Reconit Electric Starter Diagnostic Worksheet

Safety Pre-cautions:

- Always perform diagnosis with transmission set in neutral or park, parking brake set, and all electrical loads off.
- Wear face and eye protection at all times while performing diagnosis.

Following this worksheet will help determine if there is an issue with a starter motor and help prevent warranty denials for No Trouble Found (NTF) .

Step 1 - Test Individual Batteries

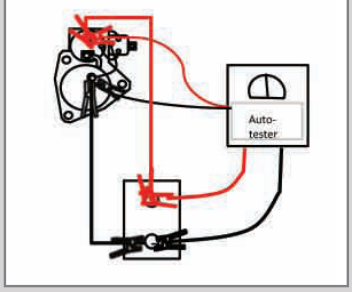
1. Follow the battery manufacturer's specification for checking state-of-charge. Each battery must have at least a 75% charge.
2. Check the open circuit voltage (OCV - see Figure 1) of each battery. The difference between each battery cannot be more than .1 Volts.

Step 2 - Test Battery Cables

Reconit Electric recommends using an automated charge/start system analyzer. In-lieu of an automated analyzer, a voltmeter and carbon pile load tester can be used. Both methods are shown below.

Step 2A - Testing Battery Cables with Automated Tester

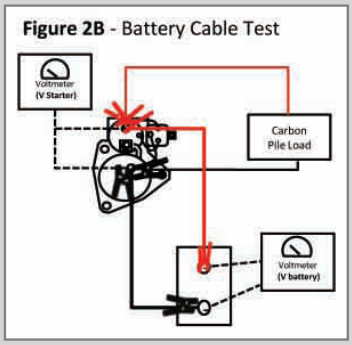
Figure 2A - Battery Cable Test



1. Connect tester as shown.
2. Follow automated tester procedure for testing battery cables.
3. Battery cable circuit resistance must be less than 2 m Ω.
4. Check results, if OK proceed to Step 3.

Step 2B - Testing Battery Cables with Carbon Pile Load

Figure 2B - Battery Cable Test

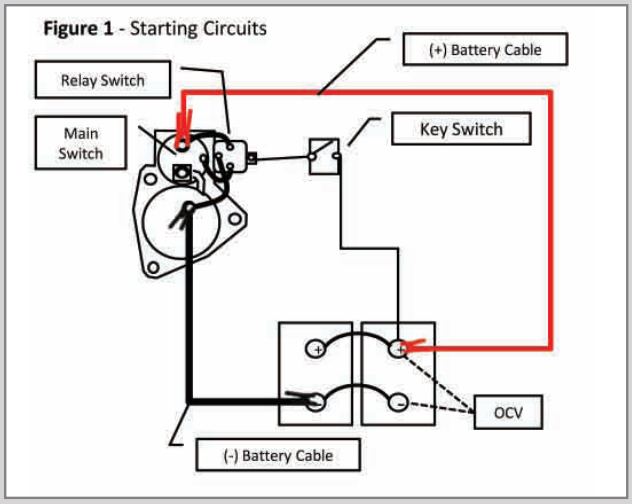


1. Connect devices as shown.
2. Maintain 500 amp load using Carbon Pile.
3. Measure voltage drop at starter. Use formula below to calculate voltage drop.

Vbattery - VStarter = Voltage Drop

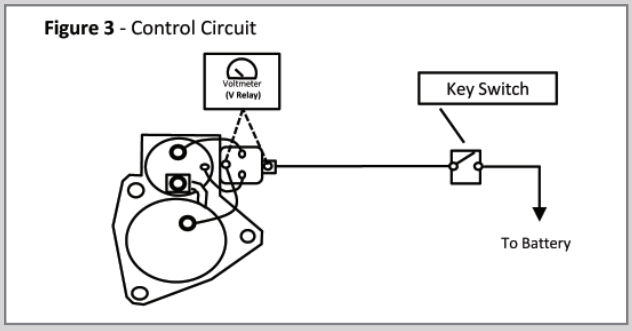
4. If the voltage drop is greater than 1 volt this indicates a problem with the battery cables.

Figure 1 - Starting Circuits



Step 3 - Test Control Circuit

Figure 3 - Control Circuit



1. Connect the measurement devices as shown.
2. Ensure parking brake is set and all electrical loads are off.
3. Turn Key Switch to crank position.
4. Check Relay voltage. Voltage must be at least 11.4 v.
5. If voltage is greater than 11.4 v and starter does not engage, replace the starter.

Reconit Electric Rebuilders Ltd
63 McIntyre Place, Unit 08
Kitchener, Ontario. N2R-1H5, Canada.
www.reconit.ca 519-748-6488