



Canoo Technologies

Application for Certification – Part 1

2023 Model Year

EPA Manufacturer Code: CAN

Test Group: PCANJ.000261

Durability Group: PCANEEVNN261

Evaporative Family: N.A.

Test Group Description:

Battery Electric Vehicle

Applicable Standards:

U.S. EPA: Tier 3 Bin 0 LDT2

Carlines Covered:

Lifestyle Delivery Vehicle
(LDV) (with 18 inch wheels)

For Questions, Contact:

Alex Holcomb, alex.holcomb@canoo.com

03/10/2023

Mr. David Wright
Vehicle Programs and Compliance Division
Environmental Protection Agency
2000 Traverwood,
Ann Arbor, MI 48105

Subject: MY 2023 Canoo Technologies Lifestyle Delivery Vehicle (LDV) Initial Application for Issuance of Certificate of Conformity for Test Group PCANJ.000261

Attached to this request is the Part 1 Application. Canoo Technologies believes that all vehicles within this test group comply with all applicable regulations within the Code of Federal Regulations Title 40 Parts 85, 86, and 600.

Vehicle Category:	LDT2
Durability Group:	PCANEEVNN261
Test Group:	PCANJ.000261
Summary Sheet No:	NA
Durability Group Description:	NA
Durability Vehicle:	NA
OBD Group:	NA
Test Group Description:	Canoo explains test groups based on: 1) vehicle model year, 2) kw rating of motor.
	P = 2023 model year 261 = 261 kw motor
Applicable Standards:	FEDERAL Tier 3 BIN 0.
Carlines Covered by this certificate:	Lifestyle Delivery Vehicle (LDV) (18 inch wheels)

Your early review and issuance of the certificate is greatly appreciated. If you have any questions, please contact me at:
(424) 731-3114

Sincerely,



Alex Holcomb
Senior Homologation Engineer

Contents

1

1.01

01.01.01

01.01.02

3

3.01

3.02

3.03

3.04

4

5

6

6.01

6.02

6.03

7

7.01

7.02

7.03

7.04

8

8.01

8.02

8.03

08.03.01

08.03.02

08.03.03

08.03.04

08.03.05

8.04

8.05

8.06

08.06.01

08.06.02

08.06.03

08.06.04

8.07

08.07.01

08.07.02

8.08

08.08.01

08.08.02

8.09

8.10

8.11

08.11.01

8.12

8.13

Communications

Mailing information

Certification information

Responsible official

Facilities, Equipment and Test Procedures

Procedure to determine mass emissions of the fuel fired heater

Battery pre-conditioning procedures

Vehicle Configuration and sub-configurations

Test Procedures

Statement of Compliance

Reserved

Maintenance

Test vehicle scheduled maintenance

recommended customer maintenance schedule

Lubricants and heater fuels

Labels

Label locations

Sample emission control information label

California Environmental Performance Index label: 2015 and later model years

Projected sales information

General Technical Description

Description of propulsion system

Description of motor(s)

Description of batteries

Battery charging capacity

Self-discharge information

Description of thermal management system

Definition of end-of-life

Description of battery disposal plan

Description of controller / inverter

Description of transmission

Description of climate control system

Electric heat pump

Fuel-fired heater

Climate control system logic

Tamper resistance of climate control system that includes a fuel-fired heater

Description of regenerative braking system

Control logic

Percentage of braking performed on road by each axle

Description of charger

Proper recharging procedures

Power requirements necessary to recharge vehicle

Accessories which draw energy from the batteries

Other unique features (solar panels)

Description of warning system(s) for maintenance / malfunction

Cut-off terminal voltages for prevention of battery damage

Description of dyno mode

Description of coastdown mode

9	Running Change vehicle description
10	Road load data
11	Starting and shifting schedules
11.01	Starting
11.02	Shifting
12	Reserved
13	Reserved
14	Reserved
15	Reserved
16	Reserved
17	California Requirements
17.01	Statement of compliance
17.01.01	General statement
17.01.02	Driveability statement
17.02	Supplemental data and certification review sheets
	Engineering evaluation of zero evaporative emissions under any and
17.03	all operating conditions (for vehicles equipped with fuel- fired
	heater only)
17.04	Credits
17.04.01	Description of multi-manufacturer agreements
17.04.02	Credit calculation
17.05	Vehicle safety
17.05.01	All information on safe handling of vehicle
17.05.02	Information on safe handling of battery system
17.05.03	Description of emergency procedures
17.06	Description of fuel-fired heater / fuel tank evaporative system
18	Fuel Economy Data Vehicle and De-Rating calculations

1 COMMUNICATIONS

1.01 Mailing information

01.01.01 Certification information

Canoo Technologies
19951 Mariner Ave
Torrance, CA, US 90503

01.01.02 Responsible officials

01.01.03 - Primary Contact

Mr. Alex Holcomb, Senior Homologation Engineer
Telephone (424) 731-3114

01.01.04 - Secondary Contact

Mr. John Spruill, VP – Reliability, Test, and Homologation
Telephone (310) 749-9255

3 FACILITIES, EQUIPMENT AND TEST PROCEDURES

Internal range test reports are on file at Canoo.

3.01 Procedure to determine mass emissions of the fuel-fired heater

Not applicable; vehicle not equipped with a fuel fired heater.

3.02 Battery pre-conditioning procedures

The lithium ion battery cells are cycled by the battery cell manufacturer before they are assembled into battery packs. There is no further pre-conditioning necessary.

3.03 Vehicle Configurations and sub configurations

Lifestyle Delivery Vehicle (LDV) with 18 inch wheels

3.04 TEST PROCEDURES

SAE J1634 was followed for all Range testing and SAE J2263 was followed for Road load measurement.

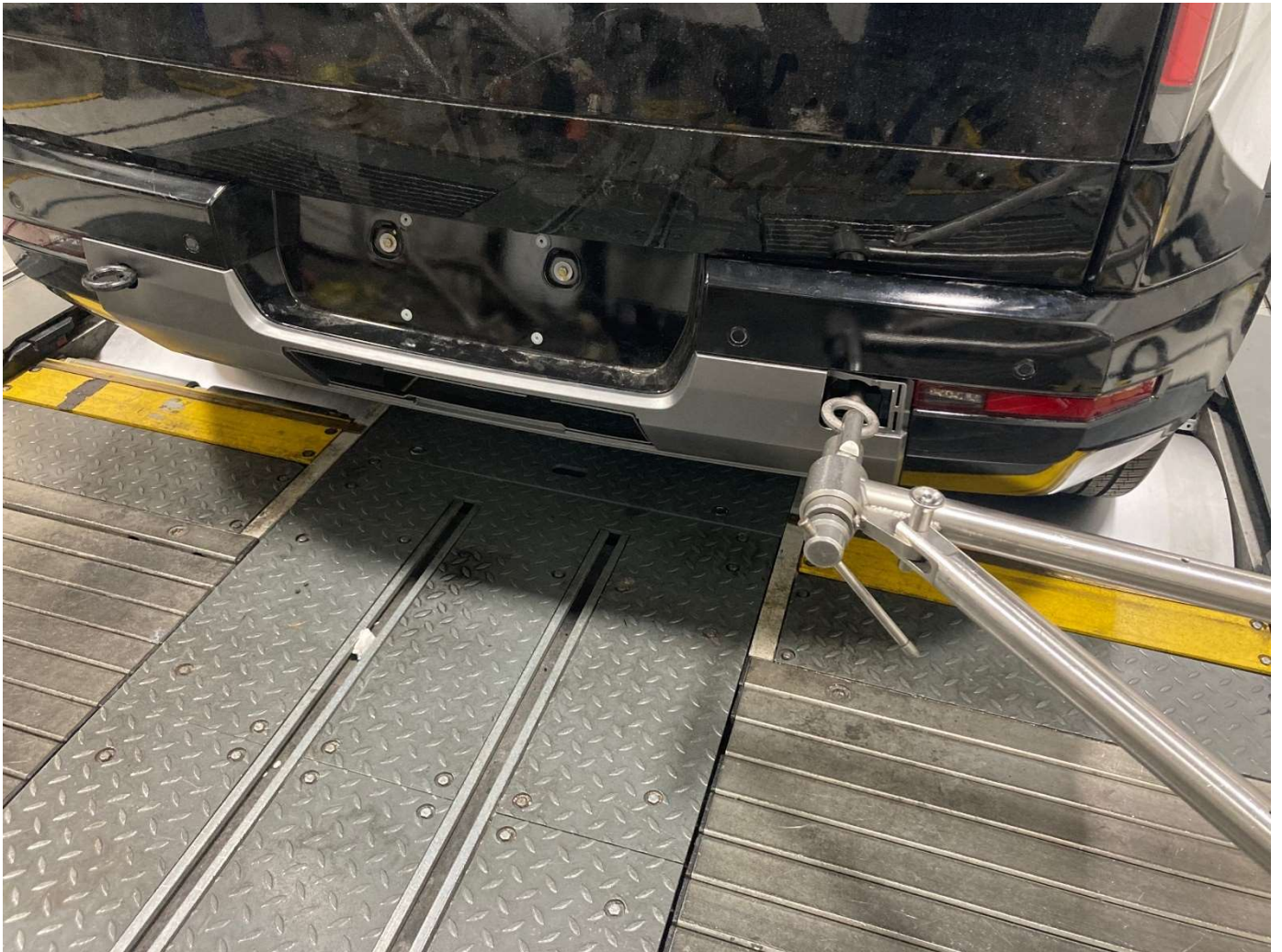
SPECIAL TEST INSTRUCTIONS

Canoo has not yet implemented “Dyno Mode” within the user interface (UI) features. The vehicle will function properly on a 4WD chassis dynamometer. This type of dyno should be used for testing. A 2WD dynamometer will not work with our vehicle.









04.00 Statement of Compliance

This vehicle conforms to US EPA Federal Tier 3 Bin 0 regulations applicable to 2023 Model Year new Light-duty Vehicles.

05.00 RESERVED

06.00 MAINTENANCE

6.01 Test vehicle scheduled maintenance

Not applicable.

6.02 Recommended customer maintenance schedule

See Owner Hand Book.

6.03 Lubricants and heater fuels

Heater fuel:	Not applicable
Transmission lubricant:	Factory Fill
Capacity	2.4 litres
Make	Valvoline
Trade name	HPEV
Type	Premium Synthetic Oil
Viscosity	25.58 cSt at 40°C (104°F)
Viscosity	5.93 cSt at 100°C (212°F)

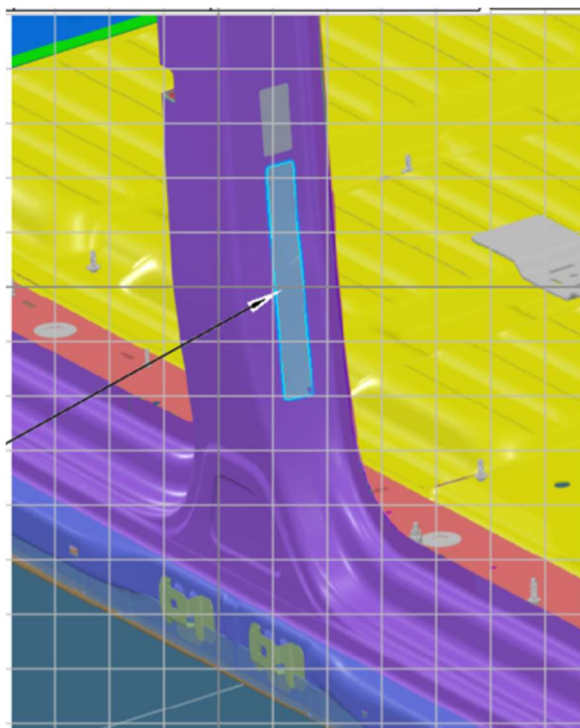
Test Vehicle

Same as factory fill

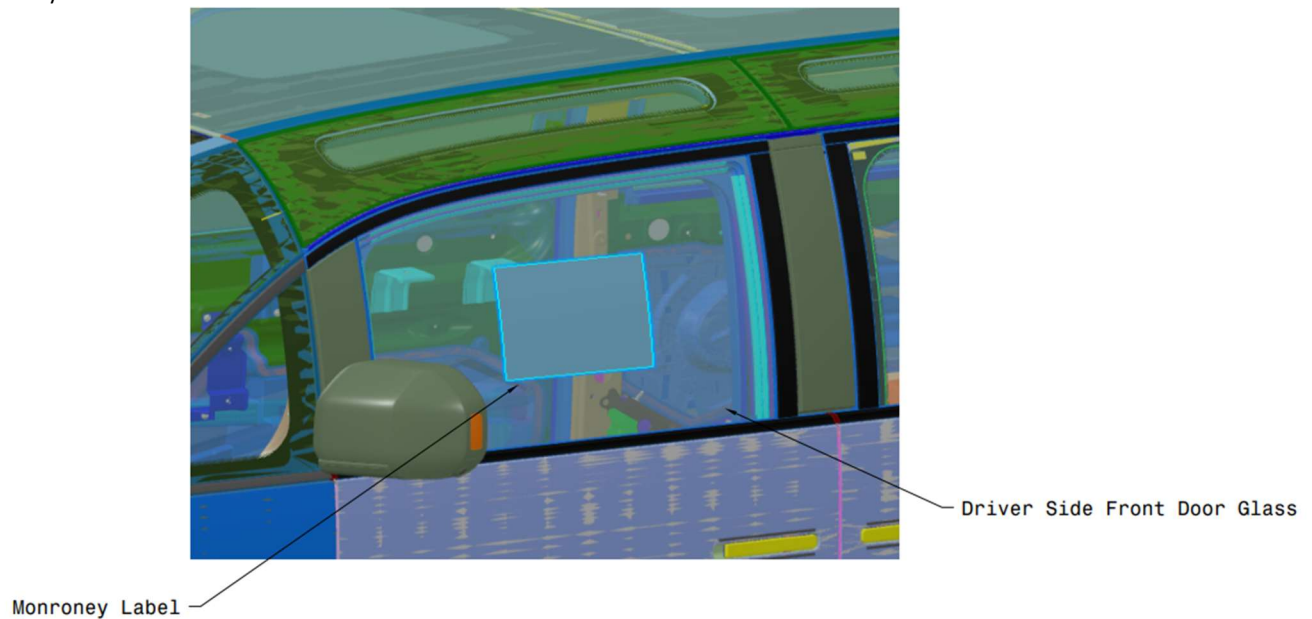
07.00 LABELS

07.01 Label locations

VECI Emission Label



Monroney Label



07.02 Emission Control Information label: 2023 Model Year

(Mandated in CFR Title 40, Part 86; §86.1807. Label format agreed with EPA)

 - C A N O O - 	CANOO INC. VEHICLE EMISSION CONTROL INFORMATION
Conforms to regulations: 2023 MY BEV	
U.S. EPA: T3B0 LDT2	
OBD: N/A	
California: N/A	
OBD: N/A	
No adjustments needed.	
Group: PCANJ.000261	
1A23BC4567D890E24 	

07.03 California Environmental Performance Index label: 2023 Model Year

(Mandated in California Environmental Performance Label Specifications for 2009 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Passenger Cars. Label format agreed with EPA/ CARB)

FF Label

EPA DOT Fuel Economy and Environment

Fuel Economy
XX MPGe Midsize cars range from 10 to 99 MPG.
 The best vehicle rates 99 MPG.

You save \$X,XXX
in fuel costs over 5 years
 compared to the average new vehicle.

Driving Range
 When fully charged, vehicle can travel about...
 0 20 40 60 80 **XX** miles

Charge Time: 8 hours (240V)

Annual fuel cost
\$XXX

Fuel Economy & Greenhouse Gas Rating (tailpipe only)
10 Best
 This vehicle emits 0 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Does not include emissions from generating electricity; learn more at fueleconomy.gov.

Smog Rating (tailpipe only)
10 Best

fueleconomy.gov
 Calculate personalized estimates and compare vehicles

Smartphone QR Code™

07.04 Projected sales information (Confidential)

07.05 08:00 GENERAL TECHNICAL DESCRIPTION

08.01 DESCRIPTION OF PROPULSION SYSTEM

The Canoo LDV propulsion system consists of one drive unit and a high voltage battery pack. The drive unit is a 3-in-1 system containing a traction motor, a fixed ratio gearbox, and a drive inverter.

The drive unit is located in the rear of the vehicle and connected to the rear wheels through the rear axle half shafts.

8.02 DESCRIPTION OF MOTOR(s)

The rear motor is an 8 pole 3-phase AC interior permanent magnet motor utilizing a hairpin wound stator.

8.03 DESCRIPTION OF BATTERIES

The battery packs used in the Canoo Lifestyle Vehicle is one of the most technically advanced lithium-ion battery packs in the world. Using automotive grade lithium-ion cells, the Canoo battery achieves unmatched energy density and enables the long-range capability of the vehicle. The low-profile flat packaging enables an efficient and functional occupant area. The battery has a replaceable fuse that is accessible with the battery removed from the vehicle and two sets of contactors inside the pack that disconnect high voltage from the positive and negative terminals on the battery pack. To disable contactors from closing during vehicle service, the 12V power feed can be disconnected in the vehicle fuse box. The battery control system consists of the Battery Monitoring System (BMS) which controls the contactors, measures pack current and voltages, electrical isolation of the battery from chassis ground and monitors cell brick voltages, module temperatures, and faults from the Battery Monitor Boards (BMBs) installed on each of the many modules. The battery is rated at 400V and can deliver in excess of 1000 Amperes. The battery mass is greater than 430 kg.

08.03.01 Battery charging capacity

The battery when fully charged contains 225Ah.

08.03.02 Self-discharge information

The self-discharge rate of the battery is likely to be less than 4% per month.

08.03.03 Description of thermal management system

The Canoo battery pack contains an integrated cooling system to ensure that the individual cells are maintained at, or close to, their optimum operating temperature. The system is a closed loop liquid coolant (glycol 50% mixed) connected to the vehicle coolant system.

08.03.04 Definition of end-of-life

The battery pack end-of-life shall be determined by Canoo's local service centers and dealerships with proper inspection and test methods.

08.03.05 Description of battery disposal plan

Canoo's lithium ion battery packs do not contain heavy metals such as lead, Cadmium, or mercury. They are exempt from hazardous waste disposal standards in the USA under the Universal Waste Regulations. However, they do contain recyclable materials, and Canoo plans to recycle all battery packs removed from vehicles.

Canoo highly recommends that all battery packs be taken to local service facilities and recycled by authorized agencies, so that the battery packs can be recycled in a safe and efficient manner.

If the customer chooses to recycle independently, then the owner must assume responsibility for recycling in a safe and legal manner. If an owner does assume this responsibility, Canoo recommends consulting with the appropriate local, state or federal authorities to determine the appropriate methods for disposal and recycling. Keep in mind that disposal regulations may vary dependent on location.

08.04 DESCRIPTION OF CONTROLLER / INVERTER

The drive inverter performs several critical functions in the Canoo LDV to provide propulsion and regeneration including torque control, power/torque derating, and status and diagnostic monitoring. The drive inverter is an integral part of the drive unit.

08.05 DESCRIPTION OF TRANSMISSION

The Canoo LDV transmission is a co-axial, fixed ratio, transversely mounted gearbox with integrated gear differential (transaxle configuration) and integrated park lock system.

8.06 DESCRIPTION OF CLIMATE CONTROL SYSTEM

General Specifications:

The LDV is a single zone system with automatic HVAC control. The modes are automatically controlled and include Defrost, Face and Foot (or any combination of these three). The system consists of two headliner vents, two foot vents, two front quarter glass defrost outlets, and two side window defrost outlets.

08.06.01 Electric cabin heater

The heater unit incorporating a variable speed electric fan is located in the front underhood area.

The heater element is a variable high voltage Positive Temperature Coefficient (PTC) Heater with High Voltage Interlock Loop.

08.06.02 Fuel-fired heater

Not applicable.

08.06.03 Air conditioning

The LDV air conditioner system is an R1234yf refrigerant system consisting of a high voltage electric scroll type with integrated inverter and High Voltage Interlock Loop. The compressor Oil is Poly Olefin Ester oil that is non-conducting.

08.06.04 Climate control system logic

Various printed circuit boards activate actuators, fans, compressor, and/or PTC Heater to maintain the cabin comfort of the occupant based on their desired set point. Evaporator temperature sensor, duct outlet temperature sensors, cabin temperature sensor, solar load sensor, and ambient temperature sensors are all used to influence the operation of the auto HVAC system.

08.06.05 Tamper resistance of climate control system that includes a fuel-fired heater

Not applicable.

08.07 DESCRIPTION OF REGENERATIVE BRAKING SYSTEM

When using regenerative braking, a portion of the energy of the braking process can be recovered that is otherwise lost in the form of heat. The regenerative braking in Canoo vehicles is divided into two categories: coast regeneration and braking regeneration.

The coast regeneration driving modes on the Canoo vehicle are calibrated to make the vehicle deceleration feel like a conventional ICE (internal combustion engine) vehicle with selectable modes – Low, High, and One Pedal. The One Pedal (1PD) coast regeneration mode is the default mode on the Canoo vehicle and provides the highest amount of regenerative braking. It is calibrated for everyday driving conditions which require a high deceleration rate at low speed. The high and low coast options provide less regenerative torque than the 1PD mode.

The amount of coast regenerative torque is proportional to the accelerator pedal position. It is at its maximum when the accelerator pedal is fully depressed, and it is reduced as the user presses the pedal. At a specific pedal position, the amount of regenerative torque is reduced to zero.

The braking regeneration is a function of brake pedal, it gradually increases as user presses the brake pedal until it crosses a preset threshold. After crossing the threshold, the regenerative torque fades out and the friction brakes take over without any distinctive change in the user feel.

Both coast regeneration and braking regeneration are also a function of vehicle speed and are gradually reduced to zero as vehicle speed starts dropping below a preset threshold.

When regenerative torque fades out, the remaining amount of deceleration torque is provided using the friction brakes. The system is calibrated so that the user will not feel any sudden change in the vehicle's deceleration during this blending process. The use of friction brakes helps to ensure the vehicle deceleration feels the same in scenarios where the vehicle cannot apply enough regen torque due to physical limits, for example, when the high voltage battery pack is near its maximum capacity.

08.08 DESCRIPTION OF VEHICLE ELECTRICAL SUPPLY EQUIPMENT (CHARGER)

The Canoo LDV is capable of accepting energy either from a permanent facility installed at the owner's location or from many readily available power outlets when 'on the road'.

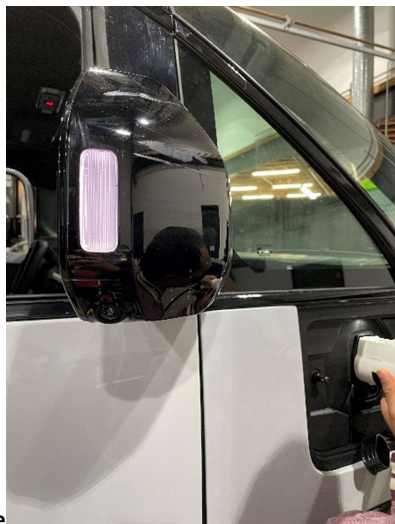
The Canoo LDV comes equipped with a Combined Charging System 1 (CCS1) port.

Charging at rates up to 32A can be achieved with a SAE J1772 AC connector. The charger communicates with the vehicle to manage the charging process. The vehicle is also capable of accepting DC current up to 415A from an off-board charger.

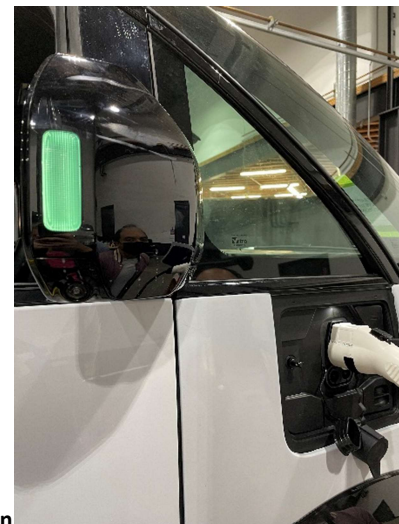
08.08.01 Proper recharging procedures

The charging system adjusts automatically to the available AC line voltage, frequency and current, within limits. The charging system in the vehicle works in conjunction with either of the external charging stations; the permanently installed public charger or the portable on-board charger.

Anytime the EV Inlet door is opened, the vehicle will prepare to enter CHARGE state. Once the user connects either supply cable to the vehicle, the charging system signals to the vehicle that it is ready to deliver the charge. The vehicle locks the cable onto the vehicle and then indicates that it is ready to accept energy and charging will commence. Failure of any of these steps will result in fault condition and lack of charge.



Prepare to charge state



Charging Indication

If the battery temperature is near or below freezing temperatures, normal charging will not occur. The vehicle will identify this condition and will begin heating the battery coolant and circulating the coolant to raise the battery temperature to enable charge. When the pack temperature rises to a temperature within the allowable charging range, heating will reduce or stop, and charging will commence.

08.08.02 Power requirements necessary to recharge vehicle

Canoo LDV comes with one on-board charger that is capable of a maximum of 32A.

08.10 OTHER UNIQUE FEATURES (i.e. solar panels)

Not applicable; vehicle is not equipped with any such features.

08.11 DESCRIPTION OF WARNING SYSTEM(S) FOR MAINTENANCE / MALFUNCTION

The Canoo LDV is equipped with a screen that will display warnings and malfunctions. It also indicates the nature of the malfunction as well as a wide range of additional vehicle data, such as when maintenance is needed.

08.11.01 Cut-off terminal voltages for prevention of battery damage

The control electronics inside of the Drive Unit and Charger are programmed not to allow the unit to drive the voltage of the battery above or below hard voltage limits. If the battery pack is unable to achieve a desired response from these systems and the voltage reaches above or below a set limit, the two contactors inside the battery pack will open, disabling the entire high voltage system in the car.

8.12 DESCRIPTION OF DYNO MODE

Canoo has not yet implemented “Dyno Mode” within the user interface (UI) features. The vehicle will function properly on a 4WD chassis dynamometer. This type of dyno should be used for testing. A 2WD dynamometer will not work with our vehicle.

8.13 DESCRIPTION OF COASTDOWN MODE

Canoo does not have a special Coastdown Mode. Coastdowns should be completed in Neutral with HVAC Off.

09.00 RUNNING CHANGE VEHICLE DESCRIPTION

N/A

10.00 ROAD LOAD DATA

See attached; Table 3.03

11.00 STARTING AND SHIFTING SCHEDULES

11.01 Starting

The Lifestyle Delivery Vehicle does not have a traditional starter switch and instead has a smart entry system for greater safety and customer convenience. The smart entry system comprises of a smart key and the brake pedal. When the driver enters the vehicle with the smart key and sits on the driver’s seat, the vehicle controller attempts to validate the unique key code by reading the key code. If successful interaction between the coded key and vehicle controller occurs, the system wakes up. The vehicle then enters accessory mode analogous to a “ACC” position on a conventional IC engine. In this mode, low voltage (12V) is supplied to the vehicle allowing operation of the infotainment and other accessories connected to the accessory rail. High Voltage (HV) necessary to enable vehicle propulsion is enabled only by the closing of the contactors, which can only be triggered when the following conditions are both satisfied:

1. Smart key is detected, and key code is validated AND
2. Brake pedal is depressed.

By requiring brake pedal activation, along with the appropriate key code, this system ensures the safety of vehicle occupants by not allowing self-mobility of the vehicle without the driver providing proper control inputs (electronic parking brake activated) and appropriate driver authorization (presence of the unique key code). If either the service brake is not activated or the key code not present, the vehicle controller will not close the connectors and self-mobility is not possible.

If the brake pedal is depressed and the proper key code present, the drive rail will activate, electronic parking brake will disengage, and allows the transmission to be shifted out of Park.

11.02 SHIFTING

Not applicable – the vehicle has a single-speed transmission.

12:00 -16:00 RESERVED

17:00 CALIFORNIA REQUIREMENTS

17:01 Statement of Compliance

N/A

17.01.01 General Statement

N/A

17.01.02 Drivability statement

N/A

17.02 Supplemental data and certification review sheets

N/A

17.03 Engineering evaluation of zero evaporative emissions under any and all operating conditions (for vehicles equipped with fuel-fired heater only)

Not applicable; vehicle is not equipped with fuel-fired heater.

17.04 Credits

17.04.01 Description of multi-manufacturer arrangements

N/A

17.04.02 Credit calculation

N/A

17.05 VEHICLE SAFETY

17.05.01 All Information for safe operation of vehicle

Canoo will submit a copy of the finalized vehicle owner's handbook by separate letter when it becomes available.

17.05.02 Information on safe handling of battery system

HANDLING

Do not short circuit, puncture, incinerate, crush, immerse, force discharge, or expose the battery pack to temperatures outside the specified maximum storage temperature range of -20°C to 60°C.

The battery pack has a nominal operating voltage of 345.6 VDC. The battery pack is sealed in a rigid metal case and its exterior is isolated from high voltage. Handling the battery pack is electrically safe provided the enclosure remains closed.

The battery pack contains hermetically sealed lithium ion cells that contain a number of chemicals and materials of construction. Risk of exposure to electrode materials and liquid electrolyte will only occur in cases of mechanical or thermal abuse of the battery pack.

STORAGE

Do not store the battery pack in a manner that allows terminals to short circuit. Do not place near heating equipment, nor expose to direct sunlight for long periods. The battery pack should only be stored in approved packaging and stacked no more than two (2) packages high. To maintain service life, the battery pack should be stored at a state of charge (SOC) of 15 to 50%.

TRANSPORT

Lithium ion batteries are regulated as Class 9 Miscellaneous dangerous goods (also known as "hazardous materials") pursuant to the International Civil Aviation Organization.

(ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air, International Air Transport Association (IATA) Dangerous Goods Regulations, the International Maritime Dangerous Goods (IMDG) Code, European Agreements concerning the International Carriage of Dangerous Goods by Rail (RID) and Road (ADR), and applicable national regulations such as the USA's hazardous materials regulations (see 49 CFR 173.185). These regulations contain very specific packaging, labelling, marking, and documentation requirements. The regulations also require that individuals involved in the preparation of dangerous goods for transport be trained on

how to properly package, label, mark and prepare shipping documents.

17.05.03 Description of emergency procedures

HIGH VOLTAGE EXPOSURE

If one of the Canoo products has been visibly damaged or its enclosure compromised, then practice appropriate high voltage preventative measures until the danger has been assessed (and dissipated if necessary). Personal Protective Equipment (PPE) provides protection against live high voltage and electrical PPE must be worn.

FIREFIGHTING MEASURES

If a fire or explosion occurs when the battery pack is charging, shut off power to the charger. In case of burning lithium ion fires, flood the area with water. The water may not extinguish them, but will cool the adjacent batteries and control the spread of the fire. CO₂, dry chemical and foam extinguishers are preferred for small fires, but also may not extinguish burning lithium ion batteries. Burning batteries will burn themselves out. Virtually all fires involving lithium ion batteries can be controlled with water. When water is used, however, hydrogen gas may be a by-product which can form an explosive mixture with air. LITH-X (powdered graphite) or copper powder fire extinguishers, sand, dry ground dolomite or soda ash may also be used. These materials act as smothering agents.

Damaged or opened cells or batteries can result in rapid heating (due to exothermic reaction of constituent materials) and the release of flammable vapors. Water (and other items listed above) disperses heat when applied in sufficient quantity to a fire. Extended heat exposure can lead to ignition of adjacent cells with a potential complete envelopment of the battery pack if not cooled. An extinguished lithium ion battery fire can re-ignite due to the exothermic reaction of constituent materials from broken or damaged cells. To avoid this, remove sources of ignition and cool the burned mass by flooding with (or immersing in) water. Fire-fighters should wear self-contained breathing apparatus. Cells or batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat, fire or over voltage conditions. Never cut into the sealed battery pack enclosure due to the high voltage and electrocution risks.

If a decision is made to fight a battery fire aggressively, then large amounts of water should be applied from a safe distance with the intent of flooding the battery pack enclosure as completely as possible. Alternatively, if a decision is made to fight a battery fire defensively, then the fire crew should pull back a safe distance and allow the battery to burn itself out. Fire crews may choose to utilize a water stream or fog pattern to protect exposures or control the path of smoke.

FIRST AID MEASURES

Under normal conditions of use, the constituent battery cells are hermetically sealed. Contents of an open (broken) constituent battery cell can cause skin irritation and/or chemical burns. If materials from a ruptured or otherwise damaged cell or battery contact skin, flush immediately with water and wash affected area with soap and water. For eye contact, flush with significant amounts of water for 15 minutes and see physician at once. Avoid inhaling any vented gases. If a chemical burn occurs or if irritation persists, seek medical assistance. Seek immediate medical assistance if an electrical shock or electrocution has occurred (or is suspected).

17.06 Description of fuel-fired heater / fuel tank evaporative system

Not applicable; vehicle is not equipped with fuel-fired heater.

18.00 FUEL ECONOMY DATASETS

Lifestyle Delivery Vehicle (18" wheels)	
CD MCT Test Identification	20221111TC203
AC Recharge Energy Wh	85868
AER Unadjusted UDDS, miles	371
AER Unadjusted HWFET, miles	291
CO2 Composite Adjusted	0 g/mi (factors into 0 g/mi on FE label)

Vehicle Operation

The vehicle can be powered on/off using one of two methods:

1. NFC card with TCXM.
2. PKE box connected to diagnostic harness.

Each gamma vehicle will use one or the other of these methods, but not both. In general the NFC card method should be used, with the PKE box method kept as an emergency back-up in case NFC fails.

Vehicle Operation Using NFC card with TXCM

Vehicle Startup

Step 1: Ensure 12V batteries are connected and voltage on both is above 12.5V.

Step 2: Swipe the vehicle's paired NFC card on the driver-side B-Pillar. You may need several attempts before a successful swipe. Some vehicles may have tape indicating the sweet spot for the NFC reader. Hold the NFC card in place over the tape for at least 3 seconds.



Step 3: Ensure the touch screen wakes up, doors unlock, and mirrors unfold.



Step 4: Wait about a minute for data on the touchscreen to update. SOC, or brake pedal position are good indicators to use.

Vehicle Shutdown

Step 1: Place the vehicle in Park.

Step 2: Exit vehicle and close all doors.

Step 3: Swipe the vehicle's paired NFC card on the driver-side B-Pillar. You may need several attempts before a successful swipe. Hold the NFC card in place over the tape for at least 3 seconds.



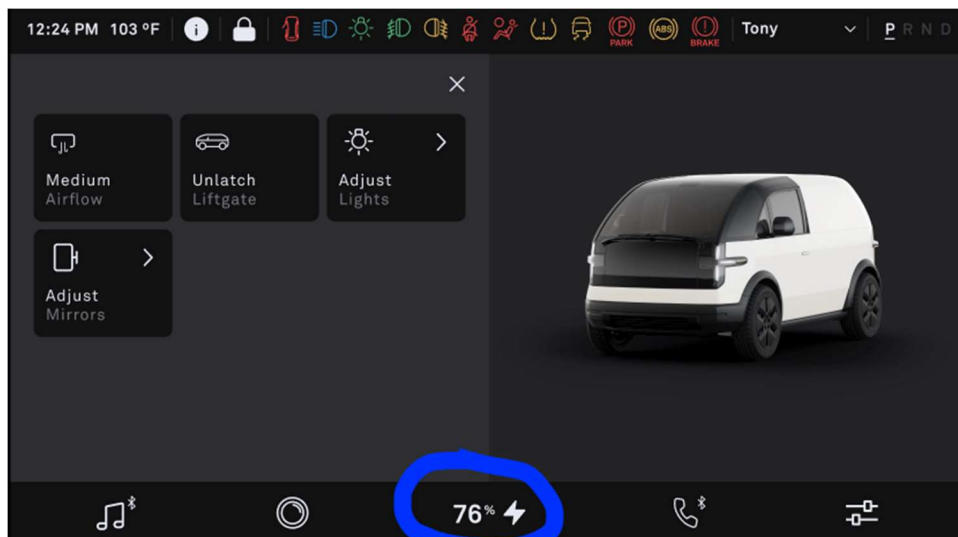
Step 4: Ensure the swipe was accepted. Doors should now lock, mirrors will fold, and powertrain resolver alignment will be performed (beep sound you will hear after vehicle exits HV).

Main Vehicle Functions

Infotainment System

SOC % – State of Charge

The infotainment screen will automatically display the current state of charge (SOC) in percentage value. Please ensure that the vehicle is appropriately charged for the duration of your trip.



Headlamp Control

Low Beam Control

Open the quick select menu by tapping (or swiping right) the white vertical bar on the left of the screen



Select "Adjust Lights"



Toggle Low Beams On or Off. Low beams and position lamps will be turned on with this setting. If this setting is off then DRLs will turn on when vehicle is out of a park state.



NOTE: Auto High Beams and ambient lights have not been implemented yet.

High Beam Control

The high beams can be controlled by the left steering wheel stalk. Pulling the stalk will momentarily actuate the high beams. Pushing the stalk will latch the high beams on until the stalk is pushed or pulled again.

Wiper Control

Wipers are controlled by the left-hand stalk. Wipers contain a an Int (Low), Medium (40 wipes per second), High (60 wipes per second), and Auto which switches between the modes. Note: Auto is not tuned well and will not be updated with production settings until TT build.

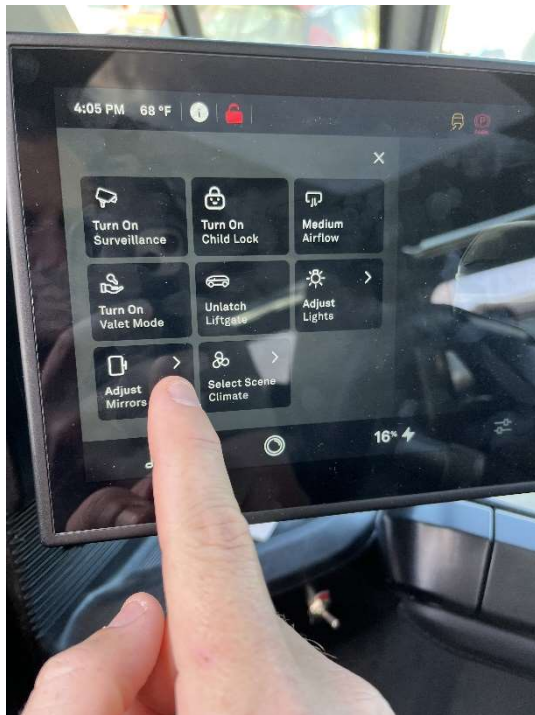


Adjust Mirrors

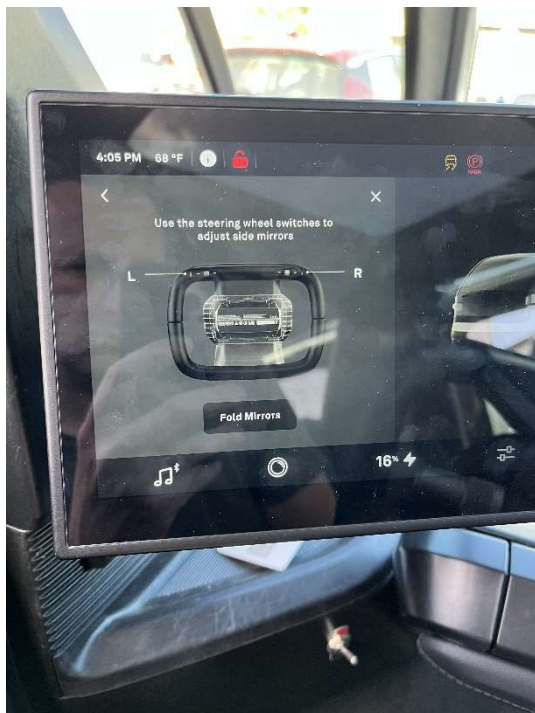
Open the quick select menu by tapping (or swiping right) the white vertical bar on the left of the screen.



Select "Adjust Mirrors"



Use the steering wheel switches to adjust mirrors according to your preference. You can also tap the “Fold Mirrors” if needed.

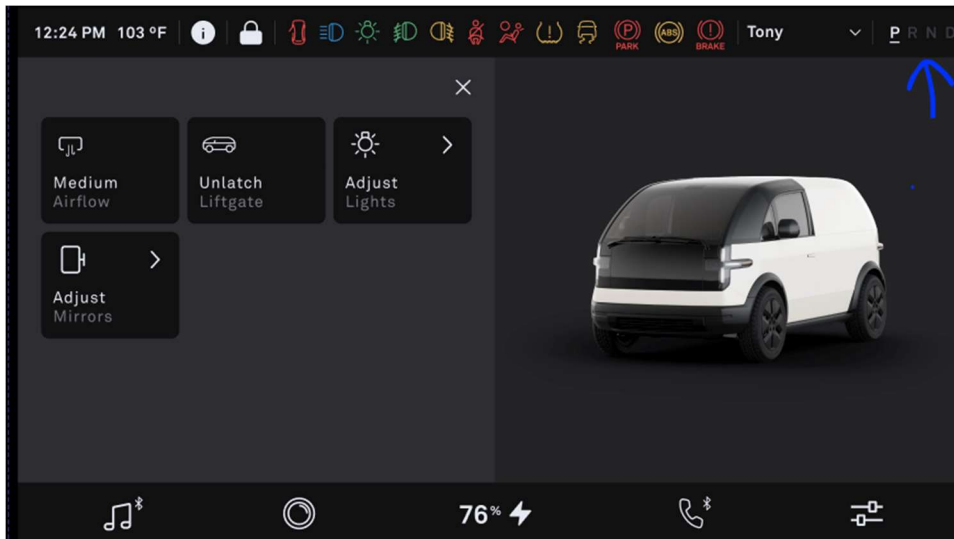


Shifting/Changing Gears

Changing gears is done using the PRND stalk on the right side of the steering column.



The current gear state is indicated on the infotainment screen in the upper right corner (as seen below denoted by the blue arrow), and also on the smaller 4" screen in the front center of the vehicle.



KEEP YOUR FOOT ON THE BRAKE AT ALL TIMES WHEN SHIFTING/CHANGING GEARS

PARK: Push in the button on the end of the PRND stalk to enter Park (P). The front display should show "P". Release the button.

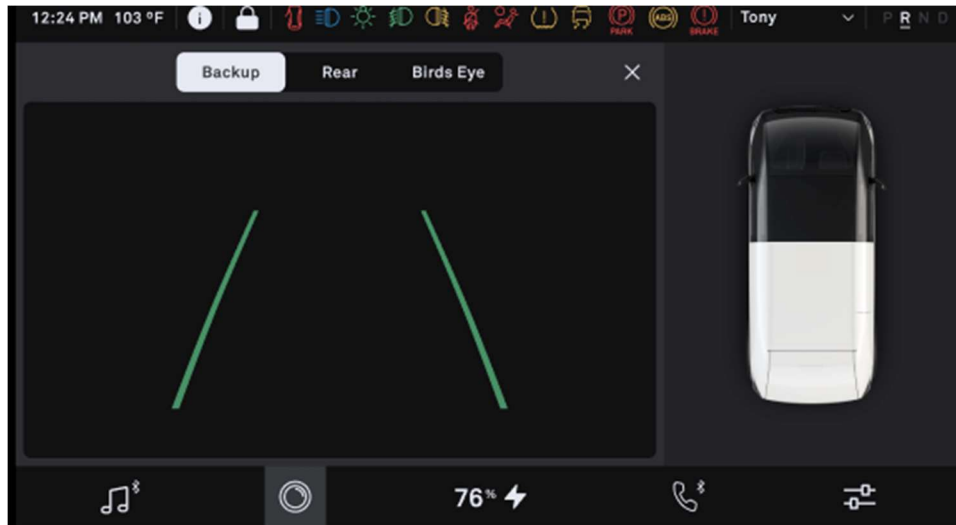
REVERSE: Push the PRND stalk all the way up and hold to enter Reverse (R). The front display should show "R". Release the stalk.

NEUTRAL: Pull or push the PRND stalk up or down one detent/click to enter Neutral (N). The front display should show "N". Release the stalk.

DRIVE: Pull the PRND stalk all the way down and hold to enter Drive (D). The front display should show "D". Release the stalk.

Reverse Mode – Back Up Camera

Upon shifting the vehicle into reverse, the infotainment screen will automatically display the back-up camera.



LV Maintenance

The current vehicle software package will command the vehicle to perform maintenance on the LV batteries once every 20 minutes. The LV maintenance session will last approximately 10-15 minutes. During this time the vehicle will be HVActive, the headlights/taillights will be on, and the radiator fans may run.

Vehicle State When Shipping

When shipping the vehicle long distances ensure that the vehicle has the driver window rolled down. Ensure the low voltage batteries are disconnected. DO NOT ship vehicles with connected batteries if vehicle is going to be left overnight.

Vehicle Configuration and sub-configurations

Make	Canoo
Carline	Lifestyle Delivery Vehicle
Type	Battery Electric Vehicle
Test Group	PCANJ.000261
Axle Ratio / Final Drive Ratio	8.97
Emission Control	NA (BEV)
Exhaust	NA (BEV)
EVAP	NA (BEV)
Model Type	Delivery (18" Wheels)
Basic Engine Code (F/R)	261
Transmission Type / Code	Automatic
Vehicle ID Tested	GR-40
Vehicle Configuration	0
Gross Vehicle Weight (lbs)	5949
33% Curb Mass (lbs)	4514
Loaded Vehicle Weight (lbs)	4814
Equivalent Test Weight (lbs)	4750
Base wheel / Tire	225/60R18
Target Road Load Coefficients	
A (lbf)	25.054
B (lbf/mph)	0.41733
C (lbf/mph^2)	0.026047
RLHP @ 50 MPH	14.82
Dyno Road Load Coefficients	
A (lbf)	-5.8203
B (lbf/mph)	-0.27305
C (lbf/mph^2)	0.03157

Fuel Economy Data Vehicle (FEDV) Selection Justification – FEDV curb mass vehicle accounts for options that have a greater than 33% take rate and highest sold wheel/tire combination that collectively represents a vehicle configuration / sub configuration that has the largest sales volume within that Model Type. Canoo affirms that the road load power and the target coefficients are those that are appropriate for the ETW of the vehicle.

EPA EV Multicycle Calculator (SAE J1634)

Manufacturer	Canoo Technologies
Carline	Lifestyle Delivery Vehicle (LDV) (18" wheels)
Model Year	2023
Vehicle	GR-40
Test Number	20221111TC203
Comments	
Lab	Volkswagen Test Centers California
Test Date	11/11/2022

Item	Parameter / Measurement	Units	Value
1	Battery ampere-hour capacity	DC A.h	215.3
2	Ambient test temperature	C	23
3	Time, soak start	-	11/10/2022 @ 21:55
4	Time, soak end	-	11/11/2022 @ 11:55
5	Time, test start	-	11/11/2022 @ 12:14
6	Distance driven (total)	mi	232.1
7	Distance driven per phase ($D_{[cycle]_i}$)	mi	Next Table
8	Discharge Energy (Edc_{total})	DC Wh	75826
9	Discharge energy (Edc_{total} , $Edc_{totalN7C}$)	DC Ah	Not Applicable applies to 5-cycle and SMCT only
10	Phase and cycle discharge energy ($Edc_{[phase]_i}$, $Edc_{[cycle]_i}$)	DC Wh	Next Table
11	Time, end of test	-	11/11/2022 @ 17:33
12	Vehicle charging mode	-	"Normal"
13	Time, start of charge	-	11/11/2022 @ 17:43
14	Power outlet voltage	AC volts	240
15	AC recharge voltage	AC volts	238.2
16	AC recharge energy (Eac_{post} , FRE_{post} , Eac_{pre} , FRE_{pre})	AC Wh	85868.4
17	Time, end of vehicle soak period	-	11/12/2022 @ 10:27
18	Time, end of recharging period	-	11/12/2022 @ 10:27

EPA EV Multicycle Calculator (SAE J1634)

Manufacturer	Canoo Technologies
Carline	Lifestyle Delivery Vehicle (LDV) (18" wheels)
Model Year	2023
Vehicle	GR-40
Test Number	20221111TC203
Comments	
Lab	Volkswagen Test Centers California
Test Date	11/11/2022

Cycle Component	Edc [Wh]	Dist [mi]	ECdc Unweighted [Wh/mi]	ECdc Weighted [Wh/mi]
UDDS1	2376.5	7.44	319.4	10.0
UDDS2	1645.8	7.46	220.6	71.2
UDDS3	1491.8	7.35	203.0	65.5
UDDS4	1525.0	7.40	206.1	66.5
HFEDS1	2780.6	10.27	270.8	135.4
HFEDS2	2592.6	10.26	252.7	126.3
CSCm	53171.5	152.79	348.0	
CSCe	10241.8	29.17	351.1	

Usable Battery Energy [Wh]	75825.6	232.14
AC Recharge Energy [Wh]	85868.4	
Recharge Allocation Factor (RAF)	88.3%	

Unadjusted City Range (AER) [miles]	355.5
Unadjusted Highway Range (AER) [miles]	289.7

Adjusted City Range [miles]	248.8
Adjusted Highway Range [miles]	202.8
Adjusted Combined Range [miles]	228.1
AC Energy Consumption [kWh / 100 miles]	26.4

Energy consumption AC City [Wh/mi]	241.5
Energy consumption AC Hwy [Wh/mi]	296.4
City Unadjusted Fuel Economy [MPGe]	139.5
Highway Unadjusted Fuel Economy [MPGe]	113.7
City Adjusted Fuel Economy [MPGe]	97.7
Highway Adjusted Fuel Economy [MPGe]	79.6
Combined Adjusted Fuel Economy [MPGe]	88.6

Certification Summary Information Report

Manufacturer	Canoo Technologies Inc	Manufacturer Code	CAN
Test Group	PCANJ.000261	Evaporative/Refueling Family	--
Certificate Number	--	CARB Executive Order #	--
Certificate Issue Date	--	Certificate Revision Date	--
Certificate Effective Date	--	Conditional Certificate	--
CSI Revision #	--	CSI Submission/Revision Date	03/10/2023 03:17:54 PM
Model Year	2023		

Test Group Information

CSI Type	Update for Correction	Running Change Reference Number	--
GHG Exempt Status	Not Exempt		

Drive Sources and Fuel(s)

Drive Source #1: Electric Motor

Fuel	Basic Fuel Metering System	Lean Burn Strategy Indicator
Electricity	--	--

Hybrid Indicator	No		
Multiple Fuel Storage	--	Rechargeable Energy Storage System Indicator	Yes
Multiple Fuel Combustion	--	Off-board Charge Capable Indicator	Yes
Fuel Cell Indicator	Yes	EPA Vehicle Class	LDT2
Federal Clean Fuel Vehicle	Yes	Federal Clean Fuel Vehicle Standard	ZEV
Federal Clean Fuel Vehicle ILEV	No	California Partial Zero Emissions Vehicle Indicator	--
Durability Group Name	PCANEEVNN261	Durability Group Equivalency Factor	1
Reduced Fee Test Group	No	Certification Region Code(s)	FA
Complies with HD GHG 2b/3 regulations?	No		
Introduction into Commerce Date	02/01/2023	CAP2000 Conditional Certificate?	N/A
Independent Commercial Importer?	--	Alternative Fuel Converter Certificate?	--
SFTP Federal Composite Compliance Identifier	Tier 3	SFTP Tier 2 Composite CO Option	--
SFTP LEV-III Composite Compliance Indicator	No		
OBD Compliance Type	Federal	OBD Demonstration Vehicle Test Group	PCANJ.000261
Test Group OBD Compliance Level	Full - no deficiencies	Number of Test Group OBD Deficiencies	0
OBD Deficiencies Comments	This is a BEV- No OBD requirements.		
Mfr Test Group Comments	--		
Mfr Exhaust / Evap Standards Comments	--		

Certification Summary Information Report

Test Group	PCANJ.000261		Evaporative/Refueling Family		--	
Models Covered by this Certificate						
Carline Manufacturer	Division	Carline	Certification Region Code(s)	Drive System	Trans - Type	- # of Gears
Canoo Technologies Inc	1 - Canoo Technologies Inc	1 - Lifestyle Delivery Vehicle	Federal	2-Wheel Drive, Rear	Automatic	1
Trans - Lockup						
No						
Engine Description						
Hybrid Type		--		Hybrid Description		--
Engine Type		--		Mfr Engine Description		--
Engine Block Arrangement		--		Mfr Engine Block Arrangement Description		--
Camless Valvetrain Indicator		--		Oil Viscosity/Classification		--
Number of Cylinders/Rotors		--		Mechanically Variable Compression Ratio Indicator		--
After Treatment Device(s) (ATD)						
Mfr After Treatment Device (ATD) Comments		--				
Direct Ozone Reduction (DOR) Device		--				
Mfr Emission Control Device Comments		--				
Official Test Numbers						
Test Group Fuel	FTP	US06	SC03	Cold CO	Highway	EPA City Litmus Value
Electricity	--	--	--	--	--	--
						EPA City Litmus Threshold
						--
						EPA Highway Litmus Value
						--
						EPA Highway Litmus Threshold
						--
						CREE Weighting Factor
						--
SFTP LEV-III Official Test Numbers						
Test Group Fuel	FTP		US06		SC03	
Electricity	--		--		--	
Official Charge Depleting Test Numbers						
Test Group Fuel	UDDS		Highway			
Electricity	NCAN10079087		NCAN10079088			

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--
Hybrid Electric Vehicle And Fuel Cell Information			
Rechargable Energy Storage System	Battery(s)	Rechargable Energy Storage System, if Other	--
Battery Type	Lithium Ion	Number of Battery Packs	1
Total Voltage of Battery Packs	346	Battery Energy Capacity	225
Battery Specific Energy	80	Battery Charger Type	On-Board
Number of Capacitors	--	Capacitor Rating (In Farads)	--
Mfr Capacitor Comments	--		
Hydraulic System Description	--		
Regenerative Braking Type	Electrical Regen Brake		
Regenerative Braking Source	Rear Wheels	Driver Controlled Regenerative Braking	Yes
Mfr Regenerative Braking Description	--		
Drive Motor(s)/Generator(s)	1		
Motor/Generator Type 1	AC Induction	Rated Motor/Generator Power	261
Mfr Fuel Cell Description	N/A		
Fuel Cell On-Board H2 Storage Capacity (kg)	--	Usable H2 Fill Capacity (kg)	--
Mfr Hybrid Electric/ Electric Vehicle Comments	--		

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--						
Emission Data Vehicle Information									
Vehicle ID / Configuration	GR40 / 0	Manufacturer Vehicle Configuration Number	0						
Original Test Group Name	NCANJ.000261	Original Evaporative/Refueling Family	--						
Original Test Vehicle Model Year	2022								
Vehicle Model									
Represented Test Vehicle Make	Canoo	Represented Test Vehicle Model	Lifestyle Delivery Vehicle (LDV)						
Leak Family Details									
Leak Family Identifier	--	Leak Family Name	--						
Drive Sources and Fuel System Details									
	<table border="1"> <tr> <th>Drive Source and Fuel#</th><th>Drive Source</th><th>Fuel</th></tr> <tr> <td>1</td><td>Electric Motor</td><td>Electricity</td></tr> </table>	Drive Source and Fuel#	Drive Source	Fuel	1	Electric Motor	Electricity		
Drive Source and Fuel#	Drive Source	Fuel							
1	Electric Motor	Electricity							
Hybrid Indicator	No								
Multiple Fuel Storage	--	Multiple Fuel Combustion	--						
Fuel Cell Indicator	No	Rechargeable Energy Storage System Indicator	Yes						
Rechargeable Energy Storage System	Battery(s)	Rechargeable Energy Storage System, if 'Other'	--						
Off-board charge Capable Indicator	Yes								
Odometer Correction -- Initial	1	Odometer Correction Factor	1						
Odometer Correction Sign	+ = System Miles is equal to (Test odometer reading * Correction factor) + Initial system miles								
Odometer Correction Units	Miles								
Engine Code	261	Rated Horsepower	350						
Displacement (liters)	0.01								
Air Aspiration Method	Naturally Aspirated	Air Aspiration Method, if 'Other'							
Number of Air Aspiration Devices	--	Air Aspiration Device Configuration	--						
Charge Air Cooler Type	--	Drive Mode While Testing	2-Wheel Drive, Rear						
Shift Indicator Light Usage	Not equipped	Aged Emission Components	4,000 (mi)						
Curb Weight (lbs)	4514	Equivalent Test Weight (pounds)	4750						
GVWR (lbs)	--	N/V Ratio	1.1						
Axle Ratio	8.97								
Transmission Type	Automatic	# of Transmission Gears	1						
Transmission Lockup	No	Creep Gear	No						
Dynamometer Coefficients:									
	Target Coefficients								
	Set Coefficients								
Coefficient Category	A (lbf)	B (lbf/mph)	C (lbf/mph**2)						
City/Highway/Evap	25.054	0.41733	0.026047						
	A (lbf)	B (lbf/mph)	C (lbf/mph**2)						
	-5.82	-0.27305	0.03157						
	EPA Calculated Total Road Load Horse Power for City/Highway/Evap Coefficients								
	14.8								
Emission Control Device Comments	N/A - this is a BEV								

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--
Manufacturer Test Vehicle Comments	N/V ratio is 110.47. Data entered is a placeholder due to CDX issues.		

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--																																									
Test #	NCAN10078405	Test Procedure	84 - Charge Depleting Highway																																									
Exhaust Test # for this Evap Test	--	Test Fuel Type	62 - Electricity																																									
Test Date	11/11/2022	Fuel	Electricity																																									
Fuel Batch ID	--	Fuel Calibration Number	--																																									
Vehicle Class	LDT2 (LVW 3751-5750, GVW 0-6000)	DF Type	Mfr. Determined																																									
Verify Test Lab ID	Volkswagen Test Center Oxnard																																											
E10 Evaporative Test Measurement Method	--																																											
Test Start Odometer Reading	2602	Odometer Units	K																																									
4WD Test Dyno	Yes	Diesel Adjustment Factor Usage	--																																									
State of Charge Delta	Yes																																											
Drive Cycle Speed Tolerance Criteria	Used Part 86 (+/- 2 mph, +/- 1 sec)	Road Speed Fan Usage	Yes																																									
PHEV/EV Charge Depleting Test Information																																												
Recharge Event Voltage	240	Recharge Event Energy (kiloWatt-hours)	85.868																																									
Charge Depleting Range (Calculated miles)	289.7	Charge Depleting Range (Actual miles)	289.7																																									
All Electric Range Unadjusted (miles)	--	Derived 5-Cycle Coefficient Model Year	--																																									
Equivalent All Electric Range (miles)	289.7																																											
Number of Charge Depleting Bags/Phases Conducted	2	Transition Bag/Phase Number	--																																									
Charge Depleting Bag/Phase																																												
	<table border="1"> <thead> <tr> <th>Charge Depleting Bag/Phase #</th> <th>Test Result/Emission Name</th> <th>Unrounded Test Result</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Carbon Monoxide</td> <td>0</td> </tr> <tr> <td>2</td> <td>Carbon dioxide</td> <td>0</td> </tr> <tr> <td>3</td> <td>Carbon-Related Exhaust Emissions</td> <td>0</td> </tr> <tr> <td>4</td> <td>Drive Trace Absolute Speed Change Rating</td> <td>2.72</td> </tr> <tr> <td>5</td> <td>Drive Trace Energy Economy Rating</td> <td>0.52</td> </tr> <tr> <td>6</td> <td>Drive Trace Inertia Work Ratio Rating</td> <td>3.16</td> </tr> <tr> <td>7</td> <td>Manufacturer Fuel Economy</td> <td>113.7</td> </tr> <tr> <td>8</td> <td>Nitrogen Oxide</td> <td>0</td> </tr> <tr> <td>9</td> <td>Non-methane organic gases</td> <td>0</td> </tr> <tr> <td>10</td> <td>Non-methane organic gases plus Nitrogen Oxides</td> <td>999.999</td> </tr> <tr> <td>11</td> <td>Particulate Matter</td> <td>0</td> </tr> <tr> <td>12</td> <td>System End State of Charge Watt-hours</td> <td>70.6685</td> </tr> <tr> <td>13</td> <td>System Start State of Charge Watt-hours</td> <td>73.4491</td> </tr> </tbody> </table>	Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	1	Carbon Monoxide	0	2	Carbon dioxide	0	3	Carbon-Related Exhaust Emissions	0	4	Drive Trace Absolute Speed Change Rating	2.72	5	Drive Trace Energy Economy Rating	0.52	6	Drive Trace Inertia Work Ratio Rating	3.16	7	Manufacturer Fuel Economy	113.7	8	Nitrogen Oxide	0	9	Non-methane organic gases	0	10	Non-methane organic gases plus Nitrogen Oxides	999.999	11	Particulate Matter	0	12	System End State of Charge Watt-hours	70.6685	13	System Start State of Charge Watt-hours	73.4491	
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result																																										
1	Carbon Monoxide	0																																										
2	Carbon dioxide	0																																										
3	Carbon-Related Exhaust Emissions	0																																										
4	Drive Trace Absolute Speed Change Rating	2.72																																										
5	Drive Trace Energy Economy Rating	0.52																																										
6	Drive Trace Inertia Work Ratio Rating	3.16																																										
7	Manufacturer Fuel Economy	113.7																																										
8	Nitrogen Oxide	0																																										
9	Non-methane organic gases	0																																										
10	Non-methane organic gases plus Nitrogen Oxides	999.999																																										
11	Particulate Matter	0																																										
12	System End State of Charge Watt-hours	70.6685																																										
13	System Start State of Charge Watt-hours	73.4491																																										
Charge Depleting Bag/Phase																																												

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--																																										
<table><tr><th>Charge Depleting Bag/Phase #</th><th>Test Result/Emission Name</th><th>Unrounded Test Result</th></tr><tr><td>14</td><td>Carbon Monoxide</td><td>0</td></tr><tr><td>15</td><td>Carbon dioxide</td><td>0</td></tr><tr><td>16</td><td>Carbon-Related Exhaust Emissions</td><td>0</td></tr><tr><td>17</td><td>Drive Trace Absolute Speed Change Rating</td><td>2.53</td></tr><tr><td>18</td><td>Drive Trace Energy Economy Rating</td><td>-0.346</td></tr><tr><td>19</td><td>Drive Trace Inertia Work Ratio Rating</td><td>3.403</td></tr><tr><td>20</td><td>Manufacturer Fuel Economy</td><td>113.7</td></tr><tr><td>21</td><td>Nitrogen Oxide</td><td>0</td></tr><tr><td>22</td><td>Non-methane organic gases</td><td>0</td></tr><tr><td>23</td><td>Non-methane organic gases plus Nitrogen Oxides</td><td>999.999</td></tr><tr><td>24</td><td>Particulate Matter</td><td>0</td></tr><tr><td>25</td><td>System End State of Charge Watt-hours</td><td>11.7668</td></tr><tr><td>26</td><td>System Start State of Charge Watt-hours</td><td>14.3595</td></tr></table>				Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	14	Carbon Monoxide	0	15	Carbon dioxide	0	16	Carbon-Related Exhaust Emissions	0	17	Drive Trace Absolute Speed Change Rating	2.53	18	Drive Trace Energy Economy Rating	-0.346	19	Drive Trace Inertia Work Ratio Rating	3.403	20	Manufacturer Fuel Economy	113.7	21	Nitrogen Oxide	0	22	Non-methane organic gases	0	23	Non-methane organic gases plus Nitrogen Oxides	999.999	24	Particulate Matter	0	25	System End State of Charge Watt-hours	11.7668	26	System Start State of Charge Watt-hours	14.3595
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result																																											
14	Carbon Monoxide	0																																											
15	Carbon dioxide	0																																											
16	Carbon-Related Exhaust Emissions	0																																											
17	Drive Trace Absolute Speed Change Rating	2.53																																											
18	Drive Trace Energy Economy Rating	-0.346																																											
19	Drive Trace Inertia Work Ratio Rating	3.403																																											
20	Manufacturer Fuel Economy	113.7																																											
21	Nitrogen Oxide	0																																											
22	Non-methane organic gases	0																																											
23	Non-methane organic gases plus Nitrogen Oxides	999.999																																											
24	Particulate Matter	0																																											
25	System End State of Charge Watt-hours	11.7668																																											
26	System Start State of Charge Watt-hours	14.3595																																											
Manufacturer Test Comments DC energy consumption HWFE1 = 270.8 Wh/mi; HWFE2 = 252.7 Wh/mi; HWFE average = 261.7 Wh/m. **Start SOC and End SOC for each phase for tables above are entered as Kilowatt Hours, due to value limit of 9999.99.**																																													
Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	RAF	NMOG/NM HC Ratio	Diesel Adjustment Factor	Add DF	Mult DF	Certification Level	Standard	Pass/Fail																																	
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass																																	
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass																																	
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--																																	
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--																																	

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--																																									
Test #	NCAN10078406	Test Procedure	81 - Charge Depleting UDDS																																									
Exhaust Test # for this Evap Test	--	Test Fuel Type	62 - Electricity																																									
Test Date	11/11/2022	Fuel	Electricity																																									
Fuel Batch ID	--	Fuel Calibration Number	--																																									
Vehicle Class	LDT2 (LVW 3751-5750, GVW 0-6000)	DF Type	Mfr. Determined																																									
Verify Test Lab ID	Volkswagen Test Center Oxnard																																											
E10 Evaporative Test Measurement Method	--																																											
Test Start Odometer Reading	2602	Odometer Units	K																																									
4WD Test Dyno	Yes	Diesel Adjustment Factor Usage	--																																									
State of Charge Delta	Yes																																											
Drive Cycle Speed Tolerance Criteria	Used Part 86 (+/- 2 mph, +/- 1 sec)	Road Speed Fan Usage	Yes																																									
PHEV/EV Charge Depleting Test Information																																												
Recharge Event Voltage	240	Recharge Event Energy (kiloWatt-hours)	85.868																																									
Charge Depleting Range (Calculated miles)	355.5	Charge Depleting Range (Actual miles)	355.5																																									
All Electric Range Unadjusted (miles)	--	Derived 5-Cycle Coefficient Model Year	--																																									
Equivalent All Electric Range (miles)	355.5																																											
Number of Charge Depleting Bags/Phases Conducted	4	Transition Bag/Phase Number	--																																									
Charge Depleting Bag/Phase																																												
	<table border="1"> <thead> <tr> <th>Charge Depleting Bag/Phase #</th> <th>Test Result/Emission Name</th> <th>Unrounded Test Result</th> </tr> </thead> <tbody> <tr><td>1</td><td>Carbon Monoxide</td><td>0</td></tr> <tr><td>2</td><td>Carbon dioxide</td><td>0</td></tr> <tr><td>3</td><td>Carbon-Related Exhaust Emissions</td><td>0</td></tr> <tr><td>4</td><td>Drive Trace Absolute Speed Change Rating</td><td>0.09</td></tr> <tr><td>5</td><td>Drive Trace Energy Economy Rating</td><td>0.27</td></tr> <tr><td>6</td><td>Drive Trace Inertia Work Ratio Rating</td><td>0.376</td></tr> <tr><td>7</td><td>Manufacturer Fuel Economy</td><td>139.5</td></tr> <tr><td>8</td><td>Nitrogen Oxide</td><td>0</td></tr> <tr><td>9</td><td>Non-methane organic gases</td><td>0</td></tr> <tr><td>10</td><td>Non-methane organic gases plus Nitrogen Oxides</td><td>999.999</td></tr> <tr><td>11</td><td>Particulate Matter</td><td>0</td></tr> <tr><td>12</td><td>System End State of Charge Watt-hours</td><td>73.4491</td></tr> <tr><td>13</td><td>System Start State of Charge Watt-hours</td><td>75.8256</td></tr> </tbody> </table>	Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	1	Carbon Monoxide	0	2	Carbon dioxide	0	3	Carbon-Related Exhaust Emissions	0	4	Drive Trace Absolute Speed Change Rating	0.09	5	Drive Trace Energy Economy Rating	0.27	6	Drive Trace Inertia Work Ratio Rating	0.376	7	Manufacturer Fuel Economy	139.5	8	Nitrogen Oxide	0	9	Non-methane organic gases	0	10	Non-methane organic gases plus Nitrogen Oxides	999.999	11	Particulate Matter	0	12	System End State of Charge Watt-hours	73.4491	13	System Start State of Charge Watt-hours	75.8256	
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result																																										
1	Carbon Monoxide	0																																										
2	Carbon dioxide	0																																										
3	Carbon-Related Exhaust Emissions	0																																										
4	Drive Trace Absolute Speed Change Rating	0.09																																										
5	Drive Trace Energy Economy Rating	0.27																																										
6	Drive Trace Inertia Work Ratio Rating	0.376																																										
7	Manufacturer Fuel Economy	139.5																																										
8	Nitrogen Oxide	0																																										
9	Non-methane organic gases	0																																										
10	Non-methane organic gases plus Nitrogen Oxides	999.999																																										
11	Particulate Matter	0																																										
12	System End State of Charge Watt-hours	73.4491																																										
13	System Start State of Charge Watt-hours	75.8256																																										
Charge Depleting Bag/Phase																																												

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--
-------------------	--------------	------------------------------	----

Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result
14	Carbon Monoxide	0
15	Carbon dioxide	0
16	Carbon-Related Exhaust Emissions	0
17	Drive Trace Absolute Speed Change Rating	-0.68
18	Drive Trace Energy Economy Rating	-0.216
19	Drive Trace Inertia Work Ratio Rating	-0.452
20	Manufacturer Fuel Economy	139.5
21	Nitrogen Oxide	0
22	Non-methane organic gases	0
23	Non-methane organic gases plus Nitrogen Oxides	999.999
24	Particulate Matter	0
25	System End State of Charge Watt-hours	69.0227
26	System Start State of Charge Watt-hours	70.6685

Charge Depleting Bag/Phase

Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result
27	Carbon Monoxide	0
28	Carbon dioxide	0
29	Carbon-Related Exhaust Emissions	0
30	Drive Trace Absolute Speed Change Rating	-1.83
31	Drive Trace Energy Economy Rating	-1.286
32	Drive Trace Inertia Work Ratio Rating	-2.269
33	Manufacturer Fuel Economy	139.5
34	Nitrogen Oxide	0
35	Non-methane organic gases	0
36	Non-methane organic gases plus Nitrogen Oxides	999.999
37	System End State of Charge Watt-hours	10.2418
38	System Start State of Charge Watt-hours	11.7668

Charge Depleting Bag/Phase

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--
-------------------	--------------	------------------------------	----

Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result
39	Carbon Monoxide	0
40	Carbon dioxide	0
41	Carbon-Related Exhaust Emissions	0
42	Drive Trace Absolute Speed Change Rating	-2.31
43	Drive Trace Energy Economy Rating	-0.942
44	Drive Trace Inertia Work Ratio Rating	-3.128
45	Manufacturer Fuel Economy	139.5
46	Nitrogen Oxide	0
47	Non-methane organic gases	0
48	Non-methane organic gases plus Nitrogen Oxides	999.999
49	System End State of Charge Watt-hours	14.3595
50	System Start State of Charge Watt-hours	15.8512

Manufacturer Test Comments

DC energy consumption UDDS 1 = 319.4 Wh/mi; UDDS2 = 220.6 Wh/mi; UDDS3 = 203.0 Wh/mi; UDDS4 = 206.1 Wh/mi; UDDS weighted = 213.3 Wh/mi; UDDS1 DC discharge energy = 2376.5 Wh/mi; MCT UBE energy = 75825.6 Wh. **Start SOC and End SOC for each phase for tables above are entered as Kilowatt Hours, due to value limit of 9999.99.**

Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	RAF	NMOG/NM HC Ratio	Diesel Adjustment Factor	Add DF	Mult DF	Certification Level	Standard	Pass/Fail
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--																																						
Test #	NCAN10079087	Test Procedure	81 - Charge Depleting UDDS																																						
Exhaust Test # for this Evap Test	--	Test Fuel Type	62 - Electricity																																						
Test Date	03/01/2023	Fuel	Electricity																																						
Fuel Batch ID	--	Fuel Calibration Number	--																																						
Vehicle Class	LDT2 (LVW 3751-5750, GVW 0-6000)	DF Type	Mfr. Determined																																						
Verify Test Lab ID	NVFEL																																								
E10 Evaporative Test Measurement Method	--																																								
Test Start Odometer Reading	3137	Odometer Units	K																																						
4WD Test Dyno	Yes	Diesel Adjustment Factor Usage	--																																						
State of Charge Delta	Yes																																								
Drive Cycle Speed Tolerance Criteria	Used Part 86 (+/- 2 mph, +/- 1 sec)	Road Speed Fan Usage	Yes																																						
PHEV/EV Charge Depleting Test Information																																									
Recharge Event Voltage	243.4	Recharge Event Energy (kiloWatt-hours)	85.306																																						
Charge Depleting Range (Calculated miles)	335.86	Charge Depleting Range (Actual miles)	335.86																																						
All Electric Range Unadjusted (miles)	--	Derived 5-Cycle Coefficient Model Year	--																																						
Equivalent All Electric Range (miles)	335.86																																								
Number of Charge Depleting Bags/Phases Conducted	4	Transition Bag/Phase Number	--																																						
Charge Depleting Bag/Phase																																									
	<table border="1"> <thead> <tr> <th>Charge Depleting Bag/Phase #</th> <th>Test Result/Emission Name</th> <th>Unrounded Test Result</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Carbon Monoxide</td> <td>0</td> </tr> <tr> <td>2</td> <td>Carbon dioxide</td> <td>0</td> </tr> <tr> <td>3</td> <td>Carbon-Related Exhaust Emissions</td> <td>0</td> </tr> <tr> <td>4</td> <td>Drive Trace Absolute Speed Change Rating</td> <td>1.39</td> </tr> <tr> <td>5</td> <td>Drive Trace Energy Economy Rating</td> <td>0.146</td> </tr> <tr> <td>6</td> <td>Drive Trace Inertia Work Ratio Rating</td> <td>1.564</td> </tr> <tr> <td>7</td> <td>Manufacturer Fuel Economy</td> <td>132.7</td> </tr> <tr> <td>8</td> <td>Nitrogen Oxide</td> <td>0</td> </tr> <tr> <td>9</td> <td>Non-methane organic gases</td> <td>0</td> </tr> <tr> <td>10</td> <td>Non-methane organic gases plus Nitrogen Oxides</td> <td>999.999</td> </tr> <tr> <td>11</td> <td>System End State of Charge Watt-hours</td> <td>13.15418</td> </tr> <tr> <td>12</td> <td>System Start State of Charge Watt-hours</td> <td>14.72188</td> </tr> </tbody> </table>	Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	1	Carbon Monoxide	0	2	Carbon dioxide	0	3	Carbon-Related Exhaust Emissions	0	4	Drive Trace Absolute Speed Change Rating	1.39	5	Drive Trace Energy Economy Rating	0.146	6	Drive Trace Inertia Work Ratio Rating	1.564	7	Manufacturer Fuel Economy	132.7	8	Nitrogen Oxide	0	9	Non-methane organic gases	0	10	Non-methane organic gases plus Nitrogen Oxides	999.999	11	System End State of Charge Watt-hours	13.15418	12	System Start State of Charge Watt-hours	14.72188	
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result																																							
1	Carbon Monoxide	0																																							
2	Carbon dioxide	0																																							
3	Carbon-Related Exhaust Emissions	0																																							
4	Drive Trace Absolute Speed Change Rating	1.39																																							
5	Drive Trace Energy Economy Rating	0.146																																							
6	Drive Trace Inertia Work Ratio Rating	1.564																																							
7	Manufacturer Fuel Economy	132.7																																							
8	Nitrogen Oxide	0																																							
9	Non-methane organic gases	0																																							
10	Non-methane organic gases plus Nitrogen Oxides	999.999																																							
11	System End State of Charge Watt-hours	13.15418																																							
12	System Start State of Charge Watt-hours	14.72188																																							
Charge Depleting Bag/Phase																																									

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	
13	Carbon Monoxide	0	
14	Carbon dioxide	0	
15	Carbon-Related Exhaust Emissions	0	
16	Drive Trace Absolute Speed Change Rating	0.61	
17	Drive Trace Energy Economy Rating	0.531	
18	Drive Trace Inertia Work Ratio Rating	1.729	
19	Manufacturer Fuel Economy	132.7	
20	Nitrogen Oxide	0	
21	Non-methane organic gases	0	
22	Non-methane organic gases plus Nitrogen Oxides	999.999	
23	System End State of Charge Watt-hours	8.86971	
24	System Start State of Charge Watt-hours	10.50158	

Charge Depleting Bag/Phase

Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	
25	Carbon Monoxide	0	
26	Carbon dioxide	0	
27	Carbon-Related Exhaust Emissions	0	
28	Drive Trace Absolute Speed Change Rating	1.03	
29	Drive Trace Energy Economy Rating	1.182	
30	Drive Trace Inertia Work Ratio Rating	1.782	
31	Manufacturer Fuel Economy	132.7	
32	Nitrogen Oxide	0	
33	Non-methane organic gases	0	
34	Non-methane organic gases plus Nitrogen Oxides	999.999	
35	Particulate Matter	0	
36	System End State of Charge Watt-hours	73.8778	
37	System Start State of Charge Watt-hours	76.3276	

Charge Depleting Bag/Phase

Certification Summary Information Report

Test Group		PCANJ.000261		Evaporative/Refueling Family				--					
		Charge Depleting Bag/Phase #		Test Result/Emission Name		Unrounded Test Result							
		38		Carbon Monoxide		0							
		39		Carbon dioxide		0							
		40		Carbon-Related Exhaust Emissions		0							
		41		Drive Trace Absolute Speed Change Rating		0.4							
		42		Drive Trace Energy Economy Rating		0.765							
		43		Drive Trace Inertia Work Ratio Rating		0.699							
		44		Manufacturer Fuel Economy		132.7							
		45		Nitrogen Oxide		0							
		46		Non-methane organic gases		0							
		47		Non-methane organic gases plus Nitrogen Oxides		999.999							
		48		Particulate Matter		0							
		49		System End State of Charge Watt-hours		69.12402							
		50		System Start State of Charge Watt-hours		70.88266							
Manufacturer Test Comments		DC energy consumption UDDS 1 = 332.85 Wh/mi; UDDS2 = 238.62 Wh/mi; UDDS3 = 212.14 Wh/mi; UDDS4 = 220.52 Wh/mi; UDDS weighted = 253.99 Wh/mi; UDDS1 DC discharge energy = 2449.8 Wh/mi; MCT UBE energy = 76327.56 Wh. **Start SOC and End SOC for each phase for tables above are entered as Kilowatt Hours, due to value limit of 9999.99.**											
Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	RAF	NMOG/NM HC Ratio	Diesel Adjustment Factor	Add DF	Mult DF	Certification Level	Standard	Pass/Fail	
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass	
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass	
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass	
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass	
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--	
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--	
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--	
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--	

Certification Summary Information Report

Test Group	PCANJ.000261	Evaporative/Refueling Family	--																																									
Test #	NCAN10079088	Test Procedure	84 - Charge Depleting Highway																																									
Exhaust Test # for this Evap Test	--	Test Fuel Type	62 - Electricity																																									
Test Date	03/01/2023	Fuel	Electricity																																									
Fuel Batch ID	--	Fuel Calibration Number	--																																									
Vehicle Class	LDT2 (LVW 3751-5750, GVW 0-6000)	DF Type	Mfr. Determined																																									
Verify Test Lab ID	Volkswagen Test Center Oxnard																																											
E10 Evaporative Test Measurement Method	--																																											
Test Start Odometer Reading	3137	Odometer Units	K																																									
4WD Test Dyno	Yes	Diesel Adjustment Factor Usage	--																																									
State of Charge Delta	Yes																																											
Drive Cycle Speed Tolerance Criteria	Used Part 86 (+/- 2 mph, +/- 1 sec)	Road Speed Fan Usage	Yes																																									
PHEV/EV Charge Depleting Test Information																																												
Recharge Event Voltage	243.4	Recharge Event Energy (kiloWatt-hours)	85.306																																									
Charge Depleting Range (Calculated miles)	276.96	Charge Depleting Range (Actual miles)	276.96																																									
All Electric Range Unadjusted (miles)	--	Derived 5-Cycle Coefficient Model Year	--																																									
Equivalent All Electric Range (miles)	276.96																																											
Number of Charge Depleting Bags/Phases Conducted	2	Transition Bag/Phase Number	--																																									
Charge Depleting Bag/Phase																																												
	<table border="1"> <thead> <tr> <th>Charge Depleting Bag/Phase #</th> <th>Test Result/Emission Name</th> <th>Unrounded Test Result</th> </tr> </thead> <tbody> <tr><td>1</td><td>Carbon Monoxide</td><td>0</td></tr> <tr><td>2</td><td>Carbon dioxide</td><td>0</td></tr> <tr><td>3</td><td>Carbon-Related Exhaust Emissions</td><td>0</td></tr> <tr><td>4</td><td>Drive Trace Absolute Speed Change Rating</td><td>5.94</td></tr> <tr><td>5</td><td>Drive Trace Energy Economy Rating</td><td>0.764</td></tr> <tr><td>6</td><td>Drive Trace Inertia Work Ratio Rating</td><td>7.055</td></tr> <tr><td>7</td><td>Manufacturer Fuel Economy</td><td>109.43</td></tr> <tr><td>8</td><td>Nitrogen Oxide</td><td>0</td></tr> <tr><td>9</td><td>Non-methane organic gases</td><td>0</td></tr> <tr><td>10</td><td>Non-methane organic gases plus Nitrogen Oxides</td><td>999.999</td></tr> <tr><td>11</td><td>Particulate Matter</td><td>0</td></tr> <tr><td>12</td><td>System End State of Charge Watt-hours</td><td>70.8827</td></tr> <tr><td>13</td><td>System Start State of Charge Watt-hours</td><td>73.8778</td></tr> </tbody> </table>	Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	1	Carbon Monoxide	0	2	Carbon dioxide	0	3	Carbon-Related Exhaust Emissions	0	4	Drive Trace Absolute Speed Change Rating	5.94	5	Drive Trace Energy Economy Rating	0.764	6	Drive Trace Inertia Work Ratio Rating	7.055	7	Manufacturer Fuel Economy	109.43	8	Nitrogen Oxide	0	9	Non-methane organic gases	0	10	Non-methane organic gases plus Nitrogen Oxides	999.999	11	Particulate Matter	0	12	System End State of Charge Watt-hours	70.8827	13	System Start State of Charge Watt-hours	73.8778	
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result																																										
1	Carbon Monoxide	0																																										
2	Carbon dioxide	0																																										
3	Carbon-Related Exhaust Emissions	0																																										
4	Drive Trace Absolute Speed Change Rating	5.94																																										
5	Drive Trace Energy Economy Rating	0.764																																										
6	Drive Trace Inertia Work Ratio Rating	7.055																																										
7	Manufacturer Fuel Economy	109.43																																										
8	Nitrogen Oxide	0																																										
9	Non-methane organic gases	0																																										
10	Non-methane organic gases plus Nitrogen Oxides	999.999																																										
11	Particulate Matter	0																																										
12	System End State of Charge Watt-hours	70.8827																																										
13	System Start State of Charge Watt-hours	73.8778																																										
Charge Depleting Bag/Phase																																												

Certification Summary Information Report

Test Group		PCANJ.000261		Evaporative/Refueling Family		--																																									
		<table><tr><th>Charge Depleting Bag/Phase #</th><th>Test Result/Emission Name</th><th>Unrounded Test Result</th></tr><tr><td>14</td><td>Carbon Monoxide</td><td>0</td></tr><tr><td>15</td><td>Carbon dioxide</td><td>0</td></tr><tr><td>16</td><td>Carbon-Related Exhaust Emissions</td><td>0</td></tr><tr><td>17</td><td>Drive Trace Absolute Speed Change Rating</td><td>9.41</td></tr><tr><td>18</td><td>Drive Trace Energy Economy Rating</td><td>0.257</td></tr><tr><td>19</td><td>Drive Trace Inertia Work Ratio Rating</td><td>10.95</td></tr><tr><td>20</td><td>Manufacturer Fuel Economy</td><td>109.43</td></tr><tr><td>21</td><td>Nitrogen Oxide</td><td>0</td></tr><tr><td>22</td><td>Non-methane organic gases</td><td>0</td></tr><tr><td>23</td><td>Non-methane organic gases plus Nitrogen Oxides</td><td>999.999</td></tr><tr><td>24</td><td>Particulate Matter</td><td>0</td></tr><tr><td>25</td><td>System End State of Charge Watt-hours</td><td>10.5016</td></tr><tr><td>26</td><td>System Start State of Charge Watt-hours</td><td>13.1542</td></tr></table>		Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result	14	Carbon Monoxide	0	15	Carbon dioxide	0	16	Carbon-Related Exhaust Emissions	0	17	Drive Trace Absolute Speed Change Rating	9.41	18	Drive Trace Energy Economy Rating	0.257	19	Drive Trace Inertia Work Ratio Rating	10.95	20	Manufacturer Fuel Economy	109.43	21	Nitrogen Oxide	0	22	Non-methane organic gases	0	23	Non-methane organic gases plus Nitrogen Oxides	999.999	24	Particulate Matter	0	25	System End State of Charge Watt-hours	10.5016	26	System Start State of Charge Watt-hours	13.1542		
Charge Depleting Bag/Phase #	Test Result/Emission Name	Unrounded Test Result																																													
14	Carbon Monoxide	0																																													
15	Carbon dioxide	0																																													
16	Carbon-Related Exhaust Emissions	0																																													
17	Drive Trace Absolute Speed Change Rating	9.41																																													
18	Drive Trace Energy Economy Rating	0.257																																													
19	Drive Trace Inertia Work Ratio Rating	10.95																																													
20	Manufacturer Fuel Economy	109.43																																													
21	Nitrogen Oxide	0																																													
22	Non-methane organic gases	0																																													
23	Non-methane organic gases plus Nitrogen Oxides	999.999																																													
24	Particulate Matter	0																																													
25	System End State of Charge Watt-hours	10.5016																																													
26	System Start State of Charge Watt-hours	13.1542																																													
Manufacturer Test Comments		DC energy consumption HWFE1 = 291.64 Wh/mi; HWFE2 = 259.55 Wh/mi; HWFE average = 308.01 Wh/m. **Start SOC and End SOC for each phase for tables above are entered as Kilowatt Hours, due to value limit of 9999.99.**																																													
Certification Region	Useful Life	Standard Level	Emission Name	Rounded Result	RAF	NMOG/NM HC Ratio	Diesel Adjustment Factor	Add DF	Mult DF	Certification Level	Standard	Pass/Fail																																			
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass																																			
Fed	4,000 miles	Federal Tier 3 Bin 0	CO	0.0	--	--	--	0	--	0	0	Pass																																			
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--																																			
Fed	4,000 miles	Federal Tier 3 Bin 0	CREE	0	--	--	--	0	--	0	--	--																																			
Fuel Properties																																															

Certification Summary Information Report

Test Group		PCANJ.000261			Evaporative/Refueling Family			--	
Consolidated List of Standards									
Exhaust Standards									
Cert Region		Federal			Cert/In-Use Code			Cert	
Vehicle Class		LDT2 (LVW 3751-5750, GVW 0-6000)			Standard Level			Federal Tier 3 Bin 0	
Fuel		Electricity			Test Procedure			Charge Depleting UDDS	
Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
4,000 miles	CO	--	--	--	--	--	--	0	0
4,000 miles	CO-COMP	--	--	--	--	--	--	0	0
4,000 miles	CREE	--	--	--	--	--	--	0	0
4,000 miles	NMOG+NOX-COMP	--	--	--	--	--	--	0	0
Cert Region		Federal			Cert/In-Use Code			Cert	
Vehicle Class		LDT2 (LVW 3751-5750, GVW 0-6000)			Standard Level			Federal Tier 3 Bin 0	
Fuel		Electricity			Test Procedure			Charge Depleting Highway	
Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
4,000 miles	CO	--	--	--	--	--	--	0	0
4,000 miles	CO-COMP	--	--	--	--	--	--	0	0
4,000 miles	CREE	--	--	--	--	--	--	0	0
4,000 miles	NMOG+NOX-COMP	--	--	--	--	--	--	0	0
Cert Region		Federal			Cert/In-Use Code			Cert	
Vehicle Class		LDT2 (LVW 3751-5750, GVW 0-6000)			Standard Level			Federal Tier 3 Bin 0	
Fuel		Electricity			Test Procedure			CVS 75 and later (w/o can. load)	
Useful Life	Emission Name	Rounded Result	RAF	NMOG / NMHC	Upward Diesel Adjustment Factor	Downward Diesel Adjustment Factor	Mult DF	Add DF	Std
4,000 miles	CO	--	--	--	--	--	--	0	0
4,000 miles	CO-COMP	--	--	--	--	--	--	0	0
4,000 miles	CREE	--	--	--	--	--	--	0	0
4,000 miles	NMOG+NOX-COMP	--	--	--	--	--	--	0	0

Certification Summary Information Report

Test Group		PCANJ.000261	Evaporative/Refueling Family		--
Glossary					
Useful Life					
4	4,000 miles		120	120,000 miles	
50	50,000 miles		150	150,000 miles	
100	100,000 miles				
Emission Name					
HC-TOTAL	Total Hydrocarbon		METHANOL	CH3OH - Methanol	
CO	Carbon Monoxide		N2O	Nitrous Oxide	
CO2	Carbon dioxide		SPITBACK	Spitback Hydrocarbon in grams	
CREE	Carbon-Related Exhaust Emissions		AMP-HRS	Integrated Amp-hours	
OPT-CREE	Optional Carbon-Related Exhaust Emissions		START-SOC	System Start State of Charge Watt-hours	
NOX	Nitrogen Oxide		END-SOC	System End State of Charge Watt-hours	
PM	Particulate Matter		ACT-DISTANCE	Actual Distance Driven (miles)	
PM-COMP	SFTP Composite Particulate Matter		AS-VOLT	Average System Voltage	
HC-NM	Non-methane Hydrocarbon		CO2 BAG 1	Bag 1 Carbon Dioxide	
OMHCE	Organic material Hydrocarbon Equivalent		CO2 BAG 2	Bag 2 Carbon Dioxide	
OMNMHCE	Organic material non-methane HC equivalent		CO2 BAG 3	Bag 3 Carbon Dioxide	
NMOG	Non-methane organic gases		CO2 BAG 4	Bag 4 Carbon Dioxide	
HCHO	Formaldehyde		NMOG+NOX	Non-methane organic gases plus Nitrogen Oxides	
H3C2HO	Acetaldehyde		NMOG+NOX-COMP	SFTP Composite Non-methane Organic Gases + Nitrogen Oxides	
HC-NM+NOX	SFTP Non-methane Hydrocarbon + Nitrogen Oxides for US06 or SC03		DT-IWRR	Drive Trace Inertia Work Ratio Rating	
HC-NM+NOX-COMP	SFTP Composite Non-methane Hydrocarbon + Nitrogen Oxides		DT-ASCR	Drive Trace Absolute Speed Change Rating	
CO-COMP	SFTP Composite Carbon Monoxide		DT-EER	Drive Trace Energy Economy Rating	
ETHANOL	C2H5OH - Ethanol		COMB-CREE	Combined Carbon-Related Exhaust Emissions	
FE BAG 1	Bag 1 Fuel Economy		COMB-OPT-CREE	Combined Optional Carbon-Related Exhaust Emissions	
FE BAG 2	Bag 2 Fuel Economy		HC-TOTAL-EQUIV	Total Hydrocarbon equivalent - Evap only	
FE BAG 3	Bag 3 Fuel Economy		METHANE-COMB	Combined CH4 for HD 2b/3 vehicles only	
FE BAG 4	Bag 4 Fuel Economy		N2O-COMB	Combined Nitrous Oxide for HD 2b/3 vehicles only	
MFR FE	Manufacturer Fuel Economy		LEAK-DIA	Effective Leak Diameter (inches)	
HC	Hydrocarbon for Running Loss and ORVR		LEAK-GAS CAP	Gas Cap Leakage (cc/min)	
METHANE	CH4 - Methane		CO2-COMB	Combined Carbon Dioxide for HD 2b/3 Vehicles Only	
Certification Region					
CA	California + CAA Section 177 states		FA	Federal	
Exhaust Emission Standard Level					
B1	Federal Tier 2 Bin 1		L3ULEV340	California LEV-III ULEV340	
B2	Federal Tier 2 Bin 2		L3ULEV250	California LEV-III ULEV250	
B3	Federal Tier 2 Bin 3		L3ULEV200	California LEV-III ULEV200	
B4	Federal Tier 2 Bin 4		L3SULEV170	California LEV-III SULEV170	
B5	Federal Tier 2 Bin 5		L3SULEV150	California LEV-III SULEV150	

Certification Summary Information Report

Test Group		PCANJ.000261	Evaporative/Refueling Family		--
B6	Federal Tier 2 Bin 6		L3LEV630	California LEV-III LEV630	
B7	Federal Tier 2 Bin 7		L3ULEV570	California LEV-III ULEV570	
B8	Federal Tier 2 Bin 8		L3ULEV400	California LEV-III ULEV400	
B9	Federal Tier 2 Bin 9		L3ULEV270	California LEV-III ULEV270	
B10	Federal Tier 2 Bin 10		L3SULEV230	California LEV-III SULEV230	
B11	Federal Tier 2 Bin 11		L3SULEV200	California LEV-III SULEV200	
HDV1	HDV1 (Federal HD chassis Class 2b GVW 8501-10000)		T3B160	Federal Tier 3 Bin 160	
HDV2	HDV2 (Federal HD chassis Class 3 GVW 10001-14000)		T3B125	Federal Tier 3 Bin 125	
L2	California LEV-II LEV		T3B110	Federal Tier 3 Transitional Bin 110	
L2OP	California LEV-II LEV Optional		T3B85	Federal Tier 3 Transitional Bin 85	
U2	California LEV-II ULEV		T3SULEV30	Federal Tier 3 Transitional LEV-II SULEV30 Carryover	
S2	California LEV-II SULEV		T3B70	Federal Tier 3 Bin 70	
ZEV	California ZEV		T3B50	Federal Tier 3 Bin 50	
OT	Other		T3B30	Federal Tier 3 Bin 30	
T1	Federal Tier 1		T3B20	Federal Tier 3 Bin 20	
PZEV	California PZEV		T3B0	Federal Tier 3 Bin 0	
L2LEV160	California LEV-II LEV160		HDV2B395	Federal Tier 3 HD Class 2b Transitional Bin 395	
L2ULEV125	California LEV-II ULEV125		HDV2B340	Federal Tier 3 HD Class 2b Transitional Bin 340	
L2SULEV30	California LEV-II SULEV30		HDV2B250	Federal Tier 3 HD Class 2b Bin 250	
L2LEV395	California LEV-II LEV395		HDV2B200	Federal Tier 3 HD Class 2b Bin 200	
L2ULEV340	California LEV-II ULEV340		HDV2B170	Federal Tier 3 HD Class 2b Bin 170	
L2LEV630	California LEV-II LEV630		HDV2B150	Federal Tier 3 HD Class 2b Bin 150	
L2ULEV570	California LEV-II ULEV570		HDV2B0	Federal Tier 3 HD Class 2b Bin 0	
L3LEV160	California LEV-III LEV160		HDV3B630	Federal Tier 3 HD Class 3 Transitional Bin 630	
L3ULEV125	California LEV-III ULEV125		HDV3B570	Federal Tier 3 HD Class 3 Transitional Bin 570	
L3ULEV70	California LEV-III ULEV70		HDV3B400	Federal Tier 3 HD Class 3 Bin 400	
L3ULEV50	California LEV-III ULEV50		HDV3B270	Federal Tier 3 HD Class 3 Bin 270	
L3SULEV30	California LEV-III SULEV30		HDV3B230	Federal Tier 3 HD Class 3 Bin 230	
L3SULEV20	California LEV-III SULEV20		HDV3B200	Federal Tier 3 HD Class 3 Bin 200	
L3LEV395	California LEV-III LEV395		HDV3B0	Federal Tier 3 HD Class 3 Bin 0	
Transmission Type Code					
AMS	Automated Manual- Selectable (e.g. Automated Manual with paddles)	M	Manual		
A	Automatic	OT	Other		
AM	Automated Manual	SA	Semi-Automatic		
CVT	Continuously Variable	SCV	Selectable Continuously Variable (e.g. CVT with paddles)		
Drive System Code					
4	4-Wheel Drive	P	Part-time 4-Wheel Drive		
F	2-Wheel Drive, Front	A	All Wheel Drive		
R	2-Wheel Drive, Rear				

Certification Summary Information Report

Test Group		PCANJ.000261		Evaporative/Refueling Family		--	
Additional Terms and Acronyms							
AFC	Alternative Fuel Converter			ICI	Independent Commercial Importer		
CSI	Certificate Summary Information			ORVR	Onboard Refueling Vapor Recovery		
DF	Deterioration Factor			SIL	Shift Indicator Light		
Evap	Evaporation, Evaporative			Trans	Transmission		