



Preliminary Information

PIC5414J Explanation Electric Range Variation and Driving Tips For Maximum Range

Models

Brand:	Model:	Model Years:	VIN:		Engine:	Transmissions:
			from	to		
Chevrolet	Volt	2011 - 2016	All	All	All	All
Cadillac	ELR	2014 - 2016	All	All	All	All
Chevrolet	Spark EV	2014 - 2016	All	All	All	All
Opel	Ampera	2013 - 2015	All	All	All	All
Holden	Volt	2013 - 2015	All	All	All	All

Supersession Statement

This PI was superseded to wording. Please discard PIC5414H.

The following diagnosis might be helpful if the vehicle exhibits the symptom(s) described in this PI.

Condition / Concern

Some customers may state that the vehicles electric range is less than customer expectations or what is being displayed on the in-vehicle display for EV range.

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

In other words, driving and braking aggressively, driving in areas with large elevation changes, or driving in extreme outdoor temperatures will impact the electric range.

The electric range displayed in the vehicle is a prediction based on past driving conditions (kw 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 estimate is constantly being recalculated.

The displayed electric range can vary seasonally, weekly and daily based on the changes in technique, terrain and, ambient temperatures, and predicted energy that will be necessary to provide cabin comfort base upon climate control settings.

Recommendations / Instructions

For 2017 Volt please refer to the last version of [PIC6231](#)

The following items listed below explain what affects electric range and provides driving tips for better energy efficiency

A) Temperature

Note: The distance you can go in an electric vehicle varies with the outside temperature. All electric vehicles are less efficient in cold or hot conditions. This is a function of battery storage capability and increased use of cabin heat and/or air conditioning in these conditions. The vehicle must also maintain a consistent battery temperature which requires high voltage AC compressor operation to cool battery or high voltage battery heater

operation to warm up battery in order to maintain desired long term performance.

1) Cold Ambient Temperatures

- During periods of cold temperatures the electric cabin heater, electric air conditioning, and battery heater may be running to defrost the windows and heat the cabin and battery. These can have a noticeable effect on electric range.
- The actual electric 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 decreases due to cold temperatures, efficiency losses, cold starts, cabin heat, and the use of defrosters.

Note: Volt and ELR - "ENGINE RUNNING DUE TO TEMPERATURE" DIC Message: In cold conditions, below 35F or 15F (depending on Engine Assisted Heating selection if equipped) 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 propulsion energy. The engine may run periodically during these conditions.

Note: Volt Only - Engine Assisted Heating - If At Very Cold Outside Temperatures is selected it will use less gasoline, but has a larger adverse impact on electric range.

2) Hot Ambient Temperatures

- During high ambient temperatures the use of A/C will also affect electric range.
- High ambient temperatures may also cause an increase in battery temperatures. When battery temperatures increase this will force the A/C compressor and battery chiller to run and maintain a 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.

3) Tire Pressure

- Tire pressure can have an impact on your electric range. Additionally tire pressures can change with temperature changes. In order to maximize your electric range, ensure that your tires are properly inflated. For proper tire pressure, consult the Owner Manual and the vehicle Tire and Loading Information Label.

4) Climate Settings

- Using the heat and air conditioning systems decreases the energy available for electric driving due to the high voltage cabin heater. Optimal energy efficiency is achieved with the heat, air conditioning, and fan turned off.
- Volt and ELR - Less energy is used at low fan speeds. When using the fan, Fan Only is the most energy efficient climate setting. ECO mode is for moderate air conditioning and heater operation and is the next most energy efficient setting. Comfort provides the most comfort but is the least energy efficient.
- Spark EV - Operating with the TEMP button off is the most energy efficient climate setting as long as defrost is not selected.
- The vehicle may be equipped with the Auto Defog feature, which can be enabled/disabled via your vehicle settings. If this feature is enabled, the vehicle may automatically enable the Air Conditioning Compressor if the system detects the need to defog the vehicle. Usage of the Air Conditioning Compressor Energy will decrease the energy available for driving. If the driver would like to have manual control over this, please refer to your user manual as to how to disable this feature.
- Use the auto heated seat feature (if equipped) instead of climate settings. Heating the seat uses less energy than heating the vehicle interior.
- Use remote start to heat or cool the interior when the vehicle is plugged in to maximize the electric range by utilizing electricity from the electrical outlet.
- Turn off the front and rear window defog/defrost when they are no longer needed.

- Avoid driving with the windows open at highway speeds.

B) Drivers Technique

- Driving aggressively (rapid accelerations and decelerations) can drain the battery faster.
- High speed driving will deplete battery capacity and electric range quickly. Electric range is maximized at 80 km/h (50 mph) and below.
- Increased weight from additional cargo or passengers can also decrease the electric range.
- Use the Efficiency Gauge located in the Instrument Cluster. The ball indicator should be kept green and in the center of the gauge.
- Use cruise control when appropriate.
- Plan ahead for decelerations and coast whenever possible. For example, do not rush to traffic signals.
- Do not shift to N (Neutral) to coast. The vehicle recovers energy while coasting and braking in D (Drive) or L (Low).
- Use Normal Mode when possible. Sport Mode provides more responsive acceleration than Normal Mode but can reduce efficiency.
- Use L (Low) and/or Regen On Demand Paddles (if equipped) in heavy stop-and-go traffic or when traveling downhill. L (Low) and Regen On Demand Paddles capture maximum regenerative braking energy, requiring less brake pedal application while providing a controlled efficient way to slow the vehicle down.

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.

C) Terrain

- Driving uphill requires more energy and can reduce electric range
- Volt and ELR - Use Mountain Mode prior to climbing long, steep grades in mountainous areas. Be sure to engage Mountain Mode before starting to climb. Mountain Mode reduces electric range and power but may be needed to maintain speeds above 96 km/h (60 mph) when climbing grades of 5% or greater.
- Anything that negatively impacts aerodynamics, whether it's open windows, bike racks, roof racks, etc, will also increase energy usage and decrease range

Please follow this diagnostic or repair process thoroughly and complete each step. If the condition exhibited is resolved without completing every step, the remaining steps do not need to be performed.

