

**REPORT NUMBER: NCAP-MGA-2015-041**

**NEW CAR ASSESSMENT PROGRAM (NCAP)  
Frontal Barrier Impact Test**

**FORD MOTOR COMPANY  
2015 Ford Expedition XLT EL 4X4 SUV  
NHTSA No.: M20150210**

**MGA RESEARCH CORPORATION  
5000 Warren Road  
Burlington, WI 53105**




**Test Date: December 11, 2014**

**Final Report Date: February 19, 2015**

**FINAL REPORT**

**U.S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Office of Crashworthiness Standards  
Mail Code: NVS-111  
1200 New Jersey Ave, SE  
Room W43-410  
Washington, DC 20590**

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Approval Date: February 19, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

\_\_\_\_\_  
Division Chief, New Car Assessment Program  
NHTSA, Office of Crashworthiness Standards

Date: \_\_\_\_\_

\_\_\_\_\_  
COTR, New Car Assessment Program  
NHTSA, Office of Crashworthiness Standards

Date: \_\_\_\_\_

### Technical Report Documentation Page

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		<b>6. Performing Organization Code</b> MGA																																																					
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		<b>15. Supplementary Notes</b>																																																					
<b>16. Abstract</b> A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2015 Ford Expedition XLT EL 4X4 SUV in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin on December 11, 2014.  The impact velocity of the vehicle was 56.3 km/h and the ambient temperature at the barrier face at the time of impact was 20.9°C. The target vehicle post-test maximum crush was 484 located to the right of the vehicle's centerline. The test vehicle's performance was as follows:																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>15</sub>)</td> <td>N/A</td> <td>700</td> <td style="background-color: yellow;">142</td> <td>700</td> <td style="background-color: yellow;">273</td> </tr> <tr> <td>Maximum Chest</td> <td>mm</td> <td>63</td> <td style="background-color: yellow;">22</td> <td>52</td> <td style="background-color: yellow;">10</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td style="background-color: yellow;">0.22</td> <td>1</td> <td style="background-color: yellow;">0.25</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td style="background-color: yellow;">1079</td> <td>2620</td> <td style="background-color: yellow;">824</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td style="background-color: yellow;">98</td> <td>2520</td> <td style="background-color: yellow;">396</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td style="background-color: yellow;">3352</td> <td>6805</td> <td style="background-color: yellow;">1246</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td style="background-color: yellow;">1447</td> <td>6805</td> <td style="background-color: yellow;">2041</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC <sub>15</sub> )	N/A	700	142	700	273	Maximum Chest	mm	63	22	52	10	Nij	N/A	1	0.22	1	0.25	Neck Tension	N	4170	1079	2620	824	Neck Compression	N	4000	98	2520	396	Left Femur Force	N	10008	3352	6805	1246	Right Femur Force	N	10008	1447	6805	2041
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## **SECTION 1 PURPOSE AND SUMMARY OF TEST**

### **PURPOSE**

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-12-D-00258. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure.

### **SUMMARY**

A load cell barrier consisting of 176 load cells was impacted by a 2015 Ford Expedition XLT EL 4X4 SUV at a velocity of 56.3 km/h. The test was performed at MGA Research Corporation on December 11, 2014. Pre-test and post-test photographs of the vehicle and dummies can be found in Appendix A.

Two (2) real-time cameras 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 this report.

One Part 572E 50<sup>th</sup> percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5<sup>th</sup> percentile female test device (ATD) was placed in the right-front passenger seating position according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also installed on the driver's shoulder and lap belts and the passenger's lap belt to measure dummy torso and pelvic section loading.

The driver (position 1) ATD (Serial No. 351) and the right-front passenger (position 2) ATD (Serial No. 138) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 628 channels of data were recorded on a data acquisition system. Appendix B contains the dummy response data traces.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the 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 484 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver's head and chest contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the knee bolster. The passenger's visible contact points were as follows: The passenger's head and chest contacted the airbag. The passenger's head also contacted the headrest. The passenger's knees contacted the glovebox.

The occupant data is summarized below:

ATD position	HIC <sub>15</sub>	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 <sup>th</sup> )	142	0.22	1079	98	39	22	3352	1447
Passenger (5 <sup>th</sup> )	273	0.25	824	396	39	10	1246	2041

The test data can be found on the NHTSA website at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov).

### TEST NOTES

Barrier K-15 MY has no valid data collected.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

**SECTION 2**  
**OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS**

**DATA SHEET NO. 1  
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	M20150210	Traction Control System (TCS)	Yes
Model Year	2015	Power Steering	Yes
Make	Ford	Power Window Auto-Reverse	Yes
Model	Expedition	Driver Frontal Airbag	Yes
Body Style	SUV	Driver Curtain Airbag	Yes
VIN	1FMJK1JT2FEF06501	Driver Head/Torso Airbag	No
Body Color	Blue Jeans Metallic	Driver Torso Airbag	Yes
Odometer (km/mi)	27 / 17	Driver Torso/Pelvis Airbag	No
Engine Displacement (L)	3.5	Driver Pelvis Airbag	No
Type/No. Cylinders	6	Driver Knee Airbag	No
Engine Placement	Longitudinal	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	Yes
Final Drive	4WD	Front Pass. Torso/Pelvis Airbag	No
Roof Rack	Yes	Front Pass. Pelvis Airbag	No
Sunroof/T-Top	No	Front Pass. Knee Airbag	No
Running Boards	Yes	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Driver Only	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	N/A

Does owner's manual provide instructions to turn off automatic door locks?	Yes
--	-----

**DATA FROM CERTIFICATION LABEL**

Manufactured By	Ford Motor Company	GVWR (kg)	3520
Date of Manufacture	09/14	GAWR Front (kg)	1678
		GAWR Rear (kg)	1950

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

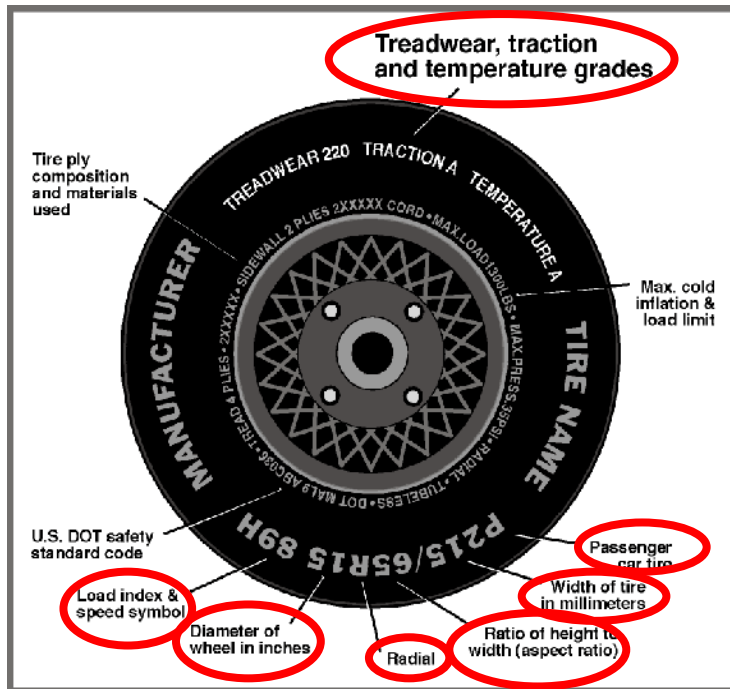
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	Split Bench	
Designated Seating Capacity (DSC)	2	3	3	8
Capacity Weight (VCW) (kg)				703
Cargo Weight (RCLW) (kg)				159

**DATA SHEET NO. 1 (CONTINUED)**  
**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

**VEHICLE TIRE INFORMATION**



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	255	255
Recommended Tire Size	275/65R18	275/65R18
Tire Size on Vehicle	275/65R18	275/65R18
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Wrangler	Wrangler
Treadwear	680	680
Traction	A	A
Temperature Grade	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	116T	116T
Tire Material	Rubber	Rubber
DOT Safety Code Left	4BYJ JEIR 3014	4BYJ JEIR 3014
DOT Safety Code Right	4BYJ JEIR 3014	4BYJ JEIR 3014

**DATA SHEET NO. 1 (CONTINUED)  
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
Test Date: 12/11/2014

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	700.0	697.0		703.5	835.5	
Right	kg	696.5	690.0		726.5	788.0	
Ratio	%	50.2	49.8		46.8	53.2	
Totals	kg	1396.5	1387.0	2783.5	1430.0	1623.5	3053.5

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2783.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	136
Calculated Test Vehicle Target Weight (TVTW)	kg	3060.1

**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	917	918	901	910	1654
As Tested	mm	910	917	876	886	1765
Post Test	mm	877	951	891	900	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3320
Total Vehicle Length at Left Side	mm	5400
Total Vehicle Length at Centerline	mm	5604
Total Vehicle Length at Right Side	mm	5400
Weight of Ballast in Cargo Area	kg	72.1
Weight of Vehicle Components Removed	kg	27.2
Amount of Stoddard Solvent in Fuel Tank	L	118.1

List of components removed to meet test weight: Rear bumper cover

List of components removed for instrumentation, data box, and equipment installation:  
Cargo divider, jack & tools, right taillight, front underbody plastic.

**DATA SHEET NO. 1 (CONTINUED)**  
**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

**TARGET VEHICLE STRUCTURAL MEASUREMENT**

	Elements	Pre-Test (mm)
1	Total Length	5604
2	Total Width	1976
3	Bumper Top Height	555
4	Bumper Bottom Height	460
5	Longitudinal Member Top Height	585
6	Distance between Longitudinal Members	755
7	Longitudinal Member Width	95
8	Engine Top Height	1080
9	Engine Bottom Height	335
10	Engine and Gearbox Width	620
11	Front Bumper-Engine Distance	872
12	Front Shock Absorber Fixing Height	832
13	Bonnet Leading Edge Height	1128
14	Front Shock Absorber Fixing Width	970
15	Front Bumper – Front Axle Distance	988
16	Front Axle – A-Pillar Distance	675
17	A-Pillar – B-Pillar Distance	1063
18	B-Pillar – Rear Axle Distance	1582
19	B-Pillar – C-Pillar Distance	870
20	Roof Sill Bottom Height	1735
21	Roof Sill Top Height	1830
22	Floor Sill Bottom Height	430
23	Floor Sill Top Height	510

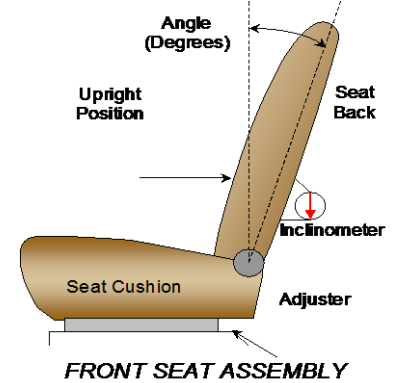
**DATA SHEET NO. 2  
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

**NOMINAL DESIGN RIDING POSITION**

The driver seat back is positioned as close as possible to the manufacturer’s design angle. For the passenger seat back, seat back is adjusted following Appendix F, “Driver & Passenger Dummy Seating & Positioning Procedures” in the NCAP Test Procedure dated August 2013.



	Degrees
Driver Seat Back Angle	10.2° on headrest post
Passenger Seat Back Angle	2.8° on headrest post

**SEAT FORE/AFT POSITIONS**

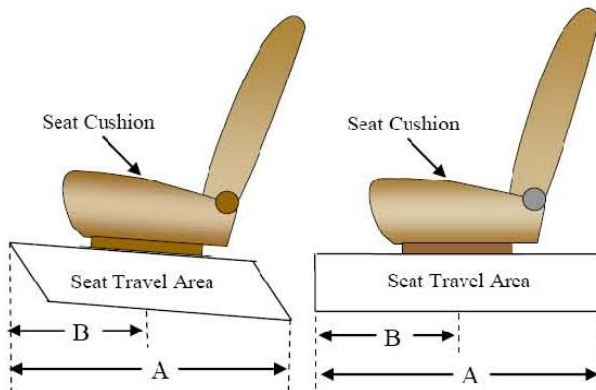
The driver and passenger seat fore/aft positions are adjusted following Appendix F, “Driver & Passenger Dummy Seating & Positioning Procedures” in the NCAP Test Procedure dated August 2013.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	269 mm	135 mm
Passenger Seat	220 mm / 23 detents	0 mm / 0 <sup>th</sup> detent (1 <sup>st</sup> as 0)

**SEAT BELT UPPER ANCHORAGES**

The seat belt upper anchorages are positioning following the manufacturer’s specified position as listed in Form 1.

	Total # of Positions	Placed in Position #
Driver Seat	5 (1 <sup>st</sup> as 1)	2 (1 <sup>st</sup> as 0)
Passenger Seat	5 (1 <sup>st</sup> as 1)	0 (1 <sup>st</sup> as 0)



**DATA SHEET NO. 2 (CONTINUED)**  
**SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
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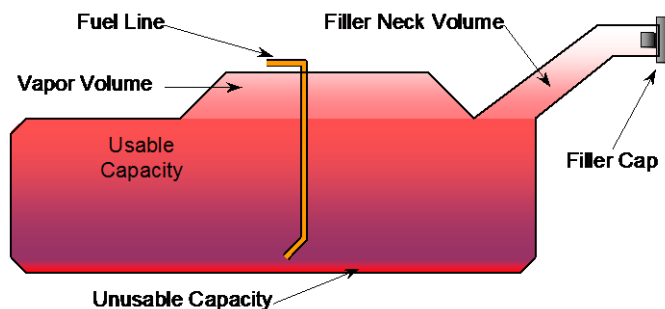
**FUEL TANK CAPACITY DATA**

	Liters
Usable Capacity of "Standard Tank"	126.8
Usable Capacity of "Optional Tank"	
92-94% of Usable Capacity	116.7 to 119.2
Actual Amount of Solvent used	118.1
1/3 of Usable Capacity	42.3

**FUEL PUMP**

Describe the fuel pump type, its behavior, and the location of the fuel filler pipe.

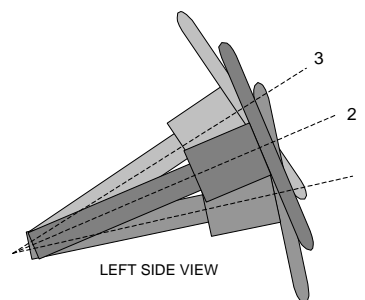
The vehicle is equipped with an electric fuel pump. The electric fuel pump operates for 3 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 3 seconds following ignition actuation, the fuel pump will shut off. The fuel pump operates continuously while the engine is running; if the engine stalls, the fuel pump is deactivated. Also a fuel pump shut-off system is provided and designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude. The fuel pipe is on the left side.



**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**

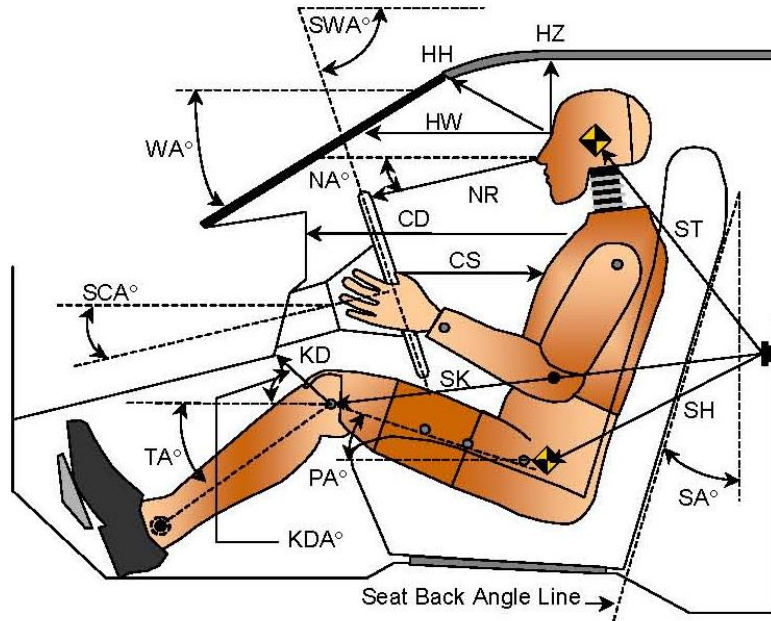
**STEERING COLUMN POSITION**

	Degrees	Fore/Aft Position (mm)
Lowermost Position 1	70.6	212
Geometric Center Position 2	68.8	190
Uppermost Position 3	67.0	168
Telescoping Steering Wheel Travel		44
Test Position	68.8	190

**DATA SHEET NO. 3  
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014



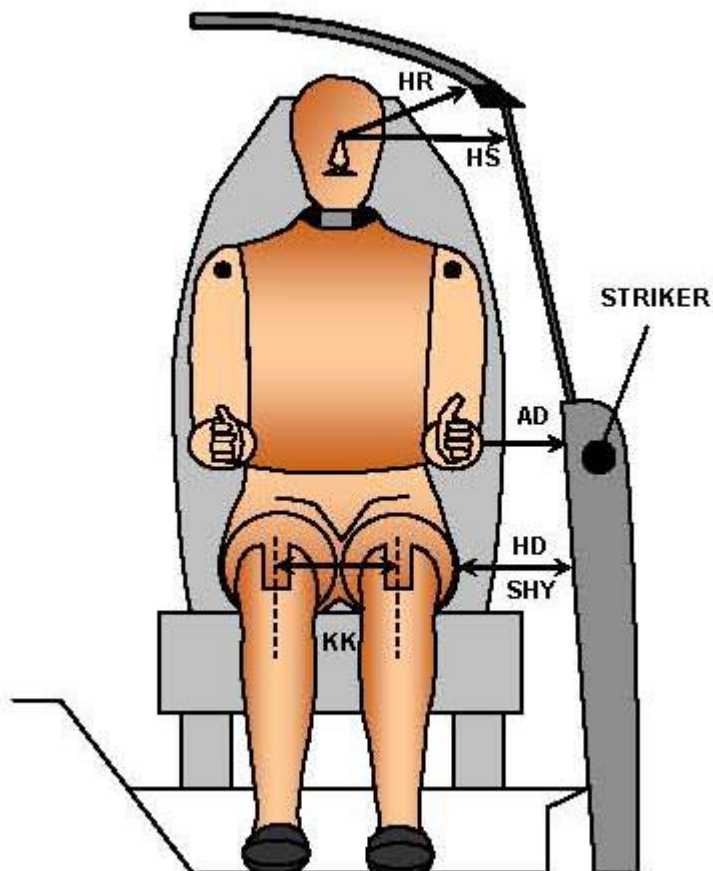
**LEFT SIDE VIEW**

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		31.7		
SWA°	Steering Wheel Angle		68.8		
SCA°	Steering Column Angle		21.2		
SA°	Seat Back Angle (on headrest post)		10.2		2.8
HZ	Head to Roof (Z)	120	90.0	229	90.0
HH	Head to Header	431	21.6	330	38.6
HW	Head to Windshield	663	0.0	605	0.0
NR	Nose to Rim	435	7.0		
CD	Chest to Dash	579		418	
CS	Chest to Steering Hub	378	1.8		
RA	Rim to Abdomen	237	0.0		
KDL	Left Knee to Dash	184	23.3	82	26.9
KDR	Right Knee to Dash	177	24.1	87	27.8
PA°	Pelvic Angle		24.5		21.5
TA°	Tibia Angle		50.6		62.6
SK	Striker to Knee	578	85.2	649	87.5
ST	Striker to Head	639	10.6	642	22.9
SH	Striker to H-Point	201	106.1	362	87.1

**DATA SHEET NO. 4  
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014



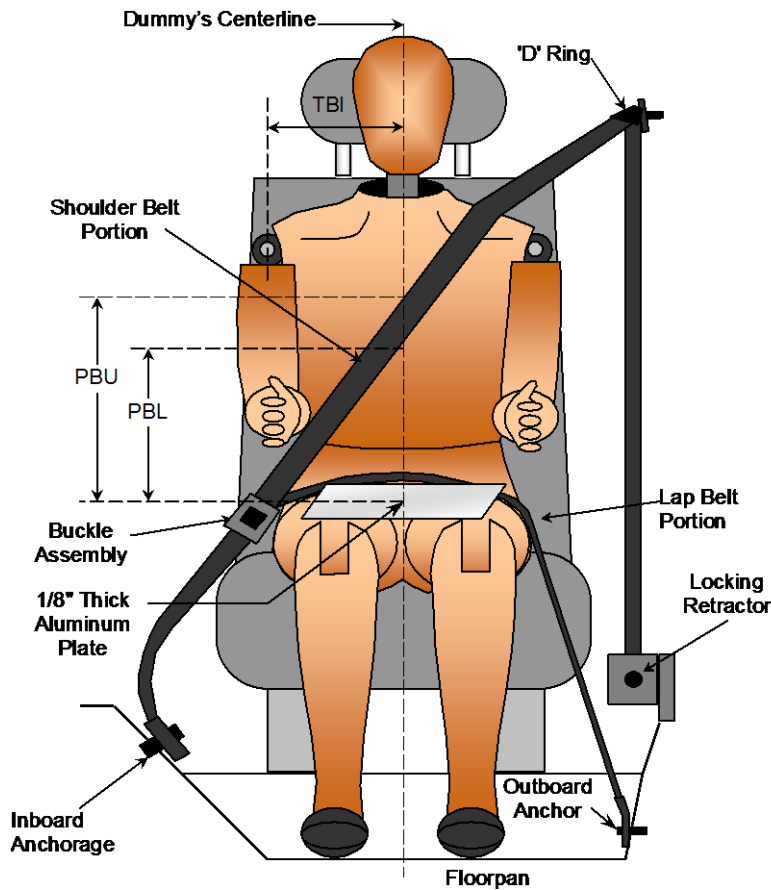
**FRONT VIEW OF DUMMY**

Code	Measurement Description	Driver	Passenger
		Length (mm)	
AD	Arm to Door	121	74
HD	H-Point to Door	134	185
HR	Head to Side Header	218	255
HS	Head to Side Window	317	348
KK	Knee to Knee	325	228
SHY	Striker to H-Point (Y Direction)	278	323
AA	Ankle to Ankle	275	179

**DATA SHEET NO. 5  
SEAT BELT POSITIONING DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014



**FRONT VIEW OF DUMMY**

**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
PBU - Top surface of reference to belt upper edge	mm	340	320
PBL - Top surface of reference to belt lower edge	mm	260	230

**BELT LENGTH DATA**

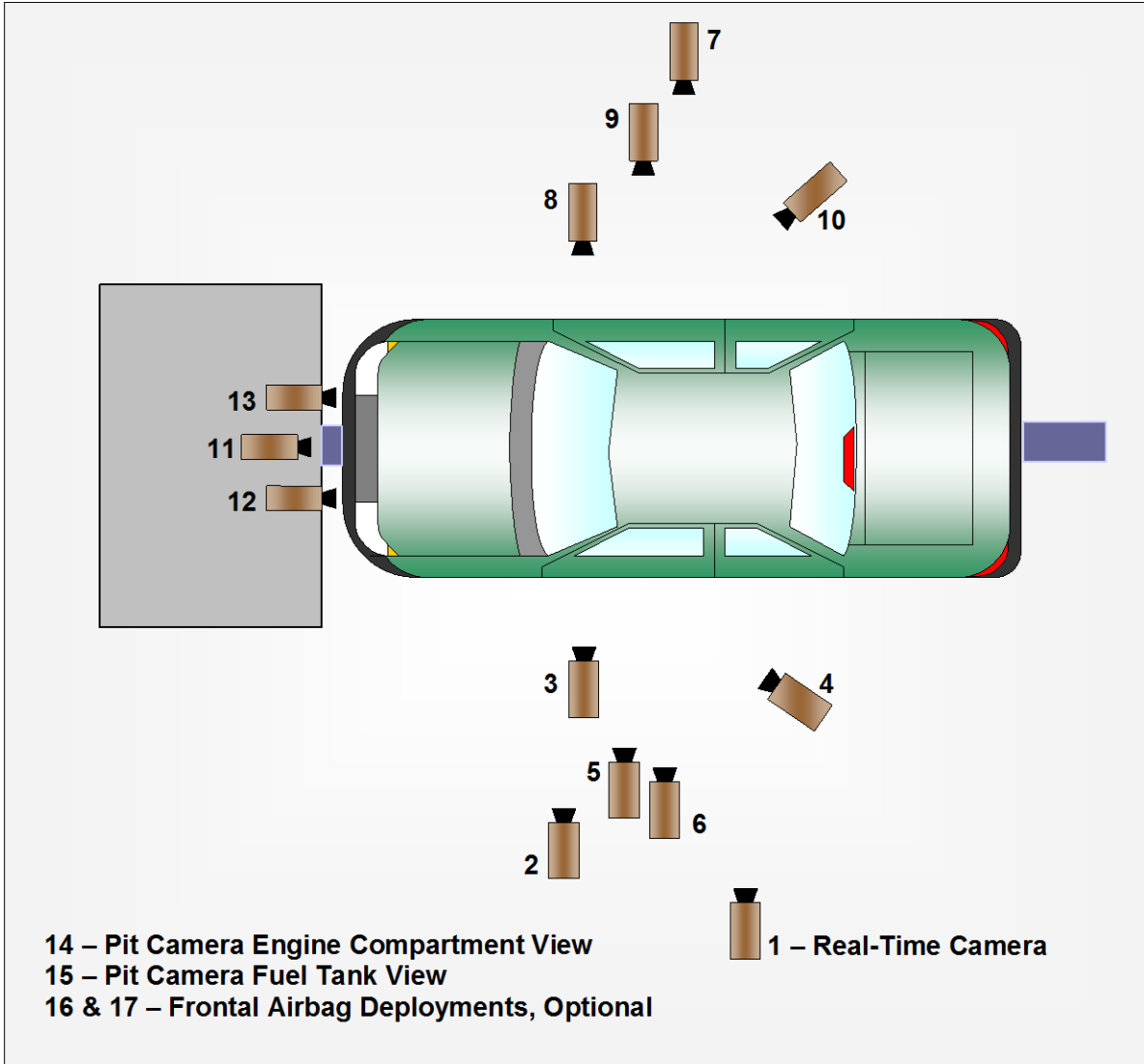
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as measured on ATD	mm	815	945
Lap Belt Length as measured on ATD	mm	780	850
Remainder of belt on reel	mm	1655	1455
Total Belt Length for Continuous Webbing Systems	mm	3250	3250

**DATA SHEET NO. 6  
HIGH-SPEED CAMERA LOCATIONS AND DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
Test Date: 12/11/2014

**CAMERA POSITIONS FOR FRONTAL IMPACTS**



**DATA SHEET NO. 6 (CONTINUED)  
CAMERA LOCATIONS AND DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

**CAMERA LOCATIONS**

No.	Camera View	Coordinates (mm)			Lens (mm)	Speed (fps)
		X*	Y*	Z*		
1	Real-Time Left Overall					30
2	Driver Close-Up	1680	-6770	-1910	35	1000
3	Left Front Half	1280	-5470	-1360	24	1000
4	Left Angle	5820	-5040	-1970	50	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	2580	6420	-1280	16	1000
8	Passenger Close-Up	1760	6810	-1930	35	1000
9	Right Front Half	1350	5520	-1240	24	1000
10	Right Angle	5870	5090	-1940	50	1000
11	Windshield	-430	0	-2810	20	1000
12	Driver Windshield	40	-450	-2030	8.5	1000
13	Passenger Windshield	40	450	-2030	8.5	1000
14	Pit Front	1110	0	3150	24	1000
15	Pit Rear	3040	0	3150	24	1000
16	Onboard Driver Side				12	1000
17	Onboard Passenger Side				12	1000
18	Real-Time Pan View					30

**\*COORDINATES:**

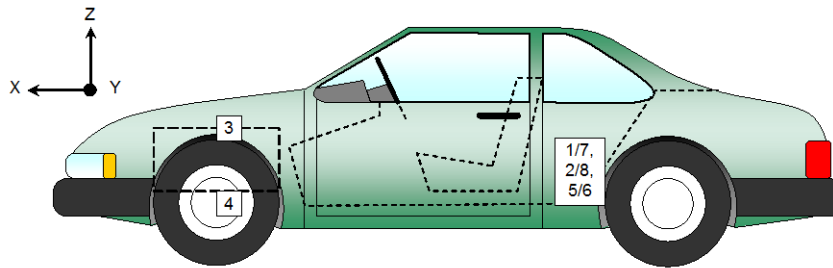
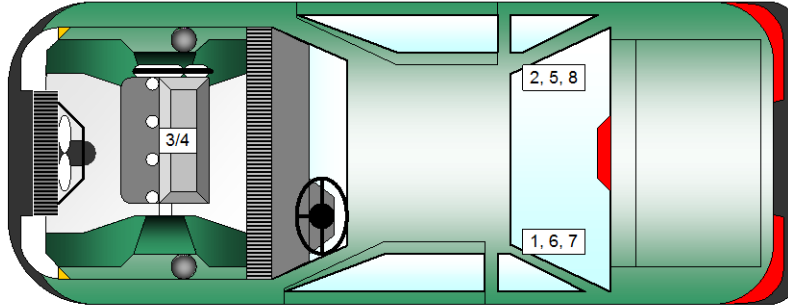
- +X = forward of impact plane
- +Y = right of monorail centerline
- +Z = below ground level

Cameras 5 & 6 were not used for this test.

**DATA SHEET NO. 7  
VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014



**VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Crossmember Accelerometer – X Direction	2506	-515	-614
2	Right Rear Crossmember Accelerometer – X Direction	2506	480	-614
3	Engine Top X	4298	0	-1030
4	Engine Bottom X	4256	0	-333
5	Left Rear Crossmember Accelerometer – Z Direction	2506	-515	-614
6	Right Rear Crossmember Accelerometer – Z Direction	2506	480	-614
7	Left Rear Crossmember Accelerometer Redundant – X Direction	2506	-515	-614
8	Right Rear Crossmember Accelerometer Redundant – X Direction	2506	480	-614

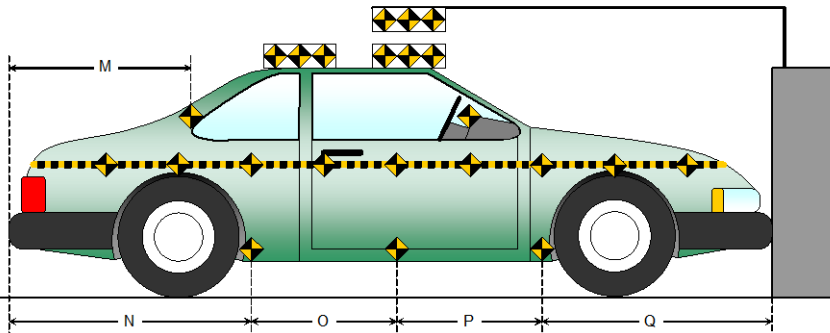
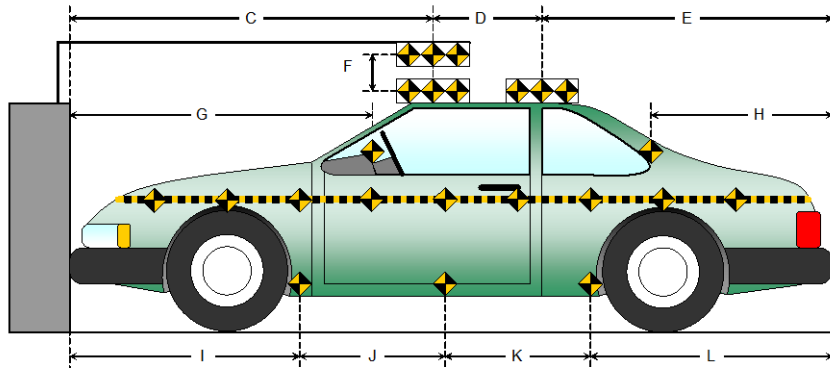
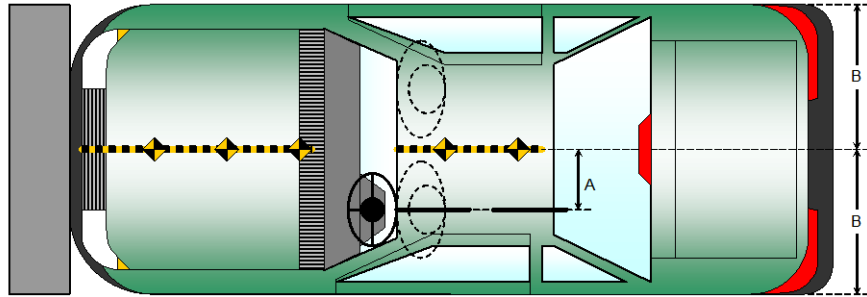
Reference Points: X - Rear Surface of Vehicle (+ forward)  
 Y - Vehicle Centerline (+ to right)  
 Z - Ground Plane (+ down)

**DATA SHEET NO. 8**  
**PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

Item	Value (mm)
A	430
B	988
C	2570
D	N/A
E	3034
F	20
G	
H	2008
I	1510
J	1139
K	1139
L	1816
M	2008
N	1816
O	1139
P	1139
Q	1510



**DATA SHEET NO. 9  
LOAD CELL LOCATIONS ON FIXED BARRIER**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

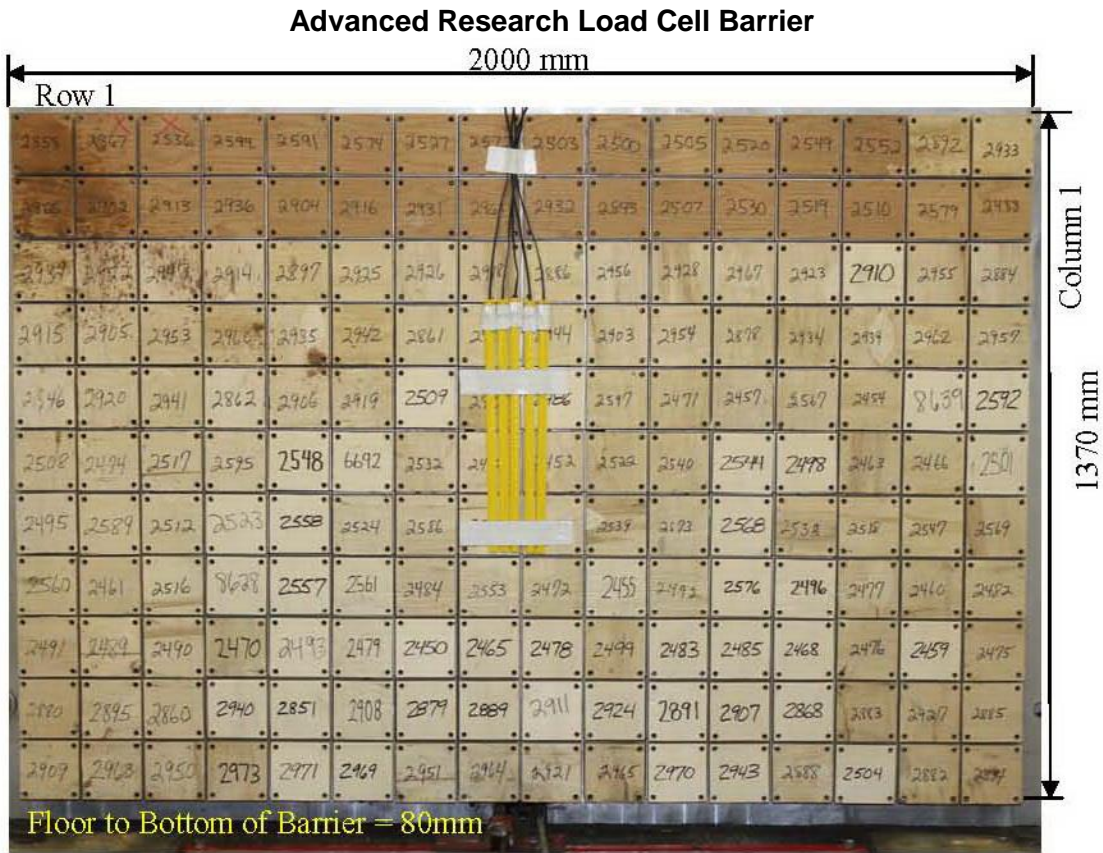


Photo for Reference Only

								Centerline								
A-16	A-15	A-14	A-13	A-12	A-11	A-10	A-09	A-08	A-07	A-06	A-05	A-04	A-03	A-02	A-01	
B-16	B-15	B-14	B-13	B-12	B-11	B-10	B-09	B-08	B-07	B-06	B-05	B-04	B-03	B-02	B-01	
C-16	C-15	C-14	C-13	C-12	C-11	C-10	C-09	C-08	C-07	C-06	C-05	C-04	C-03	C-02	C-01	
D-16	D-15	D-14	D-13	D-12	D-11	D-10	D-09	D-08	D-07	D-06	D-05	D-04	D-03	D-02	D-01	
E-16	E-15	E-14	E-13	E-12	E-11	E-10	E-09	E-08	E-07	E-06	E-05	E-04	E-03	E-02	E-01	
F-16	F-15	F-14	F-13	F-12	F-11	F-10	F-09	F-08	F-07	F-06	F-05	F-04	F-03	F-02	F-01	
G-16	G-15	G-14	G-13	G-12	G-11	G-10	G-09	G-08	G-07	G-06	G-05	G-04	G-03	G-02	G-01	
H-16	H-15	H-14	H-13	H-12	H-11	H-10	H-09	H-08	H-07	H-06	H-05	H-04	H-03	H-02	H-01	
I-16	I-15	I-14	I-13	I-12	I-11	I-10	I-09	I-08	I-07	I-06	I-05	I-04	I-03	I-02	I-01	
J-16	J-15	J-14	J-13	J-12	J-11	J-10	J-09	J-08	J-07	J-06	J-05	J-04	J-03	J-02	J-01	
K-16	K-15	K-14	K-13	K-12	K-11	K-10	K-09	K-08	K-07	K-06	K-05	K-04	K-03	K-02	K-01	

Load Cells are 121 mm x 121 mm with a 7 mm gap in between each load cell.

**DATA SHEET NO. 10**  
**TEST VEHICLE SUMMARY OF RESULTS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
Test Date: 12/11/2014

**INSTRUMENTATION**

Driver Dummy Data Channels	46
Passenger Dummy Data Channels	46
Vehicle Structure Accelerometers	8
Barrier Channels	528
Total	628

**CAMERA COVERAGE**

High-Speed Vehicle Onboard	2
High-Speed Offboard	12
Real-Time	2
Total	16

**DATA SHEET NO. 11  
POST-TEST OBSERVATIONS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50% / 351	HIII 5% / 138
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

**DOOR OPENING AND SEAT TRACK INFORMATION**

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were unlocked	Doors were unlocked
Front Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Rear Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Track Shift (mm)	0	0
Seat Back Failure	None	None

**POST TEST STRUCTURAL OBSERVATIONS**

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Cracked
Window Damage	None
Other Notable Effects	None

**VEHICLE REBOUND FROM BARRIER**

Measured Parameter	Units	Value
Left Side	mm	550
Center	mm	555
Right Side	mm	555
Average	mm	553

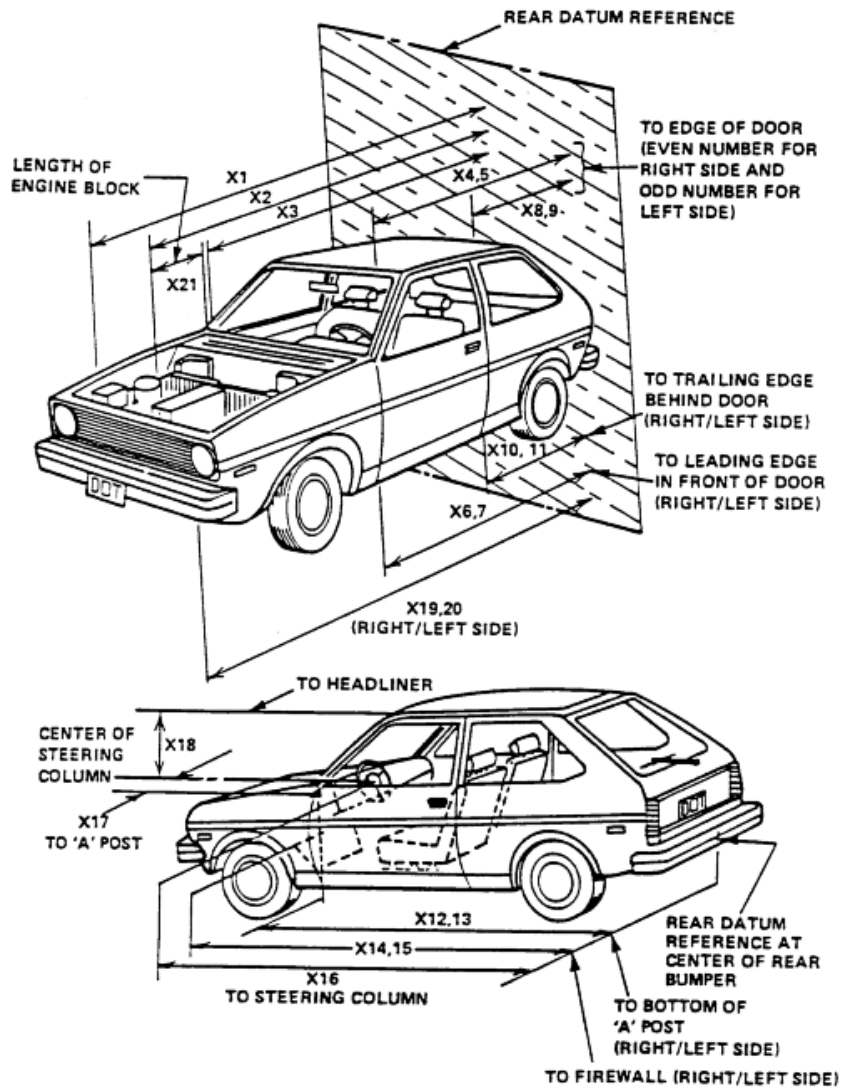
**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	Yes	Yes	Yes
Curtain Side Airbag	Yes	No	Yes	No
Torso Side Airbag	Yes	No	Yes	No
Knee Airbag	No		No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes		Yes	

## DATA SHEET NO. 12 VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014



**DATA SHEET NO. 12 (CONTINUED)  
VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
Test Date: 12/11/2014

**RSOV (Rear Surface of Vehicle)**

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	5604	5163	441
2	RSOV to Front of Engine	mm	4616	4574	42
3	RSOV to Firewall	mm	4296	4309	-13
4	RSOV to Upper Leading Edge of Right Door	mm	3886	3934	-48
5	RSOV to Upper Leading Edge of Left Door	mm	3886	3922	-36
6	RSOV to Lower Leading Edge of Right Door	mm	3808	3852	-44
7	RSOV to Lower Leading Edge of Left Door	mm	3808	3838	-30
8	RSOV to Upper Trailing Edge of Right Door	mm	2762	2809	-47
9	RSOV to Upper Trailing Edge of Left Door	mm	2762	2796	-34
10	RSOV to Lower Trailing Edge of Right Door	mm	2750	2790	-40
11	RSOV to Lower Trailing Edge of Left Door	mm	2750	2774	-24
12	RSOV to Bottom of "A" Post of Right Side	mm	3825	3862	-37
13	RSOV to Bottom of "A" Post of Left Side	mm	3825	3857	-32
14	RSOV to Firewall, Right Side	mm	4160	4173	-13
15	RSOV to Firewall, Left Side	mm	4160	4178	-18
16	RSOV to Steering Column	mm	3400	3462	-62
17	Center of Steering Column to "A" Post	mm	420	458	-38
18	Center of Steering Column to Headliner	mm	470	535	-65
19	RSOV to Right Side of Front Bumper	mm	5400	4996	404
20	RSOV to Left Side of Front Bumper	mm	5400	5103	297
21	Length of Engine Block	mm	480	480	0
RD	RSOV to Right Side of Dash Panel	mm	3649	3681	-32
CD	RSOV to Center of Dash Panel	mm	3613	3647	-34
LD	RSOV to Left Side of Dash Panel	mm	3628	3662	-34

**DATA SHEET NO. 13**  
**ACCIDENT INVESTIGATION DIVISION DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
Test Date: 12/11/2014

**VEHICLE INFORMATION**

VIN: 1FMJK1JT2FEF06501 Wheelbase (mm): 3320  
Vehicle Size Category: MPV Test Weight (kg): 3053.5

**ACCELEROMETER DATA**

Accelerometer Locations: As per measurements on Page 15

Cal. Procedure/Interval: MGA procedure / 6 month

Integration Algorithm: Trapezoidal

Linearity: > 99%

Impact Velocity (km/h): 56.3

Velocity Change (km/h): 63.2

Time of Separation (msec): 117.6

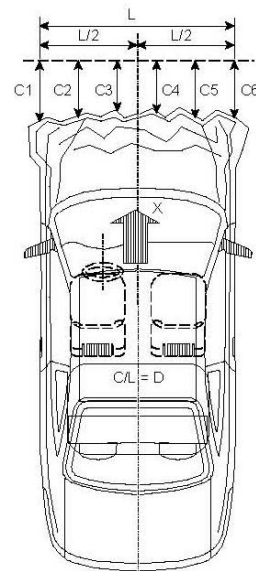
**CRUSH PROFILE**

Collision Deformation Classification: Frontal

Midpoint of Damage: Centerline

Damage Region Length (mm): 1170

Impact Mode: Frontal



No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	5400	5103	297
C2	Crush zone 2 at left side	mm	5450	5102	348
C3	Crush zone 3 at left side	mm	5480	5080	400
C4	Crush zone 4 at right side	mm	5480	4996	484
C5	Crush zone 5 at right side	mm	5450	4984	466
C6	Crush zone 6 at right side	mm	5400	4996	404
L	C1 TO C6	mm	1170	1163	7

**DATA SHEET NO. 14**  
**VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
Test Program: NCAP Frontal Barrier Impact Test

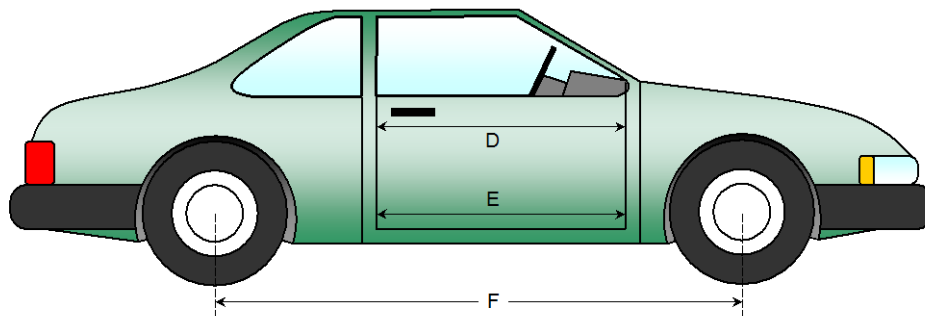
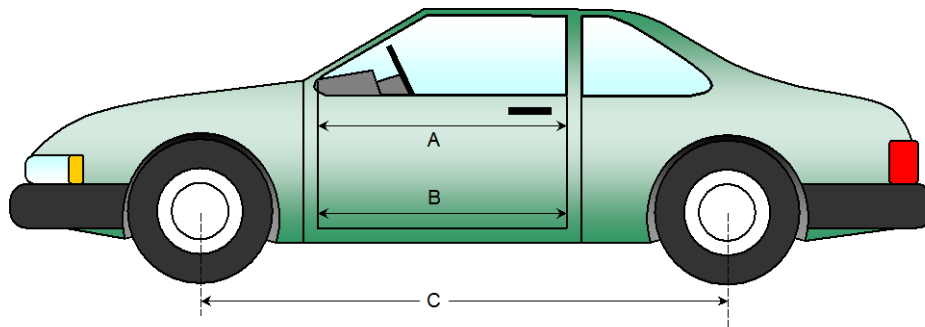
NHTSA No.: M20150210  
Test Date: 12/11/2014

**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1010	1010	0
B	Left Side Lower	mm	958	958	0
D	Right Side Upper	mm	1010	1007	3
E	Right Side Lower	mm	958	955	3

**WHEELBASE MEASUREMENTS**

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3320	3251	69
F	Right Side Wheelbase	mm	3320	3264	56



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

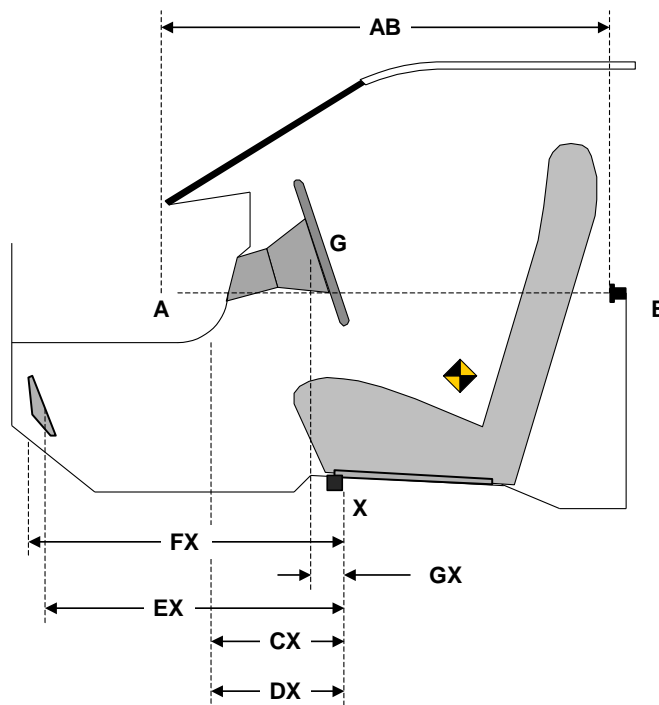
Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	700	700	0
CX	Left Knee Bolster to X	mm	271	268	3
DX	Right Knee Bolster to X	mm	256	254	2
EX	Brake Pedal to X	mm	544	541	3
FX	Foot Rest to X	mm	726	721	5
GX	Center of Steering Column Wheel Hub to X	mm	95	142	-47

X = Front of Seat Track (stationary)



**DRIVER COMPARTMENT**

**DATA SHEET NO. 15**  
**SUMMARY OF FMVSS 212, FMVSS 219 (PARTIAL) DATA, AND 301 DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

**Windshield Mounting Details:**

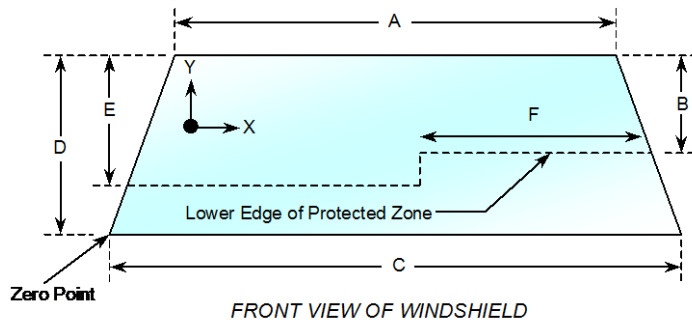
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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

Temperature of windshield molding during test: 20.9° C.

**WINDSHIELD PERIPHERY MEASUREMENTS**

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2280	2280	100
Right Side	2280	2280	100
Total	4560	4560	100



Item	Units	Value
A	mm	1364
B	mm	400
C	mm	1760
D	mm	718
E	mm	402
F	mm	476

**AREA OF PROTECTED ZONE FAILURES - NONE**

A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one that is normally in contact with the windshield. **None**

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. **None**

X	Y

**DATA SHEET NO. 15 (CONTINUED)**  
**SUMMARY OF FMVSS 212, FMVSS 219 (PARTIAL), AND 301 DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
Test Date: 12/11/2014

**FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA**

Temperature at Time of Impact: 20.9°C      Test Time: 10:56 a.m.

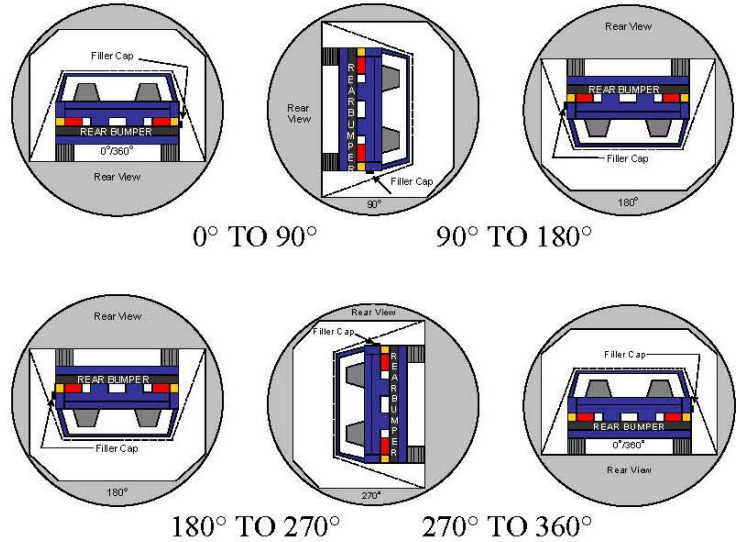
- A. From impact until vehicle motion ceases:        0   oz.  
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases:        0   oz.  
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes:        0   oz.  
(Maximum allowable = 1 oz./minute)
- D. Spillage:      None

**DATA SHEET NO. 16  
FMVSS 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent spillage: **None**



**SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	158	300	458
90° to 180°	140	300	440
180° to 270°	118	300	418
270° to 360°	151	300	451

**FMVSS 301 SPILLAGE TABLE (units in ounces)**

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eight 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

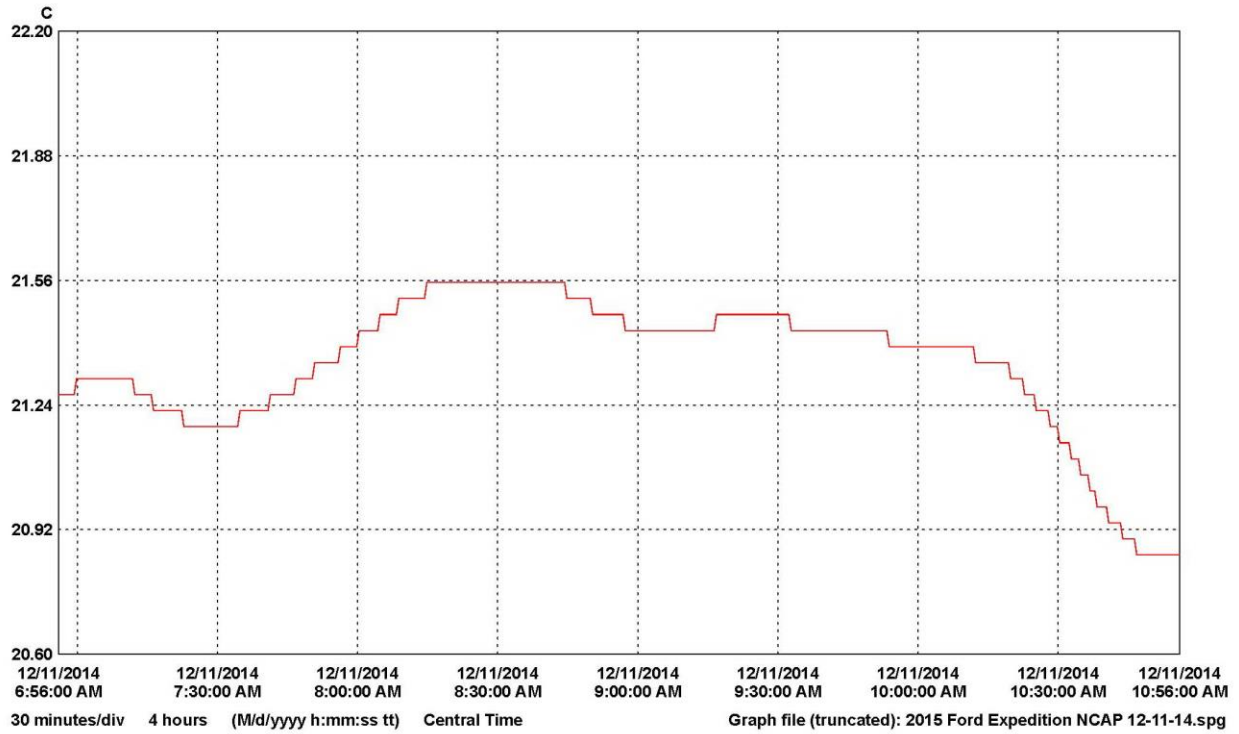
**SOLVENT SPILLAGE LOCATION TABLE**

Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

**DATA SHEET NO. 17**  
**DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA**

Test Vehicle: 2015 Ford Expedition XLT EL 4X4 SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150210  
 Test Date: 12/11/2014



LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	14182020	Crash1	1		21.55	21.35	20.85	C	Temperature	14182020_Crash1.spl
LN Logger file										
1	C:\Program Files (x86)\Veriteq Instruments\lLog 4.4\Prep 2014\14182020_Crash1.spl									ID # Security Created by Creation time