

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

**FUJI HEAVY INDUSTRIES LTD.
2006 SUBARU B9 TRIBECA
5-DOOR MPV**

NHTSA NUMBER: M65500

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



8/23/05

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**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-01-D-02005.

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: _____
Mr. Matthew Ivory, Project Engineer
KARCO Engineering, LLC

Date: September 9, 200

Reviewed by: _____
Mr. Michael L. Dunlap, Quality Assurance Manager
KARCO Engineering, LLC

Date: September 9, 2005

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

Date: September 9, 2005

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-P25001-17-NC		2. Government Accession No.		3. Recipients Catalog No.	
4. Title and Subtitle Final Report of New Car Assessment Program Testing of a 2006 Subaru Tribeca B9 5-Door MPV NHTSA No. M65500				5. Report Date September 9, 2005	
				6. Performing Organization Code KAR	
7. Authors Mr. Matthew Ivory, Project Engineer, Karco Mr. Frank Richardson, Program Manager, Karco				8. Performing Organization Report No. TR-P25001-17-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 4	
				14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS	
15. Supplementary Notes					
16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2006 Subaru Tribeca B9 5-Door MPV at Karco Engineering, LLC on 8/23/05. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 56.22 km/h. The ambient temperature at the barrier face at the time of impact is 36.1 degrees Celcius. The vehicle's maximum post-test static crush is 555 mm at the vehicle centerline. 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	461.4	522.7
Max. Chest Accel. (3 msec Clip)		G's	60	40.0	38.8
Left Femur Force		Newtons	10008	-1133.8	-808.6
Right Femur Force		Newtons	10008	-627.6	-998.0
17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2006 Subaru Tribeca B9 5-Door MPV NHTSA No. M65500				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 286	22. Price

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
1	Purpose and Summary of Test M65500	1
2	Occupant and Vehicle Information/Data Sheets	3

<u>Data Sheet</u>	<u>Description</u>	<u>Page</u>
1	Crash Test Summary	4
2	General Test and Vehicle Parameter Data	5
3	Post-Test Impact Data	8
4	Test Vehicle Information	9
5	Dummy Positioning in Vehicle	11
6	Seat Belt Positioning Data	13
7	Vehicle Accelerometer Location	14
8	Seat Belt Assessment Test Data	15
9	Summary of FMVSS 212 Data	16
10	Windshield Zone Intrusion FMVSS 219 Data (Partial)	17
11	FMVSS 301 Fuel System Integrity Post Impact Data	18
12	FMVSS 301 Static Rollover Data	19
13	Vehicle Measurements	21
14	Camera Locations	24
15	Photographic Reference Target Locations	25
16	Vehicle Intrusion Measurements	26
17	Fixed Barrier Load Cell Locations	30
18	Accident Investigation Division Data	31
19	Dummy/Vehicle Temperature Stabilization	32

<u>Appendix</u>	<u>Description</u>	<u>Appendix</u>
A	Photographs	A
B	Data Plots	B
C	Dummy Calibration Data	C

SECTION 1

PURPOSE AND SUMMARY OF TEST M65500

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 (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated December 1999. Data was obtained indicant of FMVSS 208 "Occupant Crash Protection", FMVSS 212, "Windshield Retention", FMVSS 219, "Windshield Zone Intrusion (Partial)", and FMVSS 301 "Fuel System Integrity", performance. Procedures for receiving, inspection, testing and reporting of test results are described in the test procedures and are not repeated in this report.

1.2 SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2006 Subaru B9 Tribeca MPV at a velocity of 56.22 km/h. The test was performed at Karco Engineering, LLC on August 23, 2005.

Two real-time and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet number 14 (page number 24) of 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 head (primary and redundant), chest (primary and redundant) 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. Also, shoulder belt spool-off was measured for the driver and passenger dummy. The driver (position 1) ATD (Serial No. 34) and the right-front passenger (position 2) ATD (Serial No. 35) were calibrated previous to this test.

Ninety seven (97) channels of data were recorded using an on-board data acquisition system. Appendix A contains Pre and Post-Test Photographs, Appendix B contains the Dummy Response data traces. Appendix C contains the Dummy Calibration 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 555 mm and both the driver and the passenger side doors remained closed and latched during the impact event and were operable after the impact.

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

The passenger's visible contact points were as follows: The passenger ATD's head contacted the airbag. The chest contacted the airbag and 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	T ¹	T ²	Clip (g)	T ¹	T ²	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver	461.4	58.3	91.0	40.0	56.9	59.9	-31.9	-1133.8	-627.6
Passenger	522.7	61.3	97.3	38.8	62.9	65.9	-32.6	-808.6	-998.0

Additional data plots for this test are available in the research and development section of the NHTSA website. The website can be found at: www.NHTSA.Dot.Gov

SECTION 2
OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2006 Subaru B9 Tribeca MPV

NHTSA No.: M65500

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 8/23/05

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: 2006 Subaru B9 Tribeca MPV
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
Test Date: 8/23/05

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.22
Test Weight	kg	2106
Impact Angle	degrees	0
Average Rebound	mm	506
Maximum Static Crush	mm	555

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door opening	Remained closed and latched, opened w/o tools	Remained closed and latched, opened w/o tools
Rear Door Opening	Remained closed and latched, opened w/o tools	Remained closed and latched, 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/Headrest
Chest Contact	Airbag	Airbag
Abdomen Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

MOVIE COVERAGE

High Speed	14
Real Time	2
Total	16

DATA CHANNELS

Driver ATD Sensors	40
Passenger ATD Sensors	40
Belt Assessment Sensors	8
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	36
Total	133

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M65500	Anti-Lock Brakes	Yes
Make	Subaru	All Wheel Drive	Yes
Model	Tribeca	Power Steering	Yes
Body Style	5-Door MPV	Driver Front Airbag	Yes
Vin No.	4S4WX83C464401459	Driver Side Airbag	Yes
Color	Metallic Green	Driver Head Airbag	Yes
Delivery Date	8/16/2005	Driver Curtain Airbag	Yes
Odometer	92	Pass. Airbag	Yes
Dealer	Subaru of San Bernardino	Pass. Side Airbag	Yes
Transmission	5-Speed Automatic	Pass. Head Airbag	Yes
Final Drive	AWD	Pass. Curtain Airbag	Yes
Type/No. Cyl.	V-6	Pre-Tensioners	Yes
Engine Disp. (L)	3.0	Load Limiters	Yes
Engine Placement	Longitudinal	Bucket Seats	Yes
Roof Rack	Yes	Air. Cond.	Yes
Sunroof/T-Top	Yes	AM/FM Cassette	Yes
Tinted Glass	Yes	Tilt Steering	Yes
Traction Control	Yes	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	Fuji Heavy Industries Ltd.	GVWR (kg)	2586
Date of Manufacture	May-05	GAWR Front (kg)	1368
		GAWR Rear (kg)	1515

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

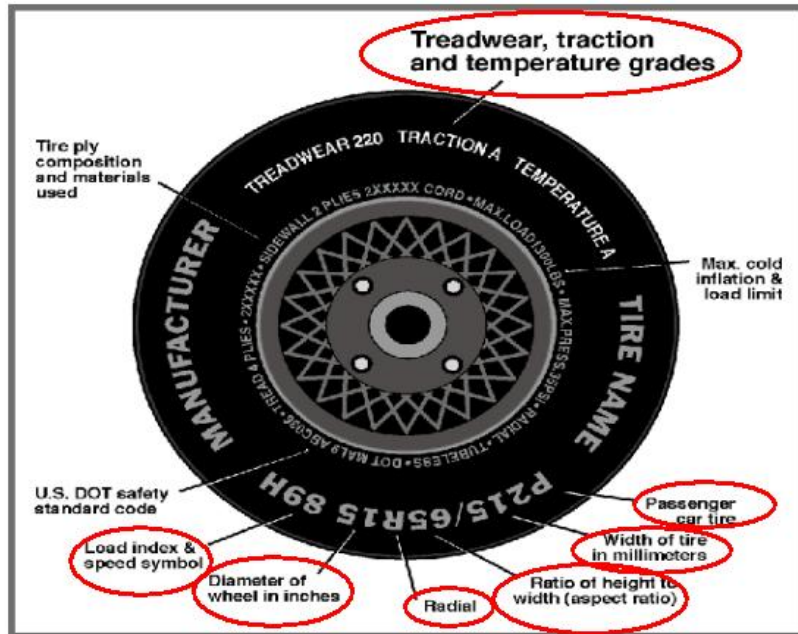
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				408
Cargo Weight (RCLW) (kg)				68

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

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

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



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	308	308
Cold Pressure (kpa)	230	220
Recommended Tire Size	P255/55R18	P255/55R18
Tire Size on Vehicle	P255/55R18	P255/55R18
Tire Manufacturer	Goodyear	Goodyear
Treadwear	400	400
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Plies Polyester Cord	2 Plies Polyester Cord
Tire Plies Body	2 Plies Tread, 2 Plies Polyester	2 Plies Tread, 2 Plies Polyester
Load Index/Speed Symbol	104H	104H
Tire Material	Polyester/Steel/Nylon/Rubber	Polyester/Steel/Nylon/Rubber
DOT Safety Code Right	M67K-CVER-1605	M67K-CVER-1605
DOT Safety Code Left	M67K-CVER-1605	M67K-CVER-1605

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

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	534	426		555	505	
Right	kg	522	411		554	492	
Ratio	%	55.8	44.2		52.6	47.4	
Totals	kg	1056	837	1893	1109	997	2106

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1893
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Wt. (RCLW)	kg	68
Calculated Vehicle Target Wt. (TVTW)	kg	2113

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	802	790	805	798	1219
As Tested	mm	791	783	793	781	1305

Vehicle Wheel Base (mm) 2756

Weight of Ballast Secured in cargo area (kg) 0

Weight of Items Removed (kg) Unknown

Vehicle Components Removed 60% portion of rear seat, rear bumper.

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

FUEL SYSTEM DATA

Fuel System Capacity From Owners Manual (L) 63.97

Actual Test Volume with entire fuel System Filled (L) 59.43

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: _____

DATA SHEET NO. 3
POST-TEST IMPACT DATA

Test Vehicle: 2006 Subaru B9 Tribeca MPV

NHTSA No.: M65500

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 8/23/05

SPEED TRAP DATA

Measured Parameter	Units	Requirement	Value
Trap No.1 Velocity (Primary)	km/h	55.51 to 57.12	56.22
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	56.24
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	4635	4241	-394
Center	mm	4821	4266	-555
Right Side	mm	4635	4231	-404

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	558
Center	mm	410
Right Side	mm	550
Average	mm	506

DATA SHEET NO. 4 **TEST VEHICLE INFORMATION**

Test Vehicle: 2006 Subaru B9 Tribeca MPV
Test Program: 2005 NHTSA 35mph NCAP

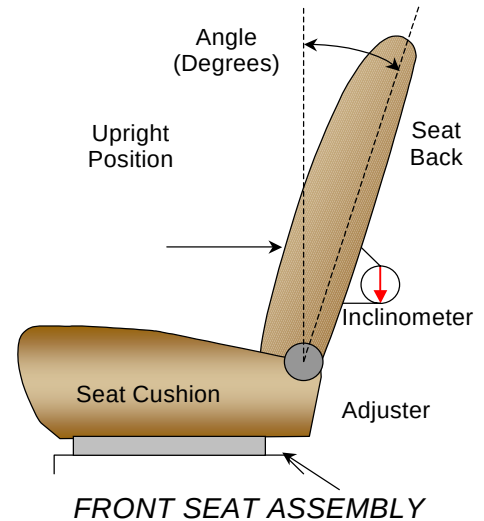
NHTSA No.: M65500
Test Date: 8/23/05

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacture's designated angle. The procedure is as follows:
Seat back angle was measured at the headrest of the seat back using a digital inclinometer.

SEAT BACK ANGLES

	Deg.
Driver w/seated Dummy	12.0
Passenger w/seated Dummy	12.0

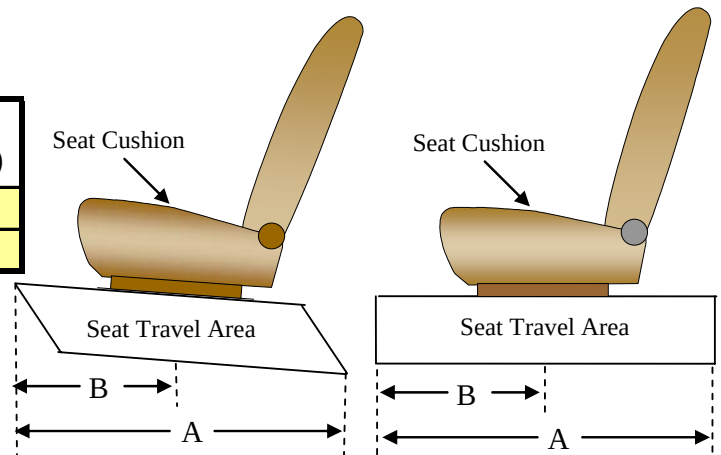


SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with the vertical adjustment at the lowest position obtainable for the driver and passenger.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel (Detent)	Placed in Position (Detent)
Driver Seat	266mm	133mm
Passenger Seat	230mm	115mm



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

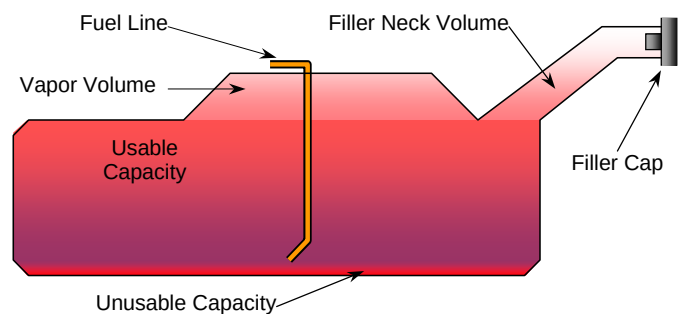
Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	63.97
Usable Capacity of "Optional" Tank	N/A
Usable Capacity used for FMVSS 301	58.67 to 60.19
Actual Amount of Solvent used	59.43

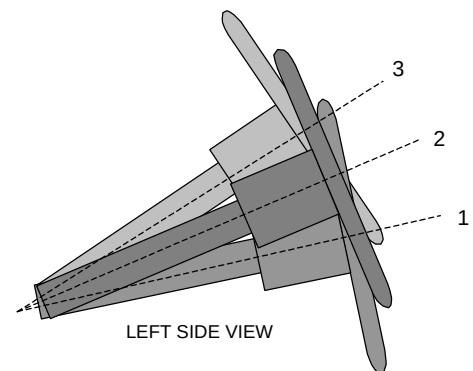
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the right rear fender. The standard fuel tank occupies 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	Fore/Aft Position (mm)
Lowermost position No. 1	25.7	
Geometric center position No. 2	27.7	
Uppermost position No. 3	29.3	

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2006 Subaru B9 Tribeca MPV
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
Test Date: 8/23/05

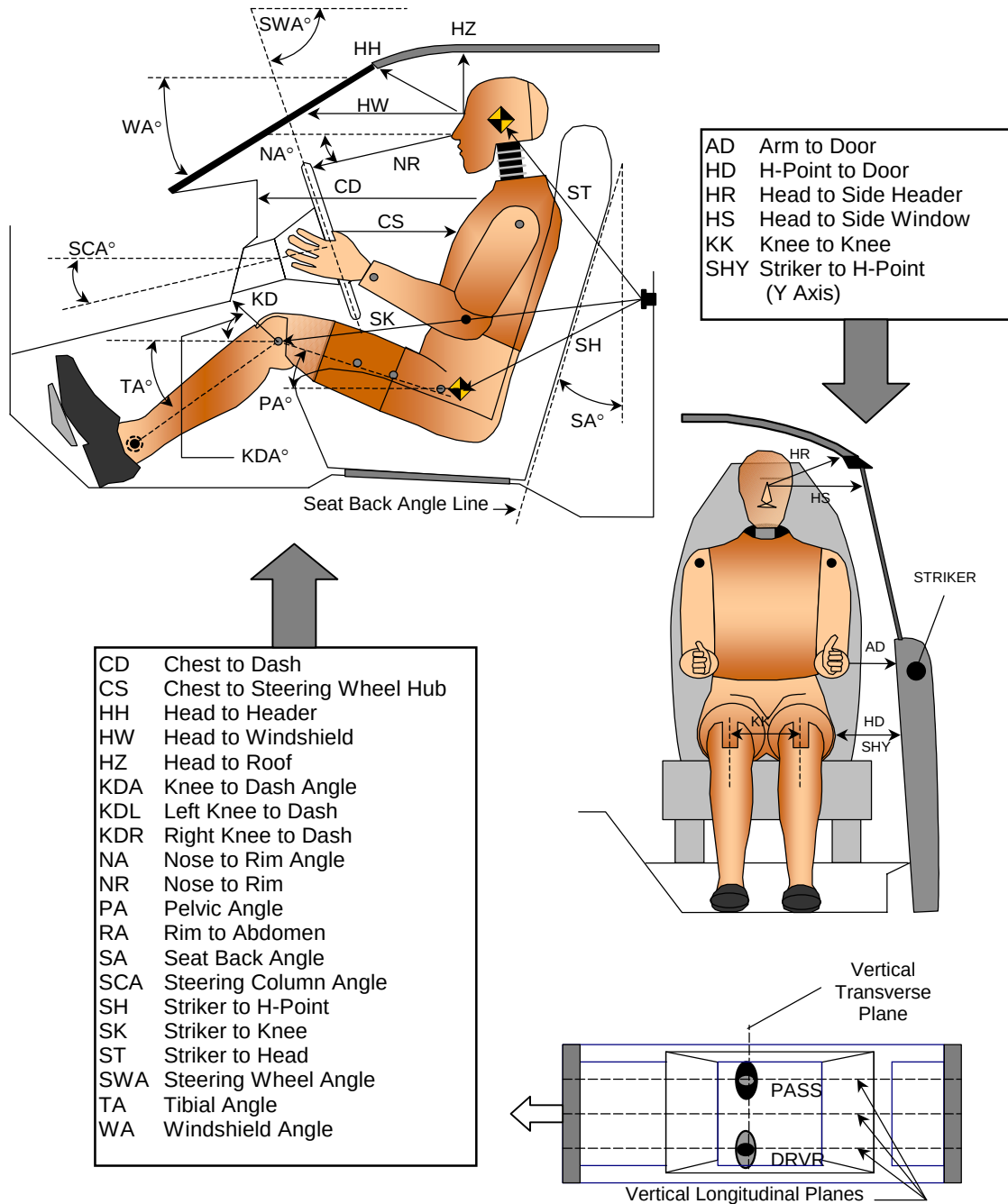
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (deg)	Length (mm)	Angle (deg)
WA	Windshield Angle		62.4		
SWA	Steering Wheel Angle		62.3		
SCA	Steering Column Angle		27.7		
SA	Seat Back Angle		12.0		12.0
HZ	Head to Roof (Z)	235	90.0	222	90.0
HH	Head to Header	440		425	
HW	Head to Windshield	800		770	
HR	Head to Side Header (Y)	330		330	
NR	Nose to Rim	460	13.0		
CD	Chest to Dash	580		615	
CS	Chest to Steering Hub	338			
RA	Rim to Abdomen	225			
KDL	Left Knee to Dash	155	13.0	175	
KDR	Right Knee to Dash	160		170	18.0
PA	Pelvic Angle		23.0		22.0
TA	Tibia Angle		51.5		51.3
KK	Knee to Knee (Y)	297		280	
SK	Striker to Knee	572		580	86.0
ST	Striker to Head	585	82.0	570	22.5
SH	Striker to H-Point	182	27.0	185	
SHY	Striker to H-Point (Y)	230		235	
HS	Head to Side Window	370		365	
HD	H-Point to Door (Y)	135		125	
AD	Arm to Door (Y)	140		55	

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

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

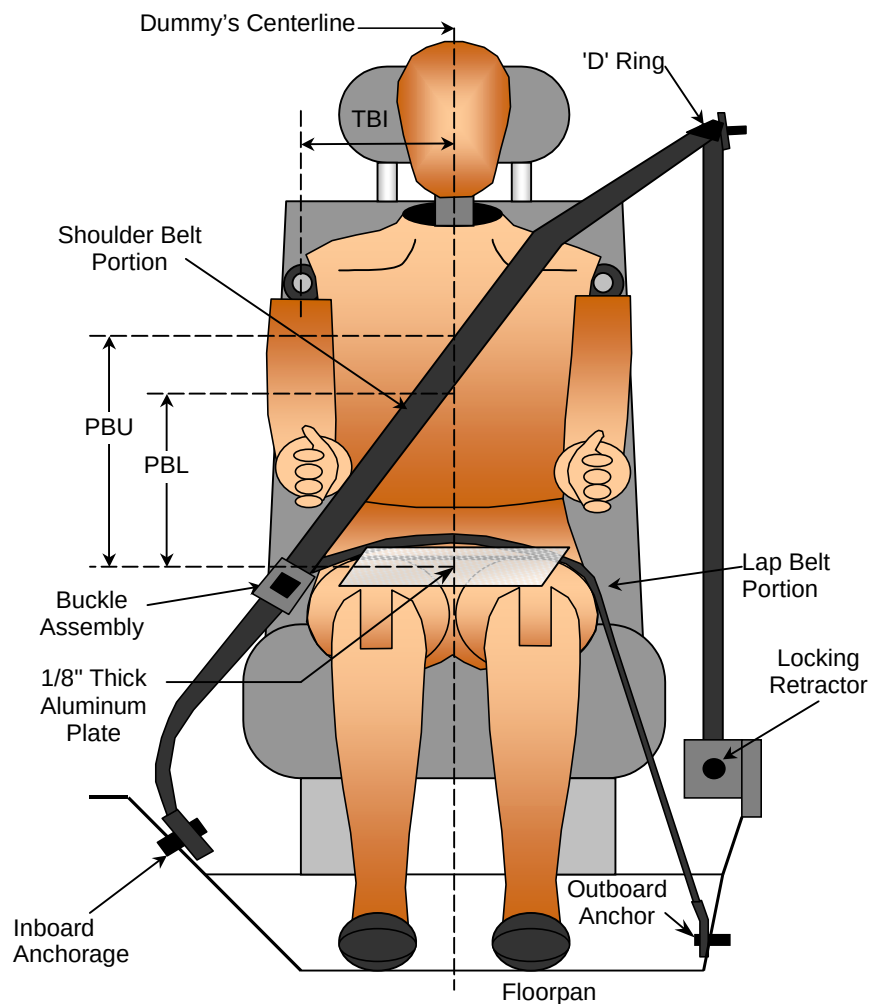


DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

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

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	200	250
PBU - Top Surface of reference to belt upper edge	mm	310	330
PBL - Top Surface of reference to belt lower edge	mm	230	260
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7
VEHICLE ACCELEROMETER LOCATION

Test Vehicle: 2006 Subaru B9 Tribeca 5-Door MPV

NHTSA No.: M65500

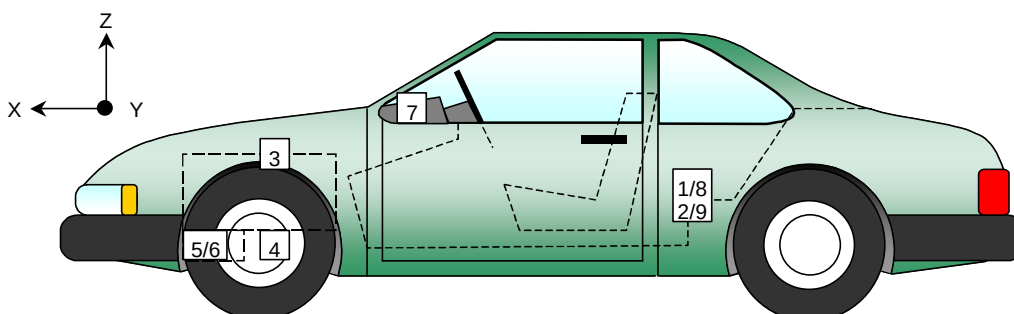
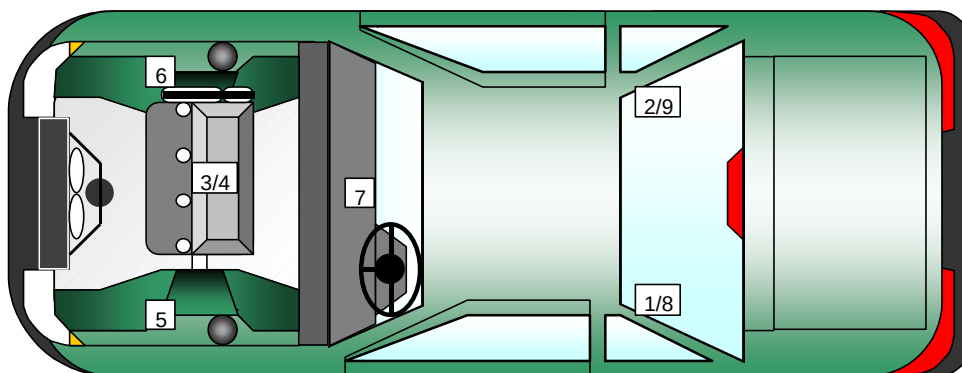
Test Program: 2005 NHTSA 35mph NCAP

Test Date: 8/23/05

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member	1840	-705	400
2	Right Rear X-Member	1840	705	400
3	Engine Top	4235	-120	800
4	Engine Bottom	4220	0	250
5	Left Brake Caliper	3695	-800	390
6	Right Brake Caliper	3695	800	390
7	Instrument Panel	3020	0	1050
8	Left Rear X-Member (Z-Axis)	1920	-705	400
9	Right Rear X-Member (Z-Axis)	1920	705	400

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



DATA SHEET NO. 8
SEAT BELT ASSESSMENT TEST DATA

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI -Dummy C/L to Lap/Shoulder Belt Intersect	mm	200	250
PBU - Top Surface of reference to belt upper edge	mm	310	330
PBL - Top Surface of reference to belt lower edge	mm	230	260
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	765	765
Shoulder Belt length as measured on ATD	mm	842	930
Lap Belt length as measured on ATD	mm	780	815
Remainder of belt on reel	mm	935	890
Total belt length for continuous webbing systems	mm	3322	3400

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	N/A	N/A
As determined electronically	mm	254.9	184.9

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. 9
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

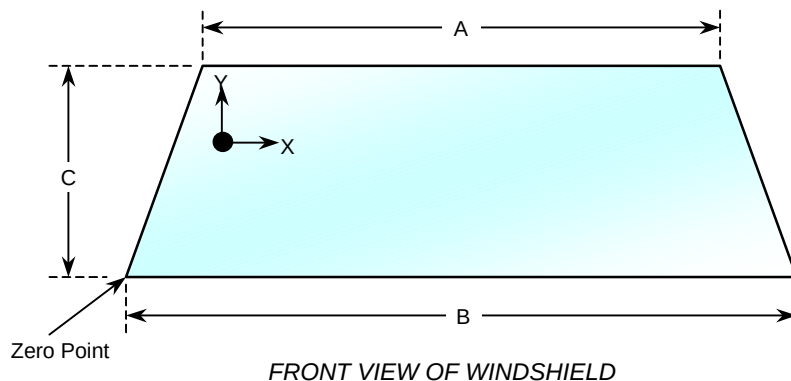
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

The standard requires that the post-test 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	2315.0	2315.0	100.0
Right Side	2315.0	2315.0	100.0
Total	4630.0	4630.0	100.0



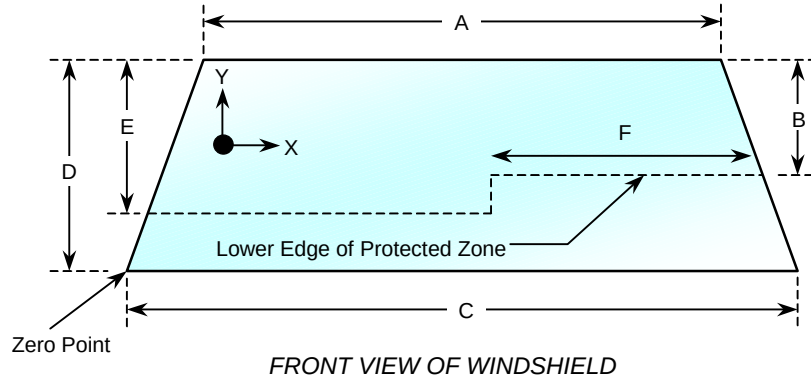
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1307.0	15.0
B	mm	1553.0	10.0
C-Left	mm	885.0	15.0
C-Right	mm	885.0	15.0

DATA SHEET NO. 10
WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05



**WINDSHIELD AND
PROTECTED ZONE**

Item	Units	Value
A	mm	1307
B	mm	556
C	mm	1553
D	mm	885
E	mm	508
F	mm	520

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

- 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

DATA SHEET NO. 11
FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2006 Subaru B9 Tribeca MPV NHTSA No.: M65500
Test Program: 2005 NHTSA 35mph NCAP Test Date: 8/23/05

Test Time: 2:09 PM Temperature: 36.1 Deg. C.

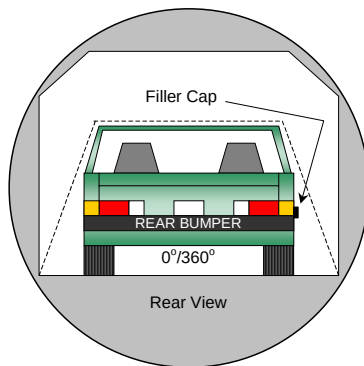
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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

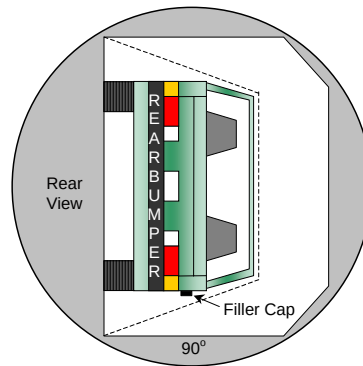
DATA SHEET NO. 12
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2006 Subaru B9 Tribeca MPV
Test Program: 2005 NHTSA 35mph NCAP

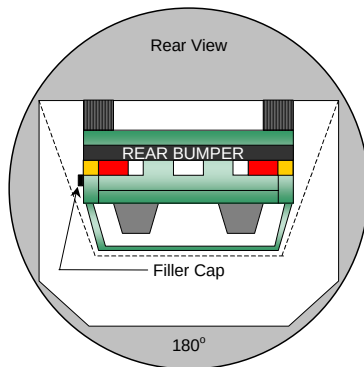
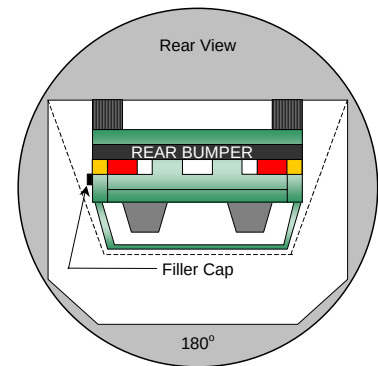
NHTSA No.: M65500
Test Date: 8/23/05



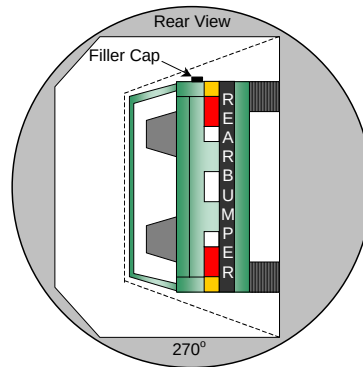
0° to 90°



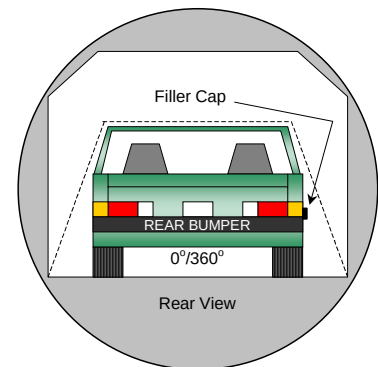
90° to 180°



180° to 270°



270° to 360°



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

DATA SHEET NO. 12...(CONTINUED)
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2006 Subaru B9 Tribeca MPV

NHTSA No.: M65500

Test Program: 2005 NHTSA 35mph NCAP

Test Date: 8/23/05

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	83	300	383
90° to 180°	78	300	378
180° to 270°	77	300	377
270° to 360°	79	300	379

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. 13
VEHICLE MEASUREMENTS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
Test Date: 8/23/05

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length of vehicle at centerline	mm	4821	4266	-555
2	RSOV to front of engine	mm	4346	4099	-247
3	RSOV to firewall centerline	mm	3800	3745	-55
4	RSOV to leading edge of right door	mm	3240	3239	-1
5	RSOV to leading edge of left door	mm	3240	3239	-1
6	RSOV to lower leading edge of right door	mm	3270	3267	-3
7	RSOV to lower leading edge of left door	mm	3277	3274	-3
8	RSOV to upper trailing edge of right door	mm	2261	2264	3
9	RSOV to upper trailing edge of left door	mm	2264	2260	-4
10	RSOV to lower trailing edge of right door	mm	2273	2271	-2
11	RSOV to lower trailing edge of left door	mm	2283	2276	-7
12	RSOV to bottom of right 'A' pillar	mm	3251	3251	0
13	RSOV to bottom of left 'A' pillar	mm	3260	3258	-2
14	RSOV to firewall on right side	mm	3706	3690	-16
15	RSOV to firewall on left side	mm	3720	3691	-29
16	RSOV to steering column	mm	2896	2961	65
17	Center of steering column to left 'A' pillar	mm	415	395	-20
18	Center of steering column to headlining	mm	475	450	-25
19	RSOV to right side of front bumper	mm	4635	4231	-404
20	RSOV to left side of front bumper	mm	4635	4241	-394
21	Length of engine block	mm	730	730	0
RD	RSOV to right side of dash panel	mm	3048	3046	-2
CD	RSOV to center of dash panel	mm	3010	3046	36
LD	RSOV to left side of dash panel	mm	3053	3041	-12

All measurements in millimeters

DATA SHEET NO. 13...(CONTINUED)
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

VEHICLE STRUCTURAL MEASUREMENT TABLE

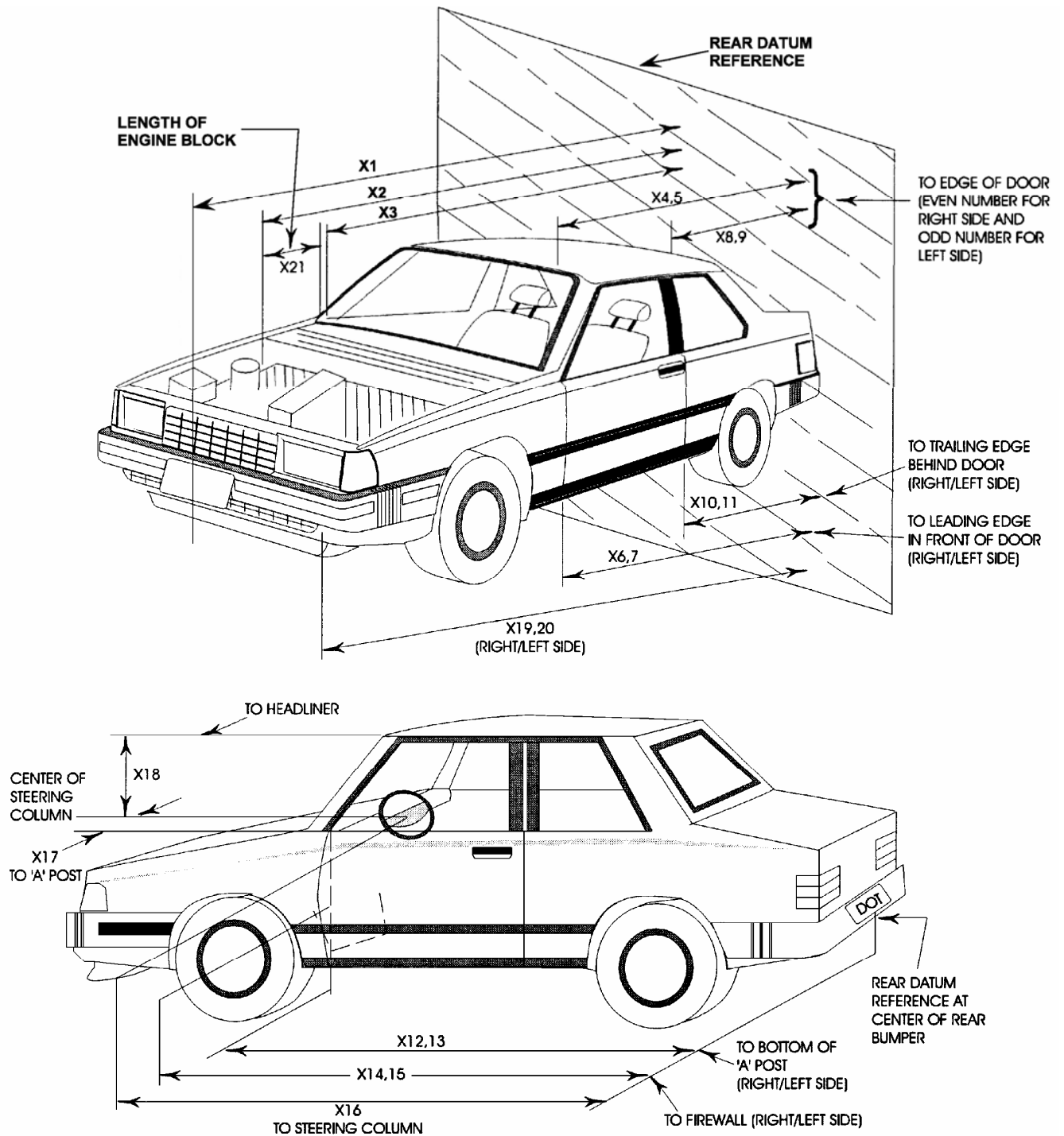
No.	Measurement Description	Units	Pre-Test	Post-Test	Diff.
1	Total length	mm	4821	4821	0
2	Total width	mm	1826	1828	2
3	Bumper top height	mm	657	623	-34
4	Bumper bottom height	mm	273	250	-23
5	Longitudinal member top height	mm	540	584	44
6	Longitudinal member bottom height	mm	370	414	44
7	Distance between longitudinal members	mm	862	985	123
8	Longitudinal member width	mm	70	67	-3
9	Engine top height	mm	890	905	15
10	Engine bottom height	mm	214	250	36
11	Engine and gear box width	mm	750	750	0
12	Front bumper to engine distance	mm	475	205	-270
13	Front shock absorber fixing width	mm	994	980	-14
14	Bonnet leading edge height	mm	855	945	90
15	Front shock absorber fixing width	mm	1167	1160	-7
16	Front bumper to front axle distance	mm	1010	480	-530
17	Front axle to 'A' pillar distance	mm	515	560	45
18	'A' pillar to 'B' pillar distance	mm	1011	1004	-7
19	'B' pillar to rear axle distance	mm	1227	1230	3
20	'B' pillar to 'C' pillar distance	mm	1085	1081	-4
21	Roof sill bottom height	mm	1460	1495	35
22	Roof sill top height	mm	1615	1600	-15
23	Floor sill bottom height	mm	251	242	-9
24	Floor sill top height	mm	395	377	-18

All measurements in millimeters

DATA SHEET NO. 13...(CONTINUED)
VEHICLE MEASUREMENTS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05



DATA SHEET NO. 14
CAMERA LOCATIONS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
Test Date: 8/23/05

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 Camera (Panning)	-12192	-6096	-1651	-10	N/A	Zoom	30
2	Overall Left Side	-2489	-8280	-1143	-4	7809	24	1000
3	Left Side View	-1677	-7620	-1329	-4	7162	50	1000
4	Driver and Interior View	-6477	-10185	-4748	-13	11097	80	1000
5	Steering Column (Bottom)	-2134	-8230	-2997	-16	7907	19	1000
6	Steering Column (Top)	-2134	-8230	-3404	-20	7998	19	985
7	Overall Right Side	-2083	8230	-1270	-6	7753	13	1015
8	Right Side View	-1677	7316	-1422	-4	6859	50	1000
9	Passenger and Interior View	-6781	9144	-2997	-9	9906	65	1000
10	Right Side View	-1829	7316	-1422	-4	6848	28	1000
11	Windshield View	-610	0	-5944	-90	N/A	13	1015
12	Driver Front View	610	-432	-2667	-40	N/A	13	1035
13	Passenger Front View	610	432	-2667	-40	N/A	13	1050
14	Pit View Engine	-914	0	1499	90	N/A	9	960
15	Pit View Fuel Tank	-2438	0	1499	90	N/A	6	1020
16	Real-Time Camera (Extra)	-1067	7976	-991	0	7599	Zoom	30

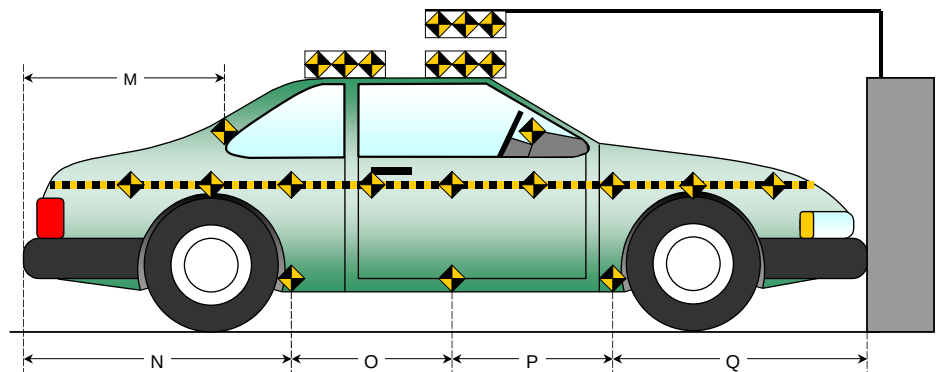
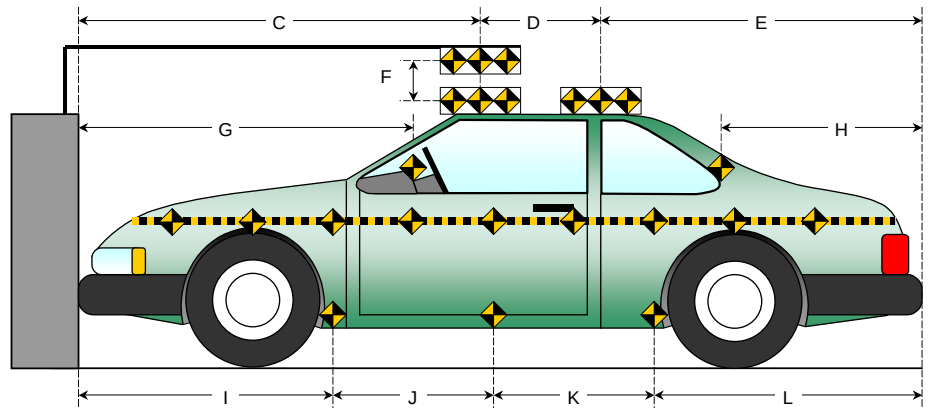
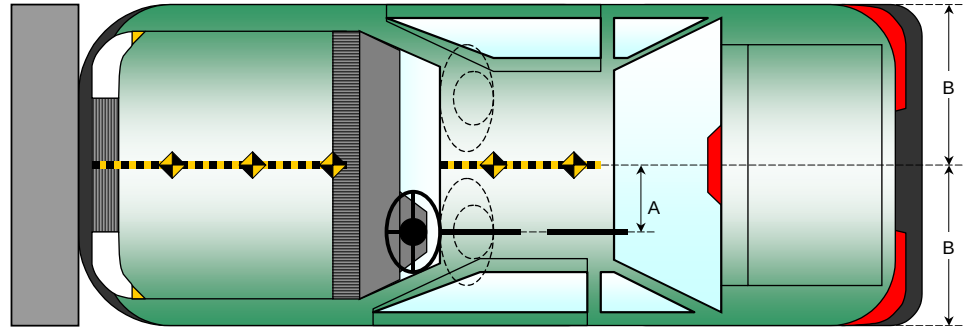
X = Barrier Face Y = Monorail Centerline Z = Ground DNR = Did Not Run NTM = No Timing Marks

DATA SHEET NO. 15
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

All Dimensions in (mm)	
Item	Value
A	*
B	1826
C	*
D	*
E	*
F	*
G	1880
H	830
I	1485
J	900
K	900
L	1543
M	830
N	1540
O	903
P	903
Q	1481



* Targets were not installed due to sunroof and curtain airbags.

DATA SHEET NO. 16
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

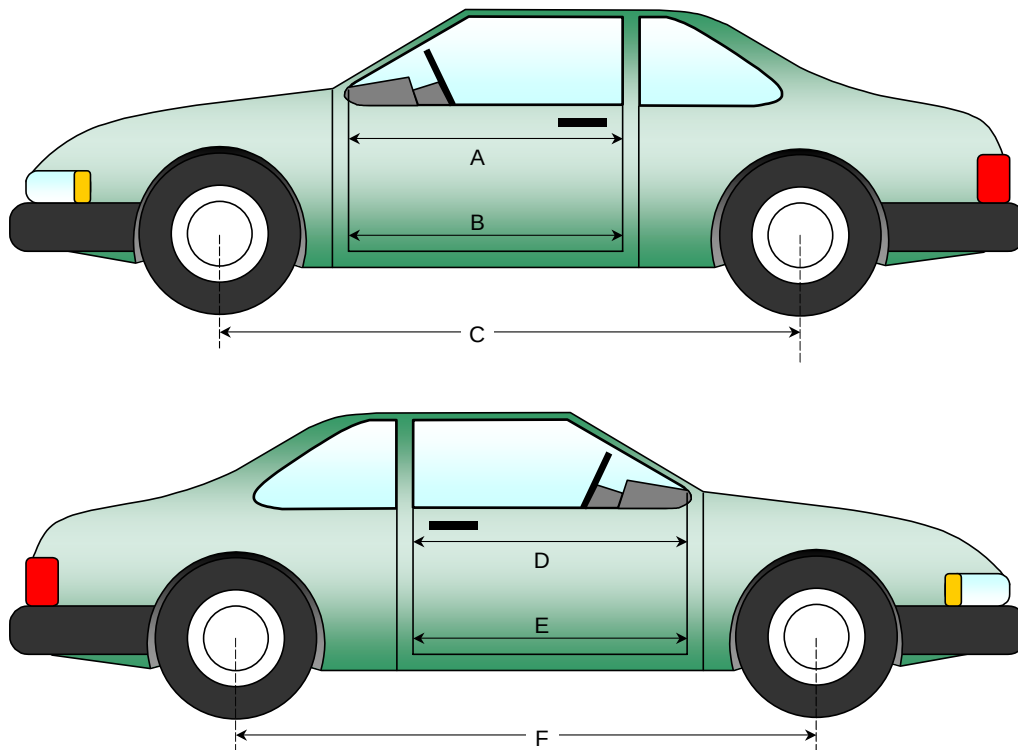
NHTSA No.: M65500
 Test Date: 8/23/05

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
A	Left Side Upper	mm	899	896	-3
B	Left Side Lower	mm	896	893	-3
D	Right Side Upper	mm	897	896	-1
E	Right Side Lower	mm	896	895	-1

WHEELBASE MEASUREMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
C	Left Side Wheel Base	mm	2756	2735	-21
F	Right Side Wheel Base	mm	2756	2740	-16



DATA SHEET NO. 16...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

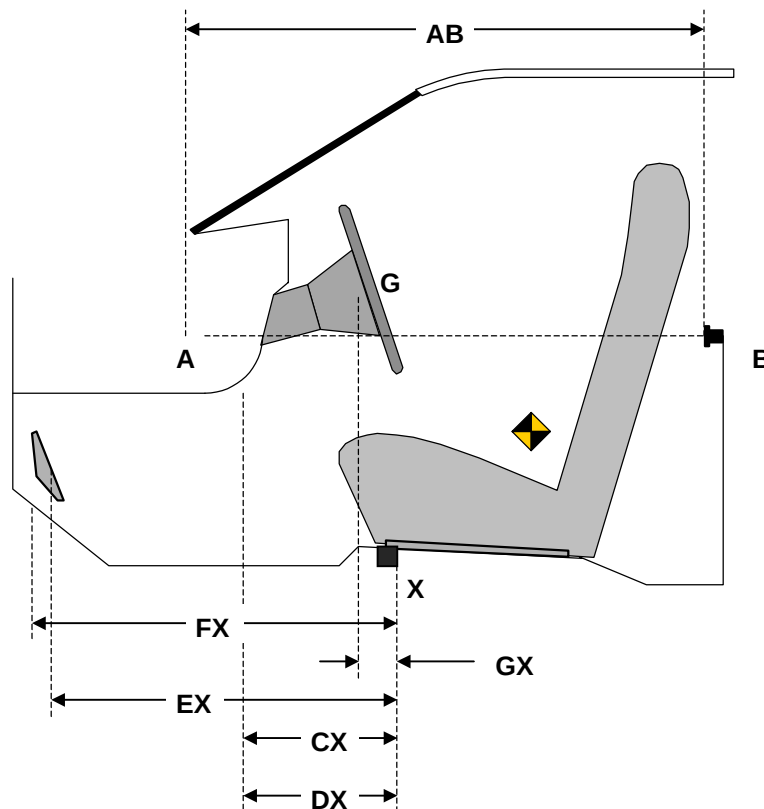
Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Diff.
AB	Door Opening (Inside window jam)	mm	899	896	-3
CX	Left Knee Bolster to X	mm	267	280	13
DX	Right Knee Bolster to X	mm	252	305	53
EX	Brake Pedal to X	mm	587	558	-29
FX	Foot Rest to X	mm	543	526	-17
GX	Center of Steering Wheel Hub to X	mm	72	45	-27

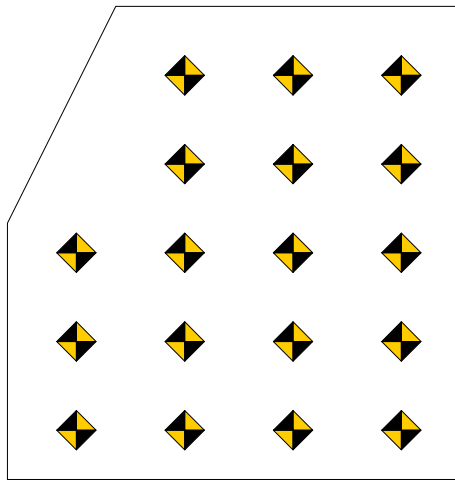
X = Left Front Seat Outboard Anchor Bolt Head



DATA SHEET NO. 16...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05



A B C D

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.

5

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		-633	-617	-627		-601	-590	-590		32	27	37
2		-536	-527	-333		-514	-501	-304		22	26	29
3	-431	-432	-429	-425	-419	-416	-402	-399	12	16	27	26
4	-329	-333	-332	-333	-318	-315	-305	-304	11	18	27	29
5	-231	-231	-229	-229	-223	-215	-209	-204	8	16	20	25

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-38	-21	-50		-16	-8	-36		22	13	14
2		-96	-60	-107		-88	-54	-101		8	6	6
3	-120	-104	-64	-108	-114	-98	-59	-99	6	6	5	9
4	-115	-105	-78	-107	-103	-101	-76	-101	12	4	2	6
5	-120	-105	-84	-65	-116	-105	-84	-49	4	0	0	16

DATA SHEET NO. 16...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

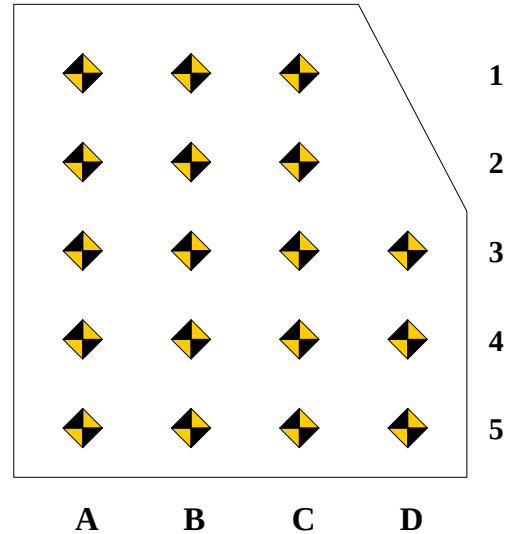
NHTSA No.: M65500
 Test Date: 8/23/05

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	-585	-595	-602		-594	-594	-593		-9	1	9	
2	-521	-525	-534		-536	-531	-538		-15	-6	-4	
3	-456	-461	-470	-467	-470	-468	-472	-469	-14	-7	-2	-2
4	-356	-360	-372	-384	-367	-371	-378	-385	-11	-11	-6	-1
5	-258	-266	-271	-284	-271	-277	-278	-287	-13	-11	-7	-3

PASSENGER FLOOR PAN Z-AXIS

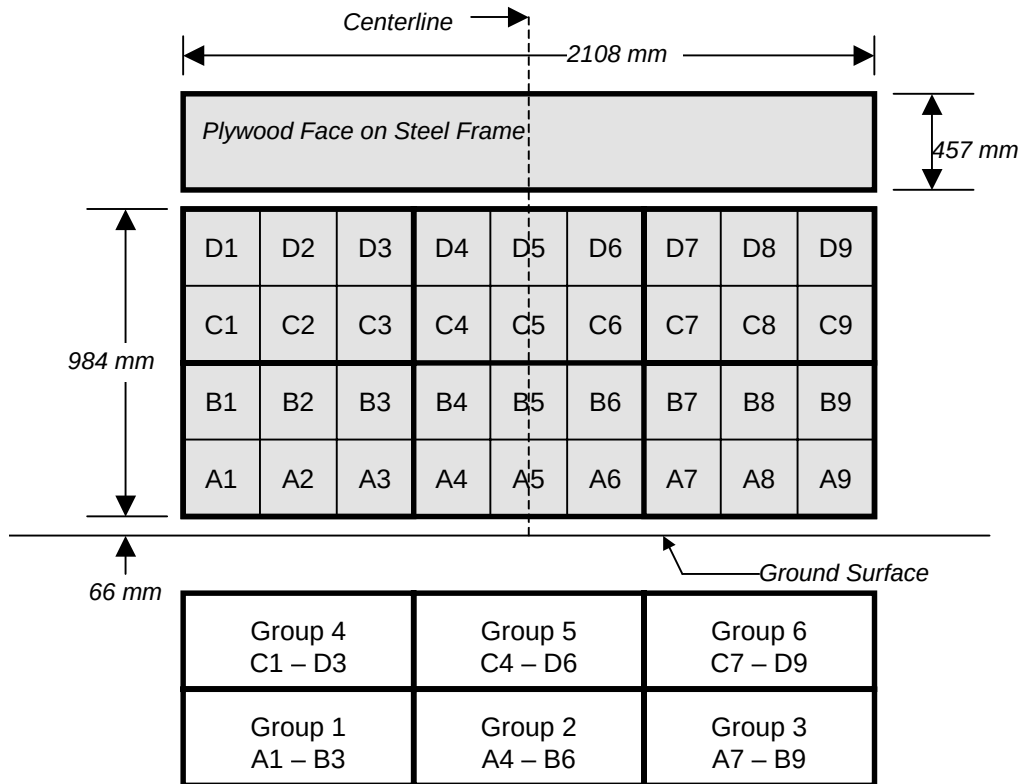
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	82	81	80		79	85	89		-3	4	9	
2	4	3	3		-4	-3	5		-8	-6	2	
3	-104	-62	-103	-113	-106	-65	-106	-117	-2	-3	-3	-4
4	-105	-72	-104	-106	-112	-78	-110	-109	-7	-6	-6	-3
5	-107	-78	-114	-122	-119	-86	-119	-125	-12	-8	-5	-3

DATA SHEET NO. 17
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

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



6 Groups of 6 Load Cells Each

DATA SHEET NO. 18
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2006 Subaru B9 Tribeca MPV
 Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
 Test Date: 8/23/05

VEHICLE INFORMATION

VIN: 4S4WX83C464401459
 Vehicle Size Category: 5-Door MPV

Wheel base (mm): 2756
 Test Weight (kg): 2106

ACCELEROMETER DATA

Accelerometer Location: Left rear floor pan
 Cal. Procedure/Interval: 6 months / drop test
 Integration Algorithm: NHTSA Standard
 Impact Velocity (km/h): 56.22
 Velocity Change (km/h): 63.17

Linearity: Good

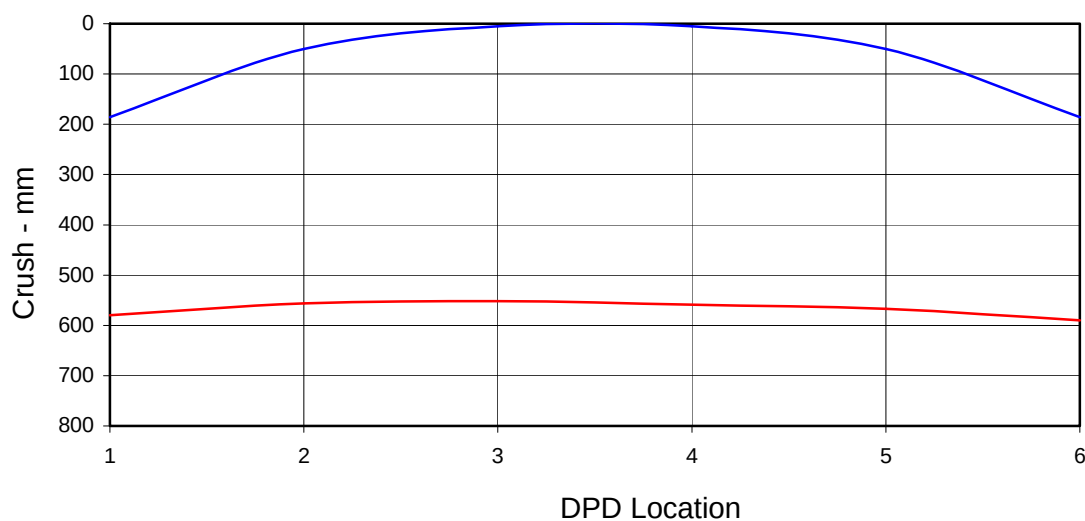
Time of Separation (msec): 67.7

CRUSH PROFILE

Collision Deformation Classification: 12FDEW6
 Damage Region Length (mm): 1421

Midpoint of Damage: Vehicle Centerline
 Impact Mode: Full Frontal

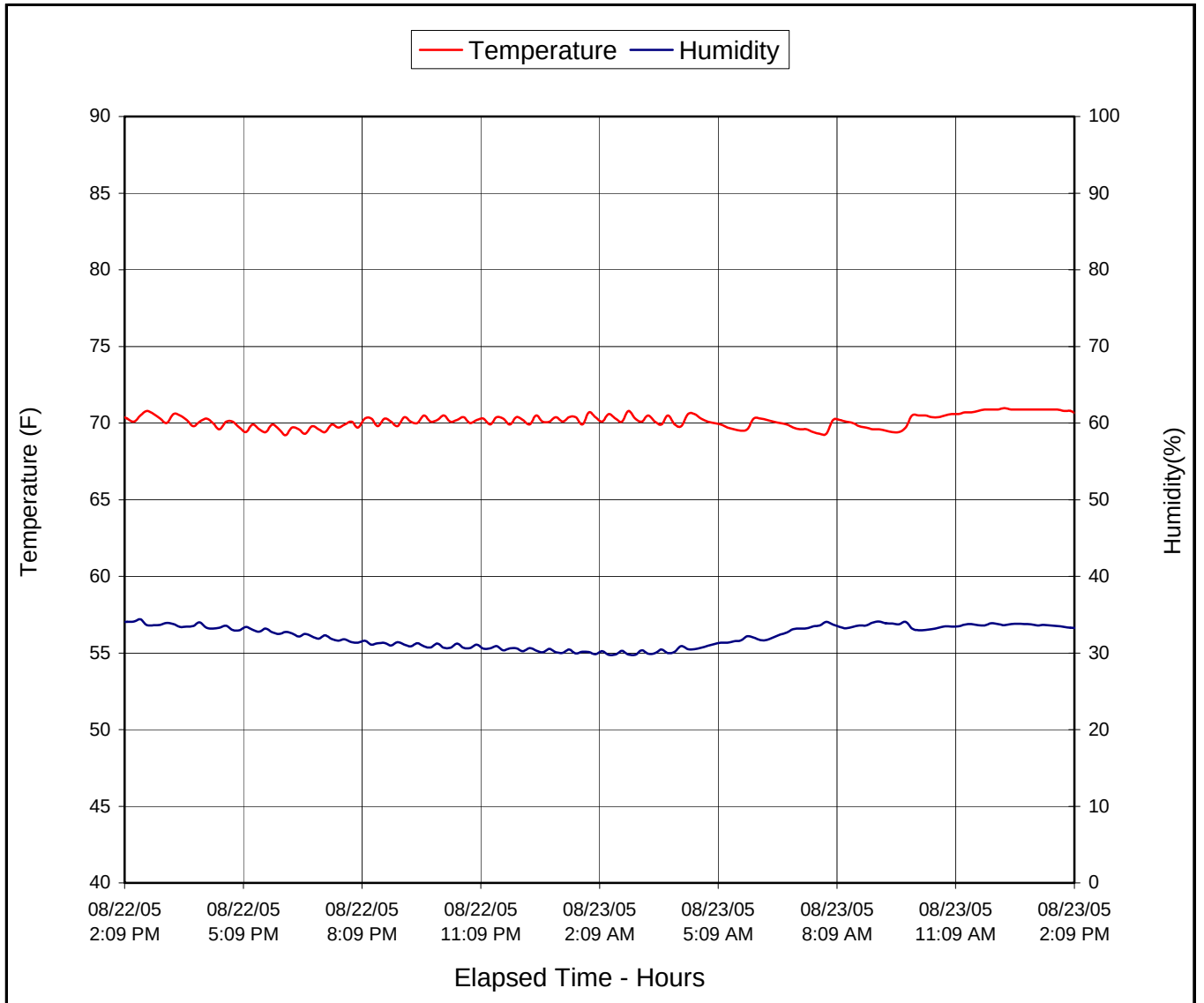
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	186	580	-394
C2	Crush zone 2 on left side	mm	50	556	-506
C3	Crush zone 3 on left side	mm	5	552	-547
C4	Crush zone 4 on right side	mm	5	559	-554
C5	Crush zone 5 on right side	mm	50	567	-517
C6	Crush zone 6 at right side	mm	186	590	-404



DATA SHEET NO. 19
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2006 Subaru B9 Tribeca MPV
Test Program: 2005 NHTSA 35mph NCAP

NHTSA No.: M65500
Test Date: 8/23/05



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure		Page
A-1	Load Cell Location	A-1
A-2	Vehicle Certification Label	A-2
A-3	Vehicle Tire Label	A-3
A-4	Right Front $\frac{3}{4}$ View, As Received	A-4
A-5	Left Rear $\frac{3}{4}$ View, As Received	A-5
A-6	Pre-Test Front View	A-6
A-7	Post-Test Front View	A-7
A-8	Pre-Test Left Side View	A-8
A-9	Post-Test Left Side View	A-9
A-10	Pre-Test Right Side View	A-10
A-11	Post-Test Right Side View	A-11
A-12	Pre-Test Right Front $\frac{3}{4}$ View	A-12
A-13	Post-Test Right Front $\frac{3}{4}$ View	A-13
A-14	Pre-Test Left Rear $\frac{3}{4}$ View	A-14
A-15	Post-Test Left Rear $\frac{3}{4}$ View	A-15
A-16	Left Rear $\frac{3}{4}$ View of Doors After Impact	A-16
A-17	Right Rear $\frac{3}{4}$ View of Doors After Impact	A-17
A-18	Pre-Test Windshield View	A-18
A-19	Post-Test Windshield View	A-19
A-20	Pre-Test Engine Compartment	A-20
A-21	Post-Test Engine Compartment	A-21
A-22	Pre-Test Fuel Cap	A-22
A-23	Post-Test Fuel Cap	A-23
A-24	Pre-Test Front Underbody View	A-24
A-25	Post-Test Front Underbody View	A-25
A-26	Pre-Test Mid Underbody View	A-26
A-27	Post-Test Mid Underbody View	A-27
A-28	Pre-Test Rear Underbody View	A-28
A-29	Post-Test Rear Underbody View	A-29
A-30	Pre-Test Driver Dummy Front View (Head Position)	A-30
A-31	Post-Test Driver Dummy Front View (Head Position)	A-31
A-32	Pre-Test Driver Dummy Front Through Window	A-32
A-33	Post-Test Driver Dummy Front Through Window	A-33
A-34	Pre-Test Driver Dummy Door Open	A-34
A-35	Post-Test Driver Dummy Door Open	A-35

LIST OF PHOTOGRAPHS...(Continued)

Figure		Page
A-36	Pre-Test Driver Dummy Feet	A-36
A-37	Post-Test Driver Dummy Feet	A-37
A-38	Pre-Test Driver Side Knee Bolster	A-38
A-39	Post-Test Driver Side Knee Bolster	A-39
A-40	Pre-Test Driver Side Floor Pan	A-40
A-41	Post-Test Driver Side Floor Pan	A-41
A-42	Post-Test Driver Dummy Head	A-42
A-43	Post-Test Driver Dummy Contact to Air Bag	A-43
A-44	Pre-Test Passenger Dummy Front View (Head Position)	A-44
A-45	Post-Test Passenger Dummy Front View (Head Position)	A-45
A-46	Pre-Test Passenger Dummy Front Through Window	A-46
A-47	Post-Test Passenger Dummy Front Through Window	A-47
A-48	Pre-Test Passenger Dummy Door Open	A-48
A-49	Post-Test Passenger Dummy Door Open	A-49
A-50	Pre-Test Passenger Dummy Feet	A-50
A-51	Post-Test Passenger Dummy Feet	A-51
A-52	Pre-Test Passenger Side Knee Bolster	A-52
A-53	Post-Test Passenger Side Knee Bolster	A-53
A-54	Pre-Test Passenger Side Floor Pan	A-54
A-55	Post-Test Passenger Side Floor Pan	A-55
A-56	Post-Test Passenger Dummy Head	A-56
A-57	Post-Test Passenger Dummy Contact to Air Bag	A-57
A-58	Vehicle on Rollover Device (0°)	A-58
A-59	Vehicle on Rollover Device (90°)	A-59
A-60	Vehicle on Rollover Device (180°)	A-60
A-61	Vehicle on Rollover Device (270°)	A-61
A-62	Vehicle During Impact	A-62

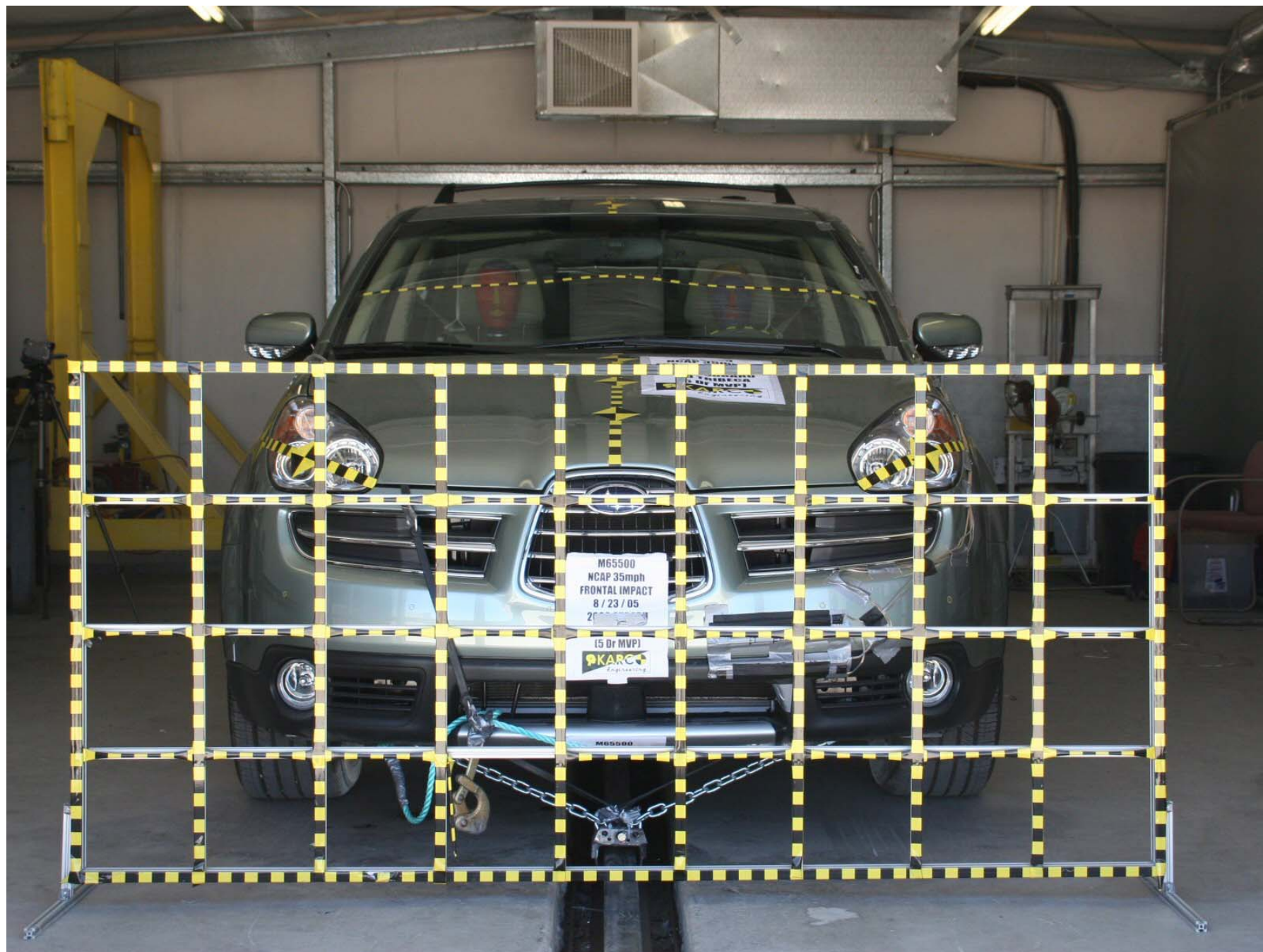


Figure A-1: Load Cell Location

This Space Left Blank Intentionally

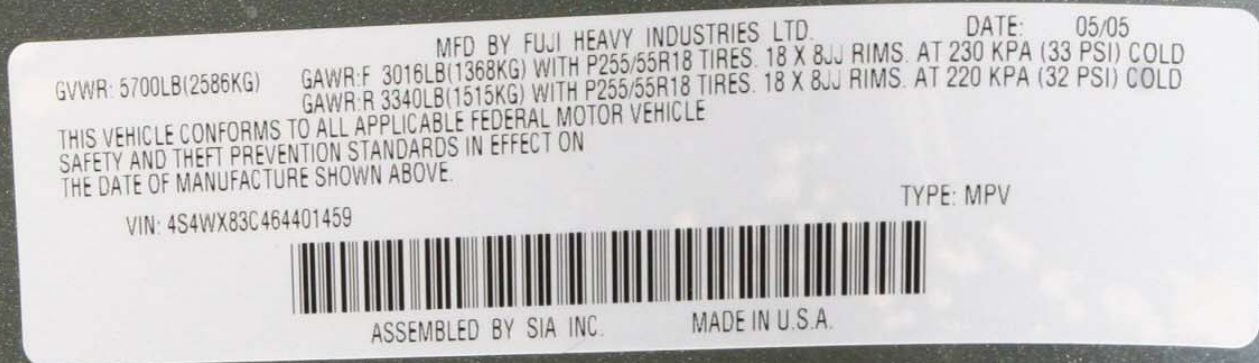


Figure A-2: Manufacturer's Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY : TOTAL 5
FRONT 2 : REAR 3

The combined weight of occupants and cargo should never exceed 408kg or 900 lbs.

ORIGINAL TIRE SIZE	COLD TIRE INFLATION PRESSURE	
P255/55R18	FRONT	230 kPa, 33 PSI
	REAR	220 kPa, 32 PSI
COMPACT SPARE TIRE	COLD TIRE INFLATION PRESSURE	
	420 kPa, 60 PSI	

SEE OWNER'S MANUAL FOR
ADDITIONAL INFORMATION

EY

Figure A-3: Tire Placard



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

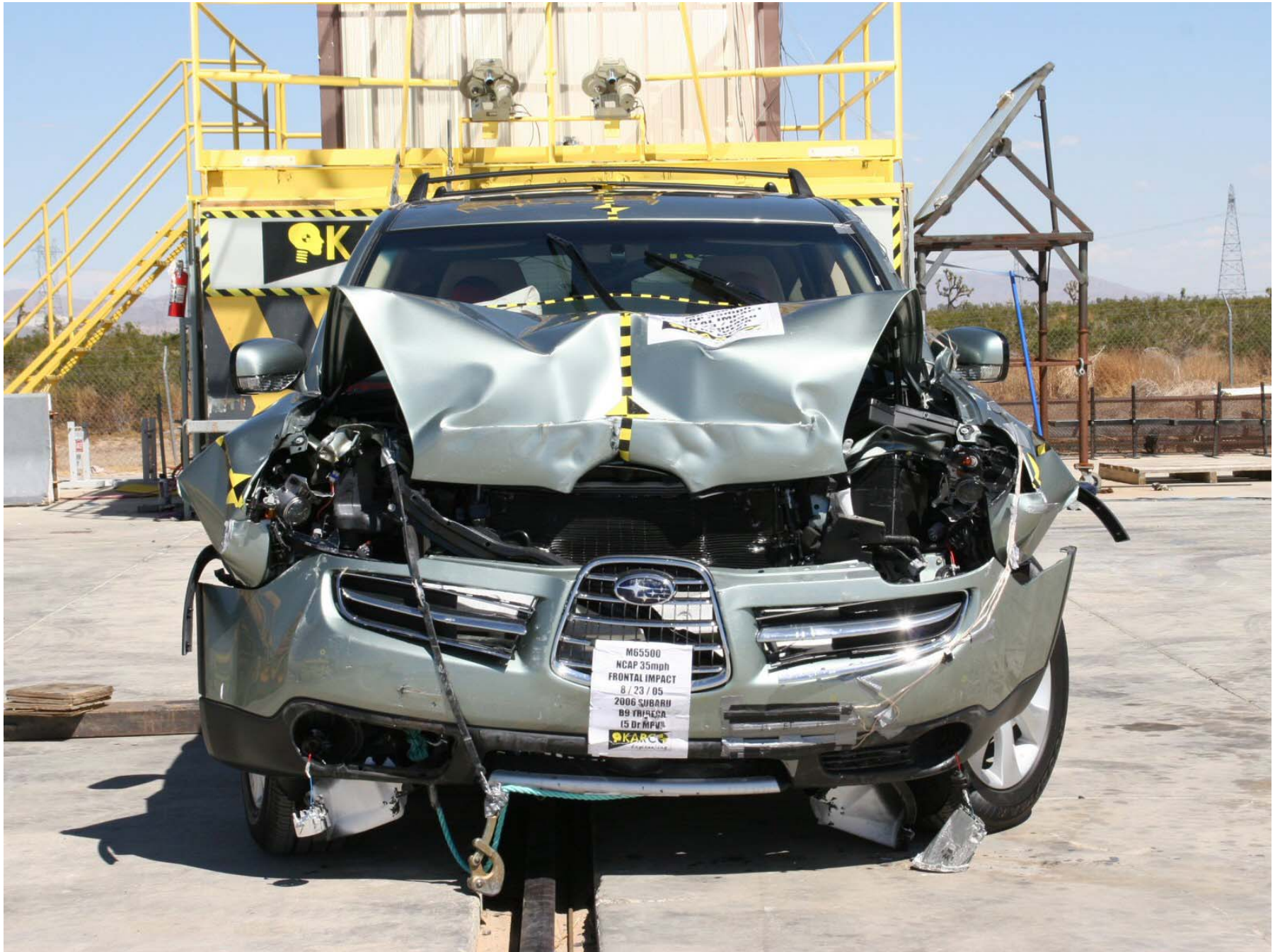


Figure A-7: Post-Test Front View



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 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: Post-Test Left Side $\frac{3}{4}$ View of Doors After Impact



Figure A-17: Post-Test Right Side $\frac{3}{4}$ View of Doors After Impact

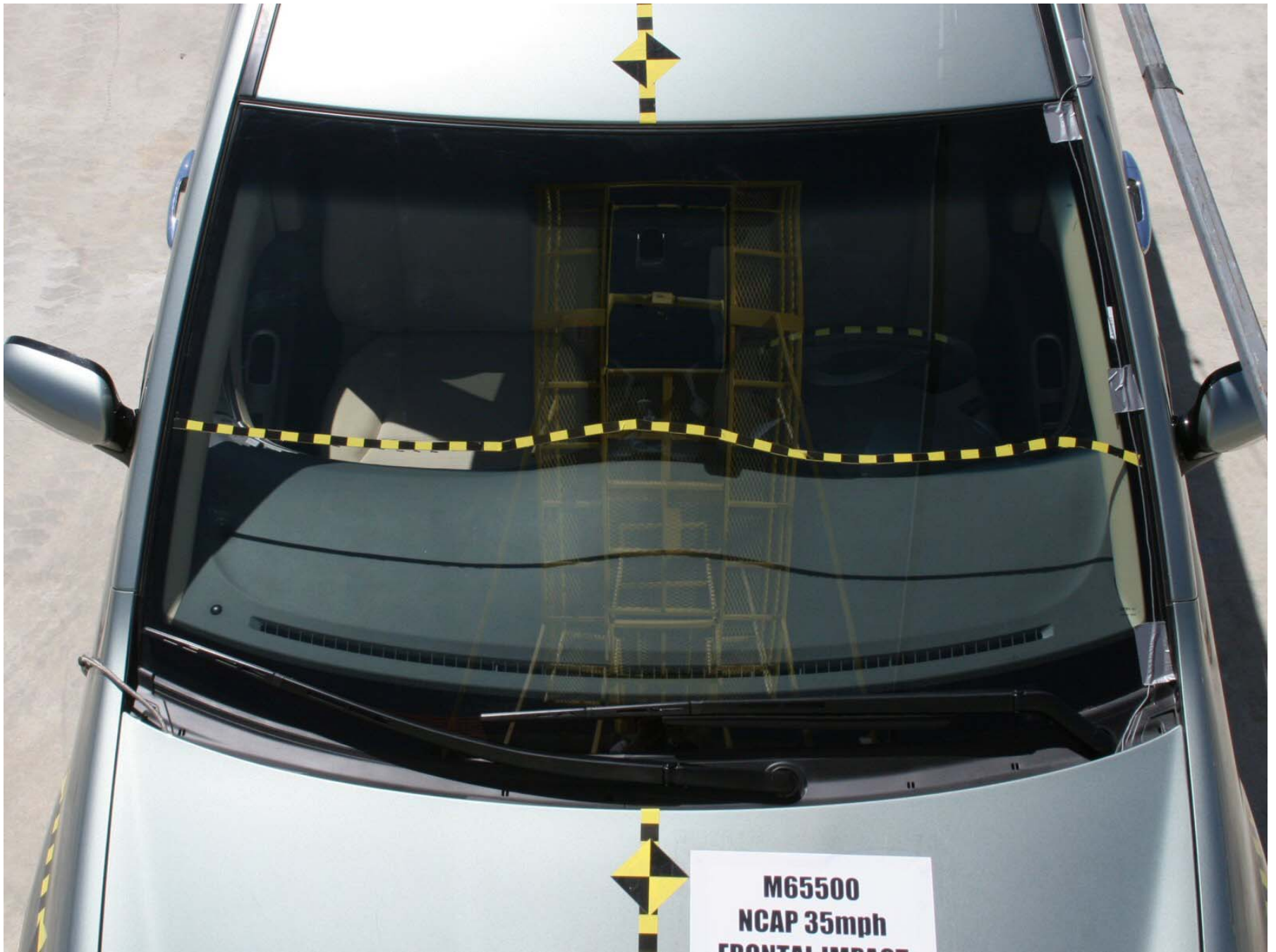


Figure A-18: Pre-Test Windshield

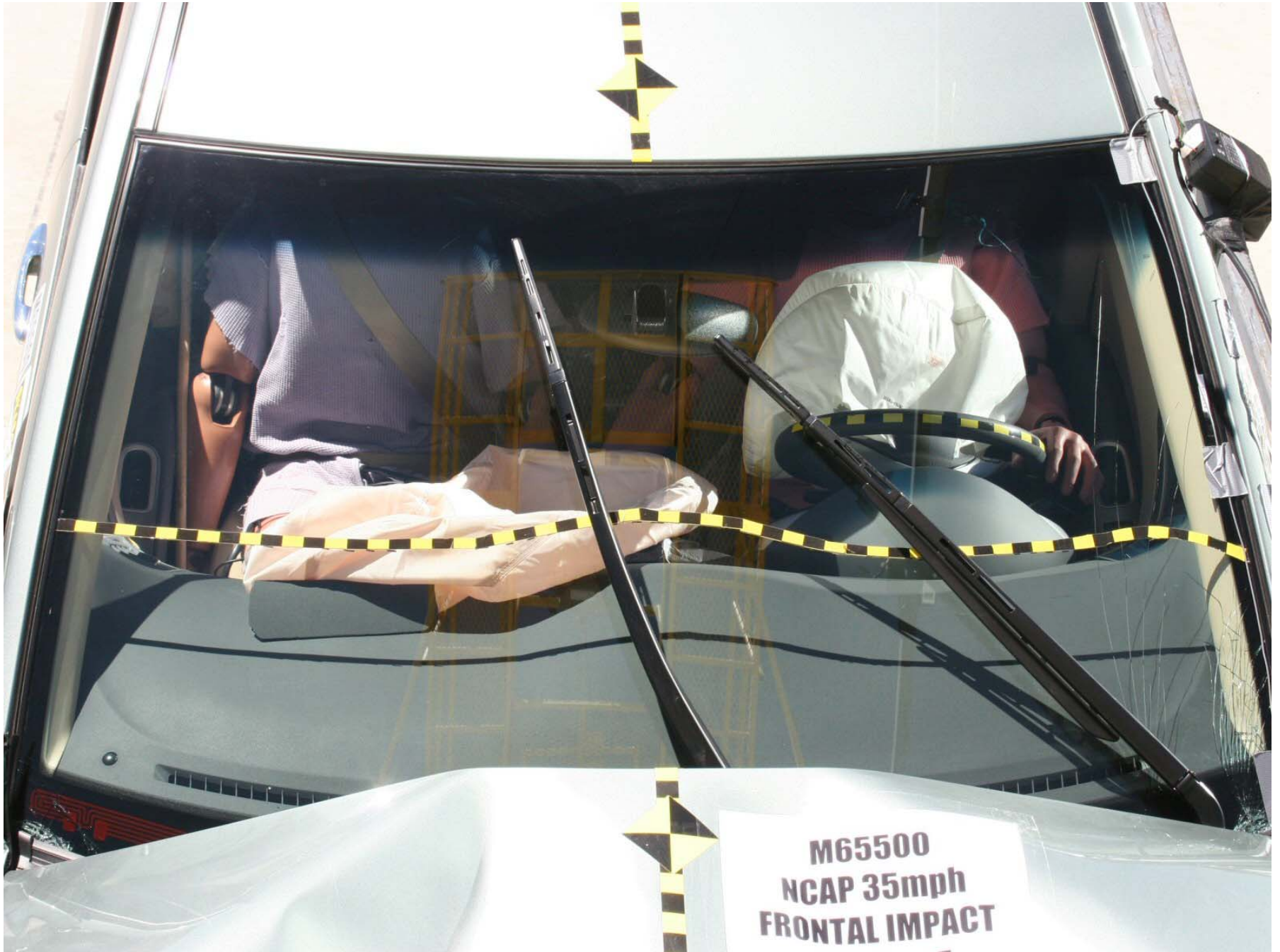


Figure A-19: Post-Test Windshield

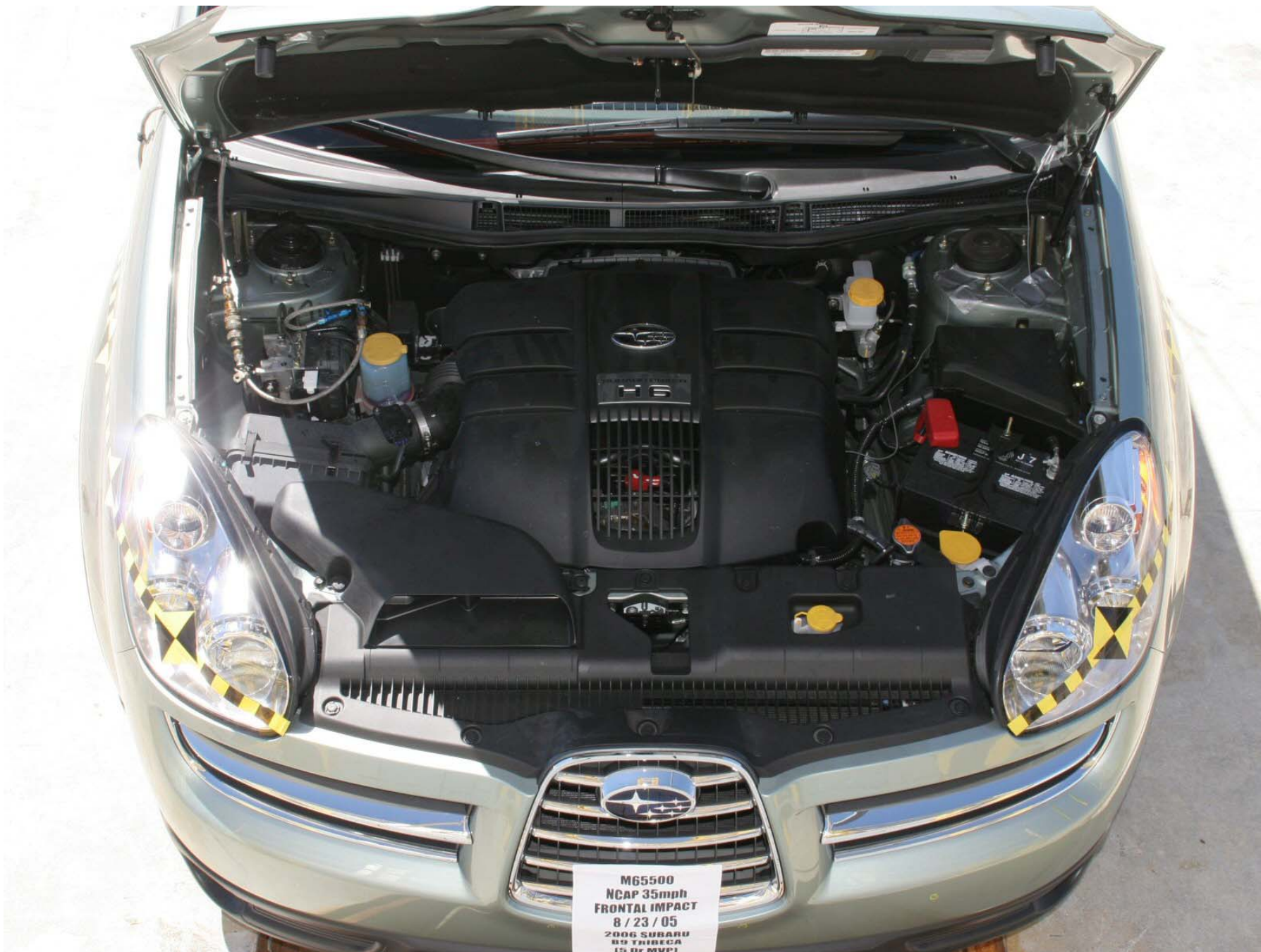


Figure A-20: Pre-Test Engine Compartment



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



Figure A-22: Pre-Test Fuel Cap

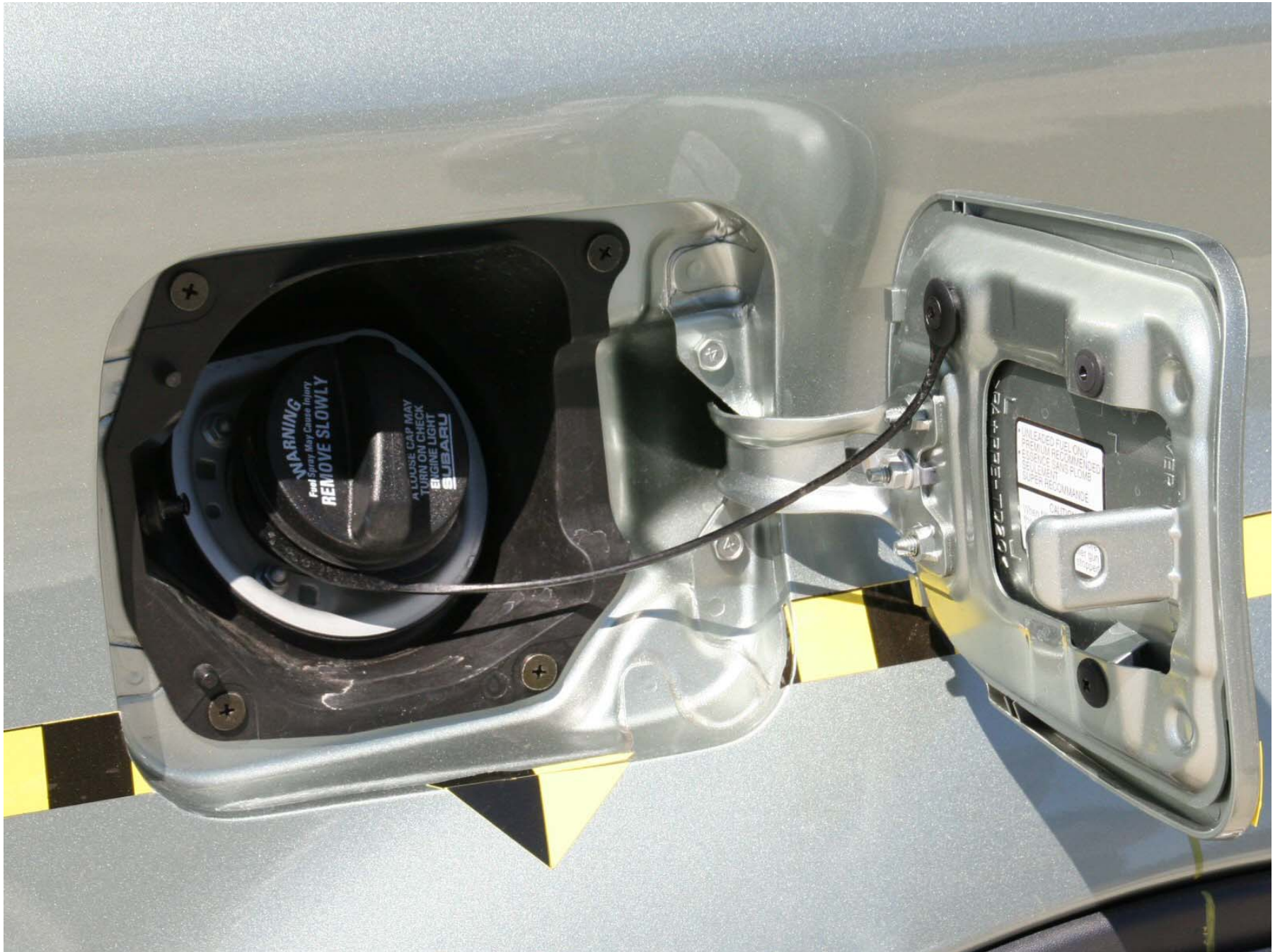


Figure A-23: Post-Test Fuel Cap

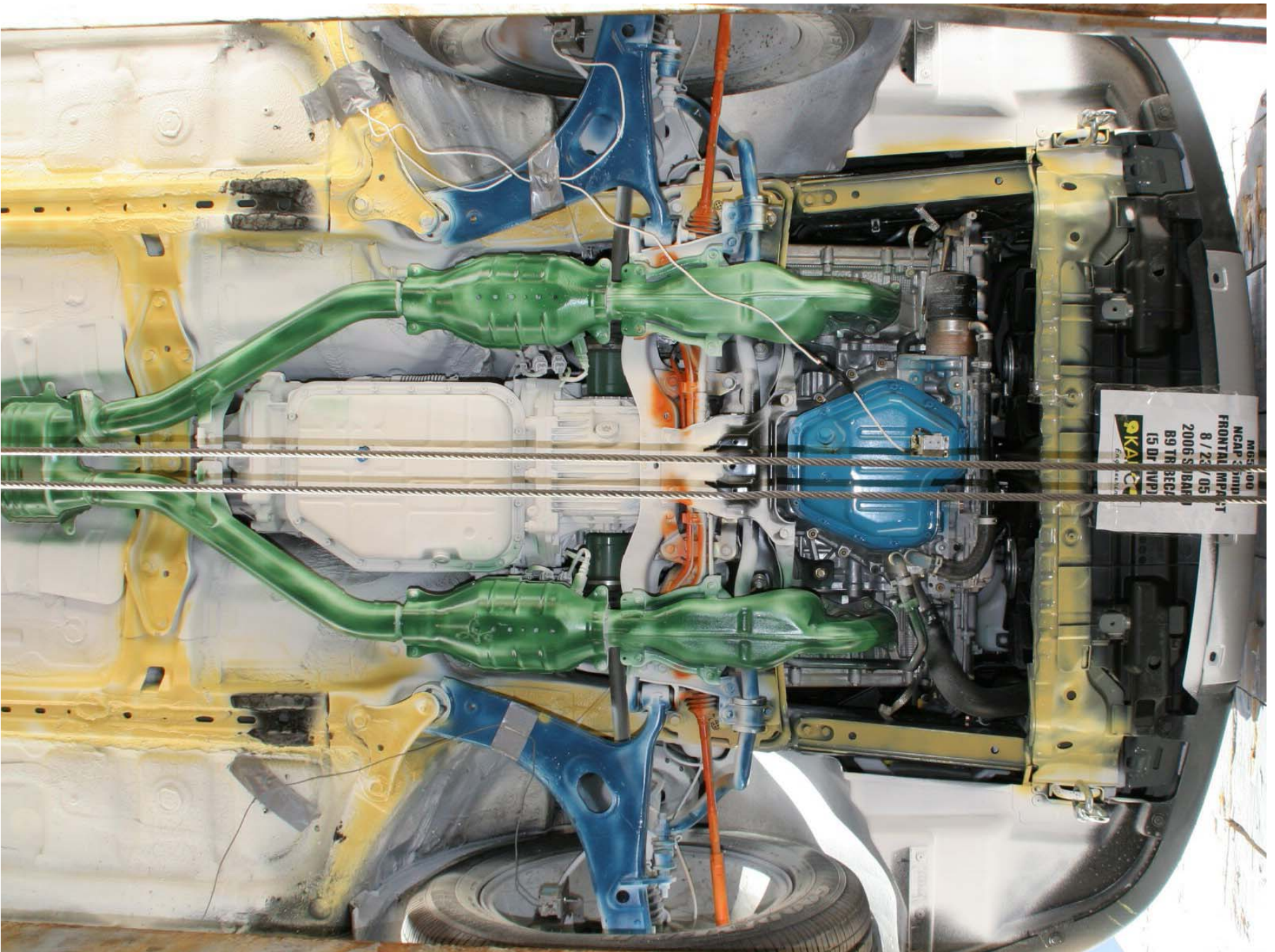


Figure A-24: Pre-Test Front Underbody

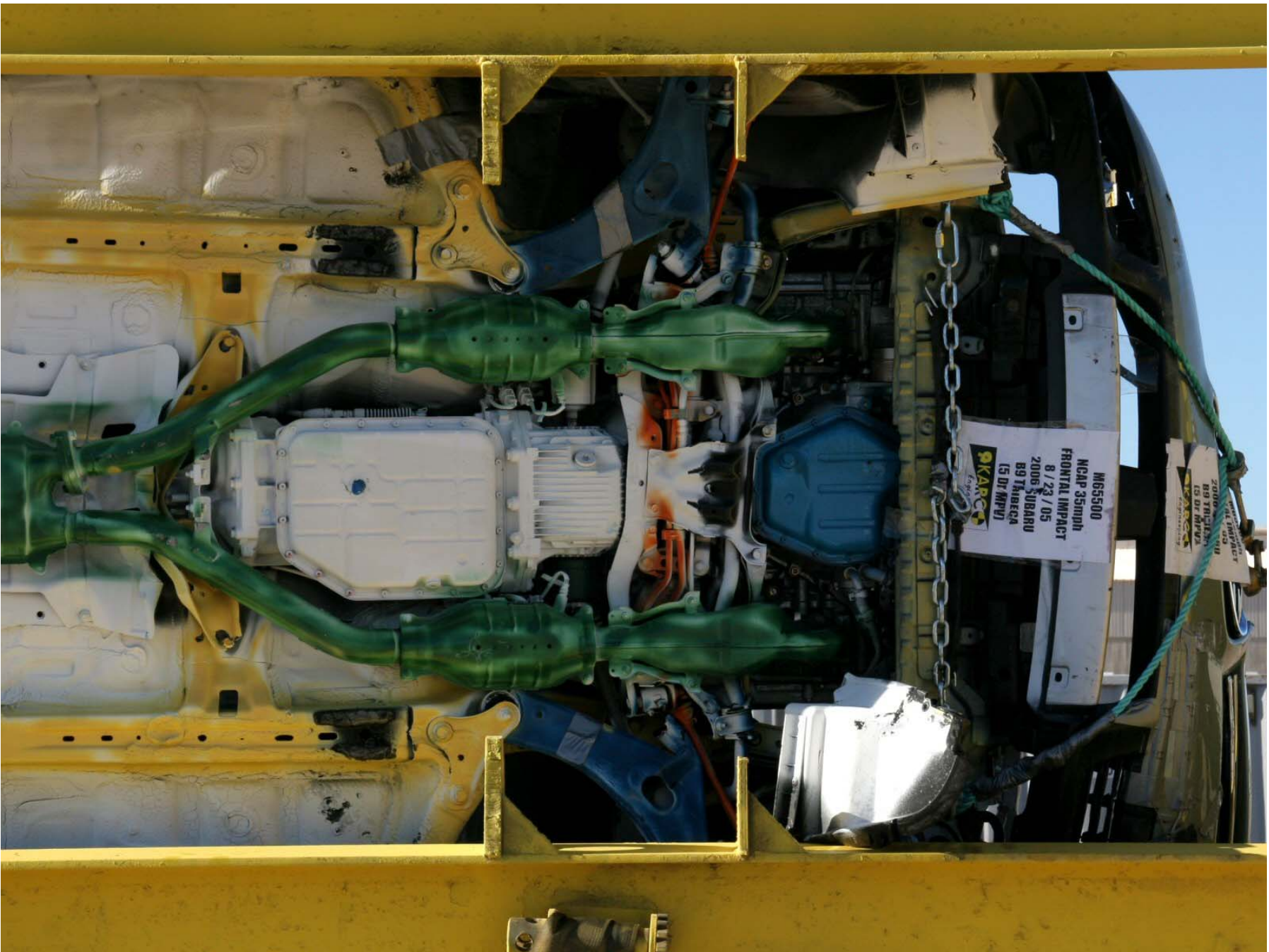


Figure A-25: Post-Test Front Underbody

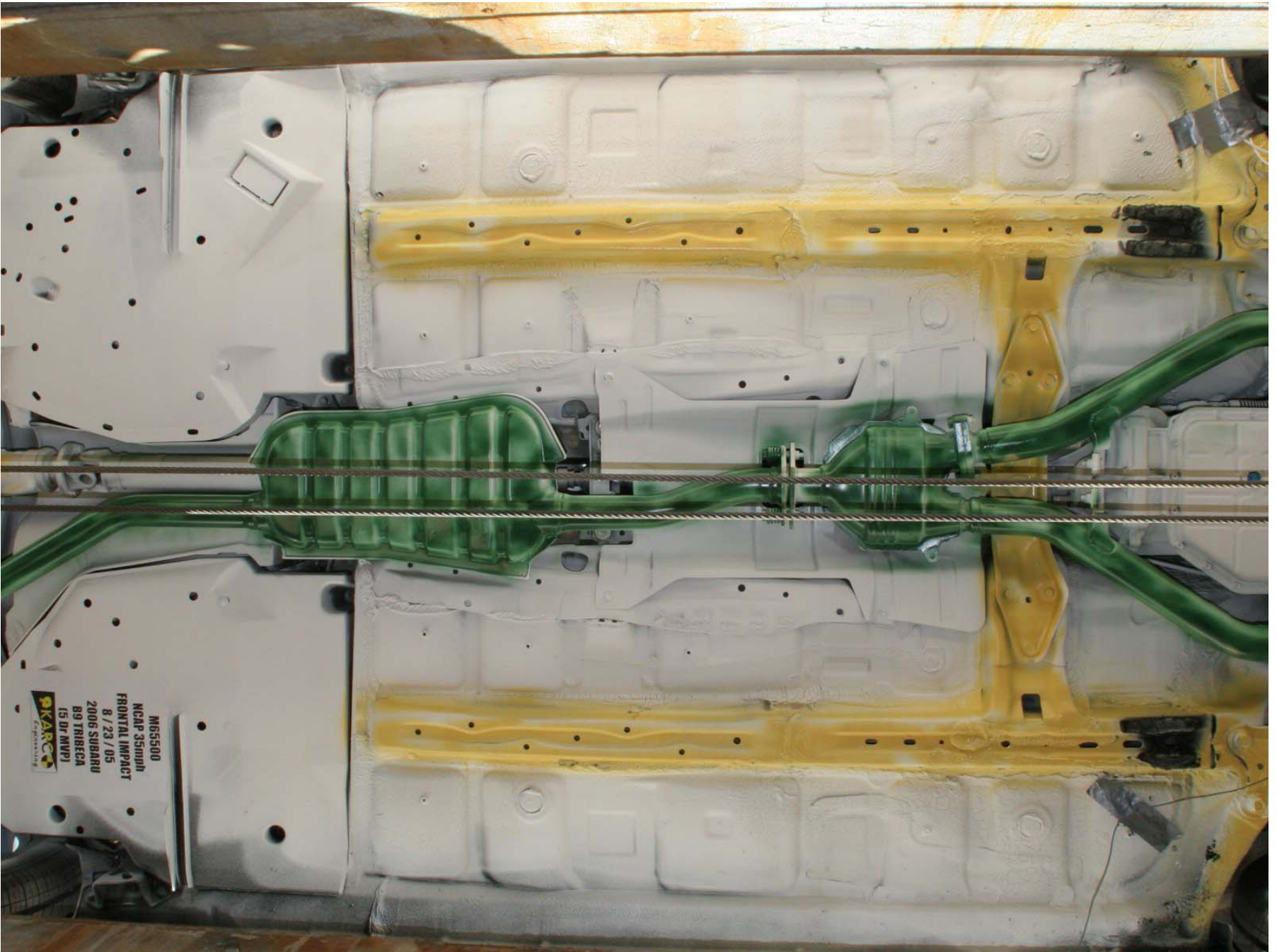


Figure A-26: Pre-Test Mid Underbody



MS5500
NCAP 35mph
FRONTAL IMPACT
8 / 23 / 05
2006 SUBARU
B9 TRIBeca
(5 Dr MPV)
KARPC
Engineering

Figure A-27: Post-Test Mid Underbody

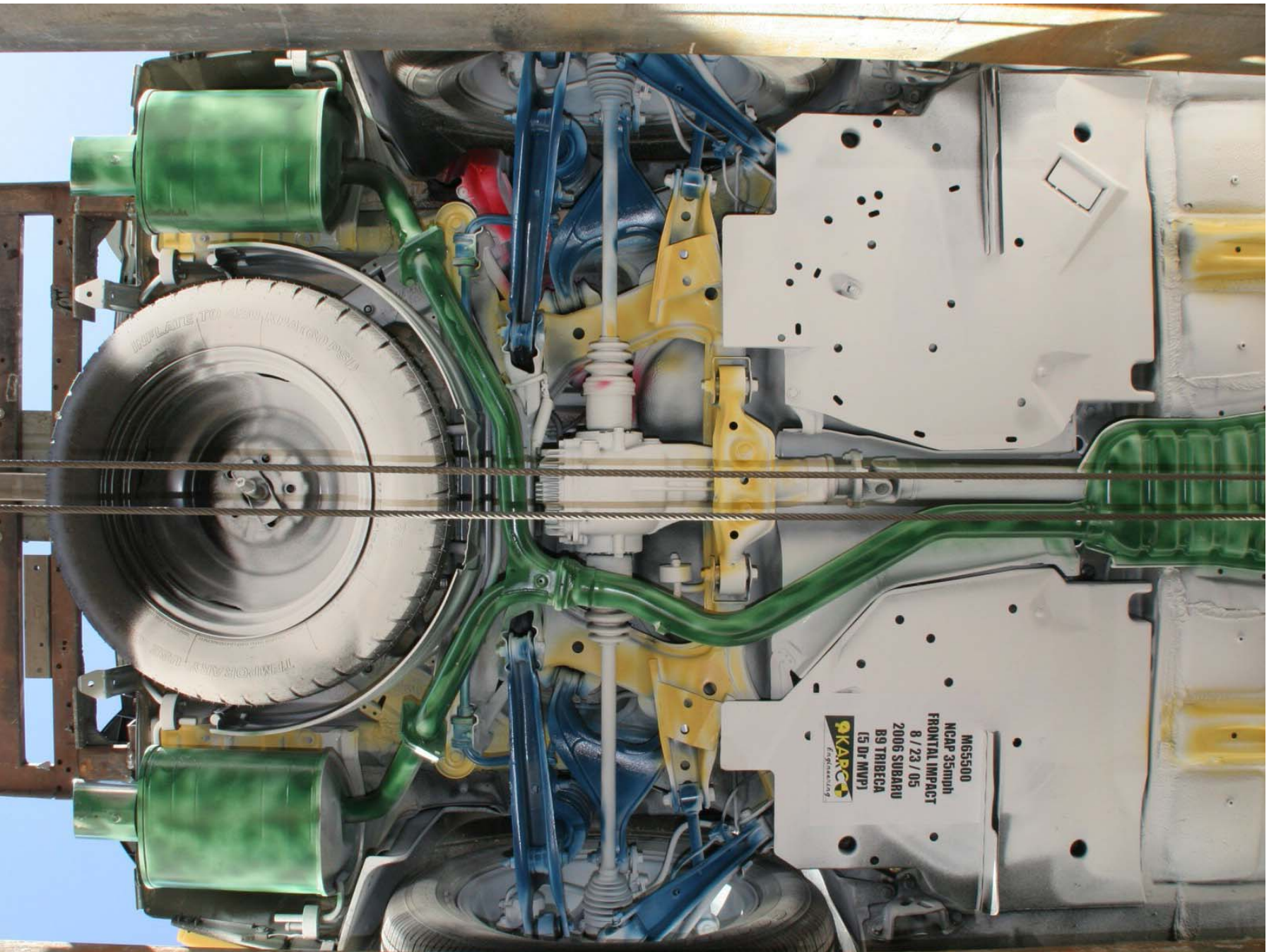


Figure A-28: Pre-Test Rear Underbody

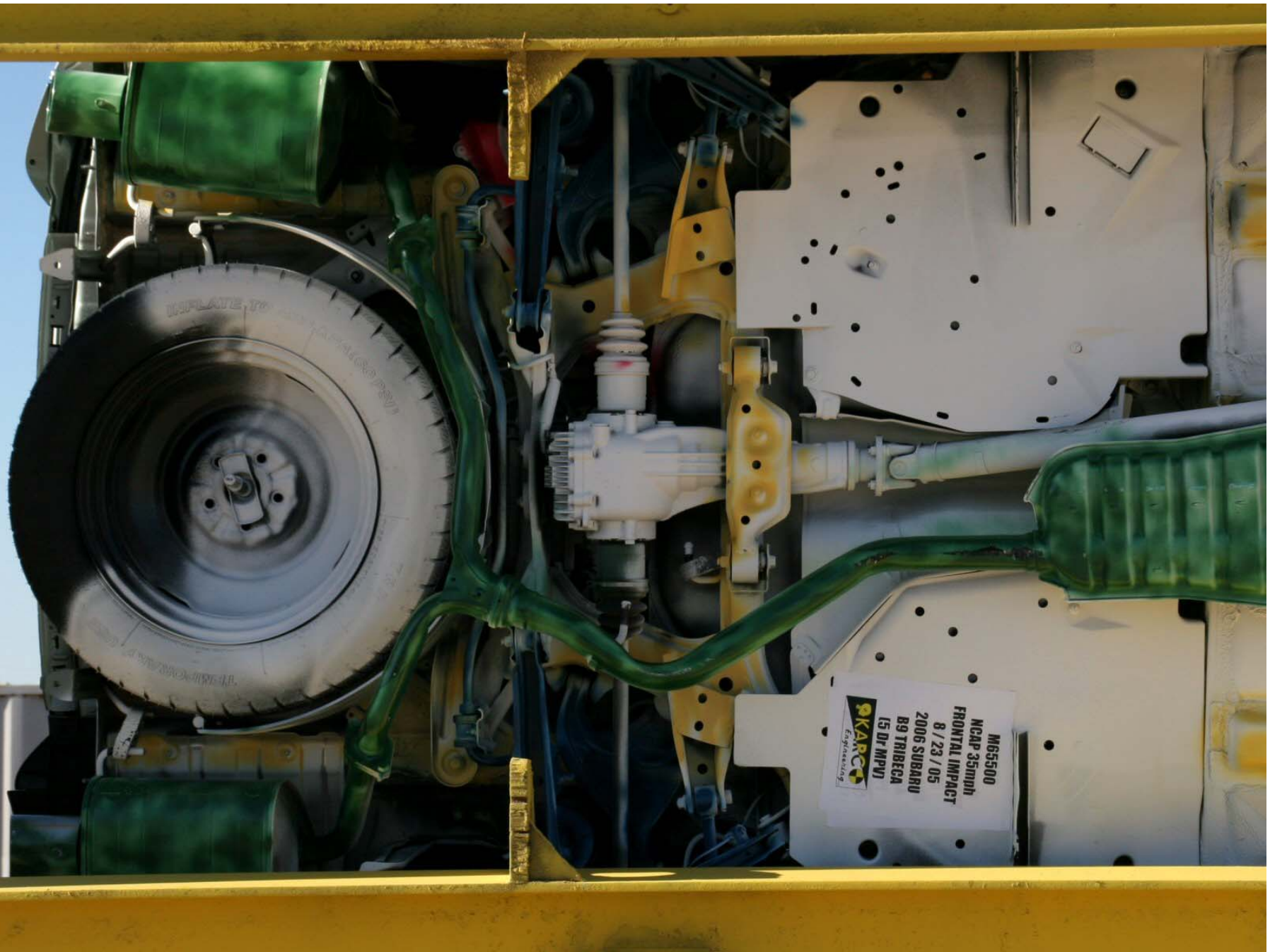


Figure A-29: Post-Test Rear Underbody



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 (Through Window)



Figure A-33: Post-Test Driver Dummy (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 Airbag Contact



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 (Through Window)



Figure A-47: Post-Test Passenger Dummy (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 Glove Box



Figure A-53: Post-Test Passenger Side Glove Box



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 Airbag Contact



Figure A-58: Vehicle on Rollover Device (0°)



Figure A-59: Vehicle on Rollover Device (90°)



Figure A-60: Vehicle on Rollover Device (180°)

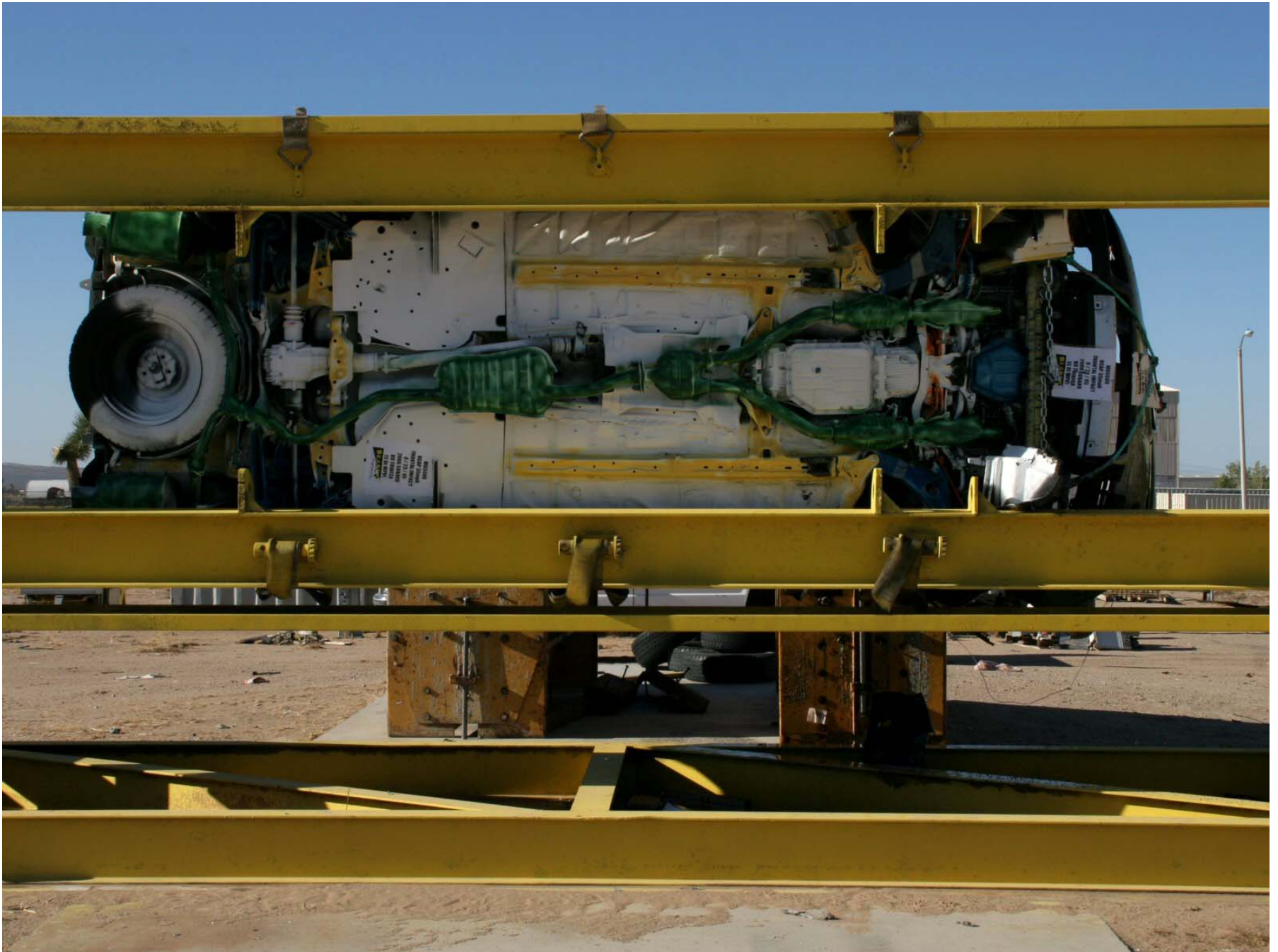


Figure A-61: Vehicle on Rollover Device (270°)



Figure A-62: Vehicle Impact

APPENDIX B

DATA PLOTS

LIST OF DATA PLOTS

Data Plot	Page	
B-1	Driver Head Primary X	B-1
	Driver Head Primary Y	B-1
	Driver Head Primary Z	B-1
	Driver Head Resultant Primary	B-1
B-2	Driver Chest Primary X	B-2
	Driver Chest Primary Y	B-2
	Driver Chest Primary Z	B-2
	Driver Chest Resultant Primary	B-2
B-3	Driver Left Femur Force Z	B-3
	Driver Right Femur Force Z	B-3
B-4	Passenger Head Primary X	B-4
	Passenger Head Primary Y	B-4
	Passenger Head Primary Z	B-4
	Passenger Head Resultant Primary	B-4
B-5	Passenger Chest Primary X	B-5
	Passenger Chest Primary Y	B-5
	Passenger Chest Primary Z	B-5
	Passenger Chest Resultant Primary	B-5
B-6	Passenger Left Femur Force Z	B-6
	Passenger Right Femur Force Z	B-6

The following additional data plots for this test can be obtained from the research and development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov.

LIST OF DATA PLOTS

Driver Head Primary X Velocity
Driver Head Primary X Displacement
Driver Head Redundant X
Driver Head Redundant Y
Driver Head Redundant Z
Driver Head Resultant Redundant
Driver Head Redundant X Velocity
Driver Head Redundant X Displacement
Driver Upper Neck Force X
Driver Upper Neck Force Y
Driver Upper Neck Force Z
Driver Upper Neck Force Resultant
Driver Upper Neck Moment X
Driver Upper Neck Moment Y
Driver Upper Neck Moment Z
Driver Upper Neck Moment Resultant
Driver Chest Primary X Velocity
Driver Chest Primary X Displacement
Driver Chest Redundant X
Driver Chest Redundant Y
Driver Chest Redundant Z
Driver Chest Resultant Redundant
Driver Chest Redundant X Velocity
Driver Chest Redundant X Displacement
Driver Chest Displacement
Driver Pelvis X
Driver Pelvis Y
Driver Pelvis Z
Driver Pelvis Resultant
Driver Pelvis X Velocity
Driver Pelvis X Displacement
Driver Left Upper Tibia Moment X
Driver Left Upper Tibia Moment Y
Driver Right Upper Tibia Moment X

LIST OF DATA PLOTS...(CONTINUED)

Driver Right Upper Tibia Moment Y
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Left Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Right Foot Fore Z
Driver Lap Belt Force
Driver Shoulder Belt Force
Driver Shoulder Belt Pullout
Driver Shoulder Belt Elongation
Passenger Head Primary X Velocity
Passenger Head Primary X Displacement
Passenger Head Redundant X
Passenger Head Redundant Y
Passenger Head Redundant Z
Passenger Head Resultant Redundant
Passenger Head Redundant X Velocity
Passenger Head Redundant X Displacement
Passenger Upper Neck Force X
Passenger Upper Neck Force Y
Passenger Upper Neck Force Z
Passenger Upper Neck Force Resultant
Passenger Upper Neck Moment X
Passenger Upper Neck Moment Y
Passenger Upper Neck Moment Z
Passenger Upper Neck Moment Resultant
Passenger Chest Primary X Velocity
Passenger Chest Primary X Displacement
Passenger Chest Redundant X

LIST OF DATA PLOTS...(CONTINUED)

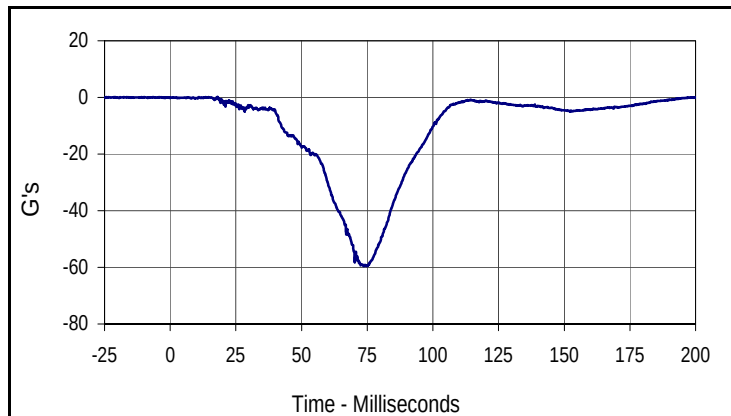
Passenger Chest Redundant Y
Passenger Chest Redundant Z
Passenger Chest Resultant Redundant
Passenger Chest Redundant X Velocity
Passenger Chest Redundant X Displacement
Passenger Chest Displacement
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Pelvis Resultant
Passenger Pelvis X Velocity
Passenger Pelvis X Displacement
Passenger Left Femur Force
Passenger Right Femur Force
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Left Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Right Foot Fore Z
Passenger Lap Belt Force
Passenger Shoulder Belt Force
Passenger Shoulder Belt Pullout
Passenger Shoulder Belt Elongation
Vehicle Left Rear X
Vehicle Left Rear X Velocity

LIST OF DATA PLOTS...(CONTINUED)

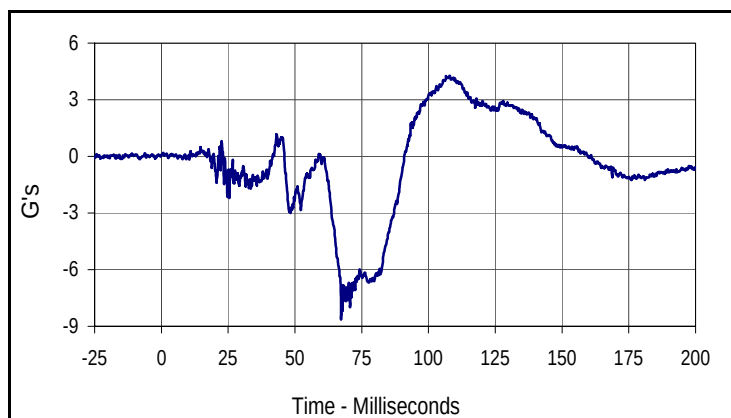
Vehicle Left Rear X Displacement
Vehicle Right Rear X
Vehicle Right Rear X Velocity
Vehicle Right Rear X Displacement
Vehicle Engine Top
Vehicle Engine Top Velocity
Vehicle Engine Top Displacement
Vehicle Engine Bottom
Vehicle Engine Bottom Velocity
Vehicle Engine Bottom Displacement
Vehicle Left Brake Caliper
Vehicle Left Brake Caliper Velocity
Vehicle Left Brake Caliper Displacement
Vehicle Right Brake Caliper
Vehicle Right Brake Caliper Velocity
Vehicle Right Brake Caliper Displacement
Vehicle Instrument Panel
Vehicle Instrument Panel Velocity
Vehicle Instrument Panel Displacement
Vehicle Left Rear Z
Vehicle Left Rear Z Velocity
Vehicle Left Rear Z Displacement
Vehicle Right Rear Z
Vehicle Right Rear Z Velocity
Vehicle Right Rear Z Displacement

Test Vehicle: 2006 Subaru B9 Tribeca 5-Door MPV
 Test Program: 2005 NHTSA 35mph NCAP

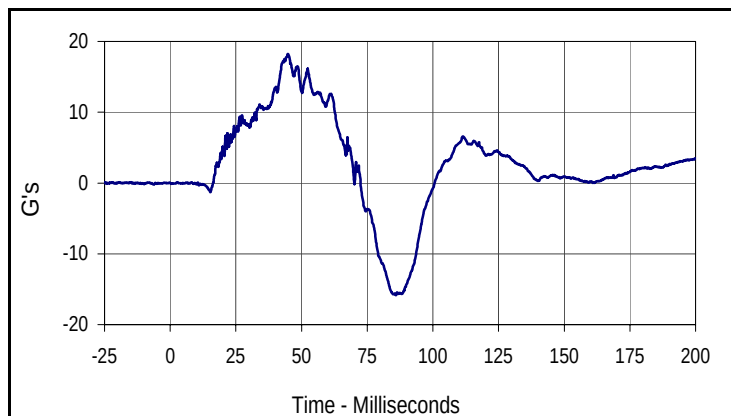
Test Date: 8/23/05
 NHTSA No.: M65500



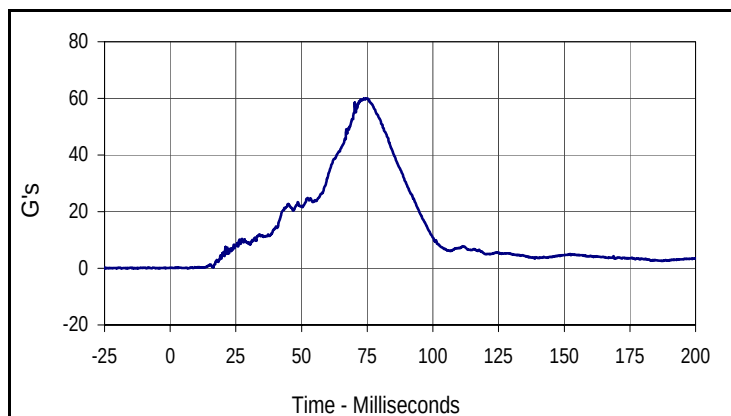
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.2	18.0	-59.5	74.9



Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.3	108.0	-8.6	67.3



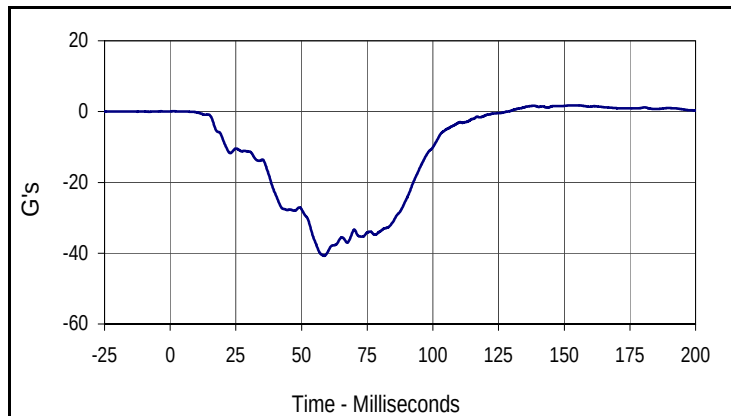
Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
18.2	44.8	-15.9	85.9



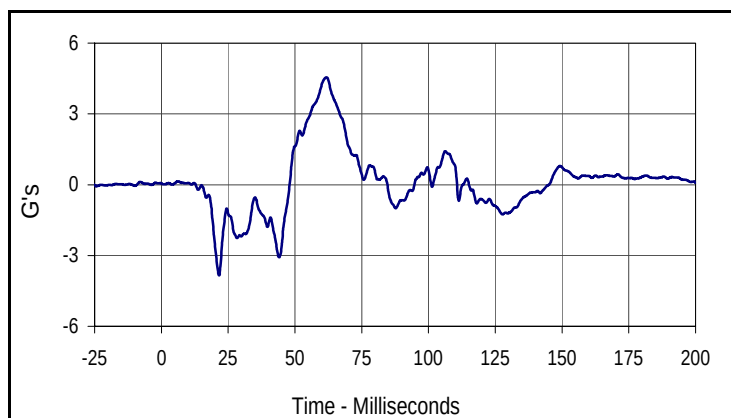
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
60.0	74.9	0.0	6.9

Test Vehicle: 2006 Subaru B9 Tribeca 5-Door MPV
 Test Program: 2005 NHTSA 35mph NCAP

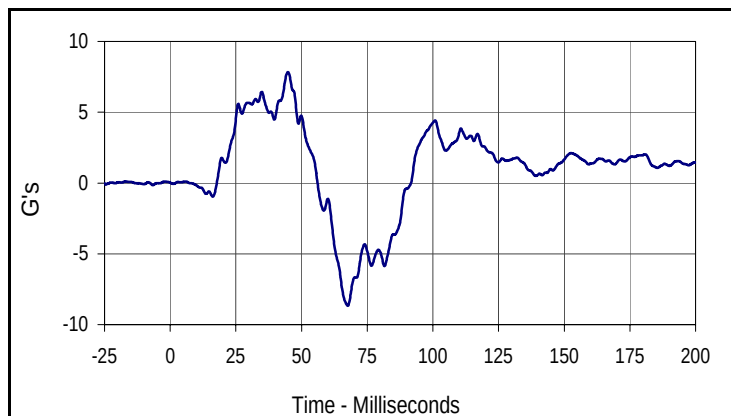
Test Date: 8/23/05
 NHTSA No.: M65500



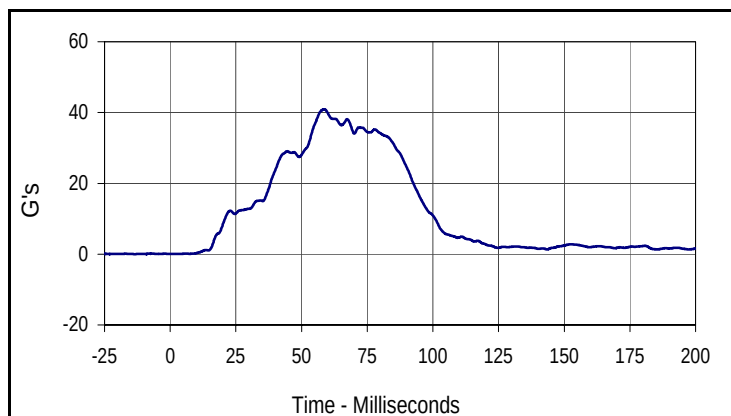
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
1.8	155.2	-40.7	58.6



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
4.5	61.8	-3.8	21.6



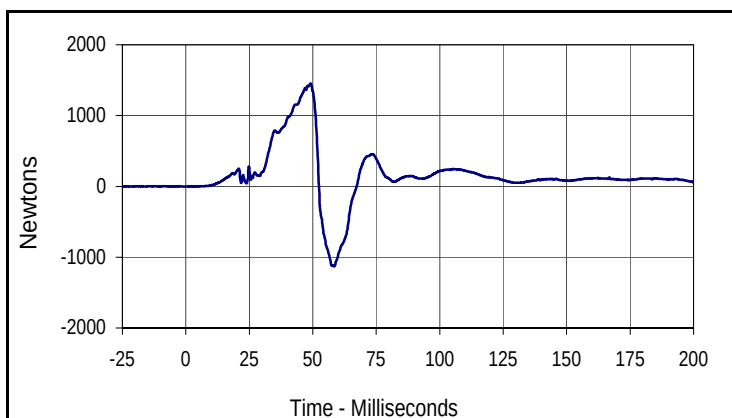
Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
7.8	44.8	-8.7	67.6



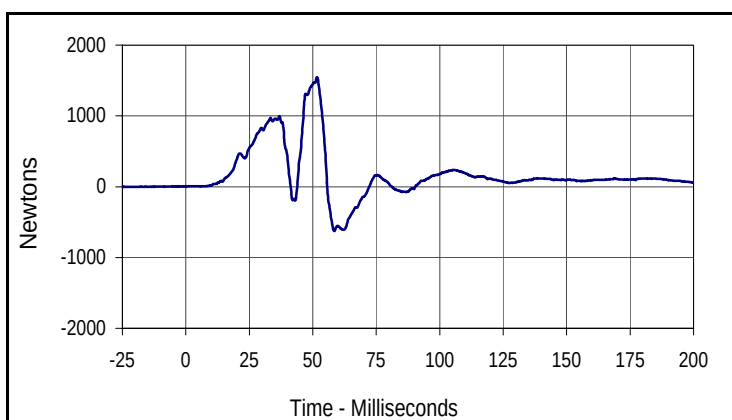
Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
40.9	58.6	0.1	4.0

Test Vehicle: 2006 Subaru B9 Tribeca 5-Door MPV
 Test Program: 2005 NHTSA 35mph NCAP

Test Date: 8/23/05
 NHTSA No.: M65500



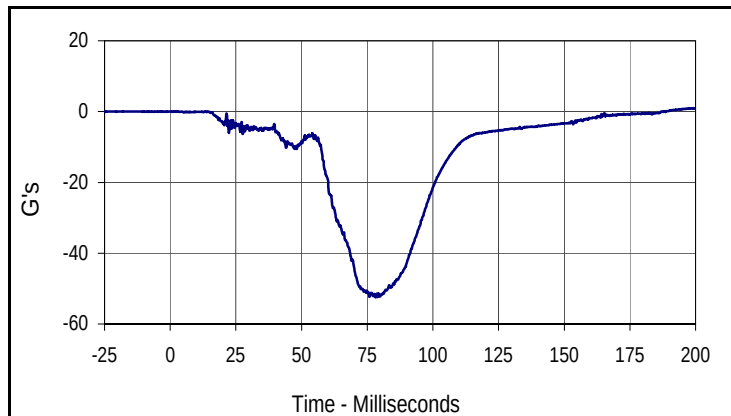
Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
1452.7	49.1	-1133.8	58.5



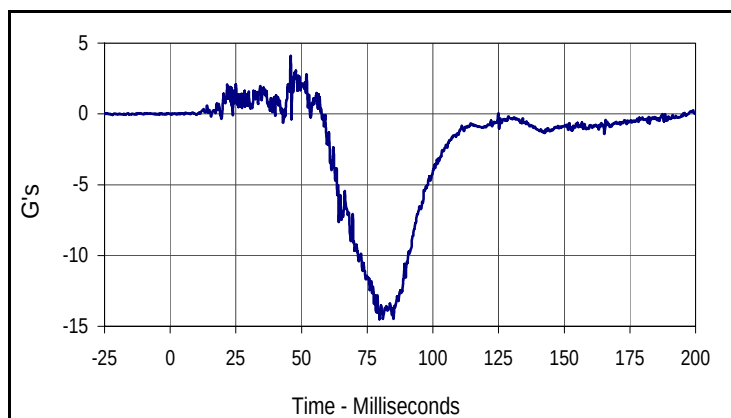
Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
1546.9	51.7	-627.6	58.5

Test Vehicle: 2006 Subaru B9 Tribeca 5-Door MPV
 Test Program: 2005 NHTSA 35mph NCAP

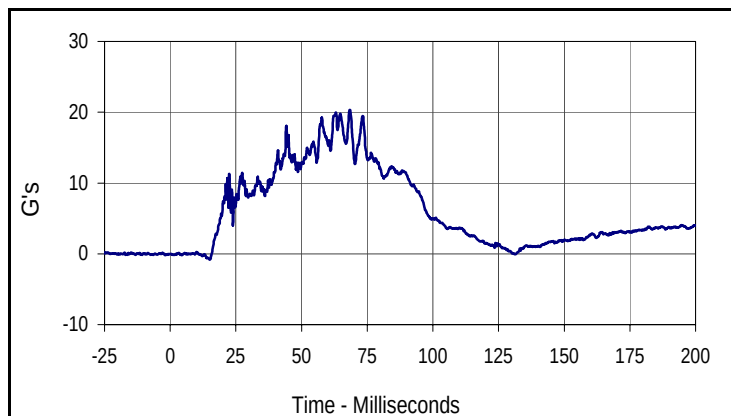
Test Date: 8/23/05
 NHTSA No.: M65500



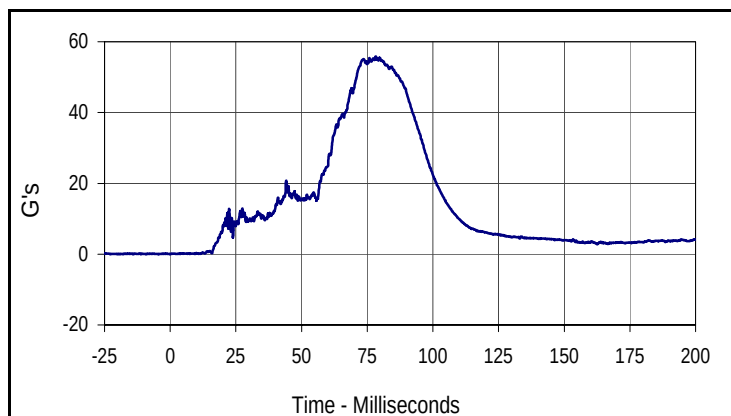
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
1.0	200.0	-52.5	78.2



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
4.1	45.9	-14.5	79.7



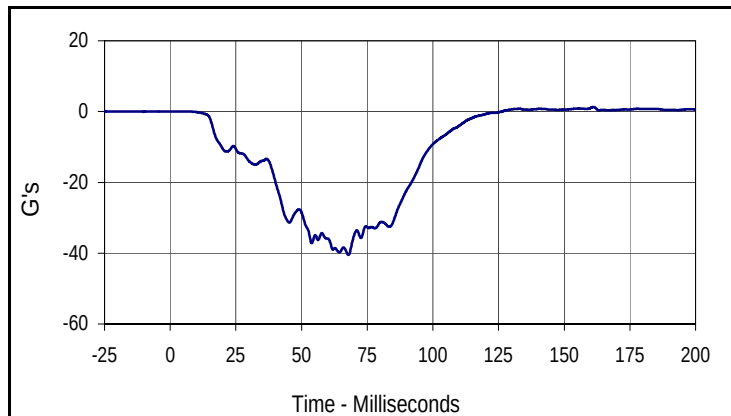
Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
20.3	68.3	-0.8	15.0



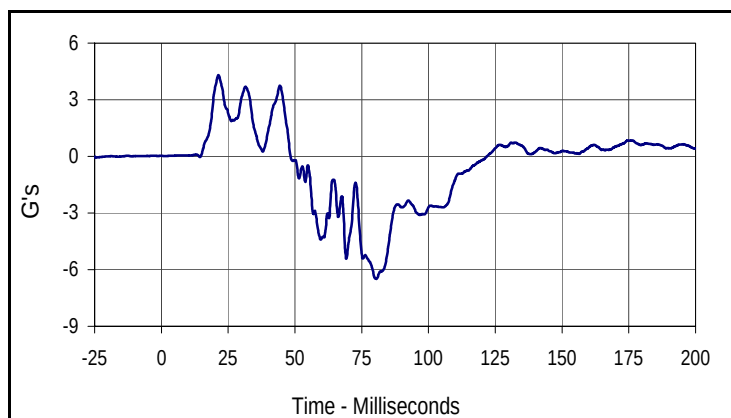
Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
55.9	78.3	0.0	0.0

Test Vehicle: 2006 Subaru B9 Tribeca 5-Door MPV
 Test Program: 2005 NHTSA 35mph NCAP

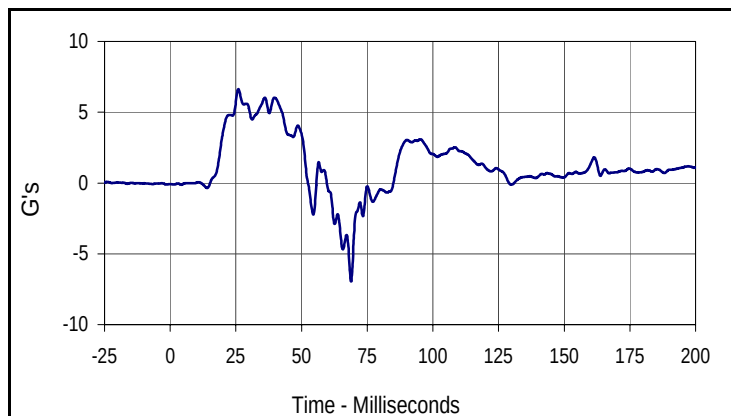
Test Date: 8/23/05
 NHTSA No.: M65500



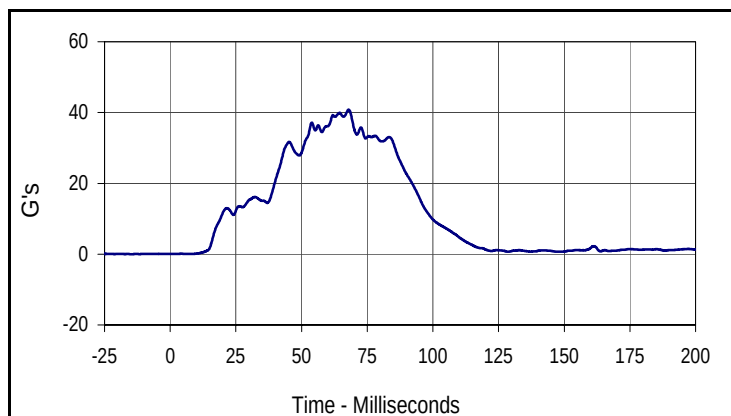
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
1.3	161.1	-40.5	67.8



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
4.3	21.4	-6.5	80.4



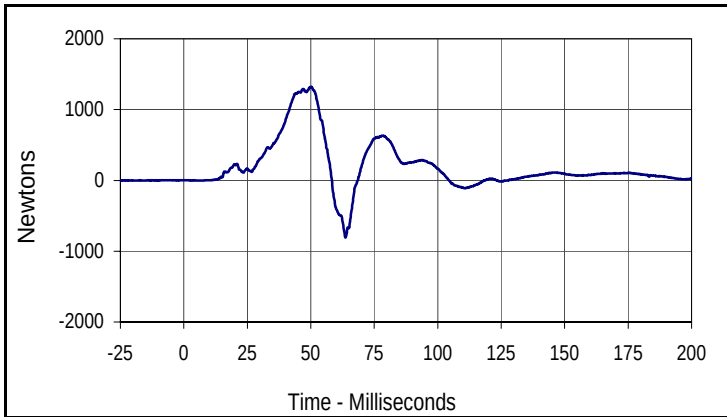
Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
6.6	25.9	-6.9	68.9



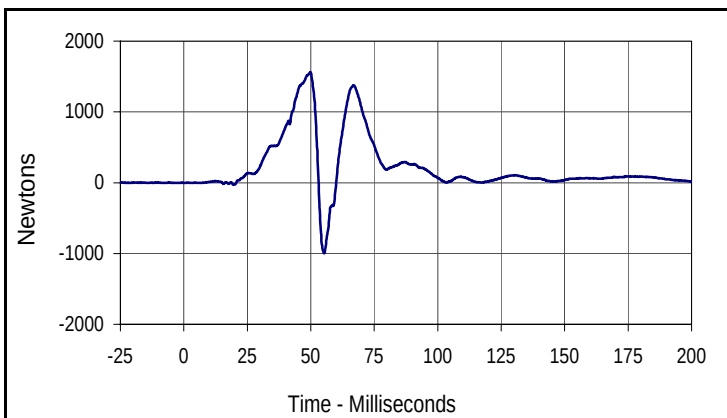
Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
40.8	67.9	0.1	8.4

Test Vehicle: 2006 Subaru B9 Tribeca 5-Door MPV
 Test Program: 2005 NHTSA 35mph NCAP

Test Date: 8/23/05
 NHTSA No.: M65500



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
1323.1	50.1	-808.6	63.7



Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
1563.0	49.8	-998.0	55.3

APPENDIX C

DUMMY CALIBRATION DATA

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

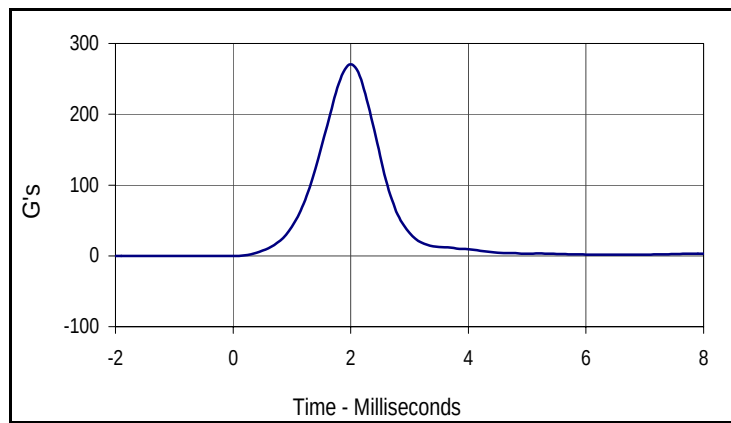
Test Date: 8/17/05

ATD Serial No.: 034

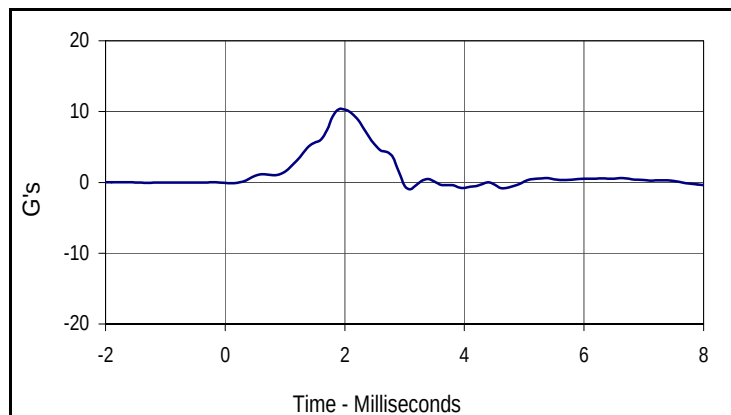
Test I.D.: HD08A



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	270.6	Pass
Peak Lateral Acceleration	G's	≤15.0	10.3	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
270.6	2.0	0.0	-0.2



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
10.3	1.9	-1.0	3.1

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

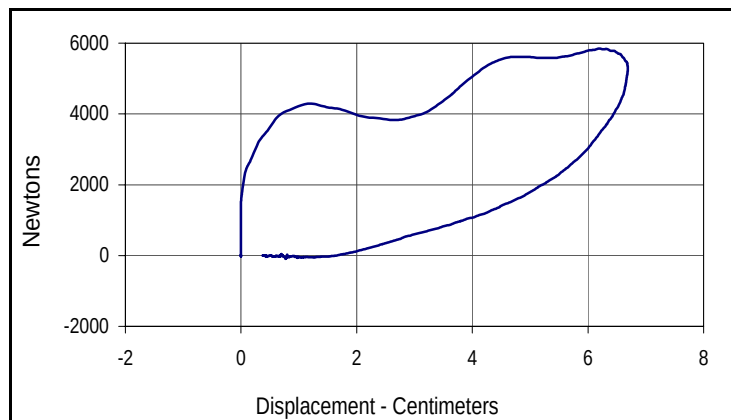
Test Date: 8/19/05

ATD Serial No.: 034

Test I.D.: CH08A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.75	Pass
Peak Probe Force	Newtons	5159 to 5893	5846	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.69	Pass
Internal Hysteresis	%	69 to 85	75.5	Pass
Overall Test Results				Pass



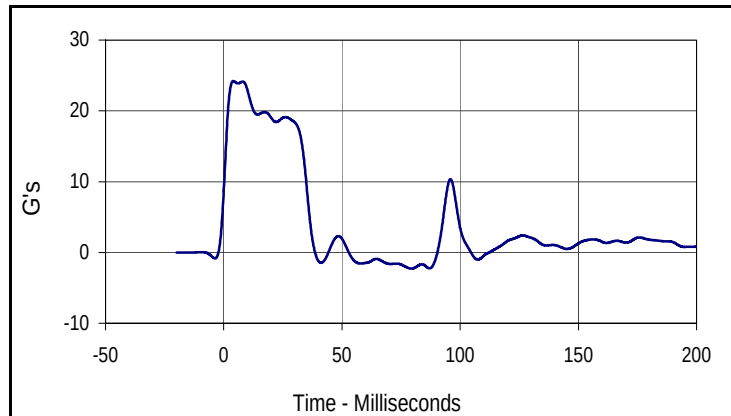
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	75.5
Peak Probe Force		Peak Chest Deflection	
5846		6.69	

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

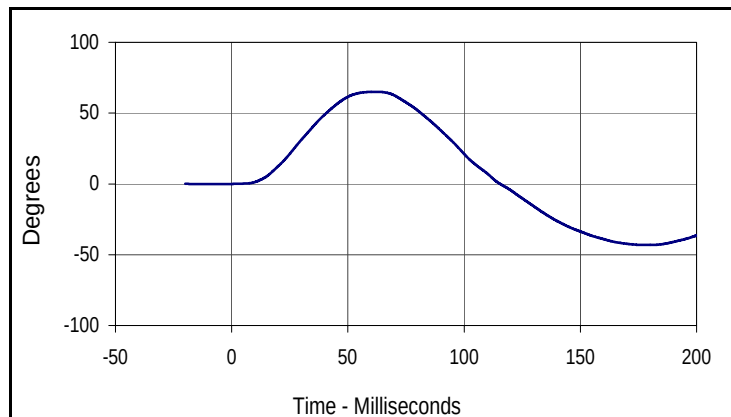
Test Date: 8/18/05
 Test I.D.: NF08A



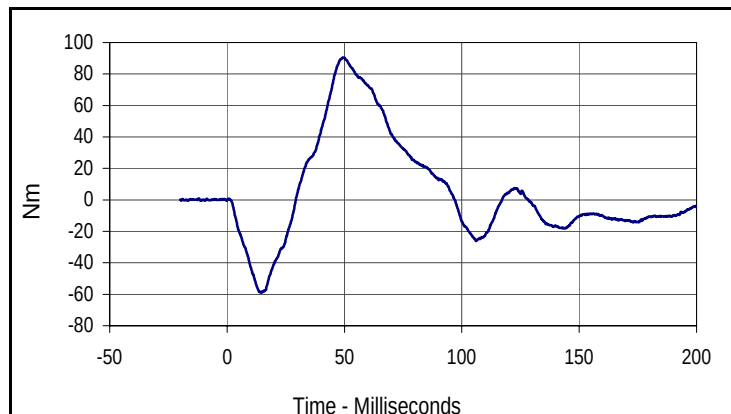
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.10	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.0	Pass
	20 Msec.	G's	17.6 to 22.6	19.1	Pass
	30 Msec.	G's	12.5 to 18.5	18.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.4	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	65.1	Pass
	Time	Msec.	57.0 to 64.0	62.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	115.5	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	90.5	Pass
	Time	Msec.	47.0 to 58.0	49.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.2	4.0	-2.3	79.4



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
65.1	62.0	-43.1	178.1



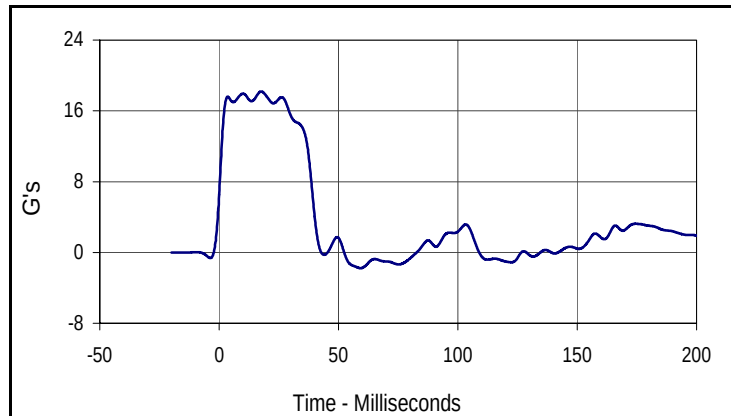
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
90.5	49.7	-59.1	14.5

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

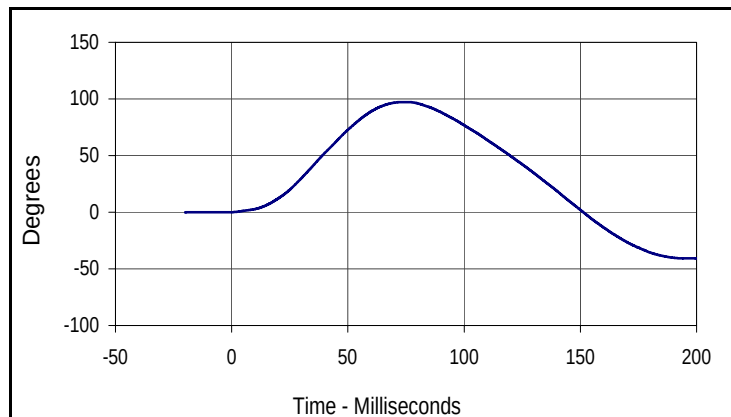
Test Date: 8/18/05
 Test I.D.: NE08A



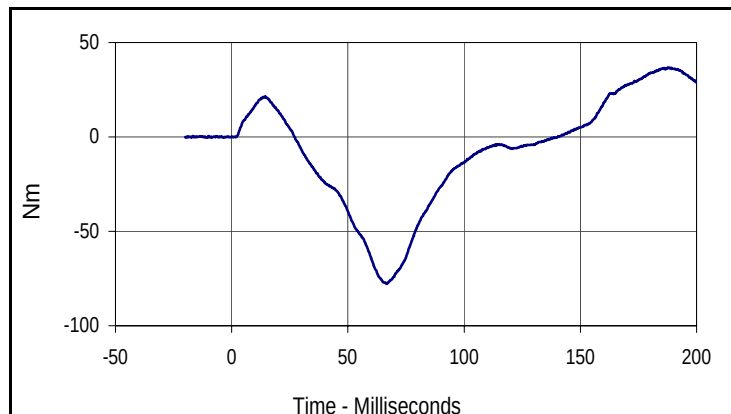
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.00	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.9	Pass
	20 Msec.	G's	14.0 to 19.0	17.6	Pass
	30 Msec.	G's	11.0 to 16.0	15.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	97.3	Pass
	Time	Msec.	72.0 to 82.0	74.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	151.3	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-77.7	Pass
	Time	Msec.	65.0 to 79.0	66.7	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
18.2	17.5	-1.8	59.2



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
97.3	74.6	-40.7	197.6



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
36.7	188.1	-77.7	66.7

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

Test Date: 8/19/05

ATD Serial No.: 034

Test I.D.: LK08A , RK08A

**Left Knee**

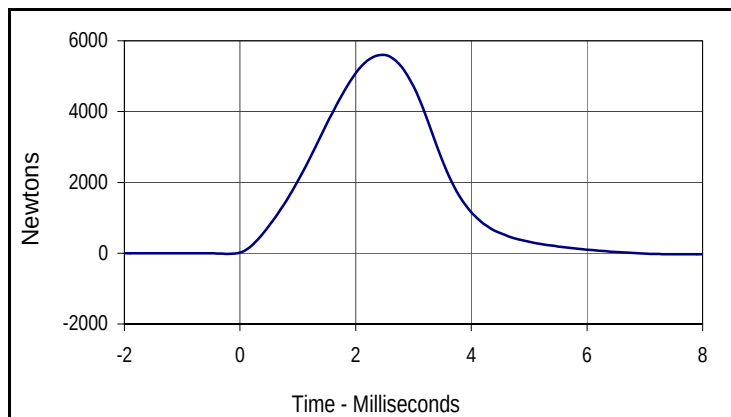
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5519	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5600	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5518.6	2.4	-23.7	7.2

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5600.1	2.5	-27.8	7.5

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 8/19/05

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	880	Pass
B - Shoulder pivot height	mm	505 to 521	517	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	139	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	145	Pass
G - Elbow back to wrist pivot	mm	290 to 305	296	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	341	Pass
J - Elbow rest height	mm	190 to 211	201	Pass
K - Buttock to knee length	mm	579 to 604	602	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	489	Pass
N - Buttock popliteal length	mm	452 to 477	470	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	261	Pass
V - Shoulder breadth	mm	422 to 437	431	Pass
W - Foot breadth	mm	91 to 107	105	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	229	Pass
Overall Test Results				Pass

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

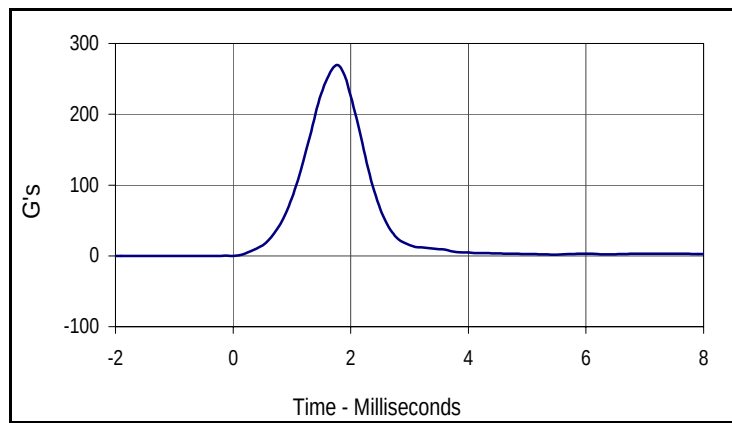
Test Date: 8/17/05

ATD Serial No.: 035

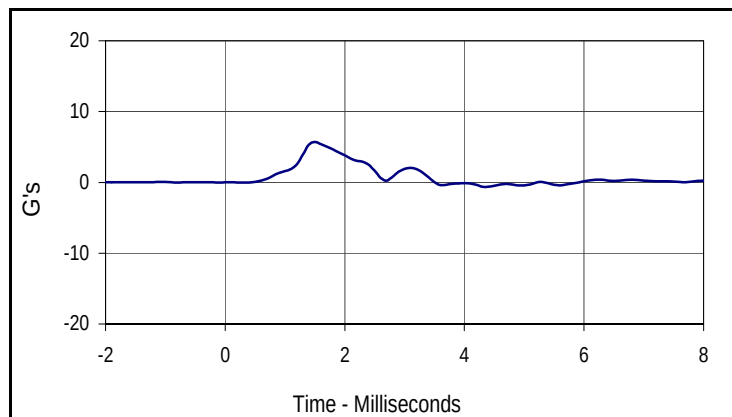
Test I.D.: HD08B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	268.8	Pass
Peak Lateral Acceleration	G's	≤15.0	5.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
268.8	1.8	0.0	-1.6



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.7	1.5	-0.6	4.4

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

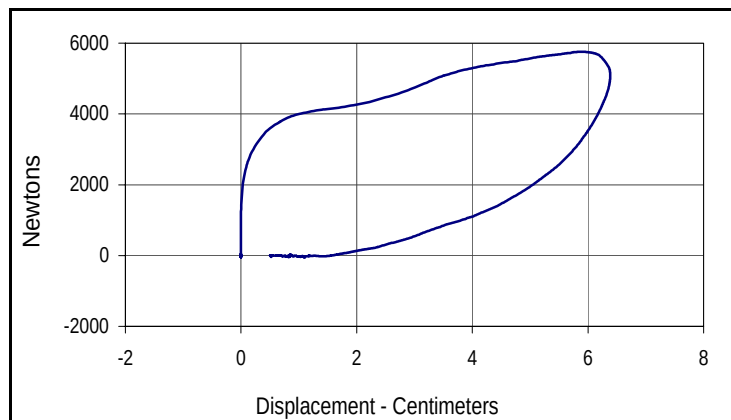
Test Date: 8/17/05

ATD Serial No.: 035

Test I.D.: CH08B



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	6.64	Pass
Peak Probe Force	Newtons	5159 to 5893	5755	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.39	Pass
Internal Hysteresis	%	69 to 85	77.3	Pass
Overall Test Results				Pass



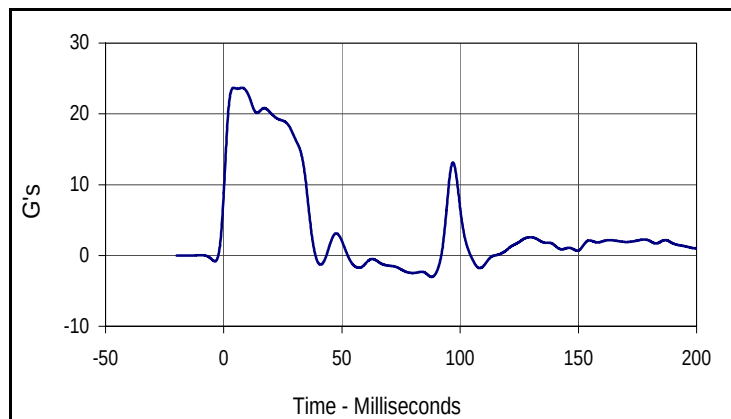
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysteresis
001	FIL	180	77.3
Peak Probe Force		Peak Chest Deflection	
5755		6.39	

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

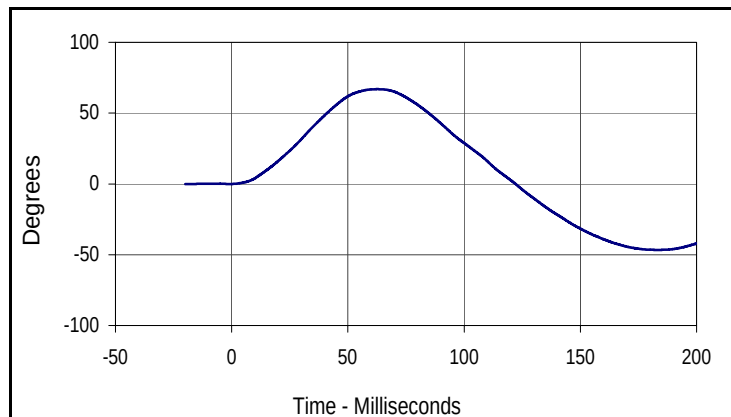
Test Date: 8/18/05
 Test I.D.: NF08B



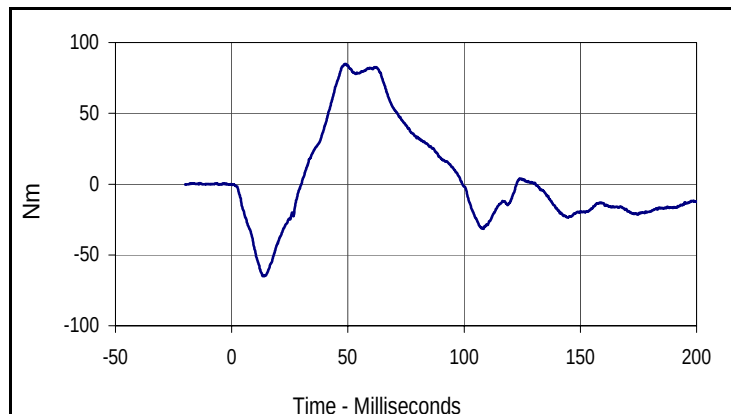
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.0	Pass
	20 Msec.	G's	17.6 to 22.6	20.1	Pass
	30 Msec.	G's	12.5 to 18.5	16.6	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	16.6	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.5	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	66.9	Pass
	Time	Msec.	57.0 to 64.0	62.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	122.1	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	84.9	Pass
	Time	Msec.	47.0 to 58.0	48.8	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	99.3	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	7.7	-3.0	87.9



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
66.9	62.6	-46.6	183.5



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
84.9	48.8	-64.9	14.0

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

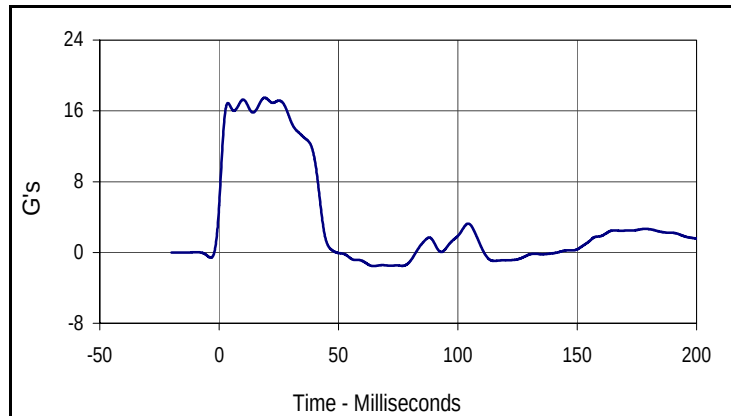
Test Date: 8/18/05

ATD Serial No.: 035

Test I.D.: NE08B



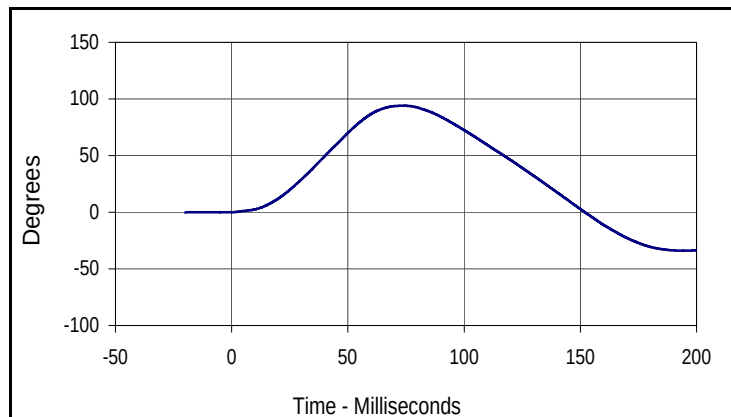
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.13	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.3	Pass
	20 Msec.	G's	14.0 to 19.0	17.4	Pass
	30 Msec.	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	42.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	94.0	Pass
	Time	Msec.	72.0 to 82.0	73.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	151.9	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-76.1	Pass
	Time	Msec.	65.0 to 79.0	64.3	Fail
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	139.3	Pass
Overall Test Results					Fail



Curve Description

Pendulum Deceleration

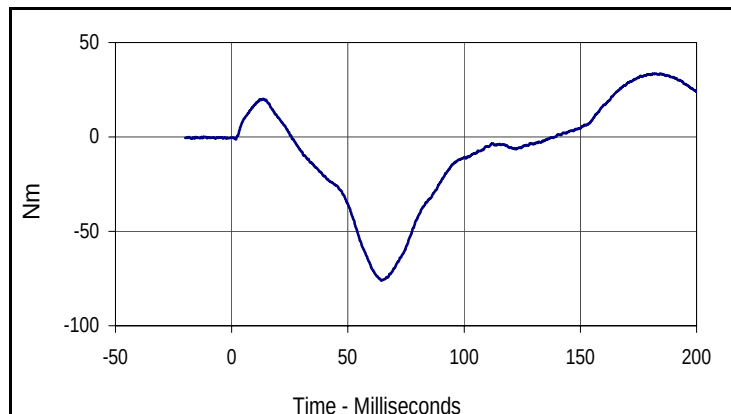
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
17.5	19.1	-1.5	64.7



Curve Description

"D" Plane Rotation

CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
94.0	73.9	-34.0	194.6



Curve Description

Moment About Occipital Condyle

CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
33.6	182.3	-76.1	64.3

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

Test Date: 8/19/05

ATD Serial No.: 035

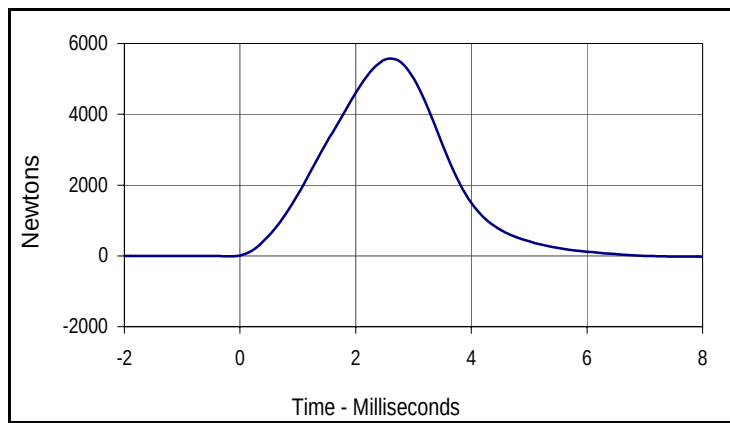
Test I.D.: LK08B , RK08B

**Left Knee**

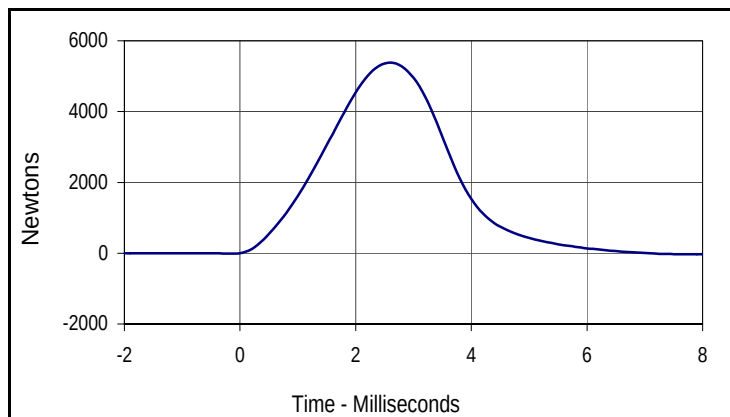
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.13	Pass
Peak Probe Force	Newtons	4715 to 5782	5578	Pass
Overall Test Results				Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5385	Pass
Overall Test Results				Pass

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

CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5577.9	2.6	-25.5	9.6

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

CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5384.7	2.6	-30.1	9.6

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 8/19/05

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	882	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	86	Pass
D - "H" point from seat back	mm	135 to 140	139	Pass
E - Shoulder pivot from back	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	210	Pass
K - Buttock to knee length	mm	579 to 604	585	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	460	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	430	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	995	Pass
Z - Waist circumference	mm	836 to 866	860	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