

Demo 6: Hipot Testing (CH2 only)

In this demo we will test a good cable then create errors that can only be detected with high voltage (hipot) testing. If you just completed Demo 5 you will be using the created a test program called “My Test Program” that has a diode. If you did not complete Demo 5, use the MIL-DEMO-CH2 test program.

Note: This demo requires a CH2 tester.

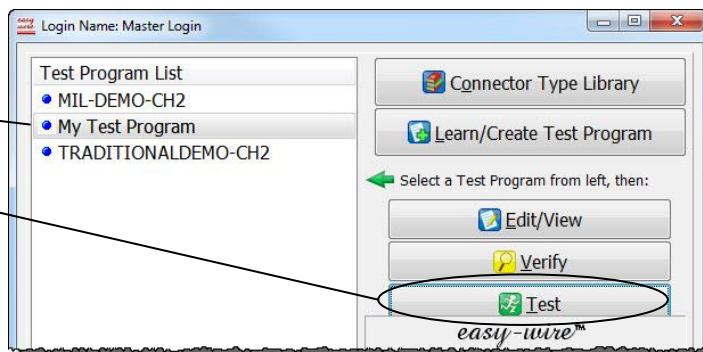
Step 1

Make sure all connectors and all wires are connected.



Step 2

In the easy-wire main menu, select “My Test Program”, and click **Test**.



Step 3

In the test window, click **Start**.



The tester will perform a low voltage test. If it passes, the display changes to “Ready to Hipot.”



Warning! Touching exposed leads during the HV test will result in a shock. Make sure to always keep your hands away from the harness board during HV testing.

Note: If using “My Test Program” from demo 5, don’t worry about damaging the diode. Cirris testers safely hipot assemblies containing components. For more on hipotting components, see http://www.cirris.com/testing/guidelines/hv_components_testing.html



Step 5

In the test window, click **Hipot**.



The cable should pass.



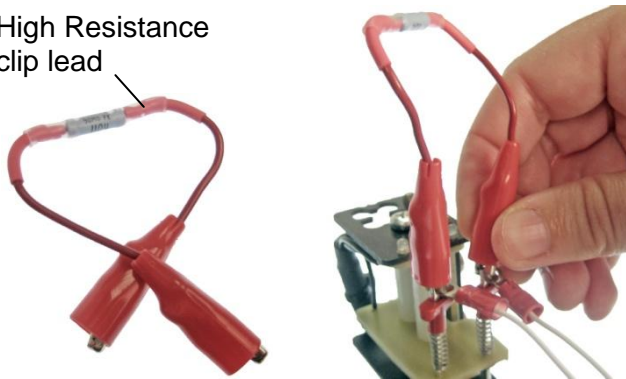
In the following steps we will introduce a high voltage leakage error between two points on the harness.

Creating an HV Leakage Error

Step 1

Retrieve the High Resistance clip lead from the parts container and attach it to the L1 and L2 E-Z-Hook contacts as shown.

High Resistance clip lead



Note: The “high resistance clip lead” has a 90 MOhm resistor that simulates an Insulation Resistance (IR) failure. The Insulation Resistance test verifies that the resistance offered by the insulating materials is sufficiently high. Failure occurs when the measured resistance value is lower than the specified value. In the demo, our IR setting is 150 MOhms; therefore, the 90 MOhm resistor is seen as an IR Leakage failure.

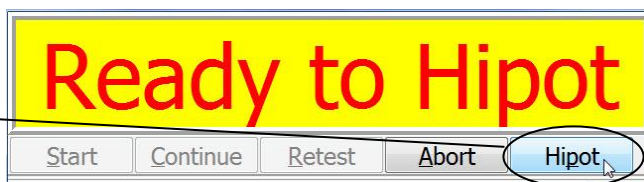
Step 2

Click **Retest**.

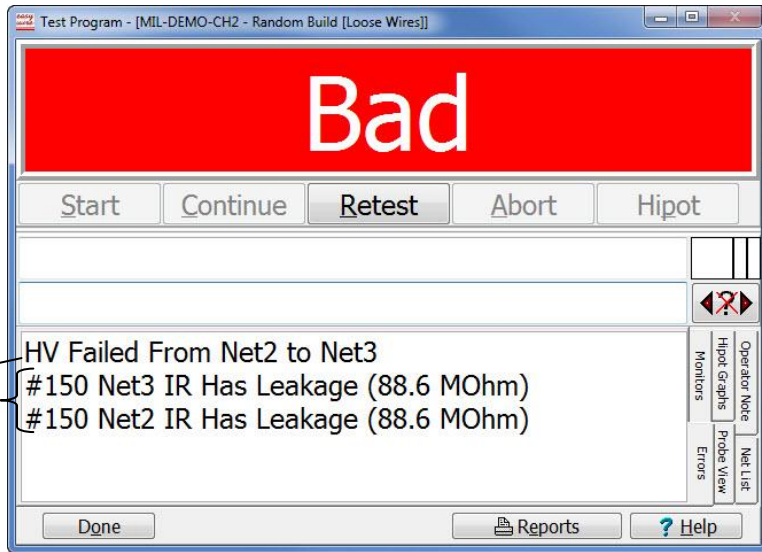


Step 3

After the low voltage test passes, click **Hipot**.



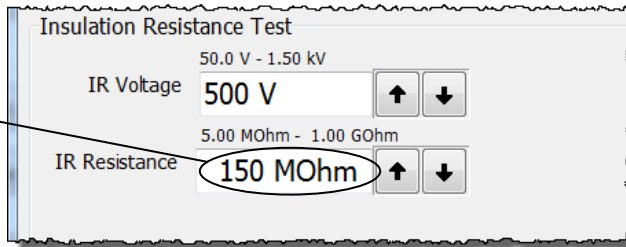
The tester displays "IR Has Leakage" errors (error code #150) for each net that failed and also displays the measured IR value.



The tester then determines which nets are failing to each other.

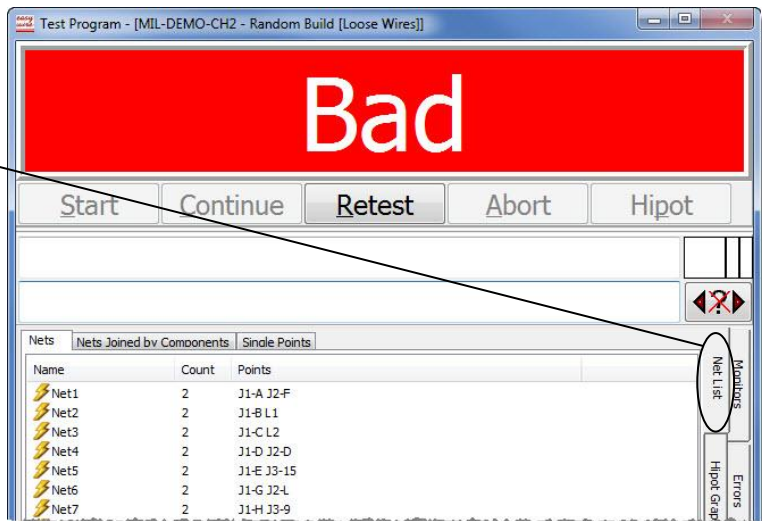
Why did the 90 MOhm Resistor Fail?

The IR setting 150 MOhms indicates that we want at least 150 MOhms of insulation resistance between wires in the harness.



Since 90 MOhms is less than 150 MOhms, the test failed.

To view the net list points, click "Net List" on the right side of the test window.



Now we will create a different kind of hipot error – a Dielectric Failure.

Creating a Dielectric Error

Step 1

Retrieve the lamp clip lead from the parts container, and replace the high resistance clip lead with the lamp clip lead.

Lamp clip lead



Notice that the two electrodes are close but not touching.

This causes an arc, similar to when two exposed wires are close to each other.



Note: If the lamp electrodes were surrounded by air, a hipot voltage over 5000 volts would be required to cause an arc. However, the neon gas inside the lamp breaks down at a much lower voltage than air; therefore, a 500 volt test creates arcing.

Step 2

Click **Retest**.



Step 3

After the low voltage test passes, click **Hipot**.



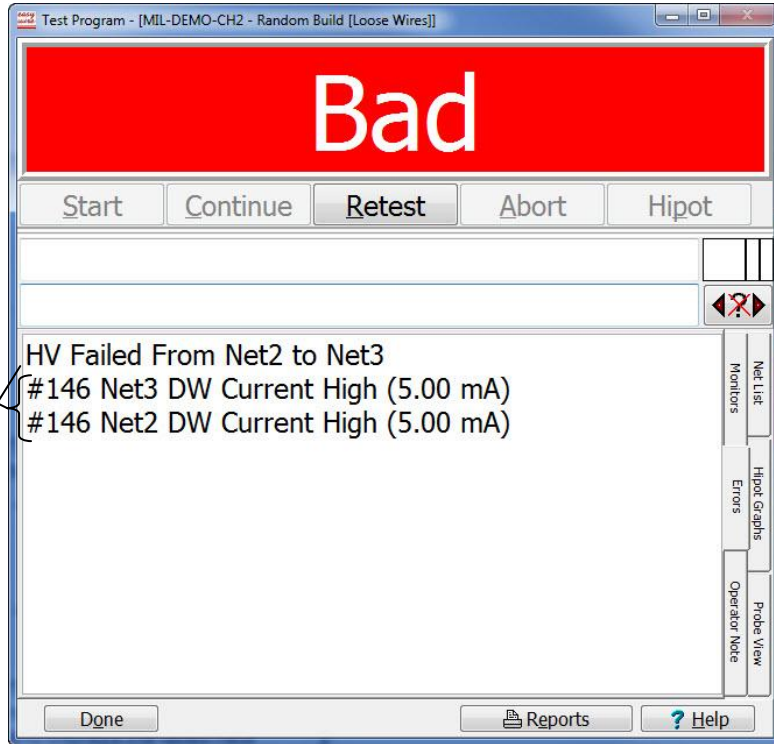
If you watch the lamp closely, you will see it flicker when an arc occurs.



The tester displays hipot failures on each net as they occur:

- “DW Current High” errors (error code 146) for each net that failed and the measured current value.
- “Arc” errors for each net that failed and the measured current value.

The tester then determines which nets are failing to each other.

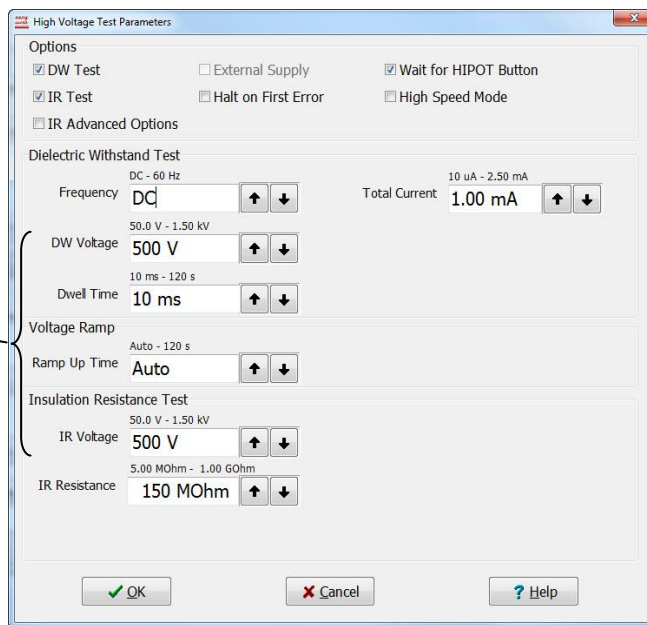


Why did the CH2 hipot tester see a Current High or Arc error?

The settings for the Dielectric Withstand Test are also in the High Voltage Test Parameters.

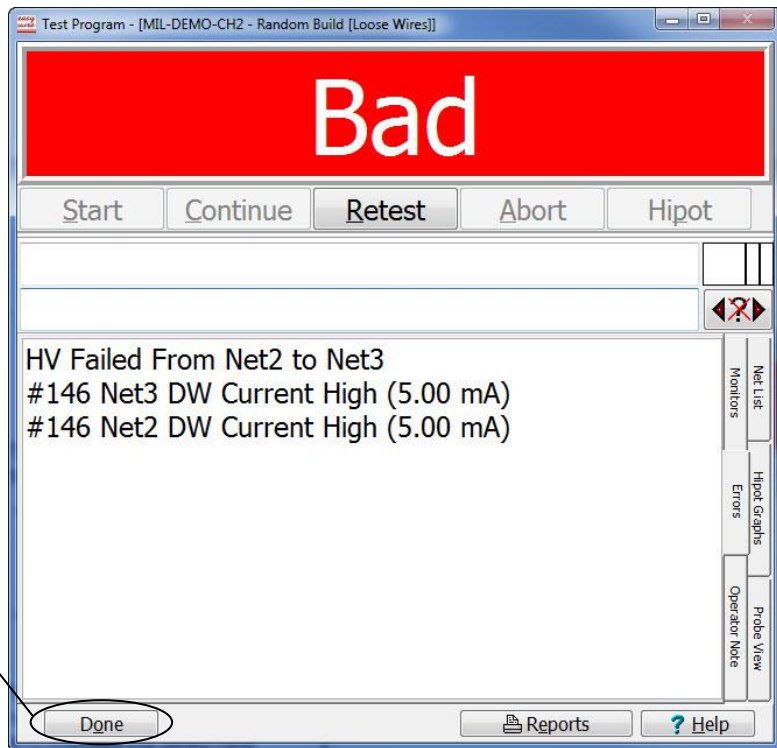
When high voltage was applied there was a sudden spike in current that exceeded the 1.00 mA setting, which was set for the test program when the high voltage test parameters were set.

A DW Current High Error indicates the applied current to the nets exceeded the current limit.



Step 4

In the test window, click **Done** to return to the main menu.



Congratulations! You successfully created and observed common types of hipot errors. Before shipping the demo board back to Cirris, please make sure all high voltage clip leads and components are back in their case on the harness board.