

# ***DYNACO SCA80(Q) C9 REPLACEMENT MANUAL***



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## **Section 1: About This Manual**

Does your SCA80 hum a lot more than it used to? There's a very good chance that its C9 has lost significant capacitance. This manual covers the replacement of the stock C9, a 5000  $\mu\text{F}$  capacitor, with a total of 9900  $\mu\text{F}$ . In addition to repairing hum problems, this gives any Dynaco SCA80Q better bass.

### ***Who Should Attempt this Project?***

You can build this kit and improve your Dynaco SCA80(Q) integrated amplifier if you can:

1. solder (using normal rosin core solder and a soldering iron).
2. use simple hand tools like screwdrivers, wire cutters, and pliers.
3. make basic voltmeter measurements
4. read and follow directions.

It helps if you:

1. know a bit about electronics, or
2. have a friend who knows a bit about electronics
3. can get to YouTube to watch a video about the assembly process (not available at this time)

### ***Tools You'll Need***

You'll need the following tools to update your SCA80(Q):

1. multi-meter capable of reading the 72 Volt (nominal) DC Power supply output
2. flat blade screwdriver for #6 screws, #2 Phillips screw driver
3. pliers or nut drivers suitable for #6 hardware (5/16" nut driver or hex wrench)
4. needle nose pliers (helpful, but not strictly necessary)
5. pencil type soldering iron of 25 to 50 Watts (no huge honking soldering guns or blowtorches)
6. wire cutters and strippers

### ***Project Overview***

The project replaces C9. The major steps are:

1. Removing the original C9.
2. Building, then installing the new C9.
3. Testing the completed result and reassembling the amplifier.

## Important Safety Notes

By purchasing this kit, you have agreed to hold AkitikA, LLC harmless for any injuries you may receive in its assembly and/or use. To prevent injuries:

- Wear safety glasses when soldering to prevent eye injuries.
- Always unplug the power before working on the amplifier.
- Large capacitors hold lots of energy for a long time. Before you put your hands into the amplifier:
  - Pull the AC plug!
  - Wait 1 full minute for the capacitors to discharge!
- Remove jewelry and rings from your hands and wrists, or anything that might dangle into the amplifier.
- If working in the amplifier, keep one hand in your pocket, especially if you're near the power supply or power supply wires. This can prevent serious shocks.
- Build with a buddy nearby. If you've ignored all the previous advice, they can dial 911 or get you to the hospital.

## Section 2: Preliminaries

### Opening the Amplifier

1. *Make sure the amplifier is unplugged. If it was recently powered allow the amp to sit for one full minute before proceeding.*
2. Remove two screws from the left side of the amp's cover. (see Figure 1).
3. Remove two screws for the right side of the amp's cover.
4. Remove the screw in the center of the cover along the back panel.
5. Lift the perforated metal top off the amplifier.



Figure 1-Side and Back views showing location of cover retaining screws

### Check the Power Supply Voltage

First, you'll need to safely check the power supply output voltage.

1. Turn the SCA80(Q) power switch off.
2. Keeping hands well clear of the inside of the SCA80(Q), plug in the power cord.
3. Turn the SCA80(Q) power switch on and give the amp about 15 seconds to stabilize.
4. Refer to Figure 7. Measure the DC voltage present on the terminals of C9. The nominal voltage is 72 volts.

- a) You may proceed with the rest of these directions if the actual voltage is between 68 and 76 volts.
- b) If the voltage is more than 80 Volts, do not go on until you have determined why this might be so. There are a number of taps on the power transformer primary to support various line voltages. Your SCA80(Q) might have these taps mis-set for your prevailing voltage. This is especially possible if your amp is new to you, e.g. an Ebay purchase.
- c) If the voltage is less than 68 volts, it may be owing to:
  - Loss of capacitance (which is why you're replacing C9)
  - Excessive load from a defective amplifier module
  - A blown fuse
  - Open diodes in the power supply

If the voltage on C9 was within tolerance, then:

- 1. Remove the power plug from the wall socket**
- 2. Turn the SCA80(Q) power switch off.**
- 3. Allow one full minute for the capacitors to discharge.**

### Removing C9

1. Tag the wires connected to C9 with plus and minus labels before desoldering them from C9's terminals.
2. Remove the three sets of 6-32 hardware (screw, nut, and lock-washer) that hold C9 to the chassis.
3. Lift C9 and its retaining clamp out of the chassis.

### Building the Dynamite Capacitor

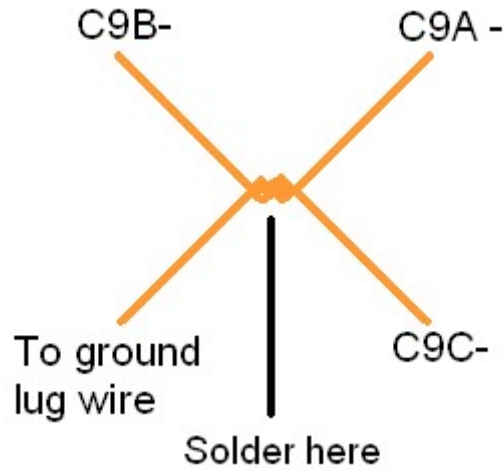
1. You'll replace C9, a single 2" diameter capacitor with three capacitors, as shown in Figure 2. The three caps are glued into a polycarbonate with a 2" diameter.
2. Note that the three capacitors have their negative leads in the center of the grouping.
3. Use the supplied 6-32x5/8" Phillips head sem screw (built-in lockwasher) and keps nut (also with a built in lockwasher) to tighten the clamp.
4. For now, tighten the screws a bit more than finger-tight.



**Figure 2-Triple cap installed into the capacitor clamp**

5. Construct the ground harness for the caps:

- a. Remove 4" of insulation from the supplied 20 AWG wire.
- b. Cut the resulting bare wire into two 2" long pieces.
- c. Twist and shape the wires as shown in Figure 3.



**Figure 3-Ground Harness Configuration**

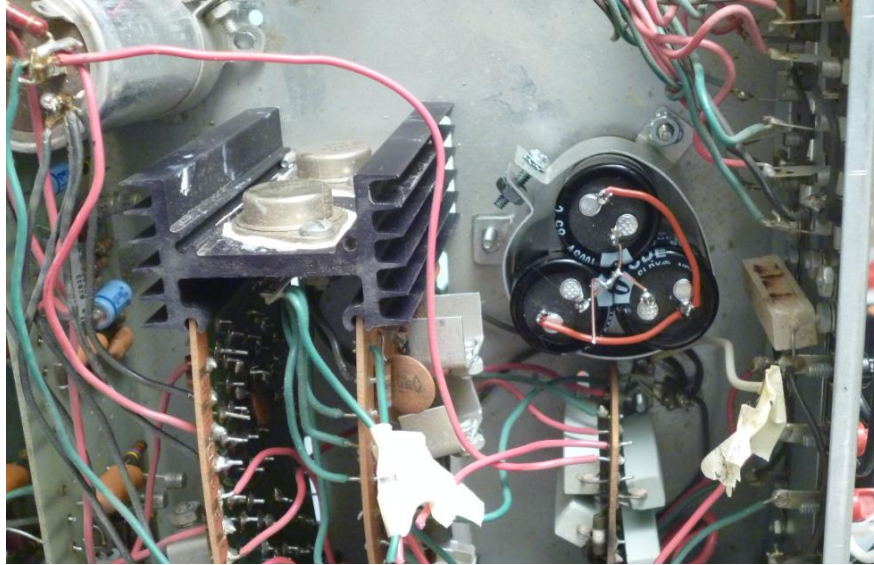
6. Solder the center section as indicated. Place the soldered portion of the jumper in the center of the dynamite capacitor configuration. Hook the ends of three of the four wires to the three negative terminals of the capacitors. Solder the wires to the negative terminals.
7. Form the remaining wire upward, away from the caps. You'll attach it to the amplifier ground connection in a later step.
8. Prepare the Positive Wire Harness as follows (see Figure 4):
  - a. Cut two pieces of red 20 AWG wire, each to a length of 2".
  - b. Remove ¼" of insulation from the ends of the wires (4 places).
  - c. Form the bare ends into hooks. Crimp the hooks around the positive terminals of the capacitor as shown in Figure 4. Solder the connections, making sure to leave room for additional wires added in later step



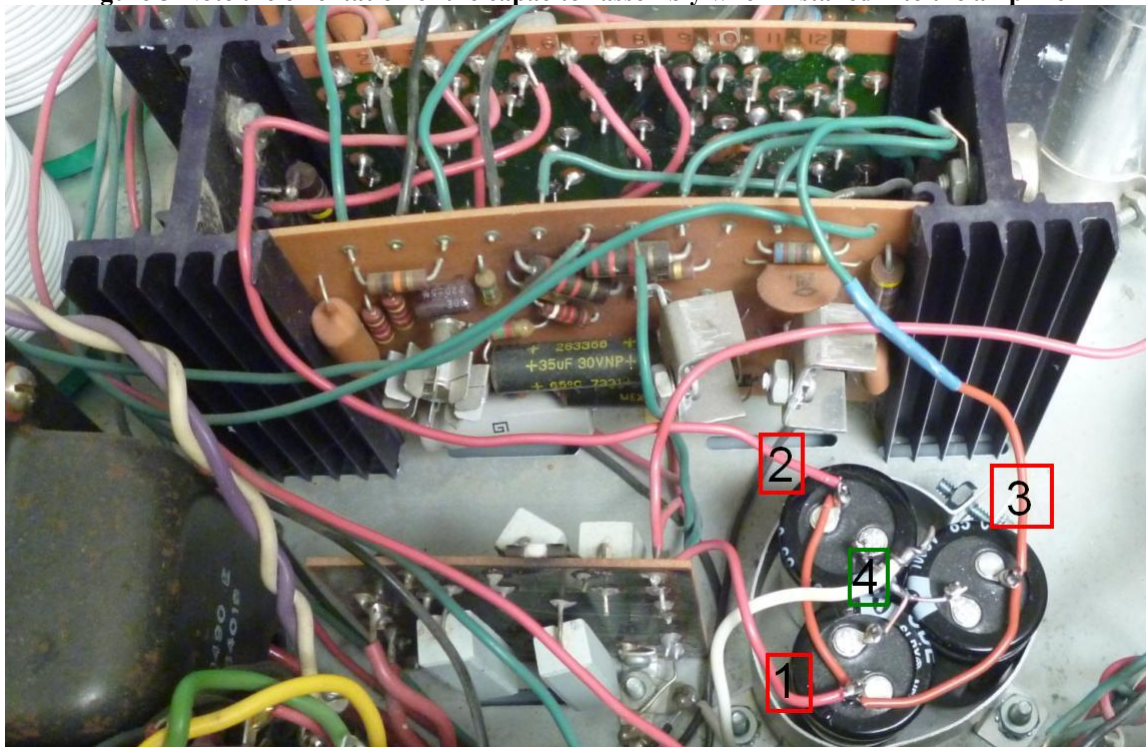
**Figure 4-Soldering the ground and positive harnesses on the new C9 dynamite capacitor arrangement**

## ***Installing the New C9 into the Amplifier***

1. Install the clamp, capacitor, harness assembly into the amplifier. Use the keps nuts with the built in lockwashers (the 3 old nuts and lockwashers aren't used).
2. Orient the new assembly as shown in Figure 5.



**Figure 5-Note the orientation of the capacitor assembly when installed into the amplifier**



**Figure 6-Reconnecting the wires to the new C9**

3. Reconnect the three positive wires as shown in Figure 6:
  - a. Wire 1 - the red wire from PC-19 terminal 2 to the positive harness terminal where the two red-wires come together.
  - b. Wire 2 – the red wire from the right amplifier channel to one end of the positive harness

- c. Wire 3 – green wire from the left amplifier channel to the other end of the positive harness. If this wire is too short to reach, extend it with a bit of the supplied red wire, and use heat shrink tubing to cover the joint. See Appendix 1 for details.
4. Reconnect the ground wire, Wire 4 in Figure 6.
5. Inspect your work carefully. Make sure that there is no possible way for wires connected to the positive and negative terminals of the new C9 configuration to come into contact.



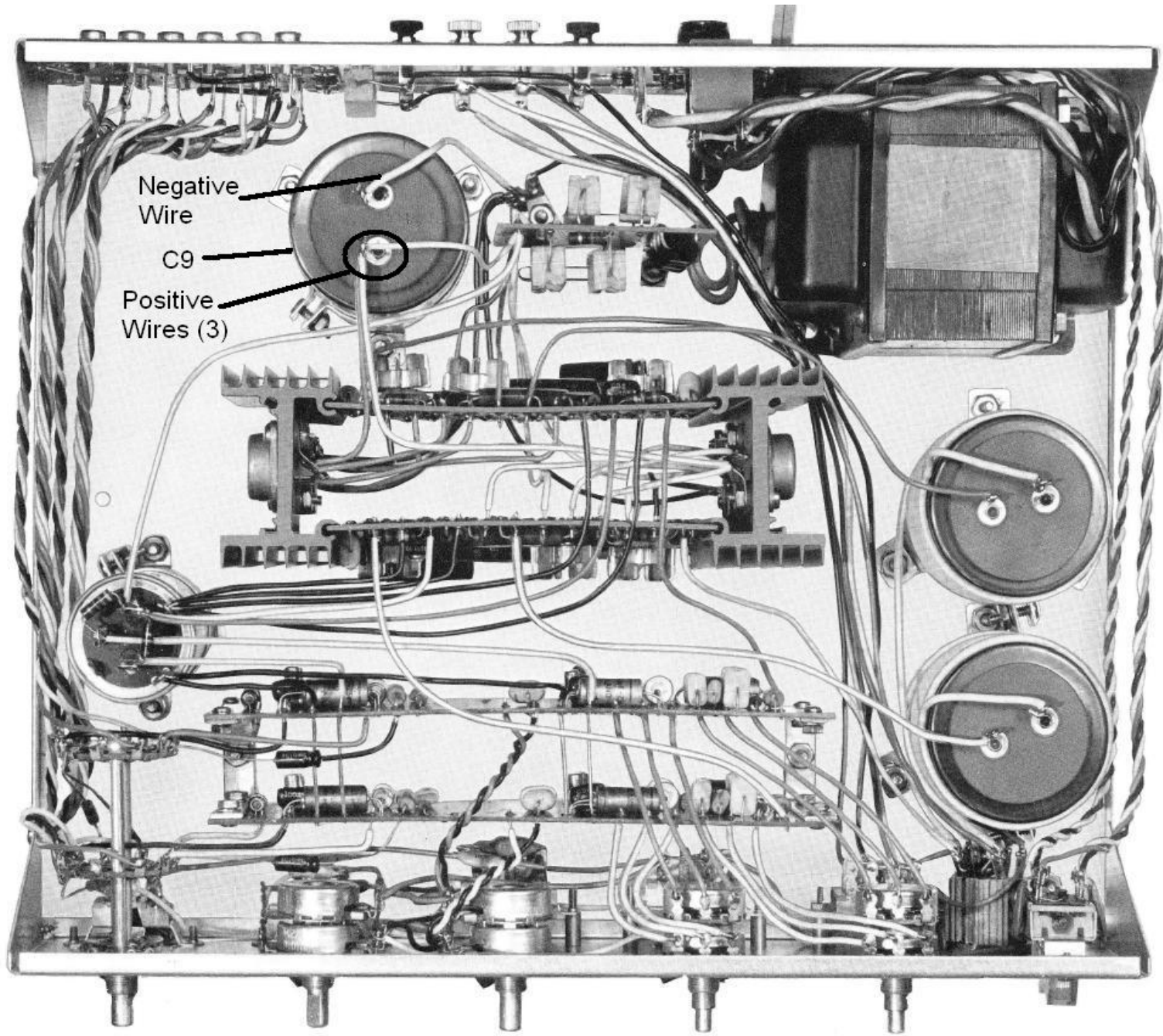
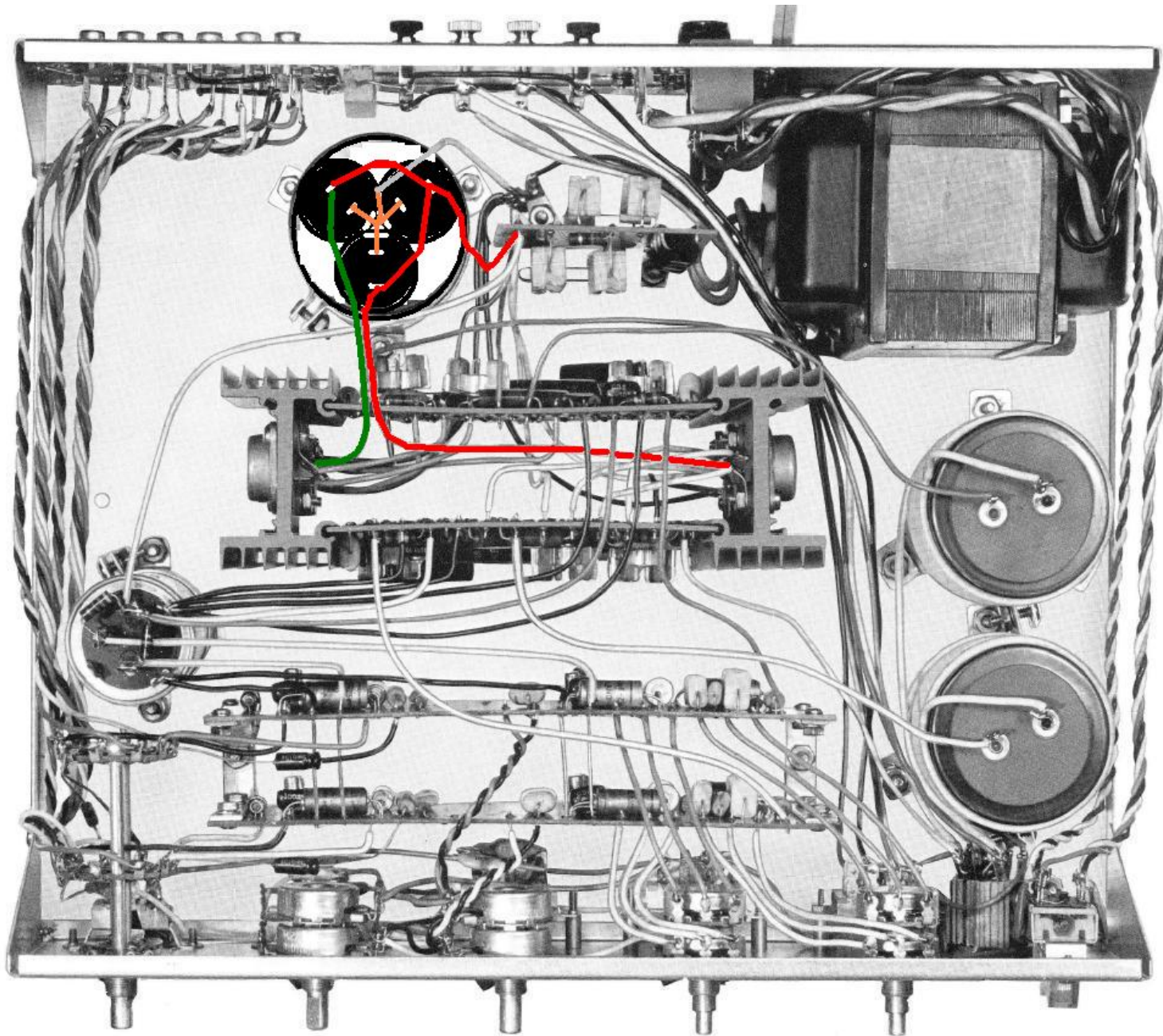


Figure 7-Stock amplifier layout (before C9 replacement)



**Figure 8-Stock Amplifier with Dynamite Capacitor Configuration Installed**

## **Check and Test Your Work**

You're about to check and test your work. Please *recall that there are potentially lethal voltages in the amplifier. Please continue to work safely.*

1. Make sure that the AC cord is still disconnected from power.
2. Verify that the positive terminals of the new C9 capacitor configuration are connected together.
3. Verify that the wires connected to the positive and negative terminals of C9 cannot, under any foreseeable circumstance, come into contact!
4. Place the rocker power switch in the SCA80(Q) in the ON position.
5. Plug the amplifier power cord into a power outlet.
6. There may be the usual "bong" as the amp powers up, but there should be nothing else notable.
7. After 30 seconds or so, check the DC voltage on the new C9. Although it isn't regulated, it should be somewhere in the range from 68 to 76 volts if everything is working correctly. The nominal voltage is 72 Volts.

*Safety First – remember to unplug the amplifier and let the capacitors discharge before working on the amplifier. These new caps will hold charge for a long time. It's safe to work on the amp after the new C9 voltage is less than about 12 volts.*

## **Reassemble the Amplifier**

Remove the power cord and wait one full minute before proceeding. Reinstall the amplifier cover using the five sheet-metal screws that hold it in place.

## **Results**

Once you've placed the amplifier back in service, you may notice the following:

1. It takes a little longer for the power supply to reach full voltage (a few seconds).
2. Upon turning power off, the amplifier will continue to produce sound longer than it previously would.
3. More extreme low bass power will be available.

## **References**

Be sure to visit [www.updatemydynaco.com](http://www.updatemydynaco.com) to see the latest information, or to download the latest version of this manual.

## ***Appendix 1***

### **Wire Splicing Using Heat Shrink Tubing**

1. Form a hook in each wire to be spliced.
2. Interconnect and crimp the hooks.



3. Solder the hook connection.
4. Slide a 1" piece of heat shrink tubing over the connection, centering the heat shrink tubing about the connection.
5. Slide the tip of your soldering iron along and around the length of the heat-shrink tubing. This causes the tubing to shrink, retaining it in place.

