The New 2016 Chevrolet Volt Takes Charge

The 2016 Chevrolet Volt is a 4-door, 5-passenger hatchback, offered in LT and Premier models, with an electric range that has increased to 53 miles (83 kilometers) — a nearly 40 percent increase over the first-generation model. A 1.5L range-extending engine using regular unleaded fuel allows for further travel.

Highlights for the 2016 model include:

- The Regen-on-Demand™ feature the driver can use to control the vehicle’s energy regeneration with a paddle on the back of the steering wheel.
- Stronger body structure with more high-strength steel and a quieter ride.
- New braking system with improved capability.
- 120V portable charging cord set boasting a simpler, compact design and more convenient storage location.
- Active grille shutters help balance design with efficiency.
- Available illuminated charge port.

The Volt also features 10 air bags, a Rear Vision Camera, and crash-avoidance items such as Lane Change Alert, Rear Cross Traffic Alert, Forward Collision Alert and Front Automatic Braking.

Driving Modes

Four driving modes are available on the 2016 Volt, which are accessed by pressing the MODE button on the center console. Scroll through a menu to select the preferred mode, which will become active three seconds after it is selected.

The four driving modes are:

- **Normal (Default)** – Activates when the vehicle is started, and is used in normal driving conditions for efficient operation.
- **Sport** – Increases throttle response and power delivery characteristics for a sportier driving experience.
- **Mountain** – Best deployed when in mountainous terrain (long grades of 5% or steeper); helps to preserve battery power and will also work to maintain higher speeds.
- **Hold** – Forces the Volt into extended range operation to maintain battery charge.

**TIP:** The Volt shouldn’t be kept out in extreme weather conditions for long periods without being driven or plugged in.
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Pushbutton Start
The Volt features an electronic pushbutton start. Press the Power button once to put the vehicle in on/run position; when the Ready light appears in the instrument cluster, the vehicle can be driven. This process can take up to 15 seconds in extreme cold.

If the Power button is pressed while the vehicle is moving, a message in the Driver Information Center will prompt the driver to turn off the Volt by pressing the Power button again.

Climate Control Systems
There are three settings — Fan Only, Eco and Max — that have a direct effect on the Volt’s electric range and fuel economy.

In the Eco mode, air conditioning and heat is controlled to maintain fuel economy while still providing some comfort. Max mode delivers the best comfort level based on the temperature setting chosen. Electric range and fuel economy will decrease in relation to the energy required to meet this level.

In both modes, the air conditioning and heat can be on at the same time, or have the A/C run with the Defrost/Defog.

Heated Seats
The Volt features optional heated front and rear seats. There is an automatic heated seats feature for the front seats that can be programmed to be activated when the vehicle is on. If the front passenger seat is not occupied, the feature will not heat that seat. With the auto feature, the seat heating level will change to what is required by the vehicle’s interior temperature.

During a remote vehicle start, the heated seats will turn on automatically in cold weather. The feature must first be enabled in the Vehicle Personalization menu.

Battery Charging
A new feature for charging the Volt is programmable charging using GPS, which enables owners to be able to set their charging preferences exclusively for their “home” charging location. The vehicle will automatically adjust to that setting when it’s at that location. Owners will only have to program the system once and the Volt will return to those settings every time it’s at the home location.

Owners can pre-set their battery charging level at 240 V or 120 V, which can be set on either 8 A or 12 A and whether they wish to charge immediately, set a departure time for each day of the week, or set a departure time and a utility rate schedule to charge only at off-peak rates.

Charging Times
• Charge Station: 240 V, 16 A: Approx. 4.5 hours.
• Portable Cord set: 120 V, 8 A: Approx. 19 hours. (Default setting)
• Portable Cord set: 120 V, 12 A: Approx. 12.5 hours.

Charging Status
A new charging status feature includes a specially designed tone that indicates when charging has begun, with additional tones sounding for delayed charging. A charging status indicator light (on the top of the instrument panel) shows the approximate charge level through a series of flashes.

When the vehicle is plugged in and the battery is charging, the number of flashes indicates the percentage of battery charge. For example, one flash = 0–25% charged, two flashes = 25–50% charged, three flashes = 50–75%, etc. A solid light means the battery is fully charged. In addition, solid or flashing green or yellow indicator lights (with tones) can communicate certain charging information as well.

TIP: Advise customers that when charging, the system may run fans and pumps that may produce sounds even when the vehicle is turned off. Additional unexpected clicking sounds may be caused by the electrical devices used while charging. This is normal.

120V Portable Charging Cord Set
A new 120 V portable cord set includes a cord that is now nearly 25-feet long (7.5 m) and can be locked using a small padlock to deter unauthorized removal during charging. Plus, for improved accessibility, a new storage bin for the cord is located on the left side of the rear cargo area above the load floor.

The 120 V Gen 1 portable charge cord will work on the new Volt. However, it is not recommended since the Gen 2 cord has an internal resistor that can detect increasing temperatures caused by a faulty or loose wall plug.

The drive motor battery charger cable has two indicators — the AC Present Indicator and the Fault Indicator — which display its status.

• A solid green AC Present Indicator means AC voltage is present at the wall plug and there are no faults.
• A flashing green AC Present Indicator and solid red Fault Indicator indicates the electrical outlet or plug is faulty or overheated.
• A solid red Fault Indicator shows that the AC outlet does not have a proper ground and charging is not permitted for safety reasons.
• A flashing red Fault Indicator means a vehicle fault has occurred and the charger cable ground-fault circuit interrupter (GFCI) has tripped.
• A solid green AC Present Indicator and flashing red Fault Indicator occurs when the charger cable has failed the self-check.

© Thanks to Sherman Dixon, Keith Newbury, Steve Falko and Chuck Wieseckel
New Volt Propulsion System

The all-new Voltec extended-range electric vehicle (EREV) propulsion system in the new Volt is even more efficient for 2016, providing greater EV range (up to 53 miles/85 km on electricity), improved fuel economy and stronger acceleration than the previous generation.

High-Voltage Battery System

GM’s industry-leading battery technology is improved for 2016 and includes revised cell chemistry that increases energy storage capacity by 20 percent on a volume basis versus the original cell. The cells are also positioned lower for an improved (lower) center of gravity and the overall mass of the pack has decreased by almost 20 pounds (9 kg).

High-voltage battery system features include:

- Battery Type: Rechargeable energy storage system comprising multiple-linked modules
- Mass: 403 lbs. (183 kg)
- Chemistry: Lithium-ion
- Thermal system: Liquid active thermal control
- Cells: 192 Lithium-ion
- Cell Groups: 96
- Energy: 18.4 kWh, of which approximately 14.2 kWh are usable in order to extend the life of the battery.

Enhanced Twin-Motor Drive Unit — Power Inverter Module

The Volt’s new drive unit was engineered with a focus on increased efficiency, performance, improved packaging and reduced noise and vibration. The enhanced twin-motor drive unit operates approximately 5 to 12 percent more efficiently and boosts torque while weighing 100 pounds (45 kg) less than the previous unit.

The Power Inverter Module manages power flow between the battery and the electric drive motors and is built directly into the drive unit to reduce mass, size and build complexity while further improving efficiency. The module receives and monitors driver commands and other sensor inputs and uses this information to vary the torque and speed of each electric motor-generator (Motor A and Motor B) and to command the engine controller and engine operation.

New 1.5L Range-Extending Engine

The 1.5L direct-injected 4-cylinder engine produces 101 horsepower at 5,600 rpm and uses regular unleaded gasoline. It features a coil-on-plug ignition, cooled exhaust gas recirculation and a variable displacement oil pump.

5ET50 Hybrid Transmission

The 5ET50 electronically-controlled, continuously-variable automatic transaxle features a torque damper assembly with a rotating friction clutch, a stationary mechanical (one way) clutch, one stationary and one rotating friction clutch assembly, a hydraulic pressurization and control system, a power inverter (and control) module, an electric fluid pump, two planetary gear sets, and two electric drive motor-generators.

It has five modes of operation:

1. Single Motor Electric Vehicle (EV)
2. Dual Motor Electric Vehicle (EV)
3. Extended Range Low
4. Fixed Ratio Extended Range
5. Extended Range High

Some Volt models may experience unexpected engine flairs when the vehicle is at a steady speed or beginning to slow down. This is a normal operating characteristic of the drive unit as it moves through the five modes of operation, with the engine speed increasing to allow for the synchronous shifting that produces the engine’s maximum efficiency. Keeping the vehicle in Drive and using the brake pedal should reduce the number of engine flairs.

© Thanks to Sherman Dixon, Keith Newbury, Steve Falko and Chuck Wieseckel
2016 Volt High-Voltage Connectors

When attempting to remove or connect high-voltage connectors on the 2016 Volt, use care to avoid breaking any part of the connectors, which can be difficult to operate and prone to damage if not handled properly.

For example, the PP2000 Axial connector — located between the T6 Power Inverter Module and the X3 connector of the Rechargeable Electric Energy Storage System (high-voltage battery pack) at the Volt’s Battery Bulkhead Disconnect Unit — can prove particularly challenging when reconnecting the cable after diagnostics and/or repairs.

**TIP:** Following is an example of how to remove and connect this connector. For details on other high-voltage connectors on the 2016 Volt, see Service Information Document 4283326.

Before working on any high voltage system, be sure to follow all high voltage safety procedures.

**PP2000 Axial Disconnect Procedure**

1. Pull the green Connector Position Assurance (CPA) tab back from the locked position to the pre-stage position. There will be an audible click sound when the tab is in the correct position.

2. Depress the orange primary lock feature (tab) to release the lever.

3. Lift and rotate the lever to place the connector in the partial-mate position. Only rotate the lever until the secondary locks contact each other at the top of the connector.

4. Depress the secondary connector lock. Keep the lock depressed and rotate the lever forward to the pre-stage position. There will be an audible click sound when the connector lock disengages.

5. Pull back on the female connector to disconnect the connector completely from the high voltage battery pack.

**PP2000 Axial Connect Procedure**

**TIP:** Using the connector lever to draw the connectors together during the pre-stage position may damage the connector lever pivots. The initial mating of the connector halves must be performed by hand without the use of the connector lever. Only use the lever to fully mate the connector halves when the lever has rotated beyond the pre-stage position.

Ensure the lever and CPA tab are in the pre-stage position.

1. With the lever and CPA tab in the pre-stage position, align the connector with the index features and install the connector to the pre-locking position. The lever will be released from its pre-stage position with a short movement.

2. Pull the lever to the full-stage position. There will be a very audible click sound.

3. Push the green CPA tab to lock the connector in the full-stage position. There will be a very audible click sound when the connector is secured.

For a demonstration, check out the December broadcast of the Emerging Issues seminar that shows the removal and connection of the connector to the high-voltage battery pack.

跂 Thanks to Joe Ciagala and Steve Falko
Fastener Appearance under the Hood

The two fasteners located on either side of the hood latch on the 2016 Camaro may appear to be loose. Upon inspection, these fasteners clearly show a gap between the head of the fastener and the plastic trim panel.

Do not attempt to tighten or otherwise move these two fasteners, even though they may appear not to be fully seated. These fasteners are part of the front fascia support bracket. The preset gap is by design and each fastener has Loctite applied to the threads so the preset gap does not change.

This component arrives at the assembly plant preadjusted, so these fasteners are not adjusted when the component is installed in the car.

The two fasteners are adjustable to allow for hood to fascia alignment, but they should only be adjusted if the fascia is too high or too low in reference to the hood. When these fasteners are adjusted, the vertical clearance of the front fascia to hood gap will be changed.

Thanks to Matt Bierlein

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Twin Turbocharged V6 Engine Sounds

A noise condition may be heard on some 2014-2016 Cadillac models equipped with the twin turbocharged V6 engine (RPO LF3, LF4).

Cold Start Rattle Sound at Idle

On some 2014-2016 CTS-V Sport and XTS models equipped with the twin turbocharged 3.6L V6 engine (RPO LF3), a rattle sound may be heard coming from the turbocharger when the engine is cold. This is a cold start noise at idle.

TIP: Do not confuse this noise with a similar noise heard when revving the engine.

If the rattle sound when cold is from the turbocharger, and the noise is unforced, there is a new turbocharger assembly available with a revised spring for the wastegate to limit movement when cold.

The new part numbers are 12666538 (turbocharger assembly – LH) and 12666539 (turbocharger assembly – RH) for the CTS-V Sport and 12666540 (turbocharger assembly – RH/LH) for the XTS. If the vehicle already has these part numbers installed, do not replace the part again.

Rattle Sound when Revving the Engine

A brief rattle or tick sound when revving the engine may be heard on some 2014-2016 CTS Sedan (VIN A) and XTS models equipped with the twin turbocharged 3.6L V6 engine (RPO LF3) and 2016 ATS-V models equipped with the twin turbocharged 3.6L V6 engine (RPO LF4).

This sound is heard when the vehicle is in Park or Neutral and can sometimes be heard at the beginning or end of vehicle acceleration while in Drive. The brief rattle sound is a normal characteristic of the vacuum actuated turbocharger. Do not replace the turbocharger assembly for this condition.

Thanks to Bryan Salisbury
Proper Battery Fuse Block Cover Removal

The battery fuse block cover assembly may be difficult to remove on 2015-2016 Colorado and Canyon models. If the cover is opened incorrectly, the hinge or latch may break.

To properly remove the battery fuse cover:
1. Unlock the small latch for the positive cable cover on the engine side of the battery cover assembly.
2. Next, lift the positive cable cover and unlock the main cover latch on the engine side of the assembly.
3. Now, the front cover latch can be unlocked. Lift the hinge nearest the fender to access the battery and fuse block.

Thanks to Charles Hensley

Poor Ground Connection at G110

On some 2009-2015 CTS-V models, several intermittent conditions may be present, including a Service Power Steering message, reduced power steering assist, and illuminated ABS, traction control and electronic stability control (StabiliTrak) warning lamps on the instrument cluster.

In addition, DTCs C0450 (Steering Assist Control Actuator Circuit), C0899 (Device Voltage Low), U0121 (Lost Communication with Electronic Brake Control Module), U0123 (Lost Communication with Yaw Rate Sensor Module), or U0126 (Lost Communication with Steering Wheel Angle Sensor Module) may be set.

If any of these conditions are found, check for an aftermarket Cold Air Intake (CAI) assembly installed on the vehicle. Certain aftermarket CAI manufacturers use Ground 110 (G110) as a bracket mounting point, which causes a poor ground connection on the vehicle.

TIP: G110 should not be used to attach any aftermarket accessories.

Remove the Cold Air Intake and reevaluate the performance of the vehicle.

Thanks to David Antal

DTCs Set after Turbocharger Replacement

After installing a remanufactured turbocharger on a 2006-2010 Express, Kodiak, Silverado, Savana, TopKick or Sierra equipped with a 6.6L diesel engine (RPO LBZ, LLY or LMM), a Check Engine MIL and DTCs P003A (Turbocharger Boost Control Position Not Learned) and/or P2563 (Turbocharger Boost Control Position Sensor Performance) may set.

The DTC P003A/P2563 diagnostic must be completed. DTCs P003A and P2563 can set due to turbocharger vane control solenoid or vane position sensor concerns. After any service performed on the turbocharger or turbocharger components, a turbocharger relearn must be performed. Failure to perform the turbocharger learn procedure may cause other DTCs to set.

If the P003A/P2563 diagnostic is inconclusive or if the vane control solenoid and vane position sensor are tested with no trouble found, replace the turbocharger.

If these conditions were found after installing remanufactured turbocharger part number 19329915, replace it with new turbocharger part number 12639460.

If these conditions were found after installing remanufactured turbocharger part number 19329916, replace it with new turbocharger part number 98011735.

Thanks to John Stempnik