

REPORT NO. 500-TRC-15-002 – TRC20110367  
NHTSA C20151000 – 2015 EZGO 2 Five

FMVSS 500  
LOW SPEED VEHICLES  
2015 EZGO 2 Five  
NHTSA C20151000

TRANSPORTATION RESEARCH CENTER INC.  
East Liberty, Ohio 43319



November 2015

FINAL REPORT


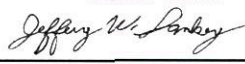
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Date: 11/20/2015

Report Accepted By:

  
Contract Technical Manager  
Office of Vehicle Safety Compliance

11/24/15  
Date

# TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 500-TRC-15-002	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle  Final report of FMVSS 500 Compliance Testing of 2015 EZGO 2 Five LSV, NHTSA No. C20151000		5. Report Date  November 19, 2015	
		6. Performing Organization Code  TRC 20110367/5005	
7. Author(s)  Derek Bevis, Engineering Technician		8. Performing Organization Report No.  500-TRC-15-002	
9. Performing Organization Name and Address  Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319		10. Work Unit No.	
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12. Sponsoring Agency Name and Address  U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance (NVS-221) 1200 New Jersey Avenue, S.E. West Wing 4 <sup>th</sup> Floor Washington, D.C. 20590		13. Type of Report and Period Covered  Final test report	
		14. Sponsoring Agency Code  NVS-221	
15. Supplementary Notes			
16. Abstract  Compliance tests were conducted on the subject 2015 EZGO 2 Five 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.			
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	
19. Security Classif. (of this report)	20. Security Classif. (of this page)	No. of Pages <b>38</b>	22.

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## **1.0 PURPOSE OF COMPLIANCE TEST**

Tests were conducted on a 2015 EZGO 2 Five, manufactured by E-Z-Go, Div. of Textron., 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 0.99 (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.: DTNH22-11-D-00247

TEST START DATE: 10/1/15 TEST END DATE: 11/16/15

TEST START ODO.: N/A TEST END ODO.: N/A

VEHICLE MAKE/MODEL/YEAR: 2015 EZGO 2 Five

PROPULSION TYPE: RWD, 48 Volt Electric Motor SEATING CAPACITY: 4

GVWR: 875 kg GAWR FRONT: 261 kg GAWR REAR: 909 kg

DEALER INSTALLED ACCESSORIES: N/A

TIRE MAKE/MODEL/TYPE & SIZE: Kenda, 205/50R10, Pro Tour, Tubeless

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.	X	
Maximum Speed Test	Pass	Fail
Maximum Speed (S5(a)): <u>40.65/40.64</u> km/hr (more than 32 km/hr and not more than 40 km/hr)	X	

\*When the test unit arrived it had certification label, however, it was illegible due to wear. The manufacturer provided a new sticker that was placed on the vehicle at the request of the COTR.

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

#### VISUAL INSPECTION

VEHICLE MAKE/MODEL/YEAR: 2015 EZGO 2 Five

TEST/INSPECTION DATE: 10/1/2015 VEHICLE ODO: N/A

NHTSA No.: C20151000

**Headlamps:** [Requirement: Must be present.]

Method of Activation: With the key in an on position, push up the headlamp activation button

Function (Yes/No): Yes.

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

Description (color and location): Front: Amber color, located immediately below the headlights on the bumper. Rear: Red color, located immediately below the rear seat on the rear bumper.

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): Red lens color. Located on the immediate outside of the rear bumper.

Method of Activation: Activation occurs with the activation of the headlamps

Function (Yes/No): Yes.

**Stop Lamps:** [Requirement: Must be present.]

Description (Lens color): Red lens color, Located on the immediate outside of the rear bumper. A third brake lamp is also located on the rear facing portion of the canopy.

Method of Activation: Activation occurs when pressing down the brake pedal.

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): Rear Side: Oval shape, 110 mm x 50 mm, red color, plastic. Rear Bumper: Oval shape, 110 mm x 50 mm, red color, plastic. Rear Foot Rest: Oval shape, 110 mm x 50 mm, red color, plastic. "B" Pillar: Rectangle shape, 110 mm x 50 mm, red color, reflective tape. Front Side: 145 mm x 45 mm, amber color, reflective tape.

Location: Rear Side: Located on the outside of the rear foot rest. Rear Bumper: Located on the rear bumper, between the taillamps. Rear Foot Rest: Located on the rear facing side of the rear foot rest. "B" Pillar: Located midway up the "B" pillar behind the front seats. Front Side: Located immediately behind the front wheels on the fenders.

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

Description (Flat or convex): All mirrors are flat.

Location: Interior: Attached to the upper center of the windshield. Driver's & Passenger's: Mounted to the outside of the "A" pillar of the test unit.

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 applied electro-magnetic park brake.

Location: Underneath the vehicle with the electric motor.

Method of Activation and Release: Activation occurs whenever the accelerator is not being moved in any way. Release of the parking brake occurs when movement of the accelerator occurs.

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: DOT 47, M900, AS1, Laminated Glass, Pilkington

**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 10RLA4B4XF5373271

Location: Located on the certification label and on a plate under the upper right hand side of the windshield.

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

Type: All 4 seat belts are Type 2 belts (lap & harness).

Labeling: Shield, Trusted Everywhere, Made In USA, Part Number 80233102, Lot #15, 1576699, Customer P/N 689000, Conforms to FMVSS 209, FMVSS 302.

Location: All seatbelt labels are sewn into the belt itself near the lower anchor points.

**Certification Label:** [Requirement: Complies with Part 567 Certification.]

Vehicle Type Identified on Label: LSV

Location: Located on the inside of the “B” pillar of the test unit.

Certification Statement (Yes/No): Yes.

Comments: When the test unit arrived it had certification label, however, it was illegible due to wear. The manufacturer provided a new sticker that was placed on the vehicle at the request of the COTR.

DATA INDICATES COMPLIANCE: YES: X No:

RECORDED BY: D. Bevis  
APPROVED BY: J. Sankey

DATE: 11/19/15  
DATE: 11/19/15



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

VEHICLE LOADING

VEHICLE MAKE/MODEL/YEAR: 2015 EZGO 2 Five

TEST/INSPECTION DATE: 10/1/15 VEHICLE ODO: N/A

NHTSA No.: C20151000

Information from vehicle certification label"

GVWR: 875 kg; 1929 lbs.; GAWR F: 261 kg; 575 lbs.; GAWR R: 2000 kg; 1695 lbs.

Number of seat belt assemblies = designated seating capacity (DSC): 4

Vehicle weight measurements:

Unloaded Vehicle Weight: Vehicle 579.6 kg or sum (front + rear) NA kg

Front 179.2 kg, Rear 400.4 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 4 x 68 kg = 272 kg

Vehicle 852.6 kg or sum (front + rear) NA kg, Front 208.2 kg, Rear 644.4 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

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 and luggage weight or vehicle capacity weight is specified, then calculate the following:

Cargo and luggage weight = GVWR 875 kg – vehicle plus occupants weight 852.6 kg (from above) = 22.4 kg (49.4. lbs)

DATA INDICATES COMPLIANCE: YES: X No: \_\_\_\_\_

RECORDED BY: D. Bevis

APPROVED BY: J. Sankey

DATE: 11/19/15

DATE: 11/19/15

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

## **SPEED TEST – PRETEST**

VEHICLE MAKE/MODEL/YEAR: 2015 EZGO 2 Five

TEST/INSPECTION DATE: 11/2/15-11/11/15 VEHICLE ODO: N/A

NHTSA No.: C20151000

Unloaded Vehicle Weight (UVW):

LF Wheel <u>92.2</u> kg	RF Wheel <u>87.0</u> kg	Front Axle <u>179.2</u> kg
LR Wheel <u>207.2</u> kg	RR Wheel <u>193.2</u> kg	Rear Axle <u>400.4</u> kg
		Total Vehicle <u>579.6</u> kg

Weight of Driver, Instrumentation and Required Ballast: 89.4 kg (78 – 90 kg)

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

LF Wheel <u>119.6</u> kg	RF Wheel <u>89.6</u> kg	Front Axle <u>209.2</u> kg
LR Wheel <u>252.6</u> kg	RR Wheel <u>207.2</u> kg	Rear Axle <u>459.8</u> kg
		Total Vehicle <u>669.0</u> kg

Actual Tire Inflation Pressure: LF 207 kPa, RF 207 kPa, LR 207 kPa, RR 207 kPa

Maximum Tire Inflation Pressure from Tire Sidewall: Front 207 kPa, Rear 207 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]	1000.6 meters North	1001.1 meters South

Vehicle Conditioning: Start Time 10:00 a.m. End Time 1:45 p.m. Duration 3 hours, 45 mins. (3 hr. min.)

Start Temp 8.9°C End Temp 12.8°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: 11/19/15

APPROVED BY: J. Sankey

DATE: 11/19/15

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

**SPEED TEST**

VEHICLE MAKE/MODEL/YEAR: 2015 EZGO 2 Five

TEST/INSPECTION DATE: 11/11/15 VEHICLE ODO: N/A

NHTSA No.: C20151000

Conditioning Temperature Range (see Data Sheet 3): 8.9°C to 12.8°C

Ambient Temperature: Pass 1 12.8°C, delta 0°C Pass 2 12.8°C, delta 0°C  
(delta = Conditioning Temperature minus Ambient Temperature)

Maximum Wind Speed: Pass 1 4.0 m/s Pass 2 4.0 m/s

Description of Vehicle Openings: N/A

Vehicle Odometer and/or Hour Meter reading: N/A

Start Time: Pass 1 2:00 p.m. End Time: Pass 1 2:03 p.m.  
Pass 2 2:06 p.m. Pass 2 2:09 p.m.

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

Measured Battery Voltage, "V" (if applicable): Start: Pass 1 51.4 V End: Pass 1 50.8 V  
(Test laboratory measured with voltmeter) Start: Pass 2 50.8 V End: Pass 2 50.6 V

**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 (1 <sup>st</sup> 1.6 km) (South)	40.65 km/hr	40.65 km/hr	3 min.
Pass #2 (2 <sup>nd</sup> 1.6 km) (North)	40.64 km/hr	40.64 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: Speed momentarily exceeded the 40.0 km/hr limit.

DATA INDICATES COMPLIANCE: YES: X No:           

RECORDED BY: D. Bevis  
APPROVED BY: J. Sankey

DATE: 11/19/15  
DATE: 11/19/15

**FMVSS 500 – DATA SHEET 4 (Sheet 2 of 2)****SPEED TEST – Post Test**VEHICLE MAKE/MODEL/YEAR: 2015 EZGO 2 FiveTEST/INSPECTION DATE: 11/11/15 VEHICLE ODO: N/ANHTSA No.: C20151000**Data Acquisition System, Field Calibration “Distance” – Post Test**

	Check No. 1 (meters)	Check No. 2 (meters)
Known Distance:	1000	1000
Measure Distance” [Allowed Tolerance $\pm$ 2 meters]	1000.6 meters South	1000.5 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)  $\pm$  1.6 km/h (1 mi/h)]**

	Check No. 1 (seconds)	Check No. 2 (seconds)
Known Time:	112	112
Measure Distance” [Allowed Tolerance $\pm$ 1 seconds]	111.65 seconds South	111.69 seconds North

Comments: None.

DATA INDICATES COMPLIANCE: YES: X No:       RECORDED BY: D. Bevis  
APPROVED BY: J. SankeyDATE: 11/19/15  
DATE: 11/19/15

#### 4.0 NOTICE OF NONCOMPLIANCE

This vehicle (C20151000) appears to meet the FMVSS 500 compliance standard.

##### Observations:

- When the test unit arrived it had certification label, however, it was illegible due to wear. The manufacturer provided a new sticker that was placed on the vehicle at the request of the COTR.
- Speed momentarily exceeded the 40.0 km/hr limit.

## **5.0     PHOTOGRAPHS**



Left Front  $\frac{3}{4}$  View





Right Rear ¾ View



MFD BY: E-Z-GO, DIV OF TEXTRON, AUGUSTA, GA  
DATE OF MANUFACTURE: 04/15  
GVWR: 1929 LBS (875 KGS)  
GAWR (FRONT): 575 LBS (261 KGS)  
GAWR (REAR): 2000 LBS (909 KGS)  
TIRE & RIM DIMENSIONS  
FRONT: 205/50 - 10 @ 30 PSI (207 KPA) -COLD  
REAR: 205/50 - 10 @ 30 PSI (207 KPA) -COLD

THIS VEHICLE CONFORMS TO ALL  
APPLICABLE FEDERAL MOTOR  
VEHICLE SAFETY STANDARDS IN  
EFFECT ON THE DATE OF  
MANUFACTURE SHOWN ABOVE.

VIN: 10RLA4B4XF5373271  
TYPE OF VEHICLE: LSV



Seat Belt Identification Label







Speed Test Instrumentation Readout





Speed Test Instrumentation



Speed Test Instrumentation Sensor





Vehicle on Scales



Inside Rear View Mirror





Left Rear View Mirror



Right Rear View Mirror





Headlight, Marker Light/Directional Signal



Tail Light/Brake Light/Directional Signal/Rear Reflector





Right Rear Side Reflector



Front Left Side Reflector





Rear Bumper Reflector



"B" Pillar Reflector



## **6.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

## INSTRUMENT CALIBRATION (12 MONTH MAXIMUM INTERVAL)

VEHICLE: 2015 EZGO 2 Five

NHTSA No.: C20151001

DATE: 11/11/15

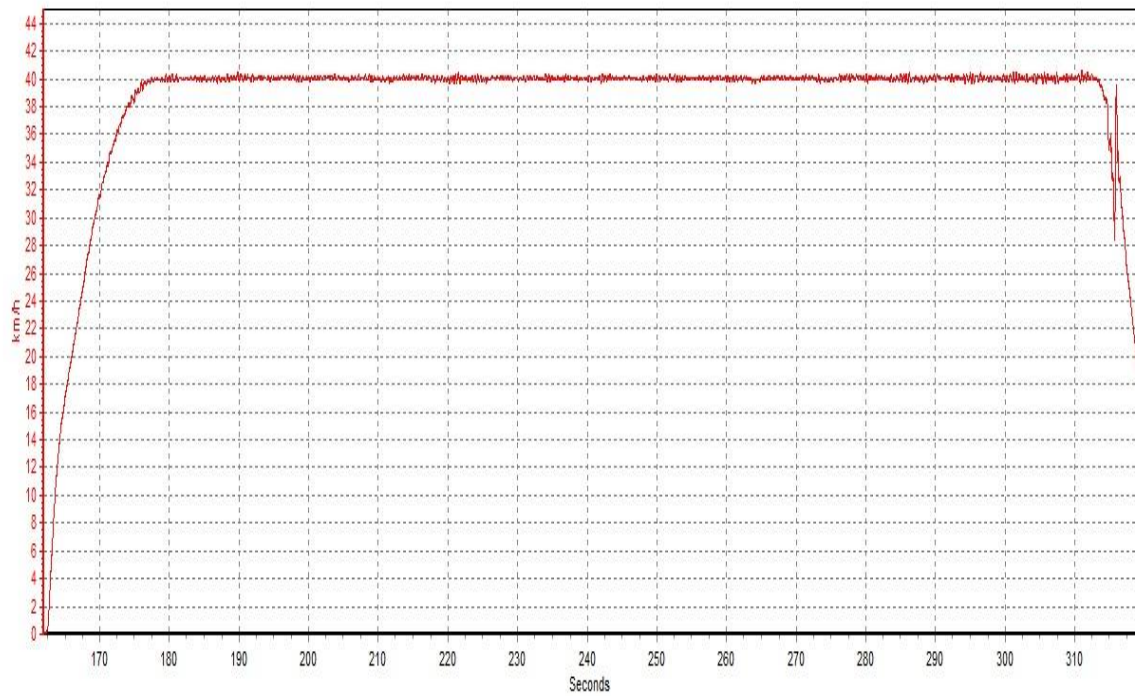
Instrument Use & Manufacturer	Model No.	Serial No.	Range & Resolution	Accuracy	Calibration Date	Next Calibration	Calibrations: Manufacturer, Internal or Contractor
Velocity - Racelogic, LTD	VBOX 3i 100 Hz	DAS-020969	0.1 - 1609 km/h 0.01 km/h	0.1 km/h full scale	1/28/15	1/28/16	Manufacturer
Distance - Racelogic , LTD	VBOX 3i 100 Hz	DAS-020969	Range: NA 1 cm	0.05%	1/28/15	1/28/16	Manufacturer
Voltage – Fluke Corporation	73 III Multimeter	DVM-84640252	0 – 320 VDC	± 0.3 % + 1 digit	4/7/15	4/7/16	Internal
Temperature – Davis Instruments	6152 Wireless Vantage Pro ISS	A070406D36D	-40 °C to 60 °C, 1 °C	± 1 °C, between -40 °C – 43 °C	2/4/15	2/4/16	Manufacturer
Wind Speed – Davis Instruments	6410 Anemometer w/790L “Large Wind Cups	070817N03	3 to 241 km/h 1 km/h	3 km/h or 5% whichever greater	2/4/15	2/4/16	Manufacturer
Tire Pressure – Tterice	Type 233.53 Fluid Filled, Bourdon Tube Pressure Gauge, Stainless S.	TRC SN: AG-139	0 – 689 kPa 3 kPa	1% of Span	6/1/15	12/1/15	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	8/18/15	11/18/15	Contractor

**APPENDIX A**  
**CONTRACTOR'S COMMENTS**  
**PROCEDURE MODIFICATIONS**  
**TEST FACILITY**

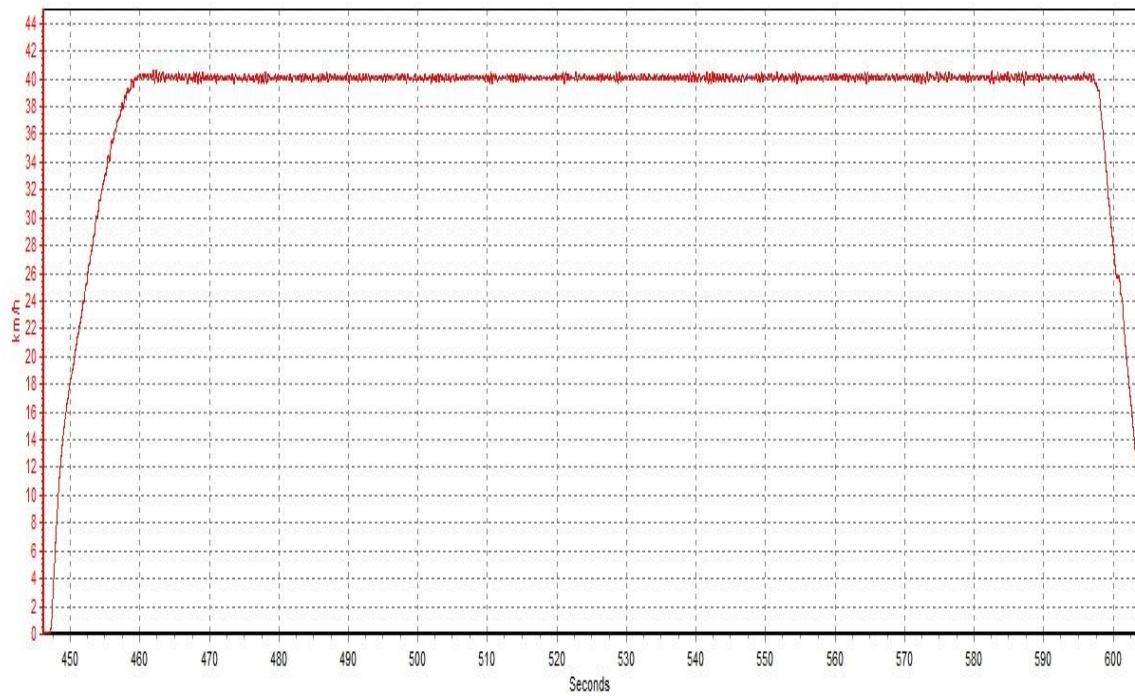
No additional comments.

**APPENDIX B**  
**TEST SPEED GRAPHS**

2015 EZGO 2 Five, Southbound, Run 1



2015 EZGO 2 Five, Northbound, Run 2



**APPENDIX C**  
**COPY OF MANUFACTURER'S STICKER**

None Supplied



**APPENDIX D**  
**PERTINENT OWNER'S MANUAL PAGES**

None