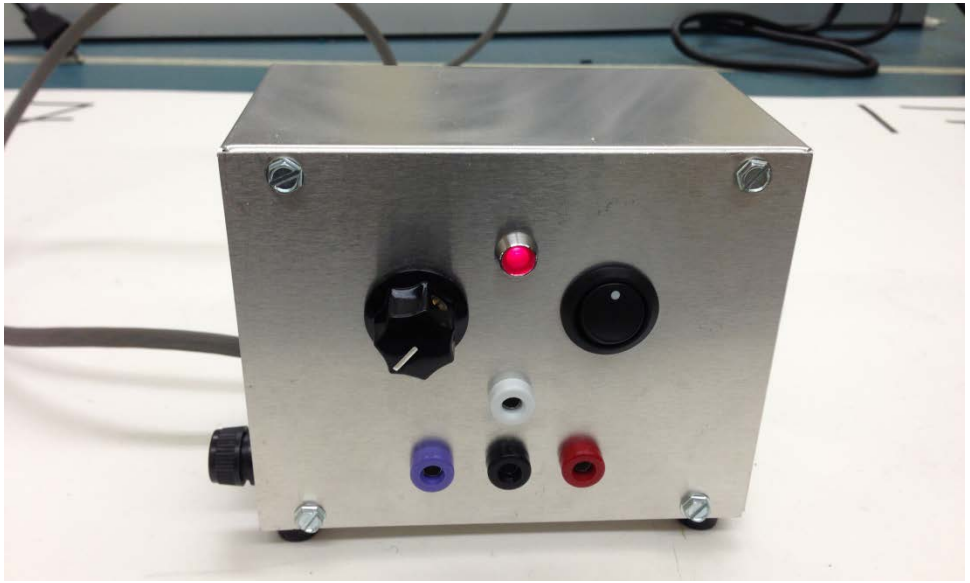
School of Energy

Electronics Fabrication
DC Power Supply



Front Panel Assembly Guidelines

Prepared by: M. LeNoble

Shop Safety

When working in the shop…

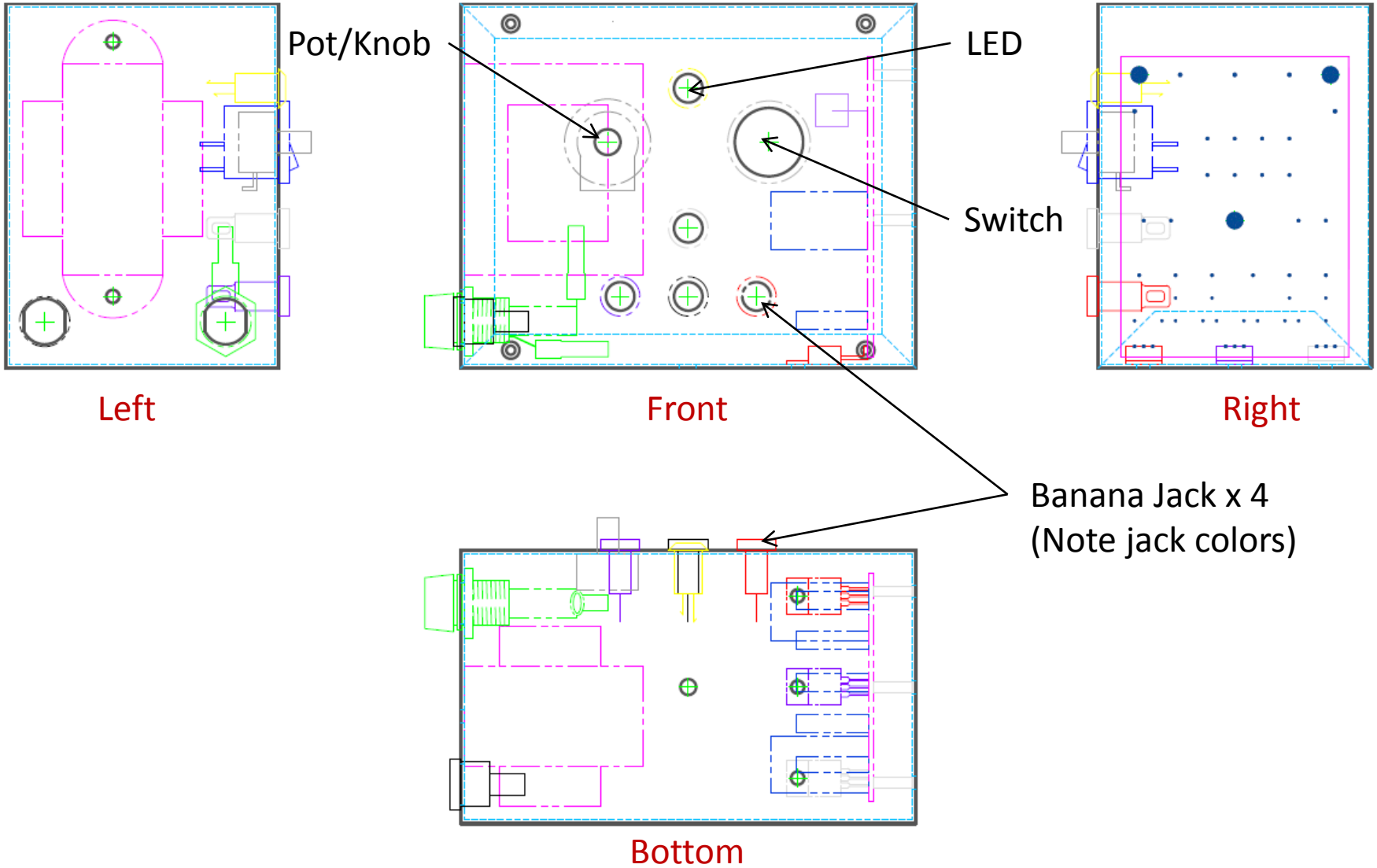
- Safety glasses must be worn at all times. (No exceptions)
- Closed toed shoes are to be worn.
- Wear close fitting clothing that cannot interfere with work.
- Tie back long hair so that it cannot interfere with work.

Front Panel Assembly

- Phase 3 of the DC Power Supply manufacture continues with the assembly of the front panel.
- The following tools are required for this phase of work:

Student Supplied	Shop Supplied
Safety glasses*	Hand reamer
Precision side cutters	Metal file
Needle-nose pliers	Adjustable wrench
Wire strippers	Hack saw / bench vise
	Crimping tool
	Pb-free solder station
	Work mat (non-ESD)
	SAC Pb-free flux core solder
	Hot air gun

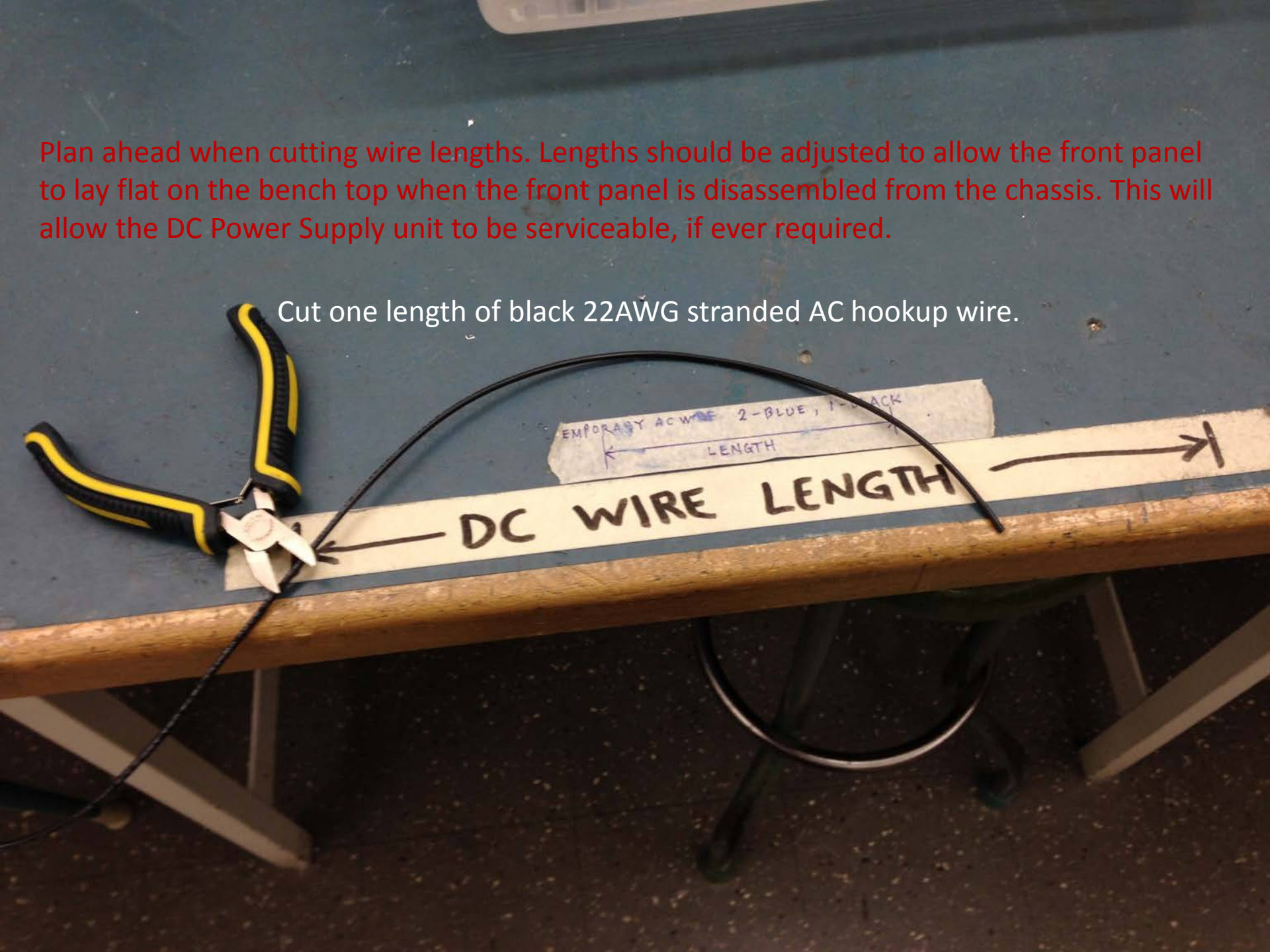
Front Panel Assembly



Refer to the above drawing to determine the correct location of each component during assembly.

Plan ahead when cutting wire lengths. Lengths should be adjusted to allow the front panel to lay flat on the bench top when the front panel is disassembled from the chassis. This will allow the DC Power Supply unit to be serviceable, if ever required.

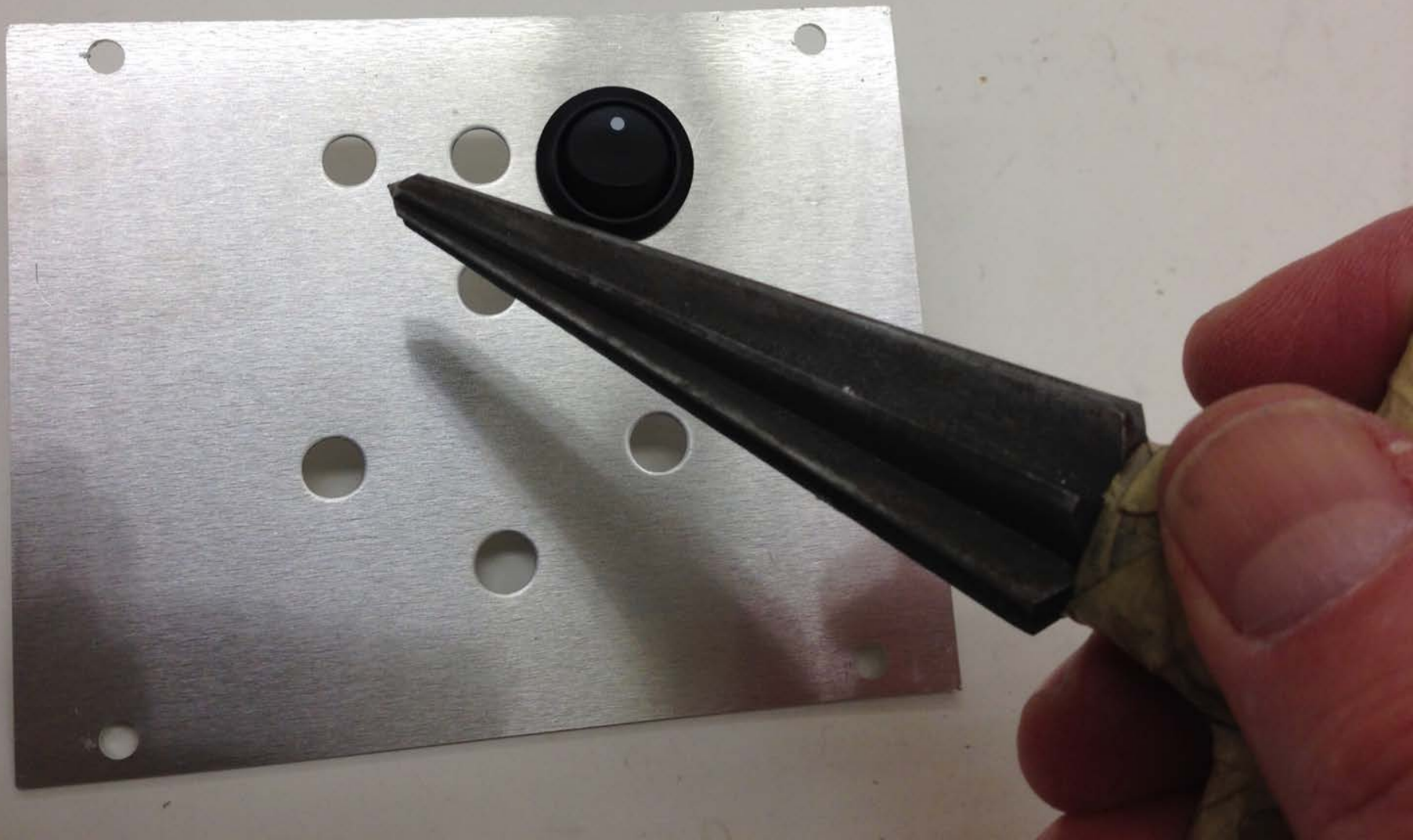
Cut one length of black 22AWG stranded AC hookup wire.



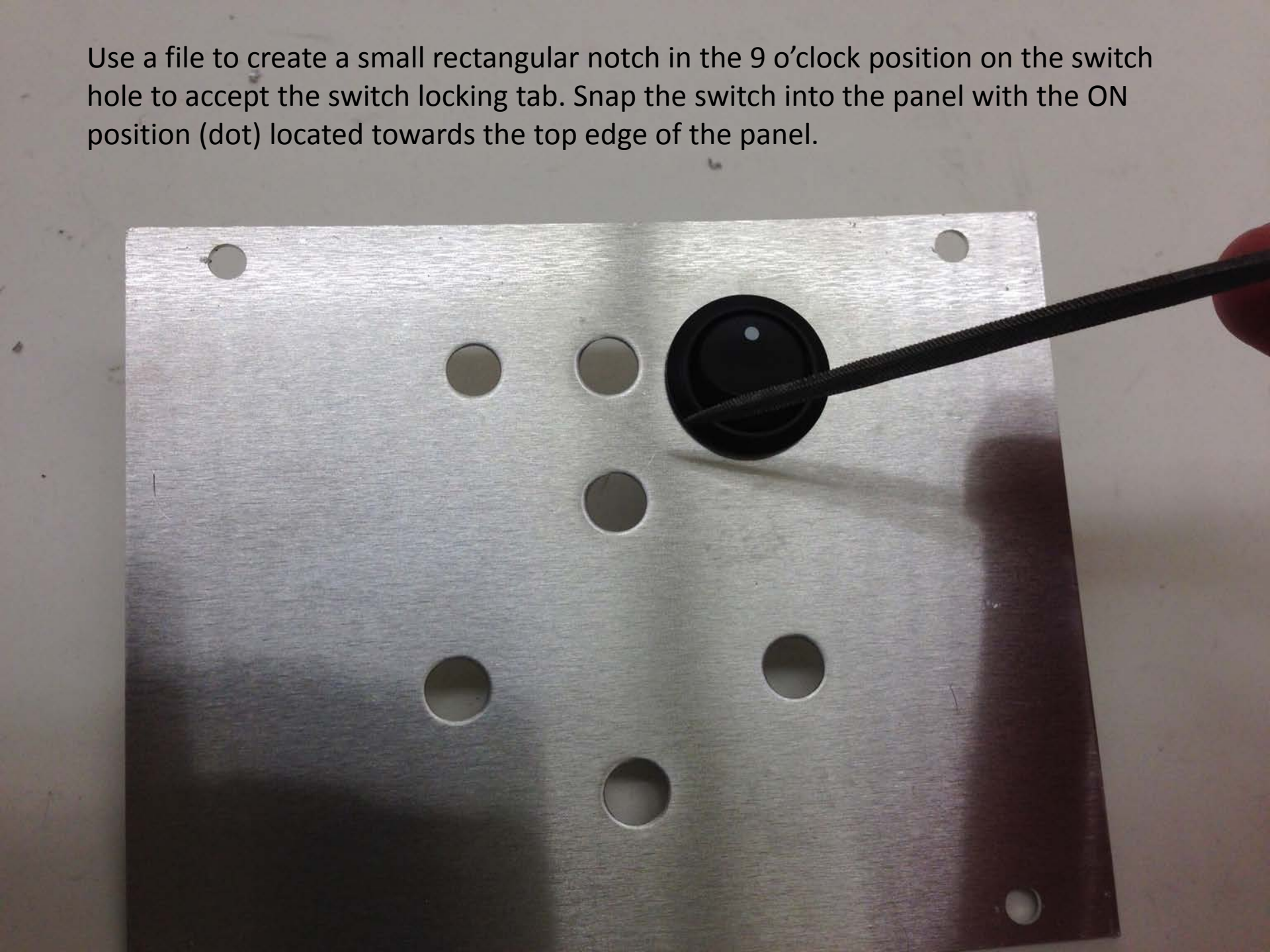
Obtain a #22-18 Quick Connect connector. Strip one end of the hookup wire insulation to the correct length for the connector. Use the 22-18 position on the crimp tool to secure the connector to the wire.

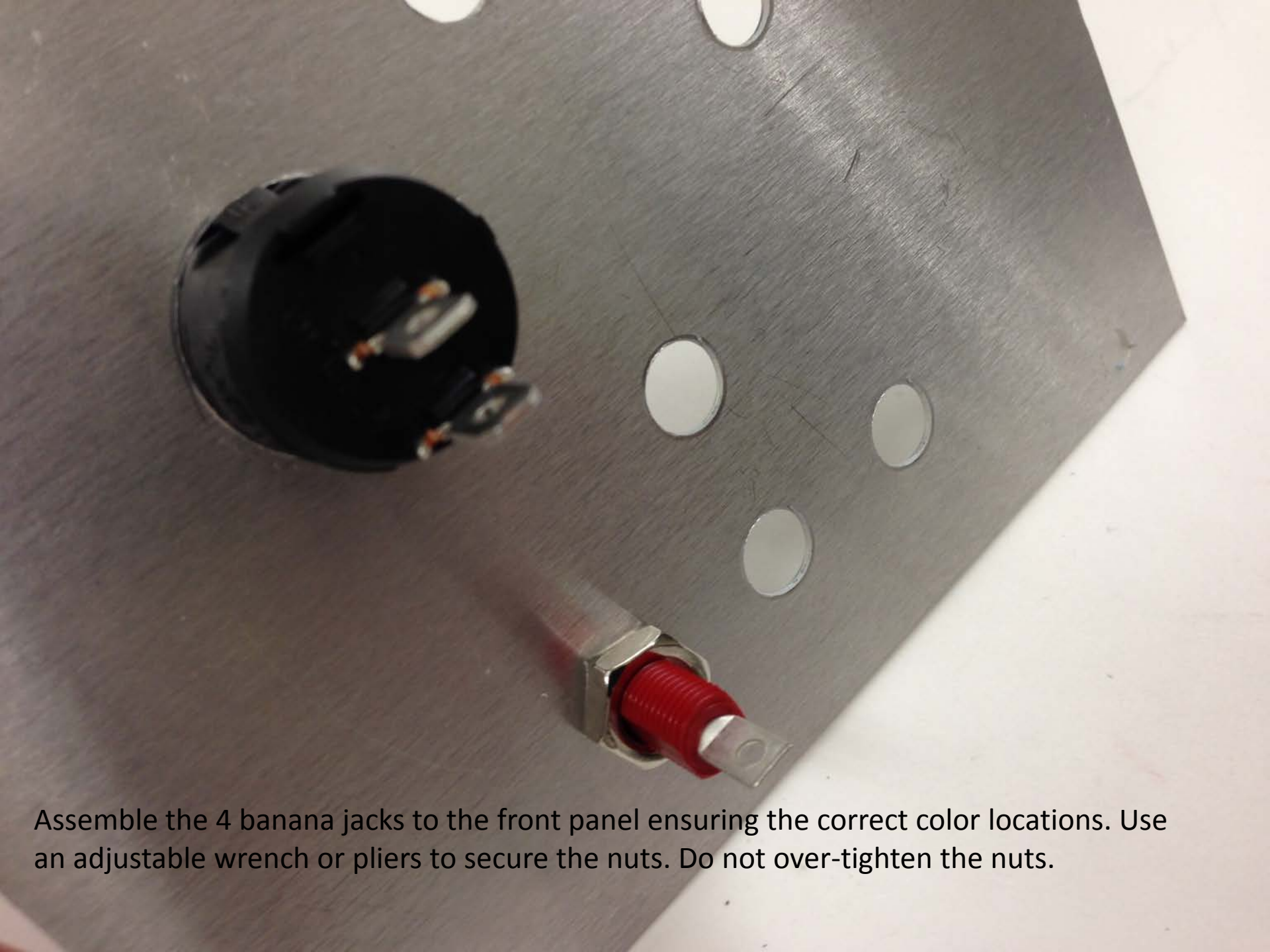
The connector must be attached with no exposed wire showing.

Use the hand reaming tool to slightly increase the ¾ inch hole diameter so the AC power switch can be inserted. (Note – do not force the switch into the hole)



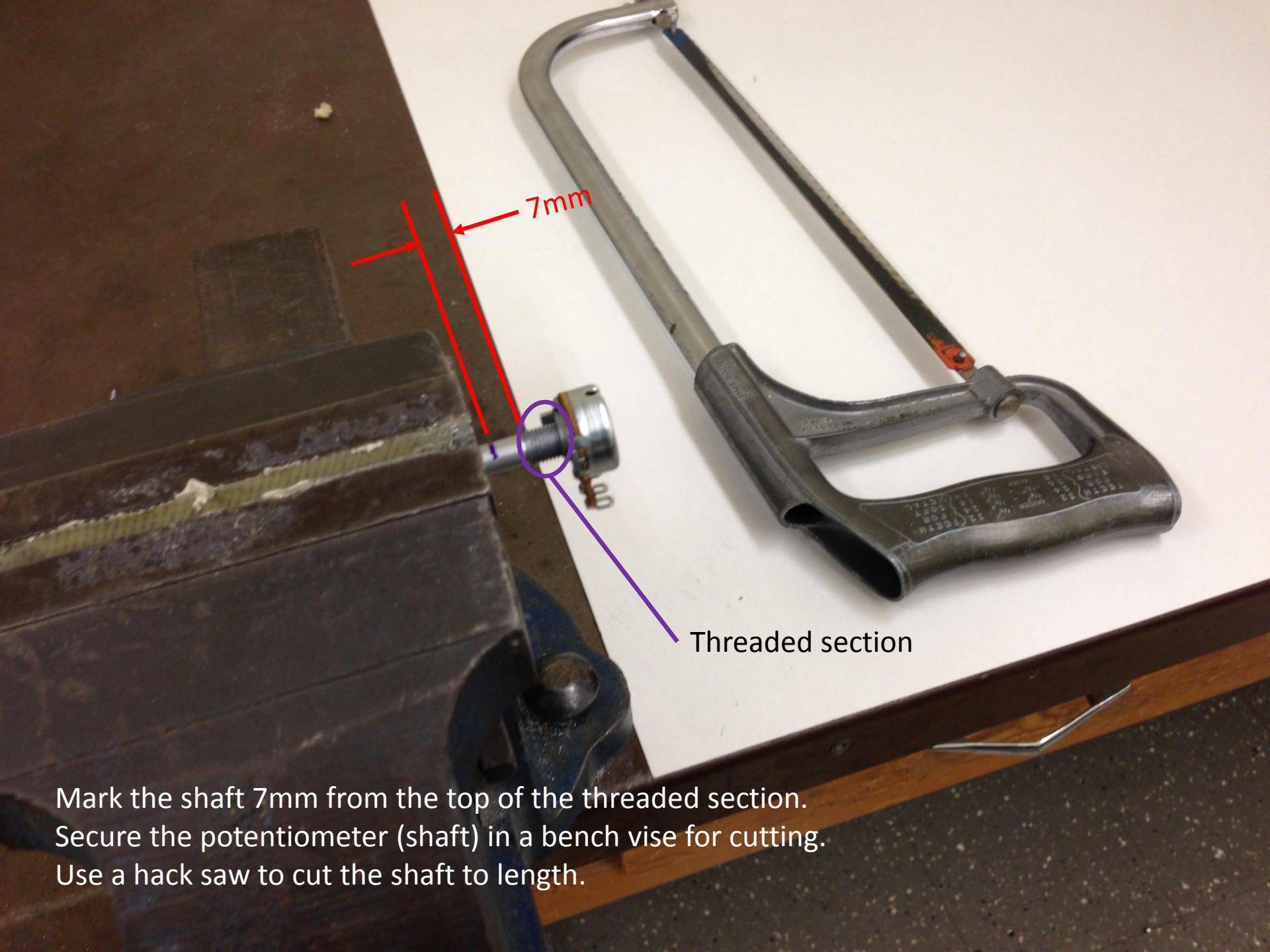
Use a file to create a small rectangular notch in the 9 o’clock position on the switch hole to accept the switch locking tab. Snap the switch into the panel with the ON position (dot) located towards the top edge of the panel.



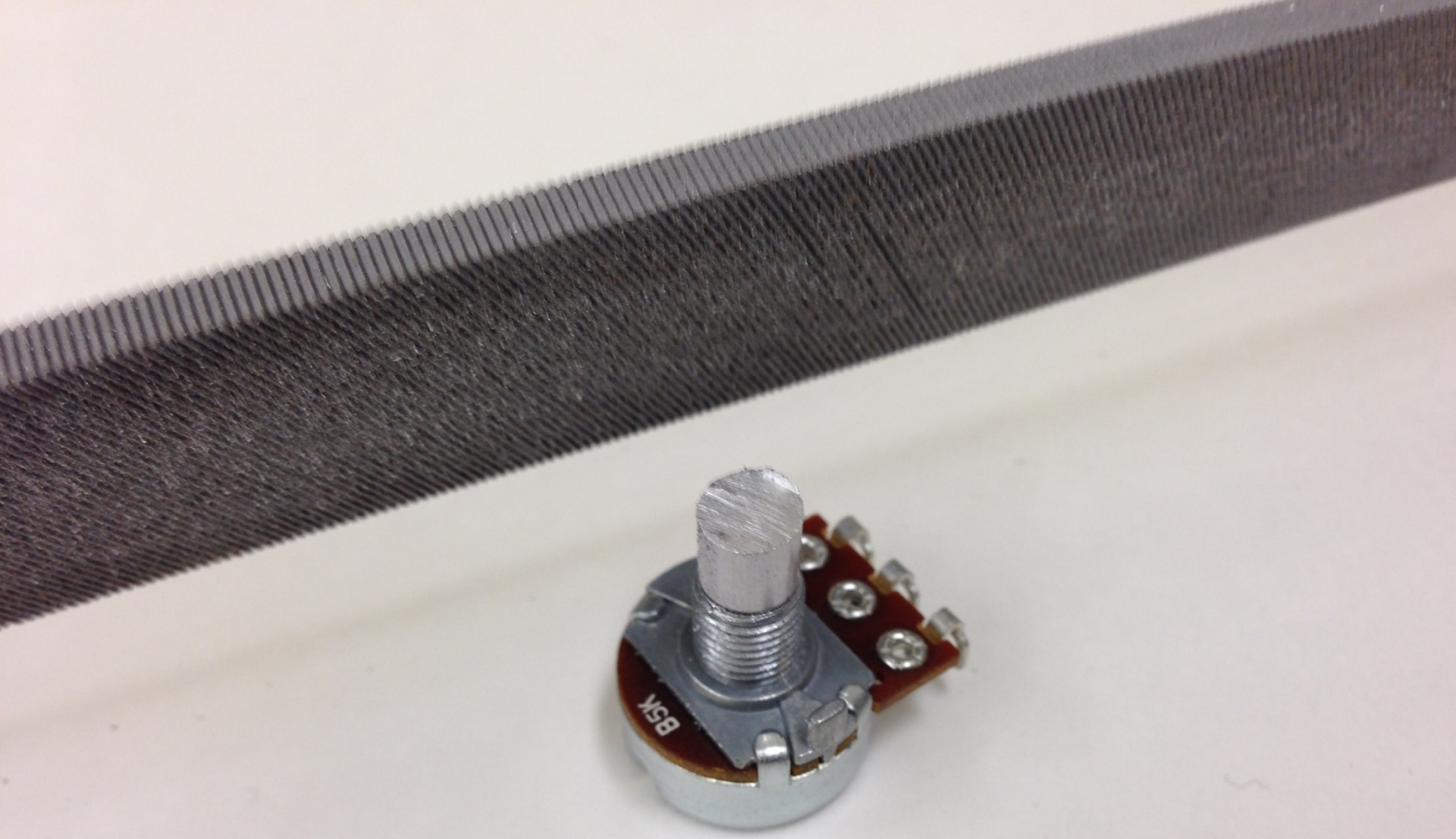


Assemble the 4 banana jacks to the front panel ensuring the correct color locations. Use an adjustable wrench or pliers to secure the nuts. Do not over-tighten the nuts.

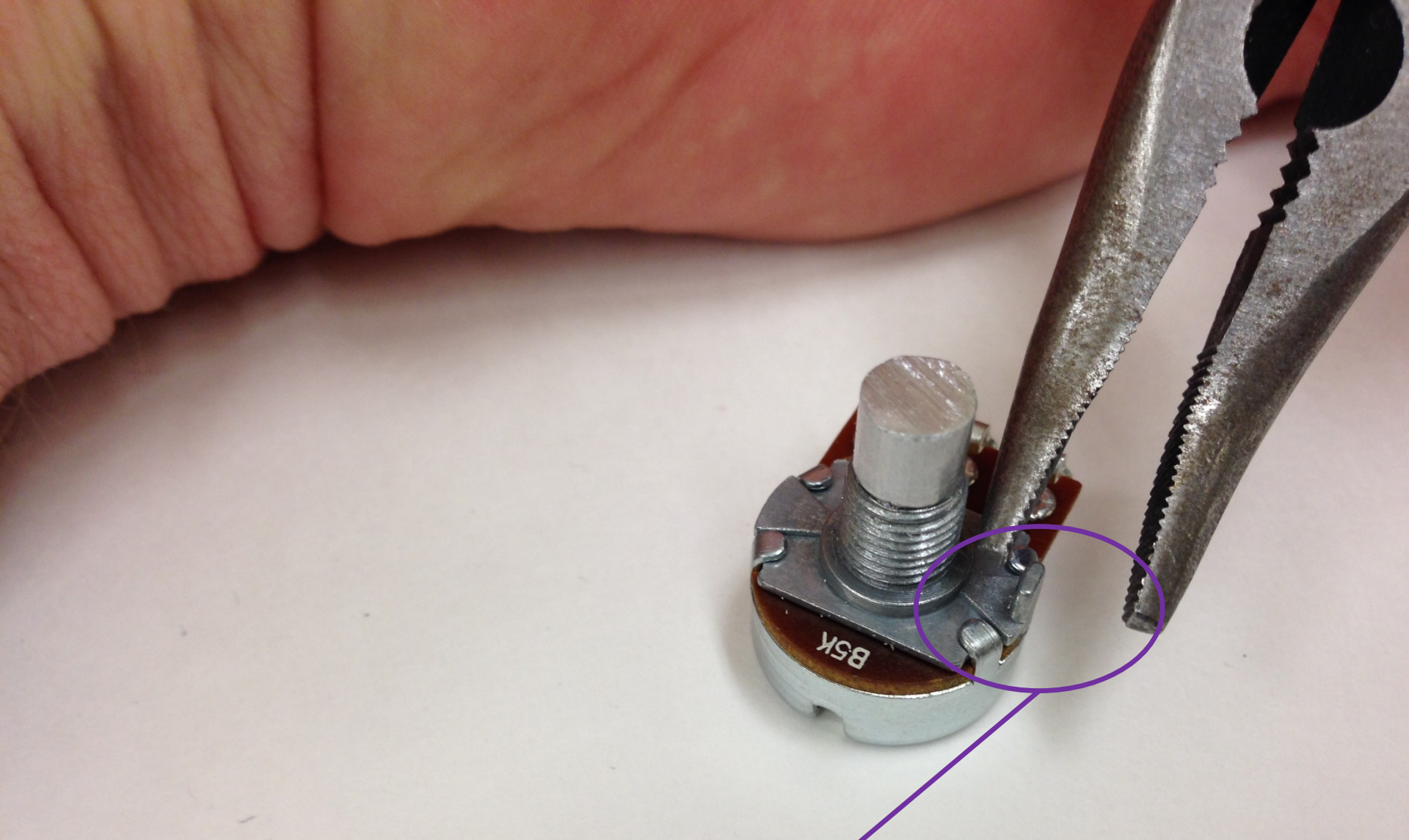
Orient the solder lugs parallel or perpendicular to the panel top edge. Confirm correct jack color locations.



Mark the shaft 7mm from the top of the threaded section.
Secure the potentiometer (shaft) in a bench vise for cutting.
Use a hack saw to cut the shaft to length.

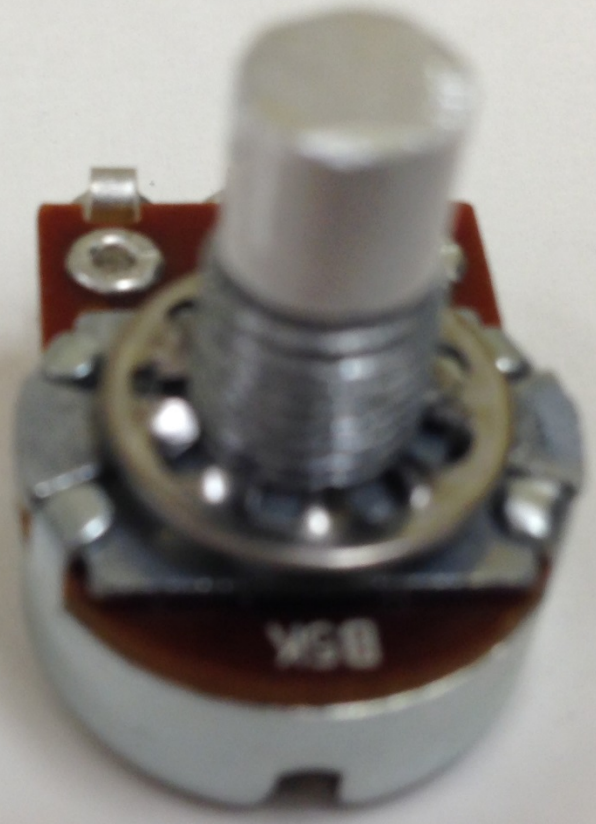


Use a file to remove the rough edges or metal protrusions where the shaft was cut.



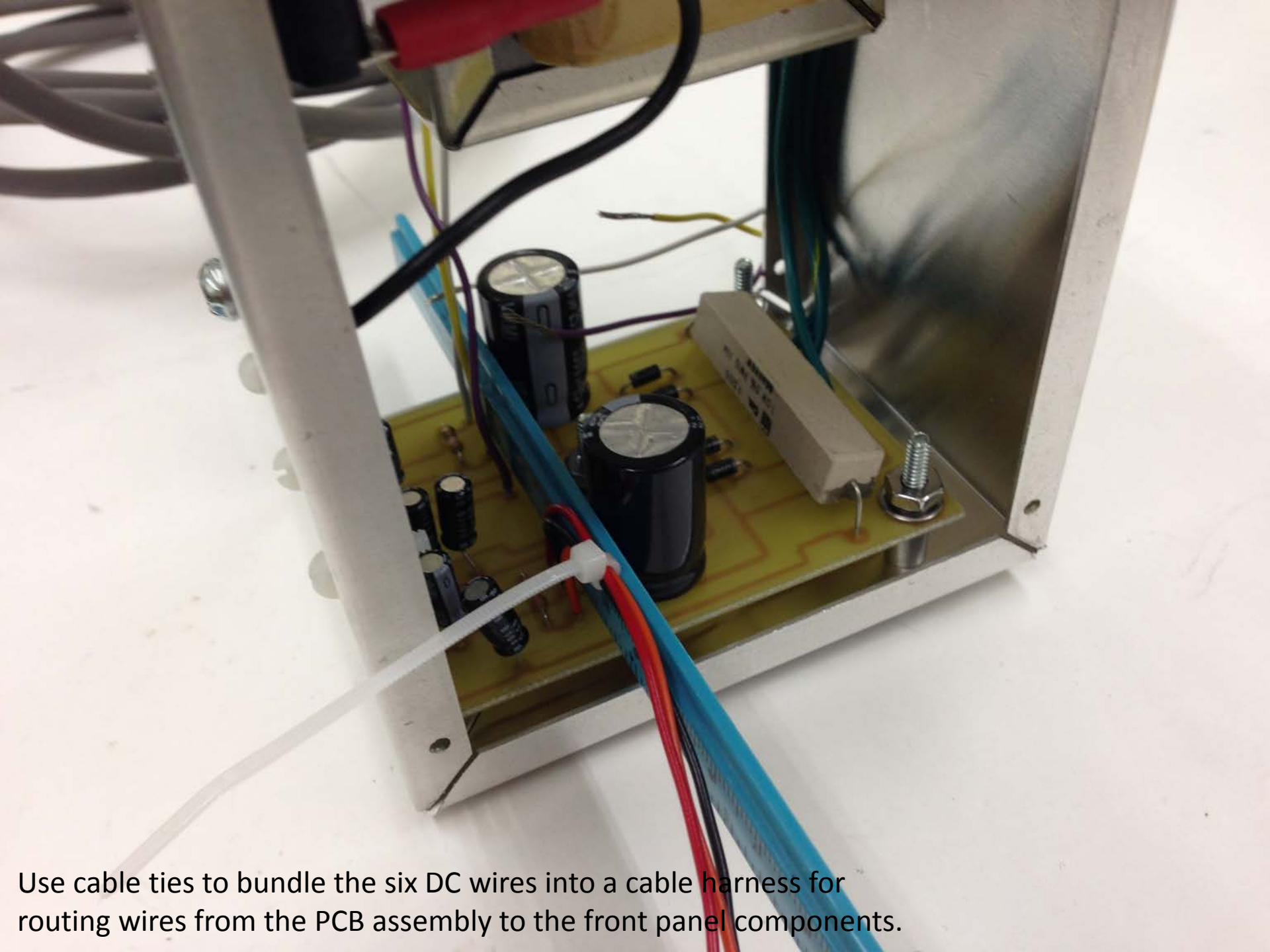
Use pliers to snap off the potentiometer lock tab.

Install a ¼ inch internal star washer on the potentiometer shaft. Insert the shaft through the appropriate front panel hole. Orient the potentiometer with the solder lugs parallel to the bottom edge of the panel and secure it to the panel using the washer and nut (supplied with the potentiometer).

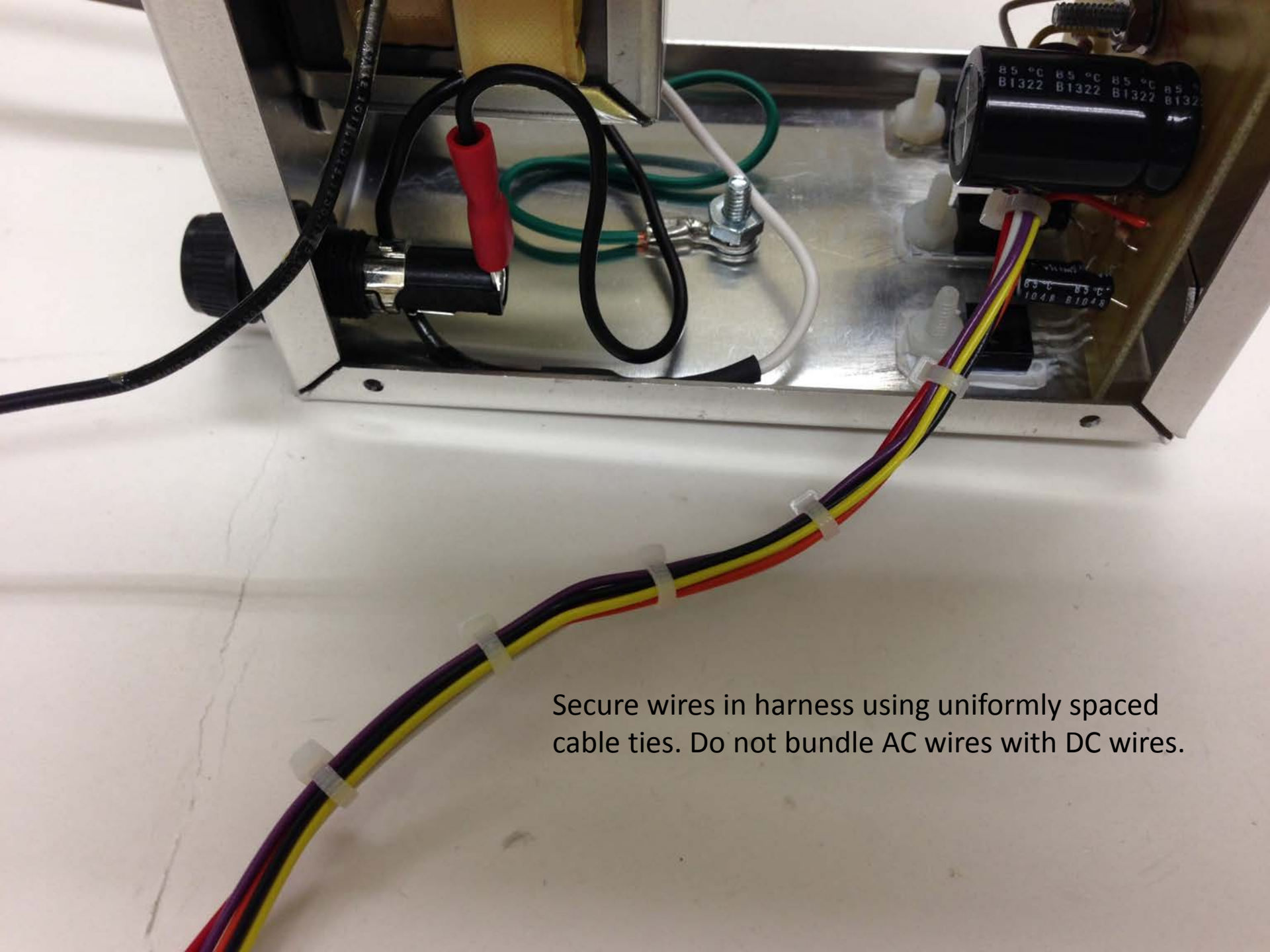


Secure the LED power indicator to the panel with the lock washer and nut (supplied with the indicator).

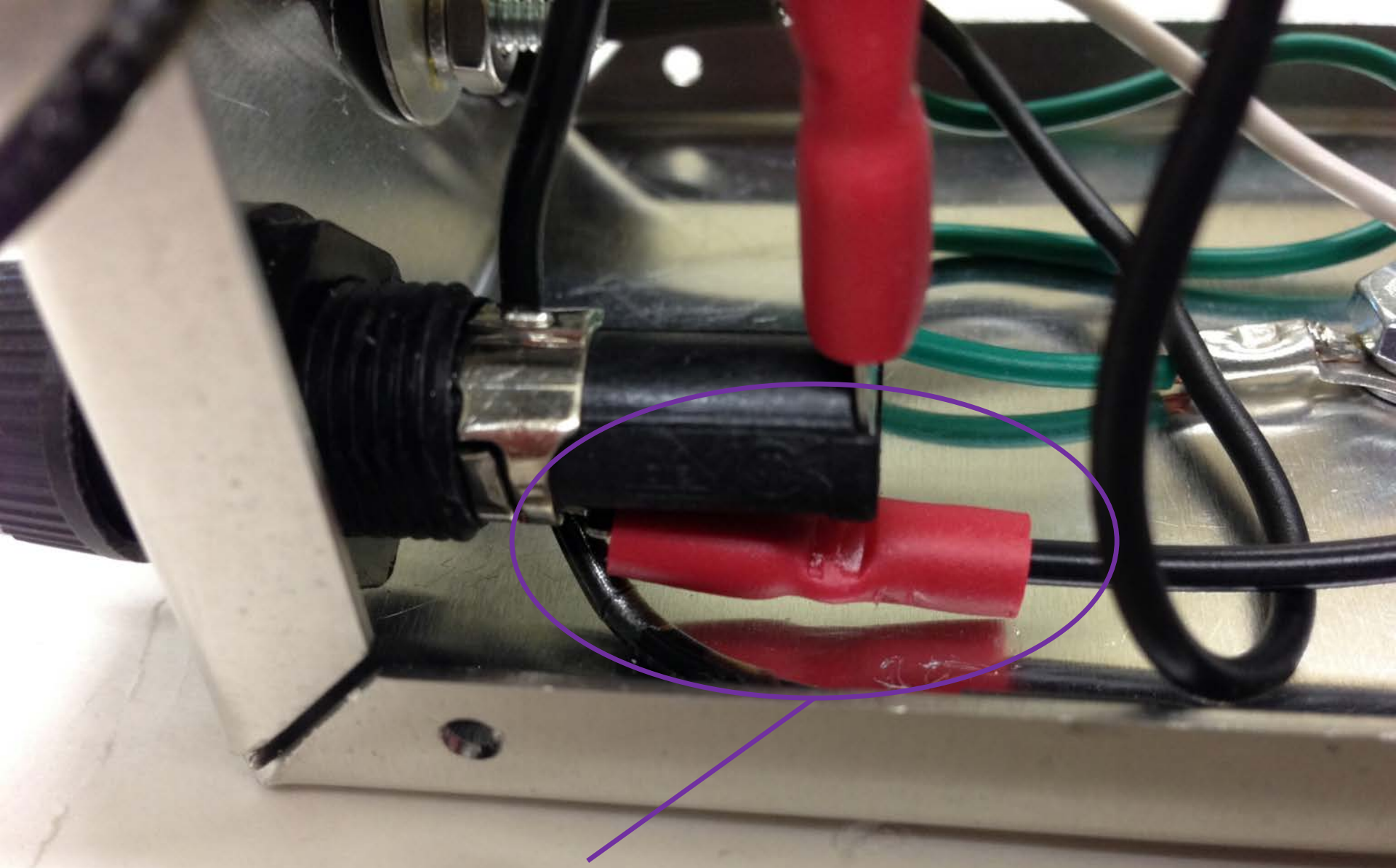
Component assembly to the front panel. Note positions.



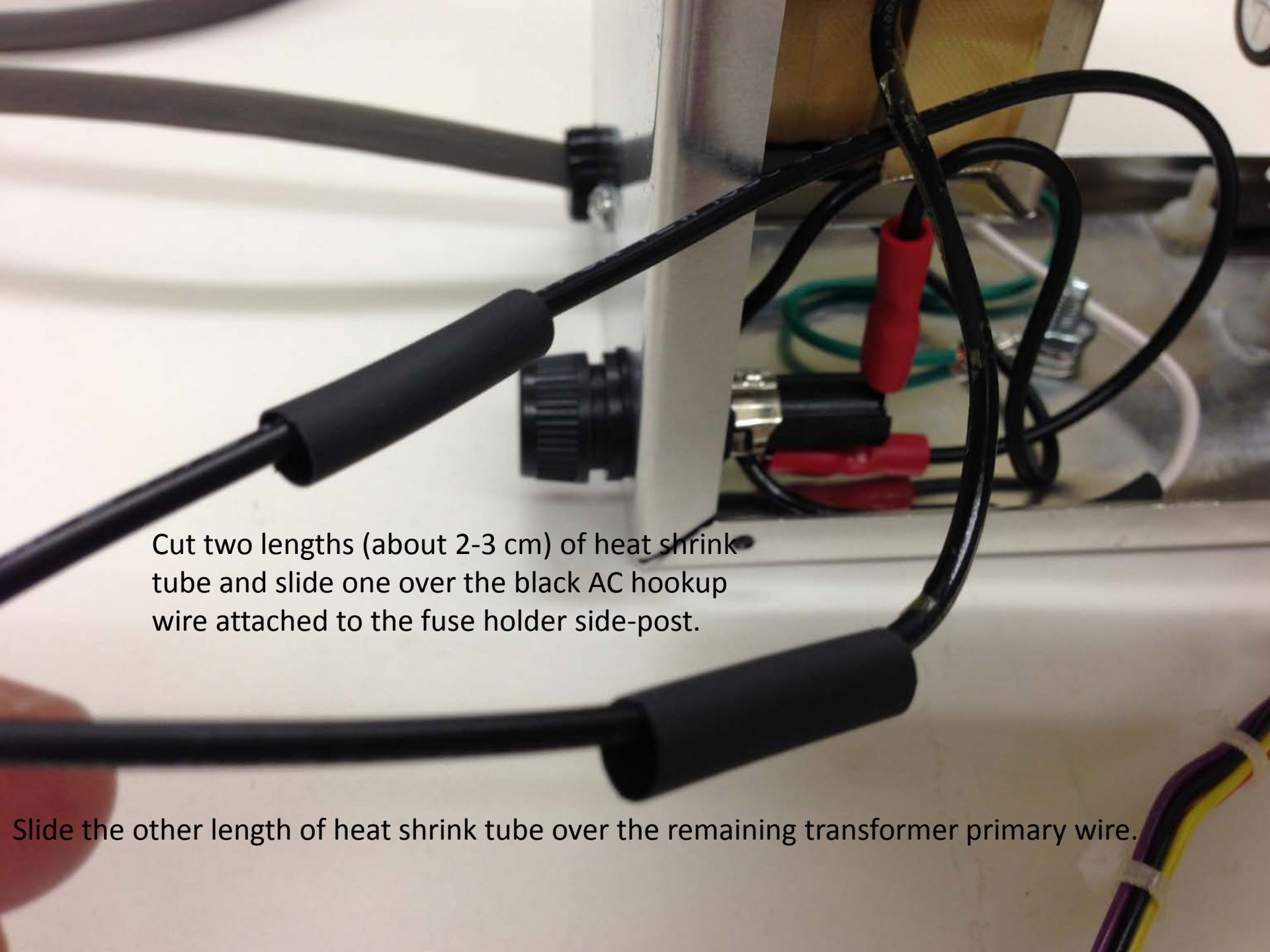
Use cable ties to bundle the six DC wires into a cable harness for routing wires from the PCB assembly to the front panel components.



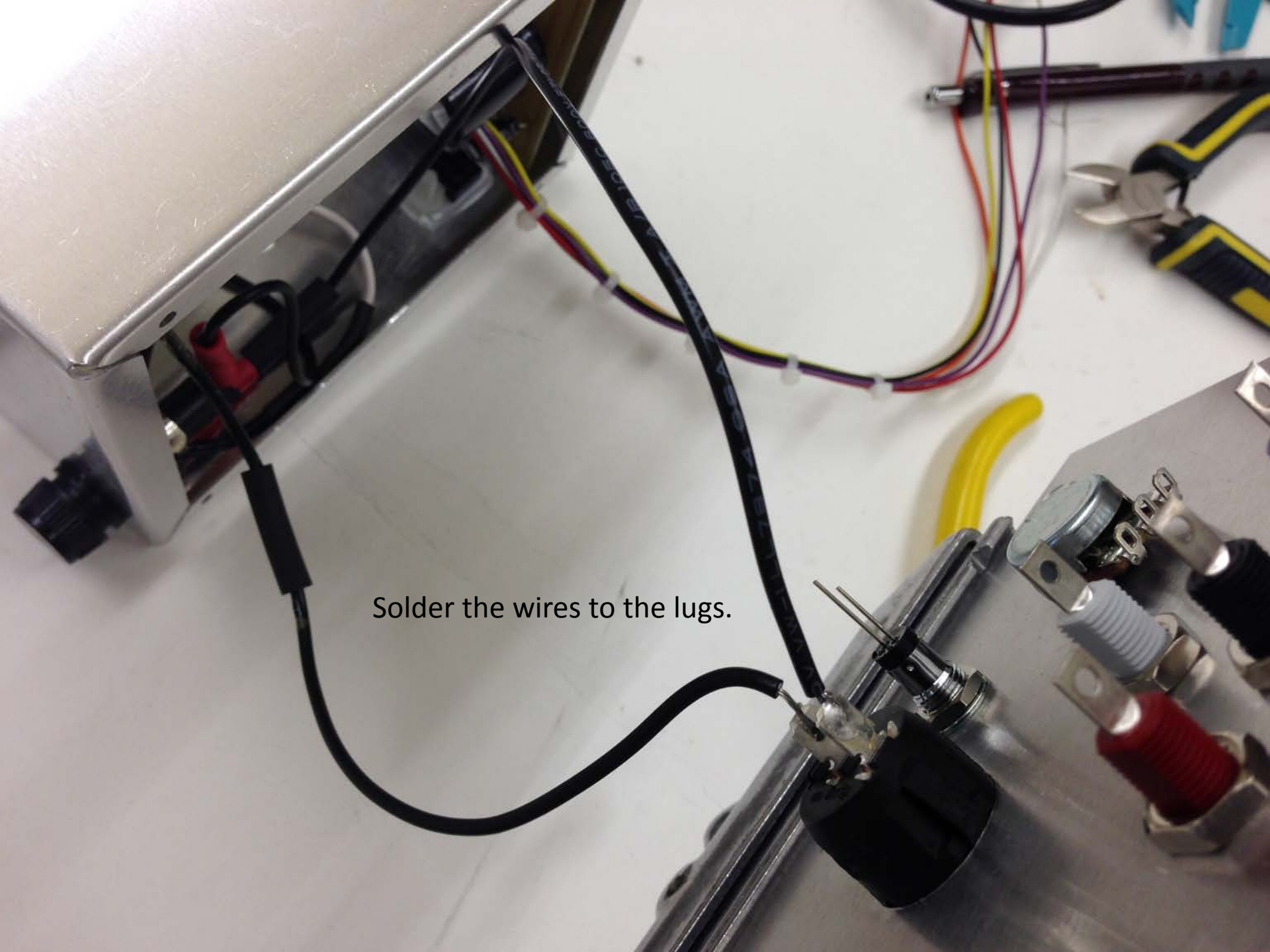
Secure wires in harness using uniformly spaced cable ties. Do not bundle AC wires with DC wires.



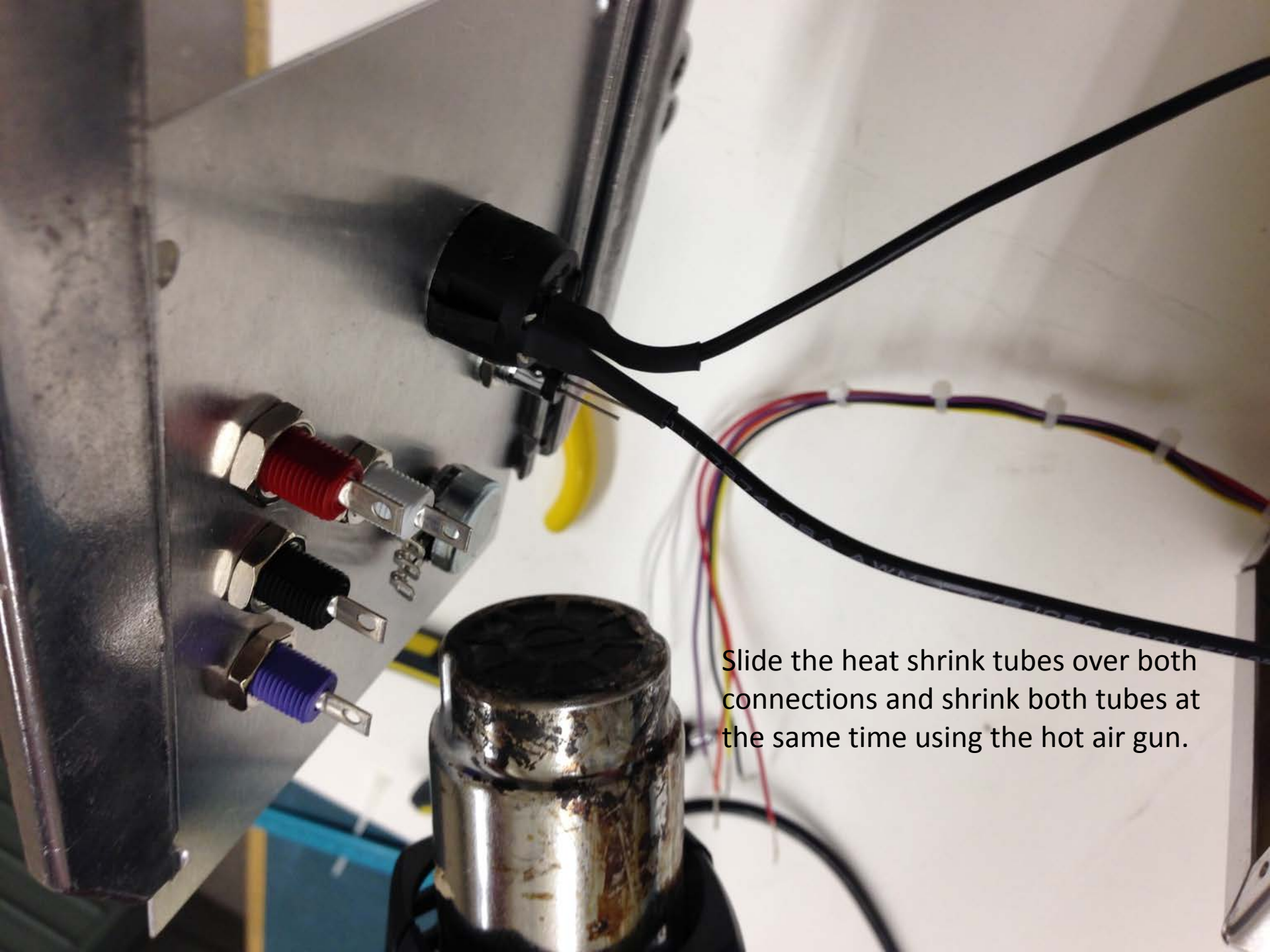
Securely attach the black AC hookup wire Quick Connector (prepared earlier) to the fuse holder side-post. Confirm the post is inserted correctly into the connector slot and <u>not</u> off to one side of the connector.

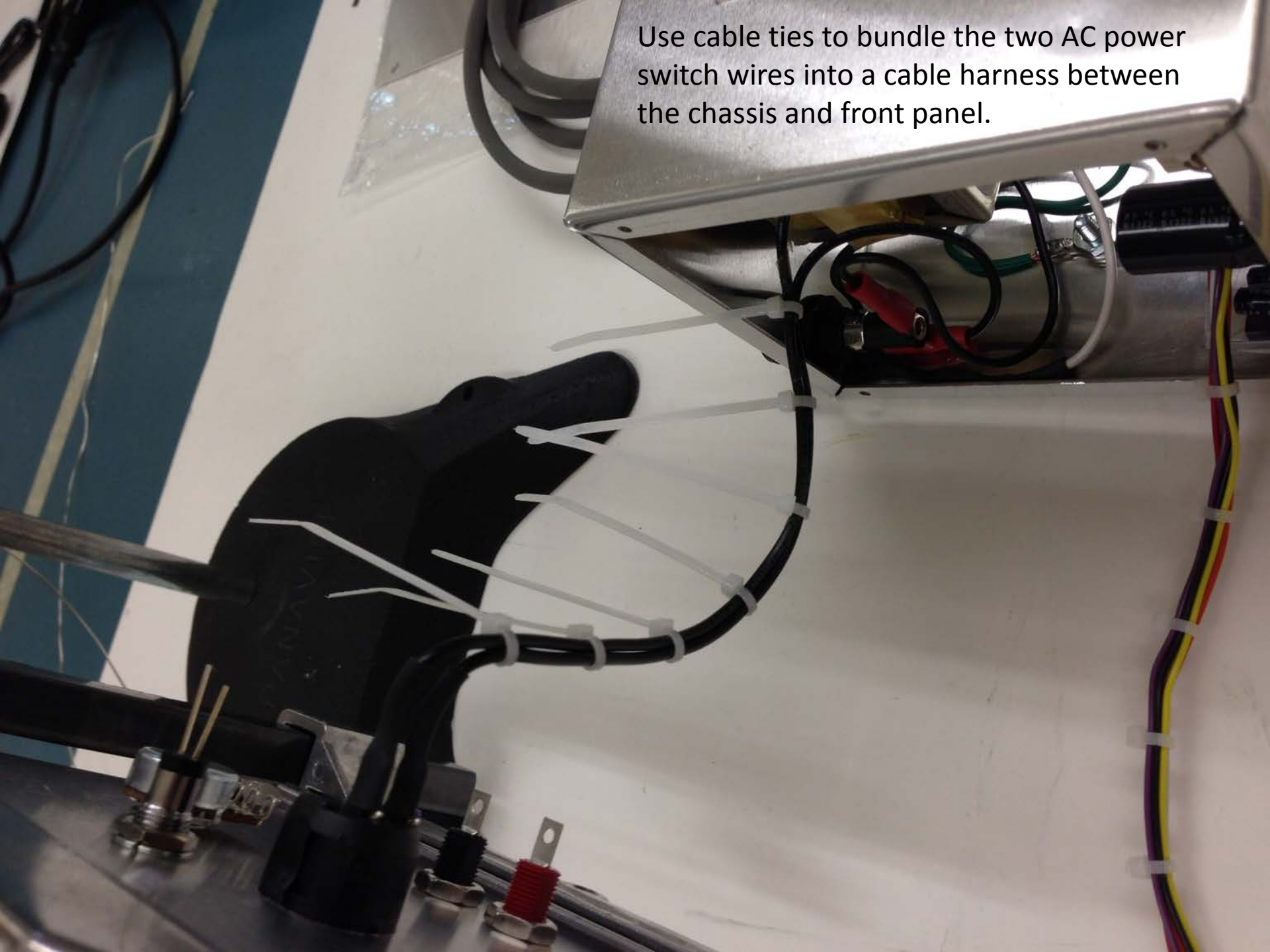

Cut two lengths (about 2-3 cm) of heat shrink tube and slide one over the black AC hookup wire attached to the fuse holder side-post.
Slide the other length of heat shrink tube over the remaining transformer primary wire.

Cut the AC hookup wire and the transformer primary wire to length and strip about 1cm of insulation from both wires. Tin each of the exposed wire ends and form into ‘hooks’. Pass one hook through each AC power switch lug and crimp using pliers.

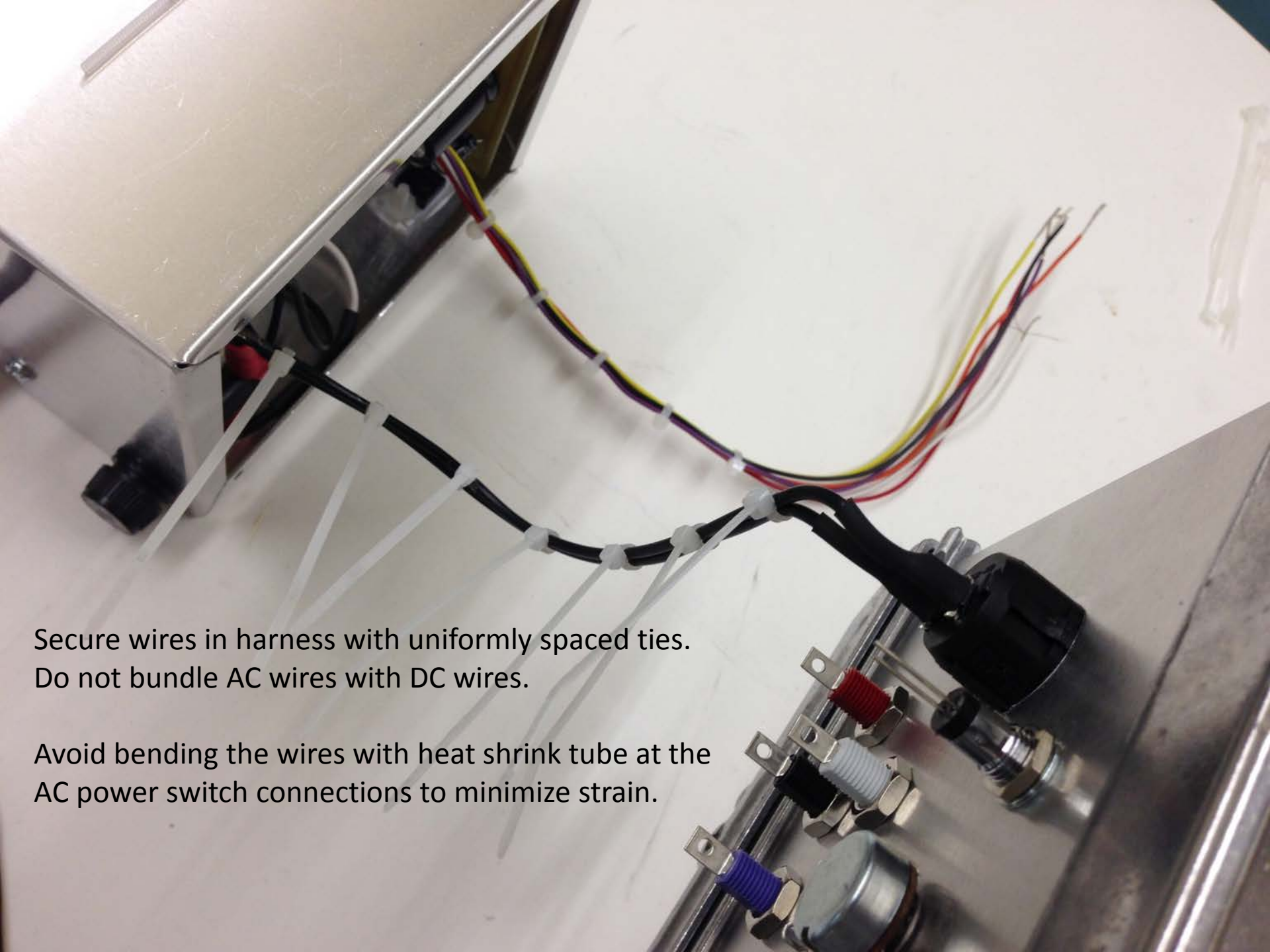


Solder the wires to the lugs.


Slide the heat shrink tubes over both connections and shrink both tubes at the same time using the hot air gun.



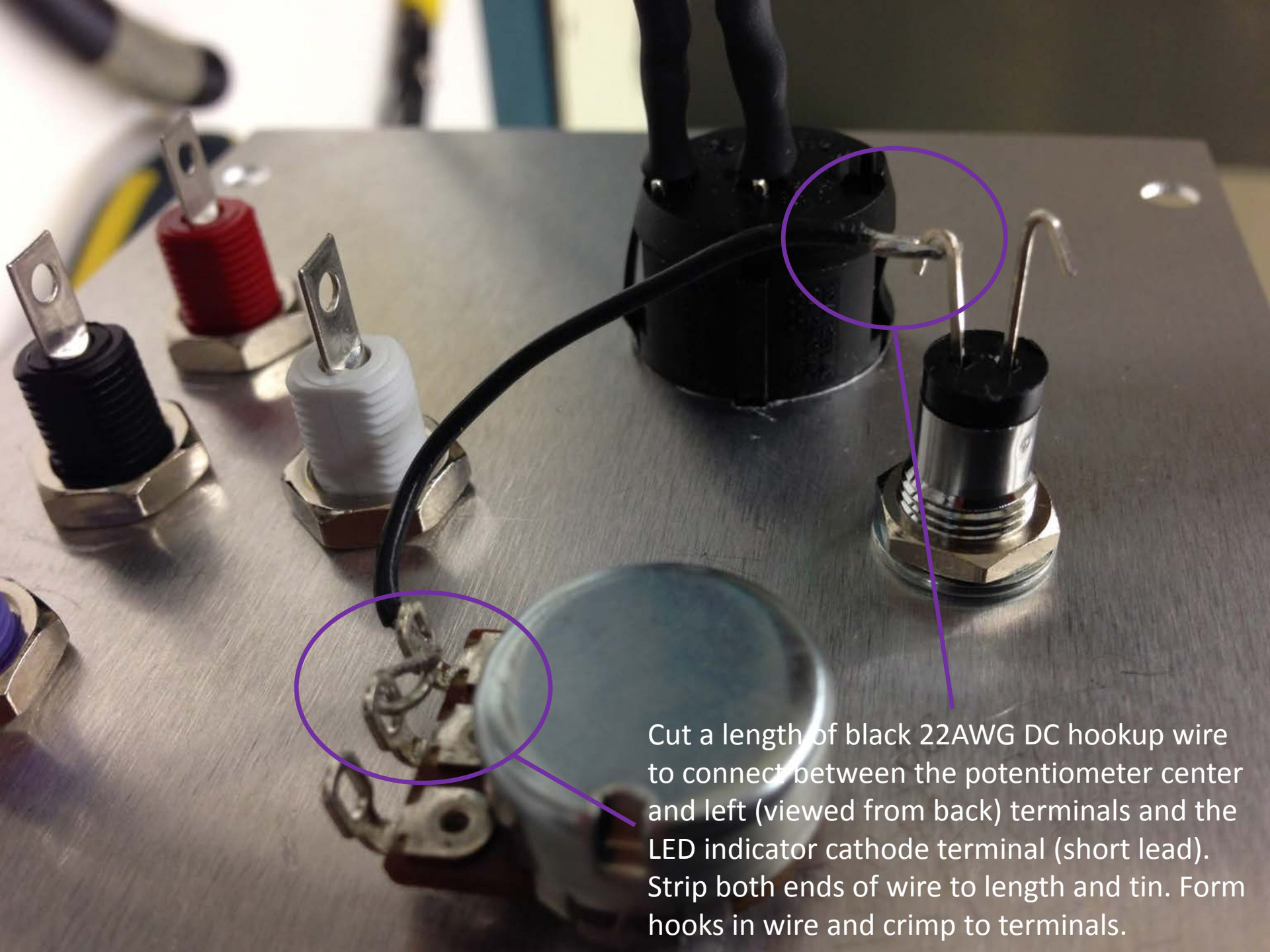
Use cable ties to bundle the two AC power switch wires into a cable harness between the chassis and front panel.



Secure wires in harness with uniformly spaced ties.
Do not bundle AC wires with DC wires.

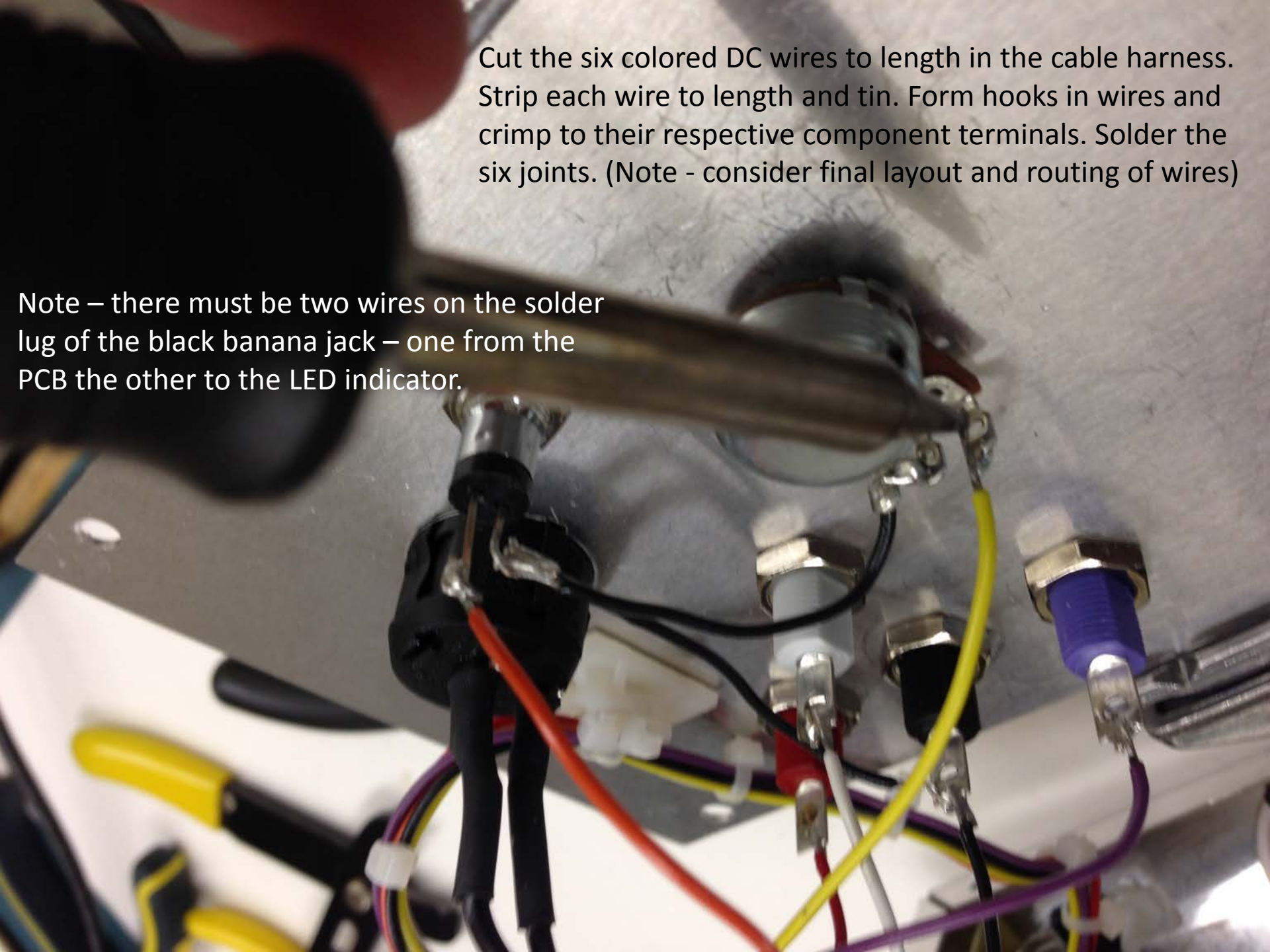
Avoid bending the wires with heat shrink tube at the AC power switch connections to minimize strain.

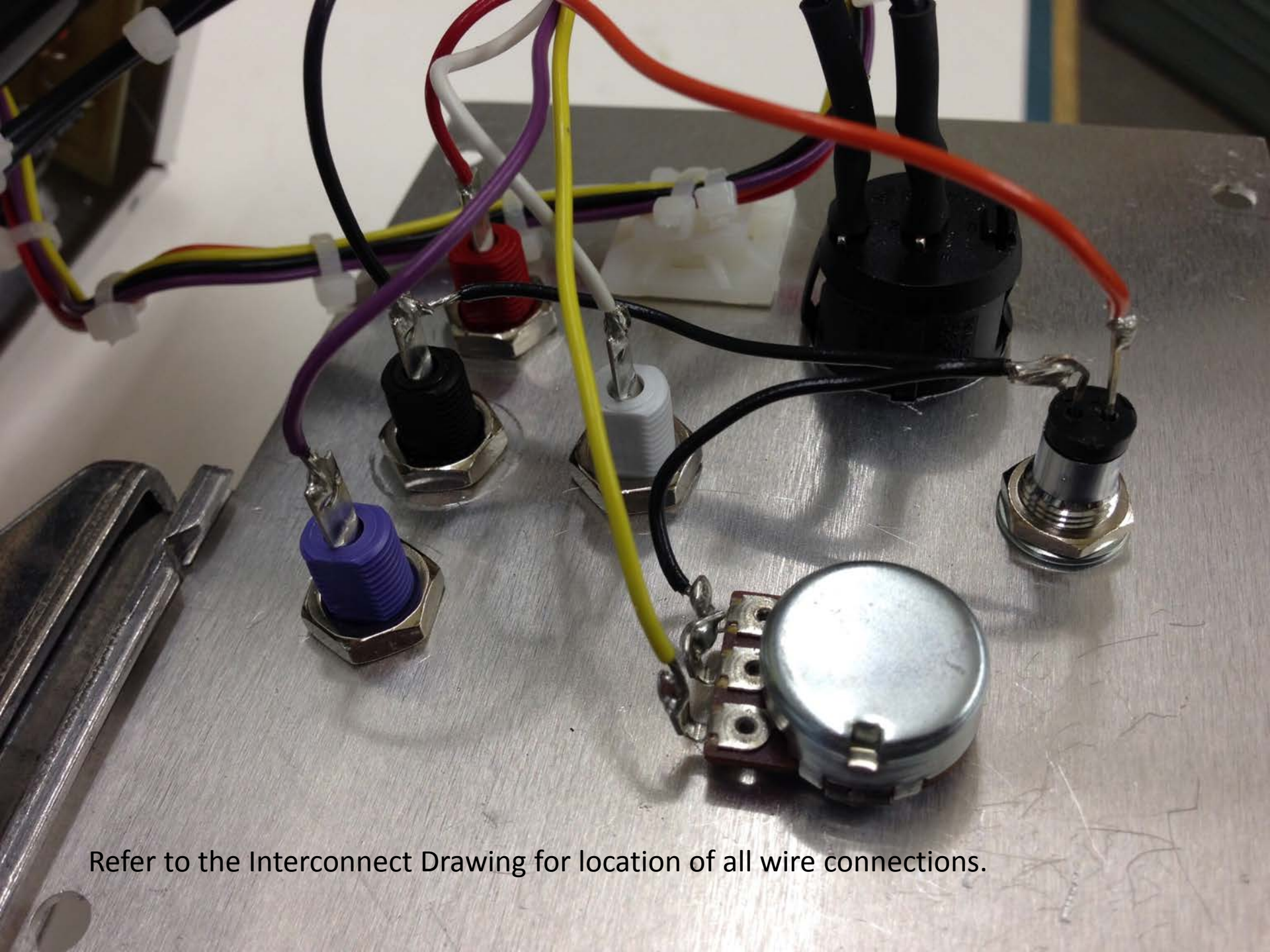
Form hooks at the ends of both LED indicator leads.
Orient the hooks away from each other.
(Note – the short lead is attached to the cathode)


Cut a length of black 22AWG DC hookup wire to connect between the potentiometer center and left (viewed from back) terminals and the LED indicator cathode terminal (short lead). Strip both ends of wire to length and tin. Form hooks in wire and crimp to terminals.

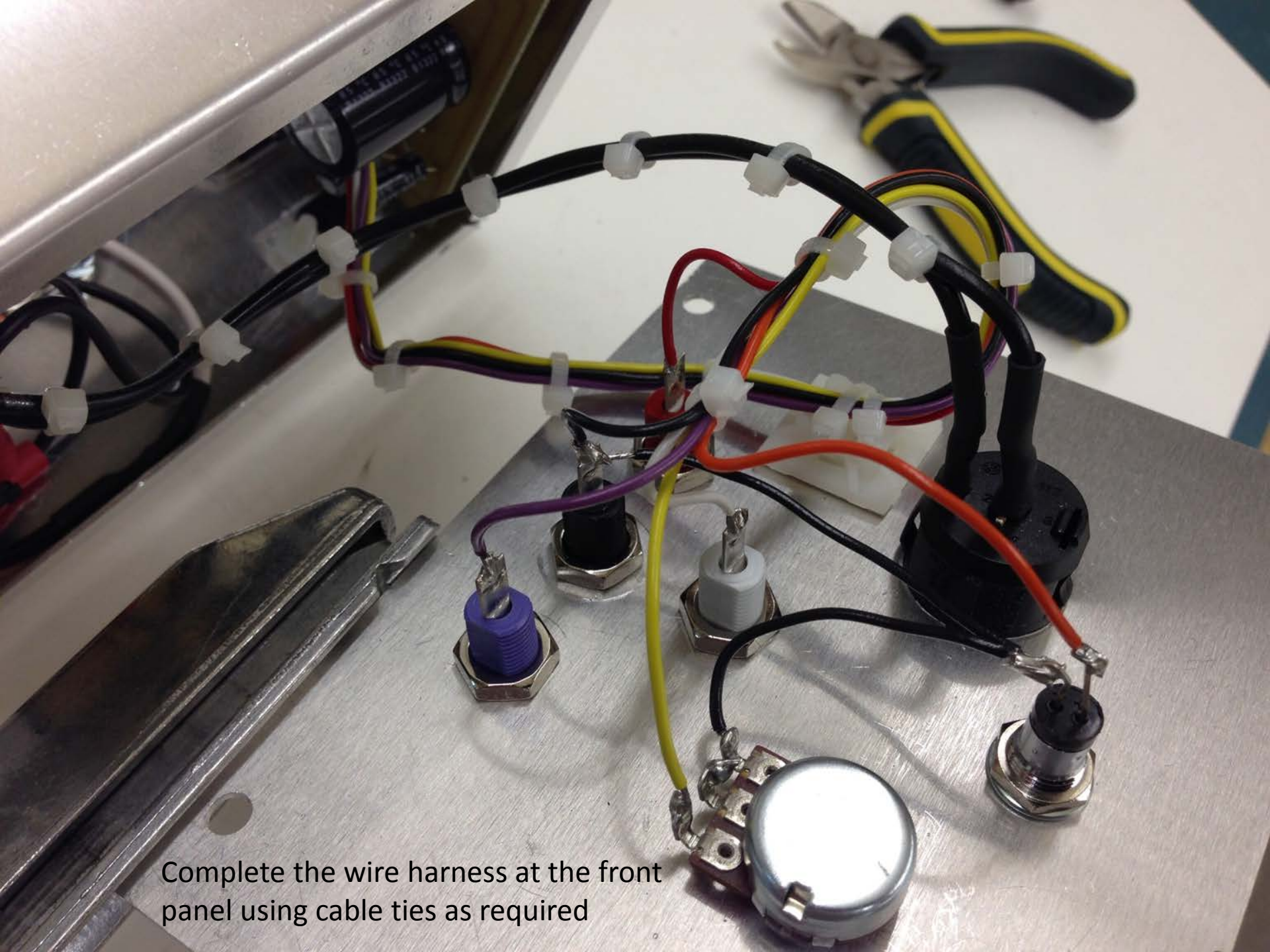
Cut a length of black 22AWG DC hookup wire to connect between the LED indicator cathode terminal (short lead) and the black banana jack solder lug. Strip both ends of wire to length and tin. Form hooks in wire and crimp to terminals.

Solder the black wire to the potentiometer and LED indicator terminals.

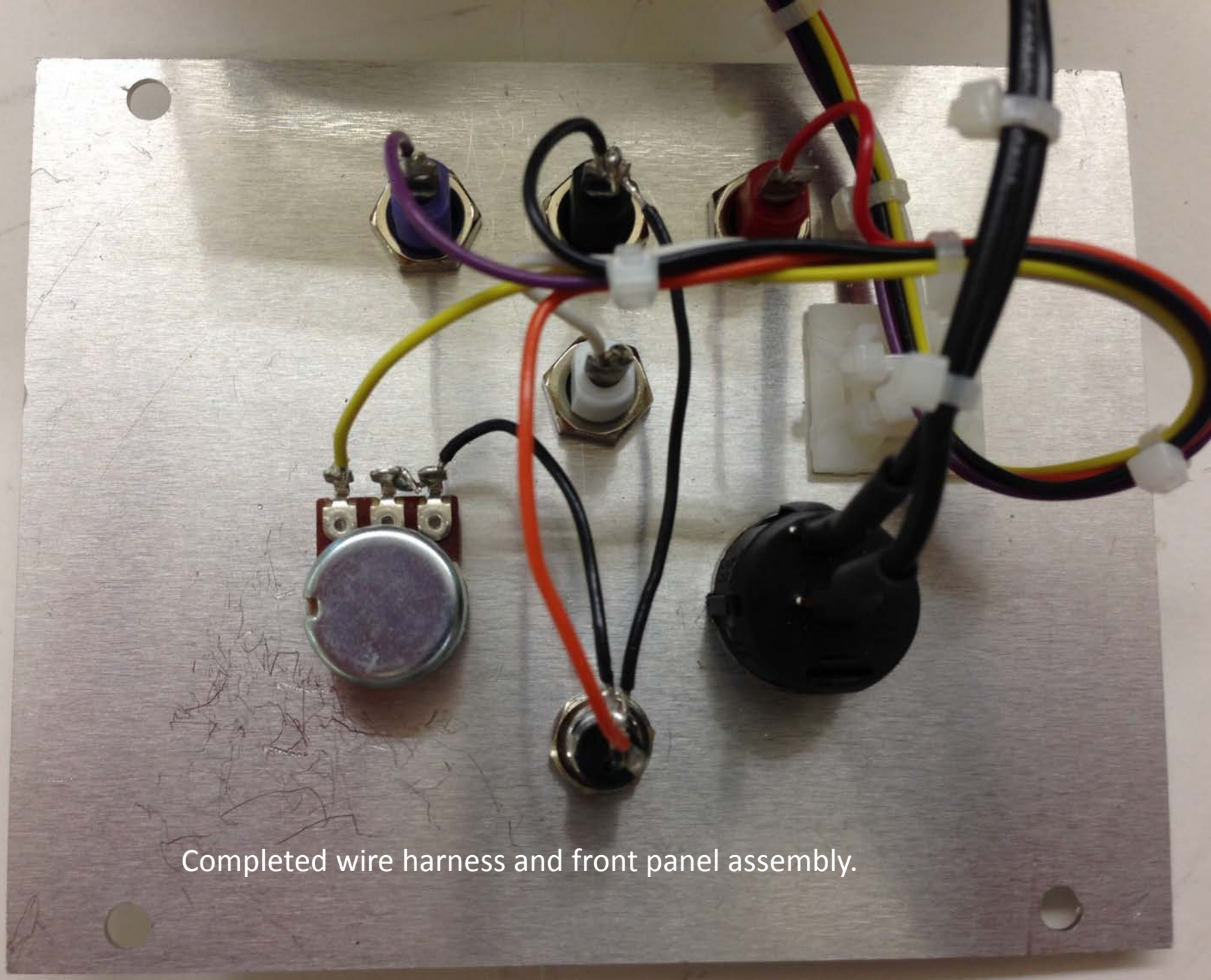

Cut the six colored DC wires to length in the cable harness. Strip each wire to length and tin. Form hooks in wires and crimp to their respective component terminals. Solder the six joints. (Note - consider final layout and routing of wires)
Note – there must be two wires on the solder lug of the black banana jack – one from the PCB the other to the LED indicator.



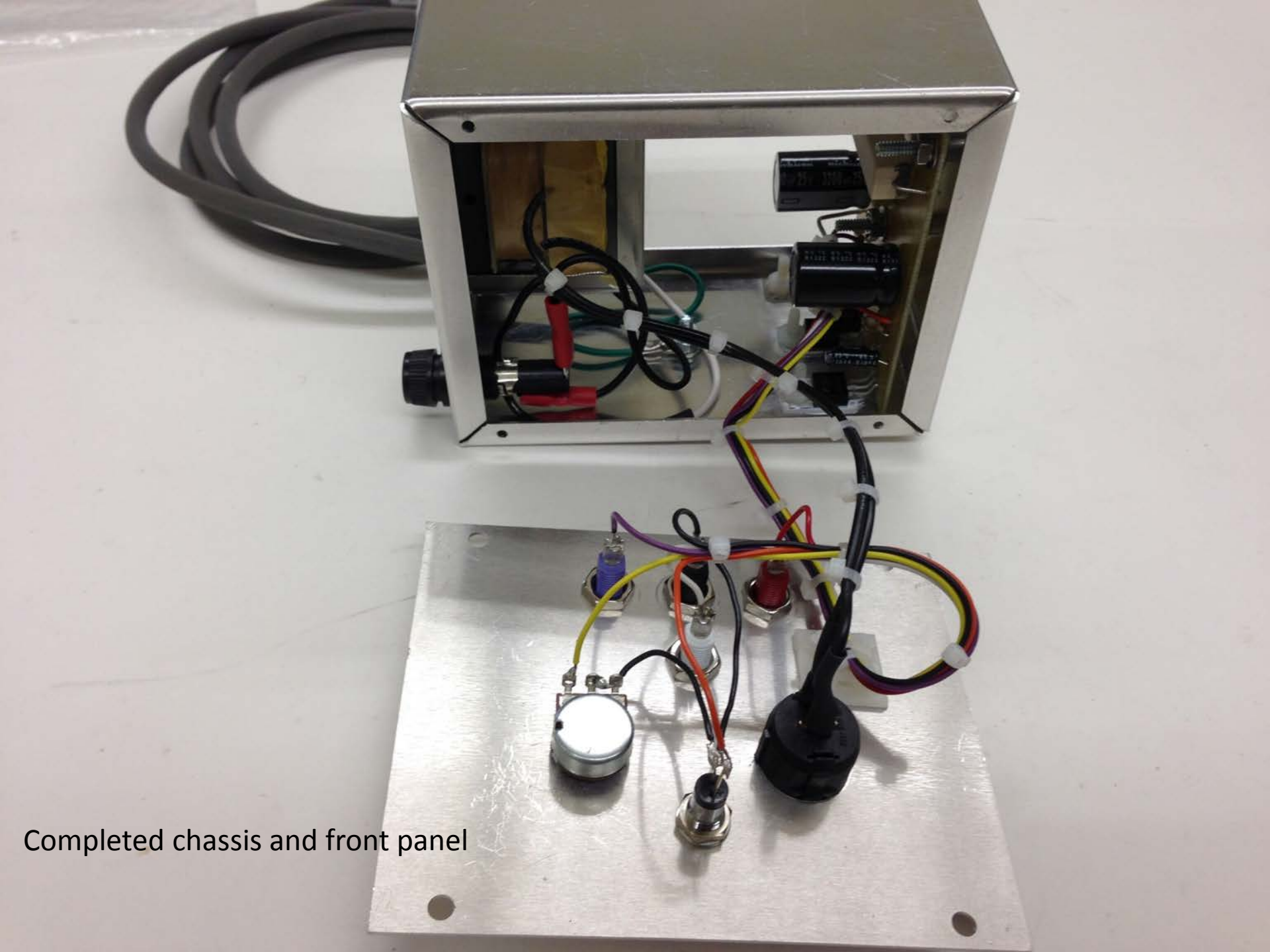
Refer to the Interconnect Drawing for location of all wire connections.



Complete the wire harness at the front panel using cable ties as required



Completed wire harness and front panel assembly.



Completed chassis and front panel

Front Panel Assembly

The front panel is ready for final assembly in Phase 4.