



Service Bulletin

PRELIMINARY INFORMATION

Subject: High Voltage Drive Motor Battery Repair and Exchange Process

Models: 2011-2015 Chevrolet Volt
2014-2016 Cadillac ELR

This PI was superseded to update Recommendation/Instructions and Labor Information. Please discard PIP4841L.

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

Condition/Concern

As part of our ongoing quality improvement process, effective February 1st, 2015 the High Voltage Drive Motor Battery and Battery Sections are being placed on restriction through the GM Technical Assistance Center (TAC).

Note: Please review all of the information provided below prior to contacting the Technical Assistance Center (TAC) @ 877-446-8227 (U.S.) or in Canada 1-800-263-7740 (English) or 1-800-263-7960 (French) to review case details.

Note: Whenever performing battery repairs it is imperative that fasteners are torqued properly and SI procedures followed.

Do not remove any Drive Motor Battery assembly covers unless instructed to do so by TAC. The Drive Motor Battery may also be referred to as the Lithium Ion High Voltage Battery. If the failure is due to one of the non-serviceable components the battery will be exchanged. The Exchanged Drive Motor Batteries will be refurbished and tested to provide a capacity greater than or equal to the replaced battery.

Prior to calling TAC, please make sure to complete the "Battery Exchange" required Information and diagnosis provided in the recommendations portion of this PI. Performing the diagnosis and obtaining the required information will minimize the time spent on the telephone and avoid the need for multiple calls to TAC. Guidelines for honoring this exchange program are being strictly enforced. To obtain a replacement drive motor battery, the servicing volt technician must provide customer complaint, conditions, diagnostic trouble codes (DTCS) and other useful information as outlined below.

IMPORTANT

Danger: Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.

The High Voltage Disabling procedure will perform the following tasks:

1. Identify how to disable high voltage.
2. Identify how to test for the presence of high voltage.
3. Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed

Before working on any high voltage system, be sure to wear the following Personal Protection Equipment:

1. Safety glasses with appropriate side shields when within 50 feet of the vehicle, either indoors or outdoors.
2. Certified and up-to-date Class "0" Insulation gloves rated at 1000V with leather protective gloves.
3. Visually and functionally inspect the gloves before use.
4. Wear the Insulation gloves at all times when working with the Drive Motor Battery assembly, whether the system is energized or not.

Failure to follow the procedures exactly as written may result in serious injury or death

Recommendation/Instructions

Please have a certified Volt/ELR technician follow the diagnostic procedures below prior to contacting TAC.

1. If DTCS are present and procedure gives direction to remove internal components; stop, capture GDS2 Session Log stored data, and test drive vehicle

with GDS and MDI, and capture a snap shot of the Hybrid Powertrain Control Module 2 (VICM) and BECM data when condition occurs. See Latest version of PIP4902 for correct Session Logs data collection. TAC may request that you e-mail the Session Logs to them. Do not clear codes prior to capturing data and calling TAC

2. If DTCs are not present, refer to " Symptoms - Hybrid Controls " in SI.
3. If any diagnostic procedure gives direction to remove internal components, stop and call TAC. If TAC has identified the repairs as being part of the allowable internal battery repairs, instructions will be provided to the dealer. It is imperative that the technician has completed all available training including hands-on training as well as have all the required dealer equipment, and all personal protection equipment (PPE) is up to date.
4. Upon review of the diagnosis, TAC will establish a case reference number and make arrangements for providing instructions to replace allowable components or ordering an exchange battery assembly unit to your dealership if necessary. Follow procedure for disabling high voltage systems in SI
5. After verifying that the high voltage systems are disabled remove battery assembly per SI procedures

Note: The Battery pack has 2 ground straps that are attached to the battery. ONLY remove the ground straps on the vehicle side. The new battery will come with the 2 ground straps already attached.

6. Prior to contacting TAC, check with your parts personnel for the parts department hours of operation (including Saturdays if open) and the name of the parts contact that will be handling the battery pack. This information along with the battery identification number and the 4 digit battery capacity number will need to be supplied to the TAC consultant prior to ordering the battery.

6.1 The battery pack 4 digit capacity code is located in the HPCM 2 under the voltage data list. You need to make sure that you have the latest version of GDS 2 to see this 4 digit code.

6.2 The battery has two battery identification tags that are located on the front of the battery above the coolant inlet and outlet pipes and an identical tag that is located on the right side of the battery. Locate one of the tags and record the 16 digit battery identification number (BIN). The BIN is the bottom most number on the label and it starts with a "T" indicator (See Photo Below). If the battery is not out of the vehicle yet, you can find the BIN by installing the MDI and using GDS 2. Access the Battery Energy Control Module and look under the identification information section and the sixteen digit number will be listed under the parameter: Hybrid/EV Battery Pack Identification Number

You will need to record the BIN and supply it to TAC when ordering a battery or battery section.



Note: The exchange unit will be shipped without coolant. Follow SI procedure for proper coolant and fill procedures. Low coolant or wrong coolant could result in internal battery damage. For additional information on how to properly bleed the battery cooling system, please see the latest version of PI: PIP4859. For information on the proper battery coolant, please see the latest version of PI: PIP4910

7. Perform K16 Drive Motor Generator Battery Control Module (BECM) reprogramming when replacing the new battery pack or battery section and also update the K114B Hybrid Powertrain Control Module 2.
8. Next reset the Hybrid / EV battery pack data . This can be found in GDS 2 under: Hybrid Powertrain Control Module 2 and selecting Configuration/Reset Functions.
9. As a final step, perform the Hybrid / EV Pack Capacity Learn. This can be found in GDS 2 under: Hybrid Powertrain Control Module 2 and selecting Configuration/Reset Functions.
10. After SPS programming the BECM, you will have to drive the vehicle in Mountain Mode with the vehicle in Low Gear for approximately 5 miles (8 km). This will pack the most energy in the battery during charging and regeneration and exercises the coolant valves and pumps. When performing the 5 mile (8 km) drive cycle, drive vehicle in slalom (side to side motion) to purge any air from battery pack cooling plates. After the drive cycle, check for codes and top off the coolant system.
11. Fully charge HV battery before delivering the vehicle to the customer

After the Battery has been removed from the vehicle (see service manual procedure), and before placement into the shipping cocoon, prepare the battery for return by performing the following:

1. Install Coolant plugs (2) in coolant lines. Coolant plugs can be removed from the new service battery assembly and installed in the returned battery. Additional coolant plugs (GM P/N 22770854) can be ordered if they are needed.
Note: As part of the battery removal process, all coolant should be drained from the drive motor battery
2. Install the Manual Service Disconnect (MSD) Cover. The MSD cover can be removed from the new service battery assembly and installed in the returned battery. Additional MSD covers (GM P/N 22770856) can be ordered if they are needed.
Note: The MSD lever should remain with the vehicle and not be returned with the battery assembly.
3. Install the High Voltage Connector Cover. The high voltage connector cover can be removed from the service battery and installed on the returned battery. If the service battery assembly did not come with a high voltage connector cover, additional covers can be ordered by calling 1-800 GM TOOLS. Reference tool # EL-50209 when placing your order.

In order to properly prepare the used battery for shipping and to insure safe shipment, all of the above steps must be followed.

Note: The used battery must be removed and returned with a battery assembly lifting fixture (GM Special Tool EL-49976.) This lifting fixture will be attached to the used battery and placed in the shipping cocoon. Each new service battery will come with a battery assembly lifting fixture for use during installation. You will keep this fixture for servicing future battery removals.

Caution: When removing the battery it is important that the cradle is raised up to the vehicle and battery and cradle alignment pin engaged. Under no circumstances should a vehicle be lowered on to the cradle that is placed on a fixed table. This could create a situation where the battery is not aligned to the cradle resulting in cradle or battery damage.

Danger: *The high voltage (HV) battery must be protected when outside of the vehicle. This is why the battery must be immediately placed in the original shipping container (cocoon).*

Storage Guidelines:

1. Store the Drive Motor Battery flat.
2. Store the Drive Motor Battery in an environmentally protected area.
3. Maintain the Drive Motor Battery at room temperature.
4. Protect the Drive Motor Battery from exposure to liquids.
5. Protect the Drive Motor Battery from physical damage.
6. Store the Drive Motor Battery in a limited-access area.

Danger: *Failure to follow these guidelines may result in serious injury or death*

PARTS RETENTION AND RETURNS UNITED STATES SERVICE AGENTS Only

All batteries and battery sections need to be returned for possible refurbishment. If the batteries are not returned within 30 days the dealer will be charged to value of a replacement battery. These charges are substantial. You will be advised within three days after repair where the battery or battery section will be returned to. There are two different area's the battery or battery section could be returned to.

1. Priority 2 Root Cause/Refurbishment: CCA Contact will advise where to ship the batteries and or sections back for possible refurbishment. It is expected that the majority of batteries will go thru this process.
2. Parts Return Request (WPC): A Special Parts Return Request will be faxed to you with proper shipping instructions. Do NOT wait for the warranty claim to be paid before returning the failed used battery

WPC guidelines below:

1. Do NOT send a battery back without a Special Parts Return Request.
2. Do NOT send the battery back to the ESC.
3. Do NOT send battery back to the WPC.

Do NOT return battery in any other container than the container (cocoon) that the new/refurbished battery was delivered in. The removed unit must be returned complete in the original exchange shipping container

The Special Parts Request will provide a request number. This request number must be placed in the outside shipping envelope along with the TAC Case number. Dealers need to place a new envelope inside the battery cocoon with completed Volt Battery Exchange information including the TAC Case #, along with a copy of the Job Card (RO) including the technician's comments, DTCs, and diagnostics. It is recommended that this be taped to the battery inside the cocoon. Failure to place this information both outside and inside the battery shipping container may delay the processing of your return. Do not ship a battery back without an official WPC Request.

Note: Failure to return the battery or battery section by the due date will result in the dealership being debited the entire warranty claim (parts and labor) as well as assessment of an environmental fee for the value of the failed pack. This fee is substantial (\$10,000) and will only be assessed if a battery pack is not returned in the designated time frame.

Note: If you do not receive a direction of where to ship the battery or battery section back, verify that you do not have an existing open WPC Request. If you don't have a WPC Request, contact Keith Lock @ 810 606 2576 or by E-mail (keith.a.loch@gm.com) for shipping instructions and the proper paper work in order to return the failed Drive Motor Battery or battery section.

Shipping Preparation for Priority 2 Root Cause:

Note: Never ship a damaged or compromised battery without prior approval. All hazardous materials must be shipped in accordance with all local, state, and federal laws.

1. Disable the high voltage at the drive motor generator battery. Refer to High Voltage Disabling.
2. Remove the Drive Motor Battery from the vehicle as outlined in Drive Motor Generator Battery Replacement in SI.
3. Tighten any fasteners that were loosened or removed during Drive Motor Battery removal to the original torque specification.
4. Remove any plastic shipping plugs or covers from the new unit and install them on the Drive Motor Battery to be returned
5. Write the TAC case reference number on the drive motor battery assembly in a visible location
6. Write the TAC case reference number on the repair order.
7. Place the Drive Motor Battery on the cradle into the shipping container and attach the completed return shipping tag to the Drive Motor Battery.

WPC Shipping Instructions:

1. Place a copy of the Special Parts Return Request, repair order with technician comments, and the completed "Volt Battery Product Feedback Form" and place into the plastic envelope. The bill of lading and customs papers (for cross border shipments) should also be inserted into the plastic envelope. Remove the original shipping label and attach the plastic envelope with the return shipping label on it to the container.
2. Label the outside of the shipping container with the Part Return request number and the TAC case reference number. Refer to Corporate Bulletin Number 99-00-89-019F for detailed shipping information.
3. Contact UPS Freight 1-800-333-7400 for pick-up of removed battery. If lift gate service is necessary, please request it at the time of arranging pick-up service.
4. Have the driver sign the bill of lading. Retain a copy of the signed bill of lading and attach your copy to the original repair order. This will be your proof of returning the Drive Motor Battery
5. Ship the Volt battery Third Party Prepaid Freight Collect with appropriate paperwork to address provided.

Parts Information

No Part Number should be entered on warranty claim . Applicable miscellaneous items such as coolant should be added to the part allowance amount and claimed in the Parts Cost column and not included in the Net Amount (DMN) column of the warranty claim.

CANADIAN SERVICE AGENTS ONLY

All Volt batteries must be returned to the appropriate core return center with completed documentation including battery return worksheets with TAC Case Number and VIN.

Note: Failure to return the battery will result in the dealership being debited the entire warranty claim (parts and labor) as well as assessment of an environmental fee for the value of the failed pack. This environmental fee is substantial (\$10,000) and will only be assessed if the battery is not returned.

For dealers in Canada, the return of failed batteries will be handled through the existing core return process. (Type 4 return)

Shipping Preparation:

1. Disable the high voltage at the drive motor generator battery. Refer to High Voltage Disabling
2. Remove the Drive Motor Battery from the vehicle as outlined in Drive Motor Generator Battery Replacement in SI.
3. Tighten any fasteners that were loosened or removed during Drive Motor Battery removal to the original torque specification.
4. Remove any plastic shipping plugs or covers from the new unit and install them on the Drive Motor Battery to be returned
5. Write the TAC case reference number on the drive motor battery assembly in a visible location.
6. Write the TAC case reference number on the repair order.
7. Place the Drive Motor Battery on the cradle into the shipping container
8. Place the completed "BATTERY PRODUCT FEEDBACK FORM" (which was included in the container containing the new battery) inside the cocoon with the failed battery. Dealers need to place a new envelope inside the battery cocoon with completed Volt Battery Exchange information including the TAC Case #, along with a copy of the Job Card (RO) including the technician's comments, DTCs, and diagnostics. It is recommended that this be taped to the battery inside the cocoon.

Canadian Shipping Instructions:

Canadian Dealers should follow the steps below to return a failed battery:

1. Submit a type 4 core return for the battery. A core return tag along with a core return application will be generated at your servicing PDC and sent to you.
2. Place the core return tag on the outside of the battery container (cocoon).
3. Complete the required return hazardous goods shipping paperwork (302C form)

4. Leave the labeled container (cocoon) along with the necessary shipping documents in the area within your dealership which you would normally use for your material/core returns. The DDS carrier will pick up this battery core along with your normal returns. If your dealership is not serviced by a DDS carrier you will need to return this battery via LTL (similar to how you would return other parts).
5. Canadian Dealers do NOT return batteries to the ESC or to the WPC.

Warranty Information

For vehicles repaired under warranty use:

Labor Operation	Description	Labor Time	Part Allowance
5031030	Drive Motor Generator Battery Replacement	Use Published Labor Operation Time	\$400.00
5030290	Drive Motor Generator Battery Section Replacement	Use Published Labor Operation Time	\$250.00
Add	Administrative Allowance	0.2 hr	
Add	Road test – Data snapshot	0.3 hr	
Add	Additional time to balance section	1.0 hr	

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.

GM bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. See your GM dealer for information on whether your vehicle may benefit from the information.



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