

REPORT NO. 500-TRC-09-002 – TRC20060110  
TIANJIN QINGYUAN ELECTRIC VEHICLE CO., LTD.  
NHTSA C91002 – 2009 MILES ZX40ST

FMVSS 500  
LOW SPEED VEHICLES  
2009 MILES ZX40ST, 2-DR. PICKUP BODY, LSV  
NHTSA C91002

TRANSPORTATION RESEARCH CENTER INC.  
East Liberty, Ohio 43319



AUGUST 2009  
FINAL REPORT

Prepared Under Contract No. DTNH22-06-C-00033

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 4<sup>th</sup> Floor  
OVSC (NVS-221)  
Washington, D.C. 20590

Prepared for the Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-06-C-00033.

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Prepared By

Approved By

Date:

Report Accepted By:

Contract Technical Manager, Office of  
Vehicle Safety Compliance

Date

## TECHNICAL REPORT STANDARD TITLE PAGE

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		6. Performing Organization Code  TRC 20060110/9502	
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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 July 17, 2009 to July 29, 2009	
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15. Supplementary Notes			
16. Abstract  Compliance tests were conducted on the subject 2009 Miles ZX40ST 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.			
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## **1.0 PURPOSE OF COMPLIANCE TEST**

Tests were conducted on a 2009 Miles ZX40ST, 2-dr. pickup body, LSV, manufactured by Tianjin Qingyuan Electric Vehicle Co., Ltd.; Peoples Republic of China and imported by North Central Zenn 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.

All stops were performed manually.

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

Skid Pad  
Speed Test

Average PFC during the test period was 0.92 (Skid Pad) utilizing the ASTM E1337 w/E1336 tire method.

The test vehicle met all the requirements of FMVSS 500.

## 2.0 FMVSS 500 – LSV INFORMATION AND TEST DATA SUMMARY

TEST LAB: TRC Inc.

CONTRACT No.: DTNH22-06-C-00033

NHTSA NO.: C91002

VIN: LECPCT22B29T000088

TEST START DATE: 07/17/09

TEST END DATE: 07/29/09

TEST START ODO.: 16 mi.

TEST END ODO.: 41 mi.

VEHICLE MAKE/MODEL/YEAR: Miles/ZX40ST/2009

PROPULSION TYPE: Battery Powered Electric Motor – RWD SEATING CAPACITY: 2

GVWR: 1361 kg GAWR FRONT: 645 kg GAWR REAR: 716 kg

DEALER INSTALLED ACCESSORIES: N/A

TIRE MAKE/MODEL/TYPE & SIZE: Goodride, H500, 165/70R13C, 88/86S, M+S,

Tubeless Radial.

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>41.1*</u> km/hr (more than 32 km/hr and not more than 40 km/hr)	X*	

Comments: \*Maximum speed was momentary with the average being approx. 40 km/hr.

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

#### VISUAL INSPECTION

VEHICLE MAKE/MODEL/YEAR: Miles/ZX40ST/2009

TEST/INSPECTION DATE: 07/20/09 VEHICLE ODO: 16 mi.

NHTSA No.: C91002

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

Method of Activation: Rotate two position switch on the end of a stalk at the left side of the steering wheel. Push stalk away from driver for High-beams.

Function (Yes/No): Yes.

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

Description (color and location): Front: Amber and immediately adjacent to the outside corner of the headlamps. Rear: Amber and toward the rear outer edges at approx. vehicle mid-height (outer lamp in a three lamp lateral array). Additionally, Sides: Amber and immediately forward of the cab doors at mid-height.

Method of Activation: Push up for right and pull down for left - stalk on left side of steering wheel. Additionally, depressing the Emergency Flasher button.

Function (Yes/No): Yes. Self cancelling feature (Yes/No): Yes.

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

Description (Lens color): Red.

Method of Activation: First and second position of the rotary switch on the stalk on the left side of steering wheel.

Function (Yes/No): Yes.

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

Description (Lens color): Red. Additionally, long thin (red) lamp near the top of the rear cab window, facing rearward.

Method of Activation: Application of the service brake.

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: Red, rectangular reflective lens, 28 mm X 48 mm. Rear: Red, rectangular reflective lens, 45 x 63 mm.

Location: Sides: Located at the extreme rear and at mid-height of the body.

Rear: At mid-body height and at the inner position of three lamp lateral array.

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

### VISUAL INSPECTION

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

Description (Flat or convex): Driver's side - Convex; Passenger's side – Convex;  
Interior: Flat.

Location: Interior mirror affixed to upper mid-point of the windshield. Exterior:  
Forward edge/corner of side windows.

Method for Adjustment: All mirrors adjusted by hand.

**Parking Brake:** [Requirement: Must be present.]

Description (Type): Spring loaded lever acting on rear service brake pads.

Location: Activation control between front seats.

Method of Activation and Release: Pull up/back on lever to activate and depress  
button on end of 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: CCC (within an oval), FY (within a diamond), E000137, FUYAO, //, D,  
AC52061000, Z, E4 (within a circle), DOT782M848AS1, 43R-000157, LAMINATED,  
I, 8., \*\*\*

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

Location: Right, bottom edge of windshield (on dash). 6.7 mm in height.

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

Type: Three point, Type 2 (by definition), Labeling: THIS BELT CONFORMS TO  
SAE J386 AND FEDERAL MOTOR VEHICLE SAFETY STANDARDS.

Labeling: Chongqing Guangda Industrial Co., Ltd., Date Mfg 032708, Pt. No.  
GD10A-05M.

Location: A sewn onto tag, at each (lap) belt's anchor point.

See Appendix E for manufacturer-supplied data.

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

Vehicle Type Identified on Label: LSV (Low-Speed Vehicle)

Location: Affixed to the edge of the driver's side door.

Certification Statement (Yes/No): Yes.

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

## **VISUAL INSPECTION**

Comments: None.

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

RECORDED BY: D. Bevis DATE: 08/18/09  
APPROVED BY: R. Landes DATE: 08/19/09

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

### VEHICLE LOADING

VEHICLE MAKE/MODEL/YEAR: Miles/ZX40ST/2009

TEST/INSPECTION DATE: 07/20/09 VEHICLE ODO: 17 mi.

NHTSA No.: C91002

Information from vehicle certification label"

GVWR: 1361 kg; 2998 lb, GAWR F: 645 kg; 1421 lb, GAWR R: 721 kg; 1577 lb  
Number of seat belt assemblies = designated seating capacity (DSC): 2

Vehicle weight measurements:

Unloaded Vehicle Weight: Vehicle 1158.5 kg or sum (front + rear) NA kg  
Front 533.3 kg, Rear 625.2 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 1294.5 kg or sum (front = rear) NA kg, Front 633.3 kg, Rear 661.2 kg

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

Source: ( ) label on vehicle, ( ) owner's manual, ( ) other: None specified.

Recommended location (if specified): NA

Source: ( ) label on vehicle, ( ) owner's manual, ( ) other: None specified.

Vehicle plus occupants, cargo and luggage weight = Vehicle 748.6 or sum (front + rear) NA kg, Front 379.6 kg, Rear 369.0 kg

Contact COTR if any vehicle weight (or sum of axle weights) exceeds GVWR or if a front or rear axle load exceeds a GAWR.

If no cargo and luggage weight or vehicle capacity weight is specified, then calculate the following:

Cargo and luggage weight = GVWR 1361 kg – vehicle plus occupants weight 1294.5 kg (from above) = 66.5 kg.

Comments: No cargo/luggage values specified by manufacturer.

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

RECORDED BY: D. Bevis

DATE: 07/20/09

APPROVED BY: R. Landes

DATE: 08/18/09

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

## VEHICLE LOADING

VEHICLE MAKE/MODEL/YEAR: Miles/ZX40ST/2009

TEST/INSPECTION DATE: 07/23/09 VEHICLE ODO: 21 mi.

NHTSA No.: C91002

Unloaded Vehicle Weight (UVW):

LF Wheel 268.8 kg RF Wheel 264.5 kg Front Axle 533.3 kg  
LR Wheel 314.4 kg RR Wheel 310.8 kg Rear Axle 625.2 kg

Weight of Driver, Instrumentation and Required Ballast: 80.7 kg (78 – 90 kg)

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

LF Wheel 307.6 kg RF Wheel 285.6 kg Front Axle 593.2 kg  
LR Wheel 336.6 kg RR Wheel 309.2 kg Rear Axle 645.8 kg  
Total Vehicle 1239.0 kg

Actual Tire Inflation Pressure: LF 375 kPa, RF 375 kPa, LR 375 kPa, RR 375 kPa

Maximum Tire Inflation Pressure from Tire Sidewall: Front 375 kPa, Rear 375 kPa

Vehicle Break-in Agenda Specified by Vehicle Manufacturer: (  ) Yes, (  ) 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]	999.6 South	1000.8 North

Vehicle Conditioning: Start Time 13:30 End Time 8:15 Duration 18.75 hr. (3 hr. min.)

Start Temp 20.5°C End Temp 18.3°C

Vehicle conditioned within 5°C of ambient: (  ) Yes, (  ) No

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

Comments: Vehicle Conditioning occurred during the p.m. of 07/23/09 through the a.m. of 07/24/09.

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

RECORDED BY: D. Bevis

DATE: 07/23/09

APPROVED BY: R. Landes

DATE: 08/19/09

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

## SPEED TEST

VEHICLE MAKE/MODEL/YEAR: Miles/ZX40ST/2009

TEST/INSPECTION DATE: 07/24/09 VEHICLE ODO: 31 mi.

NHTSA No.: C91003

Conditioning Temperature Range (see Data Sheet 3): 20.5 to 18.3 °C

Ambient Temperature: Pass 1 17.7°C, delta -0.6°C Pass 2 18.3°C, delta 0°C  
(delta = Conditioning Temperature minus Ambient Temperature)

Maximum Wind Speed: Pass 1 0.9 m/s Pass 2 0.4 m/s

Description of Vehicle Openings: All potential vehicle openings were closed.

Vehicle Odometer and/or Hour Meter reading: NA

Start Time: Pass 1 8:41 End Time: Pass 1 8:45  
Pass 2 8:49 Pass 2 8:52

\*Vehicle Charge Level Meter, % (if applicable): Start: Pass 1 99% End: Pass 1 95%  
Start: Pass 2 95% End: Pass 2 93%

Measured Battery Voltage, "V" (if applicable): Start: Pass 1 76.2V End: Pass 1 71.0V  
(Test laboratory measured with voltmeter) Start: Pass 2 71.0V End: Pass 2 73.4V

### 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 (1 <sup>st</sup> 1.6 km)	40.4 (south)	41.08*	4 min.
Pass #2 (2nd 1.6 km)	40.8 (north)	41.04*	

**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: Battery voltage was measured at the controller input, under the driver's seat.

\*See Appendix A.

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

RECORDED BY: D. Bevis

DATE: 07/24/09

APPROVED BY: R. Landes

DATE: 08/19/09

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

### SPEED TEST – Post Test

VEHICLE MAKE/MODEL/YEAR: Miles/ZX40ST/2009

TEST/INSPECTION DATE: 07/24/09

VEHICLE ODO: 33 mi.

NHTSA No.: C91002

#### 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]	999.5 South	1000.3 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]	112.00	112.51

Comments: None.

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

RECORDED BY: D. Bevis

DATE: 07/24/09

APPROVED BY: R. Landes

DATE: 08/19/09

#### **4.0 NOTICE OF NONCOMPLIANCE**

This vehicle (C91002) met the compliance standards.

## **5.0 PHOTOGRAHPS**



Left Front 3/4 View



2009 Miles ZX 40ST  
2-Dr. Pickup Body, LSV  
NHTSA No. C91002  
August 2009

2009 Miles ZX 40ST  
2-Dr. Pickup Body, LSV  
NHTSA No. C91002  
August 2009

MANUFACTURED BY: TIANJIN QINGYUAN ELECTRIC VEHICLE CO., LTD.



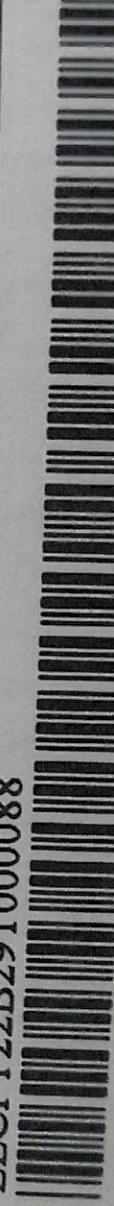
PEOPLES REPUBLIC OF CHINA

DATE OF MANUFACTURE: 05/2008

GVWR: 1361KG (2998LB)			COLD TIRE INFLATION PRESSURE	
	GAWR	TIRE	RIM	KPA/(PSI)
FRONT	645KG (1421LB)	165/70R13c	13x5.00B	262KPA (38PSI)
REAR	716KG (1577LB)	165/70R13c	13x5.00B	358KPA (52PSI)

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

VIN: LECPT22B29T000088



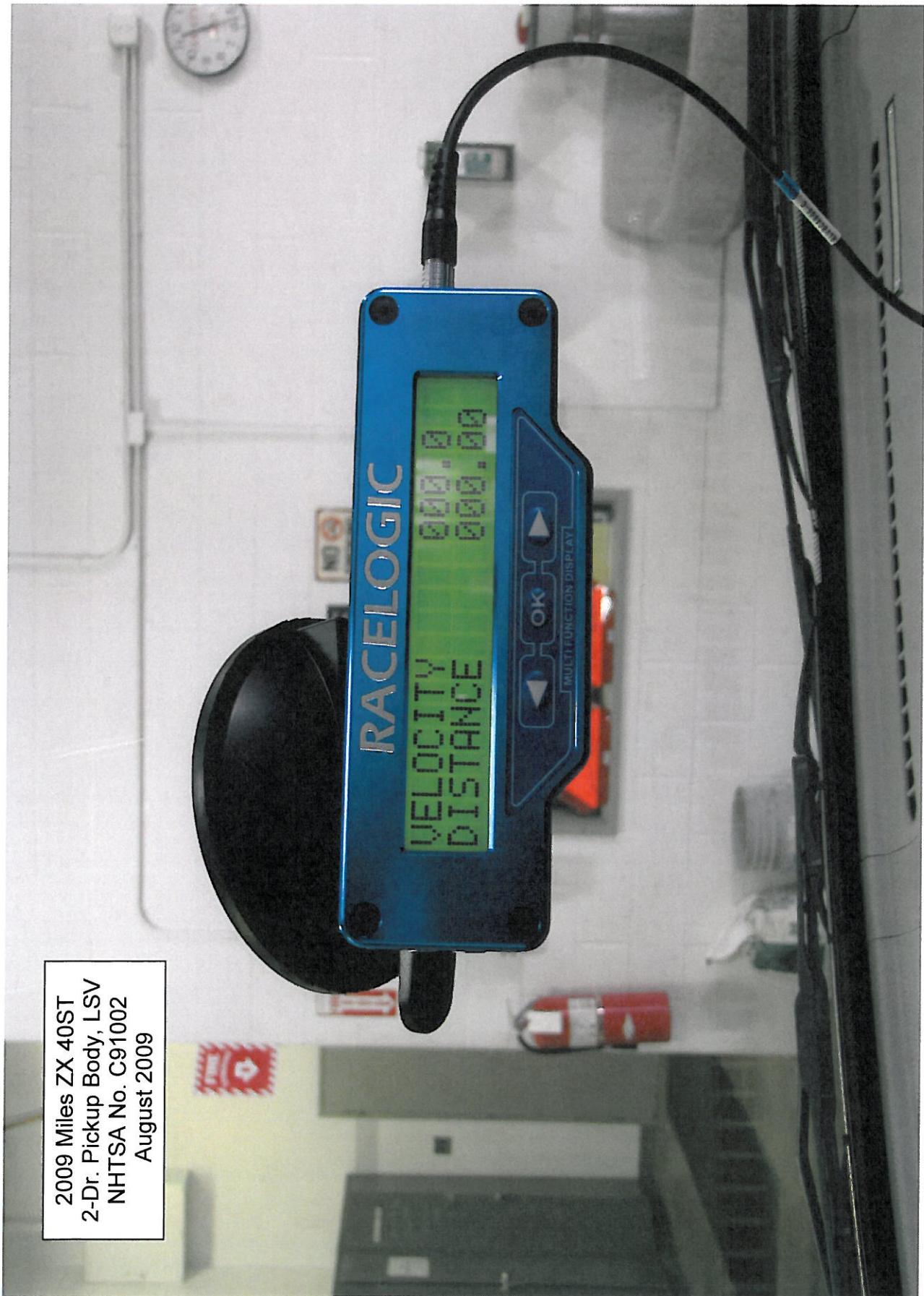
VEHICLE TYPE: LSV (LOW SPEED VEHICLE)

VIZ



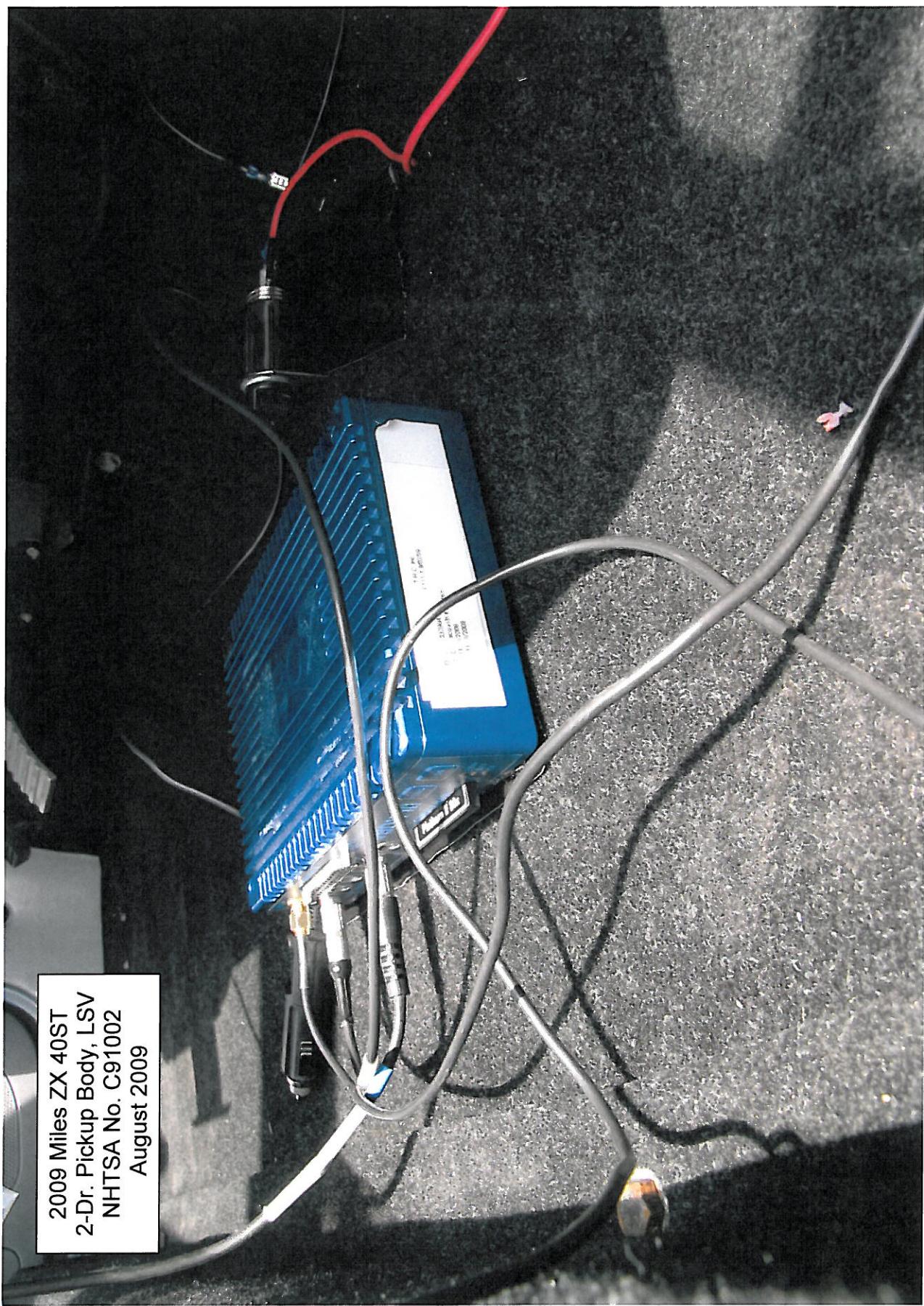
2009 Miles ZX 40ST  
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Instrumentation in Vehicle



2009 Miles ZX 40ST  
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Instrumentation in Vehicle



Instrumentation in Vehicle



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Instrumentation on Vehicle

# WARNING



## Committed to Your Safety:

The vehicle's maximum speed is 25 miles per hour and it may be a hazard on the roadways if it impedes traffic, for which the driver may be cited.

## Comprometido Con Su Seguridad:

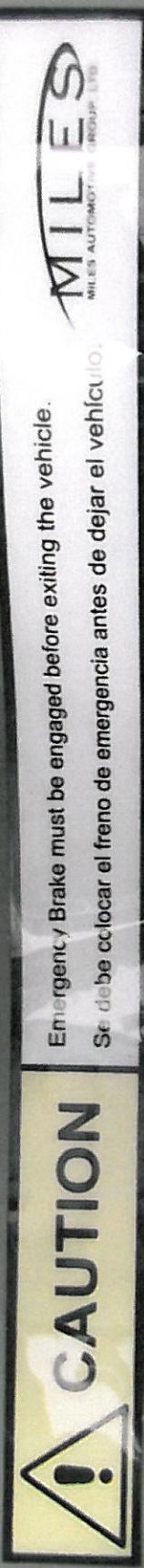
La velocidad máxima de este vehículo es 25 millas por hora y puede causar peligro en los caminos si obstruye el tráfico, motivo por el cual el conductor puede ser multado. Gasolina no requerida.



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Warning Label – Under Driver's Sun Visor

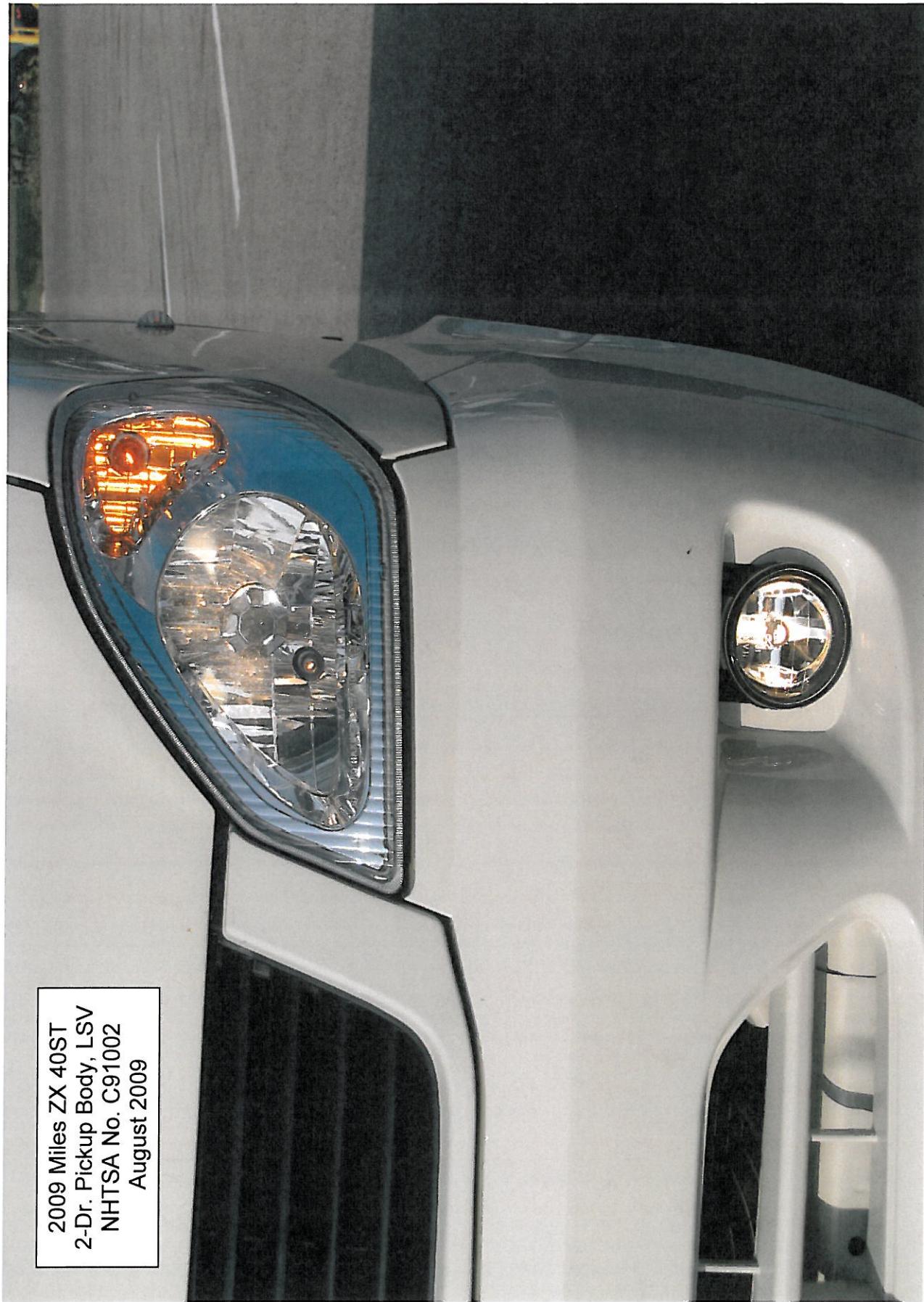
2009 Miles ZX 40ST  
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2009 Miles ZX 40ST  
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Vehicle Being Weighed



Front Parking Lamp, Headlamp, Turn Signal/Emergency Flasher Lamp and Fog Lamp [bottom] (typical)

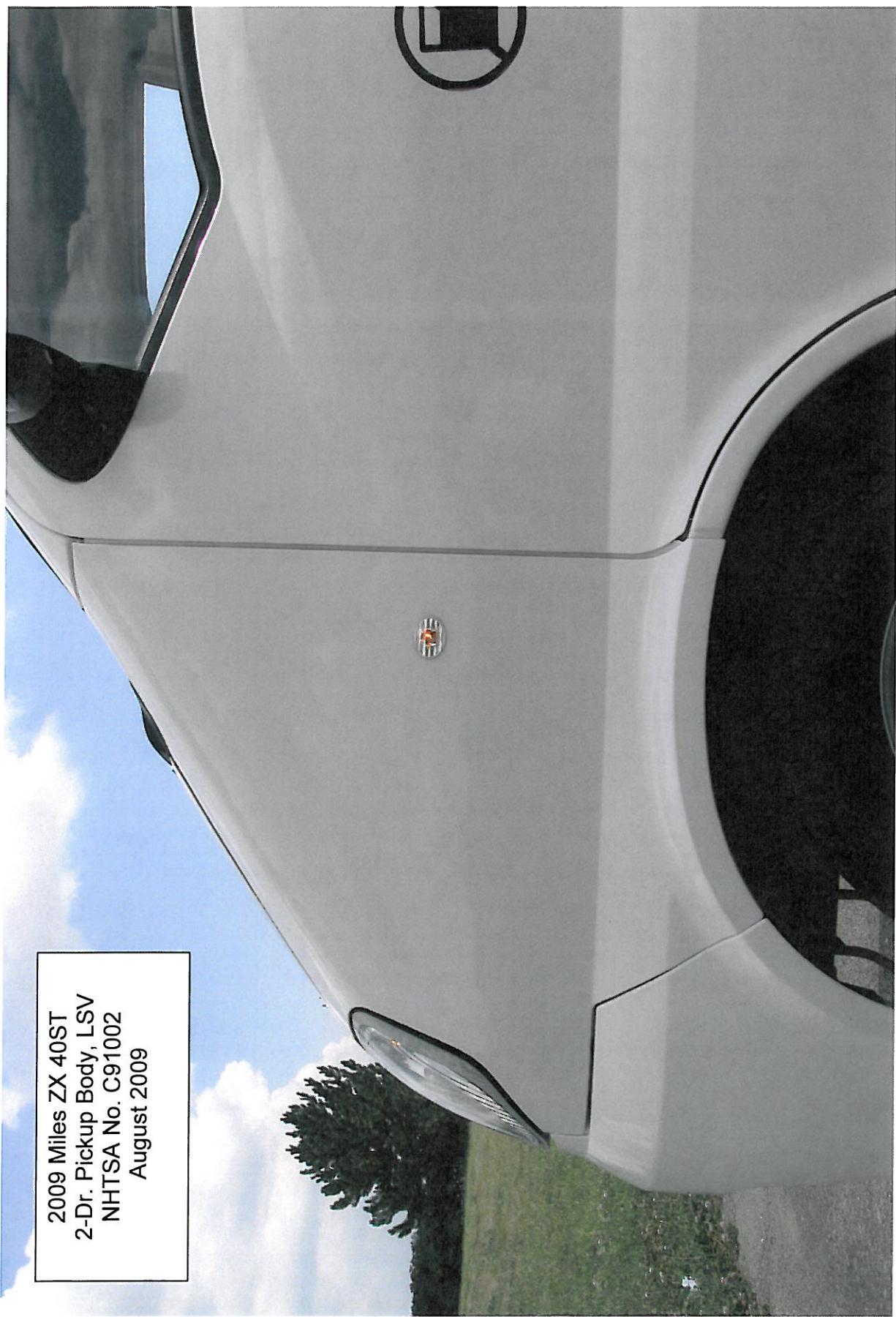


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Rear Turn Signal/Emergency Flasher Lamp, Running/Brake Lamp, Reflector and Backup Lamp (typical)

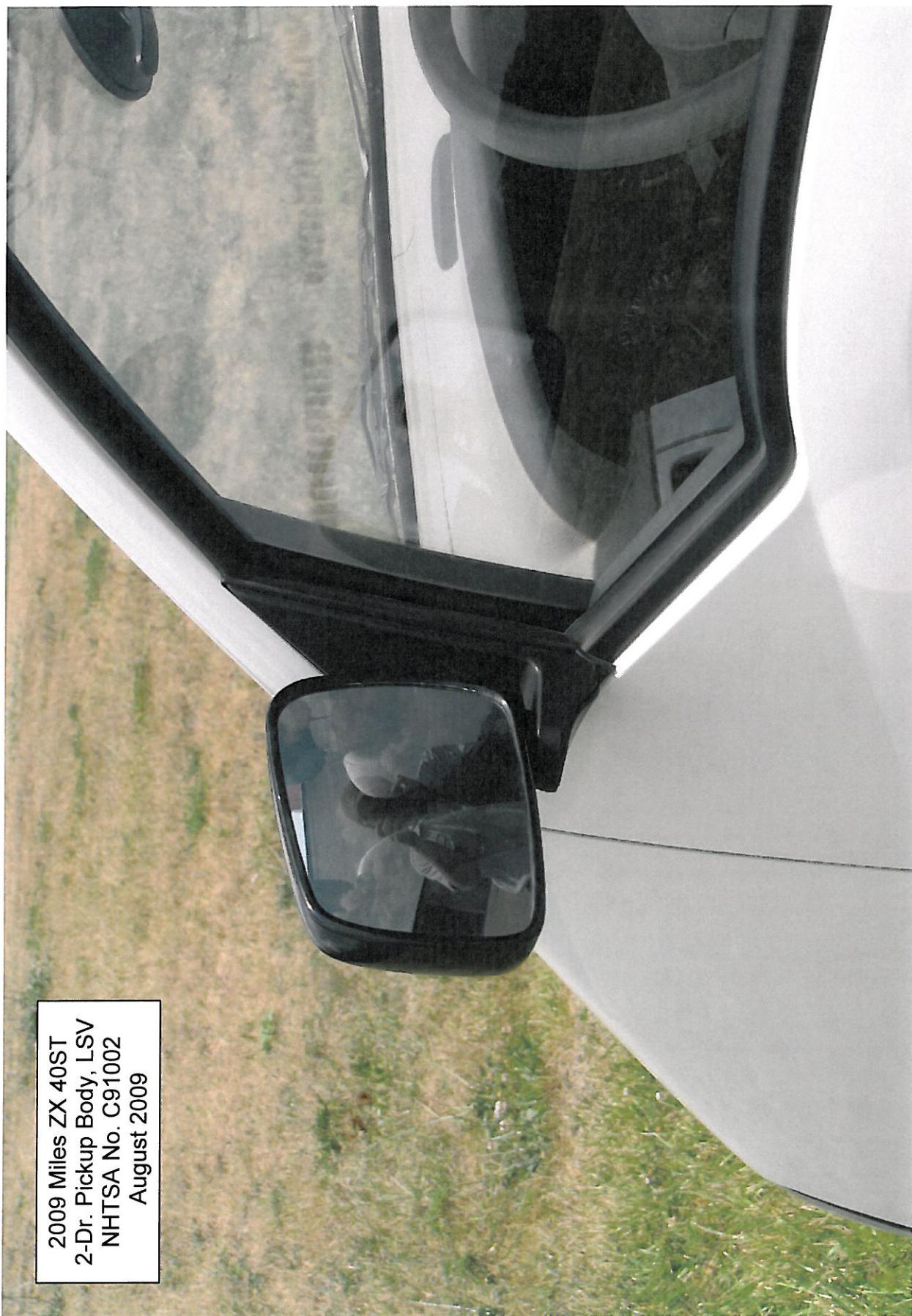


Rear Side Reflector (typical)



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Front Side Lamp (typical)



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Driver's (Left Side) Mirror



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Passenger's (Right Side) Mirror



Interior Mirror



Parking Brake Control

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FUYAO  
**E000137** // D AC52061000 Z  
DOT782MB48AS1  
**E4** 43R - 000157

LAMINATED L 8 • \*\*\*

2009 Miles ZX 40ST  
2-Dr. Pickup Body, LSV  
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Windshield VIN – Right-Lower Corner of Dash

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August 2009

CHONGQING GUANGDA  
INDUSTRIAL CO., LTD  
THIS BELT CONFORMS TO SAE J386  
AND FEDERAL MOTOR VEHICLE  
SAFETY STANDARDS

DATE MFG 032708  
MODEL NO.  
PT. NO.

GD10A-05M

Seat Belt Labeling (Driver's Side) – Conformance to FMVSS 209 (typical)

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

## INSTRUMENT CALIBRATION (12 MONTH MAXIMUM INTERVAL)

VEHICLE: Miles/ZX40ST/2009

NHTSA No.: C91002

DATE: 07/22/09

Instrument Use & Manufacturer	Model No.	Serial No.	Range & Resolution	Accuracy	Calibration Date	Next Calibration	Calibrations: Manufacturer, Internal or Contractor
Velocity - Racelogic , LTD	VBOX III 100 Hz	030904	0.1 - 1609 km/h 0.01 km/h	0.1 km/h full scale	11/18/08	11/08/09	Manufacturer
Distance - Racelogic , LTD	VBOX III 100 Hz	030904	Range: NA 1 cm	0.05%	11/08/08	11/08/09	Manufacturer
Voltage – Fluke Corporation	73 III Multimeter	DMV-84640252	0 – 320 VDC	± 0.3 % + 1 digit	03/03/09	09/03/09	Internal
Temperature – Davis Instruments	6152 Wireless Vantage Pro ISS	050608N02	-40 °C to 60 °C, 1 °C	± 1 °C, between -40 °C – 43 °C	07/13/08	07/13/09	Manufacturer
Wind Speed – Davis Instruments	6410 Anemometer w/7903L "Large Wind Cups	050608N22	3 to 241 km/h 1 km/h	3 km/h or 5% whichever greater	07/13/08	07/13/09	Manufacturer
Tire Pressure – WIKA Instrument Corporation	Type 233.53 Fluid Filled, Bourdon Tube Pressure Gauge, Stainless S.	TRC SN: AG-101	0 – 410 kPa 3 kPa	1% of Span	07/15/09	10/13/09	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	05/05/09	08/09/09	Contractor
Stopwatch	Radio Shack, Cat. No.: 63-5014	SW-ST04	24 hr., 0.01 sec.	0.1%	10/26/08	10/26/09	Internal

**APPENDIX A**

**CONTRACTOR'S COMMENTS**

**PROCEDURE MODIFICATIONS**

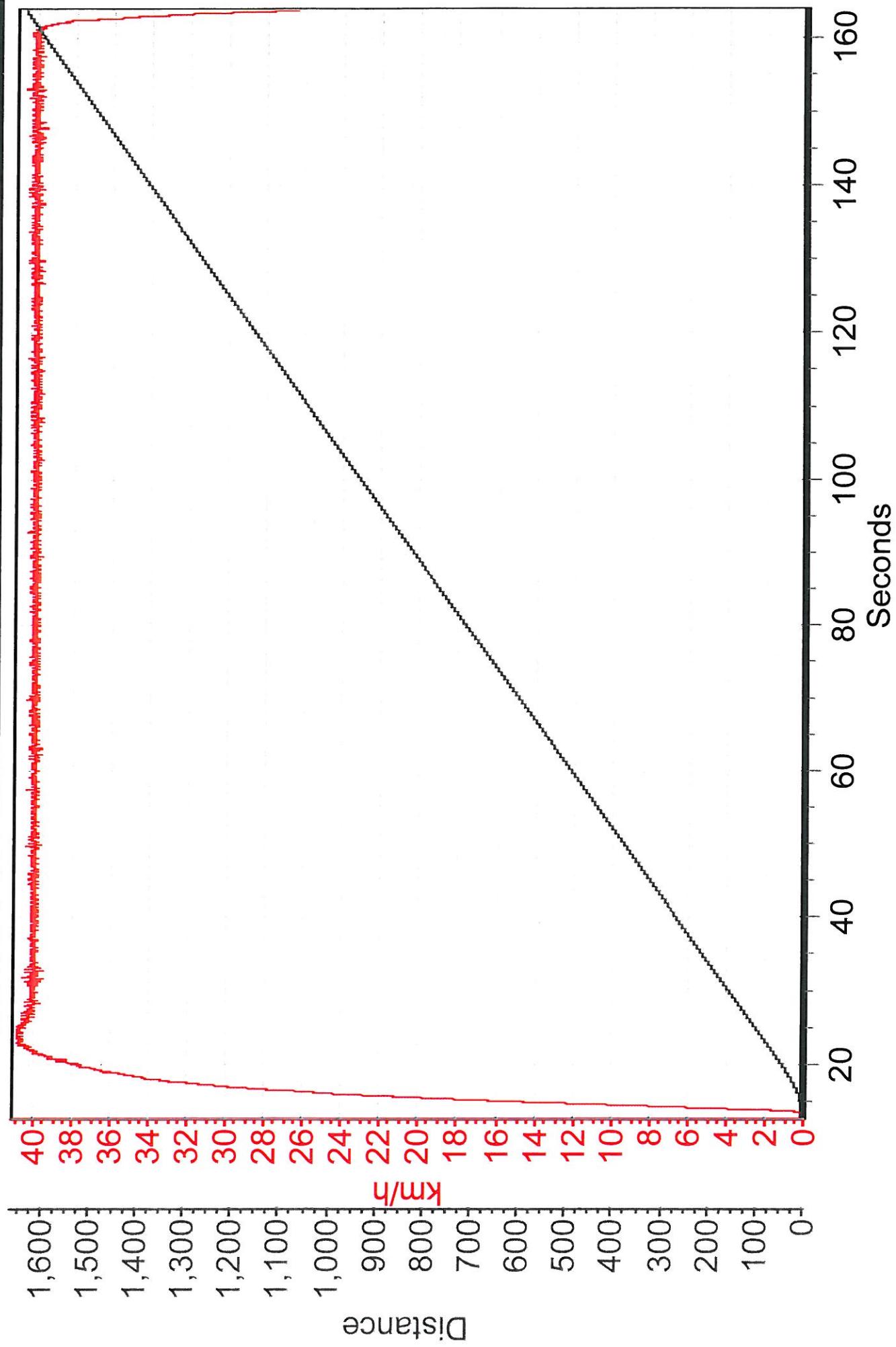
**TEST FACILITY**

During the two maximum speed tests, the vehicle accelerated up to the stated maximum speeds and remained there only momentarily. With the vehicle's throttle remaining in the maximum or "wide open throttle" position, the vehicle's electric controller very quickly reduced speed to the approximate 40 mph level and maintained this speed through the remainder of each test.

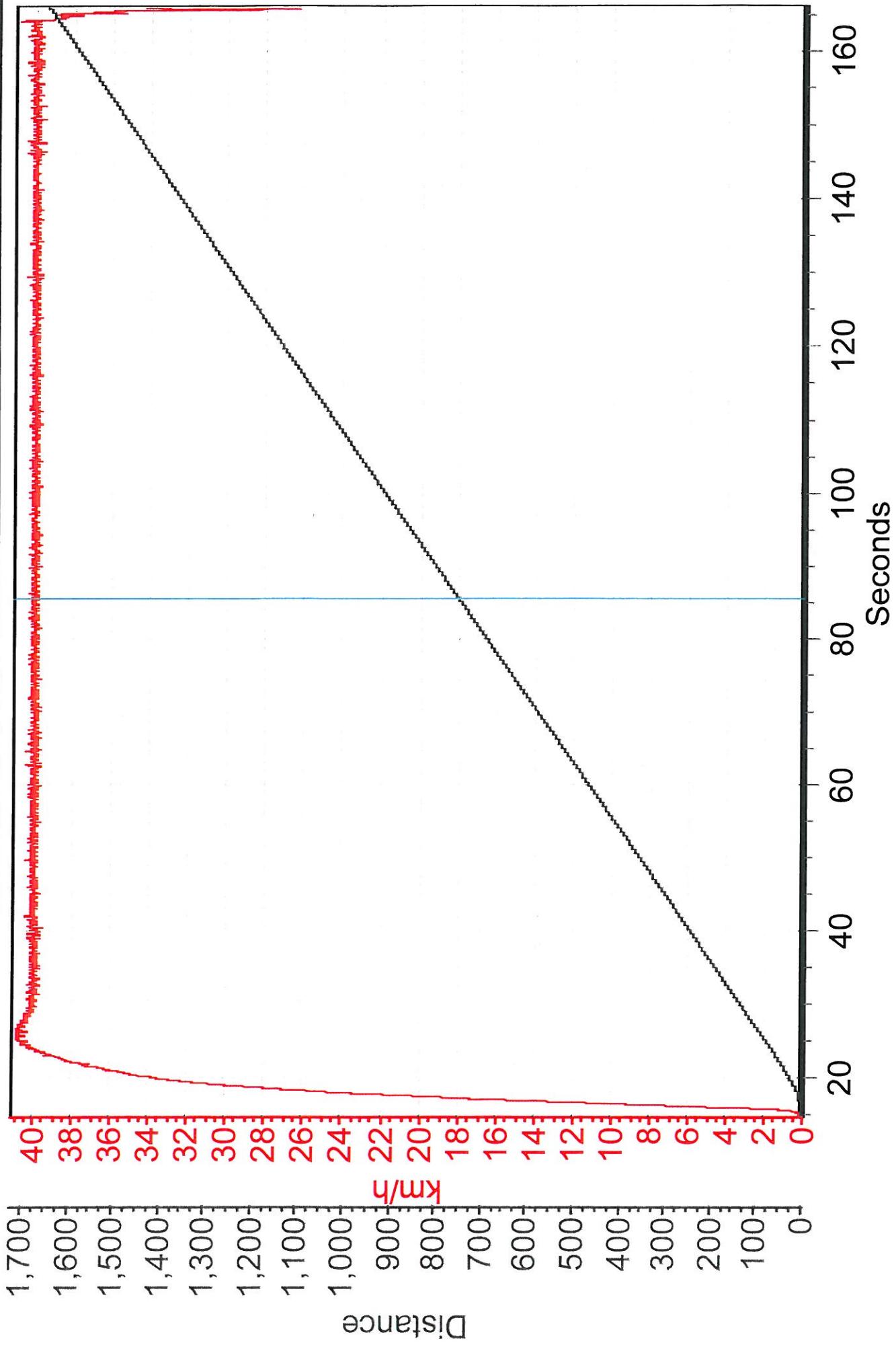
**APPENDIX B**

**TEST SPEED GRAPHS**

# 2009 Miles ZX 40ST LSV - Run #1 - South



# 2009 Miles ZX 40ST LSV - Run #2 - North



**APPENDIX C**

**COPY OF MANUFACTURER'S STICKER**



VIN#: LECPT22B29T000088

MODEL YEAR:

2009

MODEL:

ZX40ST

**PRICE INFORMATION**

MANUFACTURER'S SUGGESTED RETAIL PRICE OF  
MODEL: ZX40ST Two Passenger Vehicle

**BASE M.S.R.P.****\$19,900.00**

Exterior Color: WHITE  
 Interior Color: TAUPE  
 Interior Seats: 2  
 Motor: 7.46 kW rated 26.1 kW peak (10HP rated, 35HP peak)  
 3 Phase AC Induction Motor  
 Battery: 72V Sealed Absorbed Glass Mat, Valve  
 Regulated, Maintenance Free Lead Acid Pack  
 Transmission: Rear Wheel Drive

**STANDARD EQUIPMENT:**

Advanced Design AC Propulsion Power Train  
 Intelligent On Board Charger: 85V-265V  
 25 Foot Charger Power Cord  
 DOT Approved Auto Glass Throughout  
 Analog Instrument Panel Including Battery Gauge  
 Type II DOT Approved Seat Belt Assemblies  
 Rear Reflectors  
 Full Sized Spare Tire And Jack Assembly  
 Front Window Defroster  
 Front Intermittent Windshield Wipers  
 Forward/Neutral/Reverse Switch (Reverse with Intermittent Beep)  
 Parking Brake  
 Right and Left Directional Indicators  
 High Intensity Lights  
 Front Fog Lamps  
 Rear Lights, Brake Lights & Back Up Lights  
 Emergency Flashers  
 Three Position Dome Light  
 Adjustable Seats with Adjustable Back and Head Rest  
 Electric Heater  
 Manual Rear View Mirror and Interior Dome Light  
 Side Mirrors  
 Movable Tail Gate with Latches  
 Adjustable Side Cargo Bed Rails  
 Signage - "ALL ELECTRIC VEHICLE" "ZERO EMISSIONS"  
 Owner's Manual & 18 Month Warranty

**PRICE INFORMATION (CONT.)**

INSTALLED OPTIONAL EQUIPMENT:

**OPTIONAL EQUIPMENT TOTAL:**

INLAND FREIGHT &amp; HANDLING: \$895.00

**TOTAL PRICE: \$20,795.00****PARTS CONTENT INFORMATION**

THIS VEHICLE HAS

US/PARTS CONTENT: 23%

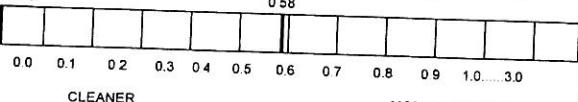
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY,  
DISTRIBUTION, OR OTHER NON-PARTS COST

FINAL ASSEMBLY POINT: TIANJIN, China

PORT OF ENTRY: LONG BEACH, CA

**Smog Index:**

The Smog Index (SI) indicates the relative level of smog-forming pollutants emitted by the vehicle. The lower the SI, the lower the vehicle's emissions.

The Smog Index of this vehicle is  
0.00The Smog Index of the average new vehicle is  
0.58

THIS LABEL IS ADDED TO THE VEHICLE TO COMPLY WITH FEDERAL LAW.  
 THIS 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

**SHIP TO:**  
 North Central Zenn  
 20 S. Main Street  
 New London, OH 44851

**SOLD TO:**  
 North Central Zenn  
 308 Union St.  
 Ashland, OH 44805

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

### Miles Electric Vehicle Operation

Put key in ignition. Make sure emergency brake is fully engaged. Turn key to right to ON position. Check to see if vehicle is in forward gear---F/R switch which places car in gear is located on the dash just to the right of the steering wheel (center console on truck) should be pushed to F position. To place vehicle in reverse, push switch to R, and you will hear an audible beeping sound. Lower emergency brake all the way. Step on the brake to activate the creep function (note the vehicle will not move in forward or reverse until you step on the brake after turning on the vehicle). The car can now be driven. After loading vehicle, engage emergency brake, turn ignition off and place key in glove box. Tie down vehicle with soft straps and secure for transport.

**Use soft straps ONLY! No chains or cables.**

### Immediately after receiving your new vehicle:

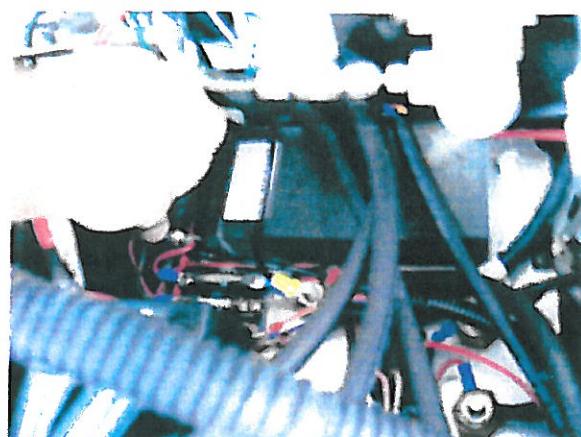
- Please reconnect the plug shown in the picture below.  
This plug is located under the passenger seat (truck) or under the hood (car).
- This plug was disconnected during storage and shipment of your vehicle to keep the batteries from getting low.

NOTE: This plug supplies power to the DC to DC converter which constantly charges the aux battery.

**Warning:** Do not use pliers or any metal tool to hold or pry the plug!



TRUCK (Under passenger seat)



pre2009 CAR (Under hood)



## ZX40ST - OWNER'S MANUAL

### INTRODUCTION

Congratulations on your purchase of a Miles ZX40ST. The Miles Automotive Group, Ltd. is committed to producing a new world of all electric pollution-free vehicles. As with any vehicle, your Miles ZX40ST will require periodic maintenance and care. This Owner's Manual details the maintenance and service program which should be strictly followed.

Your Miles ZX40ST has been manufactured to the Company's stringent specifications at our state of the art contract factory in Tianjin, China. The power train system uses six 12 volt advanced, sealed, absorbed glass mat, valve regulated, maintenance free lead-acid batteries to power its U.S. made brushless, 3 phase, alternate current, induction motor. Under normal driving condition, the truck will have a range of about 35-45 miles.

As an electric vehicle, the Miles ZX40ST differs from a conventional vehicle and this manual should be read carefully before operating. Particular attention should be paid to sections dealing with the care, maintenance, usage and charging of the battery system.

**WARNING:** The Miles ZX40ST has a maximum speed of 25 mph. It should never be operated on a street or highway with a posted speed limit in excess of 35mph. Never attempt to operate the ZX40ST on an interstate highway! **Note:** Some states limit use of Low Speed Vehicles to public roads with posted speed limits of less than 35 mph, or may not have passed Low Speed Vehicle legislation. Always check state and local regulations with your DMV as operation on public roads may be restricted in some locations.

The ZX40ST has been manufactured to conform to U.S. Department of Transportation FMVSS 500 which governs low-speed vehicles. Your vehicle is covered by an 18 months warranty which accompanies this Owner's Manual.

The U.S. manufactured controller has been programmed to regulate numerous functions and should not be tampered with in an attempt to increase motor RPMs or speed.

**WARNING:** Tampering with the controller may void your vehicle warranty.

This vehicle should only be operated and maintained by a licensed operator. Children should never be allowed to operate or service the Miles ZX40ST.

**NOTE:** Normal initial and regular maintenance is not covered by your warranty.

**NOTE:** Please reference the warranty information contained in the accompanying certificate entitled "INFORMATION ABOUT YOUR NEW MILES ZX40ST - MAINTENANCE, SERVICE AND WARRANTIES" for details about maintenance and warranty service for your vehicle.

## Battery Charging Procedure

The Battery Discharge Indicator (BDI) is displayed on the instrument panel as a gauge with readings displayed from 0 to 100. (See "Instrument Panel" on page 11). When the truck is fully charged, the needle will register at 100. At 50% state of charge (SOC), the needle will register at 50. You should never allow the batteries to be discharged to a level which is more than 80% discharge or where 20% is displayed on the BDI.

If the batteries have been discharged by approximately 80%, total time to recharge will be from 8 - 11 hours.

**NOTE:** When you initially receive your vehicle the traction batteries are not broken in and your maximum range may be limited to 10-20 miles depending on the type of terrain, weight including passengers, cargo and temperature. Your range will increase gradually as you "cycle the batteries." After you have performed 20 to 30 deep cycles, your range should increase to 35-45 miles if the vehicle is fully charged. A deep discharge cycle occurs when you begin driving the vehicle with a full SOC (99) and ends when the SOC approaches a reading of 20. A deep discharge is generally considered to be approximately 80% depth of discharge of the batteries.

**NOTE:** Cold weather will lengthen the total time required to recharge the battery pack.

**WARNING:** Never put two hands on a high voltage area. This will complete a circuit and can cause an electric shock leading to serious injury or death.

**WARNING:** You should never let the traction batteries drain to more than an 80% state of discharge. 80% of discharge is reached when the number 20 is displayed on the battery discharge indicator.

**WARNING:** The universal charger has an operating input range of from 85V-265V. The plug which is attached to the charging cord will work in any standard 110V electrical outlet.

**Note:** The batteries should be recharged after each trip, and should never be allowed to become fully discharged. Recharging should take place within 24 hours of each use. For best results recharge before the batteries are 80% discharged. The recharging should take place before the Battery Discharge Indicator gauge displays a reading of 20.

The ZX40ST is shipped with an on-board battery charger. It is located under the seat area. The charger is wired into the vehicle, and should not be removed. No other chargers should be used.

**WARNING:** Do not open the cover of the charger or take it apart.

**WARNING:** Do not wash the car while recharging the batteries. Also, the hood should remain closed during the charging process.

Always charge the ZX40ST in a well ventilated area.

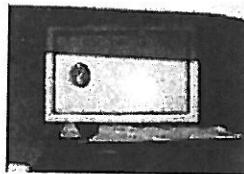
Park the vehicle near an electrical outlet. Place the ignition in the "LOCK" position and set the parking brake.

The charging port is located on the truck chassis to the rear of the passenger side door.

CHARGING PORT - OPEN



CHARGING PORT - LOCKED



Using the key provided with the vehicle, unlock and open the charging port door.

The charger should not be plugged into the wall outlet at this time. First plug the charging cord into the vehicle charging port.

**WARNING:** Make sure the electrical cord is not sitting in water before connecting to the wall power source.

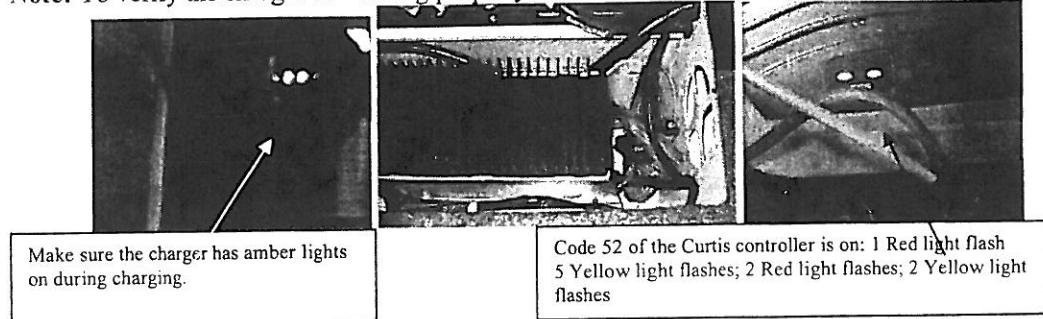
Insert the plug into a grounded 110 Volt electrical outlet.

The charging plug icon will light up on the instrument panel. The charger status is shown on the Battery Discharge Indicator and when the gauge needle rests on 20 there is a 20% state of charge. When the gauge needle rests on 100, the batteries are fully charged.

In rare instances a power surge or over heating may cause the charger to stop and the icon on the instrument panel to go out. Should this happen, you can determine the state of charge by first disconnecting the charger from the wall outlet, and then turning the vehicle on and checking the reading of the battery charge indicator.

To disconnect the charger, first unplug from the wall. Then, remove the plug from the vehicle's charging port.

**Note:** To verify the charger is working properly:



**Note:** Disconnecting the charger and ending the charging process before the batteries have reached their full charge will not damage the batteries.

To disconnect the charger, first remove the plug from the wall power source and then remove the charging cord from the charging cord outlet.

After disconnecting the power cord you may check the power charge level by turning on the car and viewing the battery charge level gauge on the instrument panel.

As noted, it is recommended that you recharge before 80% state of discharge (2 bars remaining on battery charge indicator or SOC display reads 20%). If you recharge to 80% of full charge, the time of charge will be substantially less than if you elect to go to full charge. From 20% of charge (80% of discharge) to full charge will take from 6 to 8 hours.

**If you purchased your truck with the capability to be charged using 220V current, your car came equipped with a power cord which has a 220 Volt 15 amp rated plug. You must have a 220 Volt power source (wall outlet) in order to charge your vehicle.**

**WARNING: Make sure charging port door is closed and locked before operating vehicle. The vehicle drive train cannot be engaged unless the charge port door is closed and locked.**

### **Reporting Safety Defects**

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Miles Automotive Group, Ltd.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Miles Automotive Group.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 202-366-0123 in Washington, DC area) or write to: NHTSA, U.S. Department of Transportation, Washington, DC 20590. You can also obtain other information about motor vehicle safety from the Hotline.

## Driving

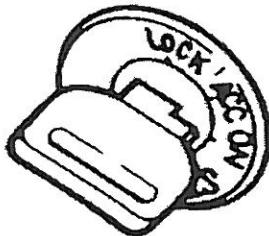
**WARNING:** This vehicle should only be operated and maintained by a licensed operator. Children should never be allowed to operate or service the Miles ZX40ST. This vehicle has a maximum speed of approx. 25 MPH. It should never be operated on a street or highway with a posted speed limit in excess of 35 MPH. Never attempt to operate the ZX40ST on an Interstate highway! **Note:** Some states limit use of Low Speed Vehicles to public roads with posted speed limits of less than 35 mph, or may not have passed Low Speed Vehicle legislation. Always check state and local regulations with your DMV as operation on public roads may be restricted in some locations.

Basic precautions should be taken when driving the vehicle. Do not drive through water that is higher than the bottom of the wheel rims. Reduce vehicle speed if driving through cross-winds or on uneven road surfaces. Proper driving and maintenance will keep the vehicle in good condition and conserve battery power, while prolonging the life of the vehicle.

The maximum range of the ZX40ST is about 35-45 miles. However, the actual range depends on many factors, including vehicle speed, rate of acceleration, adequate tire pressure, load and traffic conditions. The operating range may also be reduced in cold weather.

## **Starting the vehicle**

There are three positions on the ignition switch. The key can only be inserted and removed in the "LOCK" position. Turning the key clockwise to the "ACC" (accessory) position will provide power for interior accessories, such as the dome light and horn.



Turning the key to the "ON" position will initiate activation of the electric drive system and instrument cluster. The key should remain in the "ON" position until you wish to shut the vehicle off. Turn the key counterclockwise to the "LOCK" position to turn the vehicle off.

**NOTE:** The drive system of the vehicle cannot be activated until the key has been turned to the ON position and you have stepped on the brake pedal to activate the creep function.

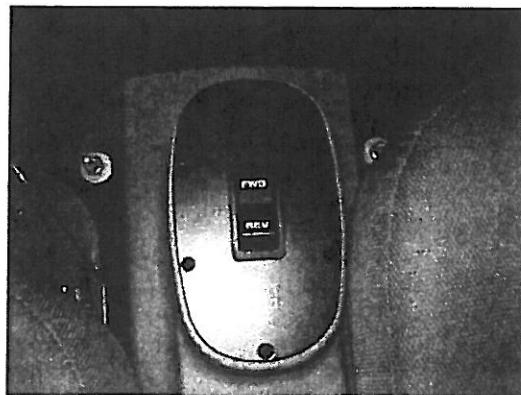
**WARNING:** If the vehicle is on a slope, it may roll forward or backwards regardless of the key position. Always set the parking brake when parking your vehicle. Keep your foot on the brake pedal when starting the vehicle or when at a stop.

## **Reverse/Neutral/Forward Shift**

The ZX40ST only has two driving modes; forward and reverse. Shown below is the reverse/neutral/forward switch, which is located to the right of the steering wheel.

**WARNING:** The hand brake should not be released when starting the vehicle until you are ready to accelerate.

**WARNING:** Make certain that the Reverse/Neutral/Forward shift is in the proper position before accelerating.



### **Reverse/Neutral/Forward Switch**

To engage the forward gear, place your foot on the brake pedal and press “FWD” on the switch mounted on the center console. The letter “F” will be displayed at the top of the instrument panel.

To place the car in Neutral, press the switch until it moves to the center position – there is no label for Neutral on the switch or the instrument panel.

To engage the reverse gear, place your foot on the brake pedal and when the vehicle stops, press “REV” on the switch mounted on the center console. The letter “R” will be displayed at the top of the instrument panel.

**WARNING:** Never switch into reverse gear when the vehicle is moving.

## **Steering**

The ZX40ST does not have power-assisted steering. Therefore, the steering will require somewhat more effort than a vehicle with power assist.

## **Braking**

The brake pedal is used to slow or stop the vehicle. The ZX40ST is equipped with front disc and rear drum brakes. The ZX40ST is equipped with an electric vacuum pump to provide assistance to the brake booster during braking. The brake pedal is the wide pedal located in the center of the floorboard, to the left of the accelerator pedal. The effort required and stopping distance will be similar to a normal vehicle. The vehicle does not have an anti-lock braking system (ABS).

## **Limp Home Mode**

In order to prevent the over discharge of the batteries which will shorten the number of life cycles, your ZX40ST is equipped with a Limp Home Mode. When the batteries reach 80% state of discharge (BDI gauge registers 20%), the motor controller will automatically reduce the maximum speed to 15 mph. You should immediately recharge the vehicle when the ZX40ST is in the limp home mode as soon as possible.

### Accelerator

The accelerator pedal is used to accelerate and maintain the speed of the vehicle. The accelerator is the narrow pedal located to the right of the brake pedal. Accelerate slowly to extend battery life and driving range. Do not step on the accelerator pedal until after the key has been turned to the "ON" position.

### Parking

**IMPORTANT:** There is no "PARK" function in the transmission. Therefore the parking brake must be used every time the vehicle is to be parked. Setting the parking brake is the only way to prevent the vehicle from rolling and it must be set whenever the vehicle is left unattended. Bring the vehicle to a stop using the brake pedal. Then, pull up firmly on the parking brake hand grip, as shown in the figure below.

**NOTE:** As a safety precaution, your ZX40ST is equipped with a warning buzzer which will sound if the key is removed from the ignition before the emergency brake is engaged.



The parking brake locks in the 'ON' position when the brake lever is pulled up and back. It locks with a ratcheting system. **Operation:** Pull the hand grip lever back all the way until the tension is tightened in order to engage the brake.

To release the parking brake, push in the handgrip lock button while pulling up slightly, as shown in the figure above. Release it all the way down. The parking brake lever should always be completely down when driving the vehicle.

The warning light, pictured at right, will illuminate in red on the instrument panel to remind you that the parking brake is on. Do not attempt to drive the vehicle if this light is illuminated.



**APPENDIX E**

**MANUFACTURER SUPPLIED FMVSS 209  
SEAT BELT DATA**

SAFETY COMPLIANCE TESTING FOR FMVSS 209  
SEAT BELT ASSEMBLIES  
Front Seat Belt Assemblies

Report No. 209-NPCQSIC-2006-012

Seat Belt Assembly Part No. GD10A-28M  
Chongqing Guangda Industrial Co.,Ltd  
FOR  
TIANJIN QINGYUAN ELECTRIC VEHICLE CO., LTD.  
C8 BUILDING, 4TH AVENUE NO. 80  
TEDA, TIANJIN, CHINA 300457  
AND  
MILES AUTOMOTIVE GROUP  
24955 PACIFIC COAST HIGHWAY B201  
MALIBU, CA 90265

FOR USE ON  
2006MYMiles ZX40, ZX40S, OR70 ALL-ELECTRIC VEHICLES

TESTED BY

NATIONAL PASSENGER CAR QUALITY SUPERVISION  
AND INSPECTION CENTER (NPCQSIC)  
Tianshan Lukou, Chenglinzhuang Road, Hedong District  
Tianjin, 300162, China

30 OCTOBER 2006

APPROVED BY: \_\_\_\_\_

DATE: \_\_\_\_\_ 30 OCTOBER 2006

### Documentation Page

1. Report No. <b>209-NPCQSIC-2006-012</b>		3. Report date <b>28 OCTOBER 2006</b>
2. Title and Subtitle <b>FINAL REPORT of FMVSS 209 compliance testing of Guangda Type2 seat belt assemblies being installed in the front seat of the Miles ZX40,ZX40S and OR70, Part No. GD10A-28M</b>		4. Performing organization Code <b>NPCQSIC</b>
5. Author  水 雄 , Test Engineer <u>Yuki Mizushima</u>  袁 健 , Senior Test Engineer <u>Yuan Jian</u>		6. Performing Organization Report No. <b>209-NPCQSIC-2006-012</b>
7. Performing Organization Name And Address: <b>NATIONAL PASSENGER CAR QUALITY SUPERVISION AND INSPECTION CENTER TianshanLukou,Chenglinzhuangdao. Hedong District ,Tianjin,300162,China</b>		8. Sponsoring Agency Name And Address <b>TIANJIN QINGYUAN ELECTRIC VEHICLE CO., LTD. C8 BUILDING, 4TH AVENUE NO. 80 TEDA, TIANJIN, CHINA 300457</b>
9. Type of Report <b>Final Test Report 30 October,2006</b>		10. Sponsoring Agency Code <b>TQEVI/MILES</b>
11. Abstract <b>Compliance tests were conducted on Guangda Type 2 seat belt assemblies being installed in Miles ZX40, ZX40S and OR70. All tests were conducted in accordance with the requirements of FMVSS 209 – Seat Belt Assemblies. Test failures identified were as follows:</b>		
12. No. of pages <b>None</b>		
13. <b>34</b>		

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**Section 1**  
**Purpose of Compliance Test**

## **PURPOSE OF COMPLIANCE TEST**

The purpose of the test was to demonstrate that the production seat belt assemblies supplied by Chongqing Guangda Industrial Co., Ltd meet the requirements of Federal Motor Vehicle Safety Standard Number 209 entitled "Seat Belt Assemblies."

NATIONAL PASSENGER CAR QUALITY SUPERVISION AND INSPECTION CENTER performed testing to FMVSS 209 under laboratory conditions. These tests do not measure and are not intended to measure all possible applications or installations of the seat belt assembly or components.

NATIONAL PASSENGER CAR QUALITY SUPERVISION AND INSPECTION CENTER is not responsible for actual performance of any seat belt assembly, seat belt retractor, or individual seat belt component as installed in any vehicle.

**Section 2**

**Compliance Date Summary**

DATA SHEET

SUMMARY OF RESULTS

RETRACTOR TYPE:       -ALR; ✓ -ELR; GROUP NO: 012  
ELR RETRACTOR SENSITIVITY:       -WSI;       - VSI; ✓ - VWSI  
BELT DATE MARKINGS: 71806  
BELT ASSY. MFR.: Chongqing Guangda Industrial Co.,Ltd  
BELT ASSY.PART NO. : GD10A-28M  
SELLER/VEHICLE MFR.: Miles Automotive Group  
LABELING/MARKING REQUIREMENTS: P  
SUMMARY OF RESULTS: (P=Passed,F=Failed,N/A=Not Applicable)  
REMARKS:

**DATA SHEET**  
**(Continued)**

NO.	Test Title	SPECIMEN NUMBER	A	A	A
		SPECIMEN NO.	1	2	3
01	Webbing Width	Pelvic Tape <u>2</u>	p	p	p
		Upper Torso	N/A	N/A	N/A
02	Webbing Elongation	Pelvic Tape <u>2</u>	p	p	p
		Upper Torso	N/A	N/A	N/A
03	Webbing Braking Strength	Pelvic Tape <u>2</u>	P	P	P
		Upper Torso	N/A	N/A	N/A
04	Resistance to Light	Pelvic Tape <u>2</u>	P	P	P
		Upper Torso	N/A	N/A	N/A
05	Resistance to Micro-Organism	Pelvic Tape <u>2</u>	N/A	N/A	N/A
		Upper Torso	N/A	N/A	N/A
06	Webbing Braking Strength	Pelvic Tape <u>2</u>	P	P	P
		Upper Torso	N/A	N/A	N/A

REMARKS:

RECORDED BY: 张燐  
APPROVED BY: 高继东

DATE: 28 OCTOBER 2006  
DATE: 28 OCTOBER 2006

**DATA SHEET**  
**(Continued)**

NO.	Test Title	SPECIMEN NUMBER	B	B	B
		SPECIMEN NO.	4	5	6
01	Web Braking Strength After Resistance to Abrasion	Pelvic Tape 2 Upper Torso	P N/A	P N/A	P N/A

REMARKS:

RECORDED BY: 张 麋  
APPROVED BY: 高继东

DATE: 28 OCTOBER 2006  
DATE: 28 OCTOBER 2006

**DATA SHEET**  
**(Continued)**

No.	TEST TITLE	GROUP NUMBER	C	C	C
		SPECIMEN NO.	7	8	9
01	Hardware Corrosion Resistance	P	P	P	
02	Hardware Temperature Resistance	P	P	P	
03	Hardware Buckle Latch	P	P	P	
04	Loop Load	Pelvic Type 2 Upper Torso	P P	P P	P P
05	Elongation	Pelvic Type 2 Upper Torso	P P	P P	P P
06	Buckle Release Force	Pelvic Type 2	P	P	P
07	Common Hardware Load	Upper Torso	P	P	P
08	Cut Webbing Strength	Pelvic Type 2 Upper Torso	N/A N/A	N/A N/A	N/A N/A
09	Retractor Load	Pelvic Type 2 Upper Torso	p P	p P	p P

REMARKS:

RECORDED BY: 张 魏  
 APPROVED BY: 高继东

DATE: 28 OCTOBER 2006  
 DATE: 28 OCTOBER 2006

SAFETY COMPLIANCE TESTING FOR FMVSS 209  
SEAT BELT ASSEMBLIES  
Rear Seat Belt Assemblies

Report No. 209-NPCQSIC-2006-012

Seat Belt Assembly Part No. GD10A-05M  
Chongqing Guangda Industrial Co., Ltd  
FOR  
TIANJIN QINGYUAN ELECTRIC VEHICLE CO., LTD.  
C8 BUILDING, 4TH AVENUE NO. 80  
TEDA, TIANJIN, CHINA 300457  
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24955 PACIFIC COAST HIGHWAY B201  
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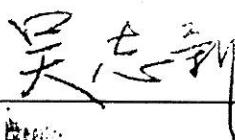
FOR USE ON  
2006MY Miles ZX40, ZX40S, OR70 ALL-ELECTRIC VEHICLES

TESTED BY

NATIONAL PASSENGER CAR QUALITY SUPERVISION  
AND INSPECTION CENTER (NPCQSIC)  
Tianshan Lukou, Chenglinzhuang Road, Hedong District  
Tianjin, 300162, China

30 OCTOBER 2006

APPROVED BY:



DATE:

30 OCTOBER 2006