SECTION 11-F
TWILIGHT SENTINEL

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11-25 TWILIGHT SENTINEL

a. Description

The Twilight Sentinel is an electronic device which automatically controls the on-off operation of the headlights, tail lights, and instrument lights of the car on which it is installed. This operation is in response to the amount of light striking a light sensitive cell. The complete system consists of three units-photocell assembly, amplifier, and manual-automatic switch. See Figure 11-172.

The photocell assembly is a photo-conductive type and is mounted face up on the instrument panel so it is exposed to direct sky light through the windshield. Light strikes the photocell through a window in the top cap of the assembly. The cap may be rotated by hand to select the amount of light striking the photocell through the window. In this manner, the sensitivity of the Twilight Sentinel may be altered by the car owner himself. See Figure 11-173.

The amplifier unit switches the car lights on or off in response to a signal from the photocell. It consists of a transistor amplifier, sensitive relay and power relay. Mounting location is under the instrument panel near the standard light switch. See Figure 11-174.

The manual-automatic switch is a push-pull type. Mounting location is in the lower area of the instrument panel to the left of the steering column.

b. Operation

With the manual-automatic switch

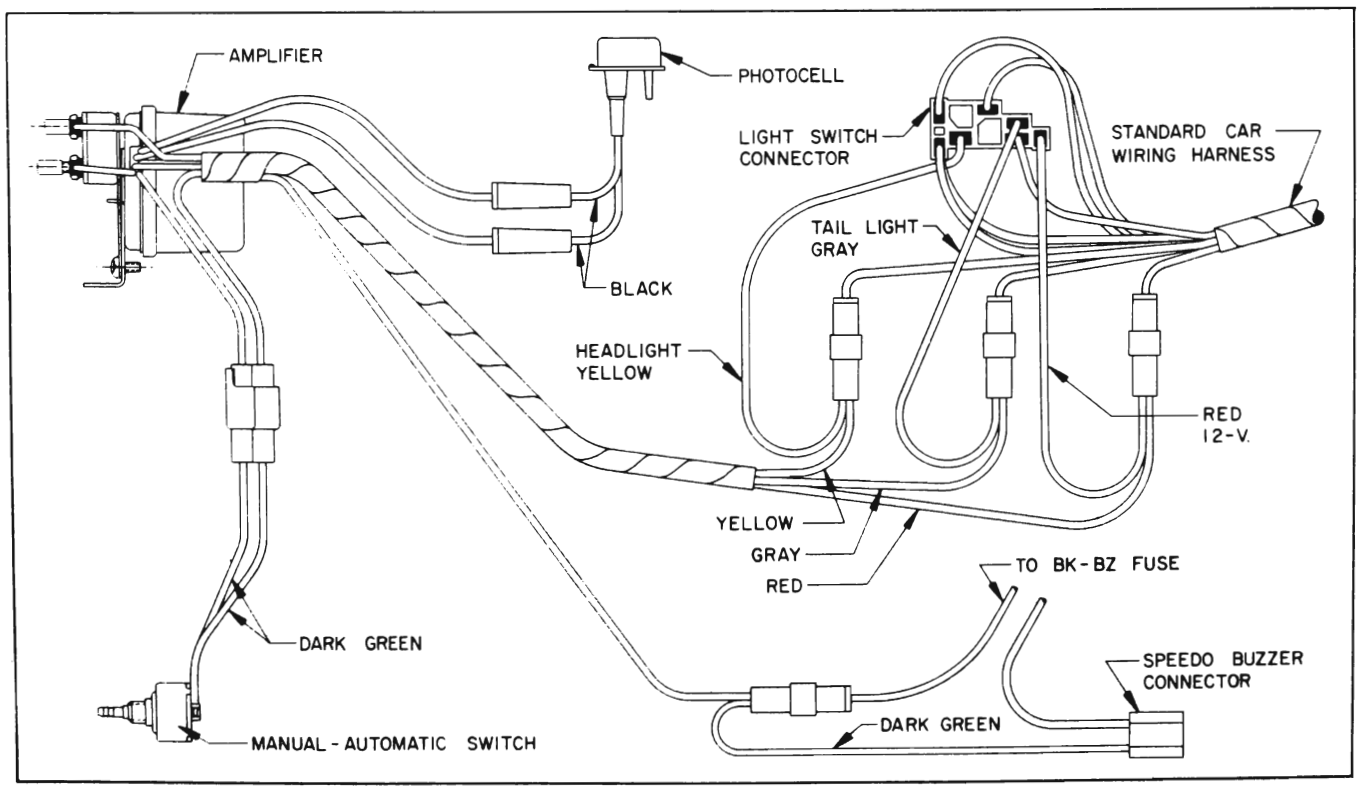


Figure 11-172—Twilight Sentinel Wiring Diagram

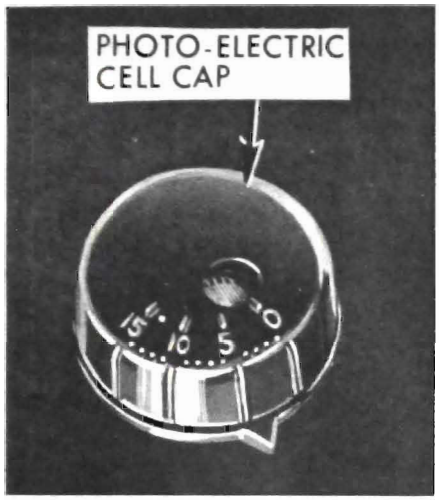


Figure 11-173—Twilight Sentinel Photocell

in "automatic" (pushed-in) position, ignition turn "on" and regular light switch in "off" position, the Twilight Sentinel provides completely automatic on-off control of the car lights as evening approaches and daylight is reduced to the point where lights are needed for safe driving, the Twilight Sentinel will "turn on" the car lights. The exact desirable time at which this takes place may be selected by the owner by rotating the top cap of the photocell. Rotating counterclockwise reduces the amount of light striking the photocell through the window and turns the lights on earlier. To turn lights on later, rotate the cap clockwise.

A built-in ratio prevents the lights turning off when passing under bright street lighting. A time delay feature is incorporated to prevent the car lights turning on immediately if the light level is reduced suddenly while the car is passing under trees, shadows, overpass, etc. When the ignition is turned off, the Twilight Sentinel is inoperative and the lights will turn off.

When the car is in a garage, the lights may turn on because of the low light level. However, as soon as the car is driven into the direct daylight, the lights will turn off.

If the driver desires to turn his lights on during the daylight hours, he may do so by operating the standard light switch. This bypasses the Twilight Sentinel and the standard light switch must be placed in "off" position before the Twilight Sentinel can regain control.

To obtain manual control of the car lights at the standard light switch, turn off the Twilight Sentinel by placing manual-automatic switch in "manual" (pulled out) position. In some states, the law requires that car lights remain off in certain tunnels. If the light level is low enough so that the Twilight Sentinel turns "on" the lights, then the manual-automatic switch must be placed in "manual" position in order to comply with the law.

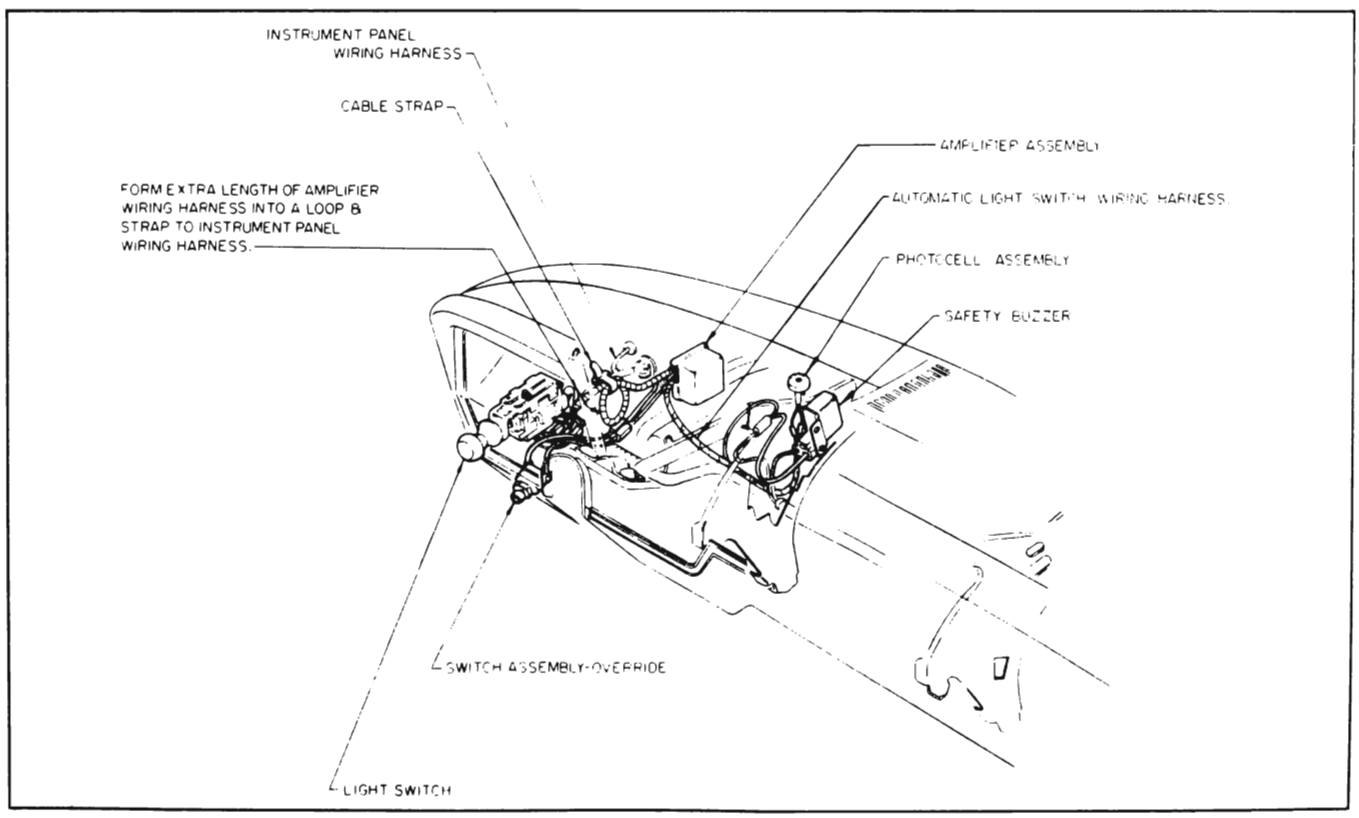


Figure 11-174—Twilight Sentinel Installation—4400-4600-4800 Series

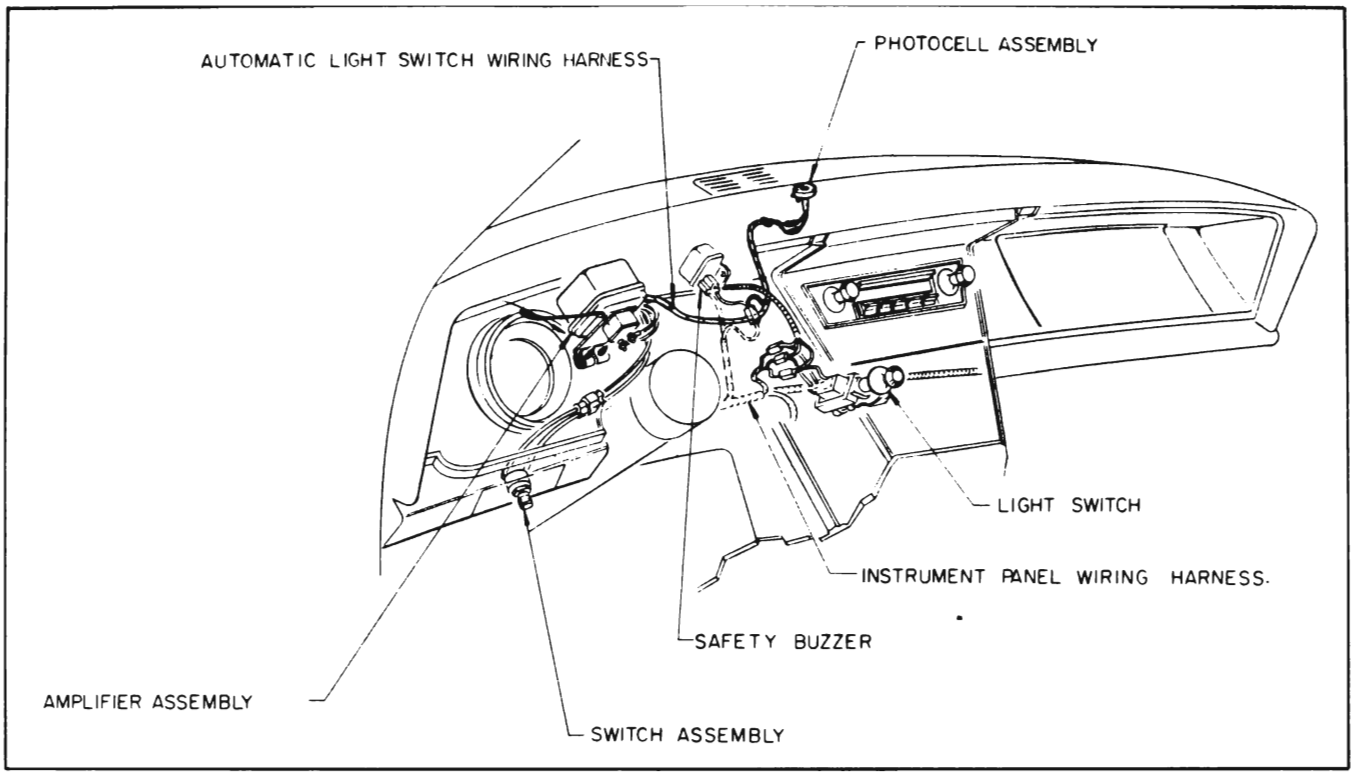


Figure 11-175—Twilight Sentinel Installation—4700 Series

The Twilight Sentinel needs no warm-up time and will provide automatic control immediately whenever the manual-automatic switch is placed in "automatic" position and standard light switch is turned "off".

c. Sensitivity Adjustment

All sensitivity adjustments to the Twilight Sentinel are made by rotating the top cap to vary the amount of light striking the photocell. By rotating the cap, the operator can select desirable exact time of "turn on". A built-in ratchet pawl will click and hold the cover in position for each degree of rotation. Numerals from "0 to 15" on the top cover indicate the amount of rotation available for registering above the pointer on the base assembly. Rotating counterclockwise reduces light striking the photocell and lights turn on earlier. Rotate clockwise for later turn on. FOR THE ABOVE REASONS, NO SERVICE SENSITIVITY ADJUSTMENT EQUIPMENT IS REQUIRED.

Due to high light levels during daylight hours, sensitivity should only be adjusted at the approximate time the lights are desired to turn on.

d. Trouble Shooting

After the Twilight Sentinel photocell cap is adjusted, it should maintain its adjustment over a long period of time. However, there may be occasions when the operation is questioned. The following complaints may be reported.

1. Complaints.

(a) Lights turn on too late in the evening.

(b) Lights turn on too soon in the evening.

(c) Lights remain on during the day.

(d) Lights fail to turn on automatically.

In most cases, the above complaints can be corrected by readjusting the cap on the cell assembly. However, a few on-car checks should be made to determine if the difficulty is more serious than can be corrected by adjustment.

2. Checking Operation

Because of the high light levels needed to operate the Twilight Sentinel, a flashlight should be held close to the photocell whenever light is needed.

(a) Place manual-automatic switch in "automatic" position, standard light switch in "off" position.

(b) Start engine and hold a black

cloth over the photocell assembly. Lights should turn on in a few seconds.

(c) Remove cloth. If lights do not turn on, shine flashlight into cell. Lights should now turn off.

(d) If the Twilight Sentinel performs as stated above, only explanation of the operation and adjustment of the photocell assembly cap is needed. If not, proceed to "Isolating Trouble".

3. Isolating Trouble

(a) Failure of lights to turn on.

(1) Check BK-B2 fuse on fuse block.

(2) If fuse is O.K., place "manual automatic" switch in automatic position and regular light switch in "off" position. Turn ignition "on" and place black cloth over photocell. Lights should turn "on". If not, proceed to Step 3.

(3) Now place regular light switch in "on" position. If light turn "on", trouble is either in amplifier or photocell. Proceed to Step 4.

(4) Place regular light switch in "off" position and remove one of the black wires connected to photocell. If lights turn "on", trouble is in photocell and it must be replaced. If lights do not turn "on", trouble is in the amplifier. Remove for service.

(b) Failure of lights to turn off.

(1) Turn on ignition place manual-automatic switch in "automatic" position (pushed-in) and place regular light switch in "off" position.

(2) Shine flashlight into photocell aperture window. Lights should turn off. If not, proceed to Step 3.

(3) Disconnect the two black wires from the photocell. Place jumper between the two black wires leading from amplifier. If lights turn "off", trouble is in the photocell assembly and it must be replaced. If lights stay "on", trouble is in the amplifier. Remove for service.

e. Removal of Units From Car

IMPORTANT: PLACE MANUAL-AUTOMATIC SWITCH IN MANUAL POSITION AND REMOVE BATTERY GROUND STRAP FROM BATTERY BEFORE STARTING REMOVAL PROCEDURES.

1. Photocell Removal

(a) Disconnect the two back leads of the cell from the harness.

(b) Remove speednut from photocell and remove the cell from the instrument panel. The speednut may be removed by inserting the blade of a screwdriver under a tang of the nut and gently bending it down.

2. Amplifier Removal

(a) Disconnect car harness wires as follows:

(1) Disconnect red wire in-line connector.

(2) Remove connector from red wire in standard car wiring harness. See Figure 11-172.

(3) Remove red wire from light switch connector.

(4) Plug red wire of car harness into light switch connector.

(b) Follow above procedure for gray and yellow car wires to light switch and dark green wire from BK-BZ fuse to speedo-buzzer connector.

(c) Disconnect connectors to photocell and to manual-automatic switch.

(d) Remove two amplifier chassis screws and remove amplifier assembly from brake pedal mounting bracket.

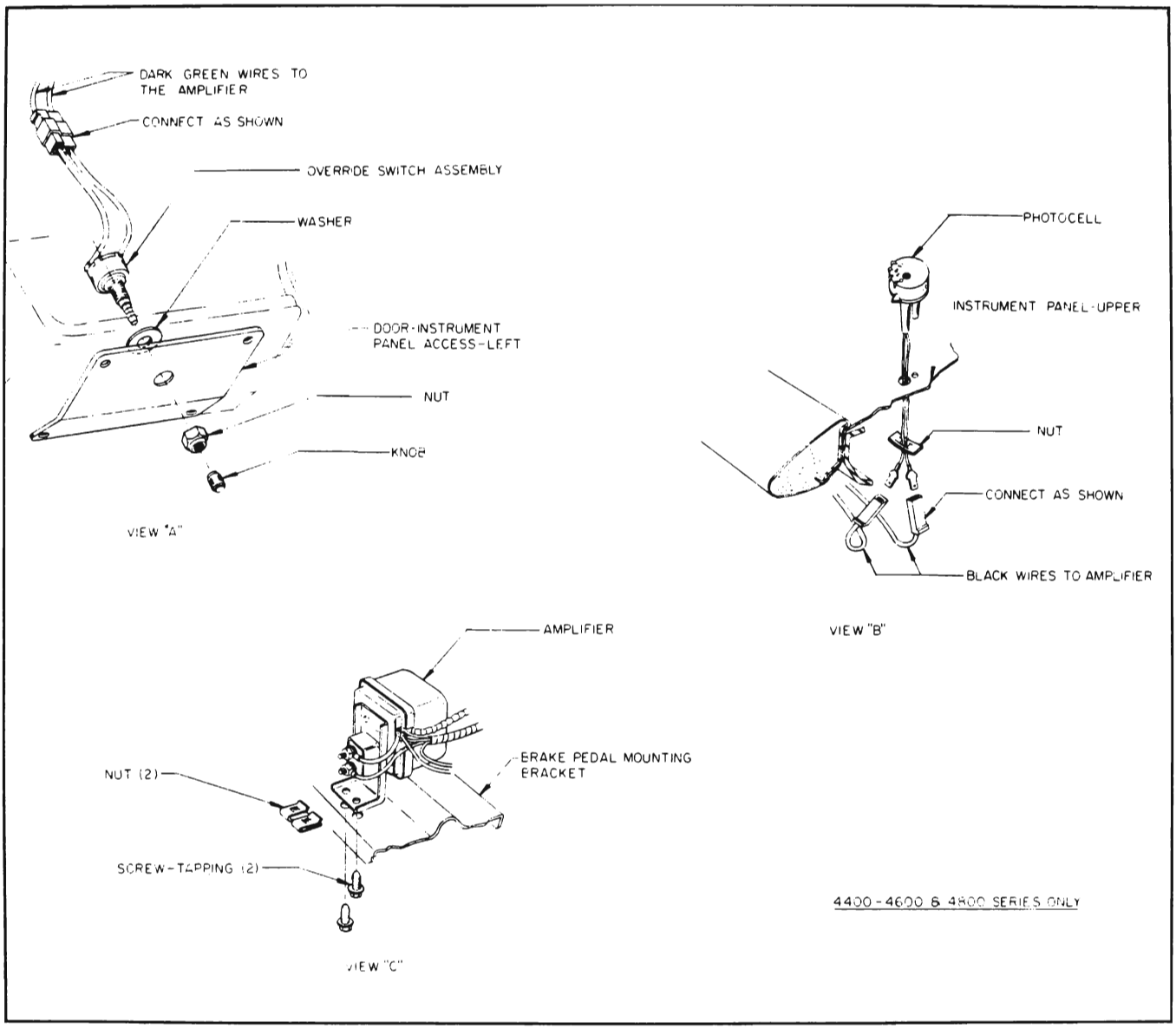


Figure 11-176—Photocell, Override Switch and Amplifier Installation—4400-4600-4800 Series

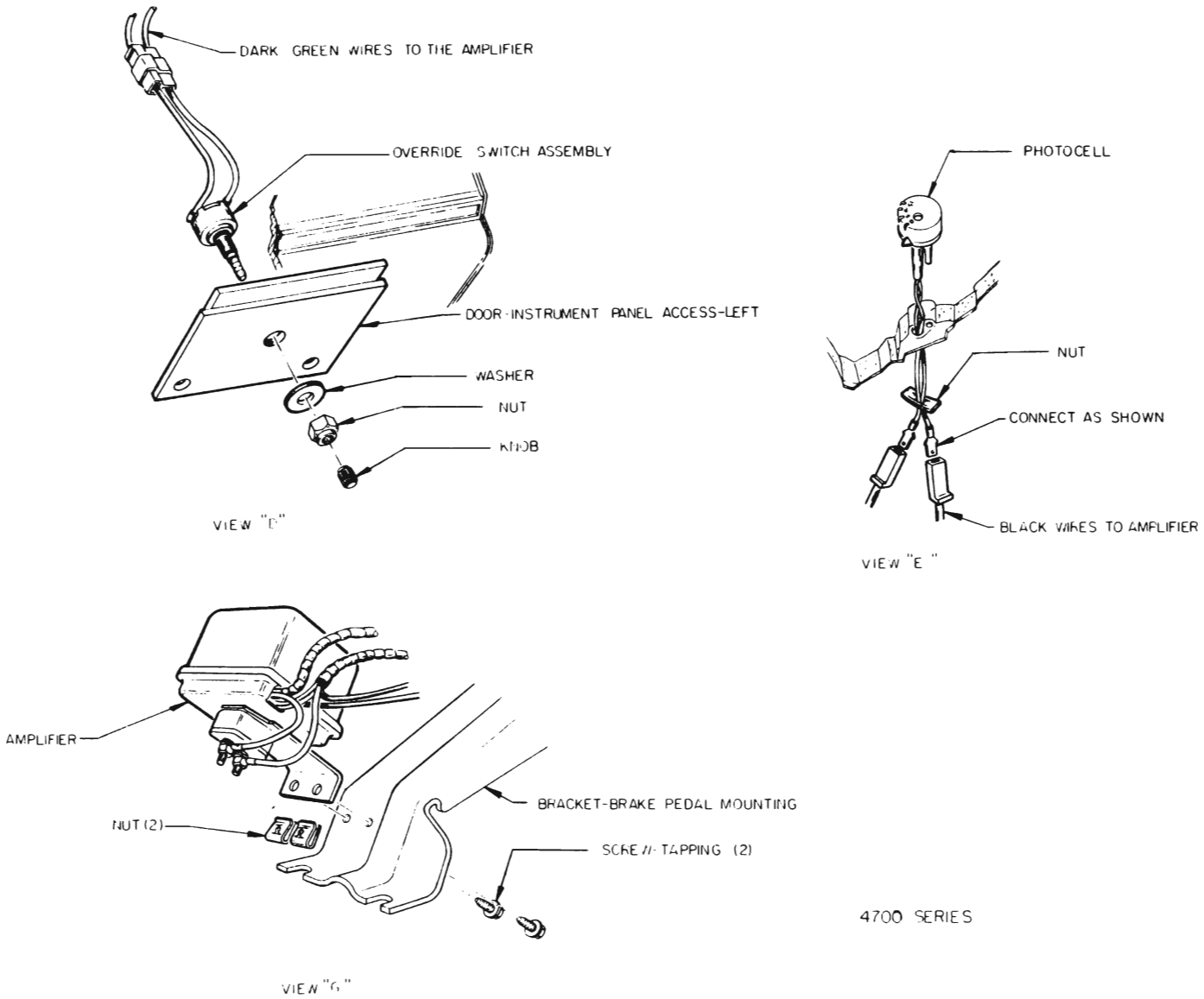
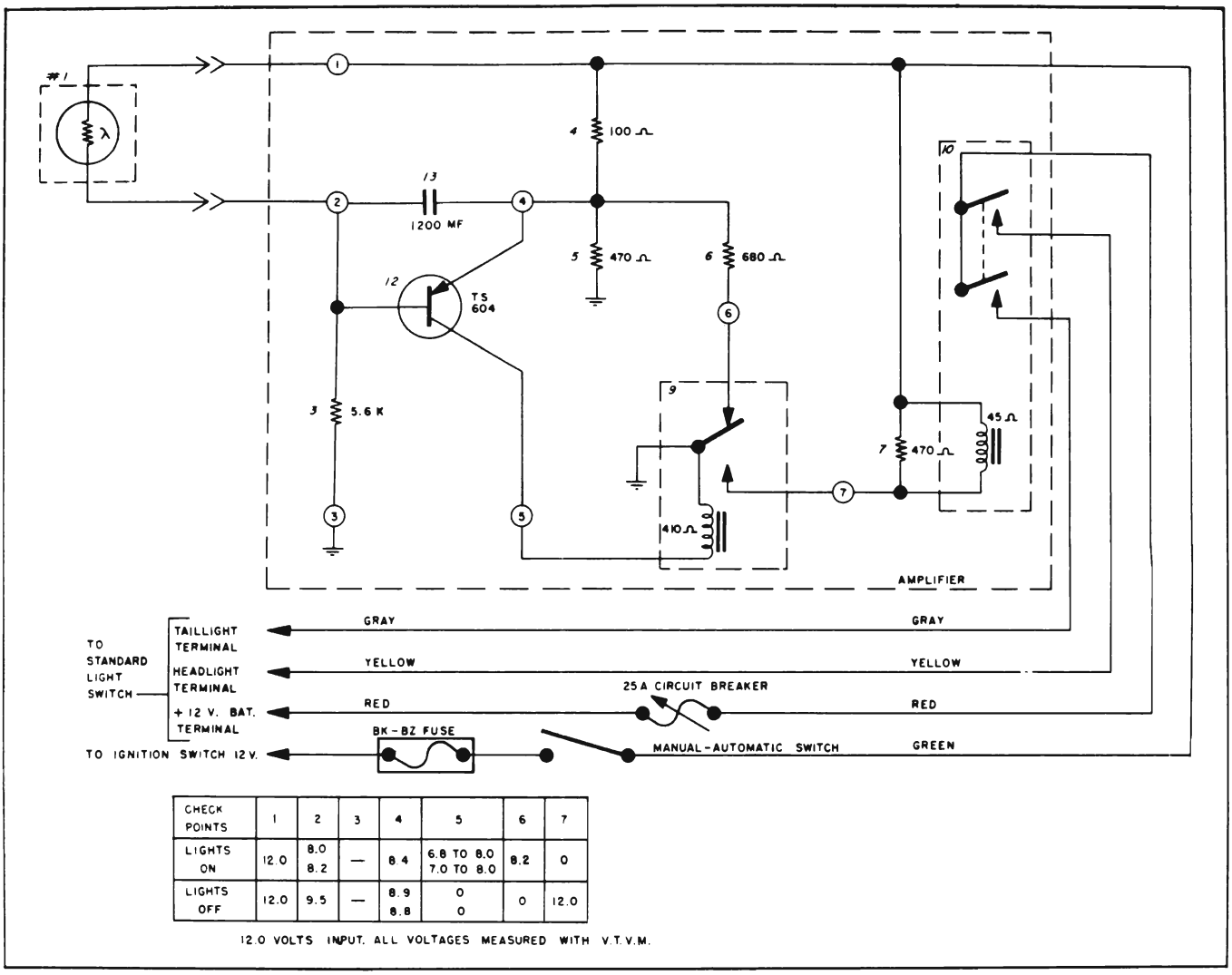


Figure 11-177—Photocell, Override Switch and Amplifier Installation—4700 Series



CHECK POINTS	1	2	3	4	5	6	7
LIGHTS ON	12.0	8.0 8.2	—	8.4	6.8 TO 8.0 7.0 TO 8.0	8.2	0
LIGHTS OFF	12.0	9.5	—	8.9 8.8	0 0	0	12.0

12.0 VOLTS INPUT. ALL VOLTAGES MEASURED WITH V.T.V.M.

Figure 11-178—Twilight Sentinel Schematic Diagram