

REPORT NUMBER: TR-P32096-14-NC

**RESEARCH AND DEVELOPMENT
80 KM/H 70% OVERLAP REAR IMPACT**

**MITSUBISHI MOTOR MFG. OF AMERICA, INC.
1998 DODGE AVENGER 2-DOOR COUPE**

NHTSA NUMBER: PW0300

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



**TEST DATE:
SEPTEMBER 18, 2012**

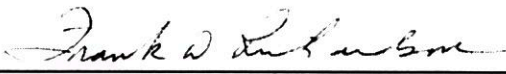
**REPORT DATE:
OCTOBER 2, 2012
FINAL REPORT**

**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
NATIONAL CENTER FOR STATISTICS AND ANALYSIS
OFFICE OF REGULATORY ANALYSIS AND EVALUATION
1200 NEW JERSEY AVE, SE
ROOM W53-469
WASHINGTON, DC 20590**

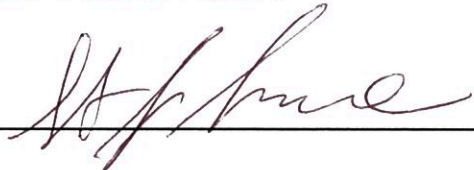
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Prepared By: 
Ms. Sweta P. Dedania, Project Engineer
KARCO Engineering, LLC.

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: October 2, 2012

FINAL REPORT ACCEPTANCE BY ^{COTR} ~~NCSA~~:


Date: 10/4/12

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. TR-P32096-14-NC		2. Government Accession No.		3. Recipient's Catalog No.	
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				6. Performing Organization Code KAR	
7. Authors Ms. Sweta P. Dedania, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO				8. Performing Organization Report No. TR-P32096-14-NC	
9. Performing Organization Name and Address KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301				10. Work Unit No.	
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12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration National Center for Statistics and Analysis Office of Regulatory Analysis and Evaluation 1200 New Jersey Ave., SE, Room W53-469 Washington, D.C. 20590				13. Type of Report and Period Covered Final Test Report, Sept. 18 - Oct. 2, 2012	
				14. Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract An 80 km/h 70% overlap rear impact test was conducted on the subject 1998 Dodge Avenger 2-door coupe in accordance with the specifications of the Office of Vehicle Compliance Laboratory Test Procedure for FMVSS 301R. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on September 18, 2012. The impact velocity was 78.92 km/h and the outside ambient temperature was 39.0 deg. C. The vehicle's doors remained closed throughout the event. There was Stoddard solvent leakage from the left front area of the gas tank immediately after the impact event. The amount of solvent collected during this period did not exceed the allowable limits. Stoddard solvent leaked from the left front area of the fuel tank of the vehicle during portions of the static rollover. Leaks were visible while moving from 0° to 90°, while moving from 180° to 270°, while holding at the 270° position and while moving from 270° to 360°. The amount of solvent collected during the 180° to 270° interval exceeded the allowable limits.					
17. Key Words FMVSS 301R Overlap Rear Impact MDB 1998 Dodge Avenger				18. Distribution Statement	
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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 1998 Dodge Avenger 2-door coupe, for FMVSS 301R *'Fuel System Integrity – Rear Impact'*.

This 80 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 Compliance Laboratory Test Procedure for FMVSS 301R *'Fuel System Integrity – Rear Impact'*, dated January, 2007.

A 1998 Dodge Avenger 2-door coupe was impacted by a moving deformable barrier at a velocity of 78.92 km/h. The test was performed at KARCO Engineering, LLC. on September 18, 2012. Pre- and post-test photographs of the vehicle and dummies 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 un-instrumented for this test.

Both the driver and passenger side doors remained closed during the impact event and after the impact.

There was Stoddard solvent leakage from the left front area of the gas tank immediately after the impact event. The amount of solvent collected during this period did not exceed the allowable limits. Stoddard solvent leaked from the left front area of the fuel tank of the vehicle during portions of the static rollover. Leaks were visible while moving from 0° to 90°, while moving from 180° to 270°, while holding at the 270° position and while moving from 270° to 360°. The amount of solvent collected during the 180° to 270° interval exceeded the allowable limits. Solvent leakage is summarized in Data Sheets 6 and 7. Photographs of the damaged area are presented in Appendix A.

SECTION 2
DATA SHEETS

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe NHTSA No.: PW0300
 Test Program: 70% Overlap Rear Impact Test Date: 09/18/12

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	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

TEST VEHICLE SPECIFICATIONS

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe NHTSA No.: PW0300
 Test Program: 70% Overlap Rear Impact Test Date: 09/18/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	PW0300
Model Year	1998
Make	Dodge
Model	Avenger
Body Style	2-door Coupe
VIN	4B3AU52N5WE0
Date Received	8/27/2012
Body Color	Gray
Odometer Reading (km / mi)	221,254 / 137,481
Engine Displacement (L)	2.5
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	3
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	Yes
Tinted Glass	Yes
Traction Control	No
Power Brakes	Yes
Front Disc Brakes	Yes
Rear Disc Brakes	Yes
Anti-Lock Brakes (ABS)	No

All Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Side Airbag	No
Driver Head Airbag	No
Driver Curtain Airbag	No
Driver Combo Airbag	No
Driver Knee Airbag	No
Passenger Front Airbag	Yes
Passenger Side Airbag	No
Passenger Head Airbag	No
Passenger Curtain Airbag	No
Passenger Combo Airbag	No
Passenger Knee Airbag	No
Seat Belt Pre-Tensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes
Air Conditioning	Yes
AM/FM CD	No
Tilt Steering	Yes
Automatic Door Locks	No
Power Windows	Yes
Power Seats	Yes

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Mitsubishi Motor MFG. of America, Inc.
Date of Manufacture	Aug-97

GVWR (kg)	1880
GAWR Front (kg)	1070
GAWR Rear (kg)	870

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)				375.0
DSC x 68.04 (kg)				340.0
Cargo Weight (RCLW) (kg)				35.0

A

B

A-B

DATA SHEET NO. 1 ... (CONTINUED)

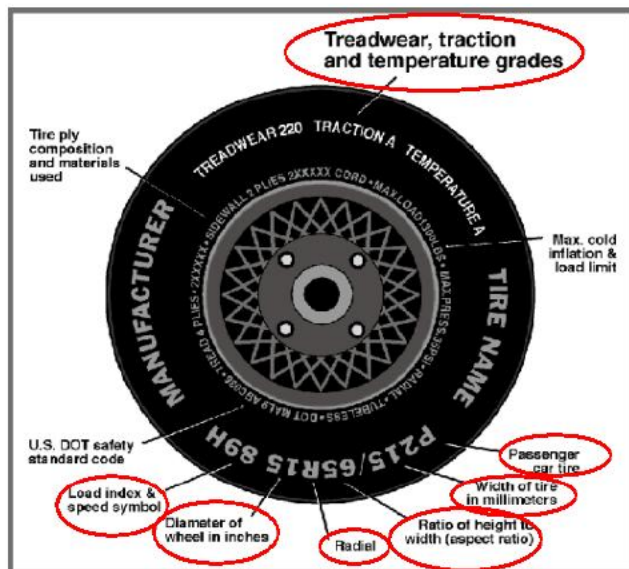
TEST VEHICLE SPECIFICATIONS

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe

NHTSA No.: PW0300

Test Program: 70% Overlap Rear Impact

Test Date: 09/18/12



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max Tire Pressure (kPa)	350	350
Cold Tire Pressure (kPa)	220	200
Max Load Tire Pressure (kPa)	220	200
Recommended Tire Size	P215/50R17	P215/50R17
Tire Size on Vehicle	P215/45R17	P215/45R17
Tire Manufacturer	General	General
Tire Model	Exclaim U1-1P	Exclaim U1-1P
Load Range	545	545
Treadwear Rating	380	380
Traction Rating	AA	AA
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 2 Nylon	1 Polyester, 2 Steel, 2 Nylon
Load Index/Speed Symbol	87W	87W
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	LL63 3P1 4607	LL63 3P1 4607
DOT Safety Code Right	LL63 3P1 4607	LL63 3P1 4607
Type of Spare Tire	T125/90D16	
Location of Tire Placard on Vehicle	Trunk	

DATA SHEET NO. 2
PRE-TEST INSPECTION

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe

NHTSA No.: PW0300

Test Program: 70% Overlap Rear Impact

Test Date: 09/18/12

Feature	Yes	No	Comments
Is the vehicle totally complete?	X		None
Does the vehicle run and drive?	X		None
Is there any sign that the vehicle has ever been in a crash?		X	None
Are the bumpers damaged?		X	None
Do the doors open and close properly?	X		None
Are the doors properly aligned so that there are no gaps when closed?	X		None
Does the battery hold a charge so that electrical accessories in the vehicle may be operated without starting the engine?	X		None
Does the vehicle sag or have a raised or lowered suspension?		X	None
Are any of the control arms or other suspension components damaged or distorted?		X	None
Do the tires have some usable tread remaining and hold pressure?	X		None
Are the radiator and/or its supporting cross members damaged?		X	None
Is the cooling system able to retain its coolant and are the proper fluid levels maintained?	X		None
Does the fuel tank leak?		X	None
Does the fuel tank have any damages or dents that would reduce its internal capacity?		X	None
Is the fuel tank located behind the rear axle?		X	None
Is the fuel tank located between the front and rear axle?	X		None
Is the vehicle attitude "as tested" between "as delivered" and "fully loaded" before running the test?	X		None

Equipment	Present		Proper Place		Operate Properly	
	Yes	No	Yes	No	Yes	No
Engine	X		X		X	
Transmission	X		X		X	
Drive Axles	X		X		X	
Battery	X		X		X	
Alternator	X		X		X	
Radiator	X		X		X	

DATA SHEET NO. 3

PRE-TEST DATA

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe NHTSA No.: PW0300
 Test Program: 70% Overlap Rear Impact Test Date: 09/18/12

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	466.0	277.5		512.5	317.0		500.5	338.5	
Right	kg	457.5	264.5		498.0	311.5		488.0	321.0	
Ratio	%	63.0%	37.0%	100.0%	61.7%	38.3%	100.0%	60.0%	40.0%	100.0%
Total	kg	923.5	542.0	1465.5	1010.5	628.5	1639.0	988.5	659.5	1648.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1465.5	A
Actual Weight of 2 P572 ATDs Used	kg	148.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	35.0	C
Calculated Vehicle Target Wt (TVTWT)	kg	1648.5	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	681	690	694	693	975
As Tested	mm	660	671	681	682	1010
Fully Loaded	mm	658	667	673	680	1054
Post-Test	mm	687	639	660	720	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2635
Total Vehicle Length	mm	4835
Amount of Stoddard Solvent in Fuel Tank	L	59.49

DATA SHEET NO. 3 ... (CONTINUED)

PRE-TEST DATA

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe NHTSA No.: PW0300
 Test Program: 70% Overlap Rear Impact Test Date: 09/18/12

BALLAST DATA

Description	Value
Type of Ballast	Ballast Dummy
Method of Securing Ballast	Seat Belt
Weight of Ballast in Cargo Area	11 kg
Weight of Vehicle Components Removed	0 kg

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

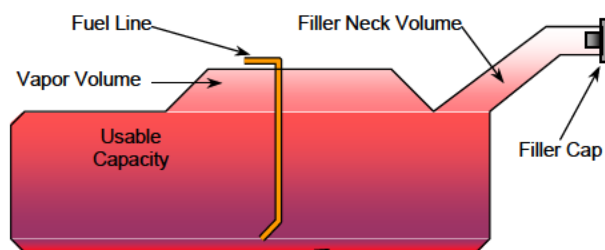
No vehicle components were removed

FUEL TANK CAPACITY

Description	Liters
Fuel System Capacity Listed in Owners Manual	63.97
Usable Capacity of "Standard Tank"	63.97
91 - 94% of Usable Capacity	58.21 - 60.13
Actual Amount of Stoddard Solvent Used	59.49

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump is activated when the ignition is turned on.



VEHICLE FUEL TANK ASSEMBLY

TEST FLUID

Description	Value
Test Fluid Type	Stoddard Solvent
Test Fluid Specific Gravity	0.97
Test Fluid Kinematic Viscosity	
Test Fluid Color	Purple

DATA SHEET NO. 3 ... (CONTINUED)

PRE-TEST DATA

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe

NHTSA No.: PW0300

Test Program: 70% Overlap Rear Impact

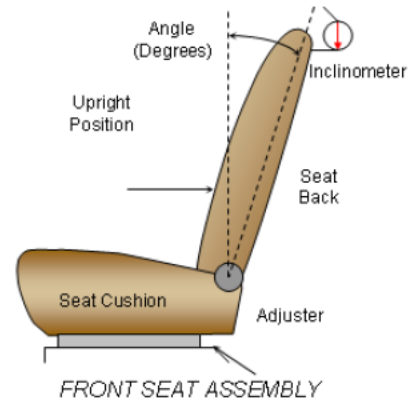
Test Date: 09/18/12

NOMINAL DESIGN RIDING POSITION

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

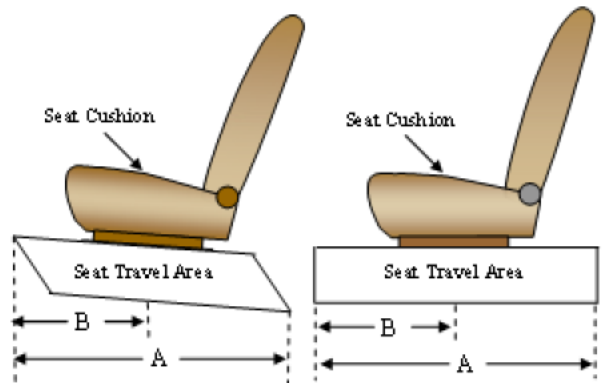
SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	9.3
Passenger Seat Back Angle	8.8



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	254 mm	127 mm
Passenger Seat	240 mm	120 mm

DATA SHEET NO. 3 ... (CONTINUED)

PRE-TEST DATA

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe

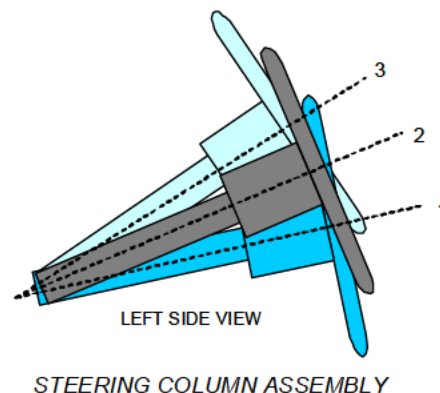
NHTSA No.: PW0300

Test Program: 70% Overlap Rear Impact

Test Date: 09/18/12

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 POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	13.7	
Geometric Center Position, No. 2	15.3	
Uppermost Position, No. 3	17.0	
Telescoping Steering Wheel Travel		
Test Position	15.3	

**DATA SHEET NO. 4
MOVING BARRIER DATA**

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe NHTSA No.: PW0300
 Test Program: 70% Overlap Rear Impact Test Date: 09/18/12

MOVING BARRIER TEST WEIGHT

	Units	As Delivered Weights (UVW)		
		Front Axle	Rear Axle	Total
Left	kg	402	298	700
Right	kg	377	292	669
Ratio	%	56.9%	43.1%	100.0%
Total	kg	779	590	1369

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	380
Overall Depth	482
Bottom Honeycomb to Bottom Bumper	51
Bumper Height	202
Ground to Top of MDB	788
Ground to Bottom of MDB	228
Ground to Bottom of Bumper	280
Ground to Top of Bumper	483

DATA SHEET NO. 5**POST-TEST DATA**Test Vehicle: 1998 Dodge Avenger 2-Door Coupe NHTSA No.: PW0300Test Program: 70% Overlap Rear Impact Test Date: 09/18/12Temperature at Time of Impact: 39.0°C Test Time: 4:48 PMVIN: 4B3AU52N5WE0**IMPACT VELOCITY DATA**

Measured Parameter	Units	Value
Trap No. 1 Velocity (Primary)	km/h	78.92
Trap No. 2 Velocity (Redundant)	km/h	78.82

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Width	mm		1735
Vertical Impact Reference Line (Left of Vehicle Center Line)	mm		347
Actual Impact Point (Left of Vehicle Center Line)	mm		386
Horizontal Offset (+ right / - left)	mm	± 50 of Intended Impact Point	-39
Vertical Offset (+ down / - up)	mm	± 40 of Intended Impact Point	0

TARGET VEHICLE PRE- AND POST- TEST STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length at Centerline	4835	4209	-626
2	Total Length	4835	4359	-476
3	Total Width	1735	1925	190
4	Left Side Wheelbase	2635	2605	-30
5	Right Side Wheelbase	2635	2307	-328

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Row	Vertical Location		From Centerline		Max. Crush (mm)
	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Left	207
B	Top of Bumper	533	800	Left	155
C	Mid Level	686	800	Left	76
D	Top of Stack	813	300	Right	62

DATA SHEET NO. 5 ... (CONTINUED)

POST-TEST DATA

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe NHTSA No.: PW0300
Test Program: 70% Overlap Rear Impact Test Date: 09/18/12

DOOR OPENING AND SEAT TRACK INFORMATION

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

DATA SHEET NO. 6

FMVSS 301 DATA

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe NHTSA No.: PW0300

Test Program: 70% Overlap Rear Impact Test Date: 09/18/12

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

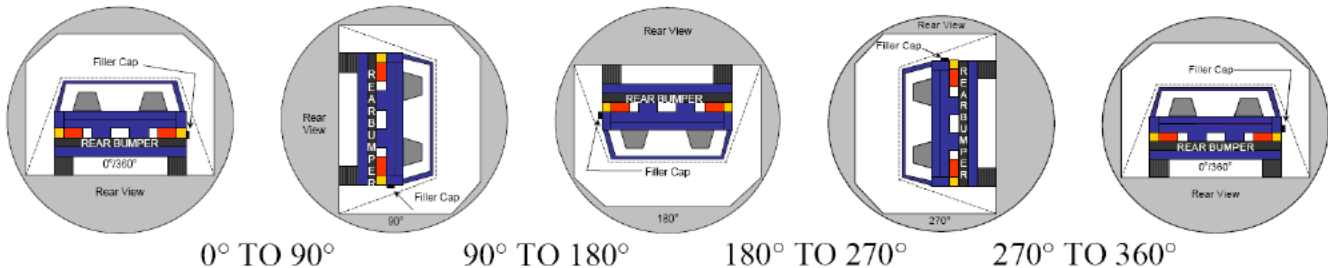
Stoddard Solvent Spillage Measurements

- A. From impact until vehicle motion ceases: 0 g
(Maximum allowable = 28 g)
- B. For the 5 minute period after motion ceases: 86 g
(Maximum allowable = 142 g)
- C. For the following 25 minutes: 10.3 g/min
(Maximum allowable = 28 g/minute)
- D. Spillage: Stoddard Solvent leaked from the left front area of the gas tank

DATA SHEET NO. 7
STATIC ROLLOVER TEST DATA

Test Vehicle: 1998 Dodge Avenger 2-Door Coupe
 Test Program: 70% Overlap Rear Impact

NHTSA No.: PW0300
 Test Date: 09/18/12



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: Stoddard solvent leaked from the left front area of the fuel tank of the vehicle during portions of the static rollover

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	84	300	384
90° To 180°	89	300	389
180° To 270°	87	300	387
270° To 360°	76	300	376

FMVSS 301 SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° To 90°	57 g	0 g		
90° To 180°	0 g			
180° To 270°	172 g	57 g	0 g	
270° To 360°	115 g	0 g		

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° To 90°	Top Front Area of Fuel Tank
90° To 180°	No Spillage
180° To 270°	Top Front Area of Fuel Tank
270° To 360°	Top Front Area of Fuel Tank

SECTION 3

LABORATORY NOTICE OF APPARENT TEST FAILURE

TEST INFORMATION:

Test Date	9/18/2012
Laboratory	KARCO Engineering, LLC.
Contract No.	DTNH22-11-D-00245
Delivery Order No.	
Lab Project Engineer's Name	Steven Matsusaka
NHTSA No.	PW0300
Test Vehicle	
Year	1998
Make	Dodge
Model	Avenger
Body Style	2-Door Coupe
VIN	4B3AU52N5WE0
Manufacturer	Mitsubishi Motor MFG of America Inc

TEST FAILURE DESCRIPTION:

Stoddard solvent leaked from the top front area of the fuel tank of the vehicle during portions of the static rollover. Leaks were visible while moving from 0° to 90°, while moving from 180° to 270°, while holding at the 270° position and while moving from 270° to 360°.

FMVSS REQUIREMENT, PARAGRAPHS:

5.3 Static Rollover

NOTIFICATION TO NHTSA

Date: 9/20/12 By: Kelsey Chiu

REMARKS:

None.

**APPENDIX A
PHOTOGRAPHS**

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29	Vehicle at 360° on Static Rollover Device	A-15
30	Post-Test Stoddard Solvent Spillage Location View	A-15

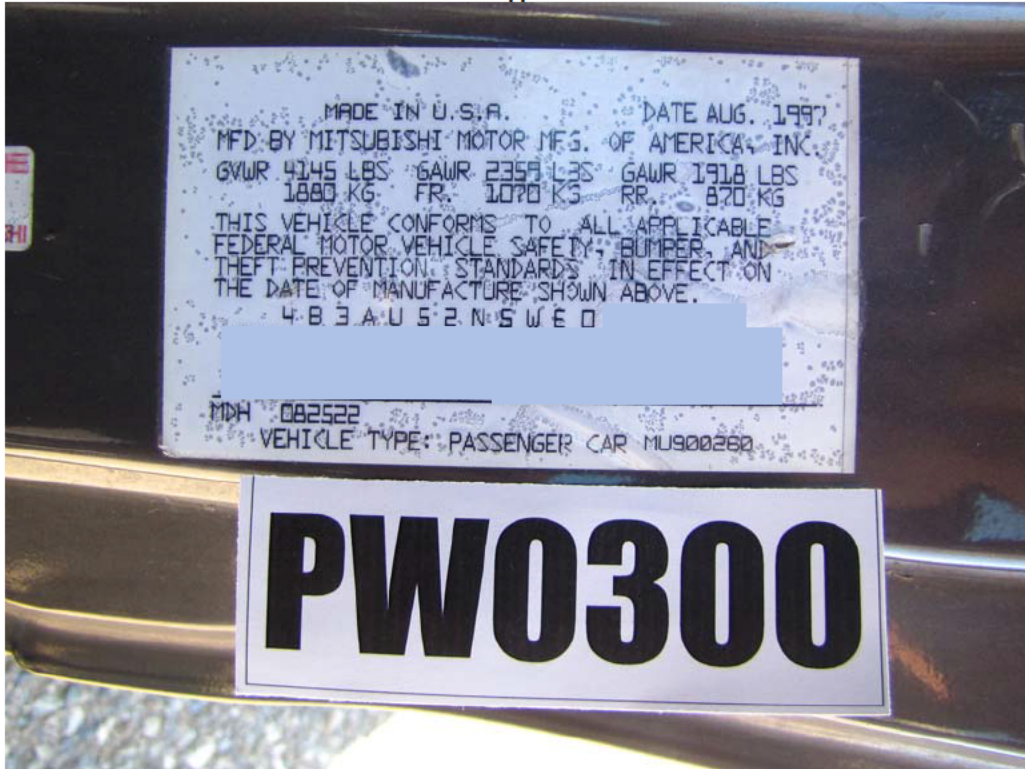


FIGURE 1. Vehicle Certification Label

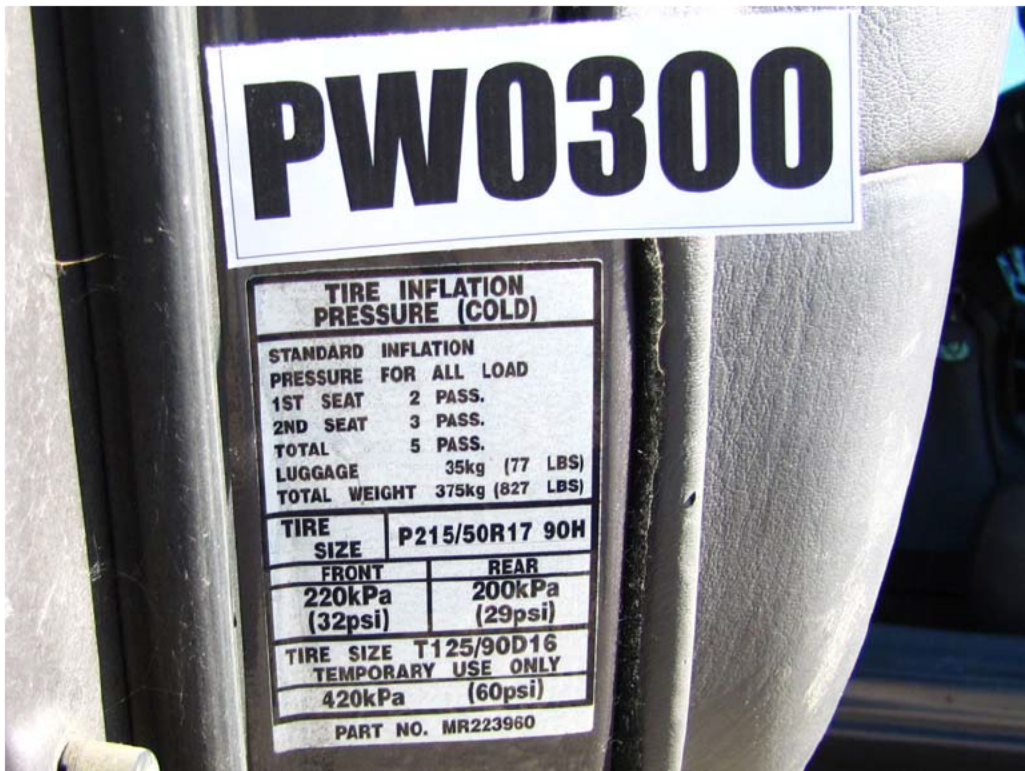


FIGURE 2. Vehicle Tire Placard



FIGURE 3. Pre-Test Front of Test Vehicle



FIGURE 4. Post-Test Front of Test Vehicle



FIGURE 5. Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 6. Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 7. Pre-Test Left View of Test Vehicle



FIGURE 8. Post-Test Left View of Test Vehicle



FIGURE 9. Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 10. Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 11. Pre-Test Rear View of Test Vehicle



FIGURE 12. Post-Test Rear View of Test Vehicle



FIGURE 13. Pre-Test Right Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 14. Post-Test Right Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 15. Pre-Test Right View of Test Vehicle

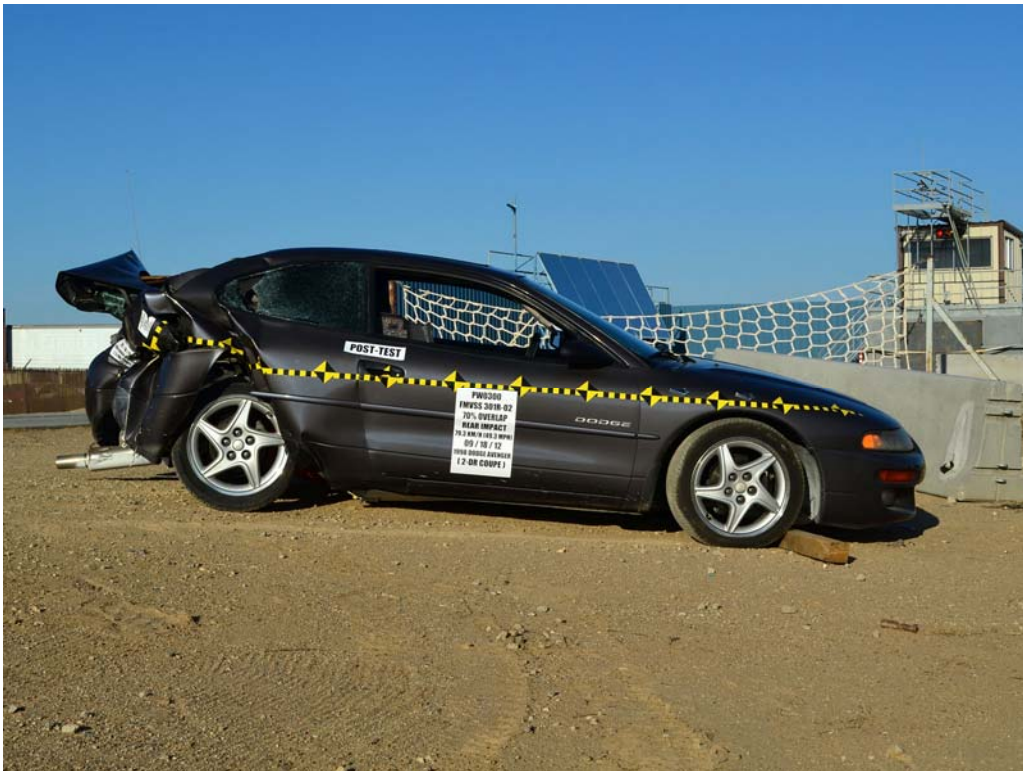


FIGURE 16. Post-Test Right View of Test Vehicle



FIGURE 17. Pre-Test Right Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 18. Post-Test Right Front $\frac{3}{4}$ View of Test Vehicle

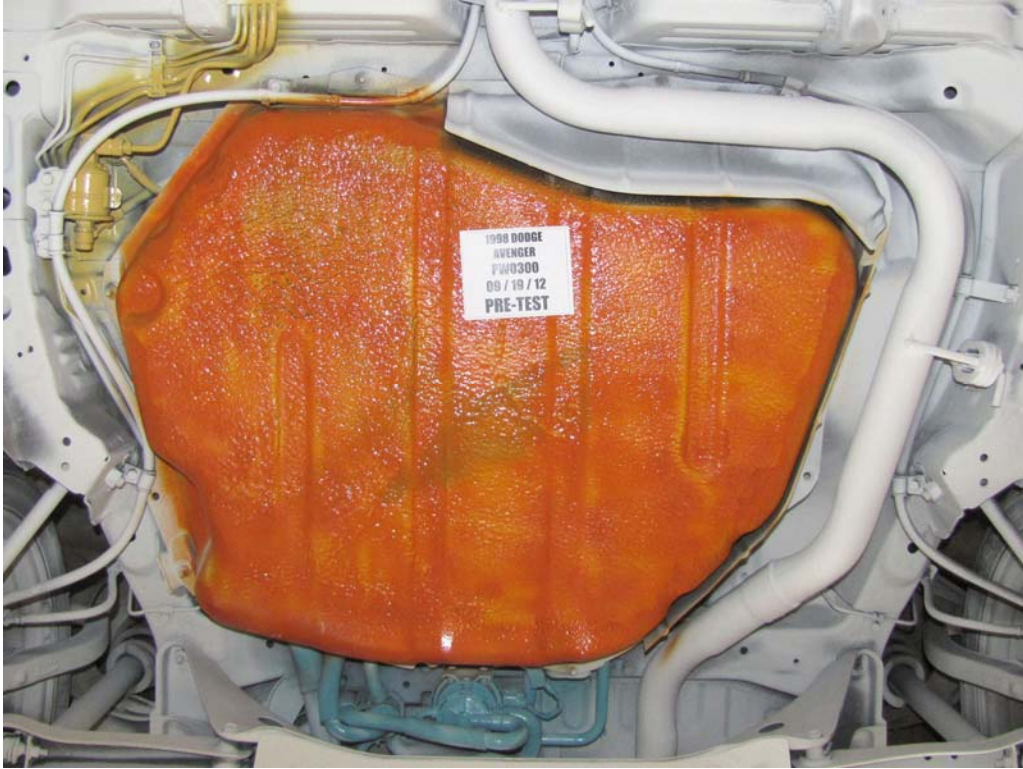


FIGURE 19. Pre-Test Underbody, Fuel Tank Location

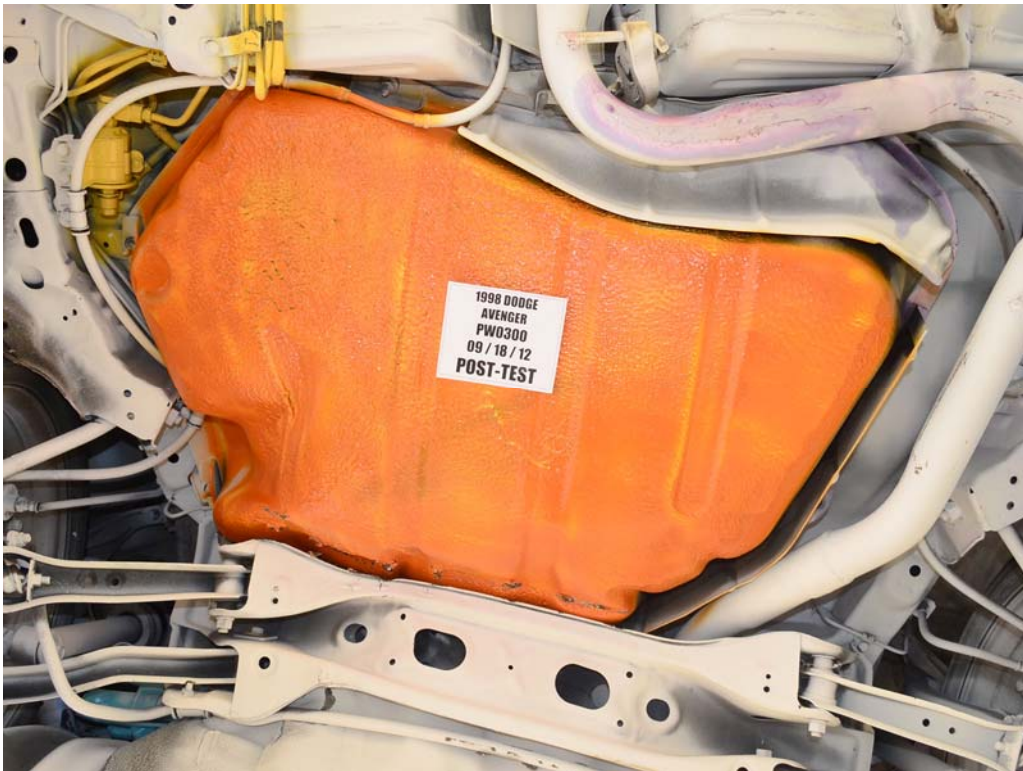


FIGURE 20. Post-Test Underbody, Fuel Tank Location



FIGURE 21. Pre-Test Underbody, Fuel Filler Neck Location

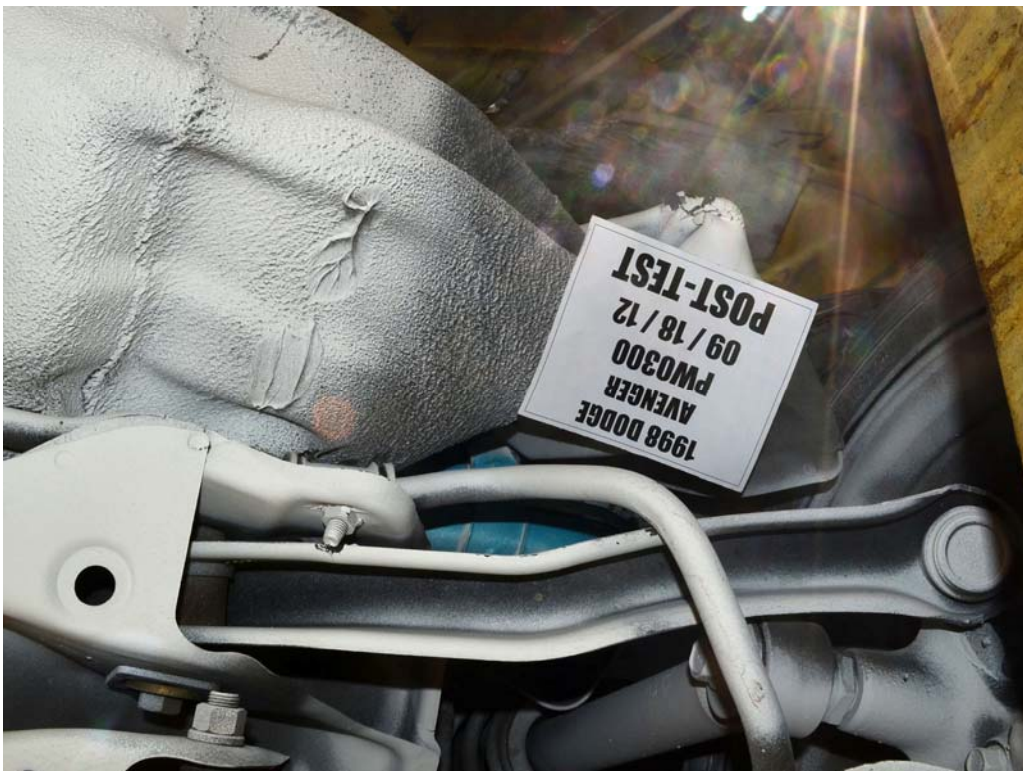


FIGURE 22. Post-Test Underbody, Fuel Filler Neck Location

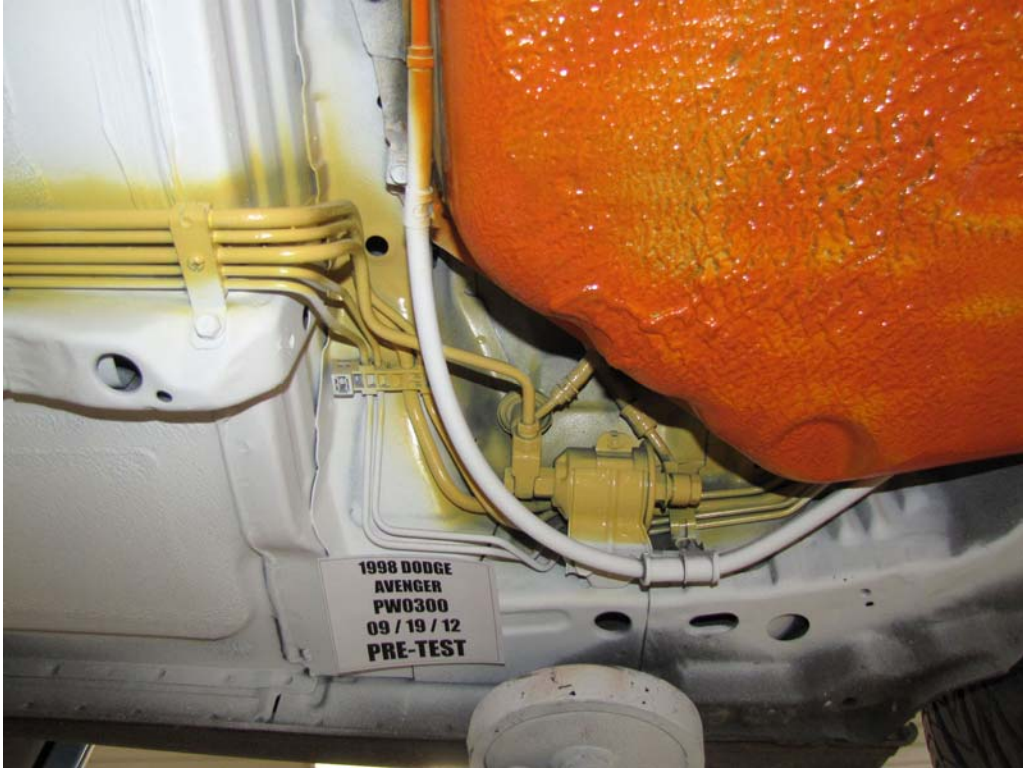


FIGURE 23. Pre-Test Underbody, Fuel Line Location



FIGURE 24. Post-Test Underbody, Fuel Line Location



FIGURE 25. Vehicle at 0° on Static Rollover Device



FIGURE 26. Vehicle at 90° on Static Rollover Device



FIGURE 27. Vehicle at 180° on Static Rollover Device



FIGURE 28. Vehicle at 270° on Static Rollover Device



FIGURE 29. Vehicle at 360° on Static Rollover Device

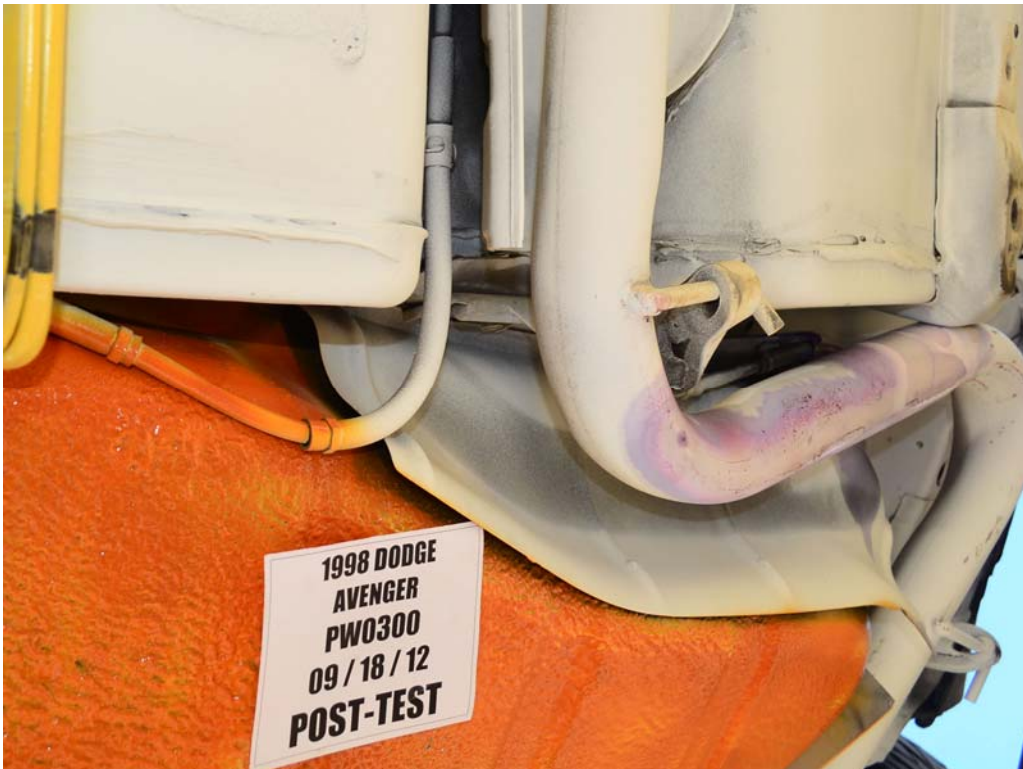


FIGURE 30. Post-Test Stoddard Solvent Spillage Location View