

CALIFORNIA AIR RESOURCES BOARD
PURCHASE INCENTIVE PROGRAMS IMPLEMENTATION MANUAL FOR
MANUFACTURERS OF ZERO-EMISSION MOTORCYCLES

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This English version takes precedence over all published translations.

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I. INTRODUCTION AND OVERVIEW

To assist in meeting its goals of reducing criteria pollutant, airborne toxic, and greenhouse gas emissions, The California Air Resources Board (CARB or Board) has been providing consumer incentives almost continuously since 2001 to promote and accelerate zero- and near-zero-emission, on-road light-duty vehicle deployment and technology innovation.

CARB first expanded incentive eligibility to zero-emission motorcycles or ZEMs in its second Zero-Emission Vehicle Incentive Program, known as ZIP II in the 2002-2004 timeframe, although eligibility was limited to highway capable fully-enclosed three-wheel ZEMs. Incentive eligibility was expanded to include low-speed fully-enclosed three wheel and highway capable two-wheel ZEMs via the 2007-2009 Alternative Fuel Vehicle Incentive Program (AFVIP). The Clean Vehicle Rebate Project (CVRP), which ran from 2010-2023, extended eligibility for both two- and three-wheel ZEMs, but only those that are highway capable. In August 2023, CARB announced that, by late 2023, it would transition away from mass-market incentive programs, such as CVRP, and focus on expanding the existing Clean Cars 4 All and Drive Clean Assistance Programs statewide, better helping low- and middle-income Californians to access zero-emission vehicles. Zero-emission motorcycles continue to be eligible for incentives via both programs.

As with prior incentive programs that extended eligibility to ZEMs, CARB has established, and will maintain, a list of ZEMs eligible to participate in its purchase incentive programs. When approving ZEMs for addition to the eligibility list, it will share the approval letter with the ZEM manufacturers and other interested parties (e.g., local air districts, state departments of environmental quality), many of whom may use it to populate their own eligibility lists.

This document constitutes the implementation manual for ZEM manufacturers participating in CARB's purchase incentive programs - The Purchase Incentive Programs Implementation Manual for Manufacturers of Zero-Emissions Motorcycles (the ZEM IM).

The ZEM IM introduces ZEM manufacturers to the eligibility and performance evaluation criteria established for participation in CARB's Clean Cars 4 All and Drive Clean Assistance Program incentive programs and guides them through the process of having eligible ZEMs added to the eligibility list. The ZEM IM, as well as the current list of eligible vehicles, is available on the light-duty vehicle eligibility web page.¹

This document does not describe the legislation establishing, and guidelines for, current incentive programs. Information about those programs is available to ZEM manufacturers and other interested parties via the CARB Low Carbon Transportation Investments and Air

¹ <https://ww2.arb.ca.gov/ZEV-eligibility-list>

Quality Improvement Program website.² Websites for each individual project will include incentive amounts for each vehicle, online applications, all applicable forms with a description of necessary supporting documentation, a real-time running total of available funds remaining in the program(s), and the number of incentives approved and issued by vehicle type. The individual project websites allow the programs to be user-friendly and provide project transparency.

II. ZERO-EMISSION MOTORCYCLE ELIGIBILITY

A. The ZEM Category

Three categories of vehicles are eligible for incentive funding under CARB's purchase incentive programs: (1) light-duty battery electric or fuel cell electric zero-emission vehicles (ZEV), (2) light-duty plug-in hybrid electric vehicles meeting Transitional ZEV emission and warranty requirements (TZEV), and (3) zero-emission motorcycles (ZEM). Vehicle eligibility for the first two categories (ZEVs and TZEVs) is described in the Light-Duty Vehicle Purchase Incentive Programs Implementation Manual for Automakers.³

Vehicles in the ZEM category include many zero-emission vehicles designed to travel on either two or three wheels. To be considered eligible for incentives, ZEMs must: (1) meet the ZEM definition in Section VI of this document, and (2) successfully complete the ZEM evaluation procedures described in Section IV and Attachments 1 and 2 of this document.

ZEM models will be approved by CARB on a model-year basis and placed on a List of Eligible Vehicle Models for incentives. A continuously updated list of eligible vehicles and incentive amounts will be maintained on active purchase incentive program websites.

ZEM manufacturers must submit a Vehicle Eligibility Application to CARB to have their ZEMs considered for incentive eligibility. The ZEM manufacturer is responsible for providing all the required documentation described both in this Implementation Manual and on the application form.

CARB will coordinate with ZEM manufacturers to request any additional documentation needed for eligibility determinations. CARB is responsible for providing any individual program Administrator, if applicable, the current List of Eligible Vehicle Models and the corresponding incentive amounts.

² <https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program>.

³ A link to the Light-Duty Vehicle Purchase Incentive Programs Implementation Manual for Automakers resides on the New Vehicle Eligibility List for Purchase Incentive Programs web page (see footnote 1).

B. ZEM Eligibility Criteria

ZEMs must meet the following criteria to be eligible for an incentive:

Have a Purchase Price at or below the established purchase price cap:

The purchase price cap for vehicles, including ZEMs, incentivized under either the joint Clean Cars 4 All / Clean Vehicle Assistance Program or the local air district Clean Cars 4 All programs is \$45,000. ZEMs with a purchase price exceeding \$45,000 are ineligible for incentives from CARB's Purchase Incentive Programs.

Be new:

Every vehicle must be a new vehicle as defined in California Vehicle Code (CVC) Section 430.⁴ The ZEM Manufacturer or its authorized licensee must manufacture the vehicle. Vehicles considered new vehicles solely for determination of compliance with state emissions standards pursuant to Health and Safety Code, Article 1.5, Prohibited Transactions, (Sections 43150-43156) and CVC Section 4000.2, Registration of Out-of-State Vehicles) are not eligible vehicles. The vehicle must have an odometer reading of fewer than 7,500 miles at the time of purchase/lease. Third-party leases are considered previously owned vehicles.

Be CARB-approved and purchased or leased in California:

Light-duty car and truck manufacturers and ZEM manufacturers have separate pathways for demonstrating eligibility to participate in California's light-duty vehicle purchase incentive programs:

- Light-duty car and truck manufacturers must certify their vehicles as new ZEVs or TZEVs as defined in the Zero-Emission Vehicle Standards for 2018 through 2025 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.⁵
- ZEM manufacturers are currently exempt from CARB certification requirements. In lieu of certification, ZEM manufacturers applying for incentive eligibility must submit with their vehicle eligibility applications copies of: (1) their federal Certificate of Conformity, and (2) the certification label required to be affixed to motor vehicles as required by the National Traffic and Motor Vehicle Safety Act (Title 49 of the Code of Federal Regulations (49 CFR) Part 567) certifying that the vehicle model complies with all applicable Federal Motor Vehicle Safety Standards for new motor vehicles and new motor vehicle equipment issued by the National Highway Traffic Safety Administration (NHTSA) as found in 49 CFR Part 571.

⁴ Per section 430 of the California Vehicle Code, a "new vehicle" is a vehicle constructed entirely from new parts that have never been the subject of a retail sale, or registered with the California Department of Motor Vehicles, or registered with the appropriate agency or authority of any other state, District of Columbia, territory or possession of the United States, or foreign State, province, or country.

⁵ Section 1962.2(i)(18) and 1962.2(i)(16), respectively, Title 13, California Code of Regulations (CCR)

ZEMs purchased or leased outside of California are not eligible for CARB's purchase incentive programs. To be eligible, ZEMs must have a California purchase or lease agreement from a dealership⁶ within the state. ZEMs delivered or received out-of-state are also not eligible for CARB's purchase incentive programs.

Meet prescribed emissions, performance, and service thresholds:

In addition to meeting the "Zero-Emission Motorcycle" definition in Section VI of this Implementation Manual, ZEMs must successfully complete the Zero-Emission Motorcycle Evaluation Procedure in Section IV and be covered by a minimum level of after-sales service. Each of these three requirements is described below.

Successful completion of the Zero-Emission Motorcycle Evaluation Procedure in Section IV. of this Implementation Manual means that a recognized third-party vehicle standards organization has evaluated the ZEM using the specified procedures and CARB has verified that the ZEM meets the specified range, and, if applicable, acceleration requirements.

Each manufacturer must demonstrate to CARB, for every vehicle for which they are requesting an eligibility determination, that they have a program to offer convenient and time-sensitive warranty, maintenance, and after-sales service to the vehicle owner. An acceptable service program will typically have readily available parts, trained service technicians, and a roadside assistance program.

Meet minimum warranty provisions:

The ZEM drive train, including an applicable energy storage system or a battery pack, must have a manufacturer warranty of at least 24 months during which time the capacity of the traction battery shall not degrade by more than 10 percent. Prior to approving a vehicle model for addition to the List of Eligible Vehicles, CARB will review ZEM manufacturer-provided copies of representative vehicle and battery warranties and a description of the manufacturer's plans to provide warranty and routine vehicle service.

C. Incentive Prequalification Program

Administrators of CARB's purchase incentive programs implement the programs by prequalifying consumer applicants. The prequalification process allows participating dealerships to provide the applicant an incentive at the point-of-sale. More information, including how dealerships may participate, is described fully on the program websites and in the Implementation Manual for each individual incentive program.

⁶ For the purposes of this Implementation Manual, the term 'ZEM dealership' includes authorized licensees. ZEM manufacturers with solely electronic storefronts will be considered on a case-by-case basis considering the availability of associated brick and mortar repair and maintenance facilities.

Participating dealerships will apply a customer's preapproved incentive amount to the purchase or lease of an eligible ZEM. In return, the dealership may then claim the incentive to be paid by the Administrator if all requirements are met.

III. COMPLETING THE VEHICLE ELIGIBILITY APPLICATION

A ZEM manufacturer may request that an eligible motorcycle be added to the light-duty vehicle purchase incentive programs eligibility list by submitting a complete Vehicle Eligibility Application Form (MSCD/EMIB/AQIP_81 (REV 01/24) available from <https://ww2.arb.ca.gov/ZEV-eligibility-list>. The Form requests ZEM manufacturer and vehicle information and supporting documentation including the federal Certificate(s) of Conformity and NHTSA labels for the ZEM model(s), warranty and after-sales service provisions, performance testing data, pricing information, battery disposal information for traction and non-lead-acid auxiliary batteries, a VIN Indicator Reference Sheet, and vehicle photos. Each of these items is described further below.

ZEM Manufacturer and Vehicle Information:

- Vehicle Manufacturer Information - includes ZEM manufacturer name, staff contact information (name and title, email address and phone number, and business mailing address).
- Vehicle Information - includes, for each ZEM for which the ZEM manufacturer is seeking eligibility, vehicle year, make, and model.

Verification of Vehicle Eligibility (The following information must be attached to or included with the Eligibility Application Form to verify vehicle eligibility):

- Federal Certificate of Conformity
- NHTSA label (in accordance with 49 CFR Part 567)
- Warranty provisions - Warranty provisions of interest include bumper-to-bumper, powertrain, and traction battery warranties in both years and miles.
- After-sales service provisions - After sales service provisions of interest include information on: (1) California dealerships that can perform maintenance and repairs, and (2) any included vehicle maintenance plans, a description of the provided roadside assistance (e.g. 24/7/365 towing, charging, tire flat repair, etc.), and the period of the roadside assistance in years and miles.
- Test data witnessed by a CARB recognized independent third-party vehicle standards organization using the test procedures prescribed in Section IV and Attachments 1 and 2 of this document demonstrating attainment of prescribed vehicle range and, if applicable, acceleration performance requirements described in that section.
- Pricing information - PDF or image of the sticker for qualifying vehicle model(s) showing base MSRP.
- Battery disposal - Briefly describe information provided to vehicle dealers/purchasers regarding proper disposal of both the propulsion/traction battery and, if applicable, non-lead acid auxiliary vehicle batteries and how this information is conveyed.

- VIN Indicator Reference Sheet. Provide a representative VIN for the applicable ZEM(s). Identify those positions within the VIN that specifically indicate that the vehicle is a ZEM (for example, is one VIN position used to identify electric motor type?). Finally, use asterisks within the representative VIN to indicate those positions that are not unique to the applicable vehicle model(s) (for example, the six-digit serial number sequence at the end of the VIN).
- Two high-resolution images for use on the CARB website, vehicle incentive program websites, and for outreach and marketing materials: (1) a “lifestyle” photo with a natural background and no obstructions, and (2) a photo with a white or solid background and no obstructions.

IV. ZERO-EMISSION MOTORCYCLE EVALUATION PROCEDURES

To ensure that those ZEMs receiving incentives via CARB purchase incentive programs are robust and offer their purchasers enduring trouble-free performance, CARB requires ZEM manufacturers to demonstrate that their ZEMs can achieve prescribed performance thresholds when tested by a CARB recognized independent third-party vehicle standards organization⁷ using the following test procedures:

For 2024 Model Year ZEMs, manufacturers may use either of the following two test procedures:

- The “Pomona Loop” testing procedure described in Attachment 1. This procedure was developed by Southern California Edison’s (SCE) Electric Vehicle Testing Center and modified, in consultation with SCE, by CARB to reflect the operating characteristics of ZEMs.
- The “Society of Automotive Engineers (SAE) International Test Procedure SAE J2982_202210 - Riding Range Test Procedure for On-Highway Electric Motorcycles, revised 10-13-2022” described in Attachment 2.

⁷ The ARB reserves the right to approve or disapprove the proposed vehicle standards organization.

For 2025 and subsequent Model Year ZEMs, manufacturers may only use the following test procedure:

- The "Society of Automotive Engineers (SAE) International Test Procedure SAE J2982_202210 - Riding Range Test Procedure for On-Highway Electric Motorcycles, revised 10-13-2022."

If using SAE J2982_202210, the vehicle must achieve a Highway Commuting⁸ certified riding range of 40 miles or more.

CARB will treat test data submitted by ZEM manufacturers as confidential. CARB will review the evaluation and issue a pass or fail determination. All other applicable legal requirements to certify operation of a motor vehicle on a public roadway must be satisfied before the vehicle is submitted to a testing entity for range and acceleration certification.

V. UPDATES TO THIS IMPLEMENTATION MANUAL

CARB staff have previously gathered information to support the development of an On-Road Motorcycles (ONMC) regulation with a zero-emission component. If the Board adopts an ONMC regulation in the future, and that regulation contains ZEM range test and warranty provisions, CARB incentive program staff will review the regulation and make changes to the ZEM IM, if necessary, to harmonize it with the ONMC regulation.

In addition to these potential changes, CARB reserves the right to update the ZEM IM at its sole discretion as needed. CARB incentive program staff will notify ZEM manufacturers when changes have been made.

VI. DEFINITIONS

"CARB-approved" means the ZEM manufacturer has demonstrated that they have received a federal Certificate of Conformity for the motorcycle for which they are requesting incentive eligibility.

"New Vehicle" a vehicle constructed entirely from new parts that have never been the subject of a retail sale, or registered with the California Department of Motor Vehicles, or registered with the appropriate agency or authority of any other state, District of Columbia, territory or possession of the United States, or foreign State, province, or country.

"ZEM Manufacturer" is the United States manufacturer or importer whose name is listed in the "Certificate Issued To:" portion of the Federal Certificate of Conformity. For the

⁸ Urban Dynamometer Driving Schedule (UDDS) drive cycle and shall also incorporate a constant speed test of either 55 mph or 70 mph as described in Attachment 2.

purposes of CARB's purchase incentive programs, vehicles must be new as defined in CVC Section 430 and manufactured by the ZEM manufacturer or its authorized licensee.

"Participating Dealership" refers to a dealership that is eligible to receive reimbursement from CARB's purchase incentive programs after applying incentive funds directly to the purchase or lease price of an Incentive Prequalification Program applicant transaction. Dealerships complete enrollment and training with the Administrator before being listed as a participating dealership.

"Zero-Emission Motorcycle (ZEM)" means a freeway capable two- or three-wheeled (partially or fully enclosed) zero-emission vehicle (one that produces zero exhaust emissions of any criteria pollutant (or precursor pollutant) or greenhouse gas under any possible operational modes or conditions). The following vehicles are not considered ZEMs for the purposes of this ZEM definition:

- three-wheeled motor vehicles that have a partially or completely enclosed seating area for the driver and passenger and are used by local public agencies for the enforcement of parking control provisions, or
- vehicles meeting the definitions contained in CVC 405, 406, or 407.5.

Attachment 1: Pomona Loop Evaluation Procedure

A. Vehicle Receipt, Preparation, and Inspection

Before accepting a vehicle for testing, the following must be satisfied:

- The vehicle must be licensed for legal operation on public roadways.
- The vehicle must pass a safety and functionality inspection.
- The vehicle must be capable of
 - sustaining posted speed limits on the Pomona Loop course,
 - a vehicle range of 40 miles or more (two city loops), and
 - accelerating from 0 to 50 miles per hour (mph) in 10 seconds or less.

Then complete the following preparation and inspection steps:

- Fill out the Vehicle Test Equipment and Nameplate Data Sheet (Form MSCD/AFV04).
- When the tires are “cold”, check the air pressure and inflate the tires to the ZEM manufacturer’s production vehicle specification using a calibrated tire pressure gauge; for consistency, pressure should be checked within one hour of starting the test drive. Tires can be considered “cold” if the vehicle has been parked for at least two hours. Check the pressure before each test at a consistent time relative to the test drive schedule.
- Check the vehicle fluid levels (coolant, brake fluid, etc.) if applicable before each drive.
- Fully charge the vehicle’s battery pack in a controlled environment using the supplied battery charger and allow it to cool at least four, and not more than twelve hours before beginning the range test.

B. Pomona Loop Range Test

Test Instructions:

- Record the odometer reading and initial ambient conditions on the Electric Vehicle Driving Test Data Sheet (Form MSCD/AFV05). It is preferable to start the drive in the morning at a consistent time and temperature. Drive the vehicle on the Pomona Loop, with no passengers, in a manner that is compatible with the safe flow of traffic, attempting to maintain the posted speed limit whenever possible, but at no time exceeding the posted speed limit. Complete two loops.
- Upon completion of the circuit, record the end-of-test data (odometer, state of charge, ending ambient conditions) on MSCD/AFV05. Recharge the vehicle battery in a controlled environment using the supplied battery charger and record the recharge data.
- If the vehicle fails to complete the required distance, fully charge the vehicle’s battery pack in a controlled environment using the supplied battery charger and allow it to cool at least four, and not more than twelve hours before repeating the test once more.

Stop Conditions if Vehicle is Unable to Complete the Test:

The maximum usable range of the vehicle is determined by vehicle gauge indications specified by the manufacturer, or if no instructions are specified, by diminished vehicle performance such that the vehicle is no longer capable of safely operating with the flow of traffic. Typically, an electric vehicle will have two warning lights near the end of the vehicle's range. The first is usually a cautionary light at roughly 20 percent state of charge (SOC). This light is usually a reminder to the driver that the state of charge is low. The second warning usually comes on at about 10 to 15 percent SOC and is an indication to charge immediately. A testing entity should use this second warning signal, as recommended by the manufacturer, to stop the range test, so that there is no chance of harming the traction battery by over-discharge. If within a mile or two of the test circuit starting position, and possible to drive it to the starting position slowly and conservatively, do so. If farther than that, the driver will stop the vehicle and have it transported.

C. Acceleration Test

Upon successful completion of the Pomona Loop Range Test, fully charge the vehicle's battery pack in a controlled environment using the supplied battery charger and allow it to cool at least four, and not more than twelve hours before beginning the acceleration test. The acceleration test will be performed on a surface street with a posted speed limit of 60 miles per hour or greater and in a manner that is compatible with the safe flow of traffic. Upon completion of the acceleration test, record the state of charge and elapsed time in the "other comments" section of MSCD/AFV05.

D. Output

The testing entity will provide the ARB with completed forms MSCD/AFV04 through 06. The ARB will review the evaluation data and will provide the manufacturer with a pass/fail determination. All data collected will be shared with the vehicle manufacturer only and to others upon request only as required by law.

E. Forms And Diagrams

The next three pages contain the three forms - MSCD/AFV-04, MSCD/AFV-05, and MSCD/AFV-06 - necessary for completing, and documenting completion of, the Pomona Loop evaluation.

VEHICLE TEST EQUIPMENT AND NAMEPLATE DATA SHEET

Project/User Contact: _____ Test: _____
Date(s): _____ File Name(s): _____
Vehicle Number: _____ Technician: _____

VEHICLE

Manufacturer: _____ VIN: _____
Model: _____ Model Year: _____ Manufacture Date: _____
Mileage: _____
Motor Manufacturer: _____ Motor Type: _____
Motor Rating/Speed: _____
Version/Serial No.: _____
Controller Version/serial No.: _____
Battery Pack Type/Version/Serial No.: _____

TIRES

Tire Manufacturer: _____ Model: _____
Tire size: _____ Maximum Pressure: _____
Maximum Tire Load: _____ Treadwear Rating: _____

CHARGER

On-board / Off-board: _____ Manufacturer: _____
Model: _____ Serial Number: _____
Charger Type/Version: _____
EVSE Manufacturer: _____
EVSE Model/Version: _____ Serial Number: _____
EVSE Software Version: _____
Charge Port Manufacturer/Model/Version/SN: _____

TEST EQUIPMENT (Describe make and model as applicable)

Power Profiler: _____
kWh Meter: _____
Thermometer: _____
Optical Meter Probe: _____
Laptop Computer: _____
Desktop Computer: _____
Stopwatch: _____
Digital multimeter: _____
Battery Cycler: _____
Sound Level Meter: _____
Measuring Wheel: _____
Other Equipment: _____

WEIGHT CERTIFICATION

Scale Location and Proprietor: _____
Examiner: _____ Date: _____
Notes: _____
Total Curb Weight: _____ lb

Date	Vehicle	VIN last 6	Test	Driver	Data File/Project		Volts
						Start	
Road Cond	Tire Press	Payload				Stop	
						Net	

DRIVING	Time	Odom	% SOC	DC Ah	DC kWh	Amb temp	A/C temp	A/C>10 min
Start								
Stop								Min. A/C
Net	0:00	0	0.00					

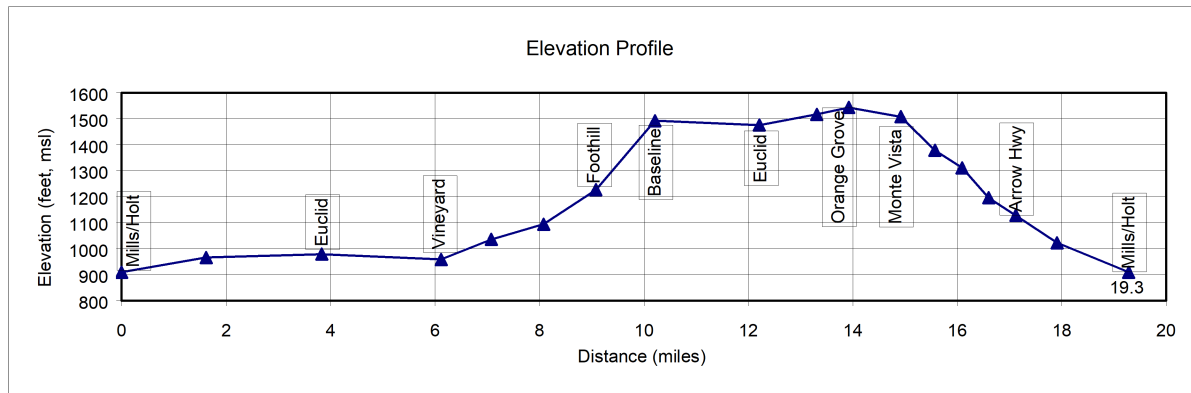
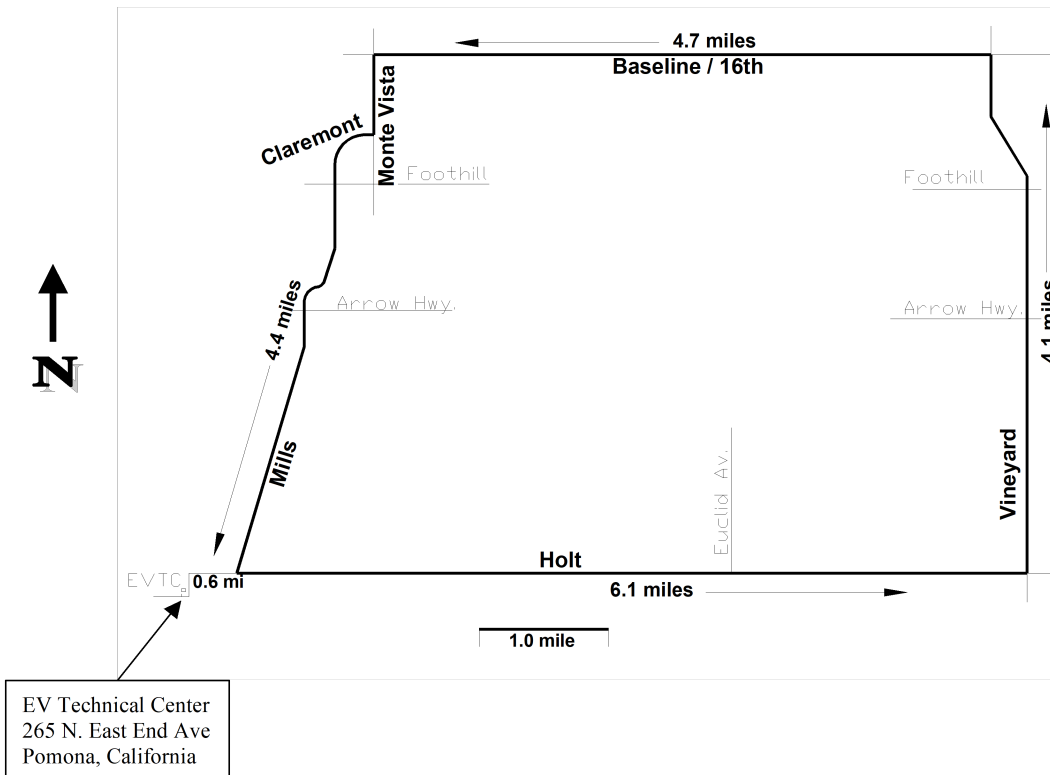
[illegible]

Accessories used: _____
 Drive / Regen setting: _____
 Handling/Braking: _____
 Other comments: _____

Charger	Serial No.		AC meter#		BMI #			
CHARGING	Date	Time	AC kWh in	BMI kWh in	DC kWh in	DC Ah in	Amb temp	Volts
Start								
Stop								
Net								

Comments: _____

URBAN POMONA LOOP



Attachment 2: Range Determination Using SAE J2982

A. Determining Certified Riding Range using SAE J2982

ZEM manufacturers choosing to determine certified riding range using Society of Automotive Engineers (SAE) International Test Procedure SAE J2982_202210 - Riding Range Test Procedure for On-Highway Electric Motorcycles, revised 10-13-2022 (SAE J2982) shall:

1. For ZEMs capable of maintaining a speed of at least 55 miles per hour but less than 70 miles per hour for at least 10 minutes and having a certified riding range of at least 40 miles, use one of the following methods, at the manufacturer's discretion:
 - a. an average of UDDS and 55 mph drive cycles, or
 - b. World Motorcycle Test Cycle (WMTC) for sub-class 3-1, chassis dynamometer test cycle as described in Annex II, section 4.3.4, Table 1-4 of "Commission Delegated Regulation No 134/2014 of 16 December 2013 supplementing Regulation (EU) No. 168/2013 of the European Parliament and of the Council with regard to environmental and propulsion unit performance requirements and amending Annex V thereof, 02014R0134 - EN - 20.03.2018," (EU 134/2014).
2. For ZEMs capable of maintaining a speed of at least 70 miles per hour for at least 10 minutes and having a certified riding range of at least 40 miles, use one of the following methods, at the manufacturer's discretion:
 - a. an average of UDDS and 70 mph drive cycles, or
 - b. WMTC for sub-class 3-2, chassis-dynamometer test cycle as described in EU 134/2014, Annex II, section 4.3.4, Table 1-4.

When utilizing the UDDS and 55 mph or 70 mph drive cycles for range testing, the dynamometer coefficients and inertial mass shall be as prescribed in Subparts E and F, Part 86, Title 40, Code of Federal Regulations. The average of UDDS and 55 mph or 70 mph range results shall be calculated in accordance with SAE J2982, section 9.3.

When utilizing the WMTC drive cycle for range testing, the dynamometer coefficients and inertial mass shall be as prescribed in EU 134/2014, Annex II, section 4.5.6.

Vehicles shall be tested for range in default mode or in normal mode if the vehicle does not have a default mode.