

### 1. No output:

If the bulb does not light up, disconnect the electrical connector and flip it 180°, then reinstall.

### 2. Incorrect beam pattern:

If the beam pattern does not appear correct, or is skewed, carefully inspect the mounting and position of the bulb in the headlamp. In most cases, this is due to misalignment or a problem with rotation. Make sure the bulb is vertically aligned in the socket, and adjust the rotation if necessary using the steps on page 3.

### 3. Flickering:

If you experience flickering while the vehicle is running, or a bulb out error, you may need Anti-Flicker modules for your vehicle's electrical system. Contact Diode Dynamics for assistance.

### 4. Fitment:

If the bulb does not seem to fit properly in the headlamp socket, check to confirm the SL1 bulb size matches that of your original bulb. If it seems too tight in the socket, carefully align the bulb so it is completely straight with tabs in the correct position, push the bulb evenly and firmly into the socket, then apply adequate rotational force to lock the bulb in place. If you experience trouble, you may adjust or remove the red rubber o-ring and attempt reinstall. Contact Diode Dynamics if you still experience any trouble.

### 5. Fitment:

While Diode Dynamics has tested hundreds of headlamps for compatibility and fitment, in certain vehicles, the SL1 bulb may not fit due to overall constraints in size and space, especially for some vehicles with dust caps. Please contact Diode Dynamics for assistance if it does not appear that the SL1 will fit properly in your vehicle.

### This installation guide is for the following SKU:

**DD0215P** H8 SL1 LED (pair)  
**DD0216P** H10 SL1 LED (pair)  
**DD0217P** H11 SL1 LED (pair)  
**DD0218P** 9005 SL1 LED (pair)

**DD0219P** 9006 SL1 LED (pair)  
**DD0220P** H9 SL1 LED (pair)  
**DD0323P** 9012Ram SL1 LED (pair)  
**DD0340P** 9012 SL1 LED (pair)

**SL1**  
**LED**  
**HEADLIGHT**

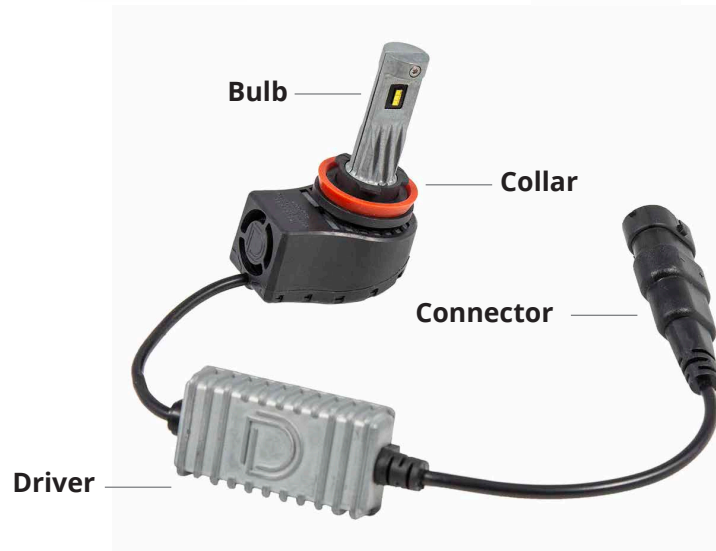
**DIODE DYNAMICS**  
 PERFORMANCE LIGHTING TECHNOLOGY

## Installation Instructions

Thank you for your purchase of the new SL1 LED from Diode Dynamics! These LEDs are a direct plug-and-play replacement for your factory bulbs.

### Features

- Correct optical focus for Street Legal photometric output
- Engineered and manufactured in USA
- Zinc die-cast heatsink and active cooling system for high reliability
- 5700K modern white color
- Copper core PCB for maximum heat transfer
- Rotatable collar



### Important Notes

- The SL1 LED bulb should only be used with 12V systems.
- When operating, the integrated Sunon® MagLev active cooling fan will produce noise. This is normal.
- When operating, the exposed metal areas of the bulb and driver box will become warm. This is normal.
- Do not look directly at the LED emitters during operation, as they are of extremely high intensity.

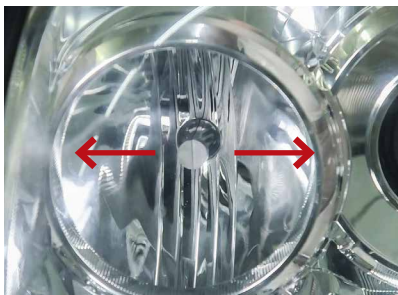
## Installation



**1. Referencing your vehicle's user manual or online resources, locate and remove your factory bulb.** In most cases, the bulb must be disconnected from the factory electrical connector, and turned counterclockwise to remove.

**2. Install the SL1 LED bulb into the bulb socket, and turn to lock into position.**

**NOTE:** In some applications, the fitment may be extremely tight. Ensure the tabs are aligned properly, push the bulb evenly and firmly into the socket, then apply adequate rotational force to lock the bulb in place. If you experience trouble, you may adjust or remove the red rubber o-ring and attempt reinstall.



**3. Check to make sure the bulb is aligned so that light is shining out to the sides horizontally. Adjust rotation if necessary.**

If the SL1 is tilted at an angle when installed on your vehicle, correct this by adjusting the rotatable collar. See collar adjustment instructions on page 3.



**4. Plug the SL1 connector into the factory electrical socket.**

**NOTE:** If your order included Anti-Flicker modules to correct power signals on certain vehicles, plug the Anti-Flicker module in to the factory socket first, then connect the SL1 to the Anti-Flicker module.

**5. Power the SL1 bulb to test function.**

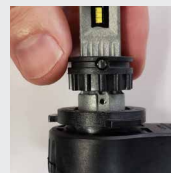
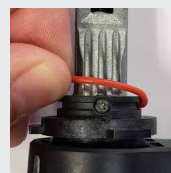
**NOTE:** If the bulb does not illuminate, unplug the connector, flip 180°, and re-connect. The bulb requires correct polarity, and will only illuminate with the connector in one orientation.

**6. Tuck all wiring.** If your headlamps use dust caps, the driver and wiring can be tucked into the headlamp and sealed inside using the original dust cap. The SL1 bulb and driver have been designed to operate in a sealed environment.

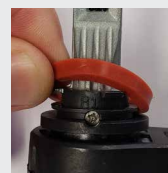
**7. Confirm the alignment of your headlamps by following headlamp aiming procedures in your vehicle manual.** Enjoy the increased output and modern LED appearance from your new SL1 LEDs!

## Collar Adjustment

**H10, 9005,  
9006, 9012**



**H8, H9, H11**



**1. Remove the red o-ring.**

**2. Use a small Philips screwdriver to remove the collar screw.**

**3. Pull the inner collar up and off the bulb.** Take note of how the inner and outer collar interlock with each other. If the two parts are tightly joined, remove both and pull apart.

**4. Rotate the collar with the tabs to the required position to achieve vertical positioning once installed.**

**5. Reassemble the two pieces together, and place back onto bulb, making sure the hole is aligned for the screw to fit in place.**

**6. Fasten in place with the screw, then reinstall red o-ring.** Test and re-adjust as necessary.

*See back for troubleshooting instructions.*

## SL1 LED Headlight

**Aftermarket or OEM?** If you're looking to improve visibility on your Dodge Charger at night, you've probably found many options for LED upgrades. Most bulbs on the market are too big to install, don't work with the electrical system, and have no focus or hotspot in the beam pattern. Even if they come close on those aspects, they still aren't anything close to the quality you would find with factory-installed lighting. Like most aftermarket products, most LED bulbs are not engineered and tested for long-term reliability.

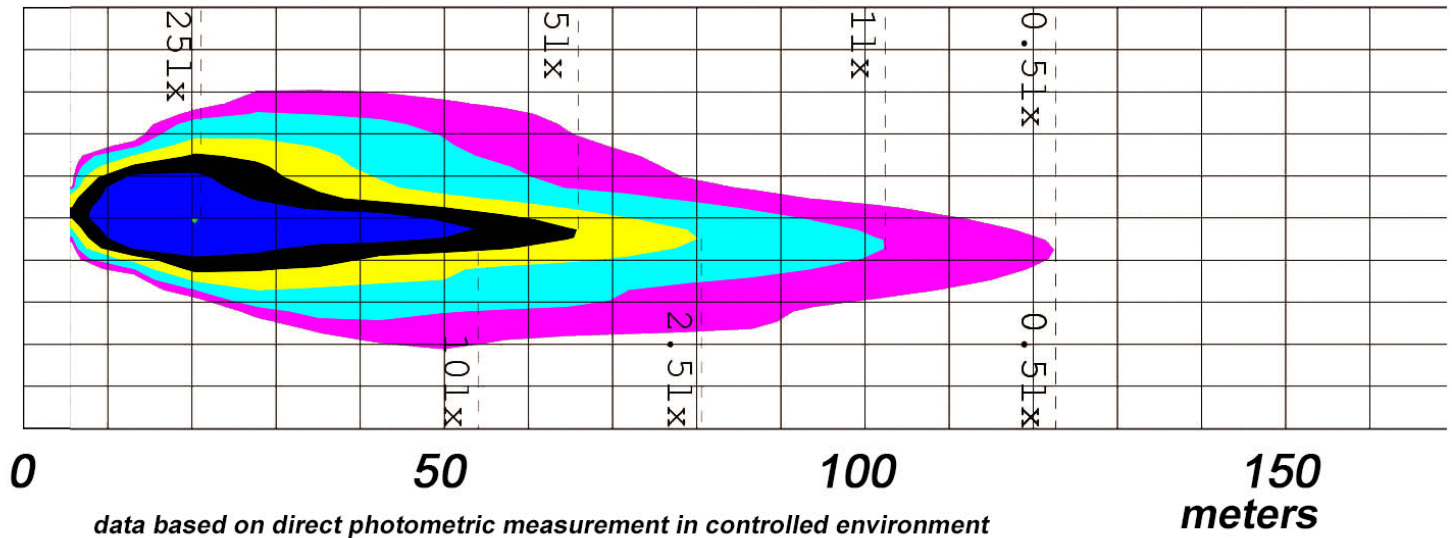
With the SL1 LED, Diode Dynamics set out to engineer a true OEM-grade solution. With its compact size, optically correct output, flow-simulated cooling, and boost-mode electrical circuit, the SL1 LED is a properly-engineered solution that finally provides a **true upgrade in performance, with high reliability**: and it's tested and validated to meet those standards, just like OEM lighting.

**Compact Size.** Your order includes two bulbs, to replace the factory bulbs on your Charger that function as both low and high beam. The bulbs are compact in size, in a patented design that isn't much bigger than the original halogen bulb. The drivers are compact too! If you have a sealed headlamp, they are designed to fit inside. The drivers and bulbs are tested to last over time, even when sealed inside with the heat of the headlamp.

**Street Legal Output.** Don't be fooled by high lumen numbers or "projector specific" bulbs. Your Charger headlights are designed as a system, to focus light. If the light source in that system is out of focus, it doesn't matter how bright it is. You won't have a focused hotspot of light to shine down the road, you'll just have more glare. To correct this, the SL1 LED headlight bulb was engineered with advanced optical design software, which simulates each ray of light in a process known as "ray tracing." Using this tool, our engineers perfectly matched the filament location, allowing the SL1 LED to **focus light just like your original bulb**, preserving the focus and hotspot, with no added glare. It produces a **functional high and low beam pattern** on the road, with a clear hotspot and wide spread of light. This is a safe, functional output, in compliance with photometric standards, which we call Street Legal.

**Tested to Perform.** We test the SL1 bulb in factory headlamps, and measure the entire beam pattern using specialized equipment. It's an elaborate affair: a headlight is mounted to a computer-controlled rotating head called a goniometer. Light shines down a tunnel, where a sensor collects data as the headlight is rotated. The entire beam pattern is mapped, and we compare the total output to the original halogen, confirming that the SL1 bulb shines more light in the hotspot, without adding extra glare on the road. The test results speak for themselves: in most lamps, like the 2015 F-150 Halogen lamp, there is 30-70% more light in the critical hotspot, with no added glare or spread of light. With proper optical engineering, testing, and validation in the application, we can assure correct optical performance.

## 2015 Ford F-150 Reflector: Stock



**Staying Cool.** You may have seen bulbs that use large straps for cooling, or fans that have big fans that just make noise. These bulbs still run hot, pushing the LEDs past their limits, resulting in degradation of output after a few months. When it comes to cooling, proper engineering is required to efficiently remove heat from the bulb. In the SL1, it comes together as a whole system that was extensively tested, with dozens of iterations to achieve the best cooling performance possible. It includes a direct-solder copper core board, thermal phase-change interface material, and thermally-modeled zinc casting get heat to the base, where base fins are designed for aerodynamic performance in conjunction with the flow rate and pressure of the Sunon bearingless microfan. The result is a highly-effective and reliable cooling system, keeping the bulb running at maximum potential.

**Fitment.** With its **patented design**, the SL1 LED fits where other bulbs won't, **without cutting or modification**. There's no hanging metal straps, just a compact bulb that plugs right in, with an exclusive reinforced shroud to keep the heat off any other components or wiring. Only slightly larger than a standard halogen bulb, it fits behind dust caps and in tight spaces. The driver and bulb are tested to function when sealed inside headlamp - no worries about heat buildup! The base sizes on the bulb are also keyed for exact applications, not one-size-fits-all, and the compact driver easily tucks away.

**Driven.** Rather than a simple buck regulator found on other bulbs, the SL1 uses a unique boost-mode circuit, which prevents thermal imbalance in the LEDs over time - again, just like you would find in OEM LEDs. It also has transient protection for long life in automotive circuits. Diode Dynamics engineers also analyzed dozens of OEM electrical systems, and added current-monitoring circuitry to mimic the electrical characteristic of halogen bulbs, drastically reducing the need for CAN-BUS adapters (though they're still needed on some applications). Finally, the SL1 bulb was put through its paces in our **environmental testing** chambers - where

the bulb successfully performed through dozens of thermal cycles, from -40 through 150 degrees Celsius. The SL1 will keep performing for years, and is backed by a **three year warranty**.

**Reliability.** Every part of the the SL1 LED was **designed for reliability**, from the custom wiring with strain reliefs and solderless terminals, to the exclusive zinc castings, to the reinforced high-temperature PP-GF plastics (the same used in halogen bulb bases). Each component was designed and tested, with dozens of variations of each component reviewed until we achieved the maximum performance possible. Finally, the SL1 was put through its paces in our **environmental testing** chambers - where the bulb successfully performed through dozens of thermal cycles, from -40 through 85 degrees Celsius (-40 to 185F). Whether you're in the Sahara or northern Canada, the SL1 will keep performing for years, and is backed by a **three year warranty**.

**Experience.** After over a decade in business, Diode Dynamics is one of the most trusted names in automotive LED lighting. We directly manufacture and engineer our own products in the United States, allowing for higher quality and performance, with the newest and brightest LED technology. No matter what you're driving, we pride ourselves in offering only the best possible LED solutions. Please contact us if you'd like to discuss your lighting project!

