



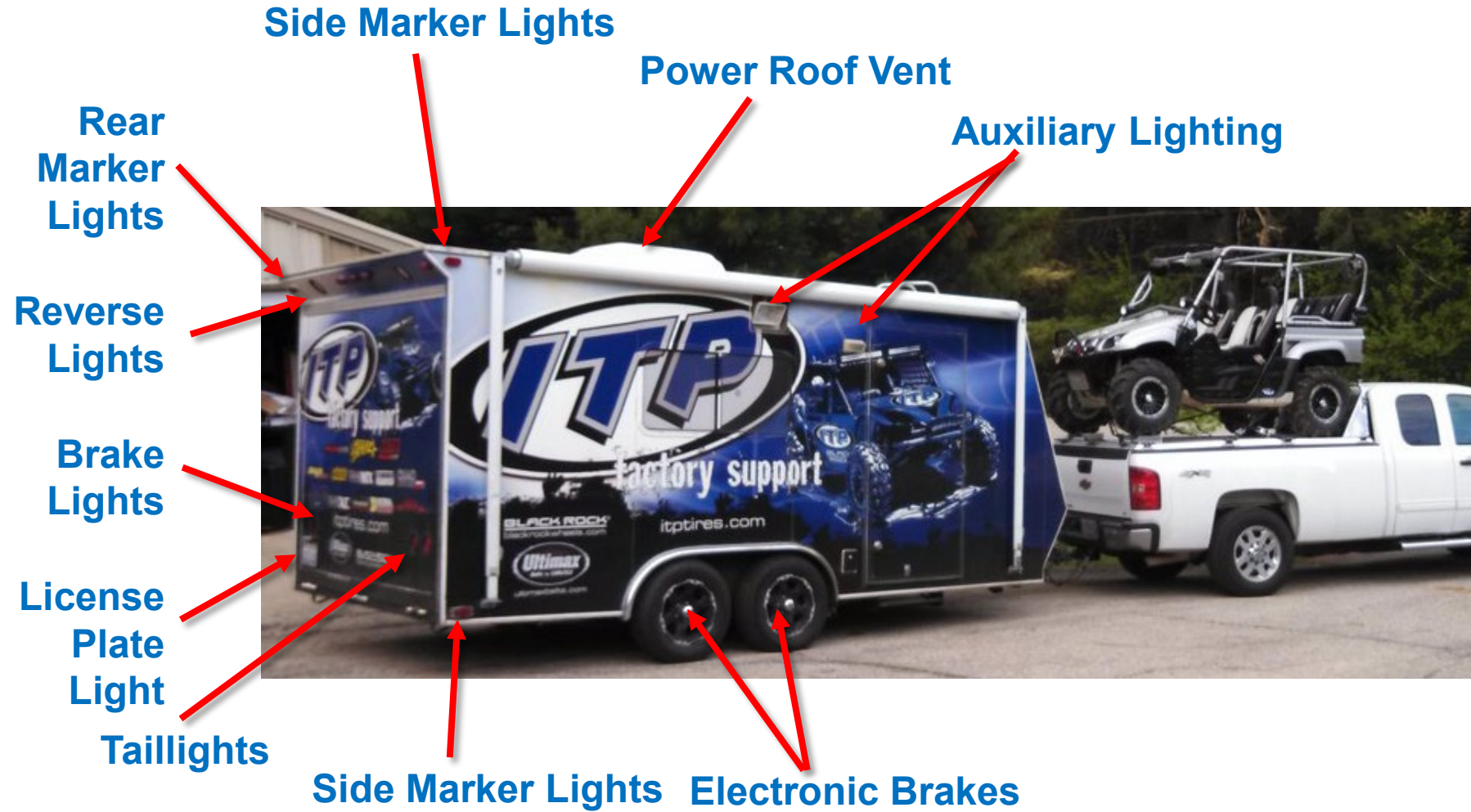
Lesson 5: Wiring the 7-Way Round Harness

Trailer Circuits STEM Kit Curriculum

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Sometimes, a 4-Wire Harness is not Enough



Larger Trailers, RVs, Trailers, Car Haulers, etc....

...use larger wiring harnesses:

- 5-way
- 6-way
- 7-way



How to Wire a 7-Way Round Harness

You will need the following:

- 7-way harness (both sides) →
- Screwdriver
- Wire cutter
- 7 U-shaped crimp terminals
- 14 wires (2 of each color, 15" long pieces of each wire)
 - Green
 - Yellow
 - Brown
 - White
 - Blue
 - Red
 - Black



Divide Up the Work

Half of the team works on the vehicle side of the harness. Skip ahead in the slides to the vehicle side wiring section.



Half of the team works on the trailer side. Skip ahead in the slides to the trailer side wiring section.



Preparing the *Trailer* Side of the Harness

Step 1: Prep the 7 Wires

Strip ½" off **both** ends of each of the 7 different colored 15" wire pieces.



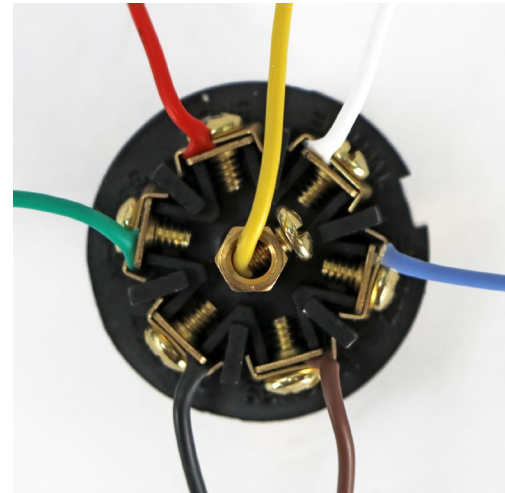
Step 2: Dismantle the Harness

1. Loosen the 2mm hex set screw, but do not remove completely. *(too easy to lose!)*
2. Push the wiring terminal out through the front.
3. Notice... the terminal has grooves that guide its orientation in the housing.



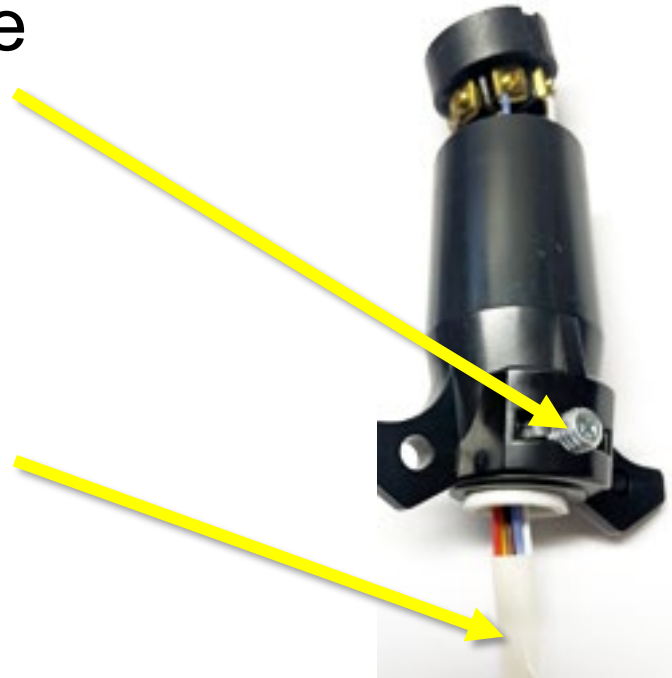
Step 3: Connect 7 Wires to Terminals

1. Notice that the wiring terminal has the colors written on each specific terminal.
2. Use the screwdriver to loosen each individual terminal.
3. One wire at a time, insert the stripped end into the terminal as shown and secure it by tightening the screw.
4. Repeat for all 7 wires.
 - Yellow goes in the middle!



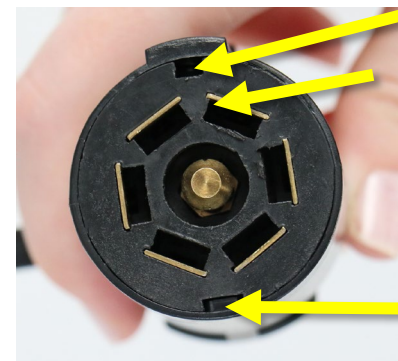
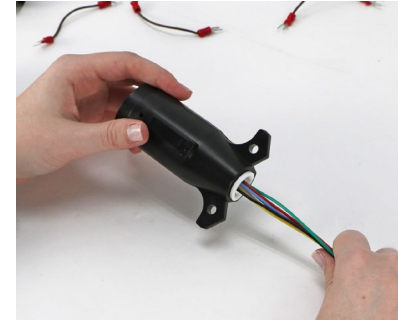
Step 4: Prepare the Housing

1. Loosen the strain relief with the screwdriver.
 - If the metal falls out, reinsert so the forks point down.
2. Bundle the loose wire ends together and tape as shown.
 - This makes it easier to insert them into the housing.



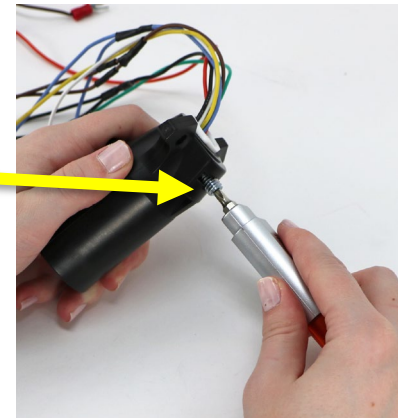
Step 5: Put the Harness Back Together

1. Slide the wire bundle into the housing so they extend completely through the back opening.
2. Push the wiring terminal back into its mounted position, lining the grooves up so it fully sets back into the housing.
3. Tighten the set screw to hold the wiring terminal in place.
4. Tighten the strain relief screw to help hold the wires in place and prevent accidental tugging that might pull wires loose.



Set screw
lines up with
narrow
groove

Wide groove
lines up with
wide notch



Step 6: Prepare Wire Ends

1. Now that the harness is wired correctly, we need to prepare the loose ends.
2. Using 7 U-shaped crimp terminals, crimp 1 terminal onto the end of each of the 7 different colored wires coming out of the harness.



Preparing the *Vehicle* Side of the Harness

Step 1: Prep the 7 Wires

1. Strip $\frac{1}{2}$ " off **both** ends of each of the 7 different colored 15" wire pieces.



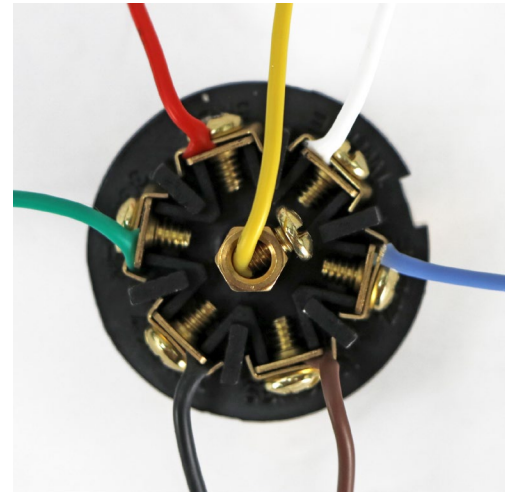
Step 2: Dismantle the Harness

1. Loosen the 2 set screws on the outer housing, but do not remove it completely. *(too easy to lose!)*
2. Push the wiring terminal out through the front.
3. Notice... the terminal has grooves that guide its orientation in the housing.



Step 3: Connect 7 Wires to Terminals

1. Notice that the wiring terminal has the colors written on each specific terminal.
2. Use the screwdriver to loosen each individual terminal.
3. One wire at a time, insert the stripped end into the terminal as shown and secure it by tightening the screw.
4. Repeat for all 7 wires.
 - Yellow goes in the middle!



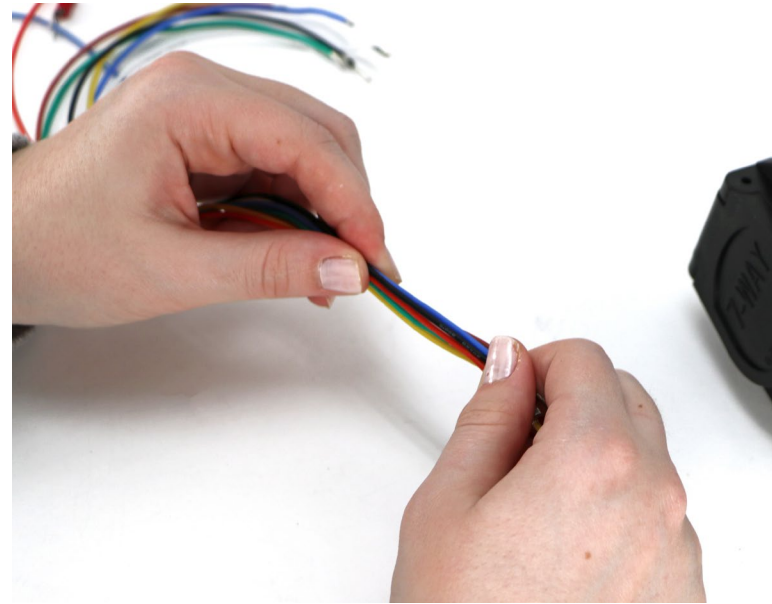
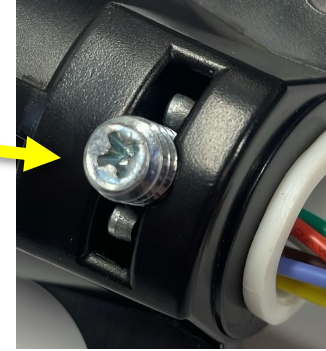
Step 4: Prepare the Housing

1. Loosen the strain relief with the screwdriver.

- If the metal falls out, reinsert so the forks point down.

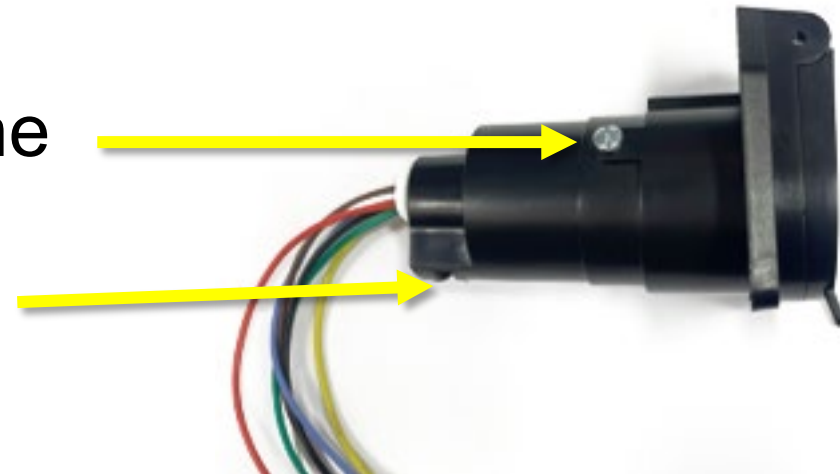
2. Bundle the loose wire ends together.

- This makes it easier to insert them into the housing.



Step 5: Put the Harness Back Together

1. Slide the wire bundle into the housing so they extend completely through the back opening.
2. Push the wiring terminal back into its mounted position, lining the grooves up so it fully sets back into the housing.
3. Tighten both set screws to hold the wiring terminal in place.
4. Tighten the strain relief screw to help hold the wires in place and prevent accidental tugging that might pull wires loose.



Step 6: Prepare Wire Ends

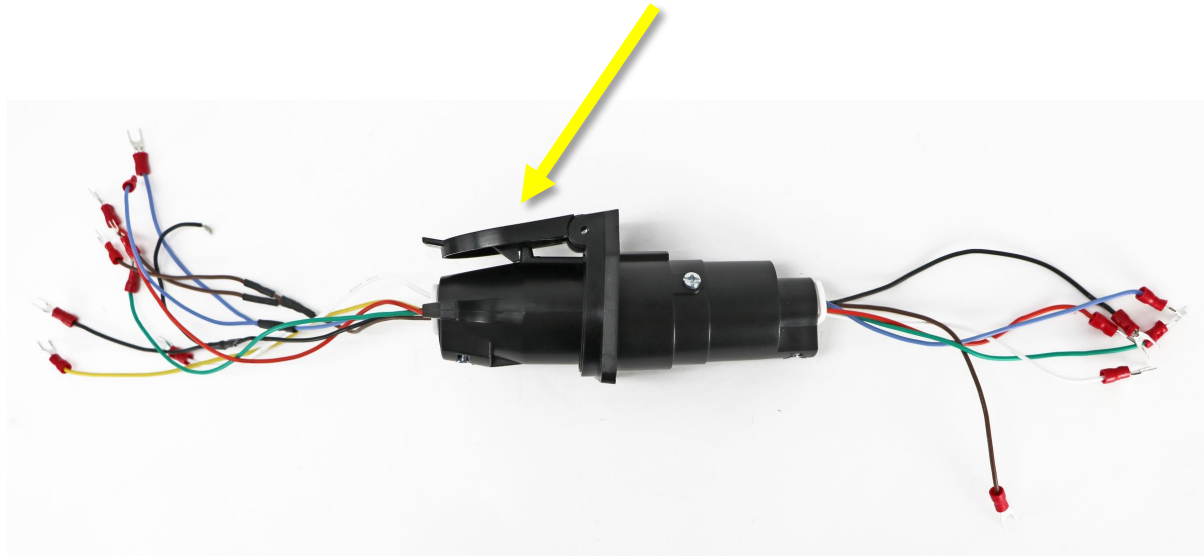
1. Now that the harness is wired correctly, you must prepare the loose ends.
2. Using 7 U-shaped crimp terminals, crimp 1 terminal onto the end of each of the 7 different colored wires coming out of the harness.



Wiring Complete! Put Both Sides Together

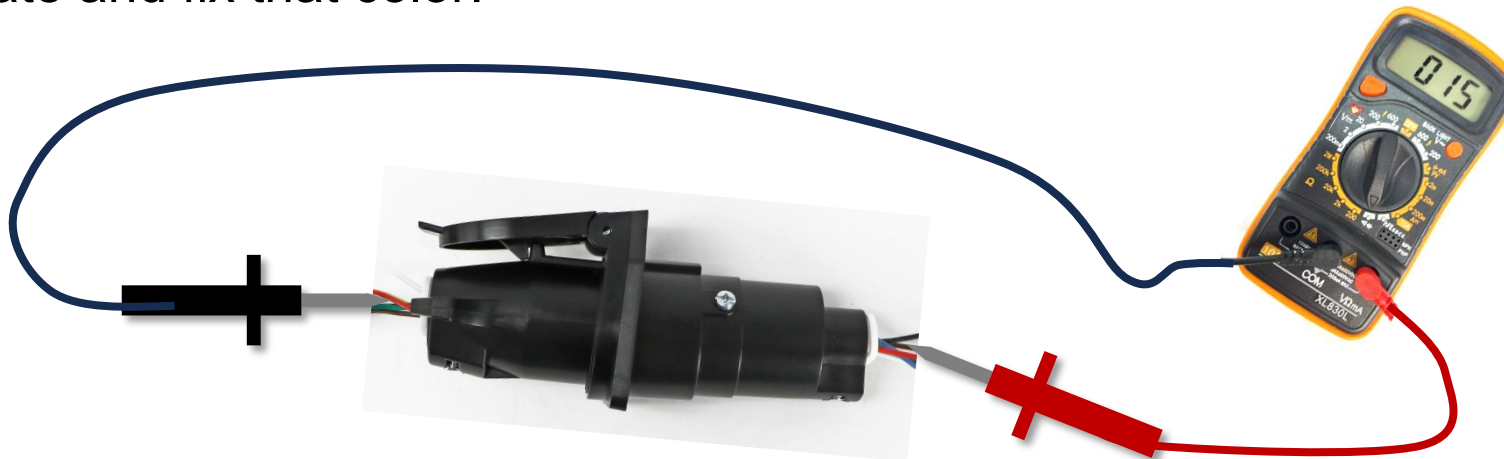
1. Lift the spring-loaded protective cover. This keeps the harness clean when not in use.
2. Rotate to line up the grooves on both sides.
3. Slide together.

The spring-loaded cover also serves as a safety latch, preventing them from separating.



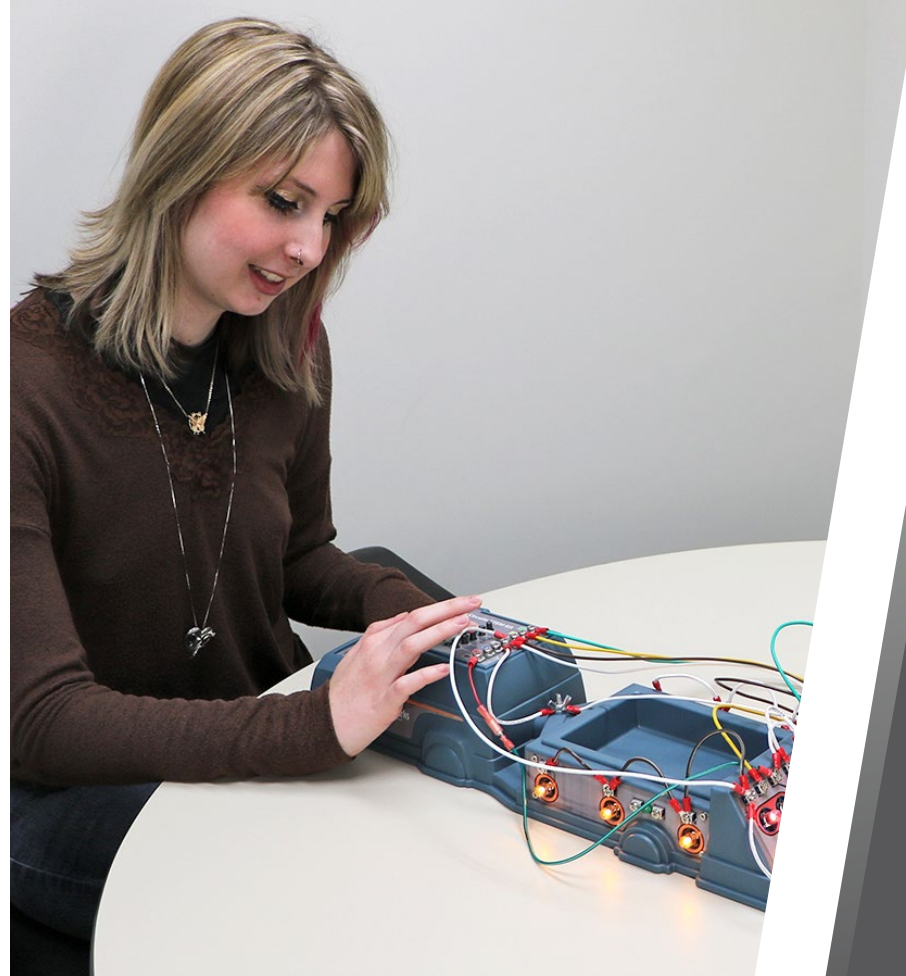
Test for Continuity with the Multimeter

1. The more wires and parts there are in a system, the more chances there are for something to go wrong, for a loose connection to exist, a bad crimp that is not making a conductive path, etc.
2. So, before we keep building, lets check our 7-way harness to make sure each color wire is a complete path for current to flow.
3. **Use the multimeter to check each color's conductive path, with a probe at each end of the path on the U-shaped crimp terminals as shown below.**
4. Record your testing results in your student workbook.
5. If continuity is not found (beep and light!), that means there is a break in that color's path... investigate and fix that color!



Congratulations!

Your 7-way round harness is ready to connect to the Trailer Circuits Truck!



**Done with the Student Workbook for
Lesson 5?**

**See your instructor to check the key
and/or turn in.**

For more information, please contact Realityworks, Inc.
through email at information@realityworks.com
or call toll free at 800.830.1416



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