

## 1970-74 GENERAL MOTORS GUIDE-MATIC

**Buick (1970-74)**  
**Cadillac (1970-74)**  
**Oldsmobile (1970-72)**

### DESCRIPTION

Guide-Matic is a semi-automatic device which controls the car headlights in response to light from an approaching car and will switch the headlights to lower beam at a distance depending upon the setting of the driver sensitivity control. After the approaching car has passed, headlights automatically return to upper beam. The system consists of a combination photo-amplifier, power relay, special foot switch, and a sensitivity control. Units are located differently on each car as follows:

**Buick & Oldsmobile** - Photo-Amplifier is mounted on left front fender forward of the left windshield post, foot switch is mounted in usual position on toeboard. On Buick, sensitivity control is mounted on light switch with control ring directly behind and concentric with light switch. On Oldsmobile control is mounted on lower instrument panel to right of steering column.

**Cadillac** - Photo-amplifier is mounted below radiator cradle tie bar at left center of car (behind slot in grille), power relay is mounted on toe pan just above foot switch. Sensitivity control is mounted on light switch with control ring directly behind and concentric with light switch knob.

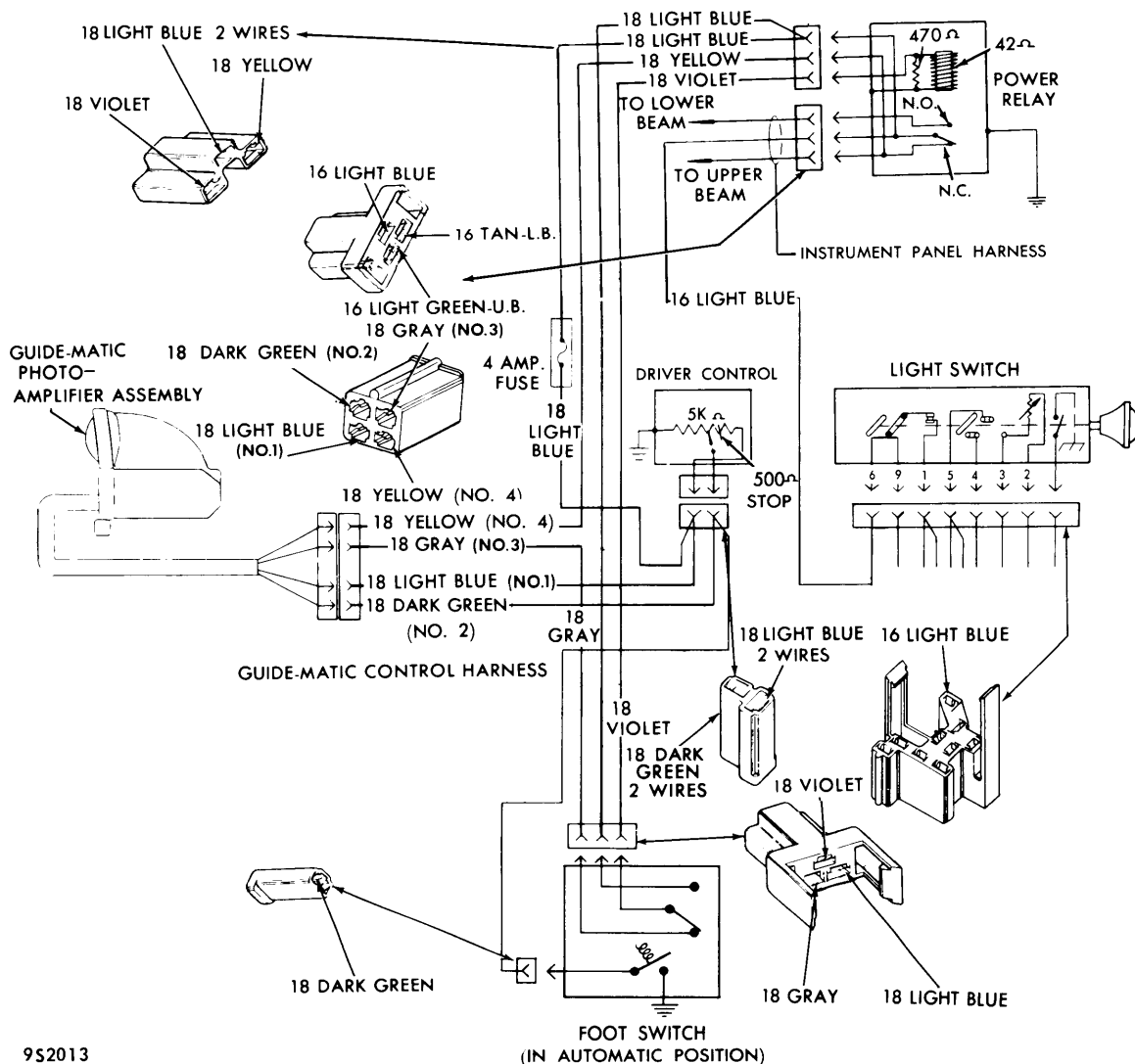
### OPERATION

#### AUTOMATIC

With system on automatic operation, lights will go to low beam whenever daylight, street light, or car light strikes the phototube. Driver may obtain high beam by overriding automatic control with a slight pressure on foot switch. Lights will return to automatic control when pressure is removed. Sensitivity is driver controlled with lever behind headlight switch and normal automatic operation is secured with pointer centered between "Off" and "Far" positions (rotating ring toward "Far" will increase sensitivity and cause headlights to switch to low beam when approaching car is farther away). Operation of Guide-Matic may be affected by reflective quality of road surfaces. To obtain furthest usable dimming distance, turn sensitivity control fully clockwise after lights dimmed for approaching car, then, after car has passed, rotate control counterclockwise slowly until lights just return to high beam.

#### MANUAL

Rotate sensitivity control fully counterclockwise so that pointer is aligned with "Off". In this position, unit will provide only High Beam with foot switch in automatic position. High and low beams can then be controlled by operation of the foot switch in the usual manner.



1970-72 CADILLAC GUIDE-MATIC CIRCUIT DIAGRAM

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## 1970-74 GENERAL MOTORS GUIDE-MATIC (Cont.)

## ADJUSTMENT

## PHOTOTUBE UNIT (VERTICAL AIMING)

With car unloaded, trunk empty, gas tank at least half full, and tire pressure correct, put car on a floor level within ¼" fore and aft of car and rock car sideways to equalize springs.

**Buick** - Photo-amplifier is mounted on fender with center line parallel to center line of car. To adjust vertical aim, mount special Level Assembly on front face of photo-amplifier with notches seated on front edge of photo-amplifier casting and extrusion on lower edge of aimer seated on extruded pad on lower part of lens, secure aimer in place with spring clamp. Use Allen wrench to turn adjusting screw on front of photo-amplifier base until level bubble is centered. Always make final adjustment by turning screw clockwise. **CAUTION** - Do not disturb screw on forward end of bubble tube. This is a calibrating screw and unit must be returned to manufacturer for recalibration if this screw disturbed.

**Cadillac** - Bubble level is permanently mounted on phototube unit. Adjust vertical aiming screw on unit until bubble is centered in level. **CAUTION** - Make final adjustment by turning screw clockwise.

## TESTING &amp; ANALYSIS

Adjusting is not recommended on electronic parts of system (except for phototube vertical aiming adjustment). The following tests will help determine which components are defective and must be replaced. Use Analyzer J-21529 with Adaptor J-22622

## PREPARATION FOR TESTS

With phototube cool to touch, put car in lighted area, adjust drive sensitivity control to center position, and operate engine at fast idle to maintain constant voltage.

**CAUTION** - Light must strike photo-amplifier face. A light source directly overhead may not accomplish this purpose.

## TEST PROCEDURE

1) Place sensitivity control in approximate center of travel between "Off" and "Far", turn light switch on. Headlights should be on Low Beam in both positions of foot switch (beam should not switch when foot switch operated). If not, make Test A.

2) With foot dimmer switch in AUTOMATIC position, slight pressure on switch should override unit and switch headlights to upper beam and return to lower beam when pressure removed (**NOTE** - If headlights do not go to upper beam, foot switch may not be in Automatic position; in this case, depress switch plunger fully, release plunger and repeat test). If this operation not secured, make Test B.

3) With foot dimmer switch in AUTOMATIC position, covering phototube opening with black cloth should cause headlights to switch to upper beam. When cloth removed, headlights should return to lower beam. If not, make Test C.

4) With foot dimmer switch in AUTOMATIC position and headlights on low beam, move sensitivity control ring pointer counterclockwise to "Off" position. Headlights should switch to high beam. If not, refer to wiring diagram and check sensitivity control for good ground.

5) If headlights perform properly in above tests (Step 1 through 4) and performance is not satisfactory, check vertical aiming adjustment. On Cadillac, make Test D "Dim & Hold Sensitivity Test" to check out photo-amplifier.

## TEST A (FUSE, DIMMER SWITCH, POWER RELAY, AMPLIFIER, DRIVER CONTROL)

1) Check for loose connections at 4-way connector near photo-amplifier. If loose, tighten connections and repeat Test Procedure (Steps 1 through 5).

2) Disconnect dark green wire at foot switch. If low beam can now be obtained in both positions of foot switch, replace shorted foot switch. If high beam obtained in one position of foot switch, disconnect photo-amplifier and connect a 12 volt test bulb between ground and light blue wire in 4-way interconnecting harness connector.

3) If bulb does not light, check continuity of blue wire through power relay and light switch (possible loose connection). If bulb lights, connect test bulb between battery and dark green wire in 4-way interconnecting harness connector. Rotate driver control ring. If bulb does not turn on and off, check for loose connection at driver control 2-way connector or for defective driver control.

4) If rotating driver control ring turns bulb on and off, place headlights on high beam (change foot switch position if necessary). Connect test bulb between ground and yellow wire in 4-way interconnecting harness connector. If bulb does not light, check for loose connection at power relay. If bulb lights, connect jumper between positive battery voltage and grey wire in 4-way interconnecting harness connector.

5) If lights remain on low beam in both positions of foot switch, replace photo-amplifier. If headlights do not remain on low beam in both positions of foot switch, check for defective power relay or foot switch.

## TEST B (OVER-RIDE CIRCUIT)

If dark green wire at foot switch not disconnected and automatic position cannot be found, ground dark green wire. If automatic position of foot switch (high beam) can now be found, replace foot switch. If automatic position cannot be found, replace photo-amplifier assembly.

## TEST C (PHOTOTUBE &amp; AMPLIFIER)

Disconnect photo-amplifier at 4-way connector. If headlights switch to high beam, replace photo-amplifier.

## TEST D (DIM &amp; HOLD SENSITIVITY)

**NOTE** - Sensitivity controls in photo-amplifier are adjusted and sealed at the factory (case filled with epoxy) so adjustment can be made in the field. Following test is only to determine if driver control can be adjusted to provide a minimum acceptable dimming sensitivity (switch to low beam) and hold sensitivity (return to high beam). Use Guide-Matic Analyzer (J-21529) with adapter (J-22622).

**ANALYZER ADAPTER NOTE:** Unit previously designed for use in testing Twilight Sentinel. Analyzer test bulb assembly must be adapted to supply a calibrated light source. A dome shaped filter is glued into adapter to reduce light intensity to correct figure. Use only #53 bulb, making sure filament of bulb is standing fairly straight up so that minimum of side is exposed to end of bulb. End of bulb should be approximately flush with end of rubber sleeve.

1) Install analyzer test bulb assembly into smaller diameter hole in rear of adapter head. Push bulb and rubber sleeve forward until they stop against inner bulkhead wall of adapter head (see illustration).

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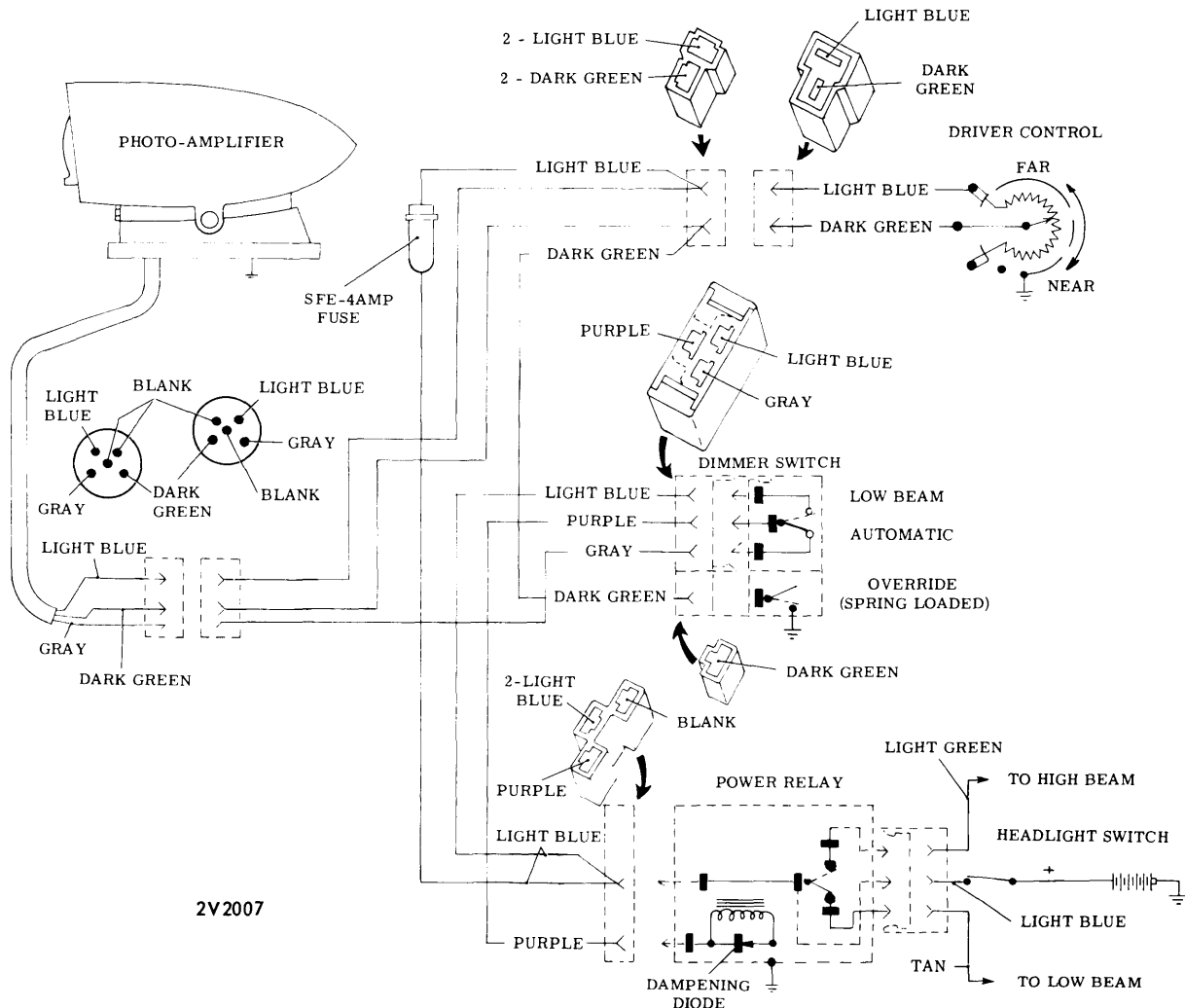
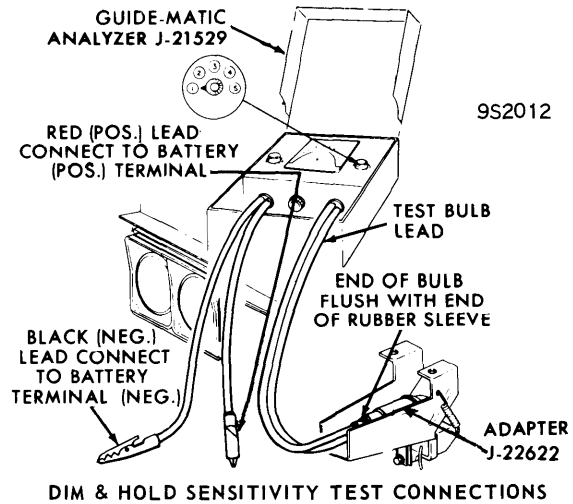
2) Cover photo-amplifier with black cloth, rotate analyzer function selector switch to #1 position. Rotate driver control ring pointer counterclockwise to "off" position, then turn on headlights and operate at fast idle. Place foot switch in automatic position.

3) Adjust voltage control knob until meter reads 7.0 volts. Slowly rotate driver control ring clockwise until headlights just switch to low beam. Check driver control adjustment by rotating analyzer voltage control knob counterclockwise until lights switch to high beam, then slowly rotate knob clockwise until lights switch to low beam. Voltmeter should read between 6.5 and 7.0 volts. If reading does not agree, repeat procedure.

4) Rotate analyzer voltage control knob counterclockwise to a reading that is one volt less than reading obtained when lights switched to low beam in Step 3. Wait four seconds (lights should remain on low beam). Rotate voltage control knob counterclockwise to a reading 3 volts less than reading obtained when lights switched to low beam in Step 3 (lights should switch to high beam within 4 seconds).

5) If this minimum dim and hold sensitivity can be obtained at any position of driver control ring, unit is functioning properly. If dim sensitivity (switching to low beam) cannot

be adjusted, replace photo-amplifier. If dim and hold sensitivity readings are close together on analyzer voltmeter (less than 1 volt), check for open yellow wire between power relay and 4-way connector near photo-amplifier. If this wire OK, replace photo-amplifier.



**BUICK & OLDSMOBILE GUIDE-MATIC CIRCUIT DIAGRAM**

