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Preliminary Information

PIC6231B EV Range Driving Tips

Models

Brand:	Model:	Model Years:	VIN:		Engine:	Transmissions:
			from	to		
Chevrolet	Volt	2017 - 2019	All	All	L3A	MKV
Cadillac	CT6	2017 - 2018	All	All	LTG	MRD

Involved Region or Country:	**North America**
Condition:	**Some customers may state that their EV range is less than expected, or the estimated EV range on the display is greater than the actual range achieved. This is most commonly noticed as the average outdoor temperature decreases in the autumn and winter months.**
Cause:	**The energy is being used in other ways, More energy to climb hills, energy to heat or cool the cabin**

Correction:

The electric range of the Volt and CT6 may be higher or lower than expected due to the driver's technique, the terrain, climate settings, and/or the outdoor temperature.

In other words, driving in extreme outdoor temperatures, accelerating and braking aggressively, use of climate control, and/or driving in areas with elevation changes will impact the electric range.

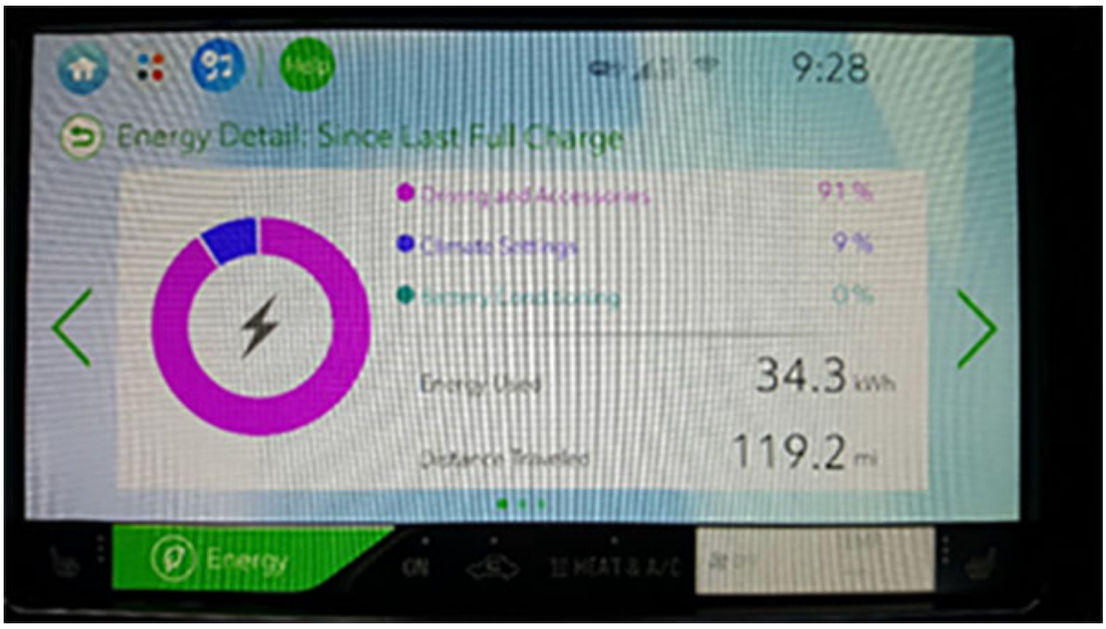
The electric range displayed in the vehicle is a prediction based on past driving conditions (kWh of energy used per distance traveled), current ambient temperature, and climate control settings. It is normal for the displayed value to adjust while the vehicle is driven as this number is constantly being recalculated to provide the best estimate of electric range.

The displayed electric range can vary seasonally, weekly, and daily based on the changes in technique, terrain, and outdoor ambient temperatures.

Information:

The 2017 model year electric vehicles provide two helpful graphical displays in the center stack energy screen, or “leaf screen,” to help customers understand why their EV range will vary.

The first is a doughnut chart showing the percentage of energy used for propulsion, the percentage of energy used for cabin climate, and the remaining energy in the pack remaining in black (Volt).



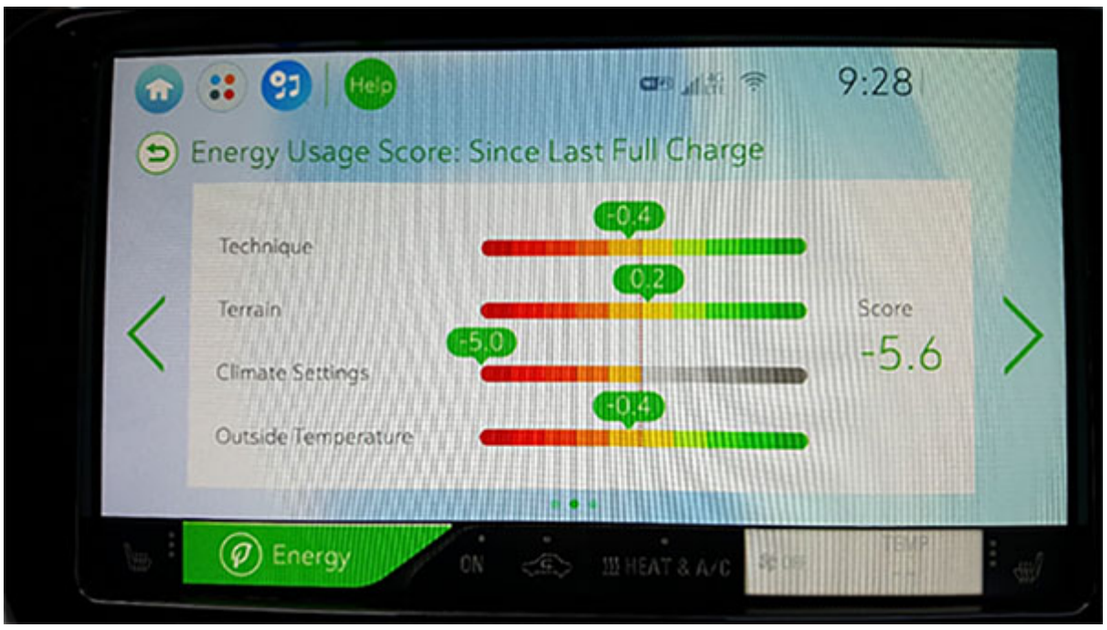
The second chart provides a total electrical energy score for the driver from -20 to +15 with a graphical breakdown of each of the critical areas affecting EV range.

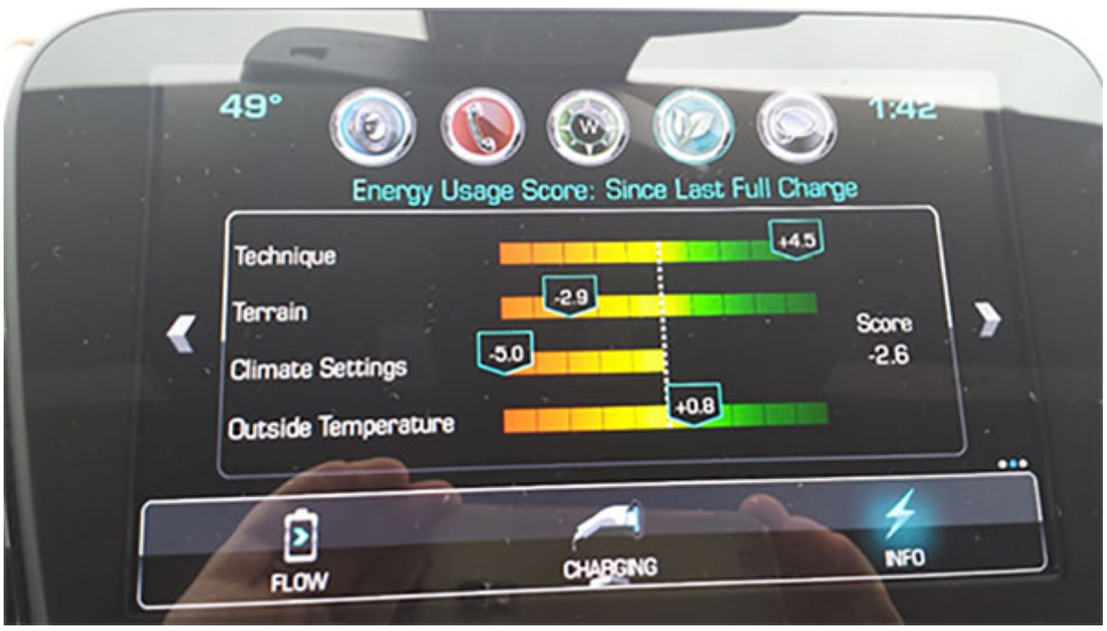
While the scored value itself is unitless, it provides feedback to the driver with a positive or negative number to help explain the likely reasons the EV range is different than expected.

For example, a total score of +5 would yield greater than expected EV range, 0 would be average, and -10 would correspond to a lower than expected value for EV range.

All values are reset after a complete charge and may not be stable until approximately 10 miles (16 km) have been driven.

2016 - 2018 models - Note it is just Score





2019 Volt- Note New Change, the Score has changed to Miles, but it is still considered a score only and not a mileage measurement.

To improve scores in each area, consider the following:

Technique

- **The score for technique is based on the efficiency gauge in the instrument cluster. The more time spent in the middle / green zone will equate to a better score.**

- **Driving aggressively (rapid accelerations and decelerations) will drain the battery faster.**
- **High speed driving will deplete battery capacity and electric range quickly. Electric range is maximized at 89 km/h (55 mph) and below.**
- **Increased mass from additional cargo or passengers can also decrease the electric range.**
- **Use cruise control when appropriate for smoother applications of torque.**
- **Plan ahead for decelerations. For example, do not rush to red traffic signals and suddenly brake.**
- **Do not shift to N (Neutral) while braking. The vehicle recovers energy while coasting and braking in Drive (D) or Low (L).**
- **Use Low (L) and/or Regen On Demand Paddles. These help reclaim maximum energy automatically, requiring less brake pedal application while providing a controlled efficient way to slow the vehicle down. There is no added wear on the vehicle to use these features.**
- **Use Normal Mode when possible. Sport Mode provides more responsive acceleration than Normal Mode but can lower the score for technique by moving the efficiency ball out of the optimal zone.**

Note: A significantly different driving style (higher speed and acceleration rate, harder braking, etc.) compared to the previous drive event (the last X miles of history recorded in the vehicle's computer) will cause the actual electric range to be significantly less than the initially predicted electric range.

Terrain

- **The score for terrain reflects even slight changes in elevation while driving.**
- **Driving up or down even a 1% grade can greatly affect EV range. Large elevation changes in mountainous regions will have an even larger impact than this score will reveal.**
- **Elevation changes are calculated through mathematical modeling to determine the scored value.**
- **Keep tires at the proper inflation pressures. Colder outdoor temperatures will result in lower pressure in the tires.**
- **Strong headwinds or rain/snow will negatively impact this score.**
- **Note: Volt - Use Mountain Mode when grades greater than 5% will be traversed at greater than 60mph. This will limit EV range but allow for climbing grades at posted speed limits. Engage Mountain Mode before reaching 10 miles (16 km) of EV range remaining.**

Climate Settings

- **The use of cabin heat and air conditioning systems decreases the energy available for electric driving. The best EV range is achieved with the heat, air conditioning, and fan turned off.**
- **Less energy is used at low fan speeds. Fan Only mode is the most energy efficient climate setting. ECO mode (on some models) is for moderate air conditioning and heater operation and is the next most energy efficient setting. Comfort mode provides the most comfortable cabin but uses the most battery energy.**
- **The vehicle is equipped with the Auto Defog feature, which can be enabled or disabled via the vehicle settings. If this feature is enabled, the vehicle may automatically enable the Cabin Heater and Air Conditioning Compressor and use energy if the system detects the need to defog the vehicle. If the driver would like to have manual control over this, please refer to your user manual for disabling this feature.**
- **Use the auto heated seat feature and heated steering wheel (if equipped) instead of cabin heat. Heating the seat or steering wheel uses less energy than heating the entire vehicle interior.**
- **Use cabin preconditioning ("remote start") to heat or cool the interior when the vehicle is plugged in to maximize the EV range by utilizing some electricity from the**

electrical utility grid.
Note: Some EV range may be lost if the charge station cannot supply enough power for the climate systems during preconditioning. Level 1 portable cord sets are limited to about 1kW of energy.

- **Turn off the front and rear window defog/defrost when they are no longer needed.**
- **Avoid driving with the windows open at higher highway speeds due to aerodynamic drag.**

Outside Temperature

- **During periods of cold temperatures, the electric cabin heater, electric air conditioning, and battery heater may be running to defrost the windows and provide heat. These can have a very noticeable effect on EV range.**
- **The actual EV range during periods of cold temperatures will be at the low side of range estimates. This may become more evident when a customer is driving for maximum fuel efficiency or on the same route and the only thing that changed was outside temperature. This is no different than a gas engine. Fuel mileage also decreases due to cold temperatures, efficiency losses, cold starts, cabin fan, and the use of the defrosters.**
- **Note: Volt - "ENGINE RUNNING DUE TO TEMPERATURE" DIC Message: In cold conditions, below 35F (2 C) or 15F (-9 C) (depending on Engine Assisted Heating selection) the customer may experience the engine running due to low ambient temperatures even when the battery is charged. This provides supplemental cabin heat as well as some fuel energy for propulsion.**
- **Note: Volt - Engine Assisted Heating – When "*At Very Cold Outside Temperatures*" is selected in the vehicle settings, the Volt will not turn on the engine until the outside temperature is below 15°F (-9C) , but this has a greater impact on electric range in the 15°F (-9 C) to 35°F (2 C) ambient range due to the added electric heat needed for the cabin.**
- **During high ambient temperatures, the use of Air Conditioning will also affect electric range, but to a lesser extent. This is due to the greater coefficient of performance by the thermodynamic heat cycle for A/C.**
- **High ambient temperatures may also cause an increase in battery temperatures. The electric A/C compressor may run to provide cooling to the liquid battery chiller to maintain proper battery temperature.**
- **If operating the HVAC system in Fan Only Mode, cold air may be felt through the HVAC vents during chiller operation, this is normal operation. When the chiller is operating, electric range will be affected.**
- **Avoid parking in direct sunlight or use sunshades inside the vehicle to aid in a cooler cabin during summer months.**

Version History

Version	3
Modified	11/18/2016 - Created on 10/10/2017 - Added CT6 and added 2018 model year 10/22/2018 - Removed Bolt EV and Ampera E and added picture of 2019 volt screen

GENERAL MOTORS