

## ***DIY: How-To-Enable DRL – 2007 Tundra***

**Design by Daless2**

Toyota does not make it easy to enable the Daytime Running Lights on the Tundra. Nor do they seem to have any interest in helping anyone add them themselves. But that's ok, like everything else it can be reverse engineered.

If you have an interest in enabling DRL on your Tundra you might want to read on. If you can follow some directions and are capable of soldering a few wires (Or using crimp-on wire taps if you feel you must) you can get them working.

### ***Factory DRL Function Overview***

The Factory DRL uses the 27-watt TURN SIGNAL bulbs on the front of the truck as the DRL. This is different than most other manufacturers, who employ the headlights, at a reduced voltage, for the DRL.

When the Ignition Key is "On" the Turn Signal Bulbs light up and function as the DRL.

If you turn the headlights on, the DRL will be turned off.

If you put the truck in Park, and apply the Parking Brake, the DRL will turn off.

If you use the Turn Signal, the DRL bulb for the side you wish to signal will turn off function as the DRL and turn on function as the Turn Signal until the Turn Indicator is canceled.

These DRL functions are controlled via the Internal "Logic" of the Main Body ECU of the truck.

When the Main Body ECU logic determines it is appropriate to turn the DRL "On" it supplies a "Ground" to Pin #5 of the combination Flasher/Turn signal/DRL Relay (Flasher Relay for short).

When the Main Body ECU logic determines the DRL should be turned "Off" the "Ground" to Pin #5 of the Flasher Relay is removed.

Once you understand what the "Functional Conditions" (the logic) for the DRL to be "On", and you know how to turn the DRL On and Off, the entire system can be replicated "Outside" the control of the Main Body ECU.

This is what this design does.

## ***DIY: Enable DRL Function***

Even though your Tundra does not have DRL from the factory, all the wiring for DRL is already in place. What you are missing are the DRL/Flasher Relay, and the Logic to control this relay.

All the factory functional logic to control the DRL is located inside the Main Body ECU, but you can't turn this control on. Nor will Toyota allow the dealers to turn it on.

That's Ok.

You can "replicate this logic" outside the Main Body ECU using two relays.

This design will enable your DRL to operate as follows:

- ❑ With Ignition Key "On" the Turn Signal Bulbs (27-watts) light up as the DRL.
- ❑ With Headlights "On", the DRL will be turned "Off".
- ❑ When using the Turn Signal, the DRL for the side you wish to signal will turn off function as the DRL and turn on function as the Turn Signal until the turn indicator is canceled. Once Canceled DRL function will return.
- ❑ *If you would like to be able to turn the DRL system off at any time you can install an "Optional Switch" (of your choice). Please see the diagram for the location to install the optional switch.*

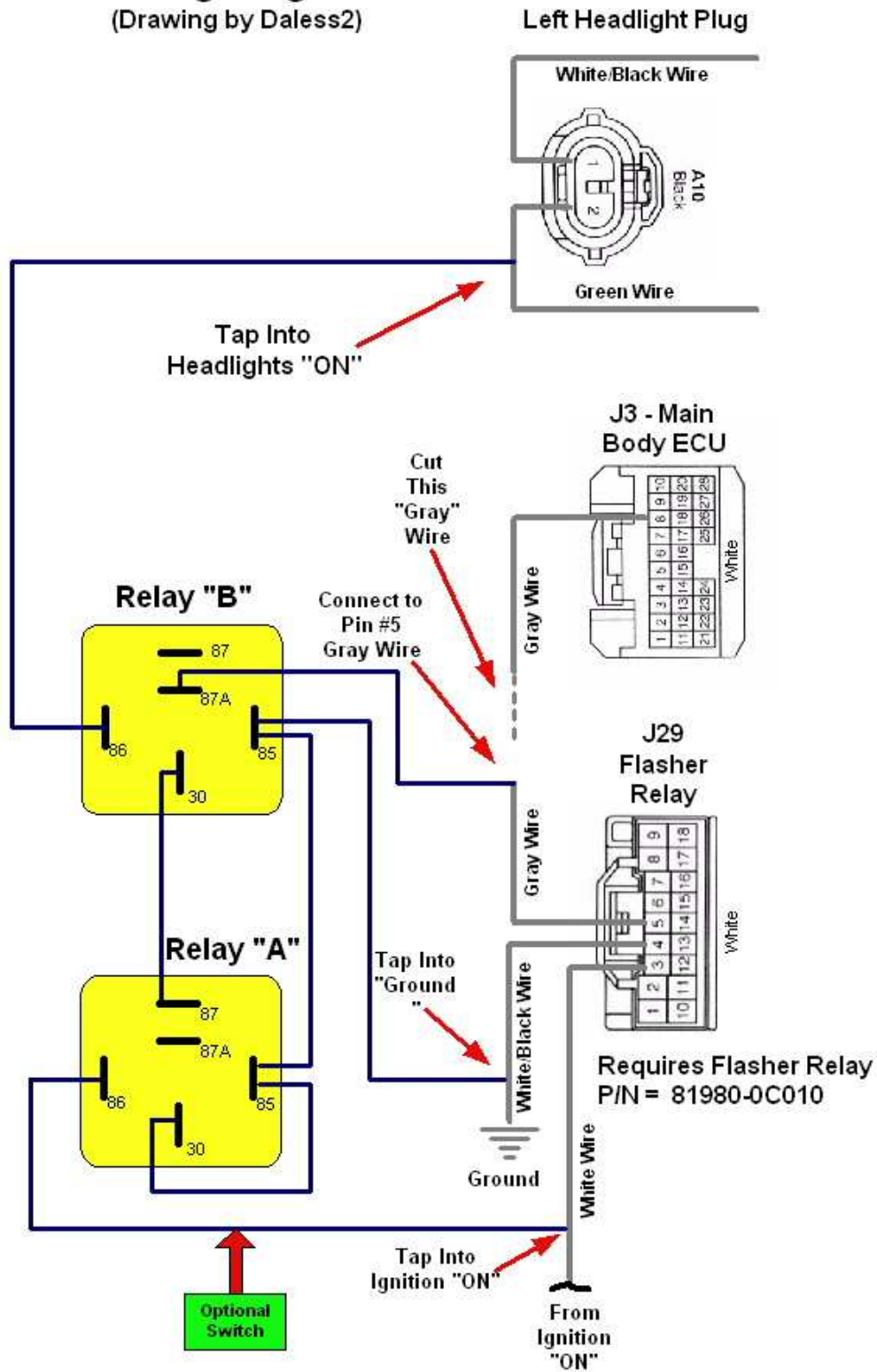
Please note: I have intentionally left out of this design, the ability to turn off the DRL lights when in Park with the Parking Brake applied. I did this to save the cost of a third relay and simplify the design as much as I could. Install switch instead if you want to turn them off.

## ***Enable DRL Wiring Design***

Here is the design that will allow you to enable DRL on your 2007 Tundra.

# Adding DRL to 2007 Toyota Tundra Wiring Diagram

(Drawing by Daless2)



Let me explain this a bit.

On the right side of the drawing you will see three “multi-pin connectors” and a few wires, all shown in “**GRAY**”. Everything shown in **GRAY** is already a part of your Truck. (I have labeled these wires with their actual color as installed on your truck.)

On the left side of the drawing you see two **YELLOW** relays, and wiring shown in **BLUE**. These are the relays and the new wires you will need to add to turn the DRL function on.

Where the **Blue** wires (new stuff) meets the **Gray** wires (original Toyota stuff) you will see **RED Arrows**. These arrows indicate where things get connected.

This design requires that you tap into three (3) existing wires and cut and connect to one (1) existing wire on your Tundra.

The hardest part of this installation is finding the courage to cut one (1) wire in your brand new Tundra. Unfortunately, if you are not willing to cut this wire, there is no other way to make the DRL work.

*Please Note: The drawing above shows the pin locations from the Front of each connector. The wires are located on the back of each connectors. Please take this into account when locating each wire.*

## Installation Overview

### ***Finding Components***

To do this installation you need to find several existing components on your Tundra. I have taken a couple of pictures to help you locate each of them.

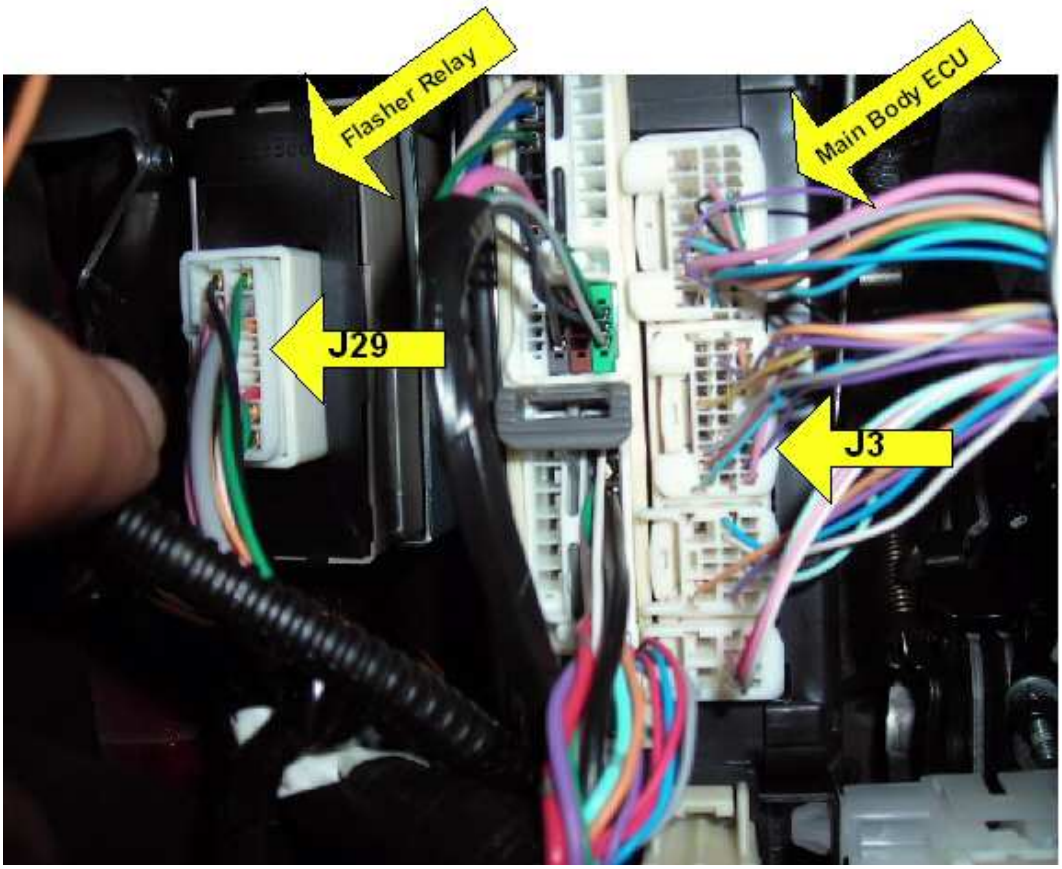
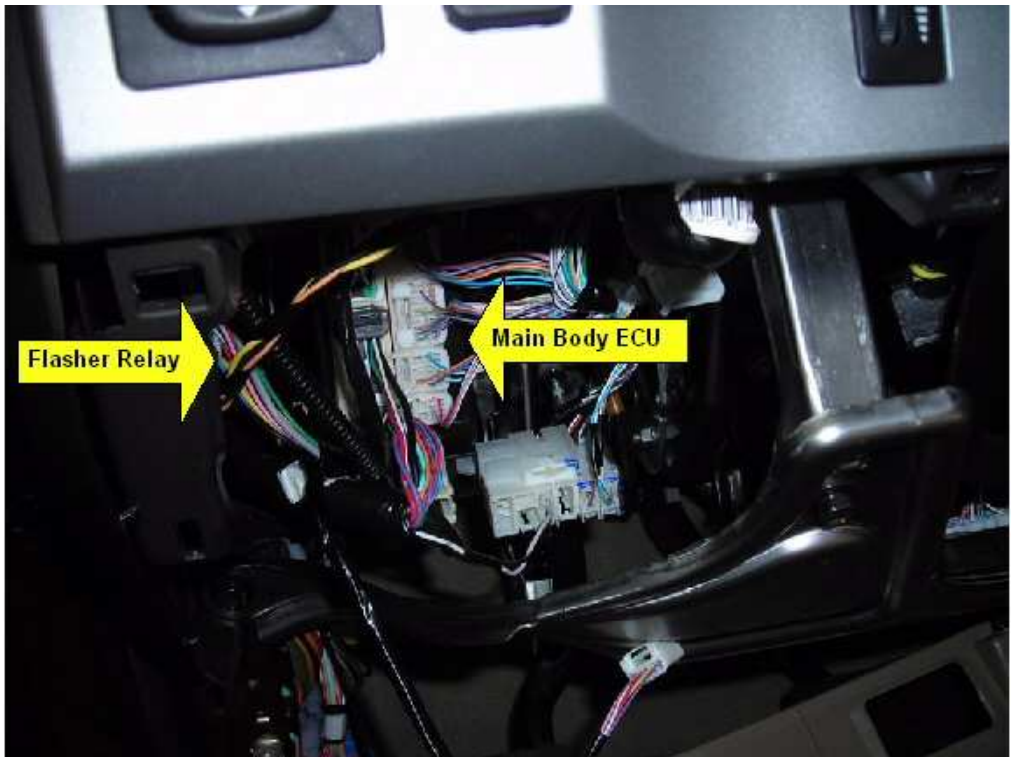
#### **Main Body ECU and Connector J3**

This is located under the dashboard to the left of the steering column. To get to it you must remove the driver doorsill plate, the driver side kick panel and the plastic knee panel under the steering wheel.

#### **Flasher Relay and Connector J29**

This is also located under the dashboard to the left of the steering column, right next to the Main Body ECU

Here are two pictures to help you identify what you are looking for.



### Left Headlight Connector – A10

This connector is located under the hood directly behind the headlight housing. It is a two-wire connector that is **BLACK** in color. There are only two wires in this Connector, one is **GREEN**, and the other is White with a Black Line on it.

This connector plugs into the Low Beam headlight on the drivers side of your truck, very near the battery.

Here is a picture.



## **Relay Wiring, Point to Point**

Most of the wirings, as seen in the schematic diagram above and the tables below, run between the pins of Relay "A" and Relay "B" which you are adding. This wiring can be done on your workbench prior top installing these relays.

There are however four wires which are connected to the already existing Tundra wires. I have highlighted these connections in the tables below with a yellow background. I will provide additional detail on connecting these four wires.

<b>Relay "A"</b>	<b>Connect to:</b>
30	Relay "A", Pin 85
86	Tap into "Ignition On", Connector J29, Pin #3, WHITE Wire
85	Relay "A", Pin 30
85	Relay "B", Pin 85
87	Relay "B", Pin 30
87A	Not Used

<b>Relay "B"</b>	<b>Connect to:</b>
30	Relay "A", Pin 87
86	Tap into "Headlight On", Connector A10, Pin 2, GREEN Wire
85	Relay "A", Pin 85
85	Tap into "Ground", Connector J29, Pin 4, WHITE/BLACK wire
87	Note Used
87A	Flasher / DRL Relay, Connector J29, pin 5, GRAY wire. Cut and Connect

The relay wiring is pretty much straight forward; just follow the diagram or the Point-to-Point wiring tables above. I will only detail the four wire connections that go to existing Tundra truck wires.

## **CAUTION!!!!!!!**

**Before you start make sure you do the following to isolate electrical system components.**

- 1. Disconnect the Negative Terminal from the Battery.**
- 2. Find and Unplug Connectors J29 from the Main Body ECU**
- 3. Find and Unplug Connector J3 from the Flasher Relay**
- 4. Find and Unplug Connector A10 from behind the driver side headlight.**
- 5. I strongly recommend that you solder all wire connections**

### **Ignition “ON” Connection**

Find the **WHITE WIRE**, located in pin Position 3, in Connector J29, which plugs into the Flasher Relay.

You need to tap into this wire, about 2-inches from the connector. Strip about ¼-inch insulation off and solder a wire to this **White Wire**.

Insulate your solder connection with electrical tape.

Connect the other end of this wire to Pin 86 on Relay “A”

*Optional: If you elect to install an On/Off switch of your choice, install it in this wire between the Tap you just made and Pin 86 on Relay “A”.*

### **Headlight “ON” Connection**

Find the **GREEN WIRE**, located in pin position 2, on connector A10, located behind the driver side headlight.

You need to tap into this wire, about 2-inches from the connector. Strip about ¼-inch insulation off and solder a wire to this **GREEN Wire**. Insulate your solder connection with electrical tape.

Route this new wire into the cab via the rubber grommet located in the firewall below the brake booster.

Connect the other end of this wire to Pin 86 on Relay “B”

### **“Ground” Connection**

Find the **WHITE** and **BLACK WIRE**, located in pin position 4, on connector J29, located on the Flasher Relay.

You need to tap into this wire, about 2-inches from the connector. Strip about ¼-inch insulation off and solder a wire to this **WHITE/BLACK** Wire.

Insulate your solder connection with electrical tape.

Connect the other end of this wire to Pin 85 on Relay “B”

### **“DRL Control” Connection**

Find the **GRAY WIRE**, located in pin position 5, on connector J29, located on the Flasher Relay.

You need to “Cut this wire about 2-inches from the plug-in connector J29.

Connect and Solder the end of this **GRAY WIRE** that is still attached to the J29 plug to a wire, which will then go to Pin 87A on Relay “B”

Insulate the other end of this GRAY WIRE, which you just cut, with electrical tape. Make sure it is insulated well.

### ***Finishing up***

If you use the Double Relay Plug that I recommend you will have two extra wires that are not connected, and not used. These wires are located at Pin 87A on Relay “A” and Pin 87 on Relay “B”. Tape the ends of these wires up with electrical tape to insulate them.

Replace your existing Flasher Relay with the New (\$40 - \$60) Flasher DRL Relay, which you picked up at Toyota.

Plug in Relays “A” and “B”

Plug connectors A10, J3, and J29 back in and reconnect the negative battery cable.

Test your DRL. All should be fine. Then replace all the plastic panels you removed to install this design.

## **Parts Required**

The above DRL Function is proved using;

- ✓ Two (2) Bosch Type SPDT Automotive Relays, 30/40 Amps
- ✓ One Double Relay Socket (or two single relay sockets)
- ✓ A few feet of wire
- ✓ Toyota DRL Flasher Relay, Part # 81980-0C010
- ✓ Electrical Tape
- ✓ Solder and Soldering Iron or:
  - Three (3) Wire T-Taps (crimp-on)
  - One Wire Connector (Butt crimp-on)
- ✓ Wire cutter/striper

*Please note. People all over the world use “crimp on” connectors. I do not. I solder wires. I hope you will too. If you have to use crimp in connectors make sure each is mechanically and electrically sound.*

## **Parts Source and Cost**

Here are the sources for the parts I used.

### **Bosch Type Automotive relays (2) 12volt, SPDT 30 amps**



Cost = \$1.49 each (You need two)

Available From: <http://www.partsexpress.com/pe/showdetl.cfm?&Partnumber=330-073>

You can also pick these up in just about any automotive store for about \$6.00 each.

### **Double Relay Socket**



Cost = \$1.90

Available from: <http://www.partsexpress.com/pe/showdetl.cfm?&Partnumber=330-078>

Also available in some automotive stores or Radio Shack for about \$7.00.

### **Toyota DRL Flasher Relay, Part # 81980-0C010**

Cost = \$40 to \$60

Available from your Dealer.

You also might be able to trade your Non-DRL Flasher Relay with someone who has DRL on his or her Tundra and does not want DRL. DRL can be turned off by installing your Non DRL Relay.

**DRL Flasher Relay** Part Number is # **81980-0C010**

## **Conclusion**

This simple design has been installed for the last three (3) months on Seven (7) 2007 Toyota Tundra's. All have operated flawlessly with no negative side effects or surprises of any kind.

If you would like to enable DRL using the 27-watt turn signals, as Toyota does, on your Tundra this low cost design will work for you.

I hope some will find this useful.

Frank (Daless2)