54.6	52
Neck Moment	Y	Nm	8.4	100	-16.1	81
Neck Moment	Z	Nm	12.1	175	-15.6	85

HEAD CG PEAK ACCELERATIONS (SAE CLASS 1000 Filtered)

Location	Axis	Units	Driver			
			Max	Time	Min	Time
Head CG	X	G's	5.0	40	-9.9	66
Head CG	Y	G's	55.4	60	-12.2	177
Head CG	Z	G's	16.8	49	-2.8	69
Head CG Resultant		G's	56.6	60		

HEAD INJURY CRITERIA (SAE CLASS 1000 Filtered)

Location	Driver			
	HIC	T1	T2	Avg G's
Head CG Resultant	339.0	48.5	73.2	45.2

Positive Acceleration Polarities: (Conforms to SAE J211)
Longitudinal (X) = + Forward
Lateral (Y) = + Right
Vertical (Z) = + Down

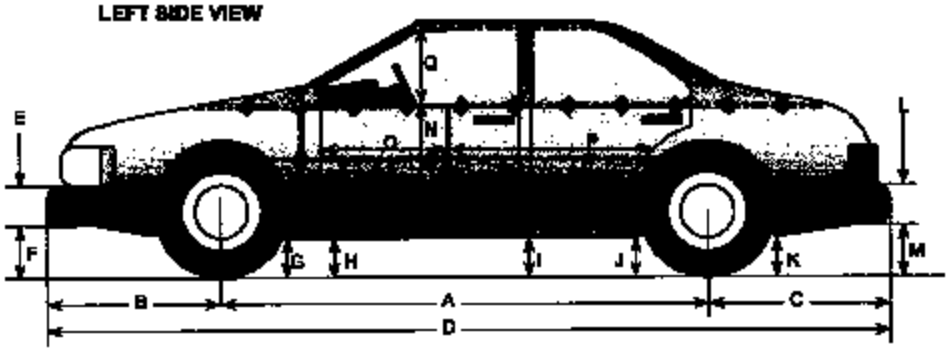
DATA SHEET NO. 6

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

LEFT SIDE VIEW



All Measurements in mm

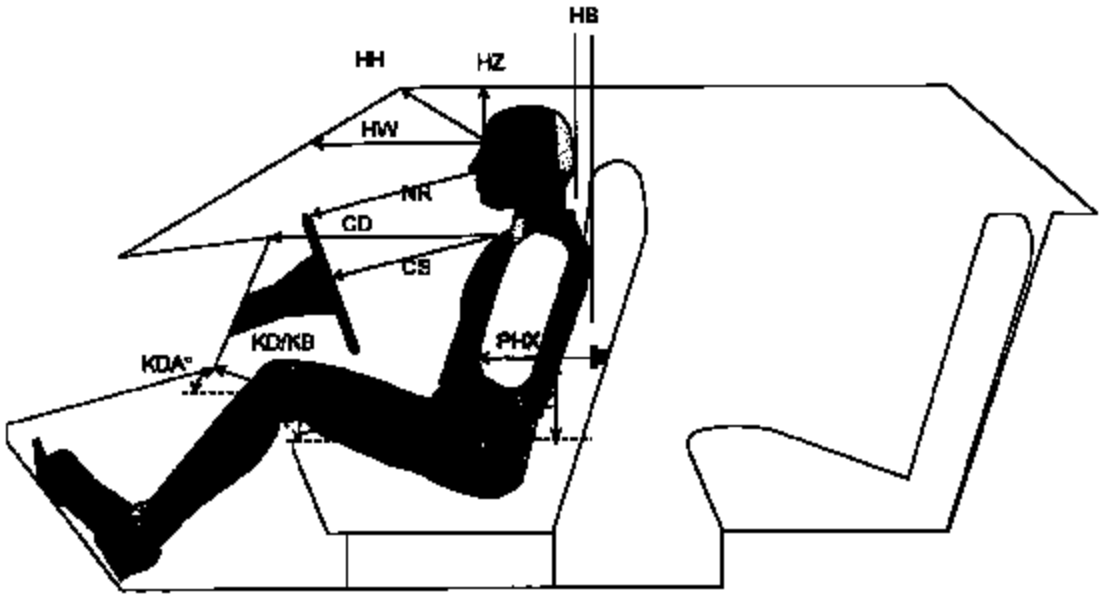
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3560	3486	74
B	Front Axle to FSOV	897	948	-51
C	Rear Axle to RSOV	1249	1233	16
D	Total Length at Centerline	5706	5667	39
E	Front Bumper Thickness	506	506	0
F	Front Bumper Bottom to Ground	341	335	6
G	Sill Height at Front Wheel Well	281	278	3
H	Sill Height at Front Door Leading Edge	290	279	11
I	Sill Height at "B" Pillar	329	299	30
J1	Sill Height at Rear Wheel Well	358	344	14
J2	Pinch Weld Height at Rear Wheel Well	321	316	5
K	Sill Height Aft of Rear Wheel Well	405	406	-1
L	Rear Bumper Thickness	221	221	0
M	Rear Bumper Bottom to Ground	520	495	25
N	Sill Height to Window Bottom Sill	834	805	29
O	Front Door Leading Edge to Impact CL	966	880	86
P	Rear Door Trailing Edge to Impact CL	890	805	85
Q	Front Window Opening	547	524	23
R	Right Side Length	4776	4827	-51
S	Left Side Length	4774	4637	137
T	Vehicle Width at "B" Post	2013	1968	45

DATA SHEET NO. 7

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005



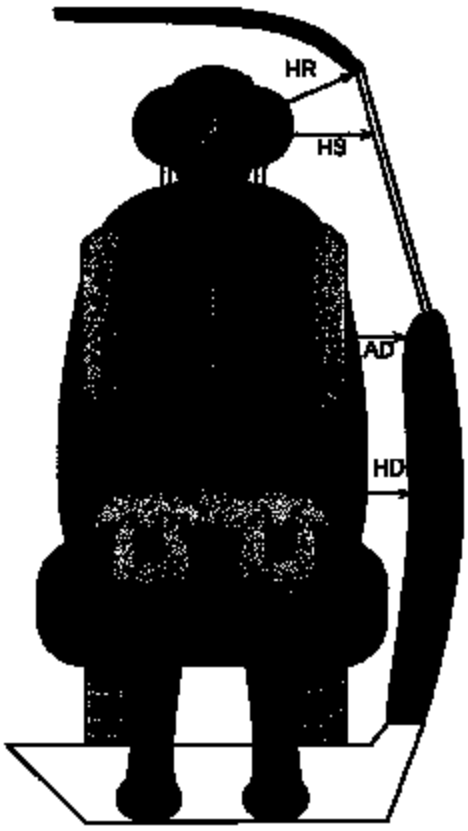
Driver Code	Measurement Description	Driver	
		Length(mm)	Angle(°)
HH	Head to Header	471	
HW	Head to Windshield	705	
HZ	Head to Roof	209	
NR	Nose to Rim	438	
CD	Chest to Dash	550	
CS	Chest to Steering Wheel	320	
KDL	Left Knee to Dash	181	21.9
KDR	Right Knee to Dash	148	20.3
PA	Pelvic Angle		22.7
PHX	H-Point to Striker (X-Axis)	289	
PHZ	H-Point to Striker (Z-Axis)	25	

DATA SHEET NO. 8

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005



FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	245
HS	Head to Side Window	mm	344
AD	Arm to Door	mm	128
HD	H-Point to Door	mm	189

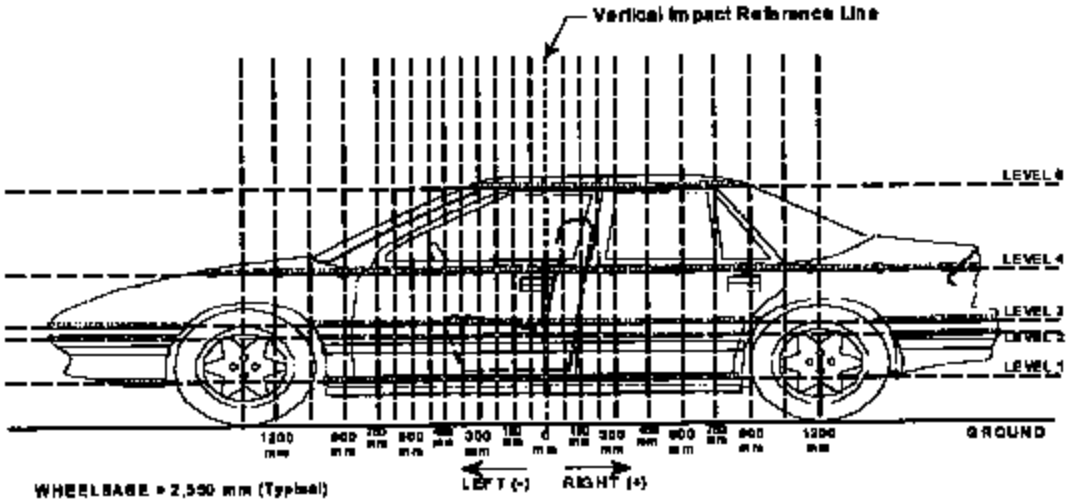
DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

PRETEST AND POST TEST EXTERIOR PROFILE MEASUREMENTS



LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.
Measurements along the vertical 0 mm.

Level	Measurement Description	Units	Height Above Ground
5	Window	mm	1660
4	Window Sill	mm	1202
3	Mid Door	mm	903
2	Occupant H-Point	mm	825
1	Sill Top	mm	455

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2004 Nissan Titan NHTSA No. C45206
Test Program: FMVSS 201P Test Date: May 19, 2005

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1875			115	195				121	190				6	-5	
-1725			102	181				118	184				16	3	
-1575				168					178					10	
-1425			97	163				115	173				18	10	
-1275			96	157				115	173				19	16	
-1125		98	99	162			125	122	180			27	23	18	
-975	134	104	107	164		166	147	132	190		32	43	25	26	
-900	145	111	113	170		176	142	142	192		31	31	29	22	
-825	154	116	119	168		202	167	169	200		48	51	50	32	
-750	154	115	117	166		216	186	189	215		62	71	72	49	
-675	152	114	116	166		231	211	213	239		79	97	97	73	
-600	151	114	115	166		247	232	235	265		96	118	120	99	
-525	151	113	114	165		264	255	260	290		113	142	146	125	
-450	149	111	114	164	420	282	277	286	313	463	133	166	172	149	43
-375	150	110	113	164	407	300	305	310	338	469	150	195	197	174	62
-300	149	110	112	162	402	323	334	339	369	480	174	224	227	207	78
-225	148	110	111	162	391	356	366	372	402	496	208	256	261	240	107
-150	148	109	111	162	391	385	396	406	434	518	237	289	295	272	127
-75	147	109	110	163	392	433	438	446	466	555	286	329	336	303	163
0	147	109	110	163	394	477	484	490	506	599	330	375	380	343	205
75	147	109	110	162	393	466	480	479	483	557	319	371	369	321	164
150	147	109	110	162	392	427	423	421	453	513	280	314	311	291	121
225	147	109	110	164	393	361	367	371	422	490	214	258	261	258	97
300	148	110	110	164	394	312	309	312	390	474	164	199	202	226	80
375	150	111	111	164	395	287	280	284	353	456	137	169	173	189	61
450	149	112	112	166	394	265	257	260	326	434	116	145	148	160	40
600	153	114	114	167	396	224	206	211	273	419	71	92	97	106	23
750	155	117	118	168	401	178	156	161	219	415	23	39	43	51	14
900	176	121	121	166	410	196	109	113	179	409	20	-12	-8	13	-1
1050	169	123	123	171		130	71	80	119		-39	-52	-43	-52	
1200	169	125	126	172		138	80	78	120		-31	-45	-48	-52	
1350	164	123	128	176		145	84	80	130		-19	-39	-48	-46	
1500	142	108	109	176		130	76	76	144		-12	-32	-33	-32	
1650		101	103	179			78	75	159			-23	-28	-20	
1800			100	181				82	174				-18	-7	
1950			99	184				84	179				-15	-5	
2100			101	187				87	183				-14	-4	
2250			101	190				91	185				-10	-5	
2400		104	104	194			96	97	189			-8	-7	-5	
2550		109	108	198			104	105	194			-5	-3	-4	
2700		113		203			110		200			-3		-3	

Reference plane is parallel to test vehicle longitudinal centerline Units = mm

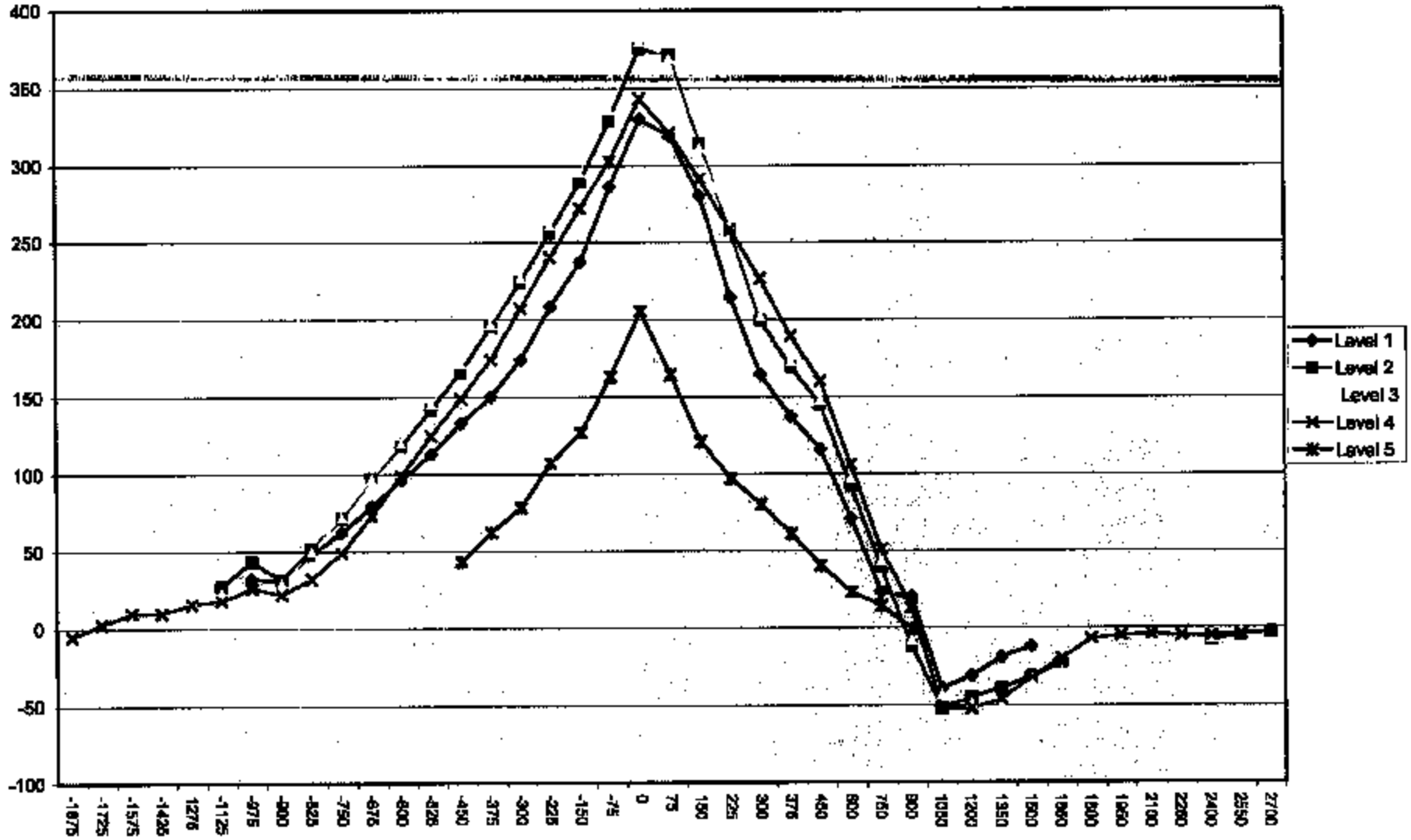
Given dimensions = Reference plane to car body

DATA SHEET NO. 10.. (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

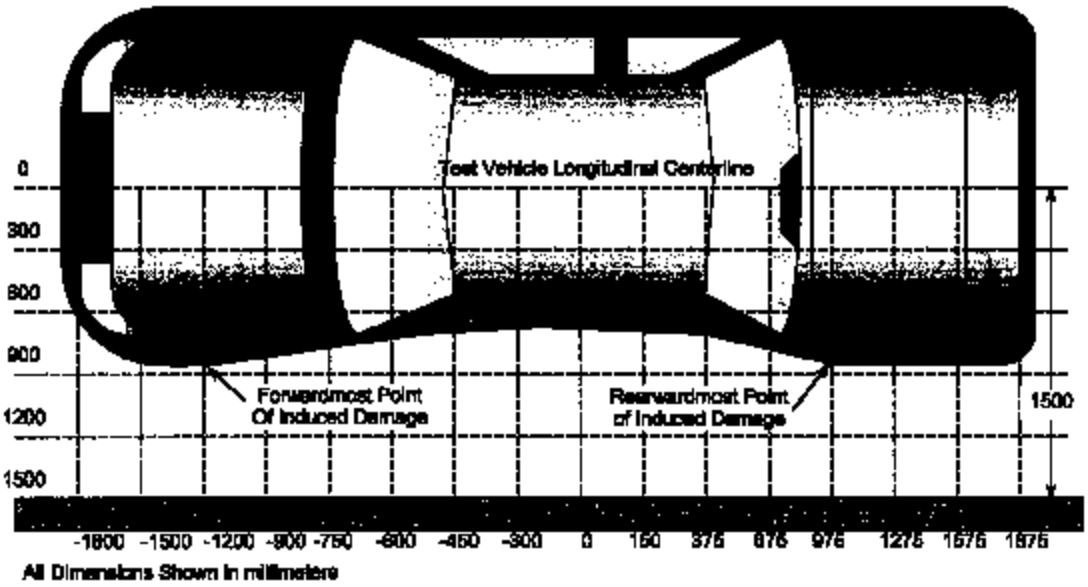


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005



TOP VIEW

Damage Profile Distances

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2700 mm	3	112	112	0
2	1927 mm	4	183	168	-15
3	1010 mm	1	171	115	-56
4	15 mm	3	110	485	375
5	-952 mm	1	136	183	47
6	-1875 mm	3	115	121	6

Reference plane is parallel to test vehicle longitudinal centerline

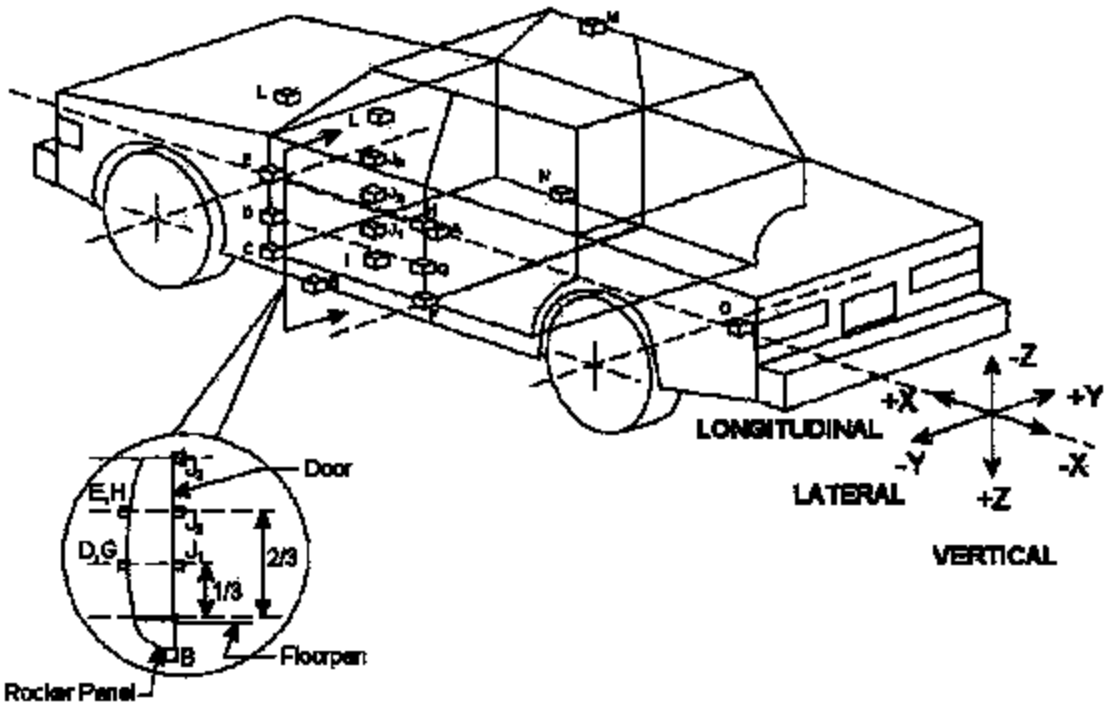
Given dimensions = Reference plane to car body

DATA SHEET NO. 12

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005



No.	Location
A	Vehicle CG
B	Left Floor Sill
C	A Pillar Sill
D	A Pillar Low
E	A Pillar Mid
G	B Pillar Sill
H	B Pillar Low
I	B Pillar Mid

No.	Location
L	Driver Seat
M1	Driver Door Rib
M2	Driver Door Pelvis
M3	Driver Door Knee
N	Engine
O	Firewall
Q	Right Floor Sill
R	Rear Deck

DATA SHEET NO. 12... (continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Peak Values (G's)				
		Axis	Max	Time	Min	Time
A	Vehicle CG	X	5.3	54	-5.1	91
		Y	*	*	*	*
		Z	10.6	84	-12.3	50
		RES	45.8	65		
B	Left Floor	Y	31.5	23	-6.2	17
C	A Pillar Sill	Y	18.8	2	-13.3	19
D	A Pillar Low	Y	17.6	47	-0.9	0
E	A Pillar Mid	Y	15.1	54	-2.7	2
G	B Pillar Sill	Y	**	**	**	**
H	B Pillar Low	Y	91.5	5	-32.2	25
I	B Pillar Mid	Y	86.6	10	-50.1	28
L	Driver Seat	Y	66.6	19	-27.0	39
M1	Driver Door Rib	Y	122.8	10	-89.1	27
M2	Driver Door Pelvis	Y	126.7	10	-66.6	26
M3	Driver Door Knee	Y	86.8	4	-52.9	25
N	Engine	X	1.7	90	-4.5	144
		Y	19.9	66	-3.2	35
O	Firewall	Y	14.0	65	-1.2	199
Q	Right Floor Sill	Y	***	***	***	***
R	Rear Deck	X	2.5	56	-3.8	119
		Y	9.7	109	-0.7	250

* No valid data collected after 65ms
** No valid data collected after 40ms
*** No valid data collected after 40ms

Positive Acceleration Polarities: (Conforms to SAE J211)
Longitudinal (X) = + Forward
Lateral (Y) = + Right
Vertical (Z) = + Down

DATA SHEET NO. 12... (continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Nissan Titan NHTSA No. C45206
Test Program: FMVSS 201P Test Date: May 19, 2005

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			
		Axis	Pre-Test	Post-Test	Difference
A	Vehicle CG	X	3199	3169	-30
		Y	0	90	90
		Z	535	717	-182
B	Left Floor Sill	X	3730	3678	-52
		Y	-768	-697	71
		Z	370	324	46
C	A Pillar Sill	X	4148	4119	-29
		Y	-766	-683	83
		Z	365	342	23
D	A Pillar Low	X	4218	4114	-104
		Y	-940	-863	77
		Z	842	714	128
E	A Pillar Mid	X	4208	4117	-91
		Y	-935	-840	95
		Z	1003	1074	-71
G	B Pillar Sill	X	3023	3002	-21
		Y	-765	-718	47
		Z	385	340	45
H	B Pillar Low	X	3121	3084	-37
		Y	-836	-787	49
		Z	792	689	103
I	B Pillar Mid	X	3099	3064	-35
		Y	-821	-758	63
		Z	1113	1092	21
L	Driver Seat	X	3282	3155	-127
		Y	-703	-651	52
		Z	868	868	-2
M1	Driver Door Rib	X	3377	3357	-20
		Y	-890	-592	298
		Z	1045	1083	-38
M2	Driver Door Pelvis	X	3368	3313	-55
		Y	-900	-585	315
		Z	810	872	-62
M3	Driver Door Knee	X	3303	3291	-12
		Y	-816	-481	335
		Z	610	608	2
N	Engine	X	4852	4793	-59
		Y	55	27	-28
		Z	1145	1189	-44
O	Firewall	X	4764	4663	-101
		Y	0	40	40
		Z	1205	1193	12
Q	Right Floor Sill	X	3213	3227	14
		Y	770	785	15
		Z	386	379	6
R	Rear Deck	X	827	733	-94
		Y	0	-2	-2
		Z	655	679	-24

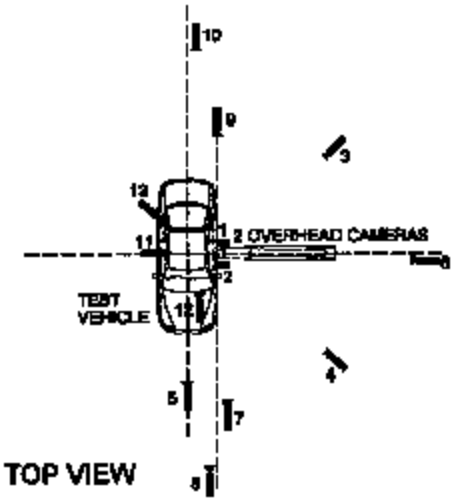
Reference Points
X – Rear of Vehicle (+ forward)
Y – Vehicle Centerline (+ to right)
Z – Ground Plane (+ down)

DATA SHEET NO. 13

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005



TOP VIEW

No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	580	-1375	5725	14	1000
2	Overhead Close-Up	0	0	5050	19	1000
3	Left Side 45° Rearward Pole View	-2525	-3475	1389	24	1000
4	Right Side 45° Forward Pole View	-2220	3220	1500	24	1000
5	Real Time				13	24
6*	Left Side Rear Pole View					
7	Front Ground Level Vehicle/Pole Impact	385	7175	1525	24	1000
8	Front Ground Level Vehicle Roof Targets and Vehicle/Pole Impact	815	6510	1495	24	1000
9	Rear Ground Level Vehicle/Pole Impact	80	-8100	1490	24	1000
10	Rear Ground Level	520	-9885	1480	35	1000
11	Test Vehicle Onboard Driver Side View				8	500
12	Test Vehicle Onboard Driver Front View				12.5	500
13	Test Vehicle Onboard Driver ¾ Rear View				10	500

Reference Points X - + Forward of Impact
Y - + Right of Impact
Z - + Ground Plane Down

* Camera 6 was not used for this test.

DATA SHEET NO. 14

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

Test Time: 11:30 AM

Temperature at Time of Impact: 21°C

Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0
(Maximum Allowable = 1 ounce)

B. For the 5 minute period after motion ceases: 0
(Maximum allowable = 5 ounces)

C. For the following 25 minutes: 0
(Maximum allowable = 1 oz. /minute)

D. Spillage Details: None

DATA SHEET NO. 15

FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2004 Nissan Titan
Test Program: FMVSS 201P

NHTSA No. C45206
Test Date: May 19, 2005

0° to 90°

90° to 180°

180° to 270°

270° to 360°

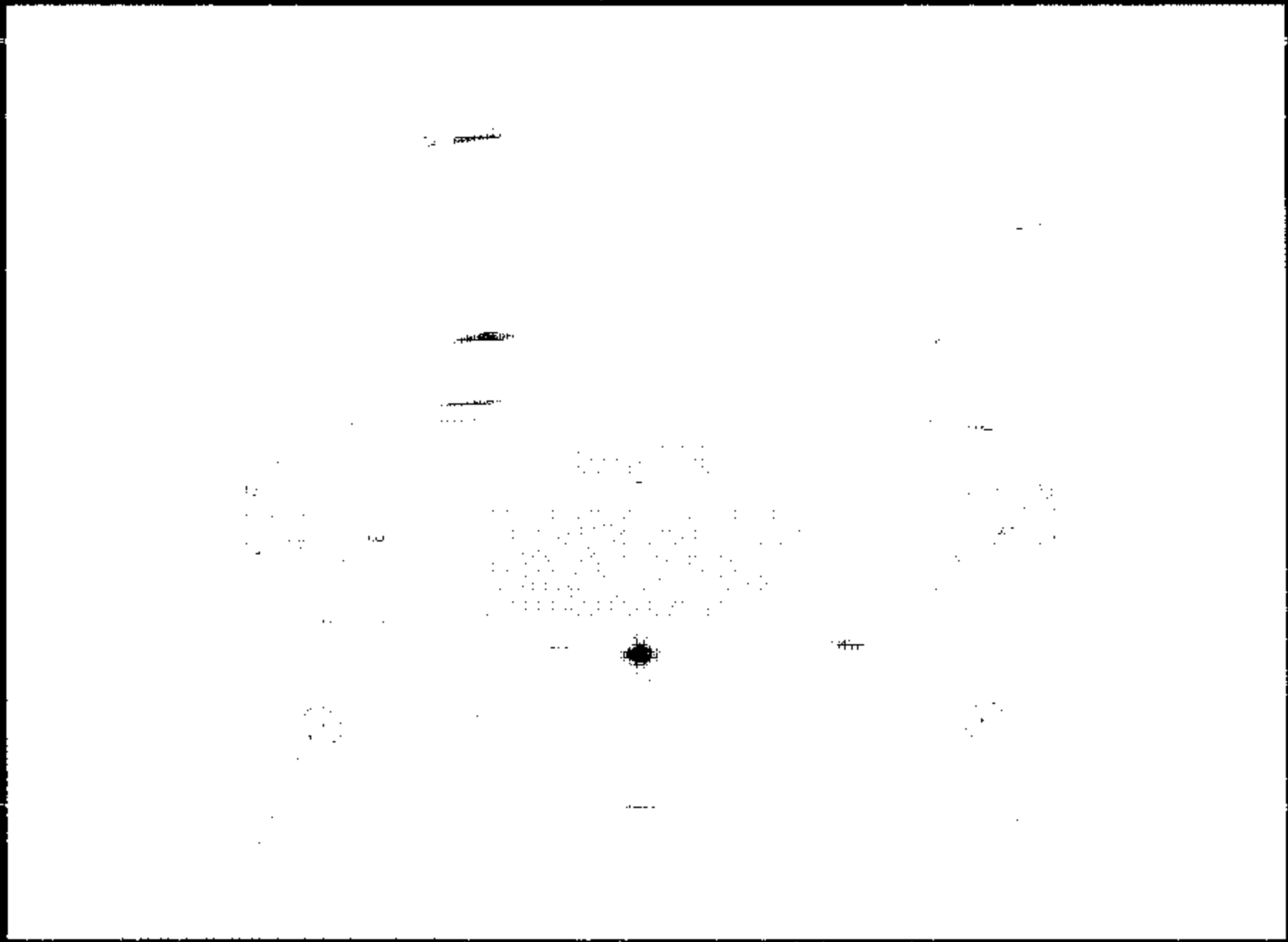
1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent Spillage locations: None

Rollover Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	158	300	0
90° to 180°	160	300	0
180° to 270°	150	300	0
270° to 360°	148	300	0

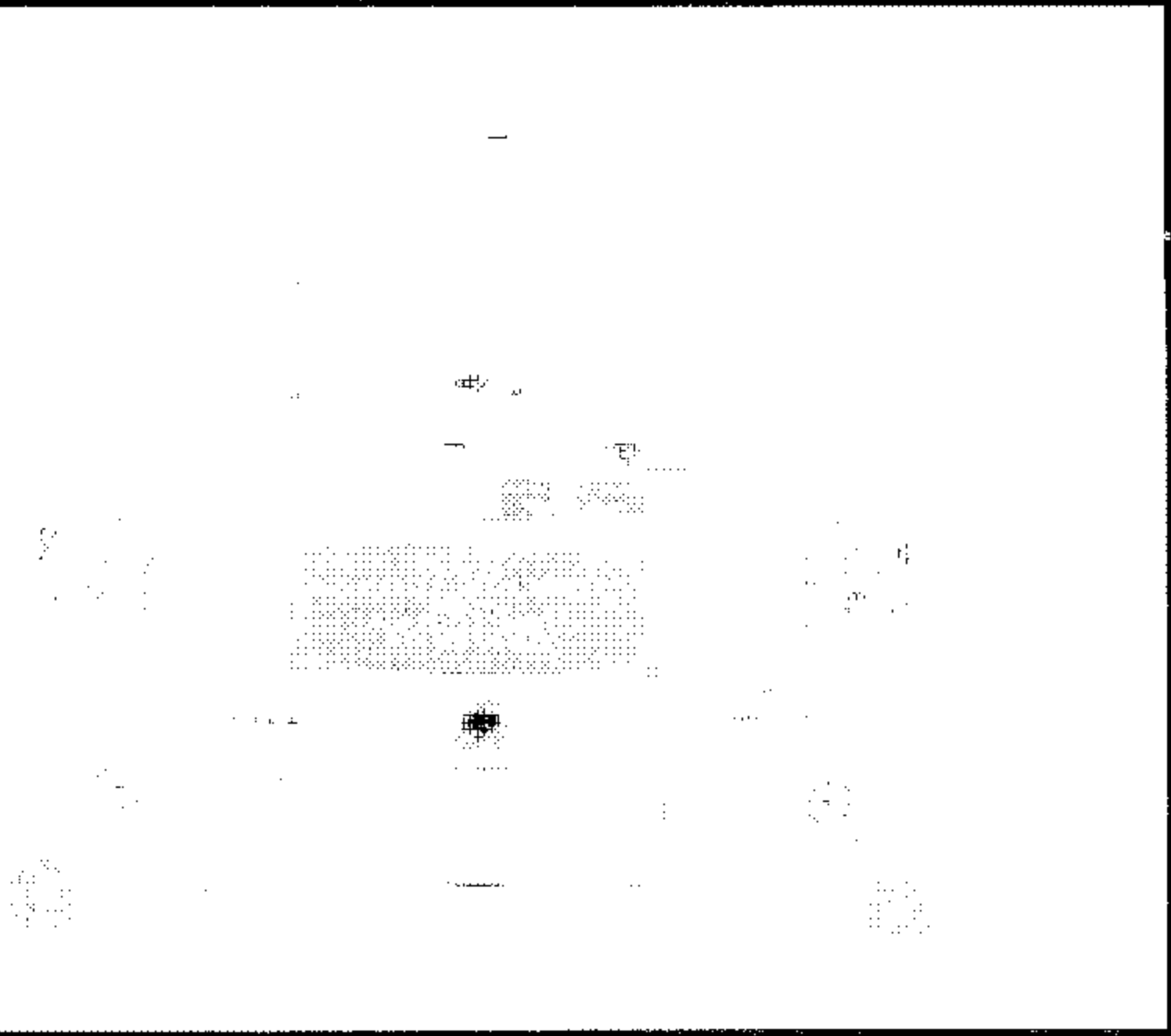
APPENDIX A

PHOTOGRAPHS

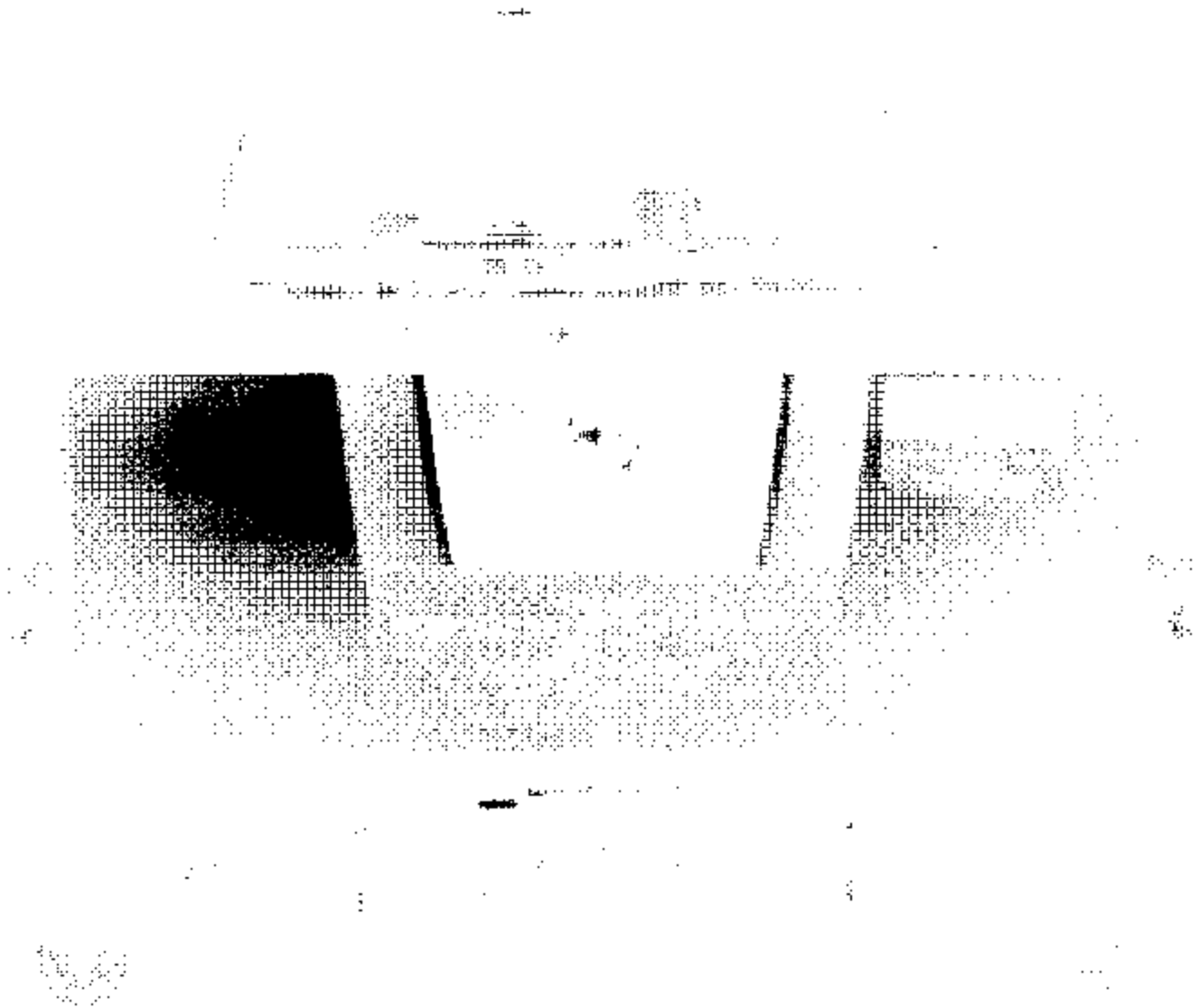
TABLE OF PHOTOGRAPHS



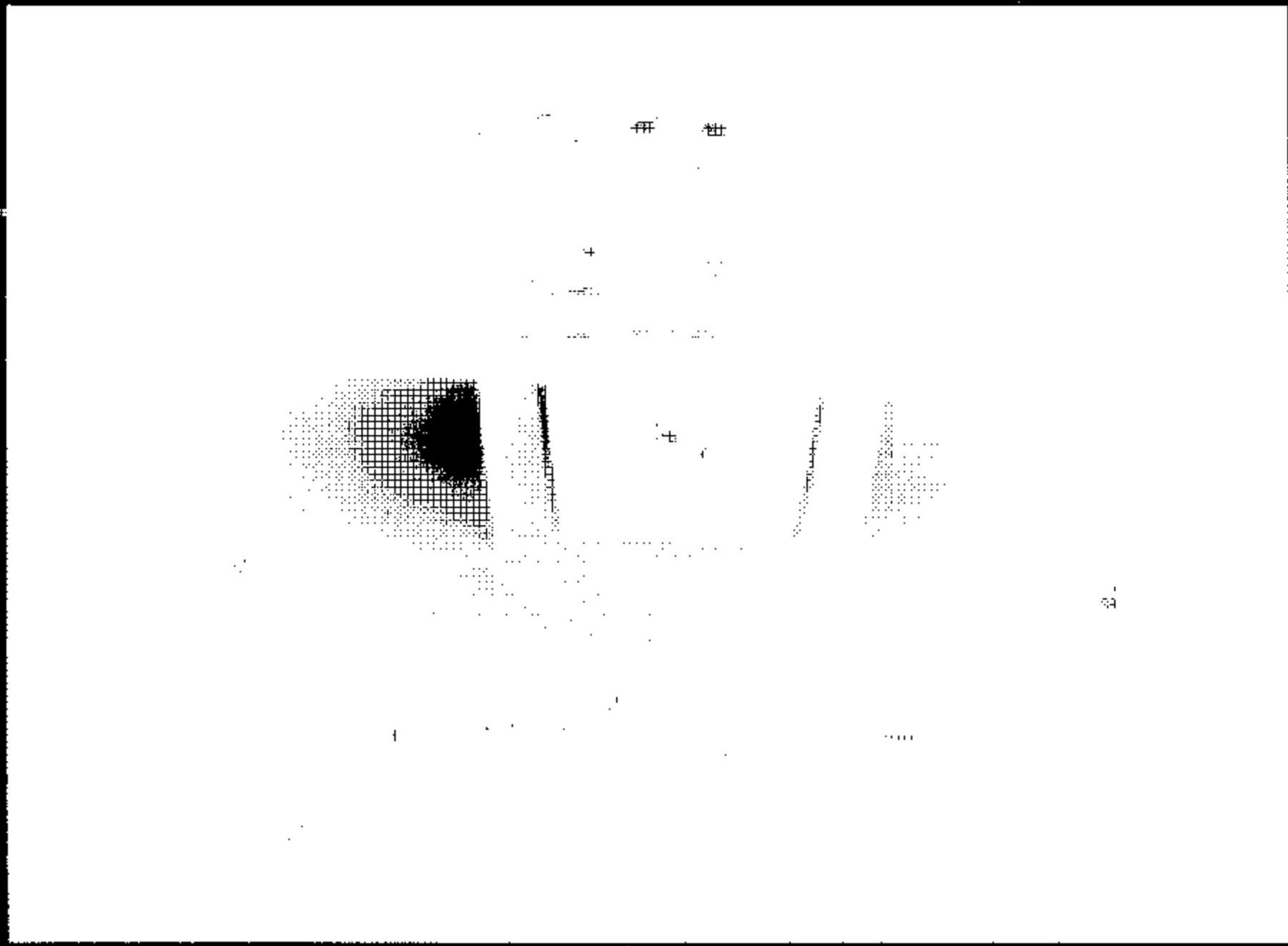
Pre-Test Front View of Test Vehicle



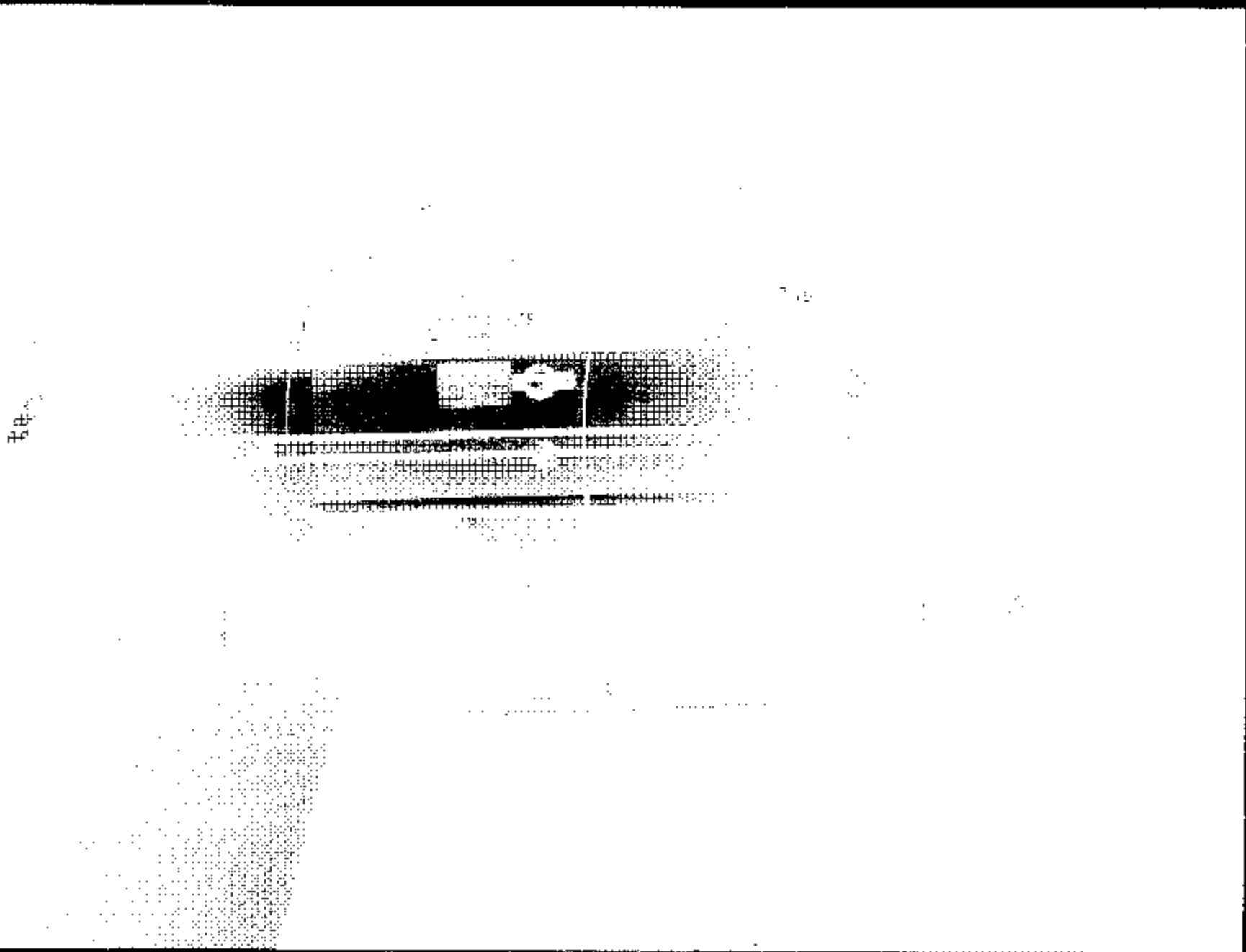
Post-Test Front View of Test Vehicle



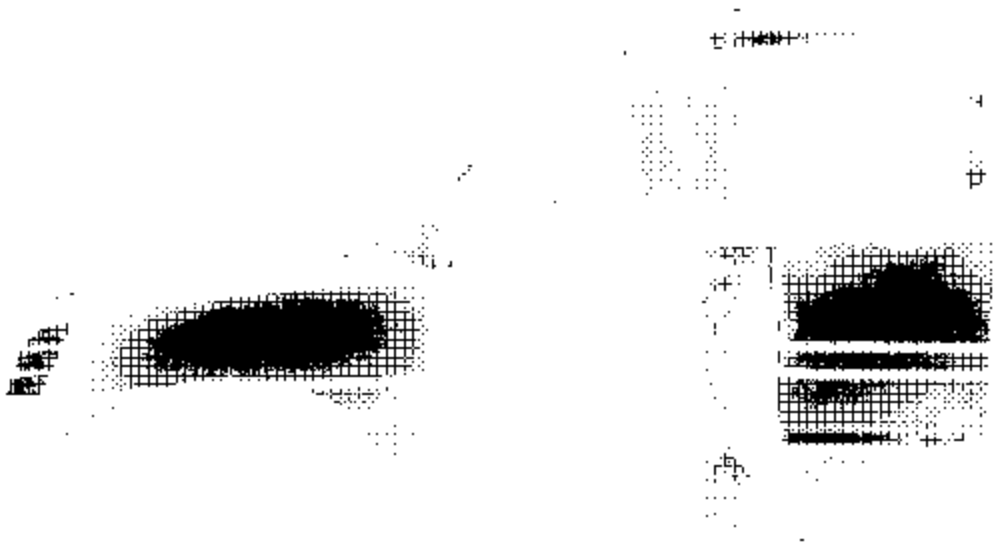
Pre-Test Rear View of Test Vehicle



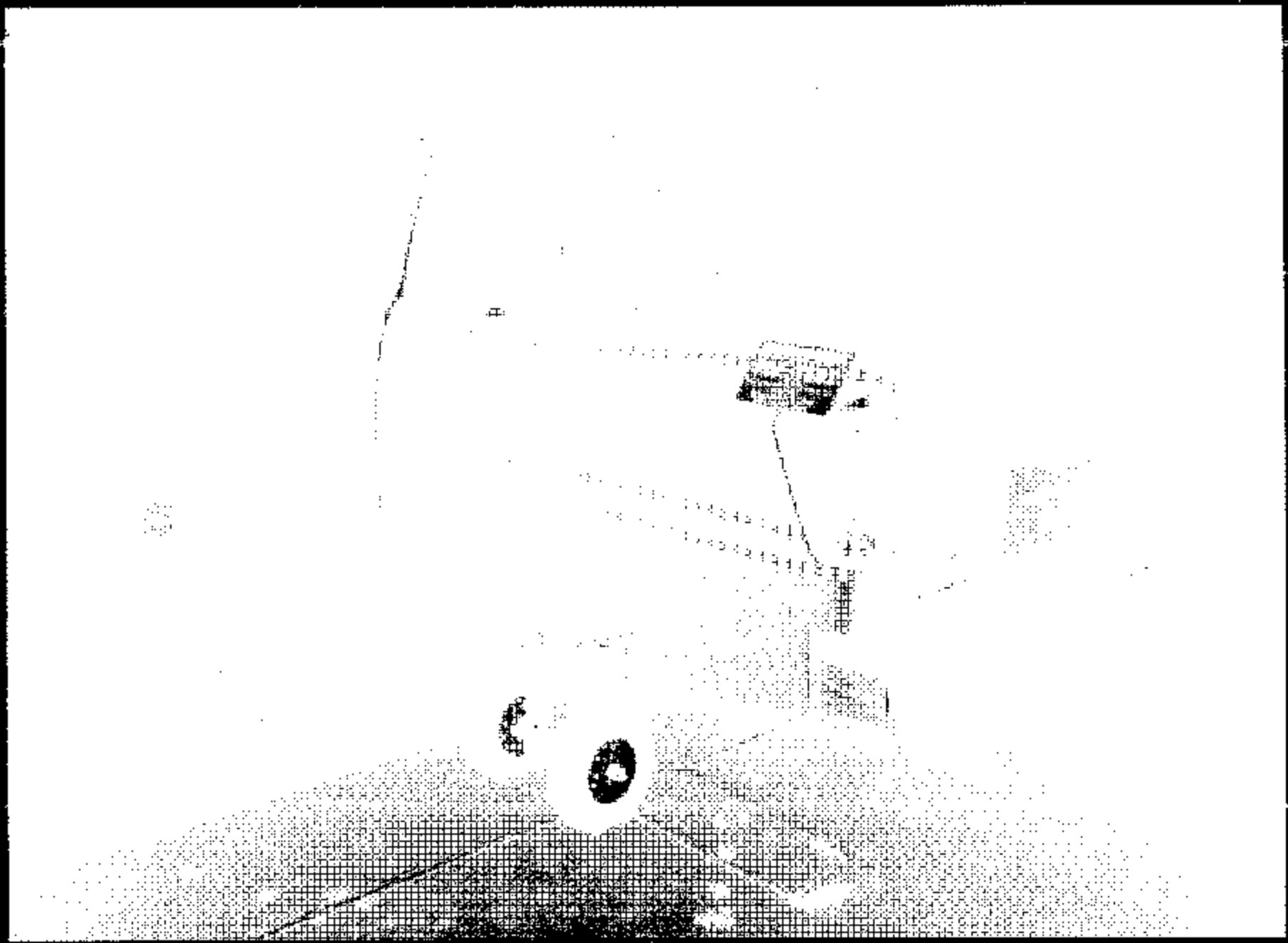
Post-Test Rear View of Test Vehicle



Pre-Test Left Side View of Test Vehicle

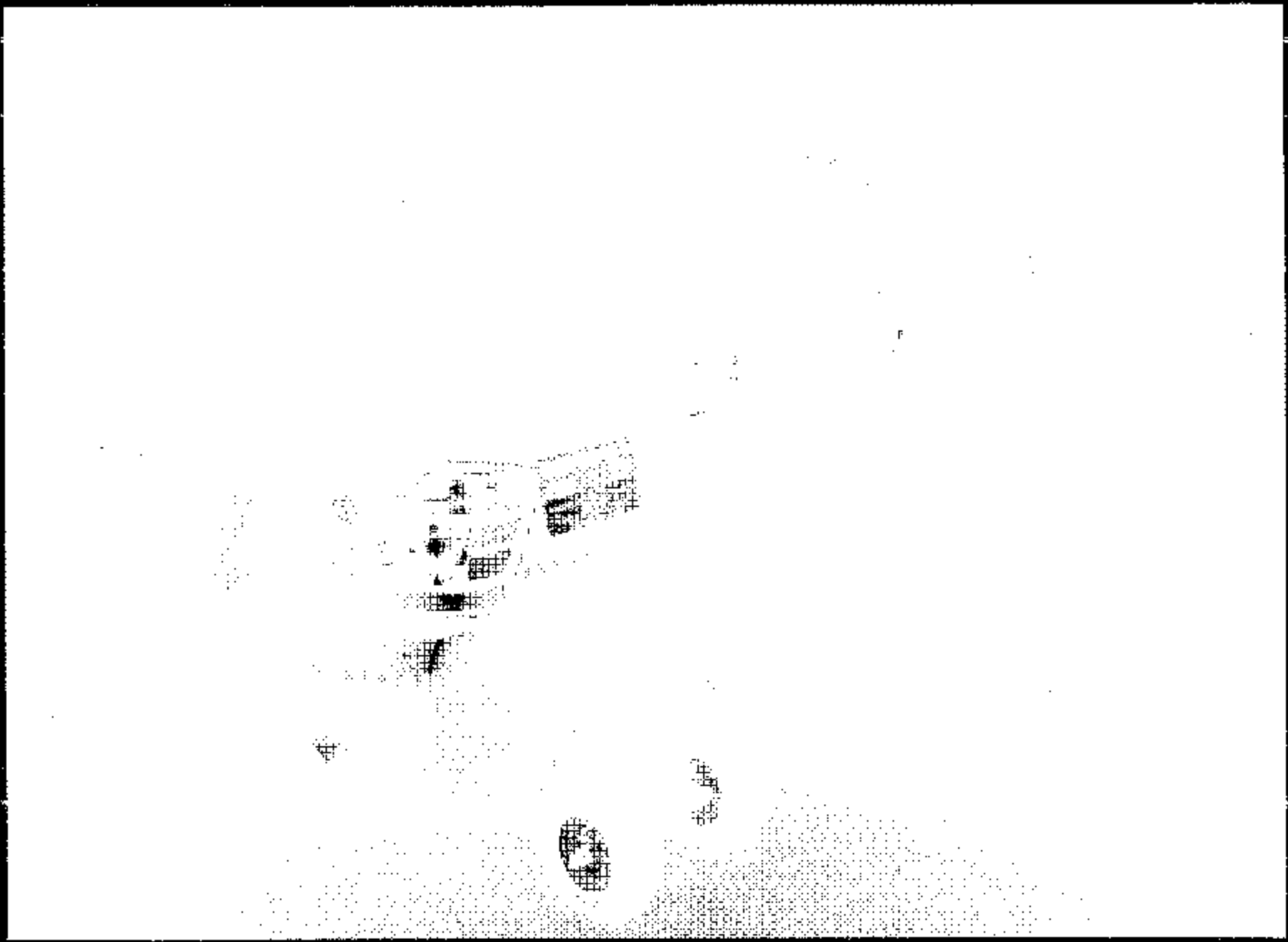


Post-Test Left Side View of Test Vehicle



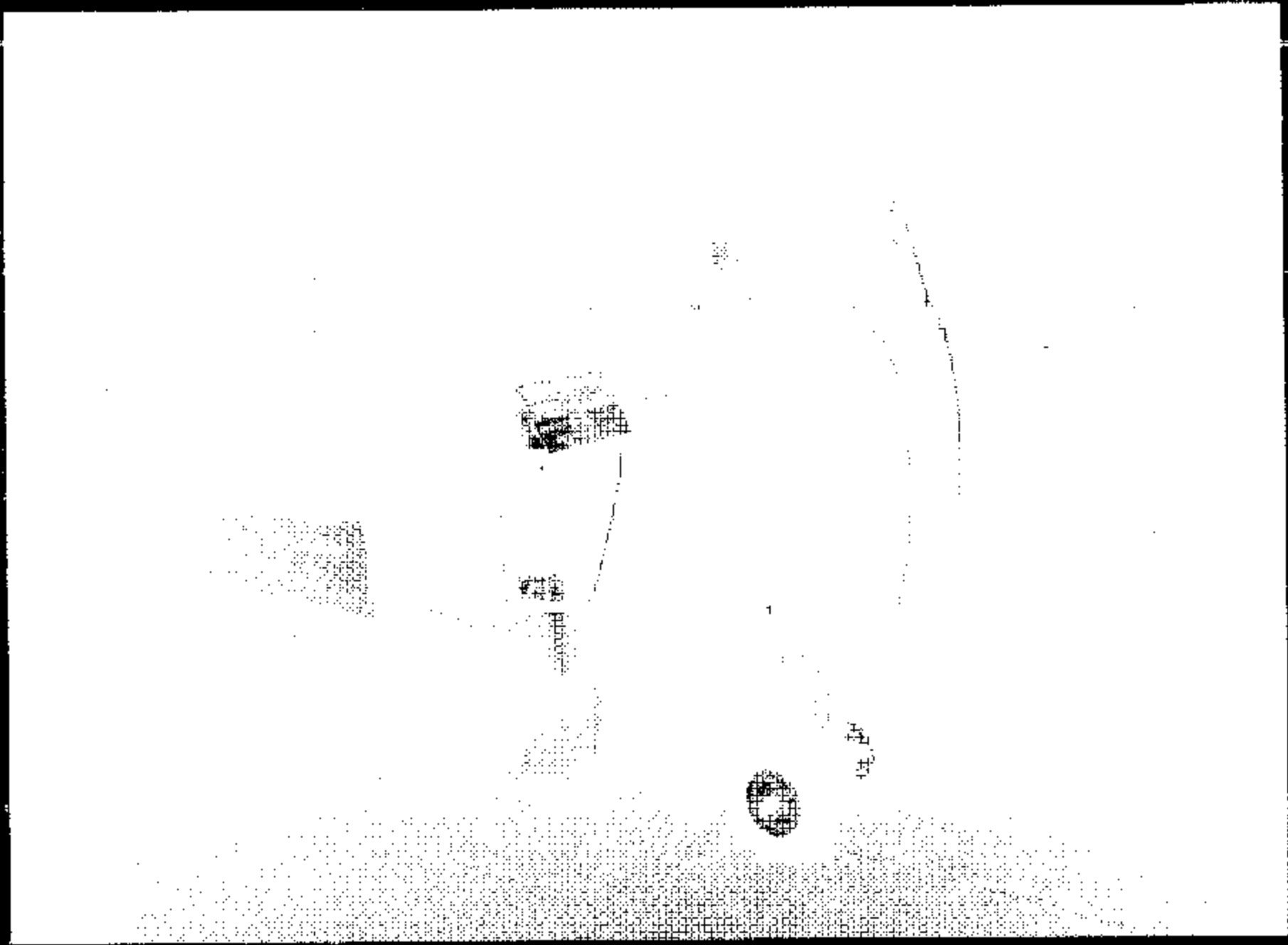
Pre-Test Left Rear Three-Quarter View

Post-Test Left Rear Three-Quarter View



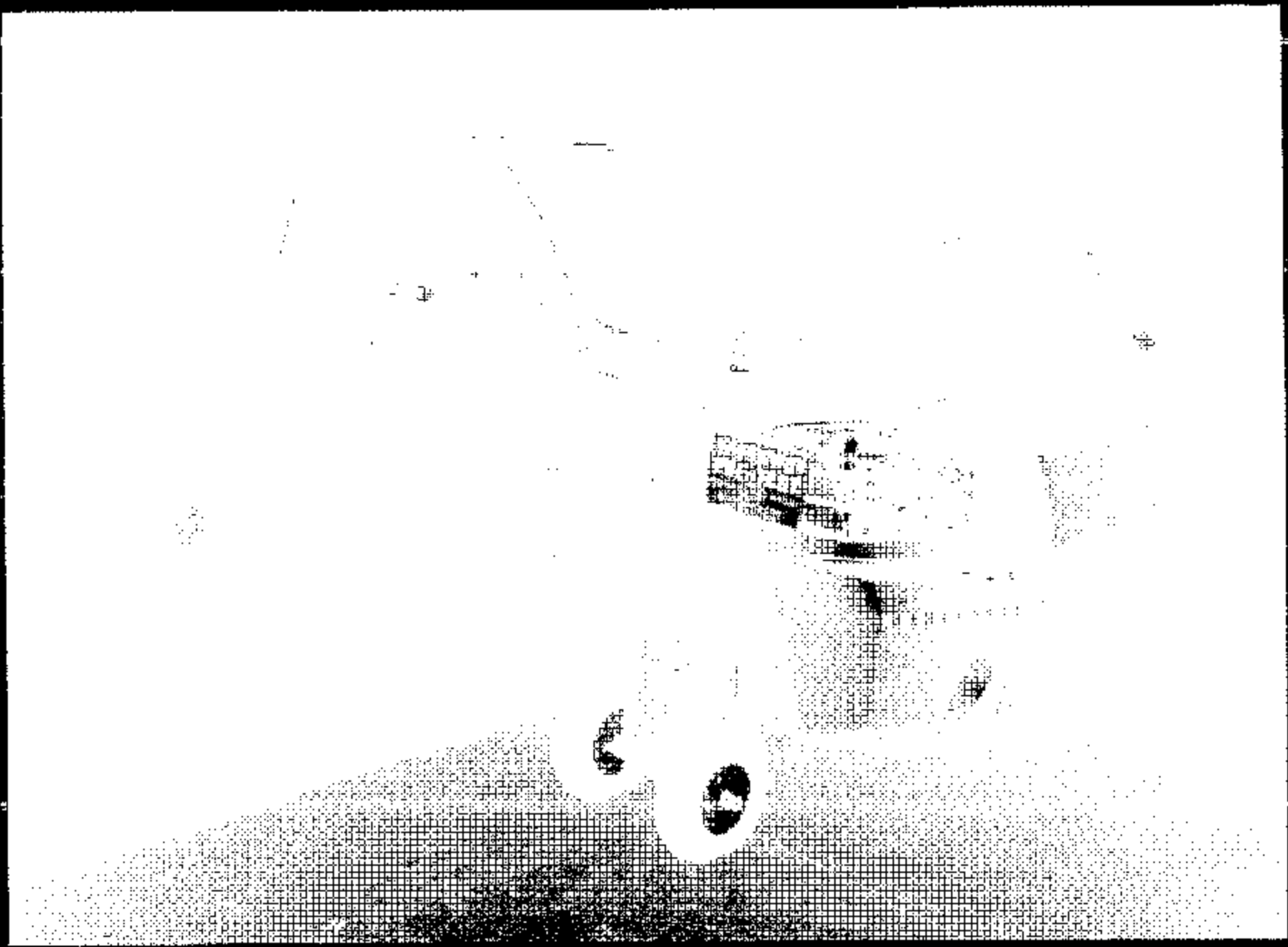
Pre-Test Left Front Three-Quarter View

Post-Test Left Front Three-Quarter View



Pre-Test Right Rear Three-Quarter View

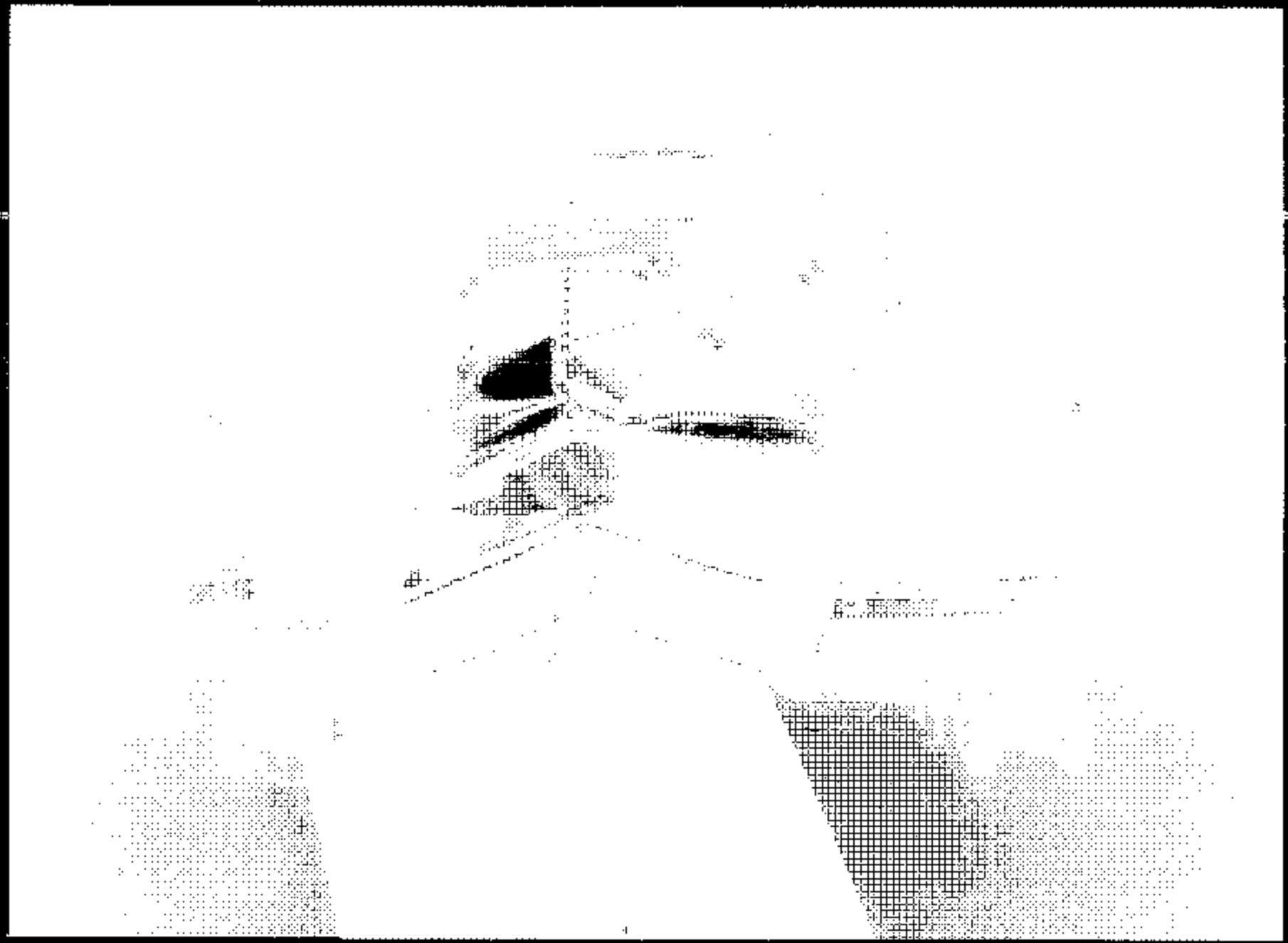
Post-Test Right Rear Three-Quarter View



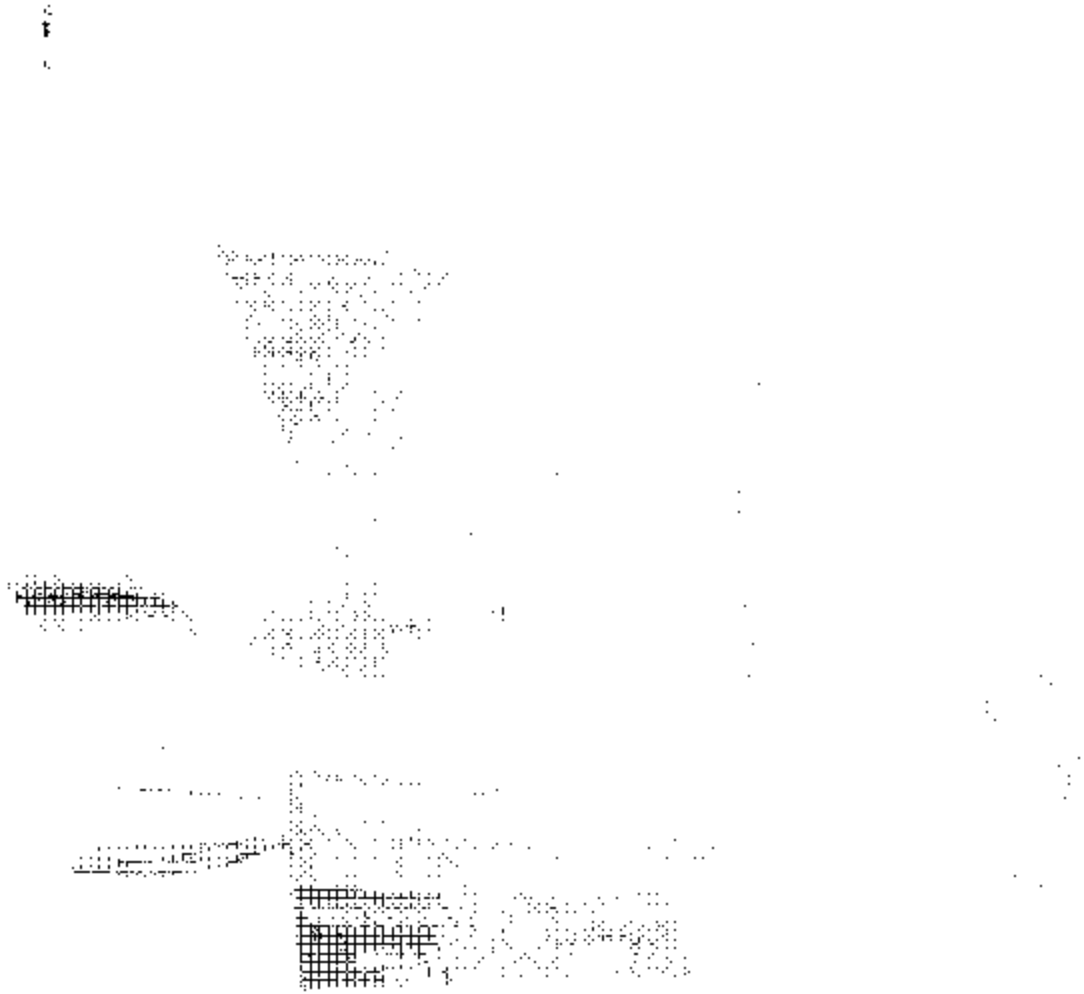
Pre-Test Right Front Three-Quarter View

Post-Test Right Front Three-Quarter View

Pre-Test Overhead View of Test Vehicle



Post-Test Overhead View of Test Vehicle



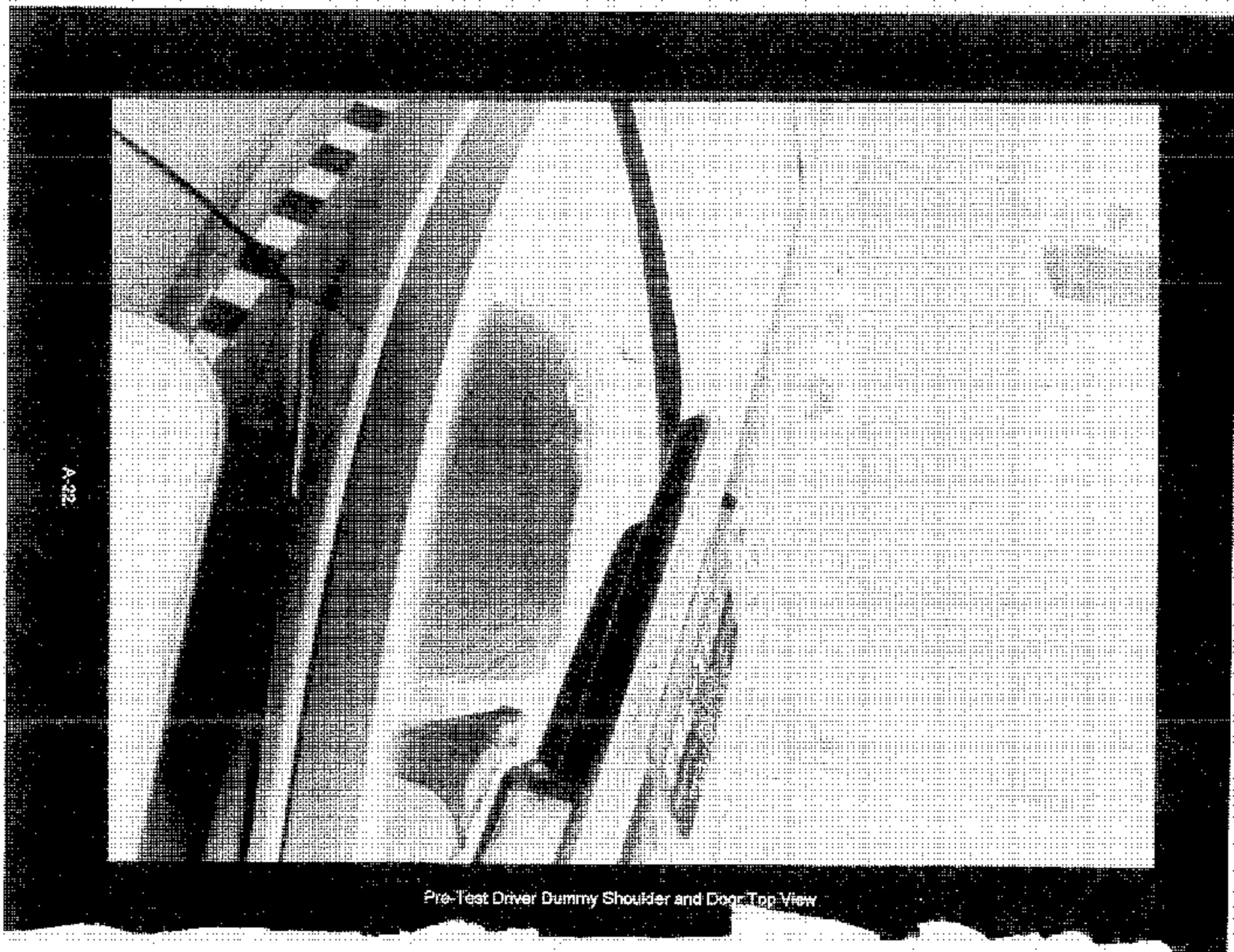
Pre-Test Driver Dummy Right Side View

Post-Test Driver Dummy Right Side View

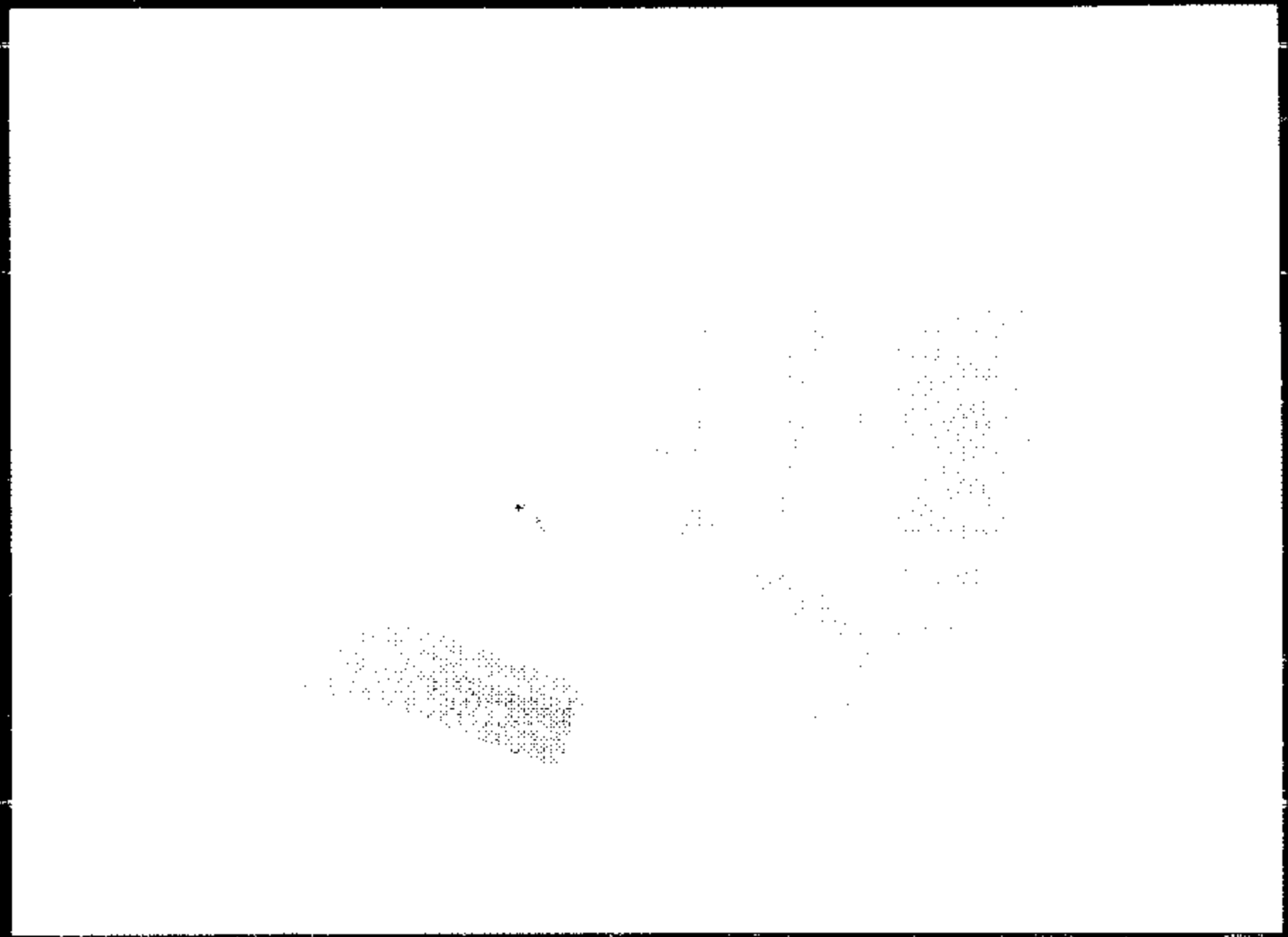
Pre-Test Driver Dummy Left Side View

Post-Test Driver Dummy Left Side View

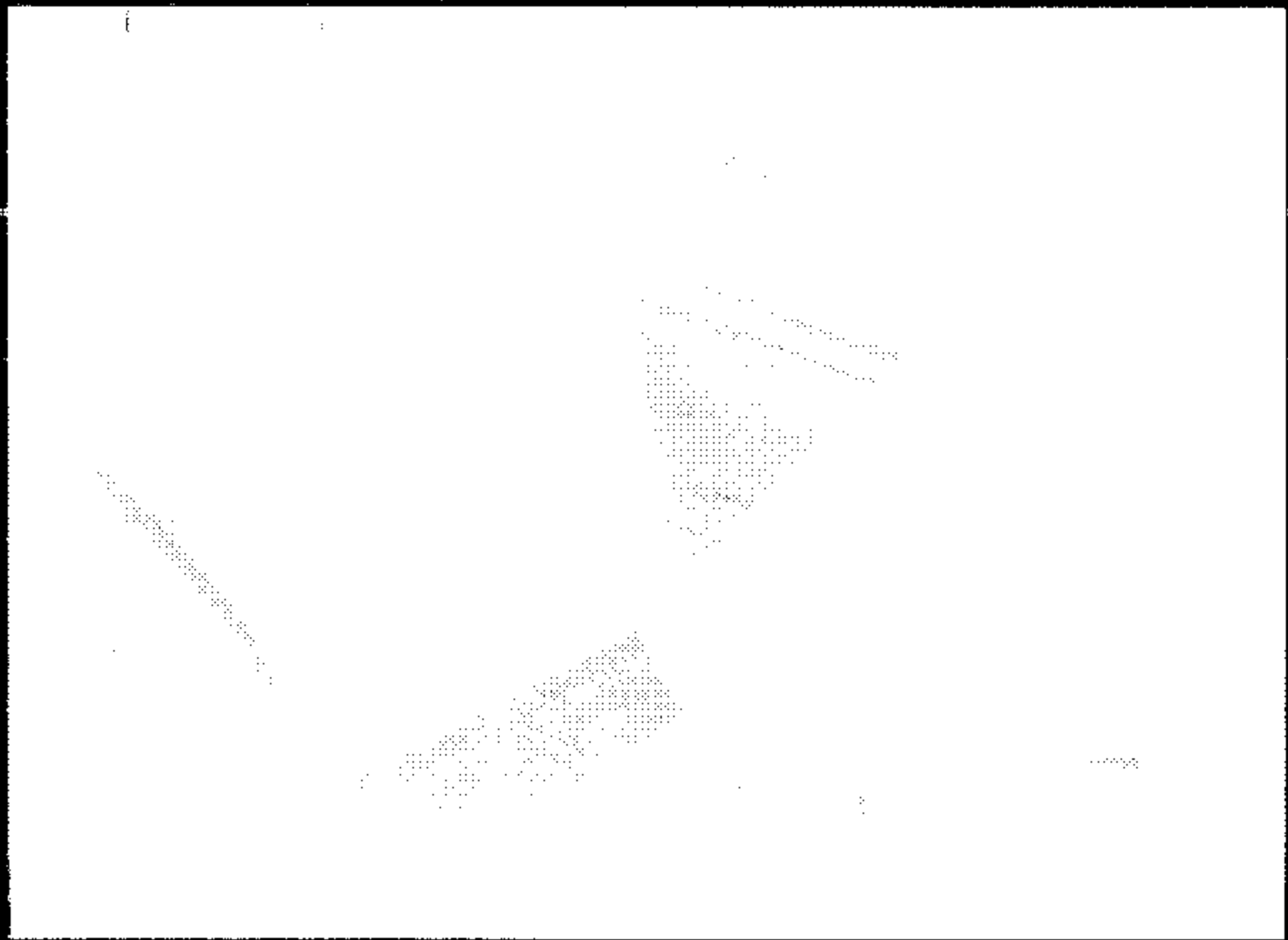
Pre-Test Driver Dummy Left Side View (Door Open)



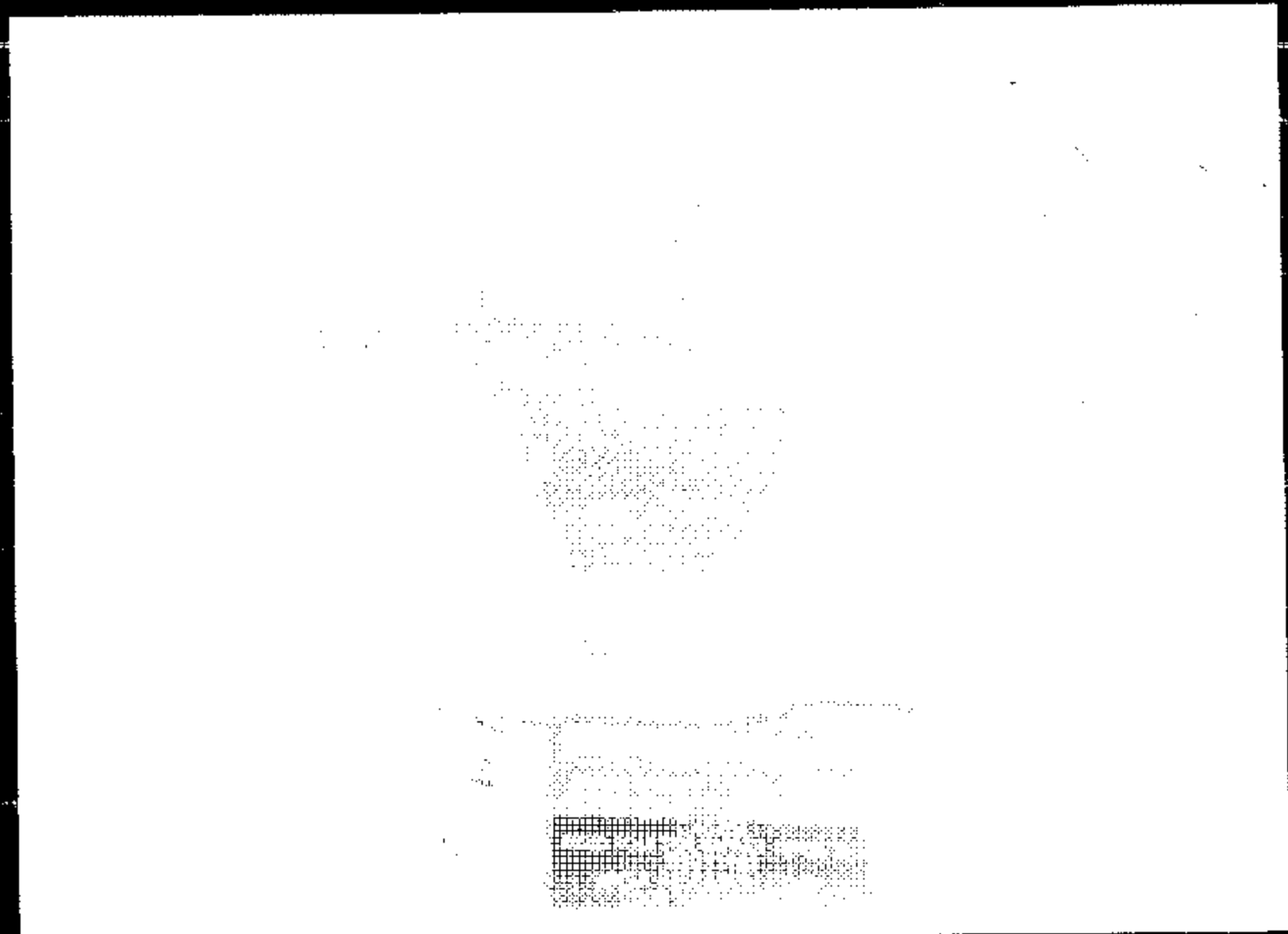
Pre-Test Driver Dummy Shoulder and Door Top View



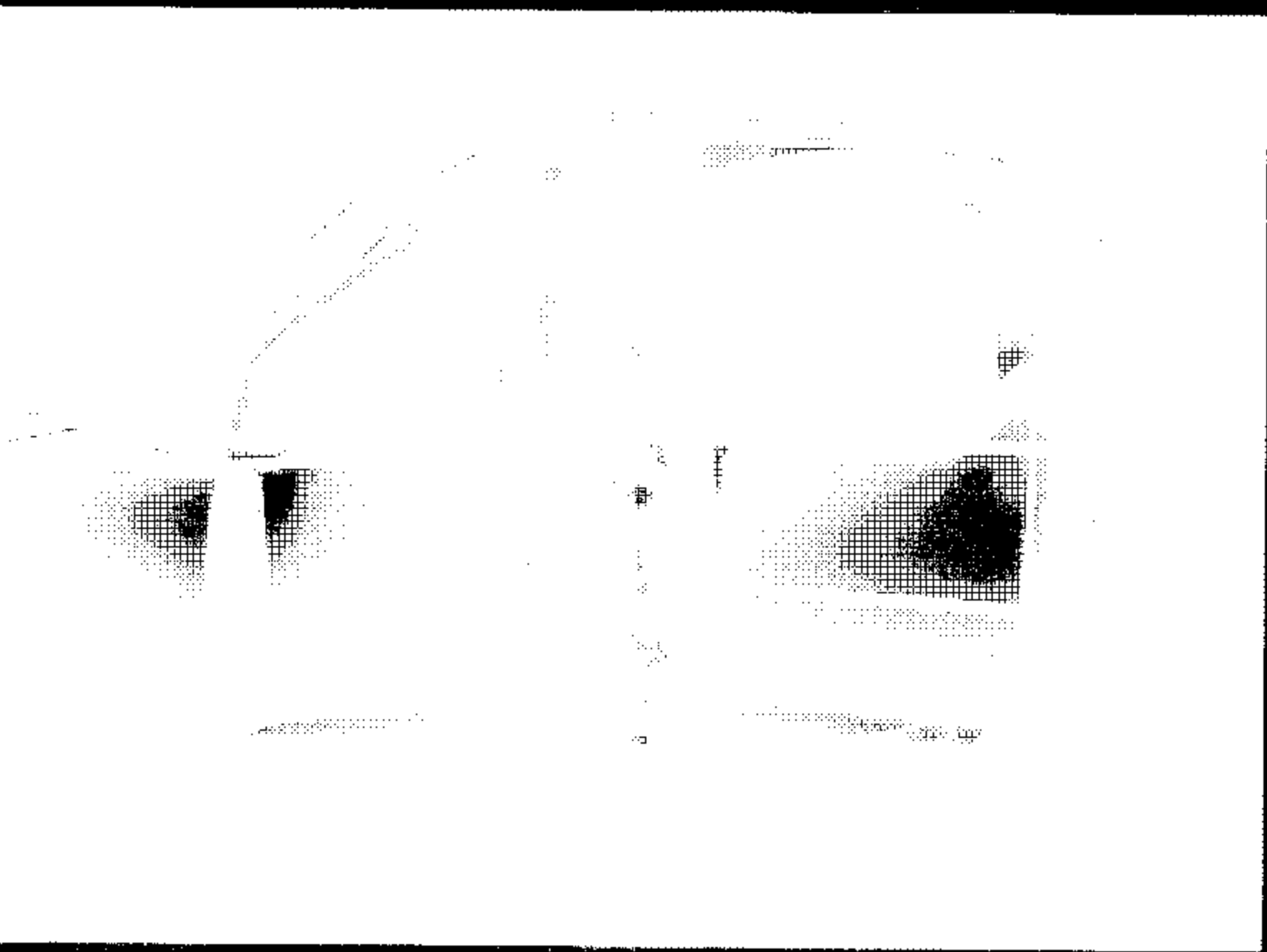
Post-Test Driver Dummy Head Contact



Post-Test Driver Dummy Thorax Contact

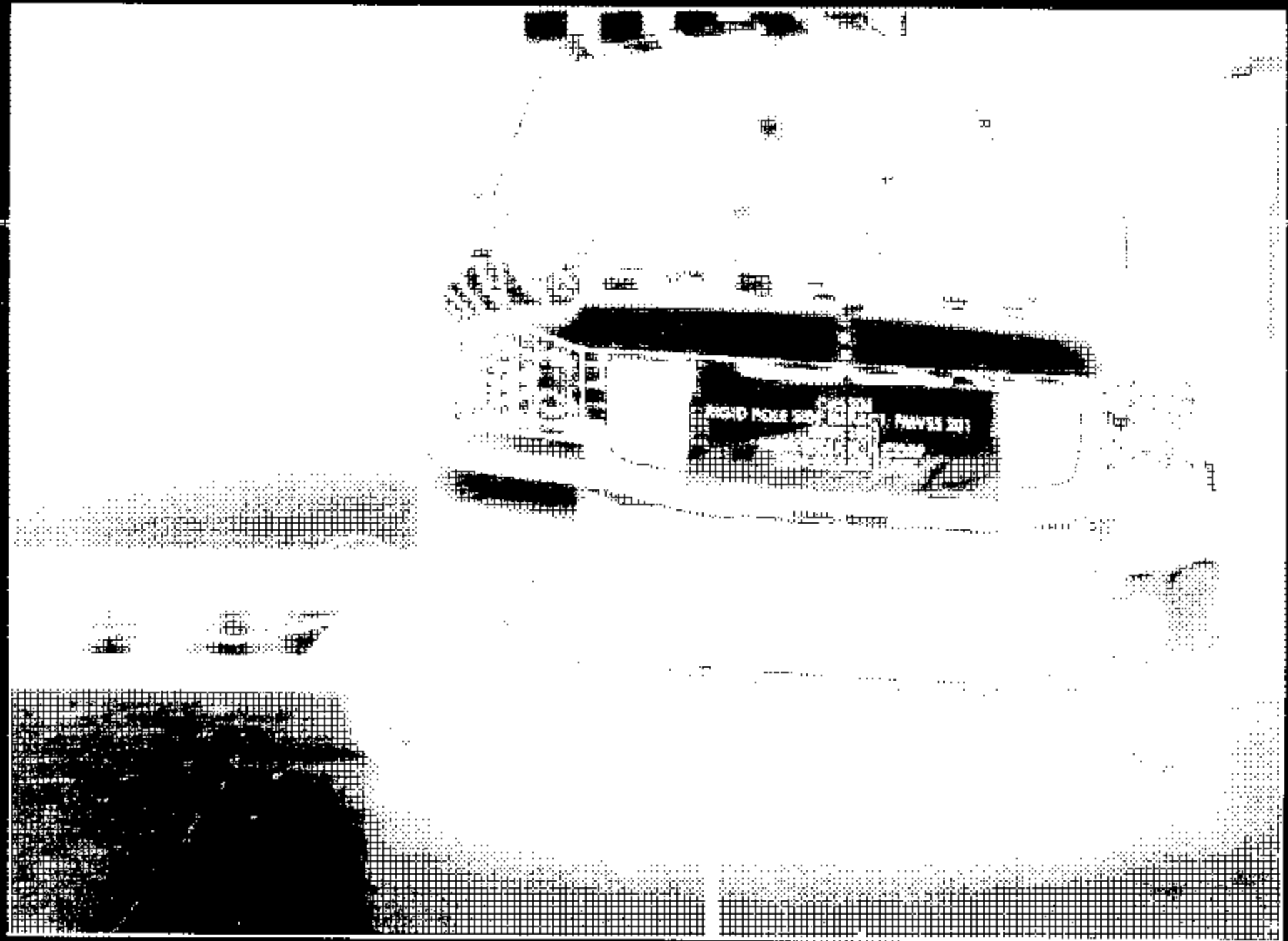


Post-Test Driver Dummy Contact

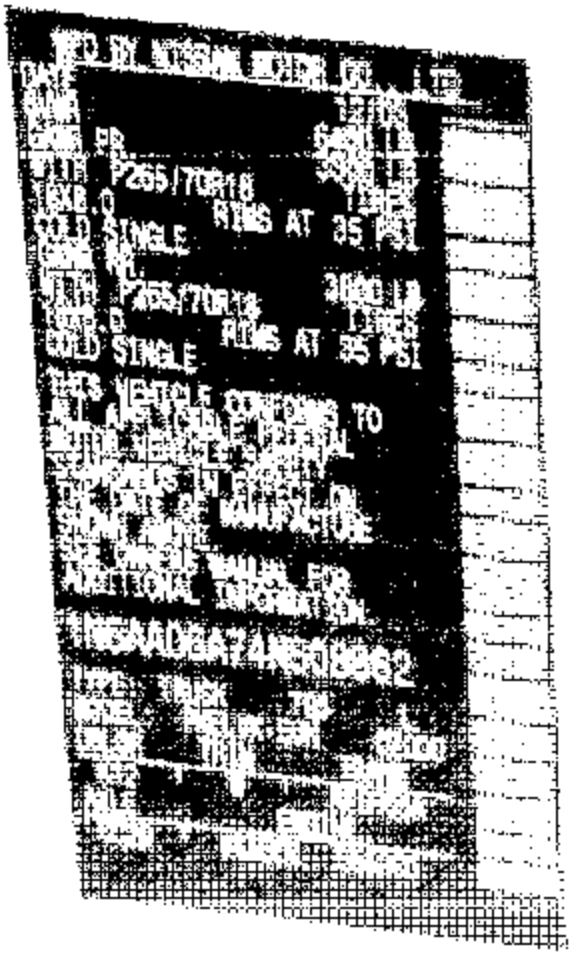


Post-Test Impact Zone Close-up View

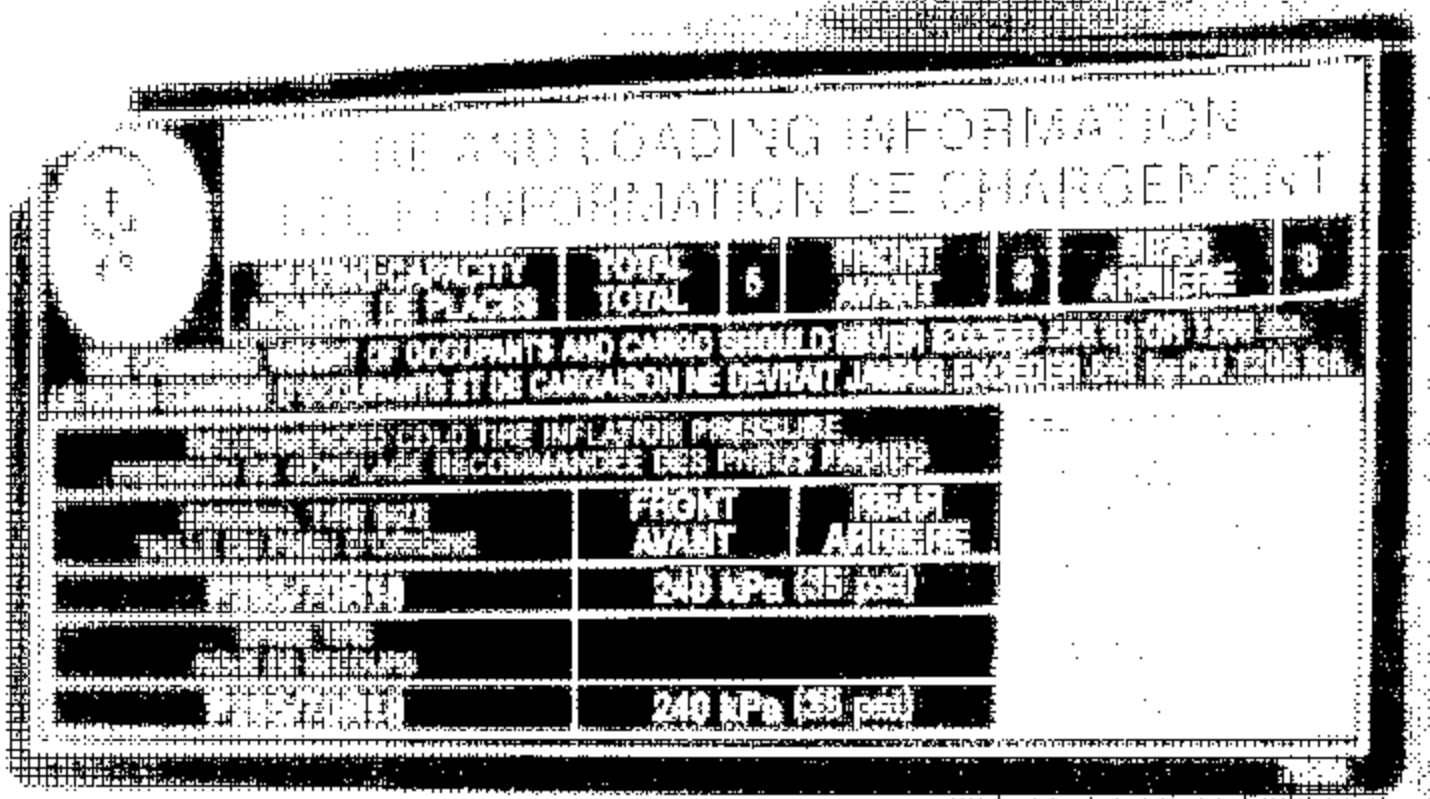
Post-Test Impact Point on Vehicle



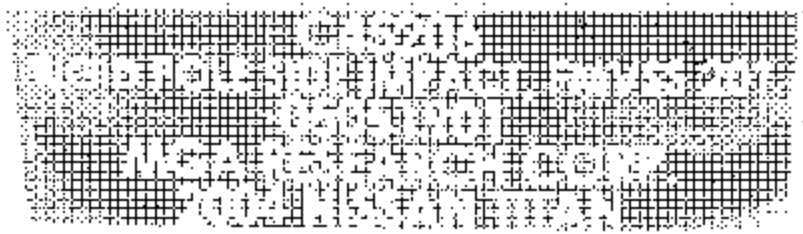
Vehicle Impact



Vehicle Certification Label

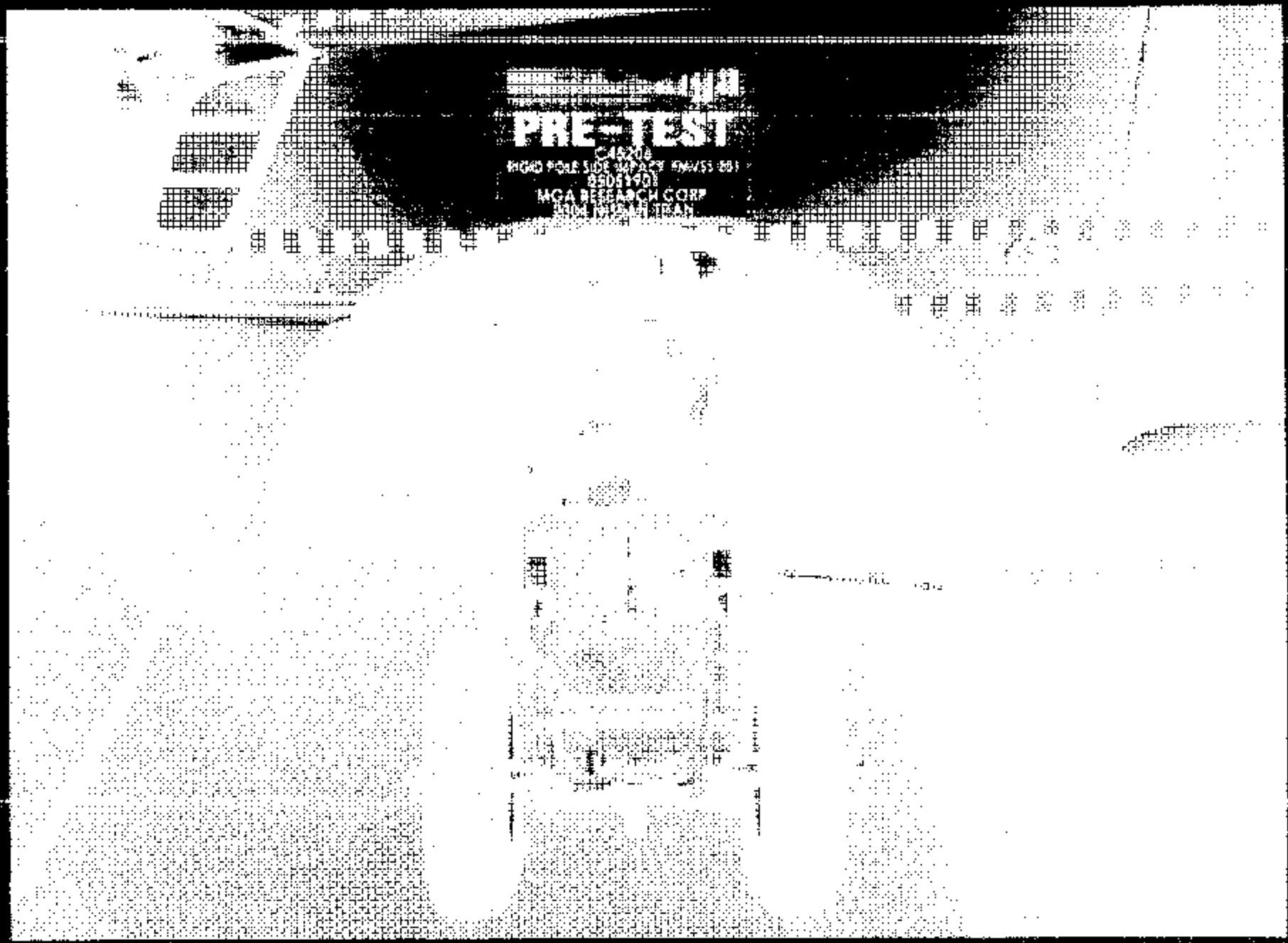


Tire Placard

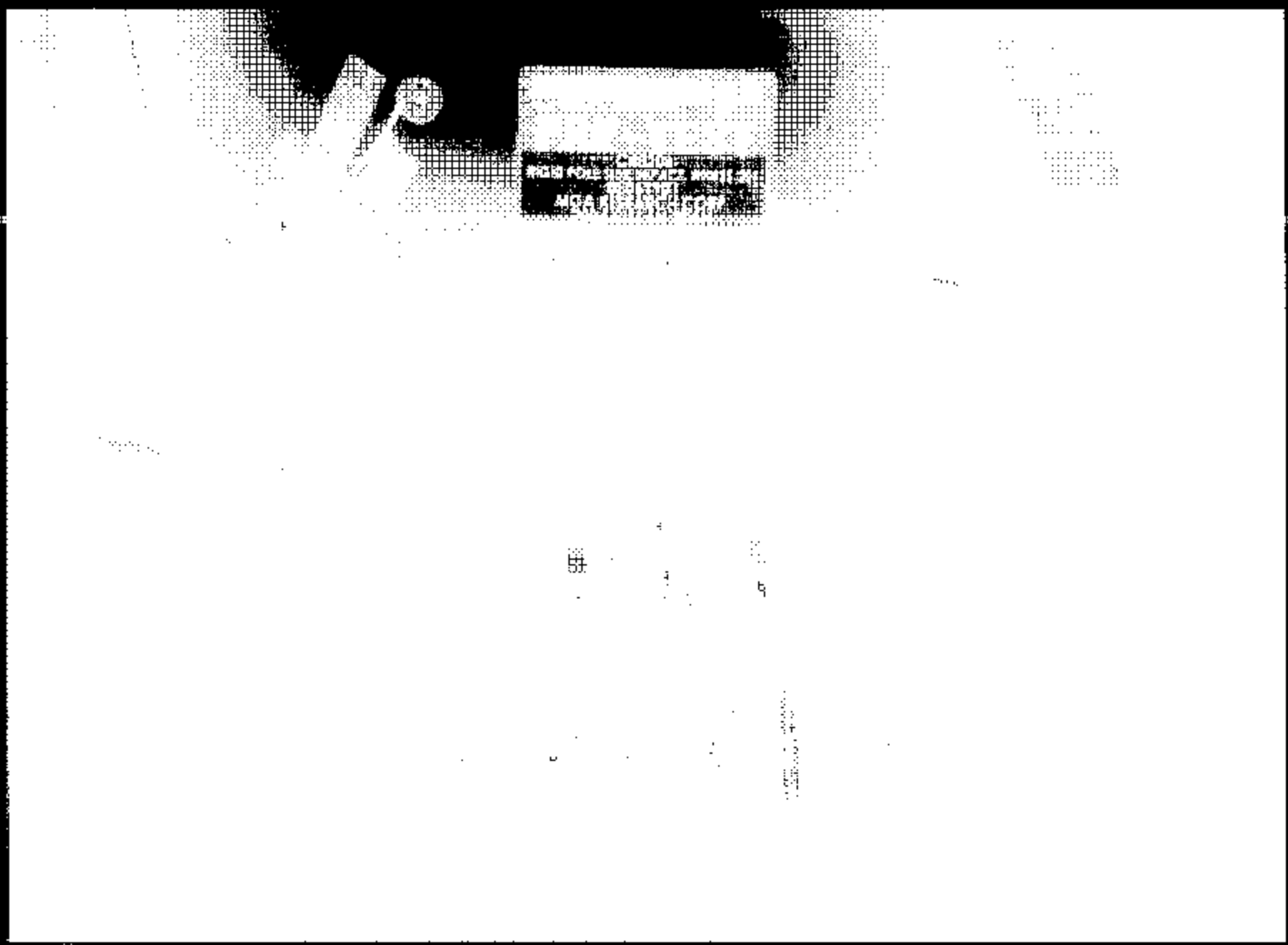


Pre-Test Fuel Filler Cap

Post-Test Fuel Filler Cap



Pre-Test Left Front Wheel Dolly



Pre-Test Right Fro : Wheel Dolly

PRE-TEST

Pre-Test Left Rear Wheel Dolly

Pre-Test Right Rear Wheel Dolly

Rollover 90 Degrees

Rollover 180 Degrees

Rollover 270 Degrees

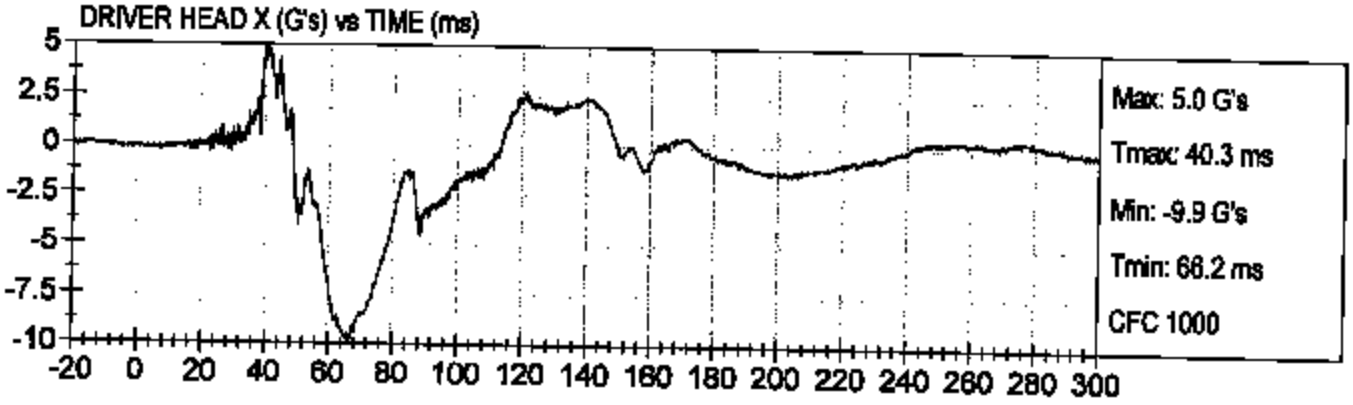
APPENDIX B

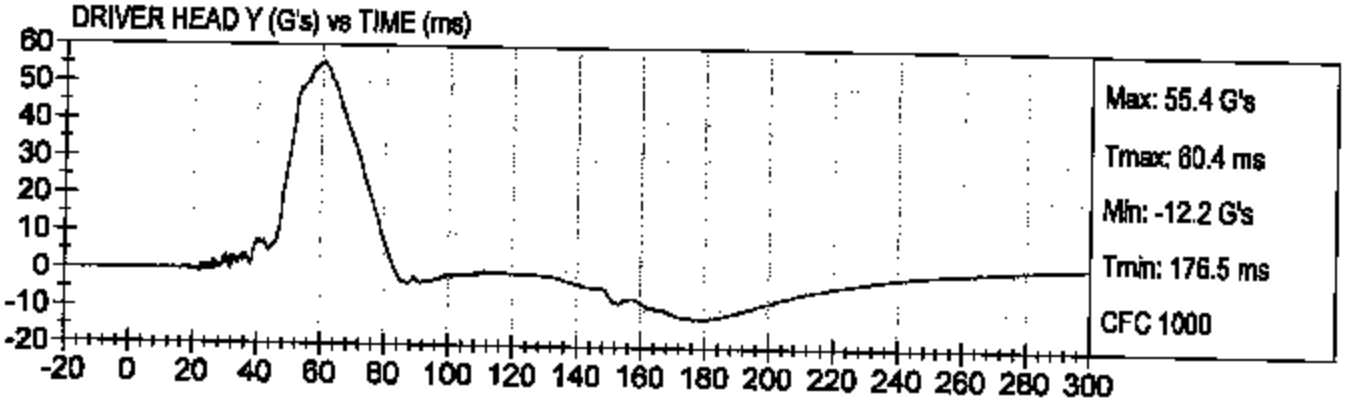
SID/HIII AND VEHICLE RESPONSE DATA

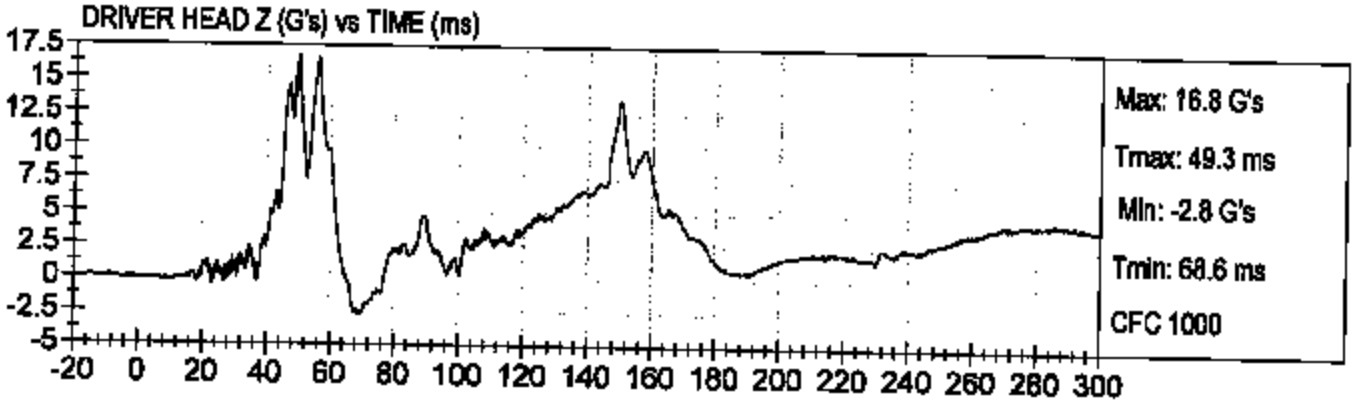
TABLE OF DATA PLOTS

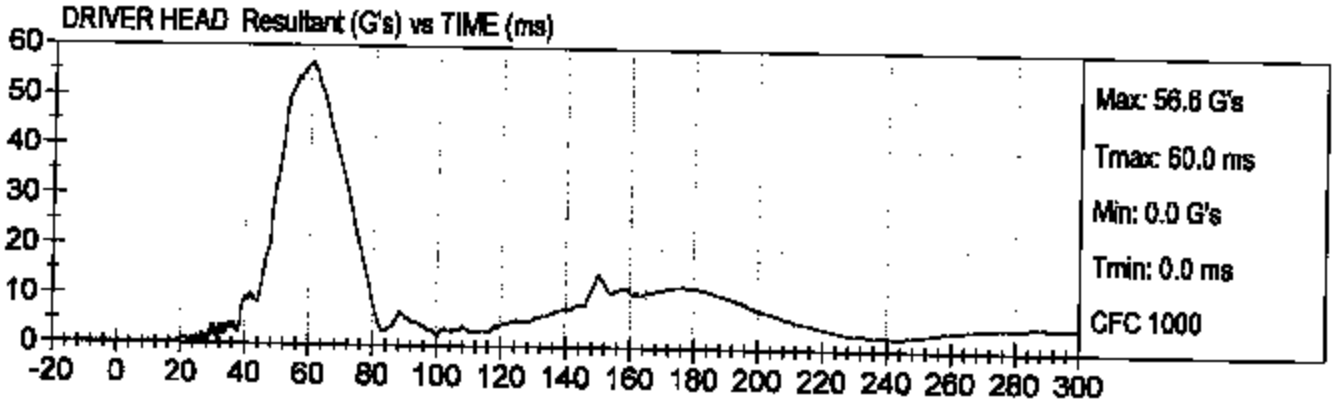
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN T/TAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)



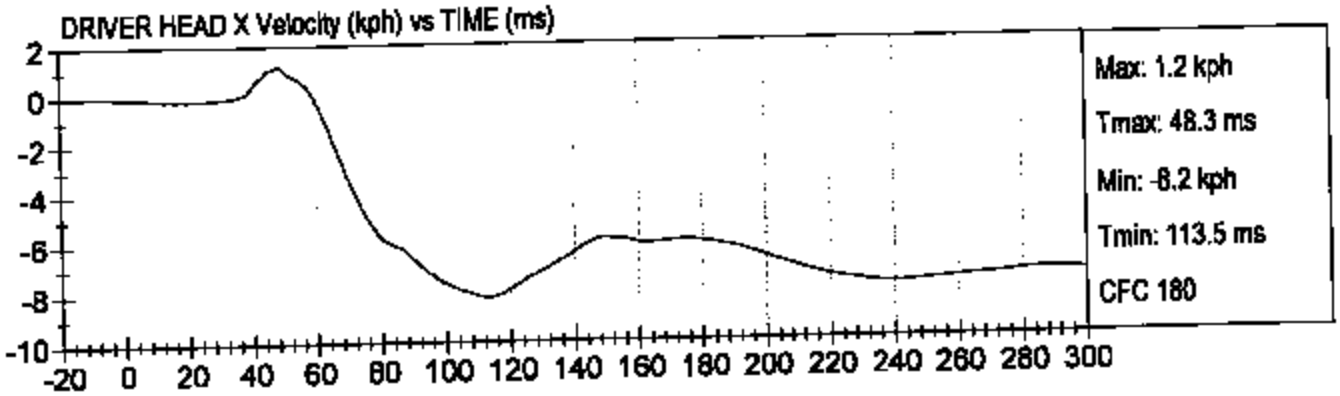


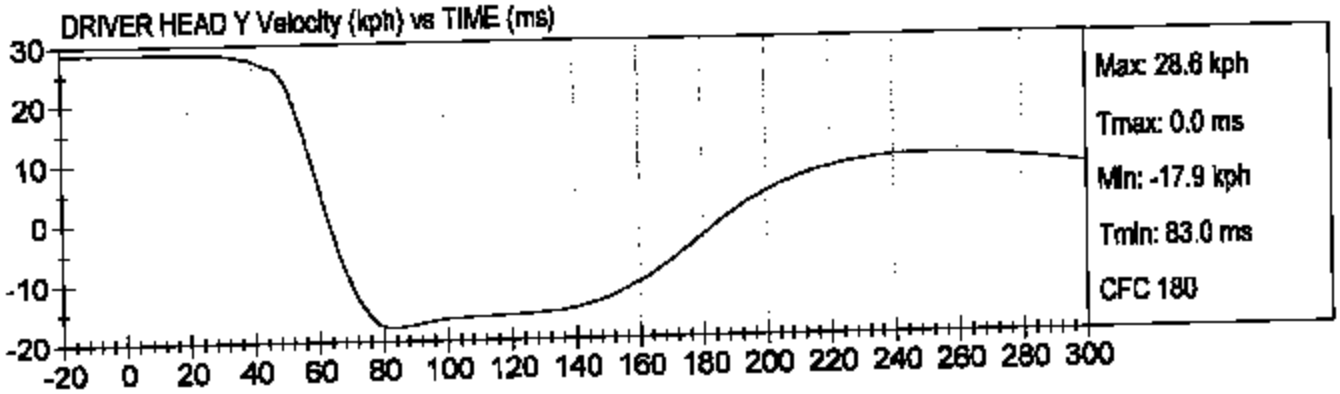


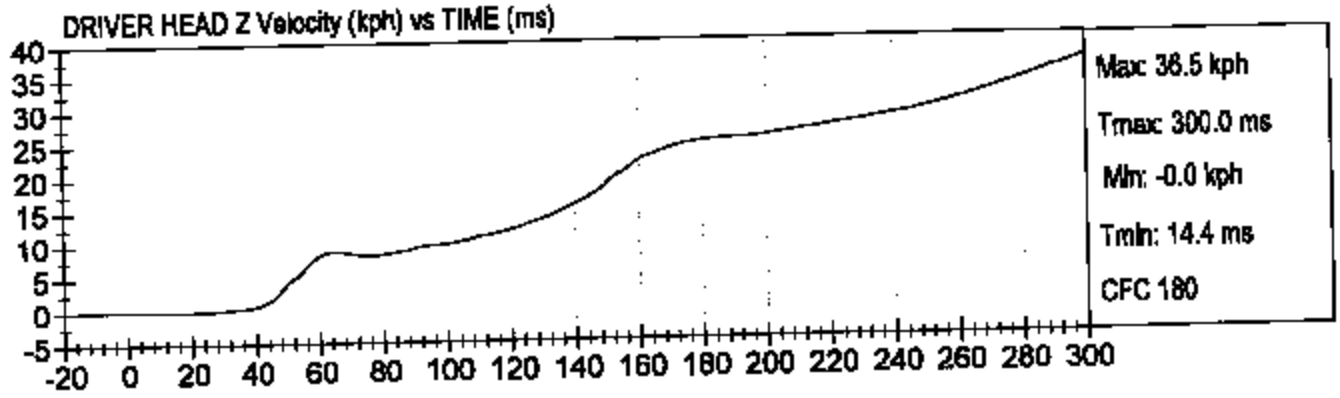


RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

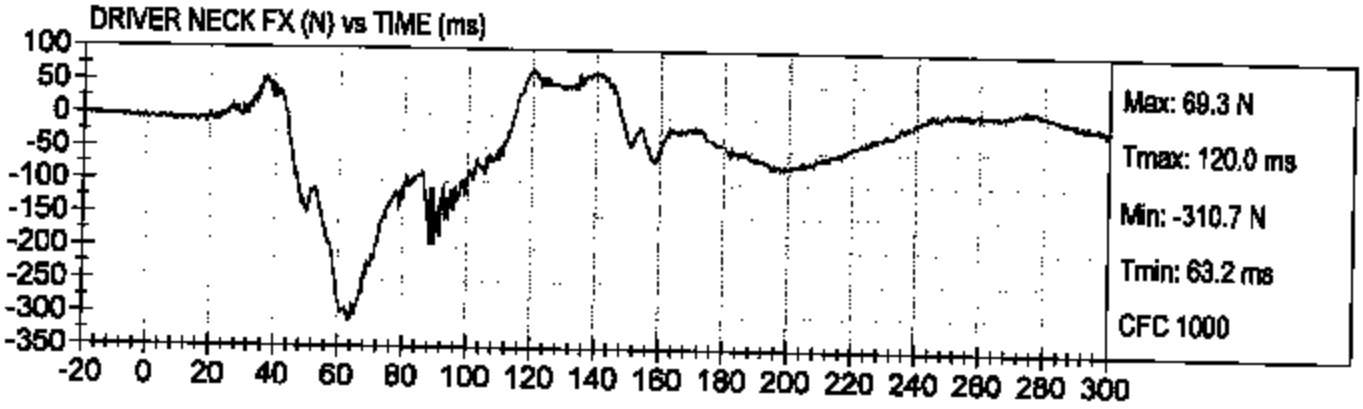


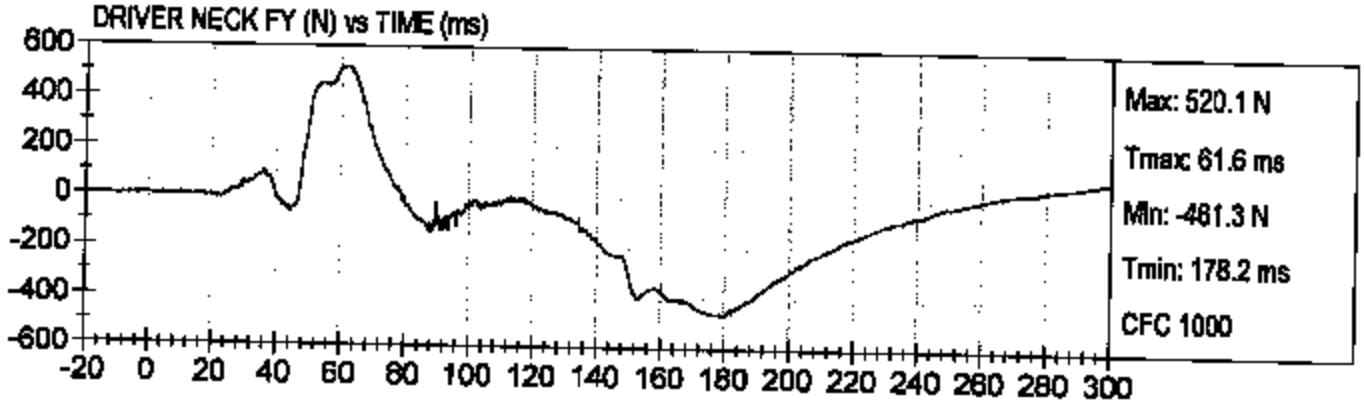


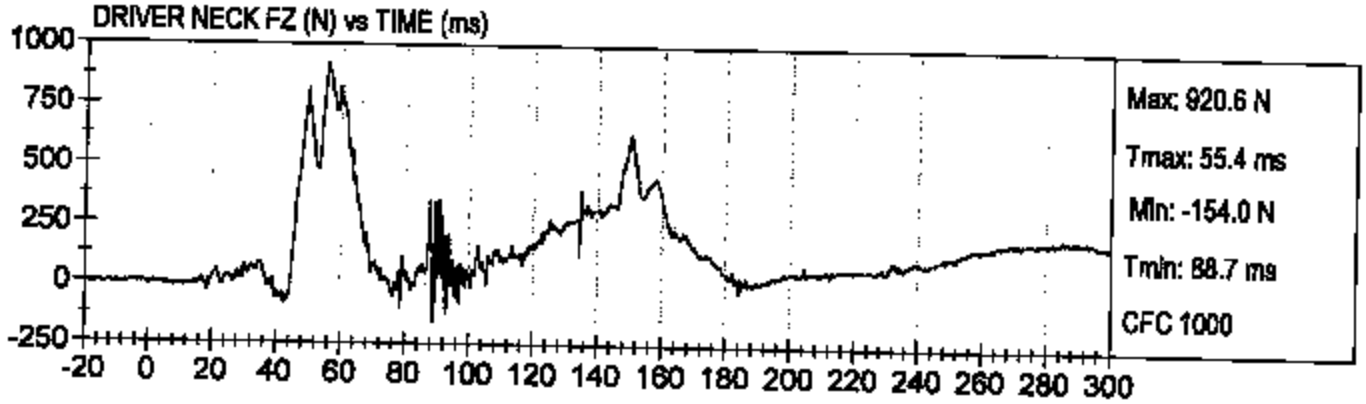


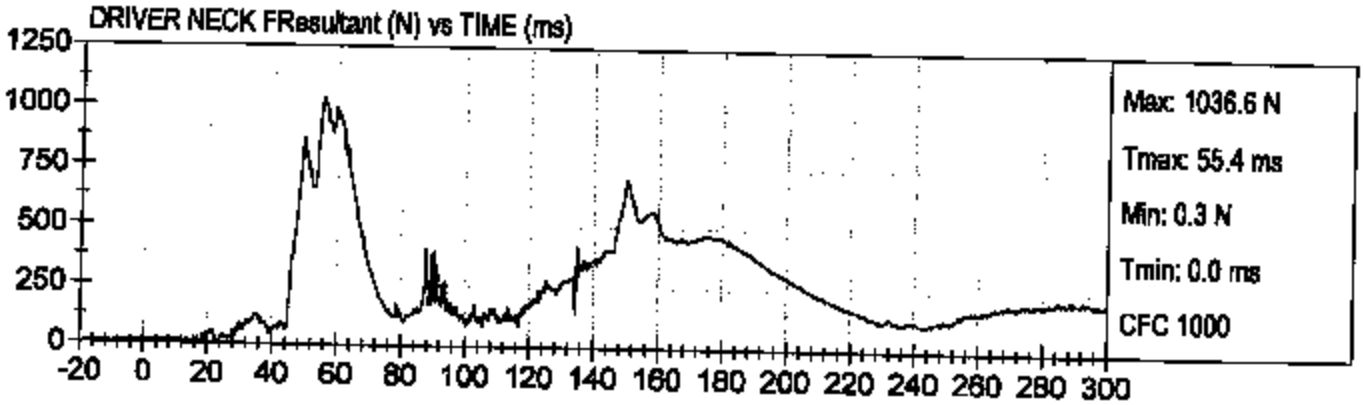
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)



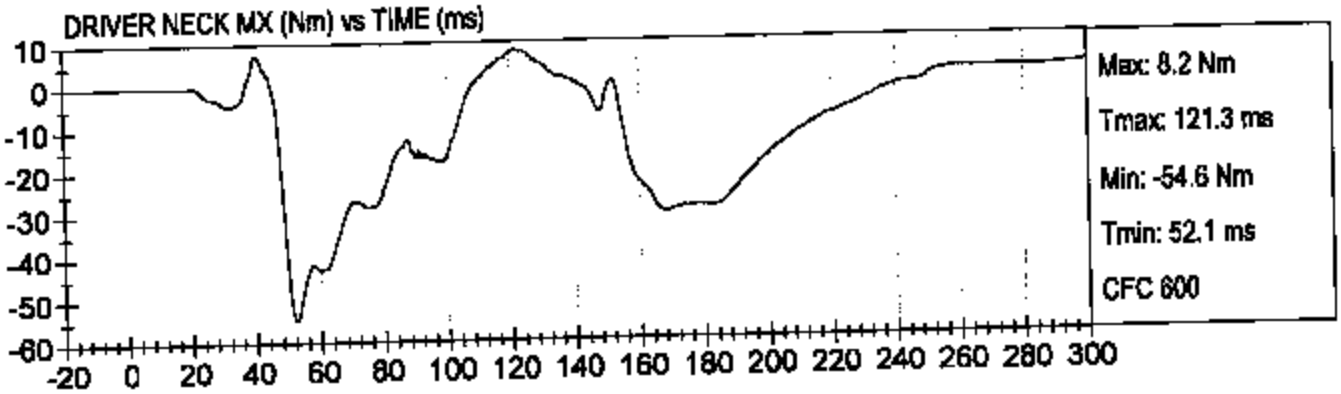


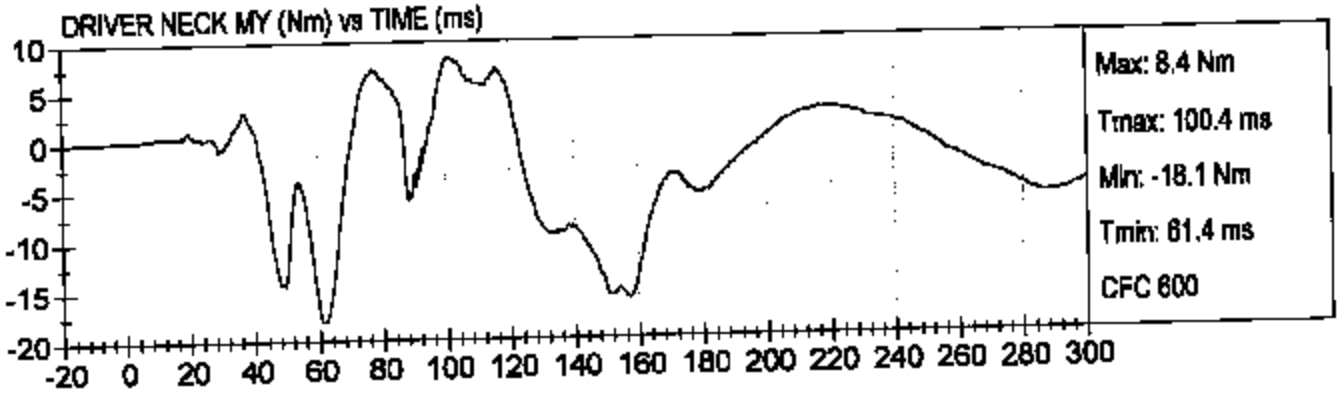


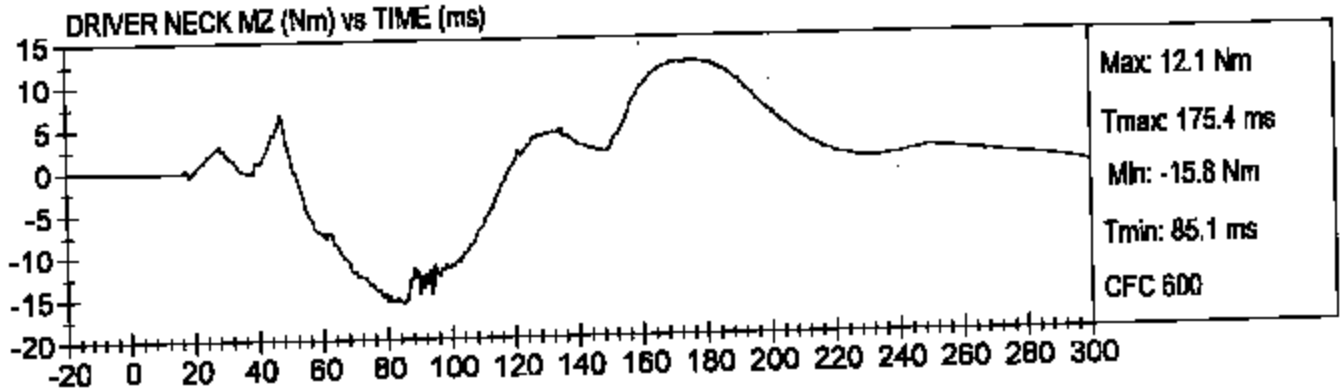


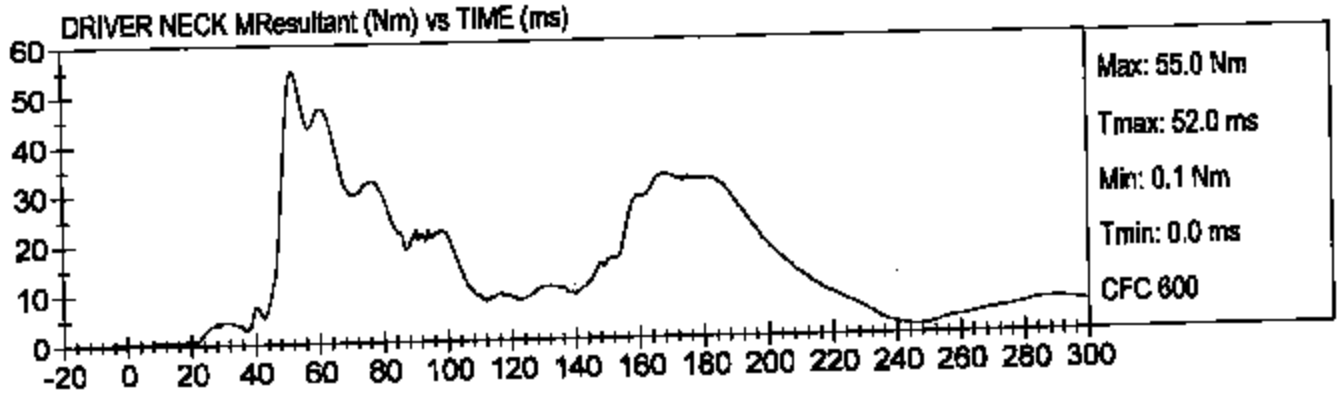
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)



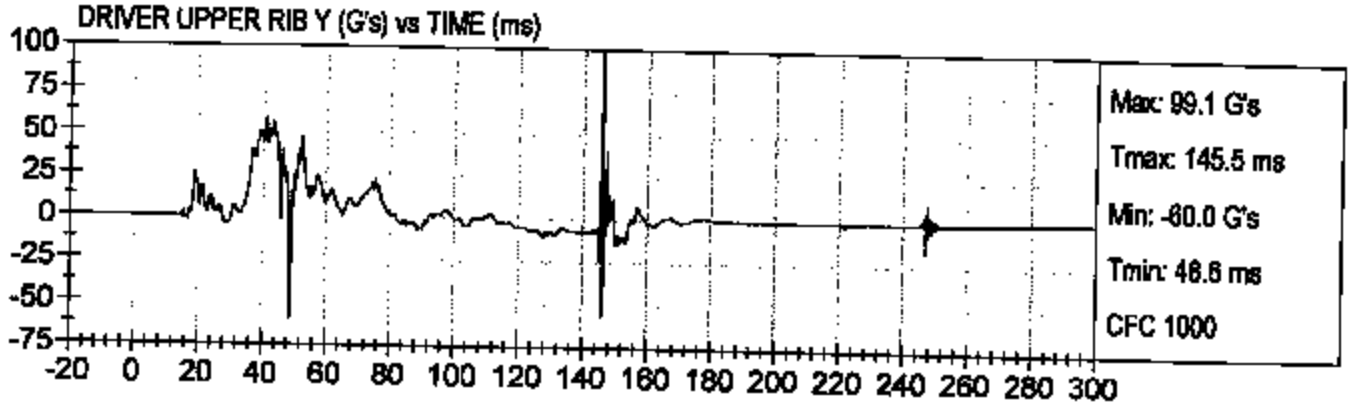


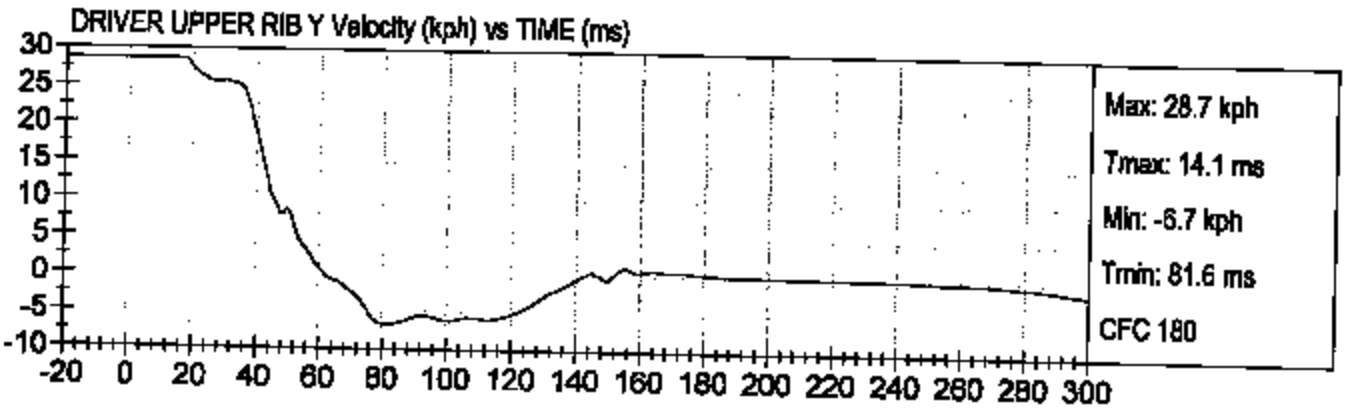


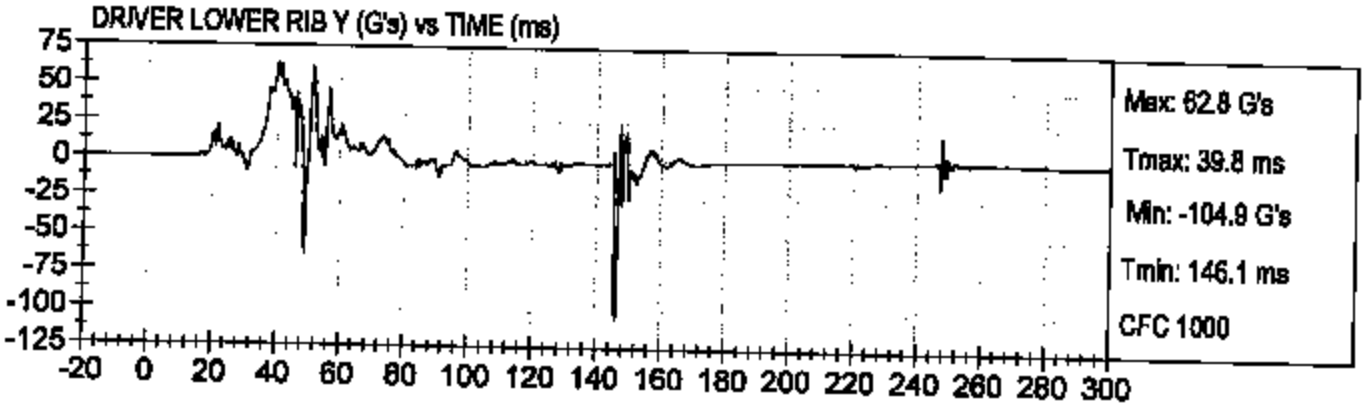


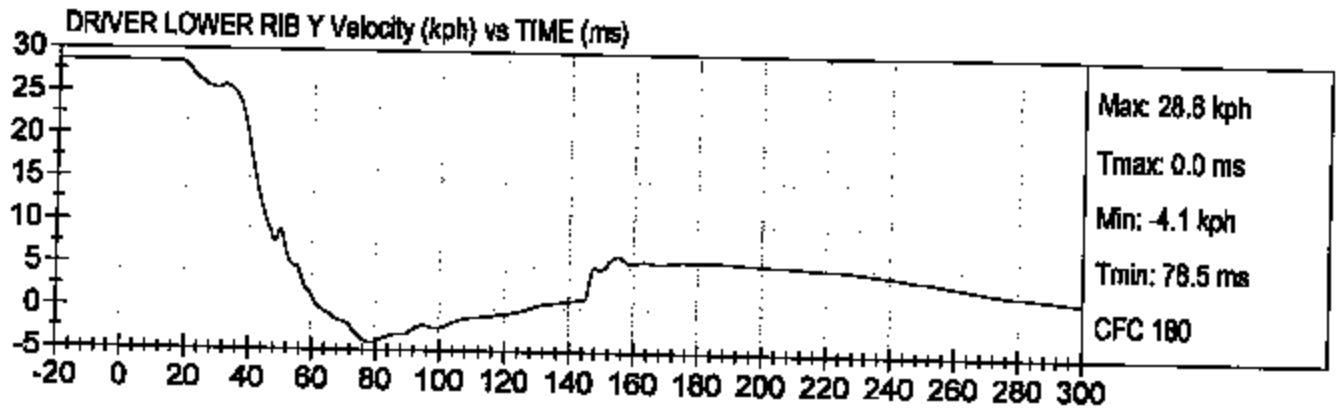
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)





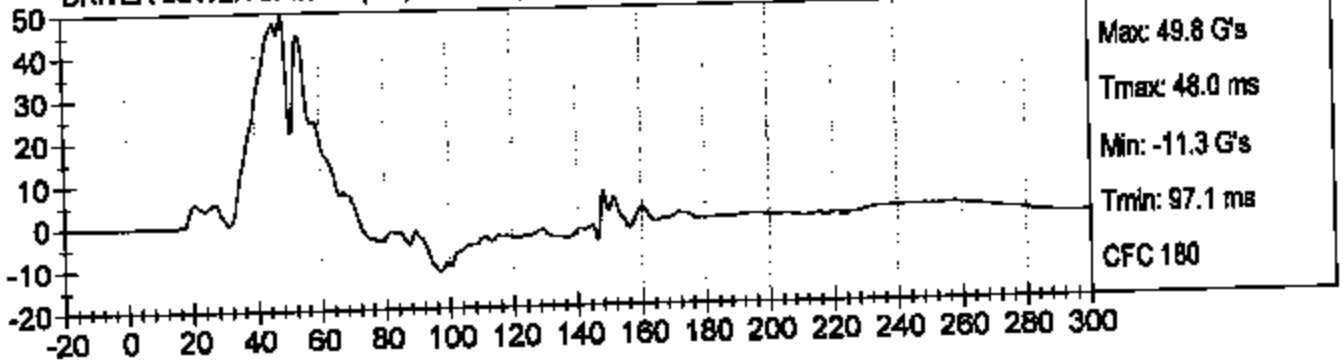




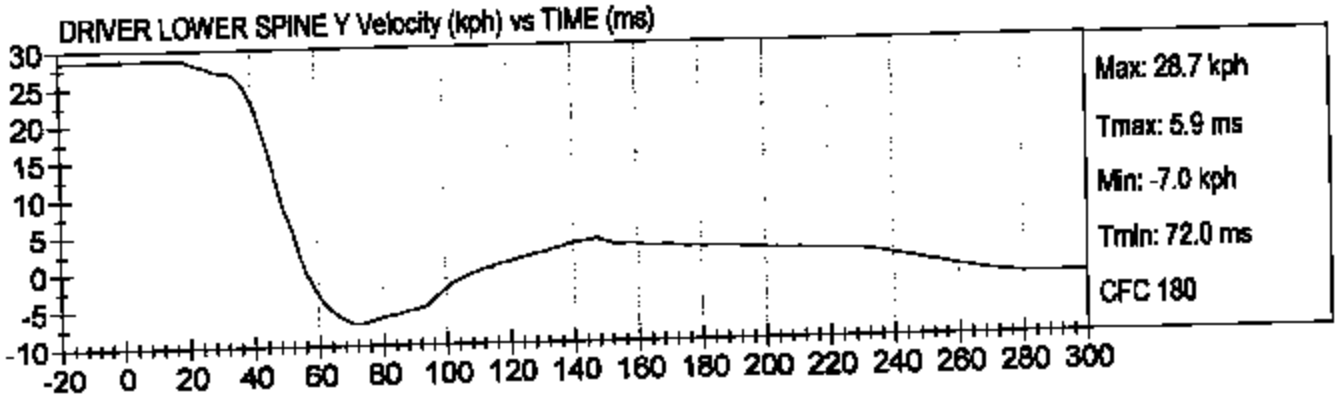
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45205)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

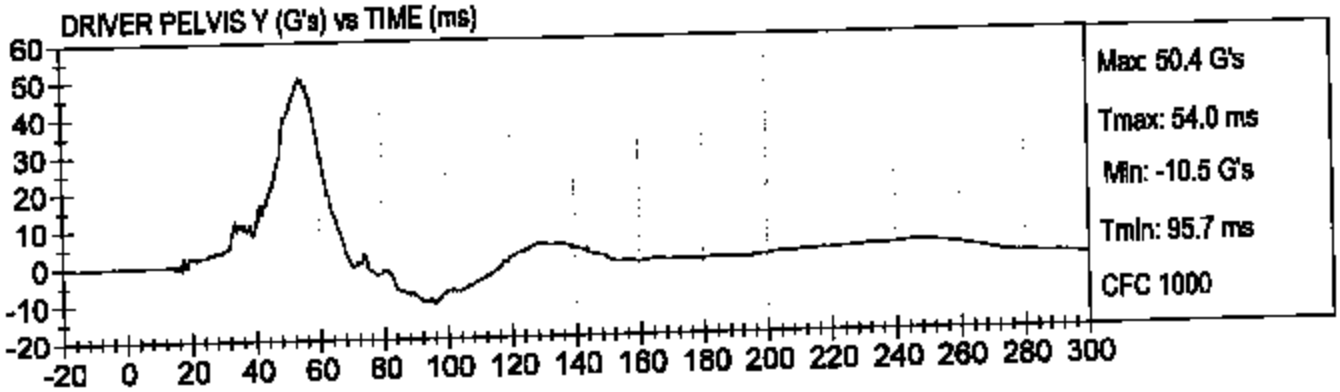
DRIVER LOWER SPINE Y (G's) vs TIME (ms)



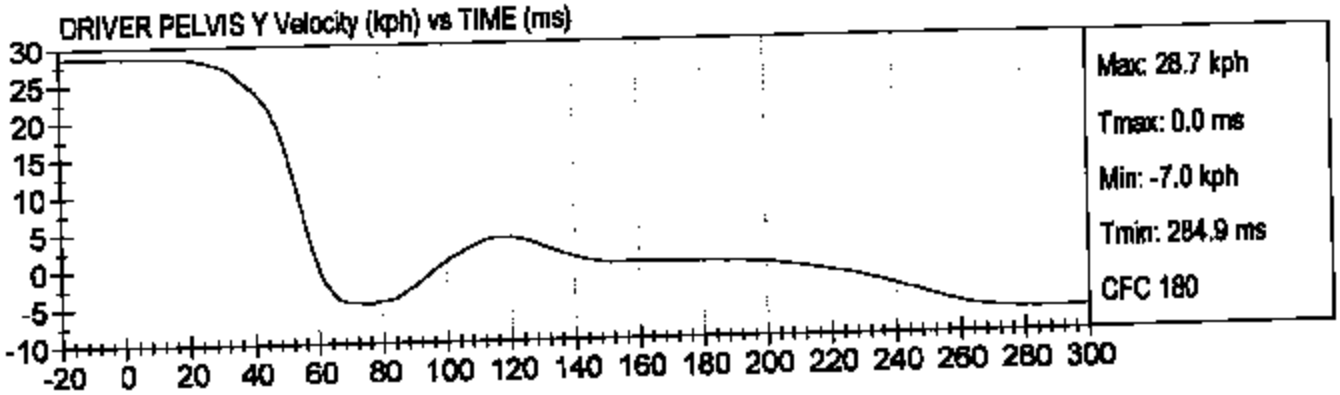
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)



DRIVER PELVIS Y (G's) vs TIME (ms)



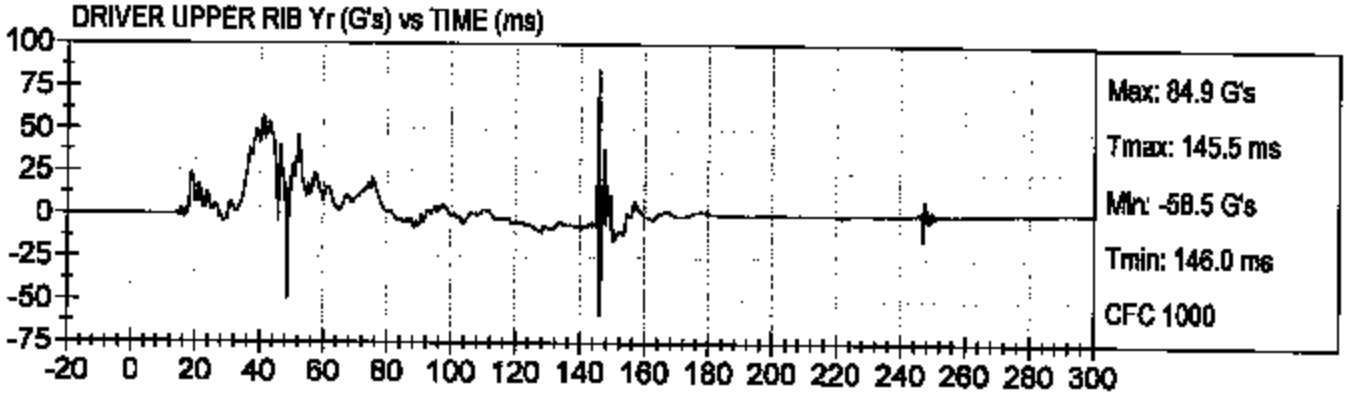
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)



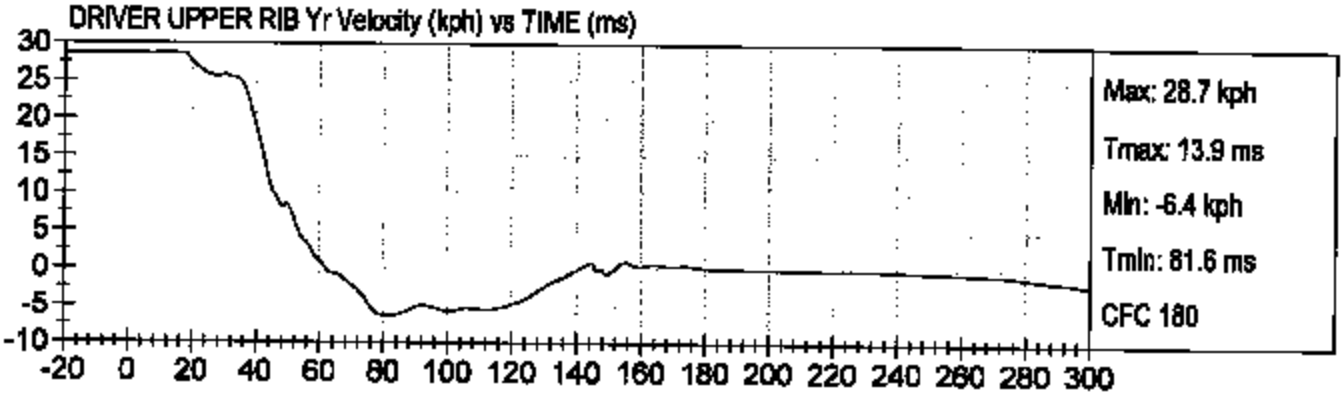
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

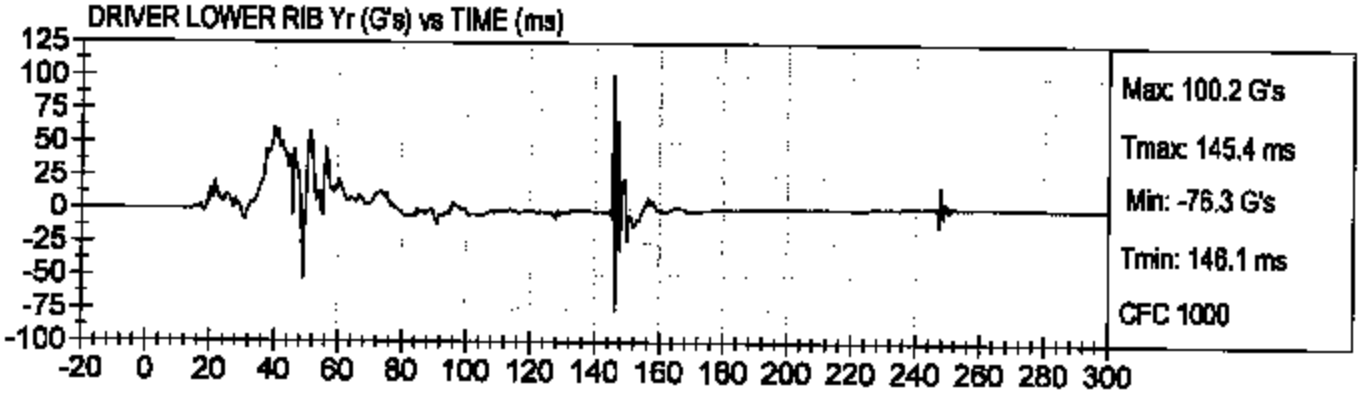
DRIVER UPPER RIB Yr (G's) vs TIME (ms)



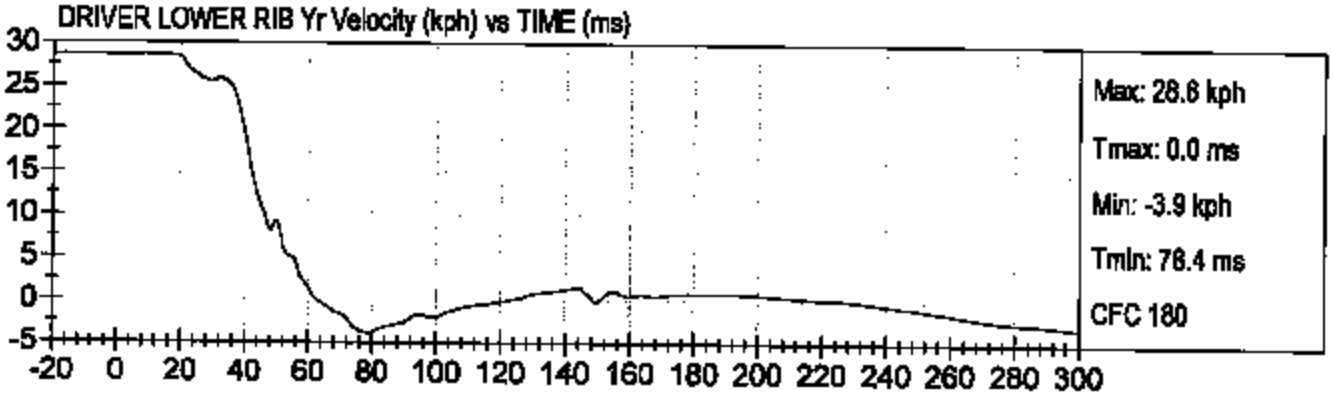
DRIVER UPPER RIB Yr Velocity (kph) vs TIME (ms)



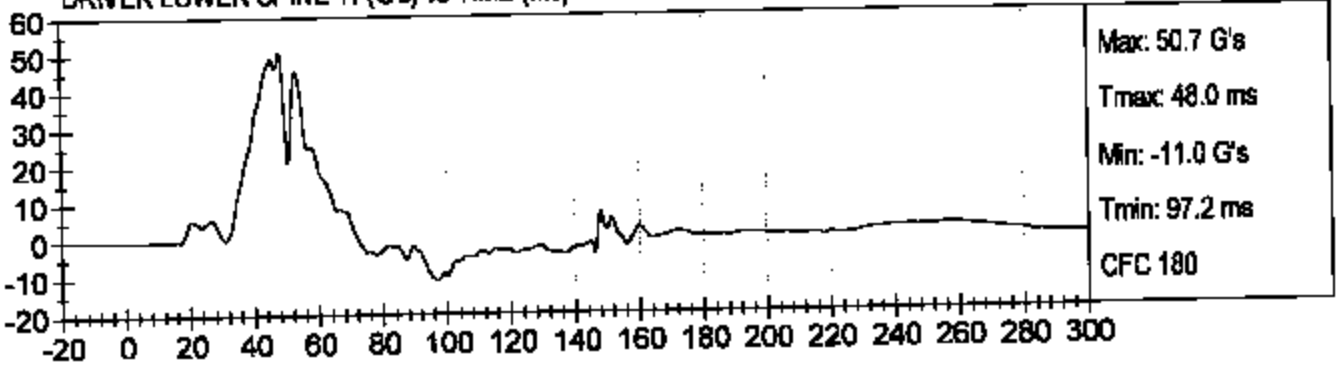
DRIVER LOWER RIB Yr (G's) vs TIME (ms)



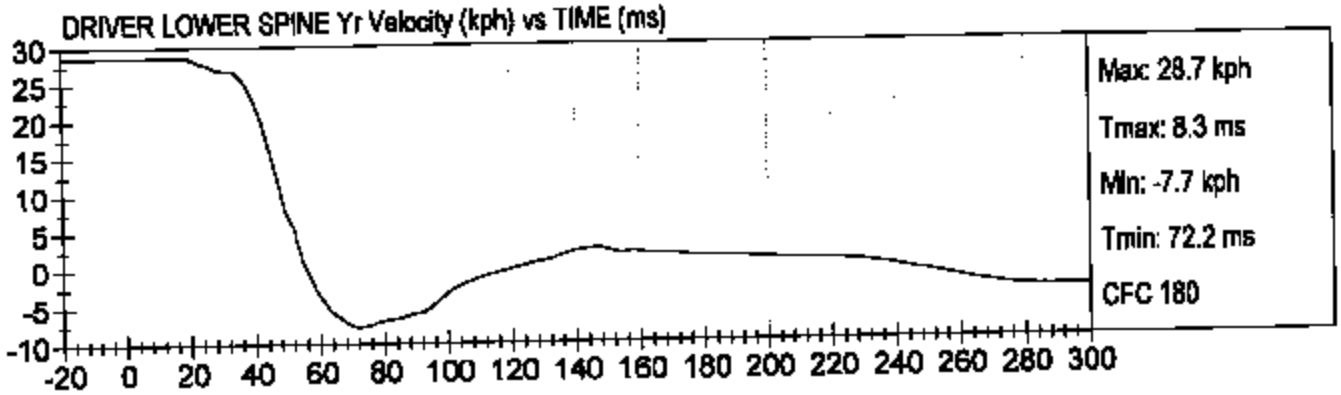
DRIVER LOWER RIB Yr Velocity (kph) vs TIME (ms)



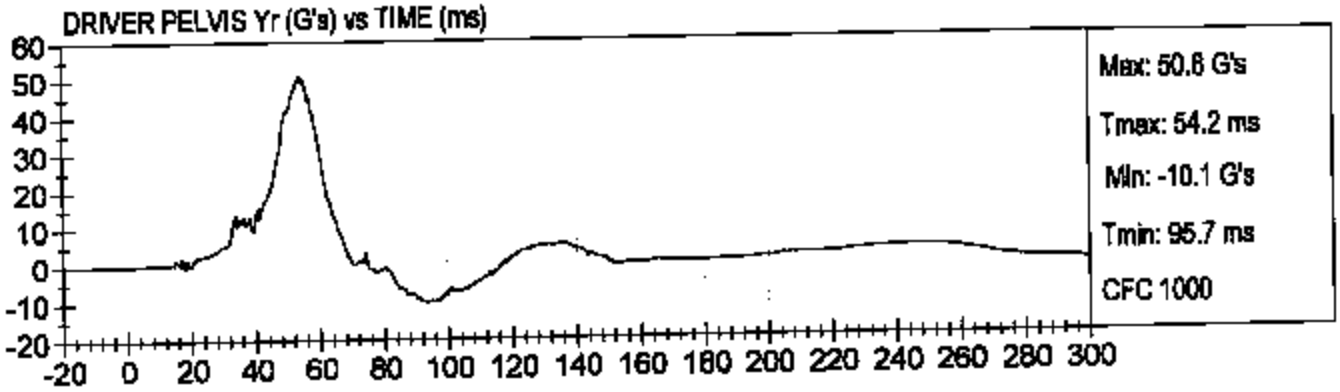
DRIVER LOWER SPINE Yr (G's) vs TIME (ms)



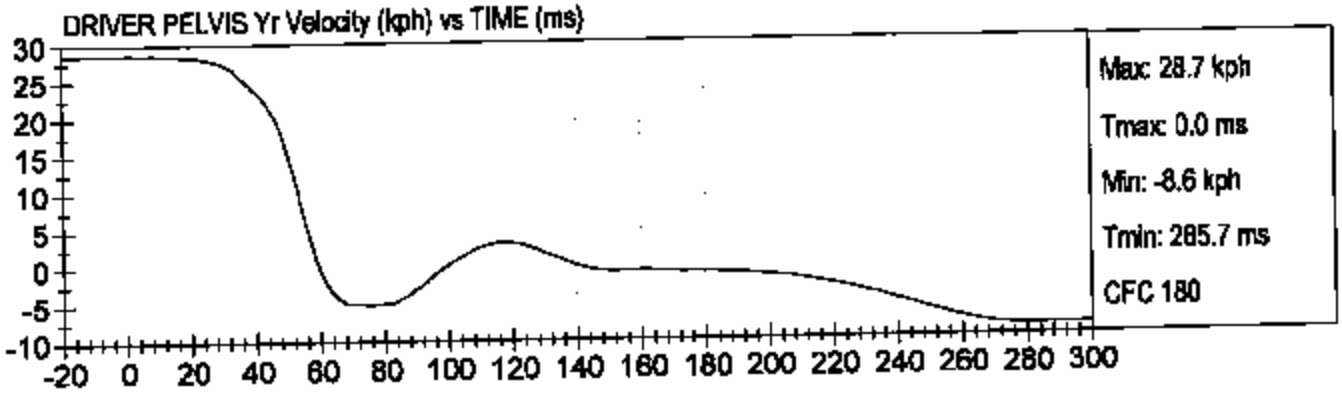
DRIVER LOWER SPINE Yr Velocity (kph) vs TIME (ms)



DRIVER PELVIS Yr (G's) vs TIME (ms)

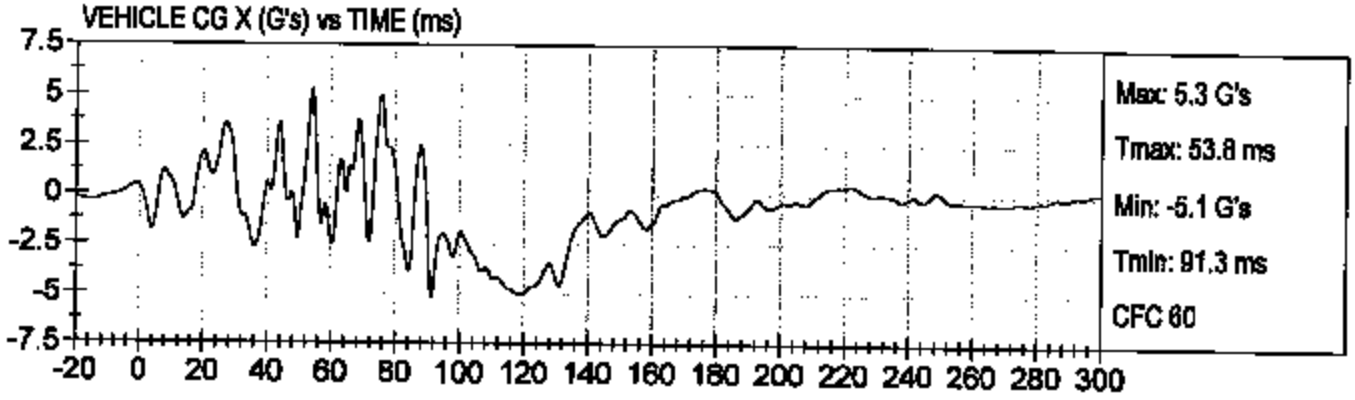


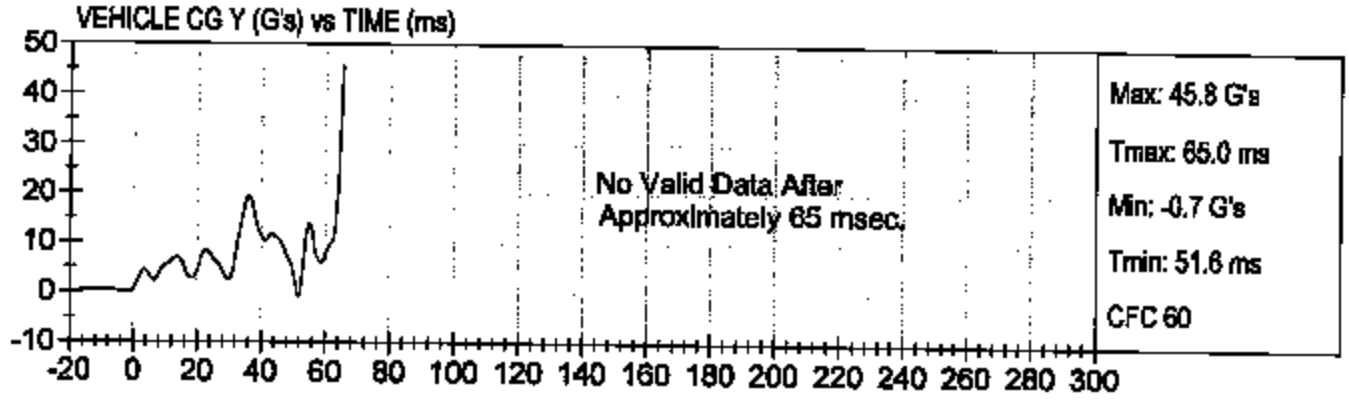
DRIVER PELVIS Yr Velocity (kph) vs TIME (ms)

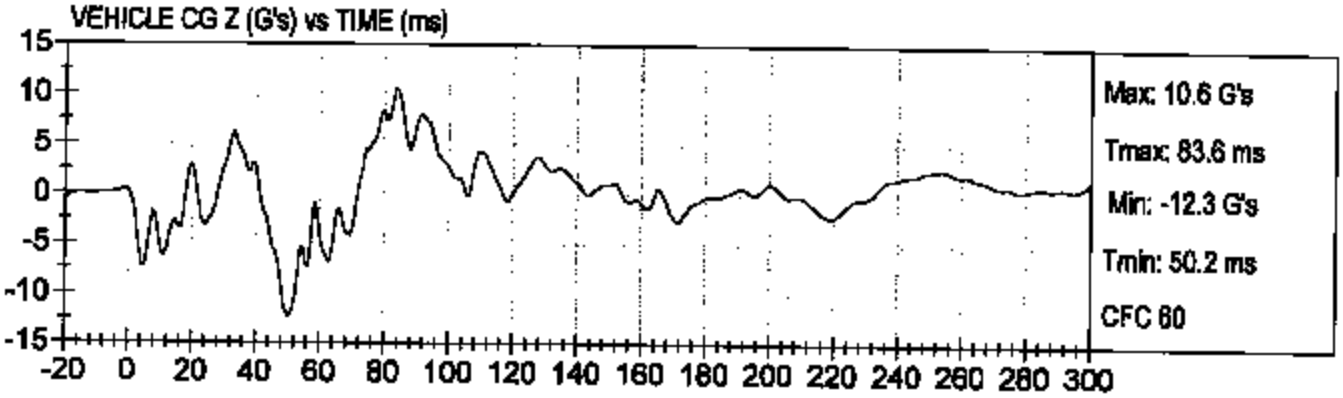


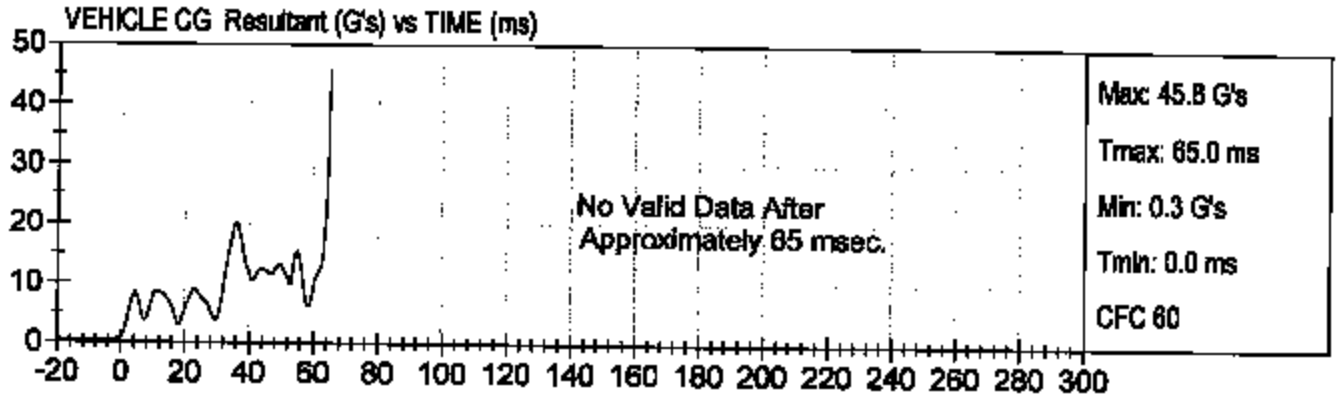
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)



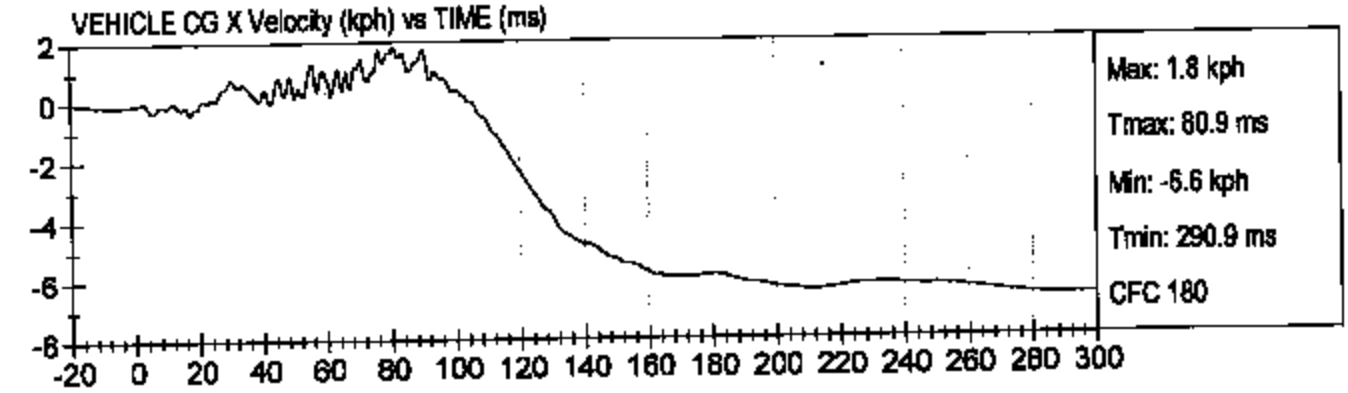


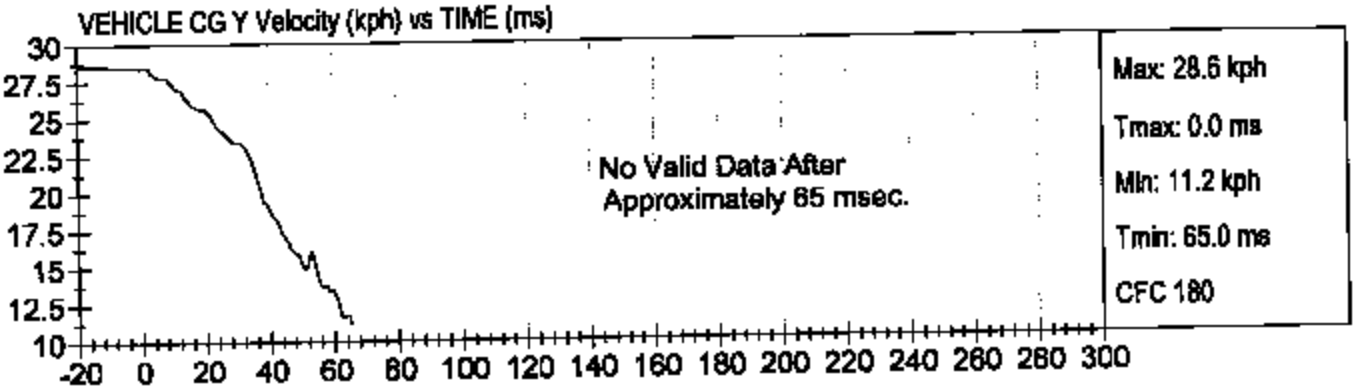


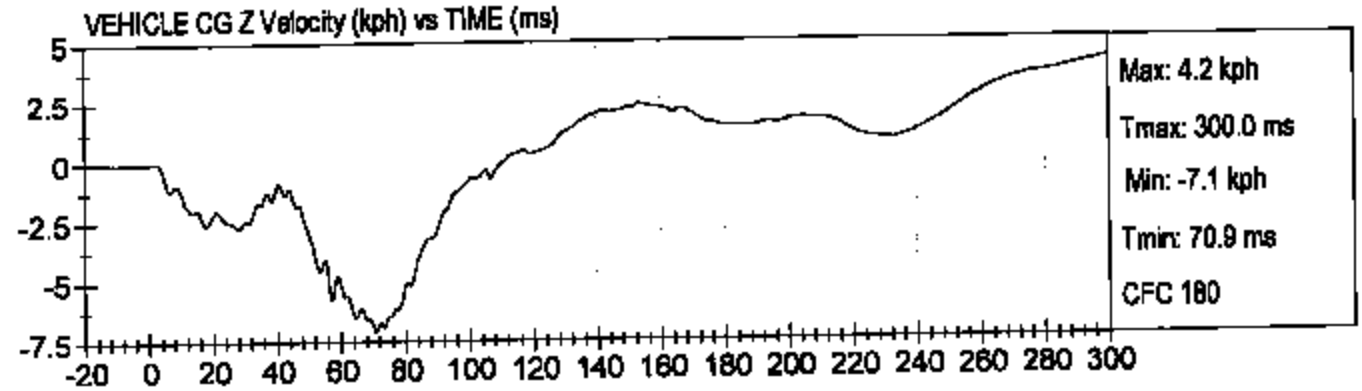


RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)



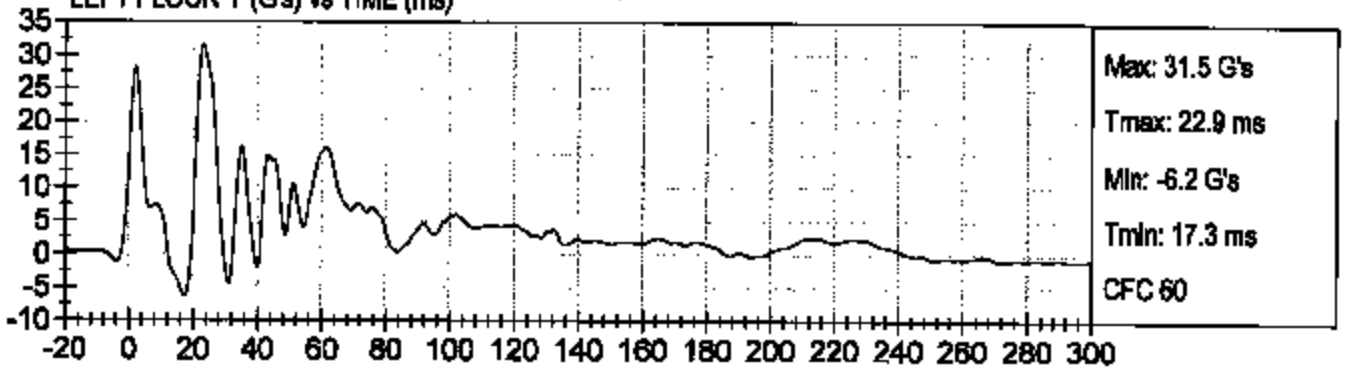




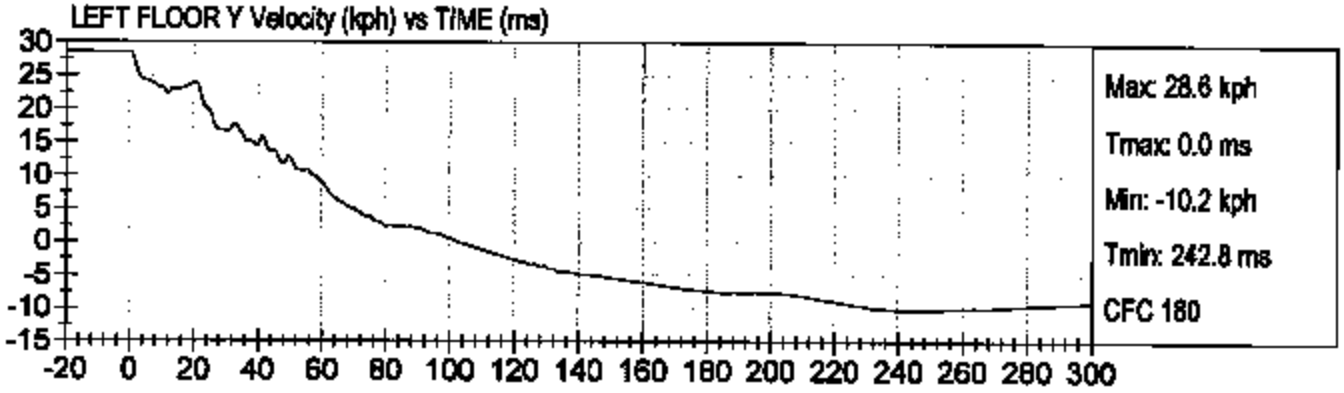
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

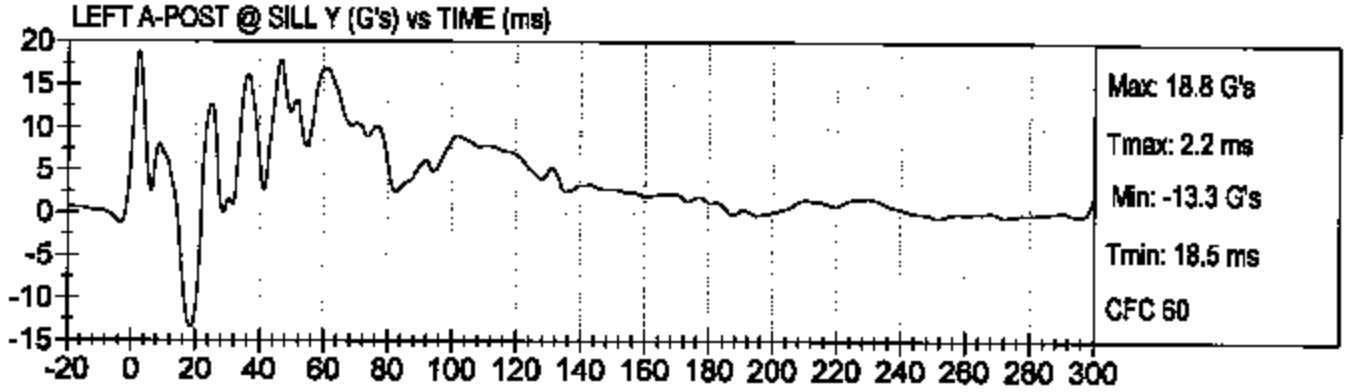
LEFT FLOOR Y (G's) vs TIME (ms)



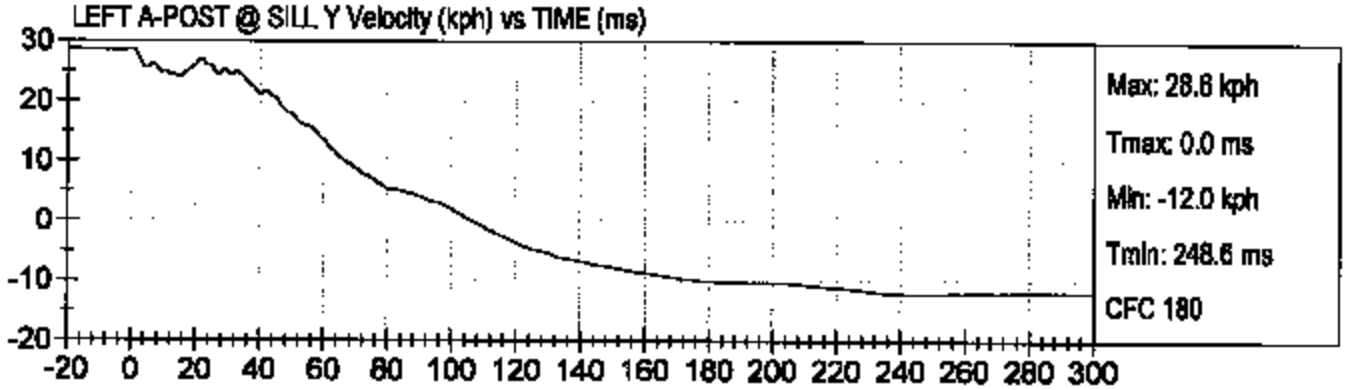
LEFT FLOOR Y Velocity (kph) vs TIME (ms)



LEFT A-POST @ SILL Y (G's) vs TIME (ms)



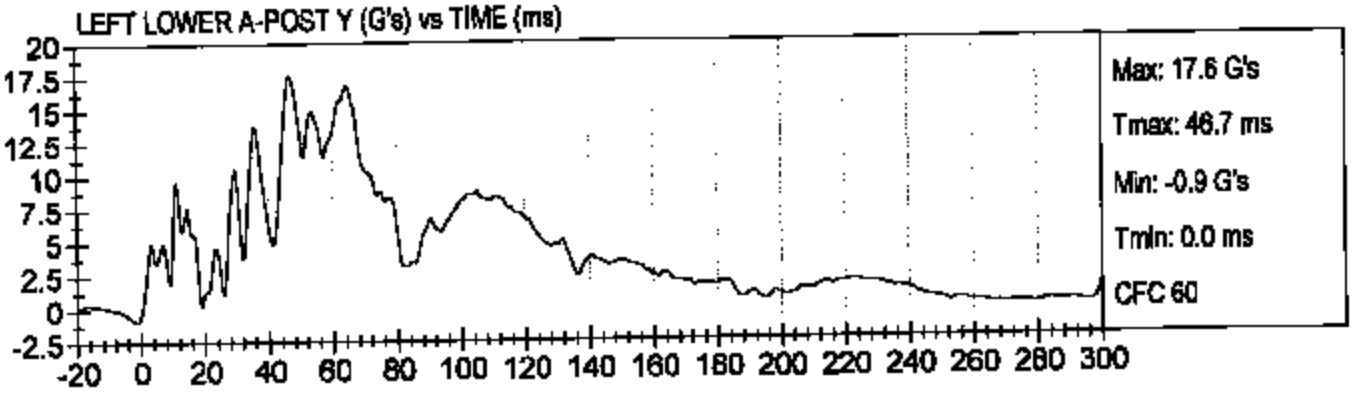
LEFT A-POST @ SILL Y Velocity (kph) vs TIME (ms)



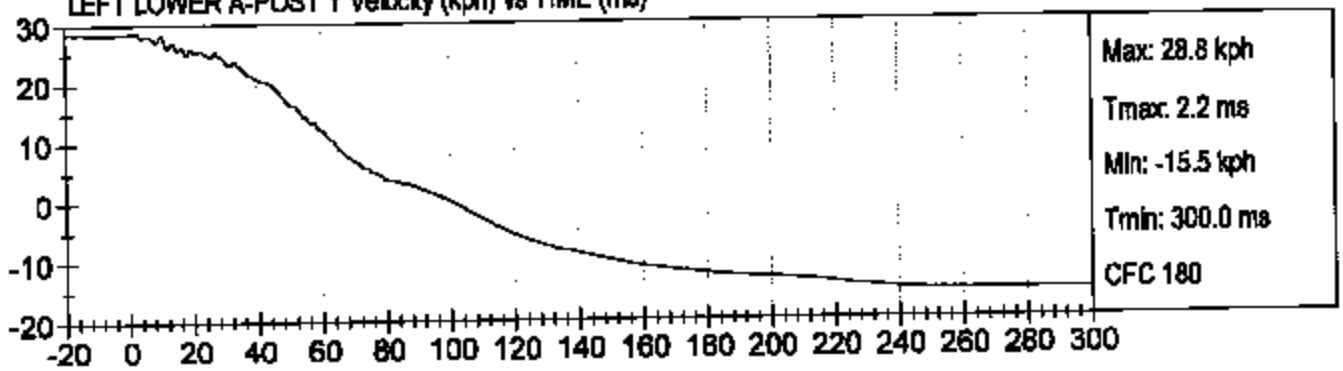
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

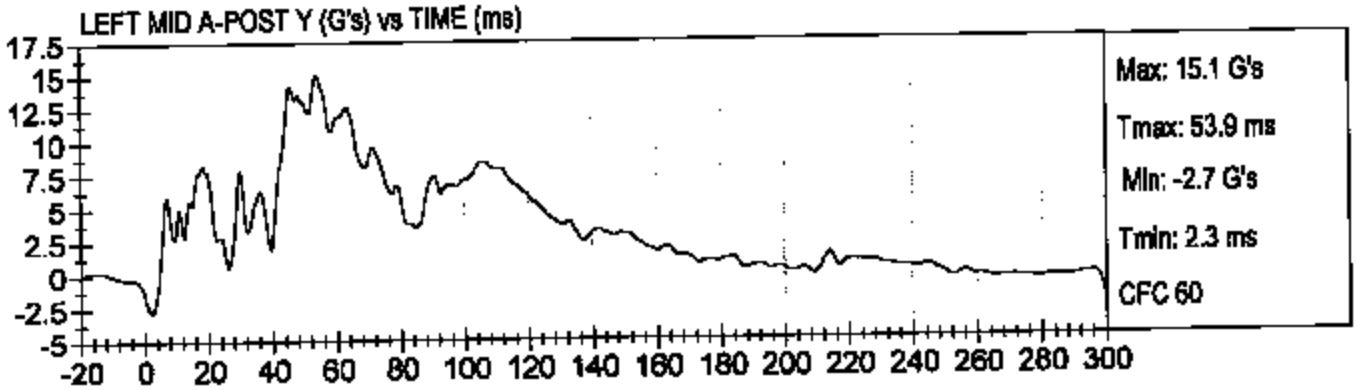
LEFT LOWER A-POST Y (G's) vs TIME (ms)



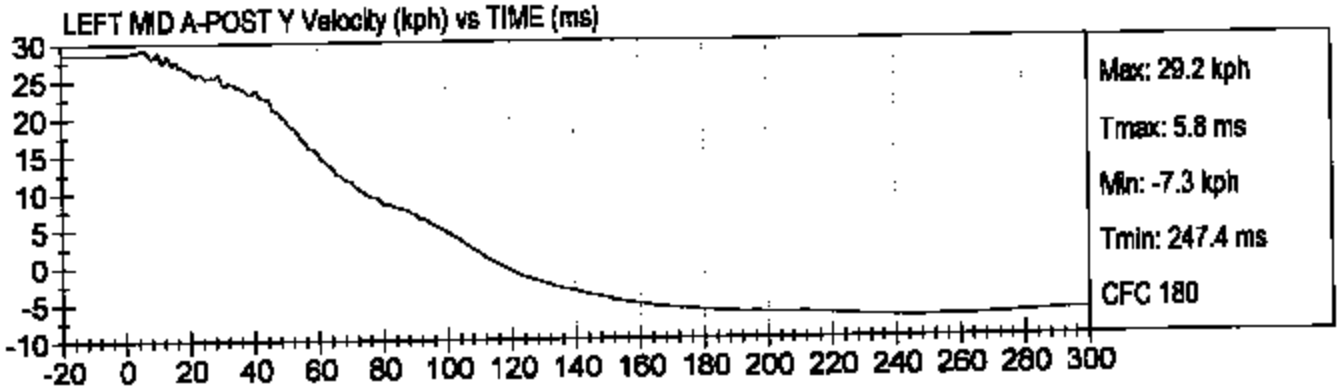
LEFT LOWER A-POST Y Velocity (kph) vs TIME (ms)



LEFT MID A-POST Y (G's) vs TIME (ms)

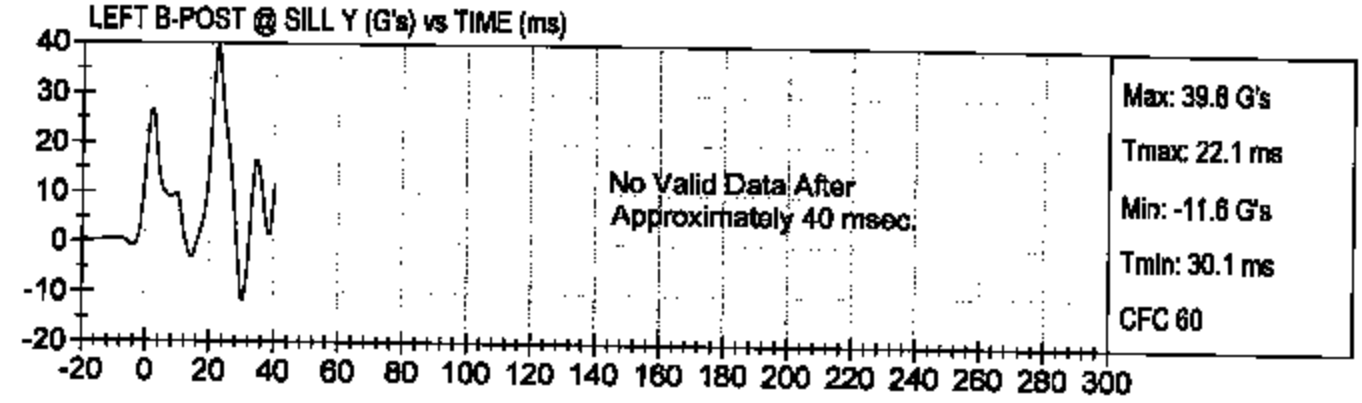


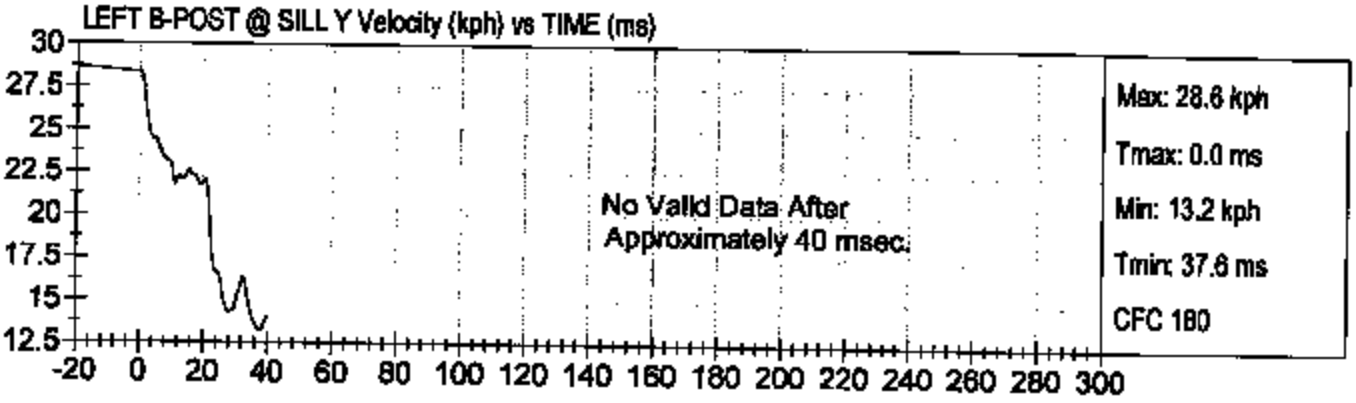
LEFT MID A-POST Y Velocity (kph) vs TIME (ms)

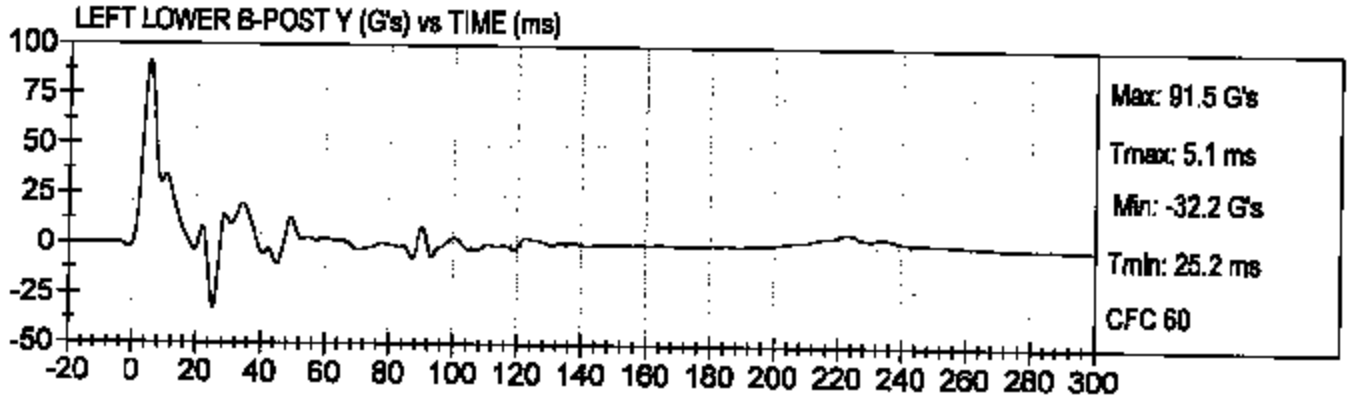


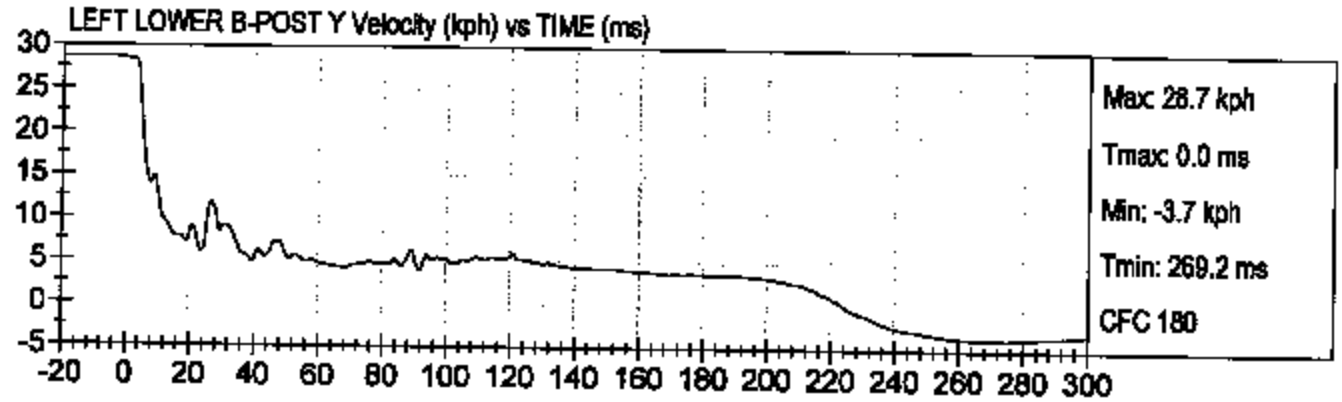
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)





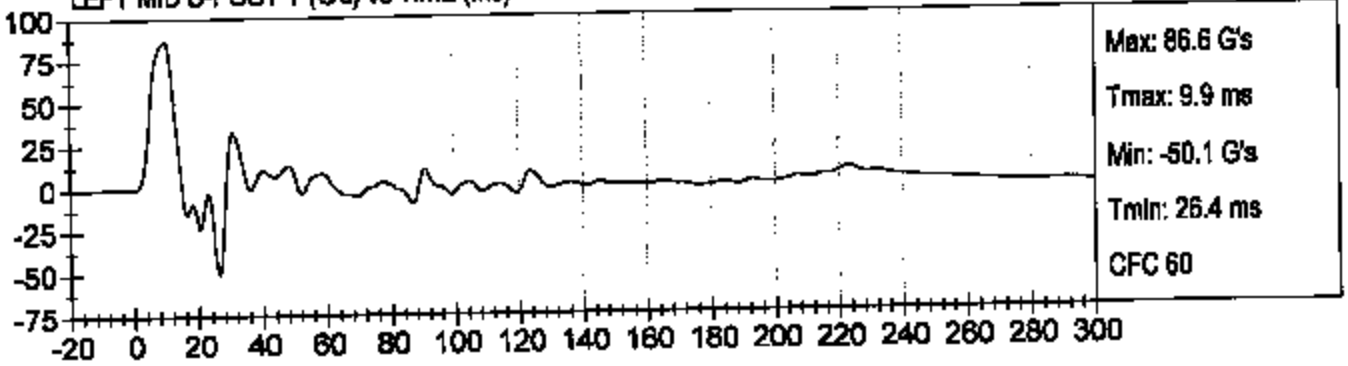




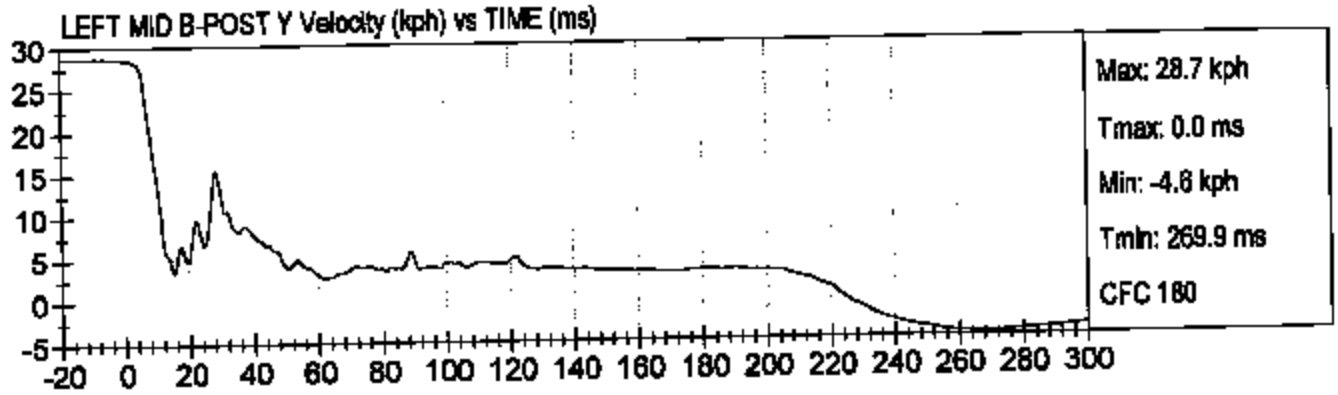
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

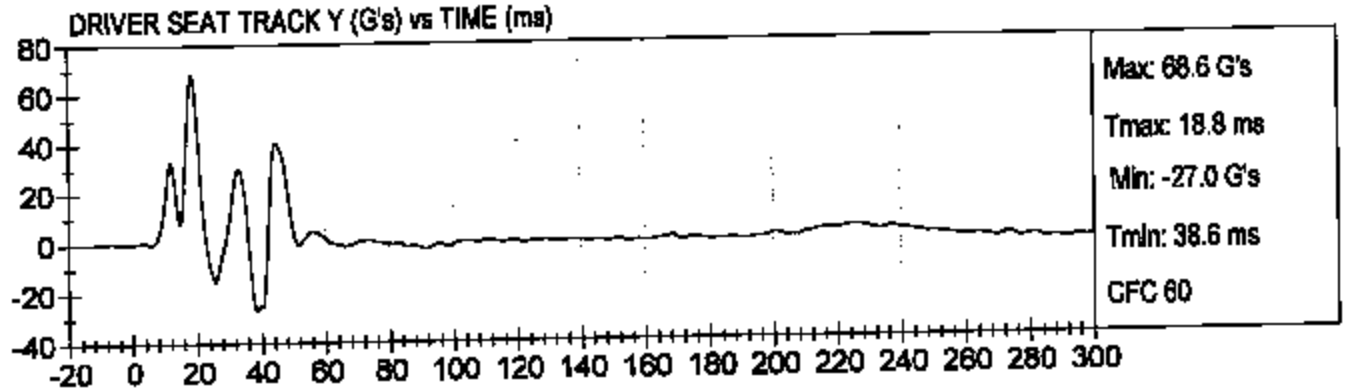
LEFT MID B-POST Y (G's) vs TIME (ms)



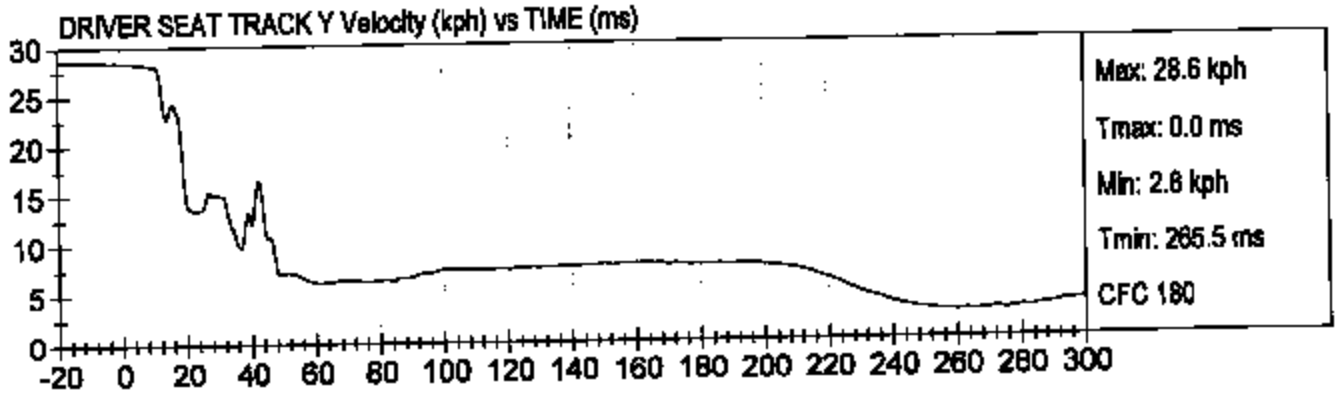
LEFT MID B-POST Y Velocity (kph) vs TIME (ms)



DRIVER SEAT TRACK Y (G's) vs TIME (ms)

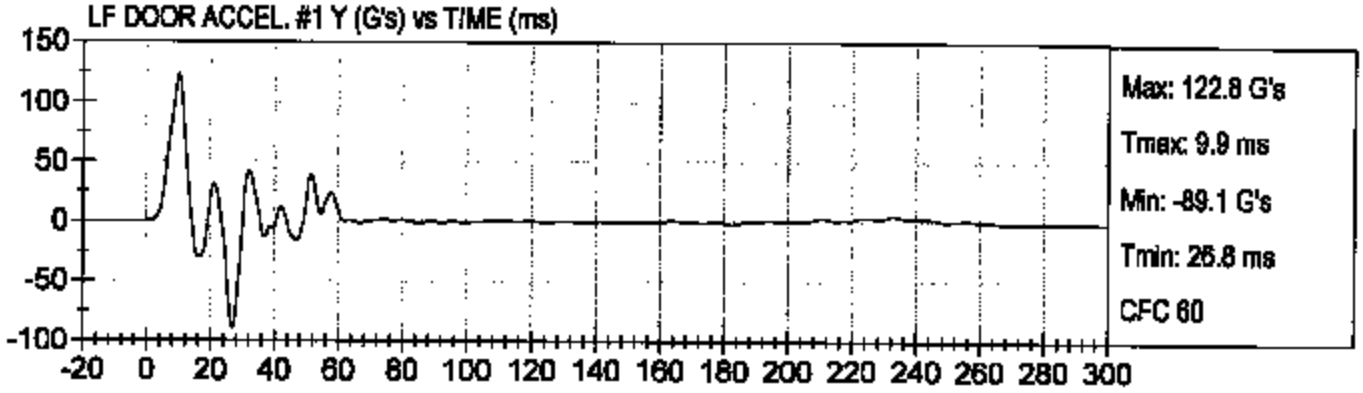


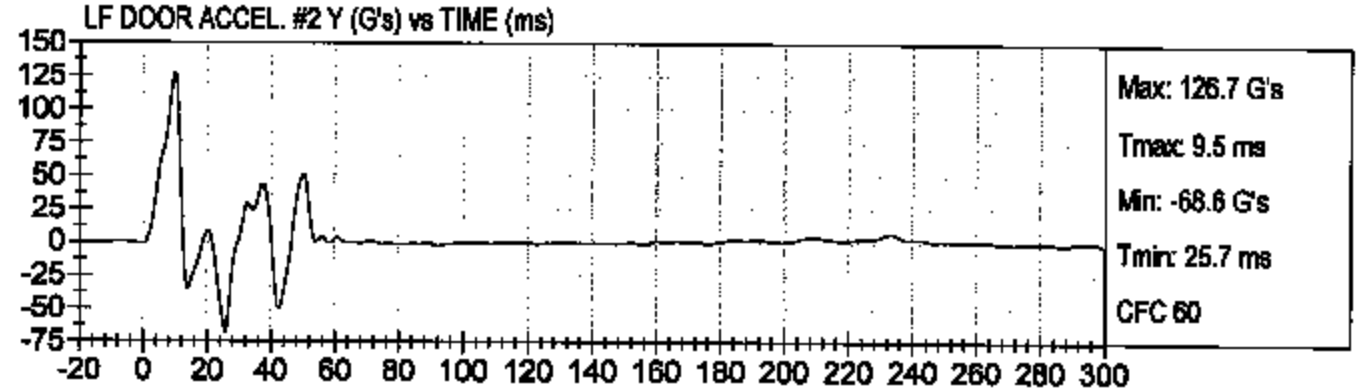
DRIVER SEAT TRACK Y Velocity (kph) vs TIME (ms)

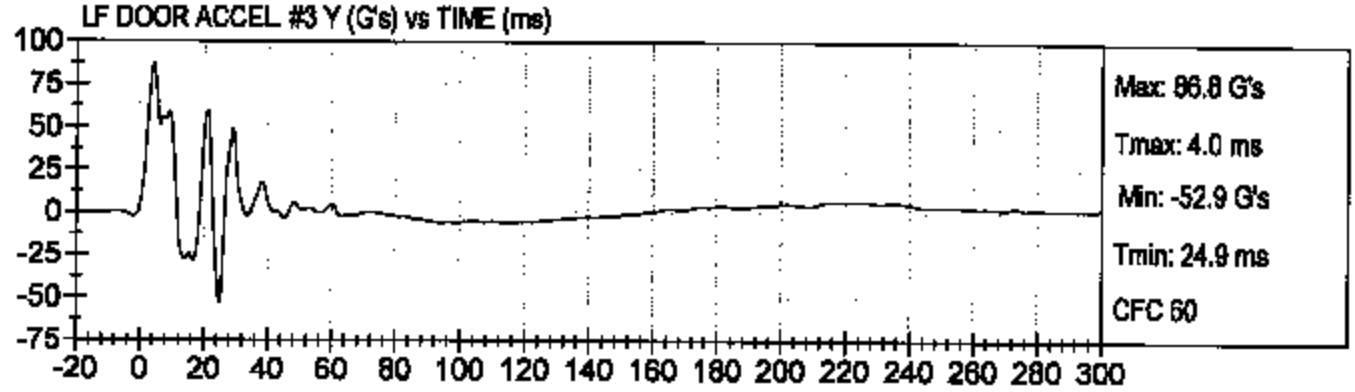


RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

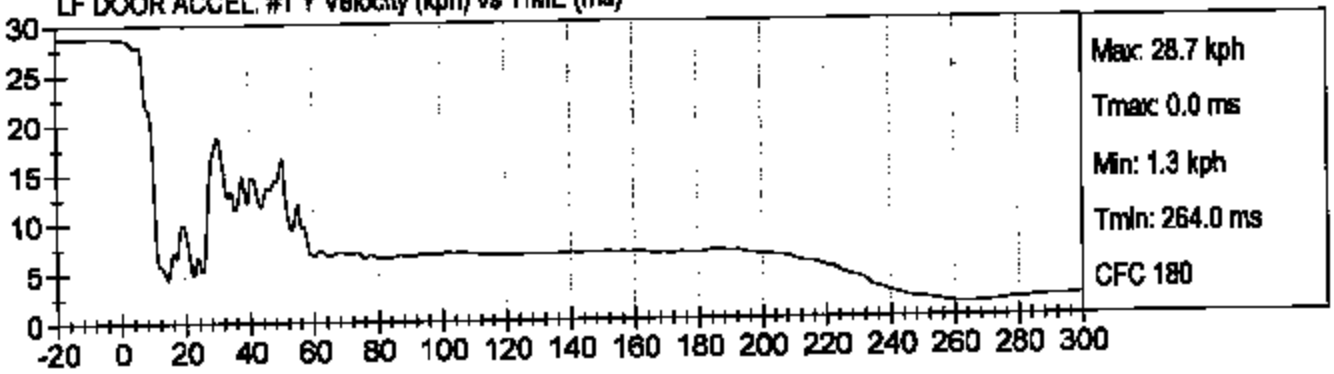
Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)



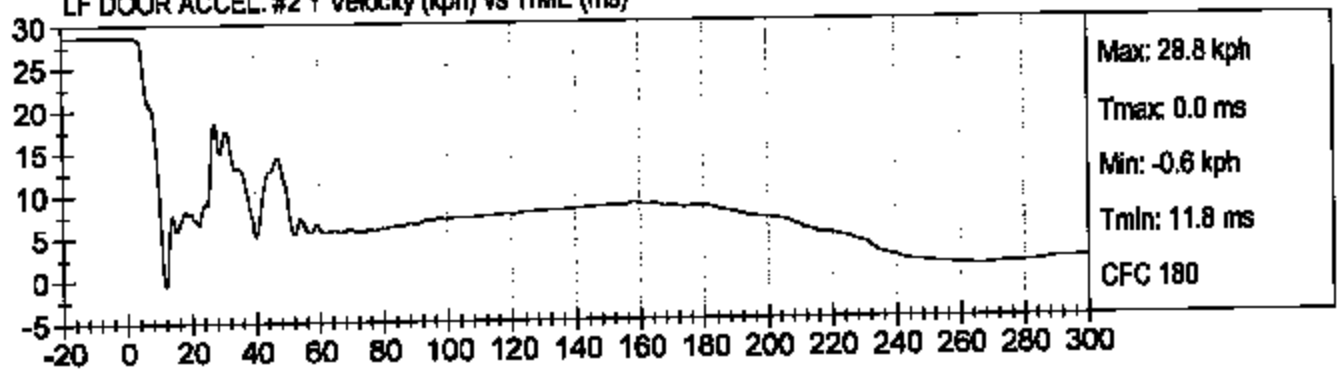




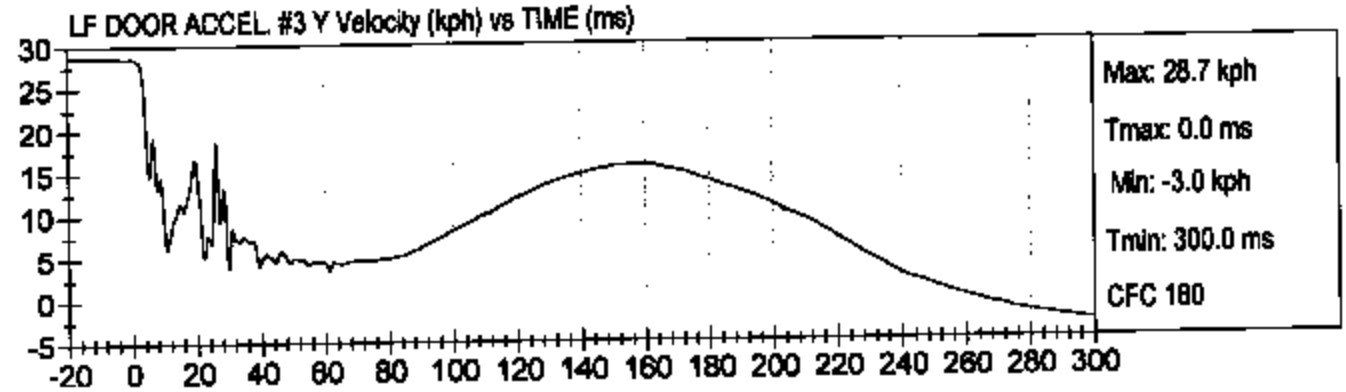
LF DOOR ACCEL. #1 Y Velocity (kph) vs TIME (ms)



LF DOOR ACCEL. #2 Y Velocity (kph) vs TIME (ms)

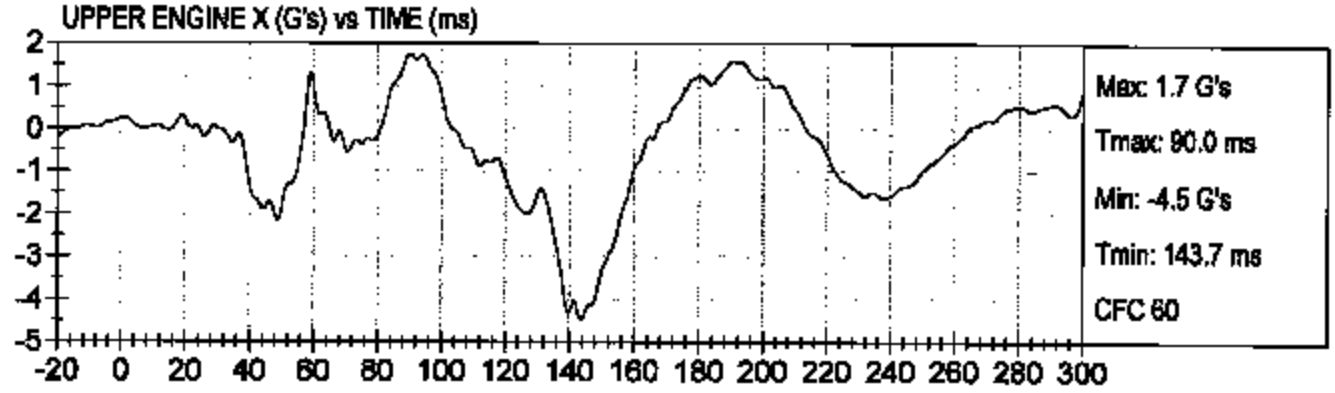


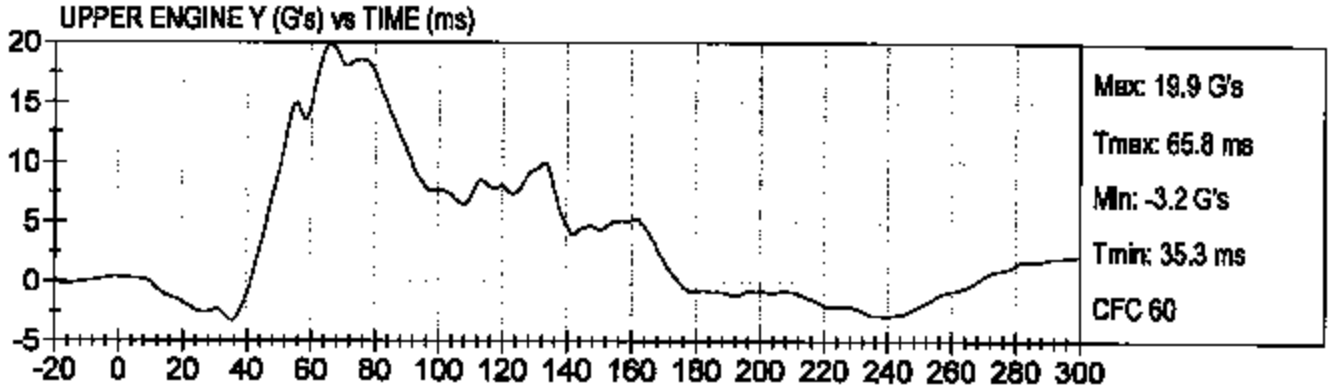
LF DOOR ACCEL. #3 Y Velocity (kph) vs TIME (ms)

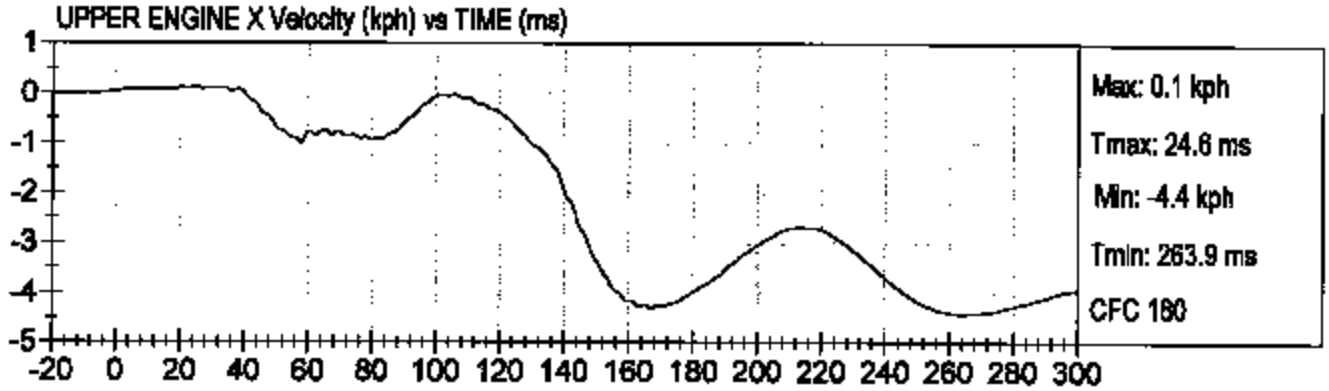


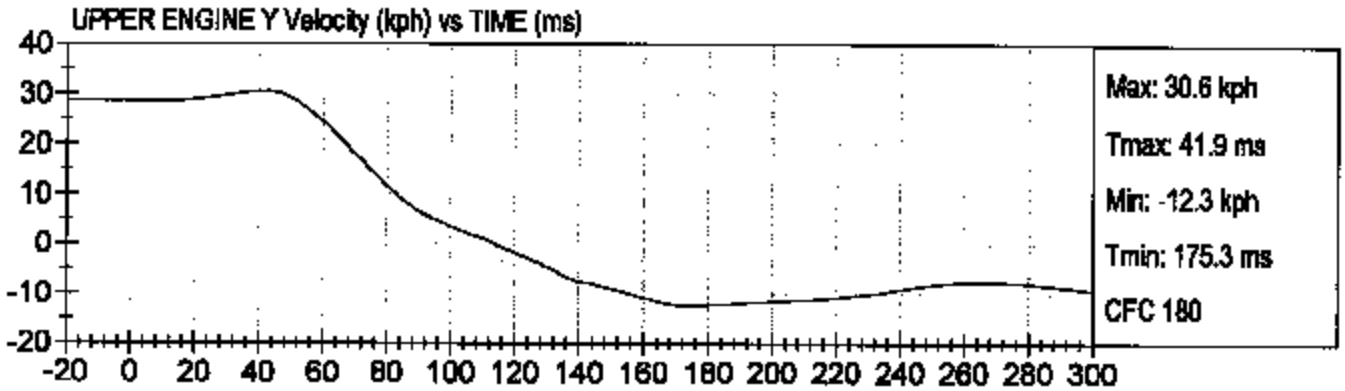
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)





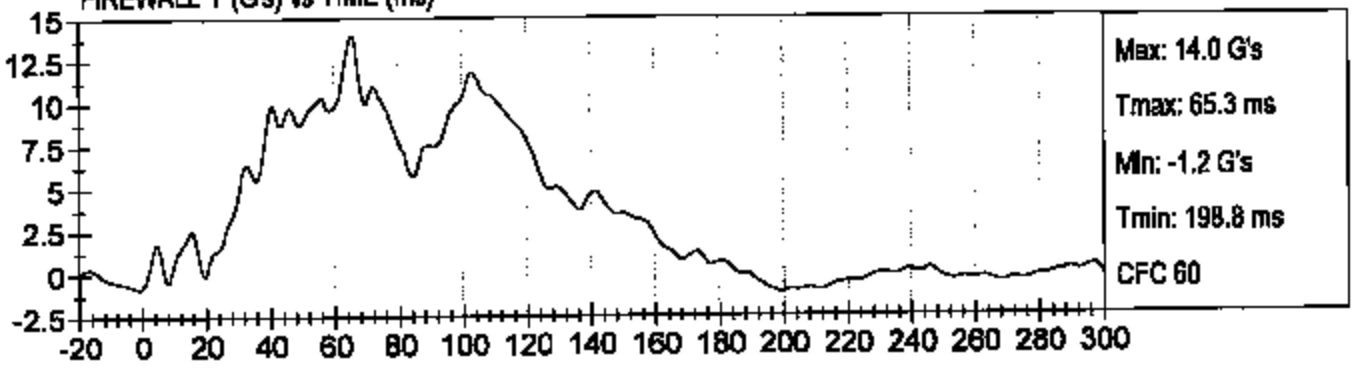




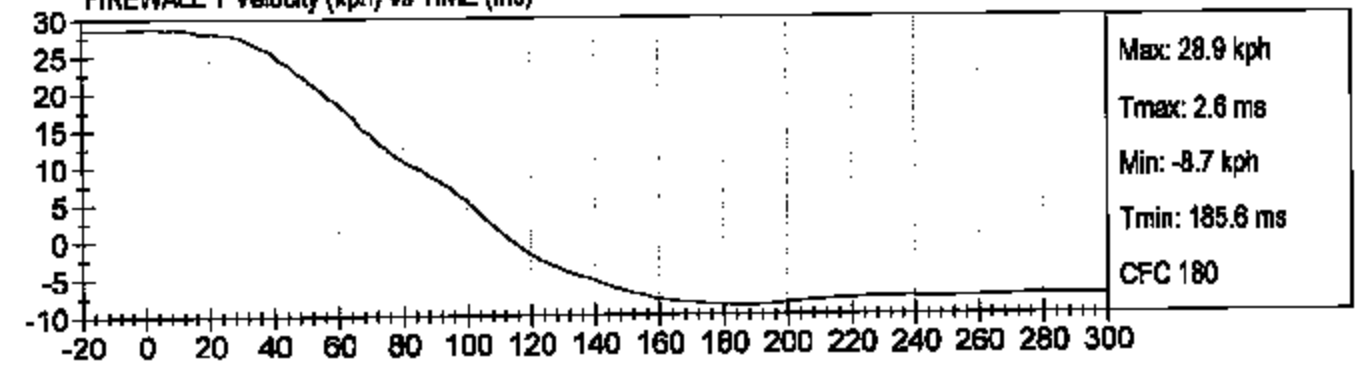
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

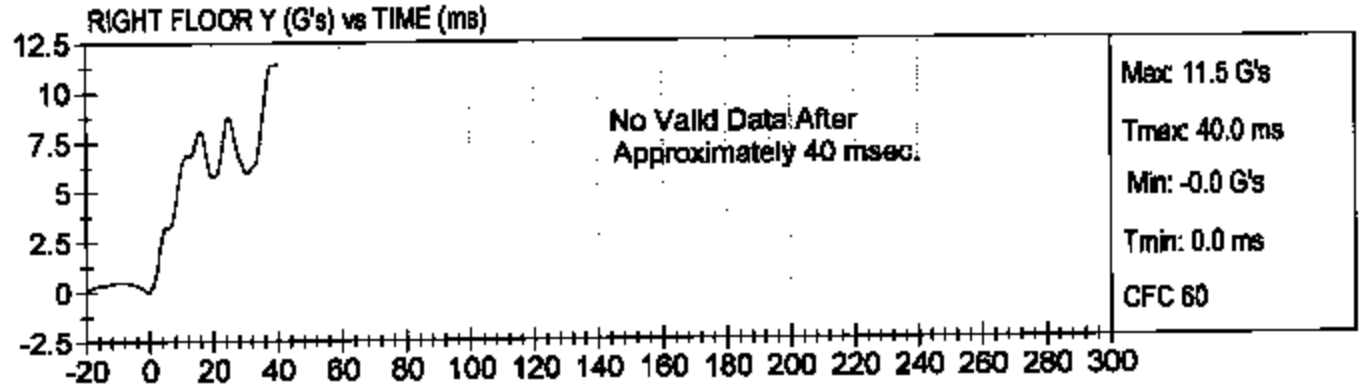
FIREWALL Y (G's) vs TIME (ms)



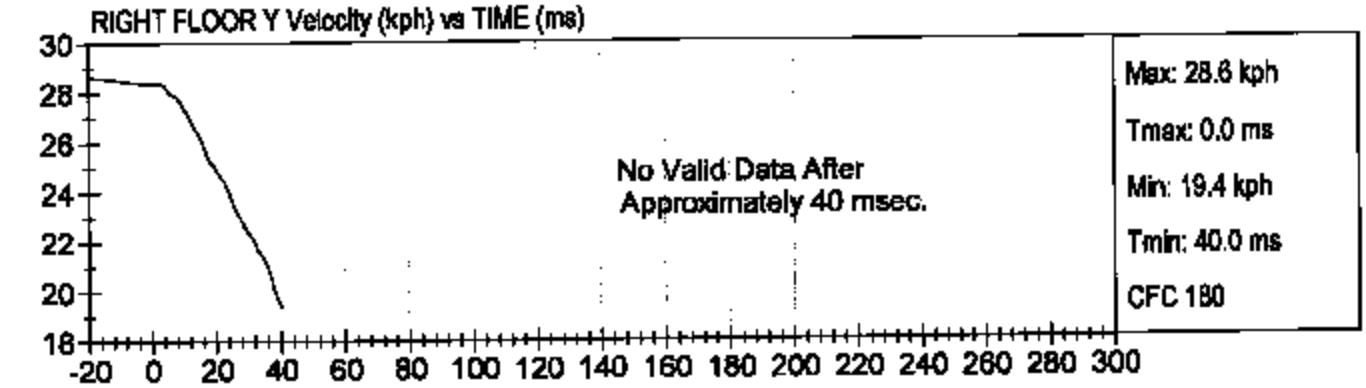
FIREWALL Y Velocity (kph) vs TIME (ms)



RIGHT FLOOR Y (G's) vs TIME (ms)



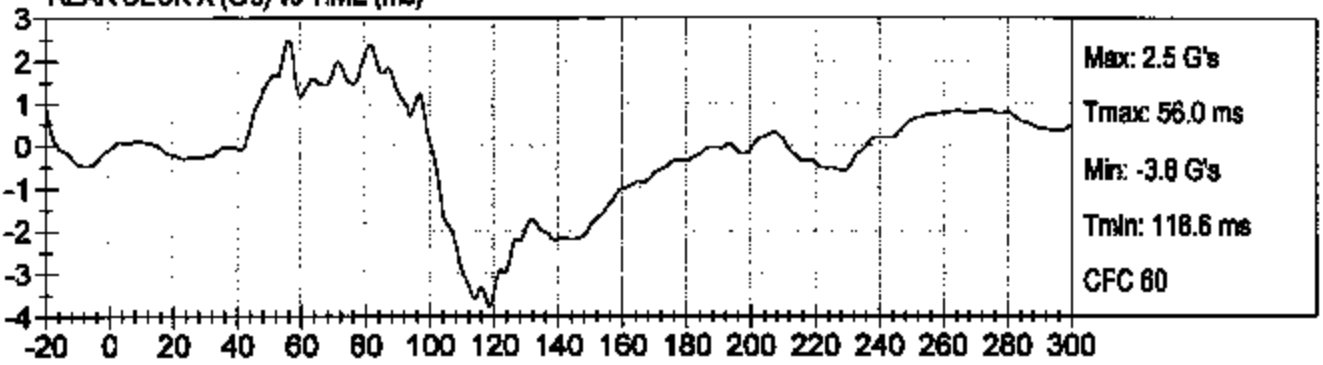
RIGHT FLOOR Y Velocity (kph) vs TIME (ms)



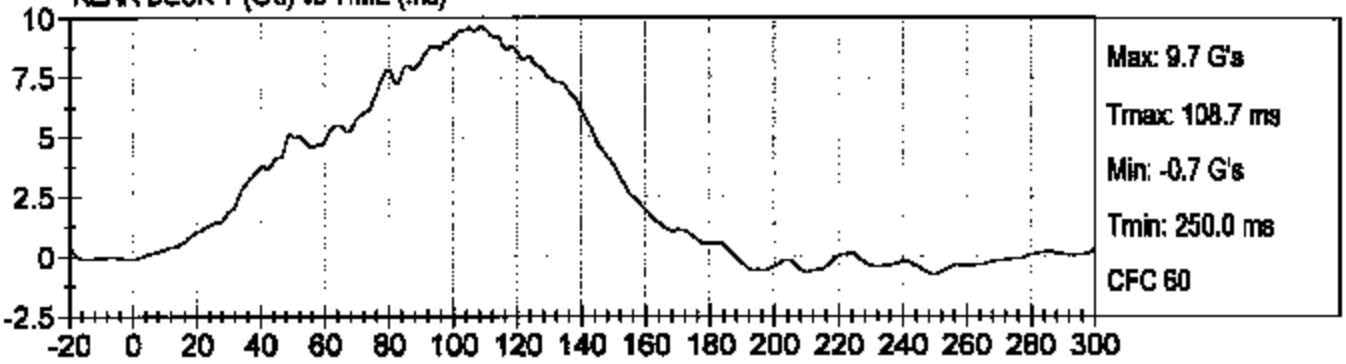
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

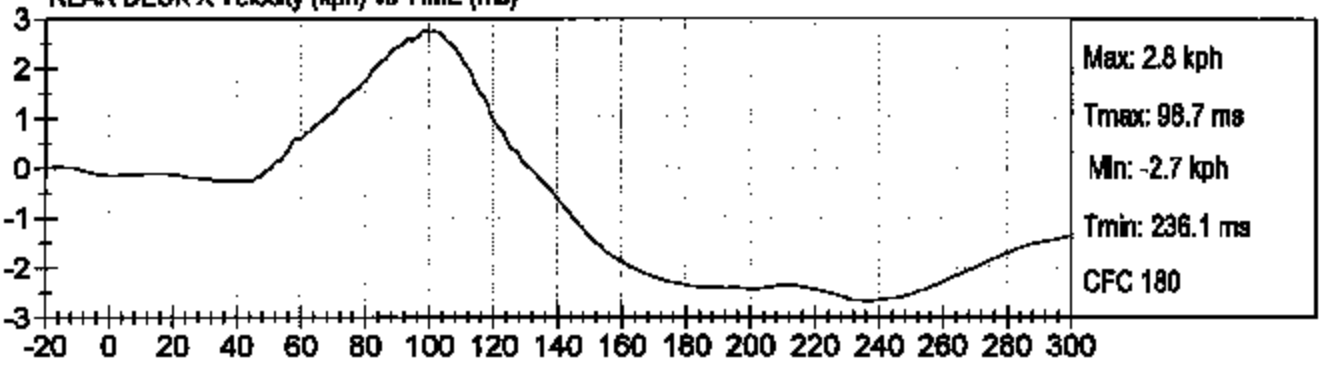
REAR DECK X (G's) vs TIME (ms)



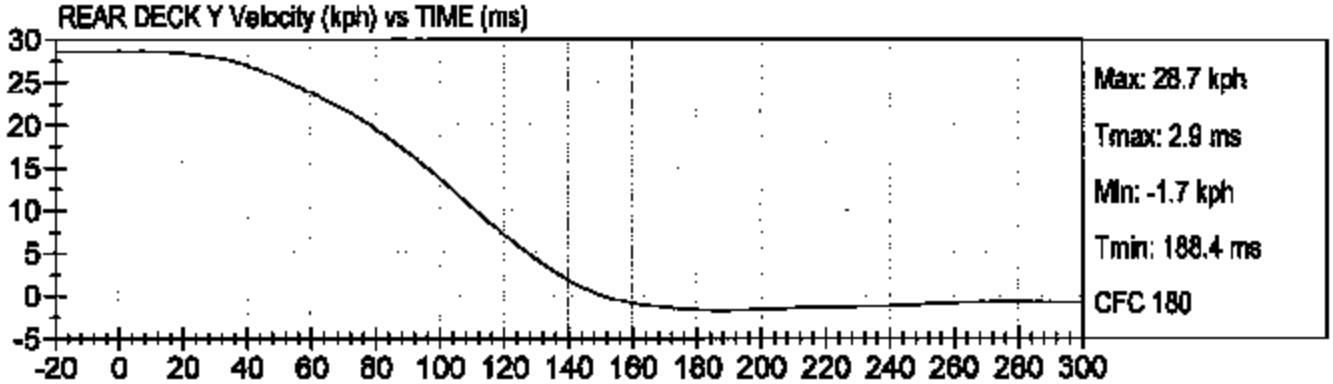
REAR DECK Y (G's) vs TIME (ms)



REAR DECK X Velocity (kph) vs TIME (ms)



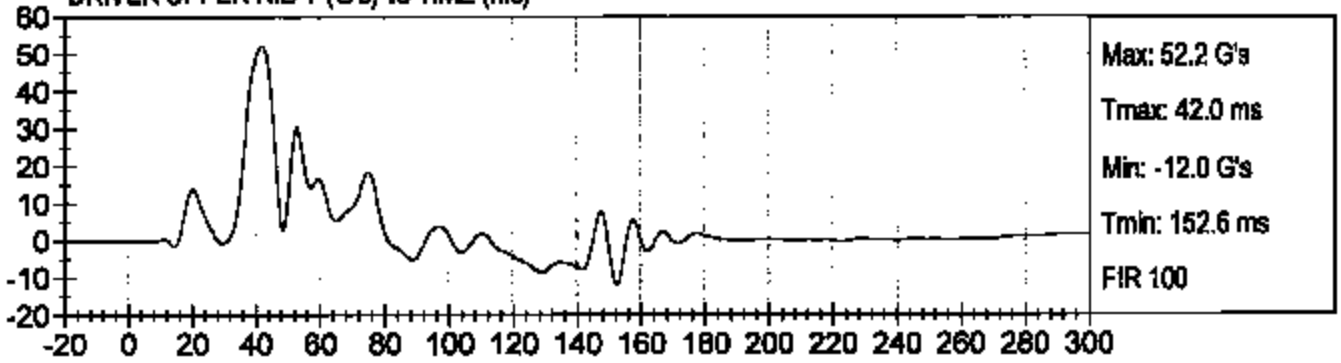
REAR DECK Y Velocity (kph) vs TIME (ms)



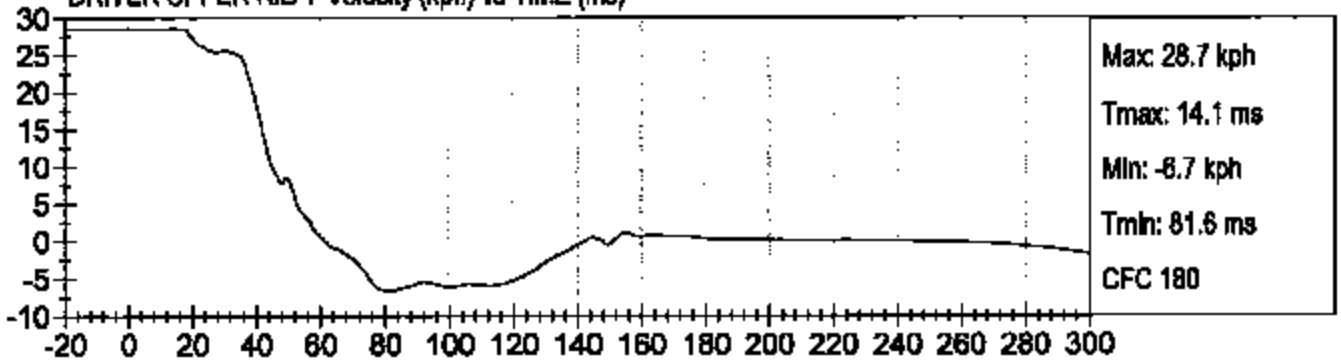
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

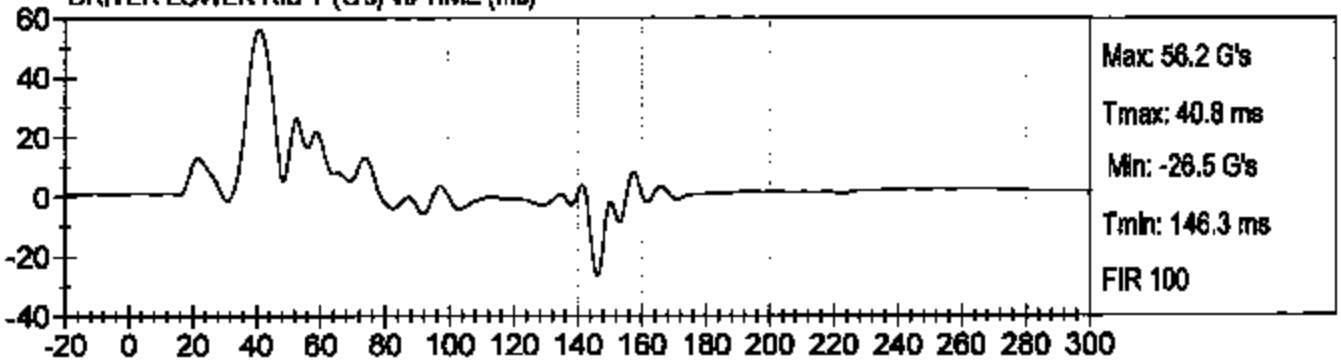
DRIVER UPPER RIB Y (G's) vs TIME (ms)



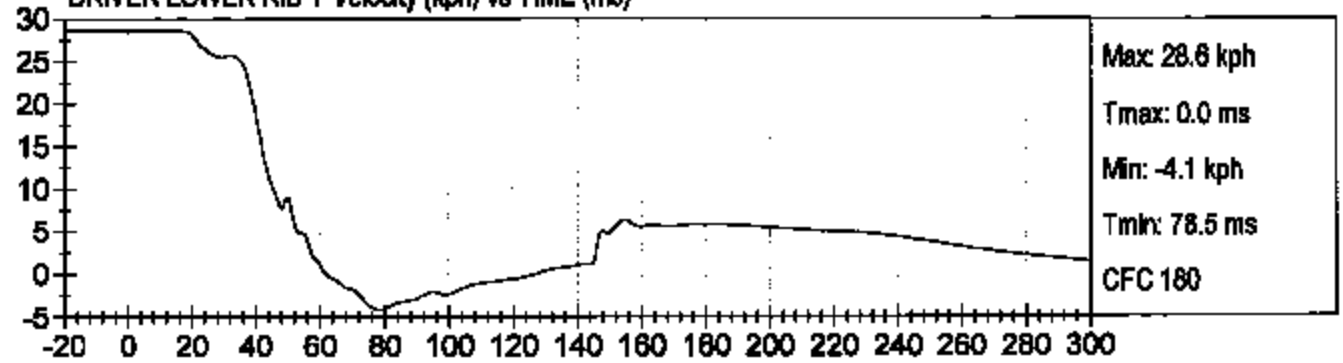
DRIVER UPPER RIB Y Velocity (kph) vs TIME (ms)



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

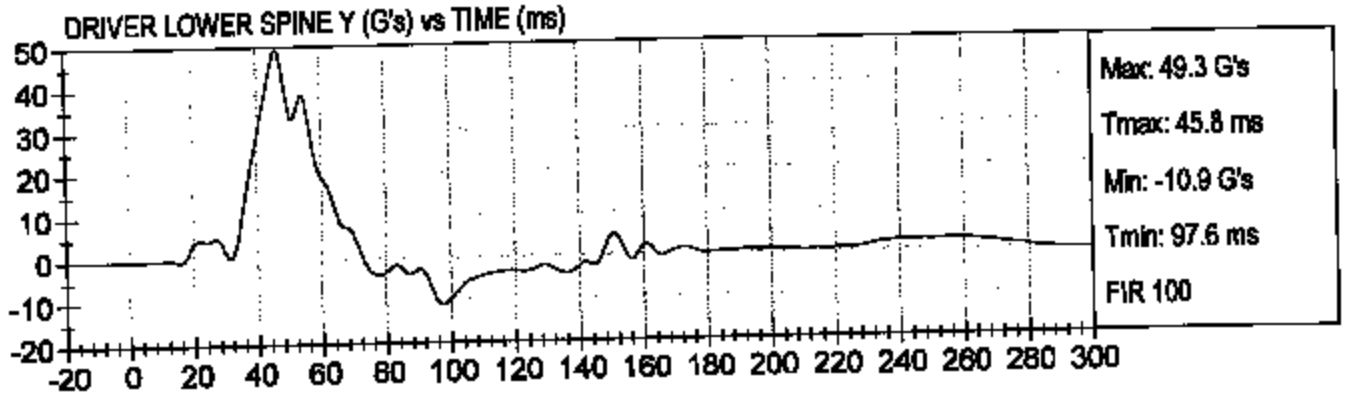


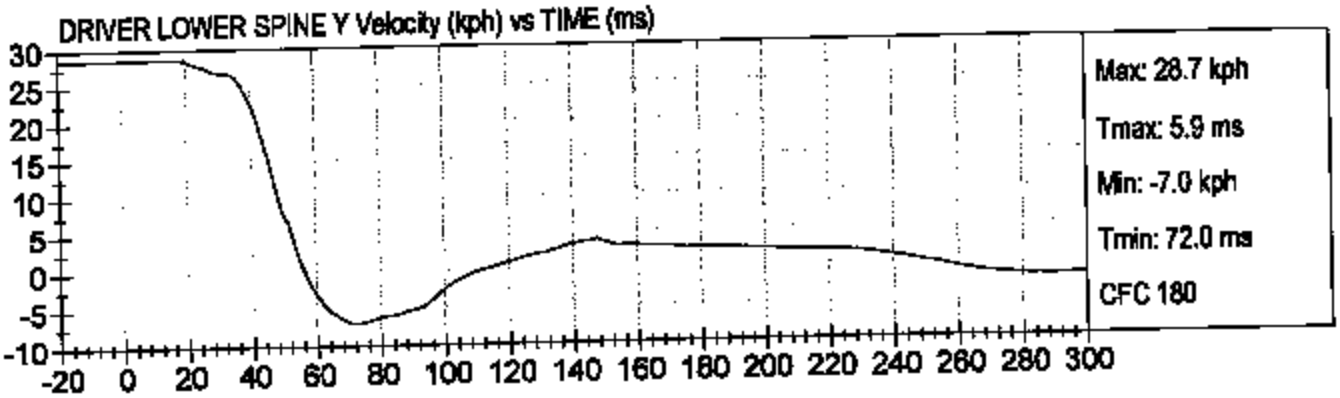
DRIVER LOWER RIB Y Velocity (kph) vs TIME (ms)

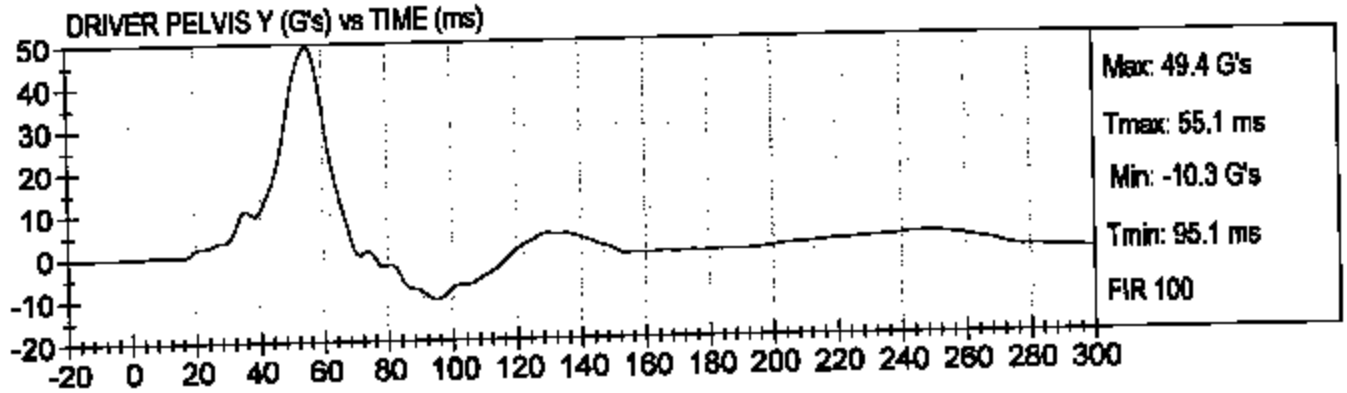


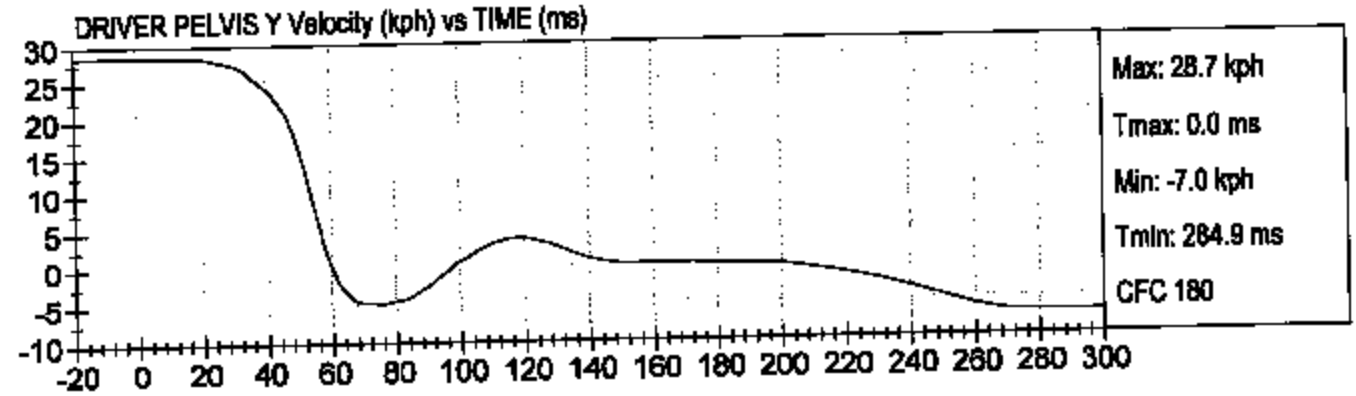
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)



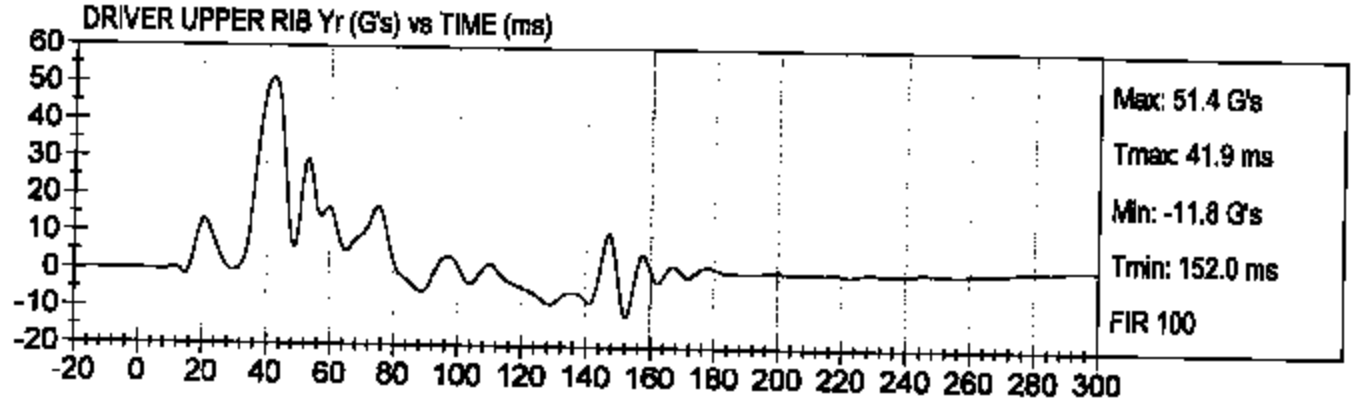


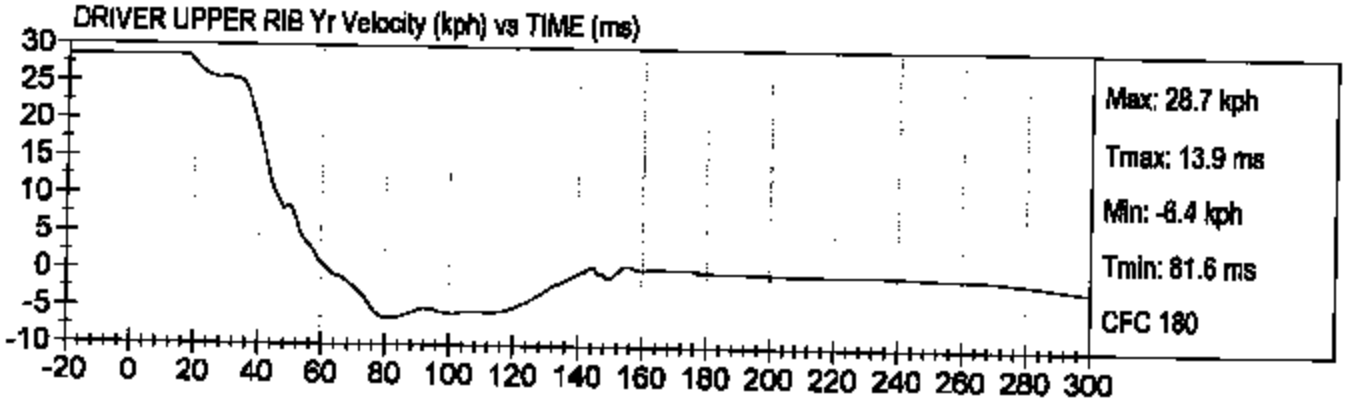


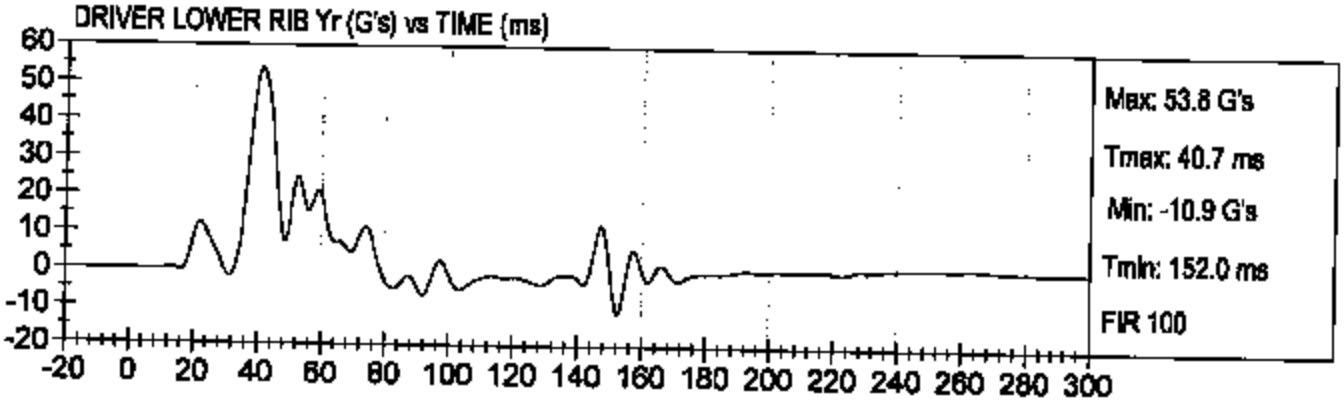


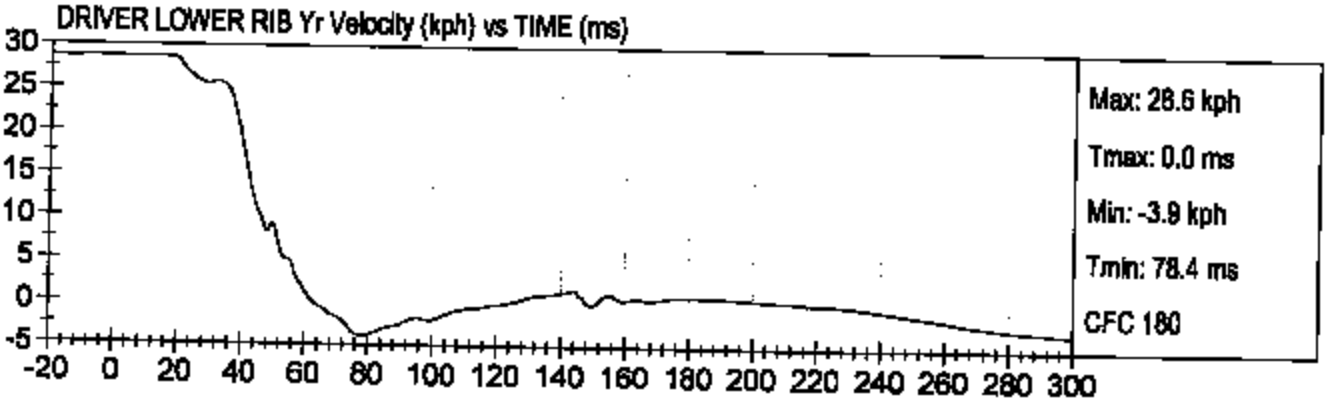
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)





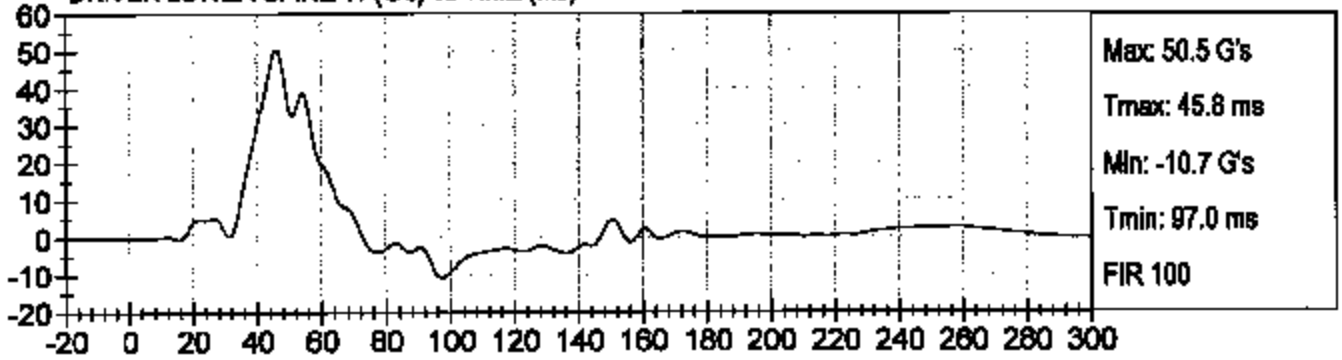




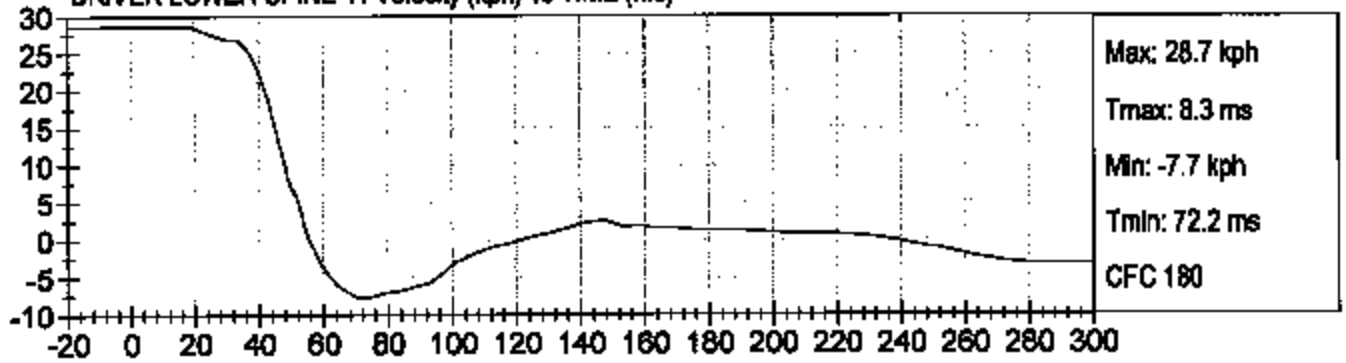
RIGID POLE SIDE IMPACT, 201P
2004 NISSAN TITAN (C45206)

Test Date: 05/19/05
Speed: 17.8 mph (28.6 km/h)

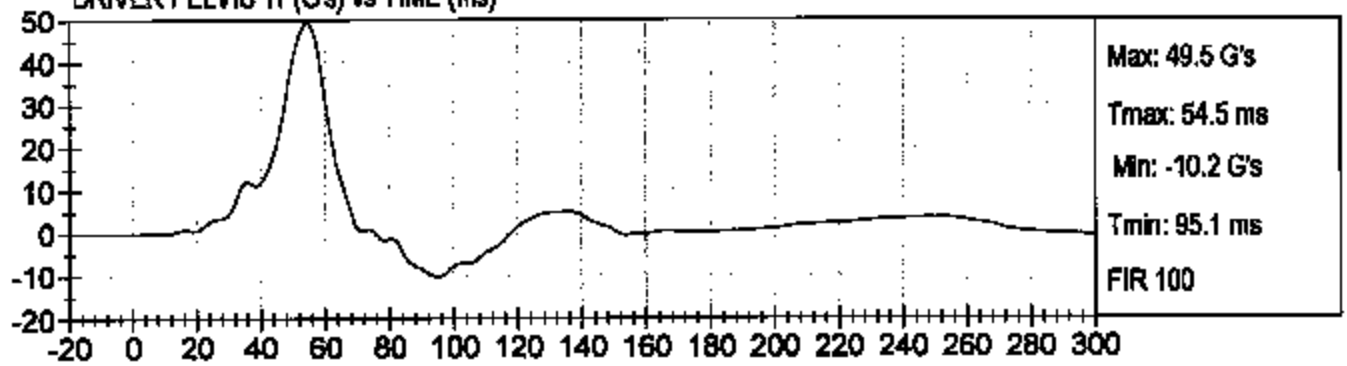
DRIVER LOWER SPINE Yr (G's) vs TIME (ms)



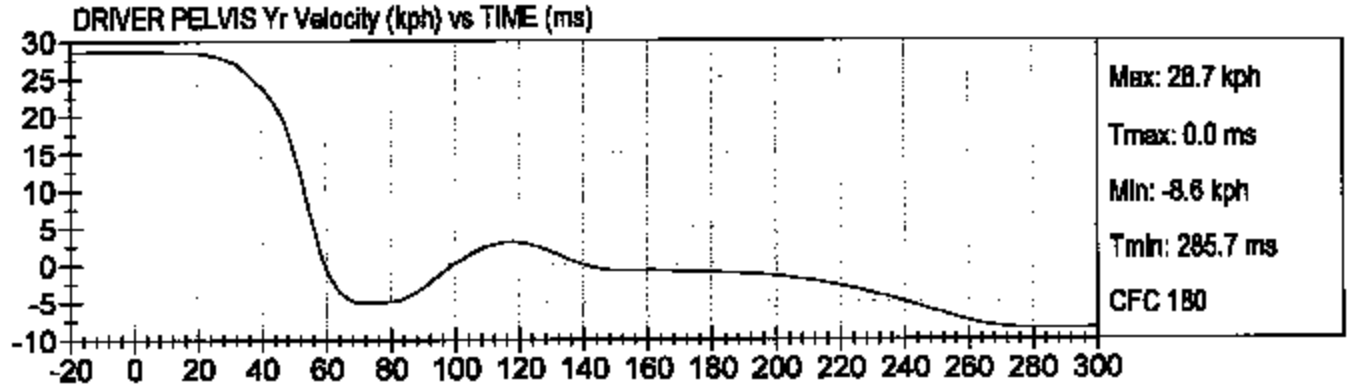
DRIVER LOWER SPINE Yr Velocity (kph) vs TIME (ms)



DRIVER PELVIS Yr (G's) vs TIME (ms)



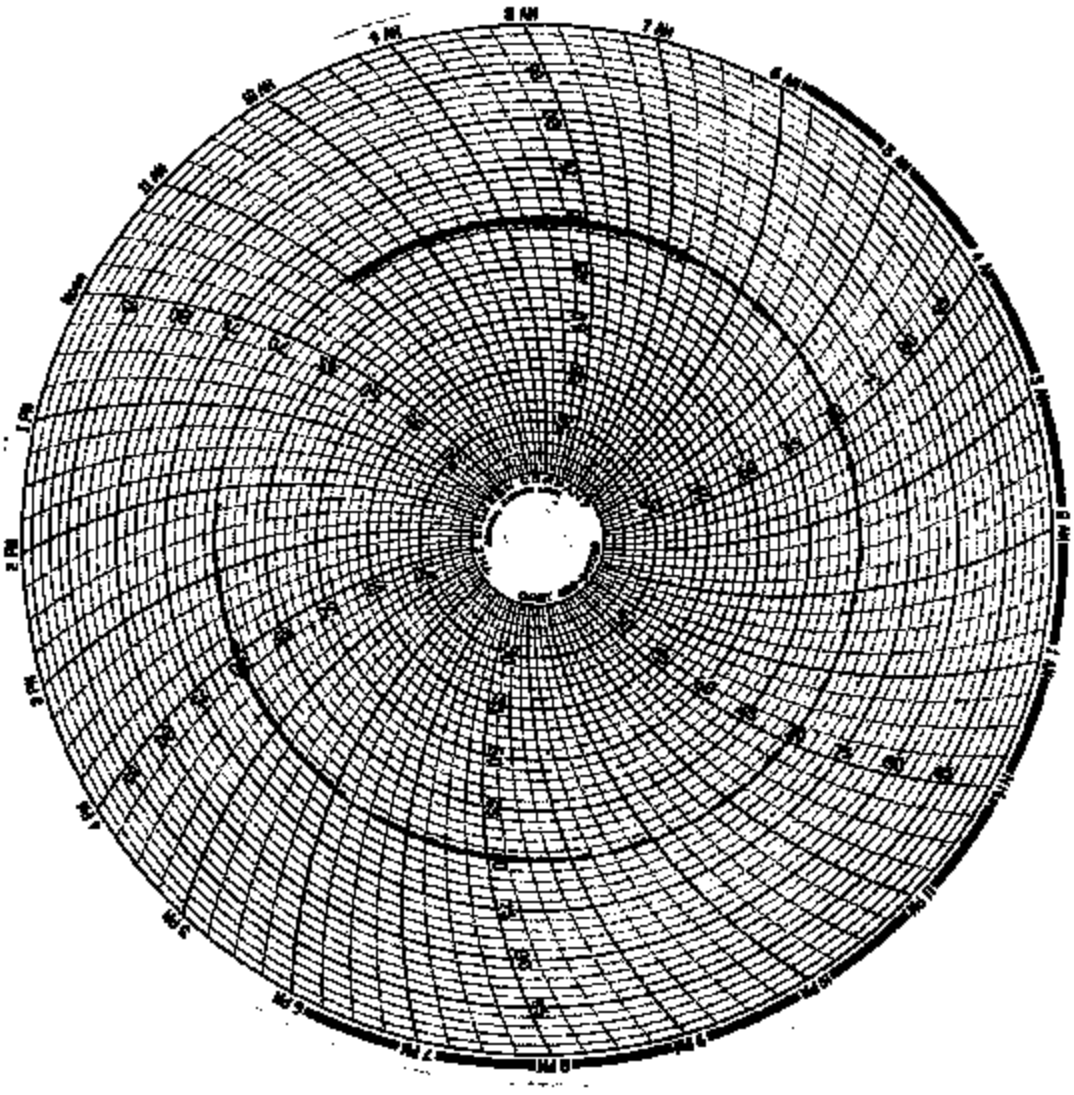
DRIVER PELVIS Yr Velocity (kph) vs TIME (ms)



APPENDIX C

SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Vehicle and Dummy Temperature



CERTIFICATION DATA

Dummy Serial Number: 036

Calibration Test Results Summary

Dummy Serial Number: 036

Pre-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet

Side Impact Dummy

Head Drop Calibration (Lateral)

ATD Serial No: 036 **Test I.D:** D051261

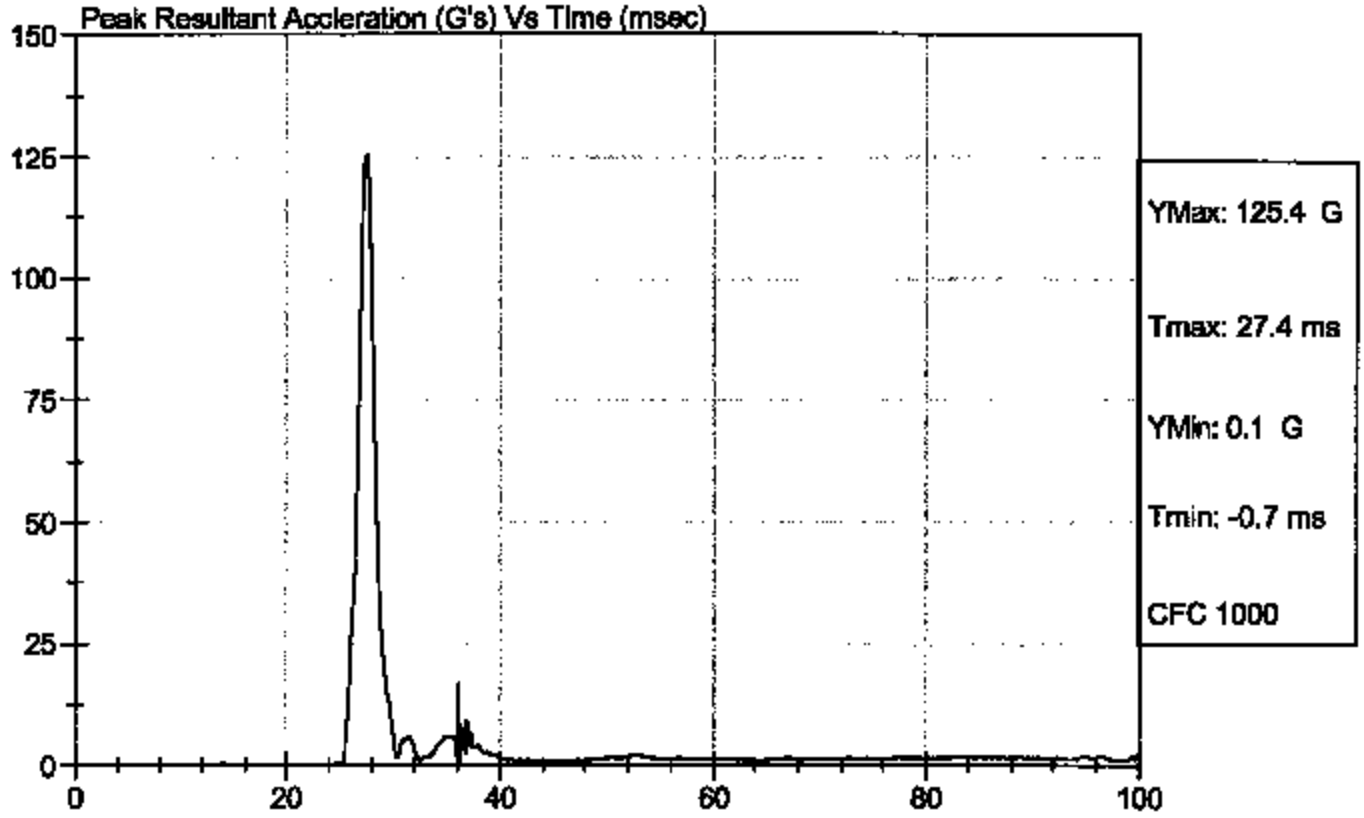
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Peak Resultant Acceleration	G's	120 to 150	125	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-11	Pass
		Overall Test Results		Pass

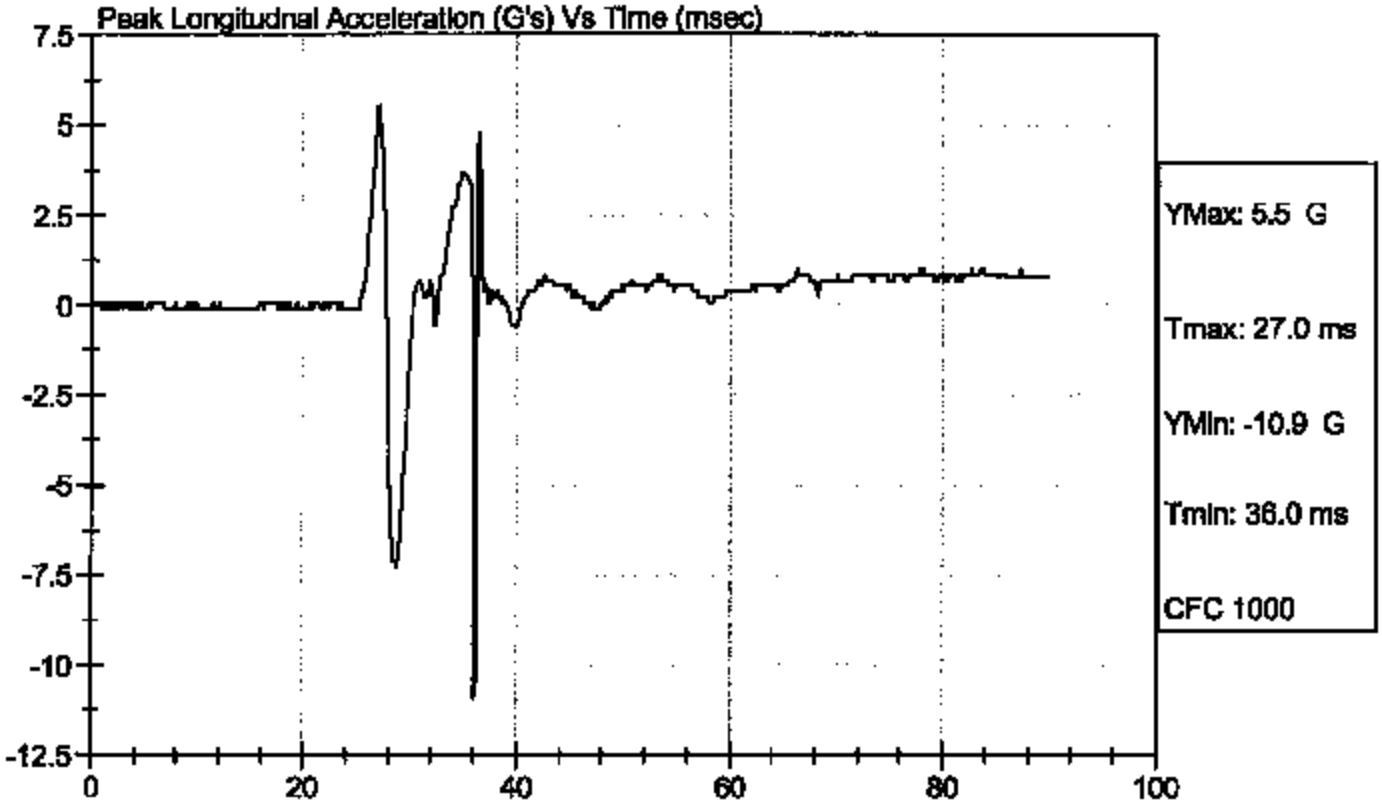
Laboratory Technician

05/10/2005
Test Date

Approved By

	Test Description: Head Drop	Test Date: 05/10/2005
	Component: D051261	Speed: 0 ft/s, 0.00 m/s





SID Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 036 **Test I.D:** D051262

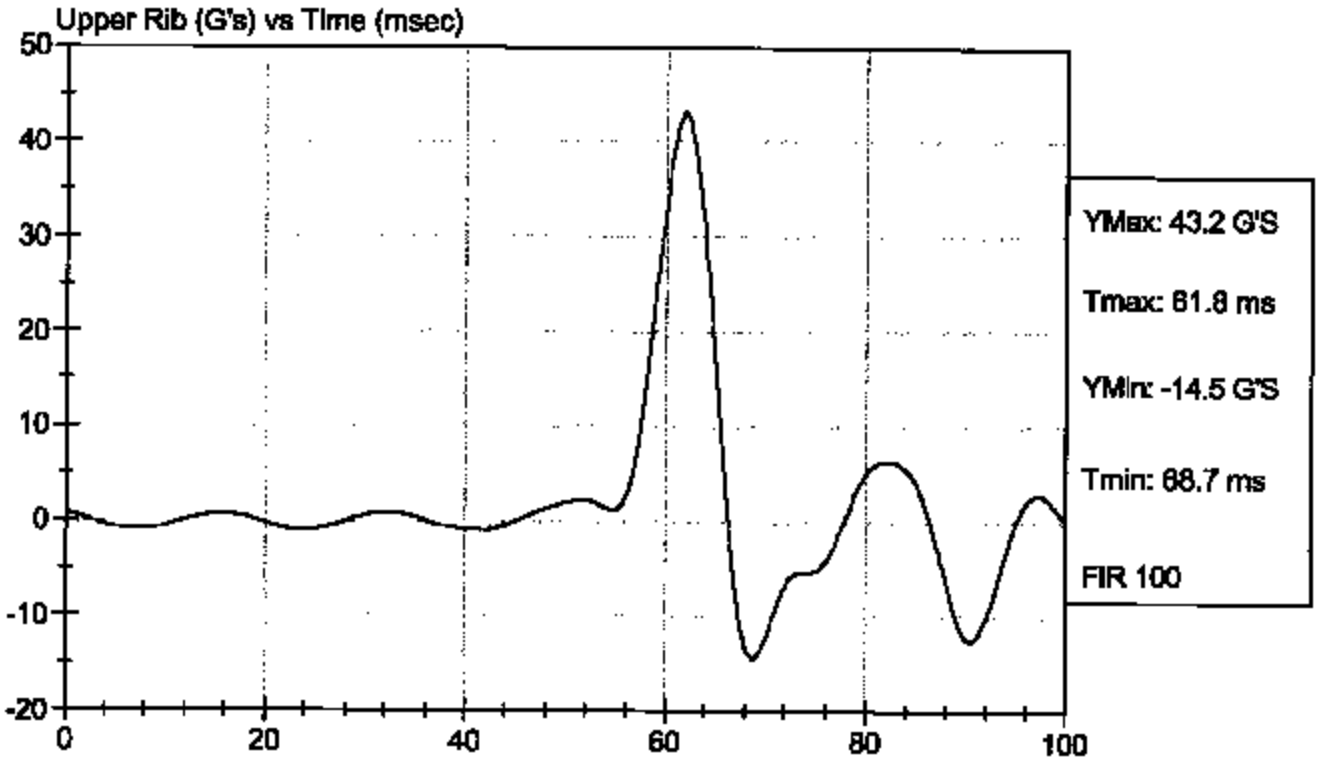
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Upper Rib	G's	37 - 46	43	Pass
Lower Rib	G's	37 - 46	41	Pass
Lower Spine	G's	15 - 22	17	Pass
		Overall Test Results		Pass

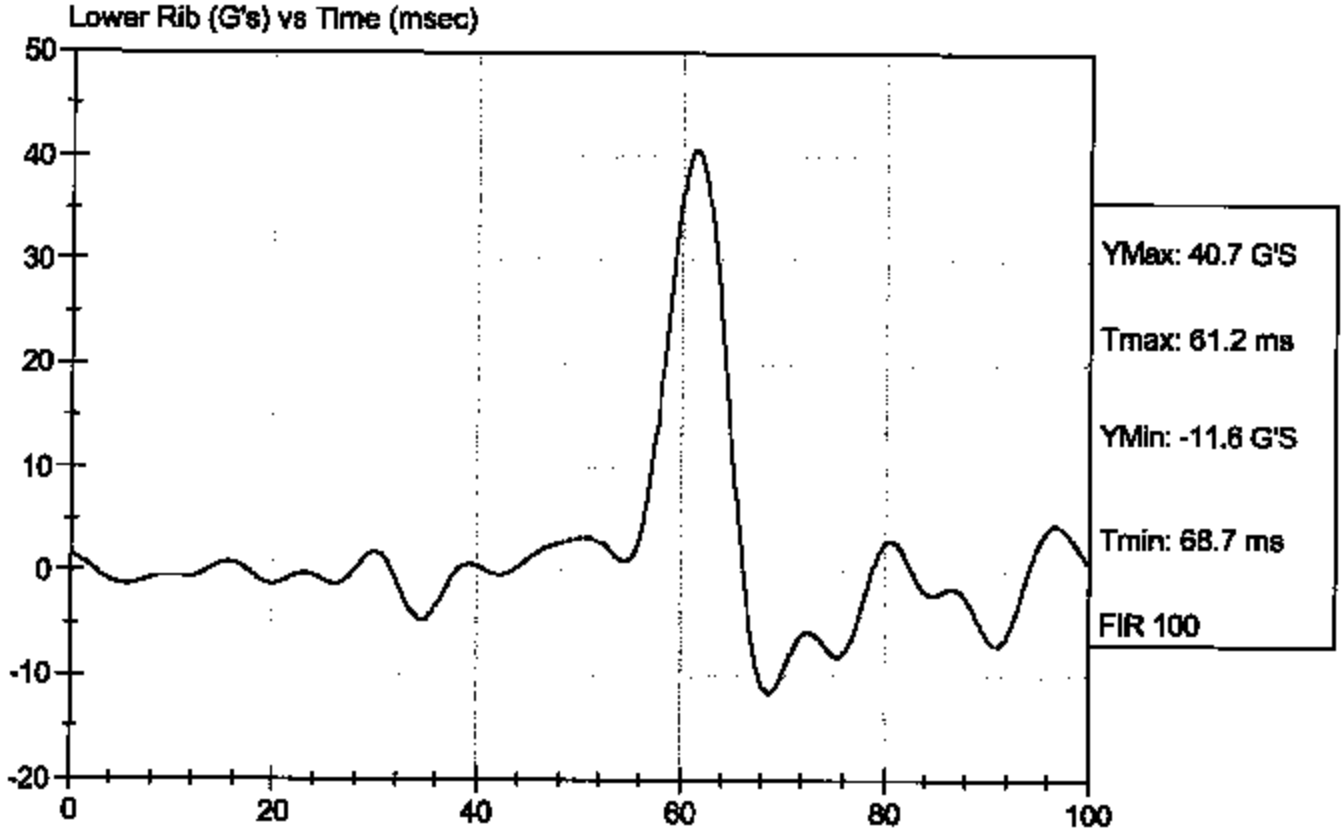
Laboratory Technician

05/11/2005
Test Date

Approved By

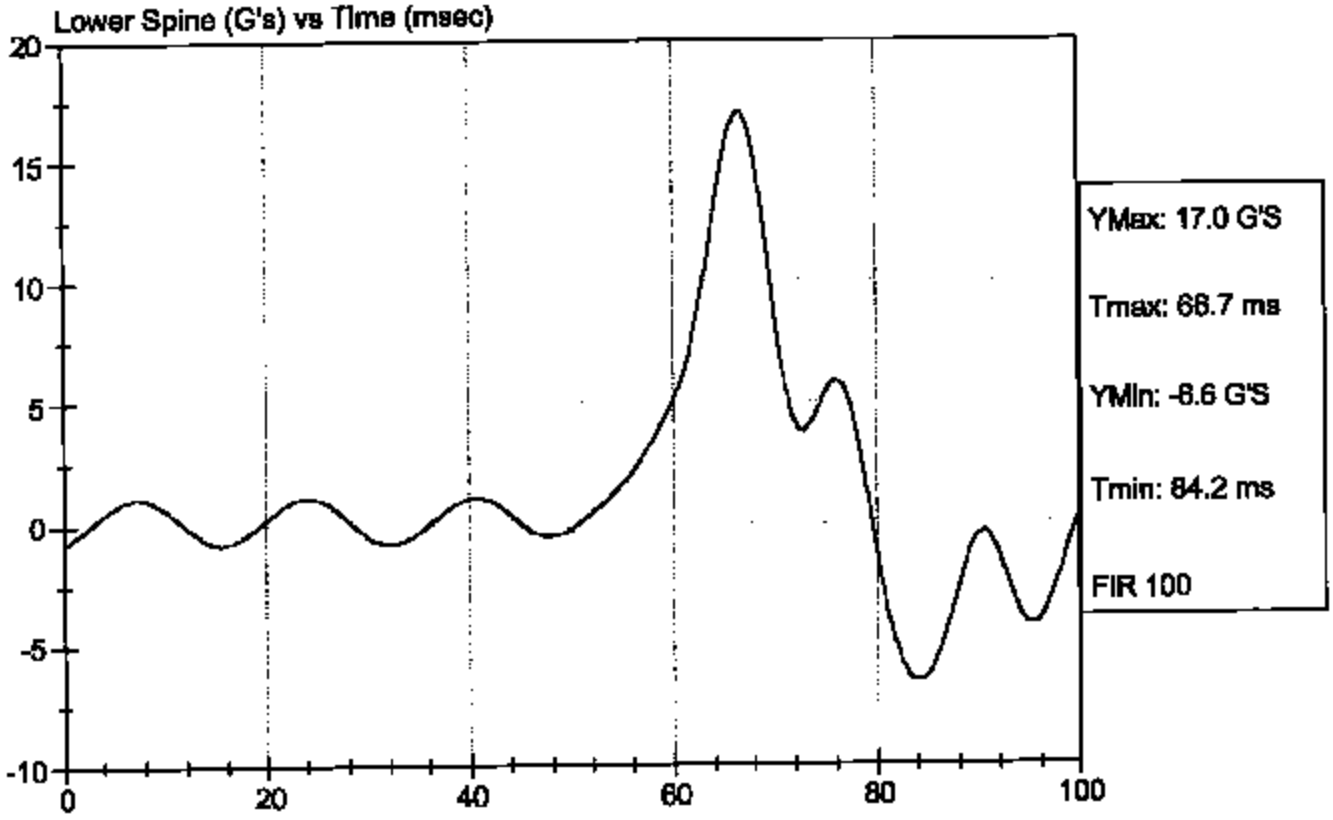
	Test Desc: Thorax Impact Component ID: D051262	Test Date: 05/11/2005 Speed: 14.08 ft/sec, 4.29 m/sec





Test Desc: Thorax Impact
Component ID: D051262

Test Date: 05/11/2005
Speed: 14.08 ft/sec, 4.29 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 036 **Test I.D:** D051263

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/s	4.27 - 4.33	4.31	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
		Overall Test Results		Pass

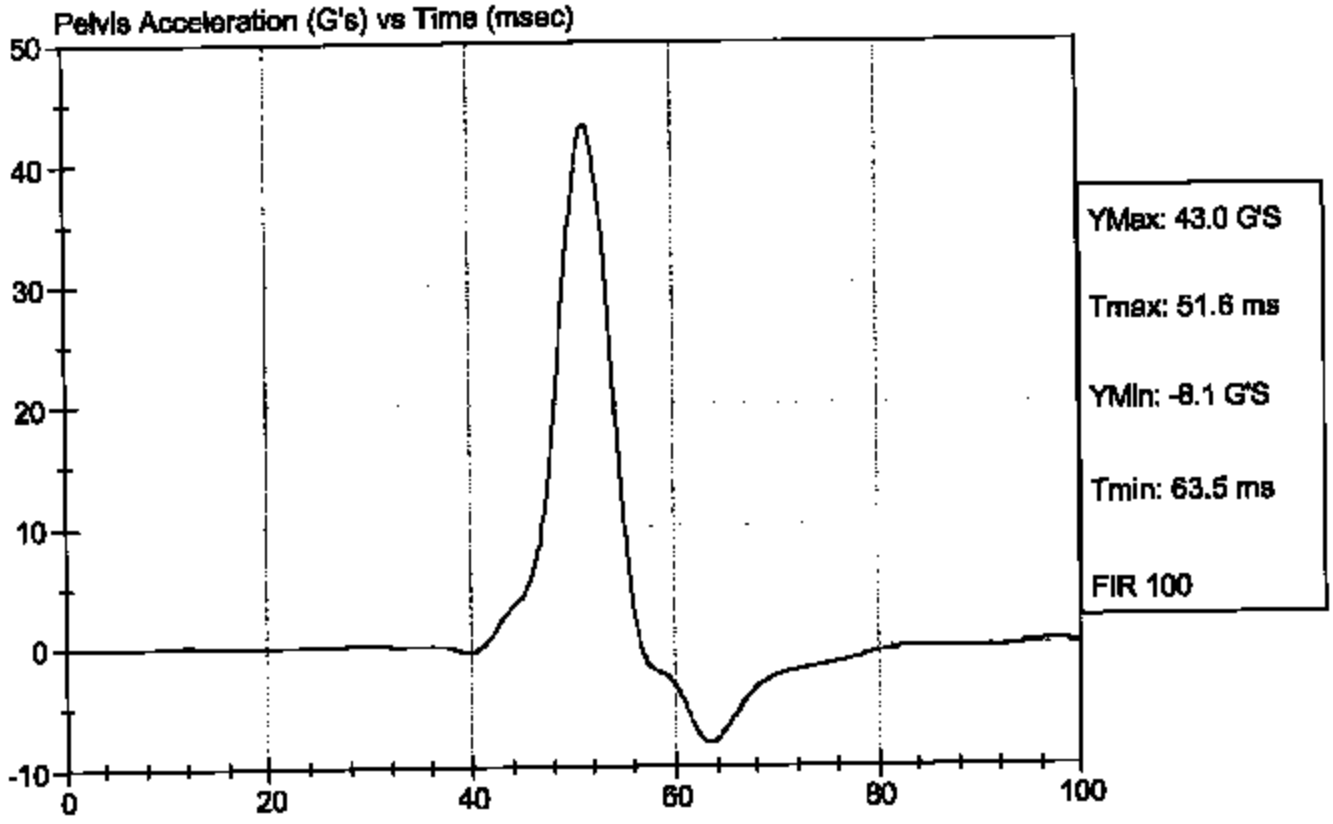
Laboratory Technician

05/11/2005
Test Date

Approved By

Test Desc: Pelvis Impact
Component ID: D051263

Test Date: 05/11/2005
Speed: 14.14 ft/sec, 4.31 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 036 **Test I.D:** D051264

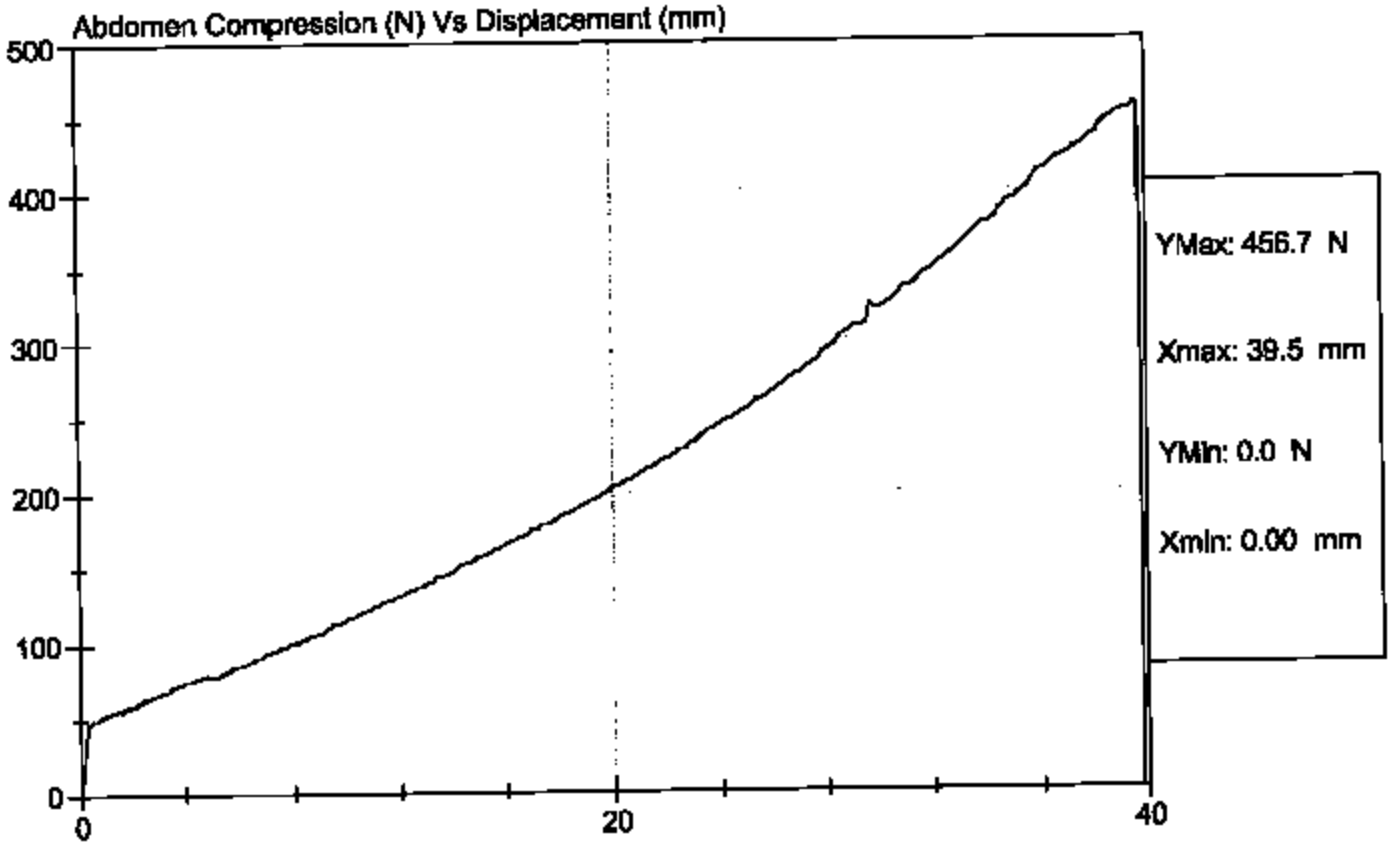
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Force At 12.7 mm	N	104 -162	138	Pass
Force At 19 mm	N	163 - 222	191	Pass
Force At 25.4 mm	N	222 - 280	281	Pass
Force At 33 mm	N	325 - 391	361	Pass
		Overall Test Results		Pass

Laboratory Technician

05/10/2005
Test Date

Approved By

Test Description: Abdomen Compression
Test Date: 05/10/2005
Component: D051264
Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 036 **Test I.D:** D051265

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	120.1	Pass
Force At 30 deg	N	151.2 - 204.6	165.8	Pass
Force At 40 deg	N	204.6 - 258.0	237.0	Pass
Return Angle	Deg	12 Maximum	4	Pass
		Overall Test Results		Pass

Laboratory Technician

05/10/2005
Test Date

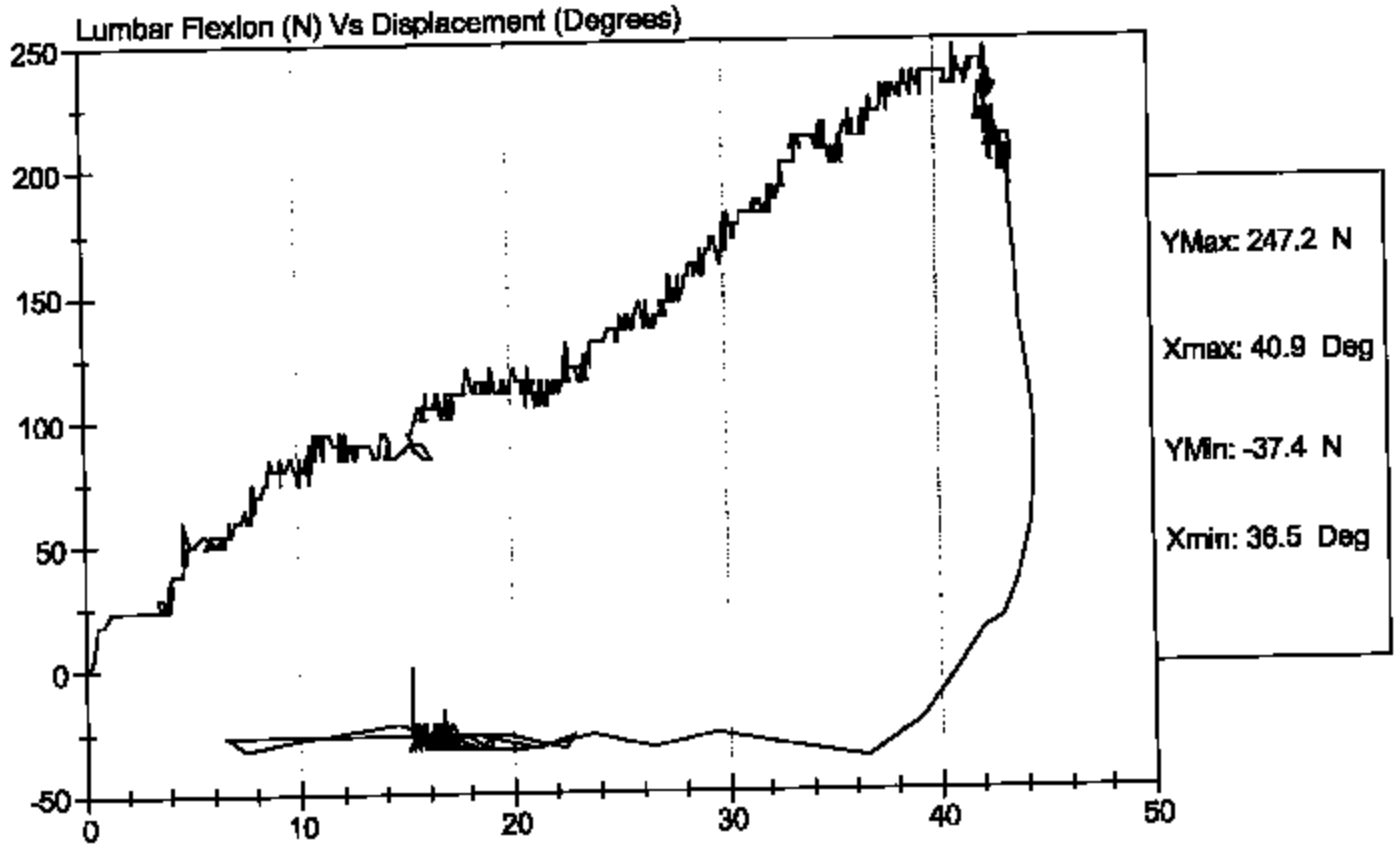
Approved By

Test Description: Lumbar Flexion

Test Date: 05/10/2005

Component: D051265

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy (SID)

Neck Pendulum Test

ATD Serial No: 036 **Test I.D:** D051269

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.40	Pass
	20 msec	m/s	4.12 to 5.10	4.79	Pass
	30 msec	m/s	5.73 to 7.01	6.59	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.05	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	73	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	78	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	54	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	12	Pass

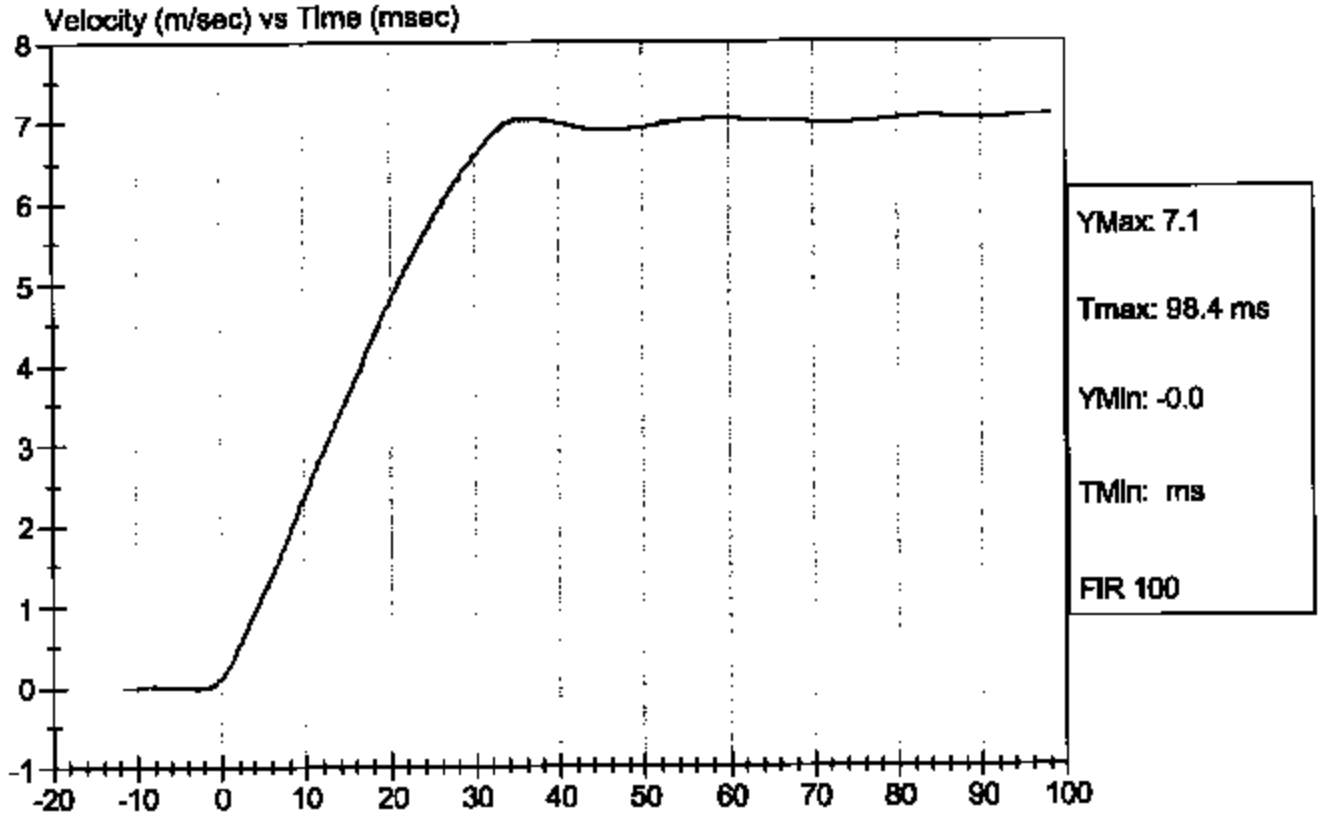
Laboratory Technician

05/10/2005
Test Date

Approved By

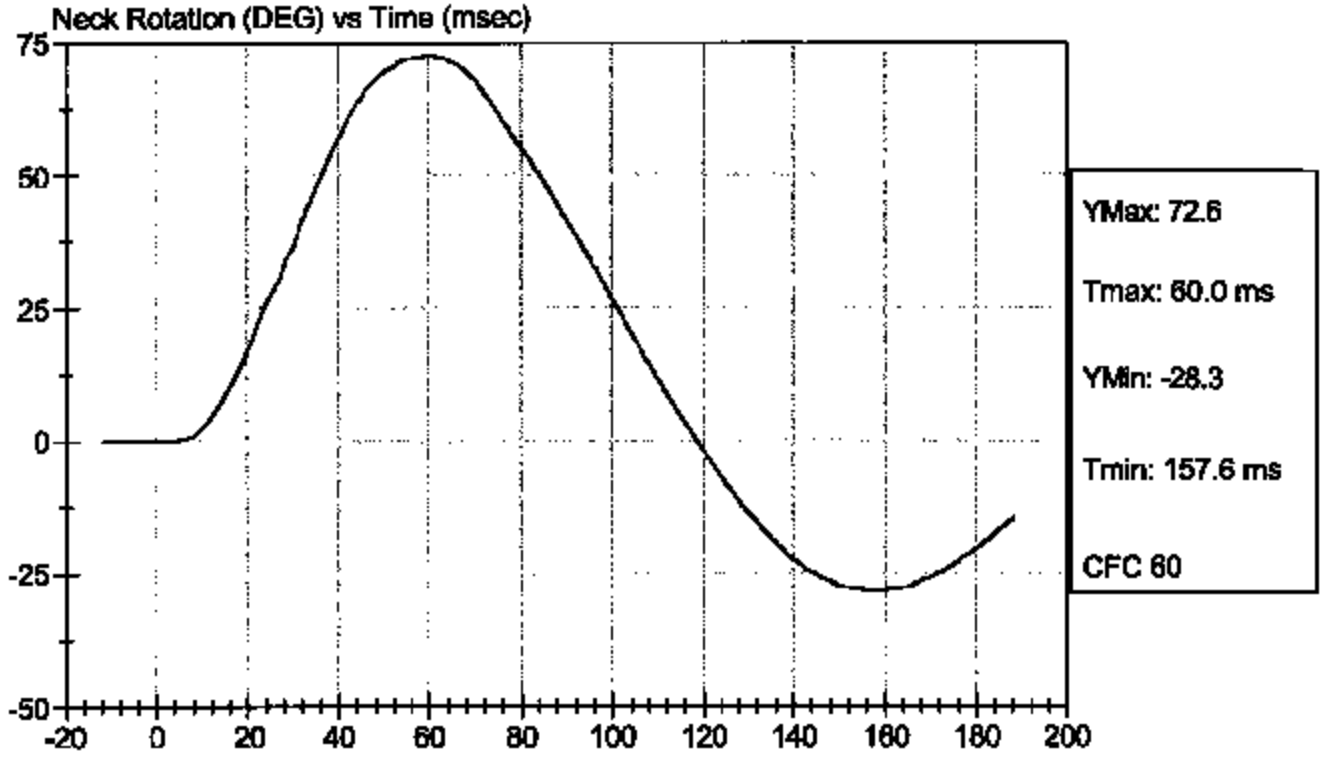
Test Desc: Neck Bending
Component ID: D051269

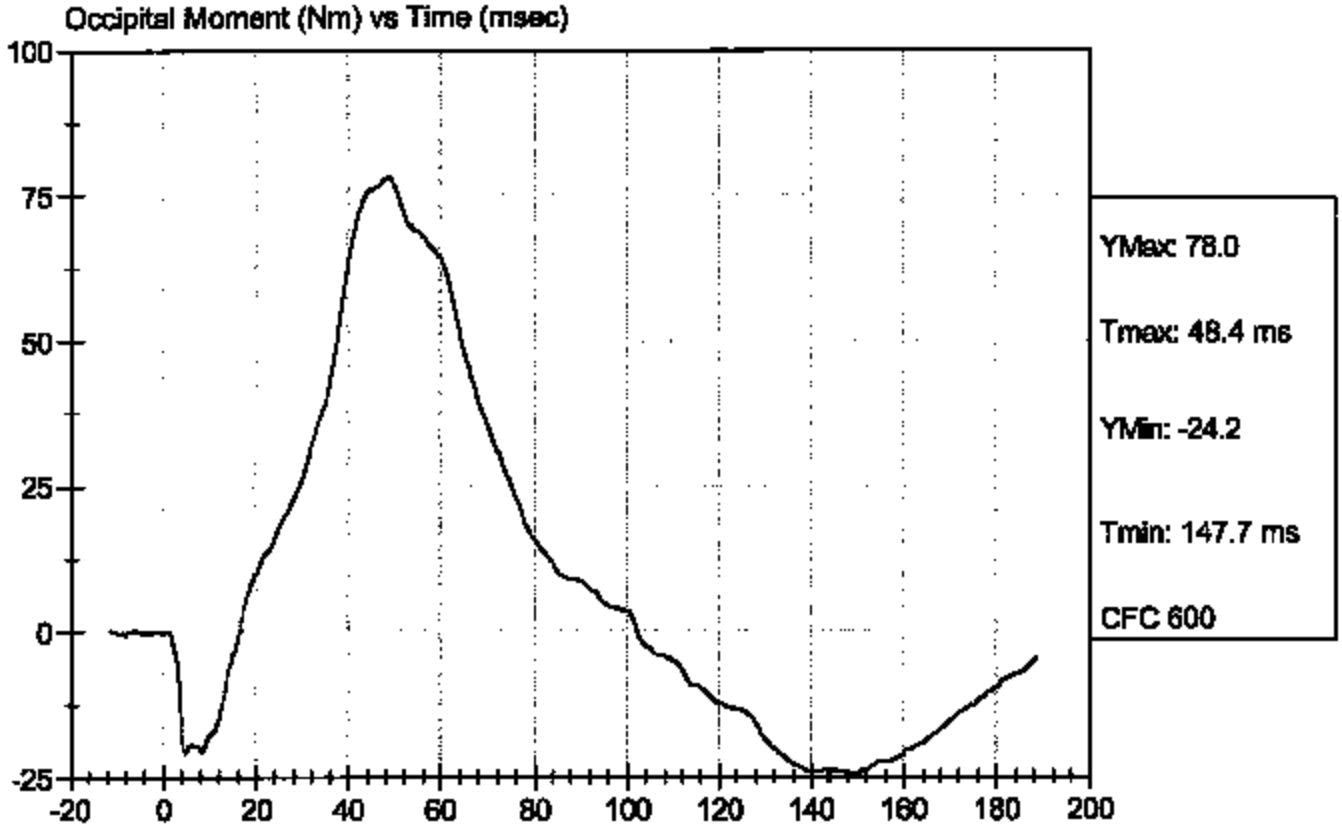
Test Date: 05/10/2005
Speed: 23.22 ft/sec, 7.08 m/sec



Test Desc: Neck Bending
Component ID: D051269

Test Date: 05/10/2005
Speed: 23.22 ft/sec, 7.08 m/sec





Calibration Test Results Summary

Dummy Serial Number: 036

Post-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet

Side Impact Dummy

Head Drop Calibration (Lateral)

ATD Serial No: 036 **Test I.D:** D051411

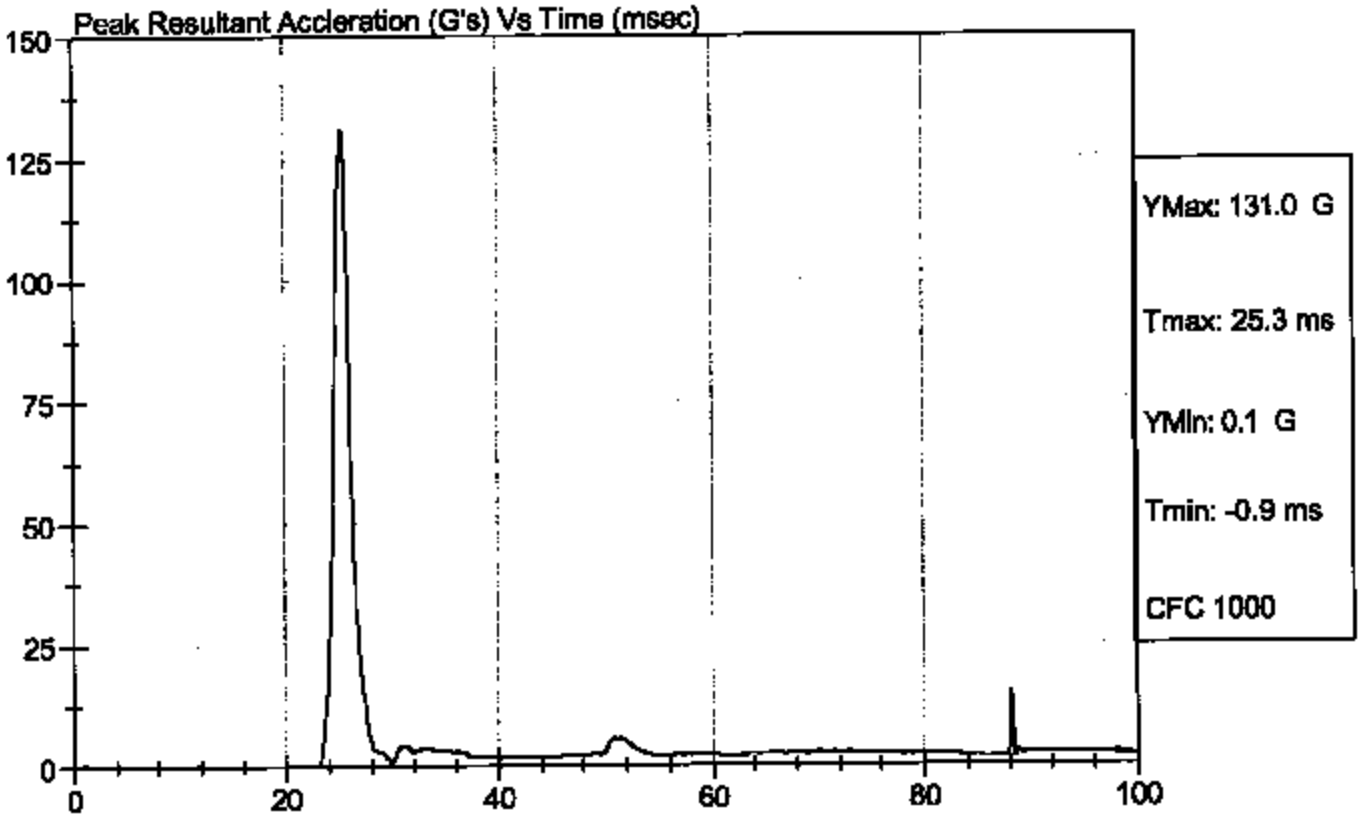
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	120 to 150	131	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-7	Pass
		Overall Test Results		Pass

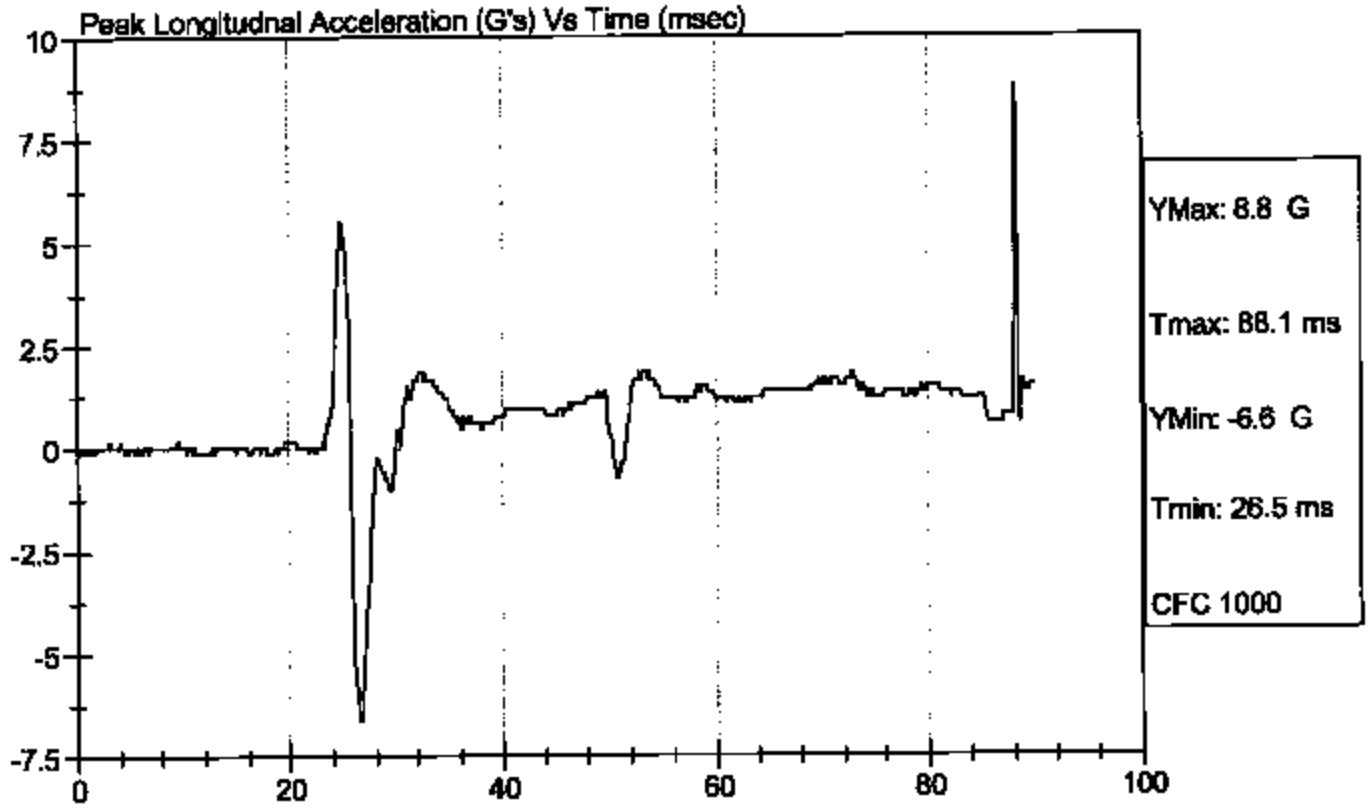
Laboratory Technician

05/23/2005
Test Date

Approved By

	Test Description: Head Drop	Test Date: 05/23/2005
	Component: D051411	Speed: 0 ft/s, 0.00 m/s





SID Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

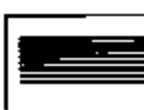
ATD Serial No: 036 **Test I.D:** D051412

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.27 - 4.33	4.27	Pass
Upper Rib	G's	37 - 46	40	Pass
Lower Rib	G's	37 - 46	39	Pass
Lower Spine	G's	15 - 22	17	Pass
		Overall Test Results		Pass

Laboratory Technician

05/24/2005
Test Date

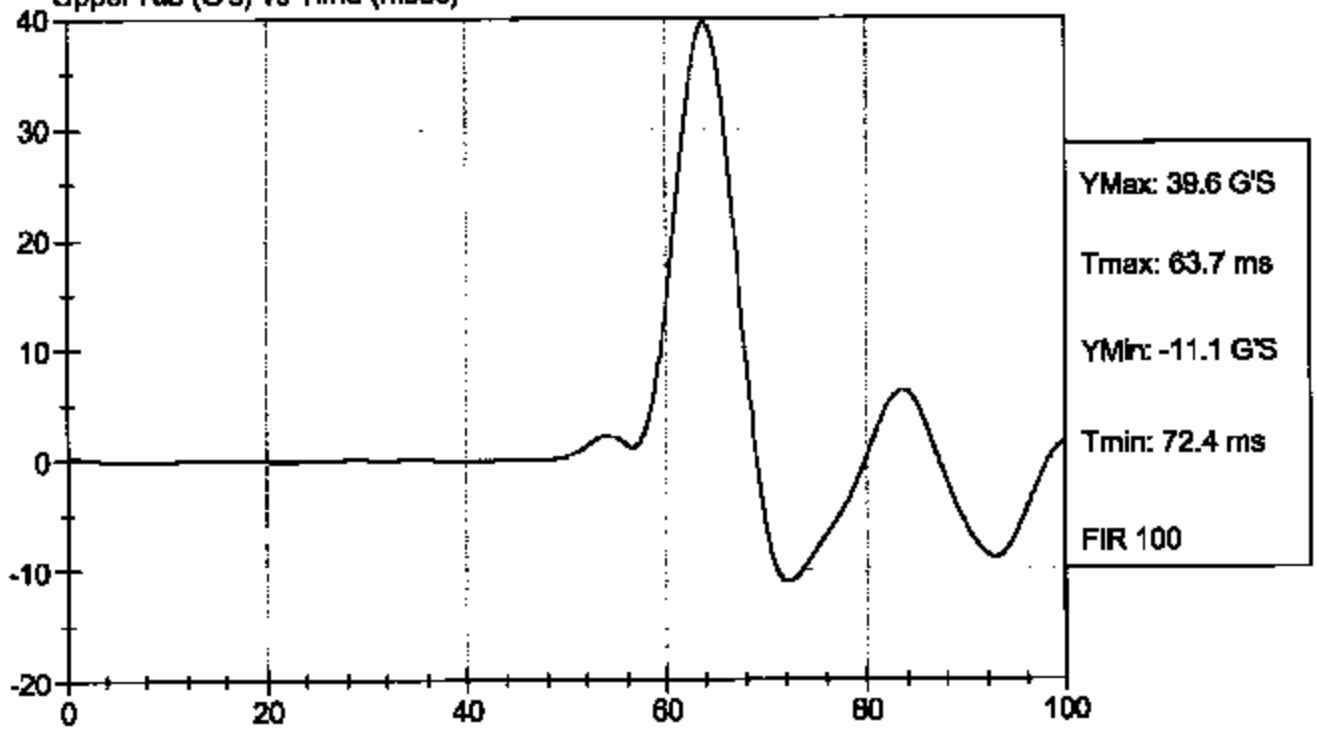
Approved By



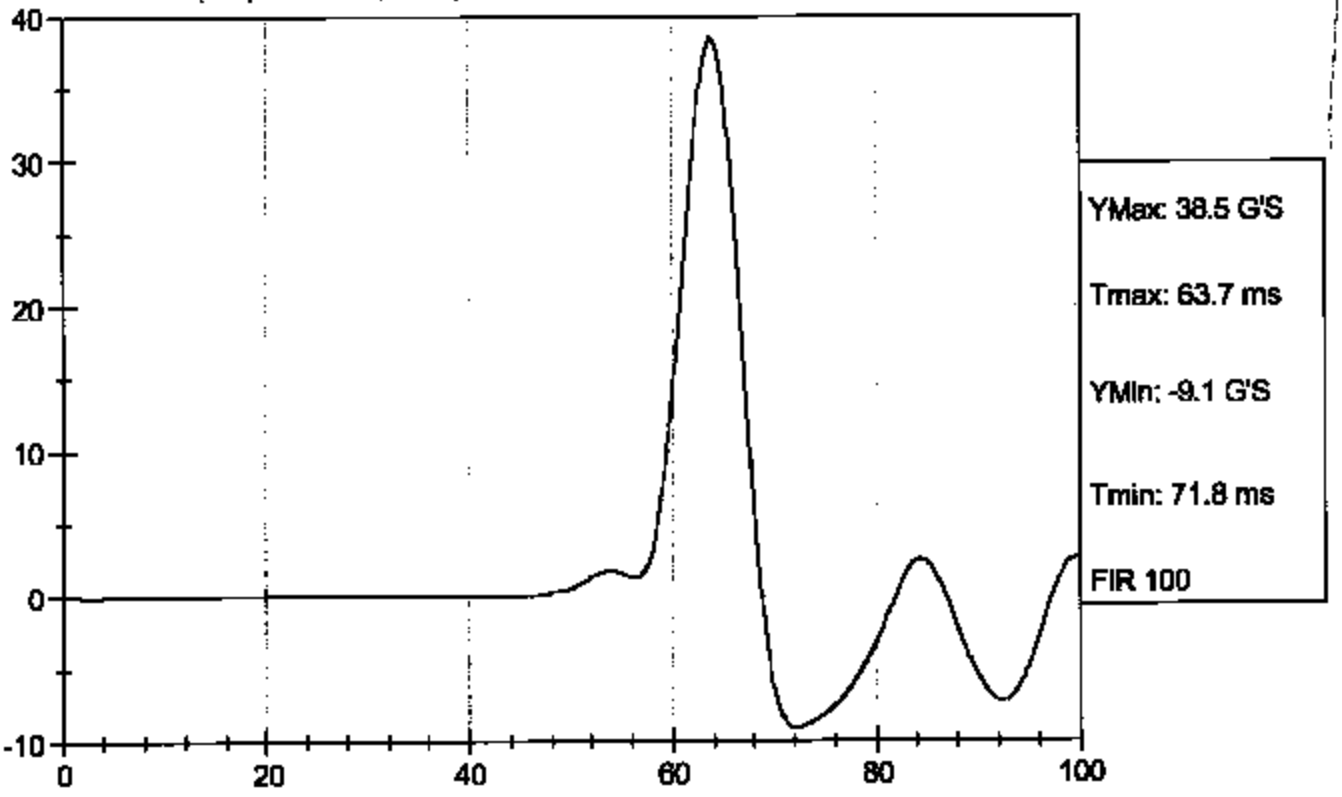
Test Desc: Thorax Impact
Component ID:D051412

Test Date: 05/24/2005
Speed: 14.0 ft/sec, 4.27 m/sec

Upper Rib (G's) vs Time (msec)

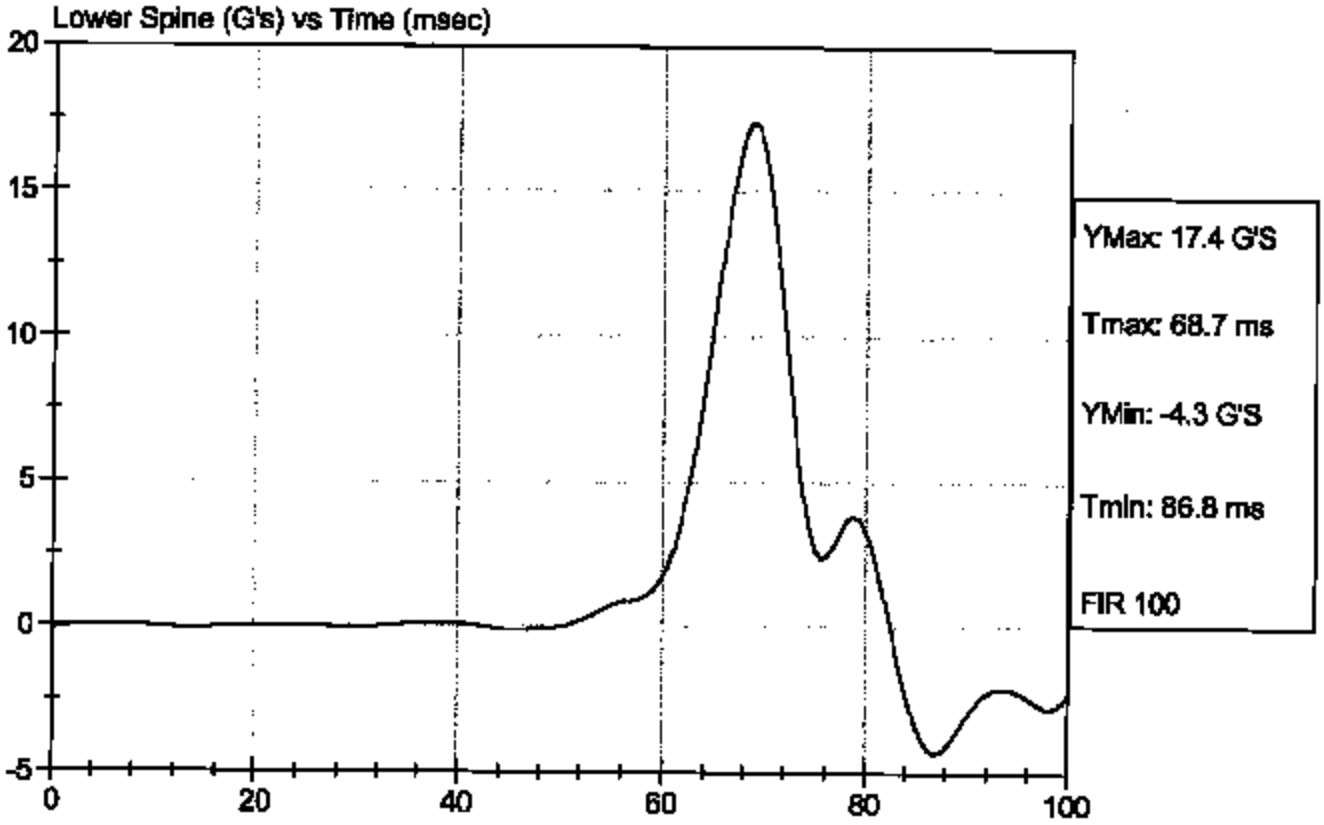


Lower Rib (G's) vs Time (msec)



Test Desc: Thorax Impact
Component ID: D051412

Test Date: 05/24/2005
Speed: 14.0 ft/sec, 4.27 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 036 **Test I.D:** D051413

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	45	Pass
		Overall Test Results		Pass

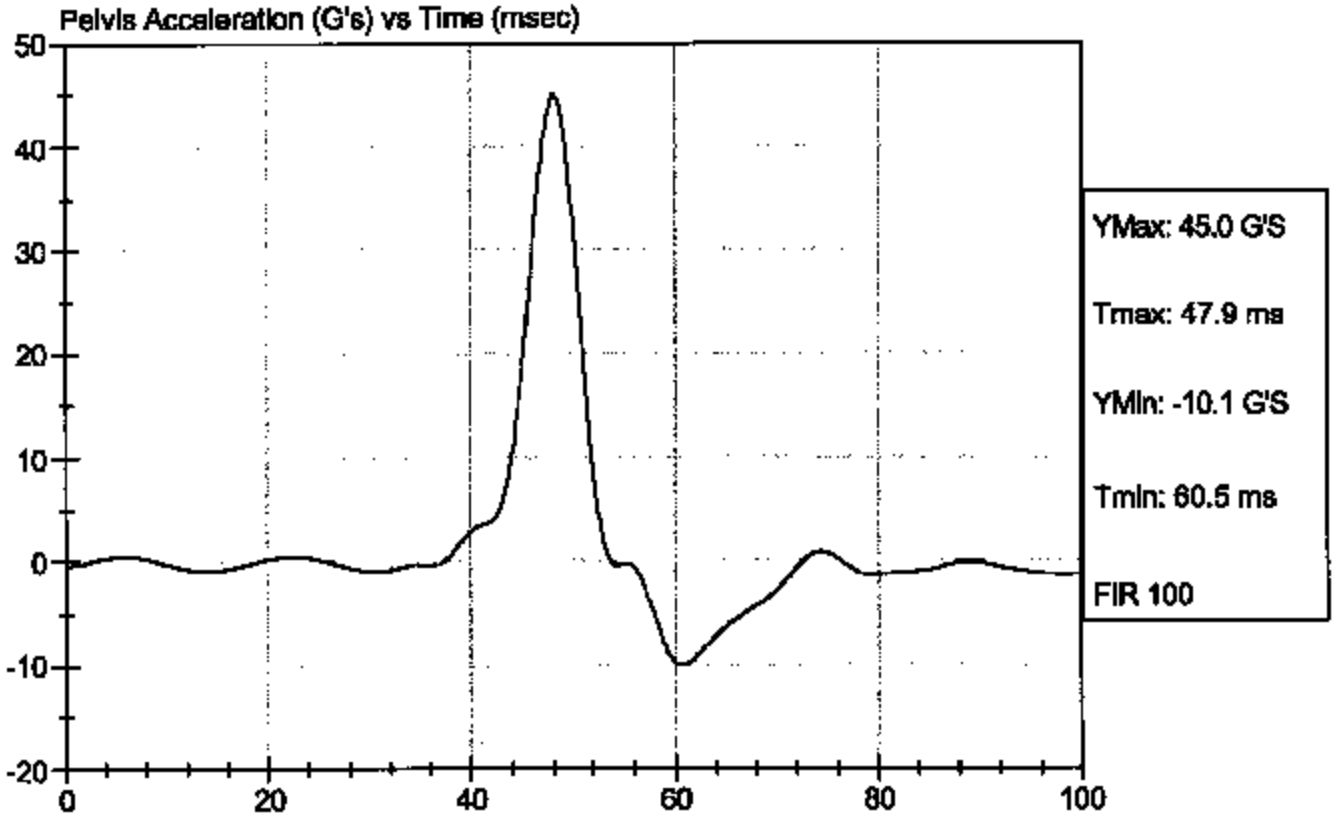
Laboratory Technician

05/24/2005
Test Date

Approved By

Test Desc: Pelvis Impact
Component ID: D051413

Test Date: 05/24/2005
Speed: 14.11 ft/sec, 4.30 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 036 **Test I.D:** D051414

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Force At 12.7 mm	N	104 -162	136	Pass
Force At 19 mm	N	163 - 222	183	Pass
Force At 25.4 mm	N	222 - 280	252	Pass
Force At 33 mm	N	325 - 391	361	Pass
		Overall Test Results		Pass

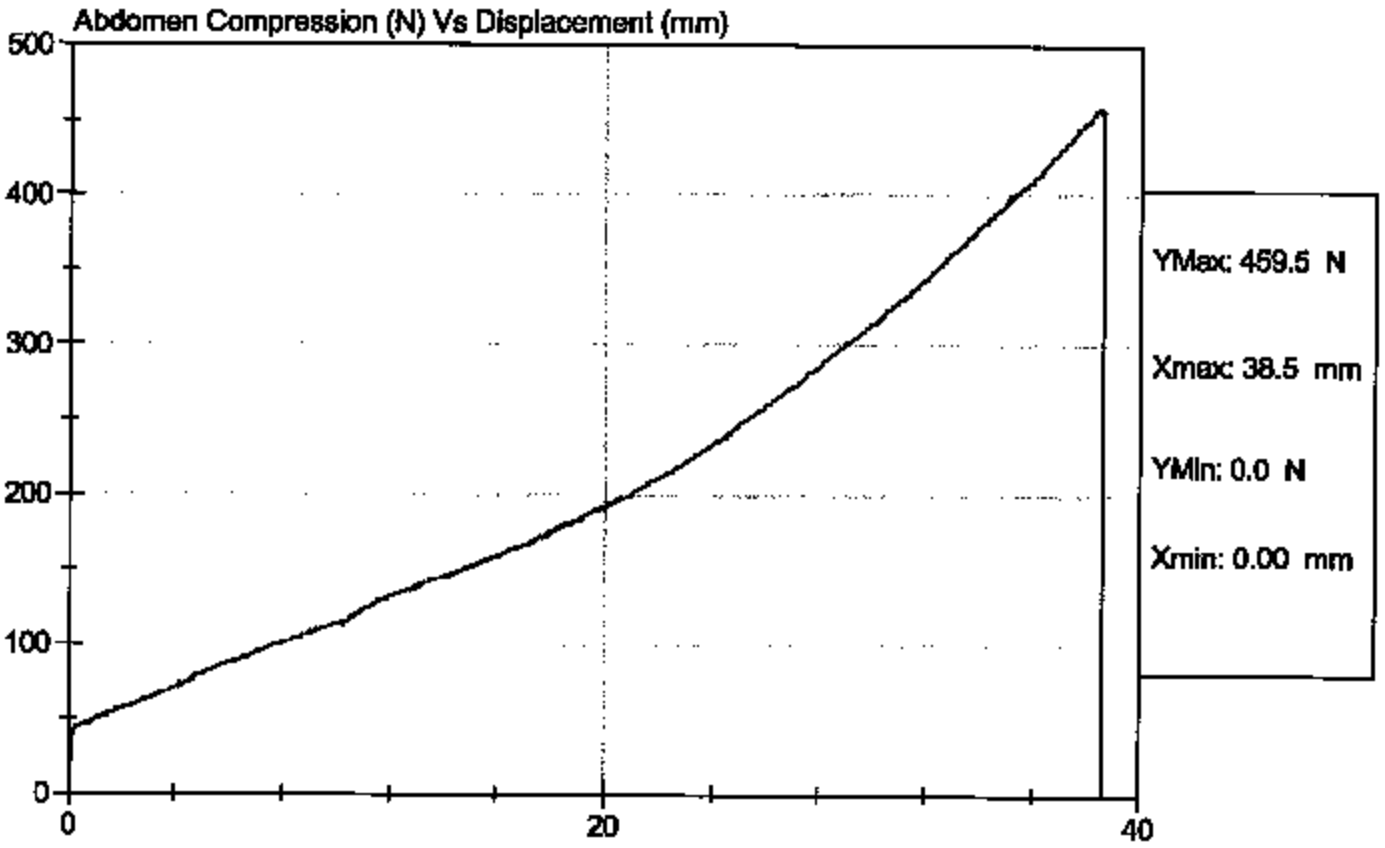
Laboratory Technician

05/23/2005
Test Date

Approved By

Test Description: Abdomen Compression Test Date: 05/23/2005

Component: D051414 Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 036 **Test I.D:** D051415

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	121.6	Pass
Force At 30 deg	N	151.2 - 204.6	177.5	Pass
Force At 40 deg	N	204.6 - 258.0	223.3	Pass
Return Angle	Deg	12 Maximum	4	Pass
		Overall Test Results		Pass

Laboratory Technician

05/23/2005
Test Date

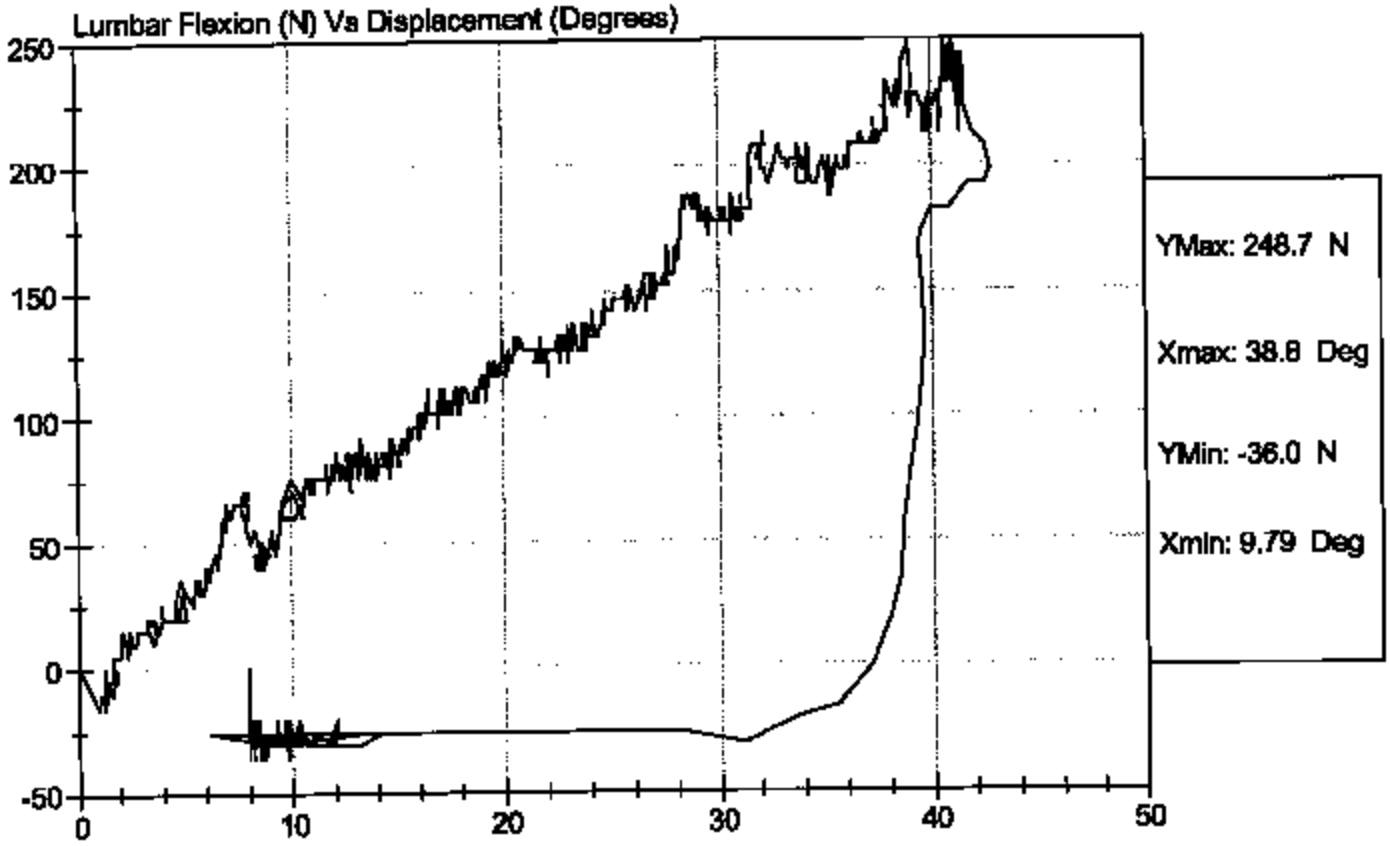
Approved By

Test Description: Lumbar Flexion

Test Date: 05/23/2005

Component: D051415

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy (SID)

Neck Pendulum Test

ATD Serial No: 036 **Test I.D:** D051419

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.7	Pass
Laboratory Relative Humidity		%	10 to 70	37	Pass
Impact Velocity		m/s	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.33	Pass
	20 msec	m/s	4.12 to 5.10	4.63	Pass
	30 msec	m/s	5.73 to 7.01	6.40	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.93	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	71	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	74	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	55	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	13	Pass

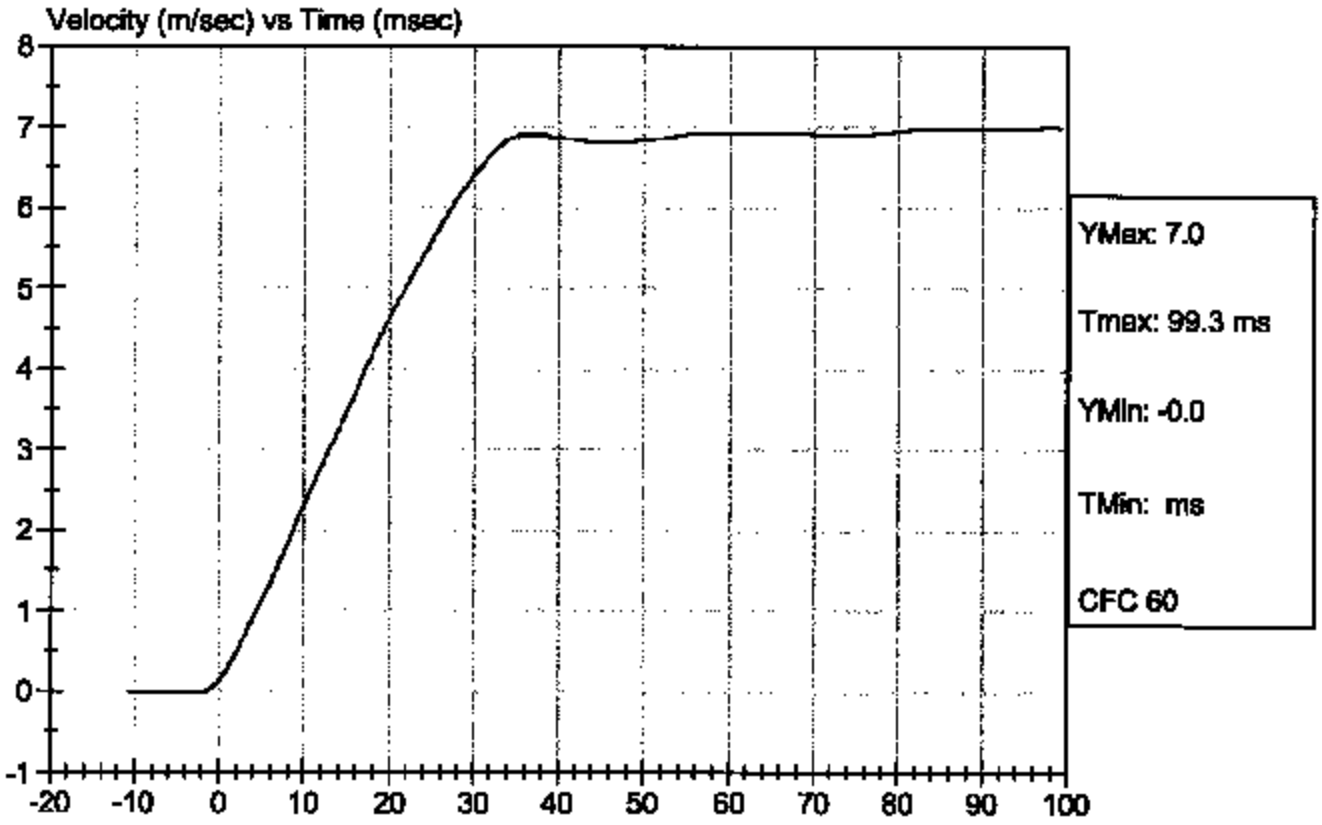
Laboratory Technician

05/23/2005
Test Date

Approved By

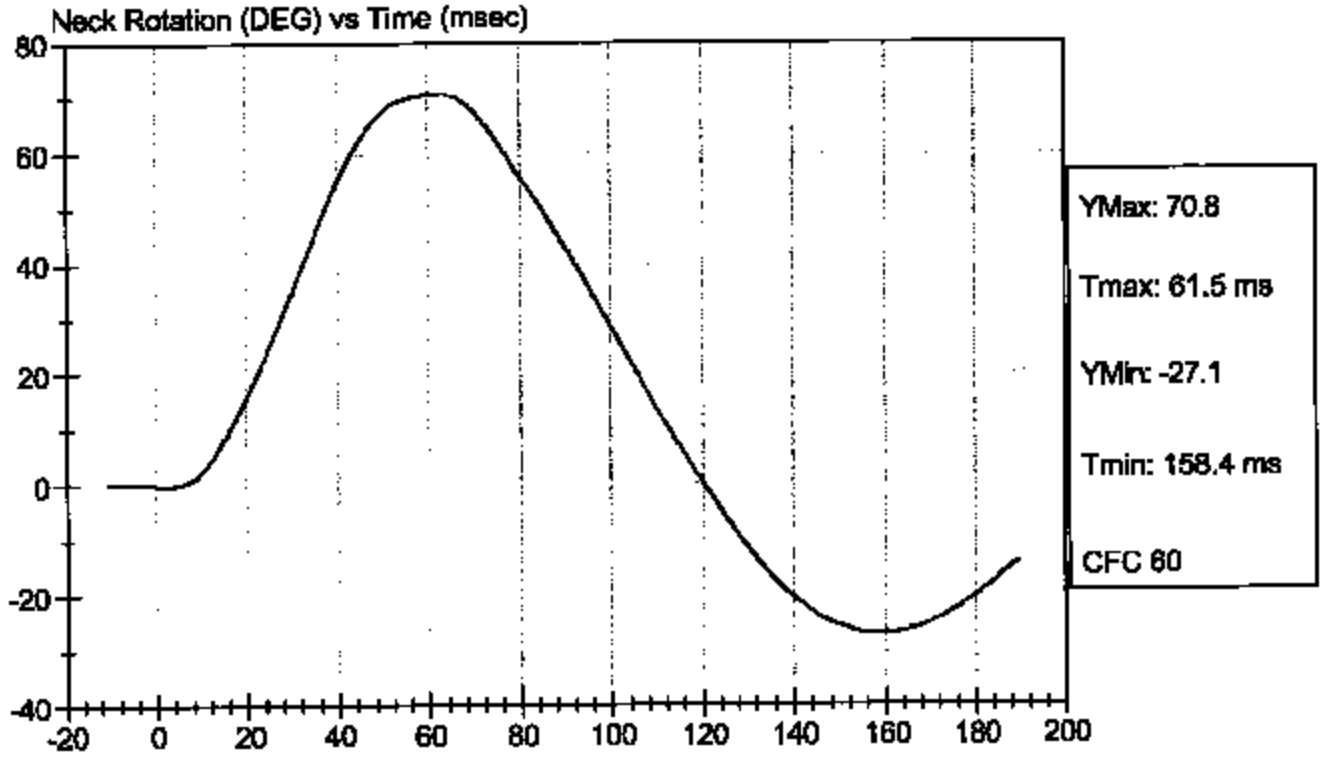
Test Desc: Neck Bending
Component ID: D051419

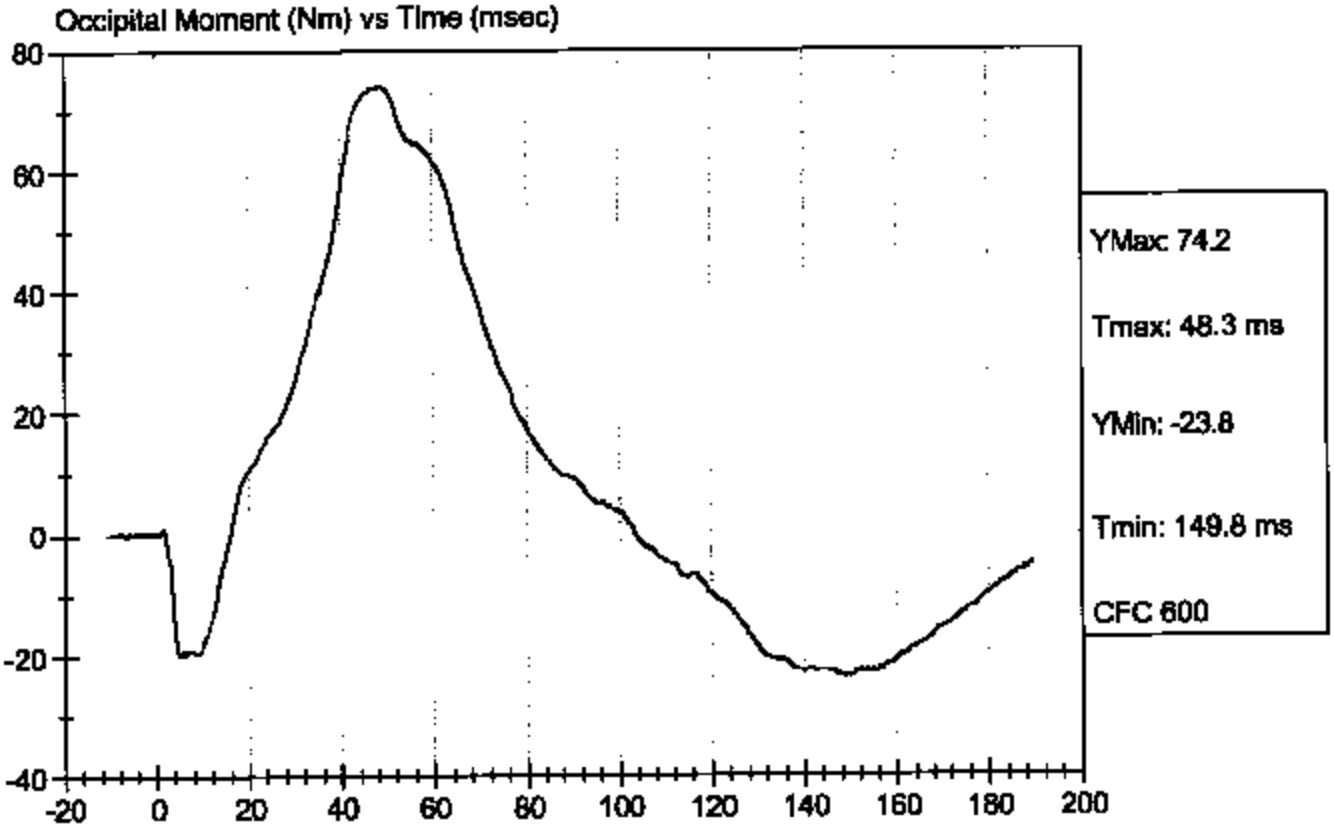
Test Date: 05/23/2005
Speed: 23.24 ft/sec, 7.08 m/sec



Test Desc: Neck Bending
Component ID: D051419

Test Date: 05/23/2005
Speed: 23.24 ft/sec, 7.08 m/sec





SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 036

Test Part	Items Checked	Result
Skin	Visual Inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass

Laboratory Technician

05/24/2005
Test Date

Approved By

APPENDIX D

CALIBRATION INFORMATION DATA

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR DRIVER S/N 036		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head CG X	AGH11	Endevco	03/16/05
Head CG Y	AH5N9	Endevco	03/16/05
Head CG Z	AGH51	Endevco	03/16/05
Neck Load Cell	376	Denton	04/11/05
Upper Rib Y	J12465	Endevco	04/12/05
Lower Rib Y	P10148	Endevco	04/12/05
Lower Spine Y	P26999	Endevco	04/12/05
Pelvis Y	B05-J04	Entran	04/12/05
Upper Rib Redundant Y	AGAY0	Endevco	04/12/05
Lower Rib Redundant Y	A27-Z02	Entran	04/12/05
Lower Spine Redundant Y	A27-Z17	Entran	04/12/05
Pelvis Redundant Y	G16-Z11	Entran	04/27/05

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Vehicle CG X	K07-R24	Entran	12/02/04
Vehicle CG Y	K18-D13	Entran	12/02/04
Vehicle CG Z	K20-J06	Entran	12/02/04
Left Floor Y	K20-J09	Entran	03/09/05
Left A-Post @ Sill Y	A09-N37	Entran	03/24/05
Left Lower A-Post Y	C06-L02	Entran	03/24/05
Left Mid A-Post Y	C04-L06	Entran	03/24/05
Left B-Post @ Sill Y	G10-F04	Entran	03/09/05
Left Lower B-Post Y	K07-R06	Entran	12/02/04
Left Mid B-Post Y	J25-R14	Entran	12/01/04
Driver Seat Track Y	J26-H03	Entran	01/21/05
LF Door Accel. #1 Y	C06-L20	Entran	03/24/05
LF Door Accel. #2 Y	C06-L01	Entran	03/24/05
LF Door Accel. #3 Y	C06-L04	Entran	03/24/05
Upper Engine X	B26-Z02	Entran	03/17/05
Upper Engine Y	B26-Z12	Entran	03/17/05
Firewall Y	B26-Z10	Entran	03/17/04
Right Floor Sill Y	C10-Z04	Entran	04/22/05
Rear Deck X	K03-J10	Entran	01/21/05
Rear Deck Y	B16-Z21	Entran	03/03/05