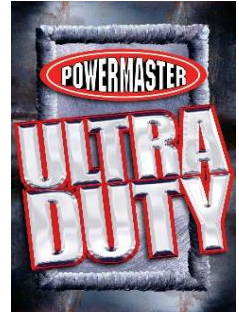




# CUMMINS INSTRUCTIONS

Need Help, or Questions!  
Tech Dept.  
(630) 957-4019

Tech@powermasterperformance.com

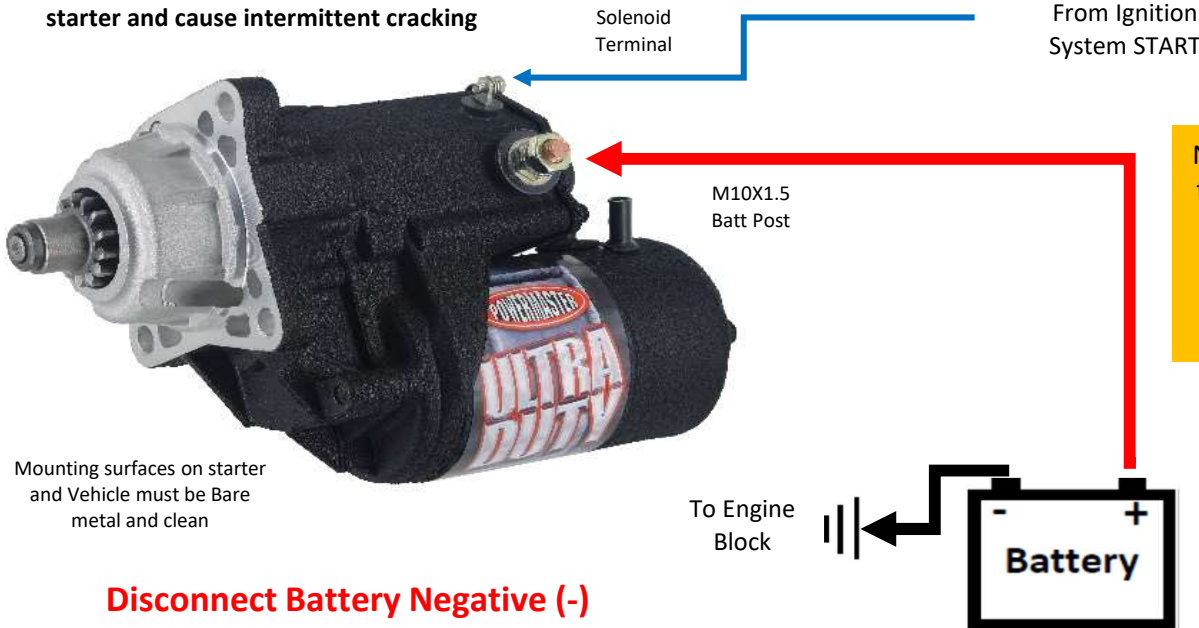


The Starter is the highest draw component while cranking, it can be upwards of 500/800 Amps, Bad connections on the main wire, solenoid wire, bad Ground path or Weak Battery, will prevent this high amperage demand to get to the starter for Peak performance see [additional tech information on how to test the Starting System](#)

**Failure to do this Voids Your Warranty**

**Warning!**

DO NOT overtighten the starter electrical connections. Use Hand Tools and Only "Wrist Tight", DO NOT use power tools, Overtightened terminals will damage the starter and cause intermittent cranking



Never operate a Starter more than 3 to 5 seconds at a time with out allowing time to cool for 1 minute. Over Cranking will Damage the Starter

**Disconnect Battery Negative (-)**

**READ ALL INSTRUCTIONS IN BOX!**

**Wire Connections:** Be sure all terminals are crimped securely, and connections are clean and tight.

**Bad wiring and or connections are the main cause for poor starter performance, 11 Volts when Cranking should be the minimum reading on the main battery cable and solenoid wire for the starter to function properly**

**Battery Wire:**

Use 0 GA or larger, Fine stranded pure copper wire

**Solenoid Switch Wire:**

Use 10 GA or larger, Fine stranded pure copper wire

**Ground:** Starter gets the Ground through the mounting Block, The **MOUNTING SURFACE MUST BE CLEAN** to bare metal to allow a clean ground path, Starter will not function properly if it does not have good grounding and will cause intermittent/poor Cranking

**Battery must have a clean ground to the engine block.**

A fully charged and in good condition Battery is Essential for the starter performance specially when HOT

A weak/defective battery will cause premature failure and intermittent Cranking

**FAILURE TO FOLLOW THESE INSTRUCTIONS WILL VOID YOUR WARRANTY**

(Warranty void if unit is soaked in Oil or Mud)

These Instructions are provided as supplementary information to the factory service manual for starter replacement



# TECH BULLETIN

## Checking Starter Supply Voltage

When it comes to starter performance issues, the most common cause is low voltage supply. If you're experiencing intermittent cranking, clicking, grinding or erratic operation, there is likely low voltage supply to one of the two starter circuits. Low voltage at either the battery connection or the smaller ignition terminal can lead to internal solenoid damage which also affects the clutch assembly that controls the pinion gear. Also, note that the ignition wire may go through a park/neutral switch or an OEM resistor causing a low voltage issue.

Low voltage supply can be caused by a weak battery, too small gauge of cable, internal cable corrosion and even poor quality crimps on the cable. Low voltage on the ignition terminal can be due to factory resistor wiring, excessive engine heat or how it is routed through a park/neutral switch.

The good news is that these can easily be checked and remedied. Two things you'll need for the test – a volt meter and a friend to help.



## TEST PROCEDURE

The goal is to check the voltage with a digital volt meter at BOTH, the battery cable connection and the ignition terminal of the starter WHILE CRANKING the engine.

1. Make sure the battery is fully charged. The battery must be at least 12.6 volts before checking the voltage values at the starter terminals. If the battery does not read 12.6 or higher, charge it or replace it.
2. With the battery at full charge, connect your volt meter to the battery terminal of the starter. It should read the same at the starter as it did across the battery terminals. If not, there is an issue within the cable/terminals from the battery positive post to the starter terminal.



3. If the voltage is the same at the battery as the starter, have your partner crank the engine for about 3-5 seconds and note the voltage on the battery terminal of the starter while cranking. It should stay above 11 volts.
4. Next, connect your volt meter to the small terminal of the starter (ignition) and to ground. Have your partner crank the starter for 3-5 seconds and note the voltage. It should also be over 11 volts.

## ***If less than 11 volts:***

1. For block mounted starters, ensure the engine block mount is clean of all paint. This is the ground source for hundreds of amps being used by the starter. A poor ground will affect the voltage values and performance of the starter.
2. Inspect the wiring. Original cables need to be replaced. Corrosion can build up inside an older cable which you'll never see. Also, the gauge may be too small to carry the current and voltage needed for a high torque starter. We recommend a high quality, multi-strand copper wire and remember that trunk mounted batteries require heavier gauge cables. You can't go too big on the battery cable!
3. Inspect the ring lug/terminals. Use the proper ring lugs and ensure they are crimped to the bare wire strands – not the insulation!



**If you have any questions about checking the starter supply voltage or other starter concerns, please contact our tech team at 630-957-4019.**