REPORT NO. 500-TRC-14-002 – TRC20110367
NHTSA C20141000 – 2014 Might-E Truck

FMVSS 500
LOW SPEED VEHICLES
2014 Might-E Truck LSV
NHTSA C20141000

TRANSPORTATION RESEARCH CENTER INC.
East Liberty, Ohio 43319

NOVEMBER 2014

FINAL REPORT

Prepared Under Contract No. DTNH22-11-D-00247

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.

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Prepared By _____
Mike Bilbee

Approved By _____
Milt Dunlop

Date: 11-11-2014

Report Accepted By:

_____
Contract Technical Manager
Office of Vehicle Safety Compliance

11/13/14
_____
Date

TECHNICAL REPORT STANDARD TITLE PAGE

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15.		Supplementary Notes

16. Abstract

Compliance tests were conducted on the subject 2014 Might-E Truck LSV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-500-02 for the determination of FMVSS 500 compliance. Test failures identified were as follows:

None.

Observations: The test speed momentarily exceeded the max allowed speed by app. 0.8 km/h. The front axle exceeds GAWR when occupants are seated in the vehicle. The windshield is not labeled with “DOT”. Seat belt manufactured date determined by Lot #.

17. Key Words Compliance Testing Safety Engineering FMVSS 500		18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division NPO-411 1200 New Jersey Avenue Washington, D.C. 20590 Email: tis@nhtsa.dot.gov Fax No.: (202) 493-2833	
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1.0 PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2014 Might-E Truck, manufactured by Canadian Electric Vehicles Ltd., to determine compliance with FMVSS 500 "Low Speed Vehicles."

All tests were conducted in accordance with the U.S. DOT, NHTSA Laboratory Procedure TP-500-02 and/or the corresponding Transportation Research Center Inc. (TRC Inc.) test procedure, which 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.

TRC Inc. personnel using the following TRC facilities conducted all tests:

Skid Pad
Speed Test

Average PFC during the test period was 0.94 (Skid Pad) utilizing the ASTM E1337 w/E1136 tire method.

2.0 FMVSS 500 – LSV INFORMATION AND TEST DATA SUMMARY

TEST LAB: TRC Inc. CONTRACT No.: N/A

TEST START DATE: 10/9/14 TEST END DATE: 10/31/14

TEST START ODO.: 8.4 mi. TEST END ODO.: 27.2 mi.

VEHICLE MAKE/MODEL/YEAR: 2014 Might-E-Truck

PROPULSION TYPE: RWO, Electric Motor SEATING CAPACITY: 2

GVWR: 3000/1361 kg GAWR FRONT: 1500/680.3 kg GAWR REAR: 1500/680.3 kg

DEALER INSTALLED ACCESSORIES: N/A

TIRE MAKE/MODEL/TYPE & SIZE: Federal, Super Steel 657, Tubeless, M + S, 185/65R14 86H

Safety Equipment	**Pass**	**Fail**
Headlamps (S5(b)(1))	X	
Turn signal lamps, front and rear (S5(b)(2))	X	
Tail lamps (S5(b)(3))	X	
Stop lamps (S5(b)(4))	X	
Reflex reflectors, one red on each side, one on rear (S5(b)(5))	X	
Driver's side exterior mirror or interior mirror (S5(b)(6))	X	
Passenger's side exterior mirror or interior mirror(S5(b)(6))	X	
Parking brake (S5(b)(7))	X	
Windshield, AS-1 or AS-4 composition (S5(b)(8))	X*	
Vehicle Identification Number [VIN] (S5(b)(9))	X**	
Seat belt assemblies – Type 1 or 2 (S5(b)(10))	X	
Certification label (Part 567)	X	
Vehicle Loading	**Pass**	**Fail**
Certification Label GVWR < 1,361 kg.	X	
With Occupant Weight Added to UVW: GVWR ≥ total measured vehicle weight. GVWR ≥ measured axle weights.		X***
With Occupant, Cargo &Luggage Weight Added to UVW: GVWR ≥ total measured vehicle weight. GVWR ≥ measured axle weights.	N/A	N/A
Maximum Speed Test	**Pass**	**Fail**
Maximum Speed (S5(a)): _40.8/40.5_ km/hr (more than 32 km/hr and not more than 40 km/hr)	X****	

* Windshield is not labeled with "DOT"
** Seat belt manufactured date determined by Lot #
*** Front GAWR exceeded when vehicle is occupied.
**** See page 7 for details.

3.0 FMVSS 500 – DATA SHEET 1 (Sheet 1 of 3)

VISUAL INSPECTION

VEHICLE MAKE/MODEL/YEAR: 2014 Might-E-Truck

TEST/INSPECTION DATE: 10/9/2014 VEHICLE ODO: 9.1 mi.

NHTSA No.: C20141000

Headlamps: [Requirement: Must be present.]

Method of Activation: Push up for on, push down for off, the button marked LIGHTS on the dashboard.
Function (Yes/No): Yes.

Turn Signals: [Requirement: Front and Rear must be present.]

Description (color and location): FRONT: Amber, immediately below the headlamps. REAR: Red, located to the immediate outside edges of the bed of the unit, above the bumper. SIDE: Immediately to the outside of the headlamps. One side of the vehicle amber color.

Method of Activation: Push up for right, push down for left, the stalk on the left side of the steering column.
Function (Yes/No): Yes. Self-cancelling feature (Yes/No): No

Tail Lamps: [Requirement: Must be present.]

Description (Lens color): REAR: Red FRONT: N/A SIDES: N/A
Method of Activation: To activate tail lamps, activation of the headlamps is necessary (see headlamps above).
Function (Yes/No): Yes.

Stop Lamps: [Requirement: Must be present.]

Description (Lens color): Red lens
Method of Activation: Activation occurs by pressing the service brake down.
Function (Yes/No): Yes.

Reflex Reflectors: [Requirement: One red on each side as far to the rear as practicable, and one red on the rear.]

Description (Color, material, shape): SIDES: 48x111mm, red reflector, oval shaped. REAR: 48x111mm, red reflector, oval shaped. REAR: On the back of the cab there is a SMV that also includes 3 red reflectors, 43x350mm
Location: SIDES: On the rear most, side portion, on the bed. REAR: On the center of the rear bumper. REAR: SMV on the back of the left side of the cab.

Mirrors: [Requirement: Exterior driver's side mirror and either an exterior passenger side mirror or an interior mirror.]

Description (Flat or convex): SIDES: Both flat. Interior: Flat

Location: SIDES: Located immediately below the front corner of the windows. INTERIOR: Located immediately above the center of the windshield, attached to the ceiling/roof.
Method for Adjustment: All mirrors can only be adjusted by hand.

FMVSS 500 – DATA SHEET 1 (Sheet 2 of 3)

VISUAL INSPECTION

Parking Brake: [Requirement: Must be present.]

Description (Type): Spring loaded lever acting on the rear service brakes.

Location: Located between the driver and the passenger seat.
Method of Activation and Release: Pull up to activate, pull up while pressing button on the end of the lever to release.
Function (Yes/No): Yes.

Windshield: [Requirement: Must meet the ANSI/SAE Z26.1 – 1996 specifications for AS-1 or AS-4 glazing and be marked with "DOT," Manufacturer, and "AS-1" or "AS-4". Conformance to FMVSS 205.]

Labeling: National, Laminated AS1, ASTM C-1172-03, ANSI Z97.1 1994, CAN/CGSB-123, M90
Does not have "DOT" marking.

Vehicle Identification Number (VIN): [Requirement: A VIN that conforms to the requirements of Part 565 – Vehicle Identification Number including 17 digit alpha- numeric number.]

VIN 2C9JC3235EE197086
Location: On the certification label, and on the plate on the dashboard.

Seatbelt: [Requirement; Type 1 or Type 2 belts conforming to FMVSS 209.]

Type: Type 2 belts, Lap & Harness

Labeling: Amsafe, Made in USA, Part Number WEIR-4-02, Lot# 14 1484706, Conforms to FMVSS 209, FMVSS 302
Location: Label attached to the end, near the anchor of the lap section of the seatbelt.

Note: Lot# was used to determine date of manufacture

Certification Label: [Requirement: Complies with Part 567 Certification.]
Vehicle Type Identified on Label: Low Speed Vehicle
Location: Located on the inside of the B pillar near the roof of the unit.

Certification Statement (Yes/No): Yes.

Comments:

DATA INDICATES COMPLIANCE: YES: X No: _____

RECORDED BY: D. Bevis DATE: 10/9/14
APPROVED BY: M. Bilbee DATE: 11/10/14

FMVSS 500 – DATA SHEET 2 (Sheet 1 of 1)

VEHICLE LOADING

VEHICLE MAKE/MODEL/YEAR: 2014 Might-E-Truck

TEST/INSPECTION DATE: 10/10/2014 VEHICLE ODO: 9.1 miles

NHTSA No.: C20141000

Information form vehicle certification label"
GVWR: 1361 kg; 3000 lbs.; GAWR F: 680.3 kg; 1500 lbs.; GAWR R: 680.3 kg; 1500 lbs.

Number of seat belt assemblies = designated seating capacity (DSC): 2

Vehicle weight measurements:

Unloaded Vehicle Weight: Vehicle 1053.8 kg or sum (front + rear) NA kg
Front 627.2 kg, Rear 426.6 kg
Includes maximum capacity of fluids necessary for operation of the vehicle; state fluids and amounts added, if any: NA

Vehicle plus occupants weight = DSC 2 x 68 kg = 136 kg
Vehicle 1190 kg or sum (front = rear) NA kg, Front 768.8* kg, Rear 421.2 kg

Cargo and Luggage Weight (if specified) = NA kg – occupant weight NA kg = NA kg.

Source: ( ) label on vehicle, ( ) owner's manual, ( ) other: None given, not tested since it would be the remainder of capacity (171 kg) located on bed.
Recommended location (if specified): NA
Source: ( ) label on vehicle, ( ) owner's manual, ( ) other: _____

Vehicle plus occupants, cargo and luggage weight = Vehicle NA g or sum (front + rear) NA kg, Front NA kg, Rear NA kg

If no cargo land luggage weight or vehicle capacity weight is specified, then calculate the following:
Cargo and luggage weight = GVWR 1361 kg – vehicle plus occupants weight 1190 kg (from above) = 171 kg (376.8 lbs)

* Exceeds Front GAWR

DATA INDICATES COMPLIANCE: YES: X No: _____

RECORDED BY: D. Bevis DATE: 10/10/14
APPROVED BY: M. Bilbee DATE: 11/10/14

FMVSS 500 – DATA SHEET 3 (Sheet 1 of 1)

SPEED TEST – PRETEST

VEHICLE MAKE/MODEL/YEAR: 2014 Might-E-Truck

TEST/INSPECTION DATE: 10/24/2014 VEHICLE ODO: 13 miles

NHTSA No.: C20141000

Unloaded Vehicle Weight (UVW):

LF Wheel 309.5 kg RF Wheel 317.7 kg Front Axle 627.2 kg
LR Wheel 237.6 kg RR Wheel 189.0 kg Rear Axle 426.6 kg
Total Vehicle 1053.8 kg

Weight of Driver, Instrumentation and Required Ballast: 89.2 kg (78 – 90 kg)

Vehicle Test Weight (UVW = weight of driver instrumentation and required ballast):

LF Wheel 364.2 kg RF Wheel 338.6 kg Front Axle 702.8 kg (over GAWR)
LR Wheel 256.8 kg RR Wheel 183.4 kg Rear Axle 440.2 kg
Total Vehicle 1143.0 kg

Actual Tire Inflation Pressure: LF 276 kPa, RF 276 kPa, LR 276 kPa, RR 276 kPa

Maximum Tire Inflation Pressure from Tire Sidewall: Front 276 kPa, Rear 276 kPa – No Info, says see placard

Vehicle Break-in Agenda Specified by Vehicle Manufacturer: ( ) Yes, (X) No.

If Yes, Describe: NA

Data Acquisition System, Field Calibration "Distance" – Pre Test

	Check No. 1 (meters)	Check No. 2 (meters)
Known Distance:	1000	1000
Measure Distance" [Allowed Tolerance ± 2 meters]	999.12 meters south	1001.3 meters north

Vehicle Conditioning: Start Time 8:30 a.m. End Time 9:30 a.m. Duration 25 hours. (3 hr. min.)
Start Temp 6.7°C End Temp 5.6°C
Vehicle conditioned within 5°C of ambient: (X) Yes, ( ) No

Propulsion Batteries Fully Charged: (X) Yes, ( ) No

Comments: None.

DATA INDICATES COMPLIANCE: YES: X No:

RECORDED BY: D. Bevis DATE: 10/24/14
APPROVED BY: M. Bilbee DATE: 11/10/14

FMVSS 500 – DATA SHEET 4 (Sheet 1 of 2)

SPEED TEST

VEHICLE MAKE/MODEL/YEAR: 2014 Might-E-Truck

TEST/INSPECTION DATE: 10/30/2014 VEHICLE ODO: 17.3 mi.

NHTSA No.: C20141000

Conditioning Temperature Range (see Data Sheet 3): 6.7°C to 5.6°C

Ambient Temperature: Pass 1 6.1°C, delta 0.5°C Pass 2 6.1°C, delta 0.5° C
(delta = Conditioning Temperature minus Ambient Temperature)

Maximum Wind Speed: Pass 1 0.9 m/s Pass 2 0.9m/s

Description of Vehicle Openings: All openings closed.

Vehicle Odometer and/or Hour Meter reading: 17.3 mi.

Start Time: Pass 1 9:56 a.m. Pass 2 10:02 a.m.

End Time: Pass 1 10:00 a.m. Pass 2 10:06 a.m.

*Vehicle Charge Level Meter, % (if applicable): Start: Pass 1 100% End: Pass 1 93%
Start: Pass 2 93% End: Pass 2 87%

Measured Battery Voltage, "V" (if applicable): Start: Pass 1 75.9V End: Pass 1 74.6V
(Test laboratory measured with voltmeter) Start: Pass 2 74.6V End: Pass 2 74.4V

Maximum Vehicle Speed Data

Pass	Maximum Speed Visual Data (km/hr)	Maximum Speed Recorded Data (km/hr)	Time Between Passes (minutes) (30 max.)
Pass #1 (1st 1.6 km) (North)	40.8 km/hr	40.8 km/hr	2 min.
Pass #2 (2nd 1.6 km) (South)	40.5 km/hr	40.5 km/hr	

NOTE: Vehicle speed and distances versus time data traces for each speed run are to be included in the final test report. See Appendix B.

Comments: On the initial acceleration, the vehicle will slightly exceed 40 kph until the controller catches up and then the speed stabilizes at an average of 39.2 kph.

DATA INDICATES COMPLIANCE: YES: X No:

RECORDED BY: D. Bevis DATE: 10/30/14
APPROVED BY: M. Bilbee DATE: 11/10/14

FMVSS 500 – DATA SHEET 4 (Sheet 2 of 2)

SPEED TEST – Post Test

VEHICLE MAKE/MODEL/YEAR: 2014 Might-E-Truck

TEST/INSPECTION DATE: 10/30/2014 VEHICLE ODO: 22 mi.

NHTSA No.: C20141000

Data Acquisition System, Field Calibration "Distance" – Post Test

	Check No. 1 (meters)	Check No. 2 (meters)
Known Distance:	1000	1000
Measure Distance" [Allowed Tolerance ± 2 meters]	1000.6 meters south	1001.1 meters north

Data Acquisition System, Field Calibration "Time" – Post Test
[Traverse Known 1000 meter Distance at Constant Speed of 32 km/h (20 mi/h) ± 1.6 km/h (1 mi/h)]

	Check No. 1 (seconds)	Check No. 2 (seconds)
Known Time:	112	112
Measure Distance" [Allowed Tolerance ± 1 seconds]	112.13 seconds south	112.05 seconds north

Comments: None.

DATA INDICATES COMPLIANCE: YES: X No:

RECORDED BY: D. Bevis DATE: 10/30/14
APPROVED BY: M. Bilbee DATE: 11/10/14

4.0 NOTICE OF NONCOMPLIANCE

This vehicle (C20141000) appears to meet the FMVSS 500 compliance standard.

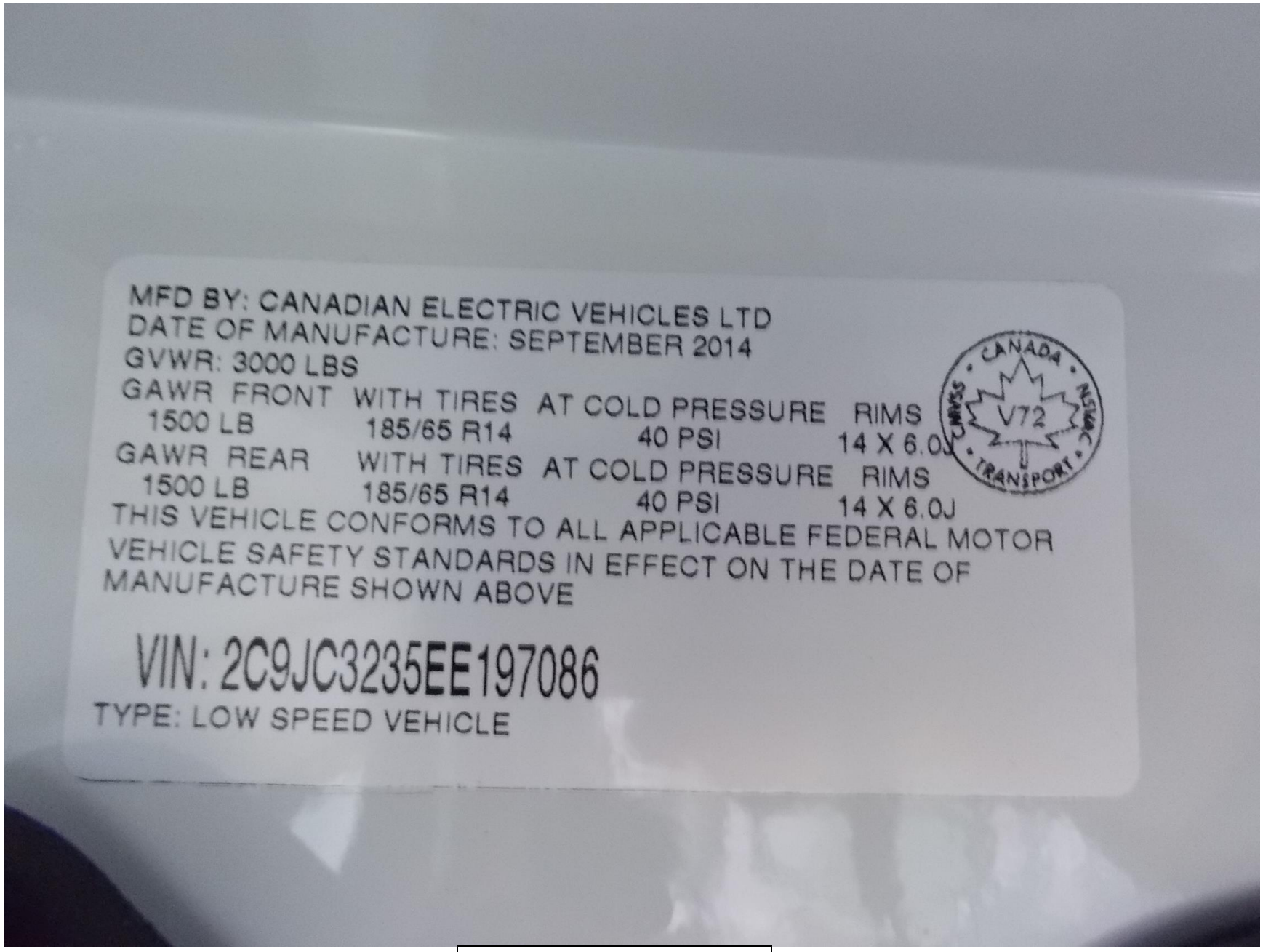
Observations:

- On the initial acceleration, the vehicle will slightly exceed 40 kph until the controller catches up and then the speed stabilizes at an average of 39.2 kph.
- The front axle GAWR is exceeded when occupants are seated in the vehicle.
- The windshield is not marked “DOT” number for U.S. market.
- Seat belt manufactured date determined from marked Lot#.

5.0 PHOTOGRAPHS

Left Front ¾ View

Right Rear ¾ View

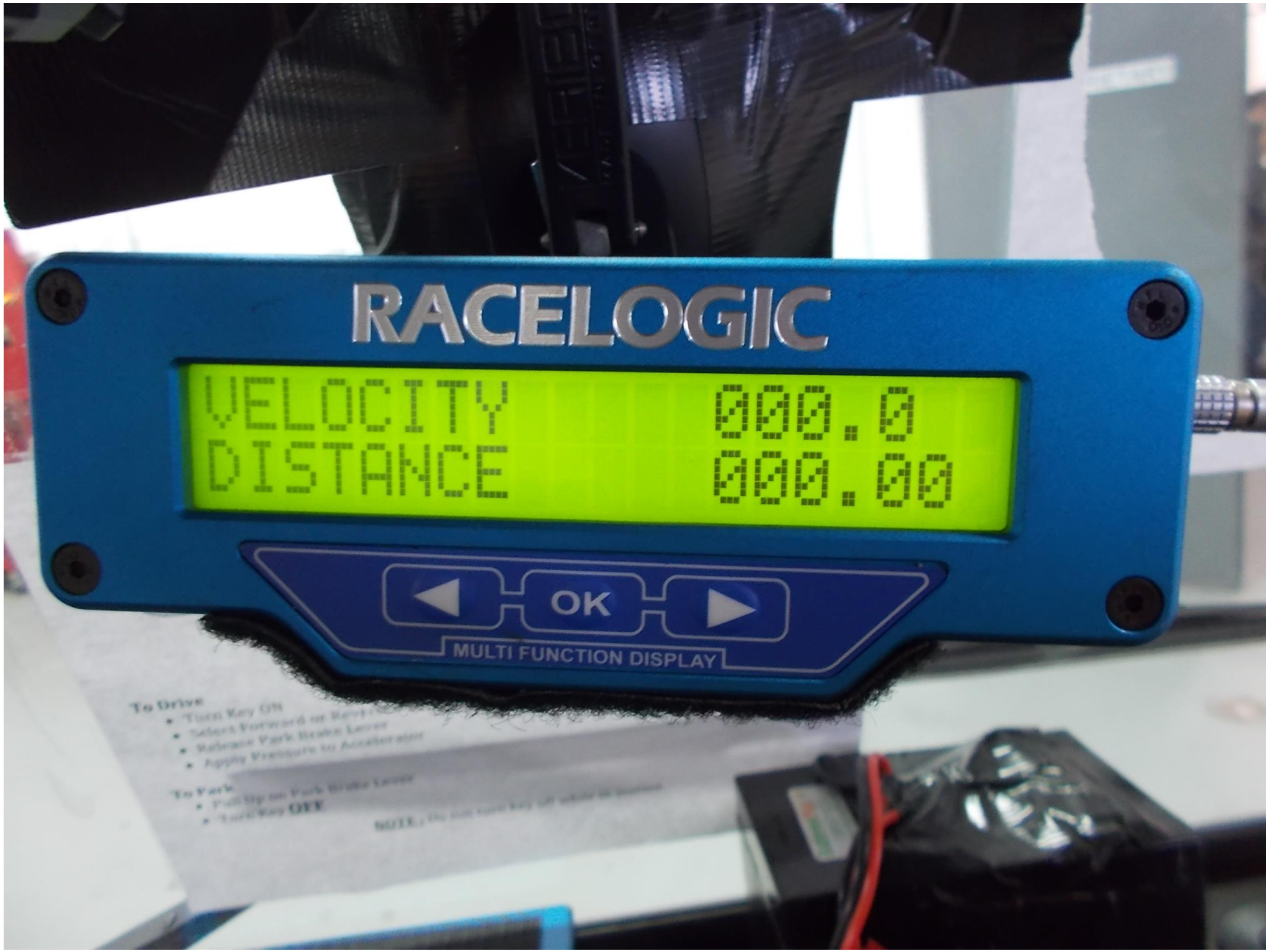


Certification Label and VIN

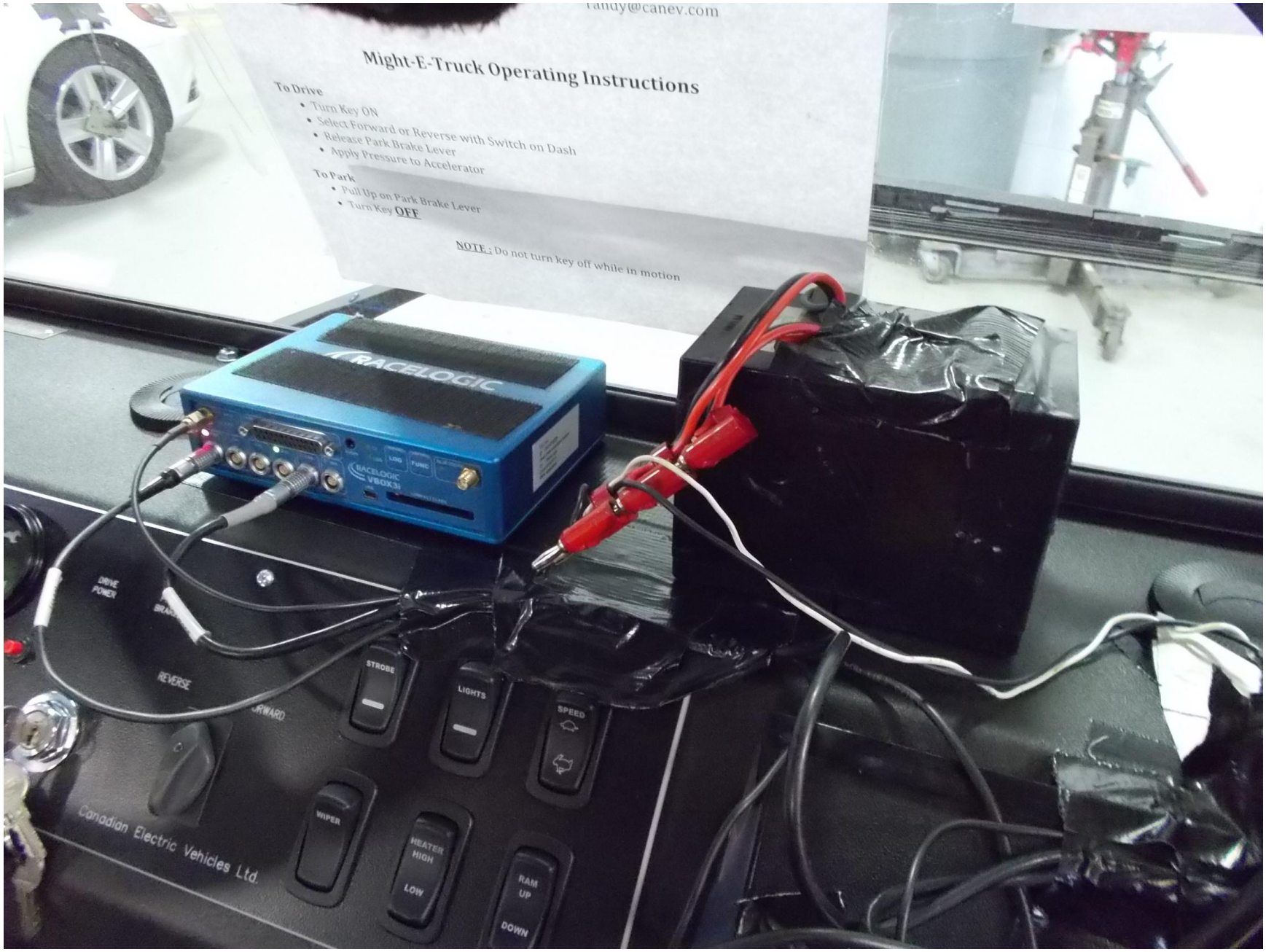
Seat Belt Identification Label

Seat Belt Identification Label

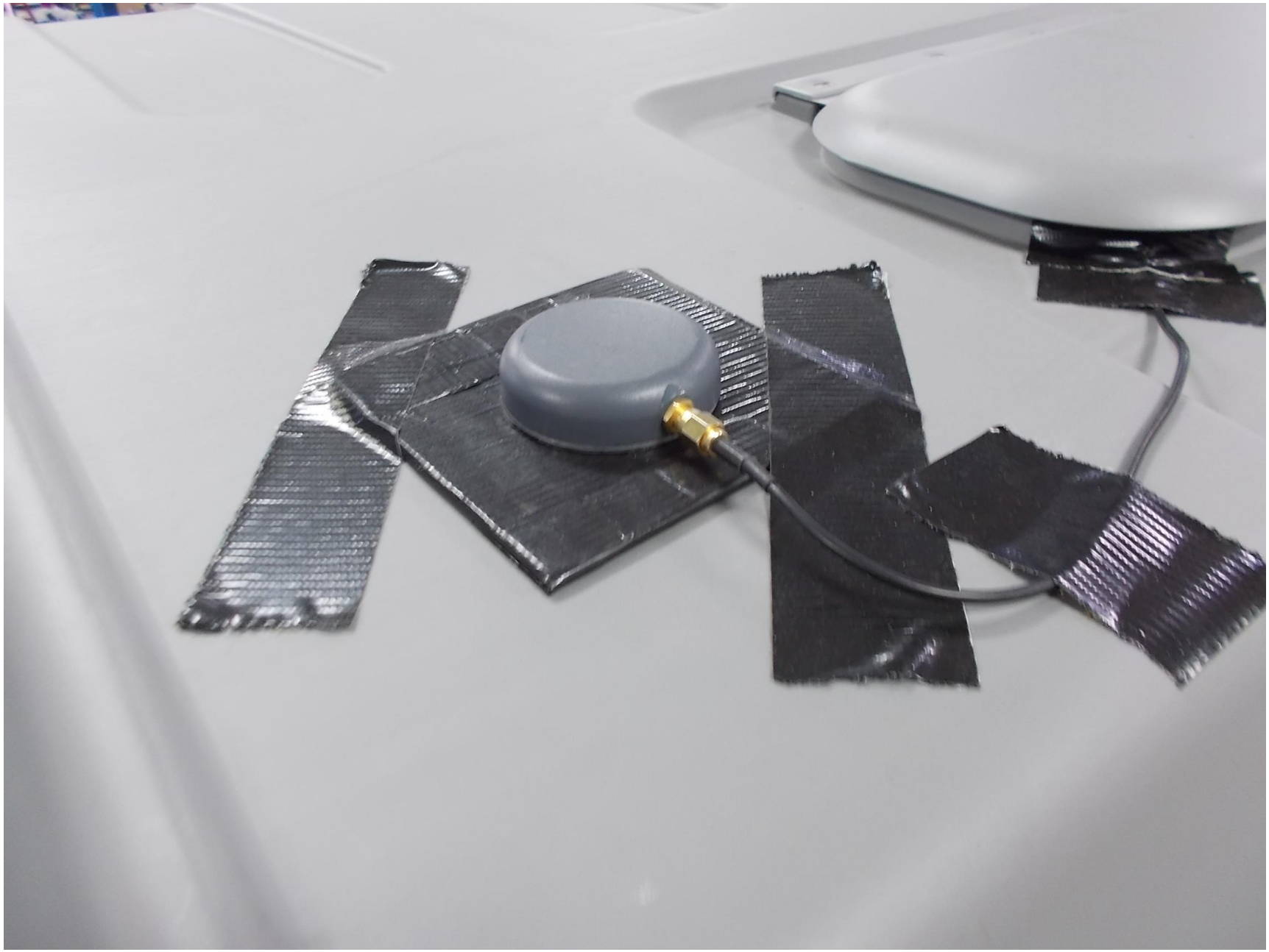
Windshield Certification



Speed Test Instrumentation Readout



Speed Test Instrumentation



Speed Test Instrumentation Sensor

Vehicle on Scales

Park Brake

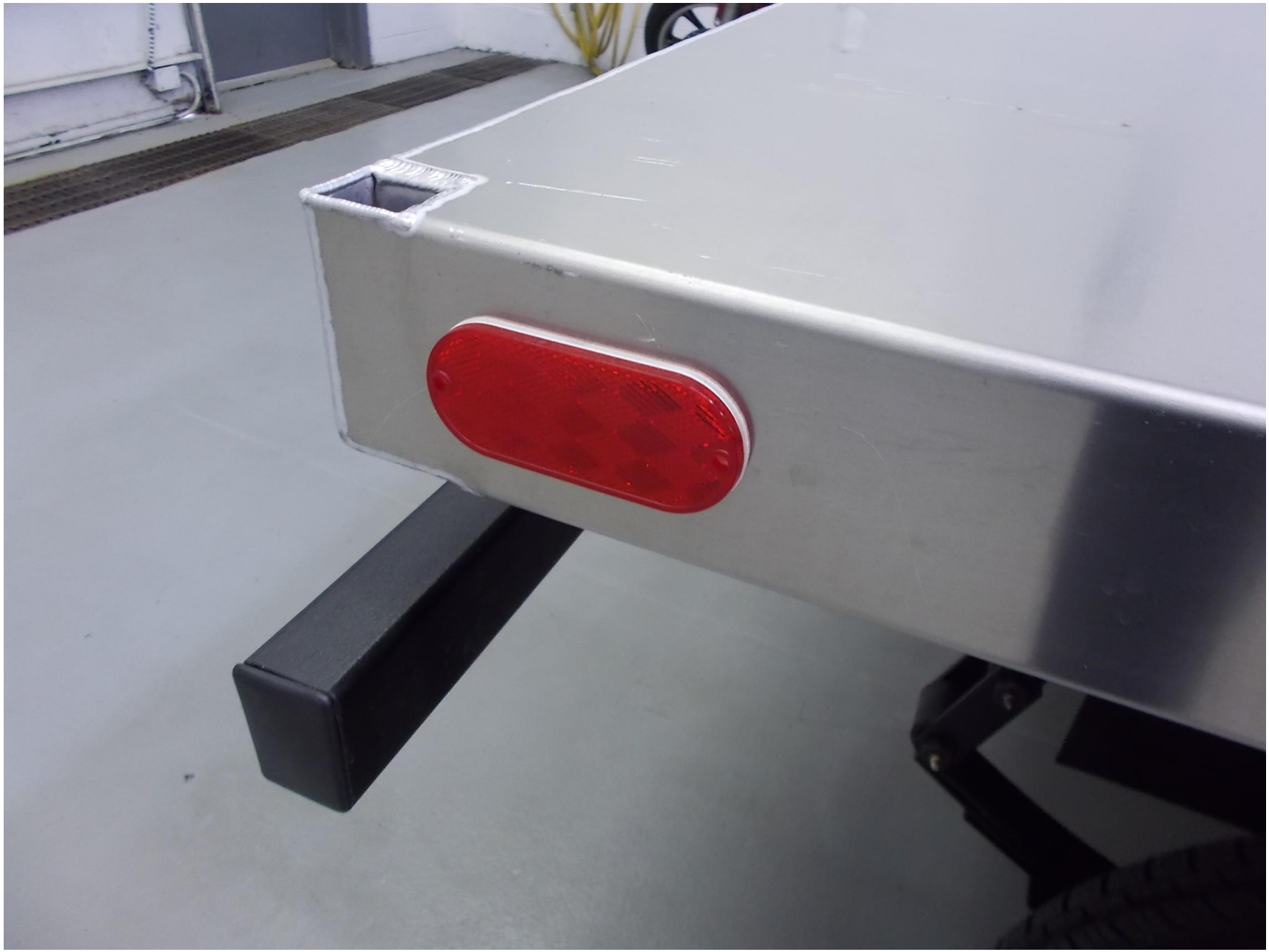
Left Rear View Mirror

Inside Rear View Mirror

Right Rear View Mirror

Headlight, Marker Light/Directional Signal, and Side Marker light

Tail Light/Brake Light/Directional Signal/Rear Reflector



Right Rear Side Reflector

6.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

INSTRUMENT CALIBRATION (12 MONTH MAXIMUM INTERVAL)

VEHICLE: 2014 Might-E Truck NHTSA No.: C20151000 DATE: 10/31/2014

Instrument Use & Manufacturer	Model No.	Serial No.	Range & Resolution	Accuracy	Calibration Date	Next Calibration	Calibrations: Manufacturer, Internal or Contractor
Velocity - Racelogic, LTD	VBOX 3i 100 Hz	DAS-018335	0.1 - 1609 km/h 0.01 km/h	0.1 km/h full scale	04/16/14	04/16/15	Manufacturer
Distance - Racelogic , LTD	VBOX 3i 100 Hz	DAS-018335	Range: NA 1 cm	0.05%	04/16/14	04/16/15	Manufacturer
Voltage – Fluke Corporation	73 III Multimeter	DVM-84640252	0 – 320 VDC	± 0.3 % + 1 digit	03/12/14	03/12/15	Internal
Temperature – Davis Instruments	6152 Wireless Vantage Pro ISS	A50609A02	-40 °C to 60 °C, 1 °C	± 1 °C, between -40 °C – 43 °C	03/20/14	03/20/15	Manufacturer
Wind Speed – Davis Instruments	6410 Anemometer w/790L “Large Wind Cups	120417N03	3 to 241 km/h 1 km/h	3 km/h or 5% whichever greater	03/20/14	03/20/15	Manufacturer
Tire Pressure – Trerice	Type 233.53 Fluid Filled, Bourdon Tube Pressure Gauge, Stainless S.	TRC SN: AG-139	0 – 689 kPa 3 kPa	1% of Span	10/29/14	1/29/15	Internal
Vehicle Mass – Mettler-Toledo	Four – #2158 Pads/Sensors One – JXGAA00000 Processor/Display	11079361JC 11079461JC 11079471JC 11079381JC 522588315JC	0 TO 1334 KG 0.2 KG	0.1% of Applied Load	08/15/14	11/15/14	Contractor

APPENDIX A

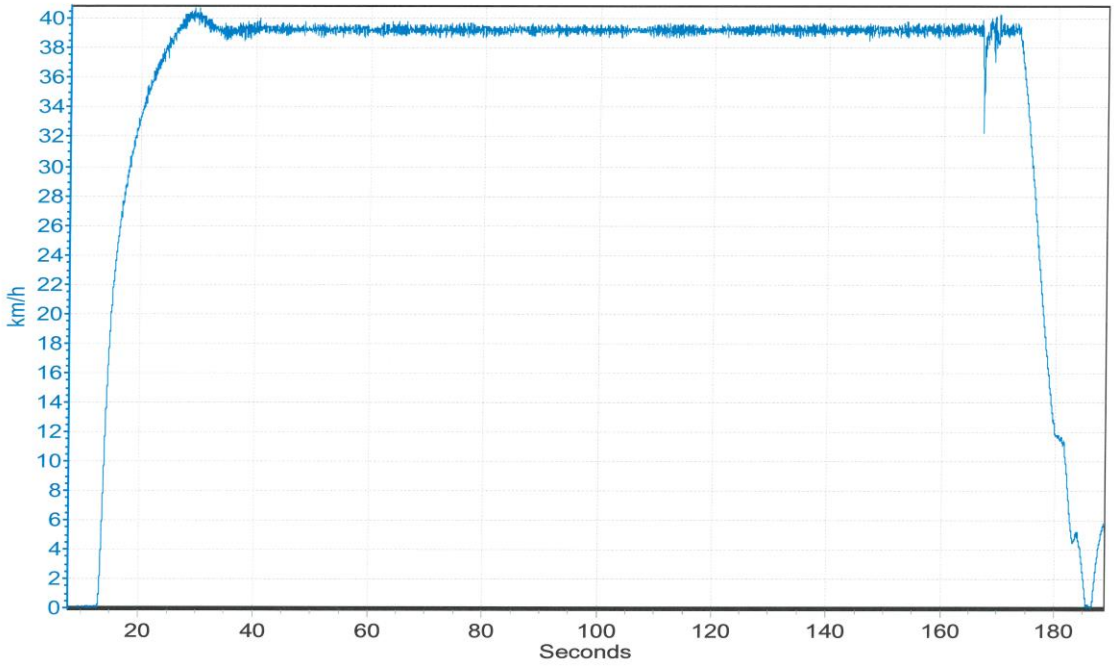
CONTRACTOR'S COMMENTS
PROCEDURE MODIFICATIONS
TEST FACILITY

No additional comments.

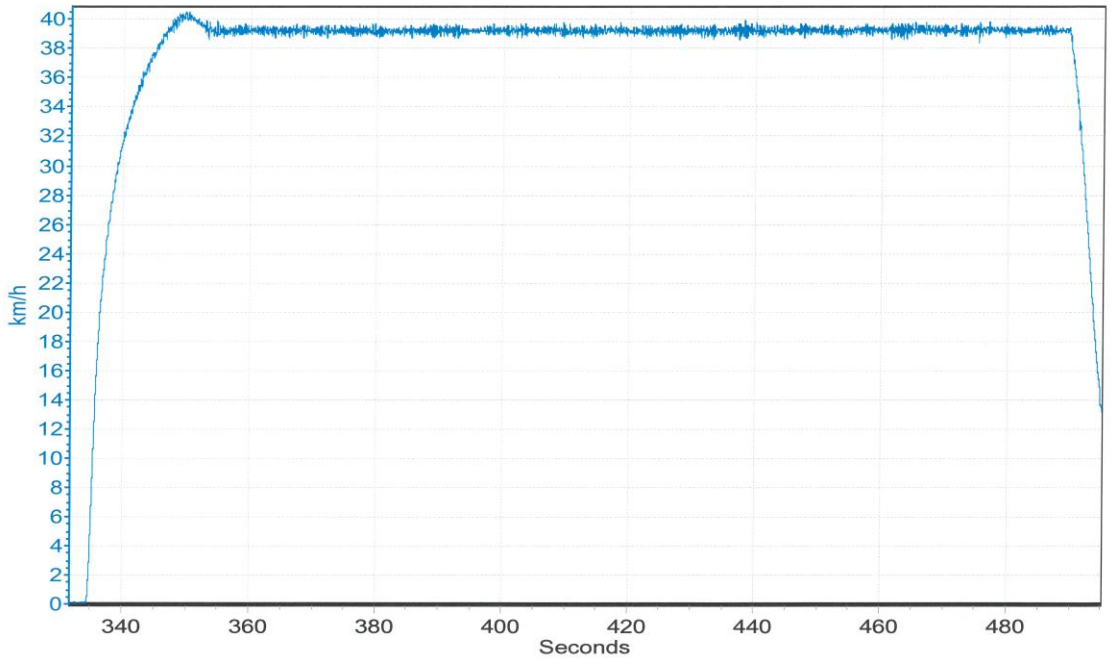
APPENDIX B

TEST SPEED GRAPHS

2014 Might-E Truck, Southbound, Run 1



2014 Might-E Truck, Northbound, Run 2



APPENDIX C

COPY OF MANUFACTURER'S STICKER

Canadian Electric Vehicles Ltd.

Canadian Electric Vehicles

www.canev.com

250-954-2230

MAKE/MODEL	Canadian Electric Vehicles/**MIGHT-E TRUCK**
MOTOR	72V 25HP AC Direct Drive
CONTROLLER	72V 550A AC
CHARGER	72V 12A @ 100 VAC - 230VAC

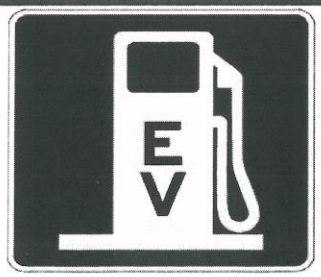
INSTALLED OPTIONS

Flat Bed

EQUIPMENT/ACCESSORIES

Programmable Speed	Up to 25 mph
Vehicle Weight	2,320 lbs
Dimensions	142"x60"x72"
Wheel Base	72"
Track Width	40"
Turning Radius	12.5'
Ground Clearance	7"
Incline Travel	25% empty, 17% with 500 lb load
Load Capacity	500 lbs on road 1500 lb off road
STANDARD FEATURES	
Anticorrosion	Cab & Frame Sprayed at Assembly
Heating & Defrost	1500W Blower/Heater Unit
Cab	Steel & Thermoplastic Composite
Doors	Steel with Sliding Windows
Door Locks	Both Doors with Single Key
Mirrors	Rear View Internal, Dual External
Windsheild	Automotive Safety Glass
Windsheild Wiper	Automotive Single Speed
Frame	Welded HD Steel Box Tube
Bumper	HD Spring Steel (FR) HD Tubing (RR)
Suspension	Leaf Springs with Shcok Absorbers
Tires	Pneumatic All-Season 185-65 R14
Steering	Automotive Rack & Pinion
Color	White (Standard)

40 Miles



APPENDIX D

PERTINENT OWNER'S MANUAL PAGES

No manual was delivered with the vehicle.