



# Service Bulletin

## PRELIMINARY INFORMATION

**Subject:** Spark EV (BEV) High Voltage Battery Exchange Process And Battery Internal Component Restriction

**Models:** 2014 -2015 Chevrolet Spark EV  
with RPO EN0

*This PI was superseded to update Email address and Administrative Details. Please discard PIP5112D.*

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 as of 08/06/2014, the Drive Motor Battery for the 2014 - 2015 Spark EV and several internal components are being placed on restriction through the General Motors Technical Assistance Center (TAC). The dealership must call TAC to establish a TAC case number and authorization to order the Rechargeable Energy Storage System (RESS) or any of the internal components listed below. TAC or Engineering will then provide guidance if internal components should be replaced or if the RESS should be replaced. If it is to be replaced, TAC will call the nearest Electronic Service Center (ESC) to order the Drive Motor Battery. At this point in time, the 2015 Spark EV Drive Motor Battery is on exchange and not to be opened for service unless authorized by GM TAC and Engineering.

**Note:** This Part Number should not be entered on the Warranty Claim. The Chevrolet Spark EV Drive Motor Battery may also be referred to as the Rechargeable Energy Storage System (RESS). Please review all of the information provided below prior to contacting the General Motors 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.

**Important:** Prior to calling TAC, please make sure to collect the required information and complete the diagnosis provided in the recommendations portion of this PI. Completing the diagnostics and obtaining all required information will minimize downtime, multiple calls to TAC, misdiagnosis, or unnecessary component replacement.

The following items should be reviewed and followed by the dealership technician.

- Do not remove the Drive Motor Battery assembly covers unless instructed to do so by TAC or Engineering.
- A GDS2 Session Log with Freeze Frame Data, Vehicle Wide DTC Check with Module ID Information, any Battery Energy Control Module (BECM) or HPCM2 data menus, will normally be requested by TAC or Engineering.
- Guidelines for honoring this exchange program are being strictly enforced. To obtain a replacement Drive Motor Battery, the servicing Spark EV technician must provide customer complaint and conditions as mentioned in this document.
- If the failure is due to one of the non-serviceable components, the battery will be exchanged
- Whenever performing battery repairs it is imperative that fasteners are torqued to specification and that G.S.I. procedures are followed
- The dealership must also use banding straps to secure the battery to the container base when shipping the Drive Motor Battery.

**Note:** Please notify GM Technical Assistance if banding equipment is not available at your dealership when requesting a Drive Motor Battery. There is a limited number of Banding Kits available when the Drive Motor Battery order is being placed through the ESC. It may be necessary to obtain a Banding Kit through existing dealership resources

**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.

**Caution:** 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

**Important:** Only have a certified Spark EV technician follow the diagnostic procedures below prior to contacting TAC. It will be necessary to connect GDS2 to record the Battery Capacity Code prior to disabling the 12V or High Voltage systems.

1. Do not clear codes prior to capturing data. GDS2 Session Log Freeze Frame & Failure Records should be reviewed prior to clearing any DTCs or performing any programming. Regardless if DTCs are current, history or G.S.I. repair procedure gives direction to remove any internal components or perform programming,
2. It may be necessary to road test the vehicle through several drive cycles with GDS2 installed in an attempt to capture relevant data in the GDS2 Session Log while attempting to duplicate the concern.
3. The GDS2 Session Log should include a Vehicle Wide DTC Check with Module ID Information, any relevant failure records, module data from the Hybrid Powertrain Control Module 2 (HPCM 2), Battery Energy Control Module (BECM) while attempting to duplicate the customer's concern in certain conditions or driving habits. TAC or Engineering may request that you e-mail the GDS2 Session Logs to them for immediate review.
4. This information, along with the Battery Identification Number (BIN) and the 4 digit battery capacity number, will be needed for the TAC Consultant prior to ordering the battery. The battery pack 4 digit capacity code is located in the HPCM 2 under the voltage datalist. You may need the latest version of GDS 2 to see this 4 digit code.
5. If the battery is not out of the vehicle yet, you can find the BIN by installing the MDI and using GDS2. Access the BECM Module Information and look under the identification information section and the sixteen digit number will be listed under the GDS2 parameter:

Hybrid/EV Battery Identification Number (BIN). You will need to record the BIN and supply it to TAC when ordering a battery. The battery also has a 16 digit Battery Identification Tag (B.I.N.) that is located on the right side of the battery. You can locate the tag and record the B.I.N. upon removal. As of date, the BIN is the number on the bottom label (See Photo Below).



1. Call GM TAC to establish a TAC case. The latest version of PIP4902 can be used to email the GDS2 Session Log that may need further review by TAC or Engineering. If a component has been identified as one of the allowable internal battery repairs, instructions will be provided to the dealer. It is imperative that the technician has completed all available Spark EV training including hands-on training as well as have all the required dealer equipment, and all Personal Protection Equipment (PPE) is up to date
2. After the data is reviewed, TAC will use a case reference number and order an exchange Drive Motor Battery through the ESC in order to have it shipped to your dealership. TAC will need the dealer's hours of operation, that they have the special tools / equipment and dealership personnel contact information.
3. After verifying that the high voltage systems are disabled, remove battery assembly per SI procedures.

**Important:** The Battery pack has two ground straps that are attached to the battery. ONLY remove the ground straps that are attached to the battery. The new battery will NOT come with the 2 ground straps already attached

**Important:** The exchange unit will be shipped without coolant. As part of the battery removal process, all coolant should be drained from the drive motor battery.

Follow G.S.I. procedure for proper coolant type, fill and coolant bleed procedures. After the Battery has been removed from the vehicle (see G.S.I. procedure),

and before placement into the shipping container, 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.
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 22989605) can be ordered if they are needed. The MSD lever should remain with the vehicle and not be returned with the battery assembly.
3. Install the High and Low Voltage Connector Covers. The covers can be removed from the service battery and installed on the returned battery. In order to properly prepare the used battery for shipping and to insure safe shipment, all of the above steps must be followed.

**Caution:** With the Drive Motor Battery on the EN 48244 Support Table, slowly raise the support table to the vehicle. Use a punch or alignment tool to get the Drive Motor Battery into position. Avoid making contact with the front of the drive motor battery with the body so damage does not occur to the studs that are used to attach the aero panels upon final installation.

**Danger:** The High Voltage Drive Motor Battery must be protected when outside of the vehicle. This is why the battery must be immediately placed in the original shipping container.

4. Follow current SI Procedure to complete installation of the Drive Motor Battery

**Important:** Programming steps: (Please carefully review steps 1-5).

1. Perform K16 Drive Motor Generator Battery Energy Control Module (BECM) programming when replacing the Drive Motor Battery. This will also program the Module Balance Boards (MBBs) and Current Sense Module (CSM) which may take approximately four minutes.
2. Turn the ignition off, disconnect all devices, close the door and allow the vehicle to enter a sleep cycle (fully power down) for at least two minutes.
3. After SPS programming the BECM, follow current SI procedure. Using GDS2, select Control Functions, perform the Hybrid / EV Pack Capacity Reset and then Battery Capacity Relearn in Hybrid Powertrain Control Module 2
4. When SI procedures are complete, you will have to drive the vehicle in Sport 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 the battery pack cooling plates. After the drive cycle, check for codes and top off the coolant system.

**Important:** Low coolant or the incorrect coolant could result in internal battery or coolant heater damage

5. Follow current SI Procedure to complete installation of the Drive Motor Battery and fully charge Drive Motor Battery before delivering the vehicle to the customer

**Danger:** The High Voltage Drive Motor Battery must be protected when outside of the vehicle. This is why the battery must be immediately placed in the original shipping container.

### 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 DEALERS

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.

Please follow 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
4. Do NOT return battery in any other container than the container (crate) that the new battery was delivered in. The removed unit must be returned complete in the original exchange shipping container
5. 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 crate with completed Spark EV Battery Exchange information including the TAC Case number 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 container. 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.

**Important:** Failure to return the battery by the due date will result in the dealership being debited the entire warranty claim (parts and labor).

**Important:** If you do not receive the WPC Special Part Request, call 248-371-9939 to obtain the proper paper work in order to return the failed Drive Motor Battery

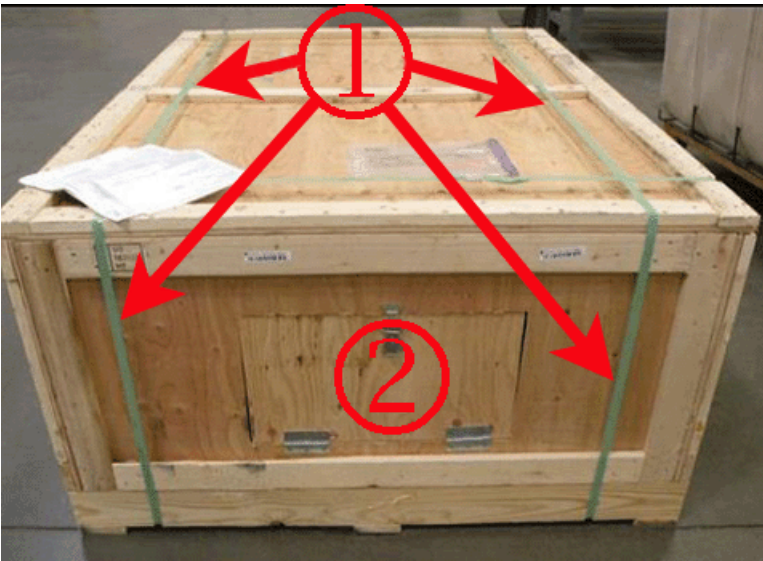
### SHIPPING PREPARATION:

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 to the original torque specification during Drive Motor Battery removal
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 into the shipping container and attach the completed return shipping tag to the Drive Motor Battery.

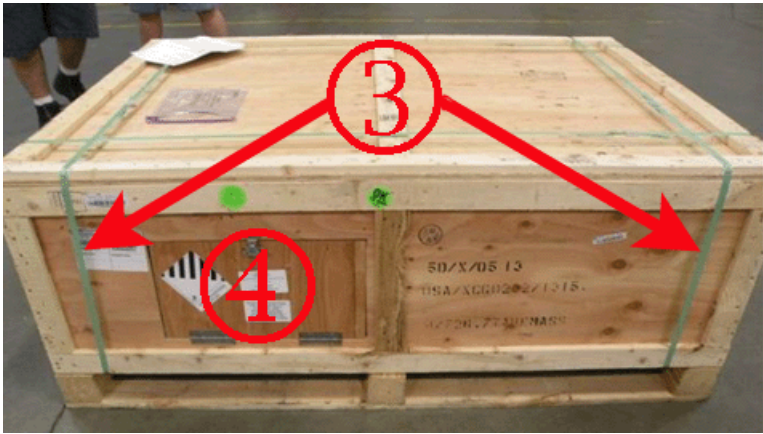


8. It is important to package the Drive Motor Battery upon return exactly as the new Drive Motor Battery was received. Zinc-Plated Steel Lag Screws for Wood, 5/16" Diameter, 2-1/2" Length are used to secure the battery pack to the crate base. The dealership must also use banding straps to secure the battery to the container base. The container top or "bonnet" must also be banded to the container base as pictured below.

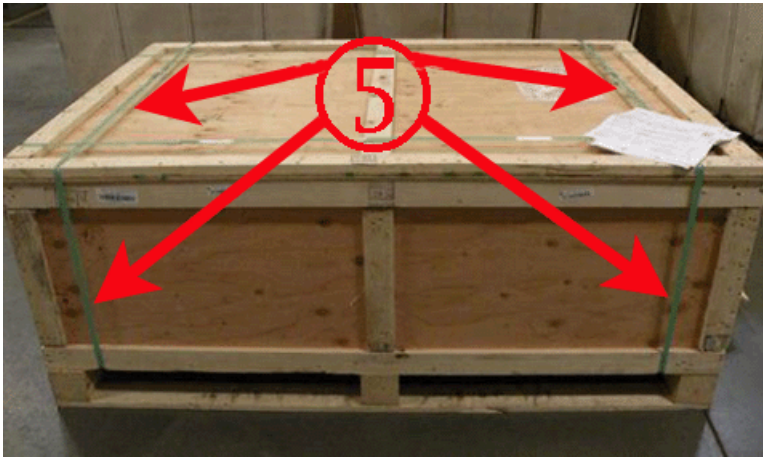
**Important:** During your call to TAC, inform them if banding equipment is not available at the dealership. Banding Kits may be obtained if requested when placing the battery order through TAC



1. Banding Straps
2. Access Door



- 3. Banding Straps
- 4. Access Door



- 5. Banding Straps

**SHIPPING INSTRUCTIONS:**

1. Place a copy of the Special Parts Return Request, repair order with technician comments, along with the completed "Spark EV Battery Product Feedback Form" (available in Global Connect) 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 99-00-89-019 for detailed shipping information.
3. Follow the shipping instructions received in the Special Parts Request.
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 Spark EV battery with appropriate paperwork to:

Battery Refurbishment  
 Dock 16  
 Brownstown Battery Assembly Plant  
 20001 Brownstown Center Drive  
 Brownstown, MI 48134  
 Attention: Brett Powell  
 +1 248 866 9010

**PARTS INFORMATION:**

No Part Number should be entered for exchange components. 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 Spark EV batteries must be returned 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.) For dealers in Canada, the return of failed batteries will be handled as outlined in Parts Bulletin GMP2013-081.

### 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 G.S.I.
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 "Spark EV Battery Product Feedback Form" (available in Global Connect) inside the crate with the failed battery. Dealers need to place a new envelope inside the battery crate with completed Spark EV 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 crate.
9. It is important to package the Drive Motor Battery upon return exactly as the new Drive Motor Battery was received. Zinc-Plated Steel Lag Screws for Wood, 5/16" Diameter, 2-1/2" Length are used to secure the battery pack to the crate base. The dealership must also use banding straps to secure the battery to the container base. The container top or "bonnet" must also be banded to the container base as pictured below. Notify Technical Assistance if banding equipment is not available at the dealership.

### CANADIAN SHIPPING INSTRUCTIONS:

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

1. Contact Rob Carlyle – CCA (905-644-5385) or Kris Muller – CCA (905-644-5159) to arrange battery/section pick-up.
2. Complete the required return hazardous goods shipping paperwork (302C form)
3. The DDS assigned carrier will pick up this battery
4. Canadian Dealers DO NOT return batteries to the ESC or to the WPC

### Parts Information

COMPONENT CODE	MODEL YEAR	PART NAME	PART NUMBER	QTY
		COMPLETE PACK (RESS)		
A4	2014	HV Drive Motor Battery	23176402	1
A4	2015	HV Drive Motor Battery	23242249	1
		INTERNAL COMPONENTS		
A28	2014	Generator Battery Control Wiring Junction Block Battery Disconnect Unit (BDU)	22989598	1
A28	2015	Generator Battery Control Wiring Junction Block Battery Disconnect Unit (BDU)	23290177	1
E54	2014	High Voltage Battery Heater	22989588	1
E54	2015	High Voltage Battery Heater	23472177	1
K16	2014	Battery Energy Control Module (BECM)	22989607	1
K16	2015	Battery Energy Control Module (BECM)	13595710	1

K112 (A-H)	2014	Drive Motor Battery Interface Control Module Replacement (VTSM 1 - 8) Located At Sides Of Each Battery Section	22989610	1
K112	2015	Drive Motor Battery Interface Control Module Replacement (VTSM)	13593091	1
K112J	2014	Drive Motor Battery Interface Control Module 9 (CSM) (Current Sense Module at Front of Pack)	22989621	1
S15	2014 - 2015	Drive Motor Battery High Voltage Manual Disconnect Lever (MSD)	23342245 supersedes 13583086	1
N/A	2015	High Voltage Battery Tray	23453650	1
N/A	2015	Battery Wiring Harness Assembly (Connector)	23242247	1
N/A	2015	Low Voltage Battery Wiring Harness Assembly (HVIL, Temp, CAN & Current Sensor)	23495424	1
N/A	2015	Battery Wiring Harness Assembly (Cell Voltage to VTSM and BECM)	23495425 supersedes 22996861	1
N/A	2014	Battery Cell Thermal Pad (Replaced with each Battery Section or MBB)	22989585	2
N/A	2014	Fuse	22989589	1
N/A	2014	Battery Cover Retaining Bolts	22989601	11

## Warranty Information

For vehicles repaired under warranty use:

Labor Operation	Description	Labor Time	Part Allowance
5030630	Drive Motor Battery Replacement	Use Published Labor Operation Time	\$400.00
Add	Administrative Allowance	0.2 hr	N/A
Add	Road Test - Data Snapshot	0.3 hr	N/A
5031030	Drive Motor Battery Replacement and Shipping Preparation **	3.9*	N/A
5021500	Battery Heater Replacement	Use Published Labor Time	N/A
5031010	Battery Energy Control Module Replacement (BECM) **	Use Published Labor Time	N/A
5030330	Drive Motor Battery Interface Control Module Replacement (VTSM / MBB) Located on the side of each Battery Section	Use Published Labor Time	N/A

5030870	Drive Motor Battery Positive High Voltage Contactor Relay Replacement (BDU)	Use Published Labor Time	N/A
5030330	Drive Motor Battery Interface Control Module (Current Sense Module at front of Battery Pack)	Use Published Labor Time	N/A
5030280	Cell Battery Pad Replacement (Thermal Pad) (Replaced with each Battery Section or MBB)	Use Published Labor Time	N/A
5030310	Drive Motor Battery High Voltage Manual Disconnect Lever Replacement (MSD)	Use Published Labor Time	N/A
*Add Time	To Fill Cooling System	0.3	N/A
**Add Time	SPS Programming Required Follow Published Service Information (SI)	Use Published Labor Time	N/A

**Note:** This Part Number must not be entered on the Warranty Claim for exchange components supplied by the ESC. The Chevrolet Spark EV Drive Motor Battery may also be referred to as the Rechargeable Energy Storage System (RESS).

**Note:** For those batteries not requested back thru the WPC for Root Cause a battery recycling process will be published shortly. Li-Ion batteries must be properly packaged, transported and, recycled using published procedures that are compliant with federal, state/provincial, and local laws and regulations.

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.

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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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