

REAR IMPACT DYNAMIC SEAT TEST

GM DAEWOO AUTO & TECHNOLOGY COMPANY
2005 SUZUKI RENO
4-DOOR SEDAN

NHTSA NUMBER: C50507

PREPARED BY:
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10/19/05

FINAL REPORT

PREPARED FOR:
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16. Abstract A rear impact dynamic seat test was conducted on a 2005 Suzuki Reno 4-Door Sedan at Karco Engineering, LLC on 8/5/05. This test was conducted to obtain data indicant of NHTSA-STD-1207. The impact velocity was 47.84 Km/h. The ambient temperature at the time of impact was 35.0 degrees Celsius. The vehicle's maximum post-test static crush was 363 mm right of the vehicle's centerline.			
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TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
1	Purpose of Test	1
2	Summary of Test	2

<u>Data Sheet</u>	<u>Description</u>	<u>Page</u>
1	General Test and Vehicle Parameter Data	3
2	Moving Barrier Data	6
3	Seat Data	7
4	ICBC Measurements	9
5	Dummy Positioning In Vehicle	10
6	Vehicle and Seat Instrumentation Data Summary	12
7	Hybrid III ATD Injury Criteria and Sensor Data	13
8	Fuel System Integrity Post-Impact Data	16
9	Static Rollover Data	17
10	Camera Locations	19
11	Reference Target Measurements	20
12	Accident Investigation Division Data	21

<u>Appendix</u>	<u>Description</u>	<u>Appendix</u>
A	Photographs	A
B	Dummy and Vehicle Response Data Traces	B
C	Instrumentation and Data Channel Assignments	C
D	Dummy Calibration Data Traces and Tables	D

SECTION 1

PURPOSE OF TEST

1. PURPOSE

This 30 mph rear impact dynamic seat test was performed on a 2005 Suzuki Reno 4-Door Sedan. The purpose of this test is to evaluate the seat and occupant performance in moderate-to-high speed rear impacts.

SECTION 2

SUMMARY OF TEST

2. SUMMARY

A 1485 kg 2005 Suzuki Reno 4-Door Sedan was impacted from the rear by a 1799 kg moving barrier at a velocity of 47.84 Km/h (29.73 mph). The test was performed by KARCO Engineering, LLC on August 5, 2005.

The vehicle was prepared and tested following the Office of Vehicle Safety Compliance Test Procedure for Federal Motor Vehicle Safety Standard (FMVSS) 301R (OVSC TP-301-03, dated February 28., 2003). For the purpose of acquiring information for Office of Vehicle Safety Research, the test was modified as follows:

- Two (2) instrumented 50th percentile male Part 572E Hybrid III ATD's were positioned in the left front driver seat (P1) and the right rear passenger seat (P3) in the place of ballast ATD's.
- Two (2) high speed cameras were installed on the vehicle's right front and left rear doors.
- Two (2) front seat back frame MHD's, one (1) left front sill and one (1) right rear sill were installed to measure rotation about the Y-axis.
- Four (4) vehicle accels were installed to measure acceleration along the X-axis.

The crash event was recorded by ten (10) high speed and three (3) real time cameras. Camera locations and other pertinent camera information are found in the data sheets. Appendix A contains Pre- and Post-Test Photographs, Appendix B contains the Dummy and Vehicle Response Data Traces. Appendix C contains the Instrumentation Data Channel assignments. Appendix D contains the Dummy Calibration Data Traces and Tables.

The occupant and seat data is summarized below.

	Seat Back Rotation		HIC 36	NIJ				3 msec.Clip (g's)	Chest Deflection (mm)	Femur	
	Left (deg.)	Right (deg.)		Ntf	Nte	Ncf	Nce			Left	Right
Driver (P1)	-15.4	-27.2	200	0.26	0.39	0.02	0.01	19.4	-0.5	-1558.6	-1394.7
Pass. (P3)			163	0.09	0.14	0.16	0.02	33.2	-3.5	-1814.6	-1644.2
	Head to Torso Rotation										
	Degrees										
Driver (P1)	-24.0										
Pass. (P3)	-8.7										

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
 Test Date: 8/5/05

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	C50507
Make	Suzuki
Model	Reno
Body Style	4-Door
Vin No.	KL5JD66Z85K073474
Color	Blue
Delivery Date	5/5/05
Odometer	83
Dealer	Suzuki Riverside
Transmission	4 Speed Automatic
Final Drive	Front
Type/No. Cyl.	4
Engine Disp. (L)	2.0
Engine Placement	Transverse
Roof Rack	No
Sunroof/T-Top	No
Tinted Glass	No
Traction Control	No
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

Anti-Lock Brakes	No
All Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Side Airbag	Yes
Driver Head Airbag	No
Driver Curtain Airbag	No
Pass. Airbag	Yes
Pass. Side Airbag	Yes
Pass. Head Airbag	No
Pass. Curtain Airbag	No
Pre-Tensioners	
Load Limiters	
Bucket Seats	Yes
Air. Cond.	Yes
AM/FM Cassette	Yes
Tilt Steering	Yes
Automatic Door Locks	Yes
Power Windows	Yes
Power Seats	No
Other	

DATA FROM CERTIFICATION LABEL

Manufactured By	GM DAEWOO AUTO & TECHNOLOGY CO.
Date of Manufacture	Aug-04

GVWR (kg)	1680
GAWR Front (kg)	920
GAWR Rear (kg)	845

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	None	
Number of Occupants	2	3	0	5
Capacity Weight (VCW) (kg)				396
Cargo Weight (RCLW) (kg)				56

DATA SHEET NO. 1...(CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
 Test Date: 8/5/05

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	406	245		439	308	
Right	kg	397	238		434	304	
Ratio	%	62.5%	37.5%		58.8%	41.2%	
Totals	kg	803	483	1286	873	612	1485

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1286
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	56
Calculated Vehicle Target Wt. (TVTW)	kg	1494

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	655	664	664	677	974
As Tested	mm	632	632	618	618	1070

Vehicle Wheel Base (mm) 2595

Weight of Ballast Secured in cargo area (kg) 13.6

Vehicle Components Removed _____

* Ballast weight does not include cameras, instrumentation and brake abort system.

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 54.89

Usable Capacity Furnished by COTR (L) 54.89

Actual Test Volume with entire fuel System Filled (L) 51.10

1/3 of Usable Capacity (L) N/A

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 Purple

Is Vehicle Fuel Pump Electric or Mechanical? Electric

If electric, does pump operate with ignition switch "On" & engine "OFF" Yes

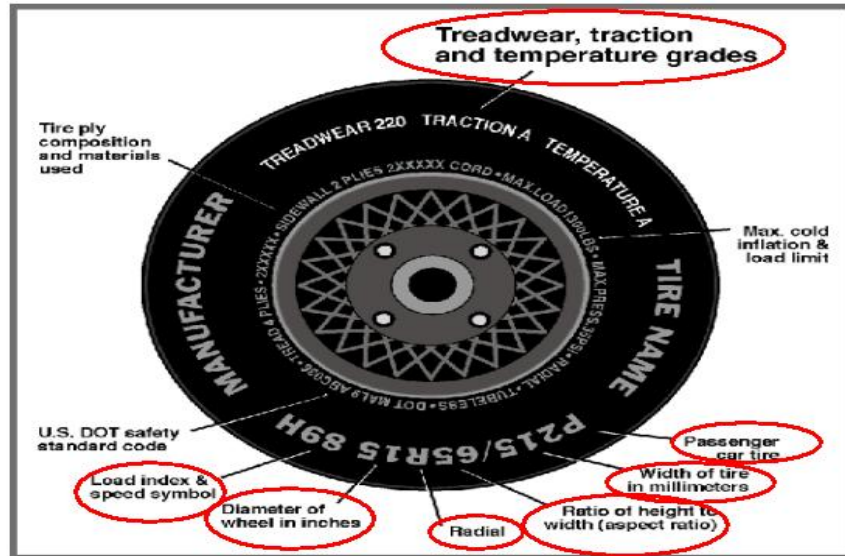
Fuel System Particulars: The fuel filler door is located on the right rear fender.
The standard fuel tank occupies the area under the rear seat.

DATA SHEET NO. 1...(CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
 Test Date: 8/5/05

Collect year, make, model, VIN, items circled in red, and tire manufacturer and tire name.



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kpa)	210	230
Recommended Tire Size	195/55/R15	195/55/R15
Tire Size on Vehicle	195/55/R15	195/55/R15
Tire Manufacturer	Hankook	Hankook
Treadwear	420	420
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester + 2 Steel	1 Polyester + 2 Steel
Load Index/Speed Symbol	84 V	84 V
Tire Material	Polyester + Steel + Rubber	Polyester + Steel + Rubber
DOT Safety Code Right	T7AMCHH2904	T7AMCHH2904
DOT Safety Code Left	T7AMCHH2904	T7AMCHH2904

DATA SHEET NO. 2
MOVING BARRIER DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
Test Date: 8/5/05

BARRIER SPECIFICATIONS

Measurement Description	mm
Barrier Face Height	1525
Barrier Face Width	1980
Barrier Face Ground Clearance	115
Tread Width	200
Wheelbase	3045
Tread Width	1530

LOCATION OF BARRIER CG

Measurement Description	mm
X-distance rearward of front wheel center	1372
Y-distance from longitudinal-vertical plane of symmetry	1523

BARRIER WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	494	405	
Right	kg	494	406	
Ratio	%	54.9%	45.1%	
Totals	kg	988	811	1799

BARRIER TIRES

Manufacturer	Maximum II
Model	Remington
Size	205-75-R15
Pressure (kPa)	241

BARRIER IMPACT VELOCITY

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	46.51 to 48.12	47.84
Trap No. 2 Velocity (Redundant)	km/h	46.51 to 48.12	47.79

DATA SHEET NO. 3

SEAT DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan

NHTSA No.: C50507

Test Program: Rear Impact Dynamic Seat Test

Test Date: 8/5/05

HEAD RESTRAINT

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X		X
Vertical Adjustment	X		X	
Fore-Aft Adjustment		X		X
Fore-Aft Locks		X		X

SEAT BACK RECLINE TYPE

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X	X	
Power		X		X
Lever (with detents)	X			X
Lever (ratchet)		X		X
Rotary Knob		X		X
Pivot Locks on both sides	X			X

LUMBAR ADJUSTMENT

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X	X	
Adjustable	X			X

BOLSTER ADJUSTMENT

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed	X		X	
Adjustable		X		X

SEAT CUSHION TYPE

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Cushion moves vertically	X		X	
Independently of seat back	X			X

DATA SHEET NO. 3...(CONTINUED)

SEAT DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan

NHTSA No.: C50507

Test Program: Rear Impact Dynamic Seat Test

Test Date: 8/5/05

SEAT CUSHION FORE-AFT

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X	X	
Power		X		X
Manual-Detents	X			X
Manual-Infinite		X		X

SEAT CUSHION FORE-AFT

	Driver (P1)		Passenger (P3)	
	Detents first/last	Travel (mm)	Detents first/last	Travel (mm)
Power				
Manual-Detents	1/22	220		
Manual-Infinite				

SEAT CUSHION VERTICAL

	Driver (P1)		Passenger (P3)	
	Yes	No	Yes	No
Fixed		X	X	
Power		X		X
Manual-Detents		X		X
Manual-Infinite	X			X

SEAT TEST POSITIONS

	Driver (P1)	Passenger (P3)
Seat Cushion Fore-Aft (mm)	220	
Seat Cushion Vertical (mm)	0	
Seat Back (Degrees)	15.0	22.7
Head Restraint to H-Point (mm)	823	805
Seatback MHD Angle (Pre/Post-Test)	29.0 Deg. / 49.4 Deg.	

DATA SHEET NO. 4
ICBC MEASUREMENTS

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan

NHTSA No.: C50507

Test Program: Rear Impact Dynamic Seat Test

Test Date: 8/5/05



HEAD RESTRAINT POSITION (vertical fore-aft)

	Driver (P1)				Height along torso line from pivot
	Units	(B)Backseat	(H)Height	Torso Angle (Degrees)	
Full Up / Fixed	mm	95	-39	25.0	823
Full Down / Fixed	mm	95	-105	25.0	759

HEAD RESTRAINT POSITION-CONFIGURED FOR TEST (vertical fore-aft)

	Driver (P1)				Height along torso line from pivot
	Units	(B)Backseat	(H)Height	Torso Angle (Degrees)	
Full Up / Fixed	mm	95	-39	25.0	823

HEAD RESTRAINT POSITION (vertical fore-aft)

	Passenger (P3)				Height along torso line from pivot
	Units	(B)Backseat	(H)Height	Torso Angle (Degrees)	
Full Up / Fixed	mm	90	-84	25.0	805
Full Down / Fixed	mm	90	-119	25.0	765

HEAD RESTRAINT POSITION-CONFIGURED FOR TEST (vertical fore-aft)

	Passenger (P3)				Height along torso line from pivot
	Units	(B)Backseat	(H)Height	Torso Angle (Degrees)	
Full Up / Fixed	mm	90	-84	25.0	805

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
Test Date: 8/5/05

TEST DUMMY POSITION MEASUREMENTS

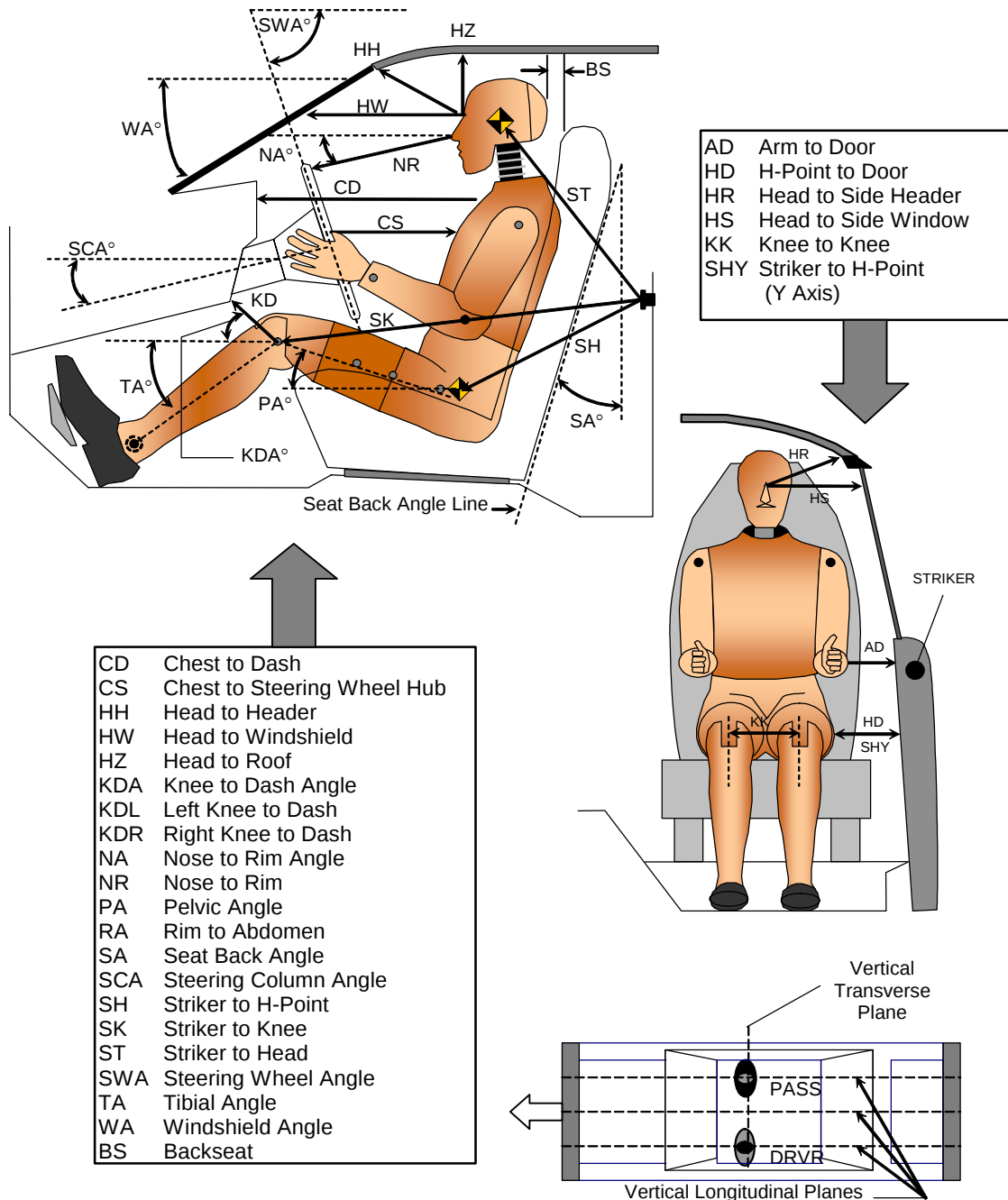
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		66.0		
SWA	Steering Wheel Angle		68.0		
SCA	Steering Column Angle		22.0		
SA	Seat Back Angle		15.0		22.7
HZ	Head to Roof (Z)	182	90.0	205	90.0
HH	Head to Header	317		1190	
HW	Head to Windshield	620		1540	
HR	Head to Side Header (Y)	230		220	
NR	Nose to Rim	435	17.0		
CD	Chest to Dash	572		1490	
CS	Chest to Steering Hub	320			
RA	Rim to Abdomen	220			
KDL	Left Knee to Dash	208	24.0	1055	
KDR	Right Knee to Dash	*		1060	2.5
PA	Pelvic Angle		24.5		24.0
TA	Tibia Angle		40.0		63.1
KK	Knee to Knee (Y)	310		277	
SK	Striker to Knee	540	2.0	610	15.0
ST	Striker to Head	495	87.0	372	70.0
SH	Striker to H-Point	210	45.0	453	47.0
SHY	Striker to H-Point (Y)	230		235	
HS	Head to Side Window	282		315	
HD	H-Point to Door (Y)	175		190	
AD	Arm to Door (Y)	128		105	
BS	Head to Back Seat	164		108	

* Not measured

DATA SHEET NO. 5...(CONTINUED) **DUMMY POSITIONING IN VEHICLE**

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
 Test Date: 8/5/05



DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6
VEHICLE AND SEAT INSTRUMENTATION DATA SUMMARY

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan

NHTSA No.: C50507

Test Program: FMVSS 301R

Test Date: 8/5/05

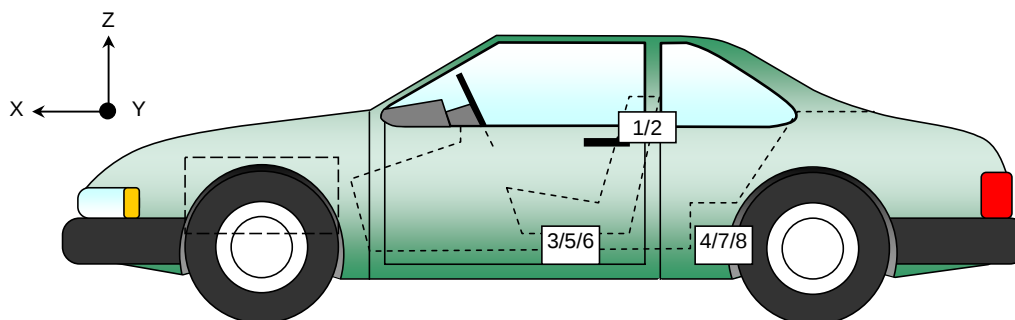
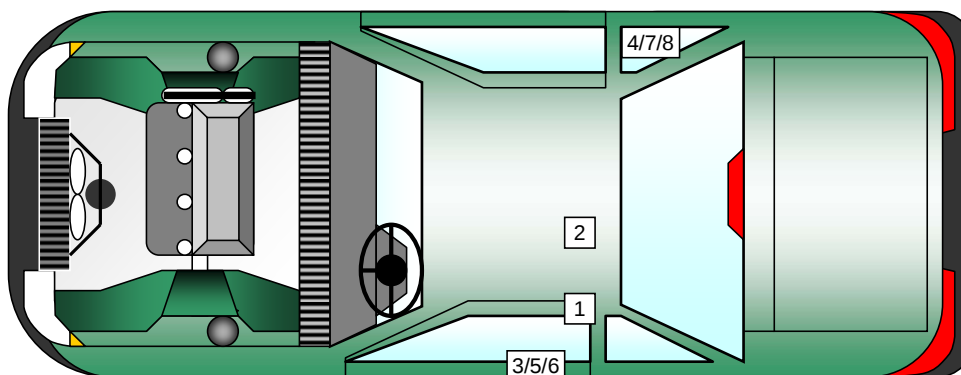
VEHICLE INSTRUMENTATION AND SEAT BACK PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Driver Seat Back Left Side	1635	-560	840	Deg/Sec	54.8	13.0	-383.1	56.1 ^{1,2}
2	Driver Seat Back Right Side	1635	-200	840	Deg/Sec	35.3	14.1	-424.4	80.8 ¹
3	Left Front Sill Angular Velocity	2360	-700	230	Deg/Sec	72.4	20.3	-47.0	12.7 ¹
4	Right Rear Sill Angular Velocity	1520	700	240	Deg/Sec	36.1	15.7	-51.7	52.7 ¹
5	Left Front Cross Member Primary	2445	-640	200	G's	21.1	21.4	-1.5	140.2
6	Left Front Cross Member Red.	2445	-610	200	G's	20.5	21.3	-1.5	140.2
7	Right Rear Cross Member Primary	1490	610	285	G's	16.1	24.5	-1.2	140.8
8	Right Rear Cross Member Red.	1490	640	285	G's	16.8	24.6	-1.2	140.6

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

1.) Digitally filtered values

2.) Channel failed at 63.0 msec.



DATA SHEET NO. 7
HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan

NHTSA No.: C50507

Test Program: FMVSS 301R

Test Date: 8/5/05

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	33.4	117.3	-4.9	64.3	34.9	51.2	-3.3	161.6
Head CG	Y	G's	0.8	77.1	-3.5	115.1	4.1	39.5	-2.6	271.3
Head CG	Z	G's	29.0	102.0	-0.1	7.9	13.2	61.3	-9.3	36.7
Head CG Resultant	N/A	G's	38.0	102.5			36.7	55.7		

CHEST PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	19.6	73.0	-3.2	349.9	34.2	40.3	-1.6	152.3
Chest CG	Y	G's	2.6	61.9	-2.2	47.3	1.4	63.3	-5.4	43.3
Chest CG	Z	G's	6.2	73.9	0.0	2.2	6.2	68.1	-9.3	42.9
Chest CG Resultant	N/A	G's	20.5	73.1			35.0	40.5		

HEAD AND CHEST PEAK ANGULAR VELOCITY

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	Y	Deg/Sec	812.9	236.5	-2422.5	95.1	648.8	73.4	-635.9	51.0 ¹
Chest CG	Y	Deg/Sec	384.9	189.7	-797.3	70.7	73.5	97.2	-184.5	31.8 ¹

1.) Digitally Filtered Values

LOWER NECK PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lower Neck	X	G's	23.3	73.4	-0.8	215.1	38.4	40.6	-2.1	140.8

HEAD INJURY CRITERIA (HIC36)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG	200.0	95.8	131.8	31.4	163.5	35.9	68.4	30.2

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG	19.4	71.6	74.6	33.2	39.2	42.2

DATA SHEET NO. 7...(CONTINUED)
HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan

NHTSA No.: C50507

Test Program: FMVSS 301R

Test Date: 8/5/05

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	463.9	122.2	-265.0	101.3	237.1	47.3	-263.4	67.5
Neck Force	Y	Newtons	39.6	49.7	-73.0	112.5	98.8	57.0	-18.0	24.0
Neck Force	Z	Newtons	1826.4	106.6	-118.9	37.5	272.1	54.0	-684.1	37.1
Neck Force Resultant	N/A	Newtons	1832.6	106.6			686.4	37.1		
Neck Moment	X	Nm	5.4	111.9	-3.8	125.3	7.0	48.9	-2.7	91.3
Neck Moment	Y	Nm	36.5	122.4	-22.8	103.7	30.9	46.8	-20.6	67.1
Neck Moment	Z	Nm	1.9	58.2	-1.6	187.7	4.9	48.4	-3.3	151.7
Neck Moment Resultant	N/A	Nm	36.6	122.4			31.5	47.4		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	688.5	118.7	-127.9	60.4	446.2	42.4	-80.8	162.3
Neck Force	Y	Newtons	279.7	93.3	-117.3	112.0	114.2	42.9	-169.0	162.3
Neck Force	Z	Newtons	1980.2	106.3	-73.7	24.2	512.8	61.7	-641.5	37.9
Neck Force Resultant	N/A	Newtons	2001.2	106.3			746.1	38.9		
Neck Moment	X	Nm	6.4	86.2	-8.4	115.9	6.7	42.6	-0.8	21.3
Neck Moment	Y	Nm	14.1	61.3	-83.3	116.2	9.8	174.6	-27.5	53.5
Neck Moment	Z	Nm	1.7	245.3	-4.9	110.9	12.9	41.4	-2.9	142.2
Neck Moment Resultant	N/A	Nm	83.8	116.2			27.9	53.5		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	718.6	88.0	-1558.6	45.5	215.0	182.9	-1814.6	47.4
Right Femur	Z	Newtons	774.6	81.3	-1394.7	43.3	192.3	198.2	-1644.2	49.2

CHEST PEAK DEFLECTIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	MM	1.4	127.7	-0.5	45.1	0.1	112.4	-3.5	44.7

DATA SHEET NO. 7...(CONTINUED)
HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan

NHTSA No.: C50507

Test Program: FMVSS 301R

Test Date: 8/5/05

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	20.8	54.4	-2.6	145.0	31.1	47.7	-2.3	195.3
Pelvis	Y	G's	2.6	84.7	-5.5	84.3	3.0	57.1	-9.4	42.6
Pelvis	Z	G's	8.6	73.7	-0.7	207.9	8.5	62.9	-1.9	213.1
Pelvis Resultant	N/A	G's	21.3	54.4			32.1	47.7		

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Load	N/A	Newtons	422.5	131.5	-11.8	60.4	151.9	123.3	-19.6	40.9
Belt Pullout	N/A	MM	12.4	349.9	-45.0	56.5	0.2	348.0	-40.7	42.7

1.) Passenger channel - Questionable data

DATA SHEET NO. 8
FUEL SYSTEM INTEGRITY POST- IMPACT DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan

NHTSA No.: C50507

Test Program: Rear Impact Dynamic Seat Test

Test Date: 8/5/05

Test Time: 5:43 PM

Temperature: 35.0 Deg. C.

STODDARD SOLVENT SPILLAGE MEASUREMENTS

A. From impact until vehicle motion ceases: 0.0 oz.
(Maximum Allowable = 1 ounce)

B. For the 5 minute period after motion ceases: 0.0 oz.
(Maximum Allowable = 5 ounces)

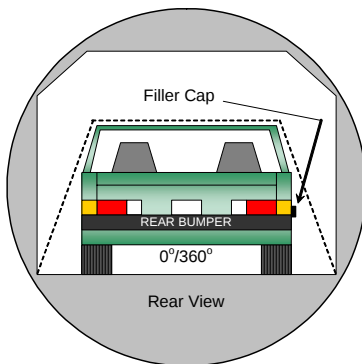
C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)

D. Spillage Location Details: No leakage occurred

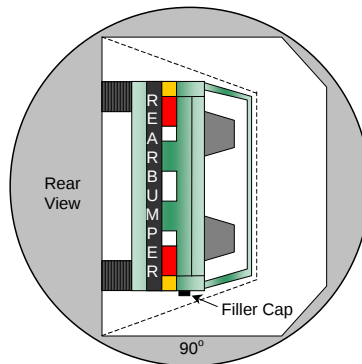
DATA SHEET NO. 9
STATIC ROLLOVER DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
Test Program: Rear Impact Dynamic Seat Test

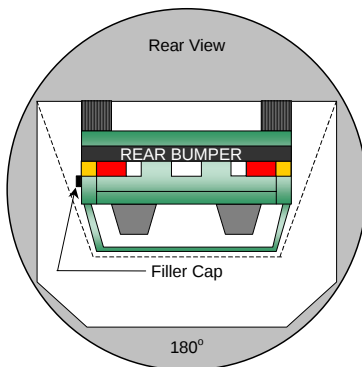
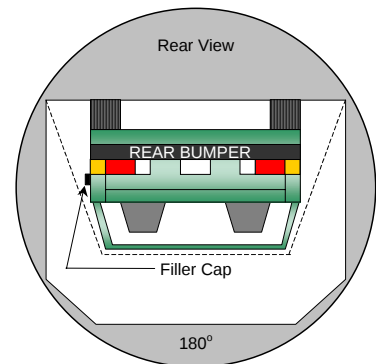
NHTSA No.: C50507
Test Date: 8/5/05



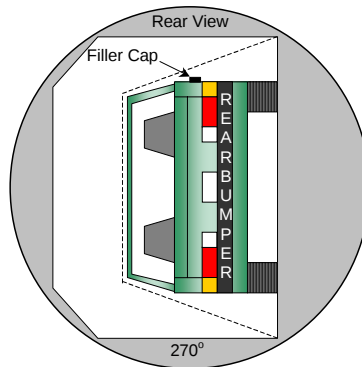
0° to 90°



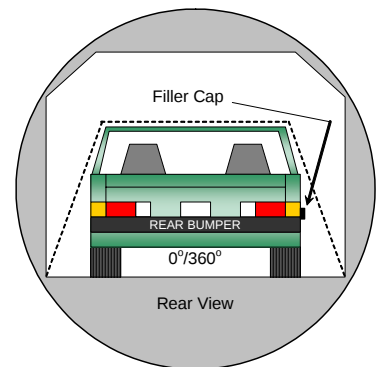
90° to 180°



180° to 270°



270° to 360°



1. The specified fixture rollover rate for each 90° of rotation is 60 to 120 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. No solvent leakage occurred during rollover.

DATA SHEET NO. 9...(CONTINUED)
STATIC ROLLOVER DATA

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
 Test Date: 8/5/05

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	89	311	400
90° to 180°	78	300	378
180° to 270°	78	313	391
270° to 360°	74	300	374

FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)

First 5 Minutes	5.0
Sixth Minute	1.0
Seventh Minute	1.0
Eighth Minute	1.0

ACTUAL TEST VEHICLE SOLVENT SPILLAGE TABLE (oz.)

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	0
90° to 180°	0	0	0	0
180° to 270°	0	0	0	0
270° to 360°	0	0	0	0

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 10
CAMERA LOCATIONS

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
Test Date: 8/5/05

VEHICLE CAMERA MEASUREMENT TABLE

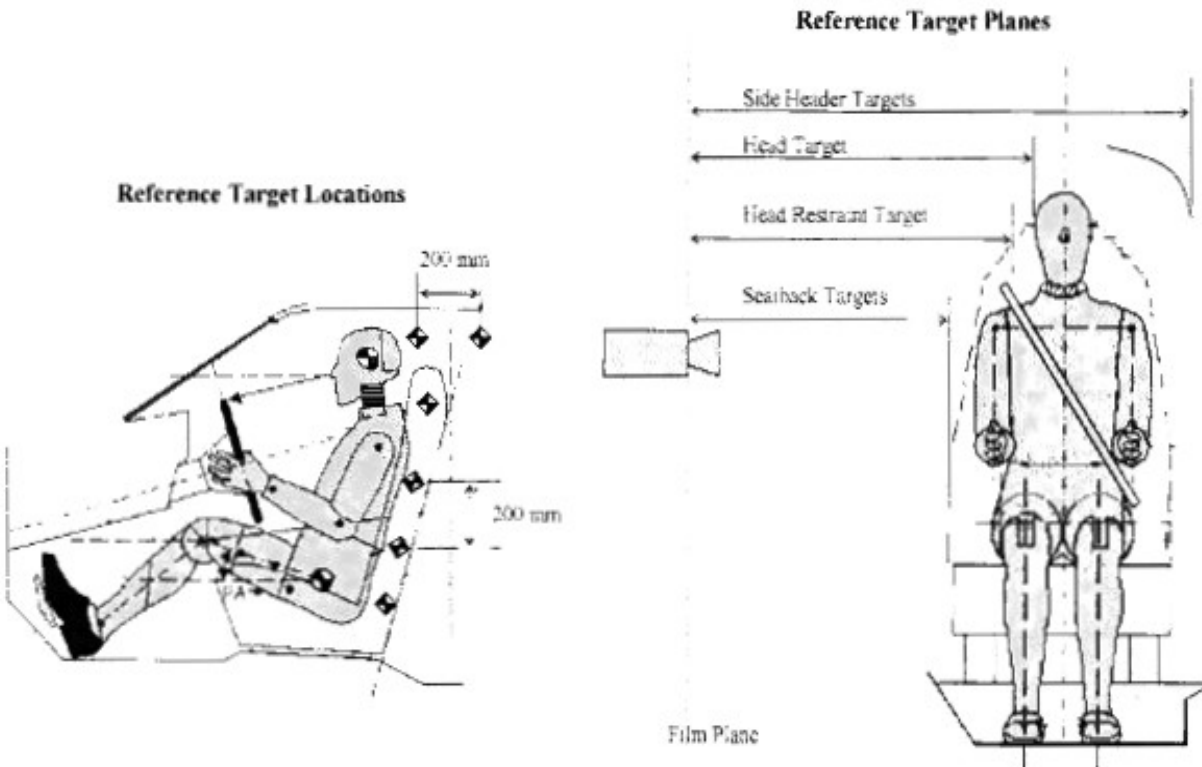
No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Real Time, Documentary	2068	1528	-1862	-7.0	Zoom	30
2	Left Side	560	-12192	-1700	0.0	35mm	1000
3	Right Side	2286	-11856	-1700	0.0	35mm	1000
4	Overhead	1220	2860	-5486	-90.0	20mm	1000
5	Moving Barrier	0	0	-2340	64.0	7mm	860
6	Rear Underside	3050	0	1832	90.0	12mm	1000
7	Mid Underside	1840	0	1849	90.0	12mm	1000
8	Front Underside	620	0	1822	90.0	13mm	1000
9	Underside Close-Up	770	270	1851	84.0	25mm	1000
10	Driver Side On-Board	-1622	72	-1142	-2.0	14mm	1000
11	Passenger On-Board	-1630	-74	-1139	-2.0	8mm	1000
12	Real Time Left Side	700	-12192	-1800	-2.0	Zoom	30
13	Real Time Right Side	2000	-11200	1800	-2.0	Zoom	30

X = Monorail Centerline Y = Impact Location Z = Ground DNR = Did Not Run NTM = No Timing Marks

DATA SHEET NO. 11
REFERENCE TARGET MEASUREMENTS

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
 Test Date: 8/5/05



Film Plane to Reference Distance		
Plane	Driver (P1)	Passenger (P3)
Seat Back	1116	
Head Restraint	1209	957
Head Target	1145	998
Side Header	911	731

* All measurements in mm

DATA SHEET NO. 12
ACCIDENT INVESTIGATION DIVISION DATA

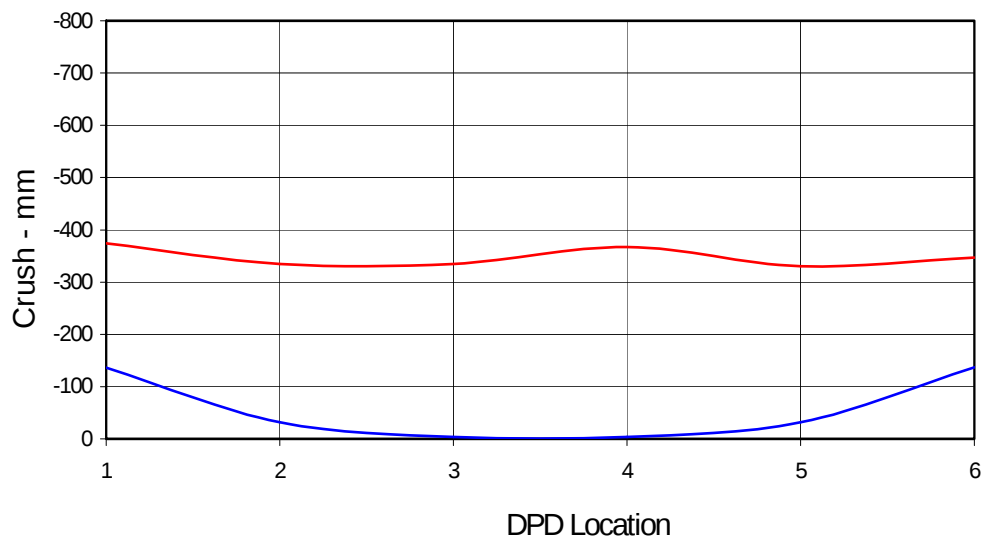
Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: Rear Impact Dynamic Seat Test

NHTSA No.: C50507
 Test Date: 8/5/05

CRUSH PROFILE

Damage Region Length (mm): 1316 Midpoint of Damage: Centerline
 Impact Mode: Rear Impact (0 Deg.)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	-136	-374	238
C2	Crush zone 2 on left side	mm	-32	-335	303
C3	Crush zone 3 on left side	mm	-4	-335	331
C4	Crush zone 4 on right side	mm	-4	-367	363
C5	Crush zone 5 on right side	mm	-32	-330	298
C6	Crush zone 6 at right side	mm	-137	-347	210



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure		Page
A-1	Left Front $\frac{3}{4}$ View, As Received	A-1
A-2	Right Rear $\frac{3}{4}$ View, As Received	A-2
A-3	Vehicle Certification Label	A-3
A-4	Vehicle Tire Label	A-4
A-5	Pre-Test Front View	A-5
A-6	Post-Test Front View	A-6
A-7	Pre-Test Left Side View	A-7
A-8	Post-Test Left Side View	A-8
A-9	Pre-Test Right Side View	A-9
A-10	Post-Test Right Side View	A-10
A-11	Pre-Test Left Front $\frac{3}{4}$ View	A-11
A-12	Post-Test Left Front $\frac{3}{4}$ View (Vehicle Moved)	A-12
A-13	Pre-Test Right Rear $\frac{3}{4}$ View	A-13
A-14	Post-Test Right Rear $\frac{3}{4}$ View	A-14
A-15	Pre-Test Front Underbody	A-15
A-16	Post-Test Front Underbody	A-16
A-17	Pre-Test Mid Underbody	A-17
A-18	Post-Test Mid Underbody	A-18
A-19	Pre-Test Rear Underbody	A-19
A-20	Post-Test Rear Underbody	A-20
A-21	Pre-Test Driver Seat Right Side View	A-21
A-22	Post-Test Driver Seat Right Side View	A-22
A-23	Pre-Test Driver Seat Close-Up View	A-23
A-24	Post-Test Driver Seat Close-Up View	A-24
A-25	Pre-Test Passenger Seat Right Side View	A-25
A-26	Post-Test Passenger Seat Right Side View	A-26
A-27	Pre-Test Passenger Seat Close-Up View	A-27
A-28	Post-Test Passenger Seat Close-Up View	A-28
A-29	Pre-Test Driver Seat ICBC Machine	A-29
A-30	Pre-Test Passenger ICBC Machine	A-30
A-31	Pre-Test Driver Dummy Left Side View	A-31
A-32	Post-Test Driver Dummy Left Side View	A-32
A-33	Pre-Test Driver Dummy Right Side View	A-33
A-34	Post-Test Driver Dummy Right Side View	A-34
A-35	Pre-Test Driver Dummy $\frac{3}{4}$ View	A-35

LIST OF PHOTOGRAPHS...(CONTINUED)

Figure		Page
A-36	Post-Test Driver Dummy ¾ View	A-36
A-37	Pre-Test Passenger Dummy Left Side View	A-37
A-38	Post-Test Passenger Dummy Left Side View	A-38
A-39	Pre-Test Passenger Dummy Right Side View	A-39
A-40	Post-Test Passenger Dummy Right Side View	A-40
A-41	Pre-Test Passenger Dummy ¾ View	A-41
A-42	Post-Test Passenger Dummy ¾ View	A-42
A-43	Vehicle on Rollover Device at 0°	A-43
A-44	Vehicle on Rollover Device at 90°	A-44
A-45	Vehicle on Rollover Device at 180°	A-45
A-46	Vehicle on Rollover Device at 270°	A-46
A-47	Vehicle During Impact	A-47
A-48	Post-Test Left Side Driver Seat Reclining Mechanism	A-48
A-49	Post-Test Right Side Driver Seat Reclining Mechanism	A-49



Figure A-1: Left Front $\frac{3}{4}$ View, As Received



Figure A-2: Right Rear $\frac{3}{4}$ View, As Received

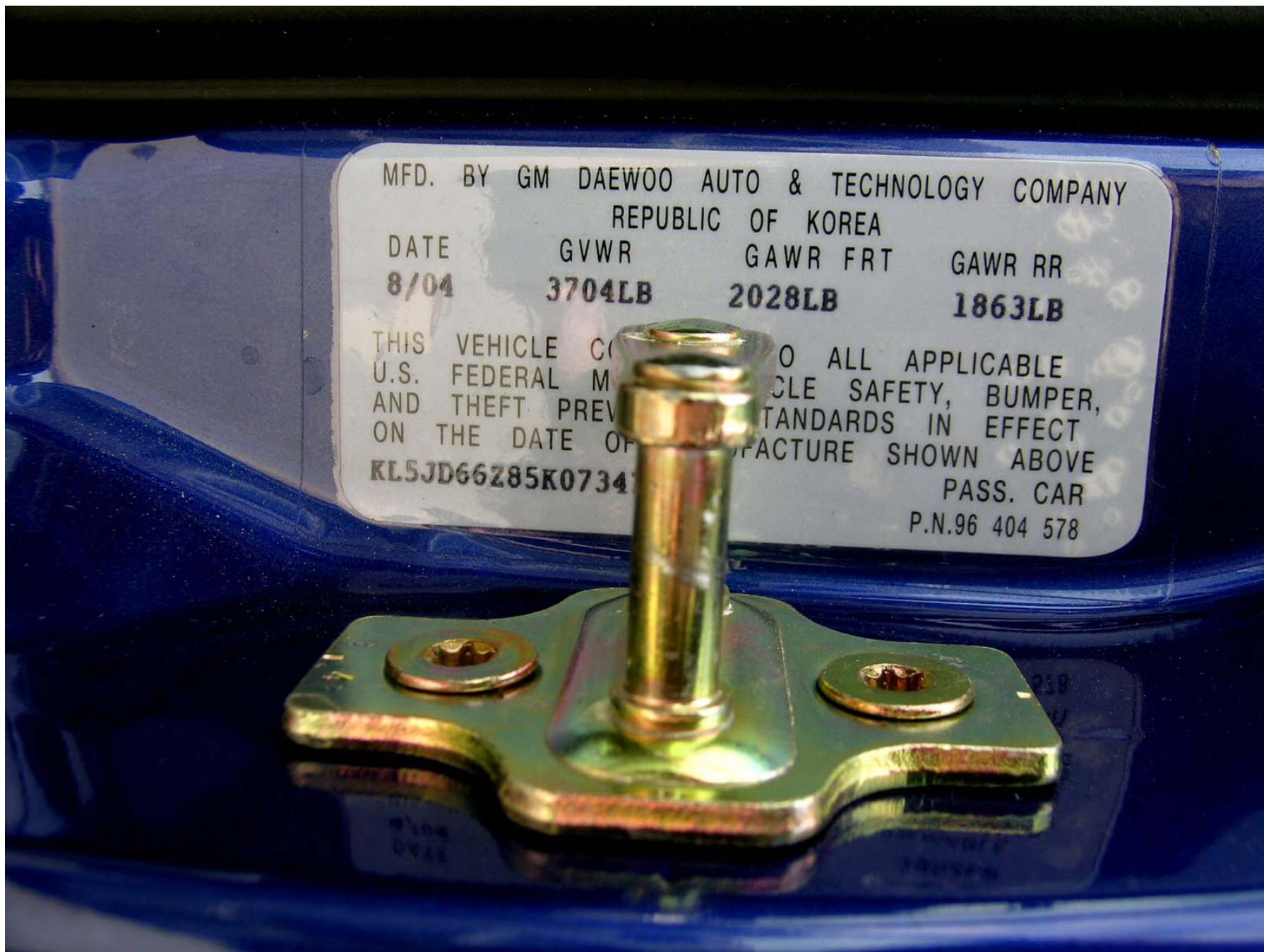


Figure A-3: Vehicle Certification Label



Figure A-4: Vehicle Tire Label



Figure A-5: Pre-Test Front View



Figure A-6: Post-Test Front View



Figure A-7: Pre-Test Left Side View



Figure A-8: Post-Test Left Side View (Vehicle Moved)



Figure A-9: Pre-Test Right Side View



Figure A-10: Post-Test Right Side View



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



Figure A-12: Post-Test Left Front $\frac{3}{4}$ View (Vehicle Moved)



Figure A-13: Pre-Test Right Rear $\frac{3}{4}$ View



Figure A-14: Post-Test Right Rear $\frac{3}{4}$ View

**Photograph Not
Available**

Figure A-15: Pre-Test Front Underbody View

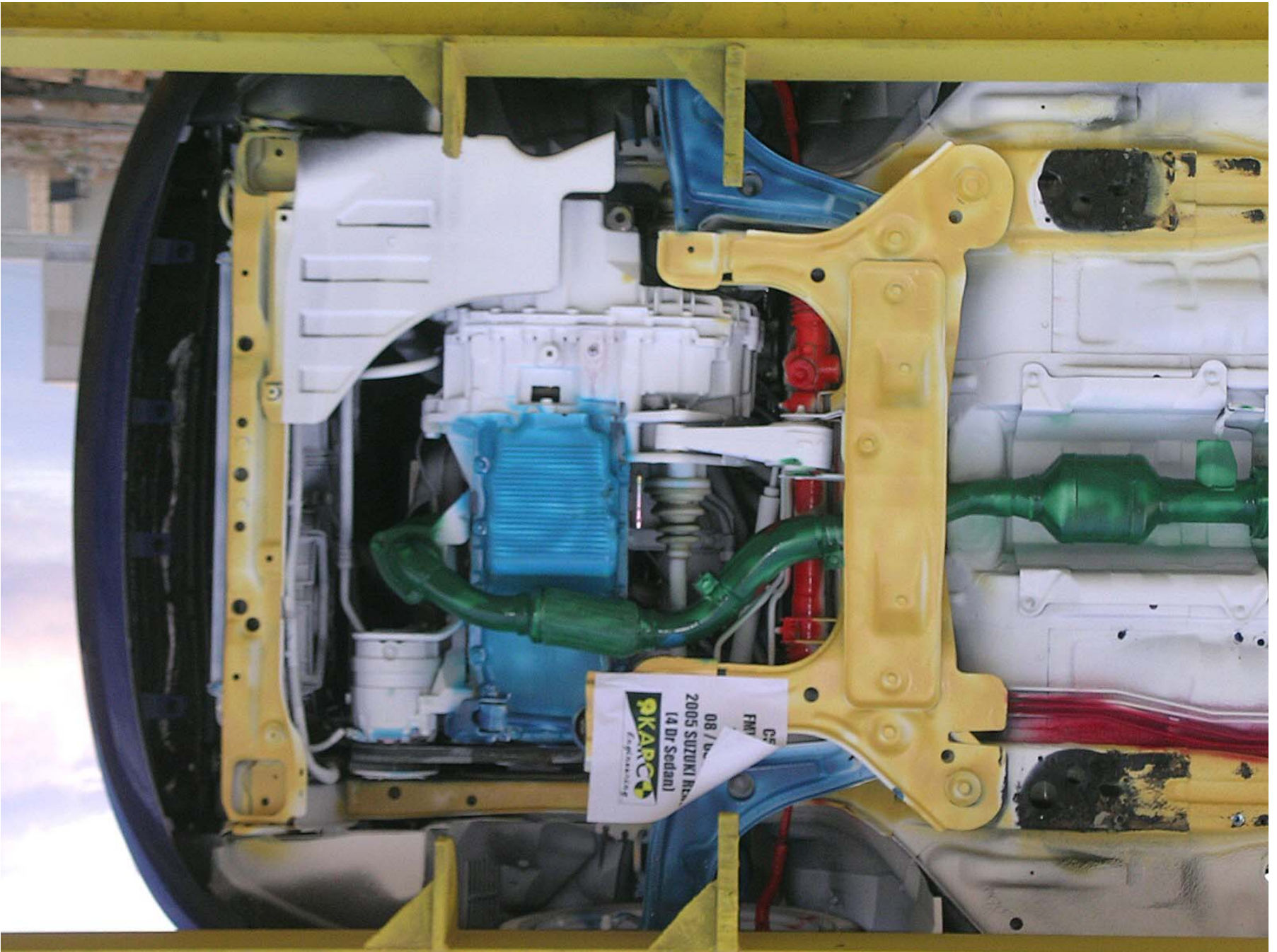


Figure A-16: Post-Test Front Underbody View

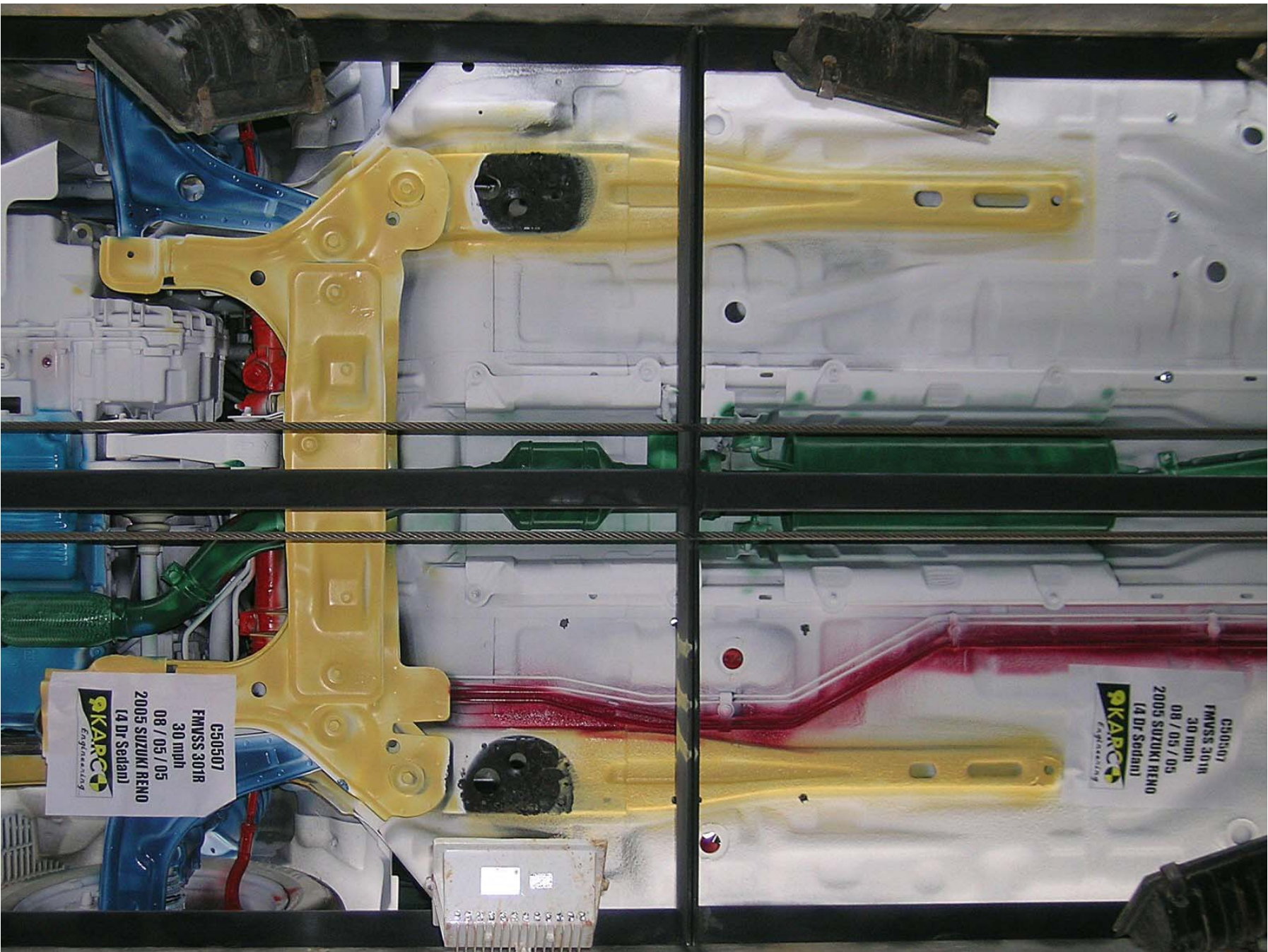


Figure A-17: Pre-Test Mid Underbody View

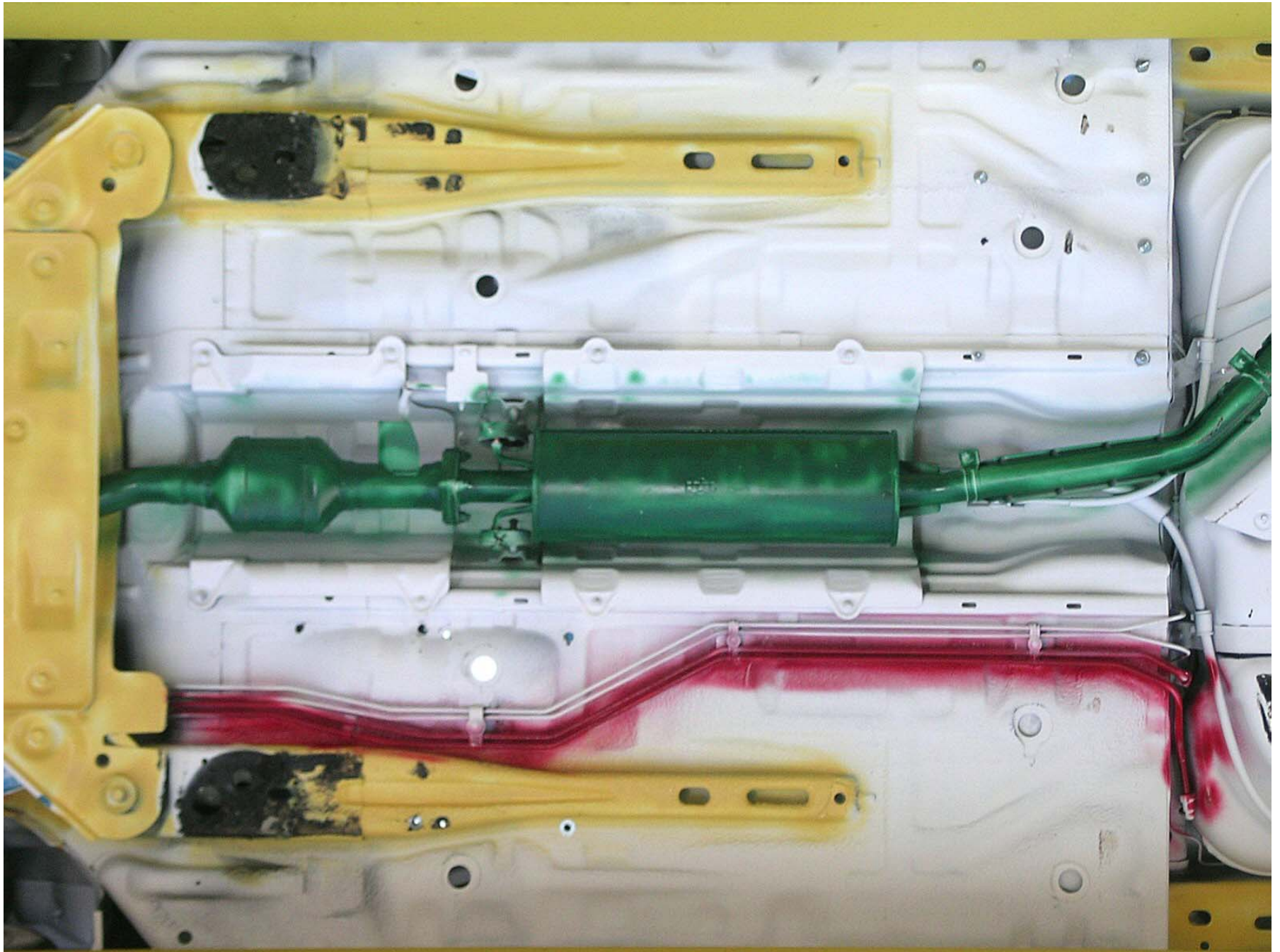


Figure A-18: Post-Test Mid Underbody View



Figure A-19: Pre-Test Rear Underbody View

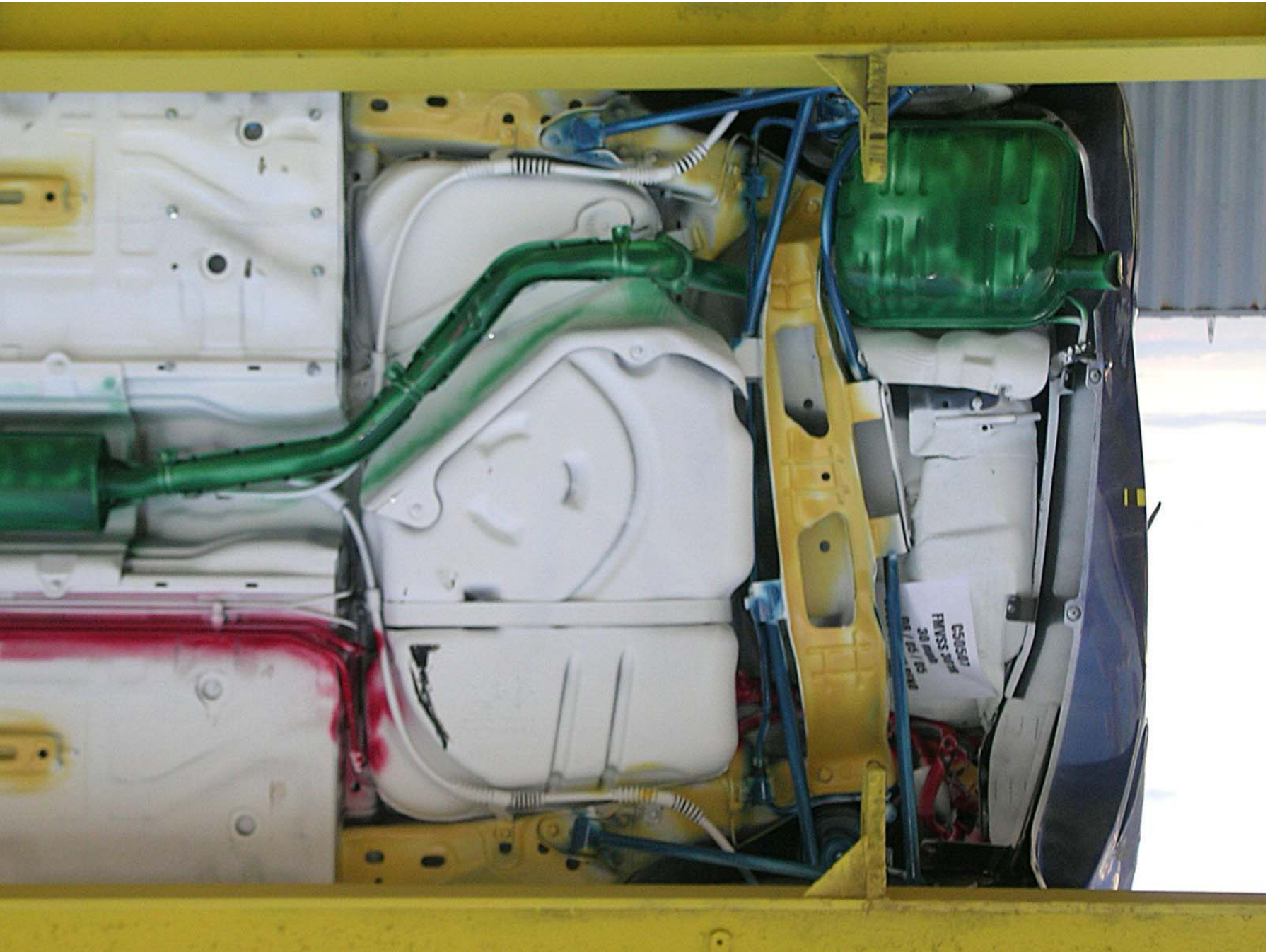


Figure A-20: Post-Test Rear Underbody View



Figure A-21: Pre-Test Driver Seat Right Side View

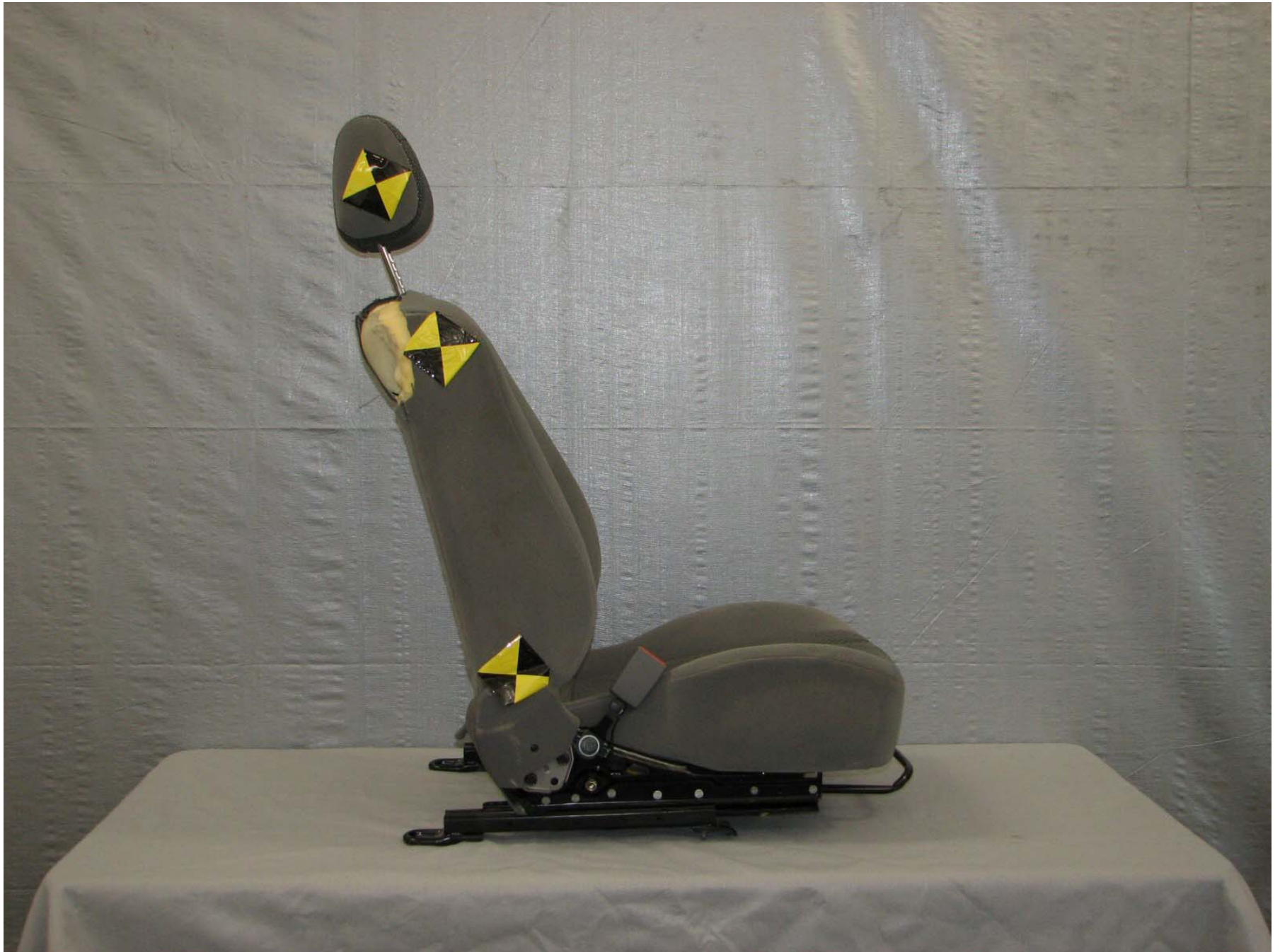


Figure A-22: Post-Test Driver Seat Right Side View



Figure A-23: Pre-Test Driver Seat Close-Up View



Figure A-24: Post-Test Driver Seat Close-Up View



Figure A-25: Pre-Test Passenger Seat Right Side View



Figure A-26: Post-Test Passenger Seat Right Side View



Figure A-27: Pre-Test Passenger Seat Close-Up View



Figure A-28: Post-Test Passenger Seat Close-Up View



Figure A-29: Pre-Test Driver Seat ICBC Machine



Figure A-30: Pre-Test Passenger Seat ICBC Machine



Figure A-31: Pre-Test Driver Dummy Left Side View



Figure A-32: Post-Test Driver Dummy Left Side View



Figure A-33: Pre-Test Driver Dummy Right Side View



Figure A-34: Post-Test Driver Dummy Right Side View



Figure A-35: Pre-Test Driver Dummy $\frac{3}{4}$ View



Figure A-36: Post-Test Driver Dummy ¾ View

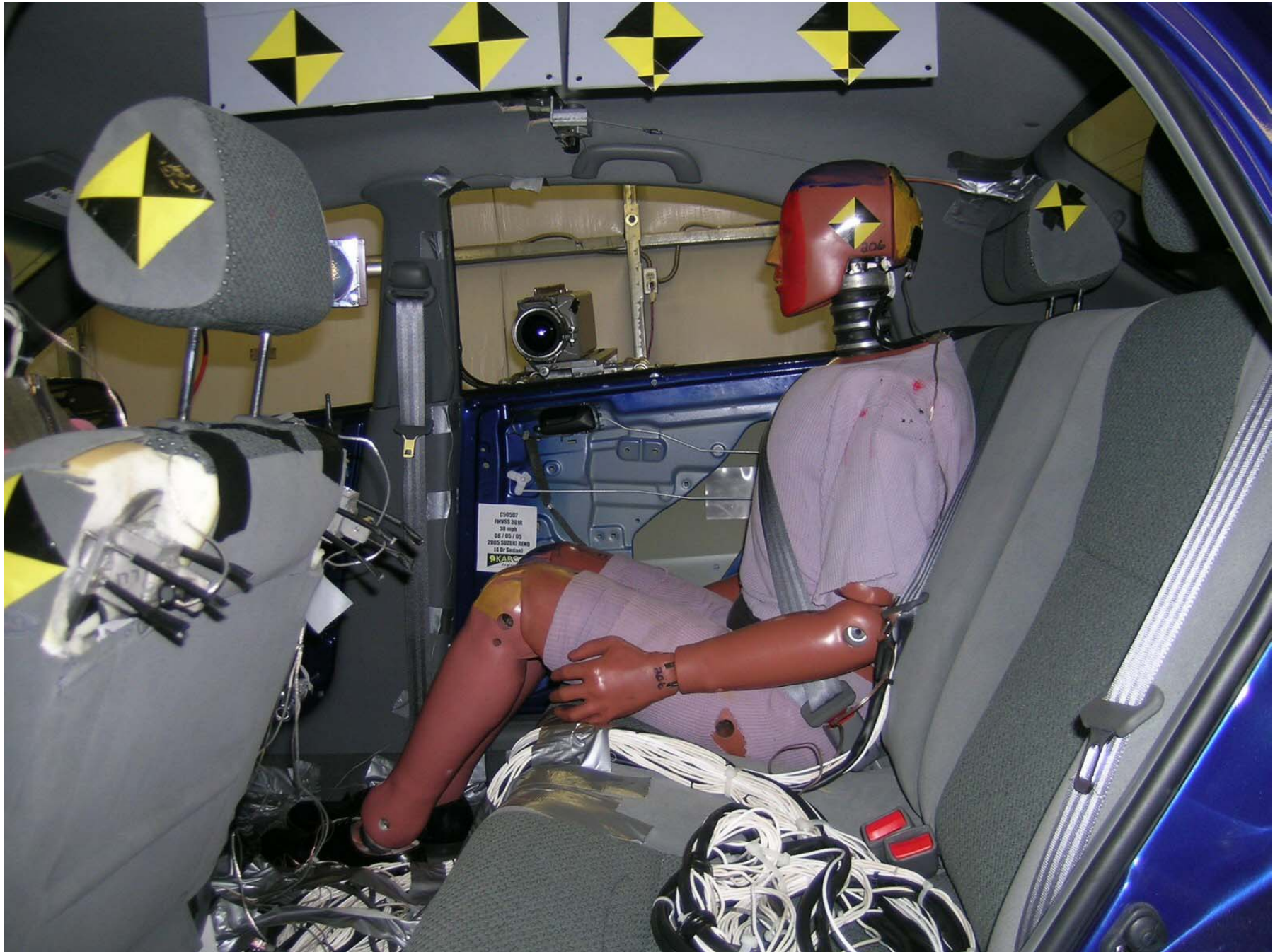


Figure A-37: Pre-Test Passenger Dummy Left Side View



Figure A-38: Post-Test Passenger Dummy Left Side View



Figure A-39: Pre-Test Passenger Dummy Right Side View

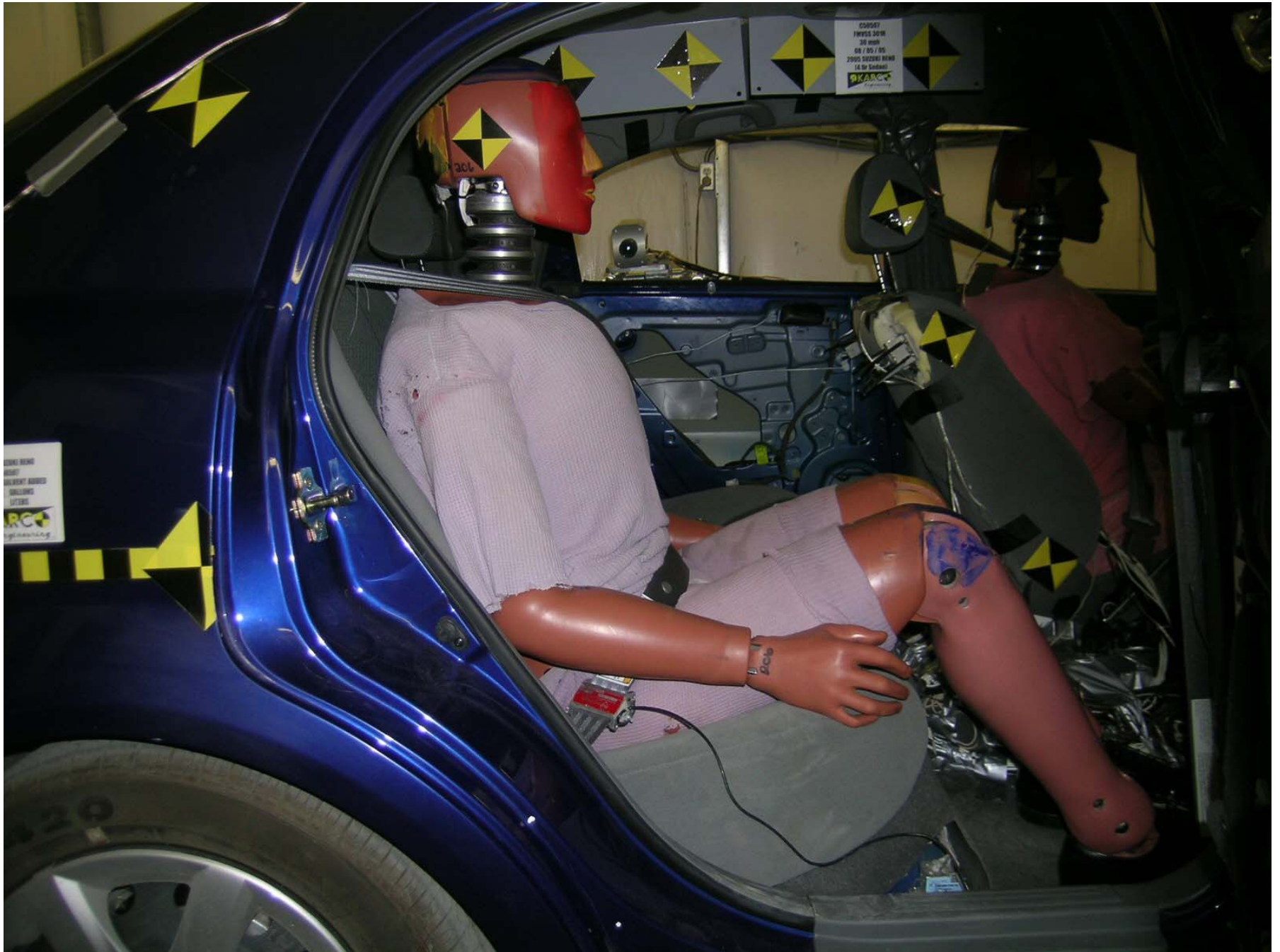


Figure A-40: Post-Test Passenger Dummy Right Side View



Figure A-41: Pre-Test Passenger Dummy $\frac{3}{4}$ View



Figure A-42: Post-Test Passenger Dummy ¾ View



Figure A-43: Vehicle on Rollover Device 0°



Figure A-44: Vehicle on Rollover Device 90°



Figure A-45: Vehicle on Rollover Device 180°

**Photograph Not
Available**

Figure A-46: Vehicle on Rollover Device 270°



Figure A-47: Vehicle During Impact



Figure A-48: Post-Test Driver Seat Left Side Reclining Mechanism



Figure A-49: Post-Test Driver Seat Right Side Reclining Mechanism

APPENDIX B

DATA PLOTS

LIST OF DATA PLOTS

Data Plot	Page
B-1	Driver Head X
	Driver Head Y
	Driver Head Z
	Driver Head Resultant
B-2	Driver Head Y Angular Velocity
	Driver Head Y Angular Velocity
	Driver Head Y Rotation
	Driver Headrest Contact
B-3	Driver Upper Neck Force X
	Driver Upper Neck Force Y
	Driver Upper Neck Force Z
	Driver Upper Neck Force Resultant
B-4	Driver Upper Neck Moment X
	Driver Upper Neck Moment Y
	Driver Upper Neck Moment Z
	Driver Upper Neck Moment Resultant
B-5	Driver Lower Neck Force X
	Driver Lower Neck Force Y
	Driver Lower Neck Force Z
	Driver Lower Neck Force Resultant
B-6	Driver Lower Neck Moment X
	Driver Lower Neck Moment Y
	Driver Lower Neck Moment Z
	Driver Lower Neck Moment Resultant
B-7	Driver Lower Neck X
B-8	Driver Chest X
	Driver Chest Y
	Driver Chest Z
	Driver Chest Resultant
B-9	Driver Chest Y Angular Velocity
	Driver Chest Y Angular Velocity
	Driver Chest Y Rotation
	Driver Chest Deflection

LIST OF DATA PLOTS...(CONTINUED)

Data Plot	Page
B-10	Driver Pelvis X
	Driver Pelvis Y
	Driver Pelvis Z
	Driver Pelvis Resultant
B-11	Driver Left Femur Force Z
	Driver Right Femur Force Z
	Driver Lap Belt Load
	Driver Shoulder Belt Pullout
B-12	Passenger Head X
	Passenger Head Y
	Passenger Head Z
	Passenger Head Resultant
B-13	Passenger Head Y Angular Velocity
	Passenger Head Y Angular Velocity
	Passenger Head Y Rotation
	Passenger Headrest Contact
B-14	Passenger Upper Neck Force X
	Passenger Upper Neck Force Y
	Passenger Upper Neck Force Z
	Passenger Upper Neck Force Resultant
B-15	Passenger Upper Neck Moment X
	Passenger Upper Neck Moment Y
	Passenger Upper Neck Moment Z
	Passenger Upper Neck Moment Resultant
B-16	Passenger Lower Neck Force X
	Passenger Lower Neck Force Y
	Passenger Lower Neck Force Z
	Passenger Lower Neck Force Resultant
B-17	Passenger Lower Neck Moment X
	Passenger Lower Neck Moment Y
	Passenger Lower Neck Moment Z
	Passenger Lower Neck Moment Resultant
B-18	Passenger Lower Neck X

LIST OF DATA PLOTS...(CONTINUED)

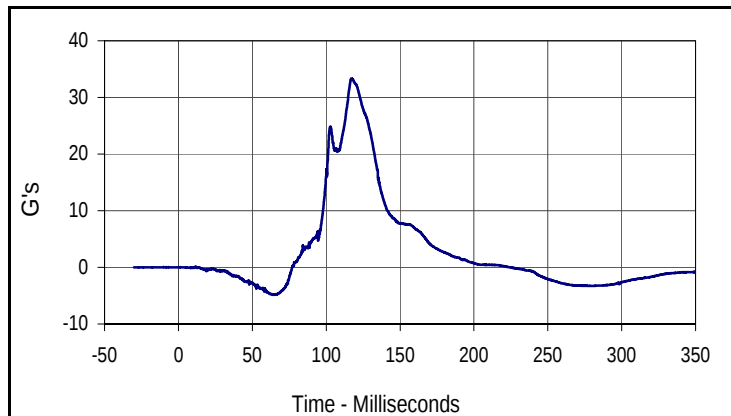
Data Plot	Page
B-19	Passenger Chest X
	Passenger Chest Y
	Passenger Chest Z
	Passenger Chest Resultant
B-20	Passenger Chest Y Angular Velocity
	Passenger Chest Y Angular Velocity
	Passenger Chest Y Rotation
	Passenger Chest Deflection
B-21	Passenger Pelvis X
	Passenger Pelvis Y
	Passenger Pelvis Z
	Passenger Pelvis Resultant
B-22	Passenger Left Femur Force Z
	Passenger Right Femur Force Z
	Passenger Lap Belt Force
	Passenger Shoulder Belt Force
B-23	Driver Seat Back Left Side Y Angular Velocity
	Driver Seat Back Left Side Y Angular Velocity
	Driver Seat Back Left Side Y Rotation
B-24	Driver Seat Back Right Side Y Angular Velocity
	Driver Seat Back Right Side Y Angular Velocity
	Driver Seat Back Right Side Y Rotation
B-25	Vehicle Left Front Sill Y Angular Velocity
	Vehicle Left Front Sill Y Angular Velocity
	Vehicle Left Front Sill Y Rotation
B-26	Vehicle Right Rear Sill Y Angular Velocity
	Vehicle Right Rear Sill Y Angular Velocity
	Vehicle Right Rear Sill Y Rotation
B-27	Vehicle Left Front X-Member Primary X
	Vehicle Left Rear X-Member Primary X Velocity
	Vehicle Left Rear X-Member Primary X Displacement

LIST OF DATA PLOTS...(CONTINUED)

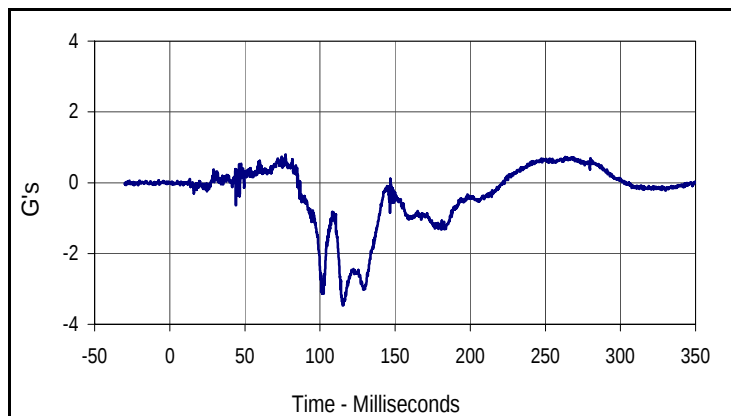
<u>Data Plot</u>	<u>Page</u>
B-28	Vehicle Left Front X-Member Redundant X
	Vehicle Left Rear X-Member Redundant X Velocity
	Vehicle Left Rear X-Member Redundant X Displacement
B-29	Vehicle Right Rear X-Member Primary X
	Vehicle Right Rear X-Member Primary Velocity
	Vehicle Right Rear X-Member Primary Displacement
B-30	Vehicle Right Rear X-Member Redundant X
	Vehicle Right Rear X-Member Redundant Velocity
	Vehicle Right Rear X-Member Redundant Displacement

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

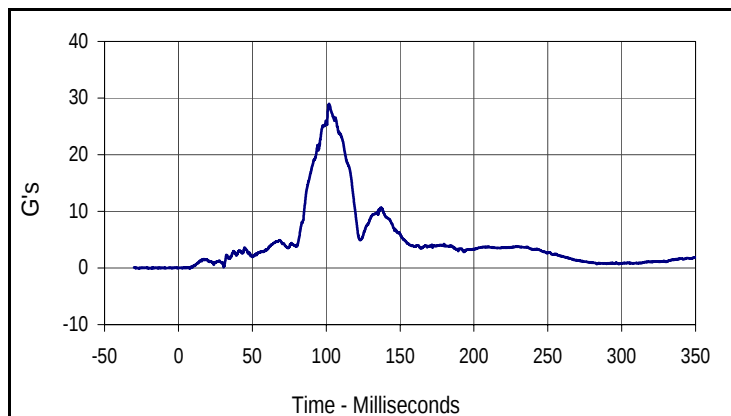
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 NHTSA No.: C50507



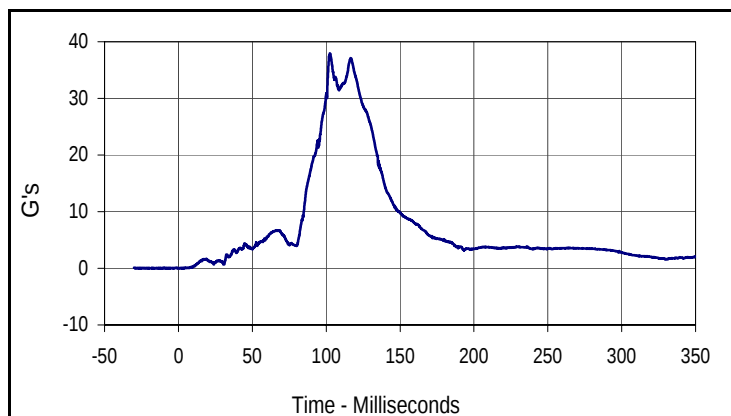
Curve Description			
Driver Head X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
33.4	117.3	-4.9	64.3



Curve Description			
Driver Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.8	77.1	-3.5	115.1



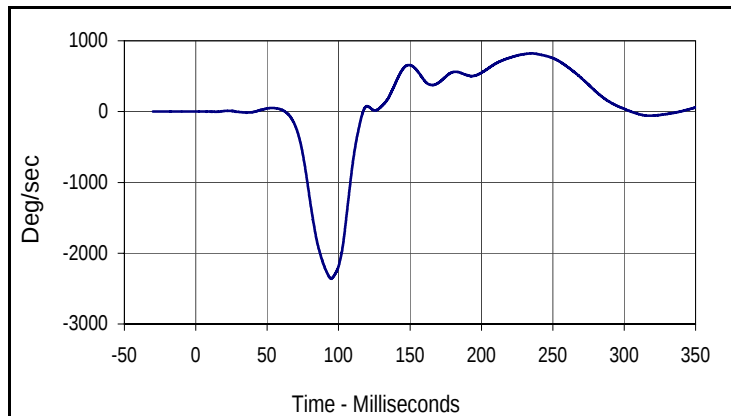
Curve Description			
Driver Head Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
29.0	102.0	-0.1	7.9



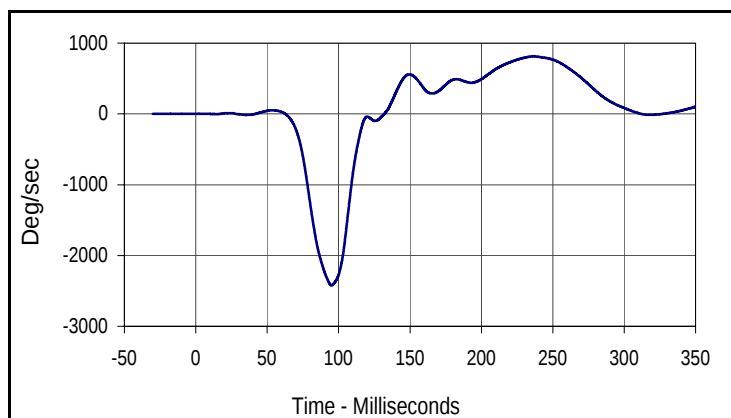
Curve Description			
Driver Head X Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
38.0	102.5	0.0	2.3

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

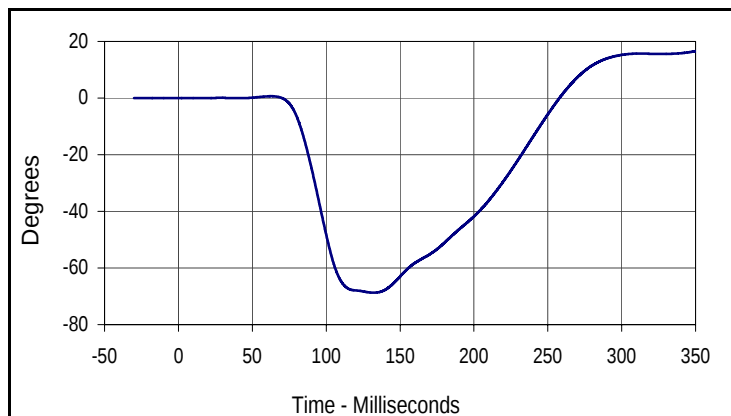
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 NHTSA No.: C50507



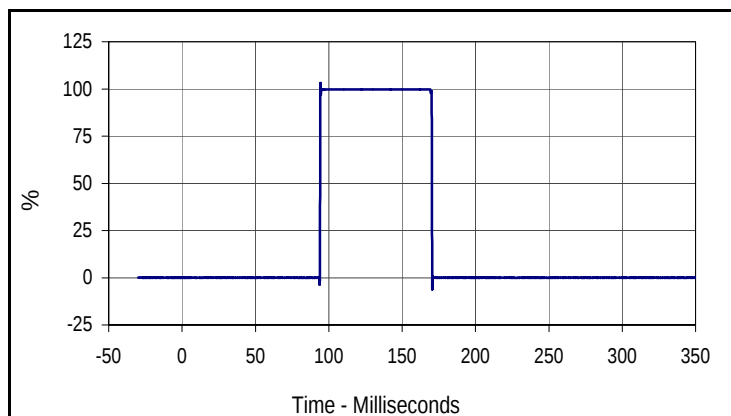
Curve Description			
Driver Head Y Angular Velocity			
CURNO	Type	SAE Class	Units
004	FIL	1000	Deg/sec
Max	Time	Min	Time
823.0	235.9	-2360.6	94.8



Curve Description			
Driver Head Y Angular Velocity			
CURNO	Type	SAE Class	Units
004	COMP	NA	Deg/sec
Max	Time	Min	Time
812.9	236.5	-2422.5	95.1



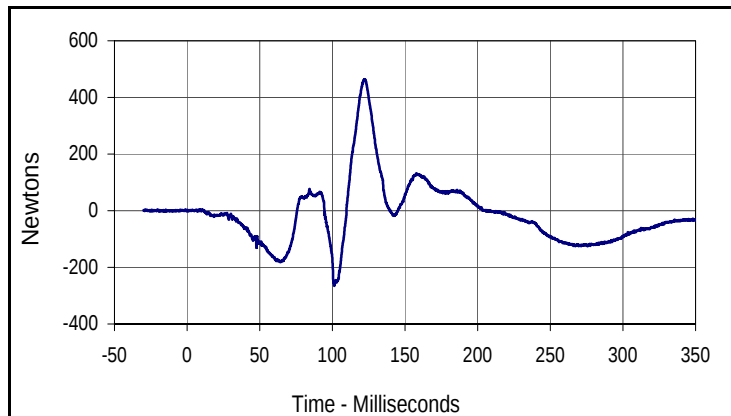
Curve Description			
Driver Head Y Rotation			
CURNO	Type	SAE Class	Units
004	COMP-IN1	NA	Degrees
Max	Time	Min	Time
16.6	349.9	-68.7	132.1



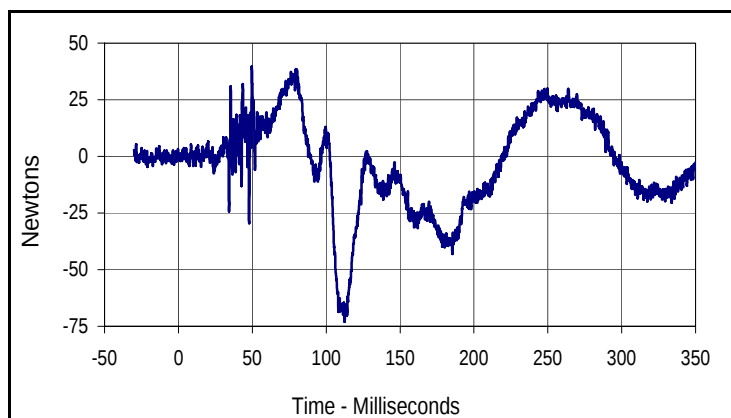
Curve Description			
Driver Headrest Contact			
CURNO	Type	SAE Class	Units
005	FIL	1000	%
Max	Time	Min	Time
102.7	94.3	-6.1	170.5

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

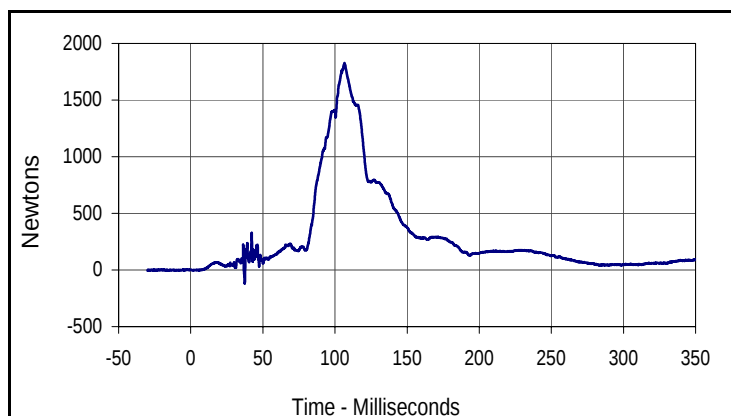
Test Date: 8/5/05
 NHTSA No.: C50507



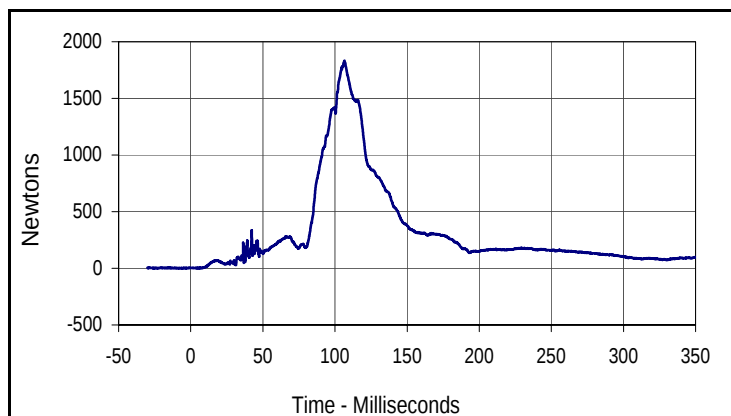
Curve Description			
Driver Upper Neck Force X			
CURNO	Type	SAE Class	Units
006	FIL	1000	Newtons
Max	Time	Min	Time
463.9	122.2	-265.0	101.3



Curve Description			
Driver Upper Neck Force Y			
CURNO	Type	SAE Class	Units
007	FIL	1000	Newtons
Max	Time	Min	Time
39.6	49.7	-73.0	112.5



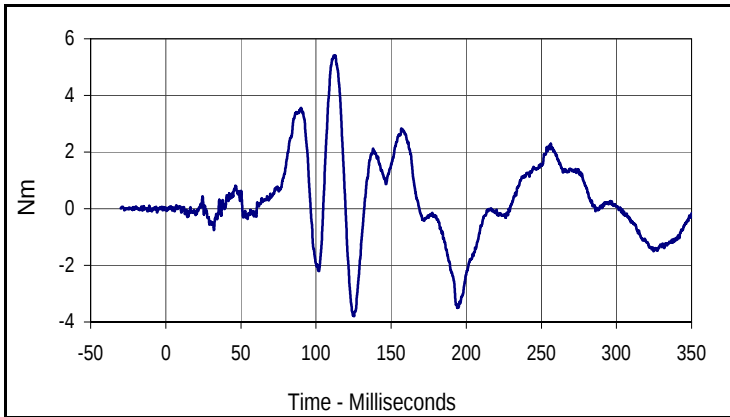
Curve Description			
Driver Upper Neck Force Z			
CURNO	Type	SAE Class	Units
008	FIL	1000	Newtons
Max	Time	Min	Time
1826.4	106.6	-118.9	37.5



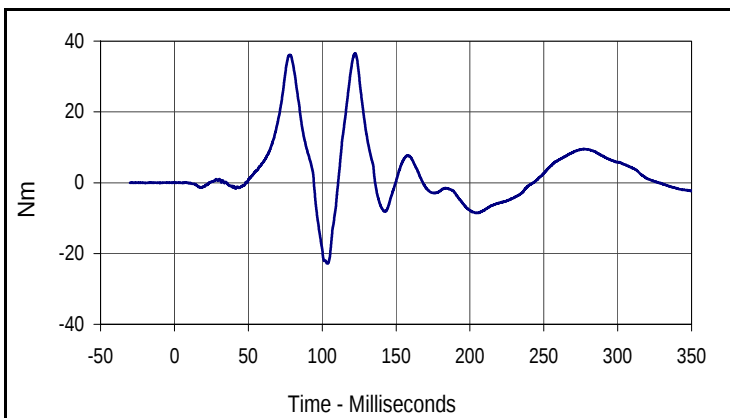
Curve Description			
Driver Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
006	RES	1000	Newtons
Max	Time	Min	Time
1832.6	106.6	0.6	4.8

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

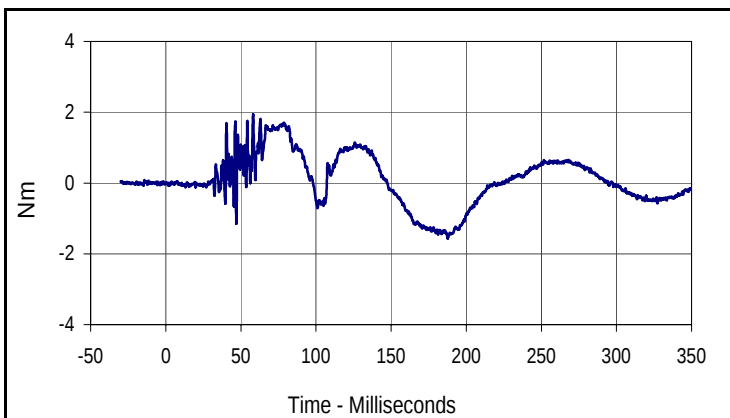
Test Date: 8/5/05
 NHTSA No.: C50507



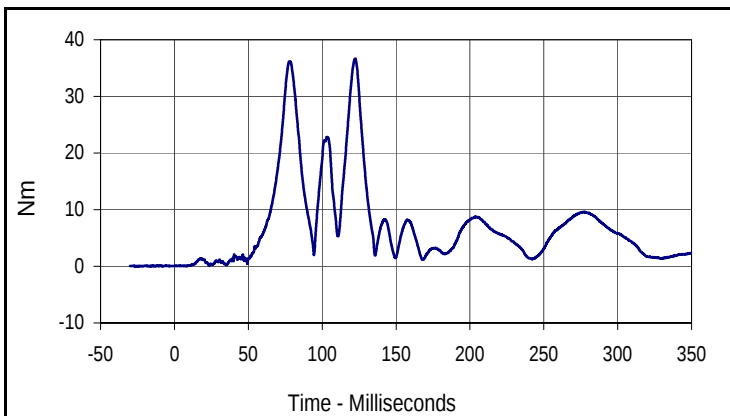
Curve Description			
Driver Upper Neck Moment X			
CURNO	Type	SAE Class	Units
009	FIL	600	Nm
Max	Time	Min	Time
5.4	111.9	-3.8	125.3



Curve Description			
Driver Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
010	FIL	600	Nm
Max	Time	Min	Time
36.5	122.4	-22.8	103.7



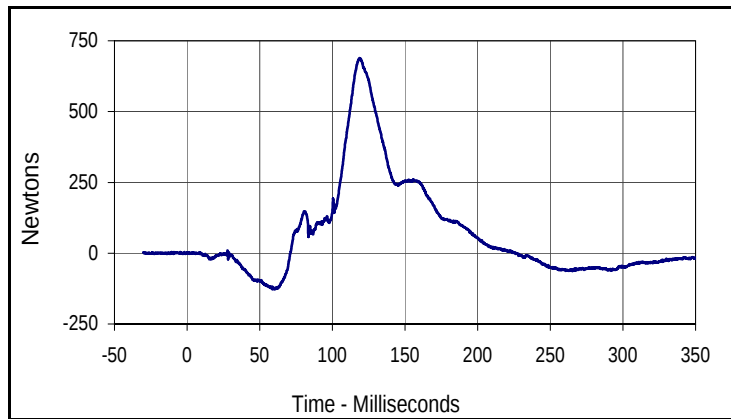
Curve Description			
Driver Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
011	FIL	600	Nm
Max	Time	Min	Time
1.9	58.2	-1.6	187.7



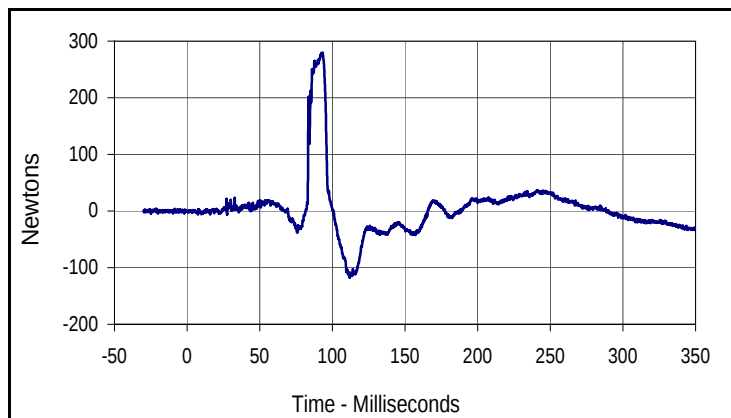
Curve Description			
Driver Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
009	RES	600	Nm
Max	Time	Min	Time
36.6	122.4	0.0	8.0

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

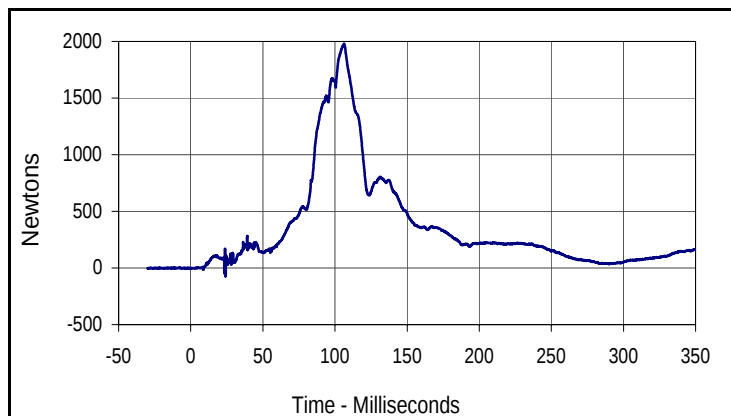
Test Date: 8/5/05
 NHTSA No.: C50507



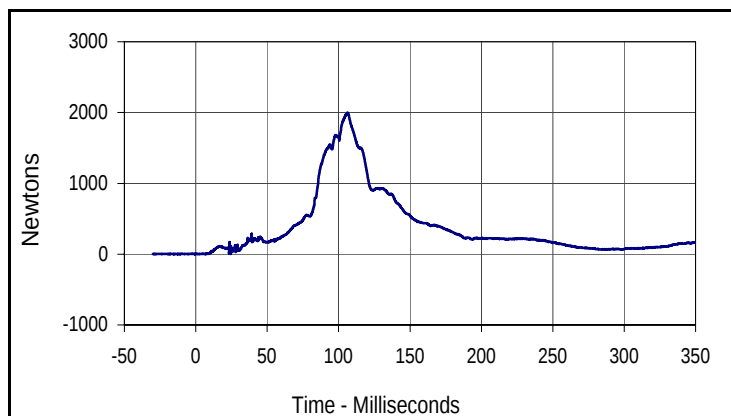
Curve Description			
Driver Lower Neck Force X			
CURNO	Type	SAE Class	Units
012	FIL	1000	Newtons
Max	Time	Min	Time
688.5	118.7	-127.9	60.4



Curve Description			
Driver Lower Neck Force Y			
CURNO	Type	SAE Class	Units
013	FIL	1000	Newtons
Max	Time	Min	Time
279.7	93.3	-117.3	112.0



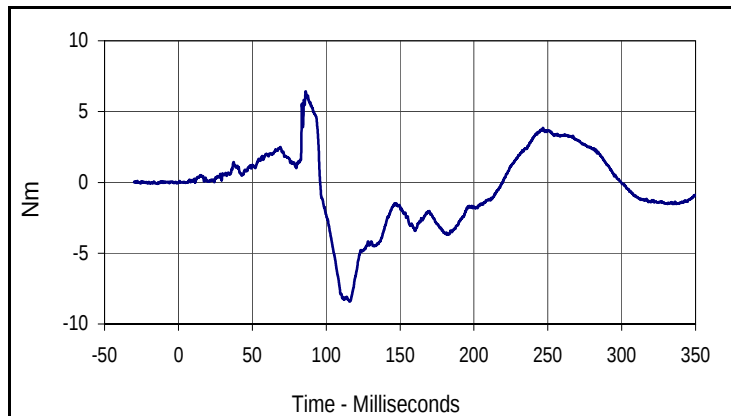
Curve Description			
Driver Lower Neck Force Z			
CURNO	Type	SAE Class	Units
014	FIL	1000	Newtons
Max	Time	Min	Time
1980.2	106.3	-73.7	24.2



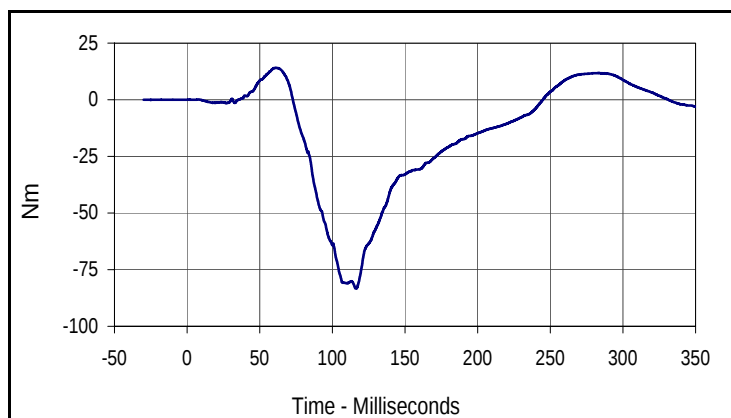
Curve Description			
Driver Lower Neck Force Resultant			
CURNO	Type	SAE Class	Units
012	RES	1000	Newtons
Max	Time	Min	Time
2001.2	106.3	0.4	2.6

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

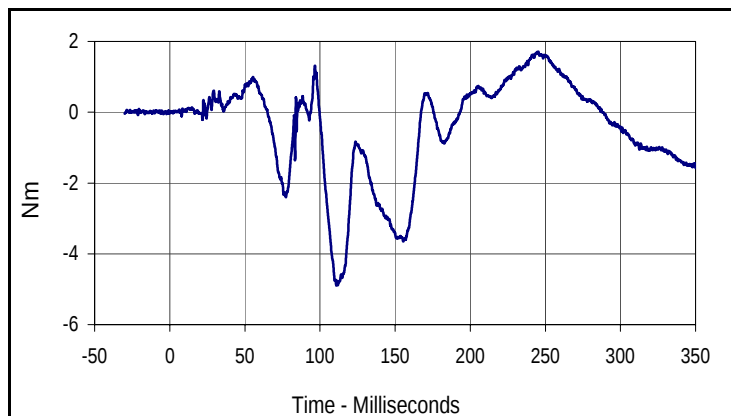
Test Date: 8/5/05
 NHTSA No.: C50507



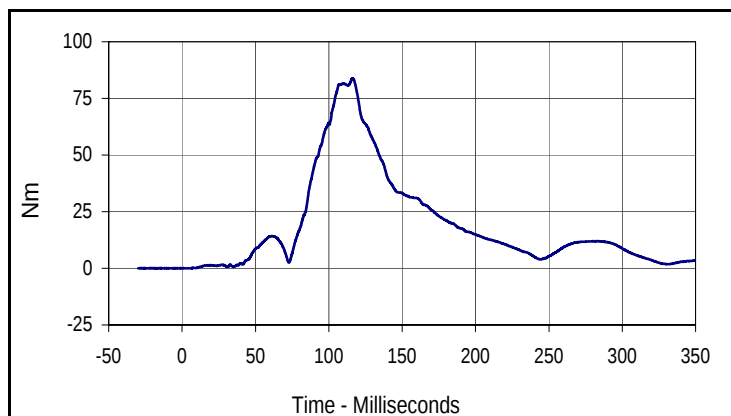
Curve Description			
Driver Lower Neck Moment X			
CURNO	Type	SAE Class	Units
015	FIL	600	Nm
Max	Time	Min	Time
6.4	86.2	-8.4	115.9



Curve Description			
Driver Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
016	FIL	600	Nm
Max	Time	Min	Time
14.1	61.3	-83.3	116.2



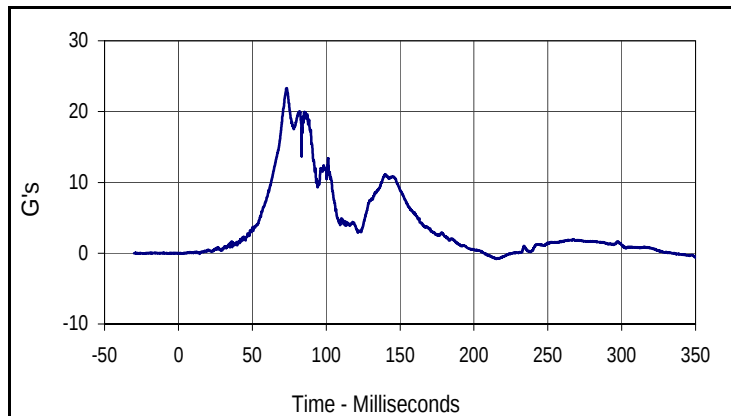
Curve Description			
Driver Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
017	FIL	600	Nm
Max	Time	Min	Time
1.7	245.3	-4.9	110.9



Curve Description			
Driver Lower Neck Moment Resultant			
CURNO	Type	SAE Class	Units
015	RES	600	Nm
Max	Time	Min	Time
83.8	116.2	0.0	3.0

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

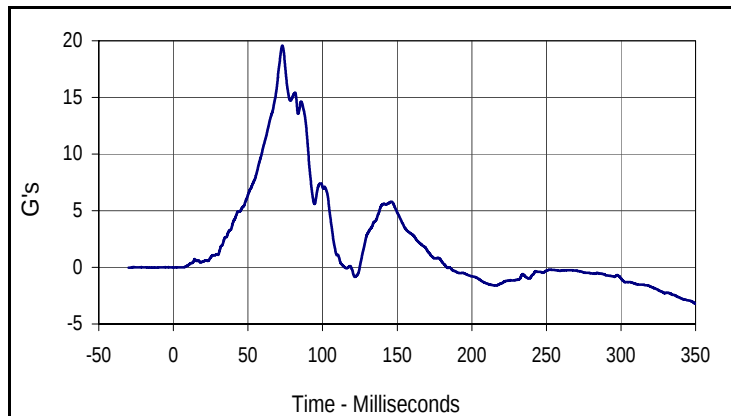
Test Date: 8/5/05
 NHTSA No.: C50507



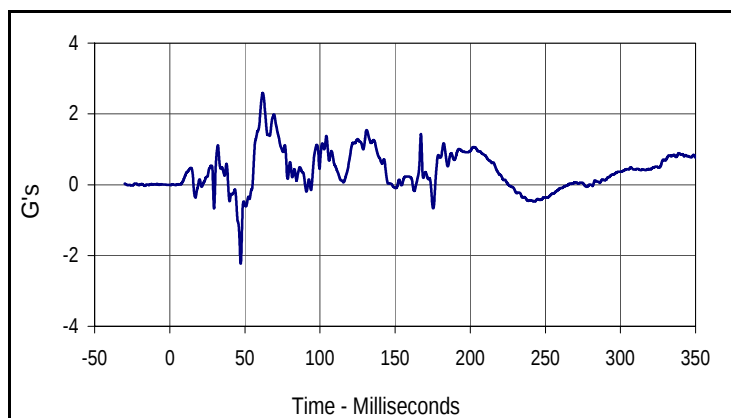
Curve Description			
Driver Lower Neck X			
CURNO	Type	SAE Class	Units
018	FIL	1000	G's
Max	Time	Min	Time
23.3	73.4	-0.8	215.1

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

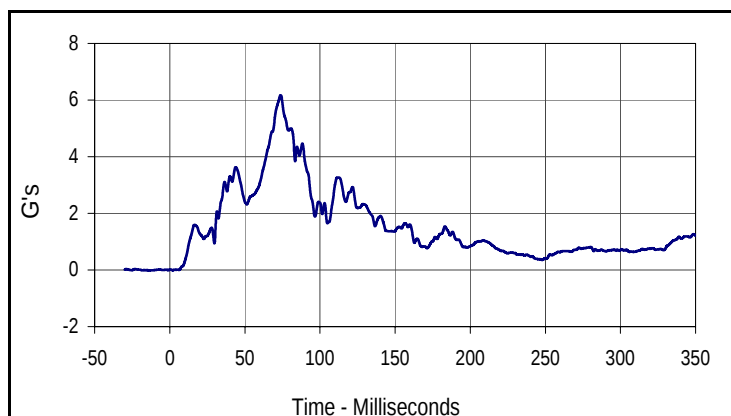
Test Date: 8/5/05
 NHTSA No.: C50507



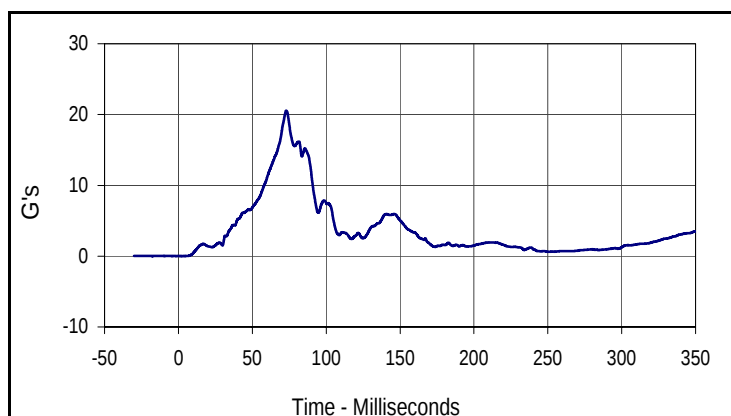
Curve Description			
Driver Chest X			
CURNO	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
19.6	73.0	-3.2	349.9



Curve Description			
Driver Chest Y			
CURNO	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
2.6	61.9	-2.2	47.3



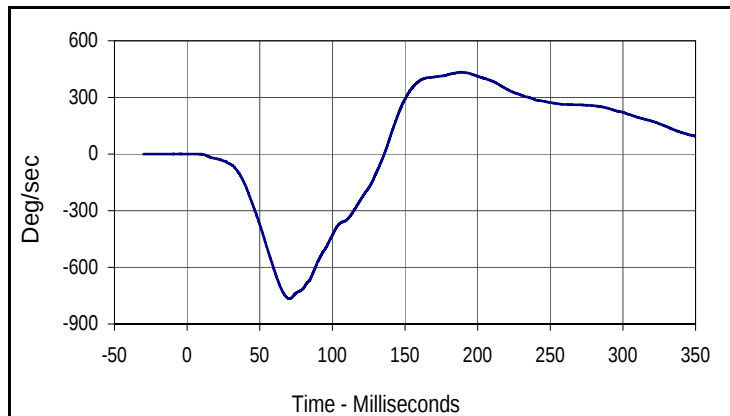
Curve Description			
Driver Chest Z			
CURNO	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
6.2	73.9	0.0	2.2



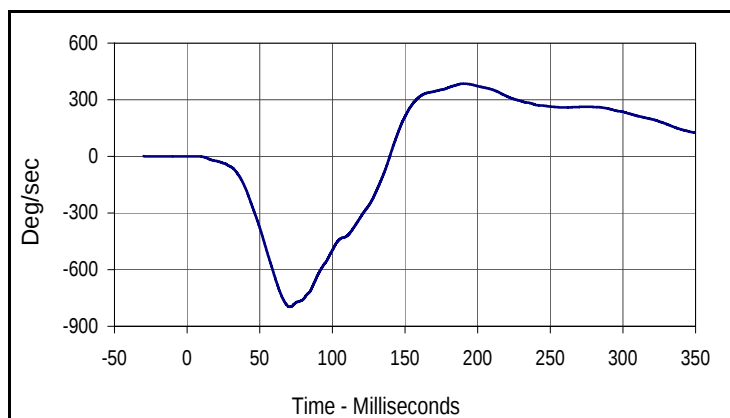
Curve Description			
Driver Chest Resultant			
CURNO	Type	SAE Class	Units
019	RES	180	G's
Max	Time	Min	Time
20.5	73.1	0.0	2.7

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

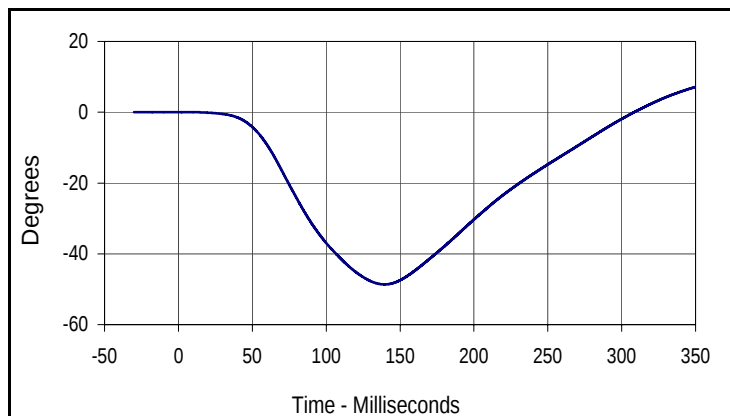
Test Date: 8/5/05
 NHTSA No.: C50507



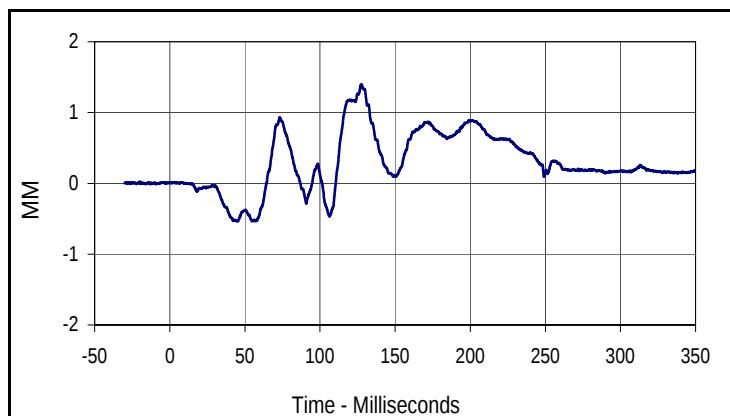
Curve Description			
Driver Chest Y Angular Velocity			
CURNO	Type	SAE Class	Units
022	FIL	600	Deg/sec
Max	Time	Min	Time
434.3	188.3	-766.7	70.4



Curve Description			
Driver Chest Y Angular Velocity			
CURNO	Type	SAE Class	Units
022	COMP	NA	Deg/sec
Max	Time	Min	Time
384.9	189.7	-797.3	70.7



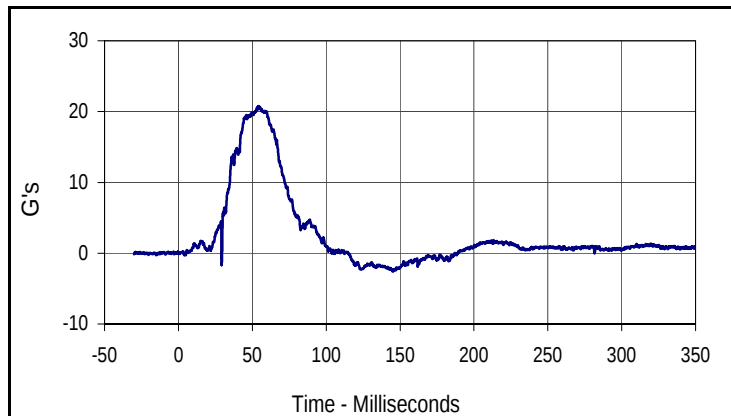
Curve Description			
Driver Chest Y Rotation			
CURNO	Type	SAE Class	Units
022	COMP-IN1	NA	Degrees
Max	Time	Min	Time
7.1	349.9	-48.7	139.5



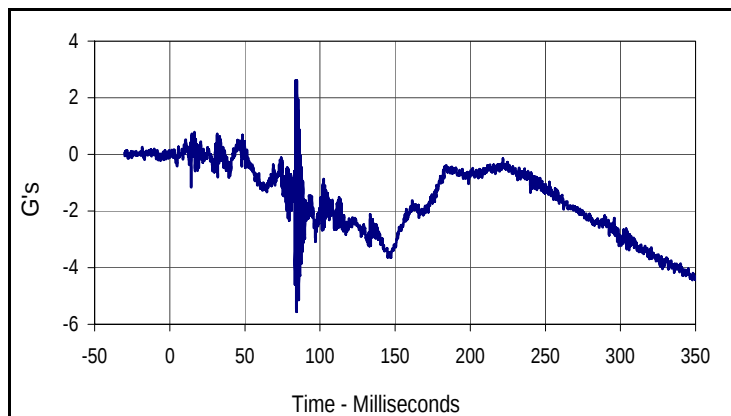
Curve Description			
Driver Chest Deflection			
CURNO	Type	SAE Class	Units
023	FIL	600	MM
Max	Time	Min	Time
1.4	127.7	-0.5	45.1

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

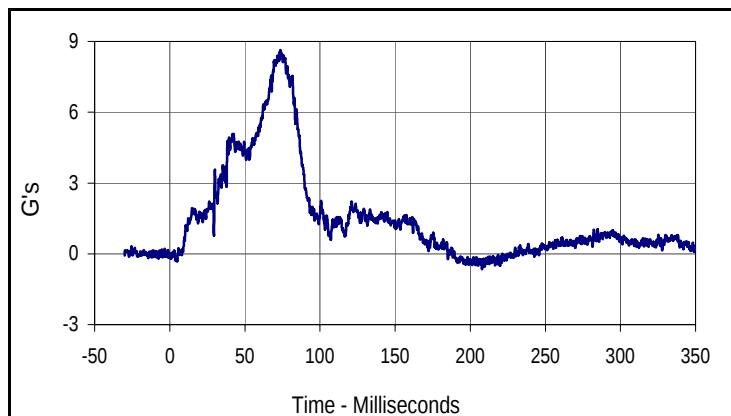
Test Date: 8/5/05
 NHTSA No.: C50507



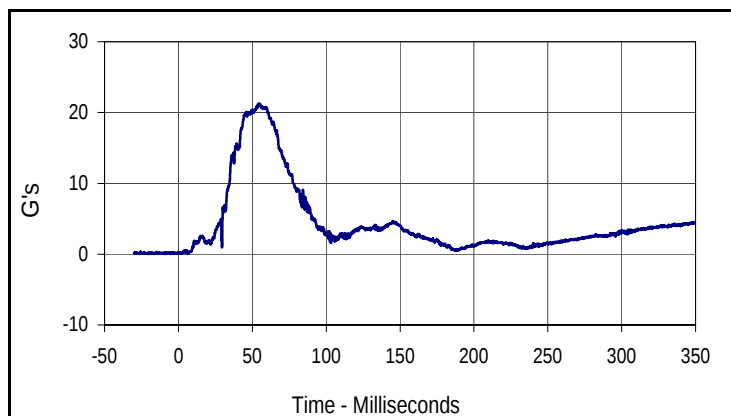
Curve Description			
Driver Pelvis X			
CURNO	Type	SAE Class	Units
024	FIL	1000	G's
Max	Time	Min	Time
20.8	54.4	-2.6	145.0



Curve Description			
Driver Pelvis Y			
CURNO	Type	SAE Class	Units
025	FIL	1000	G's
Max	Time	Min	Time
2.6	84.7	-5.5	84.3



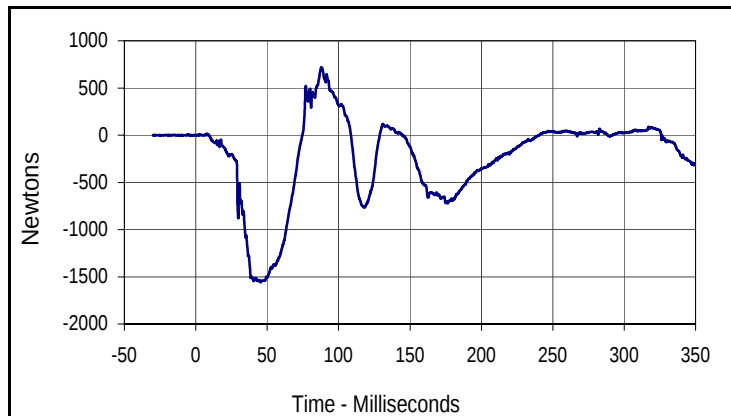
Curve Description			
Driver Pelvis Z			
CURNO	Type	SAE Class	Units
026	FIL	1000	G's
Max	Time	Min	Time
8.6	73.7	-0.7	207.9



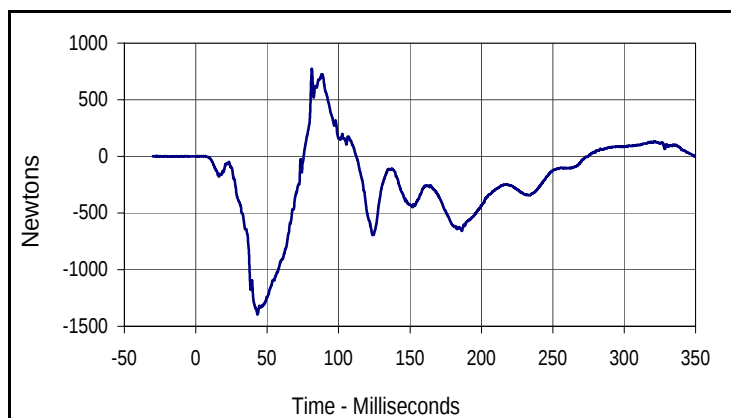
Curve Description			
Driver Pelvis Resultant			
CURNO	Type	SAE Class	Units
024	RES	1000	G's
Max	Time	Min	Time
21.3	54.4	0.1	6.7

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

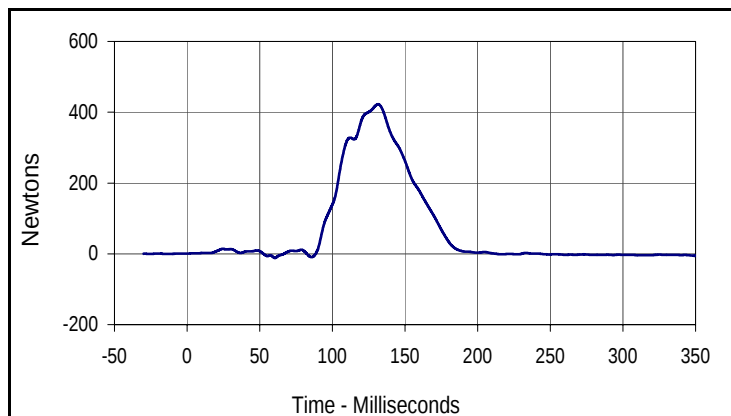
Test Date: 8/5/05
 NHTSA No.: C50507



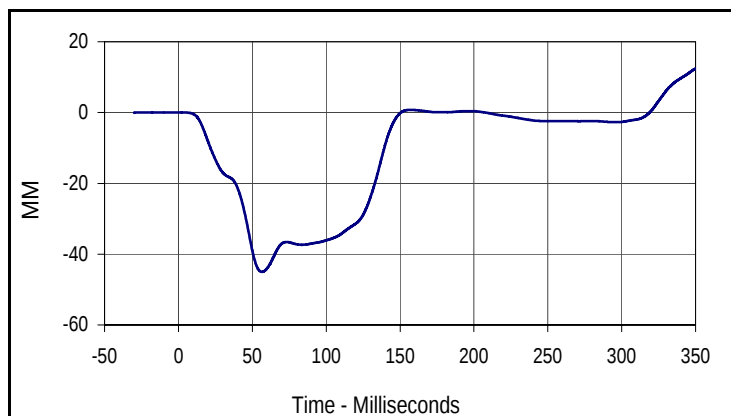
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
718.6	88.0	-1558.6	45.5



Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
774.6	81.3	-1394.7	43.3



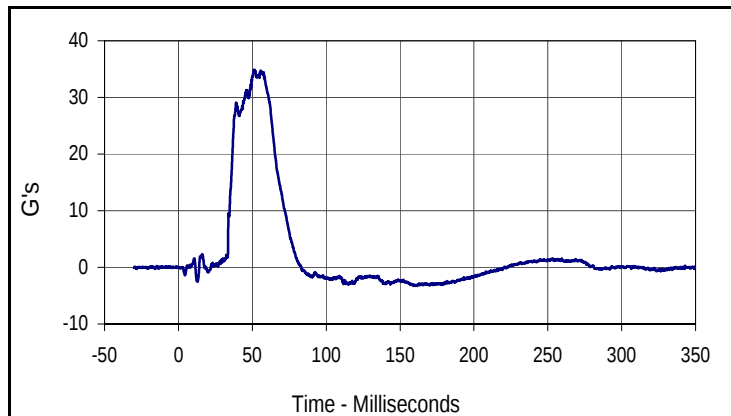
Curve Description			
Driver Lap Belt Load			
CURNO	Type	SAE Class	Units
029	FIL	60	Newtons
Max	Time	Min	Time
422.5	131.5	-11.8	60.4



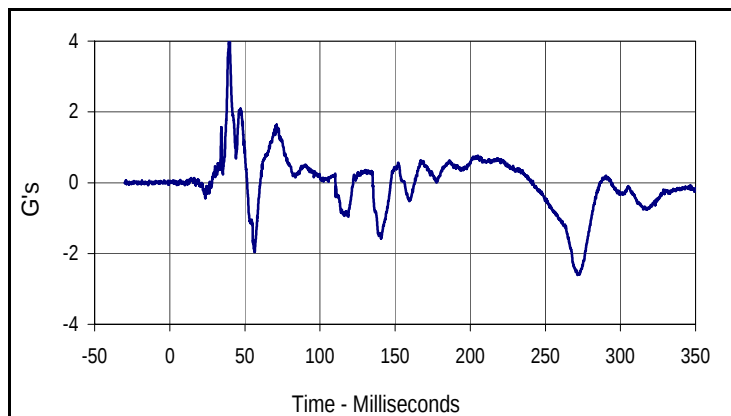
Curve Description			
Driver Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
030	FIL	60	MM
Max	Time	Min	Time
12.4	349.9	-45.0	56.5

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

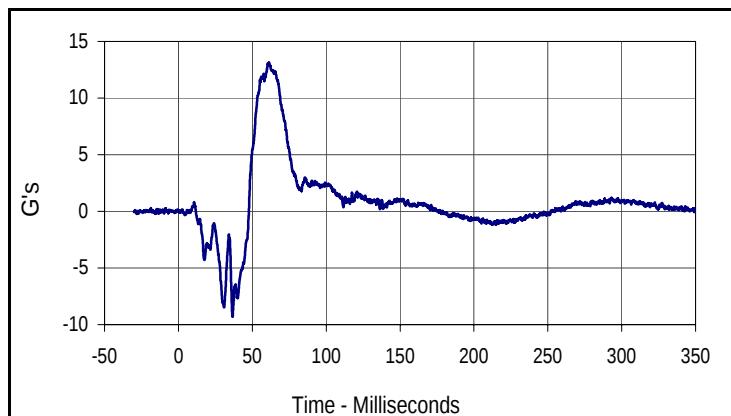
Test Date: 8/5/05
 NHTSA No.: C50507



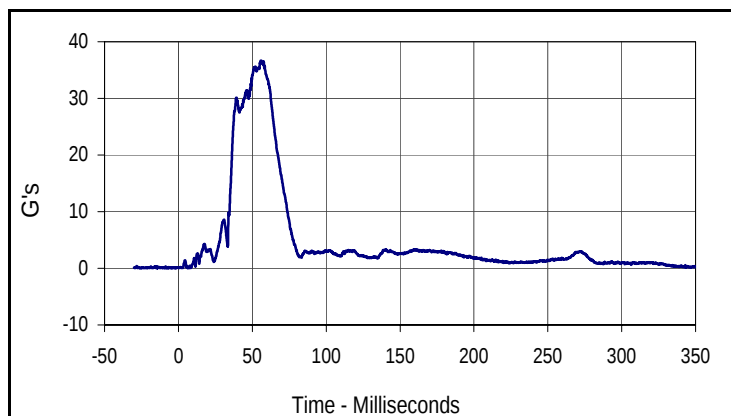
Curve Description			
Passenger Head X			
CURNO	Type	SAE Class	Units
031	FIL	1000	G's
Max	Time	Min	Time
34.9	51.2	-3.3	161.6



Curve Description			
Passenger Head Y			
CURNO	Type	SAE Class	Units
032	FIL	1000	G's
Max	Time	Min	Time
4.1	39.5	-2.6	271.3



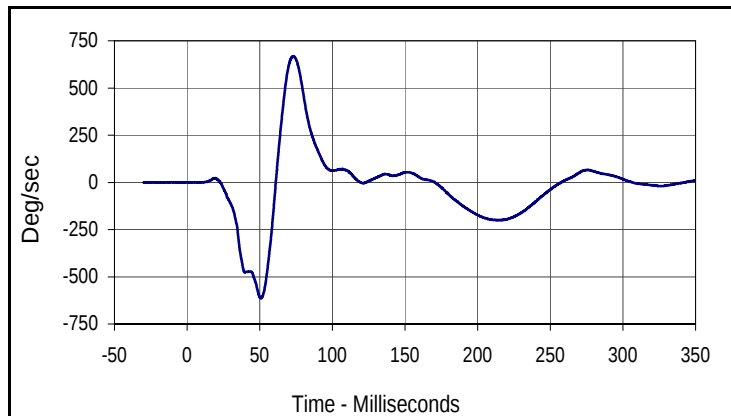
Curve Description			
Passenger Head Z			
CURNO	Type	SAE Class	Units
033	FIL	1000	G's
Max	Time	Min	Time
13.2	61.3	-9.3	36.7



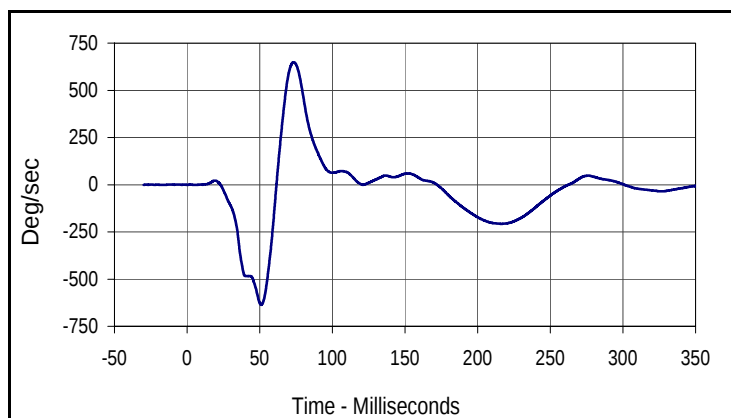
Curve Description			
Passenger Head Resultant			
CURNO	Type	SAE Class	Units
031	RES	1000	G's
Max	Time	Min	Time
36.7	55.7	0.0	6.4

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

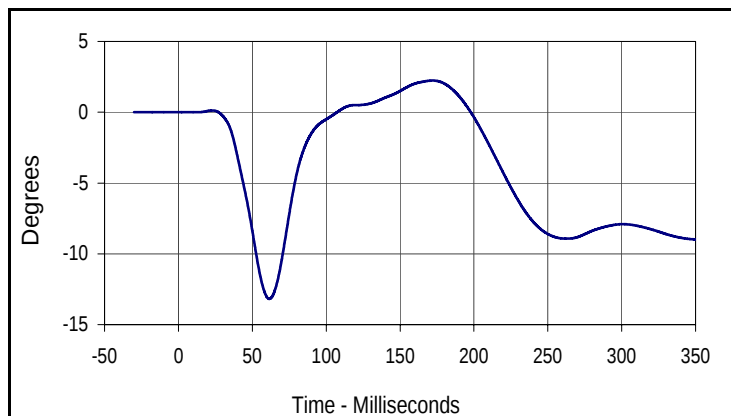
Test Date: 8/5/05
 NHTSA No.: C50507



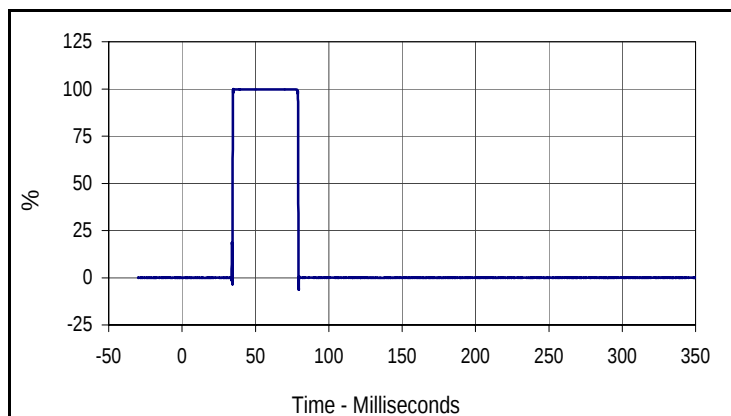
Curve Description			
Passenger Head Y Angular Velocity			
CURNO	Type	SAE Class	Units
034	FIL	1000	Deg/sec
Max	Time	Min	Time
667.8	73.2	-614.5	50.8



Curve Description			
Passenger Head Y Angular Velocity			
CURNO	Type	SAE Class	Units
034	COMP	NA	Deg/sec
Max	Time	Min	Time
648.8	73.4	-635.9	51.0



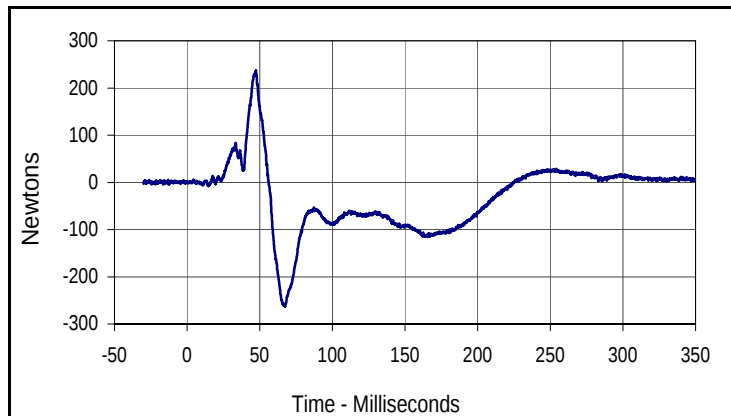
Curve Description			
Passenger Head Y Rotation			
CURNO	Type	SAE Class	Units
034	COMP-IN1	NA	Degrees
Max	Time	Min	Time
2.2	171.9	-13.2	61.5



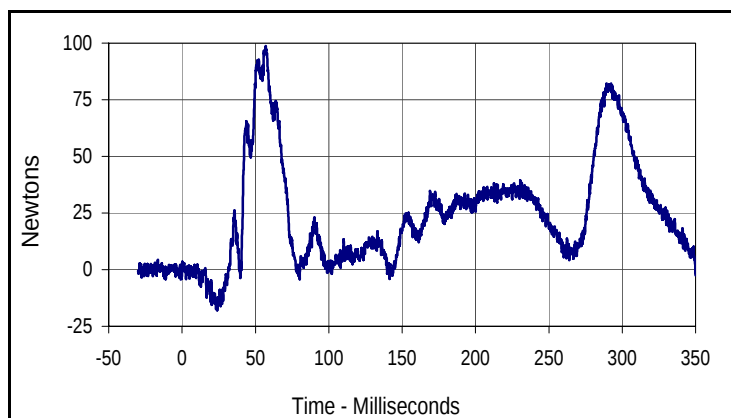
Curve Description			
Passenger Headrest Contact			
CURNO	Type	SAE Class	Units
035	FIL	1000	%
Max	Time	Min	Time
100.0	34.8	-6.3	79.5

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

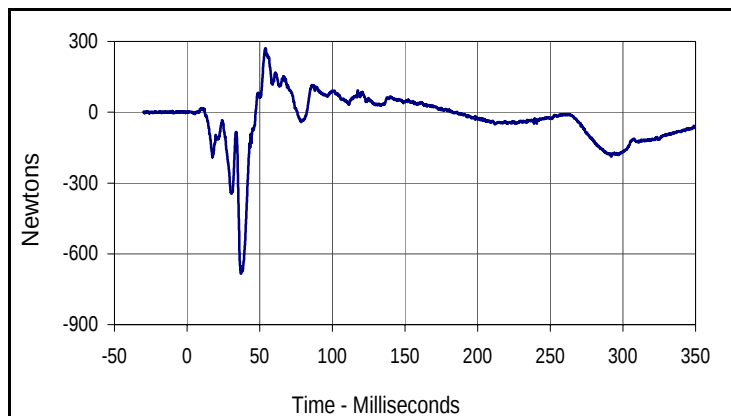
Test Date: 8/5/05
 NHTSA No.: C50507



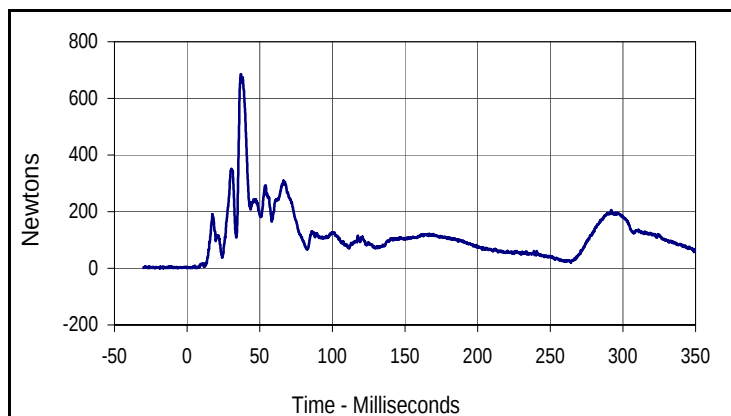
Curve Description			
Passenger Upper Neck Force X			
CURNO	Type	SAE Class	Units
036	FIL	1000	Newtons
Max	Time	Min	Time
237.1	47.3	-263.4	67.5



Curve Description			
Passenger Upper Neck Force Y			
CURNO	Type	SAE Class	Units
037	FIL	1000	Newtons
Max	Time	Min	Time
98.8	57.0	-18.0	24.0



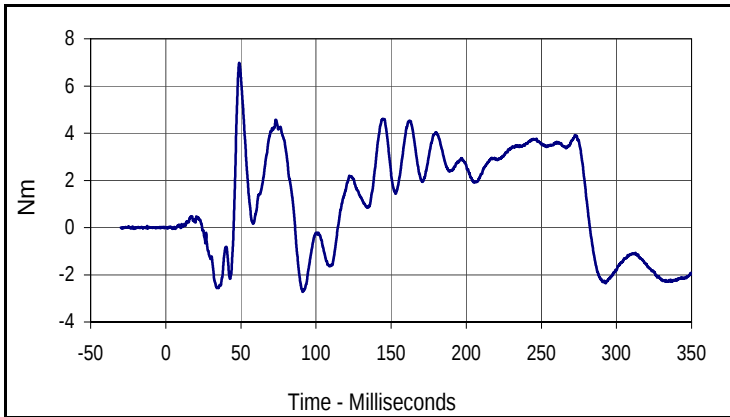
Curve Description			
Passenger Upper Neck Force Z			
CURNO	Type	SAE Class	Units
038	FIL	1000	Newtons
Max	Time	Min	Time
272.1	54.0	-684.1	37.1



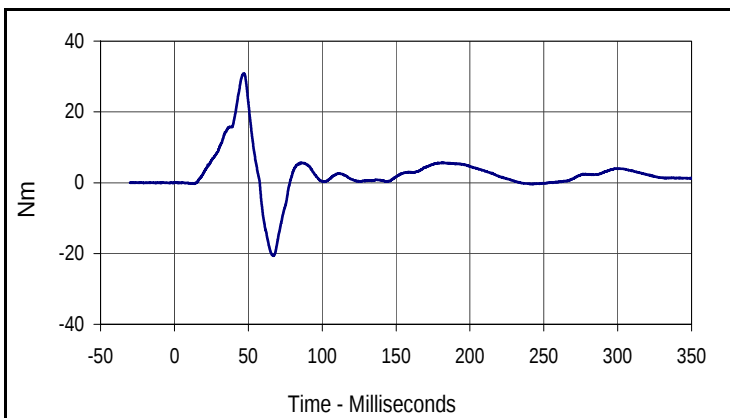
Curve Description			
Passenger Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
036	RES	1000	Newtons
Max	Time	Min	Time
686.4	37.1	0.9	1.2

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

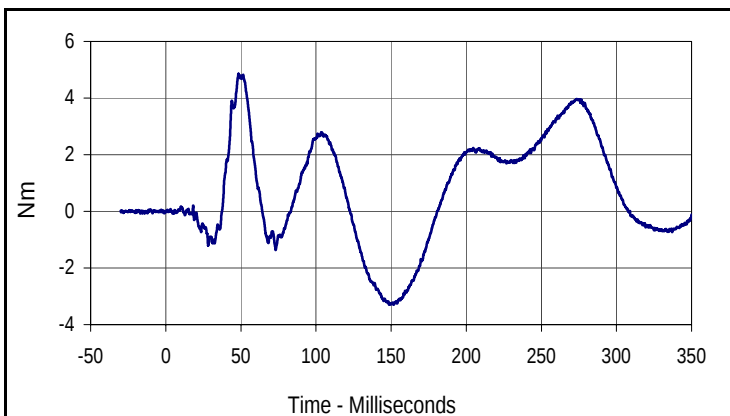
Test Date: 8/5/05
 NHTSA No.: C50507



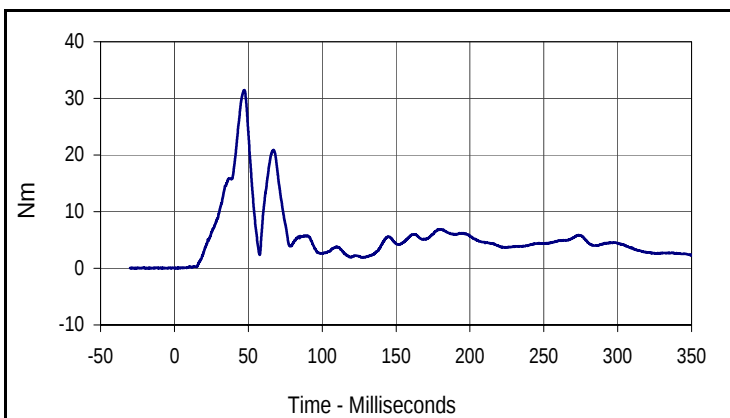
Curve Description			
Passenger Upper Neck Moment X			
CURNO	Type	SAE Class	Units
039	FIL	600	Nm
Max	Time	Min	Time
7.0	48.9	-2.7	91.3



Curve Description			
Passenger Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
040	FIL	600	Nm
Max	Time	Min	Time
30.9	46.8	-20.6	67.1



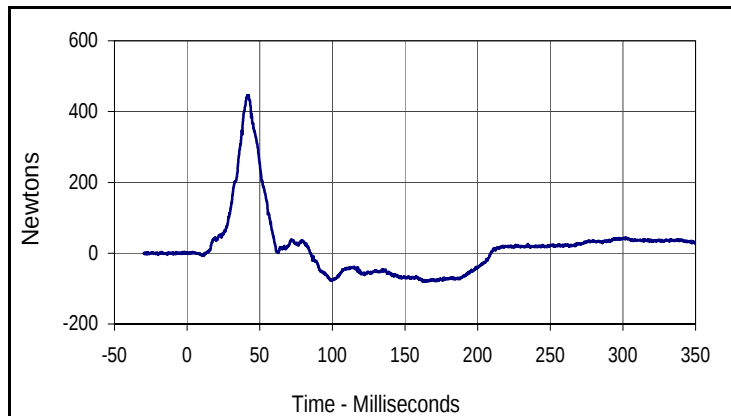
Curve Description			
Passenger Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
041	FIL	600	Nm
Max	Time	Min	Time
4.9	48.4	-3.3	151.7



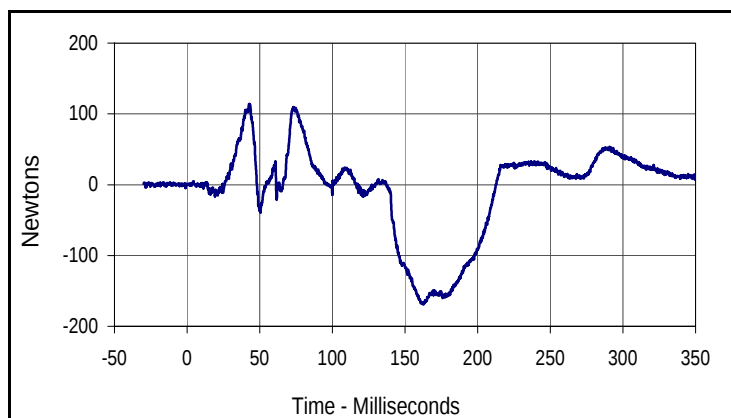
Curve Description			
Passenger Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
039	RES	600	Nm
Max	Time	Min	Time
31.5	47.4	0.0	1.6

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

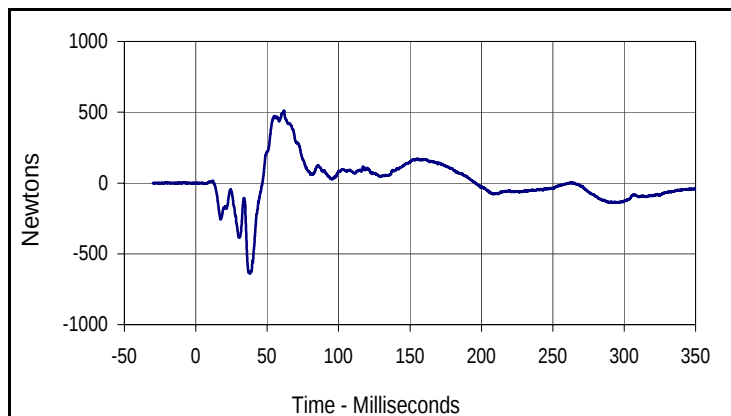
Test Date: 8/5/05
 NHTSA No.: C50507



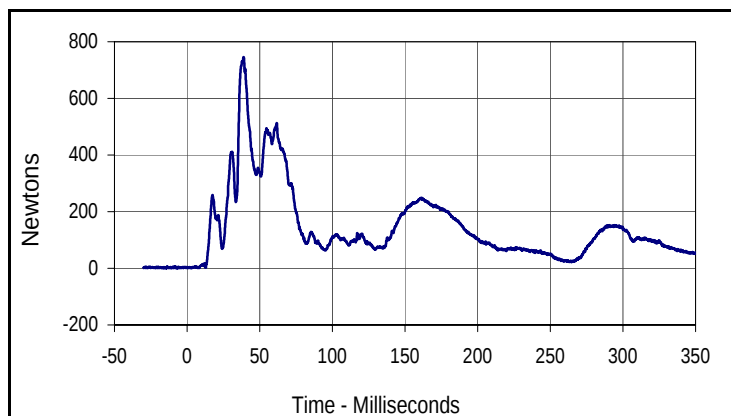
Curve Description			
Passenger Lower Neck Force X			
CURNO	Type	SAE Class	Units
042	FIL	1000	Newtons
Max	Time	Min	Time
446.2	42.4	-80.8	162.3



Curve Description			
Passenger Lower Neck Force Y			
CURNO	Type	SAE Class	Units
043	FIL	1000	Newtons
Max	Time	Min	Time
114.2	42.9	-169.0	162.3



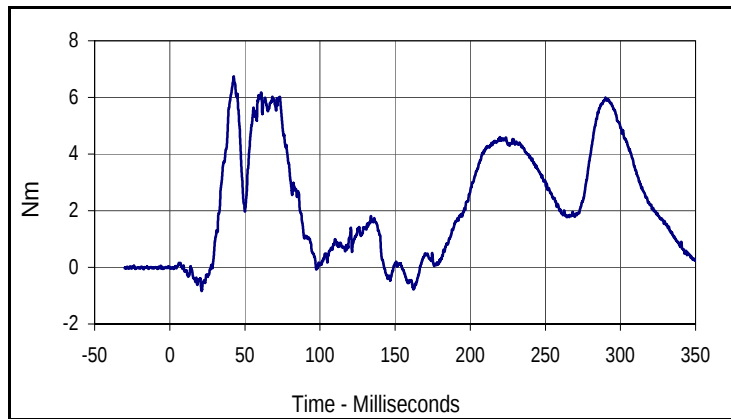
Curve Description			
Passenger Lower Neck Force Z			
CURNO	Type	SAE Class	Units
044	FIL	1000	Newtons
Max	Time	Min	Time
512.8	61.7	-641.5	37.9



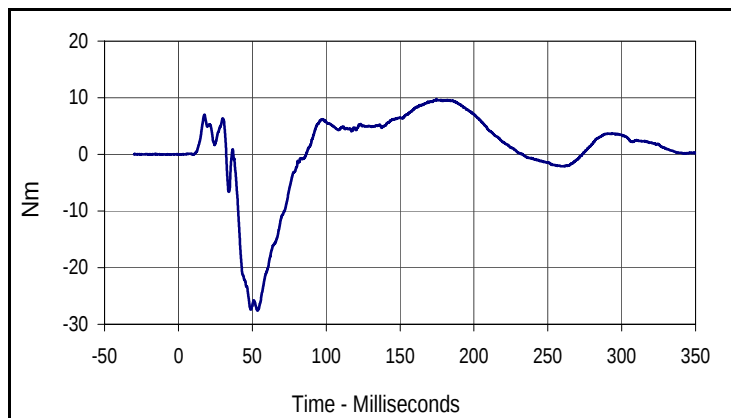
Curve Description			
Passenger Lower Neck Force Resultant			
CURNO	Type	SAE Class	Units
042	RES	1000	Newtons
Max	Time	Min	Time
746.1	38.9	0.7	3.1

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

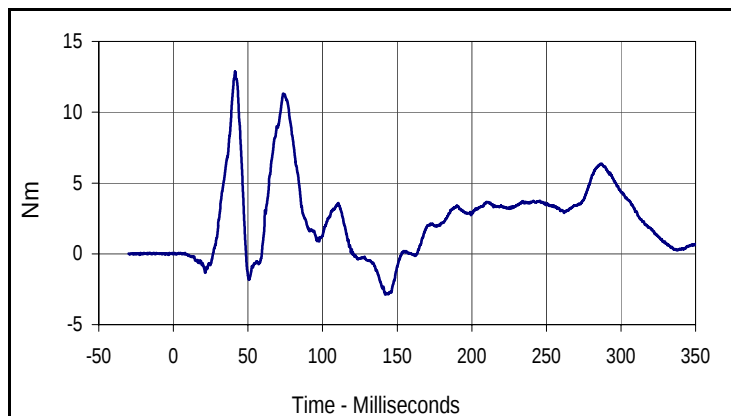
Test Date: 8/5/05
 NHTSA No.: C50507



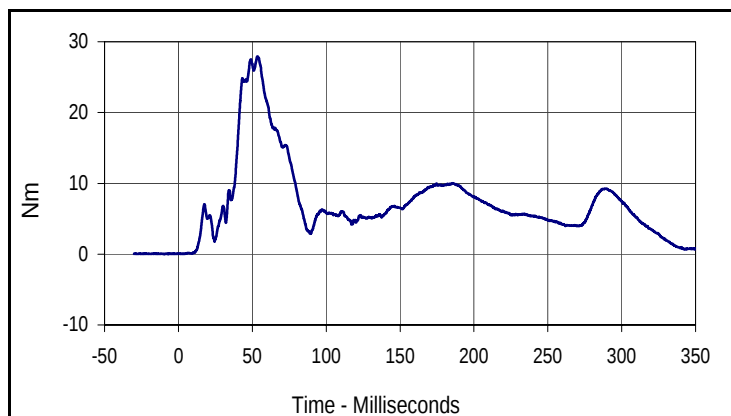
Curve Description			
Passenger Lower Neck Moment X			
CURNO	Type	SAE Class	Units
045	FIL	600	Nm
Max	Time	Min	Time
6.7	42.6	-0.8	21.3



Curve Description			
Passenger Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
046	FIL	600	Nm
Max	Time	Min	Time
9.8	174.6	-27.5	53.5



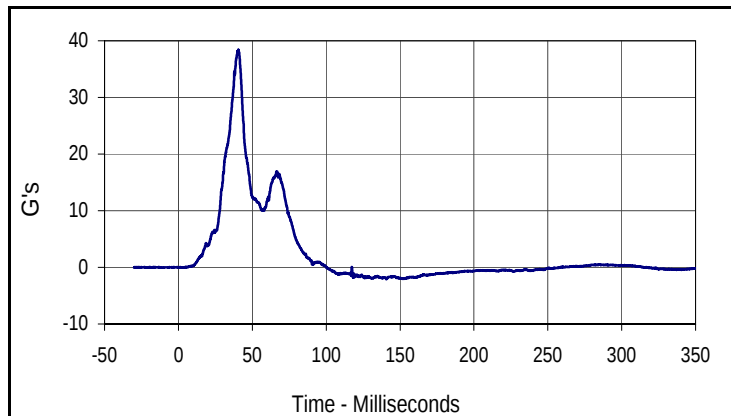
Curve Description			
Passenger Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
047	FIL	600	Nm
Max	Time	Min	Time
12.9	41.4	-2.9	142.2



Curve Description			
Passenger Lower Neck Moment Resultant			
CURNO	Type	SAE Class	Units
045	RES	600	Nm
Max	Time	Min	Time
27.9	53.5	0.0	1.9

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

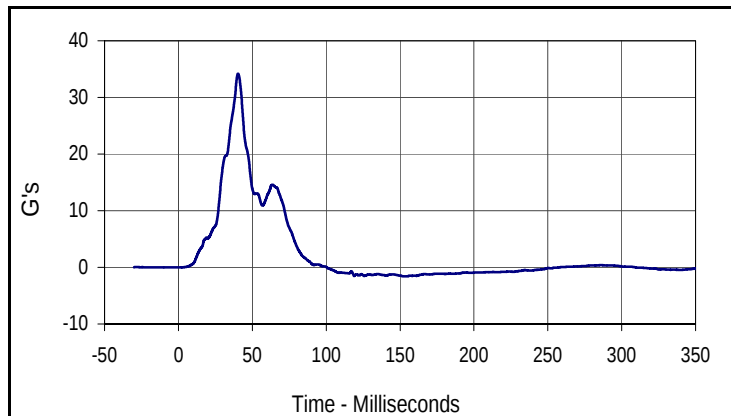
Test Date: 8/5/05
 NHTSA No.: C50507



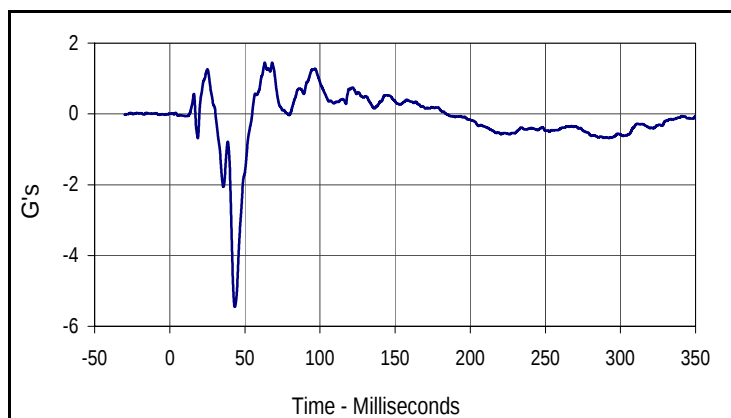
Curve Description			
Passenger Lower Neck X			
CURNO	Type	SAE Class	Units
048	FIL	1000	G's
Max	Time	Min	Time
38.4	40.6	-2.1	140.8

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

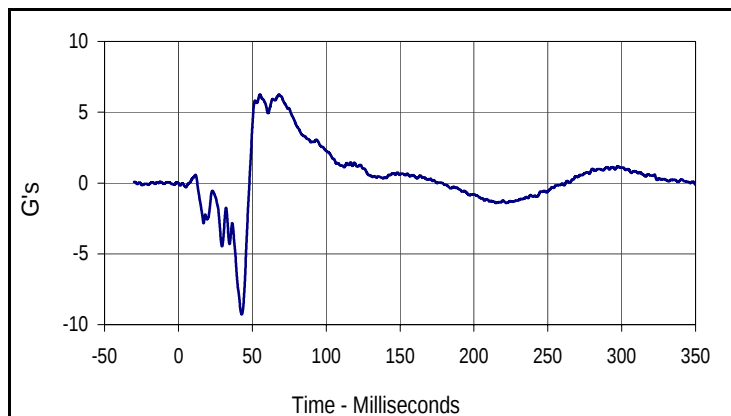
Test Date: 8/5/05
 NHTSA No.: C50507



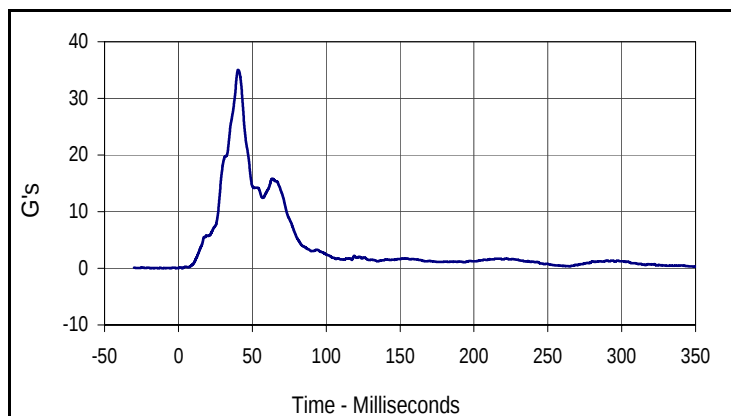
Curve Description			
Passenger Chest X			
CURNO	Type	SAE Class	Units
049	FIL	180	G's
Max	Time	Min	Time
34.2	40.3	-1.6	152.3



Curve Description			
Passenger Chest Y			
CURNO	Type	SAE Class	Units
050	FIL	180	G's
Max	Time	Min	Time
1.4	63.3	-5.4	43.3



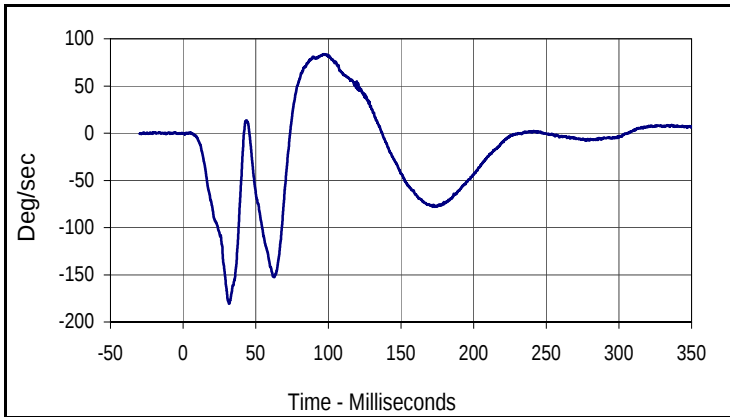
Curve Description			
Passenger Chest Z			
CURNO	Type	SAE Class	Units
051	FIL	180	G's
Max	Time	Min	Time
6.2	68.1	-9.3	42.9



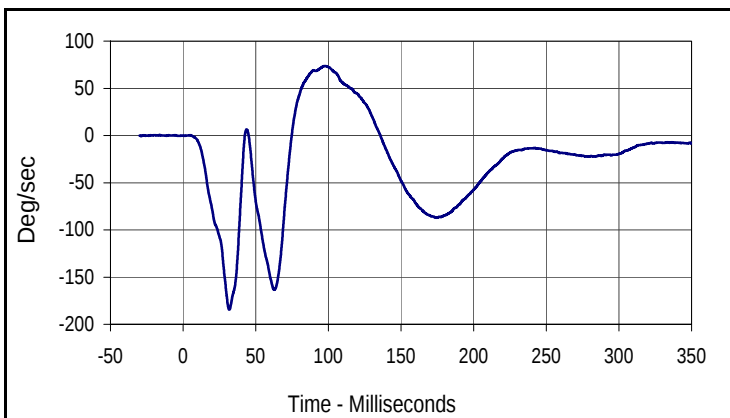
Curve Description			
Passenger Chest Resultant			
CURNO	Type	SAE Class	Units
049	RES	180	G's
Max	Time	Min	Time
35.0	40.5	0.0	2.6

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

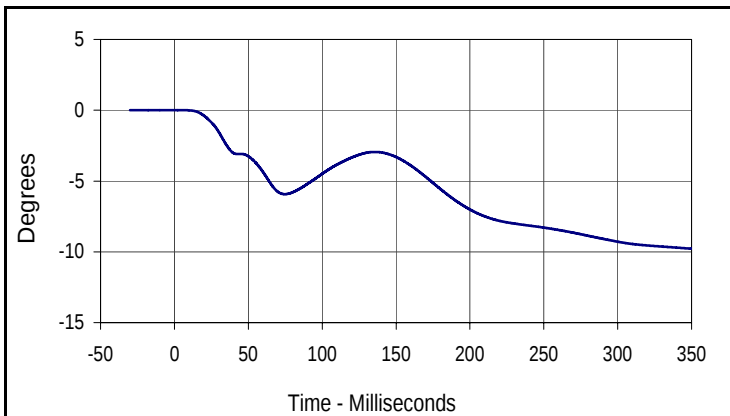
Test Date: 8/5/05
 NHTSA No.: C50507



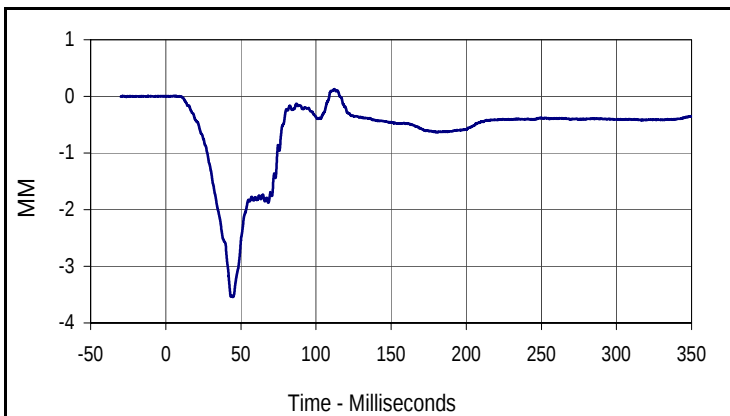
Curve Description			
Passenger Chest Y Angular Velocity			
CURNO	Type	SAE Class	Units
052	FIL	600	Deg/sec
Max	Time	Min	Time
83.8	96.9	-180.8	31.8



Curve Description			
Passenger Chest Y Angular Velocity			
CURNO	Type	SAE Class	Units
052	COMP	NA	Deg/sec
Max	Time	Min	Time
73.5	97.2	-184.5	31.8



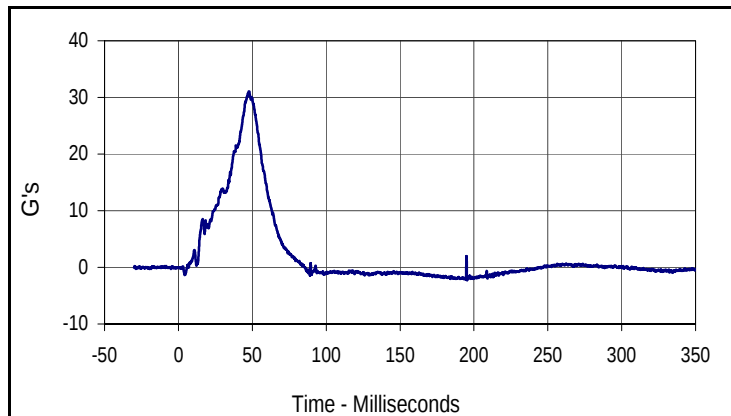
Curve Description			
Passenger Chest Y Rotation			
CURNO	Type	SAE Class	Units
052	COMP-IN1	NA	Degrees
Max	Time	Min	Time
0.0	0.0	-9.8	349.9



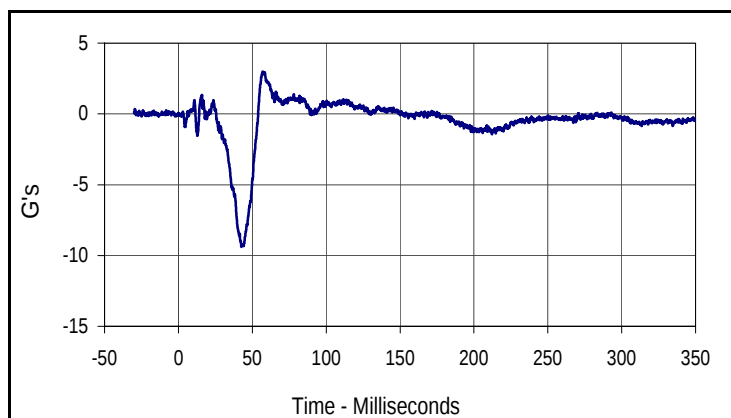
Curve Description			
Passenger Chest Deflection			
CURNO	Type	SAE Class	Units
053	FIL	600	MM
Max	Time	Min	Time
0.1	112.4	-3.5	44.7

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

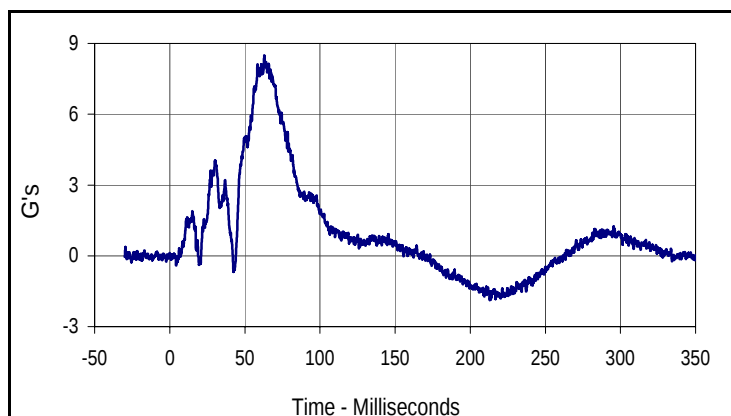
Test Date: 8/5/05
 NHTSA No.: C50507



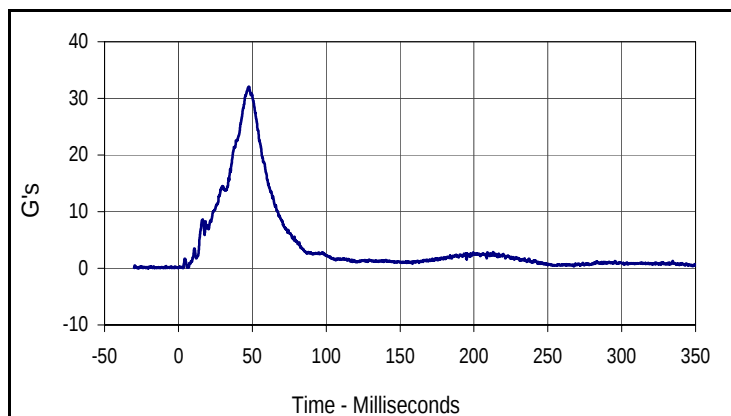
Curve Description			
Passenger Pelvis X			
CURNO	Type	SAE Class	Units
054	FIL	1000	G's
Max	Time	Min	Time
31.1	47.7	-2.3	195.3



Curve Description			
Passenger Pelvis Y			
CURNO	Type	SAE Class	Units
055	FIL	1000	G's
Max	Time	Min	Time
3.0	57.1	-9.4	42.6



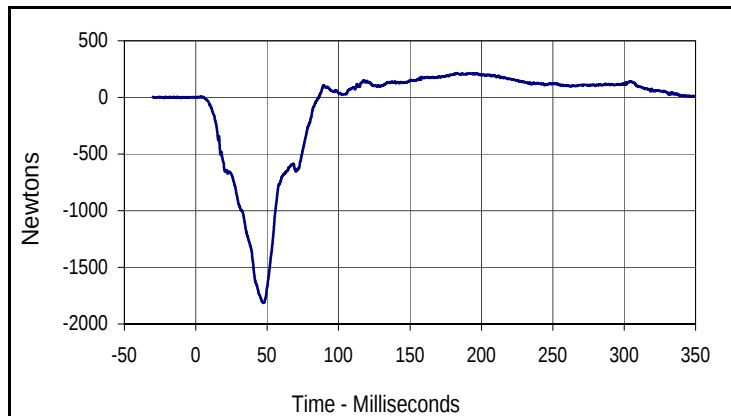
Curve Description			
Passenger Pelvis Z			
CURNO	Type	SAE Class	Units
056	FIL	1000	G's
Max	Time	Min	Time
8.5	62.9	-1.9	213.1



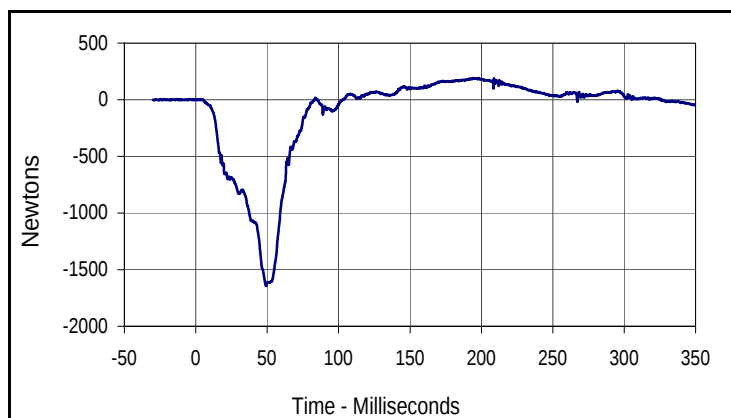
Curve Description			
Passenger Pelvis Resultant			
CURNO	Type	SAE Class	Units
054	RES	1000	G's
Max	Time	Min	Time
32.1	47.7	0.1	2.8

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

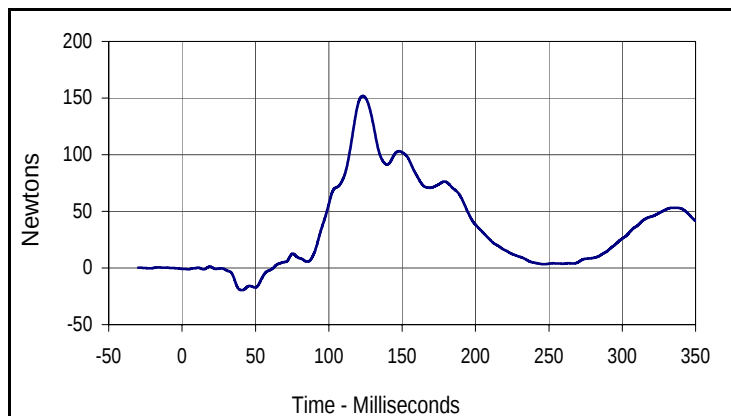
Test Date: 8/5/05
 NHTSA No.: C50507



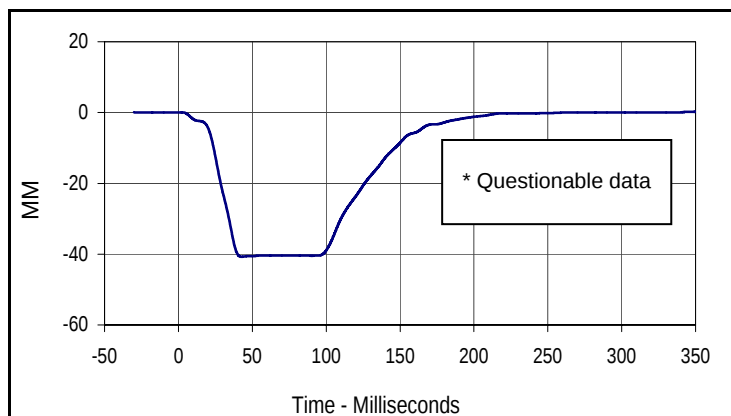
Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
057	FIL	600	Newtons
Max	Time	Min	Time
215.0	182.9	-1814.6	47.4



Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
058	FIL	600	Newtons
Max	Time	Min	Time
192.3	198.2	-1644.2	49.2



Curve Description			
Passenger Lap Belt Force			
CURNO	Type	SAE Class	Units
059	FIL	60	Newtons
Max	Time	Min	Time
151.9	123.3	-19.6	40.9

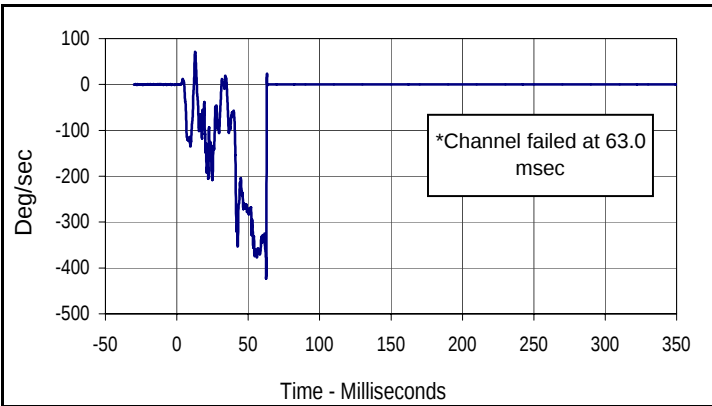


Curve Description			
Passenger Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
060	FIL	60	MM
Max	Time	Min	Time
0.2	348.0	-40.7	42.7

* Questionable data

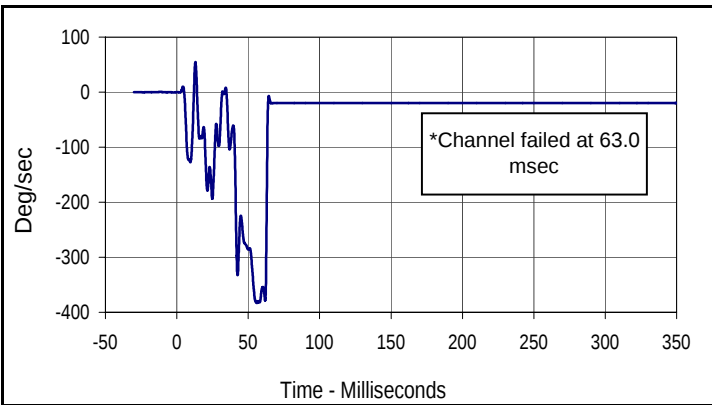
Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

Test Date: 8/5/05
 NHTSA No.: C50507



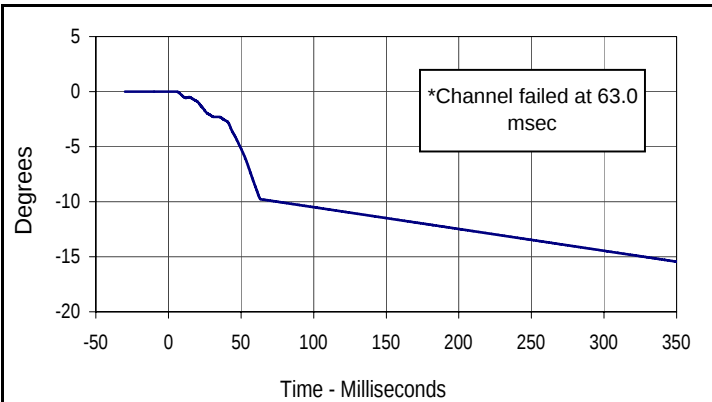
Curve Description			
Driver Seat Back Left Side Y Angular Velocity			
CURNO	Type	SAE Class	Units
061	FIL	1000	Deg/sec
Max	Time	Min	Time
71.1	12.8	-423.5	62.6

* Channel failed at 63.0 msec.



Curve Description			
Driver Seat Back Left Side Y Angular Velocity			
CURNO	Type	SAE Class	Units
061	COMP	NA	Deg/sec
Max	Time	Min	Time
54.8	13.0	-383.1	56.1

* Channel failed at 63.0 msec.

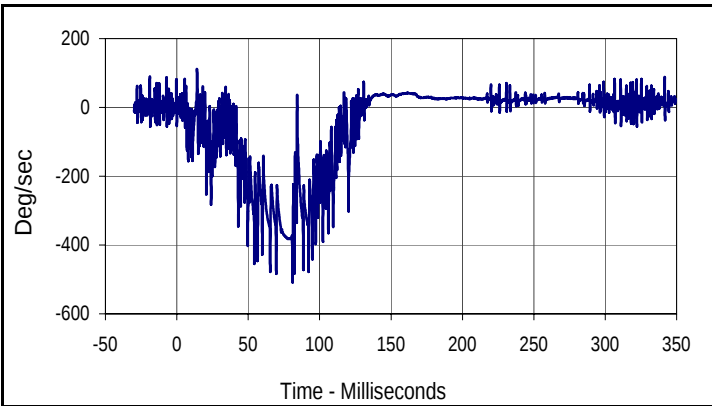


Curve Description			
Driver Seat Back Left Side Y Rotation			
CURNO	Type	SAE Class	Units
061	COMP-IN1	NA	Degrees
Max	Time	Min	Time
0.0	5.2	-15.4	349.9

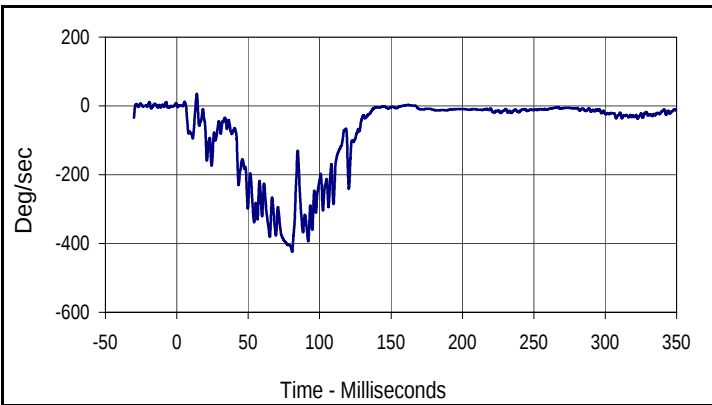
* Channel failed at 63.0 msec.

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

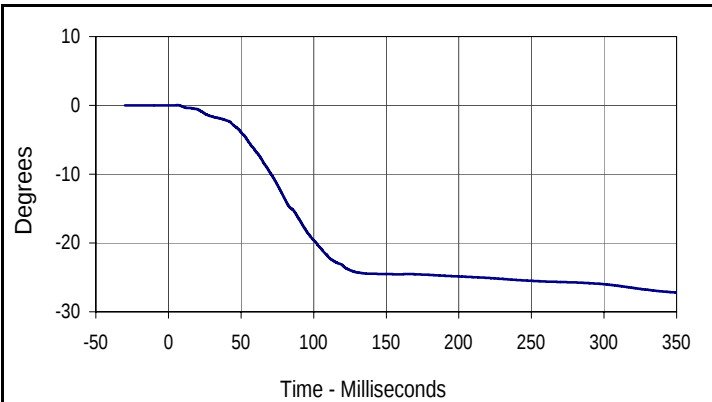
Test Date: 8/5/05
 NHTSA No.: C50507



Curve Description			
Driver Seat Back Right Side Y Angular Velocity			
CURNO	Type	SAE Class	Units
062	FIL	1000	Deg/sec
Max	Time	Min	Time
111.2	14.2	-508.4	81.0



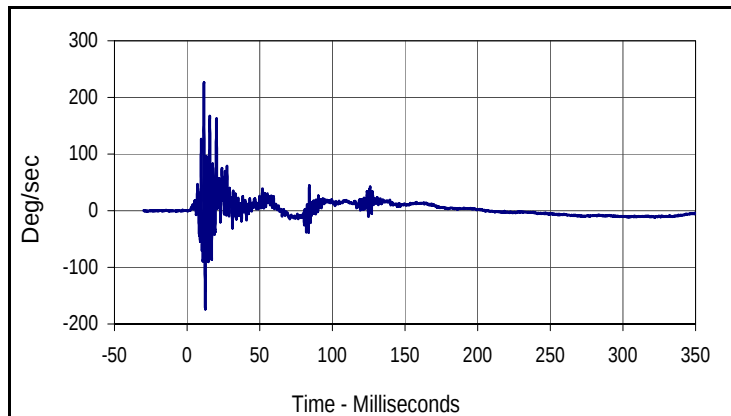
Curve Description			
Driver Seat Back Right Side Y Angular Velocity			
CURNO	Type	SAE Class	Units
062	COMP	NA	Deg/sec
Max	Time	Min	Time
35.3	14.1	-424.4	80.8



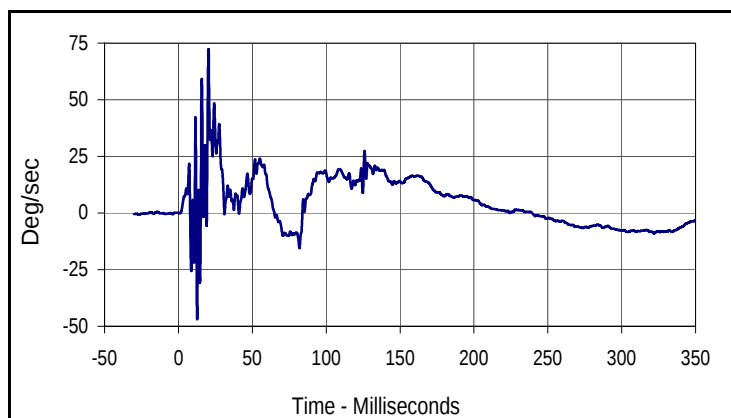
Curve Description			
Driver Seat Back Right Side Y Rotation			
CURNO	Type	SAE Class	Units
062	COMP-IN1	NA	Degrees
Max	Time	Min	Time
0.0	6.4	-27.2	349.9

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

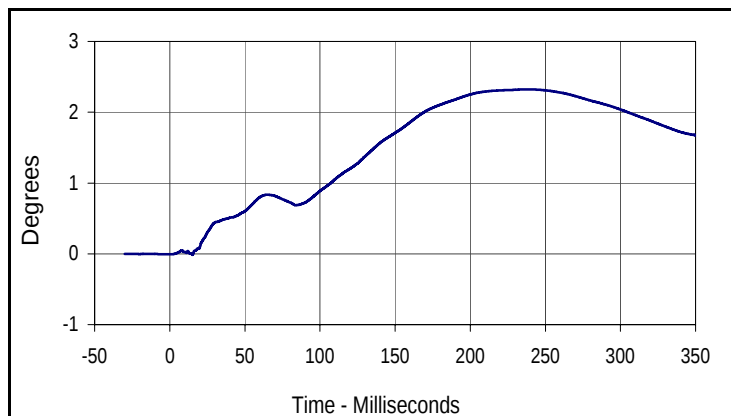
Test Date: 8/5/05
 NHTSA No.: C50507



Curve Description			
Vehicle Left Front Sill Y Angular Velocity			
CURNO	Type	SAE Class	Units
063	FIL	1000	Deg/sec
Max	Time	Min	Time
226.0	11.6	-174.2	12.5



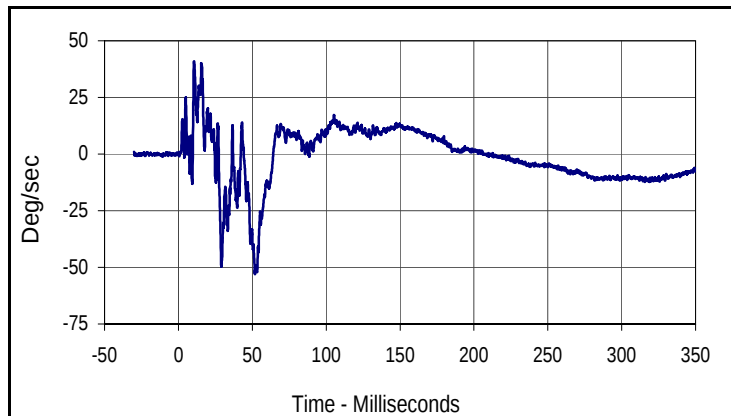
Curve Description			
Vehicle Left Front Sill Y Angular Velocity			
CURNO	Type	SAE Class	Units
063	COMP	NA	Deg/sec
Max	Time	Min	Time
72.4	20.3	-47.0	12.7



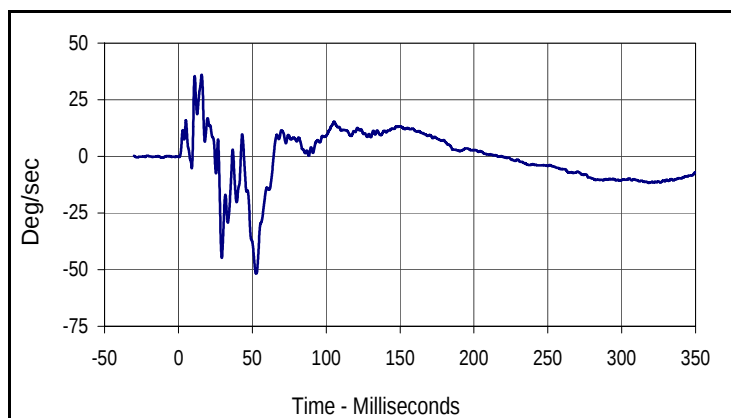
Curve Description			
Vehicle Left Front Sill Y Rotation			
CURNO	Type	SAE Class	Units
063	COMP-IN1	NA	Degrees
Max	Time	Min	Time
2.3	239.4	0.0	15.1

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

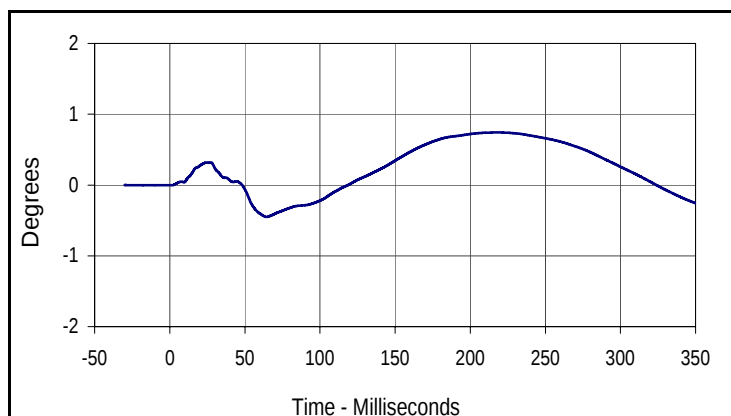
Test Date: 8/5/05
 NHTSA No.: C50507



Curve Description			
Vehicle Right Rear Sill Y Angular Velocity			
CURNO	Type	SAE Class	Units
064	FIL	1000	Deg/sec
Max	Time	Min	Time
41.0	10.6	-53.0	51.7



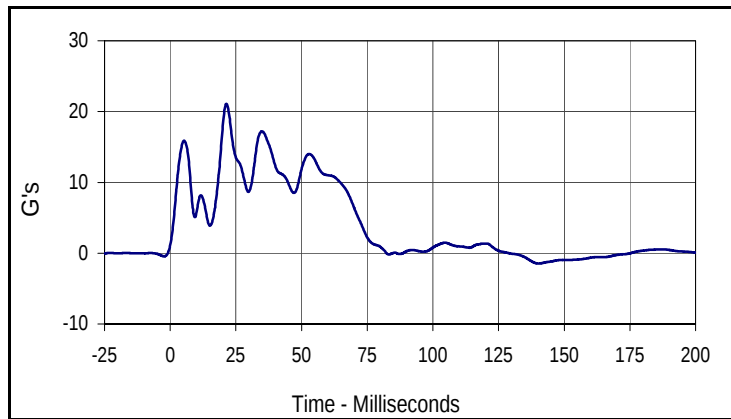
Curve Description			
Vehicle Right Rear Sill Y Angular Velocity			
CURNO	Type	SAE Class	Units
064	COMP	NA	Deg/sec
Max	Time	Min	Time
36.1	15.7	-51.7	52.7



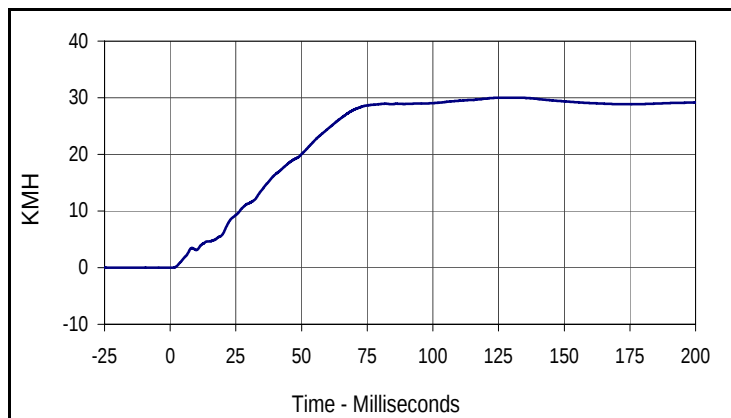
Curve Description			
Vehicle Right Rear Sill Y Rotation			
CURNO	Type	SAE Class	Units
064	COMP-IN1	NA	Degrees
Max	Time	Min	Time
0.7	216.1	-0.5	64.4

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

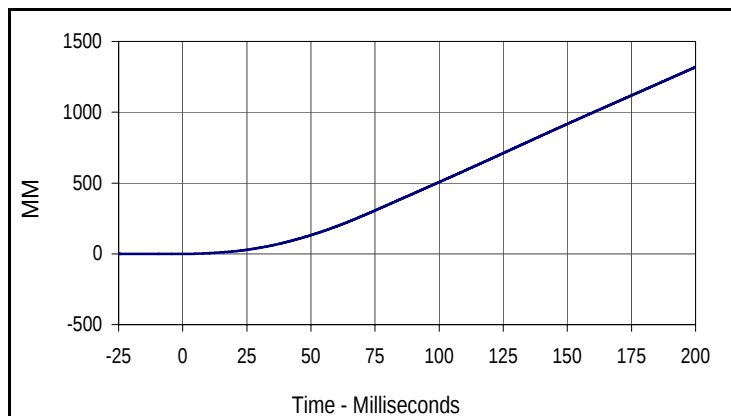
Test Date: 8/5/05
 NHTSA No.: C50507



Curve Description			
Vehicle Left Front X-Member Primary X			
CURNO	Type	SAE Class	Units
065	FIL	60	G's
Max	Time	Min	Time
21.1	21.4	-1.5	140.2



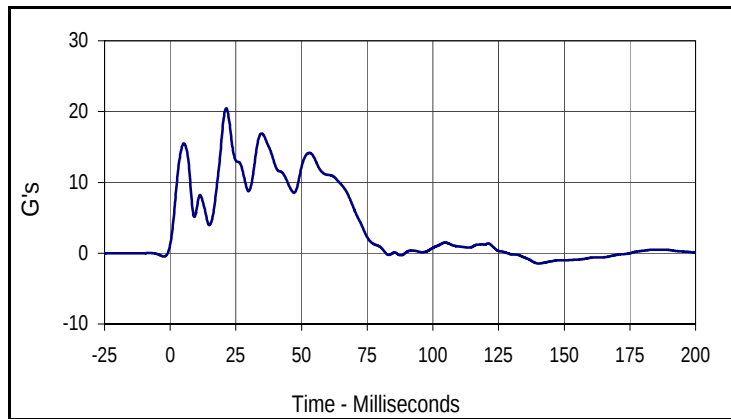
Curve Description			
Vehicle LF X-Member Primary X Velocity			
CURNO	Type	SAE Class	Units
065	IN1	180	KMH
Max	Time	Min	Time
30.0	129.2	0.0	1.0



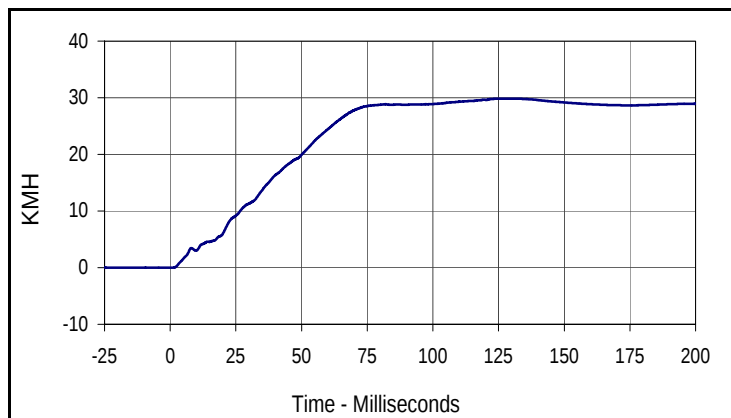
Curve Description			
Vehicle LF X-Member Primary X Displacement			
CURNO	Type	SAE Class	Units
065	IN2	180	MM
Max	Time	Min	Time
1319.1	200.0	0.0	0.0

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

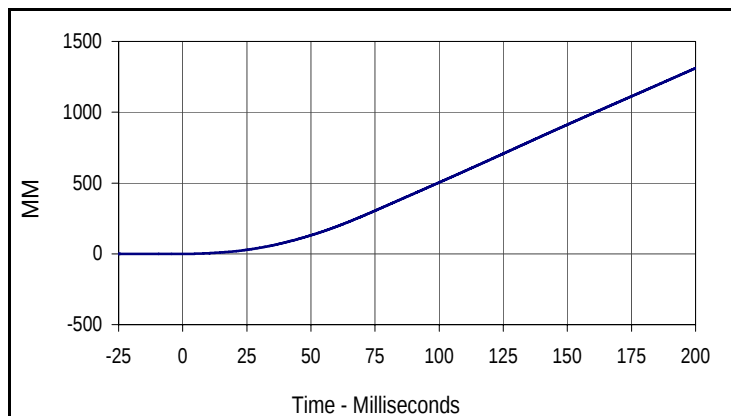
Test Date: 8/5/05
 NHTSA No.: C50507



Curve Description			
Vehicle Left Front X-Member Red. X			
CURNO	Type	SAE Class	Units
066	FIL	60	G's
Max	Time	Min	Time
20.5	21.3	-1.5	140.2



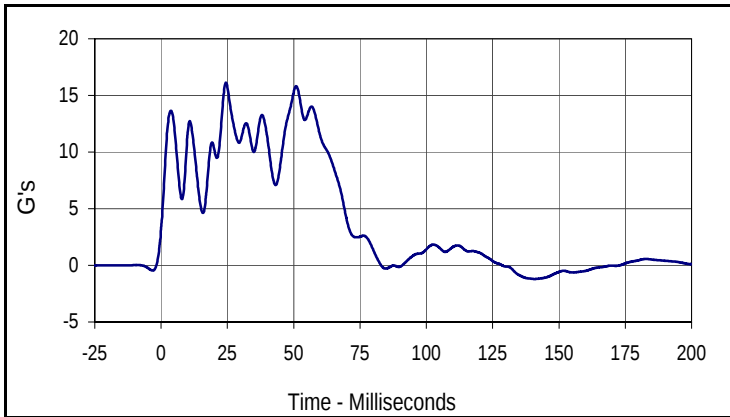
Curve Description			
Vehicle LF X-Member Red. X Velocity			
CURNO	Type	SAE Class	Units
066	IN1	180	KMH
Max	Time	Min	Time
29.9	129.1	0.0	1.0



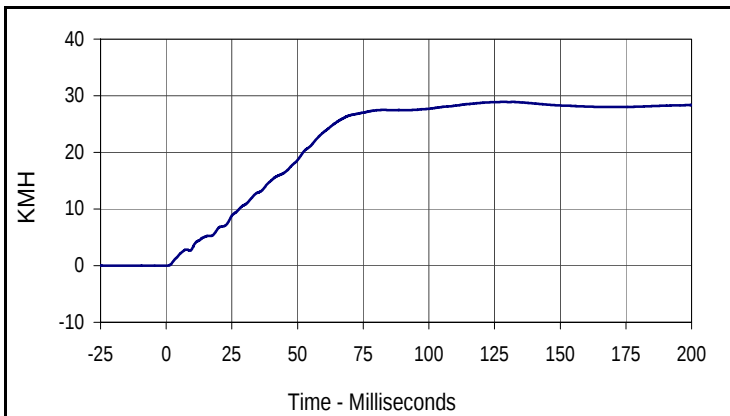
Curve Description			
Vehicle LF X-Member Red. X Displacement			
CURNO	Type	SAE Class	Units
066	IN2	180	MM
Max	Time	Min	Time
1311.4	200.0	0.0	1.3

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

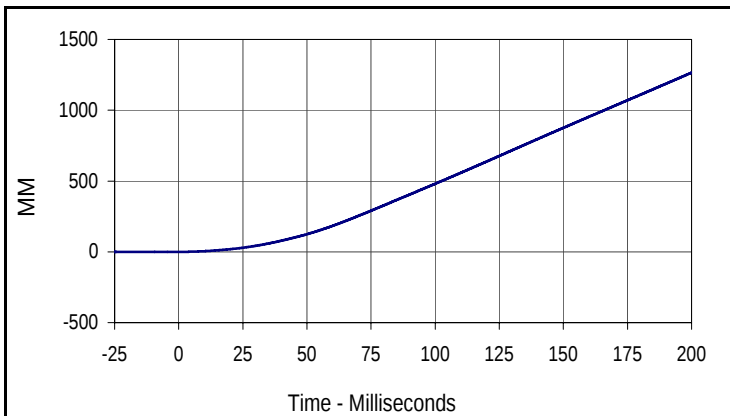
Test Date: 8/5/05
 NHTSA No.: C50507



Curve Description			
Vehicle Right Rear X-Member Primary X			
CURNO	Type	SAE Class	Units
067	FIL	60	G's
Max	Time	Min	Time
16.1	24.5	-1.2	140.8



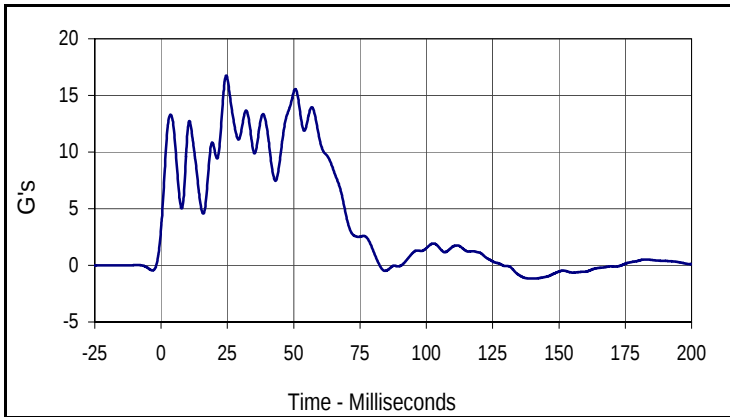
Curve Description			
Vehicle RR X-Member Primary Velocity			
CURNO	Type	SAE Class	Units
067	IN1	180	KMH
Max	Time	Min	Time
28.9	128.5	0.0	0.0



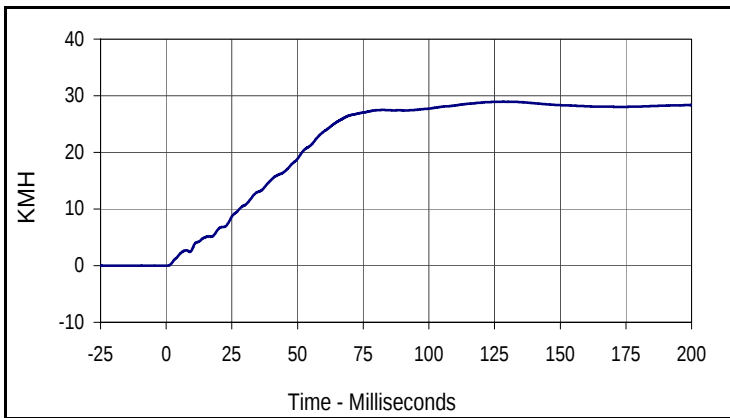
Curve Description			
Vehicle RR X-Member Primary Displacement			
CURNO	Type	SAE Class	Units
067	IN2	180	MM
Max	Time	Min	Time
1265.3	200.0	0.0	0.0

Test Vehicle: 2005 Suzuki Reno 4-Door Sedan
 Test Program: FMVSS 301R

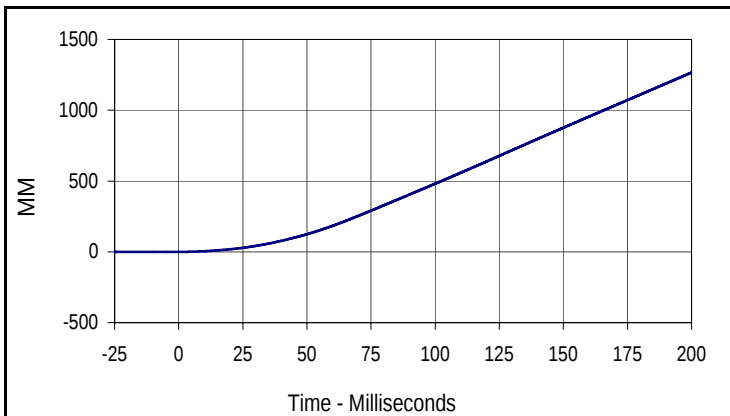
Test Date: 8/5/05
 NHTSA No.: C50507



Curve Description			
Vehicle Right Rear X-Member Red. X			
CURNO	Type	SAE Class	Units
068	FIL	60	G's
Max	Time	Min	Time
16.8	24.6	-1.2	140.6



Curve Description			
Vehicle RR X-Member Red. X Velocity			
CURNO	Type	SAE Class	Units
068	IN1	180	KMH
Max	Time	Min	Time
29.0	128.5	0.0	0.0



Curve Description			
Vehicle RR X-Member Red. X Displacement			
CURNO	Type	SAE Class	Units
068	IN2	180	MM
Max	Time	Min	Time
1266.5	200.0	0.0	0.0

APPENDIX C

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

FMVSS 301R
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 202
8/5/05
2005 Suzuki Reno 4-Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD CG	X	202HEADX	Accelerometer	Entran	EGEB6Q-2K	G
2	HEAD CG	Y	202HEADY	Accelerometer	Entran	EGEB6Q-2K	G
3	HEAD CG	Z	202HEADZ	Accelerometer	Entran	EGEB6Q-2K	G
4	HEAD CG	Y	202HEAD_Y	Angular Velocity Sensor	ATA	ARS-06	Deg/Sec
5	VEHICLE HEADREST	NA	CONT01	Contact Sensor	Tapeswitch	8 oz. tapeswitch	On/Off
6	UPPER NECK FORCE	X	202UNFX	Neck Load Cell - Force	Denton	1716A	Newtons
7	UPPER NECK FORCE	Y	202UNFY	Neck Load Cell - Force	Denton	1716A	Newtons
8	UPPER NECK FORCE	Z	202UNFZ	Neck Load Cell - Force	Denton	1716A	Newtons
9	UPPER NECK MOMENT	X	202UNMX	Neck Load Cell - Moment	Denton	1716A	Nm
10	UPPER NECK MOMENT	Y	202UNMY	Neck Load Cell - Moment	Denton	1716A	Nm
11	UPPER NECK MOMENT	Z	202UNMZ	Neck Load Cell - Moment	Denton	1716A	Nm
12	LOWER NECK FORCE	X	202LNFX	Neck Load Cell - Force	Denton	5832J	Newtons
13	LOWER NECK FORCE	Y	202LNFY	Neck Load Cell - Force	Denton	5832J	Newtons
14	LOWER NECK FORCE	Z	202LNFZ	Neck Load Cell - Force	Denton	5832J	Newtons
15	LOWER NECK MOMENT	X	202LNMX	Neck Load Cell - Moment	Denton	5832J	Nm
16	LOWER NECK MOMENT	Y	202LNMY	Neck Load Cell - Moment	Denton	5832J	Nm
17	LOWER NECK MOMENT	Z	202LNMZ	Neck Load Cell - Moment	Denton	5832J	Nm
18	LOWER NECK	X	202LNFX	Accelerometer	Entran	EGEB6Q-2K	G

FMVSS 301R
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 202
8/5/05
2005 Suzuki Reno 4-Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
19	CHEST CG	X	202CHESTX	Accelerometer	Entran	EGEB6Q-2K	G
20	CHEST CG	Y	202CHESTY	Accelerometer	Entran	EGEB6Q-2K	G
21	CHEST CG	Z	202CHESTZ	Accelerometer	Entran	EGEB6Q-2K	G
22	CHEST CG	Y	202CH_Y	Angular Velocity Sensor	ATA	ARS-06	Deg/Sec
23	CHEST	X	202CHPOT	Potentiometer	Servo	2897	MM
24	PELVIS	X	202PELX	Accelerometer	Entran	EGEB6Q-2K	G
25	PELVIS	Y	202PELY	Accelerometer	Entran	EGEB6Q-2K	G
26	PELVIS	Z	202PELZ	Accelerometer	Entran	EGEB6Q-2K	G
27	LEFT FEMUR	Z	202FEM_L	Load Cell, Femur	Denton	2121A	Newtons
28	RIGHT FEMUR	Z	202FEM_R	Load Cell, Femur	Denton	2121A	Newtons
29	LAP BELT	NA	BL112	Lap Belt Load Cell	FGP	FN4060	Newtons
30	SHOULDER BELT	NA	POT01	Shoulder Belt Spoolout Pot	Celesco	PTX101-0030	MM

FMVSS 301R
Instrumentation Data Channel Assignments
Right Rear A.T.D. Serial Number 206
8/5/05
2005 Suzuki Reno 4-Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
31	HEAD CG	X	206HEADX	Accelerometer	Entran	EGEB6Q-2K	G
32	HEAD CG	Y	206HEADY	Accelerometer	Entran	EGEB6Q-2K	G
33	HEAD CG	Z	206HEADZ	Accelerometer	Entran	EGEB6Q-2K	G
34	HEAD CG	Y	206HEAD_Y	Angular Velocity Sensor	ATA	ARS-06	Deg/Sec
35	VEHICLE HEADREST	NA	CONT01	Contact Sensor	Tapeswitch	8 oz. tapeswitch	On/Off
36	UPPER NECK FORCE	X	206UNFX	Neck Load Cell - Force	Denton	1716A	Newtons
37	UPPER NECK FORCE	Y	206UNFY	Neck Load Cell - Force	Denton	1716A	Newtons
38	UPPER NECK FORCE	Z	206UNFZ	Neck Load Cell - Force	Denton	1716A	Newtons
39	UPPER NECK MOMENT	X	206UNMX	Neck Load Cell - Moment	Denton	1716A	Nm
40	UPPER NECK MOMENT	Y	206UNMY	Neck Load Cell - Moment	Denton	1716A	Nm
41	UPPER NECK MOMENT	Z	206UNMZ	Neck Load Cell - Moment	Denton	1716A	Nm
42	LOWER NECK FORCE	X	206LNFX	Neck Load Cell - Force	Denton	5832J	Newtons
43	LOWER NECK FORCE	Y	206LNFY	Neck Load Cell - Force	Denton	5832J	Newtons
44	LOWER NECK FORCE	Z	206LNFZ	Neck Load Cell - Force	Denton	5832J	Newtons
45	LOWER NECK MOMENT	X	206LNMX	Neck Load Cell - Moment	Denton	5832J	Nm
46	LOWER NECK MOMENT	Y	206LNMY	Neck Load Cell - Moment	Denton	5832J	Nm
47	LOWER NECK MOMENT	Z	206LNMZ	Neck Load Cell - Moment	Denton	5832J	Nm
48	LOWER NECK	X	206LNFX	Accelerometer	Entran	EGEB6Q-2K	G

FMVSS 301R
Instrumentation Data Channel Assignments
Right Rear A.T.D. Serial Number 206
8/5/05
2005 Suzuki Reno 4-Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
49	CHEST CG	X	206CHESTX	Accelerometer	Entran	EGEB6Q-2K	G
50	CHEST CG	Y	206CHESTY	Accelerometer	Entran	EGEB6Q-2K	G
51	CHEST CG	Z	206CHESTZ	Accelerometer	Entran	EGEB6Q-2K	G
52	CHEST CG	X	206CH_Y	Angular Velocity Sensor	ATA	ARS-06	Deg/Sec
53	CHEST	X	206CHPOT	Potentiometer	Servo	2897	MM
54	PELVIS	X	206PELX	Accelerometer	Entran	EGEB6Q-2K	G
55	PELVIS	Y	206PELY	Accelerometer	Entran	EGEB6Q-2K	G
56	PELVIS	Z	206PELZ	Accelerometer	Entran	EGEB6Q-2K	G
57	LEFT FEMUR	Z	206FEM_L	Load Cell, Femur	Denton	2121A	Newtons
58	RIGHT FEMUR	Z	206FEM_R	Load Cell, Femur	Denton	2121A	Newtons
59	LAP BELT	NA	BL113	Lap Belt Load Cell	FGP	FN4060	Newtons
60	SHOULDER BELT	NA	POT02	Shoulder Belt Spoolout Pot	Celesco	PTX101-0030	MM

FMVSS 301R
Instrumentation Data Channel Assignments
Vehicle
8/5/05
2005 Suzuki Reno 4-Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
61	DRIVER SEAT BACK LEFT	Y	MHD031	Angular Velocity Sensor	ATA	ARS-06	DEG/SEC
62	DRIVER SEAT BACK RIGHT	Y	MHD030	Angular Velocity Sensor	ATA	ARS-06	DEG/SEC
63	LEFT FRONT SILL	Y	MHD036	Angular Velocity Sensor	ATA	ARS-06	DEG/SEC
64	RIGHT FRONT SILL	Y	MHD027	Angular Velocity Sensor	ATA	ARS-06	DEG/SEC
65	LEFT FRONT X-MEMBER	X	KEVA003	Accelerometer	ICS	3031-500	G's
66	LEFT FRONT X-MEMBER	X	KEVA013	Accelerometer	ICS	3031-500	G's
67	RIGHT REAR X-MEMBER	X	KEVA004	Accelerometer	ICS	3031-500	G's
68	RIGHT REAR X-MEMBER	X	KEVA001	Accelerometer	ICS	3031-500	G's

APPENDIX D

DUMMY CALIBRATION DATA

Test Program: Hybrid III 50th Percentile Male Head Drop Test

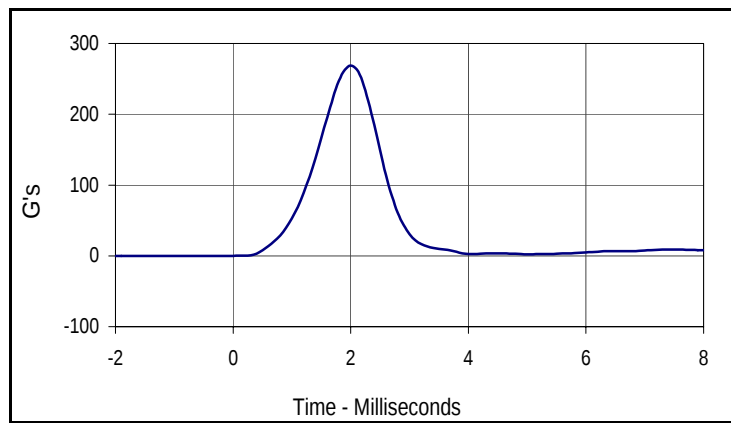
Test Date: 7/27/05

ATD Serial No.: 034

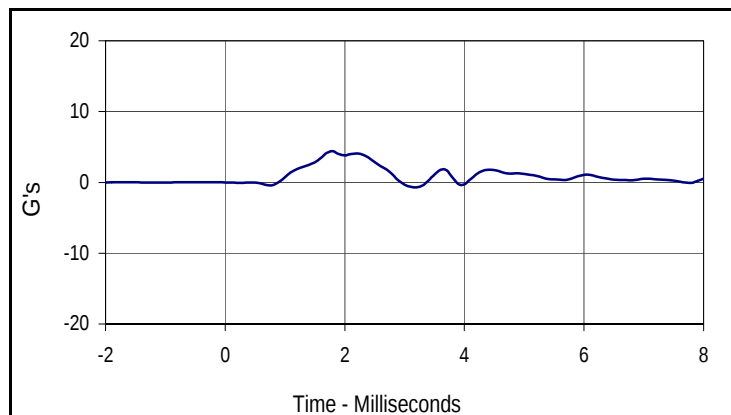
Test I.D.: HD07A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	268.9	Pass
Peak Lateral Acceleration	G's	≤15.0	4.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
268.9	2.0	0.0	-0.1



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.4	1.8	-0.7	3.2

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

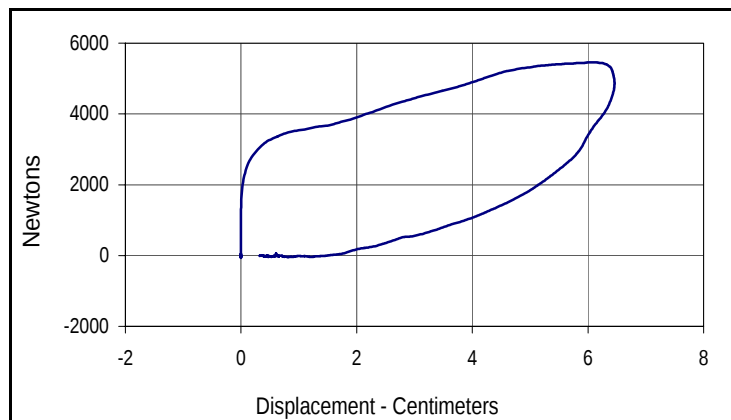
Test Date: 7/29/05

ATD Serial No.: 034

Test I.D.: CH07A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.75	Pass
Peak Probe Force	Newtons	5159 to 5893	5459	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.46	Pass
Internal Hysteresis	%	69 to 85	75.9	Pass
Overall Test Results				Pass



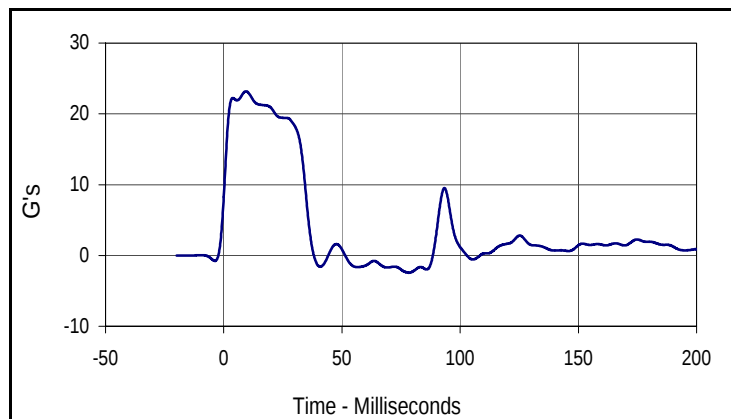
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.9
Peak Probe Force		Peak Chest Deflection	
5459		6.46	

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 034

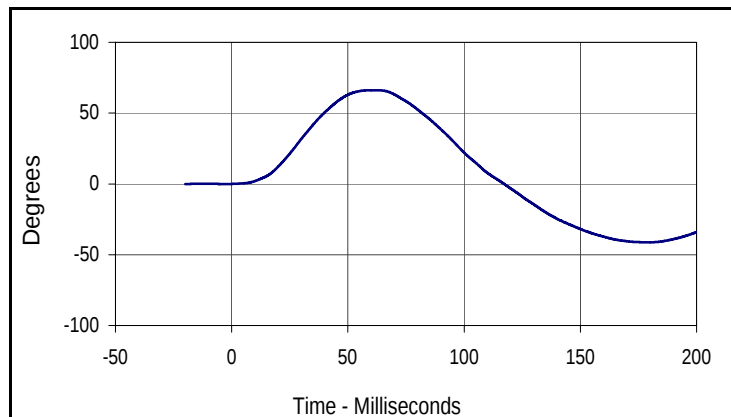
Test Date: 7/28/05
 Test I.D.: NF07A



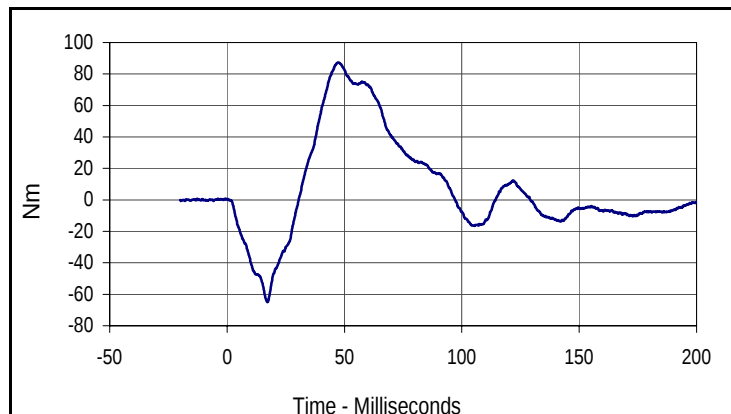
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.94	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.1	Pass
	20 Msec.	G's	17.6 to 22.6	20.8	Pass
	30 Msec.	G's	12.5 to 18.5	18.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	66.2	Pass
	Time	Msec.	57.0 to 64.0	61.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	117.2	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	87.3	Pass
	Time	Msec.	47.0 to 58.0	47.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.2	9.4	-2.4	78.2



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
66.2	61.2	-41.2	180.1



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
87.3	47.4	-65.0	17.2

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

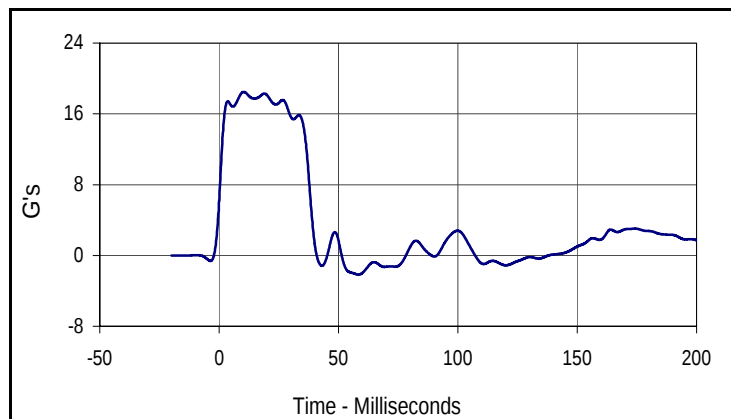
Test Date: 9/21/05

ATD Serial No.: 034

Test I.D.: NE09A



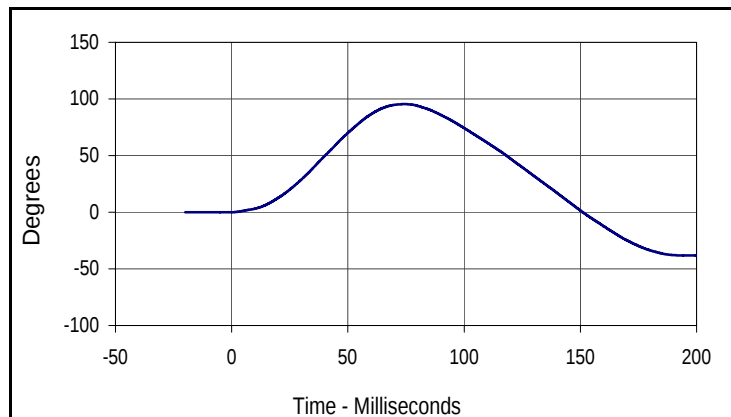
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.00	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.5	Pass
	20 Msec.	G's	14.0 to 19.0	18.1	Pass
	30 Msec.	G's	11.0 to 16.0	15.7	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	38.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	95.4	Pass
	Time	Msec.	72.0 to 82.0	74.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	151	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-79.3	Pass
	Time	Msec.	65.0 to 79.0	65.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	137.5	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

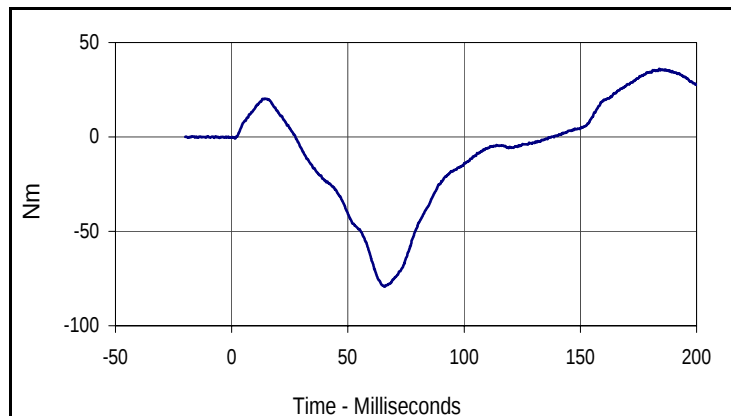
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.5	10.3	-2.2	58.4



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
95.4	74.4	-38.2	196.2



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
36.1	183.9	-79.3	65.9

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 7/27/05

ATD Serial No.: 034

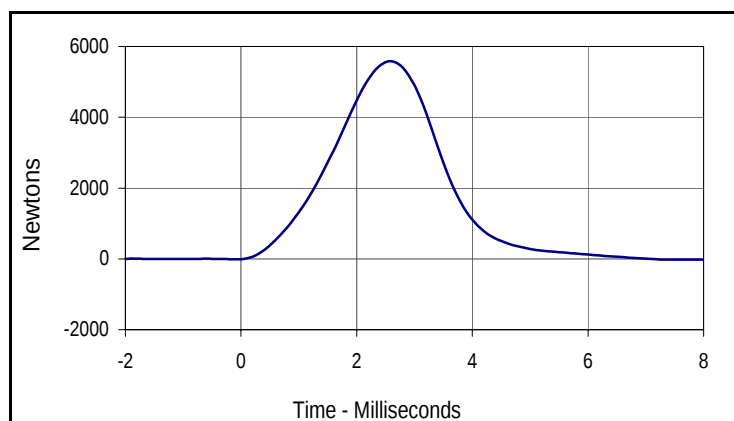
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**Left Knee**

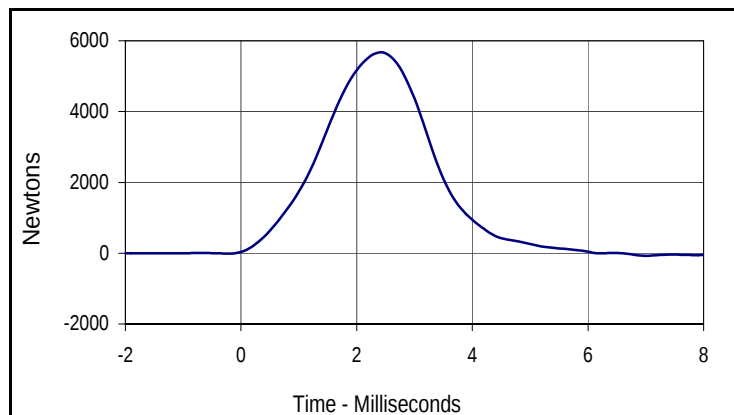
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5582	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5671	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5582.1	2.6	-24.8	7.8

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5671.0	2.4	-72.7	7.0

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 7/29/05

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	139	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	148	Pass
G - Elbow back to wrist pivot	mm	290 to 305	295	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	341	Pass
J - Elbow rest height	mm	190 to 211	201	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	489	Pass
N - Buttock popliteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	255	Pass
V - Shoulder breadth	mm	422 to 437	425	Pass
W - Foot breadth	mm	91 to 107	103	Pass
Y - Chest circumference	mm	970 to 1001	998	Pass
Z - Waist circumference	mm	836 to 866	860	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass

Test Program: Hybrid III 50th Percentile Male Head Drop Test

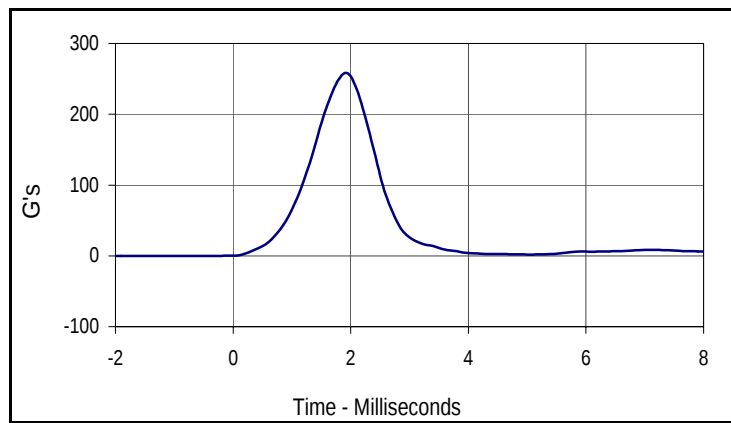
Test Date: 7/27/05

ATD Serial No.: 035

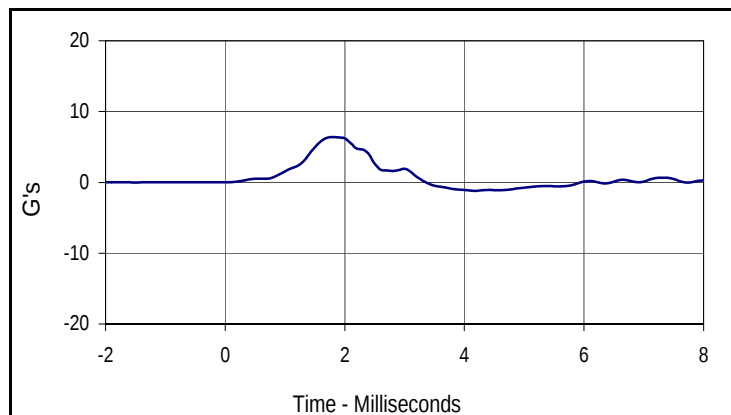
Test I.D.: HD07B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	258.3	Pass
Peak Lateral Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
258.3	1.9	0.0	-0.6



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.4	1.8	-1.2	4.2

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

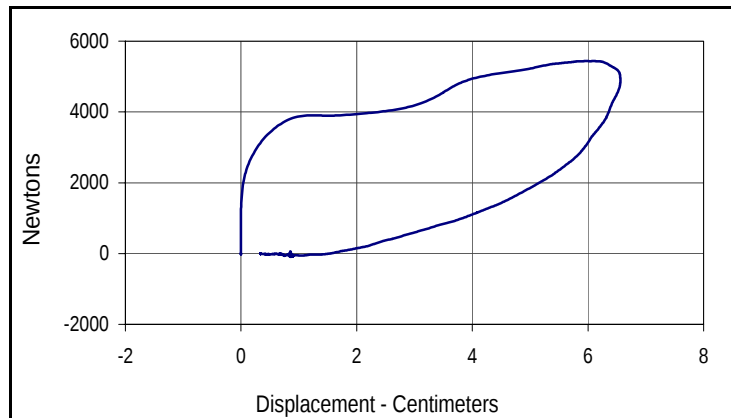
Test Date: 7/29/05

ATD Serial No.: 035

Test I.D.: CH07B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.67	Pass
Peak Probe Force	Newtons	5159 to 5893	5438	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.56	Pass
Internal Hysteresis	%	69 to 85	75.2	Pass
Overall Test Results				Pass



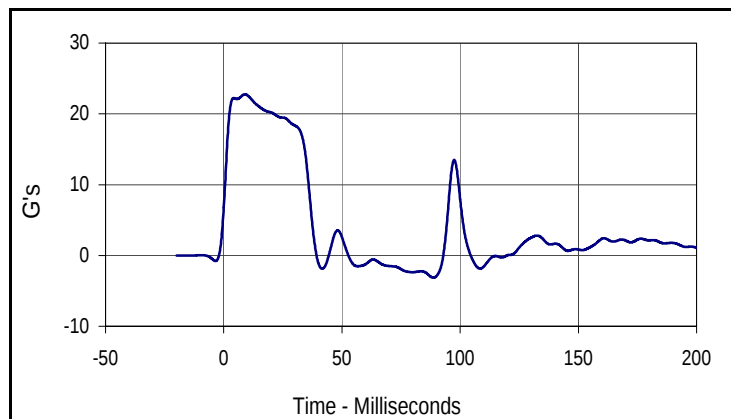
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.2
Peak Probe Force		Peak Chest Deflection	
5438		6.56	

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 035

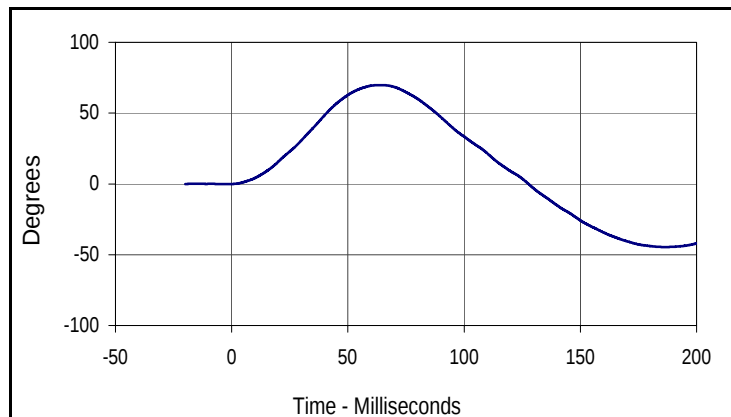
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 Test I.D.: NF07B



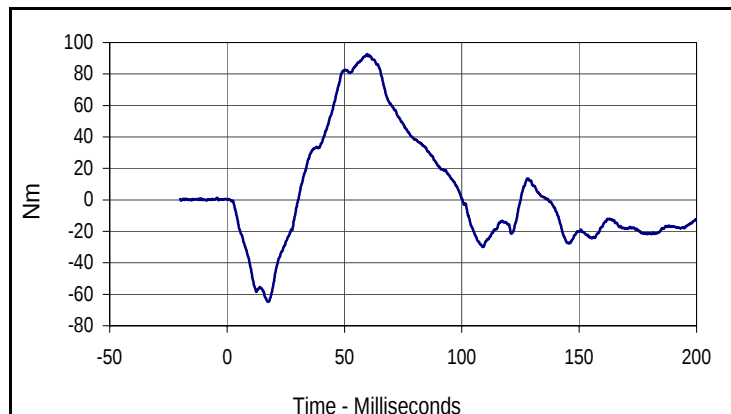
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.6	Pass
	20 Msec.	G's	17.6 to 22.6	20.2	Pass
	30 Msec.	G's	12.5 to 18.5	18.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	37.3	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	69.8	Pass
	Time	Msec.	57.0 to 64.0	64.0	Fail
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	127.7	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	92.7	Pass
	Time	Msec.	47.0 to 58.0	59.6	Fail
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	100.3	Pass
			Overall Test Results		Fail



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
22.8	8.9	-3.1	88.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
69.8	64.0	-44.6	186.6



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
92.7	59.6	-64.7	17.6

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

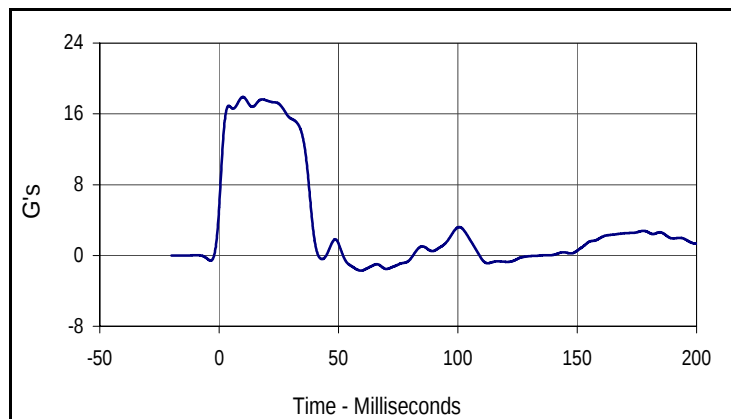
Test Date: 7/28/05

ATD Serial No.: 035

Test I.D.: NE07B



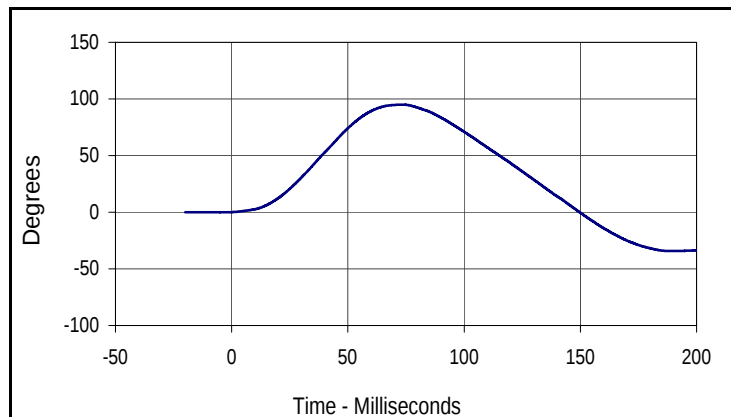
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.07	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.9	Pass
	20 Msec.	G's	14.0 to 19.0	17.5	Pass
	30 Msec.	G's	11.0 to 16.0	15.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	38.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	95.0	Pass
	Time	Msec.	72.0 to 82.0	73.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.7	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-71.6	Pass
	Time	Msec.	65.0 to 79.0	65.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	133.1	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Deceleration

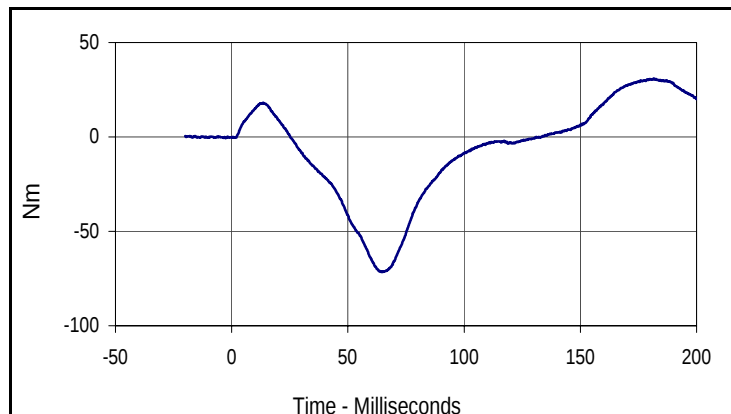
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.9	10.0	-1.7	59.3



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
95.0	73.5	-34.2	189.0



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
31.0	181.6	-71.6	65.0

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 7/27/05

ATD Serial No.: 034

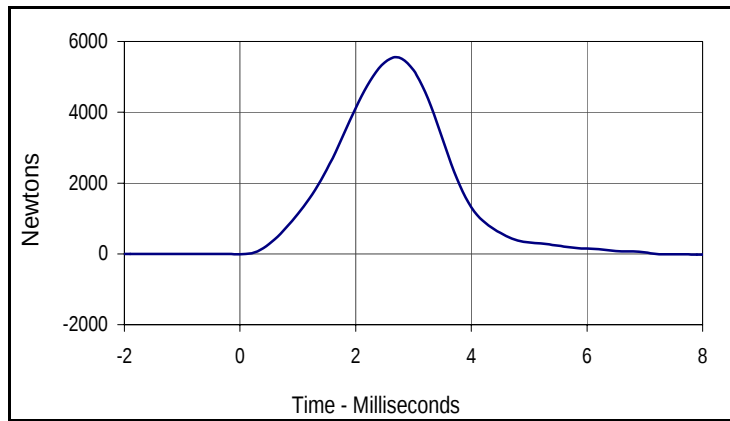
Test I.D.: LK07B , RK07B

**Left Knee**

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5553	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5538	Pass
Overall Test Results				Pass

**Curve Description****Left Knee Probe Force**

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5553.5	2.7	-28.9	9.7

**Curve Description****Right Knee Probe Force**

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5538.5	2.4	-58.0	6.9

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 7/29/05

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	882	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	139	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	205	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	435	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	465	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	995	Pass
Z - Waist circumference	mm	836 to 866	850	Pass
AA - Location for chest circumference	mm	429 to 434	432	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass