

# Chassis Cab Exterior Lighting Modifications

Ram Trucks | Ram Engineering | Connecting LED Tail Lamps Video

## Explanation of Bulb out Detection Feature

Ram trucks have the ability to perform lighting diagnostics on all exterior lighting circuits, excluding trailer tow circuits. These lights and their associated diagnostics are controlled by the central body controller (CBC). The CBC continuously monitors all lighting circuits for short and open circuit conditions by comparing the current load on the circuit to that of the anticipated factory condition load. If a condition causes the load to go outside this predefined range, the CBC will set a diagnostic trouble code (DTC) and may send a notification to the cluster about the bulb that is out of range and/or turn off the output. If the bulb is a turn signal, the cluster will “fast flash” the turn signal indicator of the appropriate turn signal (left or right).

An out of range condition can easily be created through modification or disconnecting of the exterior lighting circuits. This document will outline what you need to know about avoid this condition and its effects on Ram trucks.

Caution: Exterior lighting circuits have NO FUSING between the lights and the driver on the CBC. Excessive loads placed on the lighting circuit may cause damage to the CBC and result in expensive repairs. The guidelines in this document must be followed when modifying exterior lighting.

## Rear Bulb Out Detection Disabling

*Note: NHTSA requires turn signal bulb out detection on some vehicle configurations. It is the upfitter’s responsibility to confirm that the vehicle is complaint with FMVSS 108 when delivered to the end user.*

In order to prevent pop ups and DTCs related to rear lighting, bulb out detection must be disabled. Disabling bulb out detection will also eliminate any existing DTCs and pop ups that may have already occurred.

Starting in 2016 model year, certain Ram truck configurations will have bulb out detection disabled from the factory on REAR FACING LIGHTING ONLY. These configurations are as follows:

- All 4500 and 5500 cab chassis
- All dual rear wheel 3500 cab chassis (dual rear wheels are standard on 3500 cab chassis)
- All box delete 2500 and 3500 pickups (sales code XBC)

For all other configurations, the following options are available to disable bulb out detection on REAR FACING LIGHTING ONLY.

### **Method A – Recommended**

Also new for 2016, all 2500, 3500, 4500, and 5500 can have rear bulb out detection disabled at an authorized dealer. If your dealer is not familiar with this procedure, inform them that the sales code LB6 must be added to the vehicle using the “Vehicle Option Updates” tool. Once the sales code is associated to you VIN, a vehicle reconfiguration must be performed with a service tool to update the truck.

### **Method B**

Circuit L950 is a blunt cut LG/WT wire that can be grounded to disable rear bulb out detection. This circuit, along with several others, is found in location H which is underneath the power distribution center (PDC) next to the driver’s side fender. These wires are secured to a PDC wiring harness with tear tape and can be pulled out for easier access. Note: These are the same wires found inside the fender for 2013-2014 model years that were relocated under the PDC in 2015 for easier access. See “Upfitter Wire Interface Instructions” of “Upfitter Electrical Instructions” for more details.

Rear facing lighting includes: stop/turn lights, backup lights, CHMSL light (when equipped), and rear park lights.

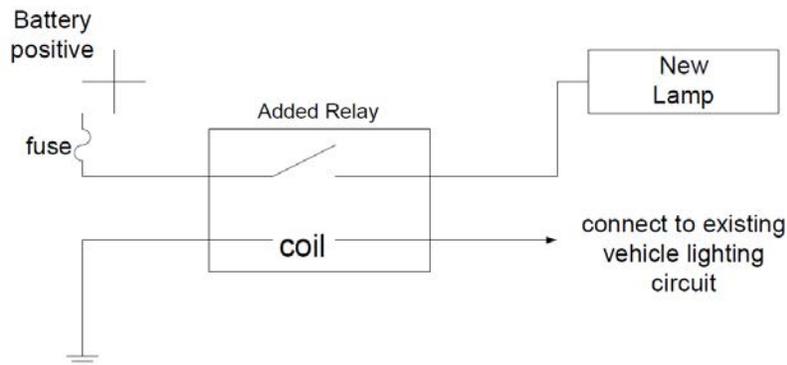
### **Modifying Exterior Lighting on Ram Trucks**

Once bulb out detection has been disabled, the OEM lighting can be replaced with aftermarket components as long as the overall load of the lighting doesn’t exceed the max current rating of the circuit. The table below shows the max current ratings for each of the lighting outputs.

Circuit	Max Continuous Current Rating (A)
Stop/Turn	9
Reverse	4.5
Park	3.5
CHMSL	3

Note that these ratings are separate for the left and right circuits, but the wires CANNONT BE PHYSICALLY COMBINED to double the max continuous current rating. Instead, left side lighting should be wired to the left side circuitry and right to the right to take full advantage of the current maximums on both sides of the vehicle.

Finally, if these ratings are insufficient to support the desired lighting, a relay must be used. The diagram below shows an example of how the relay should be wired to power additional lighting.



### **Over Current (Short) Conditions**

The body controller will consider any load that exceeds the limits above to be a short circuit. This can be caused by placing too many lights on a signal circuit, installing too large of a light, or connecting the lighting circuit directly to ground. When this occurs, the CBC will turn off the overloaded lighting circuit in order to protect its hardware from failure. If it is determined with a volt meter, test light, or other means that a lighting output has been disabled, it can be re-enabled by eliminating the load condition causing the short and cycling the ignition off and back to run. If cycling the ignition doesn't re-enable the circuit, then it's possible that the driver on the CBC has been permanently damaged.

Note that an over current situation may not be encountered until the vehicle's engine is running. This is because the vehicle's charging system will increase the battery voltage when the engine is running. Increasing voltage will increase current draw of the load, potentially triggering short circuit detection.

### **Re-enabling Bulb out Detection**

If it is determined that bulb out detection must be re-enabled ensure that the OEM lighting, or lighting with an equivalent load has been installed before following the steps below. Failure to do so will result in DTCs and possible faults displaying in the cluster.

#### **Method A**

If this method was followed to disable bulb out detection, or if your vehicle came from the factory with bulb out detection disabled, an authorized dealer can enable bulb out detection on your vehicle.

If your dealer is not familiar with this procedure, inform them that the sales code 5QR must be added to the vehicle using the "Vehicle Option Updates" tool. Once the sales code is associated to your VIN, a vehicle reconfiguration must be performed with a service tool to update the truck.

### **Method B**

If method B was used to disabled bulb out detection, simply unground the wire and isolate or remove any bare wire used to make the ground connection.

### **Forward Facing Lighting**

Modification of the forward facing lighting and its associated circuitry is generally not advised. For 2015 and beyond, snow plow upfits should make used of the dedicated snow plow wiring found under the power distribution center. See Snow Plow Installation for more details.