



Metric Diode Kit Explained

Information and Diagram References Courtesy Bareass Choppers: www.bareasschoppers.com

Note: The tips and explanations in this document highlight the use of a diode installed in the dash panel with a single indicator light on most metric motorcycles. Should you decide to undertake this project you will need the proper tools and the ability to solder wires together. Do not attempt this project if you are unsure. All work you perform on is at your own risk. Custom Dynamics assumes no liability for any modifications to your motorcycle.

Why Do I need a Diode Kit When I convert to LED's?

Some metric bikes have 2 indicator lights on the dash for the turn signals, one for left and one for right. But many bikes only have a single indicator light for both turn signals. It is the single indicator light circuit that has issues with current "leak" when switching to a low current LED turn signal. A diode in the circuit at the indicator light will prevent the current from travelling in the wrong direction and allow the front turn signals to flash properly.

Understanding The Turn Signal Circuit

To better understand this condition, you first need to understand how a basic DC (direct current) electrical circuit works. The schematic diagram on page 2 shows the complete circuit. Disregard the indicator for now. Current travels from the 12V supply (your battery), through a 10A fuse which is designed to protect the circuit if there is a "short" in it. It then goes past the fuse to the relay which determines the rate at which the signal flashes, and then to the switch which is what turns the circuit on and off. With the switch in the "on" position the circuit is completed and power is allowed to flow from the battery, through the fuse, relay, switch and into the "load" (the turn signal bulbs), then finally to ground. The main point to learn from this is that in order for any circuit to function, there needs to be a complete circuit from power source all the way to ground. The switch in this circuit is what allows power to flow and the turn signals to flash.

**Standard Metric Motorcycle
Turn Signal Circuit
(single Indicator)**

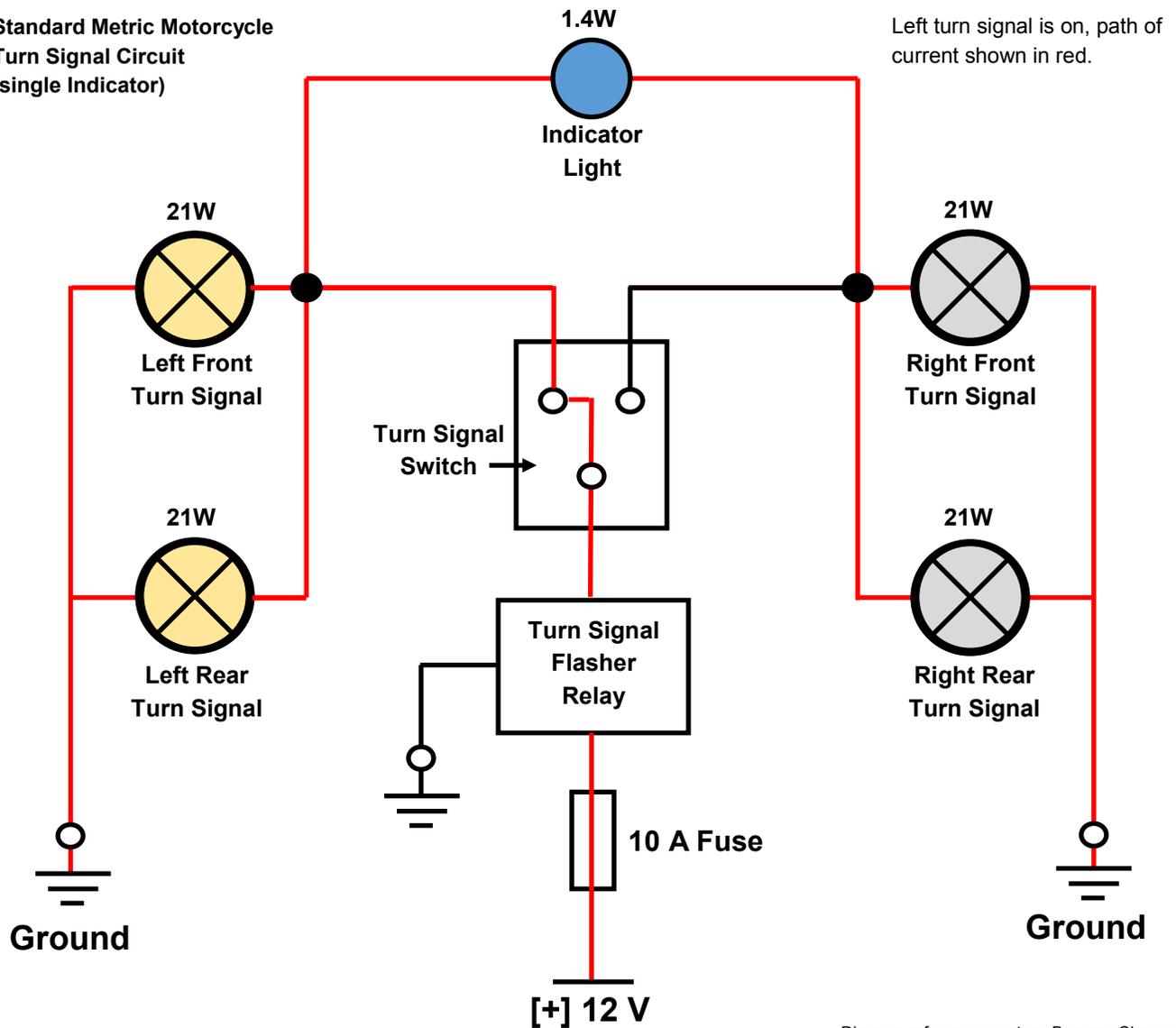


Diagram reference courtesy Bareass Choppers

Signal Indicator Function

With basic understanding of how this circuit works, now let's take a look at how the single indicator light functions. By having only one indicator light we can see that it must get power from either the left or right side in order to flash. The problem is that many manufacturers designed this system in such a way that when the left turn signal is turned on, it provides power to the indicator light which then finds its electronic ground (to complete the circuit) through the right side of the circuit – and vice-versa for the right turn signal. If that seems confusing, then look at the diagram above and follow the red line from the battery to the right side ground. When using stock incandescent bulbs with the switch flipped to the left, the right side of the circuit doesn't function, but the indicator light uses it as a way to find its ground so it can light up.



Switching to LEDs

Now that we understand how the indicator light gets its power from each side of the circuit, we can see in the illustration how a small amount of power “leaks” over from one side of the circuit to the other. This small amount of current doesn’t matter when you use stock incandescent bulbs or aftermarket halogen bulbs because they require more power to light up than the small indicator light can “leak” to them. LEDs, on the other hand, require a much smaller amount of power to light up, therefore the indicator light “leaks” enough power to light the LEDs. So instead of hitting the left turn signal button and getting a left turn flash, you get “hazard flashers” with all 4 lights flashing together.

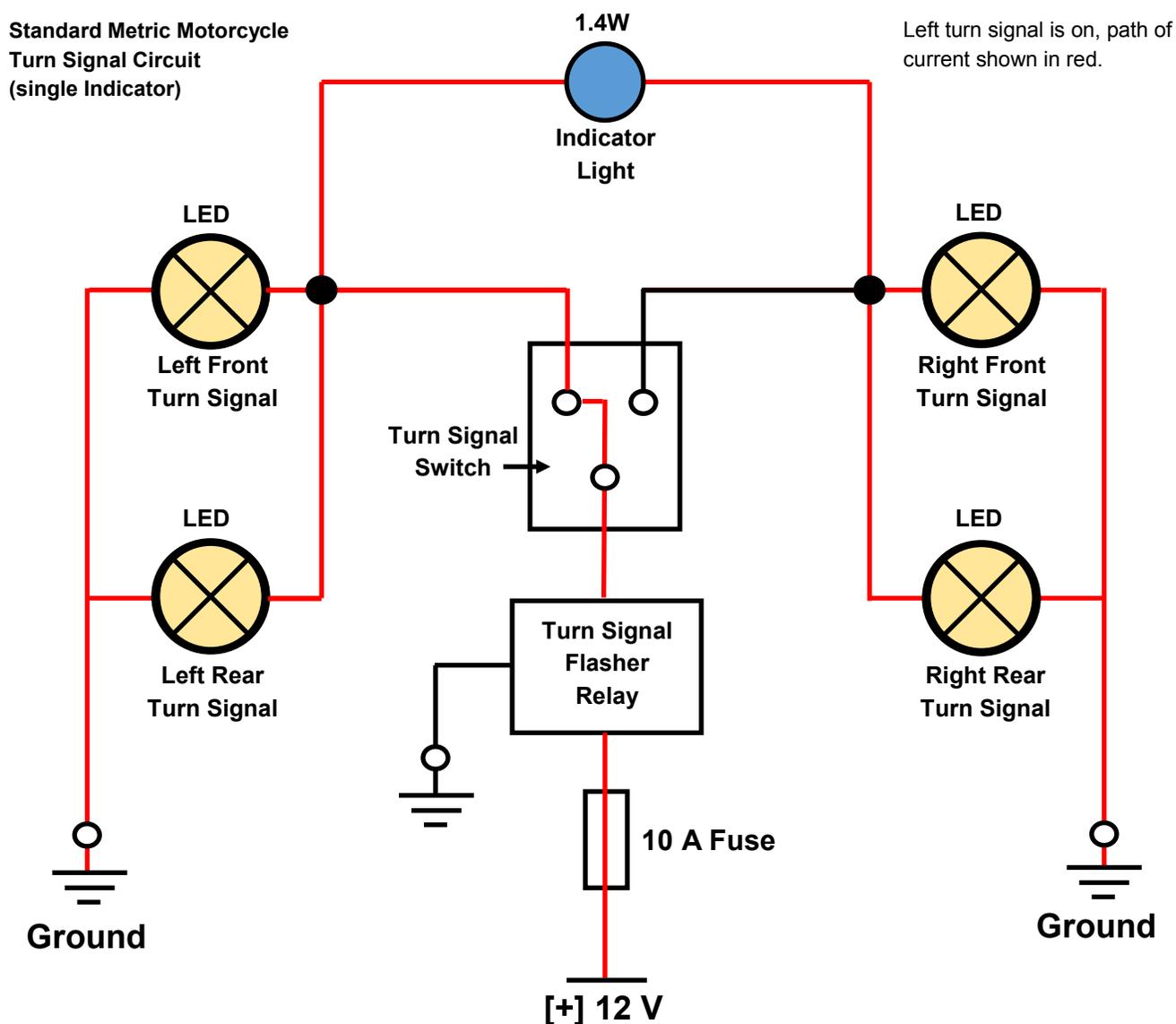


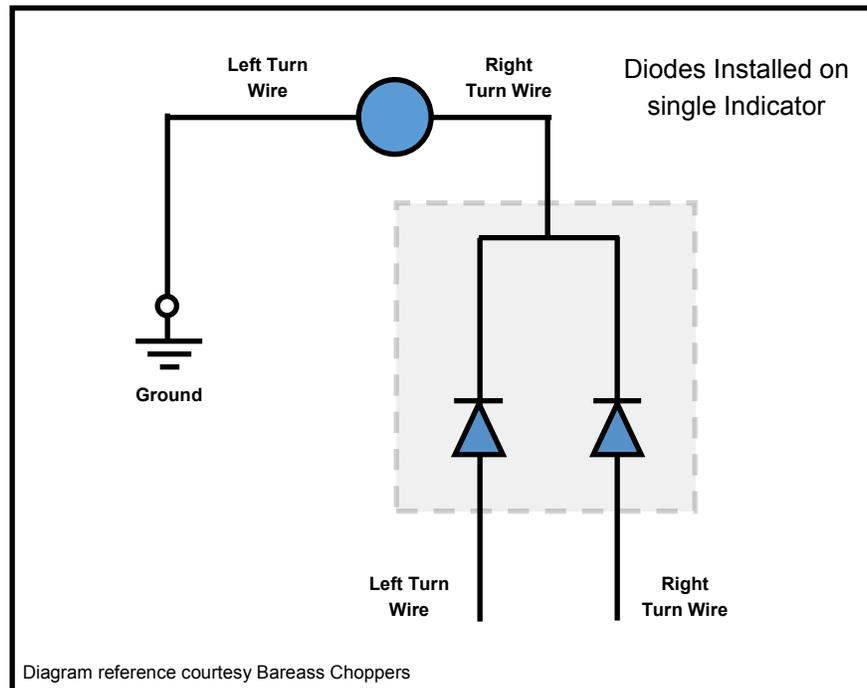
Diagram reference courtesy Bareass Choppers



The Fix

So how do we get the indicator light to function with LED signals based on the design of the bike's circuit? We must modify the circuit like the schematic below. It shows how to rewire the indicator light portion of the circuit. Using a diode kit to fix the circuit so that no "feedback" can occur from one side to the other. The section of the circuit inside the dashed box represents the diodes that are added to the circuit.

To better understand diodes, think of them as a one-way valve for electricity. They let power flow in one direction only. With the diodes installed, it allows the current to flow to the indicator lamp but not back the other way. This eliminates the 4 way flash issue.



Installing Custom Dynamics® Metric Diode Kit (GEN-MDK)

Installing the diode kit is relatively easy once you locate the wiring for the single indicator bulb. You will need to gain access to the indicator in your dash panel or other location depending on your make and model. Make sure the bike is **cool** and parked on a **flat level surface**.

1. Locate the battery and disconnect the negative [-] battery cable.
2. Consult your bike's service manual on how to access the indicator light and or bulb replacement. Remove any parts from the bike to gain access to the wiring of the indicator.
3. Cut the two wires coming out of the indicator, paying attention to allowing enough room necessary for splicing.
4. Strip the jacketing off of the ends of the indicator wires with wire strippers allowing enough room to make good solder connections. Next, strip the wires back going to the turn signals.
5. Slide the provided heat shrink pieces over both wires of the indicator before the next step.
6. Solder one wire from the turn signal indicator bulb (it does not matter which one) to ground. Use the provided black wire with the kit to extend the wire if needed. Once good connection is made, cover the solder joint with the heat shrink tubing and heat until connection is well insulated. Take care not to melt the jacketing on the wires.
7. Solder the other wire from the indicator to the single WHITE side of the "Y" module, then cover with the heat shrink tubing and apply heat until connection is well insulated.
8. Slide the provided heat shrink pieces over both red wires of the "Y" before the next step.
9. Solder the two red wires on the "Y" module to the turn signal wires (the other side of the wires you cut to remove the indicator). It does not matter which red wire goes where. Cover the connections with the shrink tubing and apply heat until connection is well insulated.
10. Reconnect the Negative [-] battery cable to the battery.
11. Turn ignition on and test turn signals for proper function and flash.
12. Reinstall dash assembly.

