REPORT NO. 135-TRC-15-006

COMPLIANCE TESTING FOR FMVSS 135
Light Vehicle Brake Systems

****

Chrysler Group LLC
2015 Chrysler 200 S AWD, Passenger Car
NHTSA No. C20150303

TRANSPORTATION RESEARCH CENTER INC.
10820 State Route 347, P.O. Box B-67
East Liberty, Ohio 43319

November 20, 2015

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
1200 New Jersey Avenue S.E.
West Building 4th Floor
OVSC (NVS-221)
Washington, D.C. 20590

Prepared for the Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-11-D-00247.

Prepared By 
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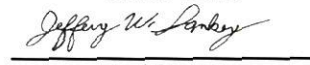
Approved By 
Jeff Sankey

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Final Report Acceptance By OVSC:


Contract Technical Manager, Office of Vehicle Safety Compliance

12/14/15
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1. REPORT NUMBER: 135-TRC-15-006	2. GOVERNMENT ACCESSION NO.:	3. RECIPIENTS CATALOG NO.:
4. TITLE AND SUBTITLE: Final report of FMVSS 135 Compliance Testing of a 2015 Chrysler 200 S AWD, Passenger Car, NHTSA No. C20150303		5. REPORT DATE: November 20, 2015 6. PERFORMING ORGANIZATION CODE: TRC 20110367/3529
7. AUTHOR(S): Derek Bevis, Engineering Technician		8. PERFORMING ORGANIZATION REPORT NO.: TRC-DOT-135-028
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Transportation Research Center Inc. 10820 State Route 347, P.O. Box B-67 East Liberty, Ohio 43319		10. WORK UNIT NUMBER: 11. CONTRACT OR GRANT NO.: DTNH22-11-D-00247
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15. SUPPLEMENTARY NOTES:		
16. ABSTRACT: Compliance tests were conducted on the subject 2015 Chrysler 200 S AWD, Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-135-01 for the determination of FMVSS 135 compliance. Test failures identified were as follows: None.		
17. KEY WORDS: Compliance Testing Safety Engineering FMVSS 135		18. DISTRIBUTION STATEMENT: Copies of this report are available from: NHTSA Technical Information Services NPO-411 1200 New Jersey Ave, S.E. Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833
19. SECURITY CLASSIF. (OF THIS REPORT): Unclassified	20. SECURITY CLASSIF. (OF THIS PAGE). Unclassified	21. NO. OF PAGES: 62 / 22. PRICE:

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1.0 INTRODUCTION

Tests were conducted on a 2015 Chrysler 200 S AWD, Passenger Car manufactured by Chrysler Group LLC, to determine compliance with FMVSS 135 "Light Vehicle Brake Systems." All tests were conducted in accordance with the U.S. D.O.T., NHTSA Laboratory Procedure TP 135-01 and/or the corresponding TRC Inc. Test Procedure that was submitted to NHTSA for their approval. The Test Procedure was clearly described in the submitted document and has not been repeated in this report.

All stops were performed manually.

All tests were conducted by TRC Inc. personnel using the following TRC facilities:

7.5-Mile Test Track
Vehicle Maximum Speed

Skid Pad
Burnish
Cold Effectiveness Stops
High Speed Effectiveness Stops
Stops with Engine Off
Failed ABS
Failed Variable Proportioning Valve (if applicable)
Failed Hydraulic Circuits
Brake Power Assist Unit Failures
RBS Failure (if applicable)
EMF (Battery) Failure (if applicable)
Heating Snubs and Hot Performance Stops
Brake Cooling and Recovery Stops

Brake Slope
Parking Brake

Average PFC during the test period was 0.99 (Skid Pad) and 0.98 (Test Track) utilizing the ASTM E1337 w/E1136 tire method.

The test vehicle was ABS-equipped; therefore, the Wheel Lock Sequence and Adhesion Utilization Tests were not performed.

This vehicle appears to meet the requirements of FMVSS 135.

2.0 SUMMARY OF RESULTS

VEHICLE: 2015 Chrysler 200 S AWD NHTSA NO.: C20150303 DATE: 11/20/15

		Specification and Limit				TEST RESULTS (In compliance if one stop meets requirement)		
TEST	Loading Condition	Speed (km/h)	Min. Pedal Force (N)	Max. Pedal Force (N)	Stopping Distance Requirement (m)	Shortest Stop Max. Pedal Force Newtons (Average – N)	Shortest Stop Stopping Distance (m) (Corrected)	Pass / Fail
Equipment Requirements					Specified Equipment	Vehicle contains specified equipment		Pass
Vehicle Maximum Speed	LLVW	NA				193.5 km/h avg.		Pass
Burnish	GVWR	80				200, 80-0 km/h stops @3.0mpsps		Pass
Wheel Lockup Sequence w/o ABS	GVWR				Lockup of front wheels prior to rear	ABS equipped – not required.		NA
Wheel Lockup Sequence w/o ABS	LLVW					ABS equipped – not required.		NA
Adhesion Utilization w/o ABS	LLVW				Rear axle adhesion utilization curve below specified value	ABS equipped – not required.		NA
Adhesion Utilization w/o ABS	GVWR					ABS equipped – not required.		NA
Cold Effectiveness	GVWR	100	65	500	70	464.8	48.2	Pass
High Speed Effectiveness	GVWR	160	65	500	spd. depend. – 176	444.6	109.8	Pass
Stops with Engine Off	GVWR	100	65	500	70	406.8	47.9	Pass
Cold Effectiveness	LLVW	100	65	500	70	483.3	48.4	Pass
High Speed Effectiveness	LLVW	160	65	500	spd. depend. – 176	465.7	106.7	Pass
Failed Antilock	LLVW	100	65	500	85	348.5	55.5	Pass
Failed Proportioning Valve	LLVW	100	65	500	110	NA	NA	NA
Failed Hydraulic Circuit #1	LLVW	100	65	500	168	495.7	91.5	Pass
Failed Hydraulic Circuit #2	LLVW	100	65	500	168	476.6	104.0	Pass
Failed Hydraulic Circuit #1	GVWR	100	65	500	168	499.8	104.4	Pass
Failed Hydraulic Circuit #2	GVWR	100	65	500	168	492.0	107.0	Pass
Failed Antilock	GVWR	100	65	500	85	335.2	57.5	Pass
Failed Proportioning Valve	GVWR	100	65	500	110	NA	NA	NA
Regenerative Brake System (RBS) Failure	GVWR	100	65	500	168	NA	NA	NA
Electromotive Force (EMF) – Battery Failure	GVWR	100	65	500	70	NA	NA	NA
Power Brake Unit Failure	GVWR	100	65	500	168	443.3	69.6	Pass
Parking Brake - Uphill	GVWR	-	-	400	Hold for 5 min.?	7.1 P-Brake	Yes-Holds	Pass
Parking Brake - Downhill	GVWR	-	-	400	Hold for 5 min.?	7.2 P-Brake	Yes-Holds	Pass
Heating Snubs	GVWR	120-60	NA	NA	15 Snubs- 3.0 mpsps	42.2 Avg.	NA	Pass
Hot Performance Stop #1	GVWR	100	65	318 **avg**	73.6	274.1 (226.6)	51.1	Pass
Hot Performance Stop #2	GVWR	100	65	500	89.0	381.4 (255.2)	50.4	Pass
Brake Cooling	GVWR	50	NA	NA	4 Stops - 3.0 mpsps	47.9 Avg.	NA	Pass
Recovery Performance Stop #1	GVWR	100	65	318 **avg**	One of the two stops between 35.5 and 64.5 meters.	310.5 (259.4)	49.3	
Recovery Performance Stop #2	GVWR	100	65	318 **avg**		299.2 (202.1)	49.0	Pass
Final Inspection-Brake Integrity	Check components for detachment, fracture or lubricants.					No detachments or fractures-normal appear. & color		Pass
Final Inspection- Reservoirs/Warning Indicators	Master cylinder or brake power reservoir shall meet the volume and label requirements of S5.4.2 and S5.4.3.					Brake system has sufficient capacity and indicators are in compliance.		Pass

3.0 TEST VEHICLE INFORMATION AND DATA SHEETS

The compliance data sheets associated with the FMVSS 135 Brake for NHTSA Vehicle No. C20150303 follow:

Vehicle Specifications

Year: 2015
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Manufacture Date: 12/1/2014
VIN: 1C3CCCDG9FN632248
Transmission Type: 9 Speed Automatic Transmission
Engine Type: Gasoline, V-6, 24 Valve VVT
Displacement: 3.6 Liter
Engine Horsepower: N/A
Idle Speed (rpm): 750
No. of Axles: 2

Test Number: 6
GVWR (kg): 2241
GAWR Front (kg): 1185
GAWR Rear (kg): 1185
Wheelbase (mm): 2750
Odometer Start (mi): 110 mi.
Odometer End (mi): 646 mi.

BUSES ONLY

Chassis Mfg.: N/A
Serial Number: N/A
No. of Seats: N/A
Mfg. Date: N/A

TIRES

Size: 235/45R18 94V
Type: Ecopia, M+S, Tubeless, Radial
Manufacturer: Bridgestone
Front GVWR Tire Pressure: 260.0 kPa
Rear GVWR Tire Pressure: 260.0 kPa

Brake Application System

Series: Front: Disc Rear: Disc
Actuation: Diagonal
Foundation: Hydraulic
Parking Mechanism: Yes
Type of Parking Unit: Automatic transmission with park detent

Master Cylinder Dia. (mm): 26.24
Pedal Ratio: 2.69:1
Anti-Skid Device: Yes
Anti-Skid Unit Mfg.: Delphi

Power Unit: Vacuum
Power Assist Unit: N/A
Power Unit with Accumulator: N/A
Power Asst/Power Unit with Backup: Yes
Variable Proportioning System: Yes

Brake Component Materials and Construction

Brake Type Front: Disc
Construction: Integral Cast Vented
Rotor Diameter (mm): 330.09
Rotor Thickness (mm): 28.04
Lining Construction: Bonded
Material: Cast Iron
Hydraulic Piston Dia. (mm): 55.58

Inboard (Leading)
Width (mm): 52.72
Length (mm): 105.87
Thickness (mm): 13.91
Lining Code/Color: AK NS419H FF

Outboard (Trailing)
Width (mm): 52.99
Length (mm): 105.92
Thickness (mm): 13.69
Lining Code/Color: AK NS419H FF

Brake Type Rear: Disc
Construction: Cast Unvented
Rotor Diameter (mm): 278.14
Rotor Thickness (mm): 12.03
Lining Construction: Bonded
Material: Cast Iron
Hydraulic Piston Dia. (mm): 36.3

Inboard (Leading)
Width (mm): 44.26
Length (mm): 93.36
Thickness (mm): 10.74
Lining Code/Color: NAC N550H FF

Outboard (Trailing)
Width (mm): 43.98
Length (mm): 93.45
Thickness (mm): 10.87
Lining Code/Color: NAC N550H FF

Other Component Information

Friction-type Park Brake: Hand Operated
Non-Service Brake Type: N/A

Technician: _____ Date: 11/24/2015

Quality Assurance: Jeffery W. Lankey

Vehicle Weight

Odometer Start (mi): 110 mi. Odometer End (mi): 646 mi. Scales Used: Building 70 Mettler Scales

GVWR/GAWR Information
(From Vehicle Certification Label)

GVWR (kg): 2241
GAWR Front (kg): 1185
GAWR Rear (kg): 1185

Unloaded Vehicle Weight
UVW (kg)

	Left	Right	Total Axle	Total Weight
Front	509.6	510.8	1,020.4	1,714.0
Rear	352.0	341.6	693.6	

NOTE: GVWR, LLVW and axle weights to measure within +0% and -1%

Target Light Loaded Vehicle Weight
LLVW (kg)

	Left	Right	Total Axle	Total Weight
Front	562.0	556.0	1,118.0	1,895.0
Rear	394.6	382.4	777.0	

Actual Light Loaded Vehicle Weight
LLVW (kg)

	Left	Right	Total Axle	Total Weight
Front	564.2	554.4	1,118.6	1,895.0
Rear	401.0	375.4	776.4	

Load: Driver/Observer 100.0 (kg) + Instrumentation 18.0 (kg) + Ballast 63.0 (kg) = 181.0(kg)

NOTE 1: LLVW = UVW +181.4 kg

NOTE 2: Weight distributed in front passenger seat area.

NOTE 3: Neither axle load at LLVW less than at UVW; ballast as required.

Fully Loaded Vehicle Weight
GVWR (kg)

	Left	Right	Total Axle	Total Weight
Front	567.8	552.6	1,120.4	2,241.0
Rear	577.0	543.6	1,120.6	

Load: Driver/Observer 100.0 (kg) + Instrumentation 18.0 (kg) + Ballast 409.0 (kg) = 527.0(kg)

NOTE 1: Vehicle loaded so axle loads proportional to GAWR shown previously.

NOTE 2: But no axle weight to be less than at LLVW.

NOTE 3: If weight on any axle at LLVW exceeds the axle's proportional share of the GVWR, the load required to reach GVWR is placed so that the weight on the axle remains the same as at LLVW.

Technician: _____ Date: 11/24/15

Quality Assurance: _____

Service Brake System (S5.1)

Vehicle equipped with a service brake acting on all wheels?	Yes

Wear Adjustment (S5.1.1)

Service brakes are compensated for wear by means of a system of automatic adjustment?	Yes

Description: Front & Rear: Disc, Automatic clearance take up.

Wear Status (S5.1.2)

Wear status of service brakes is indicated by:

(A) Acoustic or optical device?	Yes

Description: Metal tab emitts high frequency squeal when worn.

or

(B) Visual check outside or under vehicle?	Yes

Description: Front & Rear: Look through the caliper.

Regenerative Braking System (S5.1.3)

EV with RBS, RBS is a part of the service brake system if automatically activated, there is no means to deactivate, and functions in all transmission positions?	N/A
If equipped with ABS and RBS that is part of the service brake system, ABS controls RBS?	N/A

Parking Brake System (S5.2)

Vehicle equipped with a parking brake system of friction type with solely mechanical means to retain engagement?	Yes

Controls (S5.3)

(A) Service brakes activated by means of a foot control?	Yes
(B) Parking brake control is independent of the service brake control?	Yes
(C) Parking Brake control is hand or foot operated?	Yes
(D) ABS, if equipped, cannot be manually disabled?	
Data Indicates Compliance	Yes

Comments:

Technician: _____ Date: 11/24/2015

Quality Assurance: _____

Date Tested: 10/26/2015

S4 Max. Speed at LLVW

Weather Conditions: 57ºF Wind: 6 mph at 61º

Start Odometer: 122 End Odometer: 137

Schedule:

LLVW, accelerate from 0 kph to Max.
speed attainable in 3.2 km on a level surface.

Performance Requirements:

None.

Stop #	Max. Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Time 0-100 km/h (s)
1	*193.3*	108.7	109.6	59.2	60.5	8.7
2	*193.8*	125.3	127.7	74.9	77.7	8.8

Average Speed = 193.5 kph

Stop #	Direction of Run
1	South
2	North

Driver: D. Bevis/T. Rice

Observer: None

Recorded Data Processed by: Derek Bevis

Date:11/20/2015

Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 10/27/2015

S7.1 Burnish at GVWR

Weather Conditions: 45ºF Wind: 28 mph at 246º

Start Odometer: 142 End Odometer: 408

Schedule:

Initial Brake Temperature less than 100ºC
Initial Speed 80 kph to zero
200 stops with transmission in gear

Performance Requirements:

Interval between runs: Time necessary to reduce IBT to 100ºC or 2 km distance, whichever occurs first.
constant decel rate: 3.0 m/s/s
Ped. Force ajusted to maintain constant decel
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Avg. Decel (m/s^2)
1	81.2	77.5	82.4	41.5	43.9	76.6	55.2	3.3
10	80.6	118.4	128.9	66.8	74.0	66.2	44.6	3.1
20	80.6	118.6	132.6	72.7	77.5	65.5	47.7	3.1
30	80.6	102.0	111.0	57.3	60.9	59.1	44.4	3.1
40	80.6	123.8	133.1	76.8	81.3	56.3	43.1	3.1
50	80.8	119.9	127.8	77.5	82.0	58.2	41.9	3.0
60	81.3	125.7	134.2	82.2	88.3	66.3	42.2	3.0
70	80.3	114.1	123.0	75.2	79.6	71.7	47.5	3.1
80	81.1	115.4	124.1	80.3	85.0	77.6	45.0	3.1
90	80.7	121.2	128.0	82.1	88.8	57.5	41.2	3.1
100	81.0	122.8	131.6	82.3	91.8	66.5	40.0	3.1
110	80.9	126.1	135.9	87.1	97.5	64.5	38.2	2.9
120	80.8	112.3	122.1	81.9	89.1	66.9	45.2	3.1
130	80.8	123.4	134.2	87.3	97.3	63.5	44.1	3.1
140	80.5	106.7	115.0	79.3	85.4	64.4	44.3	3.0
150	80.5	93.4	102.6	62.3	71.6	61.9	43.9	3.0
160	80.4	106.0	111.2	75.6	84.8	60.1	42.5	3.0
170	80.2	103.5	109.9	79.4	85.6	64.3	41.6	3.1
180	80.6	97.4	103.0	71.5	78.9	64.3	42.2	3.1
190	80.6	111.3	113.9	81.1	89.6	65.3	42.0	3.0
200	80.6	101.8	105.2	77.8	81.5	73.4	41.8	3.1

Brake Adjustment Schedule: Adjust service brakes; record procedure and amount adjusted.

Left Front : None
Right Front: None
Left Rear : None
Right Rear : None
Comments: None
Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice Observer: None

Recorded Data Processed by: Derek Bevis Date:11/20/2015

Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 10/30/2015

S7.5 Cold Effectiveness at GVWR

Weather Conditions: 44ºF Wind: 6 mph at 297º

Start Odometer: 415 End Odometer: 421

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:

One stop with:
Stopping distance less than or equal to 70m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	101.1	81	82	51	50	49.6	48.5	436.5	276.6	10.8	8.0
2	100.9	90	90	50	49	49.4	48.5	429.4	343.0	11.2	8.0
3	100.8	89	91	49	48	49.0	48.2	464.8	317.9	11.2	8.9
4	100.6	94	95	50	51	49.0	48.4	405.7	318.1	11.6	8.1
5	100.6	93	93	46	48	48.9	48.3	401.7	316.1	11.7	8.8
6	100.4	94	94	45	48	49.4	49.0	490.8	339.0	11.5	7.9

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: None

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 10/30/2015

S7.6 High Speed Effectiveness at GVWR

Weather Conditions: 45ºF Wind: 5 mph at 321º

Start Odometer: 421 End Odometer: 443

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 155 kph to zero
6 stops with transmission in gear

Performance Requirements:

One stop with:
Stopping distance less than or equal to 176m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	155.7	91	91	42	44	114.3	112.9	502.1	357.3	11.4	8.8
2	156.8	86	92	44	44	113.2	110.3	406.0	300.2	12.4	9.2
3	156.0	83	91	47	46	111.5	109.8	444.6	327.1	11.9	8.6
4	155.8	86	92	50	49	112.7	111.2	374.8	301.9	11.3	9.2
5	156.1	83	92	47	47	112.3	110.4	441.5	302.9	11.5	9.2
6	156.0	87	96	50	52	112.1	110.4	386.6	297.6	12.2	8.7

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: None

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 10/30/2015

S7.7 Stops with Engine Off at GVWR

Weather Conditions: 46ºF Wind: 2 mph at 332º

Start Odometer: 443 End Odometer: 450

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:

One stop with:
Stopping distance less than or equal to 70m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.9	92	95	42	42	50.7	49.9	409.2	289.8	11.7	7.9
2	100.6	89	92	42	43	50.5	49.9	374.6	266.4	11.8	7.8
3	100.5	87	91	42	42	48.4	47.9	406.8	309.0	11.5	8.1
4	101.0	91	94	44	45	49.7	48.8	435.7	294.2	13.6	8.0
5	101.0	90	92	40	43	49.9	48.9	417.1	301.4	11.3	7.9
6	100.9	90	93	41	43	49.3	48.4	386.8	304.0	11.5	8.0

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.

Comments: None

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice

Observer: None

Recorded Data Processed by: Derek Bevis

Date:11/20/2015

Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/02/2015

S7.5 Cold Effectiveness at LLVW

Weather Conditions: 68ºF Wind: 6 mph at 165º

Start Odometer: 455 End Odometer: 469

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:

One stop with:
Stopping distance less than or equal to 70m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.4	93	86	44	45	52.3	51.9	409.5	353.6	10.6	7.8
2	100.6	95	91	44	44	50.0	49.4	499.3	421.9	11.2	8.9
3	100.6	94	91	43	42	50.0	49.3	496.6	426.5	11.8	8.9
4	100.6	93	94	45	44	50.6	49.9	453.2	374.8	12.0	8.8
5	100.8	92	94	45	44	50.9	50.1	488.5	342.6	11.4	8.1
6	100.6	95	97	46	45	49.0	48.4	483.3	424.2	11.7	9.0

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: None

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/03/2015

S7.6 High Speed Effectiveness at LLVW

Weather Conditions: 60ºF Wind: 6 mph at 161º

Start Odometer: 478 End Odometer: 493

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 155 kph to zero
6 stops with transmission in gear

Performance Requirements:

One stop with:
Stopping distance less than or equal to 176m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	154.9	80	77	40	39	106.7	106.7	465.7	387.4	12.6	8.7
2	154.1	96	96	41	42	107.1	108.0	506.5	437.1	12.1	9.2
3	154.6	93	94	36	36	109.0	109.4	490.6	409.8	10.8	8.5
4	154.3	89	92	35	34	106.4	107.1	478.4	386.7	12.2	8.6
5	155.8	91	93	37	36	111.0	109.6	466.5	404.8	10.9	8.4
6	155.0	91	94	35	34	110.4	110.1	465.1	403.8	11.5	9.1

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: Over on the Max Pedal Force on Stop# 2 due to driver error.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/03/2015

S7.8 Antilock Failure at LLVW

Weather Conditions: 66ºF Wind: 7 mph at 157º

Start Odometer: 495 End Odometer: 511

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:

One stop with:
Stopping distance less than or equal to 85m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.7	87	93	36	37	60.6	59.8	207.6	185.7	9.0	7.4
2	100.7	86	91	38	36	61.2	60.3	202.1	178.6	9.1	7.4
3	100.9	88	93	40	39	59.8	58.7	245.6	220.4	9.1	6.9
4	101.0	88	93	38	39	58.8	57.7	273.2	217.0	9.5	7.1
5	101.0	89	93	38	39	56.6	55.5	348.5	303.9	9.8	8.0
6	100.8	92	97	45	45	57.3	56.4	274.9	217.0	9.7	7.3

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: Removed 40 Amp ABS fuse from the fuseblock under the hood to induce ABS failure.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc.

Date Tested: 11/04/2015

S7.10 Hydraulic Circuit Failure #1 at LLVW

Weather Conditions: 57ºF Wind: 5 mph at 144º

Start Odometer: 516 End Odometer: 525

Schedule:
Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:
One stop with:
Stopping distance less than or equal to 168m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.8	25	90	65	19	94.8	93.3	478.4	415.2	7.3	4.8
2	100.8	37	95	58	19	94.1	92.5	457.6	417.0	7.7	4.8
3	100.9	42	93	48	21	96.1	94.5	477.1	417.5	7.1	4.7
4	100.4	46	90	43	21	92.2	91.5	495.7	430.4	7.0	4.8

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: Subsystem #1 failed, No LF or RR brakes available.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc.

Date Tested: 11/04/2015

S7.10 Redundant Hydraulic Circuit Fail #2 at LLVW

Weather Conditions: 70ºF Wind: 5 mph at 111º

Start Odometer: 528 End Odometer: 542

Schedule:
Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:
One stop with:
Stopping distance less than or equal to 168m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.7	90	55	25	60	115.4	113.9	507.0	423.6	4.8	3.5
2	100.9	95	59	29	47	106.0	104.2	457.9	395.2	5.4	4.0
3	100.5	93	60	31	48	106.3	105.2	473.4	414.0	5.6	4.0
4	100.7	94	62	32	52	105.6	104.0	476.6	412.7	5.7	4.0

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: Subsystem #2 failed, No RF or LR brakes available.
Over on Max Pedal Force on Stop# 1 due to driver error.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/05/2015

S7.10 Hydraulic Circuit Failure #1 at GVWR

Weather Conditions: 70ºF Wind: 10 mph at 202º Start Odometer: 564 End Odometer: 575

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:

One stop with:
Stopping distance less than or equal to 168m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	101.1	38	90	60	26	120.0	117.4	485.5	429.9	4.8	3.6
2	100.8	43	90	54	27	106.0	104.4	499.8	436.9	6.9	4.3
3	100.7	53	94	65	28	106.5	105.0	476.6	425.1	6.1	4.1
4	100.8	50	87	65	29	106.2	104.6	481.8	422.1	6.3	4.2

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.

Comments: Subsystem #1 failed, No LF or RR brakes available.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice Observer: None

Recorded Data Processed by: Derek Bevis Date:11/20/2015

Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/05/2015

S7.10 Redundant Hydraulic Circuit Fail #2 at GVWR

Weather Conditions: 62ºF Wind: 10 mph at 161º Start Odometer: 547 End Odometer: 560

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:

One stop with:
Stopping distance less than or equal to 168m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.9	95	28	20	62	114.1	112.0	474.6	425.8	5.8	3.8
2	100.7	93	37	22	68	110.4	109.0	501.7	443.4	5.1	3.9
3	100.8	94	42	22	74	110.7	108.9	467.0	417.0	5.6	3.9
4	100.5	95	43	23	79	108.2	107.0	492.0	420.5	5.7	4.0

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: Subsystem #2 failed, No RF or LR brakes available.
Over on Max Pedal Force on Stop #2 due to driver error.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice Observer: None
Recorded Data Processed by: Derek Bevis Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/05/2015

S7.8 Antilock Failure at GVWR

Weather Conditions: 73ºF Wind: 15 mph at 229º

Start Odometer: 577 End Odometer: 591

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:

One stop with:
Stopping distance less than or equal to 85m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.7	88	82	62	60	67.4	66.4	230.3	195.7	8.0	6.6
2	100.9	88	89	49	50	60.8	59.8	284.1	257.5	9.1	7.4
3	100.8	95	94	50	50	58.5	57.5	335.2	246.1	9.1	7.6
4	101.6	88	87	47	45	66.9	64.8	434.6	213.0	9.0	6.5
5	100.2	96	92	51	48	60.1	59.9	184.1	156.1	8.9	6.8
6	100.6	92	94	45	48	59.0	58.3	307.5	204.6	9.0	7.3

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: Removed the 40 Amp ABS fuse from the fuseblock under the hood to induce ABS failure.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/05/2015

S7.11 Power Brake Unit Failure at GVWR

Weather Conditions: 73ºF Wind: 10 mph at 209º

Start Odometer: 593 End Odometer: 608

Schedule:

Initial Brake Temperature 65 -100 ºC
Initial Speed 100 kph to zero
6 stops with transmission in neutral

Performance Requirements:

One stop with:
Stopping distance less than or equal to 168m
Ped. Force between 65N and 500N
No lock up allowed longer than 0.1 sec above 15 kph
Vehicle must stay in lane of 3.5m

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.6	95	92	50	50	70.9	70.1	463.9	397.8	9.1	6.2
2	100.7	96	93	56	54	88.9	87.6	453.8	417.1	6.1	4.9
3	100.5	90	89	55	53	70.7	70.1	443.5	395.2	9.1	6.6
4	100.7	95	92	60	58	70.5	69.6	443.3	388.7	9.1	6.1
5	100.6	92	90	57	58	72.1	71.3	457.6	405.2	8.7	6.4
6	100.9	86	88	51	54	71.5	70.2	447.0	393.6	9.1	6.1

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.

Comments: Removed the brake booster vacuum lone from the engine side of the system and left it open to atmosphere. Performed 10 firm applications of the service brake to deplete the system.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice

Observer: None

Recorded Data Processed by: Derek Bevis

Date:11/20/2015

Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/06/2015

S7.12 Parking Brake Static at GVWR

Weather Conditions: 63ºF Wind: 11 mph at 248º Start Odometer: 616 End Odometer: 616

Schedule:

Initial Brake Temperature ≤100 ºC
or Ambient Temp. if non-service brake type materials
Loaded to GVWR with transmission in Neutral
Drive onto 20% slope in forward and reverse directions.

Performance Requirements:

Up to three Applies in each direction:
Parking brake must hold the vehicle stationary
in both directions for 5 miutes each
Ped. Force: Hand Control: <400N
Ped. Force: Foot Control: <500N

Stop #	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Max. Ped. Force (N)	Max. P-Brake Force (N)
1	61	54	33	31	44.3	7.1
2	55	52	31	30	36.0	7.2

Stationary time: 5 minutes

Comments: Park brake was an electric push/pull button type. A digital force guage was utilized to measure the force to actuate the parking brake.

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice Observer: None
Recorded Data Processed by: Derek Bevis Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/06/2015

S7.13 Heating Snubs at GVWR

Weather Conditions: 62ºF Wind: 9 mph at 258º

Start Odometer: 617 End Odometer: 630

Schedule:

Initial Brake Temperature 55 -65 ºC
Initial Speed 120 kph to 60
15 snubs with transmission in gear

Performance Requirements:

Maintain a constant Decel rate of 3.0 m/s ^{2}
Attain the specified Decel within one second
and maintain it for the remainder of the snub.
Maintain a time interval of 45s between the start of snubs.
Accelerate as rapidly as possible to the initial test speed
immediately after each snub.

Stop #	Avg. Decel (m/s ^{2})	Time Between Snubs (s)	Avg. Ped. Force (N)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Initial Speed (kph)
1	3.3	0.0	57.3	48	60	28	30	121.2
2	3.1	46.1	44.9	95	99	54	59	121.4
3	3.4	44.8	47.4	140	137	81	90	121.5
4	3.1	44.7	49.5	181	174	106	119	121.8
5	3.2	45.2	44.2	215	205	130	148	121.6
6	3.0	45.5	44.5	241	230	153	174	121.6
7	3.2	45.0	39.8	265	252	176	197	121.5
8	3.2	44.6	41.9	281	269	195	216	121.7
9	3.1	45.2	46.2	294	283	211	231	121.7
10	3.1	44.8	42.8	307	295	225	241	121.7
11	3.3	45.6	43.7	317	306	237	250	121.8
12	3.2	44.4	45.9	329	317	247	259	121.6
13	3.2	45.1	43.9	338	327	255	266	121.7
14	3.2	44.4	42.2	345	336	261	273	121.6
15	3.1	46.1	39.3	348	343	265	278	121.5

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	North	Yes
2	No	East	Yes
3	No	South	Yes
4	No	South	Yes
5	No	South	Yes
6	No	South	Yes
7	No	West	Yes
8	No	North	Yes
9	No	North	Yes
10	No	North	Yes
11	No	East	Yes
12	No	South	Yes
13	No	South	Yes
14	No	South	Yes
15	No	South	Yes

Comments: None

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/06/2015

S7.14 Hot Performance at GVWR

Weather Conditions: 62ºF Wind: 9 mph at 258º

Start Odometer: 630 End Odometer: 630

Schedule:

Initial Speed 100 kph to zero
2 runs with transmission in neutral

Performance Requirements:

Run 1: Maintain an Avg. Ped. Force <= 318 N
Run 1: Stopping distance less than or equal to 73.6m
Run 2: Maintain an Avg. Ped. Force <= 500 N
Run 2: Stopping distance less than or equal to 89m
Based on shortest GVWR Cold Effectiveness stop # 3

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	100.5	365	356	274	287	51.6	51.1	274.1	226.6	9.7	8.2
2	100.7	376	367	284	297	51.2	50.4	381.4	255.2	9.8	8.2

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	West	Yes
2	No	West	Yes

Corrected Distances are used to determine shortest stopping distance.

Comments: None

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice

Observer: None

Recorded Data Processed by: Derek Bevis

Date:11/20/2015

Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc. TRC

Date Tested: 11/06/2015

S7.15 Brake Cooling Stops at GVWR

Weather Conditions: 62ºF Wind: 9 mph at 258º

Start Odometer: 630 End Odometer: 634

Schedule:

Initial Speed 50 kph to zero
4 stops with transmission in gear
After each stop, immediately accelerate at the
Max. rate to 50 kph
Maintain that speed until beginning the next stop
at a distance of 1.5 km from the beginning of the previous stop

Performance Requirements:

Ped. Force adjust as necessary
Maintain a constant Decel rate of 3.0 m/s ^{2}
No lock up allowed longer than 0.1 sec above 15 kph

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s ^{2})	Avg. Decel (m/s ^{2})
1	51.9	341	346	269	278	37.5	34.9	72.8	51.1	3.8	3.0
2	51.8	297	302	229	236	36.0	33.6	66.7	48.2	4.0	3.1
3	51.8	257	259	193	200	36.3	33.8	62.4	43.6	3.7	3.0
4	51.9	225	227	166	174	36.6	34.0	63.9	49.4	3.9	3.2

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	North	Yes
2	No	North	Yes
3	No	North	Yes
4	No	East	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: None

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Project Number: 20110367-3529
NHTSA Unit Number: C20150303

Test Number: 6
Manufacturer: Chrysler Group LLC
Make: Chrysler
Model: 200 S AWD
Body Style: Pass. Car
Front Cold Tire Pressure: 260.0 kPa
Rear Cold Tire Pressure: 260.0 kPa

Transportation Research Center Inc.

Date Tested: 11/06/2015

S7.16 Recovery Performance at GVWR

Weather Conditions: 62ºF Wind: 9 mph at 258º

Start Odometer: 634 End Odometer: 635

Schedule:

Initial Speed 100 kph to zero
2 runs with transmission in neutral

Performance Requirements:

Maintain an Avg. Ped. Force <= 318 N
Stopping distance of at least one stop
within 35.5m to 64.5m
No lock up allowed longer than 0.1 sec above 15 kph
Based on shortest GVWR Cold Effectiveness stop # 3

Stop #	Initial Speed (kph)	Left Front IBT (ºC)	Right Front IBT (ºC)	Left Rear IBT (ºC)	Right Rear IBT (ºC)	Actual Distance (m)	Corrected Distance SAE J299 (m)	Max. Ped. Force (N)	Avg. Ped. Force (N)	Max. Decel (m/s 2)	Avg. Decel (m/s 2)
1	101.2	207	211	154	163	50.5	49.3	310.5	259.4	11.8	9.0
2	100.5	225	224	164	172	49.5	49.0	299.2	202.1	11.1	8.0

Stop #	Wheel Lock Up	Direction of Stop	Stay In Lane
1	No	South	Yes
2	No	South	Yes

Corrected Distances are used to determine shortest stopping distance.
Comments: None

Data Indicates Compliance: Yes

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

Test Completion Inspection (7.17)

VEHICLE: 2015 Chrysler 200 S AWD NHTSA NO.: C20150303 ODO.: 646 mi. DATE: 11/20/2015

System Integrity (S5.6)

Each vehicle shall meet the complete performance requirements of this standard without:
(a) Detachment or fracture of any component of the braking system such as brake springs and brake shoes or disc pad facings, other than minor cracks, that do not impair attachment of the friction facings. All mechanical components of the braking system shall be intact and functional. Friction facing tearout (complete detachment of lining) shall not exceed 10 percent of the lining on any single frictional element.
(b) Any visible brake fluid or lubricant on the friction surface of the brake or leakage at the master cylinder or brake power unit reservoir cover, seal, and filler openings.

Friction Material Condition: Primary/Inner		**Friction Material Condition: Secondary/Outer**	
LF	Normal Appearance & Color	LF	Normal Appearance & Color
RF	Normal Appearance & Color	RF	Normal Appearance & Color
LR	Normal Appearance & Color	LF	Normal Appearance & Color
RR	Normal Appearance & Color	RR	Normal Appearance & Color
Drum (or Rotor) Condition:		**Brake Fluid/Lubricant Inside Brakes:**	
LF	Normal Appearance & Color	LF	None
RF	Normal Appearance & Color	RF	None
LR	Normal Appearance & Color	LR	None
RR	Normal Appearance & Color	RR	None
Hydraulic Component Condition:		**Mechanical Component Condition:**	
LF	Good	Brk/Pedal	Good
RF	Good	Power Brk	Good
LR	Good	Stop/Lamp	Good
RR	Good	Linkage	Good
M/Cyl	Good	Other	NA

COMPLIANCE: Yes_X_ No____
Comments: None.

Technician: Derek Bevis

TEST COMPLETION INSPECTION (S7.17)

VEHICLE: 2015 Chrysler 200 S AWD; NHTSA NO.: C20150303 GVWR: 2241 kg
MASTER CYLINDER RESERVOIR:

DATE		Requirements	Pass	Fail
Reservoir Compartments (S5.4.1)				
(1) Does master cylinder have a reservoir compartment for each brake subsystem?	***Yes***	Master cylinder shall have a reservoir compartment for each subsystem.	X	
	No			
(2) Does loss of fluid in one compartment result in complete loss from another compartment?	Yes	Loss of fluid from one compartment shall not cause complete loss from another compartment.	X	
	No			
Reservoir Capacity (S5.4.2)				
Shall conform to requirements (1) or (2), state units: (1) For reservoirs having completely separate compartments for each subsystem (two separate, independent reservoirs):				
Subsystem 1 Subsystem reservoir capacity		Each compartment (reservoir) shall have a minimum capacity equivalent to the fluid displacement resulting when all wheel cylinders or caliper pistons serviced by that independent compartment/reservoir moves from a new lining, fully retracted position to a fully worn, properly adjusted, fully applied position. (Use CALCULATION OF MINIMUM RESERVOIR VOLUME REQUIREMENTS Data Sheet)	NA	NA
Subsystem 1 Fluid displaced from new to worn lining				
Subsystem 2 Subsystem reservoir capacity			NA	NA
Subsystem 2 Fluid displaced from new to worn lining				
2) For reservoirs utilizing a portion of the reservoir for a common supply to two or more subsystems:				
Total minimum capacity for the entire master cylinder reservoir (includes individual compartment reservoirs)	490 ml	Shall have total minimum capacity for entire reservoir for displacement resulting from all subsystem wheel cylinders or caliper positions moving from new lining to full worn condition as above.	X	
Fluid displaced from new to worn linings (ALL linings) *Value calculated from CALCULATION OF MINIMUM RESERVOIR VOLUME REQUIREMENTS Data Sheet	177.8 ml*			

Comments: None

Technician: Derek Bevis

TEST COMPLETION INSPECTION (S7.18)

VEHICLE: 2015 Chrysler 200 S AWD; NHTSA NO.: C20150303 GVWR: 2241 kg

MASTER CYLINDER RESERVOIR:

DATE		Requirements	Pass	Fail
Master Cylinder Piston Displacement(S5.4.2) [If Common Reservoir Supply – continued from previous page]				
Fluid displaced by three strokes of master cylinder piston for Subsystem No. 1.	30 ml	Individual partial compartments of reservoir shall **each** have a minimum of fluid equal to at least the volume displaced by the master cylinder piston servicing the subsystem during a full stroke of the piston. **NOTE:** Procedure uses three strokes to ensure an accurate measurement.		
Fluid displaced by three strokes of master cylinder piston for Secondary (Subsystem No. 2)	32 ml			
Fluid displaced per stroke, Subsystem No. 1.	10.0 ml			
Fluid displaced per stroke, Subsystem No. 2.	10.7ml			
Fluid available in partial compartment Subsystem No. 1	58 ml		X	
Fluid available in partial compartment Subsystem No. 2	64 ml		X	
Brake Power Unit Reservoir (S5.4.2)				
Volume displaced in charging system piston or accumulator to normal operating pressure plus wheel cylinder or caliper piston displacement.		Shall have a capacity at least equal to fluid displacement required to charge the system pistons on accumulators to normal operating pressure plus displacement when wheel cylinders or caliper pistons move from new lining to full worn condition as above.	NA	
Reservoir Labeling (S5.4.3)				
Exact copy of reservoir label: On top of master cylinder reservoir: WARNING CLEAN FILLER CAP BEFORE REMOVING. USE ONLY DOT3 FLUID FROM A SEALED CONTAINER.		Label shall read: "Warning, clean filler cap before removing; use only * fluid from a sealed container". * Fluid type specified in 49 CFR 571.116	X	
Measure letter height	3.5 mm	Letters shall be at least 3.2 mm/ 0.125" high	X	
Describe label attachment method and location. Embossed on the top of the master cylinder reservoir cap.		Lettering shall be permanently affixed, engraved or embossed and located so as to be visible by direct view either on or within 100 mm/3.94 inches of the brake fluid reservoir filler plug or cap.	X	
Does the lettering contrast with the background?	***Yes*** No	If label is not engraved or **embossed**, letters shall be of a color that contrasts with the background	X	

Comments: None

Technician: Derek Bevis

TEST COMPLETION INSPECTION (S7.18)

VEHICLE: 2015 Chrysler 200 S AWD; NHTSA NO.: C20150303 DATE: 11/20/2015

BRAKE SYSTEM WARNING INDICATOR (S5.5)

CONDITION	ANSWER	REQUIREMENTS	PASS	FAIL
Brake Systems Indicator Lamp Function Check (S5.5.2) (Bulb and systems check)				
Describe location of brake indicator lamp: Located above the speedometer.	NA	Shall be in front, and in clear view, of driver.	X	
Does lamp light with ignition (start) switch at ON/RUN?	Yes	Automatic activation when ignition switch is "on" when engine **not running**, or ignition between "on" and "start" if is manufacturer check position- OR -single manual action by driver	X	
Does lamp light with ignition between ON and Start?	Yes			
Brake check description in owner's manual?	Yes	Manufacturer shall explain the brake check function test procedure in the owner's manual.	X	
Brake System Warning Indicator ACTIVATION (S5.5.1) DURATION (S5.5.3) FUNCTION (S5.5.4)				
CONDITION	**Light ON?**	**REQUIREMENT**	**PASS**	**FAIL**
A. In event of hydraulic leak (1) On or before appearance of pressure differential of 218 psi (split system)	NA	When ignition (Start) switch is **ON**, lamp must light whenever (A), (B), (C), or (D) occurs. In addition, if service brake system is not a split system, audible warning must be activated when any condition in (A) exists. Visual warning indicator for non-split systems must be flashing.	X	
(2) If any reservoir falls below either "safe" level or 25% of capacity, whichever is greater. Values: 215 **ml** or cc remaining = 43.8 %	Yes			
(3) On or before supply pressure to brake power unit falls to 50%	NA			
B. Electrical functional failure in an antilock or variable brake proportioning system.	NA		X	
C. Application of the parking brake.	Yes			
D. Brake lining wear-out if optical warning.	NA			
E. *For a vehicle with electrically-actuated service brakes, failure of the source of electric power to the brakes or diminution of state of charge of the batteries.*	NA			
F. *For a vehicle with electric transmission of the service brake control signal, failure to a brake control circuit.*	NA			
G. *For an EV with RBS that is part of the service brake system failure of RBS.*	NA			
Must have Audible alarm if not split system and a condition in (a) above exists?	NA			
If condition (A) (2) above does not exist, then fluid reservoir must be **transparent** for fluid check without the need for reservoir to be opened? (S5.4.4)	NA			
Indicator lamps remain activated as long as condition exists - ignition "on", and engine on or off? _____ (S5.5.3 DURATION))	Yes			
Visual warning – continuous or flashing? Audible warning –continuous or flashing?	Yes-cont. Yes			

Comments:

Technician: Derek Bevis

TEST COMPLETION INSPECTION (S7.18)

VEHICLE: 2015 Chrysler 200 S AWD NHTSA NO.: C20150303 DATE: 11/20/2015

BRAKE SYSTEM WARNING INDICATOR LABELING (S5.5.5)

CONDITION AND REQUIREMENT	ANSWER NOTE: Standard requires that the answer to questions be YES	PASS	FAIL
Are visual indicators legible to driver in daylight and nighttime conditions when activated?	Yes	X	
Are visual indicator words 3.2 mm (.125") high minimum? Record Height: "Brake" – 3.2 mm; "ABS" – 3.2 mm	Yes	X	
Visual indicator words and background contrasting colors, one of which is red. Record colors Letters –Red, Lens – Black	Yes	X	
If split system, is there one brake indicator? If yes, does it say the word "Brake"? (With one symbol adjacent.)	Yes	X	
If not split system; is there a separate indicator for loss of fluid or fluid pressure? Does this indicator say "Stop-Brake Failure"? Are the letters block and not less than 6.4 mm (.25") in height? Record letter height_____	NA		
If separate indicator for: 1. Low brake fluid per S5.5.1(a)(1), does indicator say "Brake Fluid"? NOTE: not required for mineral oil system Record wording: NA 2. Gross pressure loss per S5.5.1(a)(2), does indicator say "Brake Pressure"? Record wording: NA 3. Electrical functional failure in antilock or variable proportioning system per S5.5.1(b), letters and background contrasting colors one of which is yellow? Record colors Lens – Black, Letters – Yellow. Does indicator say "Antilock" or "ABS" or "Brake Proportioning"? Record wording: "ABS". 4. Parking brake per S5.5.1(c), does indicator say "Park" or "Parking Brake"? Record wording: Utilizes common BRAKE lamp. 5. Brake lining wear-out per S5.5.1(d), does indicator say "Brake Wear"? Record wording -_____. 6. *If separate indicator for RBS, the letters and background shall be of contrasting colors, one of which is yellow. The indicator shall be labeled "RBS". RBS failure in a system which is part of the service brake system may also be indicated by a yellow lamp that also indicates "ABS" failure and displays the symbol "ABS/RBS." Record wording:* 7. For any other function? If yes, Record NA	NA NA Yes NA NA NA NA	X	

DATA INDICATES COMPLIANCE: YES X NO_____

Comments: None.

Technician: Derek Bevis

CALCULATION OF MINIMUM RESERVOIR VOLUME REQUIREMENTS

VEHICLE: 2015 Chrysler 200 S AWD NHTSA NO.: C20150303 DATE: 11/20/2015

BRAKE		LINING		
LOCATION	**TYPE**	**DESCRIPTION**	**MINIMUM THICKNESS**	**THICKNESS TO FULLY WORN (1) mm***
Left Front	Drum	Leading	Pre-test 13.91 mm	
		Primary	Post Test 13.56 mm	
		Inboard X	Δ 0.35 mm	
	Disc X	Trailing	Pre-test 13.69 mm	
		Secondary	Post Test 13.14 mm	
		Outboard X	Δ 0..28 mm	
LINING CLEARANCE:	Diametrical (2): N/A	Inboard – app 0 mm.	Outboard – app 0 mm.	
WHEEL CYLINDER DIAMETER (3) N/A		CALIPER PISTON DIAMETER (3): 55.58 mm x 1 pistons		
SHOE CAGE DIAMETER (4) N/A ; CENTER POINT OF BRAKE ASSY TO CENTER POINT OF W.C. N/A				
Right Rear	Drum	Leading	Pre-test 10.74 mm	
		Primary	Post Test 10.61 mm	
		Inboard X	Δ 0.13 mm	
	Disc X	Trailing	Pre-test 10.87 mm	
		Secondary	Post Test 10.78 mm	
		Outboard X	Δ 0.09 mm	
LINING CLEARANCE:	Diametrical (2) NA	Inboard – app 0 mm	Outboard – app 0 mm	
WHEEL CYLINDER DIAMETER (3): NA		CALIPER PISTON DIAMETER (3): 36.30 mm x 1 piston		
SHOE CAGE DIAMETER (4): NA		CENTER POINT OF BRAKE ASSY TO CENTER PT. OF W.C.: NA		
CIRCUIT #1 CONSISTS OF:	LF - X	LR	RF	RR - X
CIRCUIT #2 CONSISTS OF:	LF	LR - X	RF - X	RR
(1) MFRS. RECOMMENDATIONS – FRONT and REAR: NA				
(2) DRUM BRAKES, MEASURED AT HORIZONTAL CENTERLINE: NA				
(3) MFRS. DATA: NA (4) RESET POSITION: NA				

Comments: None.

Technician: Derek Bevis

Determination of Master Cylinder Volume Requirement
Determining the minimum volume requirements. The measured data is taken from the previous page, and the manufacturer's data is taken from Appendix E (when made available).

DISC BRAKES

Volume Required, $V_r = (\Delta t_i + t_{ic} + \Delta t_o + t_{oc}) \times [\pi (D^2)]/4$, where

V_r	= Volume required per wheel
Δt	= Change in thickness (average)
i	= Inboard
o	= Outboard
D	= Caliper cylinder diameter
c	= Average clearance

DRUM BRAKES

Volume Required, $V_r = ((2C + \Delta t_s + t_p)/ \cos \alpha) \times \pi r^2$, $\alpha = \sin^{-1}(2 Y/D)$, where

V_r	= Volume required per wheel
C	= Manufacturer's recommended drum-to-lining clearance
Δt_p	= Change in thickness of primary lining
Δt_s	= Change in thickness of secondary lining
Y	= Center point of wheel cylinder to center point of brake assembly
r	= Radius of wheel cylinder bore
D	= Cage diameter

Using the above equations, the volume requirements for Subsystem No. 1 and Subsystem No. 2 were calculated utilizing measured and manufacturer's provided data to create the greatest displacement, as shown on next page:

Front
Disc Brake: $V_r = (\Delta t_i + t_{ic} + \Delta t_o + t_{oc}) \times \frac{\pi D^2}{4}$

Δt_i	13.91 mm
Δt_o	13.56 mm
t_{ic}	0.0 mm
t_{oc}	0.0 mm
D	55.58 mm x 1

$V_r = (13.91 + 0.0) \frac{\pi (55.58)^2}{4} + (13.56 + 0.0) \frac{\pi (55.58)^2}{4}$

$= (13.91)(2425) + (13.56)(2425)$

$= 33732 + 32883$

$= 66615 \text{ mm}^3 = 66.6 \text{ ml} \times 1 \text{ piston} = 66.6 \text{ ml}$

(Rear)

Disc Brake: $V_r = (\Delta t_i + t_{ic} + \Delta t_o + t_{oc}) \times \frac{\pi D^2}{4}$

Δt_i	10.74 mm
Δt_o	10.87 mm
t_{ic}	0.0 mm
t_{oc}	0.0 mm
D	36.30 mm x 1

$$V_r = (10.74 + 0.0) \frac{\pi (36.30)^2}{4} + (10.87 + 0.0) \frac{\pi (36.30)^2}{4}$$

$$= (10.74)(1034) + (10.87)(1034)$$

$$= 11105 + 11240$$

$$= 22345 \text{ mm}^3 = 22.3 \text{ ml x 1 piston} = 22.3 \text{ ml}$$

Subsystem 1	LF	RF	Totals
	66.6 ml	22.3 ml	88.9 ml
Subsystem 2	LF	RF	
	22.3 ml	66.6 ml	88.9 ml

*TOTAL VOLUME REQUIRED = $V_t = V_{r1} + V_{r2} = 88.9 + 88.9 =$ **177.8 ml**

4.0 NOTICE OF POSSIBLE NON-COMPLIANCE

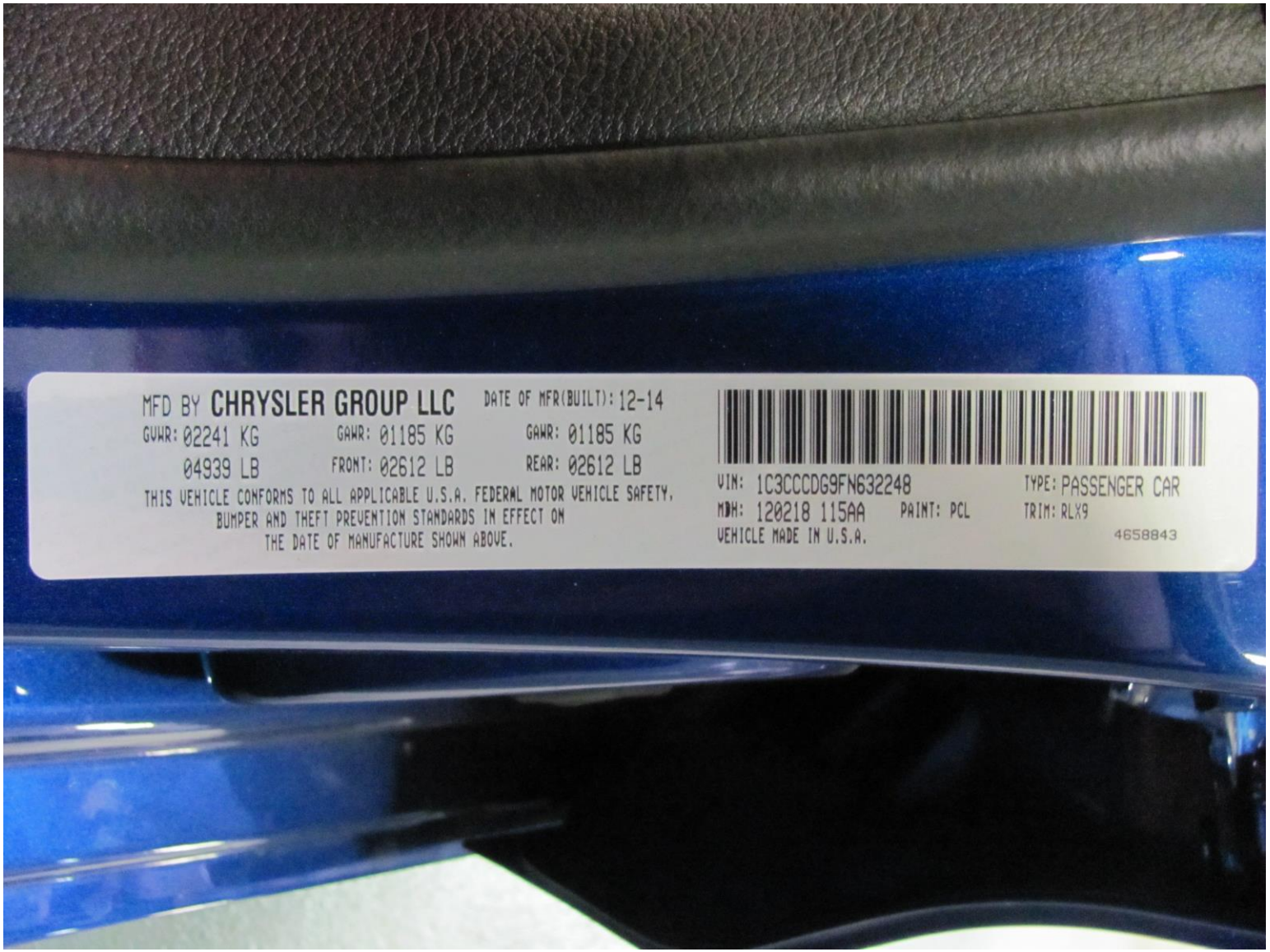
This vehicle (C20150303) appears to meet the requirements of the FMVSS 135 Standard.

5.0 PHOTOGRAPHS

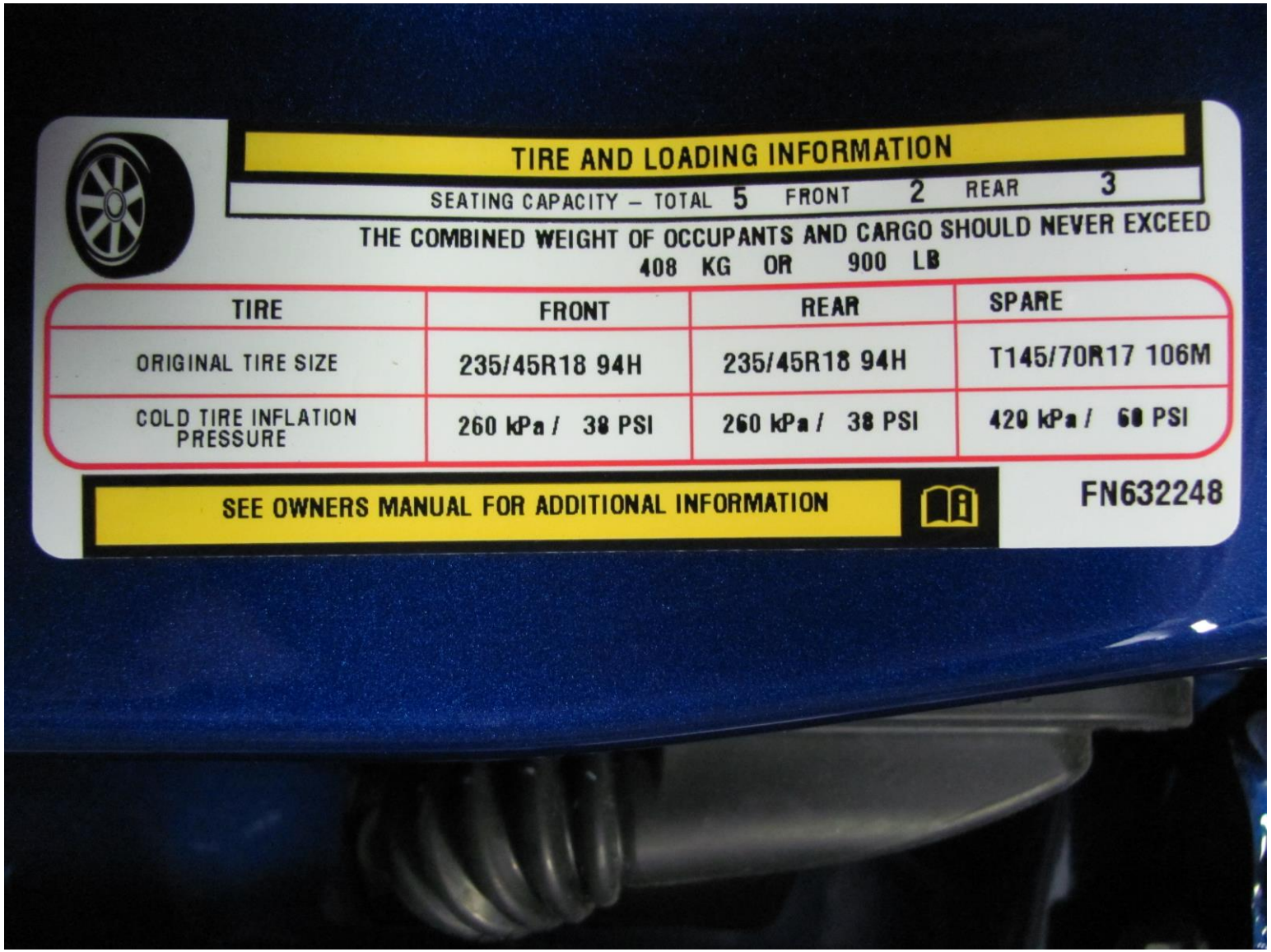
Photographs to document the vehicle, the instrumentation and ballast used, plus any other pertinent information are included in this report.

Left Front ¾ View

Right Rear ¾ View



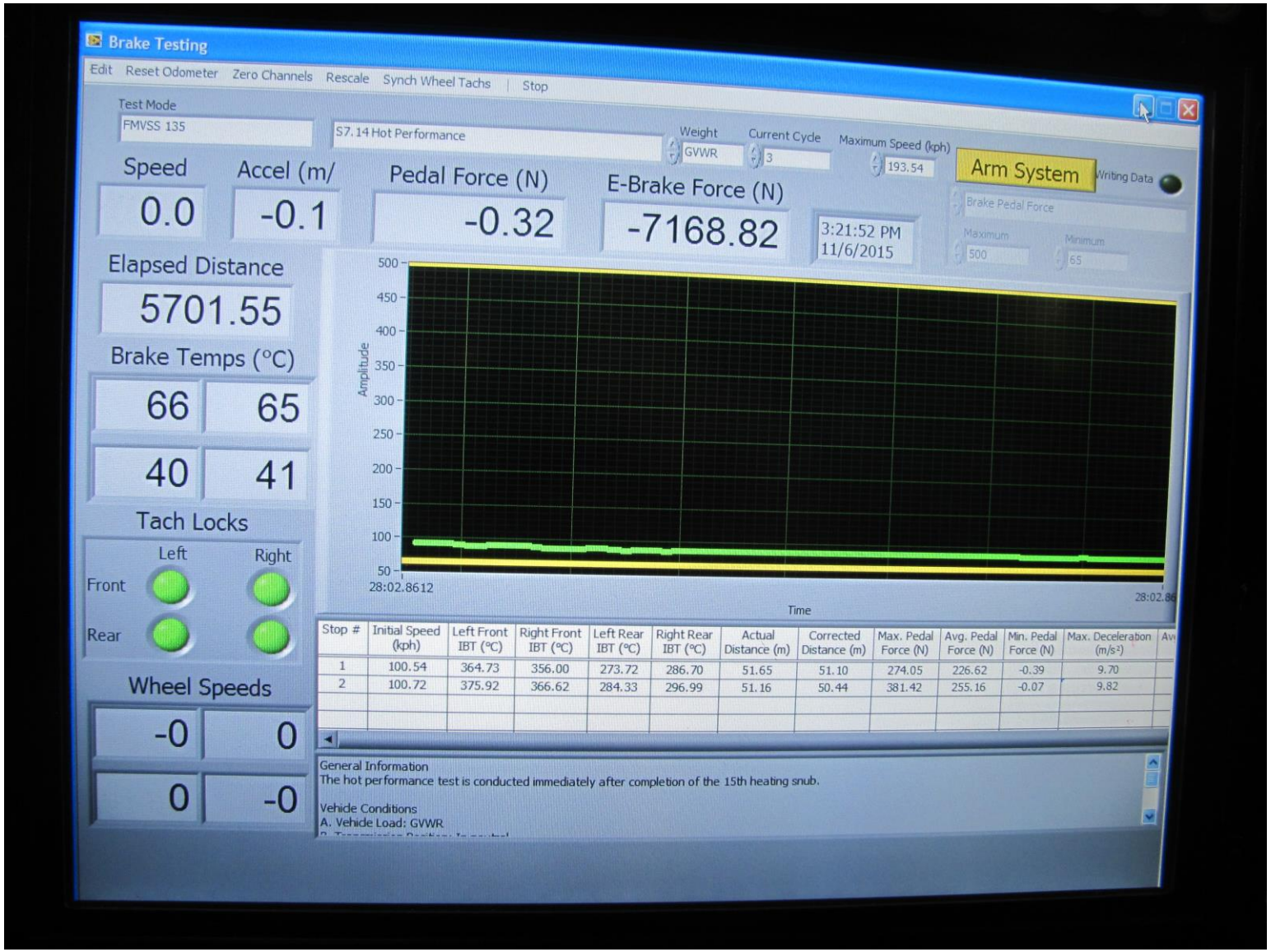
Vehicle Certification Placard



Tire Information Label

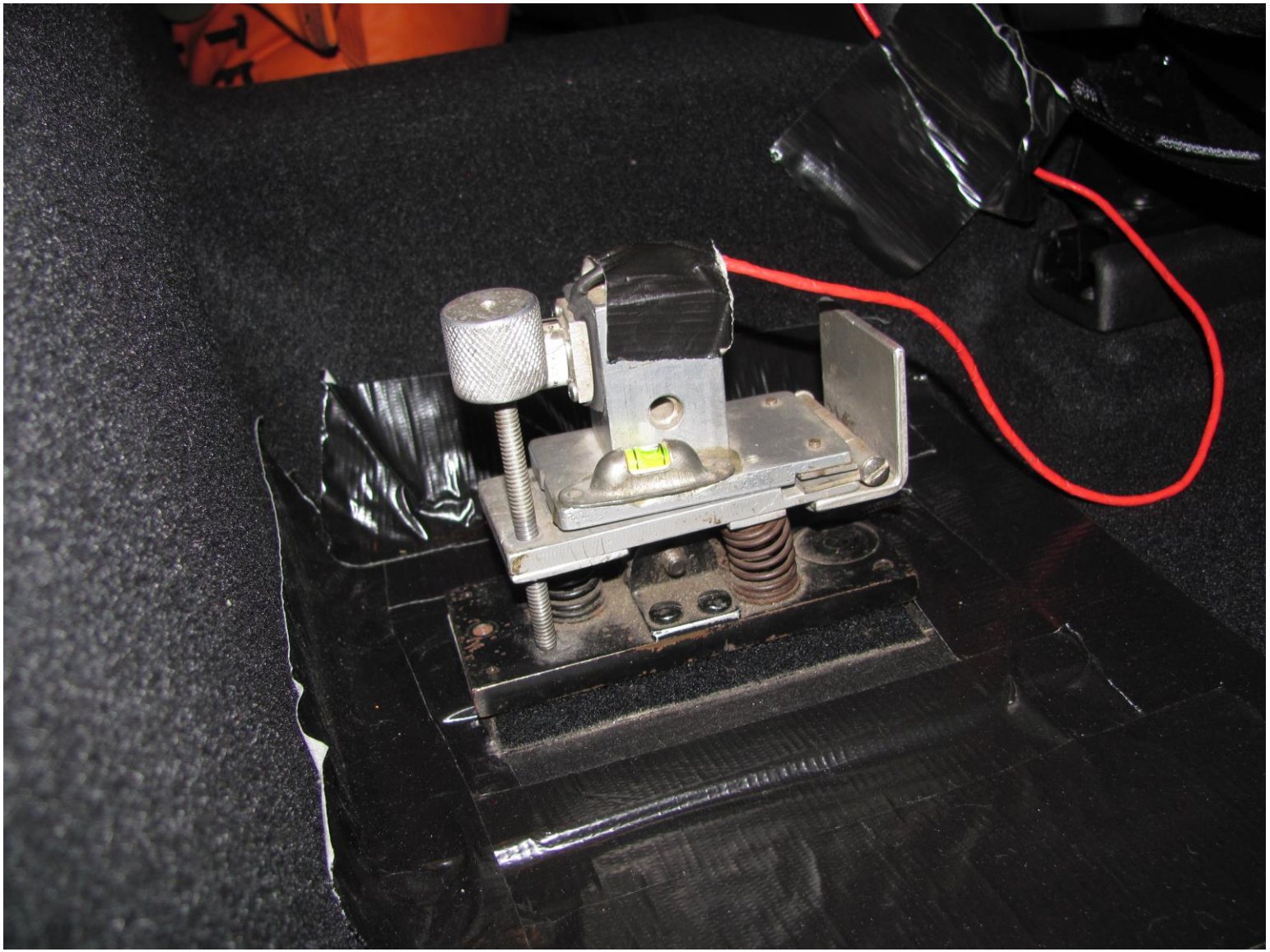
Left Front Thermocouple Installation

Right Rear Thermocouple Installation



Test Instrumentation in Vehicle

Test Instrumentation in Vehicle



Test Instrumentation in Vehicle

Test Instrumentation in Vehicle

Vehicle Being Weighed

Ballast in Vehicle

Ballast in Vehicle

Ballast in Vehicle

Ballast in Vehicle

Brake Indicator (Warning) Lamp

ABS Indicator (Warning) Lamp

Brake System Reservoir Warning (Top of Cap)

6.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

A calibration report is included here that documents the instrumentation used on this test and the calibration dates.

Manufacturer	Model	Serial	Calibration Date	Calibration Due
National Instruments	NI cDAQ-9172	DAS-13FBE1F	1/30/2015	1/30/2016
GSE	Park Brake Trans.	SN-981373	Each Test	Each Test
Fisher Scientific	Stopwatch	SW122613621	8/4/2015	8/4/2016
Fisher Scientific	Stopwatch	SW-97216633	8/4/2015	8/4/2016
Trerice	Tire Pressure Gauge	AG-139	6/1/2015	12/1/2015
Imada	Digital Force Gauge	OE-173727	8/14/2015	8/14/2016
Ohaus	Asst. Pipe-Handle Steel Weights	LB-0001	6/30/2015	6/30/2016
Setra	141a	A-849724	Each Test	Each Test
Racelogic	VBSS100	SpdBX-017640	Each Test	Each Test
Davis	6410	070817N03	2/4/2015	2/4/2016
Davis	6152	A070406D36D	2/4/2015	2/5/2016
Temprel/NI	LF Brake Thermocouple	T52-0B-24K	Ea. Test w/NI	Ea. Test w/NI
Temprel/NI	RF Brake Thermocouple	T52-0B-24K	Ea. Test w/NI	Ea. Test w/NI
Temprel/NI	LR Brake Thermocouple	T52-0B-24K	Ea. Test w/NI	Ea. Test w/NI
Temprel/NI	RR Brake Thermocouple	T52-0B-24K	Ea. Test w/NI	Ea. Test w/NI
Toledo/Mettler Scales	JAGXTREME 3000000	SN 5225831-5JC	8/18/2015	11/18/2015

Driver: D. Bevis/T. Rice
Observer: None
Recorded Data Processed by: Derek Bevis
Date:11/20/2015
Approving Laboratory Official: Mike Bilbee

APPENDIX A

Copy of Manufacturer's Sticker

CHRYSLER

2015 200S AWD

For more information visit: www.chrysler.com
or call 1-800-CHRYSLER

Chrysler Group LLC

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: $29,025

CHRYSLER 200S AWD
Exterior Color: Vivid Blue Pearl Coat Exterior Paint
Interior Color: Black Interior Color
Interior: Cloth with Leather-Trimmed Sport Seats
Engine: 3.6-Liter V6 24-Valve VVT Engine
Transmission: 9-Speed 9HP48 Automatic Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES
- Advanced Multistage Front Airbags
- Supplemental Front Seat-Mounted Side Airbags
- Supplemental Side-Curtain Front and Rear Airbags
- Driver Inflatable Knee-Bolster Airbag
- Passenger Inflatable Knee-Bolster Airbag
- LATCH Ready Child Seat Anchor System
- Electronic Stability Control
- Traction Control
- AWD Sport Suspension
- Heavy Duty Anti-Lock 4-Wheel Disc Brakes
- Brake Assist
- Electric Park Brake
- Electric Power Steering
- Keyless Enter 'n Go™
- Variable Intermittent Windshield Wipers
- Security Alarm
- Speed Control

INTERIOR FEATURES
- Air Conditioning
- Uconnect® 5.0 AM/FM/BT
- 6 Speakers
- SiriusXM Satellite Radio w/ 1-Yr Radio Subscription
- For More Information, Call 800-643-2112
- Audio Jack Input for Mobile Devices
- Remote USB Port
- Steering Wheel Mounted Shift Control
- Leather-Wrapped Steering Wheel
- Black Chrome Interior Accents
- Power Front Windows w/ 1-Touch Up and Down Feature
- Power 8-Way Driver Seat
- Power 4-Way Driver Lumbar Adjust
- 6-Way Manual Passenger Seat Adjust
- Ambient LED Interior Lighting
- Electronic Vehicle Information Center
- Tilt / Telescope Steering Column
- 12-Volt Auxiliary Power Outlet in Console
- Overhead Console with Sunglass Holder

EXTERIOR FEATURES
- Automatic Headlamps
- Bi-Function Halogen Projector Headlamps with LEDs
- Fog Lamps
- LED Tail Lamps
- 18-Inch x 8.0-Inch Satin Carbon Aluminum Wheels
- Dual Integrated Exhaust Tips
- Power Heated Mirrors with Manual Fold-Away
- Active Grille Shutters
- Laminated Acoustic Front Door Glass
- Tinted Acoustic Windshield Glass

OPTIONAL EQUIPMENT (May Replace Standard Equipment)
Customer Preferred Package 26L

DESTINATION CHARGE $995

TOTAL PRICE: * $30,020

WARRANTY COVERAGE
5-year or 100,000-mile Powertrain Limited Warranty.
3-year or 36,000-mile Basic Limited Warranty.
5-year or 100,000-mile Roadside Assistance; certain restrictions apply.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5 YEAR/100,000 MILE POWERTRAIN WARRANTY

Assembly Point/Port of Entry: STERLING HTS, MICH., U.S.A.

VIN: 1C3-CCCDG9FN-632248 L4-VON: 3787 1203

SHIPTO: 26539 23
CUETER CHRYSLER JEEP DODGE LLC
2448 WASHTENAW AVE
YPSILANTI MI 48197-1503

SOLDTO: 42 26539
CUETER CHRYSLER JEEP DODGE LLC
2448 WASHTENAW AVE
YPSILANTI MI 48197-1503

THIS LABEL IS ADDED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.

* STATE AND/OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

EPA DOT Fuel Economy and Environment

E85 Flexible-Fuel Vehicle Gasoline-Ethanol (E85)

Fuel Economy

22 MPG combined city/hwy

18 city | 29 highway | 4.5 gallons per 100 miles

Midsize cars range from 13 to 58 MPG. The best vehicle rates 119 MPGe. Values are based on gasoline and do not reflect performance and ratings based on E85.

Driving Range
Gasoline: 348 miles
Ethanol (E85): 269 miles

You spend **$1,000** more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $2,400

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 5 (1–10, Best)

Smog Rating (tailpipe only): 6 (1–10, Best)

This vehicle emits 403 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and cost $11,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.50 per gallon. This is a dual fueled automobile. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a signficant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code™

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score		**Not Rated**

Based on the combined ratings of frontal, side, and rollover.
Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver	**Not Rated**
	Passenger	**Not Rated**

Based on the risk of injury in a frontal impact.
Should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat	★★★★★
	Rear seat	★★★★★

Based on the risk of injury in a side impact.

Rollover	★★★★

Based on the risk of rollover in a single-vehicle crash.

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

The safety ratings above are based on Federal Government tests of particular vehicles equipped with certain features and options. The performance of this vehicle may differ.

Bumper Performance
This vehicle is equipped with bumper systems that can withstand a frontal barrier impact speed of 2.5 miles per hour and a rear barrier impact speed of 2.5 miles per hour with no more damage than allowed by the Federal bumper standard. The Federal bumper standard allows damage to the bumpers and attaching hardware and specifies barrier tests to be conducted at 2.5 miles per hour.

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 67 %
MAJOR SOURCES OF FOREIGN PARTS CONTENT:
MEXICO: 16 %
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
STERLING HTS, MICH., U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

APPENDIX B

Discussion on Data

DISCUSSION ON DATA

Symbols for Brake Components

4	-	4 Wheel	G	-	Groan	DL	-	Deceleration (State FPSPS)
X	-	Skid	SQ	-	Squeal	PF	-	Pedal on Floor
L	-	Left	SQK	-	Squeak	SCP	-	Shoe Scrape
R	-	Right	PO	-	Pinchout	RB	-	Rubber Banding
R	-	Rear	P	-	Pull	O	-	Odor
F	-	Front	R	-	Shudder	NOX	-	No Skid
B	-	Both	M	-	Momentary			

INT or INIT	-	Initial Part of Stop
MID	-	Middle of Stop
END	-	End of Stop

All stops were made manually.

APPENDIX C

Contractor's Comments
Procedure Modifications
and
Test Facility

Comments for vehicle C20150303.

For all recorded decelerations:

The recorded *average* deceleration values for the tests are slightly lower than that which is required or targeted for certain test sections. However, in all cases and in reality, the driver maintained the correct required/target deceleration values for the majority of time for each of those stops. The recorded deceleration is acquired from the moment the service brake pedal is moved until the vehicle reaches zero speed. Therefore, the time needed to achieve the target deceleration (rise time) and the time the vehicle goes from the target deceleration to zero (fall time) is included in the average deceleration calculation. The rise and fall times were added to the entire length of the stops. Hence, the recorded average deceleration values were generally and slightly less than the required/target deceleration values.

For Antilock Functional Failures, the “ABS”, “BRAKE”, and traction control lamps alighted. ABS failure was induced by removing the 40 Amp ABS fuse from the fuseblock under the hood.

The Hydraulic Circuit Failure Tests were performed not to the lab procedure sequence to both save time and cause minimal disruption to the hydraulic brake system. Sequence: Circuit #1 @ LLVW; Circuit #2 @ LLVW: Circuit #2 @ GVWR and Circuit #1 @ GVWR.

7.5-MILE TEST TRACK

The 7.5-mile test track encloses a 1,600-acre area, one mile wide and 3.5 miles long.

The track has a downward grade, north to south, of 0.228 percent and a cross slope in the straight-aways of 3/16 inch per foot. The 1.88 mile long straight-aways flow into transition areas 2,300 feet in length and then into 5,275-foot long curves with a constant radius of 2,400 feet. The 36-foot wide straight-aways and the 42-foot wide curves provide three test lanes. 12 foot berms border the straight-aways and the inside of the curves.

As a vehicle moves toward the outside of the track in the curves, it encounters a progressively steeper bank. The inside lane (or "slow" lane) has a bank of 10 degrees allowing a neutral speed of 80 mph with no side forces. In the center lane, the slope increases to 19 degrees resulting in a neutral speed of 110 mph. The outside lane's 28-degree bank allows a 140 mph neutral speed. Rimming the outer lane is a seven-foot safety lane culminating in a 36-degree slope at the guardrail.

The facility is paved with asphalt. It carries a maximum single axle load of 36,000 pounds and a maximum tandem axle load weight of 48,000 pounds. Special provisions can be made for heavier weight loads.

With 22.5 lane miles, our track will accommodate many vehicles simultaneously. Research which utilizes the track includes component performance and durability studies, brake tests, aerodynamic studies, fuel economy studies, drive line efficiency tests, and the determination of vehicular acceleration and cruise characteristics. In addition, it supports maximum speed determination, road load power, noise and emission measurements and tire durability test programs.

The 7.5-mile test track can be used in conjunction with other facilities at TRC. It provides an excellent area for pre-test conditioning of equipment such as brake burnishing, tire break-in, and vehicle warm-up.

TRC SKID PAD

The Skid Pad is a test facility which is utilized primarily for the evaluation of tire and brake systems.

The overall dimensions of the pad are 9,000 feet by 84 feet with loops on the north and south ends. Both turnaround loops have a 309-foot radius and are 16 feet wide with a 25 percent super elevation. They will accommodate speeds of 45 mph with zero side force and 60 mph with .5 g's lateral acceleration. The acceleration/deceleration lanes at each end are 3,280 feet in length.

A test area of 210,000 square feet is situated in the center of the skid pad containing several test pads with varying surface textures. Skid numbers in this area range from 30 (wet) to mid 80s (dry). Dry Peaks are in the upper 90's.

The skid pad is paved with Portland cement. The load capacity of the skid pad is 36,000 pounds maximum single axle weight and 48,000 pounds maximum tandem axle weight.