# Governor Anticipator

## (Poly-watt Transient Anticipator)

### Purpose

The polywatt transient anticipator is designed to close the turbine governing valves very quickly in case load in excess of predetermined amount is rapidly removed from the generator. After a predetermined interval of one to three seconds, the governor will reopen the valves to carry its share of the available load at the speed for which the speed changer is set. The operation of this device is extremely rapid and will close the governing valves much faster than the governor, which normally would not start closing the valves until speed started to rise. In the case of heavy load surges, this device will trip if the surge on the machine exceeds the load-drop for which it is set and will aid materially in stopping the surge.

### Description

Figure 1 shows a schematic diagram of the anticipating device and its relation to the turbine governor. The device proper consists of two wattmeter balance elements with the cores connected through a spring to the balance beam. These elements are all connected to pull downward and are energized through the potential and current transformers shown. As load is put on the unit, a downward force is exerted on the cores which move downward, stretching their respective springs and keeping the beam against the stop shown at the right. The cores assume a position corresponding to the sum of the load being carried in the two windings of three phases each.

If load in excess of a certain amount, as is predetermined by the scale of the springs and the characteristics of the windings, is dropped from any or all phases, all cores tend to rise, decreasing the load on the springs. Those cores on the left of the drawing move freely, but those on the right are impeded by the dashpot and thus move slowly, unbalancing the beam which rotates clockwise and closes the contacts. This action energizes the sealing-in relay which will hold itself in and complete the circuit to the main solenoid through the contacts of the normally closed Type 1415 M Contactor.

When the main solenoid is energized its core moves downward; and through suitable linkage, actuates the hydraulic mechanism which causes the governing valves to close rapidly.

At the same time that the main solenoid is energized, the operation of the Type TL relay is initiated. After the solenoid has been energized for from one to three seconds, depending upon the setting of the Type TL relay, the relay will close its contacts and energize the coil of the 1415 M contactor, which in turn opens its contacts and de-energizes the solenoid circuit. This also de-energizes the holding-in circuit of the sealing-in contactor which will drop open and reset the circuit. The dashpot on the wattmeter elements will have released by this time, breaking the contact.

The governor anticipator dashpot will release in about two seconds, and restore the governor in event that the TL relay fails to reset.

Figure 2 shows in detail the construction of the hydraulic mechanism. The principal parts consist of the linkage connecting the main solenoid to the relay, the body "16", the relay "15", and the restoring dashpot piston "19". The lower land of the relay controls the flow of high pressure oil to the governor. The relay is normally held at the top of



www.ElectricalPartManuals.com

www . ElectricalPartManuals . com

restore exact balance, tapping the base to facilitate observation of the lever system.

(6) Repeat (3) to (5) with the lower right coil balanced against the upper left.

(7) Repeat (3) to (5) with the lower left balanced against the lower right coil.

(8) Reset and lock stop screw as first determined in (1) to give 4 - to 6 - mill. contact gap. Reconnect biasing springs to lever. Set needle valve to 8 turns open. Complete connections to all coils per diagram (Figure 1) so all coils pull downward.

(9) Connect to a balanced 3-phase load, (such as rheostats across each phase), through two or three-pole load dumping disconnect switch. (If convenient, two shunting relays can be arranged to open two outside lines to the load for sudden load dumping by energizing relays.) Connect the sealing-in relay to the contacts so as to seal itself closed when the anticipator contacts momentarily close. Adjust the biasing spring to hold the anticipator contacts open under steady load or on no load; but so that when a load of the desired magnitude is suddenly dumped, the contacts momentarily close as shown by the sealing-in relay. Begin spring adjustment by centering the adjusting studs of both springs, then cutting off the left-hand spring turn at a time (bending up new hook) till the anticipator operates. Allow ample time between each load-dumping test to permit dashpot piston to fully creep to its final position of balance. Complete adjustment with right-hand spring adjusting stud.

B - Hydraulic Section

There are no adjustments to be made on the hydraulic trip device other than those required to set it initially for time. This adjustment is obtained by using an orifice plug of the correct size to obtain a two second operating time.

The following list has been compiled to facilitate ordering spare or renewal parts by item number and name together with the serial number of the turbine.

| Item No. | Name | Item No. | Name |
|---|---|---|---|
| 1 | Fulcrum Stud | 12 | Relay Head Lock Nut |
| 2 | Fulcrum Pin | 13 | Relay Spring Seat |
| 3 | Lever | 14 | Relay Spring |
| 4 | Solenoid | 15 | Relay |
| 5 | Solenoid Crosshead | 16 | Body |
| 6 | Solenoid Crosshead Link (in pairs) | 17 | Gasket |
| 7 | Lever Pin | 18 | Bracket |
| 8 | Cover | 19 | Dashpot Piston |
| 9 | Relay Link (in pairs) | 20 | Dashpot Piston Spring |
| 10 | Relay Link Spacer | 21 | Ball Check Valve |
| 11 | Relay head | 22 | Orifice Plug |

www.ElectricalPartManuals.com

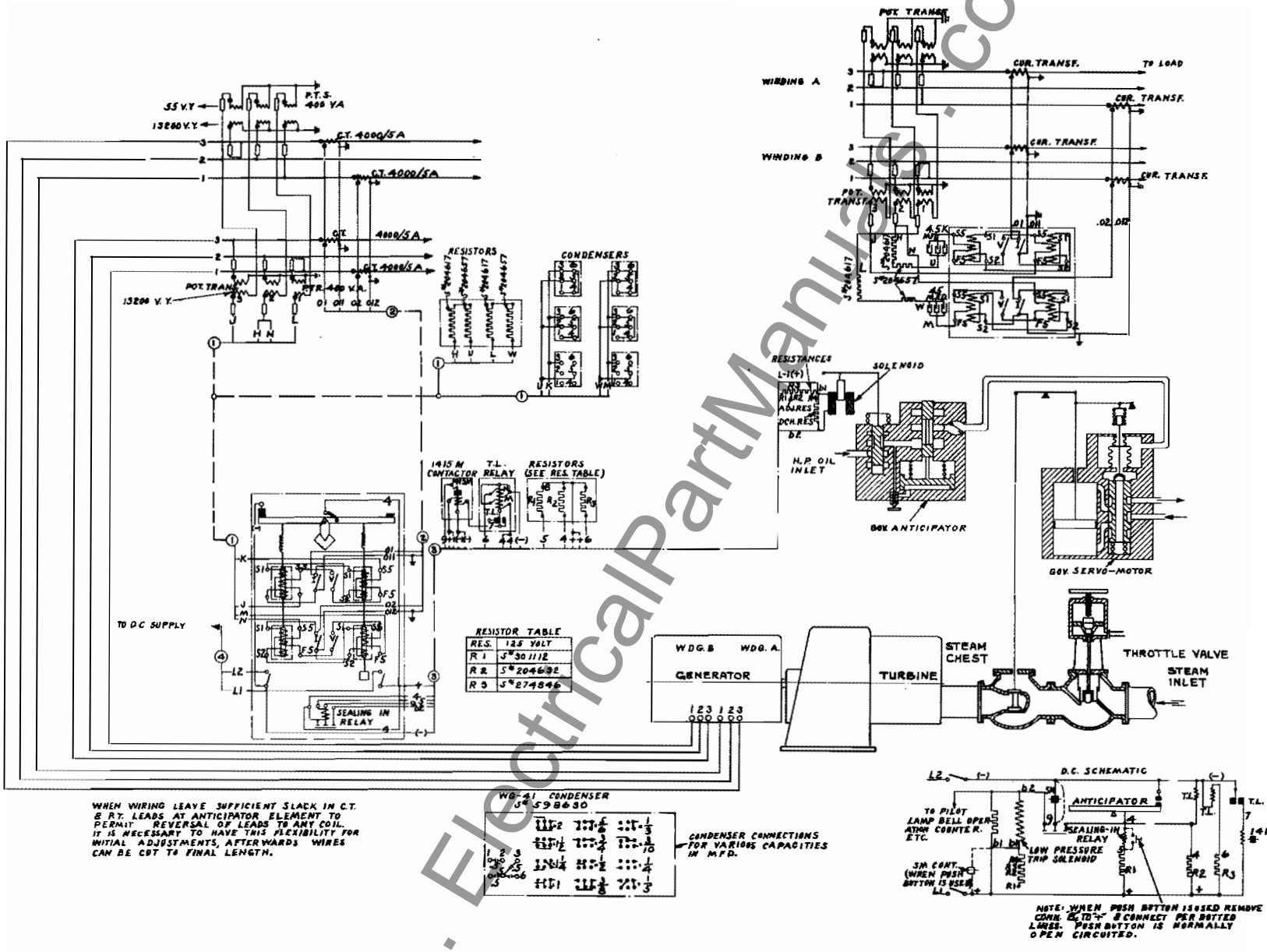


Fig. 1 - Polywatt Transient Anticipator Gov. System

www.ElectricalPartManuals.com