REPORT NUMBER TR-P29001-02-NC

NEW CAR ASSESMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

FORD MOTOR CO.
2009 FORD F-150 XLT SUPERCREW 4X4
4-DOOR TRUCK

NHTSA NUMBER: M90205

Prepared By:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301

DECEMBER 19, 2008

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
RULEMAKING
MAIL CODE: NVS-111
1200 NEW JERSEY AVE SE, ROOM W43-410
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 DTNH22-06-D-00027.

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: _____ Date: December 19, 2008
Mr. Jordan Hu, Project Engineer
KARCO Engineering, LLC

Reviewed by: _____ Date: December 19, 2008
Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC

Approved by: _____ Date: December 19, 2008
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

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-P29001-02-NC	**2. Government Accession No.**	**3. Recipients Catalog No.**
4. Title and Subtitle Final Report of New Car Assessment Program Testing of a 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No. M90205		**5. Report Date** December 19, 2008 **6. Performing Organization Code** KAR
7. Authors Mr. Jordan Hu, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO		**8. Performing Organization Report No.** TR-P29001-02-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.** DTNH22-06-D-00027
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NVS-111 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C 20590		**13. Type of Report and Period Covered** Final Test Report **14. Sponsoring Agency Code** DOT/NHTSA/NRM/OCS

15. Supplementary Notes

16. Abstract

A 35 mph (56.3 km/h) frontal barrier impact test was conducted on the subject 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck at KARCO Engineering, LLC, in Adelanto, CA, on December 19, 2008. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity was 56.16 km/h. The ambient temperature at the barrier at the time of the crash was 5.6 degrees Celsius. The vehicle's maximum post static crush was 641 mm at DPD 4, to the right of the vehicle's centerline. The test vehicle was equipped with a 3-point continuous belt system and a second generation airbag at both front outboard 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	438.9	391.1
Max. Chest Accel. (3 msec. Chest Clip)	G's	60	36.8	38.3
Left Femur Force	Newtons	10008	-3399.8	-1547.4
Right Femur Force	Newtons	10008	-1044.2	-2473.7

17. Key Words 56.3 km/h NCAP Frontal Impact Test New Car Assesment Program (NCAP) 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No. M90205		**18. Distribution Statement** Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division 1200 New Jersey Ave., SE, Room W43-410 Washington, DC 20590	
19. Security Classification of this report UNCLASSIFIED	**20. Security Classification of this page** UNCLASSIFIED	**21. No. of Pages** 131	**22. Price**

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

SECTION 1
PURPOSE AND SUMMARY OF TEST M90205

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. DTNH22-06-D-00027. 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 July 2005. 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 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck at a velocity of 56.16 km/h. The test was performed at KARCO Engineering, LLC on December 19, 2008

Three (3) real-time and fourteen (14) 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 placed on the driver’s and passenger’s lap and shoulder belts to measure dummy torso and pelvic section loading. Shoulder belt spool-off was measured for the driver and passenger dummies. The driver (position 1) ATD (Serial No.192) and the right-front passenger (position 2) ATD (Serial No. 360) were calibrated prior to this test.

One hundred and thirty-two (132) channels of data were recorded using a TDAS data acquisition system. Appendix A contains Pre and Post-Test Photographs, Appendix B contains the Dummy Response data traces, and Appendix C contains the Dummy Calibration data.

There was 100% windshield retention and no intrusion into the protected zone of the windshield during impact. 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 641 mm at DPD 4, to the right of the vehicle's centerline. Both the driver and 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 and chest contacted the airbag. The head also contacted the headrest. Both knees contacted the bolster.

The passenger’s visible contact points were as follows: The passenger ATD's head and chest contacted the airbag. The head also contacted the headrest. Both knees contacted the glovebox.

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY

ATD Position	HIC 36	3 msec Chest Clip	Chest Defl. (mm)	Left Femur (N)	Right Femur (N)
Driver	438.9	36.8	-23.3	-3399.8	-1044.2
Passenger	391.1	38.3	-24.4	-1547.4	-2473.7

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

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

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	miles/hr	km/hr	1.609344
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	^oF	^oC	=(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: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	56.16
Test Weight	kg	2859
Impact Angle	degrees	0
Average Rebound	mm	388
Maximum Static Crush	mm	641

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door Opening	Remained closed and latched, opened without tools	Remained closed and latched, opened without tools
Rear Door Opening	Remained closed and latched, opened without tools	Remained closed and latched, opened without tools
Seat Track Shift (mm)	None	None
Seatback Failure	No	No

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type/Serial No.	50% Male Hybrid III No.192	50% Male Hybrid III No. 360
Head Contact	Airbag, Headrest	Airbag, Headrest
Chest Contact	AIrbag	Airbag
Abdomen Contact	None	None
Left Knee Contact	Bolster	Glovebox
Right Knee Contact	Bolster	Glovebox

MOVIE COVERAGE

Cameras	Standard	Additional
High Speed	14	0
Real Time	1	2
Total	15	2

DATA CHANNELS

Driver ATD Sensors	40
Passenger ATD Sensors	40
Belt Assessment Sensors	8
Vehicle Structure Acclerometers	8
Rigid Barrier Load Cells	36
Total	132

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M90205
Make	Ford
Model	F-150 XLT Supercrew 4x4
Body Style	4-Door Truck
VIN No.	1FTPW14V89FA02226
Color	Oxford White
Delivery Date	12/02/08
Odometer (Miles)	41.5
Dealer	Team Ford of Las Vegas
Transmission	Automatic 6 Speed
Final Drive	4WD
Type/No. of Cylinders	V-8
Engine Displ. (L)	5.4
Engine Placement	Longitudinal
Roof Rack	No
Sunroof/T-top	No
Tinted Glass	No
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

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

Does the Owner's Manual provide instructions to turn off automatic door locks? Yes

DATA FROM CERTIFICATION TABLE

Manufactured By	FORD MOTOR CO.
Date of Manufacture	Oct-08

GVWR (kg)	3266
GAWR Front (kg)	1701
GAWR Rear (kg)	1746

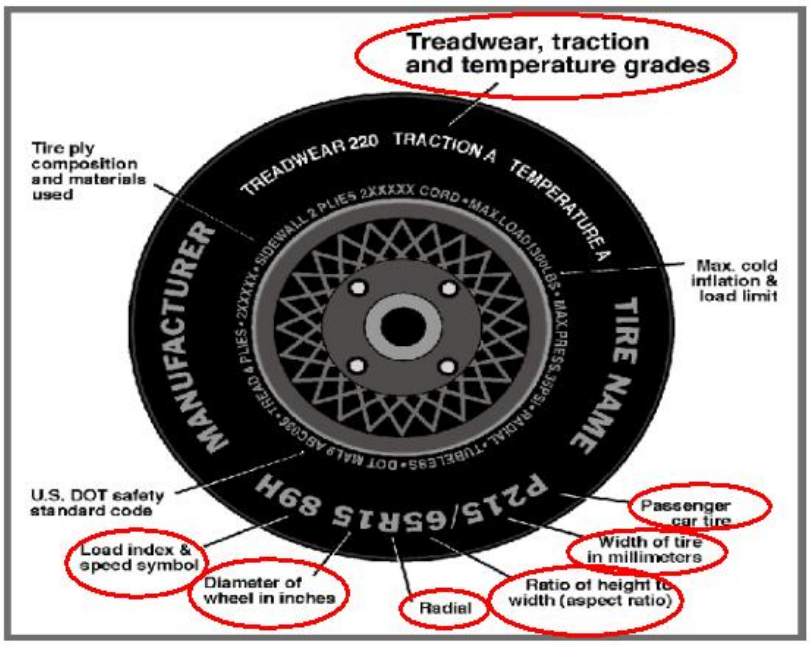
VEHICLE SEATING CAPACITY AND WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	3	3		6
Capacity Weight (VCW) (kg)				680
Cargo Weight (RCLW) (kg)				136

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

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



TIRE INFORMATION

Measured Paramater	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Tire Pressure (kPa)	240	240
Recommended Tire Size	P255/70R17	P255/70R17
Tire Size on Vehicle	P255/70R17	P255/70R17
Tire Manufacturer	General	General
Treadwear	500	500
Traction	A	A
Temperature Grades	B	B
Tire Plies - Sidewall	2	2
Tire Plies - Body	5	5
Load Index/Speed Symbol	110S	110S
Tire Material	Polyester, Steel, and Nylon.	Polyester, Steel, and Nylon.
DOT Safety Code Right	A3ND46WW	A3ND46WW
DOT Safety Code Left	A3ND46WW	A3ND46WW

DATA SHEET NO. 2…(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	739	541	1280	779	685	1464
Right	kg	728	570	1298	751	644	1395
Ratio	%	56.9	43.1	100.0	53.5	46.5	100.0
Totals	kg	1467	1111	2578	1530	1329	2859

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2578
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Weight (RCLW)	kg	136
Calculated Target Vehicle Test Weight (TVTW)	kg	2866

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	949	947	1003	1001	1586
As Tested	mm	945	938	966	965	1711

Vehicle Wheel Base (mm) 3680

Weight of Ballast Secured in Cargo Area (kg) 69

Weight of Items Removed (kg) 10

Vehicle Components Removed: Rear Window, Spare Tire Tools

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

FUEL SYSTEM DATA

Fuel System Capacity from Owner's Manual (L) 136.26

Actual Test Volume with Entire Fuel System Filled (L) 129.45

Test Fluid Type Stoddard Solvent

Kinematic Viscosity as per ASTM Standard D484-71 Red

Is Vehicle Fuel Pump Electric or Mechanical? Electric

If electric, does pump operate with the ignition switch "ON" & engine "OFF"? Yes

Fuel System Particulars The electric fuel pump operates for 3 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 3 seconds the fuel pump will shut off. The fuel pump operates continuously while the engine is running.

DATA SHEET NO. 3

POST-TEST IMPACT DATA

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

SPEED TRAP DATA

Measured Paramater	Units	Requirement	Value
Trap No. 1 Velocity	km/h	55.52 to 57.13	56.16
Trap No. 2 Velocity	km/h	55.52 to 57.13	56.17

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	5697	5205	492
Center	mm	5885	5277	608
Right Side	mm	5697	5225	472

VEHICLE REBOUND FROM BARRIER

Measured Paramater	Units	Value
Left Side	mm	258
Center	mm	465
Right Side	mm	440
Average	mm	388

DATA SHEET NO. 4

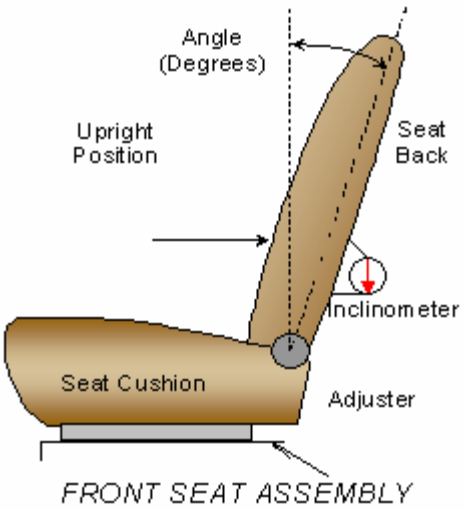
TEST VEHICLE INFORMATION

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

NOMINAL DESIGN RIDING POSITION

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



SEAT BACK ANGLES

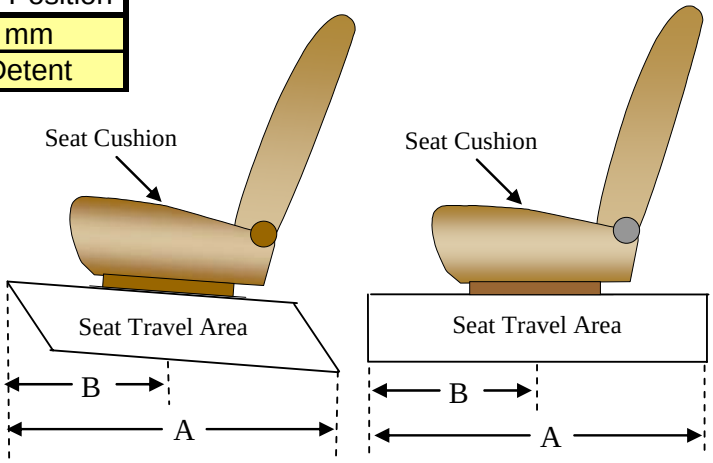
Position	Degrees
Driver w/ Seated Dummy	17.9 @ Seat Back
Passenger w/ Seated Dumm	18.0 @ Seat Back

SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position. The seat was set at the longitudinal mid position. There were vertical adjustments on the driver seat that was equipped with the vehicle. There were no adjustments on the passenger seat. The driver seat was placed in the lowermost position.

SEAT FORE/AFT POSITIONING

Position	Total Fore/Aft Travel	Placed in Position
Driver Seat	282 mm	141 mm
Passenger Seat	53 Detents	27th Detent



SEAT BELT ANCHORAGE

Position number one (1) is the uppermost position.

SEAT BELT ANCHORAGE POSITIONING

	Total Number of Positions	Placed in Position
Driver Seat	4	2
Passenger Seat	4	2

TEST VEHICLE INFORMATION

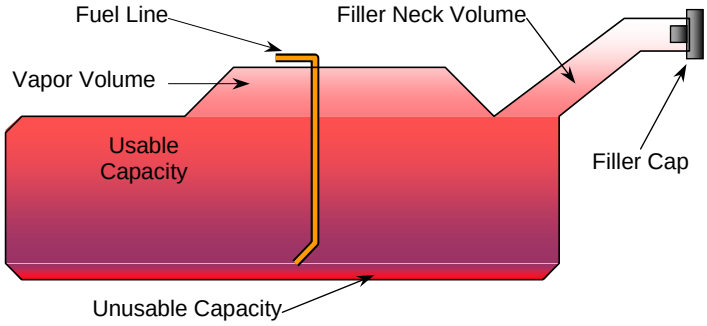
Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

FUEL TANK CAPACITY

	Liters
Usable Capacity of Standard Tank	136.26
Usable Capacity of Optional Tank	
Usable Capacity Used for FMVSS 301	125.36 to 128.10
Actual Amount of Solvent Used	126.72

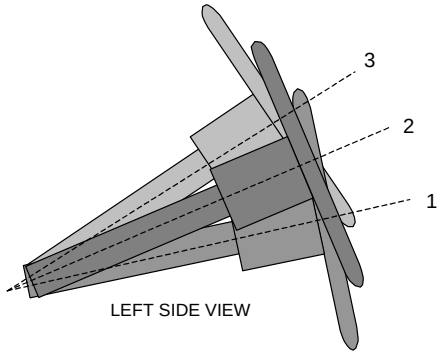
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately two (2) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area left side of truck bed.



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	11.5	
Geometric Center - Position No. 2	21.6	
Uppermost - Position No. 3	31.7	

DATA SHEET NO. 5

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

TEST DUMMY POSITION MEASUREMENTS

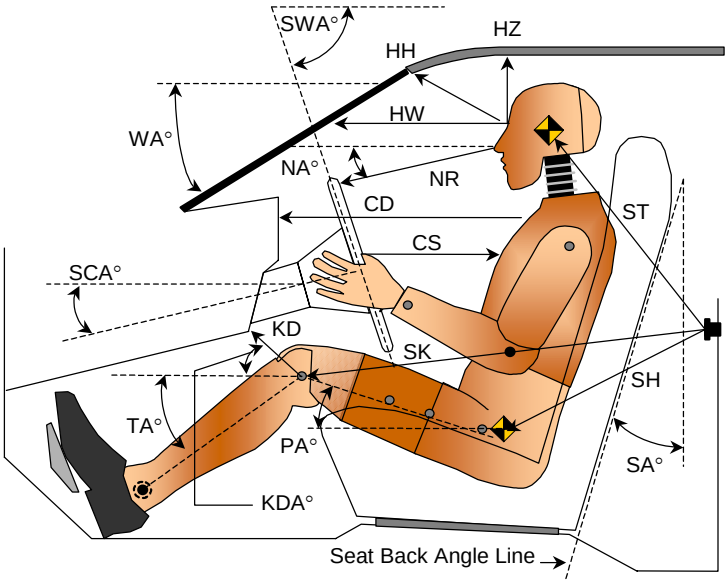
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windsheild angle		32.0		
SWA	Steering wheel angle		21.4		
SCA	Steering column angle		68.6		
SA	Seat Back angle		17.9		18.0
HZ	Head to roof (Z)	277	90.0	272	90.0
HH	Head to header	465		447	
HW	Head to windshield	730		729	
HR	Head to side header (Y)	308		296	
NR	Nost to rim	410	3.3		
CD	Chest to dash	592		586	
CS	Chest to steering hub	367			
RA	Rim to abdomen	231			
KDL	Left knee to dash	189	30.5	154	
KDR	Right knee to dash	169		162	23.5
PA	Pelvic angle		24.9		23.1
TA	Tibia Angle		55.4		63.1
KK	Knee to knee	294		280	
SK	Striker to outboard knee	734	9.4	755	9.0
ST	Striker to head	625	65.3	667	64.8
SH	Striker to H-Point	369	0.0	371	0.0
SHY	Striker to H-Point (Y)	280		270	
HS	Head to side window	362		364	
HD	H-Point to door	161		137	
AD	Arm to door	166		143	

DATA SHEET NO. 5…(CONTINUED)

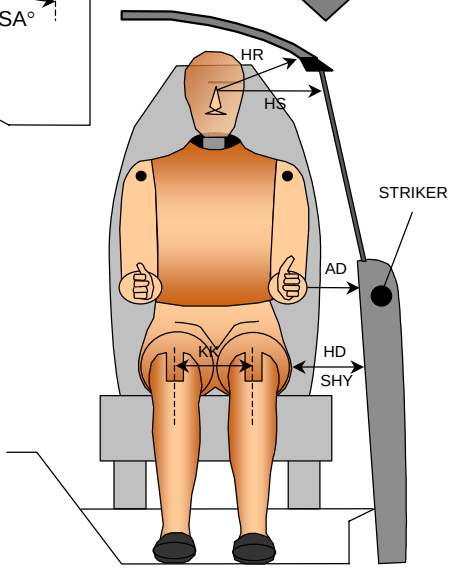
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

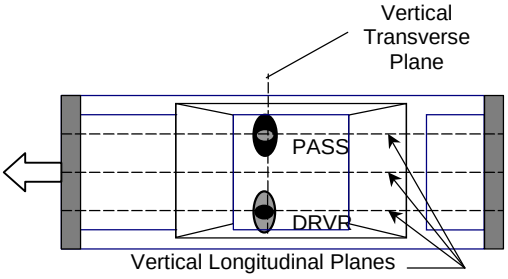
Test Program: NHTSA 35mph NCAP Test Date: 12/19/08



AD	Arm to Door
HD	H-Point to Door
HR	Head to Side Header
HS	Head to Side Window
KK	Knee to Knee
SHY	Striker to H-Point (Y Axis)



CD	Chest to Dash
CS	Chest to Steering Wheel Hub
HH	Head to Header
HW	Head to Windshield
HZ	Head to Roof
KDA	Knee to Dash Angle
KDL	Left Knee to Dash
KDR	Right Knee to Dash
NA	Nose to Rim Angle
NR	Nose to Rim
PA	Pelvic Angle
RA	Rim to Abdomen
SA	Seat Back Angle
SCA	Steering Column Angle
SH	Striker to H-Point
SK	Striker to Knee
ST	Striker to Head
SWA	Steering Wheel Angle
TA	Tibial Angle
WA	Windshield Angle

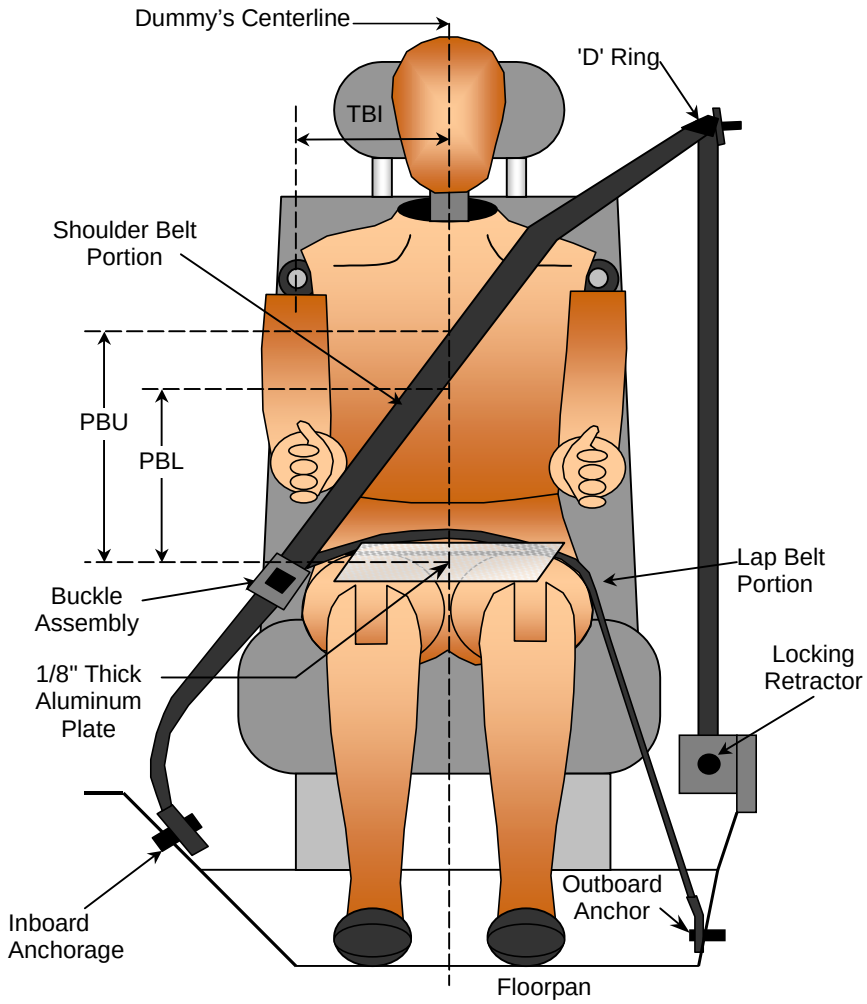


DATA SHEET NO. 6

SEAT BELT POSITIONING DATA

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08



SEAT BELT POSITIONING MEASUREMENTS

Measured Parameter	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	200	210
PBU - Top Surface of Reference to Belt Upper Edge	mm	345	320
PBL - Top Surface of Reference to Belt Lower Edge	mm	260	235
Lap Belt Tension	Newtons	10	10
Shoulder Belt Tension	N/A	Retractor	Retractor

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurement (mm)			
		X	Y	Z	
1	Left Rear X-Member	2560	-785	605	
2	Right Rear X-Member	2560	785	605	
3	Engine Top				2
4	Engine Bottom	4850	100	295	
5	Left Brake Caliper	4775	-735	360	
6	Right Brake Caliper	4775	735	360	
7	Instrument Panel				1
8	Left Rear X-Member (Z-Axis)	2560	-785	605	
9	Right Rear X-Member (Z-Axis)	2560	785	605	

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

1.) Instrument Panel no longer used by NHTSA.

2.) Not installed.

DATA SHEET NO. 8

SEAT BELT ASSESSMENT TEST DATA

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
Retractor Reel to D-Ring	mm	725	725
Shoulder Belt Length as Measured on ATD	mm	921	969
Lap Belt Length as Measured on ATD	mm	600	576
Remainder of Belt on Reel	mm	796	781
Total Belt Length for Continuous Webbing Systems	mm	3042	3051

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	140	224
As determined electronically	mm	133.9	253.4

BELT STRETCH DATA

Measurement Description	Units	Driver	Passenger
Electronically between belt load cell and D-Ring	mm/cm	*	*
Mechanically	mm/cm		

*Not used with shoulder belt pre-tensioner systems

DATA SHEET NO. 9

SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

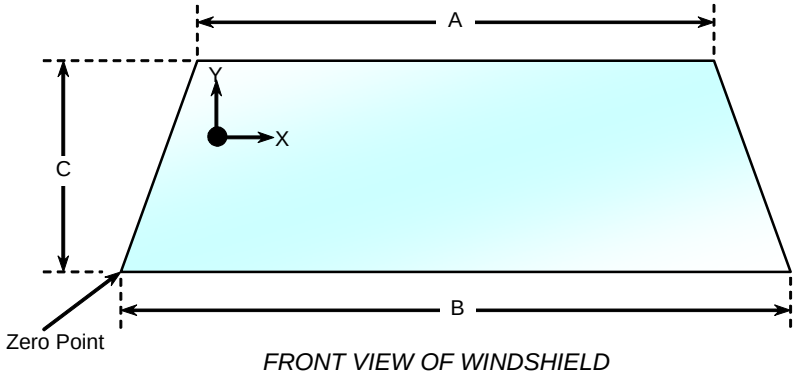
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with Rubber Cement type adhesive. Plastic molding covers the windshield periphery.

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: 5.6 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2426	2426	100.0
Right Side	2426	2426	100.0
Total	4852	4852	100.0



FRONT VIEW OF WINDSHIELD

WINDSHIELD DIMENSIONS

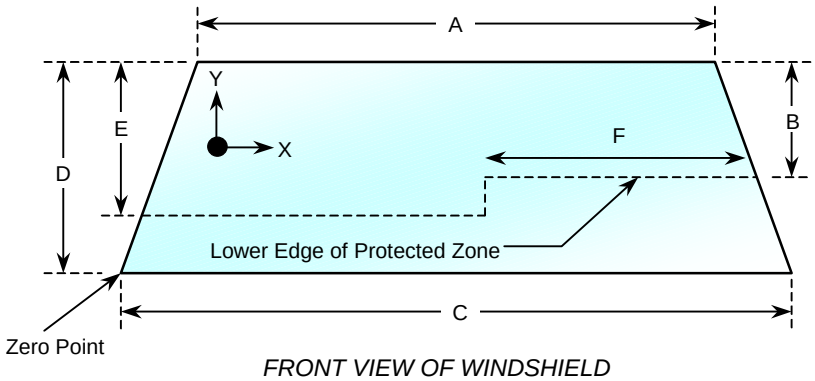
Item	Units	Segment Length	Molding Width
A	mm	1467	5
B	mm	1825	12
C-Left	mm	780	8
C-Right	mm	780	8

DATA SHEET NO. 10

WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08



FRONT VIEW OF WINDSHIELD

WINDSHIELD AND PROTECTED ZONE

Item	Units	Value
A	mm	1467
B	mm	431
C	mm	1825
D	mm	780
E	mm	475
F	mm	624

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: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

Test Time: 4:00 PM Temperature: 5.6 ºC

STODDARD SOLVENT SPILLAGE MEASUREMENTS

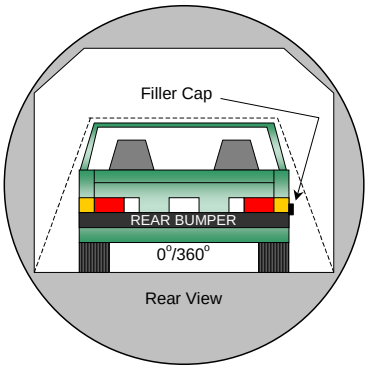
A.	From impact until vehicle motion ceases:	0
	(Maximum allowable = 1 ounce)	
B.	For the 5 minute period after motion ceases:	0
	(Maximum allowable = 5 ounces)	
C.	For the following 25 minutes:	0
	(Maximum allowable = 1 oz/minute)	
D.	Spillage Details:	No leakage occurred

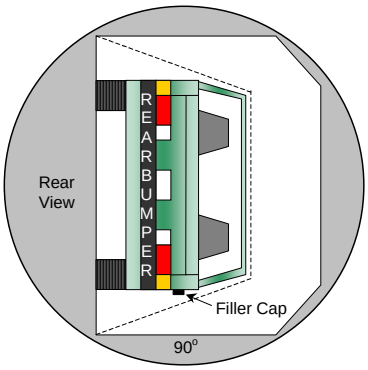
DATA SHEET NO. 12

FMVSS 301 STATIC ROLLOVER DATA

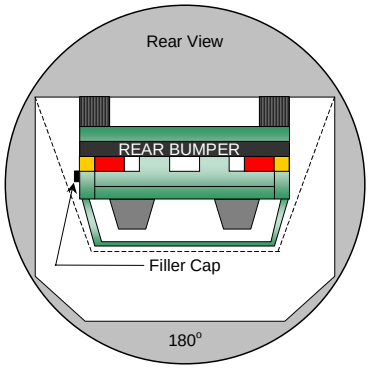
Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

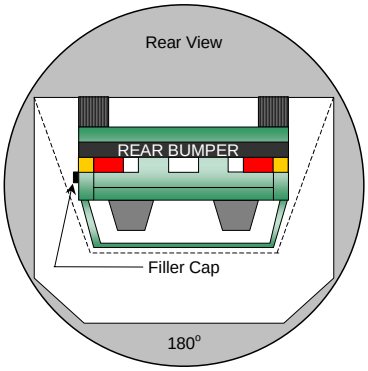




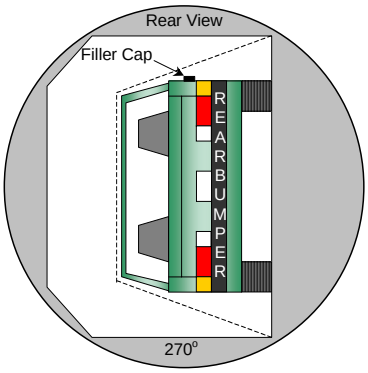
0° to 90°

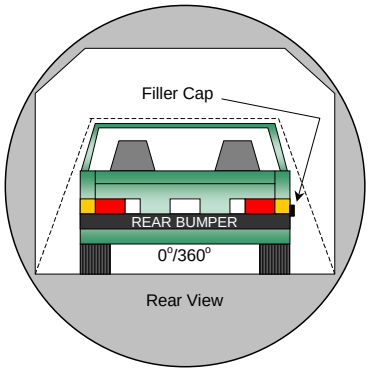


90° to 180°



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: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	80	310	390
90° to 180°	84	310	394
180° to 270°	83	302	385
270° to 360°	85	305	390

FMVSS 301 SPILLAGE TABLE REQUIREMENT

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: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

VEHICLE MEASUREMENT TABLE

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Length of test vehicle at centerline	mm	5885	5277	-608
2	RSOV to front of engine	mm	5082	4945	-137
3	RSOV to firewall centerline	mm	4695	4665	-30
4	RSOV to upper leading edge of right door	mm	4296	4300	4
5	RSOV to upper leading edge of left door	mm	4296	4296	0
6	RSOV to lower leading edge of right door	mm	4250	4262	12
7	RSOV to lower leading edge of left door	mm	4254	4254	0
8	RSOV to upper trailing edge of right door	mm	3047	3046	-1
9	RSOV to upper trailing edge of left door	mm	3046	3040	-6
10	RSOV to lower trailing edge of right door	mm	3023	3028	5
11	RSOV to lower trailing edge of left door	mm	3023	3025	2
12	RSOV to bottom of right A-pillar	mm	4263	4269	6
13	RSOV to bottom of left A-pillar	mm	4268	4280	12
14	RSOV to firewall on right side	mm	4685	4665	-20
15	RSOV to firewall on left side	mm	4690	4685	-5
16	RSOV to steering column hub	mm	3845	3870	25
17	Center of steering column to left A-pillar, Y	mm	482	495	13
18	Center of steering column to headlining, Z	mm	493	430	-63
19	RSOV to right side of front bumper	mm	5697	5225	-472
20	RSOV to left side of front bumper	mm	5697	5205	-492
21	Length of engine block	mm	600	600	0
RD	RSOV to right side of dash panel	mm	4030	4040	10
CD	RSOV to center of dash panel	mm	4050	4050	0
LD	RSOV to left side of dash panel	mm	4030	4025	-5

DATA SHEET NO. 13…(CONTINUED)

VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

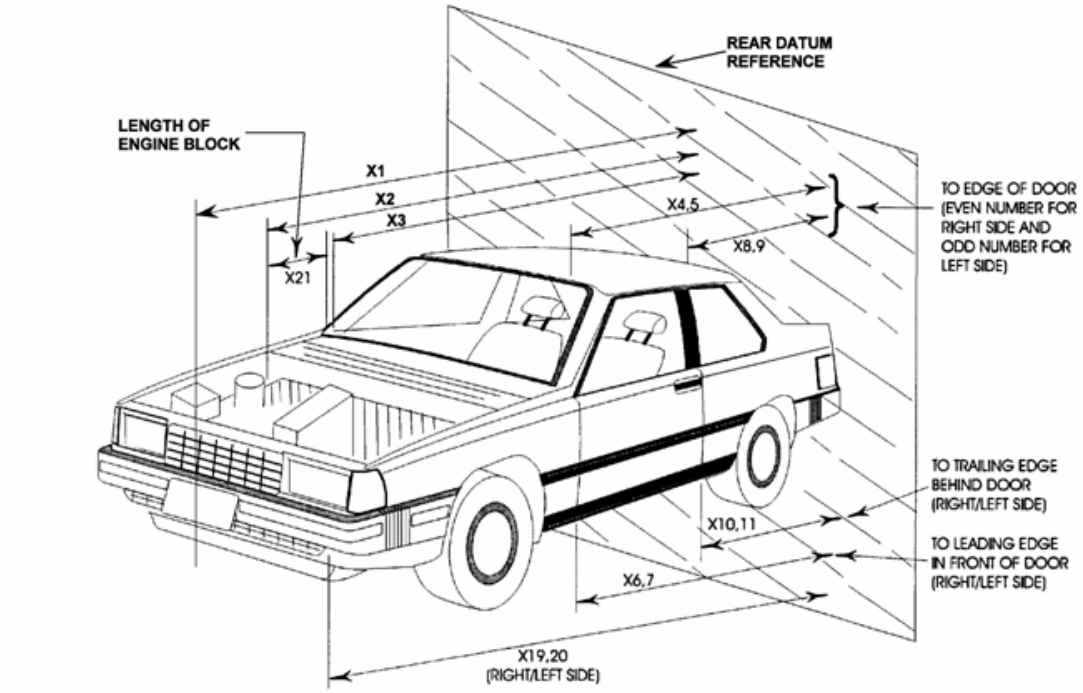
VEHICLE STRUCTURAL MEASUREMENT TABLE

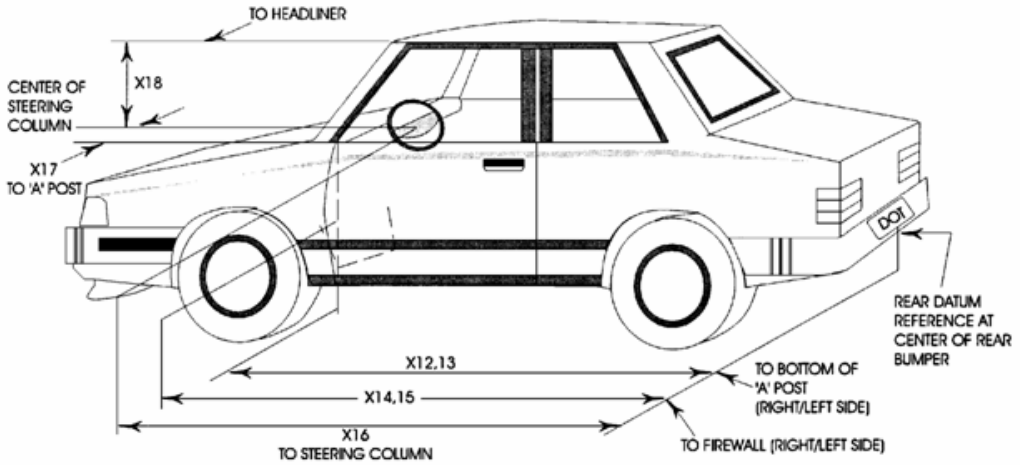
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length	mm	5885	5277	-608
2	Total width	mm	1964	1970	6
3	Front bumper top height	mm	660	630	-30
4	Front bumper bottom height	mm	398	384	-14
5	Longitudinal member top height	mm	575	430	-145
6	Longtidunal member bottom height	mm	425	330	-95
7	Distance between longitudinal members	mm	755	750	-5
8	Longitudinal member width	mm	115	123	8
9	Engine top height	mm	1021	1046	25
10	Engine bottom height	mm	317	366	49
11	Engine and gearbox width	mm	760	760	0
12	Front bumper-engine distance	mm	803	330	-473
13	Front shock absorber height	mm	840	870	30
14	Front hood leading edge height	mm	1160	1165	5
15	Disatnce between front shock absorbers	mm	920	1010	90
16	Front bumper-front axle distance	mm	970	510	-460
17	Front axle to A-pillar distance	mm	605	495	-110
18	A Pillar to B Pillar distance	mm	1155	1152	-3
19	B Pillar to rear axle distance	mm	1803	1780	-23
20	B Pillar to C Pillar distance	mm	833	832	-1
21	Roof sill bottom height	mm	1765	1773	8
22	Roof sill top height	mm	1880	1875	-5
23	Floor sill bottom height	mm	458	466	8
24	Floor sill top height	mm	593	600	7

VEHICLE MEASUREMENTS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08





DATA SHEET NO. 14

CAMERA LOCATIONS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

VEHICLE CAMERA MEASUREMENT TABLE

No.	Camera View	Location			Angle (deg)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Real Time Camera (Panning)	-11412	-8150	-1484	0			30
2	Overall Left Side	-2538	-7621	-1128	0	8105	20	1000
3	Closeup Left Side	-1678	-7228	-1456	0	7844	50	1000
4	Driver and Interior View	-6696	-5987	-1071	-17	15570	ZOOM	1000
5	Steering Column (Bottom)	-1972	-8184	-2879	-13	9453	35	1000
6	Steering Column (Top)	-1966	-8141	-3258	-13	9549	35	1000
7	Overall Right Side	-2956	7857	-1129	0	7409	20	1000
8	Closeup Right Side	-1691	-1208	-1478	0	7079	50	1000
9	Passenger and Interior View	-5136	9516	-2460	-10	10211	ZOOM	1000
10	Right Side View	-1582	7995	-1713	-6	7134	ZOOM	1000
11	Windshield View	-354	0	-5749	-90		24	1000
12	Driver Front View	363	-543	-2548	-34		25	1000
13	Passenger Front View	381	445	-2548	-34		25	1000
14	Pit View of Engine	-756	0	1495	90		12	1000
15	Pit View of Fuel Tank	-3398	0	1495	90		8	1000
16	Driver Side Dummy On-Board	-3467	229	1843	-26	1065	12	1000
17	Passenger Side Dummy On-Board	-3465	227	1845	-25	1073	12	1000

All measurements are made relative to the point of impact.

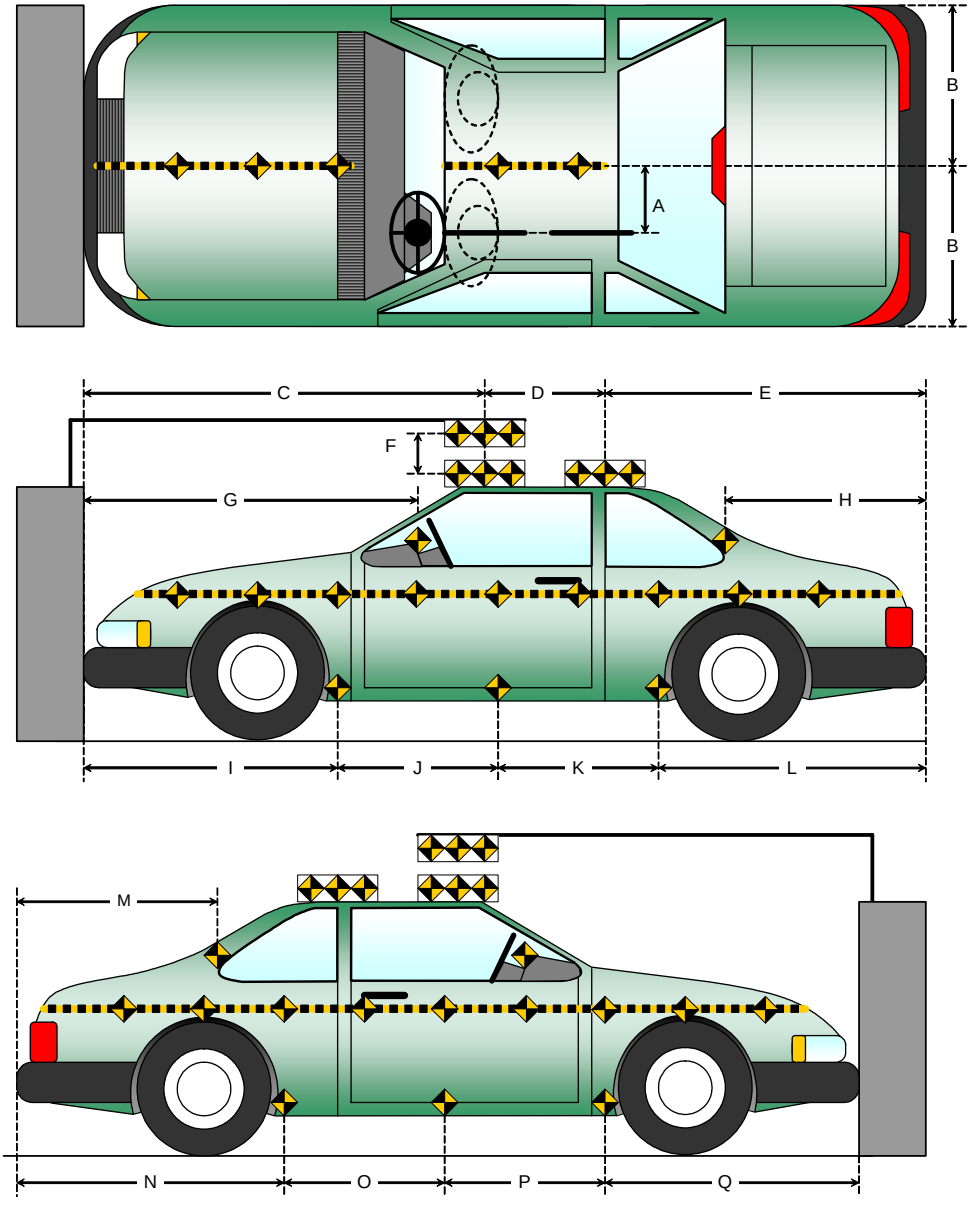
DATA SHEET NO. 15

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

All Dimensions in Millimeters (mm)	
Item	Value
A	460
B	982
C	2280
D	615
E	2954
F	155
G	1890
H	2047
I	1540
J	1112
K	1112
L	2116
M	2050
N	2127
O	1102
P	1102
Q	1552



DATA SHEET NO. 16

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

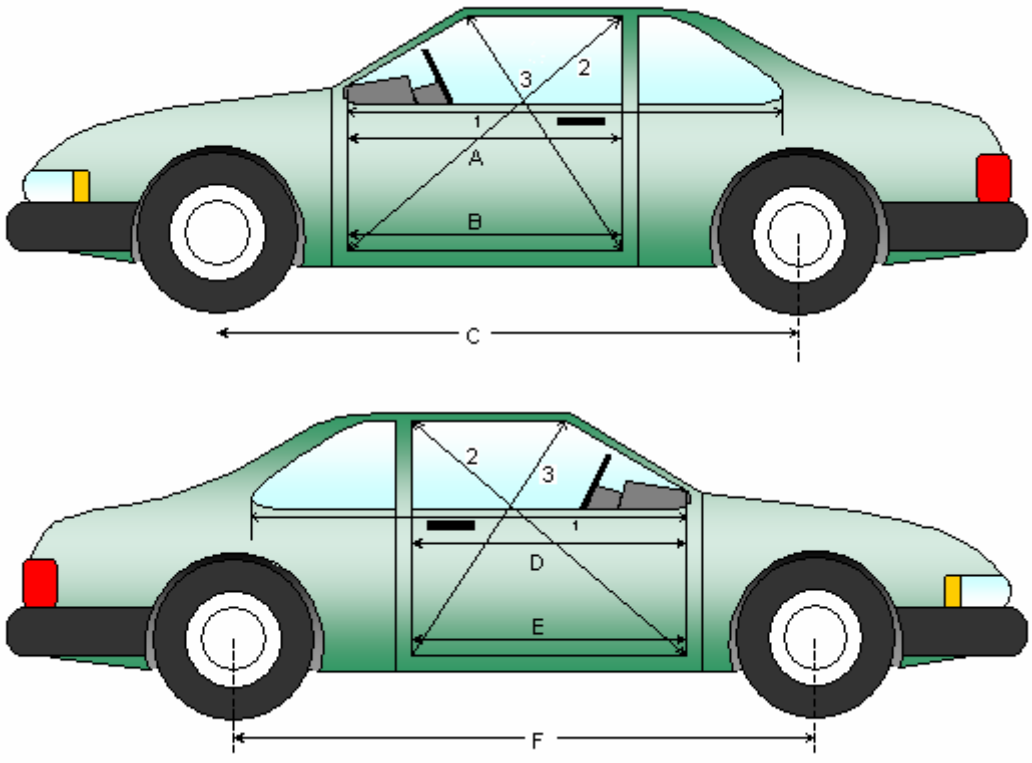
Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

DOOR OPENING WIDTH TABLE

Item	Description	Units	Pre-Test	Post-Test	Difference
1L	Left Side	mm	1155	1152	3
2L	Left Side (Diagonally)	mm	1630	1646	-16
3L	Left Side (Diagonally)	mm	1338	1336	2
1R	Right Side	mm	1148	1148	0
2R	Right Side (Diagonally)	mm	1645	1636	9
3R	Right Side (Diagonally)	mm	1328	1336	-8

WHEELBASE MEASURMENT TABLE

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3680	3525	155
F	Right Side Wheelbase	mm	3680	3560	120



DATA SHEET NO. 16…(CONTINUED)

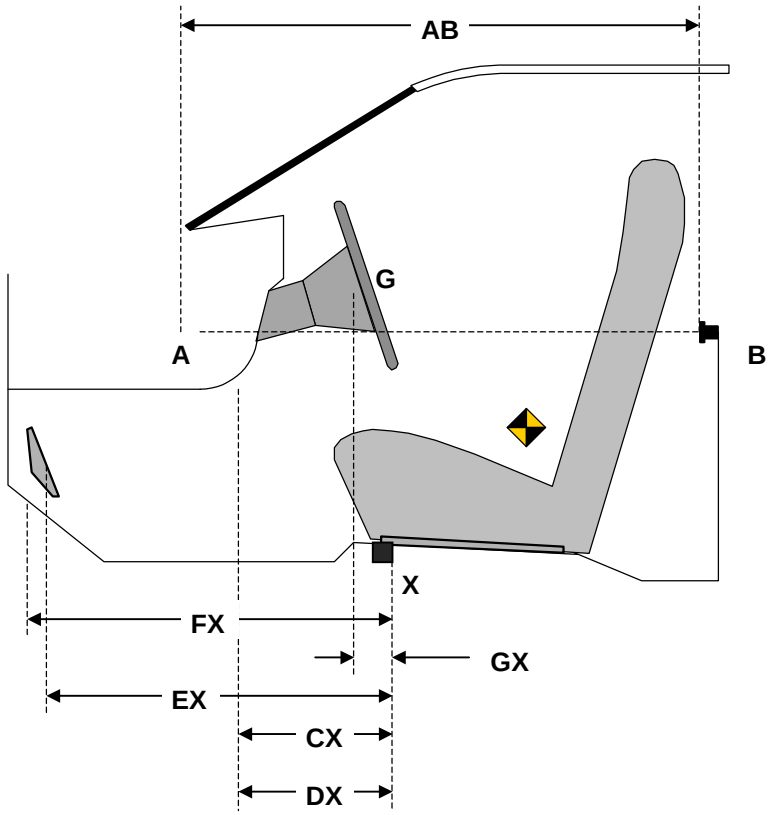
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

DRIVER COMPARTMENT INTRUSION TABLE

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Windown Jam)	mm	1155	1152	3
CX	Left Knee Bolster to X	mm	280	240	40
DX	Right Knee Bolster to X	mm	340	240	100
EX	Brake Pedal to X	mm	503	480	23
FX	Foot Rest to X	mm	563	490	73
GX	Center of Steering Wheel Hub to X	mm	80	90	-10

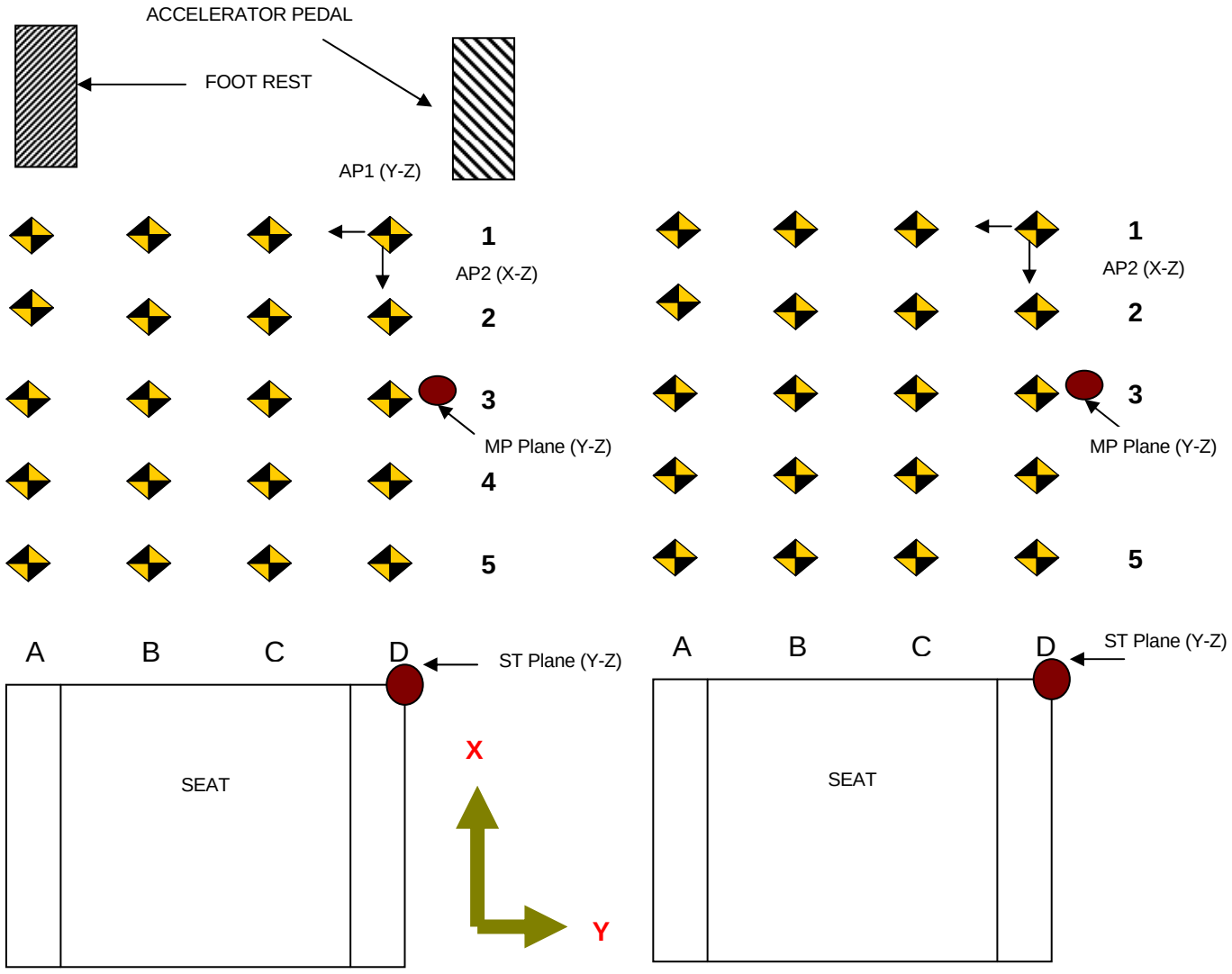


DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08



AP1: Y-Z Plane passing through D1
AP2: X-Z Plane passing through D1
AP3: X-Y plane passing through D1
MP: Y-Z plane, halfway between the ST plane and AP1 plane
CF Plane: X-Z plane passes through center of footrest.
BP Plane: X-Z plane passes through center of brake pedal
TP Plane: Y-Z plane, intersection of BP Plane and the intersection of the toe pan and floorboard
Column A: intersection of vehicle and CF plane
Column D: Intersection of vehicle and AP2 plane
Row 1: intersection of the vehicle and the AP3 Plane
Row 3: intersection of the vehicle and TP plane
Row 5: intersection of the vehicle and MP plane
Row 2: evenly spaced between row 1 and 3
Row 4: evenly spaced between row 3 and 5

DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

All measurements in mm

DRIVER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	661	659	658	657	637	632	625	616	24	27	33	41
2	567	567	563	560	551	549	545	537	16	18	18	23
3	466	468	467	467	448	452	451	446	18	16	16	21
4	346	343	342	342	328	327	325	326	18	16	17	16
5	224	224	220	216	208	207	202	201	16	17	18	15

DRIVER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	64	145	223	365	57	137	214	356	7	8	9	9
2	65	146	224	367	54	136	212	356	11	10	12	11
3	64	150	226	371	51	135	213	358	13	15	13	13
4	58	145	226	367	49	133	213	354	9	12	13	13
5	59	146	223	372	48	134	211	360	11	12	12	12

DRIVER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-42	-45	-44	-44	-23	-26	-22	-23	-19	-19	-22	-21
2	-89	-90	-90	-90	-84	-85	-88	-85	-5	-5	-2	-5
3	-129	-127	-130	-130	-113	-128	-135	-132	-16	1	5	2
4	-128	-126	-129	-133	-132	-132	-137	-151	4	6	8	18
5	-129	-121	-127	-130	-133	-128	-136	-145	4	7	9	15

DATA SHEET NO. 16…(CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

All measurements in mm

PASSENGER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	644	667	667	668	612	637	643	645	32	30	24	23
2	397	570	571	467	546	547	553	557	-149	23	18	15
3	345	466	465	347	450	453	453	453	14	13	12	14
4	225	346	347	227	330	332	332	334	15	14	15	13
5	225	225	227	227	211	212	212	212	14	13	15	15

DRIVER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	368	233	152	61	365	230	149	59	3	3	3	2
2	370	230	152	62	369	227	147	58	1	3	5	4
3	371	230	151	58	369	226	148	55	2	4	3	3
4	371	229	147	59	368	225	144	57	3	4	3	2
5	371	225	144	57	368	220	141	55	3	5	3	2

PASSENGER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	13	35	39	38	18	0	10	12	-5	35	29	26
2	53	87	89	89	63	63	70	74	-10	24	19	15
3	127	131	130	131	117	124	120	117	10	7	10	14
4	126	129	126	129	126	127	121	116	0	2	5	13
5	123	125	123	129	128	126	120	123	-5	-1	3	6

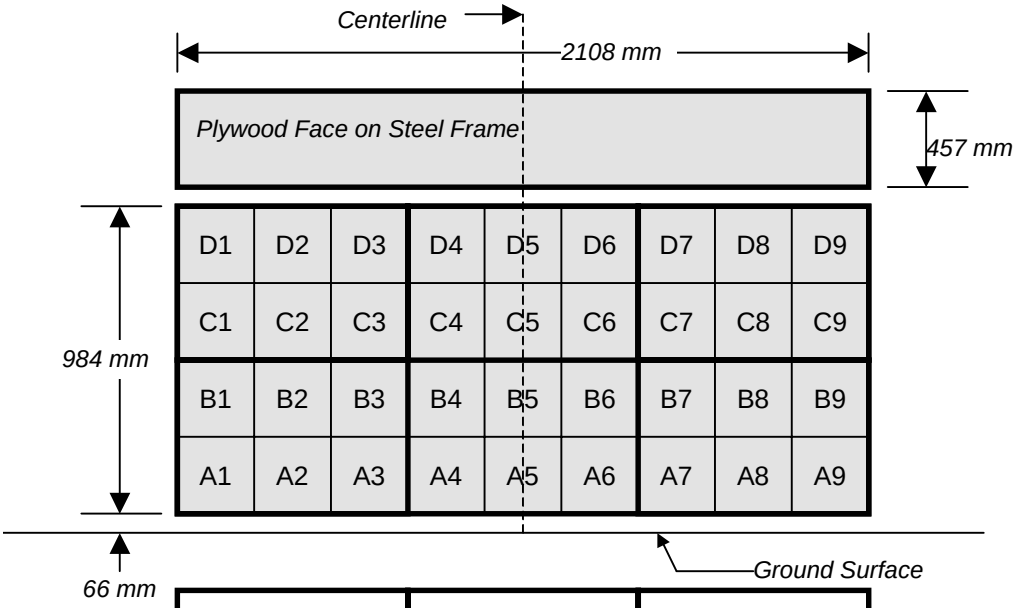
DATA SHEET NO. 17

FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

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



D1	D2	D3	D4	D5	D6	D7	D8	D9
C1	C2	C3	C4	C5	C6	C7	C8	C9
B1	B2	B3	B4	B5	B6	B7	B8	B9
A1	A2	A3	A4	A5	A6	A7	A8	A9

Group 4 C1 – D3	Group 5 C4 – D6	Group 6 C7 – D9
Group 1 A1 – B3	Group 2 A4 – B6	Group 3 A7 – B9

6 Groups of 6 Load Cells Each

DATA SHEET NO. 18

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08

VEHICLE INFORMATION

VIN: 1FTPW14V89FA02226 Wheelbase (mm): 3680

Vehicle Size Category: 4-Door Truck Test Weight (kg): 2859

ACCELEROMETER DATA

Accelerometer Location: Left rear cross member

Cal. Procedure/Interval: 6 months/drop test

Integration Algorithm: NHTSA Standard Linearity: Good

Impact Velocity (km/h): 56.16

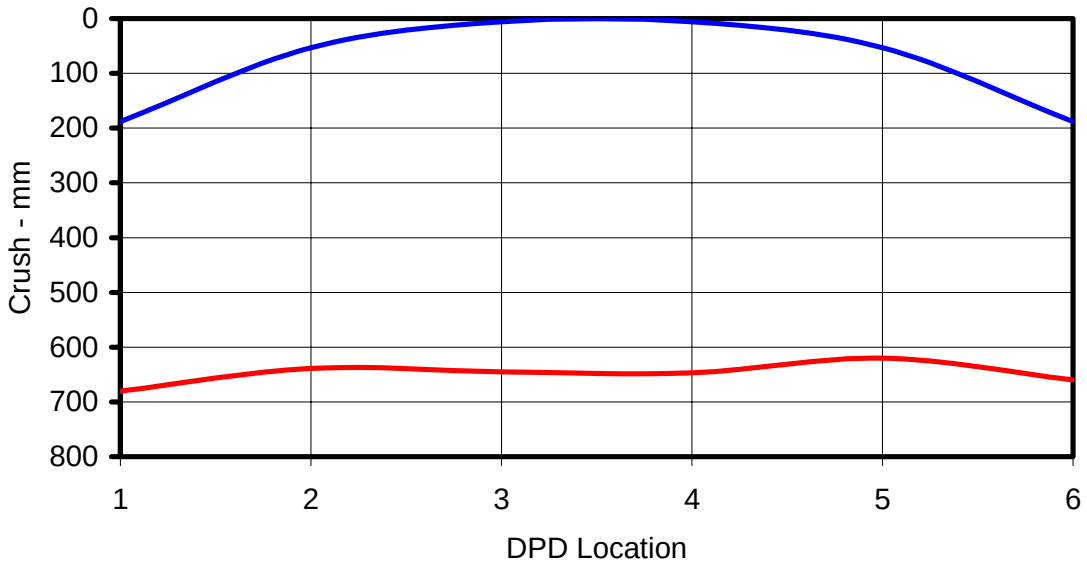
Velocity Change (km/h): 66.1 Time of Separation (msec): 75.5

CRUSH PROFILE

Collision Deformation Classification: 12FDEW6 Midpoint of Damage: Vehicle Centerline

Damage Region Length: 1474 Impact Mode: Full frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side of vehicle	mm	188	680	-492
C2	Crush zone 2 on left side of vehicle	mm	53	639	-586
C3	Crush zone 3 on left side of vehicle	mm	6	645	-639
C4	Crush zone 4 on right side of vehicle	mm	6	647	-641
C5	Crush zone 5 on right side of vehicle	mm	53	620	-567
C6	Crush zone 6 at right side of vehicle	mm	188	660	-472

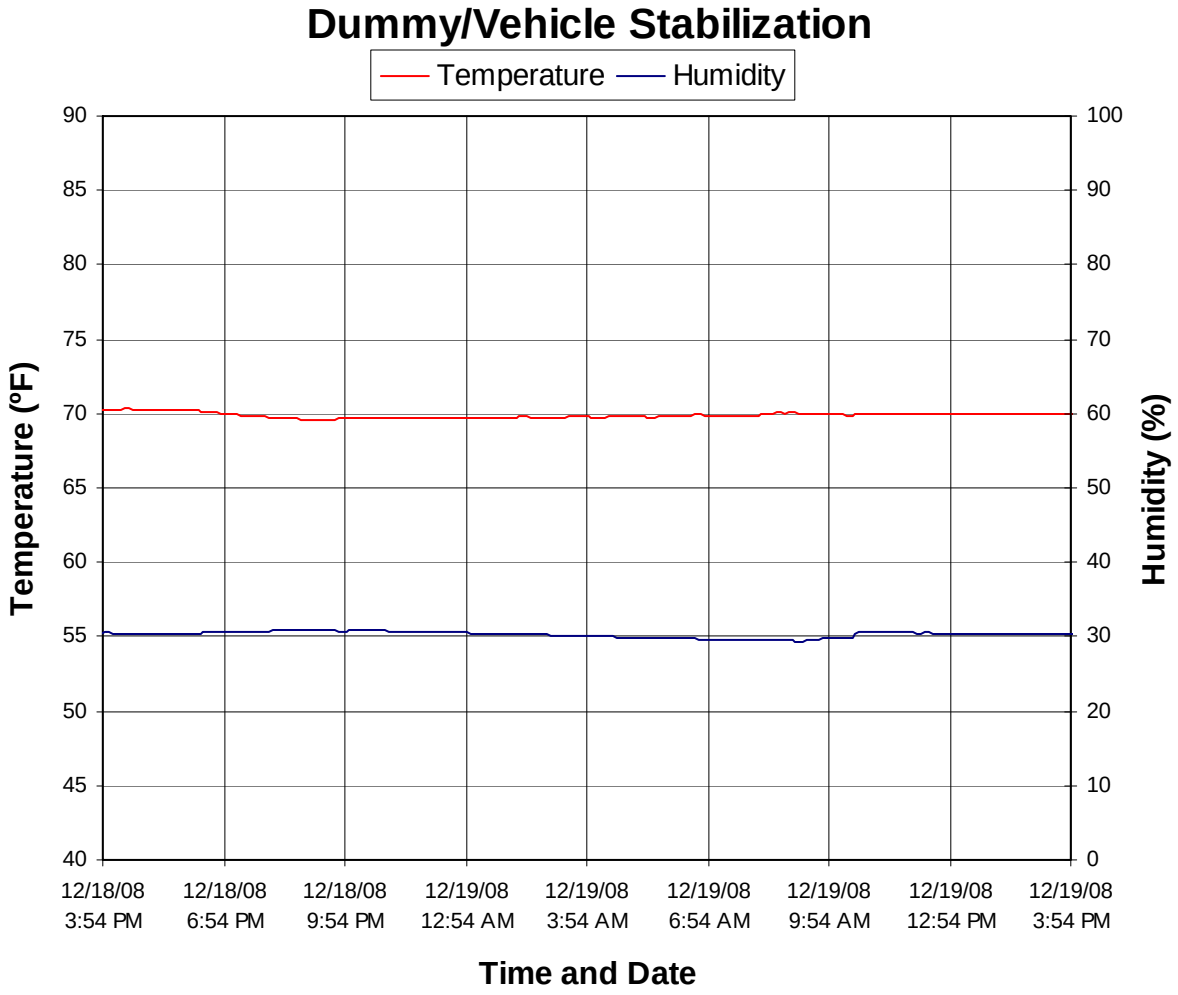


DATA SHEET NO. 19

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2009 Ford F-150 XLT Supercrew 4x4 4-Door Truck NHTSA No.: M90205

Test Program: NHTSA 35mph NCAP Test Date: 12/19/08



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

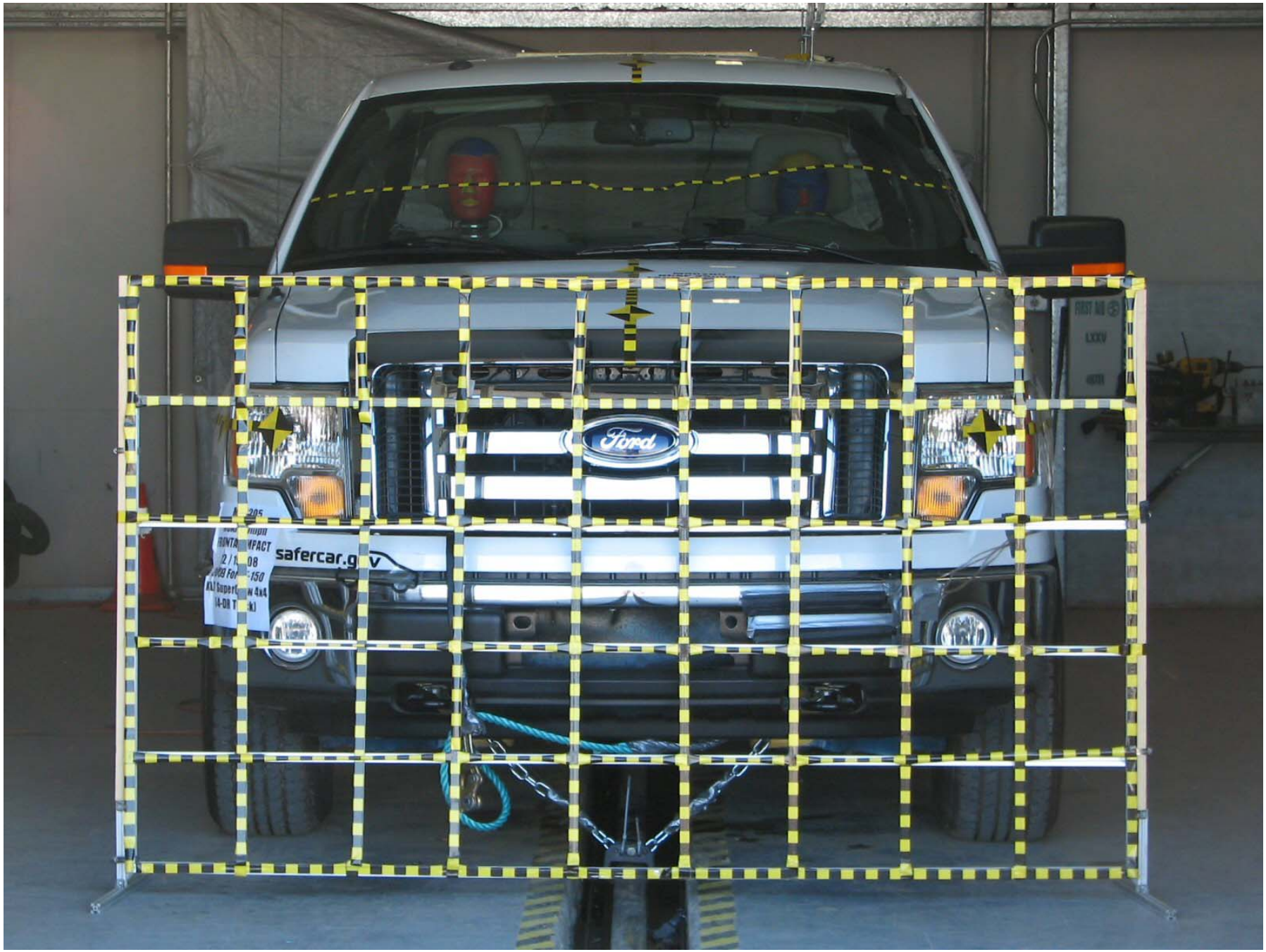


Figure A-1: Load Cell Location

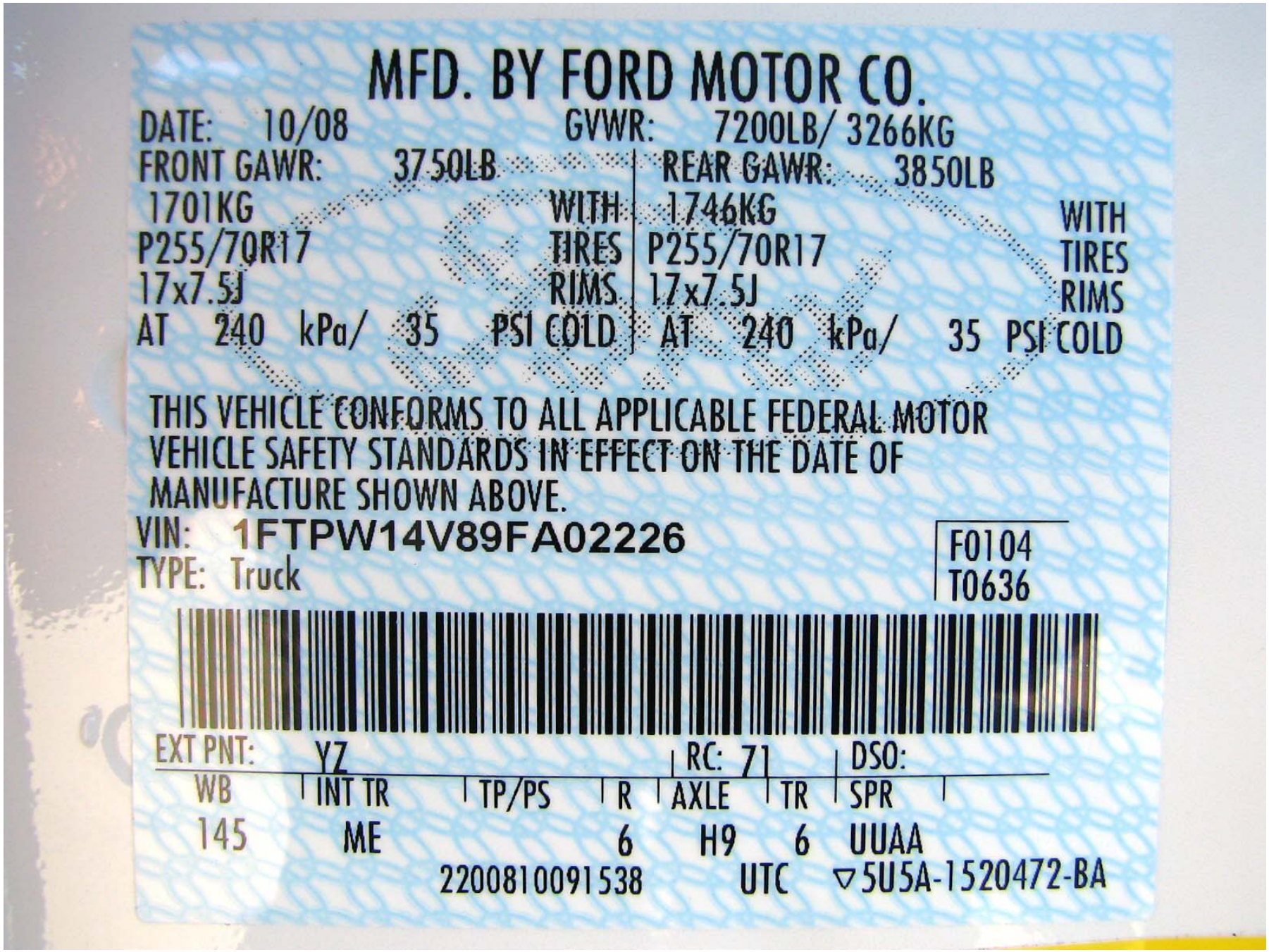


Figure A-2: Manufacturer's Label

Figure A-3: Tire Placard

Figure A-4: Right Front ¾ View, As Received

Figure A-5: Left Rear ¾ View, as Received

Figure A-6: Pre-Test Front View

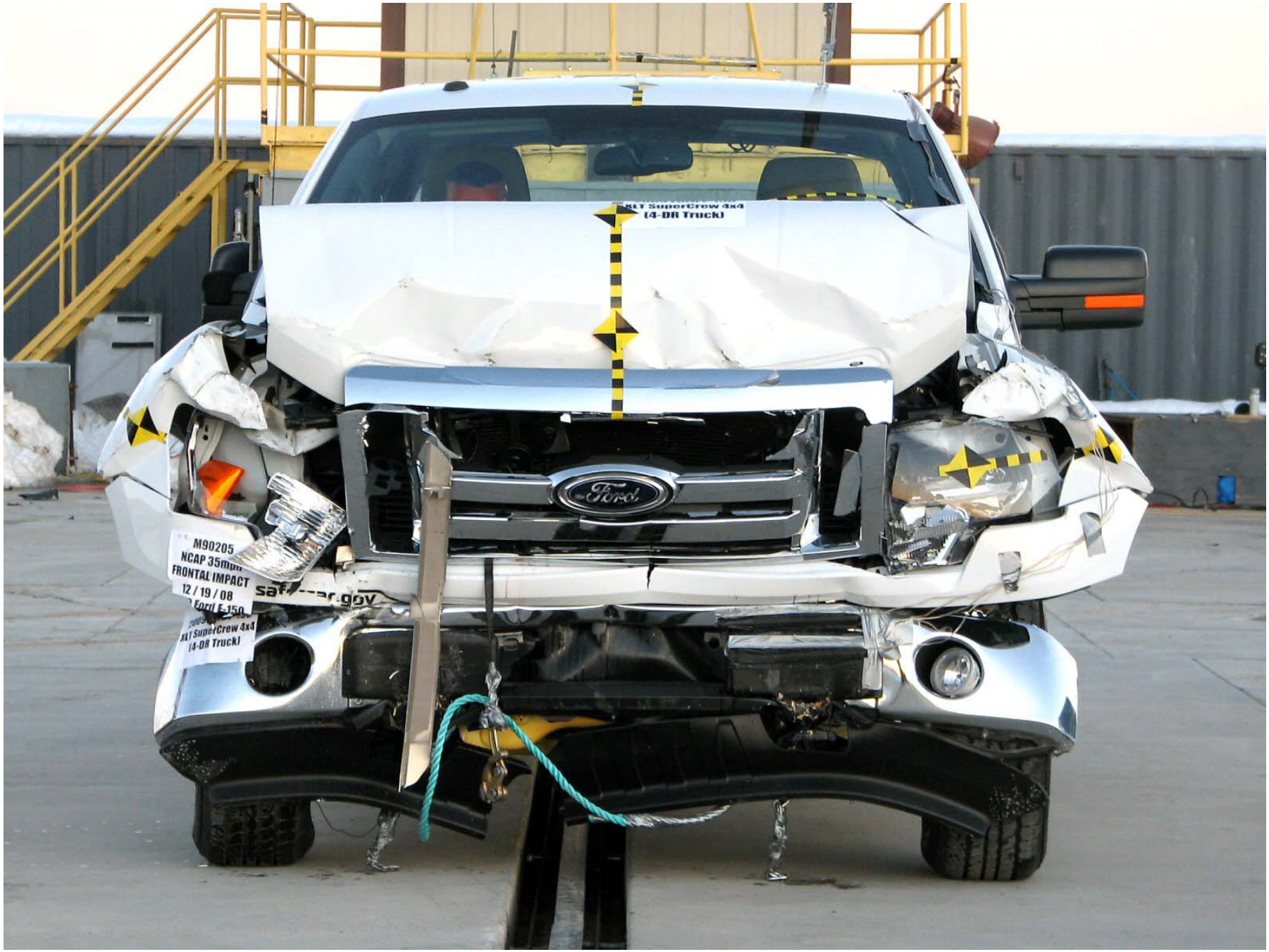


Figure A-7: Post-Test Front View (Vehicle Moved)

Figure A-8: Pre-Test Left Side View

Figure A-9: Post-Test Left Side View

Figure A-10: Pre-Test Right Side View

Figure A-11: Post-Test Right Side View

Figure A-12: Pre-Test Right Front ¾ View

Figure A-13: Post-Test Right Front ¾ View (Vehicle Moved)

Figure A-14: Pre-Test Left Rear ¾ View

Figure A-15: Post-Test Left Rear ¾ View

Figure A-16: Post-Test Left Side ¾ View of Doors After Impact

Figure A-17: Post-Test Right Side ¾ View of Doors After Impact

Figure A-18: Pre-Test Windshield

Figure A-19: Post-Test Windshield

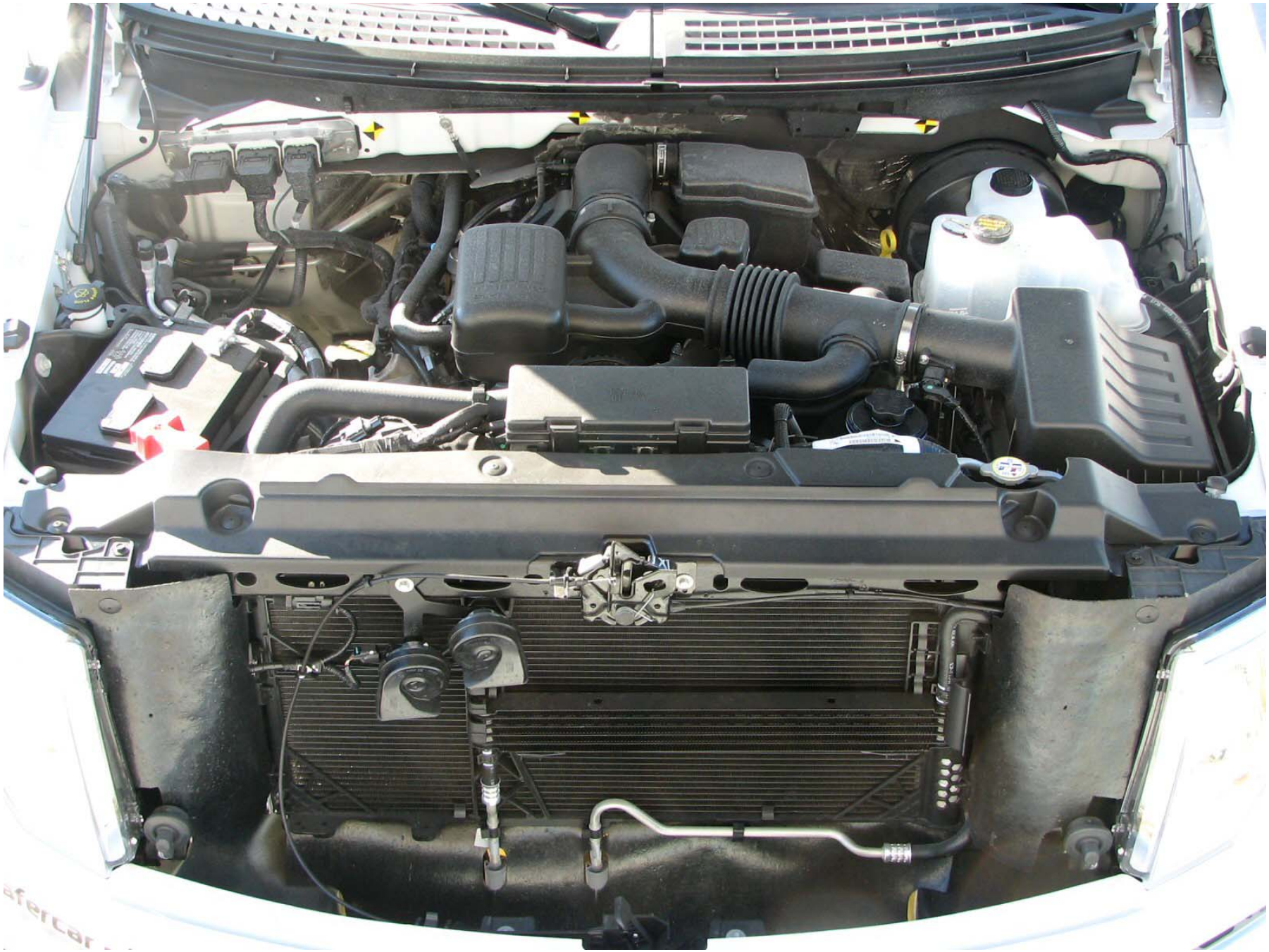


Figure A-20: Pre-Test Engine Compartment

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

Figure A-22: Pre-Test Fuel Cap

Figure A-23: Post-Test Fuel Cap

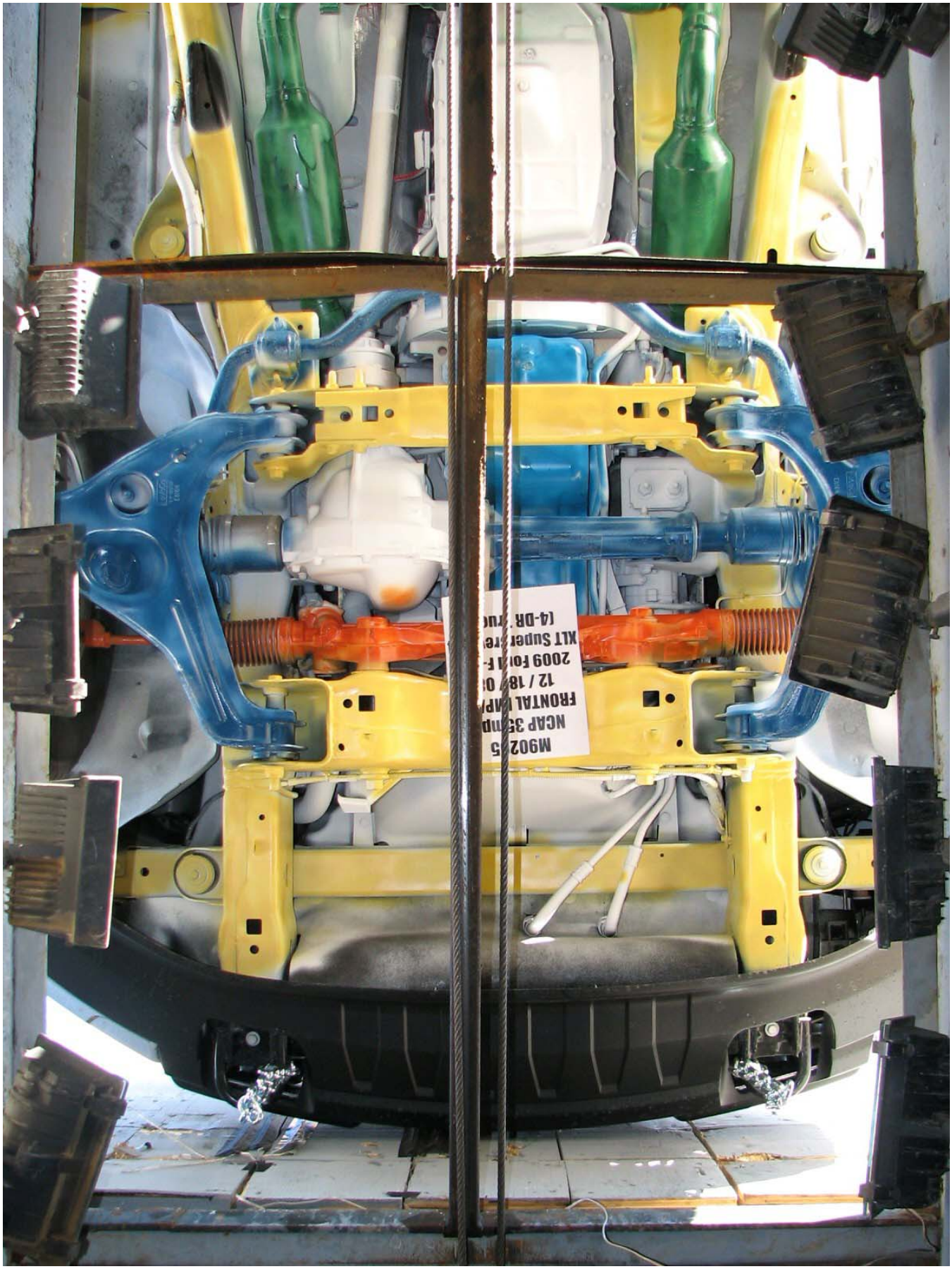


Figure A-24: Pre-Test Front Underbody

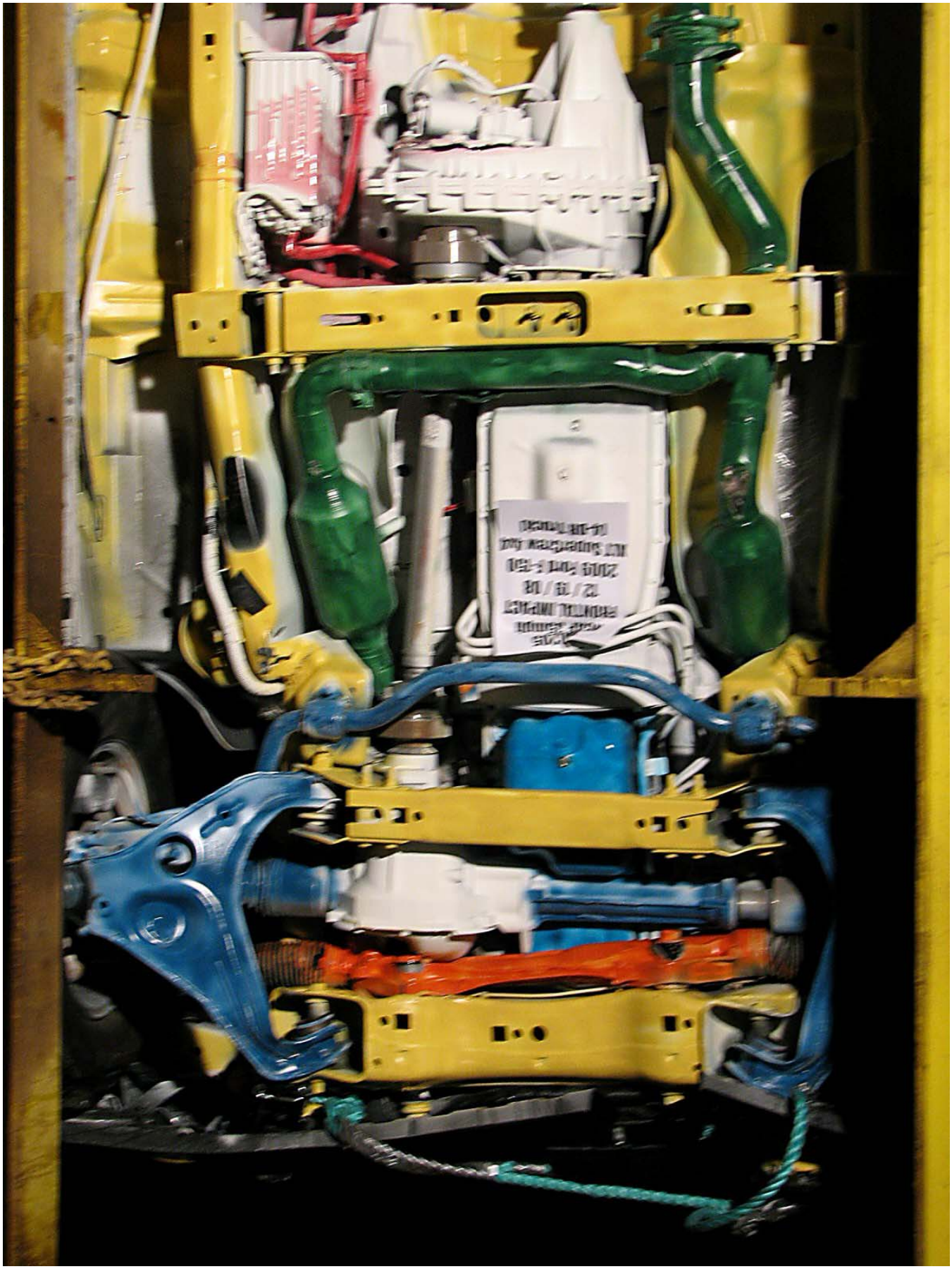


Figure A-25: Post-Test Front Underbody

Figure A-26: Pre-Test Mid Underbody

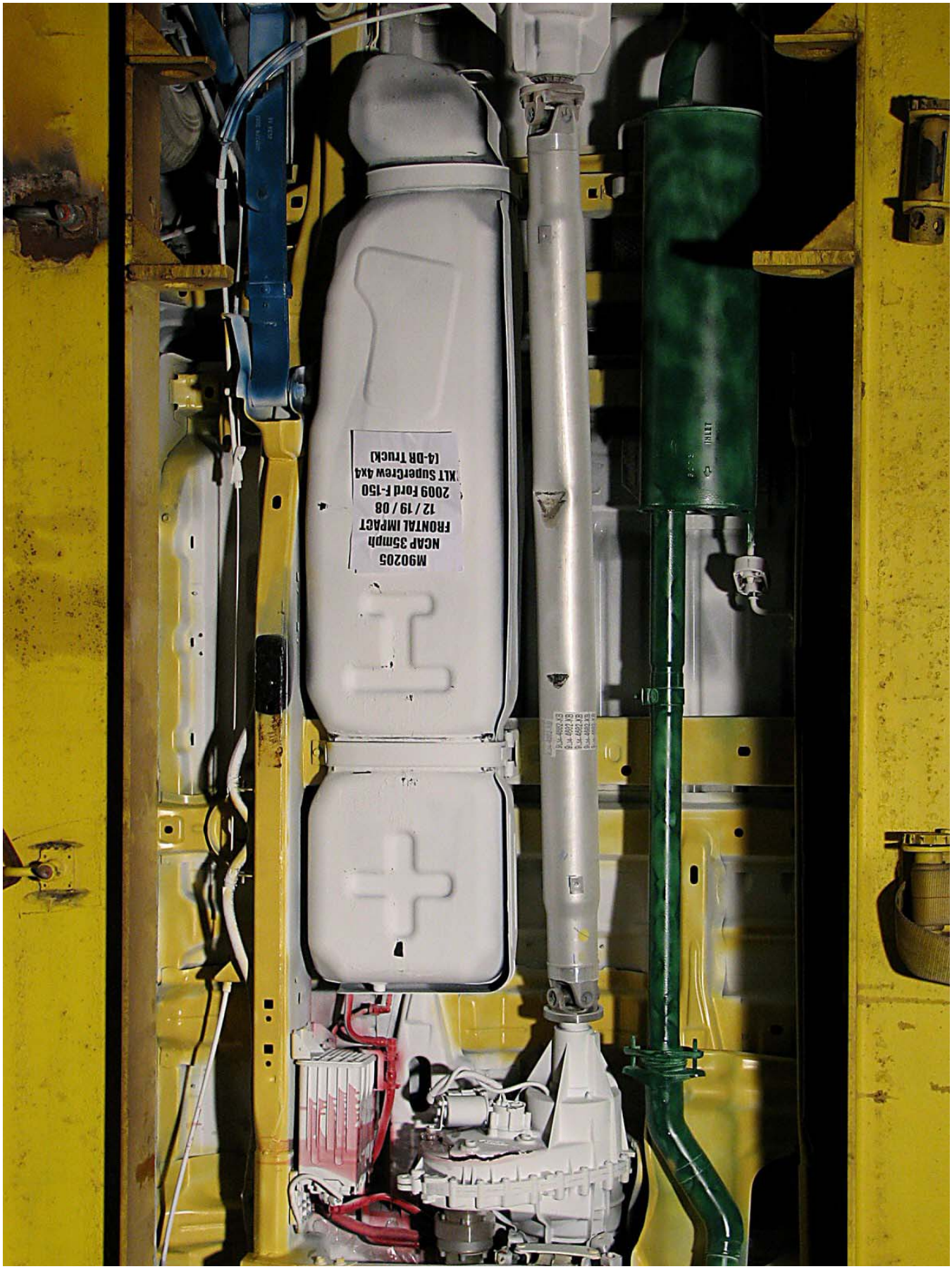


Figure A-27: Post-Test Mid Underbody

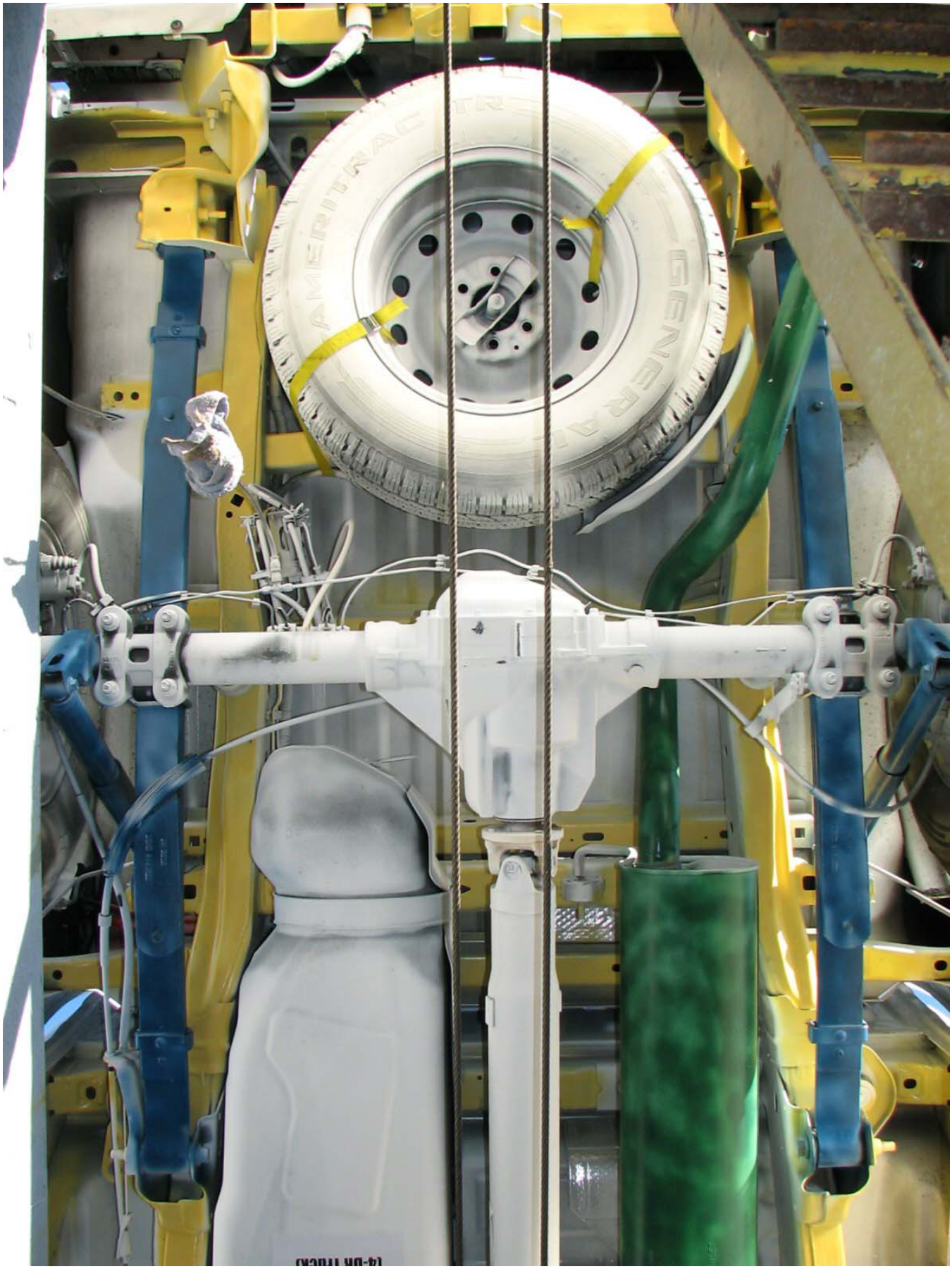


Figure A-28: Pre-Test Rear Underbody

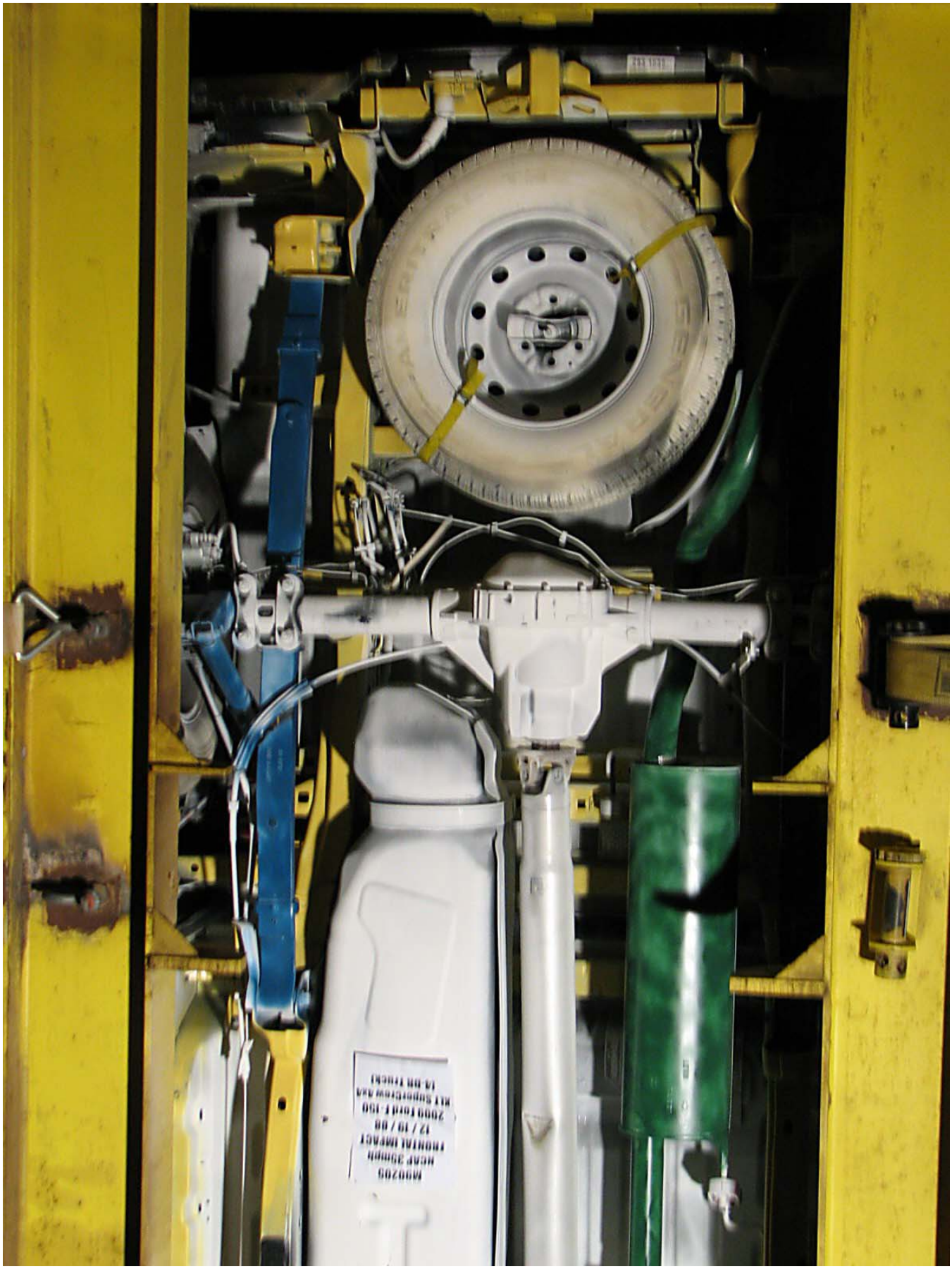


Figure A-29: Post-Test Rear Underbody

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)

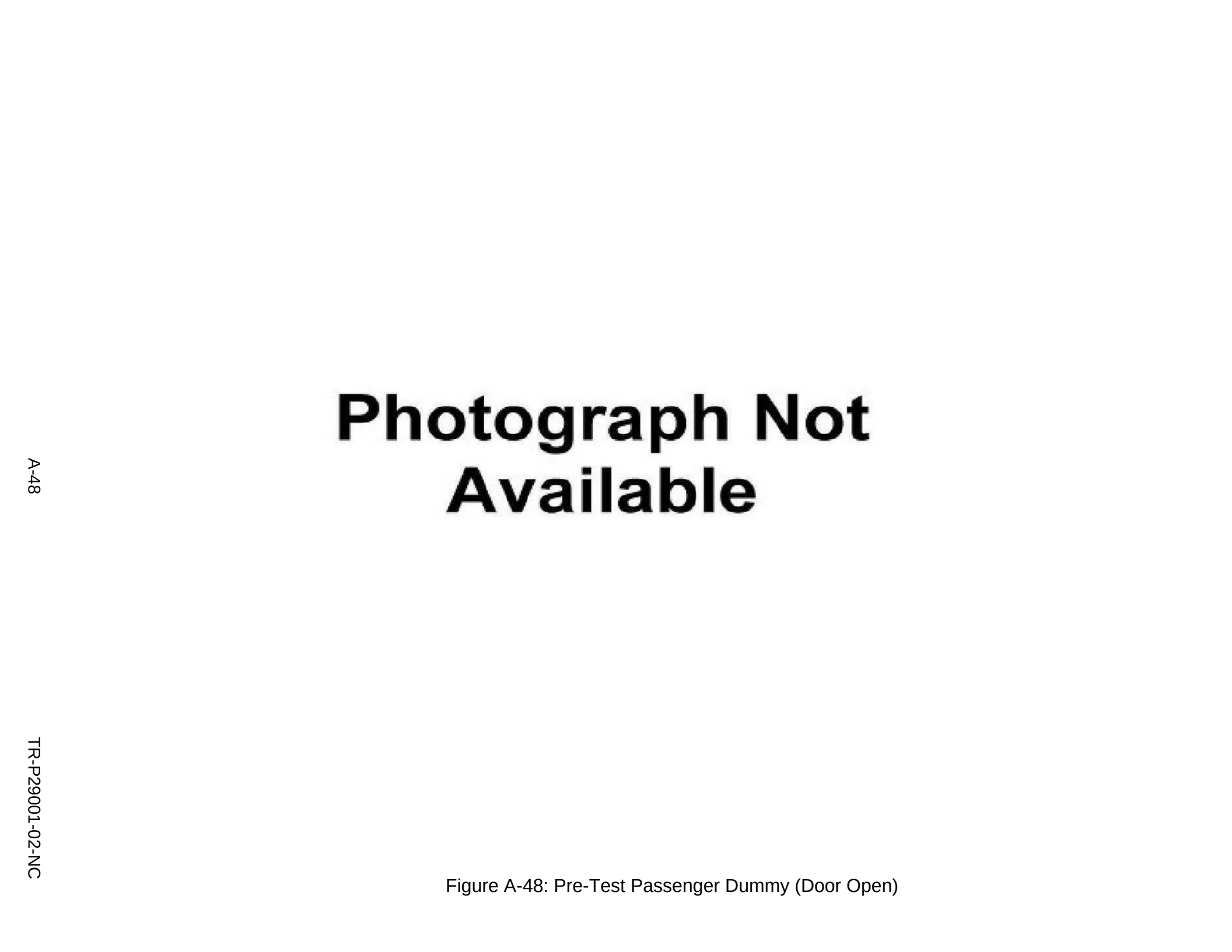


Figure A-48: Pre-Test Passenger Dummy (Door Open)

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

Figure A-50: Pre-Test Passenger Dummy Feet

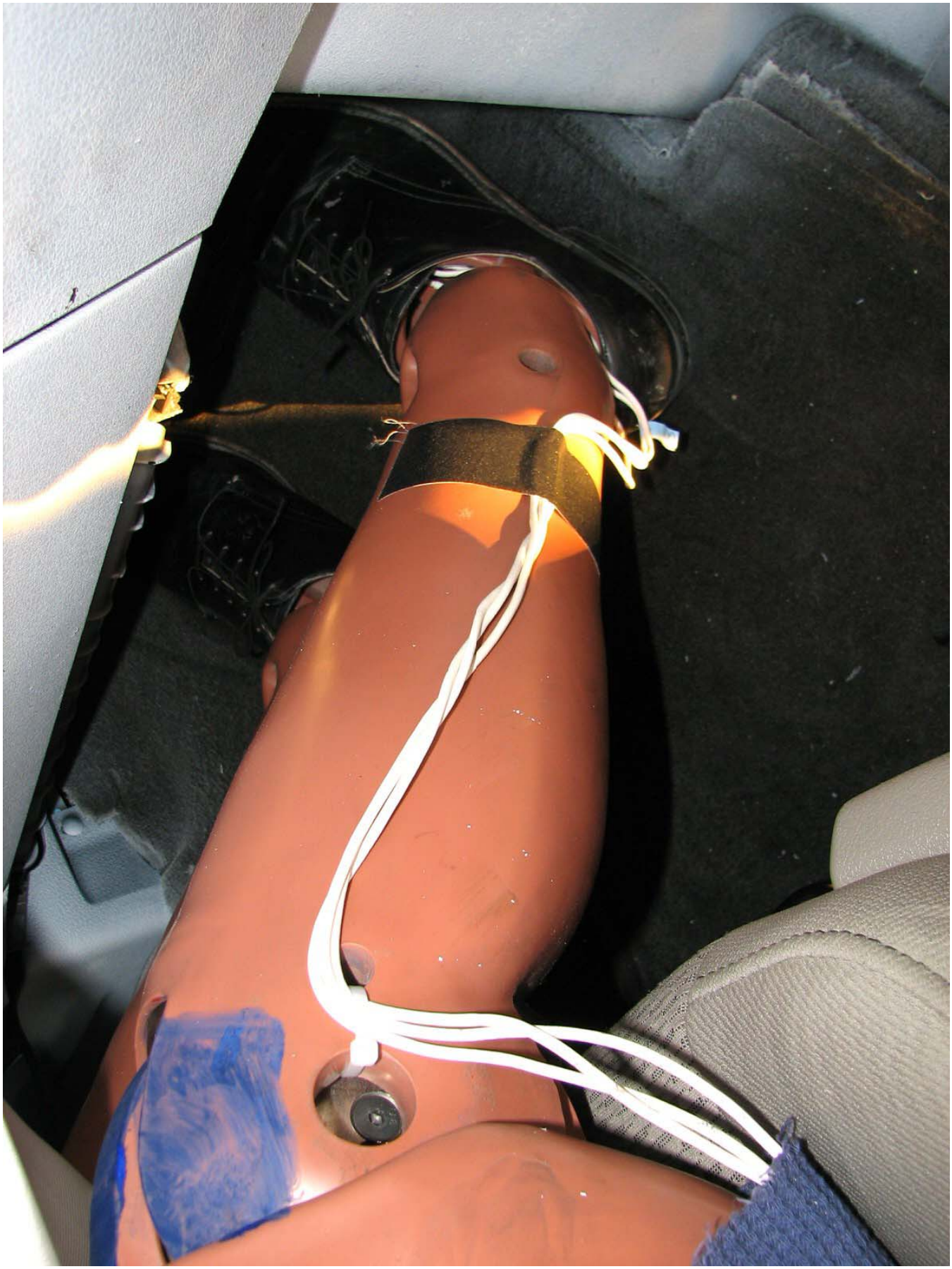


Figure A-51: Post-Test Passenger Dummy Feet

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

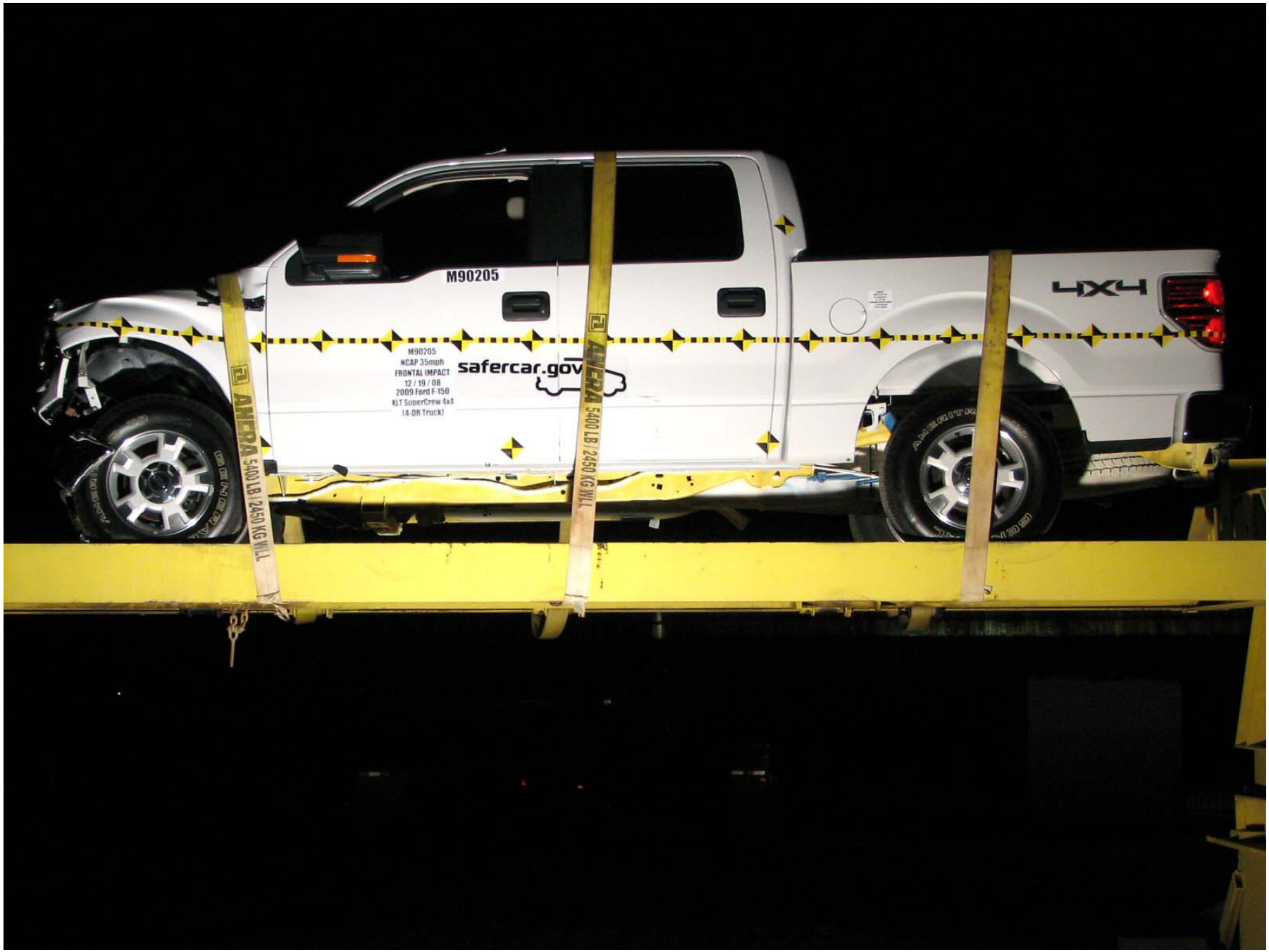


Figure A-58: Vehicle on Rollover Device (0°)

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

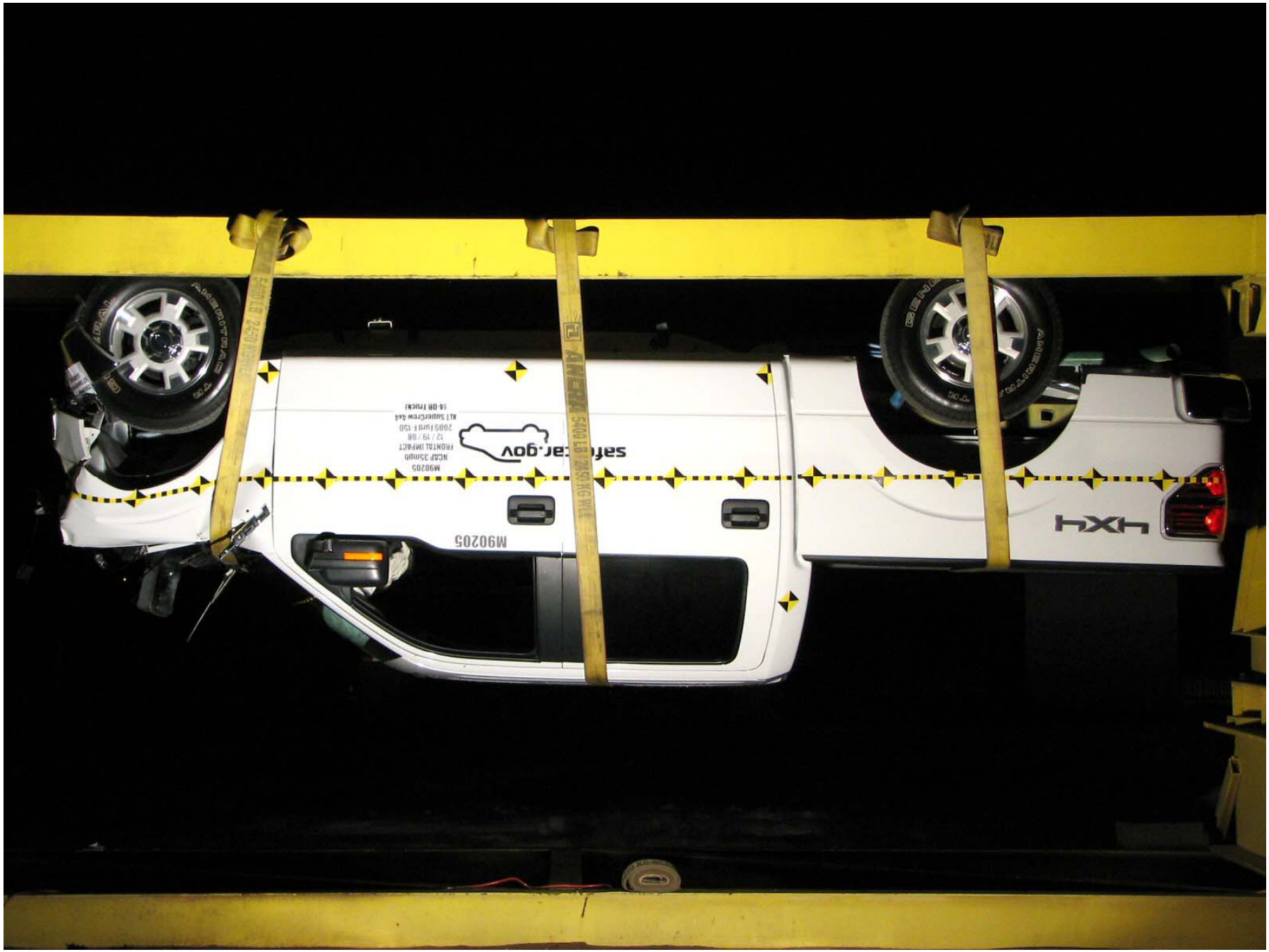


Figure A-60: Vehicle on Rollover Device (180°)

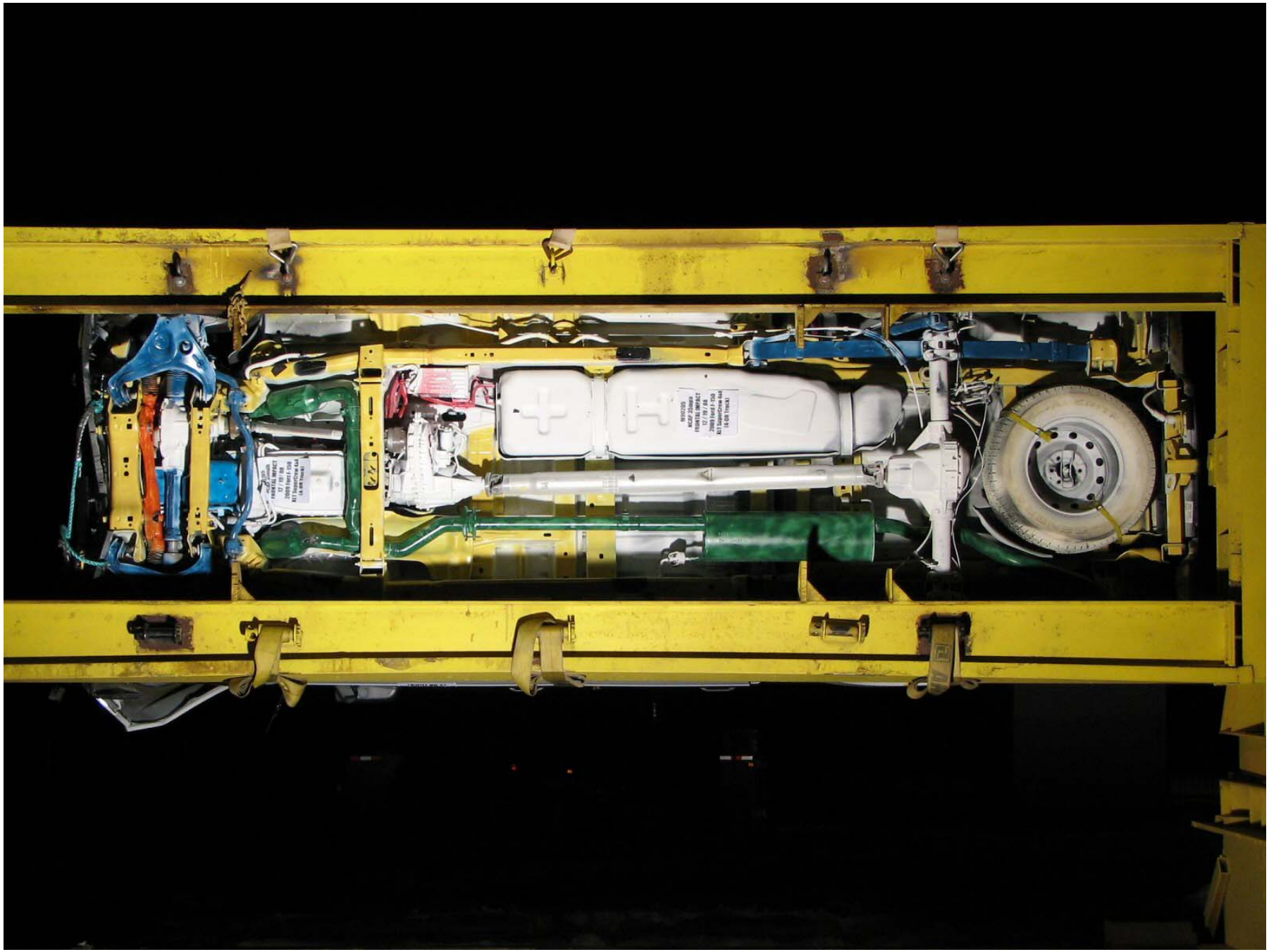


Figure A-61: Vehicle on Rollover Device (270°)

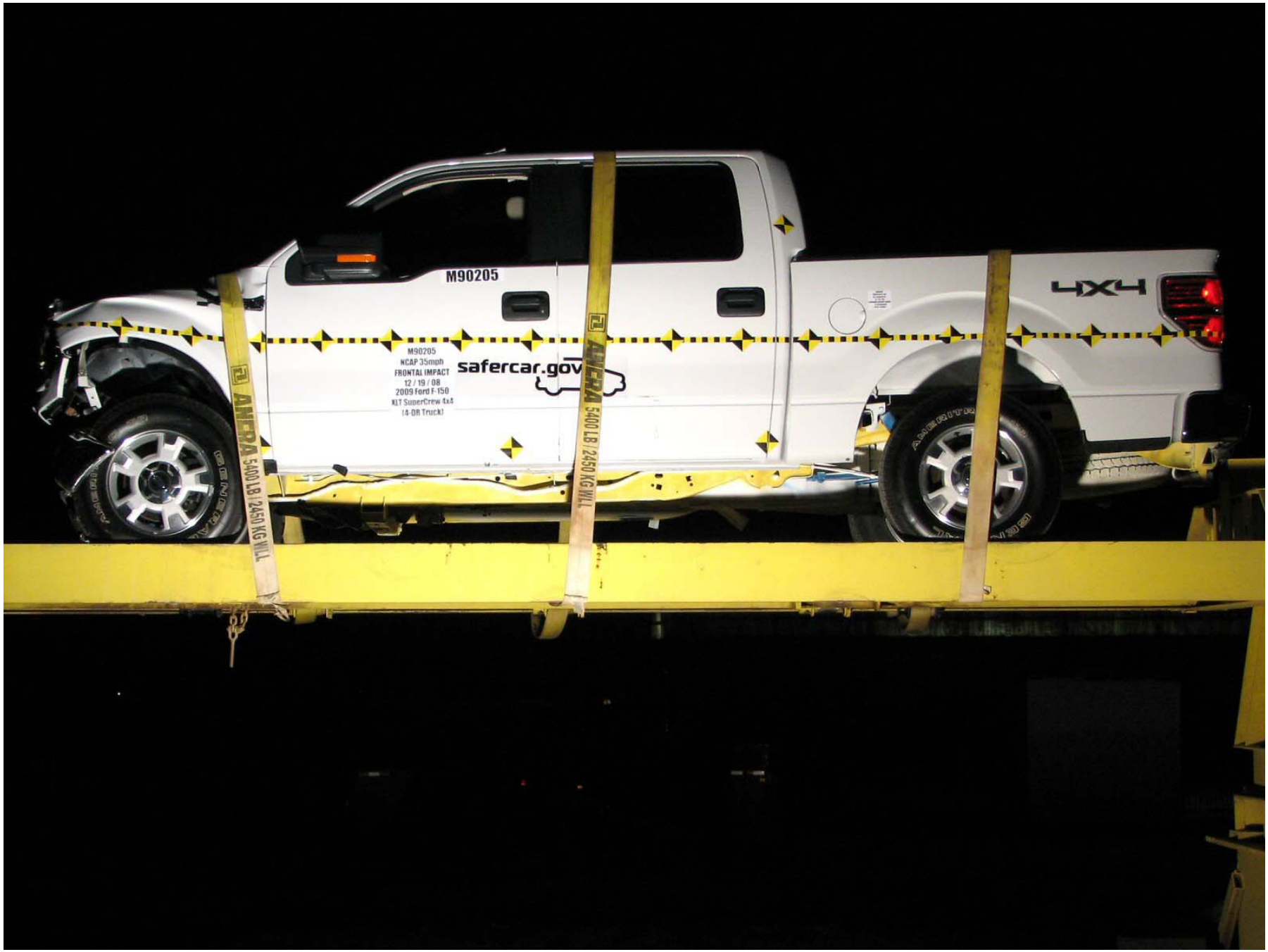


Figure A-62: Vehicle on Rollover Device (360°)

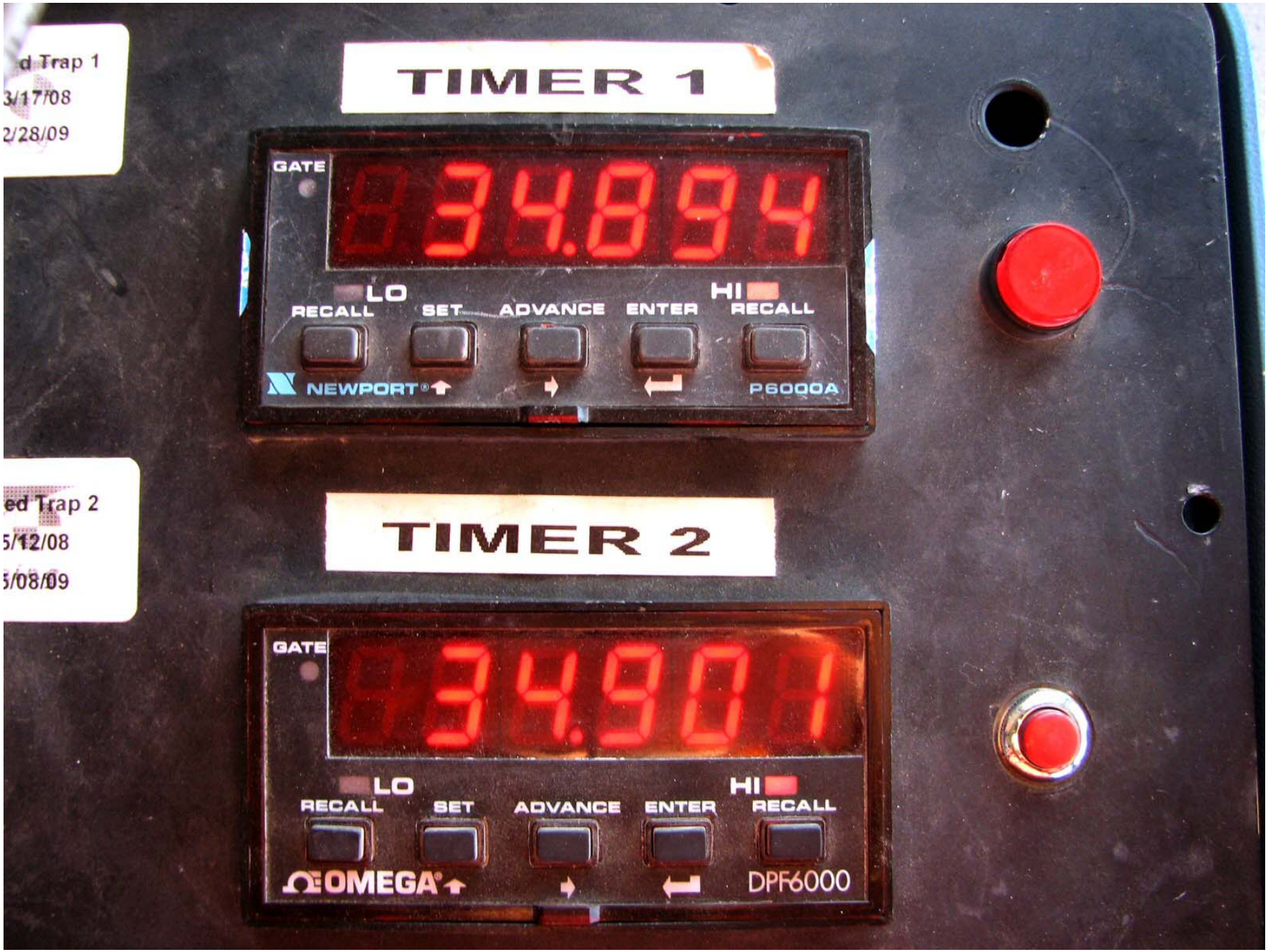


Figure A-63: Timers

Figure A-64: Vehicle Impact

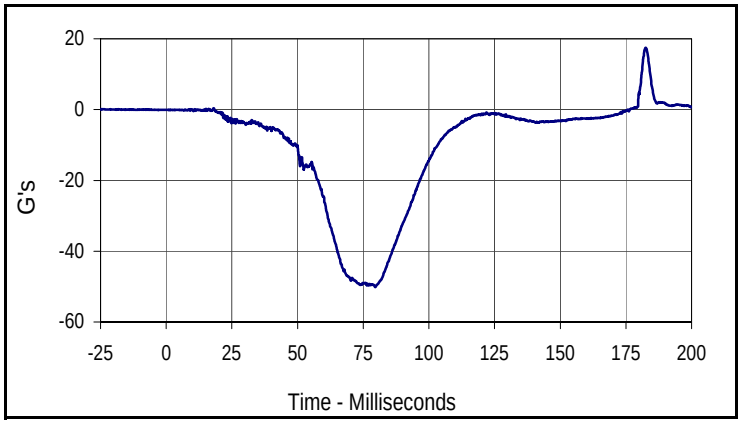
APPENDIX B
DATA PLOTS

LIST OF DATA PLOTS

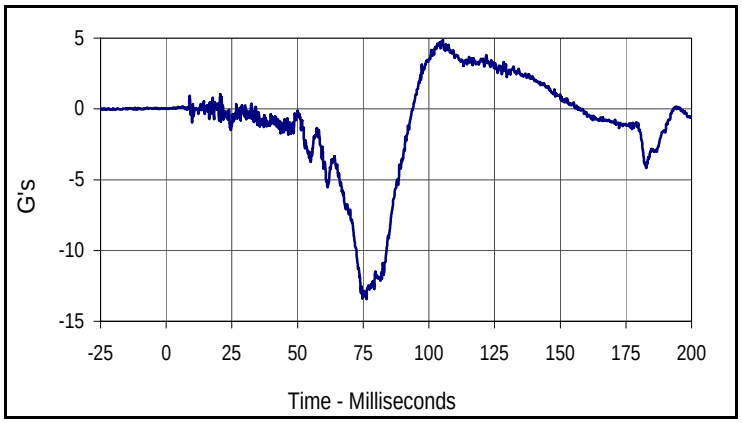
The following additional data plots for this test can be obtained from the research and development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov.

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

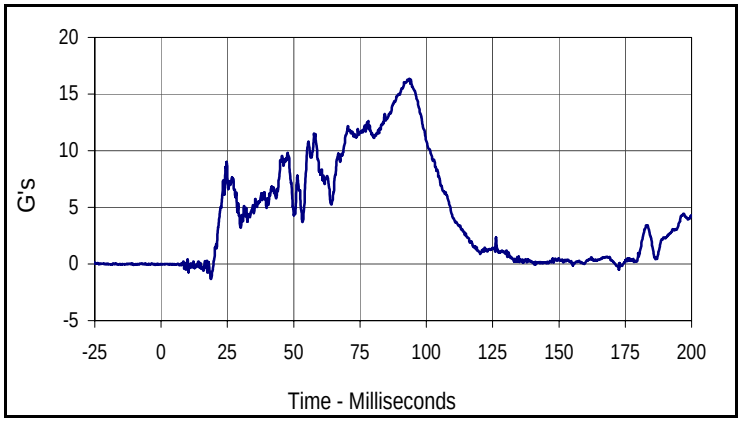
Test Vehicle:	2009 Ford F-150 XLT SuperCrew 4-Door Truck	Test Date:	12/19/08
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	M90205



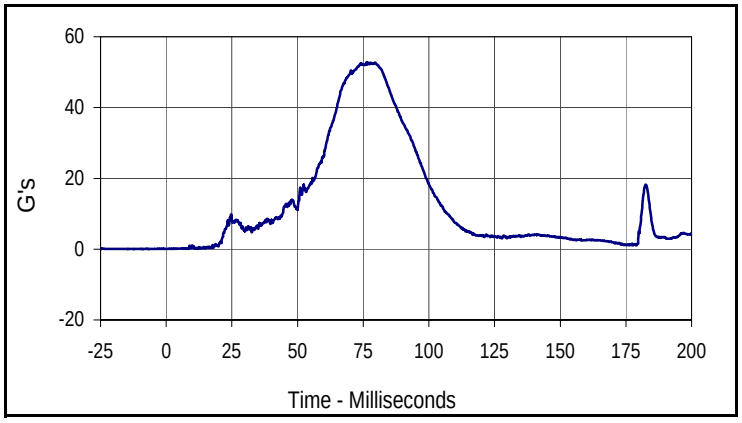
Curve Description			
Driver Head Primary X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
17.5	182.5	-50.1	79.6



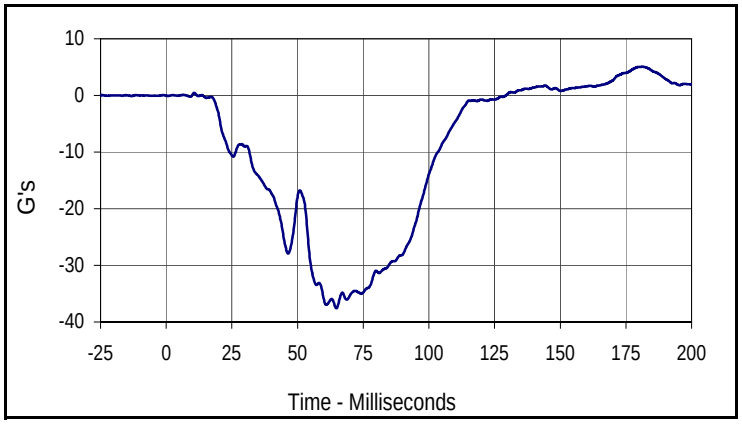
Curve Description			
Driver Head Primary Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.9	105.3	-13.4	76.2



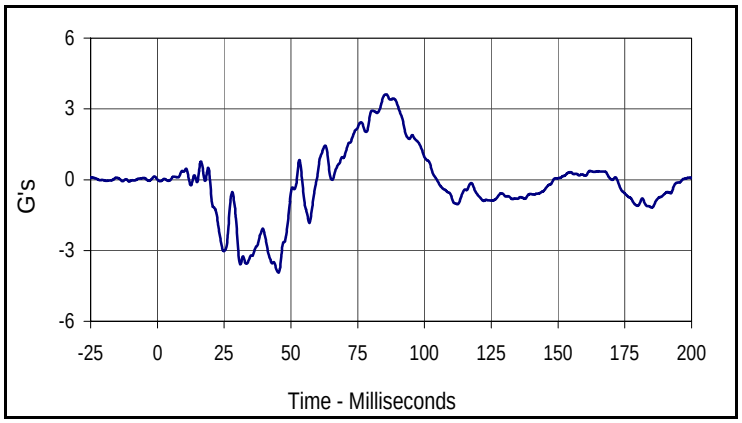
Curve Description			
Driver Head Primary Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
16.4	93.6	-1.3	18.8



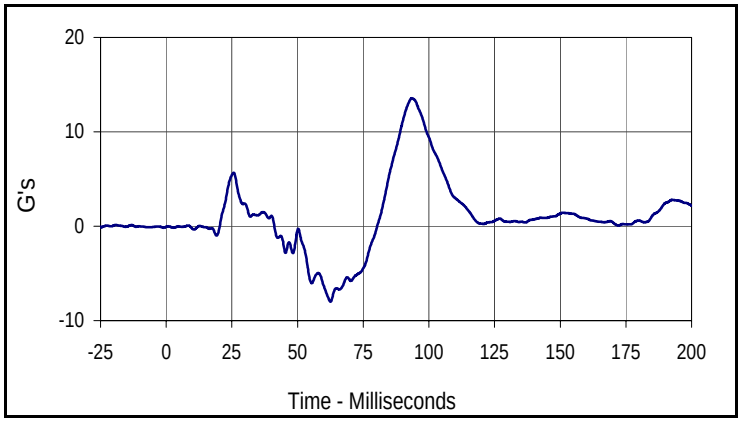
Curve Description			
Driver Head Resultant Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
52.8	76.3	0.0	12.0



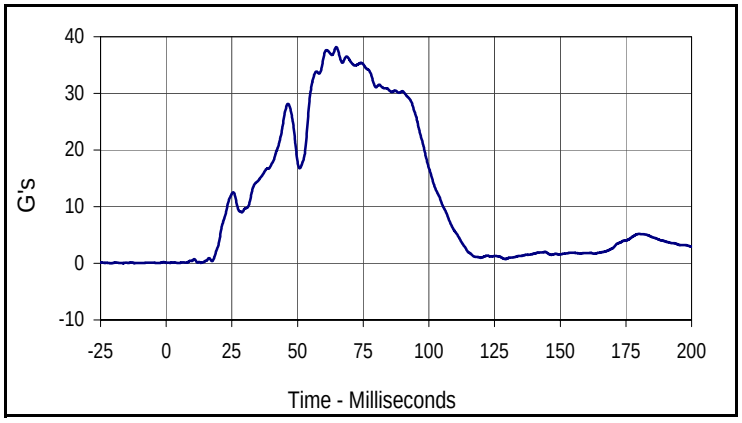
Curve Description			
Driver Chest Primary X			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
5.1	181.3	-37.6	64.7



Curve Description			
Driver Chest Primary Y			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
3.6	85.7	-3.9	45.4

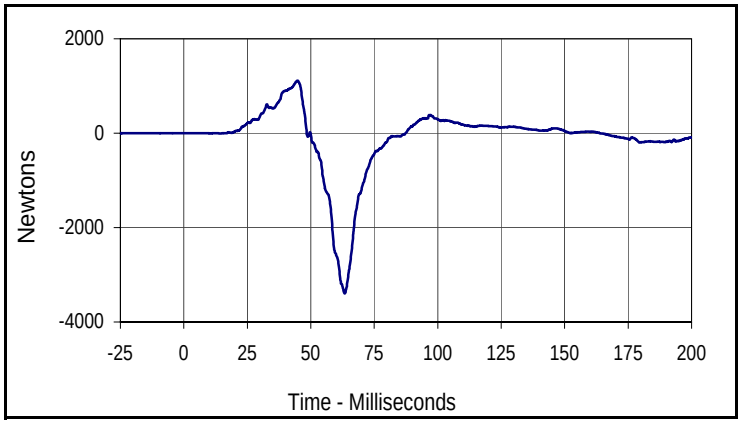


Curve Description			
Driver Chest Primary Z			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
13.6	93.5	-8.0	62.5

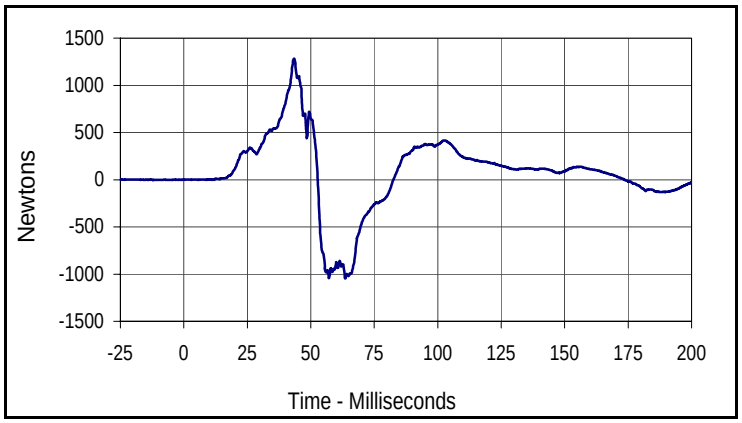


Curve Description			
Driver Chest Resultant Primary			
CURNO	Type	SAE Class	Units
004	RES	180	G's
Max	Time	Min	Time
38.2	64.7	0.0	13.2

Test Vehicle:	2009 Ford F-150 XLT SuperCrew 4-Door Truck	Test Date:	12/19/08
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	M90205

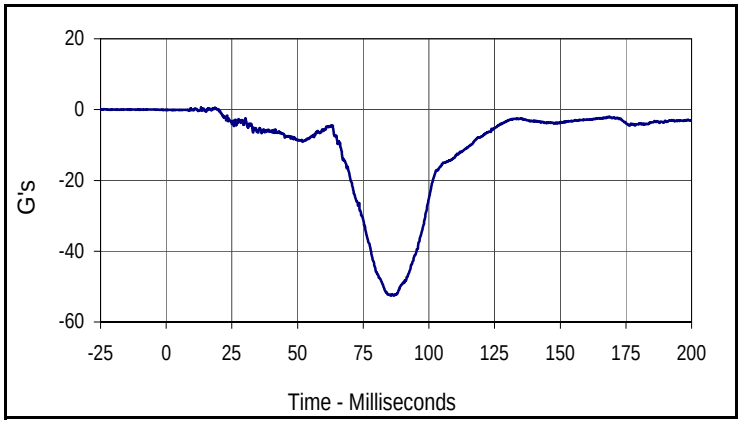


Curve Description			
Driver Left Femur Force Z			
CURNO	Type	SAE Class	Units
007	FIL	600	Newtons
Max	Time	Min	Time
1112.7	44.7	-3399.8	63.4

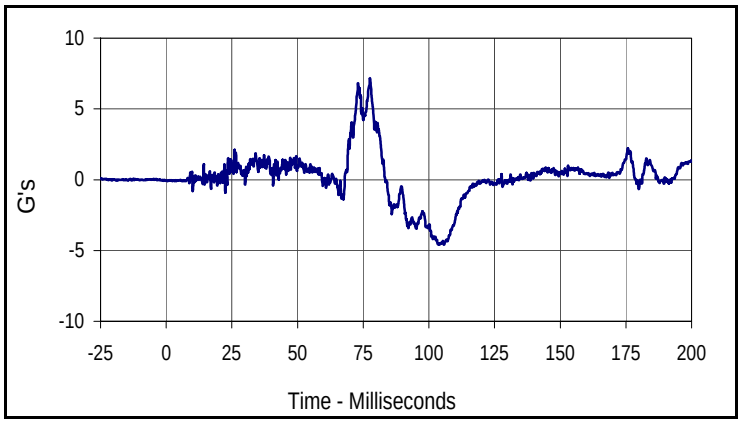


Curve Description			
Driver Right Femur Force Z			
CURNO	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
1284.3	43.5	-1044.2	63.6

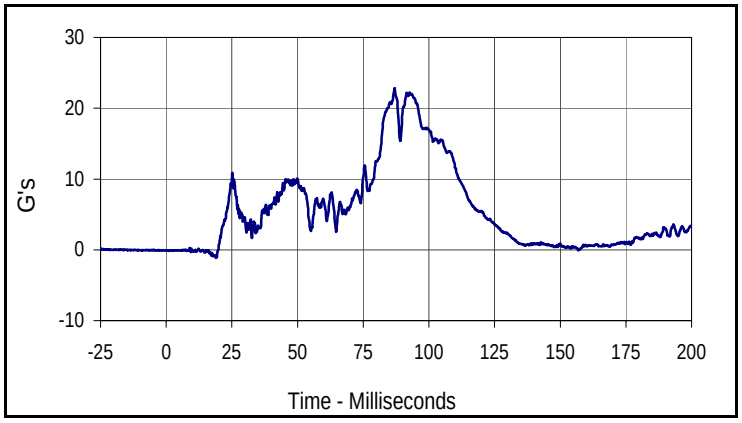
Test Vehicle:	2009 Ford F-150 XLT SuperCrew 4-Door Truck	Test Date:	12/19/08
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	M90205



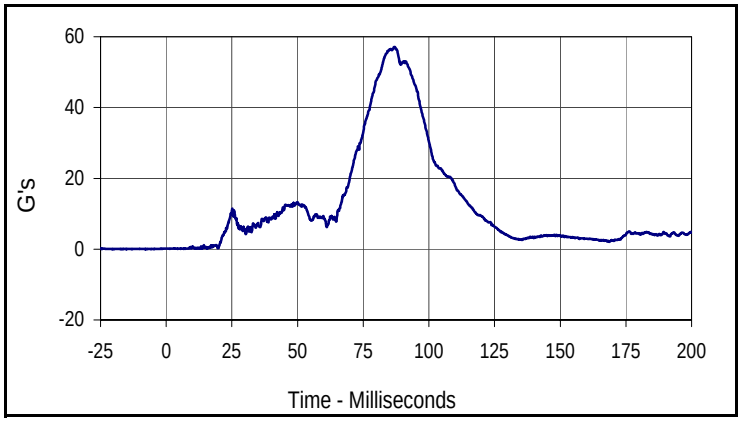
Curve Description			
Passenger Head Primary X			
CURNO	Type	SAE Class	Units
009	FIL	1000	G's
Max	Time	Min	Time
0.6	13.3	-52.6	85.6



Curve Description			
Passenger Head Primary Y			
CURNO	Type	SAE Class	Units
010	FIL	1000	G's
Max	Time	Min	Time
7.2	77.6	-4.6	105.7

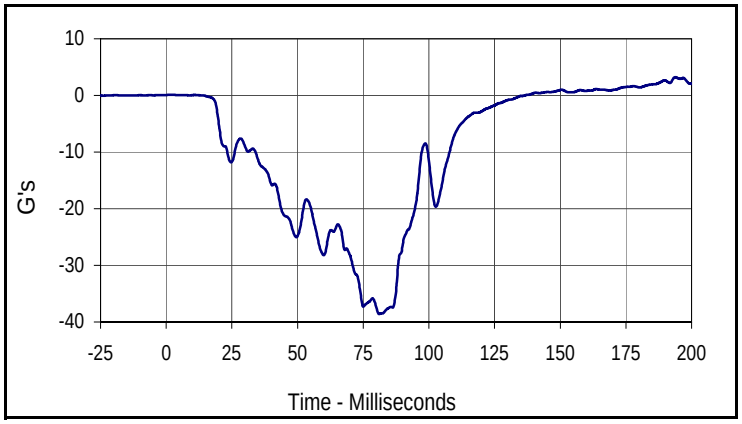


Curve Description			
Passenger Head Primary Z			
CURNO	Type	SAE Class	Units
011	FIL	1000	G's
Max	Time	Min	Time
22.8	87.0	-1.1	18.9

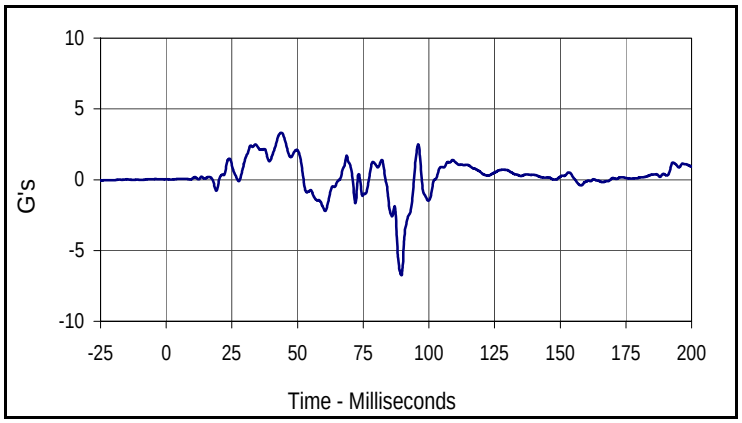


Curve Description			
Passenger Head Resultant Primary			
CURNO	Type	SAE Class	Units
009	RES	1000	G's
Max	Time	Min	Time
57.1	87.0	0.1	6.7

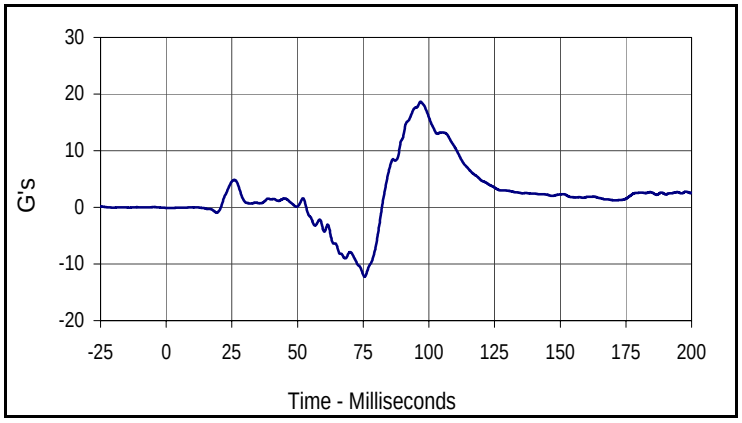
Test Vehicle:	2009 Ford F-150 XLT SuperCrew 4-Door Truck	Test Date:	12/19/08
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	M90205



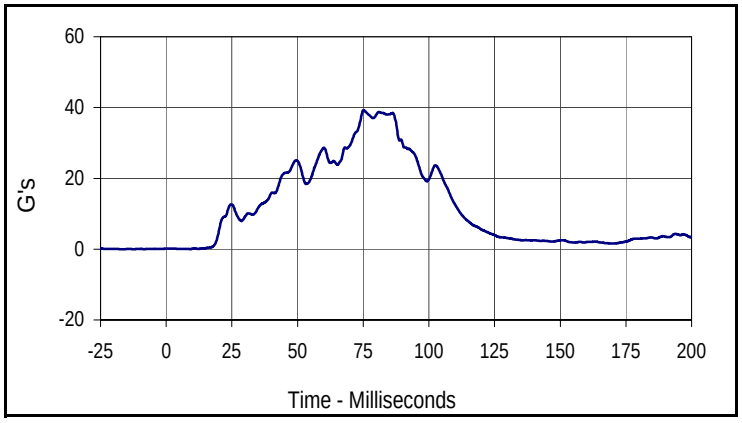
Curve Description			
Passenger Chest Primary X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
3.2	193.7	-38.6	81.1



Curve Description			
Passenger Chest Primary Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
3.3	43.8	-6.7	89.5

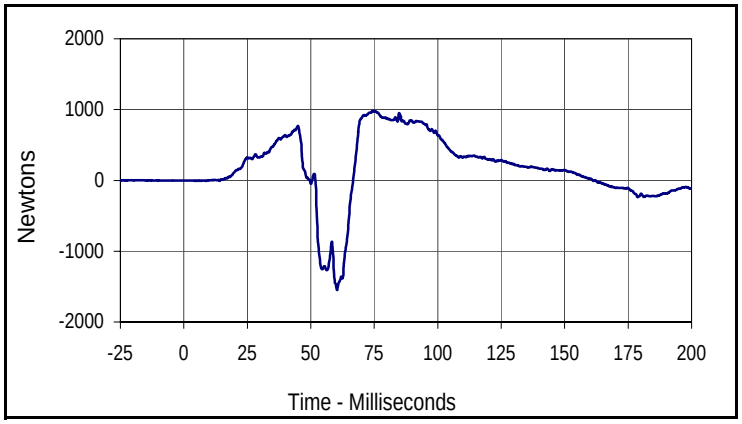


Curve Description			
Passenger Chest Primary Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
18.6	96.8	-12.3	75.5

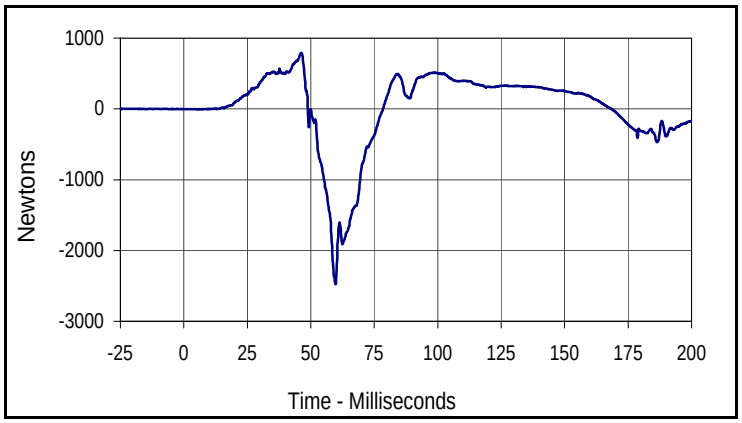


Curve Description			
Passenger Chest Resultant Primary			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
39.2	75.1	0.0	9.2

Test Vehicle:	2009 Ford F-150 XLT SuperCrew 4-Door Truck	Test Date:	12/19/08
Test Program:	NHTSA 35mph NCAP	NHTSA No.:	M90205



Curve Description			
Passenger Left Femur Force Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
980.8	74.3	-1547.4	60.3



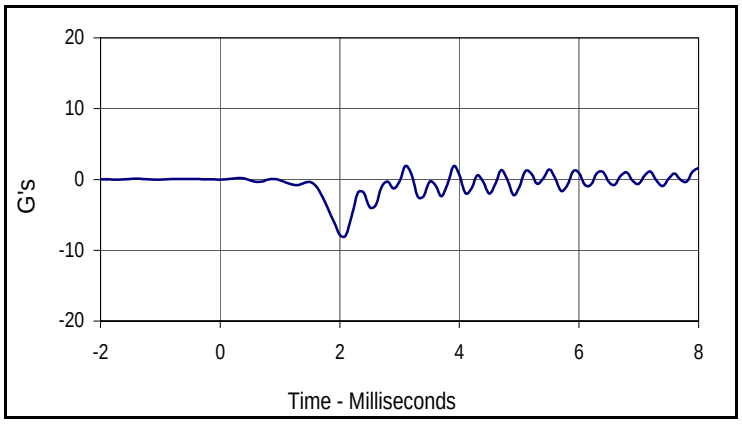
Curve Description			
Passenger Right Femur Force Z			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
791.8	46.3	-2473.7	59.8

APPENDIX C
DUMMY CALIBRATION DATA

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	12/15/08
ATD Serial No.:	192	Test I.D.:	HD192A

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	239.7	Pass
Peak Lateral Acceleration	G's	≤15.0	7.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

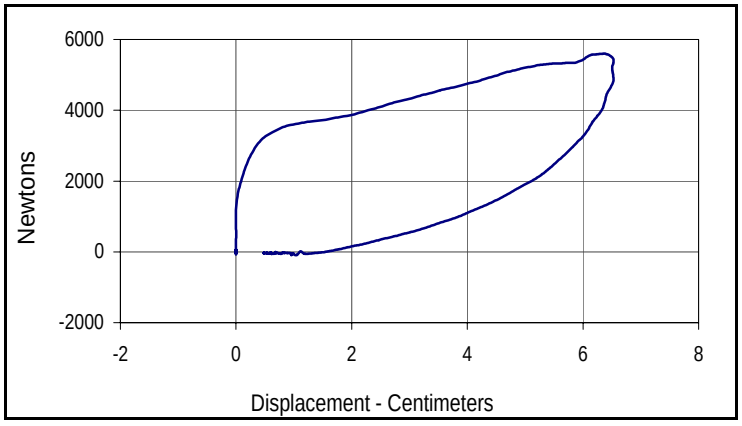
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
239.7	2.1	0.6	0.2



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.9	3.1	-7.9	2.1

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	12/15/08
ATD Serial No.:	192	Test I.D.:	Ch192

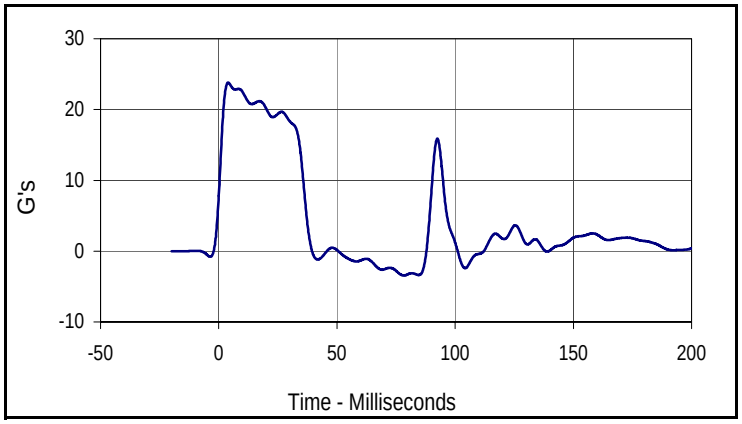
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.74	Pass
Peak Probe Force	Newtons	5159 to 5893	5607	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.53	Pass
Internal Hysterysis	%	69 to 85	74.3	Pass
		Overall Test Results		Pass



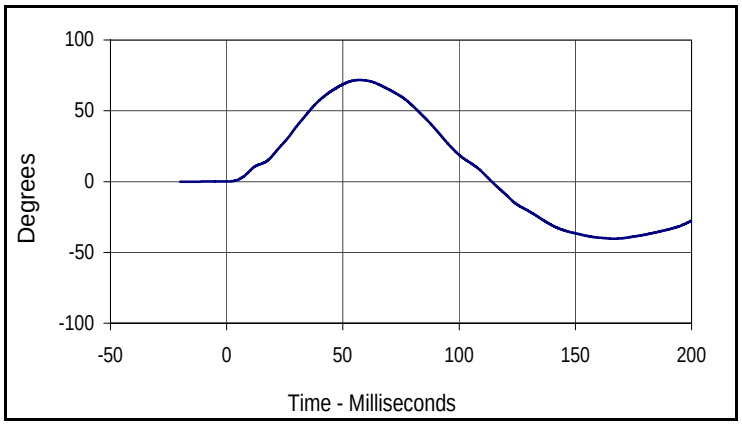
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	600	74.3
Peak Probe Force		Peak Chest Deflection	
5607		6.53	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	12/15/08
ATD Serial No.:	192	Test I.D.:	NF192G

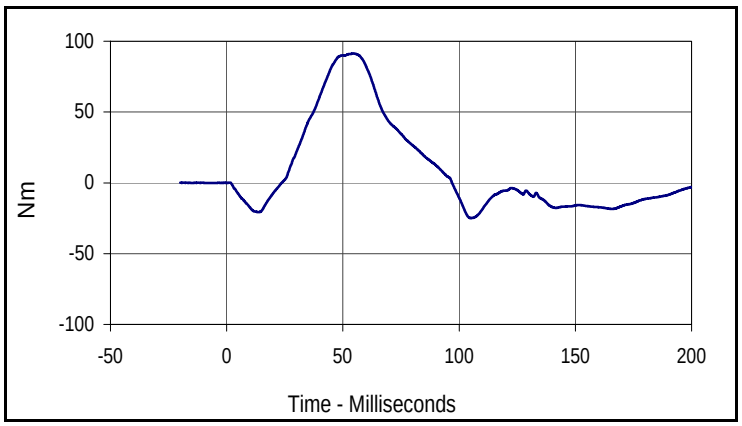
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	22.5	Pass
	20 Msec.	G's	17.6 to 22.6	20.2	Pass
	30 Msec.	G's	12.5 to 18.5	18.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	37.2	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	71.7	Pass
	Time	Msec.	57.0 to 64.0	57.1	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	114.1	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	91.3	Pass
	Time	Msec.	47.0 to 58.0	54.6	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.8	4.0	-3.4	78.3



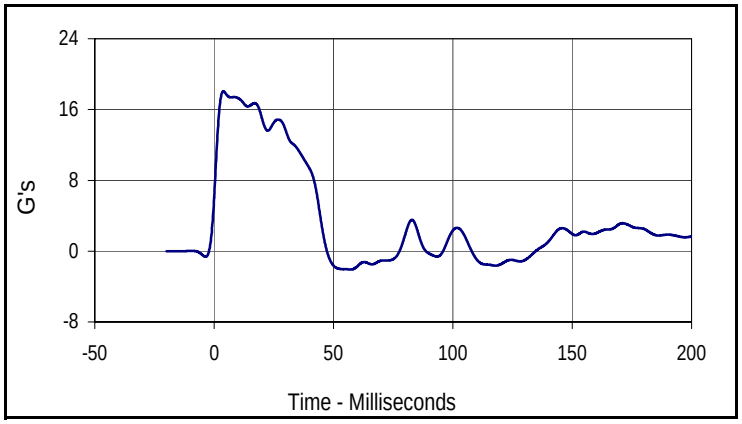
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
71.7	57.1	-40.3	166.5



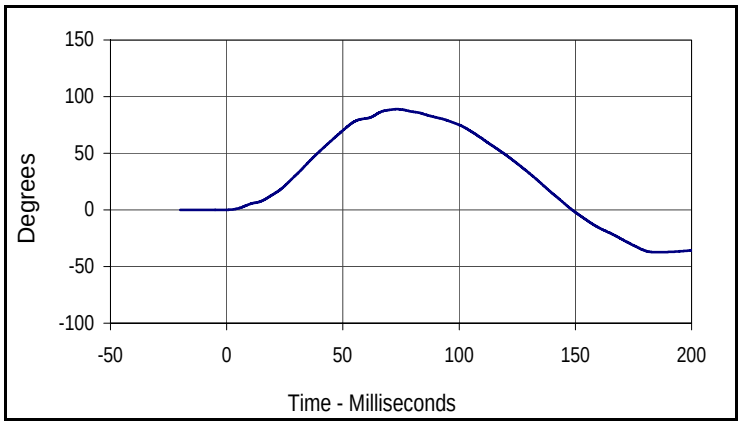
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
91.3	54.6	-24.9	105.1

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	12/15/08
ATD Serial No.:	192	Test I.D.:	NE192A

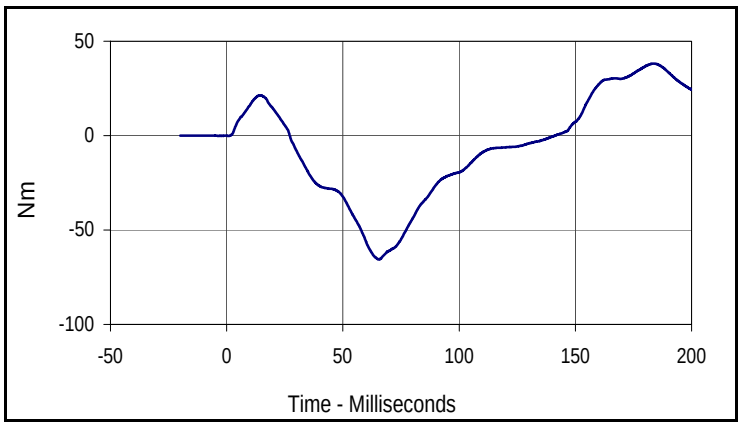
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.96	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.3	Pass
	20 Msec.	G's	14.0 to 19.0	15.0	Pass
	30 Msec.	G's	11.0 to 16.0	13.6	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	13.6	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	43.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	88.9	Pass
	Time	Msec.	72.0 to 82.0	73.3	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	148.6	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-65.6	Pass
	Time	Msec.	65.0 to 79.0	65.5	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	141.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.1	3.9	-2.1	57.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
88.9	73.3	-37.4	185.5



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
38.2	183.6	-65.6	65.5

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	12/15/08
ATD Serial No.:	192	Test I.D.:	LK192 , RK192

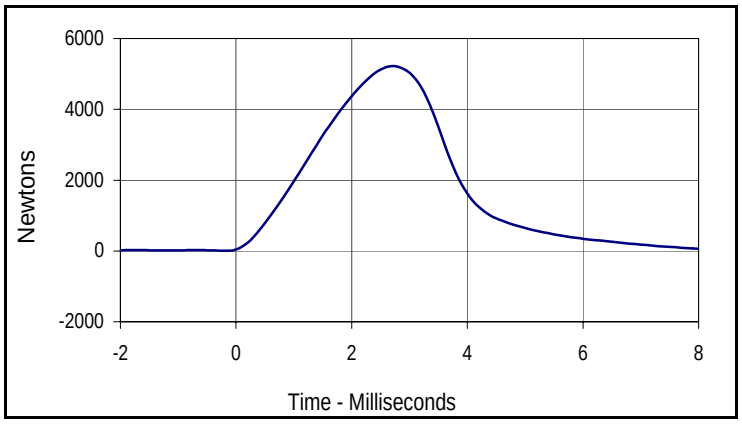
Left Knee

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	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5753	Pass
		Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5223	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5753.3	2.2	-20.6	8.6



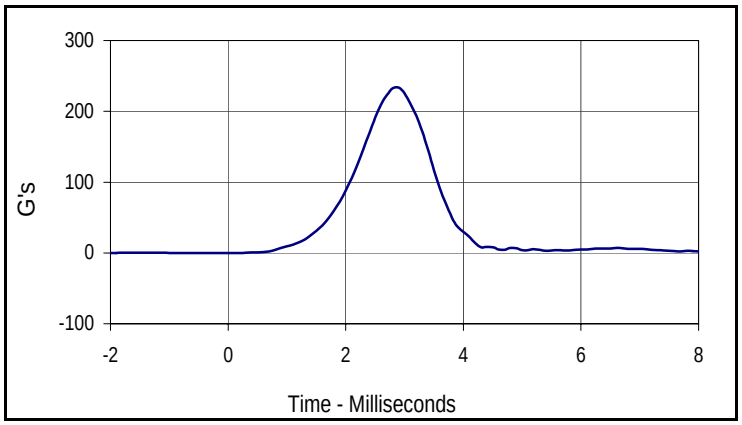
Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5223.3	2.7	-2.6	9.8

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	12/15/08
ATD Serial No.:	192	Test I.D.:	N/A

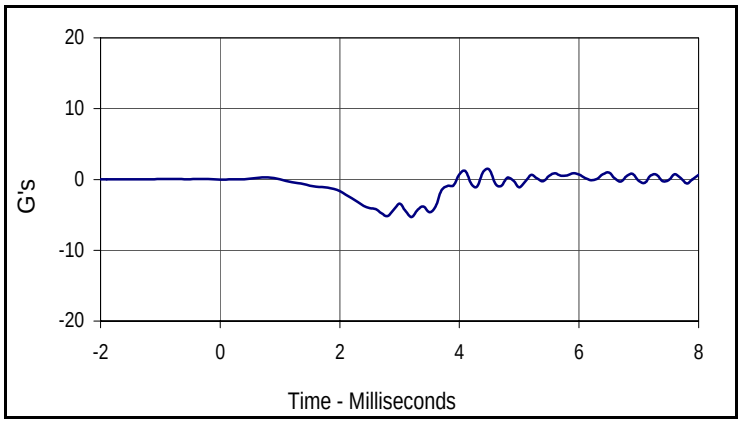
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	880	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	143	Pass
G - Elbow back to wrist pivot	mm	290 to 305	293	Pass
H - Skull cap to back line	mm	41 to 46	43	Pass
I - Shoulder to elbow length	mm	330 to 345	341	Pass
J - Elbow rest height	mm	190 to 211	191	Pass
K - Buttock to knee length	mm	579 to 604	592	Pass
L - Poplipteal length	mm	429 to 455	441	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock poplipteal length	mm	452 to 477	476	Pass
O - Chest depth	mm	213 to 229	213	Pass
P - Foot length	mm	251 to 267	256	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	995	Pass
Z - Waist circumference	mm	836 to 866	865	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	231	Pass
		Overall Test Results		Pass

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	12/15/08
ATD Serial No.:	360	Test I.D.:	HD360A

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	233.7	Pass
Peak Lateral Acceleration	G's	≤15.0	5.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



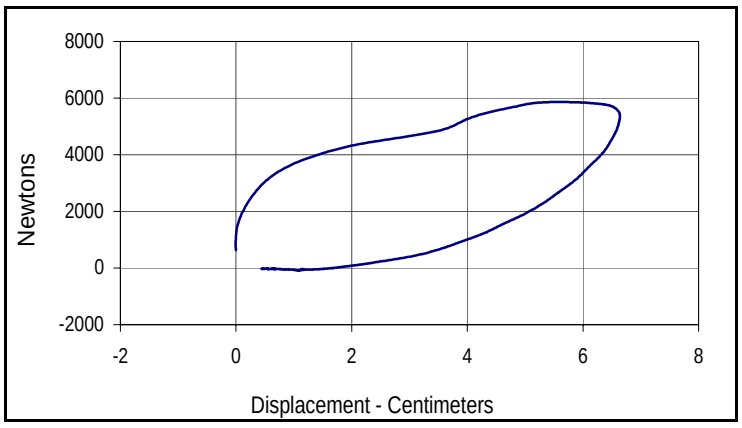
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
233.7	2.9	0.0	-2.0



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.4	4.5	-5.3	3.2

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	12/15/08
ATD Serial No.:	360	Test I.D.:	CH360C

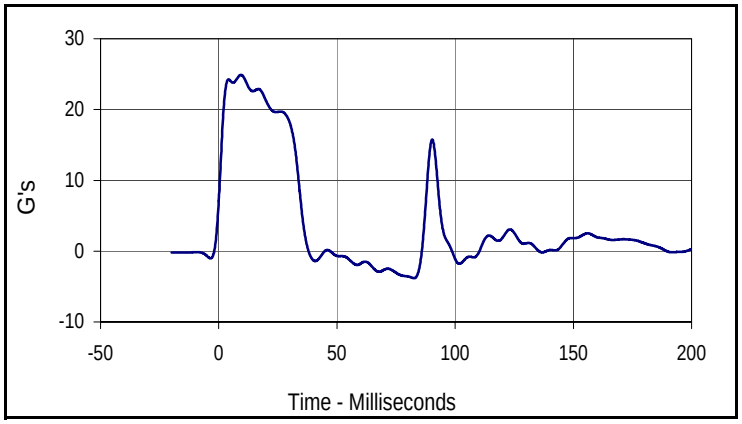
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.74	Pass
Peak Probe Force	Newtons	5159 to 5893	5864	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.64	Pass
Internal Hysterysis	%	69 to 85	75.8	Pass
		Overall Test Results		Pass



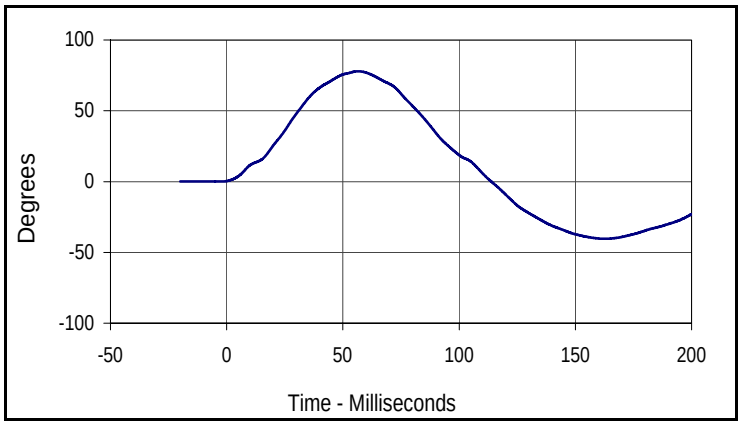
Curve Description			
Probe Force vs. Chest Deflection			
CURNO	Type	SAE Class	Hysterysis
001	FIL	180	75.8
Peak Probe Force		Peak Chest Deflection	
5864		6.64	

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	12/15/08
ATD Serial No.:	360	Test I.D.:	NF360D

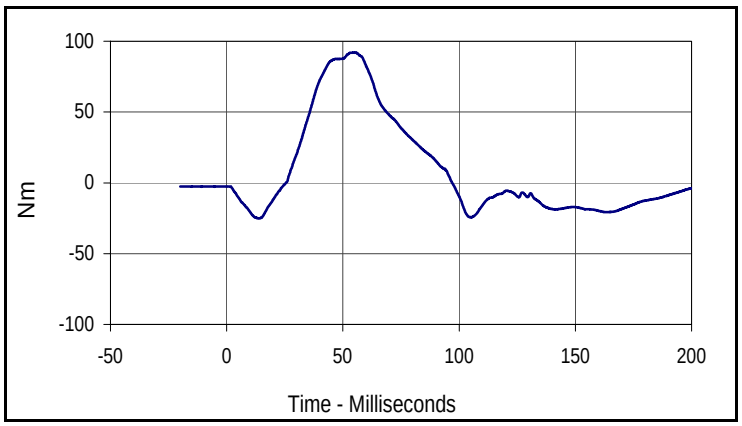
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.8	Pass
	20 Msec.	G's	17.6 to 22.6	21.2	Pass
	30 Msec.	G's	12.5 to 18.5	18.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.4	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	77.9	Pass
	Time	Msec.	57.0 to 64.0	57.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	113.9	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	92.1	Pass
	Time	Msec.	47.0 to 58.0	54.5	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.9	9.4	-3.8	82.6



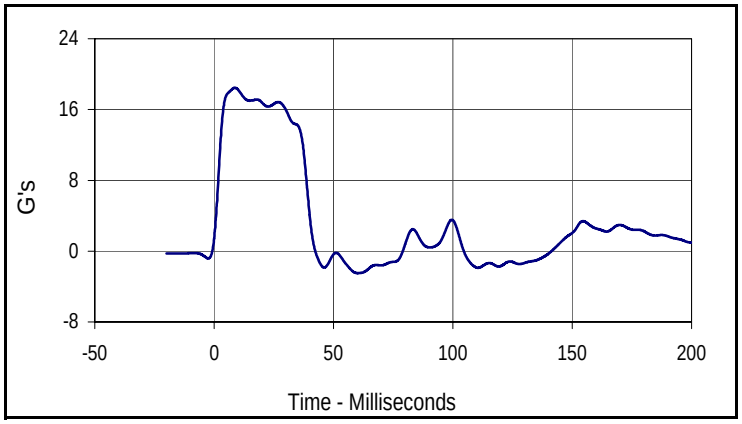
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
77.9	57.5	-40.4	163.7



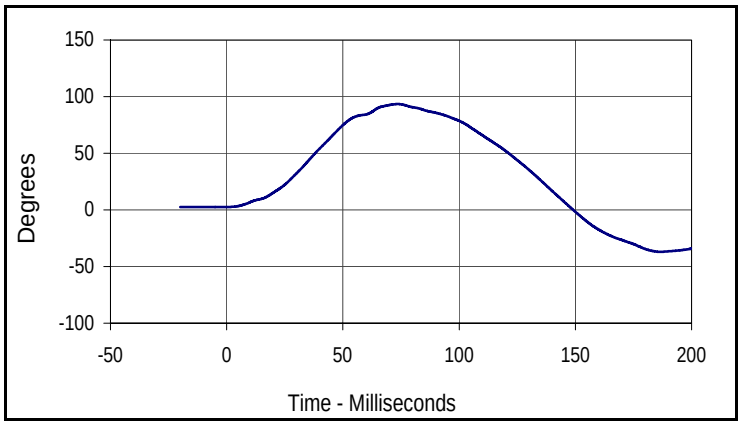
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
92.1	54.5	-25.2	13.8

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	12/15/08
ATD Serial No.:	360	Test I.D.:	NE360A

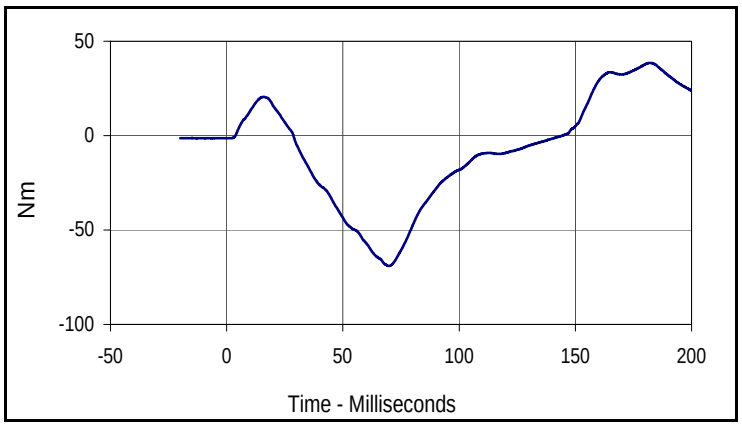
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.96	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.3	Pass
	20 Msec.	G's	14.0 to 19.0	16.8	Pass
	30 Msec.	G's	11.0 to 16.0	16.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	16.0	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	93.4	Pass
	Time	Msec.	72.0 to 82.0	73.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.1	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to- 79.9	-69.0	Pass
	Time	Msec.	65.0 to 79.0	69.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	144.4	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
CURNO	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.5	8.7	-2.5	60.2



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
93.4	73.5	-37.0	186.5



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
38.5	181.7	-69.0	69.9

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	12/15/08
ATD Serial No.:	360	Test I.D.:	LK360 , RK360

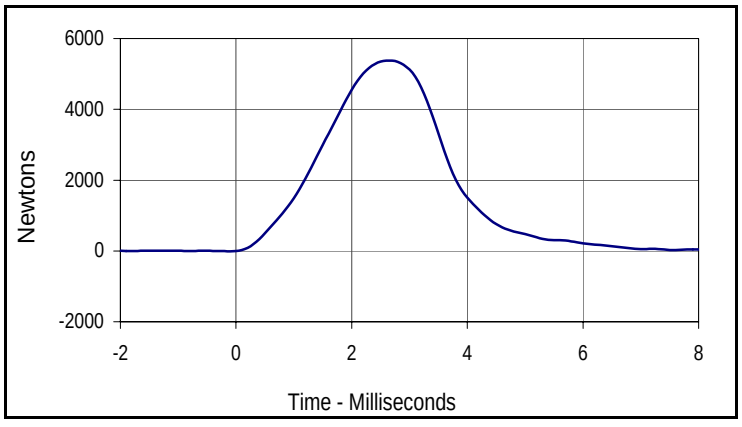
Left Knee

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	5207	Pass
		Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.12	Pass
Peak Probe Force	Newtons	4715 to 5782	5381	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5206.6	2.6	-20.9	9.9



Curve Description			
Right Knee Probe Force			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
5380.7	2.6	-20.9	10.0

Test Program:	Hybrid III 50th Percentile Male External Measurements	Test Date:	12/15/08
ATD Serial No.:	360	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	881	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	89	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	143	Pass
G - Elbow back to wrist pivot	mm	290 to 305	295	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	343	Pass
J - Elbow rest height	mm	190 to 211	197	Pass
K - Buttock to knee length	mm	579 to 604	592	Pass
L - Poplipteal length	mm	429 to 455	442	Pass
M - Knee pivot height	mm	485 to 500	489	Pass
N - Buttock poplipteal length	mm	452 to 477	463	Pass
O - Chest depth	mm	213 to 229	213	Pass
P - Foot length	mm	251 to 267	257	Pass
V - Shoulder breadth	mm	422 to 437	431	Pass
W - Foot breadth	mm	91 to 107	102	Pass
Y - Chest circumference	mm	970 to 1001	999	Pass
Z - Waist circumference	mm	836 to 866	865	Pass
AA - Location for chest circumference	mm	429 to 434	432	Pass
BB - Location for waist circumference	mm	226 to 231	231	Pass
		Overall Test Results		Pass

Test Program:	Dummy Damage Checklist	Test Date:	12/15/08
ATD Serial No.:	192	Test I.D.:	N/A

GENERAL	DAMAGED	OK
Outer skin on entire dummy		X
Head ballast secure		X
Gashes, rips, general appearance, etc.		X
Neck-Broken or cracks in rubber		X
Check that upper neck bracket is firmly attached to lwr neck bracket		X
Three rubber bumpers in place		X
Spine- Broken or cracks in rubber		X
Check for looseness at the condyle joint		X
Nodding blocks- cracked or out of position		X
Ribs- Check all ribs and rib supports for damage (bent or broken)		X
Check damping material or separation or cracks		X
OTHER		
CHEST DISPLACEMENT ASSEMBLY		
Bent shaft		X
Slider arm riding correctly, in track		X
TRANSDUCER LEADS		
Torn cables		X
ACCELEROMETER MOUNTINGS		
Check for secure mounting		X
KNEES		
Check outer skin, insert and casting (without removing insert)		X
Knee sliders - Wires intact		X
Knee sliders- Rubber returned to "at rest position"		X
LIMBS		
Check for normal movement and adjustment		X
PELVIS		
Inspect for breakage, especially at iliac crest		X

Comments on repair or replacement parts:

Test Program:	Dummy Damage Checklist	Test Date:	12/15/08
ATD Serial No.:	360	Test I.D.:	N/A

GENERAL	DAMAGED	OK
Outer skin on entire dummy		X
Head ballast secure		X
Gashes, rips, general appearance, etc.		X
Neck-Broken or cracks in rubber		X
Check that upper neck bracket is firmly attached to lwr neck bracket		X
Three rubber bumpers in place		X
Spine- Broken or cracks in rubber		X
Check for looseness at the condyle joint		X
Nodding blocks- cracked or out of position		X
Ribs- Check all ribs and rib supports for damage (bent or broken)		X
Check damping material or separation or cracks		X
OTHER		
CHEST DISPLACEMENT ASSEMBLY		
Bent shaft		X
Slider arm riding correctly, in track		X
TRANSDUCER LEADS		
Torn cables		X
ACCELEROMETER MOUNTINGS		
Check for secure mounting		X
KNEES		
Check outer skin, insert and casting (without removing insert)		X
Knee sliders - Wires intact		X
Knee sliders- Rubber returned to "at rest position"		X
LIMBS		
Check for normal movement and adjustment		X
PELVIS		
Inspect for breakage, especially at iliac crest		X

Comments on repair or replacement parts: