

LIONEL SERVICE MANUAL

V and Z TRAIN-MASTER TRANSFORMER

SERVICE NOTES

Types 'V' and 'Z' transformers, last built in 1947, are similar in appearance and construction but differ from each other in their wattage rating and therefore in the size and weight of the coil and lamination assemblies and in details of other internal parts.

Type 'V' transformer is rated at 150 watts and is able to deliver continuously approximately 110 watts, or about 8 amperes at the working track voltage. This transformer can be used with power lines of 110-125 volts, 50-60 cycles.

Type 'Z' transformer, rated at 250 watts, can supply continuously 180 watts, or approximately 14 amperes at the operating track voltage. Type 'Z' transformer can be used with power lines of 110-125 volts, 60 cycles only.

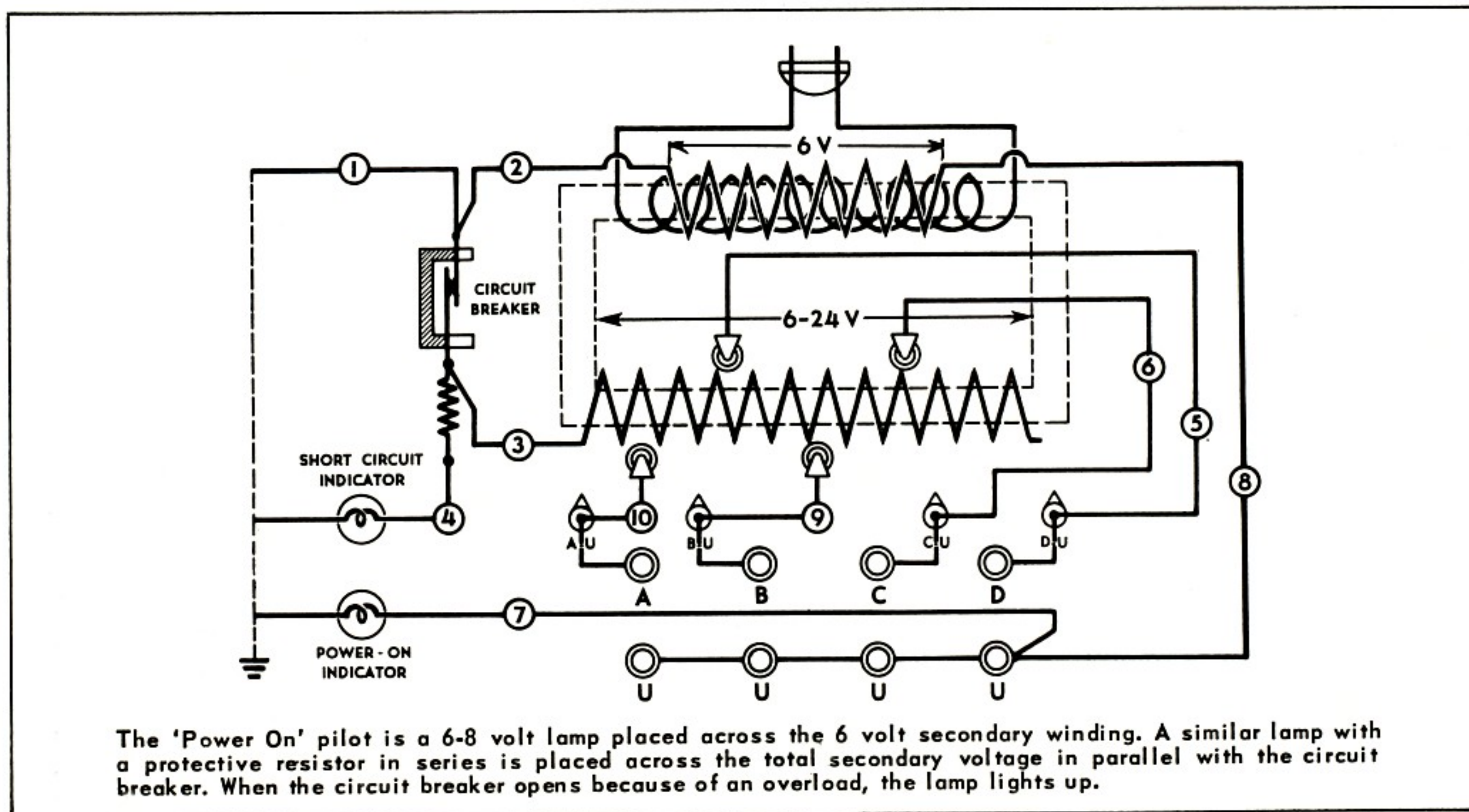
As illustrated in the schematic diagram, the secondary winding of these transformers consists of two coils connected in series, one of 6 volts wound on top of the primary, and the other of 18 volts wound with rectangular wire on a separate molded bakelite form assembled on the opposite leg of the iron core. Four separately controlled contact arms ride over the two bare surfaces of this coil and thus make available four different voltage sources each individually variable from 6 to 24 volts, open circuit voltage.

These transformers are sturdily constructed and do not offer any special service problems. The circuit breaker and the binding post connections are reached by removing the bottom plate. The coil and bearing plate assemblies are reached by first removing the nameplate. To prevent possible breakage the knobs should be removed by prying up with two screwdrivers as illustrated in Figure 1, Page 4, Section PS. The nameplate is held by four small hexagonal head drive screws which may be removed with flat nose pliers. Very useful socket wrenches for small screws of this type can be made by mounting Allen recessed head machine screws on wooden file handles. Over a period of time two different size drive screws were used, one fitting into No. 6, the other into No. 8 Allen screws.

The bearing plate casting is held to the bottom half of the transformer case by two screws entering from the bottom. The four round head screws on top of the casting are for the purpose of clamping down the coil and lamination assembly, and should be screwed all the way down against the laminations.

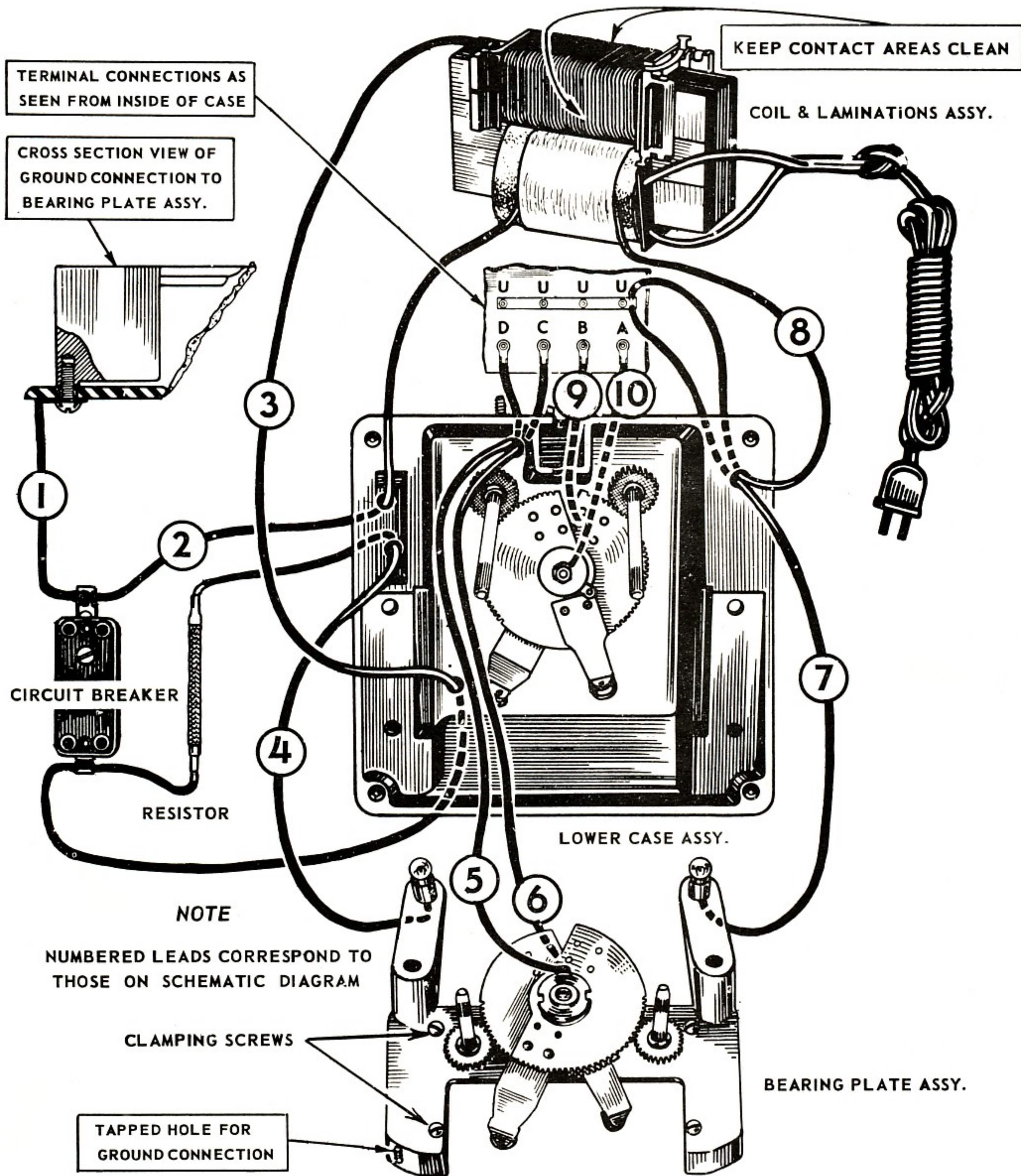
When overhauling the transformer make sure to clean the contact surfaces of the coil and check the condition of the carbon rollers and the tension of the spring contact arms.

SCHMATIC DIAGRAM OF V AND Z TRANSFORMERS



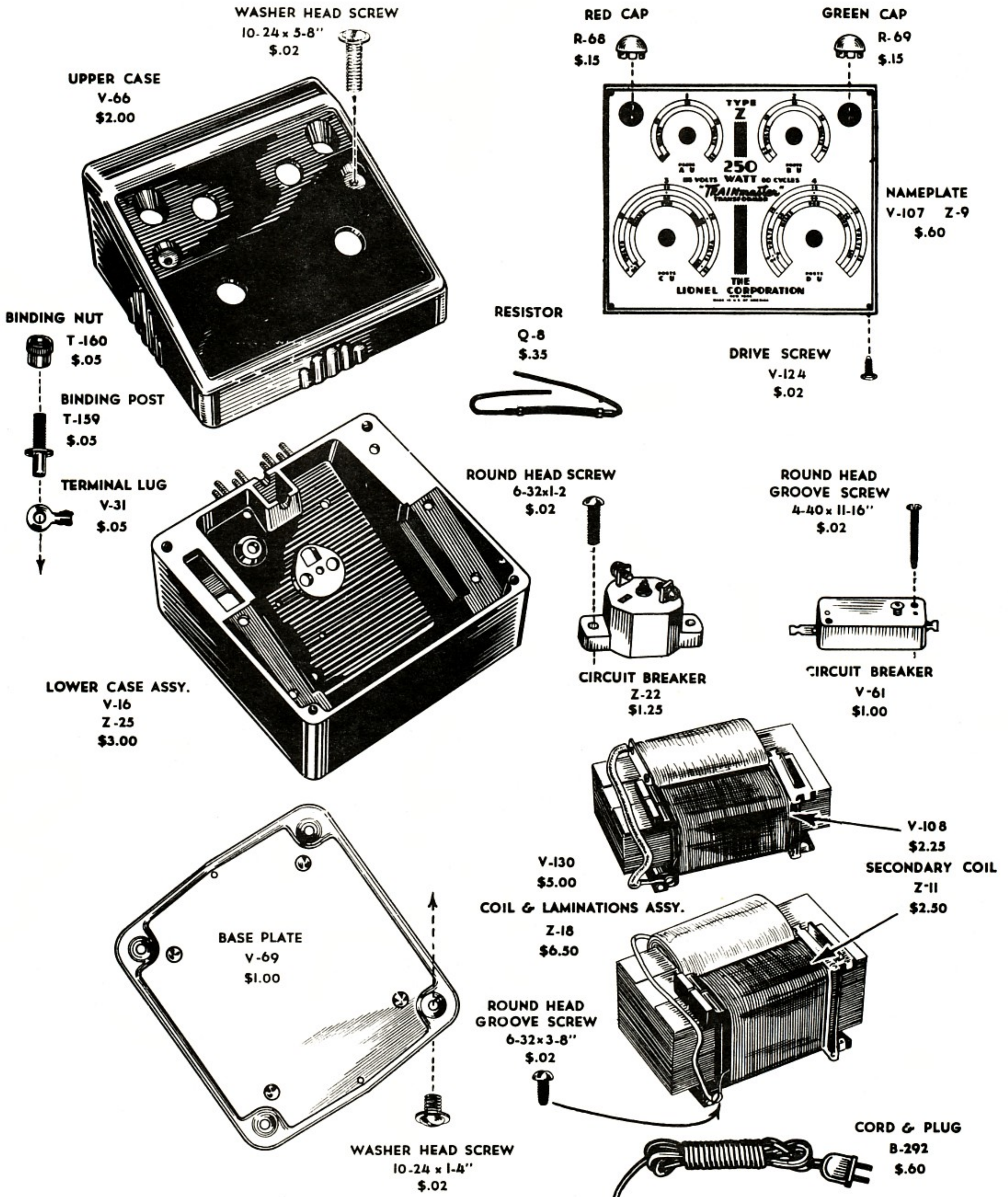
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PICTORIAL WIRING DIAGRAM OF 'V' AND 'Z' TRANSFORMERS



'A' is wired to solder lug held by center screw and makes contact with the top gear and roller assembly.
'B' is wired to ear projecting through transformer case and makes contact with bottom gear and roller.
'C' is wired to the lower of the two gear and roller assemblies mounted on the bearing plate.
'D' is wired to the upper of the two gear and roller assemblies mounted on the bearing plate.

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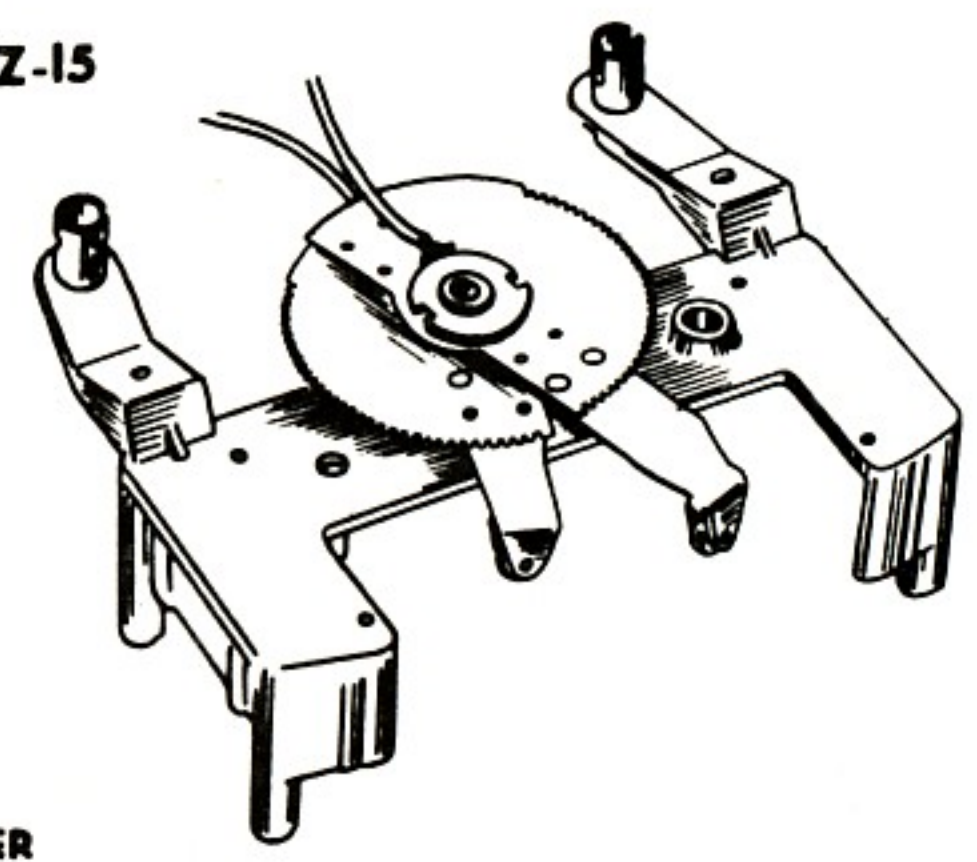
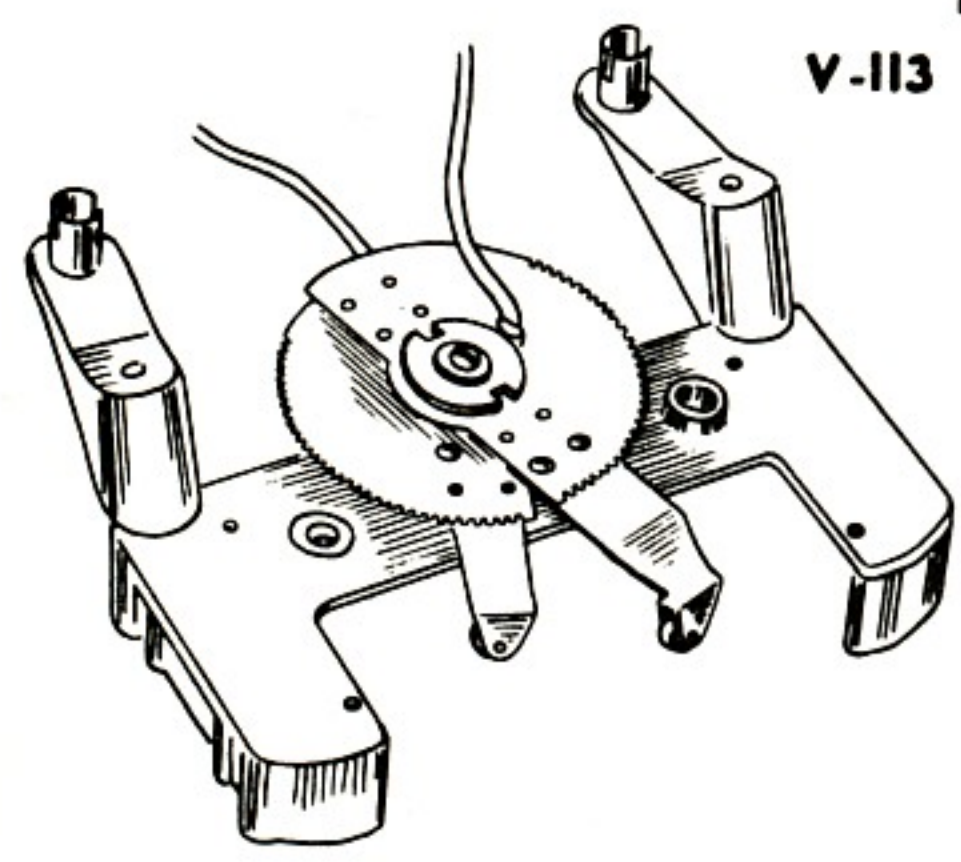
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BEARING PLATE ASSEMBLY

V-113

\$3.00

Z-15



ALTERNATE ASSEMBLY

DRIVE STUD
WS-93
\$.05

BINDING HEAD SCREW
4-40 x 3-8"
\$.02

STEEL WASHER
V-60
\$.05

PHENOLIC WASHER
V-56
\$.10

8" WIRE & LINK
V-127
\$.20

SMALL KNOB
V-116
\$.25

L.H. UPPER SHAFT ASSY.
Z-17 V-102
\$.45

R.H. UPPER SHAFT ASSY.
Z-16 V-101
\$.45

SHOULDER WASHER
V-47
\$.15

UPPER GEAR ASSY.
(LONG) V-135
\$.75

LOWER GEAR ASSY.
(SHORT) V-134
\$.75

GEAR & BUSHING
V-115
\$.35

7" WIRE & LINK
V-125
\$.20

PHENOLIC WASHER
V-56
\$.10

ROUND HEAD SCREW
6-32 x 3-4"
\$.02

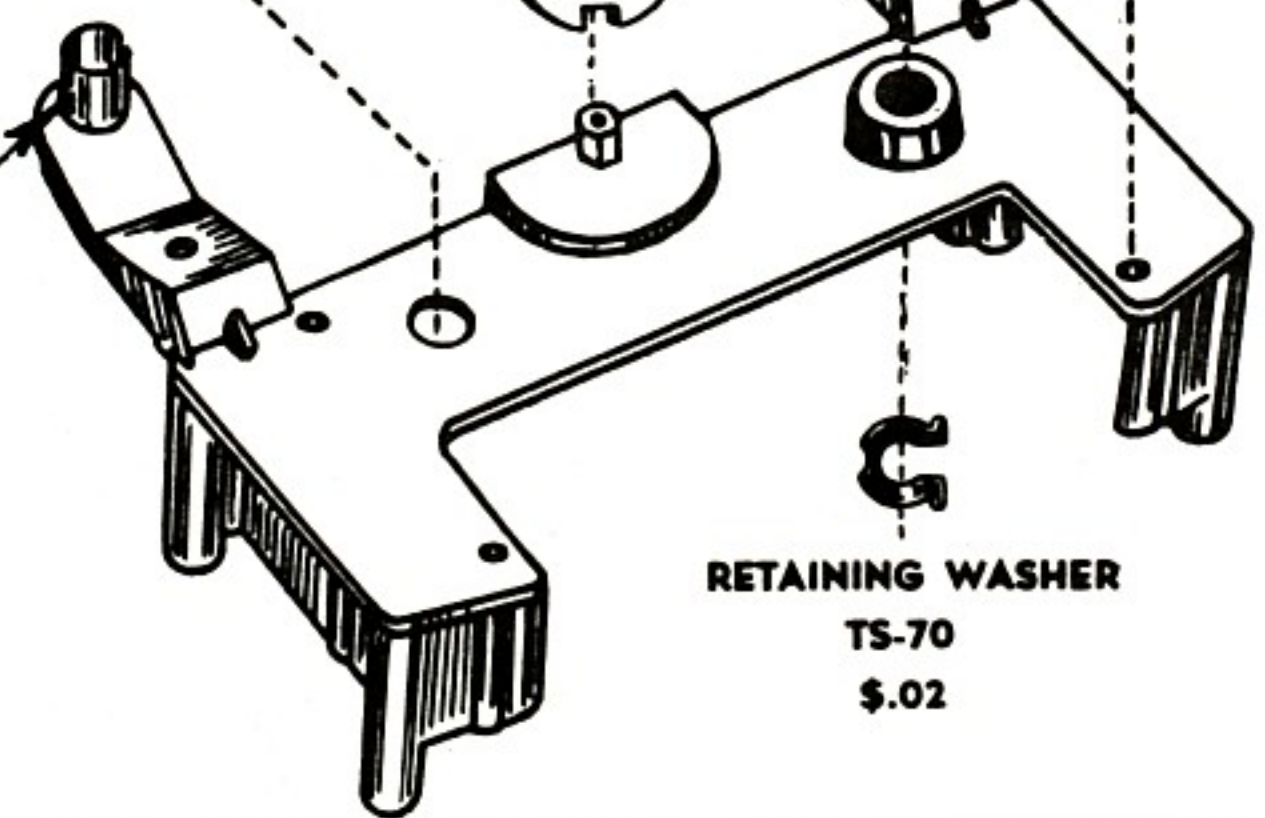
6-8 VOLT LAMP
Q-90
\$.25

L.H. LAMP WIRE
R-97
\$.10

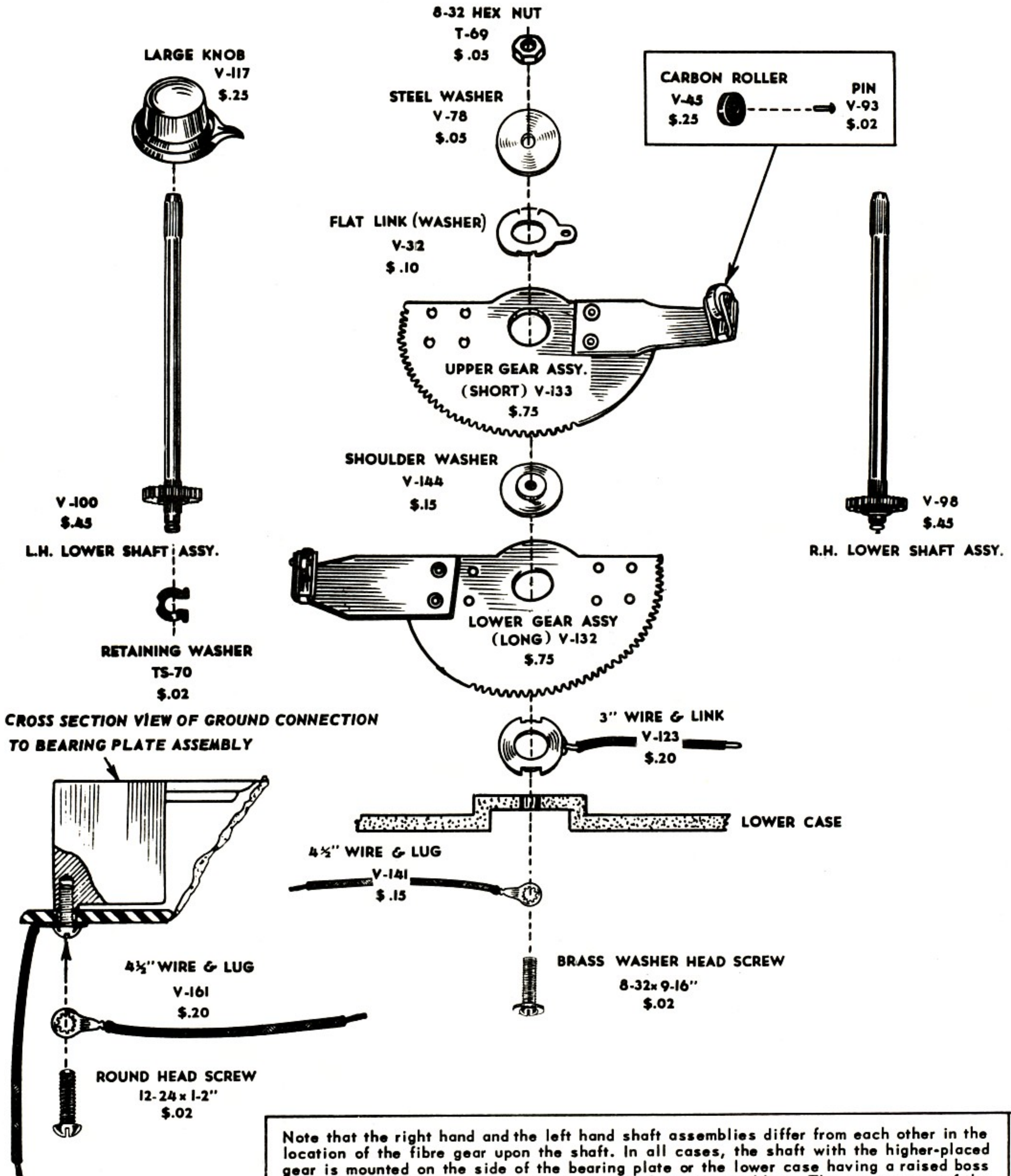
R.H. LAMP WIRE
V-119
\$.15

LAMP SOCKET
R-92
\$.20

RETAINING WASHER
TS-70
\$.02



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Note that the right hand and the left hand shaft assemblies differ from each other in the location of the fibre gear upon the shaft. In all cases, the shaft with the higher-placed gear is mounted on the side of the bearing plate or the lower case having a raised boss and meshes with the upper of the two control gear assemblies. The components of the lower case shown on this page are identical for both V and Z transformers but the upper shaft assemblies for the two transformers differ in length, as shown on preceding page.