CPR FOR AUTO RADIO VIBRATORS

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From the Northern California Newsletter of the Cadillac La Salle Club, Vol. 92, no. 19.

If your pride and joy dates back to the mid 1950s or earlier, chances are that its radio is "blessed" with a vibrator power supply. The vibrator internally works much like a door buzzer. When power is applied to its coil, the armature is attracted to the coil. The first contact closes shorting the coil and the coil loses its current. As a result, the magnetic attraction ceases and the armature springs away from the coil. The second contact then closes. This occurs approximately 115 times a second. This action is used to "fool" the power transformer into thinking that alternating current (AC) is applied to its primary, by alternately grounding each end of the primary with the battery supply connected to the center tap of the power transformer.

When your radio has not been used for a long period of time, the vibrator contacts may oxidize and leave you with silence instead of the familiar hum of the vibrator and the sound of your favorite “oldies” station. When you finally find that spare vibrator you wisely stashed away ten years ago, you find that it also fails to function. You may be able to coax one or both of the vibrators back to life using a simple trick I learned some years ago from Carl Larry Steig. Carl credits Skinned Knuckles magazine as his source.

THIS DISCUSSION DOES NOT APPLY IF YOU HAVE INSTALLED A SOLID STATE REPLACEMENT FOR YOUR ORIGINAL TYPE VIBRATOR. Solid state vibrators are notoriously unforgiving of even momentary overloads or incorrect polarity. Do not use them to troubleshoot another defective radio. The buffer capacitor should always be replaced before a new vibrator of either solid state or original type is installed.

The 6 or 12-volt battery supply is not sufficient to break through the undesired oxidation on the contacts. The application of 120 volts AC (with current limited by a 60 watt light bulb) to the contact connected to the vibrator coil will often break through the oxide. The lamp should glow at about 1/2 of normal brightness as each vibrator contact is closed less than 1/2 of the time. A pulsing of the lamp brightness is often seen as the vibrator frequency of approximately 115 Hz beats with the 60 Hz line frequency.

A second 60 watt lamp connected to the second (non-coil) contact of the vibrator will remove the oxide from it. This is important, because although the vibrator may vibrate, loss of the second contact would result in a low D.C. plate supply voltage. Both lamps should glow at approximately equal brightness.

A NOTE OF CAUTION: Remove vibrator from the radio for these tests. Always unplug the 120 VAC when making connection to the vibrator. Keep hands clear of the vibrator when the 120 VAC is applied. Do not leave the 120 VAC connected any longer than required to remove the oxide to lessen the chance of damage to the vibrator. (Using an isolation transformer and a ground fault circuit interrupter are also good ideas.)

Diagram A shows the connections to a twelve volt, three prong vibrator used in 1953 and later radios rising vibrators. Diagram B applies to six volt, four pin vibrators used from 1940 through 1952. Note the two different internal connections and two different pin diameters. Cadillac used several types of synchronous vibrators prior to 1940. The contact arrangements are too varied to cover in this article. These vibrators use a second set of contacts instead of a rectifier tube to produce the plate supply voltage. The second set of contacts must also be free of oxide to produce the proper plate voltage. The same testing principles apply to these vibrators. One lamp is used to find the contact associated with the coil and make the vibrator vibrate. The second lamp is used to “clear” each of the remaining contacts in turn. Mark the installed position of the vibrator before removal from the radio as some of these vibrators can be rotated 180 degrees, which will result in the wrong polarity of plate supply voltage and non-operating of the radio.

Diagram A shows the connections to a 12 V. 3 prong vibrator used in 1953 and later radios using vibrators.

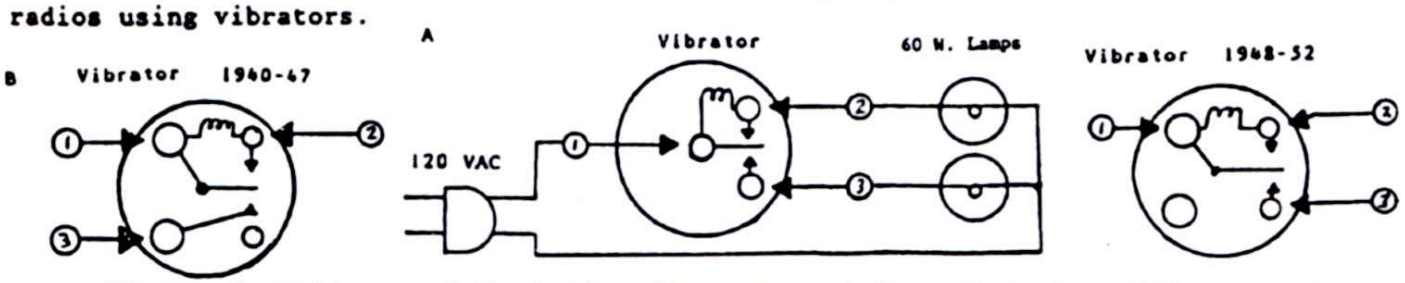

Diagram B applies to 6 V. 4 pin vibrators used from 1940 thru 1952. Note the two different internal connections and two different pin diameters.