Report Number: NCAP-TRC-02-001

New Car Assessment Program

"Side Impact Testing"

Toyota Motor Corporation

2002 Lexus ES300 4-door Sedan

NHTSA Number: M25101

Transportation Research Center Inc.

10820 State Route 347

P. O. Box B-67

East Liberty, OH 43319

December 14, 2001

Final Report

U. S. Department of Transportation

National Highway Traffic Safety Administration

Office of Crashworthiness Standards

400 Seventh Street, S. W.

Room No. 5313 (NPS-10)

Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-98-D-12001. This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange.

Test Performed By: Michael S. Postle, Engineering Technician

Report Approved By: _____

Virginia L. Watters, Project Manager

Transportation Research Center Inc.

Approval Date: _____

FINAL REPORT ACCEPTANCE BY OCS:

Accepted By: _____

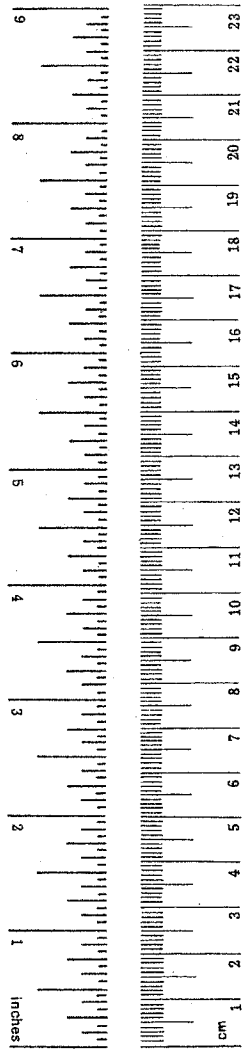
Acceptance Date: _____

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

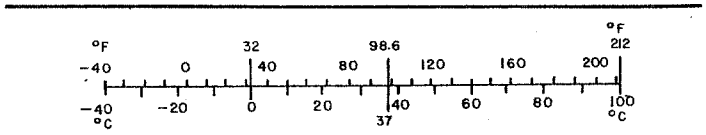
Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



Technical Report Documentation Page

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4. Title and Subtitle	5. Report Date
New Car Assessment Program Side Impact Testing of a 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101	December 14, 2001
	6. Performing Organization Code: TRC Inc.
7. Author(s): Virginia L. Watters, Project Manager, Transportation Research Center Inc.	8. Performing Organization Report No.: NCAP-TRC-02-001
9. Performing Organization Name and Address: Transportation Research Center Inc., 10820 State Route 347, East Liberty, OH 43319	10. Work Unit No. (TRAIS)
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	14. Sponsoring Agency Code: NPS-10

15. Supplemental Notes

16. Abstract

This 55/28 km/h 270° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject vehicle, a 2002 Lexus ES300 4-door Sedan, in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure Side NCAP for the generation of consumer information on vehicle side crash protection. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on November 29, 2001.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.2 km/h, and the ambient temperature at the struck (Driver's side) side of the target vehicle at the time of impact was 22° C. The target vehicle's post-test maximum crush was 337 mm at Level 2.

The test or target vehicle's performance is given below (FIR100 filter):

	Front SID		Rear SID	
Left Upper Rib Acceleration:	41.7	g's	58.1	g's
Left Lower Rib Acceleration:	56.8	g's	73.8	g's
Lower Spine Acceleration:	53.9	g's	61.3	g's
Thoracic Trauma Index, (TTI):	55.4	g's	67.5	g's
Pelvis Acceleration (PEV):	72.1	g's	69.7	g's

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

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact MDB Side Impact Dummy (SID)	Copies of this report are available from: NHTSA Technical Reference Division Room 5108 (NAD-52), 400 Seventh Street, S.W. Washington, DC 20590 Telephone No. (202) 366-4946 Attn: Robert Hornicle

19. Security Classification (of this report)	20. Security Classification (of this page)	21. Number of Pages	22. Price
Unclassified	Unclassified	359	

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Section 1

Purpose and Test Procedure

Purpose and Test Procedure

This side impact test is part of the FY02 New Car Assessment Program Side Impact Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-98-D-12001. The purpose of this test was to generate comparative side impact protection in a 2002 Lexus ES300 4-door Sedan. The test was conducted in accordance with the Office of Crashworthiness Standards' Laboratory Test Procedure dated July 1997.

Section 2

Summary of Side Impact Test

Summary of Side Impact Test

A 2002 Lexus ES300 4-door Sedan was impacted on the driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 62.2 km/h (38.6 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on November 29, 2001. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SIDs) are included in Appendix A.

Two belt-restrained Side Impact Dummies (SIDs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions of the target vehicle according to the instructions specified in the OCS Side Impact Laboratory Test Procedure dated July 1997. Both SIDs were certified prior to this test. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The target vehicle was equipped with 3-point safety belts at all positions, frontal airbags, front seat-mounted side airbags, and front and rear side air curtains.

The SIDs were instrumented with the following accelerometers:

1. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
3. Lower Thoracic Spine (T_{12}) uniaxial and redundant accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)
5. Head (HED) triaxial accelerometers (X-Y-Z-directions)

A summary of the side impact dummy (SID) configuration and verification test data can be found in Appendix C. A total of 59 channels of data were recorded. Appendix B contains the vehicle, MDB, and dummy response data traces.

The following table summarizes the results of the test.

Injury Criteria	Front SID	Rear SID
TTI (g)	55.4	67.5
PEV (g)	72.1	69.7

Data Acquisition Explanations

The driver's upper rib Y-axis redundant acceleration data channel, LURYR1, recorded a data spike that exceeded its full-scale value at 25 milliseconds and lost data after that. This also affected the integrated redundant velocity data channel and driver's Thoracic Trauma Index (TTI) redundant calculation.

The vehicle's left front door centerline Y-axis acceleration data channel, LFCYG1, recorded a data spike that exceeded its full-scale value at 6 milliseconds. This also affected the integrated velocity data channel.

The vehicle's left rear door mid rear Y-axis acceleration data channel, LFMYG1, recorded a data spike that exceeded its full-scale value at 6 milliseconds. This also affected the integrated velocity data channel.

The vehicle's left rear door upper centerline Y-axis acceleration data channel, LRUYG1, recorded a data spike that exceeded its full-scale value at 8 milliseconds. This also affected the integrated velocity data channel.

The vehicle's lower A-post Y-axis acceleration data channel, LLAYG1, recorded a data spike that exceeded its full-scale value at 7 milliseconds. This also affected the integrated velocity data channel.

Section 3

Vehicle Test Data

Data Sheet 1
General Test Vehicle Parameter Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

Test Vehicle Information:

Year/Make/Model/Body: 2002 Lexus ES300 4-door Sedan

Vehicle Body Color: Silver VIN: JTHBF30G120011953

Vehicle NHTSA No.: M25101 Build Date: 09/01

Engine Data: 6 Cylinders; ____ CID; 3 Liters; _____ cc

Placement: - Longitudinal; or - Lateral; or - Horizontal

Transmission: 4 Speed; - Manual; X Automatic; - Overdrive

Final Drive: - RWD; X FWD; - Four-Wheel Drive

Odometer Reading: 199 km

Options: X A/C; X Power steering; X Power brakes; X Power windows

Data From Vehicle's Tire Placard:

Tire Pressure (at capacity)* 200 kPa Front; 200 kPa Rear

Recommended Tire Size: P215/60R16

Tires on Test Vehicle: P215/60R16 Manufacturer: Michelin

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; N/A 3rd seat; 5 Total

Type of Front Seats: X Bucket; - Bench; - Split bench

Type of Front Seat Back: - Fixed; X Adjustable with - Lever or X Knob

Vehicle Max. Capacity Loading = 410 kg (A)

No. of Occupants x 68 kg. = 340 kg (B)

Vehicle Cargo Capacity (A-B) = 70 kg

Restraint Information:

Driver:	Rear Passenger:
3-point safety belt	3-point safety belt
Frontal airbag (did not deploy)	Side air curtain
Seat-mounted side impact airbag	
Side air curtain	

* Tire pressure used in test.

Data Sheet 1 (continued)
General Test Vehicle Parameter Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

Test Vehicle Delivered Weight With Maximum Fluids:

Left Front	=	487.5 kg	Left Rear	=	308.0 kg
Right Front	=	470.0 kg	Right Rear	=	302.0 kg
Total Front	=	957.5 kg	Total Rear	=	610.0 kg
Front % of Total Weight	=	61.1 %	Rear % of Total Weight	=	38.9 %
Total Weight	=	1567.5 kg			

Calculation of Vehicle's Target Test Weight:

Total Test Vehicle Delivered Weight with Max. Fluids	=	1567.5 kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	70.0 kg (B)
Weight of Instrumented Side Impact Dummies (2 X 80.0 kg)	=	160.0 kg (C)
Test Vehicle Target Weight:	=	1797.5 kg (A+B+C)

Fully Loaded Test Vehicle (UDW + 1 or 2 SID(s) + Cargo):

Left Front	=	529.0 kg	Left Rear	=	417.0 kg
Right Front	=	463.0 kg	Right Rear	=	371.5 kg
Total Front	=	992.0 kg	Total Rear	=	788.5 kg
Front % of Total Weight	=	55.7 %	Rear % of Total Weight	=	44.3 %
Total Weight	=	1780.5 kg			

As Tested Weight of Test Vehicle (1 or 2 SID(s) + Cargo + Equipment & Instrumentation):

Left Front	=	530.4 kg	Left Rear	=	405.0 kg
Right Front	=	485.2 kg	Right Rear	=	365.5 kg
Total Front	=	1015.6 kg	Total Rear	=	770.6 kg
Front % of Total Weight	=	56.9 %	Rear % of Total Weight	=	43.1 %
Total Weight	=	1786.2 kg			

Data Sheet 1 (continued)
General Test Vehicle Parameter Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

Test Vehicle Attitude (all dimensions in millimeters):[1]

As Delivered		Fully Loaded		Ready For Test	
Right Front	N/A	Right Front	N/A	Right Front	703
Left Front	N/A	Left Front	N/A	Left Front	695
Right Rear	N/A	Right Rear	N/A	Right Rear	675
Left Rear	N/A	Left Rear	N/A	Left Rear	660

Test Vehicle Wheelbase: 2715 mm

C.G. = 1171 mm rearward of front wheel centerline

Pre-Test Vehicle Sill Heights:

Right Front	210	mm
Left Front	213	mm
Right Rear	206	mm
Left Rear	205	mm

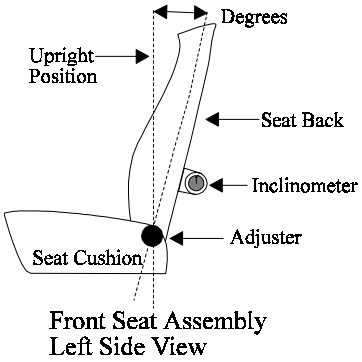
Total Vehicle Length:

Right Side	=	4595	mm
Left Side	=	4572	mm
Centerline	=	4857	mm

[1] Correct delivered and fully loaded attitudes were not recorded. Pre-test sill height measurements compared closely to manufacturer's test data information.

Data Sheet 1 (continued)
General Test Vehicle Parameter Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.

Front Seat Cushion Placement: Mid

Total Length of Fore/Aft Adjustment Travel: 240 mm

Total Number of Adjustment Positions or Detents: N/A

Front Seat Back Adjustment Position: The back was initially adjusted to the manufacturer's instructions of 3° on headrest post without dummy.

Seat Back Torso Angle: 4.6 degrees on headrest post with dummy seated

Second Position Seat Placement: Fixed position

Total Length of Fore/Aft Adjustment Travel: N/A mm

Seat Back Adjustment Position: Fixed position

Adjustable Steering Column Position: 3rd position up from bottom

Window Positions:

Right Front: Open Right Rear: Open

Left Front: Closed Left Rear: Closed

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

Amount of Stoddard Solvent In Fuel Tank:

70.0 liters (fuel tank usable capacity)

65.1 liters used in test (92% - 94% of fuel tank usable capacity)

Location of Impact Point On Test Vehicle Side To Be Impacted:

Wheelbase = 2715 millimeters

Intended impact point is 433 millimeters rearward of front axle centerline

(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 423 millimeters rearward of front axle centerline

Data Sheet 2
Test Vehicle Summary of Results

Vehicle Identification:

Vehicle Year/Make/Model: 2002/Lexus/ES300

Body Style: 4-door Sedan VIN: JTHBF30G120011953

NHTSA No.: M25101 Test Date: 11/29/01

Vehicle Overall Length = 4857 mm Overall Width = 1786 mm

Vehicle Test Weight (Pre-Test):

Left Front	= 530.4 kg		Left Rear	= 405.0 kg	
Right Front	= 485.2 kg		Right Rear	= 365.6 kg	
Total Front	= 1015.6 kg		Total Rear	= 770.6 kg	
Total Weight	= 1786.2 kg				
Wheelbase	= 2715 mm				

Longitudinal C.G. From Center of Front Axle = 1171 mm

Impact Angle With Respect To Impactor = 270 degrees

Impact Point:

Actual Impact Point is 10 mm Right of nominal impact ref. line (Lateral)

Actual Impact Point is 6 mm Up from nominal impact point (Vertical)

Maximum Exterior Static Crush:

1. Level 1 (260 mm above ground) = 48 mm
2. Level 2 (534 mm above ground) = 337 mm
3. Level 3 (636 mm above ground) = 325 mm
4. Level 4 (930 mm above ground) = 241 mm
5. Level 5 (1414 mm above ground) = 45 mm

Maximum Post-Test Intrusion = 337 mm

Occupants:	Front Passenger	Rear Passenger
Dummy Identification	270	272
Restraints Used/Deployed	Seat belt, side airbag, side air curtain	Seat belt, side air curtain

Instrumentation:

Number of Vehicle Data Channels: = 26

Number of Cameras: Onboard = 3 Offboard = 7 Total = 10

Data Sheet 3
Moving Deformable Barrier(MDB) Summary

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

MDB Face Manufacturer And Serial Number:

Plascore; Sample ID: 1N323473; Block #033A0801

Position of Impactor (MDB) On Monorail:

Crabbed 27° to the right

MDB Specifications:

Overall Width of Framework Carriage	=	1251	mm
Overall Length of MDB (Incl. honeycomb impact face)	=	4013	mm
Wheelbase of Framework Carriage	=	2591	mm
Track of Framework Carriage (Front & Rear)	=	1880	mm
C.G. Location Rearward of Front Axle	=	1122	mm

MDB Weight:

Left Front	=	396.4	kg	Left Rear	=	274.0	kg
Right Front	=	374.4	kg	Right Rear	=	315.0	kg
Total Front	=	770.8	kg	Total Rear	=	589.0	kg
Total MDB Weight	=	1359.8	kg				

Impact Angle (MDB C/L to Target Vehicle C/L) = 90 degrees

Impact Speed = 62.2 km/h

Maximum Static Crush of Honeycomb Impact Face:

1. Row A at Center of Bumper Level	=	231.6	millimeters
2. Row B at Top of Bumper Level	=	112.7	millimeters
3. Row C at Mid Level	=	113.6	millimeters
4. Row D at Top of Stack Level	=	141.8	millimeters

Instrumentation:

Number of MDB Data Channels = 7

Data Sheet 4
Post-Test Observations

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

Visible Dummy Contact Points:

	Left Front SID	Left Rear SID
Head:	Side curtain, head restraint	Roof rail, side curtain, head restraint
Upper Torso:	Door panel	Door panel
Lower Torso:	Door panel, side airbag	Door panel
Left Knee:	None	None
Right Knee:	None	None

Door Opening:

	Left Side	Right Side
Front:	Jammed shut	Closed & operational
Rear:	Jammed shut	Closed & operational

MDB Distance From Target Impact Point:

Vertical: 6 mm Up from target

Horizontal: 10 mm Right from target

Arm Rest Locations:

Front: Fixed in console

Rear: Positioned up

Seat Movement:

Front: None

Rear: None

Glazing Damage:

Windshield: None

Window: Shattered

Pillar Separation: No

Sill Separation: No

Other Notable Impact Effects:

The driver and passenger frontal airbags did not deploy.

Section 4

Occupant and Vehicle Information

Data Sheet 5

SID Instrumentation Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

TEST NUMBER: 011129 DRIVER DUMMY SERIAL NUMBER: 270

	POSITIVE DIRECTION		NEGATIVE DIRECTION	
HEAD ACCELERATION				
LONGITUDINAL	8.8 g	@ 153.1 ms	15.7 g	@ 51.1 ms
LATERAL	38.6 g	@ 53.8 ms	10.6 g	@ 173.9 ms
VERTICAL	16.7 g	@ 28.6 ms	2.3 g	@ 23.1 ms
RESULTANT	42.7 g	@ 53.8 ms		
HIC	115 from 43.4 to 62.7 ms			
LEFT UPPER RIB ACCELERATION				
LATERAL (P)	41.7 g	@ 35.6 ms	6.7 g	@ 87.5 ms
LATERAL (R)[1]	---	---	---	---
LEFT LOWER RIB ACCELERATION				
LATERAL (P)	56.8 g	@ 36.3 ms	9.4 g	@ 95.0 ms
LATERAL (R)	58.0 g	@ 36.3 ms	9.7 g	@ 95.0 ms
TTI d (P)	55.4			
TTI d (R)[1]	---			
LOWER SPINE ACCELERATION				
LATERAL (P)	53.9 g	@ 40.6 ms	10.3 g	@ 81.3 ms
LATERAL (R)	55.5 g	@ 40.6 ms	10.0 g	@ 81.3 ms
PELVIS ACCELERATION				
LATERAL (P)	72.1 g	@ 30.0 ms	13.0 g	@ 77.5 ms
LATERAL (R)	70.9 g	@ 30.0 ms	13.6 g	@ 77.5 ms

[1] See DATA ACQUISITION EXPLANATION

Rib, spine, and pelvis data are processed with the Finite Impulse Response filter routine for injury criteria evaluation.

Data Sheet 5 (Continued)

SID Instrumentation Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

TEST NUMBER: 011129 PASSENGER DUMMY SERIAL NUMBER: 272

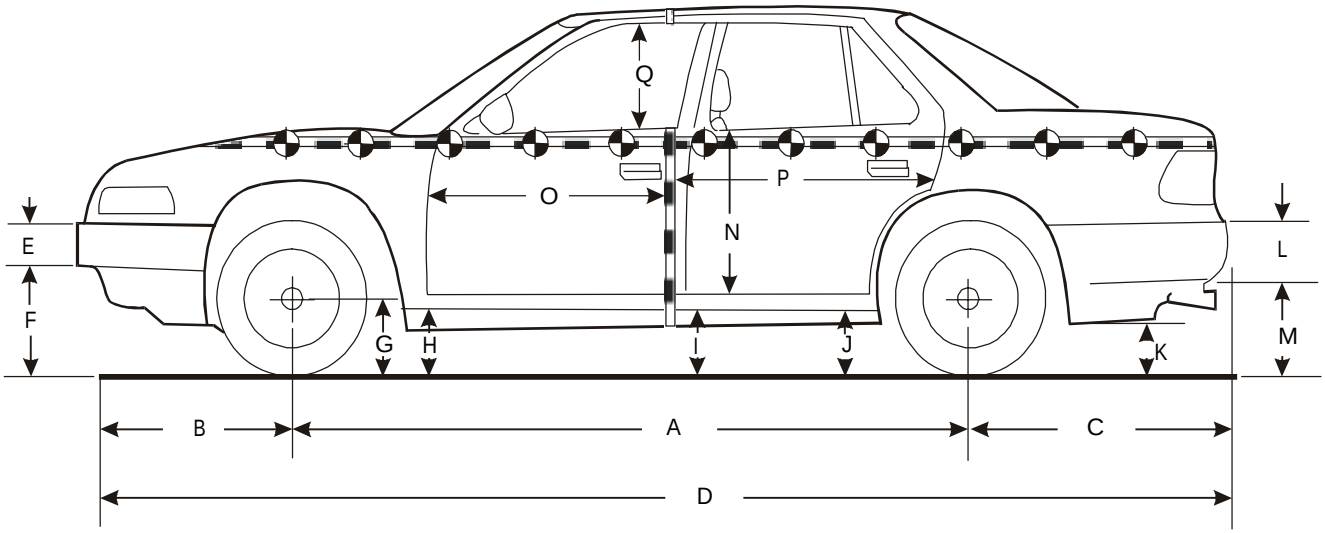
	POSITIVE DIRECTION		NEGATIVE DIRECTION	
HEAD ACCELERATION				
LONGITUDINAL	6.7 g	@ 179.9 ms	15.6 g	@ 62.9 ms
LATERAL	26.9 g	@ 37.3 ms	10.1 g	@ 207.7 ms
VERTICAL	12.9 g	@ 48.1 ms	47.8 g	@ 64.3 ms
RESULTANT	55.1 g	@ 62.9 ms		
HIC	164 from 55.1 to 71.0 ms			
LEFT UPPER RIB ACCELERATION				
LATERAL (P)	58.1 g	@ 49.4 ms	13.1 g	@ 101.9 ms
LATERAL (R)	56.7 g	@ 49.4 ms	17.5 g	@ 101.9 ms
LEFT LOWER RIB ACCELERATION				
LATERAL (P)	73.8 g	@ 48.8 ms	16.2 g	@ 101.9 ms
LATERAL (R)	72.3 g	@ 48.8 ms	20.2 g	@ 101.9 ms
TTI d (P)	67.5			
TTI d (R)	67.1			
LOWER SPINE ACCELERATION				
LATERAL (P)	61.3 g	@ 52.5 ms	14.6 g	@ 76.3 ms
LATERAL (R)	61.9 g	@ 53.1 ms	14.6 g	@ 76.9 ms
PELVIS ACCELERATION				
LATERAL (P)	69.7 g	@ 44.4 ms	6.5 g	@ 100.0 ms
LATERAL (R)	69.3 g	@ 44.4 ms	6.5 g	@ 100.0 ms

Rib, spine, and pelvis data are processed with the Finite Impulse Response filter routine for injury criteria evaluation.

Data Sheet 6

Vehicle Pre-Test And Post-Test Measurements

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Left Side View

Note: All dimensions are in millimeters with tolerance of ±3 mm

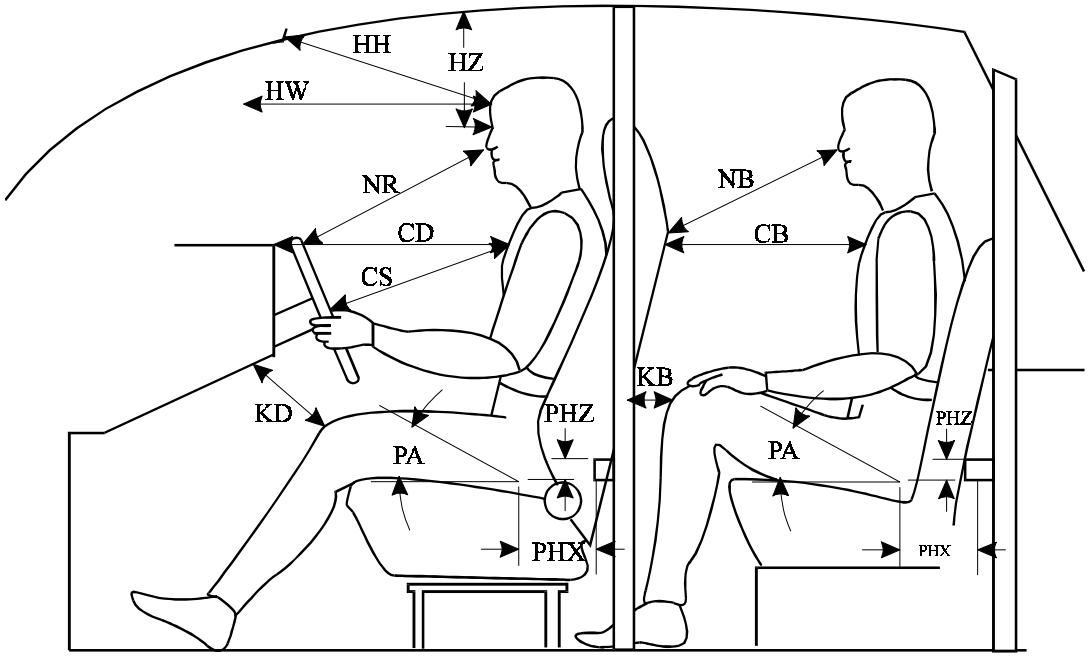
	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	2715	2715	2684	31
B	1001	1001	1011	-10
C	1150	1150	1122	28
D	4857	4857	4843	14
E	129	129	128	1
F	442	442	445	-3
G	313	305	305	0
H	246	220	260	-40
I	275	240	275	-35
J1	228	187	185	2
J2	285	243	259	-16
K	315	242	271	-29
L	214	214	214	0
M	432	385	385	0
N	740	740	656	84
O	832	832	825	7
P	1398	1398	1395	3
Q	385	385	391	-6
R	4595	4595	4617	-22
S	4572	4572	4533	39
T	1341	1341	1188	153

D = Length at centerline E&L = Bumper Thickness R = Right Side Length S = Left Side Length
T = Width at B-pillar J1 = To Pinch Weld J2 = To Sill

Data Sheet 7

SID Longitudinal Clearance Dimensions

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Left Side View

Note: All measurements are in millimeters with tolerance of ±3 mm

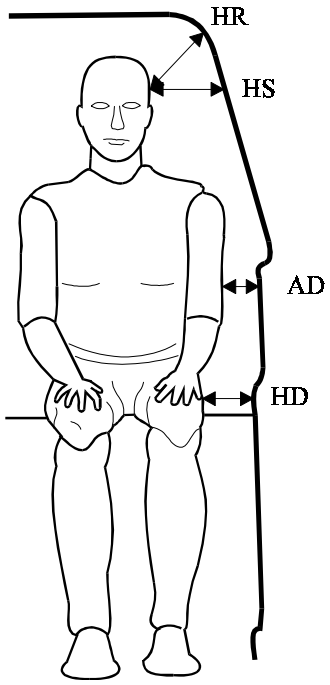
Measurement	Driver SID # 270	Left Rear Passenger SID # 272
HH	394	N/A
HW	572	N/A
HZ	133	142
NR/NB	478	606
CD/CB	541	493
CS	335	N/A
KDL(KDA°)/KBL(KBA°)	128/64.2°	146/64.9°
KDR(KDA°)/KBR(KBA°)	139/56.4°	158/71.2°
PA°	24.4°	23.9°
PHX	225	355
PHZ	228	332

Note: 2-door vehicle shown. Rear dummy PHX and PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

Data Sheet 8

SID Lateral Clearance Dimensions

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Note: All measurements are in millimeters with tolerance of ±3 mm

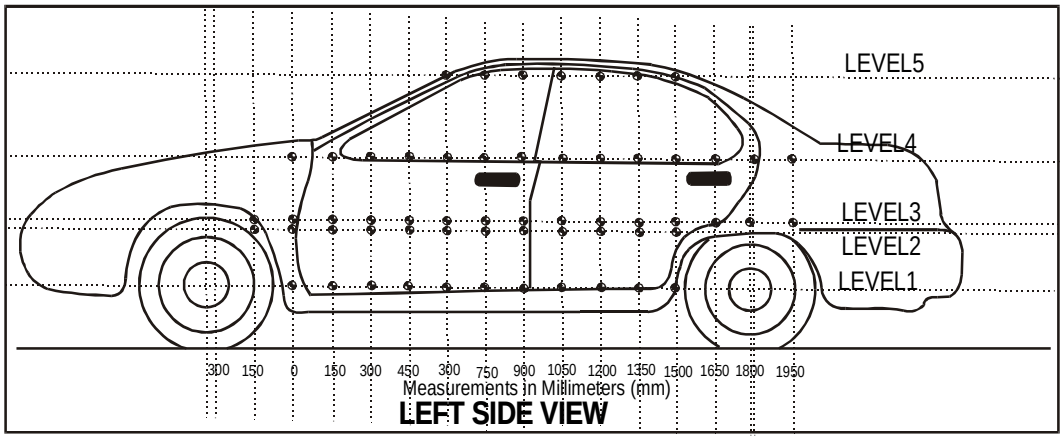
Measurement	Driver SID # 270	Left Rear Passenger SID # 272
HR	152	177
HS	257	273
AD*	Lower: 124 Upper: 115	Lower: 113 Upper: 90
HD	-148	169

* Lower measurement is taken laterally at center of the lower rib accelerometer height from the SID arm segment to the closest part of the vehicle side.
Upper measurement is taken laterally at center of the upper rib accelerometer height from the SID arm segment to the closest part of the vehicle side.

Data Sheet 9

Vehicle Side Measurements

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Level 5 - Window Top
Level 4 - Window Sill
Level 3 - Mid-Door
Level 2 - Occupant H-Point
Level 1 - Axle Centerline Height or Sill Top Height

Measurements Are Taken When The Vehicle Is In The "As Tested" Configuration.

Measurements along the vertical 750 mm line shown above:

Level 5 @ Window Top	=	1414	mm
Level 4 @ Window Sill	=	930	mm
Level 3 @ Mid Door	=	636	mm
Level 2 @ Occupant H-Point	=	534	mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	260	mm

Data Sheet 10

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

Location	Height		(mm) From Impact Point													
			-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750
Level 1 Side Sill	260	Pre	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	738	745	750	751	752	755
		Post	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	778	793	795	795	795	796
		Crush	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40	48	45	44	43	41
Level 2 H-Point	534	Pre	N/A	760	730	714	N/A	N/A	N/A	N/A	707	707	708	710	711	711
		Post	N/A	745	725	713	N/A	N/A	N/A	N/A	719	967	1004	1024	1033	1045
		Crush	N/A	-15	-5	-1	N/A	N/A	N/A	N/A	12	260	296	314	322	334
Level 3 Mid-Door	636	Pre	N/A	774	740	716	N/A	N/A	N/A	700	702	705	706	707	707	705
		Post	N/A	764	730	709	N/A	N/A	N/A	708	709	943	986	1020	1025	1030
		Crush	N/A	-10	-10	-7	N/A	N/A	N/A	8	7	238	280	313	318	325
Level 4 Window Sill	930	Pre	N/A	N/A	N/A	839	805	784	773	767	760	755	750	746	743	744
		Post	N/A	N/A	N/A	825	802	785	775	770	765	827	898	965	975	976
		Crush	N/A	N/A	N/A	-14	-3	1	2	3	5	72	148	219	232	232
Level 5 Window Top	1414	Pre	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1025
		Post	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1030
		Crush	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5

Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

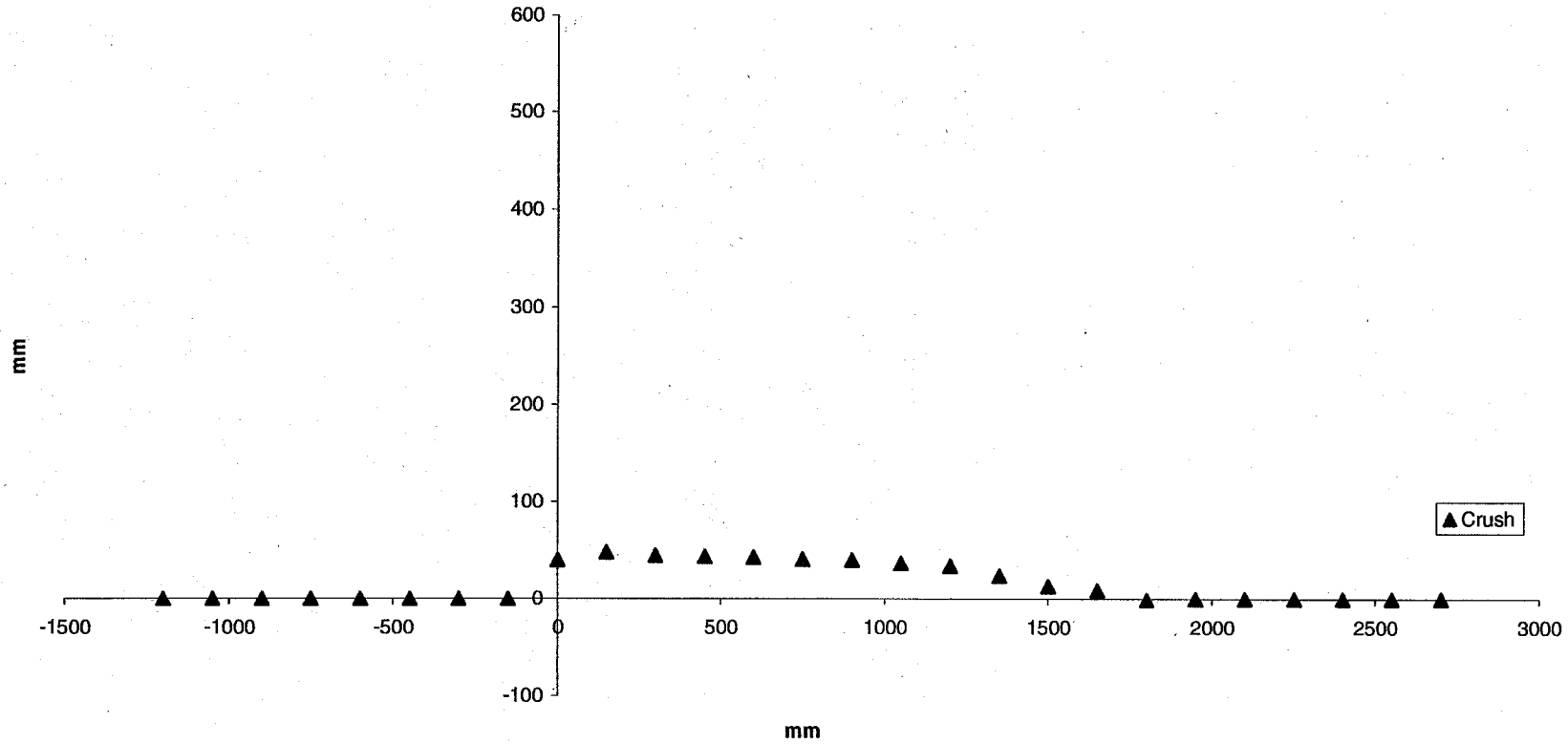
Location	Height		(mm) From Impact Point												
			900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700
Level 1 Side Sill	260	Pre	755	755	756	762	761	755	750	N/A	N/A	N/A	N/A	N/A	N/A
		Post	795	792	790	786	774	764	749	N/A	N/A	N/A	N/A	N/A	N/A
		Crush	40	37	34	24	13	9	-1	N/A	N/A	N/A	N/A	N/A	N/A
Level 2 H-Point	534	Pre	713	713	720	716	720	720	715	710	N/A	N/A	N/A	N/A	730
		Post	1049	1050	968	974	954	923	842	741	N/A	N/A	N/A	N/A	739
		Crush	336	337	248	258	234	203	127	31	N/A	N/A	N/A	N/A	9
Level 3 Mid-Door	636	Pre	707	705	710	711	714	715	713	705	N/A	N/A	N/A	714	725
		Post	1009	999	955	958	954	909	834	761	N/A	N/A	N/A	726	731
		Crush	302	294	245	247	240	194	121	56	N/A	N/A	N/A	12	6
Level 4 Window Sill	930	Pre	741	740	740	740	740	740	739	738	740	740	742	750	750
		Post	955	950	955	981	977	941	894	833	765	761	756	756	762
		Crush	214	210	215	241	237	201	155	95	25	21	14	6	12
Level 5 Window Top	1414	Pre	1022	1016	1010	1014	1020	1020	1026	1040	N/A	N/A	N/A	N/A	N/A
		Post	1030	1038	1050	1057	1065	1057	1048	1049	N/A	N/A	N/A	N/A	N/A
		Crush	8	22	40	43	45	37	22	9	N/A	N/A	N/A	N/A	N/A

Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

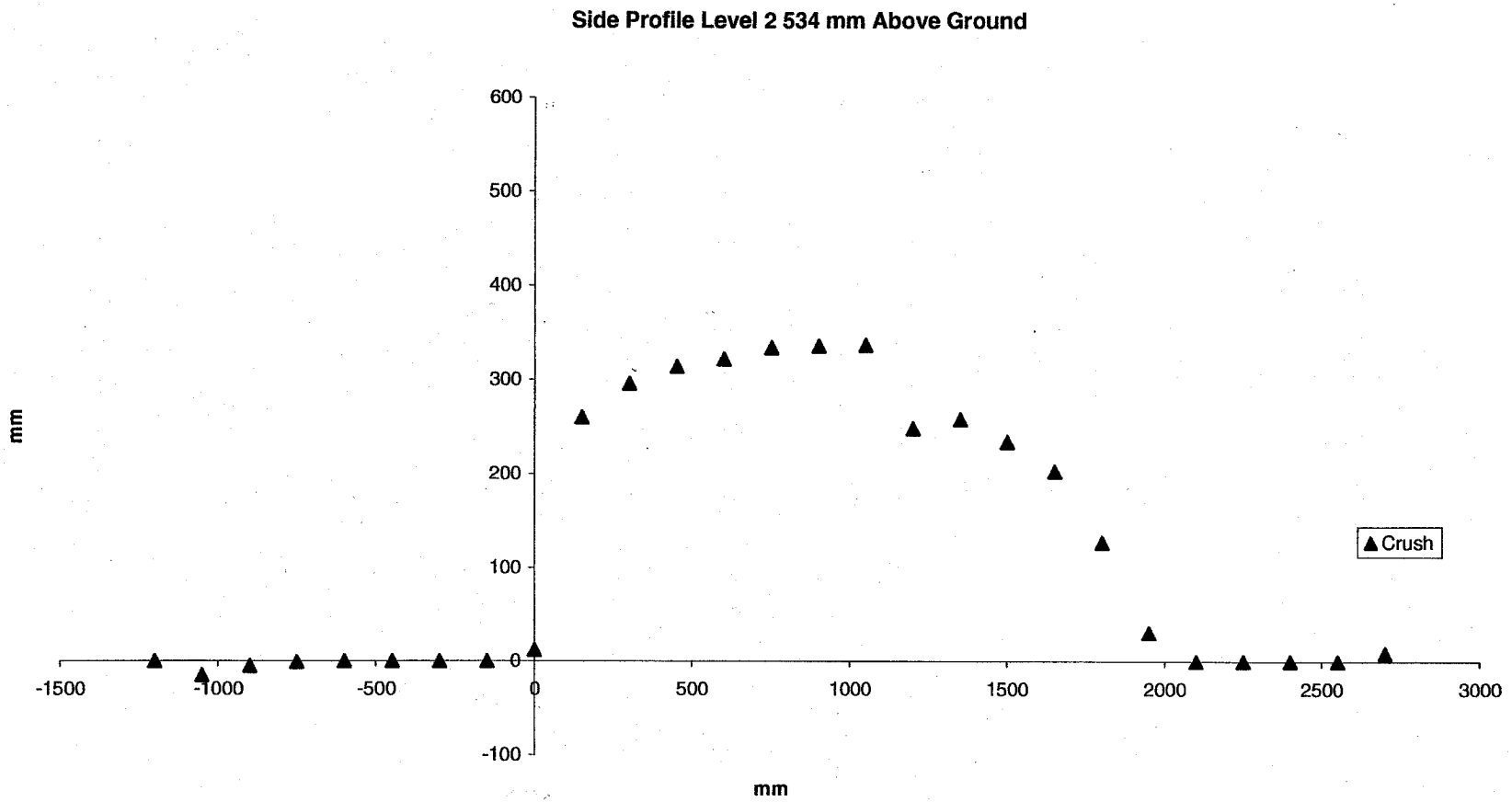
Side Profile Level 1 260 mm Above Ground



Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

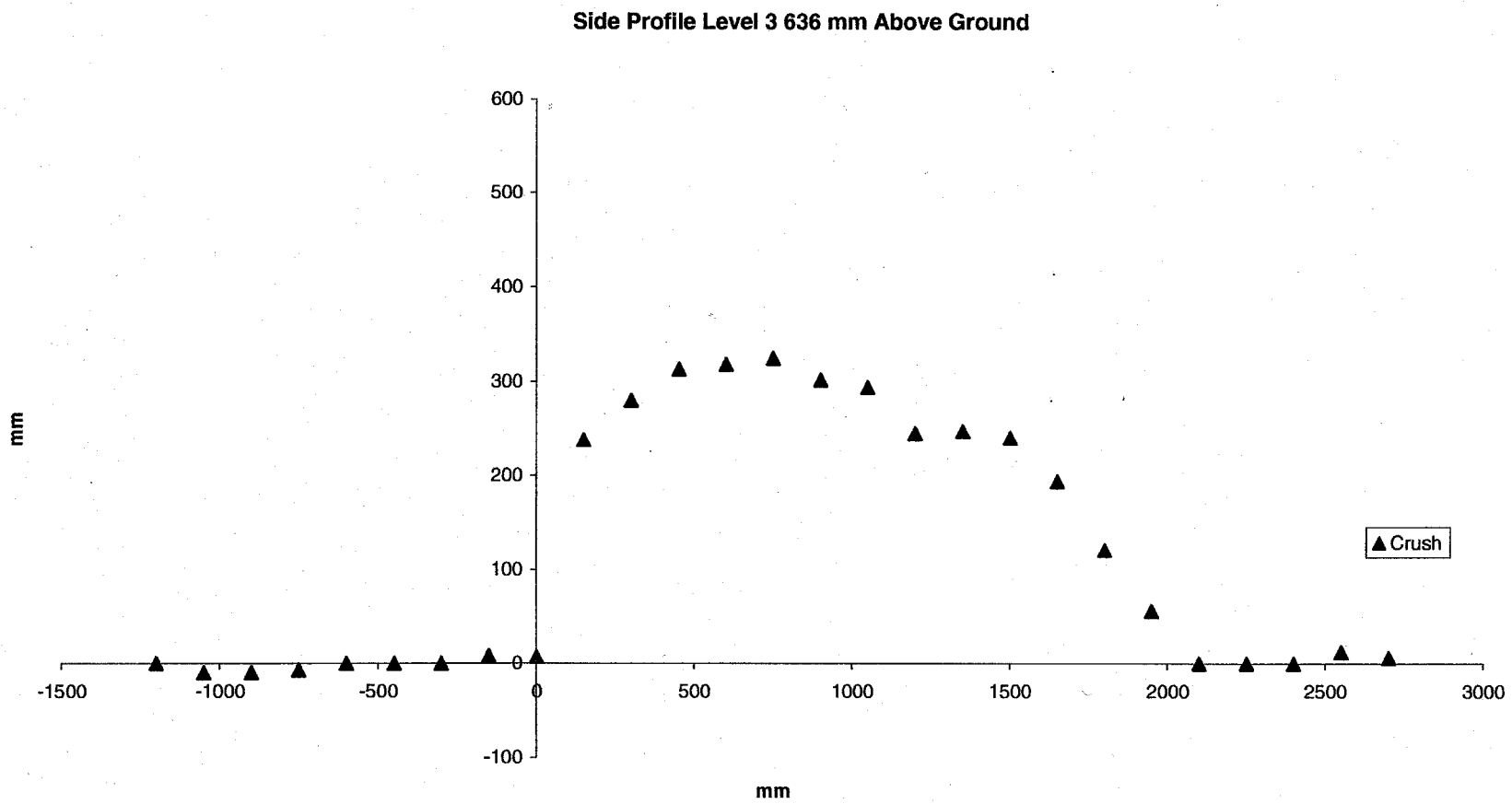
Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

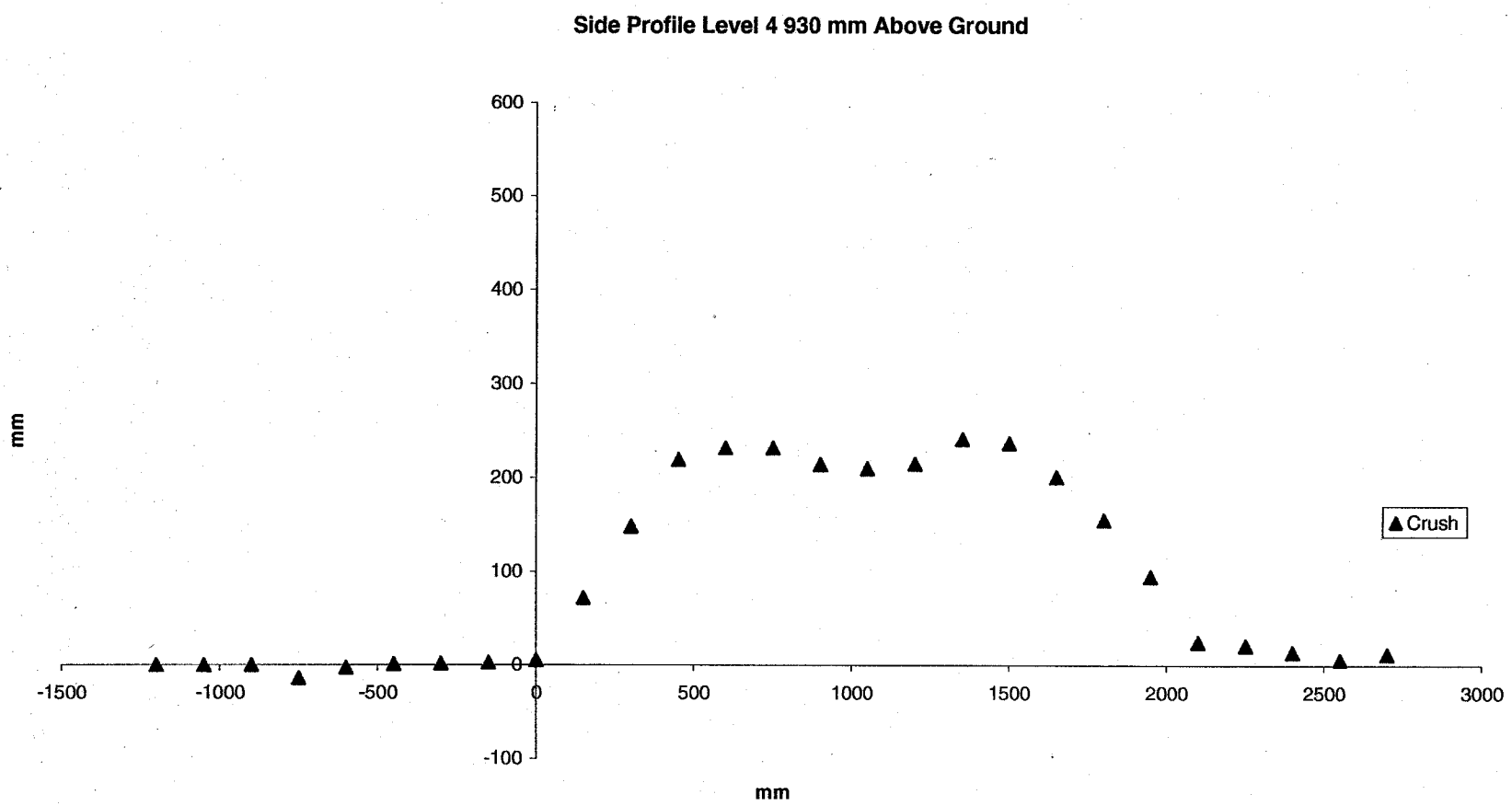
Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

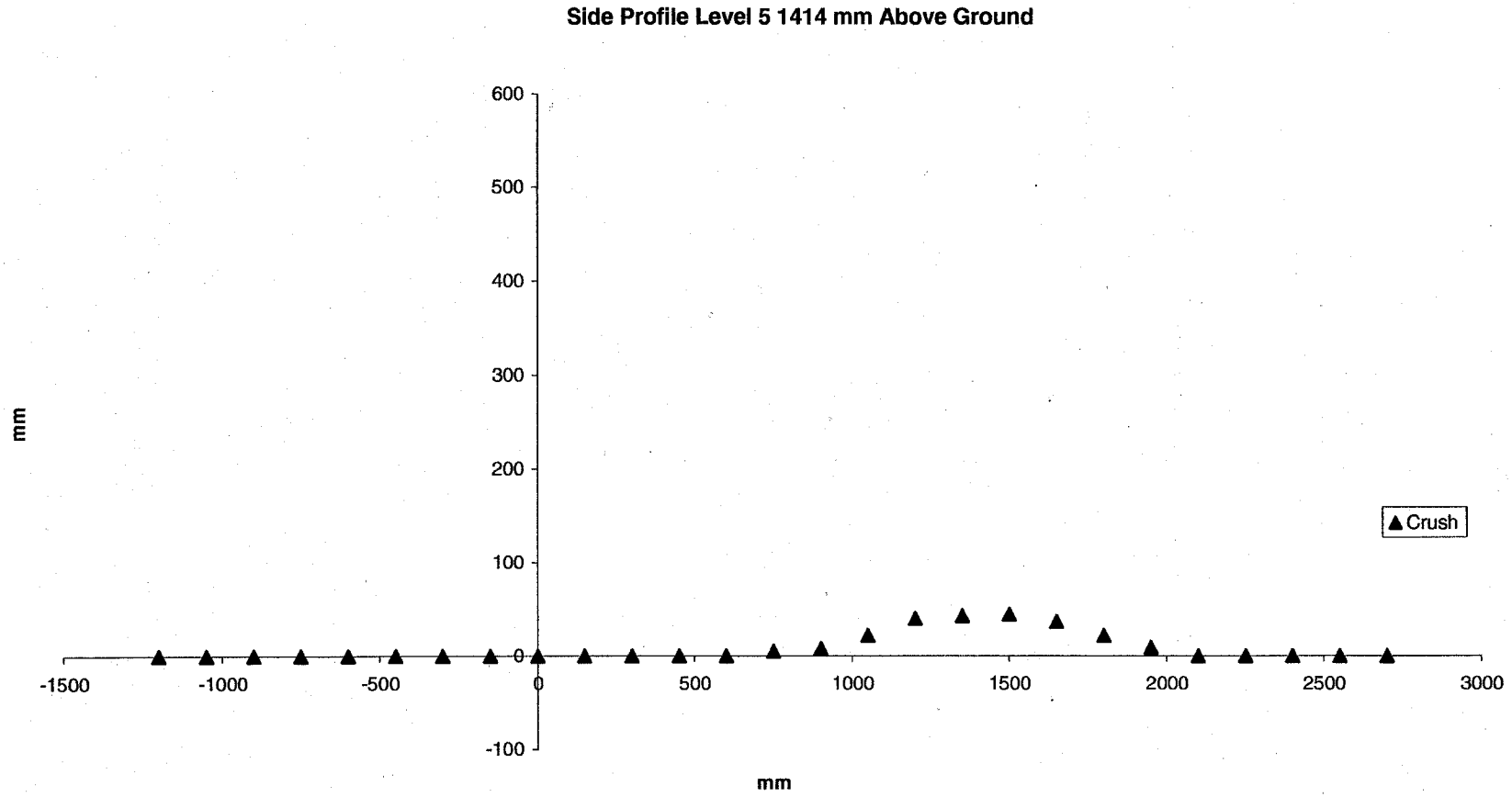
Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

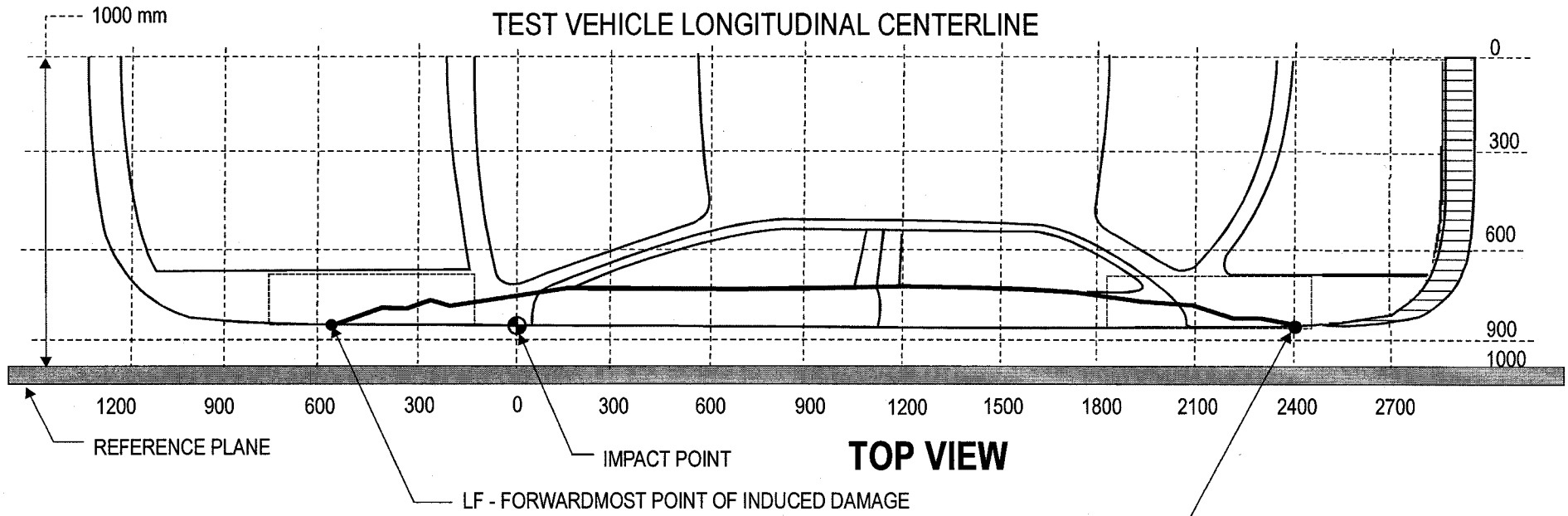


Data Sheet 11

Vehicle Damage Profile Distances

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

NOTE: All measurements are in millimeters (mm) and should be accurate to plus or minus 3mm.



MEASUREMENT CONVENTIONS:
Forward of the impact point (towards front of vehicle) is considered negative (-)
Rearward of the impact point (towards rear end of vehicle) is considered positive (+)

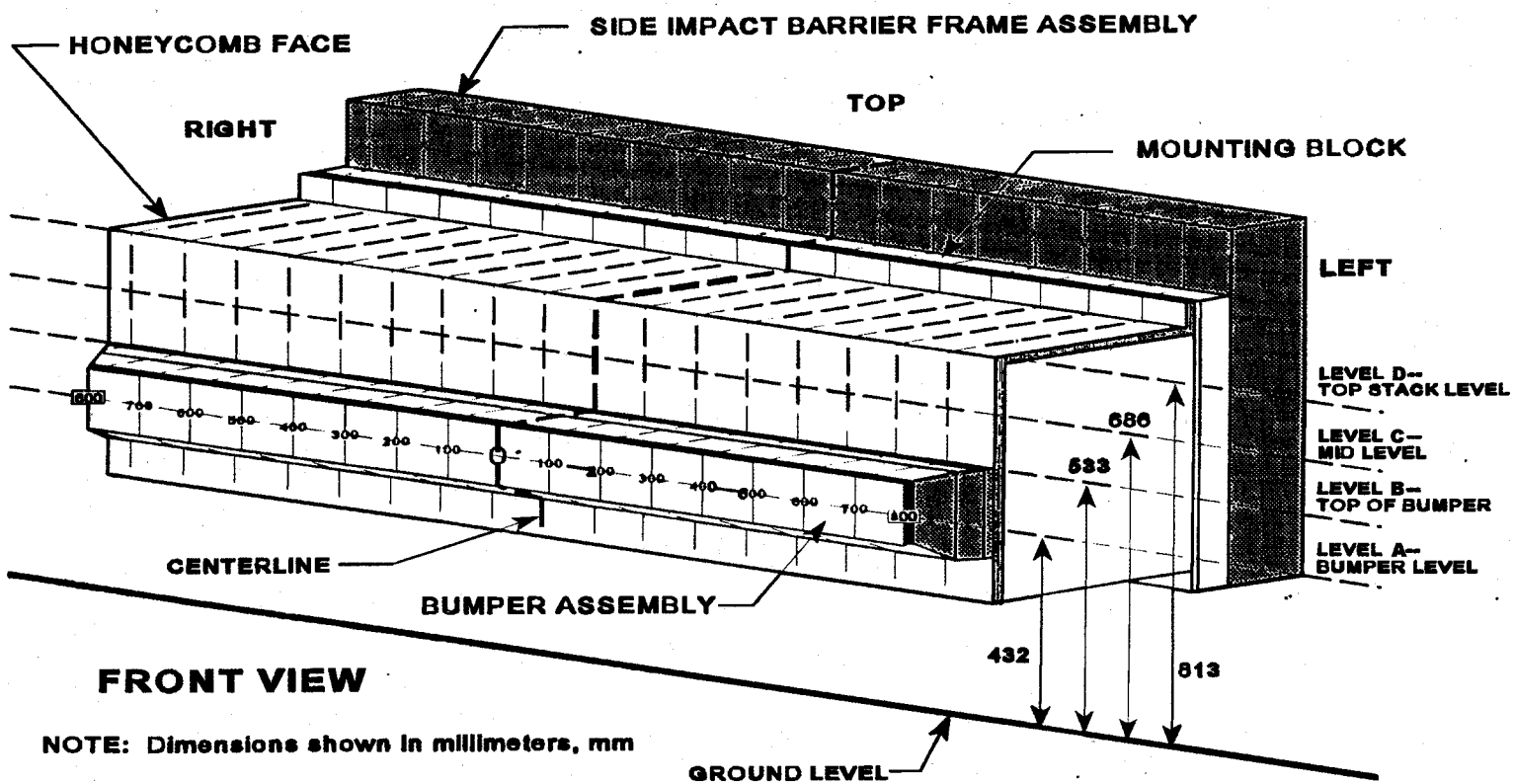
DPD Measurements	Post-Test (mm)	Pre-Test (mm)	Static Crush (mm)
6 -150 mm (Level 3)	708	700	8
5 300 mm (Level 2)	1004	708	296
4 750 mm (Level 2)	1045	711	334
3 1350 mm (Level 2)	974	716	258
2 1800 mm (Level 4)	894	739	155
1 2250 mm (Level 4)	761	740	21

Data Sheet 12

Exterior Static Crush For Impactor Face

(Grid as looking at MDB from front)

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

		Distance Right of Center (mm)									Distance Left of Center (mm)							
Location	Height At CL	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Top Stack Level - Level D	813	-97.6	-58.9	-24.8	-13.3	-9.3	-15.3	-45.9	-63.4	-50.3	-27.9	-20.1	-19.0	-21.0	-29.6	-49.7	-88.2	-141.8
Mid Level Level C	685	-113.6	-66.0	-36.2	-20.0	-13.9	-10.9	-26.3	-31.7	-14.0	-9.3	-12.3	-13.0	-15.4	-20.6	-27.4	-43.3	-95.5
Top Bumper Level - Level B	546	-112.7	-101.2	-85.0	-71.8	-43.3	-29.4	-21.9	-23.5	-29.7	-29.9	-36.5	-42.1	-47.8	-51.4	-57.1	-65.9	-77.5
Mid Bumper Level - Level A	432	-231.6	-214.6	-183.3	-152.7	-123.8	-103.9	-98.4	-97.1	-99.6	-101.7	-106.3	-112.0	-115.9	-121.3	-129.6	-144.1	-156.2

All measurements are in millimeters and have a tolerance of ± 3mm.

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2002 Lexus ES300 4-door Sedan

Deformable Barrier Face Profile

NHTSA No.: M25101

Pre-Test

Index	Xmm	Ymm	Zmm
1	-407.0	796.0	-70.8
2	-406.7	696.6	-70.8
3	-406.4	595.9	-71.7
4	-406.3	495.9	-72.5
5	-407.4	396.2	-71.6
6	-406.7	296.3	-73.9
7	-407.0	196.4	-73.3
8	-406.6	96.7	-73.8
9	-406.6	-5.0	-74.2
10	-407.6	-105.0	-74.4
11	-406.6	-205.9	-75.6
12	-407.3	-306.4	-75.5
13	-406.8	-406.9	-76.1
14	-407.0	-507.0	-76.8
15	-406.9	-606.6	-77.3
16	-407.1	-706.9	-77.5
17	-407.4	-806.6	-77.1
18	-407.3	797.2	-199.0
19	-407.5	696.8	-199.9
20	-407.7	597.4	-201.0
21	-406.9	496.5	-200.4
22	-407.4	396.7	-201.0

Post-Test

Index	Xmm	Ymm	Zmm
1	-309.4	753.5	-128.7
2	-347.8	661.7	-126.3
3	-381.6	568.2	-125.4
4	-393.1	470.1	-123.4
5	-398.2	370.3	-121.0
6	-391.4	271.4	-120.7
7	-361.1	175.2	-120.9
8	-343.3	76.4	-124.3
9	-356.3	-25.2	-117.5
10	-379.7	-122.5	-107.0
11	-386.6	-222.5	-101.0
12	-388.3	-322.6	-95.0
13	-385.8	-421.7	-88.9
14	-377.4	-521.2	-84.0
15	-357.2	-618.2	-81.5
16	-319.0	-710.4	-83.5
17	-265.6	-793.4	-94.2
18	-293.8	743.0	-253.6
19	-341.5	655.3	-253.2
20	-371.5	563.9	-250.6
21	-386.9	466.3	-248.1
22	-393.5	367.4	-248.9

Difference

Index	Xmm	Ymm	Zmm
1	-97.6	42.5	57.9
2	-58.9	34.9	55.5
3	-24.8	27.7	53.7
4	-13.3	25.8	50.9
5	-9.3	25.9	49.5
6	-15.3	24.9	46.9
7	-45.9	21.3	47.7
8	-63.4	20.3	50.6
9	-50.3	20.3	43.3
10	-27.9	17.5	32.6
11	-20.1	16.7	25.5
12	-19.0	16.2	19.5
13	-21.0	14.8	12.8
14	-29.6	14.2	7.2
15	-49.7	11.6	4.2
16	-88.2	3.5	6.1
17	-141.8	-13.2	17.1
18	-113.6	54.3	54.7
19	-66.0	41.5	53.3
20	-36.2	33.6	49.6
21	-20.0	30.3	47.7
22	-13.9	29.4	47.9

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2002 Lexus ES300 4-door Sedan

Deformable Barrier Face Profile Cont'd.

NHTSA No.: M25101

Pre-Test

Index	Xmm	Ymm	Zmm
23	-407.0	296.9	-201.5
24	-407.8	196.6	-201.6
25	-406.9	95.8	-202.3
26	-408.2	-4.6	-202.5
27	-407.8	-104.8	-203.3
28	-407.5	-204.1	-204.3
29	-407.5	-304.7	-204.8
30	-407.7	-405.1	-205.0
31	-408.0	-505.8	-205.8
32	-407.2	-604.3	-204.9
33	-407.8	-704.5	-204.5
34	-408.1	-805.3	-206.6
35	-408.3	797.0	-340.3
36	-407.9	696.5	-341.6
37	-407.3	596.6	-341.7
38	-407.1	496.3	-341.7
39	-407.6	395.6	-341.8
40	-407.5	296.2	-341.0
41	-407.1	196.4	-341.4
42	-407.5	95.9	-341.2
43	-408.8	-4.6	-341.3
44	-408.5	-103.7	-342.8

Post-Test

Index	Xmm	Ymm	Zmm
23	-396.1	268.6	-247.9
24	-381.5	170.0	-248.0
25	-375.2	69.9	-244.8
26	-394.2	-28.1	-237.0
27	-398.5	-127.6	-232.7
28	-395.2	-227.8	-227.7
29	-394.6	-328.6	-222.5
30	-392.3	-427.7	-216.3
31	-387.4	-528.3	-211.8
32	-379.9	-627.5	-206.3
33	-364.6	-726.0	-202.1
34	-312.6	-808.1	-210.0
35	-295.6	744.1	-344.1
36	-306.7	649.7	-323.6
37	-322.4	556.4	-332.0
38	-335.4	464.6	-347.4
39	-364.3	347.7	-363.5
40	-378.2	272.4	-368.5
41	-385.3	164.9	-366.8
42	-384.1	75.4	-365.7
43	-379.1	-40.0	-363.7
44	-378.7	-131.2	-356.5

Difference

Index	Xmm	Ymm	Zmm
23	-10.9	28.4	46.4
24	-26.3	26.6	46.4
25	-31.7	26.0	42.5
26	-14.0	23.5	34.5
27	-9.3	22.8	29.4
28	-12.3	23.8	23.5
29	-13.0	23.9	17.7
30	-15.4	22.6	11.4
31	-20.6	22.5	5.9
32	-27.4	23.2	1.4
33	-43.3	21.5	-2.4
34	-95.5	2.8	3.4
35	-112.7	53.0	3.8
36	-101.2	46.8	-18.0
37	-85.0	40.2	-9.8
38	-71.8	31.7	5.8
39	-43.3	47.9	21.7
40	-29.4	23.9	27.5
41	-21.9	31.5	25.4
42	-23.5	20.5	24.5
43	-29.7	35.4	22.4
44	-29.9	27.5	13.7

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2002 Lexus ES300 4-door Sedan

Deformable Barrier Face Profile Cont'd.

NHTSA No.: M25101

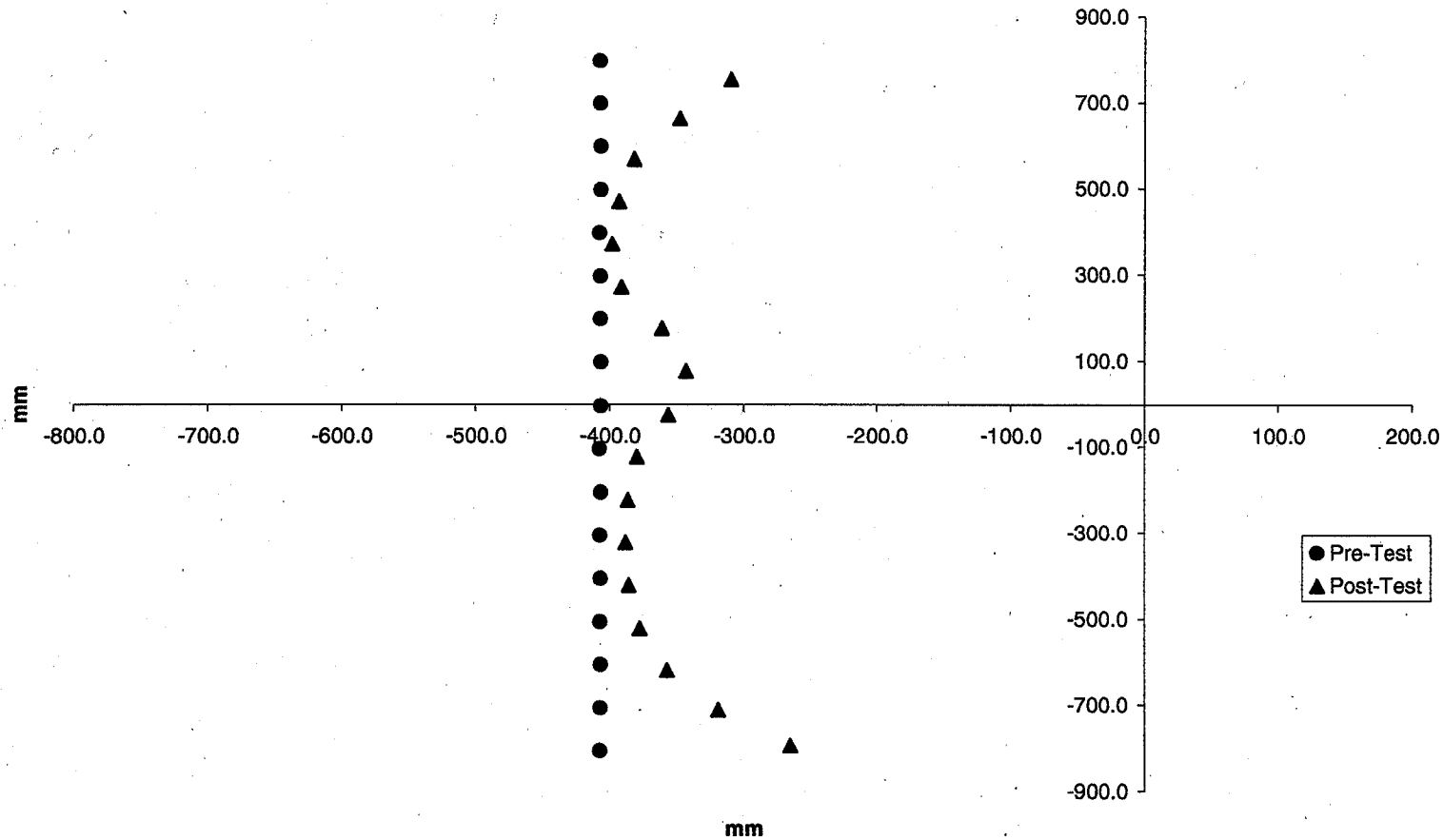
Pre-Test				Post-Test				Difference			
Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm
45	-408.6	-203.1	-344.2	45	-372.1	-232.8	-349.3	45	-36.5	29.7	5.1
46	-408.2	-304.6	-344.8	46	-366.1	-332.2	-344.8	46	-42.1	27.6	0.0
47	-408.4	-404.0	-345.0	47	-360.6	-432.9	-341.5	47	-47.8	28.9	-3.6
48	-408.9	-504.7	-344.7	48	-357.6	-531.8	-336.0	48	-51.4	27.1	-8.7
49	-408.7	-604.9	-343.8	49	-351.6	-631.9	-330.5	49	-57.1	27.0	-13.3
50	-408.2	-704.5	-344.6	50	-342.3	-731.8	-324.1	50	-65.9	27.3	-20.5
51	-408.5	-805.0	-344.1	51	-331.1	-831.6	-319.1	51	-77.5	26.6	-25.0
52	-502.2	791.9	-450.8	52	-270.6	730.2	-444.8	52	-231.6	61.7	-6.1
53	-511.4	693.4	-451.8	53	-296.9	635.4	-454.6	53	-214.6	58.0	2.8
54	-511.6	593.7	-451.7	54	-328.3	542.1	-465.8	54	-183.3	51.6	14.1
55	-511.6	493.8	-453.0	55	-359.0	447.6	-481.4	55	-152.7	46.2	28.5
56	-511.9	394.2	-453.2	56	-388.1	352.9	-493.3	56	-123.8	41.3	40.1
57	-512.2	294.7	-454.5	57	-408.3	255.4	-501.0	57	-103.9	39.3	46.5
58	-511.9	193.5	-452.9	58	-413.5	155.4	-501.0	58	-98.4	38.1	48.2
59	-511.8	93.9	-454.0	59	-414.7	56.0	-497.1	59	-97.1	37.9	43.1
60	-511.8	-7.0	-455.0	60	-412.3	-42.2	-497.8	60	-99.6	35.2	42.8
61	-512.1	-105.5	-456.0	61	-410.4	-143.1	-495.6	61	-101.7	37.6	39.7
62	-511.8	-206.2	-455.4	62	-405.6	-243.1	-491.9	62	-106.3	36.9	36.6
63	-512.0	-306.5	-455.9	63	-400.0	-342.8	-488.5	63	-112.0	36.3	32.6
64	-511.3	-405.7	-454.6	64	-395.4	-442.7	-484.7	64	-115.9	37.0	30.1
65	-511.0	-505.4	-455.6	65	-389.7	-541.8	-481.1	65	-121.3	36.4	25.5
66	-510.9	-605.3	-455.7	66	-381.3	-641.9	-475.2	66	-129.6	36.6	19.5
67	-511.2	-705.25	-456.7	67	-367.15	-739.8	-466.65	67	-144.1	34.6	9.9
68	-499.9	-800.6	-455.8	68	-343.75	-833.05	-452.6	68	-156.2	32.4	-3.2

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

Row D - Deformable Barrier Face Profile 1-17

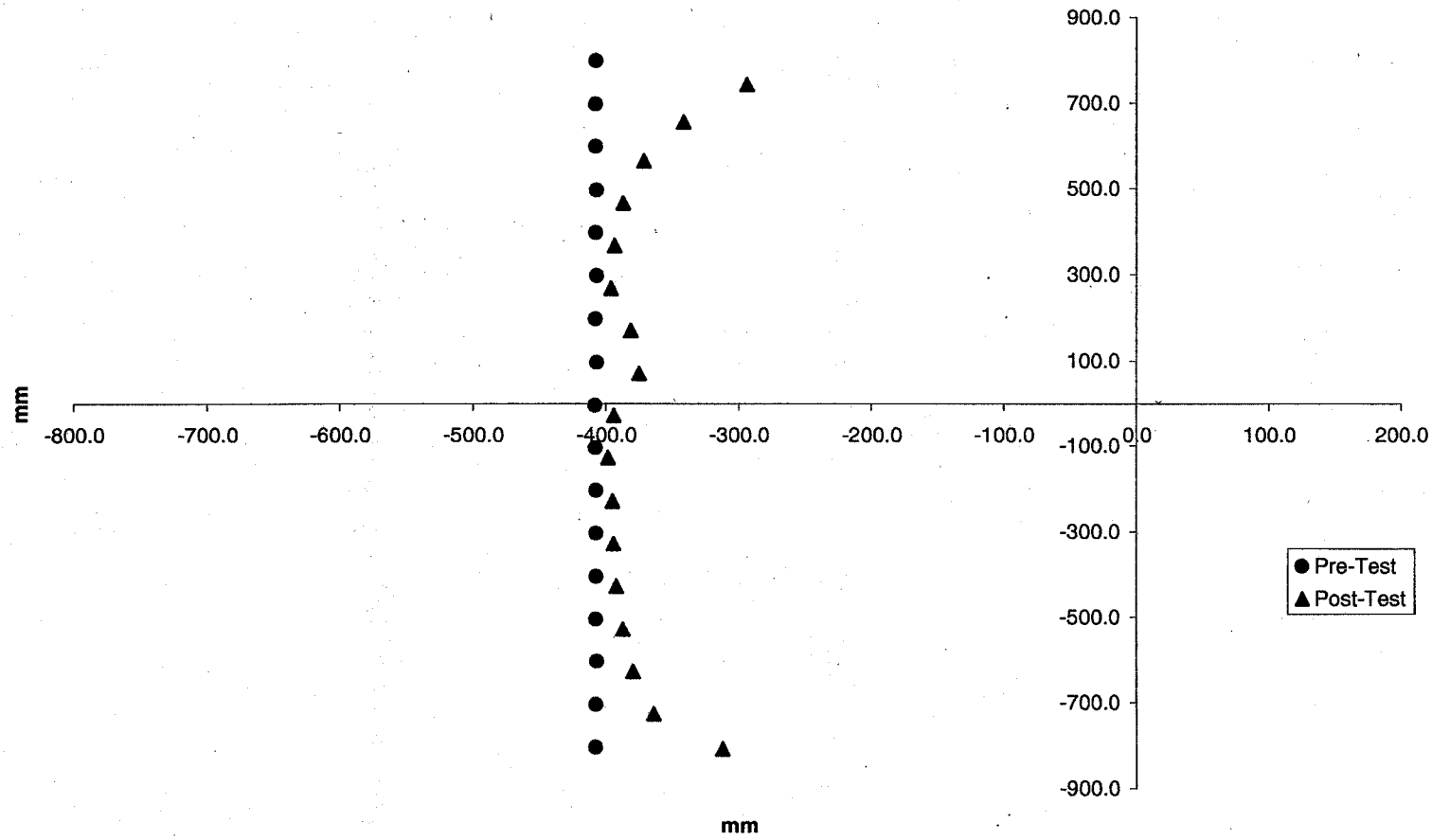


Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

Row C - Deformable Barrier Face Profile 18-34

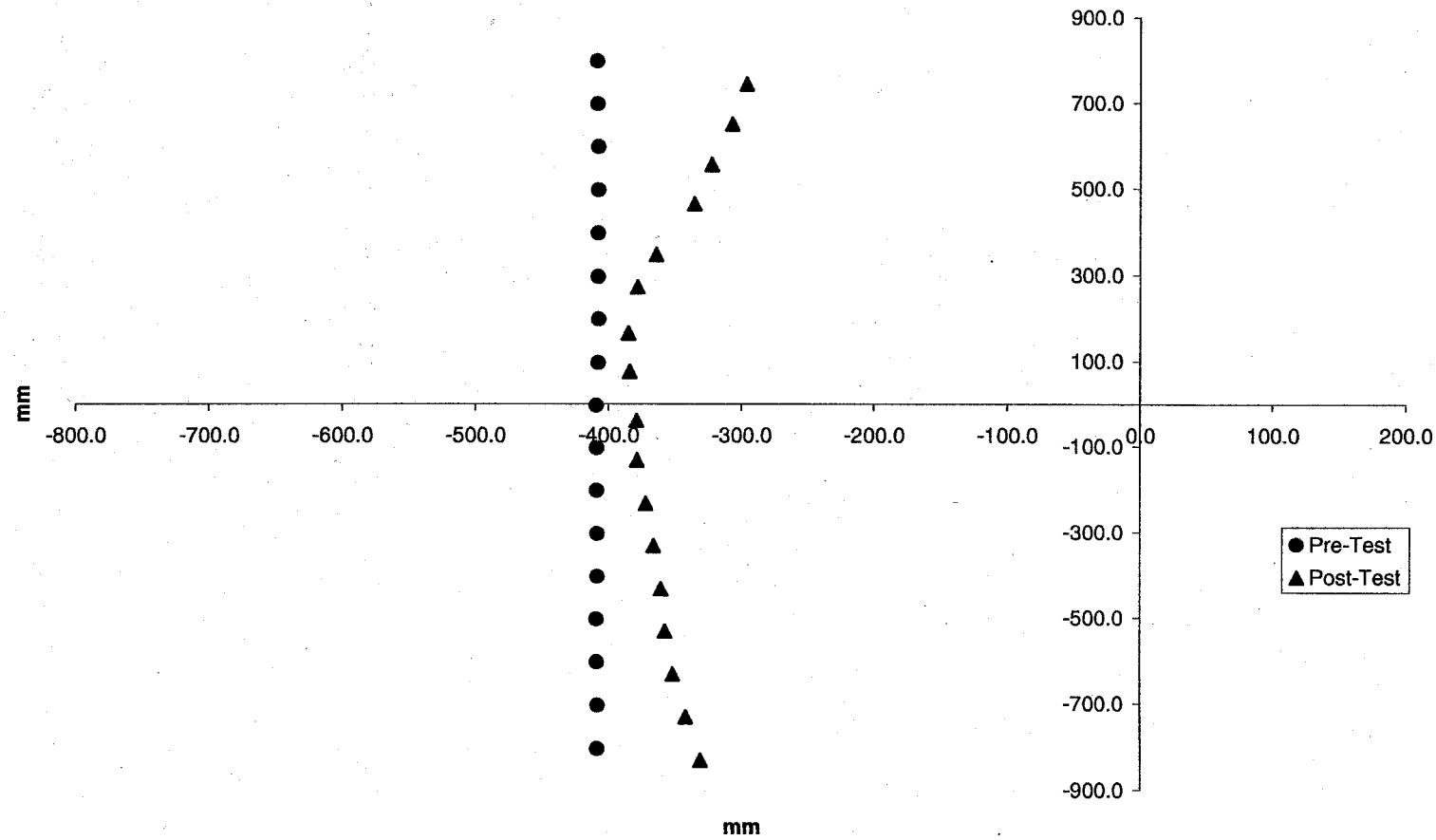


Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

Row B - Deformable Barrier Face Profile 35-51

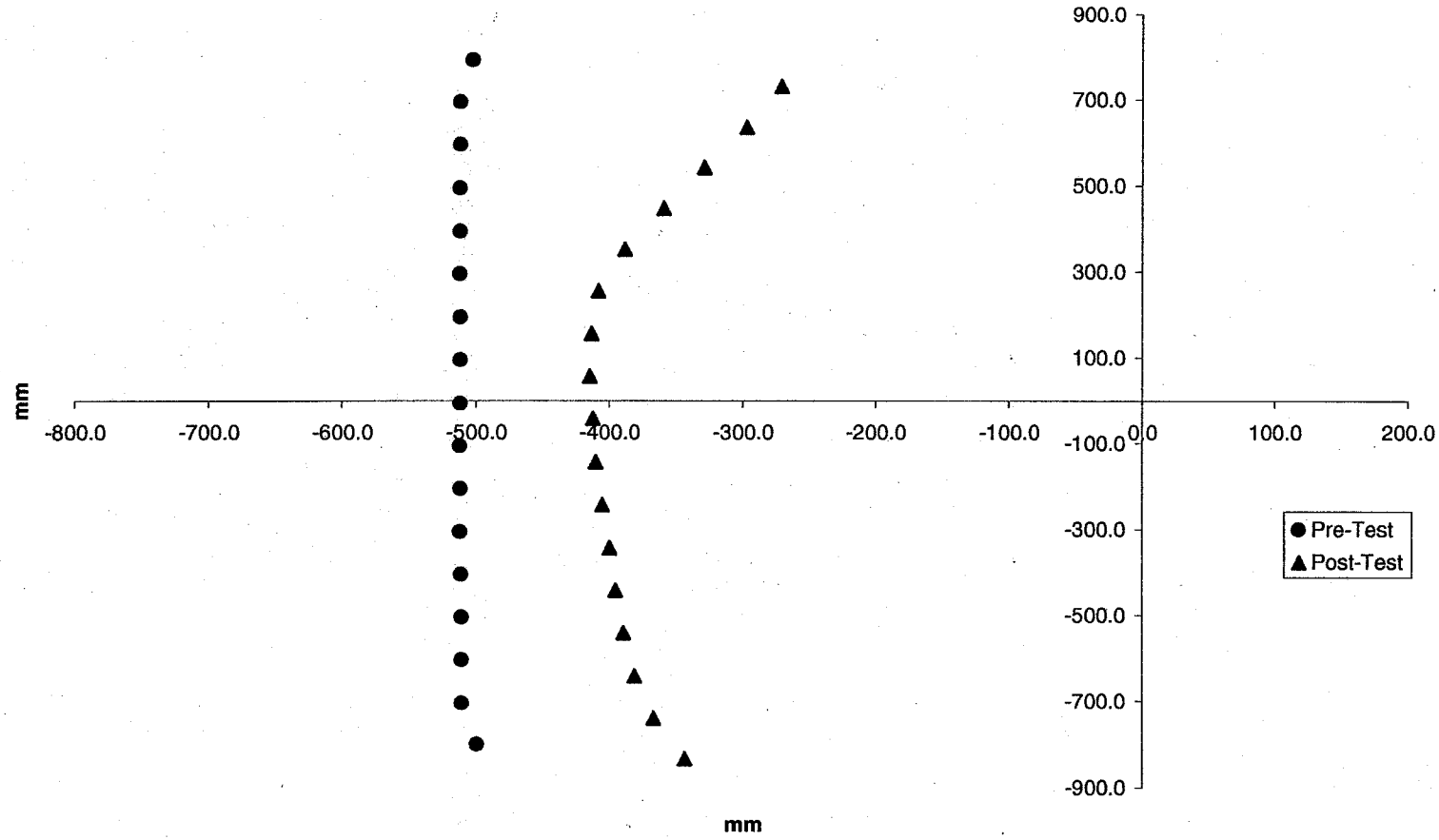


Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

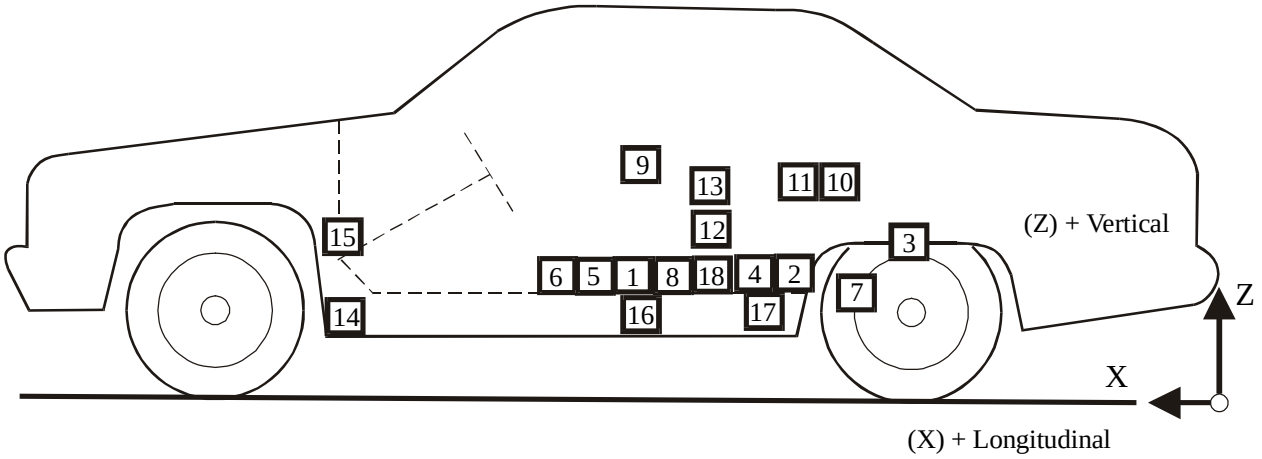
Row A - Deformable Barrier Face Profile 52-68



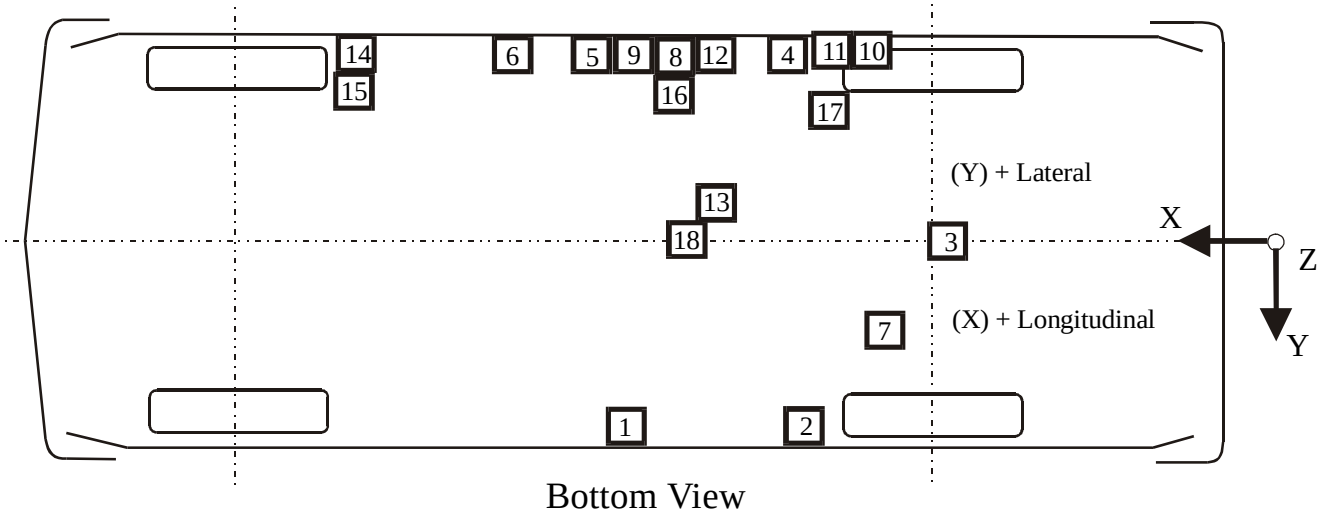
Data Sheet 13

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Side View



Bottom View

1-Right Front Side Sill
2-Right Side Sill at Rear Seat
3-Rear Floorpan above Axle
4-Left Side Sill at Rear Seat
5-Left Front Side Sill at Front Seat
6-Left Front Door on Centerline
7-Right Rear Occupant Compartment
8-Left Front Door Mid Rear
9-Left Front Door Upper Centerline
10-Left Rear Door Mid Rear
11-Left Rear Door Upper Centerline
12-Left Side Lower B-pillar
13-Left Side Middle B-pillar
14-Left Side Lower A-pillar
15-Left Side Middle A-pillar
16-Left Side Front Seat Track at H-point
17-Left Rear Seat Track at H-point
18-Vehicle Center of Gravity

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

TEST NUMBER: 011129

No.	LOCATION		X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1	RIGHT SIDE SILL	PRE	2875 mm	740 mm	345 mm				
	AT FRONT SEAT	POST	NA	NA	338 mm				
	LONGITUDINAL					4.3 g	@ 60.2 ms	3.5 g	@ 14.7 ms
	LATERAL					22.4 g	@ 8.9 ms	3.0 g	@ 152.6 ms
	VERTICAL					5.1 g	@ 65.9 ms	5.9 g	@ 11.8 ms
	RESULTANT					22.8 g	@ 9.0 ms		
2	RIGHT SIDE SILL	PRE	1947 mm	740 mm	345 mm				
	AT REAR SEAT	POST	NA	NA	330 mm				
	LONGITUDINAL					4.9 g	@ 60.6 ms	3.1 g	@ 37.5 ms
	LATERAL					25.3 g	@ 9.1 ms	2.4 g	@ 134.2 ms
	VERTICAL					7.7 g	@ 30.6 ms	5.1 g	@ 22.4 ms
	RESULTANT					25.6 g	@ 9.1 ms		
3	REAR FLOORPAN	PRE	1150 mm	0 mm	480 mm				
	ABOVE AXLE	POST	NA	NA	455 mm				
	LONGITUDINAL					1.6 g	@ 111.2 ms	6.2 g	@ 32.4 ms
	LATERAL					22.8 g	@ 9.8 ms	1.9 g	@ 134.5 ms
	VERTICAL					10.4 g	@ 33.1 ms	4.9 g	@ 59.2 ms
	RESULTANT					23.5 g	@ 32.9 ms		
4	LEFT SIDE SILL	PRE	1945 mm	-740 mm	335 mm				
	AT REAR SEAT	POST	NA	NA	NA				
	LATERAL					55.7 g	@ 14.8 ms	22.6 g	@ 28.8 ms
5	LEFT SIDE SILL	PRE	2816 mm	-740 mm	336 mm				
	AT FRONT SEAT	POST	NA	NA	NA				
	LATERAL					77.7 g	@ 7.1 ms	26.6 g	@ 19.4 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

TEST NUMBER: 011129 No. LOCATION		X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
6 LEFT FRONT DOOR	PRE	2829 mm	-790 mm	405 mm		
ON CENTERLINE	POST	NA	NA	NA		
LATERAL[1]					192.3 g @ 5.4 ms	45.2 g @ 9.5 ms
7 RIGHT REAR OCCUPANT	PRE	1595 mm	420 mm	320 mm		
COMPARTMENT	POST	NA	NA	325 mm		
LATERAL					23.0 g @ 20.9 ms	3.0 g @ 133.9 ms
8 LEFT FRONT DOOR	PRE	2647 mm	-790 mm	397 mm		
MIDREAR	POST	NA	NA	NA		
LATERAL[1]					171.9 g @ 6.3 ms	24.3 g @ 30.3 ms
9 LEFT FRONT DOOR	PRE	2829 mm	-790 mm	644 mm		
UPPER CENTERLINE	POST	NA	NA	NA		
LATERAL					128.1 g @ 7.8 ms	149.9 g @ 28.4 ms
10 LEFT REAR DOOR	PRE	1537 mm	-780 mm	667 mm		
MIDREAR	POST	NA	NA	NA		
LATERAL					114.0 g @ 9.5 ms	56.5 g @ 14.1 ms
11 LEFT REAR DOOR	PRE	1740 mm	-780 mm	662 mm		
UPPER CENTERLINE	POST	NA	NA	NA		
LATERAL[1]					166.0 g @ 19.7 ms	92.7 g @ 29.8 ms
12 LEFT LOWER B-POST	PRE	2321 mm	-740 mm	568 mm		
	POST	NA	NA	NA		
LATERAL					264.2 g @ 6.7 ms	58.1 g @ 15.6 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

TEST NUMBER: 011129

No.	LOCATION		X	Y	Z	POSITIVE DIRECTION			NEGATIVE DIRECTION		
13	LEFT MIDDLE B-POST	PRE	2285 mm	-70 mm	835 mm						
		POST	NA	NA	NA						
	LATERAL					188.8 g	@	6.9 ms	48.2 g	@	16.9 ms
14	LEFT LOWER A-POST	PRE	3329 mm	-750 mm	501 mm						
		POST	NA	NA	NA						
	LATERAL[1]					81.6 g	@	3.0 ms	18.2 g	@	22.9 ms
15	LEFT MIDDLE A-POST	PRE	3355 mm	-750 mm	683 mm						
		POST	NA	NA	NA						
	LATERAL					55.6 g	@	3.1 ms	9.5 g	@	22.9 ms
16	LEFT FRONT SEAT TRACK	PRE	2595 mm	-740 mm	377 mm						
		POST	NA	NA	NA						
	LATERAL					78.1 g	@	7.3 ms	32.2 g	@	18.8 ms
17	LEFT REAR SEAT TRACK	PRE	1730 mm	-730 mm	365 mm						
		POST	NA	NA	NA						
	LATERAL					38.1 g	@	8.4 ms	5.0 g	@	27.5 ms
18	VEHICLE CENTER	PRE	2660 mm	0 mm	560 mm						
	OF GRAVITY	POST	NA	NA	547 mm						
	LONGITUDINAL					10.6 g	@	25.0 ms	13.1 g	@	36.2 ms
	LATERAL					52.4 g	@	26.7 ms	24.2 g	@	34.1 ms
	VERTICAL					25.4 g	@	29.1 ms	42.8 g	@	34.0 ms
	RESULTANT					53.5 g	@	26.9 ms			

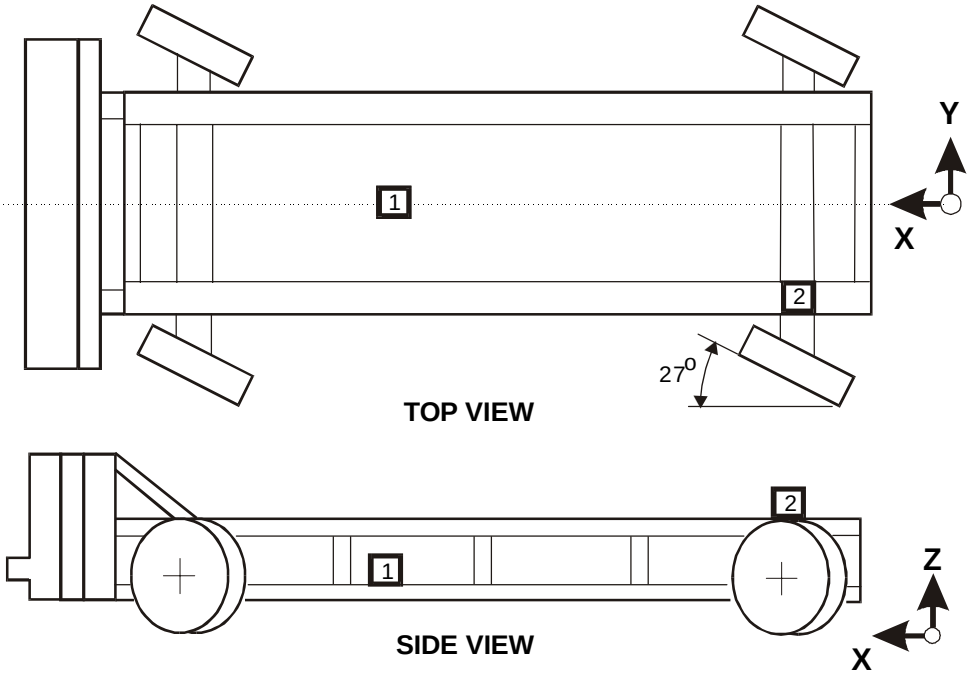
REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + RIGHTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

[1] See DATA ACQUISITION EXPLANATIONS

Data Sheet 14

MDB Accelerometer Locations and Data Summary

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Accel. No.	Location	Coordinates (millimeters) X*	Y*	Z*	Positive Direction Max. (g)	Time (ms)	Negative Direction Max. (g)	Time (ms)
1	MDB Center of Gravity	1850	0	530				
	Longitudinal X				1.7	94.0	22.7	38.0
	Lateral Y				2.8	64.5	8.8	36.2
	Vertical Z				7.9	121.1	5.6	88.3
	Resultant R				24.3	37.7		
2	Rear Frame Member	411	-728	630				
	Longitudinal X				4.3	113.6	21.9	34.4
	Lateral Y				3.8	28.4	3.1	114.2

*Reference: X = Rear Bumper (+ Forward)

Y = Vehicle Centerline (+ To Right)

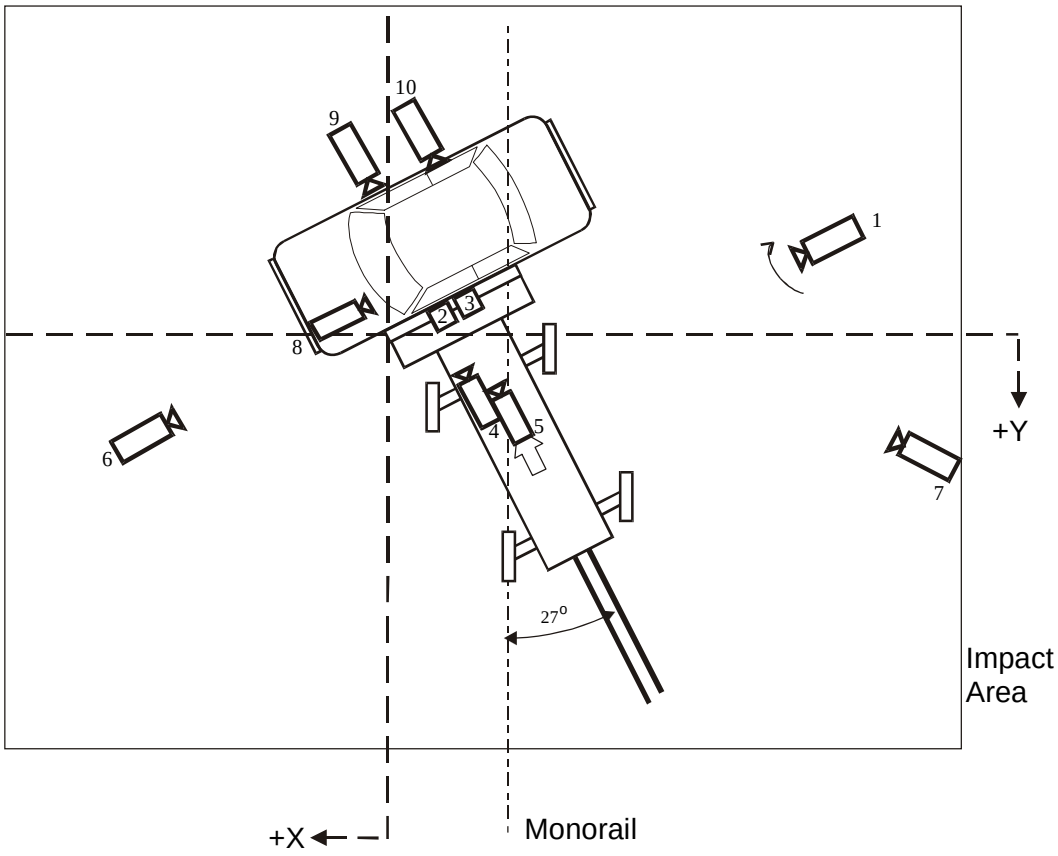
Z = Ground Level (+ Up)

All measurements accurate to within ±3 mm.

Data Sheet 15

High-Speed Camera Locations and Data Summary

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101



Camera Number	Location	Location, mm X	Y	Z	Lens (mm)	Speed (fps)
1	Real-time Panning	N/A	N/A	N/A	16	24
2	Overhead wide	N/A	N/A	N/A	8.5	1005
3	Overhead tight	N/A	N/A	N/A	25	997
4	Onboard MDB left side	-740	1710	790	13	975
5	Onboard MDB center	-1995	2420	1405	13	997
6	Front wide	3877	2306	1050	13	1005
7	Rear wide	-6622	2371	1120	13	1007
8	Onboard vehicle front	435	-535	1263	8	1000
9	Onboard side front door	245	-1625	1045	8	1010
10	Onboard side rear door	-601	-1645	1060	8	1000

+X: As illustrated based on line parallel to monorail and passing through impact reference line.
+Y: As illustrated based on line perpendicular to monorail and passing through impact reference line.
+Z: Upward from ground level

Section 5

Vehicle Fuel System Integrity

Data Sheet 16

FMVSS 301 Fuel System Integrity Data

NHTSA No.: M25101 Test Date: November 29, 2001

Vehicle Year/Make/Model/Body Style: 2002 Lexus ES300 4-door Sedan

****

Test Vehicle Impact Type :

_____	Frontal (48.28 km/h)
_____	Oblique (48.28 km/h) with ____° barrier face first contacting the (driver/passenger) side
_____	Rear Moving Barrier (48.28 km/h)
_____	Lateral Moving Barrier (32.19 km/h)
X	Side Impact Moving Deformable Barrier (38.6 mph) contacting the Driver's side

Fuel Spillage Measurement:

	Actual	Maximum Allowed
1. From impact until vehicle motion ceases	0 g	28 g
2. For five-minute period after vehicle motion ceases	0 g	142 g
3. For next 25 minutes.	0 g	28 g/1 minute

Solvent Spillage Details :

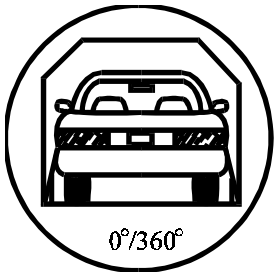
None

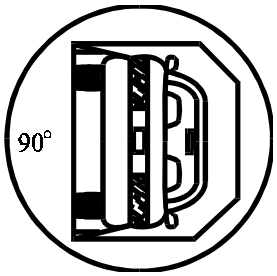
Data Sheet 17

FMVSS 301 Rollover Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

0 - 90 Degrees





1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	1	minutes	2	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	5	minutes	0	seconds
Total	6	minutes	2	seconds
Next whole minute interval	7	minutes		

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

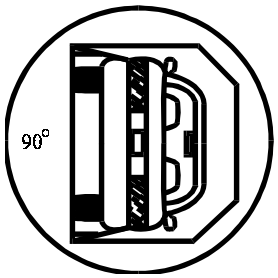
None

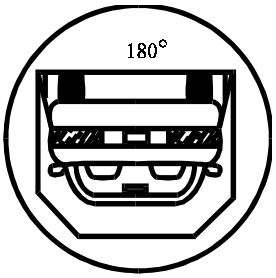
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

90 - 180 Degrees





1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	1	minutes	2	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	5	minutes	0	seconds
Total	6	minutes	2	seconds
Next whole minute interval	7	minutes		

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

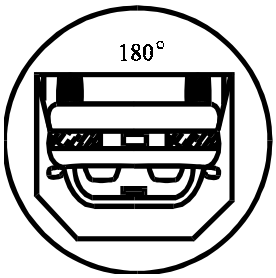
None

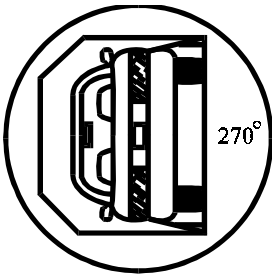
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

180 - 270 Degrees





1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	1	minutes	2	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	5	minutes	0	seconds
Total	6	minutes	2	seconds
Next whole minute interval	7	minutes		

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

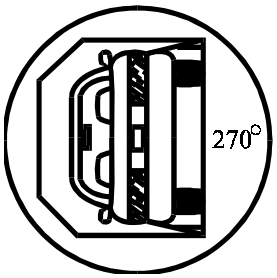
None

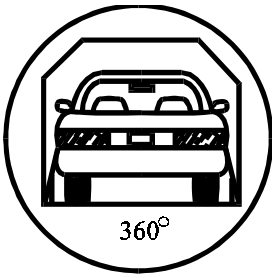
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2002 Lexus ES300 4-door Sedan NHTSA No.: M25101

270 - 360 Degrees





1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	1	minutes	2	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	5	minutes	0	seconds
Total	6	minutes	2	seconds
Next whole minute interval	7	minutes		

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

Appendix A

Photographs

List of Photographs

List of Photographs, Cont'd.

List of Photographs, Cont'd.

Appendix B

Data Plots

Table Of Data Plots

Driver And Passenger Instrumentation Plots

Head and Rib Acceleration Data - Filter Class 1000; Lower Spine Filter Class 180
Integration Data Filter Class 180; Contact Data - Filter Class 1000

Table Of Data Plots Cont'd.

Test Vehicle Instrumentation Plots

Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

Table Of Data Plots Cont'd.

Table Of Data Plots Cont'd.

Moving Deformable Barrier Instrumentation Plots

Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

Contact Data - Filter Class 1000

Table Of Data Plots Cont'd.

Driver And Passenger Dummy Instrumentation Plots

Acceleration Data - FIR100 Filtered

Appendix C

SID Configuration And Performance Verification Data

Summary
SID Pre-Test And Post-Test Calibration

Configured For Left Side Impact

Date: Pre: 11/28/01; Post: 12/05/01 Laboratory Technician: Jack Willike

TRC Inc. Calibration Number: SN270 CAL01-02; SN272 CAL01-02

Test Parameter	Specification	SID 270		SID 272	
		Pre-Test	Post-Test	Pre-Test	Post-Test
SH - seated height (mm)	889-909	896.6	904.2	896.6	901.7
RH - Rib Height (mm)	502-520	510.5	502.9	505.5	510.5
HP - Hip Pivot Height (mm)	99 ref	99.1	99.1	99.1	99.1
RD - Rib from Back Line (mm)	229-241	236.2	236.2	231.1	236.2
KV - Knee Pivot from Back Line (mm)	511-526	520.7	520.7	523.2	515.6
SW - Knee Pivot to Floor (mm)	490-505	492.8	495.3	495.3	500.4
HW - Hip Width (mm)	356-391	373.4	375.9	383.5	378.5
Thorax Impacts					
Temperature (°C)	18.9-25.5	21.1	21.7	21.1	21.1
Relative Humidity (%)	10-70	33	38	33	36
Probe Speed (m/s)	4.27-4.33	4.28	4.26	4.28	4.28
Upper Rib (g's)	37-46	40.6	41.0	39.8	40.3
Lower Rib (g's)	37-46	40.5	39.5	37.8	38.4
Lower Spine (g's)	15-22	19.0	18.5	18.4	18.7
Pelvis Impacts					
Temperature (°C)	18.9-25.5	21.1	22.2	21.7	21.7
Relative Humidity (%)	10-70	32	37	34	41
Probe Speed (m/s)	4.27-4.33	4.27	4.27	4.29	4.29
Pelvis (g's)	40-60	58.6	43.2	40.5	40.7

Calibration Test Results

Pre-Test

SID: 270

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Thorax Impact Test:	The lateral thorax passed all impact test requirements.
Pelvis Impact Tests:	The lateral pelvis passed all impact test requirements.
Thoracic Shock Absorbers:	The thorax passed all shock absorber requirements.
Abdominal Compression Tests:	The abdomen met the Part 572B compression test requirements.
Lumbar Flexion Tests:	The dummy met the Part 572B lumbar flexion test requirements.

Calibration Test Results

Pre-Test

SID: 272

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Thorax Impact Test:	The lateral thorax passed all impact test requirements.
Pelvis Impact Tests:	The lateral pelvis passed all impact test requirements.
Thoracic Shock Absorbers:	The thorax passed all shock absorber requirements.
Abdominal Compression Tests:	The abdomen met the Part 572B compression test requirements.
Lumbar Flexion Tests:	The dummy met the Part 572B lumbar flexion test requirements.

Calibration Test Results

Post-Test

SID: 270

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Thorax Impact Test:	The lateral thorax passed all impact test requirements.
Pelvis Impact Tests:	The lateral pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen met the Part 572B compression test requirements.
Lumbar Flexion Tests:	The dummy met the Part 572B lumbar flexion test requirements.

Calibration Test Results

Post-Test

SID: 272

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Thorax Impact Test:	The lateral thorax passed all impact test requirements.
Pelvis Impact Tests:	The lateral pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen met the Part 572B compression test requirements.
Lumbar Flexion Tests:	The dummy met the Part 572B lumbar flexion test requirements.

Transportation Research Center Inc. Hybrid III Dummy Pre-Use Inspection

Type: SID S/N: 270 Mfr: First Tech Test Date: 11/29/01
Proj./Seg. No.: 19970454-3100 Test Eng.: Ginny Watters

Item	Pre-Use	
Head:		
Head Ballast Condition	X	
Accelerometer Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Accelerometer Cable Exit (left or right)	(Left)	(Right) X
Neck:		
* Rubber Condition and Separation From End Caps	X	
Thorax:		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket (No Damper Pot) Left	X	
* Location and Adjustment of Chest Pot Bracket and Collars	X	
* Chest Pot Rod End Nuts and Eyebolt	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
Pelvis:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No Tape = No kits)	(With)	(Without)
Legs and Feet:		
Femur Load Cell Bolts (40 ft/lbs.)	X	
Breakaway Femur Bolts (5-6 ft/lbs)	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
Other:		
Cleanliness	X	
Target Position Calf Pants	X	
Clothes	X	
Shoes	X	
Knee and Ankle One G Joint Adjustments	X	

Inspection Completed By: J. Clarridge Date: 11/28/01

Transportation Research Center Inc. Hybrid III Dummy Pre-Use Inspection

Type: SID S/N: 272 Mfr: First Tech Test Date: 11/29/01
Proj./Seg. No.: 19970454-3100 Test Eng.: Ginny Watters

Item		Pre-Use	
Head:			
Head Ballast Condition		X	
Accelerometer Mount Bolts and Cables		X	
Skull Cap Bolts		X	
Accelerometer Cable Exit (left or right)		(Left)	(Right) X
Neck:			
* Rubber Condition and Separation From End Caps		X	
Thorax:			
Stacked Shoulder Foams and Bolts		X	
* Rib Cage Spring and Support Assembly		X	
* Rib Cage Bolts		X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket (No Damper Pot)	Left	X	
* Location and Adjustment of Chest Pot Bracket and Collars		X	
* Chest Pot Rod End Nuts and Eyebolt		X	
Arm Foam Orientation		X	
Thorax/Lumbar Spine Bolts		X	
Pelvis:			
Tightness and Alignment of H-Point Tool Insert		X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)		X	
Upper Femur Bolt Adjustment and Position		X	
Check Spine Kits (Yellow tape = Kits/No Tape = No kits)		(With)	(Without)
Legs and Feet:			
Femur Load Cell Bolts	(40 ft/lbs.)	X	
Breakaway Femur Bolts	(5-6 ft/lbs)	X	
Knee Joint Function and Range of Motion		X	
Leg Skin Condition and Position		X	
Ankle Range of Motion		X	
Foot Condition		X	
Other:			
Cleanliness		X	
Target Position	Calf Pants	X	
Clothes		X	
Shoes		X	
Knee and Ankle One G Joint Adjustments		X	

Inspection Completed By: J. Clarridge Date: 11/28/01

Transportation Research Center Inc. Hybrid III Dummy Post-Use Inspection

Type: SID S/N: 270 Mfr: First Tech Test Date: 11/29/01
Proj./Seg. No.: 19970454-3100 Test Eng.: Ginny Watters

Item	Post-Use
Head:	
Head Skin Condition	X
Head Ballast Condition	
Neck:	
Rubber Condition and Separation from End Caps	X
Thorax:	
Jacket Condition	X
Arm Foam Condition	X
Damper and Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen Condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation from End Caps	X
Pelvis:	
Illiac Crest Bone	X
Flesh Condition	X
Hip Range of Motion	X
Legs and Feet:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

Notes: No damage to report.

Inspection Completed By: J. Clarridge Date: 12/03/01

Transportation Research Center Inc. Hybrid III Dummy Post-Use Inspection

Type: SID S/N: 272 Mfr: First Tech Test Date: 11/29/01
Proj./Seg. No.: 19970454-3100 Test Eng.: Ginny Watters

Item	Post-Use
Head:	
Head Skin Condition	X
Head Ballast Condition	
Neck:	
Rubber Condition and Separation from End Caps	X
Thorax:	
Jacket Condition	X
Arm Foam Condition	X
Damper and Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen Condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation from End Caps	X
Pelvis:	
Illiac Crest Bone	X
Flesh Condition	X
Hip Range of Motion	X
Legs and Feet:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

Notes: No damage to report.

Inspection Completed By: J. Clarridge Date: 12/03/01

Dummy 270n **Type** SID **Description** NHTSA - 270n SID-LEFT IMP. CONFIG. CAL DUE 5-17-02(DKS 11-27-01)J211

Chsname	Location	Model	Name	Manufacturer	Sens./mV/V/U	Fullscale	Caldate	Pos Output	Flip
HEDXG	Head Accel X	7264-2000TZ	J26885	Endevco	0.0235 G	2000	11/21/2001	Rwd	1
HEDYG	Head Accel Y	7264-2000TZ	J26864	Endevco	0.02387 G	2000	11/21/2001	Lft	1
HEDZG	Head Accel Z	7264-2000TZ	J27950	Endevco	0.02575 G	2000	11/21/2001	Up	1
!NEKXF	Neck Force X	1716A	1716A-858-FX	Denton	0.000193719 N	8896.4	08/16/2001	Hd Fd,Cst Rr	1
!NEKYF	Neck Force Y	1716A	1716A-858-FY	Denton	0.000186907 N	8896.4	08/16/2001	Hd Lt,Cst Rt	0
!NEKZF	Neck Force Z	1716A	1716A-858-FZ	Denton	0.000096144 N	13344.6	08/16/2001	Hd Up,Cst Dn	0
!NEKXM	Neck Moment X	1716A	1716A-858-MX	Denton	0.005827965 NM	282.5	08/16/2001	Rt Ear to Rt Shld	1
!NEKYM	Neck Moment Y	1716A	1716A-858-MY	Denton	0.005966726 NM	282.5	08/16/2001	Chn to Strnm	0
!NEKZM	Neck Moment Z	1716A	1716A-858-MZ	Denton	0.008246372 NM	282.5	08/16/2001	Chn to Lt Shld	0
LURYG	Left Upper Rib Y	7264-2000TZ	J34404	Endevco	0.03039 G	2000	11/21/2001	Rgt	0
LURYGR	Left Upper Rib Red Y	7264-2000TZ	J34078	Endevco	0.03005 G	2000	11/21/2001	Rgt	0
LLRYG	Left Lower Rib Y	7264-2000TZ	J34630	Endevco	0.02634 G	2000	11/21/2001	Rgt	0
LLRYGR	Left Lower Rib Red Y	7264-2000TZ	J34438	Endevco	0.03322 G	2000	11/21/2001	Rgt	0
T12YG	Lower Spine Y	7264-2000TZ	J34352	Endevco	0.02249 G	2000	11/23/2001	Lft	1
T12YGR	Lower Spine Red Y	7264-2000TZ	J22046	Endevco	0.0267 G	2000	11/23/2001	Lft	1
PEVYG	Pelvis Accel Y	7264-2000TZ	J20561	Endevco	0.02424 G	2000	11/23/2001	Lft	1
PEVYGR	Pelvis Accel Red Y	7264-2000TZ	J27111	Endevco	0.02106 G	2000	11/23/2001	Rgt	0

! Indicates that this channel is not included in the present dummy configuration.

Dummy 272n **Type** SID **Description** NHTSA - 272n SID-LEFT IMP. CONFIG. CAL DUE 5-17-02(DKS 11-26-01)J211

Chsname	Location	Model	Name	Manufacturer	Sens./mV/V/U	Fullscale	Caldate	Pos Output	Flip
HEDXG	Head Accel X	7264-2000TZ	J26498	Endevco	0.02372 G	2000	11/23/2001	Rwd	1
HEDYG	Head Accel Y	7264-2000TZ	J26491	Endevco	0.02519 G	2000	11/23/2001	Lft	1
HEDZG	Head Accel Z	7264-2000TZ	J26499	Endevco	0.02554 G	2000	11/23/2001	Up	1
!NEKXF	Neck Force X	1716A	1716A-858-FX	Denton	0.000193719 N	8896.4	08/16/2001	Hd Fd,Cst Rr	1
!NEKYF	Neck Force Y	1716A	1716A-858-FY	Denton	0.000186907 N	8896.4	08/16/2001	Hd Lt,Cst Rt	0
!NEKZF	Neck Force Z	1716A	1716A-858-FZ	Denton	0.000096144 N	13344.6	08/16/2001	Hd Up,Cst Dn	0
!NEKXM	Neck Moment X	1716A	1716A-858-MX	Denton	0.005827965 NM	282.5	08/16/2001	Rt Ear to Rt Shld	1
!NEKYM	Neck Moment Y	1716A	1716A-858-MY	Denton	0.005966726 NM	282.5	08/16/2001	Chn to Strnm	0
!NEKZM	Neck Moment Z	1716A	1716A-858-MZ	Denton	0.008246372 NM	282.5	08/16/2001	Chn to Lt Shld	0
LURYG	Left Upper Rib Y	7264-2000TZ	J28884	Endevco	0.029 G	2000	11/23/2001	Rgt	0
LURYGR	Left Upper Rib Red Y	7264-2000TZ	J28868	Endevco	0.02884 G	2000	11/23/2001	Rgt	0
LLRYG	Left Lower Rib Y	7264-2000TZ	J27117	Endevco	0.0218 G	2000	11/23/2001	Rgt	0
LLRYGR	Left Lower Rib Red Y	7264-2000TZ	J27359	Endevco	0.02366 G	2000	11/23/2001	Rgt	0
T12YG	Lower Spine Y	7264-2000TZ	J27051	Endevco	0.02439 G	2000	11/21/2001	Lft	1
T12YGR	Lower Spine Red Y	7264-2000TZ	J20025	Endevco	0.02871 G	2000	11/21/2001	Lft	1
PEVYG	Pelvis Accel Y	7264-2000TZ	J20243	Endevco	0.03111 G	2000	11/21/2001	Lft	1
PEVYGR	Pelvis Accel Red Y	7264-2000TZ	J20462	Endevco	0.02488 G	2000	11/21/2001	Rgt	0

! Indicates that this channel is not included in the present dummy configuration.

Appendix D

Test Equipment List and Calibration Information

Report Sign Convention
SAE J211 MAR95

Accelerometers:	+X: Forward	
	+Y: Rightward	
	+Z: Downward	
Potentiometers:	+Chest longitudinal deflection:	Outward
	+Chest lateral deflection:	Leftward
	+Seat belt displacement:	Outward
	+Seat belt extension:	Elongation
	+Knee slider displacement:	Distance between femur and tibia increased (in relation to a seated dummy)
Rotation potentiometers:		
	+About the X-axis:	Left foot-eversion
		Right foot-inversion
	+About the Y-axis:	Left/right foot-dorsiflexion
	+About the Z-axis:	Left foot-internal
		Right foot-external
Load cells:	+Femur force:	Tension
	+Seat belt force:	Tension
	+Barrier force:	Tension
Neck load cells:	+X force:	Head pushed rearward
	+Y force:	Head pushed leftward
	+Z force:	Head pulled upward (tension on neck)
	+X moment:	Left ear rotating toward left shoulder
	+Y moment:	Chin rotating toward chest
	+Z moment:	Chin rotating toward left shoulder
Tibia load cells:	+X force:	Ankle forward, knee rearward
	+Y force:	Ankle rightward, knee leftward
	+Z force:	Tension
	+X moment:	Bottom of tibia moving leftward
	+Y moment:	Bottom of tibia moving rearward

[1] The chest deflection and knee slider displacement presented in the dummy certification in Appendix C are opposite of J211 polarity.

Frequency Response Classes
SAE J211 MAR95

Typical Test Measurements	Channel Class
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	180
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head form Accelerations	1000

The direction column on the following sheets describes the transducer output as mounted and wired in the test location. See Report Sign Convention sheet for description of data output as presented in the report: channels were adjusted in post-acquisition processing to conform to J211 MAR95.

Channel Report

11/29/2001 6:51:14 AM

Name of Test 011129 **System** K3600 **Name of DAU** DAU1

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.		Group	Mfg.	Model
1000	EVENT	SYNC1	SYNC1		10.24	V	+	11/21/2002	OK	-1	TRC	Event
1001	J26885	HEDXG1	Driver head X-axis acceleration	Rwd	806.93459	G	-	11/21/2001	OK	270n	Endevco	7264-2000TZ
1002	J26864	HEDYG1	Driver head Y-axis acceleration	Lft	794.42660	G	-	11/21/2001	OK	-1	Endevco	7264-2000TZ
1003	J27950	HEDZG1	Driver head Z-axis acceleration	Up	795.33980	G	-	11/21/2001	OK	270n	Endevco	7264-2000TZ
1004	J34404	LURYG1	Driver upper rib Y-axis	Rgt	802.26891	G	+	11/21/2001	OK	270n	Endevco	7264-2000TZ
1005	J34078	LURYR1	Driver upper rib Y-axis	Rgt	792.47765	G	+	11/21/2001	OK	270n	Endevco	7264-2000TZ
1006	J34630	LLRYG1	Driver lower rib Y-axis	Rgt	793.39252	G	+	11/21/2001	OK	270n	Endevco	7264-2000TZ
1007	J34438	LLRYR1	Driver lower rib Y-axis	Rgt	790.37959	G	+	11/21/2001	OK	270n	Endevco	7264-2000TZ
1008	J34352	T12YG1	Driver lower spine Y-axis	Lft	399.39778	G	-	11/23/2001	OK	270n	Endevco	7264-2000TZ
1009	J22046	T12YR1	Driver lower spine Y-axis	Lft	399.50062	G	-	11/23/2001	OK	270n	Endevco	7264-2000TZ
1010	J20561	PEVYG1	Driver pelvis Y-axis	Lft	398.53041	G	-	11/23/2001	OK	270n	Endevco	7264-2000TZ
1011	J27111	PEVYR1	Driver pelvis Y-axis	Rgt	398.54903	G	+	11/23/2001	OK	270n	Endevco	7264-2000TZ
1012	J26498	HEDXG4	Left Rear Passenger head X-axis	Rwd	799.45037	G	-	11/23/2001	OK	272n	Endevco	7264-2000TZ
1013	J26491	HEDYG4	Left Rear Passenger head Y-axis	Lft	797.07945	G	-	11/23/2001	OK	272n	Endevco	7264-2000TZ
1014	J26499	HEDZG4	Left Rear Passenger head Z-axis	Up	801.87940	G	-	11/23/2001	OK	272n	Endevco	7264-2000TZ
1015	J28884	LURYG4	Left Rear Passenger upper rib	Rgt	802.50783	G	+	11/23/2001	OK	272n	Endevco	7264-2000TZ
1016	J28868	LURYR4	Left Rear Passenger upper rib	Rgt	806.96003	G	+	11/23/2001	OK	272n	Endevco	7264-2000TZ
1017	J27117	LLRYG4	Left Rear Passenger lower rib	Rgt	796.14367	G	+	11/23/2001	OK	272n	Endevco	7264-2000TZ
1018	J27359	LLRYR4	Left Rear Passenger lower rib	Rgt	801.47772	G	+	11/23/2001	OK	272n	Endevco	7264-2000TZ
1019	J27051	T12YG4	Left Rear Passenger lower spine	Lft	399.85161	G	-	11/21/2001	OK	272n	Endevco	7264-2000TZ
1020	J20025	T12YR4	Left Rear Passenger lower spine	Lft	400.75297	G	-	11/21/2001	OK	272n	Endevco	7264-2000TZ
1021	J20243	PEVYG4	Left Rear Passenger pelvis	Lft	401.40806	G	-	11/21/2001	OK	272n	Endevco	7264-2000TZ
1022	J20462	PEVYR4	Left Rear Passenger pelvis	Rgt	399.58792	G	+	11/21/2001	OK	272n	Endevco	7264-2000TZ
1023	J40097	RFSXG1	Right Side Sill at Front Seat	FWD	399.02737	G	+	11/15/2001	OK	-1	Endevco	7264-2000TZ
1024	J40098	RFSYG1	Right Side Sill at Front Seat	LT	1011.1682	G	-	11/15/2001	OK	-1	Endevco	7264-2000TZ
1025	J40073	RFSZG1	Right Side Sill at Front Seat	UP	399.95000	G	-	11/1/2001	OK	-1	Endevco	7264-2000TZ
1026	J35794	RRSXG1	Right Side Sill at Rear Seat	FWD	400.94284	G	+	11/1/2001	OK	-1	Endevco	7264-2000TZ
1027	J35805	RRSYG1	Right Side Sill at Rear Seat	LT	1006.6058	G	-	7/11/2001	OK	-1	Endevco	7264-2000TZ
1028	J35802	RRSZG1	Right Side Sill at Rear Seat	UP	400.12816	G	-	8/29/2001	OK	-1	Endevco	7264-2000TZ
1029	J37990	RDKXG1	Rear Floorpan Above Axil	FWD	991.83479	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ

1030	J37089	RDKYG1	Rear Floorpan Above Axil	RT	996.47729	G	+	7/17/2001	OK	-1	Endevco	7264-2000TZ
1031	J37152	RDKZG1	Rear Floorpan Above Axil	UP	1001.0068	G	-	7/16/2001	OK	-1	Endevco	7264-2000TZ
1032	J37955	LFSYG1	Left Side Sill at Front Seat	RT	1009.2150	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ
1033	J38149	LRSYG1	Left Side Sill at Rear Seat Y-axis	RT	1013.0188	G	+	8/30/2001	OK	-1	Endevco	7264-2000TZ
1034	J38848	LFCYG1	Left Side Door on Centerline	RT	991.47947	G	+	10/29/2001	OK	-1	Endevco	7264-2000TZ
1035	J36783	RRTYG1	Right Rear Occupant	RT	1003.3313	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ
1036	J38076	LFMYG1	Mid-Rear of Left Front Door	RT	1011.6777	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ
1037	J37655	LFUYG1	Left Front Door Upper	RT	1005.9927	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ
1038	J30421	LRMYG1	Mid-Rear of Left Rear Door	RT	1006.8235	G	+	6/19/2001	OK	-1	Endevco	7264-2000TZ
1039	J35748	LRUYG1	Left Rear Door Upper	RT	999.42415	G	+	6/20/2001	OK	-1	Endevco	7264-2000TZ
1040	J39562	LLAYG1	Left Lower A-Post Y-axis	LT	1003.1937	G	-	11/16/2001	OK	-1	Endevco	7264-2000TZ
1041	J39658	LMAYG1	Left Middle A-Post Y-axis	LT	1008.7278	G	-	11/16/2001	OK	-1	Endevco	7264-2000TZ
1042	J35051	LLBYG1	Left Lower B-Post Y-axis	RT	1011.5678	G	+	10/30/2001	OK	-1	Endevco	7264-2000TZ
1043	J35536	LMBYG1	Left Middle B-Post Yaxis	RT	1001.9569	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ
1044	J36595	LFTYG1	Left Front Seat Track Y-axis	RT	988.94200	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ
1045	J38645	LRTYG1	Left Rear Seat Track Y-axis	RT	1006.6850	G	+	11/16/2001	OK	-1	Endevco	7264-2000TZ
1046	J36201	VCGXG1	Vehicle Center of Gravity	FWD	994.18440	G	+	11/16/2001	OK	-1	Endevco	7264-2000TZ
1047	J34528	VCGYG1	Vehicle Center of Gravity	LT	994.18440	G	-	11/16/2001	OK	-1	Endevco	7264-2000TZ
1048	J27868	VCGZG1	Vehicle Center of Gravity Z-axis	UP	1009.0658	G	-	11/16/2001	OK	-1	Endevco	7264-2000TZ

Channel Report

11/29/2001 6:51:14 AM

Name of Test 011129 **System** MINIDAU **Name of DAU** DAU6

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.		Group	Mfg.	Model
6001	EVENT	SYNC6	SYNC6		5.12	V	+	11/21/2002	OK	-1	TRC	Event
6002	J38413	BCGXG1	MDB Center of Gravity X-axis	FWD	997.79782	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ
6003	J38570	BCGYG1	MDB Center of Gravity Y-axis	LT	997.17596	G	-	9/7/2001	OK	-1	Endevco	7264-2000TZ
6004	J38007	BCGZG1	MDB Center of Gravity Z-axis	UP	976.46565	G	-	9/19/2001	OK	-1	Endevco	7264-2000TZ
6005	J37996	LRRXG1	MDB Left Rear X-axis	FWD	983.85857	G	+	9/7/2001	OK	-1	Endevco	7264-2000TZ
6006	J38421	LRRYG1	MDB Left Rear Y-axis	LT	1016.0141	G	-	10/29/2001	OK	-1	Endevco	7264-2000TZ

Digital and System Channel Report

2001-11-29 04:43:01

Name of Test 011129 **System** K3600 **Name of DAU** DAU1 **descriptio**

enabled	Channel	Short Name	Type	Data File	Module Type
Yes	1500	DIG0	dig0	DAT11500	KM3650 Sequencer

bit position	bit	short	long	descriptio
MSB = bit 15	1	EVENT	EVENT	
bit 14	1	SHLET1	Driver Shoulder Contact Switch	A
bit 13	1	PEVET1	Driver Pelvis Contact Switch	B
bit 12	1	SHLET4	LT RR PSNG SHLD Switch	C
bit 11	1	PEVET4	LT RR PHNG PELVIS Switch	D
bit 10	0			
bit 09	0			
bit 08	0			
bit 07	0			
bit 06	0			
bit 05	0			
bit 04	0			
bit 03	0			
bit 02	0			
bit 01	0			
LSB = bit 00	0			

Digital and System Channel Report

Name of Test 011129 **System** MINIDAU **Name of DAU** DAU6 **descriptio**

enabled	Channel	Short Name	Type	Data File	Module Type
Yes	6501		dig0	DAT66501	KM3710 Controller

bit position	bit	short	long	descriptio
MSB = bit 15	1	MDBR1	MDB Right Side Contact Switch	B
bit 14	1	MDBL1	MDB Left Side Contact Switch	A
bit 13	0			
bit 12	0			
bit 11	0			
bit 10	0			
bit 09	0			
bit 08	0			
bit 07	0			
bit 06	0			
bit 05	0			
bit 04	0			
bit 03	0			
bit 02	0			
bit 01	0			
LSB = bit 00	0			

PLASCORE

SIDE IMPACTOR BARRIER CERTIFICATION

Date: September 12, 2001

To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION

Customer P.O. Number: 14572
Work Order Number: 10512
Quantity: 05 pieces

CORE INFORMATION

Core Type: PCGA-1/4-5.2-P-3003-T
Measured Cell Size: 0.250 inches
Measured Density: 5.2 pcf

Unit Numbers: 033A0801 - 05 pcs.

This is to certify that the aluminum honeycomb core supplied, under the unit numbers provided, meets the crush requirements of 232 – 250 psi as per DWG# DSL-1285.

QA Plascore Accept 001

Quality Control Representative
Karl D. Zwaanstra

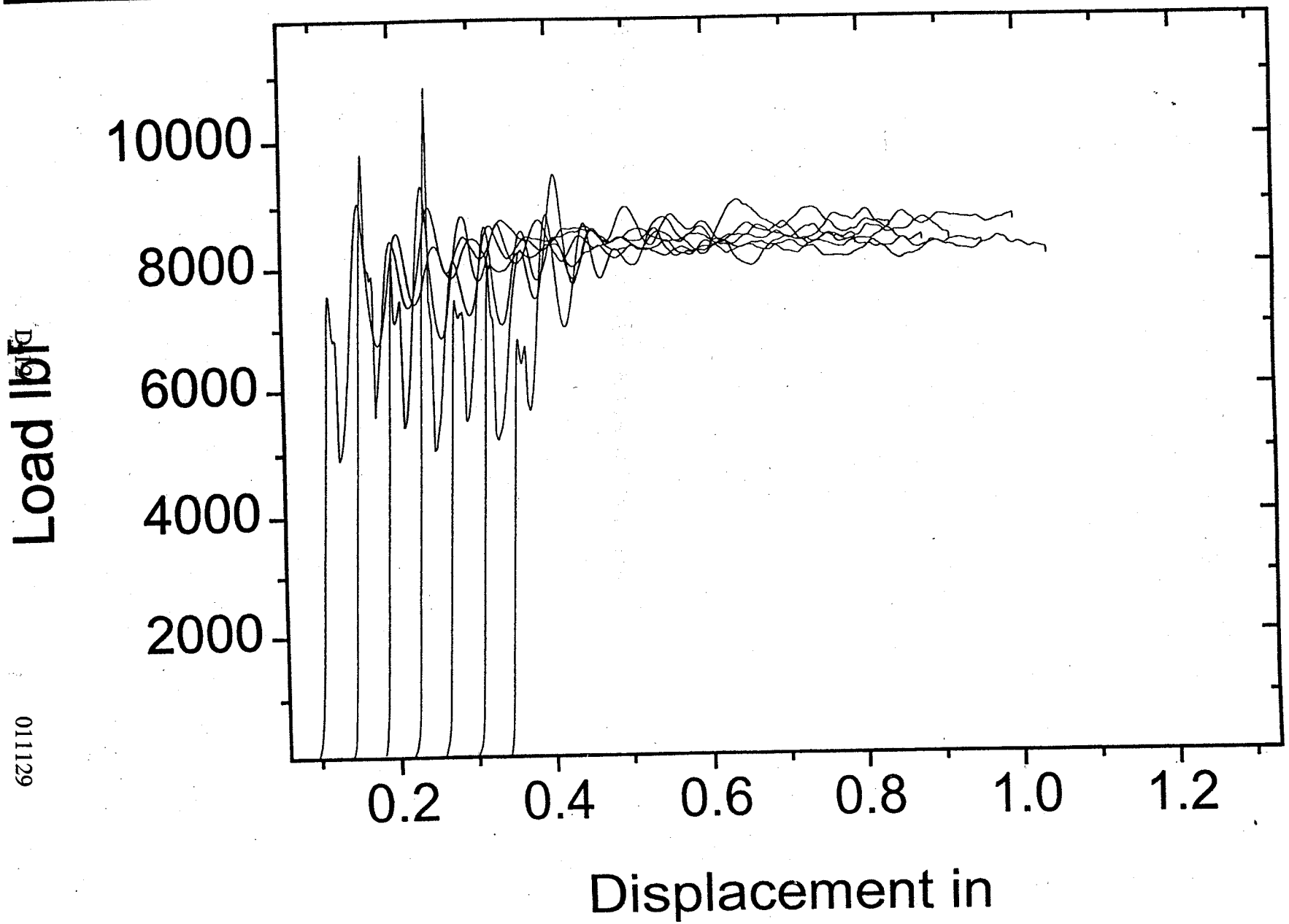
PLASCORE

Crush Data
232 - 250 psi per DWG # DSL-1285

Block Number: **033A0801**

Specimen Number	Zone 1	Zone 2	Zone 3
1	232.12	233.03	236.22
2	239.79	244.02	245.85
3	233.62	235.47	234.04
4	243.59	243.72	244.91
5	234.15	234.82	235.01
6	234.74	236.21	238.29
7	233.99	233.53	236.16

BLOCK # 033A0801 Sample ID: IN323473



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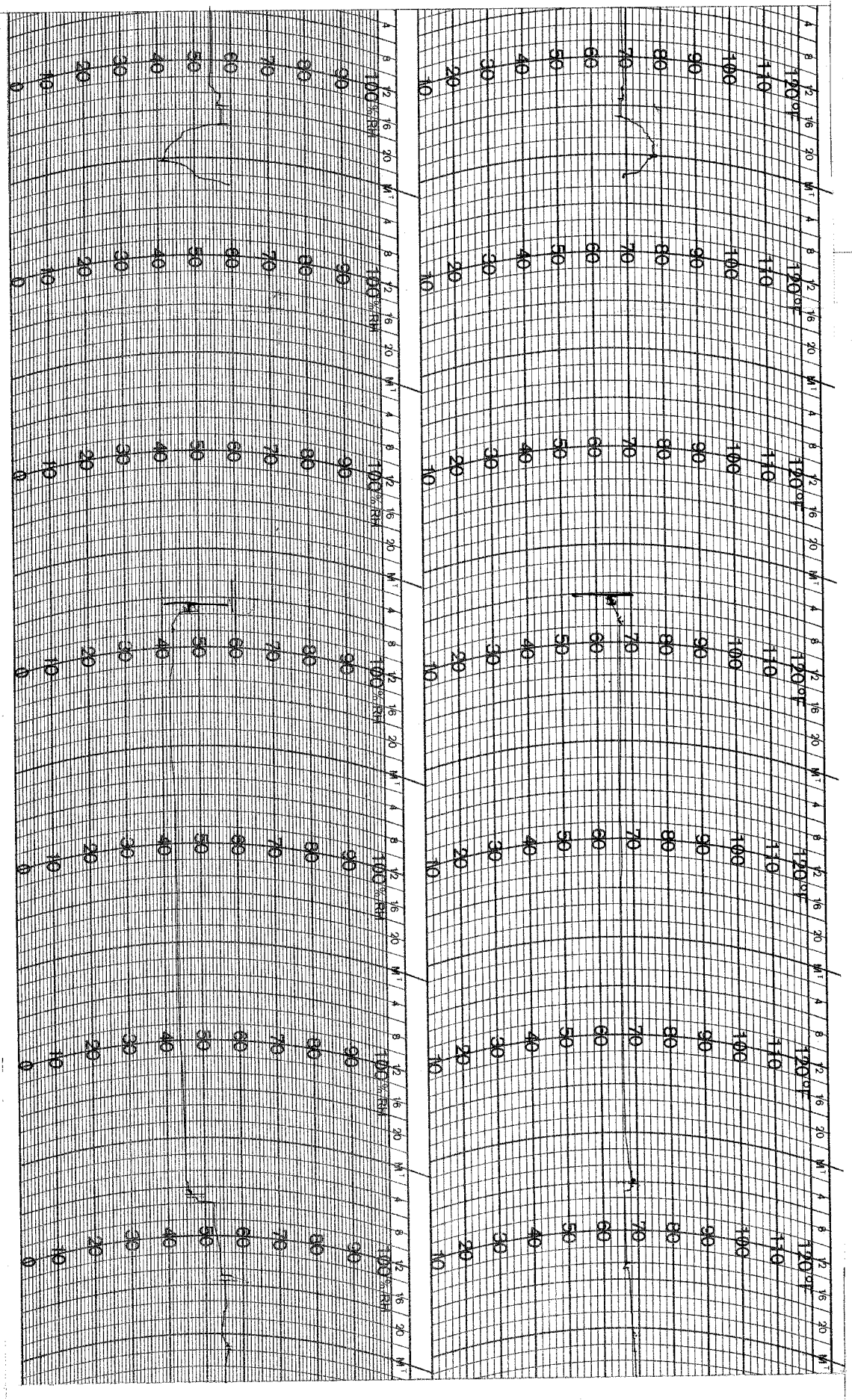

GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK

HYGROTHERMOGRAPH

No. C311WHF PRINTED IN U.S.A.

STATION 19970454 3100 DATE ON 11/28/01 DATE OFF NHTSA