

Jump Assist

Procedure Description

During certain conditions such as long term vehicle storage, the drive motor battery may discharge to such a state that cranking of the engine is not possible.

Jump Assist is a procedure that allows the accessory DC power control module (APM) to convert 12V energy into 300V energy to charge the drive motor battery. Jump Assist is initiated with a scan tool output control. For the duration of the Jump Assist Procedure, the APM, hybrid powertrain control module (HPCM) and the battery energy control module (BECM) remain awake and communicating while the ignition is OFF.

Reference Information

Description and Operation

[Jump Assist Description and Operation](#)

Required Tools

- Tech 2 Scan Tool
- 12 Volt DC Battery Charger rated at greater than 20 amps continuous

Vehicle Set-up Procedure

1. Ensure the 12 volt DC accessory battery is completely charged and tested. Refer to [Battery Inspection/Test](#).
2. Turn the ignition OFF.

Warning: High temperatures may result from failure to make a secure electrical connection. This could result in the potential for personal injury and damage to the vehicle and/or charger due to the extended period of time of operation and high currents involved with Jump-Assist.

3. Connect a 12 volt DC battery charger to the vehicles 12 volt jump start locations ensuring that an electrically secure connection is made. The Jump Assist will abort if the 12 volt DC accessory battery voltage drops below 11.1 volts.
4. Plug in the 12 volt DC battery charger and make certain that it is in the highest continuous CHARGE, but not START, state available. If required, turn the Charger ON.
5. Proceed to Charging Procedure.

Charging Procedure

1. Turn the ignition key to the RUN position.
2. Observe and record the BECM Hybrid Battery Pack Calculated voltage scan tool parameter. You should observe greater than 240 volts.
⇒ If the voltage is less than 240 volts, Jump Assist will not initiate and the drive motor generator battery must be replaced. Refer to [Drive Motor Battery Replacement and Shipping Preparation](#).
3. Observe and record the APM HPCM 300 V Circuit voltage scan tool parameter. Compare the BECM Hybrid Battery Pack Calculated voltage value to the HPCM 300V Circuit voltage parameter. You should observe both parameters are within 30 volts.

- ⇒ If the parameters are not within the specification, the high voltage contactor relays have not closed. Diagnose the DTCs that have opened the high voltage contactor relays. Refer to [Diagnostic System Check - Vehicle](#).
4. Upon activation of Jump Assist, the Driver Information Center (DIC) display will transition from the current message such as "HOOD OPEN" to "JUMP ASSIST READY TURN KEY OFF". Do not turn the ignition OFF without first turning OFF the scan tool or the procedure may fail to initialize. Perform the following steps in exact order:
 - 4.1. Initiate the APM Jump Assist output control with the scan tool. You should observe the READY message on the DIC.
 - 4.2. Turn the scan tool OFF.
 - 4.3. Turn the ignition key to the OFF position.

⇒ Jump Assist will initiate and a transfer of energy between the 12 volt DC battery charger and the drive motor generator battery will occur through the APM. The DIC should display "JUMP ASSIST ACTIVE BATTERY CHARGING".
 5. While leaving the ignition OFF, turn the scan tool ON and observe the BECM Calc. Hybrid Batt. Current parameter. Estimate the total amount of time for a successful Jump Assist using the Jump Assist Current vs. Time table shown below.

Note: The scan tool may be removed from the vehicle at this time if desired and the Jump Assist will continue.
 6. Continue with Jump Assist until the estimated time has elapsed or the DIC displays either JUMP ASSIST COMPLETE or JUMP ASSIST ABORTED.

⇒ If the estimated time has elapsed or the DIC displays the "JUMP ASSIST COMPLETE" message the drive motor battery should have sufficient charge to start the engine.

⇒ If the DIC displays the "JUMP ASSIST ABORTED" message, one of the following conditions has occurred. Repair the condition and restart Jump Assist if necessary.

 - The 12 volt circuit was not maintained at greater than 11.0 volts
 - The HPCM stored a DTC which resulted in the opening of the high voltage contactor relays
 - The drive motor generator battery voltage is greater than 358 volts or less than 240 volts
 - The ignition key was turned to the RUN position while the Jump Assist output control was active
 7. Turn the ignition ON. The DIC may display JUMP ASSIST ABORTED.
 8. Attempt to start the engine.

⇒ If the engine cranks and runs, drive the vehicle for at least 20 minutes to allow the BECM to relearn drive motor battery state of charge.

⇒ If the engine does not crank, refer to [Engine Will Not Crank](#).

Jump Assist Current vs Time

Calc. Hybrid Battery Current (Amps)*	Time (Minutes)
0.25 Amps	228 minutes
0.50 Amps	114 minutes
0.90 Amps	63 minutes
1.40 Amps	41 minutes

Calc. Hybrid Battery Current (Amps)*	Time (Minutes)
1.90 Amps	30 minutes
2.40 Amps	24 minutes
2.90 Amps	20 minutes

*Depending upon model year, hybrid battery current may be displayed as a negative value when charging during Jump Assist.