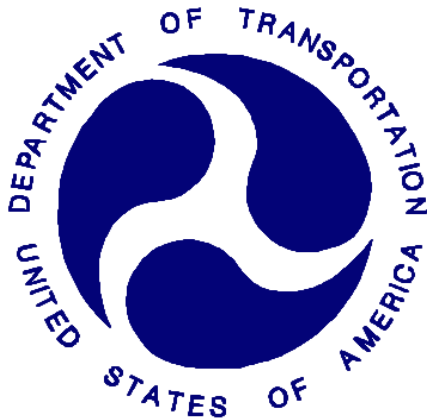


**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

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

NHTSA NUMBER: M45104

**PREPARED BY:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301**



1/28/04

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590**

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Prepared by: _____
Mr. James E. Gorth, Project Engineer
KARCO Engineering, LLC

Date: February 4, 2004

Reviewed by: _____
Mr. Jerry L. Kratzke, Director of Operations
KARCO Engineering, LLC

Date: February 4, 2004

Approved by: _____
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

Date: February 4, 2004

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

Technical Report Documentation Page

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2004 Lexus ES 330 4 Door Sedan at Karco Engineering, LLC on 1/28/04. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 55.62 km/h. The ambient temperature at the barrier face at the time of impact is 14.4 degrees Celcius. The vehicle's maximum post test static crush is not known due to vehicle fire before post test measurements could be taken. The test vehicle is equipped with a 3-point continuous belt system and second generation supplemental airbags in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:					
Measurement Description		Units	Threshold	Driver ATD	Passenger ATD
Head Injury Criteria (HIC)		N/A	1000	382.7	489.3
Max. Chest Accel. (3 msec Clip)		G's	60	38.7	42.5
Left Femur Force		Newtons	10008	-1107.8	-2144.7
Right Femur Force		Newtons	10008	-3493.2	-1843.0
17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2004 Lexus ES 330 4 Door Sedan NHTSA No. M45104				18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, D.C. 20590	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M45104

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-D-02005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph (48.3 km/h) requirements.

The 35 mph (56.3 km/h) frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Test Procedure.

1.2 SUMMARY

NOTE: NO POST TEST MEASUREMENTS WERE TAKEN DUE TO VEHICLE FIRE

A load cell barrier consisting of 36 load cells was impacted by a 2004 Lexus ES 330 4 Door Sedan at a velocity of 55.62 km/h. The test was performed at Karco Engineering, LLC on January 28, 2004.

One real-time and 16 (Sixteen) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with nine accelerometer array heads, chest and pelvis triaxial accelerometers, chest displacement potentiometers, six-axis upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also placed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 34) and the right-front passenger (position 2) ATD (Serial No. 35) were calibrated one test prior to this test.

One Hundred and Nine (109) channels of data were recorded using an on-board data acquisition system. Appendix A contains Pre and Post-Test Photographs, Appendix B contains the vehicle and dummy response data traces. Appendix C contains Load Cell Barrier information. Appendix D contains the Instrumentation Data Channel assignments. Appendix E contains the Dummy Calibration data and Appendix F contains the Child Restraint System (CRS). Appendix G contains the Nine Accelerometer Array Head data.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the impact event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was not obtained due to vehicle fire before post test measurements could be taken. Both the driver and the passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were follows: The driver ATD head and chest contacted the airbag. The abdomen had no contact. Both knees contacted the knee bolster.

The passenger's visible contact points were as follows: The passenger ATD head and chest contacted the airbag. The abdomen had no contact. Both knees contacted the glove box.

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY

ATD Position	HIC	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)
Driver	382.7	38.7	-21.1	-1107.8	-3493.2	162.6
Passenger	489.3	42.5	-26.8	-2144.7	-1843.0	134.8

SECTION 2
OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

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
CRASH TEST SUMMARY

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	55.62
Test Weight	kg	1795
Impact Angle	degrees	0
Average Rebound	mm	1540
Maximum Static Crush	mm	N/A

N/A = Due to vehicle fire prior to measurements being taken.

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door opening	Remained closed, opened w/o tools	Remained closed, opened w/o tools
Rear Door Opening	Remained closed, opened w/o tools	Remained closed, opened w/o tools
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type/ Serial No.	50% Male Hybrid III No. 34	50% Male Hybrid III No. 35
Head Contact	Airbag	Airbag
Chest Contact	Airbag	Airbag
Abdomen Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

16mm MOVIE COVERAGE

High Speed	16
Real Time	1
Total	17

DATA CHANNELS

Driver ATD Sensors	46
Passenger ATD Sensors	46
Belt Assessment Sensors	8
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	36
Total	145

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M45104	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.	JTHBA30G240013440	Driver Side Airbag	Yes
Color	Silver	Driver Head Airbag	No
Delivery Date	1/21/2004	Driver Curtain Airbag	Yes
Odometer	160.0	Pass. Airbag	Yes
Dealer	Crown Lexus	Pass. Side Airbag	Yes
Transmission	5 Speed Automatic	Pass. Head Airbag	No
Final Drive	Front	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	No	Tilt Steering	Yes
Traction Control	No	Automatic 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 to turn off automatic door locks.

Yes

DATA FROM CERTIFICATION LABEL

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

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

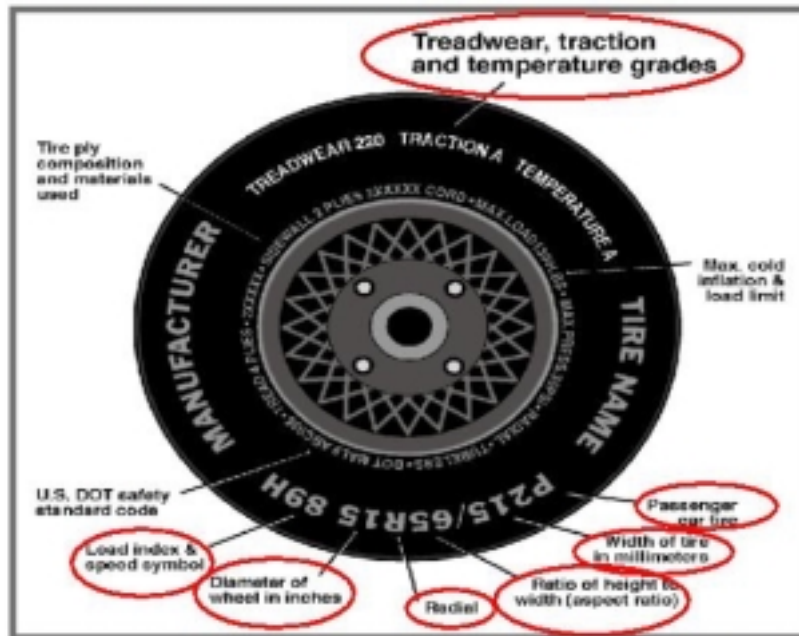
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket	None	
Number of Occupants	2	3	N/A	5
Capacity Weight (VCW) (kg)				410
Cargo Weight (RCLW) (kg)				68

DATA SHEET NO. 2.....(CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

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



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	357	357
Cold Pressure (kpa)	200	200
Recommended Tire Size	P215/60R16	P215/60R16
Tire Size on Vehicle	P215/60R16	P215/60R16
Tire Manufacturer	Bridgestone	Bridgestone
Treadwear	140	140
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	2	2
Load Index/Speed Symbol	94V	94V
Tire Material	Polyester/Steel	Polyester/Steel
DOT Safety Code Right	EL-FI-JNB4903	EL-FI-JNB4903
DOT Safety Code Left	EL-FI-JNB5003	EL-FI-JNB4903

DATA SHEE NO. 2.....(CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	480	310		523	394	
Right	kg	482	311		508	370	
Ratio	%	60.8	39.2		57.5	42.5	
Totals	kg	962	621	1583	1031	764	1795

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1583
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	68
Calculated Vehicle Target Wt. (TVTW)	kg	1803

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	710	718	711	711	1065
As Tested	mm	690	702	680	688	1155

Vehicle Wheel Base (mm) 2715

Weight of Ballast Secured in cargo area (kg) 0

Vehicle Components Removed Trunk lid, rear bumper, rear windows, spare tire, mufflers
rear interior panels and tail lights.

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

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 70.03

Usable Capacity Furnished by COTR (L) 70.03

Actual Test Volume with entire fuel System Filled (L) 26.50

1/3 of Usable Capacity (L) 23.34

Test Fluid Type: Stoddard Solvent

Kinematic Viscosity: as per ASTM Standard D484-71 Purple

Is Vehicle Fuel Pump Electric or Mechanical? Electric

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

Fuel System Particulars: Key operated w/ automatic shutoff.

DATA SHEET NO. 3
POST TEST IMPACT DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
Test Date: 1/28/04

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	55.62
Trap No. 1 Entry Distance	mm	<1524	1524
Trap No.1 Exit Distance	mm	<1524	305
Trap No.2 Velocity (Redun.)	km/h	55.51 to 57.12	55.64
Trap No.2 Entry Distance	mm	<1524	1524
Trap No.2 Exit Distance	mm	<1524	305

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4706	N/A	N/A
Center	mm	4845	N/A	N/A
Right Side	mm	4706	N/A	N/A

N/A = Due to vehicle fire prior to measurements being taken.

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1550
Center	mm	1555
Right Side	mm	1515
Average	mm	1540

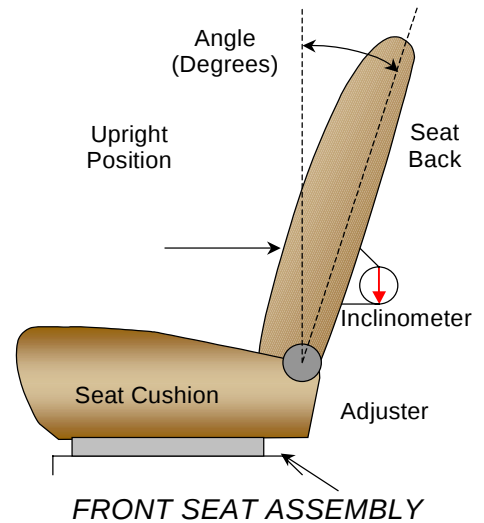
DATA SHEET NO. 4 TEST VEHICLE INFORMATION

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

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 w/seated dummy	3.0
Passenger w/seated Dummy	3.0

SEAT FORE/AFT POSITIONS

The first or forward most position is counted as number one (1). The fore/aft position is set aft of the middle position for both the driver and passenger.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	240mm	120mm
Passenger Seat	240mm	120mm

SEAT BELT UPPER ANCHORAGE

Position number one (1) is the uppermost position.

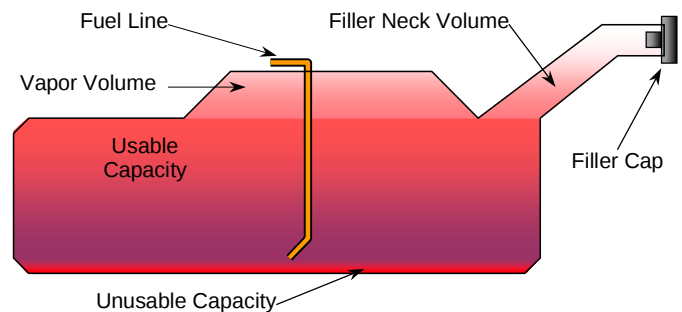
SEAT BELT UPPER ANCHORAGE

	Total # of Positions	Placed in Position #
Driver Seat	5	2
Passenger Seat	5	2

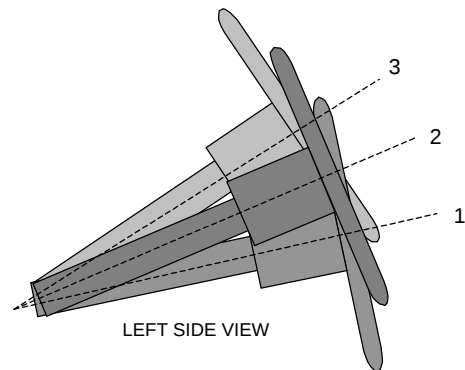
DATA SHEET NO. 4.....(CONTINUED)**TEST VEHICLE INFORMATION**Test Vehicle: 2004 Lexus ES 330 4 Door SedanNHTSA No.: M45104Test Program: 2004 NHTSA 35mph NCAPTest Date: 1/28/04**FUEL TANK CAPACITY**

	Liters
Usable Capacity of "Standard Tank"	70.03
Usable Capacity of "Optional" Tank	N/A
Usable Capacity used for FMVSS 301	64.43 to 65.83
Actual Amount of Solvent used	26.50
1/3 of Usable Capacity	23.34

The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.

**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	17.0
Geometric center position No. 2	24.0
Uppermost position No. 3	33.0

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
Test Date: 1/28/04

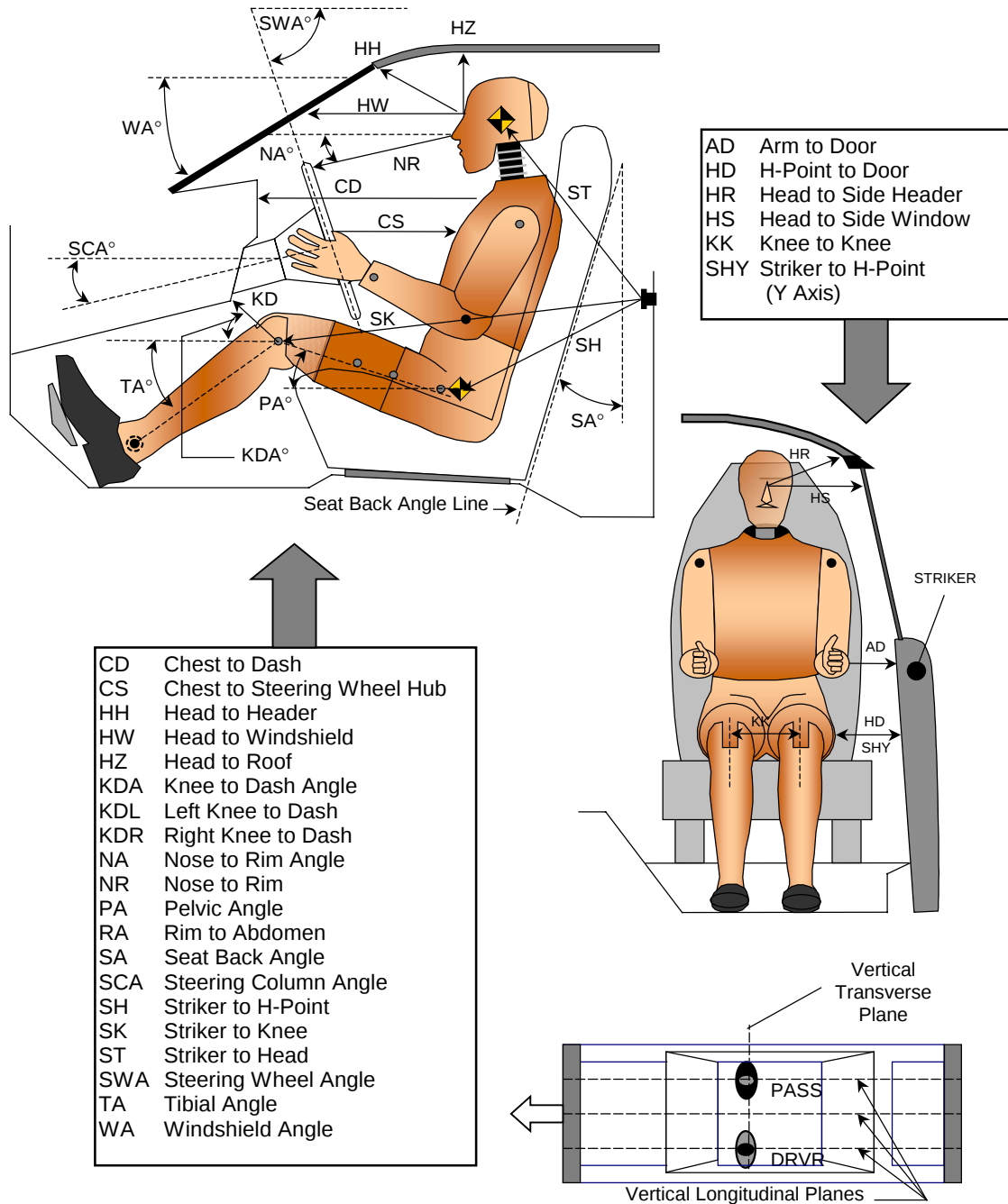
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		26		
SWA	Steering Wheel Angle		66.0		
SCA	Steering Column Angle		24.0		
SA	Seat Back Angle		3.0		3.0
HZ	Head to Roof (Z)	165	90	140	90
HH	Head to Header	337		305	
HW	Head to Windshield	650		610	
HR	Head to Side Header (Y)	262		245	
NR	Nose to Rim	383	14		
CD	Chest to Dash	510		575	
CS	Chest to Steering Hub	300			
RA	Rim to Abdomen	188			
KDL	Left Knee to Dash	160	14	170	
KDR	Right Knee to Dash	160		165	21
PA	Pelvic Angle		24		24.5
TA	Tibia Angle		39		42
KK	Knee to Knee (Y)	305		268	
SK	Striker to Knee	642	15	462	13
ST	Striker to Head	432	68	666	72
SH	Striker to H-Point	331	51	325	44
SHY	Striker to H-Point (Y)	239		248	
HS	Head to Side Window	325		325	
HD	H-Point to Door (Y)	130		150	
AD	Arm to Door (Y)	113		130	

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

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

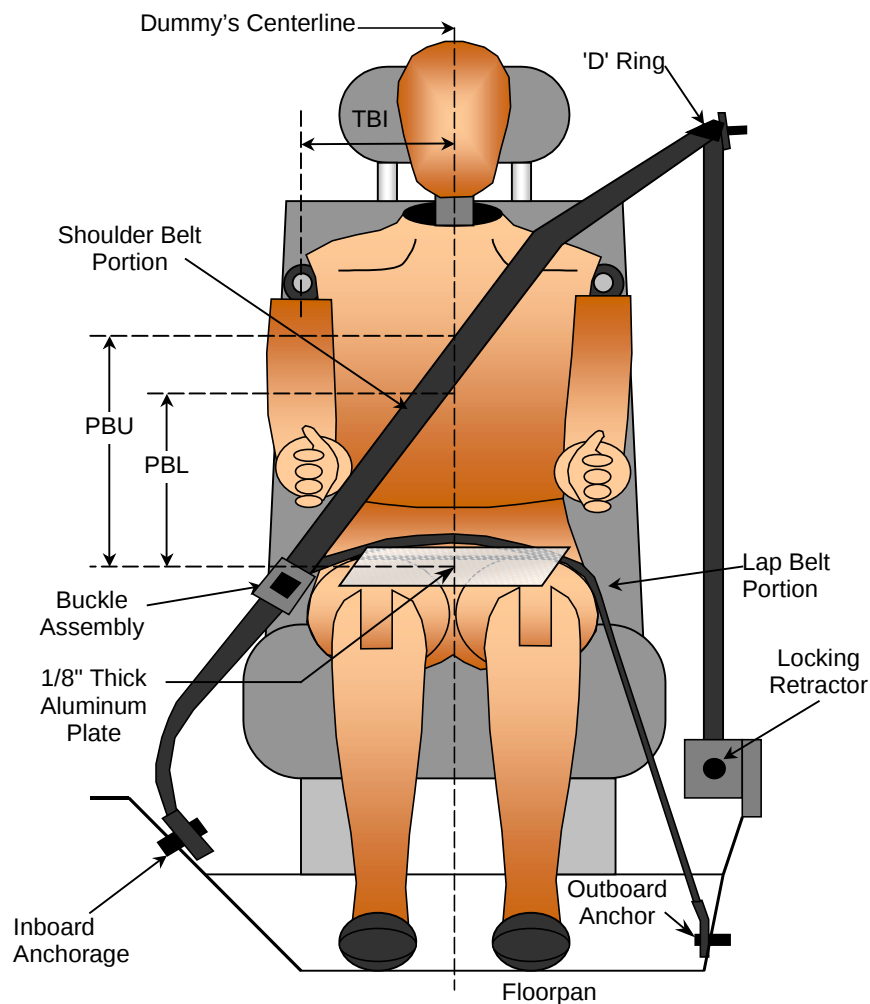


DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6 **SEAT BELT POSITIONING DATA**

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	245	245
PBU - Top Surface of reference to belt upper edge	mm	340	300
PBL - Top Surface of reference to belt lower edge	mm	285	230
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7 - VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

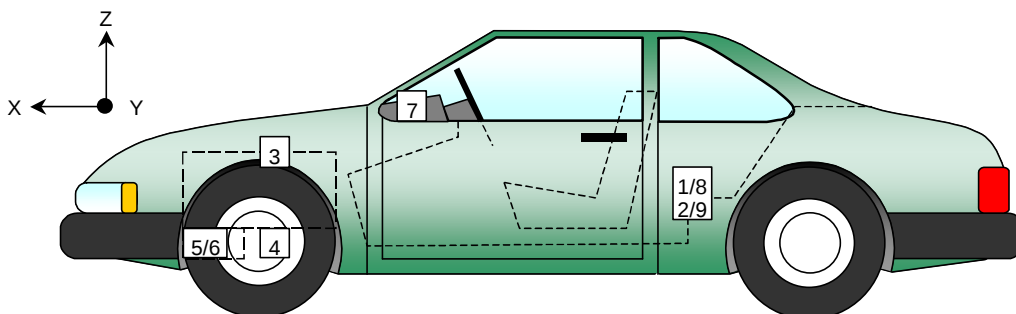
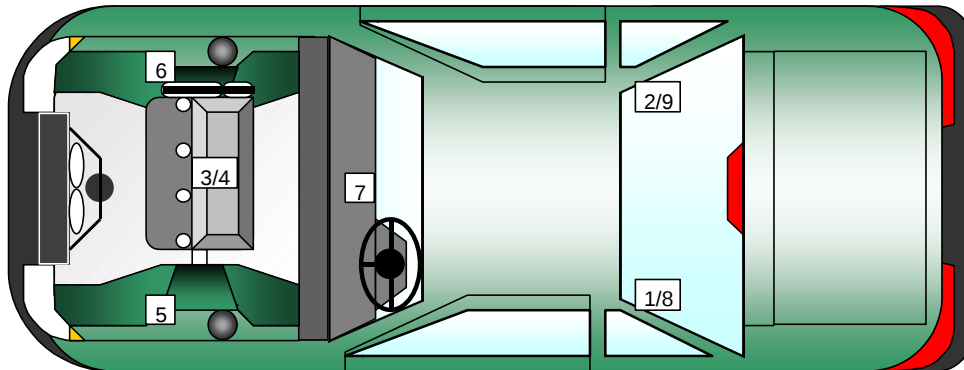
Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member	2060	-720	390	G's	1.4	123.8	-35.6	44.1
2	Right Rear X-Member	2060	720	390	G's	1.6	112.7	-41.0	45.3
3	Engine Top	4210	60	800	G's	27.8	46.4	-116.0	31.9
4	Engine Bottom	4150	330	190	G's	54.1	43.7	-153.8	31.5
5	Left Brake Caliper	4020	-750	270	G's	28.8	74.4	-69.9	32.9
6	Right Brake Caliper	4020	750	270	G's	16.2	77.3	-84.9	58.3
7	Instrument Panel	3210	0	98	G's	39.5	29.8	-131.4	38.9
8	Left Rear X-Member (Z-Axis)	1990	-720	390	G's	4.7	15.1	-7.2	39.3
9	Right Rear X-Member (Z-Axis)	1990	720	390	G's	4.9	15.1	-8.7	41.3

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



DATA SHEET NO. 8 - HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	1.9	198.9	-53.2	81.8	0.1	193.9	-57.5	79.6
Head CG	Y	G's	8.3	94.0	-3.4	21.6	1.8	33.5	-9.7	90.7
Head CG	Z	G's	17.5	77.1	-2.5	100.1	20.9	78.5	-4.2	102.2
Head CG Resultant	N/A	G's	55.6	81.8			61.3	78.7		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	5.6	175.7	-40.3	81.2	5.0	175.0	-44.0	75.5
Chest CG	Y	G's	3.2	92.3	-3.3	28.7	4.6	80.9	-4.9	66.8
Chest CG	Z	G's	5.3	22.1	-7.5	62.2	6.7	20.8	-3.9	100.6
Chest CG Resultant	N/A	G's	40.4	81.2			44.0	75.5		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	1037.6	51.8	-1107.8	61.0	310.5	47.7	-2144.7	37.4
Right Femur	Z	Newtons	763.7	51.2	-3493.2	62.0	601.9	49.9	-1843.0	36.2

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Shoulder Belt Pullout	N/A	MM	162.6	101.8	-61.6	50.6	134.8	92.6	-60.1	35.5
Shoulder Belt Stretch	N/A	MM/CM	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0 ¹
Lap Belt Force	N/A	Newtons	4967.3	59.2	-36.7	100.9	7442.1	68.4	-44.6	168.4
Shoulder Belt Force	N/A	Newtons	5141.2	86.0	-47.4	8.1	5121.2	52.5	-55.4	155.8

1.) Not used with pre-tensioners

PRIMARY HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary	382.7	64.5	96.8	42.6	489.3	65.4	97.2	47.2

PRIMARY CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	38.7	79.9	82.9	42.5	73.8	76.8

DATA SHEET NO. 8...(continued)

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	4.0	182.7	-62.3	61.4	4.1	176.9	-52.6	65.3
Pelvis	Y	G's	5.8	86.5	-8.2	60.4	4.5	38.7	-5.5	90.6
Pelvis	Z	G's	4.1	184.3	-27.5	69.7	3.6	169.9	-28.2	71.5
Pelvis Resultant	N/A	G's	67.4	61.4			57.1	65.3		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	434.8	78.4	-329.1	143.2	178.2	91.5	-406.7	54.8
Neck Force	Y	Newtons	119.7	129.6	-130.0	62.5	73.9	69.7	-94.3	166.7
Neck Force	Z	Newtons	1117.2	82.7	-64.5	144.9	973.5	73.4	-211.3	97.9
Neck Force Resultant	N/A	Newtons	1190.6	82.7			999.5	73.1		
Neck Moment	X	N•m	10.3	119.7	-13.0	94.6	16.6	93.1	-6.7	161.1
Neck Moment	Y	N•m	32.4	68.5	-16.2	97.7	17.6	161.4	-17.4	78.1
Neck Moment	Z	N•m	7.3	153.6	-11.7	100.2	10.4	96.6	-4.1	165.4
Neck Moment Resultant	N/A	N•m	32.6	68.5			22.7	78.6		

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	12.1	43.4	-43.5	59.3	22.3	62.0	-69.4	48.2
Left Foot Aft	Z	G's	2.6	185.2	-39.5	59.9	15.6	71.5	-43.8	35.9
Left Foot Fore	Z	G's	3.8	183.4	-55.5	28.4	19.2	72.0	-104.9	46.2
Right Foot Aft	X	G's	15.7	37.0	-92.0	48.5	9.0	74.7	-58.0	57.1
Right Foot Aft	Z	G's	6.9	72.4	-57.4	47.7	7.8	189.6	-69.5	36.3
Right Foot Fore	Z	G's	17.6	33.3	-118.6	36.5	11.2	189.6	-67.2	47.0

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Upper Moment	X	N•m	0.0	0.0	0.0	0.0	56.9	80.0	-10.5	31.0 ¹
Left Upper Moment	Y	N•m	15.4	177.9	-87.1	61.4	37.3	54.1	-112.4	37.5
Right Upper Moment	X	N•m	21.1	60.3	-33.3	48.2	43.5	85.4	-25.5	35.6
Right Upper Moment	Y	N•m	57.7	59.5	-90.5	48.7	18.7	122.3	-107.9	37.7
Left Lower Moment	X	N•m	13.2	49.7	-21.2	64.3	41.4	80.3	-9.4	41.5
Left Lower Moment	Y	N•m	23.9	90.8	-28.1	51.8	48.1	37.2	-39.3	47.9
Left Lower Force	Z	Newtons	0.0	0.0	0.0	0.0	115.1	163.8	-5152.9	37.4 ¹
Right Lower Moment	X	N•m	41.2	49.3	-58.0	61.9	13.4	84.2	-15.2	36.2
Right Lower Moment	Y	N•m	11.2	43.3	-34.9	66.1	29.3	37.1	-31.0	48.8
Right Lower Force	Z	Newtons	92.5	162.5	-2663.5	62.1	141.3	131.7	-4888.2	37.2

1.) Driver channels failed, no data

DATA SHEET NO. 8...(continued)Test Vehicle: 2004 Lexus ES 330 4 Door SedanNHTSA No.: M45104Test Program: 2004 NHTSA 35mph NCAPTest Date: 1/28/04**CHEST PEAK DISPLACEMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	MM	0.0	5.8	-21.1	90.5	0.0	4.0	-26.8	82.2

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	2.1	198.9	-54.3	77.9	0.2	190.6	-57.7	79.4
Head CG	Y	G's	8.5	89.3	-3.2	21.6	3.1	37.0	-10.3	92.3
Head CG	Z	G's	17.6	77.0	-2.5	100.1	20.6	78.7	-4.5	101.2
Head CG Resultant	N/A	G's	57.1	77.9			61.4	78.8		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	5.8	175.6	-40.6	81.2	5.1	175.2	-44.1	75.5
Chest CG	Y	G's	3.4	92.5	-3.3	29.5	5.0	80.9	-4.8	68.8
Chest CG	Z	G's	5.5	22.2	-7.8	62.4	6.6	20.9	-3.8	115.6
Chest CG Resultant	N/A	G's	40.6	81.2			44.1	75.5		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Redundant	383.7	64.8	96.8	42.8	493.7	65.5	97.3	47.4

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	39.1	79.9	82.9	42.6	73.9	76.9

DATA SHEET NO. 9
SEATBELT ASSESSMENT TEST DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	245	245
PBU - Top Surface of reference to belt upper edge	mm	340	300
PBL - Top Surface of reference to belt lower edge	mm	285	230
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
Retractor Reel to "D" ring	mm	650	650
Shoulder Belt length as measured on ATD	mm	900	925
Lap Belt length as measured on ATD	mm	900	890
Remainder of belt on reel	mm	835	855
Total belt length for continuous webbing systems	mm	3285	3320

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	115.0	120.0
As determined electronically	mm	162.6	134.8

BELT STRETCH DATA

Measurement Description	Units	Driver	Passenger
Electronically between belt load cell and "D" ring	mm/cm	*	*
Mechanically	mm/cm	N/A	N/A

* Not used with shoulder belt pre-tensioner systems

DATA SHEET NO. 10
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

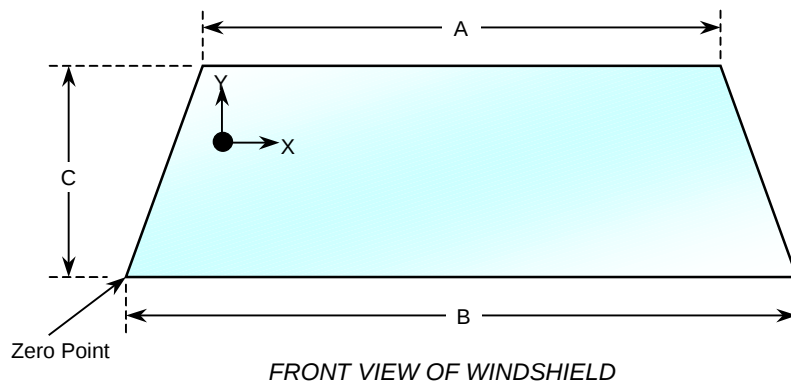
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

The standard requires that the posttest retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles that are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.1 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test(mm)	Post-Test(mm)	% of Retention
Left Side	2197.5	2197.5	100.0
Right Side	2197.5	2197.5	100.0
Total	4395.0	4395.0	100.0



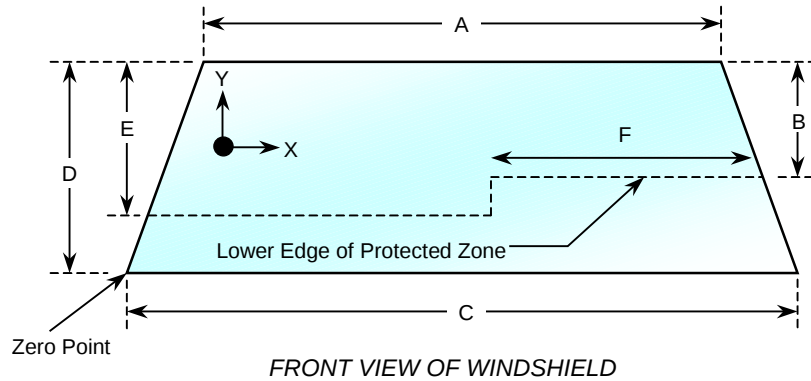
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1190.0	9.0
B	mm	1515.0	9.0
C-Left	mm	845.0	9.0
C-Right	mm	845.0	9.0

DATA SHEET NO. 11
WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04



**WINDSHIELD AND
PROTECTED ZONE**

Item	Units	Value
A	mm	1190
B	mm	490
C	mm	1515
D	mm	845
E	mm	500
F	mm	575

AREA OF PROTECTED ZONE FAILURES

- A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 in. by a vehicle component other than one that is normally in contact with the windshield.

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

DATA SHEET NO. 12
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

Test Time: 1:09 PM

Temperature: 14.4 Deg. C.

STODDARD SOLVENT SPILLAGE MEASUREMENTS

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

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

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

D. Spillage Location Details: No leakage occurred

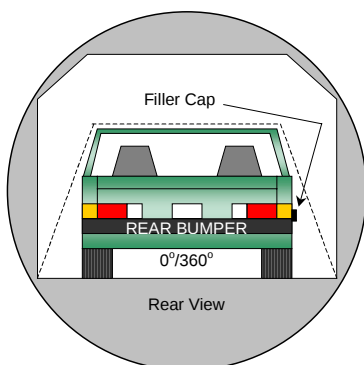
DATA SHEET NO. 13
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

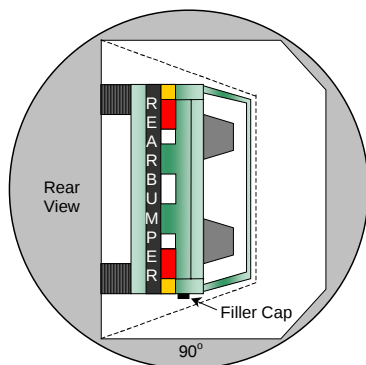
NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

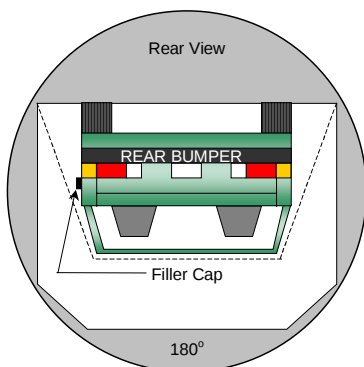
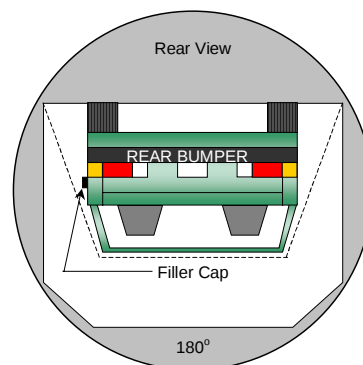
Test Date: 1/28/04



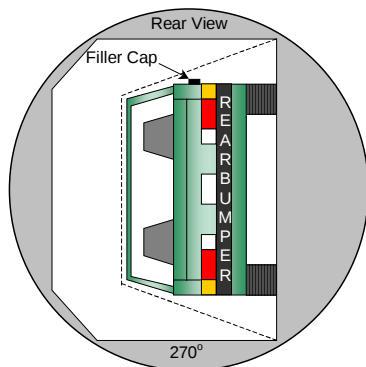
0° to 90°



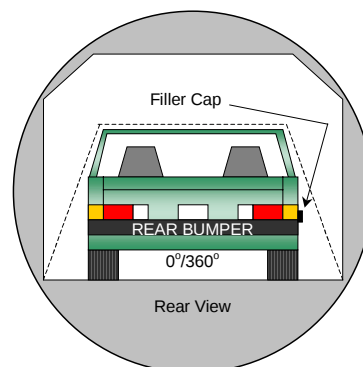
90° to 180°



180° to 270°



270° to 360°



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

DATA SHEET NO. 13....(CONTINUED)
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	85	300	385
90° to 180°	75	300	375
180° to 270°	77	300	377
270° to 360°	80	300	380

FMVSS 301 SPILLAGE TABLE REQUIREMENT (oz.)

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

ACTUAL TEST VEHICLE SOLVENT SPILLAGE TABLE (oz.)

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

SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 14
VEHICLE MEASUREMENTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
Test Date: 1/28/04

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	4845	N/A	N/A
2	RSOV to front of engine	mm	4234	N/A	N/A
3	RSOV to firewall centerline	mm	3674	N/A	N/A
4	RSOV to leading edge of right door	mm	3381	N/A	N/A
5	RSOV to leading edge of left door	mm	3382	N/A	N/A
6	RSOV to lower leading edge of right door	mm	3357	N/A	N/A
7	RSOV to lower leading edge of left door	mm	3359	N/A	N/A
8	RSOV to upper trailing edge of right door	mm	2256	N/A	N/A
9	RSOV to upper trailing edge of left door	mm	2255	N/A	N/A
10	RSOV to lower trailing edge of right door	mm	2247	N/A	N/A
11	RSOV to lower trailing edge of left door	mm	2246	N/A	N/A
12	RSOV to bottom of right 'A' pillar	mm	3237	N/A	N/A
13	RSOV to bottom of left 'A' pillar	mm	3319	N/A	N/A
14	RSOV to firewall on right side	mm	3940	N/A	N/A
15	RSOV to firewall on left side	mm	3945	N/A	N/A
16	RSOV to steering column	mm	2873	N/A	N/A
17	Center of steering column to left 'A' pillar	mm	410	N/A	N/A
18	Center of steering column to headlining	mm	435	N/A	N/A
19	RSOV to right side of front bumper	mm	4706	N/A	N/A
20	RSOV to left side of front bumper	mm	4706	N/A	N/A
21	Length of engine block	mm	535	N/A	N/A
RD	RSOV to right side of dash panel	mm	3094	N/A	N/A
CD	RSOV to center of dash panel	mm	3094	N/A	N/A
LD	RSOV to left side of dash panel	mm	3089	N/A	N/A

N/A = Due to vehicle fire prior to measurements being taken.

All measurements in millimeters

DATA SHEET NO. 14.....(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

VEHICLE STRUCTURAL MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	4845	N/A	N/A
2	Total width	mm	1792	N/A	N/A
3	Bumper top height	mm	625	N/A	N/A
4	Bumper bottom height	mm	220	N/A	N/A
5	Longitudinal member top height	mm	572	N/A	N/A
6	Longitudinal member bottom height	mm	474	N/A	N/A
7	Distance between longitudinal members	mm	915	N/A	N/A
8	Longitudunal member width	mm	55	N/A	N/A
9	Engine top height	mm	835	N/A	N/A
10	Engine bottom height	mm	193	N/A	N/A
11	Engine and gear box width	mm	820	N/A	N/A
12	Front bumper to engine distance	mm	610	N/A	N/A
13	Front shock absorber fixing width	mm	894	N/A	N/A
14	Bonnet leading edge height	mm	755	N/A	N/A
15	Front shock absorber fixing width	mm	1194	N/A	N/A
16	Front bumper to front axle distance	mm	990	N/A	N/A
17	Front axle to 'A' pillar distance	mm	480	N/A	N/A
18	'A' pillar to 'B' pillar distance	mm	1149	N/A	N/A
19	'B' pillar to rear axle distance	mm	1140	N/A	N/A
20	'B' pillar to 'C' pillar distance	mm	1060	N/A	N/A
21	Roof sill bottom height	mm	1375	N/A	N/A
22	Roof sill top height	mm	1425	N/A	N/A
23	Floor sill bottom height	mm	210	N/A	N/A
24	Floor sill top height	mm	380	N/A	N/A

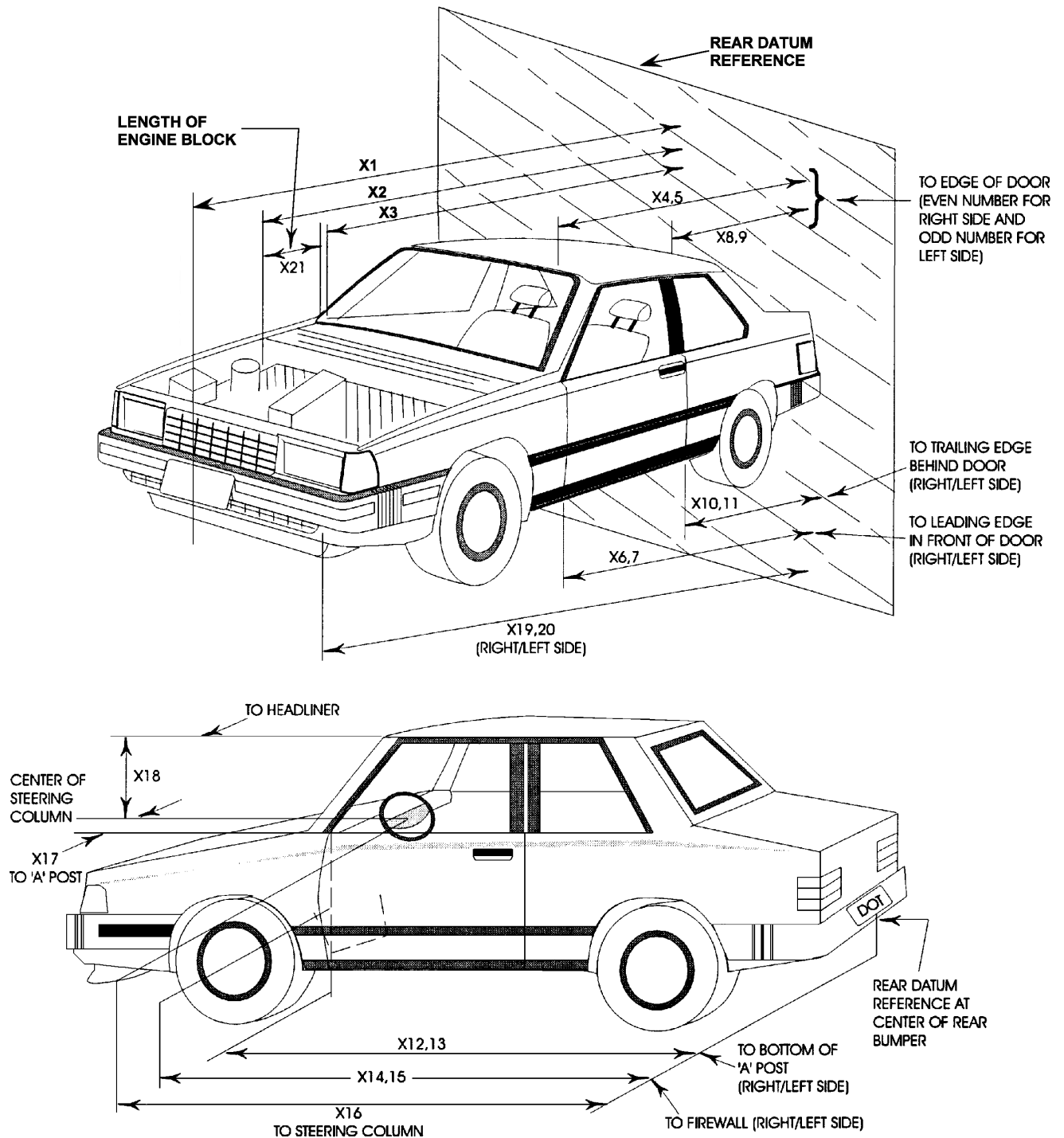
N/A = Due to vehicle fire prior to measurements being taken.

All measurements in millimeters

DATA SHEET NO. 14...(CONTINUED)
VEHICLE MEASUREMENTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04



DATA SHEET NO. 15
CAMERA LOCATIONS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

VEHICLE CAMERA MEASUREMENT TABLE

No.	Camera View	Location (mm)			Angle (deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time	18288	-22890	2540	10	N/A	17-70	24
2	Driver Overall	1930	8357	1321	4	7861	13	1030
2B	Driver Overall	1626	8230	1092	4	7755	17	NTM
3	Driver Close-Up	1626	8230	1600	4	7766	35	1020
4	3/4 Driver	6477	10185	4648	13	11085	35-85	1020
5	Steering Column	1524	8230	2997	16	7977	19	920
6	Steering Column	1524	8230	3404	20	8080	19	1000
7	Driver Side Child	2743	-610	1372	25	1260	6	1000
8	Passenger Overall	2286	-8230	1524	6	7730	13	NTM
9	Passenger Close-Up	1219	-6096	1524	4	5709	35	1000
10	3/4 Passenger	8026	-8941	2997	9	10335	80	DNR
11	Passenger Door	1626	-8836	1702	4	8375	50	1030
12	Passenger Side Child	2743	610	1372	25	1260	6	1000
13	Overhead	610	0	6172	90	N/A	13	1000
14	Driver Front	-610	406	2743	40	N/A	13	700
15	Passenger Front	-610	406	2743	40	N/A	13	1100
16	Pit Engine	762	0	-1499	90	N/A	9	1130
17	Pit Fuel Tank	3658	0	-1499	90	N/A	6	870

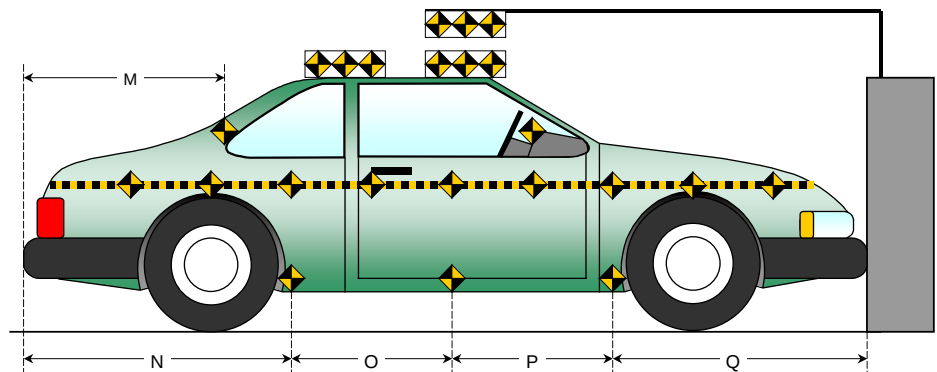
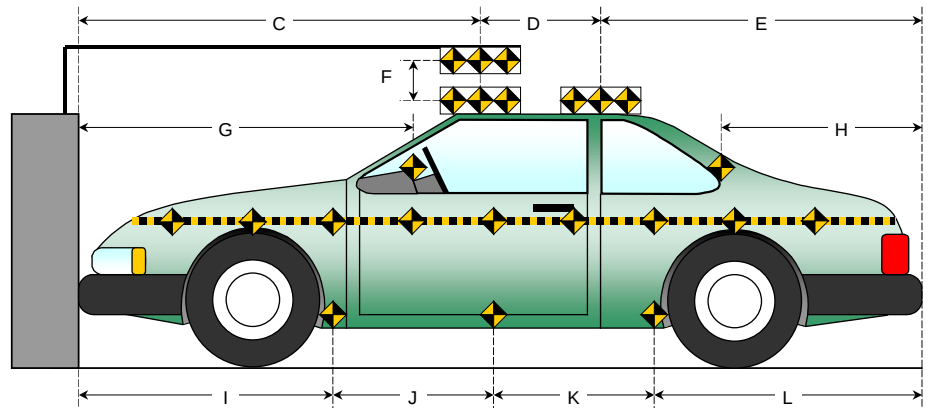
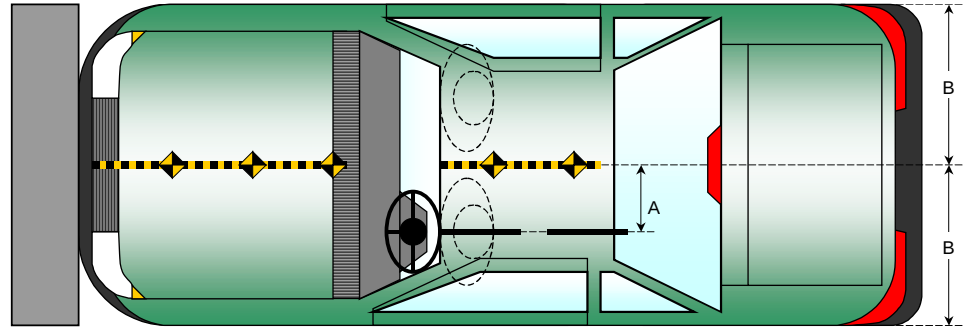
X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run NTM = No Timing Marks

DATA SHEET NO. 16
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

All Dimensions in (mm)	
Item	Value
A	N/A
B	896
C	N/A
D	N/A
E	N/A
F	150
G	1755
H	1155
I	1435
J	921
K	921
L	1564
M	1175
N	1565
O	922
P	922
Q	1436



DATA SHEET NO. 17
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

DOOR OPENING WIDTH TABLE

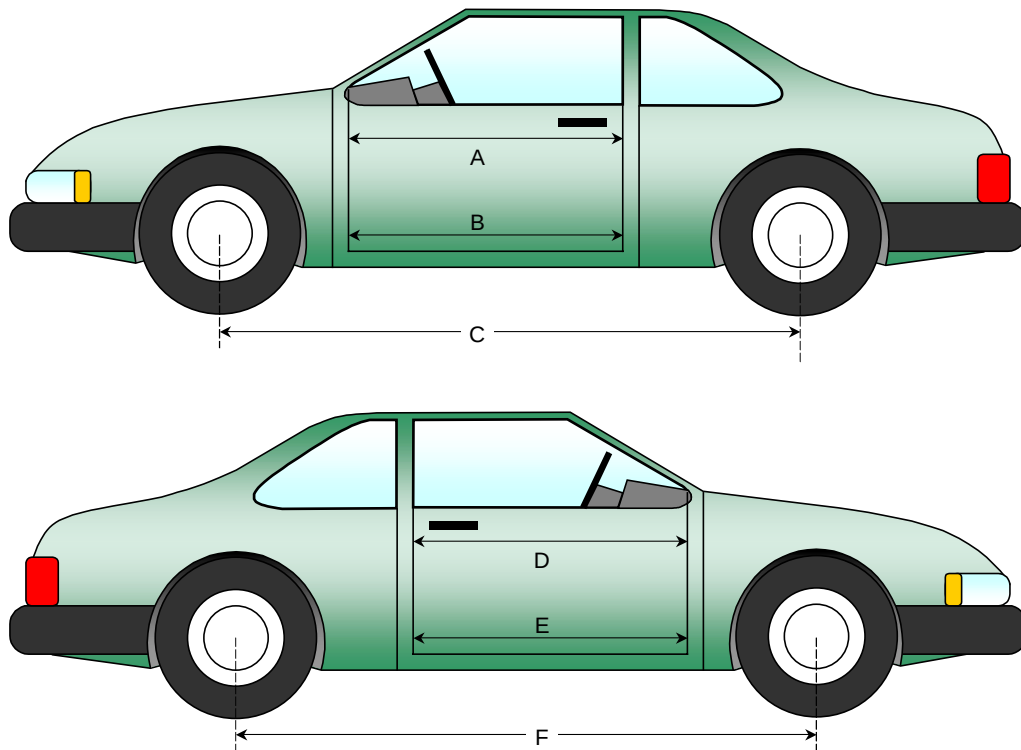
Item	Description	Units	Pre-Test	Post-Test	Diff.
A	Left Side Upper	mm	1059	N/A	N/A
B	Left Side Lower	mm	900	N/A	N/A
D	Right Side Upper	mm	1061	N/A	N/A
E	Right Side Lower	mm	894	N/A	N/A

N/A = Due to vehicle fire prior to measurements being taken

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2715	N/A	N/A
F	Right Side Wheel Base	mm	2715	N/A	N/A

N/A = Due to vehicle fire prior to measurements being taken



DATA SHEET NO. 17...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

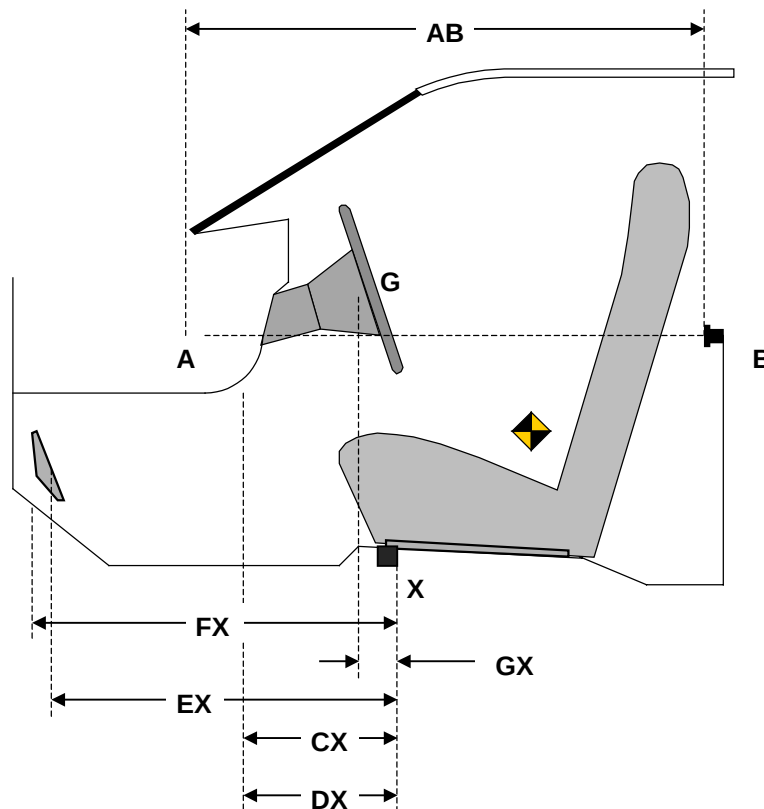
NHTSA No.: M45104
 Test Date: 1/28/04

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	1059	N/A	N/A
CX	Left Knee Bolster to X	mm	270	N/A	N/A
DX	Right Knee Bolster to X	mm	265	N/A	N/A
EX	Brake Pedal to X	mm	574	N/A	N/A
FX	Foot Rest to X	mm	589	N/A	N/A
GX	Center of Steering Wheel Hub to X	mm	25	N/A	N/A

N/A = Due to vehicle fire prior to measurements being taken.

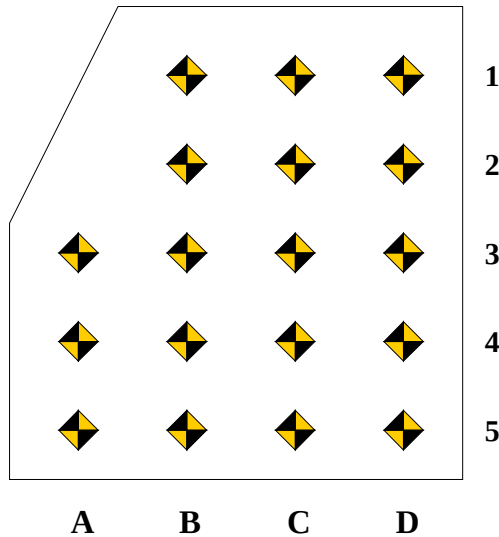
X = Left Front Seat Outboard Anchor Bolt Head



DATA SHEET NO. 17...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04



1 Measurement reference point for X and Z-axis is the forward outboard seat mounting bolt.

2 Columns A through D are evenly spaced.

3 Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4 and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		644	643	642		N/A	N/A	N/A		N/A	N/A	N/A
2		561	561	559		N/A	N/A	N/A		N/A	N/A	N/A
3	460	461	461	460	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	362	360	358	358	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	256	262	258	258	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		11	9	4		N/A	N/A	N/A		N/A	N/A	N/A
2		-43	-46	-48		N/A	N/A	N/A		N/A	N/A	N/A
3	-67	-64	-65	-70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	-79	-65	-71	-78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	-81	-46	-78	-86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A = Due to Vehicle fire prior to measurements being taken.

NOTE: FIRE OCCURRED 12 HOURS AFTER TEST AND DID NOT EFFECT TEST RESULTS.

DATA SHEET NO. 17...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

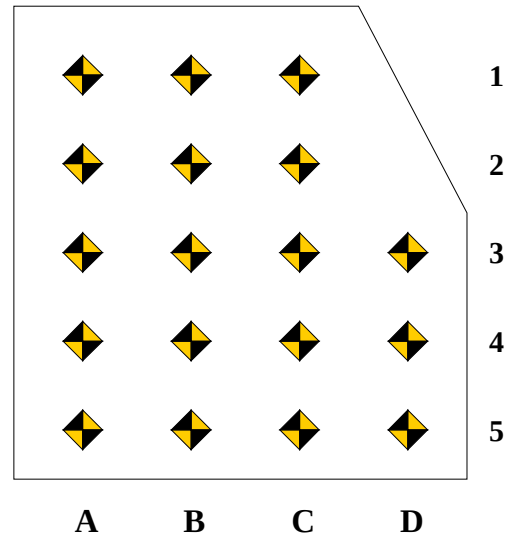
NHTSA No.: M45104
 Test Date: 1/28/04

Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4 and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	639	642	643		N/A	N/A	N/A		N/A	N/A	N/A	
2	558	561	564		N/A	N/A	N/A		N/A	N/A	N/A	
3	460	463	466	470	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	362	367	370	375	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	271	271	271	274	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	17	16	19		N/A	N/A	N/A		N/A	N/A	N/A	
2	-39	-39	-39		N/A	N/A	N/A		N/A	N/A	N/A	
3	-64	-65	-64	-64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	-79	-74	-62	-69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	-91	-87	-73	-77	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A = Due to Vehicle fire prior to measurements being taken

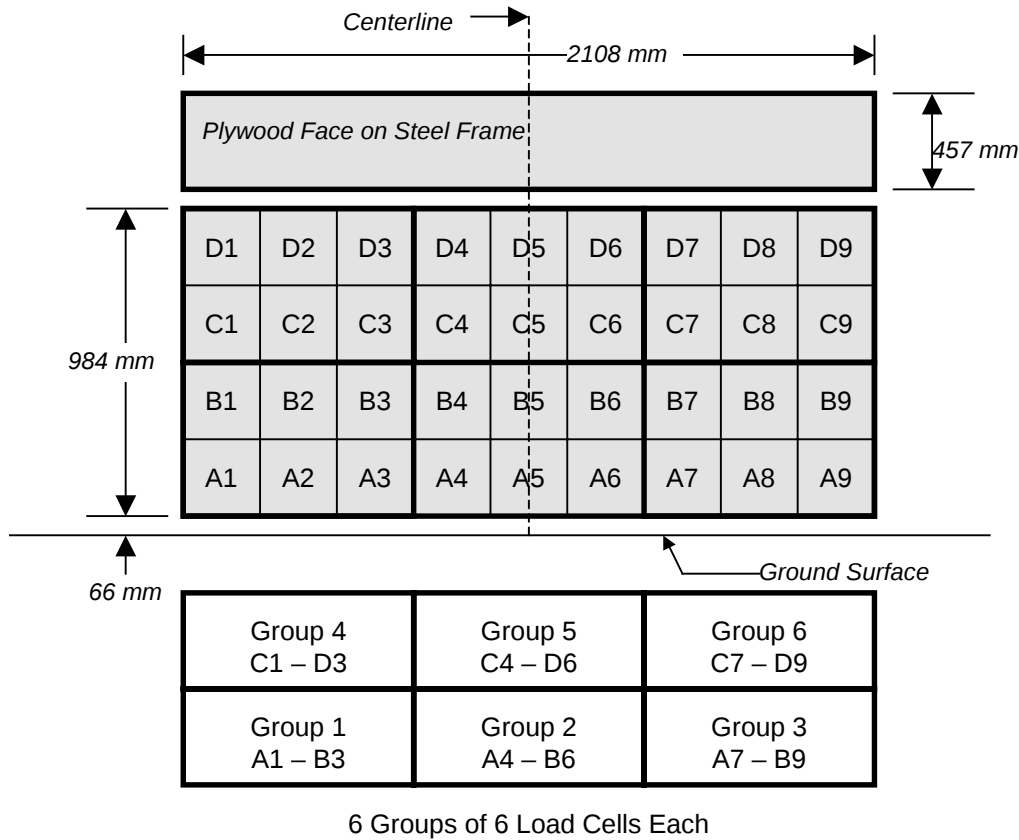
NOTE: FIRE OCCURRED 12 HOURS AFTER TEST AND DID NOT EFFECT TEST RESULTS.

DATA SHEET NO. 18
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

36 Load Cell Rigid Barrier (NHTSA Standard)
Load Cell Locations on Fixed Barrier



The Data is presented in Appendix C with the following requirements:

- 1.) Data from 36 individual load cells
- 2.) Sum data from 6 groupings shown above (6 cells/group)
- 3.) Total or sum of all 36 individual load cells
- 4.) Sum of all 36 individual load cells vs. vehicle dynamic crush

DATA SHEET NO. 19
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

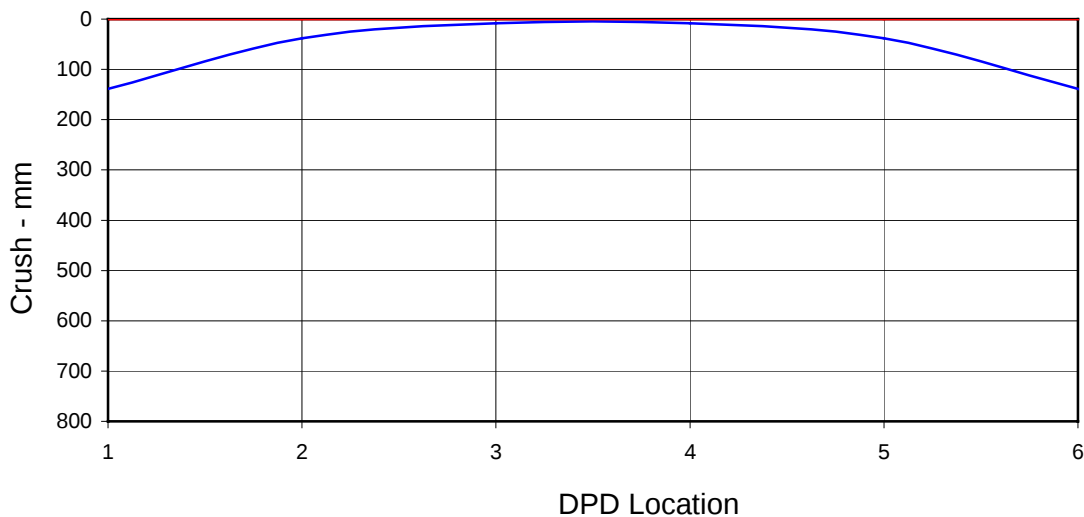
Cal. Procedure/Interval: 6 months / drop test
 Integration Algorithm: NHTSA Standard Linearity: Good
 Impact Velocity (km/h): 55.62
 Velocity Change (km/h): 61.55 Time of Separation (msec): 74.2

CRUSH PROFILE

Collision Deformation Classification: 12FDEW6 Midpoint of Damage: Vehicle Centerline
 Damage Region Length (mm): 1372 Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	139	N/A	N/A
C2	Crush zone 2 on left side	mm	38	N/A	N/A
C3	Crush zone 3 on left side	mm	8	N/A	N/A
C4	Crush zone 4 on right side	mm	8	N/A	N/A
C5	Crush zone 5 on right side	mm	38	N/A	N/A
C6	Crush zone 6 at right side	mm	139	N/A	N/A

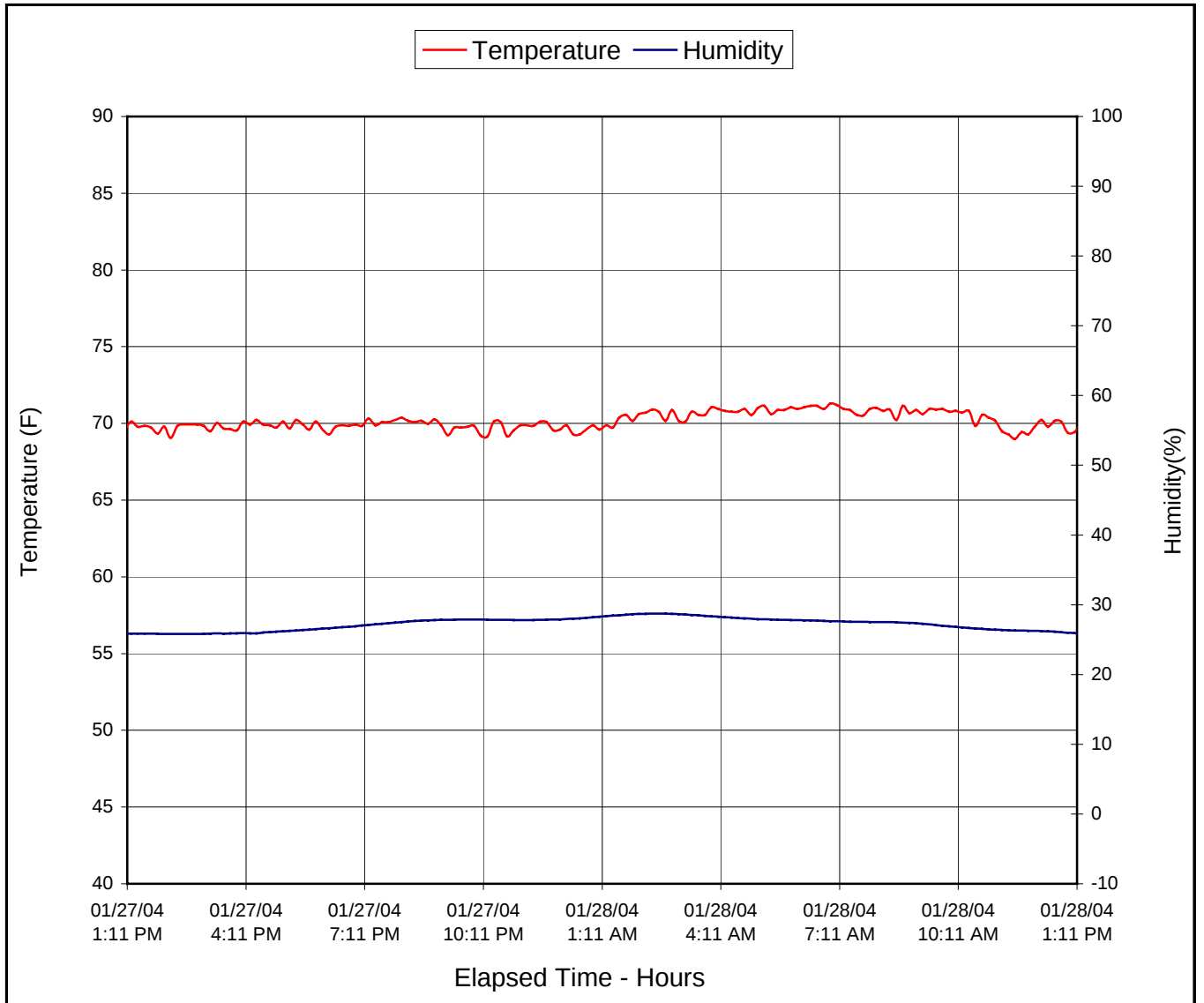
N/A = Due to vehicle fire prior to measurements being taken.



DATA SHEET NO. 20
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
Test Date: 1/28/04



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

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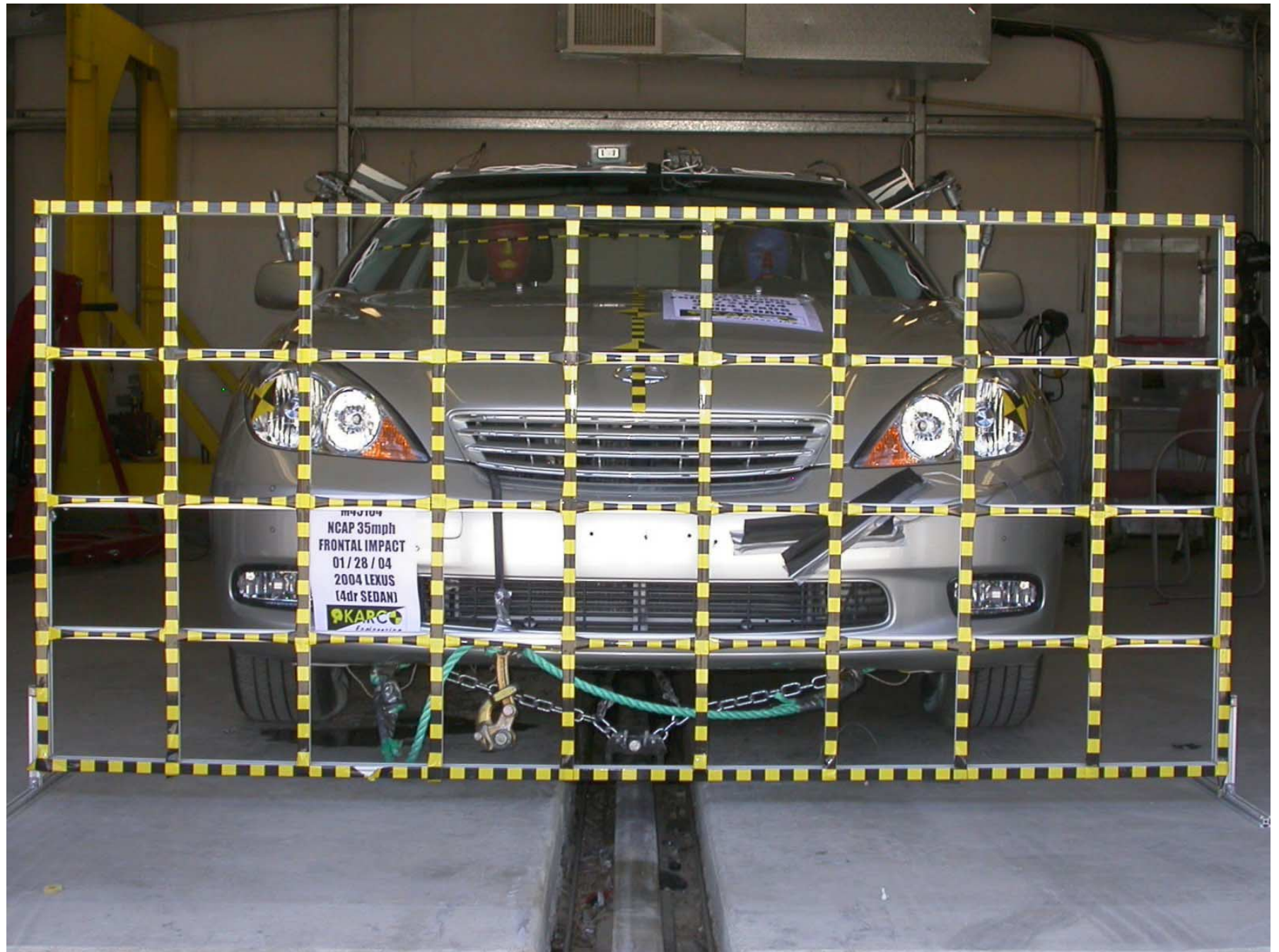


Figure A-1: Load Cell Location

7

AVE:

E.

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.
JTHBA30G240013440 PASS. CAR



C/TR: 1C0/LA27 MCV31L-BEAGKA
A/TM: -02A/U151E MADE IN JAPAN

663 A

Figure A-2: 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-3: Vehicle Tire Label



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



Figure A-5: Left Rear $\frac{3}{4}$ View, as Received



Figure A-6: Pre-Test Front View

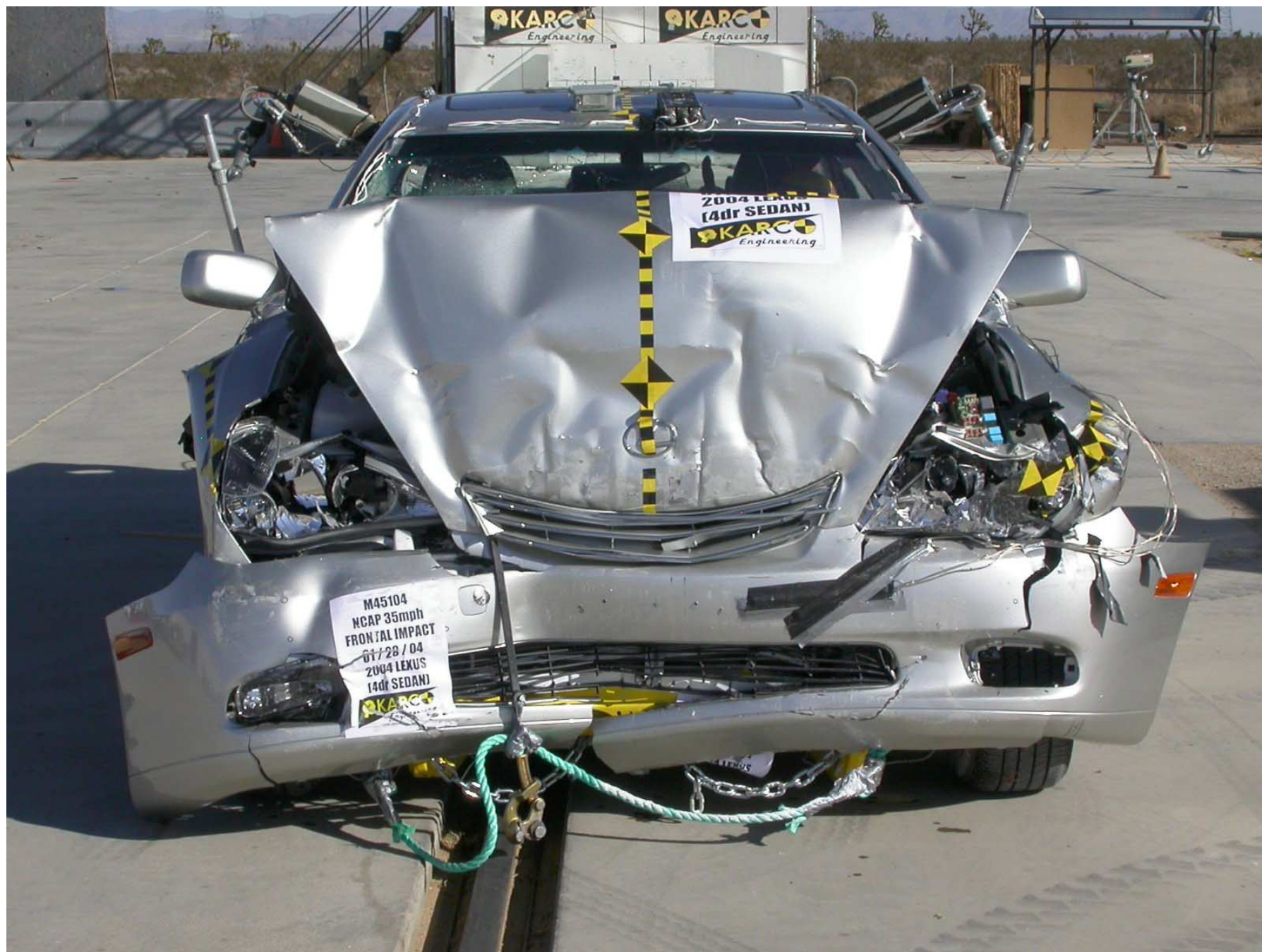


Figure A-7: Post-Test Front View (Vehicle Moved)



Figure A-8: Pre-Test Left Side View



Figure A-9: Post-Test Left Side View



Figure A-10: Pre-Test Right Side View



Figure A-11: Post-Test Right Side View



Figure A-12: Pre-Test Right Front $\frac{3}{4}$ View



Figure A-13: Post-Test Right Front $\frac{3}{4}$ View



Figure A-14: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-15: Post-Test Left Rear $\frac{3}{4}$ View



Figure A-16: Left Rear $\frac{3}{4}$ View of Doors After Impact



Figure A-17: Right Rear ¾ View of Doors After Impact



Figure A-18: Pre-Test Windshield View



Figure A-19: Post-Test Windshield View



Figure A-20: Pre-Test Engine Compartment

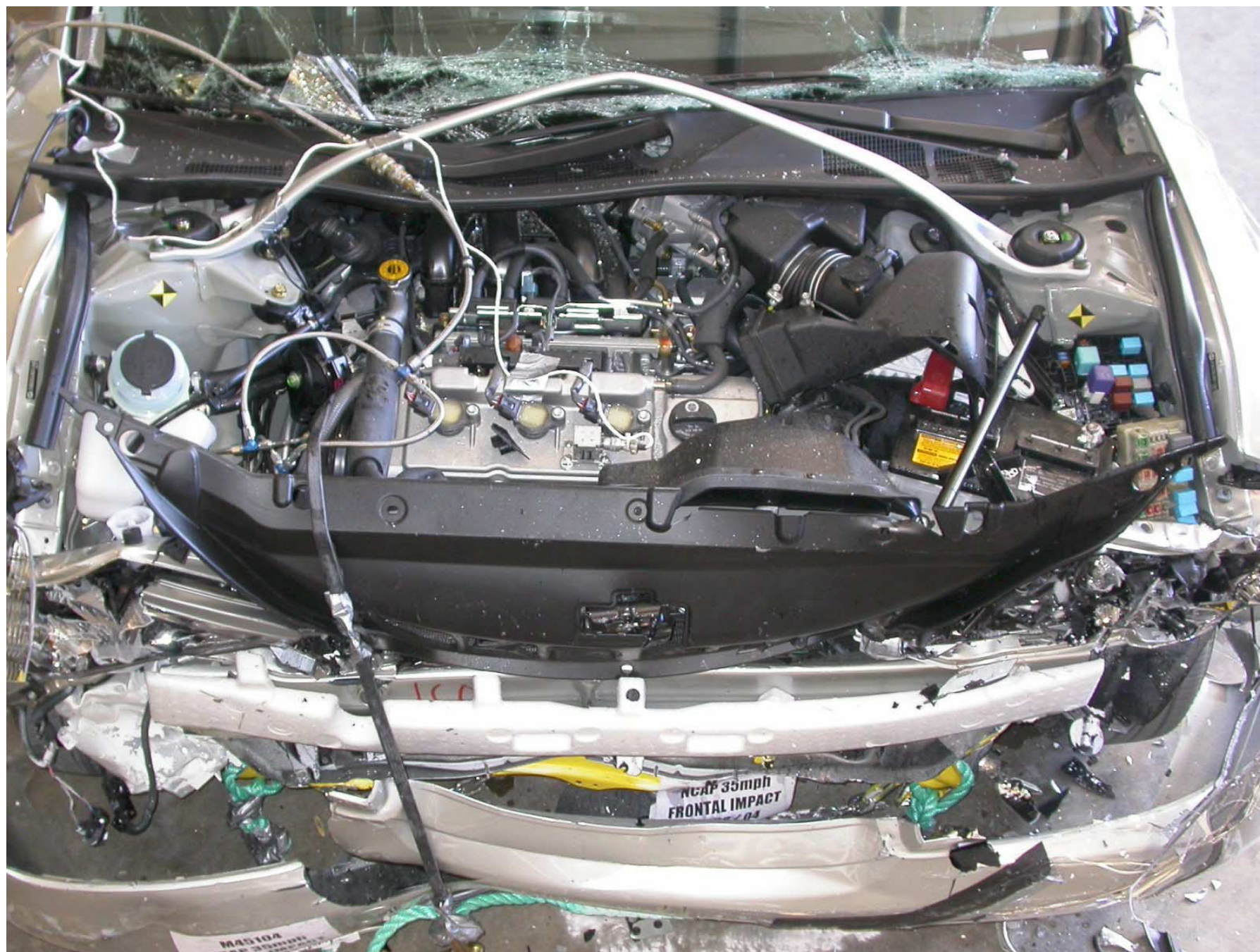


Figure A-21: Post-Test Engine Compartment (Vehicle Moved)



Figure A-22: Pre-Test Fuel Cap



Figure A-23: Post-Test Fuel Cap



Figure A-24: Pre-Test Front Underbody View

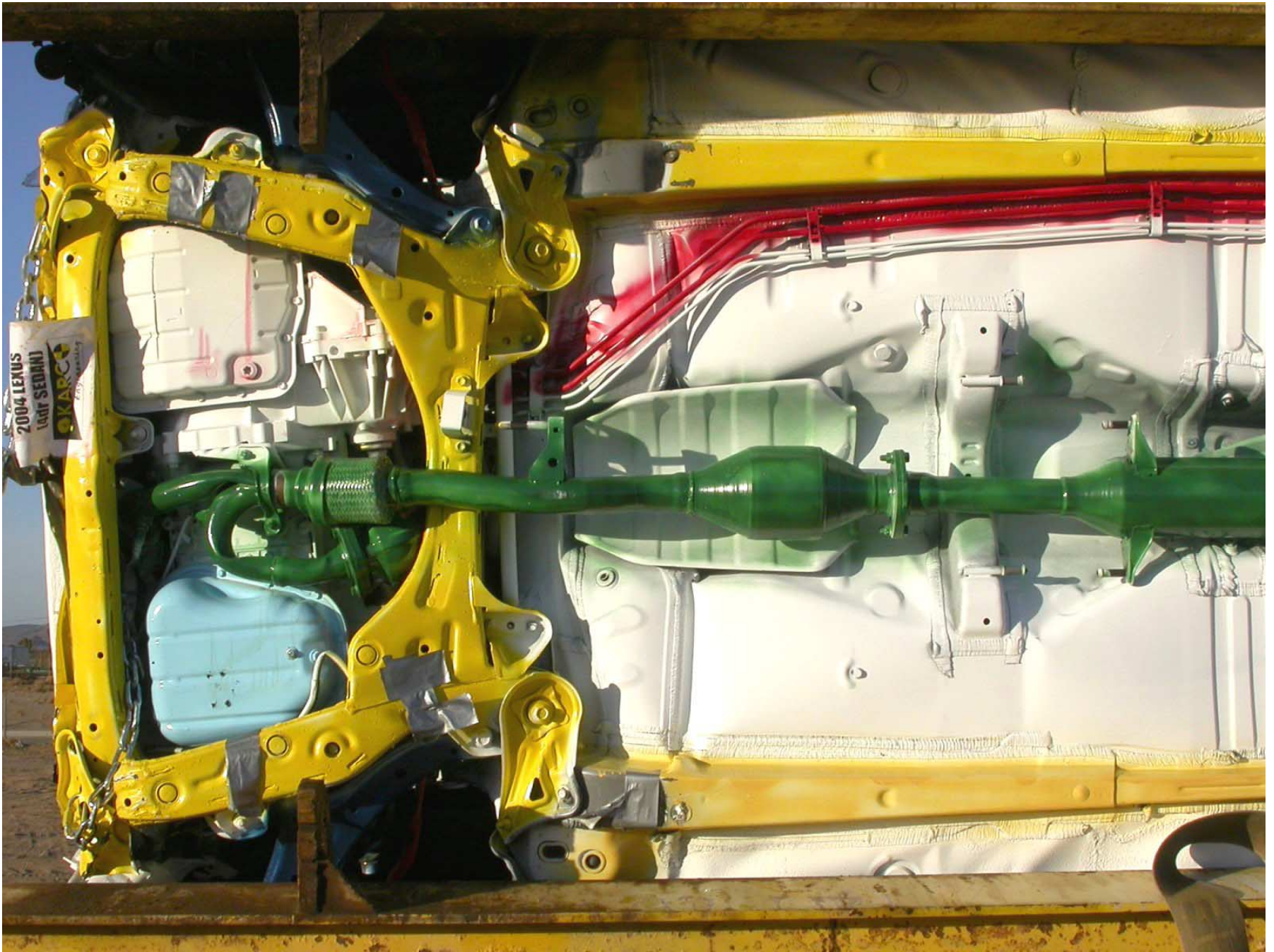


Figure A-25: Post-Test Front Underbody View

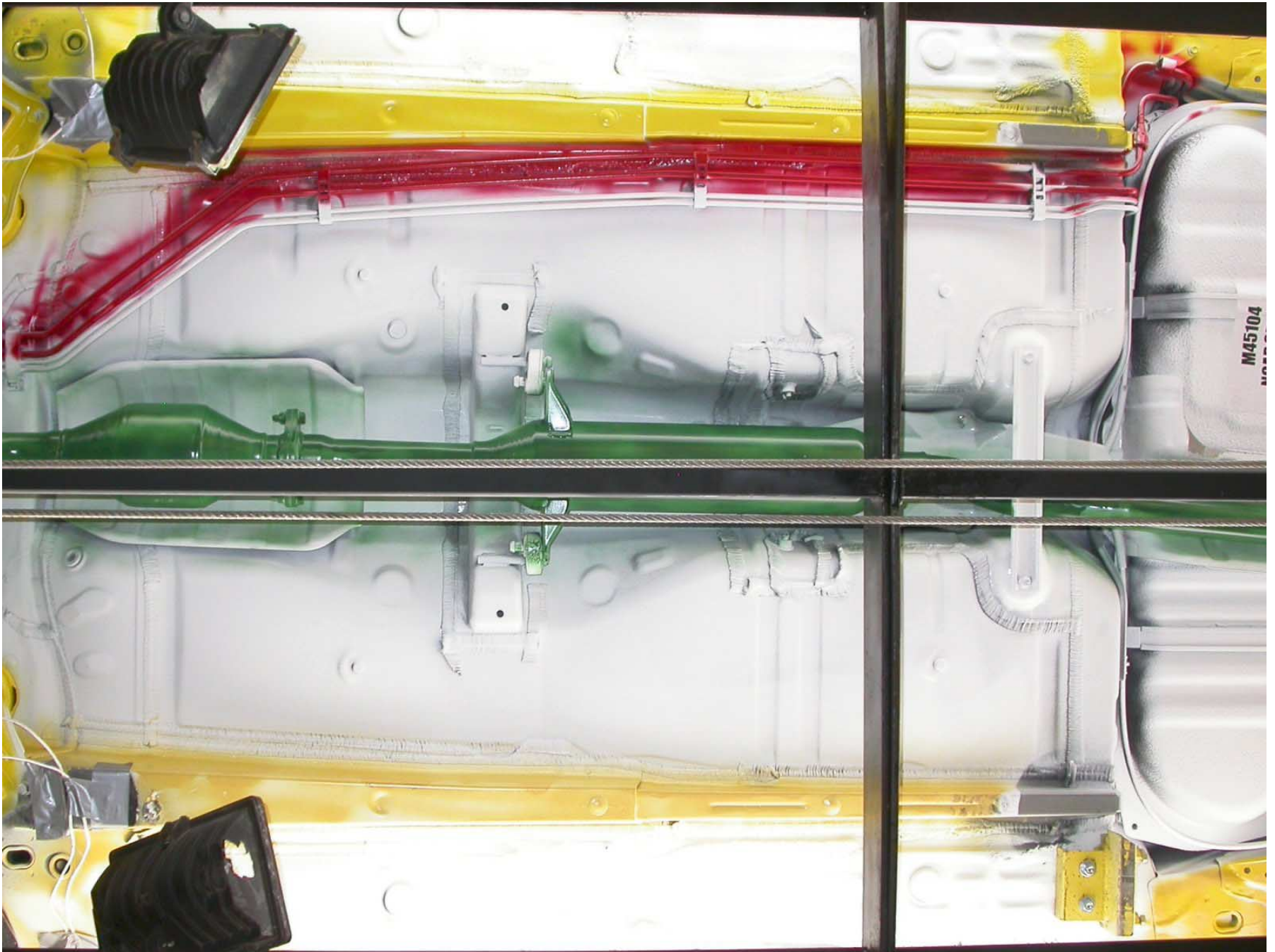


Figure A-26: Pre-Test Mid Underbody View



Figure A-27: Post-Test Mid Underbody View

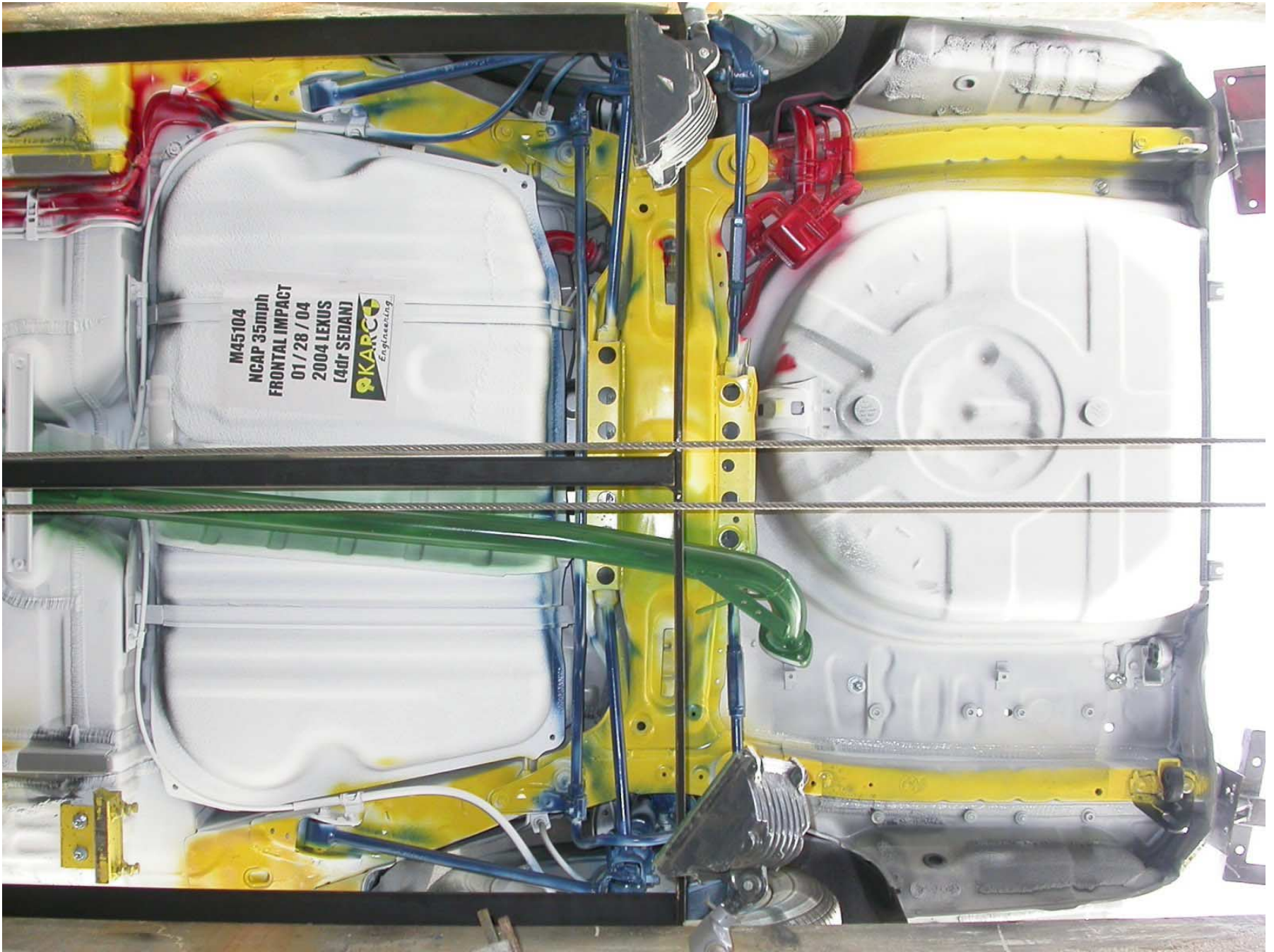


Figure A-28: Pre-Test Rear Underbody View



Figure A-29: Post-Test Rear Underbody View



Figure A-30: Pre-Test Driver Dummy Front View (Head Position)



Figure A-31: Post-Test Driver Dummy Front View (Head Position)



Figure A-32: Pre-Test Driver Dummy Front Through Window



Figure A-33: Post-Test Driver Dummy Front Through Window



Figure A-34: Pre-Test Driver Dummy Door Open



Figure A-35: Post-Test Driver Dummy Door Open



Figure A-36: Pre-Test Driver Dummy Feet



Figure A-37: Post-Test Driver Dummy Feet



Figure A-38: Pre-Test Driver Side Knee Bolster

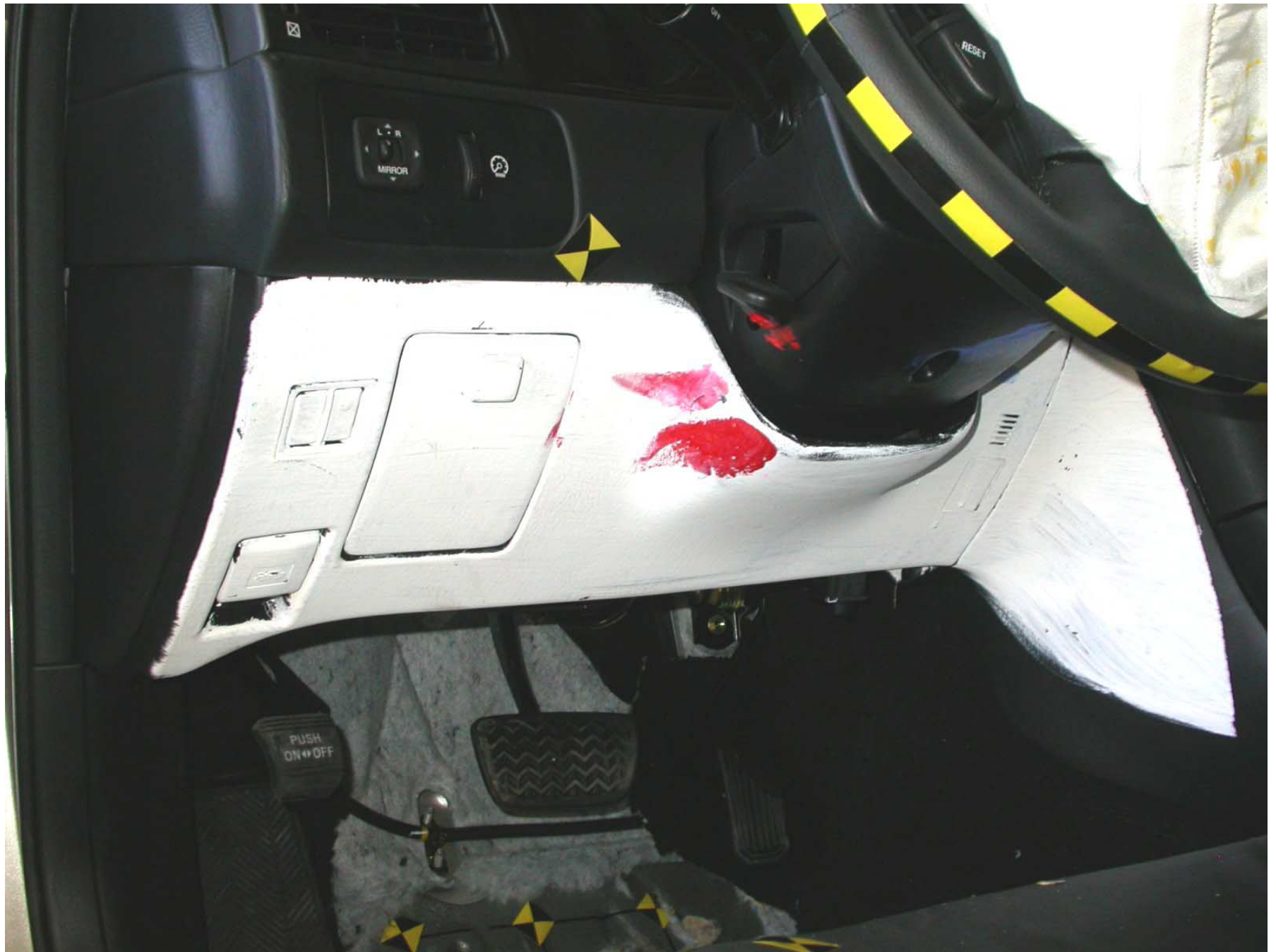


Figure A-39: Post-Test Driver Side Knee Bolster



Figure A-40: Pre-Test Driver Side Floor Pan



Figure A-41: Post-Test Driver Side Floor Pan



Figure A-42: Post-Test Driver Dummy Head

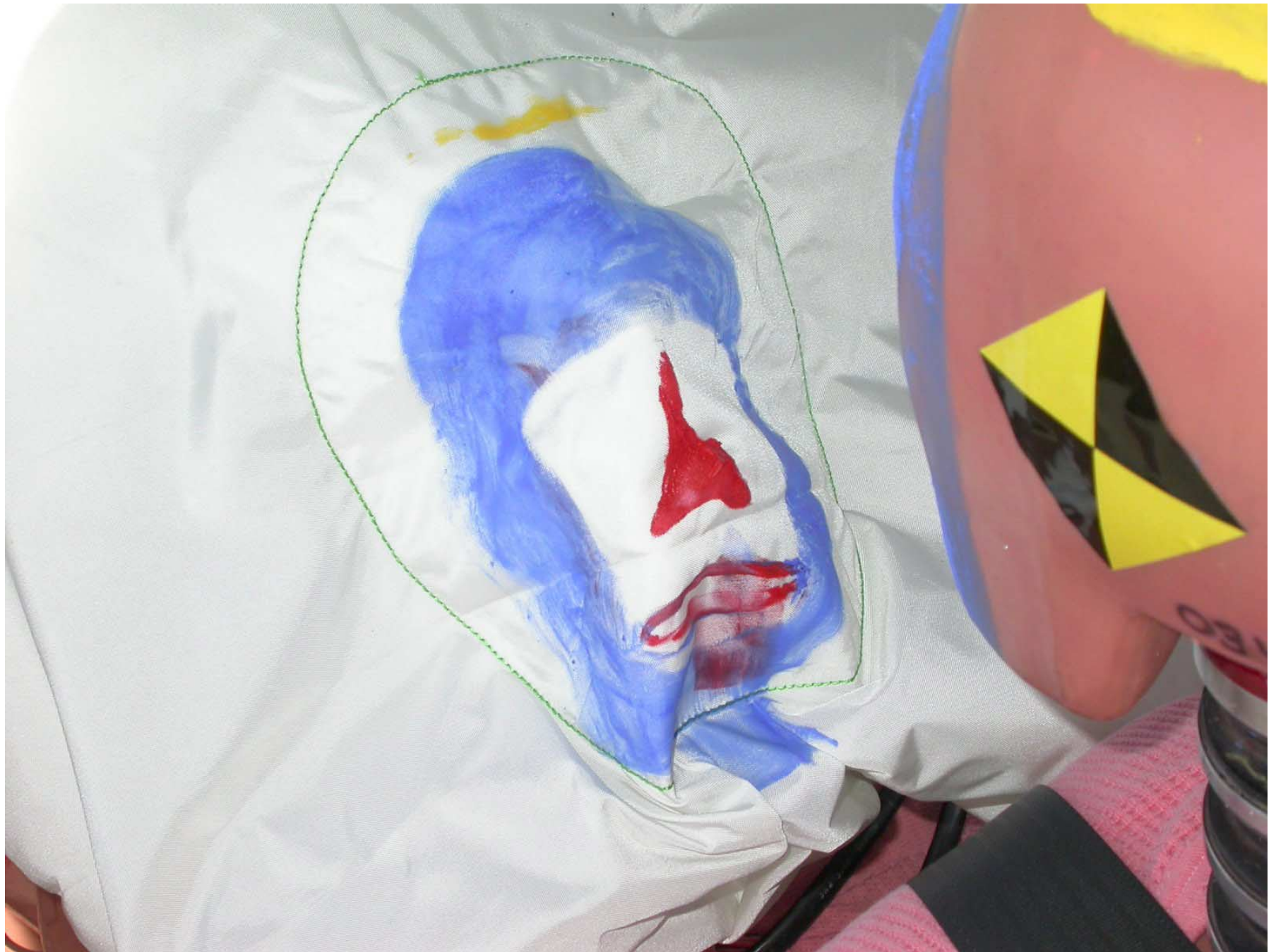


Figure A-43: Post-Test Driver Dummy Contact to Air Bag



Figure A-44: Pre-Test Passenger Dummy Front View (Head Position)



Figure A-45: Post-Test Passenger Dummy Front View (Head Position)



Figure A-46: Pre-Test Passenger Dummy Front Through Window



Figure A-47: Post-Test Passenger Dummy Front Through Window



Figure A-48: Pre-Test Passenger Dummy Door Open



Figure A-49: Post-Test Passenger Dummy Door Open



Figure A-50: Pre-Test Passenger Dummy Feet



Figure A-51: Post-Test Passenger Dummy Feet



Figure A-52: Pre-Test Passenger Side Knee Bolster



Figure A-53: Post-Test Passenger Side Knee Bolster



Figure A-54: Pre-Test Passenger Side Floor Pan



Figure A-55: Post-Test Passenger Side Floor Pan



Figure A-56: Post-Test Passenger Dummy Head



Figure A-57: Post-Test Passenger Dummy Contact to Air Bag



Figure A-58: Vehicle on Rollover Device



Figure A-59: Vehicle on Rollover Device



Figure A-60: Vehicle on Rollover Device

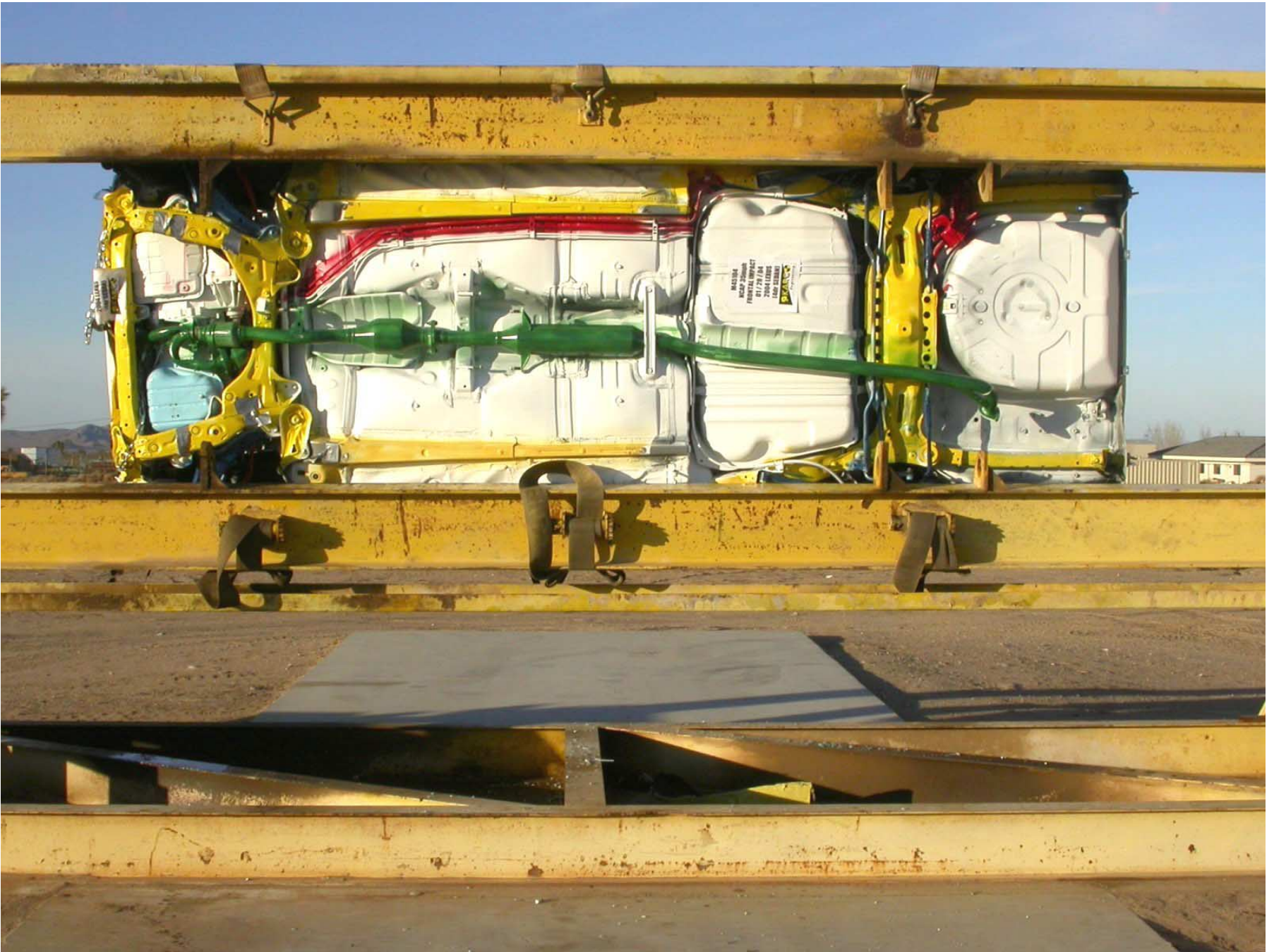


Figure A-61: Vehicle on Rollover Device



Figure A-62: Action Sequence During Impact (~33 msec. Between photos)

APPENDIX B

DATA PLOTS

LIST OF DATA PLOTS

Data Plot	Page
B-1	Driver Head Primary X
	Driver Head Primary Y
	Driver Head Primary Z
	Driver Head Resultant Primary
B-2	Driver Head Primary X Velocity
	Driver Head Primary X Displacement
B-3	Driver Head Redundant X
	Driver Head Redundant Y
	Driver Head Redundant Z
	Driver Head Resultant Redundant
B-4	Driver Head Redundant X Velocity
	Driver Head Redundant X Displacement
B-5	Driver Upper Neck Force X
	Driver Upper Neck Force Y
	Driver Upper Neck Force Z
	Driver Upper Neck Force Resultant
B-6	Driver Upper Neck Moment X
	Driver Upper Neck Moment Y
	Driver Upper Neck Moment Z
	Driver Upper Neck Moment Resultant
B-7	Driver Chest Primary X
	Driver Chest Primary Y
	Driver Chest Primary Z
	Driver Chest Resultant Primary
B-8	Driver Chest Primary X Velocity
	Driver Chest Primary X Displacement
B-9	Driver Chest Redundant X
	Driver Chest Redundant Y
	Driver Chest Redundant Z
	Driver Chest Resultant Redundant
B-10	Driver Chest Redundant X Velocity
	Driver Chest Redundant X Displacement
B-11	Driver Chest Displacement

LIST OF DATA PLOTS...(Continued)

Data Plot	Page
B-12	Driver Pelvis X
	Driver Pelvis Y
	Driver Pelvis Z
	Driver Pelvis Resultant
B-13	Driver Pelvis X Velocity
	Driver Pelvis X Displacement
B-14	Driver Left Femur Force
	Driver Right Femur Force
B-15	Driver Left Upper Tibia Moment X
	Driver Left Upper Tibia Moment Y
	Driver Right Upper Tibia Moment X
	Driver Right Upper Tibia Moment Y
B-16	Driver Left Lower Tibia Moment X
	Driver Left Lower Tibia Moment Y
	Driver Left Lower Tibia Force Z
B-17	Driver Right Lower Tibia Moment X
	Driver Right Lower Tibia Moment Y
	Driver Right Lower Tibia Force Z
B-18	Driver Left Foot Aft X
	Driver Left Foot Aft Z
	Driver Left Foot Fore Z
B-19	Driver Right Foot Aft X
	Driver Right Foot Aft Z
	Driver Right Foot Fore Z
B-20	Driver Lap Belt Force
	Driver Shoulder Belt Force
	Driver Shoulder Belt Pullout
	Driver Shoulder Belt Elongation
B-21	Passenger Head Primary X
	Passenger Head Primary Y
	Passenger Head Primary Z
	Passenger Head Resultant Primary
B-22	Passenger Head Primary X Velocity
	Passenger Head Primary X Displacement

LIST OF DATA PLOTS...(Continued)

Data Plot	Page
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	Passenger Head Redundant Y
	Passenger Head Redundant Z
	Passenger Head Resultant Redundant
B-24	Passenger Head Redundant X Velocity
	Passenger Head Redundant X Displacement
B-25	Passenger Upper Neck Force X
	Passenger Upper Neck Force Y
	Passenger Upper Neck Force Z
	Passenger Upper Neck Force Resultant
B-26	Passenger Upper Neck Moment X
	Passenger Upper Neck Moment Y
	Passenger Upper Neck Moment Z
	Passenger Upper Neck Moment Resultant
B-27	Passenger Chest Primary X
	Passenger Chest Primary Y
	Passenger Chest Primary Z
	Passenger Chest Resultant Primary
B-28	Passenger Chest Primary X Velocity
	Passenger Chest Primary X Displacement
B-29	Passenger Chest Redundant X
	Passenger Chest Redundant Y
	Passenger Chest Redundant Z
	Passenger Chest Resultant Redundant
B-30	Passenger Chest Redundant X Velocity
	Passenger Chest Redundant X Displacement
B-31	Passenger Chest Displacement
B-32	Passenger Pelvis X
	Passenger Pelvis Y
	Passenger Pelvis Z
	Passenger Pelvis Resultant
B-33	Passenger Pelvis X Velocity
	Passenger Pelvis X Displacement

LIST OF DATA PLOTS...(Continued)

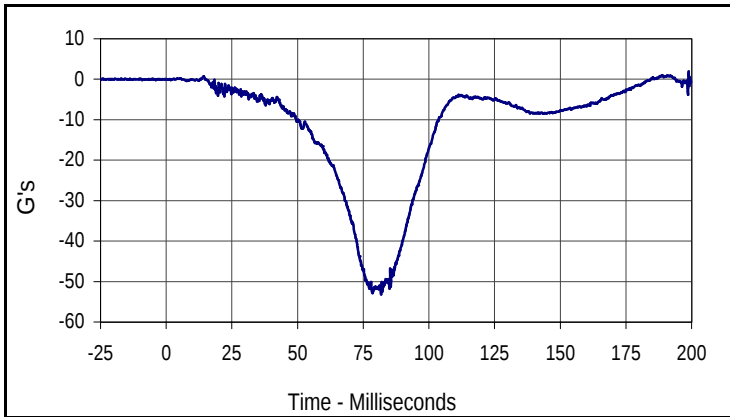
Data Plot		Page
B-34	Passenger Left Femur Force	B-34
	Passenger Right Femur Force	B-34
B-35	Passenger Left Upper Tibia Moment X	B-35
	Passenger Left Upper Tibia Moment Y	B-35
	Passenger Right Upper Tibia Moment X	B-35
	Passenger Right Upper Tibia Moment Y	B-35
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	Passenger Shoulder Belt Pullout	B-40
	Passenger Shoulder Belt Elongation	B-40
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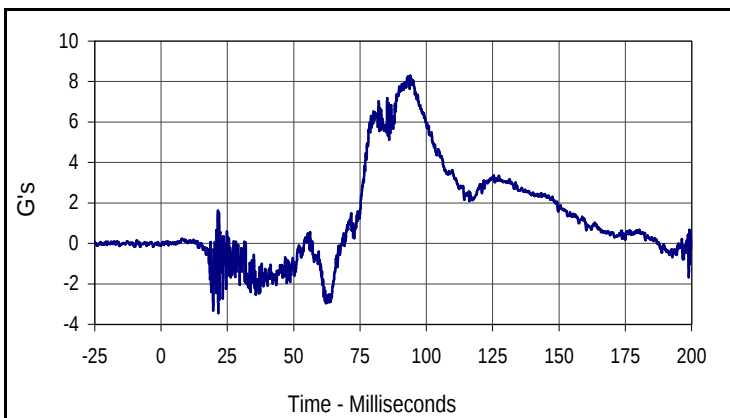
<u>Data Plot</u>	<u>Page</u>
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	Vehicle Left Brake Caliper Displacement
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	Vehicle Right Rear Z Velocity
	Vehicle Right Rear Z Displacement

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

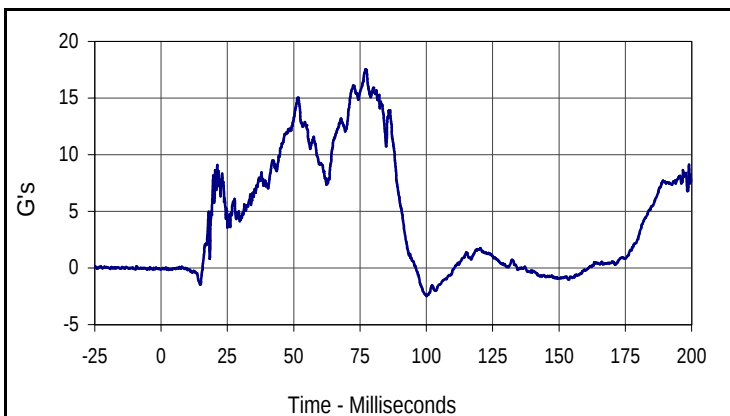
Test Date: 1/28/04
 NHTSA No.: M45104



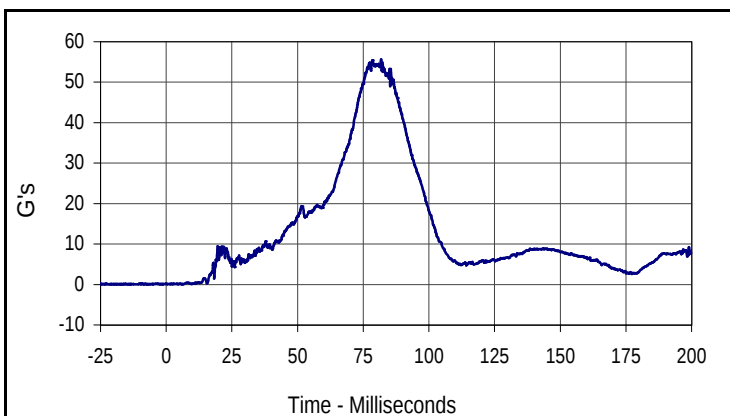
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
1.9	198.9	-53.2	81.8



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
8.3	94.0	-3.4	21.6



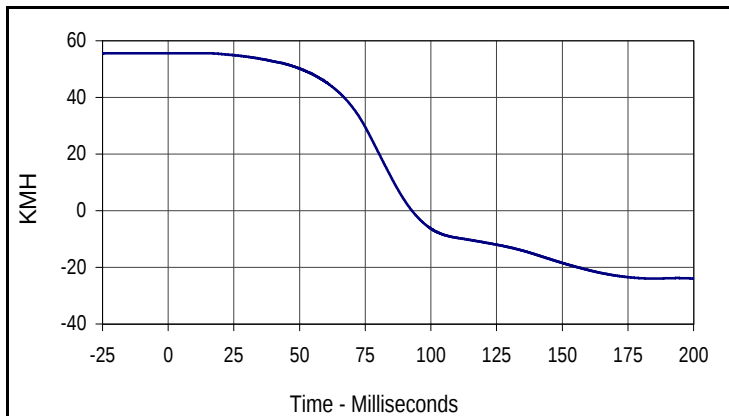
Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
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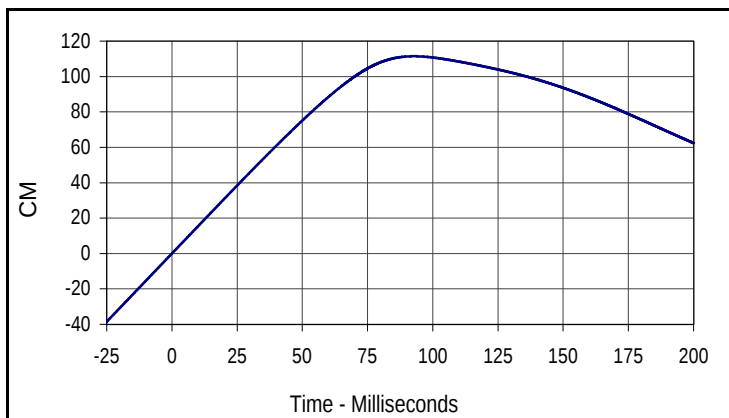
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
55.6	81.8	0.0	5.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



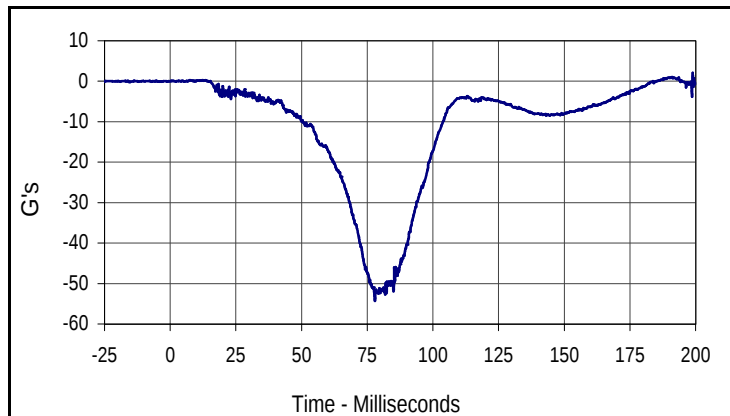
Curve Description			
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CURNO	Type	SAE Class	Units
001	IN1	180	KMH
Max	Time	Min	Time
55.6	6.2	-24.0	184.5



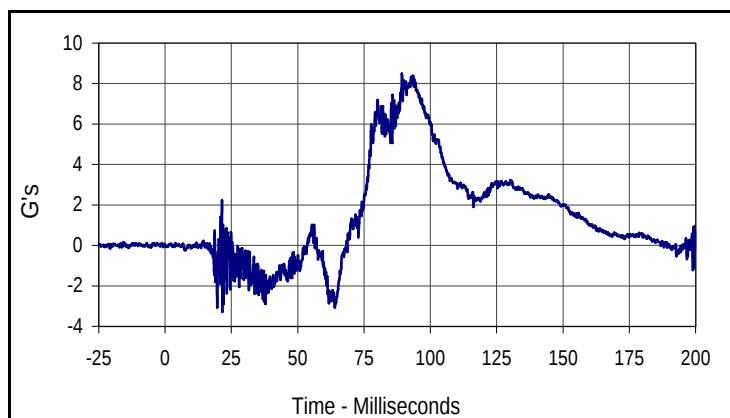
Curve Description			
Driver Head Primary X Displacement			
CURNO	Type	SAE Class	Units
001	IN2	180	CM
Max	Time	Min	Time
111.4	92.8	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

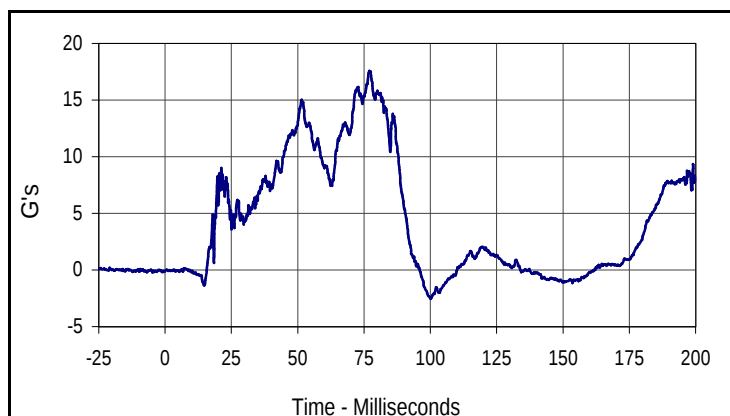
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 NHTSA No.: M45104



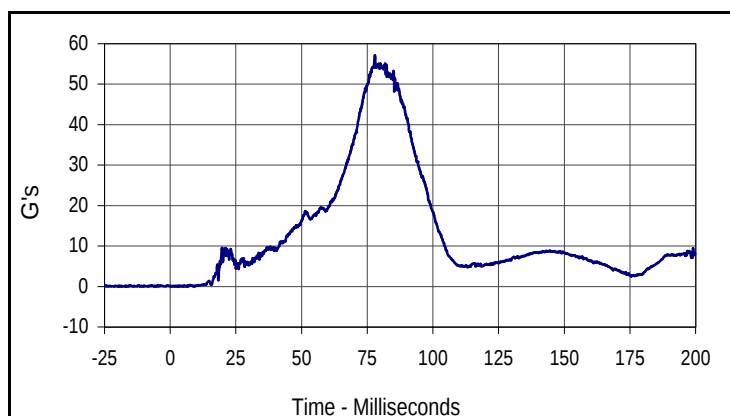
Curve Description			
Driver Head Redundant X			
CURNO	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
2.1	198.9	-54.3	77.9



Curve Description			
Driver Head Redundant Y			
CURNO	Type	SAE Class	Units
005	FIL	1000	G's
Max	Time	Min	Time
8.5	89.3	-3.2	21.6



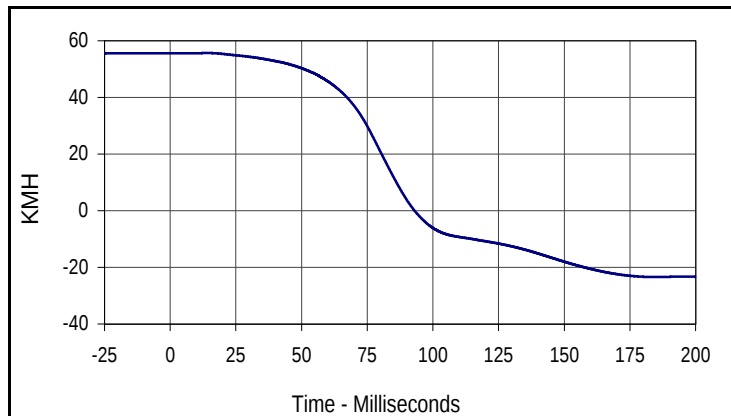
Curve Description			
Driver Head Redundant Z			
CURNO	Type	SAE Class	Units
006	FIL	1000	G's
Max	Time	Min	Time
17.6	77.0	-2.5	100.1



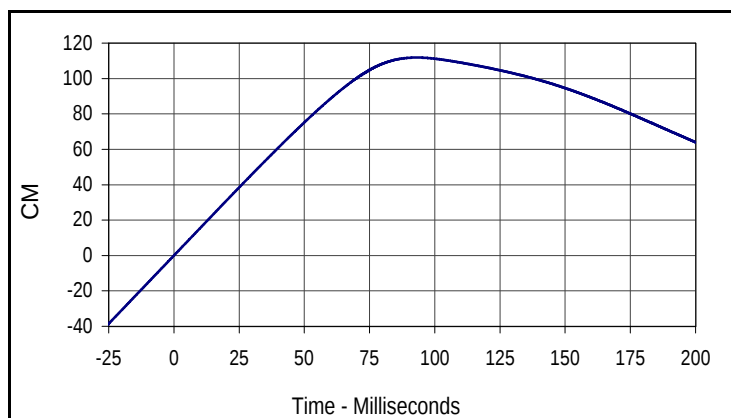
Curve Description			
Driver Head Resultant Redundant			
CURNO	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
57.1	77.9	0.0	1.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



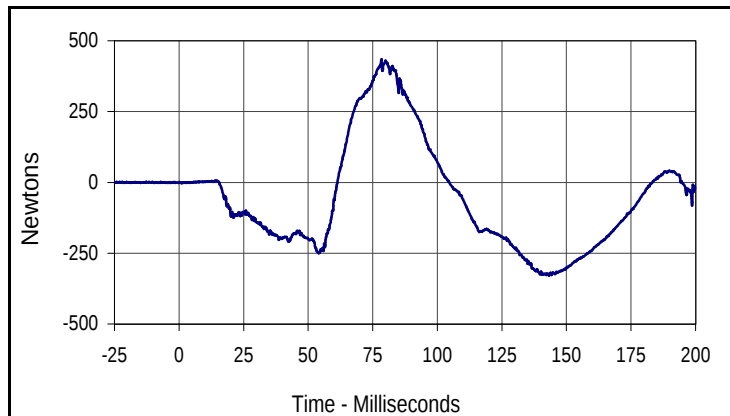
Curve Description			
Driver Head Redundant X Velocity			
CURNO	Type	SAE Class	Units
004	IN1	180	KMH
Max	Time	Min	Time
55.7	14.6	-23.4	185.2



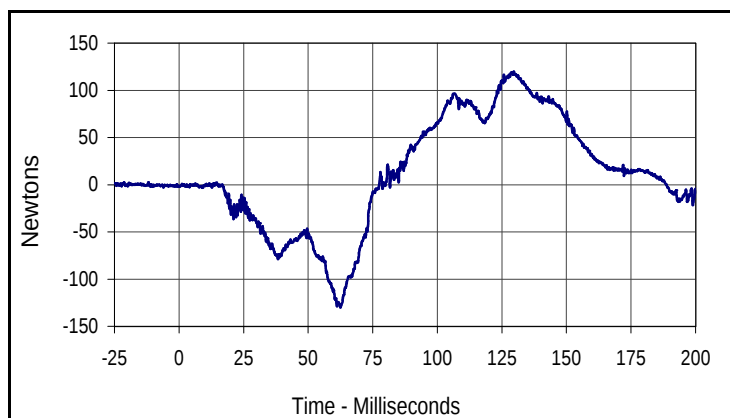
Curve Description			
Driver Head Redundant X Displacement			
CURNO	Type	SAE Class	Units
004	IN2	180	CM
Max	Time	Min	Time
111.8	93.0	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

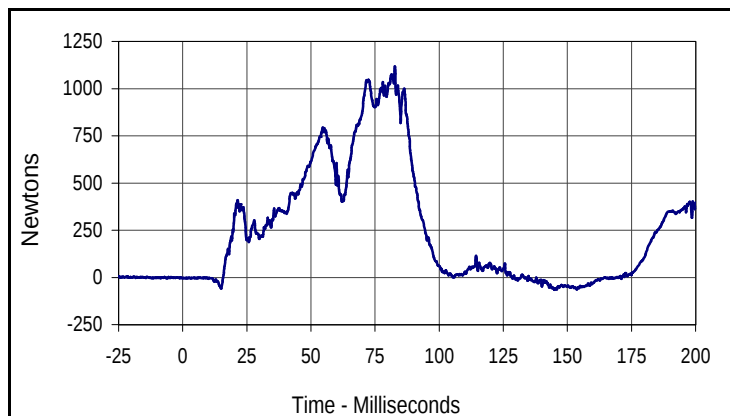
Test Date: 1/28/04
 NHTSA No.: M45104



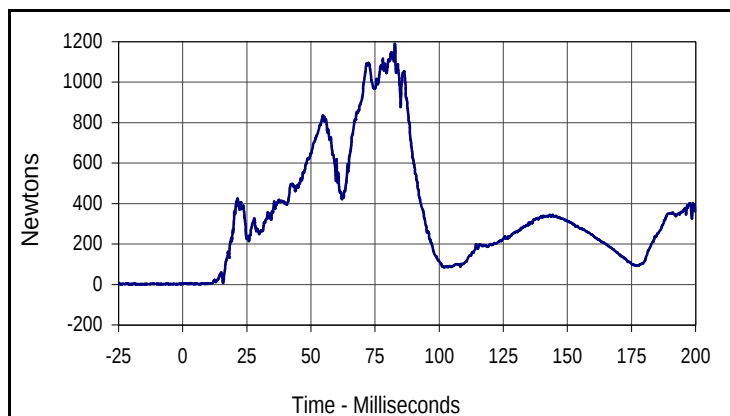
Curve Description			
Driver Upper Neck Force X			
CURNO	Type	SAE Class	Units
007	FIL	1000	Newtons
Max	Time	Min	Time
434.8	78.4	-329.1	143.2



Curve Description			
Driver Upper Neck Force Y			
CURNO	Type	SAE Class	Units
008	FIL	1000	Newtons
Max	Time	Min	Time
119.7	129.6	-130.0	62.5



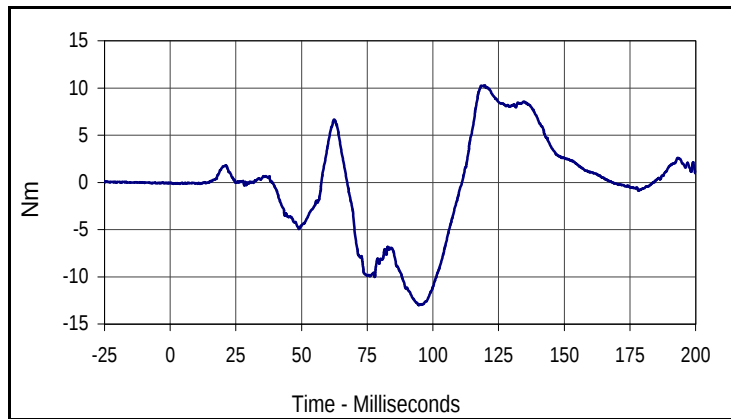
Curve Description			
Driver Upper Neck Force Z			
CURNO	Type	SAE Class	Units
009	FIL	1000	Newtons
Max	Time	Min	Time
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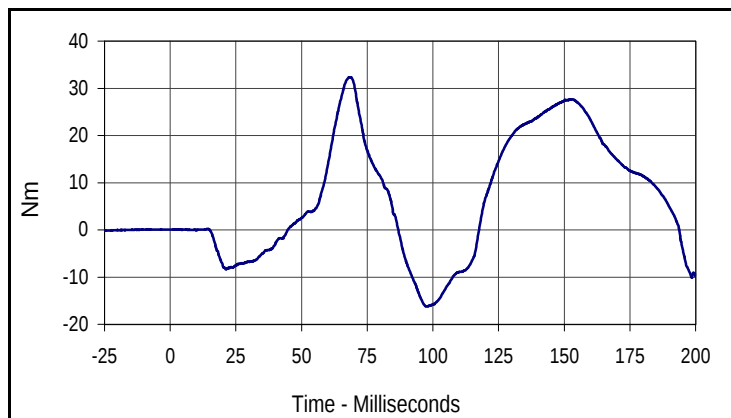
Curve Description			
Driver Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
007	RES	1000	Newtons
Max	Time	Min	Time
1190.6	82.7	1.1	6.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

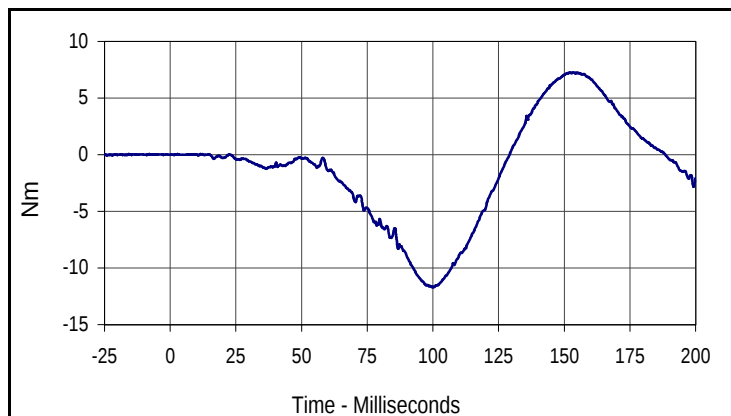
Test Date: 1/28/04
 NHTSA No.: M45104



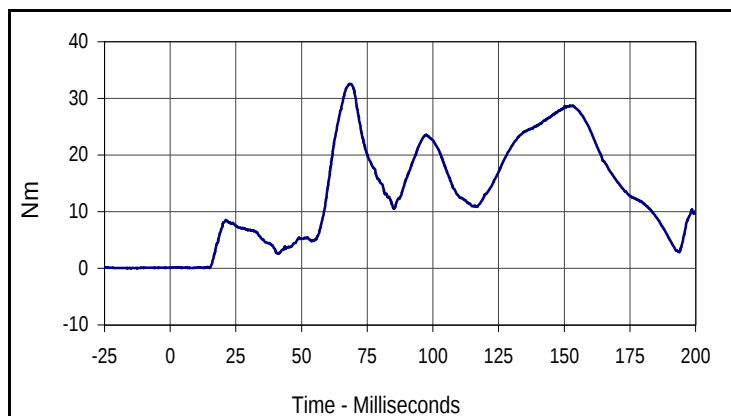
Curve Description			
Driver Upper Neck Moment X			
CURNO	Type	SAE Class	Units
010	FIL	600	Nm
Max	Time	Min	Time
10.3	119.7	-13.0	94.6



Curve Description			
Driver Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
011	FIL	600	Nm
Max	Time	Min	Time
32.4	68.5	-16.2	97.7



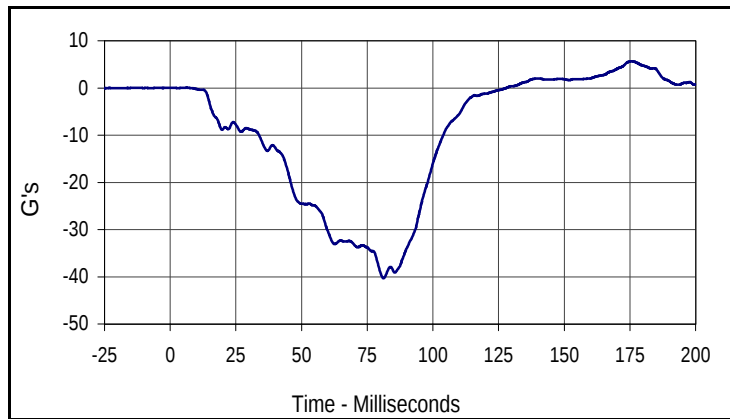
Curve Description			
Driver Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
7.3	153.6	-11.7	100.2



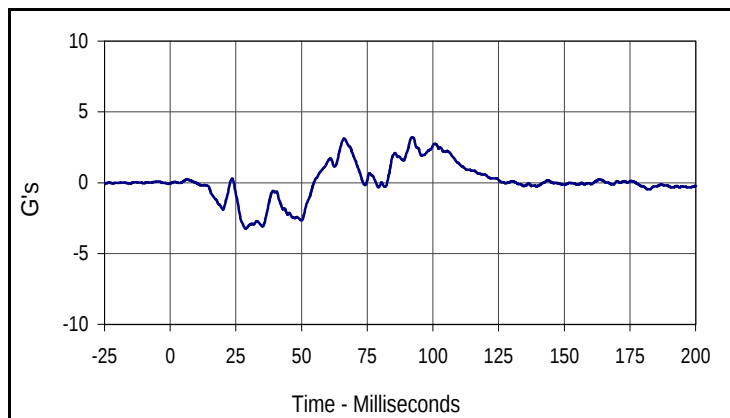
Curve Description			
Driver Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
010	RES	600	Nm
Max	Time	Min	Time
32.6	68.5	0.0	4.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

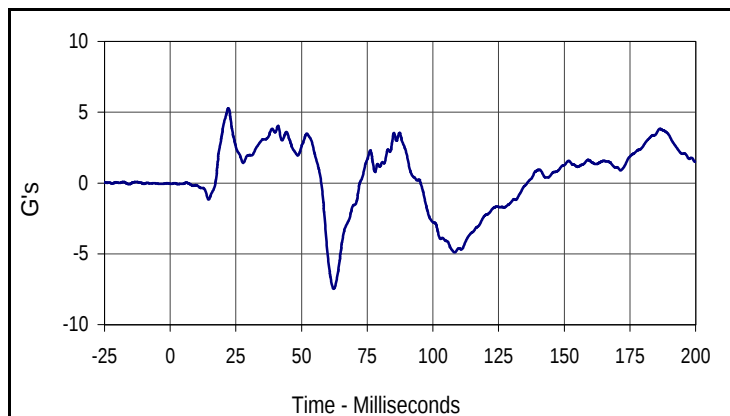
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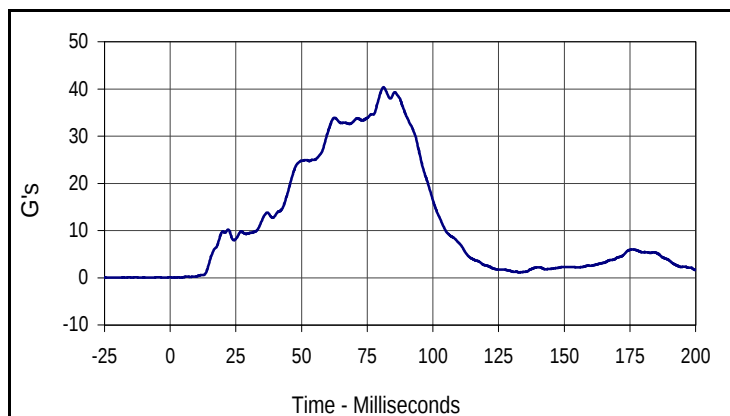
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
5.6	175.7	-40.3	81.2



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
3.2	92.3	-3.3	28.7



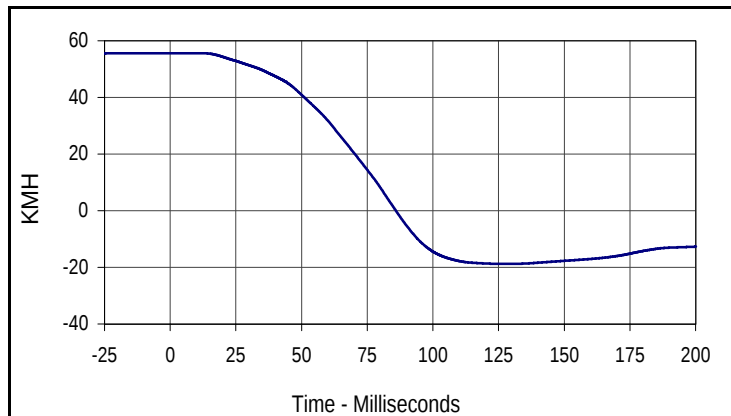
Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
015	FIL	180	G's
Max	Time	Min	Time
5.3	22.1	-7.5	62.2



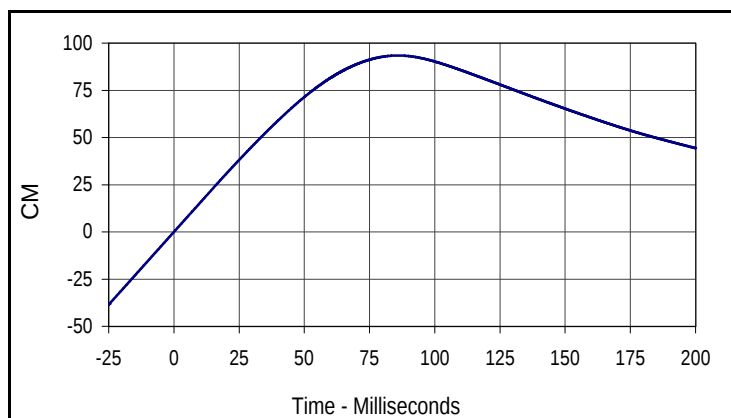
Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
013	RES	180	G's
Max	Time	Min	Time
40.4	81.2	0.1	4.1

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



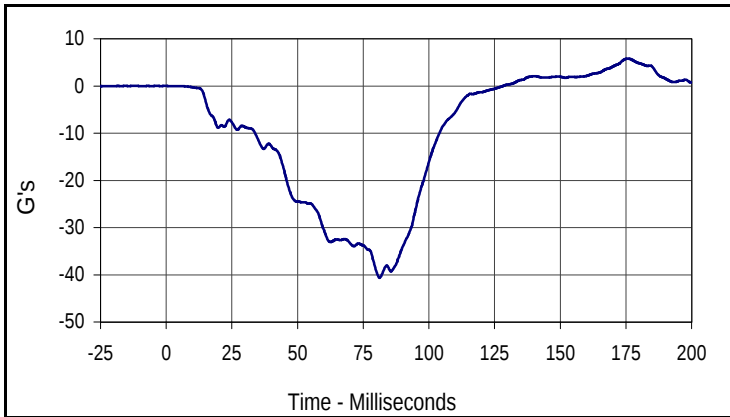
Curve Description			
Driver Chest Primary X Velocity			
CURNO	Type	SAE Class	Units
013	IN1	180	KMH
Max	Time	Min	Time
55.6	7.5	-18.8	127.9



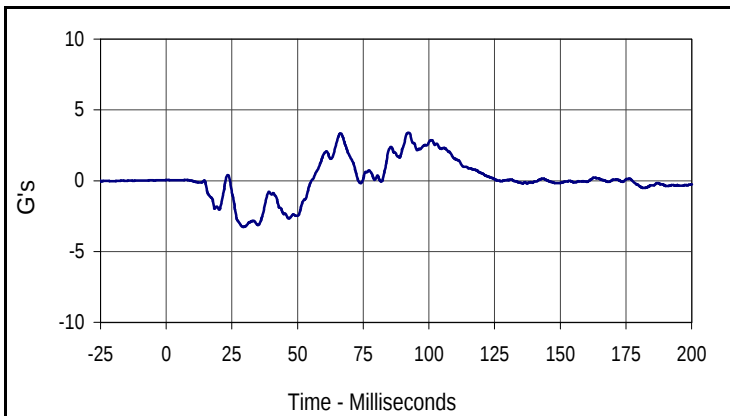
Curve Description			
Driver Chest Primary X Displacement			
CURNO	Type	SAE Class	Units
013	IN2	180	CM
Max	Time	Min	Time
93.4	85.9	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

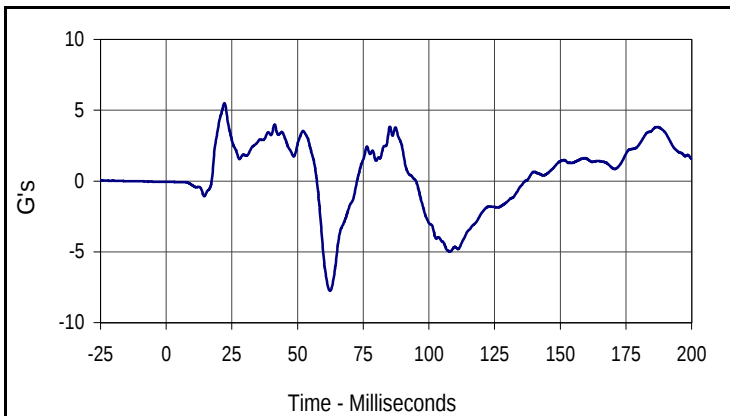
Test Date: 1/28/04
 NHTSA No.: M45104



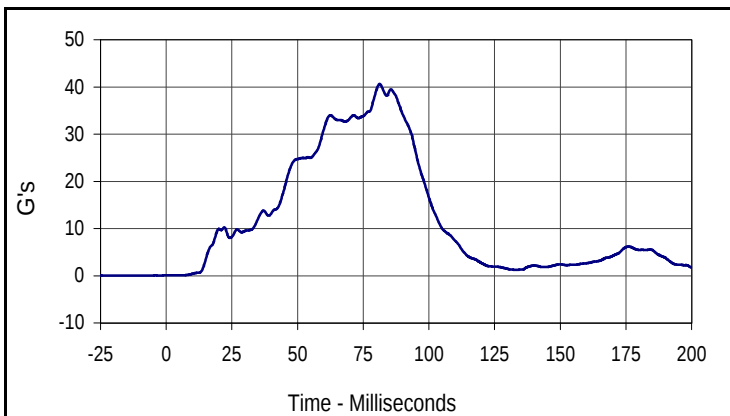
Curve Description			
Driver Chest Redundant X			
CURNO	Type	SAE Class	Units
016	FIL	180	G's
Max	Time	Min	Time
5.8	175.6	-40.6	81.2



Curve Description			
Driver Chest Redundant Y			
CURNO	Type	SAE Class	Units
017	FIL	180	G's
Max	Time	Min	Time
3.4	92.5	-3.3	29.5



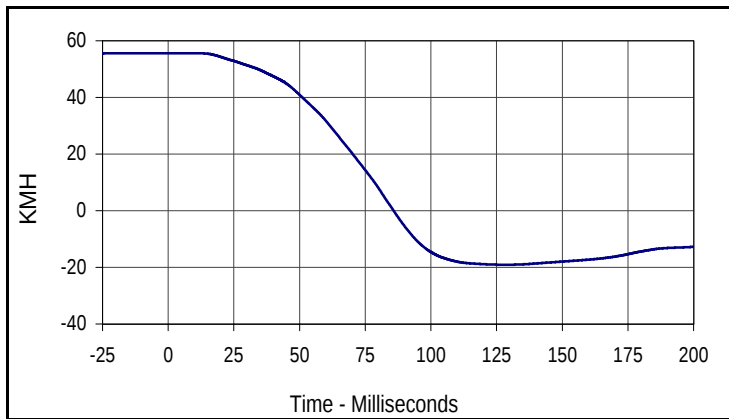
Curve Description			
Driver Chest Redundant Z			
CURNO	Type	SAE Class	Units
018	FIL	180	G's
Max	Time	Min	Time
5.5	22.2	-7.8	62.4



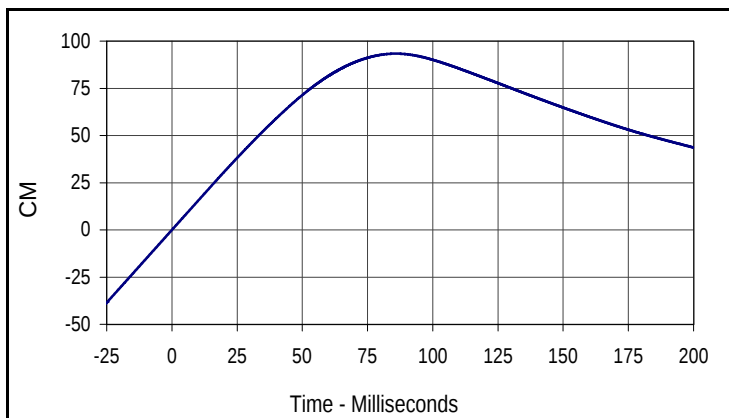
Curve Description			
Driver Chest Resultant Redundant			
CURNO	Type	SAE Class	Units
016	RES	180	G's
Max	Time	Min	Time
40.6	81.2	0.1	1.1

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



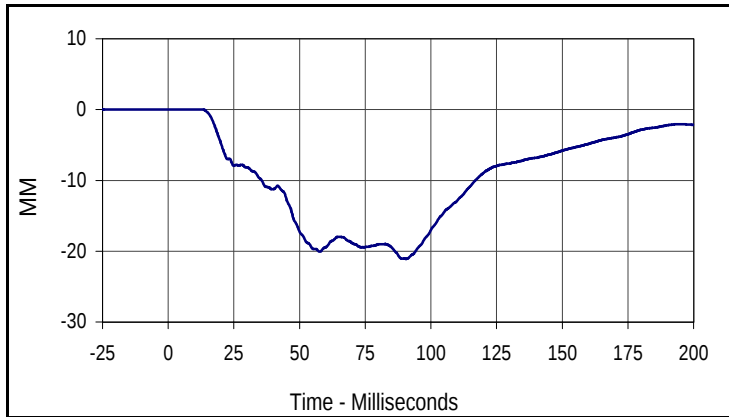
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Driver Chest Redundant X Velocity			
CURNO	Type	SAE Class	Units
016	IN1	180	KMH
Max	Time	Min	Time
55.6	0.6	-19.1	128.3



Curve Description			
Driver Chest Redundant X Displacement			
CURNO	Type	SAE Class	Units
016	IN2	180	CM
Max	Time	Min	Time
93.4	85.8	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

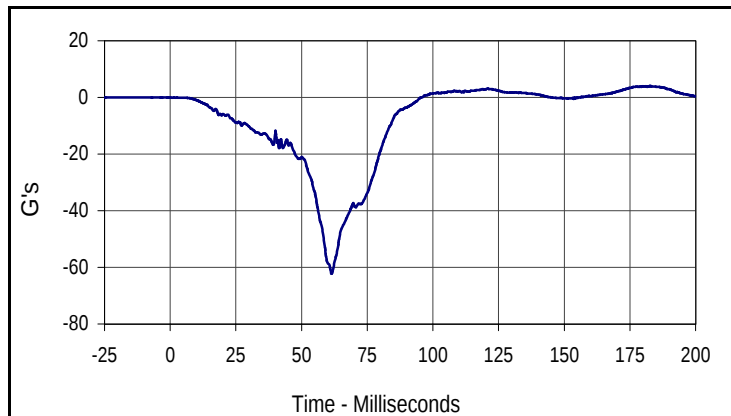
Test Date: 1/28/04
 NHTSA No.: M45104



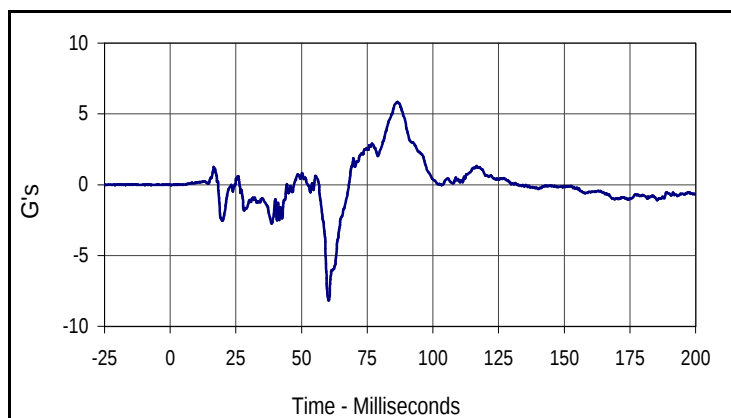
Curve Description			
Driver Chest Displacement			
CURNO	Type	SAE Class	Units
019	FIL	600	MM
Max	Time	Min	Time
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Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

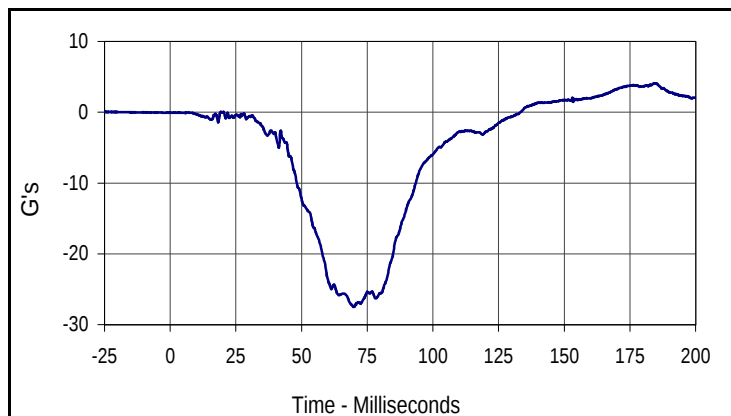
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 NHTSA No.: M45104



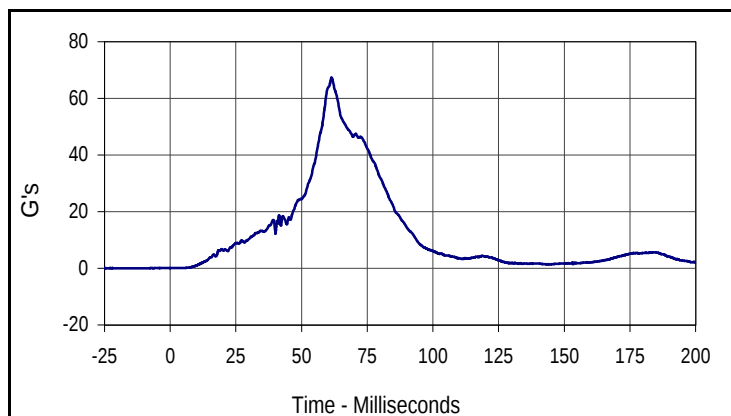
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Driver Pelvis X			
CURNO	Type	SAE Class	Units
020	FIL	1000	G's
Max	Time	Min	Time
4.0	182.7	-62.3	61.4



Curve Description			
Driver Pelvis Y			
CURNO	Type	SAE Class	Units
021	FIL	1000	G's
Max	Time	Min	Time
5.8	86.5	-8.2	60.4



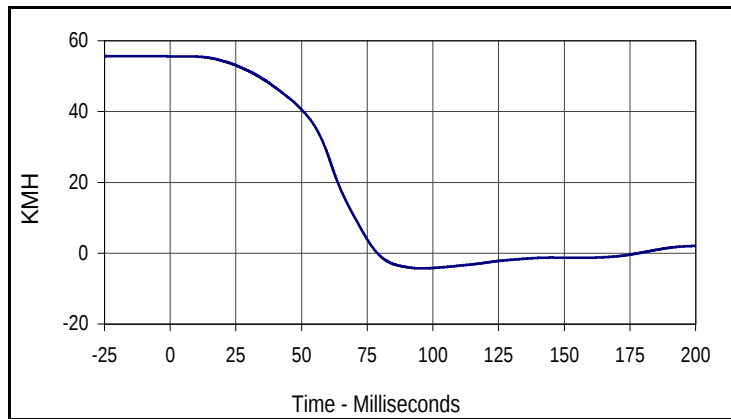
Curve Description			
Driver Pelvis Z			
CURNO	Type	SAE Class	Units
022	FIL	1000	G's
Max	Time	Min	Time
4.1	184.3	-27.5	69.7



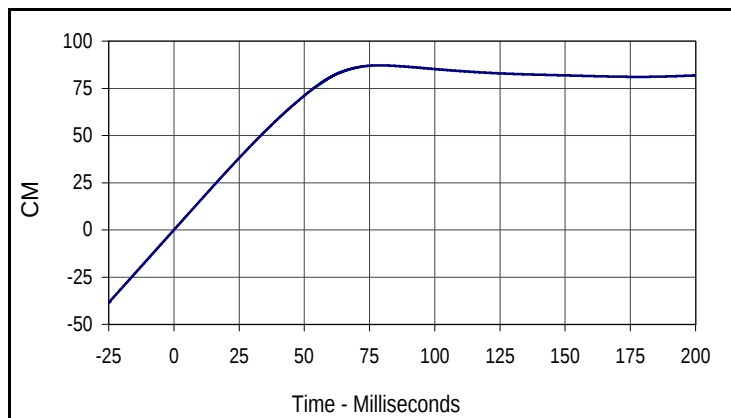
Curve Description			
Driver Pelvis Resultant			
CURNO	Type	SAE Class	Units
020	RES	1000	G's
Max	Time	Min	Time
67.4	61.4	0.1	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



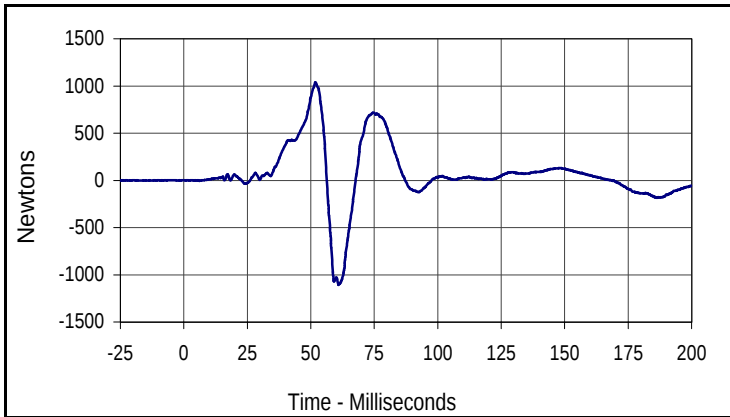
Curve Description			
Driver Pelvis X Velocity			
CURNO	Type	SAE Class	Units
020	IN1	180	KMH
Max	Time	Min	Time
55.6	0.0	-4.3	95.6



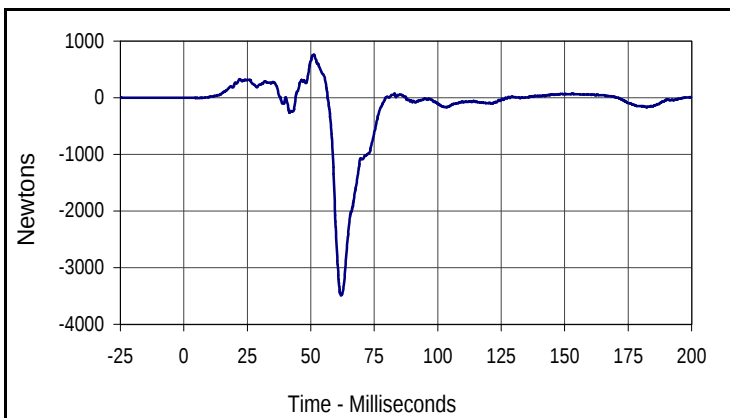
Curve Description			
Driver Pelvis X Displacement			
CURNO	Type	SAE Class	Units
020	IN2	180	CM
Max	Time	Min	Time
87.2	78.9	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



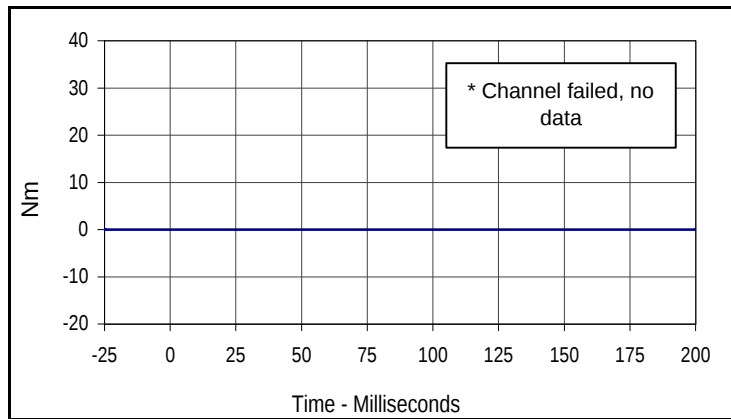
Curve Description			
Driver Left Femur Force			
CURNO	Type	SAE Class	Units
023	FIL	600	Newtons
Max	Time	Min	Time
1037.6	51.8	-1107.8	61.0



Curve Description			
Driver Right Femur Force			
CURNO	Type	SAE Class	Units
024	FIL	600	Newtons
Max	Time	Min	Time
763.7	51.2	-3493.2	62.0

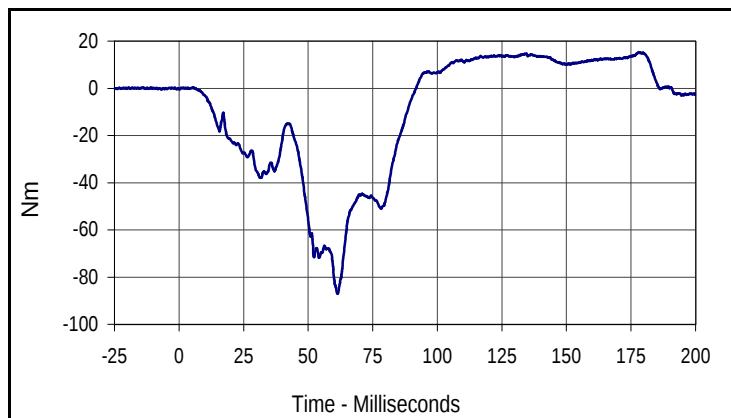
Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104

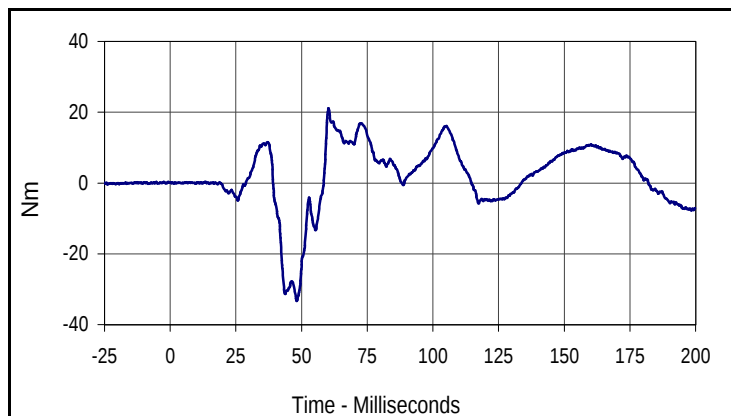


Curve Description			
Driver Left Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
025	FIL	600	Nm
Max	Time	Min	Time
0.0	0.0	0.0	0.0

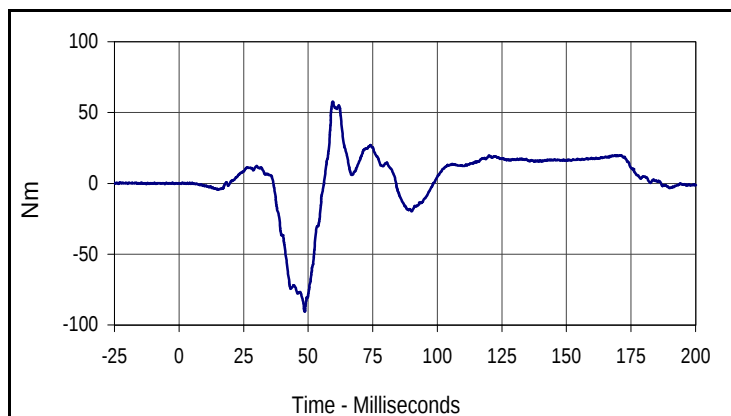
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Curve Description			
Driver Left Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
15.4	177.9	-87.1	61.4



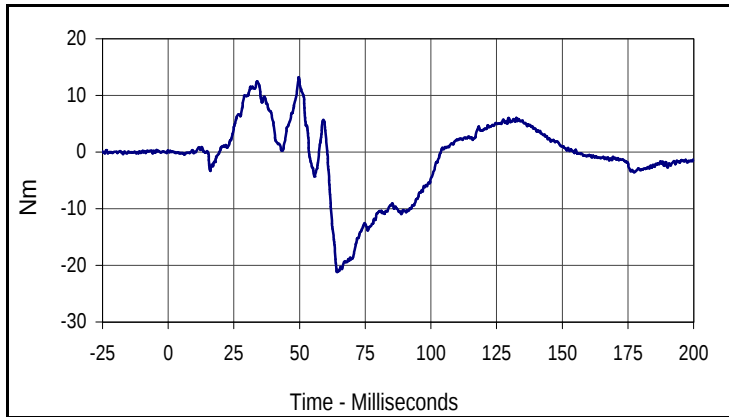
Curve Description			
Driver Right Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
027	FIL	600	Nm
Max	Time	Min	Time
21.1	60.3	-33.3	48.2



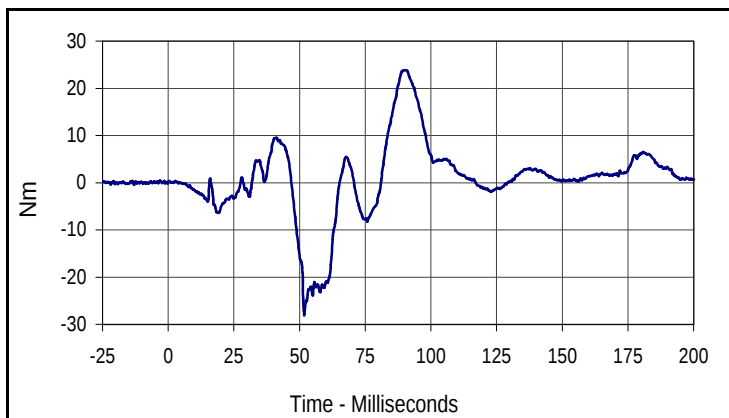
Curve Description			
Driver Right Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
028	FIL	600	Nm
Max	Time	Min	Time
57.7	59.5	-90.5	48.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

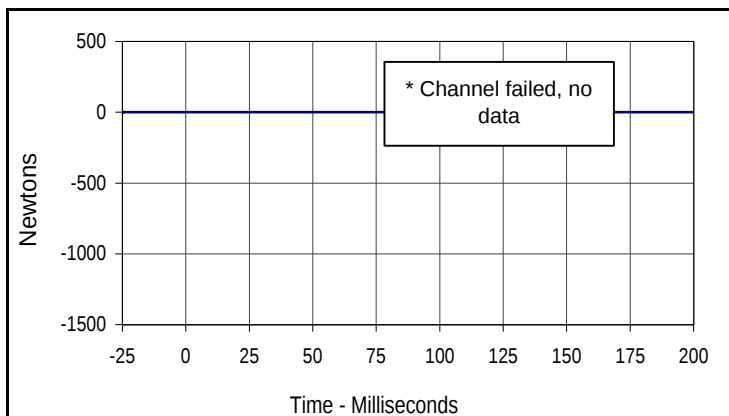
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Driver Left Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
029	FIL	600	Nm
Max	Time	Min	Time
13.2	49.7	-21.2	64.3



Curve Description			
Driver Left Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
030	FIL	600	Nm
Max	Time	Min	Time
23.9	90.8	-28.1	51.8

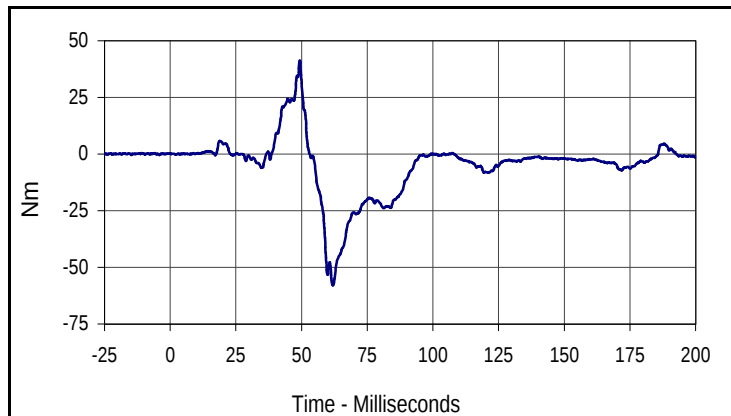


Curve Description			
Driver Left Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
031	FIL	600	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

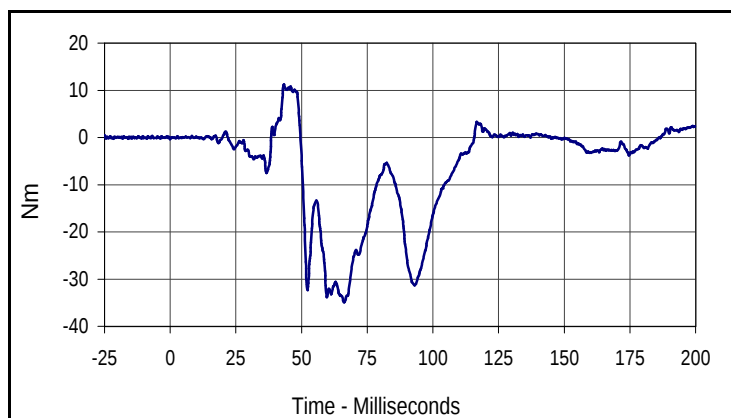
* Channel failed, no data

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

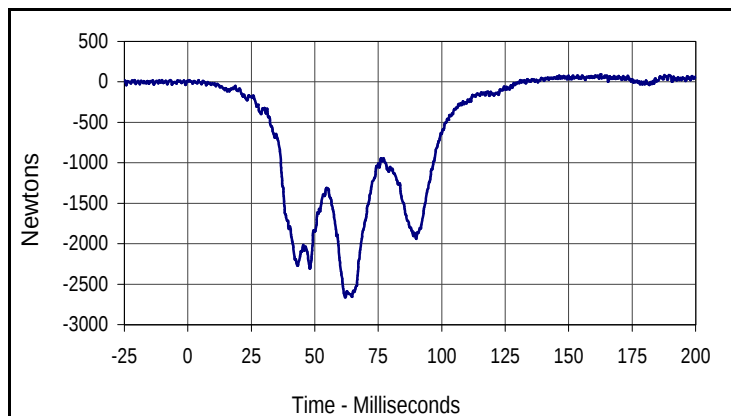
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Driver Right Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
032	FIL	600	Nm
Max	Time	Min	Time
41.2	49.3	-58.0	61.9



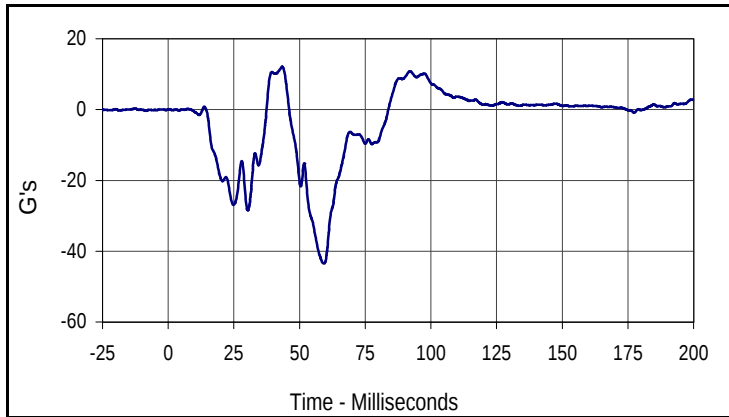
Curve Description			
Driver Right Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
033	FIL	600	Nm
Max	Time	Min	Time
11.2	43.3	-34.9	66.1



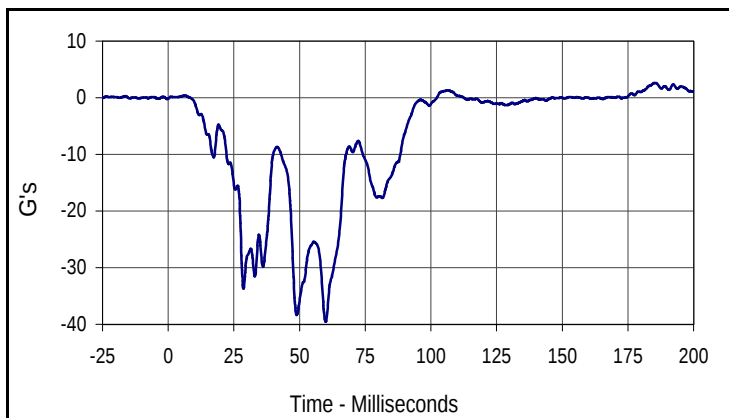
Curve Description			
Driver Right Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
034	FIL	600	Newtons
Max	Time	Min	Time
92.5	162.5	-2663.5	62.1

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

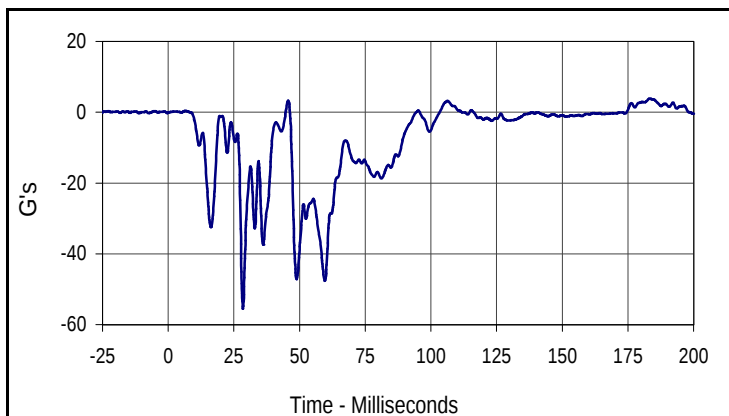
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Driver Left Foot Aft X			
CURNO	Type	SAE Class	Units
035	FIL	180	G's
Max	Time	Min	Time
12.1	43.4	-43.5	59.3



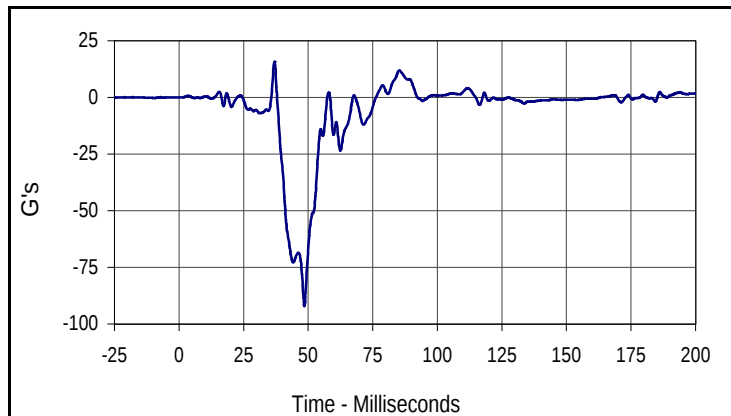
Curve Description			
Driver Left Foot Aft Z			
CURNO	Type	SAE Class	Units
036	FIL	180	G's
Max	Time	Min	Time
2.6	185.2	-39.5	59.9



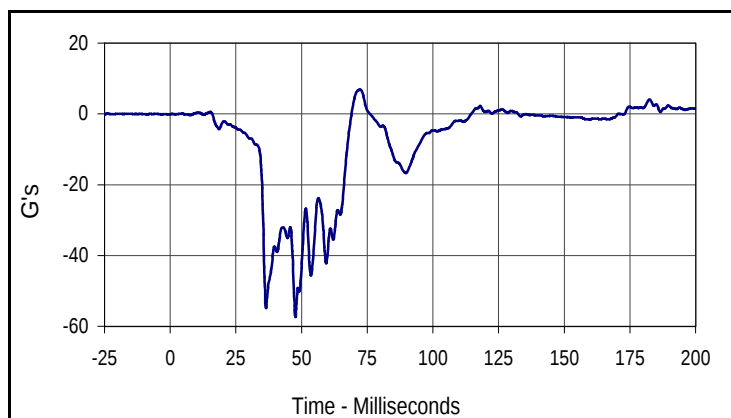
Curve Description			
Driver Left Foot Fore Z			
CURNO	Type	SAE Class	Units
037	FIL	180	G's
Max	Time	Min	Time
3.8	183.4	-55.5	28.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

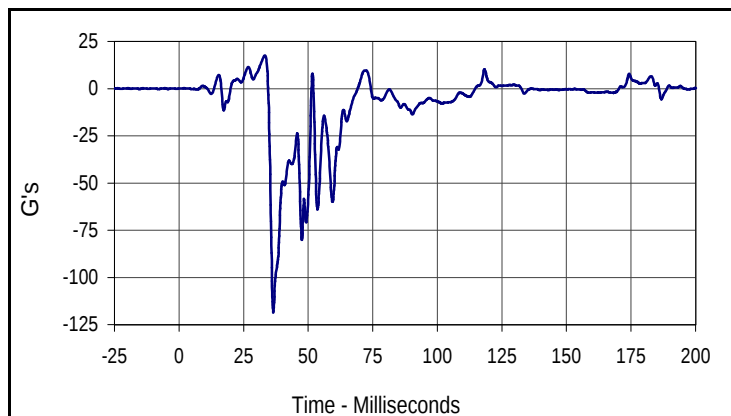
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Driver Right Foot Aft X			
CURNO	Type	SAE Class	Units
038	FIL	180	G's
Max	Time	Min	Time
15.7	37.0	-92.0	48.5



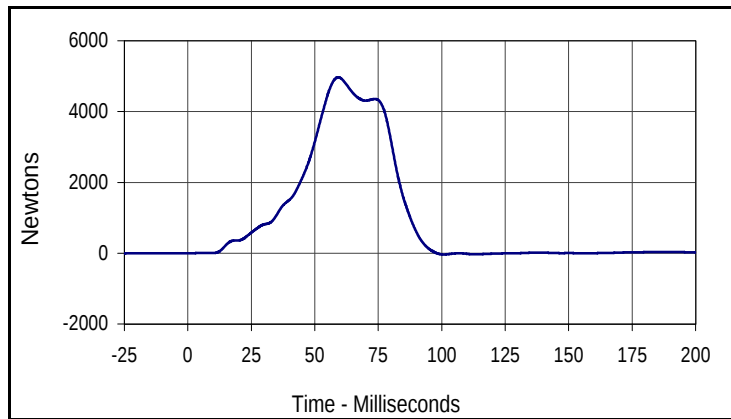
Curve Description			
Driver Right Foot Aft Z			
CURNO	Type	SAE Class	Units
039	FIL	180	G's
Max	Time	Min	Time
6.9	72.4	-57.4	47.7



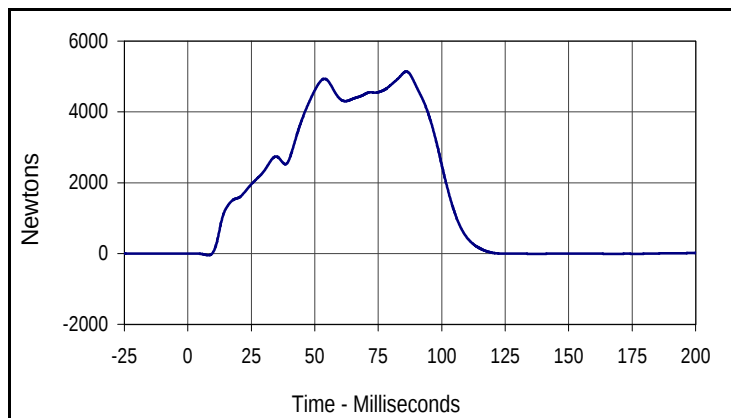
Curve Description			
Driver Right Foot Fore Z			
CURNO	Type	SAE Class	Units
040	FIL	180	G's
Max	Time	Min	Time
17.6	33.3	-118.6	36.5

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

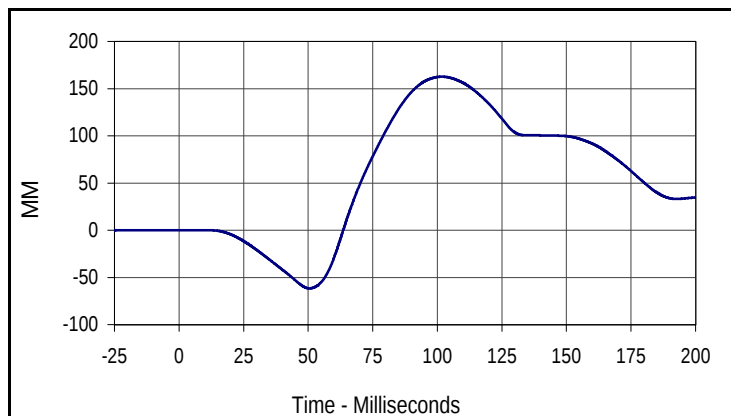
Test Date: 1/28/04
 NHTSA No.: M45104



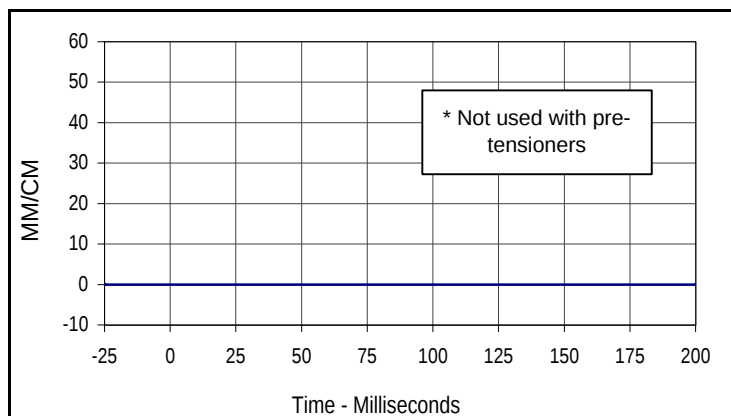
Curve Description			
Driver Lap Belt Force			
CURNO	Type	SAE Class	Units
041	FIL	60	Newtons
Max	Time	Min	Time
4967.3	59.2	-36.7	100.9



Curve Description			
Driver Shoulder Belt Force			
CURNO	Type	SAE Class	Units
042	FIL	60	Newtons
Max	Time	Min	Time
5141.2	86.0	-47.4	8.1



Curve Description			
Driver Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
043	FIL	60	MM
Max	Time	Min	Time
162.6	101.8	-61.6	50.6

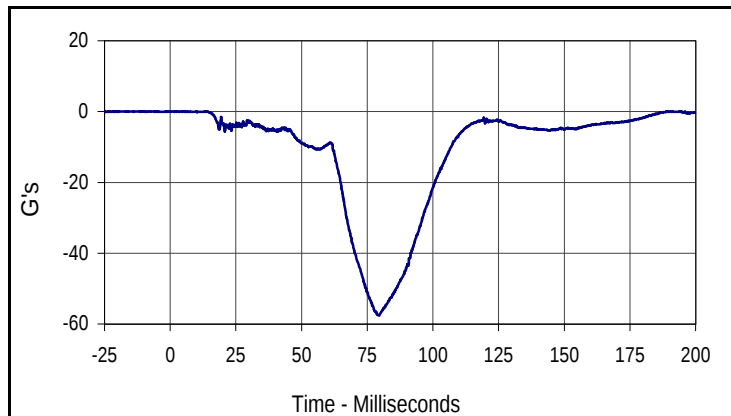


Curve Description			
Driver Shoulder Belt Elongation			
CURNO	Type	SAE Class	Units
044	FIL	60	MM/CM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

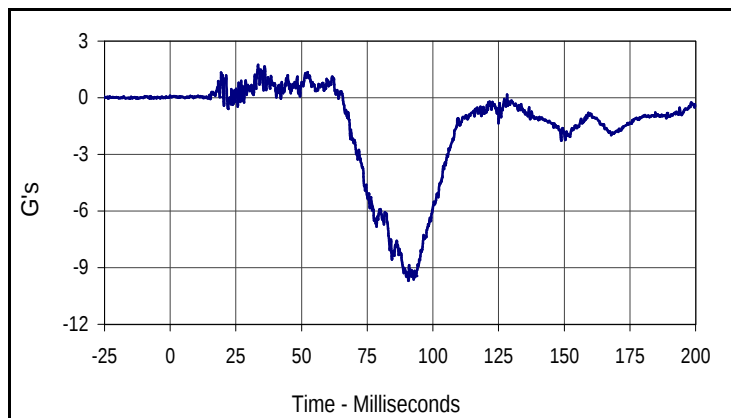
* Not used with pre-tensioners

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

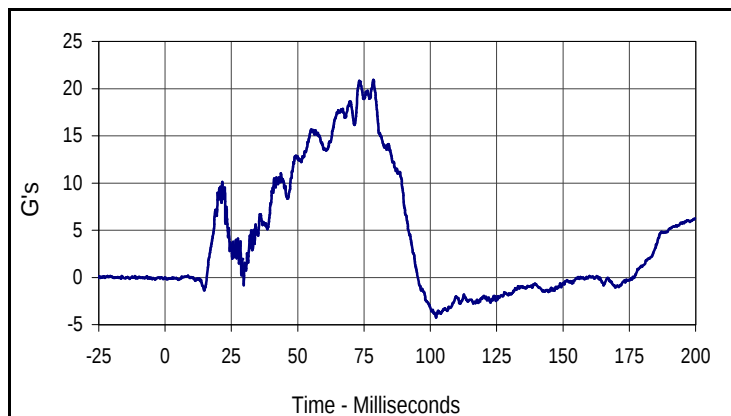
Test Date: 1/28/04
 NHTSA No.: M45104



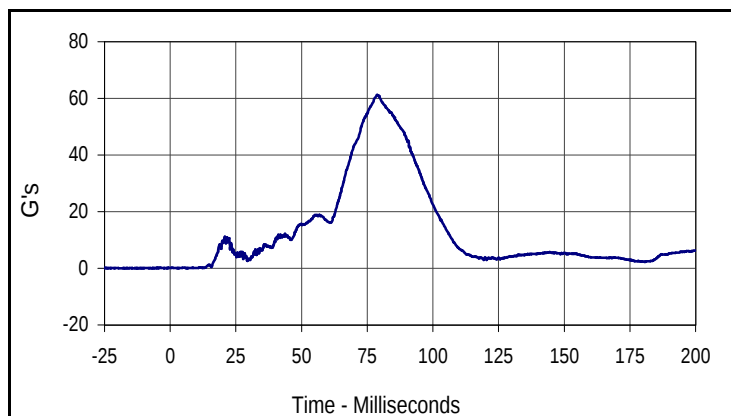
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
045	FIL	1000	G's
Max	Time	Min	Time
0.1	193.9	-57.5	79.6



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
046	FIL	1000	G's
Max	Time	Min	Time
1.8	33.5	-9.7	90.7



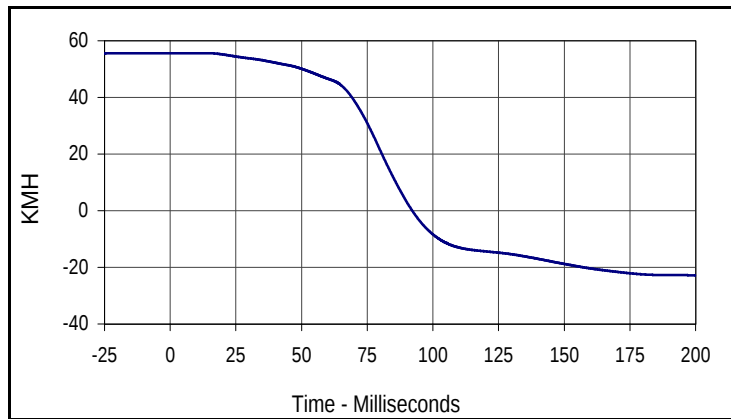
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
047	FIL	1000	G's
Max	Time	Min	Time
20.9	78.5	-4.2	102.2



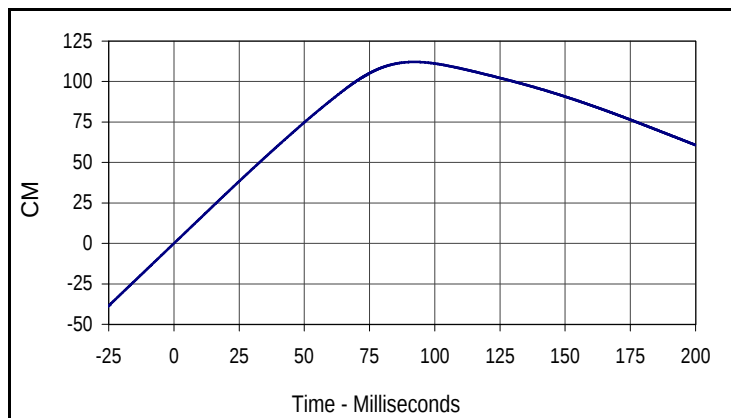
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
045	RES	1000	G's
Max	Time	Min	Time
61.3	78.7	0.0	6.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



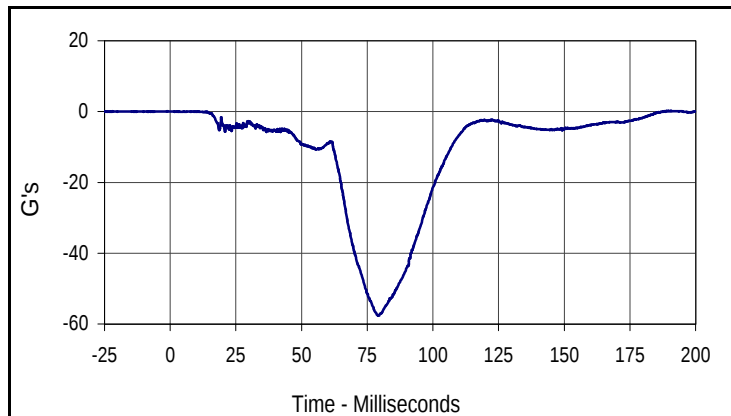
Curve Description			
Passenger Head Primary X Velocity			
CURNO	Type	SAE Class	Units
045	IN1	180	KMH
Max	Time	Min	Time
55.6	0.0	-22.8	200.0



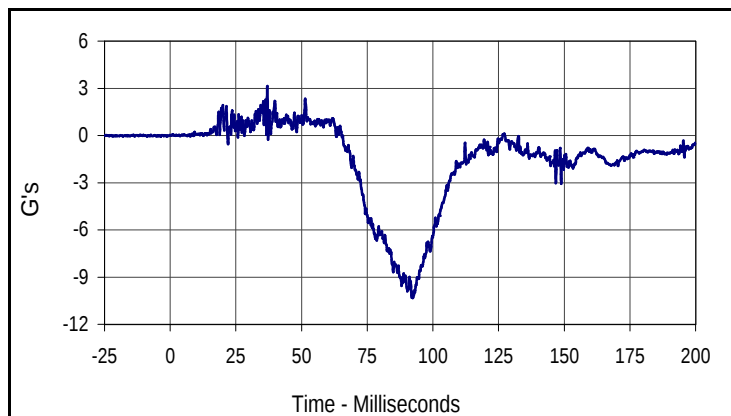
Curve Description			
Passenger Head Primary X Displacement			
CURNO	Type	SAE Class	Units
045	IN2	180	CM
Max	Time	Min	Time
112.1	92.1	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

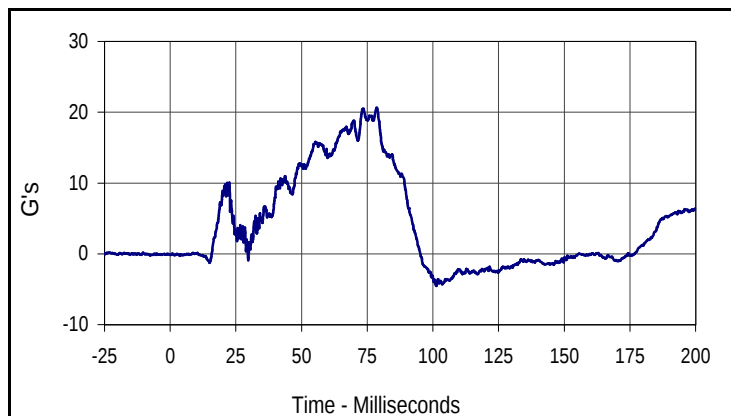
Test Date: 1/28/04
 NHTSA No.: M45104



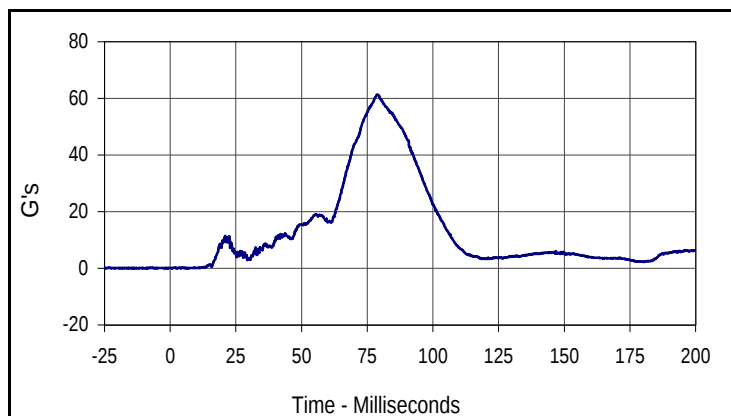
Curve Description			
Passenger Head Redundant X			
CURNO	Type	SAE Class	Units
048	FIL	1000	G's
Max	Time	Min	Time
0.2	190.6	-57.7	79.4



Curve Description			
Passenger Head Redundant Y			
CURNO	Type	SAE Class	Units
049	FIL	1000	G's
Max	Time	Min	Time
3.1	37.0	-10.3	92.3



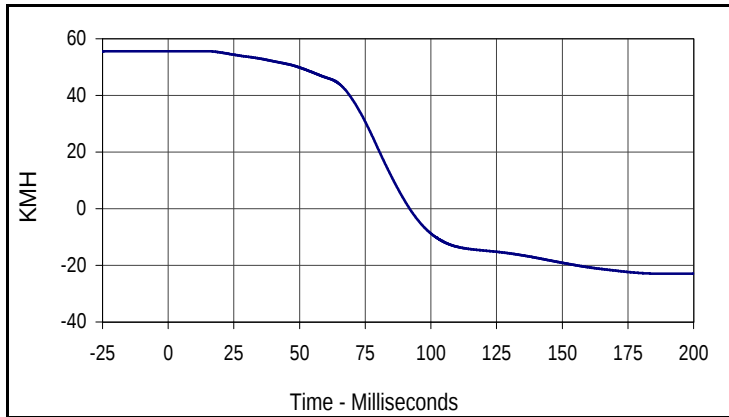
Curve Description			
Passenger Head Redundant Z			
CURNO	Type	SAE Class	Units
050	FIL	1000	G's
Max	Time	Min	Time
20.6	78.7	-4.5	101.2



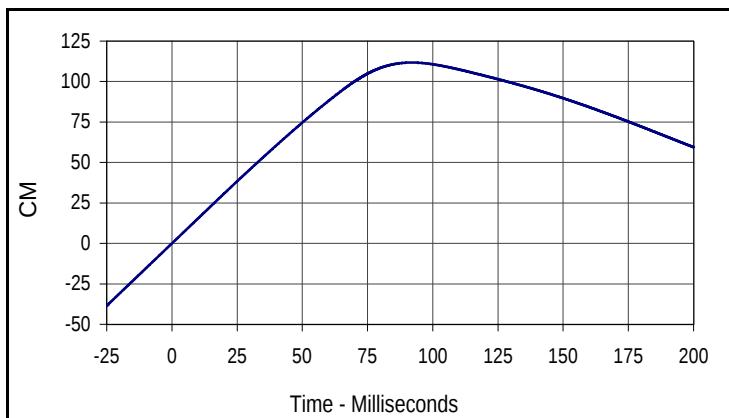
Curve Description			
Passenger Head Resultant Redundant			
CURNO	Type	SAE Class	Units
048	RES	1000	G's
Max	Time	Min	Time
61.4	78.8	0.0	6.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



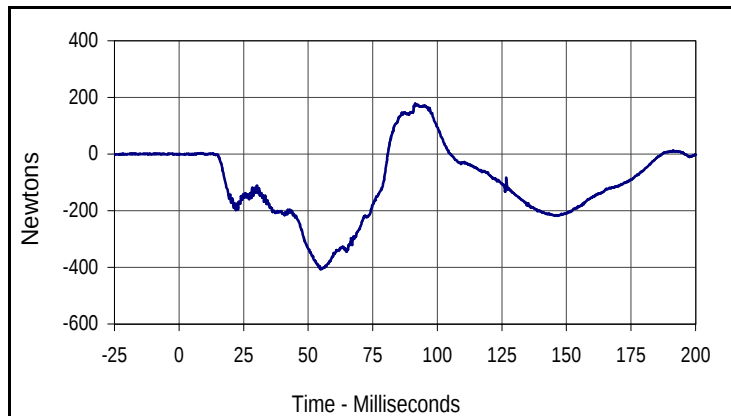
Curve Description			
Passenger Head Redundant X Velocity			
CURNO	Type	SAE Class	Units
048	IN1	180	KMH
Max	Time	Min	Time
55.6	1.8	-22.9	187.6



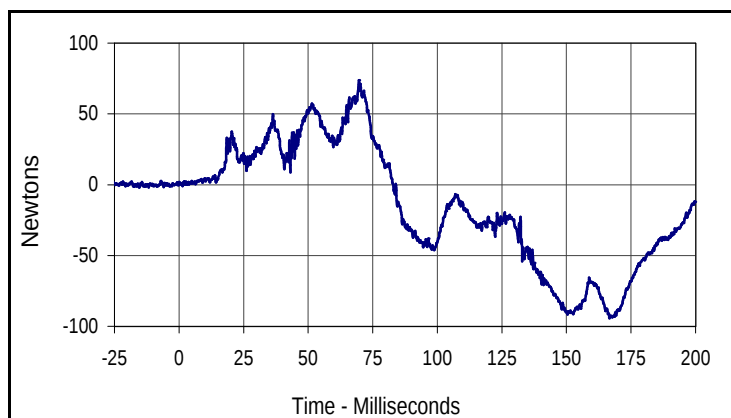
Curve Description			
Passenger Head Redundant X Displacement			
CURNO	Type	SAE Class	Units
048	IN2	180	CM
Max	Time	Min	Time
111.8	91.9	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

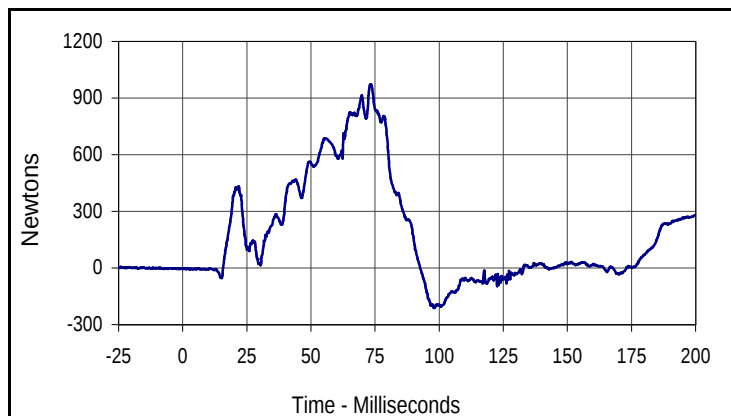
Test Date: 1/28/04
 NHTSA No.: M45104



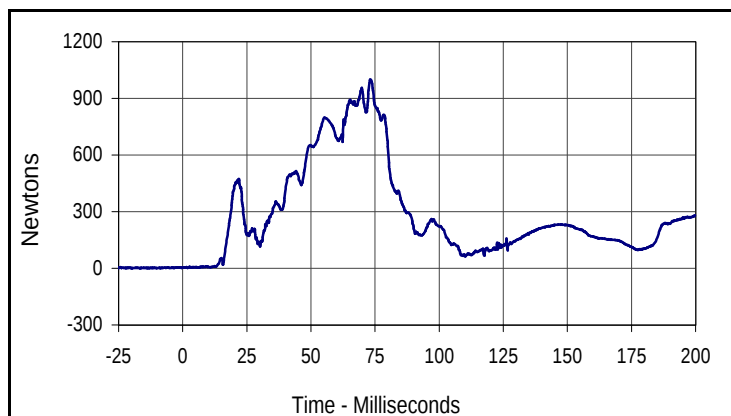
Curve Description			
Passenger Upper Neck Force X			
CURNO	Type	SAE Class	Units
051	FIL	1000	Newtons
Max	Time	Min	Time
178.2	91.5	-406.7	54.8



Curve Description			
Passenger Upper Neck Force Y			
CURNO	Type	SAE Class	Units
052	FIL	1000	Newtons
Max	Time	Min	Time
73.9	69.7	-94.3	166.7



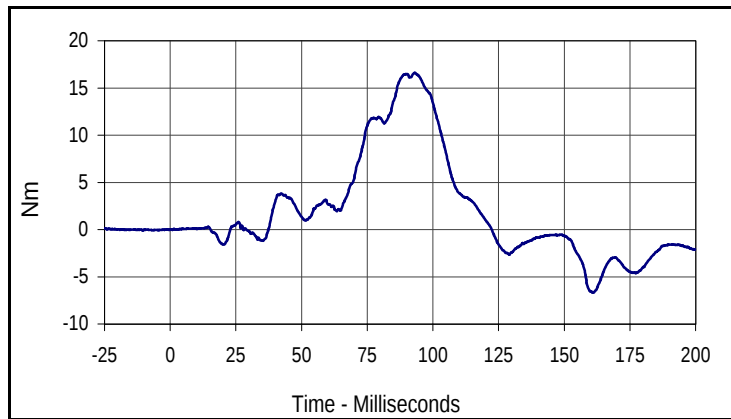
Curve Description			
Passenger Upper Neck Force Z			
CURNO	Type	SAE Class	Units
053	FIL	1000	Newtons
Max	Time	Min	Time
973.5	73.4	-211.3	97.9



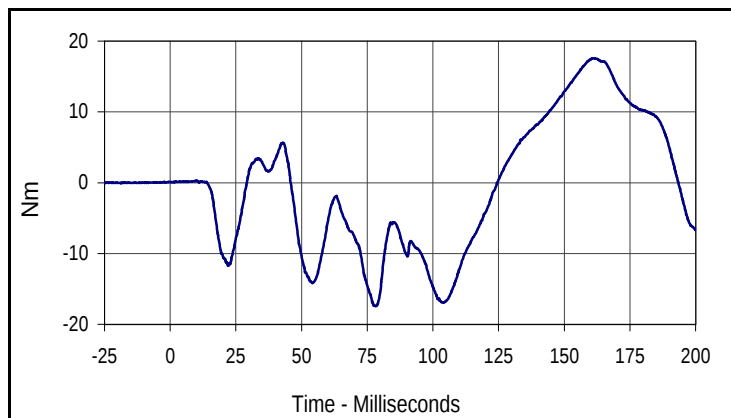
Curve Description			
Passenger Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
051	RES	1000	Newtons
Max	Time	Min	Time
999.5	73.1	2.4	1.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

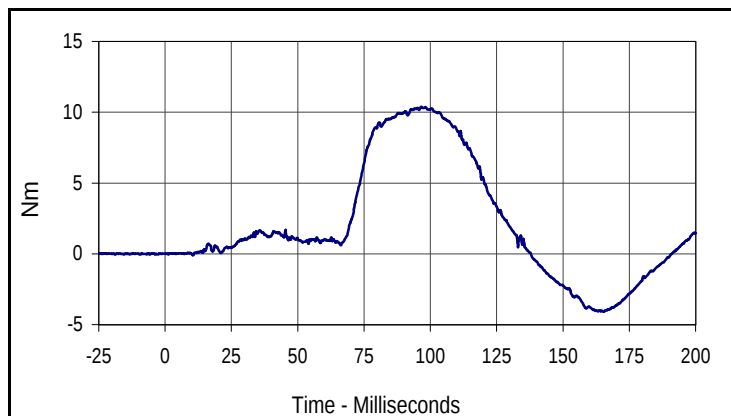
Test Date: 1/28/04
 NHTSA No.: M45104



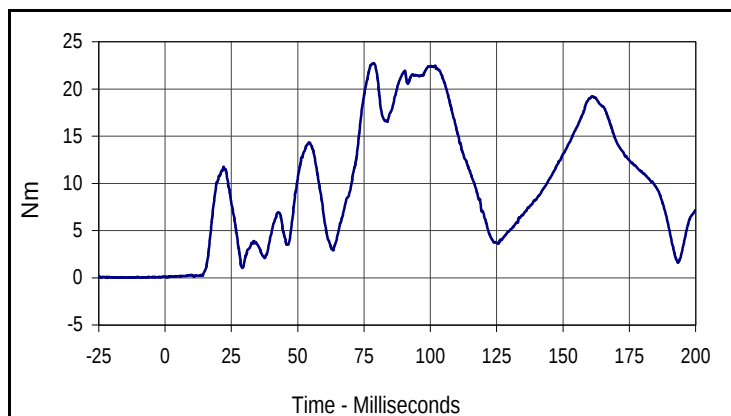
Curve Description			
Passenger Upper Neck Moment X			
CURNO	Type	SAE Class	Units
054	FIL	600	Nm
Max	Time	Min	Time
16.6	93.1	-6.7	161.1



Curve Description			
Passenger Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
055	FIL	600	Nm
Max	Time	Min	Time
17.6	161.4	-17.4	78.1



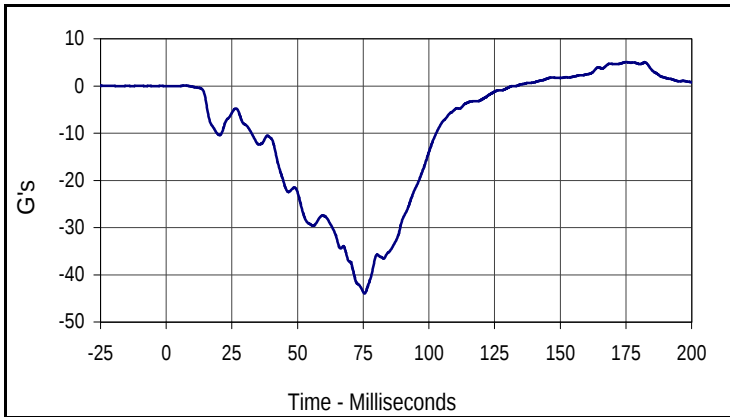
Curve Description			
Passenger Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
056	FIL	600	Nm
Max	Time	Min	Time
10.4	96.6	-4.1	165.4



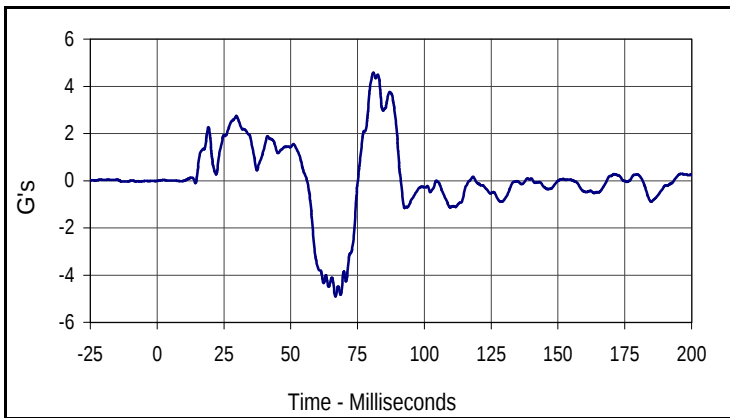
Curve Description			
Passenger Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
054	RES	600	Nm
Max	Time	Min	Time
22.7	78.6	0.1	0.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

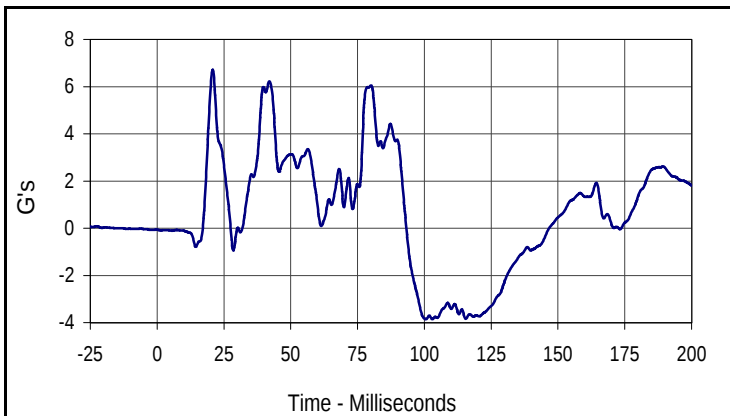
Test Date: 1/28/04
 NHTSA No.: M45104



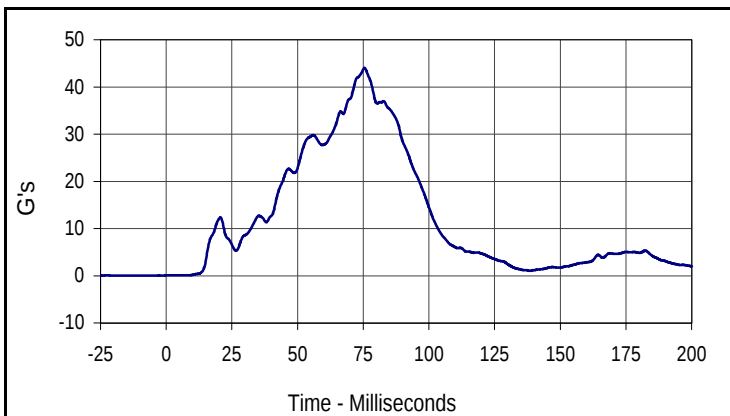
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
057	FIL	180	G's
Max	Time	Min	Time
5.0	175.0	-44.0	75.5



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
058	FIL	180	G's
Max	Time	Min	Time
4.6	80.9	-4.9	66.8



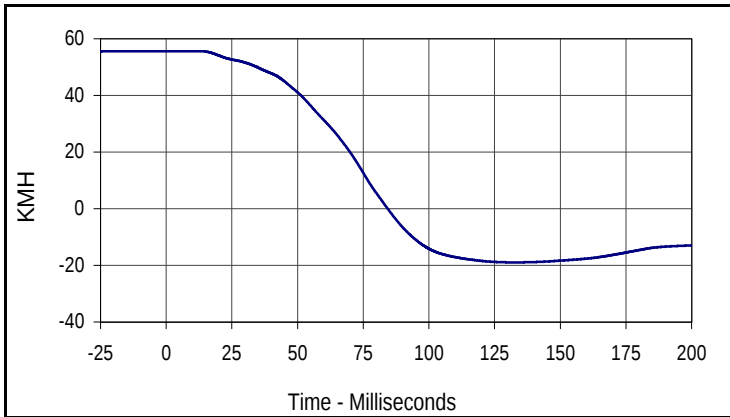
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
059	FIL	180	G's
Max	Time	Min	Time
6.7	20.8	-3.9	100.6



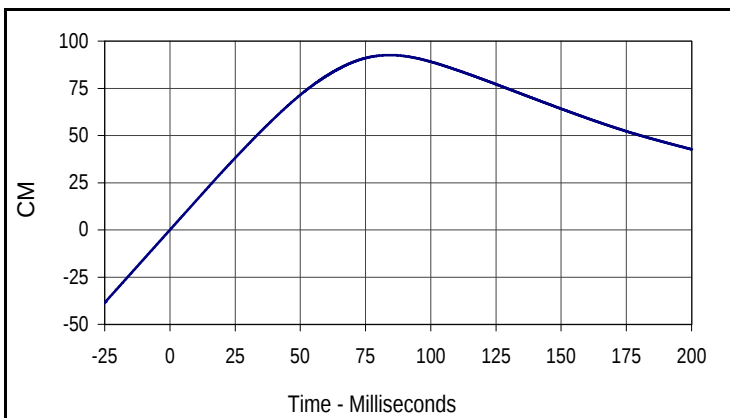
Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
057	RES	180	G's
Max	Time	Min	Time
44.0	75.5	0.1	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
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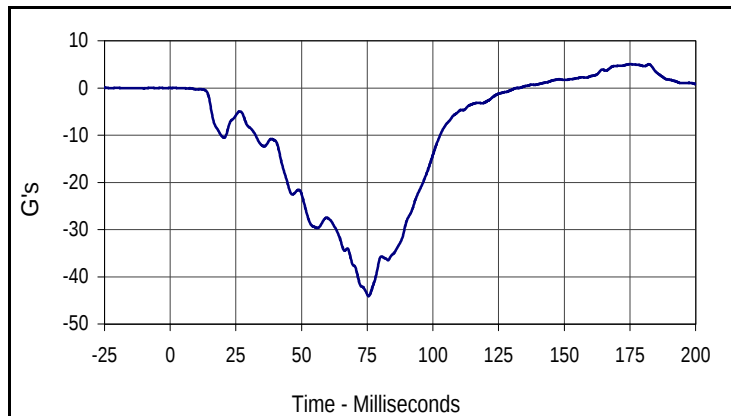
Curve Description			
Passenger Chest Primary X Velocity			
CURNO	Type	SAE Class	Units
057	IN1	180	KMH
Max	Time	Min	Time
55.6	8.6	-19.0	133.4



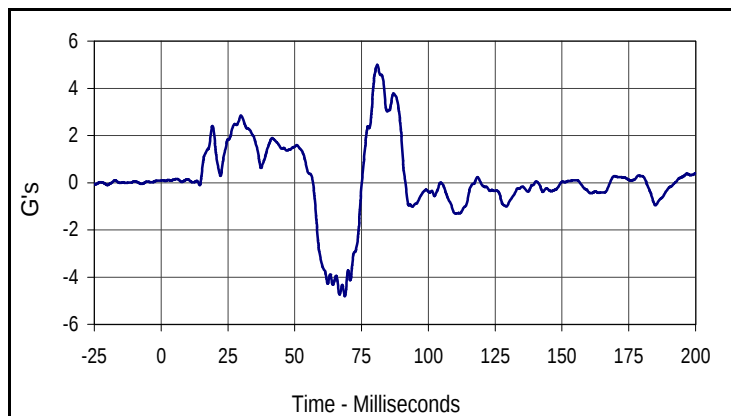
Curve Description			
Passenger Chest Primary X Displacement			
CURNO	Type	SAE Class	Units
057	IN2	180	CM
Max	Time	Min	Time
92.6	84.3	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

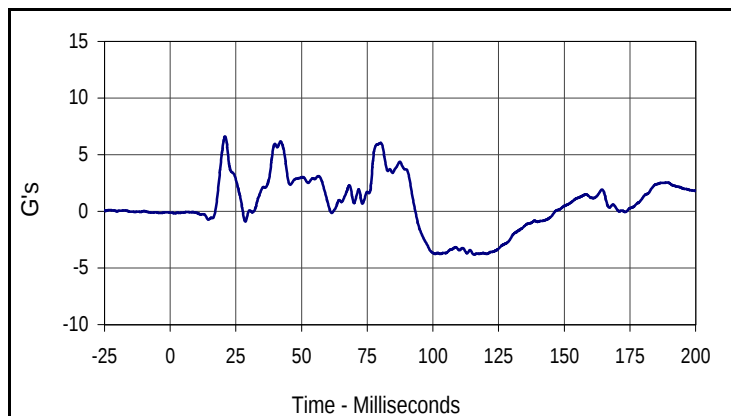
Test Date: 1/28/04
 NHTSA No.: M45104



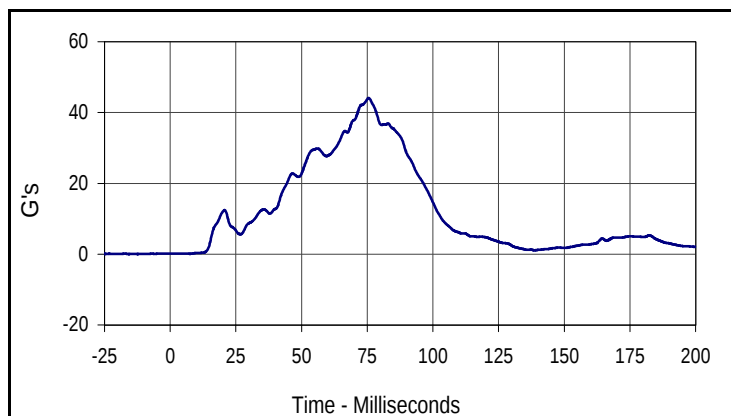
Curve Description			
Passenger Chest Redundant X			
CURNO	Type	SAE Class	Units
060	FIL	180	G's
Max	Time	Min	Time
5.1	175.2	-44.1	75.5



Curve Description			
Passenger Chest Redundant Y			
CURNO	Type	SAE Class	Units
061	FIL	180	G's
Max	Time	Min	Time
5.0	80.9	-4.8	68.8



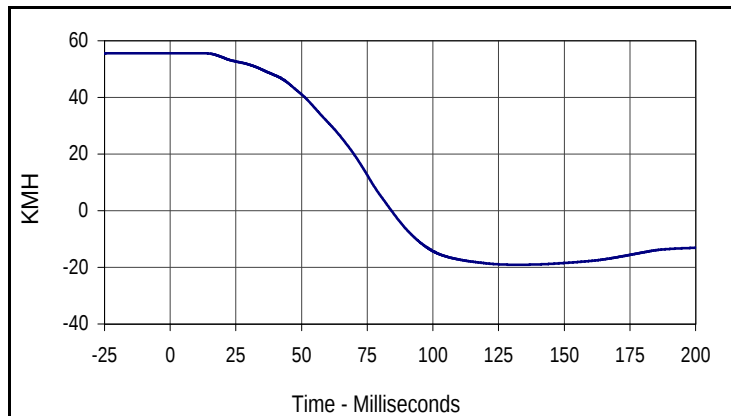
Curve Description			
Passenger Chest Redundant Z			
CURNO	Type	SAE Class	Units
062	FIL	180	G's
Max	Time	Min	Time
6.6	20.9	-3.8	115.6



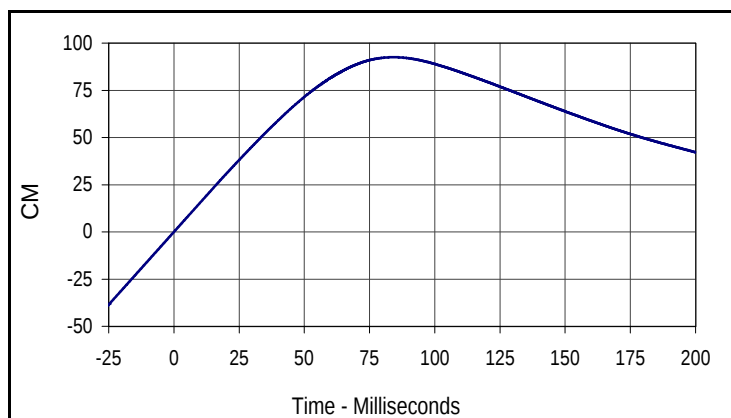
Curve Description			
Passenger Chest Resultant Redundant			
CURNO	Type	SAE Class	Units
060	RES	180	G's
Max	Time	Min	Time
44.1	75.5	0.1	7.5

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



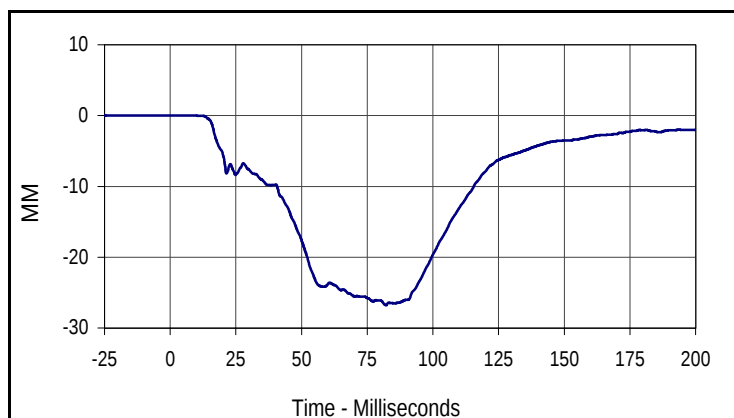
Curve Description			
Passenger Chest Redundant X Velocity			
CURNO	Type	SAE Class	Units
060	IN1	180	KMH
Max	Time	Min	Time
55.6	2.3	-19.1	131.9



Curve Description			
Passenger Chest Redundant X Displacement			
CURNO	Type	SAE Class	Units
060	IN2	180	CM
Max	Time	Min	Time
92.5	84.2	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

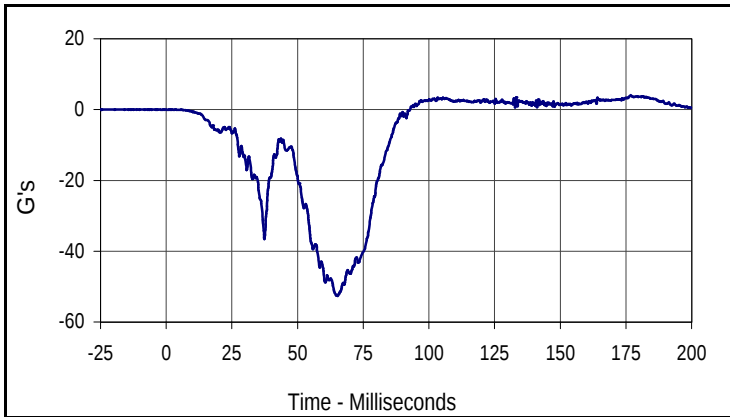
Test Date: 1/28/04
 NHTSA No.: M45104



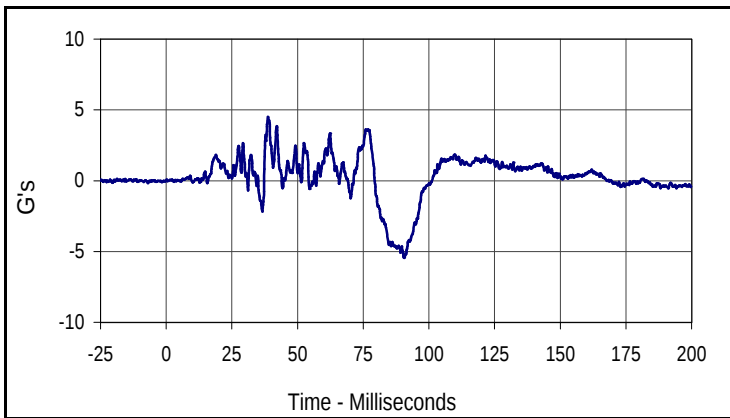
Curve Description			
Passenger Chest Displacement			
CURNO	Type	SAE Class	Units
063	FIL	600	MM
Max	Time	Min	Time
0.0	4.0	-26.8	82.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

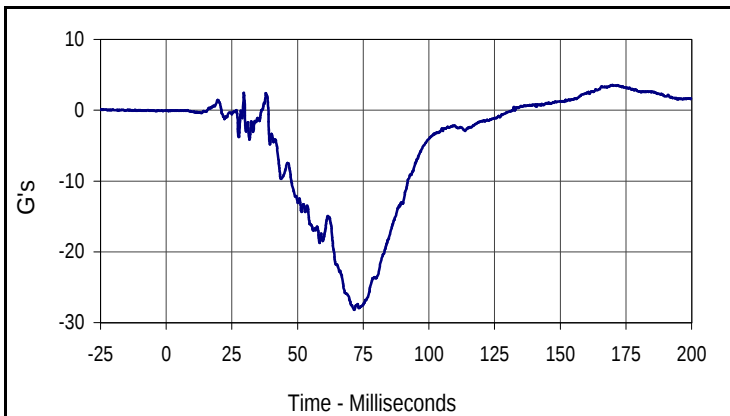
Test Date: 1/28/04
 NHTSA No.: M45104



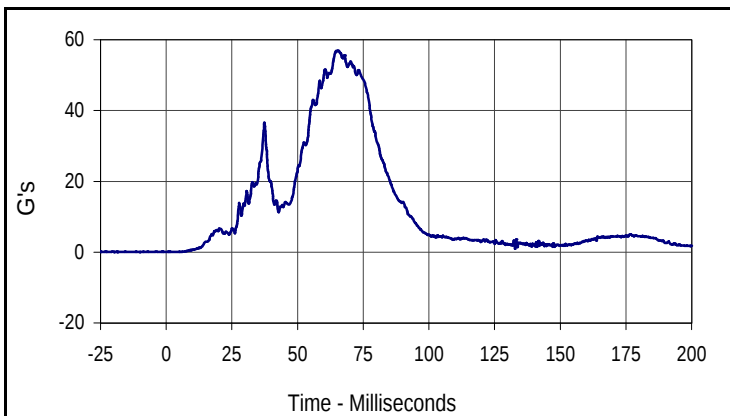
Curve Description			
Passenger Pelvis X			
CURNO	Type	SAE Class	Units
064	FIL	1000	G's
Max	Time	Min	Time
4.1	176.9	-52.6	65.3



Curve Description			
Passenger Pelvis Y			
CURNO	Type	SAE Class	Units
065	FIL	1000	G's
Max	Time	Min	Time
4.5	38.7	-5.5	90.6



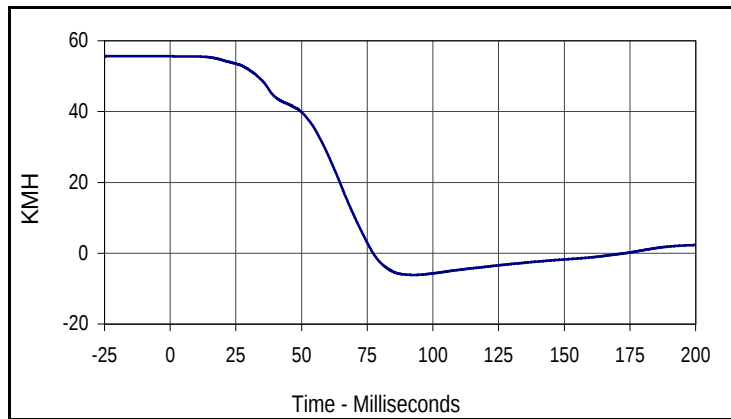
Curve Description			
Passenger Pelvis Z			
CURNO	Type	SAE Class	Units
066	FIL	1000	G's
Max	Time	Min	Time
3.6	169.9	-28.2	71.5



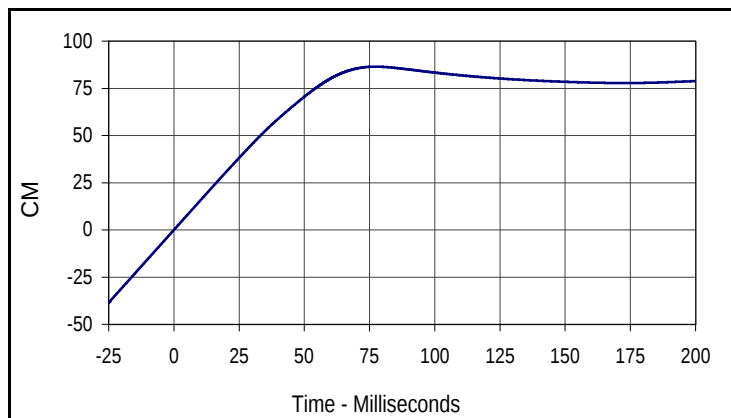
Curve Description			
Passenger Pelvis Resultant			
CURNO	Type	SAE Class	Units
064	RES	1000	G's
Max	Time	Min	Time
57.1	65.3	0.0	1.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



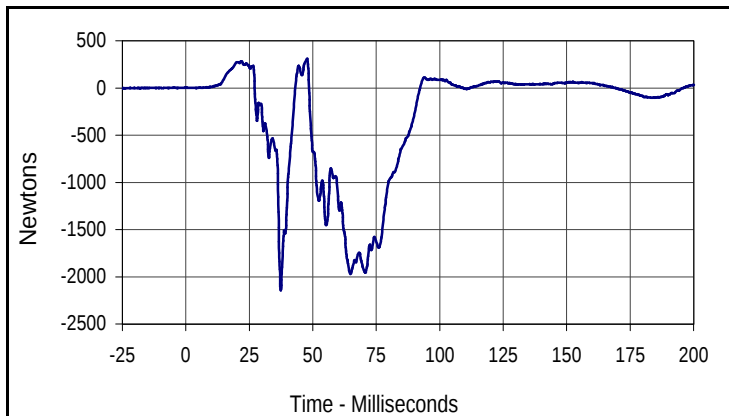
Curve Description			
Passenger Pelvis X Velocity			
CURNO	Type	SAE Class	Units
064	IN1	180	KMH
Max	Time	Min	Time
55.6	0.0	-6.2	92.7



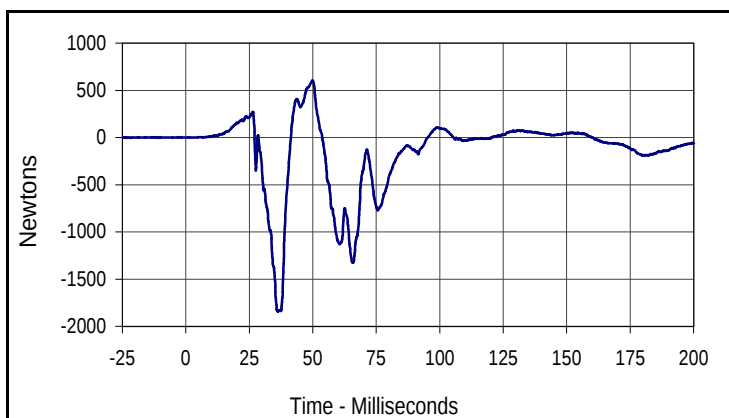
Curve Description			
Passenger Pelvis X Displacement			
CURNO	Type	SAE Class	Units
064	IN2	180	CM
Max	Time	Min	Time
86.5	77.2	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



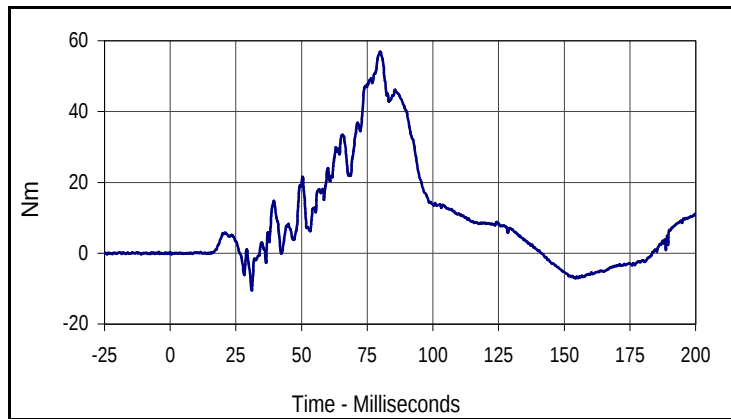
Curve Description			
Passenger Left Femur Force			
CURNO	Type	SAE Class	Units
067	FIL	600	Newtons
Max	Time	Min	Time
310.5	47.7	-2144.7	37.4



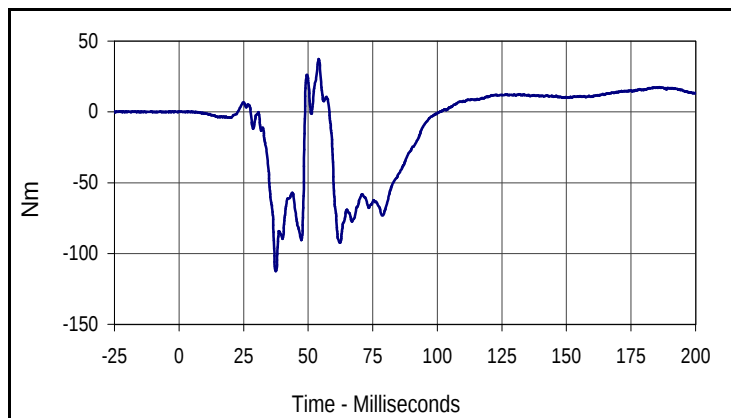
Curve Description			
Passenger Right Femur Force			
CURNO	Type	SAE Class	Units
068	FIL	600	Newtons
Max	Time	Min	Time
601.9	49.9	-1843.0	36.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

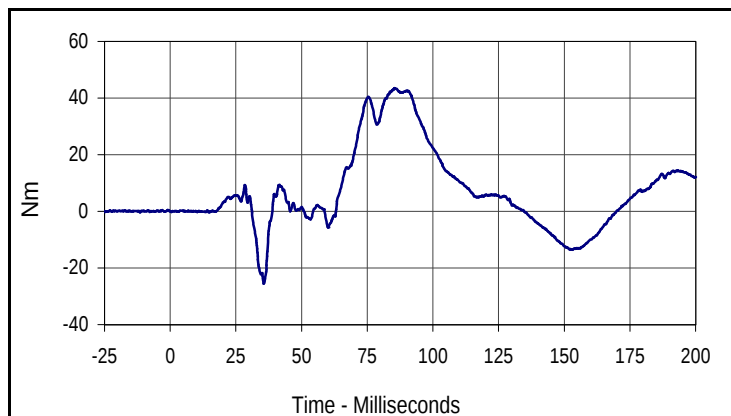
Test Date: 1/28/04
 NHTSA No.: M45104



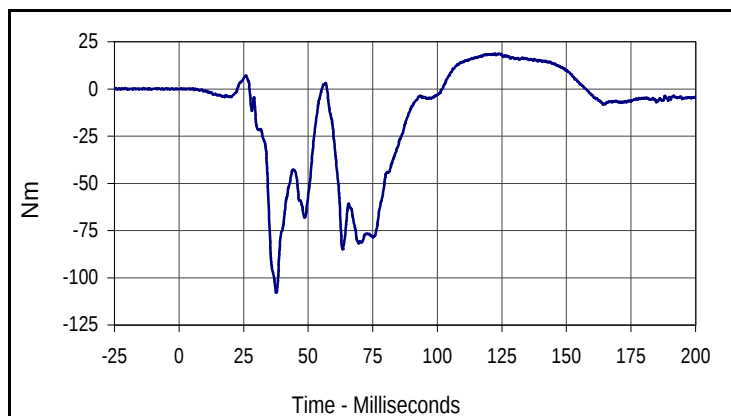
Curve Description			
Passenger Left Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
069	FIL	600	Nm
Max	Time	Min	Time
56.9	80.0	-10.5	31.0



Curve Description			
Passenger Left Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
070	FIL	600	Nm
Max	Time	Min	Time
37.3	54.1	-112.4	37.5



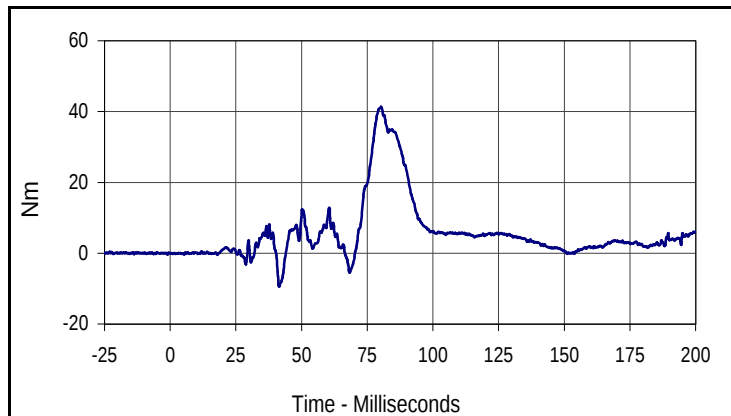
Curve Description			
Passenger Right Upper Tibia Moment X			
CURNO	Type	SAE Class	Units
071	FIL	600	Nm
Max	Time	Min	Time
43.5	85.4	-25.5	35.6



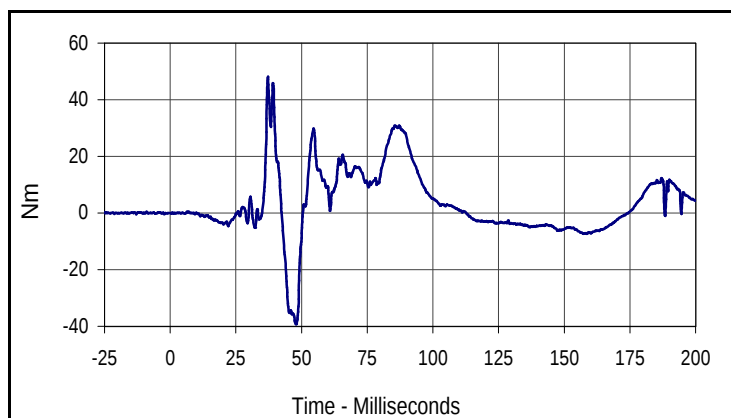
Curve Description			
Passenger Right Upper Tibia Moment Y			
CURNO	Type	SAE Class	Units
072	FIL	600	Nm
Max	Time	Min	Time
18.7	122.3	-107.9	37.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

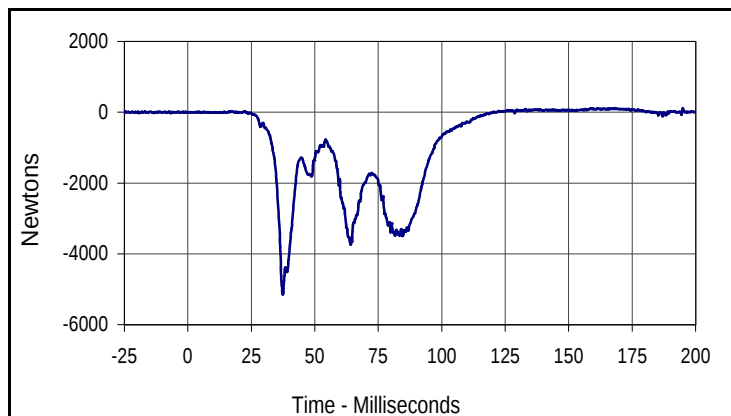
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Passenger Left Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
073	FIL	600	Nm
Max	Time	Min	Time
41.4	80.3	-9.4	41.5



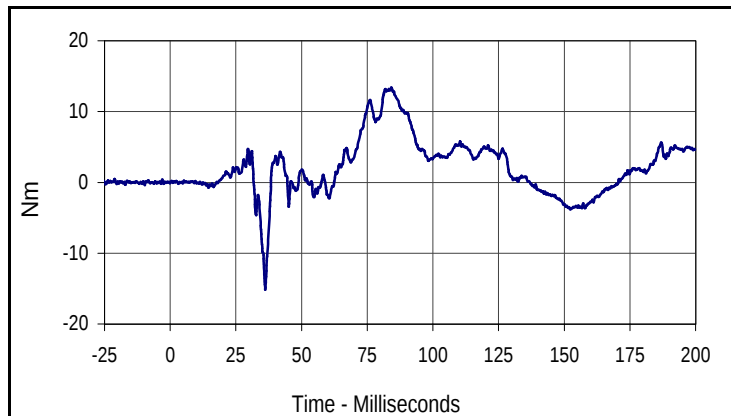
Curve Description			
Passenger Left Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
074	FIL	600	Nm
Max	Time	Min	Time
48.1	37.2	-39.3	47.9



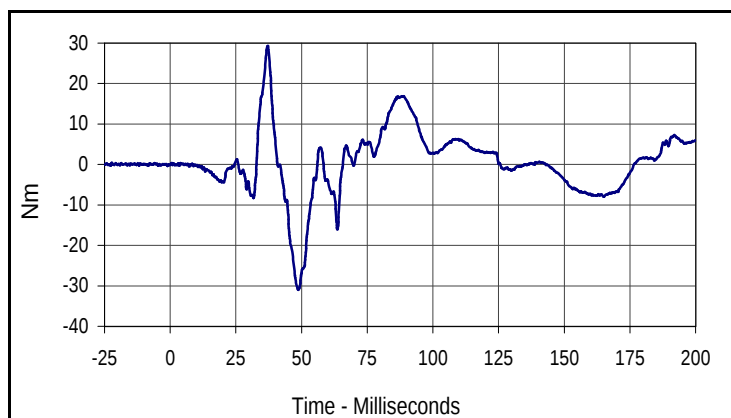
Curve Description			
Passenger Left Lower Tibia Force Z			
CURNO	Type	SAE Class	Units
075	FIL	600	Newtons
Max	Time	Min	Time
115.1	163.8	-5152.9	37.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

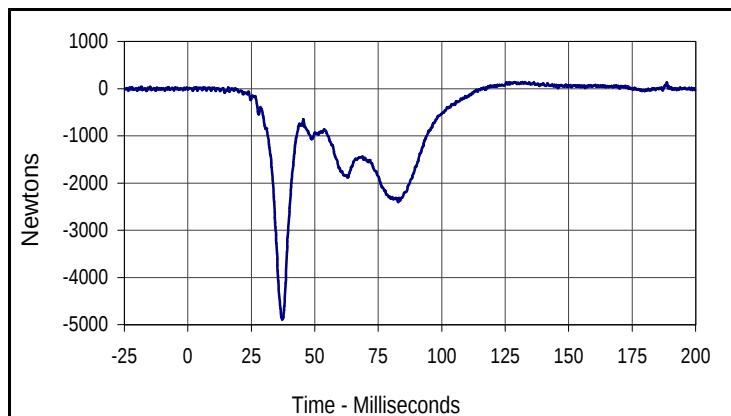
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Passenger Right Lower Tibia Moment X			
CURNO	Type	SAE Class	Units
076	FIL	600	Nm
Max	Time	Min	Time
13.4	84.2	-15.2	36.2



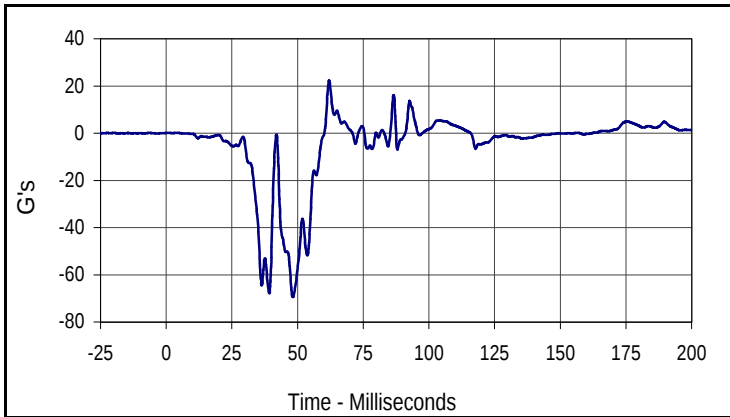
Curve Description			
Passenger Right Lower Tibia Moment Y			
CURNO	Type	SAE Class	Units
077	FIL	600	Nm
Max	Time	Min	Time
29.3	37.1	-31.0	48.8



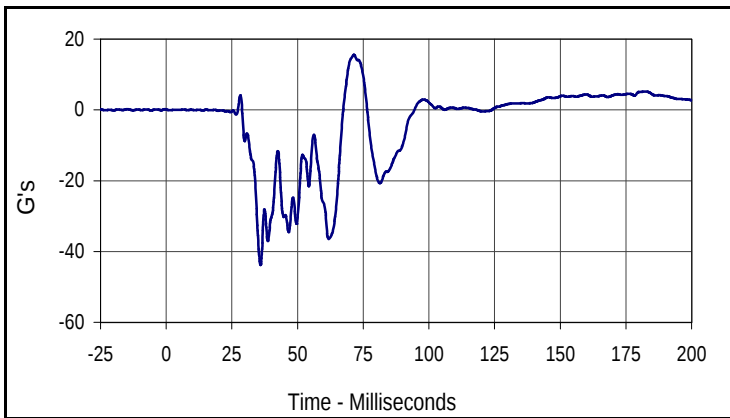
Curve Description			
Passenger Right lower Tibia Force Z			
CURNO	Type	SAE Class	Units
078	FIL	600	Newtons
Max	Time	Min	Time
141.3	131.7	-4888.2	37.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

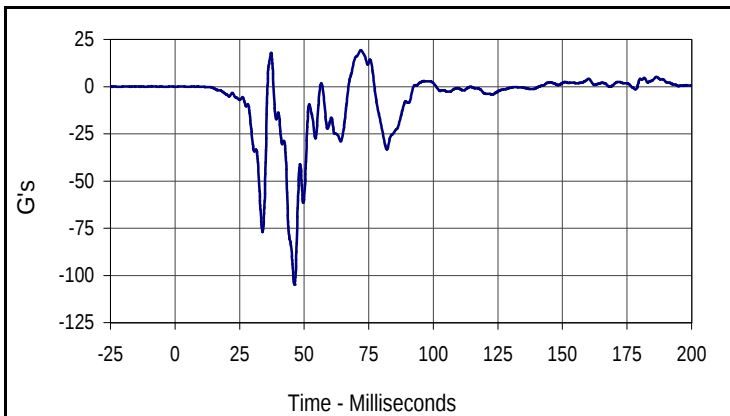
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Passenger Left Foot Aft X			
CURNO	Type	SAE Class	Units
079	FIL	180	G's
Max	Time	Min	Time
22.3	62.0	-69.4	48.2



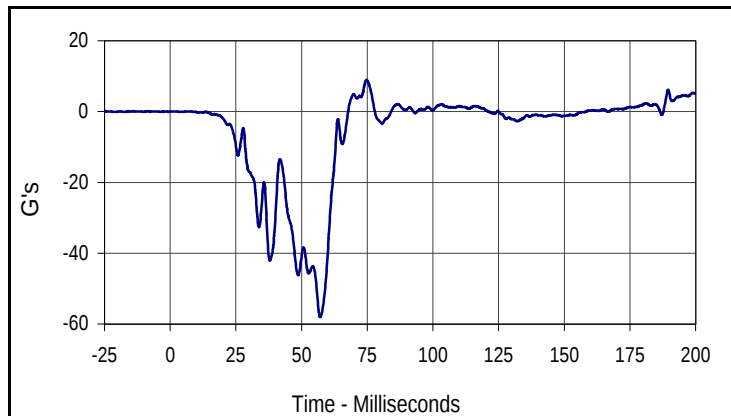
Curve Description			
Passenger Left Foot Aft Z			
CURNO	Type	SAE Class	Units
080	FIL	180	G's
Max	Time	Min	Time
15.6	71.5	-43.8	35.9



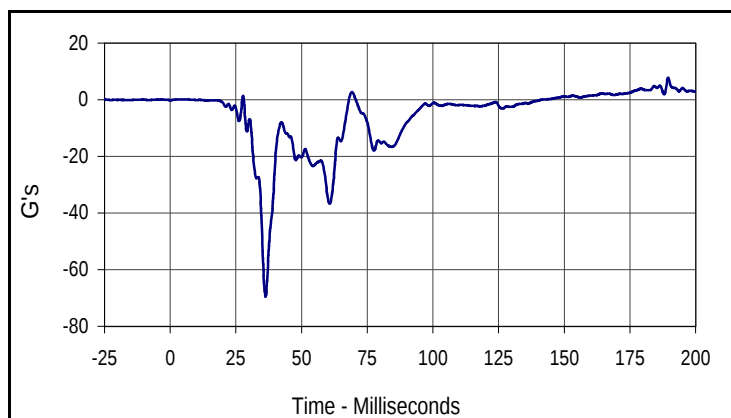
Curve Description			
Passenger Left Foot Fore Z			
CURNO	Type	SAE Class	Units
081	FIL	180	G's
Max	Time	Min	Time
19.2	72.0	-104.9	46.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

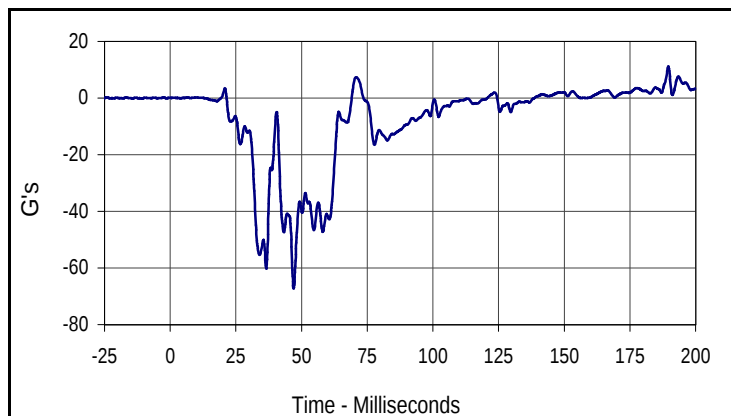
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Passenger Right Foot Aft X			
CURNO	Type	SAE Class	Units
082	FIL	180	G's
Max	Time	Min	Time
9.0	74.7	-58.0	57.1



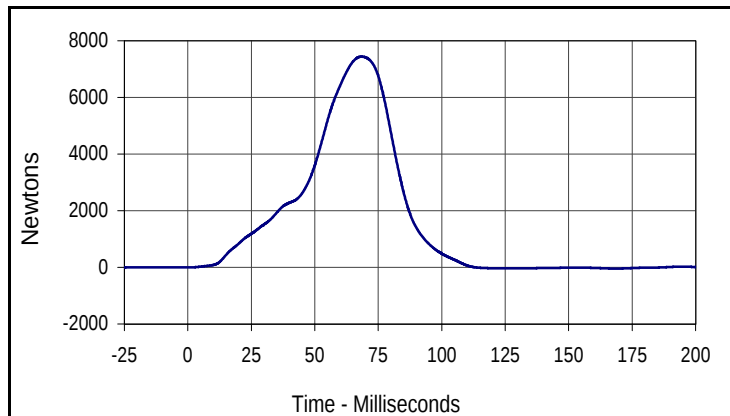
Curve Description			
Passenger Right Foot Aft Z			
CURNO	Type	SAE Class	Units
083	FIL	180	G's
Max	Time	Min	Time
7.8	189.6	-69.5	36.3



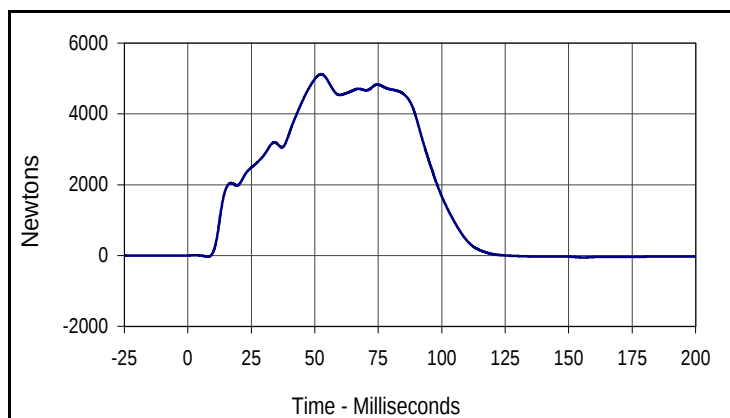
Curve Description			
Passenger Right Foot Fore Z			
CURNO	Type	SAE Class	Units
084	FIL	180	G's
Max	Time	Min	Time
11.2	189.6	-67.2	47.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

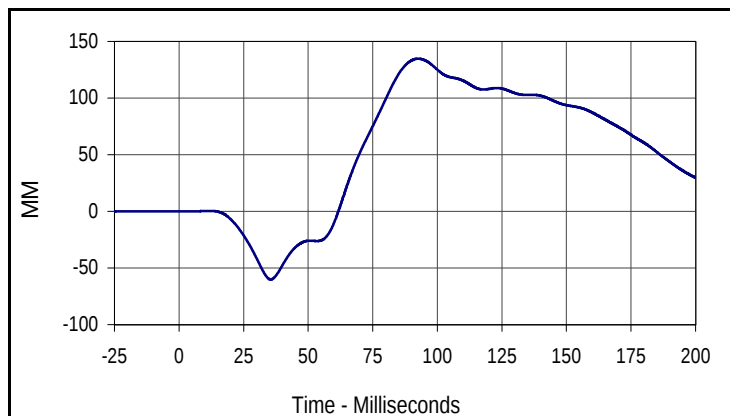
Test Date: 1/28/04
 NHTSA No.: M45104



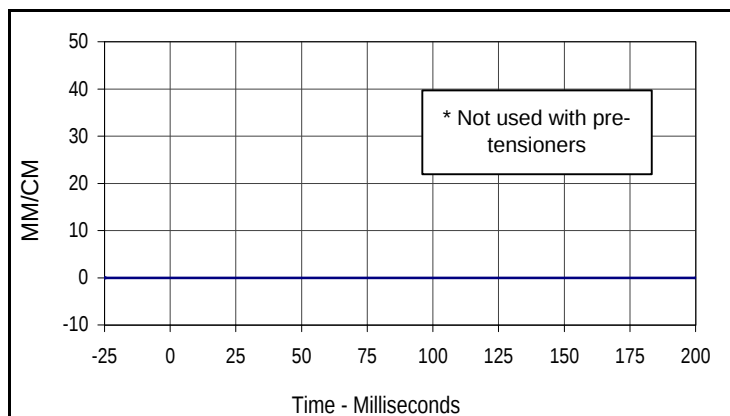
Curve Description			
Passenger Lap Belt Force			
CURNO	Type	SAE Class	Units
085	FIL	60	Newtons
Max	Time	Min	Time
7442.1	68.4	-44.6	168.4



Curve Description			
Passenger Shoulder Belt Force			
CURNO	Type	SAE Class	Units
086	FIL	60	Newtons
Max	Time	Min	Time
5121.2	52.5	-55.4	155.8



Curve Description			
Passenger Shoulder Belt Pullout			
CURNO	Type	SAE Class	Units
087	FIL	60	MM
Max	Time	Min	Time
134.8	92.6	-60.1	35.5

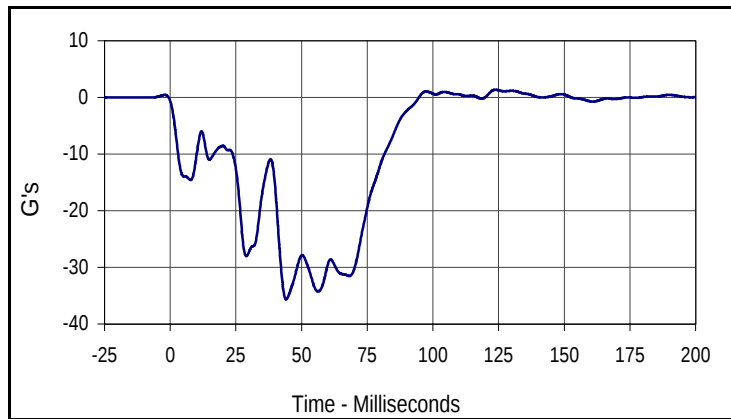


Curve Description			
Passenger Shoulder Belt Elongation			
CURNO	Type	SAE Class	Units
088	FIL	60	MM/CM
Max	Time	Min	Time
0.0	0.0	0.0	0.0

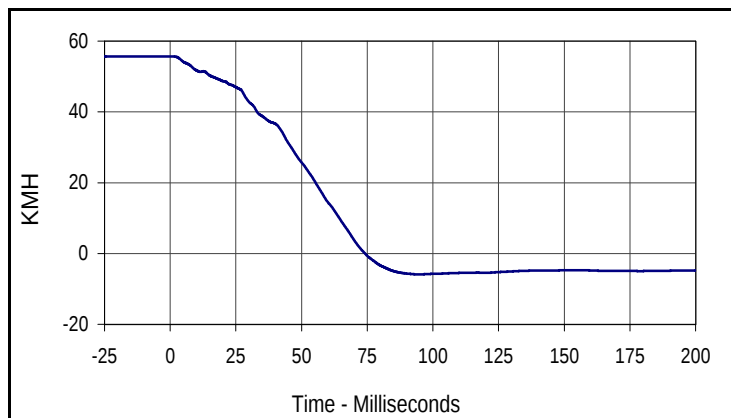
* Not used with pre-tensioners

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

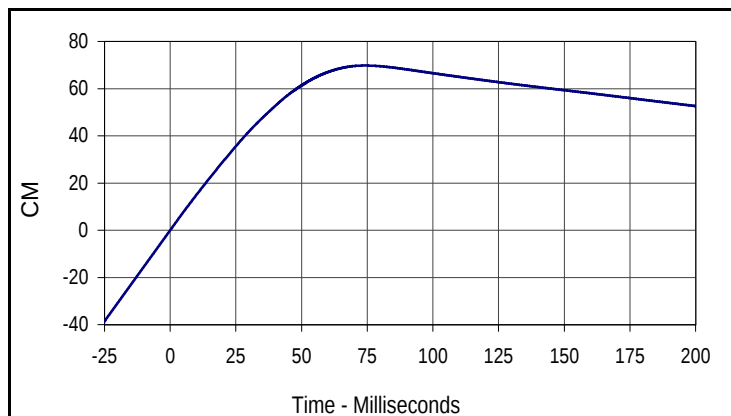
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Left Rear X			
CURNO	Type	SAE Class	Units
089	FIL	60	G's
Max	Time	Min	Time
1.4	123.8	-35.6	44.1



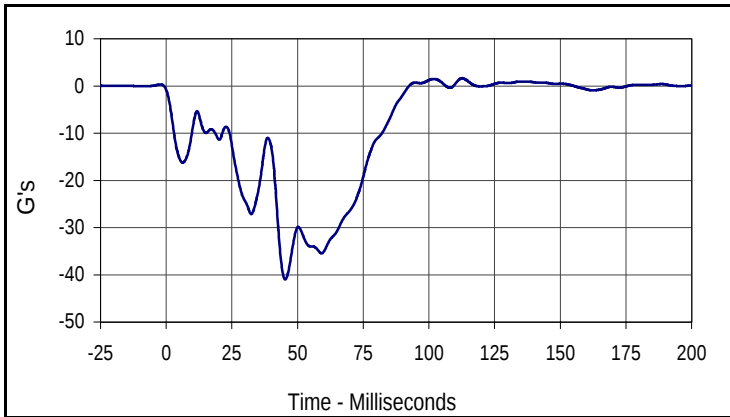
Curve Description			
Vehicle Left Rear X Velocity			
CURNO	Type	SAE Class	Units
089	IN1	180	KMH
Max	Time	Min	Time
55.6	1.0	-5.9	94.6



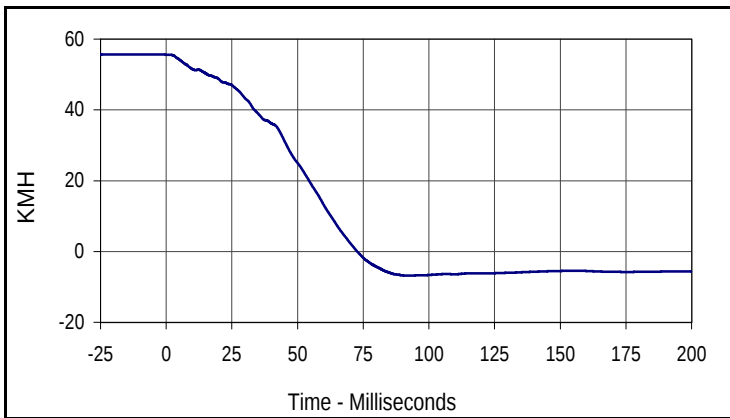
Curve Description			
Vehicle Left Rear X Displacement			
CURNO	Type	SAE Class	Units
089	IN2	180	CM
Max	Time	Min	Time
69.8	74.1	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

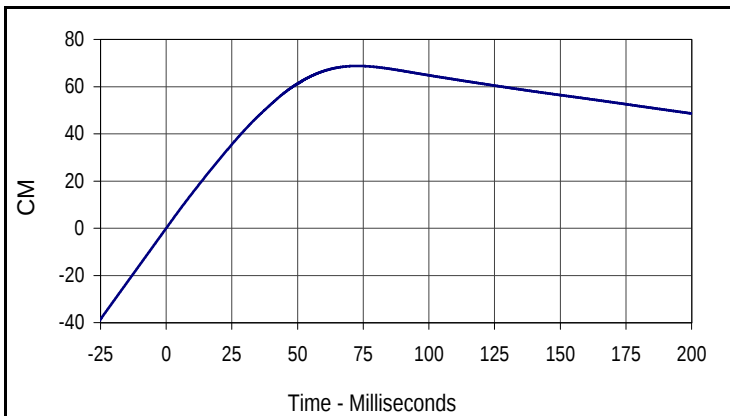
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Right Rear X			
CURNO	Type	SAE Class	Units
090	FIL	60	G's
Max	Time	Min	Time
1.6	112.7	-41.0	45.3



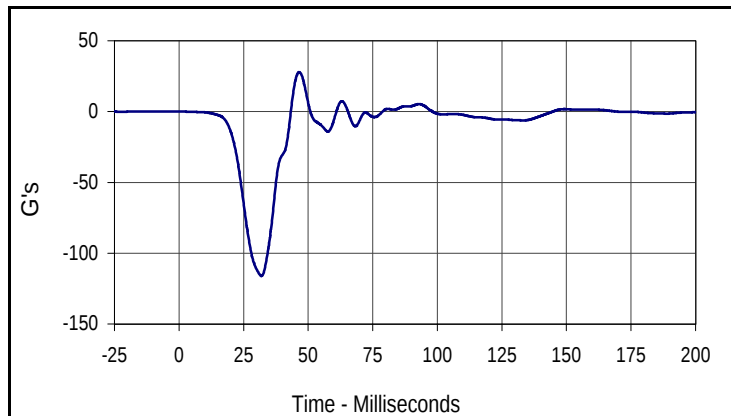
Curve Description			
Vehicle Right Rear X Velocity			
CURNO	Type	SAE Class	Units
090	IN1	180	KMH
Max	Time	Min	Time
55.6	0.0	-6.8	92.0



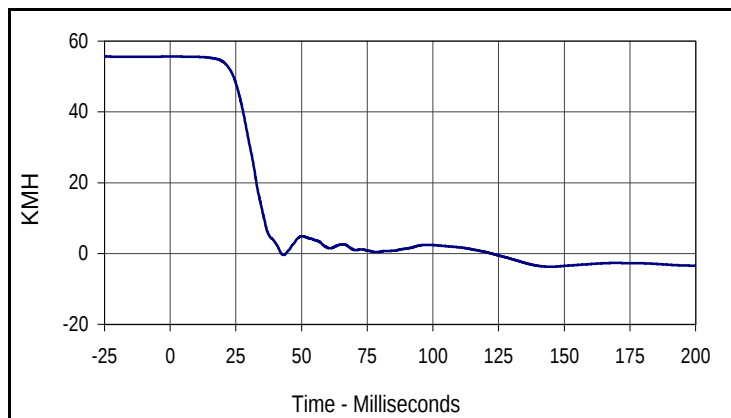
Curve Description			
Vehicle Right Rear X Displacement			
CURNO	Type	SAE Class	Units
090	IN2	180	CM
Max	Time	Min	Time
68.8	72.7	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

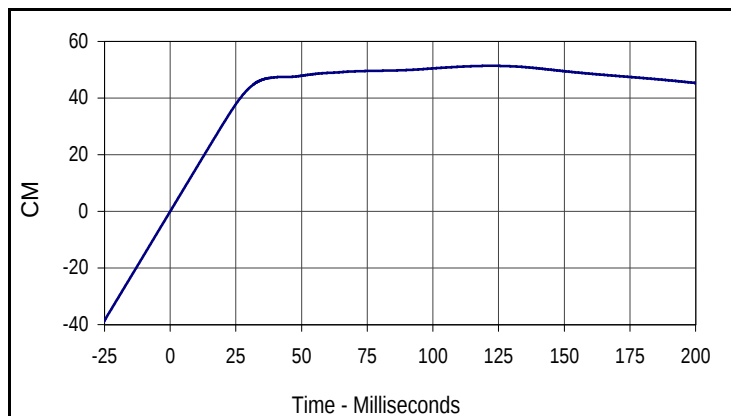
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Engine Top			
CURNO	Type	SAE Class	Units
091	FIL	60	G's
Max	Time	Min	Time
27.8	46.4	-116.0	31.9



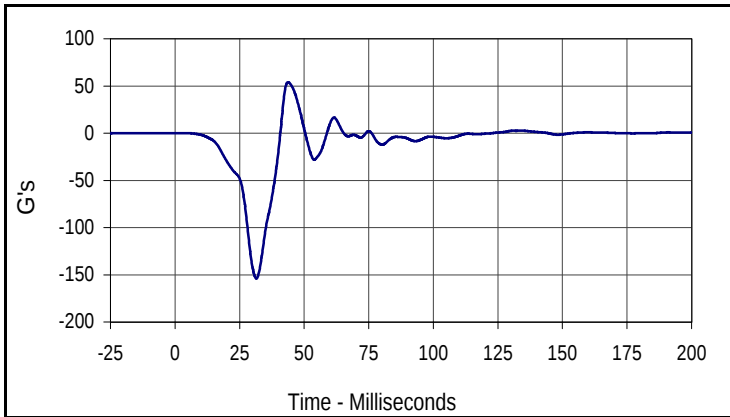
Curve Description			
Vehicle Engine Top Velocity			
CURNO	Type	SAE Class	Units
091	IN1	180	KMH
Max	Time	Min	Time
55.6	2.6	-3.7	144.7



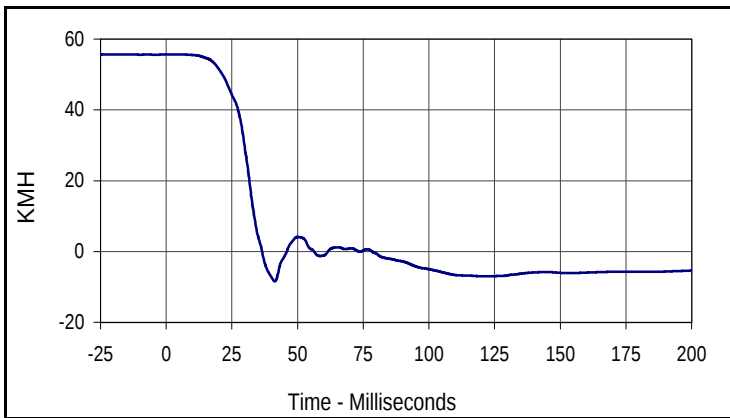
Curve Description			
Vehicle Engine Top Displacement			
CURNO	Type	SAE Class	Units
091	IN2	180	CM
Max	Time	Min	Time
51.4	122.3	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

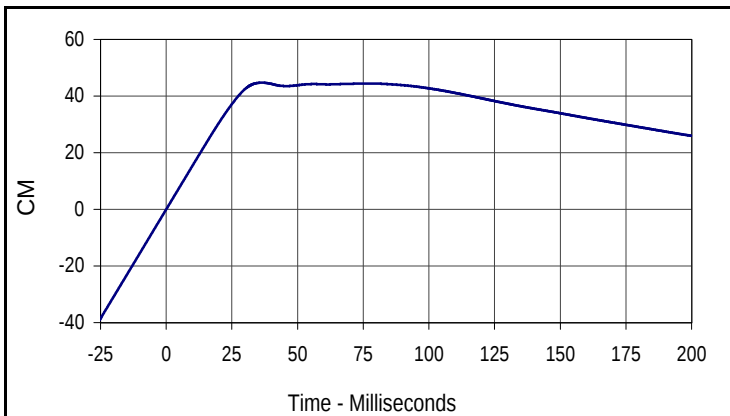
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Engine Bottom			
CURNO	Type	SAE Class	Units
092	FIL	60	G's
Max	Time	Min	Time
54.1	43.7	-153.8	31.5



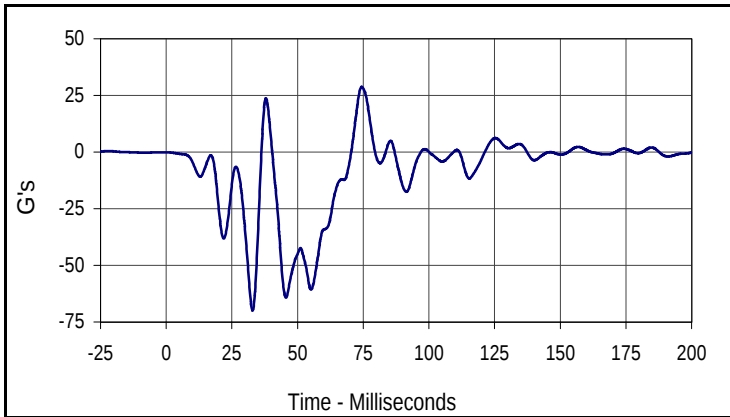
Curve Description			
Vehicle Engine Bottom Velocity			
CURNO	Type	SAE Class	Units
092	IN1	180	KMH
Max	Time	Min	Time
55.6	4.3	-8.4	41.3



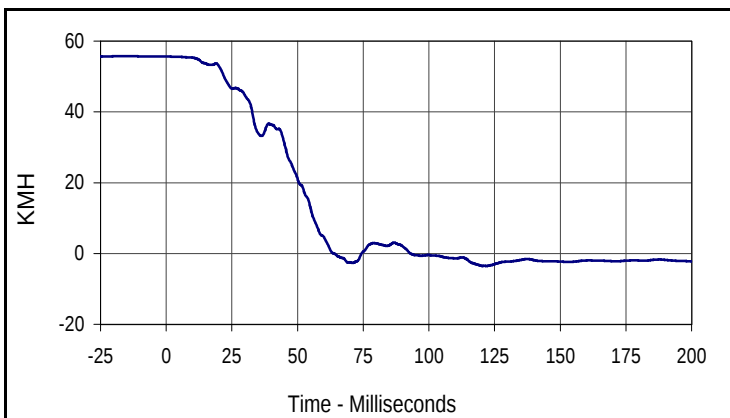
Curve Description			
Vehicle Engine Bottom Displacement			
CURNO	Type	SAE Class	Units
092	IN2	180	CM
Max	Time	Min	Time
44.7	36.5	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

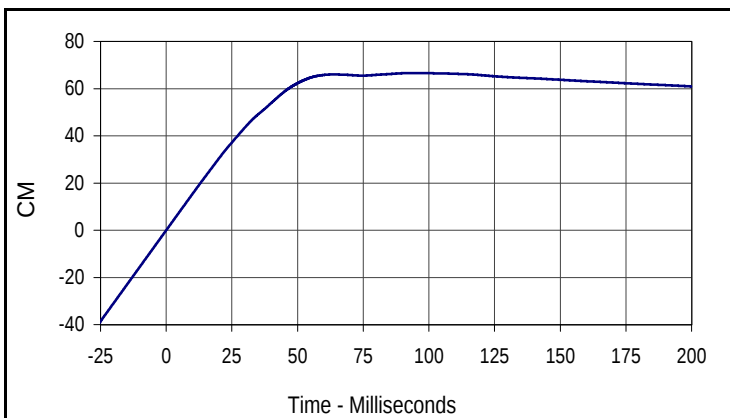
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Left Brake Caliper			
CURNO	Type	SAE Class	Units
093	FIL	60	G's
Max	Time	Min	Time
28.8	74.4	-69.9	32.9



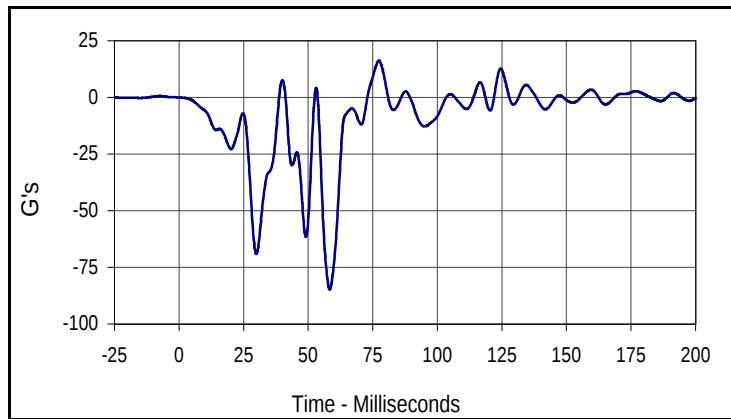
Curve Description			
Vehicle Left Brake Caliper Velocity			
CURNO	Type	SAE Class	Units
093	IN1	180	KMH
Max	Time	Min	Time
55.6	0.0	-3.5	122.0



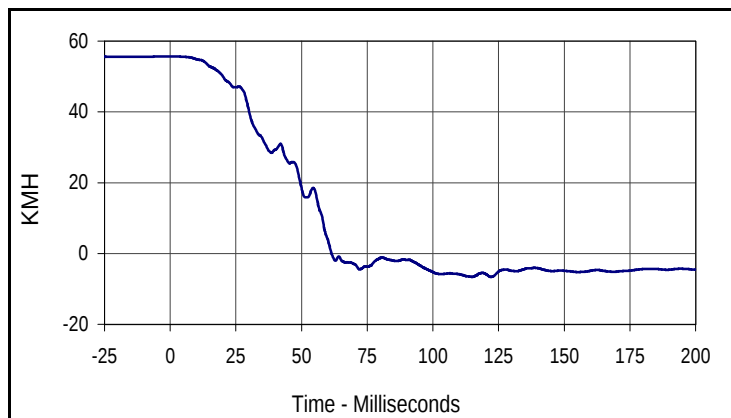
Curve Description			
Vehicle Left Brake Caliper Displacement			
CURNO	Type	SAE Class	Units
093	IN2	180	CM
Max	Time	Min	Time
66.6	92.9	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

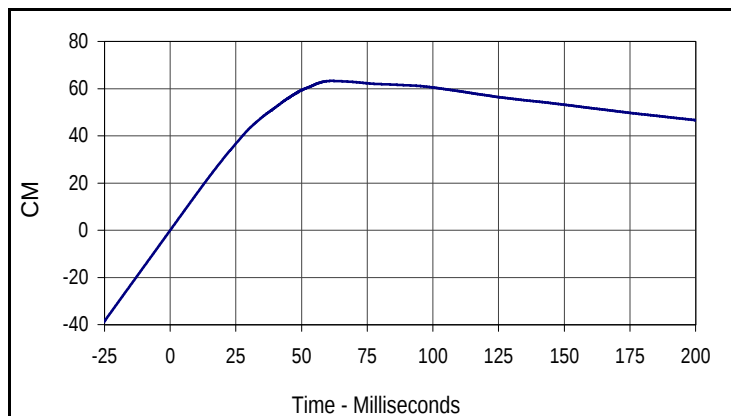
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Right Brake Caliper			
CURNO	Type	SAE Class	Units
094	FIL	60	G's
Max	Time	Min	Time
16.2	77.3	-84.9	58.3



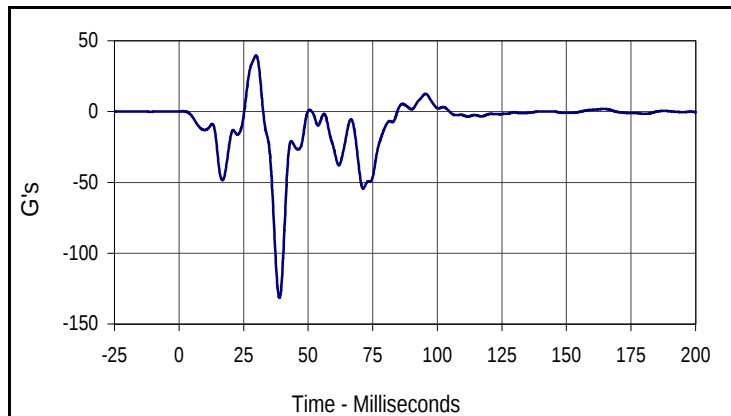
Curve Description			
Vehicle Right Brake Caliper Velocity			
CURNO	Type	SAE Class	Units
094	IN1	180	KMH
Max	Time	Min	Time
55.7	0.0	-6.6	122.1



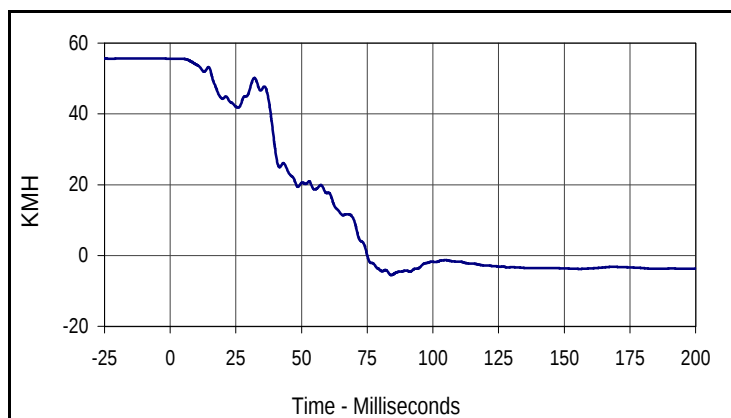
Curve Description			
Vehicle Right Brake Caliper Displacement			
CURNO	Type	SAE Class	Units
094	IN2	180	CM
Max	Time	Min	Time
63.3	61.4	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

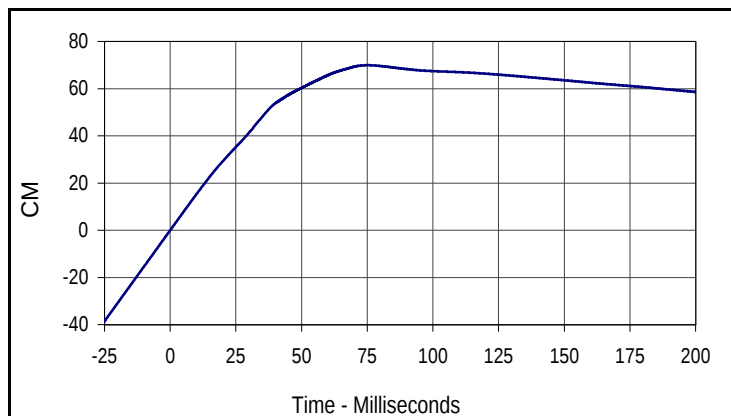
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Instrument Panel			
CURNO	Type	SAE Class	Units
095	FIL	60	G's
Max	Time	Min	Time
39.5	29.8	-131.4	38.9



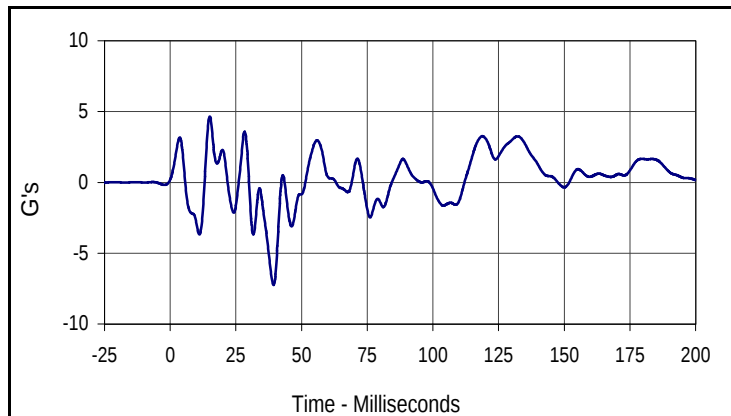
Curve Description			
Vehicle Instrument Panel Velocity			
CURNO	Type	SAE Class	Units
095	IN1	180	KMH
Max	Time	Min	Time
55.6	0.0	-5.5	84.1



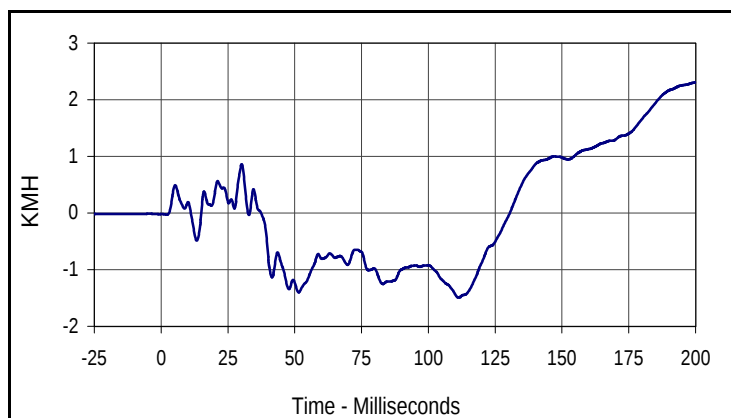
Curve Description			
Vehicle Instrument Panel Displacement			
CURNO	Type	SAE Class	Units
095	IN2	180	CM
Max	Time	Min	Time
69.9	75.0	0.0	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

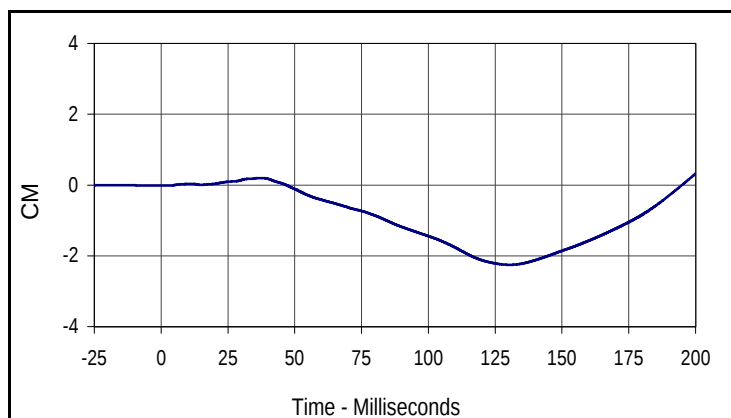
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Left Rear Z			
CURNO	Type	SAE Class	Units
096	FIL	60	G's
Max	Time	Min	Time
4.7	15.1	-7.2	39.3



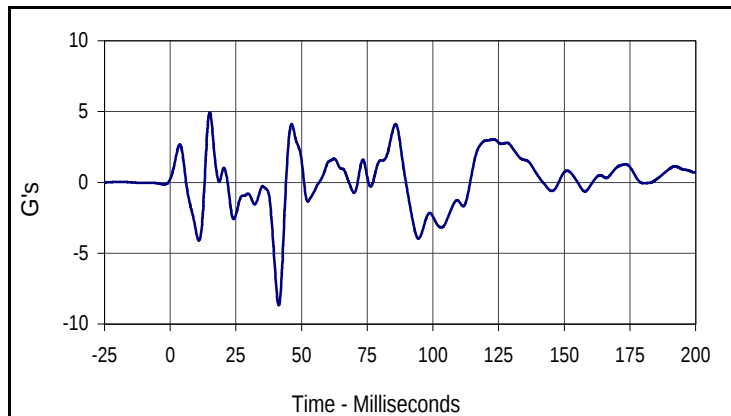
Curve Description			
Vehicle Left Rear Z Velocity			
CURNO	Type	SAE Class	Units
096	IN1	180	KMH
Max	Time	Min	Time
2.3	200.0	-1.5	111.3



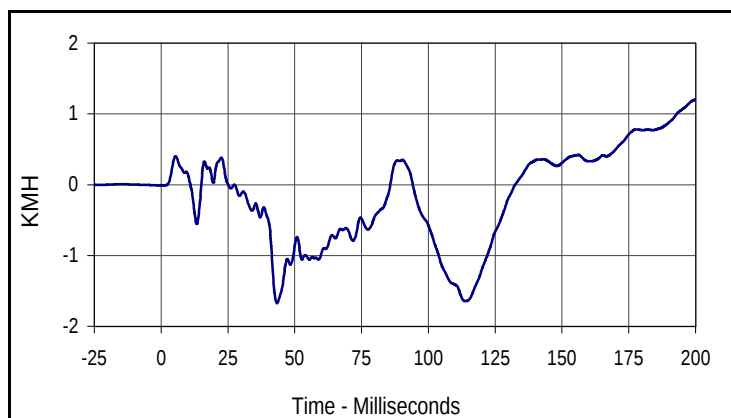
Curve Description			
Vehicle Left Rear Z Displacement			
CURNO	Type	SAE Class	Units
096	IN2	180	CM
Max	Time	Min	Time
0.3	200.0	-2.3	130.5

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

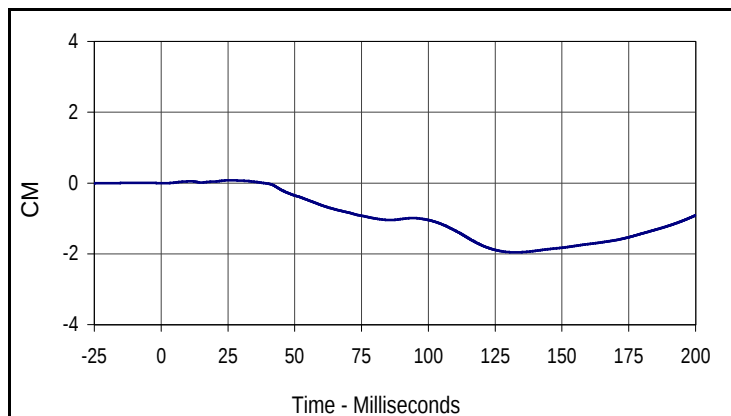
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Vehicle Right Rear Z			
CURNO	Type	SAE Class	Units
097	FIL	60	G's
Max	Time	Min	Time
4.9	15.1	-8.7	41.3



Curve Description			
Vehicle Right Rear Z Velocity			
CURNO	Type	SAE Class	Units
097	IN1	180	KMH
Max	Time	Min	Time
1.2	200.0	-1.7	43.4



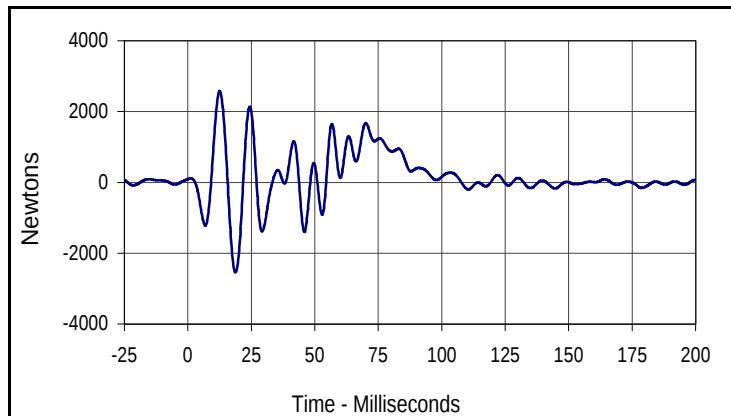
Curve Description			
Vehicle Right Rear Z Displacement			
CURNO	Type	SAE Class	Units
097	IN2	180	CM
Max	Time	Min	Time
0.1	25.1	-2.0	132.5

APPENDIX C

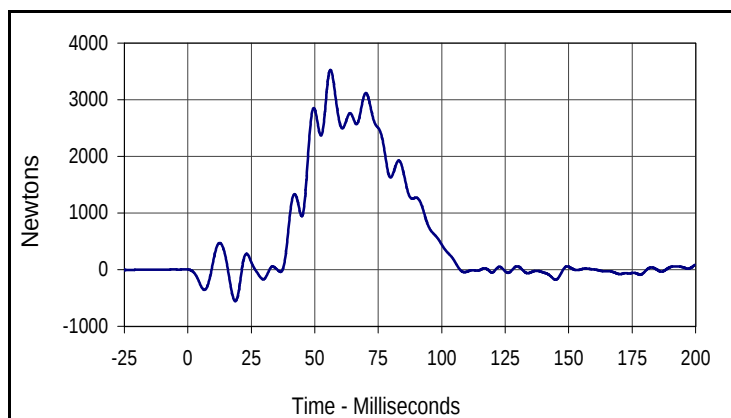
LOAD CELL BARRIER DATA PLOTS

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

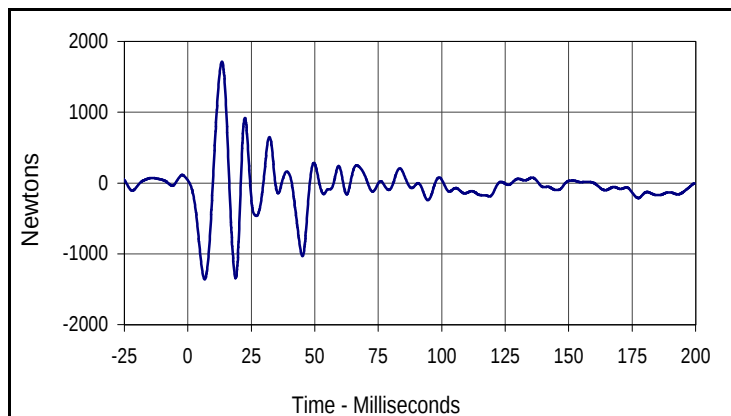
Test Date: 1/28/04
 NHTSA No.: M45104



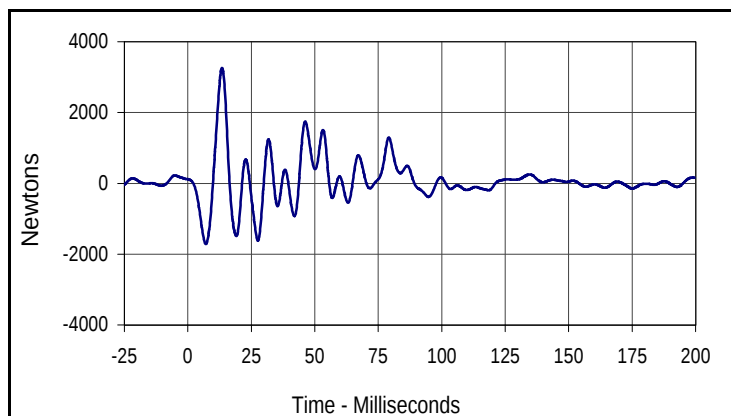
Curve Description			
Barrier Force A1			
CURNO	Type	SAE Class	Units
098	FIL	60	Newtons
Max	Time	Min	Time
2581.7	12.5	-2547.8	18.7



Curve Description			
Barrier Force B1			
CURNO	Type	SAE Class	Units
107	FIL	60	Newtons
Max	Time	Min	Time
3527.9	56.2	-559.0	18.7



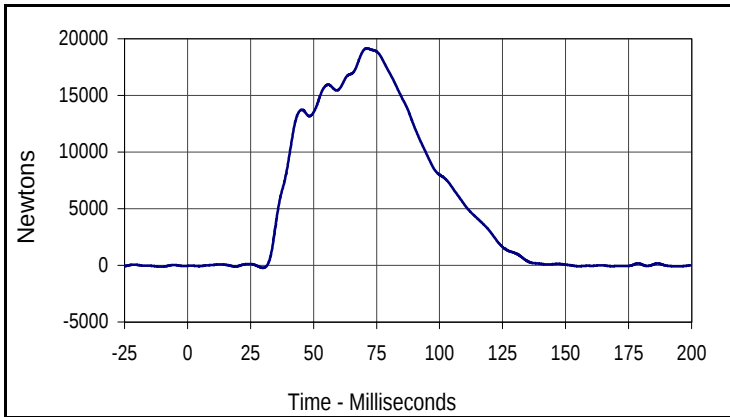
Curve Description			
Barrier Force C1			
CURNO	Type	SAE Class	Units
116	FIL	60	Newtons
Max	Time	Min	Time
1715.2	13.5	-1361.5	6.6



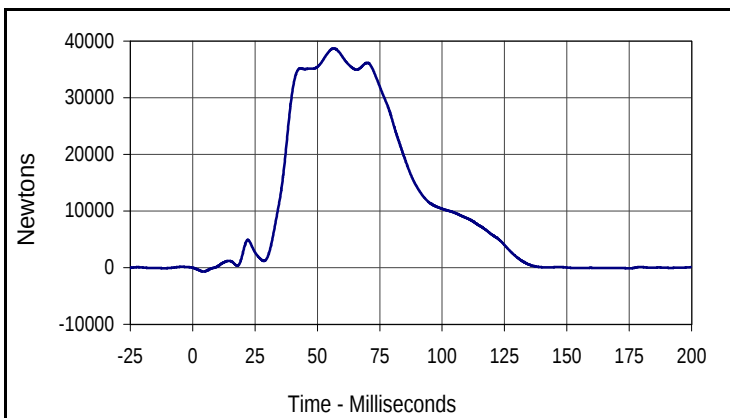
Curve Description			
Barrier Force D1			
CURNO	Type	SAE Class	Units
125	FIL	60	Newtons
Max	Time	Min	Time
3256.1	13.5	-1710.8	7.1

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

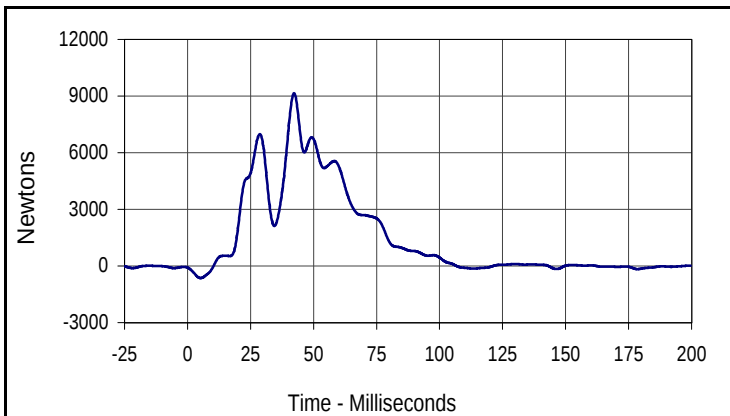
Test Date: 1/28/04
 NHTSA No.: M45104



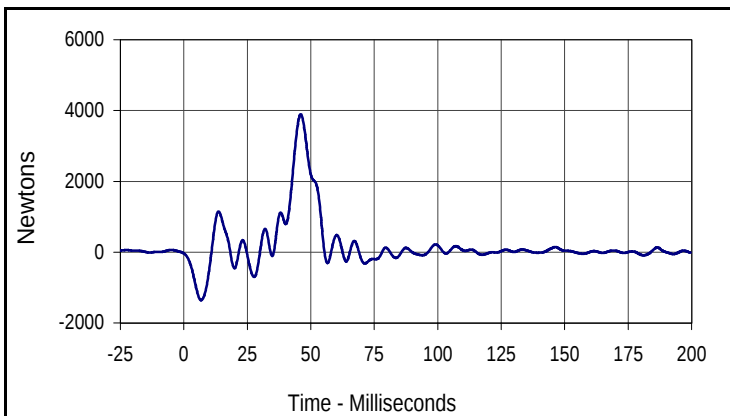
Curve Description			
Barrier Force A2			
CURNO	Type	SAE Class	Units
099	FIL	60	Newtons
Max	Time	Min	Time
19148.5	71.2	-216.3	29.9



Curve Description			
Barrier Force B2			
CURNO	Type	SAE Class	Units
108	FIL	60	Newtons
Max	Time	Min	Time
38696.2	56.5	-683.5	4.3



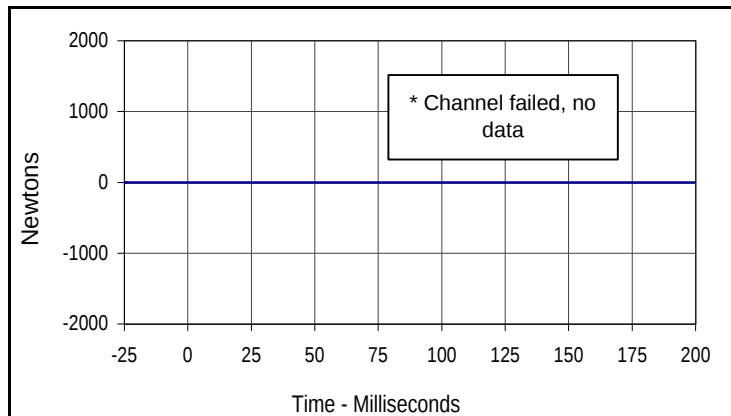
Curve Description			
Barrier Force C2			
CURNO	Type	SAE Class	Units
117	FIL	60	Newtons
Max	Time	Min	Time
9148.3	42.3	-637.2	5.2



Curve Description			
Barrier Force D2			
CURNO	Type	SAE Class	Units
126	FIL	60	Newtons
Max	Time	Min	Time
3897.1	46.0	-1356.8	6.8

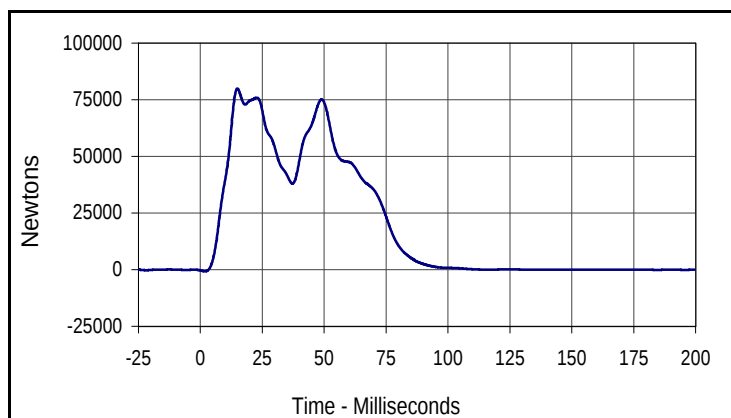
Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104

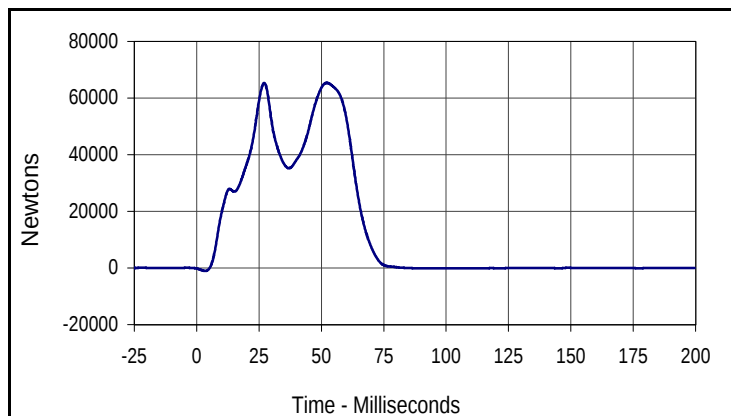


Curve Description			
Barrier Force A3			
CURNO	Type	SAE Class	Units
100	FIL	60	Newtons
Max	Time	Min	Time
0.0	0.0	0.0	0.0

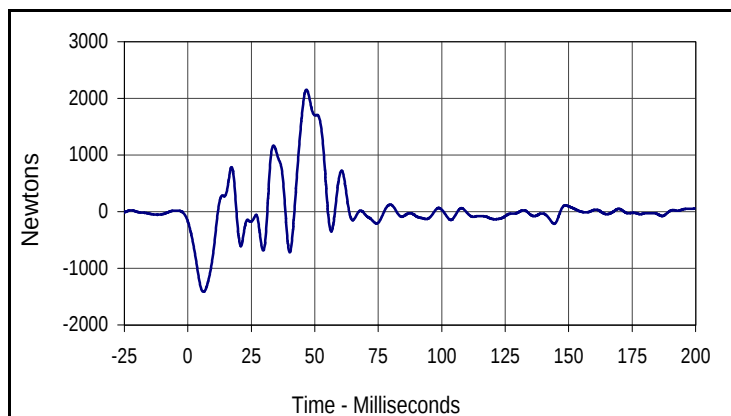
* Channel failed, no data



Curve Description			
Barrier Force B3			
CURNO	Type	SAE Class	Units
109	FIL	60	Newtons
Max	Time	Min	Time
79995.1	15.0	-736.7	1.9



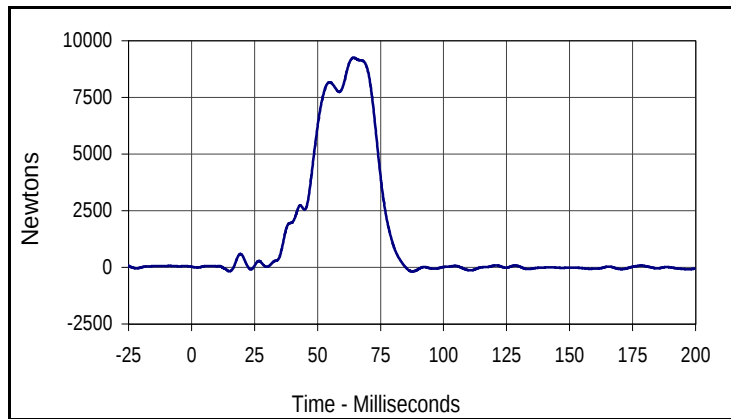
Curve Description			
Barrier Force C3			
CURNO	Type	SAE Class	Units
118	FIL	60	Newtons
Max	Time	Min	Time
65369.3	52.2	-1056.2	3.5



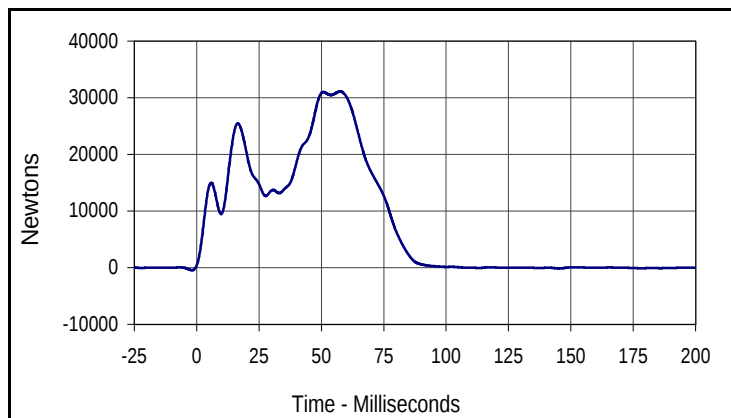
Curve Description			
Barrier Force D3			
CURNO	Type	SAE Class	Units
127	FIL	60	Newtons
Max	Time	Min	Time
2154.0	46.7	-1414.0	6.2

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

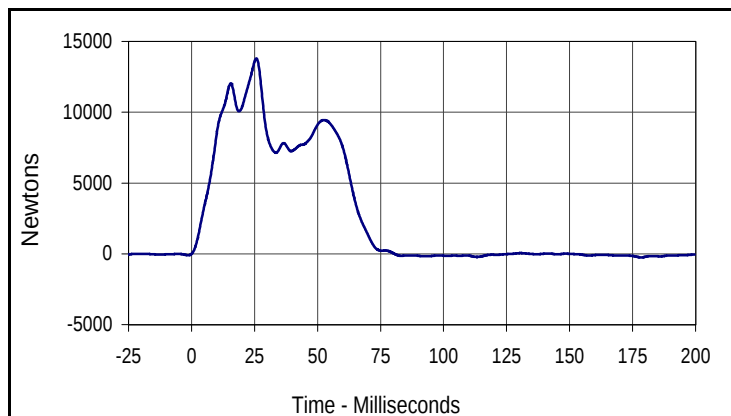
Test Date: 1/28/04
 NHTSA No.: M45104



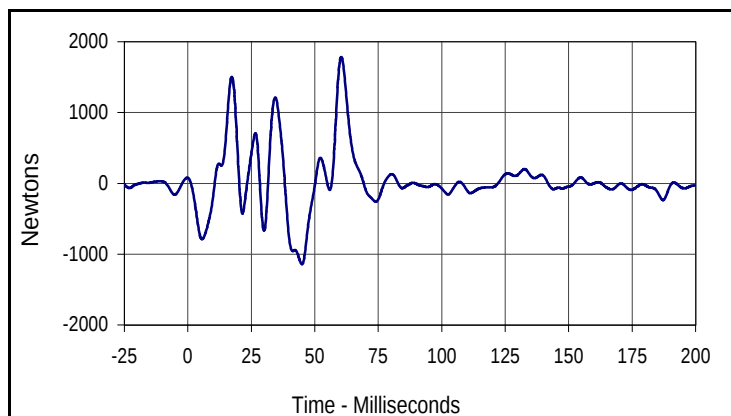
Curve Description			
Barrier Force A4			
CURNO	Type	SAE Class	Units
101	FIL	60	Newtons
Max	Time	Min	Time
9252.0	64.3	-179.5	87.6



Curve Description			
Barrier Force B4			
CURNO	Type	SAE Class	Units
110	FIL	60	Newtons
Max	Time	Min	Time
31117.8	57.5	-142.7	145.1



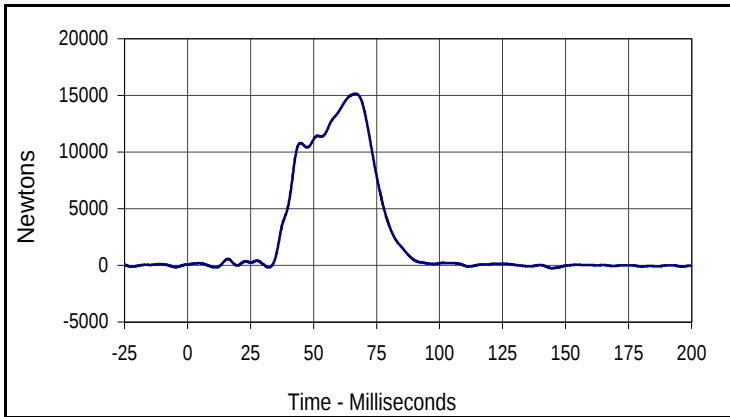
Curve Description			
Barrier Force C4			
CURNO	Type	SAE Class	Units
119	FIL	60	Newtons
Max	Time	Min	Time
13796.6	25.7	-262.1	178.4



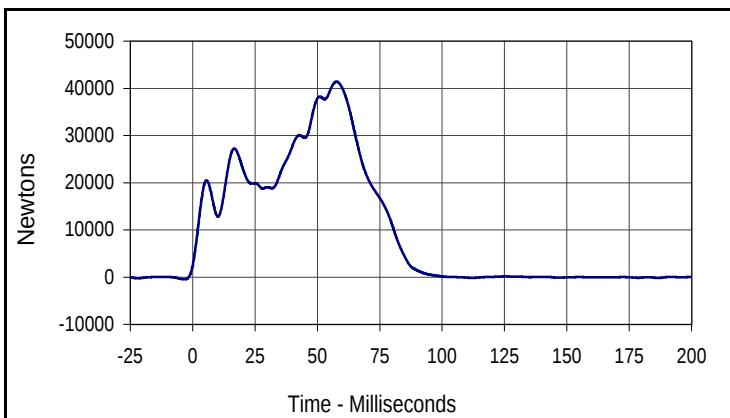
Curve Description			
Barrier Force D4			
CURNO	Type	SAE Class	Units
128	FIL	60	Newtons
Max	Time	Min	Time
1784.9	60.4	-1143.8	45.0

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

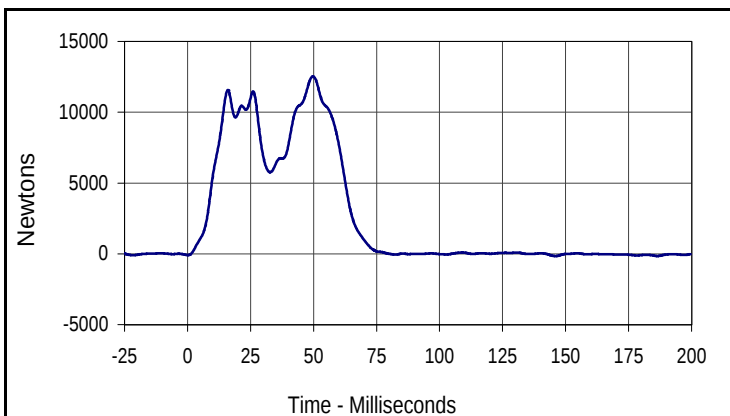
Test Date: 1/28/04
 NHTSA No.: M45104



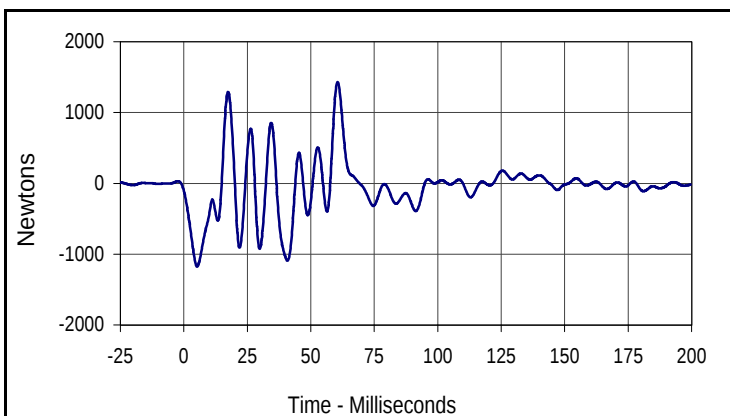
Curve Description			
Barrier Force A5			
CURNO	Type	SAE Class	Units
102	FIL	60	Newtons
Max	Time	Min	Time
15142.3	66.7	-250.2	144.5



Curve Description			
Barrier Force B5			
CURNO	Type	SAE Class	Units
111	FIL	60	Newtons
Max	Time	Min	Time
41399.6	57.7	-200.1	186.6



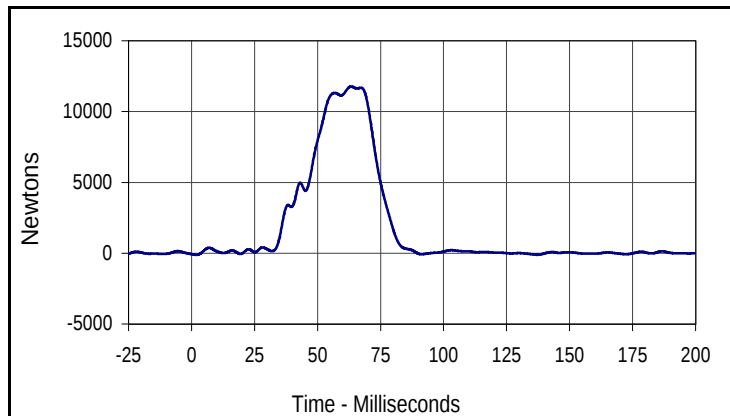
Curve Description			
Barrier Force C5			
CURNO	Type	SAE Class	Units
120	FIL	60	Newtons
Max	Time	Min	Time
12537.3	49.8	-158.7	146.0



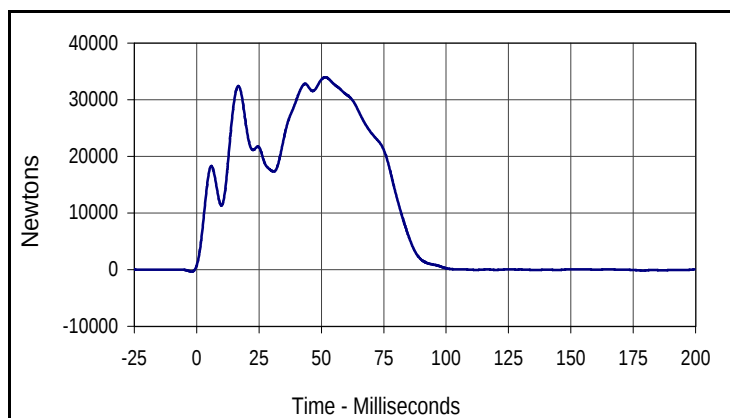
Curve Description			
Barrier Force D5			
CURNO	Type	SAE Class	Units
129	FIL	60	Newtons
Max	Time	Min	Time
1431.3	60.6	-1178.0	5.2

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

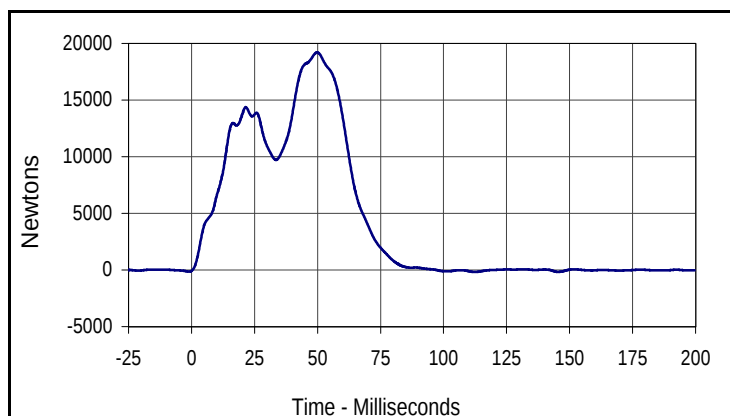
Test Date: 1/28/04
 NHTSA No.: M45104



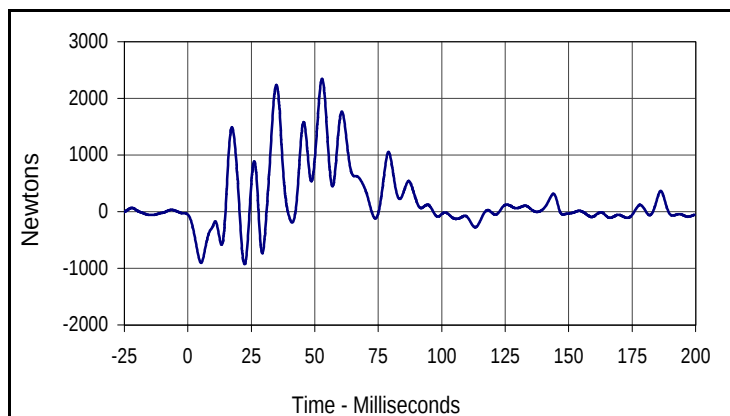
Curve Description			
Barrier Force A6			
CURNO	Type	SAE Class	Units
103	FIL	60	Newtons
Max	Time	Min	Time
11770.3	63.3	-112.5	1.9



Curve Description			
Barrier Force B6			
CURNO	Type	SAE Class	Units
112	FIL	60	Newtons
Max	Time	Min	Time
33963.1	51.5	-160.8	179.0



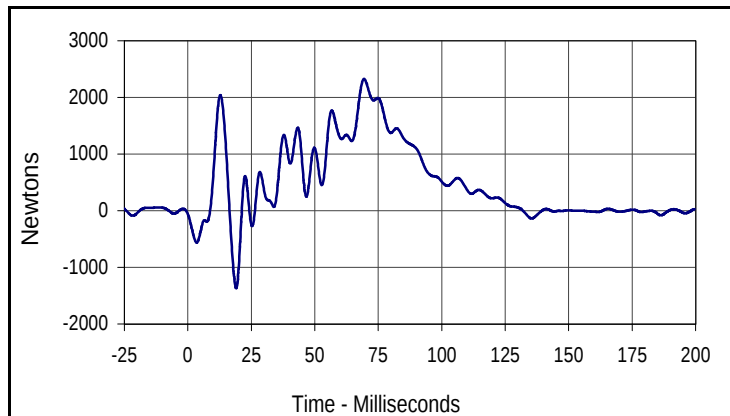
Curve Description			
Barrier Force C6			
CURNO	Type	SAE Class	Units
121	FIL	60	Newtons
Max	Time	Min	Time
19197.2	49.8	-179.1	112.4



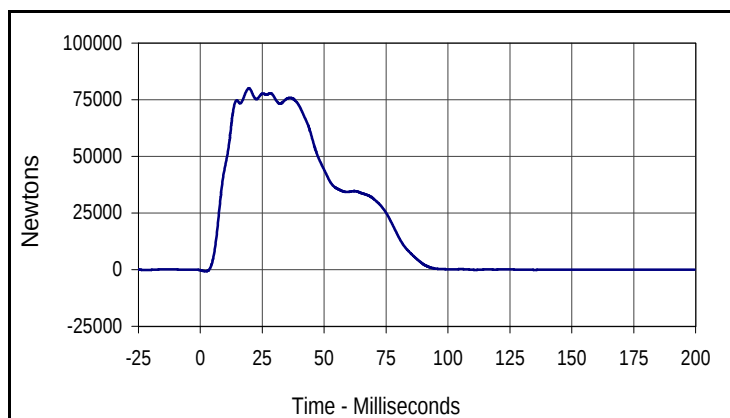
Curve Description			
Barrier Force D6			
CURNO	Type	SAE Class	Units
130	FIL	60	Newtons
Max	Time	Min	Time
2342.7	52.9	-928.2	22.4

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

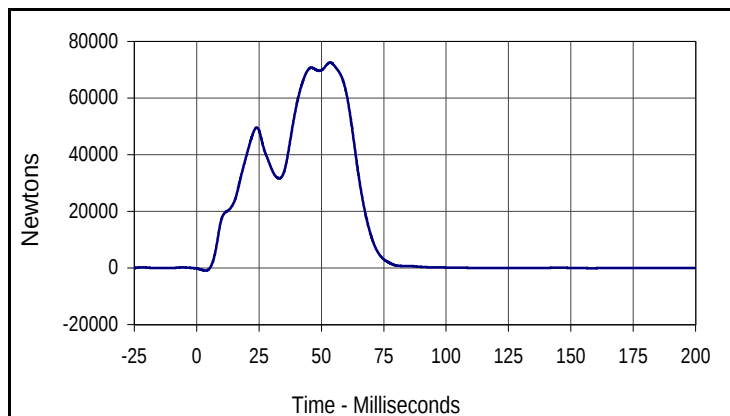
Test Date: 1/28/04
 NHTSA No.: M45104



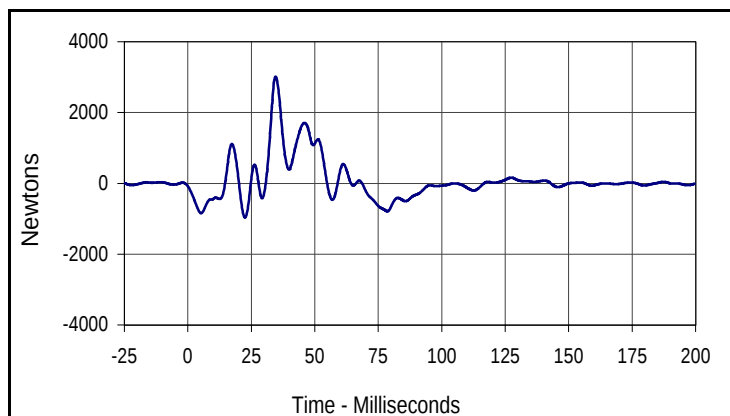
Curve Description			
Barrier Force A7			
CURNO	Type	SAE Class	Units
104	FIL	60	Newtons
Max	Time	Min	Time
2326.9	69.4	-1365.4	19.0



Curve Description			
Barrier Force B7			
CURNO	Type	SAE Class	Units
113	FIL	60	Newtons
Max	Time	Min	Time
80039.4	19.6	-704.8	2.1



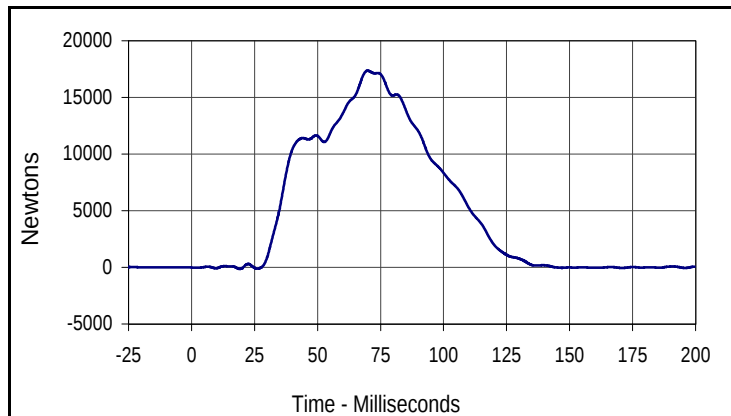
Curve Description			
Barrier Force C7			
CURNO	Type	SAE Class	Units
122	FIL	60	Newtons
Max	Time	Min	Time
72556.2	53.5	-930.8	3.6



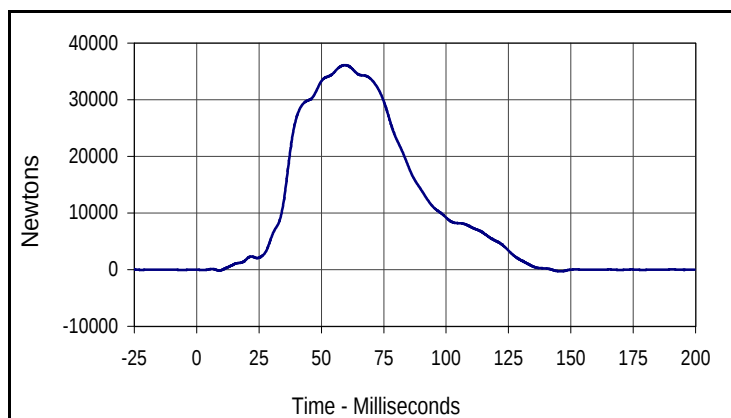
Curve Description			
Barrier Force D7			
CURNO	Type	SAE Class	Units
131	FIL	60	Newtons
Max	Time	Min	Time
3013.9	34.6	-958.4	22.5

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

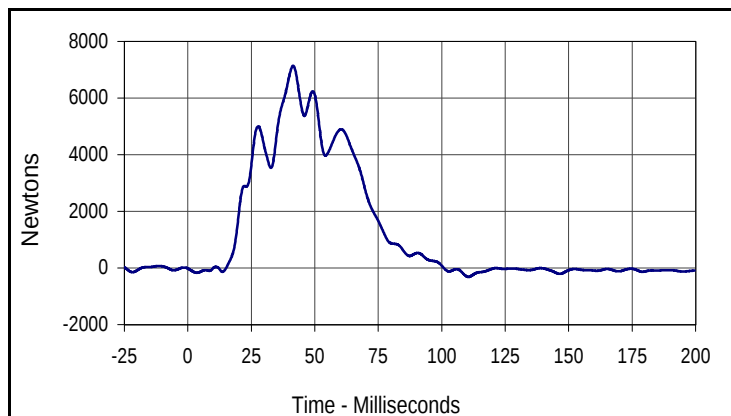
Test Date: 1/28/04
 NHTSA No.: M45104



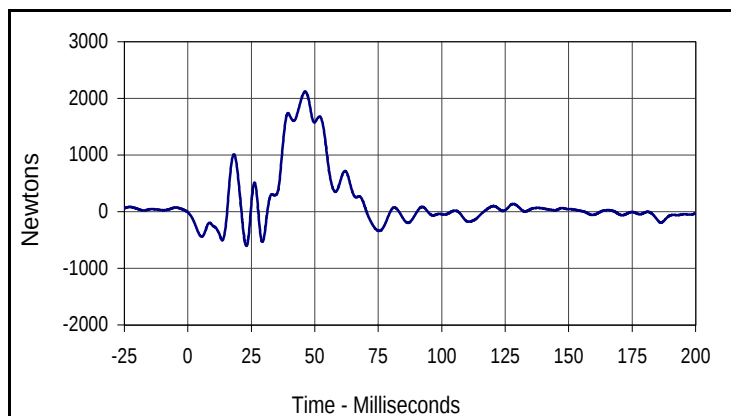
Curve Description			
Barrier Force A8			
CURNO	Type	SAE Class	Units
105	FIL	60	Newtons
Max	Time	Min	Time
17364.5	69.9	-137.3	19.2



Curve Description			
Barrier Force B8			
CURNO	Type	SAE Class	Units
114	FIL	60	Newtons
Max	Time	Min	Time
36096.6	59.4	-299.0	146.0



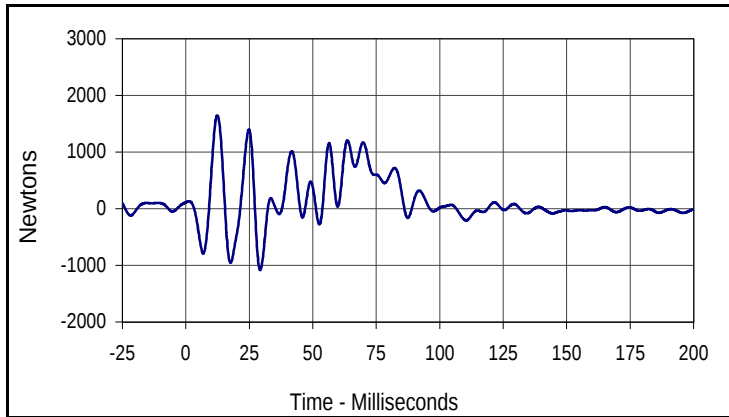
Curve Description			
Barrier Force C8			
CURNO	Type	SAE Class	Units
123	FIL	60	Newtons
Max	Time	Min	Time
7143.2	41.5	-315.6	110.6



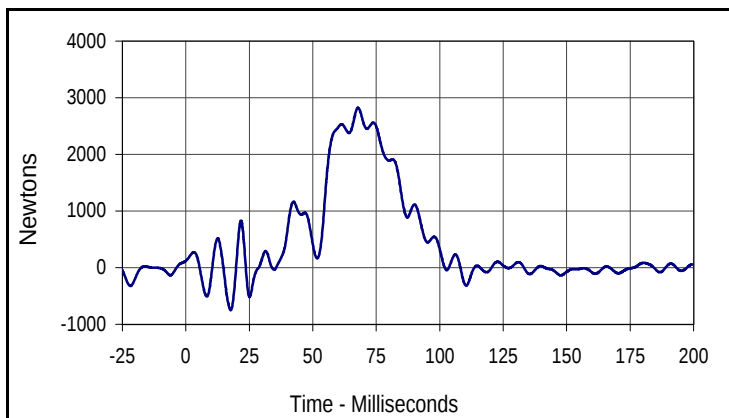
Curve Description			
Barrier Force D8			
CURNO	Type	SAE Class	Units
132	FIL	60	Newtons
Max	Time	Min	Time
2116.9	46.2	-604.9	23.1

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

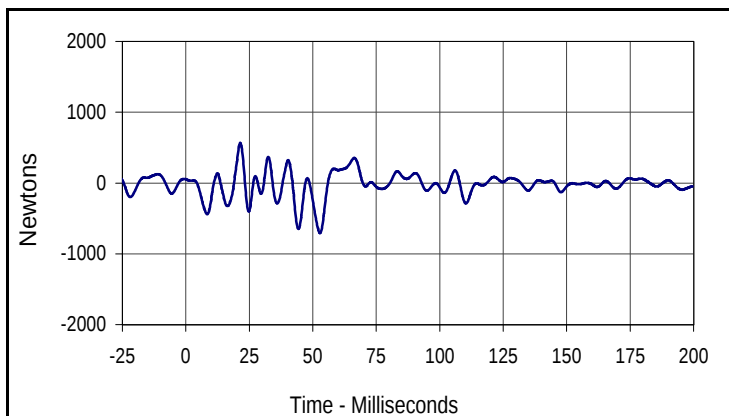
Test Date: 1/28/04
 NHTSA No.: M45104



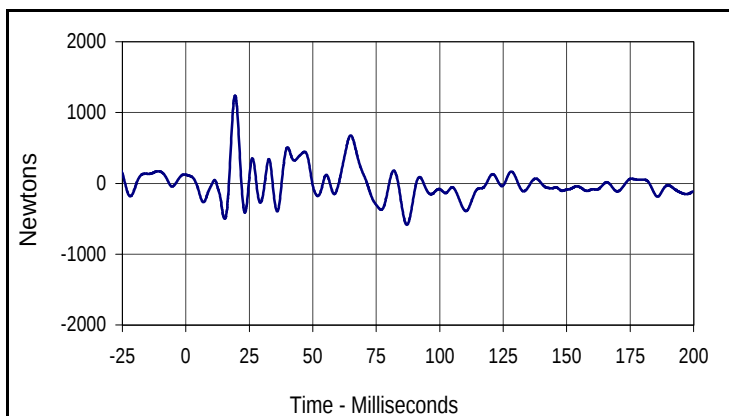
Curve Description			
Barrier Force A9			
CURNO	Type	SAE Class	Units
106	FIL	60	Newtons
Max	Time	Min	Time
1646.7	12.4	-1083.4	29.3



Curve Description			
Barrier Force B9			
CURNO	Type	SAE Class	Units
115	FIL	60	Newtons
Max	Time	Min	Time
2822.1	67.8	-750.4	17.7



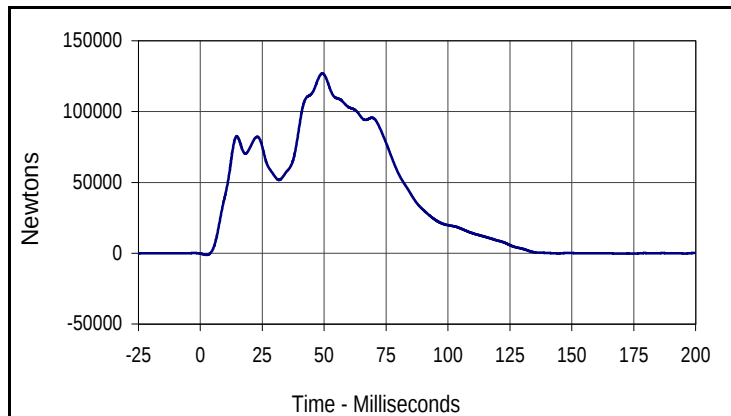
Curve Description			
Barrier Force C9			
CURNO	Type	SAE Class	Units
124	FIL	60	Newtons
Max	Time	Min	Time
565.5	21.4	-706.3	52.8



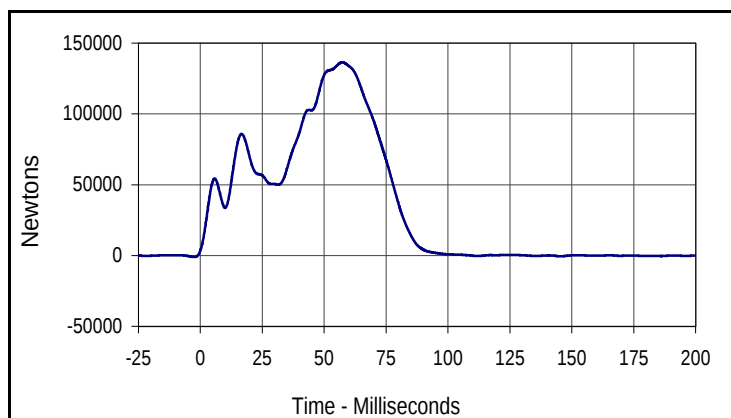
Curve Description			
Barrier Force D9			
CURNO	Type	SAE Class	Units
133	FIL	60	Newtons
Max	Time	Min	Time
1237.5	19.4	-586.3	87.1

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

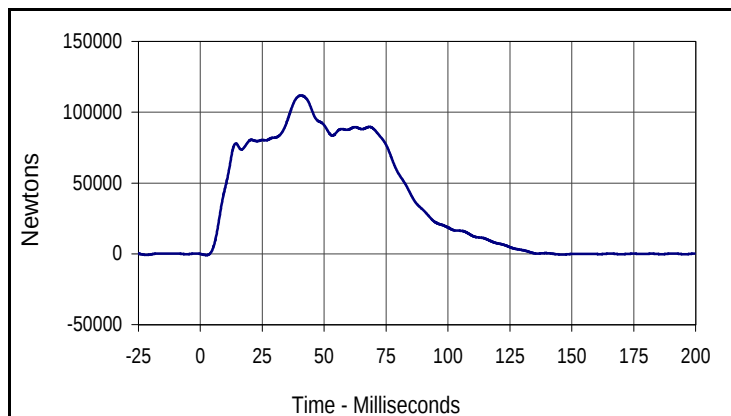
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Barrier Force Sum Group 1			
CURNO	Type	SAE Class	Units
001	SUM	60	Newtons
Max	Time	Min	Time
126870.9	49.3	-1116.0	2.5



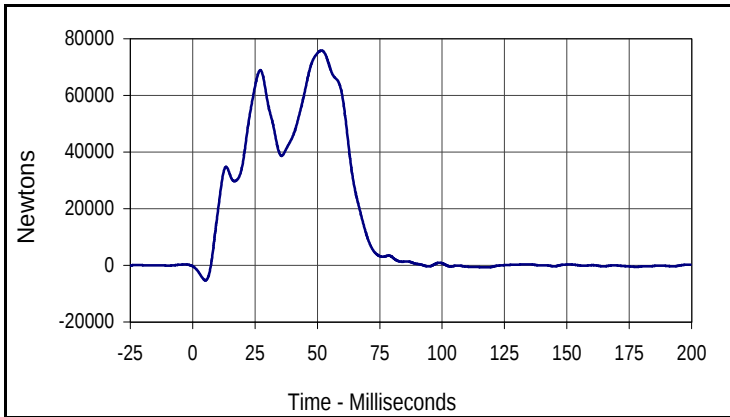
Curve Description			
Barrier Force Sum Group 2			
CURNO	Type	SAE Class	Units
002	SUM	60	Newtons
Max	Time	Min	Time
136470.3	57.3	-529.1	145.4



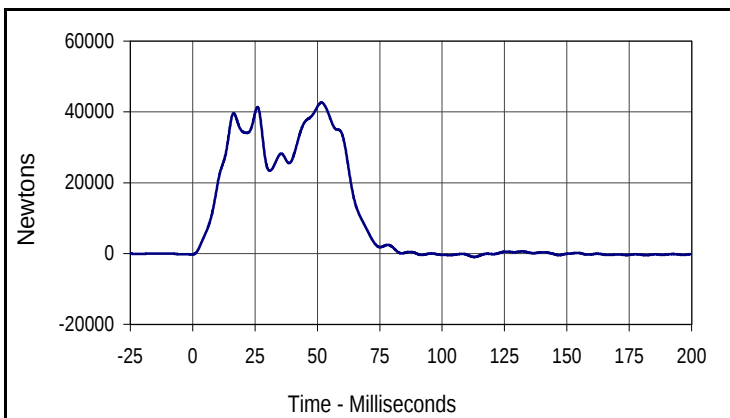
Curve Description			
Barrier Force Sum Group 3			
CURNO	Type	SAE Class	Units
003	SUM	60	Newtons
Max	Time	Min	Time
111772.3	40.6	-907.8	2.5

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

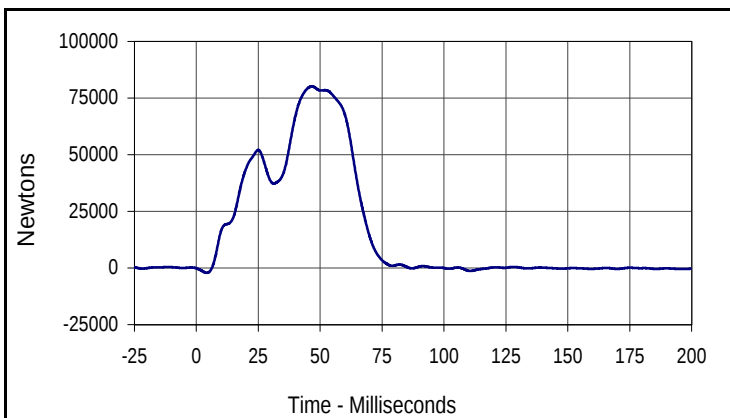
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Barrier Force Sum Group 4			
CURNO	Type	SAE Class	Units
004	SUM	60	Newtons
Max	Time	Min	Time
75832.9	51.6	-5302.4	5.1



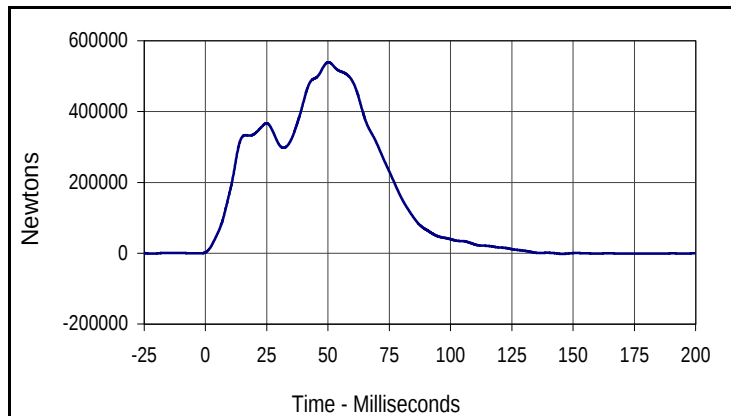
Curve Description			
Barrier Force Sum Group 5			
CURNO	Type	SAE Class	Units
005	SUM	60	Newtons
Max	Time	Min	Time
42642.8	51.6	-987.4	112.9



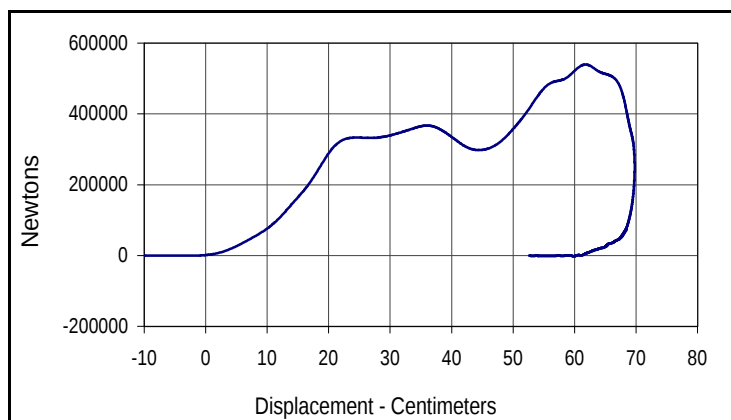
Curve Description			
Barrier Force Sum Group 6			
CURNO	Type	SAE Class	Units
006	SUM	60	Newtons
Max	Time	Min	Time
80195.9	46.6	-2121.8	4.2

Test Vehicle: 2004 Lexus ES 330
 Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Barrier Force Total Sum			
CURNO	Type	SAE Class	Units
007	SUM	60	Newtons
Max	Time	Min	Time
539347.4	50.2	-1955.0	145.7



Curve Description			
Barrier Force Total Sum vs. Displ.			
CURNO	Type	SAE Class	Units
001	XVY	60	Newtons
Max	CM	Min	CM
539347.4	61.8	-1955.0	59.8

BARRIER LOAD CELL SUMMARY DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

Location	Units	Max	Time	Min	Time
Barrier Force A1	Newtons	2581.7	12.5	-2547.8	18.7
Barrier Force A2	Newtons	19148.5	71.2	-216.3	29.9
Barrier Force A3	Newtons	0.0	0.0	0.0	0.0
Barrier Force A4	Newtons	9252.0	64.3	-179.5	87.6
Barrier Force A5	Newtons	15142.3	66.7	-250.2	144.5
Barrier Force A6	Newtons	11770.3	63.3	-112.5	1.9
Barrier Force A7	Newtons	2326.9	69.4	-1365.4	19.0
Barrier Force A8	Newtons	17364.5	69.9	-137.3	19.2
Barrier Force A9	Newtons	1646.7	12.4	-1083.4	29.3
Barrier Force B1	Newtons	3527.9	56.2	-559.0	18.7
Barrier Force B2	Newtons	38696.2	56.5	-683.5	4.3
Barrier Force B3	Newtons	79995.1	15.0	-736.7	1.9
Barrier Force B4	Newtons	31117.8	57.5	-142.7	145.1
Barrier Force B5	Newtons	41399.6	57.7	-200.1	186.6
Barrier Force B6	Newtons	33963.1	51.5	-160.8	179.0
Barrier Force B7	Newtons	80039.4	19.6	-704.8	2.1
Barrier Force B8	Newtons	36096.6	59.4	-299.0	146.0
Barrier Force B9	Newtons	2822.1	67.8	-750.4	17.7
Barrier Force C1	Newtons	1715.2	13.5	-1361.5	6.6
Barrier Force C2	Newtons	9148.3	42.3	-637.2	5.2
Barrier Force C3	Newtons	65369.3	52.2	-1056.2	3.5
Barrier Force C4	Newtons	13796.6	25.7	-262.1	178.4
Barrier Force C5	Newtons	12537.3	49.8	-158.7	146.0
Barrier Force C6	Newtons	19197.2	49.8	-179.1	112.4
Barrier Force C7	Newtons	72556.2	53.5	-930.8	3.6
Barrier Force C8	Newtons	7143.2	41.5	-315.6	110.6
Barrier Force C9	Newtons	565.5	21.4	-706.3	52.8
Barrier Force D1	Newtons	3256.1	13.5	-1710.8	7.1
Barrier Force D2	Newtons	3897.1	46.0	-1356.8	6.8
Barrier Force D3	Newtons	2154.0	46.7	-1414.0	6.2
Barrier Force D4	Newtons	1784.9	60.4	-1143.8	45.0
Barrier Force D5	Newtons	1431.3	60.6	-1178.0	5.2
Barrier Force D6	Newtons	2342.7	52.9	-928.2	22.4
Barrier Force D7	Newtons	3013.9	34.6	-958.4	22.5
Barrier Force D8	Newtons	2116.9	46.2	-604.9	23.1
Barrier Force D9	Newtons	1237.5	19.4	-586.3	87.1
Barrier Force Sum Group 1	Newtons	126870.9	49.3	-1116.0	2.5
Barrier Force Sum Group 2	Newtons	136470.3	57.3	-529.1	145.4
Barrier Force Sum Group 3	Newtons	111772.3	40.6	-907.8	2.5
Barrier Force Sum Group 4	Newtons	75832.9	51.6	-5302.4	5.1
Barrier Force Sum Group 5	Newtons	42642.8	51.6	-987.4	112.9
Barrier Force Sum Group 6	Newtons	80195.9	46.6	-2121.8	4.2
Barrier Force Total Sum	Newtons	539347.4	50.2	-1955.0	145.7

*Channel failed, no data

APPENDIX D

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 34
1/28/04
2004 Lexus ES 330 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	KEAC039	Accel.,1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	KEAC038	Accel.,1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	KEAC027	Accel.,1/2 bridge	Endevco	7264-2000	G
4	HEAD, REDUNDANT	X	KEAC031	Accel.,1/2 bridge	Endevco	7264-2000	G
5	HEAD, REDUNDANT	Y	KEAC032	Accel.,1/2 bridge	Endevco	7264-2000	G
6	HEAD, REDUNDANT	Z	KEAC026	Accel.,1/2 bridge	Endevco	7264-2000	G
7	NECK FORCE	X	GPUN02FX	Load cell, six axis neck	R. A. Denton	1716A	N
8	NECK FORCE	Y	GPUN02FY	Load cell, six axis neck	R. A. Denton	1716A	N
9	NECK FORCE	Z	GPUN02FZ	Load cell, six axis neck	R. A. Denton	1716A	N
10	NECK MOMENT	X	GPUN02MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
11	NECK MOMENT	Y	GPUN02MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
12	NECK MOMENT	Z	GPUN02MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
13	CHEST , PRIMARY	X	GPAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
14	CHEST , PRIMARY	Y	GPAC024	Accel., 1/2 bridge	Endevco	7264-2000	G
15	CHEST , PRIMARY	Z	GPAC029	Accel., 1/2 bridge	Endevco	7264-2000	G
16	CHEST , REDUNDANT	X	KEAC023	Accel.,1/2 bridge	Endevco	7264-200	G
17	CHEST , REDUNDANT	Y	KEAC022	Accel.,1/2 bridge	Endevco	7264-200	G
18	CHEST , REDUNDANT	Z	KEAC024	Accel.,1/2 bridge	Endevco	7264-200	G
19	CHEST DISPLACEMENT	X	GPCP001	Rotary Pot Chest	Servo	14CBI	MM
20	PELVIS, PRIMARY	X	KEAC019	Accel.,1/2 bridge	Endevco	7264-200	G
21	PELVIS, PRIMARY	Y	KEAC020	Accel.,1/2 bridge	Endevco	7264-200	G
22	PELVIS, PRIMARY	Z	KEAC021	Accel.,1/2 bridge	Endevco	7264-200	G
23	LEFT FEMUR FORCE	Z	KEFF001	Load cell, Femur	R.A. Denton	2121	N
24	RIGHT FEMUR FORCE	Z	KEFF002	Load cell, Femur	R.A. Denton	2121	N

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 34
1/28/04
2004 Lexus ES 330 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
26	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
27	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
28	UP. TIBIA RIGHT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
29	LWR. TIBIA LEFT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
30	LWR. TIBIA LEFT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
31	LWR. TIBIA LEFT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
32	LWR. TIBIA RIGHT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
33	LWR. TIBIA RIGHT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
34	LWR. TIBIA RIGHT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
35	FOOT LEFT, AFT	X	KEIC003X	Accel., Foot Triax	I.C. Sensor	3031-500	G
36	FOOT LEFT, AFT	Z	KEIC003Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
37	FOOT LEFT, FORE	Z	KEIC003Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
38	FOOT RIGHT, AFT	X	KEIC004X	Accel., Foot Triax	I.C. Sensor	3031-500	G
39	FOOT RIGHT, AFT	Z	KEIC004Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
40	FOOT RIGHT, FORE	Z	KEIC004Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
41	LAP BELT FORCE	X	BL134	Load cell, Seat belt	FGP	FN4060	N
42	SHOULDER BELT FORCE	X	BL135	Load cell, Seat belt	FGP	FN4060	N
43	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM
44	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 35
1/28/04
2004 Lexus ES 330 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	HEAD, PRIMARY	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
46	HEAD, PRIMARY	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
47	HEAD, PRIMARY	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
48	HEAD, REDUNDANT	X	GPAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
49	HEAD, REDUNDANT	Y	GPAC021	Accel., 1/2 bridge	Endevco	7264-2000	G
50	HEAD, REDUNDANT	Z	GPAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
51	NECK FORCE	X	GPUN01FX	Load cell, six axis neck	R. A. Denton	1716A	N
52	NECK FORCE	Y	GPUN01FY	Load cell, six axis neck	R. A. Denton	1716A	N
53	NECK FORCE	Z	GPUN01FZ	Load cell, six axis neck	R. A. Denton	1716A	N
54	NECK MOMENT	X	GPUN01MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
55	NECK MOMENT	Y	GPUN01MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
56	NECK MOMENT	Z	GPUN01MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
57	CHEST , PRIMARY	X	GPAC005	Accel., 1/2 bridge	Endevco	7264-2000	G
58	CHEST , PRIMARY	Y	GPAC011	Accel., 1/2 bridge	Endevco	7264-2000	G
59	CHEST , PRIMARY	Z	GPAC010	Accel., 1/2 bridge	Endevco	7264-2000	G
60	CHEST , REDUNDANT	X	GPAC034	Accel., 1/2 bridge	Endevco	7264-2000	G
61	CHEST , REDUNDANT	Y	GPAC023	Accel., 1/2 bridge	Endevco	7264-2000	G
62	CHEST , REDUNDANT	Z	GPAC020	Accel., 1/2 bridge	Endevco	7264-2000	G
63	CHEST DISPLACEMENT	X	GPCP002	Rotary Pot Chest	Servo	14CBI	MM
64	PELVIS, PRIMARY	X	GPAC025	Accel., 1/2 bridge	Endevco	7264-2000	G
65	PELVIS, PRIMARY	Y	GPAC022	Accel., 1/2 bridge	Endevco	7264-2000	G
66	PELVIS, PRIMARY	Z	GPAC019	Accel., 1/2 bridge	Endevco	7264-2000	G
67	LEFT FEMUR FORCE	Z	KEFF003	Load cell, Femur	R.A. Denton	2121	N
68	RIGHT FEMUR FORCE	Z	KEFF004	Load cell, Femur	R.A. Denton	2121	N

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 35
1/28/04
2004 Lexus ES 330 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
70	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
71	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
72	UP. TIBIA RIGHT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
73	LWR. TIBIA LEFT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
74	LWR. TIBIA LEFT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
75	LWR. TIBIA LEFT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
76	LWR. TIBIA RIGHT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
77	LWR. TIBIA RIGHT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
78	LWR. TIBIA RIGHT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
79	FOOT LEFT, AFT	X	KEIC002X	Accel., Foot Triax	I.C. Sensor	3031-500	G
80	FOOT LEFT, AFT	Z	KEIC002Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
81	FOOT LEFT, FORE	Z	KEIC002Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
82	FOOT RIGHT, AFT	X	KEIC001X	Accel., Foot Triax	I.C. Sensor	3031-500	G
83	FOOT RIGHT, AFT	Z	KEIC001Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
84	FOOT RIGHT, FORE	Z	KEIC001Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
85	LAP BELT FORCE	X	BL168	Load cell, Seat belt	First Tech	IF-964	N
86	SHOULDER BELT FORCE	X	BL169	Load cell, Seat belt	First Tech	IF-964	N
87	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM
88	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

**2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Vehicle Accelerometers
1/28/04
2004 Lexus ES 330 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
89	LEFT REAR	X	KEVA002	Accel., Pre-Amp	I.C.S/Karco	3031-500	G
90	RIGHT REAR	X	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G
91	ENGINE TOP	X	KEVA009	Accel., Vehicle block	I.C. Sensor	3031-500	G
92	ENGINE BOTTOM	X	KEVA007	Accel., Vehicle block	I.C. Sensor	3031-500	G
93	LEFT BRAKE CALIPER	X	KEVA008	Accel., Vehicle block	I.C. Sensor	3031-500	G
94	RIGHT BRAKE CALIPER	X	KEVA012	Accel., Vehicle block	I.C. Sensor	3031-500	G
95	INSTRUMENT PANEL	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-200	G
96	LEFT REAR	Z	KEVA001	Accel., Vehicle block	I.C. Sensor	3031-500	G
97	RIGHT REAR	Z	KEVA010	Accel., Vehicle block	I.C. Sensor	3031-200	G

**2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
1/28/04
2004 Lexus ES 330 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
98	BARRIER FORCE A1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
99	BARRIER FORCE A2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
100	BARRIER FORCE A3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
101	BARRIER FORCE A4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
102	BARRIER FORCE A5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
103	BARRIER FORCE A6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
104	BARRIER FORCE A7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
105	BARRIER FORCE A8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
106	BARRIER FORCE A9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
107	BARRIER FORCE B1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
108	BARRIER FORCE B2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
109	BARRIER FORCE B3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
110	BARRIER FORCE B4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
111	BARRIER FORCE B5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
112	BARRIER FORCE B6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
113	BARRIER FORCE B7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
114	BARRIER FORCE B8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
115	BARRIER FORCE B9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N

**2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
1/28/04
2004 Lexus ES 330 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
116	BARRIER FORCE C1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
117	BARRIER FORCE C2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
118	BARRIER FORCE C3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
119	BARRIER FORCE C4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
120	BARRIER FORCE C5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
121	BARRIER FORCE C6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
122	BARRIER FORCE C7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
123	BARRIER FORCE C8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
124	BARRIER FORCE C9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
125	BARRIER FORCE D1	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
126	BARRIER FORCE D2	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
127	BARRIER FORCE D3	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
128	BARRIER FORCE D4	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
129	BARRIER FORCE D5	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
130	BARRIER FORCE D6	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
131	BARRIER FORCE D7	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
132	BARRIER FORCE D8	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N
133	BARRIER FORCE D9	X	BARRIER	Load Cell, LCB	Interface	1220-FS	N

**2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Nine Accelerometer Array Head
1/28/04
2004 Lexus ES 330 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
186	DRIVER X-ARM	Y	GPAC016	Accel., 1/2 bridge	Endevco	7264-2000	G
187	DRIVER X-ARM	Z	GPAC015	Accel., 1/2 bridge	Endevco	7264-2000	G
188	DRIVER Y-ARM	X	GPAC004	Accel., 1/2 bridge	Endevco	7264-2000	G
189	DRIVER Y-ARM	Z	GPAC018	Accel., 1/2 bridge	Endevco	7264-2000	G
190	DRIVER Z-ARM	X	GPAC006	Accel., 1/2 bridge	Endevco	7264-2000	G
191	DRIVER Z-ARM	Y	GPAC007	Accel., 1/2 bridge	Endevco	7264-2000	G
192	PASS. X-ARM	Y	GPAC012	Accel., 1/2 bridge	Endevco	7264-2000	G
193	PASS. X-ARM	Z	GPAC001	Accel., 1/2 bridge	Endevco	7264-2000	G
194	PASS. Y-ARM	X	GPAC036	Accel., 1/2 bridge	Endevco	7264-2000	G
195	PASS. Y-ARM	Z	GPAC014	Accel., 1/2 bridge	Endevco	7264-2000	G
196	PASS. Z-ARM	X	GPAC030	Accel., 1/2 bridge	Endevco	7264-2000	G
197	PASS. Z-ARM	Y	GPAC037	Accel., 1/2 bridge	Endevco	7264-2000	G

APPENDIX E

DUMMY CALIBRATION DATA

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

Test Date: 1/9/04

ATD Serial No.: 034

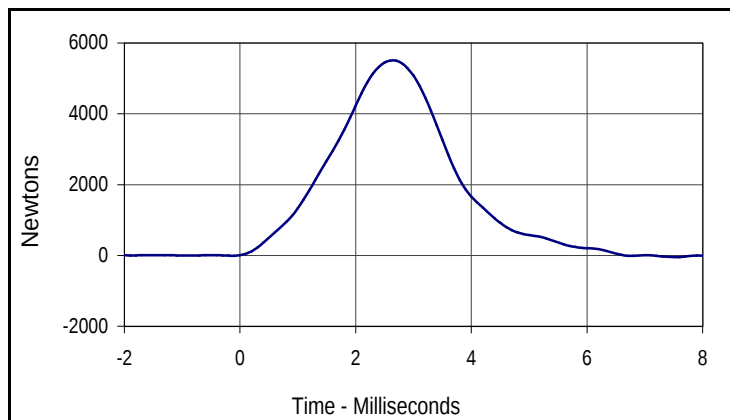
Test I.D.: LK03A , RK03A

**Left Knee**

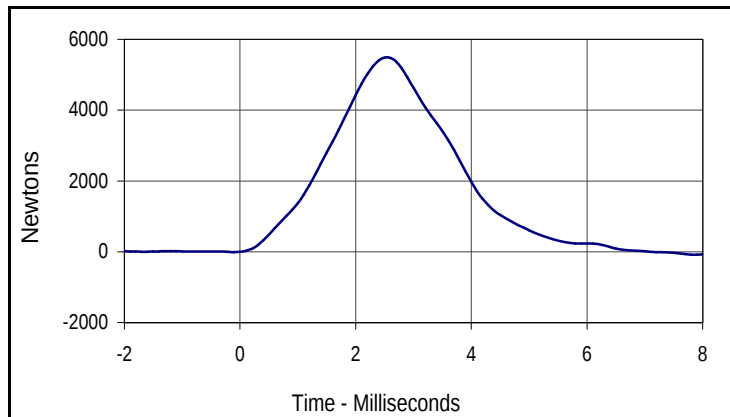
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5503	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5486	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5503.4	2.6	-50.0	7.5

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5486.4	2.5	-102.9	9.4

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

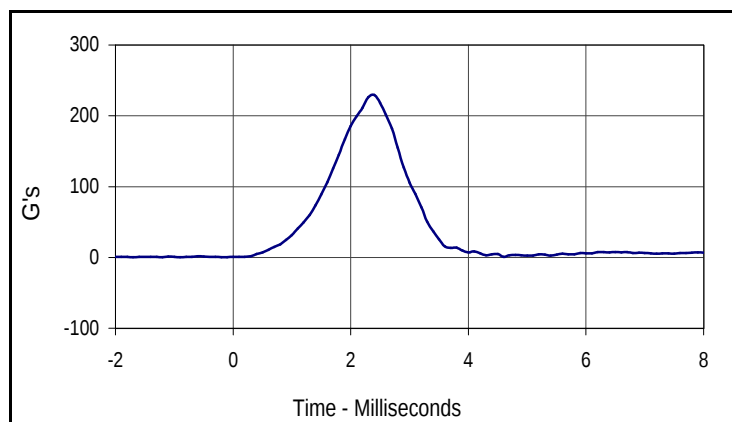
Test Date: 1/9/04

ATD Serial No.: 034

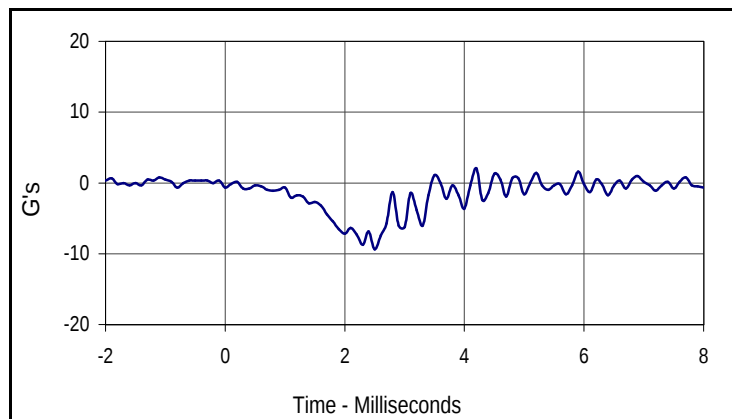
Test I.D.: HD03A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	229.7	Pass
Peak Lateral Acceleration	G's	≤15.0	9.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
229.7	2.4	0.2	-0.2



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.1	4.2	-9.4	2.5

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

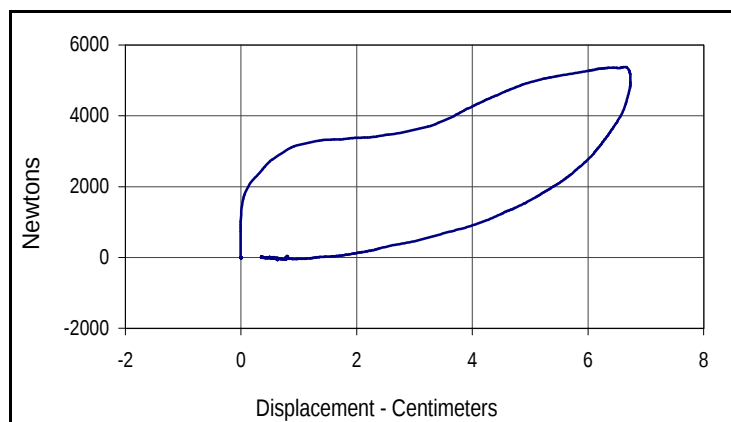
Test Date: 1/10/04

ATD Serial No.: 034

Test I.D.: CH03A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.60	Pass
Peak Probe Force	Newtons	5159 to 5893	5378	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.74	Pass
Internal Hysteresis	%	69 to 85	74.0	Pass
Overall Test Results				Pass



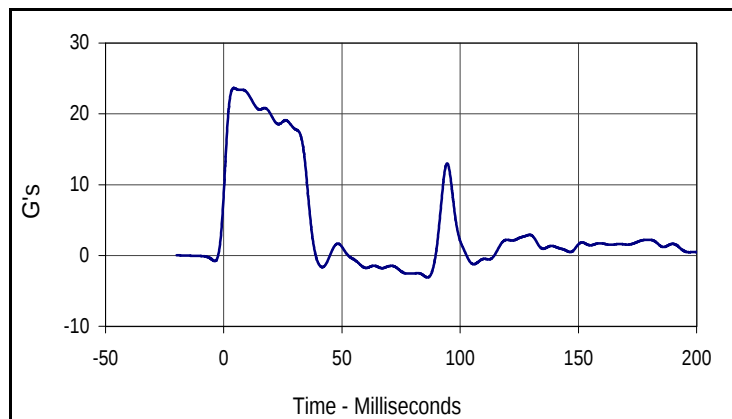
Curve Description			
Probe Force vs. Chest Displacement			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	74.0
Peak Probe Force		Peak Chest Displ.	
5378.1		6.74	

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

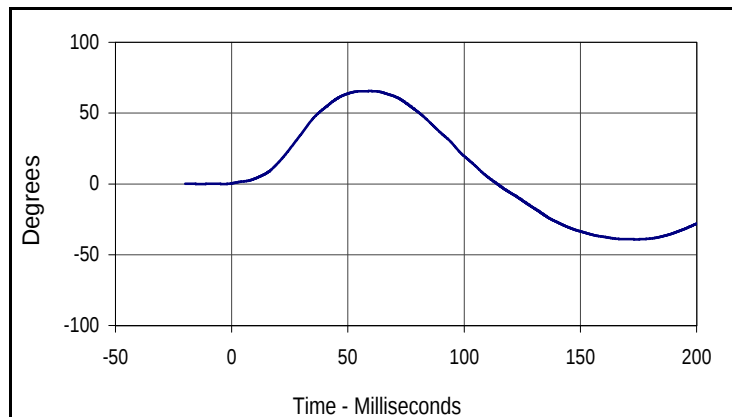
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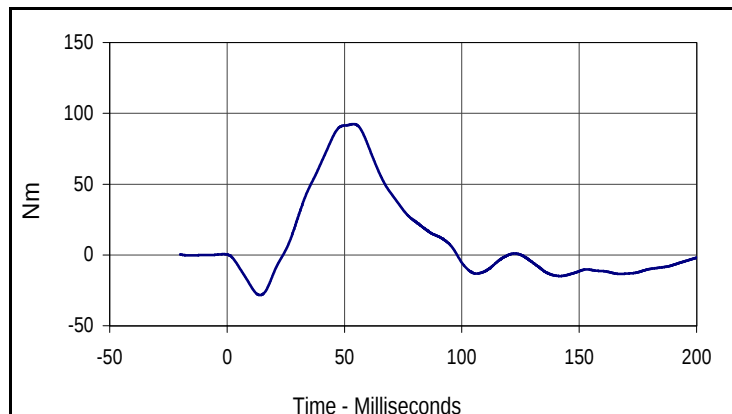
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.11	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.0	Pass
	20 Msec.	G's	17.6 to 22.6	19.9	Pass
	30 Msec.	G's	12.5 to 18.5	17.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	65.5	Pass
	Time	Msec.	57.0 to 64.0	59.8	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	114.2	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	92.4	Pass
	Time	Msec.	47.0 to 58.0	53.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.7	4.2	-3.1	86.2



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
65.5	59.8	-39.1	174.3



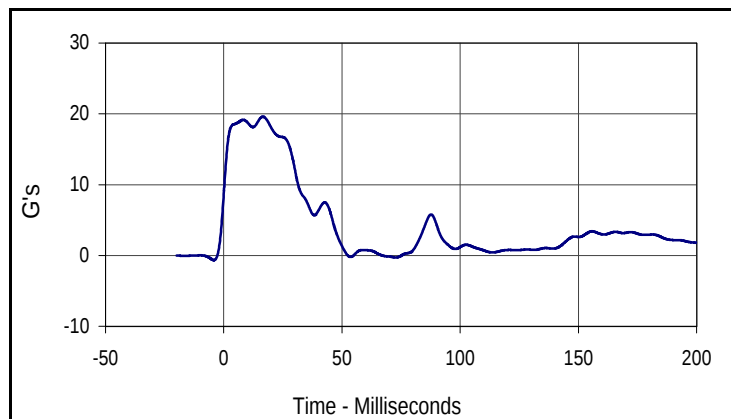
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
92.4	53.9	-28.4	14.0

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

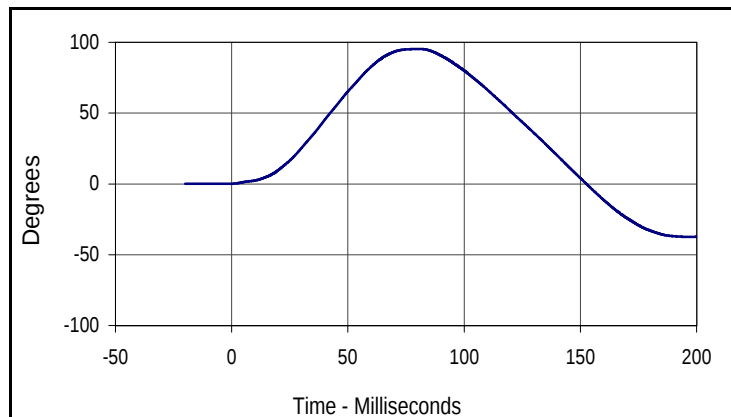
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 Test I.D.: NE03A



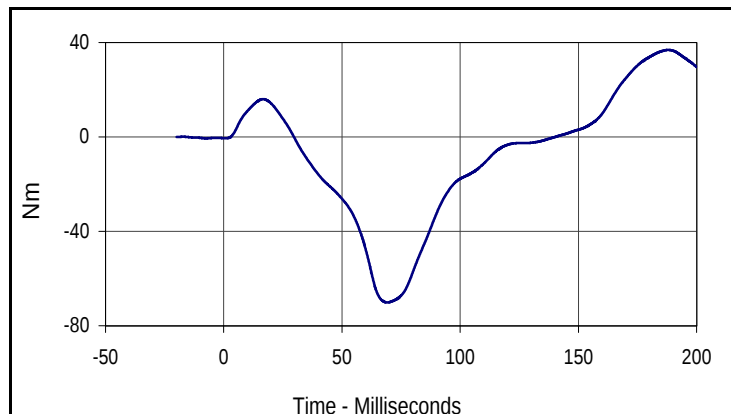
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.97	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.8	Pass
	20 Msec.	G's	14.0 to 19.0	18.1	Pass
	30 Msec.	G's	11.0 to 16.0	12.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	12.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	46.0	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	95.3	Pass
	Time	Msec.	72.0 to 82.0	81.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	152.7	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-70.1	Pass
	Time	Msec.	65.0 to 79.0	69.2	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	140.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.6	16.6	-0.7	-4.2



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
95.3	81.0	-37.3	196.0



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
36.9	188.0	-70.1	69.2

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 1/10/04

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	880	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	153	Pass
G - Elbow back to wrist pivot	mm	290 to 305	298	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	210	Pass
K - Buttock to knee length	mm	579 to 604	580	Pass
L - Popliteal length	mm	429 to 455	445	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock popliteal length	mm	452 to 477	455	Pass
O - Chest depth	mm	213 to 229	220	Pass
P - Foot length	mm	251 to 267	265	Pass
V - Shoulder breadth	mm	422 to 437	425	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	985	Pass
Z - Waist circumference	mm	836 to 866	840	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass

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

Test Date: 1/9/04

ATD Serial No.: 035

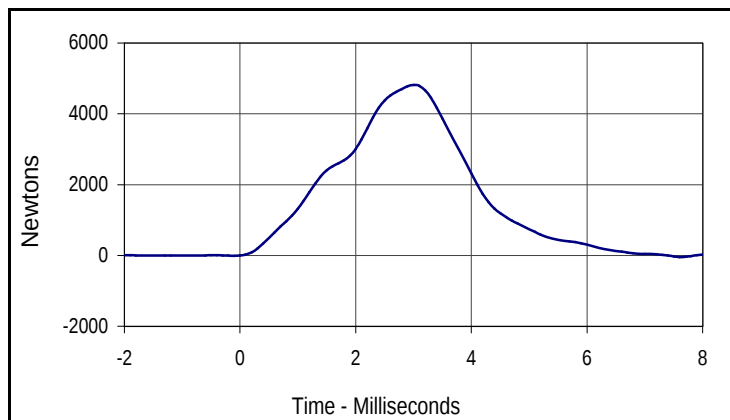
Test I.D.: LK03B , RK03B

**Left Knee**

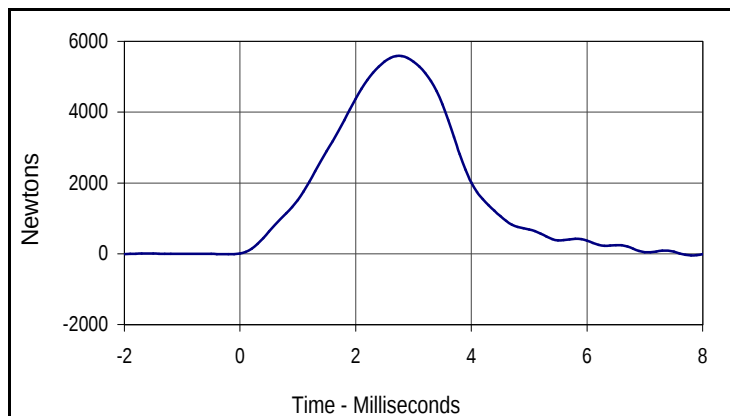
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	4815	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5584	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4815.5	3.0	-47.4	8.4

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5584.4	2.7	-112.6	9.3

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

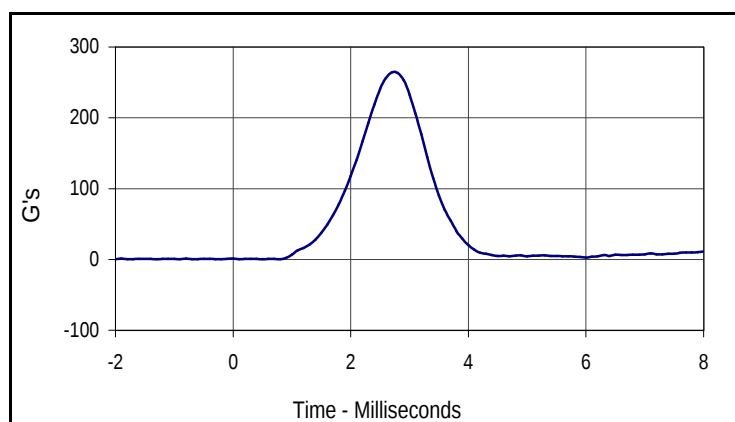
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ATD Serial No.: 035

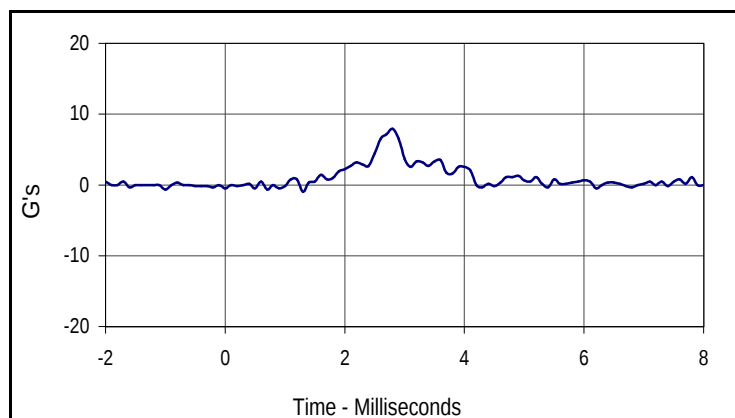
Test I.D.: HD03B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	264.4	Pass
Peak Lateral Acceleration	G's	≤15.0	8.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
264.4	2.7	0.2	-0.9



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
8.0	2.8	-1.0	1.3

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

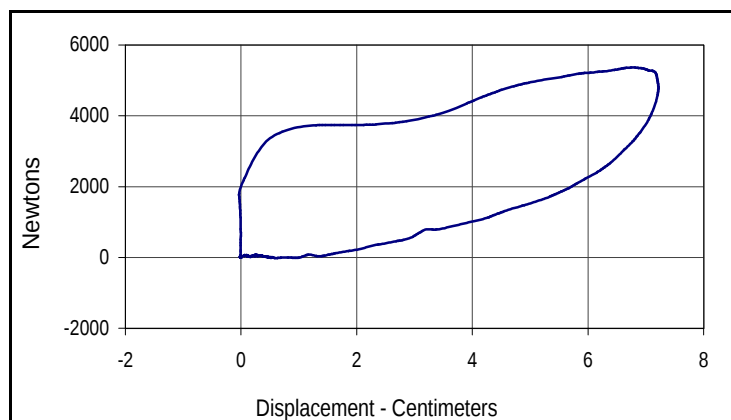
Test Date: 1/10/04

ATD Serial No.: 035

Test I.D.: CH03B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.74	Pass
Peak Probe Force	Newtons	5159 to 5893	5367	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	7.22	Pass
Internal Hysteresis	%	69 to 85	73.3	Pass
Overall Test Results				Pass



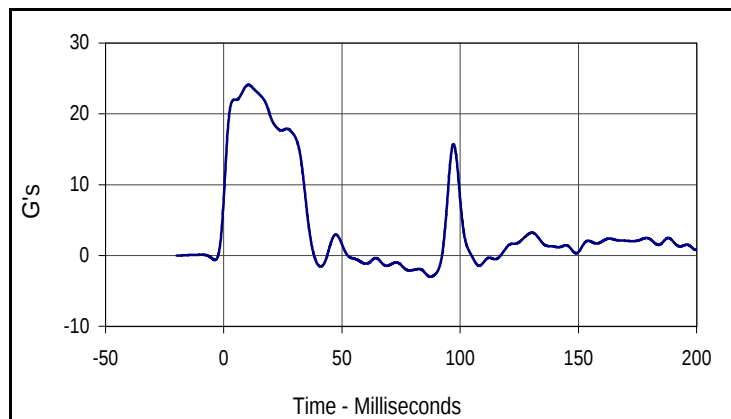
Curve Description			
Probe Force vs. Chest Displacement			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	73.3
Peak Probe Force		Peak Chest Displ.	
5366.8		7.22	

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

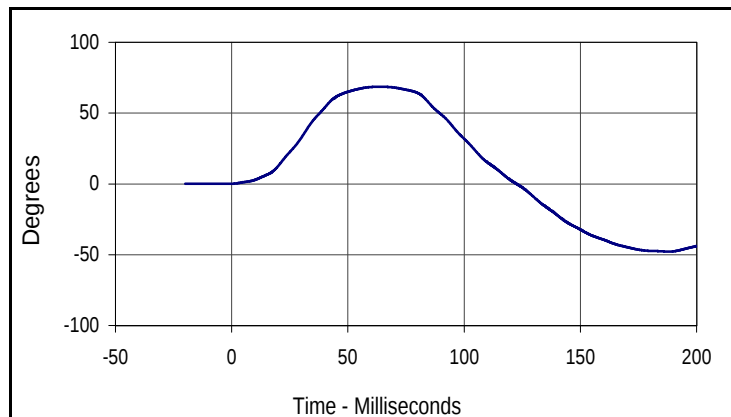
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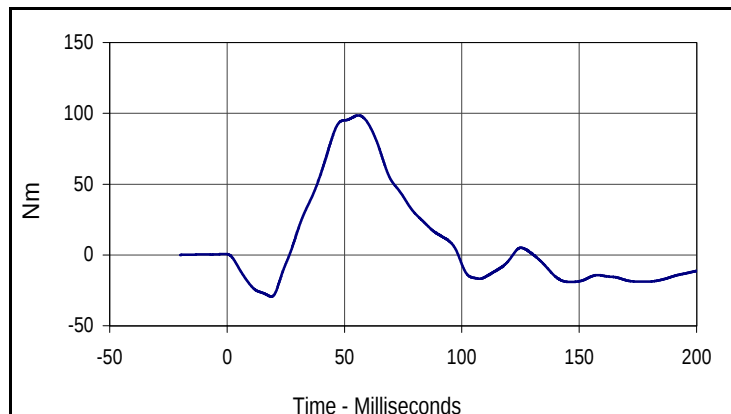
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.12	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.1	Pass
	20 Msec.	G's	17.6 to 22.6	19.4	Pass
	30 Msec.	G's	12.5 to 18.5	16.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	16.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	68.6	Pass
	Time	Msec.	57.0 to 64.0	63.4	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	122.5	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	98.5	Pass
	Time	Msec.	47.0 to 58.0	55.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.1	10.4	-3.0	87.4



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
68.6	63.4	-47.8	188.1



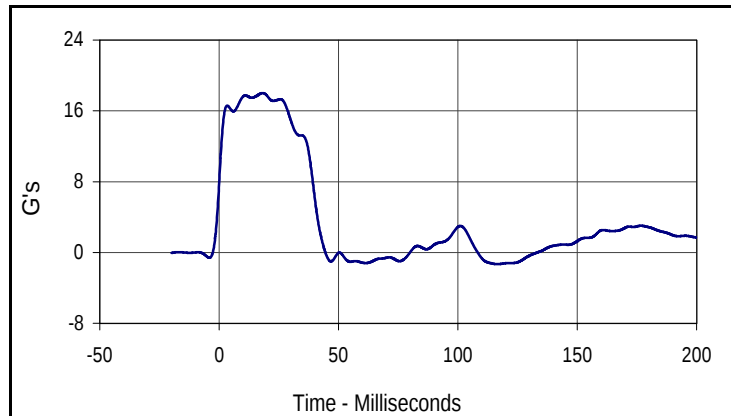
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
98.5	55.9	-29.4	18.8

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

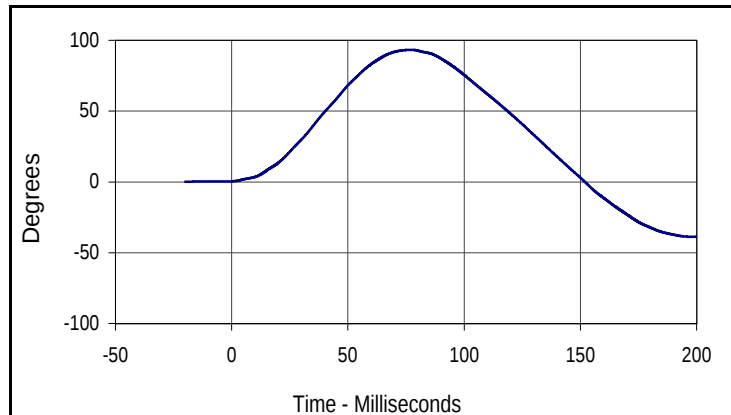
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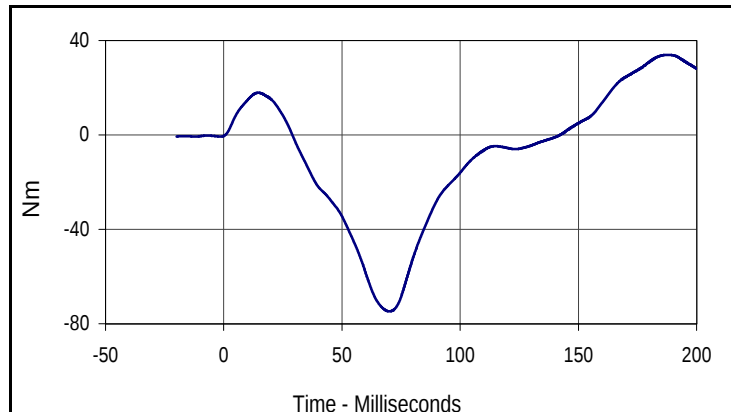
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.16	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.6	Pass
	20 Msec.	G's	14.0 to 19.0	17.7	Pass
	30 Msec.	G's	11.0 to 16.0	14.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	40.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	93.3	Pass
	Time	Msec.	72.0 to 82.0	76.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	152	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-74.7	Pass
	Time	Msec.	65.0 to 79.0	70.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	142.3	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.0	18.2	-1.3	116.5



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
93.3	76.9	-38.8	200.0



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	60	Nm
Max	Time	Min	Time
33.9	187.7	-74.7	70.1

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 1/10/04

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	880	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	155	Pass
G - Elbow back to wrist pivot	mm	290 to 305	295	Pass
H - Skull cap to back line	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	340	Pass
J - Elbow rest height	mm	190 to 211	210	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	445	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	255	Pass
V - Shoulder breadth	mm	422 to 437	425	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	1000	Pass
Z - Waist circumference	mm	836 to 866	860	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	228	Pass
Overall Test Results				Pass

APPENDIX F

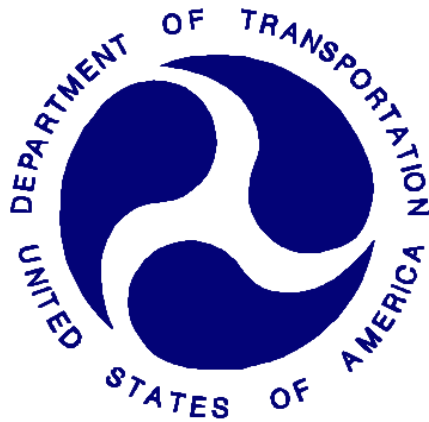
CHILD RESTRAINT SYSTEM

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

TOYOTA MOTOR CORPORATION
2004 LEXUS ES 330
4 DOOR SEDAN

NHTSA NUMBER: M45104

PREPARED BY:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301



1/28/04

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590

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Prepared by: _____
Mr. James E. Gorth, Project Engineer
KARCO Engineering, LLC

Date: February 4, 2004

Reviewed by: _____
Mr. Jerry L. Kratzke, Director of Operations
KARCO Engineering, LLC

Date: February 4, 2004

Approved by: _____
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

Date: February 4, 2004

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

Technical Report Documentation Page

1. Report No. TR-P24001-11-NC	2. Government Accession No.	3. Recipients Catalog No.		
4. Title and Subtitle Final Report of New Car Assessment Program Testing of a 2004 Lexus ES 330 4 Door Sedan NHTSA No. M45104		5. Report Date February 4, 2004		
		6. Performing Organization Code		
7. Authors Mr. James E. Gorth, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco		8. Performing Organization Report No. TR-P24001-11-NC		
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301		10. Work Unit No.		
		11. Contract or Grant No. DTNH22-01-D-02005		
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NPS-111 400 Seventh Street, SW, Room 5311 Washington, D.C 20590		13. Type of Report and Period Covered Final Test Report Option Year 3		
		14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS		
15. Supplementary Notes				
16. Abstract A frontal test was conducted on the subject CRS's Evenflo Vanguard 5 Convertible and a Britax Roundabout Convertible in conjunction with frontal NCAP testing on a 2004 Lexus ES 330 4 Door Sedan and in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at Karco Engineering, LLC on January 28, 2003.				
Measurement Description	Units		Left Rear	Right Rear
Head Injury Criteria (HIC) 36	N/A		1268.0	721.2
Head Injury Criteria (HIC) 15	N/A		1010.8	462.5
3 msec. Chest Clip	G's		50.0	51.2
Peak Chest Displacement	mm		-17.3	-12.7
17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2004 Lexus ES 330 4 Door Sedan NHTSA No. M45104			18. Distribution of Statement Copies of this report available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5108 Washington, D.C. 20590	
19. Security Classification (this report) Unclassified	20. Security Classification (this page) Unclassified	21. No. of Pages 148	22. Price	

Form DOT F1700.7 (8-72)

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SECTION F-1

PURPOSE AND SUMMARY OF TEST M45104

The purpose of this test is to obtain CRS performance data during an NCAP (35mph) frontal impact test.

The 55.62 km/h NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

Two three-year-old child dummies were instrumented with head, chest, and pelvic triaxial accelerometers. In addition chest displacement and upper and lower six axial neck force and moment load cell sensors were utilized. Triaxial accelerometers were installed on the CRS.

The right rear (Position 3) child dummy (Serial No. 139) and the left rear (Position 4) child dummy (Serial No. 082) were calibrated prior to this test. Child dummy certification information is found in Section F-5.

CHILD DUMMY VALUES

Location	HIC 36 Values	HIC 15 Values	3 Msec. Chest Clip	Peak Chest Disp.
Right Rear Child	721.2	462.5	51.2	-12.7
Left Rear Child	1268.0	1010.8	50.0	-17.3

SECTION F-1**DATA SHEET NO.1.....CRASH TEST SUMMARY**Test Vehicle: 2004 Lexus ES 330 4 Door SedanNHTSA No.: M45104Test Program 2004 NHTSA 35mph NCAPTest Date: 1/28/04**CHILD RESTRAINT SYSTEM INFORMATION**

Description	Position # 3 CRS	Position #4 CRS
Manufacturer	Evenflo	Britax
Model Name	Vanguard 5	Roundabout
Serial No.	3691261 P1	E9L02400562
Type	Convertible	Convertible
Forward/Rearward	Forward	Forward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS	Position #4 CRS
Head Contact	None	Chin,retainer clip, chest
Chest Contact	None	None
Abdomen Contact	None	None
Left Knee Contact	None	None
Right Knee Contact	None	None
Left Toe Contact	Seatback	Seatback
Right Toe Contact	Seatback	Seatback
Ret. Clip Movement	None	None
Harness Stretch	None	None
Movement Amount	None	None

POST TEST DOOR OPENINGS

Description	Position #3 CRS	Position #4 CRS
Left Side Doors	Remained closed/latched, opened w/o aid of tools	Remained closed/latched, opened w/o aid of tools
Right Side Doors	Remained closed/latched, opened w/o aid of tools	Remained closed/latched, opened w/o aid of tools
Hatch/Other Door	N/A	N/A

POST TEST SEAT DATA

Location	Seat Movement (mm)	Seat Back Failure
Left Front	None	None
Right Front	None	None
Left Rear	70mm	None
Right Rear	None	None

CAMERA COVERAGE

High Speed	2
Real Time	1
Total	3

SECTION F-1**DATA SHEET NO.2.....CRS PARAMETER DATA**Test Vehicle: 2004 Lexus ES 330 4 Door SedanNHTSA No.: M45104Test Program 2004 NHTSA 35mph NCAPTest Date: 1/28/04**TEST VEHICLE WEIGHTS**

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	480	310		523	394	
Right	kg	482	311		508	370	
Ratio	%	60.8	39.2		57.4	42.6	
Totals	kg	962	621	1583	1031	764	1795

TARGET TEST WEIGHT CALCULATION

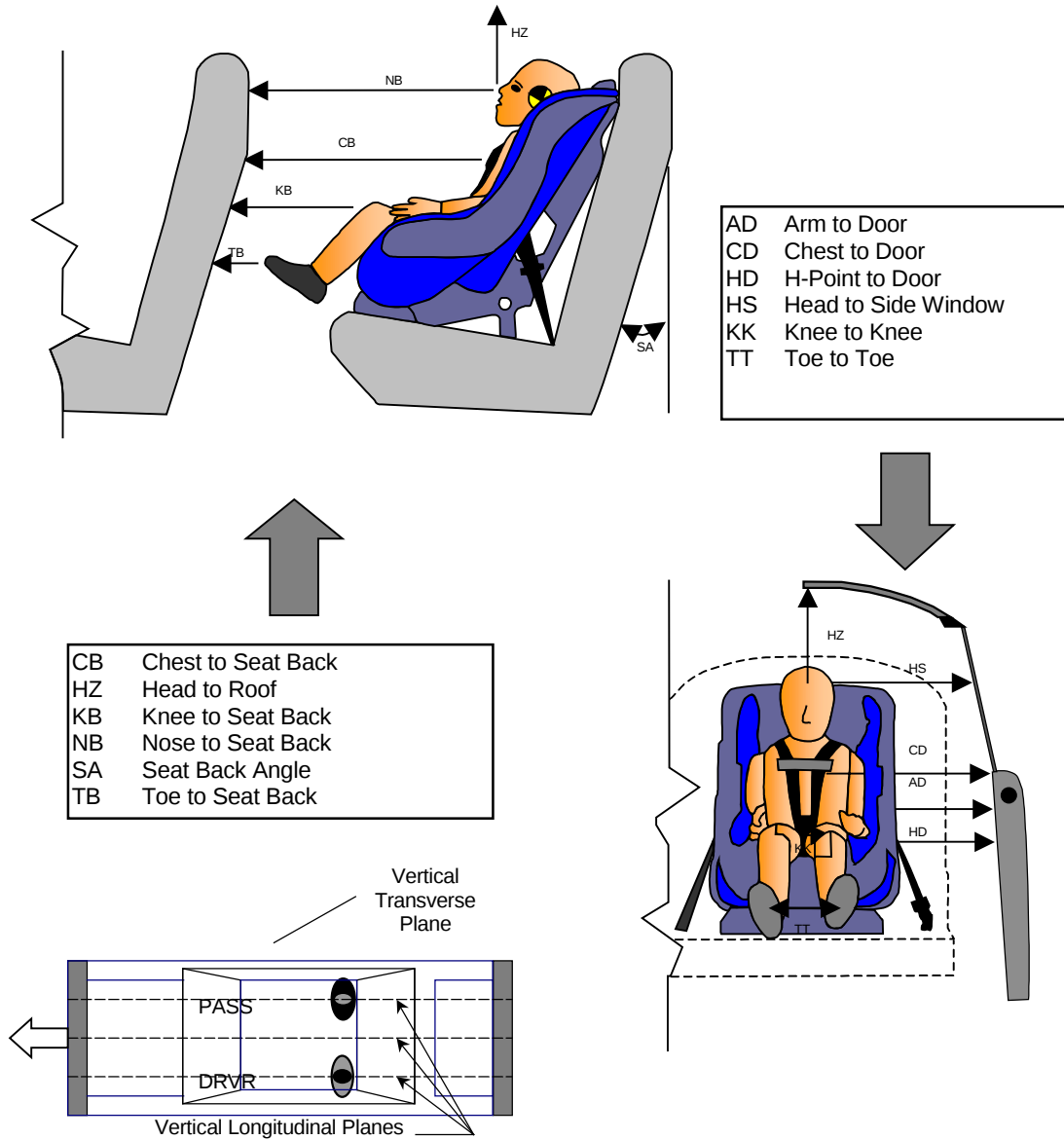
Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1583
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	68
Calculated Vehicle Target Wt. (TVTW)	kg	1803

SECTION F-1

DATA SHEET NO.3.....CHILD DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

SECTION F-1

DATA SHEET NO.3.....CHILD DUMMY POSITIONING IN VEHICLE...(continued)

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

CHILD DUMMY POSITION MEASUREMENTS

Code	Measurement	Units	P3 CRS Serial No. 139			P4 CRS Serial No. 082			
			Pre-Test	Post-Test	Diff.	Pre-Test	Post-Test	Diff.	
SA	Seat Back Angle	deg.	28	28		28	28		
HZ	Head to Roof (Z)	mm	330	310	-20	342	275	-67	
CD	Chest to Door	mm	395	375	-20	392	365	-27	
KK	Knee to Knee (Y)	mm	210	187	-23	215	230	15	
HS	Head to Side Window	mm	375	355	-20	405	370	-35	
HD	H-Point to Door (Y)	mm	308	320	12	315	300	-15	
AD	Arm to Door	mm	250	250	0	252	236	-16	
NB	Nose to Seat Back	mm	587	650	63	590	660	70	
CB	Chest to Seat Back	mm	568	655	87	520	620	100	
FF	Foot to Foot	mm	190	180	-10	205	440	235	
KB-Left	Knee to Seat Back	mm	355	448	93	300	360	60	
KB-Right	Knee to Seat Back	mm	340	420	80	285	380	95	
TB-Left	Toe to Seat Back	mm	120	165	45	100	130	30	
TB-Right	Toe to Seat Back	mm	100	120	20	108	145	37	
CCA	Car Cushion Angle	deg.	76				76		
BA	Back Angle	deg.	65				58		
SCA	Seat Cushion Angle	deg.	20				44		

DATA SHEET NO. 4 - 3 YEAR OLD HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	45.8	195.0	-50.5	98.0	38.6	192.6	-27.2	77.6
Head CG	Y	G's	36.1	97.9	-16.7	105.7	2.6	194.4	-9.1	82.9
Head CG	Z	G's	89.1	86.6	-13.4	55.9	66.7	85.7	-7.6	51.3
Head CG Resultant	N/A	G's	92.7	86.5			70.2	85.7		

PRIMARY HEAD INJURY CRITERAS (HIC)

Location	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary (HIC36)	1268.0	72.8	99.4	74.2	721.2	67.9	103.9	52.5
Head CG Primary (HIC15)	1010.8	77.5	92.5	85.3	462.5	74.7	89.7	62.4

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	9.2	168.5	-43.9	77.3	10.7	179.4	-53.1	83.6
Chest CG	Y	G's	6.2	76.1	-3.1	106.3	2.1	160.1	-7.7	84.6
Chest CG	Z	G's	31.2	90.7	-37.6	66.6	16.9	91.7	-28.8	59.5
Chest CG Resultant	N/A	G's	50.8	70.1			53.9	78.3		

PRIMARY CHEST CLIP (3MSEC)

Location	Left Rear (3 Yr.)			Right Rear (3 Yr.)		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	50.0	67.8	70.8	51.2	76.3	79.3

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	MM	0.0	4.5	-17.3	105.2	0.1	10.1	-12.7	72.8

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	18.0	117.0	-41.0	68.7	17.5	127.9	-46.8	75.0
Pelvis	Y	G's	9.1	88.8	-12.6	199.9	6.3	67.5	-5.1	54.9
Pelvis	Z	G's	24.6	92.9	-42.3	68.0	12.4	96.4	-30.6	55.1
Pelvis Resultant	N/A	G's	59.1	68.0			51.6	74.4		

DATA SHEET NO. 4...(continued)

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan

NHTSA No.: M45104

Test Program: 2004 NHTSA 35mph NCAP

Test Date: 1/28/04

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	10.5	175.2	-734.6	105.2	126.7	185.4	-630.9	77.5
Neck Force	Y	Newtons	94.3	96.0	-40.3	70.5	48.4	116.2	-151.0	83.0
Neck Force	Z	Newtons	2511.1	84.8	-380.6	55.9	1942.5	85.7	-196.3	51.3
Neck Force Resultant	N/A	Newtons	2582.0	84.9			2023.9	85.7		
Neck Moment	X	Nm	8.7	96.7	-7.6	117.1	3.7	139.4	-18.2	86.8
Neck Moment	Y	Nm	10.9	99.1	-11.8	76.9	6.9	154.4	-9.0	60.8
Neck Moment	Z	Nm	7.1	103.3	-4.8	128.5	3.9	87.8	-3.6	200.0
Neck Moment Resultant	N/A	Nm	13.5	97.5			18.6	86.8		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	275.4	196.4	-1566.6	86.8	231.5	191.6	-511.1	85.1
Neck Force	Y	Newtons	155.4	98.6	-111.2	73.7	441.1	80.6	-273.6	93.1
Neck Force	Z	Newtons	2237.4	83.3	-472.0	55.9	1174.0	85.6	-434.6	52.8
Neck Force Resultant	N/A	Newtons	2680.3	85.2			1292.4	85.6		
Neck Moment	X	Nm	20.0	96.7	-9.7	73.8	4.9	136.6	-43.9	86.9
Neck Moment	Y	Nm	99.2	90.6	-17.5	196.2	111.6	85.3	-14.2	189.5
Neck Moment	Z	Nm	13.4	97.0	-6.6	116.7	2.9	140.5	-21.2	83.9
Neck Moment Resultant	N/A	Nm	100.8	90.8			121.3	85.3		

CHILD SEAT TETHER BELT SENSOR PEAK VALUES

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Car Seat Upper Tether Force	N/A	Newtons	840.4	75.1	-59.1	101.8	2858.3	77.3	-110.8	142.5

CHILD SEAT ACCELEROMETER PEAK VALUES

Location	Axis	Units	Left Rear (3 Yr.)				Right Rear (3 Yr.)			
			Max	Time	Min	Time	Max	Time	Min	Time
Child Seat	X	G's	9.9	102.6	-47.9	59.3	9.9	105.2	-46.4	54.3
Child Seat	Y	G's	3.1	80.5	-3.3	74.4	5.9	72.8	-3.1	136.5
Child Seat	Z	G's	10.1	94.4	-8.8	199.0	12.4	127.1	-10.3	155.4
Child Seat Resultant	N/A	G's	48.0	59.3			46.5	54.2		

SECTION F-1

DATA SHEET NO.5CRS PERFORMANCE DATA

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program 2004 NHTSA 35mph NCAP

NHTSA No.: M45104
 Test Date: 1/28/04

CRS PERFORMANCE DATA

Location	P3 CRS Serial No. 139		P4 CRS Serial No. 082	
	Damage	Post-Test	Damage	Post-Test
Upper Tether Strap	N/A	N/A	N/A	N/A
Upper Tether Buckle	N/A	N/A	N/A	N/A
Upper Tether Hook	N/A	N/A	N/A	N/A
Veh. Upper Tether Anchor	N/A	N/A	N/A	N/A
Lower Anchor Strap	N/A	N/A	N/A	N/A
Lower Anchor Buckle	N/A	N/A	N/A	N/A
Lower Anchor Hooks	N/A	N/A	N/A	N/A
Veh. Lower CRS Anchors	N/A	N/A	N/A	N/A
5 Point Harness Connections	N/A	N/A	N/A	N/A
Cracks on CRS	N/A	N/A	N/A	N/A
Fabric Tears on CRS	N/A	N/A	N/A	N/A
Vehicle Seat Structure	N/A	N/A	N/A	N/A
Vehicle Seat Fabric Tears	N/A	N/A	N/A	N/A

Note: Photograph F2-33 shows damage to Position 4 Dummy of harness digging into the dummy jacket.

N/A = Due to vehicle fire prior to measurements being taken

SECTION F-1**DATA SHEET NO.6CRS CAMERA DATA**Test Vehicle: 2004 Lexus ES 330 4 Door SedanNHTSA No.: M45104Test Program 2004 NHTSA 35mph NCAPTest Date: 1/28/04**CAMERA LOCATIONS**

No.	Camera View	Location(mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Driver Side Child Dummy	2743	-610	1372	25	1260	6	1000
2	Passenger Side Child Dummy	2743	610	1372	25	1260	6	1000

X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run NTM = No Time Marks

SECTION F-2

PHOTOGRAPHS

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2	Pre-Test Frontal View of Position 3 CRS	F2-2
3	Post-Test Frontal View of Position 3 CRS	F2-3
4	Pre-Test Rear View of Position 3 CRS	F2-4
5	Post-Test Rear View of Position 3 CRS	F2-5
6	Pre-Test Left Side View of Position 3 CRS	F2-6
7	Post-Test Left Side View of Position 3 CRS	F2-7
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9	Post-Test Right Side View of Position 3 CRS	F2-9
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12	Pre-Test Position 3 Left Side View	F2-12
13	Post-Test Position 3 Left Side View	F2-13
14	Pre-Test Position 3 Right Side View	F2-14
15	Post-Test Position 3 Right Side View	F2-15
16	Post-Test Position 3 Contact Point (Back of Right Front Seat)	F2-16

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18	Pre-Test Frontal View of Position 4 CRS	F2-18
19	Post-Test Frontal View of Position 4 CRS	F2-19
20	Pre-Test Rear View of Position 4 CRS	F2-20
21	Post-Test Rear View of Position 4 CRS	F2-21
22	Pre-Test Left Side View of Position 4 CRS	F2-22
23	Post-Test Left Side View of Position 4 CRS	F2-23
24	Pre-Test Right Side View of Position 4 CRS	F2-24
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26	Pre-Test position 4 Front View	F2-26
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30	Pre-Test Position 4 Right Side View	F2-30
31	Post-Test Position 4 Right Side View	F2-31
32	Post-Test Position 4 Contact Point (Back of Left Front Seat)	F2-32
33	Post-Test Position 4 Damage	F2-33



Manufactured in 17DEC03
Model # 3691261 P1

The image shows a white, rectangular label with rounded corners, placed on a dark, textured metal surface. The label contains two lines of bold, black, sans-serif text. The first line reads 'Manufactured in 17DEC03' and the second line reads 'Model # 3691261 P1'. In the background, there are some metallic components, including a U-bolt and a nut, which are slightly out of focus.

Figure F2-1: Close-up View Position 3 CRS Label



Figure F2-2: Pre-Test Frontal View of Position 3 CRS



Figure F2-3: Post-Test Frontal View of Position 3 CRS (With Smoke Damage)



Figure F2-4: Pre-Test Rear View of Position 3 CRS



Figure F2-5: Post-Test Rear View of Position 3 CRS (With Smoke Damage)



Figure F2-6: Pre-Test Left Side View of Position 3 CRS



Figure F2-7: Post-Test Left Side View of Position 3 CRS (With Smoke Damage)



Figure F2-8: Pre-Test Right Side View of Position 3 CRS



Figure F2-9: Post-Test Right Side View of Position 3 CRS (With Smoke Damage)



Figure F2-10: Pre-Test Position 3 Front View



Figure F2-11: Post-Test Position 3 Front View



Figure F2-12: Pre-Test Position 3 Left Side View



Figure F2-13: Post-Test Position 3 Left Side View



Figure F2-14: Pre-Test Position 3 Right Side View



Figure F2-15: Post-Test Position 3 Right Side View



Figure F2-16: Post-Test Position 3 Contact Point (Back of Right Front Seat)



A close-up photograph of a white, rectangular label with rounded corners, affixed to a light-colored plastic surface. The label contains four lines of black, sans-serif text. Above the label, a piece of tan-colored fabric with yellow stitching is visible. To the right, a black cable is partially seen. The background is dark and out of focus.

RESTRAINT MODEL: E9L0240
SERIAL NUMBER: E9L02400562
MANUFACTURED IN: Sept 12, 2003
BATCH NUMBER: 504440

Figure F2-17: Close-up View Position 4 CRS Label



Figure F2-18: Pre-Test Frontal View of Position 4 CRS



Figure F2-19: Post-Test Front View of Position 4 CRS (With Smoke Damage)



Figure F2-20: Pre-Test Rear View of Position 4 CRS



Figure F2-21: Post-Test Rear View of Position 4 CRS (With Smoke Damage)



Figure F2-22: Pre-Test Left Side View of Position 4 CRS



Figure F2-23: Post-Test Left Side View of Position 4 CRS (With Smoke Damage)



Figure F2-24: Pre-Test Right Side View of Position 4 CRS



Figure F2-25: Post-Test Right Side View of Position 4 CRS (With Smoke Damage)



Figure F2-26: Pre-Test Position 4 Front View



Figure F2-27: Post-Test Position 4 Front View



Figure F2-28: Pre-Test Position 4 Left Side View



Figure F2-29: Post-Test Position 4 Left Side View



Figure F2-30: Pre-Test Position 4 Right Side View



Figure F2-31: Post-Test Position 4 Right Side View



Figure F2-32: Post-Test Position 4 Contact Point (Back of Left Front Seat)



Figure F2-33: Post-Test Position 4 Damage

SECTION F-3

CHILD DUMMY RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS #4

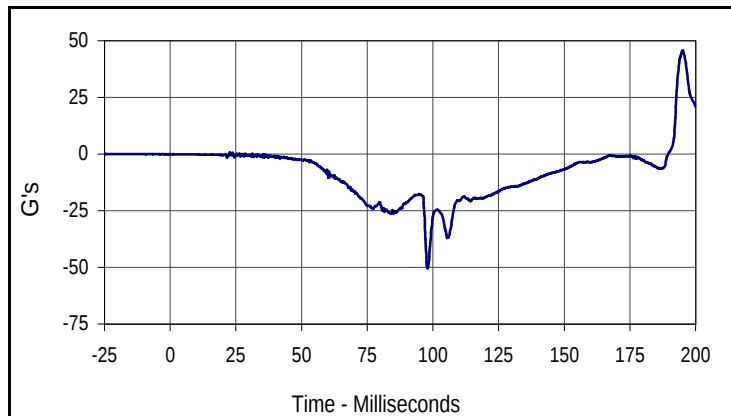
Data Plot	Page
F3-1	Left Rear (3yr. old) Head X
	F3-1
	Left Rear (3yr. old) Head Y
	F3-1
	Left Rear (3yr. old) Head Z
	F3-1
	Left Rear (3yr. old) Head Resultant
	F3-1
F3-2	Left Rear (3yr. old) Upper Neck Force X
	F3-2
	Left Rear (3yr. old) Upper Neck Force Y
	F3-2
	Left Rear (3yr. old) Upper Neck Force Z
	F3-2
	Left Rear (3yr. old) Upper Neck Force Resultant
	F3-2
F3-3	Left Rear (3yr. old) Upper Neck Moment X
	F3-3
	Left Rear (3yr. old) Upper Neck Moment Y
	F3-3
	Left Rear (3yr. old) Upper Neck Moment Z
	F3-3
	Left Rear (3yr. old) Upper Neck Moment Resultant
	F3-3
F3-4	Left Rear (3yr. old) Lower Neck Force X
	F3-4
	Left Rear (3yr. old) Lower Neck Force Y
	F3-4
	Left Rear (3yr. old) Lower Neck Force Z
	F3-4
	Left Rear (3yr. old) Lower Neck Force Resultant
	F3-4
F3-5	Left Rear (3yr. old) Lower Neck Moment X
	F3-5
	Left Rear (3yr. old) Lower Neck Moment Y
	F3-5
	Left Rear (3yr. old) Lower Neck Moment Z
	F3-5
	Left Rear (3yr. old) Lower Neck Moment Resultant
	F3-5
F3-6	Left Rear (3yr. old) Chest X
	F3-6
	Left Rear (3yr. old) Chest Y
	F3-6
	Left Rear (3yr. old) Chest Z
	F3-6
	Left Rear (3yr. old) Chest Resultant
	F3-6
F3-7	Left Rear (3yr. old) Chest Displacement
	F3-7
F3-8	Left Rear (3yr. old) Pelvis X
	F3-8
	Left Rear (3yr. old) Pelvis Y
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	F3-10
	Left Rear Car Seat Z
	F3-10
	Left Rear Car Seat Resultant
	F3-10

LIST OF DATA PLOTS #3

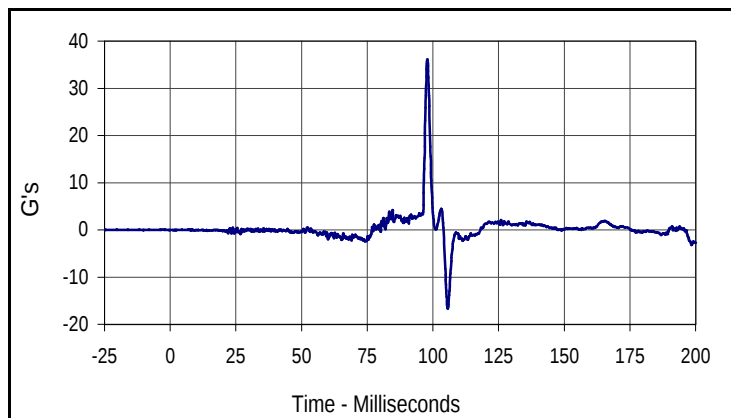
<u>Data Plot</u>		<u>Page</u>
F3-11	Right Rear Child (3 yr. old) Head X	F3-11
	Right Rear Child (3 yr. old) Head Y	F3-11
	Right Rear Child (3 yr. old) Head Z	F3-11
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F3-12	Right Rear Child (3 yr. old) Upper Neck Force X	F3-12
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	Right Rear Child (3 yr. old) Lower Neck Force Z	F3-14
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	Right Rear Child (3 yr. old) Lower Neck Moment Y	F3-15
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F3-19	Right Rear Child (3 yr. old) Car Seat Upper Tether Force	F3-19
F3-20	Right Rear Child (3 yr. old) Car Seat X	F3-20
	Right Rear Child (3 yr. old) Car Seat Y	F3-20
	Right Rear Child (3 yr. old) Car Seat Z	F3-20
	Right Rear Child (3 yr. old) Car Seat Resultant	F3-20

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

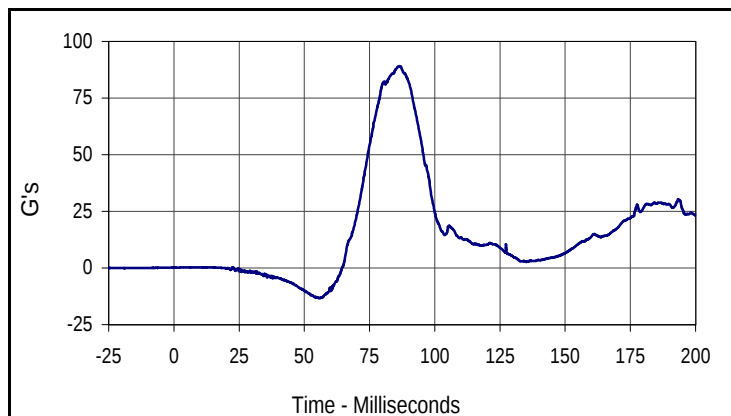
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 NHTSA No.: M45104



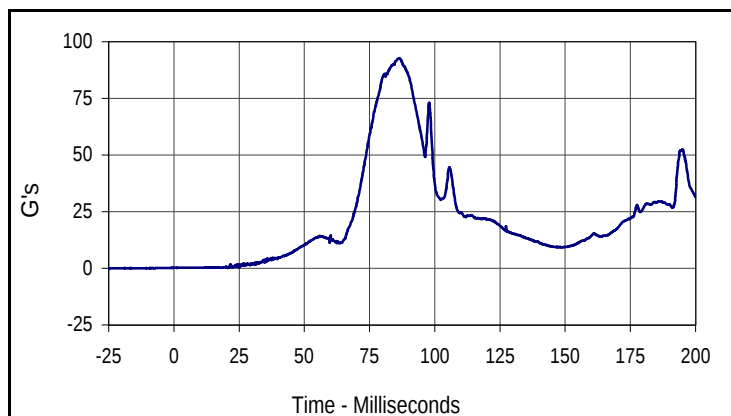
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Left Rear (3 Yr.) Head X			
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134	FIL	1000	G's
Max	Time	Min	Time
45.8	195.0	-50.5	98.0



Curve Description			
Left Rear (3 Yr.) Head Y			
CURNO	Type	SAE Class	Units
135	FIL	1000	G's
Max	Time	Min	Time
36.1	97.9	-16.7	105.7



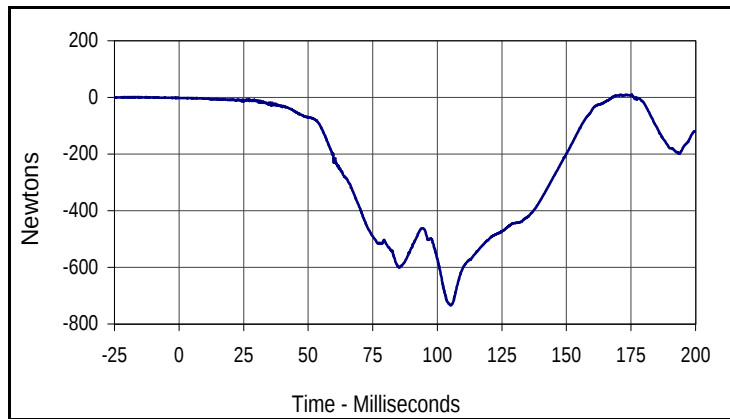
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Left Rear (3 Yr.) Head Z			
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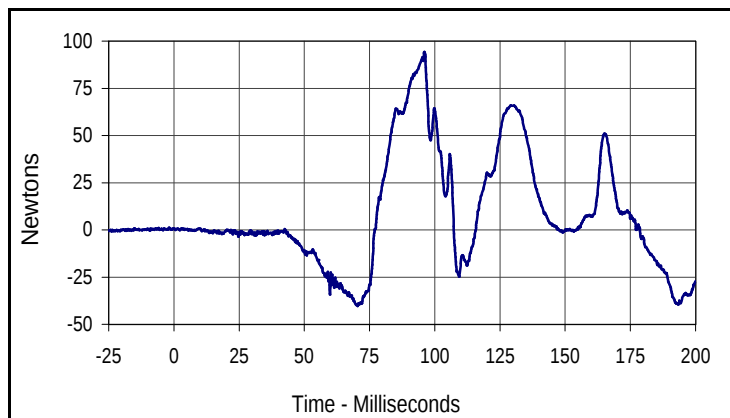
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Left Rear (3 Yr.) Head Resultant			
CURNO	Type	SAE Class	Units
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Max	Time	Min	Time
92.7	86.5	0.2	1.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

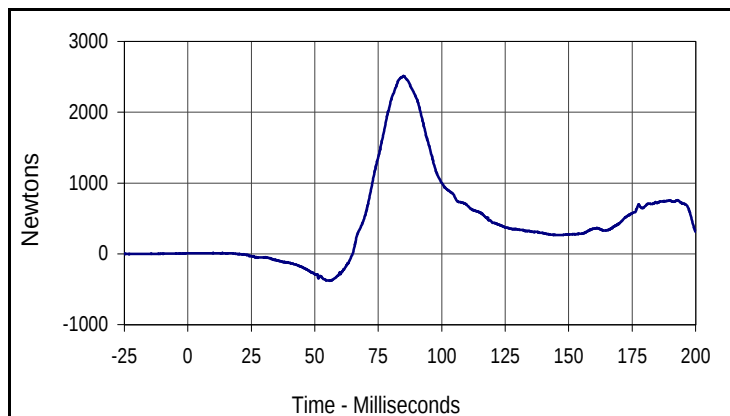
Test Date: 1/28/04
 NHTSA No.: M45104



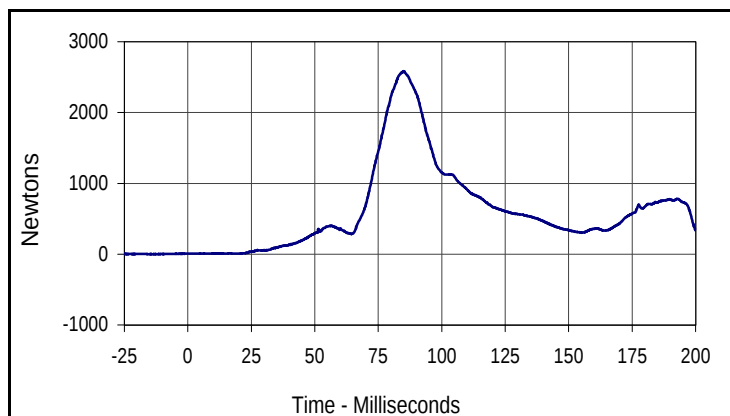
Curve Description			
Left Rear (3 Yr.) Upper Neck Force X			
CURNO	Type	SAE Class	Units
137	FIL	1000	Newtons
Max	Time	Min	Time
10.5	175.2	-734.6	105.2



Curve Description			
Left Rear (3 Yr.) Upper Neck Force Y			
CURNO	Type	SAE Class	Units
138	FIL	1000	Newtons
Max	Time	Min	Time
94.3	96.0	-40.3	70.5



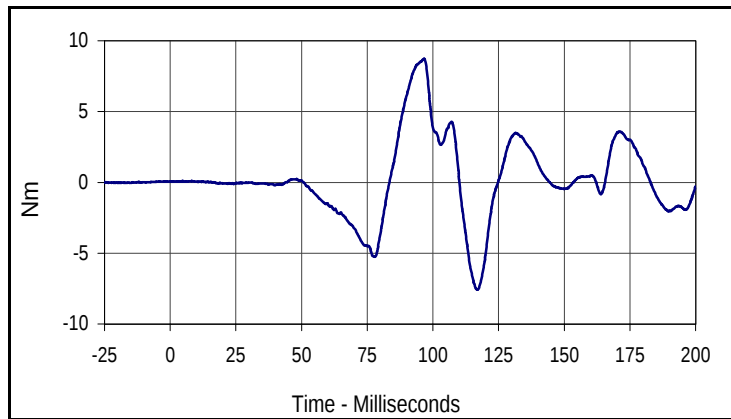
Curve Description			
Left Rear (3 Yr.) Upper Neck Force Z			
CURNO	Type	SAE Class	Units
139	FIL	1000	Newtons
Max	Time	Min	Time
2511.1	84.8	-380.6	55.9



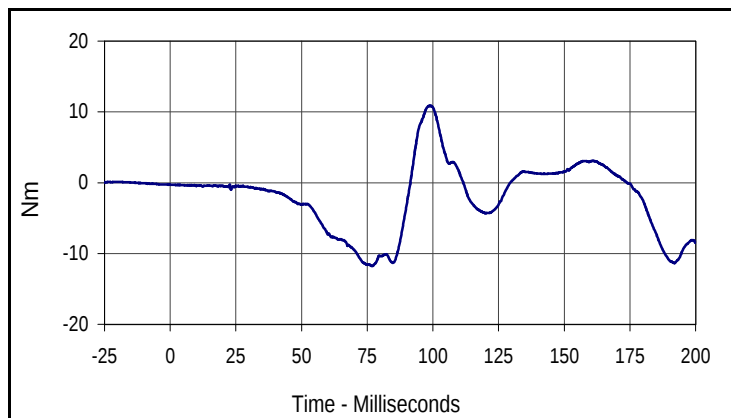
Curve Description			
Left Rear (3 Yr.) Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
137	RES	1000	Newtons
Max	Time	Min	Time
2582.0	84.9	6.3	0.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

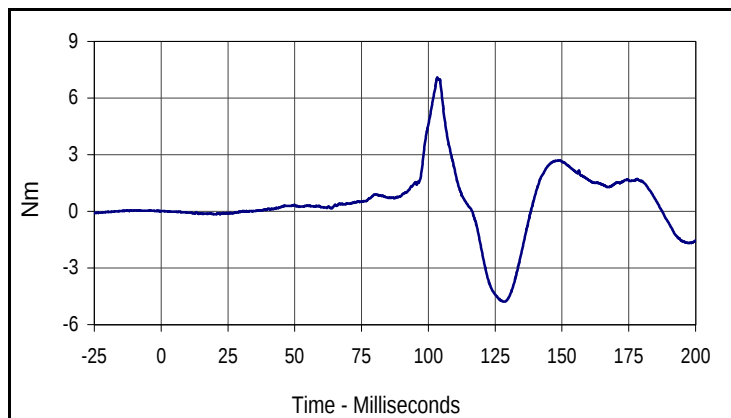
Test Date: 1/28/04
 NHTSA No.: M45104



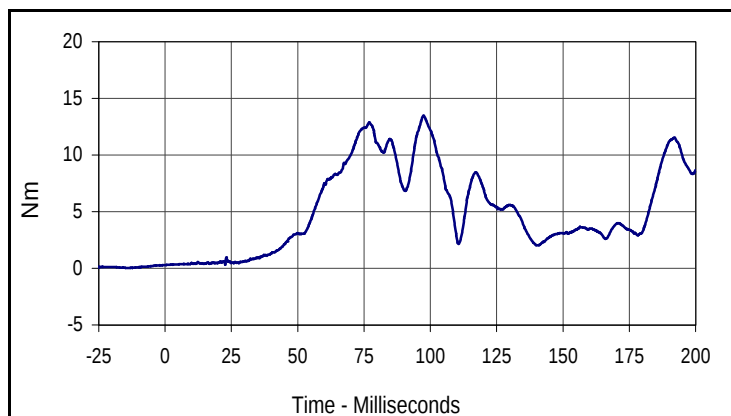
Curve Description			
Left Rear (3 Yr.) Upper Neck Moment X			
CURNO	Type	SAE Class	Units
140	FIL	600	Nm
Max	Time	Min	Time
8.7	96.7	-7.6	117.1



Curve Description			
Left Rear (3 Yr.) Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
141	FIL	600	Nm
Max	Time	Min	Time
10.9	99.1	-11.8	76.9



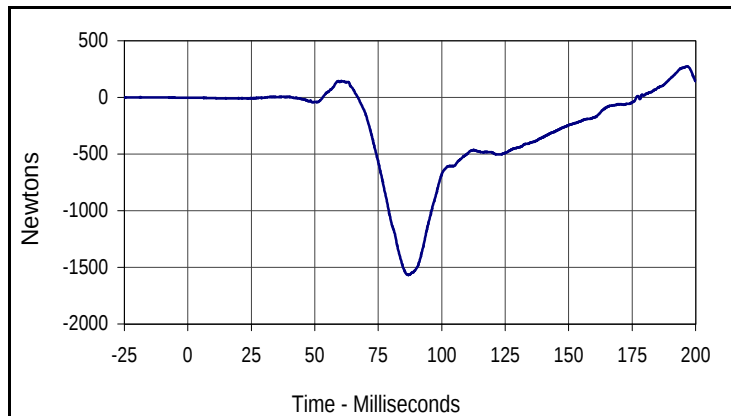
Curve Description			
Left Rear (3 Yr.) Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
142	FIL	600	Nm
Max	Time	Min	Time
7.1	103.3	-4.8	128.5



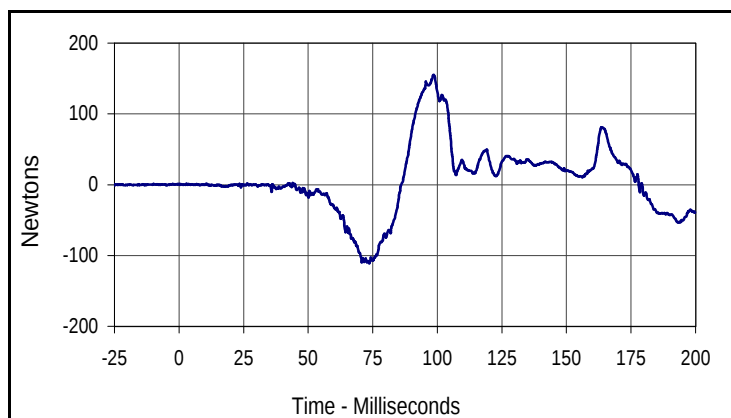
Curve Description			
Left Rear (3 Yr.) Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
140	RES	600	Nm
Max	Time	Min	Time
13.5	97.5	0.3	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

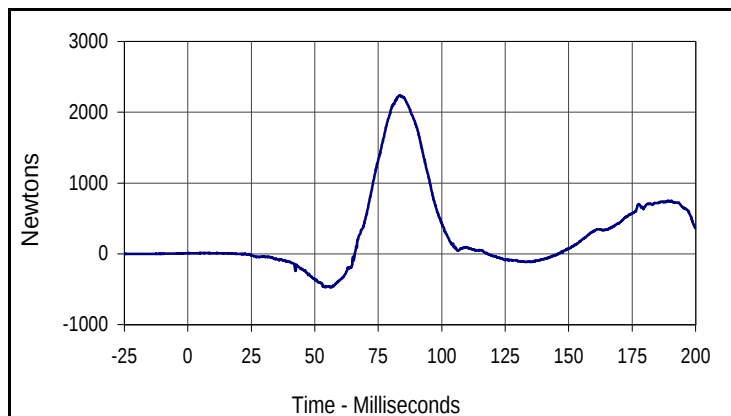
Test Date: 1/28/04
 NHTSA No.: M45104



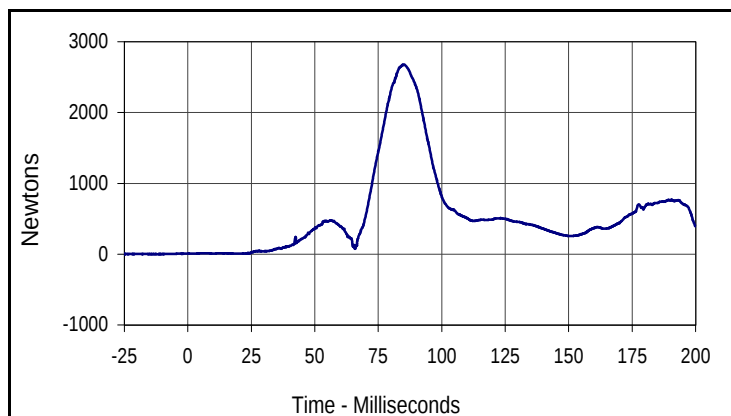
Curve Description			
Left Rear (3 Yr.) Lower Neck Force X			
CURNO	Type	SAE Class	Units
143	FIL	1000	Newtons
Max	Time	Min	Time
275.4	196.4	-1566.6	86.8



Curve Description			
Left Rear (3 Yr.) Lower Neck Force Y			
CURNO	Type	SAE Class	Units
144	FIL	1000	Newtons
Max	Time	Min	Time
155.4	98.6	-111.2	73.7



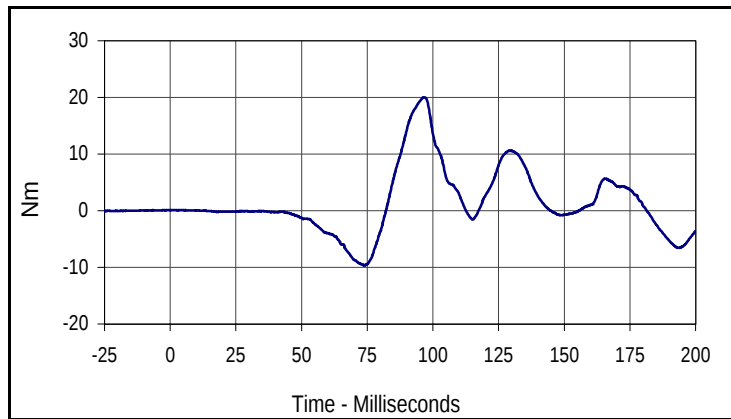
Curve Description			
Left Rear (3 Yr.) Lower Neck Force Z			
CURNO	Type	SAE Class	Units
145	FIL	1000	Newtons
Max	Time	Min	Time
2237.4	83.3	-472.0	55.9



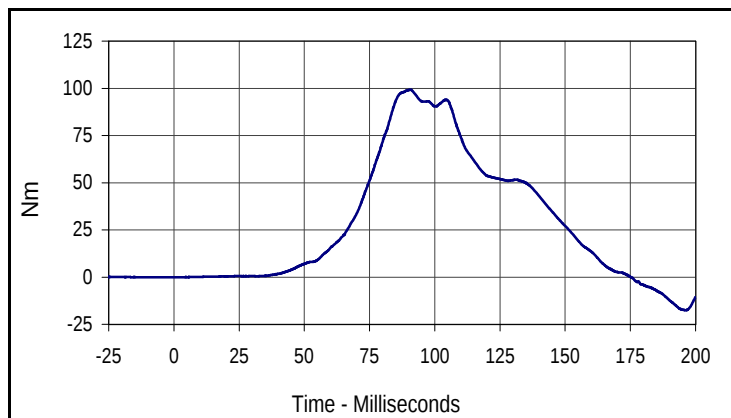
Curve Description			
Left Rear (3 Yr.) Lower Neck Force Res.			
CURNO	Type	SAE Class	Units
143	RES	1000	Newtons
Max	Time	Min	Time
2680.3	85.2	7.0	20.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

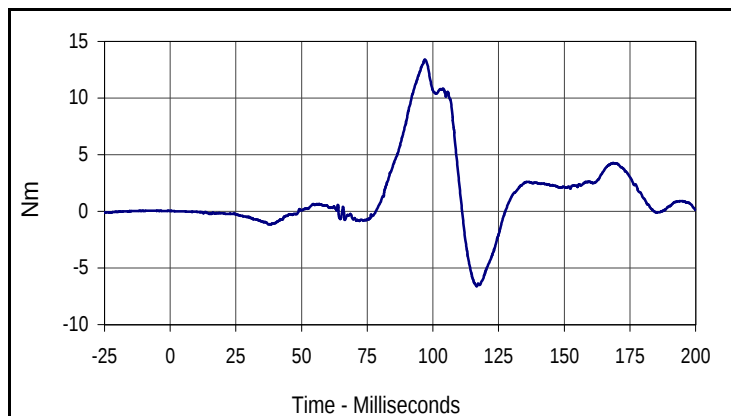
Test Date: 1/28/04
 NHTSA No.: M45104



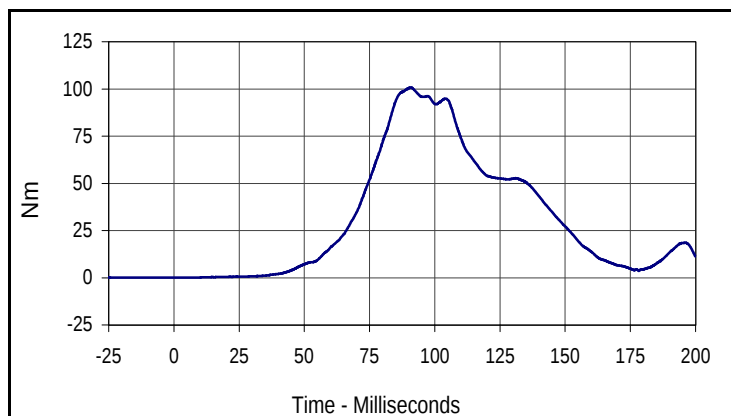
Curve Description			
Left Rear (3 Yr.) Lower Neck Moment X			
CURNO	Type	SAE Class	Units
146	FIL	600	Nm
Max	Time	Min	Time
20.0	96.7	-9.7	73.8



Curve Description			
Left Rear (3 Yr.) Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
147	FIL	600	Nm
Max	Time	Min	Time
99.2	90.6	-17.5	196.2



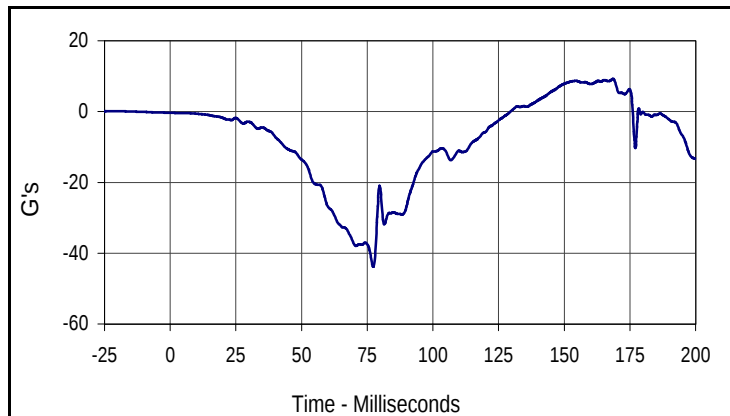
Curve Description			
Left Rear (3 Yr.) Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
148	FIL	600	Nm
Max	Time	Min	Time
13.4	97.0	-6.6	116.7



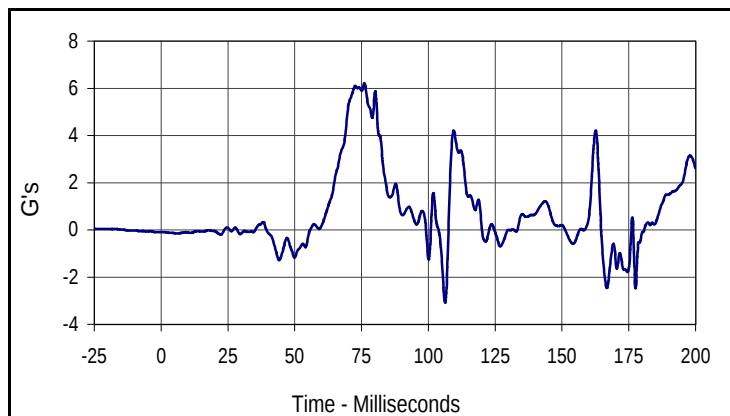
Curve Description			
Left Rear (3 Yr.) Lower Neck Moment Res.			
CURNO	Type	SAE Class	Units
146	RES	600	Nm
Max	Time	Min	Time
100.8	90.8	0.1	7.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

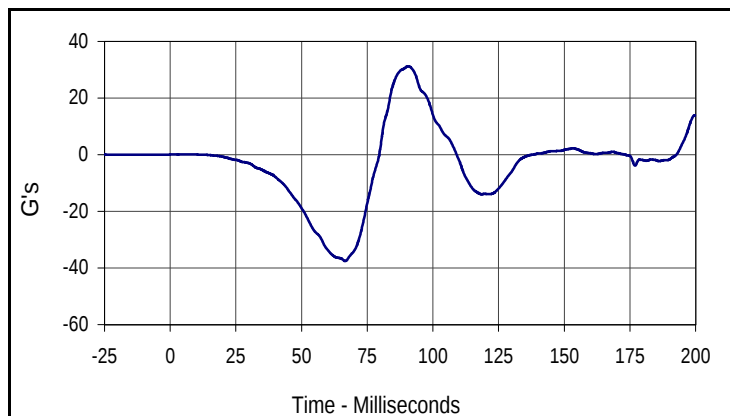
Test Date: 1/28/04
 NHTSA No.: M45104



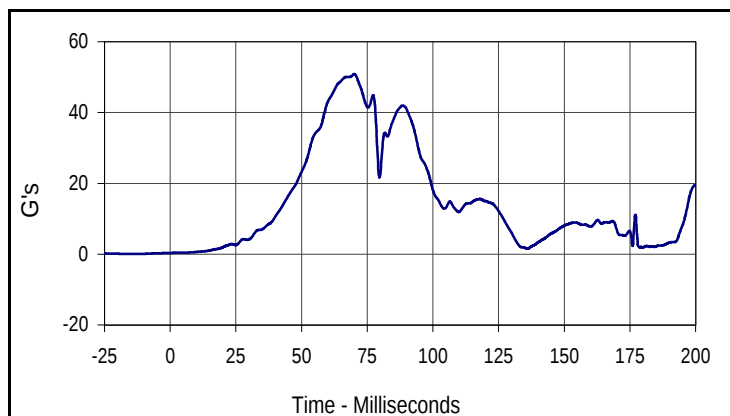
Curve Description			
Left Rear (3 Yr.) Chest X			
CURNO	Type	SAE Class	Units
149	FIL	180	G's
Max	Time	Min	Time
9.2	168.5	-43.9	77.3



Curve Description			
Left Rear (3 Yr.) Chest Y			
CURNO	Type	SAE Class	Units
150	FIL	180	G's
Max	Time	Min	Time
6.2	76.1	-3.1	106.3



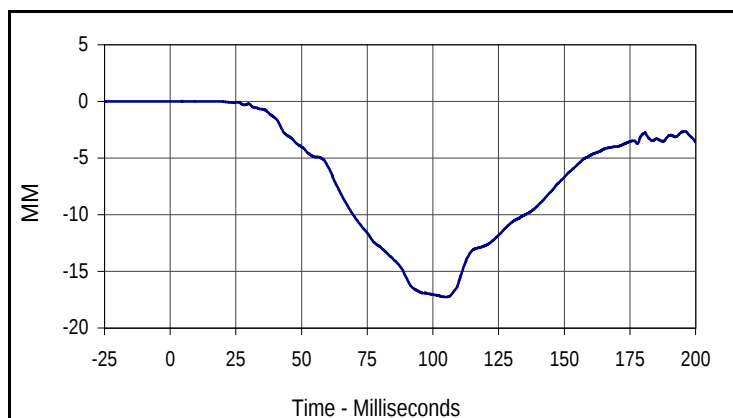
Curve Description			
Left Rear (3 Yr.) Chest Z			
CURNO	Type	SAE Class	Units
151	FIL	180	G's
Max	Time	Min	Time
31.2	90.7	-37.6	66.6



Curve Description			
Left Rear (3 Yr.) Chest Resultant			
CURNO	Type	SAE Class	Units
149	RES	180	G's
Max	Time	Min	Time
50.8	70.1	0.4	0.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

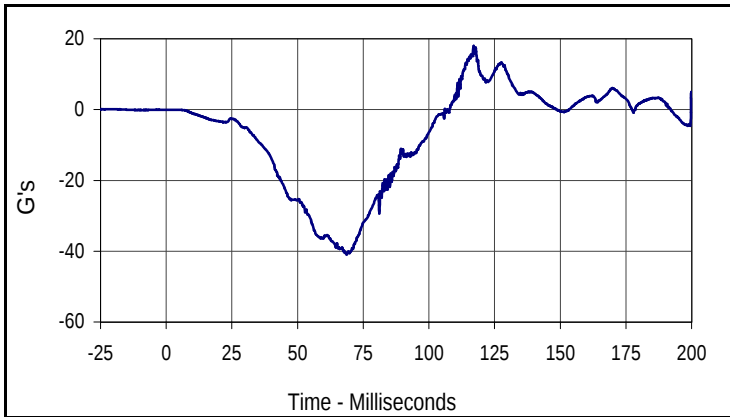
Test Date: 1/28/04
 NHTSA No.: M45104



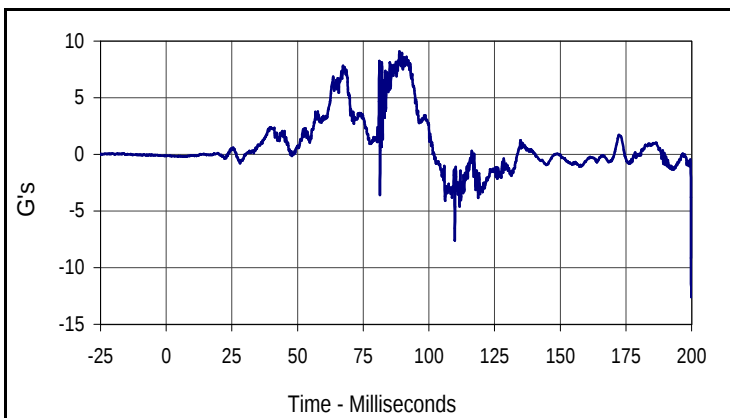
Curve Description			
Left Rear (3 Yr.) Chest Displacement			
CURNO	Type	SAE Class	Units
152	FIL	600	MM
Max	Time	Min	Time
0.0	4.5	-17.3	105.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

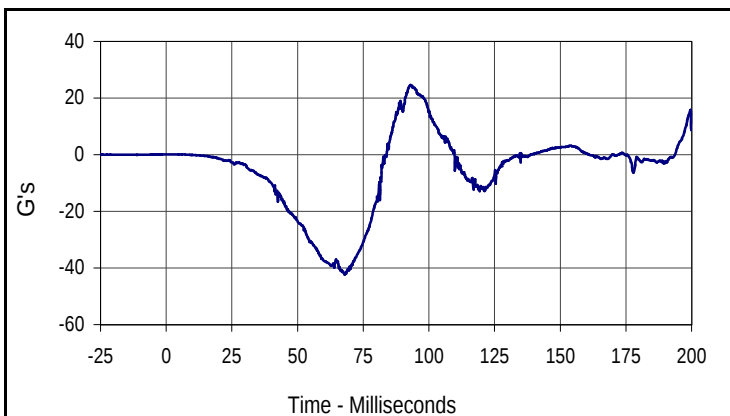
Test Date: 1/28/04
 NHTSA No.: M45104



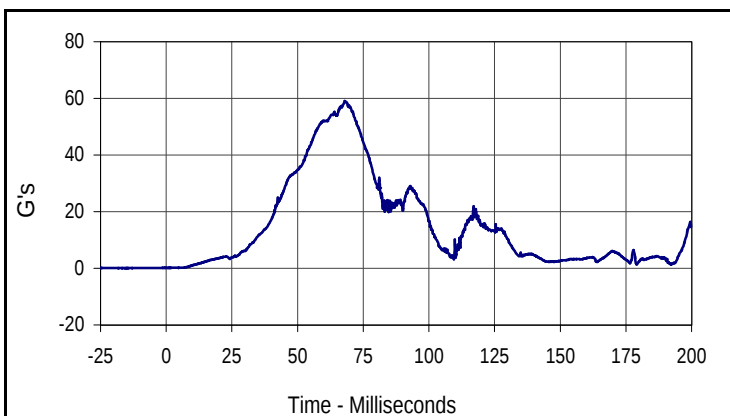
Curve Description			
Left Rear (3 Yr.) Pelvis X			
CURNO	Type	SAE Class	Units
153	FIL	1000	G's
Max	Time	Min	Time
18.0	117.0	-41.0	68.7



Curve Description			
Left Rear (3 Yr.) Pelvis Y			
CURNO	Type	SAE Class	Units
154	FIL	1000	G's
Max	Time	Min	Time
9.1	88.8	-12.6	199.9



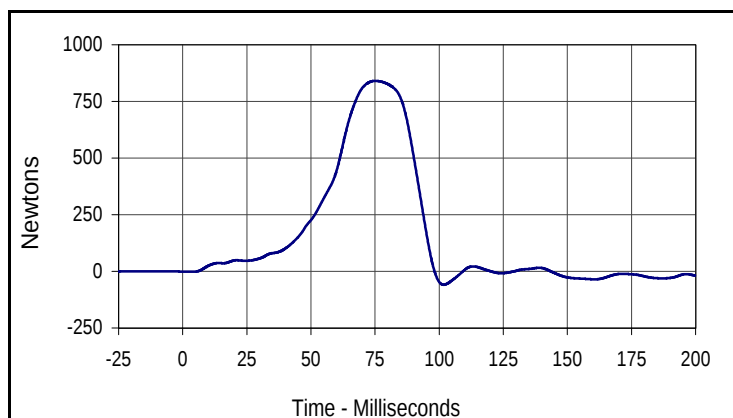
Curve Description			
Left Rear (3 Yr.) Pelvis Z			
CURNO	Type	SAE Class	Units
155	FIL	1000	G's
Max	Time	Min	Time
24.6	92.9	-42.3	68.0



Curve Description			
Left Rear (3 Yr.) Pelvis Resultant			
CURNO	Type	SAE Class	Units
153	RES	1000	G's
Max	Time	Min	Time
59.1	68.0	0.2	0.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

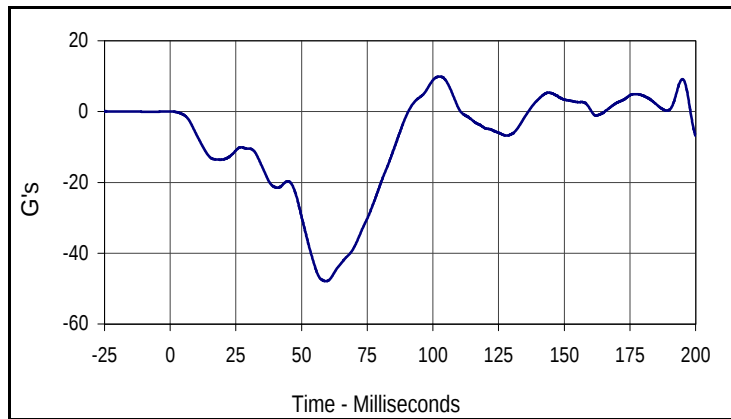
Test Date: 1/28/04
 NHTSA No.: M45104



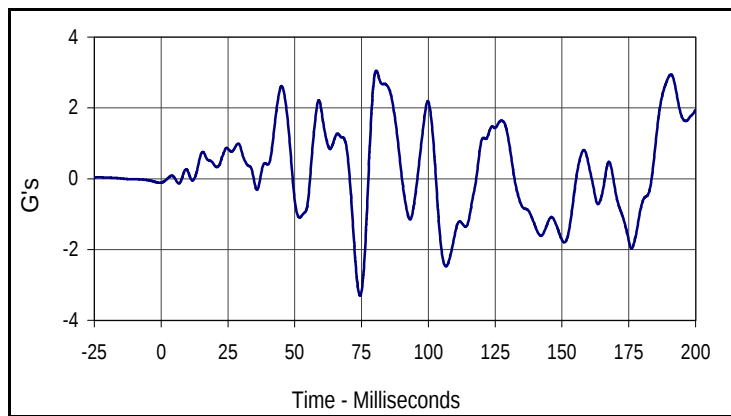
Curve Description			
Left Rear (3 Yr.) Child Seat Tether Load			
CURNO	Type	SAE Class	Units
156	FIL	60	Newtons
Max	Time	Min	Time
840.4	75.1	-59.1	101.8

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

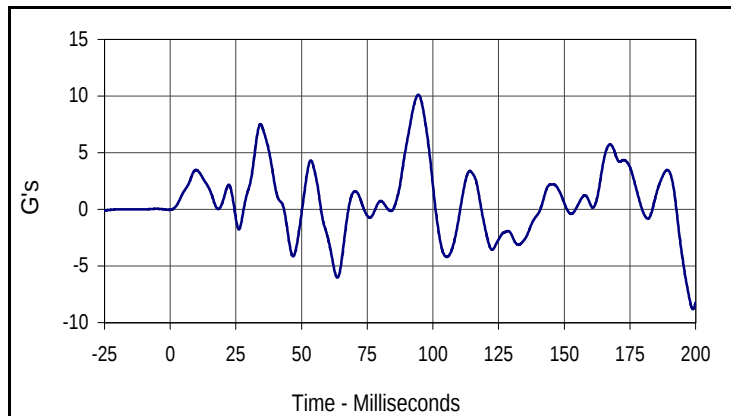
Test Date: 1/28/04
 NHTSA No.: M45104



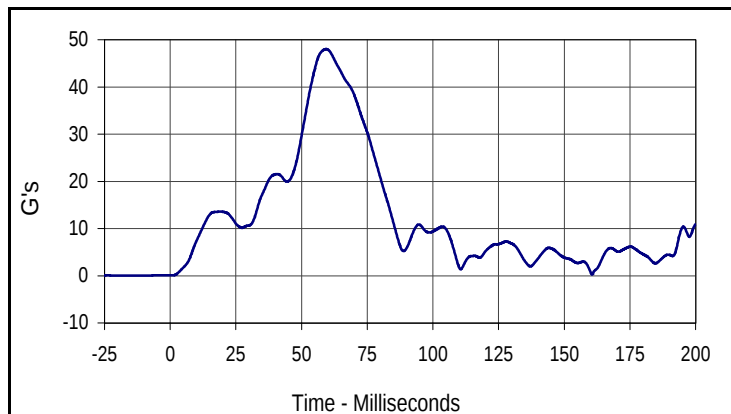
Curve Description			
Left Rear (3 Yr.) Car Seat X			
CURNO	Type	SAE Class	Units
157	FIL	60	G's
Max	Time	Min	Time
9.9	102.6	-47.9	59.3



Curve Description			
Left Rear (3 Yr.) Car Seat Y			
CURNO	Type	SAE Class	Units
158	FIL	60	G's
Max	Time	Min	Time
3.1	80.5	-3.3	74.4



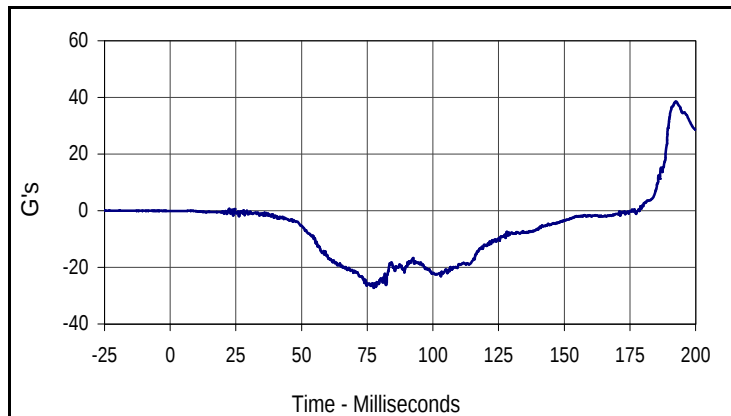
Curve Description			
Left Rear (3 Yr.) Car Seat Z			
CURNO	Type	SAE Class	Units
159	FIL	60	G's
Max	Time	Min	Time
10.1	94.4	-8.8	199.0



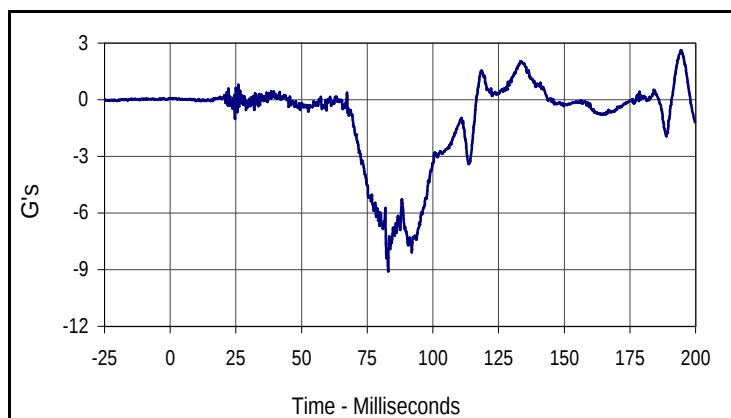
Curve Description			
Left Rear (3 Yr.) Car Seat Resultant			
CURNO	Type	SAE Class	Units
157	RES	60	G's
Max	Time	Min	Time
48.0	59.3	0.1	1.1

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

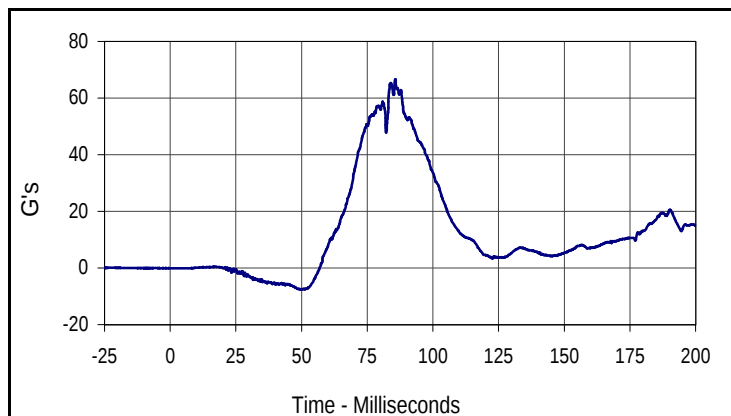
Test Date: 1/28/04
 NHTSA No.: M45104



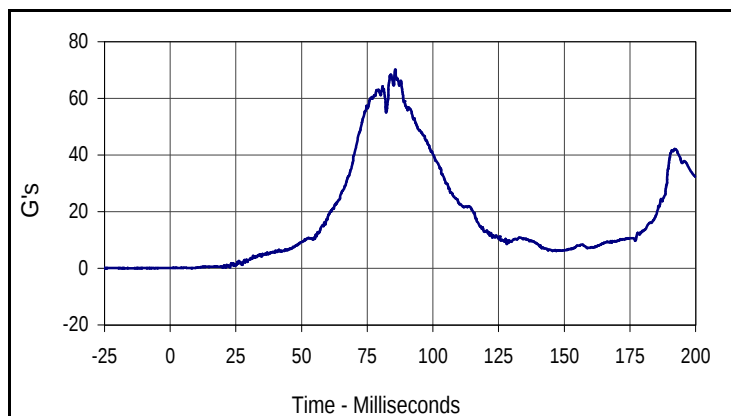
Curve Description			
Right Rear (3 Yr.) Head X			
CURNO	Type	SAE Class	Units
160	FIL	1000	G's
Max	Time	Min	Time
38.6	192.6	-27.2	77.6



Curve Description			
Right Rear (3 Yr.) Head Y			
CURNO	Type	SAE Class	Units
161	FIL	1000	G's
Max	Time	Min	Time
2.6	194.4	-9.1	82.9



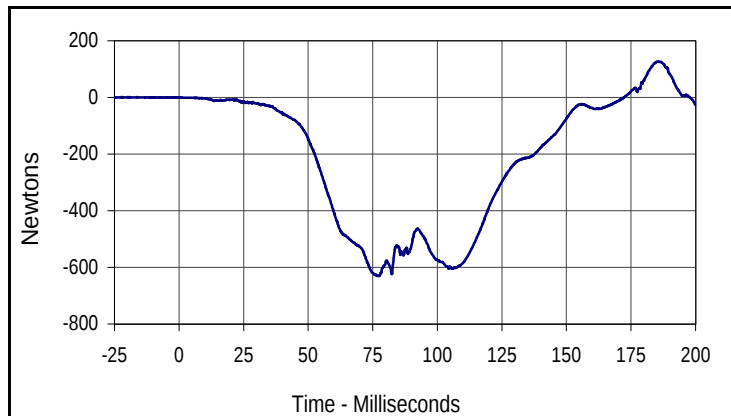
Curve Description			
Right Rear (3 Yr.) Head Z			
CURNO	Type	SAE Class	Units
162	FIL	1000	G's
Max	Time	Min	Time
66.7	85.7	-7.6	51.3



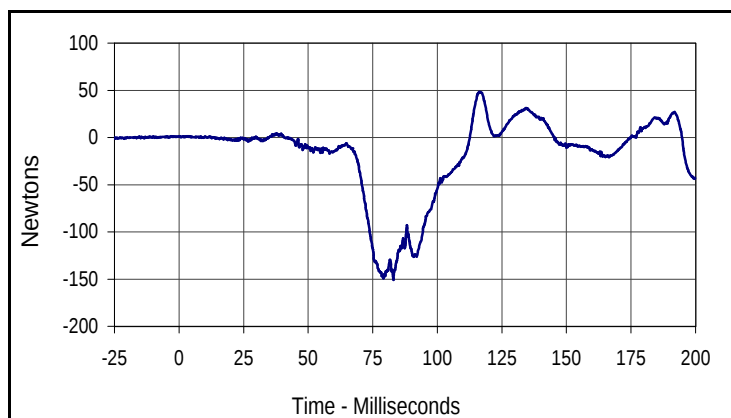
Curve Description			
Right Rear (3 Yr.) Head Resultant			
CURNO	Type	SAE Class	Units
160	RES	1000	G's
Max	Time	Min	Time
70.2	85.7	0.0	8.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

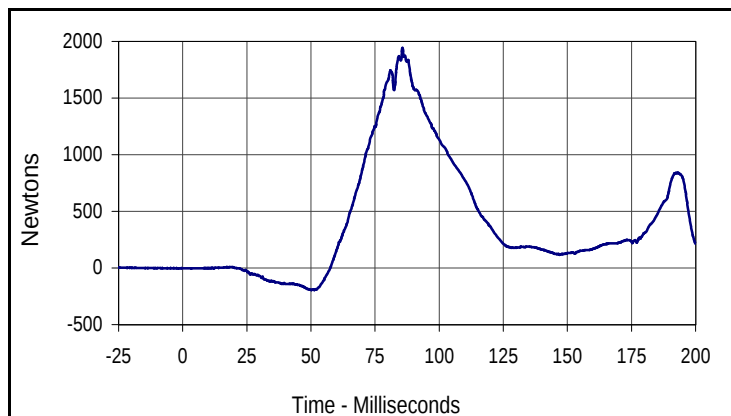
Test Date: 1/28/04
 NHTSA No.: M45104



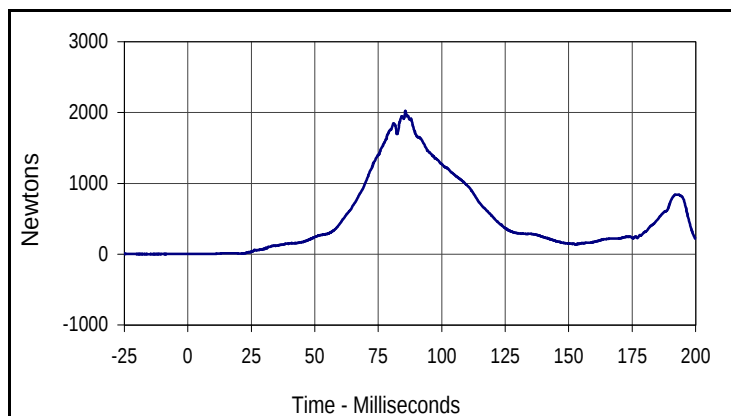
Curve Description			
Right Rear (3 Yr.) Upper Neck Force X			
CURNO	Type	SAE Class	Units
163	FIL	1000	Newtons
Max	Time	Min	Time
126.7	185.4	-630.9	77.5



Curve Description			
Right Rear (3 Yr.) Upper Neck Force Y			
CURNO	Type	SAE Class	Units
164	FIL	1000	Newtons
Max	Time	Min	Time
48.4	116.2	-151.0	83.0



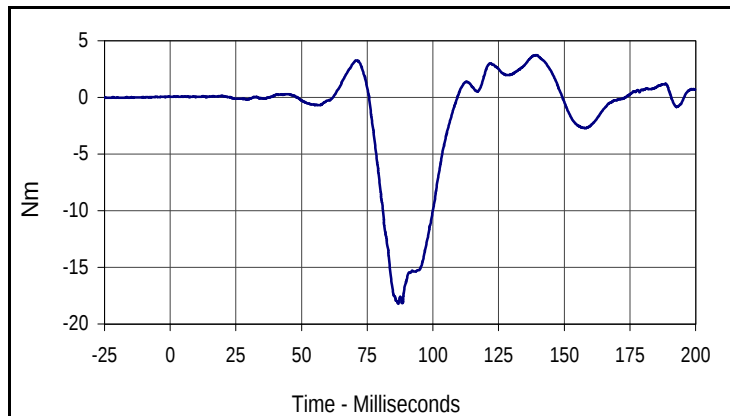
Curve Description			
Right Rear (3 Yr.) Upper Neck Force Z			
CURNO	Type	SAE Class	Units
165	FIL	1000	Newtons
Max	Time	Min	Time
1942.5	85.7	-196.3	51.3



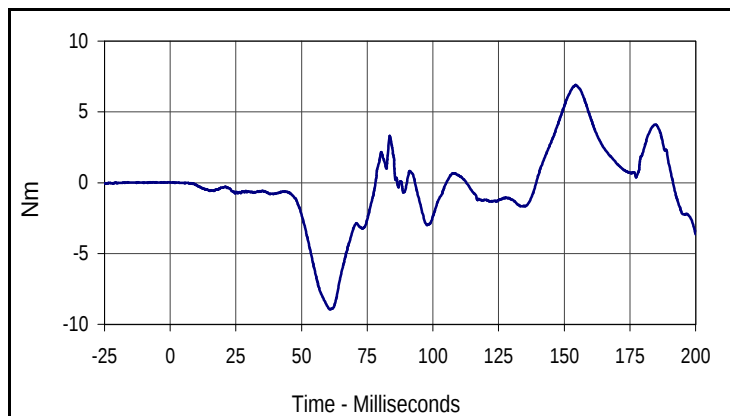
Curve Description			
Right Rear (3 Yr.) Upper Neck Force Res.			
CURNO	Type	SAE Class	Units
163	RES	1000	Newtons
Max	Time	Min	Time
2023.9	85.7	2.2	1.7

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

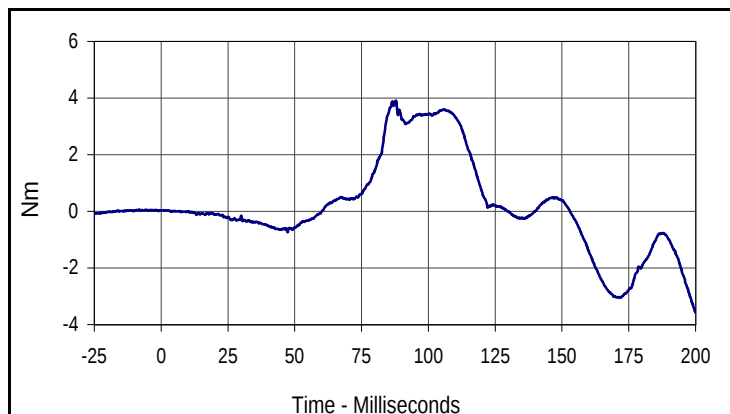
Test Date: 1/28/04
 NHTSA No.: M45104



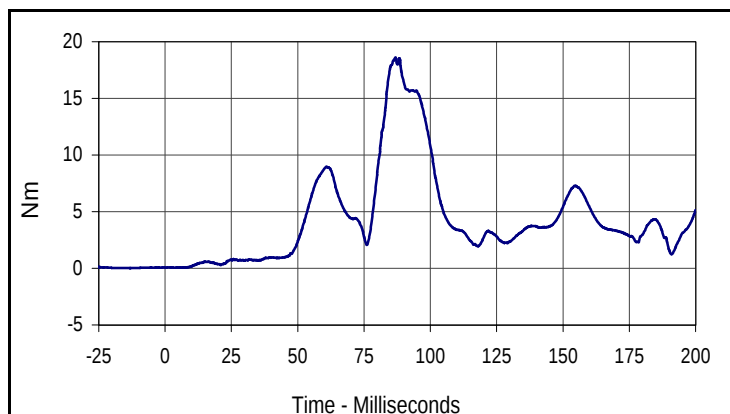
Curve Description			
Right Rear (3 Yr.) Upper Neck Moment X			
CURNO	Type	SAE Class	Units
166	FIL	600	Nm
Max	Time	Min	Time
3.7	139.4	-18.2	86.8



Curve Description			
Right Rear (3 Yr.) Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
167	FIL	600	Nm
Max	Time	Min	Time
6.9	154.4	-9.0	60.8



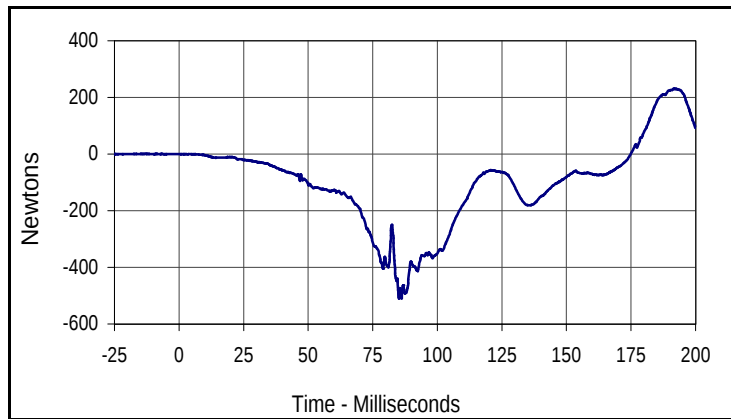
Curve Description			
Right Rear (3 Yr.) Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
168	FIL	600	Nm
Max	Time	Min	Time
3.9	87.8	-3.6	200.0



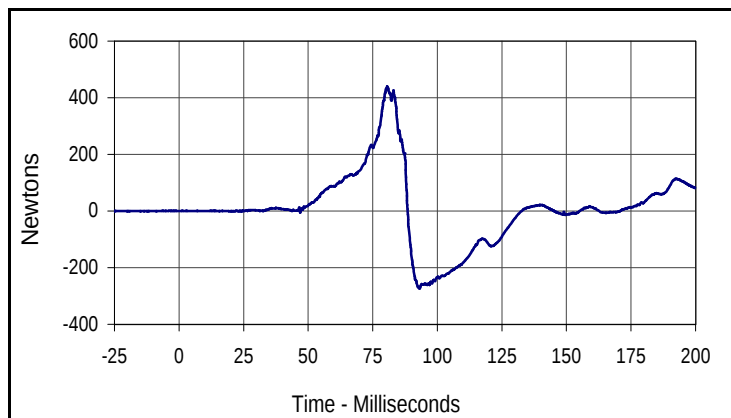
Curve Description			
Right Rear (3 Yr.) Upper Neck Moment Res.			
CURNO	Type	SAE Class	Units
166	RES	600	Nm
Max	Time	Min	Time
18.6	86.8	0.0	5.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

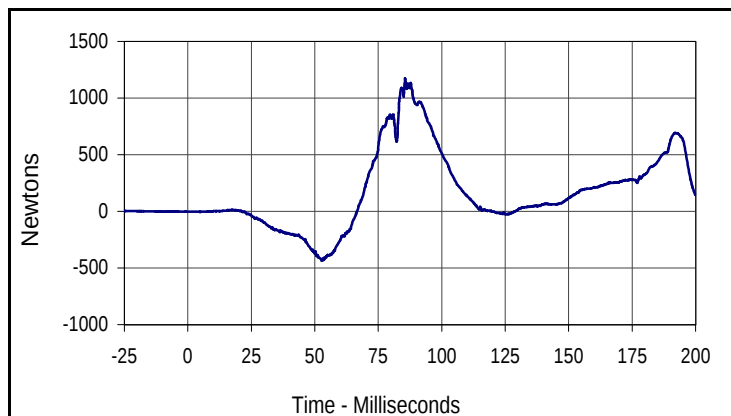
Test Date: 1/28/04
 NHTSA No.: M45104



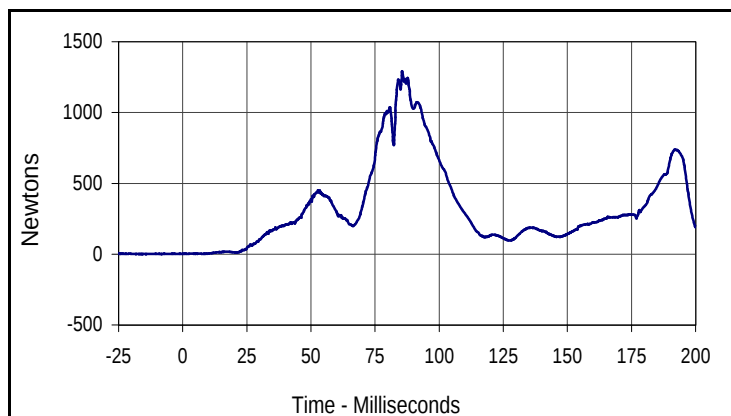
Curve Description			
Right Rear (3 Yr.) Lower Neck Force X			
CURNO	Type	SAE Class	Units
169	FIL	1000	Newtons
Max	Time	Min	Time
231.5	191.6	-511.1	85.1



Curve Description			
Right Rear (3 Yr.) Lower Neck Force Y			
CURNO	Type	SAE Class	Units
170	FIL	1000	Newtons
Max	Time	Min	Time
441.1	80.6	-273.6	93.1



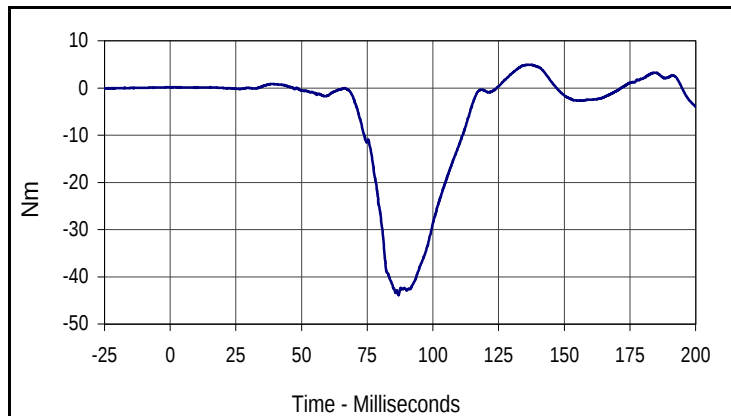
Curve Description			
Right Rear (3 Yr.) Lower Neck Force Z			
CURNO	Type	SAE Class	Units
171	FIL	1000	Newtons
Max	Time	Min	Time
1174.0	85.6	-434.6	52.8



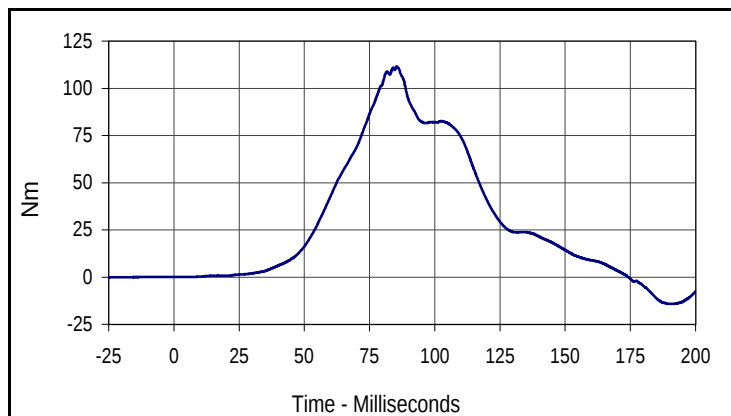
Curve Description			
Right Rear (3 Yr.) Lower Neck Force Res.			
CURNO	Type	SAE Class	Units
169	RES	1000	Newtons
Max	Time	Min	Time
1292.4	85.6	1.9	4.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

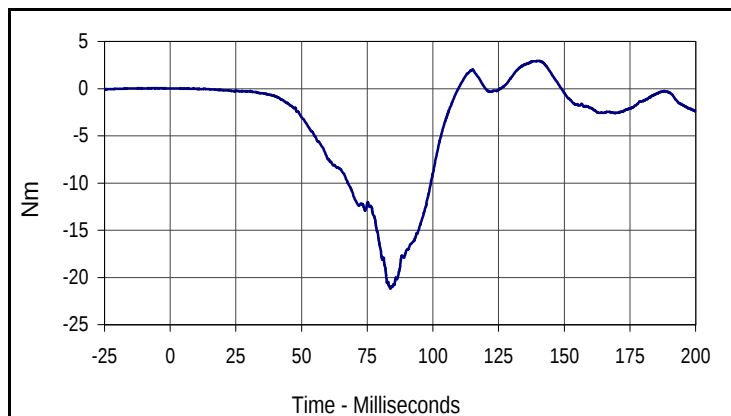
Test Date: 1/28/04
 NHTSA No.: M45104



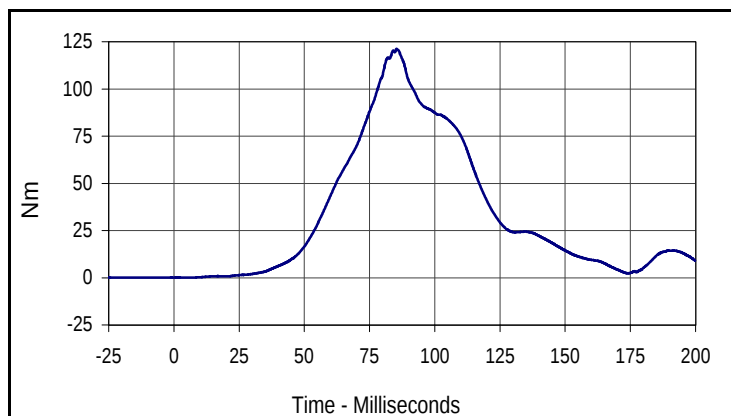
Curve Description			
Right Rear (3 Yr.) Lower Neck Moment X			
CURNO	Type	SAE Class	Units
172	FIL	600	Nm
Max	Time	Min	Time
4.9	136.6	-43.9	86.9



Curve Description			
Right Rear (3 Yr.) Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
173	FIL	600	Nm
Max	Time	Min	Time
111.6	85.3	-14.2	189.5



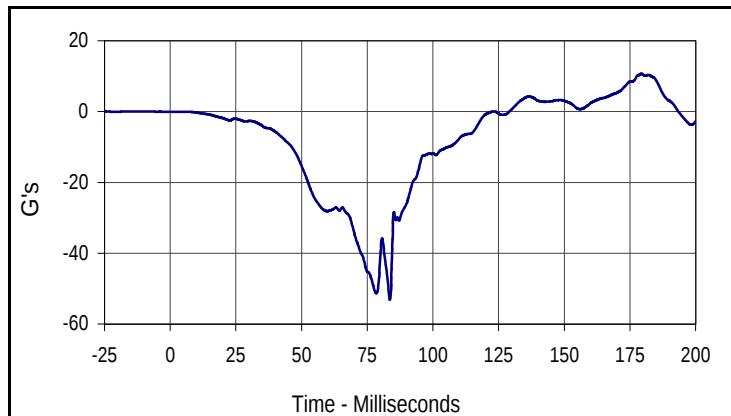
Curve Description			
Right Rear (3 Yr.) Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
174	FIL	600	Nm
Max	Time	Min	Time
2.9	140.5	-21.2	83.9



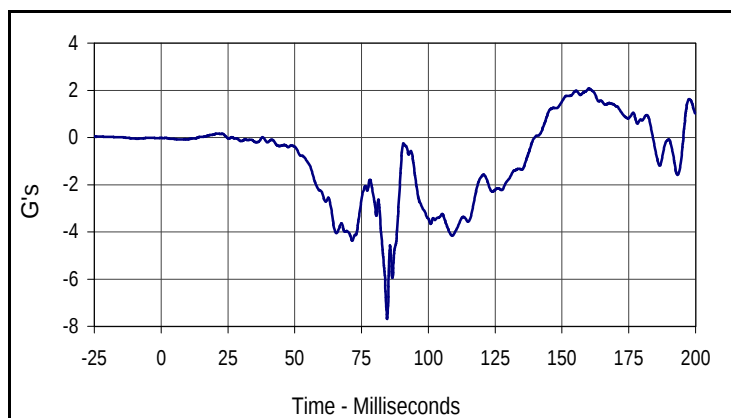
Curve Description			
Right Rear (3 Yr.) Lower Neck Moment Res.			
CURNO	Type	SAE Class	Units
172	RES	600	Nm
Max	Time	Min	Time
121.3	85.3	0.1	6.6

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

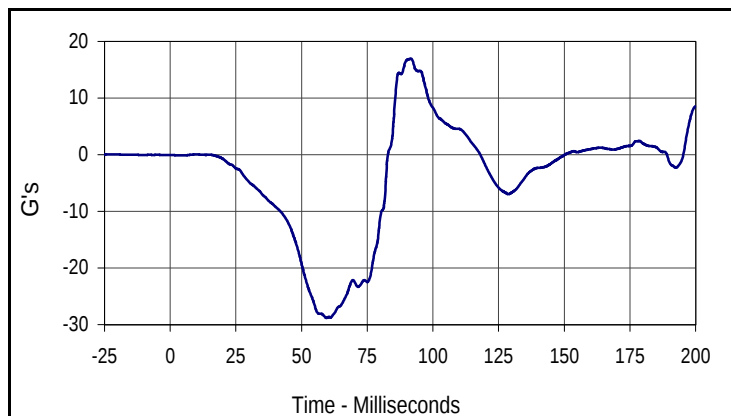
Test Date: 1/28/04
 NHTSA No.: M45104



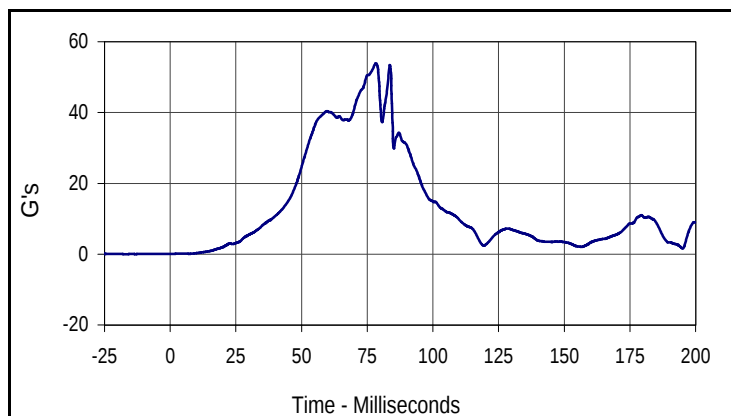
Curve Description			
Right Rear (3 Yr.) Chest X			
CURNO	Type	SAE Class	Units
175	FIL	180	G's
Max	Time	Min	Time
10.7	179.4	-53.1	83.6



Curve Description			
Right Rear (3 Yr.) Chest Y			
CURNO	Type	SAE Class	Units
176	FIL	180	G's
Max	Time	Min	Time
2.1	160.1	-7.7	84.6



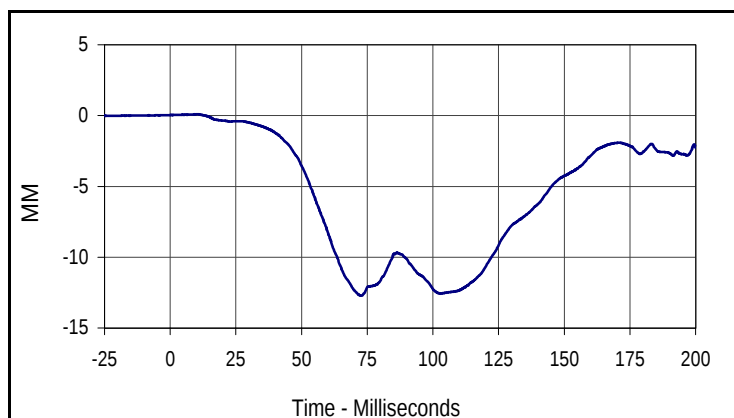
Curve Description			
Right Rear (3 Yr.) Chest Z			
CURNO	Type	SAE Class	Units
177	FIL	180	G's
Max	Time	Min	Time
16.9	91.7	-28.8	59.5



Curve Description			
Right Rear (3 Yr.) Chest Resultant			
CURNO	Type	SAE Class	Units
177	RES	180	G's
Max	Time	Min	Time
53.9	78.3	0.1	0.2

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

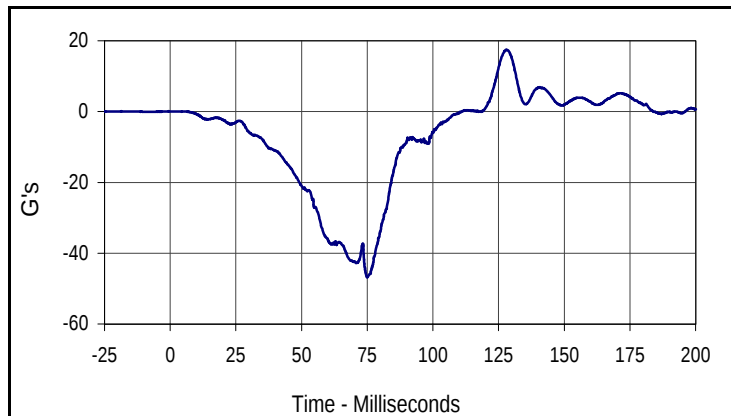
Test Date: 1/28/04
 NHTSA No.: M45104



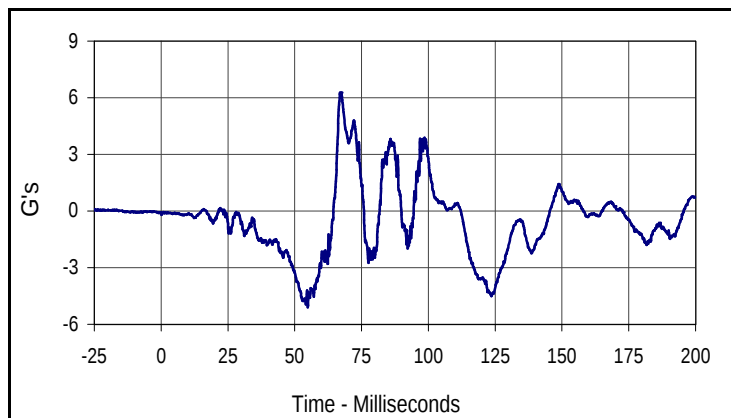
Curve Description			
Right Rear (3 Yr.) Chest Displacement			
CURNO	Type	SAE Class	Units
178	FIL	600	MM
Max	Time	Min	Time
0.1	10.1	-12.7	72.8

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

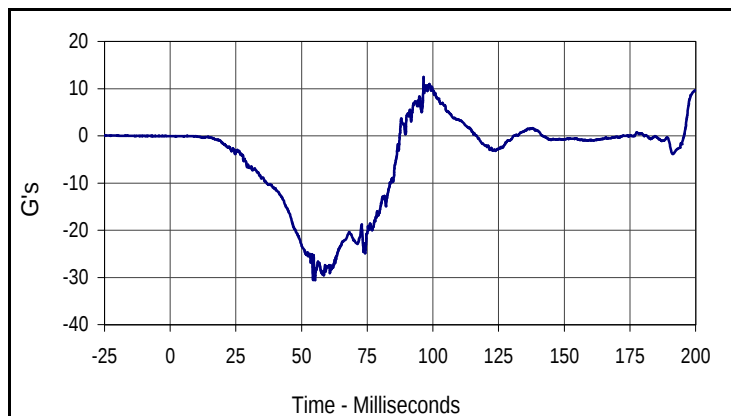
Test Date: 1/28/04
 NHTSA No.: M45104



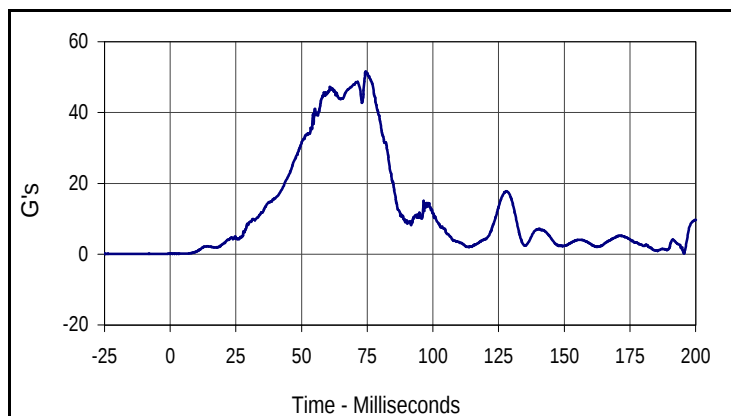
Curve Description			
Right Rear (3 Yr.) Pelvis X			
CURNO	Type	SAE Class	Units
179	FIL	1000	G's
Max	Time	Min	Time
17.5	127.9	-46.8	75.0



Curve Description			
Right Rear (3 Yr.) Pelvis Y			
CURNO	Type	SAE Class	Units
180	FIL	1000	G's
Max	Time	Min	Time
6.3	67.5	-5.1	54.9



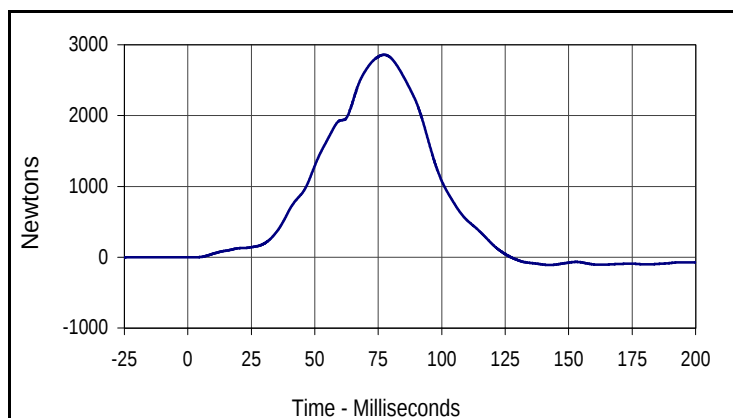
Curve Description			
Right Rear (3 Yr.) Pelvis Z			
CURNO	Type	SAE Class	Units
181	FIL	1000	G's
Max	Time	Min	Time
12.4	96.4	-30.6	55.1



Curve Description			
Right Rear (3 Yr.) Pelvis Resultant			
CURNO	Type	SAE Class	Units
179	RES	1000	G's
Max	Time	Min	Time
51.6	74.4	0.1	0.9

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

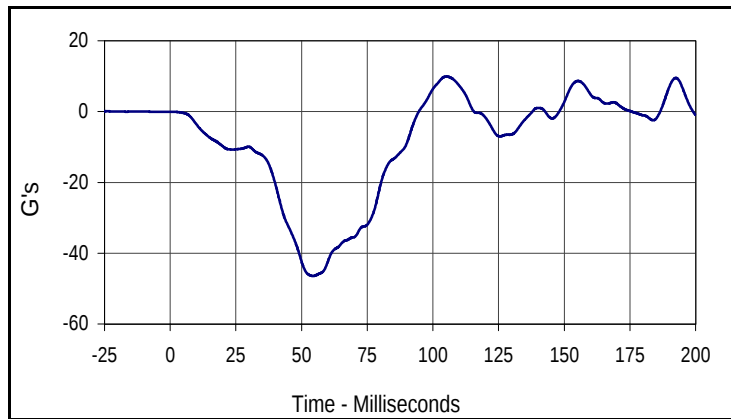
Test Date: 1/28/04
 NHTSA No.: M45104



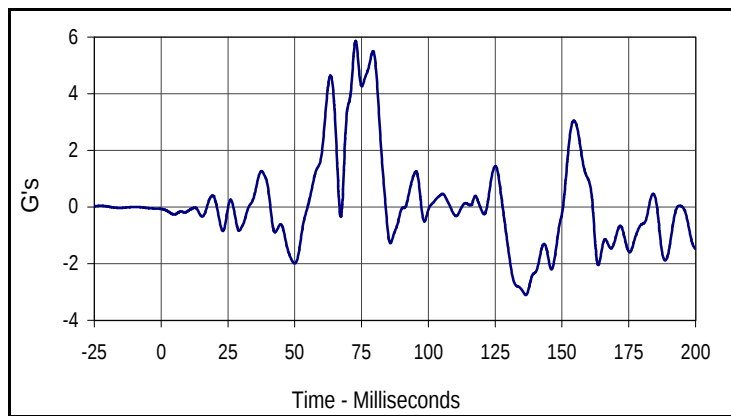
Curve Description			
Right Rear (3 Yr.) Car Seat Upper Tether Force			
CURNO	Type	SAE Class	Units
182	FIL	60	Newtons
Max	Time	Min	Time
2858.3	77.3	-110.8	142.5

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

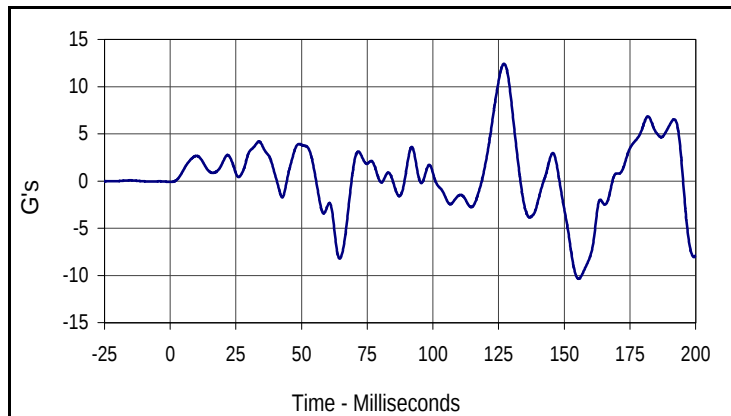
Test Date: 1/28/04
 NHTSA No.: M45104



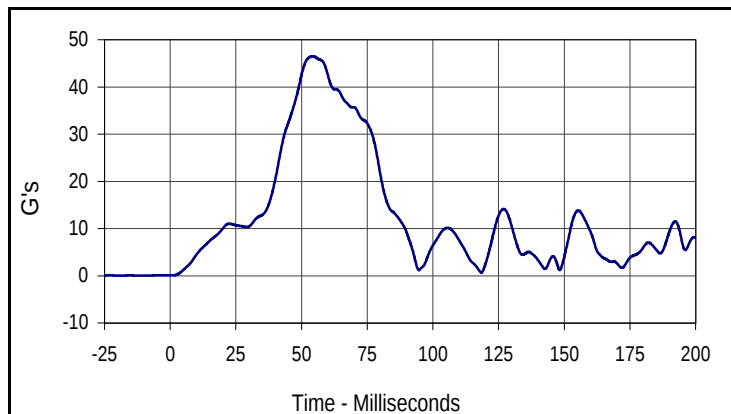
Curve Description			
Right Rear (3 Yr.) Car Seat X			
CURNO	Type	SAE Class	Units
183	FIL	60	G's
Max	Time	Min	Time
9.9	105.2	-46.4	54.3



Curve Description			
Right Rear (3 Yr.) Car Seat Y			
CURNO	Type	SAE Class	Units
184	FIL	60	G's
Max	Time	Min	Time
5.9	72.8	-3.1	136.5



Curve Description			
Right Rear (3 Yr.) Car Seat Z			
CURNO	Type	SAE Class	Units
185	FIL	60	G's
Max	Time	Min	Time
12.4	127.1	-10.3	155.4



Curve Description			
Right Rear (3 Yr.) Car Seat Resultant			
CURNO	Type	SAE Class	Units
183	RES	60	G's
Max	Time	Min	Time
46.5	54.2	0.1	1.3

SECTION F-4

CHILD DUMMY INSTRUMENTATION INFORMATION

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Left Rear Child A.T.D. Serial Number 082
1/28/04
2004 Lexus ES 330 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
134	HEAD CG	X	GPAC050	Accel.,1/2 bridge	Endevco	7264-2000	G
135	HEAD CG	Y	GPAC051	Accel.,1/2 bridge	Endevco	7264-2000	G
136	HEAD CG	Z	GPAC052	Accel.,1/2 bridge	Endevco	7264-2000	G
137	UPPER NECK FORCE	X	082UNFX	Load cell, six axis neck	R. A. Denton	IF-234	N
138	UPPER NECK FORCE	Y	082UNFY	Load cell, six axis neck	R. A. Denton	IF-234	N
139	UPPER NECK FORCE	Z	082UNFZ	Load cell, six axis neck	R. A. Denton	IF-234	N
140	UPPER NECK MOMENT	X	082UNMX	Load cell, six axis neck	R. A. Denton	IF-234	Nm
141	UPPER NECK MOMENT	Y	082UNMY	Load cell, six axis neck	R. A. Denton	IF-234	Nm
142	UPPER NECK MOMENT	Z	082UNMZ	Load cell, six axis neck	R. A. Denton	IF-234	Nm
143	LOWER NECK FORCE	X	082LNFX	Load cell, six axis neck	R. A. Denton	3303	N
144	LOWER NECK FORCE	Y	082LNFY	Load cell, six axis neck	R. A. Denton	3303	N
145	LOWER NECK FORCE	Z	082LNFZ	Load cell, six axis neck	R. A. Denton	3303	N
146	LOWER NECK MOMENT	X	082LNMX	Load cell, six axis neck	R. A. Denton	3303	Nm
147	LOWER NECK MOMENT	Y	082LNMY	Load cell, six axis neck	R. A. Denton	3303	Nm
148	LOWER NECK MOMENT	Z	082LNMZ	Load cell, six axis neck	R. A. Denton	3303	Nm
149	CHEST CG	X	2116-A11	Accel., Full Bridge	Entran	2000JF	G
150	CHEST CG	Y	2116-A14	Accel., Full Bridge	Entran	2000JF	G
151	CHEST CG	Z	2116-A23	Accel., Full Bridge	Entran	2000JF	G
152	CHEST DISPLACEMENT	X	082CP	Rotary Pot Chest	Servo	14CBI	MM
153	PELVIS	X	2116-A12	Accel., Full Bridge	Entran	2000JF	G
154	PELVIS	Y	2116-A19	Accel., Full Bridge	Entran	2000JF	G
155	PELVIS	Z	2116-A17	Accel., Full Bridge	Entran	2000JF	G
156	CAR SEAT UPPER TETHER FORCE	X	BL112	Load cell, Seat belt	FGP	FN4060	N
157	CAR SEAT	X	KETX1A	Accel.,1/2 bridge	Endevco	7264-200	G
158	CAR SEAT	Y	KETX1B	Accel.,1/2 bridge	Endevco	7264-200	G
159	CAR SEAT	Z	KETX1C	Accel.,1/2 bridge	Endevco	7264-200	G

2004 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Right Rear Child A.T.D. Serial Number 139
1/28/04
2004 Lexus ES 330 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
160	HEAD CG	X	GPAC047	Accel.,1/2 bridge	Endevco	7264-2000	G
161	HEAD CG	Y	GPAC048	Accel.,1/2 bridge	Endevco	7264-2000	G
162	HEAD CG	Z	GPAC049	Accel.,1/2 bridge	Endevco	7264-2000	G
163	UPPER NECK FORCE	X	139UNFX	Load cell, six axis neck	R. A. Denton	IF-234	N
164	UPPER NECK FORCE	Y	139UNFY	Load cell, six axis neck	R. A. Denton	IF-234	N
165	UPPER NECK FORCE	Z	139UNFZ	Load cell, six axis neck	R. A. Denton	IF-234	N
166	UPPER NECK MOMENT	X	139UNMX	Load cell, six axis neck	R. A. Denton	IF-234	Nm
167	UPPER NECK MOMENT	Y	139UNMY	Load cell, six axis neck	R. A. Denton	IF-234	Nm
168	UPPER NECK MOMENT	Z	139UNMZ	Load cell, six axis neck	R. A. Denton	IF-234	Nm
169	LOWER NECK FORCE	X	139LNFX	Load cell, six axis neck	R. A. Denton	3303	N
170	LOWER NECK FORCE	Y	139LNFY	Load cell, six axis neck	R. A. Denton	3303	N
171	LOWER NECK FORCE	Z	139LNFZ	Load cell, six axis neck	R. A. Denton	3303	N
172	LOWER NECK MOMENT	X	139LNMX	Load cell, six axis neck	R. A. Denton	3303	Nm
173	LOWER NECK MOMENT	Y	139LNMY	Load cell, six axis neck	R. A. Denton	3303	Nm
174	LOWER NECK MOMENT	Z	139LNMZ	Load cell, six axis neck	R. A. Denton	3303	Nm
175	CHEST CG	X	2116-A01	Accel., Full Bridge	Entran	2000JF	G
176	CHEST CG	Y	2116-A06	Accel., Full Bridge	Entran	2000JF	G
177	CHEST CG	Z	2116-A07	Accel., Full Bridge	Entran	2000JF	G
178	CHEST DISPLACEMENT	X	139CP	Rotary Pot Chest	Servo	14CBI	MM
179	PELVIS	X	2116-N07	Accel., Full Bridge	Entran	2000JF	G
180	PELVIS	Y	2116-A03	Accel., Full Bridge	Entran	2000JF	G
181	PELVIS	Z	2116-A17	Accel., Full Bridge	Entran	2000JF	G
182	CAR SEAT UPPER TETHER FORCE	X	BL113	Load cell, Seat belt	FGP	FN4060	N
183	CAR SEAT	X	KETX4A	Accel.,1/2 bridge	Endevco	7264-200	G
184	CAR SEAT	Y	KETX4B	Accel.,1/2 bridge	Endevco	7264-200	G
185	CAR SEAT	Z	KETX4C	Accel.,1/2 bridge	Endevco	7264-200	G

SECTION F-5

CHILD DUMMY CALIBRATION INFORMATION



Calibration Data Sheet Hybrid III 3 Year Old Head Drop Test

ATD Serial No.: 082

Test I.D.: HD02A

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	250.0 to 280.0	269.6	Pass
Peak Lateral Acceleration	G's	≤15.0	6.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	3.7	Pass
Overall Test Results				Pass

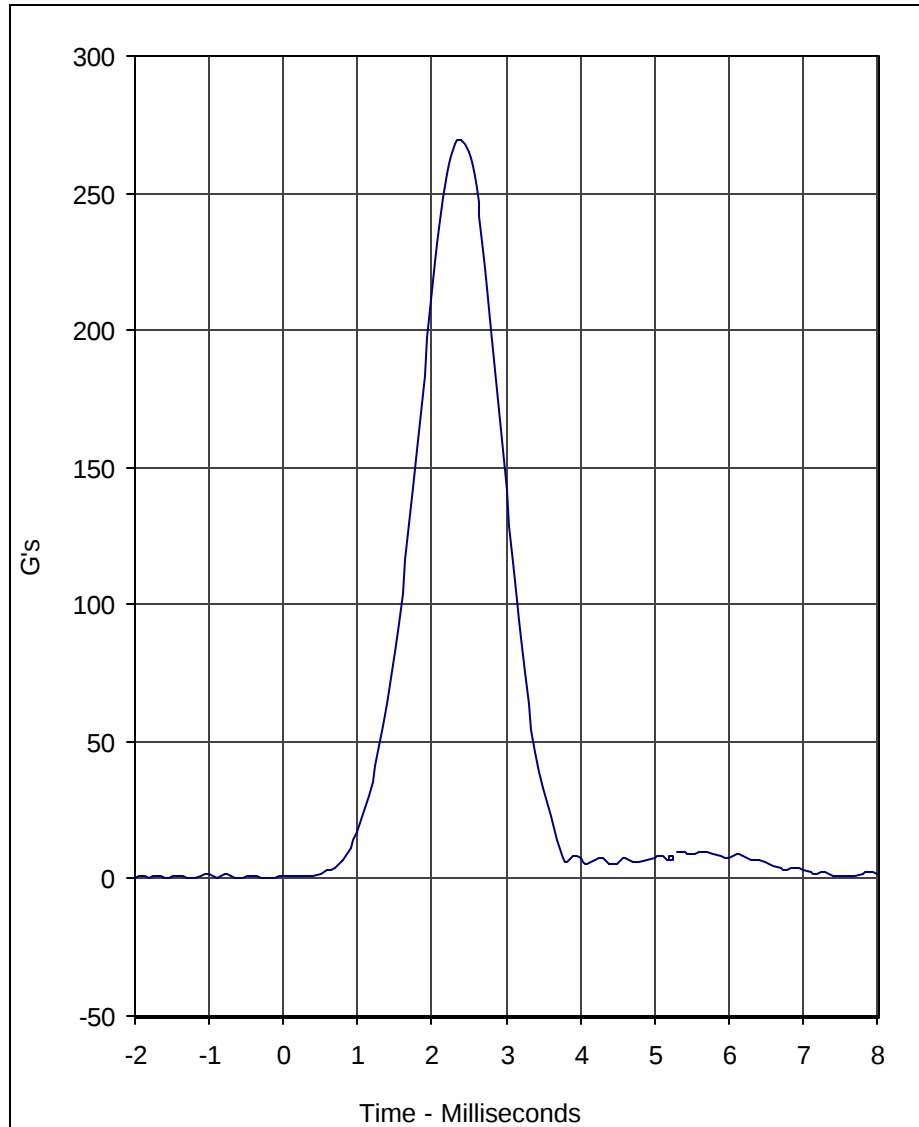
F5-1

TR-P24001-11-NC

Laboratory Technician

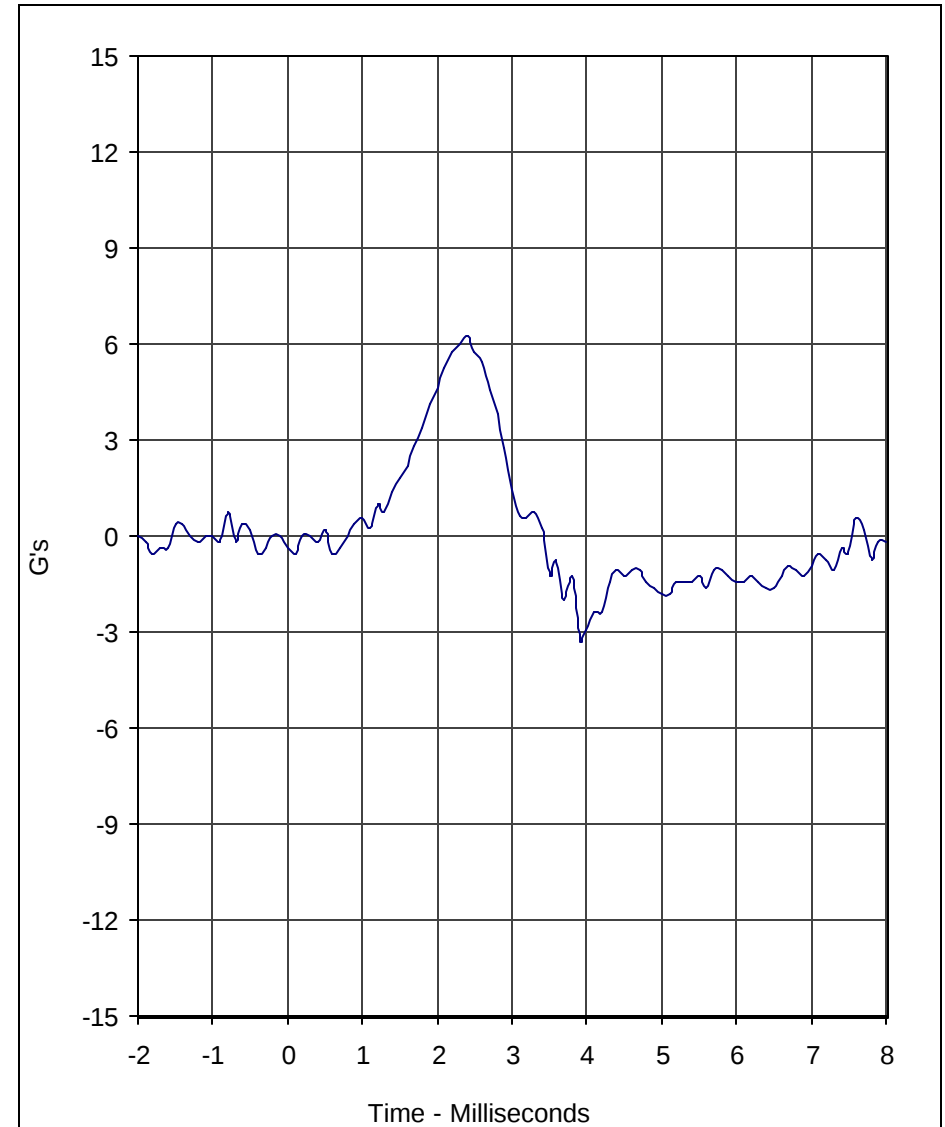
January 7, 2004

Test Date



Curve Description				CURNO	Type
Head Resultant				001	RES
Units	Max	Time	Min	Time	SAE Class
G's	269.6	2.4	0.4	-0.9	1000

Test Program: Hybrid III 3 Year Old Head Drop Test
 Test Date: 1/7/04



Curve Description				CURNO	Type
Head Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	6.3	2.4	-3.3	3.9	1000

A.T.D. Serial No.: 082
 Test I.D.: HD02A





Calibration Data Sheet

Hybrid III 3 Year Old

Thorax Impact Test

ATD Serial No.: 082

Test I.D.: CH02A

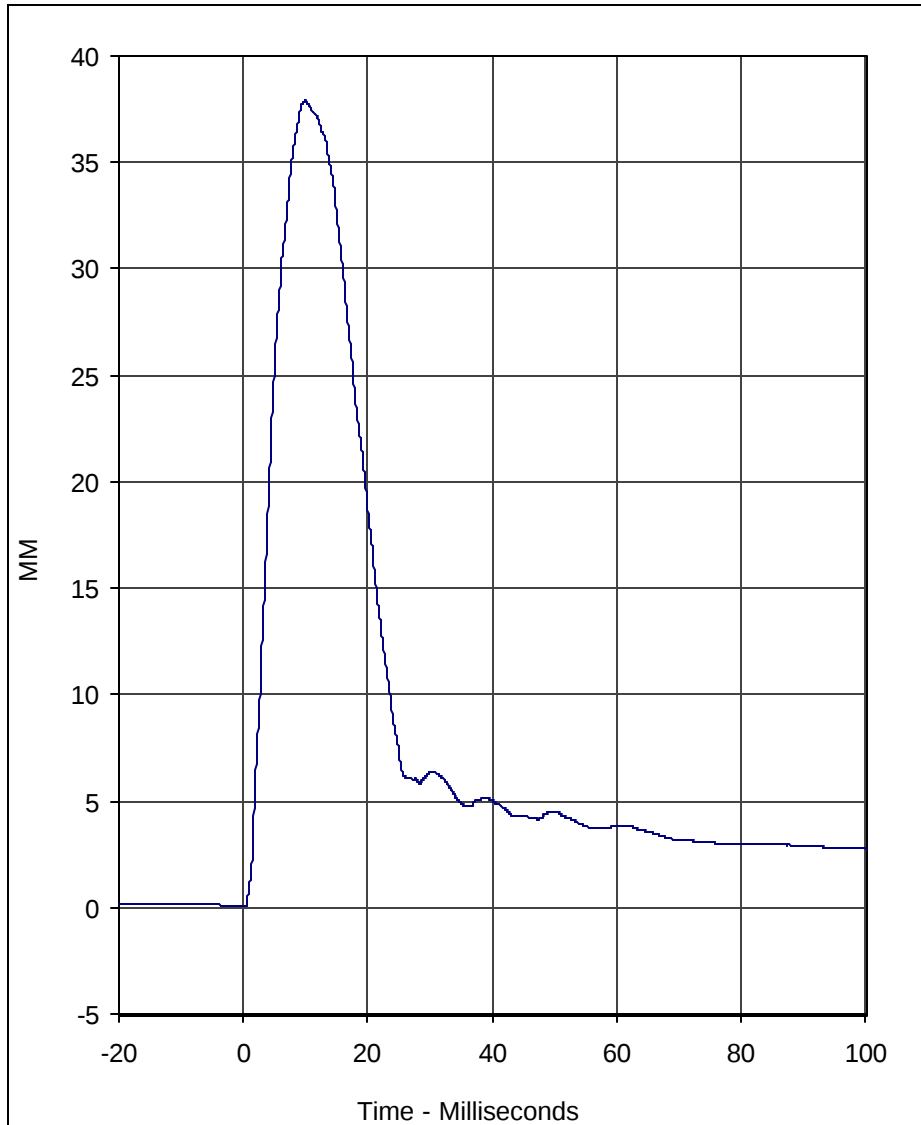
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.9 to 6.1	5.91	Pass
Peak Chest Compression	MM	32 to 38	37.9	Pass
Peak Probe Force Between 32 and 38 MM	Newtons	680 to 810	775.3	Pass
Peak Probe Force Between 12.5 and 32 MM	Newtons	≤860	806.4	Pass
Internal Hysteresis	%	65 to 85	78.2	Pass
Overall Test Results				Pass

F5-3

TR-P24001-11-NC

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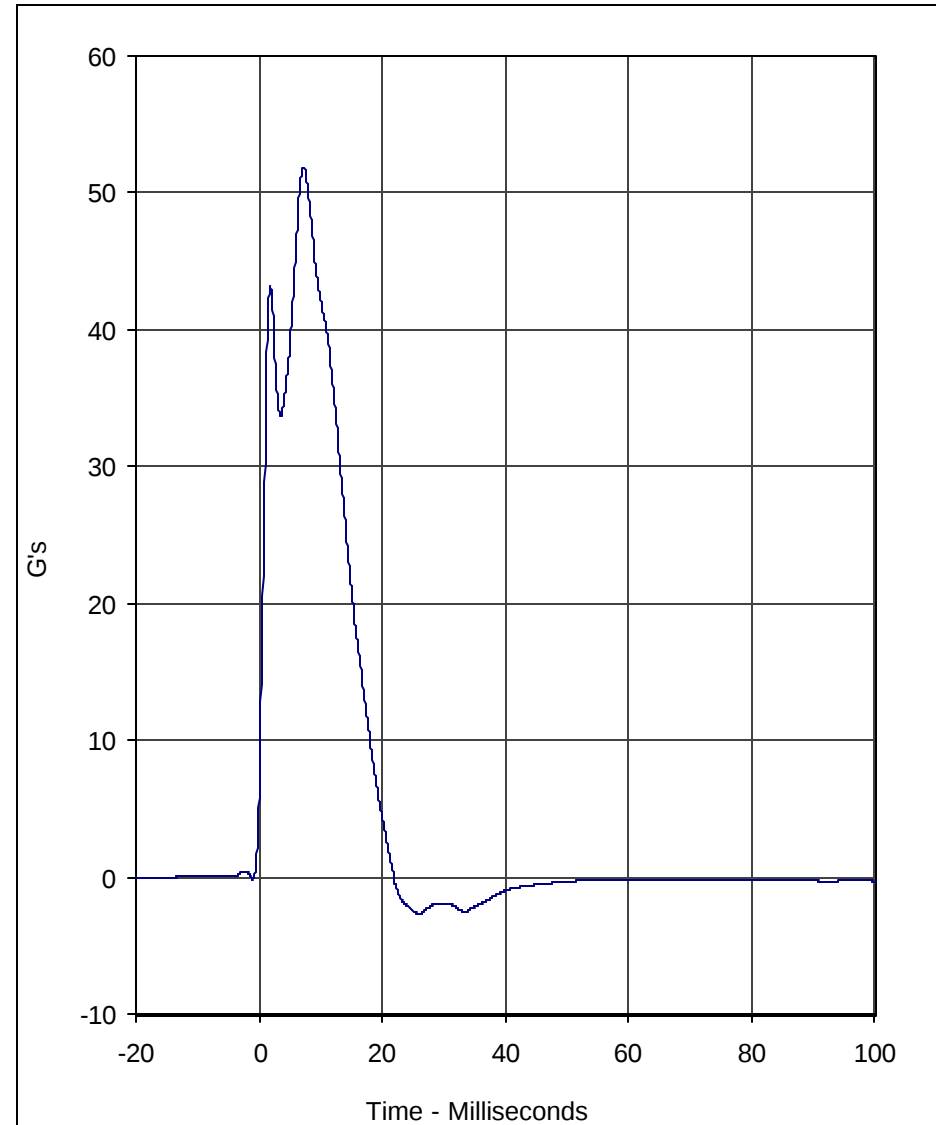
January 7, 2004
Test Date



Curve Description				CURNO	Type
Chest Compression				001	FIL
Units	Max	Time	Min	Time	SAE Class
MM	37.9	10.5	0.1	0.8	600

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 1/7/04

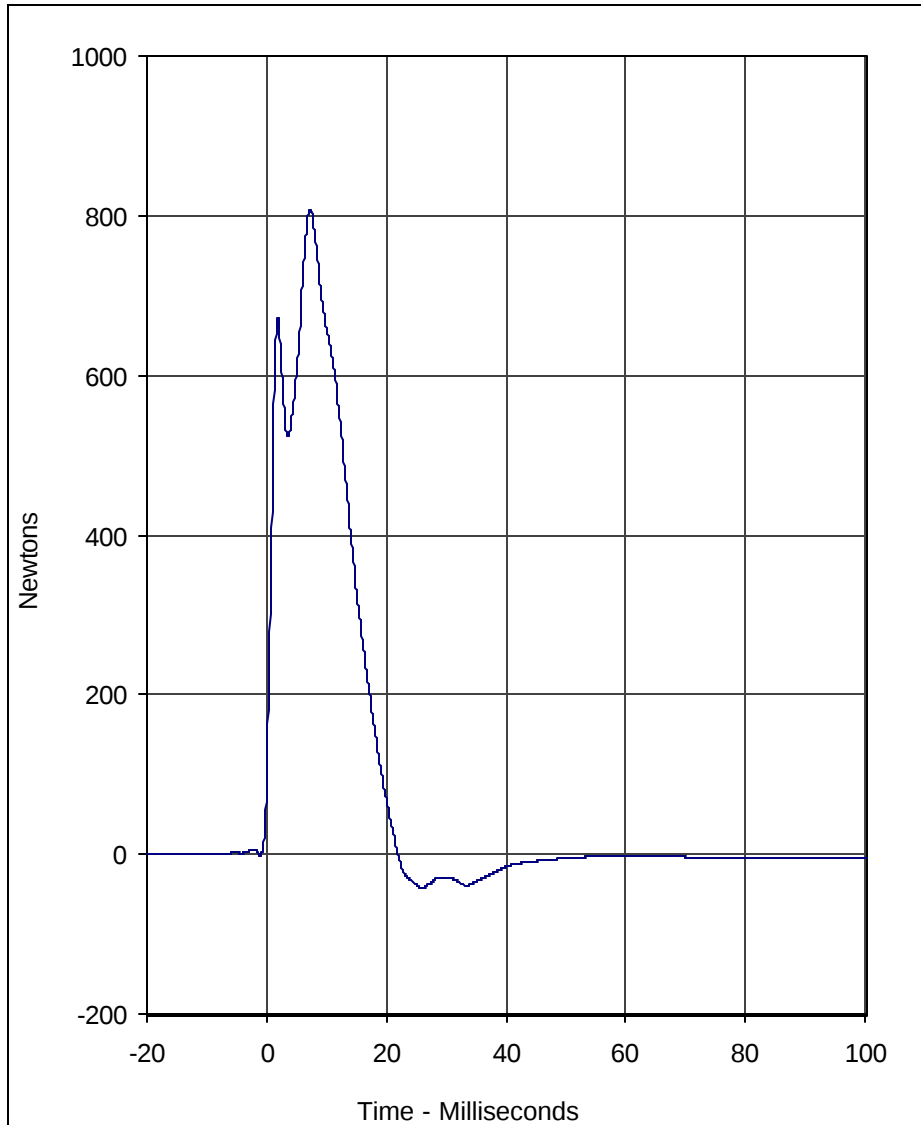


Curve Description				CURNO	Type
Probe Acceleration				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	51.8	7.8	-2.7	26.5	600

A.T.D. Serial No.: 082

Test I.D.: CH02A

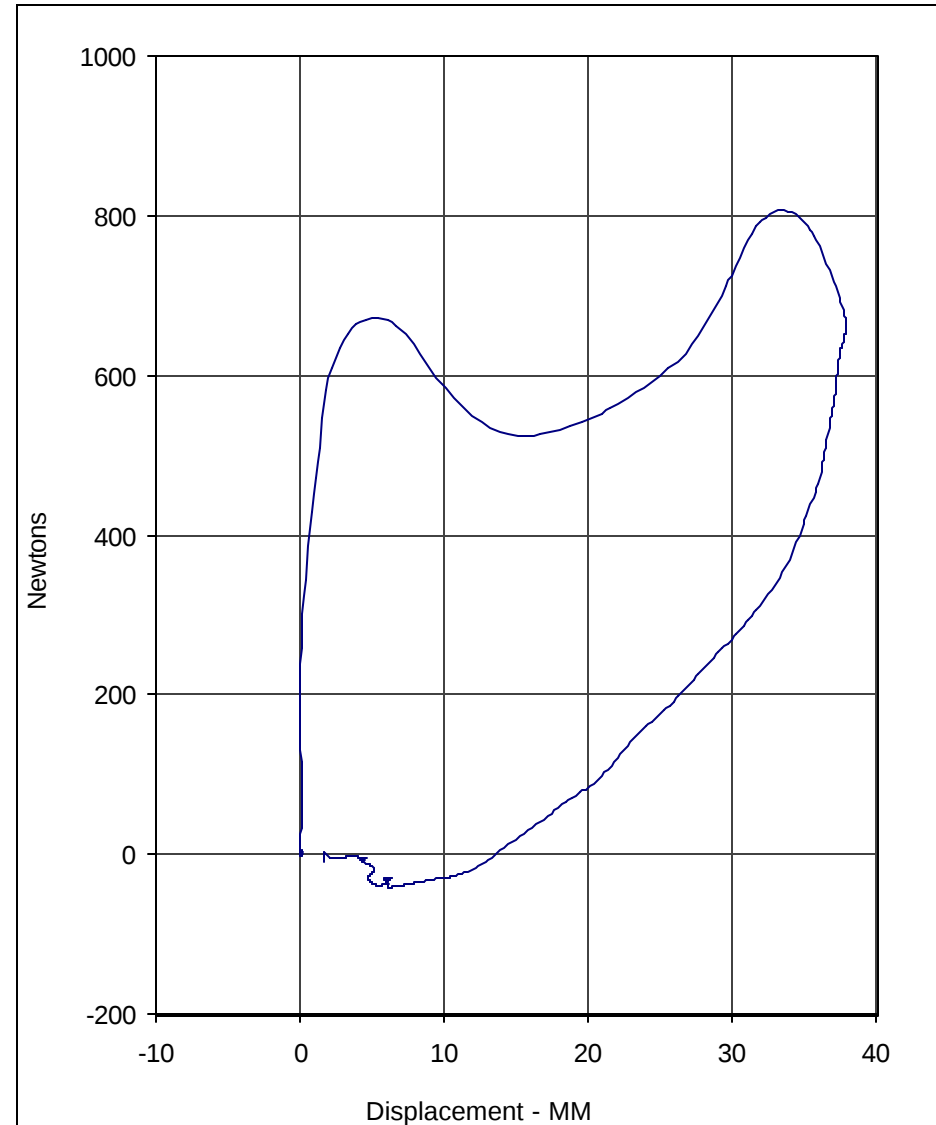




Curve Description				CURNO	Type
Probe Force				003	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	806.4	7.3	-41.6	26.0	180

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 1/7/04



Curve Description			CURNO	Type
Probe Force vs. Chest Compression			004	FIL
Units	Hysteresis	SAE Class		
%	78.2	180/600		

A.T.D. Serial No.: 082

Test I.D.: CH02A





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Flexion Test

ATD Serial No.: 082

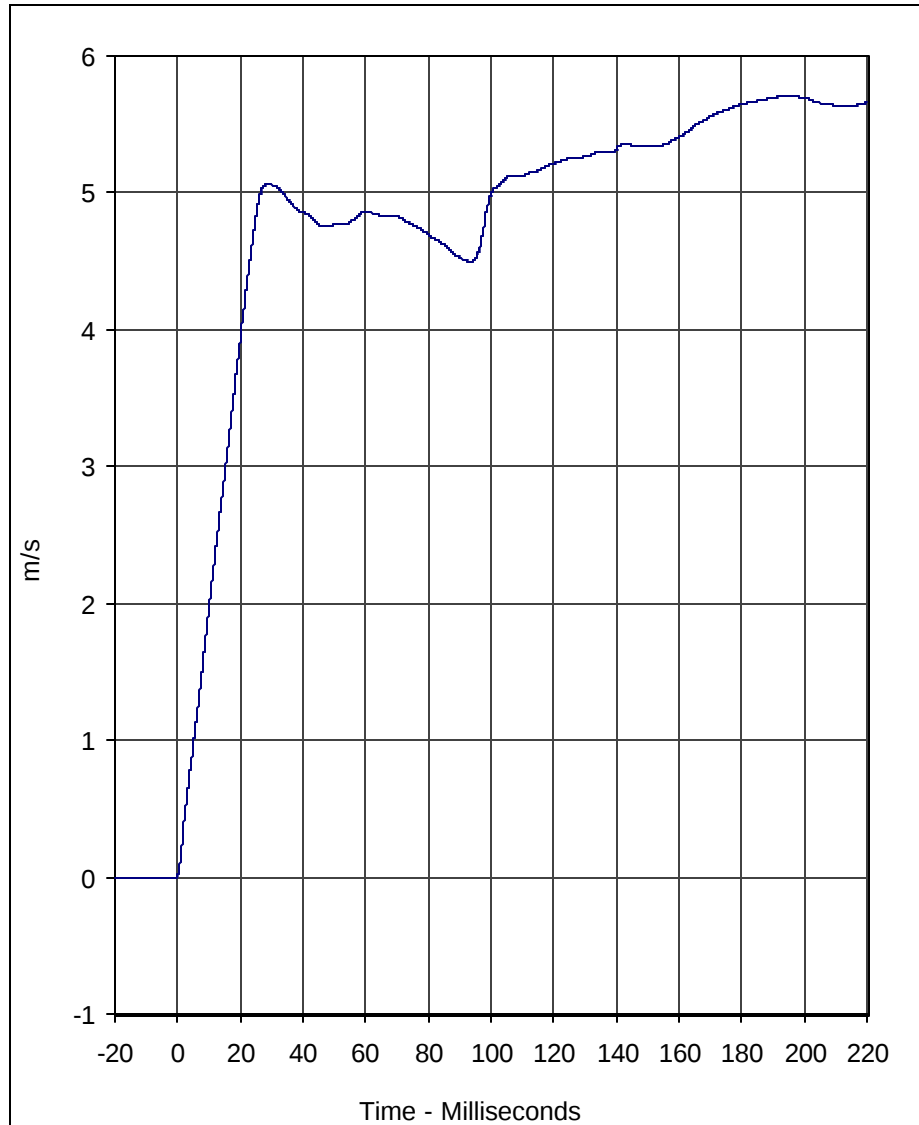
Test I.D.: NF02A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.40 to 5.60	5.58	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.0	Pass
	20 Msec.	m/s	3.0 to 4.0	3.9	Pass
	30 Msec.	m/s	4.0 to 5.1	5.1	Pass
"D" Plane Rotation	Maximum	Degrees	70.0 to 82.0	78.0	Pass
Peak Moment in Rotation	Maximum	Nm	42.0 to 53.0	50.2	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	78.3	Pass
Overall Test Results					Pass

Laboratory Technician

January 7, 2004

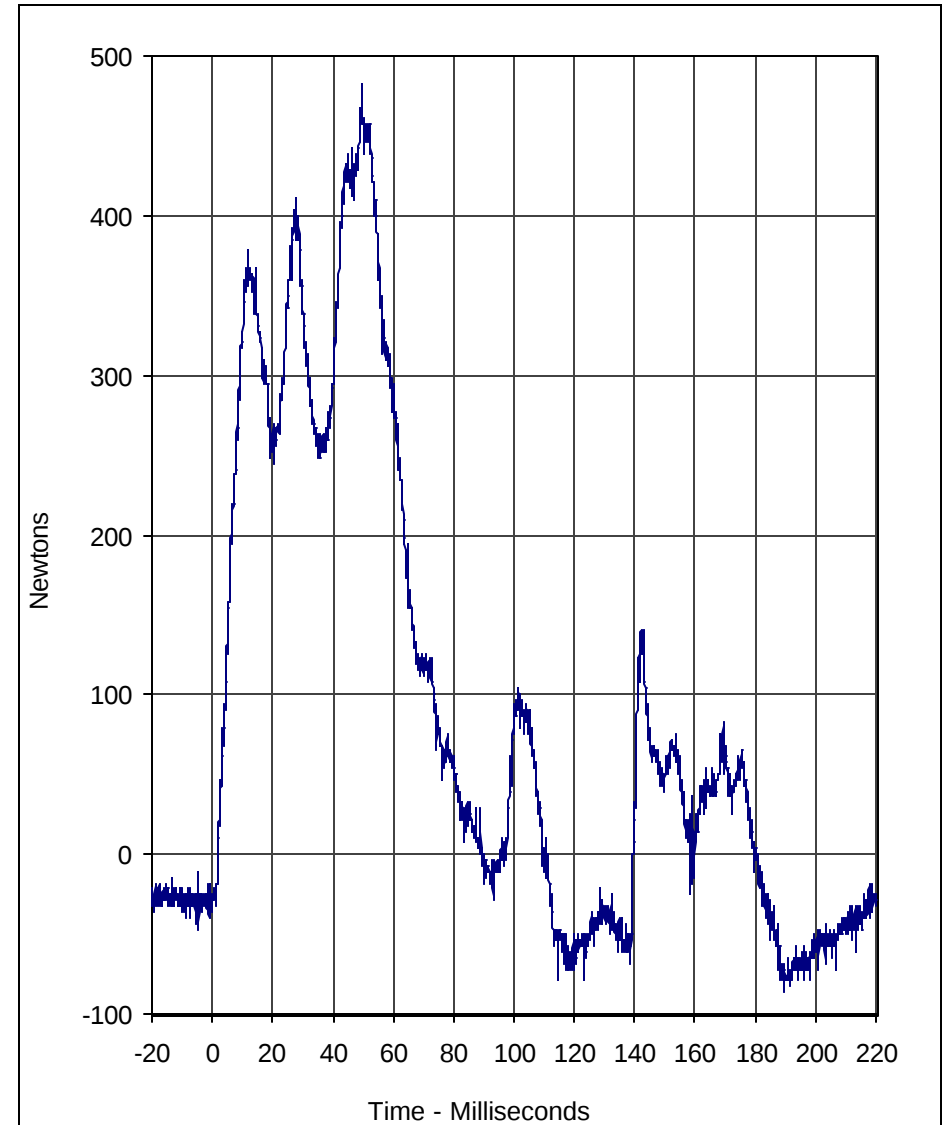
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	5.7	194.1	0.0	-0.6	180

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 1/7/04

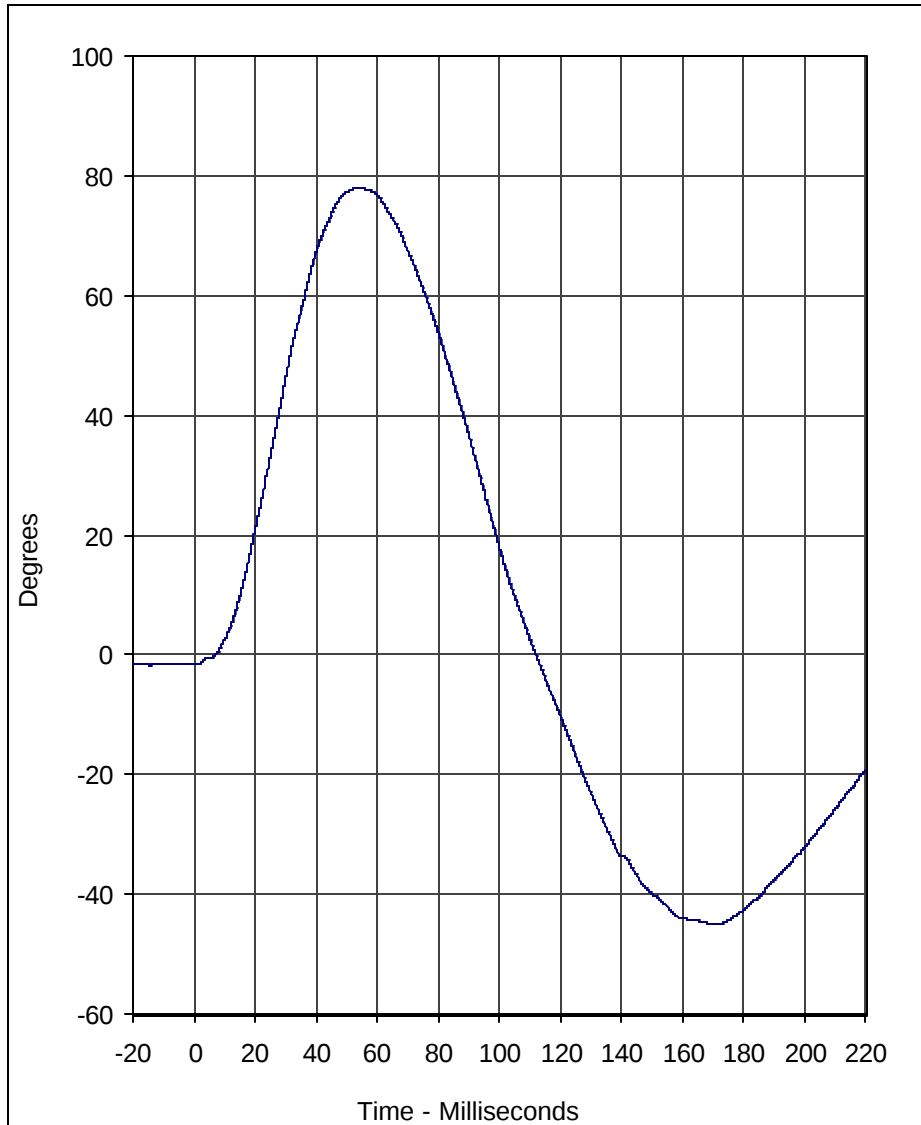


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	482.4	49.4	-86.4	189.5	1000

A.T.D. Serial No.: 082

Test I.D.: NF02A

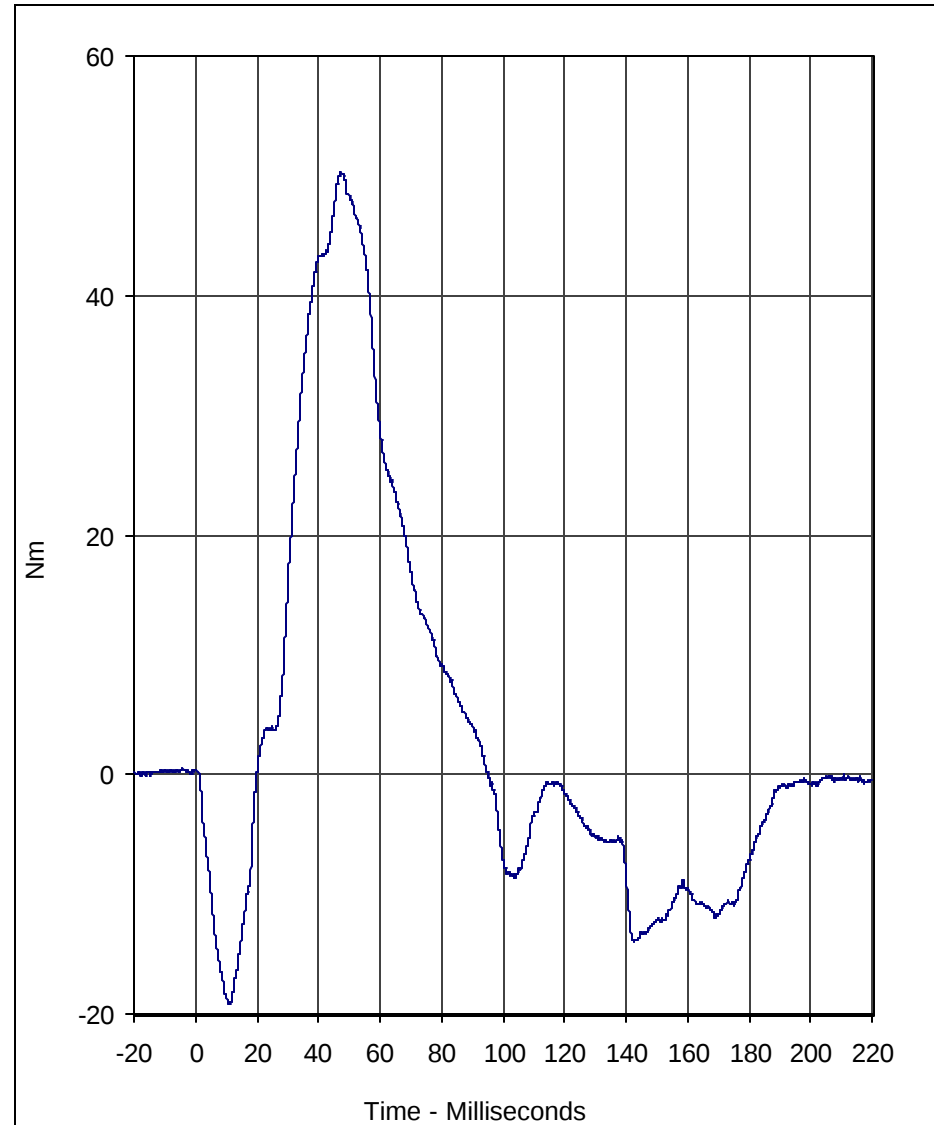




Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	78.0	53.8	-45.1	171.4	180

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 1/7/04



Curve Description				CURNO	Type
Neck Moment Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	50.2	47.2	-19.2	10.7	600

A.T.D. Serial No.: 082

Test I.D.: NF02A





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Extension Test

ATD Serial No.: 082

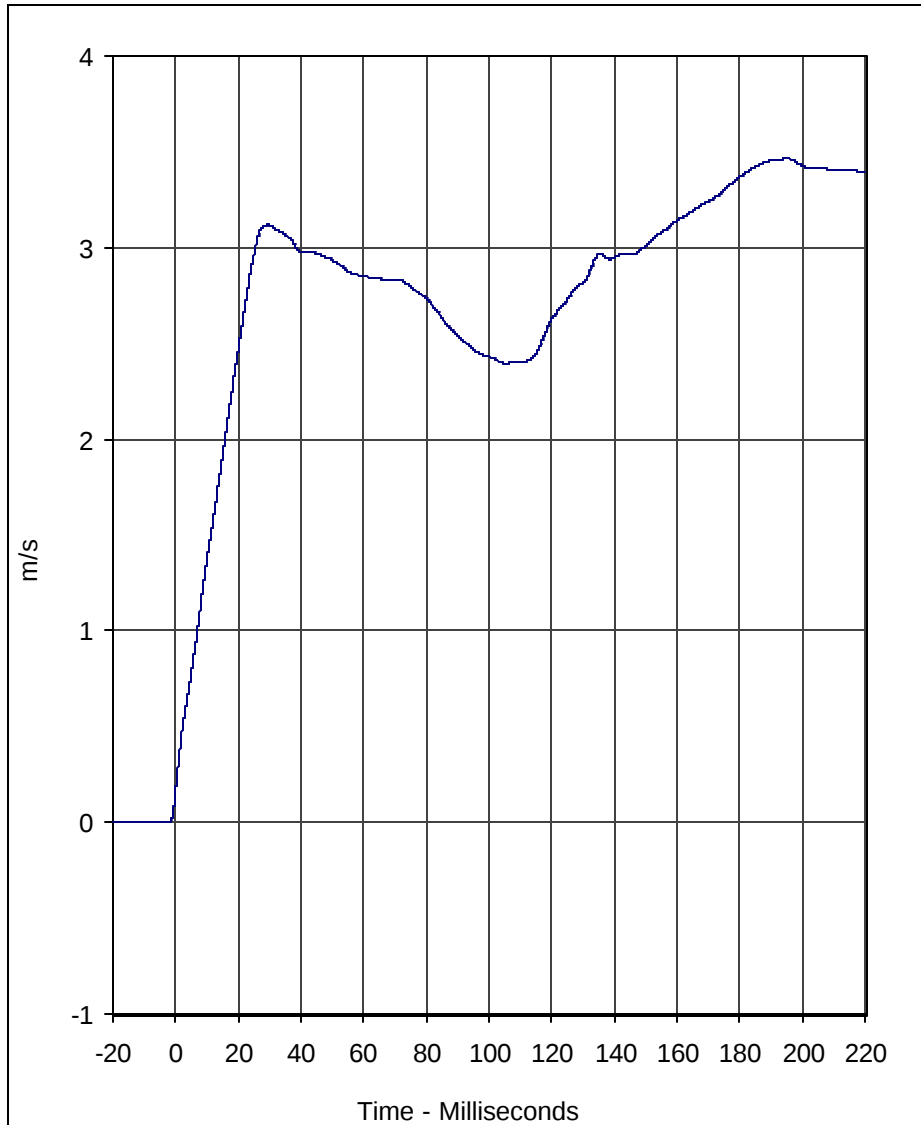
Test I.D.: NE02A

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	3.55 to 3.75	3.60	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.4	Pass
	20 Msec.	m/s	1.9 to 2.5	2.5	Pass
	30 Msec.	m/s	2.8 to 3.5	3.1	Pass
"D" Plane Rotation	Maximum	Degrees	83.0 to 93.0	85.8	Pass
Peak Moment in Rotation	Maximum	Nm	-43.7 to -53.3	-51.7	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	78.5	Pass
Overall Test Results					Pass

Laboratory Technician

January 7, 2004

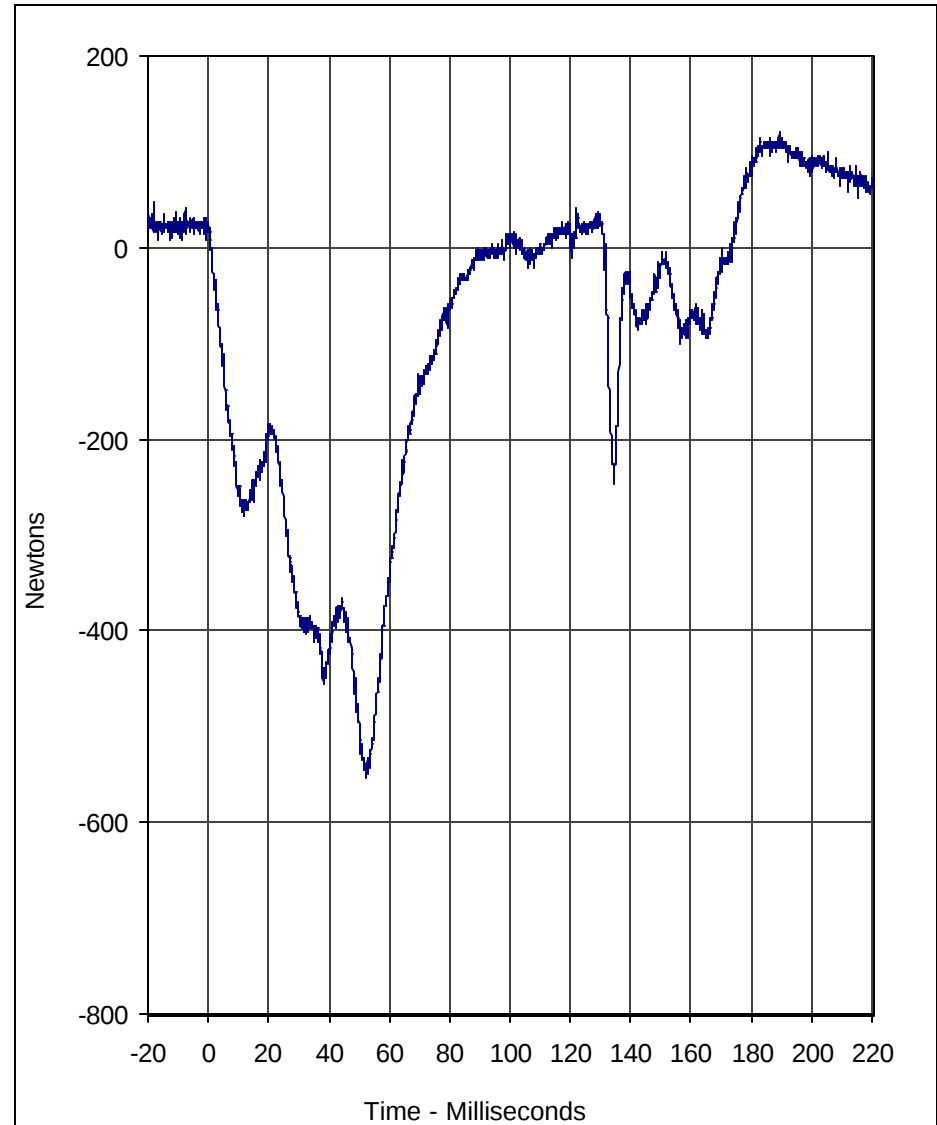
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	3.5	195.2	0.0	-18.7	180

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 1/7/04

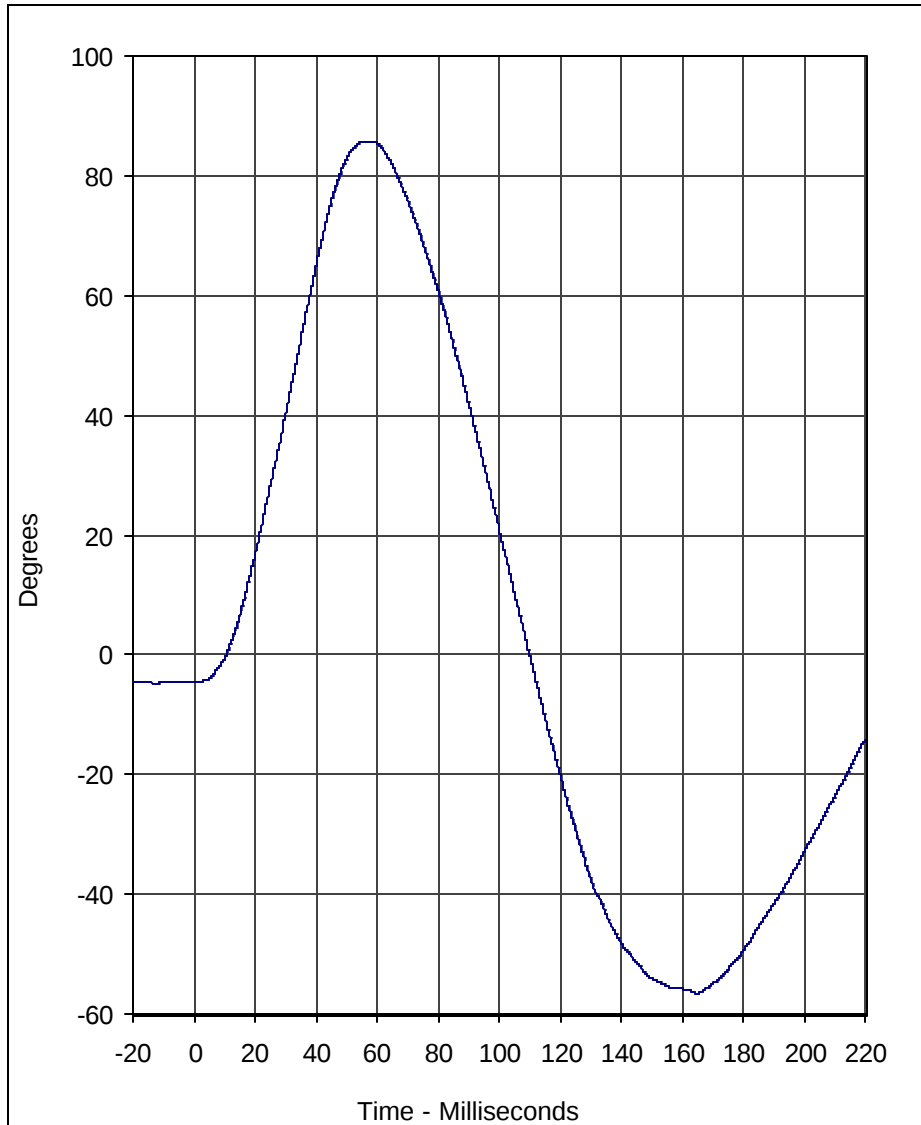


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	120.6	189.2	-552.9	52.3	1000

A.T.D. Serial No.: 082

Test I.D.: NE02A

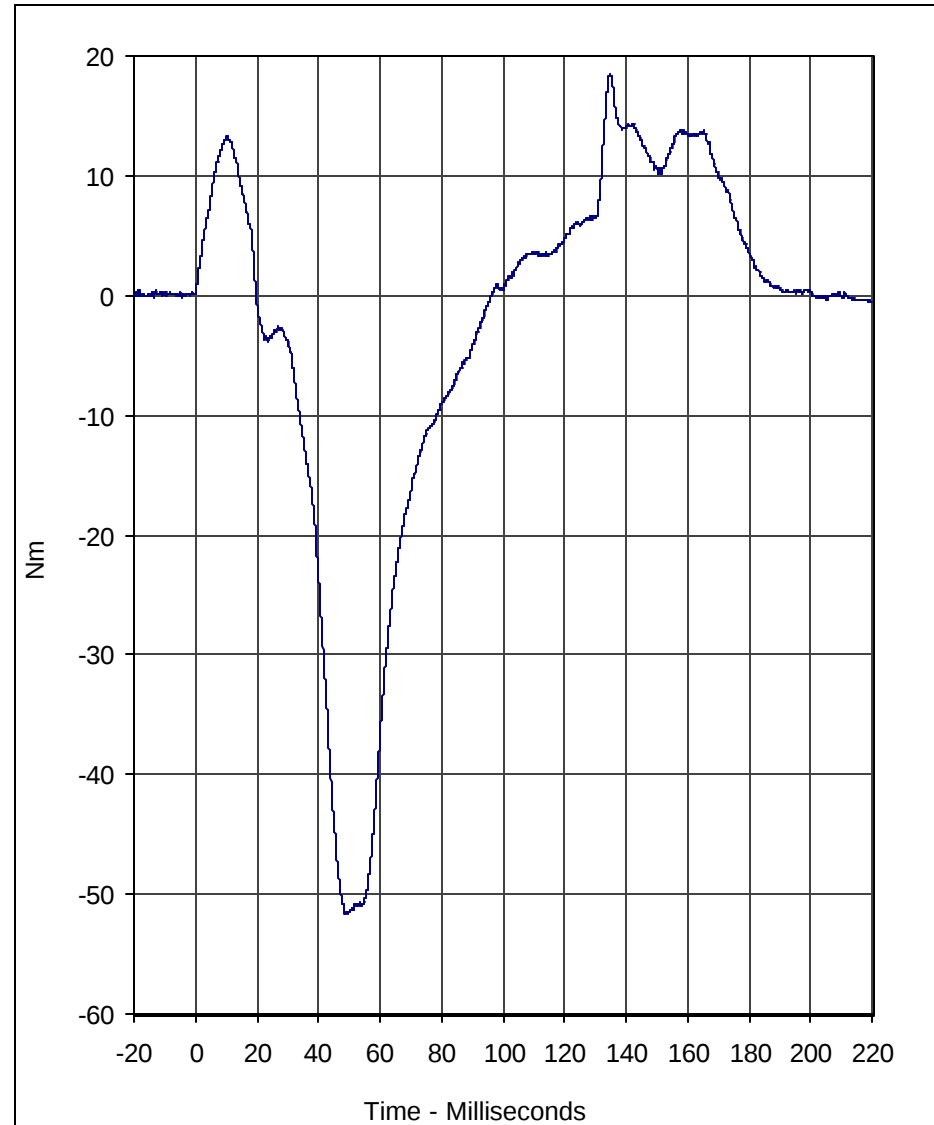




Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	85.8	55.7	-56.5	164.9	180

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 1/7/04



Curve Description				CURNO	Type
Neck Moment Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	18.4	134.9	-51.7	48.9	600

A.T.D. Serial No.: 082

Test I.D.: NE02A





Calibration Data Sheet

Hybrid III 3 Year Old

Torso Flexion Test

ATD Serial No.: 082

Test I.D.: TF02A

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
Initial reference plane angle	Degrees	≤15.0	2.7	Pass
Peak Force at 45 +/-0.5 degrees	Newtons	130.0 to 180.0	167.0	Pass
Torso rotation rate	deg/sec	0.5 to 1.5	1.2	Pass
Final reference plane angle	Degrees	+/-10	6.2	Pass
Overall Test Results			Pass	

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Laboratory Technician

January 7, 2004

Test Date



Calibration Data Sheet Hybrid III 3 Year Old External Measurements

ATD Serial No.: 082

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	539 to 554	550	Pass
B - Shoulder pivot height	mm	307 to 323	310	Pass
C - "H" point height	mm	34 to 45	40	Pass
D - "H" point from backline	mm	57 to 67	65	Pass
E - Shoulder pivot from back	mm	61 to 71	70	Pass
F - Thigh clearance	mm	81 to 91	85	Pass
G - Elbow back to wrist pivot	mm	247 to 263	255	Pass
H - Skull cap to back line	mm	48 to 58	50	Pass
I - Shoulder to elbow length	mm	185 to 201	200	Pass
J - Elbow rest height	mm	134 to 149	135	Pass
K - Buttock to knee length	mm	285 to 300	295	Pass
L - Popliteal length	mm	219 to 234	225	Pass
M - Knee pivot height	mm	242 to 257	245	Pass
N - Buttock popliteal length	mm	218 to 233	230	Pass
O - Chest depth with jacket	mm	139 to 154	145	Pass
P - Foot length	mm	138 to 148	140	Pass
R - Buttock to knee pivot length	mm	251 to 262	255	Pass
S - Head Breadth	mm	128 to 144	135	Pass
T - Head Depth	mm	167 to 183	180	Pass
U - Hip breadth	mm	201 to 216	210	Pass
V - Shoulder breadth	mm	237 to 252	250	Pass
W - Foot breadth	mm	54 to 64	60	Pass
X - Head circumference	mm	500 to 516	515	Pass
Y - Chest circumference with jacket	mm	527 to 553	535	Pass
Z - Waist circumference	mm	527 to 553	530	Pass
AA - Location for chest circumference	mm	249 to 259	255	Pass
BB - Location for waist circumference	mm	160 to 170	165	Pass
Overall Test Results				Pass

Laboratory Technician

January 7, 2004
Test Date



Calibration Data Sheet Hybrid III 3 Year Old Head Drop Test

ATD Serial No.: 139

Test I.D.: HD02B

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	250.0 to 280.0	279.3	Pass
Peak Lateral Acceleration	G's	≤15.0	1.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<10	2.8	Pass
Overall Test Results				Pass

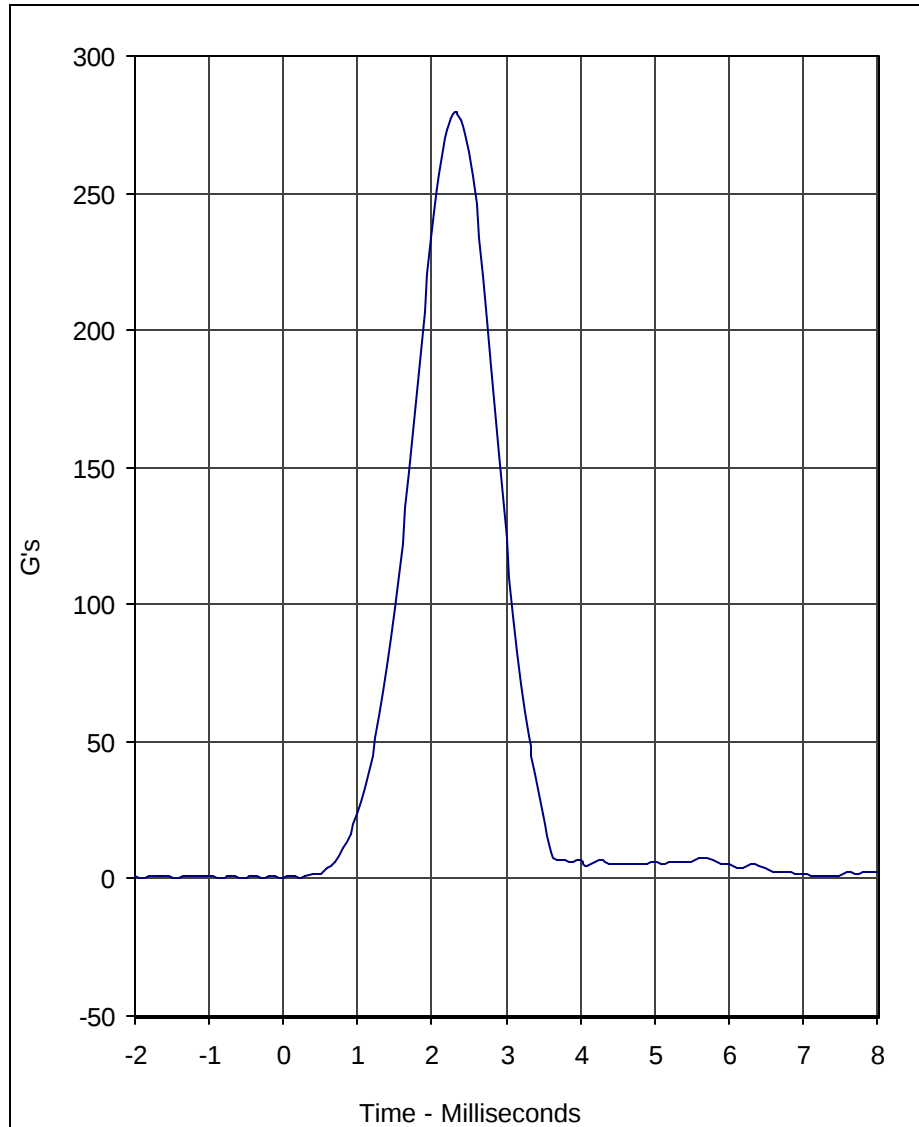
FS-14

TR-P24001-11-NC

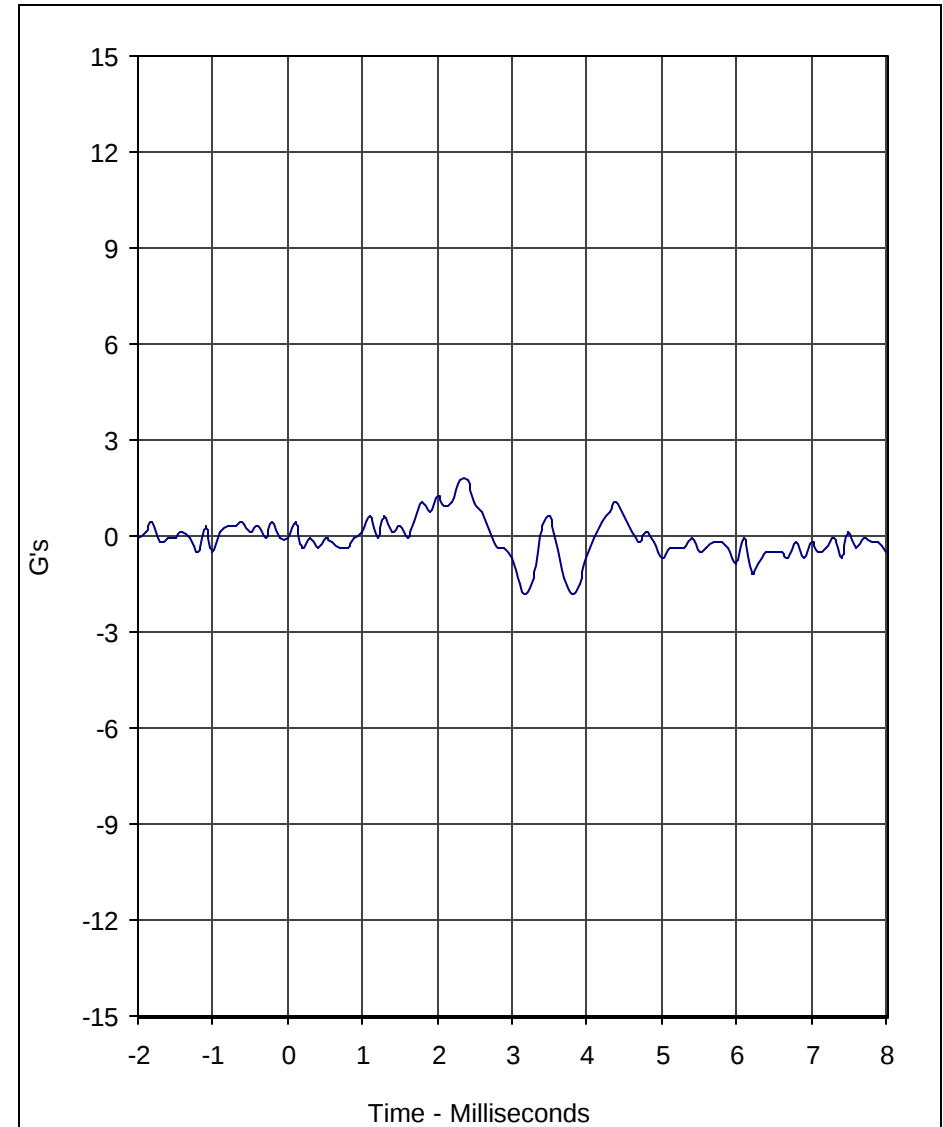
Laboratory Technician

January 7, 2004

Test Date



Curve Description				CURNO	Type
Head Resultant				001	RES
Units	Max	Time	Min	Time	SAE Class
G's	279.3	2.3	0.2	-1.4	1000



Curve Description				CURNO	Type
Head Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	1.7	2.3	-1.8	3.2	1000

Test Program: Hybrid III 3 Year Old Head Drop Test
 Test Date: 1/7/04

A.T.D. Serial No.: 139
 Test I.D.: HD02B





Calibration Data Sheet

Hybrid III 3 Year Old

Thorax Impact Test

ATD Serial No.: 139

Test I.D.: CH02B

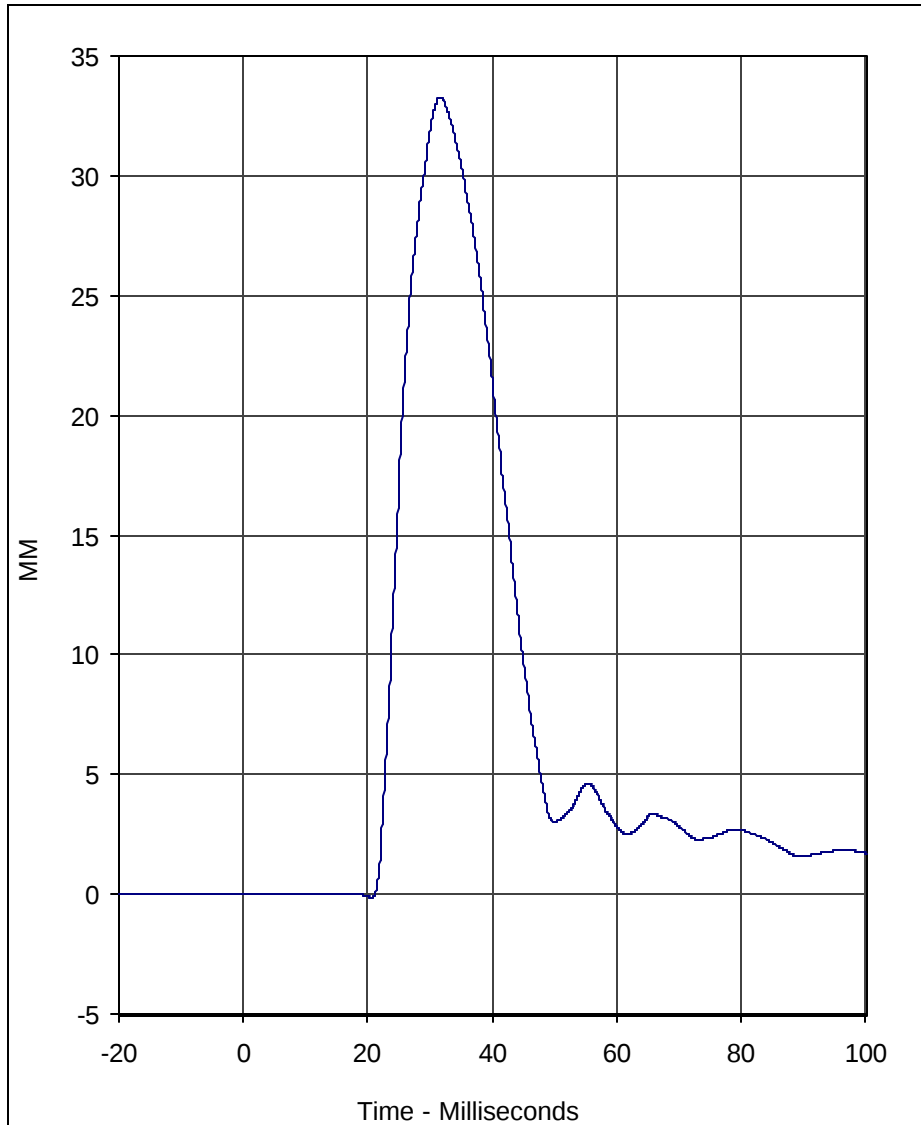
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.9 to 6.1	5.96	Pass
Peak Chest Compression	MM	32 to 38	33.3	Pass
Peak Probe Force Between 32 and 38 MM	Newtons	680 to 810	742.3	Pass
Peak Probe Force Between 12.5 and 32 MM	Newtons	≤860	750.3	Pass
Internal Hysteresis	%	65 to 85	75.9	Pass
Overall Test Results				Pass

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Laboratory Technician

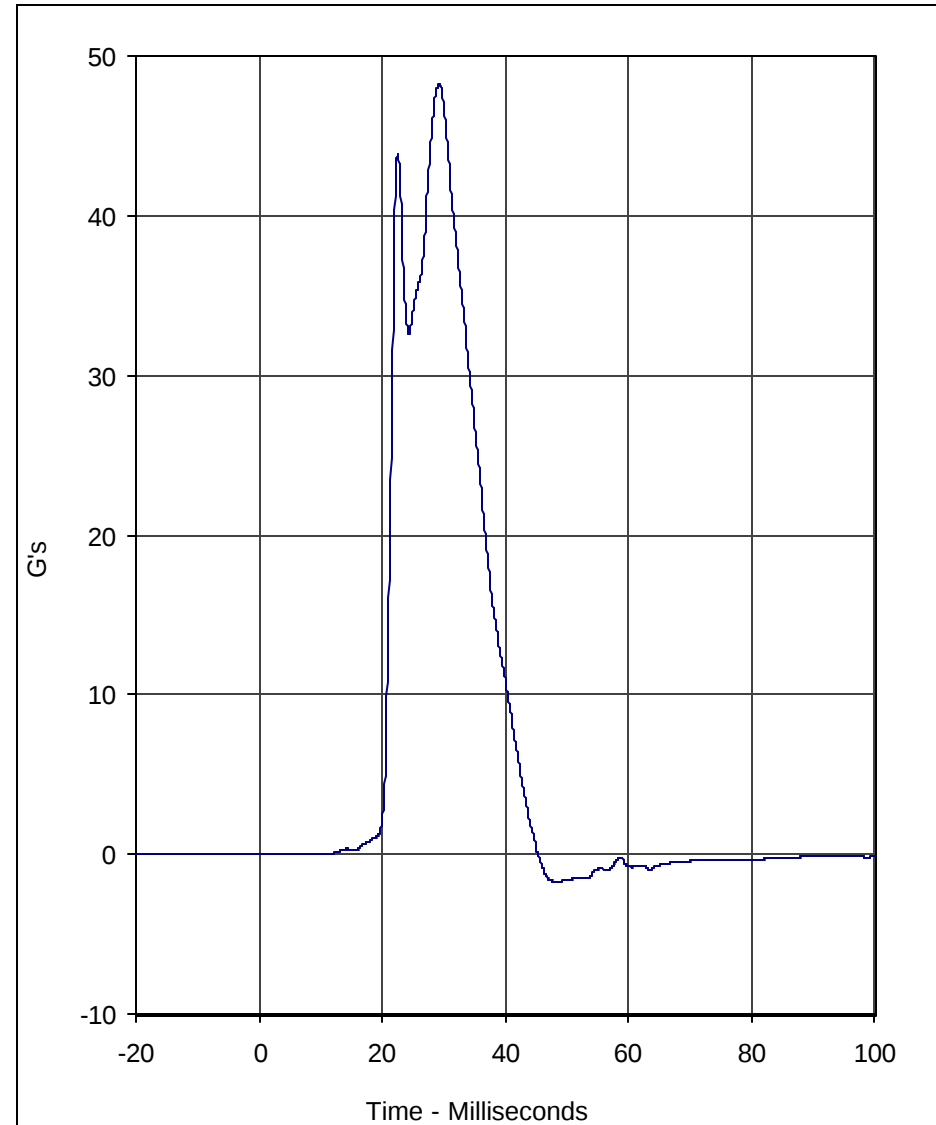
January 7, 2004
Test Date



Curve Description				CURNO	Type
Chest Compression				001	FIL
Units	Max	Time	Min	Time	SAE Class
MM	33.3	32.2	-0.1	21.1	600

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 1/7/04

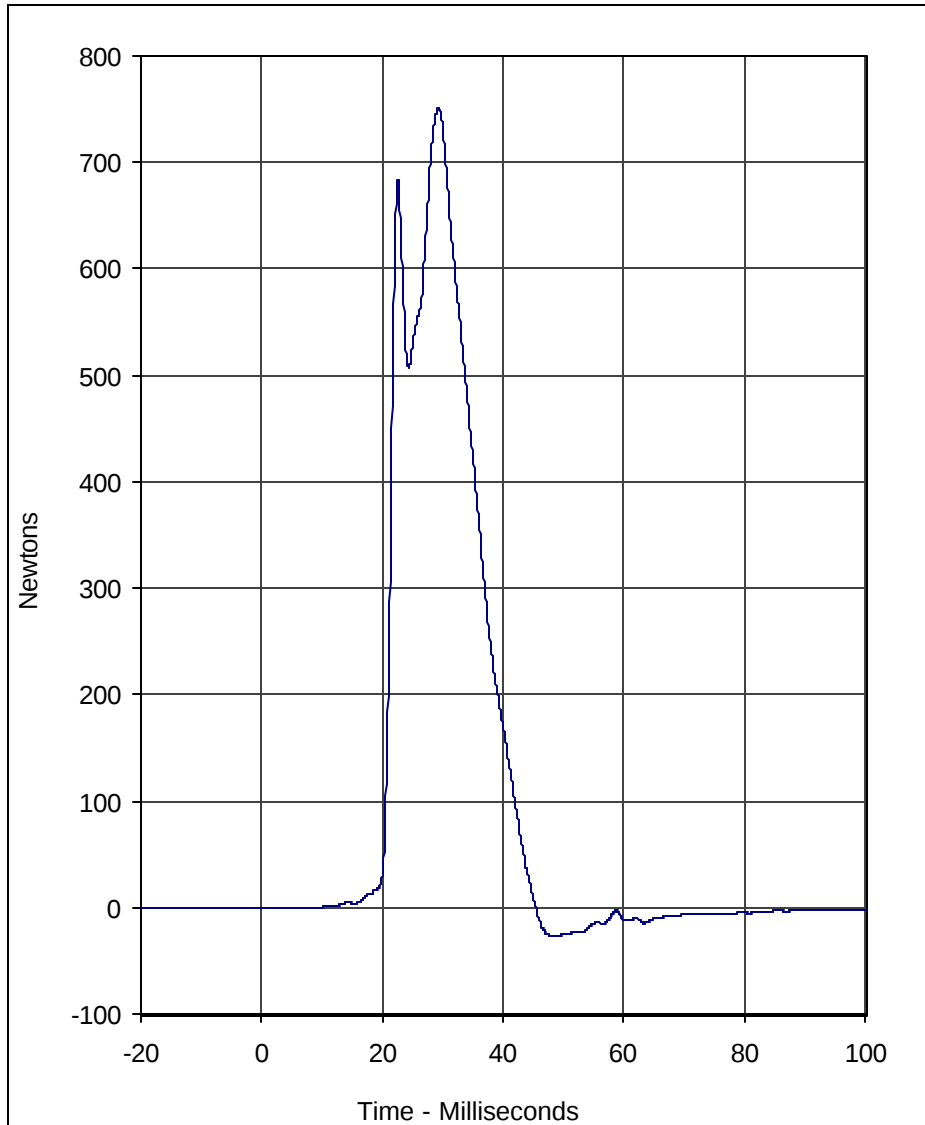


Curve Description				CURNO	Type
Probe Acceleration				002	FIL
Units	Max	Time	Min	Time	SAE Class
G's	48.2	29.8	-1.7	48.8	180

A.T.D. Serial No.: 139

Test I.D.: CH02B

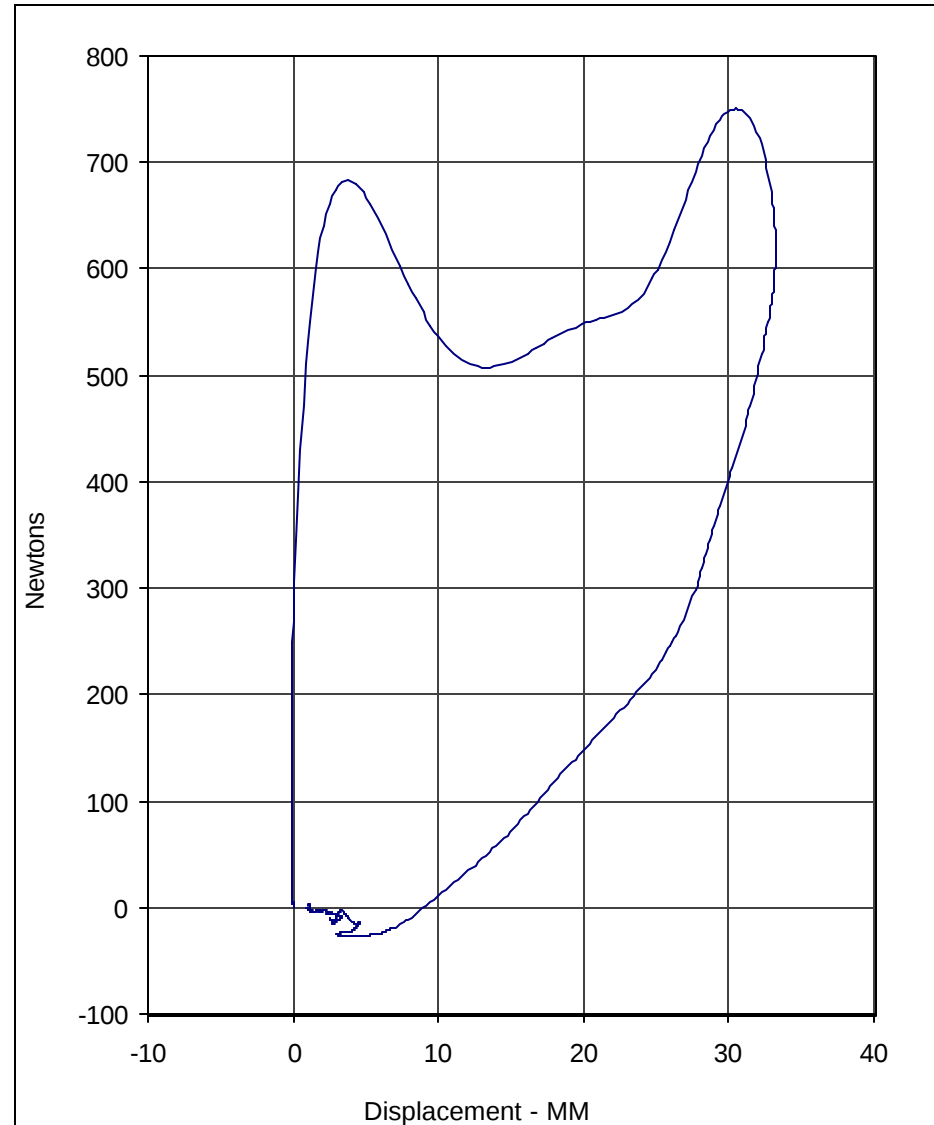




Curve Description				CURNO	Type
Probe Force				003	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	750.3	29.3	-26.5	48.3	180

Test Program: Hybrid III 3 Year Old Thorax Impact

Test Date: 1/7/04



Curve Description			CURNO	Type
Probe Force vs. Chest Compression			004	FIL
Units	Hysteresis	SAE Class		
%	75.9	180/600		

A.T.D. Serial No.: 139

Test I.D.: CH02B





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Flexion Test

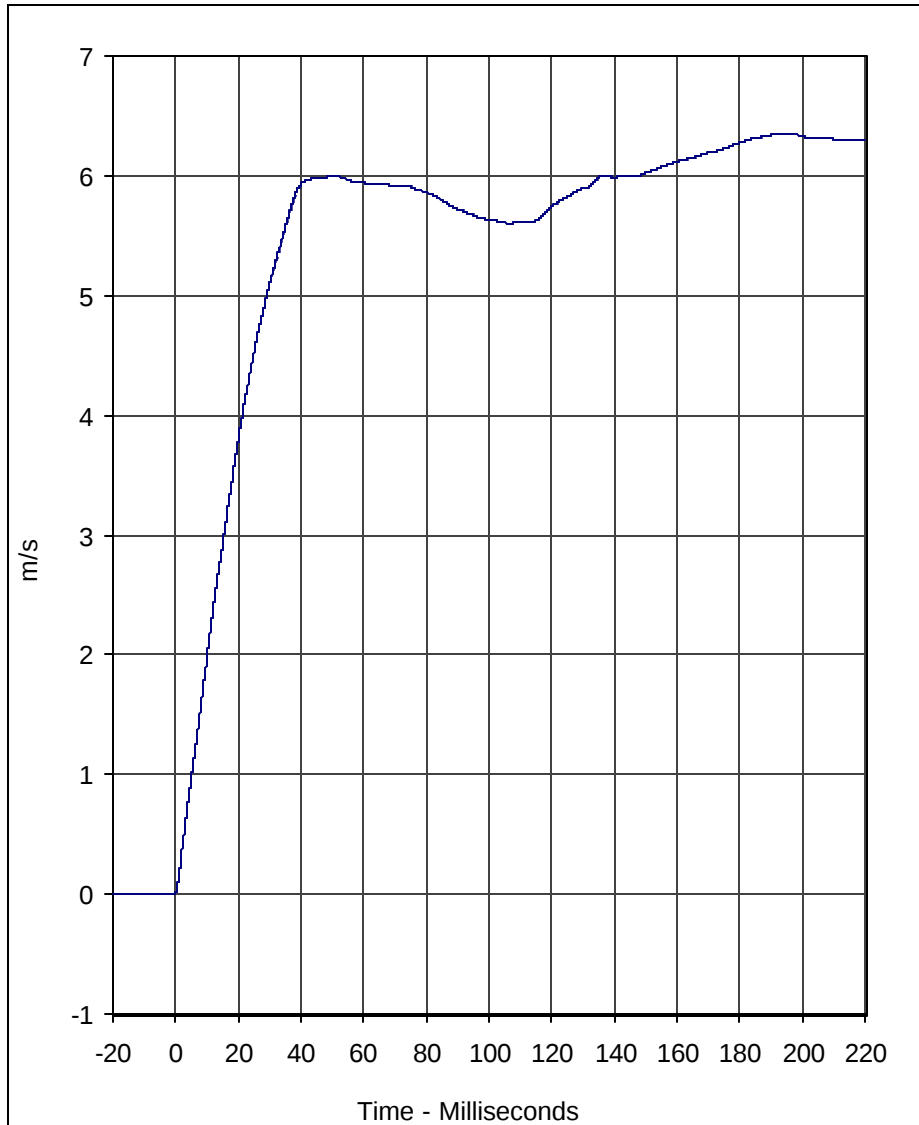
ATD Serial No.: 139

Test I.D.: NF02B

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.40 to 5.60	5.47	Pass
Pendulum Deceleration	10 Msec.	m/s	2.0 to 2.7	2.0	Pass
	20 Msec.	m/s	3.0 to 4.0	3.8	Pass
	30 Msec.	m/s	4.0 to 5.1	5.1	Pass
"D" Plane Rotation	Maximum	Degrees	70.0 to 82.0	76.9	Pass
Peak Moment in Rotation	Maximum	Nm	42.0 to 53.0	48.9	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	78.8	Pass
Overall Test Results					Pass

Laboratory Technician

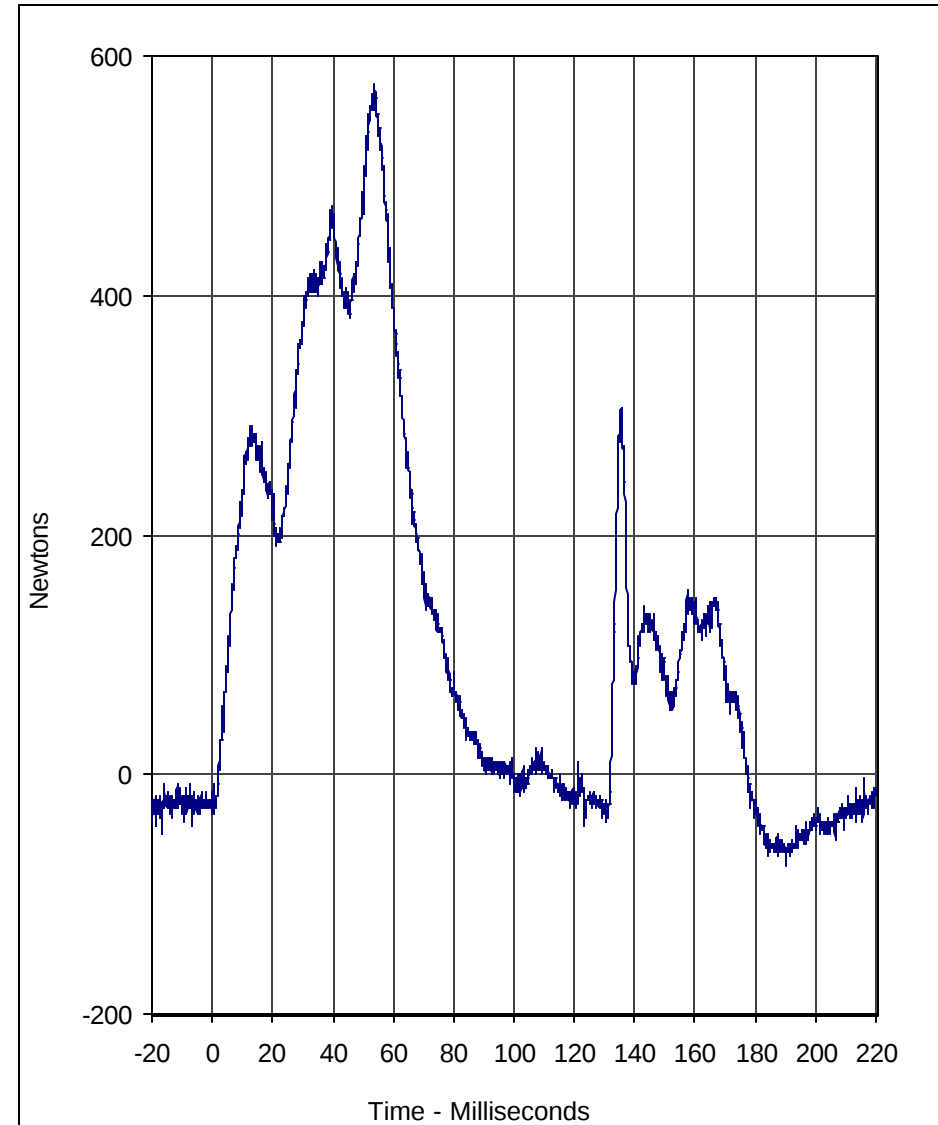
January 7, 2004
Test Date



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	6.4	196.2	0.0	-0.7	180

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 1/7/04

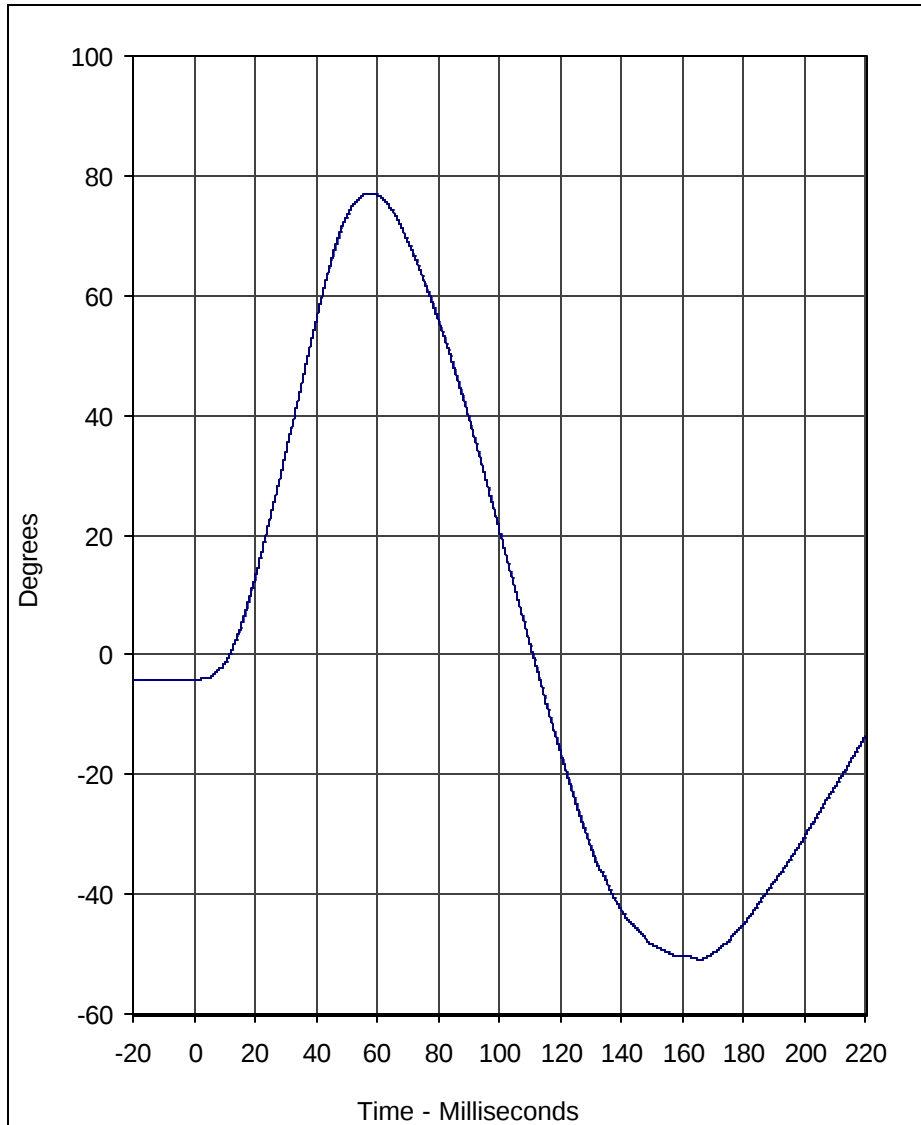


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	576.0	53.4	-75.6	190.3	1000

A.T.D. Serial No.: 139

Test I.D.: NF02B

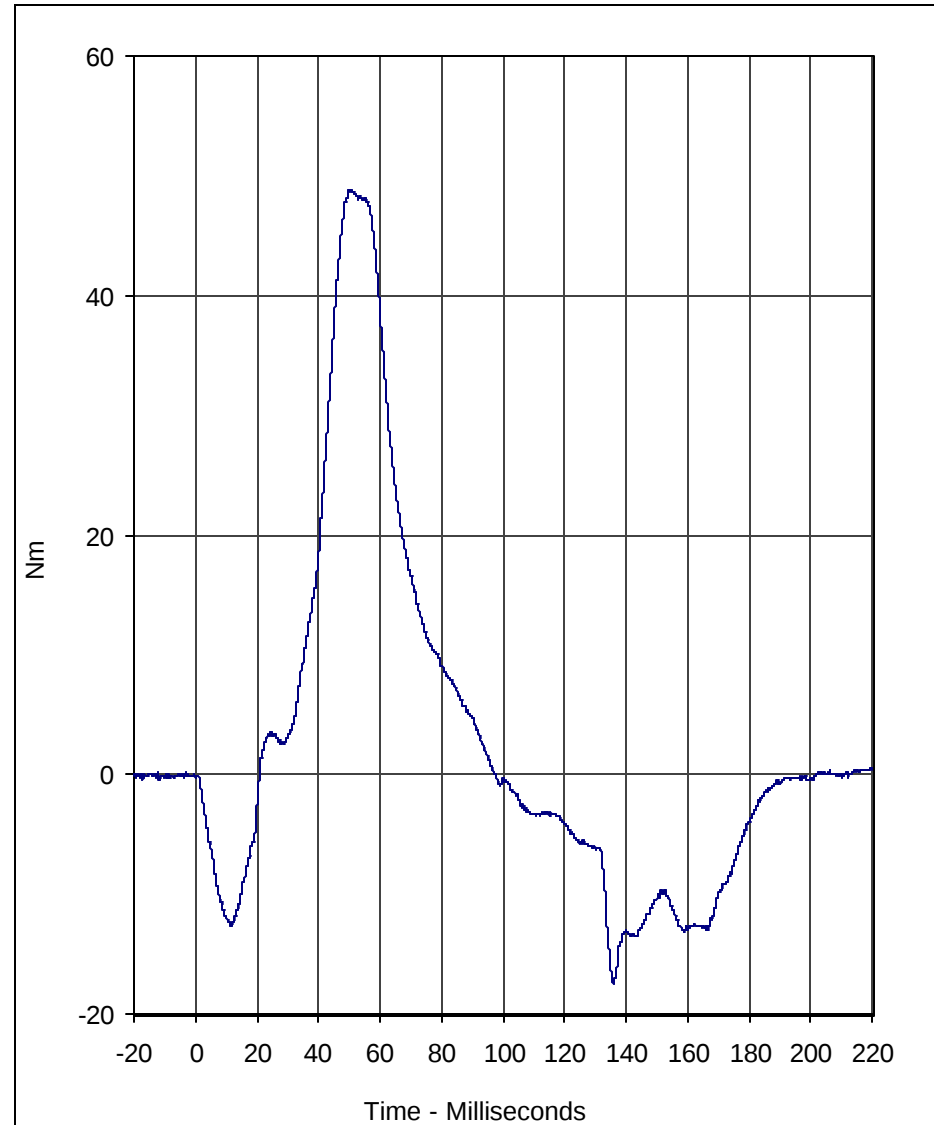




Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL
Units	Max	Time	Min	Time	SAE Class
Degrees	76.9	56.8	-51.0	166.0	180

Test Program: 3 Year Old Hybrid III Neck Flexion Test

Test Date: 1/7/04



Curve Description				CURNO	Type
Neck Moment Y				002	FIL
Units	Max	Time	Min	Time	SAE Class
Nm	48.9	50.0	-17.4	136.0	600

A.T.D. Serial No.: 139

Test I.D.: NF02B





Calibration Data Sheet

Hybrid III 3 Year Old

Neck Extension Test

ATD Serial No.: 139

Test I.D.: NE02B

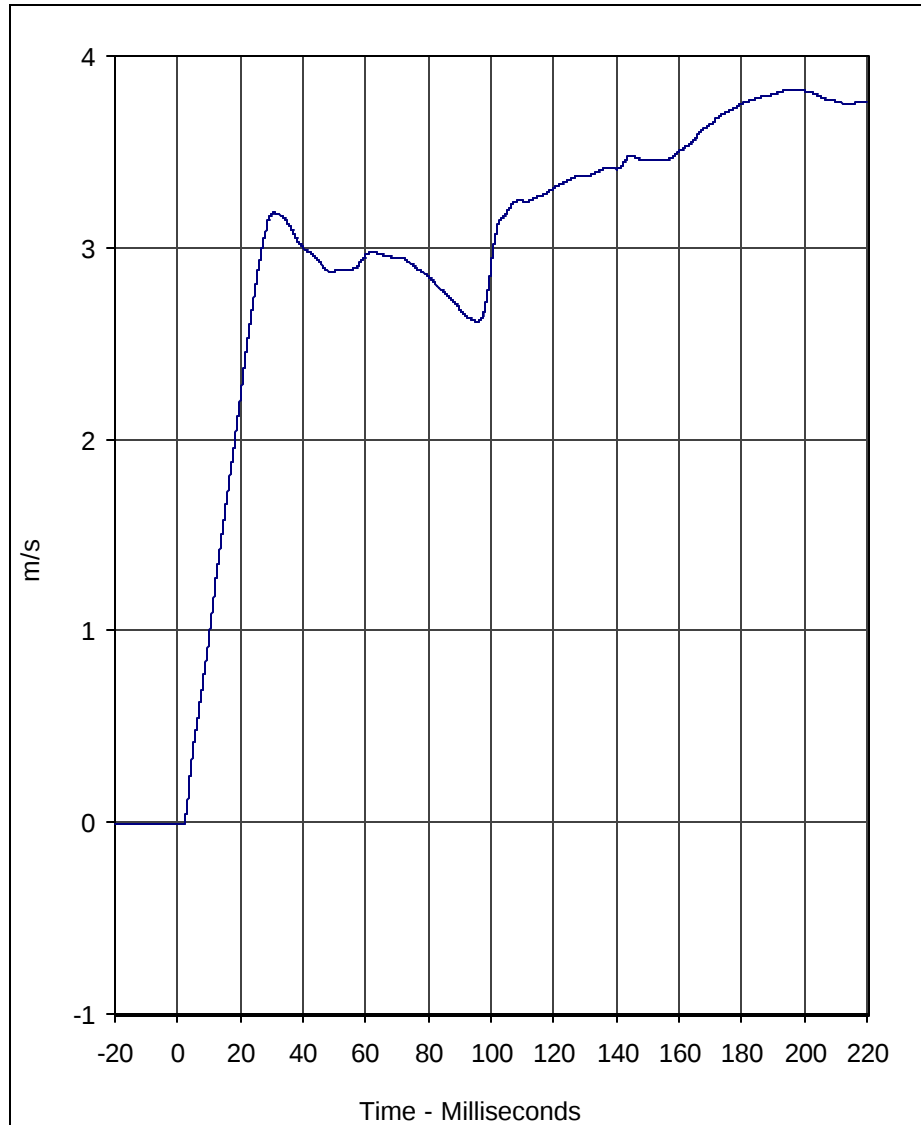
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	3.55 to 3.75	3.63	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.1	Pass
	20 Msec.	m/s	1.9 to 2.5	2.2	Pass
	30 Msec.	m/s	2.8 to 3.5	3.2	Pass
"D" Plane Rotation	Maximum	Degrees	83.0 to 93.0	84.2	Pass
Peak Moment in Rotation	Maximum	Nm	-43.7 to -53.3	-47.0	Pass
Positive Moment Decay, Time to 10Nm		Msec.	60.0 to 80.0	79.9	Pass
Overall Test Results					Pass

Laboratory Technician

January 7, 2004
Test Date

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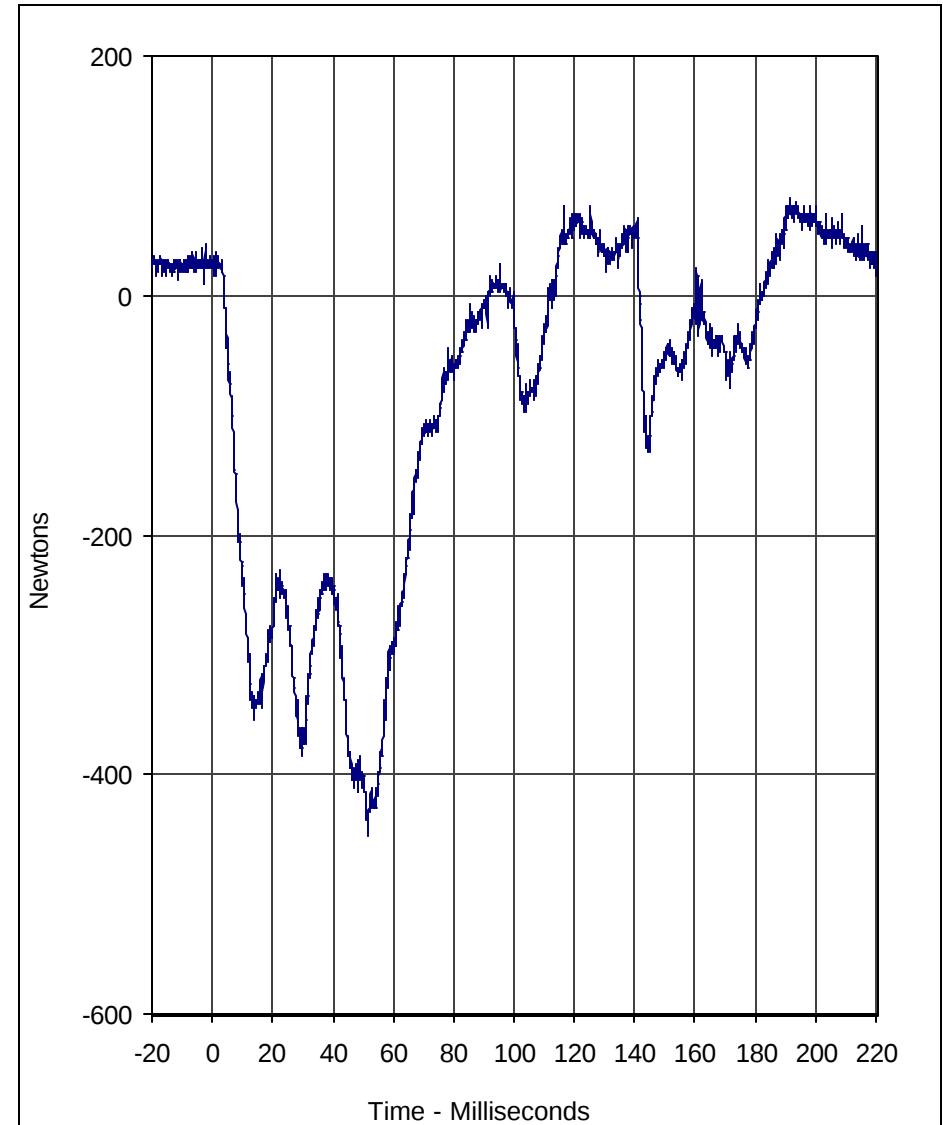
TR-P24001-11-NC



Curve Description				CURNO	Type
Pendulum Velocity				001	FIL
Units	Max	Time	Min	Time	SAE Class
m/s	3.8	196.2	0.0	1.6	180

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 1/7/04

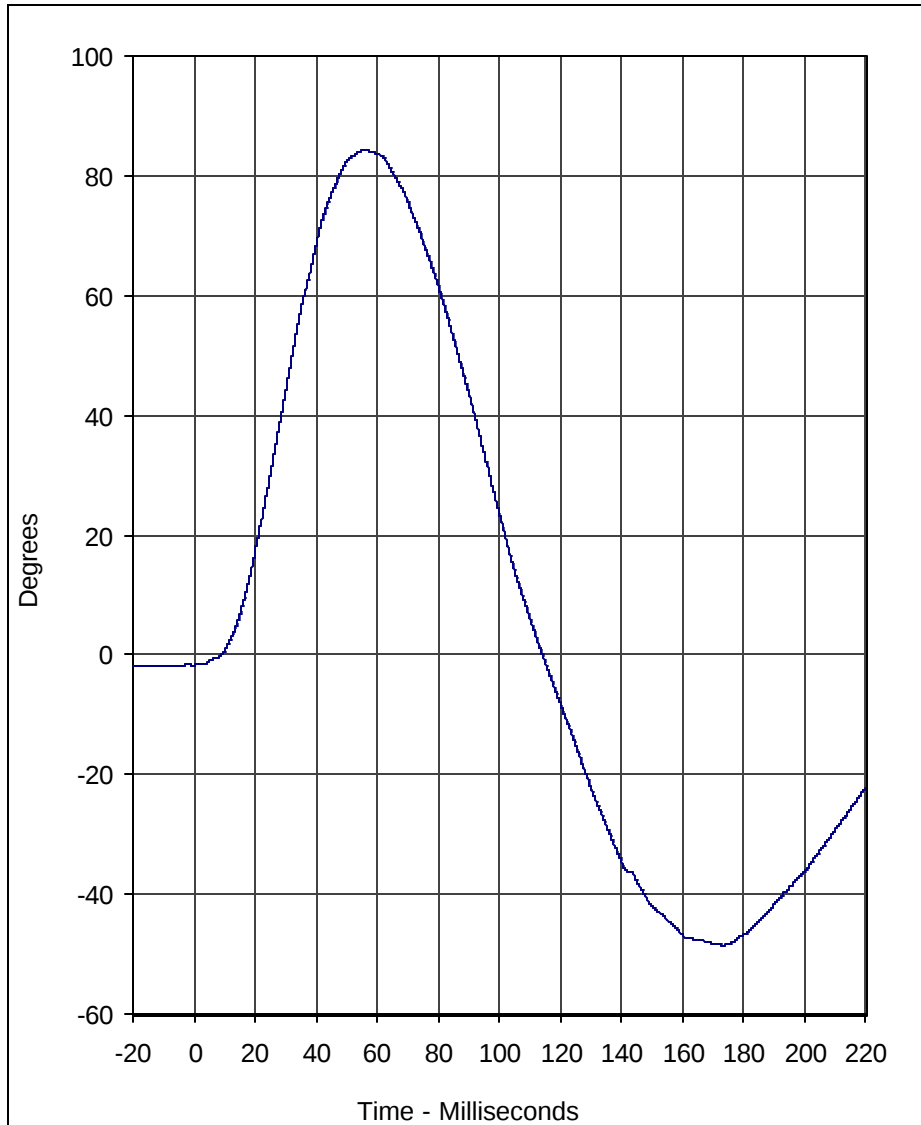


Curve Description				CURNO	Type
Neck Force X				002	FIL
Units	Max	Time	Min	Time	SAE Class
Newtons	80.9	191.6	-451.7	51.5	1000

A.T.D. Serial No.: 139

Test I.D.: NE02B



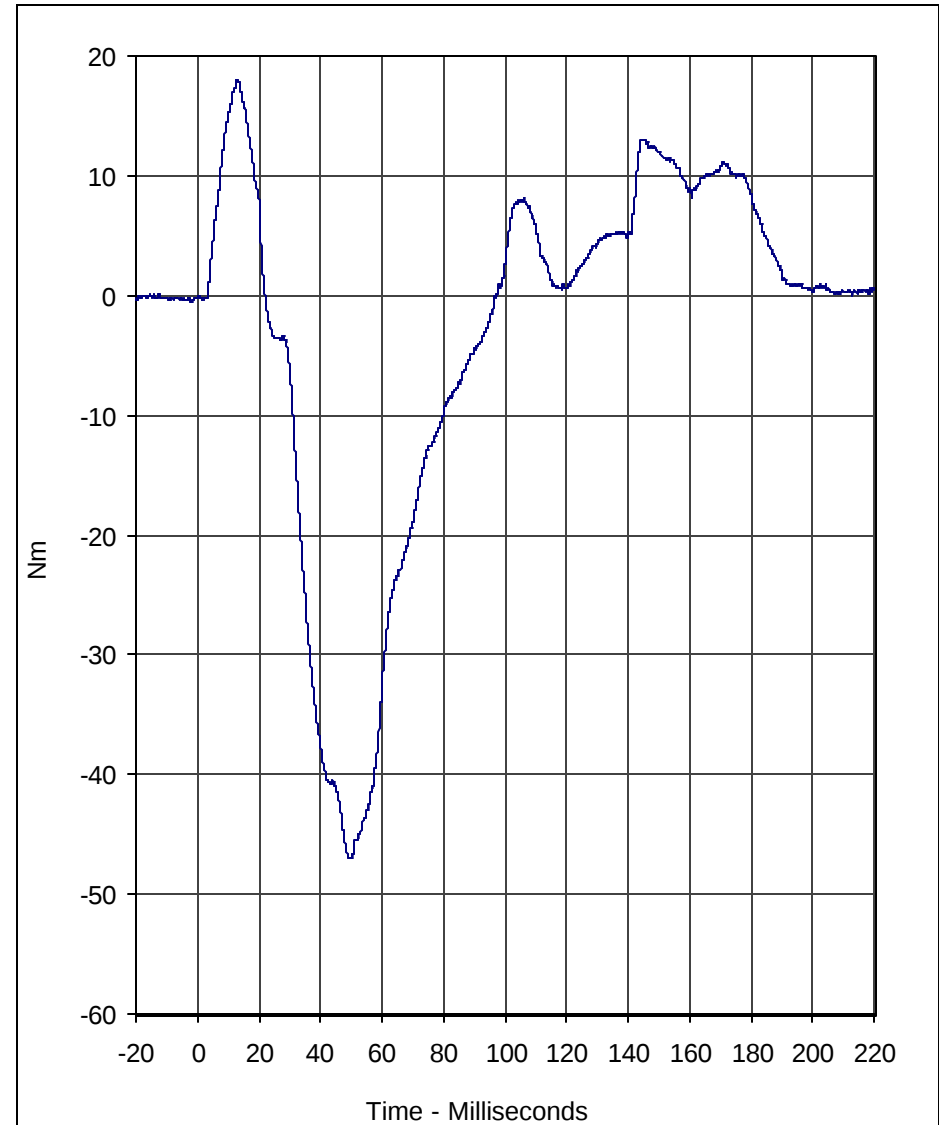


Curve Description				CURNO	Type
"D" Plane Rotation				003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	84.2	55.9	-48.6	173.5	180

Test Program: 3 Year Old Hybrid III Neck Extension Test

Test Date: 1/7/04



Curve Description				CURNO	Type
Neck Moment Y				002	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	18.0	12.8	-47.0	49.3	600

A.T.D. Serial No.: 139

Test I.D.: NE02B





Calibration Data Sheet

Hybrid III 3 Year Old

Torso Flexion Test

ATD Serial No.: 139

Test I.D.: TF02B

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
Initial reference plane angle	Degrees	≤15.0	3.8	Pass
Peak Force at 45 +/-0.5 degrees	Newtons	130.0 to 180.0	178.5	Pass
Torso rotation rate	deg/sec	0.5 to 1.5	0.7	Pass
Final reference plane angle	Degrees	+/-10	2.6	Pass
Overall Test Results				Pass

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Laboratory Technician

January 7, 2004

Test Date



Calibration Data Sheet Hybrid III 3 Year Old External Measurements

ATD Serial No.: 139

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	539 to 554	545	Pass
B - Shoulder pivot height	mm	307 to 323	320	Pass
C - "H" point height	mm	34 to 45	35	Pass
D - "H" point from backline	mm	57 to 67	65	Pass
E - Shoulder pivot from back	mm	61 to 71	67	Pass
F - Thigh clearance	mm	81 to 91	84	Pass
G - Elbow back to wrist pivot	mm	247 to 263	252	Pass
H - Skull cap to back line	mm	48 to 58	50	Pass
I - Shoulder to elbow length	mm	185 to 201	194	Pass
J - Elbow rest height	mm	134 to 149	140	Pass
K - Buttock to knee length	mm	285 to 300	296	Pass
L - Popliteal length	mm	219 to 234	225	Pass
M - Knee pivot height	mm	242 to 257	245	Pass
N - Buttock popliteal length	mm	218 to 233	223	Pass
O - Chest depth with jacket	mm	139 to 154	150	Pass
P - Foot length	mm	138 to 148	145	Pass
R - Buttock to knee pivot length	mm	251 to 262	260	Pass
S - Head Breadth	mm	128 to 144	140	Pass
T - Head Depth	mm	167 to 183	175	Pass
U - Hip breadth	mm	201 to 216	212	Pass
V - Shoulder breadth	mm	237 to 252	243	Pass
W - Foot breadth	mm	54 to 64	56	Pass
X - Head circumference	mm	500 to 516	512	Pass
Y - Chest circumference with jacket	mm	527 to 553	535	Pass
Z - Waist circumference	mm	527 to 553	542	Pass
AA - Location for chest circumference	mm	249 to 259	254	Pass
BB - Location for waist circumference	mm	160 to 170	164	Pass
Overall Test Results				Pass

Laboratory Technician

January 7, 2004
Test Date

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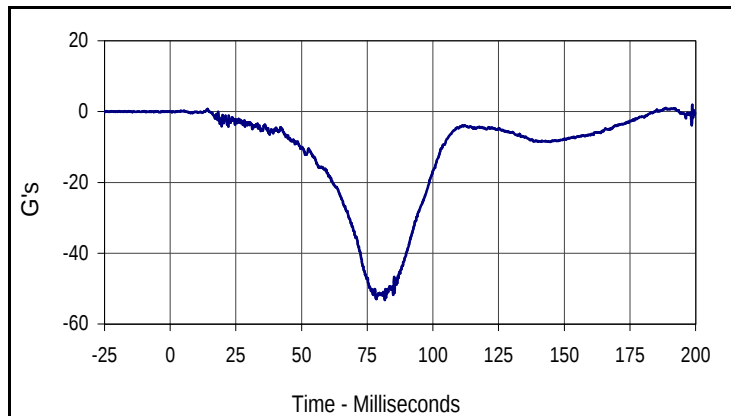
TR-P24001-11-NC

APPENDIX G

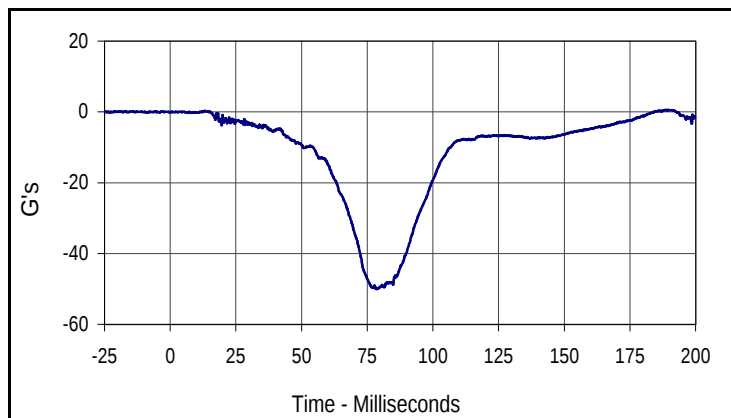
NINE ACCELEROMETER ARRAY HEAD

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

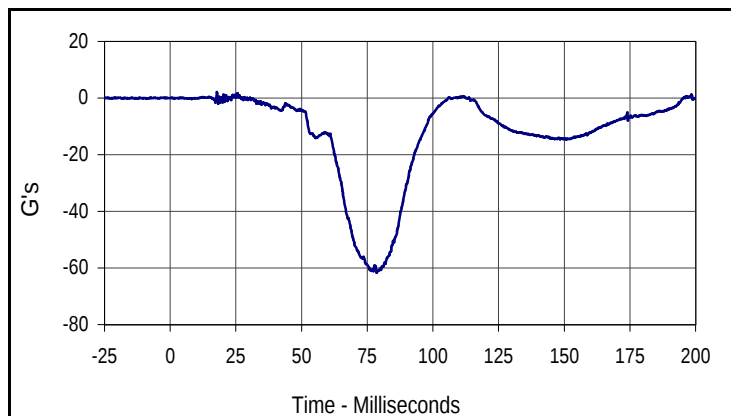
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
1.9	198.8	-53.2	81.7



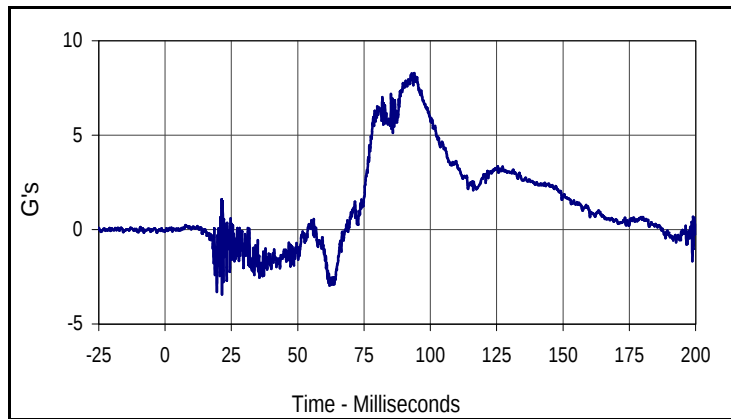
Curve Description			
Driver NAAH Yarm-X			
CURNO	Type	SAE Class	Units
188	FIL	1000	G's
Max	Time	Min	Time
0.6	188.4	-50.1	78.6



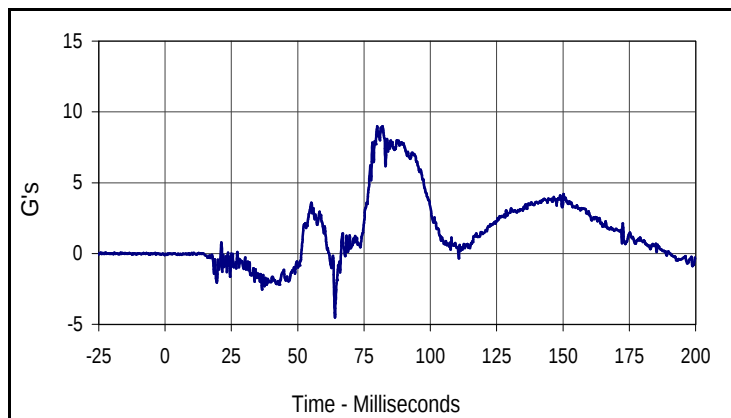
Curve Description			
Driver NAAH Zarm-X			
CURNO	Type	SAE Class	Units
190	FIL	1000	G's
Max	Time	Min	Time
2.1	17.8	-61.7	78.6

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

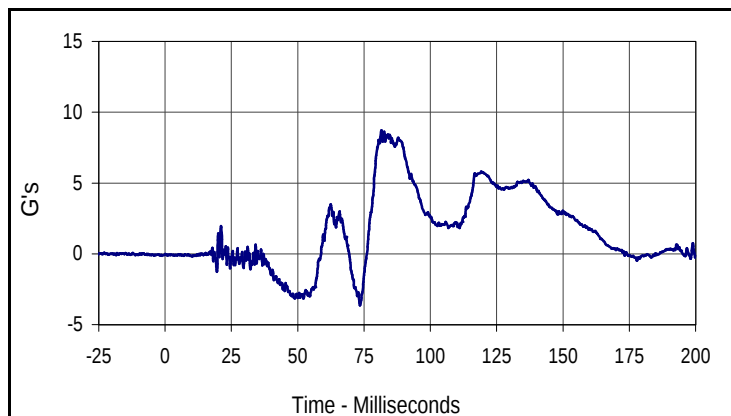
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
8.3	93.9	-3.4	21.5



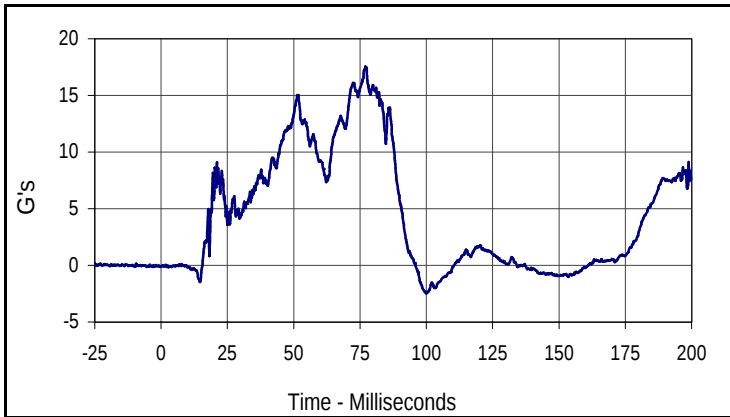
Curve Description			
Driver NAAH Xarm-Y			
CURNO	Type	SAE Class	Units
186	FIL	1000	G's
Max	Time	Min	Time
9.0	80.0	-4.5	64.0



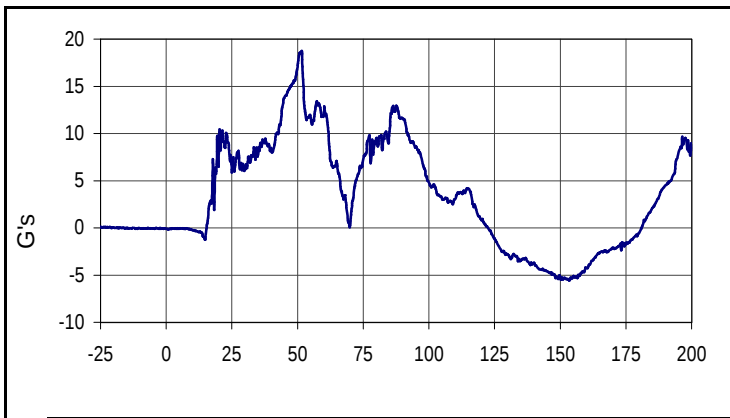
Curve Description			
Driver NAAH Zarm-Y			
CURNO	Type	SAE Class	Units
191	FIL	1000	G's
Max	Time	Min	Time
8.7	81.5	-3.6	73.5

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

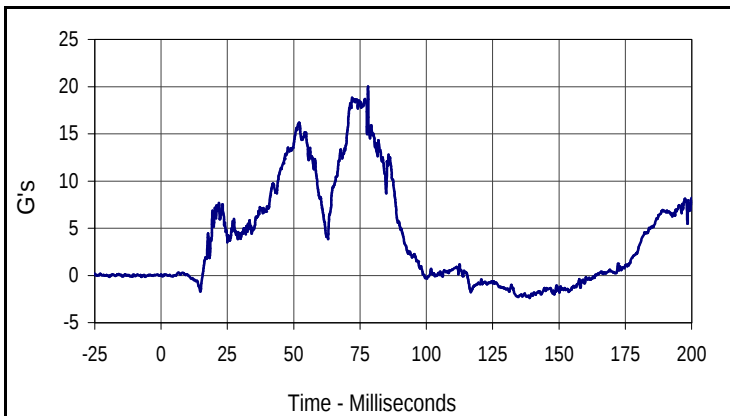
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
17.5	77.0	-2.5	100.0



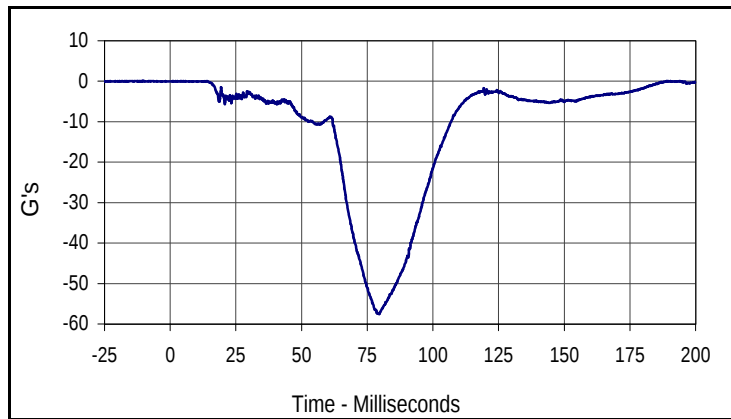
Curve Description			
Driver NAAH Xarm-Z			
CURNO	Type	SAE Class	Units
187	FIL	1000	G's
Max	Time	Min	Time
18.8	51.6	-5.6	153.5



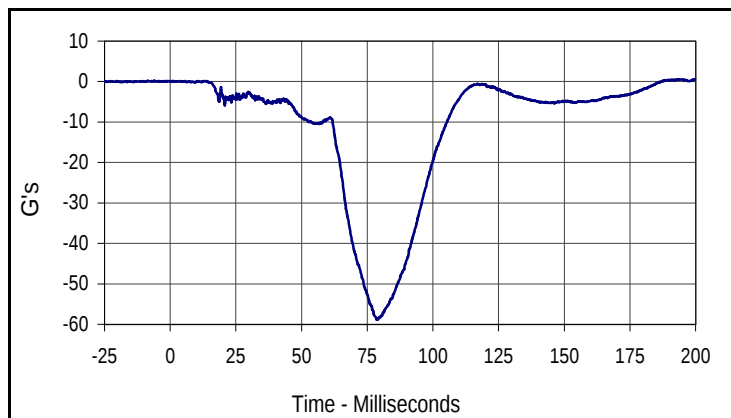
Curve Description			
Driver NAAH Yarm-Z			
CURNO	Type	SAE Class	Units
189	FIL	1000	G's
Max	Time	Min	Time
20.0	78.0	-2.4	139.0

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

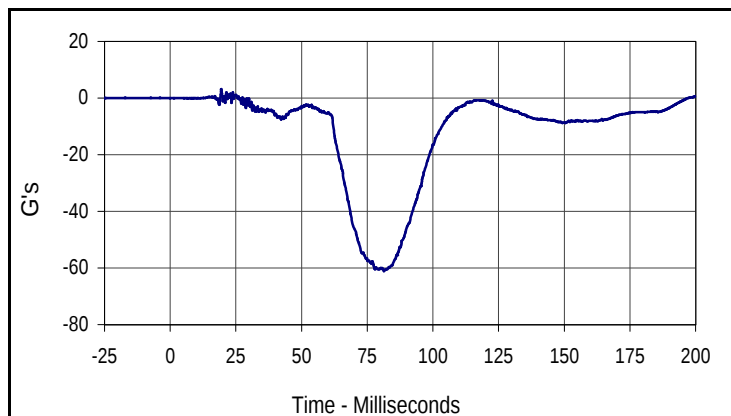
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
045	FIL	1000	G's
Max	Time	Min	Time
0.1	193.9	-57.5	79.6



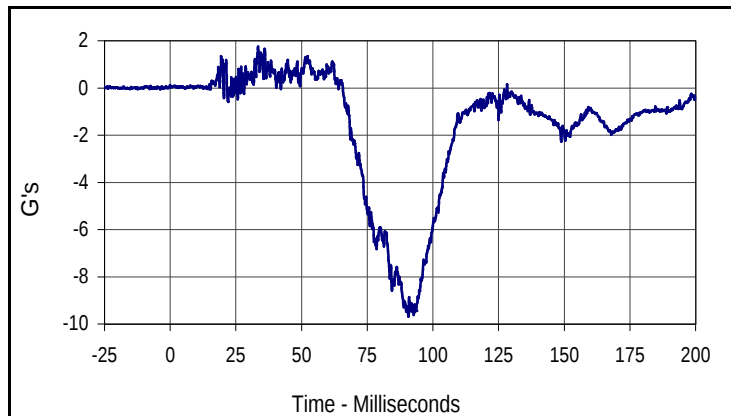
Curve Description			
Passenger NAAH Yarm-X			
CURNO	Type	SAE Class	Units
194	FIL	1000	G's
Max	Time	Min	Time
0.5	193.2	-58.8	78.8



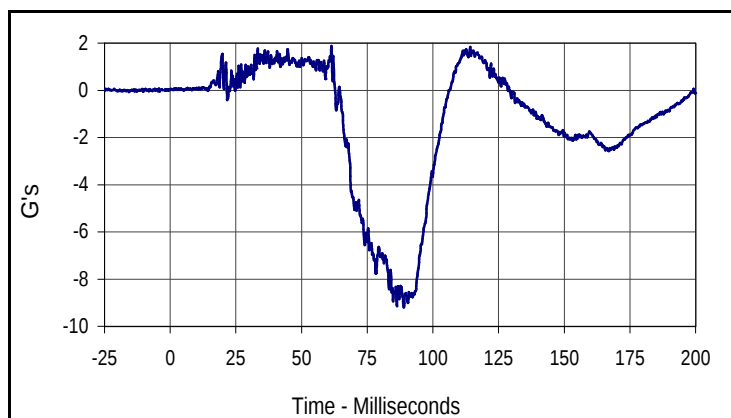
Curve Description			
Passenger NAAH Zarm-X			
CURNO	Type	SAE Class	Units
196	FIL	1000	G's
Max	Time	Min	Time
3.2	19.5	-61.1	81.4

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

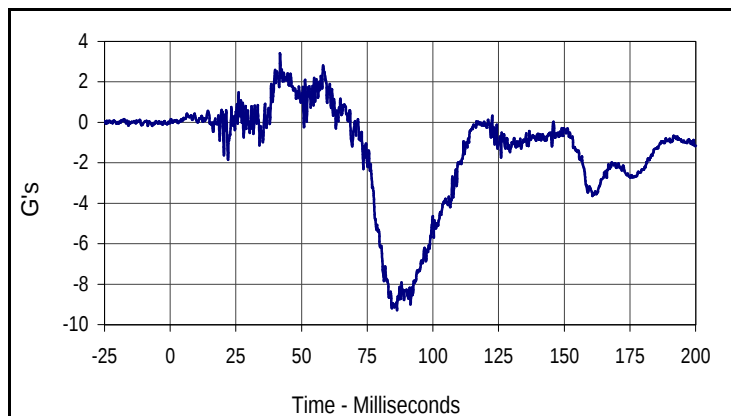
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
046	FIL	1000	G's
Max	Time	Min	Time
1.8	33.5	-9.7	90.7



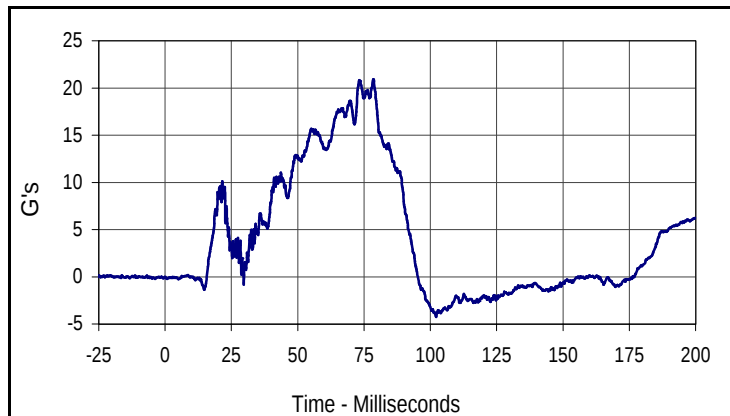
Curve Description			
Passenger NAAH Xarm-Y			
CURNO	Type	SAE Class	Units
192	FIL	1000	G's
Max	Time	Min	Time
1.9	61.4	-9.2	88.9



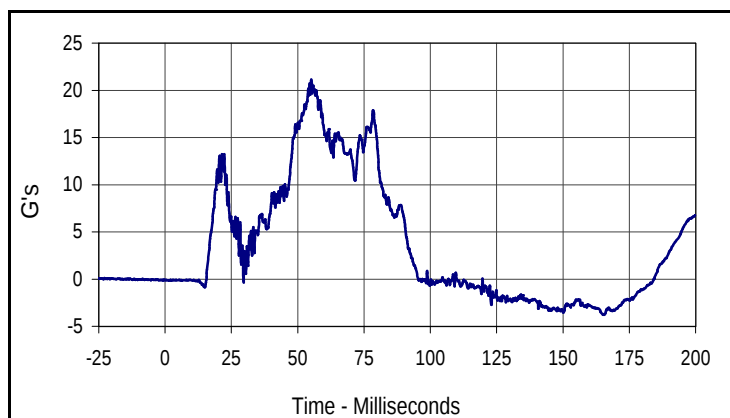
Curve Description			
Passenger NAAH Zarm-Y			
CURNO	Type	SAE Class	Units
197	FIL	1000	G's
Max	Time	Min	Time
3.4	41.8	-9.3	86.3

Test Vehicle: 2004 Lexus ES 330 4 Door Sedan
 Test Program: 2004 NHTSA 35mph NCAP

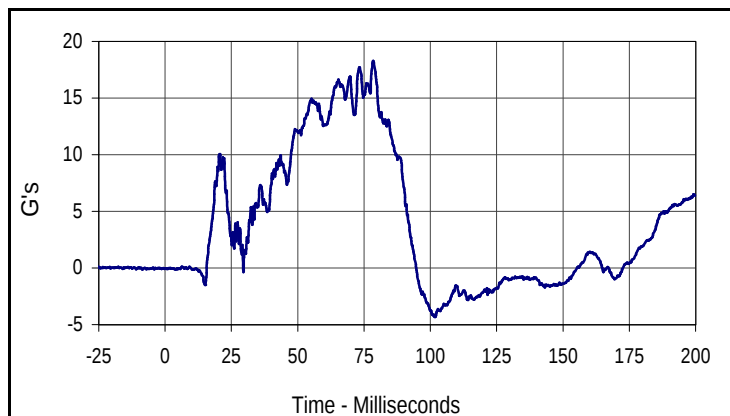
Test Date: 1/28/04
 NHTSA No.: M45104



Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
047	FIL	1000	G's
Max	Time	Min	Time
20.9	78.5	-4.2	102.2



Curve Description			
Passenger NAAH Xarm-Z			
CURNO	Type	SAE Class	Units
193	FIL	1000	G's
Max	Time	Min	Time
21.2	55.1	-3.8	165.6



Curve Description			
Passenger NAAH Yarm-Z			
CURNO	Type	SAE Class	Units
195	FIL	1000	G's
Max	Time	Min	Time
18.3	78.5	-4.3	101.9