

Pretoria - Tech Talk # 4

Date: Revised: 11/19/2010

Topic: Servicing Pretoria LED Interior Lighting Systems

Pretoria Transit Interiors has issued this Tech Talk to keep our customers informed on issues pertaining to the use and service of Pretoria LED passenger interior light systems.

Pretoria LED Lighting Systems

The interior LED lights are energized when the "Interior Lights" toggle switch is flipped to the ON position. When these switches are properly set, current flows through a Multiplexing module to complete the circuit and illuminate the LED's. Circuit diagrams for the interior lights and their controlling switches, relays, and circuit breakers, are shown on the applicable wiring diagrams in the OEM's Electrical Schematics Manual.

This document Tech Talk #4 will explain how to remove the lens, fixture end seals, LED Array and the LED driver. Other Tech Talks that may be helpful are: Tech Talk #5 explains how to manipulate and program the Pretoria Interior Lighting Control (ILC) module available with our Programmable Dimming Option. Tech Talk #8 describes LED Driver Part #LIG-063-01G which contains a switching station which allows a choice of dim mode light output values.

The following information describes the three operating or functionality options offered with the Pretoria LED system in new bus construction. Your vehicle if equipped with Pretoria LED delivered after June of 2009 should have one of the below operating configurations.

Standard Configuration

Offers the functionality of a fluorescent system where each fixture can fully extinguish or dim at 10%, 20%, 40%, 60% or 80% light outputs with the closing of the doors. In order to fully extinguish a specific fixture the bus multiplexing or door switch can simply open or close the power circuit to the fixtures LED driver. To dim a specific fixture, simply apply 24V to the signal terminal on the LED driver input which is described further in this Tech Talk and in Tech Talk #8.

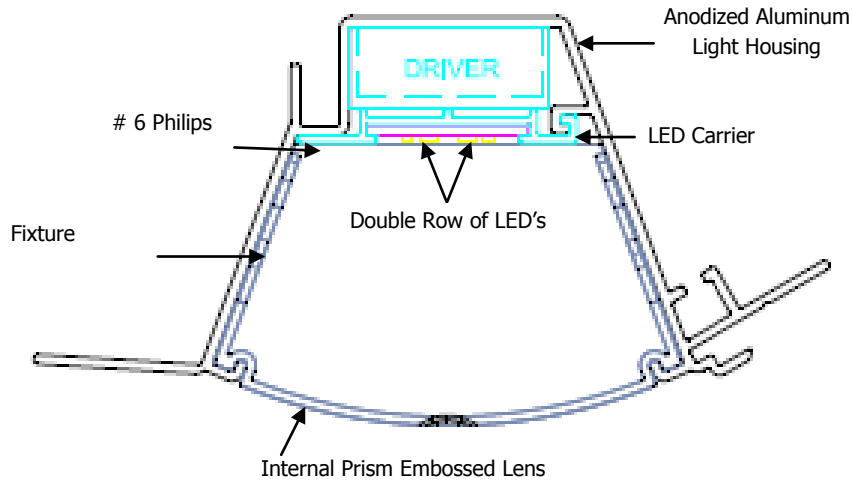
Manual Dimming Option

Consist of the Standard Configuration plus R/S and C/S potentiometers which allow the driver to easily adjust the interior light output for their own needs to reduce windshield glare. The potentiometer knobs can control the entire R/S and C/S side of the bus or specific fixtures such as the front two. With the Manual Dimming Configuration, each fixture retains the ability to fully extinguish or dim and all fixtures can emit 100% light output with the opening of the doors for passenger entry and egress.

Programmable Dimming Option

Consist of the Standard Configuration plus an onboard Interior Lighting Control (ILC) module that enables the end user to define and control the light output for each fixture in the various run modes and door positions. It also allows control of the dwell time to ramp up or ramp down the lights, control an included photo sensor, store multiple programs and locate communication fault errors. See Tech Talk #5 for more information on the Programmable Dimming Configuration.

Pretoria LED Fixture Cross-section



Removal of the LED Lens

- 1) Locate the Pretoria LED Lens removal tool (Part # PLA-082-01) from the backside of a cove panel access door, please contact Pretoria for replacement tools.
- 2) Place the lens removal tool into the notch located beside the lens edge as shown in figure 1.
- 3) While making sure that the lens removal tool is perpendicular to the fixture, push down on the tool and make a ¼ turn or twists with the lens removal tool toward the lens edge to disengage the lens keeper from the light fixture. Do not attempt to pry the lens off as damage may occur. A simple push and ¼ twist of the lens removal tool will effectively disengage the lens from the fixture.
- 3) Once one side of the lens is loosened from the light fixture, grasp the lens and pull the lens from the light housing.
- 4) To replace the LED lens, align one end with the Fixture End Cap Seal and squeeze the lens while pushing the lens keepers into the fixture working your way toward the opposite end. You may also gently pound into place with the heel of your hand as if you were replacing a hubcap.

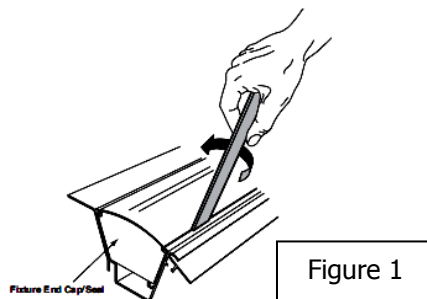


Figure 1

Removal of the Fixture End Cap Seal

- 1) The fixture end cap seal cannot be removed until after the lens has been removed.
- 2) Use a Philips screw driver to remove the screws shown in figure 2.
- 3) Use the Lens Removal Tool (part #PLA-082-01) to separate the two fixture end caps as shown in figure 3.1 through figures 3.4.
- 4) Once the fixture end caps are as shown in figure 3.4, removal of the LED extrusion can commence.
- 5) Once the LED extrusion has been changed, push the fixture end caps back into position by hand and re-install the fixture end cap screw.



Figure 2



Figure 3.1

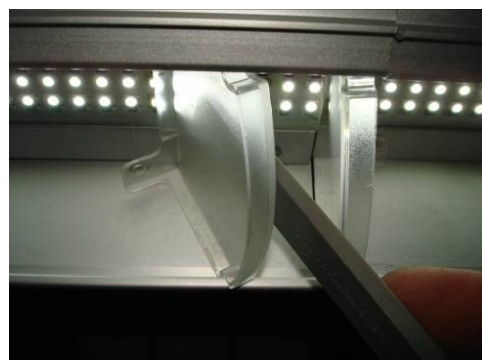


Figure 3.2

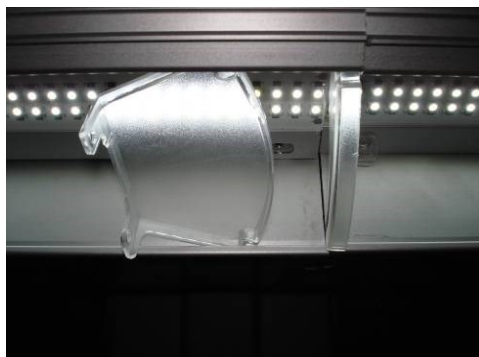


Figure 3.3



Figure 3.4

Removal of the LED Array Extrusion

- 1) Remove the screws which attach the LED Array extrusion from the fixture, the quantity of screws will depend on the length of the LED Array; (72" LED extrusion will have three screws counting the End Cap Seals which also secure the LED Extrusion).
- 2) Once the screws are removed, slide the LED Array so that it disengages from the fixture as shown in figure 4.
- 3) Flip the LED Array over and disconnect the input and output connectors from the LED driver using a pulling action.
- 4) Replace the LED Array by reversing the above steps making sure that the LED Extrusion is fully engaged into the fixture as shown in figure 4 before replacing the screws and Fixture End Caps.

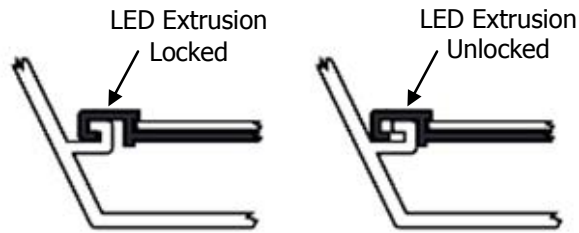


Figure 4

Removal of the LED Driver

- 1) Once the input and output connectors are disconnected from the LED driver and the LED Extrusion has been removed from the fixture carefully use a hand held Philips screw driver and remove the two screws as shown in figure 6. It is highly recommended to use a hand driver rather than a power driver to avoid damaging the LED driver.
- 2) You must insure that the provided insulation board is installed under the LED driver prior to installation to avoid damage to the LED driver.
 - a. Install the LED driver by reversing the previous steps.



Figure 6

Input from Bus Harness

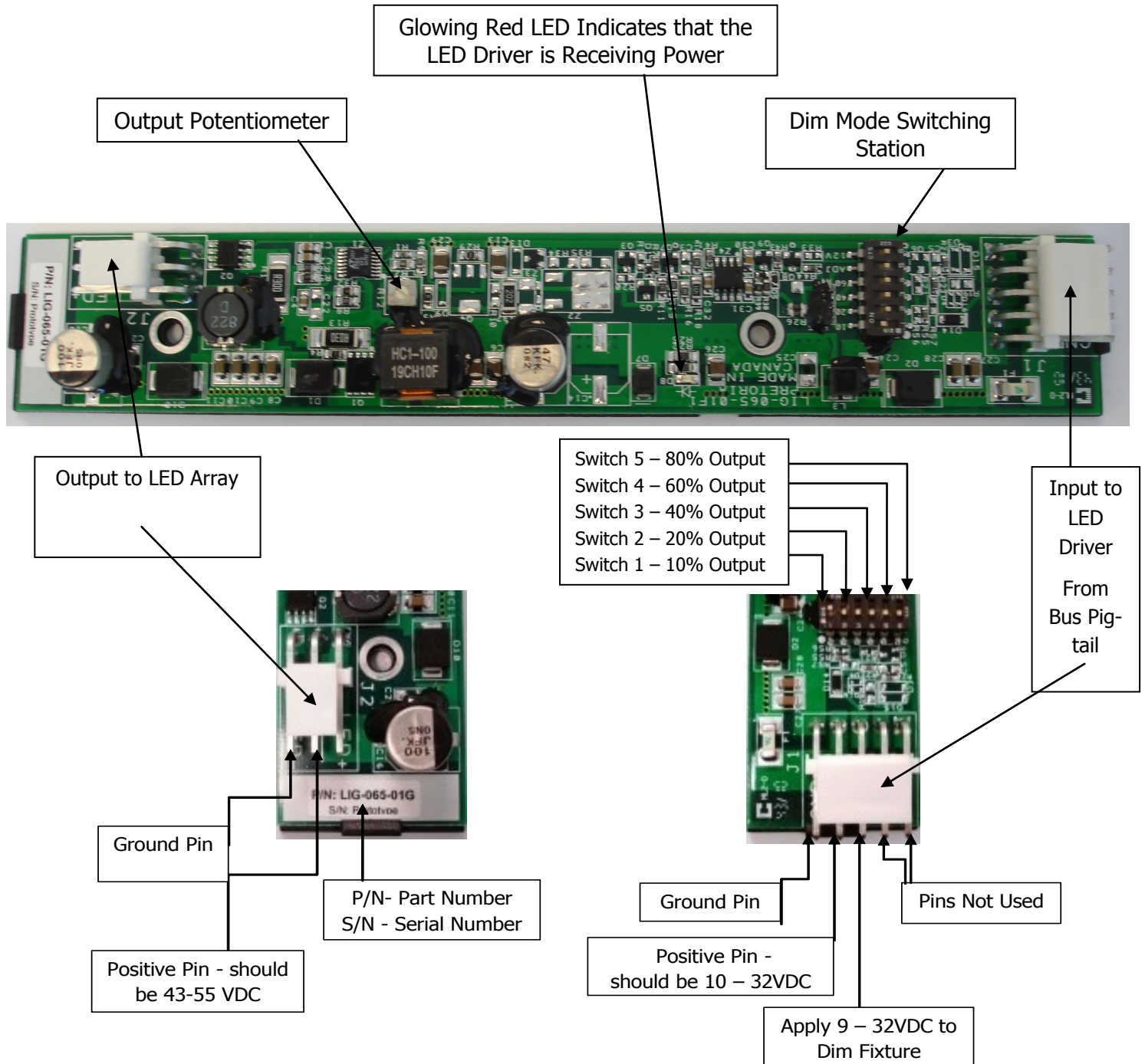
LED Driver Fastening #6
Philips Head Screws
The use of a power screw
driver is not recommended.

Output to LED Extrusion

Troubleshooting the System

Before using the below trouble shooting guide you should know which LED configuration is installed into the vehicle. The Standard and Manual Dimming Configurations are detailed below, the Programmable Dimming Configuration has a Lighting Control Module which may be used to trouble shoot communication issues, see Tech Talk #5.

LED Driver – Standard and Manual Dimming Configurations



Symptom

Action

<p>No Light Emitting From Fixtures</p>	<p>Insure that the interior light switches are in their correct positions Verify Input Power - LED on the LED driver will glow red Verify Input Voltage - Should be 10 – 32 VDC Verify Output Voltage - Should be 43 – 55 VDC Check output fuse #2 on LED driver for continuity Check Connectors and Pins for continuity</p>
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Cleaning of Panels and Lens

The panels used to on the standard Pretoria light / duct system are aluminum composite panels which are finished with a baked on - coil coated - Polyester finish. Although baked on Polyester finishes are very durable, care must be taken not to use cleaning agents containing solvents or aromatic hydrocarbons which may soften the paint system. We have found that most non-abrasive and mild detergent household cleaners such as Windex, Fantastic, 409, etc will clean normal dirt and grime off of the aluminum composite with satisfactory results. Graffiti of various types can also be cleaned off of the aluminum composite panels with good results using common graffiti removers suited for painted objects, and other commercially available citrus based graffiti removal systems. Always test a non-conspicuous area for compatibility and use your best judgment before cleaning the entire panel surface.

Lens cleaning is best accomplished with mild detergents suited for polycarbonate. Do not use solvents or hydrocarbons of any type to clean the polycarbonate lens as crazing, yellowing, or softening of the surface may result.

For more information contact: