

REPORT NUMBER TR-P24003-02-NC

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**TOYOTA MOTOR CORPORATION
2004 LEXUS ES 330
4 DOOR SEDAN**

NHTSA NUMBER: M45111

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1/27/04

FINAL REPORT

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16. Abstract A 55/28 km/h 90 deg. Moving Deformable Barrier Side Impact NCAP Test was conducted on the subject 2004 Lexus ES 330 4 Door Sedan in accordance with the specifications of the Office of Crash Worthiness Standards Test Procedures for the generation of consumer information on vehicle side crash protection. The test was conducted at KARCO Engineering,LLC laboratories in Adelanto, California, on January 27, 2004. The impact velocity of the Moving Deformable Barrier was 61.56 km/h, and the outside ambient temperature at the struck (driver's) side of the vehicle was 15.6 deg. C. The target vehicle's maximum post test static crush was 347 mm located at level 2. The test vehicle's occupant performance data is as follows:					
Measurement Description		Driver SID/HIII	Pass. SID/HIII		
Left Upper Rib (LUR) G's		50.5	58.3		
Left Lower Rib (LLR) G's		40.9	59.8		
Lower Spine (T ₁₂) G's		43.2	64.3		
Thoracic Trauma Index (TTI) G's		47.0	62.0		
Pelvis (PEV) G's		83.0	74.0		
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SECTION 1

PURPOSE and TEST PROCEDURE

1.1 PURPOSE

This Side Impact NCAP test is conducted as part of the FY' 2004 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract No. DTNH22-03-D-32005. The purpose of this test is to generate comparative side impact data on a 2004 Lexus ES 330 4 Door Sedan manufactured by Toyota Motor Corporation.

1.2 TEST PROCEDURE

The side impact test was conducted in accordance with the current National Highway Traffic Safety Administration (NHTSA), Office of Crashworthiness Standards (OCS), laboratory test procedure NCAP Side Impact Testing, dated November 2002 and the corresponding KARCO Engineering Test Procedure KTP-214D, dated November 18, 1998. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

SECTION 2
SUMMARY OF SIDE IMPACT TEST

2.1 SUMMARY OF SIDE IMPACT NCAP TEST

A model year 2004 Lexus ES 330 4 Door Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.56 km/h. The specified impact velocity range is from 61.1 to 62.7 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 1801kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering, LLC in Adelanto, California, on January 27, 2004.

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front Driver		Left Rear (Passenger)	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	Not Deployed	No	N/A
Side Torso Airbag	Yes	Deployed	No	N/A
Head Airbag	No	N/A	No	N/A
Curtain Airbag	Yes	Deployed	Yes	Deployed

One (1) real-time motion picture camera and 11 (Eleven) high-speed motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information is documented in the data sheets. Pre- and post-test photographs of the vehicle and SID/HIIIs can be found in Appendix A. Two 50th percentile adult male Side Impact Dummies, Hybrid III (SID/HIIIs) were placed in the driver's and left rear passenger designated seating positions according to the test procedure. Each SID/HIII is instrumented with contact switches on the pelvis, thorax and six-axis neck load cells, and fourteen accelerometers in the following locations:

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

The test vehicle was instrumented with twenty-five (25) structural accelerometers and the MDB was instrumented with five (5) accelerometers and two (2) contact switches on the right bumper to compare left side to right side bumper impact timing. All data channels were recorded with the fully self contained on-board Data Acquisition System (DAS). The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

SECTION 2.....(CONTINUED)

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 347 mm at level 2, 1200mm rearward of the left vertical impact point. The driver SID/Hybrid III, Serial No. 275 and the passenger SID/Hybrid III, Serial No. 274 were calibrated just prior to this test. The SID/Hybrid III injury criteria is summarized as follows:

Measurement	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	47.0	62.0
Peak Pelvic G's (PEV)	G's	83.0	74.0

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

SECTION 3

OCCUPANT AND VEHICLE INFORMATION SHEETS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

CONVERSION FACTORS USED IN THIS REPORT*

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

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M45111	Anti-Lock Brakes	Yes
Make	Lexus	All Wheel Drive	No
Model	ES 330	Power Steering	Yes
Body Style	4 Door Sedan	Driver Front Airbag	Yes
Vin No.	JTHBA30G945021750	Driver Side Torso Airbag	Yes
Color	Tan	Driver Side Head Airbag	No
Delivery Date	1/20/2004	Driver Curtain Airbag	Yes
Odometer	66.0	Rear Pass. Airbag	No
Dealer	Crown Lexus	Rear Pass. Side Airbag	No
Transmission	5 Speed Automatic	Rear Pass. Head Airbag	No
Final Drive	Front	Rear Pass. Curtain Airbag	Yes
Type/No. Cyl.	V-6	Pre-Tensioners	Yes
Engine Disp. (L)	3.3	Load Limiters	Yes
Engine Placement	Transverse	Bucket Seats	Yes
Roof Rack	No	Air Cond.	Yes
Sunroof/T-Top	Yes	AM/Fm Cassette	Yes
Tinted Glass	Yes	Tilt Steering	Yes
Traction Control	No	Power Door Locks	Yes
Power Brakes	Yes	Power Windows	Yes
Front Disc	Yes	Power Seats	Yes
Rear Disc	Yes	Other	None

Does Owners Manual provide instructions for turning off automatic door locks.

Yes

Doors Locked _____ Doors Unlocked Yes _____

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Corporation	GVWR (kg)	2034
Date of Manufacture	12/03	GAWR Front (kg)	1211
		GAWR Rear (kg)	1211

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	None	
Number of Occupants	2	3	N/A	5
Capacity Weight (VCW) (kg)				408
Cargo Weight (RCLW) (kg)				68

DATA SHEET NO. 1.....(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

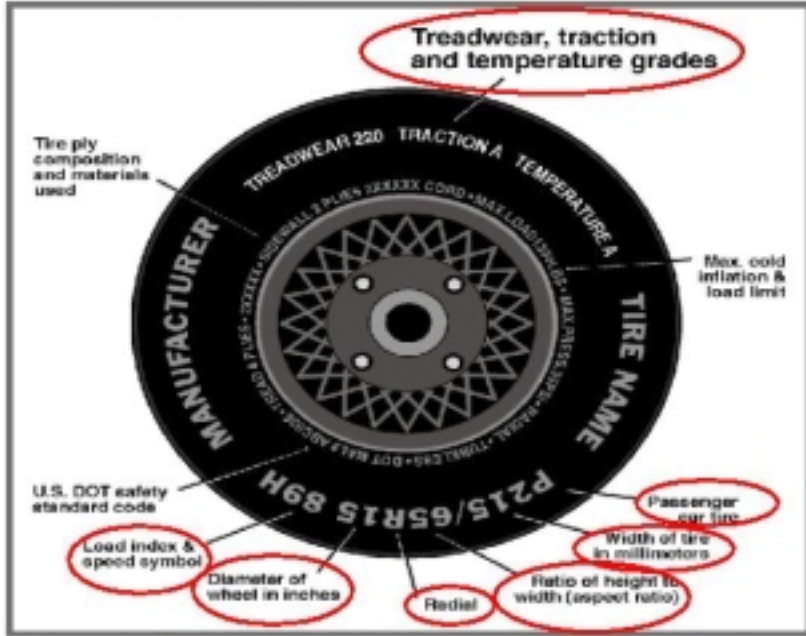
Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

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



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpg)	357	357
Cold Pressure (kpg)	200	200
Recommended Tire Size	P215/60R16	P215/60R16
Tire Size on Vehicle	P215/60R16	P215/60R16
Tire Manufacturer	Bridgestone	Michelin
Treadwear	140	140
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	2	2
Load Index/Speed Symbol	94 Y	94 Y
Tire Material	Polyester/Steel	Polyester/Steel
DOT Safety Code Right	ELF1JNB4903	ELF1JNB4903
DOT Safety Code Left	ELF1JNB4903	ELF1JNB4903

DATA SHEET NO. 1.....(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	488	316		540	390	
Right	kg	476	298		516	355	
Ratio	%	61.1	38.9		58.6	41.4	
Totals	kg	964	614	1578	1056	745	1801

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1578
Weight of 2 P572 ATD's	kg	161
Rated Cargo/Luggage Wt. (RCLW)	kg	69
Calculated Vehicle Target Wt. (TVTWTW)	kg	1808

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	708	705	703	711	1055
As Tested	mm	695	699	683	686	1122
Fully Loaded	mm	693	698	669	681	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2713
Total Vehicle Length at Left Side	mm	3116
Total Vehicle Length at Centerline	mm	4858
Total Vehicle Length at Right Side	mm	3116
Weight of Ballast In Cargo Area	kg	43
Amount of Stoddard Solvent in Fuel Tank	Liters	65.1
1/3 of Usable Capacity	Liters	23.3

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2713
Target Impact Point Aft of Front Axle	mm	417
Actual Impact Point Aft of Front Axle	mm	406

DATA SHEET NO. 1.....(continued)

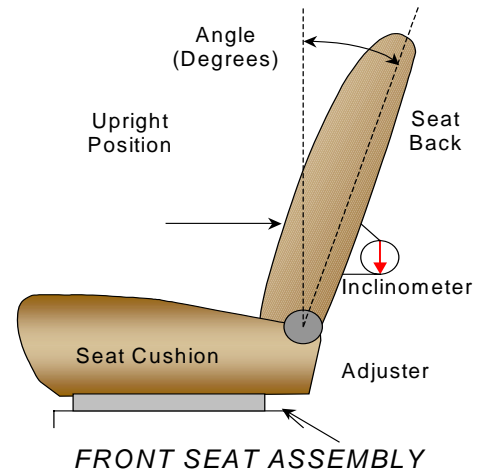
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturers designated angle. The procedure is as follows: A special application tool with pointed probes is inserted through the fabric to make contact with the rigid portion of the lower seat frame assembly, approximately 13 inches above the pivot point of the seat back. An inclinometer is placed against the flat surface of the tool and the seat back angle is measured directly from the dial face.



SEAT BACK ANGLES

	Deg.
Driver Seat Back Angle	3.0
Rear Seat Back Angle	3.0

SEAT FORE/AFT POSITIONS

The Drivers seat is adjustable. The fore/aft position is set to the middle.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	238mm	119mm
Rear Seat	238mm	119mm

SEAT BELT UPPER ANCHORAGE

Position number one (1) is the uppermost position.

SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	5	3
Rear Seat	5	3

DATA SHEET NO. 1.....(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

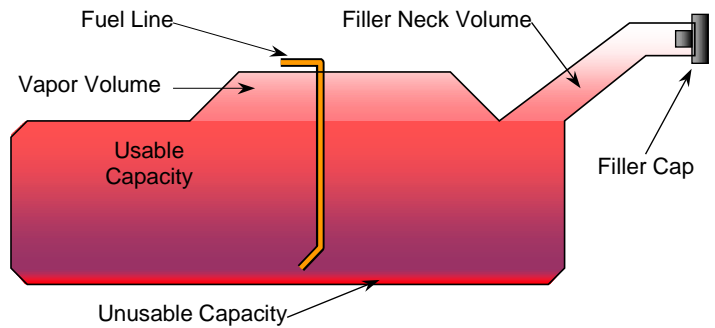
Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	70.0
Usable Capacity of "Optional" Tank	N/A
Usable Capacity used for FMVSS 301	64.4 to 65.8
Actual Amount of Solvent used	65.1
1/3 of Usable Capacity	31.0

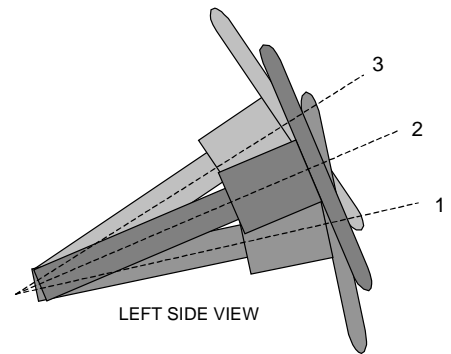
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately three (3) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Degrees
Lowermost position No. 1	17.3
Geometric center position No. 2	25.2
Uppermost position No. 3	33.1

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UWW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	488	316		540	390	
Right	kg	476	298		516	355	
Ratio	%	61.1	38.9		58.6	41.4	
Totals	kg	964	614	1578	1056	745	1801

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	67	222
Level 2	Occupant H-Point	mm	347	516
Level 3	Mid Door	mm	302	593
Level 4	Window Sill	mm	231	904
Level 5	Window top	mm	72	1376
N/A	Maximum Penetration	mm	347	

INSTRUMENTATION

Driver SID/Hybrid III Accelerometers	20
Passenger SID/Hybrid III Accelerometers	20
Vehicle Structure Accelerometers	25
MDB Accelerometers	5
Total	70

CAMERA COVERAGE

High Speed, Vehicle On-Board	3
High Speed, Off-Board	5
High Speed, MDB On-Board	2
Real Time, Panning	1
Total	11

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

MDB SPECIFICATIONS (mm)

Measurement Description	Length
Overall Width of Framework Carriage	1252
Overall Length including Honeycomb Face	4115
Wheel Base of Framework Carriage	2590
C.G. location aft of Front Axle	1127

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	384	308	
Right	kg	385	284	
Ratio	%	56.5	43.5	
Totals	kg	769	592	1361

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.56
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.58
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE (mm)

Vertical Location			From Centerline		Max. Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	302	Right	241
B	Top of Bumper	533	177	Right	138
C	Mid Level	686	180	Right	146
D	Top of Stack	813	212	Left	156

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	11

DATA SHEET NO. 4

POST TEST OBSERVATIONS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	P572F, SID / No. 275	P572F, SID / No. 274
Head Contact	Curtain Airbag	C-Pillar/Curtain Airbag
Upper Torso Contact	Airbag/Door panel	Door Panel
Lower Torso Contact	Airbag/Door panel	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Remained closed/latched, inoperable	Remained closed/latched, inoperable
Right Side Door Opening	Remained closed/latched, operable	Remained closed/latched, operable
Seat Movement	None	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Pillars pushed inward with no apparent failure
Sill Separation	No apparent visible failures
Windshield Damage	Glazing cracks on struck side only
Window Damage	Both struck windows broke
Other Notable Effects	No other significant items to note

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 01		Left Rear (Passenger) Occupant Location 04	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	Not Deployed	No	N/A
Side Airbag	Yes	Deployed	No	N/A
Head Airbag	No	N/A	No	N/A
Curtain Airbag	Yes	Deployed	Yes	Deployed
Seat Belt Pretensioner	Yes	N/A	No	N/A
Seat Belt Load Limiter	Yes	N/A	No	N/A

MDB LEFT EDGE IMPACT POINT DATA

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

DATA SHEET NO. 5
SID/HIII INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 1/27/04

THORAX AND PELVIS PEAK ACCELERATIONS, PRIMARY (FIR 100 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Upper Rib (LUR)	Y	G's	50.5	38.1	-6.2	91.3	58.3	45.0	-10.3	107.5
Lower Rib (LLR)	Y	G's	40.9	39.4	-7.2	92.5	59.8	45.0	-13.5	107.5
Lower Spine (T ₁₂)	Y	G's	43.2	23.8	-6.6	99.4	64.3	48.1	-12.1	73.1
Pelvis (PEV)	Y	G's	82.5	25.0	-13.6	53.8	74.0	40.6	-4.1	106.9

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

Location	Driver				Passenger			
	LUR	T ₁₂	TTI(g)	PEV(g)	LLR	T ₁₂	TTI(g)	PEV(g)
Primary Rib, Spine, and Pelvis	50.487	43.152	47	83	59.829	64.254	62	74

THORAX AND PELVIS PEAK ACCELERATIONS, REDUNDANT (FIR 100 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Upper Rib (LUR)	Y	G's	50.3	38.8	-6.3	91.3	58.8	45.0	-8.8	107.5
Lower Rib (LLR)	Y	G's	41.2	40.0	-7.4	92.5	60.4	45.0	-12.3	107.5
Lower Spine (T ₁₂)	Y	G's	43.7	23.8	-6.4	100.0	63.8	48.1	-12.0	73.1
Pelvis (PEV)	Y	G's	81.1	25.0	-13.0	53.8	74.4	40.6	-4.1	106.9

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

Location	Driver				Passenger			
	LUR	T ₁₂	TTI(g)	PEV(g)	LLR	T ₁₂	TTI(g)	PEV(g)
Redundant Rib, Spine, and Pelvis	50.348	43.694	47	81	60.434	63.805	62	74

Positive Acceleration Polarities:

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

DATA SHEET NO. 5...(continued)
SID/HIII INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 1/27/04

HEAD PRIMARY PEAK ACCELERATIONS (SAE CLASS 1000 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	7.7	155.4	-28.9	55.4	3.4	176.2	-9.0	55.5
Head CG	Y	G's	26.7	29.1	-5.4	167.0	46.7	42.5	-9.7	18.9
Head CG	Z	G's	53.7	54.6	-3.2	36.3	20.9	43.6	-38.3	60.0
Head CG Resultant	N/A	G's	59.7	54.6			49.7	43.9		

HEAD PRIMARY INJURY CRITERIA (SAE CLASS 1000 Filtered)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG	128.2	51.2	87.2	26.3	251.1	39.9	68.1	37.9

HEAD REDUNDANT PEAK ACCELERATIONS (SAE CLASS 1000 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	7.4	155.4	-29.4	55.4	3.4	176.7	-9.0	55.5
Head CG	Y	G's	26.1	29.2	-5.2	166.8	47.1	42.5	-8.6	200.0
Head CG	Z	G's	54.2	54.6	-3.1	35.6	21.0	43.6	-38.3	60.1
Head CG Resultant	N/A	G's	60.3	54.6			49.9	43.9		

HEAD REDUNDANT INJURY CRITERIA (SAE CLASS 1000 Filtered)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG	132.1	50.0	86.0	26.6	253.8	39.8	68.1	38.1

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	413.2	43.0	-873.1	59.8	595.1	61.2	-41.0	120.6
Neck Force	Y	Newtons	454.1	70.6	-163.4	25.2	141.8	141.9	-817.3	56.1
Neck Force	Z	Newtons	1591.4	54.6	-1439.8	40.2	449.3	43.7	-1628.3	60.3
Neck Force Resultant	N/A	Newtons	1741.4	54.7			1906.9	60.3		
Neck Moment	X	N•m	39.1	59.5	-50.8	41.5	16.9	134.5	-52.6	60.9
Neck Moment	Y	N•m	23.3	79.1	-69.1	59.8	18.5	91.3	-21.5	64.1
Neck Moment	Z	N•m	27.6	75.3	-20.0	178.3	8.3	102.1	-18.0	200.0
Neck Moment Resultant	N/A	N•m	80.8	59.8			55.5	61.3		

DATA SHEET NO. 6

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

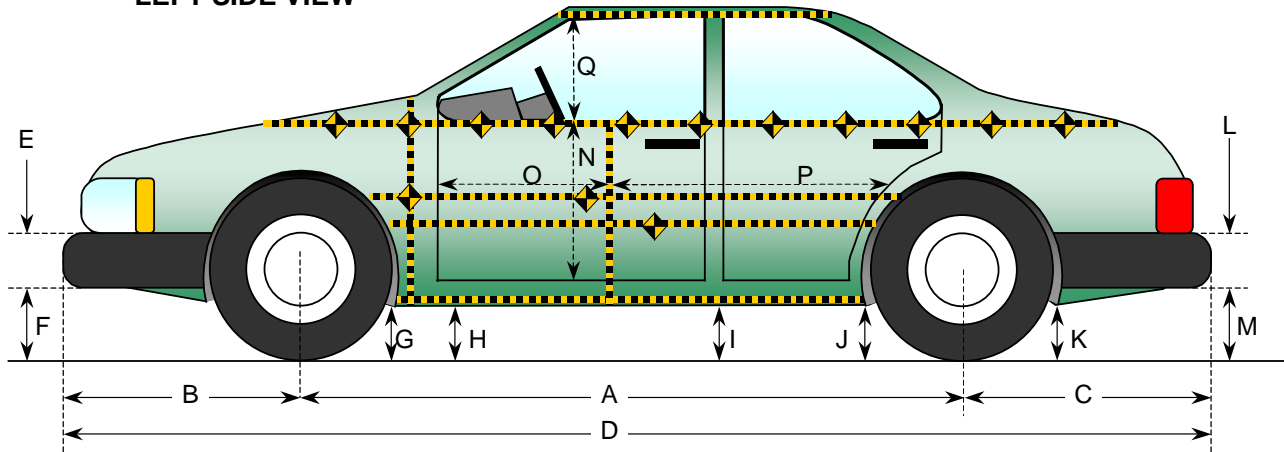
Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

LEFT SIDE VIEW



VEHICLE PRE AND POST TEST MEASUREMENT INFORMATION

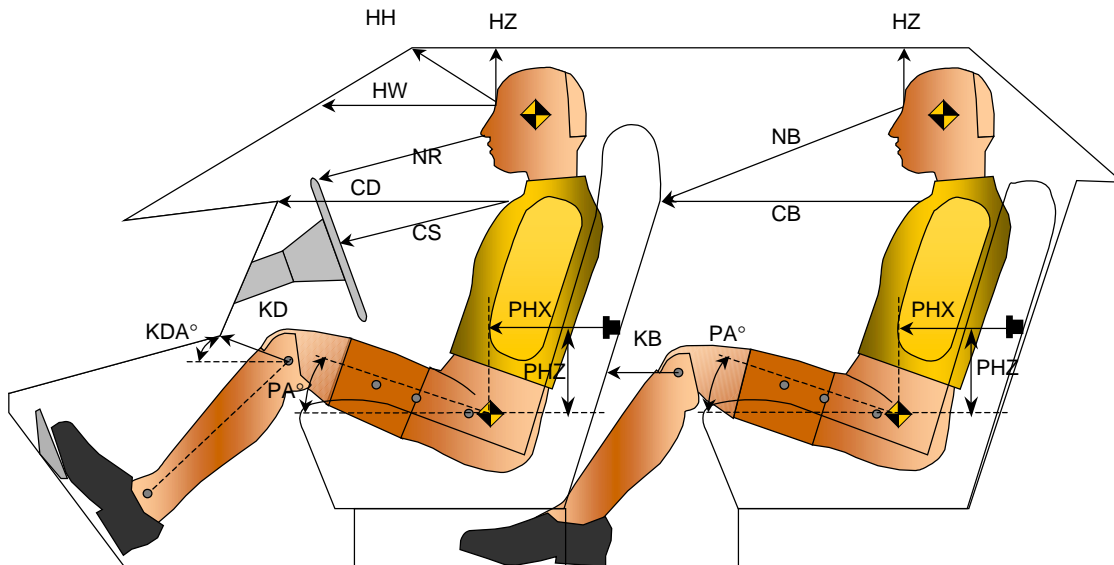
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2713	2700	-13
B	Front Axle to FSOV	1003	1000	-3
C	Rear Axle to RSOV	1142	1142	0
D	Total Length at Centerline	4858	4850	-8
E	Front Bumper Thickness	412	412	0
F	Front Bumper Bottom to Ground	213	226	13
G	Sill Height at Front Wheel Well	166	196	30
H	Sill Height at Front Door Leading Edge	167	199	32
I	Sill Height at "B" Pillar	188	246	58
J1	Sill Height at Rear Wheel Well	196	226	30
J2	Pinch Weld Height at Rear Wheel Well	188	246	58
K	Sill Height aft of Rear Wheel Well	228	278	50
L	Rear Bumper Thickness	350	350	0
M	Rear Bumper Bottom to Ground	286	363	77
N	Sill Height to Window Bottom Sill	705	595	-110
O	Front Door Leading Edge to Impact CL	837	770	-67
P	Rear Door Trailing Edge to Impact CL	1387	1340	-47
Q	Front Window Opening	395	400	5
R	Right Side Length	3116	3116	0
S	Left Side Length	3116	3116	0
T	Vehicle Width at "B" Post	1795	1600	-195

DATA SHEET NO. 7

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04



LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle	Length(mm)	Angle
HH		Head to Header	380	15		
HW		Head to Windshield	665			
HZ	HZ	Head to Roof	160		140	90
NR	NB	Nose to Rim/Seatback	468	16	630	24
CD	CB	Chest to Dash or Seatback	525	6	550	64
CS		Chest to Steering Wheel	290			
KDL	KBL	Left Knee to Dash or Seatback	172	9	245	0
KDR	KBR	Right Knee to Dash or Seatback	170		248	
PA	PA	Pelvic Angle		23		25
PHX	PHX	H-Point to Striker (X-Axis)	328	45	493	43
PHZ	PHZ	H-Point to Striker (Z-Axis)	226		338	

DATA SHEET NO. 8

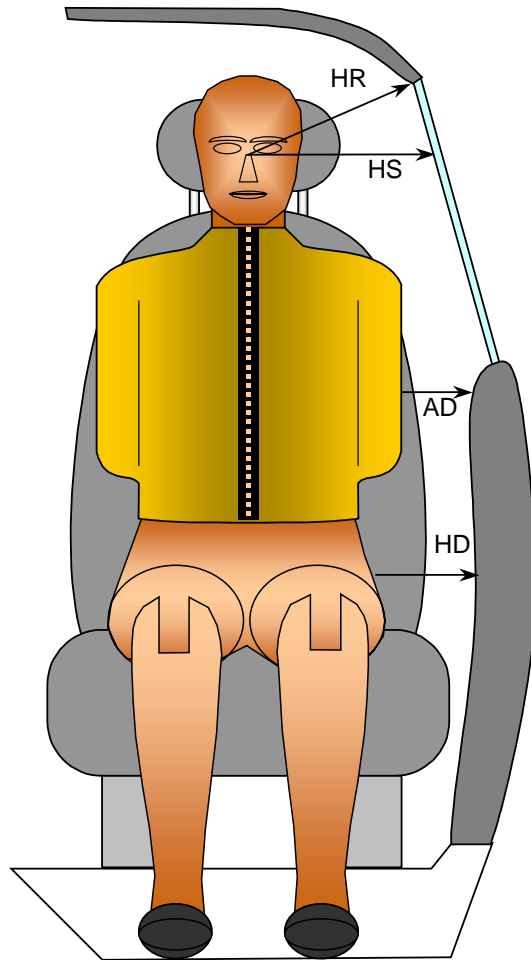
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04



FRONT VIEW OF DUMMY

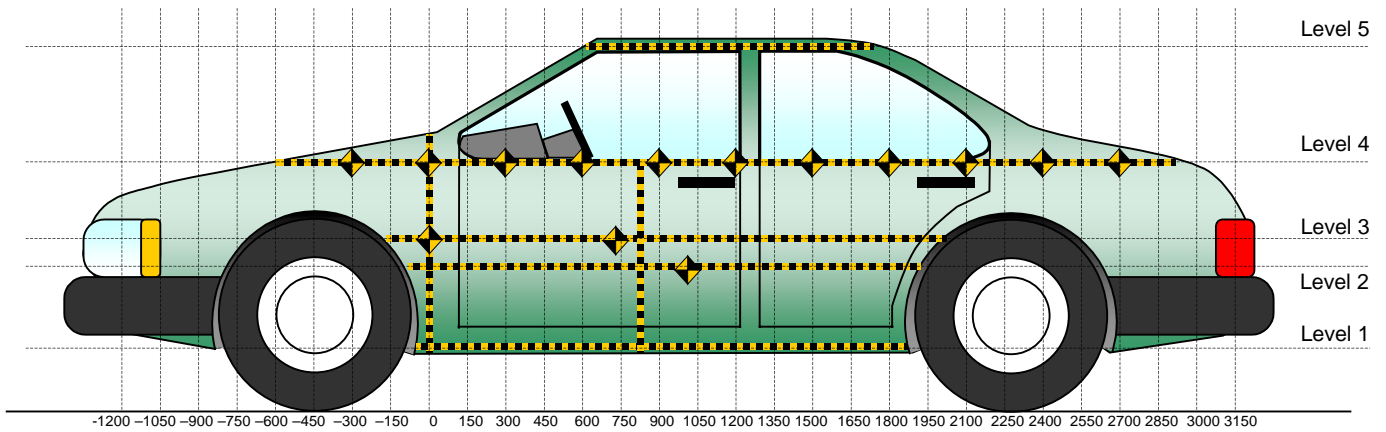
LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	242	267
HS	Head to Side Window	mm	325	335
AD	Arm to Door	mm	98	95
HD	H-Point to Door	mm	145	152

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.
 Measurements taken 900mm right of impact reference.
 All measurements below in mm.

Level	Measurement Description	Height Above Ground
1	Sill Top	222
2	Occupant H-Point	516
3	Mid Door	593
4	Window Sill	904
5	Window Top	1376

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

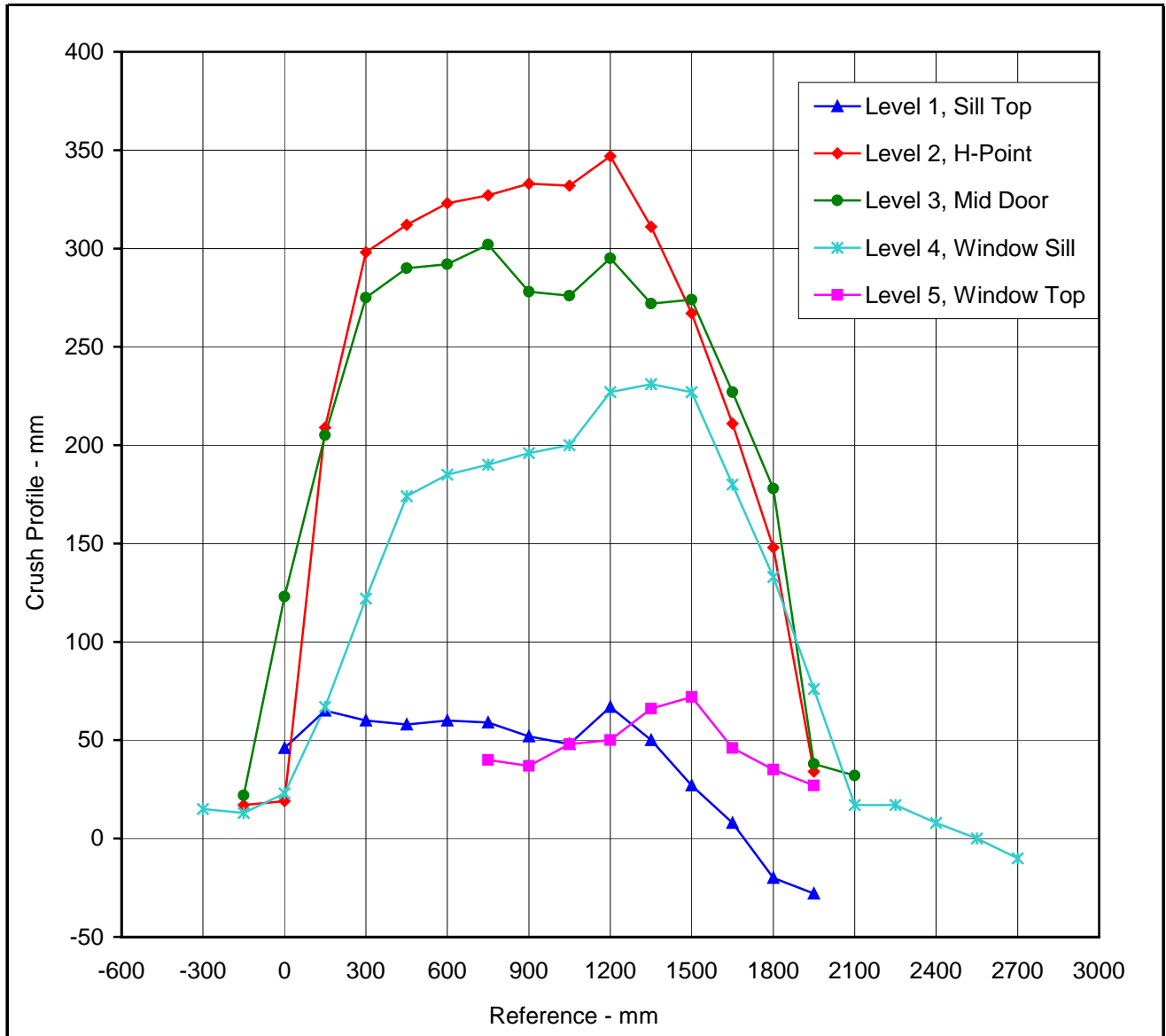
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300				686					701					15	
-150		604	604	678			621	626	691			17	22	13	
0	640	607	604	666		686	626	727	689		46	19	123	23	
150	646	609	606	666		711	818	811	733		65	209	205	67	
300	651	610	606	664		711	908	881	786		60	298	275	122	
450	654	610	606	658		712	922	896	832		58	312	290	174	
600	654	610	606	656		714	933	898	841		60	323	292	185	
750	656	612	608	653	931	715	939	910	843	971	59	327	302	190	40
900	659	613	609	650	919	711	946	887	846	956	52	333	278	196	37
1050	663	614	610	646	914	711	946	886	846	962	48	332	276	200	48
1200	663	616	611	644	916	730	963	906	871	966	67	347	295	227	50
1350	668	619	614	645	911	718	930	886	876	977	50	311	272	231	66
1500	669	621	616	646	914	696	888	890	873	986	27	267	274	227	72
1650	662	620	616	646	918	670	831	843	826	964	8	211	227	180	46
1800	656	616	615	646	923	636	764	793	779	958	-20	148	178	133	35
1950	651	611	608	646	939	623	645	646	722	966	-28	34	38	76	27
2100			608	646				640	663				32	17	
2250				644					661					17	
2400				650					658					8	
2550				661					661					0	
2700				671					661					-10	
2850															
3000															

Measurements are taken from fixed reference 1500mm from vehicle CL.

DATA SHEET NO. 10.....(CONTINUED)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04



	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	67	347	302	231	72
Distance from Impact	mm	1200	1200	750	1350	1500

DATA SHEET NO. 11

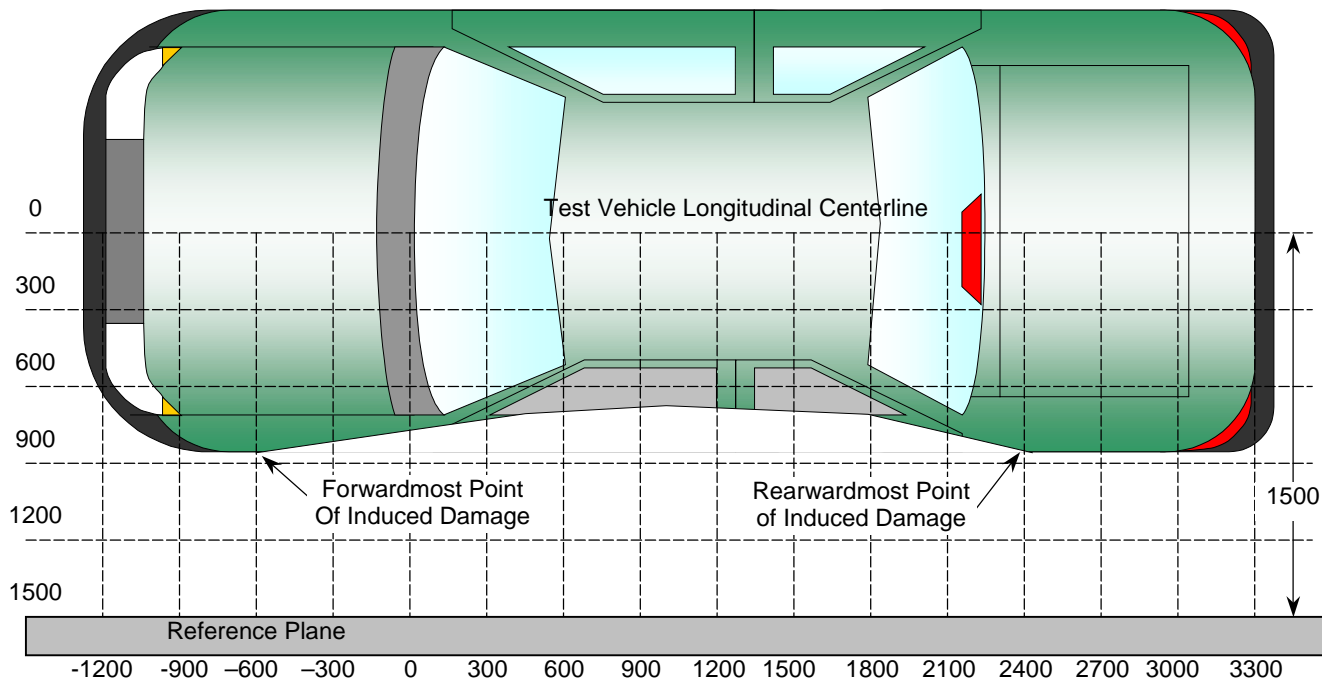
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04



All Dimensions Shown in millimeters

TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	-300	4	686	701	15
2	300	2	610	908	298
3	900	2	613	946	333
4	1500	3	616	890	274
5	2100	3	608	640	32
6	2700	4	674	661	-13

DATA SHEET NO. 12

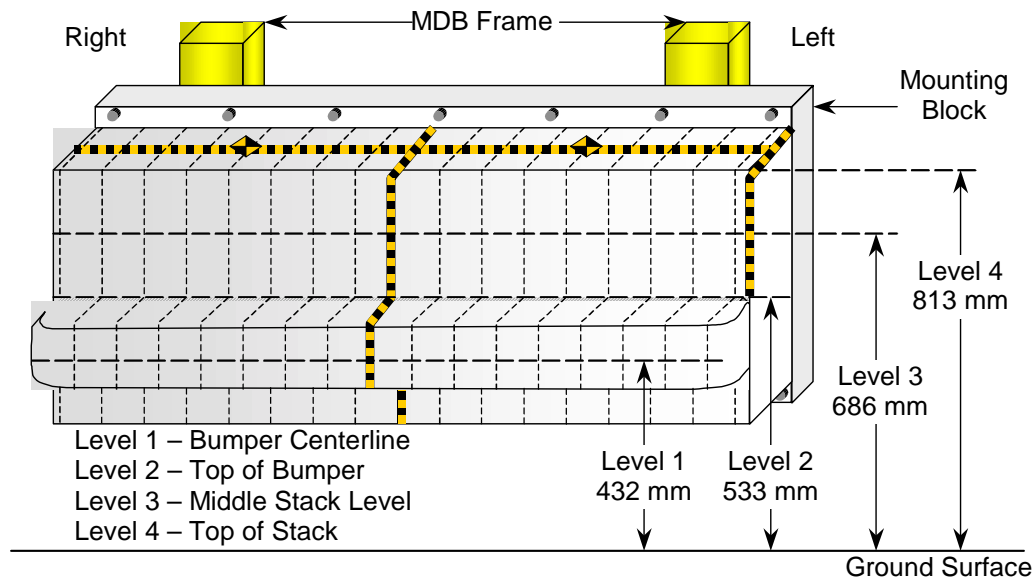
DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	302	264	224	189	169	167	169	170	168	167	167	169	170	174	183	196	236
2	177	161	135	108	104	102	100	98	98	100	102	105	107	111	115	127	138
3	180	122	108	93	86	90	106	99	89	88	87	87	90	95	103	124	174
4	167	122	88	82	82	97	126	127	106	89	87	88	92	102	132	170	212

All Dimensions in mm

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

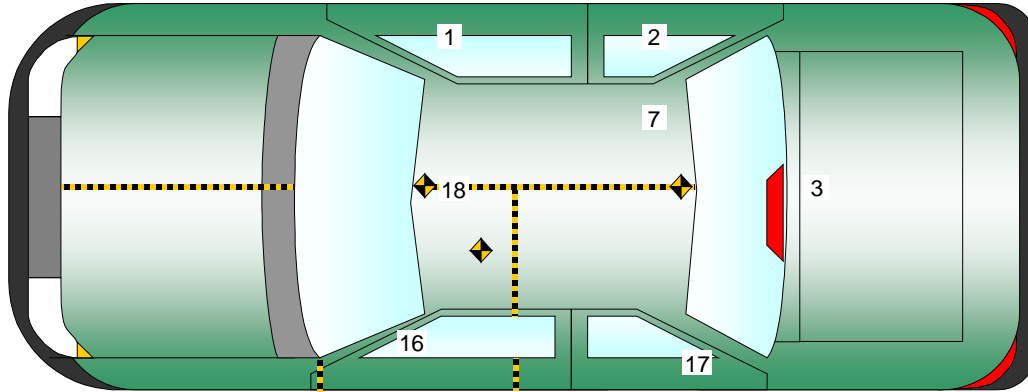
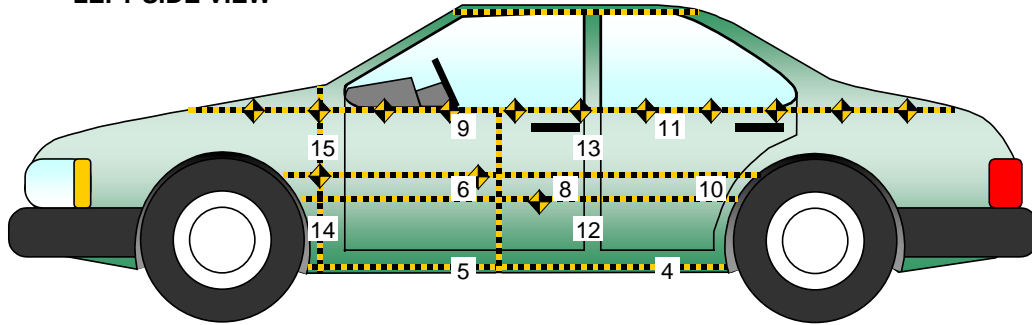
Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

LEFT SIDE VIEW



No.	Location
1	Right Sill at Front Seat
2	Right Sill at Rear Seat
3	Rear Floorpan Above Axle
4	Left Sill at Rear Door
5	Left Sill at Front Door
6	Left Front Door Centerline
7	Right Rear Occupant Compartment
8	Left Front Door Mid-Rear
9	Left Front Door Upper Centerline

No.	Location
10	Left Rear Door Mid-Rear
11	Left Rear Door Upper Centerline
12	Left Lower B-Post
13	Left Middle B-Post
14	Left Lower A-Post
15	Left Middle A-Post
16	Front Seat Track
17	Rear Seat Track or Structure
18	Vehicle CG

DATA SHEET NO. 13.....(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 1/27/04

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	Right Sill at Front Seat	2960	700	350	X	5.0	57.9	-3.9	18.8
					Y	20.9	5.1	-1.9	166.6
					Z	5.5	58.2	-5.6	9.0
					RES	21.3	5.1		
2	Right Sill at Rear Seat	1980	700	350	X	5.7	57.7	-3.8	18.9
					Y	26.6	5.6	-1.6	182.9
					Z	7.2	31.3	-7.0	8.4
					RES	26.7	5.6		
3	Rear Floorpan Above Axle	760	430	480	X	17.9	10.9	-11.7	7.3
					Y	29.0	35.6	-2.8	105.2
					Z	21.2	15.6	-27.1	20.0
					RES	37.4	20.0		
4	Left Sill at Rear Door	1840	-700	220	Y	40.8	3.5	-12.3	6.5
5	Left Sill at Front Door	2500	-700	210	Y	48.4	3.6	-15.2	7.0
6	Front Door Centerline	2730	-795	710	Y	153.8	8.5	-122.0	25.4
7	Rt. Rear Occ. Compartment	2220	370	206	Y	24.8	5.8	-1.8	178.5
8	Front Door Mid-Rear	2330	-795	630	Y	220.4	5.2	-62.2	25.1
9	Front Door Upper Centerline	2750	-795	820	Y	111.7	12.4	-129.9	25.4
10	Rear Door Mid-Rear	1500	-770	700	Y	128.5	15.8	-56.2	22.5
11	Rear Door Upper Centerline	1730	-770	865	Y	0.0	0.0	0.0	0.0
12	B-Post Lower	2090	-750	520	Y	216.6	2.8	-42.8	25.6
13	B-Post Middle	2090	-750	680	Y	148.1	3.4	-37.4	25.1
14	A-Post Lower	3340	-830	500	Y	161.8	3.2	-20.0	17.6
15	A-Post Middle	3340	-830	840	Y	0.0	0.0	0.0	0.0
16	Front Seat Track	2750	-450	280	Y	16.3	11.4	-4.0	67.9
17	Rear Seat Structure				Y				
18	Vehicle CG	3140	190	216	X	3.1	58.3	-7.2	8.7
					Y	21.2	4.6	-1.9	61.1
					Z	7.4	4.6	-5.1	8.1
					RES	22.5	4.6		

1.) Not installed

2.) Channels failed, no data

3.) Channel failed at 55.4 msec.

DATA SHEET NO. 14
MDB ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04

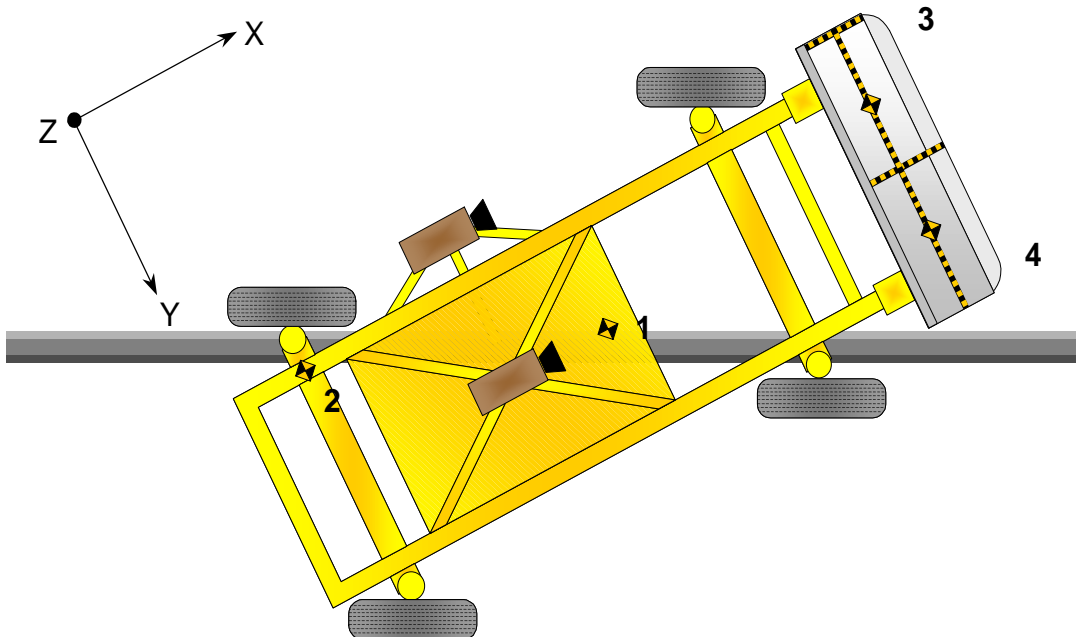
MDB ACCELEROMETER PEAK DATA AND LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	-1195	0	430	X	3.6	153.3	-21.4	35.5
					Y	2.6	103.1	-8.0	29.8
					Z	19.0	114.4	-23.5	127.6
					RES	23.6	127.6		
2	MDB Rear	-2642	-593	608	X	2.5	116.1	-21.4	31.2
					Y	3.2	84.8	-4.4	25.8

Reference Points X - MDB Front Axle Y - MDB Centerline Z - Ground Plane

MDB BUMPER CONTACT SWITCH DATA

Loc. No.	Contact Switch Location	Units	Peak and 50% Crossing Point			
			Max	Time	50%	Time
3	MDB Left Bumper (T=0)	% F.S	100.0	0.0	50.0	0.0
4	MDB Right Bumper	% F.S	104.3	35.8	50.0	0.3



DATA SHEET NO. 15

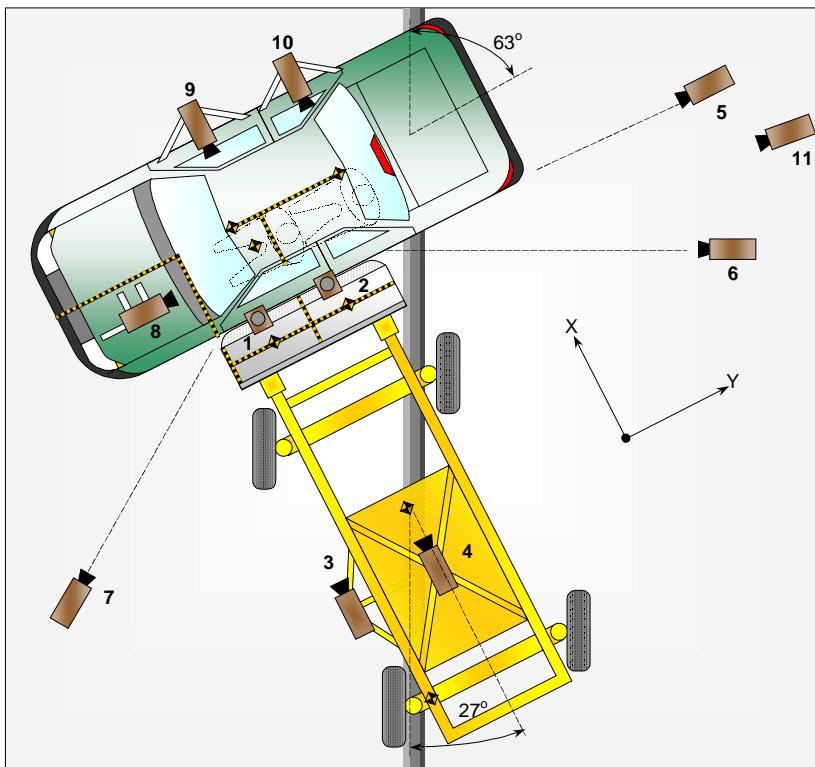
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04



No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Real Time	22860	3658	1727	5	17-70	24
2	Overhead Overall	2438	609	5486	90	8	910
3	Overhead Close-Up	1676	-1067	5486	90	35	1000
4	Impact Point	0	-2134	1143	7	13	1020
5	Side Overall	838	-3912	1829	11	13	670
6	Rear	15545	228	1371	1	35-80	1010
7	Left Rear	16459	-7188	939	1	80	5000
7	Left Front	-4775	-2666	1473	7	13	1010
7B	Left Front	-5080	-3531	1524	8	17	NTM
8	Driver Front	-432	483	1395	20	19	1030
9	Driver Side	914	1245	990	5	6	1020
10	Rear Passenger	1676	1245	990	5	6	1020

X = Barrier Face Y = Monorail Centerline Z = Ground NTM = No Timing Marks

DATA SHEET NO. 16

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

Test Date: 1/27/04

Test Time: 12:01 PM

Temperature: 15.6 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 Details: No leakage occurred

DATA SHEET NO. 17

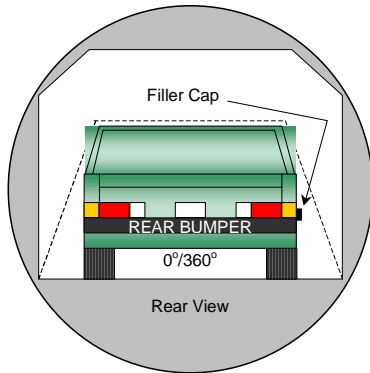
FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

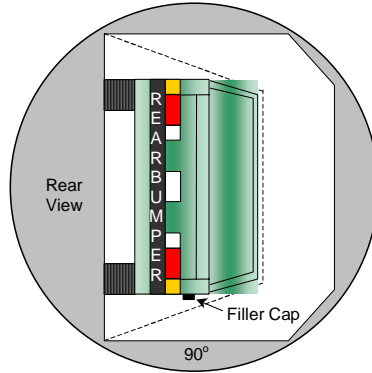
NHTSA No.: M45111

Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

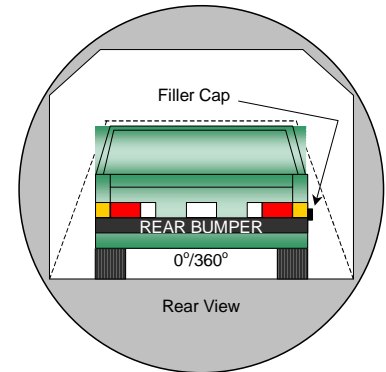
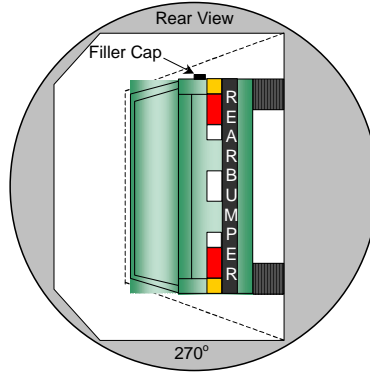
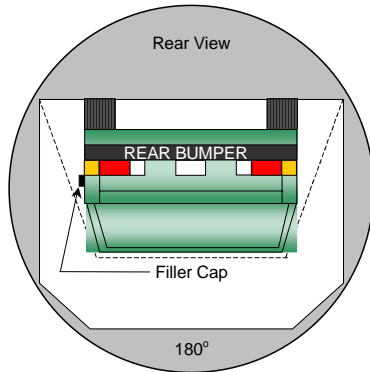
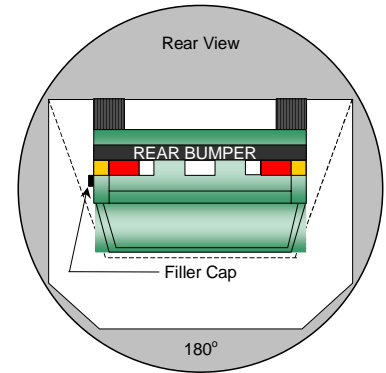
Test Date: 1/27/04



0° TO 90°



90° TO 180°



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. Details of Stoddard Solvent spillage locations.
4. No solvent leakage occurred during static rollover testing.

DATA SHEET NO. 17.....(CONTINUED)
FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h 90 Deg. Side Impact NCAP

NHTSA No.: M45111
 Test Date: 1/27/04

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	86	300	386
90° to 180°	90	300	390
180° to 270°	76	300	376
270° to 360°	76	300	376

FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)

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

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

**APPENDIX A
PHOTOGRAPHS**

LIST OF PHOTOGRAPHS

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A-3	Vehicle Certification Label	A-3
A-4	Vehicle Tire Label	A-4
A-5	Front View, Pre-test	A-5
A-6	Front View, Post-Test	A-6
A-7	Left Front $\frac{3}{4}$ View, Pre-Test	A-7
A-8	Left Front $\frac{3}{4}$ View, Post -Test	A-8
A-9	Left (Impacted) Side View, Pre-Test	A-9
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Figure A-1: Left Front, as Received



Figure A-2: Right Rear, as Received

MFD. BY: TOYOTA MOTOR CORPORATION 12/03
GVWR 4485LB GAWR FR 2670LB RR 2670LB
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND
THEFT PREVENTION STANDARDS IN EFFECT ON
THE DATE OF MANUFACTURE SHOWN ABOVE.
JTHBA30G945021750 PASS. CAR



C/TR: 3Q4/LA17 MCV31L-BEAGKA
A/TM: -02A/U151E MADE IN JAPAN 183 A

Figure A-3: Vehicle Certification Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY: TOTAL 5
FRONT 2: REAR 3

The combined weight of occupants and cargo should never exceed 410 kg or 900 lbs.

ORIGINAL TIRE SIZE	COLD TIRE INFLATION PRESSURE	
P215/60R16	FRONT	200kPa, 29PSI
	REAR	200kPa, 29PSI

SEE OWNER'S MANUAL FOR
ADDITIONAL INFORMATION

33571

INFORMATION SUR LES PNEUS ET LE CHARGEMENT

NOMBRE DE PLACES ASSISES : TOTAL 5
AVANT 2 : ARRIÈRE 3

Le poids total des occupants et du chargement ne doit jamais être supérieur à 410 kg ou 900 lb.

DIMENSION DES PNEUS D'ORIGINE	PRESSION DE GONFLAGE À FROID	
P215/60R16	AVANT	200kPa, 29PSI
	ARRIÈRE	200kPa, 29PSI

POUR DE PLUS AMPLES INFORMATIONS,
VOIR LE MANUEL DU PROPRIÉTAIRE

3 C

Figure A-4: Vehicle Tire Label



Figure A-5: Front View, Pre-Test



Figure A-6: Front View, Post-Test



Figure A-7: Left Front $\frac{3}{4}$ View, Pre-Test



Figure A-8: Left Front ¾ View, Post-Test



Figure A-9: Left (Impacted) Side View, Pre-Test



Figure A-10: Left (Impacted) Side View, Post-Test



Figure A-11: Left Rear $\frac{3}{4}$ View, Pre-Test



Figure A-12: Left Rear 3/4 View, Post-Test



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Figure A-13: Rear View, Pre-Test



Figure A-14: Rear View, Post-Test



Figure A-15: Right Rear 3/4 View, Pre-Test



Figure A-16: Right Rear 3/4 View, Post-Test



Figure A-17: Right Side View, Pre-Test



Figure A-18: Right Side View, Post-Test



Figure A-19: Right Front $\frac{3}{4}$ View, Pre-Test

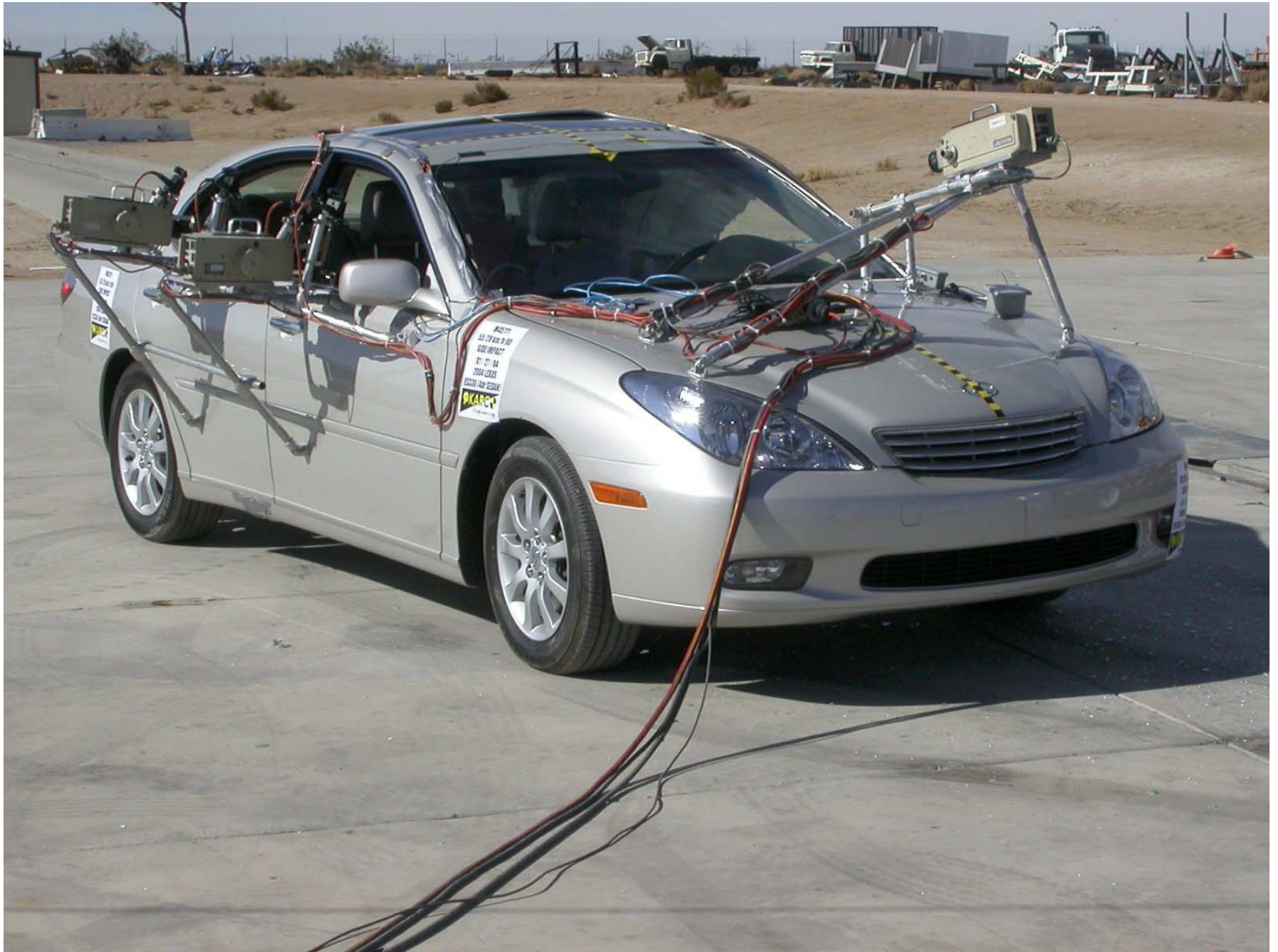


Figure A-20: Right Front ¾ View, Post-Test



Figure A-21: Overhead Overall View, Pre-Test



Figure A-22: Overhead Overall View, Post-Test



Figure A-23: Overhead Close-up View, Pre-Test

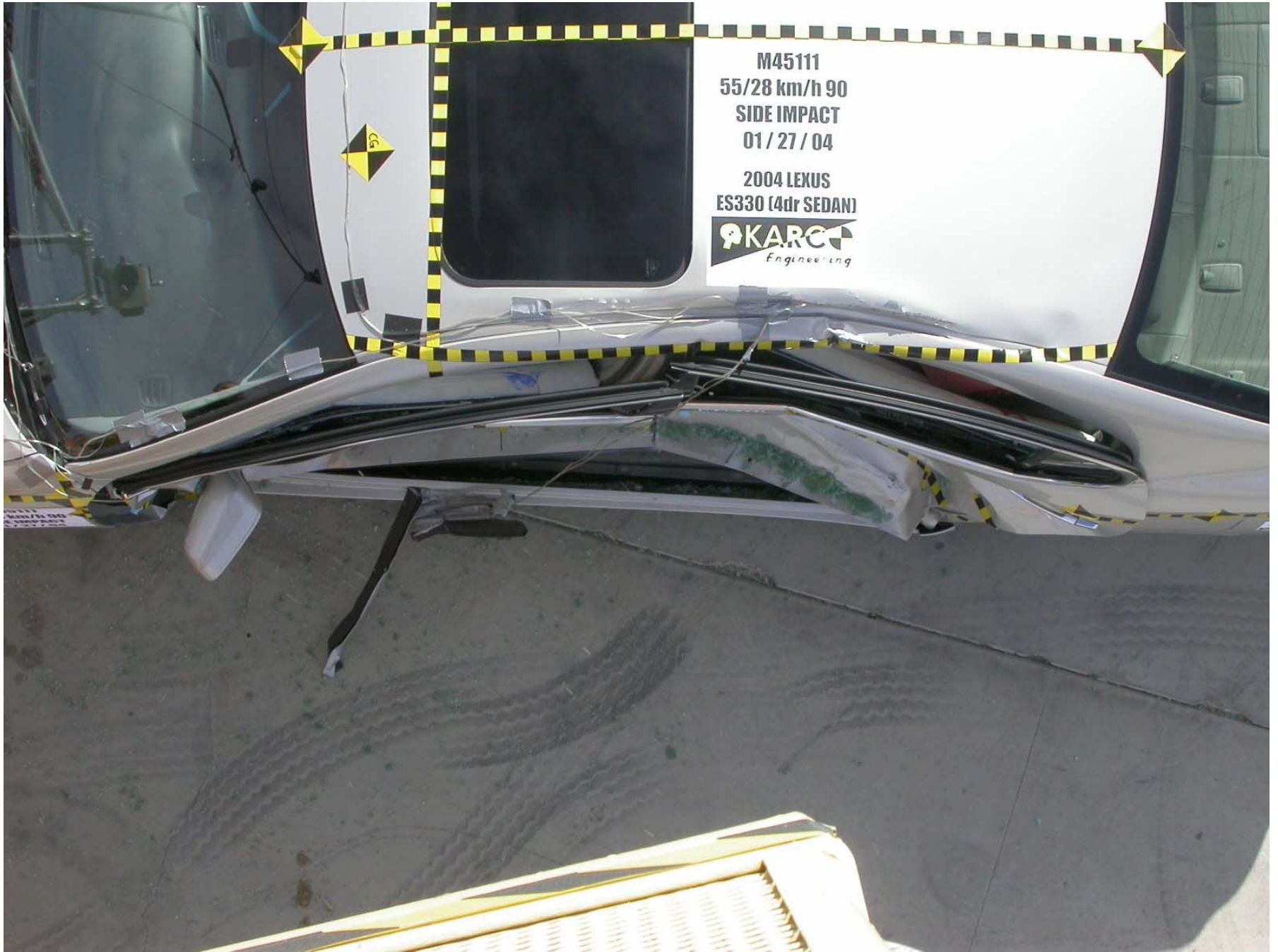


Figure A-24: Overhead Close-up View, Post-Test



Figure A-25: Impact Point Target Set-up, Pre-Test



Figure A-26: Impact Point Target, Post-Test



Figure A-27: Front ¾ View of Left Side Doors, Pre-Test



Figure A-28: Front ¾ View of Left Side Doors, Post-Test



Figure A-29: Rear $\frac{3}{4}$ View of Left Side Doors, Pre-Test

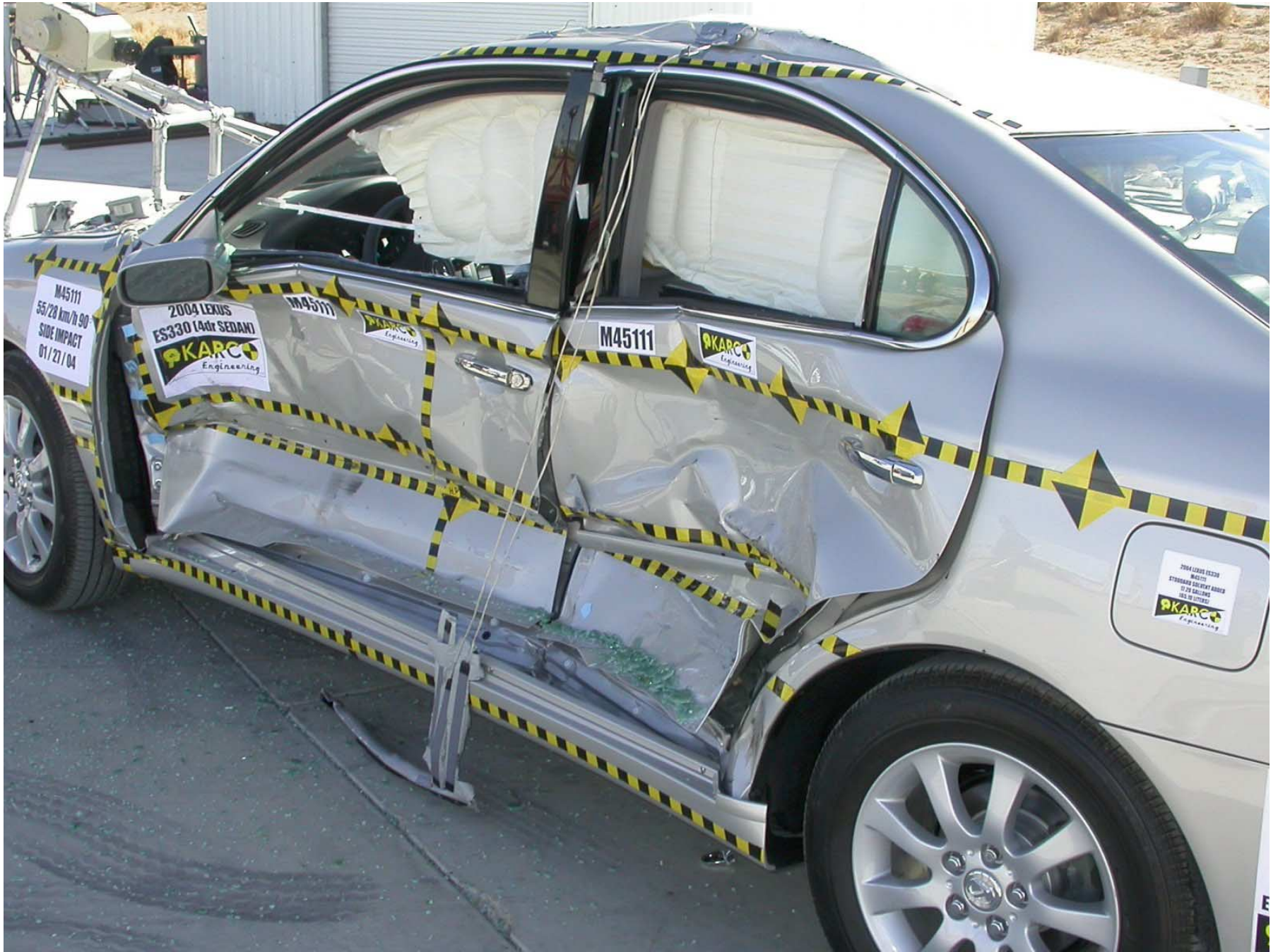


Figure A-30: Rear ¾ View of Left Side Doors, Post-Test



Figure A-31: Left Front Door Closed, Pre-Test



Figure A-32: Left Front Door Closed, Post-Test



Figure A-33: Left Rear Door Closed, Pre-Test



Figure A-34: Left Rear Door Closed, Post-Test



Figure A-35: Driver Dummy Left Side with Door Open, Pre-Test



Figure A-36: Driver Dummy Left Side, Pre-test



Figure A-37: Driver Dummy Left Side, Post-Test



Figure A-38: Driver Dummy Clearance, Pre-Test



Figure A-39: Driver Dummy Clearance, Post-Test



Figure A-40: Driver Dummy Inside View, Pre-Test



Figure A-41: Driver Dummy Inside View, Post-Test



Figure A-42: Driver Door Inside View, Pre-Test



Figure A-43: Driver Dummy Contact Points Inside View, Post-Test (Vehicle Moved)



Figure A-44: Passenger Dummy Left Side with Door Open, Pre-Test



Figure A-45: Passenger Dummy Left Side, Pre-Test



Figure A-46: Passenger Dummy Left Side, Post-Test



Figure A-47: Passenger Dummy Clearance, Pre-Test



Figure A-48: Passenger Dummy Clearance, Post-Test



Figure A-49: Passenger Dummy Inside View, Pre-Test



Figure A-50: Passenger Dummy Inside View, Post-Test



Figure A-51: Passenger Door Inside View, Pre-Test



Figure A-52: Passenger Dummy Contact Points Inside View, Post-Test (Vehicle Moved)



Figure A-53: Front View of Deformable Barrier, Pre-Test



Figure A-54: Front View of Deformable Barrier, Post-Test



Figure A-55: Top View of Deformable Barrier, Pre-Test

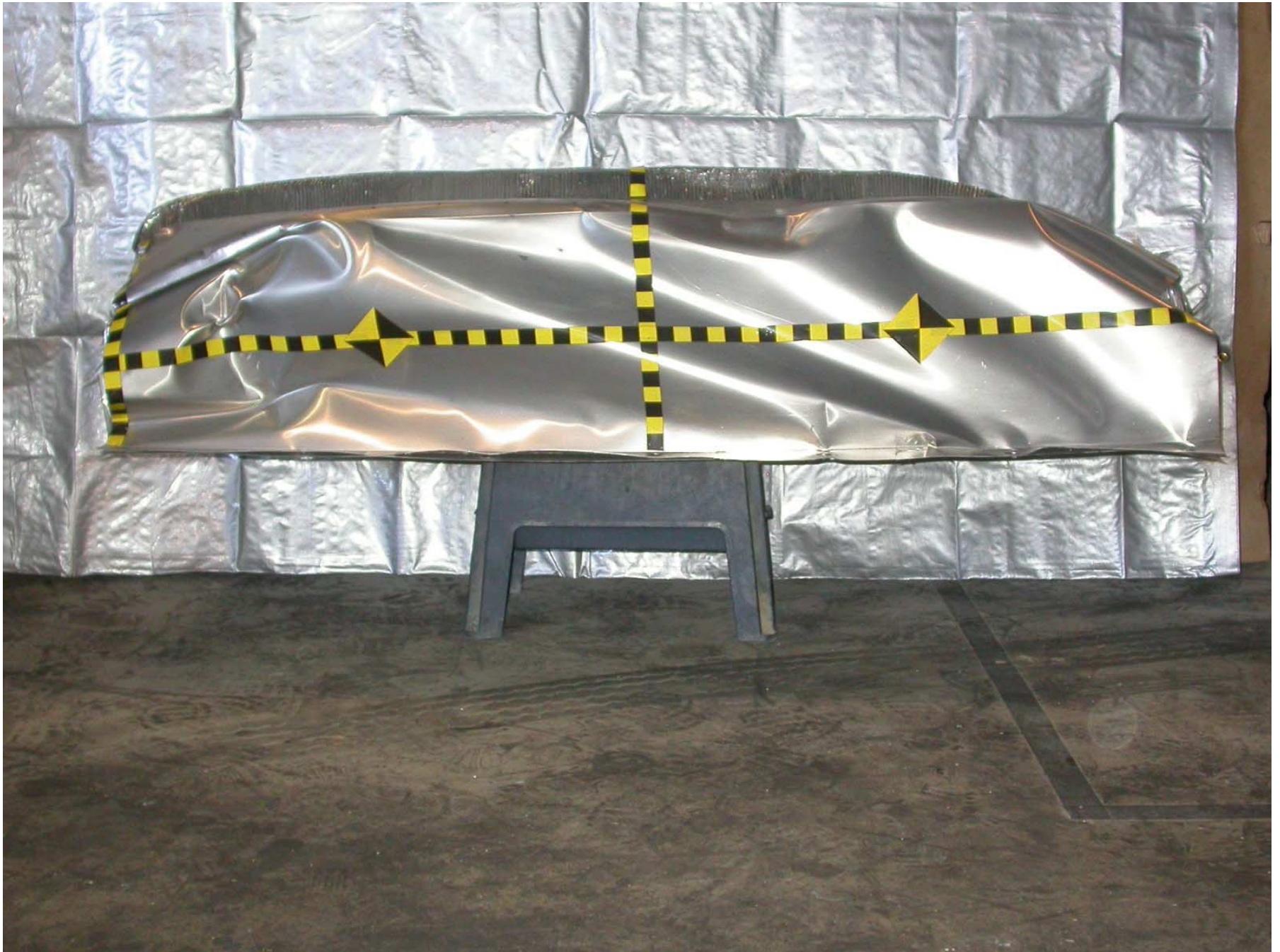


Figure A-56: Top View of Deformable Barrier, Post-Test



Figure A-57: Right Side View of Deformable Barrier, Pre-Test



Figure A-58: Right Side View of Deformable Barrier, Post-Test

A-59

TR-PP24003-02-NC



Figure A-59: Left Side View of Deformable Barrier, Pre-Test



Figure A-60: Left Side View of Deformable Barrier, Post-Test



Figure A-61: Vehicle on Rollover Device, 0° View



Figure A-62: Vehicle on Rollover Device, 90° View



Figure A-63: Vehicle on Rollover Device, 180° View

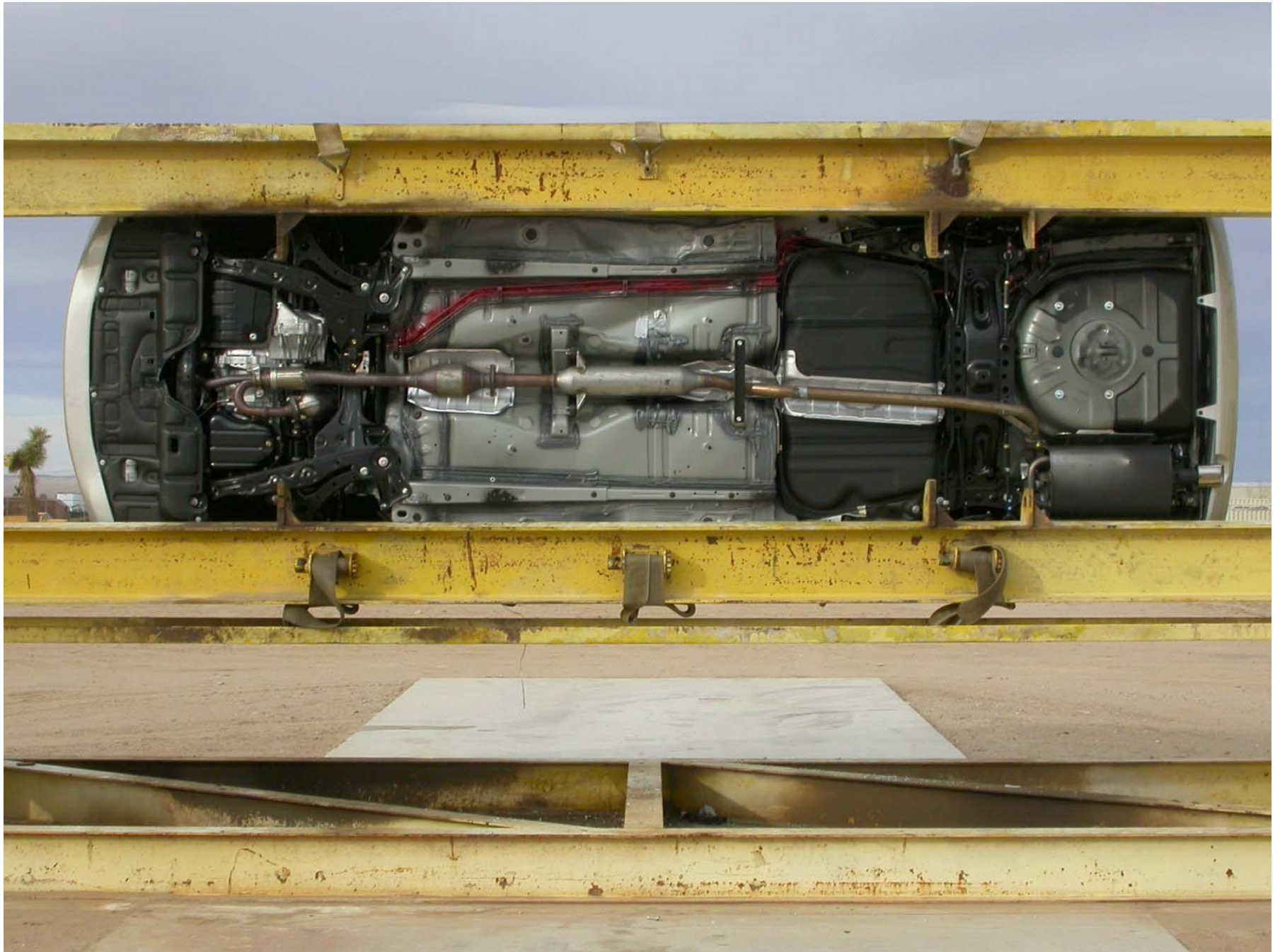


Figure A-64: Vehicle on Rollover Device, 270° View



Figure A-65: Vehicle During Impact

APPENDIX B
SID/HIII, VEHICLE AND MDB RESPONSE DATA

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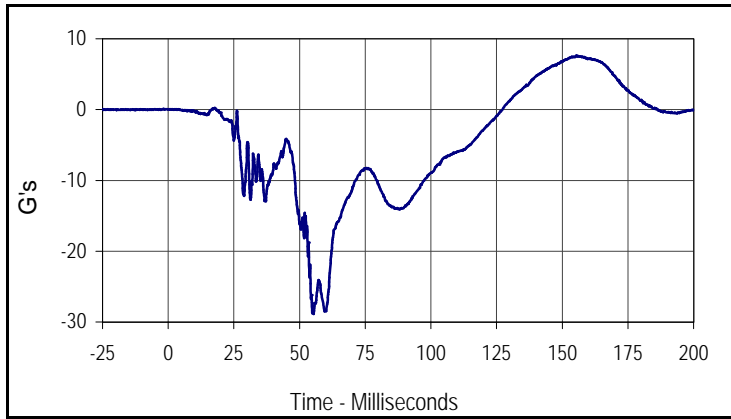
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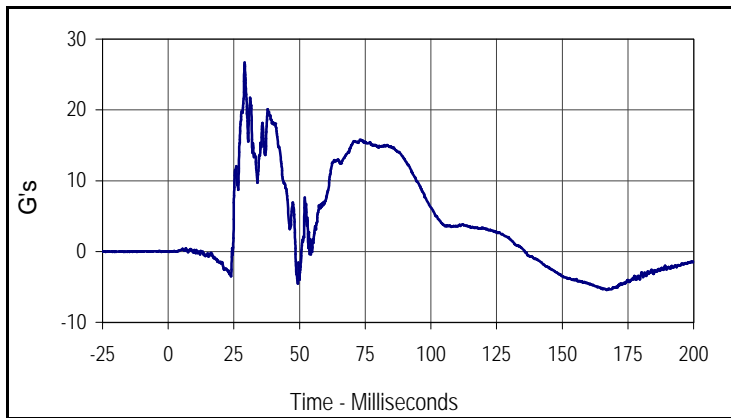
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Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

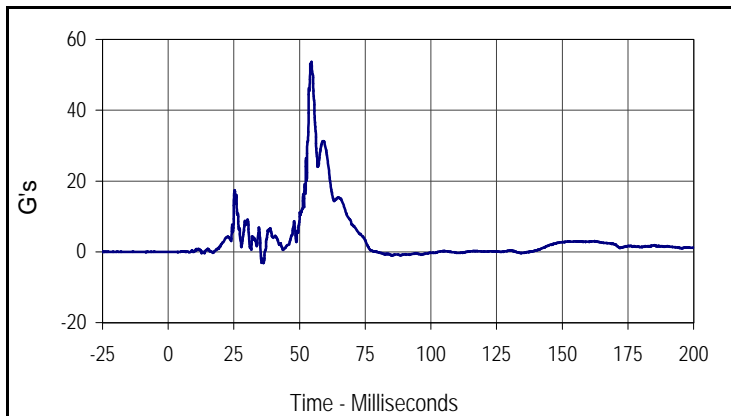
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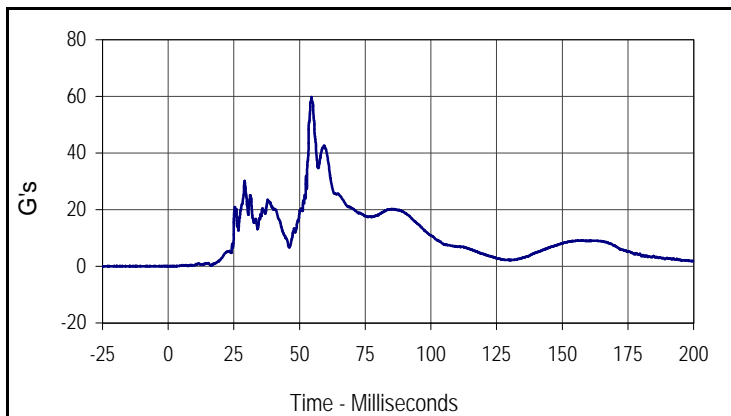
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Max	Time	Min	Time
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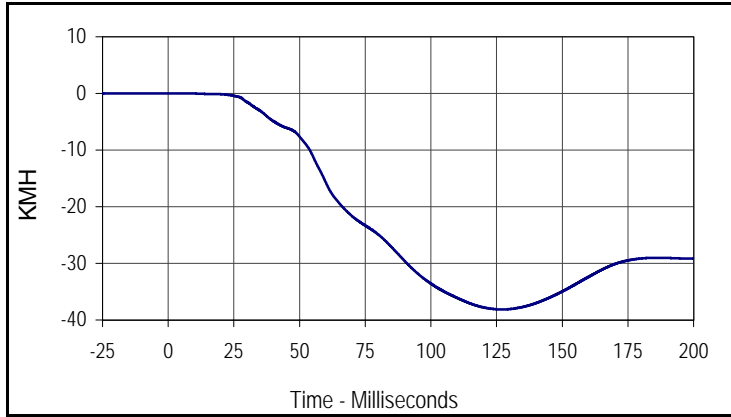
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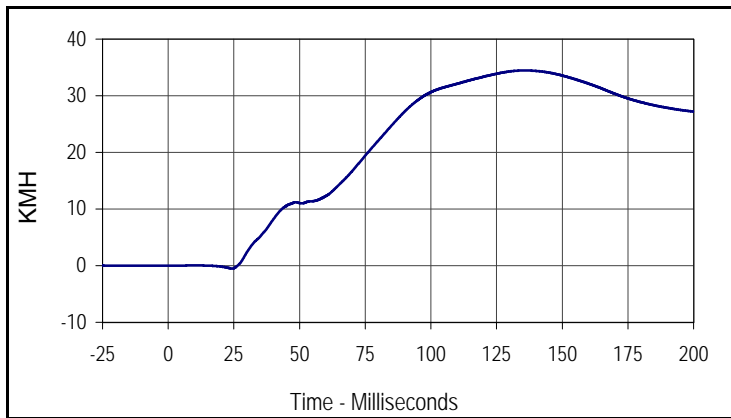
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Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

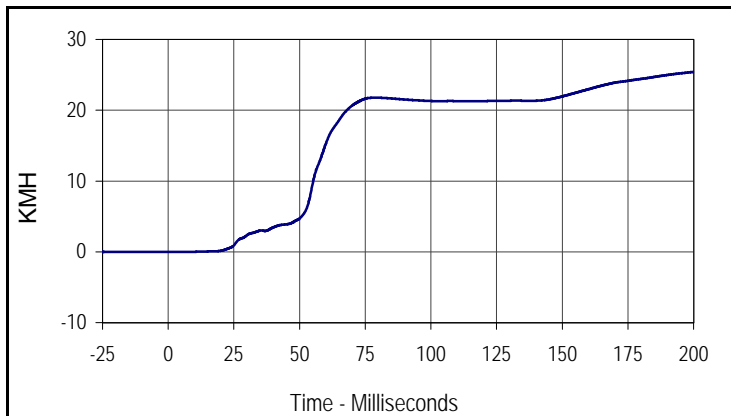
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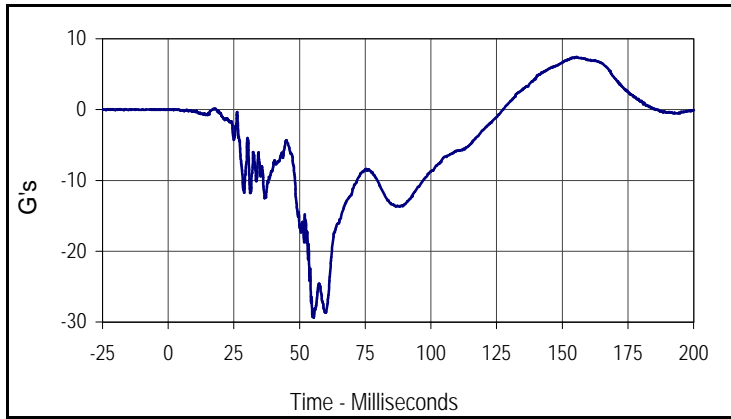
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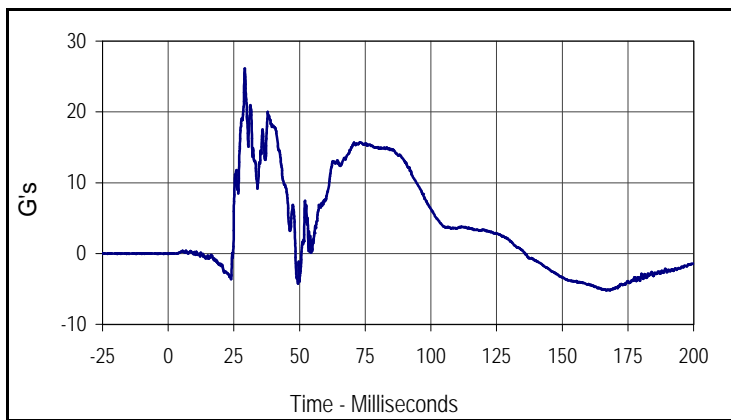
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Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

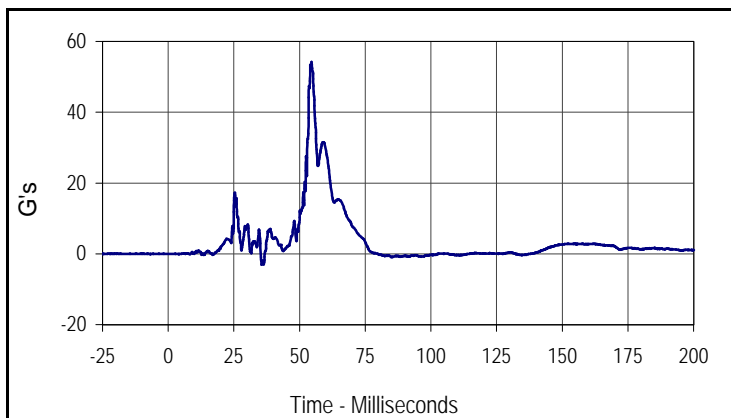
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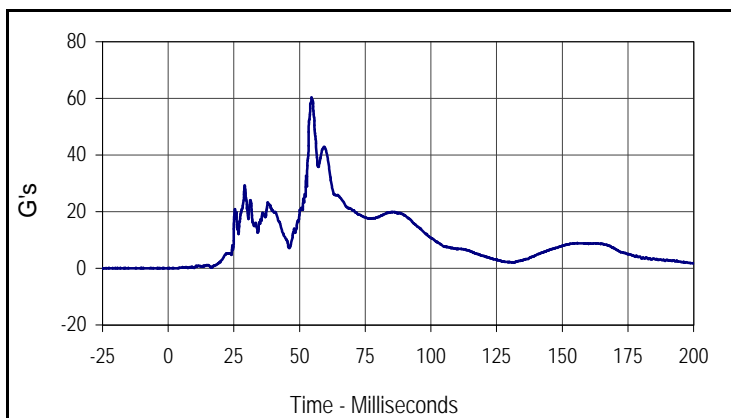
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Max	Time	Min	Time
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Max	Time	Min	Time
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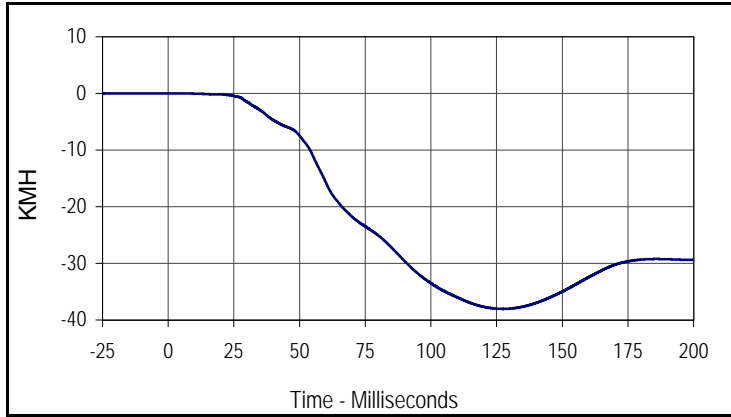
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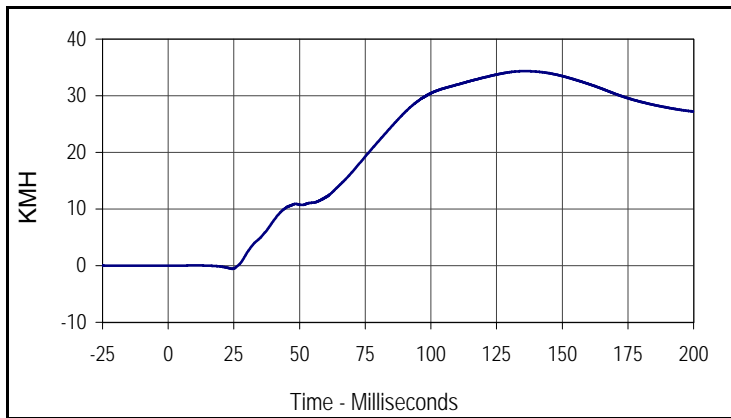
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Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

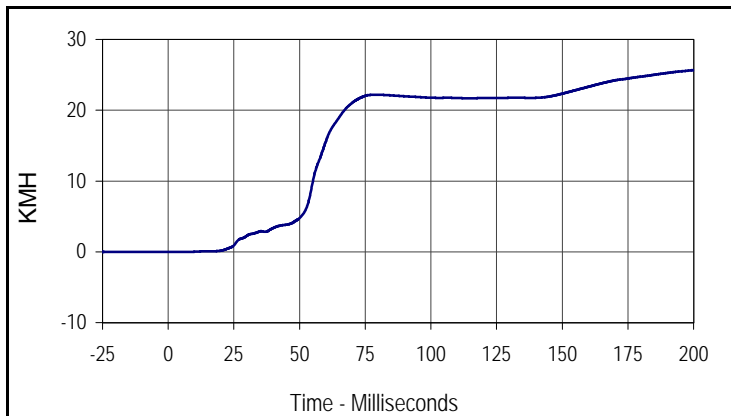
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Max	Time	Min	Time
0.0	0.0	-38.1	127.5



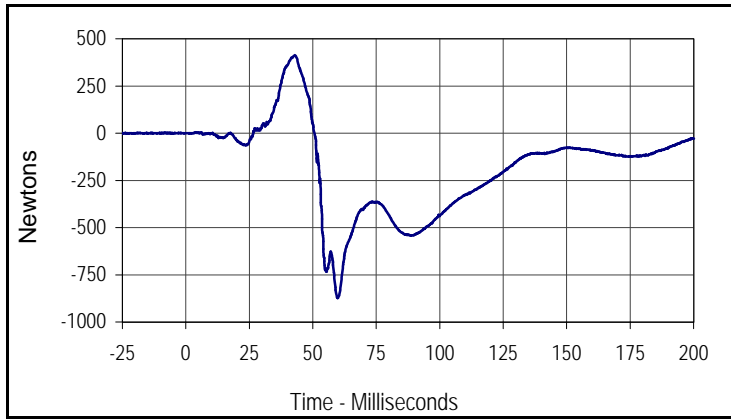
Curve Description			
Driver Head Redundant Y Velocity			
CURNO	Type	SAE Class	Units
005	IN1	180	KMH
Max	Time	Min	Time
34.4	135.9	-0.5	24.4



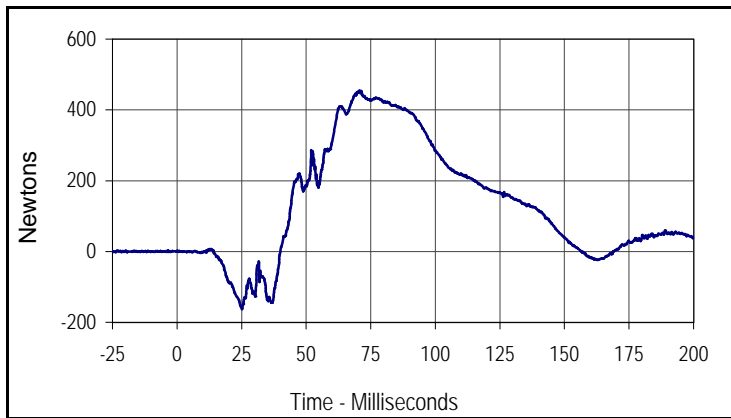
Curve Description			
Driver Head Redundant Z Velocity			
CURNO	Type	SAE Class	Units
006	IN1	180	KMH
Max	Time	Min	Time
25.7	200.0	0.0	4.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

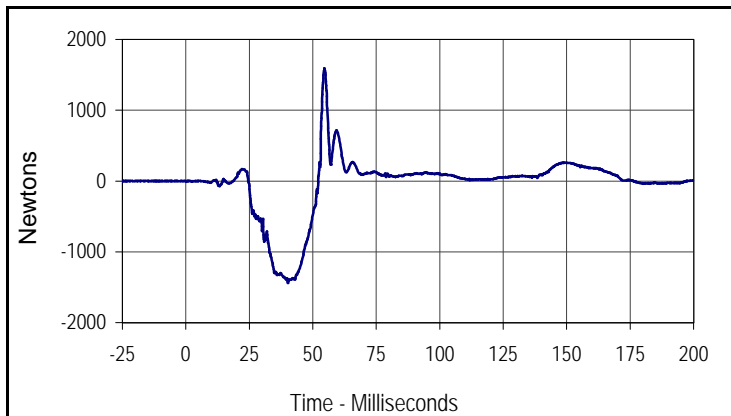
Test Date: 1/27/04
 NHTSA No.: M45111



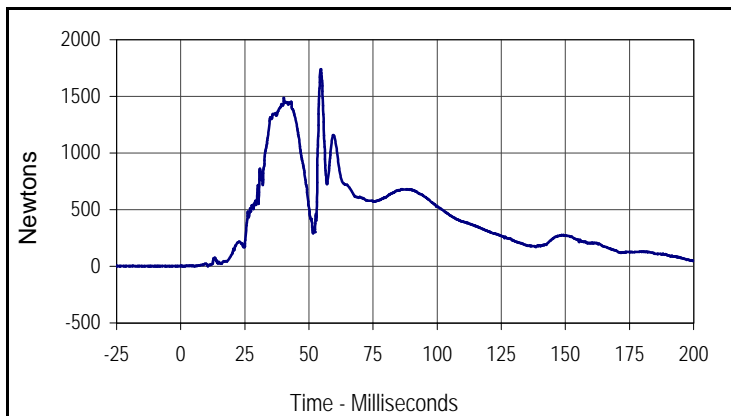
Curve Description			
Driver Upper Neck Force X			
CURNO	Type	SAE Class	Units
007	FIL	1000	Newtons
Max	Time	Min	Time
413.2	43.0	-873.1	59.8



Curve Description			
Driver Upper Neck Force Y			
CURNO	Type	SAE Class	Units
008	FIL	1000	Newtons
Max	Time	Min	Time
454.1	70.6	-163.4	25.2



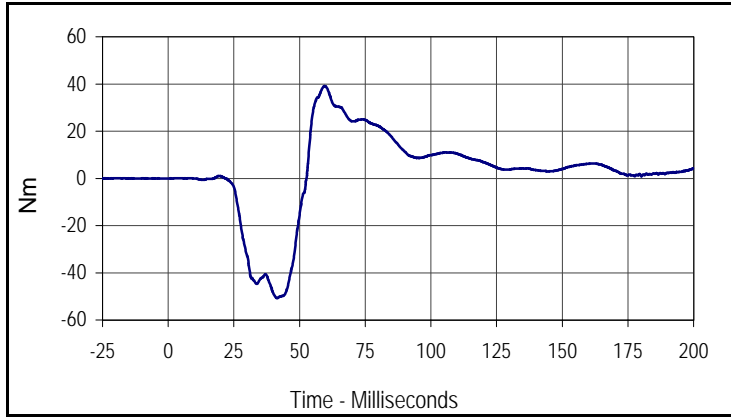
Curve Description			
Driver Upper Neck Force Z			
CURNO	Type	SAE Class	Units
009	FIL	1000	Newtons
Max	Time	Min	Time
1591.4	54.6	-1439.8	40.2



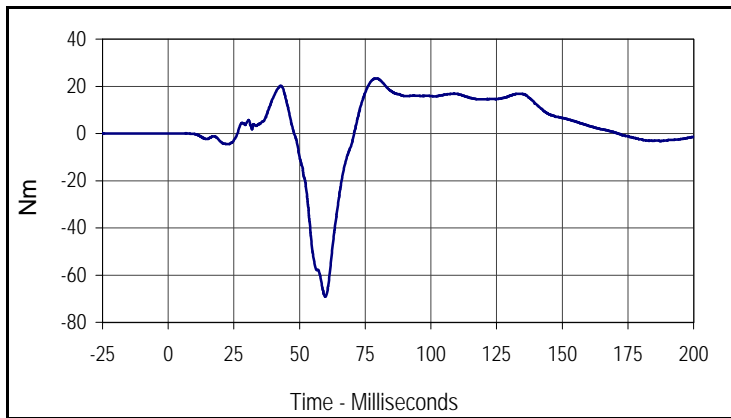
Curve Description			
Driver Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
007	RES	1000	Newtons
Max	Time	Min	Time
1741.4	54.7	0.5	1.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

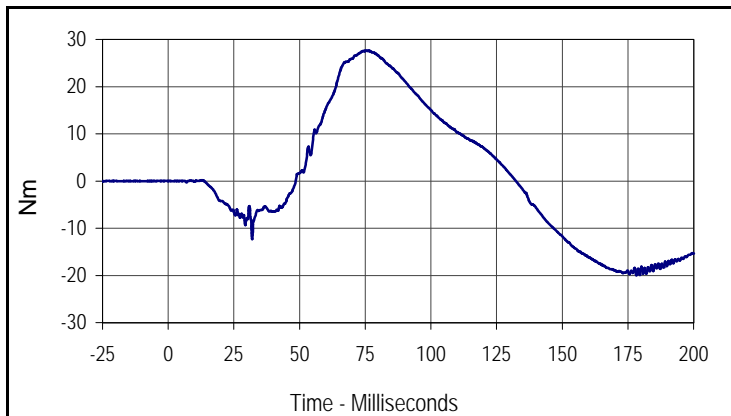
Test Date: 1/27/04
 NHTSA No.: M45111



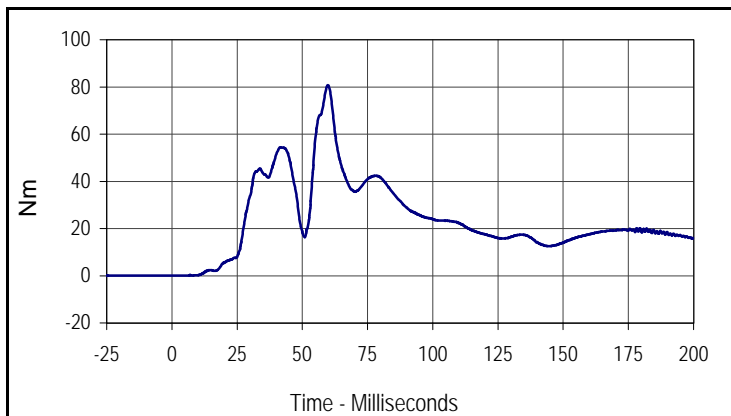
Curve Description			
Driver Upper Neck Moment X			
CURNO	Type	SAE Class	Units
010	FIL	600	Nm
Max	Time	Min	Time
39.1	59.5	-50.8	41.5



Curve Description			
Driver Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
011	FIL	600	Nm
Max	Time	Min	Time
23.3	79.1	-69.1	59.8



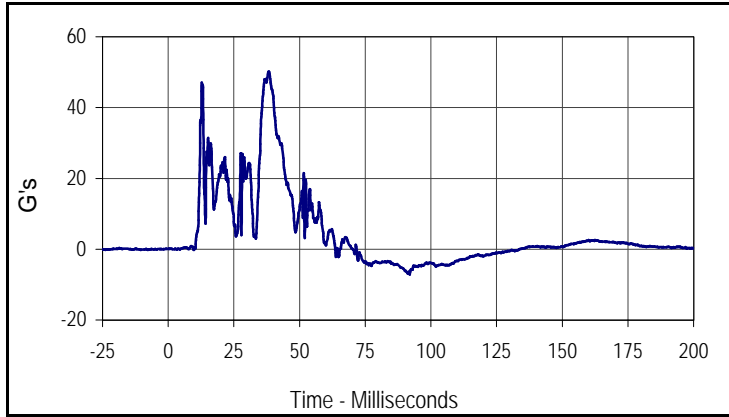
Curve Description			
Driver Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
27.6	75.3	-20.0	178.3



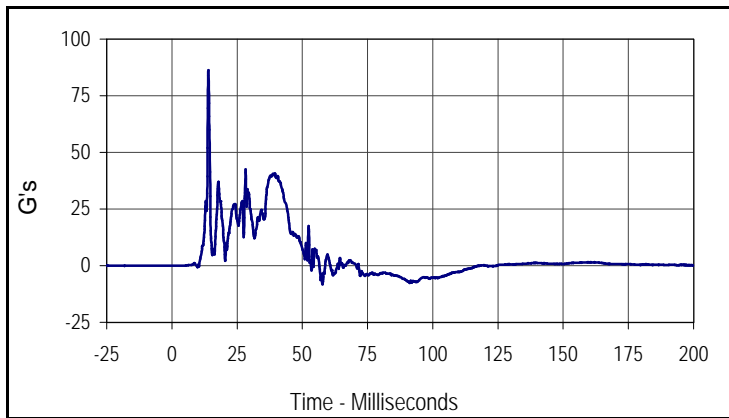
Curve Description			
Driver Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
010	RES	600	Nm
Max	Time	Min	Time
80.8	59.8	0.0	0.3

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

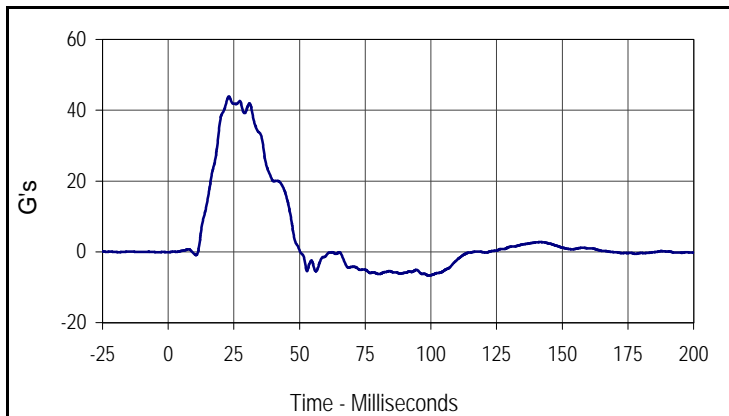
Test Date: 1/27/04
 NHTSA No.: M45111



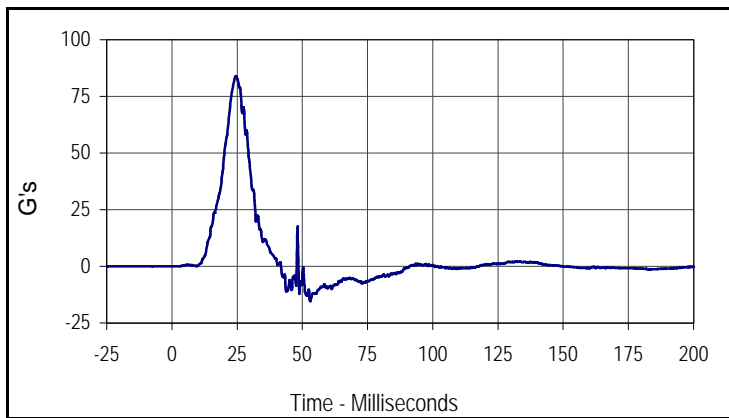
Curve Description			
Driver Upper Rib Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	1000	G's
Max	Time	Min	Time
50.2	38.2	-7.1	91.9



Curve Description			
Driver Lower Rib Primary Y			
CURNO	Type	SAE Class	Units
014	FIL	1000	G's
Max	Time	Min	Time
86.3	14.0	-8.2	57.8



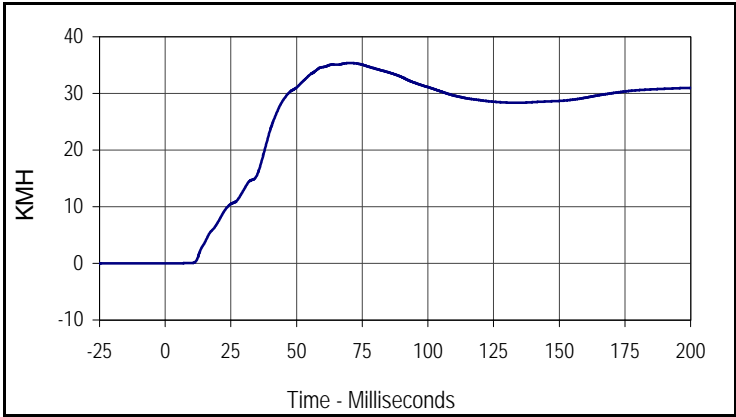
Curve Description			
Driver Lower Spine Primary Y			
CURNO	Type	SAE Class	Units
015	FIL	180	G's
Max	Time	Min	Time
43.9	23.1	-6.7	99.2



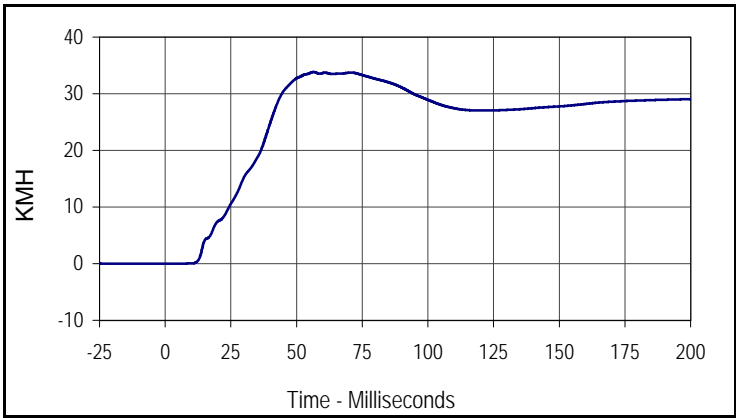
Curve Description			
Driver Pelvis Primary Y			
CURNO	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
84.0	24.5	-15.4	53.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

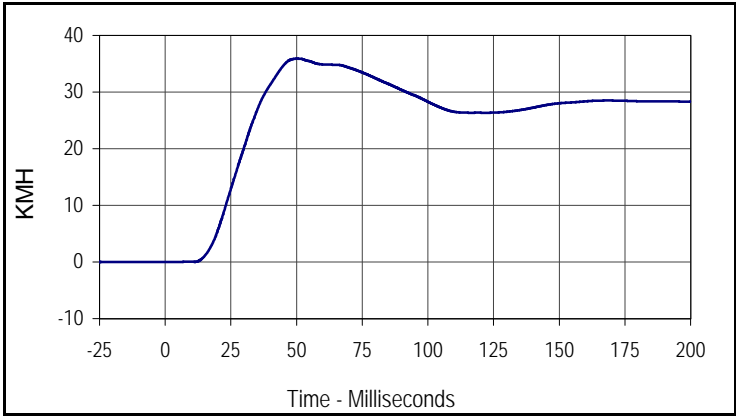
Test Date: 1/27/04
 NHTSA No.: M45111



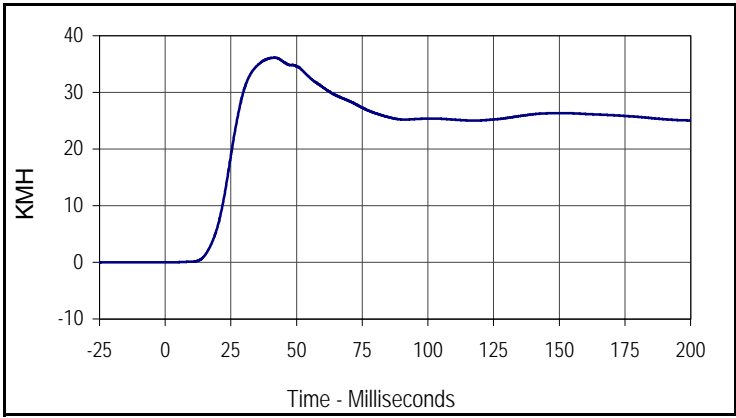
Curve Description			
Driver Upper Rib Primary Y Velocity			
CURNO	Type	SAE Class	Units
013	IN1	180	KMH
Max	Time	Min	Time
35.4	70.1	0.0	0.0



Curve Description			
Driver Lower Rib Primary Y Velocity			
CURNO	Type	SAE Class	Units
014	IN1	180	KMH
Max	Time	Min	Time
33.8	56.5	0.0	4.5



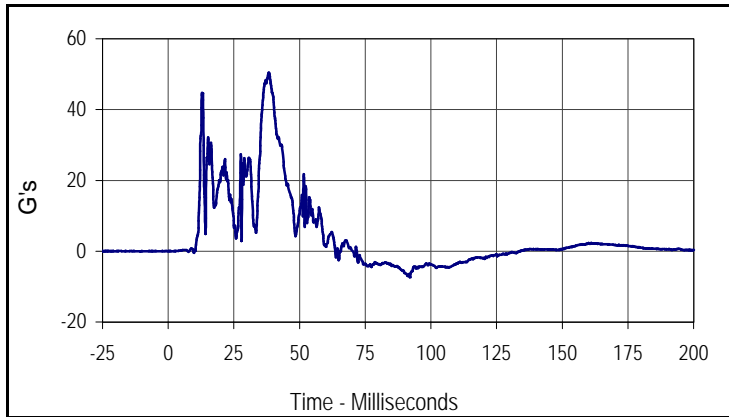
Curve Description			
Driver Lower Spine Primary Y Velocity			
CURNO	Type	SAE Class	Units
015	IN1	180	KMH
Max	Time	Min	Time
35.9	50.2	0.0	1.3



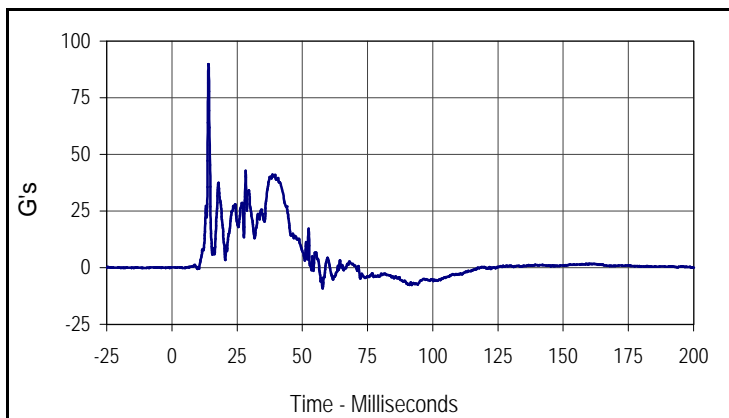
Curve Description			
Driver Pelvis Primary Y Velocity			
CURNO	Type	SAE Class	Units
016	IN1	180	KMH
Max	Time	Min	Time
36.1	41.6	0.0	2.6

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

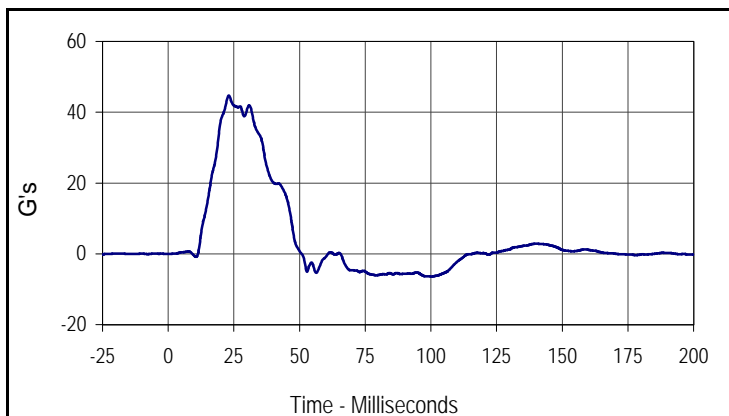
Test Date: 1/27/04
 NHTSA No.: M45111



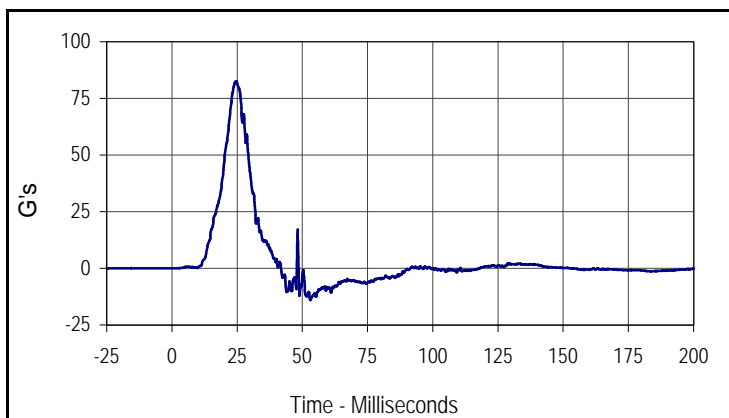
Curve Description			
Driver Upper Rib Redundant Y			
CURNO	Type	SAE Class	Units
017	FIL	1000	G's
Max	Time	Min	Time
50.4	38.3	-7.4	92.0



Curve Description			
Driver Lower Rib Redundant Y			
CURNO	Type	SAE Class	Units
018	FIL	1000	G's
Max	Time	Min	Time
89.8	14.0	-9.2	57.8



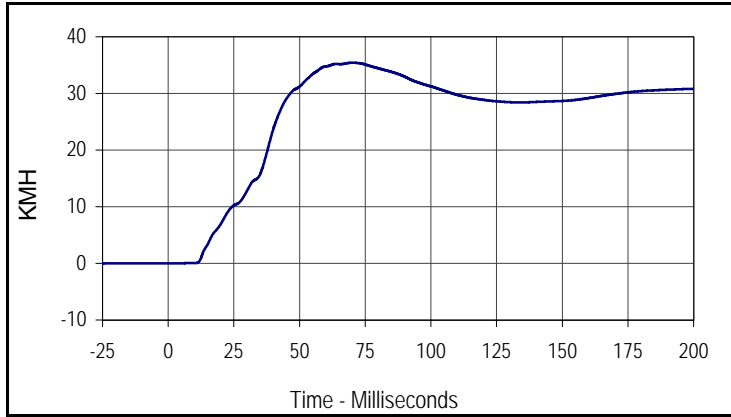
Curve Description			
Driver Lower Spine Redundant Y			
CURNO	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
44.7	23.1	-6.4	100.2



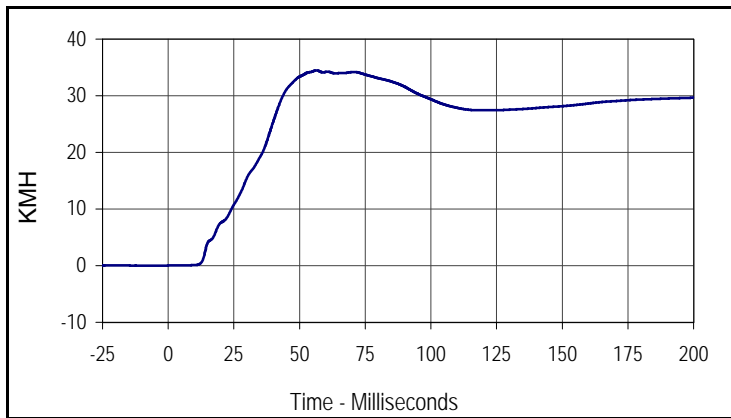
Curve Description			
Driver Pelvis Redundant Y			
CURNO	Type	SAE Class	Units
020	FIL	1000	G's
Max	Time	Min	Time
82.5	24.7	-14.0	53.1

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

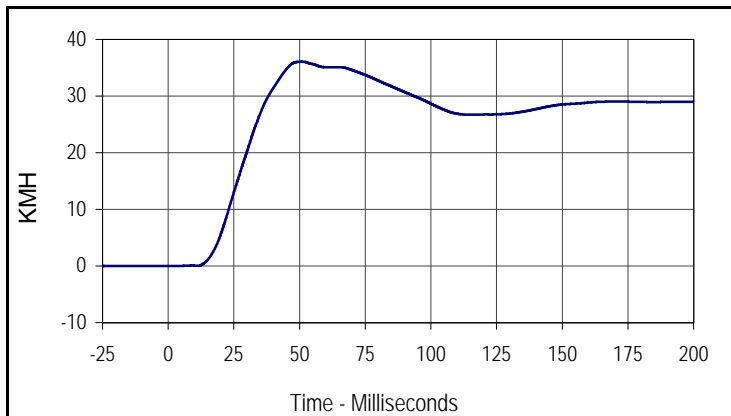
Test Date: 1/27/04
 NHTSA No.: M45111



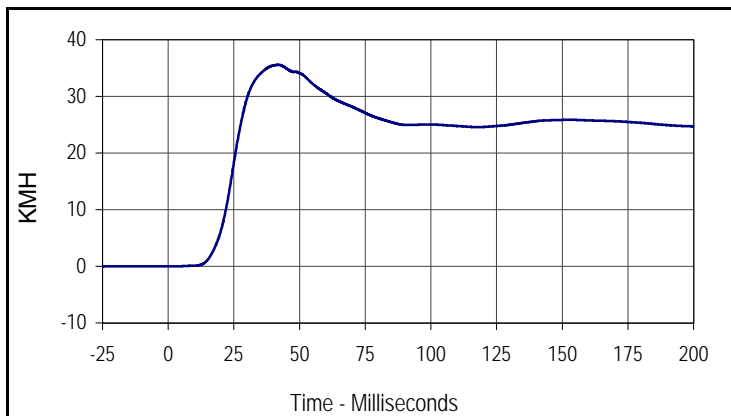
Curve Description			
Driver Upper Rib Redundant Y Velocity			
CURNO	Type	SAE Class	Units
017	IN1	180	KMH
Max	Time	Min	Time
35.4	70.2	0.0	0.0



Curve Description			
Driver Lower Rib Redundant Y Velocity			
CURNO	Type	SAE Class	Units
018	IN1	180	KMH
Max	Time	Min	Time
34.5	56.4	0.0	0.0



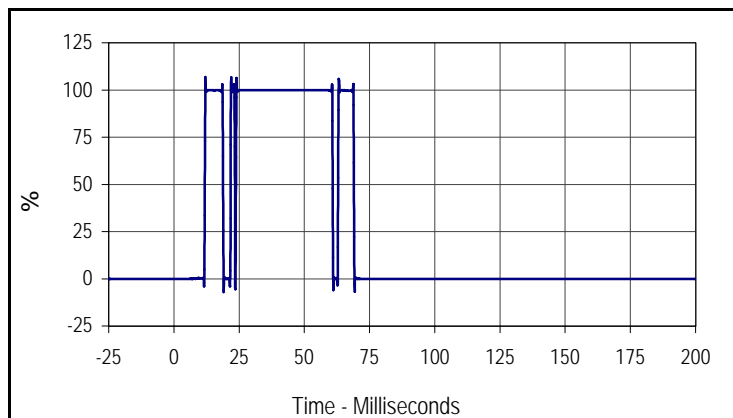
Curve Description			
Driver Lower Spine Redundant Y Velocity			
CURNO	Type	SAE Class	Units
019	IN1	180	KMH
Max	Time	Min	Time
36.1	50.8	0.0	1.2



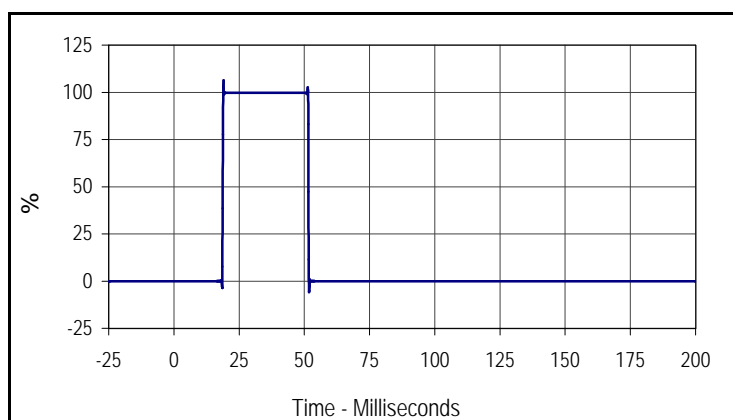
Curve Description			
Driver Pelvis Redundant Y Velocity			
CURNO	Type	SAE Class	Units
020	IN1	180	KMH
Max	Time	Min	Time
35.6	41.8	0.0	0.8

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

Test Date: 1/27/04
 NHTSA No.: M45111



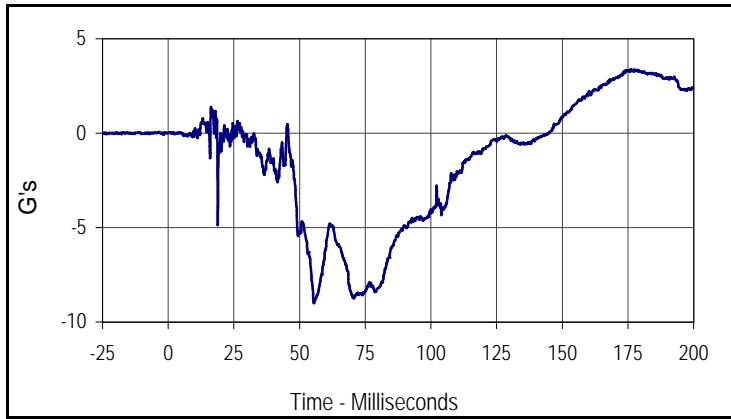
Curve Description			
Driver Thorax Contact			
CURNO	Type	SAE Class	Units
021	FIL	1000	%
Max	Time	Cross %	Time
106.9	12.1	50.0	11.5



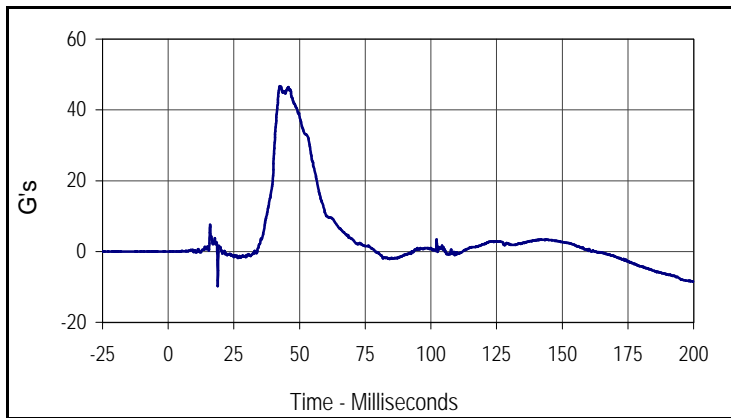
Curve Description			
Driver Pelvis Contact			
CURNO	Type	SAE Class	Units
022	FIL	1000	%
Max	Time	Cross %	Time
106.4	19.0	50.0	18.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

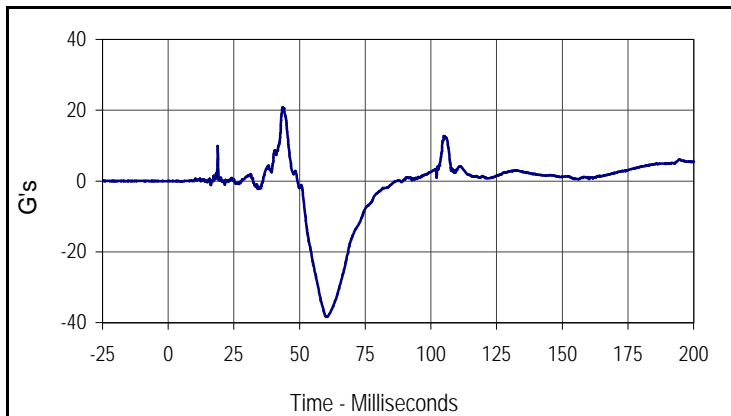
Test Date: 1/27/04
 NHTSA No.: M45111



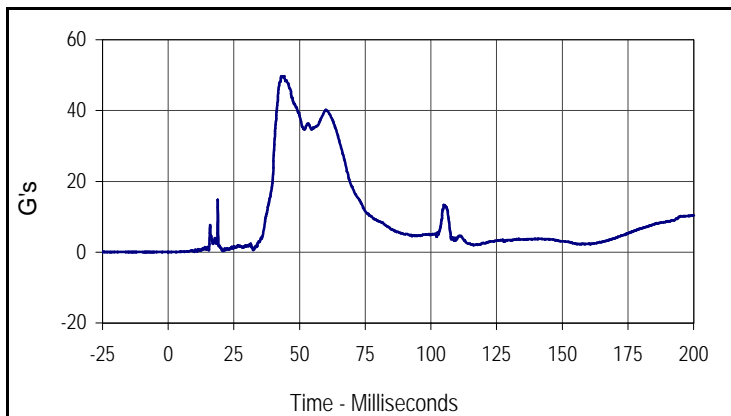
Curve Description			
Passenger Head X Primary			
CURNO	Type	SAE Class	Units
023	FIL	1000	G's
Max	Time	Min	Time
3.4	176.2	-9.0	55.5



Curve Description			
Passenger Head Y Primary			
CURNO	Type	SAE Class	Units
024	FIL	1000	G's
Max	Time	Min	Time
46.7	42.5	-9.7	18.9



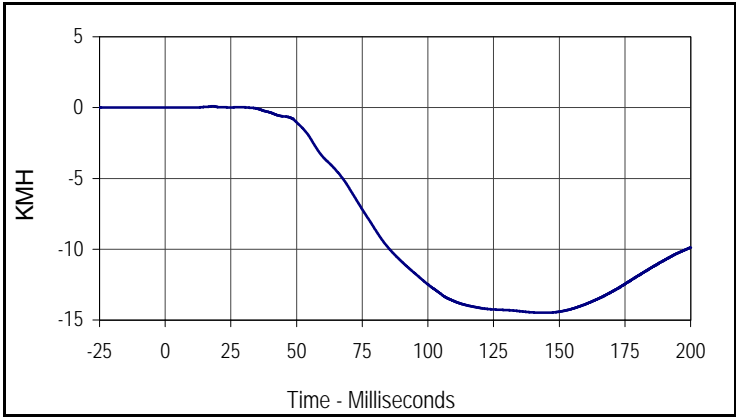
Curve Description			
Passenger Head Z Primary			
CURNO	Type	SAE Class	Units
025	FIL	1000	G's
Max	Time	Min	Time
20.9	43.6	-38.3	60.0



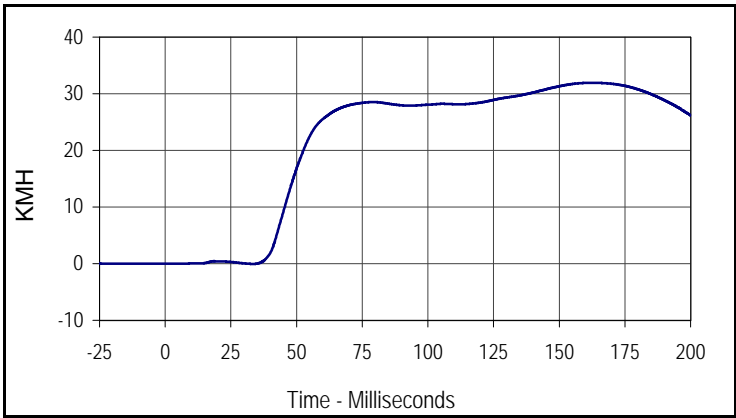
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
023	RES	1000	G's
Max	Time	Min	Time
49.7	43.9	0.0	3.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

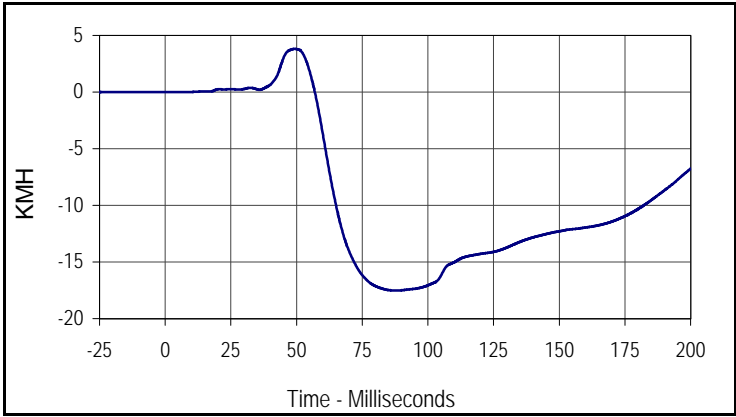
Test Date: 1/27/04
 NHTSA No.: M45111



Curve Description			
Passenger Head Primary X Velocity			
CURNO	Type	SAE Class	Units
023	IN1	180	KMH
Max	Time	Min	Time
0.1	18.2	-14.5	144.8



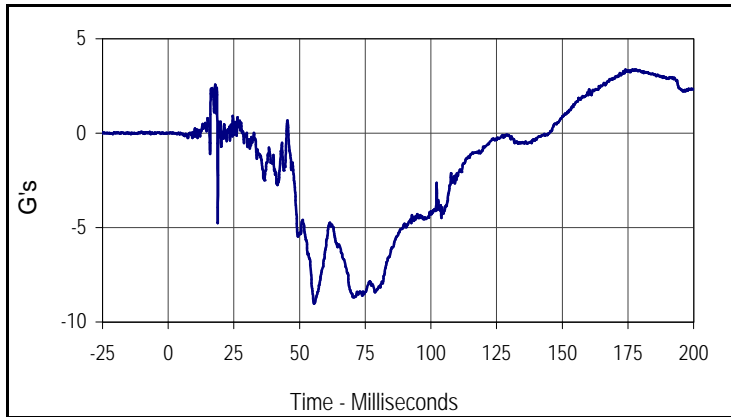
Curve Description			
Passenger Head Primary Y Velocity			
CURNO	Type	SAE Class	Units
024	IN1	180	KMH
Max	Time	Min	Time
31.9	162.5	0.0	33.6



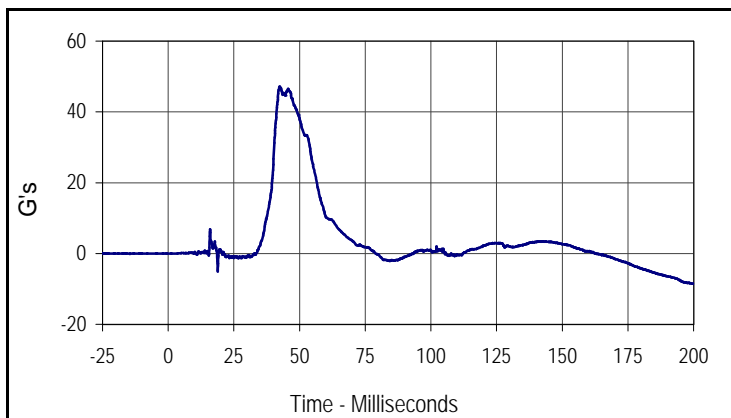
Curve Description			
Passenger Head Primary Z Velocity			
CURNO	Type	SAE Class	Units
025	IN1	180	KMH
Max	Time	Min	Time
3.8	49.3	-17.5	89.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

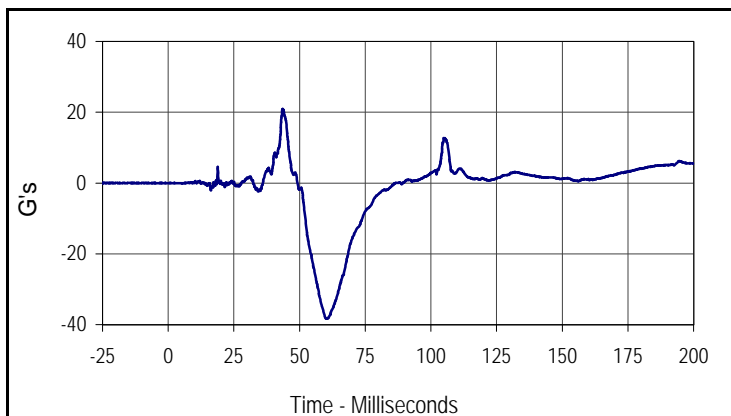
Test Date: 1/27/04
 NHTSA No.: M45111



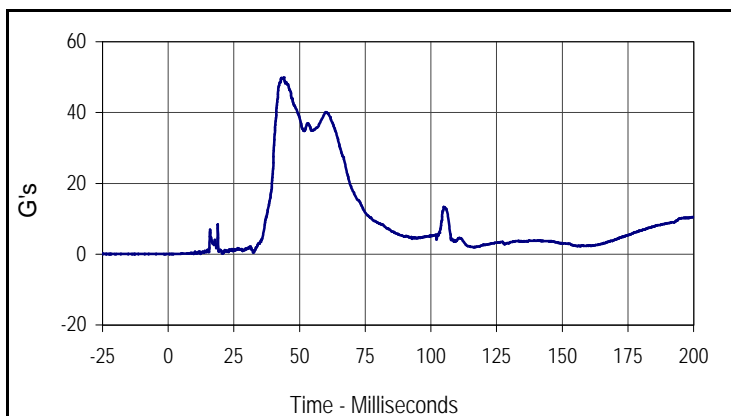
Curve Description			
Passenger Head X Redundant			
CURNO	Type	SAE Class	Units
026	FIL	1000	G's
Max	Time	Min	Time
3.4	176.7	-9.0	55.5



Curve Description			
Passenger Head Y Redundant			
CURNO	Type	SAE Class	Units
027	FIL	1000	G's
Max	Time	Min	Time
47.1	42.5	-8.6	200.0



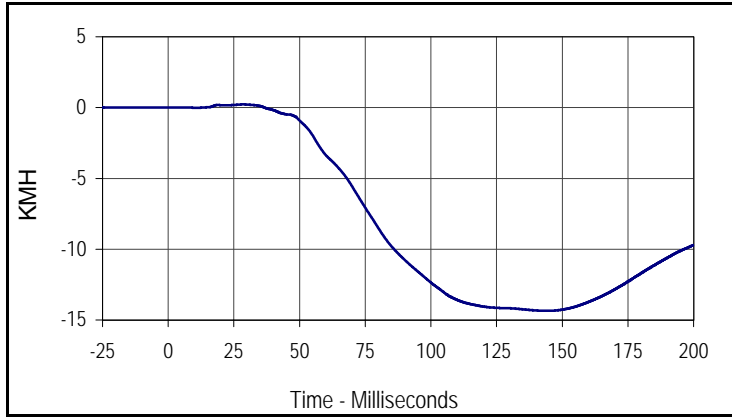
Curve Description			
Passenger Head Z Redundant			
CURNO	Type	SAE Class	Units
028	FIL	1000	G's
Max	Time	Min	Time
21.0	43.6	-38.3	60.1



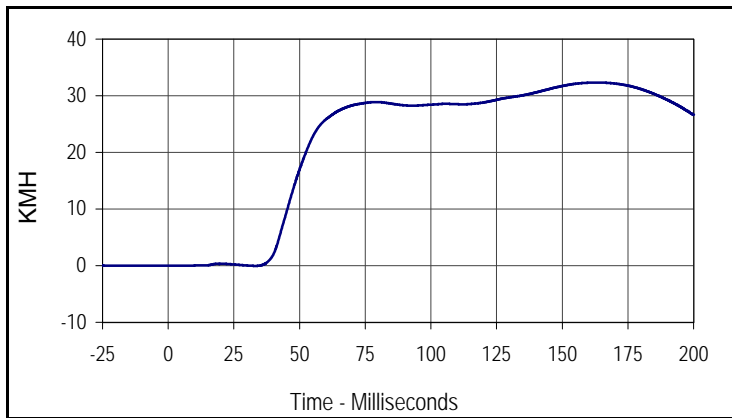
Curve Description			
Passenger Head Resultant Redundant			
CURNO	Type	SAE Class	Units
026	RES	1000	G's
Max	Time	Min	Time
49.9	43.9	0.0	0.6

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

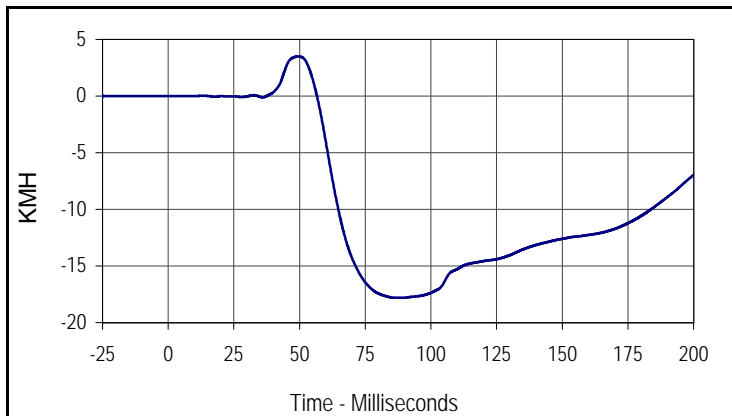
Test Date: 1/27/04
 NHTSA No.: M45111



Curve Description			
Passenger Head Redundant X Velocity			
CURNO	Type	SAE Class	Units
026	IN1	180	KMH
Max	Time	Min	Time
0.2	28.4	-14.4	145.0



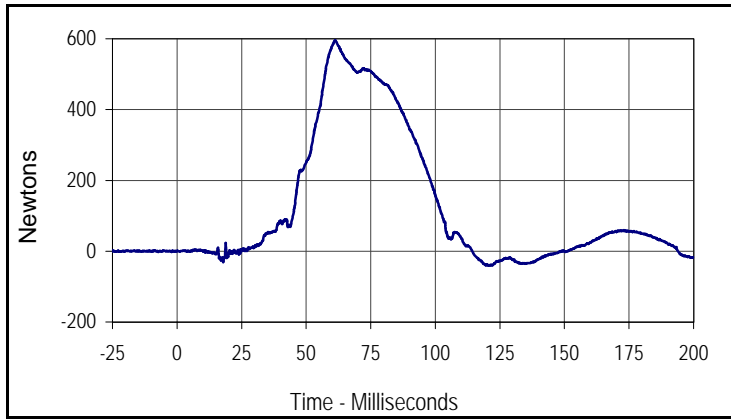
Curve Description			
Passenger Head Redundant Y Velocity			
CURNO	Type	SAE Class	Units
027	IN1	180	KMH
Max	Time	Min	Time
32.3	162.8	0.0	33.3



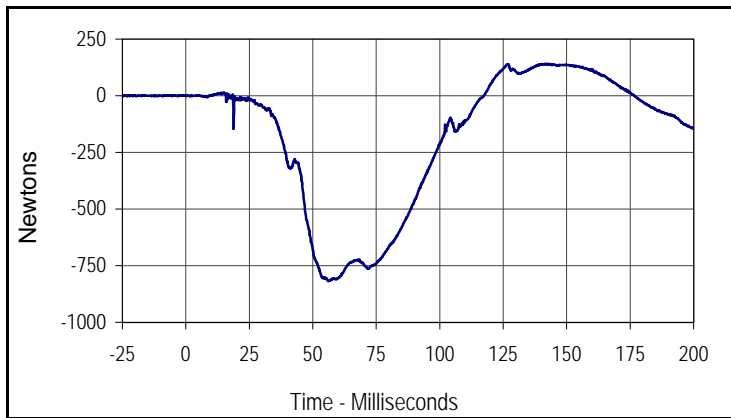
Curve Description			
Passenger Head Redundant Z Velocity			
CURNO	Type	SAE Class	Units
028	IN1	180	KMH
Max	Time	Min	Time
3.5	49.3	-17.8	86.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

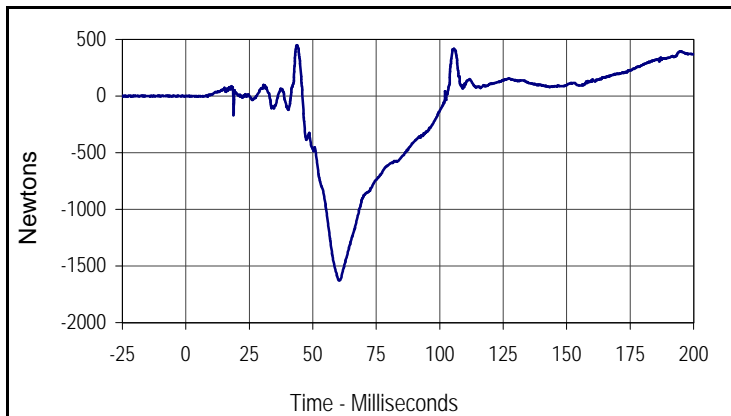
Test Date: 1/27/04
 NHTSA No.: M45111



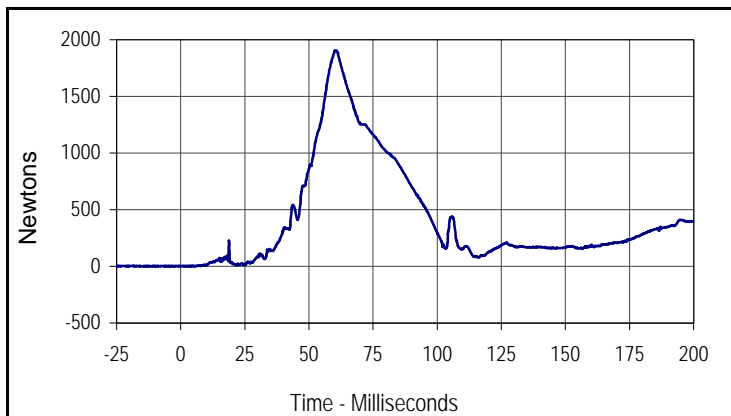
Curve Description			
Passenger Upper Neck Force X			
CURNO	Type	SAE Class	Units
029	FIL	1000	Newtons
Max	Time	Min	Time
595.1	61.2	-41.0	120.6



Curve Description			
Passenger Upper Neck Force Y			
CURNO	Type	SAE Class	Units
030	FIL	1000	Newtons
Max	Time	Min	Time
141.8	141.9	-817.3	56.1



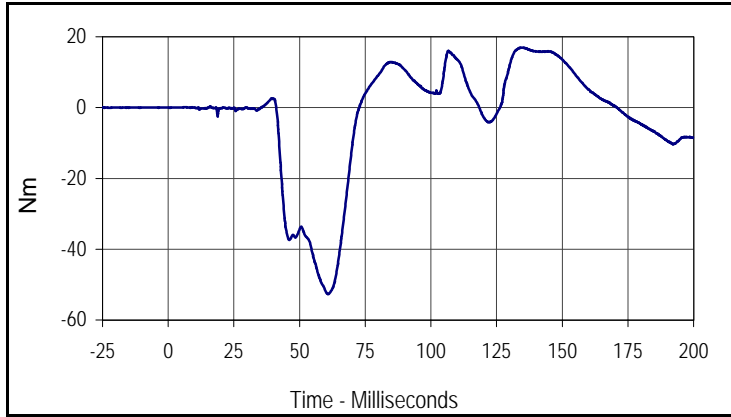
Curve Description			
Passenger Upper Neck Force Z			
CURNO	Type	SAE Class	Units
031	FIL	1000	Newtons
Max	Time	Min	Time
449.3	43.7	-1628.3	60.3



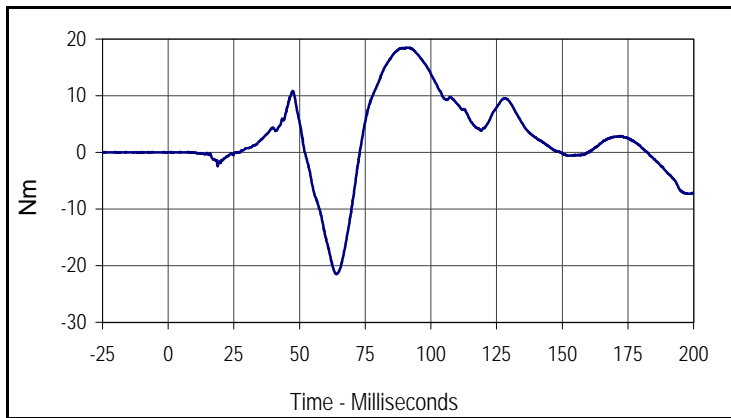
Curve Description			
Passenger Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
029	RES	1000	Newtons
Max	Time	Min	Time
1906.9	60.3	0.5	5.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

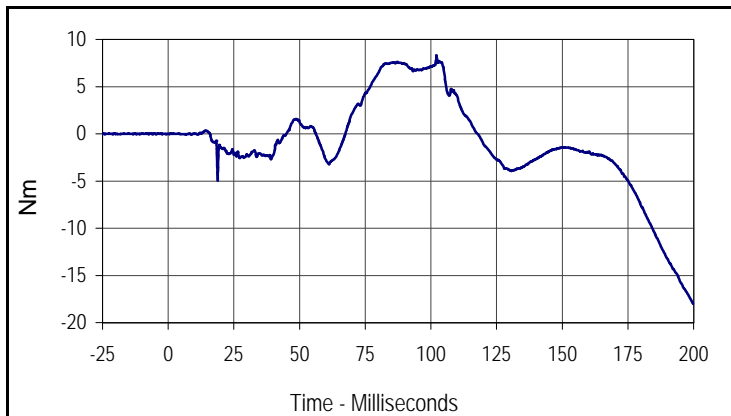
Test Date: 1/27/04
 NHTSA No.: M45111



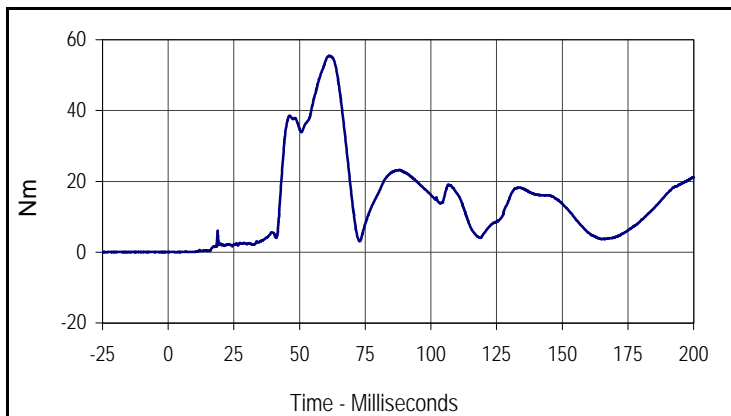
Curve Description			
Passenger Upper Neck Moment X			
CURNO	Type	SAE Class	Units
032	FIL	600	Nm
Max	Time	Min	Time
16.9	134.5	-52.6	60.9



Curve Description			
Passenger Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
033	FIL	600	Nm
Max	Time	Min	Time
18.5	91.3	-21.5	64.1



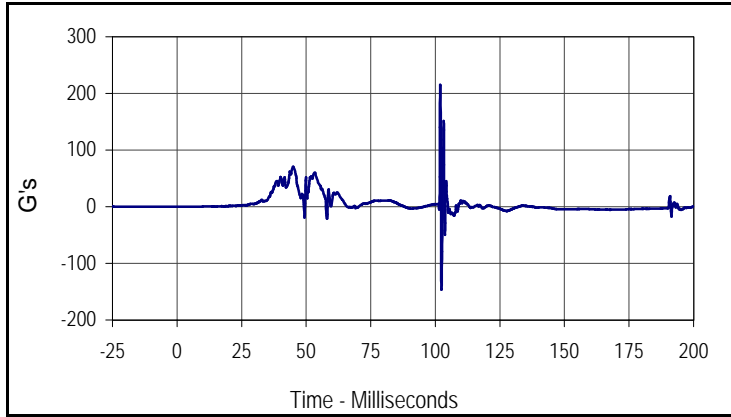
Curve Description			
Passenger Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
034	FIL	600	Nm
Max	Time	Min	Time
8.3	102.1	-18.0	200.0



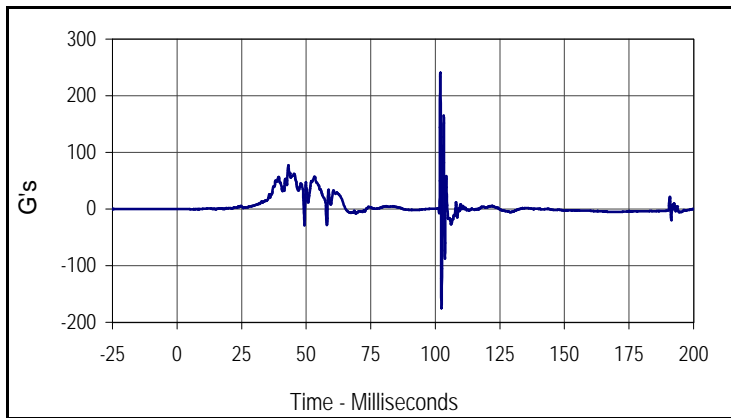
Curve Description			
Passenger Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
032	RES	600	Nm
Max	Time	Min	Time
55.5	61.3	0.0	3.1

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

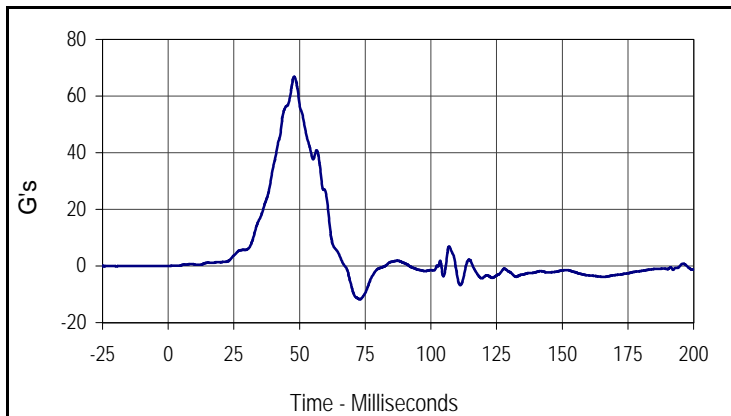
Test Date: 1/27/04
 NHTSA No.: M45111



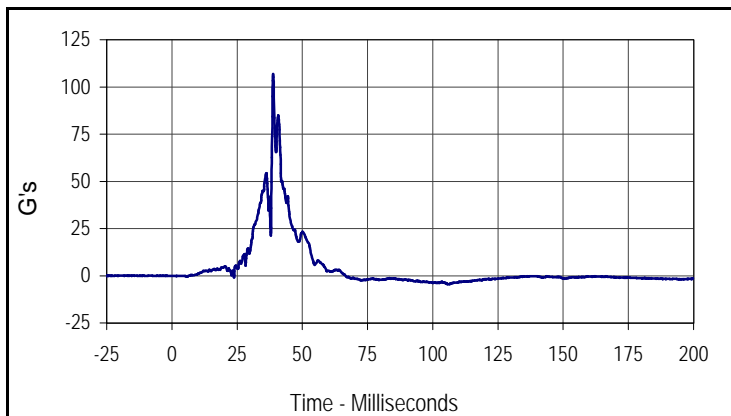
Curve Description			
Passenger Upper Rib Primary Y			
CURNO	Type	SAE Class	Units
035	FIL	1000	G's
Max	Time	Min	Time
215.0	101.9	-145.6	102.4



Curve Description			
Passenger Lower Rib Primary Y			
CURNO	Type	SAE Class	Units
036	FIL	1000	G's
Max	Time	Min	Time
240.1	102.0	-174.8	102.4



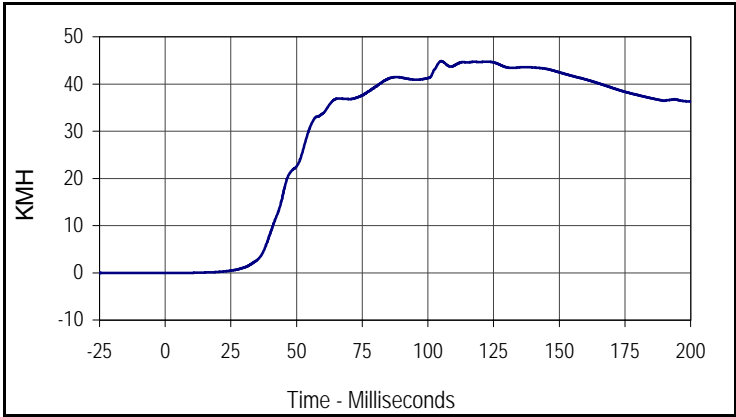
Curve Description			
Passenger Lower Spine Primary Y			
CURNO	Type	SAE Class	Units
037	FIL	180	G's
Max	Time	Min	Time
66.8	47.9	-11.8	73.0



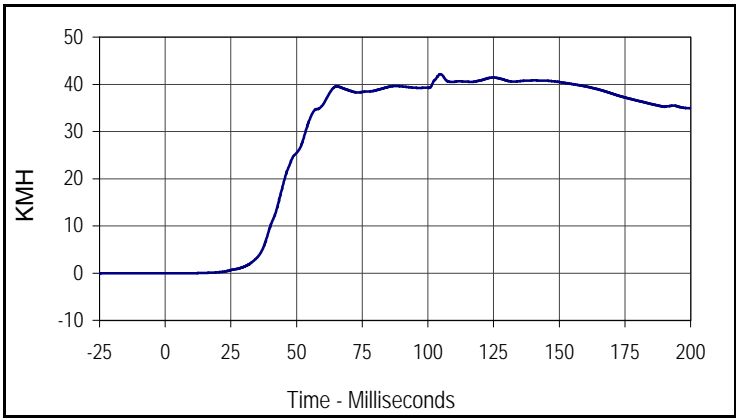
Curve Description			
Passenger Pelvis Primary Y			
CURNO	Type	SAE Class	Units
038	FIL	1000	G's
Max	Time	Min	Time
106.8	38.8	-4.5	106.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

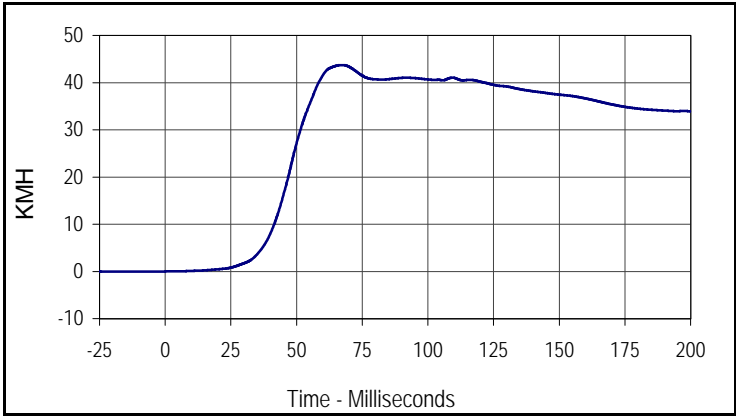
Test Date: 1/27/04
 NHTSA No.: M45111



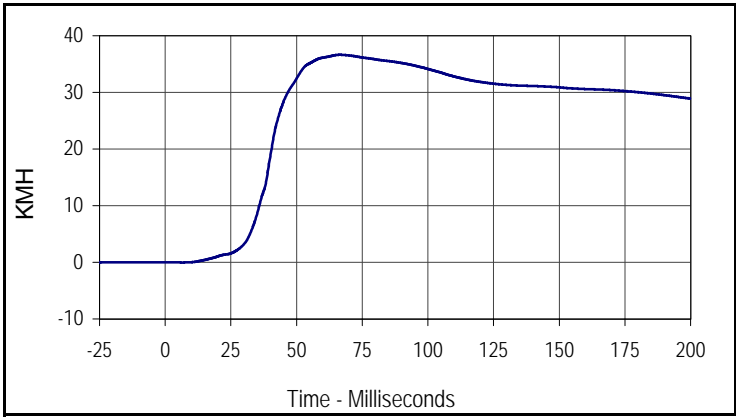
Curve Description			
Passenger Upper Rib Primary Y Velocity			
CURNO	Type	SAE Class	Units
035	IN1	180	KMH
Max	Time	Min	Time
44.8	105.0	0.0	9.2



Curve Description			
Passenger Lower Rib Primary Y Velocity			
CURNO	Type	SAE Class	Units
036	IN1	180	KMH
Max	Time	Min	Time
42.2	104.8	-0.1	9.6



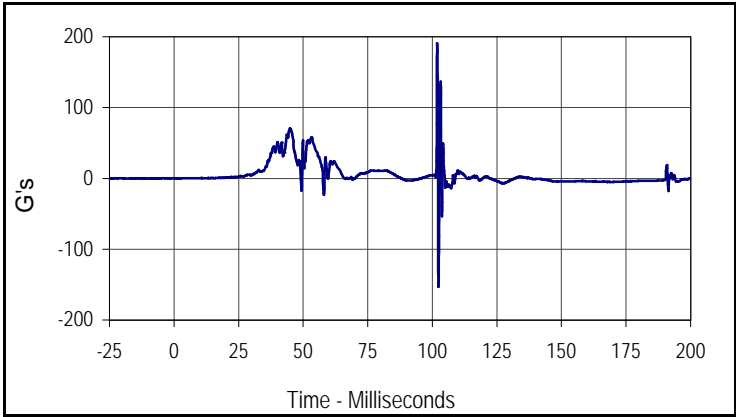
Curve Description			
Passenger Lower Spine Primary Y Velocity			
CURNO	Type	SAE Class	Units
037	IN1	180	KMH
Max	Time	Min	Time
43.7	67.2	0.0	0.0



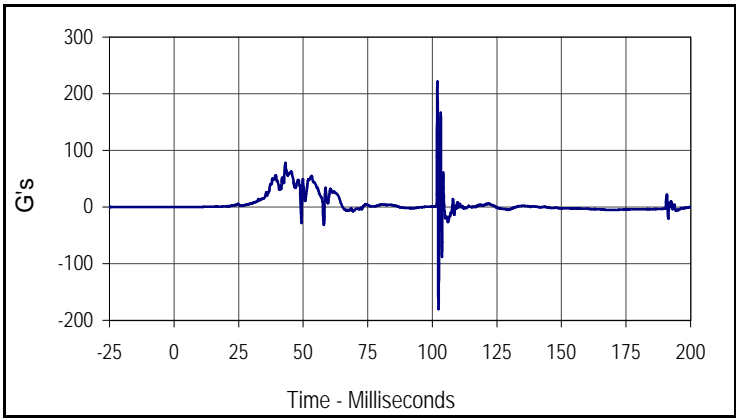
Curve Description			
Passenger Pelvis Primary Y Velocity			
CURNO	Type	SAE Class	Units
038	IN1	180	KMH
Max	Time	Min	Time
36.6	66.5	0.0	6.5

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

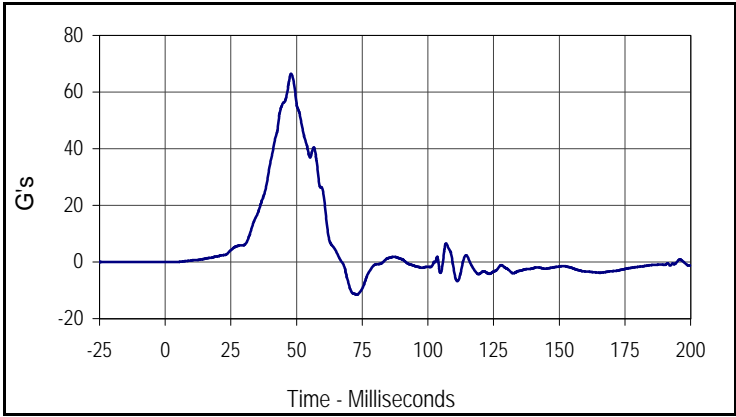
Test Date: 1/27/04
 NHTSA No.: M45111



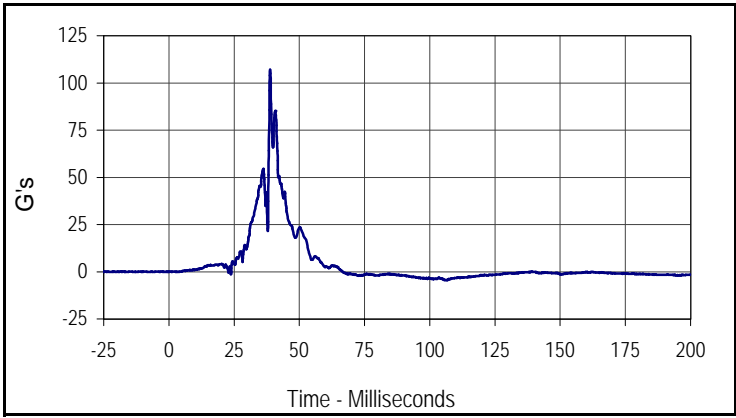
Curve Description			
Passenger Upper Rib Redundant Y			
CURNO	Type	SAE Class	Units
039	FIL	1000	G's
Max	Time	Min	Time
190.0	101.9	-152.1	102.4



Curve Description			
Passenger Lower Rib Redundant Y			
CURNO	Type	SAE Class	Units
040	FIL	1000	G's
Max	Time	Min	Time
220.9	102.0	-178.9	102.4



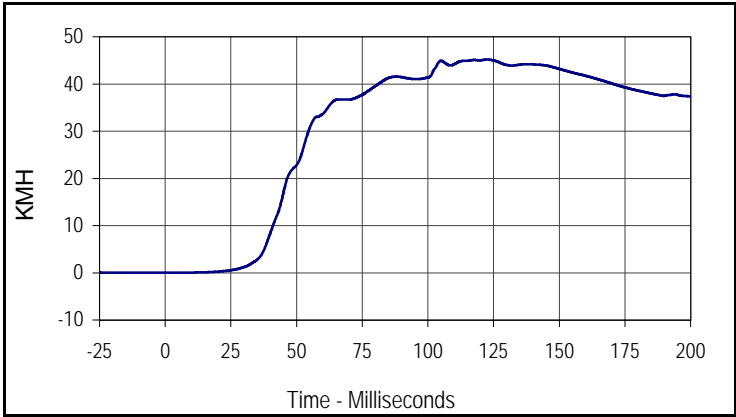
Curve Description			
Passenger Lower Spine Redundant Y			
CURNO	Type	SAE Class	Units
041	FIL	180	G's
Max	Time	Min	Time
66.4	47.9	-11.5	72.9



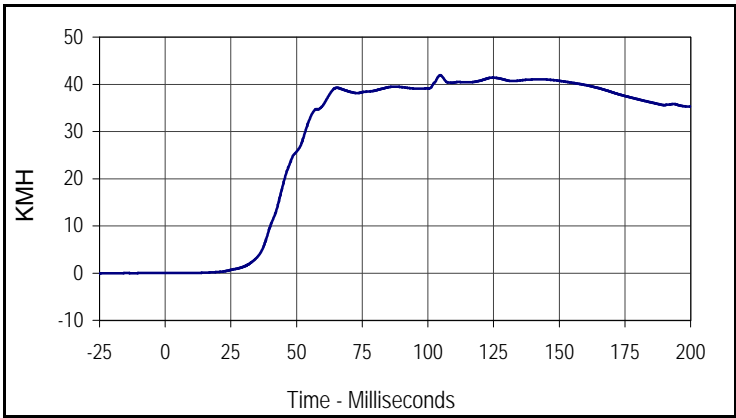
Curve Description			
Passenger Pelvis Redundant Y			
CURNO	Type	SAE Class	Units
042	FIL	1000	G's
Max	Time	Min	Time
107.0	38.8	-4.5	106.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

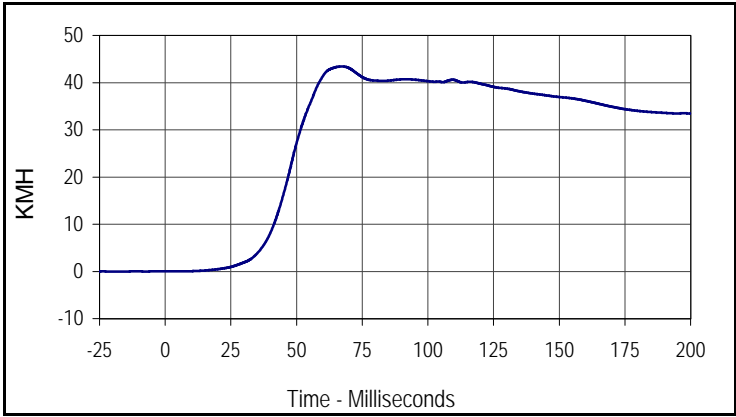
Test Date: 1/27/04
 NHTSA No.: M45111



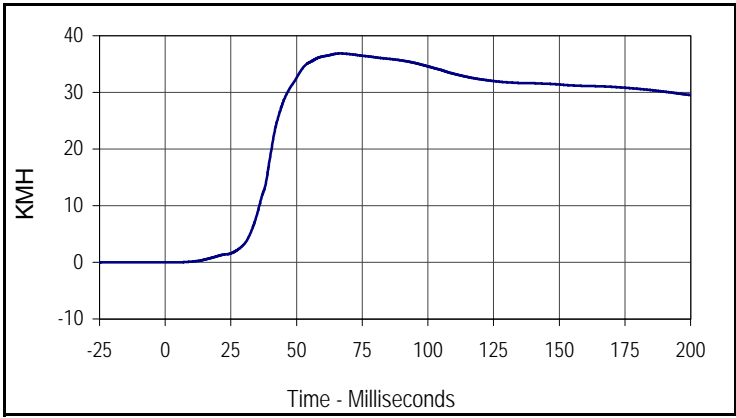
Curve Description			
Passenger Upper Rib Redundant Y Velocity			
CURNO	Type	SAE Class	Units
039	IN1	180	KMH
Max	Time	Min	Time
45.2	122.4	0.0	0.0



Curve Description			
Passenger Lower Rib Redundant Y Velocity			
CURNO	Type	SAE Class	Units
040	IN1	180	KMH
Max	Time	Min	Time
41.9	104.7	0.0	5.0



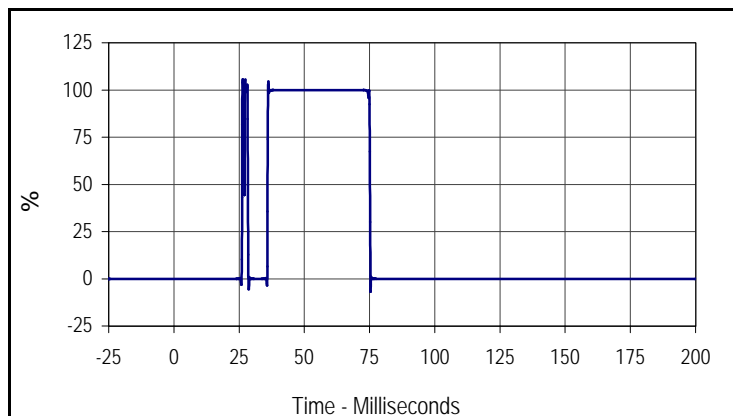
Curve Description			
Passenger Lower Spine Redundant Y Velocity			
CURNO	Type	SAE Class	Units
041	IN1	180	KMH
Max	Time	Min	Time
43.4	67.2	0.0	0.0



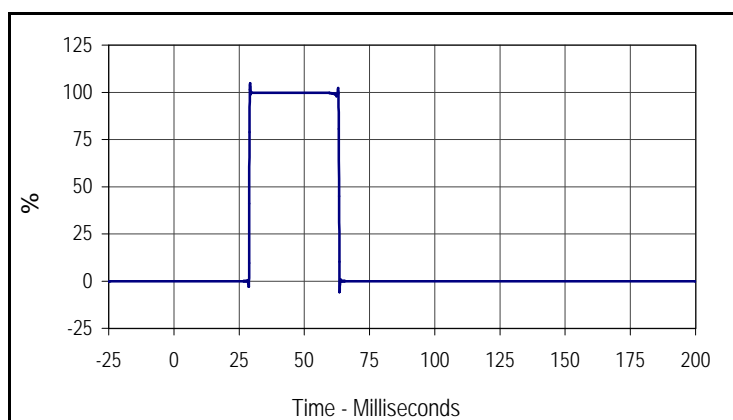
Curve Description			
Passenger Pelvis Redundant Y Velocity			
CURNO	Type	SAE Class	Units
042	IN1	180	KMH
Max	Time	Min	Time
36.9	66.6	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

Test Date: 1/27/04
 NHTSA No.: M45111



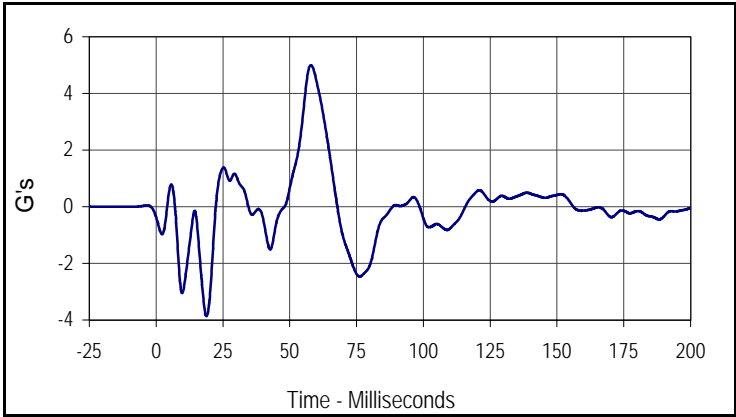
Curve Description			
Passenger Thorax Contact			
CURNO	Type	SAE Class	Units
043	FIL	1000	%
Max	Time	Cross %	Time
105.7	26.4	50.0	25.8



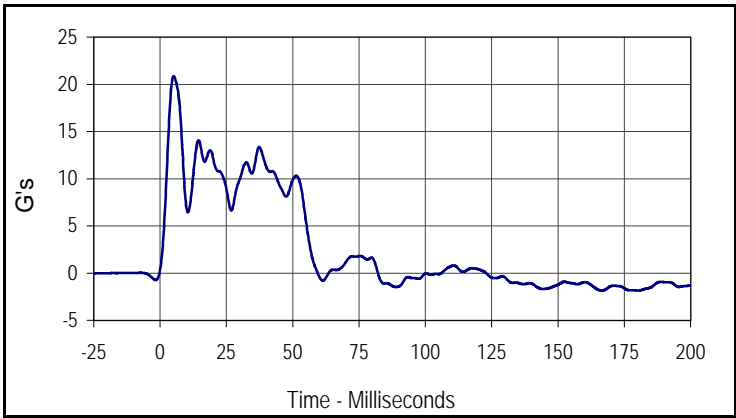
Curve Description			
Passenger Pelvis Contact			
CURNO	Type	SAE Class	Units
044	FIL	1000	%
Max	Time	Cross %	Time
104.8	29.2	50.0	28.6

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

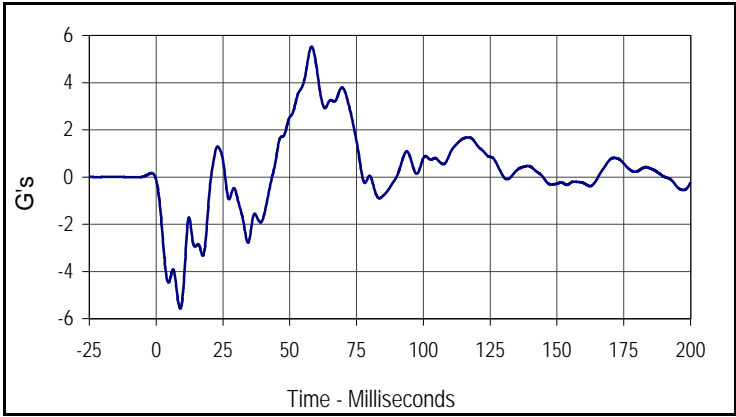
Test Date: 1/27/04
 NHTSA No.: M45111



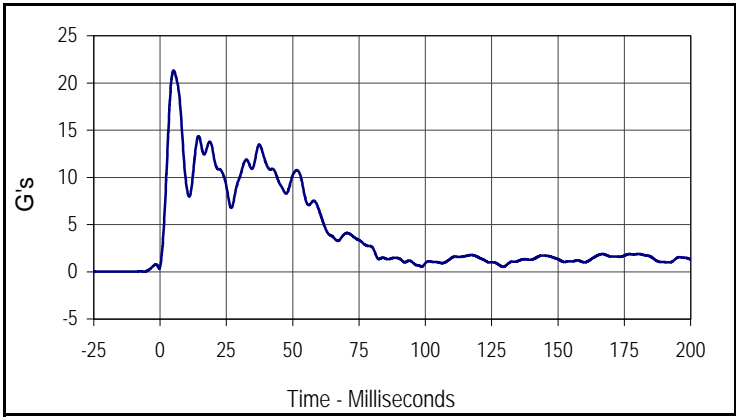
Curve Description			
Vehicle Right Sill at Front Seat X			
CURNO	Type	SAE Class	Units
045	FIL	60	G's
Max	Time	Min	Time
5.0	57.9	-3.9	18.8



Curve Description			
Vehicle Right Sill at Front Seat Y			
CURNO	Type	SAE Class	Units
046	FIL	60	G's
Max	Time	Min	Time
20.9	5.1	-1.9	166.6



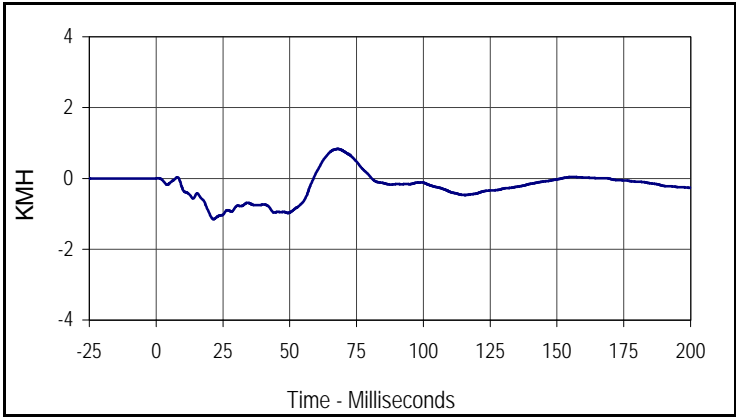
Curve Description			
Vehicle Right Sill at Front Seat Z			
CURNO	Type	SAE Class	Units
047	FIL	60	G's
Max	Time	Min	Time
5.5	58.2	-5.6	9.0



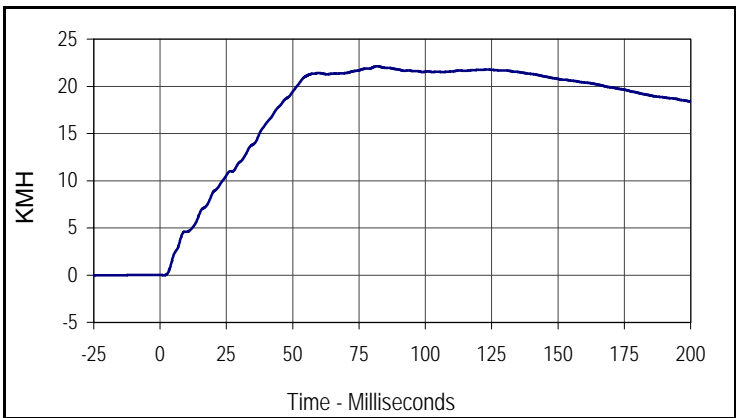
Curve Description			
Vehicle Right Sill Front Seat Resultant			
CURNO	Type	SAE Class	Units
045	RES	60	G's
Max	Time	Min	Time
21.3	5.1	0.5	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

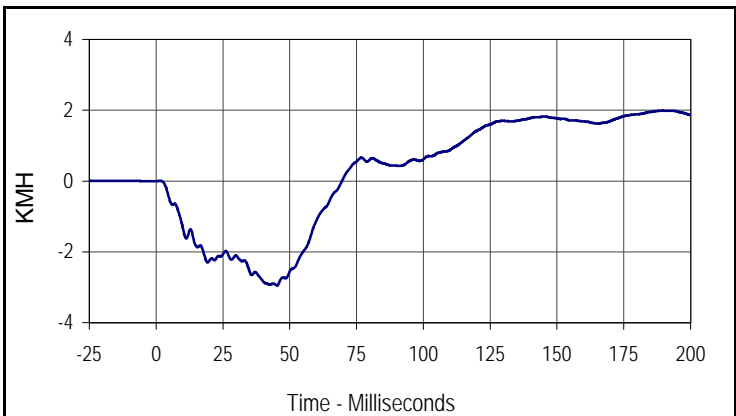
Test Date: 1/27/04
 NHTSA No.: M45111



Curve Description			
Vehicle Right Sill at Front Seat X Velocity			
CURNO	Type	SAE Class	Units
045	IN1	180	KMH
Max	Time	Min	Time
0.8	68.0	-1.2	21.5



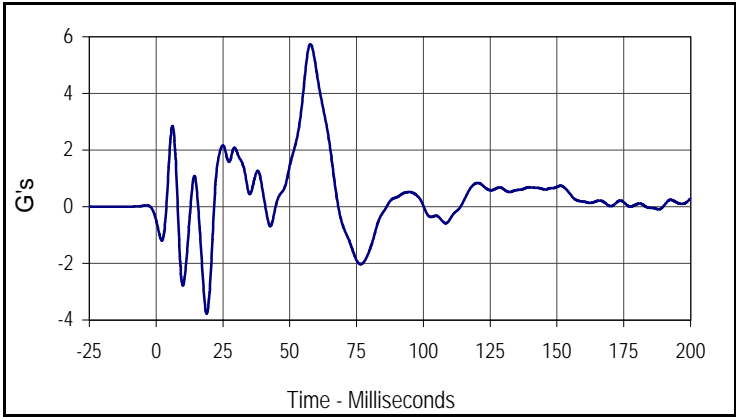
Curve Description			
Vehicle Right Sill at Front Seat Y Velocity			
CURNO	Type	SAE Class	Units
046	IN1	180	KMH
Max	Time	Min	Time
22.1	81.8	0.0	1.6



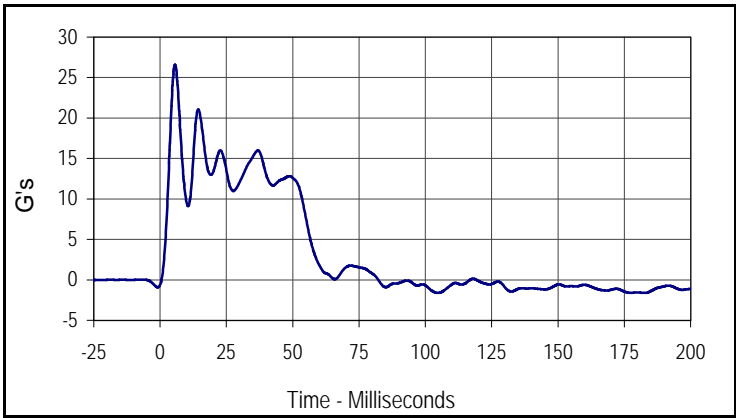
Curve Description			
Vehicle Right Sill at Front Seat Z Velocity			
CURNO	Type	SAE Class	Units
047	IN1	180	KMH
Max	Time	Min	Time
2.0	189.6	-3.0	45.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

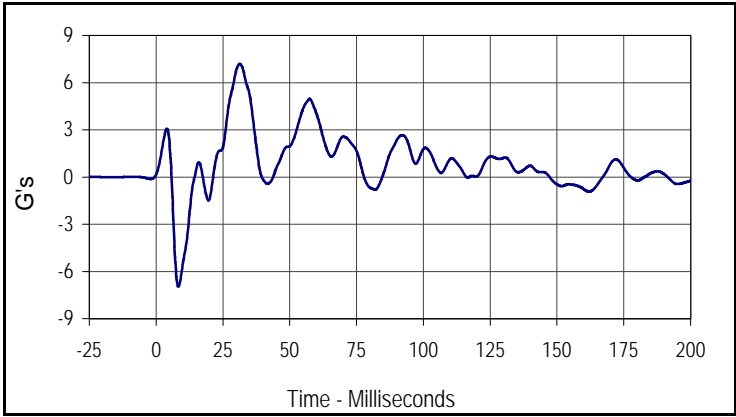
Test Date: 1/27/04
 NHTSA No.: M45111



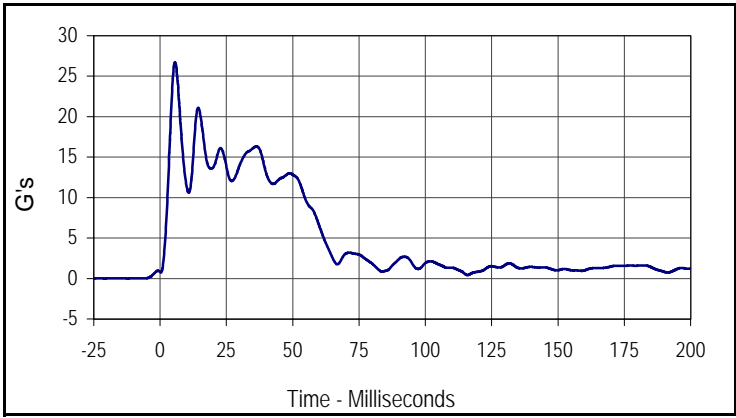
Curve Description			
Vehicle Right Sill at Rear Seat X			
CURNO	Type	SAE Class	Units
048	FIL	60	G's
Max	Time	Min	Time
5.7	57.7	-3.8	18.9



Curve Description			
Vehicle Right Sill at Rear Seat Y			
CURNO	Type	SAE Class	Units
049	FIL	60	G's
Max	Time	Min	Time
26.6	5.6	-1.6	182.9



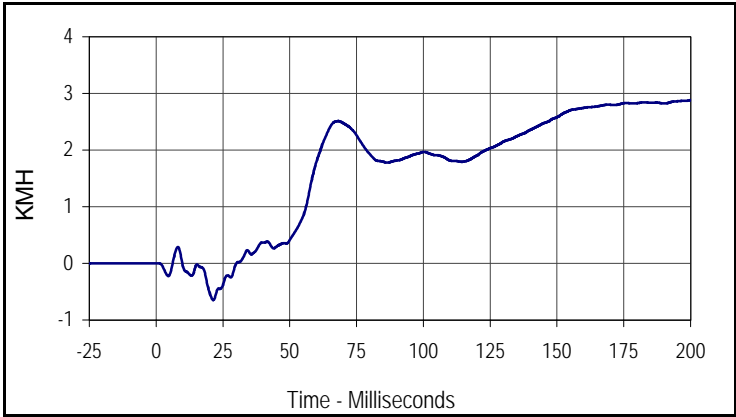
Curve Description			
Vehicle Right Sill at Rear Seat Z			
CURNO	Type	SAE Class	Units
050	FIL	60	G's
Max	Time	Min	Time
7.2	31.3	-7.0	8.4



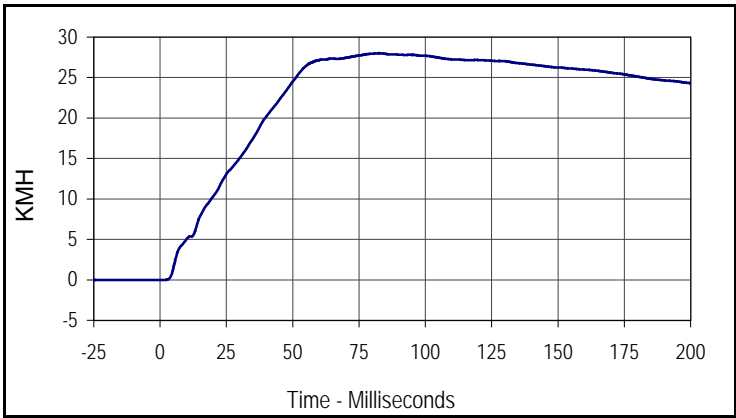
Curve Description			
Vehicle Right Sill Rear Seat Resultant			
CURNO	Type	SAE Class	Units
048	RES	60	G's
Max	Time	Min	Time
26.7	5.6	0.4	115.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

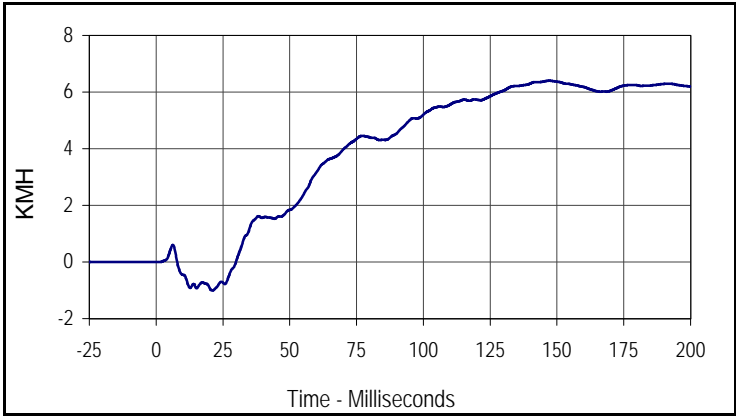
Test Date: 1/27/04
 NHTSA No.: M45111



Curve Description			
Vehicle Right Sill at Rear Seat X Velocity			
CURNO	Type	SAE Class	Units
048	IN1	180	KMH
Max	Time	Min	Time
2.9	200.0	-0.6	21.4



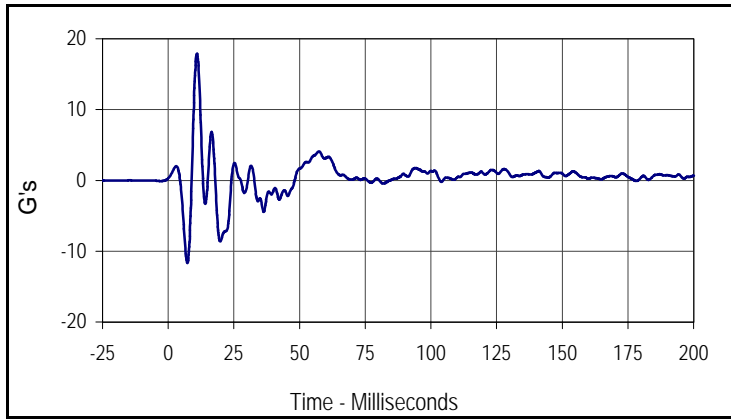
Curve Description			
Vehicle Right Sill at Rear Seat Y Velocity			
CURNO	Type	SAE Class	Units
049	IN1	180	KMH
Max	Time	Min	Time
28.0	82.4	0.0	1.7



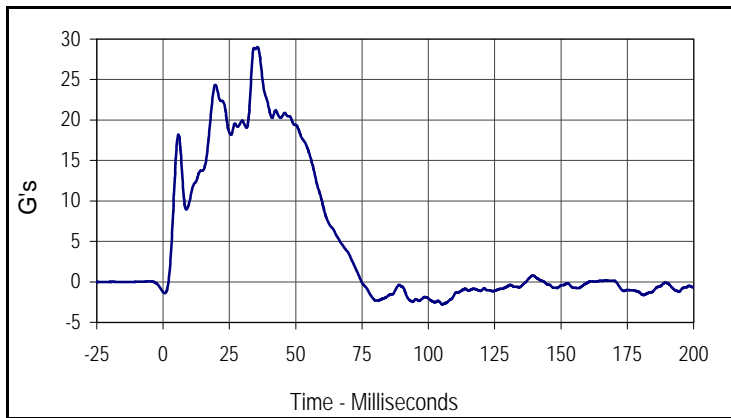
Curve Description			
Vehicle Right Sill at Rear Seat Z Velocity			
CURNO	Type	SAE Class	Units
050	IN1	180	KMH
Max	Time	Min	Time
6.4	147.1	-1.0	21.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

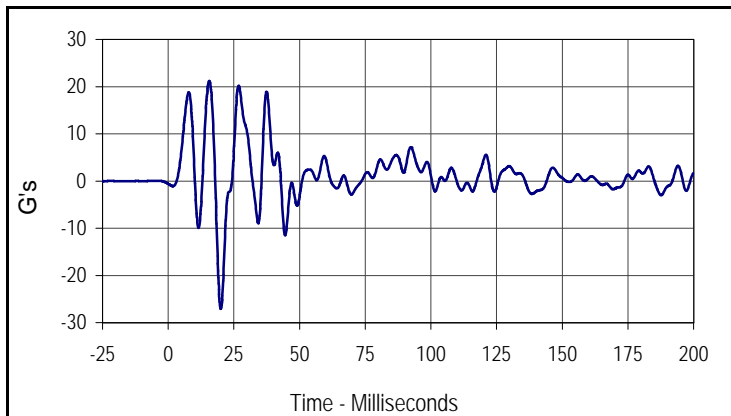
Test Date: 1/27/04
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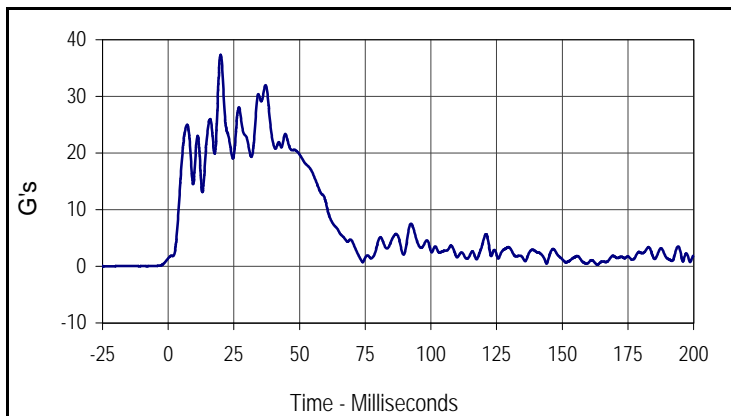
Curve Description			
Vehicle Rear Floor Above Axle X			
CURNO	Type	SAE Class	Units
051	FIL	60	G's
Max	Time	Min	Time
17.9	10.9	-11.7	7.3



Curve Description			
Vehicle Rear Floor Above Axle Y			
CURNO	Type	SAE Class	Units
052	FIL	60	G's
Max	Time	Min	Time
29.0	35.6	-2.8	105.2



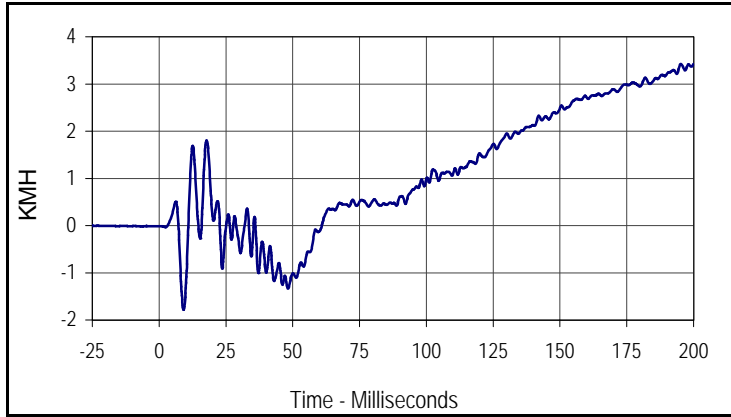
Curve Description			
Vehicle Rear Floor Above Axle Z			
CURNO	Type	SAE Class	Units
053	FIL	60	G's
Max	Time	Min	Time
21.2	15.6	-27.1	20.0



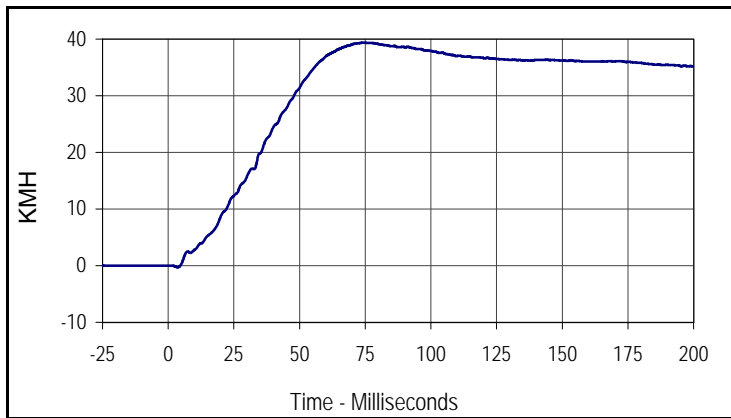
Curve Description			
Vehicle Rear Floor Above Axle Resultant			
CURNO	Type	SAE Class	Units
051	RES	60	G's
Max	Time	Min	Time
37.4	20.0	0.3	163.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

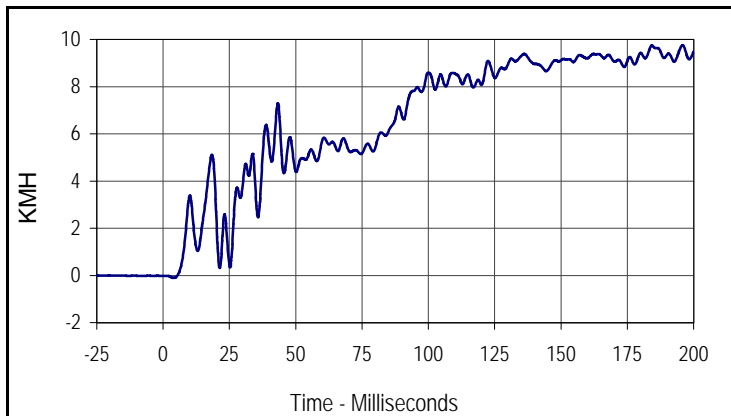
Test Date: 1/27/04
 NHTSA No.: M45111



Curve Description			
Vehicle Rear Floor Above Axle X Velocity			
CURNO	Type	SAE Class	Units
051	FIL	180	KMH
Max	Time	Min	Time
3.4	200.0	-1.8	9.2



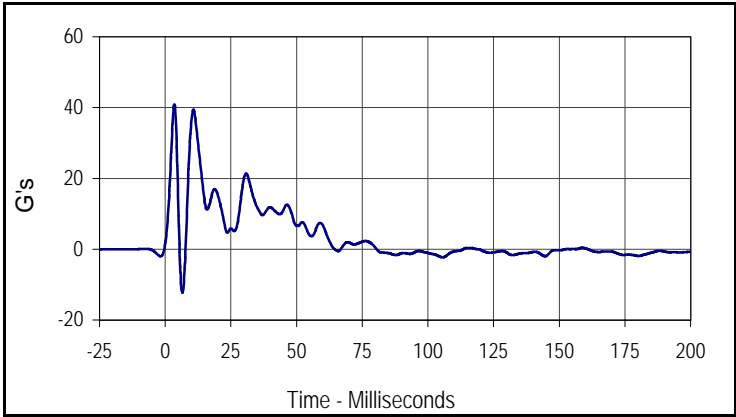
Curve Description			
Vehicle Rear Floor Above Axle Y Velocity			
CURNO	Type	SAE Class	Units
052	FIL	180	KMH
Max	Time	Min	Time
39.4	74.3	-0.3	3.6



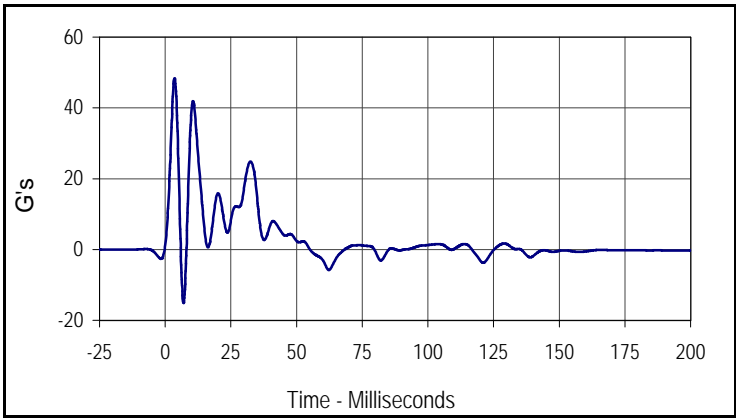
Curve Description			
Vehicle Rear Floor Above Axle Z Velocity			
CURNO	Type	SAE Class	Units
053	FIL	180	KMH
Max	Time	Min	Time
9.8	195.9	-0.1	3.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

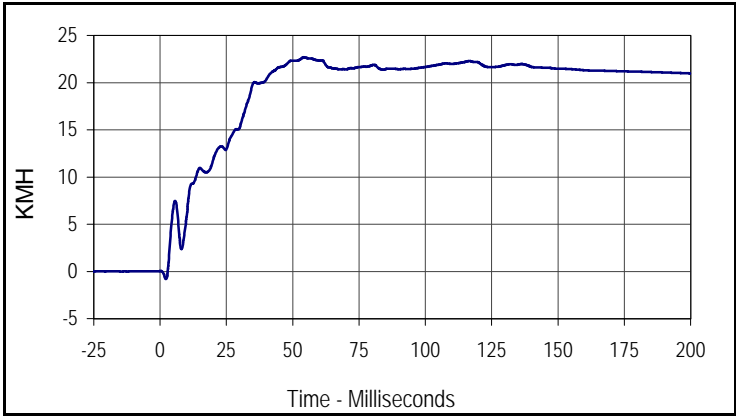
Test Date: 1/27/04
 NHTSA No.: M45111



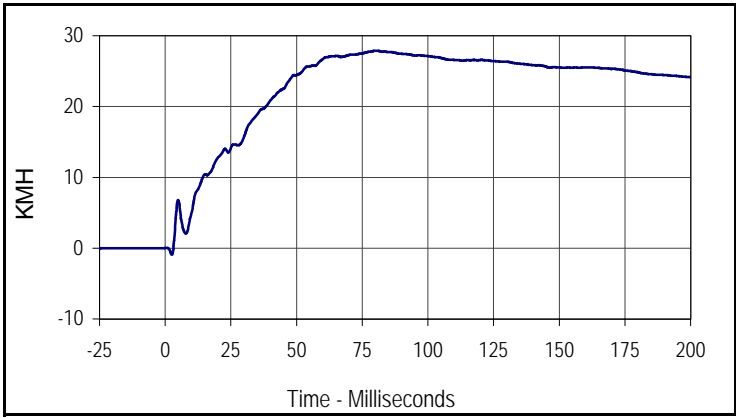
Curve Description			
Vehicle Left Sill at Rear Door Y			
CURNO	Type	SAE Class	Units
054	FIL	60	G's
Max	Time	Min	Time
40.8	3.5	-12.3	6.5



Curve Description			
Vehicle Left Sill at Front Door Y			
CURNO	Type	SAE Class	Units
055	FIL	60	G's
Max	Time	Min	Time
48.4	3.6	-15.2	7.0



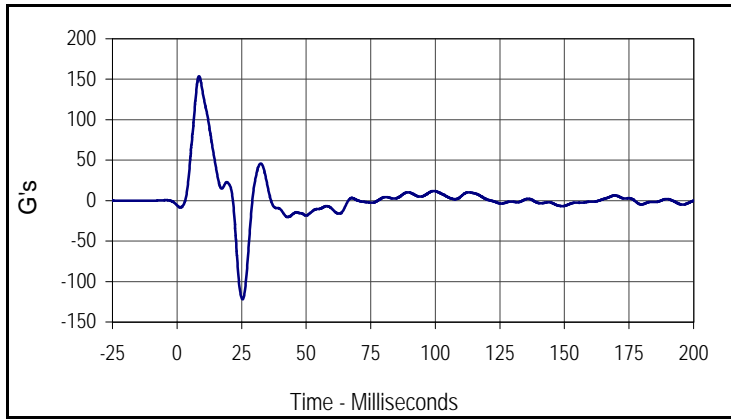
Curve Description			
Vehicle Left Sill at Rear Door Y Velocity			
CURNO	Type	SAE Class	Units
054	IN1	180	KMH
Max	Time	Min	Time
22.7	54.3	-0.8	2.2



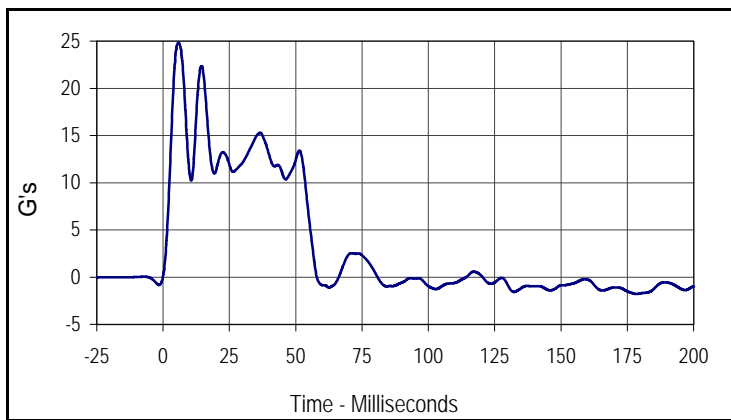
Curve Description			
Vehicle Left Sill at Front Door Y Velocity			
CURNO	Type	SAE Class	Units
055	IN1	180	KMH
Max	Time	Min	Time
27.9	80.0	-0.9	2.5

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

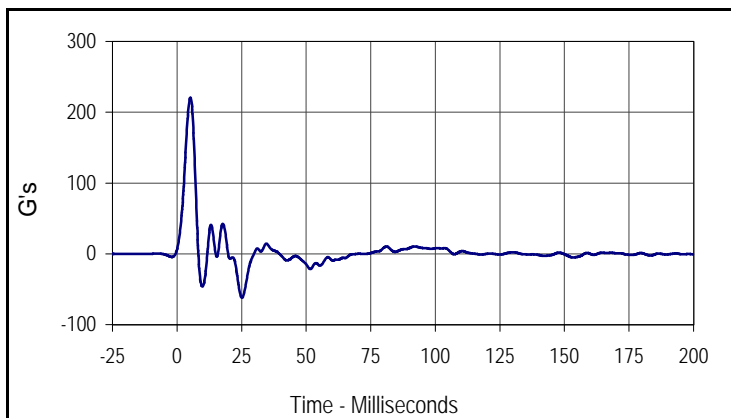
Test Date: 1/27/04
 NHTSA No.: M45111



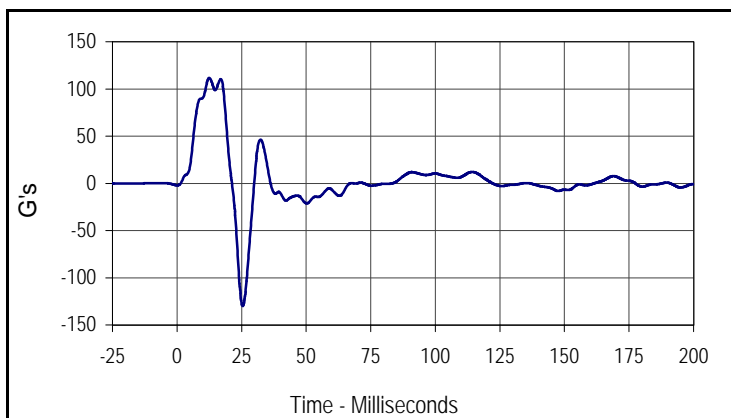
Curve Description			
Vehicle Left Front Door CL Y			
CURNO	Type	SAE Class	Units
056	FIL	60	G's
Max	Time	Min	Time
153.8	8.5	-122.0	25.4



Curve Description			
Vehicle Right Rear Occupant Compartment			
CURNO	Type	SAE Class	Units
057	FIL	60	G's
Max	Time	Min	Time
24.8	5.8	-1.8	178.5



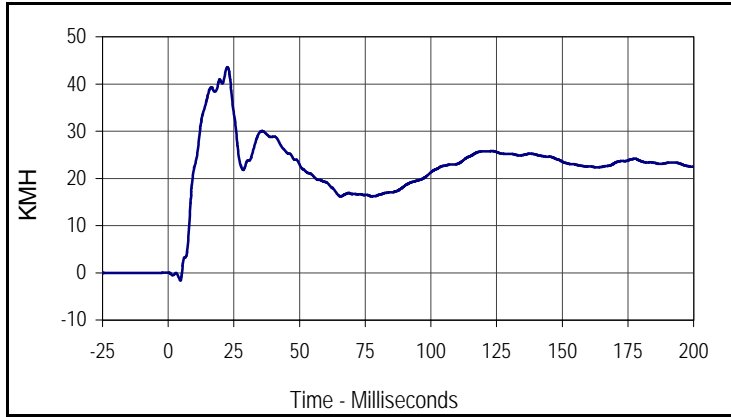
Curve Description			
Vehicle Left Front Door Mid Rear Y			
CURNO	Type	SAE Class	Units
058	FIL	60	G's
Max	Time	Min	Time
220.4	5.2	-62.2	25.1



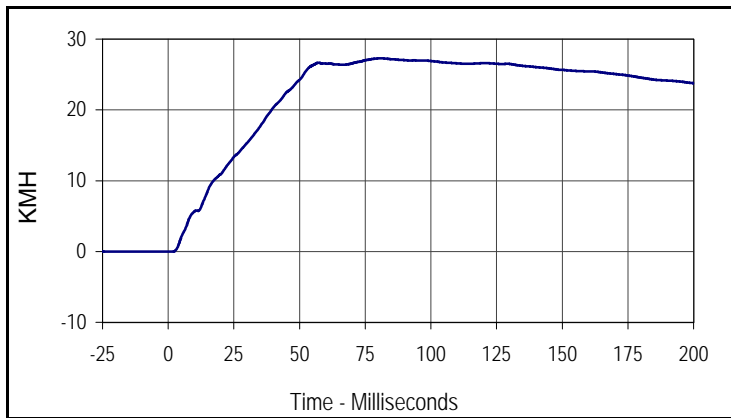
Curve Description			
Vehicle Left Front Door Upper CL Y			
CURNO	Type	SAE Class	Units
059	FIL	60	G's
Max	Time	Min	Time
111.7	12.4	-129.9	25.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

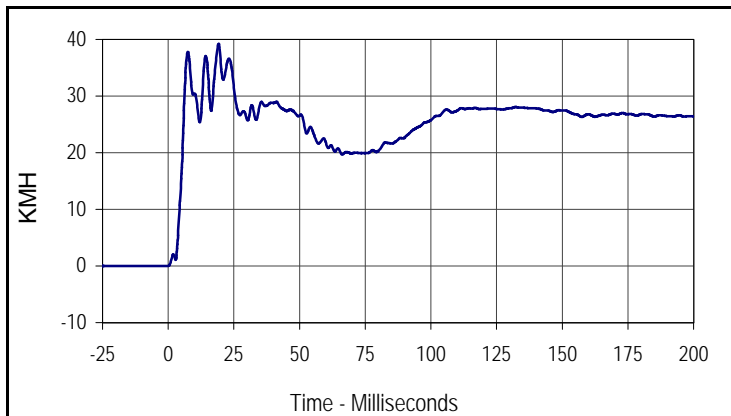
Test Date: 1/27/04
 NHTSA No.: M45111



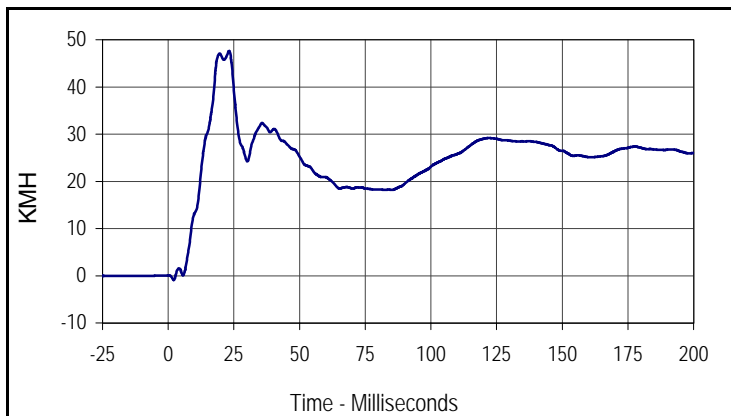
Curve Description			
Vehicle Left Front Door CL Y Velocity			
CURNO	Type	SAE Class	Units
056	IN1	180	KMH
Max	Time	Min	Time
43.5	22.5	-1.7	4.6



Curve Description			
Vehicle Right Rear Occupant Compartment Y Velocity			
CURNO	Type	SAE Class	Units
057	IN1	180	KMH
Max	Time	Min	Time
27.3	81.0	0.0	1.5



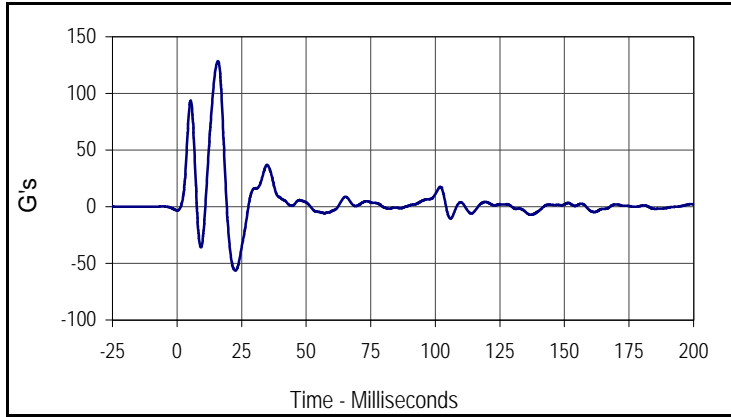
Curve Description			
Vehicle Left Front Door Mid Rear Y Velocity			
CURNO	Type	SAE Class	Units
058	IN1	180	KMH
Max	Time	Min	Time
39.2	19.2	0.0	0.0



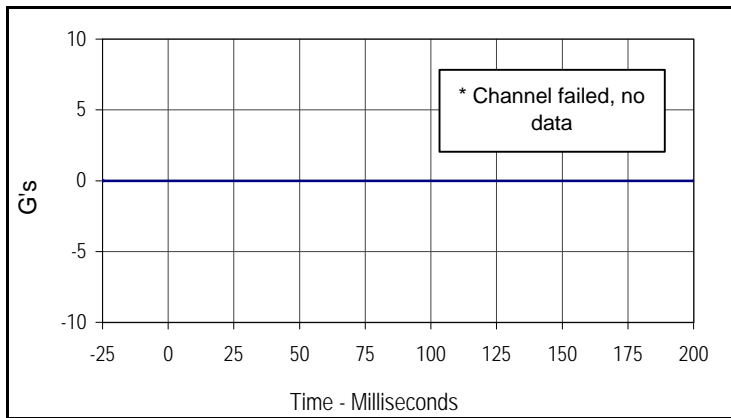
Curve Description			
Vehicle Left Front Door Upper CL Y Velocity			
CURNO	Type	SAE Class	Units
059	IN1	180	KMH
Max	Time	Min	Time
47.6	23.2	-0.9	2.1

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

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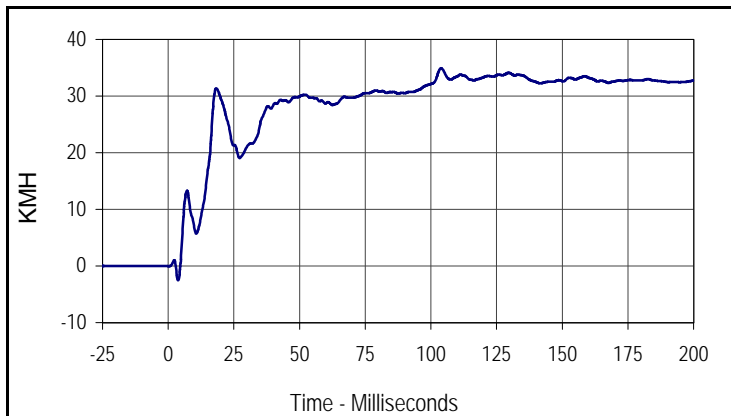


Curve Description			
Vehicle Left Rear Door Mid Rear Y			
CURNO	Type	SAE Class	Units
060	FIL	60	G's
Max	Time	Min	Time
128.5	15.8	-56.2	22.5

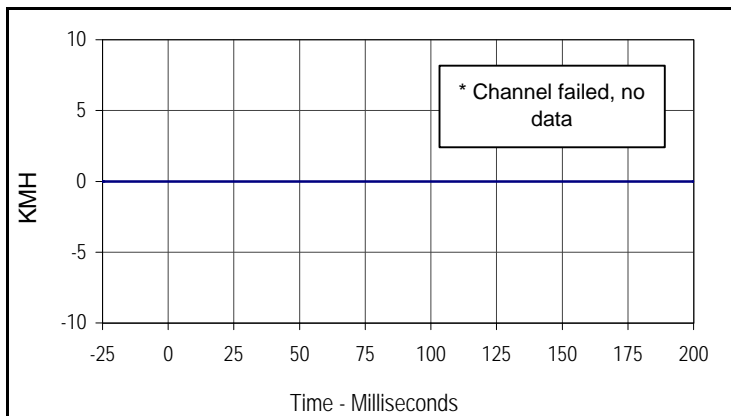


Curve Description			
Vehicle Left Rear Door Upper CL Y			
CURNO	Type	SAE Class	Units
061	FIL	60	G's
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Channel failed, no data



Curve Description			
Vehicle Left Rear Door Mid Rear Y Velocity			
CURNO	Type	SAE Class	Units
060	IN1	180	KMH
Max	Time	Min	Time
34.9	103.9	-2.6	3.8

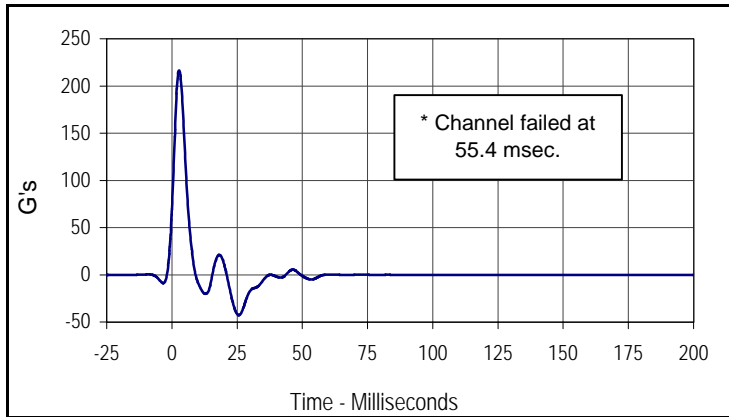


Curve Description			
Vehicle Left Rear Door Upper CL Y Velocity			
CURNO	Type	SAE Class	Units
061	IN1	180	KMH
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Channel failed, no data

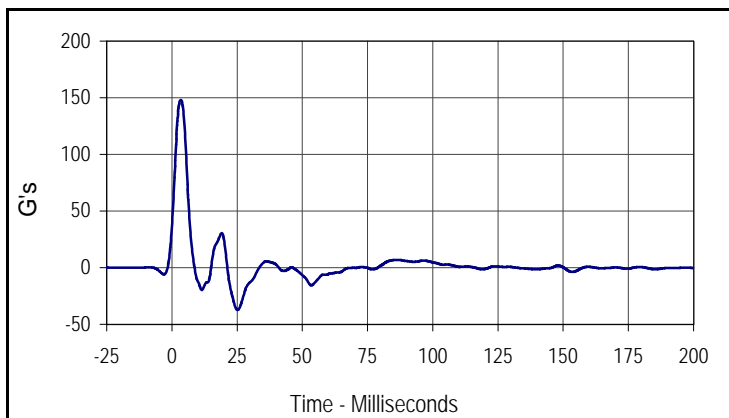
Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

Test Date: 1/27/04
 NHTSA No.: M45111

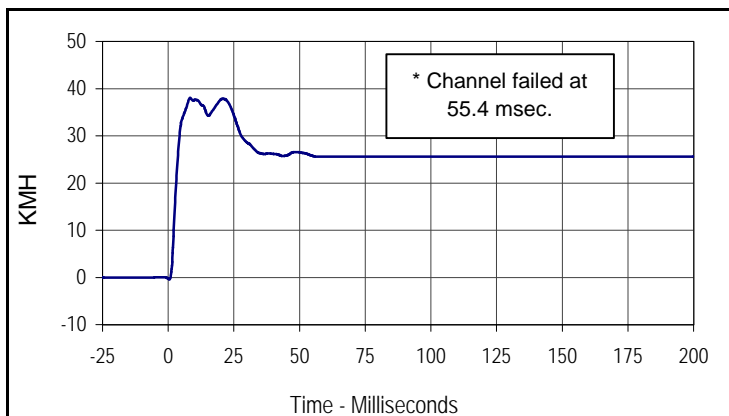


Curve Description			
Vehicle B-Post Lower Y			
CURNO	Type	SAE Class	Units
062	FIL	60	G's
Max	Time	Min	Time
216.6	2.8	-42.8	25.6

* Channel failed at 55.4 msec.

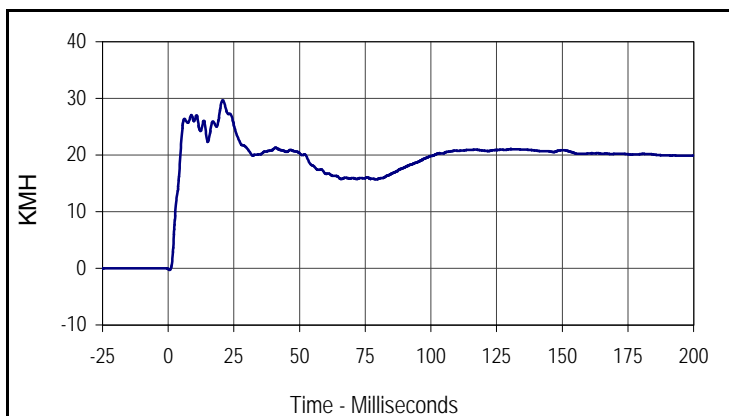


Curve Description			
Vehicle B-Post Middle Y			
CURNO	Type	SAE Class	Units
063	FIL	60	G's
Max	Time	Min	Time
148.1	3.4	-37.4	25.1



Curve Description			
Vehicle B-Post Lower Y Velocity			
CURNO	Type	SAE Class	Units
062	IN1	180	KMH
Max	Time	Min	Time
38.0	8.3	-0.4	0.4

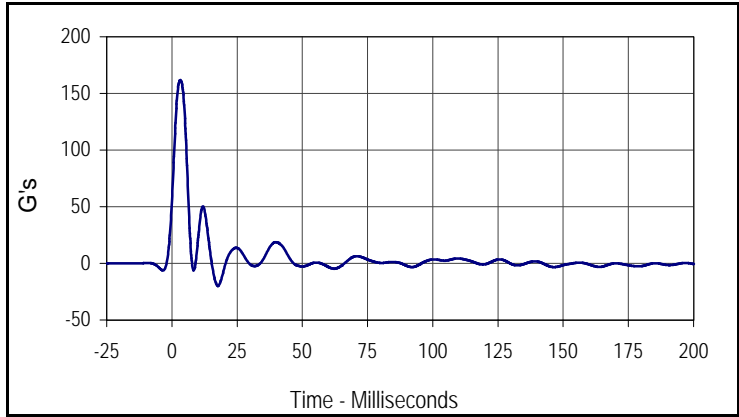
* Channel failed at 55.4 msec.



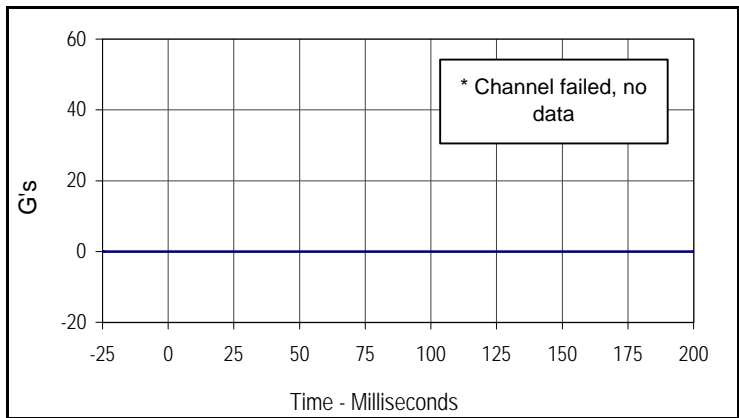
Curve Description			
Vehicle B-Post Middle Y Velocity			
CURNO	Type	SAE Class	Units
063	IN1	180	KMH
Max	Time	Min	Time
29.7	20.7	-0.3	0.6

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
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Test Date: 1/27/04
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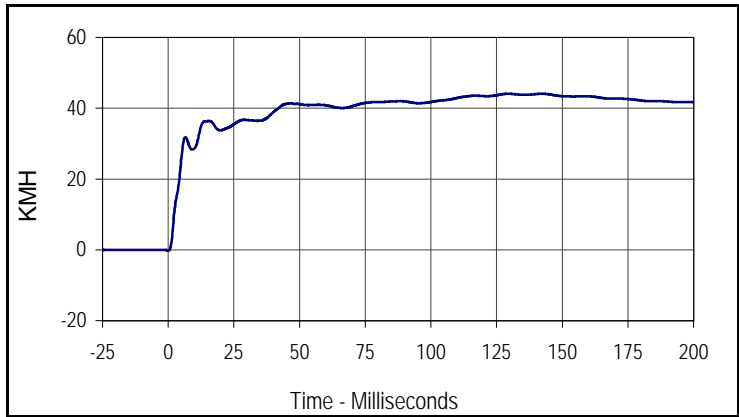


Curve Description			
Vehicle A-Post Lower Y			
CURNO	Type	SAE Class	Units
064	FIL	60	G's
Max	Time	Min	Time
161.8	3.2	-20.0	17.6

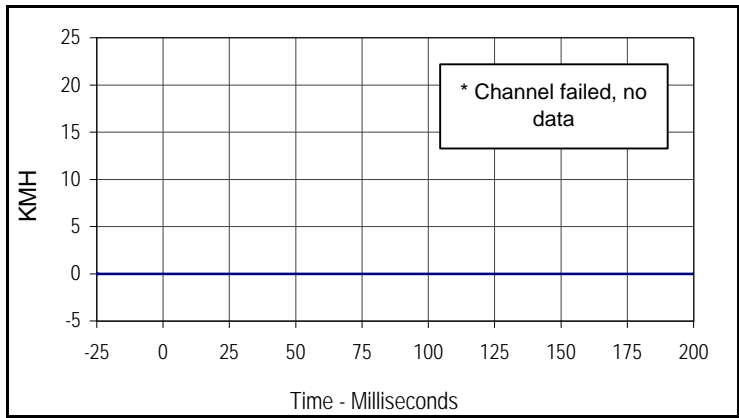


Curve Description			
Vehicle A-Post Middle Y			
CURNO	Type	SAE Class	Units
065	FIL	60	G's
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Channel failed, no data



Curve Description			
Vehicle A-Post Lower Y Velocity			
CURNO	Type	SAE Class	Units
064	IN1	180	KMH
Max	Time	Min	Time
44.1	142.2	-0.2	0.0

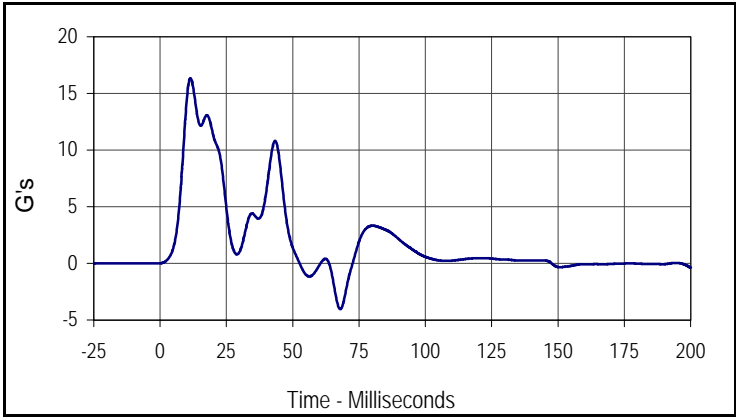


Curve Description			
Vehicle A-Post Middle Y Velocity			
CURNO	Type	SAE Class	Units
065	IN1	180	KMH
Max	Time	Min	Time
0.0	0.0	0.0	0.0

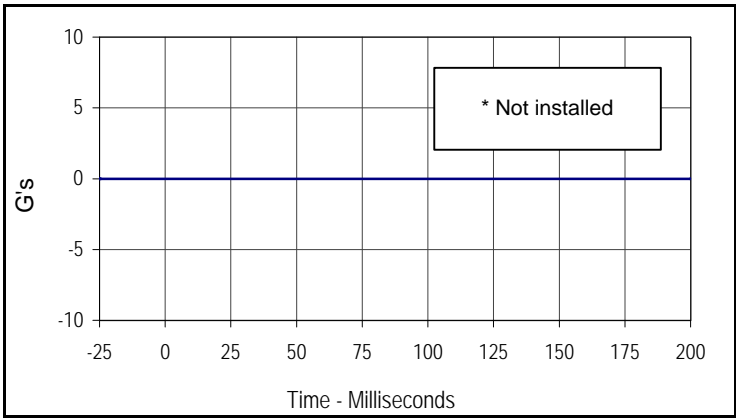
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Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

Test Date: 1/27/04
 NHTSA No.: M45111

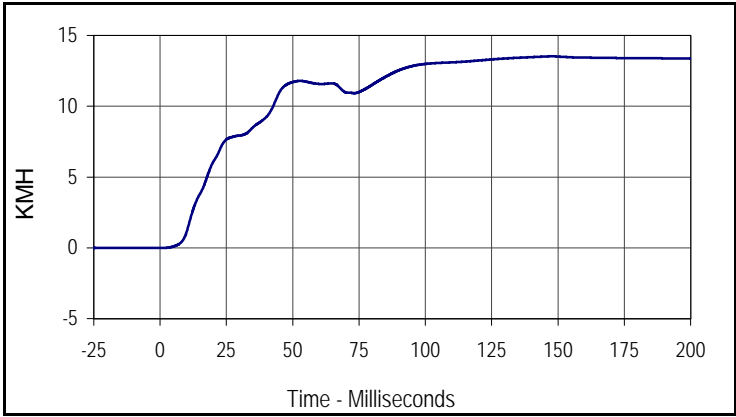


Curve Description			
Vehicle Left Front Seat Track			
CURNO	Type	SAE Class	Units
066	FIL	60	G's
Max	Time	Min	Time
16.3	11.4	-4.0	67.9

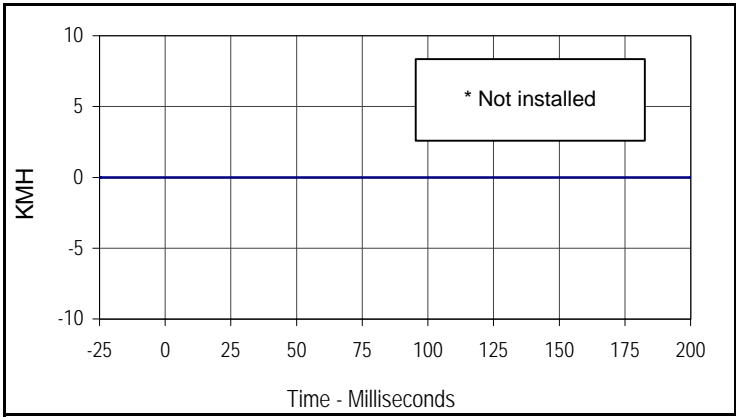


Curve Description			
Vehicle Rear Seat Structure			
CURNO	Type	SAE Class	Units
067	FIL	60	G's
Max	Time	Min	Time
0.0	0.0	0.0	0.0

* Not installed



Curve Description			
Vehicle Left Front Seat Track Y Velocity			
CURNO	Type	SAE Class	Units
066	IN1	180	KMH
Max	Time	Min	Time
13.5	147.6	0.0	0.0

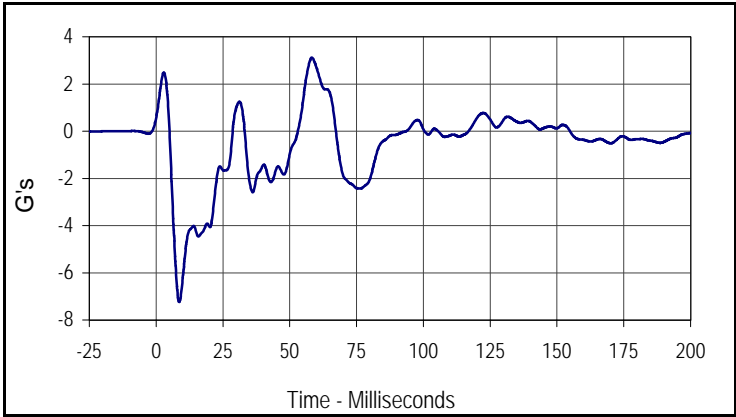


Curve Description			
Vehicle Rear Seat Structure Y Velocity			
CURNO	Type	SAE Class	Units
067	IN1	180	KMH
Max	Time	Min	Time
0.0	0.0	0.0	0.0

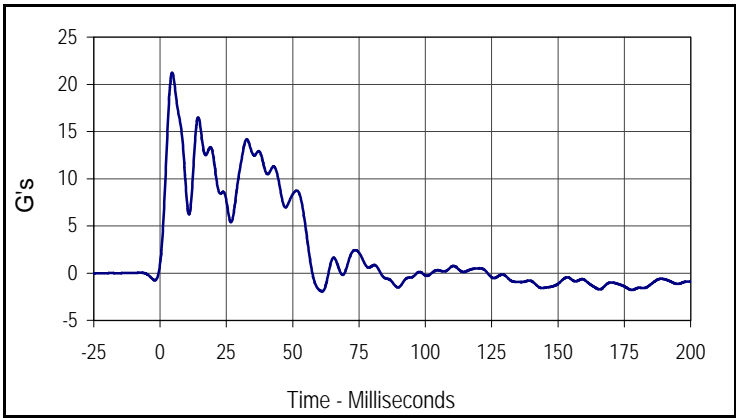
* Not installed

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

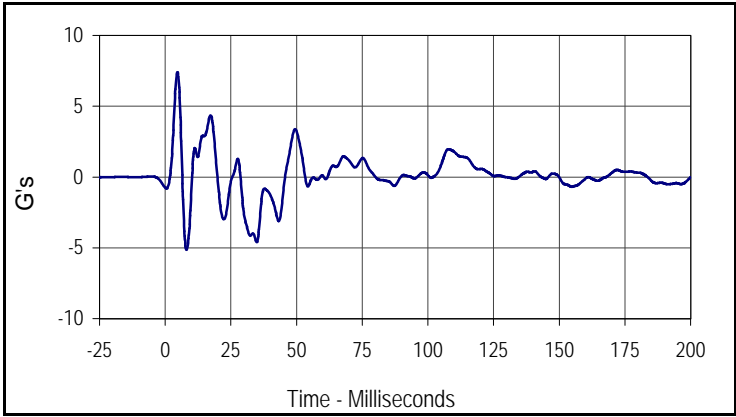
Test Date: 1/27/04
 NHTSA No.: M45111



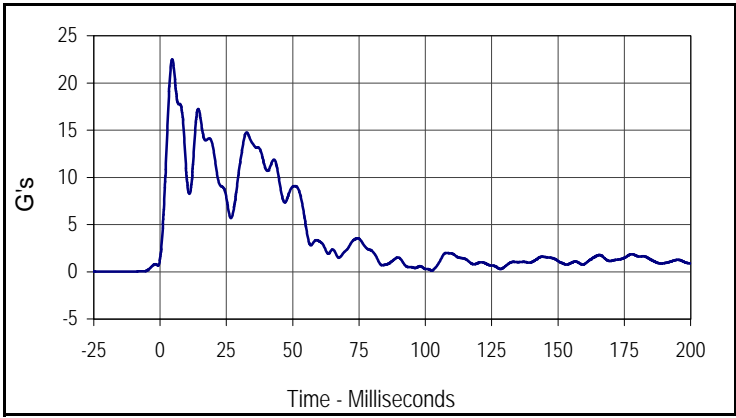
Curve Description			
Vehicle CG X			
CURNO	Type	SAE Class	Units
068	FIL	60	G's
Max	Time	Min	Time
3.1	58.3	-7.2	8.7



Curve Description			
Vehicle CG Y			
CURNO	Type	SAE Class	Units
069	FIL	60	G's
Max	Time	Min	Time
21.2	4.6	-1.9	61.1



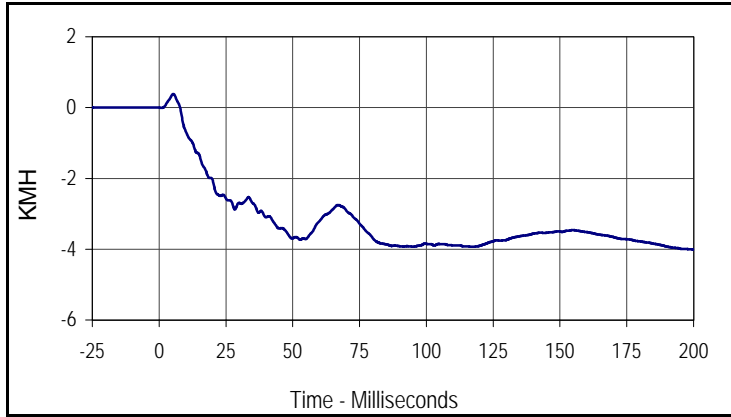
Curve Description			
Vehicle CG Z			
CURNO	Type	SAE Class	Units
070	FIL	60	G's
Max	Time	Min	Time
7.4	4.6	-5.1	8.1



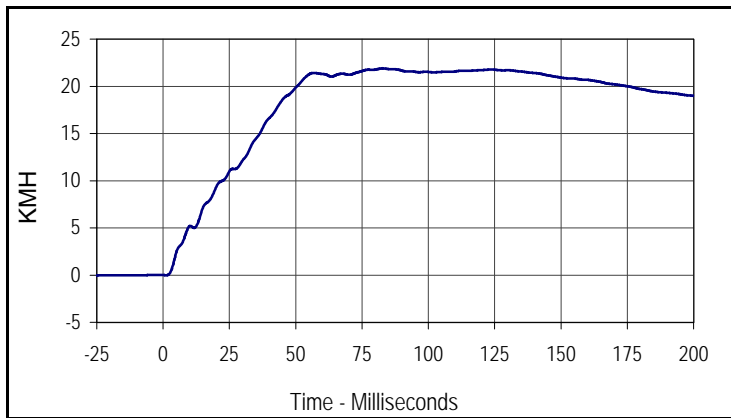
Curve Description			
Vehicle CG Resultant			
CURNO	Type	SAE Class	Units
068	RES	60	G's
Max	Time	Min	Time
22.5	4.6	0.1	102.5

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
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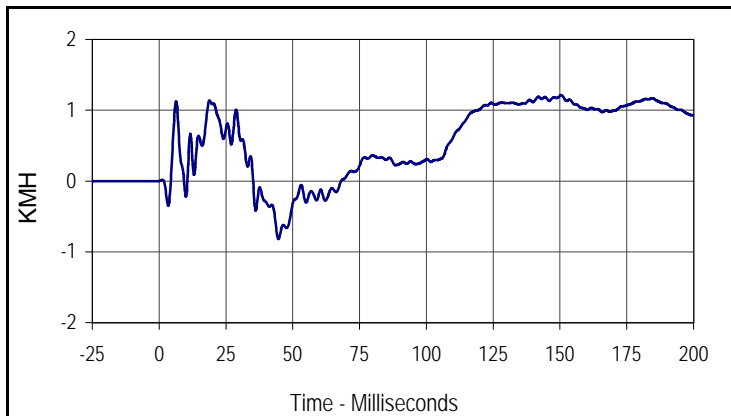
Test Date: 1/27/04
 NHTSA No.: M45111



Curve Description			
Vehicle CG X Velocity			
CURNO	Type	SAE Class	Units
068	IN1	180	KMH
Max	Time	Min	Time
0.4	5.3	-4.0	200.0



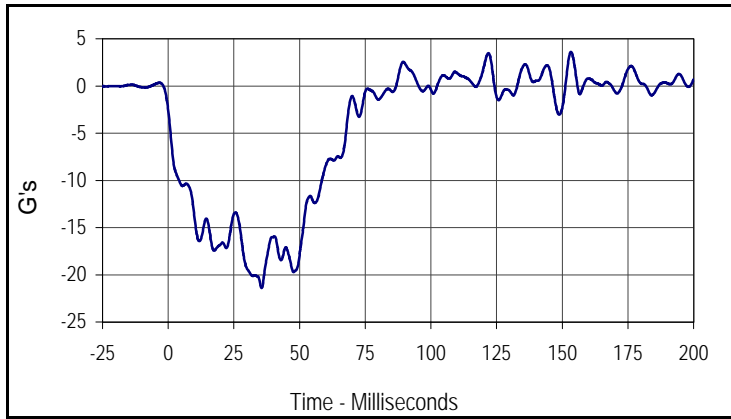
Curve Description			
Vehicle CG Y Velocity			
CURNO	Type	SAE Class	Units
069	IN1	180	KMH
Max	Time	Min	Time
21.9	82.7	0.0	1.2



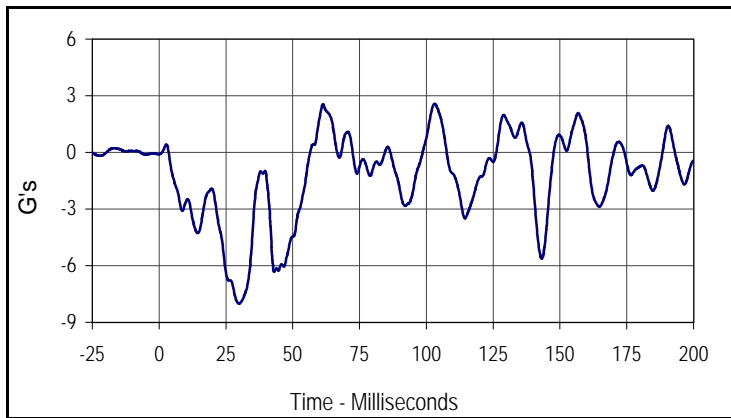
Curve Description			
Vehicle CG Z Velocity			
CURNO	Type	SAE Class	Units
070	IN1	180	KMH
Max	Time	Min	Time
1.2	150.5	-0.8	44.6

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

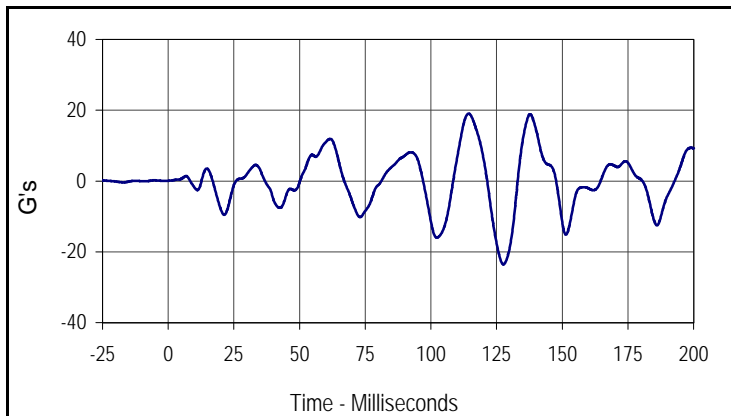
Test Date: 1/27/04
 NHTSA No.: M45111



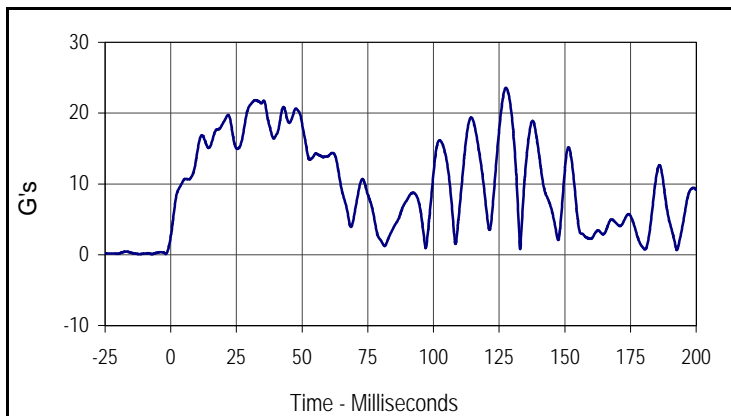
Curve Description			
MDB CG X			
CURNO	Type	SAE Class	Units
071	FIL	60	G's
Max	Time	Min	Time
3.6	153.3	-21.4	35.5



Curve Description			
MDB CG Y			
CURNO	Type	SAE Class	Units
072	FIL	60	G's
Max	Time	Min	Time
2.6	103.1	-8.0	29.8



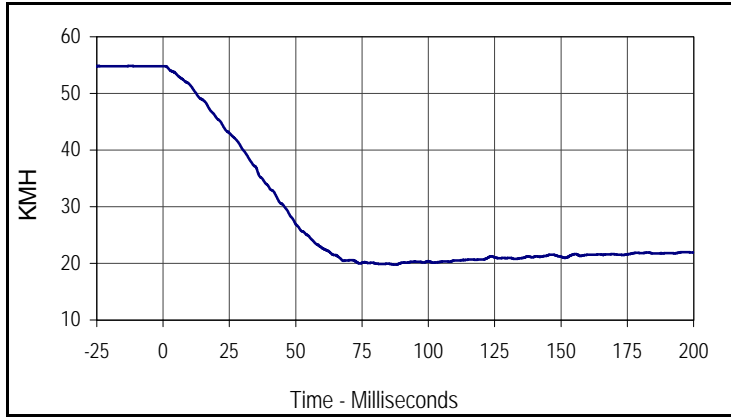
Curve Description			
MDB CG Z			
CURNO	Type	SAE Class	Units
073	FIL	60	G's
Max	Time	Min	Time
19.0	114.4	-23.5	127.6



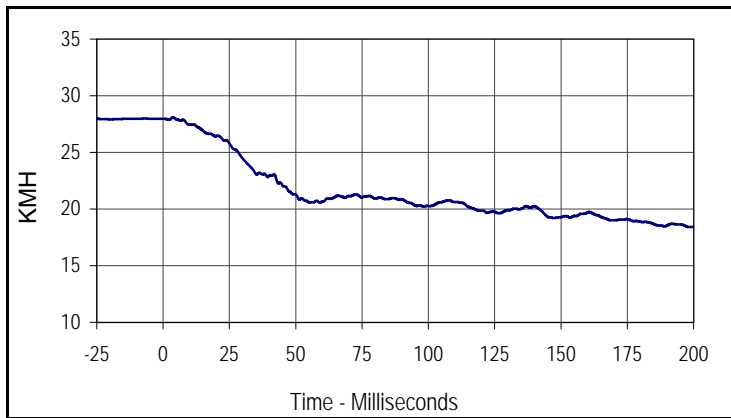
Curve Description			
CG Resultant			
CURNO	Type	SAE Class	Units
071	RES	60	G's
Max	Time	Min	Time
23.6	127.6	0.7	192.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
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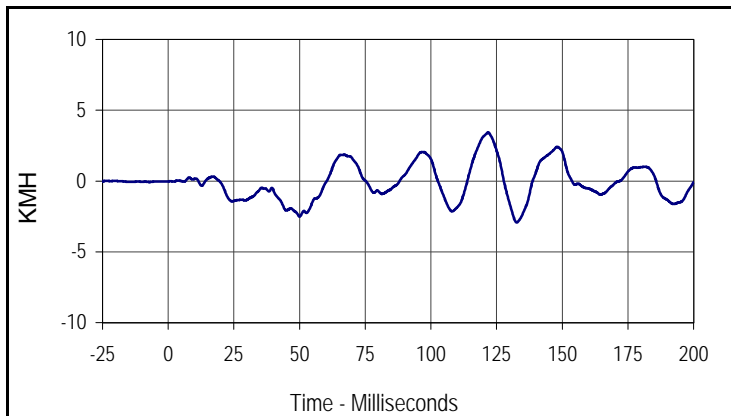
Test Date: 1/27/04
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Curve Description			
MDB CG X Velocity			
CURNO	Type	SAE Class	Units
071	IN1	180	KMH
Max	Time	Min	Time
54.8	0.5	19.8	87.4



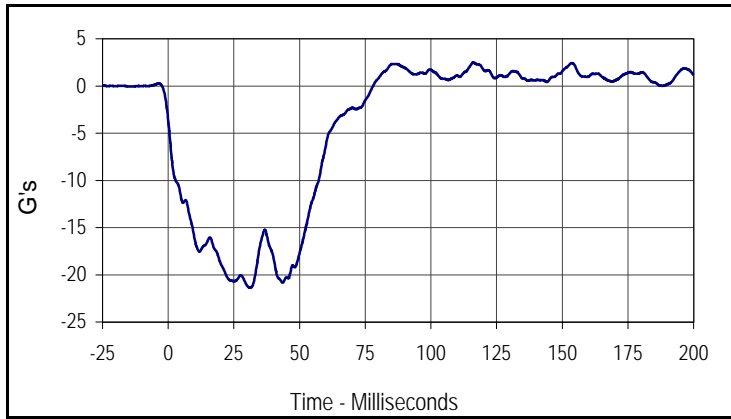
Curve Description			
MDB CG Y Velocity			
CURNO	Type	SAE Class	Units
072	IN1	180	KMH
Max	Time	Min	Time
28.1	3.7	18.4	198.8



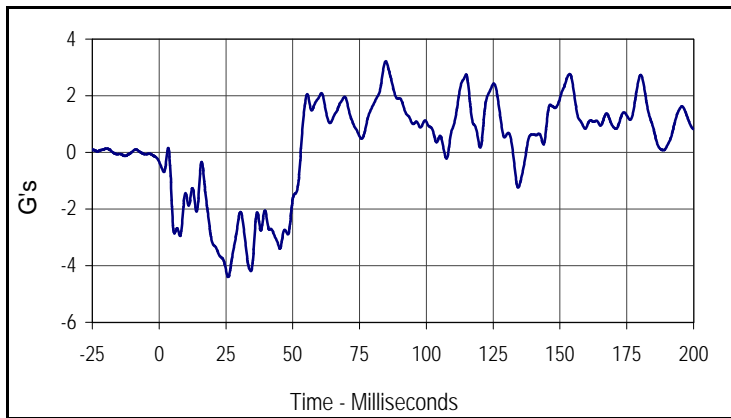
Curve Description			
MDB CG Z Velocity			
CURNO	Type	SAE Class	Units
073	IN1	180	KMH
Max	Time	Min	Time
3.4	121.8	-2.9	132.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

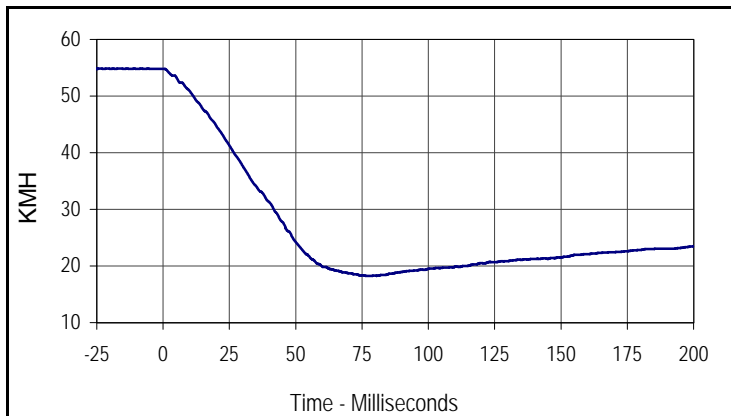
Test Date: 1/27/04
 NHTSA No.: M45111



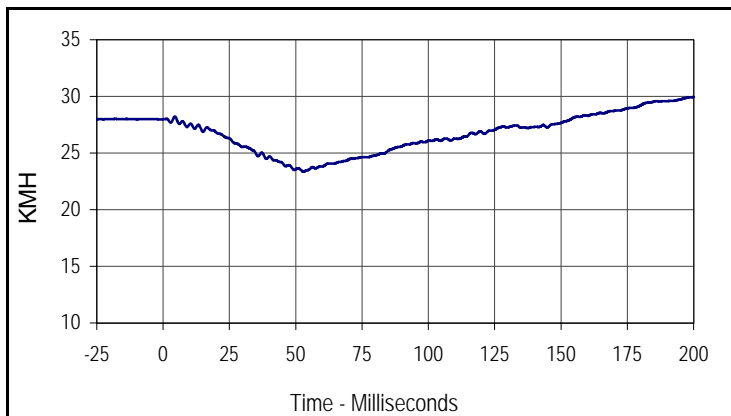
Curve Description			
MDB Rear X			
CURNO	Type	SAE Class	Units
074	FIL	60	G's
Max	Time	Min	Time
2.5	116.1	-21.4	31.2



Curve Description			
MDB Rear Y			
CURNO	Type	SAE Class	Units
075	FIL	60	G's
Max	Time	Min	Time
3.2	84.8	-4.4	25.8



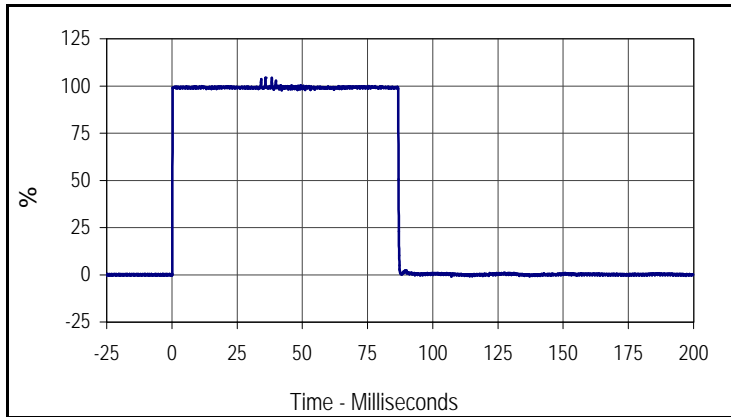
Curve Description			
MDB Rear X Velocity			
CURNO	Type	SAE Class	Units
074	IN1	180	KMH
Max	Time	Min	Time
54.8	0.1	18.2	77.2



Curve Description			
MDB Rear Y Velocity			
CURNO	Type	SAE Class	Units
075	IN1	180	KMH
Max	Time	Min	Time
29.9	200.0	23.4	52.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
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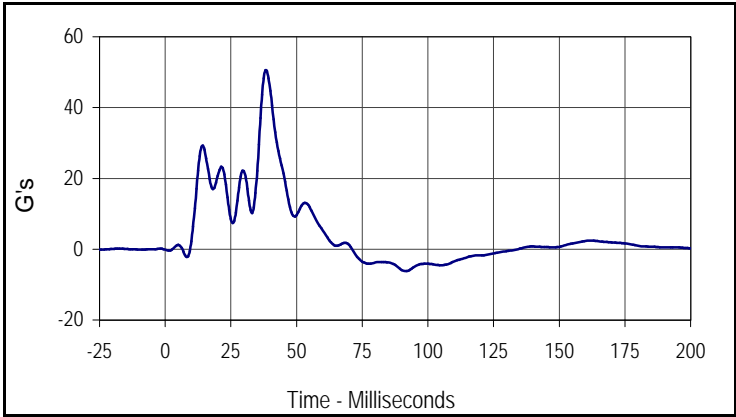
Test Date: 1/27/04
 NHTSA No.: M45111



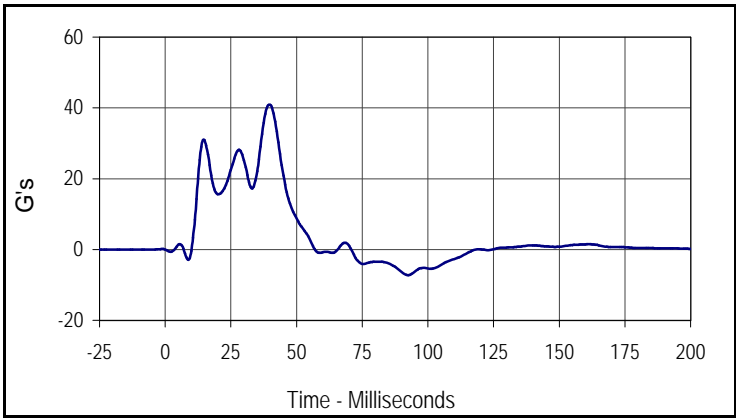
Curve Description			
MDB Right Bumper Contact			
CURNO	Type	SAE Class	Units
076	FIL	1000	%
Max	Time	Cross %	Time
104.3	35.8	50.0	0.3

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

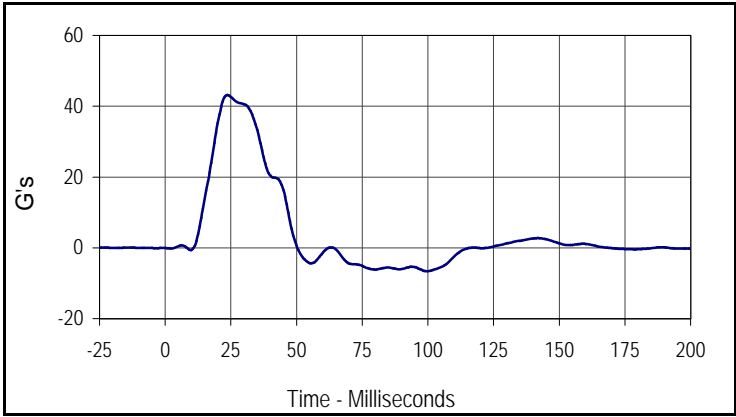
Test Date: 1/27/04
 NHTSA No.: M45111



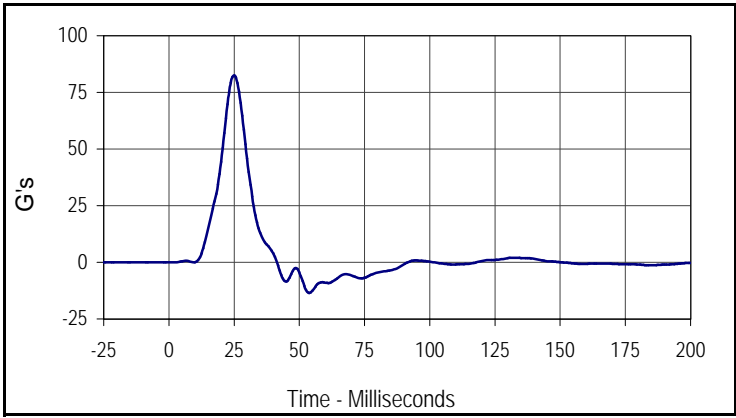
Curve Description			
Driver Upper Rib Primary Y			
CURNO	Type	SAE Class	Units
013	FIR	FIR100	G's
Max	Time	Min	Time
50.5	38.1	-6.2	91.3



Curve Description			
Driver Lower Rib Primary Y			
CURNO	Type	SAE Class	Units
014	FIR	FIR100	G's
Max	Time	Min	Time
40.9	39.4	-7.2	92.5



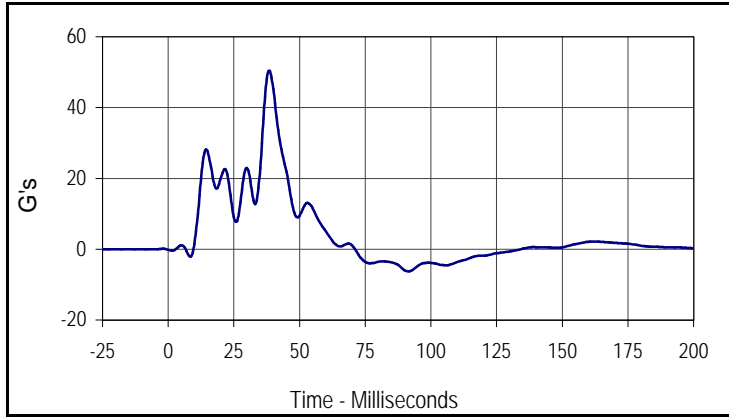
Curve Description			
Driver Lower Spine Primary Y			
CURNO	Type	SAE Class	Units
015	FIR	FIR100	G's
Max	Time	Min	Time
43.2	23.8	-6.6	99.4



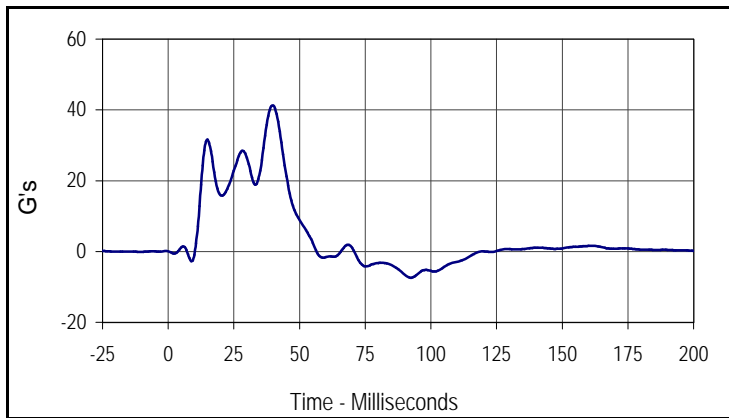
Curve Description			
Driver Pelvis Primary Y			
CURNO	Type	SAE Class	Units
016	FIR	FIR100	G's
Max	Time	Min	Time
82.5	25.0	-13.6	53.8

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

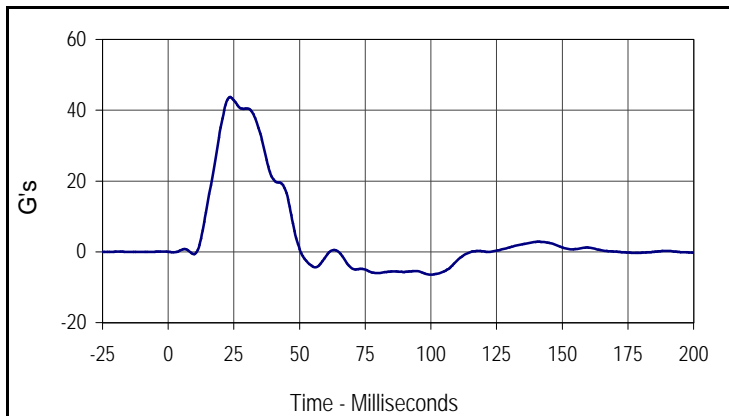
Test Date: 1/27/04
 NHTSA No.: M45111



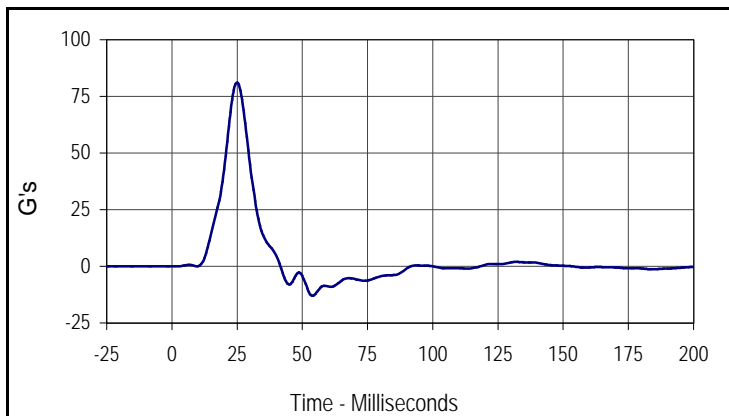
Curve Description			
Driver Upper Rib Redundant Y			
CURNO	Type	SAE Class	Units
017	FIR	FIR100	G's
Max	Time	Min	Time
50.3	38.8	-6.3	91.3



Curve Description			
Driver Lower Rib Redundant Y			
CURNO	Type	SAE Class	Units
018	FIR	FIR100	G's
Max	Time	Min	Time
41.2	40.0	-7.4	92.5



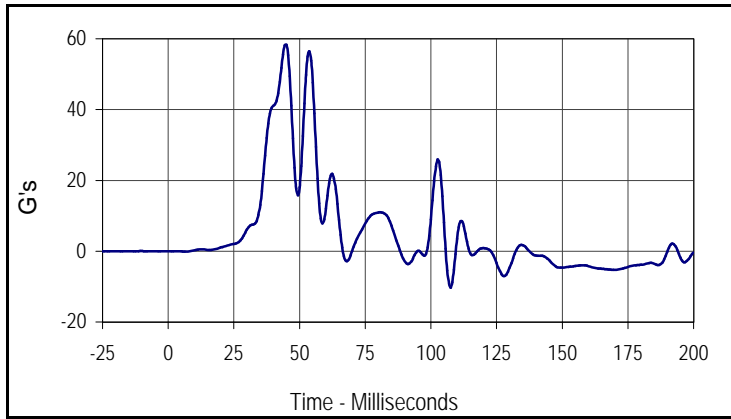
Curve Description			
Driver Lower Spine Redundant Y			
CURNO	Type	SAE Class	Units
019	FIR	FIR100	G's
Max	Time	Min	Time
43.7	23.8	-6.4	100.0



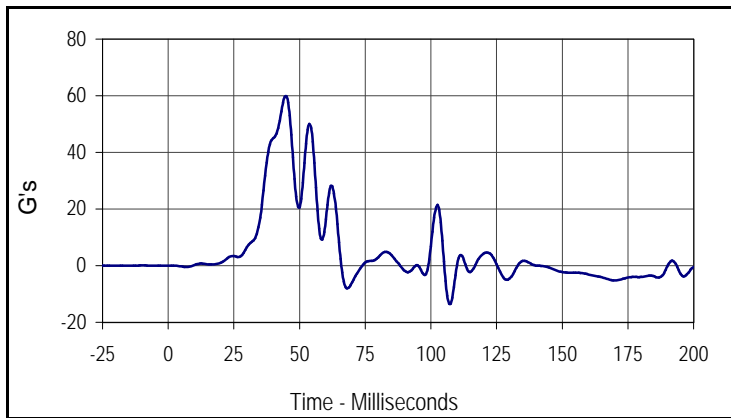
Curve Description			
Driver Pelvis Redundant Y			
CURNO	Type	SAE Class	Units
020	FIR	FIR100	G's
Max	Time	Min	Time
81.1	25.0	-13.0	53.8

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
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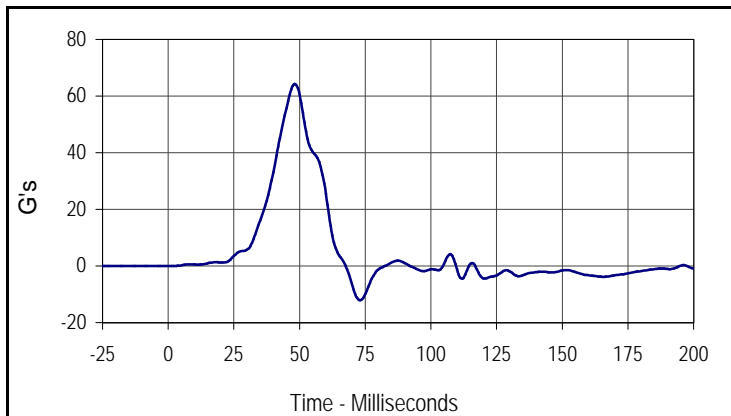
Test Date: 1/27/04
 NHTSA No.: M45111



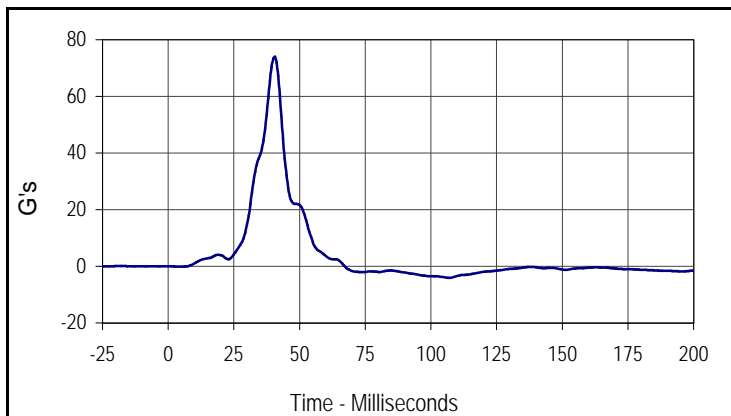
Curve Description			
Passenger Upper Rib Primary Y			
CURNO	Type	SAE Class	Units
035	FIR	FIR100	G's
Max	Time	Min	Time
58.3	45.0	-10.3	107.5



Curve Description			
Passenger Lower Rib Primary Y			
CURNO	Type	SAE Class	Units
036	FIR	FIR100	G's
Max	Time	Min	Time
59.8	45.0	-13.5	107.5



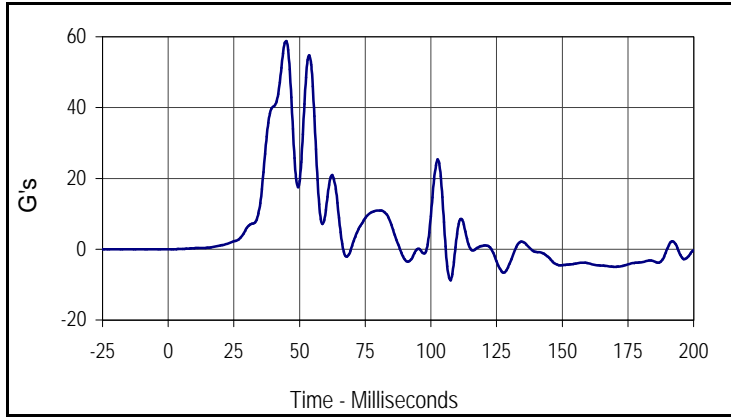
Curve Description			
Passenger Lower Spine Primary Y			
CURNO	Type	SAE Class	Units
037	FIR	FIR100	G's
Max	Time	Min	Time
64.3	48.1	-12.1	73.1



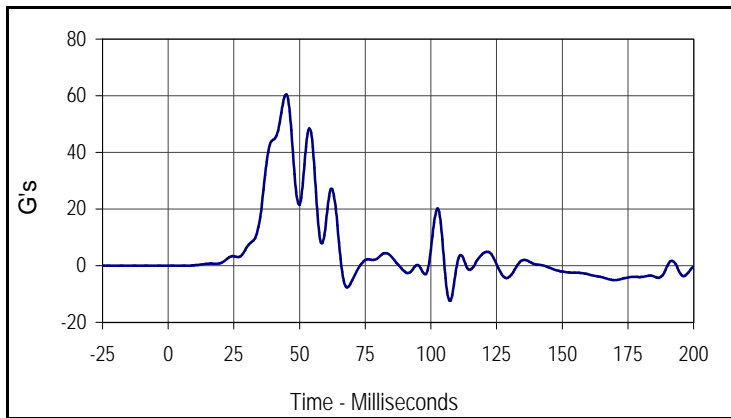
Curve Description			
Passenger Pelvis Primary Y			
CURNO	Type	SAE Class	Units
038	FIR	FIR100	G's
Max	Time	Min	Time
74.0	40.6	-4.1	106.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 55/28 km/h Side Impact NCAP

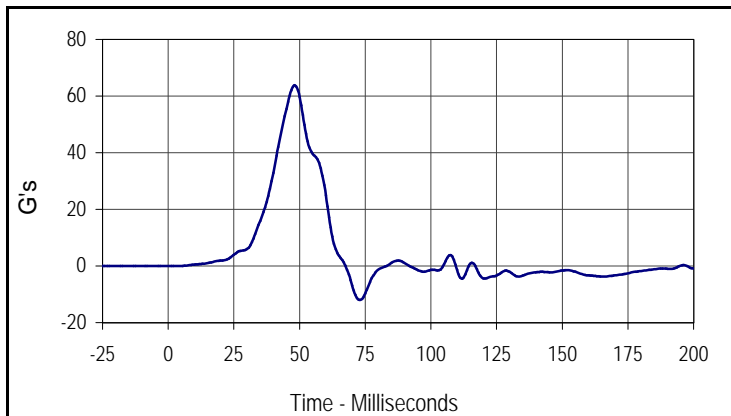
Test Date: 1/27/04
 NHTSA No.: M45111



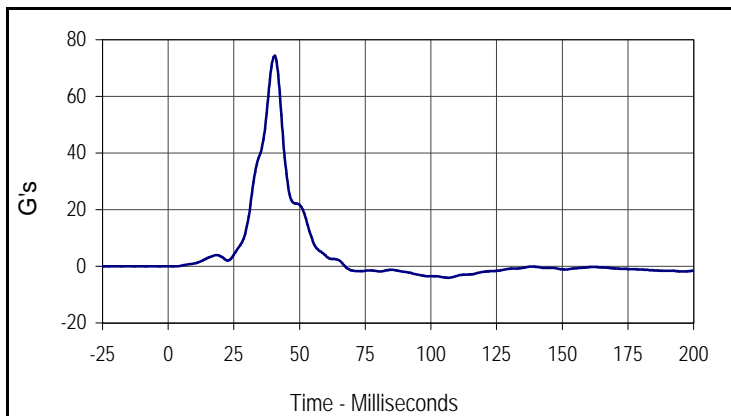
Curve Description			
Passenger Upper Rib Redundant Y			
CURNO	Type	SAE Class	Units
039	FIR	FIR100	G's
Max	Time	Min	Time
58.8	45.0	-8.8	107.5



Curve Description			
Passenger Lower Rib Redundant Y			
CURNO	Type	SAE Class	Units
040	FIR	FIR100	G's
Max	Time	Min	Time
60.4	45.0	-12.3	107.5



Curve Description			
Passenger Lower Spine Redundant Y			
CURNO	Type	SAE Class	Units
041	FIR	FIR100	G's
Max	Time	Min	Time
63.8	48.1	-12.0	73.1



Curve Description			
Passenger Pelvis Redundant Y			
CURNO	Type	SAE Class	Units
042	FIR	FIR100	G's
Max	Time	Min	Time
74.4	40.6	-4.1	106.9

APPENDIX C
SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) External Measurements

ATD Serial No.: 274

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
SH- Seated Height	mm	889 to 909	905	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	516	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	521	Pass
KV- Knee Pivot From Floor	mm	490 to 505	501	Pass
HW- Hip Width	mm	356 to 391	387	Pass
Overall Test Results				Pass

C-1

TR-P24003-02-NC

Laboratory Technician

January 23, 2004

Test Date



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Thorax Lateral Impact

ATD Serial No.: 274

Test I.D.: TH03D

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
Probe Velocity	m/s	4.21 to 4.33	4.25	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	43.3	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	42.4	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.8	Pass
Overall Test Results				Pass

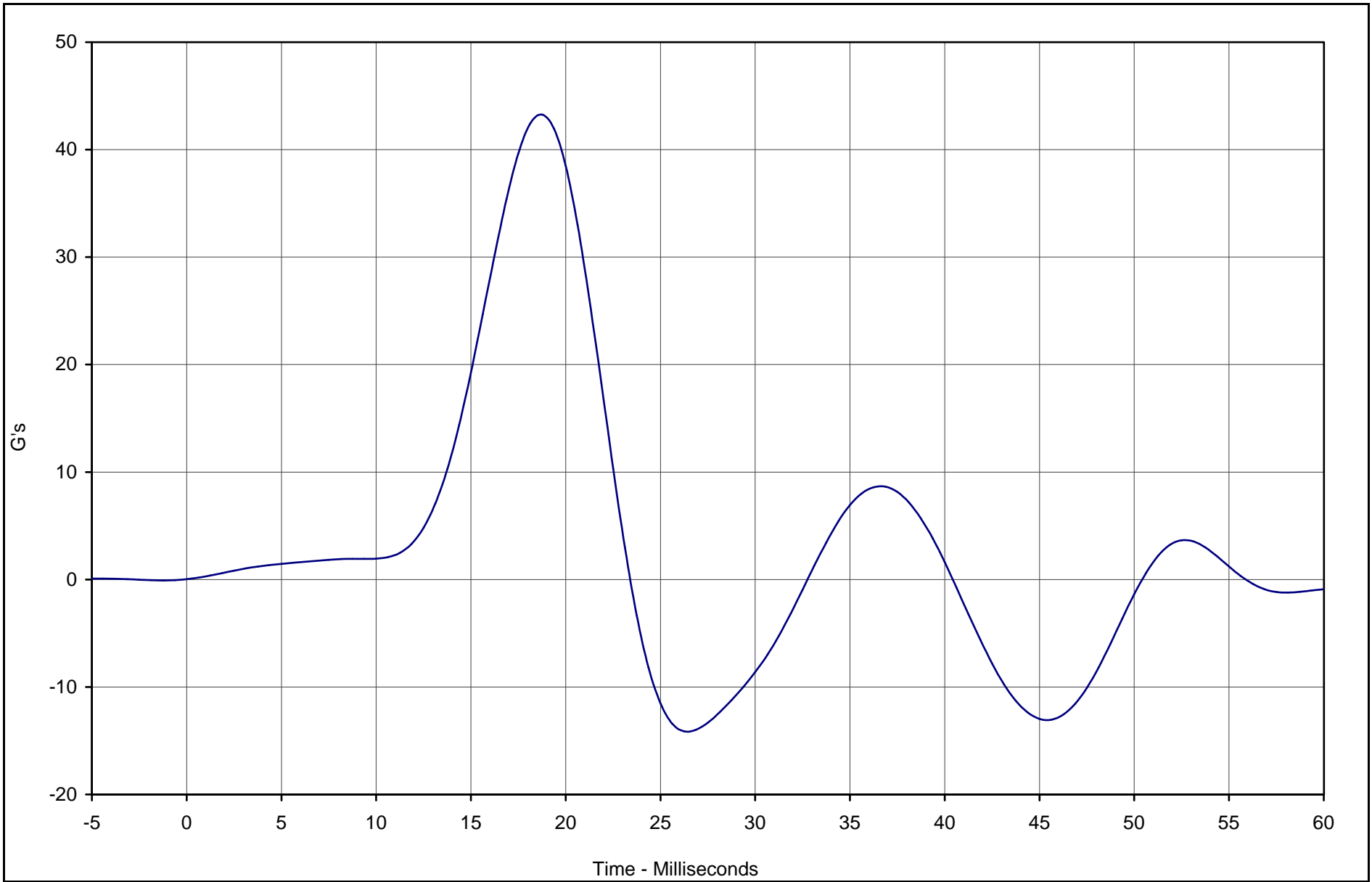
C-2

TR-P24003-02-NC

Laboratory Technician

January 22, 2004

Test Date



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Upper Rib Y Acceleration	001	FIL	G's	43.3	18.8	-14.1	26.3	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

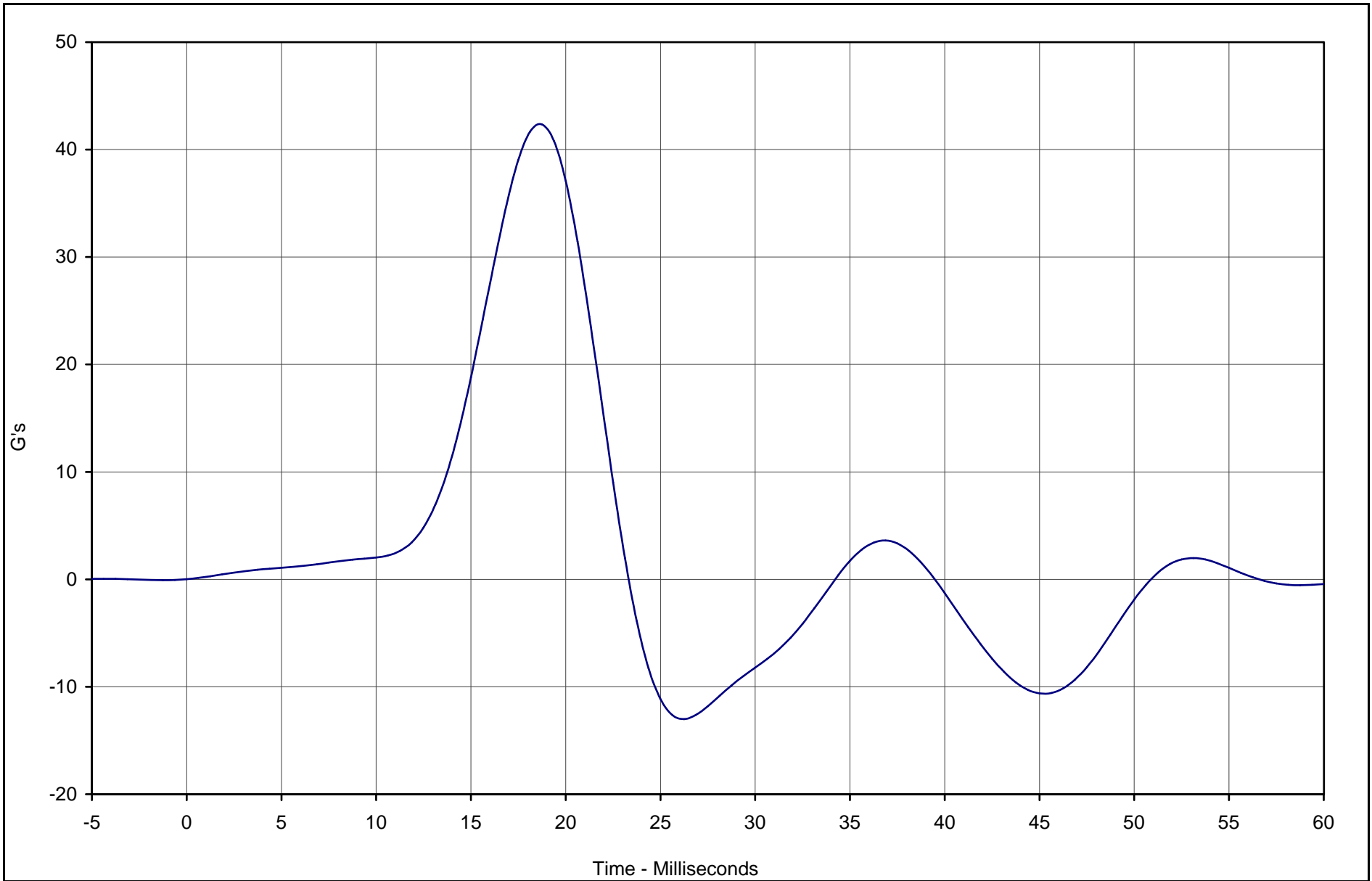
SID Serial No.: 274

Test Date: 1/22/04

Test I.D.: TH03D

C-4

TR-P24003-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Lower Rib Y Acceleration	002	FIL	G's	42.4	18.8	-13.0	26.3	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

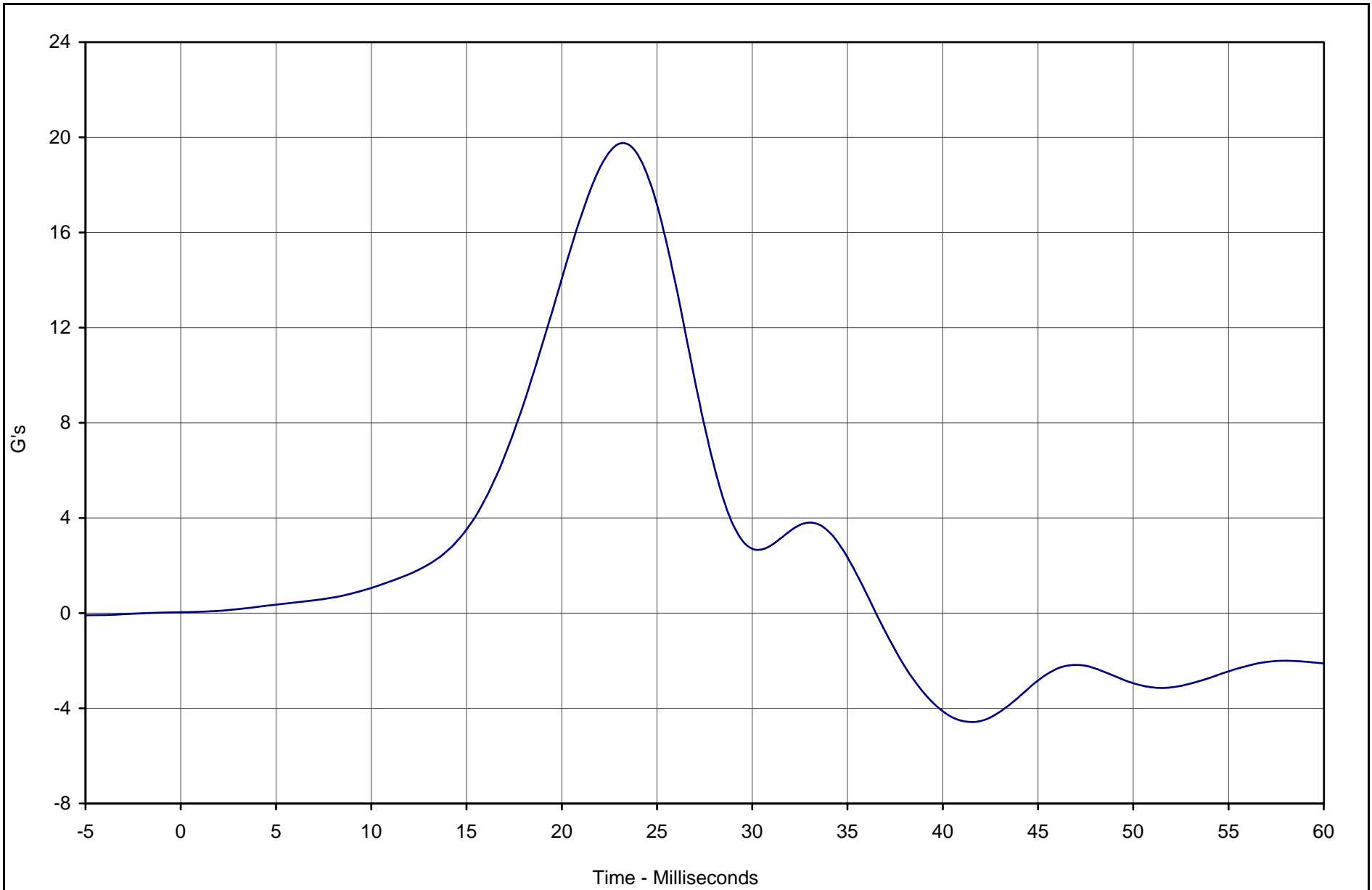
SID Serial No.: 274

Test Date: 1/22/04

Test I.D.: TH03D

C-5

TR-P24003-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Lower Spine Y Acceleration	003	FIL	G's	19.8	23.1	-4.6	41.3	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

SID Serial No.: 274

Test Date: 1/22/04

Test I.D.: TH03D



Calibration Data Sheet

Side Impact Hybrid Dummy (SID/HIII)

Pelvis Lateral Impact

ATD Serial No.: 274

Test I.D.: PL03C

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
Probe Velocity	m/s	4.21 to 4.33	4.24	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	43.3	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	7.0	Pass
Overall Test Results				Pass

C-6

TR-P24003-02-NC

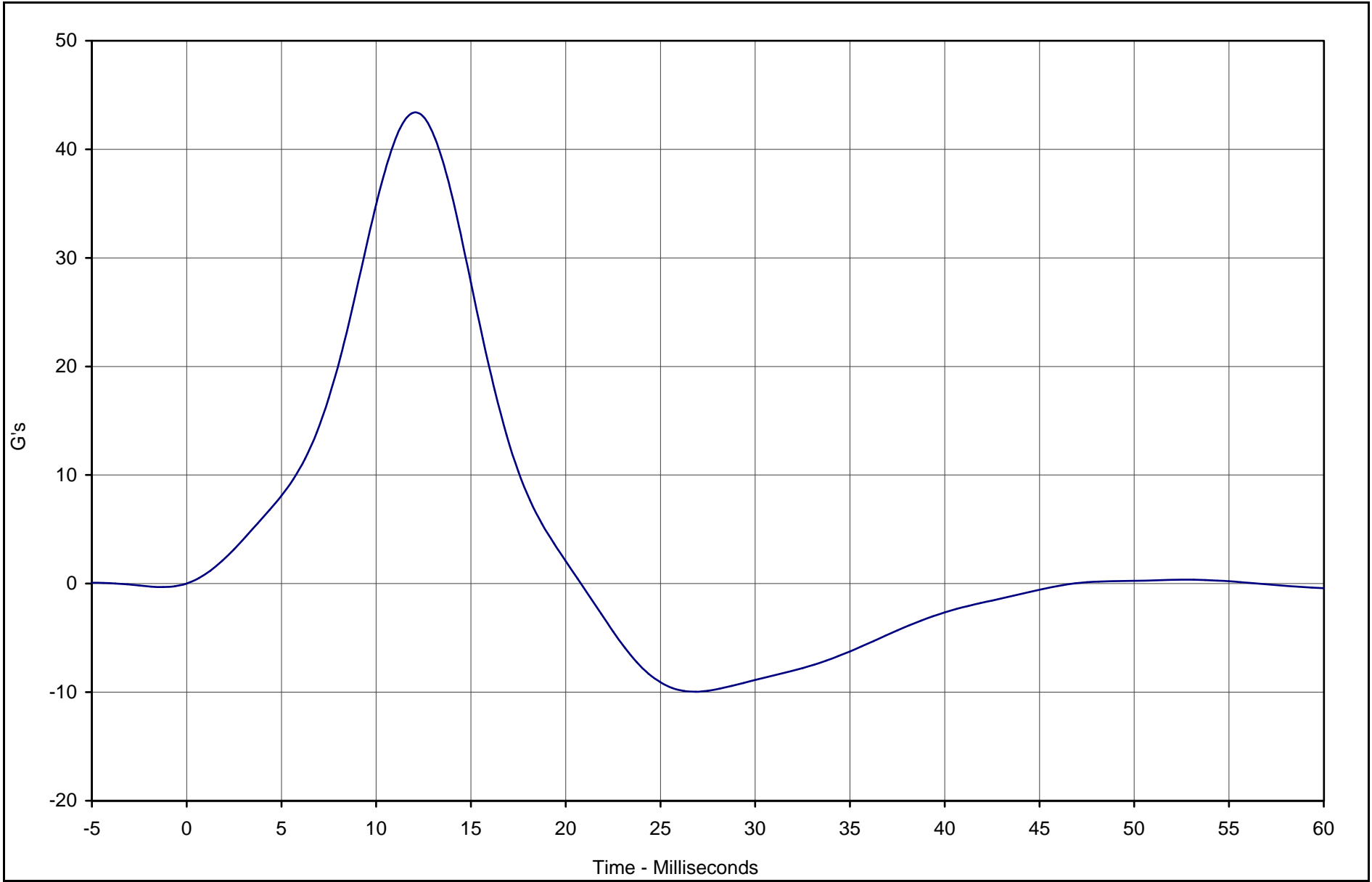
Laboratory Technician

January 23, 2004

Test Date

C-7

TR-P24003-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pelvis Y Acceleration	001	FIL	G's	43.3	11.9	-10.0	26.9	FIR100



Test Vehicle: Side Impact Dummy (SID) Pelvis Lateral Impact

SID Serial No.: 274

Test Date: 1/23/04

Test I.D.: PL03C



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Head Drop Lateral Impact Test

ATD Serial No.: 274

Test I.D.: HD03C

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	120.0 to 150.0	144.0	Pass
Peak Longitudinal Acceleration	G's	≤15.0	5.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	2.7	Pass
Overall Test Results				Pass

C-8

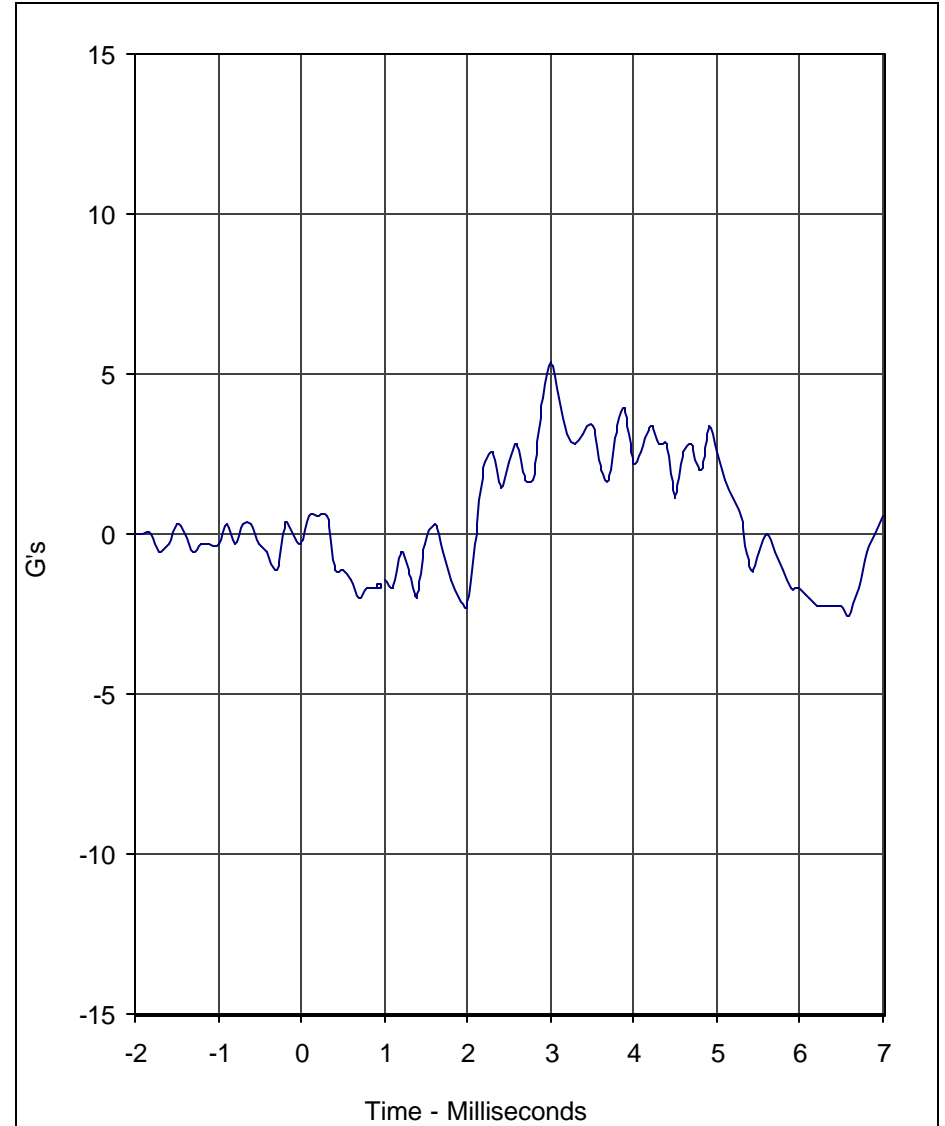
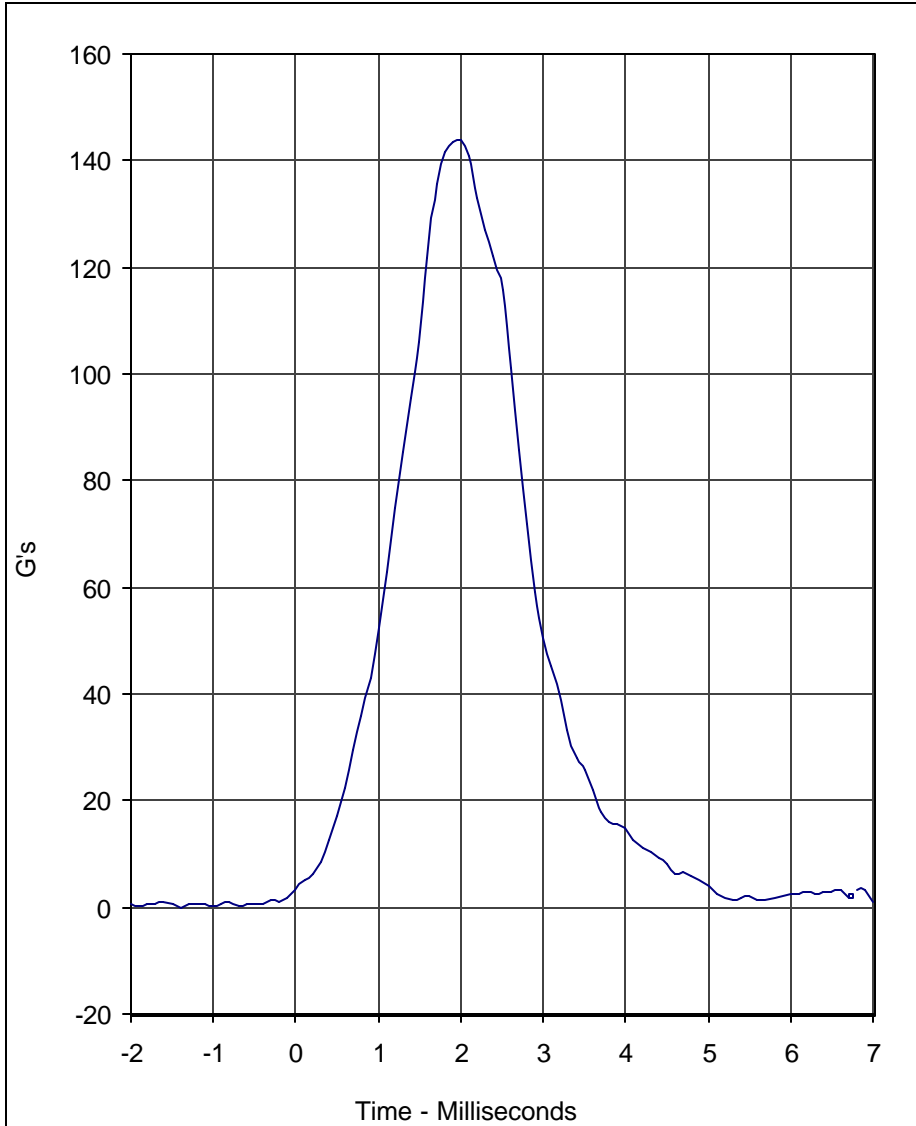
TR-P24003-02-NC

Laboratory Technician

January 23, 2004

Test Date

C-9



Curve Description	CURNO	Type
Head Resultant	001	RES

Units	Max	Time	Min	Time	SAE Class
G's	144.0	2.0	0.0	-1.4	1000

Curve Description	CURNO	Type
Head X	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	5.4	3.0	-2.5	6.6	1000

Test Program: SID / HIII Head Drop Lateral Impact Test
 Test Date: 1/23/04

A.T.D. Serial No.: 274
 Test I.D.: HD03C



TR-P24003-02-NC



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Neck Pendulum Lateral Test

ATD Serial No.: 274

Test I.D.: NB03C

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	7.01	Pass
Pendulum Deceleration	10	Msec.	1.96 to 2.55	2.01	Pass
	20	Msec.	4.12 to 5.10	4.28	Pass
	30	Msec.	5.73 to 7.01	6.37	Pass
	40 to 70	Msec.	6.27 to 7.64	7.43	Pass
Maximum "D" Plane Rotation		Degrees	66.0 to 82.0	74.1	Pass
Maximum "D" Plane Rotation Time After Peak Moment		Msec.	2.0 to 15.0	14.1	Pass
"D" Plane Rotation Decay Time From Peak Angle to Zero Angle		Msec.	58.0 to 67.0	62.8	Pass
Calculated Moment About Occipital Condyle		N•m	73.0 to 88.0	86.6	Pass
Moment About Occipital Condyle Decay, Time From Positive Peak Value To 0 N•m		Msec.	49.0 to 64.0	50.3	Pass
Overall Test Results					Pass

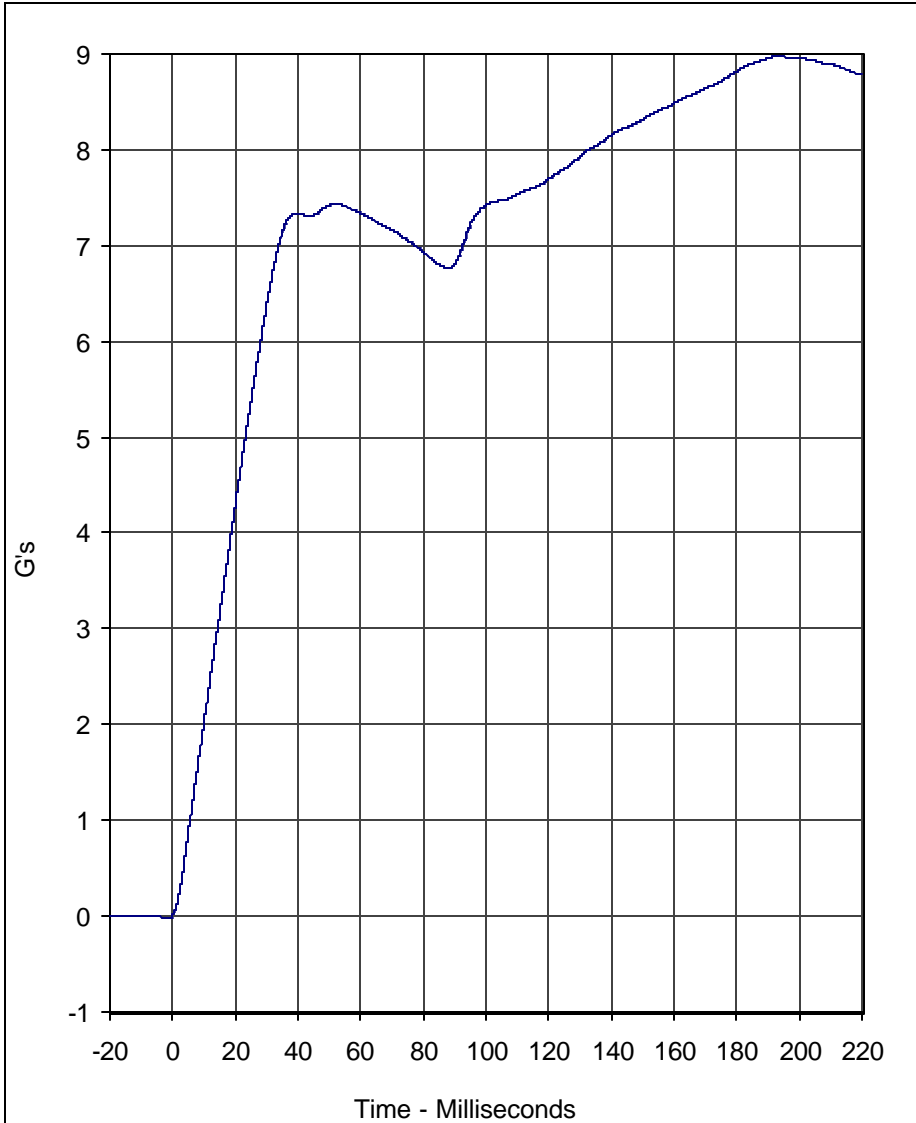
Laboratory Technician

January 23, 2004

Test Date

C-10

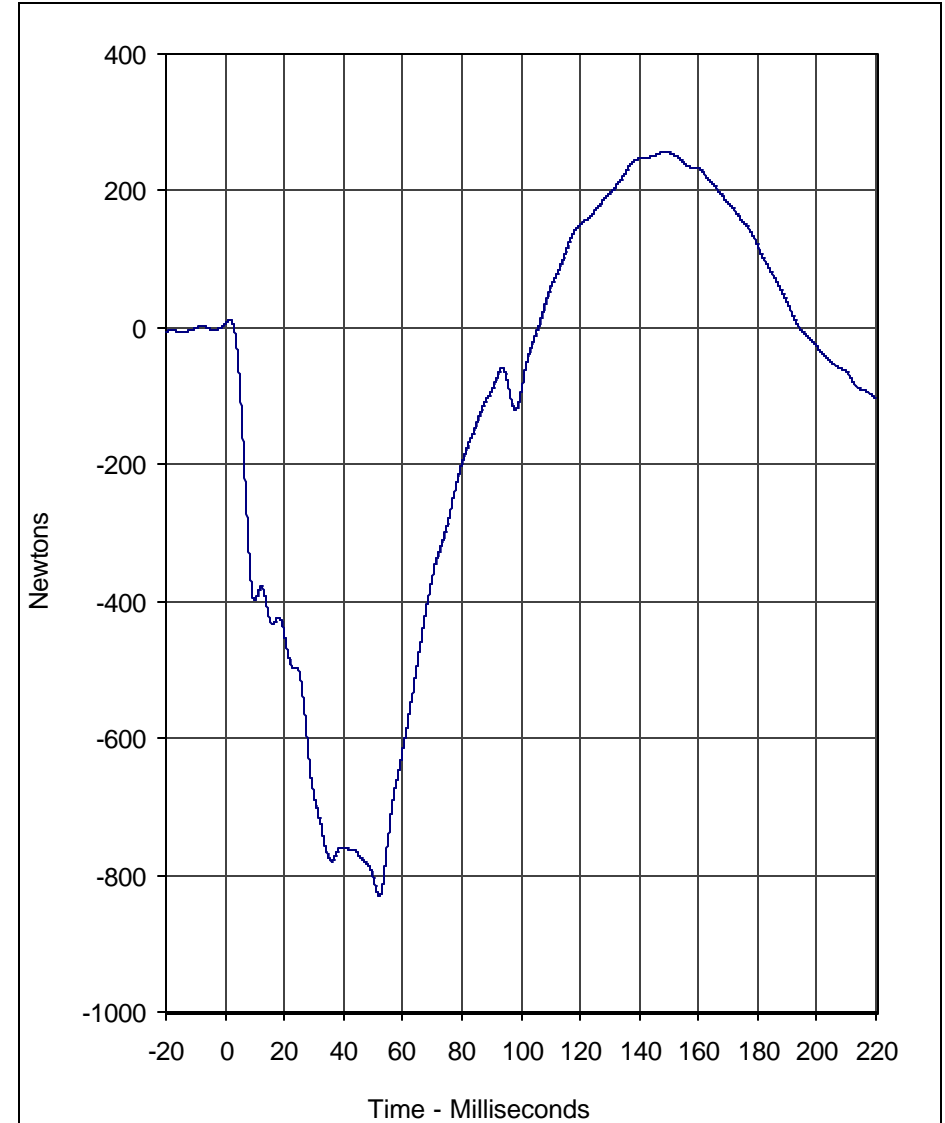
TR-P24003-02-NC



Curve Description	CURNO	Type
Pendulum Velocity	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	9.0	192.8	0.0	-1.5	60

Test Program: SID / HIII Neck Pendulum Lateral Test
 Test Date: 1/23/04

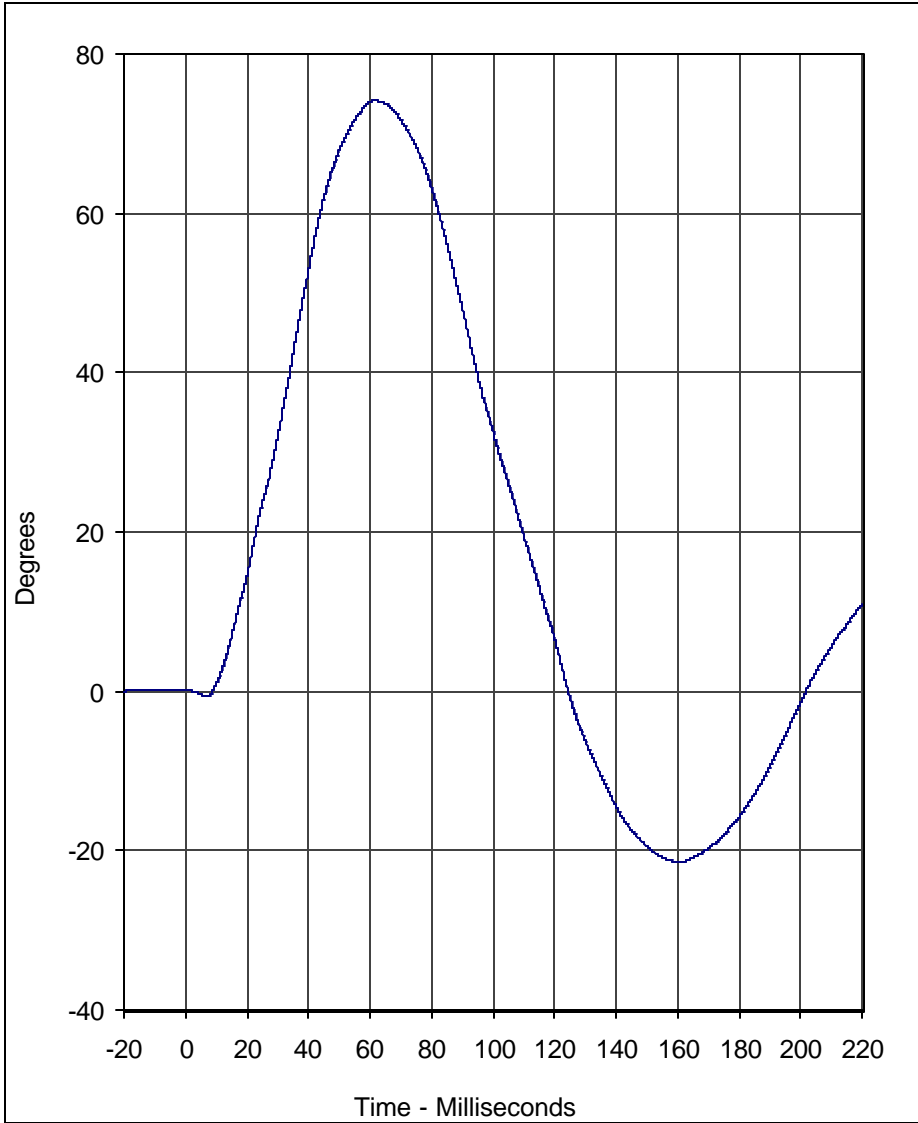


Curve Description	CURNO	Type
Neck Force Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	256.0	148.6	-831.2	52.1	60

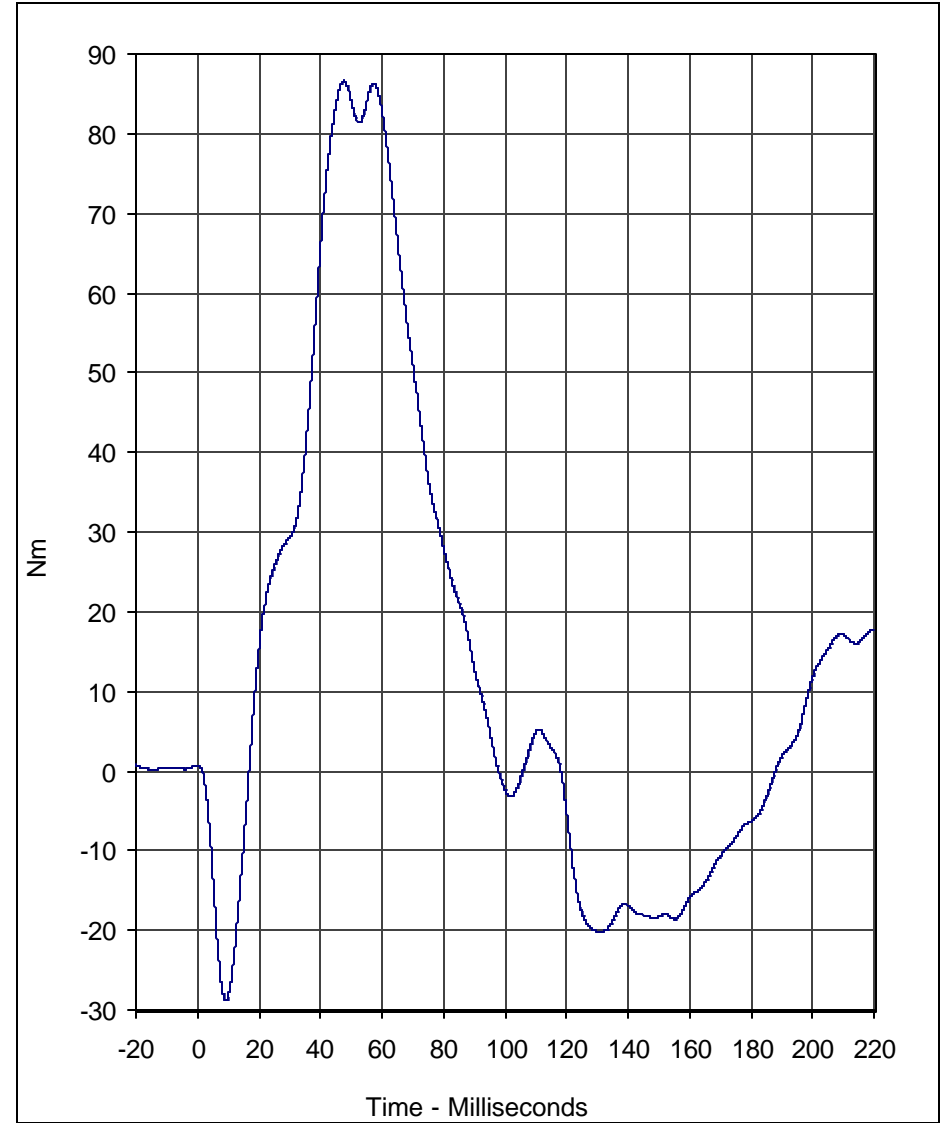
A.T.D. Serial No.: 274
 Test I.D.: NB03C





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	74.1	61.7	-21.5	160.7	60



Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	86.6	47.6	-28.8	9.3	60

Test Program: SID / HIII Neck Pendulum Lateral Test
 Test Date: 1/23/04

A.T.D. Serial No.: 274
 Test I.D.: NB03C





Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) External Measurements

ATD Serial No.: 275

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
SH- Seated Height	mm	889 to 909	903	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	513	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	518	Pass
KV- Knee Pivot From Floor	mm	490 to 505	500	Pass
HW- Hip Width	mm	356 to 391	382	Pass
Overall Test Results				Pass

C-13

TR-P24003-02-NC

Laboratory Technician

January 23, 2004
Test Date



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Thorax Lateral Impact

ATD Serial No.: 275

Test I.D.: TH03C

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
Probe Velocity	m/s	4.21 to 4.33	4.27	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	41.7	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	44.0	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.5	Pass
Overall Test Results				Pass

C-14

TR-P24003-02-NC

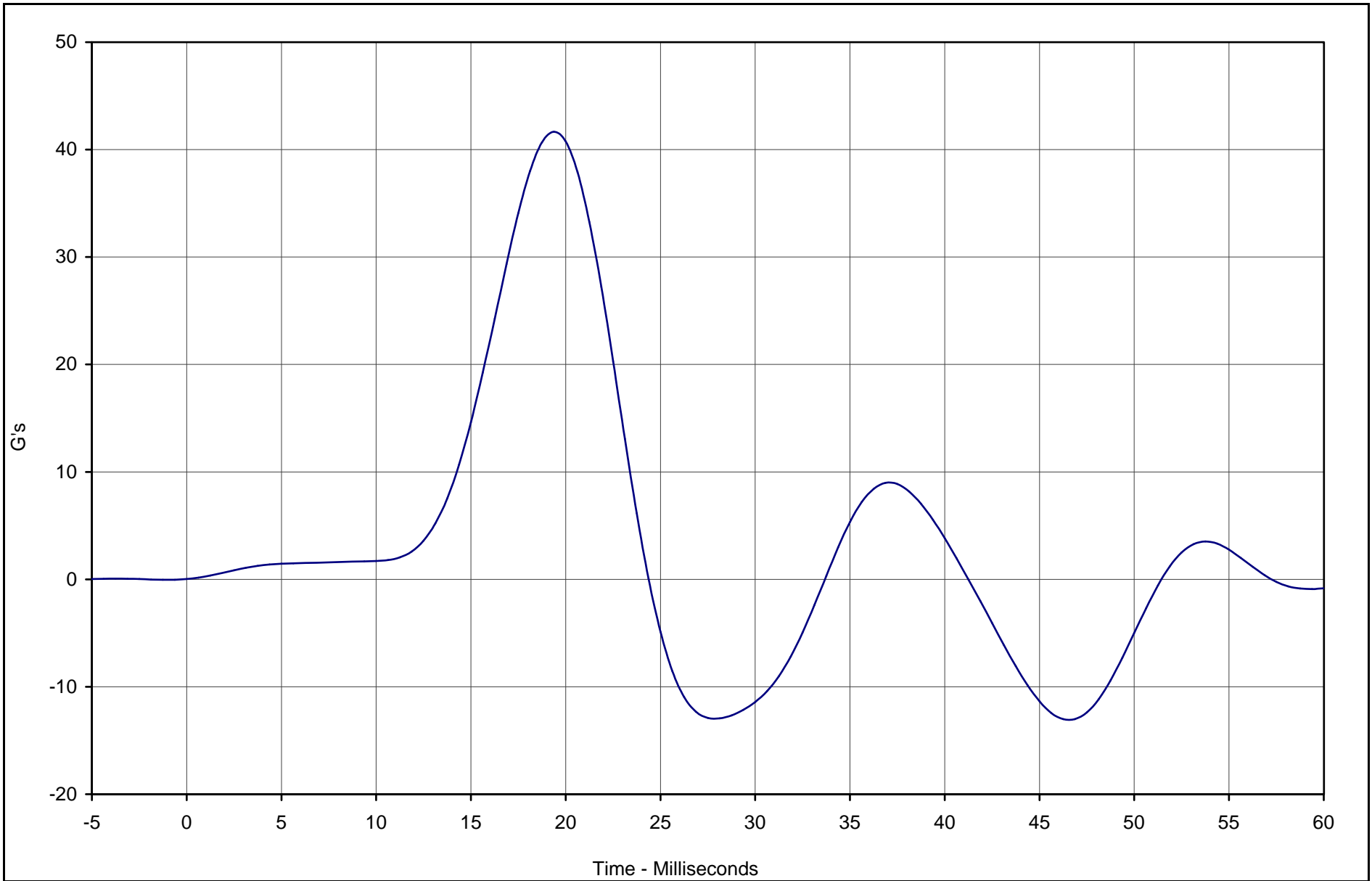
Laboratory Technician

January 22, 2004

Test Date

C-15

TR-P24003-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Upper Rib Y Acceleration	001	FIL	G's	41.7	19.4	-13.0	46.3	FIR100

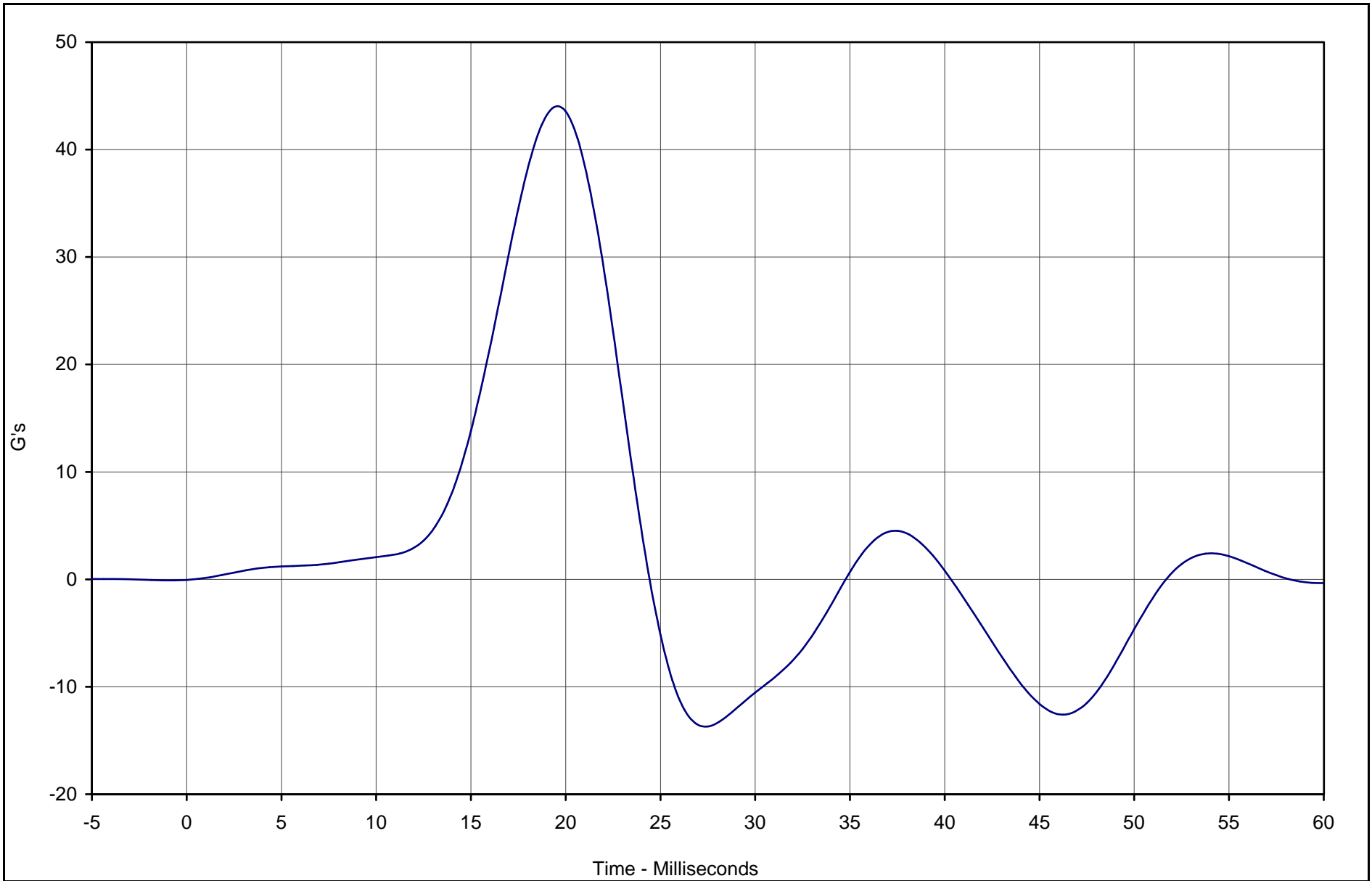


Test Vehicle: SID / HIII Thorax Lateral Impact

SID Serial No.: 275

Test Date: 1/22/04

Test I.D.: TH03C



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Lower Rib Y Acceleration	002	FIL	G's	44.0	19.4	-13.7	27.5	FIR100

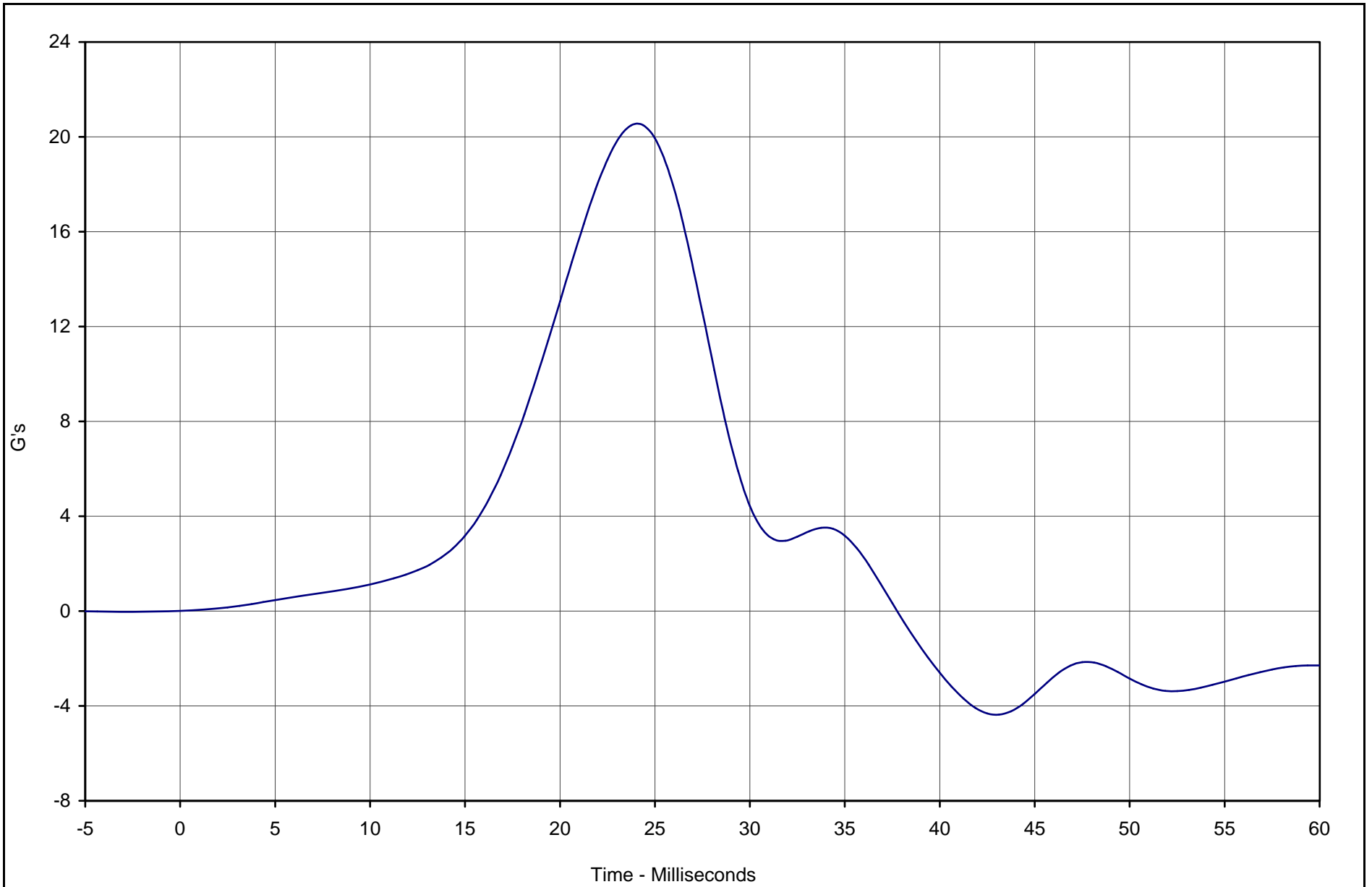


Test Vehicle: SID / HIII Thorax Lateral Impact

SID Serial No.: 275

Test Date: 1/22/04

Test I.D.: TH03C



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Lower Spine Y Acceleration	003	FIL	G's	20.5	24.4	-4.4	43.1	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

SID Serial No.: 275

Test Date: 1/22/04

Test I.D.: TH03C



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Pelvis Lateral Impact

ATD Serial No.: 275

Test I.D.: PL03D

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
Probe Velocity	m/s	4.21 to 4.33	4.24	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	44.0	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	6.9	Pass
Overall Test Results				Pass

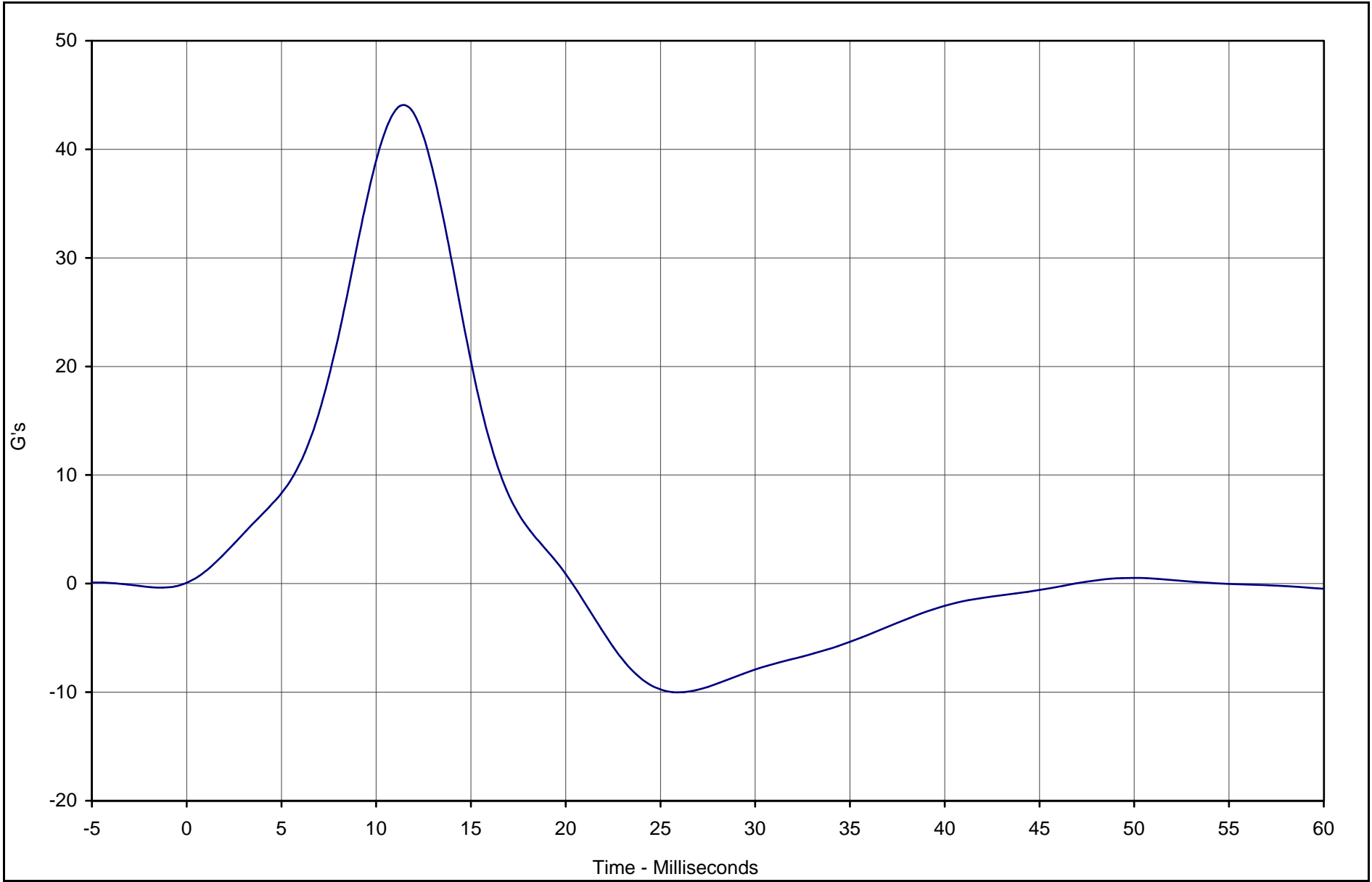
C-18

TR-P24003-02-NC

Laboratory Technician

January 23, 2004

Test Date



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pelvis Y Acceleration	001	FIL	G's	44.0	11.3	-10.0	26.3	FIR100



Test Vehicle: Side Impact Dummy (SID) Pelvis Lateral Impact

SID Serial No.: 275

Test Date: 1/23/04

Test I.D.: PL03D



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Head Drop Lateral Impact Test

ATD Serial No.: 275

Test I.D.: HD03D

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	120.0 to 150.0	140.9	Pass
Peak Longitudinal Acceleration	G's	≤15.0	9.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	3.8	Pass
Overall Test Results				Pass

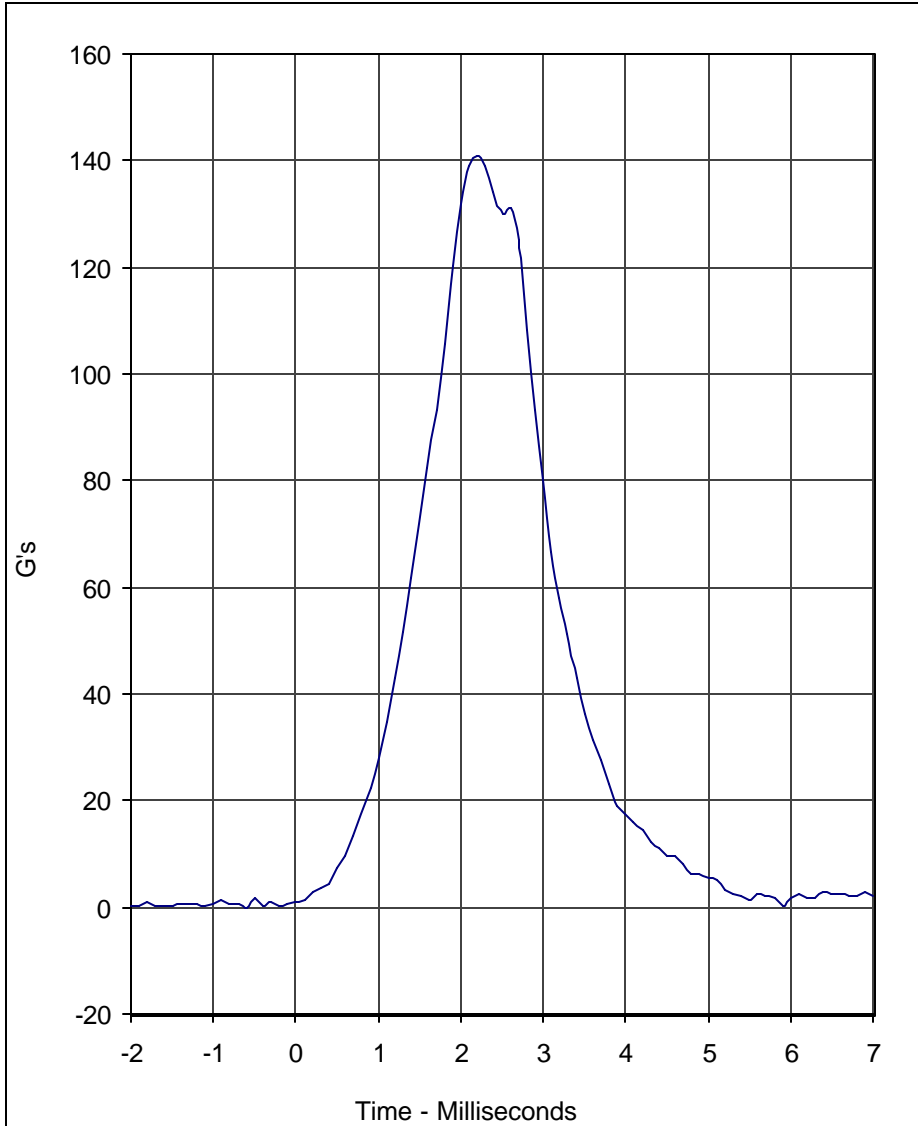
C-20

TR-P24003-02-NC

Laboratory Technician

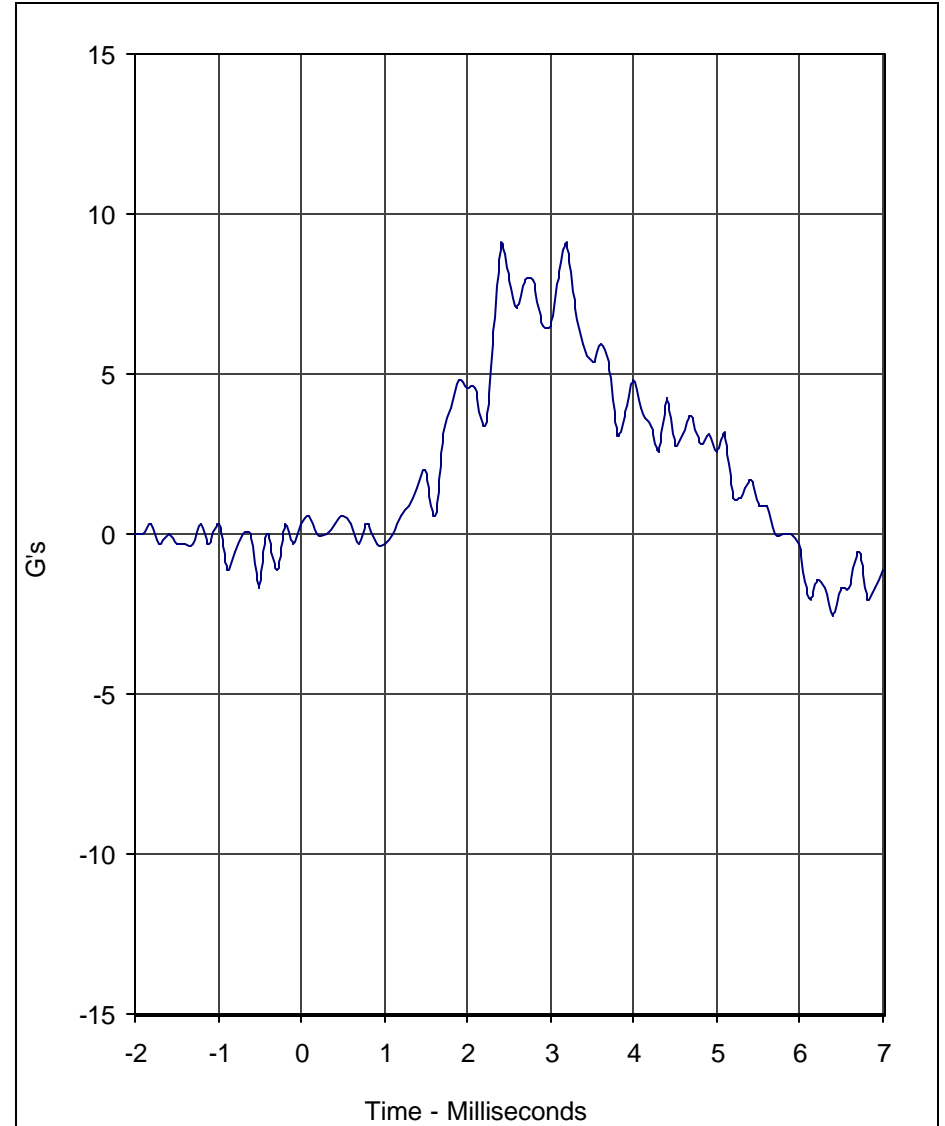
January 23, 2004

Test Date



Curve Description		CURNO	Type
Head Resultant		001	RES

Units	Max	Time	Min	Time	SAE Class
G's	140.9	2.2	0.0	-0.6	1000



Curve Description		CURNO	Type
Head X		002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	9.1	2.4	-2.6	6.4	1000

Test Program: SID / HIII Head Drop Lateral Impact Test
 Test Date: 1/23/04

A.T.D. Serial No.: 275
 Test I.D.: HD03D





Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Neck Pendulum Lateral Test

ATD Serial No.: 275

Test I.D.: NB03D

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	6.95	Pass
Pendulum Deceleration	10	Msec.	1.96 to 2.55	1.96	Pass
	20	Msec.	4.12 to 5.10	4.24	Pass
	30	Msec.	5.73 to 7.01	6.38	Pass
	40 to 70	Msec.	6.27 to 7.64	7.63	Pass
Maximum "D" Plane Rotation		Degrees	66.0 to 82.0	71.9	Pass
Maximum "D" Plane Rotation Time After Peak Moment		Msec.	2.0 to 15.0	4.7	Pass
"D" Plane Rotation Decay Time From Peak Angle to Zero Angle		Msec.	58.0 to 67.0	58.7	Pass
Calculated Moment About Occipital Condyle		N•m	73.0 to 88.0	83.1	Pass
Moment About Occipital Condyle Decay, Time From Positive Peak Value To 0 N•m		Msec.	49.0 to 64.0	61.3	Pass
Overall Test Results					Pass

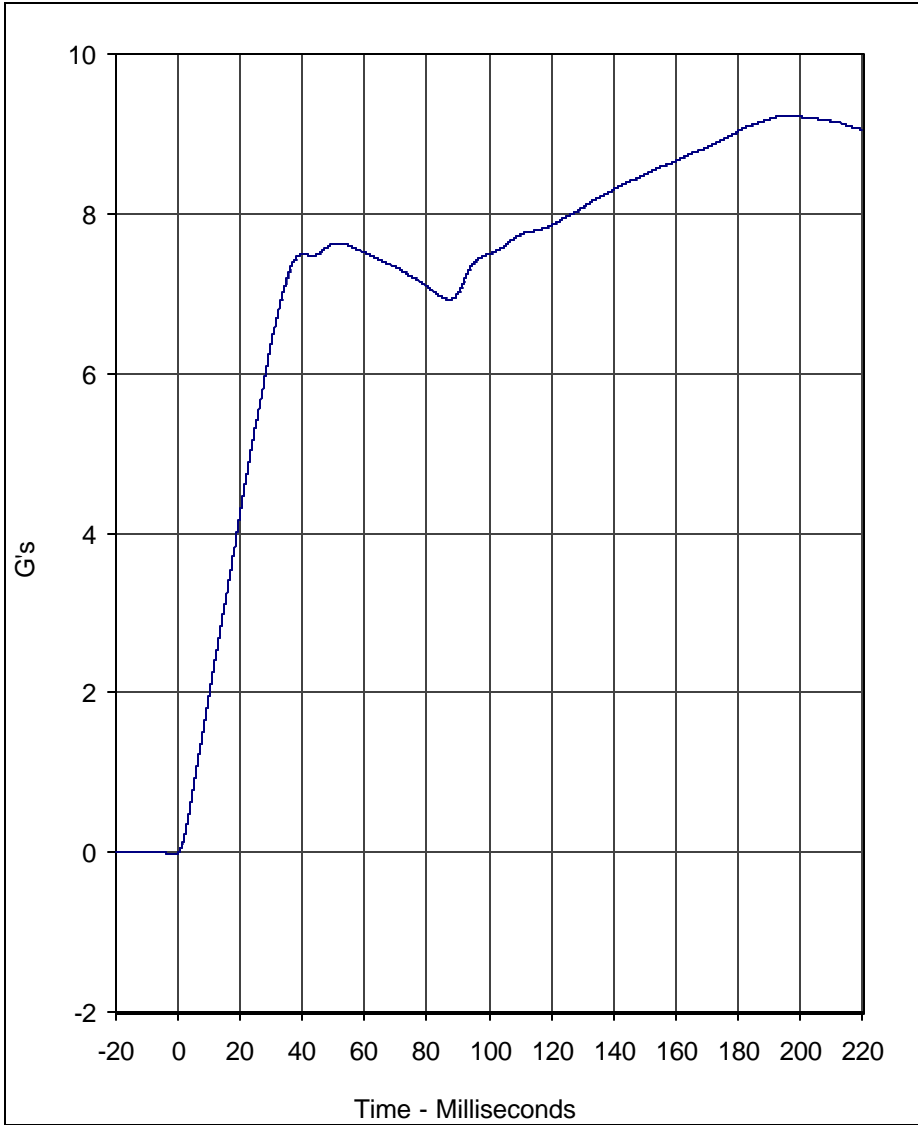
Laboratory Technician

January 23, 2004

Test Date

C-22

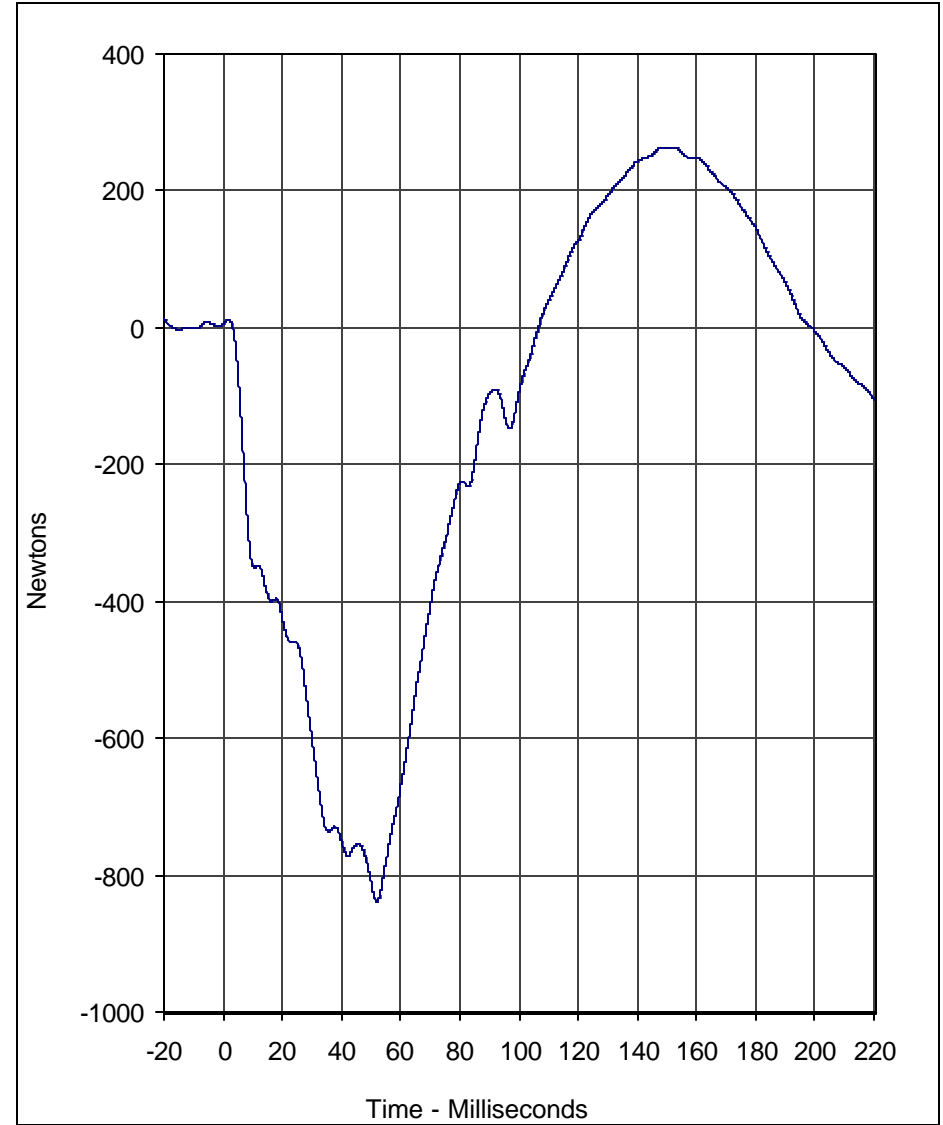
TR-P24003-02-NC



Curve Description	CURNO	Type
Pendulum Velocity	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	9.2	197.2	0.0	-1.4	60

Test Program: SID / HIII Neck Pendulum Lateral Test
 Test Date: 1/23/04

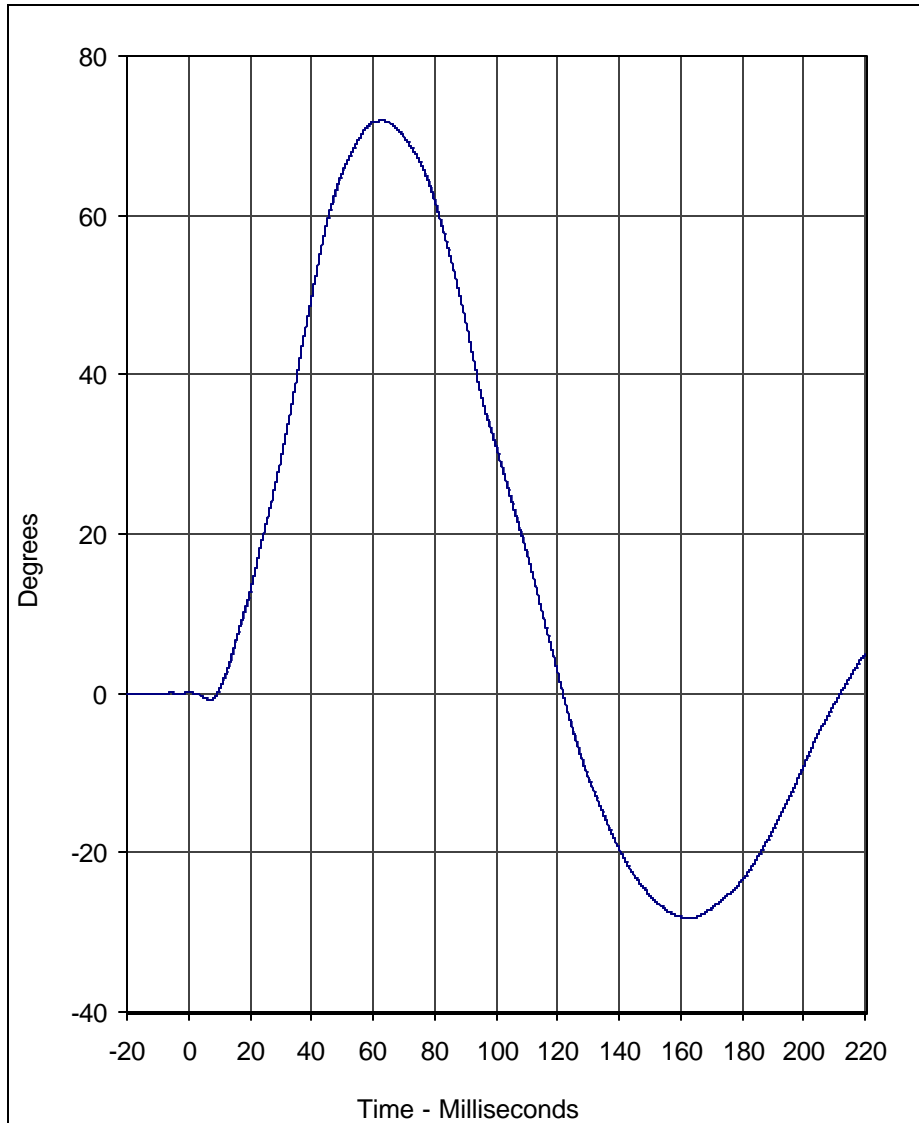


Curve Description	CURNO	Type
Neck Force Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	263.0	151.9	-839.0	52.0	60

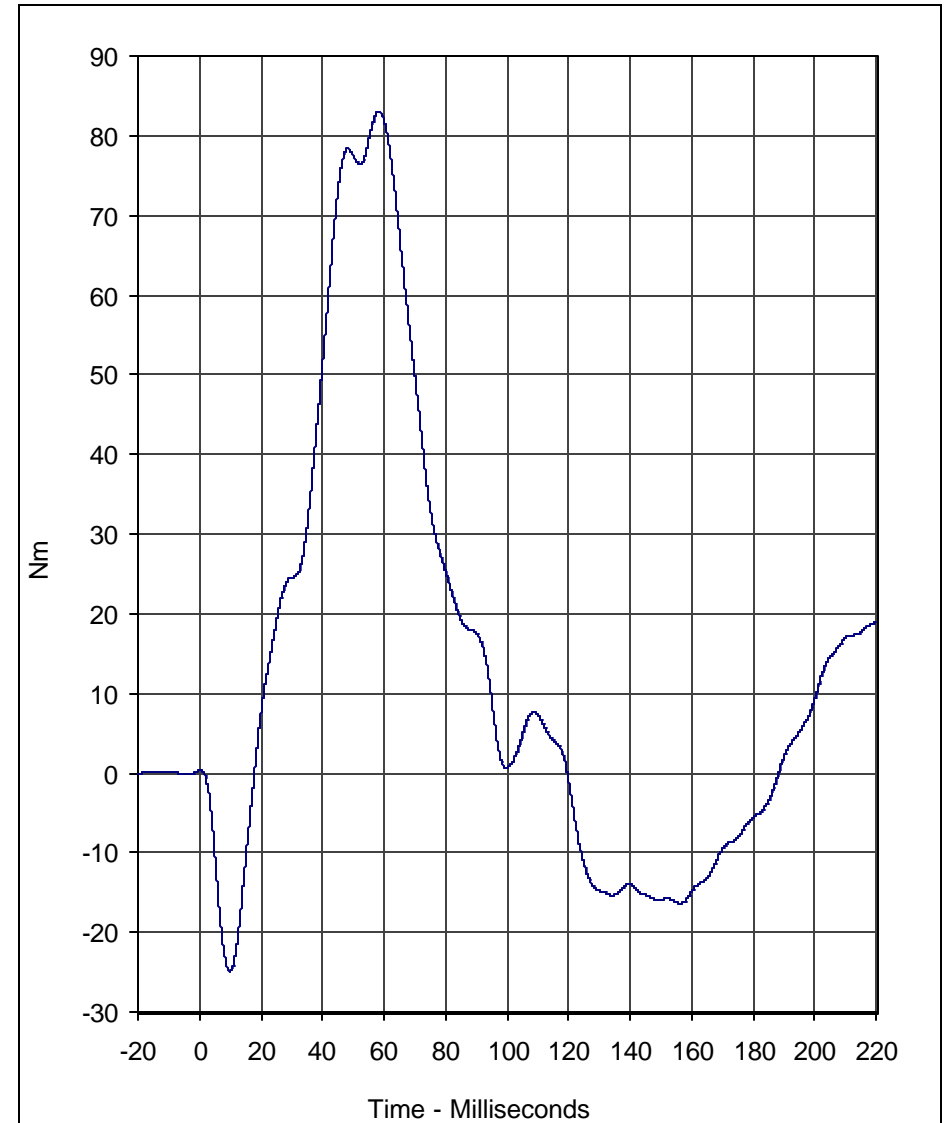
A.T.D. Serial No.: 275
 Test I.D.: NB03D





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	71.9	63.1	-28.2	163.2	60



Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	83.1	58.4	-24.9	9.9	60

Test Program: SID / HIII Neck Pendulum Lateral Test
 Test Date: 1/23/04

A.T.D. Serial No.: 275
 Test I.D.: NB03D



APPENDIX C
POST-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) External Measurements

ATD Serial No.: 274

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
SH- Seated Height	mm	889 to 909	892	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	515	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	516	Pass
KV- Knee Pivot From Floor	mm	490 to 505	502	Pass
HW- Hip Width	mm	356 to 391	380	Pass
Overall Test Results				Pass

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TR-P24003-02-NC

Laboratory Technician

January 30, 2004

Test Date



Calibration Data Sheet

Side Impact Hybrid Dummy (SID/HIII)

Thorax Lateral Impact

ATD Serial No.: 274

Test I.D.: TH03E

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
Probe Velocity	m/s	4.21 to 4.33	4.31	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	44.6	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	44.5	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.9	Pass
Overall Test Results				Pass

C-26

TR-P23004-02-NC

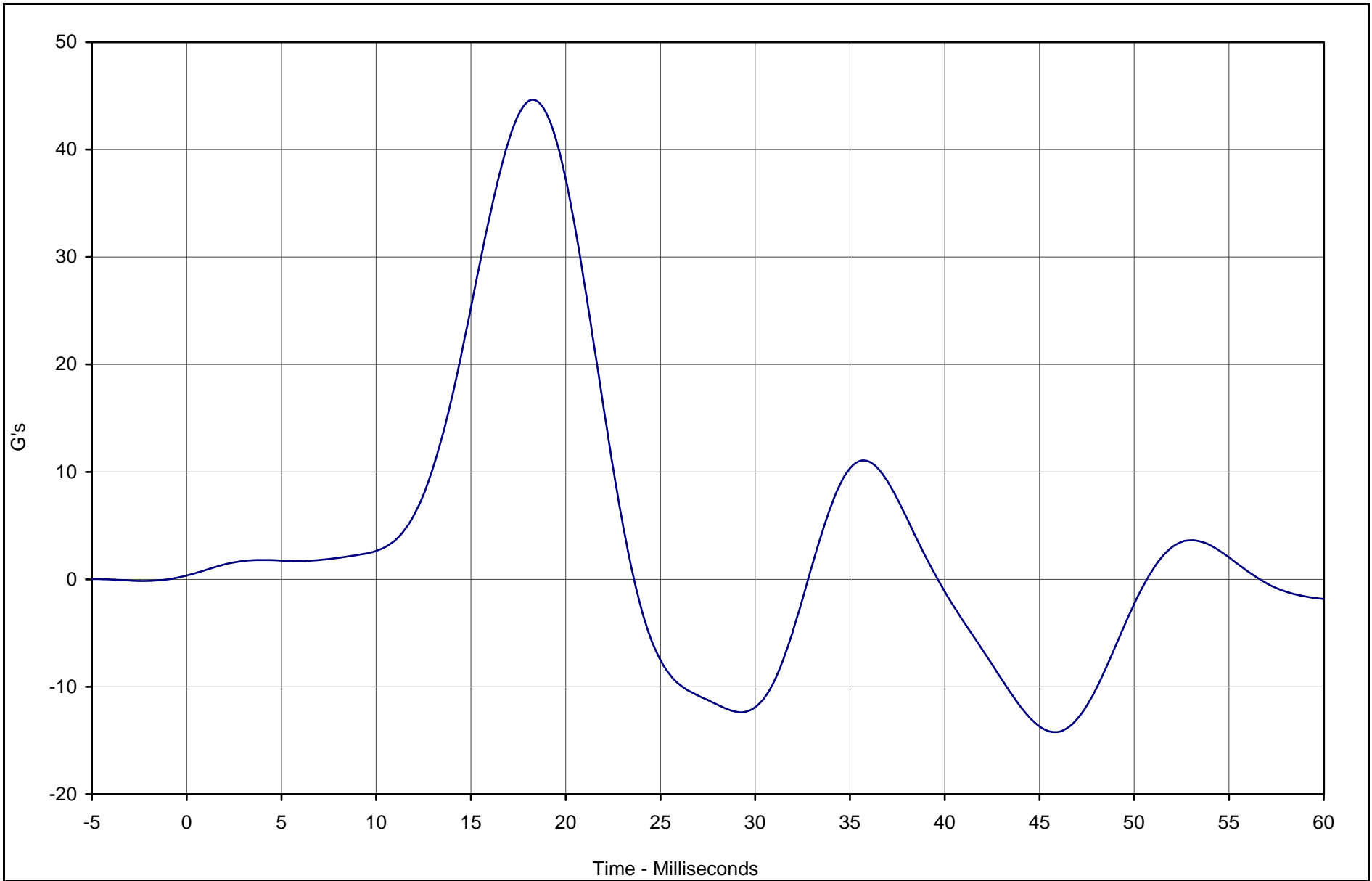
Laboratory Technician

January 29, 2004

Test Date

C-27

TR-P23004-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Upper Rib Y Acceleration	001	FIL	G's	44.6	18.1	-14.2	45.6	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

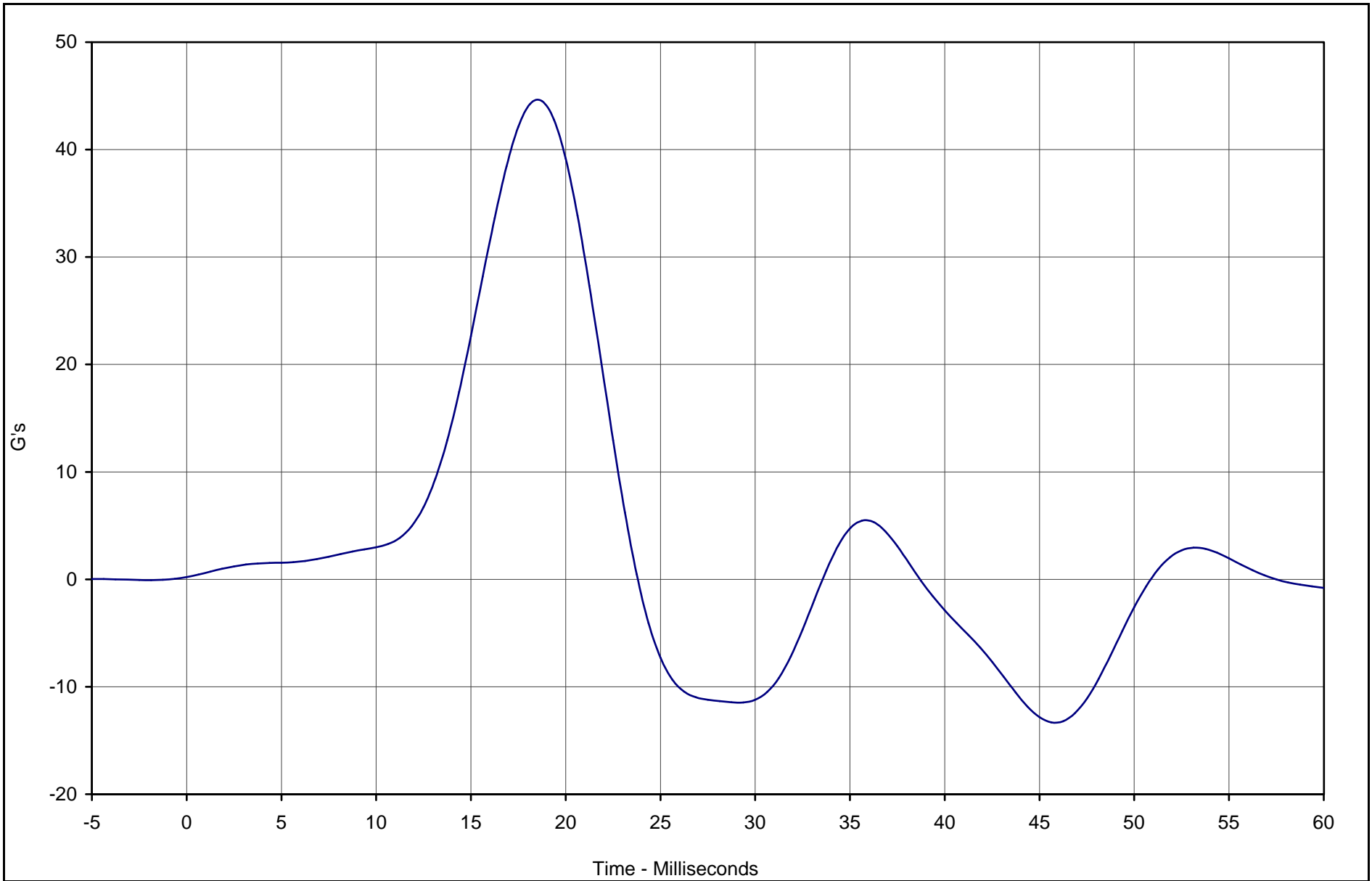
SID Serial No.: 274

Test Date: 1/29/04

Test I.D.: TH03E

C-28

TR-P23004-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Lower Rib Y Acceleration	002	FIL	G's	44.5	18.8	-13.3	45.6	FIR100

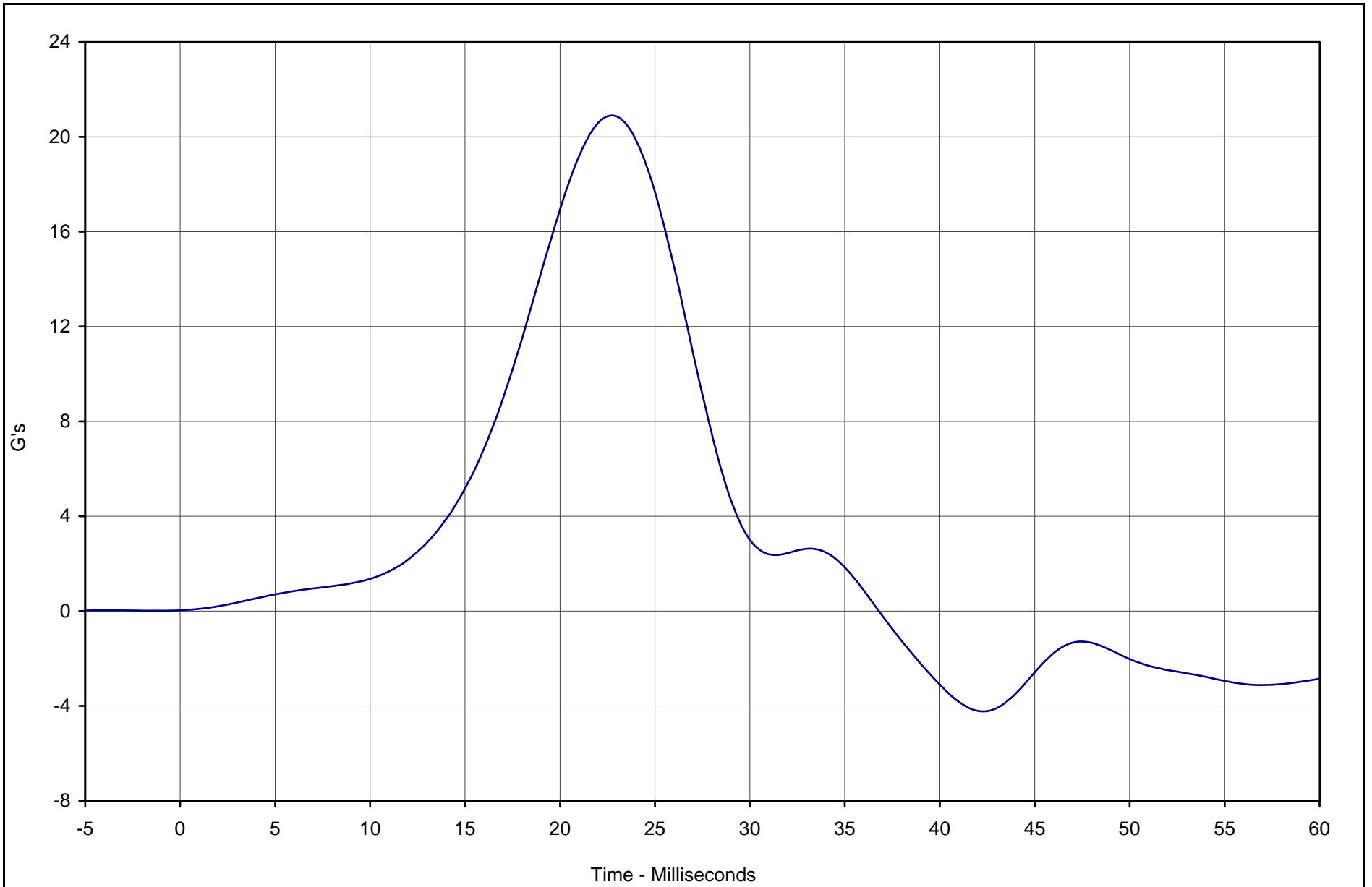


Test Vehicle: SID / HIII Thorax Lateral Impact

SID Serial No.: 274

Test Date: 1/29/04

Test I.D.: TH03E



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Lower Spine Y Acceleration	003	FIL	G's	20.9	22.5	-4.2	42.5	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

SID Serial No.: 274

Test Date: 1/29/04

Test I.D.: TH03E



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Pelvis Lateral Impact

ATD Serial No.: 274

Test I.D.: PL03E

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
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	40.9	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	5.6	Pass
Overall Test Results				Pass

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TR-P24003-02-NC

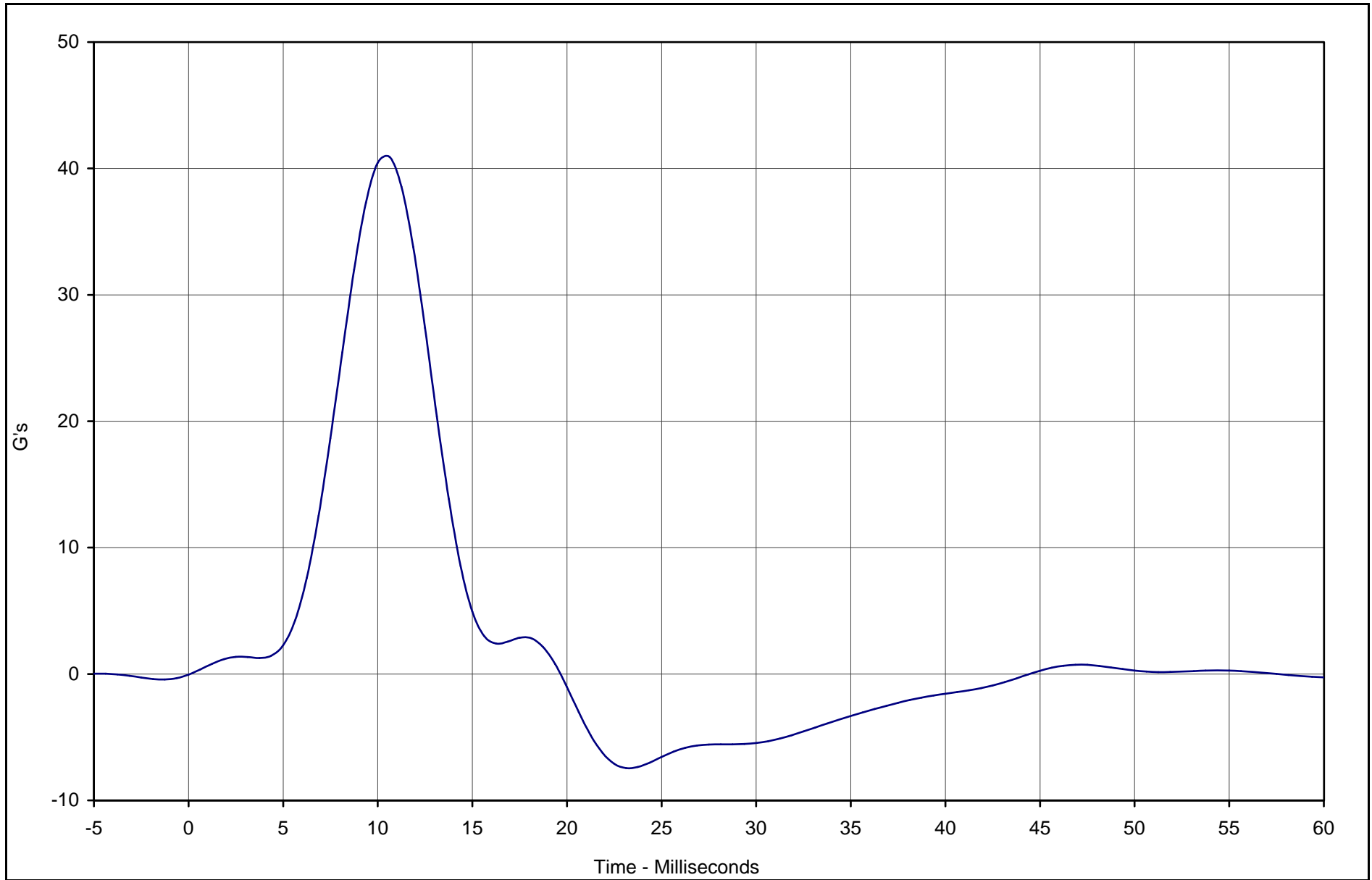
Laboratory Technician

January 29, 2004

Test Date

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pelvis Y Acceleration	001	FIL	G's	40.9	10.6	-7.4	23.1	FIR100



Test Vehicle: Side Impact Dummy (SID) Pelvis Lateral Impact

SID Serial No.: 274

Test Date: 1/29/04

Test I.D.: PL03E



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Head Drop Lateral Impact Test

ATD Serial No.: 274

Test I.D.: HD03E

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	120.0 to 150.0	149.4	Pass
Peak Longitudinal Acceleration	G's	≤15.0	8.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	4.2	Pass
Overall Test Results				Pass

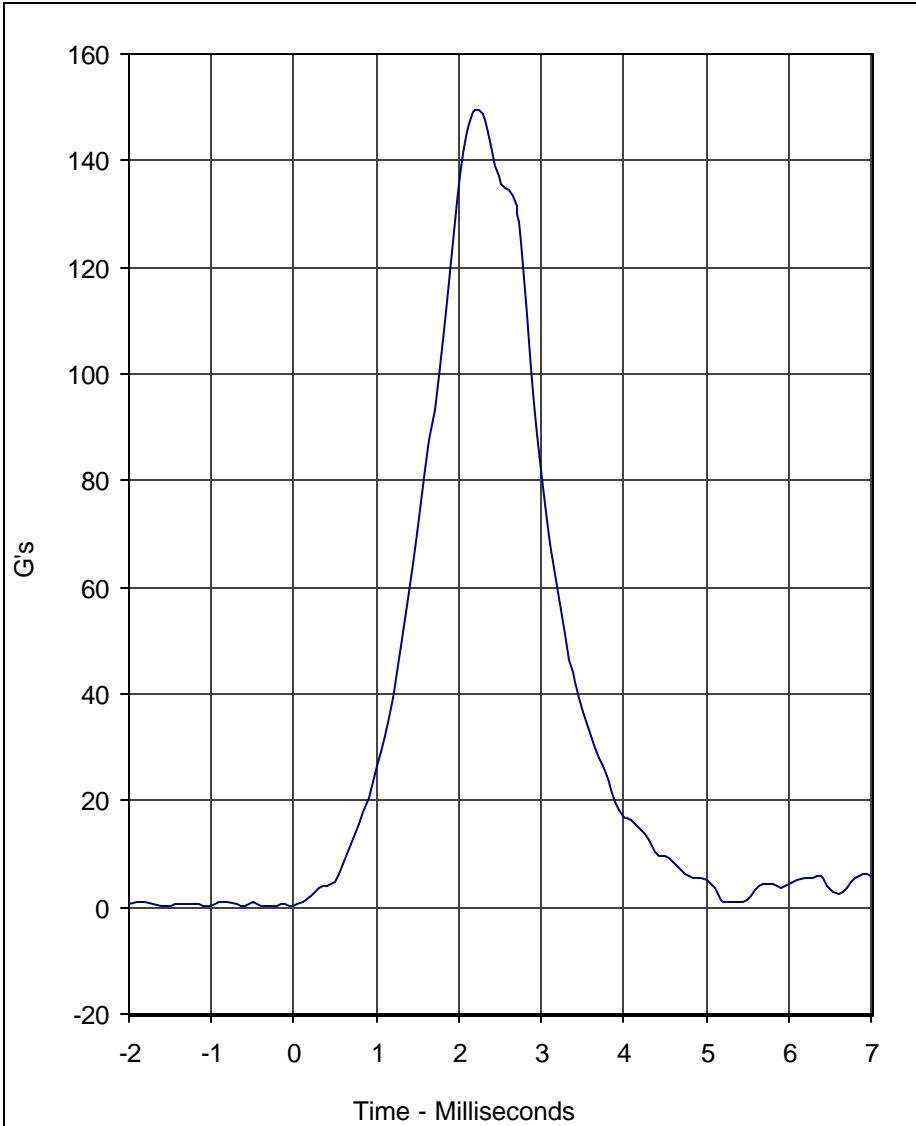
C-32

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Laboratory Technician

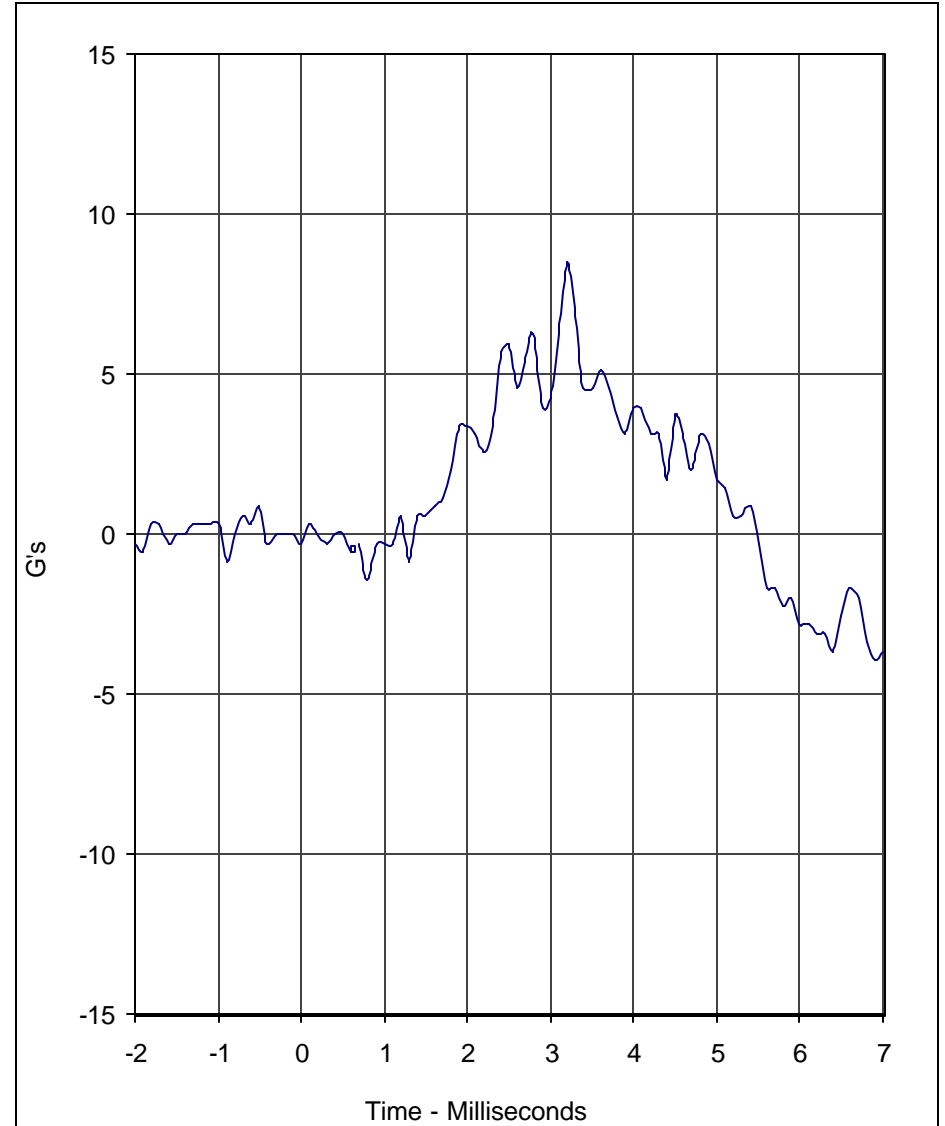
January 30, 2004

Test Date



Curve Description	CURNO	Type
Head Resultant	001	RES

Units	Max	Time	Min	Time	SAE Class
G's	149.4	2.2	0.3	-0.3	1000



Curve Description	CURNO	Type
Head X	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	8.5	3.2	-4.0	6.9	1000

Test Program: SID / HIII Head Drop Lateral Impact Test
 Test Date: 1/30/04

A.T.D. Serial No.: 274
 Test I.D.: HD03E





Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Neck Pendulum Lateral Test

ATD Serial No.: 274

Test I.D.: NB03E

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	7.10	Pass
Pendulum Deceleration	10	Msec.	1.96 to 2.55	1.97	Pass
	20	Msec.	4.12 to 5.10	4.36	Pass
	30	Msec.	5.73 to 7.01	6.49	Pass
	40 to 70	Msec.	6.27 to 7.64	7.50	Pass
Maximum "D" Plane Rotation		Degrees	66.0 to 82.0	68.8	Pass
Maximum "D" Plane Rotation Time After Peak Moment		Msec.	2.0 to 15.0	3.5	Pass
"D" Plane Rotation Decay Time From Peak Angle to Zero Angle		Msec.	58.0 to 67.0	58.4	Pass
Calculated Moment About Occipital Condyle		N•m	73.0 to 88.0	78.0	Pass
Moment About Occipital Condyle Decay, Time From Positive Peak Value To 0 N•m		Msec.	49.0 to 64.0	51.5	Pass
Overall Test Results					Pass

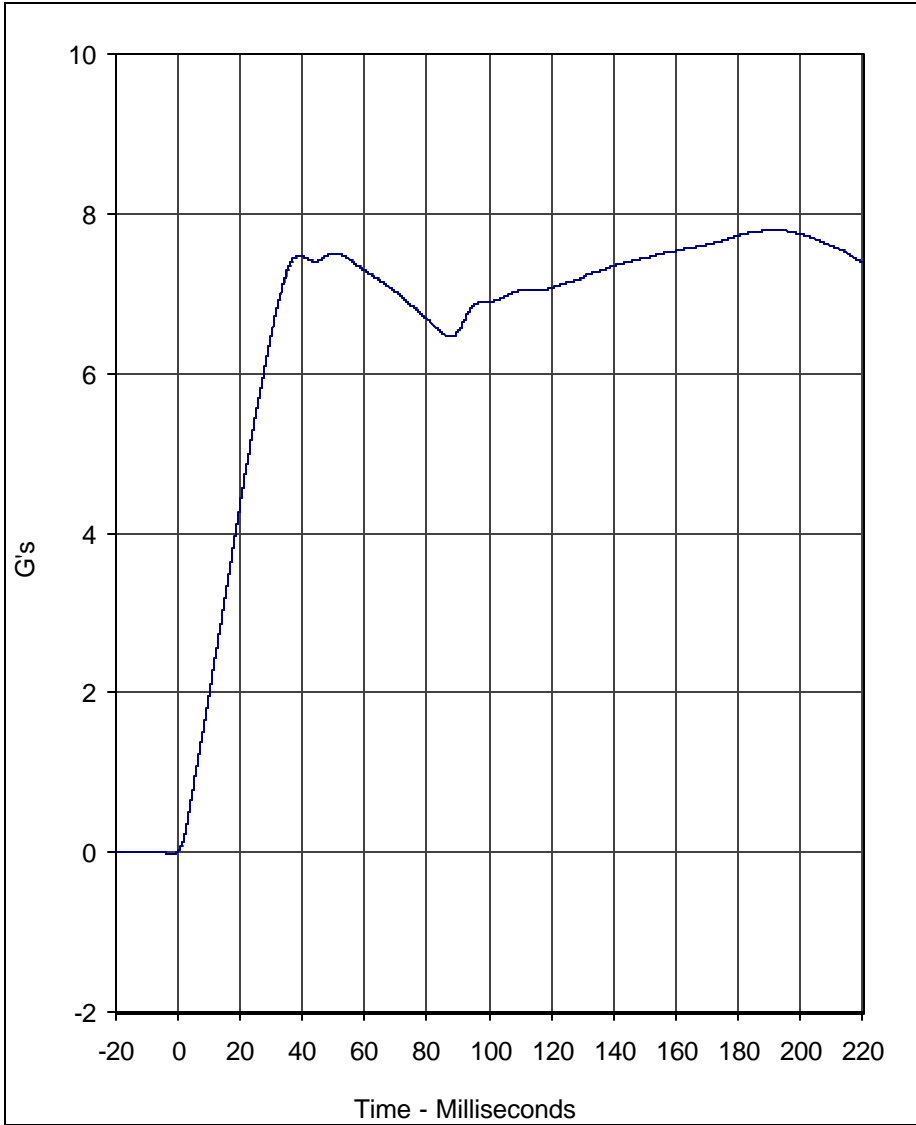
Laboratory Technician

January 29, 2004

Test Date

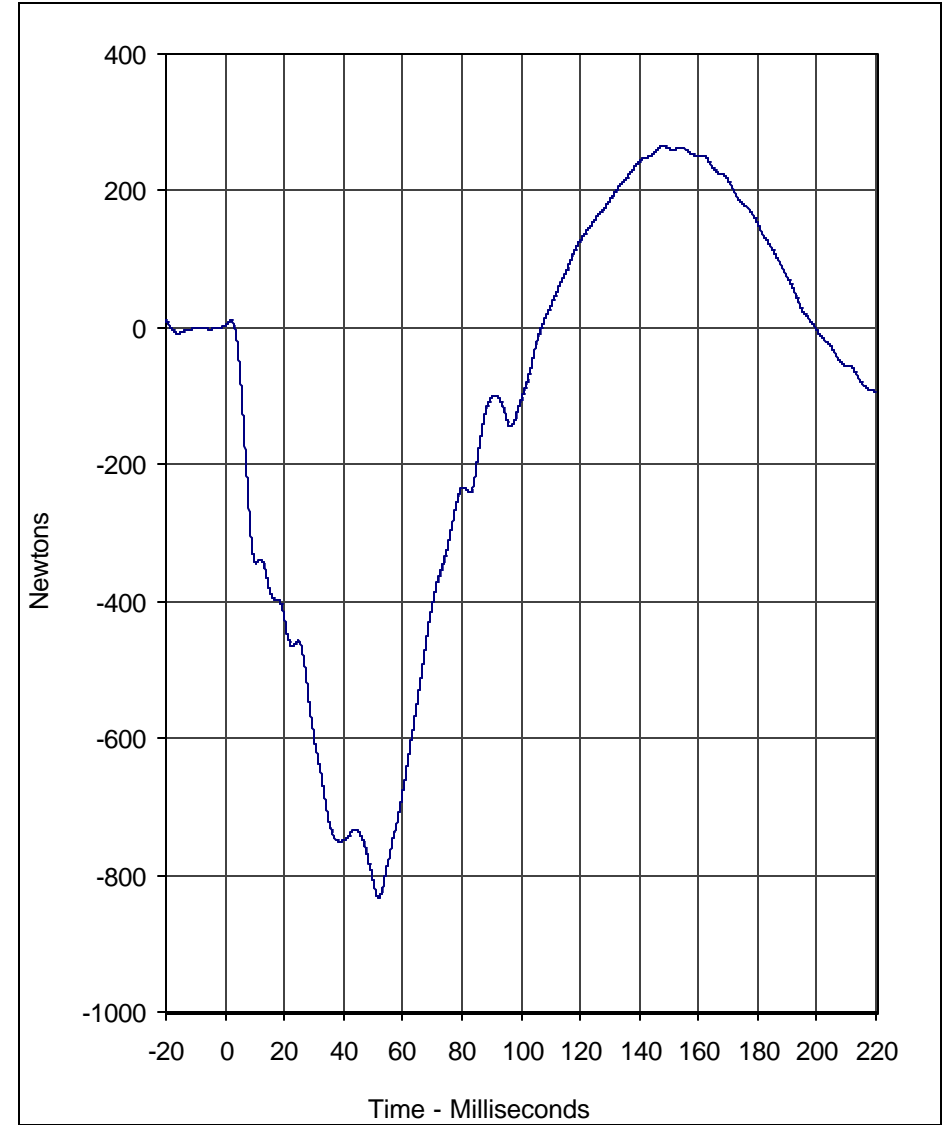
C-34

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Curve Description	CURNO	Type
Pendulum Velocity	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	7.8	192.1	0.0	-1.5	60



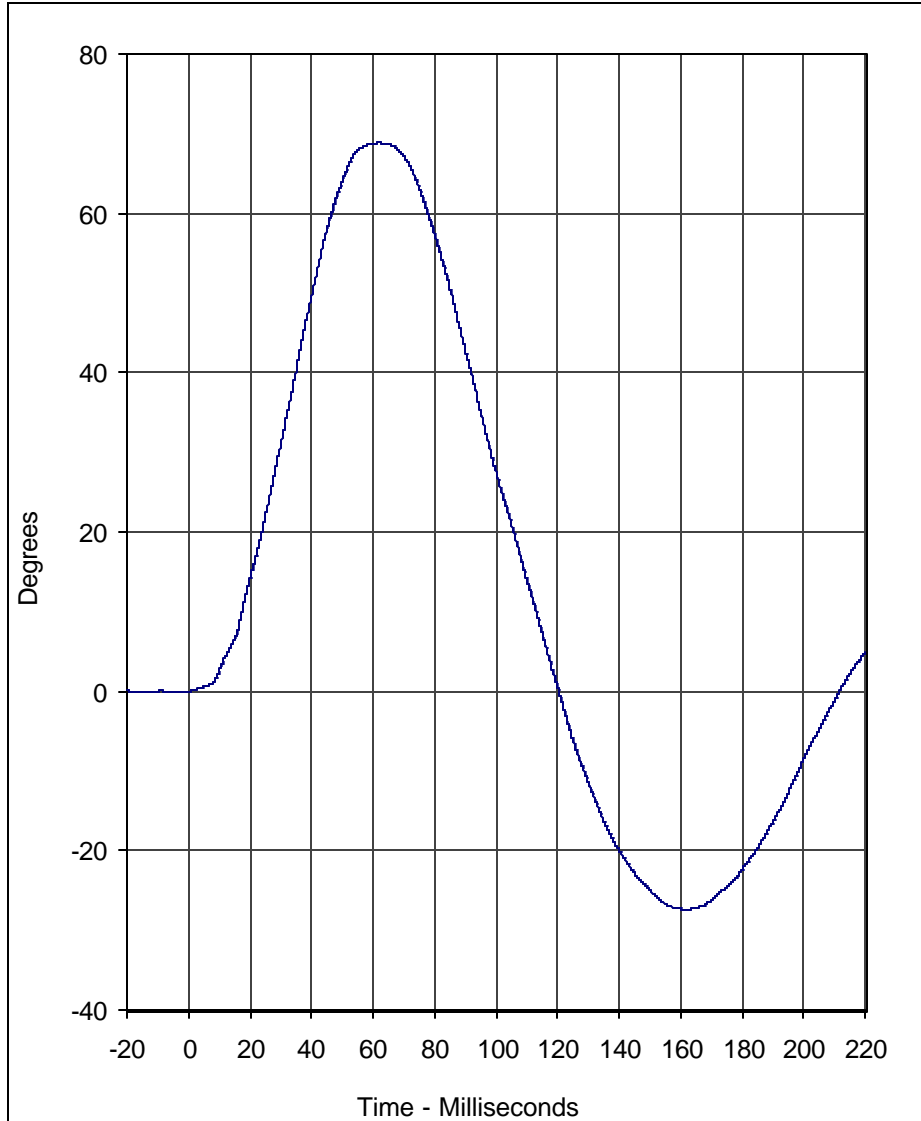
Curve Description	CURNO	Type
Neck Force Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	265.0	147.9	-833.0	51.9	60

Test Program: SID / HIII Neck Pendulum Lateral Test
 Test Date: 1/29/04

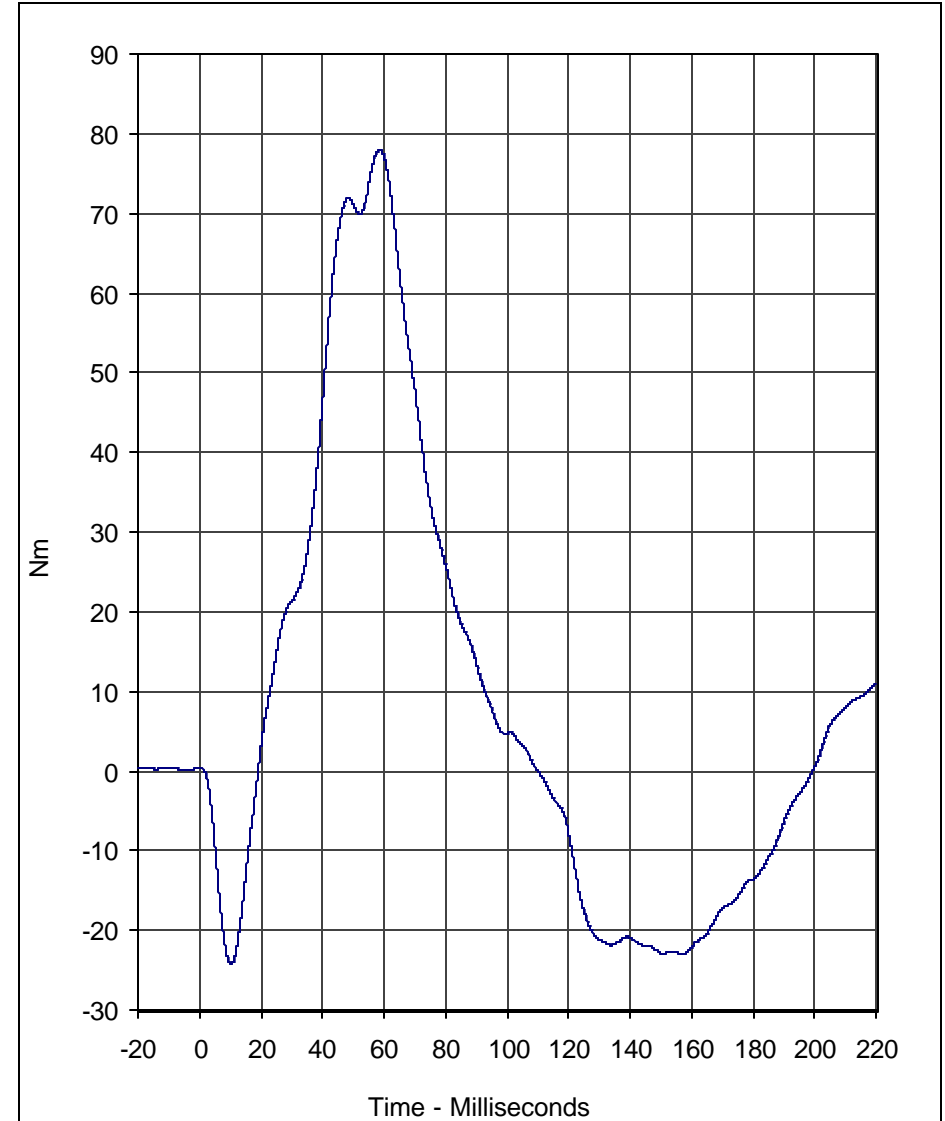
A.T.D. Serial No.: 274
 Test I.D.: NB03E





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	68.8	62.1	-27.4	161.7	60



Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	78.0	58.6	-24.2	10.3	60

Test Program: SID / HIII Neck Pendulum Lateral Test
 Test Date: 1/29/04

A.T.D. Serial No.: 274
 Test I.D.: NB03E





Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) External Measurements

ATD Serial No.: 275

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
SH- Seated Height	mm	889 to 909	900	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	505	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	515	Pass
KV- Knee Pivot From Floor	mm	490 to 505	495	Pass
HW- Hip Width	mm	356 to 391	365	Pass
Overall Test Results				Pass

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TR-P24003-02-NC

Laboratory Technician

January 30, 2004
Test Date



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Thorax Lateral Impact

ATD Serial No.: 275

Test I.D.: TH03F

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
Probe Velocity	m/s	4.21 to 4.33	4.26	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	43.9	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	44.2	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.9	Pass
Overall Test Results				Pass

C-38

TR-P23004-02-NC

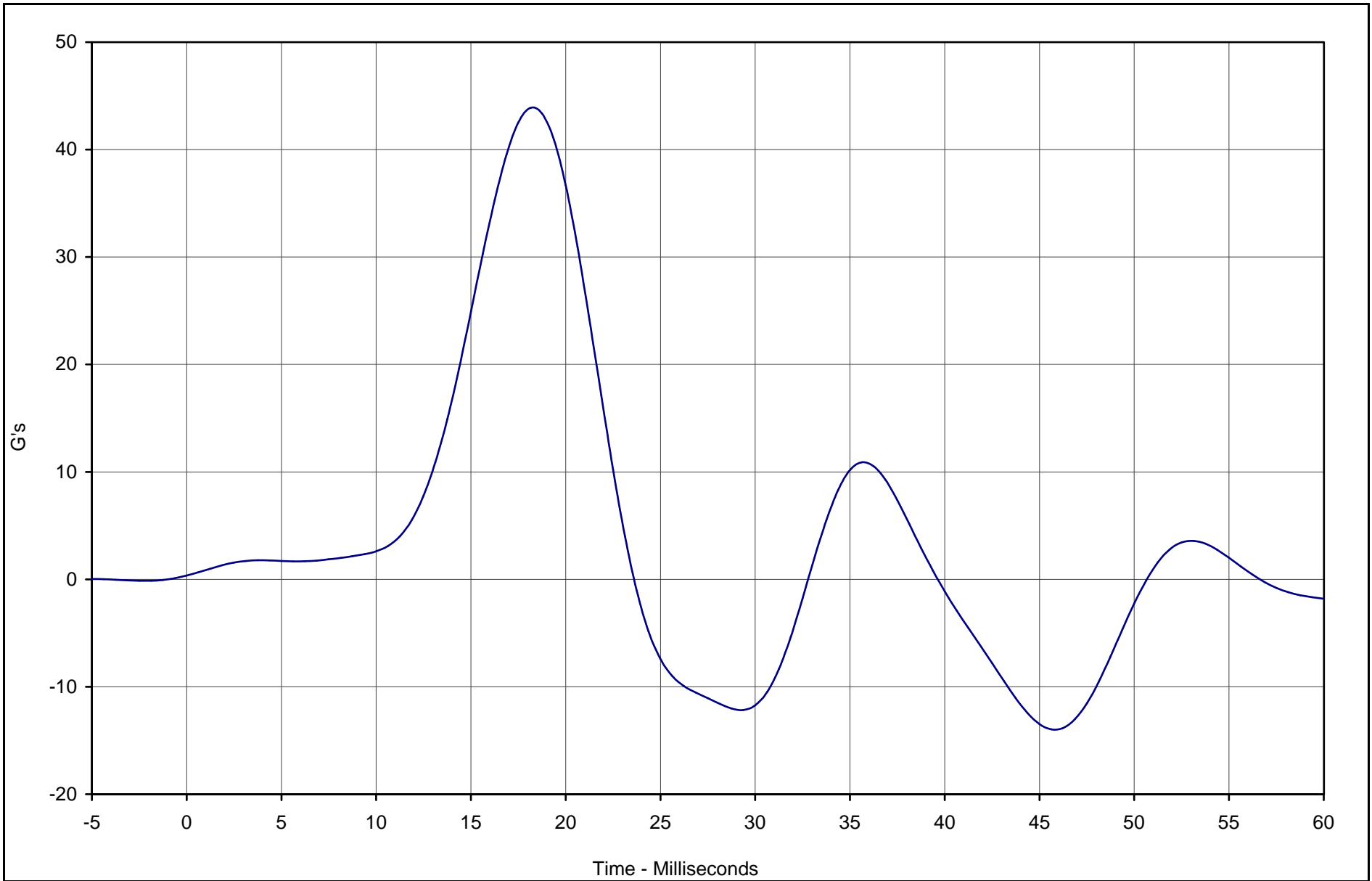
Laboratory Technician

January 29, 2004

Test Date

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TR-P23004-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Upper Rib Y Acceleration	001	FIL	G's	43.9	18.1	-14.0	45.6	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

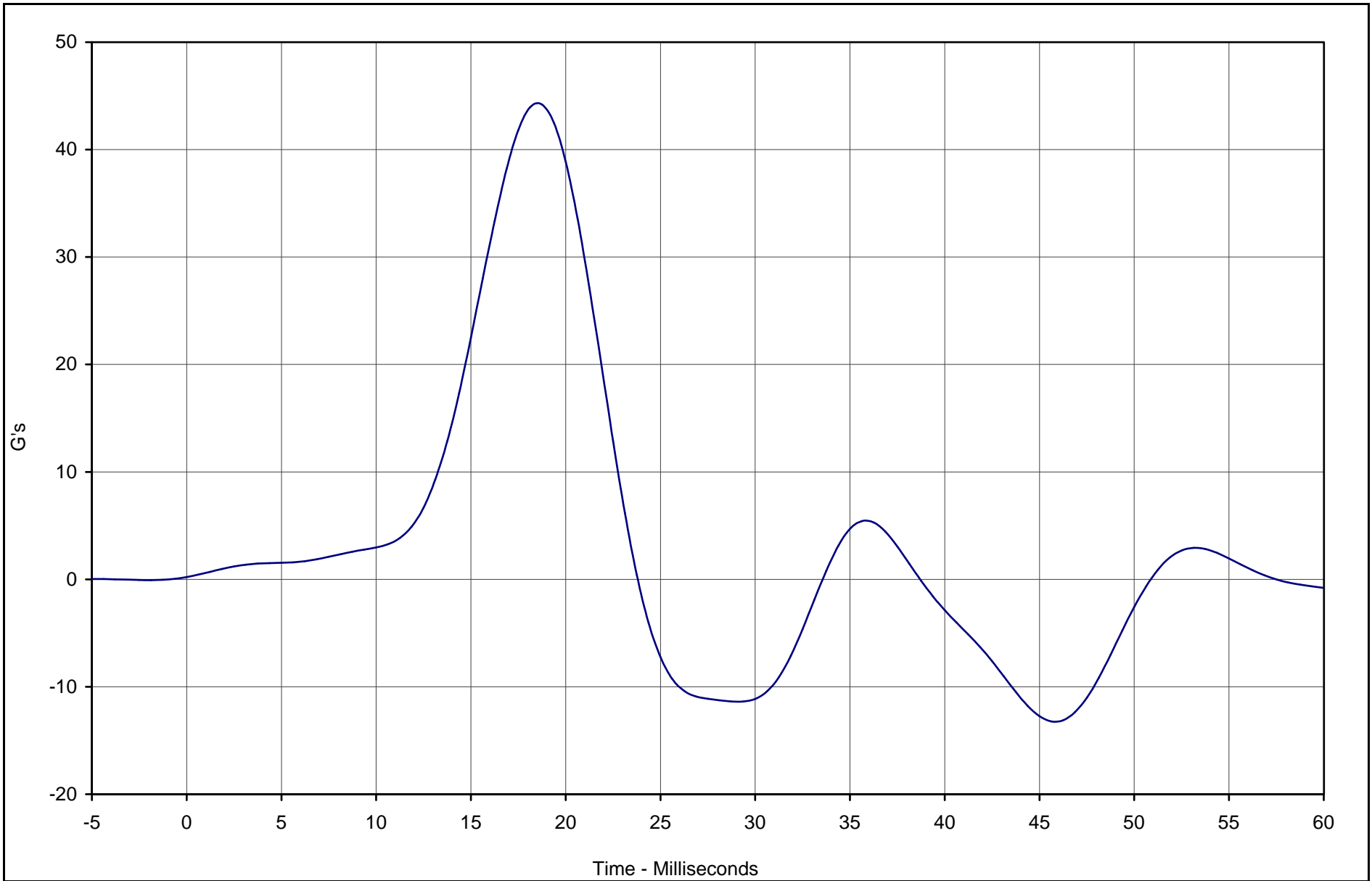
SID Serial No.: 275

Test Date: 1/29/04

Test I.D.: TH03F

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TR-P23004-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Lower Rib Y Acceleration	002	FIL	G's	44.2	18.8	-13.2	45.6	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

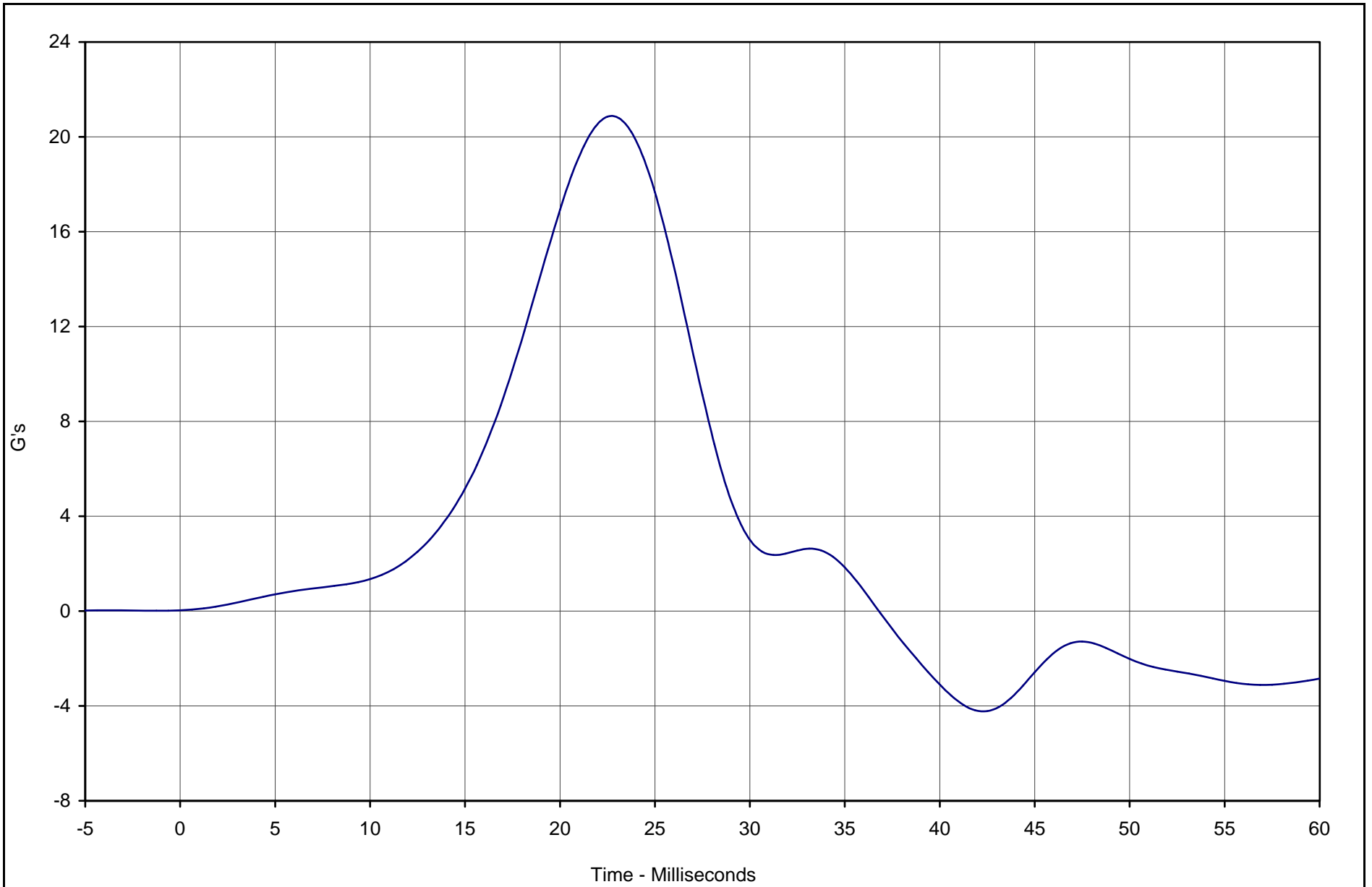
SID Serial No.: 275

Test Date: 1/29/04

Test I.D.: TH03F

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TR-P23004-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Lower Spine Y Acceleration	003	FIL	G's	20.9	22.5	-4.2	42.5	FIR100



Test Vehicle: SID / HIII Thorax Lateral Impact

SID Serial No.: 275

Test Date: 1/29/04

Test I.D.: TH03F



Calibration Data Sheet

Side Impact Hybrid Dummy (SID/HIII)

Pelvis Lateral Impact

ATD Serial No.: 275

Test I.D.: PL03F

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
Probe Velocity	m/s	4.21 to 4.33	4.26	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	40.6	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	6.9	Pass
Overall Test Results				Pass

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TR-P24003-02-NC

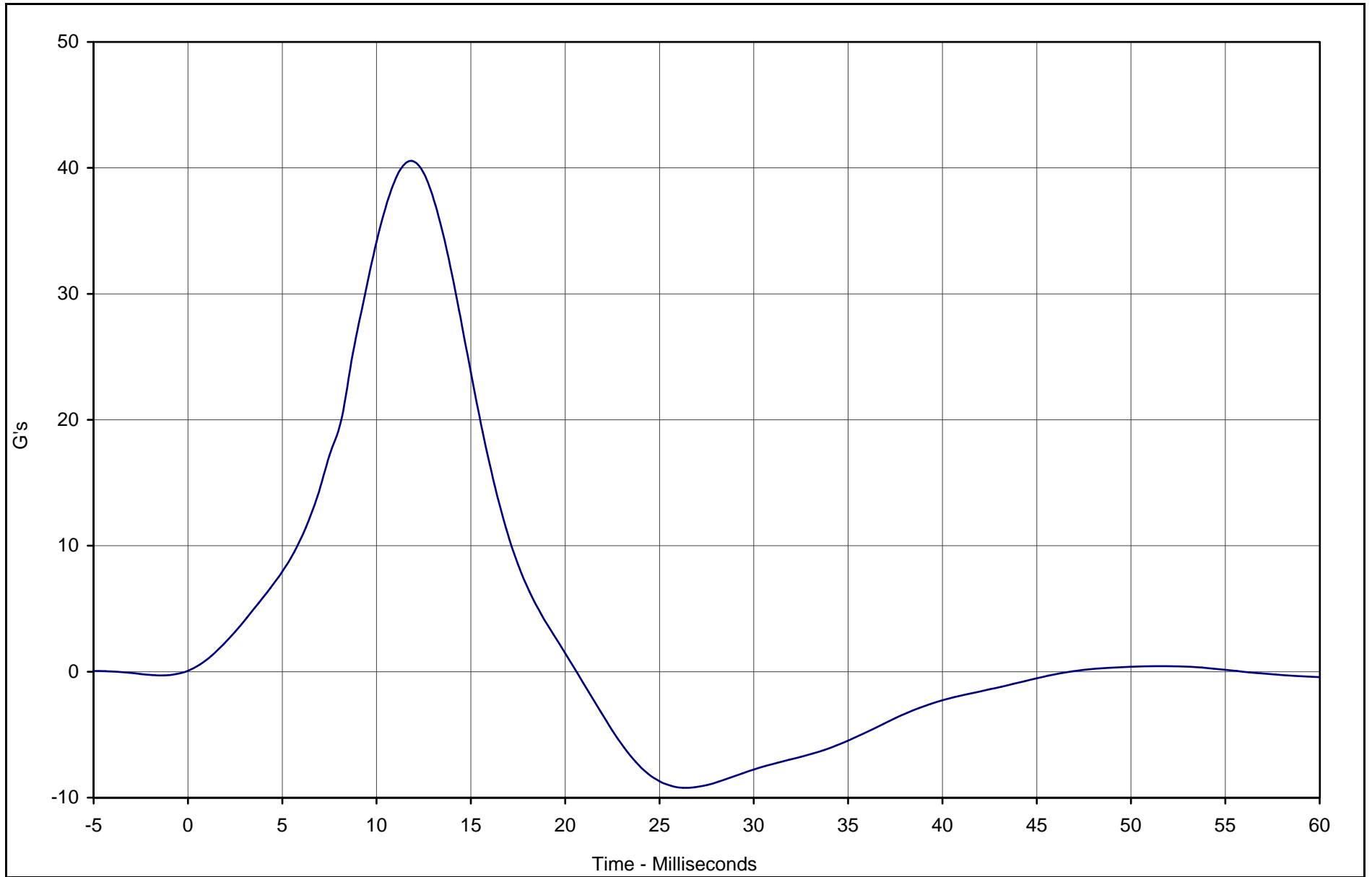
Laboratory Technician

January 29, 2004

Test Date

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TR-P24003-02-NC



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pelvis Y Acceleration	001	FIL	G's	40.6	11.9	-9.2	26.3	FIR100



Test Vehicle: Side Impact Dummy (SID) Pelvis Lateral Impact

SID Serial No.: 275

Test Date: 1/29/04

Test I.D.: PL03F



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Head Drop Lateral Impact Test

ATD Serial No.: 275

Test I.D.: HD03F

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	120.0 to 150.0	138.8	Pass
Peak Longitudinal Acceleration	G's	≤15.0	8.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	7.4	Pass
Overall Test Results				Pass

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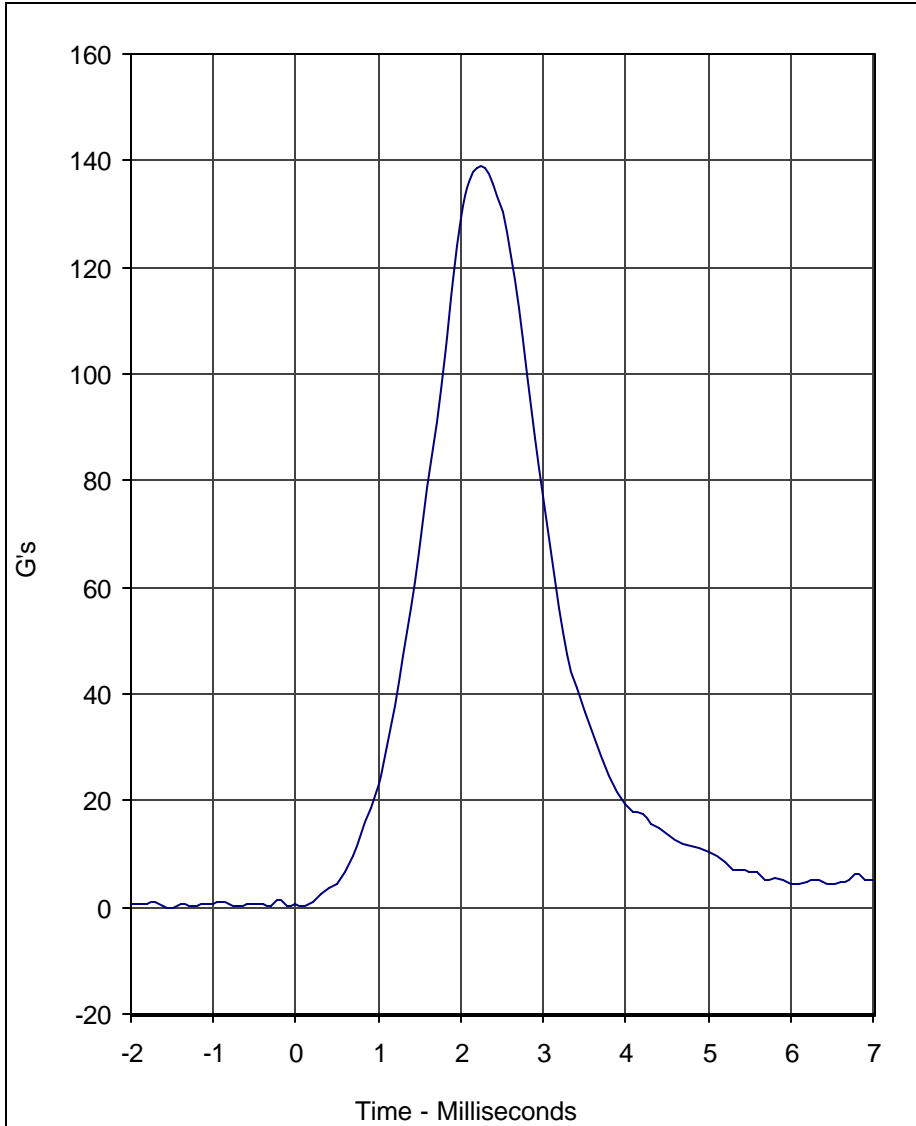
TR-P24003-02-NC

Laboratory Technician

January 30, 2004

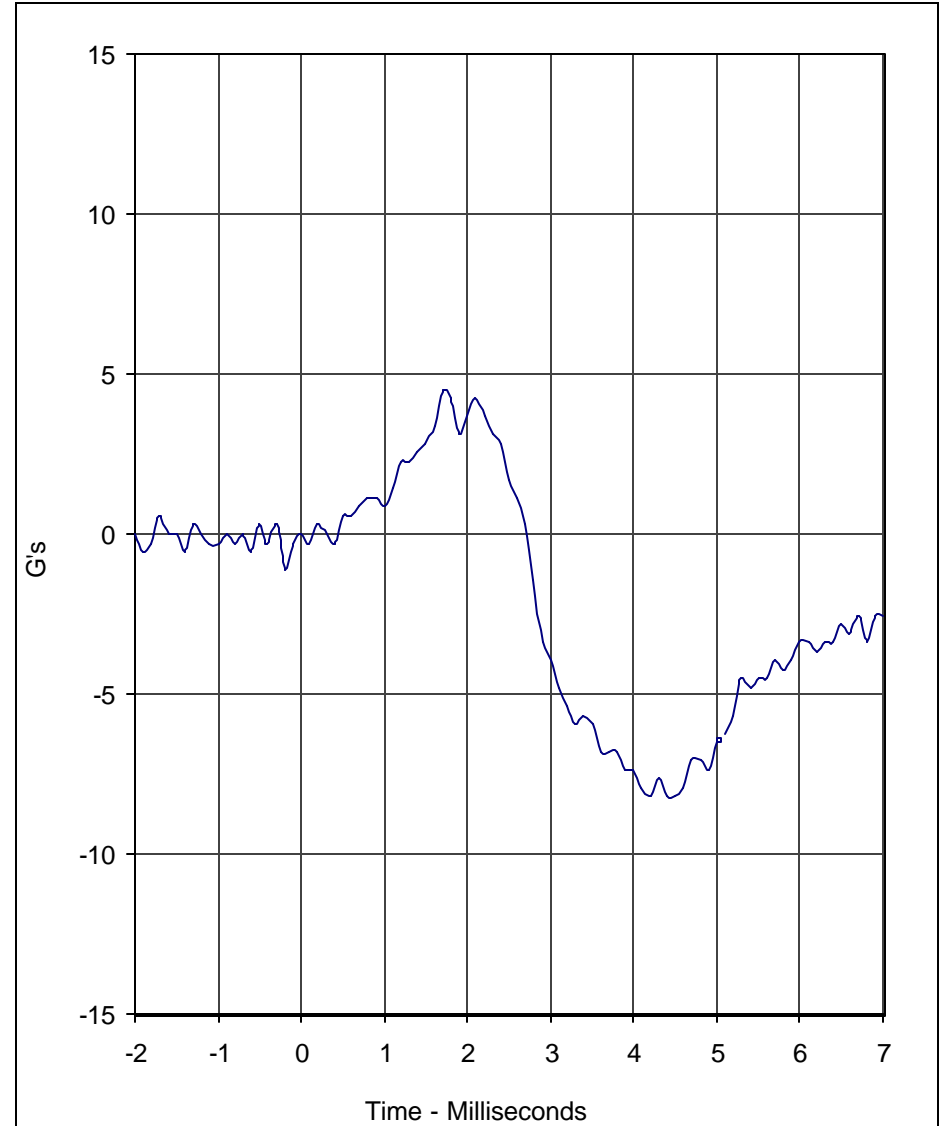
Test Date

C-45



Curve Description		CURNO	Type
Head Resultant		001	RES

Units	Max	Time	Min	Time	SAE Class
G's	138.8	2.3	0.0	-1.5	1000



Curve Description		CURNO	Type
Head X		002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	4.5	1.7	-8.2	4.2	1000

Test Program: SID / HIII Head Drop Lateral Impact Test
 Test Date: 1/30/04

A.T.D. Serial No.: 275
 Test I.D.: HD03F



TR-P24003-02-NC



Calibration Data Sheet Side Impact Hybrid Dummy (SID/HIII) Neck Pendulum Lateral Test

ATD Serial No.: 275

Test I.D.: NB03F

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	7.05	Pass
Pendulum Deceleration	10	Msec.	1.96 to 2.55	2.05	Pass
	20	Msec.	4.12 to 5.10	4.45	Pass
	30	Msec.	5.73 to 7.01	6.58	Pass
	40 to 70	Msec.	6.27 to 7.64	7.52	Pass
Maximum "D" Plane Rotation		Degrees	66.0 to 82.0	69.3	Pass
Maximum "D" Plane Rotation Time After Peak Moment		Msec.	2.0 to 15.0	4.2	Pass
"D" Plane Rotation Decay Time From Peak Angle to Zero Angle		Msec.	58.0 to 67.0	58.5	Pass
Calculated Moment About Occipital Condyle		N•m	73.0 to 88.0	78.5	Pass
Moment About Occipital Condyle Decay, Time From Positive Peak Value To 0 N•m		Msec.	49.0 to 64.0	52.6	Pass
Overall Test Results					Pass

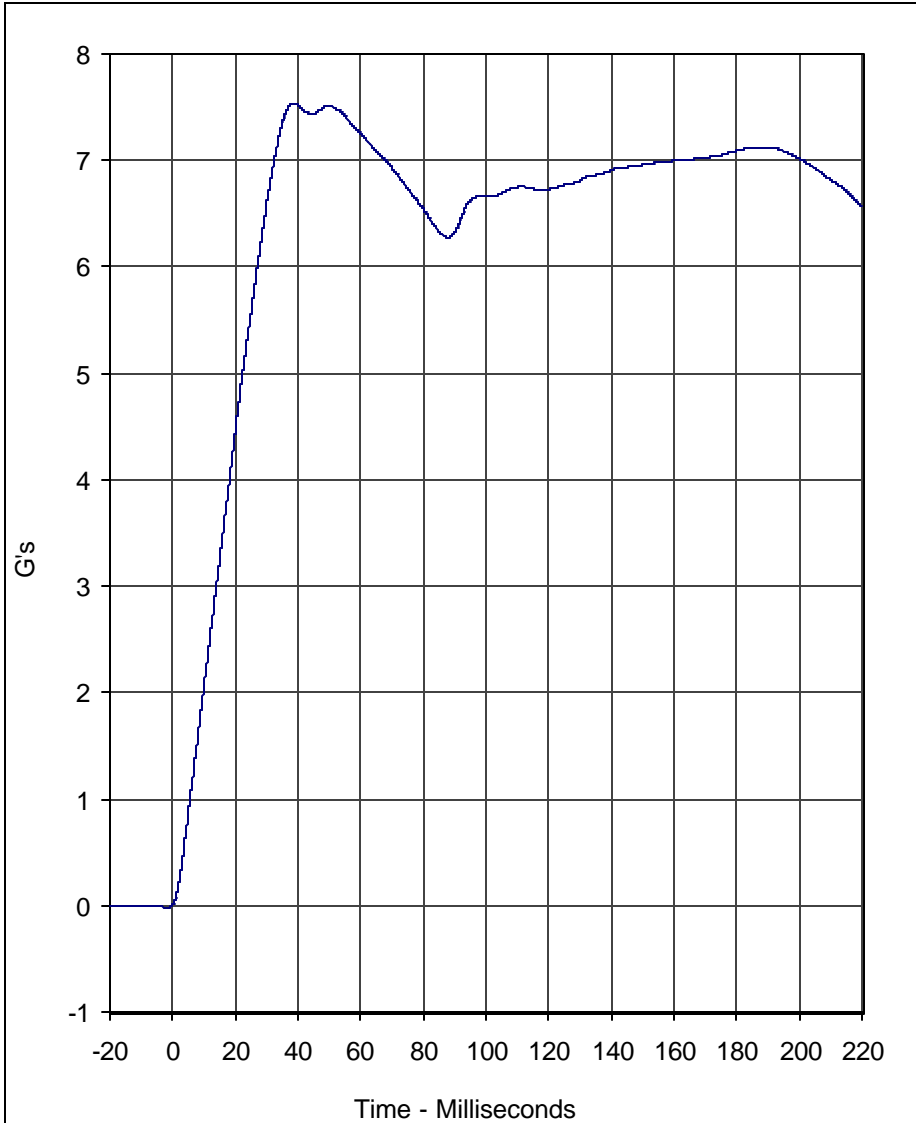
Laboratory Technician

January 29, 2004

Test Date

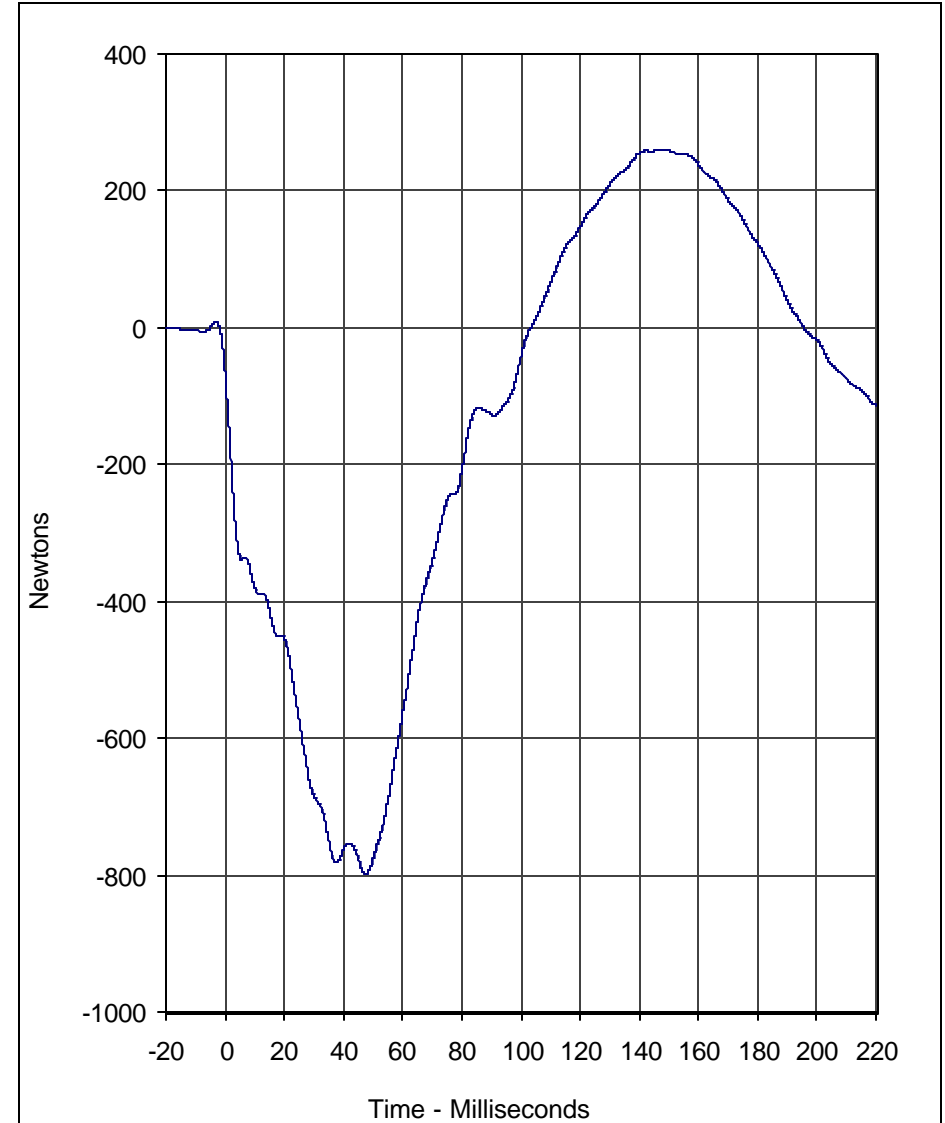
C-46

TR-P24003-02-NC



Curve Description	CURNO	Type
Pendulum Velocity	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	7.5	38.6	0.0	-1.5	60



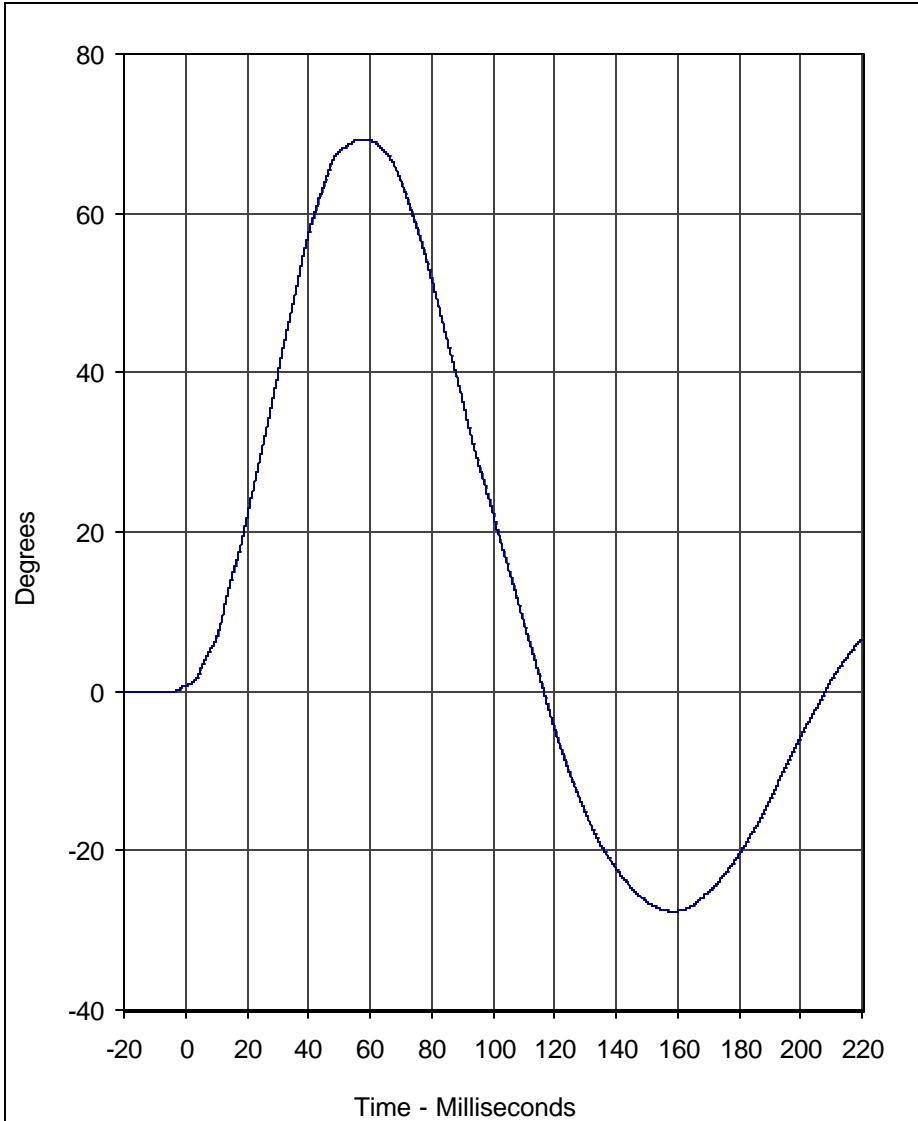
Curve Description	CURNO	Type
Neck Force Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	261.1	147.8	-799.5	47.3	60

Test Program: SID / HIII Neck Pendulum Lateral Test
 Test Date: 1/29/04

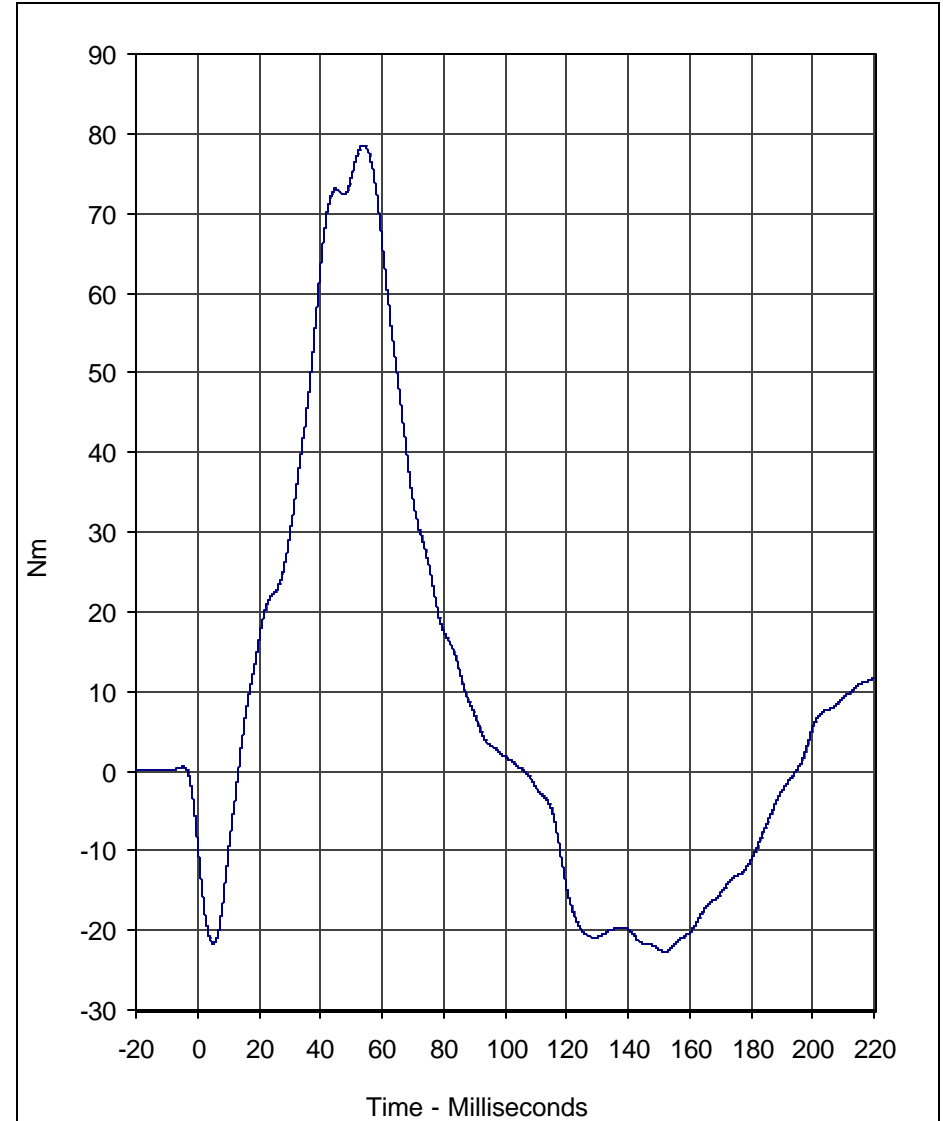
A.T.D. Serial No.: 275
 Test I.D.: NB03F





Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	69.3	58.1	-27.6	158.5	60



Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	78.5	53.9	-22.7	151.9	60

Test Program: SID / HIII Neck Pendulum Lateral Test
 Test Date: 1/29/04

A.T.D. Serial No.: 275
 Test I.D.: NB03F



APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

**55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Driver SID/HIII Serial Number 275
1/27/04
2004 Lexus ES 330 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	Head CG	X	GPAC072X	Accel., Full Bridge	Entran	2000JF	G
2	Head CG	Y	GPAC073Y	Accel., Full Bridge	Entran	2000JF	G
3	Head CG	Z	GPAC074Z	Accel., Full Bridge	Entran	2000JF	G
4	Head CG, Redundant	X	GPAC075X	Accel., Full Bridge	Entran	2000JF	G
5	Head CG, Redundant	Y	GPAC077Y	Accel., Full Bridge	Entran	2000JF	G
6	Head CG, Redundant	Z	GPAC078Z	Accel., Full Bridge	Entran	2000JF	G
7	Neck Force	X	275_NFX	Load cell, six axis neck	R. A. Denton	1716A	N
8	Neck Force	Y	275_NFY	Load cell, six axis neck	R. A. Denton	1716A	N
9	Neck Force	Z	275_NFZ	Load cell, six axis neck	R. A. Denton	1716A	N
10	Neck Moment	X	275_NMX	Load cell, six axis neck	R. A. Denton	1716A	Nm
11	Neck Moment	Y	275_NMY	Load cell, six axis neck	R. A. Denton	1716A	Nm
12	Neck Moment	Z	275_NMZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
13	Upper Rib Primary	Y	KEAC066X	Accel., 1/2 bridge	Endevco	7264-2000X	G
14	Lower Rib, Primary	Y	KEAC067Y	Accel., 1/2 bridge	Endevco	7264-2000Y	G
15	Lower Spine, Primary	Y	KEAC068Z	Accel., 1/2 bridge	Endevco	7264-2000Z	G
16	Pelvis, Primary	Y	KEAC079X	Accel., 1/2 bridge	Endevco	7264-2000X	G
17	Upper Rib Redundant	Y	KEAC073X	Accel., 1/2 bridge	Endevco	7264-2000X	G
18	Lower Rib, Redundant	Y	KEAC074Y	Accel., 1/2 bridge	Endevco	7264-2000Y	G
19	Lower Spine, Redundant	Y	KEAC075Z	Accel., 1/2 bridge	Endevco	7264-2000Z	G
20	Pelvis, Redundant	Y	KEAC081X	Accel., 1/2 bridge	Endevco	7264-2000X	G
21	Thorax Contact	Y	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%
22	Pelvis Contact	Y	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%

**55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Passenger SID/HIII Serial Number 274
1/27/04
2004 Lexus ES 330 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
23	Head CG	X	GPAC066X	Accel., Full Bridge	Entran	2000JF	G
24	Head CG	Y	GPAC067Y	Accel., Full Bridge	Entran	2000JF	G
25	Head CG	Z	GPAC068Z	Accel., Full Bridge	Entran	2000JF	G
26	Head CG, Redundant	X	GPAC069X	Accel., Full Bridge	Entran	2000JF	G
27	Head CG, Redundant	Y	GPAC070Y	Accel., Full Bridge	Entran	2000JF	G
28	Head CG, Redundant	Z	GPAC071Z	Accel., Full Bridge	Entran	2000JF	G
29	Neck Force	X	274_NFX	Load cell, six axis neck	R. A. Denton	1716A	N
30	Neck Force	Y	274_NFY	Load cell, six axis neck	R. A. Denton	1716A	N
31	Neck Force	Z	274_NFZ	Load cell, six axis neck	R. A. Denton	1716A	N
32	Neck Moment	X	274_NMX	Load cell, six axis neck	R. A. Denton	1716A	Nm
33	Neck Moment	Y	274_NMY	Load cell, six axis neck	R. A. Denton	1716A	Nm
34	Neck Moment	Z	274_NMZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
35	Upper Rib Primary	Y	KEAC070X	Accel., 1/2 bridge	Endevco	7264-2000X	G
36	Lower Rib, Primary	Y	KEAC071Y	Accel., 1/2 bridge	Endevco	7264-2000Y	G
37	Lower Spine, Primary	Y	KEAC072Z	Accel., 1/2 bridge	Endevco	7264-2000Z	G
38	Pelvis, Primary	Y	GPAC065X	Accel., Full bridge	Endevco	7264A-2000	G
39	Upper Rib Redundant	Y	KEAC076X	Accel., 1/2 bridge	Endevco	7264-2000X	G
40	Lower Rib, Redundant	Y	KEAC077Y	Accel., 1/2 bridge	Endevco	7264-2000Y	G
41	Lower Spine, Redundant	Y	KEAC078Z	Accel., 1/2 bridge	Endevco	7264-2000Z	G
42	Pelvis, Redundant	Y	KEAC089X	Accel., 1/2 bridge	Endevco	7264-2000X	G
43	Thorax Contact	N/A	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%
44	Pelvis Contact	N/A	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%

**55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Vehicle Accelerometers
1/27/04
2004 Lexus ES 330 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	Right at Sill Front Seat	X	KETX1A	Accel., Triax	I.C. Sensor	3031-200	G
46	Right at Sill Front Seat	Y	KETX1B	Accel., Triax	I.C. Sensor	3031-200	G
47	Right at Sill Front Seat	Z	KETX1C	Accel., Triax	I.C. Sensor	3031-200	G
48	Right at Sill Rear Seat	X	KETX4A	Accel., Triax	I.C. Sensor	3031-500	G
49	Right at Sill Rear Seat	Y	KETX4B	Accel., Triax	I.C. Sensor	3031-500	G
50	Right at Sill Rear Seat	Z	KETX4C	Accel., Triax	I.C. Sensor	3031-500	G
51	Rear Floorpan Above Axle	X	KETX5A	Accel., Triax	I.C. Sensor	3031-500	G
52	Rear Floorpan Above Axle	Y	KETX5B	Accel., Triax	I.C. Sensor	3031-500	G
53	Rear Floorpan Above Axle	Z	KETX5C	Accel., Triax	I.C. Sensor	3031-500	G
54	Left Sill at Rear Door	Y	KEVA012	Accel., Vehicle block	I.C. Sensor	3031-500	G
55	Left Sill at Front Door	Y	KEVA010	Accel., Vehicle block	I.C. Sensor	3031-500	G
56	Left Front Door Centerline	Y	ICST004X	Accel., Triax	I.C. Sensor	3031-500	G
57	Rear Occupant Compartment	Y	KEVA013	Accel., Vehicle block	I.C. Sensor	3031-200	G
58	Left Front Door Mid-Rear	Y	ICST004Y	Accel., Triax	I.C. Sensor	3031-500	G
59	Left Front Door Upper Centerline	Y	ICST004Z	Accel., Triax	I.C. Sensor	3031-500	G
60	Rear Door Mid-Rear	Y	ICST005X	Accel., Triax	I.C. Sensor	3031-500	G
61	Rear Door Upper Centerline	Y	ICST005Y	Accel., Triax	I.C. Sensor	3031-500	G
62	B-Post Lower	Y	KEBX2A	Accel., Biax	I.C. Sensor	3031-500	G
63	B-Post Middle	Y	KEBX2B	Accel., Biax	I.C. Sensor	3031-500	G
64	A-Post Lower	Y	KEBX1A	Accel., Biax	I.C. Sensor	3031-500	G
65	A-Post Middle	Y	KEBX1B	Accel., Biax	I.C. Sensor	3031-500	G
66	Front Seat Track	Y	KEIC008Y	Single	I.C. Sensor	3031-500	G
67	Rear Seat Structure	Y	N/A	N/A	N/A	N/A	N/A
68	Vehicle CG	X	KETX2A	Accel., Triax	I.C. Sensor	3031-200	G
69	Vehicle CG	Y	KETX2B	Accel., Triax	I.C. Sensor	3031-200	G
70	Vehicle CG	Z	KETX2C	Accel., Triax	I.C. Sensor	3031-200	G

**55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Moving Deformable Barrier
1/27/04
2004 Lexus ES 330 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
71	MDB CG	X	ICST001X	Accel., Triax	I.C. Sensor	3031-500	G
72	MDB CG	Y	ICST001Y	Accel., Triax	I.C. Sensor	3031-500	G
73	MDB CG	Z	ICST001Z	Accel., Triax	I.C. Sensor	3031-500	G
74	MDB Rear Centerline	X	ICST002X	Accel., Triax	I.C. Sensor	3031-50	G
75	MDB Rear Centerline	Y	ICST002Y	Accel., Triax	I.C. Sensor	3031-50	G
76	Right Bumper Contact	N/A	T0	Contact Switch	Tapeswitch	40 oz. Grey	%