

PHILCO® MODEL 9200 TUBE TESTER

CALIBRATION INSTRUCTIONS

CHART INFORMATION FOR NEW TUBES CAN BE OBTAINED IMMEDIATELY WITH THIS PROCEDURE. IT KEEPS YOUR MODEL 9200 TEST DATA UP-TO-DATE AT ALL TIMES.

The basic requirements for establishing a calibration are:

1. Several tubes known to operate in equipment.
2. Socket connections and filament voltage as published in tube manuals, service, and technical publications. This information can also be obtained by tracing the circuit.
3. Socket adapters for tubes that do not directly fit Model 9200.
4. Complete familiarity with Philco Model 9200 Operating Instructions.

The calibration procedure will be clarified by reviewing the control and circuit functions of the Model 9200. This instrument is designed to test filament continuity, emission (cathode quality or condition), and shorts. Each tube element is individually checked for shorts, and each section of a multi-purpose tube is also tested individually.

The above flexibility is achieved by the 10-lever switch. Sections 1 through 9 correspond to published pin numbers in tube basing diagrams. Section 0 is connected to the cap lead. In NORMAL position, the levers connect to the common or low end of the power transformer. In position C, they connect to the filament supply. Thus, if the basing diagram shows the filament connected to pins 2 and 7, either lever 2 or 7 would be set at C, with the other one left on NORMAL. The TEST position applies voltage between any one element and all other elements:

Example 1 - In testing for shorts, all elements, except the heater which is set at C, are at NORMAL and each element is individually thrown to TEST--85 volts are applied to the element through the neon indicator.

Example 2 - In testing emission, the cathode is left at NORMAL, and all other elements, except the heater, are set to TEST. With this connection; emission is indicated on the meter when the READ METER button is depressed.

NOTE: In both examples, when elements are connected to more than one base pin, it is necessary to switch these pins as a group.

Heater Voltage

Obtain the voltage nearest to the published value by adjusting Switch "B" --see wiring diagram for voltages corresponding to Switch "B" positions. If the exact voltage is not available, try the next lowest; and if this does not

result in satisfactory calibration, use the next highest. Tubes will not be damaged by slight overvoltage because of the short test period and relatively low operating current.

Test Voltage

The emission capability of various tube types varies greatly. Switch "A" provides four test voltages ranging from 32 to 250 volts. In general, power tubes require a lower test voltage. Further refinement of test voltage, as required to obtain the correct meter setting, is made with Control "D". This control can be considered a "load resistor".

Calibration Directions

1. Use published data from tube manuals or periodicals for base connections and filament voltage.
2. Obtain several tubes of each type to be calibrated which are known to operate in equipment, or with known calibration in terms of a calibrated tester. Tube types already on the chart, which have characteristics quite similar to the new type, can be used as a basis for calibrating.
3. Set Switch "A" to POSITION 1.
4. Set all lever switches to NORMAL.
5. Set Switch "B" for correct heater voltage. Set one heater lead to C with opposite end at NORMAL. However, if heater has center tap, set center at C with ends at NORMAL--example: The heater tap of type 12AU7 is pin 9, which is thrown to POSITION C; pins 4 and 5 remain at NORMAL setting. Note, in this case, that full heater voltage (4 to 5) is 12 and that the above connection takes 6 volts or 1/2 voltage.
6. Insert one of the tubes being used for calibration in correct socket.
7. Turn Line Control ON and adjust for correct voltage.
8. The following steps apply to a single section tube--they must be repeated for each section of a multi-section tube. Record settings on a form similar to the roll chart.

a. Cathode Short Test

Move all levers connecting the cathode being tested to TEST. The Short Test Lamp will NOT glow if cathode is clear. Return levers to NORMAL after test.

CAUTION: This test cannot be made on filament type tubes nor on tubes with internal heater-cathode connections.

Record lever numbers corresponding to cathode on chart, showing

levers common to one section on the same line and lever numbers of other cathodes on additional lines.

b. Short Test

Watch for steady glow of short indicator as the levers corresponding to each element (except heater and cathode) are individually moved to TEST and returned to NORMAL. Usually, the short indicator will not light; however, there are exceptions with certain tube types, and if all test samples of known good tubes actuate the short indicator, make a note on the chart. Record lever numbers as in paragraph a.

c. Emission Test

Set Switch "A" at POSITION 1 and Control "D" at ZERO (counterclockwise). Put the levers used in checking shorts (see paragraph b) in TEST position. Press and hold down READ METER button, and advance Control "D" for meter reading of 70. If meter will not reach 70, return "D" to ZERO and try again with "A" on POSITION 2. If necessary, repeat on POSITIONS 3 and 4. Record setting of Control "D".

Repeat this test with other tubes of the same type and, if necessary, readjust "D" to a setting which makes all known good samples read in the GOOD region. Use this final value of "D" for chart.