SECTION 11-D

GUIDE-MATIC POWER HEADLAMP CONTROL

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11-23 GUIDE-MATIC POWER HEADLIGHT CONTROL

a. Description and Operation

The Guide-Matic is an electronic device which provides automatic switching of headlamps between upper and lower beam in response to light from an approaching vehicle.

The system consists of a phototube unit, amplifier unit, power relay, and a combination dimmer-override type foot switch. See Figure 11-158.

The phototube unit mounted on top of the instrument panel is the light sensing device which converts light into an electrical signal for use by the amplifier unit. A control is located on the rear of the unit which allows the driver to limit the amount of sensitivity of the unit. Manual operation of the headlights, by using the foot switch, may be obtained by rotating the control completely counterclockwise to the off position. See Figure 11-159.

The amplifier unit receives and amplifies the signal from the phototube unit into a signal strong enough to actuate the power relay. It is mounted on the lower edge of the dash under the glove box.

The power relay has special heavy duty contacts for switching headlamp beams. It is located on the left side of the steering column brace.

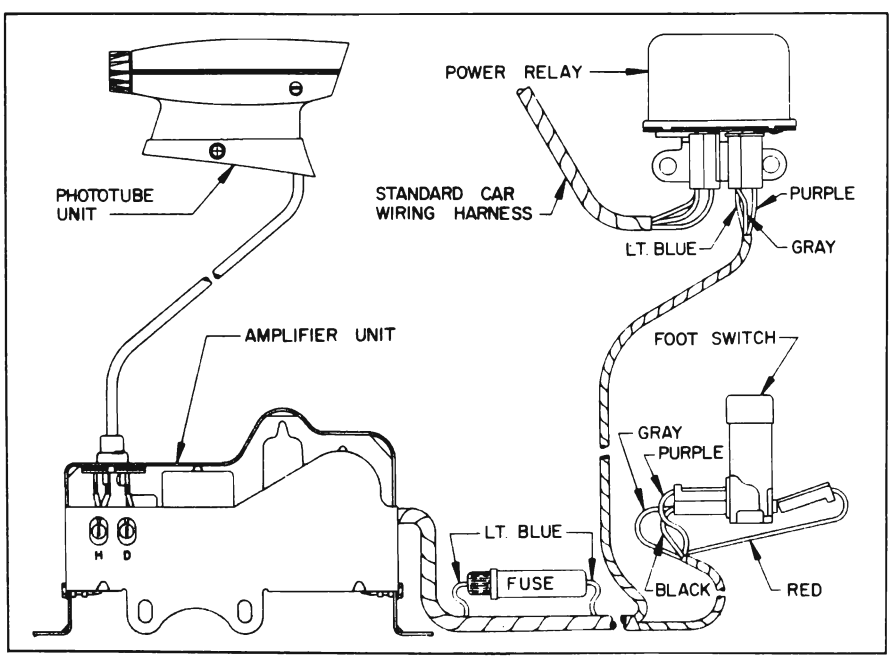


Figure 11-158—Guide-Matic Circuit Diagram

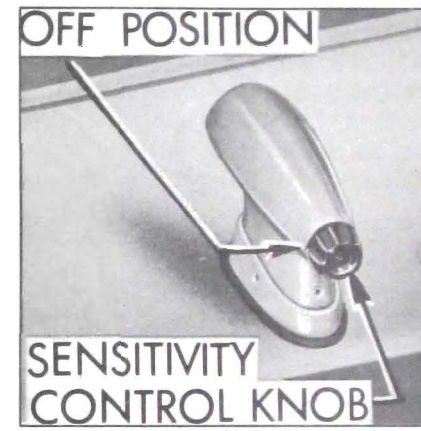


Figure 11-159—Guide-Matic Phototube

The dimmer-override foot switch provides automatic control of the headlamp beams in one position, and manual low beams in the other position. In automatic position, a spring loaded momentary contact type switch is also provided. Depressing the foot switch slightly provides an overriding upper beam condition regardless of light on the phototube unit. This permits the driver to signal if an approaching vehicle fails to switch to low beam promptly, and also, in a lighted area provides a simple test for "automatic" position of the foot switch.

The Guide-Matic is connected to turn on with the headlamps. After approximately 30 seconds warm-up period, the Guide-Matic will provide complete automatic switching of the headlamp beams.

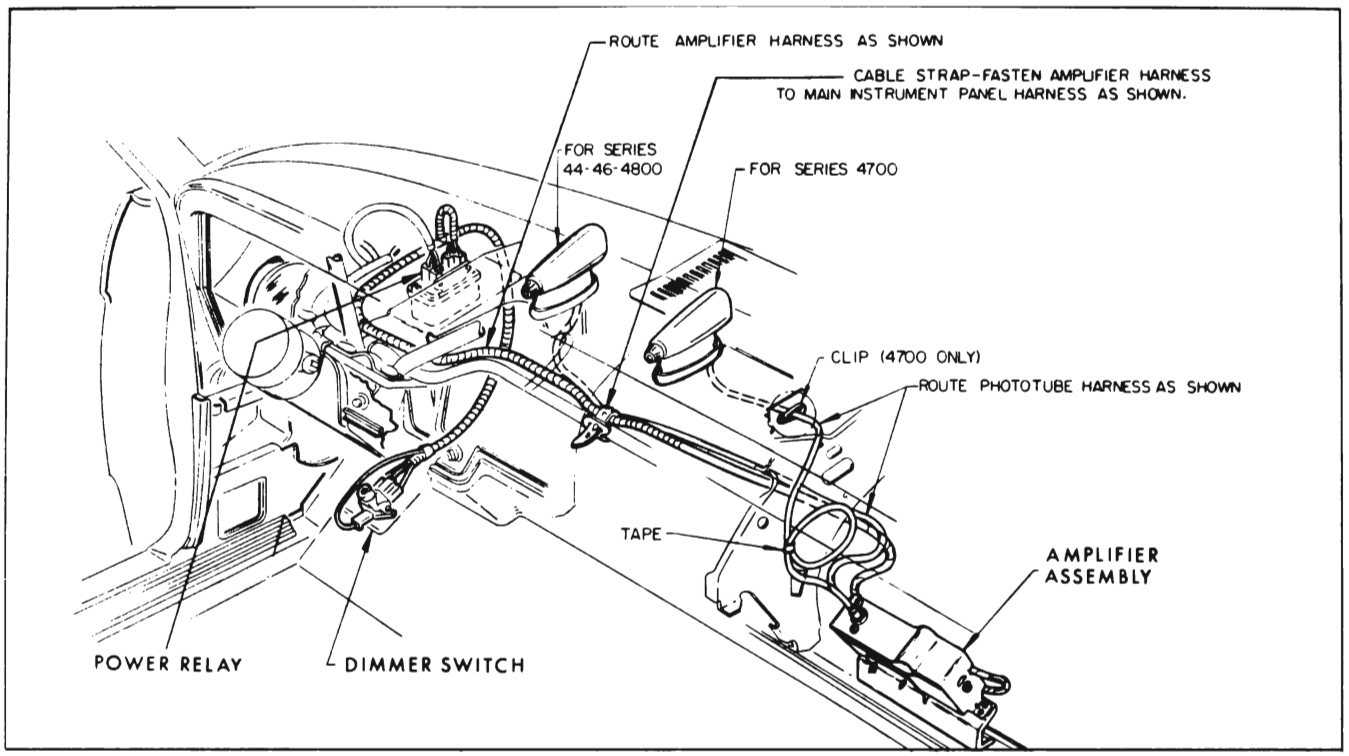


Figure 11-160—Guide-Matic Installation

Street lights and other extraneous lights encountered in the city are sufficient to maintain its vehicle headlamps on low beam. Occasionally, when trailing an older model car with poor lighting on the rear, or due to some other unfavorable condition, it may be desirable to change the foot switch position to manual low beam. The Guide-Matic is disconnected from its vehicle headlamps in this position, but is not turned off. It continues to function as long as vehicle headlamps are turned on.

b. Trouble Shooting:

1. Determination of Complaint -

Turn Guide-Matic on and allow at least one minute warmup.

In a lighted area, the headlamps should be on low beam in both positions of the foot switch. If not, go to "Headlamps Stay On Upper Beam."

With black cloth over the phototube unit, the headlamps should be on upper beam in one position of the foot switch. If not, go to "Headlamps Stay On Lower Beam".

With the black cloth removed from the phototube unit, in one position of the foot switch, upper beam should be obtained by depressing the foot switch 1/4 inch. If not, go to "No Overriding Upper Beam".

If customer complains of the Guide-Matic dimming too late or too soon, go to "Sensitivity Adjustment".

2. Preparation

NOTE: IF CAR HAS BEEN IN THE SUN IMMEDIATELY PRIOR TO CHECKING, ALLOW TO COOL IN A COVERED PLACE FOR APPROXIMATELY ONE HOUR BEFORE THE CHECKS ARE MADE.

(a) Turn on headlamps.

(b) Allow minimum of one minute warmup.

(c) Follow tests progressively under the specific complaint until trouble is located.

3. Headlamps Stay On Low Beam:

(a) Remove the phototube unit harness from the amplifier unit and operate the foot switch.

(1) If headlamps are on low beam in both positions of the foot switch, go to Step b.

(2) If headlamps are on upper beam in one position of foot switch, trouble is in the phototube unit. Remove both units for servicing.

b. Remove the 4 amp fuse from the fuse holder near the amplifier unit and ratchet the foot switch.

(1) If the headlamps change beams, the amplifier unit is faulty

and should be removed for servicing.

(2) If upper beam is not obtained, trouble is in power relay, foot switch, or car harness.

4. Headlamps Stay On Upper Beam:

(a) Ground the white wire of the phototube harness. (It may be necessary to lower amplifier. If so, use external ground for case of amplifier.)

(1) If headlamps remain on upper beam, go to Step b.

(2) If headlamps go to lower beam, trouble is in the phototube unit. Remove amplifier and phototube unit for servicing.

(b) Remove red wire from foot switch -

(1) If headlamps go to low beam, replace foot switch.

(2) If headlamps remain on upper beam, check power relay and if okay, remove amplifier for servicing.

5. No Overriding High Beam

(a) Check to see if red wire is connected to foot switch. If not, make correction.

(b) If it is, remove red wire and place a jumper from the red wire to ground. If override is obtained, replace foot switch.

(c) If override is not obtained, trouble is in the amplifier. Remove amplifier for servicing.

c. Removal and Installation

If diagnosis indicates that the phototube unit must be removed for repair by an authorized warranty repair dealer (United Motors Service), the amplifier unit should also be removed and sent with the phototube unit. If the amplifier unit must be removed for repair, the phototube

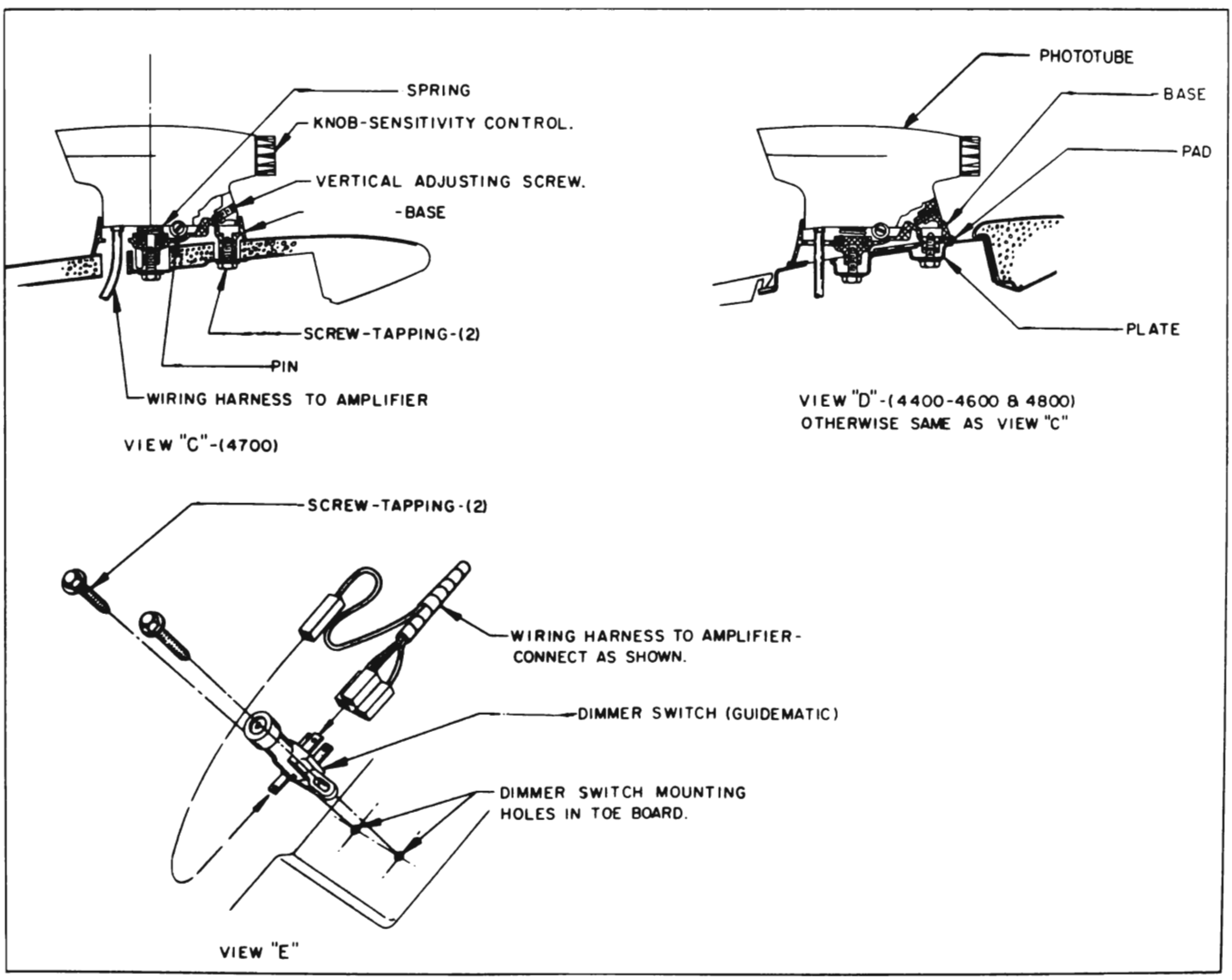


Figure 11-161—Phototube and Dimmer Switch Installation

unit need not be sent with it if diagnosis indicates it was operating satisfactorily. If car is to be driven before part is reinstalled, connect car wiring harness to foot switch to give manual operation of headlights at dimmer switch.

NOTE: Disconnect battery ground cable before removing Guide-Matic unit.

1. Phototube Unit

(a) Disconnect phototube wire from amplifier.

(b) Remove the Phillips head pivot pin from right side of phototube unit base, then lift the unit off the base and remove phototube unit and harness. See Figure 11-161.

(c) To install, reverse the procedure. Check vertical aim and dim and hold sensitivity adjustments. See subparagraph d.

2. Amplifier Unit

(a) Disconnect foot switch harness from foot switch.

(b) Disconnect phototube harness from amplifier. See Figure 11-162.

(c) Remove the amplifier attaching screws.

(d) To install, reverse the procedure. After installing the amplifier unit, check the dim and hold sensitivity adjustments. See subparagraph d.

d. Adjustments and Tests

Tester J-8465, made by Kent-Moore, is required for checking or adjusting the Guide-Matic. The tester includes a vertical aiming device No. 6 and a sensitivity test lamp. See Figure 11-163.

CAUTION: Do not reverse the polarity of Test J-8465 as damage may result to the tester and/or Guide-Matic units.

1. Phototube Unit Vertical Aiming Procedure

Proper performance of the Guide-Matic power headlight control requires that the phototube unit be accurately aimed vertically. If the unit is aimed to low, back reflections from the headlamps which are being controlled will

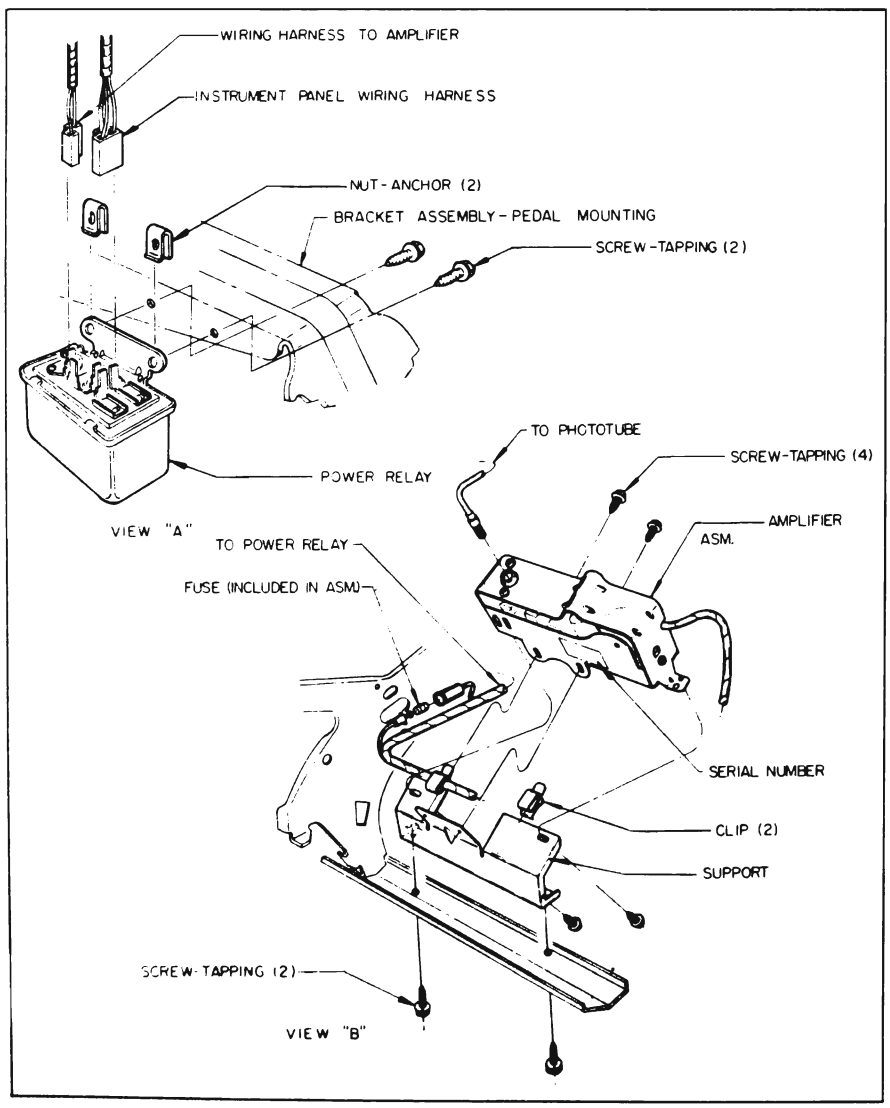


Figure 11-162—Amplifier and Power Relay Installation

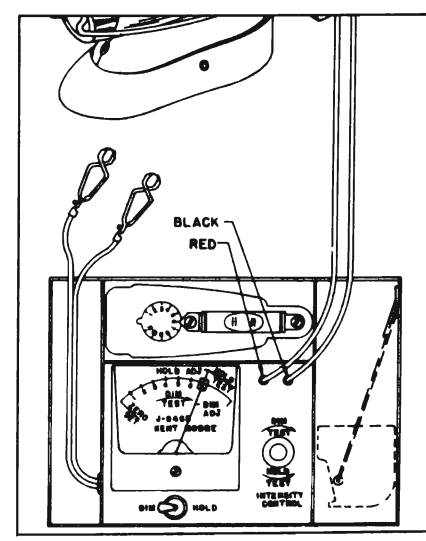


Figure 11-163—Tester J-8465

lock the amplifier on low beam. However, the unit must be aimed as low as possible to provide maximum tolerance for car loading.

(a) Phototube unit vertical aiming should be done with car unloaded, truck empty except for spare tire, gas tank at least half full, and with tires at correct pressure.

(b) Locate car on a level floor (level within 1/4" fore and aft of car).

(c) Rock car sideways to equalize springs.

(d) Set Aiming Device No. 6 on top of phototube unit as shown in Figure 11-164.

(1) The three points on aiming device must be resting on top of phototube unit.

(2) The aiming device must be touching front of phototube unit.

(e) Set aiming dial of aiming device to 6.

(f) Adjust vertical aim screw until bubble is centered in level.

2. Dim and Hold Sensitivity Tests

CAUTION: Phototube unit must be covered with a black cloth during test. Tests of adjustments on the Guide-Matic should be made with the phototube unit below 100°F. If car has been in the sun immediately prior to checking, allow it to cool in a covered place for approximately one hour before the check is actually made.

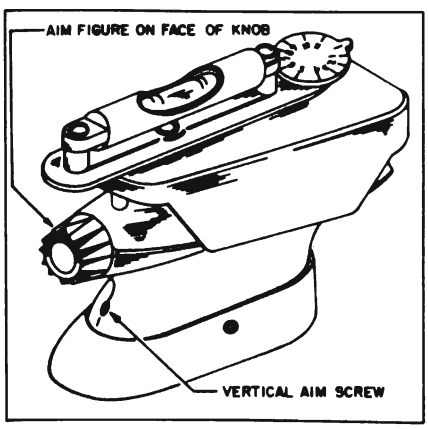


Figure 11-164—Aiming Device Installed

(a) Preparation for Tests

(1) Set driver control to detent position.

(2) Install Tester Lamp. (Use Kent-Moore Model J-8465). See Figure 11-163.

(3) Start engine and operate at fast idle while making adjustments.

(4) Turn headlamps on and wait at least 5 minutes for amplifier unit to stabilize. Place foot switch in automatic position.

(5) Turn zero corrector on face of meter until meter pointer is on "ZERO SET" line. See Figure 11-163.

(6) Turn Tester "INTENSITY CONTROL" counterclockwise.

(7) Connect battery leads of Guide-Matic tester to battery terminals.

(b) Dim Sensitivity Test

(1) Rotate tester "INTENSITY CONTROL" completely counterclockwise.

(2) Turn "DIM-HOLD" switch to "HOLD" position and then back to "DIM" position. Headlamp should be on upper beam.

(3) Turn tester "INTENSITY CONTROL" clockwise slowly just to point where headlamps switch to lower beam. The meter pointer should now read in the black "DIM ADJ." range on the meter scale. See Figure 11-163. If not, proceed to the hold and dim sensitivity adjustments.

(c) Hold Sensitivity Test

(1) Turn "INTENSITY CONTROL" all the way clockwise.

(2) Turn "DIM-HOLD" switch to "DIM" position and back to "HOLD" position to obtain a lower beam.

(3) Slowly turn "INTENSITY CONTROL" counterclockwise just to the point where headlamps switch to upper beam. The meter pointer should now read in the green "HOLD ADJ." range on the meter scale. See Figure 11-163. If not, proceed to the hold and dim sensitivity adjustments.

3. Hold and Dim Sensitivity Adjustments

CAUTION: Hold sensitivity must be properly adjusted before adjusting dim sensitivity. Phototube unit must be covered with a black cloth during adjustments.

(a) Preparation for Adjustments. Same as preparation for tests above.

(b) Hold Sensitivity Adjustment

(1) Hold and dim sensitivity controls are slotted for screwdriver adjustment and are located at the side of the amplifier unit. See Figure 11-165.

(2) Rotate the amplifier hold control completely clockwise. See Figure 11-165.

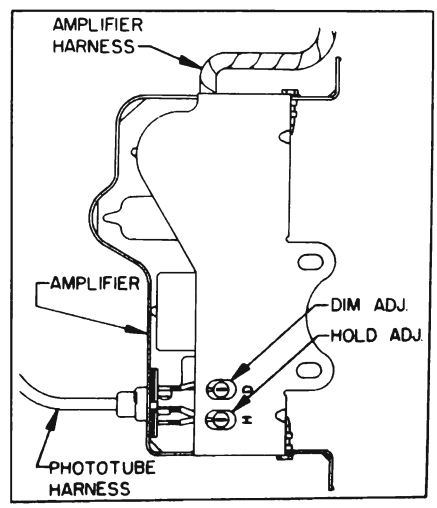


Figure 11-165—Amplifier Adjustments

(3) Rotate tester "INTENSITY CONTROL" all the way clockwise.

(4) Turn "DIM-HOLD" switch momentarily to "DIM" position to switch lights to lower beam, then switch back to "HOLD" position.

NOTE: If lights do not switch to lower beam, the amplifier dim control must be turned completely clockwise and then readjust after hold adjustment is correct.

(5) Adjust "INTENSITY CONTROL" slowly counterclockwise until meter pointer is on "HOLD ADJ." line. See Figure 11-163.

(6) Turn amplifier hold control slowly counterclockwise just to the point where headlamps switch to upper beam. Do not go beyond this setting.

(7) Recheck sensitivity as shown in Steps (1) through (3) under Hold Sensitivity Test.

(c) Dim Sensitivity Adjustment

NOTE: Dim sensitivity should not be adjusted until after hold sensitivity is properly adjusted.

(1) Rotate amplifier dim control completely counterclockwise. See Figure 11-165.

(2) Momentarily turn "DIM-HOLD" switch to "HOLD" then back to "DIM" position to obtain upper beam. See Figure 11-165.

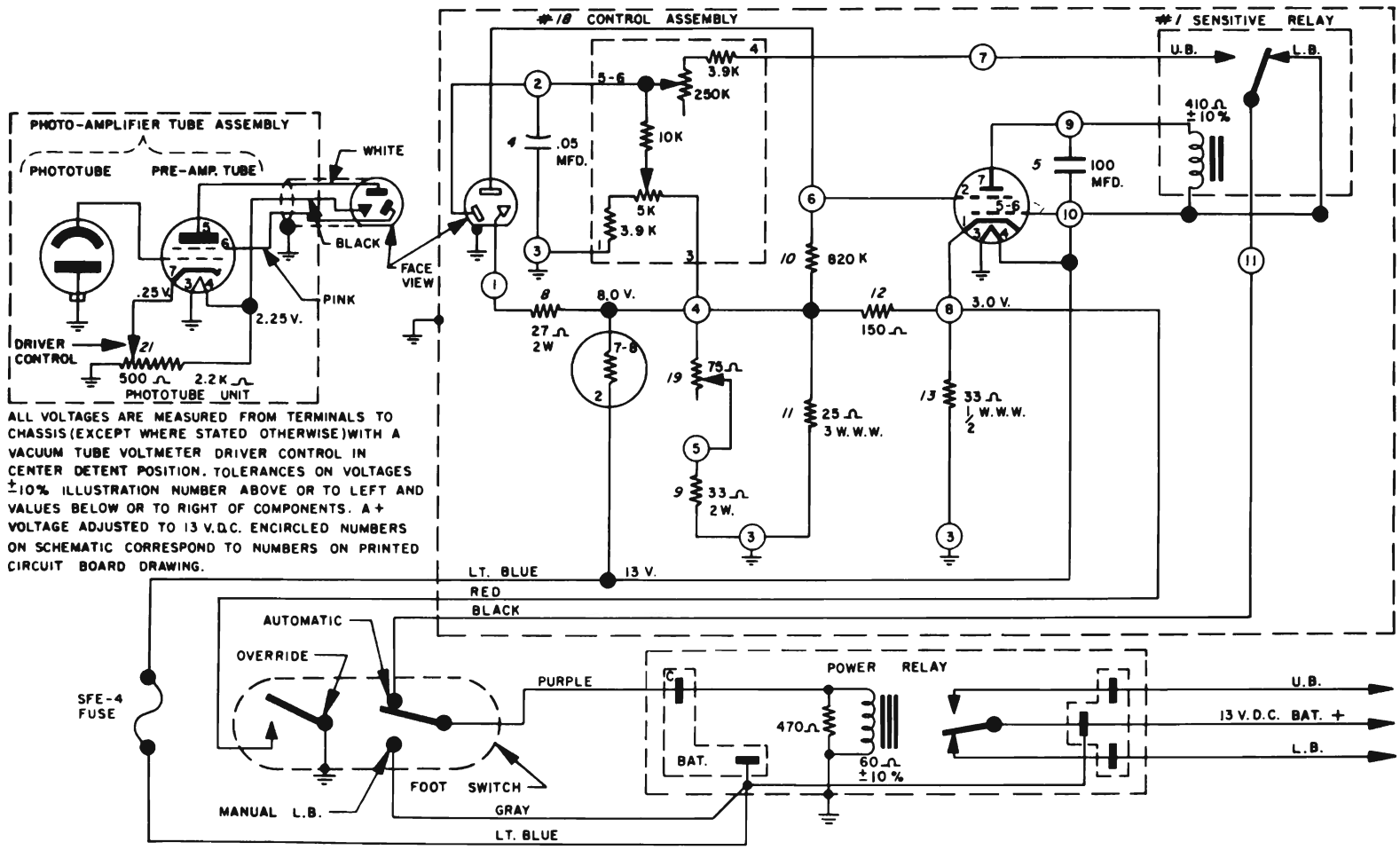
(3) Adjust tester "INTENSITY CONTROL" until meter pointer is at "DIM ADJ." line. See Figure 11-165.

(4) Slowly rotate amplifier dim control clockwise just to point where headlamps switch to lower beam. Do not go beyond this setting.

(5) Recheck sensitivity as shown in Steps (1) through (3) under Dim Sensitivity Test. If sensitivity is not correct, repeat adjustment procedure.

(6) If adjustment is correct, turn off headlamps and disconnect Kent-Moore tester.

(7) Remove tester lamp from the phototube unit.



POWER RELAY OPERATING POINTS

PULL IN (TO L.B.)	10 V.	COIL
DROP OUT (TO U.B.)	10 V.	VOLTS

SENSITIVE RELAY OPERATING POINTS

PULL IN (TO U.B.)	3.5 V. MAX.	COIL
DROP OUT (TOL.B.)	1.0 V. MIN.	VOLTS

TUBE VOLTAGES

TUBES	PIN NUMBERS																	
	1		2		3		4		5		6		7		8		9	
	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.	U.B.	L.B.
PREAMP.	0	0	0	0	0	0	2.0	2.0	3.0 3.5	.2	3.0 7.0	4.0 7.5	.25	.25				
AMP.	3.0	2.8	3.0 3.5	.2	0	0	13.0	13.0	13.0	13.0	13.0	13.0	8.0 9.5	13.0				
BALLAST	13.0	13.0	13.0	13.0	13.0	13.0	13.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	0	0

Figure 11-166—Guide-Matic Schematic Diagram