REPORT NUMBER: 201-MGA-2005-004

SAFETY COMPLIANCE TESTING FOR FMVSS 201
RIGID POLE SIDE IMPACT TEST

GENERAL MOTORS CORPORATION
2005 CHEVROLET EQUINOX
NHTSA NUMBER: C50101

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

July 6, 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.

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

FINAL REPORT ACCEPTED BY:

COTR, Side Impact

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Technical Report Documentation Page

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15. Supplementary Notes

16. Abstract

A rigid pole side impact test was conducted on a 2005 Chevrolet Equinox 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 July 6, 2005.

The impact velocity of the vehicle was 28.3 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 419 mm at level 2. The test vehicle's occupant performance is as follows:

	REQUIREMENT	DRIVER
HIC	≤ 1000	707.0

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.

17. Key Words Compliance Testing Rigid Pole Side Impact Test FMVSS 201		*18. Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, (NPO-230) 400 Seventh Street, S.W. Washington, D.C. 20590	
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TABLE OF CONTENTS

SECTION 1
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 2006 Chevrolet Equinox manufactured by General Motors Corporation.

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 2005 Chevrolet Equinox. The subject vehicle was towed into a rigid pole at a velocity of 28.3 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 1929.2 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on July 6, 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 419 mm at level 2, at the vertical impact line. The driver SID/HIII, Serial No. 037, was calibrated just prior to this test. The SID/HIII's injury criteria are summarized as follows:

Measurements	Units	Driver
HIC		707.0
TTI*	G's	70.9
Pelvis*	G's	43.0
Neck Force X*	N	-326
Neck Force Y*	N	607
Neck Force Z*	N	1067
Neck Moment X*	Nm	-85.2
Neck Moment Y*	Nm	-16.3
Neck Moment Z*	Nm	-11.1

* 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:

Left Floor Y after 20ms
Left A-Post @ Sill Y after 90ms
Left B-Post @ Sill Y after 40ms
Driver Seat Track Y after 65ms
Right Floor Y after 240ms

The following channels were not used in 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: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 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: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005

TEST VEHICLE INFORMATION

Make	Chevrolet
Model	Equinox
Body Style	SUV
NHTSA No.	C50101
VIN	2CND173F956070947
Color	Black
Delivery Date	6/27/05
Odometer Reading (mile)	188
Dealer	Unknown/Transfer
Transmission	Automatic
Final Drive	AWD
Number of Cylinders	6
Engine Displacement (L)	3.4
Engine Placement	Lateral

TEST VEHICLE OPTIONS

Front Airbag	Yes
Side Airbags	Yes, 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	Yes
Anti-lock Brakes	Yes
AM/FM/CD	Yes
Anti-theft System	Yes
Cruise Control	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors Corporation
Date of Manufacture	08/04

GVWR (kg)	2300
GAWR Front (kg)	1150
GAWR Rear (kg)	1150

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	303	303
Cold Pressure (kPa)	210	210
Recommended Tire Size	P235/60R17	P235/60R17
Tire Size on Vehicle	P235/60R17	P235/60R17
Tire Manufacturer	Bridgestone	Bridgestone

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Buckets	Split Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				555
Cargo Wt. (RCLW) (kg)				215

DATA SHEET NO. 1... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Chevrolet Equinox NHTSA No. C50101
Test Program: FMVSS 201P Test Date: July 6, 2005

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	502.1	370.1		534.8	425.5	
Right	kg	471.7	376.0		518.5	450.4	
Ratio	%	56.6	43.4		54.6	45.4	
Totals	kg	973.8	746.1	1719.9	1053.3	875.9	1929.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1719.9
Weight of SID/HIII Side Impact Dummy	kg	80.7
Rated Cargo/Luggage Weight (RCLW)	kg	136.0
Calculated Vehicle Target Weight (TVTW)	kg	1936.6

TEST VEHICLE ATTITUDES

	Units	As Delivered	Fully Loaded	Ready For Test
Right Front	mm	815	810	811
Left Front	mm	817	818	809
Right Rear	mm	832	804	807
Left Rear	mm	829	803	818
Right Door Sill Angle	deg	0.3 ND	0.3 ND	0.3 ND
Left Door Sill Angle	deg	0.3 ND	0.1 ND	0.3 ND
Front Bumper Angle	deg	1.5 RD	1.8 RD	1.5 RD
Rear Bumper Angle	deg	0.3 LD	0.3 RD	0.3 LD

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

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2866
Total Vehicle Length at Left Side	mm	3795
Total Vehicle Length at Centerline	mm	4749
Total Vehicle Length at Right Side	mm	3797
Total Vehicle Width at B-Post	mm	1787
Weight of Ballast in Cargo Area	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	liters	59.8

DATA SHEET NO. 1... (Continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Chevrolet Equinox NHTSA No. C50101
Test Program: FMVSS 201P Test Date: July 6, 2005

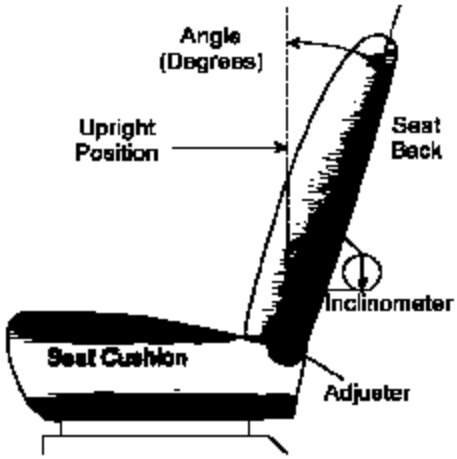
TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Target Impact Point Aft of Front Axle	mm	1404
Actual Impact Point Aft of Front Axle	mm	1410

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: The seat back is measured relative to the rocker sill.

Driver seat back angle: Initial – 4.5 deg. on headrest post
Final –; 0.6 deg. on headrest post



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

Initial: the fore/aft was set to the middle position for the driver's seat. (120mm of 240mm)
Final: the fore/aft was set 34mm forward from the middle position (154mm of 240mm).

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 mid position of the available positions.

DATA SHEET NO. 1... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Chevrolet Equinox NHTSA No. C50101
Test Program: FMVSS 201P Test Date: July 6, 2005

FUEL TANK CAPACITY DATA

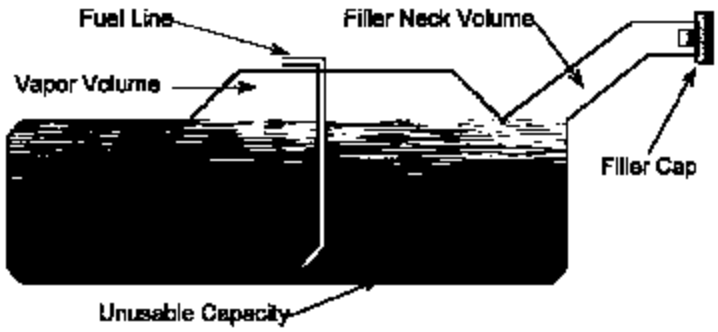
The "Usable Capacity" of the standard equipment fuel tank is: 53.6 liters

The "Usable Capacity" of any optional equipment fuel tank is: N/A liters

92-94% of "Usable Capacity" for certification to FMVSS 301 requirements: 58.5 – 59.8 liters

Actual amount of Stoddard solvent added to vehicle for certification test 59.8 liters

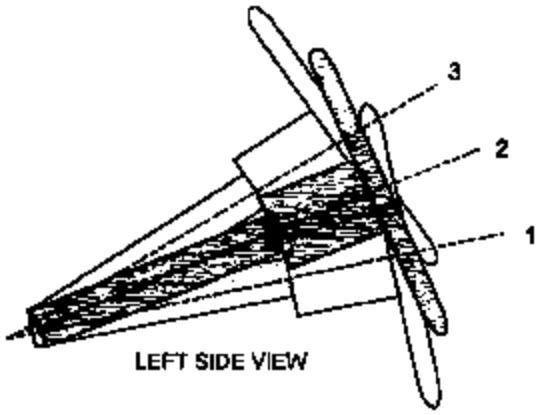
The fuel pump will initially operate to charge the fuel lines to the system's working pressure and cycle 'on and off' per system demand.



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. The vehicle is equipped with a 5 position tilt column. Test position is mid-position.



STEERING COLUMN ASSEMBLY

The steering column was placed in the mid-position for the test.

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	502.1	370.1		534.8	425.5	
Right	kg	471.7	376.0		518.5	450.4	
Weight Ratio	%	56.6	43.4		54.6	45.4	
Totals	kg	973.8	746.1	1719.9	1053.3	875.9	1929.2

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	338	370
Level 2	Occupant H-Point	mm	419	650
Level 3	Mid Door	mm	413	725
Level 4	Window Sill	mm	362	1030
Level 5	Window Top	mm	200	1600
N/A	Maximum Penetration	mm	419	650

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	6 rearward

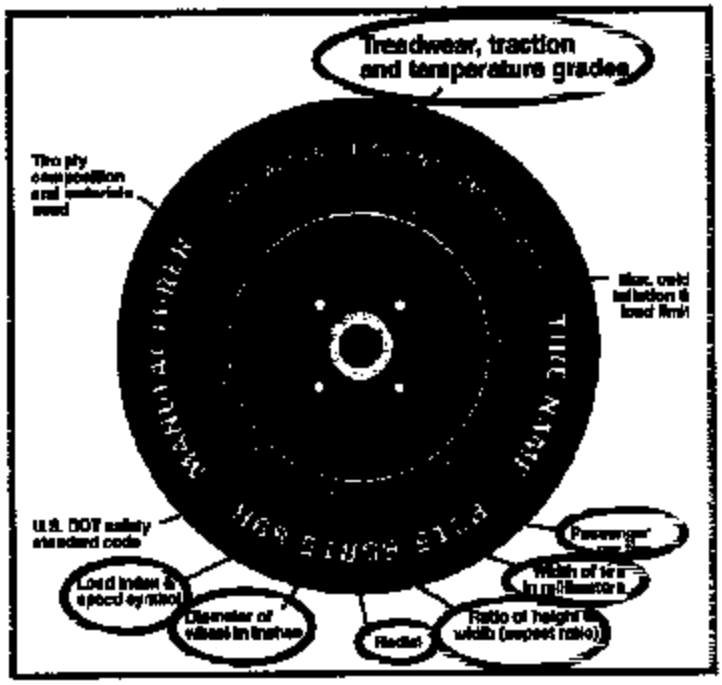
DATA SHEET NO. 3

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005

Vehicle Year	2005	Vehicle Make	Chevrolet
VIN	2CND173F956070947	Vehicle Model	Equinox



	Front	Rear
Tire Manufacturer	Bridgestone	Bridgestone
Tire Name	Dueler H/T	Dueler H/T
Tire Type	P	P
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	17	17
Load Index & Speed Symbol	100	100
Treadwear	360	360
Traction Grade	B	B
Temperature Grade	B	B

DATA SHEET NO. 4

POST TEST OBSERVATIONS

Test Vehicle: 2005 Chevrolet Equinox NHTSA No. C50101
Test Program: FMVSS 201P Test Date: July 6, 2005

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Left Front Seating Position
Dummy Type / Serial No.	SID/HIII / 037
Head Contact	Airbag curtain, Headliner, Headrest
Upper Torso Contact	Door Panel
Lower Torso Contact	Door Panel
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	N/A
Curtain	Yes

ARMREST LOCATION AND SEAT CRUSH

	Driver
Front Armrest (from bottom of window)	258
Front Seat Back Crush	122
Front Seat Cushion Crush	76

SECTION 4

OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5

SID/HIII INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005

THORAX AND PELVIS PEAK ACCELERATIONS (FIR 100 Filtered)

Location	Axis	Units	Driver			
			Max	Time	Min	Time
Upper Rib (LUR)	Y	G's	76.9	43	-5.1	100
Upper Rib (LUR) (R)	Y	G's	76.2	43	-5.5	100
Lower Rib (LLR)	Y	G's	72.8	44	-16.2	83
Lower Rib (LLR) (R)	Y	G's	72.0	44	-16.9	83
Lower Spine (T_{12})	Y	G's	64.9	45	-18.5	76
Lower Spine (T_{12}) (R)	Y	G's	64.1	45	-20.2	77
Pelvis (PEV)	Y	G's	43.0	46	-14.2	91
Pelvis (PEV) (R)	Y	G's	43.2	46	-14.7	91

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

Location	Driver			
	LUR	T_{12}	TTI(g)	PEV(g)
Rib, Spine, and Pelvis	76.9	64.9	70.9	43.0
Rib, Spine, and Pelvis (R)	76.2	64.1	70.2	43.2

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

Location	Axis	Units	Driver			
			Max	Time	Min	Time
Neck Force	X	N	78	266	-326	66
Neck Force	Y	N	607	57	-262	153
Neck Force	Z	N	1067	58	-48	239
Neck Moment	X	Nm	13.2	113	-85.2	53
Neck Moment	Y	Nm	13.3	103	-16.3	133
Neck Moment	Z	Nm	8.8	60	-11.1	101

HEAD CG PEAK ACCELERATIONS (SAE CLASS 1000 Filtered)

Location	Axis	Units	Driver			
			Max	Time	Min	Time
Head CG	X	G's	4.7	55	-7.2	66
Head CG	Y	G's	86.7	60	-5.7	44
Head CG	Z	G's	10.5	64	-14.1	46
Head CG Resultant		G's	86.8	61		

HEAD INJURY CRITERIA (SAE CLASS 1000 Filtered)

Location	Driver			
	HIC	T1	T2	Avg G's
Head CG Resultant	707	52.2	70.5	68.4

Positive Acceleration Polarities: (Conforms to SAE J211)

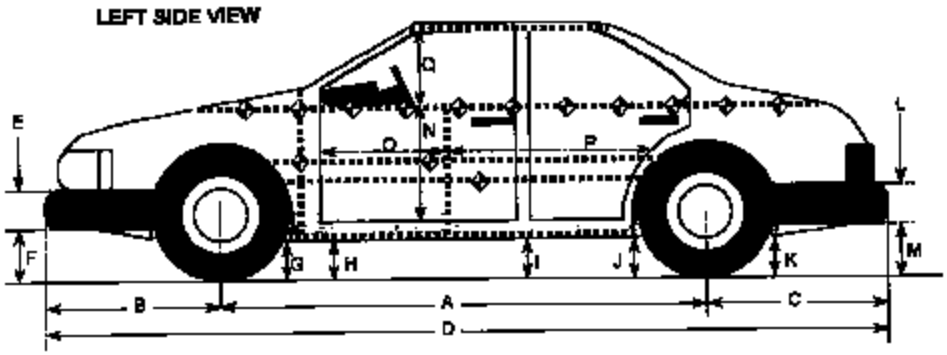
Longitudinal (X)	= + Forward	
Lateral (Y)	= + Right	
Vertical (Z)	= + Down	

DATA SHEET NO. 6

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005



All Measurements in mm

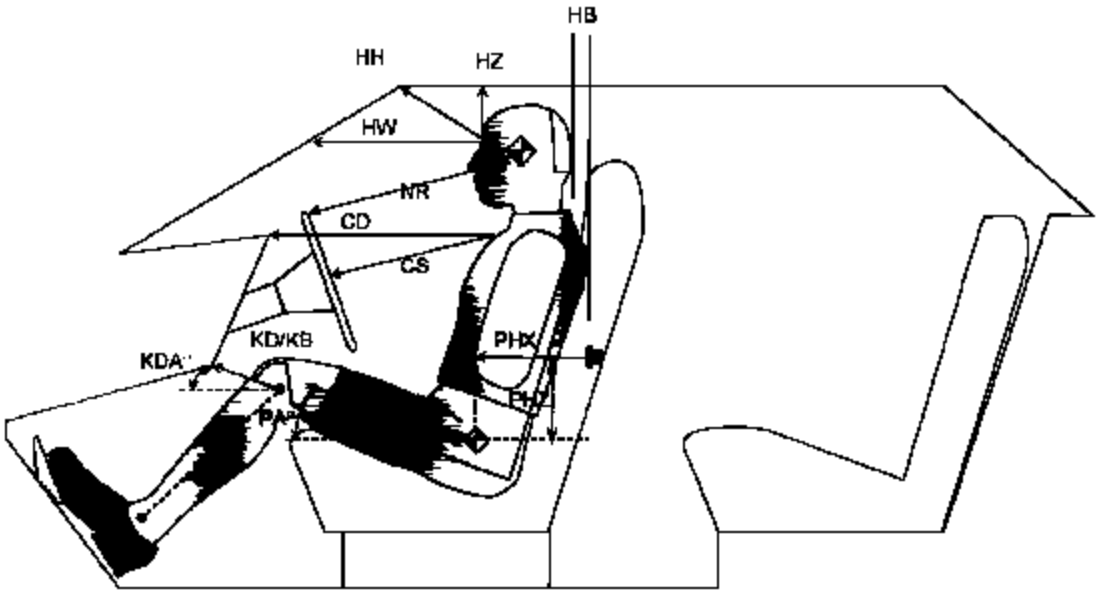
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2866	2763	103
B	Front Axle to FSOV	969	904	65
C	Rear Axle to RSOV	914	1012	-98
D	Total Length at Centerline	4749	4679	70
E	Front Bumper Thickness	185	185	0
F	Front Bumper Bottom to Ground	500	535	-35
G	Sill Height at Front Wheel Well	343	329	14
H	Sill Height at Front Door Leading Edge	346	334	12
I	Sill Height at "B" Pillar	350	320	30
J1	Sill Height at Rear Wheel Well	349	358	-9
J2	Pinch Weld Height at Rear Wheel Well	342	360	-18
K	Sill Height Aft of Rear Wheel Well	402	412	-10
L	Rear Bumper Thickness	228	228	0
M	Rear Bumper Bottom to Ground	429	424	5
N	Sill Height to Window Bottom Sill	756	737	19
O	Front Door Leading Edge to Impact CL	602	553	49
P	Rear Door Trailing Edge to Impact CL	1534	1315	219
Q	Front Window Opening	473	422	51
R	Right Side Length	3797	3810	-13
S	Left Side Length	3795	3668	127
T	Vehicle Width at "B" Post	1787	1472	315

DATA SHEET NO. 7

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005



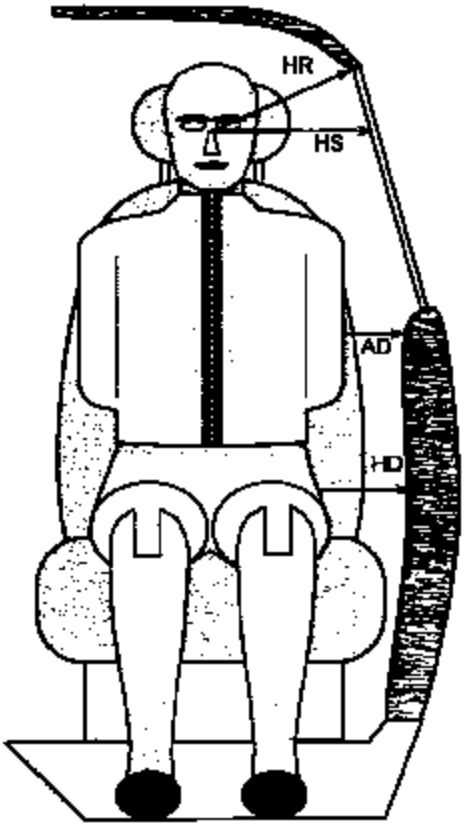
Driver Code	Measurement Description	Driver	
		Length(mm)	Angle(°)
HH	Head to Header	343	
HW	Head to Windshield	596	
HZ	Head to Roof	155	
NR	Nose to Rim	364	
CD	Chest to Dash	489	
CS	Chest to Steering Wheel	301	
KDL	Left Knee to Dash	126	34.2
KDR	Right Knee to Dash	129	34.6
PA	Pelvic Angle		23.0
PHX	H-Point to Striker (X-Axis)	204	
PHZ	H-Point to Striker (Z-Axis)	68	

DATA SHEET NO. 8

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005



FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	198
HS	Head to Side Window	mm	332
AD	Arm to Door	mm	77
HD	H-Point to Door	mm	121

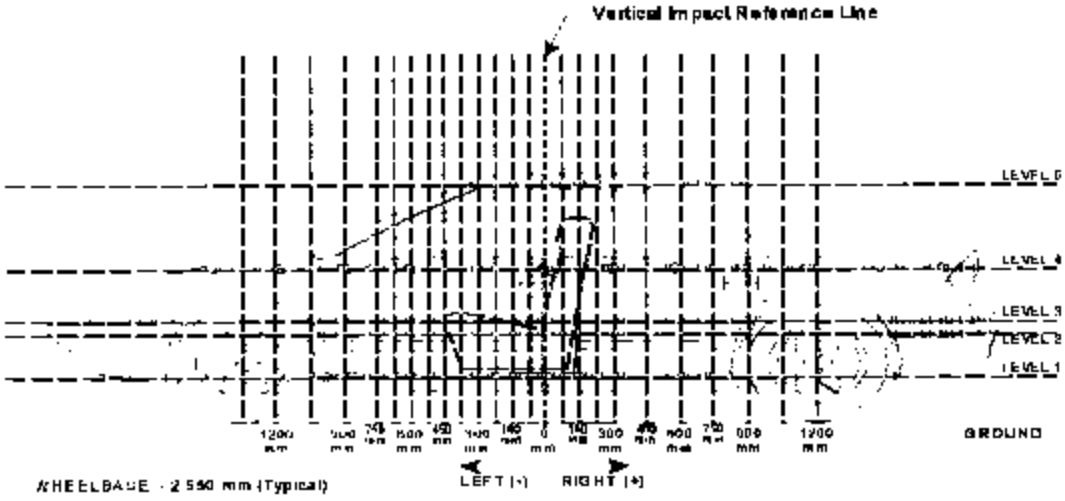
DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 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	1600
4	Window Sill	mm	1030
3	Mid Door	mm	725
2	Occupant H-Point	mm	650
1	Sill Top	mm	370

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2005 Chevrolet Equinox NHTSA No. C50101
Test Program: FMVSS 201P Test Date: July 6, 2005

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1650				305					300					-5	
-1500				296					296					0	
-1350				293					293					0	
-1200				290					297					7	
-1050			200	287				219	303				19	16	
-975	234	207	209	288		254	225	228	302		20	18	19	14	
-900	253	225	223	289		276	237	238	303		23	12	15	14	
-825	276	228	228	286		301	258	255	304		25	30	27	18	
-750	288	220	227	286		344	281	285	322		56	61	58	36	
-675	295	219	225	285		366	315	319	344		71	96	94	59	
-600	295	216	226	286		390	352	358	375		95	136	132	89	
-525	296	215	227	285		406	384	390	404		110	169	163	119	
-450	296	214	227	285		423	419	423	436		127	205	196	151	
-375	297	214	226	284		442	459	460	471		145	245	234	187	
-300	296	211	225	285	504	457	490	489	499	540	161	279	264	214	36
-225	295	210	225	284	498	497	525	524	532	559	202	315	299	248	61
-150	295	210	225	284	495	550	562	562	570	594	255	352	337	286	99
-75	295	210	225	283	493	604	604	604	612	644	309	394	379	329	151
0	295	210	225	283	490	633	629	638	645	690	338	419	413	362	200
75	296	209	224	284	490	616	603	627	628	671	320	394	403	344	181
150	295	208	224	284	489	577	569	591	591	662	282	361	367	307	173
225	295	218	222	285	488	512	441	476	517	627	217	223	254	232	139
300	295	207	223	285	486	486	410	447	496	611	191	203	224	211	125
450	296	207	223	285	484	432	363	391	476	595	136	156	168	191	111
600	295	210	225	287	483	391	332	347	448	578	96	122	122	161	95
750	295	210	228	290	480	336	296	309	413	551	41	86	81	123	71
900	275	214	228	293	479	273	267	280	382	535	-2	53	52	89	56
1050		205	221	295	479		222	250	359	533		17	29	64	54
1200			195	298	478			181	329	517			-14	31	39
1350				300	479				328	503				28	24
1500				306	480				330	500				24	20
1650				313	480				333	499				20	19
1800				323	485				334	513				11	28

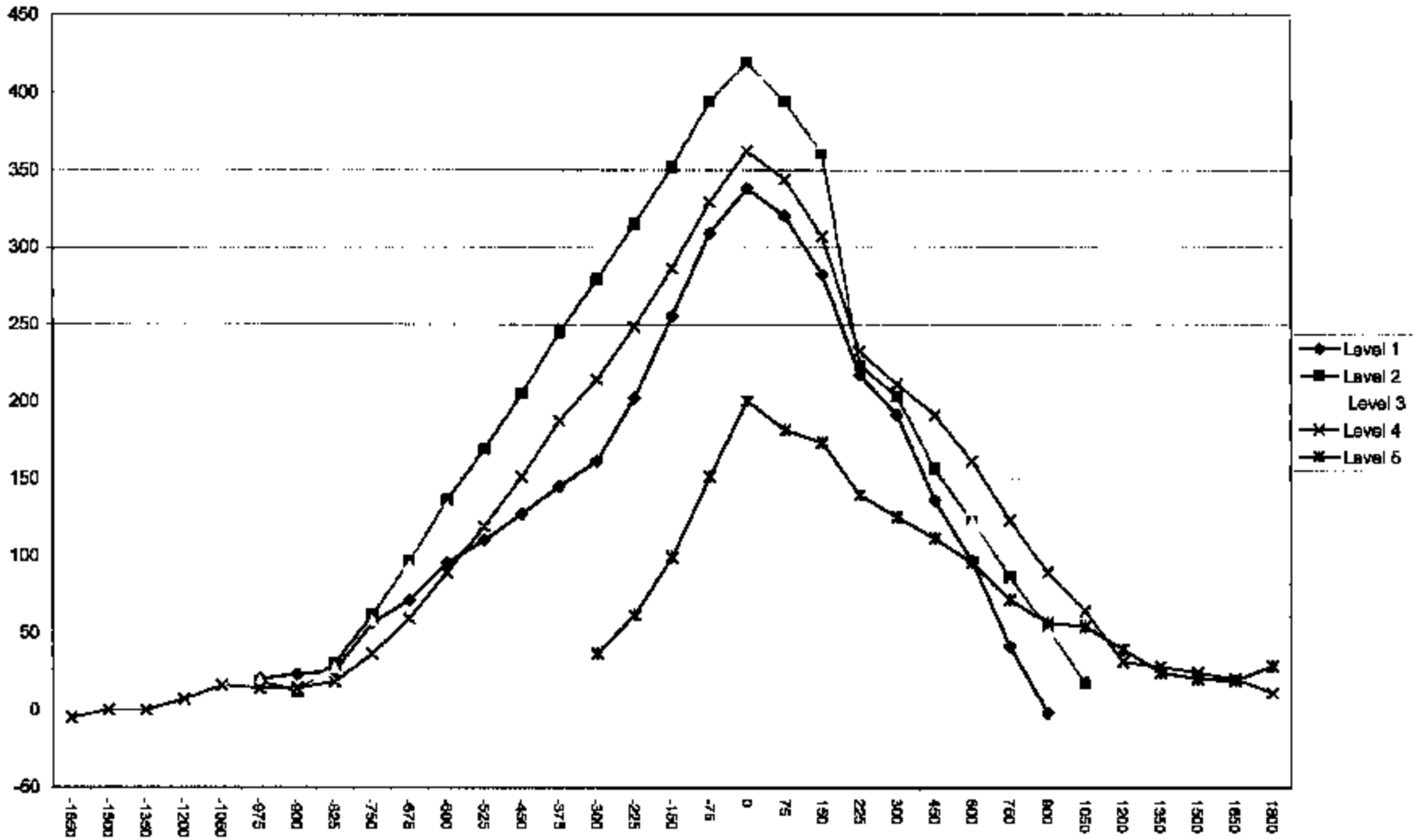
Reference plane is parallel to test vehicle longitudinal centerline Units = mm

Given dimensions = Reference plane to car body

DATA SHEET NO. 10... (continued)

VEHICLE EXTERIOR CRUSH PROFILES

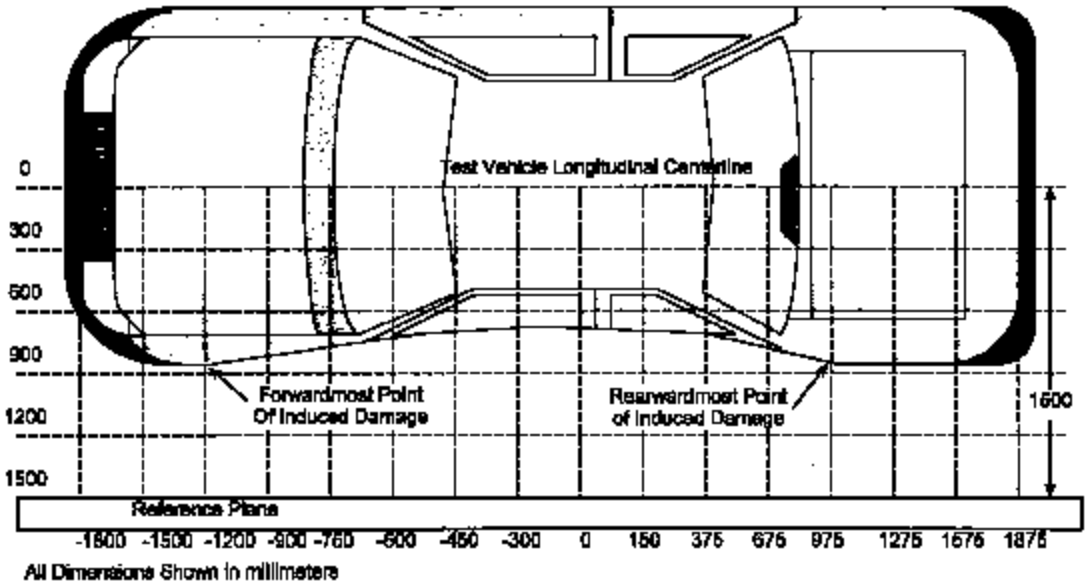
Test Vehicle: 2005 Chevrolet Equinox NHTSA No. C50101
Test Program: FMVSS 201P Test Date: July 6, 2005



DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2005 Chevrolet Equinox NHTSA No. C50101
Test Program: FMVSS 201P Test Date: July 6, 2005



TOP VIEW

Damage Profile Distances

OPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	1800 mm	4	323	334	11
2	1265 mm	4	298	329	31
3	583 mm	3	225	350	125
4	-250 mm	3	225	500	275
5	-953 mm	3	227	235	8
6	-1650 mm	4	305	300	5

Reference plane is parallel to test vehicle longitudinal centerline

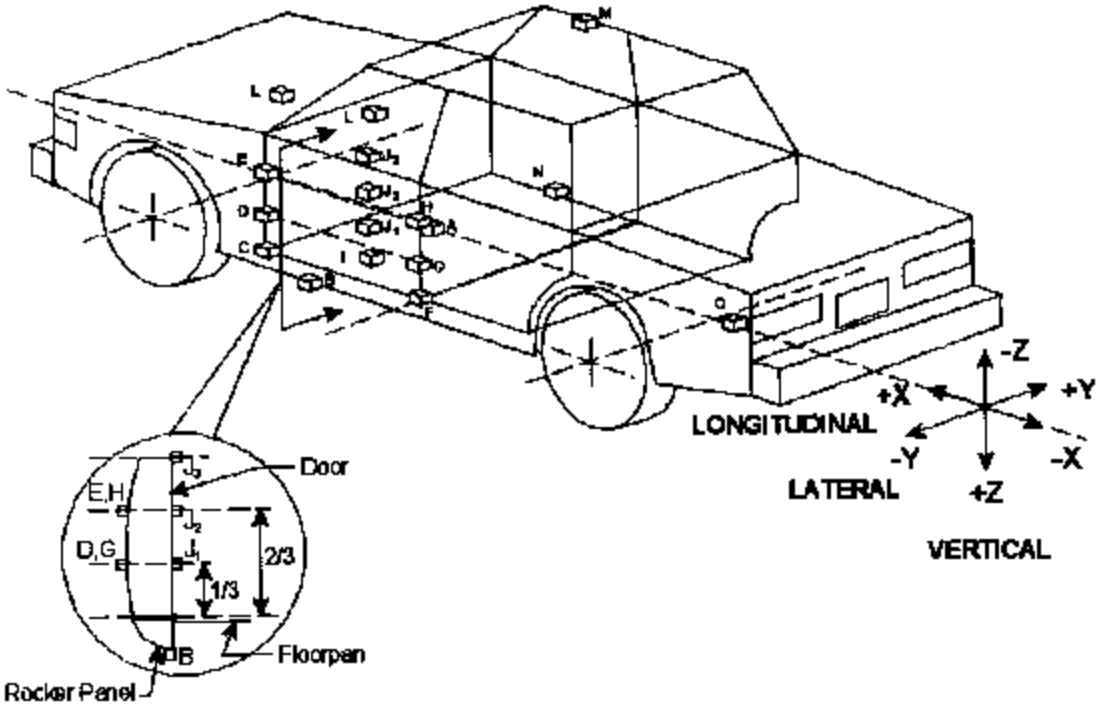
Given dimensions = Reference plane to car body

DATA SHEET NO. 12

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 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: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 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	4.8	58	-2.7	41
		Y	12.9	45	-1.1	37
		Z	4.9	89	-13.4	49
		RES	15.9	49		
B	Left Floor	Y	*	*	*	*
C	A Pillar Sill	Y	**	**	**	**
D	A Pillar Low	Y	17.8	37	-2.7	10
E	A Pillar Mid	Y	13.4	52	-2.5	3
G	B Pillar Sill	Y	***	***	***	***
H	B Pillar Low	Y	63.2	22	-4.4	59
I	B Pillar Mid	Y	40.2	22	-9.8	61
L	Driver Seat	Y	****	****	****	****
M1	Driver Door Rib	Y	52.3	9	-40.3	33
M2	Driver Door Pelvis	Y	74.8	9	-52.5	33
M3	Driver Door Knee	Y	66.6	25	-54.2	18
N	Engine	X	4.3	97	-6.7	58
		Y	10.5	56	-1.7	250
O	Firewall	Y	9.0	67	-1.4	5
Q	Right Floor Sill	Y	*****	*****	*****	*****
R	Rear Deck	X	5.3	72	-3.1	77
		Y	12.9	50	-0.9	226

* No valid data collected after 20ms
** No valid data collected after 90ms
*** No valid data collected after 40ms
**** No valid data collected after 85ms
***** No valid data collected after 240ms

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: 2005 Chevrolet Equinox NHTSA No. C50101
Test Program: FMVSS 201P Test Date: July 6, 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	2719	2643	-76
		Y	0	15	15
		Z	461	473	-12
B	Left Floor Sill	X	2684	2593	-91
		Y	-746	-496	250
		Z	282	291	-9
C	A Pillar Sill	X	3183	3055	-128
		Y	-747	-622	-125
		Z	280	274	6
D	A Pillar Low	X	3224	3069	-155
		Y	-840	-678	162
		Z	600	580	20
E	A Pillar Mid	X	3223	3091	-132
		Y	-835	-680	155
		Z	965	956	9
G	B Pillar Sill	X	2174	2137	-37
		Y	-747	-445	302
		Z	285	303	-18
H	B Pillar Low	X	2186	2190	4
		Y	-670	-403	267
		Z	512	543	-31
I	B Pillar Mid	X	2135	2142	7
		Y	-372	-377	-5
		Z	1080	1099	-19
L	Driver Seat	X	2334	2288	-46
		Y	-576	-337	239
		Z	543	526	17
M1	Driver Door Rib	X	2657	2563	-94
		Y	-793	-470	323
		Z	1030	1030	0
M2	Driver Door Pelvis	X	22623	2533	-90
		Y	-800	-456	344
		Z	880	888	-8
M3	Driver Door Knee	X	2645	2536	-109
		Y	-802	-478	324
		Z	584	595	-11
N	Engine	X	3945	3955	10
		Y	25	50	25
		Z	890	915	-25
O	Firewall	X	3741	3725	-16
		Y	60	97	37
		Z	1022	1030	-8
Q	Right Floor Sill	X	2586	2614	28
		Y	746	785	39
		Z	282	277	5
R	Rear Deck	X	968	968	0
		Y	0	10	10
		Z	680	670	10

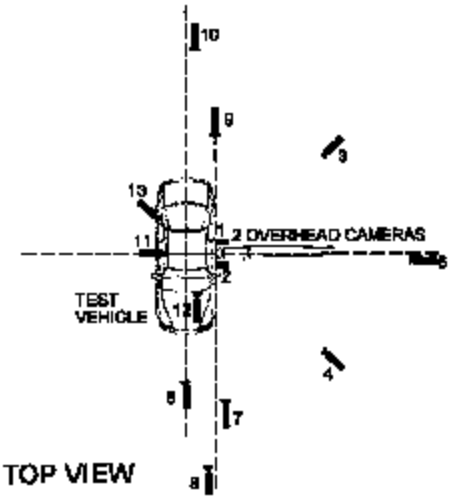
Reference Points
X – Rear of Vehicle (+ forward)
Y – Vehicle Centerline (+ to right)
Z – Ground Plane (+ down)

DATA SHEET NO. 13

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005



TOP VIEW

No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	530	-1050	5725	14	1000
2	Overhead Close-Up	-15	0	5050	19	1000
3	Left Side 45° Rearward Pole View	-2185	-2670	1465	24	1000
4	Right Side 45° Forward Pole View	-2370	2940	1460	24	1000
5	Real Time				13	24
6*	Left Side Rear Pole View					
7	Front Ground Level Vehicle/Pole Impact	215	7010	1515	24	1000
8	Front Ground Level Vehicle Roof Targets and Vehicle/Pole Impact	520	6140	1445	35	1000
9	Rear Ground Level Vehicle/Pole Impact	890	-7240	1465	24	1000
10	Rear Ground Level	480	-8100	1455	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				8	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: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005

Test Time: 9:46 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)

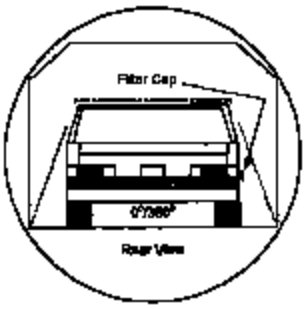
D. Spillage Details: None

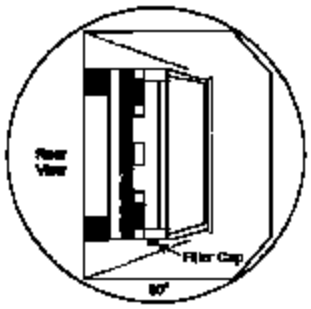
DATA SHEET NO. 15

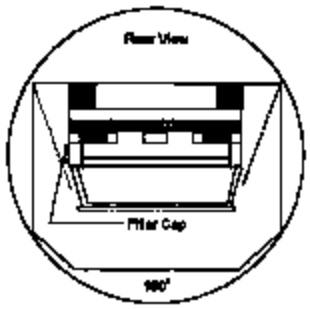
FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2005 Chevrolet Equinox
Test Program: FMVSS 201P

NHTSA No. C50101
Test Date: July 6, 2005

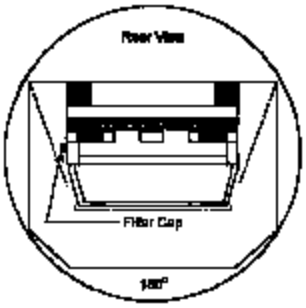


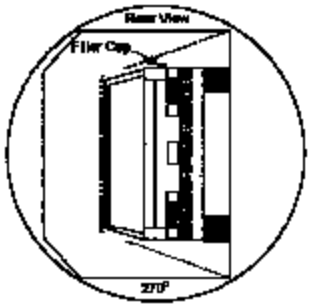


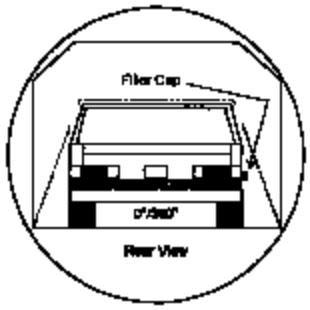


0° to 90°

90° to 180°







180° to 270°

270° to 360°

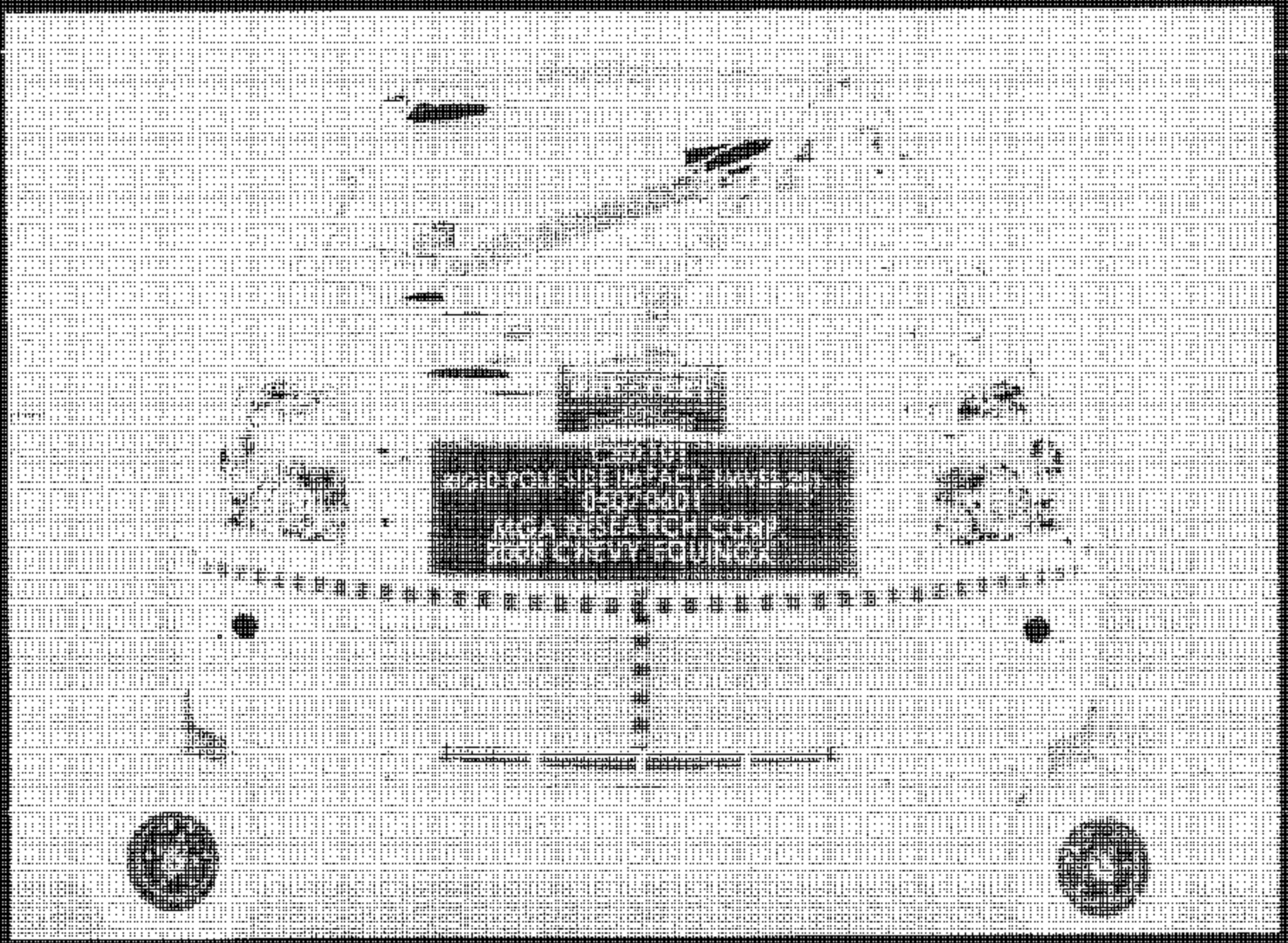
1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent Spillage locations: None

Rollover Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	172	300	0
90° to 180°	160	300	0
180° to 270°	138	300	0
270° to 360°	143	300	0

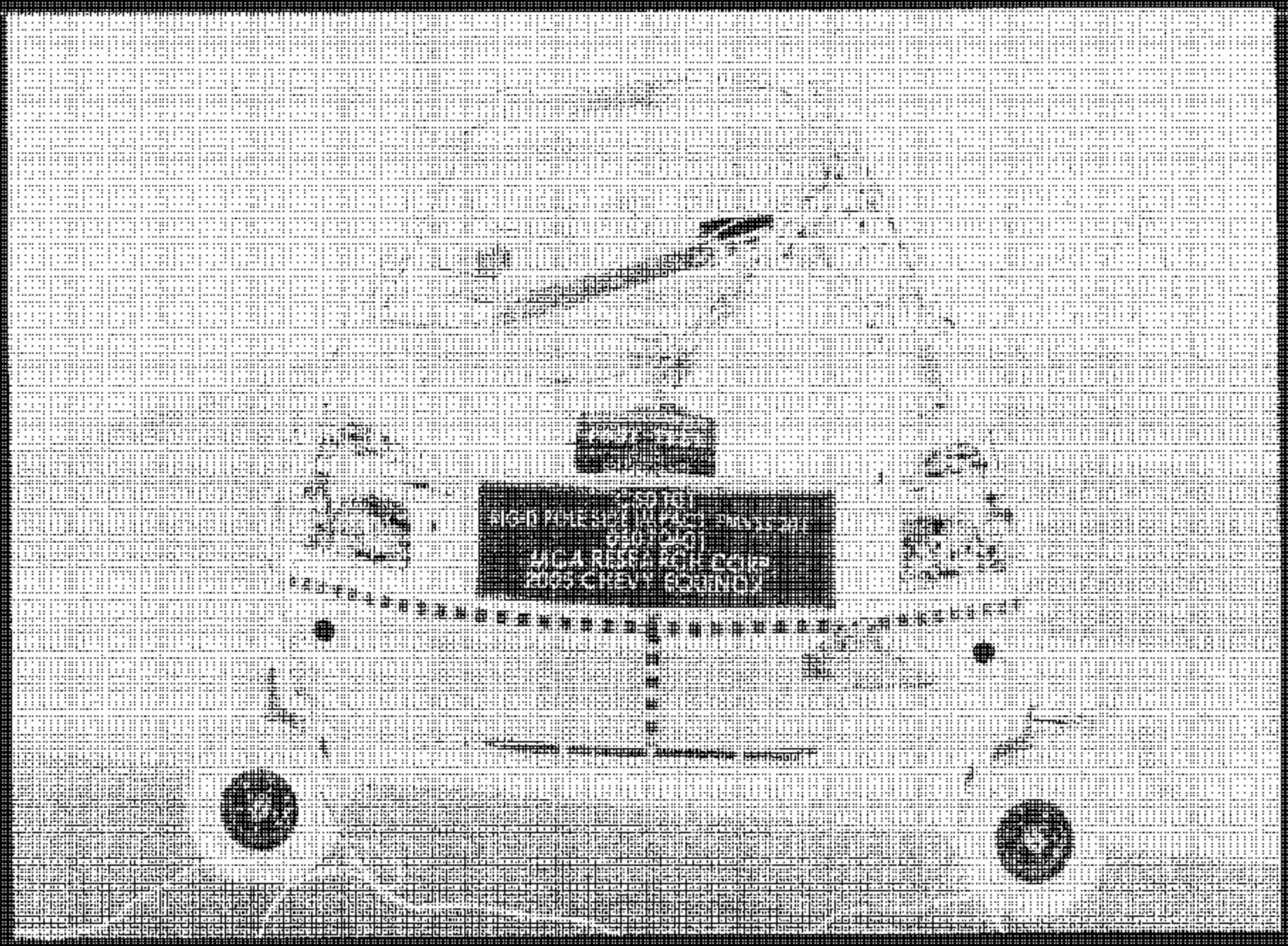
APPENDIX A

PHOTOGRAPHS

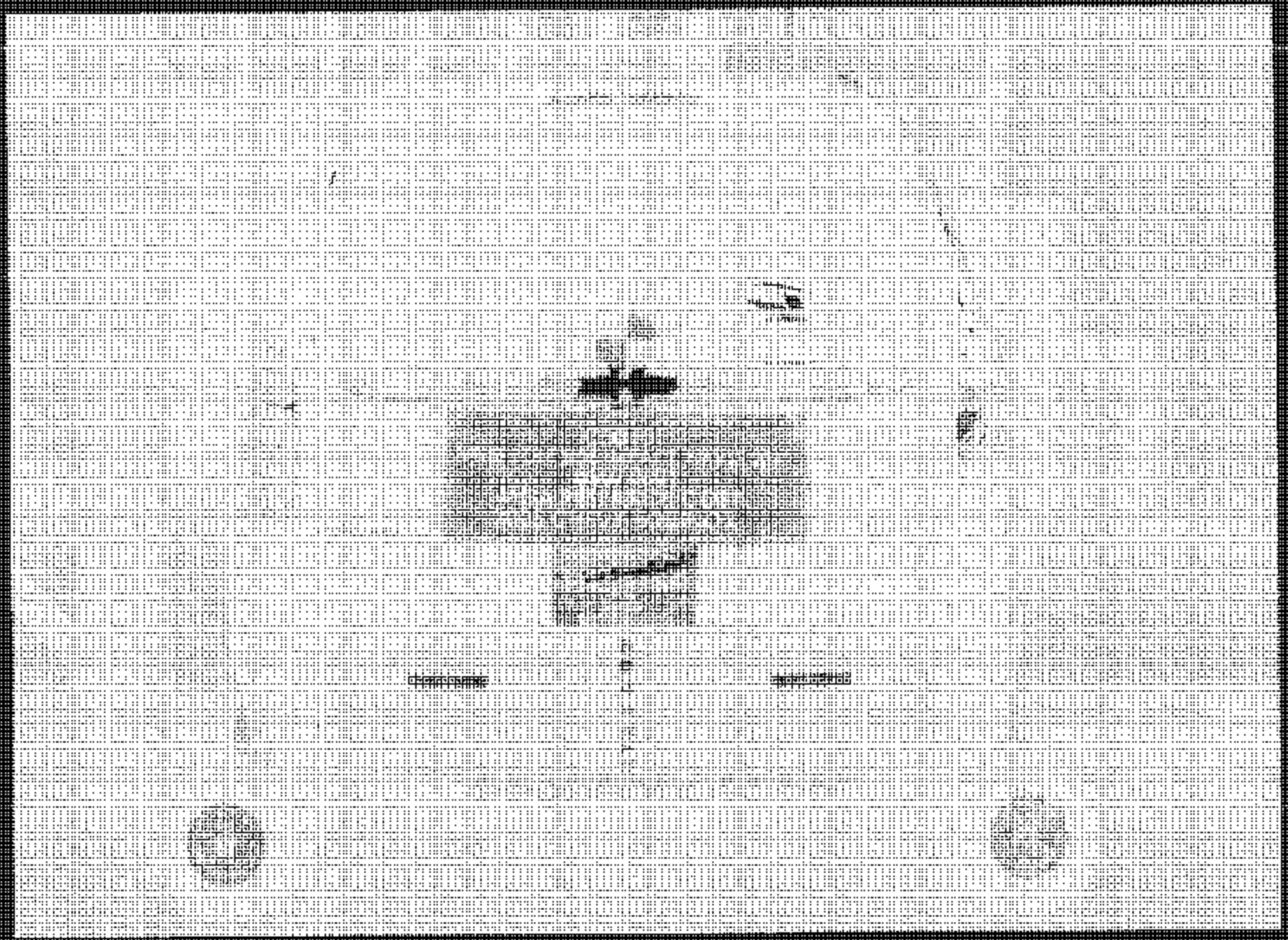
TABLE OF PHOTOGRAPHS



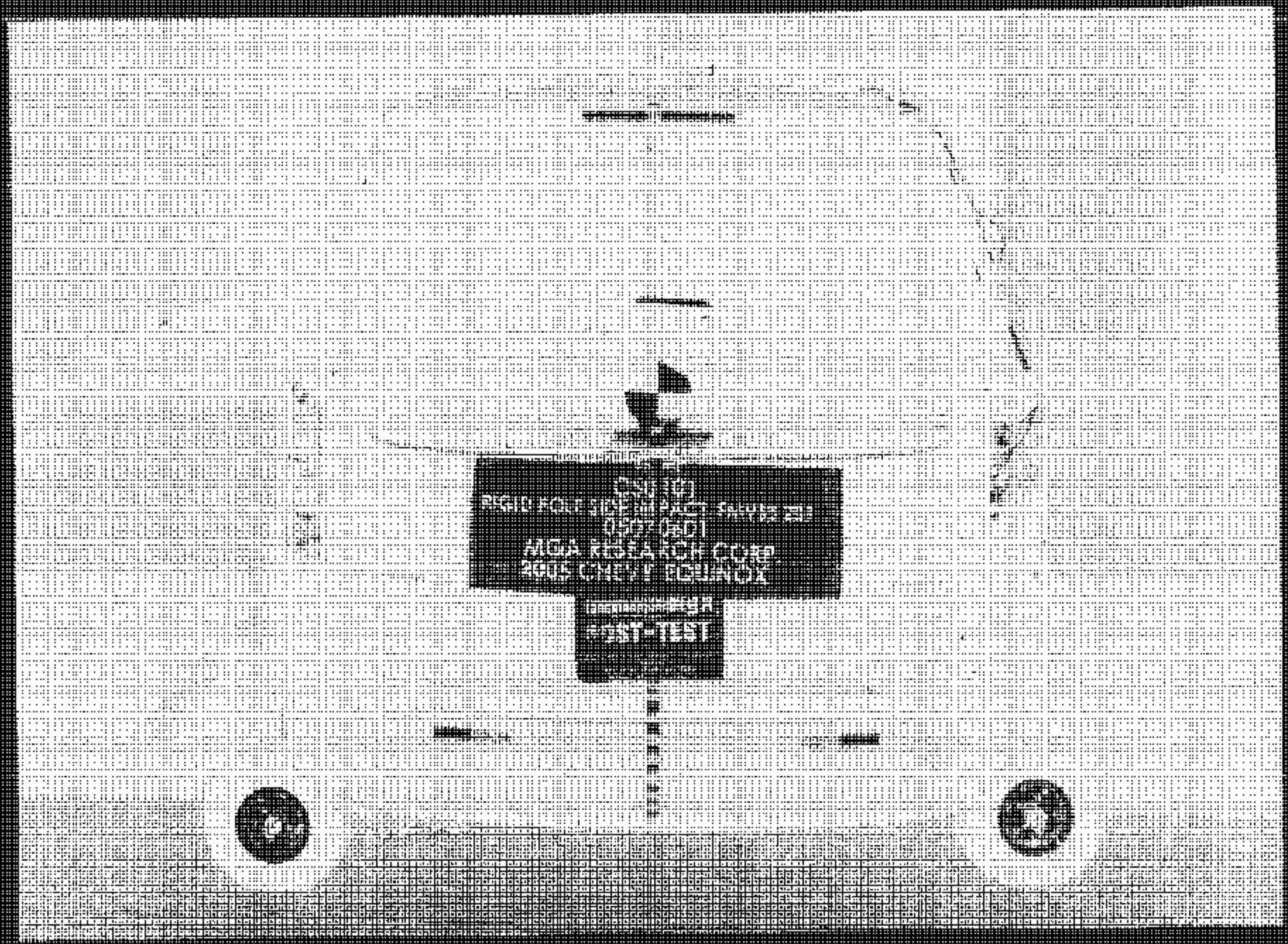
Pre-Test Front View of Test Vehicle



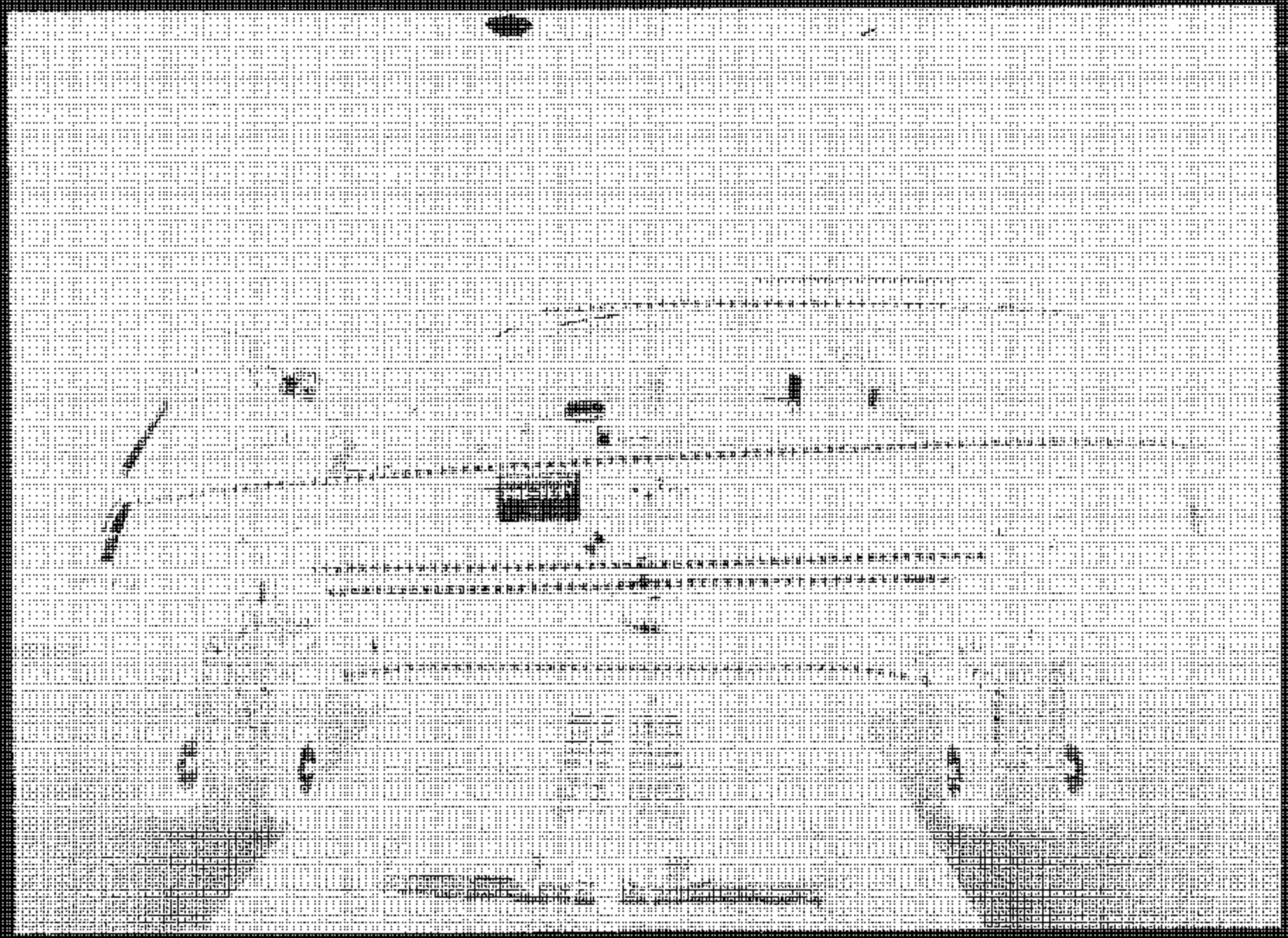
Post-Test Front View of Test Vehicle



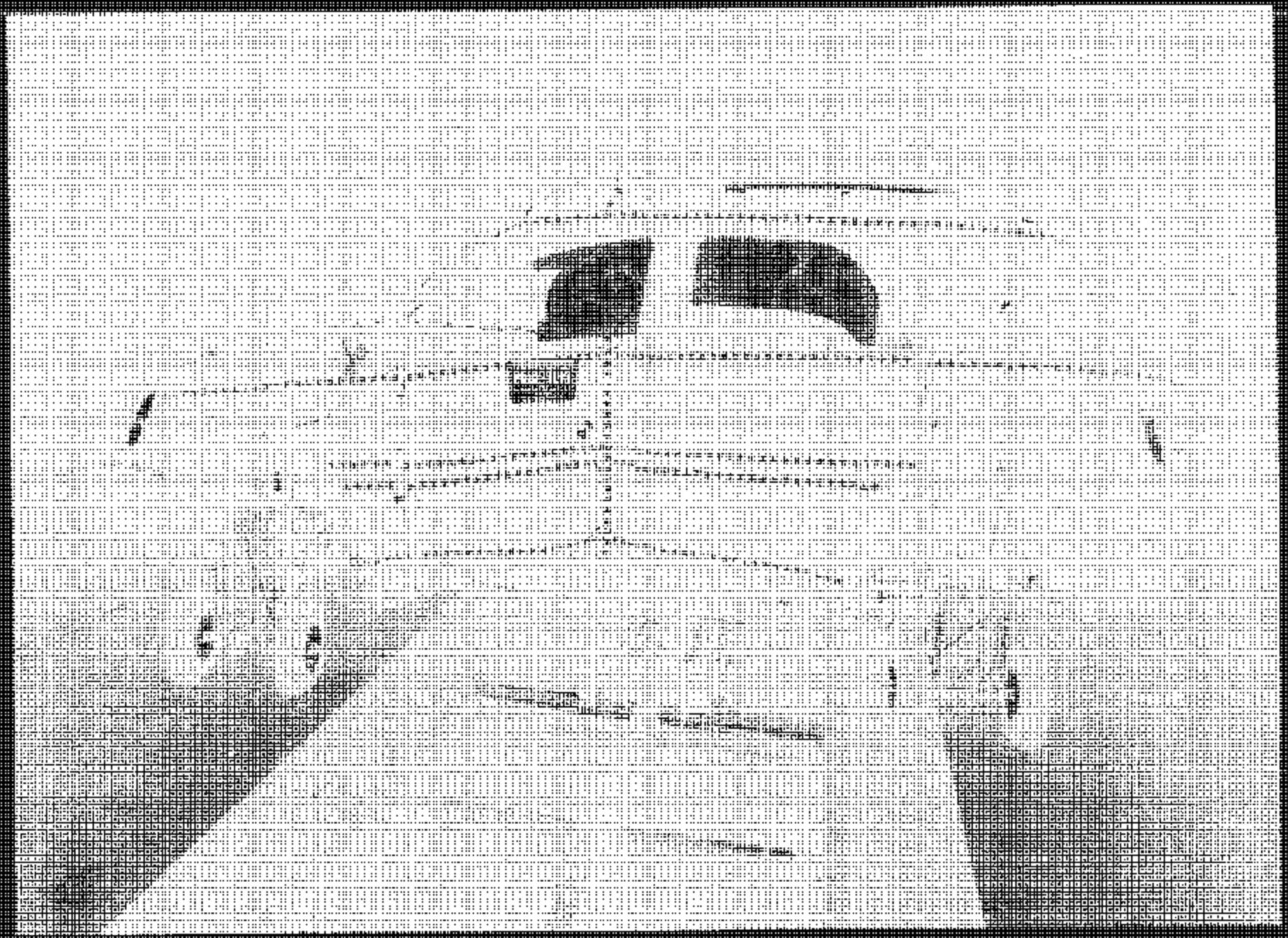
Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle



Pre-Test Left Side View of Test Vehicle

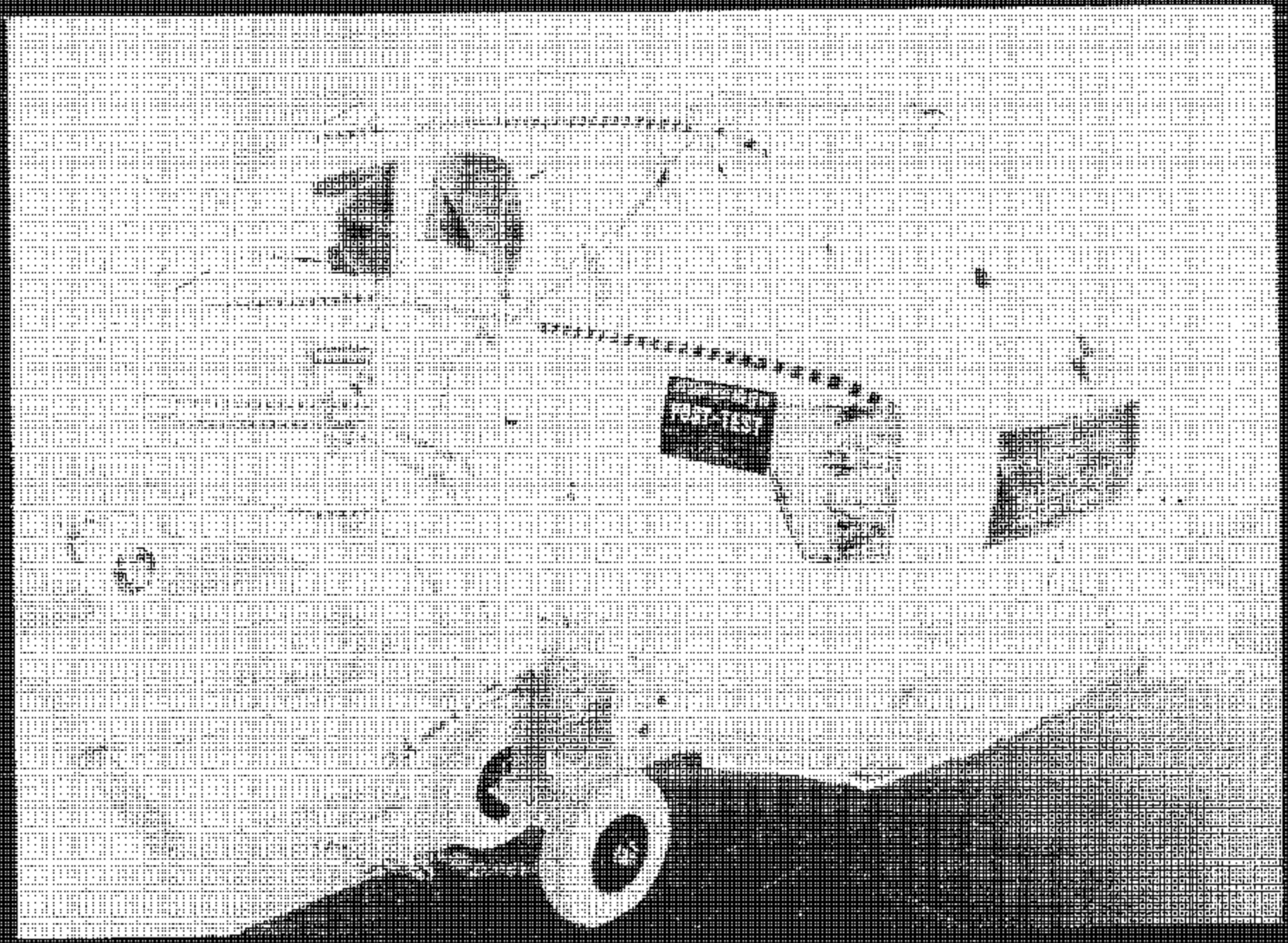


Post Test Left Side View of Test Vehicle

Pre-Test Right Side View of Test Vehicle

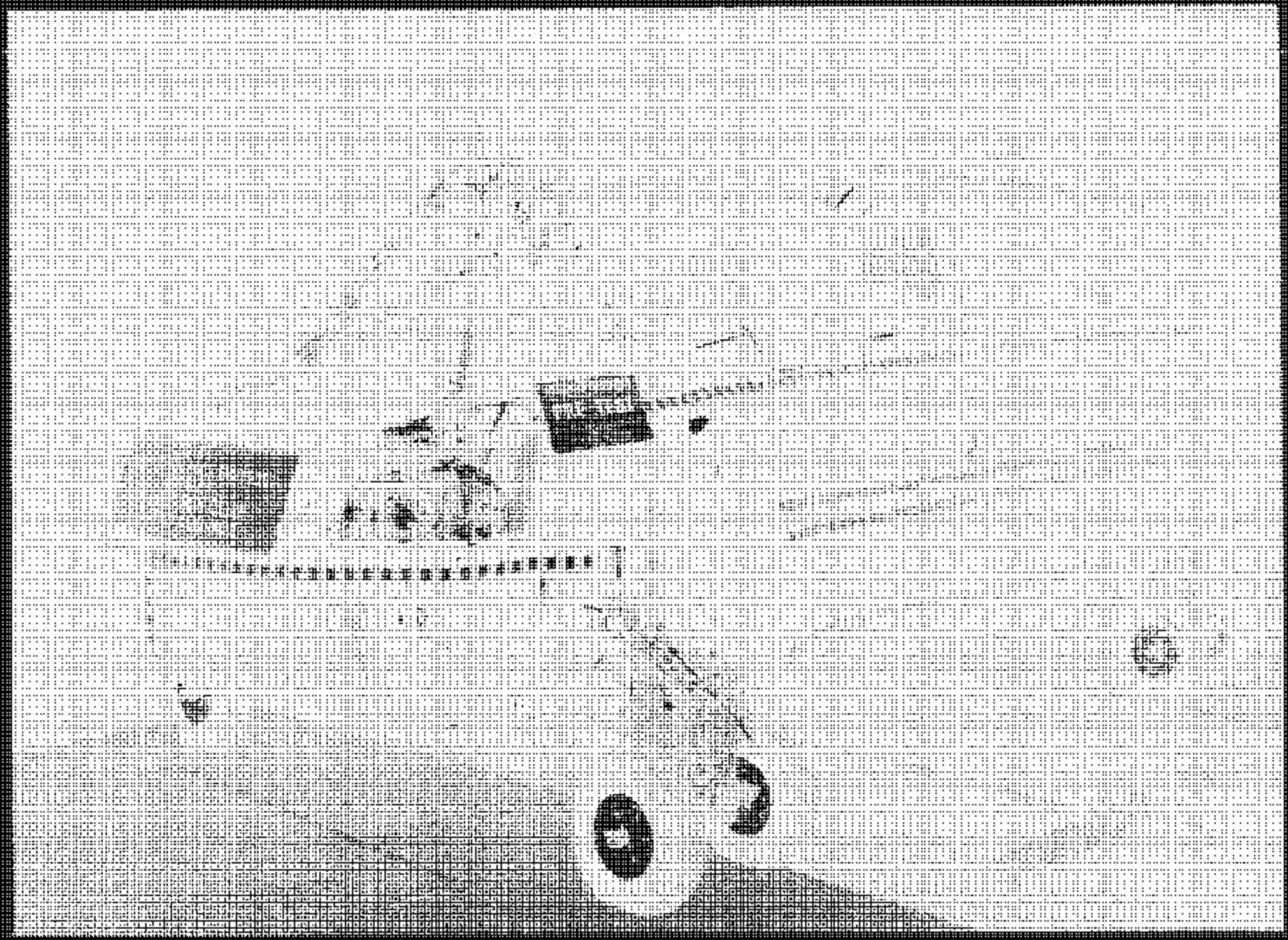
Post-Test Right Side View of Test Vehicle

Pre-Test Left Rear Three-Quarter View



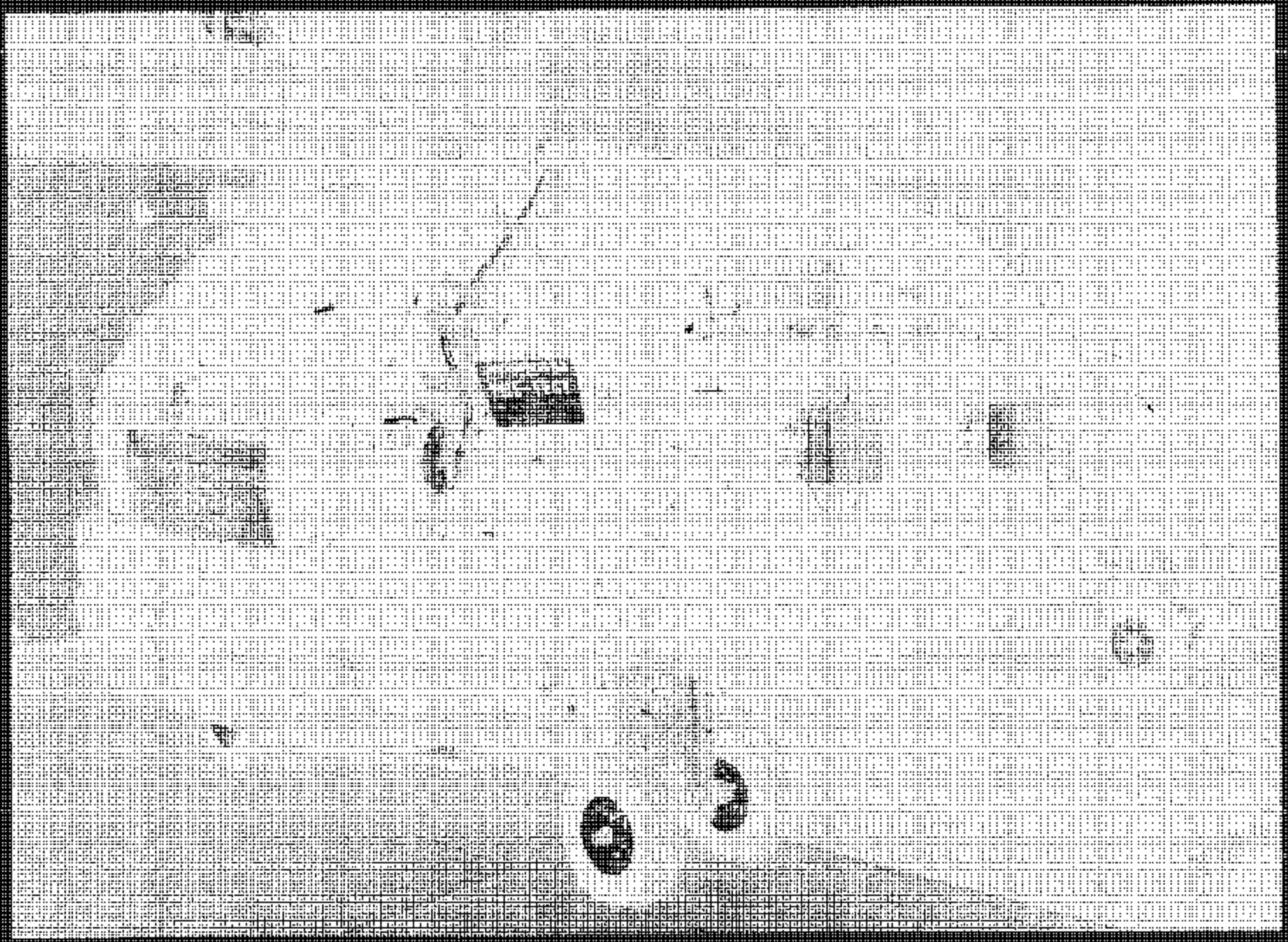
Post-Test Left Rear Three-Quarter View

FIG. 14



Pre-Test Left Front Three-Quarter View

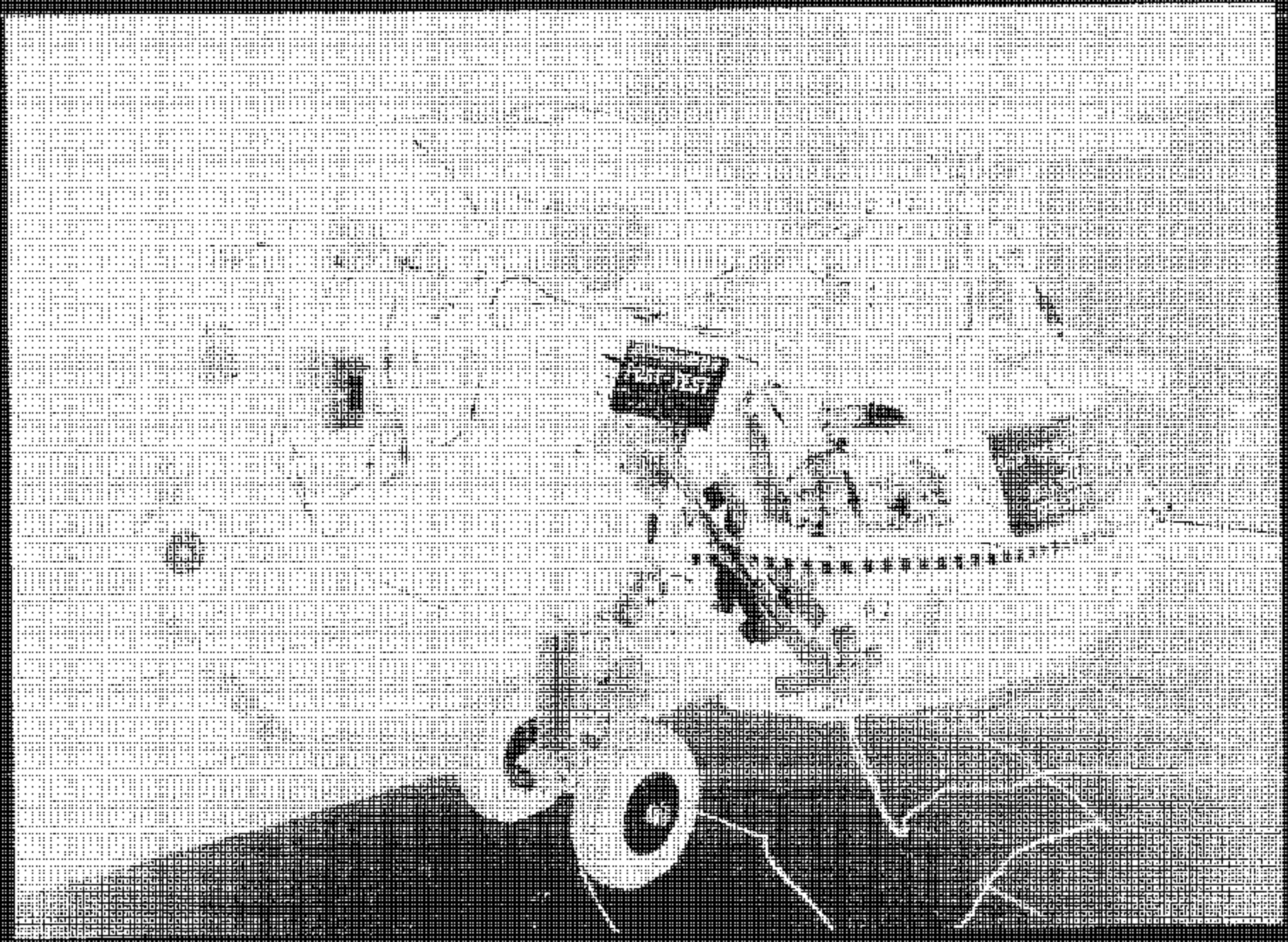
Post-Test Left Front Three-Quarter View



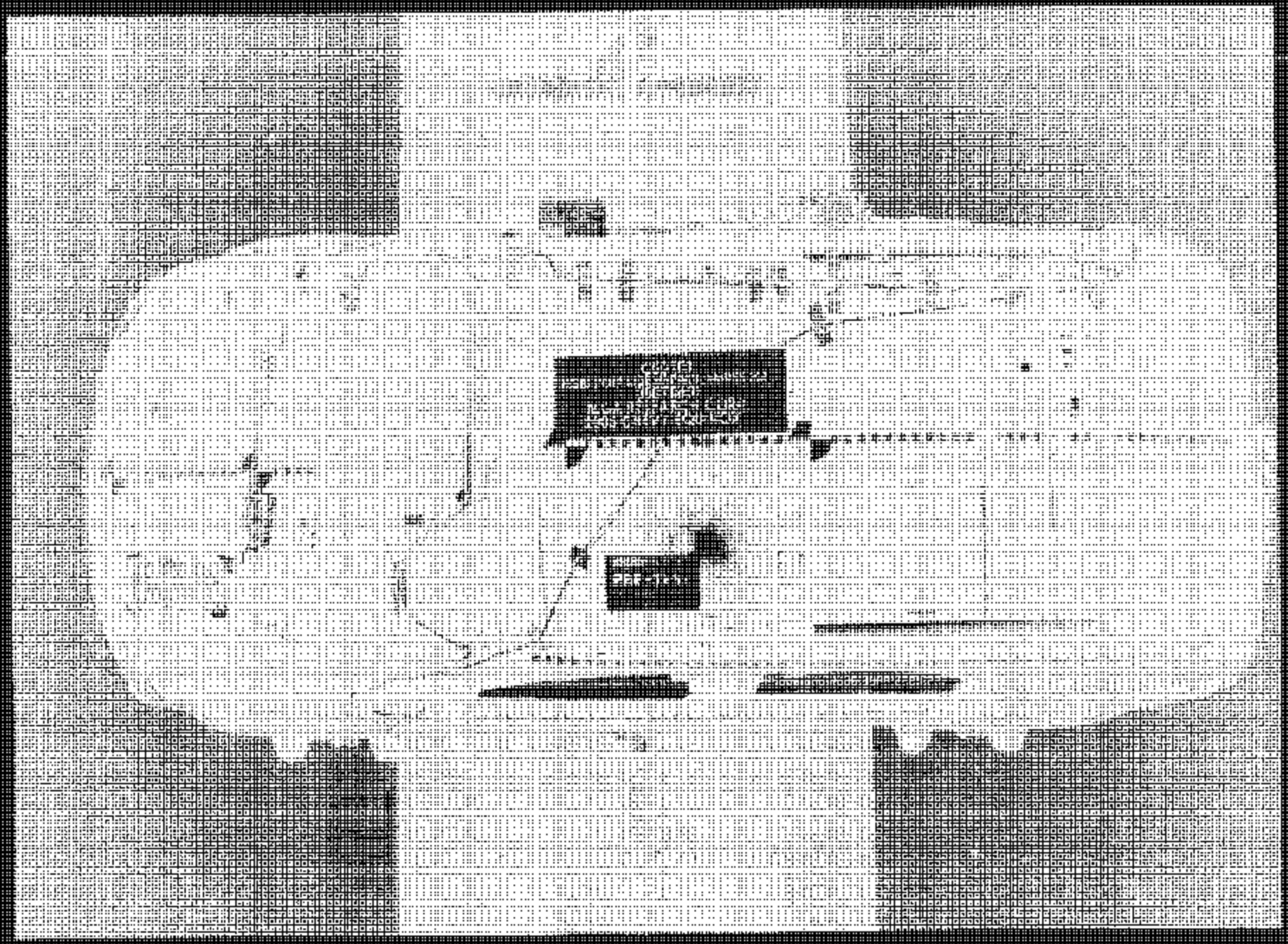
Pre-Test Right Rear Three-Quarter View

Post Test Right Rear Three-Quarter View

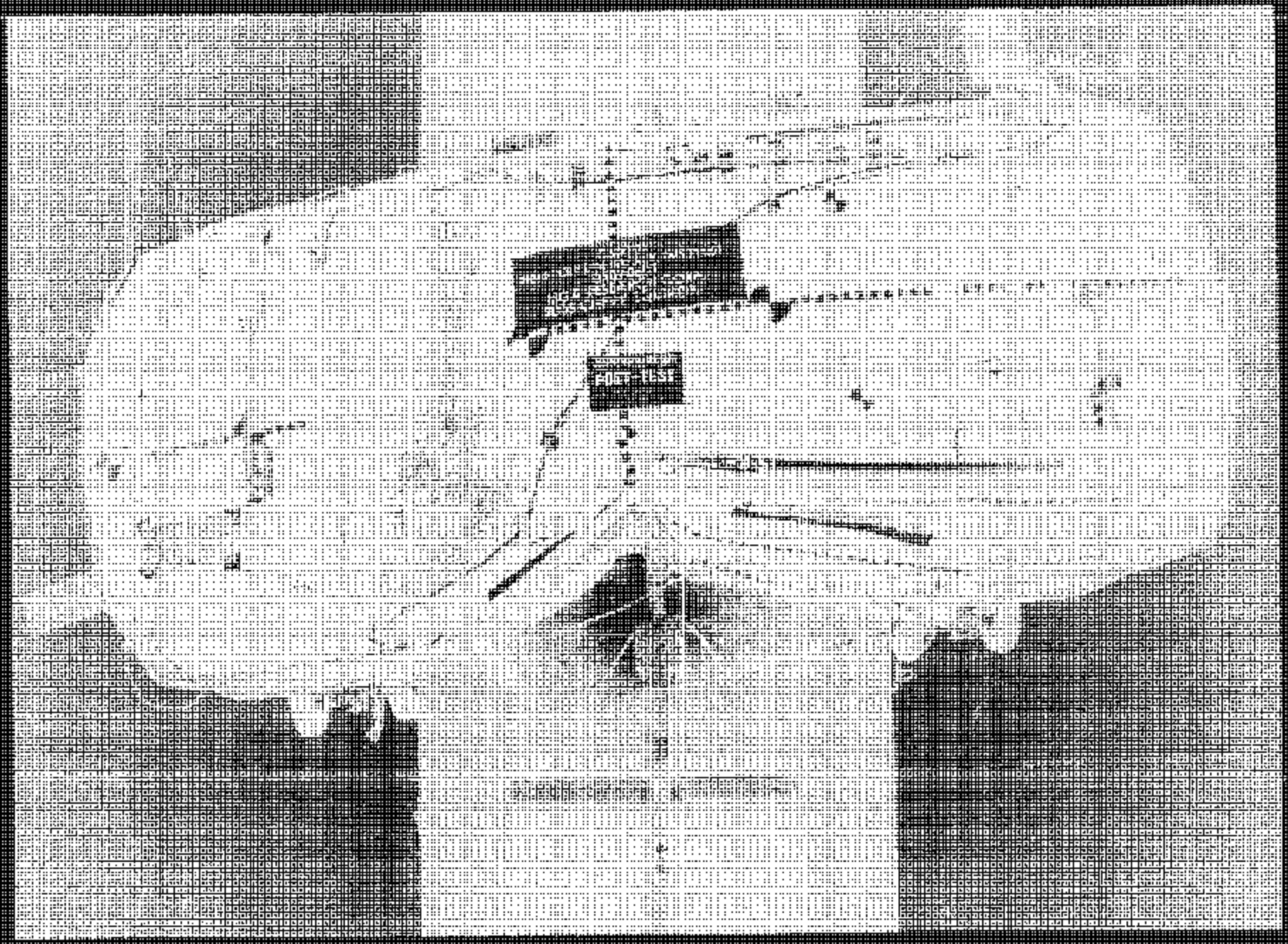
Pre-Test Right Front Three-Quarter View



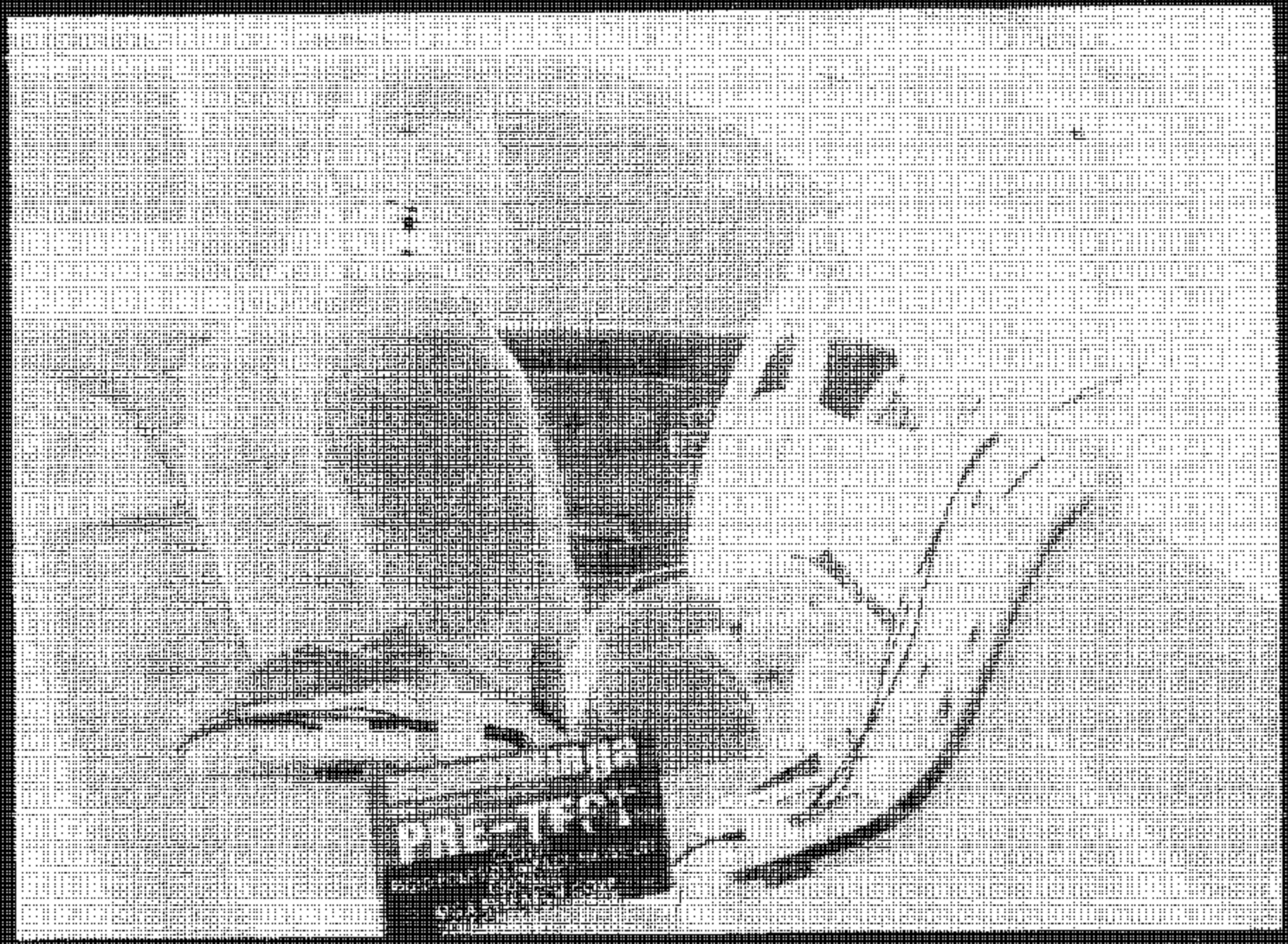
Post-Test Right Front Three-Quarter View



Pre-Test Overhead View of Test Vehicle

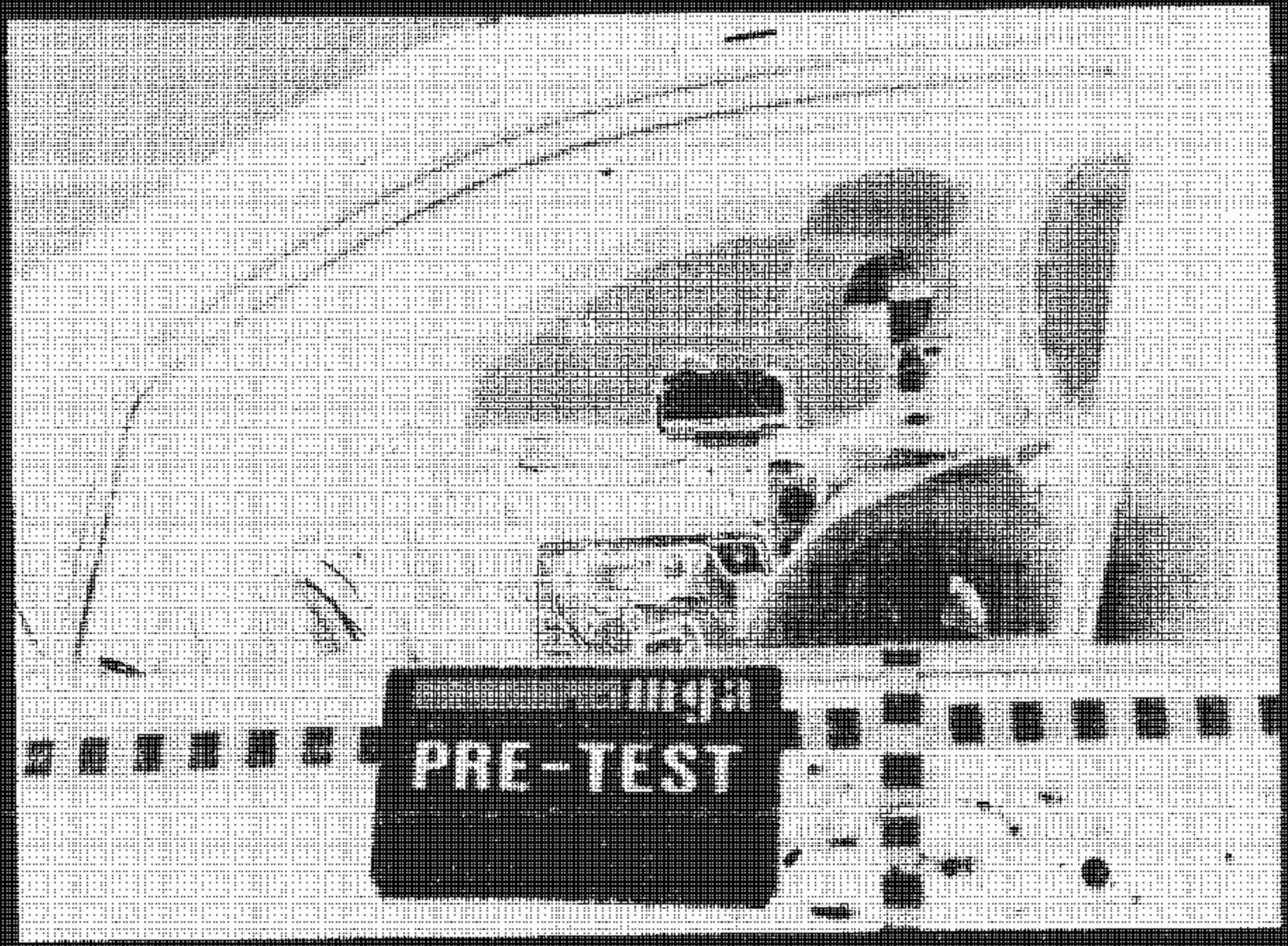


Post-Test Overhead View of Test Vehicle



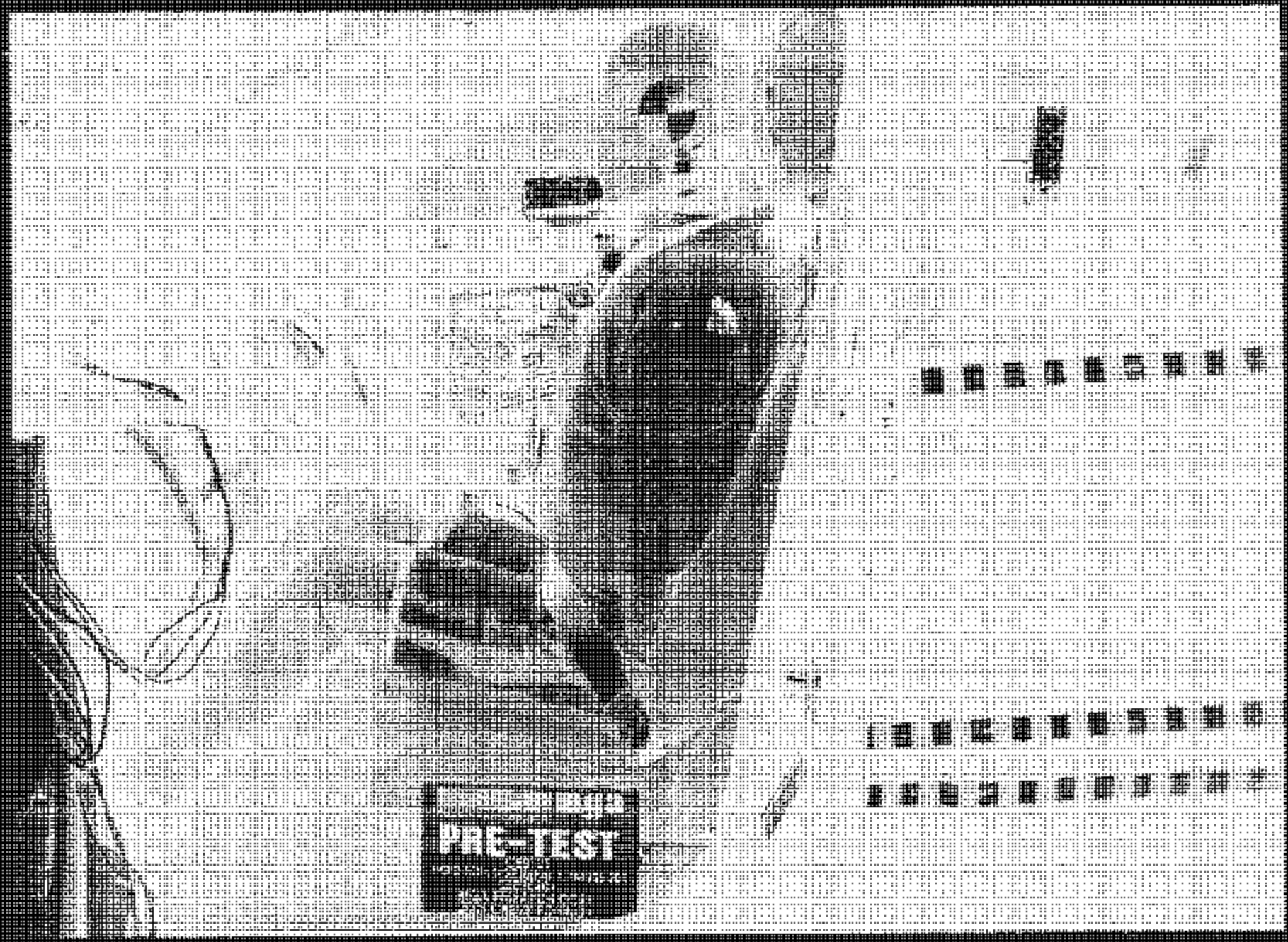
Pre-Test Driver Dummy Right Side View

Post-Test Drive Dummy Right Side View

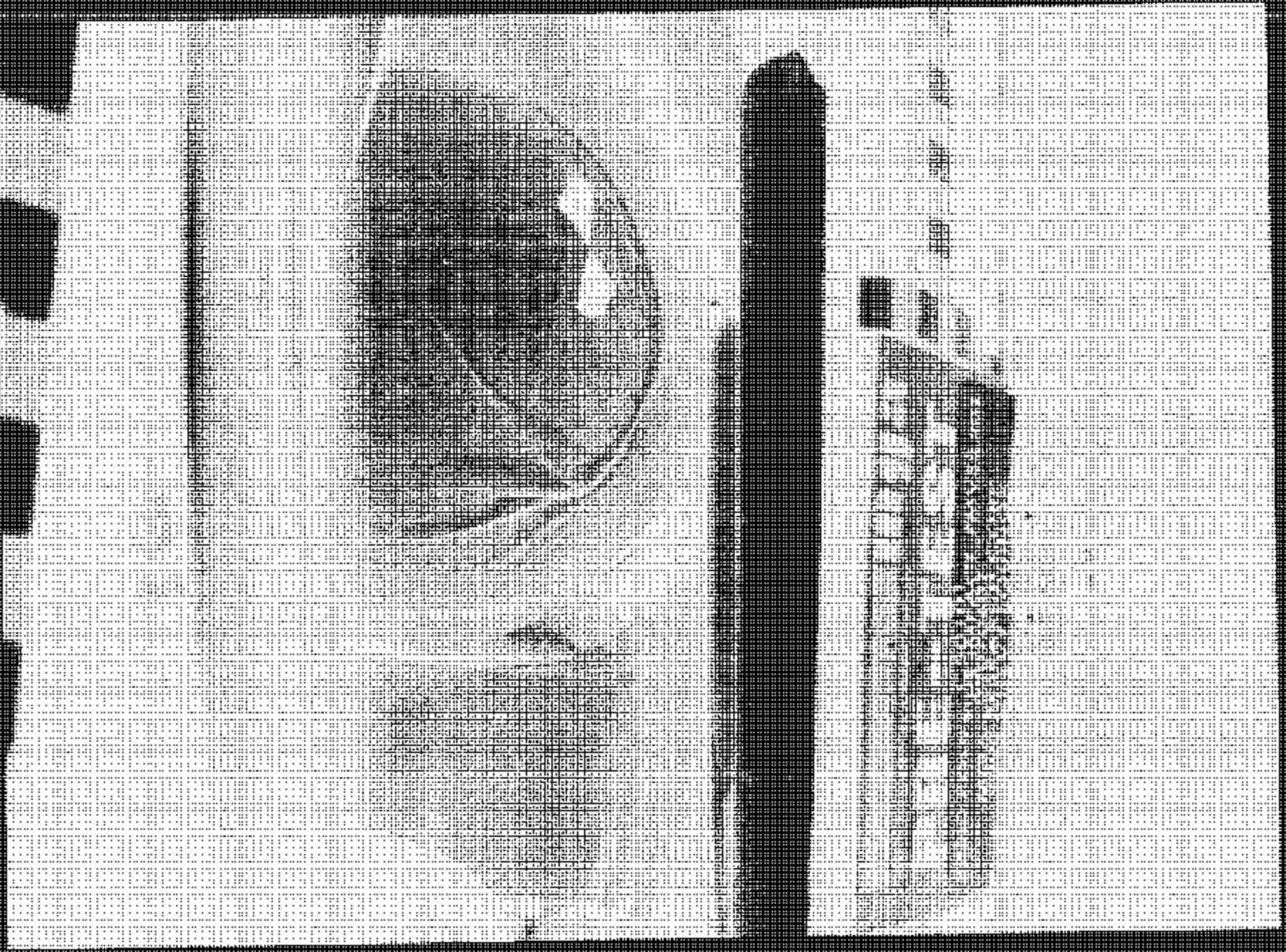


Pre-Test Driver Dummy Left Side View

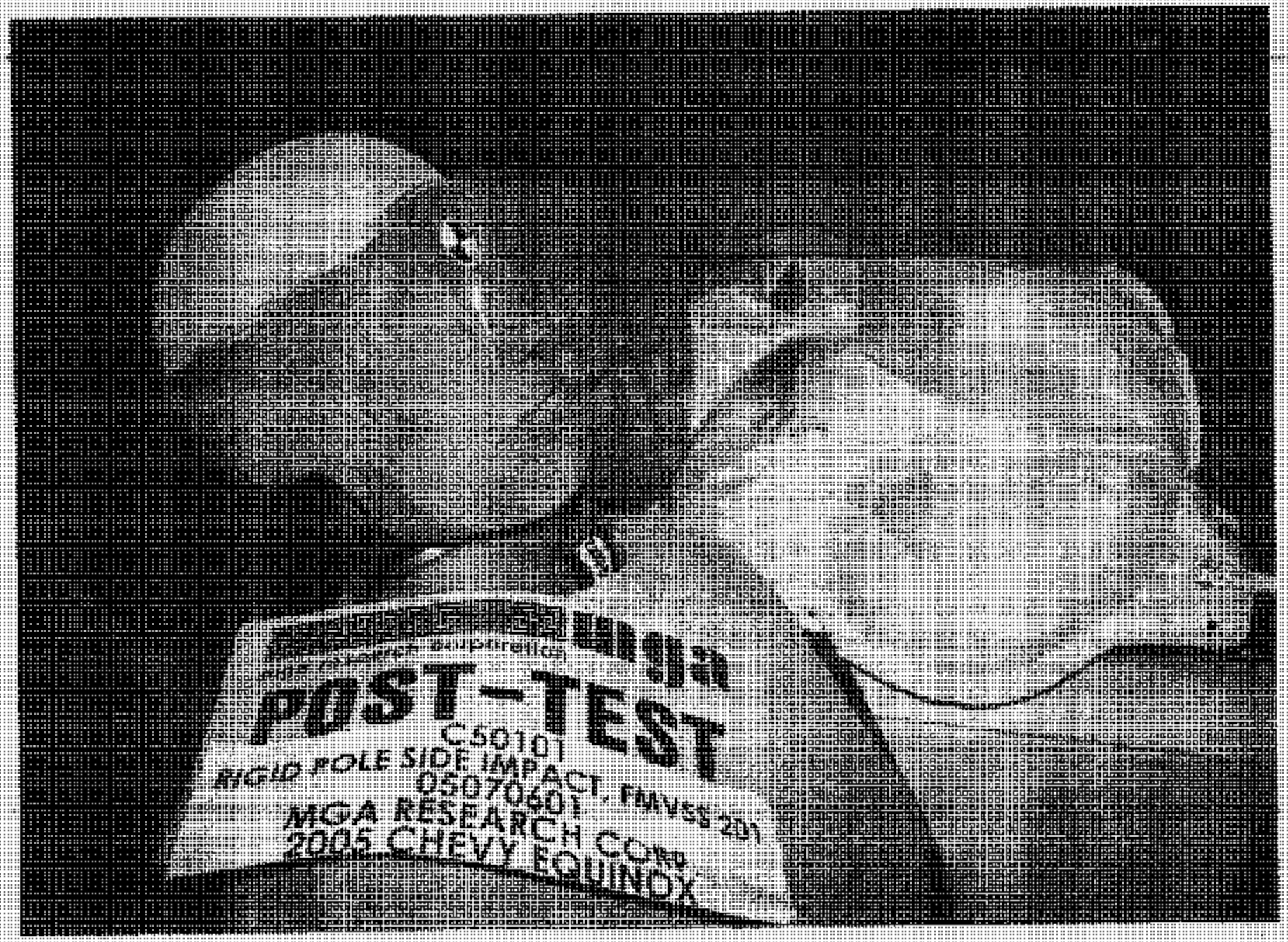
Post-Test Driver Dummy Left Side View



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

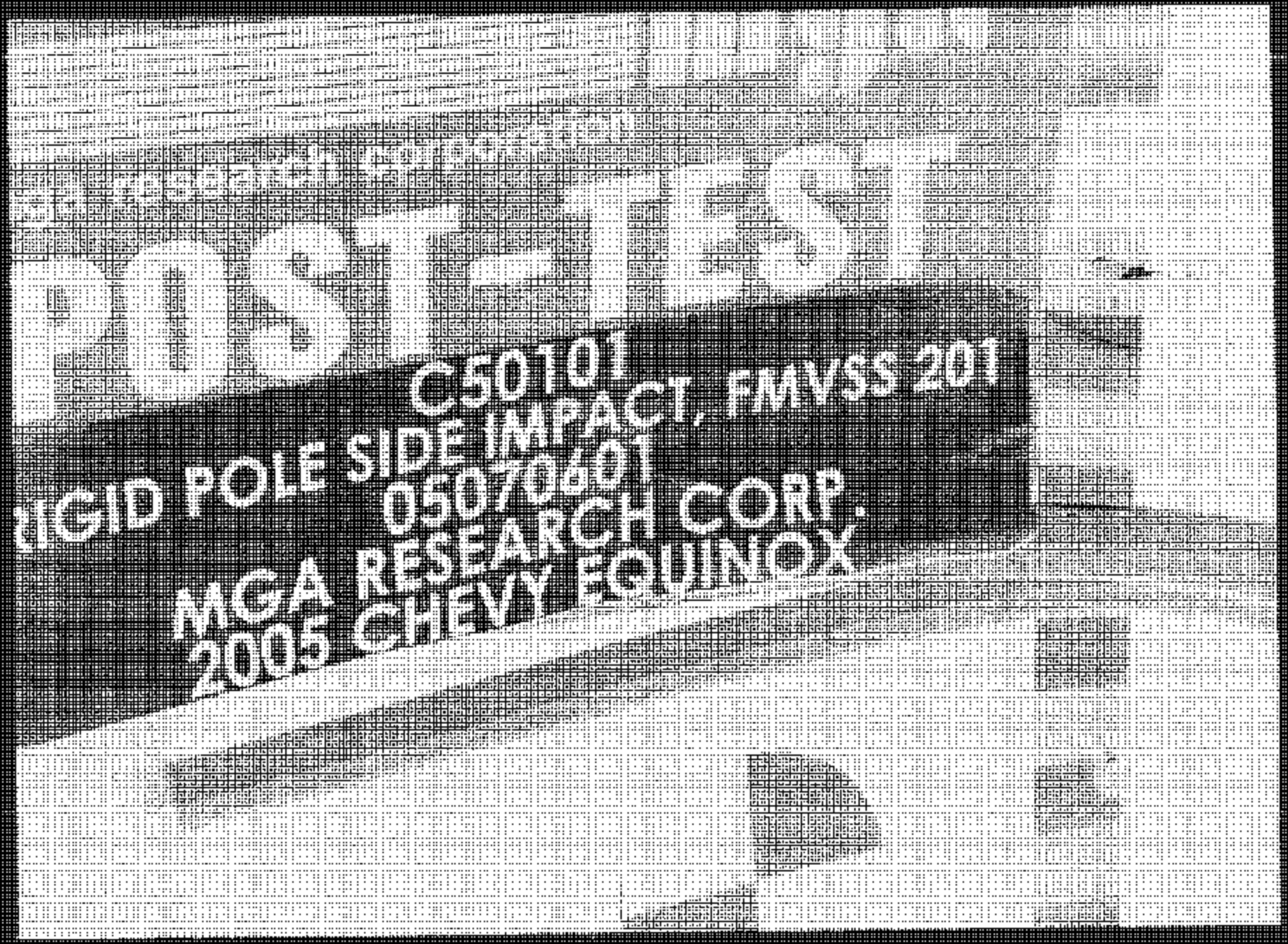


Pre-Test Driver Dummy Shoulder and Door Top View



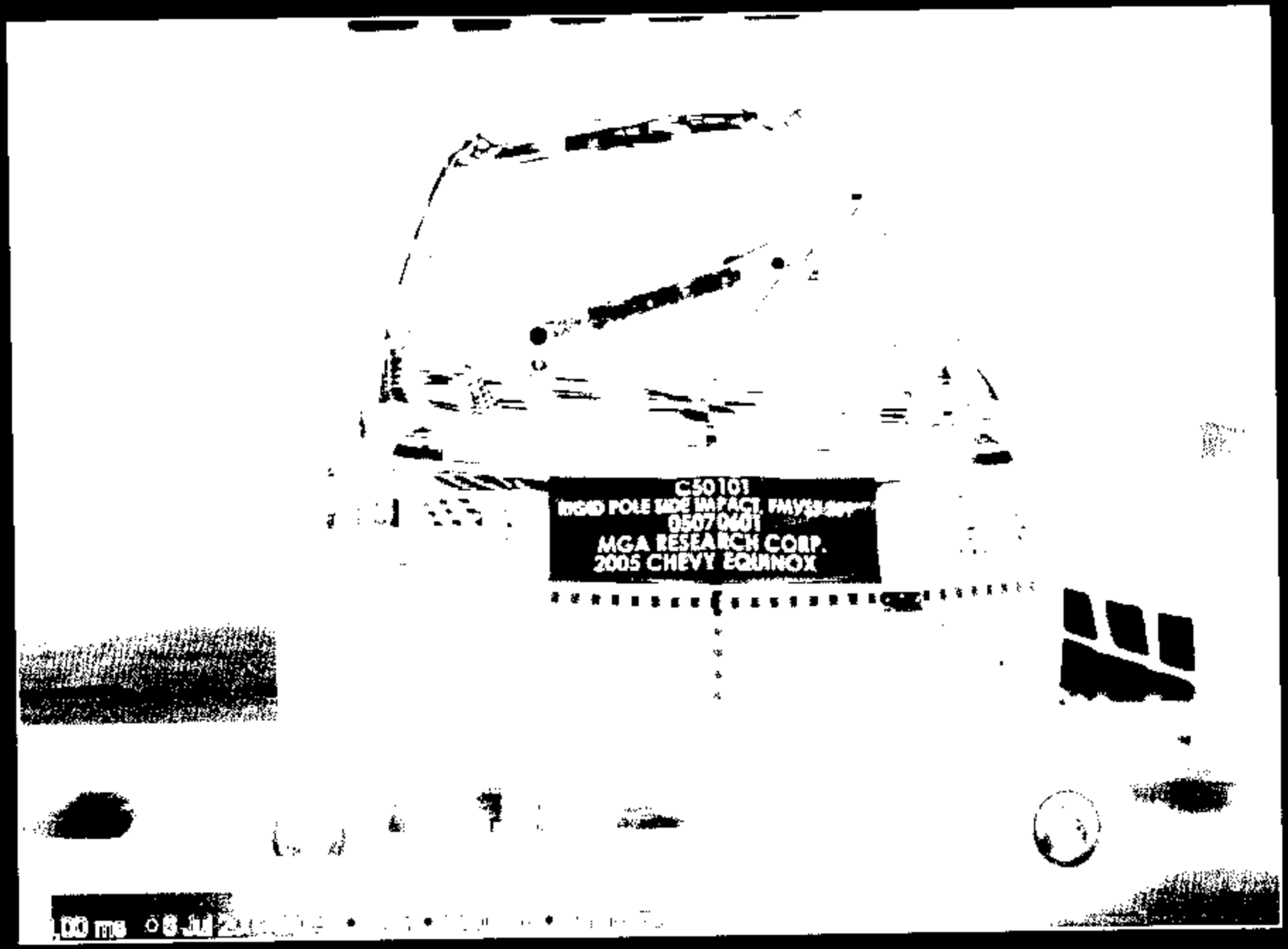
Post-Test Driver Dummy Head Contact

Post Test Driver Dummy Contact

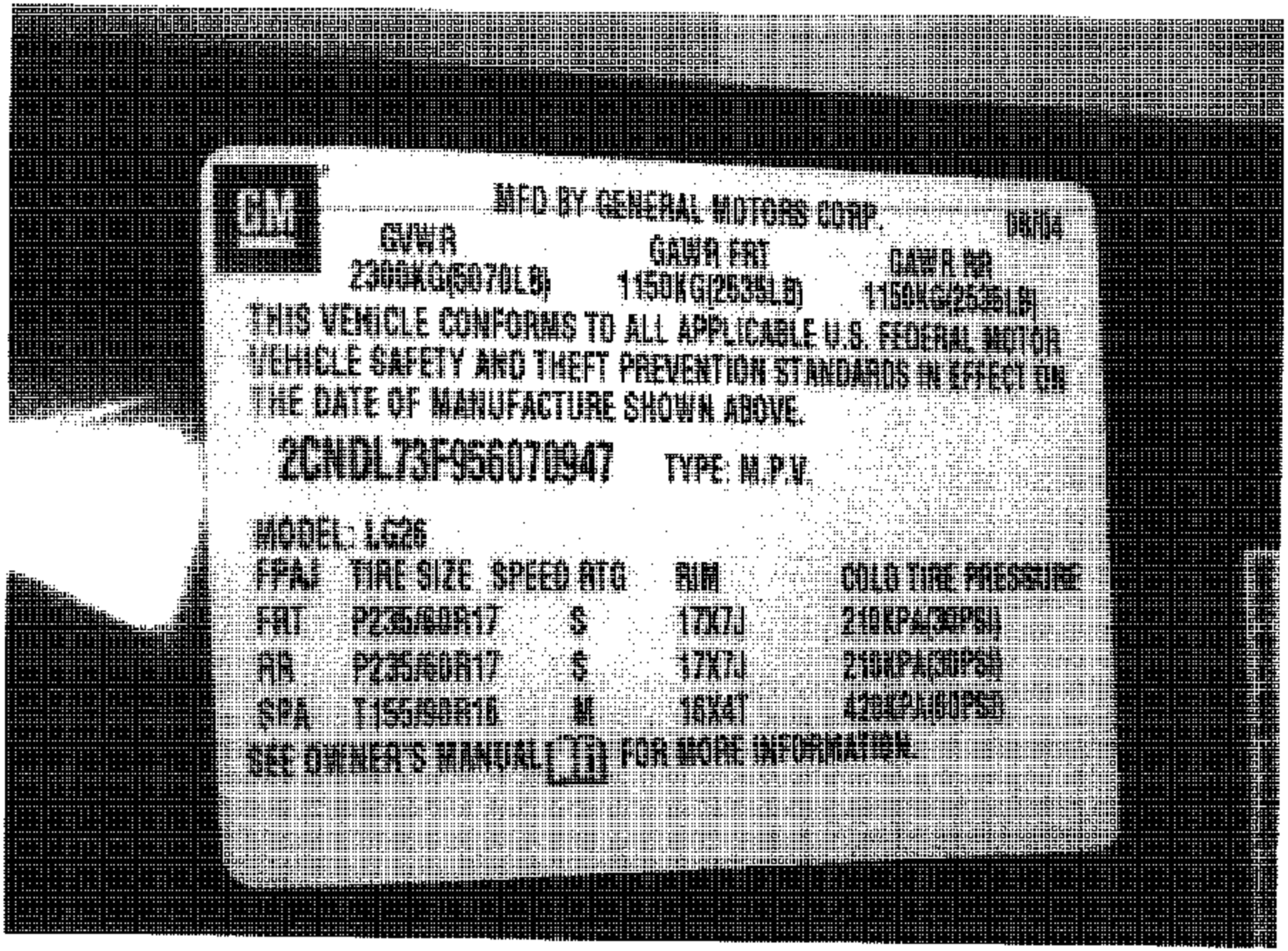


Post-Test Impact Point on Vehicle

Post-Test Impact Zone Close-up View



Vehicle Impact



Vehicle Certification Label

TIRE AND LOADING INFORMATION

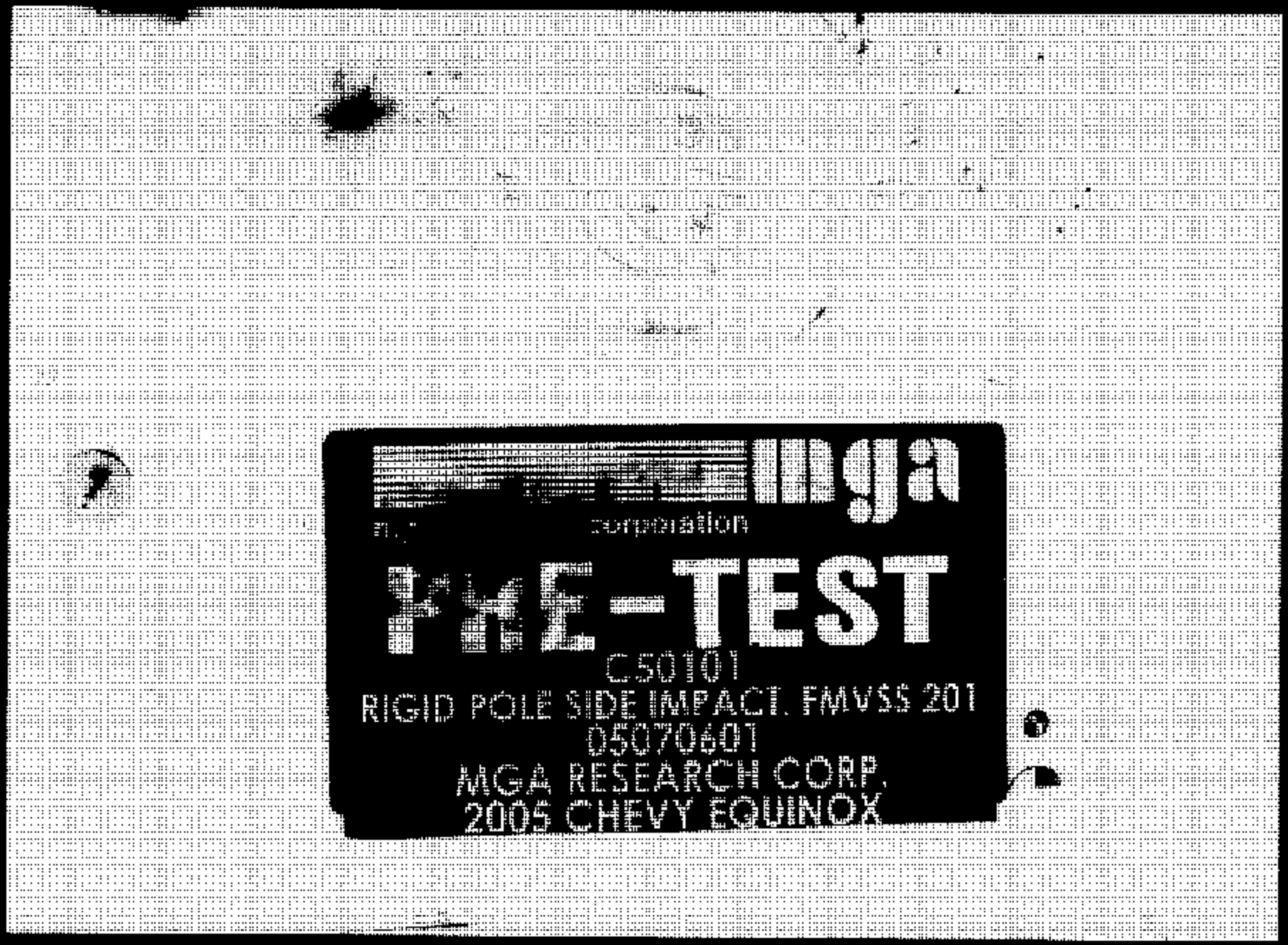
SEATING CAPACITY | TOTAL 5 | FRONT 2 | CENTER 0 | REAR 3

The combined weight of occupants and cargo should never exceed 555 kg or 1223 lbs.

ORIGINAL TIRE SIZE	COLD TIRE INFLATION PRESSURE	
P235/60R17	FRONT	210 kPa, 30 PSI
P235/60R17	REAR	210 kPa, 30 PSI
T155/90R16	SPARE	420 kPa, 60 PSI

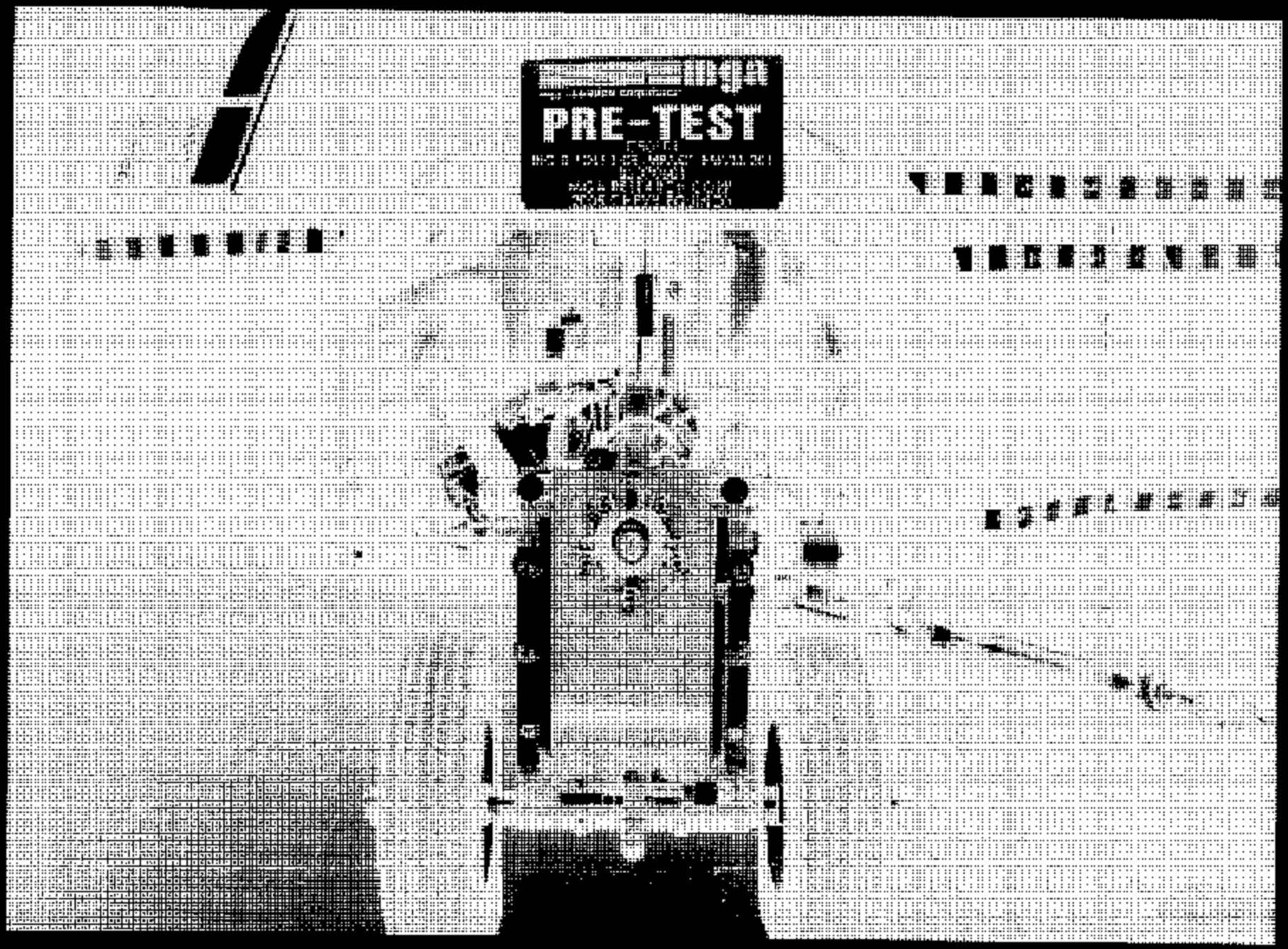
SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION

Tire Placard

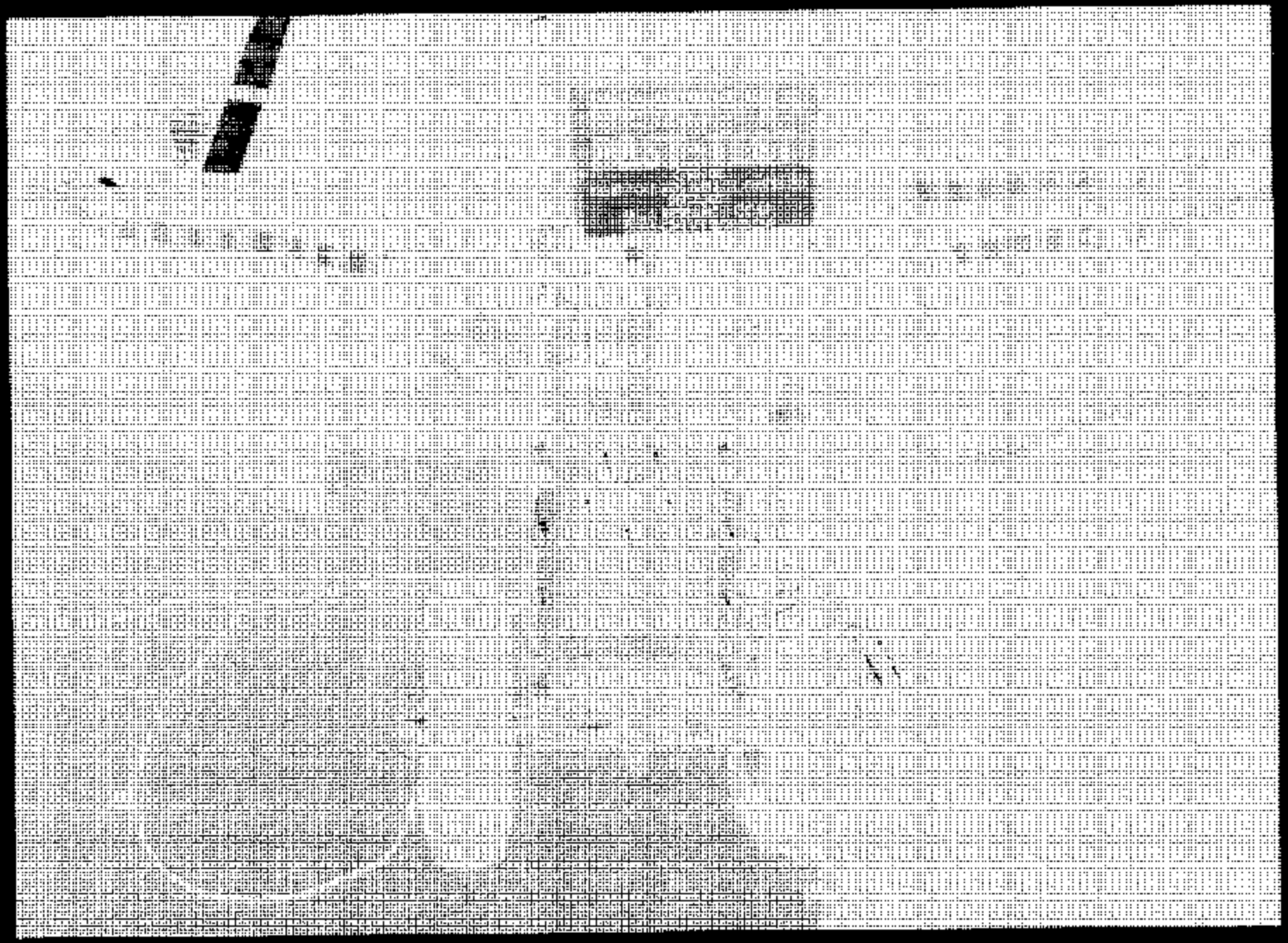


Pre-Test Fuel Filler Cap

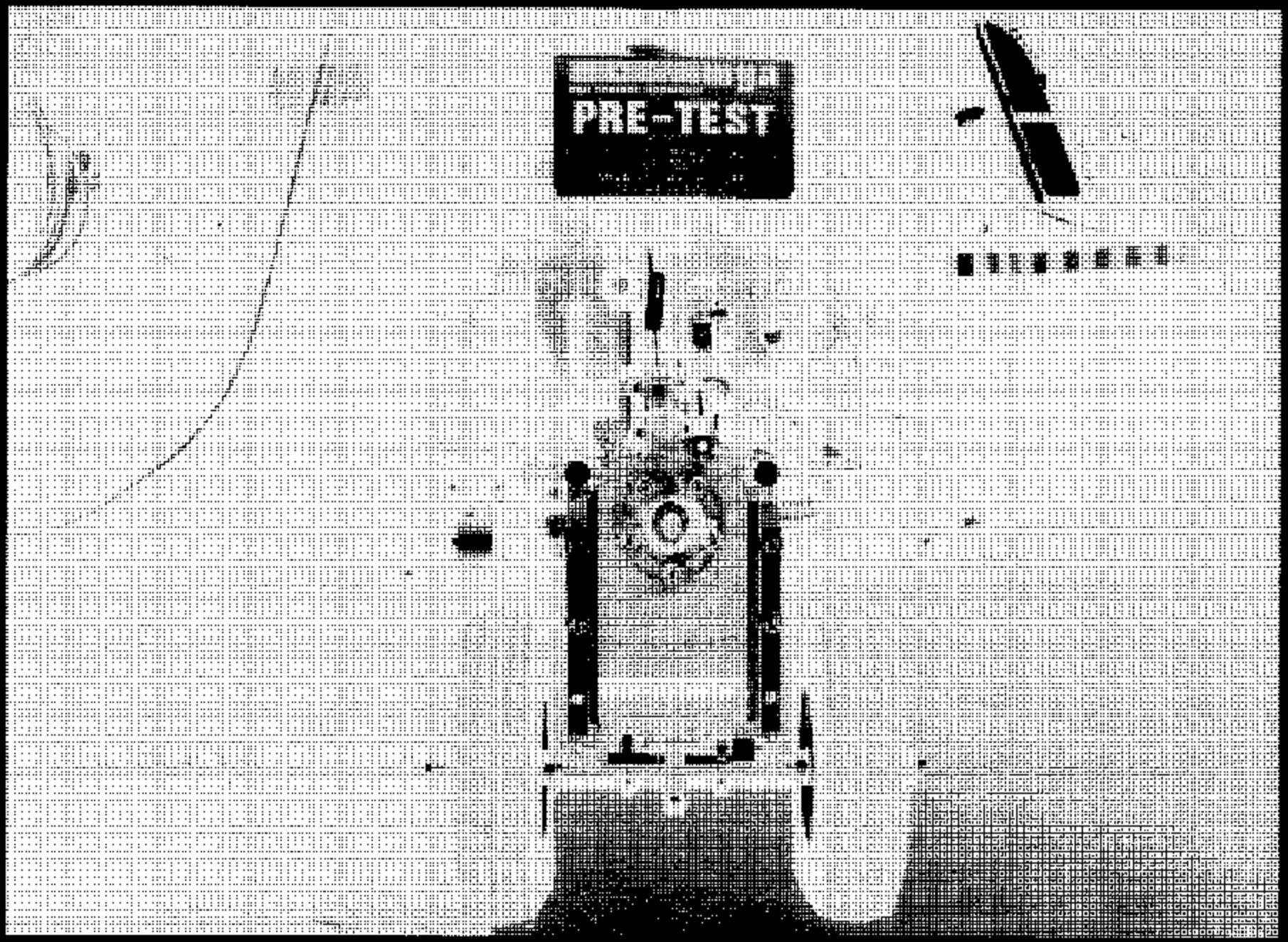
Post-Test Fuel Filler Cap



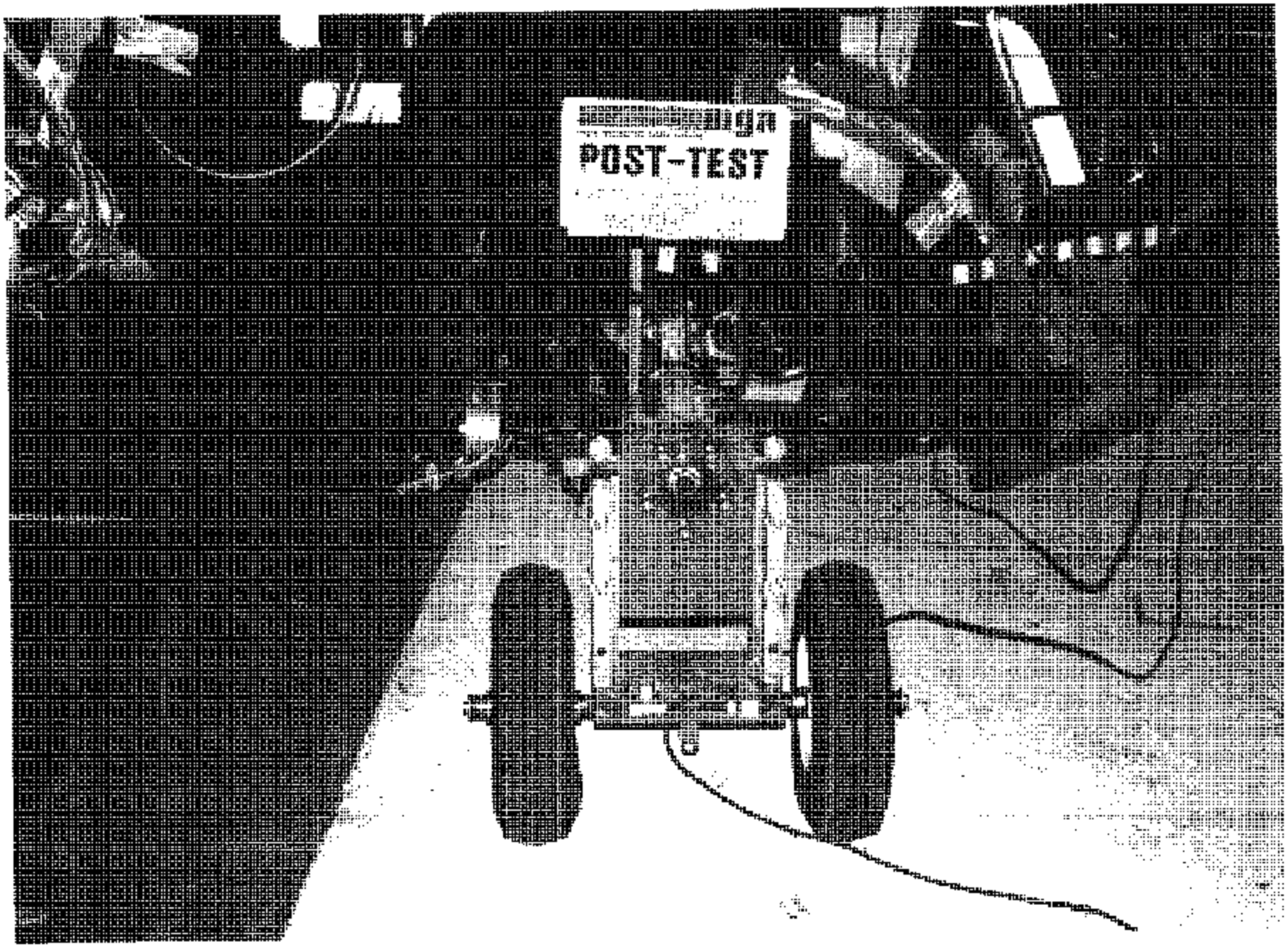
Pre-Test Left Front Wheel Dolly



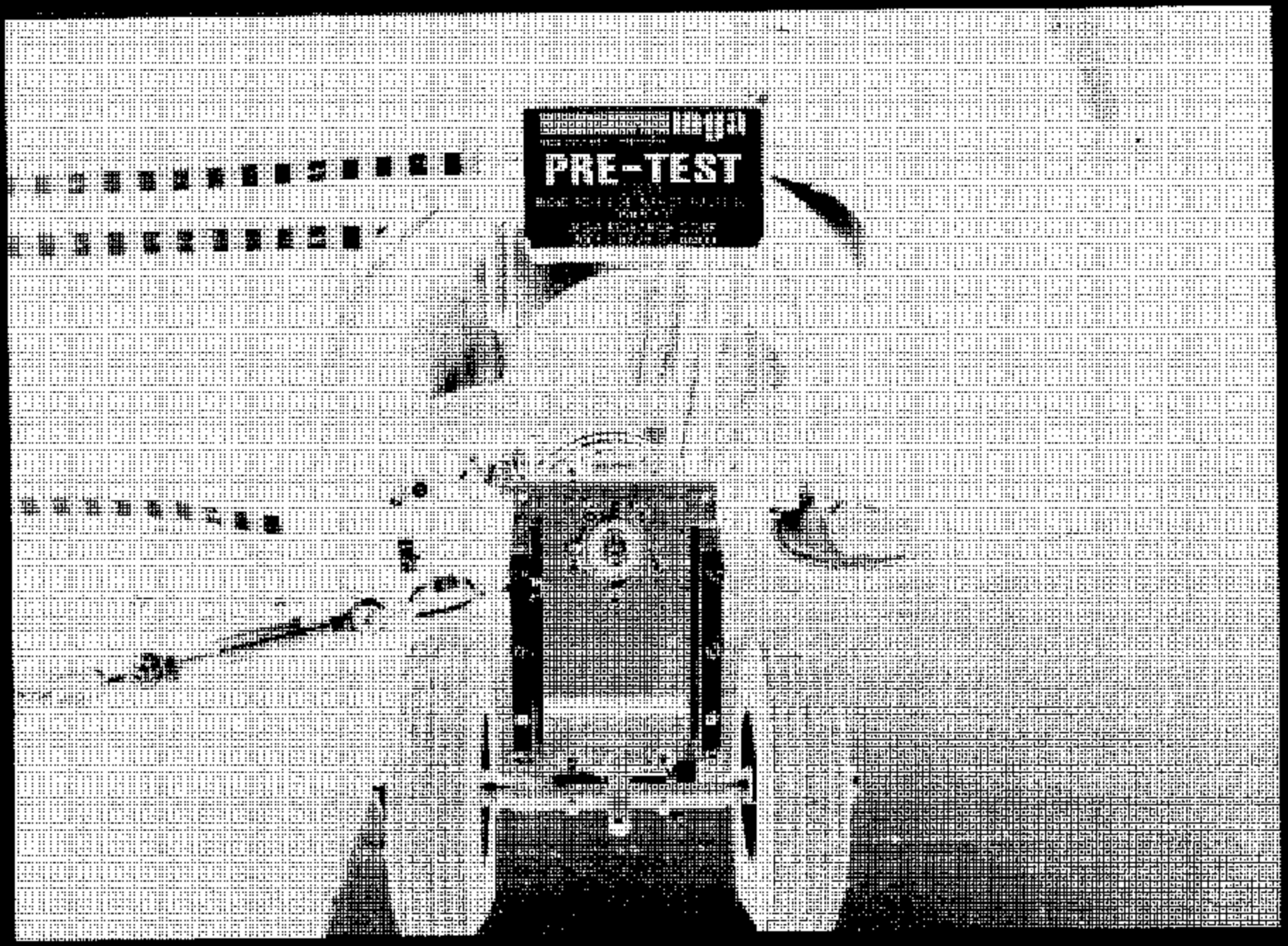
Post-Test Left Front Wheel Dolly



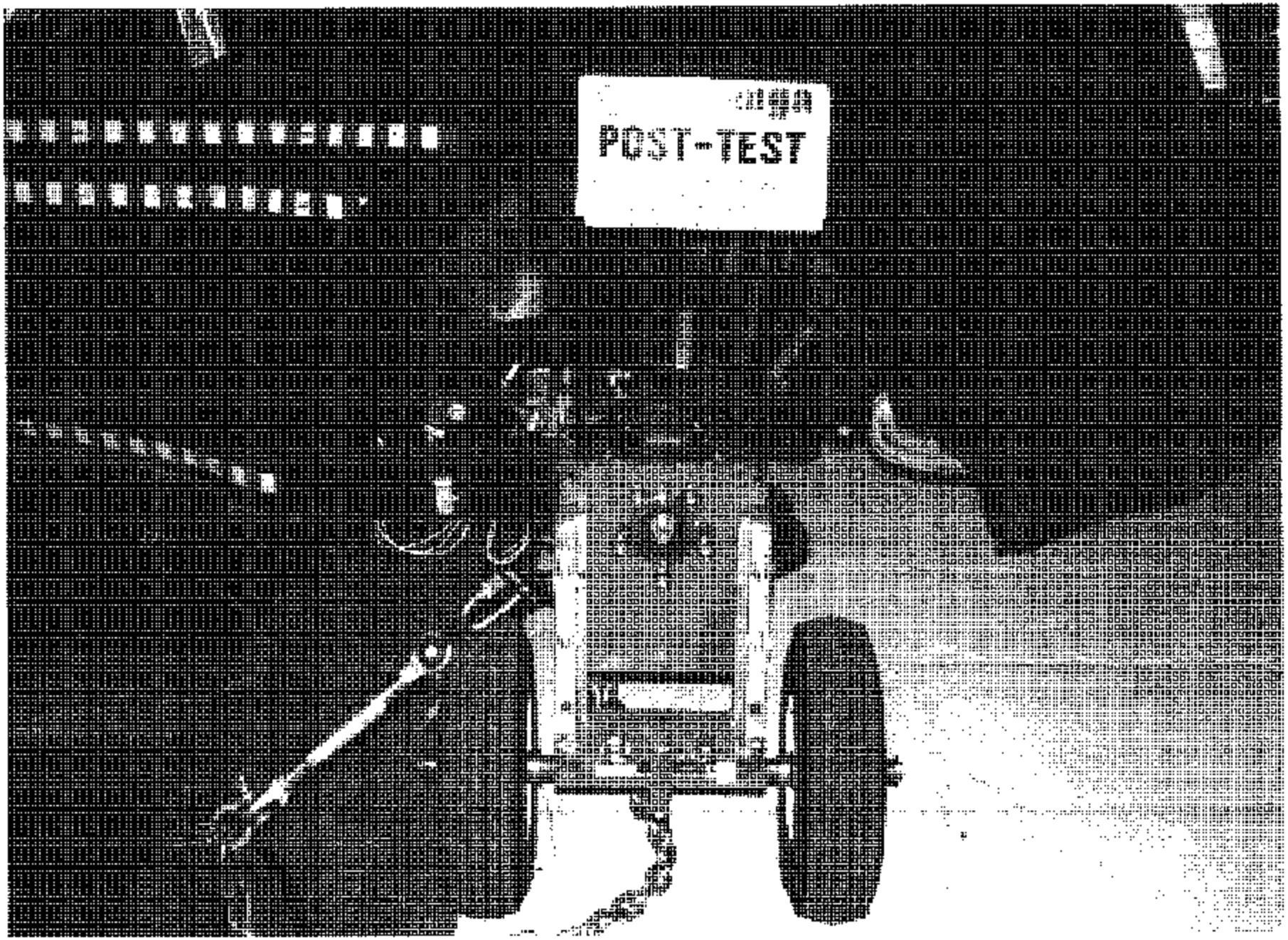
Pre-Test Right Front Wheel Dolly



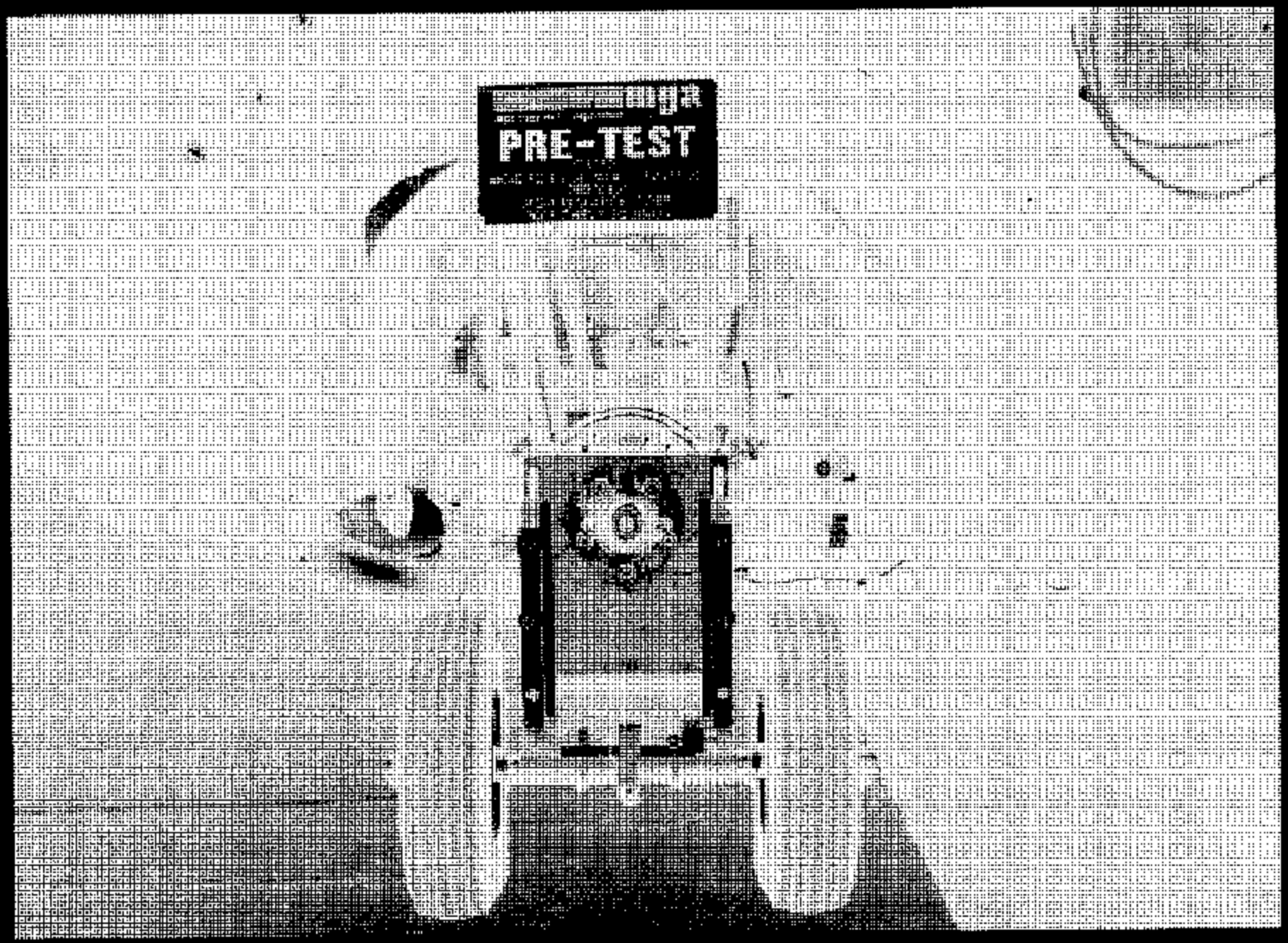
Post-Test Right Front Wheel Dolly



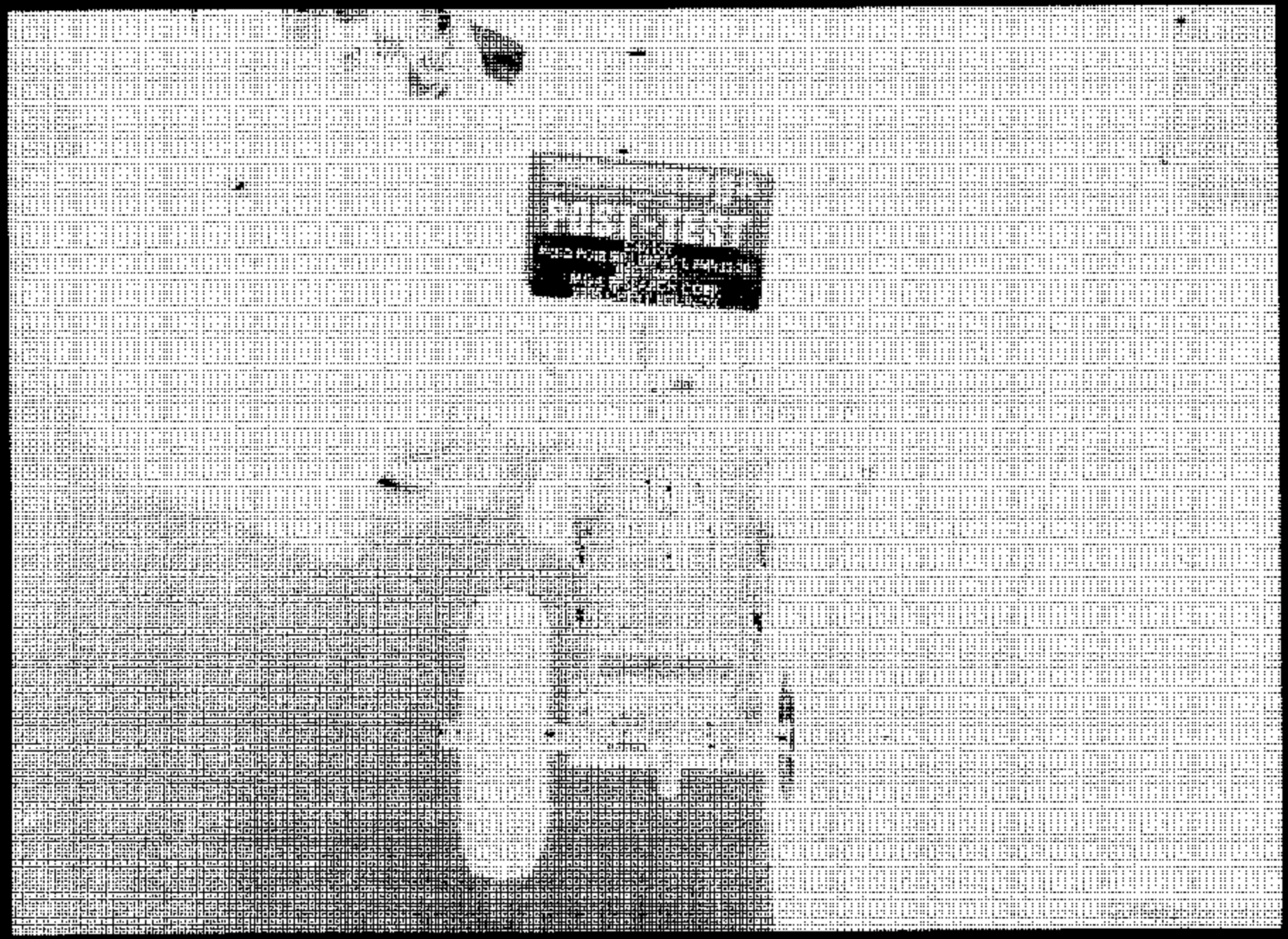
Pre-Test Left Rear Wheel Dolly



Post-Test Left Rear Wheel Dolly

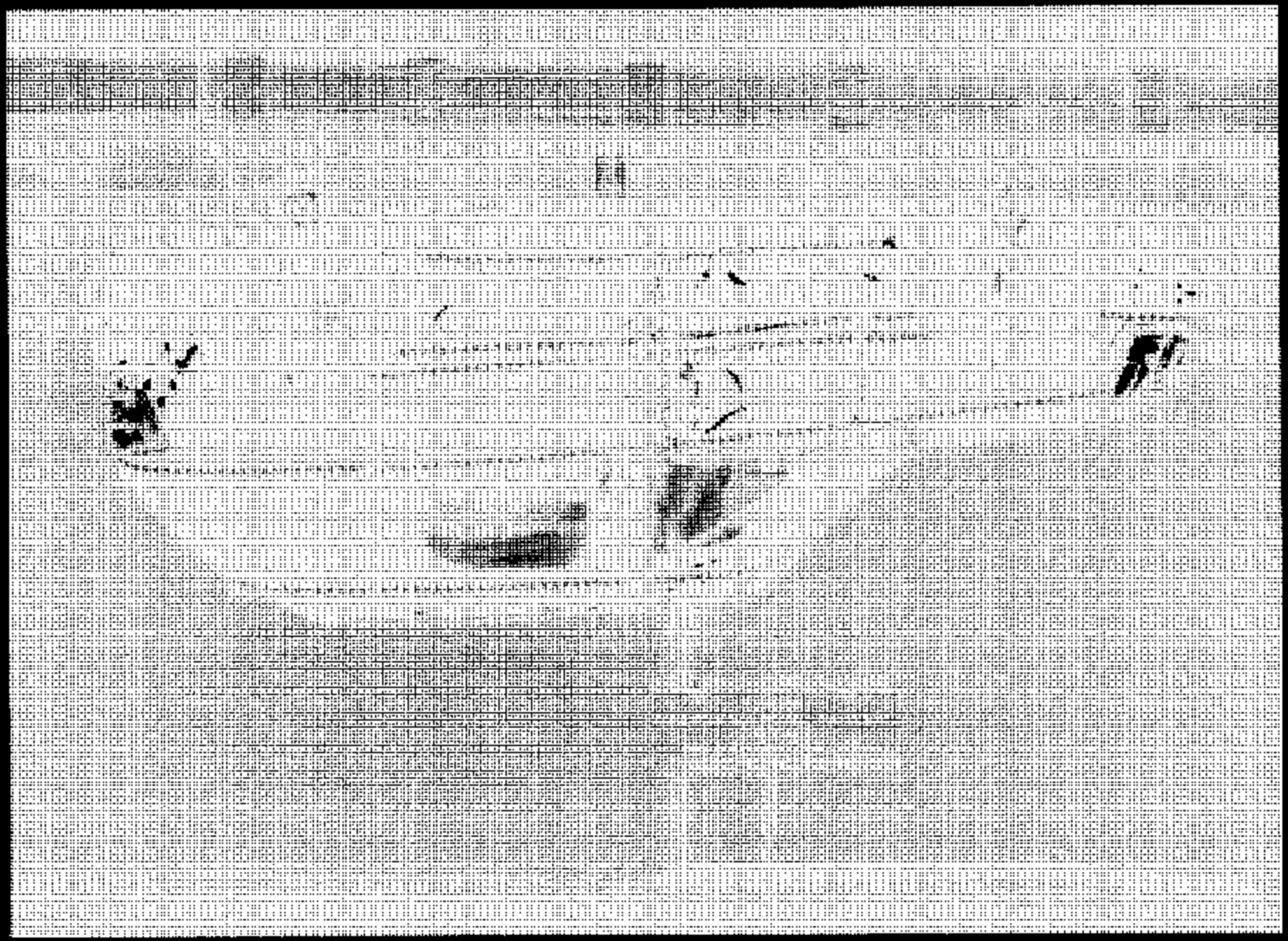


Pre-Test Right Rear Wheel Dolly



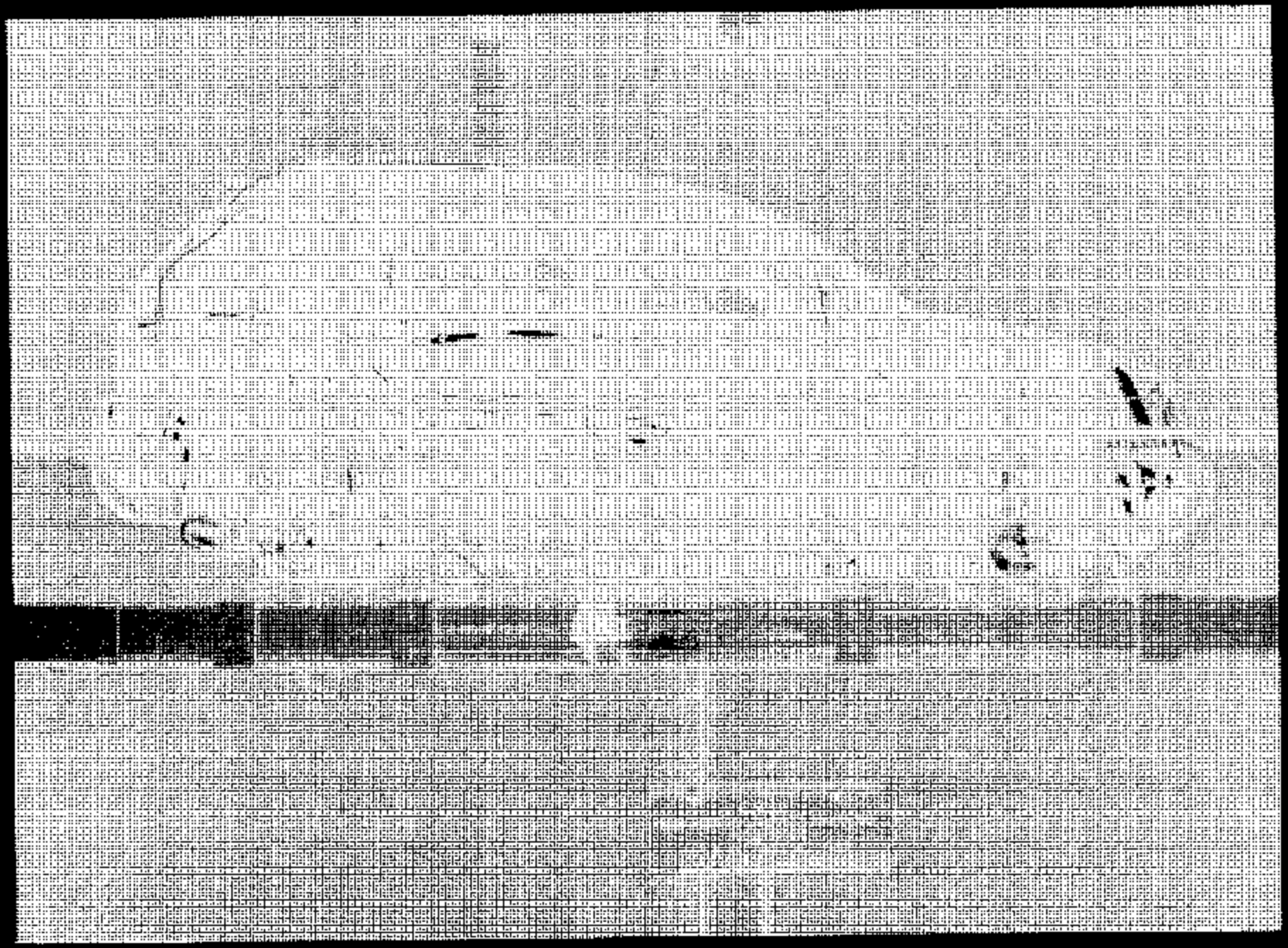
Post-Test Right Rear Wheel Dolly

Rollover 60 Degrees



Rollover 180 Degrees

Rollover 270 Degrees



Rollover 360 Degrees

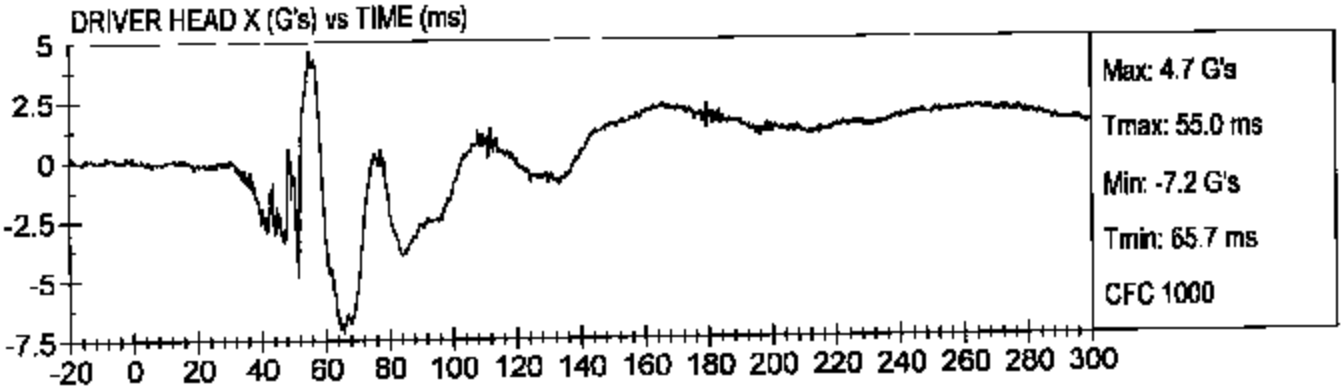
APPENDIX B

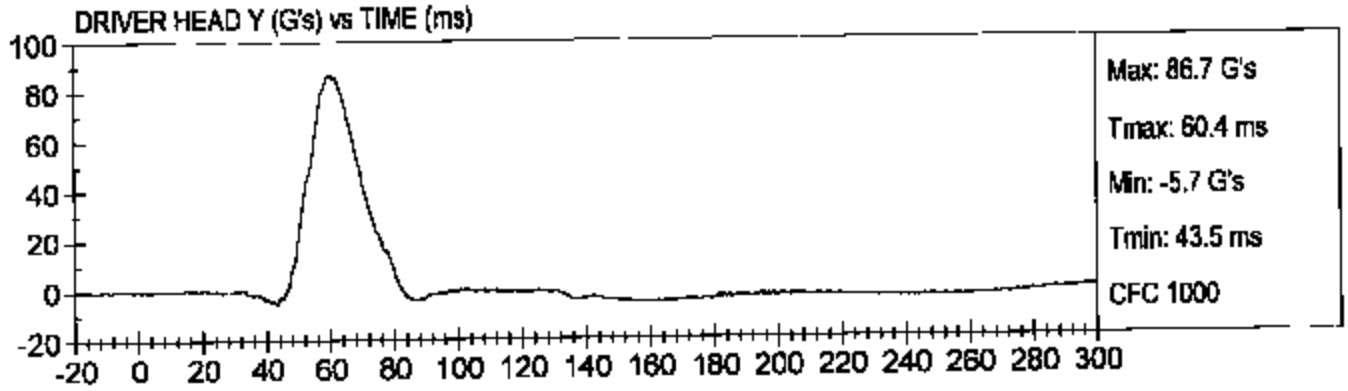
SID/HIII AND VEHICLE RESPONSE DATA

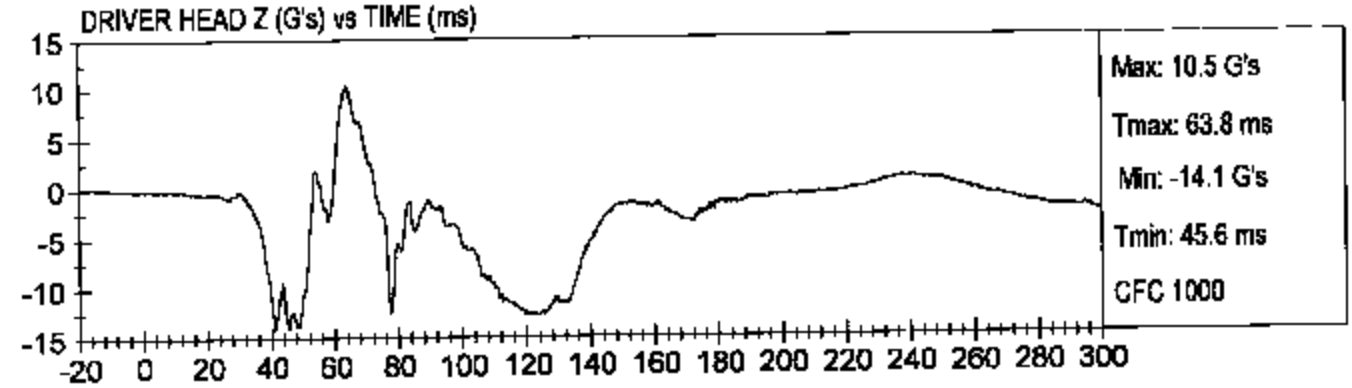
TABLE OF DATA PLOTS

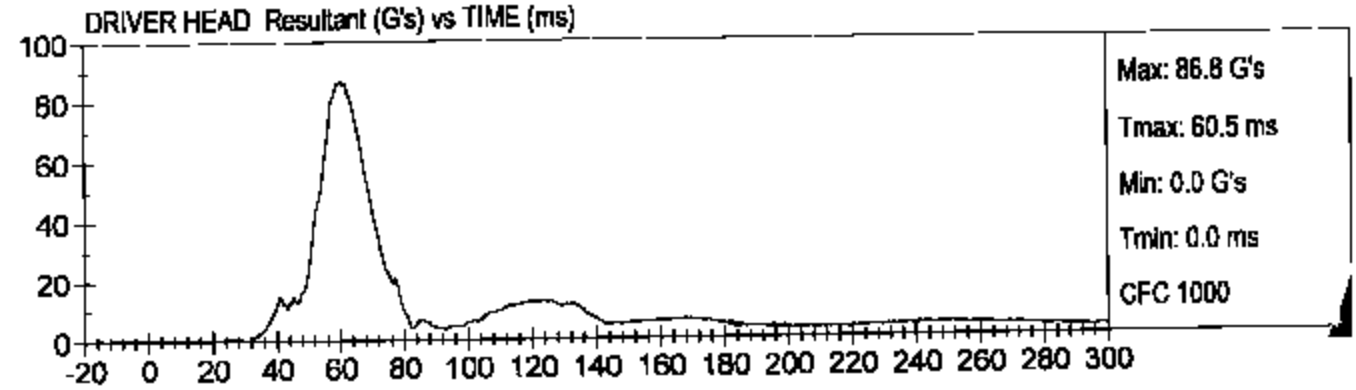
RIGID POLE SIDE IMPACT, FMVSS 201P
2006 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)



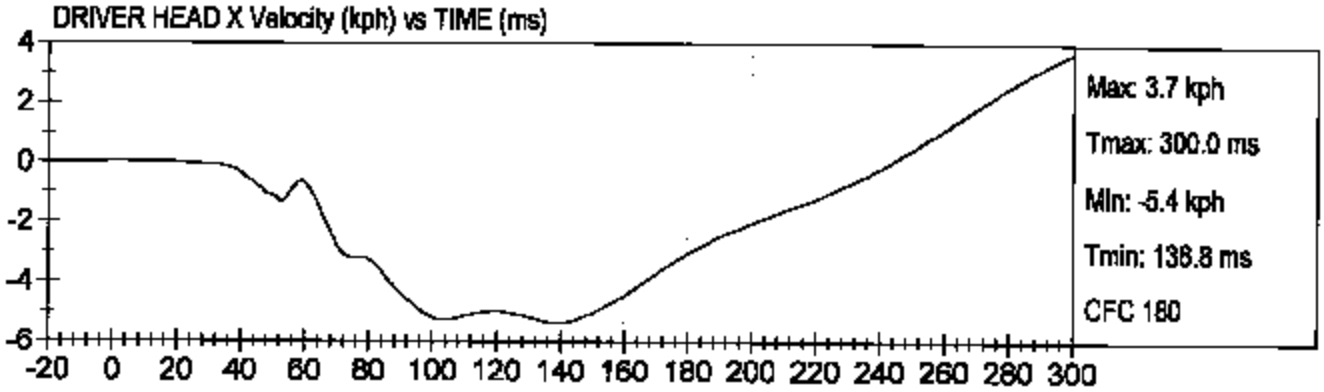


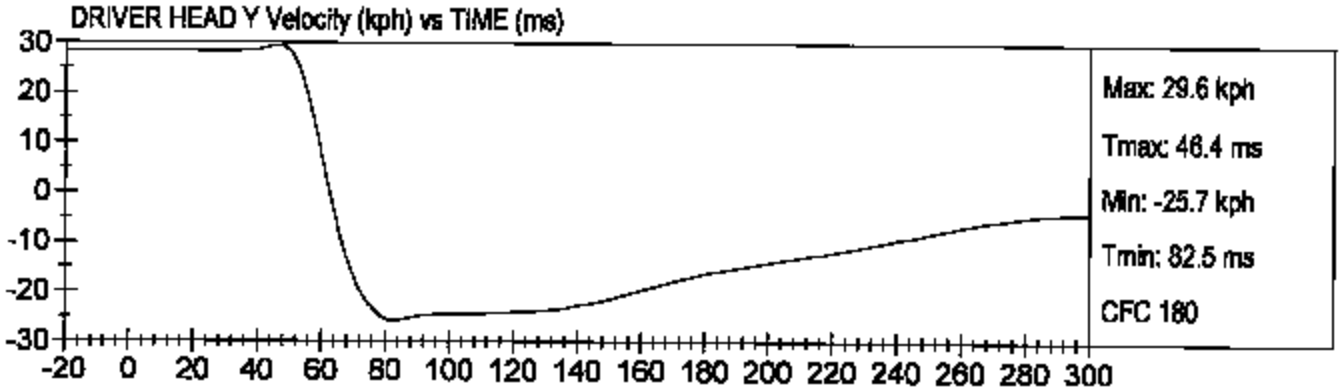


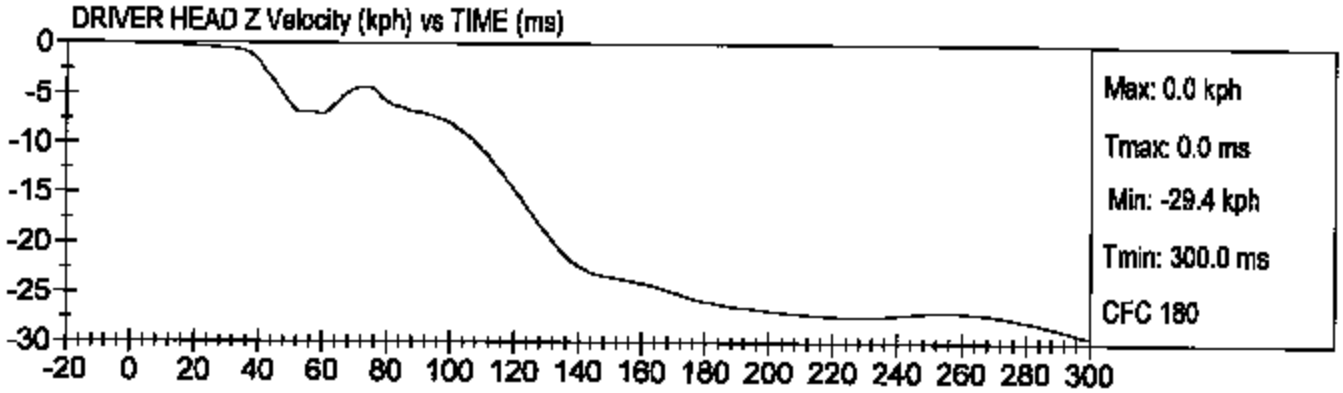


RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

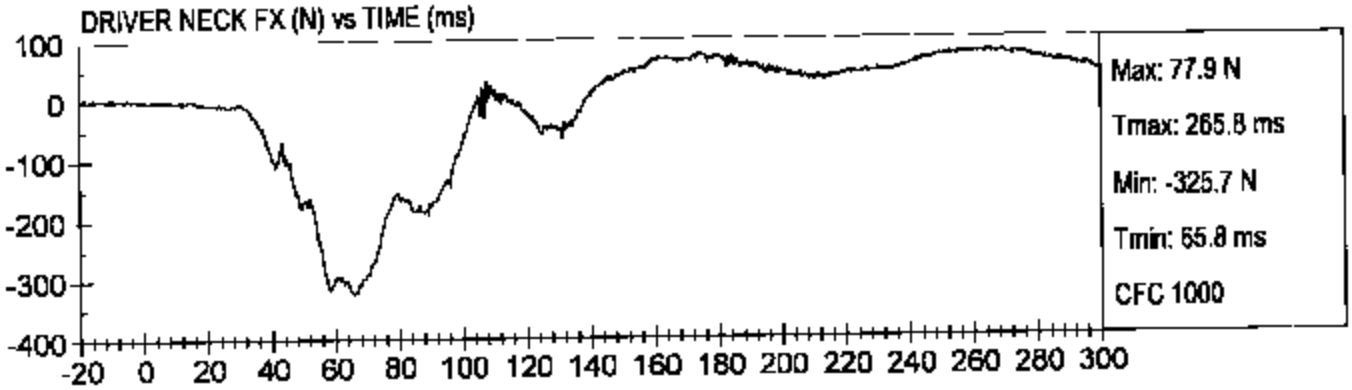


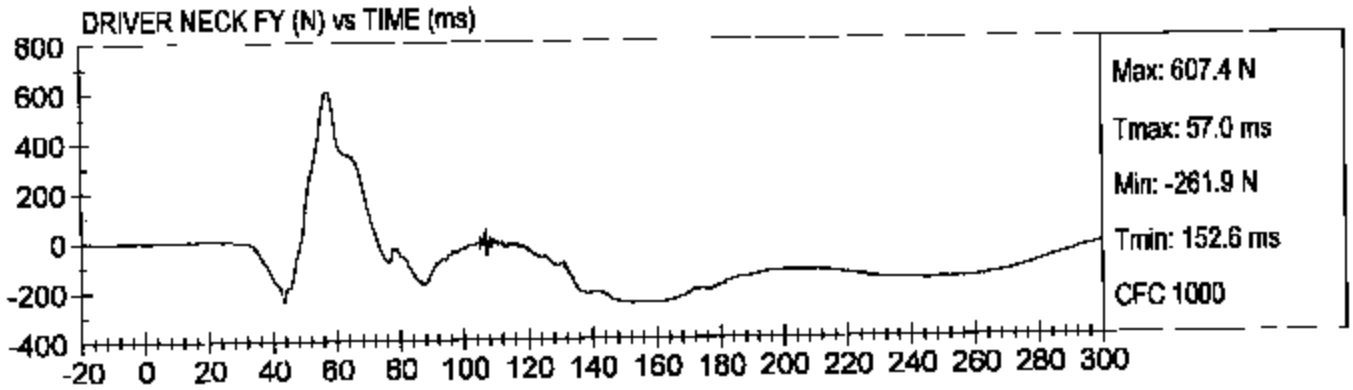


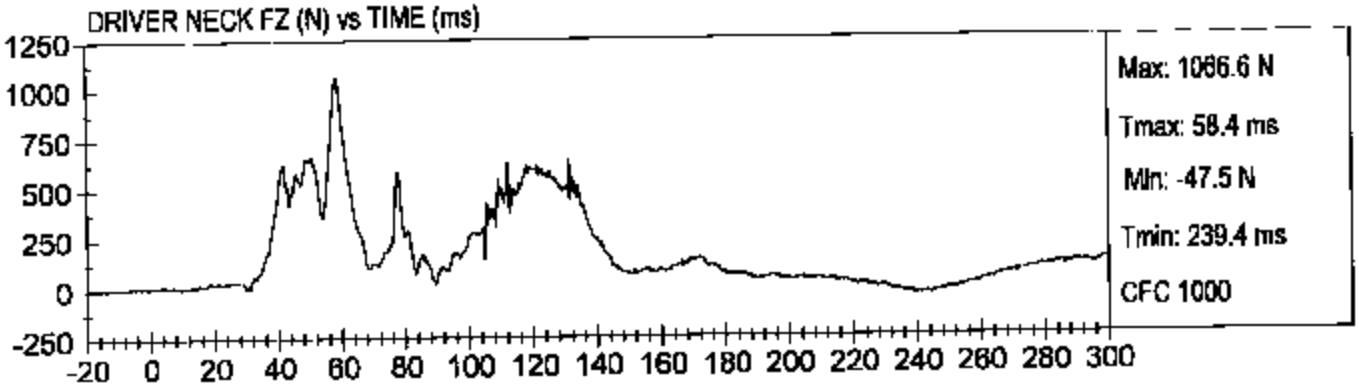


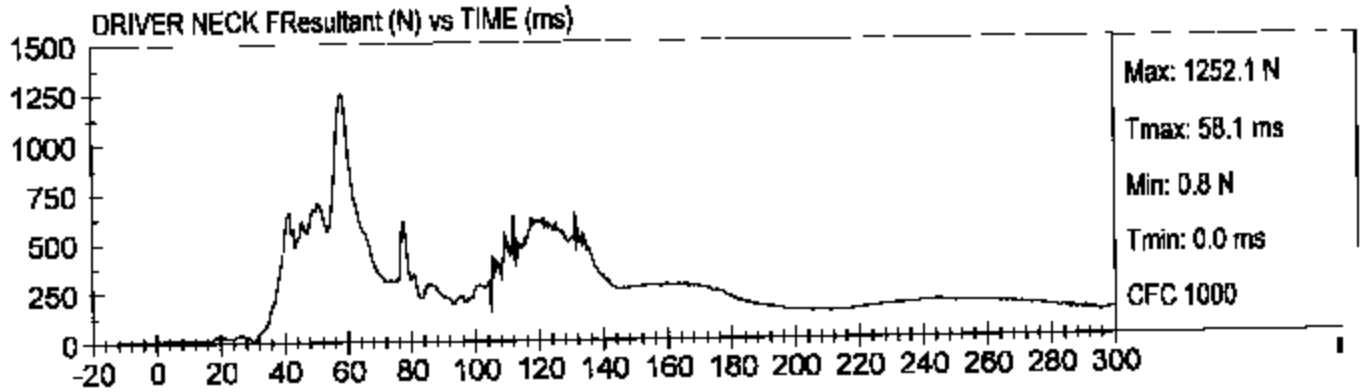
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)



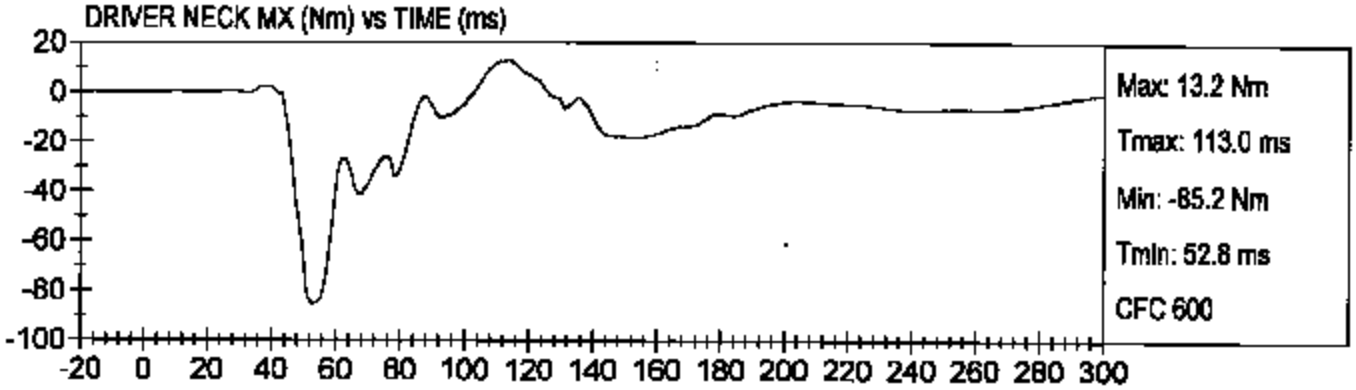


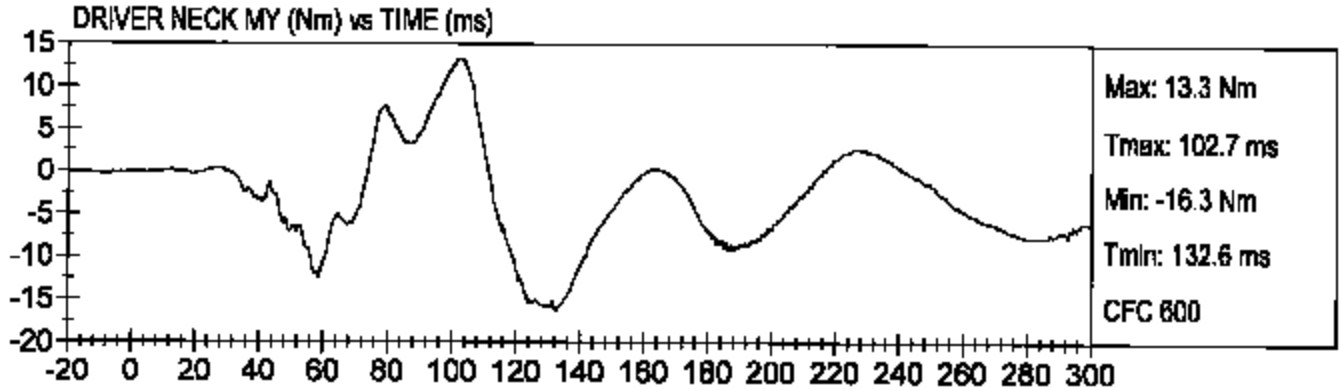


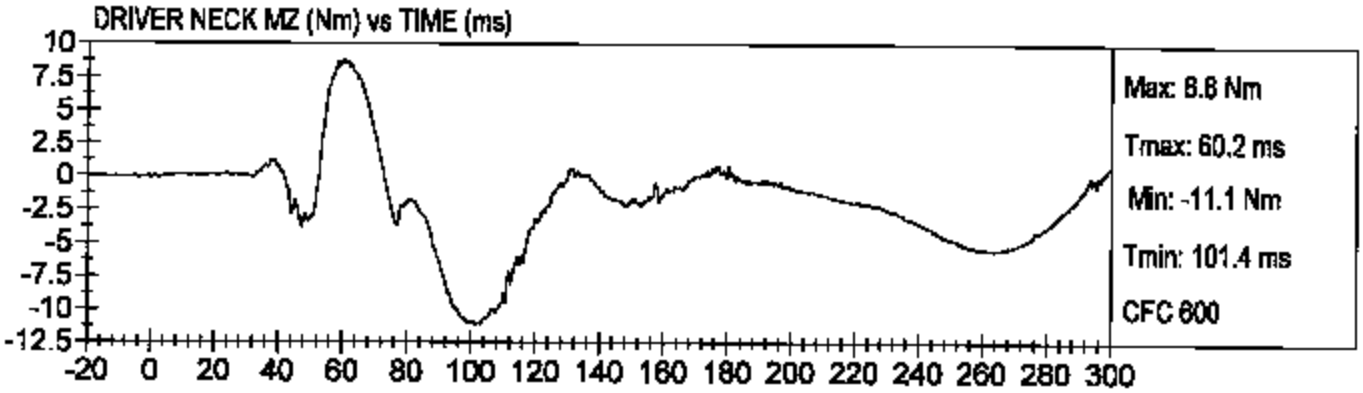


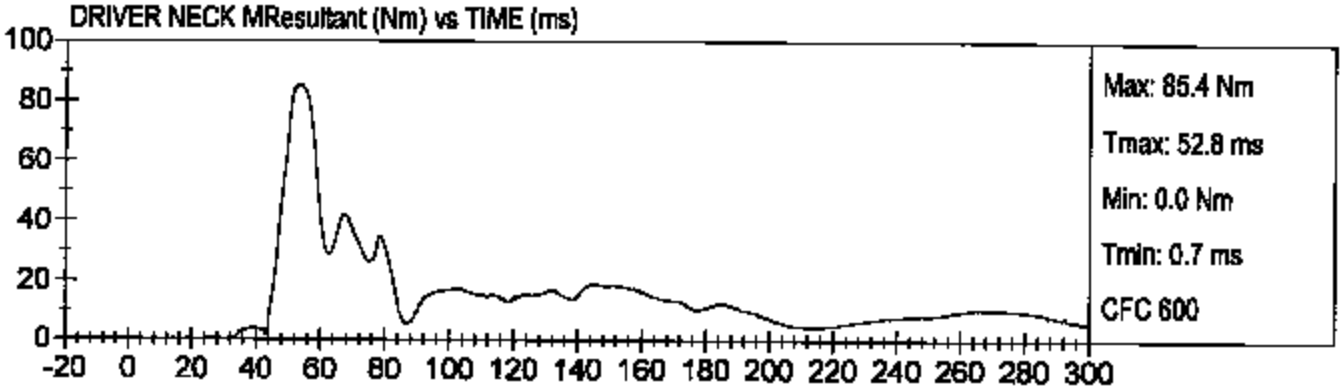
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)



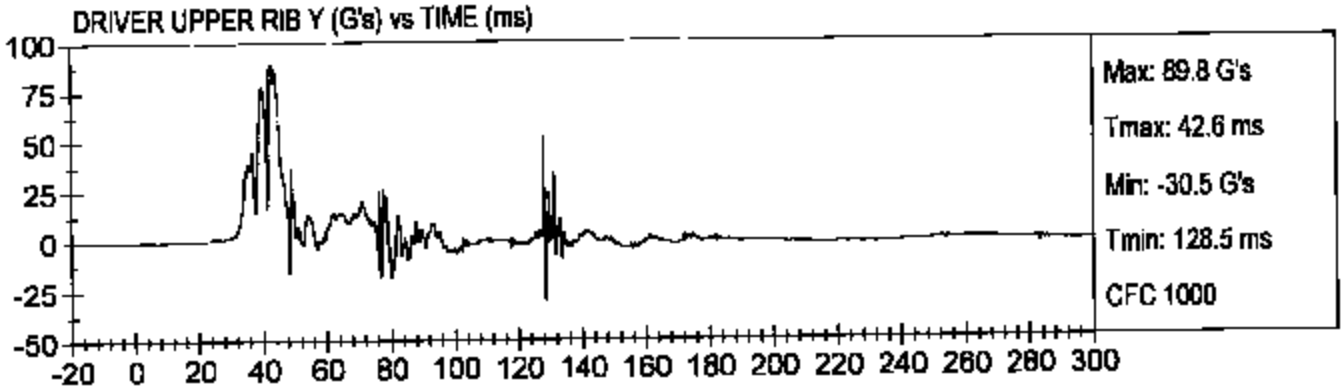


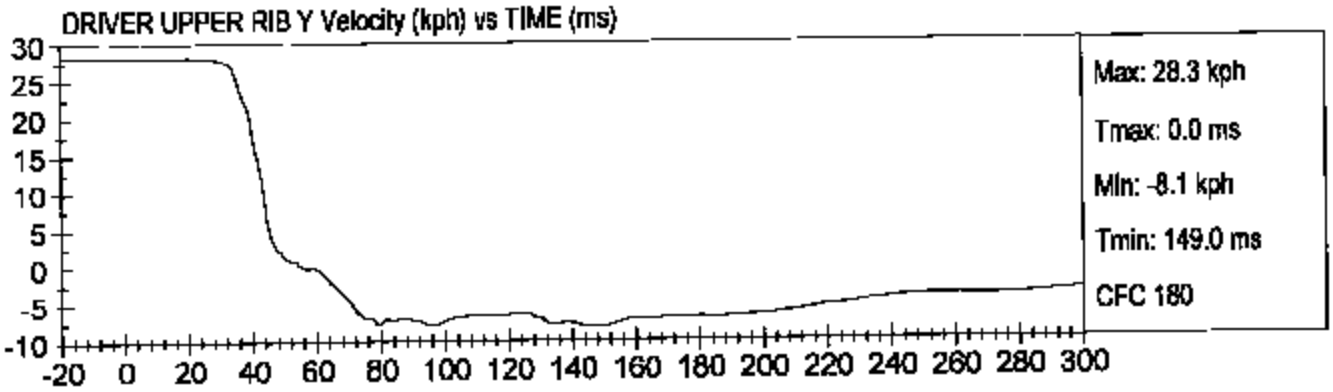


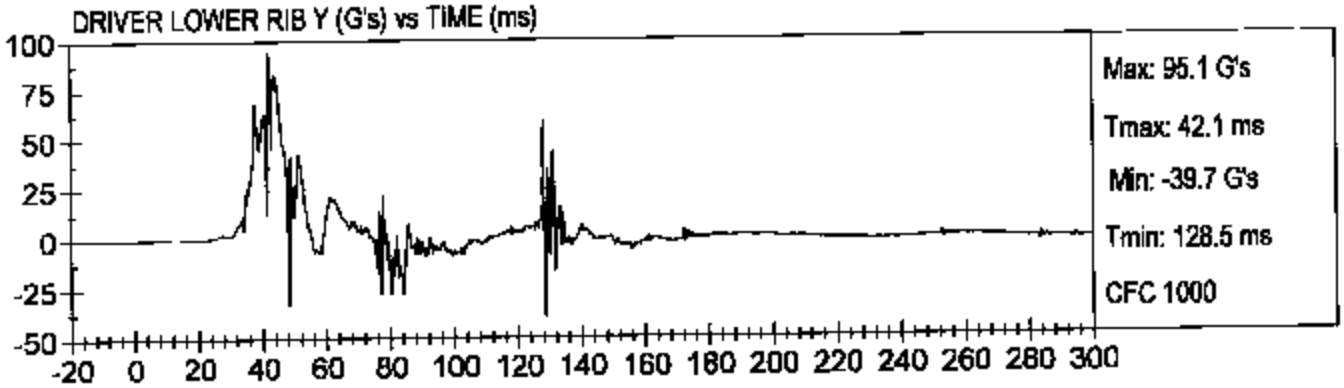


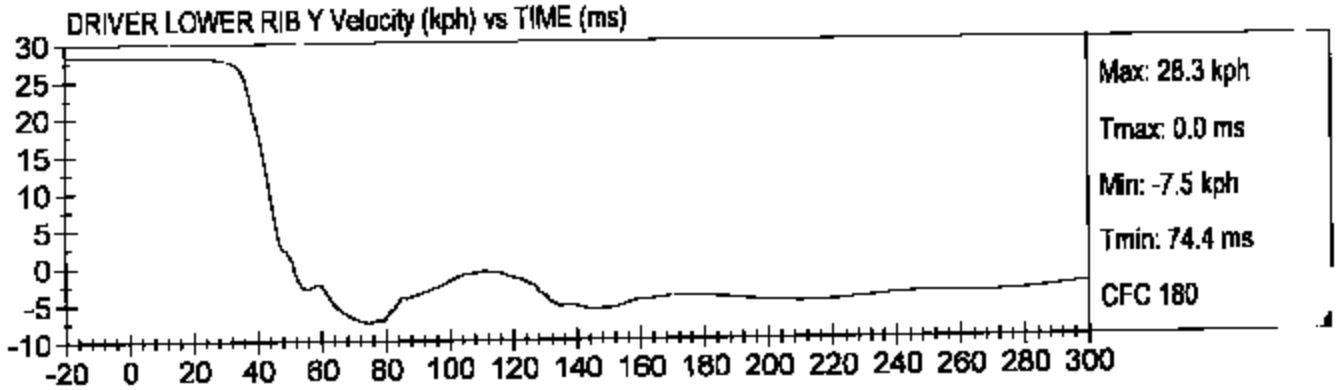
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)





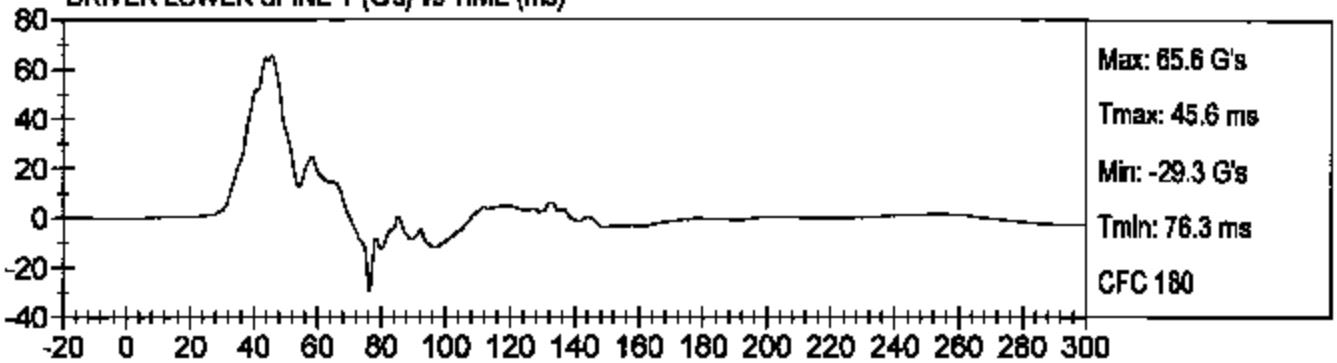




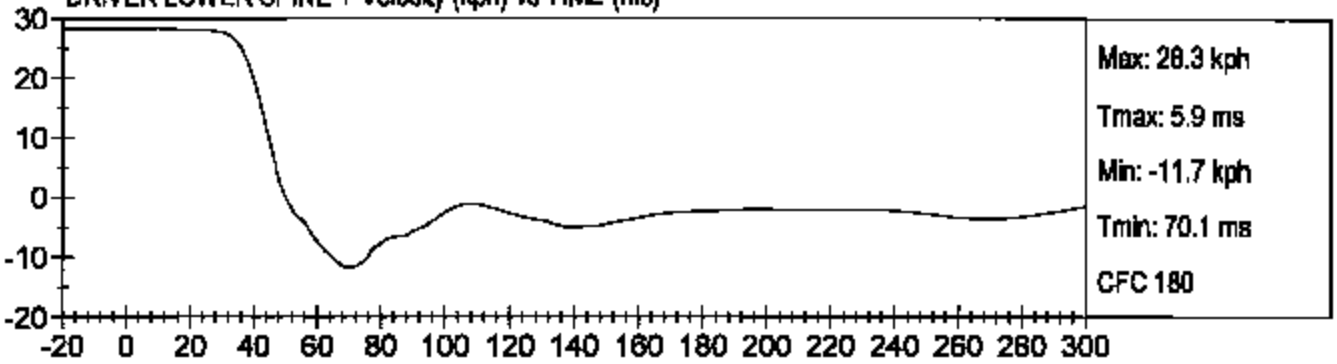
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

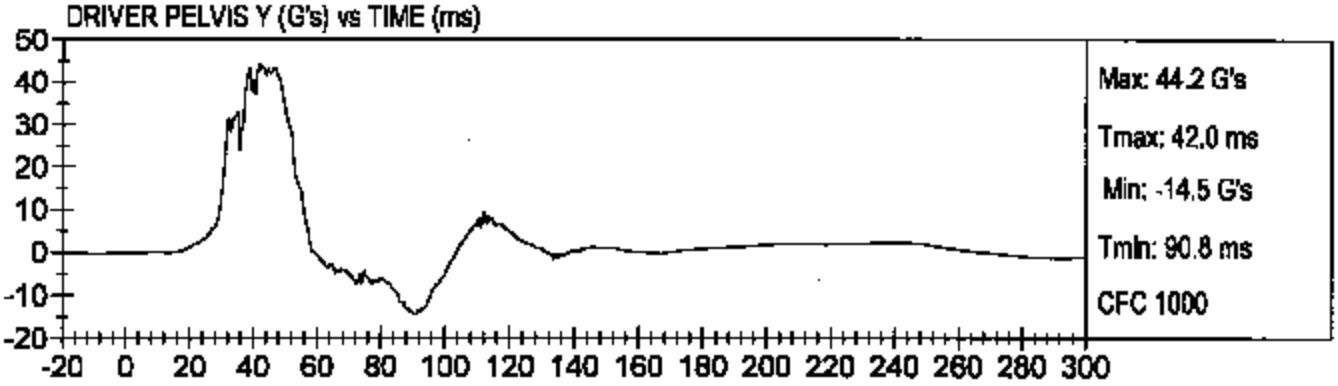
DRIVER LOWER SPINE Y (G's) vs TIME (ms)



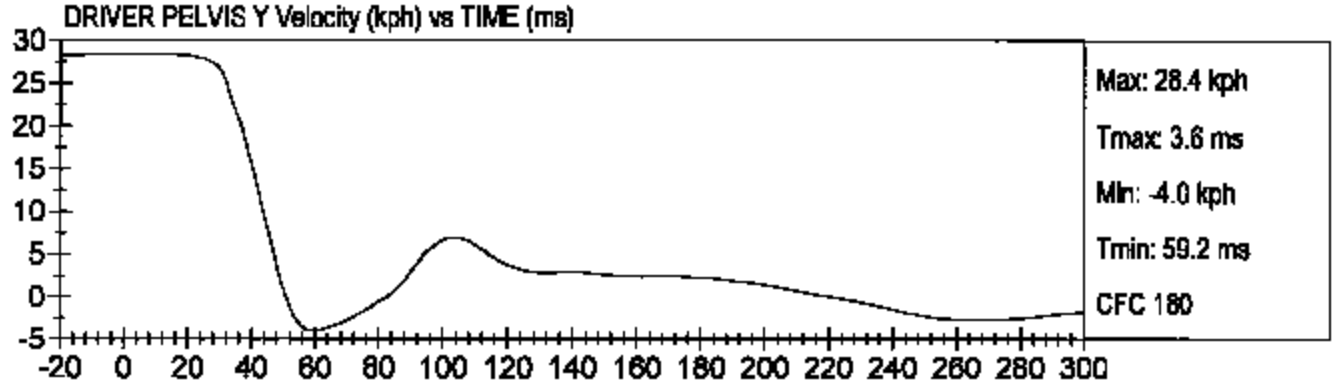
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)



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



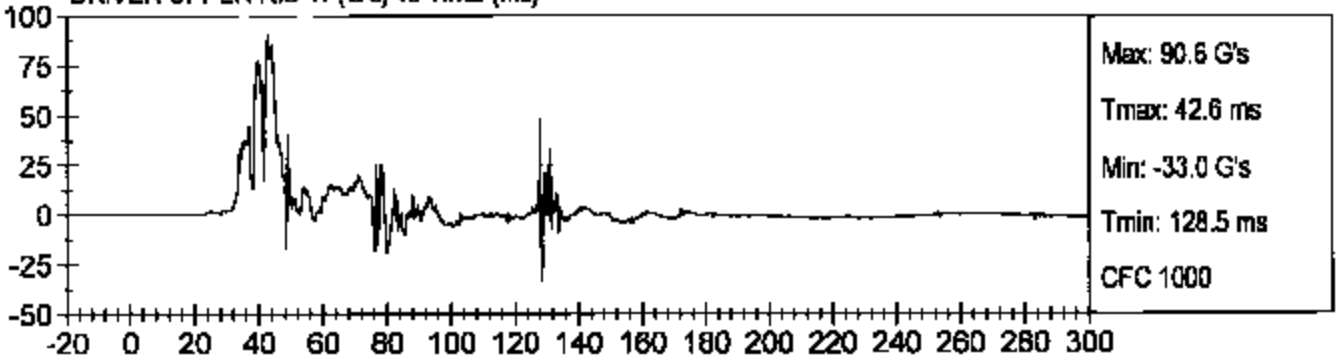
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)



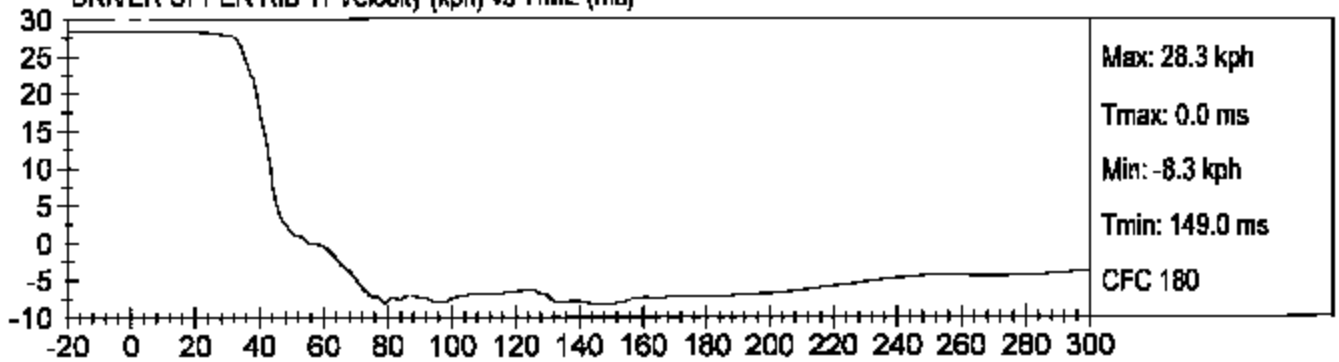
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

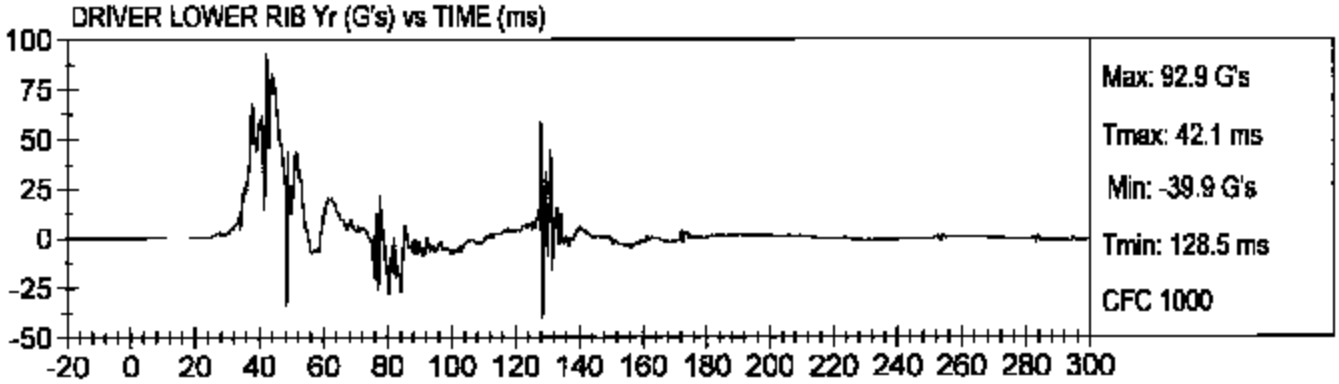
DRIVER UPPER RIB Yr (G's) vs TIME (ms)



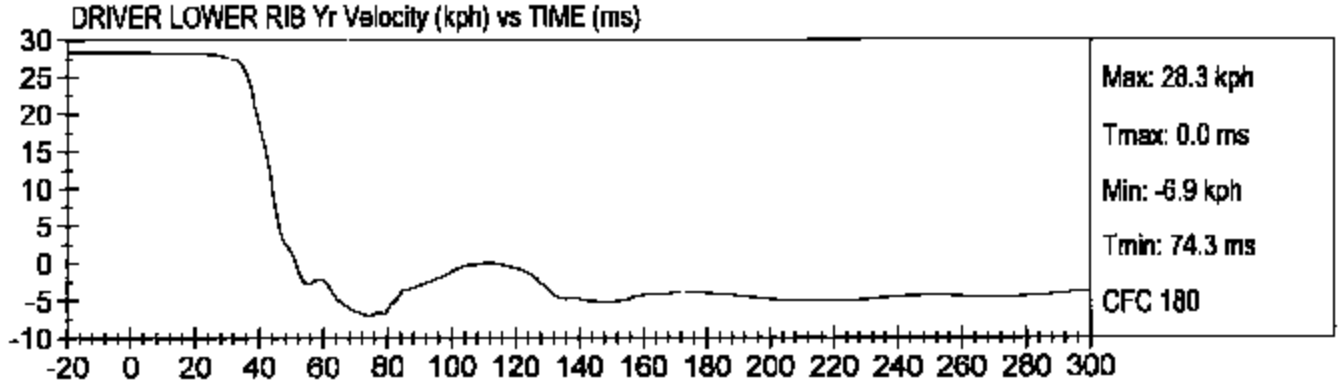
DRIVER UPPER RIB Yr Velocity (kph) vs TIME (ms)



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



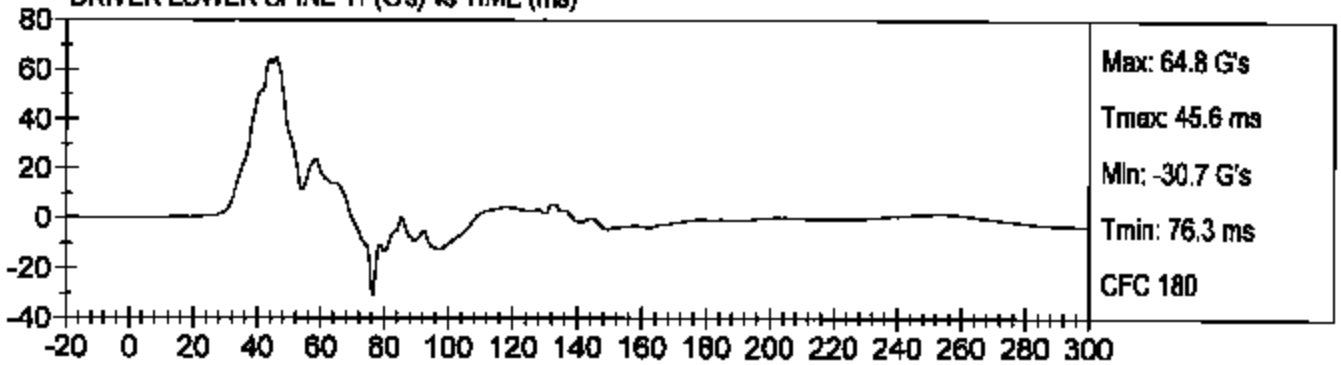
DRIVER LOWER RIB Yr Velocity (kph) vs TIME (ms)



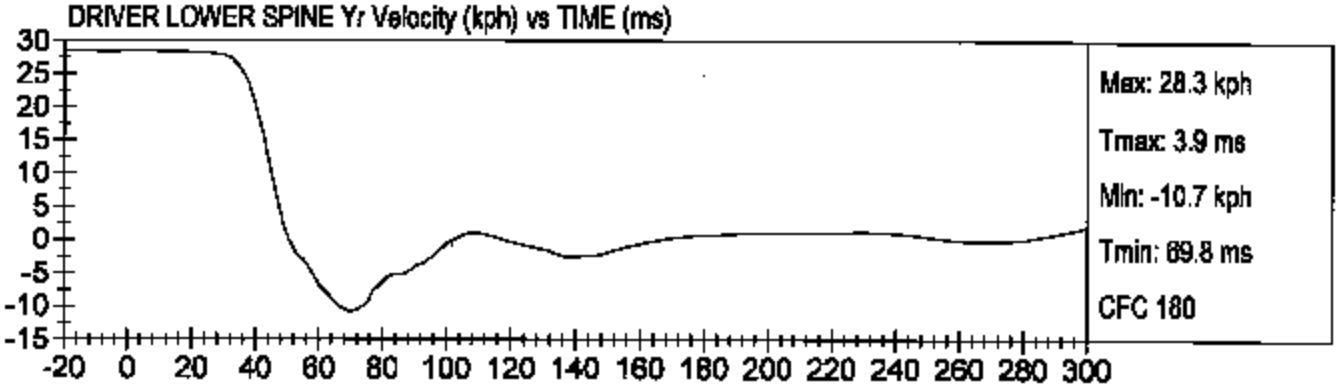
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

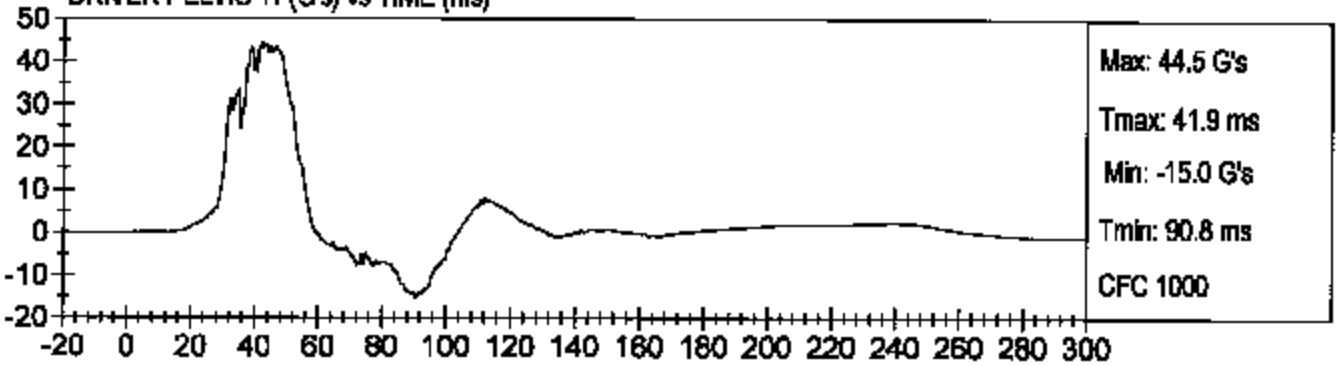
DRIVER LOWER SPINE Yr (G's) vs TIME (ms)



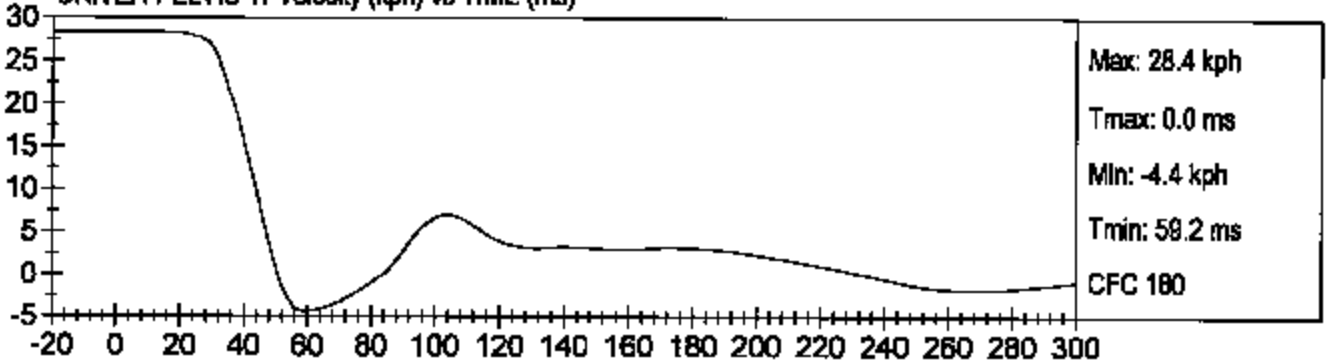
DRIVER LOWER SPINE Yr Velocity (kph) vs TIME (ms)



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

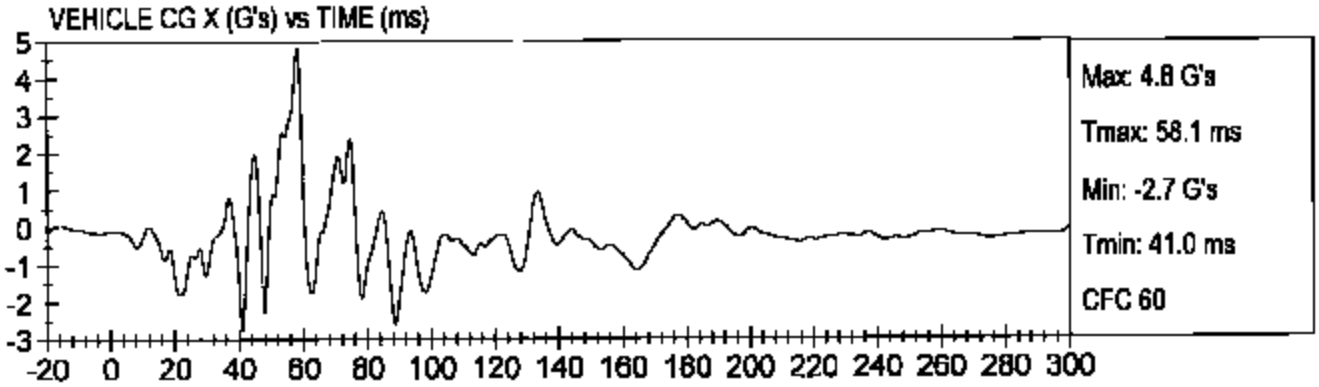


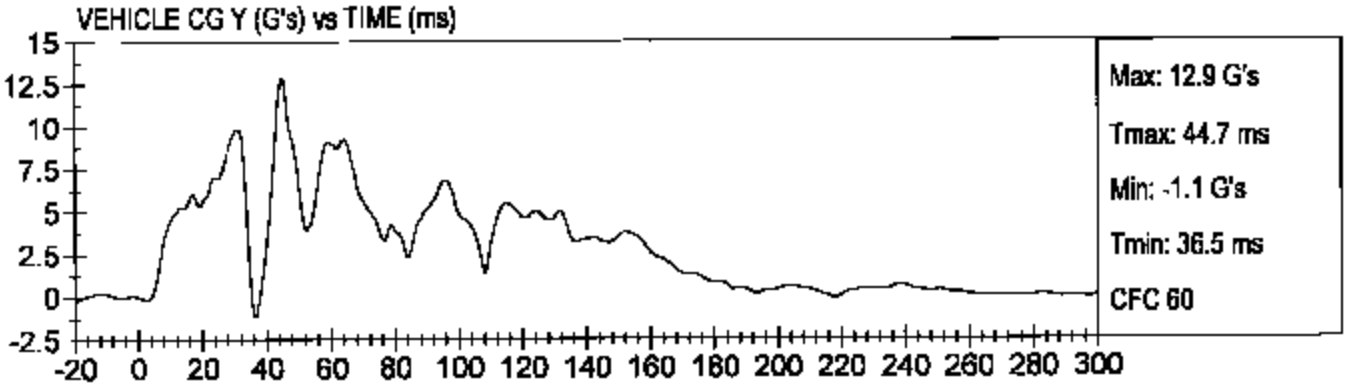
DRIVER PELVIS Yr Velocity (kph) vs TIME (ms)

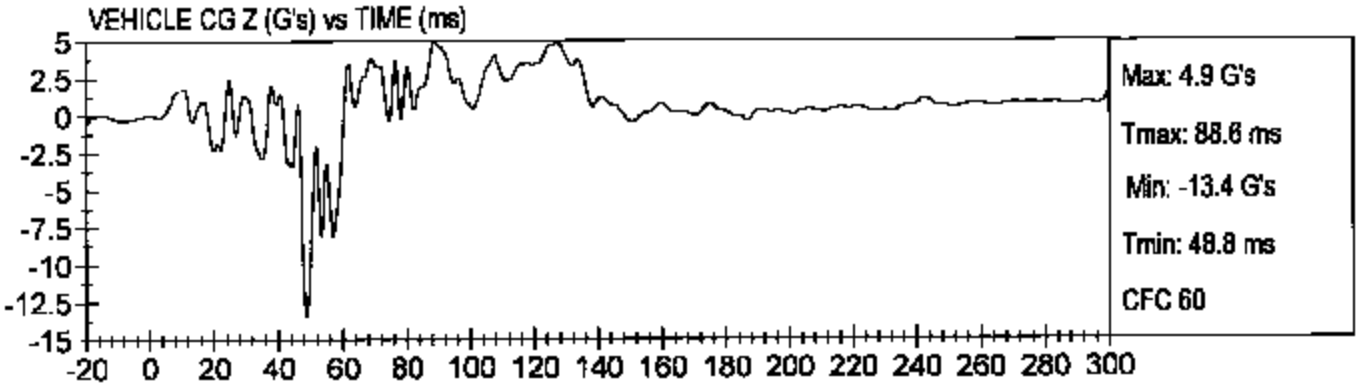


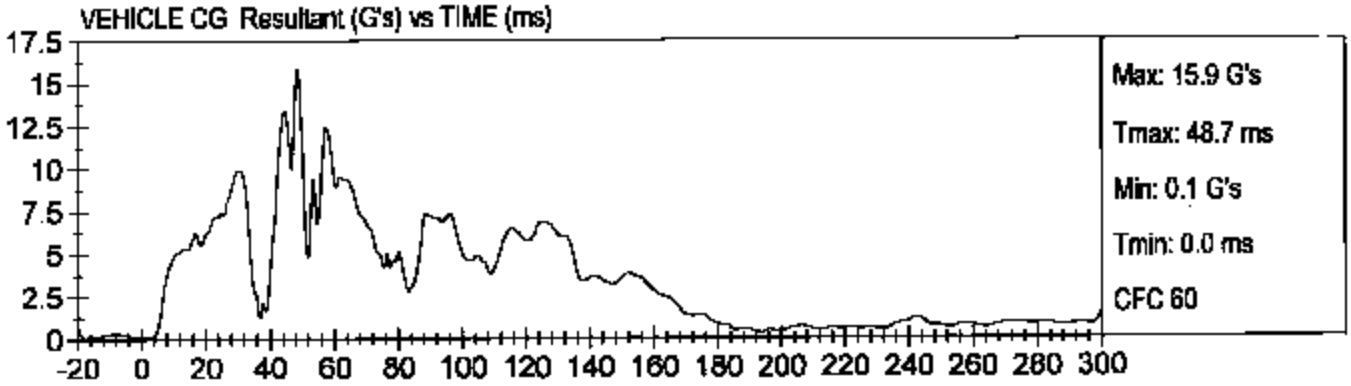
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)









RIGID POLE SIDE IMPACT, FMVSS 201P
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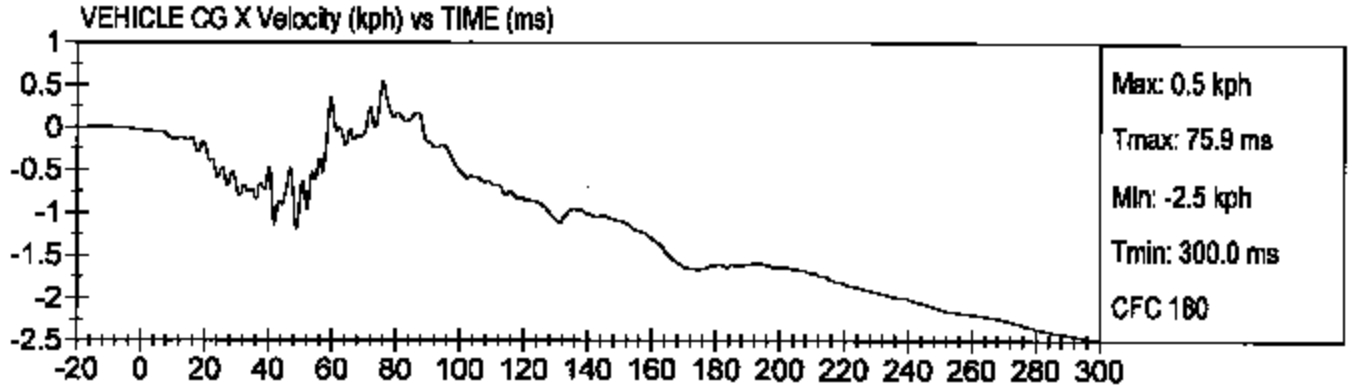
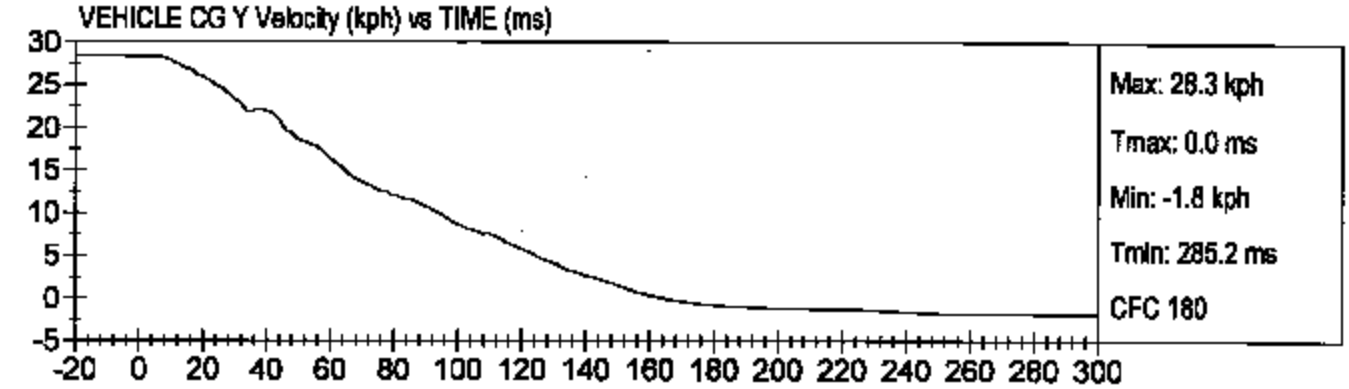
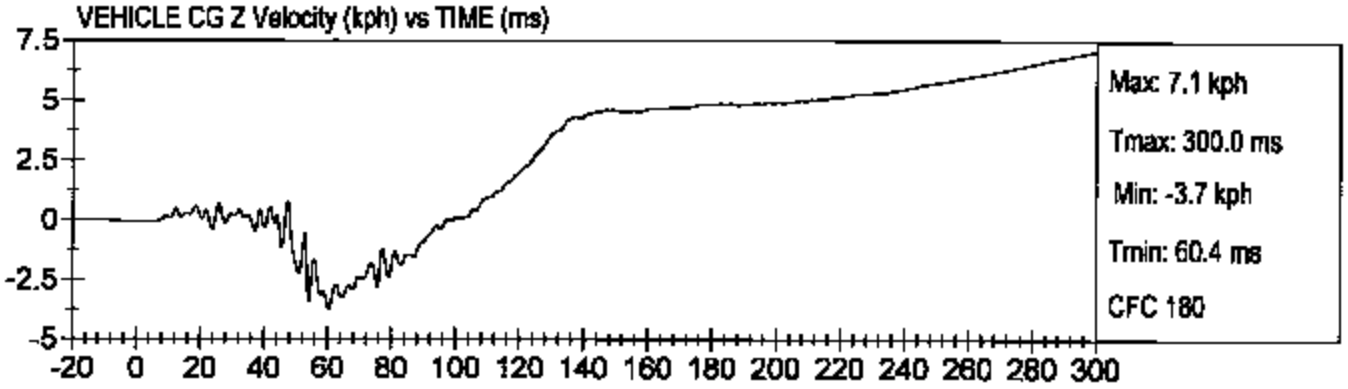
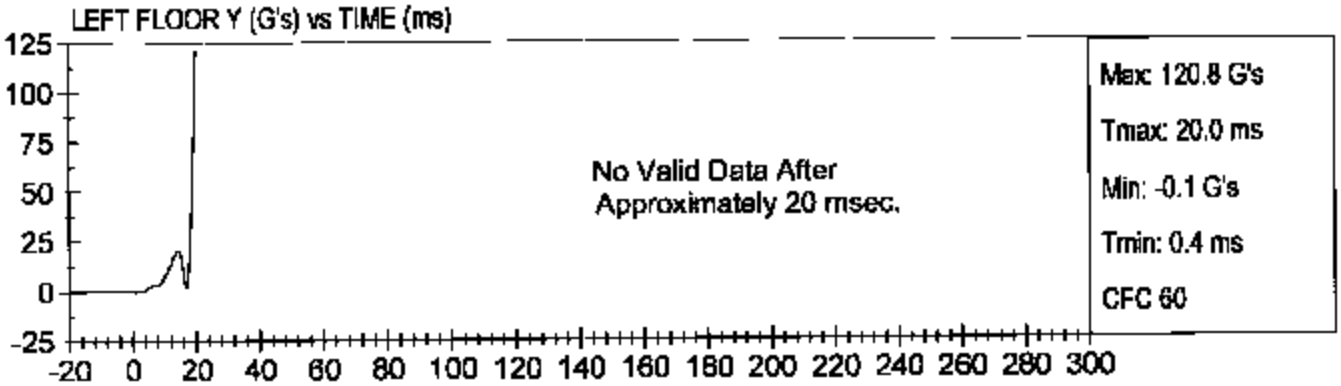


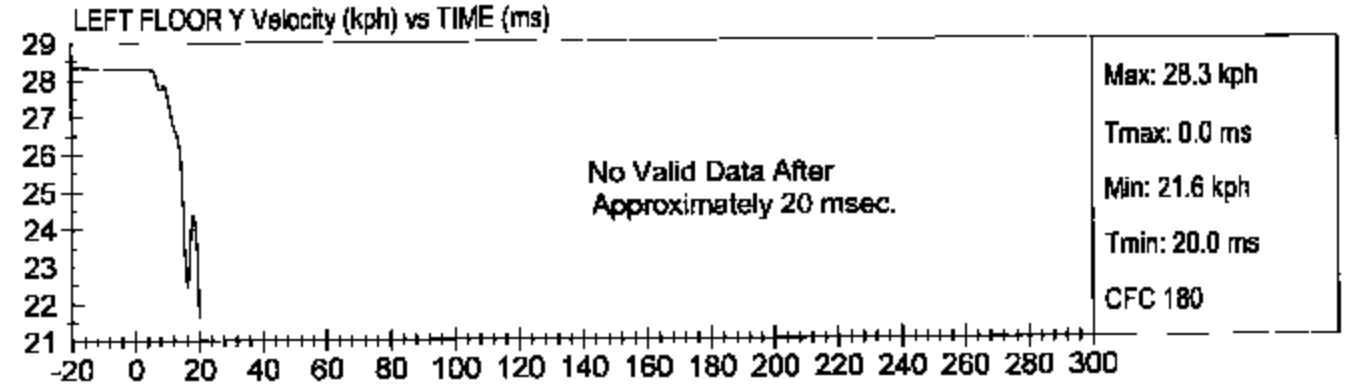


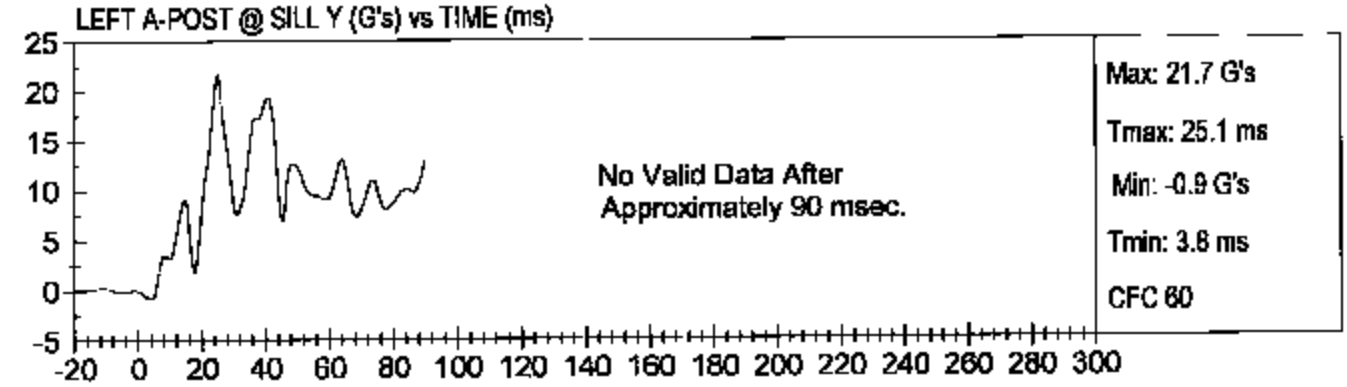


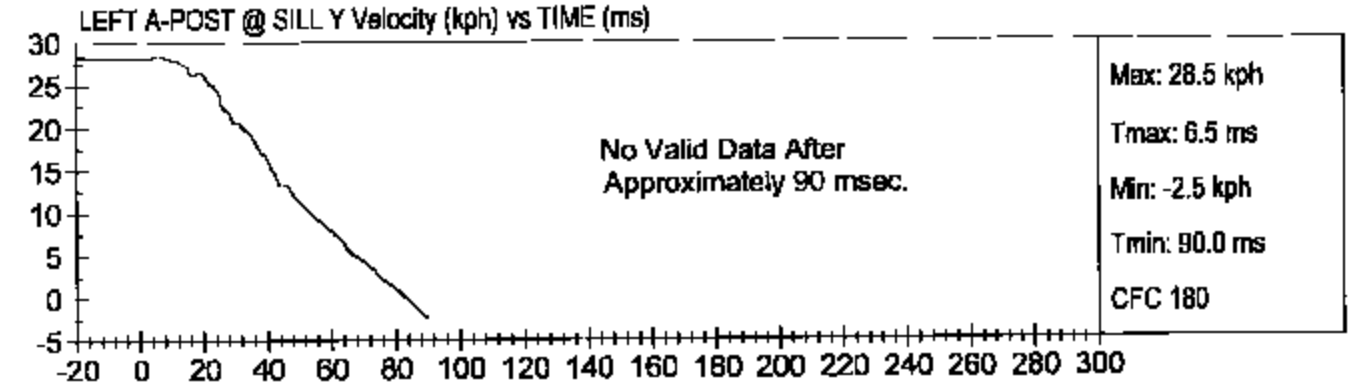
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)





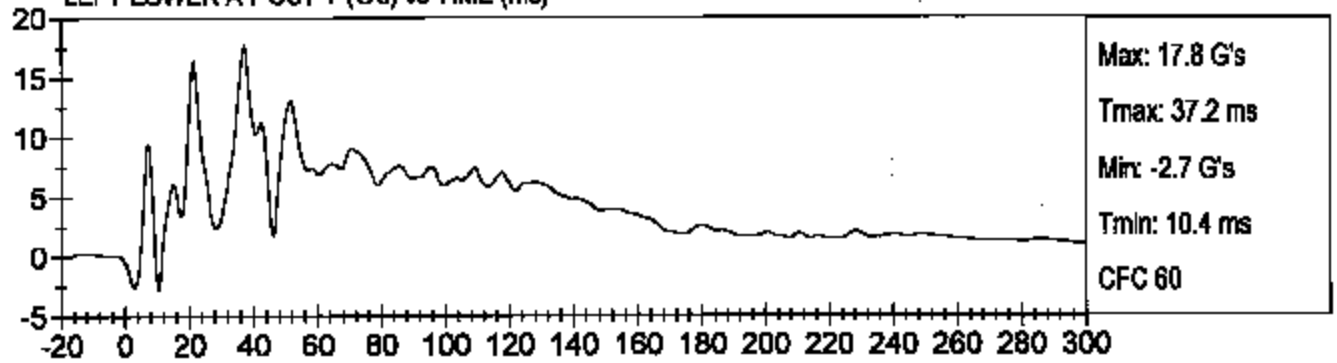




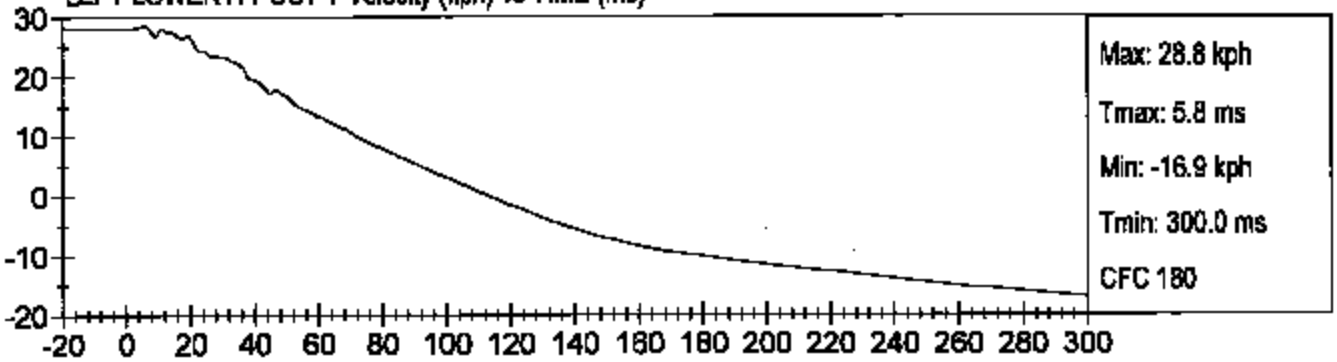
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

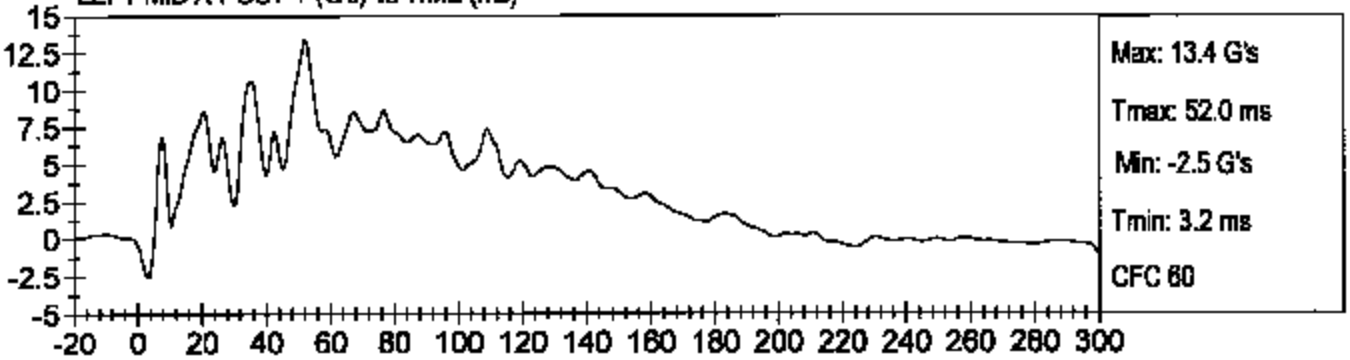
LEFT LOWER A-POST Y (G's) vs TIME (ms)



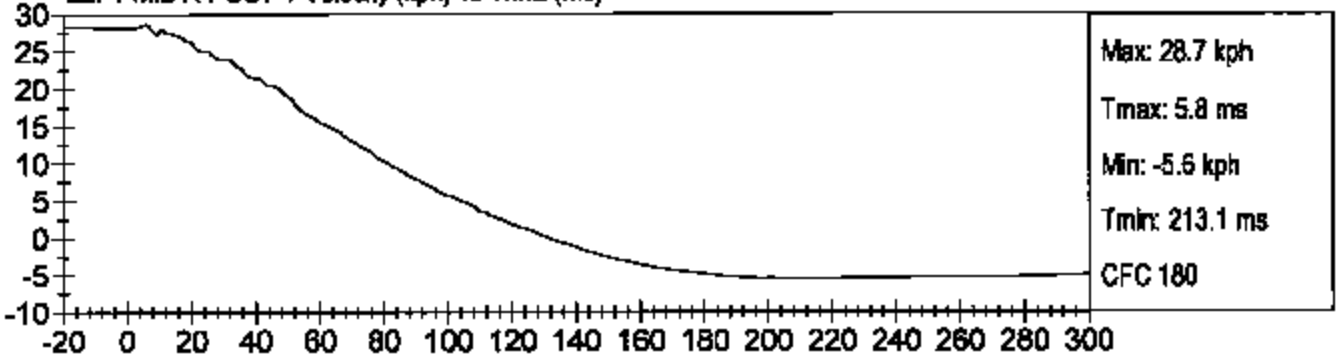
LEFT LOWER A-POST Y Velocity (kph) vs TIME (ms)



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

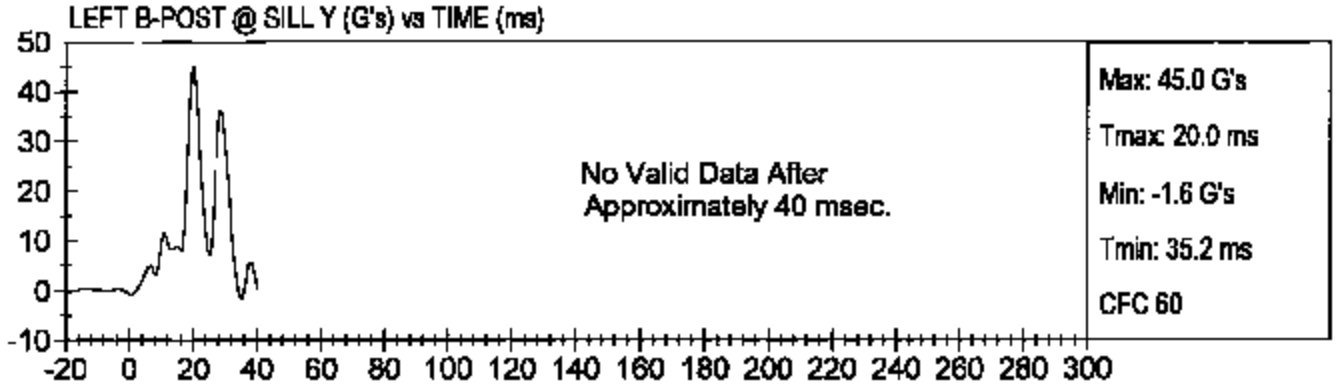


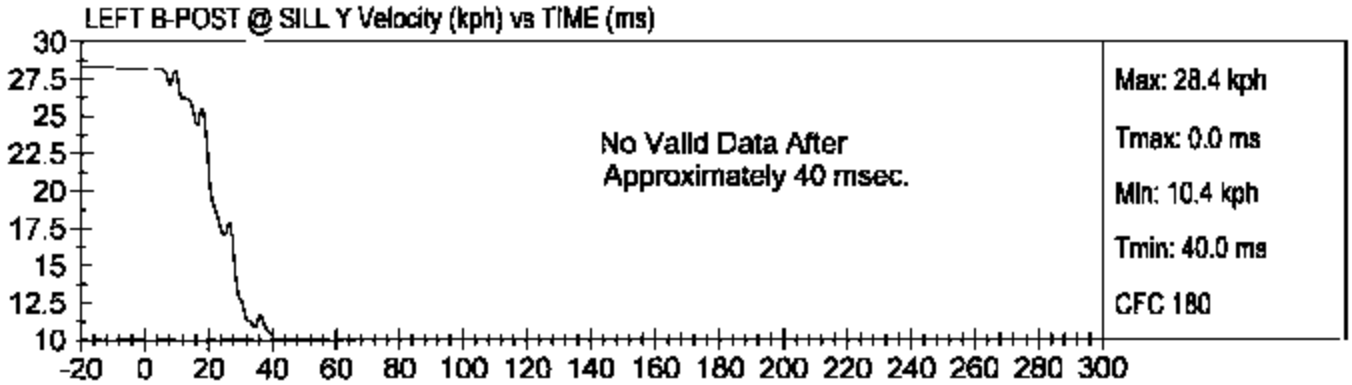
LEFT MID A-POST Y Velocity (kph) vs TIME (ms)

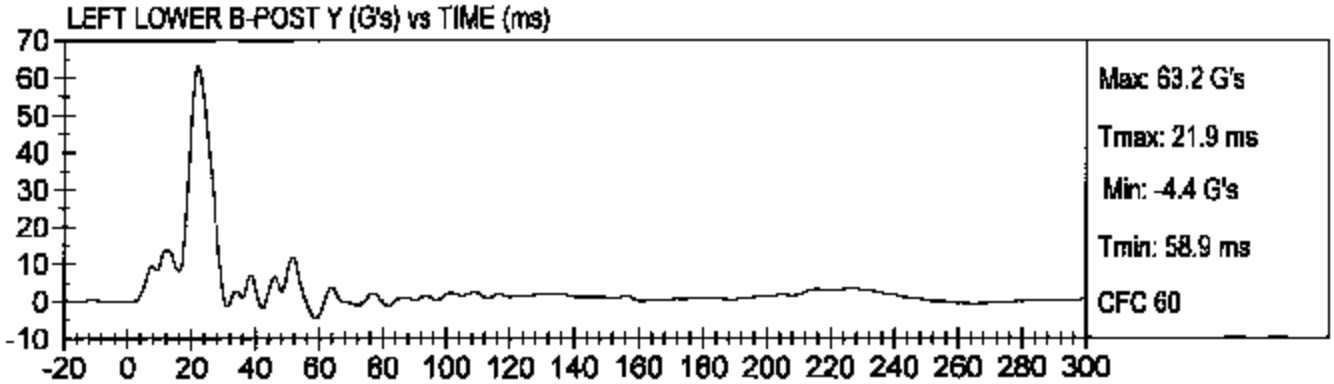


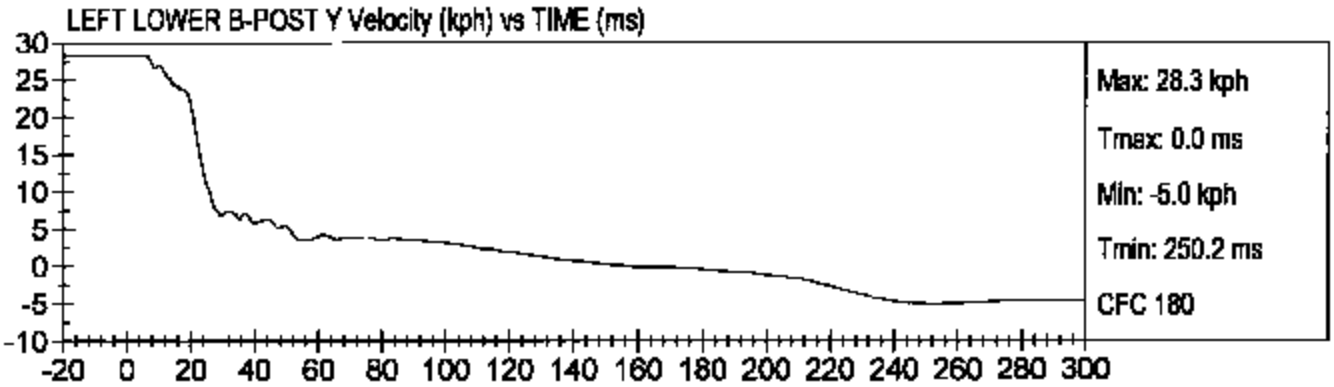
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)





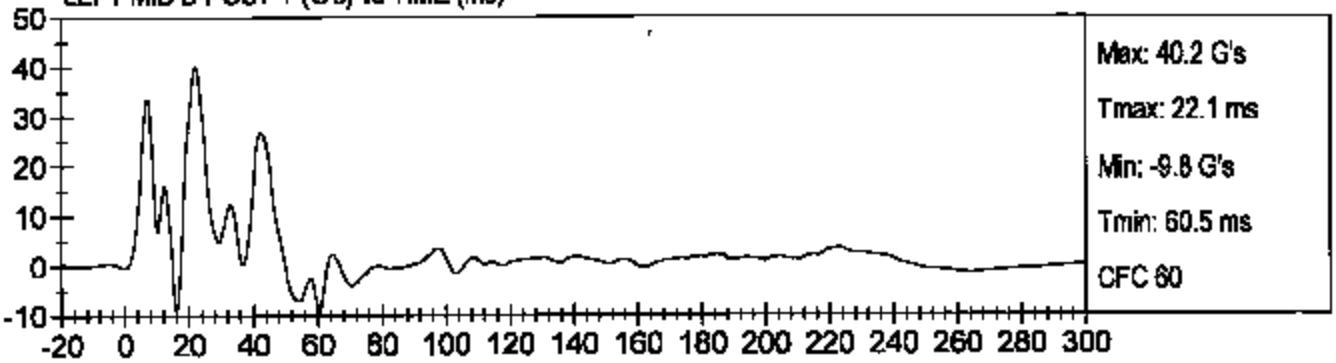




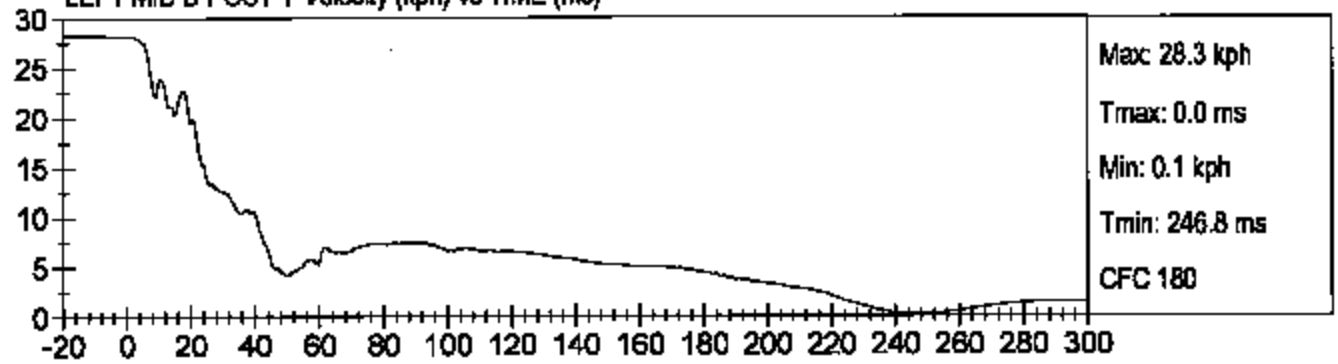
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

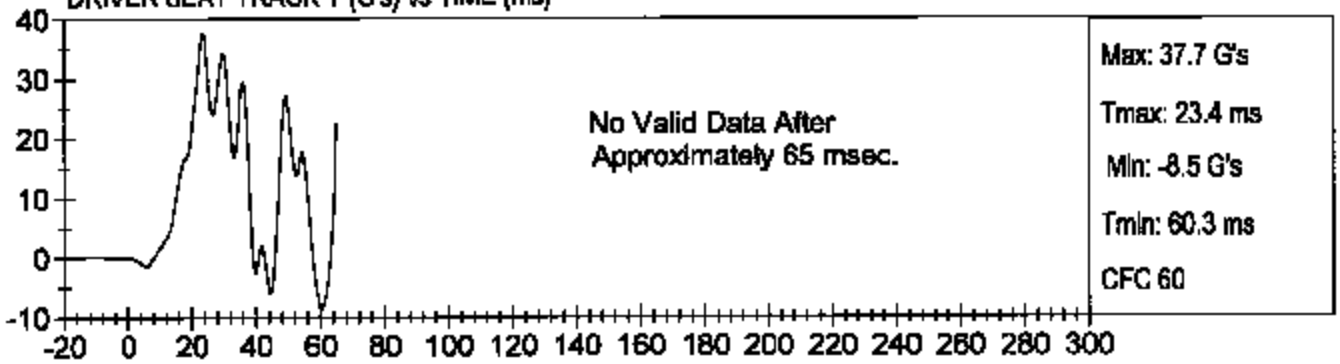
LEFT MID B-POST Y (G's) vs TIME (ms)



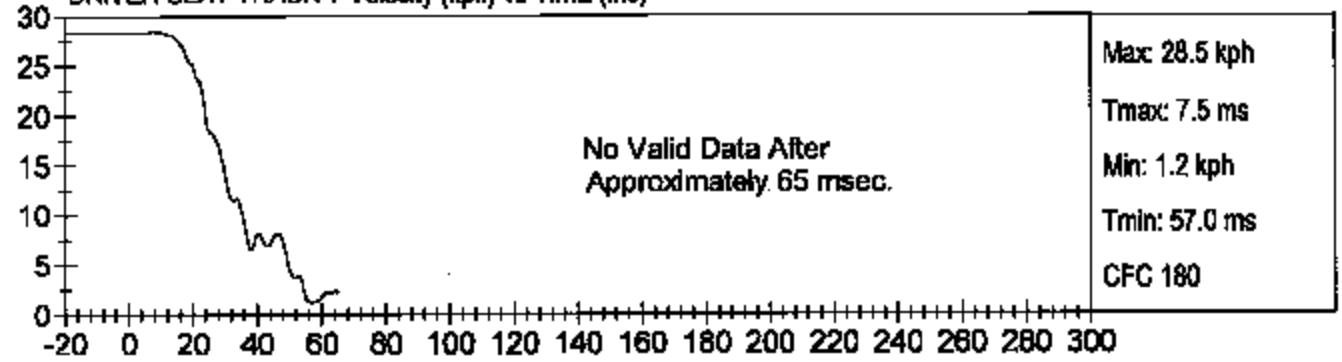
LEFT MID B-POST Y Velocity (kph) vs TIME (ms)



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

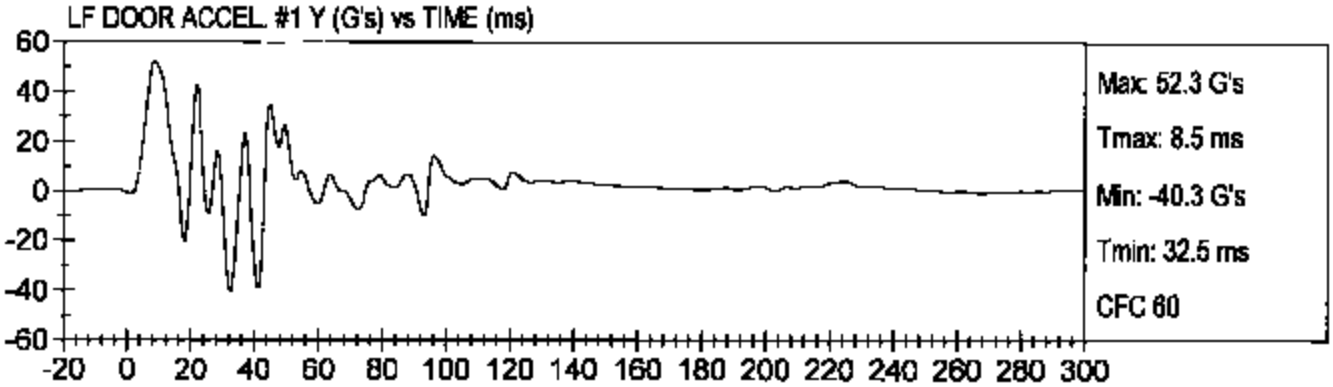


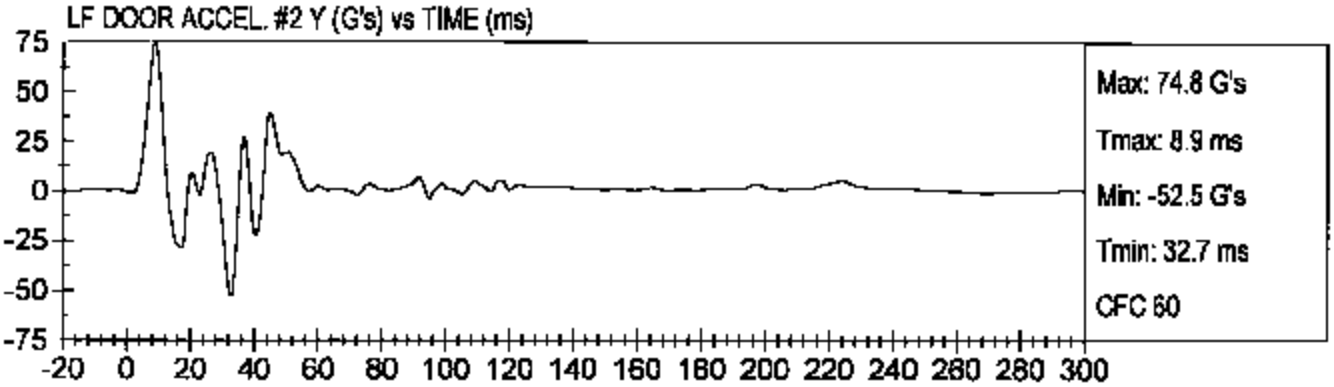
DRIVER SEAT TRACK Y Velocity (kph) vs TIME (ms)

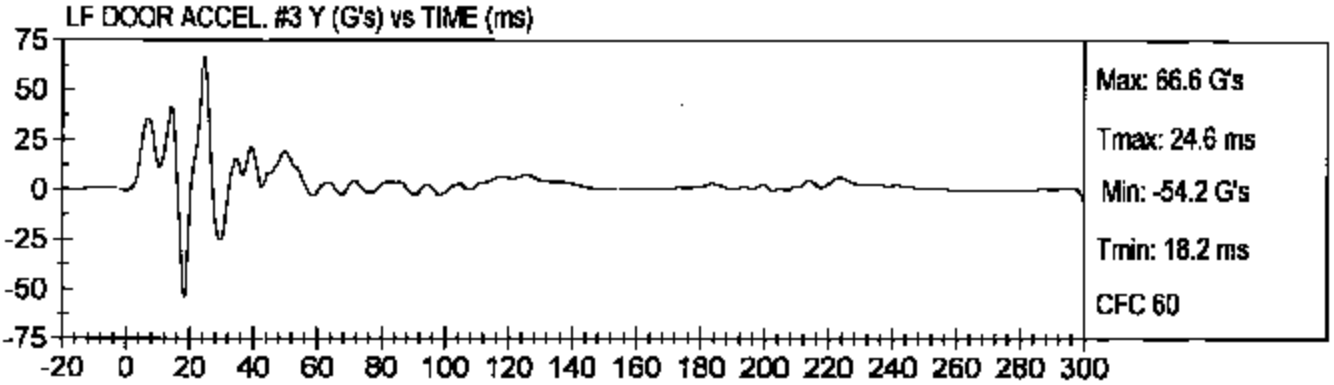


RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

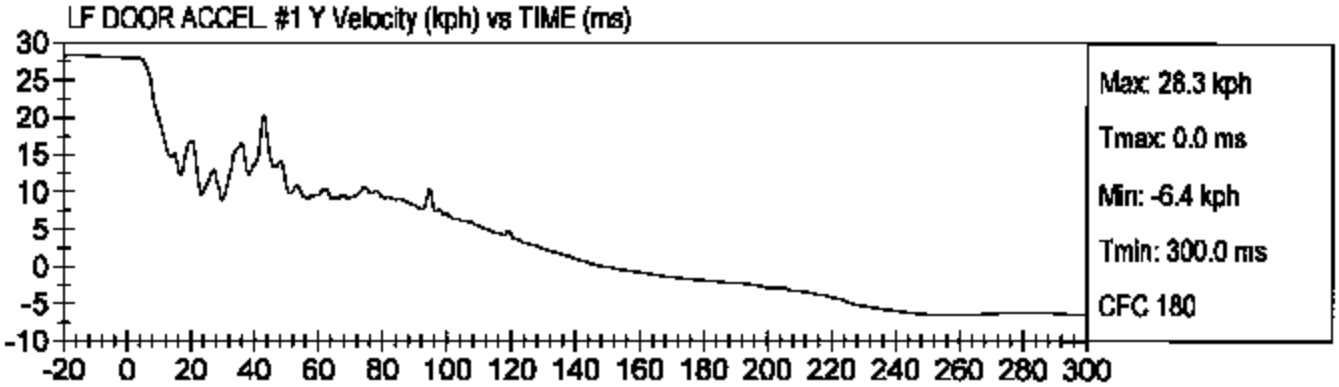


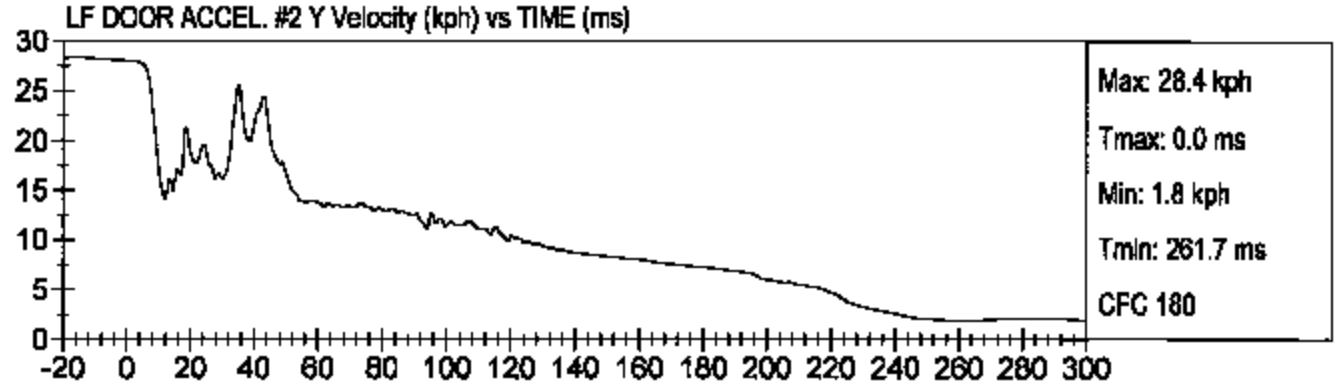


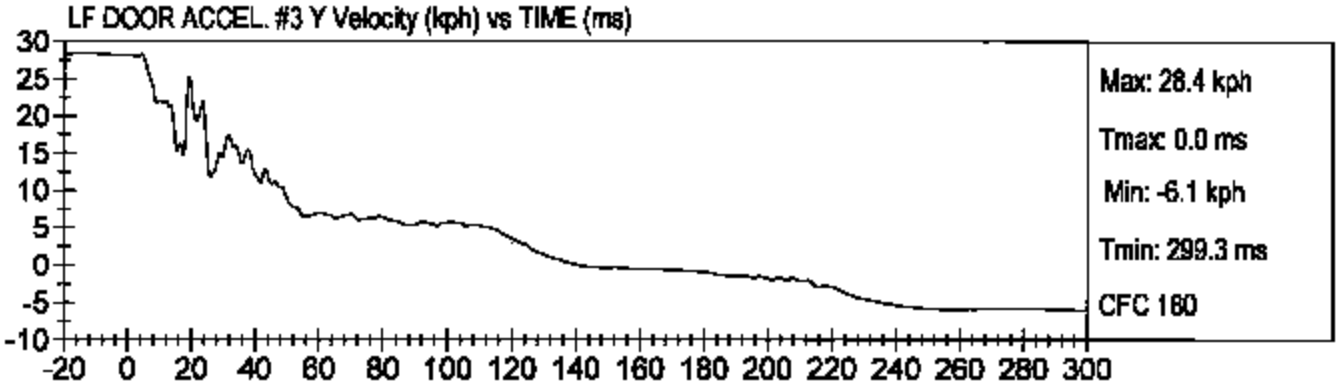


RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

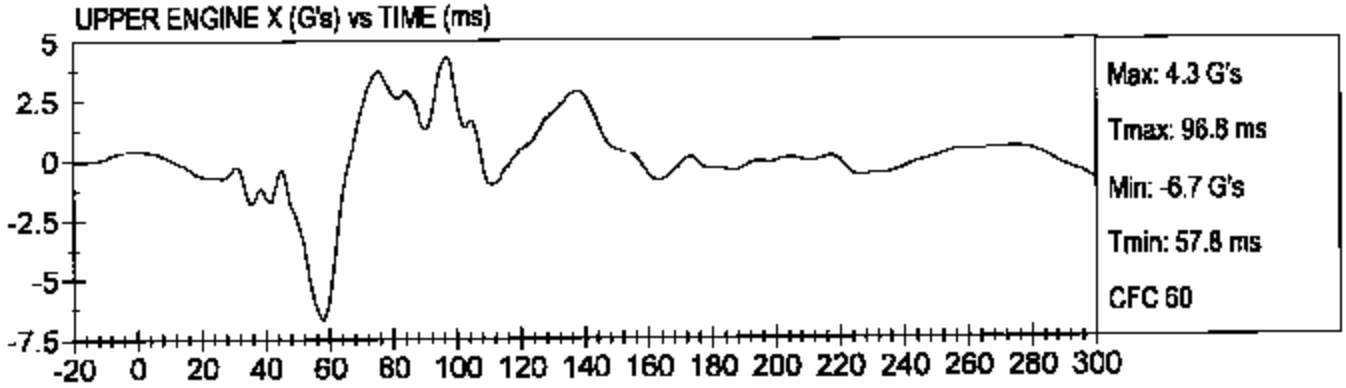


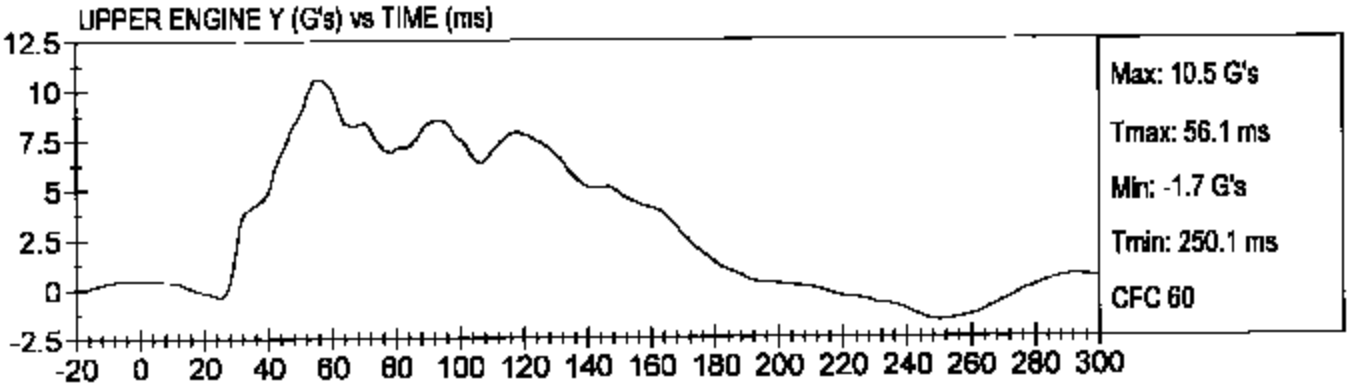


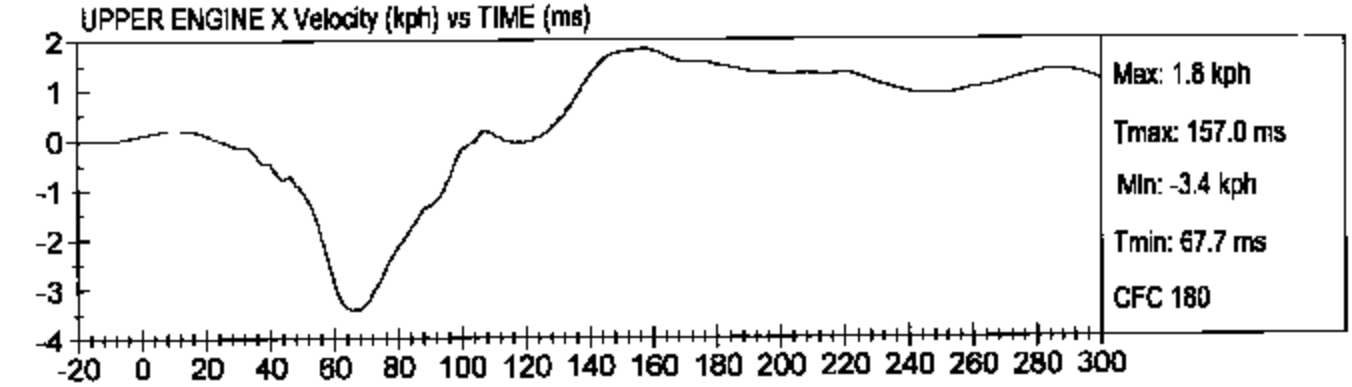


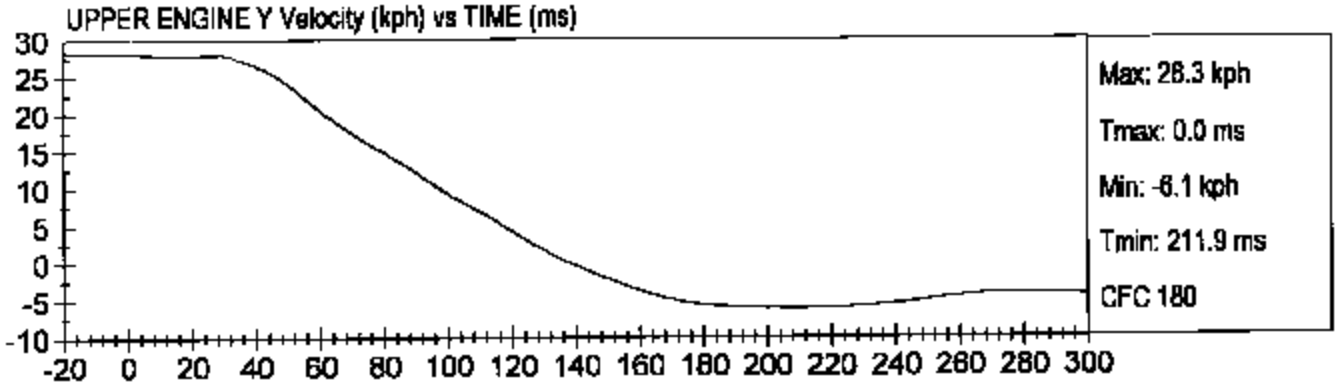
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)



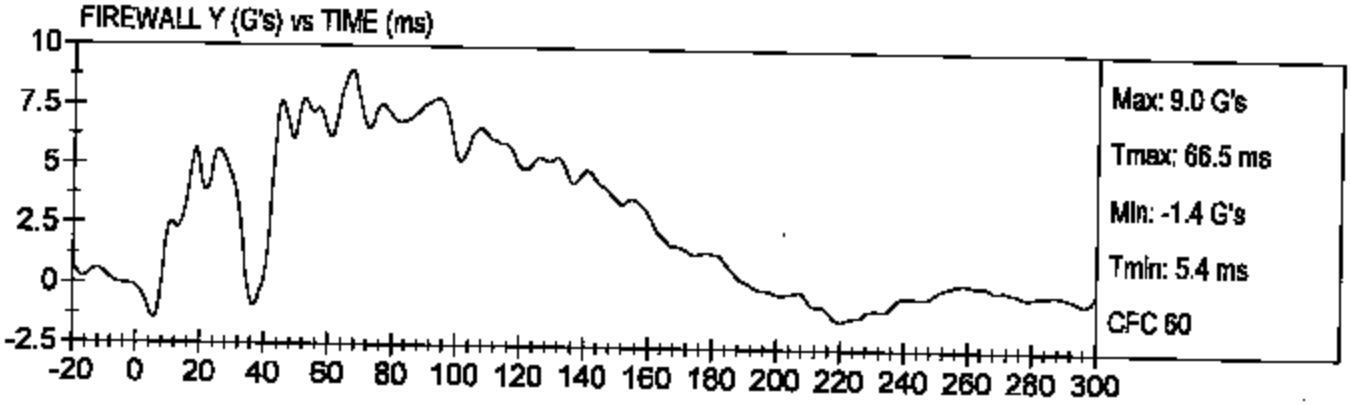


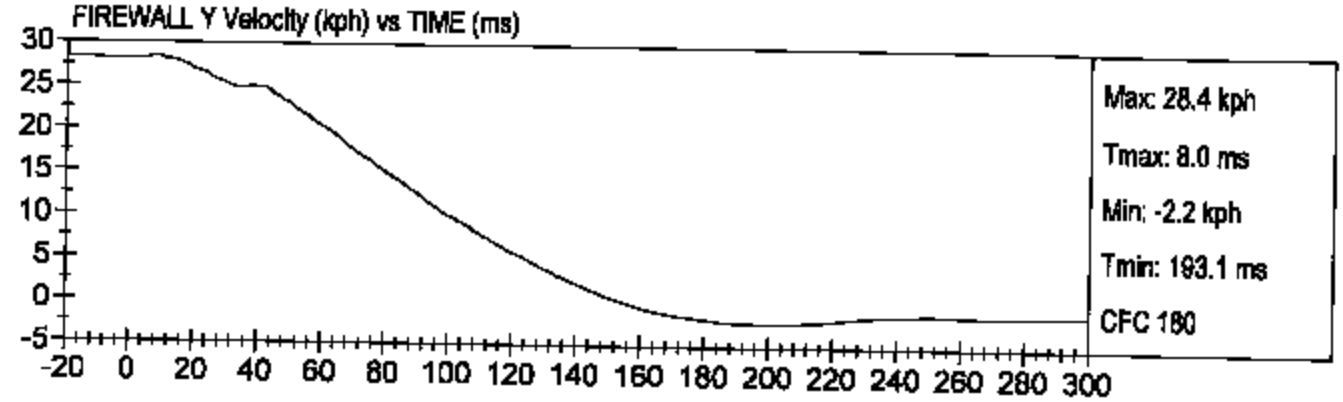


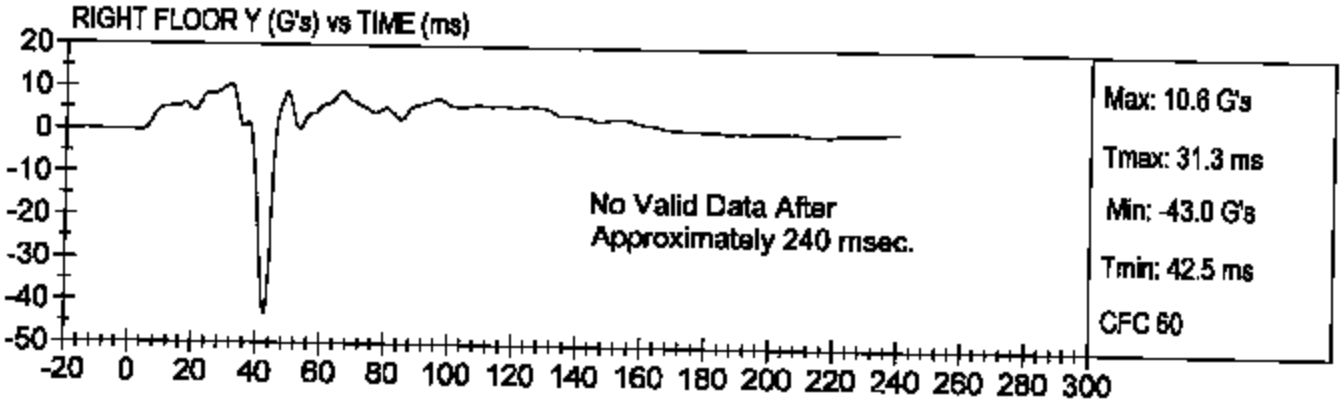


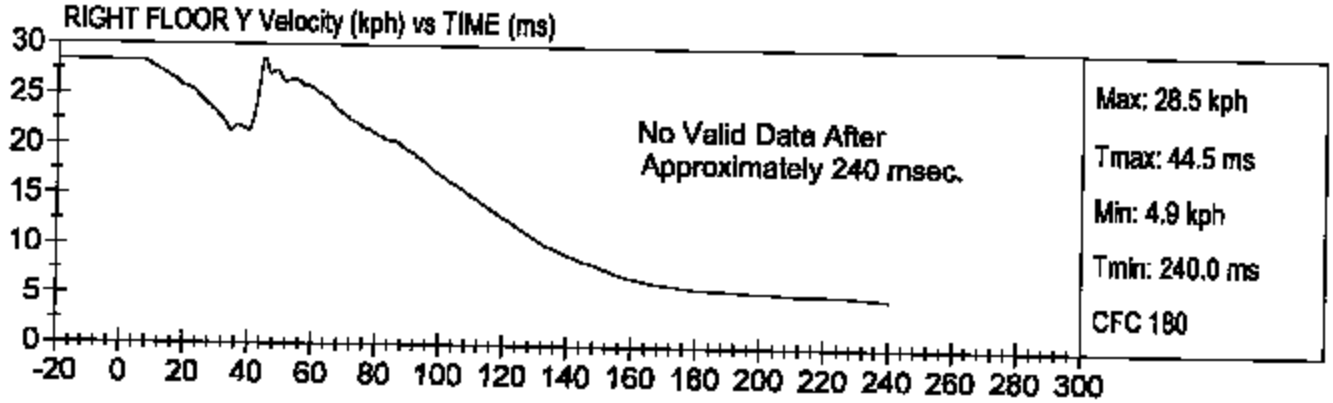
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)



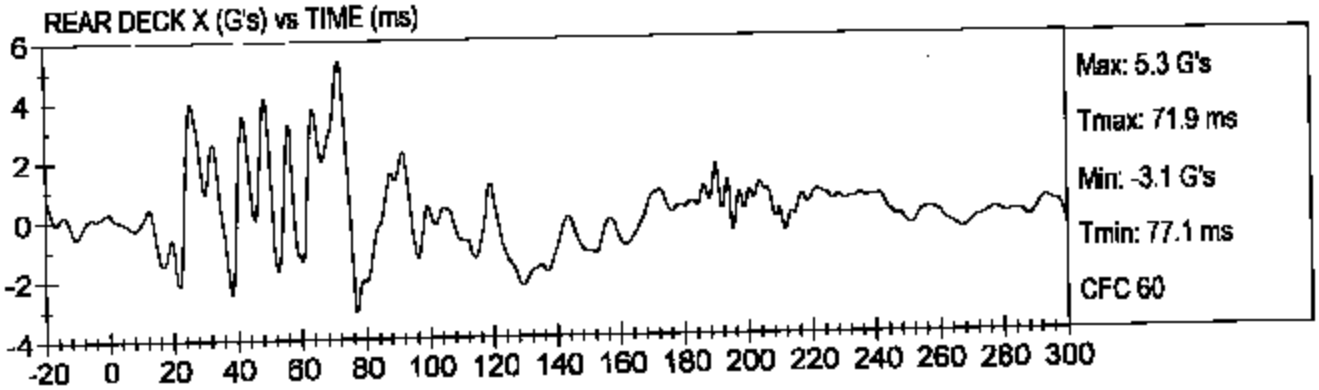


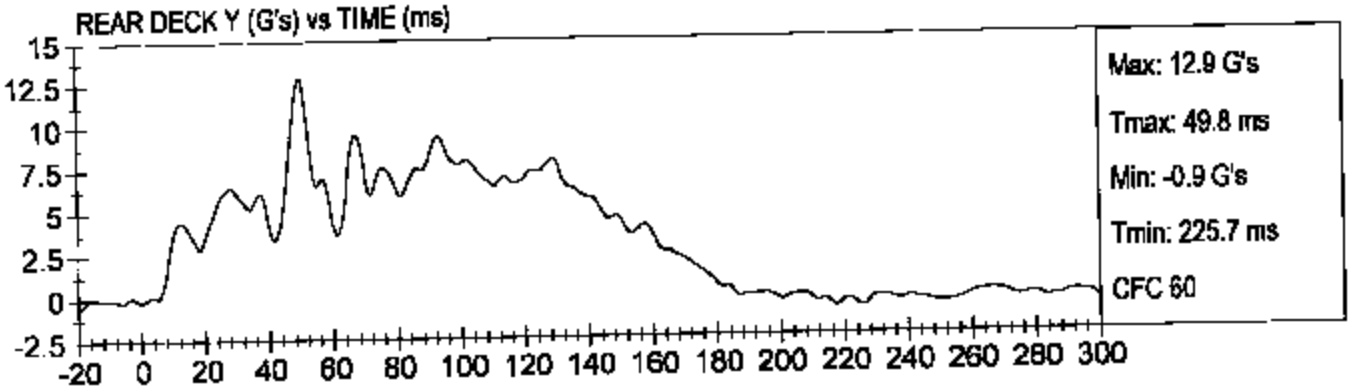


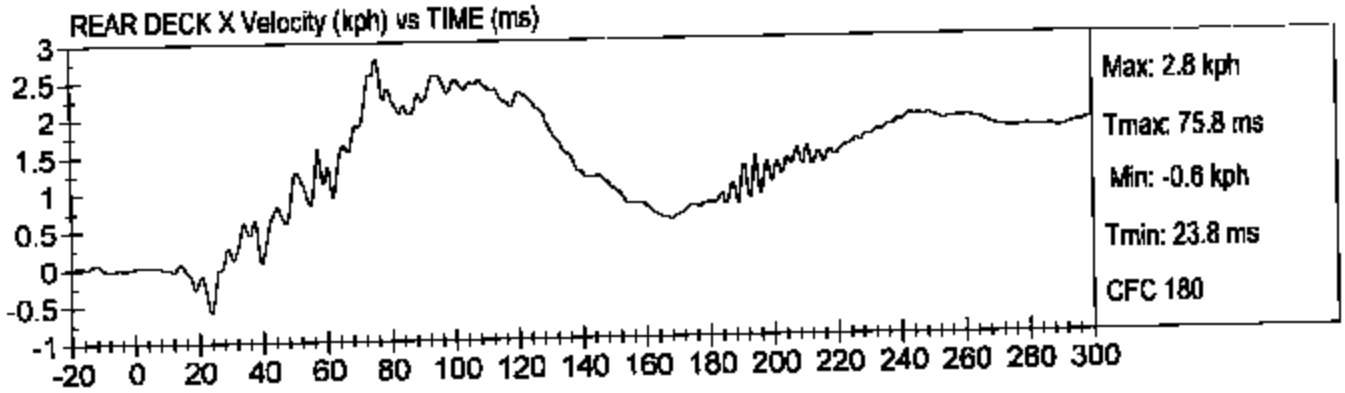


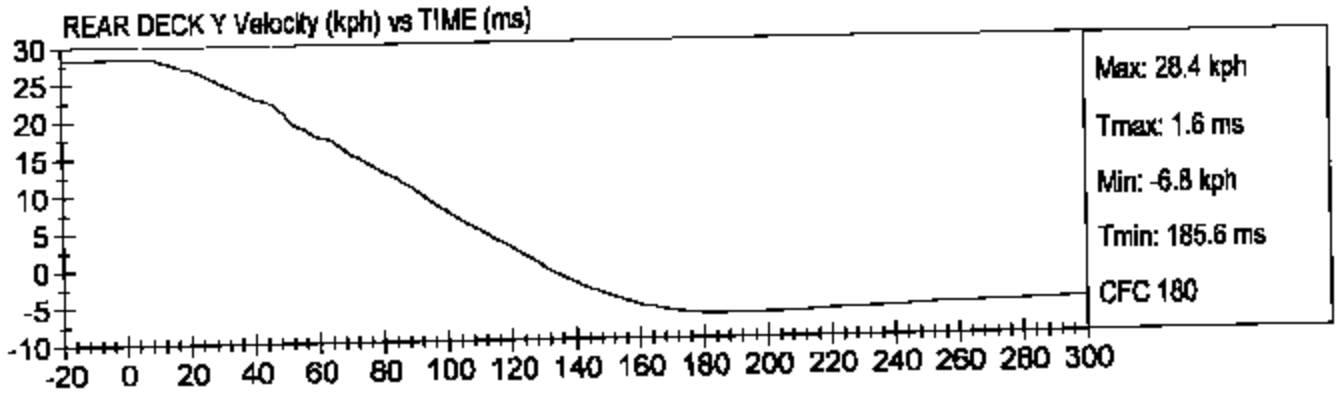
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)





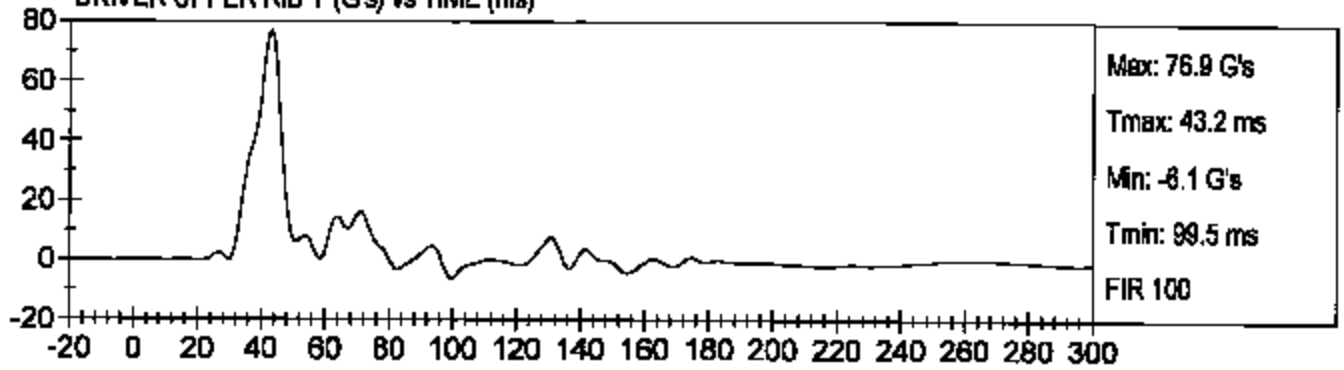




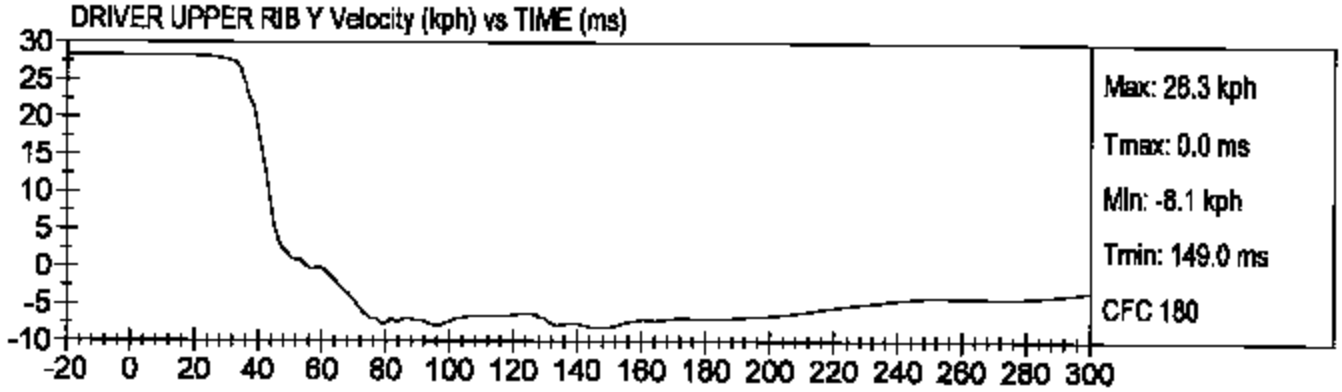
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)

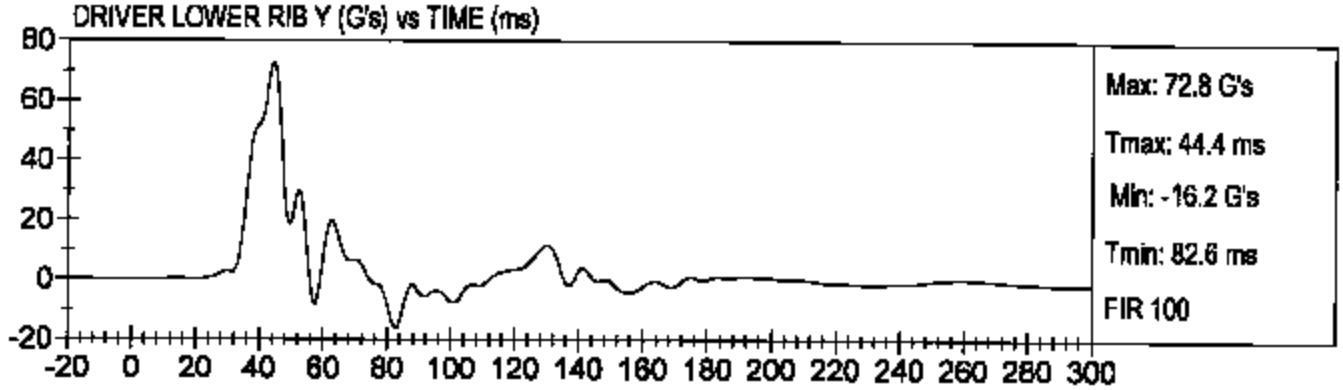
DRIVER UPPER RIB Y (G's) vs TIME (ms)



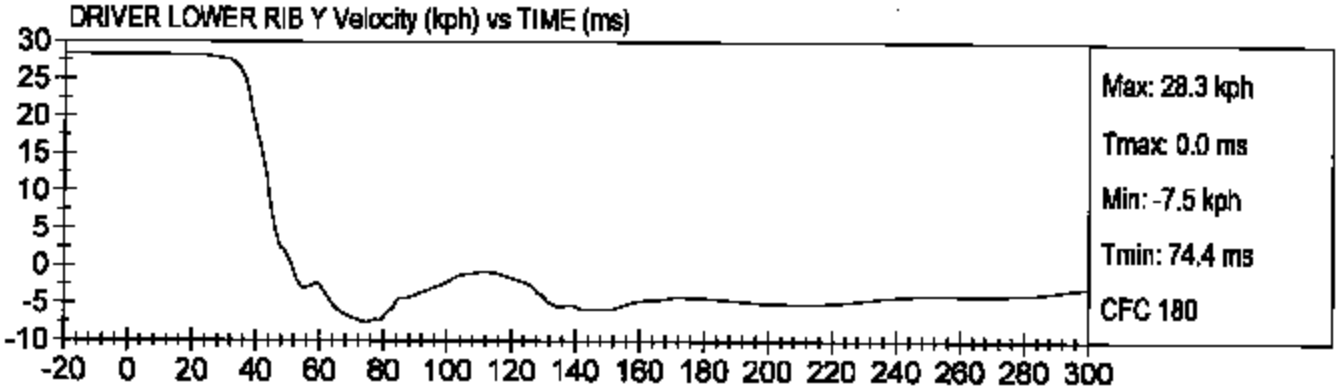
DRIVER UPPER RIB Y Velocity (kph) vs TIME (ms)



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

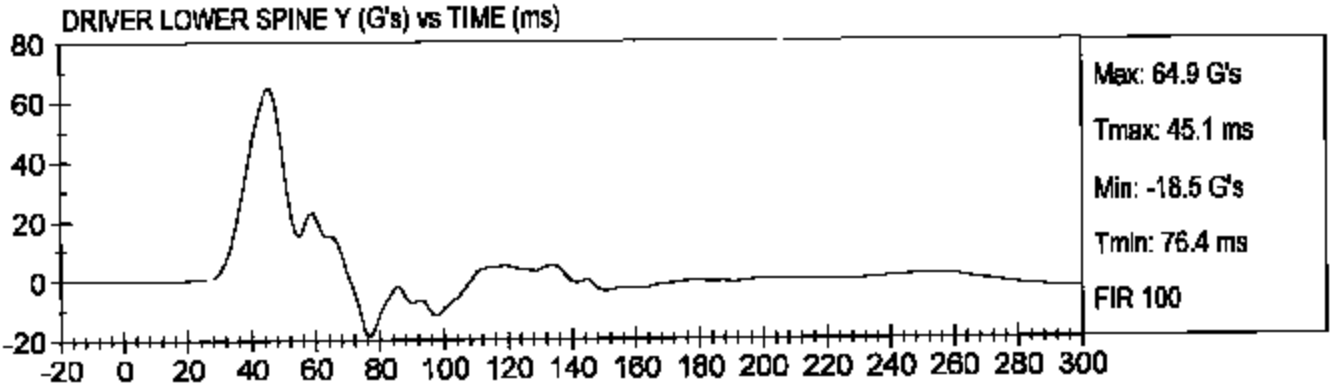


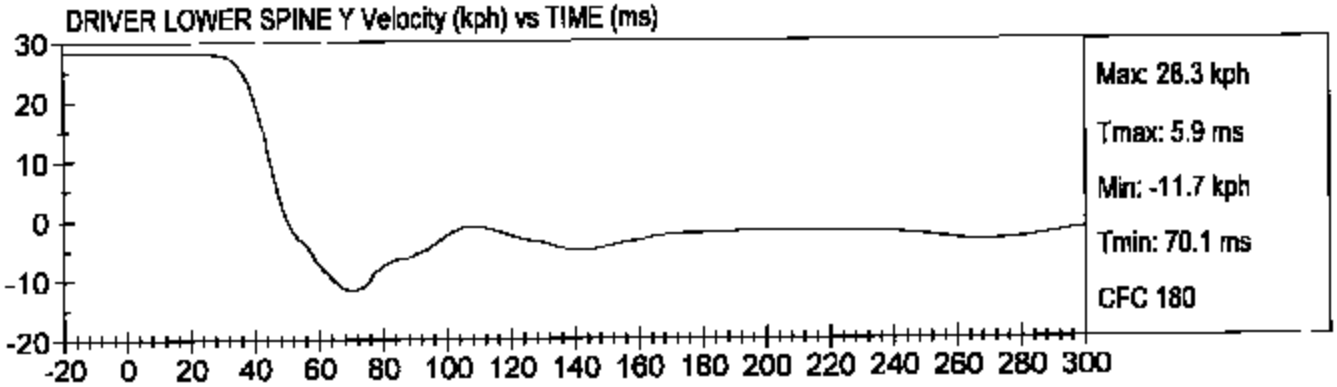
DRIVER LOWER RIB Y Velocity (kph) vs TIME (ms)

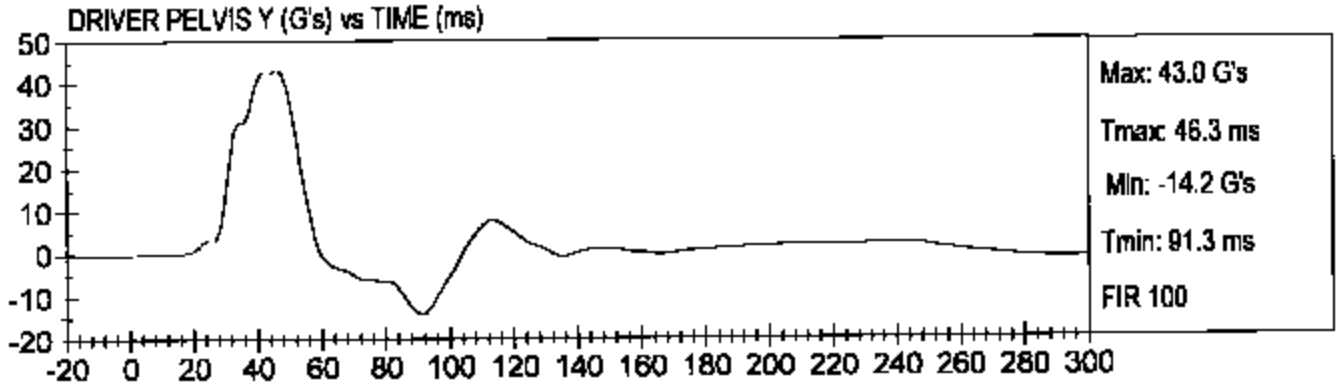


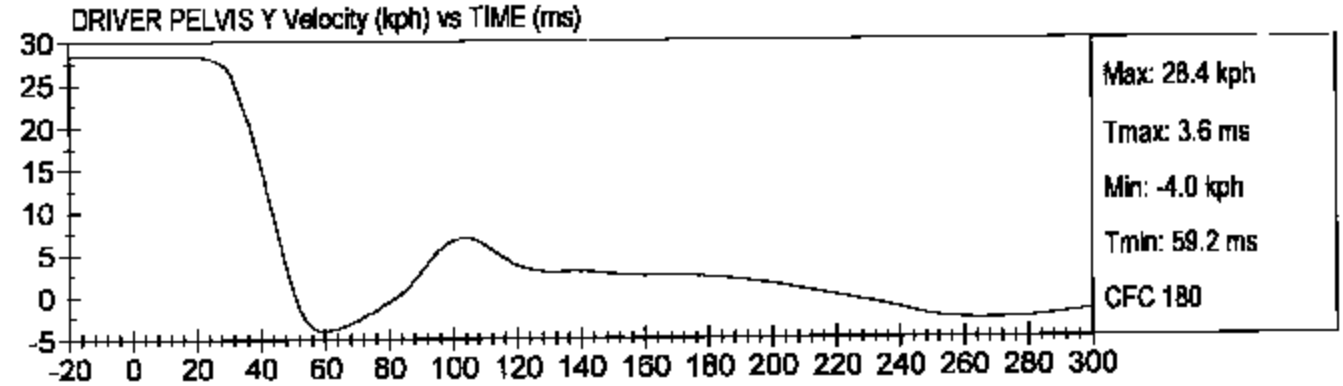
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)



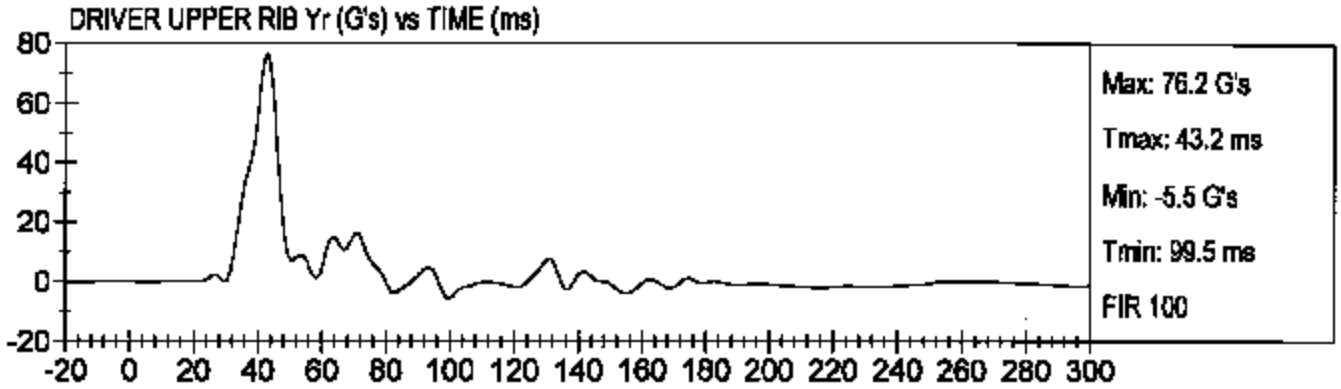


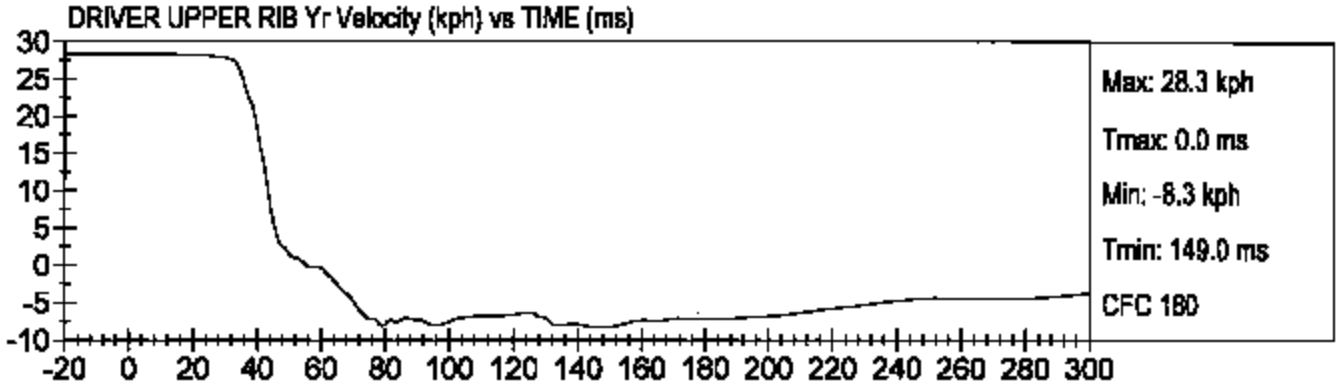


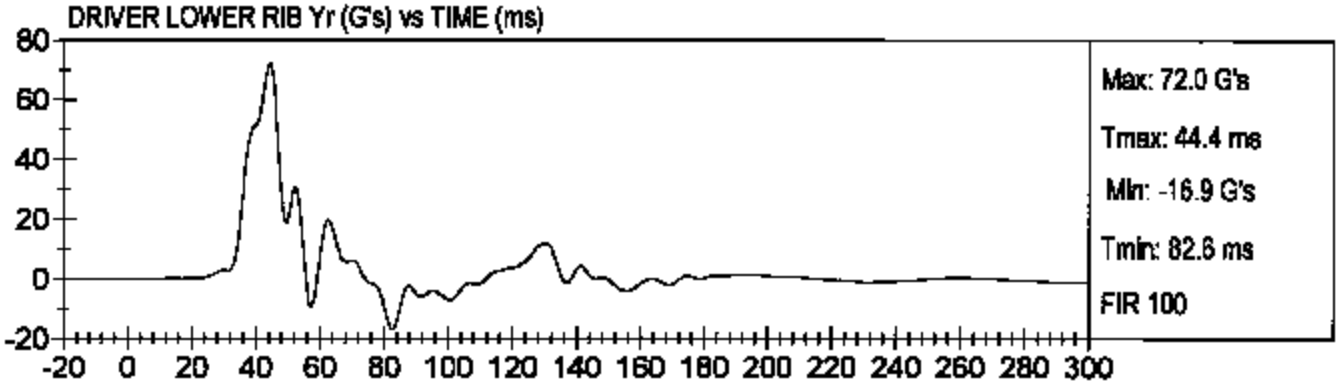


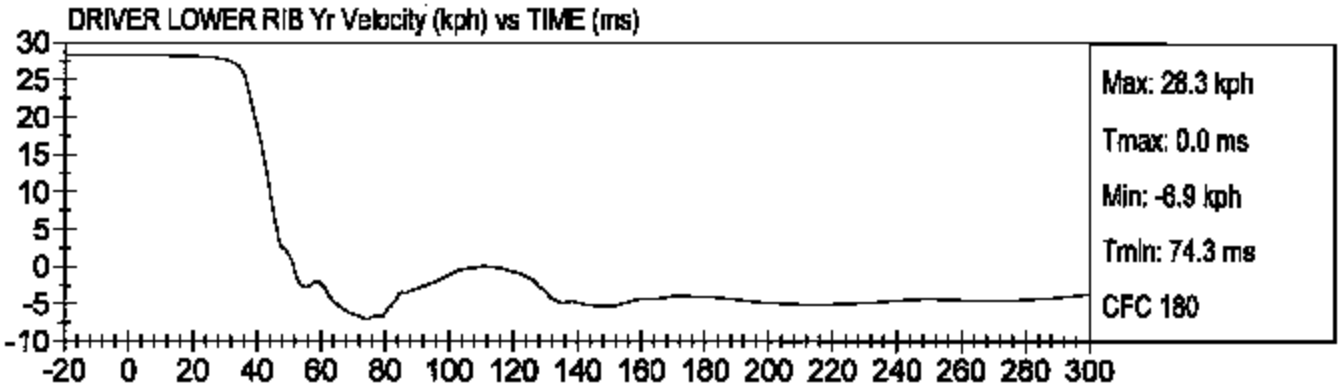
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)



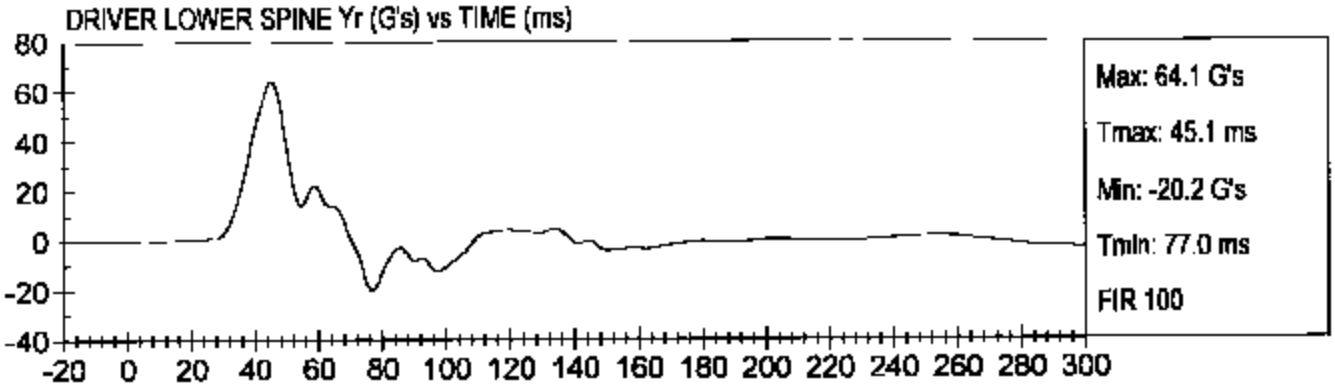


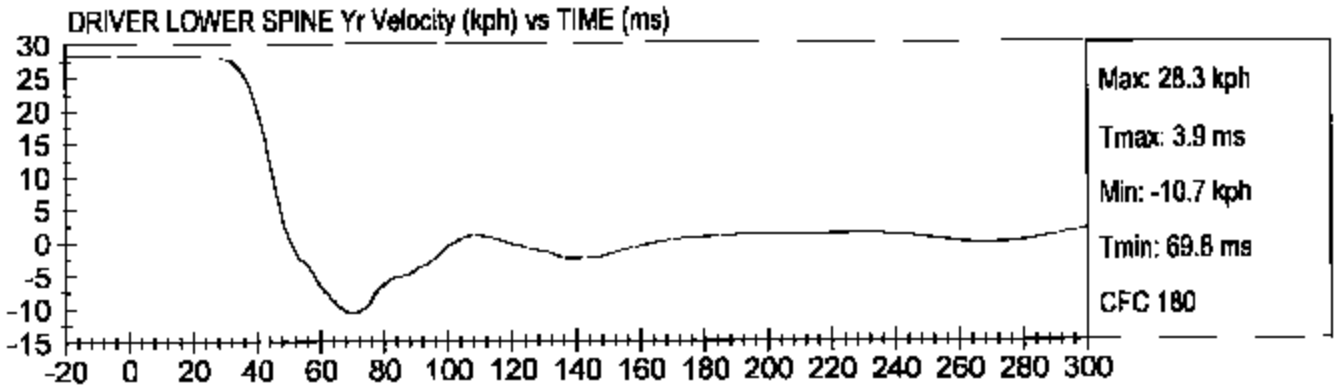


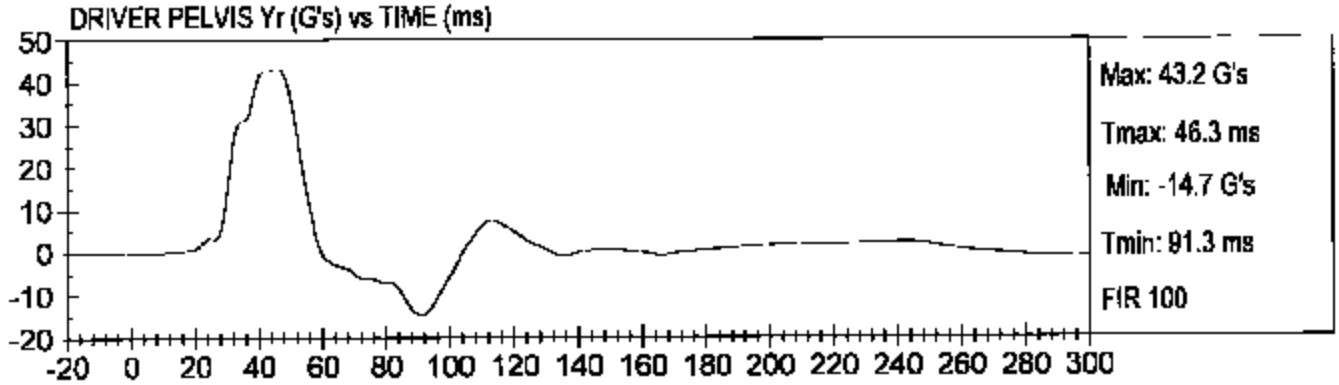


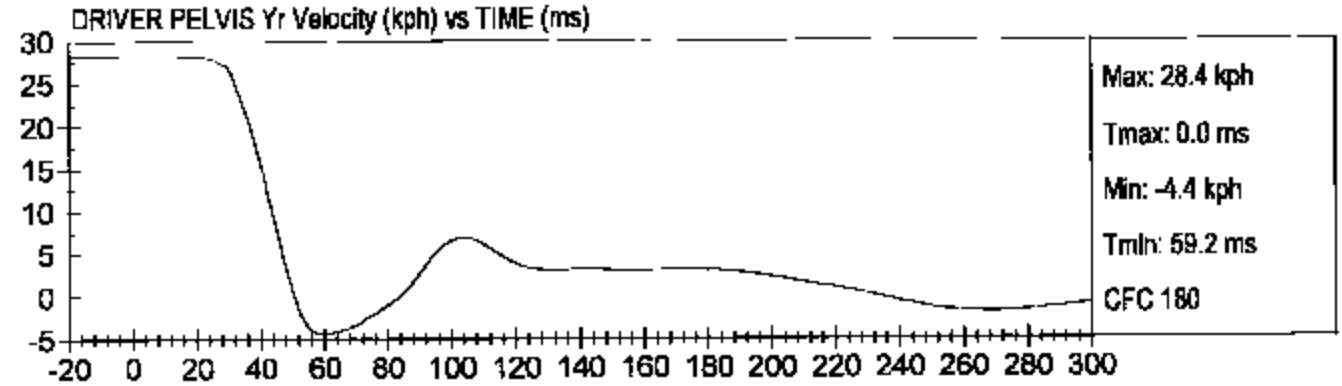
RIGID POLE SIDE IMPACT, FMVSS 201P
2005 CHEVY EQUINOX (C50101)

Test Date: 07/06/05
Speed: 17.6 mph (28.3 km/h)







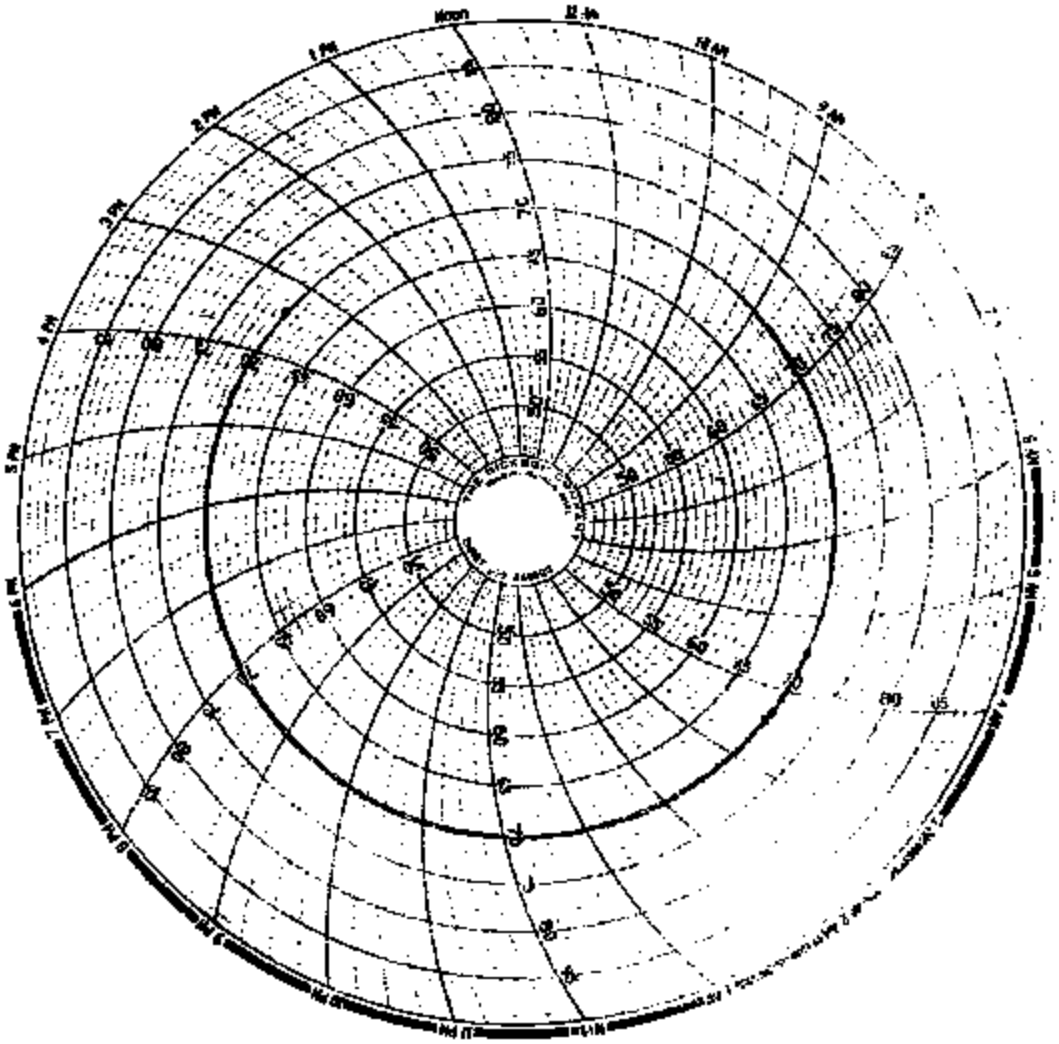


APPENDIX C

SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Vehicle and Dummy Temperature

Test Vehicle:	2005 Chevrolet Equinox	NHTSA No.	C50101
Test Program:	FMVSS 201P	Test Date:	July 8, 2005



CERTIFICATION DATA

Dummy Serial Number: 037

Calibration Test Results Summary

Dummy Serial Number: 037

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: 037 **Test I.D:** D051421

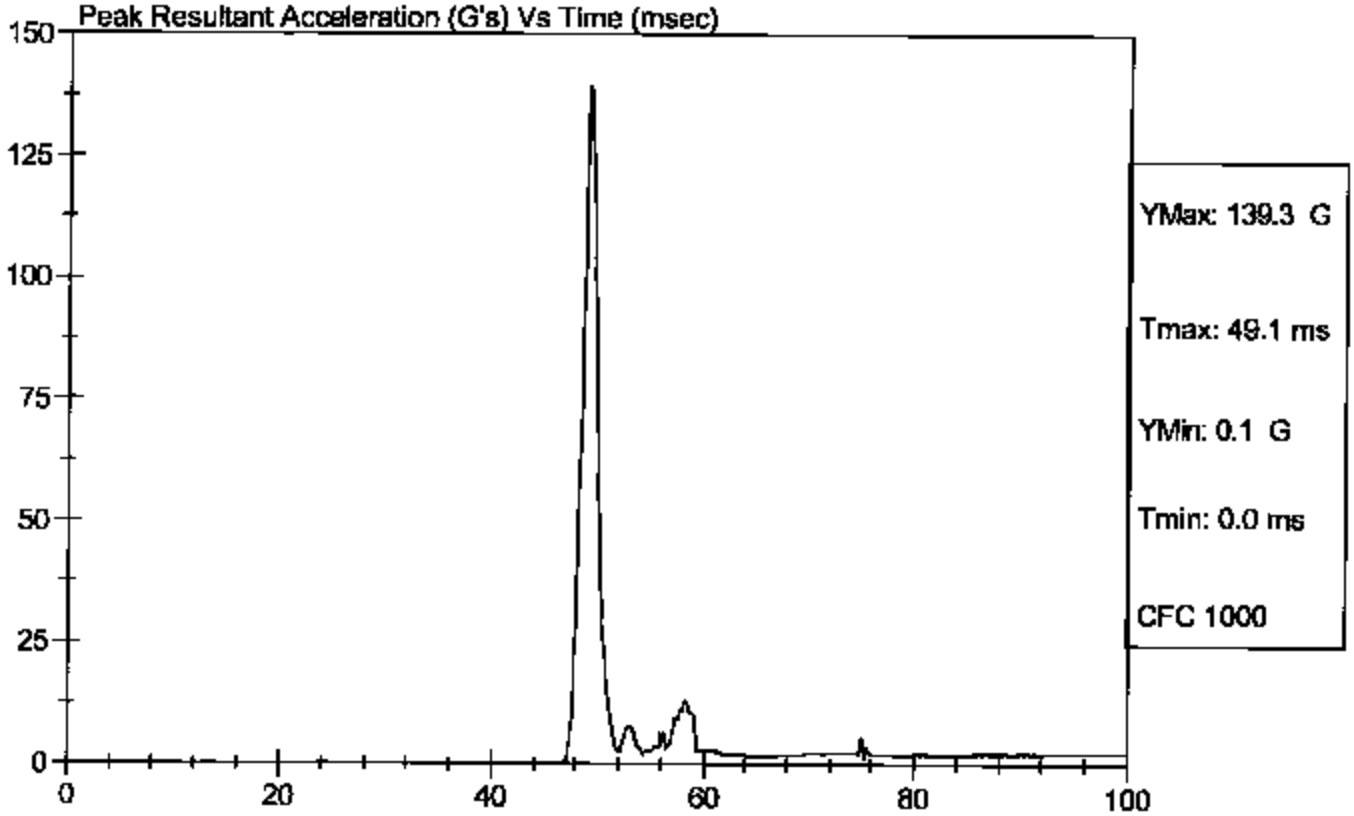
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Peak Resultant Acceleration	G's	120 to 150	139	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-10	Pass
		Overall Test Results		Pass

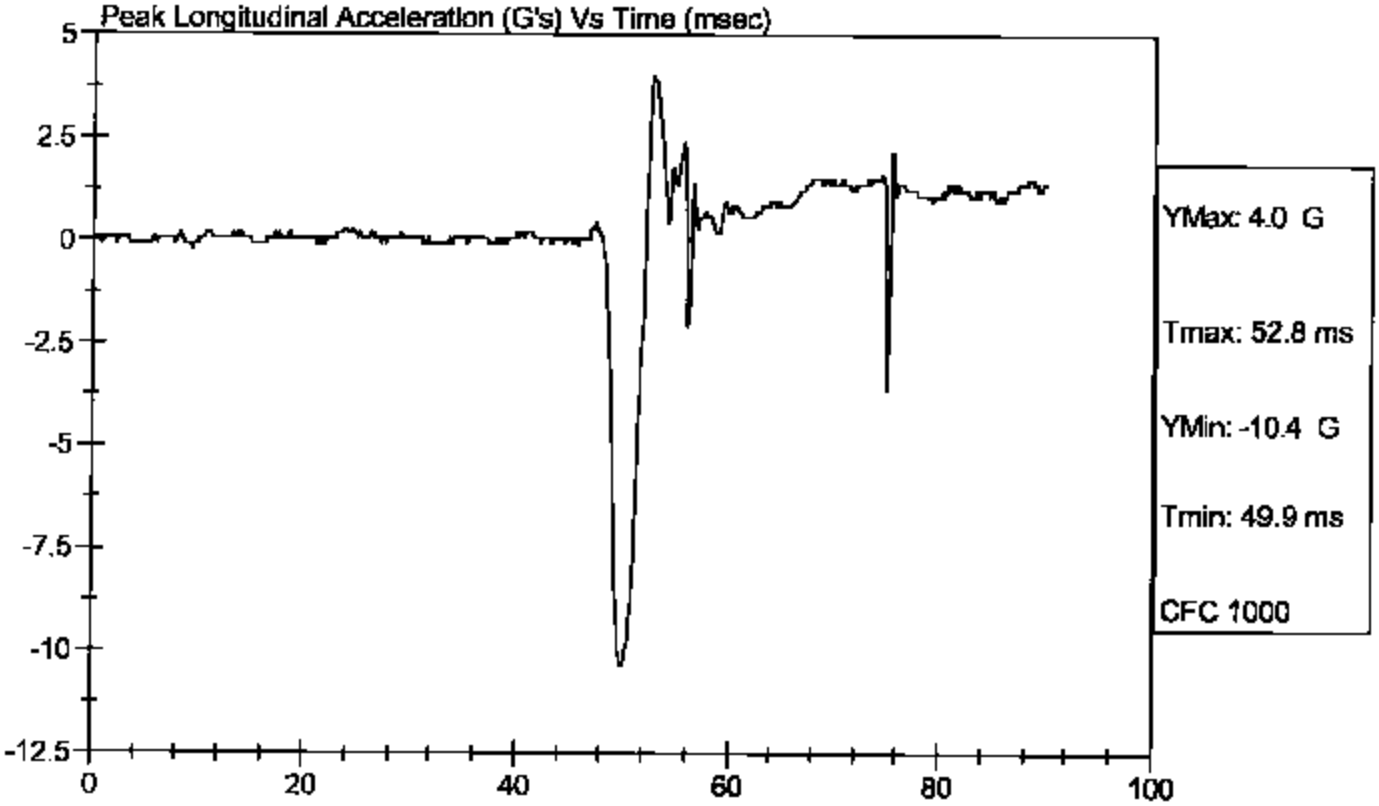
Joe Flack
Laboratory Technician

05/24/2005
Test Date

Jessica Hall
Approved By

mga	Test Description: Head Drop	Test Date: 05/24/2005
	Component: D051421	Speed: 0 ft/s, 0.00 m/s





SID Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 037 **Test I.D:** D051422

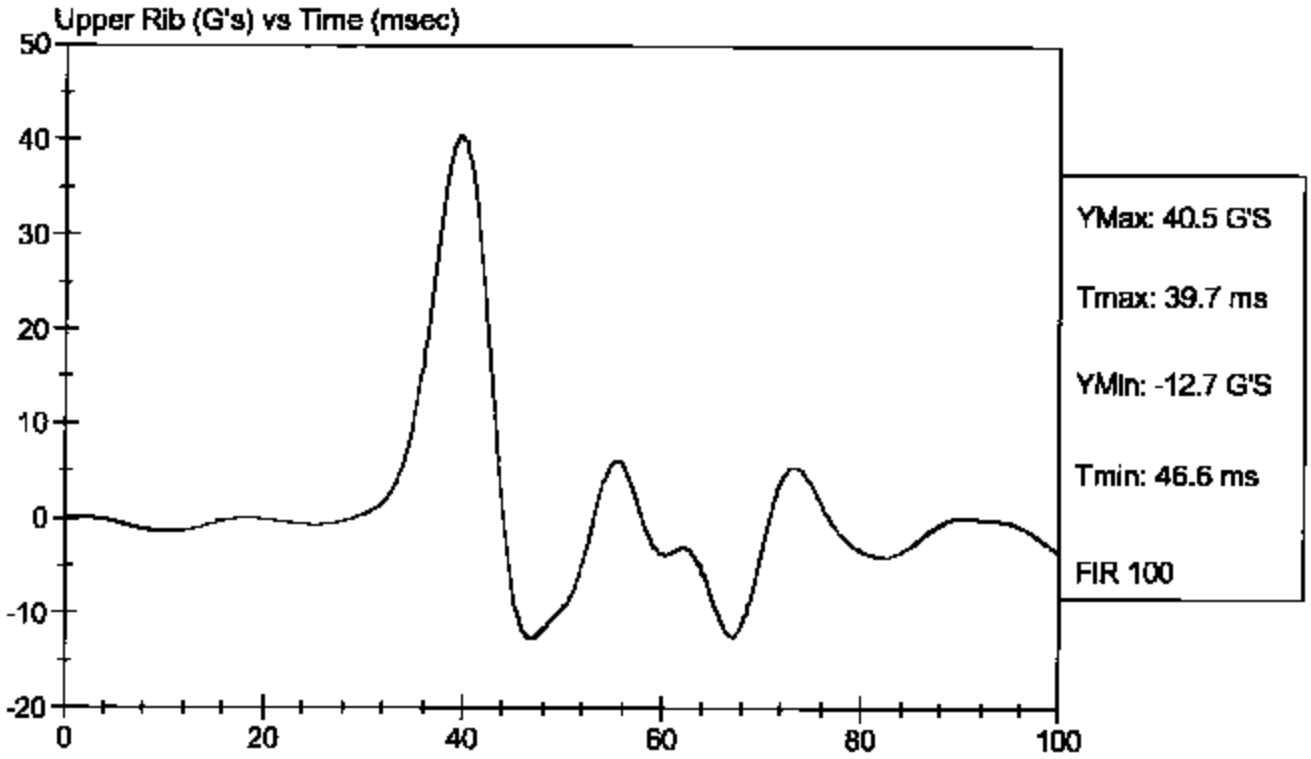
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Probe Velocity	m/s	4.27 - 4.33	4.32	Pass
Upper Rib	G's	37 - 46	41	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	22	Pass
		Overall Test Results		Pass

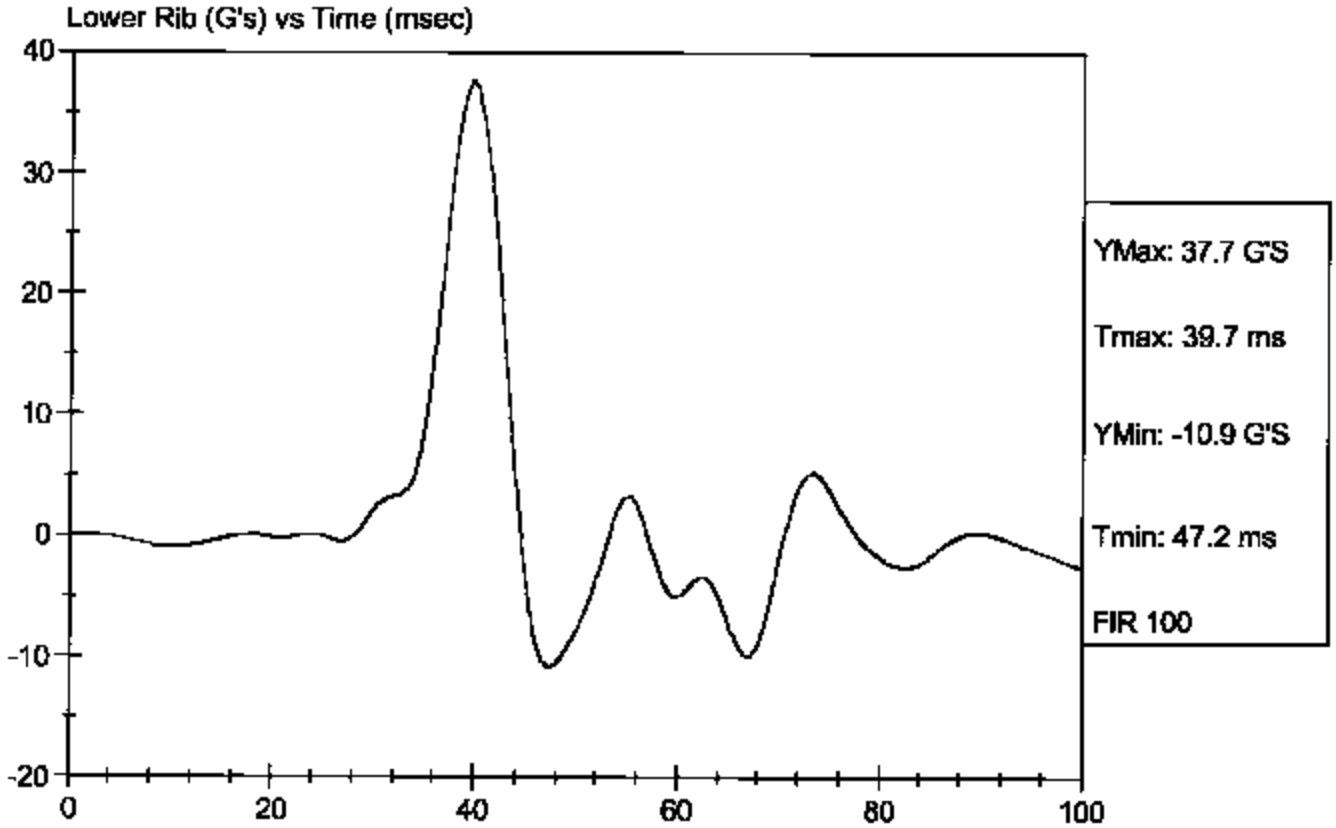
Laboratory Technician

05/24/2005
Test Date

Approved By

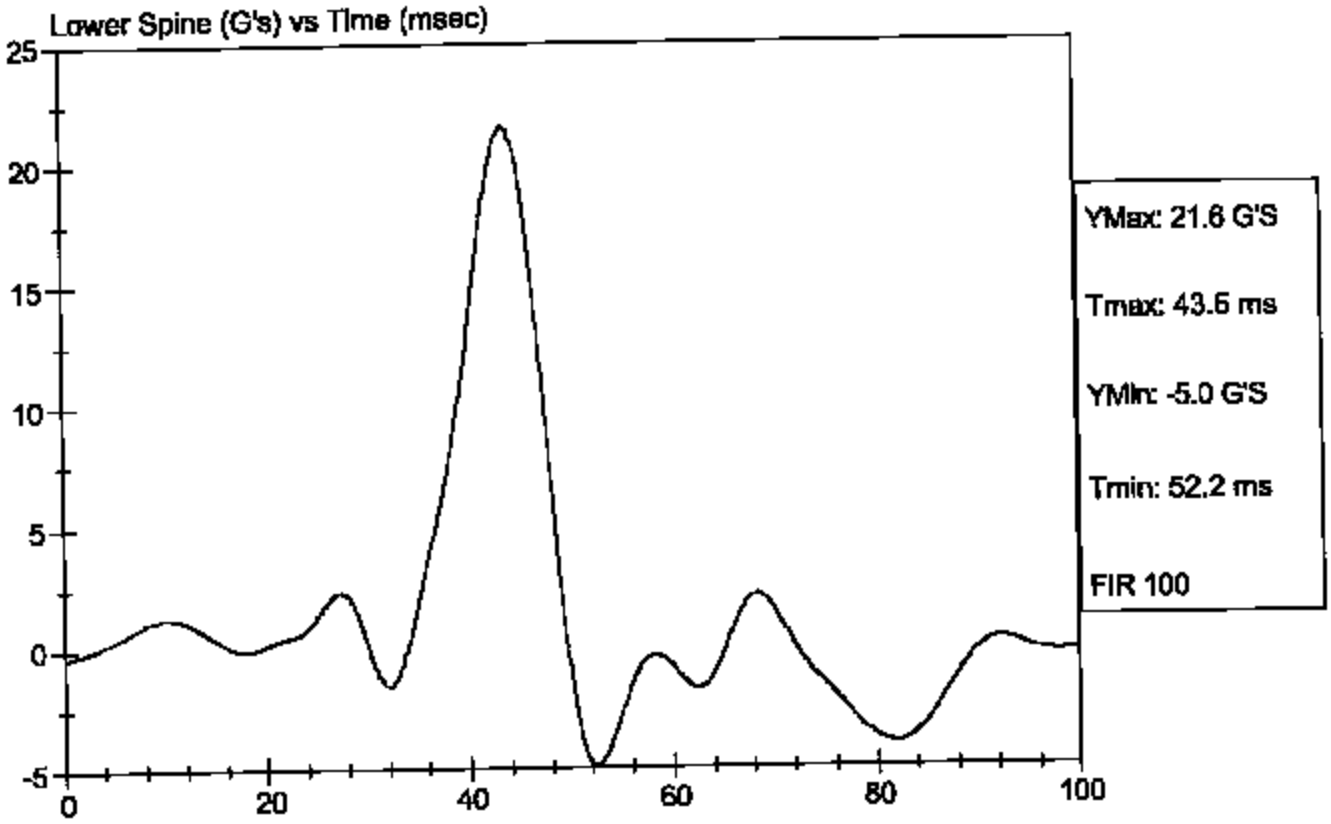
mga	Test Desc: Thorax Impact Component ID: D051422	Test Date: 05/24/2005 Speed: 14.17 ft/sec, 4.32 m/sec





Test Desc: Thorax Impact
Component ID: D051422

Test Date: 05/24/2005
Speed: 14.17 ft/sec, 4.32 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 037 **Test I.D:** D051423

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	39	Pass
Probe Velocity	m/s	4.27 - 4.33	4.32	Pass
Pelvis Acceleration	G's	40 - 60	45	Pass
		Overall Test Results		Pass

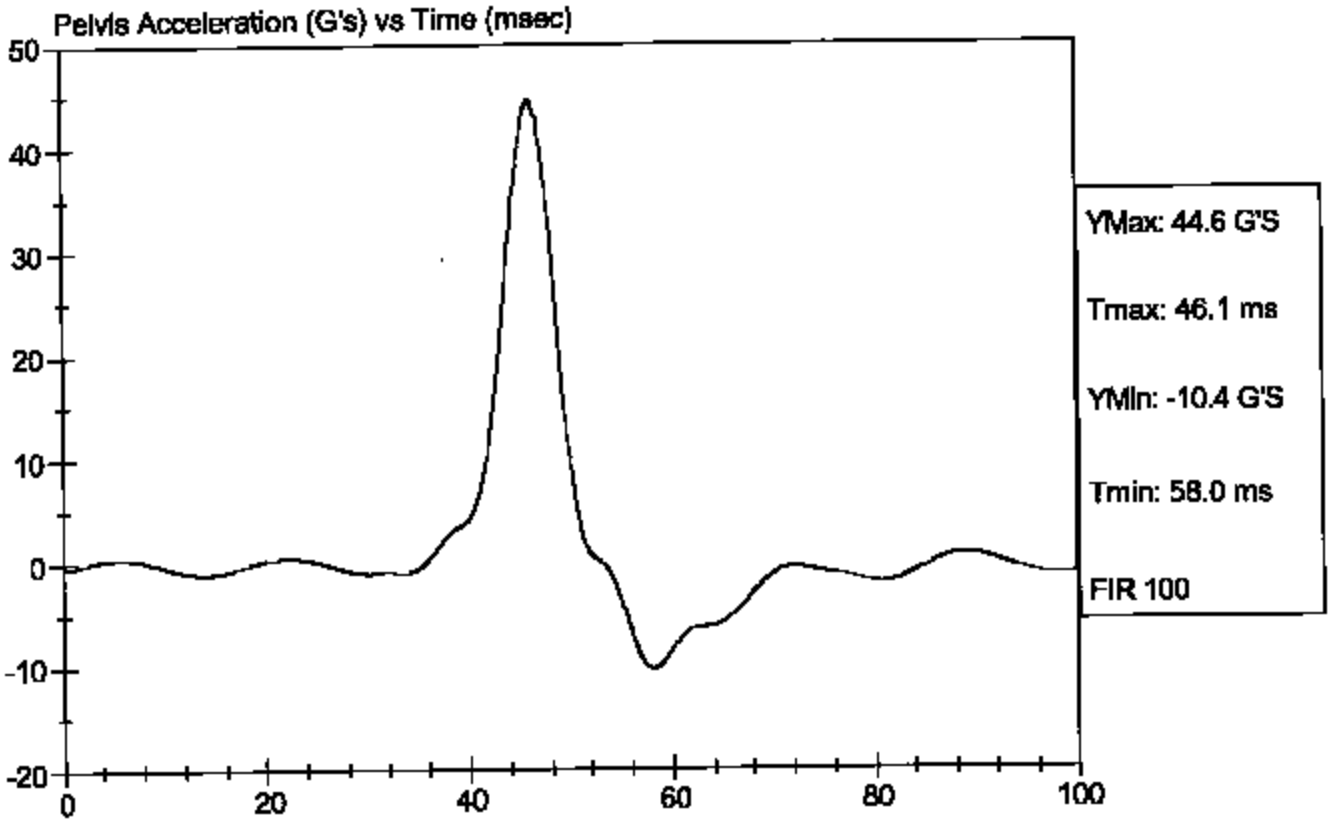
Laboratory Technician

05/24/2005
Test Date

Approved By

Test Desc: Pelvis Impact
Component ID: D051423

Test Date: 05/24/2005
Speed: 14.17 ft/sec, 4.32 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 037 **Test I.D:** D051424

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Force At 12.7 mm	N	104 -162	149	Pass
Force At 19 mm	N	163 - 222	206	Pass
Force At 25.4 mm	N	222 - 280	268	Pass
Force At 33 mm	N	325 - 391	361	Pass
		Overall Test Results		Pass

Laboratory Technician

05/23/2005
Test Date

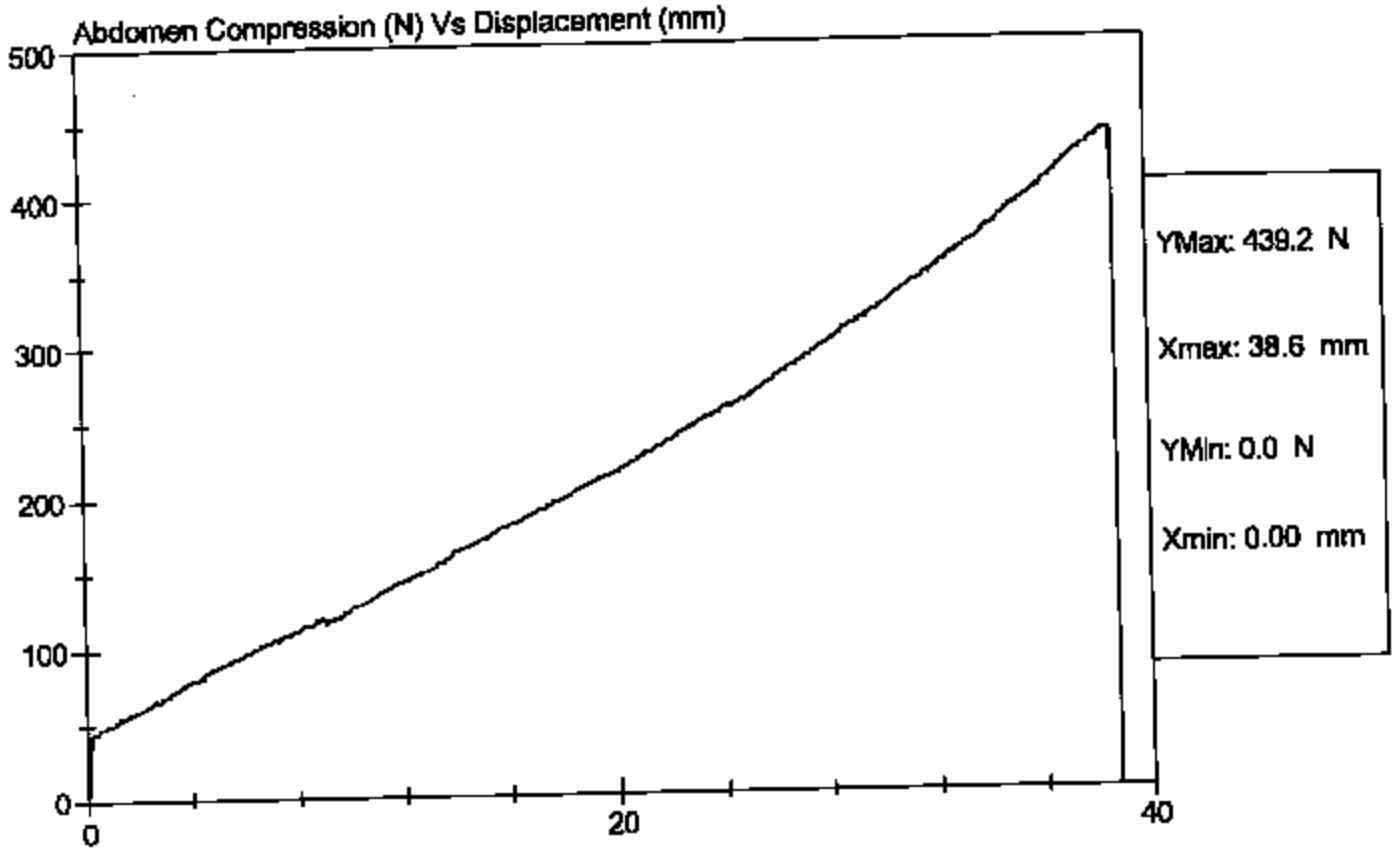
Approved By

Test Description: Abdomen Compression

Test Date: 05/23/2005

Component: D051424

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 037 **Test I.D:** D051425

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	125.7	Pass
Force At 30 deg	N	151.2 - 204.6	166.3	Pass
Force At 40 deg	N	204.6 - 258.0	222.2	Pass
Return Angle	Deg	12 Maximum	4	Pass
		Overall Test Results		Pass

Laboratory Technician

05/23/2005
Test Date

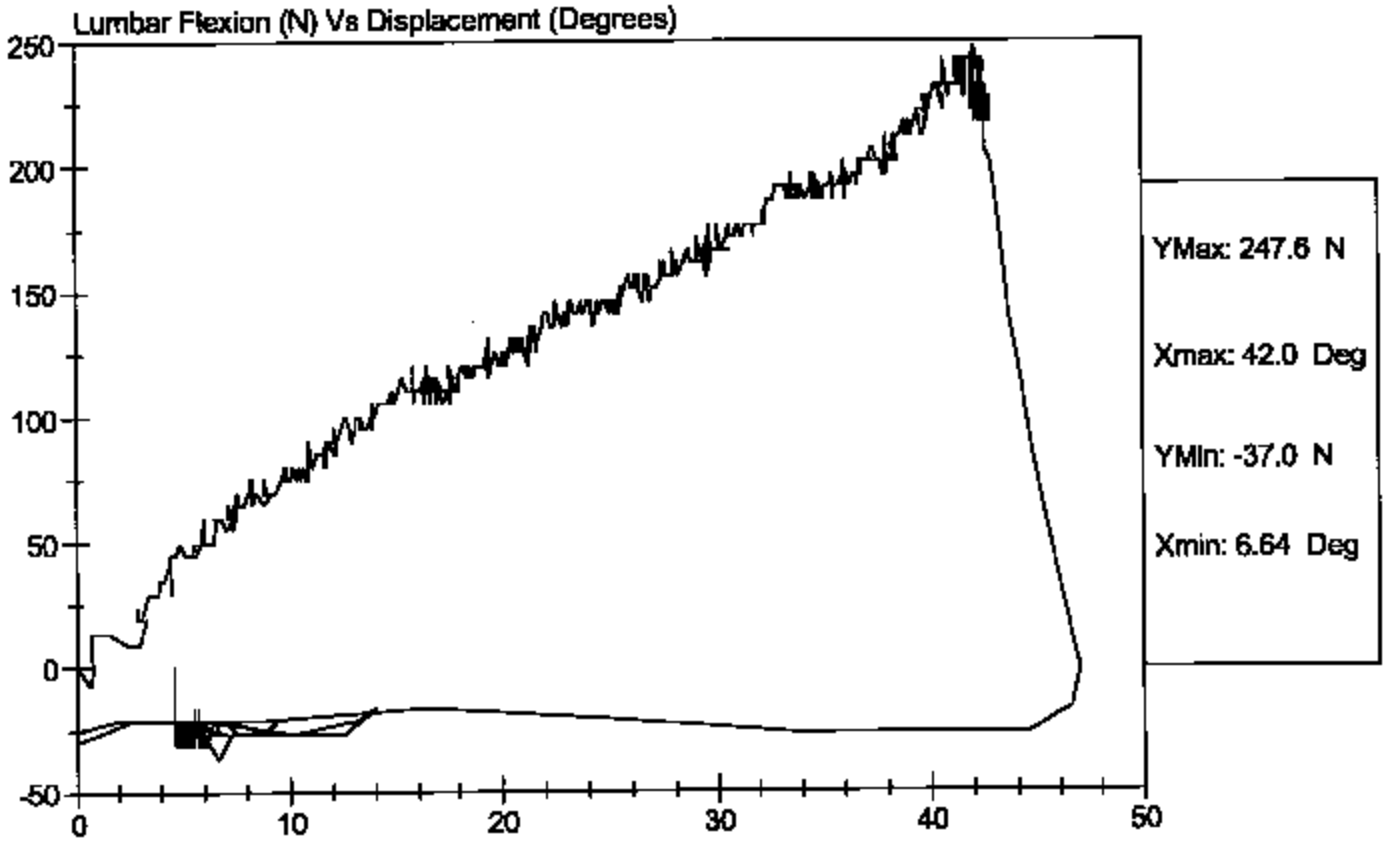
Approved By

Test Description: Lumbar Flexion

Test Date: 05/23/2005

Component: D051425

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy (SID)

Neck Pendulum Test

ATD Serial No: 037 **Test I.D:** D051429

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	7.07	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.26	Pass
	20 msec	m/s	4.12 to 5.10	4.47	Pass
	30 msec	m/s	5.73 to 7.01	6.09	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.91	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	72	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	61	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	11	Pass

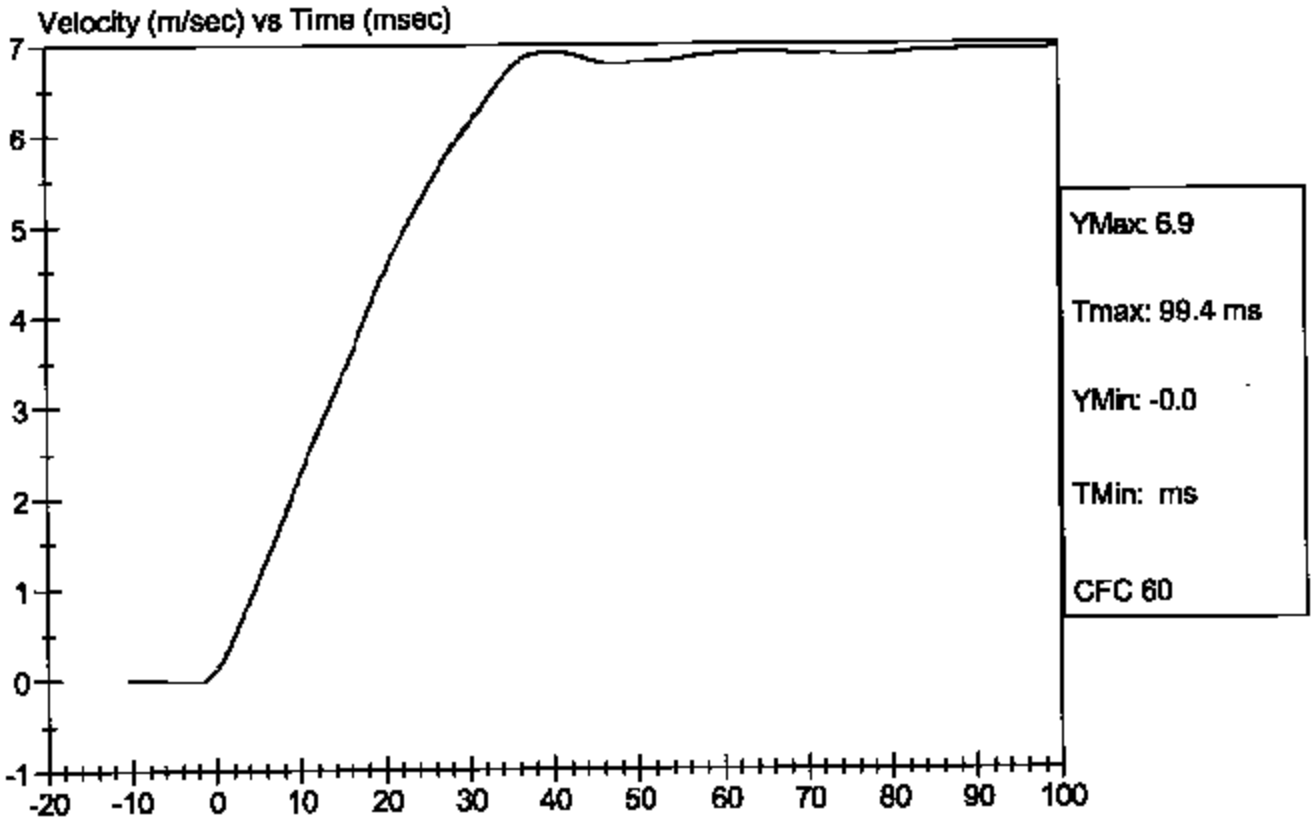
Laboratory Technician

05/23/2005
Test Date

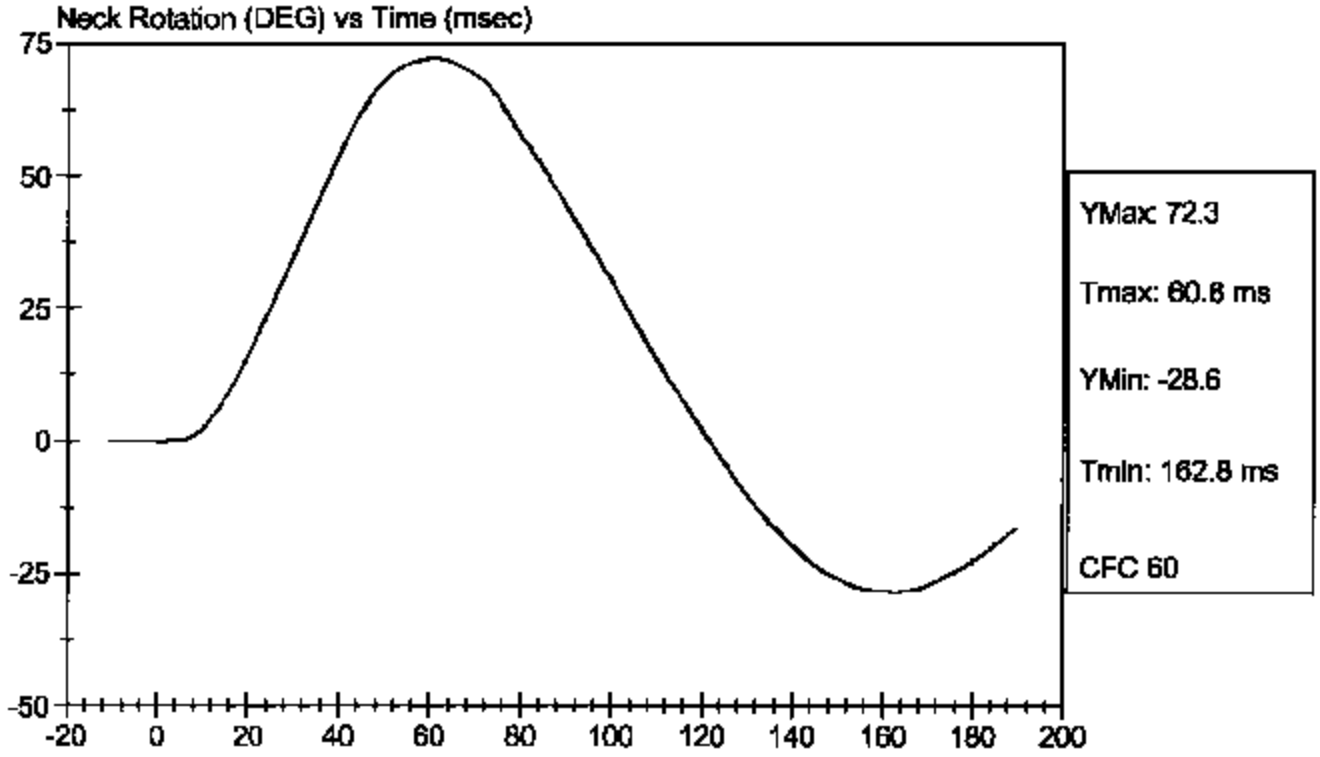
Approved By

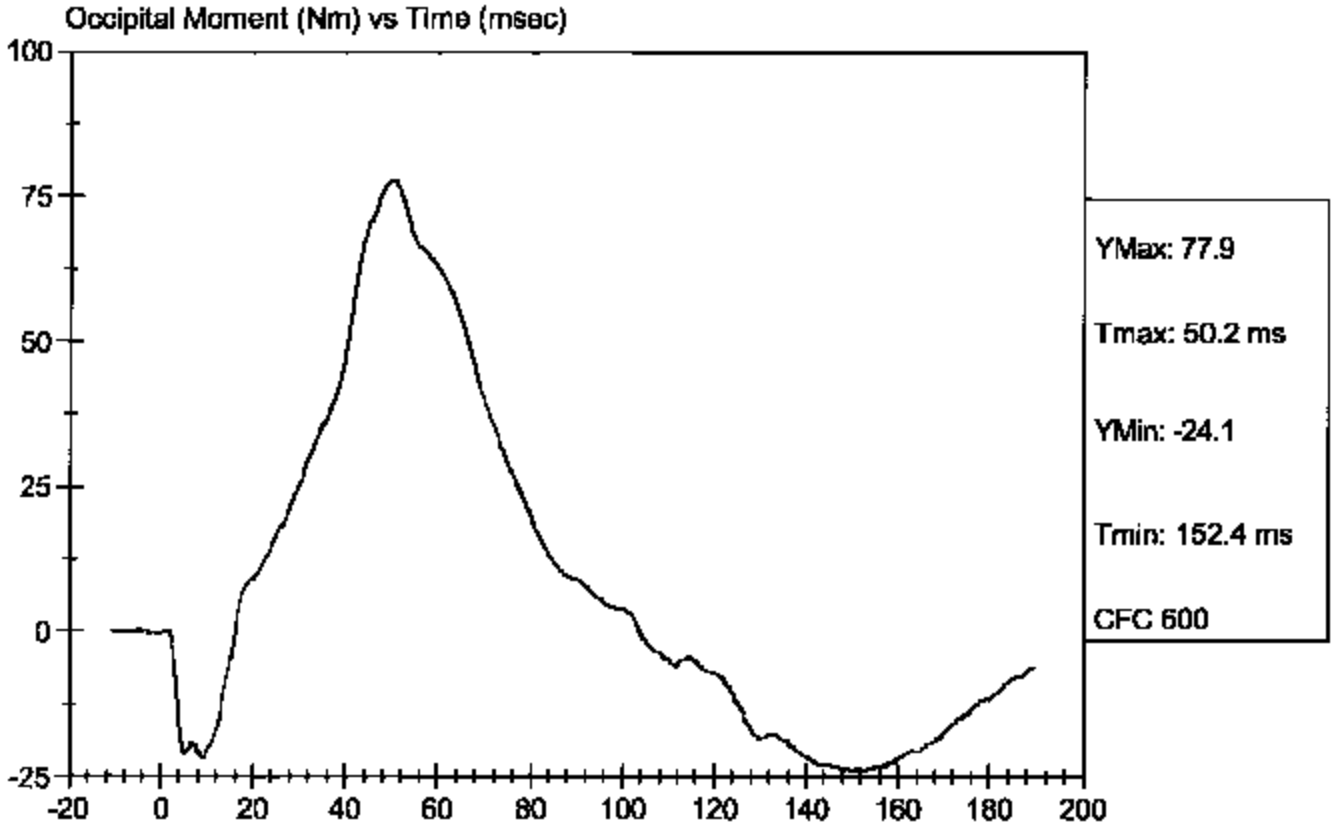
Test Desc: Neck Bending
Component ID: D051429

Test Date: 05/23/2005
Speed: 23.19 ft/sec, 7.07 m/sec



	Test Desc: Neck Bending Component ID: D051429	Test Date: 05/23/2005 Speed: 23.19 ft/sec, 7.07 m/sec





Calibration Test Results Summary

Dummy Serial Number: 037

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: 037 **Test I.D:** D051881

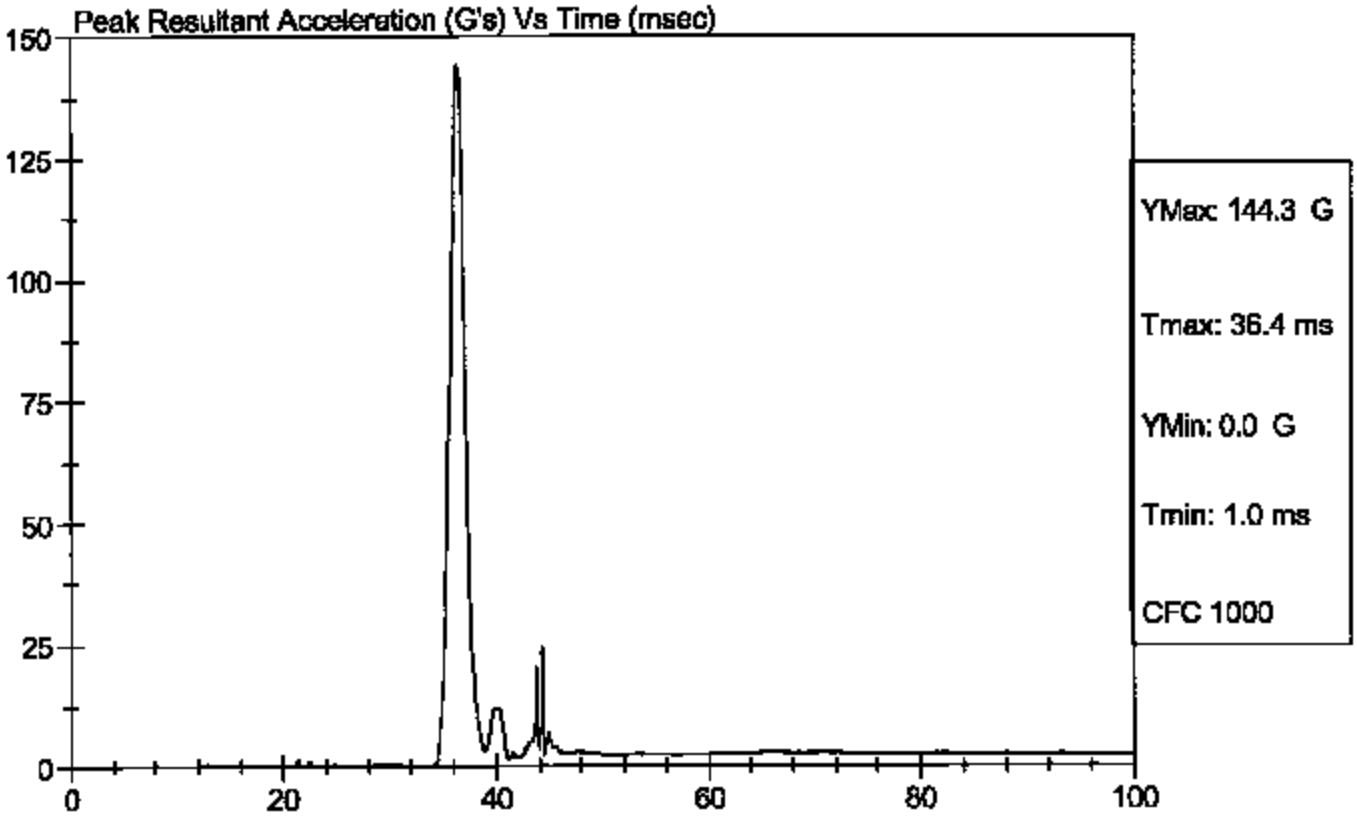
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Peak Resultant Acceleration	G's	120 to 150	144	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-13	Pass
		Overall Test Results		Pass

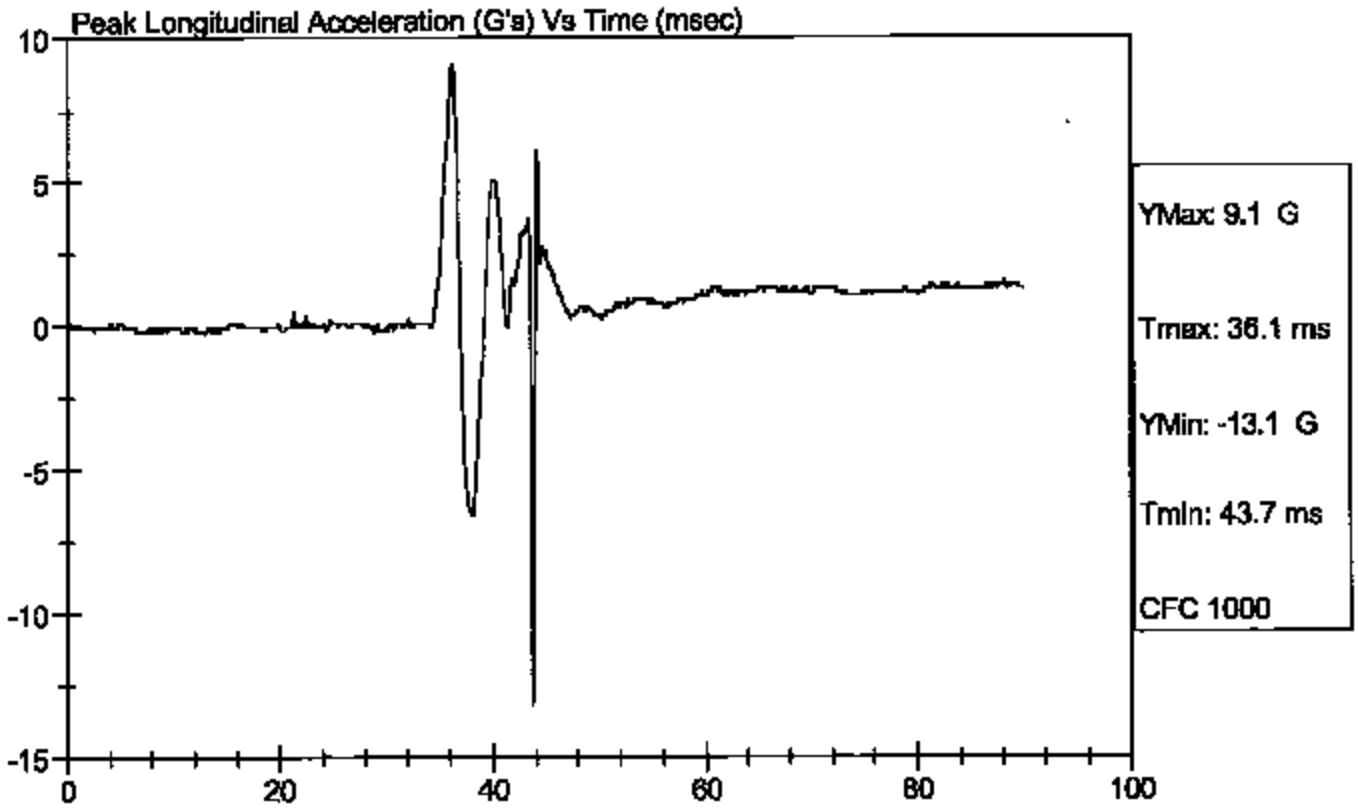
Laboratory Technician

07/06/2005
Test Date

Approved By

	Test Description: Head Drop	Test Date: 07/06/2005
	Component: D051881	Speed: 0 ft/s, 0.00 m/s





SID Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 037 **Test I.D:** D051882

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.2	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	43	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	21	Pass
		Overall Test Results		Pass

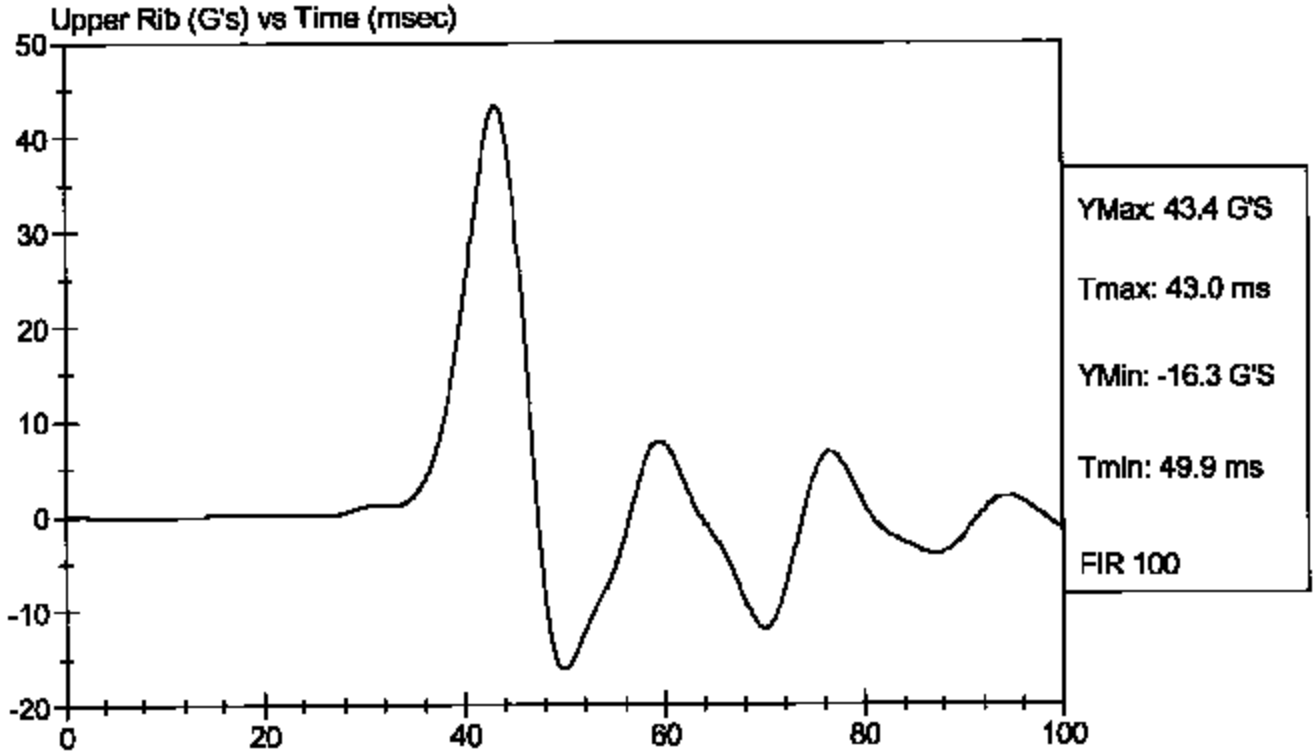
Laboratory Technician

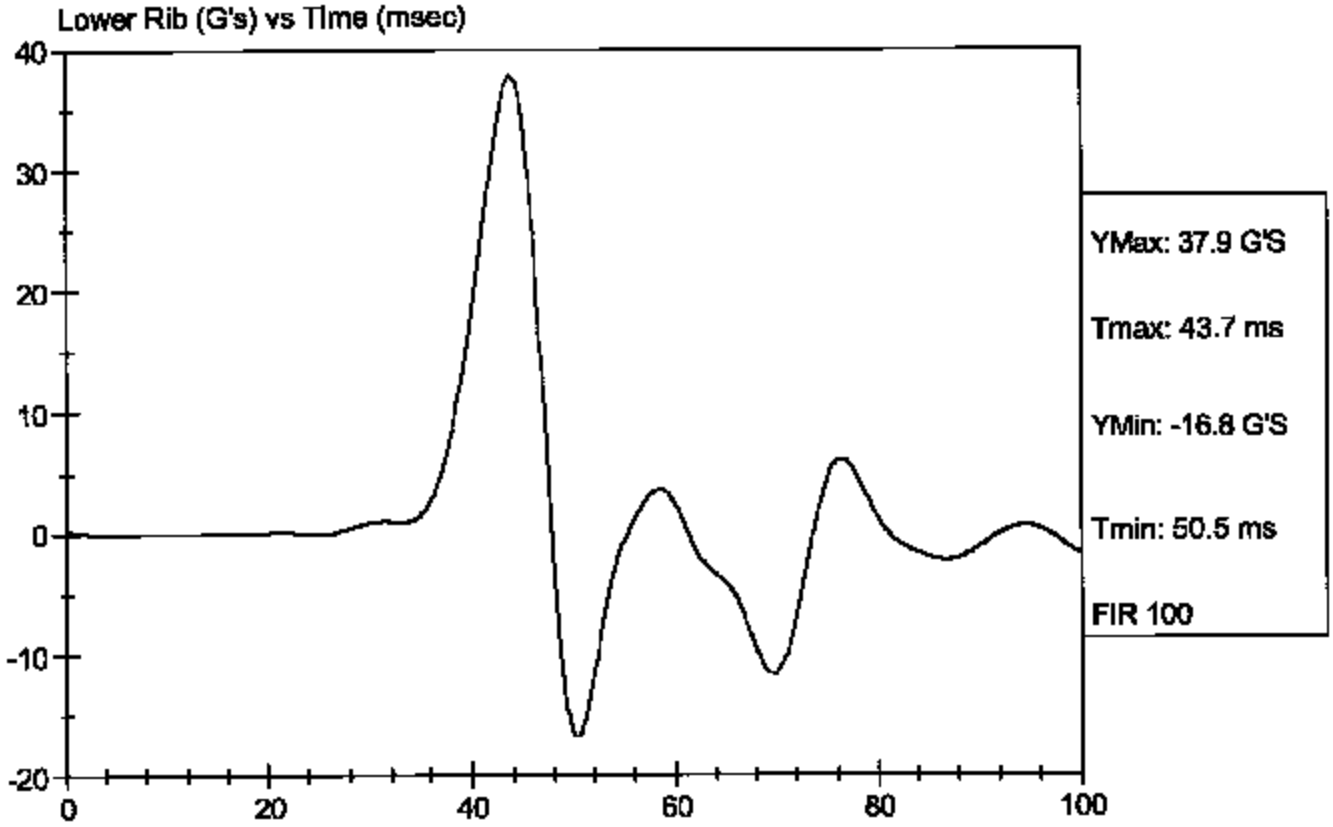
07/07/2005
Test Date

Approved By

Test Desc: Thorax Impact
Component ID: D051882

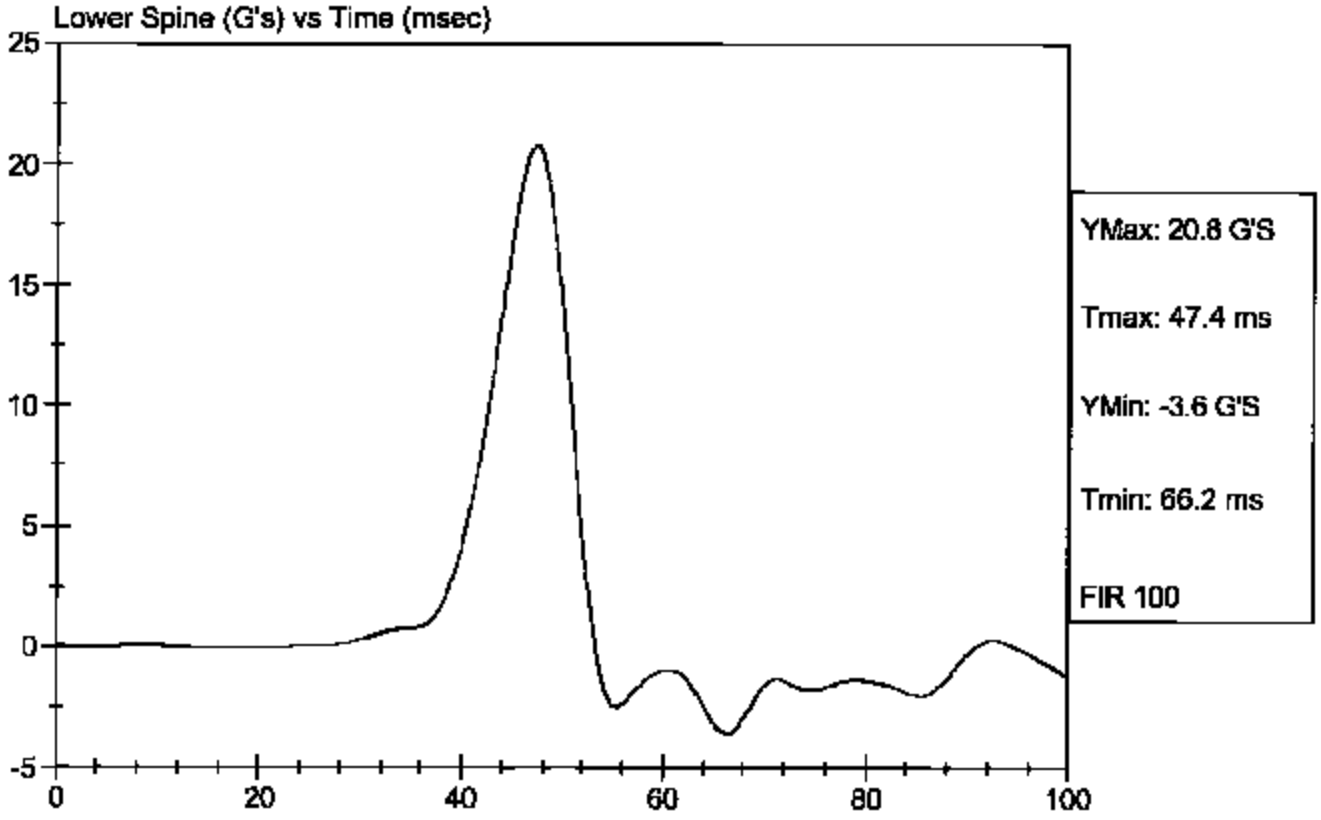
Test Date: 07/07/2005
Speed: 14.01 ft/sec, 4.27 m/sec





Test Desc: Thorax Impact
Component ID: D051882

Test Date: 07/07/2005
Speed: 14.01 ft/sec, 4.27 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 037 **Test I.D:** D051883

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	4.27 - 4.33	4.28	Pass
Pelvis Acceleration	G's	40 - 60	42	Pass
		Overall Test Results		Pass

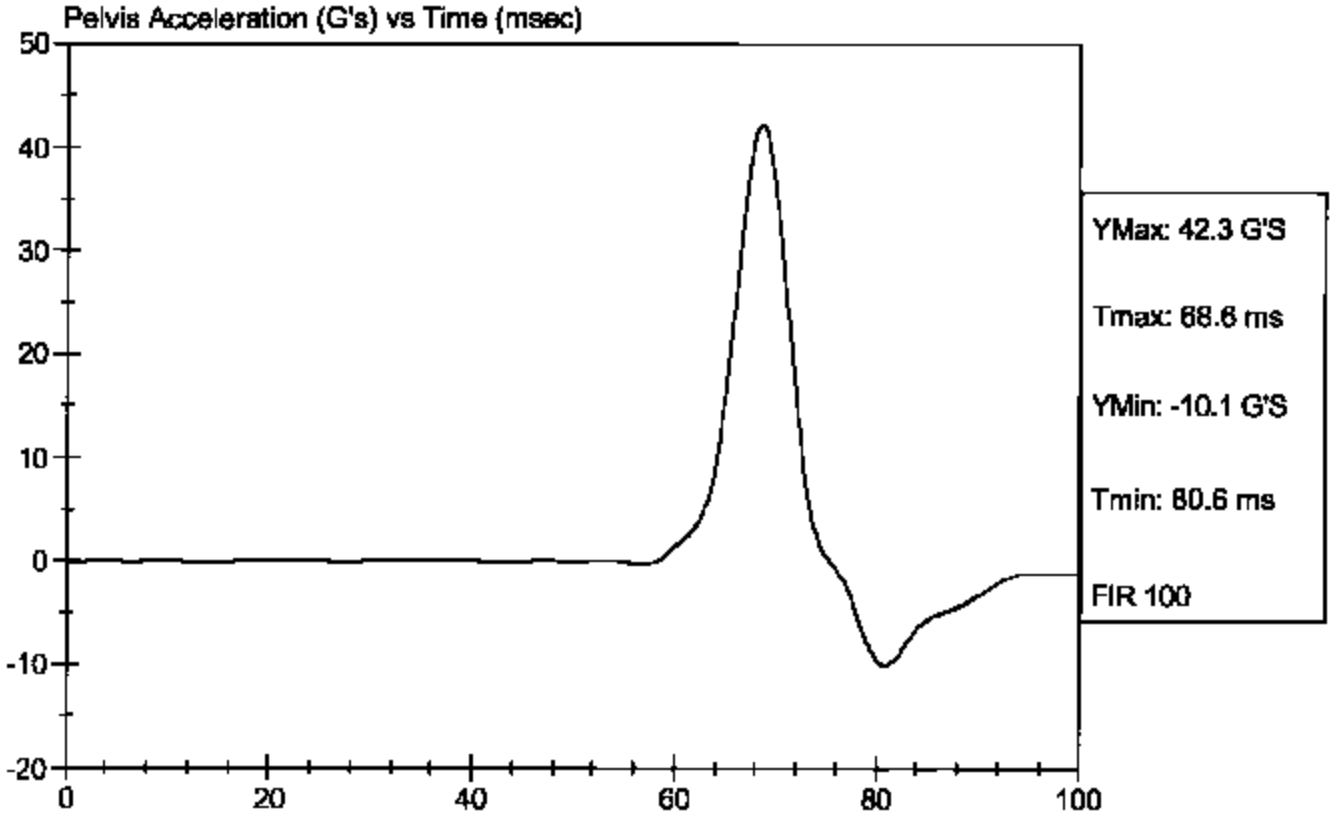
Laboratory Technician

07/07/2005
Test Date

Approved By

Test Desc: Pelvis Impact
Component ID: D051883

Test Date: 07/07/2005
Speed: 14.05 ft/sec, 4.28 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 037 **Test I.D:** D051884

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Force At 12.7 mm	N	104 -162	132	Pass
Force At 19 mm	N	163 - 222	190	Pass
Force At 25.4 mm	N	222 - 280	252	Pass
Force At 33 mm	N	325 - 391	344	Pass
		Overall Test Results		Pass

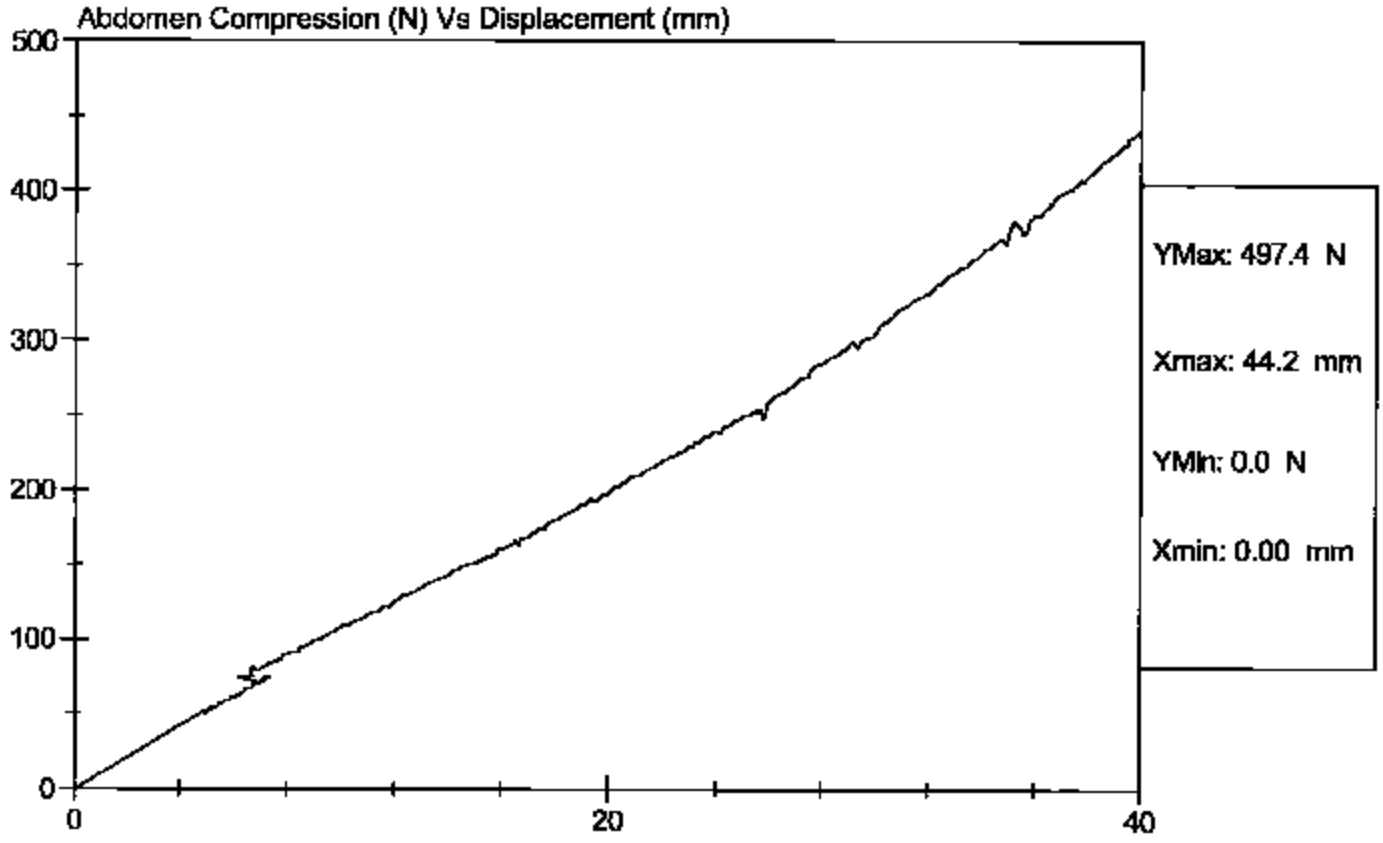
Laboratory Technician

07/07/2005
Test Date

Approved By

Test Description: Abdomen Compression | Test Date: 07/07/2005

Component: D051884 | Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 037 **Test I.D:** D051885

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	101.5	Pass
Force At 30 deg	N	151.2 - 204.6	167.6	Pass
Force At 40 deg	N	204.6 - 258.0	223.5	Pass
Return Angle	Deg	12 Maximum	2	Pass
		Overall Test Results		Pass

Laboratory Technician

07/07/2005
Test Date

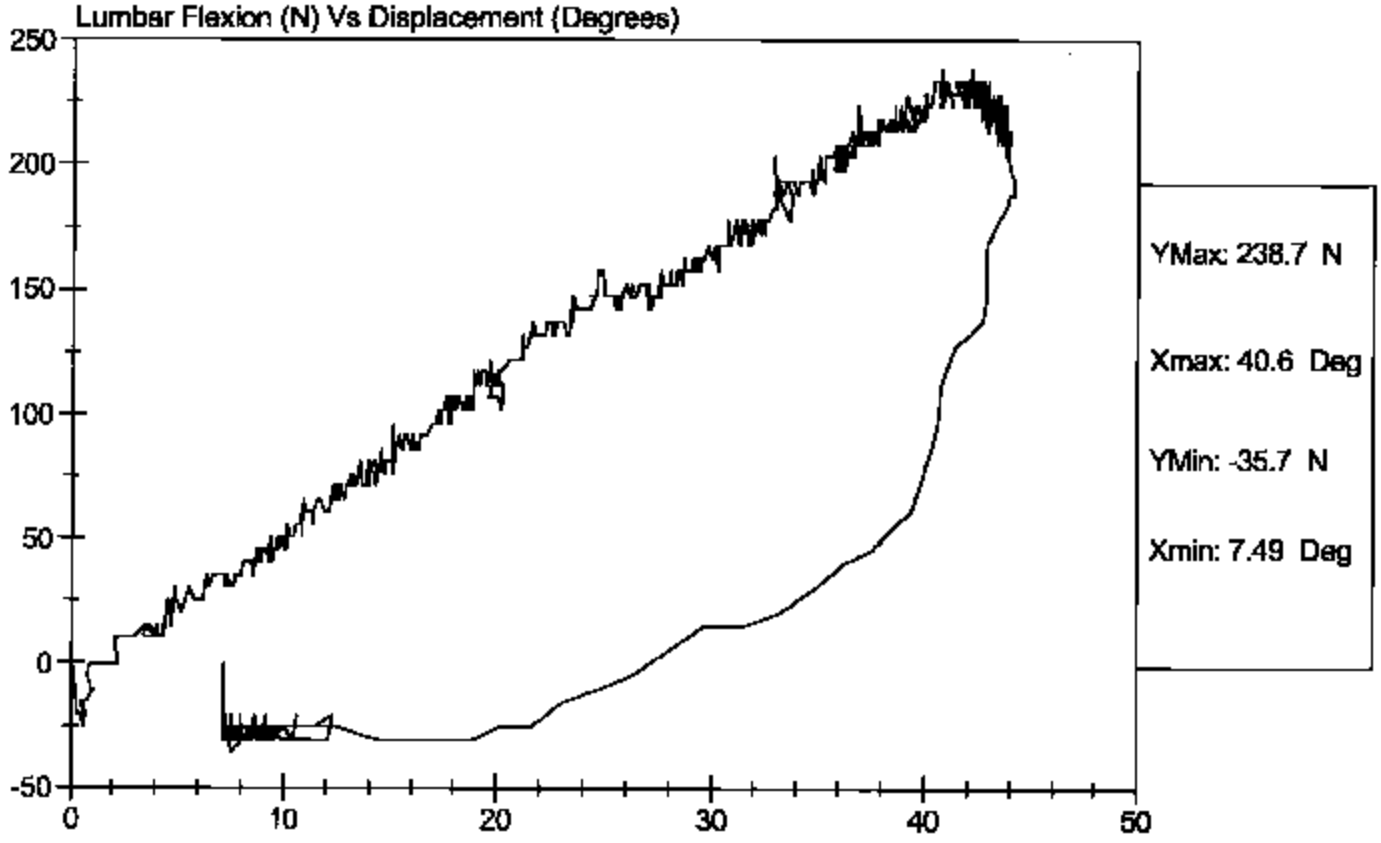
Approved By

Test Description: Lumbar Flexion

Test Date: 07/07/2005

Component: D051885

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy (SID)

Neck Pendulum Test

ATD Serial No: 183 **Test I.D:** D051889

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Impact Velocity		m/s	6.89 to 7.13	6.94	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.18	Pass
	20 msec	m/s	4.12 to 5.10	4.36	Pass
	30 msec	m/s	5.73 to 7.01	6.20	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.10	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	70	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	77	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	55	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	11	Pass

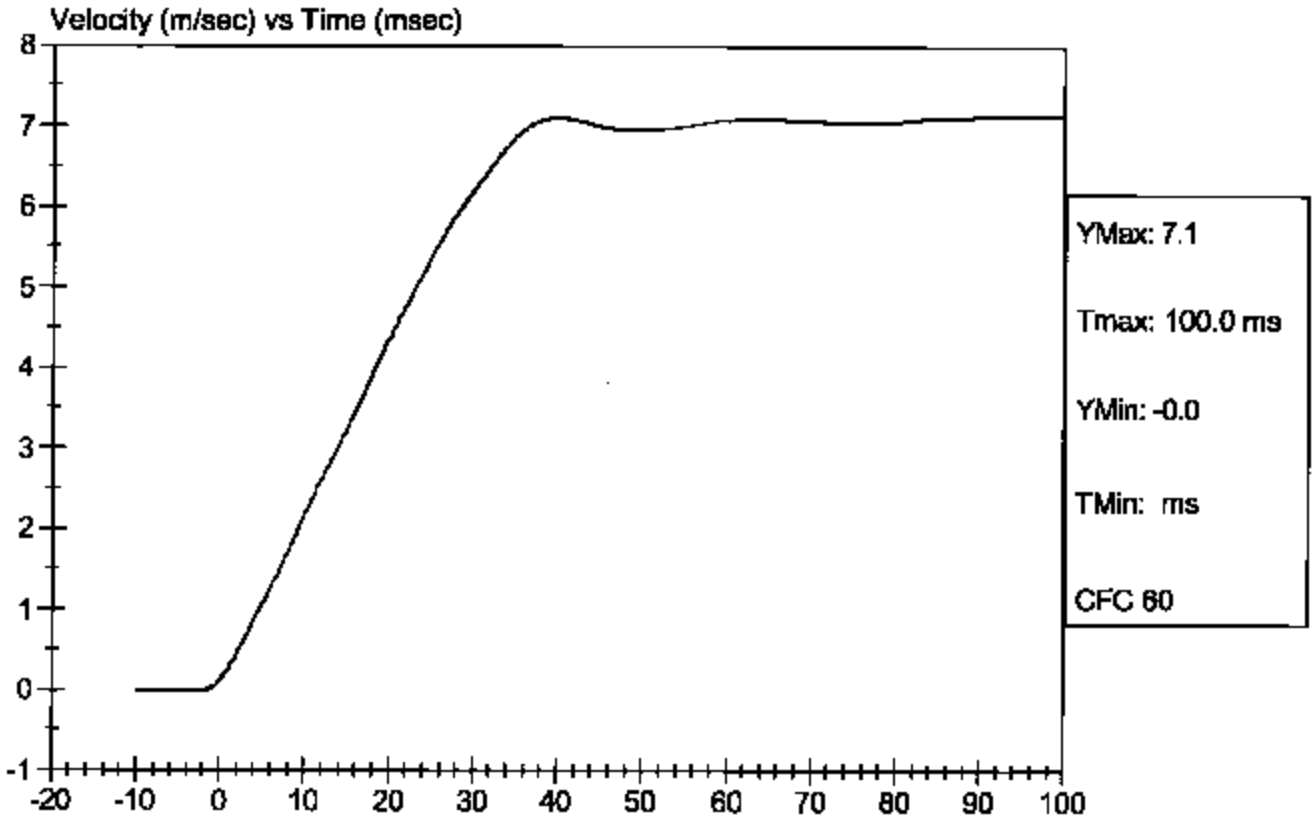
Laboratory Technician

07/07/2005
Test Date

Approved By

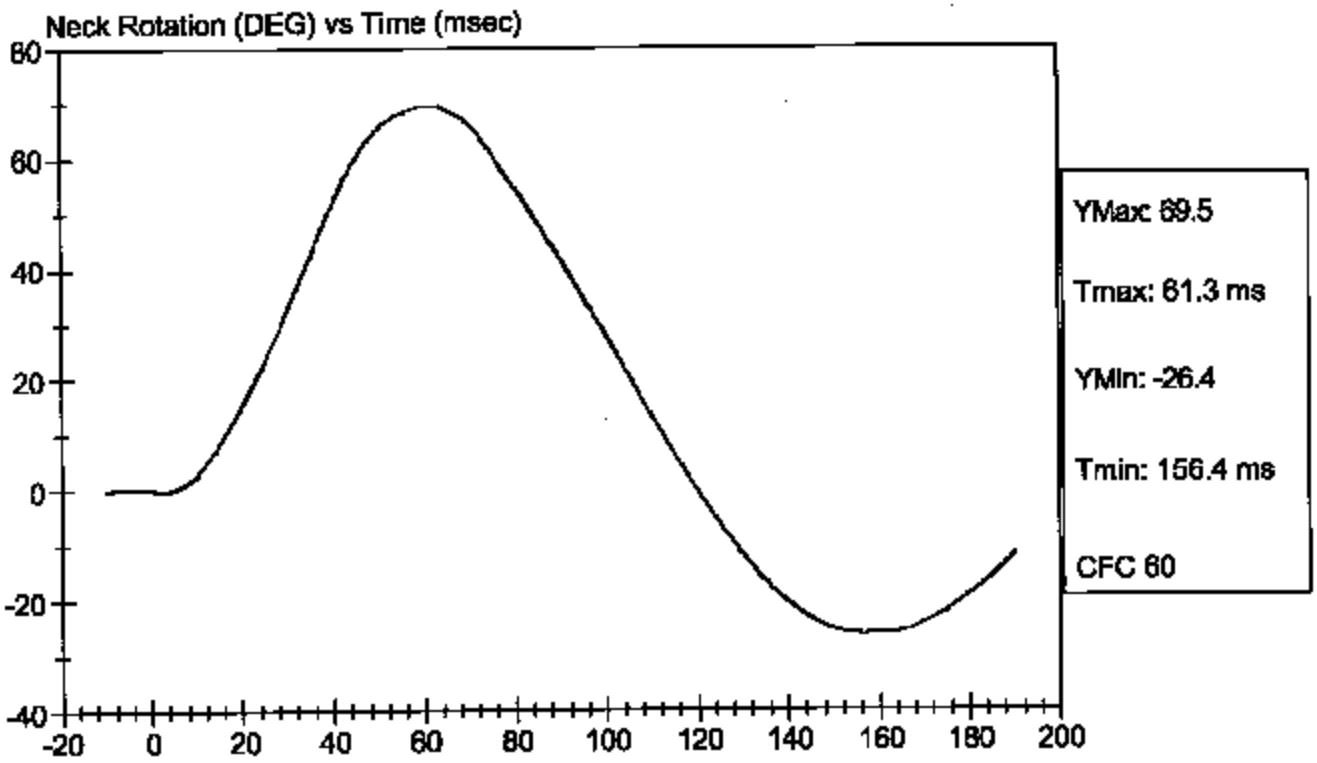
Test Desc: Neck Bending
Component ID: D051889

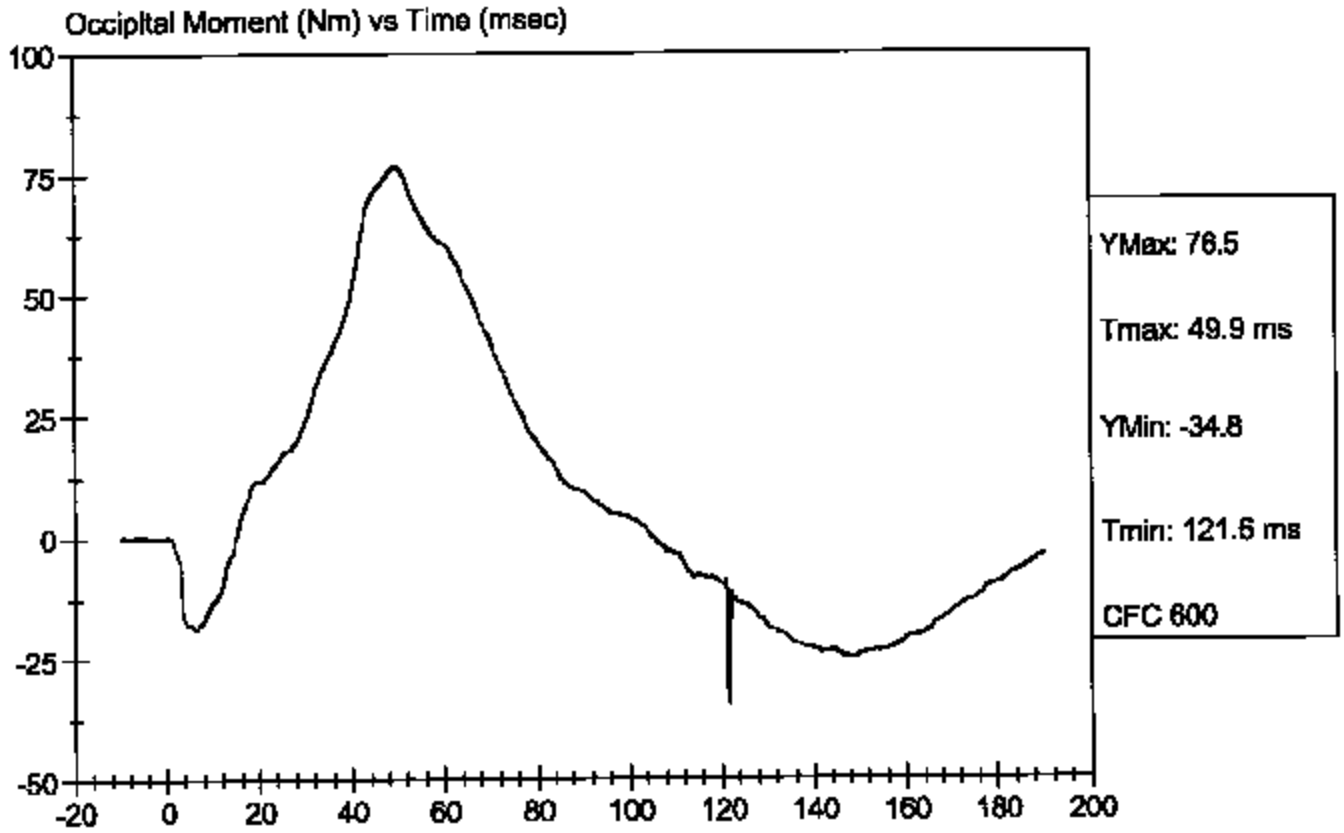
Test Date: 07/07/2005
Speed: 22.77 ft/sec, 6.94 m/sec



Test Desc: Neck Bending
Component ID: D051869

Test Date: 07/07/2005
Speed: 22.77 ft/sec, 6.94 m/sec





SID Calibration Data Sheet

Side Impact Dummy

Inspection Checklist

ATD Serial No: 037

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

07/7/2005

Test Date

Approved By

APPENDIX D

CALIBRATION INFORMATION DATA

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR DRIVER S/N 037		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head CG X	C10770	Endevco	3/17/05
Head CG Y	AH5E5	Endevco	3/17/05
Head CG Z	C12863	Endevco	3/21/05
Neck Load Cell	252	Denton	5/02/05
Upper Rib Y	G16-Z10	Entran	4/27/05
Lower Rib Y	G16-Z09	Entran	4/27/05
Lower Spine Y	F22-Z01	Entran	4/27/05
Pelvis Y	J14-J17	Entran	3/15/05
Upper Rib Redundant Y	F08-Z15	Entran	3/02/05
Lower Rib Redundant Y	F15-M11	Entran	3/02/05
Lower Spine Redundant Y	F09-N03	Entran	3/02/05
Pelvis Redundant Y	B26-J11	Entran	4/12/05

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Vehicle CG X	C09-Y09	Entran	3/31/05
Vehicle CG Y	B19-Z01	Entran	3/03/05
Vehicle CG Z	C11-Z13	Entran	3/31/05
Left Floor Y	B19-Z14	Entran	3/03/05
Left A-Post @ Sill Y	B26-Z16	Entran	3/17/05
Left Lower A-Post Y	B16-Z29	Entran	3/17/05
Left Mid A-Post Y	A09-N37	Entran	3/24/05
Left B-Post @ Sill Y	B28-Z10	Entran	3/17/05
Left Lower B-Post Y	C09-Y13	Entran	3/31/05
Left Mid B-Post Y	B28-Z15	Entran	3/17/05
Driver Seat Track Y	C06-L02	Entran	3/24/05
LF Door Accel. #1 Y	C06-L04	Entran	3/24/05
LF Door Accel. #2 Y	C06-L20	Entran	3/24/05
LF Door Accel. #3 Y	C06-L01	Entran	3/24/05
Upper Engine X	F04-R22	Entran	3/17/05
Upper Engine Y	C06-L08	Entran	3/24/05
Firewall Y	C06-L16	Entran	3/24/05
Right Floor Sill Y	K11-Z01	Entran	4/28/05
Rear Deck X	C04-L10	Entran	3/24/05
Rear Deck Y	C06-L19	Entran	3/24/05