

INSTALLATION • OPERATION • MAINTENANCE INSTRUCTIONS

TYPE TD-2 TIMING RELAY

CAUTION: Before putting relays into service, remove all blocking which may have been inserted for the purpose of securing the parts during shipment, make sure that all moving parts operate freely, inspect the contacts to see that they are clean and close properly, and operate the relay to check the settings and electrical connections.

APPLICATION

- ✱ The type TD-2 relay provides time delay for zone 2 and zone 3 in the conventional line distance phase relaying.

CONSTRUCTION AND OPERATION

The type TD-2 relay consists of a synchronous motor-driven timer, a saturating transformer and two telephone relays. One of the telephone relays, TX, has a double coil and starts the timer for a fault in zone two or zone three. The other telephone relay, TM, provides seal-in for the T2 contact.

Synchronous Timer

The timer is a small synchronous motor which operates from the current circuit through a saturating transformer, and drives a moving contact arm through a gear train. The contact on the moving arm is a cylindrical silver sleeve, loosely fitted on the moving arm. In making contact, this sleeve rolls across two vertically projecting stationary butt contacts to bridge the gap between them.

The synchronous motor has a floating rotor

which is in mesh with the gear train only when energized. The rotor falls out instantly when the motor is de-energized, allowing a spring to reset the moving arm.

- ✱ The timer operates as a cycle counter, therefore the actual times will be different for the same number of cycle settings depending on whether it is a 60 hertz or 50 hertz relay.

Saturating Transformer

The saturating transformer has a double winding current circuit, each winding being fed by a different phase of the protected circuit. Thus, for a fault on any pair of phases, at least one of the current transformer primary windings will be energized. The timing motor will operate when either one or both of the current windings on the saturating transformer are energized.

CHARACTERISTICS

- ✱ The maximum time delay of the standard TD-2 is two seconds or 120 cycles (60 hertz base). Timers having ranges of 3 or 5 seconds, (180 or 300 cycle) and 50 hertz timers, are also available.
- ✱ Minimum time setting is 10 cycles for 120 cycle relay, 12 cycles for 180 cycle relay and 20 cycles for 300 cycle relay.
- ✱ Note that on 50 hertz the 120, 180, and 300 cycle times correspond to 2.4, 3.6, and 5 seconds respectively.

All possible contingencies which may arise during installation, operation, or maintenance, and all details and variations of this equipment do not purport to be covered by these instructions. If further information is desired by purchaser regarding his particular installation, operation or maintenance of his equipment, the local Westinghouse Electric Corporation representative should be contacted.

SUPERSEDES I.L. 41-573C, DATED JULY 1967

✱ DENOTES CHANGE FROM SUPERSEDED ISSUE

EFFECTIVE JULY 1978

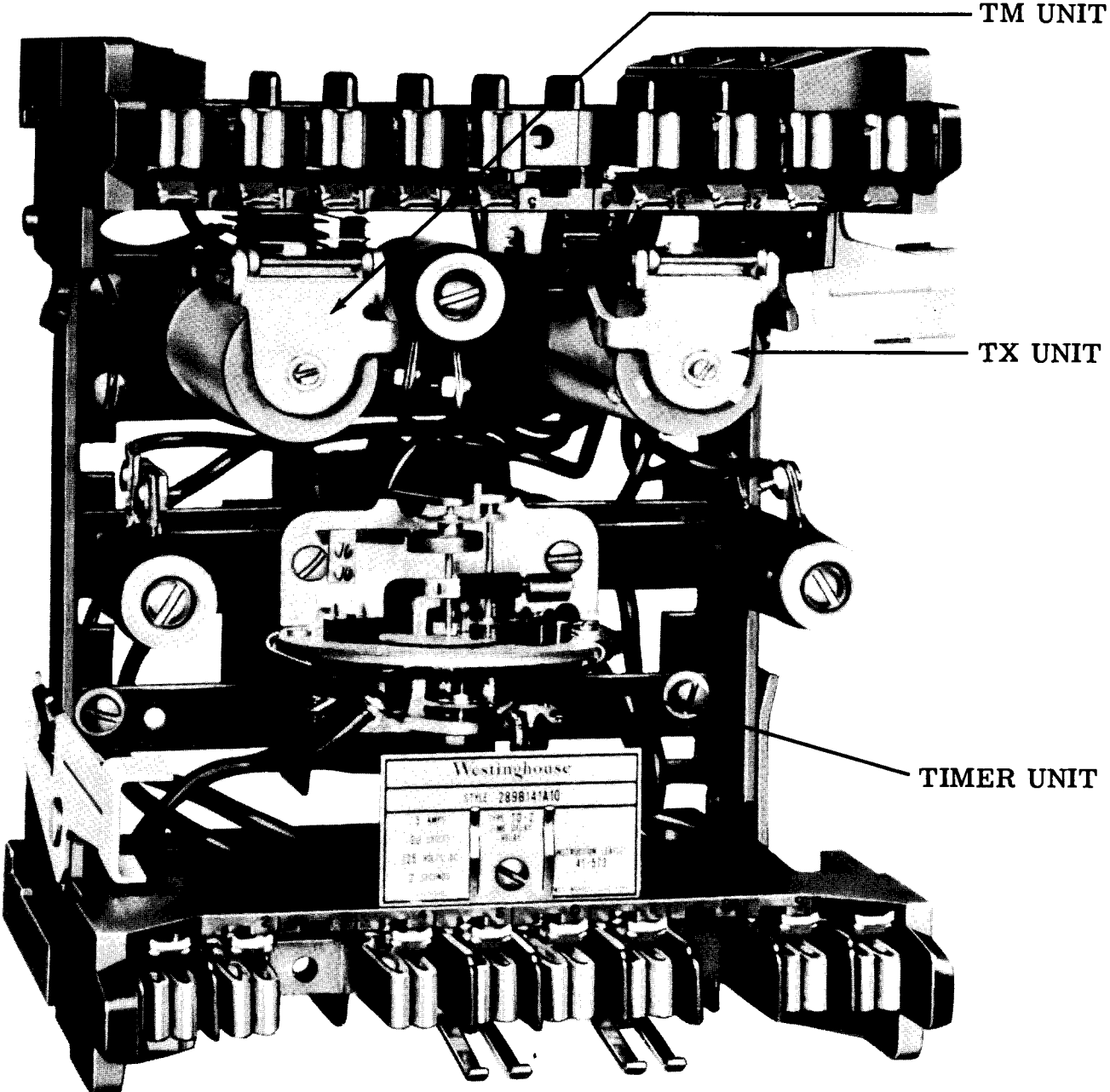


Fig. 1. Type TD-2 Relay without Case.

- Minimum pickup of the motor circuit is 2 amperes ac in one current winding. Timing accuracy, however, is not as good at 2 amperes as it is at 3 amperes or greater. Rated voltages are 48, 125, or 250 volts dc. Continuous current rating is 8 amperes ac. One second current rating is 196 amperes ac.

Current Circuit Burden Data

With 5 amperes load current in each primary coil:

Current Transformer Volt-Amperes Power Factor

Phase 1	0	-----
Phase 2	12.45	116° lag
Phase 3	13.25	52° lag

Telephone Relay Resistance Data

TX: 500 ohms in each coil.

TM: 500 ohms.

SETTINGS

The time delay of the timer is set to coordinate with the relays which are backed up by the second and third zone impedance elements. Two sets of stationary contacts, mounted in Micarta insulating blocks, are adjustable around a semi-circular calibrated scale. The relay setting is obtained by lining up the white slot in the center of the block with the number of cycles time delay desired.

ADJUSTMENTS AND MAINTENANCE

The proper adjustments to insure correct operation of this relay have been made at the factory. Upon receipt of the relay, no customer adjustments, other than those covered under "SETTINGS", should be required.

Acceptance Test

The following check is recommended to insure that the relay is in proper working order:

A. Telephone Relays

Check that TX closes when 80% rated dc voltage is applied to terminals 11 and 12 or 13 and

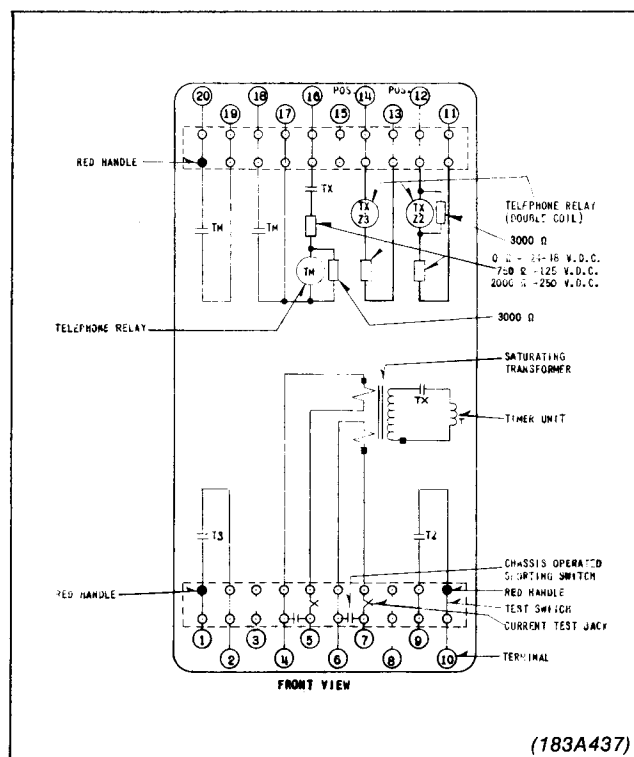


Fig. 2. Internal Schematic of the Type TD-2 Relay in the FT22 Case.

14. With TX contacts closed, check that TM closes its contacts when 80% rated dc voltage is applied to terminals 16 and 17.

B. Timer

With TX contacts closed, and terminal 5 connected to terminal 7, check that the contact arm rotates when 1.5 amperes ac is applied to terminals 4 and 6.

Timing accuracy should be approximately ± 3 cycles for a low setting of the stationary contacts and approximately ± 4 cycles for a high setting of the stationary contacts.

Routine Maintenance

All relays should be inspected periodically and the operation should be checked at least once a year or at such other time intervals as may be dictated by experience to be suitable to the particular application.

All contacts should be periodically cleaned. A contact burnisher S#182A836H01 is recom-

mended for this purpose. The use of abrasive material for cleaning contacts is not recommended, because of the danger of embedding small particles in the face of the soft silver and thus impairing the contact.

It is recommended that a timing check be made, with 3.0 amperes ac through terminals 4 and 5 or 6 and 7. This check should be made with the stationary contact in the in-service position. Accuracy should be approximately ± 3 cycles for a low setting of the stationary contact and ± 4 cycles for a high setting of the stationary contact.

Calibration

Use the following procedure for calibrating the relay if the relay has been taken apart for repairs or if the adjustments have been disturbed. This procedure should not be used unless it is apparent that the relay is not in proper working order.

A. Timer Zero Position

- With the stationary contact set for 30 cycles, close TX and energize transformer primary terminals 4 and 5 or 6 and 7 with 3.0 amperes ac. Check the average of 10 readings. If not very close to 30 cycles, loosen the holding screw and rotate the moving arm on the shaft. Check readings again. NOTE: It is important to maintain the vertical position of the arm on the shaft when the holding screw is loosened. This must be done so that the moving contact will properly bridge both sets of stationary contacts. In other words, the moving arm must make a positive contact and still reset freely from any position, particularly after it has just passed over the stationary contact.

INSTALLATION

The relays should be mounted on switchboard panels or their equivalent in a location free from dirt, moisture, excessive vibration and heat. Mount the relay vertically by means of the rear mounting stud or studs for the type FT projection case or by means of the four mounting holes on the flange for the semi-flush type FT case. Either the stud or the mounting screws may be utilized for grounding the relay. External toothed washers are provided for use in the locations shown on the outline and drilling plan to facilitate making a good electrical connection between the relay case, its mounting screws or studs, and the relay panel. Ground Wires are affixed to the mounting screws or studs as required for poorly grounded or insulating panels. Other electrical connections may be made directly to the terminals by means of screws for steel panel mounting or to the terminal stud furnished with the relay for thick panel mounting. The terminal stud may be easily removed or inserted by locking two nuts on the stud and then turning the proper nut with a wrench.

For detail information on the FT case refer to I.L. 41-076.

RENEWAL PARTS

Repair work can be done most satisfactorily at the factory. However, interchangeable parts can be furnished to the customers who are equipped for doing repair work. When ordering parts, always give the complete nameplate data.

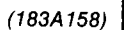


Fig. 3. Outline and Drilling Plan of the Type TD-2 Relay in the FT22 Case.



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