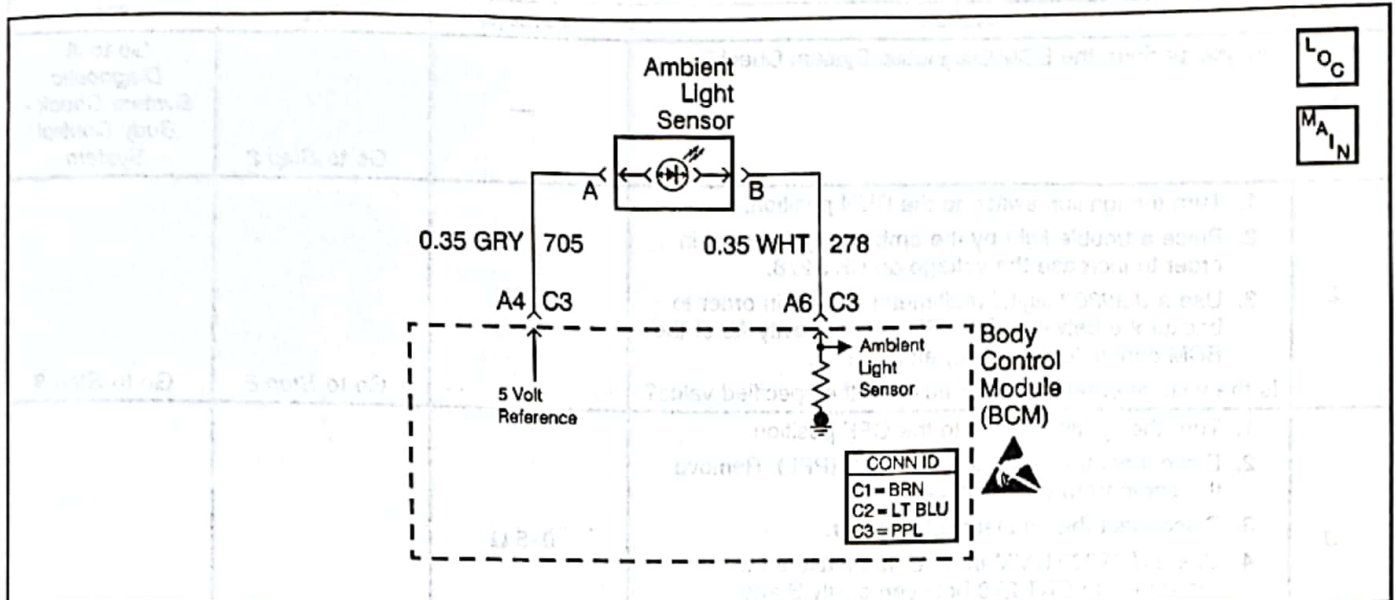## DTC B2647 Ambient Light Sensor Circuit Low

357942

Circuit Description

The body control module (BCM) monitors CKT 278 in order to determine if either of the following lamps should be turned ON when the headlamp and panel dimmer switch is in the AUTO mode:

- The daytime running lamps (DRL)
- The headlamps

The DRL will be commanded ON when the following conditions exist:

- The BCM senses that the ambient light sensor voltage is between 2.2–4.7 volts.
- The sensor resistance is low.

The headlamps will be commanded ON when the following conditions exist:

- The BCM senses that the ambient light sensor voltage is between 0.2–1.3 volts.
- The sensor resistance is high.

If the BCM senses that the current on CKT 278 is less than 0.2 volts, the BCM will set DTC B2647.

Conditions for Setting the DTC

- The ambient light sensor input voltage is less than 0.2 volts. This low voltage occurs when CKT 278 is shorted to ground.
- The system voltage is between 9.0–16.0 volts.
- The above conditions exist for 0.5 seconds.

Action Taken When the DTC Sets

The automatic headlight control will be turned ON.

Conditions for Clearing the MIL/DTC

- DTC B2647 will clear immediately when open or short to ground is no longer detected.
- A history DTC will clear after 100 consecutive ignition cycles without a fault present.
- History and current DTCs may be cleared using a scan tool.

Diagnostic Aids

- Always perform the first DTC that is listed on the scan tool if more than one is displayed.
- Verify that the scan tool displays DTC B2647 as a current code before you perform diagnostics.
- Inspect for loose or poor connections at all of the related components.
- Refer to *Intermittents and Poor Connections Diagnosis* in Wiring Systems.
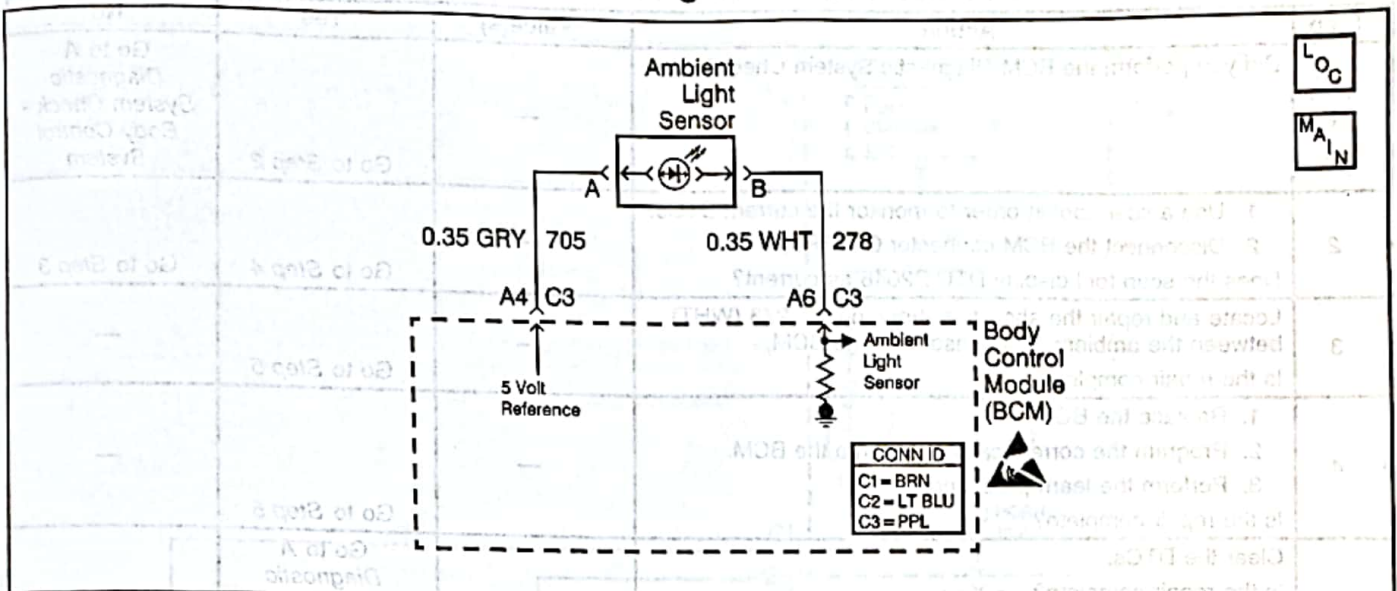
Test Description

The numbers below refer to the step numbers on the diagnostic table.

2. This step determines if the BCM is defective.
3. This step tests the ambient light sensor CKT 278 for an open.
4. This step tests CKT 278 for a short to ground.

DTC B2647 Ambient Light Sensor Circuit Low

Step	Action	Value(s)	Yes	No
1	Did you perform the BCM Diagnostic System Check?	—	Go to *Step 2*	Go to *A Diagnostic System Check - Body Control System*
2	1. Turn the ignition switch to the RUN position. 2. Place a trouble light by the ambient light sensor in order to increase the voltage on CKT 278. 3. Use a *J 39200* digital multimeter (DMM) in order to backprobe between CKT 278 (WHT) cavity A6 of the BCM connector C3 (PPL) and ground. Is the voltage greater than or equal to the specified value?	1 V	Go to *Step 8*	Go to *Step 3*
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the BCM connector C3 (PPL). Remove the comb from the connector. 3. Disconnect the ambient light sensor. 4. Use a *J 39200* DMM in order to measure the resistance in CKT 278 between cavity B and cavity A6. Is the resistance within the specified range?	0–5 Ω	Go to *Step 4*	Go to *Step 5*
4	Connect a test lamp from CKT 278 cavity B to good power source. Does the test lamp light?	—	Go to *Step 6*	Go to *Step 7*
5	Locate and repair the open in CKT 278 (WHT) between the ambient light sensor and the BCM. Is the repair complete?	—	Go to *Step 9*	
6	Locate and repair the short to ground in CKT 278 between the ambient light sensor and the BCM. Is the repair complete?		Go to *Step 9*	
7	Replace the ambient light sensor. Is the repair complete?		Go to *Step 9*	
8	1. Replace the BCM. 2. Program the correct calibrations into the BCM. 3. Perform the learn procedure. Is the repair complete?		Go to *Step 9*	
9	Clear the DTCs. Is the repair complete?	—	Go to *A Diagnostic System Check - Body Control System*	

DTC B2648 Ambient Light Sensor Circuit High

357942

Circuit Description

The body control module (BCM) monitors CKT 278 in order to determine if either of the following lamps should be turned ON when the headlamp and panel dimmer switch is in the AUTO mode:

- The daytime running lamps (DRL)
- The headlamps

The DRL will be commanded ON when the following conditions exist:

- The BCM senses that the ambient light sensor voltage is between 2.2–4.7 volts.
- The sensor resistance is low.

The headlamps will be commanded ON if the following conditions exist:

- The BCM senses the ambient light sensor voltage is between 0.2–1.3 volts.
- The sensor resistance is high.

If the BCM senses voltage on CKT 278 above 5.25 volts, the BCM will set DTC B2648.

Conditions for Setting the DTC

- The ambient light sensor voltage is greater than 5.0 volts, which indicates that CKT 278 is shorted to battery.
- The system voltage is between 9.0–16.0 volts.
- The above conditions exist for 0.5 seconds.

Action Taken When the DTC Sets

The automatic headlamp control will remain ON in any ambient light state.

Conditions for Clearing the MIL/DTC

- This DTC will clear immediately when the short to battery is no longer detected.
- A history DTC will be cleared after 100 consecutive ignition cycles without a fault present.
- History and current DTCs may be cleared using a scan tool.

Diagnostic Aids

- Always perform the first DTC that is listed on the scan tool if more than one is displayed.
- Verify that the scan tool displays DTC B2648 as a current code before you perform diagnostics.
- Inspect for loose or poor connections at all of the related components.
- Refer to *Intermittents and Poor Connections Diagnosis* in Wiring Systems.

Test Description

The number below refers to the step number on the diagnostic table.

2. This step determines if the BCM is defective or if there is a short to battery voltage.

DTC B2648 Ambient Light Sensor Circuit High

Step	Action	Value(s)	Yes	No
1	Did you perform the BCM Diagnostic System Check?	—	Go to *Step 2*	Go to *A Diagnostic System Check - Body Control System*
2	1. Use a scan tool in order to monitor the current DTCs. 2. Disconnect the BCM connector C3 (PPL). Does the scan tool display DTC B2648 as current?	—	Go to *Step 4*	Go to *Step 3*
3	Locate and repair the short to battery in CKT 278 (WHT) between the ambient light sensor and the BCM. Is the repair complete?	—	Go to *Step 5*	—
4	1. Replace the BCM. 2. Program the correct calibrations into the BCM. 3. Perform the learn procedure. Is the repair complete?	—	Go to *Step 5*	—
5	Clear the DTCs. Is the repair complete?	—	Go to *A Diagnostic System Check - Body Control System*	—