

Spitronics - Safe Jump Start - Quick Guide

Jump-starting a vehicle with electronic control systems requires additional care.

A completely discharged battery may not simply have a low state of charge. It may have high internal resistance, damaged or shorted cells, or may no longer be capable of accepting charge correctly.

A faulty battery, poor jumper cable connections or disconnecting the battery while the engine is running can create unstable charging conditions and damaging voltage spikes.

If the condition of the battery is uncertain, test it before attempting to jump-start the vehicle. Where practical, replace a faulty battery or recover a discharged battery using a suitable slow charger.

Before Connecting Jumper Cables

Inspect both batteries and the jumper cables before starting.

Do not attempt to jump-start a battery that is visibly damaged, leaking, swollen or otherwise unsafe.

Make sure:

- [] Battery terminals are secure.
- [] Jumper cable clamps are clean and make good contact.
- [] Jumper cables are suitable for the required starting current.
- [] Battery polarity has been positively identified.
- [] The vehicles cannot touch each other.
- [] Unnecessary electrical loads are switched off.

Poor jumper cable contact can create an intermittent connection. Breaking and reconnecting a high-current circuit can produce electrical transients that may damage ECUs and other electronic devices.

Connect the Jumper Cables

Connect the jumper cables in the following order:

1. Connect the Red cable to the discharged battery Positive (+).
2. Connect the other Red clamp to the donor battery Positive (+).
3. Connect the Black cable to the donor battery Negative (-).
4. Connect the final Black clamp to a suitable Engine or Chassis Ground on the vehicle with the discharged battery.

Do not make the final connection directly at the discharged battery where a suitable remote Ground point is available.

This helps keep any connection spark away from the battery, where flammable gas may be present.

Pre-Charge the Discharged Battery

Do not immediately attempt to crank the engine.

Allow the batteries to remain connected for approximately 1 minute so that some charge can transfer into the discharged battery.

If additional charging is required:

1. Start the donor vehicle.
2. Allow the donor vehicle to idle.
3. Do not rev the donor engine.
4. Allow approximately 5 minutes for some charge to transfer.
5. Monitor the discharged battery voltage with a multimeter.

The battery voltage should increase in a controlled manner.

A battery that behaves abnormally, rapidly rises in voltage without recovering useful starting capacity, becomes hot or will not accept charge should be regarded as suspect.

Where possible, replace the battery or charge and test it properly rather than continuing to jump-start the vehicle.

Preferred Starting Method

After the pre-charge period, switch the donor engine OFF before attempting to start the vehicle with the discharged battery.

With the donor battery still connected:

1. Keep the donor engine OFF.
2. Attempt to start the vehicle with the discharged battery.
3. Observe cranking speed and battery behaviour.

This method allows the donor battery to assist with starting while avoiding unnecessary interaction between two operating charging systems. The original guide also identifies this as the preferred starting method.

If the engine does not crank normally, do not continue repeated starting attempts without investigating the battery and electrical system.

If Additional Assistance Is Required

If the vehicle still cannot start and the discharged battery appears capable of accepting charge:

1. Start the donor vehicle.
2. Allow it to idle.
3. Do not rev the donor engine.
4. Allow additional charging time.
5. Switch the donor engine OFF before another starting attempt where practical.

A battery that cannot recover enough capacity to crank the engine normally should preferably be replaced or properly charged and tested.

After the Engine Starts

Once the vehicle with the discharged battery starts, monitor its battery voltage and charging behaviour.

Do not disconnect its battery while the engine is running.

If the charging voltage is unstable, excessively high or behaves abnormally, switch the engine OFF and investigate the battery and charging system before continuing.

When disconnecting the jumper cables, switch the donor vehicle OFF first.

Disconnect the cables in reverse order:

1. Black - Engine or Chassis Ground on the assisted vehicle.
2. Black - Donor battery Negative (-).
3. Red - Donor battery Positive (+).
4. Red - Assisted vehicle battery Positive (+).

The original guide specifically warns against leaving both alternators operating together when one of the batteries may be faulty.

Checking for an Abnormal Battery

A multimeter can provide useful information about how the discharged battery and charging system are behaving.

Check DC battery voltage while charging and observe whether the voltage increases normally.

A battery that immediately rises to a relatively high voltage but still has very little starting capacity may have high internal resistance or another internal fault.

AC voltage measurement across the battery can also be used as an additional diagnostic check for unstable or pulsed charging behaviour.

Because multimeters respond differently when measuring AC voltage on a DC charging system, do not use the AC reading alone to condemn a battery or alternator. If the reading appears abnormal, investigate further with proper battery and charging-system tests.

Important Battery Warning

Never loosen or disconnect a battery terminal while the engine is running.

The battery forms an important part of the vehicle charging system. Disconnecting it while the alternator is charging can produce severe voltage transients and may damage the ECU and other electronic devices.

This warning also applies when working with battery isolators. A simple battery isolator that disconnects the battery while the alternator remains active can create the same dangerous condition.

Refer to the **Spitronics - Power and Grounding - Installation and Testing Guide** for more information.

Quick Procedure

- [] Inspect the battery and jumper cables.
- [] Switch unnecessary electrical loads OFF.
- [] Connect Positive to Positive.
- [] Connect donor Negative.
- [] Make the final Negative connection to a suitable Engine or Chassis Ground.
- [] Allow approximately 1 minute for initial charge transfer.
- [] Pre-charge longer if required.
- [] Keep the donor engine OFF during the preferred starting attempt.
- [] Do not repeatedly crank a vehicle with a battery that behaves abnormally.
- [] After starting, check charging voltage.
- [] Never disconnect the battery while the engine is running.
- [] Switch the donor engine OFF before removing jumper cables.
- [] Disconnect jumper cables in reverse order.