1970-73 GENERAL MOTORS TWILIGHT SENTINEL

Buick (1970-73)
Cadillac (1970-73)

DESCRIPTION

System automatically controls on-off operation of headlights, tail lights and instrument panel lights in response to amount of daylight in which car is being operated. A time delay control allows lights to remain on for a preselected period after ignition is turned off. Component location differs on individual car models as follows:

Buick – Photocell (with "Early-Late" sensitivity disc) and Time Delay Control are located in a unit mounted on left windshield post, exposing photocell to direct sunlight entering through windshield. Amplifier is mounted behind instrument panel on left side.

Cadillac – Photocell is mounted with sensing surface upward and is located under left hand radio front speaker grille. In this position, photocell is exposed to direct outside light entering windshield. Amplifier unit is mounted on lower steering column cover (this unit also contains turn-off time delay, sensitivity relay, and power relay). Time delay turn-off control switch is mounted on back of regular light switch and is controlled by a ring which is located directly behind and concentric with light switch knob. An additional feature, is a warning buzzer that will sound when a door is opened (with ignition off) and manual light switch is left on in either position.

OPERATION

AUTOMATIC

1) With time-delay control ON, ignition switch ON, and regular headlight switch OFF, photocell is responsive to amount of daylight and will automatically turn on headlights when daylight decreases to a point where headlights are required for safe driving. Driver adjustment of time when headlights turn on is provided by rotating cap on top of photocell (Buick only – cap marked "Early-Late", not used on Cadillac). Circuit is designed so lights will not go on or off when there are sudden changes in lighting such as going through tunnels, passing under bright lights, etc. This is accomplished by a 10-60 second delay before amplifier switches system either on or off.

2) A variable time-delay switch control permits driver to select a delay period of from a few seconds to a maximum of 1½-4½ minutes for headlights to go off after ignition switch is turned off. Additional lighting may be provided (during this period) by turning on cornering lights (if equipped). All lights will turn off automatically at end of time-delay period selected by driver.

MANUAL

Manual operation of lights can be obtained by rotating time-delay control knob to OFF position. This disables twilight sentinel by disconnecting ground circuit. Lights will now operate only by use of regular light switch.

TESTING & DIAGNOSIS

Make sure time-delay control is in ON position, photocell is not obstructed, lighting system operates correctly manually, manual headlight switch is OFF, and that fuses are not blown.

CHECKING PROCEDURE

Buick – Follow procedures in sequence listed.

1) Rotate photocell "Early-Late" disc to extreme clockwise (Early) position, place "Off-Max. Delay" control just clockwise of OFF position, make certain manual light switch is off. Turn ignition on but do not start engine. Car lights should turn on within 3 seconds. If car lights do not turn on in this time, make Test A.

2) Rotate photocell "Early-Late" disc to extreme counter-clockwise (Late) position. Shine bright light (2-cell flashlight with good batteries) through windshield to photocell window. Car lights should turn off in 10-60 seconds. If car lights do not turn off in this time, make Test B.

3) Rotate "Off-Max. Delay" control to extreme clockwise (maximum time delay) position. With ignition turned on, car lights should turn on within 10-60 seconds. Turn ignition off. Car lights should remain on for 1½-4½ minutes and then turn off. If not, make Test C.

4) System is operating correctly if it checks out in steps 1, 2, & 3.

Cadillac – Follow procedures in sequence listed.

1) Place black cloth over photocell opening, turn manual headlight switch off, then rotate time delay control to ON position with pointer approximately straight down. Turn ignition on but do not start engine. Lights should turn on within 60 seconds. If lights do not turn on in this time, make Test A.

2) Remove black cloth from photocell opening and shine bright light into opening. Car lights should turn off within 60 seconds. If lights do not turn off in this time, make Test B.

3) Cover photocell opening with black cloth and rotate time delay control ring pointer to maximum time delay position. Wait until headlights turn on and then turn ignition off. Car lights should remain on from 1½-4½ minutes and then turn off. If not, make Test C.

4) System is operating correctly if it checks out in steps 1, 2, & 3. If operating correctly in above steps but turn-on time is incorrect, make Minor Sensitivity Adjustment.

TEST A (FUSE, PHOTOCELL, AMPLIFIER)

1) If headlights turn on but tail lights do not, check tail light fuse. Turn manual headlight switch on; if lights do not turn on, car wiring is defective. If lights turn on, check wiring and connections between amplifier and light switch.

2) Check for loose ground connection or loose wiring harness connection at amplifier unit. Connect jumper wire between body ground and purple wire in amplifier 10-way connector; if lights turn on, check ground path through manual switch section of turn-off time delay control.

3) Disconnect either one of the black wires (amplifier-to-photocell) from amplifier 10-way connector; if lights turn on, replace photocell and make sensitivity adjustment (Cadillac only). *See "Sensitivity Test & Adjustment".*

4) If lights fail to turn on after completing steps 1 through 3, replace amplifier and make sensitivity adjustment (Cadillac only). *See "Sensitivity Test & Adjustment".*

1970-73 GENERAL MOTORS TWILIGHT SENTINEL (Cont.)

TEST B (AMPLIFIER & PHOTOCELL)

1) Check for open wire connections between amplifier and photocell, then connect jumper wire between black and grey amplifier-to-photocell wires in 10-way connector on side of amplifier. If lights turn off within a few seconds, photocell is disconnected, not mounted properly, or defective. If lights remain on, amplifier must be replaced and sensitivity must be readjusted (Cadillac only). See *"Sensitivity Test & Adjustment"*.

2) Before replacing amplifier, make certain amplifier is securely mounted and properly connected.

TEST C (AMPLIFIER)

No Time Delay Or Insufficient Time Delay – Check for shorted wiring and defective time delay control potentiometer. If no defects are found, replace amplifier.

Excessive Time Delay After Ignition Turn-Off – Check for open wire connection or open time delay control. If no defects are found, replace amplifier.

SENSITIVITY ADJUSTMENT (CADILLAC ONLY)

NOTE – Buick photocell has "Early-Late" driver control knob, no other sensitivity adjustment is required.

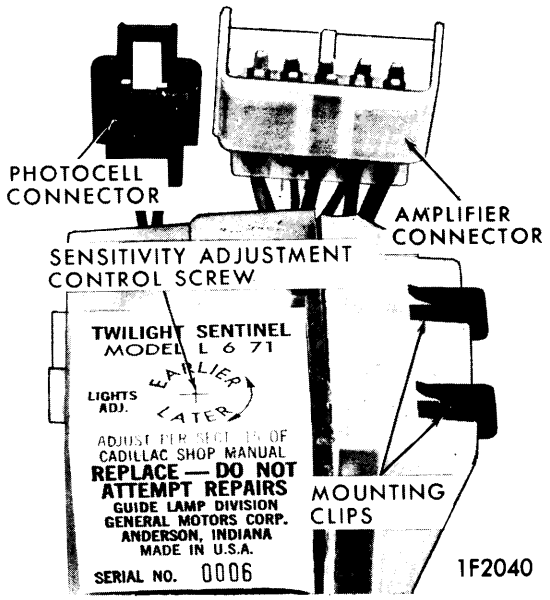
If a photocell or amplifier is defective, both must be replaced as a matched set since no provision is made for adjusting a mismatched unit. If owner is dissatisfied with evening turn-on time or morning turn-off time, follow recommended correction procedure to advance or retard operational times as outlined below:

HEAD LIGHTS TURN ON TOO LATE IN EVENING OR OFF TO EARLY IN MORNING

With ignition and headlight switch turned off, cover photocell so no light is striking it. Take a resistance reading between black and purple wire terminals in amplifier 10-way connector. Puncture paper seal and adjust control screw counterclockwise (earlier) until resistance reading is one-half that obtained above. In the event the amplifier has been previously adjusted (paper seal will have been broken), set resistance value to 4100-4500 ohms.

HEADLIGHTS TURN ON TO EARLY IN EVENING OR OFF TOO LATE IN MORNING

Follow same procedure as above, turning screw clockwise (later) until resistance reading is one and one-half times the original reading.



SENSITIVITY ADJUSTMENT CONTROL