

High Voltage Enabling

Diagnostic Instructions

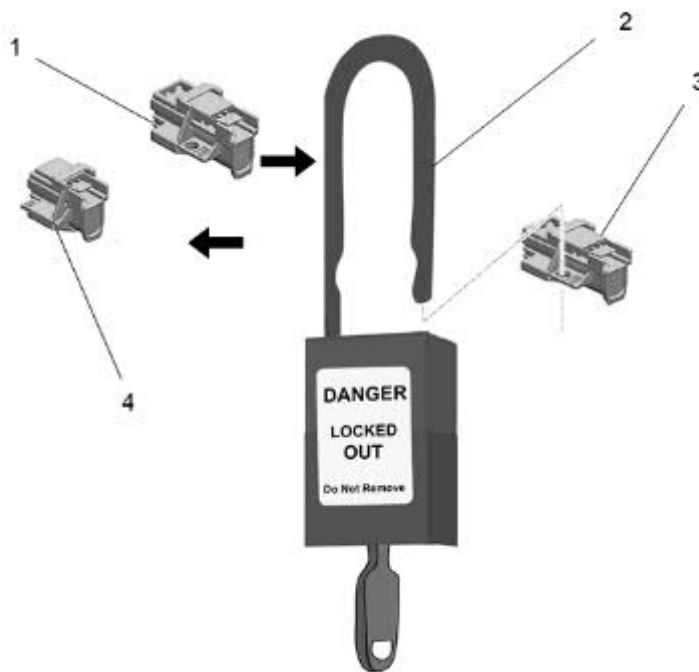
- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Circuit/System Description

The High Voltage Enabling procedure will perform the following tasks:

- Identify how to enable high voltage.
- Verify high voltage system integrity and that all connectors are installed.

Diagnostic Aids



High Voltage Service Lockout

Note:

- Disabling the High Voltage Service Lockout should be performed by or under the direction of, the person who performed the High Voltage Disabling procedure.
 - Disabling the High Voltage Service Lockout performs two functions when removing the locking device it allows the closing of the electrical connection and it closes the electrical connections.
1. When instructed to do so, disable the High Voltage Service Lockout by inserting the key, unlock HV padlock (2) and remove padlock from the HVSL (3).

2. Move the HVSL (4) from the '**OFF**' to '**ON**' position as indicated on the HVSL and move red connector position assurance tab to secured position.

Component Location

Review the [High Voltage Connectors](#) information for connector identification and the approved procedures for disconnecting and connecting high voltage connectors.

Reference Information

Schematic Reference

[Hybrid/EV Energy Storage Schematics](#)

Connector End View Reference

[Master Electrical Component List](#)

Description and Operation

[Drive Motor Battery System Description](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

Danger: Ensure all High Voltage safety procedures are followed. You must have the appropriate level of up-to-date high voltage training and certification combined with Personal Protection Equipment (PPE) to continue. Review the procedure steps to ensure you have the proper qualifications. You must stop if not properly qualified. Failure to follow the procedure exactly as written may result in serious injury or death.

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 includes the following steps:

- Identify how to disable high voltage.
- Identify how to test for the presence of high voltage.
- 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:

- Safety glasses with appropriate side shields when within 15 meters (50 feet) of the vehicle, either indoors or outdoors.
- Certified and up-to-date Class "0" Insulation gloves rated at 1000V with leather protectors.
 - Visually and functionally inspect the gloves before use.

- Wear the Insulation gloves with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.

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

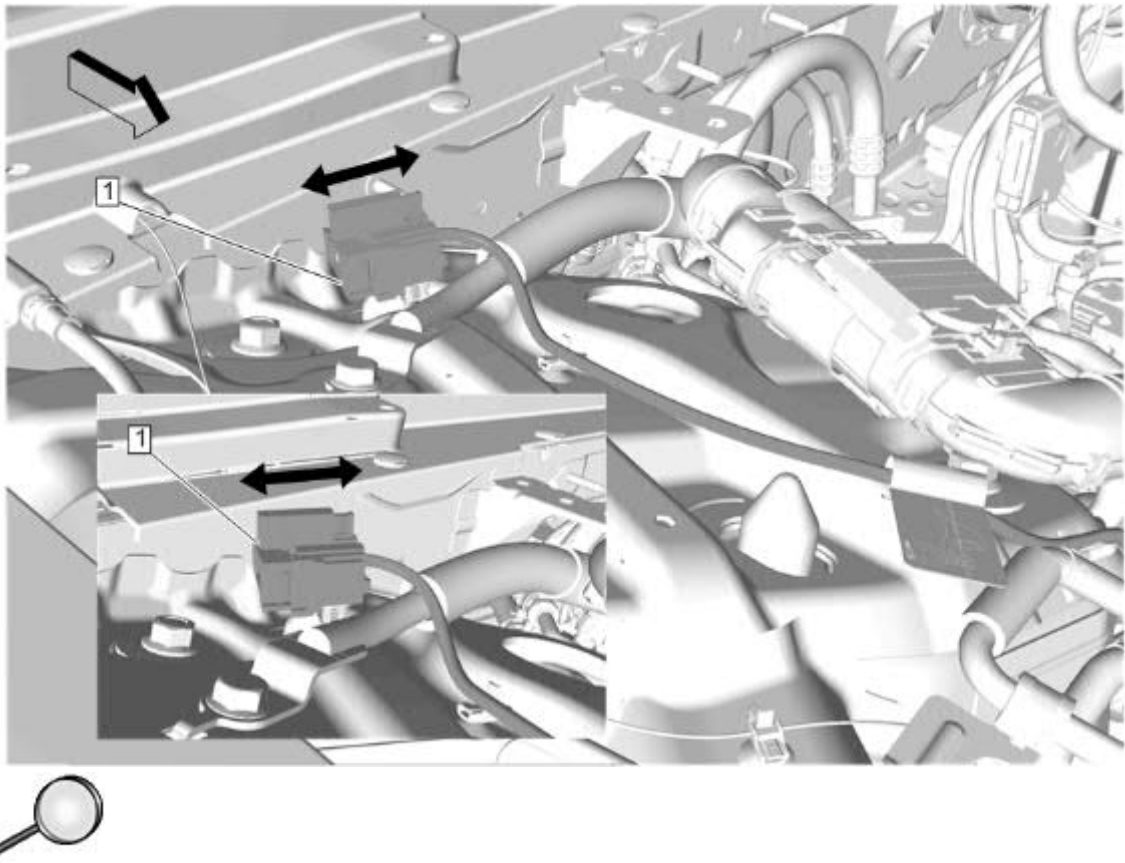
1. Review the high voltage safety information prior to performing the High Voltage Enabling procedure. High Voltage Safety.

Warning: Always ensure the Battery Maintenance Mode is inactive before disconnecting the low voltage 12 volt battery (or batteries). This mode can be active with the ignition off, regardless of whether the vehicle charging cord is plugged in or not. When this mode is active, the on-board high voltage battery charger(s) will energize the 12 volt battery cables and charge the 12 volt battery (or batteries). Disconnecting any battery cables while this mode is active may result in an electrical shock or a burn from hot battery cable leads.

2. Check the 12 volt battery voltage with a digital multimeter before disconnecting any battery cables leads. If the voltage is 13.5 volts or above, the Battery Maintenance Mode is active. The technician must wait for the T18 battery charger to deactivate before disconnecting the battery negative cable. Charging System Description and Operation
3. Ensure that the 12 V battery is disconnected. Battery Negative Cable Disconnection and Connection

Note:

- Always tighten the high voltage fasteners to the specified torque and recheck. Insufficient or excessive torque will cause malfunctions or damage.
 - The high voltage connectors that have been disconnected do not require a specific sequence when connecting.
4. After finishing work on the high voltage systems and before disengaging the high voltage service lockout, inspect for the following:
 - Verify that all tools or loose components have been removed.
 - Inspect any disconnected High Voltage Battery Positive and Negative cable seals for being deformed, missing, or damaged. Replace any seals that are deformed, missing, or damaged.
 - Verify high voltage system integrity and that all connectors are installed.
 - Verify that all high voltage components are installed, and any ground cables are connected.
 - Install any components or connectors that have been removed or replaced during diagnosis.
 5. If the drive motor battery cooling system was drained, perform the Vac-N-Fill cooling system draining and filling procedure steps 1 through 29. This is to ensure at least partial cooling system fill prior to enabling the system. Drive Motor Battery Cooling System Draining and Filling. The Vac-N-Fill procedure will be completed later in step 12.



6. Disengage the high voltage service lockout (HVSL) (1) by cutting off the tie-strap and/or removing the locking device. Depress the connector tab and slide the connector halves together until the indicator tab wording changes from '**OFF**' to '**ON**'. Engage the HVSL red connector position assurance tab.

Note: It may be necessary to relearn windows express function and the power front compartment system, as applicable, after restoring 12V battery power connection.

7. Connect the 12 V battery. Battery Negative Cable Disconnection and Connection

8. Vehicle Power Mode State: **Service Mode**.

9. Verify if the A4 Hybrid/EV Battery Pack or the K16 Battery Energy Control Module has been replaced.

⇒ **If the A4 Hybrid/EV Battery Pack or the K16 Battery Energy Control Module has been replaced**

Program the K16 Battery Energy Control Module. K16 Battery Energy Control Module: Programming and Setup. Continue to the next step once programming is complete.

⇓ **If the A4 Hybrid/EV Battery Pack or the K16 Battery Energy Control Module has not been replaced**

10. Vehicle Power Mode State: **Service Mode**.
11. Perform the driver window express learn, and clear all DTC Information with a scan tool. Window Motor Programming - Express Function
12. Once the diagnosis and vehicle repairs have been made, Clear the Secured High Voltage DTCs/lockout state by performing a reset. Refer to Clear Secured High Voltage DTCs.
13. Vehicle Power Mode State: **OFF** and all vehicle systems OFF. It may take up to 12 minutes for all vehicle systems to power down.
14. Vehicle Power Mode State **ON**.
15. Verify with a scan tool no DTCs are set.

⇒ **If any DTCs are set**

Refer to Diagnostic Trouble Code (DTC) List - Vehicle.

↓ **If no DTCs are set**

16. Complete the Drive Motor Battery Cooling System Vac-N-Fill procedure. Drive Motor Battery Cooling System Draining and Filling
17. Verify with the scan tool the K107A, and K107B (as applicable) Drive Motor Control Modules and K16 Battery Energy Control Module DTC Information that the following DTCs have Ran Since Code Clear and have not set:
 - Motor position sensor learn DTC P0C17.
 - Contactor DTCs P0D0A.
 - Discharge and Pre-charge DTCs P0C76, P0C78, and P3061.
 - High voltage loss of isolation DTCs P0AA6.

⇒ **If any DTCs are set**

Refer to Diagnostic Trouble Code (DTC) List - Vehicle.

⇒ **If the DTCs have Not Ran Since Code Clear**

- 17.1. Review and operate the vehicle according to the applicable DTC Conditions for Running and ensure the DTCs run and pass.
- 17.2. Verify with the scan tool the K107 and K107 (as applicable) Drive Motor Control Modules and K16 Battery Energy Control Module DTC Information that the specified DTCs have Ran Since Code Clear and have not set:

⇒ If any DTCs are set, refer to Diagnostic Trouble Code (DTC) List - Vehicle.

↓ If the DTCs have Ran and Passed

- 17.3. Test drive the vehicle and verify no DTCs are set.

↓ **If the DTCs have Ran and Passed**

18. Test drive the vehicle and verify no DTCs are set.