

Vacuum Tube Audio

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Testing the Dynaco Stereo-70 Transformers & Quad cap

Power Transformer

1. Remove all tubes (4X output tubes, 2X driver tubes, 1x GZ-34 rectifier tube)
2. Disconnect the Red/Black Stripe wire connected to the Selenium rectifier
 - cover this end with tape or 1/8” shrink tubing to prevent contact with other items
3. Install a 0.1A fuse
4. Connect the amplifier to 120VAC mains.
5. Switch on the amplifier (for approximately 1 minute)
6. Switch off the amplifier
7. Remove and examine the fuse
8. If the fuse is not tripped, the power transformer has passed the short test
9. Install a 1.0 amp fuse
10. Switch on the amplifier
11. Measure the AC voltage from chassis to pin 4 of the GZ-34 rectifier tube (should be approx. 330VAC)
12. Measure the AC voltage from chassis to pin 6 of the GZ-34 rectifier tube (should be approx. 330VAC)
13. Measure the AC voltage from chassis to the Red/ Black Stripe lead of the power transformer (should be approx 60 VAC)
14. Measure the AC voltage ACROSS pins 2 & 8 of the GZ-34 – should be 5 VAC
15. Measure the AC voltage ACROSS pins 2 & 7 of the right channel output tube V7
 - should be 6.3 VAC
16. Measure the AC voltage ACROSS pins 2 & 7 of the left channel output tube V2
 - should be 6.3 VAC
17. If all of the above voltages are within 10% the power transformer is functional.
18. Switch off the amplifier and return the original fuse.

Output Transformers

This procedure checks both the left and right output transformers simultaneously.

A defect in either transformer will result in a test fail result.

If one of the output transformers (in the pair) is defective it is questionable as to if further investment into this particular amplifier is warranted and therefore we consider this test useful for go / no-go purposes.

1. Remove all tubes (4X output tubes, 2X driver tubes, 1x GZ-34 rectifier tube).
The Stereo-70 must be completely disconnected from the AC mains and all inputs and outputs must be disconnected.
2. Using a alligator jumper, temporary connect V3/pin3 to V6/pin3.
3. Using another alligator jumper, temporary connect V2/pin3 to V7/pin3.
4. Obtain another "test" receiver (preferably tube but not mandatory) and connect the output of one channel to the Dynaco Stereo-70 Right Channel Speaker Terminals 8 Ohm and Ground.
5. Obtain a 8 Ohm "Test" Loudspeaker and connect it to the Dynaco Stereo-70 Left Channel Speaker Terminals 8 Ohm and Ground.
6. Have the other channel of the service amplifier directly connected to another loudspeaker (control speaker) identical to the test loudspeaker.
Set the test receiver to monophonic operation.
7. Starting at very low levels (with the volume control of the test receiver fully attenuated) bring up the level until you have a soft level available from both the test and control loudspeaker.
Note – it is not necessary to operate the test receiver at high or even moderate volumes – it is only necessary to raise the level sufficiently to be able to discern equal loudness from both the test and control loudspeaker.
8. With the balance control of the test receiver centered, the sound from both speakers should be nearly the same. If there is a noticeable difference one of your output transformers is defective.

Reforming the Quad Electrolytic Capacitor

Dynaco vacuum tube amplifiers incorporate components that may undergo electrochemical changes if left in an unpowered state over a long period (approximately 6 months). To preserve the operation of the components and operator safety is it generally recommended that the reapplication of power be conducted in a controlled manner. It is the purpose of this document to describe a suitable procedure for the typical owner without access to laboratory test equipment.

The following components and test equipment will be required:

1. Digital DVM (inexpensive model from Radio Shack or equivalent)
2. 100K ohm / 3 to 5 Watt Resistor
3. 3" length of 1/8" heat shrink tubing

Procedure:

1. You will first remove the top and bottom covers by removing the 4 (6 on some units) located on the right and left sides of the amplifier. Both covers should be free to be released.
2. Remove the rectifier tube (GZ-34).

3. Connect the amplifier to 120VAC mains.
4. Switch on the amplifier (for approximately 1 minute). Examine the four output tubes and two small driver tubes to confirm the illumination of the filaments.
5. Locate the 7 pin terminal strip on the underside of the amplifier to the left of the power transformer. Using your digital voltmeter (set to DC volts) Measure the DC voltage on lug # 4 (counting from the left edge of the amplifier) and confirm a reading of approximately negative 65 VDC (+/- 10%) relative to the chassis. Failure to achieve this voltage suggests a defective selenium rectifier or other bias supply problems.
6. Switch off the amplifier and disconnect from the AC mains.
7. Remove the remainder of the tubes (4X output, 2X 7199 driver) and label to identify for re-positioning later. Install the Rectifier tube (GZ-34).
8. De-solder the red wire connected to lug 2 (See figure 1) of the Dynaco Quad electrolytic capacitor (the other end is connected to V1/pin8).
9. Slide the 3" length of the 1/8" heat shrink tubing down the free length of the red wire removed during the previous step.
Tack solder one end of the 100K ohm / 3Watt resistor to the free end of the red wire removed in the previous step. Slide the heat shrink tubing upwards to completely cover the exposed any wire including the resistor lead.
Connect the remaining free end of the 100K / 3Watt resistor to lug #2 of the Dynaco quad electrolytic capacitor.
10. Set your voltmeter to DC volts and set the range of your voltmeter to be capable of reading 500VDC. Securely connect the Black Test lead of your voltmeter to V1/pin8. Securely connect the remaining Red Test lead to Lug # 2 of the Dynaco Quad electrolytic capacitor. During the tests that follow it is important to remember that your DVM will be floating at nearly 500 VDC relative the amplifier chassis. Most DVM's are suitably insulated however you should be advised nonetheless and take the appropriate precautions.
11. Connect the amplifier to 120VAC mains.
12. Switch on the amplifier. Examine the Digital Voltmeter reading. It will begin at a very high voltage (nearly 550 VDC) and begin to drop over time. This voltage represents the normal charging of the quad electrolytic capacitor and actually is re-forming the capacitor simultaneously via the 100K ohm resistor.
Observe the reading over a 15 to 30 minute period. If after approximately 1 hour the voltage reading of the DVM fails to drop to 10 volts or less, the condition of the Quad electrolytic capacitor is suspect and should be replaced.
13. Switch off the amplifier, disconnect it from the AC mains, and wait at least one hour.

14. Slide back the heat shrink tubing and de-solder the 100K / 3Watt resistor from both the red wire and lug #2 of the quad electrolytic capacitor.
15. Re-connect the red-wire from the previous step to lug #2 of the Quad electrolytic capacitor.
16. Install the output tubes – the two small driver tubes will be installed later. Rotate the bias adjustment potentiometers (located near the center of the chassis) completely counterclockwise.
17. Connect the amplifier to the AC mains and apply power. Re-adjust the bias per the Dynaco Owners manual.
18. Switch off the amplifier and re-install the two remaining driver tubes (7199).
19. Replace the covers and return your amplifier to service.