REPORT NUMBER: TR-P34135-02-NC

SAFETY COMPLIANCE TESTING FOR FMVSS 301R

FUEL SYSTEM INTEGRITY – REAR IMPACT

79.3 KM/H 70% OVERLAP REAR IMPACT

HONDA OF CANADA MFG.

2014 HONDA CR-V 5-DOOR MPV

NHTSA NUMBER: C20145303

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

TEST DATE:

SEPTEMBER 4, 2014

REPORT DATE:

SEPTEMBER 17, 2014

FINAL REPORT

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ENFORCEMENT

OFFICE OF VEHICLE SAFETY COMPLIANCE

ROOM 6111, NVS-220

400 SEVENTH STREET, SW

WASHINGTON, DC 20590

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Prepared By: _____

Mr. Balbino A. Beltran, Project Engineer
KARCO Engineering, LLC.

Reviewed By: _____

Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC.

Approved By: _____

Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC.

Approval Date: September 17, 2014

FINAL REPORT ACCEPTANCE BY OVSC:

EDWARD E CHAN

Digitally signed by EDWARD E CHAN
DN: c=US, o=U.S. Government, ou=DOT Headquarters, ou=NHTSAHQ, cn=EDWARD E CHAN
Date: 2014.09.24 13:55:49 -04'00'

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Final Report of FMVSS 301R 70% Overlap Rear Impact Testing of a 2014 Honda CR-V 5-Door MPV NHTSA No. C20145303	September 17, 2014 **6. Performing Organization Code** KAR
7. Authors Mr. Balbino A. Beltran, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO	**8. Performing Organization Report No.** TR-P34135-02-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.** DTNH22-11-D-00245
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance Room 6111, NVS-220 400 Seventh Street, SW Washington, D.C. 20590	**13. Type of Report and Period Covered** Final Test Report, Sept. 4 - 17, 2014 **14. Sponsoring Agency Code**

15. Supplementary Notes

16. Abstract

A 79.3 km/h 70% overlap rear impact test was conducted on the subject 2014 Honda CR-V 5-door MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Laboratory Test Procedure for FMVSS 301R. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on September 4, 2014.

The impact velocity was 79.93 km/h and the outside ambient temperature was 34.4 deg. C. There was no Stoddard solvent leakage immediately after the test or during any portion of the static rollover

17. Key Words	18. Distribution Statement
FMVSS 301R Overlap Rear Impact MDB 2014 Honda CR-V	

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
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SECTION 1
SUMMARY OF TEST

SUMMARY

The purpose of this rear impact test series is to measure the performance of the subject vehicle, a 2014 Honda CR-V 5-door MPV, for FMVSS 301R *'Fuel System Integrity – Rear Impact'*.

This 79.3 km/h 70% Overlap Rear Impact is sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-11-D-00245. It was conducted in accordance with the Office of Vehicle Safety Compliance Laboratory Test Procedure TP-301R-02 for FMVSS 301R *'Fuel System Integrity – Rear Impact'*, dated January, 2007.

The test was performed at KARCO Engineering, LLC. on September 4, 2014. Pre- and post-test photographs of the vehicle and ATDs can be found in Appendix A of this report.

Two (2) real-time cameras and three (3) high-speed cameras were used to document the rear impact event.

Two Part 572E 50th percentile male anthropomorphic test devices (ATD) were placed in the driver and right front passenger seating positions. Both ATD's were not instrumented for this test.

There was no Stoddard solvent leakage after the impact or during any portion of the static rollover. FMVSS 301 data is summarized in Data Sheets 6 and 7.

SECTION 2

DATA SHEETS

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

CONVERSION FACTORS

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	29.574
Pressure	Tire Pressures	lbf/in^2	kPa	6.895
Temperature	General Use	^oF	^oC	=(Tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

TEST VEHICLE SPECIFICATIONS

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	C20145303
Model Year	2014
Make	Honda
Model	CR-V
Body Style	5-Door MPV
VIN	2HKRM3H35EH523889
Body Color	Black
Odometer Reading (km / mi)	686 / 426
Engine Displacement (L)	2.4
Type / No. of Cylinders	Inline 3
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	5
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

Traction Control System	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Seat Belt Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda of Canada Mfg.
Date of Manufacture	Jan-14

GVWR (kg)	1965
GAWR Front (kg)	1010
GAWR Rear (kg)	975

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

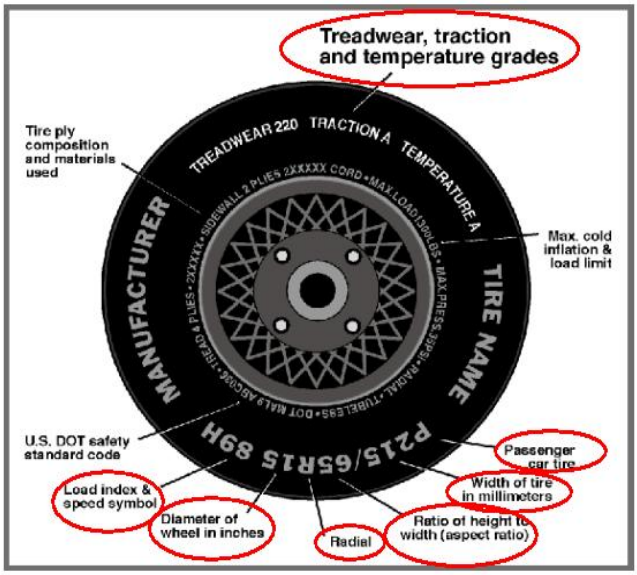
Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				385.0	*A*
DSC x 68 (kg)				340.0	*B*
Cargo Weight (RCLW) (kg)				45.0	*A-B*

DATA SHEET NO. 1 … (CONTINUED)

TEST VEHICLE SPECIFICATIONS

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max Tire Pressure (kPa)	500	500
Cold Tire Pressure (kPa)	220	220
Max Load Tire Pressure (kPa)		
Recommended Tire Size	P215/70R16	P215/70R16
Tire Size on Vehicle	P215/70R16	P215/70R16
Tire Manufacturer	Continental	Continental
Tire Model	Cross Contact	Cross Contact
Load Range	800	800
Treadwear Rating	680	680
Traction Rating	A	A
Temperature Grades	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	100s	100s
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	A309 3WM 4813	A309 3WM 4813
DOT Safety Code Right	A309 3WM 4813	A309 3WM 4813
Type of Spare Tire	Compact Size Spare Tire T165/80D17	
Location of Tire Placard on Vehicle	Driver Side 'B' Pillar Panel	

DATA SHEET NO. 2

PRE-TEST DATA

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	447.5	317.5		489.5	371.0		481.0	385.0	
Right	kg	422.5	304.0		467.0	348.5		457.0	360.5	
Ratio	%	58.3%	41.7%	100.0%	57.1%	42.9%	100.0%	55.7%	44.3%	100.0%
Total	kg	870.0	621.5	1491.5	956.5	719.5	1676.0	938.0	745.5	1683.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1491.5	A
Actual Weight of 2 P572 ATDs Used	kg	148.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	45.0	C
Calculated Vehicle Target Wt (TVTW)	kg	1684.5	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	845	839	842	845	1180
As Tested	mm	825	823	826	826	1216
Fully Loaded	mm	832	825	823	826	1255
Post-Test	mm	810	835	799	811	

GENERAL TEST VEHICLE DATA

Measured Parameter	Units	Value
Total Vehicle Wheel Base	mm	2626
Total Vehicle Length	mm	4510
Total Vehicle Width	mm	1820
Amount of Stoddard Solvent in Fuel Tank	L	53.9

DATA SHEET NO. 2… (CONTINUED)

PRE-TEST DATA

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

BALLAST DATA

Description	Value
Type of Ballast	Ballast Dummies
Method of Securing Ballast	Seat Belt
Weight of Ballast in Cargo Area	0 kg
Weight of Vehicle Components Removed	0 kg

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

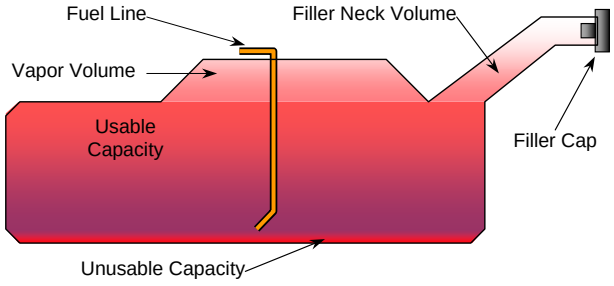
No vehicle components were removed

FUEL TANK CAPACITY

Description	Liters
Fuel System Capacity Listed in Owners Manual	57.91
Usable Capacity of "Standard Tank"	57.91
91 - 94% of Usable Capacity	52.70 - 54.44
Actual Amount of Stoddard Solvent Used	53.86

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump is activated on the ignition key is set to the 'ON' position. The pump is filled for two seconds after which pressure is maintained.



VEHICLE FUEL TANK ASSEMBLY

TEST FLUID

Description	Value
Test Fluid Type	Stoddard Solvent
Test Fluid Specific Gravity	0.76
Test Fluid Kinematic Viscosity	
Test Fluid Color	Purple

DATA SHEET NO. 2… (CONTINUED)

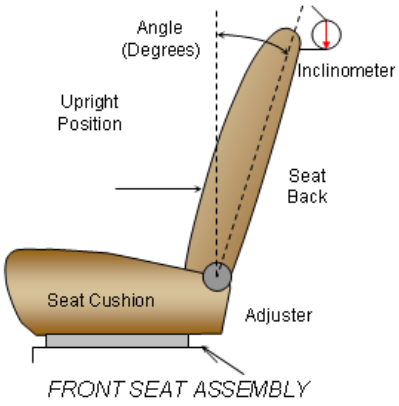
PRE-TEST DATA

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

NOMINAL DESIGN RIDING POSITION

Seat back angle is measured at the headrest post using a digital inclinometer.

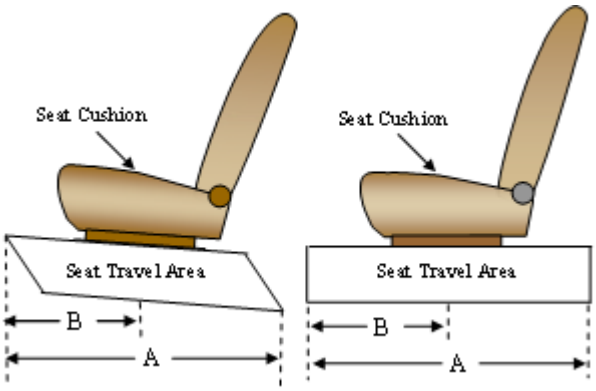


SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	9.2
Passenger Seat Back Angle	9.5

SEAT FORE / AFT POSITIONING

The total seat travel is measured from the forward most possible position to the rear most possible position. The driver's seat is set to the middle of the fore-aft travel. The passenger's seat is set to the middle of the fore-aft travel.



SEAT FORE/AFT POSITIONS

Seating Position	Total Fore-Aft Travel	Placed in Position
Driver Seat	277 mm	139 mm
Passenger Seat	240 mm	120 mm

DATA SHEET NO. 2… (CONTINUED)

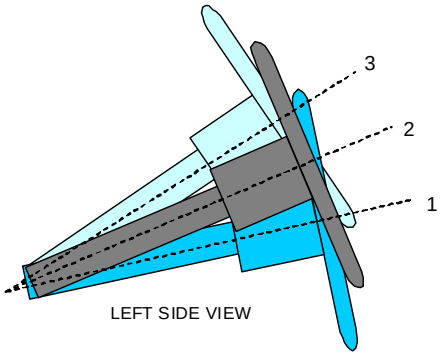
PRE-TEST DATA

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

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. A digital inclinometer is used to measure a plate which is placed across the rim of the steering wheel for angular measurements. A tape measure is used to measure telescoping steering wheel travel.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	25.5	132
Geometric Center Position, No. 2	27.9	111
Uppermost Position, No. 3	30.4	89
Telescoping Steering Wheel Travel	4.9	43
Test Position	27.9	111

DATA SHEET NO. 3

MOVING BARRIER DATA

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

MOVING BARRIER TEST WEIGHT

	Units	As Delivered Weights (UVW)		
		Front Axle	Rear Axle	Total
Left	kg	402.0	298.0	700.0
Right	kg	377.0	292.0	669.0
Ratio	%	56.9%	43.1%	100.0%
Total	kg	779.0	590.0	1369.0

MOVING BARRIER TIRE INFORMATION

Measured Parameter	Front	Rear
Recommended Tire Size	205/75R15	205/75R15
Tire Size on Vehicle	205/75R15	205/75R15
Tire Manufacturer	Pacemark	Pacemark
Tire Model	All Weather	All Weather
Treadwear	420	420
Traction	A	A
Temperature Grades	B	B
Tire Pressure - Front	220	220
Tire Pressure - Rear	220	220

MOVING BARRIER DIMENSIONS

Measurement Description	Length (mm)
Overall Width	1676
Overall Height	559
Honeycomb Depth	382
Overall Depth	483
Bottom Honeycomb to Bottom Bumper	50
Bumper Height	201
Ground to Top of MDB	788
Ground to Bottom of MDB	229
Ground to Bottom of Bumper	279
Ground to Top of Bumper	483

DATA SHEET NO. 4

POST-TEST DATA

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

Temperature at Time of Impact: 34.4°C Test Time: 10:45 AM

VIN: 1HKRM3H35EH523889

IMPACT VELOCITY DATA

Measured Parameter	Units	Value
Trap No. 1 Velocity (Primary)	km/h	79.93
Trap No. 2 Velocity (Redundant)	km/h	79.87

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Width	mm		1820
Vertical Impact Reference Line (Right of Vehicle Center Line)	mm		364
Actual Impact Point (Right of Vehicle Center Line)	mm		378
Horizontal Offset (+ right / - left)	mm	± 50 of Intended Impact Point	-14
Vertical Offset (+ down / - up)	mm	± 40 of Intended Impact Point	4

TARGET VEHICLE PRE- AND POST- TEST STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length at Centerline	4510	4224	286
2	Total Length	4510	4270	240
3	Total Width	1820	2096	276
4	Left Side Wheelbase	2626	2505	121
5	Right Side Wheelbase	2626	2620	6

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	233
B	Top of Bumper	533	800	Right	263
C	Mid Level	686	700	Right	212
D	Top of Stack	813	800	Right	154

DATA SHEET NO. 4… (CONTINUED)

POST-TEST DATA

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door Opening	Remained closed and latched	Remained closed and latched
Rear Door Opening	Jammed Shut	Jammed Shut
Hatch and other doors	Jammed Shut	

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0 g
(Maximum allowable = 28 g)

B. For the 5 minute period after motion ceases: 0 g
(Maximum allowable = 28 g)

C. For the following 25 minutes: 0 g
(Maximum allowable = 28 g/minute)

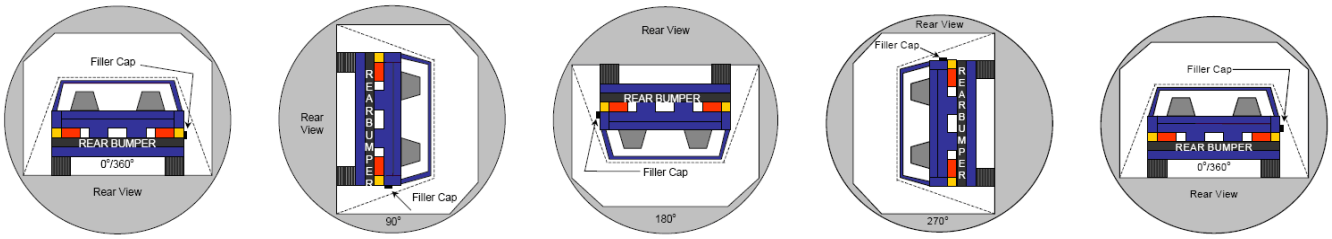
D. Spillage: No Stoddard Solvent leakage

DATA SHEET NO. 5

STATIC ROLLOVER TEST DATA

Test Vehicle: 2014 Honda CR-V 5-Door MPV NHTSA No.: C20145303

Test Program: 79.3 km/h 70% Overlap Rear Impact Test Date: 09/04/14



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 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).

Details of Stoddard solvent spillage: No Stoddard solvent spillage

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	84	300	384
90° To 180°	82	300	382
180° To 270°	79	300	379
270° To 360°	83	300	383

FMVSS 301 SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° To 90°	0 g			
90° To 180°	0 g			
180° To 270°	0 g			
270° To 360°	0 g			

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° To 90°	No Spillage
90° To 180°	No Spillage
180° To 270°	No Spillage
270° To 360°	No Spillage

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

FIGURE 1. As Received Right Front ¾ View of Test Vehicle

FIGURE 2. As Received Left Rear ¾ View of Test Vehicle

FIGURE 3. Test Vehicle Manufacturer's Label

FIGURE 4. Test Vehicle Tire Information Placard

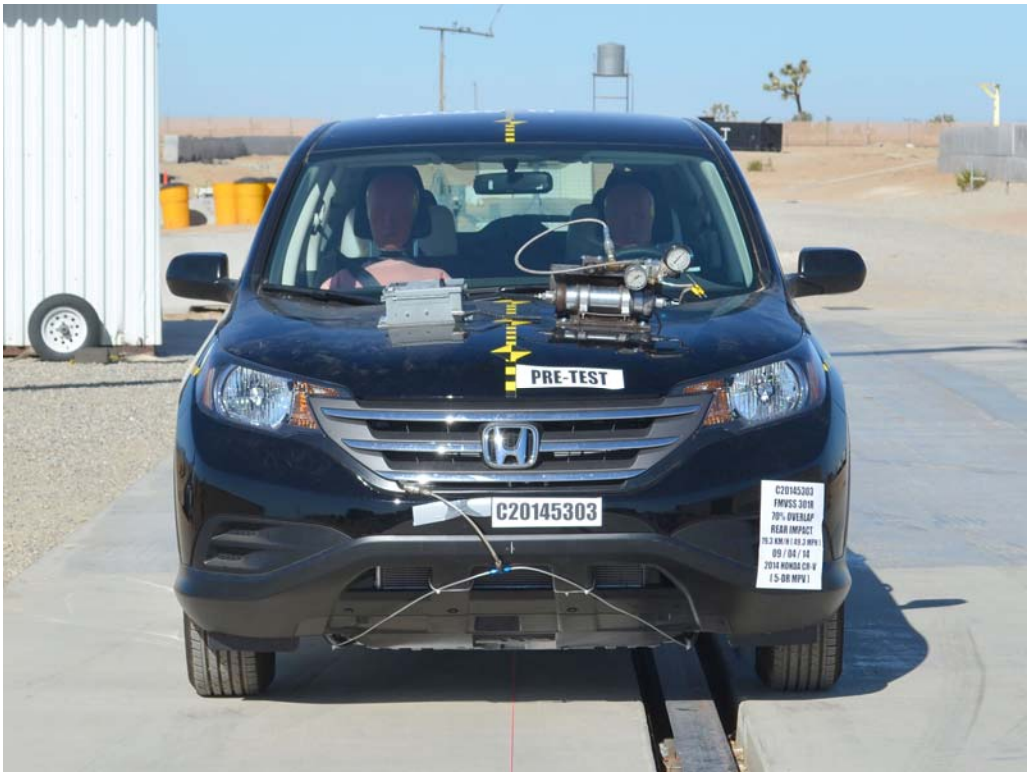


FIGURE 5. Pre-Test Front View of Test Vehicle

FIGURE 6. Post-Test Front View of Test Vehicle

FIGURE 7. Pre-Test Left Front ¾ View of Test Vehicle

FIGURE 8. Post-Test Left Front ¾ View of Test Vehicle

FIGURE 9. Pre-Test Left Side View of Test Vehicle

FIGURE 10. Post-Test Left Side View of Test Vehicle

FIGURE 11. Pre-Test Left Rear ¾ View of Test Vehicle

FIGURE 12. Post-Test Left Rear ¾ View of Test Vehicle

FIGURE 13. Pre-Test Rear View of Test Vehicle

FIGURE 14. Post-Test Rear View of Test Vehicle

FIGURE 15. Pre-Test Right Rear ¾ View of Test Vehicle

FIGURE 16. Post-Test Right Rear ¾ View of Test Vehicle

FIGURE 17. Pre-Test Right Side View of Test Vehicle

FIGURE 18. Post-Test Right Side View of Test Vehicle

FIGURE 19. Pre-Test Right Front ¾ View of Test Vehicle

FIGURE 20. Post-Test Right Front ¾ View of Test Vehicle

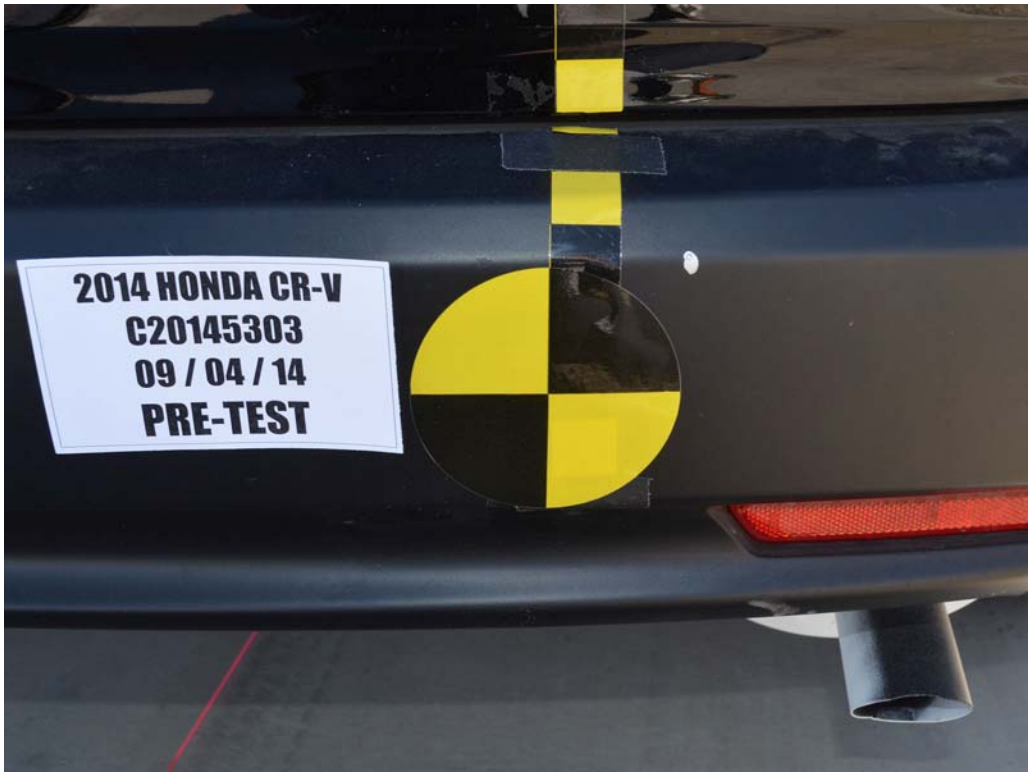


FIGURE 21. Pre-Test Close-Up View of Impact Point Target

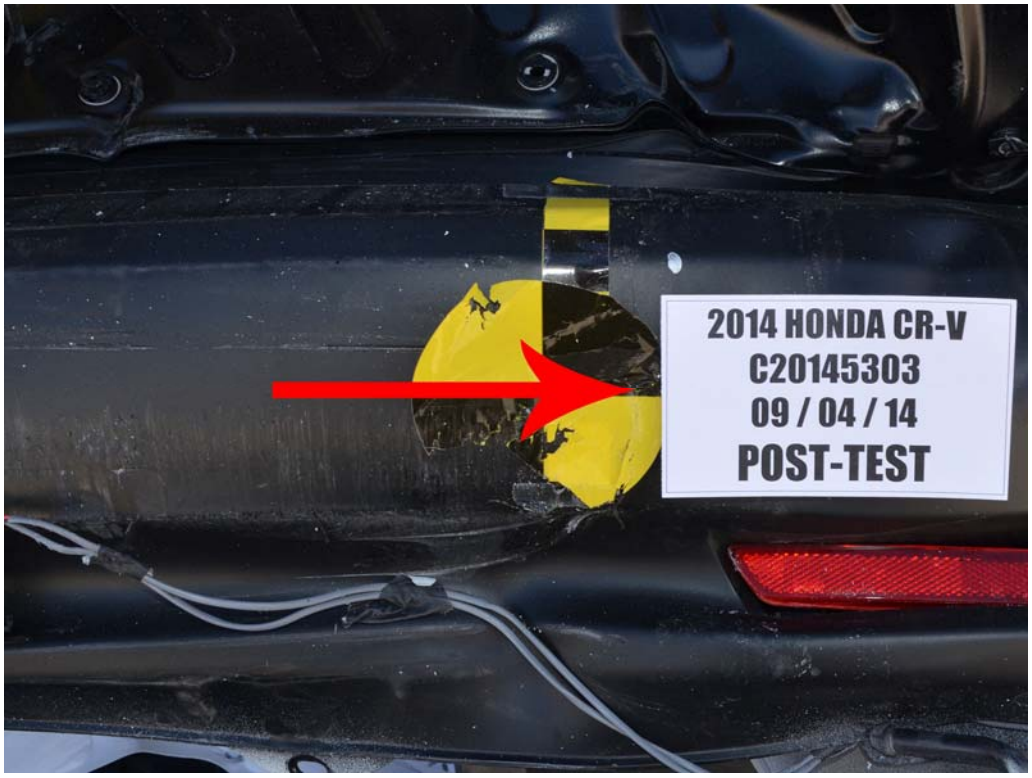


FIGURE 22. Post-Test Close-Up View of Impact Point Target

FIGURE 23. Pre-Test View of Fuel Filler Cap

FIGURE 24. Post-Test View of Fuel Filler Cap

FIGURE 25. Pre-Test Rear Underbody View of Test Vehicle

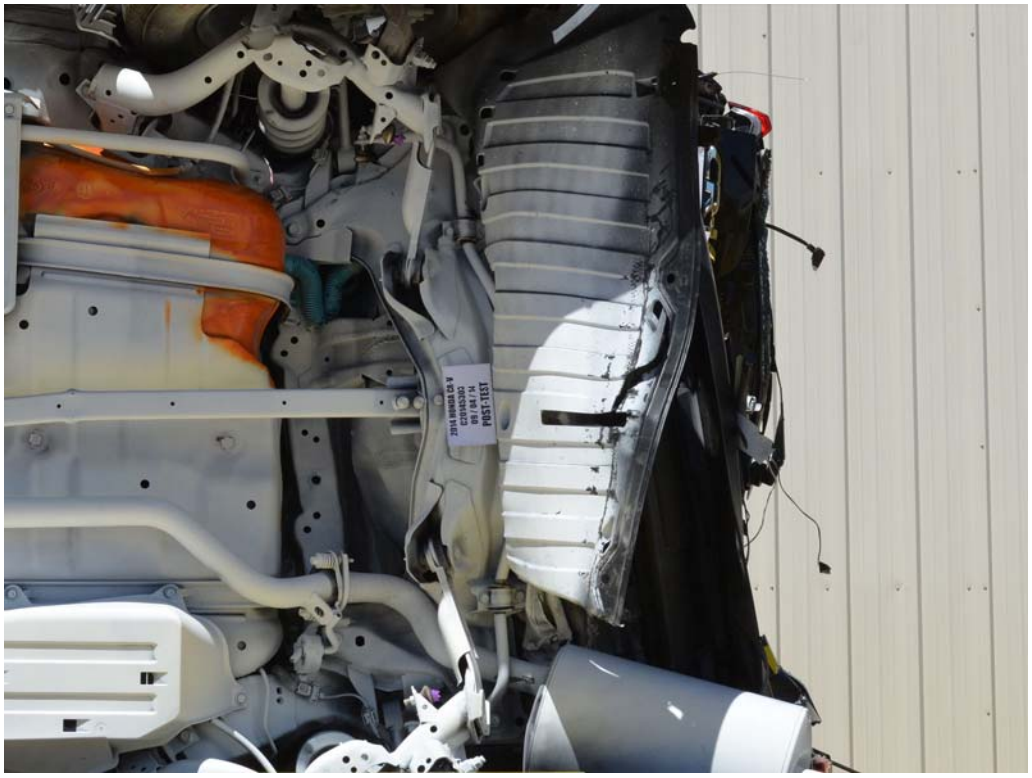


FIGURE 26. Post-Test Rear Underbody View of Test Vehicle

FIGURE 27. Pre-Test Underbody View of Fuel Tank

FIGURE 28. Post-Test Underbody View of Fuel Tank

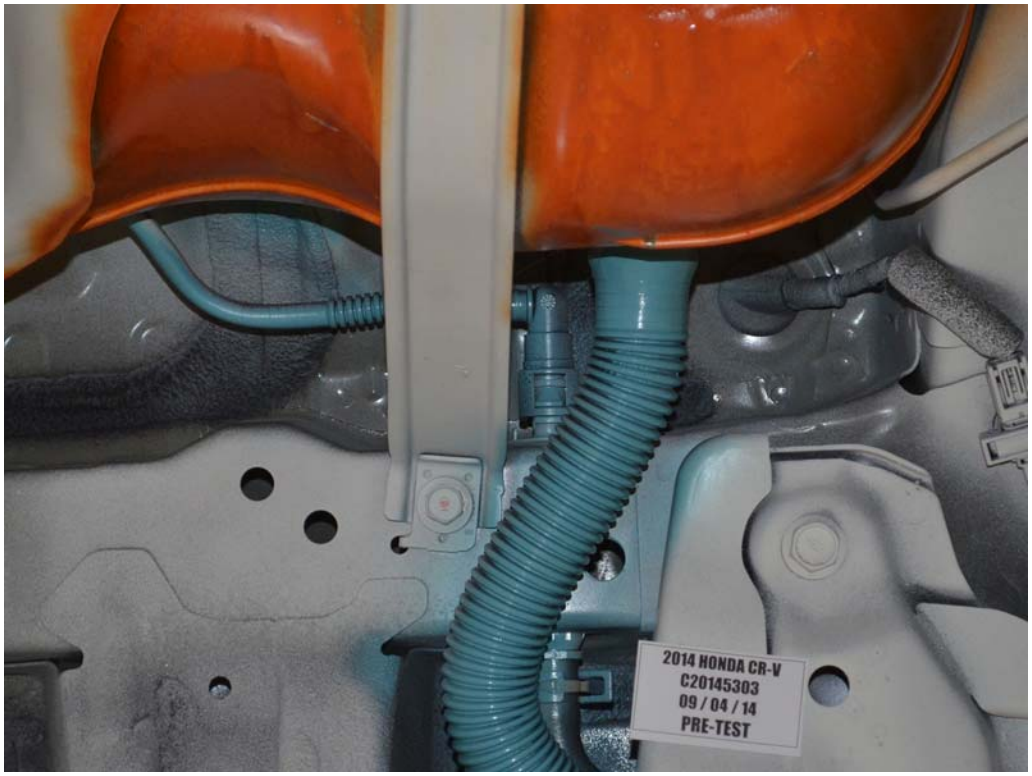


FIGURE 29. Pre-Test Underbody View of Fuel Filler Neck

FIGURE 30. Post-Test Underbody View of Fuel Filler Neck

FIGURE 31. Test Vehicle at 0° on FMVSS 301 Static Rollover Device

FIGURE 32. Test Vehicle at 90° on FMVSS 301 Static Rollover Device

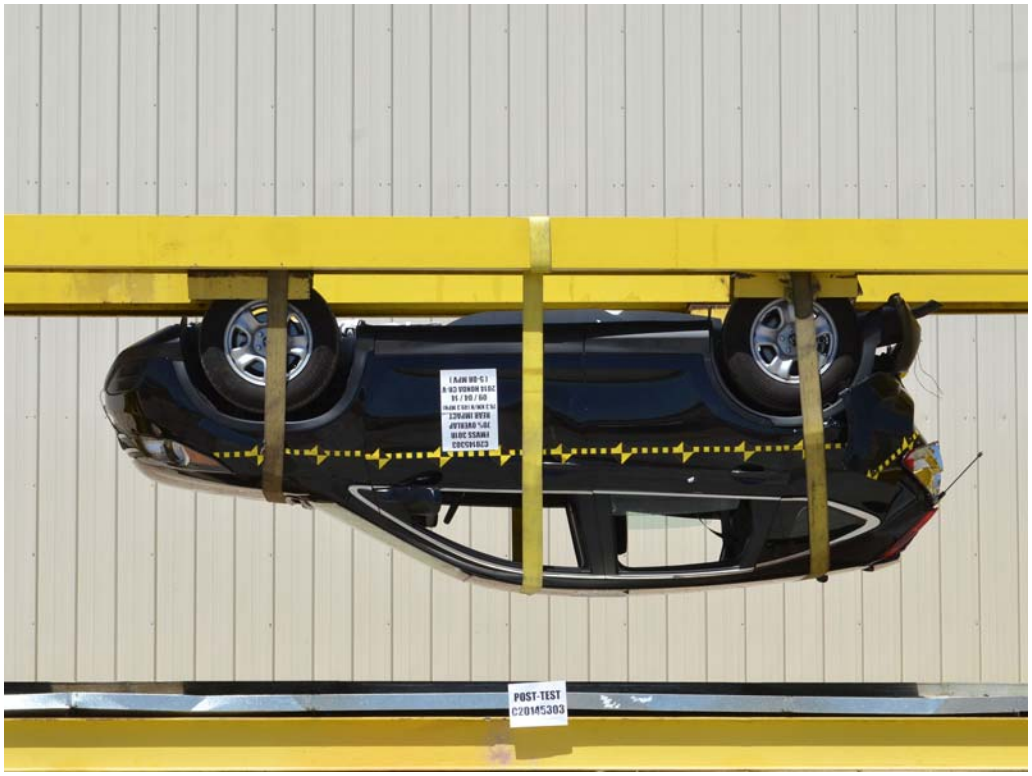


FIGURE 33. Test Vehicle at 180° on FMVSS 301 Static Rollover Device

FIGURE 34. Test Vehicle at 270° on FMVSS 301 Static Rollover Device

FIGURE 35. Test Vehicle at 360° on FMVSS 301 Static Rollover Device

FIGURE 36. Impact Event