13250 N Haggerty Rd
Plymouth MI, 48170

Ms. Kathryn Kochunas
Compliance and Innovative Strategies Division
Office of Mobile Sources
Environmental Protection Agency
2000 Traverwood, Ann Arbor, MI 48105

Subject: MY 2022 Rivian Medium Duty Passenger Vehicle Initial Application for issuance of Certificate of Conformity for Test Group NRIVT00.0194.

Rivian believes that all vehicles within this test group comply with all applicable regulations within Code of Federal Regulations Title 40 Parts 85, 86, 600, and California Code of Regulations Title 13.

Vehicle Category:	Medium Duty Passenger Vehicle
Test Group:	NRIVT00.0194
Evaporative Family:	NRIVR0000194
Federal Standard:	Tier 3 Bin 0
California Standard:	ZEV

Test Group Description:
1 - Rivian R1T
9- 9 Module Battery
4 - 4 AC motors

Vehicles Covered by this certificate: Rivian R1T

Your early review and issuance of the certificate will be greatly appreciated. If you have any questions, please email me at sepzaker@Rivian.com or my phone number available on CDX.

Sepehr Zakeresfahani
Sr. Homologation Engineer - Range & Environmental

13250 N Haggerty Rd
Plymouth MI, 48170

Mr. Steven Hada
Emissions Certification and Compliance Division (ECCD)
Air Resources Board Laboratory
9528 Telstar Avenue, El Monte, CA 91731

Subject: MY 2022 Rivian Medium-Duty Vehicles Initial Application for issuance of Certificate of Conformity for Test Group NRIVT00.0194.

Rivian believes that all vehicles within this test group comply with all applicable regulations within Code of Federal Regulations Title 40 Parts 85, 86, 600, and California Code of Regulations Title 13.

Vehicle Category:	Medium-Duty Vehicles
Test Group:	NRIVT00.0194
Evaporative Family:	NRIVR0000194
Federal Standard:	Tier 3 Bin 0
California Standard:	ZEV

Test Group Description:
1 - Rivian R1T
9- 9 Module Battery
4 - 4 AC motors

Vehicles Covered by this certificate:	Rivian R1T

Your early review and issuance of the certificate will be greatly appreciated. If you have any questions, please email me at sepzaker@Rivian.com or my phone number available on DMS.

Sepehr Zakeresfahani
Sr. Homologation Engineer - Range & Environmental

13250 N Haggerty Rd
Plymouth MI, 48170

Contents

01.00.00 Communications

01.01.00 Mailing Information
Rivian Automotive, LLC
13250 N Haggerty Rd
Plymouth MI, 48170
Attention: Sepehr Zakeresfahani

01.01.01 Certification Information
Rivian Automotive, LLC
13250 N Haggerty Rd
Plymouth MI, 48170

01.01.02 Responsible official
Primary Contact:
Sepehr Zakeresfahani, Sr. Homologation Engineer.
SepZaker@rivian.com

02.00.00 Confidential Information
02.01.00 Statement of confidentiality

02.02.00 Test vehicle selection

02.03.00 Projected California annual model-year sales

03.00.00 Facilities, equipment, and test procedures

03.01.00 (Reserved)
03.02.00 Battery pre-conditioning procedures (if necessary)

03.03.00 Configurations and Sub configurations

03.04.00 Test Procedures
03.04.01 Range Test Procedures
03.04.02 Description of Coastdown

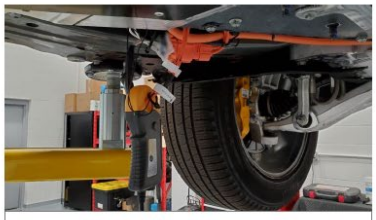
03.05.00 Special Test Instructions

Vehicle Setup:

Bleyer rigid bar fixation system. Front bar fixed to the front tow hook. and rear bar fixed to the tow hitch receiver.

Instrumentation:
Battery voltage and current measurement were taken using a HBM Gen4TB power analyzer and Hioki CT684X-05 and current clamps.

- Clamps installed to minimize number of measured current channels.
- Current clamp sizes determined by maximum combined circuit current.

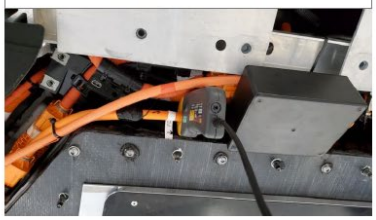


DC/AC Converter & PTC Heater – 200A

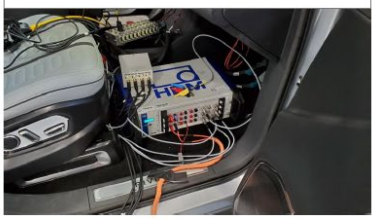
Rear Drive Unit – 500A

DC/DC Converter, AC Compressor & On-Board Charger – 200A

Front Drive Unit – 500A



Power Analyzer



AC Level 2 240 V/ 48 A (11.5 kW) charger was used for charging.

03.05.00 Statement of Compliance
Every vehicle which is covered by this application conforms to US EPA Federal Tier 3 Bin 0 regulations applicable to new Medium Duty Passenger Vehicles and state of California ZEV regulations applicable to new Medium-Duty Vehicles for the 2022 Model Year.

04.00.00 (Reserved)
05.00.00 (Reserved)
06.00.00 Maintenance
06.01.00 Test vehicle scheduled maintenance
06.02.00 Recommended customer maintenance schedule
Rivian Service is our proactive and personal approach to vehicle care, centered around the lives of our owners. Through remote diagnostics, a large fleet of mobile service vans staffed with Rivian Technicians, a network of service centers, and a flexible loaner program. Our approach to vehicle care requires very little from you. Rivian maintenance intervals are determined by onboard prognostics. Vehicle and environment sensors measure or model the remaining life of maintenance items. Owners are informed when maintenance is approaching or due by scheduling necessary maintenance items only.
Our fleet of mobile service vans can perform most vehicle care needs at your home, place of work, or wherever your vehicle might be. In many instances, you don't even have to be present, so you can carry on with your day. Mobile service is available for all Rivian owners anywhere in the US and Canada. As we expand into other markets, our suite of Rivian vehicle care capabilities, including mobile service, will continue to be a key component of our strategy.

Time till repair (year)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Miles to repair equivalent	12.5K	25K	37.5K	50K	62.5K	75K	87.5K	90K	102.5K	115K
R1T Maintenance Schedule										
Multi-point inspection	X	X	X	X	X	X	X	X	X	X
Drive unit & gearbox fluid lubricant									X	

06.03.00 Lubricants and heater fuels, if any

Transmission Oil:

BOT 350 M3 transmission fluid for dry electric drive units.

Test	Method	Units	
SAE Grade		-	**75W**
Density @ 15C, Relative	ASTM D1298	g/ml	**0.852**
Appearance Visual		-	**clear**
Viscosity, Kinematic 100°C	ASTM D445	mm²/s	**6.3**
Viscosity, Kinematic 40°C	ASTM D445	mm²/s	**32**
Viscosity Index		-	**154**
Viscosity, Brookfield @ -40°C	ASTM D2983	mPa.s (cP)	**10000**
Pour Point	ASTM D97	°C	**-51**
Flash Point, COC	ASTM D92	°C	**226**

Coolant: L228

Performance of L288 According to ASTM D3306

Table 1 – ASTM D3306 Results

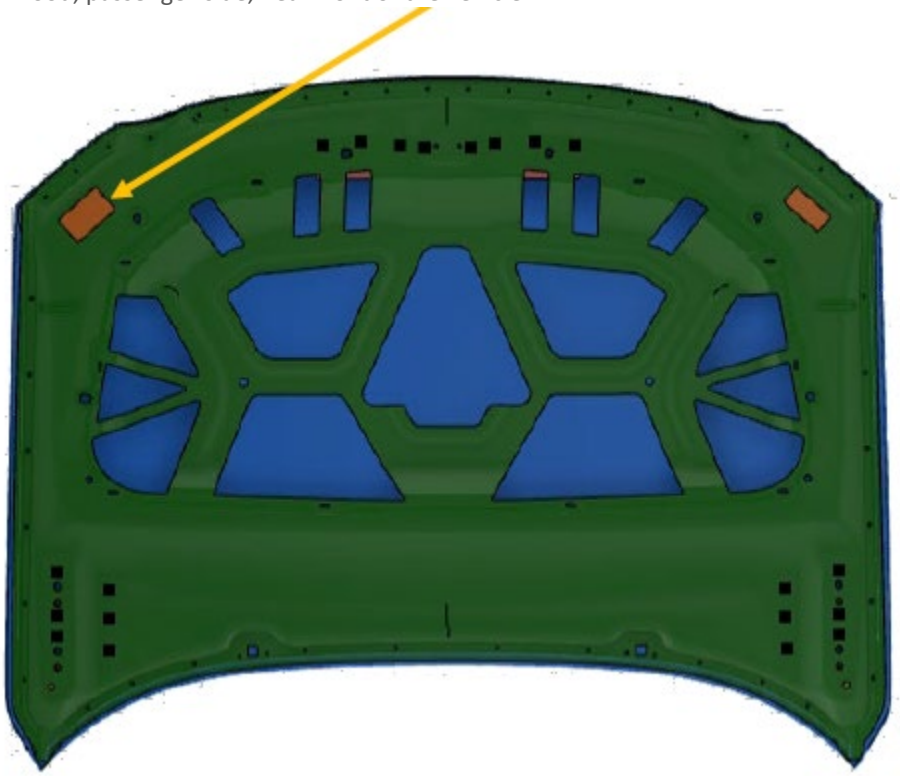
Item			ASTM D3306 Type I	CCI L288
Color			Distinctive	Yellow
Relative Density 15.5/15.5°C			1.110 ~ 1.145	1.128
Freezing Point °C	50 vol% in DI water		-36.4 max.	-37
Boiling Point °C	50 vol% in DI water		108 min.	109
Ash content mass%			5 max.	1.7
pH	50 vol% in DI water		7.5 ~ 11.0	7.6
Chloride μg/g			25 max.	<25
Water mass%			5 max.	3.8
Reserve Alkalinity mL			Report	8.0
Effect on Automotive Finish			No Effect	Pass
Corrosion in Glassware	Weight Loss[1] mg/Specimen	Copper	10 max.	0.2
		Solder	30 max.	4.3
		Brass	10 max.	1.9
		Steel	10 max.	0.7
		Cast Iron	10 max.	1.4
		Aluminum	30 max.	+0.2
Simulated Service Test	Weight Loss[1] mg/Specimen	Copper	20 max.	0.7
		Solder	60 max.	6.9
		Brass	20 max.	5.9
		Steel	20 max.	0.2
		Cast Iron	20 max.	3.3
		Aluminum	60 max.	0.1
Corrosion of Cast Aluminum Alloys at Heat-Rejecting Surfaces mg/cm²/week			1.0 max.	0.1
Foaming	Volume mL		150 max.	20
	Break Time s		5 max.	3
Cavitation-Erosion Rating for pitting, cavitation, and erosion of the water pump			8 min.	9

Note (1): A plus sign designates weight gain.

07.00.00 Vehicle Emission Control Information (VECI) and Environmental

07.01.00 VECI Label locations

Under-hood, passenger-side, near front of the vehicle.



07.02.00 Sample VECI labels

RIVIAN

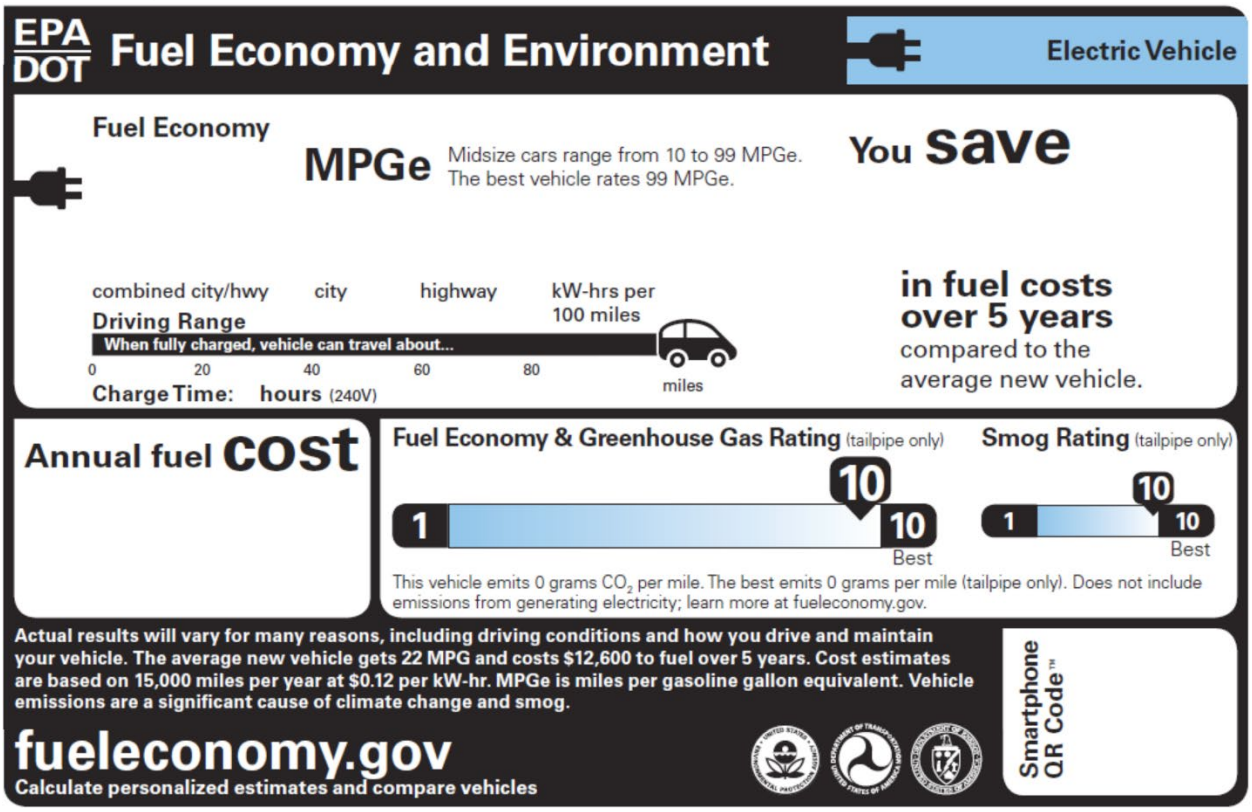
RIVIAN AUTOMOTIVE, LLC

VEHICLE EMISSION CONTROL INFORMATION / INFORMATIONS SUR LE CONTRÔLE DES ÉMISSIONS DES VÉHICULES

MODEL / MODÉLE: R1T — OBD: N/A
MOTOR / MOTEUR: ELECTRIC MOTOR — FUEL: ELECTRICITY
TEST GROUP / GROUPE D'ESSAI: NRIVT00.0194
EVAPORATIVE FAMILY / FAMILLE DE GAZ D'ÉVAPORATION: NRIVR0000194

THIS VEHICLE CONFORMS TO U.S. EPA REGULATIONS APPLICABLE TO T3B0 2022 MODEL YEAR NEW MDPV AND TO CALIFORNIA REGULATIONS APPLICABLE TO ALL-ELECTRIC 2022 MODEL YEAR NEW ZEV MDV.
CE VÉHICULE EST CONFORME AUX RÉGLEMENTATIONS DE L'US EPA APPLICABLES AU NOUVEAU MDPV T3B0 2022 ANNÉE MODÈLE ET AUX RÉGLEMENTATIONS DE CALIFORNIE APPLICABLES AU MODÈLE TOUT ÉLECTRIQUE 2022 ANNÉE NOUVEAU ZEV MDV.

07.03.00 Sample EP label (Formerly called the Smog Index label)



07.04.00 Statement of compliance

Every vehicle which is covered by this application conforms to US EPA Federal Tier 3 Bin 0 regulations applicable to new Medium Duty Passenger Vehicles and state of California ZEV regulations applicable to new Medium-Duty Vehicles for the 2022 Model Year.

08.00.00 General technical description

08.01.00 Description of Propulsion System

See 08.01.01 through 08.01.06.

08.01.01 Description of Vehicle Architecture

4 motors, full torque vectoring capability with 1 motor/gearset per wheel. Drive units are packaged inboard, with priority on maximizing half shaft length to each wheel to enable maximum durability and suspension articulation.

08.01.02 Description of Drive Unit Architecture

Front and rear drive units have high level of commonality. The motor, gearbox, and inverter are sub assembled into a drive unit to optimize mass, cost, and package spacing. The motors are the largest part of the drive unit, and the drive unit orientation in vehicle is adjusted to have the motors as low and towards the center of the vehicle as possible, reducing the center of gravity and the vehicle's polar moment of inertia.

08.01.03 Description of Motor(s)

Interior permanent magnet motors and water jacket cooled stator. Motor air space is a sealed "air cavity" that is shared with the Dual Power Inverter Module, DPIM. This air cavity is vented through 2 Polytetrafluoroethylene (PTFE) membranes.

08.01.04 Description of Gearbox(s)
Fully automatic, 2 stage, single speed reduction gearset for each wheel. Left and right gearsets share oil and a common cavity for a given drive unit. Gearbox is vented through a single PTFE membrane. The gearsets share many parts and utilize a 12.6:1 ratio on the front and rear drive units.

08.01.05 Description of Inverter(s)
Front drive units are silicon carbide, while rear drive units are silicone based IGBT's. All drive units share a single capacitor for 2 motors which reduces cost, mass, and package space.

08.01.06 Description of Drivetrain(s)
Ball spline half-shafts are utilized to maximize half-shaft durability, efficiency, and torque capacity during high articulation suspension events. On the rear drive unit, a modular disconnect is utilized to decouple the half-shaft from the output gears such that the vehicle can operate in FWD. This allows a significant range improvement during low power output and steady state cruise driving events.

08.03.00 Description of Batteries
The Battery pack consists of 7,776 lithium-ion battery cells which are arranged in 9 cell modules. The 9 cell modules are assembled into a fully sealed enclosure built from an aluminum frame structure. The lid includes a removable service access panel, and the bottom plate provides protection from ground strikes consistent with the vehicle's on and off-road capability. Liquid coolant is distributed in parallel to each cell module via the coolant manifold. A Battery Management System (BMS) communicates battery operation with other vehicle systems, controls the contactors, and monitors current, voltage, and isolation measurements. The BMS also monitors sensors for detection of gases, water, and bottom plate puncture.

08.03.01 Battery charging capacity
Battery pack nominal capacity is 360 Ah based on a constant current C/5 discharge rate.

08.03.02 Self-discharge information
Rivian estimates the average self-discharge rate of the battery is likely less than 4% per month.

08.03.03 Description of thermal management system
The thermal management system for the high voltage battery is a liquid coolant system. A pump circulates coolant thru the battery and a refrigerant-cooled chiller to extract heat and lower the temperature of the battery. In cold weather, an in-line heating element is used to heat the coolant to raise the temperature of the battery.

08.03.04 Definition of end-of-life
The battery warranty for in vehicle use is 8 years or 175k miles, whichever occurs first. See section 08.03.05 for information on reuse strategy.

08.03.05 Description of battery disposal plan
Safe battery removal and discharge by Rivian service is recommended. Rivian service will determine which battery components meet standards for reuse. Rivian prioritizes the remanufacture of battery components into equivalent vehicle parts, and then consumption in 2nd life applications. For components which do not meet the necessary standards, Rivian approved partners will transport, break down, and recycle all materials used within the battery.

Rivian is pursuing UL 1973 certification of vehicle battery modules to enable their reuse for 2nd life grid storage applications. Rivian also plans to develop a process to evaluate the suitability of modules from field returned packs for reuse for grid storage applications in line with UL 1974 (Standard for Evaluation for Repurposing Batteries).

If a facility other than one approved by Rivian intends to dispose of the HV Battery or components, the vehicle owner and/or facility assume the responsibility to comply with any local or federal standards that may apply. A certificate from the recycler should be obtained as proof that the materials were properly and legally disposed of.

08.04.00 Description of Controller/Inverter
See Section 08.01.05

08.05.00 Description of Transmission
See Section 08.01.04

08.06.00 Description of climate control system

- Rivian's climate control is a Dual Zone system with Automatic Temperature control.
- HVAC predominantly includes Defrost mode, Panel mode, and Floor mode (or any combination of these three).
- The vehicle could be remotely conditioned to a comfortable climate setpoint using a Mobile Application.
- The system consists of four electronically controlled face vent to direct airflow around passengers.
- The recirculation door is independently controlled by the passengers.
- Auto humidity control.
- Auto/manual blower fan control.
- The system is equipped with Air Conditioning and PTC heater to provide adequate heating and cooling for individual zones.

08.06.01 Electric Heat Pump
N/A

08.06.02 (Reserved)
08.06.03 Climate control system logic
HVAC software has multiple modes which can be selected based on user preference:

- In Manual Mode, the user has complete control on blower speed, temperature, and airflow distribution to face or feet. Recirculation of air is also manually controlled by the user.
- In Auto mode, the software provides adequate heating and cooling requests to control the breathing temperature of both driver and passenger to the requested setpoint. In this mode, the airflow distribution and the blower speeds are automatically selected to maintain the desired temperature from the screen. The software estimates the breathing temperature of individual passenger based on airflow through ducts, In-Cabin sensors, external ambient temperature sensors, and solar load sensors. Recirculation of air inside the cabin is automatically selected based on humidity level inside the cabin.
- Additionally, defrost or demist mode is provided to the user for a clear view while driving. During defog mode, the software supplies conditioned air towards the windshield based on the dew point calculation. If the desired mode is Defrost, the PTC (Positive Temperature Coefficient) heater blows hot air towards the windshield to clear frost.

08.06.04 (Reserved)
08.07.00 Description of Regenerative Braking System
The regenerative braking system can use up to all 4 electric propulsion motors to convert the vehicles kinetic energy to electrical energy which is stored in the vehicles high voltage battery.

08.07.01 Control logic
The regenerative control logic uses two main inputs, acceleration pedal position and vehicle speed to determine a desired regenerative braking torque. The requested braking torque is then distributed between the front and rear axles based on the vehicle state, axle disconnect status, and calculated normal force on each axle. The regenerative torque is limited when the vehicle experiences low wheel traction events (e.g. ice or snow).

08.07.02 Percentage of braking performed on road by each axle
The percentage of braking performed on road by each axle is constantly changing and redistributing. It is based on the driver demanded torque and has been optimized for vehicle dynamics and range attributes.

08.07.03 Overlap of friction brakes and regenerative braking
One pedal driving is the default, in this mode, fully releasing the pedal yields the maximum regen level. And about halfway through the pedal travel is the neutral point, where regen is limited. As the driver manually increases primary service brake pressure and friction braking torque, the vehicle regen level will proportionally ramp down to 0 Nm based on the driver braking pressure. The ramp profile is affected by many factors, such as those described in 08.07.01. When autohold is active and the vehicle approaches standstill, the braking torque will blend from motors to friction brakes.

08.08.00 Description of charger
The Rivian R1T is capable of conductive charging using Electric Vehicle Supply Equipment (EVSE) off-board chargers for the following charge methods:

- AC Level 1 Charging at 120 V / 12 A
- AC Level 2 Charging at 240 V / 48 A
- DC Fast Charging at up to 210 kW

For Level 1 and Level 2 charging, the vehicle is equipped with an On-Board Charger that will convert the single-phase alternating current from the EVSE into DC current.

The vehicle is equipped with a SAE J1772 Type 1 Combo CCS inlet, located at the front left corner of the vehicle and covered by a charge port door.

08.08.01 Proper recharging procedures
Detailed instructions can be found in the owner's guide.

- Put the vehicle in park (P).
- Open the charge port door, located at the front left corner of the vehicle.
- Plug the charger connector from the Electric Vehicle Supply Equipment (EVSE) into the vehicle's charge inlet, so that the connector is fully seated and latched.
- Follow any instructions provided by the EVSE to begin the charging session.
- When the charging session is complete, it is indicated by the vehicle's center touchscreen and by an indicator light at the vehicle's charge inlet.
- Stop the charge via the vehicle touchscreen or button at the charge port, or follow any instructions provided by the EVSE to end the charging session.
- Remove the charger connector and close the charge port door.

The charge port light color indicates the charging status:

- White (solid), Ready.
- White (pulsing), Starting to charge.
- Green (pulsing), Charging.
- Green (solid), Charge Complete.
- Blue (solid), Charge Scheduled.
- Red (solid), Error.
- Red (pulsing), Error.

Select Trip, Extended, or Daily to set a charging limit based on your range needs.

- Daily, requires less time to charge and maximizes battery efficiency.
- Extended, allows you to travel farther on one charge.
- Trip, maximizes range and requires more time to charge.

To stop the charging session:

- Select Stop Charge from Energy menu.
- Unplug the charge cable and return the plug to the charger.
- Store the cable neatly to prevent a tripping hazard.

To turn on a charge schedule:
Set up a schedule to charge at home when electricity costs are less or to stagger charging times between multiple vehicles.

- Select Charge Schedule from the Energy menu.
- Select days to schedule.
- Select times to start and stop charging.
- To disable the charge schedule, select Off.

08.08.02 Power requirements necessary to recharge vehicle
The Rivian R1T complies with industry standard SAE J1772 for AC Level 1 (120 VAC) and AC Level 2 (240 VAC) charging.

AC Level 1 charging requires a conventional 110-120 Volt AC grounded outlet capable of the rating of the EVSE to be used. A portable EVSE cordset that is capable of AC Level 1 charging is included with the vehicle.

AC Level 2 charging requires a 220-240 Volt AC outlet capable of the rating of the EVSE to be used. A portable EVSE cordset that is capable of AC Level 2 charging is included with the vehicle.

08.09.00 Accessories which draw energy from the batteries
Energy from the high voltage battery is used to power the electric heater and electric air conditioning. Energy is drawn by an on-board DC-DC converter that converts the high voltage to 14 Volts DC to maintain the low voltage battery system and power 12 Volt systems. Energy is also drawn by an on-board DC-AC converter to provide AC power to NEMA 15-5 outlets located in the vehicle.

08.10.00 Other unique features (e.g. solar panels)
N/A

08.11.00 Description of warning system(s) for maintenance / malfunction
The Rivian vehicles communicate maintenance and malfunction needs to the driver through easy to read timely notifications. If issues occur, the notification system uses a combination of telltales, texts, and visuals to explain the situation. Our notifications are simple to understand, communicate when the vehicle needs service, and alerts

the customer if an issue arises. The customer leaves the experience feeling confident knowing the system explains the proper actions to take. Any notifications that appears in the driver's instrument cluster retire to the center display so the driver can recall still relevant notifications at a later time.
The Rivian R1T provides warning telltale lights on the driver's display for minor and major defects. A message and an audible tone may also be provided for some major defects. Detailed descriptions of the warnings can be found in the Owner's Guide.

08.11.01 Cut off terminal voltages for prevention of battery damage
Battery management control system is programmed to prevent a state of under-voltage or over-voltage per the voltage limits defined by Rivian. Contactor opens and DTCs are set when voltage of the 9 module 135 kWh battery is below 216 V or above 459 V.

09.00.00 (Reserved)
10.00.00 (Reserved)

11.00.00 Starting and shifting schedules

12.00.00 (Reserved)
13.00.00 (Reserved)
14.00.00 (Reserved)
15.00.00 (Reserved)
16.00.00 (Reserved)
17.00.00 California requirements
17.01.00 Statement of compliance
Every vehicle which is covered by this application conforms to US EPA Federal Tier 3 Bin 0 regulations applicable to new Medium Duty Passenger Vehicles and state of California ZEV regulations applicable to new Medium-Duty Vehicles for the 2022 Model Year.

17.01.01 General statement
Rivian confirms that the production vehicles covered by this application will be substantially the same as the vehicles tested for the purposes of this application.

17.01.02 Drivability statement
As of 01/01/2006, This statement is no longer included in the California Exhaust Emission Standards and Test Procedures.

17.02.00 Supplemental Data and Certification Review Sheets
See attached.

17.03.00 (Reserved)
17.04.00 Credits
17.04.01 Description of multi-manufacturer arrangements
N/A

17.04.02 Credit calculation
Rivian is a Battery Electric Vehicle manufacturer, all Rivian vehicles can be classified as ZEV and Tier3 Bin0. The number of credits will depend on the Unadjusted UDDS range and is dependent on vehicle type, high voltage battery capacity, and motor configurations.

Variant	Unadjusted UDDS Range	# of Credits
R1T	452.36	4

17.05.00 Vehicle Safety
The Rivian architecture comprises a body attached to a skateboard frame structure. The primary structure encompasses engineered crush zones used to, in case of a crash, absorb the crash energy. The “safety cage” comprises of body pillars, side impact bars, floor sills and roof rails (working with other structural elements) and with an advanced optimized restraint system to help properly restrain and protect occupants.

17.05.01 All information for safe operation of vehicle
See sections 03.04.00, 03.05.00, and 11.00.00.

17.05.02 Information on safe handling of battery system
The high voltage battery is to be serviced and handled only by technicians authorized by Rivian.

17.05.03 Description of emergency procedures
Emergency procedures are described in the Owner’s Guide. Please refer to the Owner’s Guide for details. Emergency procedures for first responders are described in the Emergency Response Guide provided for this vehicle.

17.06.00 (Reserved)

Test Results:
Sport Mode:

City 5-Cycle Fuel Economy Calculations		City FE (mi/kWh)
Name	Value	
Running Fuel	0.36159 kWh/mi	2.412 mi/kWh
Start Fuel UDDS	0.05905 kWh/mi	
Start Fuel 20F UDDS	0.84246 kWh/mi	
Start Fuel Consumption	0.01989 kWh/mi	
Highway 5-Cycle Fuel Economy Calculations		**Highway FE (mi/kWh)**
Name	Value	
Running Fuel	0.41543 kWh/mi	2.207 mi/kWh
Start Fuel UDDS	0.05905 kWh/mi	
Start Fuel 20F UDDS	0.84246 kWh/mi	
Start Fuel Consumption	0.00136 kWh/mi	
Combined 5-Cycle DC Fuel Economy Calculation DC Energy		2.3152 mi/kWh
Combined 2-Cycle DC Fuel Economy Calculation DC Energy		3.1578 mi/kWh
Combined 2-Cycle AC Fuel Economy Calculation AC Energy		2.7652 mi/kWh
5-Cycle AC Adjusted Fuel Economy Calculation AC Energy		2.0274 mi/kWh
Adjustment Factor		0.7332

Constants		
Cycle	Unweighted	Weighted
UDDS-1	0.250	0.020
UDDS-2	0.250	0.327
UDDS-3	0.250	0.327
UDDS-4	0.250	0.327
HWY-1	0.500	
HWY-2	0.500	
Recharge Calculation		
Charge Efficiency		87.57%
RAF		1.14
Results		
Result	UDDS	Highway
Range	429.42 mi	380.88 mi
WhAC/mi	342.02	385.60
MPGe	98.5462	87.4085
kWh/100mi	34.2022	38.5603
Adjusted Range		
298 miles		

Adjusted MPGe	
City	Combined
72 MPGe	68 MPGe
Highway	
64 MPGe	

EPA EV Multicycle Calculator (SAE J1634 Oct 2012)

Manufacturer: RIV — As used by EPA laboratory

Carline: R1T

Model Year 2022 — D.Good March 8, 2016

Vehicle Cinnamon

Test Number 1

Comments: **Tested in "Sport" Mode (EPA raw data)**

Lab FEV

Test Date 5/21/2021

Cycle	Energy (Wh)	Distance (mi)	ECdc_cyc	Kuwgt	Kwgt
UDDS1	2563.12	7.45	344.04	86.01	6.86
UDDS2	2279.66	7.429	306.86	76.71	100.25
UDDS3	2169.34	7.434	291.81	72.95	95.33
UDDS4	2207.91	7.431	297.12	74.28	97.07
HWY1	3551.78	10.276	345.64	172.82	
HWY2	3388.28	10.277	329.70	164.85	
SS1	103961.64	255.058			
SS2	8489.99	20.977			
TOTAL	**128611.72**	**326.332**			

Recharge AC WattHrs
146869.86

K-Factors	UDDS1	UDDS2	UDDS3	UDDS4	HWY1	HWY2
Unweighted	0.250	0.250	0.250	0.250	0.500	0.500
Weighted	0.020	0.327	0.327	0.327	NA	NA

Results	Range (mi)	AC Wh/mi	MPGe	kWh/100mi
UDDSu	414.93	353.96		
UDDSw	429.42	342.02	98.5462	34.2022
HWY	380.88	385.60	87.4085	38.5603

EPA version
kWh/100mi
34.20224
38.56032

Note:
1. Fill in yellow shaded areas to compute range and AC wh/mi results
2. Weighted results based on SAE J1634 calculations
3. Final values in green shaded area should be rounded to appropriate significant digits

Conserve Mode:

City 5-Cycle Fuel Economy Calculations		City FE (mi/kWh)
Name	Value	
Running Fuel	0.33337 kWh/mi	2.616 mi/kWh
Start Fuel UDDS	0.05149 kWh/mi	
Start Fuel 20F UDDS	0.78712 kWh/mi	
Start Fuel Consumption	0.01835 kWh/mi	
Highway 5-Cycle Fuel Economy Calculations		**Highway FE (mi/kWh)**
Name	Value	
Running Fuel	0.38934 kWh/mi	2.355 mi/kWh
Start Fuel UDDS	0.05149 kWh/mi	
Start Fuel 20F UDDS	0.78712 kWh/mi	
Start Fuel Consumption	0.00125 kWh/mi	
Combined 5-Cycle DC Fuel Economy Calculation DC Energy		2.4918 mi/kWh
Combined 2-Cycle DC Fuel Economy Calculation DC Energy		3.5149 mi/kWh
Combined 2-Cycle AC Fuel Economy Calculation AC Energy		3.0056 mi/kWh
5-Cycle AC Adjusted Fuel Economy Calculation AC Energy		2.1307 mi/kWh
Adjustment Factor		0.7089

Constants		
Cycle	Unweighted	Weighted
UDDS-1	0.250	0.017
UDDS-2	0.250	0.328
UDDS-3	0.250	0.328
UDDS-4	0.250	0.328
HWY-1	0.500	
HWY-2	0.500	
Recharge Calculation		
Charge Efficiency		85.51%
RAF		1.17
Results		
Result	UDDS	Highway
Range	477.90 mi	428.14 mi
WhAC/mi	316.17	352.92
MPGe	106.6030	95.5025
kWh/100mi	31.6173	35.2923
Adjusted Range		
322 miles		

Adjusted MPGe	
City	Combined
76 MPGe	72 MPGe
Highway	
68 MPGe	

EPA EV Multicycle Calculator (SAE J1634 Oct 2012)

Manufacturer: RIV — As used by EPA laboratory

Carline: R1T

Model Year 2022 — D.Good March 8, 2016

Vehicle Cinnamon

Test Number 1

Comments: **Tested in "Conserve" Mode (EPA raw data)**

Lab FEV

Test Date 5/3/2021

Cycle	Energy (Wh)	Distance (mi)	ECdc_cyc	Kuwgt	Kwgt	Recharge AC WattHrs
UDDS1	2201.8	7.458	295.23	73.81	5.03	151099.39
UDDS2	2038.5	7.447	273.73	68.43	89.69	
UDDS3	1976.41	7.468	264.65	66.16	86.71	
UDDS4	2018.3	7.437	271.39	67.85	88.92	
HWY1	3160.41	10.26	308.03	154.02		
HWY2	3031.3	10.257	295.53	147.77		
SS1	100158.82	267.798				
SS2	14619.28	39.331				
TOTAL	**129204.82**	**357.456**				

K-Factors	UDDS1	UDDS2	UDDS3	UDDS4	HWY1	HWY2
Unweighted	0.250	0.250	0.250	0.250	0.500	0.500
Weighted	0.017	0.328	0.328	0.328	NA	NA

Results	Range (mi)	AC Wh/mi	MPGe	kWh/100mi	EPA version kWh/100mi
UDDSu	467.71	323.06			
UDDSw	477.91	316.17	106.6046	31.6168	31.61683
HWY	428.14	352.92	95.5025	35.2923	35.29226

Note:

1. Fill in yellow shaded areas to compute range and AC wh/mi results
2. Weighted results based on SAE J1634 calculations
3. Final values in green shaded area should be rounded to appropriate significant digits

Average:

Sport	UDDS	HWY	Adj Factor
UnAjd	429.42	380.88	0.7332
Adj	314.85	279.26	
Conserve	UDDS	HWY	Adj Factor
UnAdj	477.90	428.14	0.7089
Adj	338.78	303.51	
HarmoAvg	326.38	290.88	
Combined	310.40		

Suggested ZEV Application Format for Certification

E.O.#. _____ Page 1 of 2

2022 MODEL-YEAR AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET
ZEV-PASSENGER CARS, LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES

Manufacturer: Rivian Automotive, LLC Test Group: NRIVT00.0194

Vehicle Class(es): PC____, LDT1 (0-3750 lbs. LVW)____, LDT2 (≥ 3,751 lbs. LVW)____,
MDV6 (8,500-10,000 lbs. GVW) X, MDV7 (10,001-14,000 lbs. GVW)____

ZEV Type: NEV___, ZEV X

No. of ZEV Credits per vehicle: 4

Fuel Type: Electro-chemical Battery X, Fuel Cell___, Capacitor___, Other (specify)_____

Battery Type(s): Lead Acid____ Nickel Cadmium____ SBLA____ Sodium Sulfur____
Sodium Nickel Chloride____ Nickel Metal Hydride____ Lithium Metal Disulfide____
Zinc Air_____ Zinc Bromine_____ Lithium Polymer_____, Lithium Ion X,
Other (specify):_____

Total Battery Weight (kg.): 796 Total Battery Volume (liters): 562

No. of batteries or modules per vehicle: 1 Total Battery Voltage: 400

Charger(s): On-board X Off-board X Conductive X Inductive____.

Drive Motors(s): AC Induction X DC Brush____. DC Brushless____
Switched Reluctance____ Other (specify):_____.

No. of Drive Motors 4 Rated motor power 162 kW @ 6000 RPM Fronts / 163 kW @ 5000 RPM Rears Max rpm: 18000.

Drive: FWD____ RWD____ 4WD-FT____ 4WD-PT X

Regenerative Braking: No____ Yes X FW____ RW____ AW X.

Driver Controlled Regen Braking: Yes X No___ Coast Regen Braking: Yes X No___.

Air Conditioning: Yes X No___, Fuel Fired Heater:[1] Yes____ No X

Vehicle Make & Models (If coded, see attachments)	Trans type M5, A4 (If applicable)	GVWR	Curb Weight	ETW or Test Weight	DPA / RLHP or Dyno Coeff. a=, b=, c=
Make: Rivian Model: R1T	Automatic	8532 lbs	6949 lbs	7000 lbs	Conserve: A: 44.81 lbs B: 0.9309 lbs/mpg C: 0.01765 lbs/mph2 Sport: A: 48.47 lbs B: 0.7674 lbs/mph C: 0.01799 lbs/mph2

Date Issued: 05/26/2021 Revisions:

[1] Fuel fired heaters are not allowed in pure ZEVs for model year 2009 and subsequently.

2022 MODEL-YEAR AIR RESOURCES BOARD CERTIFICATION REVIEW SHEET
ZEV-PASSENGER CARS, LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES

Manufacturer: Rivian Automotive, LLC Test Group: NRIVT00.0194

Range Test Results

Vehicle ID	Trans	(check one) ____TW X ETW	(check one) ____DPA ____RLHP Or dyno coeff.	City Range	System AC (Wh/mi)	System DC (Wh/mi)	Vehicle DC (Wh/mi)
Cinnamon	At	7000	Conserve: A: -14.19 lbs B: 0.6393 lbs/mph C: 0.01915 lbs/mph2 Sport: A: -6.75 lbs B: 0.4237 lbs/mph C: 0.02018 lbs/mph2	Conserve: 477.90 Sport: 429.42	316.17 342.02	270.36 299.5	270.36 299.5

Hwy. Range	System AC (Wh/mi)	System DC (Wh/mi)	Vehicle DC (Wh/mi)
Conserve: 428.14 Sport: 380.88	352.92 385.61	301.78 337.67	301.78 337.67

Battery Test Results: Pass Specific Energy: Wh/kg 169

Remarks: None

Date Issued: 05/26/2021 Revisions:

---------- **ARB USE ONLY** ----------

Application:
Processed By:_____ Date:_____ Reviewed by:_____ Date:_____