



## Grand Blanc High School Robotics Team

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### Initial Member Deliverables Strip and Crimp a Wire

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Mentor(s) to ask if you have questions about, and may sign off on this Challenge: Clinton Bolinger, Cathy Fillwock or Marty Ray

Always remember: If you get stuck or have questions, ask a Veteran Team Member on your (or another) VEX Team BEFORE you approach a Mentor.

#### Gather the following Materials:

1. One piece of wire from the SCRAP WIRE RECYCLING BIN in the back room that is 6 to 8 inches in length. **DO NOT USE NEW WIRE FOR THIS CHALLENGE.**
2. Check the board in the conference room to see if a Kit is available to check out for this Deliverable Training.
3. Reference the Recommended Completion Schedule calendar (located on the board) to see if this Deliverable is featured for your Team this month:
  1. If your VEX Team is the featured Team, then proceed with the instructions below.
  2. If not, ask a Veteran Student Team Member to go with you to ask the Team Captain of the featured Team if they plan to use the materials at tonight's meeting:
    1. If the materials will NOT be used by that Team, then proceed with the instructions below.
    2. If the materials WILL be used tonight, please choose a different training to complete today.
4. Follow the directions listed on the board in the Conference Room to check-out a Kit (if available):
  1. Visit [www.team2337.com/checkout](http://www.team2337.com/checkout) on an internet connected device (yours or the Team's).
5. Take an inventory of the components **BEFORE** you leave the Conference Room. Your kit should contain:
  1. One Pair of Wire Strippers
  2. One bin of miscellaneous connectors (red, yellow and blue)
  3. A wiring Guide (from the FIRST manual)
  4. If any materials are missing, please inform one of the Mentors listed above BEFORE you get started.

#### Challenge Instructions:

- a. Watch the "How to strip and crimp" video tutorial on YouTube, here: <https://youtu.be/-WN-IBkjkAc>
- b. Use the materials that you gathered from the wire recycling bin, along with the connectors and tools from the Supplies Kit to:
  - a. Determine which connector you should use, based on the AWG of your wire,
  - b. Strip BOTH ends of the wire,
  - c. Attach a correctly-sized connector to each end.
- c. Ensure that a proper crimp has been made:
  - a. The connector should match the gauge of the wire
  - b. No strands of wire should be exposed around the base of the connector
  - c. A "pull, push, pull" test should be administered on BOTH ends to guarantee the connector will not come loose.
    - i. Hold the wire securely in your non-dominant hand, pull the terminal HARD with your dominant hand,
    - ii. Push the terminal as hard as you can with your dominant hand,
    - iii. Pull the terminal as hard as you can with your dominant hand,
    - iv. If the terminal comes off or moves, you must re-do the crimp. ☹️
    - v. If your terminal remains in tact, you have made a good connection! 😊
- d. Once you have made a "good" crimp, begin work on your Engineering Notebook Entry.



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#### Engineering Notebook Entry Instructions:

- a. Crayons, Markers, Colored Pencils and Straight Edge tools are available on the Cart in the Conference Room, BUT:
  - a. These materials MUST be returned to the correct bins once your are done with them
  - b. If the materials are not returned on a regular basis, we will stop providing them.
- b. In your Engineering Notebook, draw a picture of the wire you terminated, and indicate:
  - a. Color, Gauge and length of wire used
  - b. Type and color of connector used
  - c. Location of crimp(s)
- c. Use COMPLETE SENTENCES to answer the following questions:
  - a. Why is it important to use the “pull, push, pull” test when terminating a wire?
  - b. Why is there black wire and red wire?
  - c. What does the color of the connector indicate?
  - d. As the gauge of the wire increases, what happens to the diameter of the wire? (This question may require research this on the internet)
  - e. Use the attached document to determine the following:
    - i. What gauge wire is used for a 40A (amp) circuit?
    - ii. What gauge wire is used for a 20A (amp) circuit?
    - iii. What gauge wire is used for a 30A (amp) circuit?

#### If you are **NOT done** with your training by at least 15 minutes before the end of the meeting:

1. Return materials to the bin, and save your work on the Computer.
2. Clean your workspace AND the floor around you:
  - a. Wipe off tables
  - b. Push in Chairs
  - c. Sweep the floor,
  - d. Throw away trash
3. Write your name on a post-it (available on the cart next to the Deliverables shelf in the Conference Room), and attach it to the outside the bin (on the lid),
4. Return the bin to the shelf in the Conference Room, with the label facing upward
5. **DO NOT** complete the online check-in form!
6. If you do not show up for the next two meetings, the kit will be given to someone else.



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#### To Complete Your Challenge:

1. Ensure that your Engineering Notebook entry is complete.
2. Bring your Engineering Notebook and your terminated wire to one of the Mentors listed on this challenge to have it tested.
  - a. Be sure it's correct BEFORE you take it to a Mentor!
  - b. If the Mentor is able to remove your connector with the "Push, Pull, Push" test, you will have to start over, and create new crimps.
3. Once your connection passes, ask one of the listed Mentors to approve your Engineering Notebook entry and have your deliverables checklist validated.
4. Clean your workspace AND the floor around you:
  - a. Wipe off tables,
  - b. Throw away trash,
  - c. Push in Chairs,
  - d. Sweep the floor.
5. Follow the directions on the board in the conference room to check the kit in, and:
  - a. Refill any empty connectors from the bin on the cart in the Conference Room (next to the Deliverables shelf)
  - b. Check the kit in using the online form, available at [www.team2337.com/checkin](http://www.team2337.com/checkin)
  - c. Return the bin to the correct shelf in the Conference Room, with the label facing outward,
  - d. Erase your name from the sign-out board, using a tissue and hand sanitizer.
6. Put away your completed wire:
  - a. If you do not want to keep your wire, please cut the terminals off of it, and return the wire to the recycling bin.
  - b. If you intend to keep it, make sure you put it away, and do NOT leave it lay around at Premier (or else it will be thrown away).