

## **TOUCH-PLATE® COMPONENTS**

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### **TROUBLE SHOOTING INSTALLATION GUIDE FOR HARD-WIRED RELAY SYSTEMS**

- **If a single light fails to light be sure the bulb is good.**
- **To Change Light Bulb in CC unit:**

Remove the cover plate from the wall. You may want to insert a flat screwdriver behind cover to gently pry the outside edge of the plate in the upper left corner (near button #1) and the lower right corner (near button #6). Unscrew metal sub-plate from the wall. You will find 2 screws on the back of the unit. Unscrew both screws and remove the metal back-plate that holds the light bulbs. Replace the light bulbs one at a time (make sure the tracer wire remains in the socket). When you replace the CC housing on the plate, make sure you put the same color wires next to each other (i.e. yellow pilot wire with black tracer wire next to solid yellow switch wire).

- **No Touch-Plate Control--No Power At Any Controlled Outlets**

Check your supply from the breaker to the relay gang box. You are not getting 110-volt power into the Touch-Plate controlled distribution system. If the breaker won't hold in, you are almost sure to have a short in the high voltage make-up at some fixture.

- **No Touch-Plate Control--Some Outlets On, Others Off:**

You are getting 110-volts into the system, but the low voltage circuit is shorted or is open. A short condition is the more probable because it will not allow the transverter to charge. To find the cause of the short, disconnect the transverter pigtail labeled "switches" from the one or more wires connected to it. Touch these disconnected wires to the pigtail one at a time. When you hear one of the relays click, you have discovered the short. You can then isolate it to the proper relay by having someone watch the outlets to see which light is turning off and on. Then check your low voltage make-up for all switches wired to this relay. Once in a while, wires pulled tightly around a ventilation or heating duct can break insulation and cause difficulty.

- **Stuck Switches – How to find which one**

If you suddenly find that you cannot switch on or off any of your lights, the most likely cause of the problem is a stuck switch.

When a switch (button on the wall) sticks, either mechanically, or the contacts fuse together, then the transverter cannot switch any relays since it is continually pumping current through the relay last switched. The transverter (TVR-1 or TPS-0120) and the relay with the stuck switch are probably warm to the touch. The following should help you find the stuck switch.

\*NOTE! Perform the following at your own risk. Shock is unlikely since the low-voltage side of the transverter (the two thinner wires) is only about 30 volts DC, but it is not impossible. Contact an electrician and give him this information if you are unsure of the presence of dangerous voltages. A simple multimeter or voltmeter should be sufficient for testing for the presence of high voltages (use AC and DC mode both to check for high voltages).

Now, how to troubleshoot your system:

To find the relay with the stuck switch, locate the transverter's two SMALL (thin) wires, which are connected to the relays and switches. Disconnect ONE of the SMALL wires from its connection. You now have 2 bare wire ends. One is going to the transverter, the other is going to the rest of the system. When you touch these two bare wire ends momentarily, a relay should click over. Do this several times in succession to locate the sound of the relay. You should also see one of your lights turning on and off. When you find the relay, it should be warm or hot if it has not been too long since the connection at the transverter was broken. If you disconnect this relay on its low-voltage side (either of the two low-voltage wires), your system should be freed up, allowing you to control the rest of your lights. If you still cannot, check the voltage at the transverter (low-voltage side). If it is about 30V DC, then it probably needs replaced. If it is about 3V DC, then you probably have another stuck switch, or you have disconnected the wrong relay and you should repeat the above procedure.

Theory of Operation: The transverter is at rest most of the time. Its "at rest" voltage is about 28-30 volts DC. When a button is held down, the relay switches, and the transverter's voltage drops to about 3 volts DC until the button is released. This can be simulated with a working system: just hold down one button, then, about a second later, with the button still held down, try pressing another button. It shouldn't work until the first button is released. The troubleshooting procedure above works because the two bare wire ends become the "switch", since the stuck switch is now just a constant electrical path.

In brief, the testing procedure is as follows:

- 1) disconnect one of the low-voltage wires at the transverter.
- 2) momentarily touch the resultant two bare wire ends together.
- 3) follow the clicking sound, and disconnect one low-voltage wire on the relay that is clicking.
- 4) if the lights work now, find and replace the stuck switch.
- 5) if the lights still do not switch: check the voltage across the low-voltage side of the transverter. If it is about 30VDC, you probably need to replace the transverter.
- 6) If the voltage is about 3VDC, you probably still have a stuck switch that is connected to a relay other than the one that has been disconnected.

- **Measure Output Voltage**

To measure the output voltage of the TPS-0120, set your meter to VDC, touch your ground lead wire to the brown relay wire of the TPS-0120, and the red meter lead wire to the white switch wire. This will give you your voltage. You should be getting between 28.5-30VDC. Reversing the leads of the meter will give a negative voltage reading. If the wires are not Brown & White it's okay.

- **Some Touch-Plate Control—But Not All Relays Working**

This may happen when you have relays in several gang boxes. Be sure you have a supply from the transverter pigtail labeled “relay” supplying the common relay connection in all gang boxes. This is occasionally overlooked, but is easily discovered because it will cause all relays in one box to be inoperative.

- **Touch-Plate Working--Some Pilot Lights Burn Dim**

If pilot light switches have dim or erratic pilot light operations, it frequently indicates an open in the common low voltage AC lead to the pilot lights.

- **All Pilots Burn Dim When Any Button is Operated**

110-Volt neutral to pilot light transformers is loose or disconnected.

- **Pilot Lights Burned Out**

Burned out pilot lamps on the new installations are generally caused by reversing the low voltage common leads. Solid white wire from TPS-0120 transverter is common to switches. White wire with black tracer from TPS-2001 or TPS-2003 is common to pilot lamps. Reversing these will cause difficulty.

- **Existing Older Installations Where One, Two or More Relays Cease Operating**

This is not relay failure. It is due to a weakening low voltage power supply. Check for stuck switches. A continuous drain reduces the life of the rectifier and is usually the cause of failure. If the installation does not have the transverter TPS-0120, but is a two separate component power supply, it can be checked by; taking the converter out of the system, hooking the low voltage lines directly to the transformer and testing the operation on AC. A TPS-0120 transverter should be used to replace both the 78K transformer and 17C converter.

- **Hot / Cold Weather – Relay Sticks**

Older relays used an oil-based lubricant, which over time can accumulate dust and cause the relay to stick in extreme temperature conditions. Replace with new relay. Newer relays have been designed to accommodate this situation.

### **INSTALL A NEW TPS-0120 BEFORE CHANGING RELAYS**

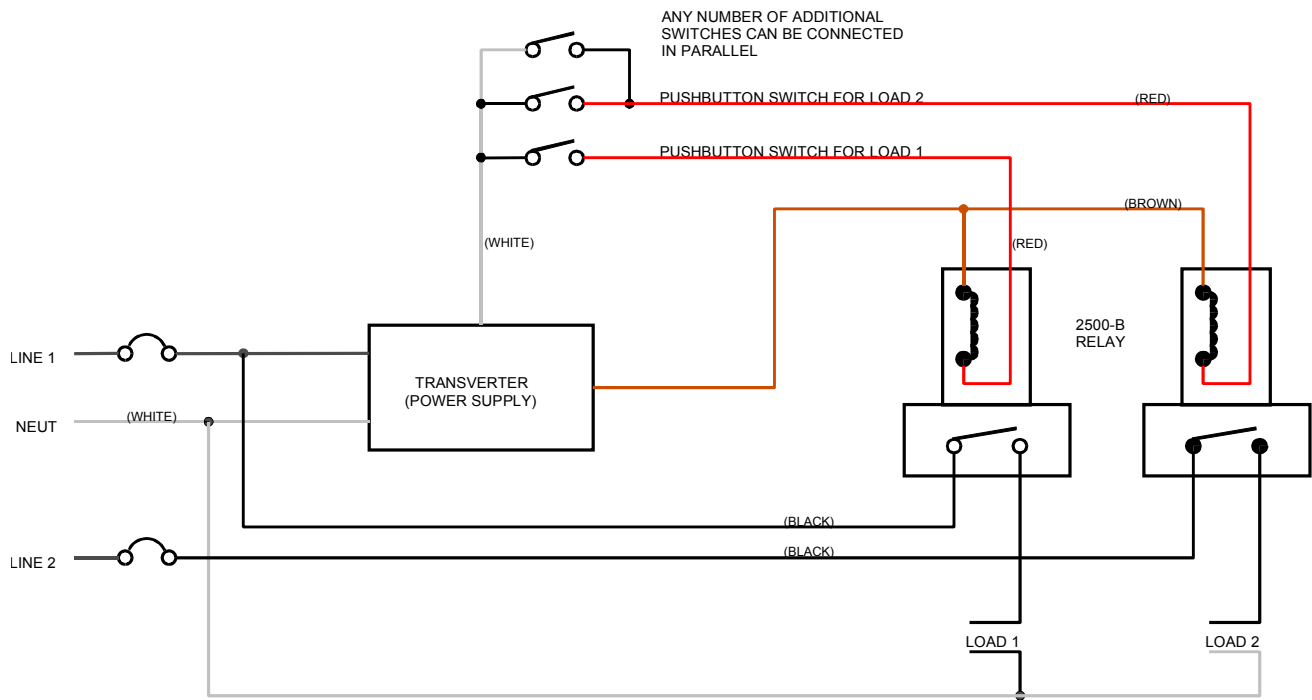
- **NOTE ABOUT SYSTEMS BEFORE 1957**

If your Touchplate system was built before 1957 then it is possible that instead of a TVR-1 or TPS-0120 transverter, you may have two components that do the same job. So when you are replacing your power supply you will need to look for a 78K1 which is the transformer and a 17C which is the converter. When you are replacing the power supply you will need to remove both the 78K1 and the 17C and install the TPS-0120.

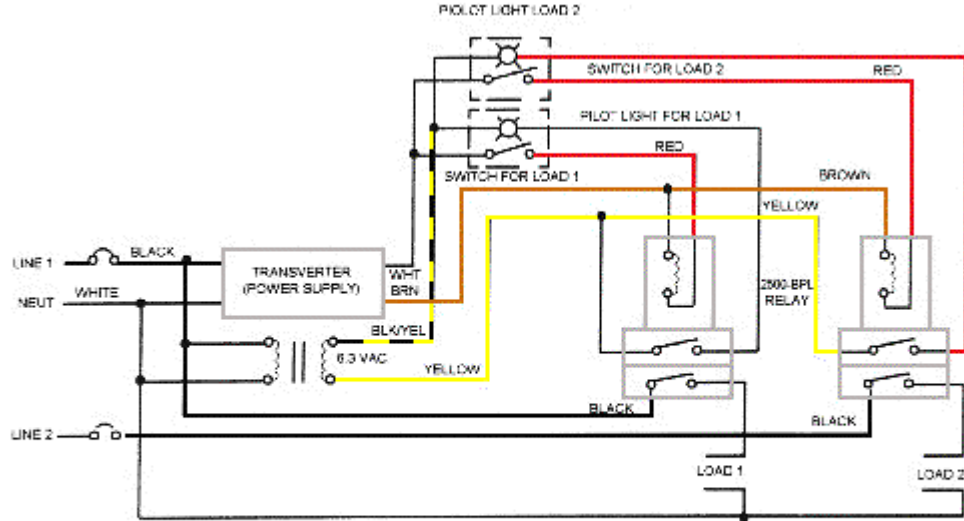
### **GENERAL NOTES-RELAYS**

- Relays not overloaded will seldom fail. In trouble shooting a job you can count on the relays as being O.K. until you have checked all other parts and make-up in the system.
- If a relay fails to operate, it may be due to the relay making contact against a dead short in the 110-volt wiring at the fixture. Such a dead short can pass enough current before the breaker drops out to fuse the contact points in the relay together. If you do find a relay failure, be sure and eliminate cause before you replace the relay.
- Two relays will not operate from one switch.
- Use only one transverter in a single prewired unit.

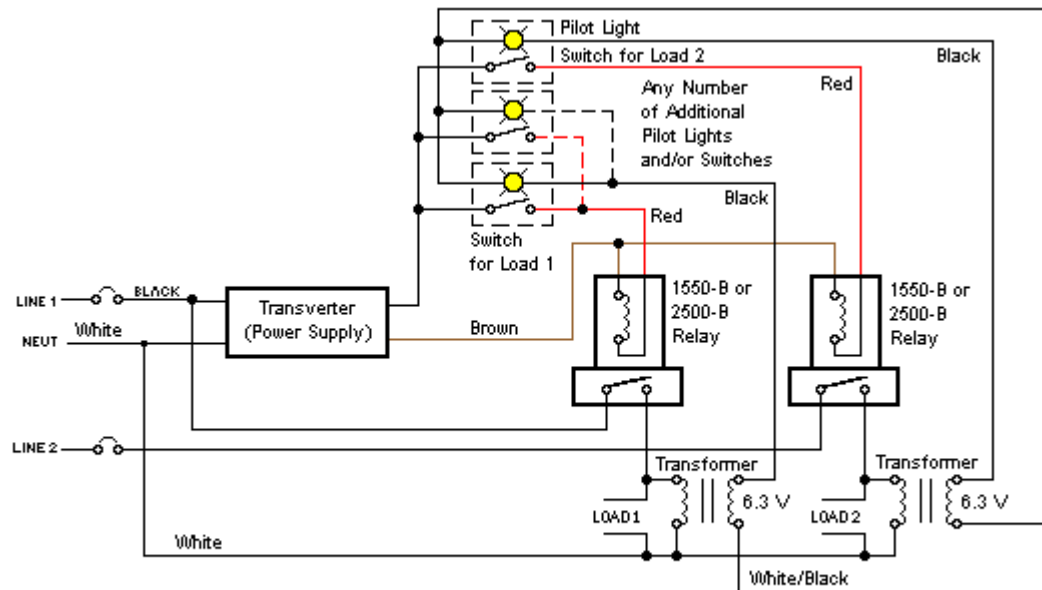
- Touch-Plate overall warranty is dependent upon the use of #18 wire
- Touch-plate relays should not be used for doorbells.
- Painted switches will cause difficulty. Broken switch plates that let the low voltage wires free can also short out. Remember that any continuous drain of the low voltage system will considerably reduce the normal expected life of the transverter.
- In low voltage failure, always look for the cause. If you replace the low voltage power unit and the cause of failure is not eliminated, you will naturally have a reoccurrence of the trouble.



BASIC INSTALLATION USING 2500-B RELAYS



**INSTALLATION USING TPS-2003 TRANSFORMER  
(MAX. 30 PILOT LIGHTS) & 2500-BPL RELAYS**



Installation using PL-120, PL-230 or PL-277, pilot light transformers, one per relay (max. 4 pilot lights per transformer) and 1550-B or 2500-B relays.