REPORT NUMBER: 301-CAL-07-02

SAFETY COMPLIANCE TESTING FOR FMVSS 301
FUEL SYSTEM INTEGRITY – REAR IMPACT

NISSAN MOTOR CO. LTD.
2007 NISSAN ALTIMA
4 - DOOR

NHTSA NUMBER: C75206

CALSPAN
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225

June 21, 2007

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance (NVS-224)
1200 New Jersey Avenue, SE
Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-06-C-00031. 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 manufactures' 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.

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16. Abstract Compliance tests were conducted on the subject 2007 Nissan Altima 4 - door in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301R-02 for the determination of FMVSS 301 compliance. Test failures identified were as follows: The test vehicle appeared to comply with all requirements of FMVSS 301R-02 "Fuel System Integrity – Rear Impact."			
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SECTION 1

PURPOSE AND TEST PROCEDURE

This rear impact test is part of the FMVSS 301 Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-06-C-00031. The purpose of this test was to determine if the subject vehicle, a 2007 Nissan Altima 4 - door, meets the performance requirements of FMVSS No. 301R-02 "Fuel System Integrity – Rear Impact." The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-301R-02, dated January 17, 2007).

SECTION 2

COMPLIANCE TEST RESULTS SUMMARY

A 1805 kg 2007 Nissan Altima 4 - door was impacted from the rear by an 1362.5 kg moving barrier at a velocity of 78.5 kph (48.8 mph). The test was performed by Calspan Corporation on June 21, 2007.

The test vehicle was equipped with a 75.5 liter fuel tank which was filled to 92 percent capacity with stoddard fluid prior to impact. Additional ballast (59 kg) was secured in the vehicle cargo area. Two ballast Part 572E 50th percentile male Anthropomorphic Test Device (ATD) were placed in the front occupant seating positions and.

The crash event was recorded by three high-speed cameras and one real-time camera. High-speed camera locations and other pertinent camera information are found on page 3-6 of this report. Pre- and post-test photographs of the vehicle can be found in Appendix A.

There was no fuel system fluid spillage following the impact or during any portion of the static rollover test. The average vehicle longitudinal crush was 537 millimeters. The vehicle appeared to comply with all the requirements of FMVSS No. 301 "Fuel System Integrity."

SECTION 3

SUMMARY OF TEST RESULTS

DATA SHEET 1

TEST VEHICLE SPECIFICATIONS

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2007 Nissan Altima 4 - door

Vehicle Body Color: Pebble Beach NHTSA Number: C75206

Engine Data: 4 Cylinders; - CID; 2.5 Liters; - cc

Transmission: 3 Speed; - Manual; x Automatic; - Overdrive

Final Drive: - Rear Wheel Drive; x Front Wheel Drive; - Four Wheel Drive

MAJOR TEST VEHICLE OPTIONS:

x AC; x Pwr Steering; x Power Brakes; x Power Locks; - Power Seats

x ABS; x Tilt Wheel; x Stab Control x Traction Control x Anti-Theft

DEALER AND DELIVERY INFORMATION:

Date Received: 3/28/07 ; Odometer Reading 278 km

Selling Dealer: West Herr Nissan

Dealer Address: 3580 Southwestern Blvd Orchard Park, NY 14127

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufacturer: Nissan Motor Co. LTD.

Vehicle Build Date: 02

VIN:: 1N4CL21E37C161161

GVWR: 2058 kg; GAWR: 1066 kg FRONT; 1000 kg REAR

DATA FROM VEHICLE'S TIRE LABEL AND SIDEWALL:

Location of Tire Placard: Driver Bottom Door Sill

Type of Spare Tire: Space Saver

	Front	Rear
Maximum Tire Pressure (sidewall - kPa)	240	240
Cold Pressure (tire placard - kPa) – test pressure	240	240
Recommended Tire Size (tire placard)	P215/60R16	P215/60R16
Vehicle Tire Size with load index & speed symbol	P215/60R16 94T	P215/60R16 94T
Tire Manufacturer	Continental	Continental
Tire Name	ContiProcontact	ContiProcontact
Treadwear, Traction, Temperature	400 AA A	400 AA A

VEHICLE CAPACITY DATA:

Type of Front Seats: - Bench; x Bucket; - Split Bench

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 408 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 67.8 kg

DATA SHEET 2

PRE-TEST DATA

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	466	469	58.8	935.0
Rear =	332	323	41.2	655.0
			Total Delivered Weight (UDW) =	1590.0

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW) =	1590.0	kg
Rated Cargo/Luggage Weight (RCLW) =	67.8	kg
Weight of 2 p.572E Dummies @ 78 each =	156	kg
TARGET TEST WEIGHT =	1813.8	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 59.0 KG OF CARGO WEIGHT:

	Left Side (kg)	Right Side (kg)	Ratio (%)	Total (kg)
Front =	521	519	57.6	1040.0
Rear =	383	382	42.4	765.0
			Total Vehicle Test Weight (ATW) =	1805.0

Weight of Ballast Secured in Vehicle[1] = 59 kg Ballast Type Lead shot bags

Method of securing Ballast: Compartment placement

Components Removed for Weight Reduction: None

VEHICLE ATTITUDE (all dimension in millimeters):

	Left Front	Right Front	Left Rear	Right Rear	CG[2]
AS DELIVERED:	754	748	746	746	1631
AS TESTED:	734	732	728	727	1598

Vehicle's Wheel Base: 2774 mm

[1]Ballast weight does not include the weight of instrumentation, on-board cameras and data acquisition system

[2]Rearward of the front axle centerline.

VEHICLE PRE-TEST WIDTH AND IMPACT OFFSET MEASUREMENT:

Vehicle Width at Widest Point: 1810 mm Location: Front fender over axle

Centerline offset for impact line: 362 mm

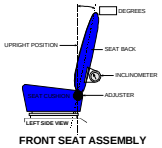
Filler neck side (left/right) Left

DATA SHEET 2 (continued)

PRE-TEST DATA

Vehicle: 2007 Nissan Altima 4 - door NHTSA No. C75206

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



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat: 7 degrees

Measurement instructions: 7 detents of mechanical adjustment

Seat back angle for passenger's seat: 7 degrees

Measurement instructions: 7 detents of mechanical adjustment

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: 0 to 24 detents – mechanical adjustment

Placed in 10th detent starting from 0 according to set-up information

Positioning of the passenger's seat: 0 to 24 detents – mechanical adjustment

Placed in 12th detent starting from 0 according to set-up information

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 75.7 liters

B. "Usable Capacity" of the optional equipment fuel tank is NONE liters

C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = 69.64 to 71.16 liters

3.2 Actual Amount of Stoddard solvent added to vehicle for test = 70.0 liters

Stoddard Fluid: specific gravity: 0.764 ; kinematic viscosity: 0.96 centistokes; color: Red

3.3 Is vehicle equipped with electric fuel pump? Yes- x ; No- -

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

With ignition turned "ON"

4. STEERING COLUMN ADJUSTMENTS:

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions: Telescoping column placed in mechanical middle with wheel tilt placed on

Mechanical middle which is 3rd detent starting from 0 position.

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: 4 detents in anchorage system – placed in 0 detent which is top position

6. COMMENTS:

None

DATA SHEET 3

MOVING DEFORMABLE BARRIER (MDB) DATA

Vehicle: 2007 Nissan Altima 4 - door NHTSA No. C75206

MDB FACE MANUFACTURER AND SERIAL NUMBER:

N/A

MDB DETAILS:

Overall Width of Framework Carriage	=	1250	millimeters
Overall Length of MDB (incl. honeycomb impact face)	=	4120	millimeters
Wheelbase of Framework Carriage	=	2591	millimeters
Tread of Framework Carriage (Front & Rear)	=	1875	millimeters
C.G. Location Rearward of Front Axle	=	1139	millimeters

MDB WEIGHT:

Left Front	=	357.0	kg	Left Rear	=	323.0	kg
Right Front	=	404.0	kg	Right Rear	=	273.5	kg
TOTAL FRONT =		761.0	kg	TOTAL REAR	=	596.5	kg
TOTAL MDB WEIGHT =		1357.5	kg				

Tires (Mfr, line, size):

TIRE PRESSURE:

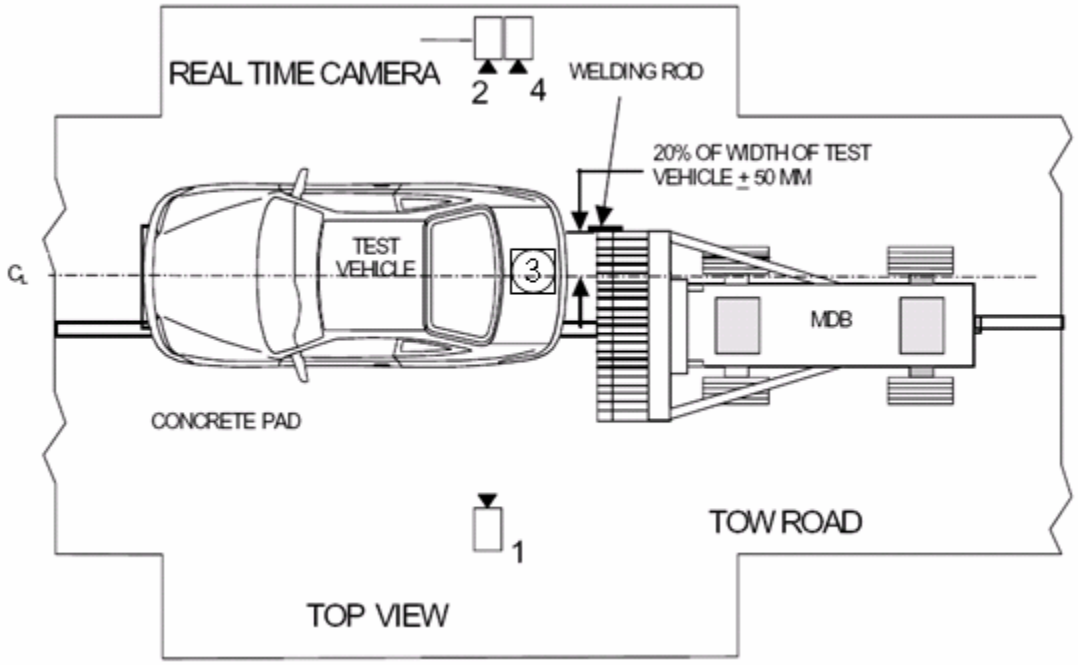
Left Front	=	207	kPa	Left Rear	=	207	kPa
Right Front	=	207	kPa	Right Rear	=	207	kPa

Brake Abort System? (Yes/No)	Yes
Date of Last Calibration:	6/15/07

DATA SHEET 4

HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2007 Nissan Altima 4 - door NHTSA No. C75206



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left Side View	7676	1450	868	-1.8	50	1000
2	Real-Time Camera	-	-	-	-	-	30
3	Overhead View	0	436		90	14	1000
4	Right Side View	9226	1630	1470	-6.9	24	1000

* Reference (from point of impact); all measurements accurate to within ±6 mm.

X = (Impact Point) + Forward
Y = (Impact Point) + To Right
Z = (Ground Level) + Down

DATA SHEET 5

POST-TEST DATA

Vehicle: 2007 Nissan Altima 4 - door NHTSA No. C75206

REQUIRED IMPACT VELOCITY RANGE:: 78.5 to 80.1 km/h

ACTUAL IMPACT VELOCITY WITHIN 1.5 M OF IMPACT PLANE:

Trap No. 1 = 78.5 km/h Trap No. 2 = 78.5 km/h

Average Impact Speed = 78.5 km/h

WELDING ROD IMPACT POINT:

-25 Vertical distance from target center (+ is above) Tolerance: ±50 mm

0 Horizontal distance from target center (+ is right) Tolerance: ±50 mm

STODDARD SOLVENT SPILLAGE MEASUREMENT:

A. Front impact until vehicle motion ceases -

Actual = 0 g Maximum Allowable = 28 g

B. For 5 minute period after vehicle motion ceases -

Actual = 0 g Maximum Allowable = 28 g

C. For next 25 minutes -

Actual = 0 g/minute Maximum Allowable = 28 g/minute

D. Provide Spillage Details:

None

DATA SHEET 5

POST-TEST DATA (Continued)

Vehicle: 2007 Nissan Altima 4 - door NHTSA No. C75206

POST TEST SEAT DATA

LOCATION	SEAT MOVEMENT (mm)	SEAT BACK FAILURE
P1 (Left Front)	0	Seat reclined backwards
P2 (Right Front)	0	Seat reclined backwards

POST TEST ATD CONTACT DATA

LOCATION	Position 1 (Driver)	Position 2 (Passenger)
Head	Back of head to head rest	Back of head to head rest
Chest	N/A	N/A
Abdomen	N/A	N/A
Left Knee	N/A	N/A
Right Knee	N/A	N/A

VEHICLE DIMENSIONS:

Vehicle length:

	Left Side	Centerline	Right Side
Pre-Test	4780	4811	4780
Post-Test	N/A	4274	4526
Crush	N/A	537	254

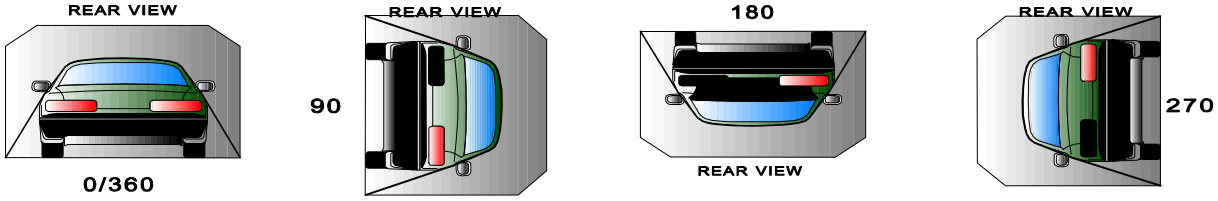
Vehicle Wheel Base:

	Left Side	Right Side
Pre-Test	2774	2774
Post-Test	2756	2749
Crush	18	25

DATA SHEET 6

FMVSS 301 ROLLOVER DATA

Vehicle: 2007 Nissan Altima 4 - door NHTSA No.: C75206



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0º - 90º	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes
90º - 180º	1	minutes	01	seconds	5	minutes	6	minutes	1	seconds	7	minutes
180º-270º	0	minutes	59	seconds	5	minutes	5	minutes	59	seconds	6	minutes
270º-360º	1	minutes	08	seconds	5	minutes	6	minutes	8	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0º - 90º	0	0	0	N/A
90º - 180º	0	0	0	N/A
180º-270º	0	0	0	N/A
270º-360º	0	0	0	N/A

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

IV. SOLVENT SPILLAGE LOCATION(S):

Rollover Stage	Spillage Location
0º - 90º	None
90º - 180º	None
180º-270º	None
270º-360º	None

APPENDIX A

PHOTOGRAPHS

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Figure A-2: Vehicle Tire Placard

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Figure A-4: Post-Test Front View

Figure A-5: Pre-Test Left Side View

Figure A-6: Post-Test Left Side View

Figure A-7: Pre-Test Right Side View

Figure A-8: Post-Test Right Side View

Figure A-9: Pre-Test Left Front Three-Quarter View

Figure A-10: Post-Test Left Front Three-Quarter View

Figure A-11: Pre-Test Right Front Three-Quarter View

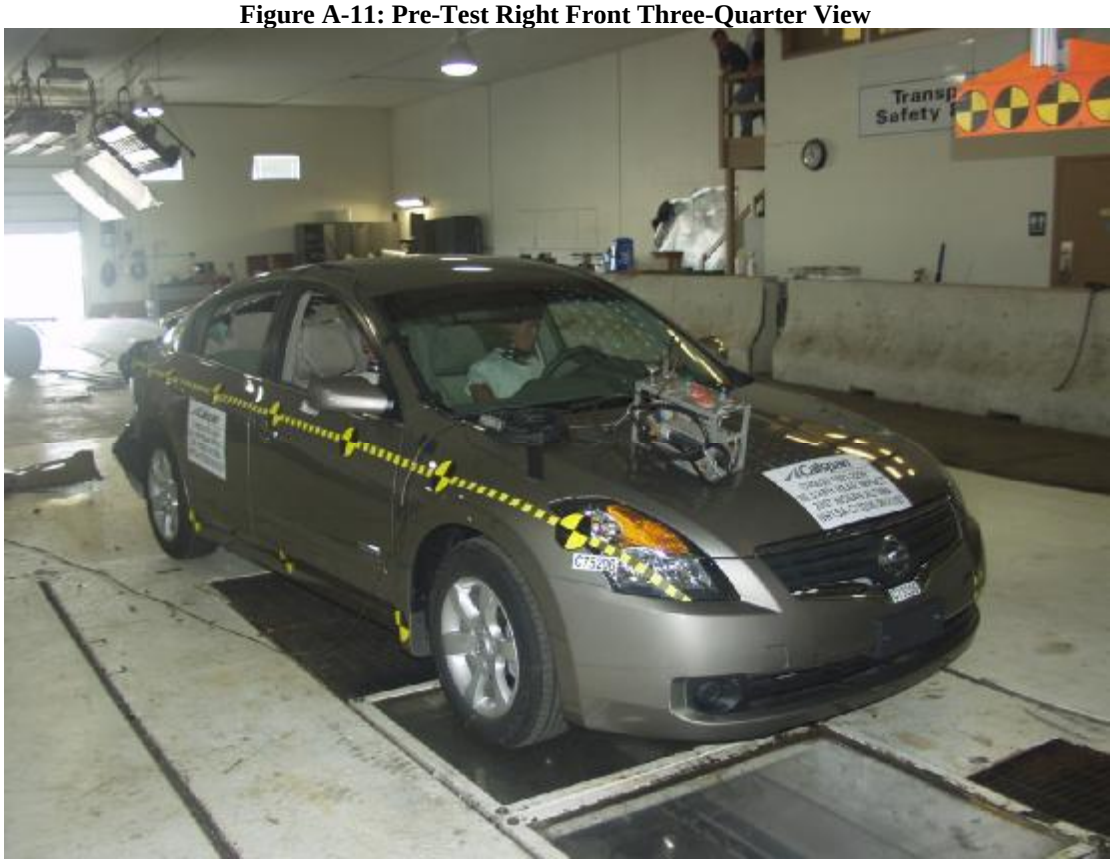

Figure A-12: Post-Test Right Front Three-Quarter View

Figure A-13: Pre-Test Left Rear Three-Quarter View

Figure A-14: Post-Test Left Rear Three-Quarter View

Figure A-15: Pre-Test Right Rear Three-Quarter View

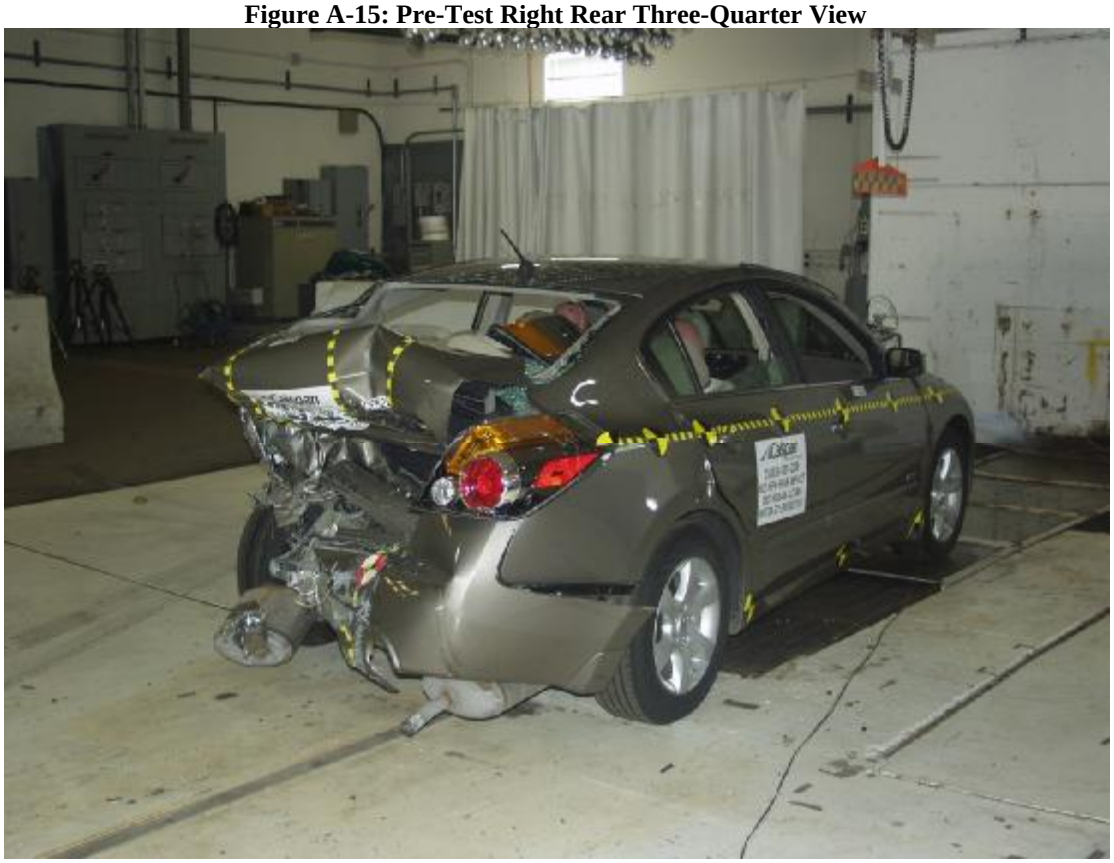

Figure A-16: Pre-Test Right Rear Three-Quarter View

Figure A-17: Pre-Test Rear View

Figure A-18: Post-Test Rear View

Figure A-19: Pre-Test MDB Front View

Figure A-20: Post-Test MDB Front View

Figure A-21: Pre-Test MDB Left Side View

Figure A-22: Post-Test MDB Left Side View

Figure A-23: Pre-Test MDB Right Side View

Figure A-24: Post-Test MDB Right Side View

Figure A-25: Pre-Test MDB Top View

Figure A-26: Post-Test MDB Top View

Figure A-27: Pre-Test Overhead Vehicle and MDB View

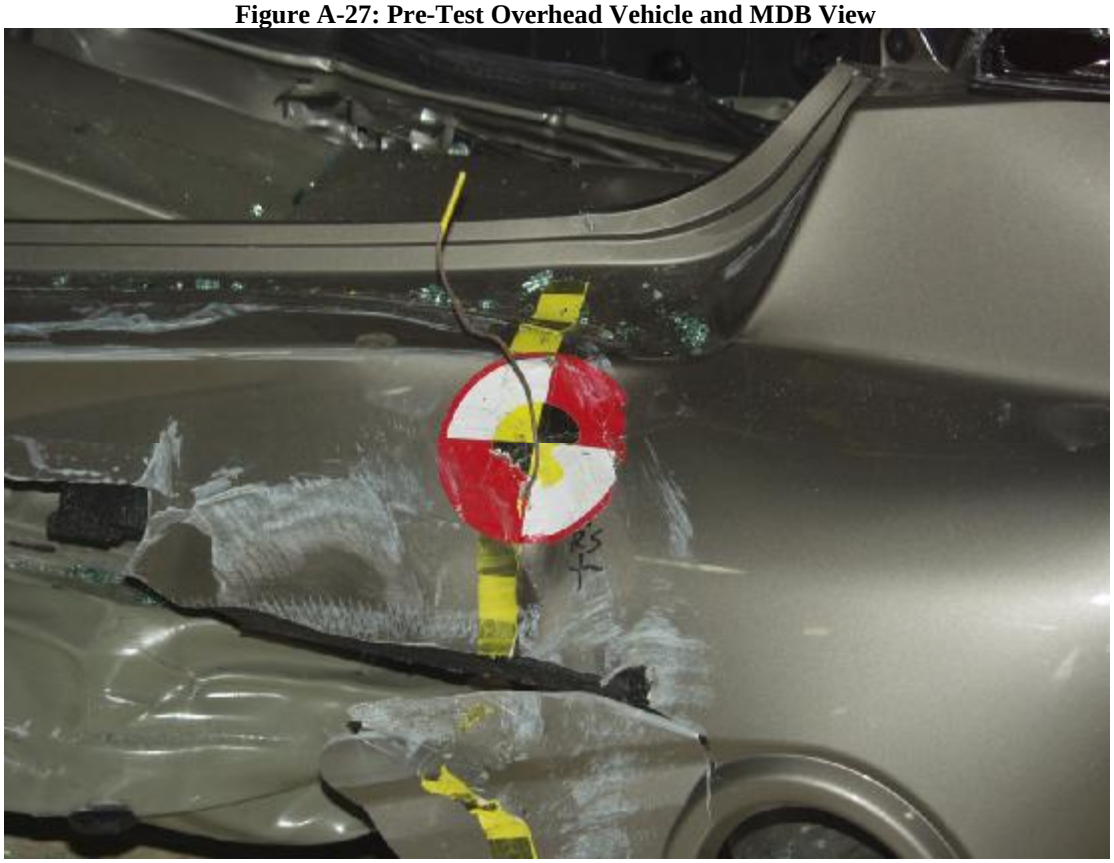

Figure A-28: Post-Test Impact Target View

Figure A-29: Pre-Test Front Underbody View

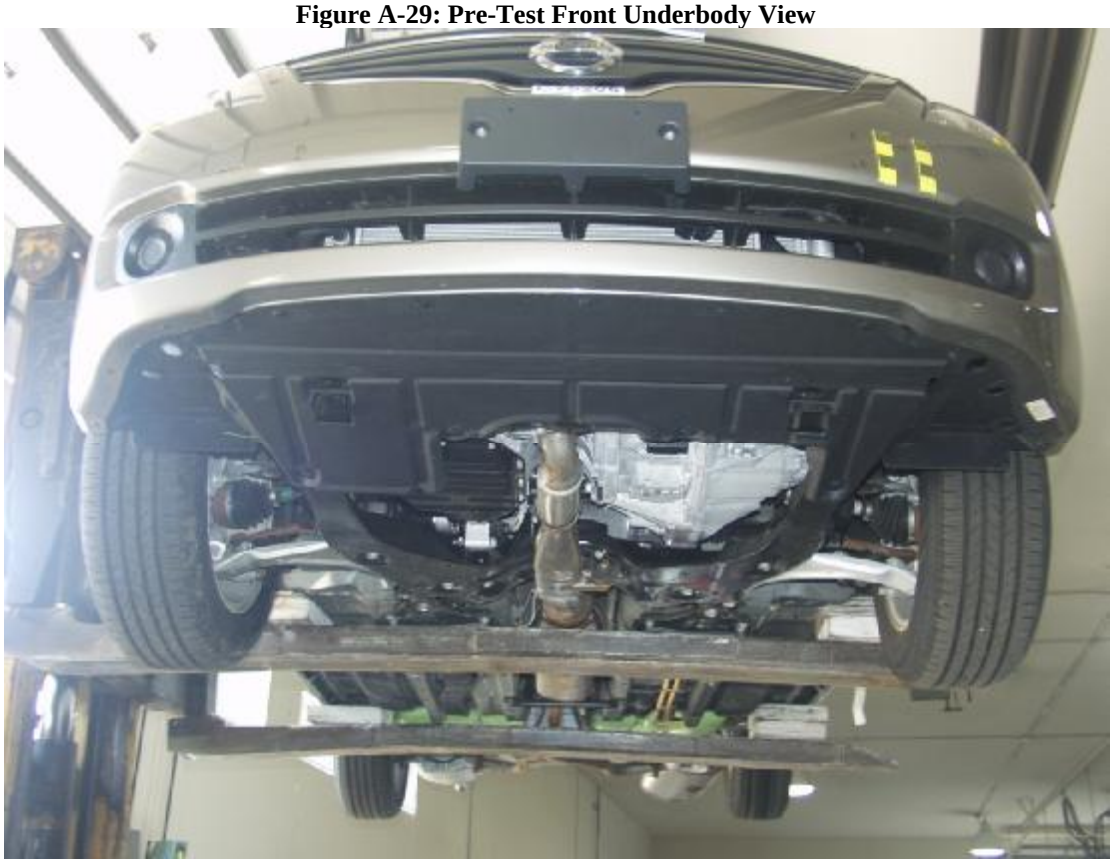

Figure A-30: Post-Test Front Underbody View

Figure A-31: Pre-Test Mid Underbody View

Figure A-32: Post-Test Mid Underbody View

Figure A-33:Pre-Test Rear Underbody View

Figure A-34: Post-Test Rear Underbody View

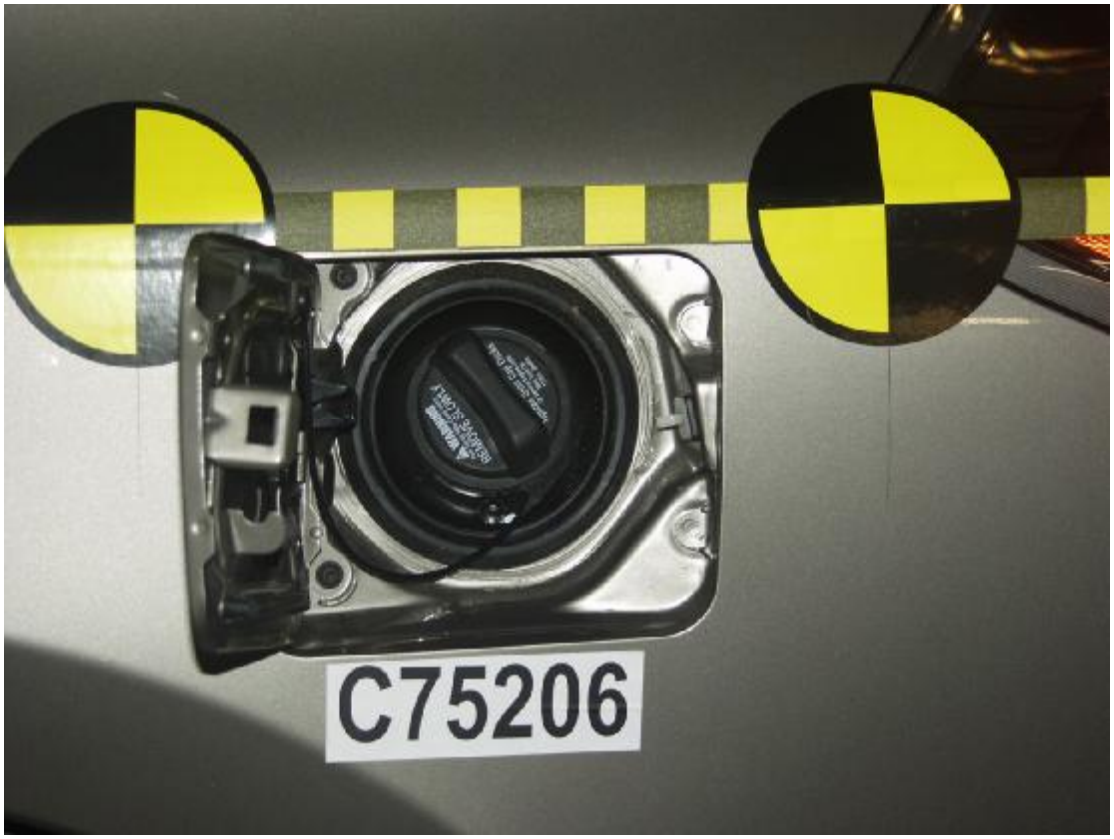

Figure A-35: Pre-Test Fuel Filler Cap View

Figure A-36: Post-Test Fuel Filler Cap View

Figure A-37: Impact View

Figure A-38: Rollover 90° View

Figure A-39: Rollover 180° View

Figure A-40: Rollover 270° View

Figure A-41: Rollover 360° View