



## **Air/Fuel Lean Switch**

Overview: The Air/Fuel Lean switch is a device that will shut off your nitrous system if it runs lean during a nitrous run. It can also be used for boost control if you run lean during heavy boost. The Air/Fuel ratio is always displayed so this device can double as a basic Narrow or Wideband air fuel Display. Follow all the directions and warnings in this document.

### **Installation:**

- 1) Use the diagram that best fits your application. Wire it exactly as shown in your diagram!
- 2) Wires on A/F Lean Switch:
  - a. **Red**--- Powers the A/F switch, use a switched 12V power source like from the fuse box.
  - b. **Black**---Ground, Connect to a solid chassis or battery ground.
  - c. **Blue**---Trigger/TPS wire, this wire is looking for a signal from a source only when the nitrous is spraying. It can be configured to detect a 12V signal (High) or a Ground signal (Low) or TPS (Throttle Position Sensor Voltage).
  - d. **Yellow**---This wire sends out a 12V signal (High) when the system is triggered. If a lean A/F is detected then the 12V (High) signal is removed or stopped.
  - e. **White/Yellow**--- This wire sends out a Ground signal (Low) when the system is triggered. If a lean A/F is detected then the Ground (Low) signal is removed or stopped.
  - f. **Purple**---This wire will go to your factory narrow band or wideband o2 sensor. Factory Narrow band o2 sensors work on an output voltage of 0-1v while Wideband o2 sensors need a microprocessor to make it work and it works on an output voltage of 0-5V being much more accurate.
  - g. **Green**---This wire is used to ground a remote LED status indicator. When the LED is Lit you know a lean condition occurred and the system shut down. The Remote LED (If equipped) will flash at power up to let you know the A/F Lean Switch is working.

### **3) Configuration:**

- a. To enter the configuration menu, press and hold both the “Set-up” and “Select” buttons until you see “pro” on the display then release the buttons.
- b. Pressing the left “set-up” button steps through the options/menu’s, pressing the right “Select” button changes the settings. Keep pressing the “select” button to go to the next segment on the display. Configure the A/F switch as required per your need.

### **Menu 1: Trigger Mode**

- 0=Ground (Low) used as trigger (Use Setting 0 for drawings 4,5,7,9)
- 1=12V (High) used as a trigger (Use Setting 1 for drawings 1,2,10)
- 2= TPS Input used as trigger (Use Setting 2 for drawings 3,6,8)

### **Menu 2: TPS Setup** (Menu 2 only active if option “2” is selected above otherwise you will be sent directly to menu 3)

Press the “Select” button. The display will flash as you are now in the “Learn” mode. Push the throttle to the floor with engine not running. The display will show the wide open throttle voltage. Press the “Set-up” button to save this setting.

### **Menu 3: A/F Mode** (Narrow or Wideband)

- 0=Narrow band input (Factory O2 sensors)
- 1=Wideband input (For use with Innovate Brand controllers)
- 2=Wideband input (For use with FJO Brand controllers)

## Menu 4: Air/Fuel ratio trip point

- 1) For narrow band o2 sensors it will display in Volts. If running a narrow band o2 sensor, use .80v as an initial setting. .50v is 14.7:1 A/F so .80 is a good starting point. At some point you could set this to .99V to make sure you're A/F switch is working...Any reading lower(leaner) than your trip point, in this case .99 would shut down the nitrous. Normal engines will have about a .80-.95 reading while using Nitrous.
- 2) For wideband o2 sensors it will display in A/F ratio. If running a Wideband band o2 sensor system, use 13.0 A/F as an initial setting as a good starting point. At some point you could set this to 10.0 A/F to make sure you're A/F switch is working...Any reading higher (leaner) than your trip point, in this case 10.0 A/F would shut down the nitrous. Normal engines will have about 11.0-13.0 A/F while using Nitrous.

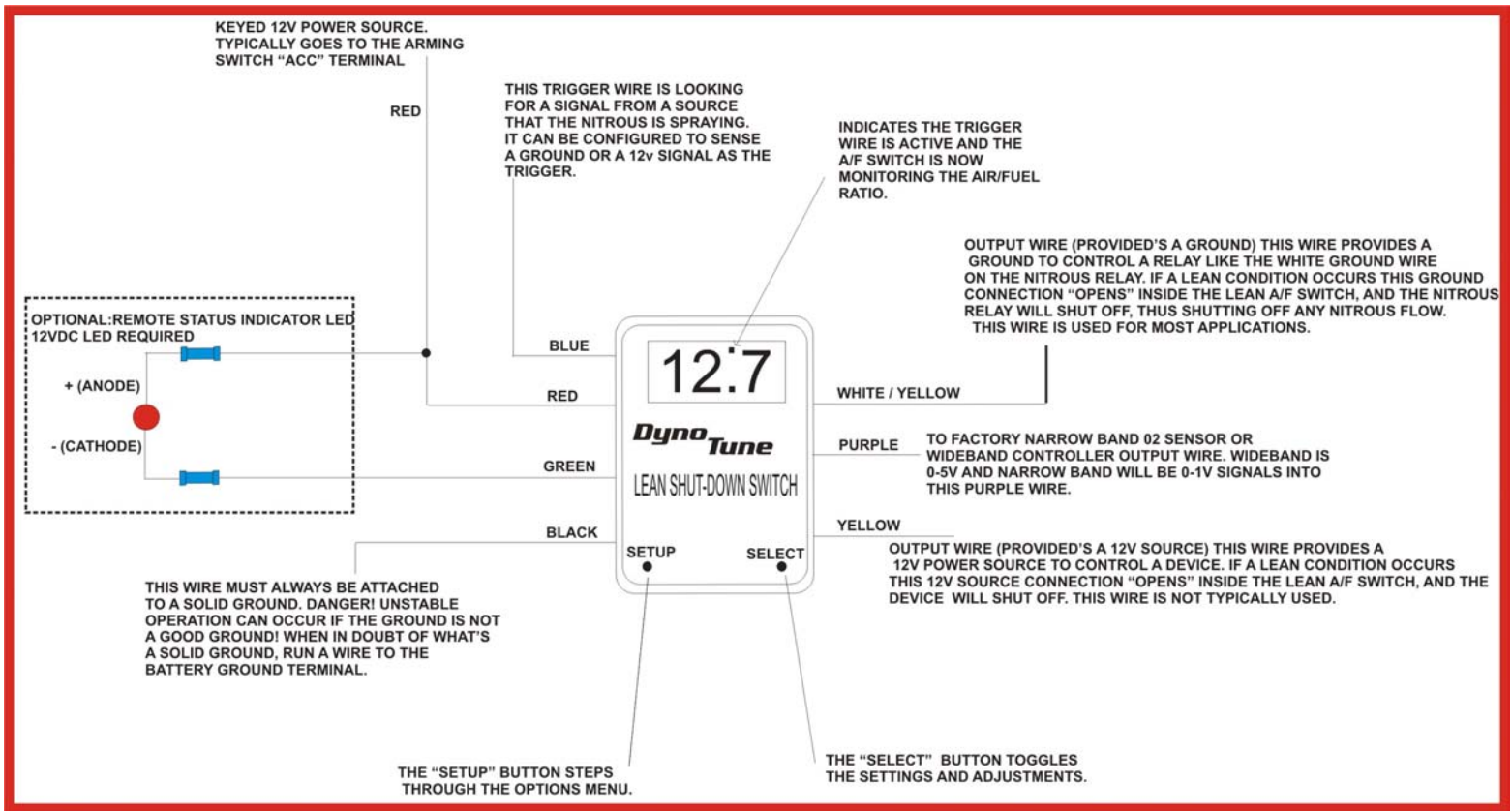
## Menu 5: Air/Fuel Ratio Delay

This feature allows you to custom adjust the delay before the A/F switch will stop nitrous flow. In some Nitrous kits there can be a small lean spike in the Air/Fuel ratio during the initial Nitrous turning on. Initial setting would be about .6 seconds. You can keep reducing it if you don't have any lean spikes. These spikes happen fast and you probably will not see it on the display. Smaller initial spikes are normal in many nitrous kits and do not pose any real danger. Press the "select" button to enter your delay, press the "setup" button to move to the next segment on the display.

Some basic operating notes:

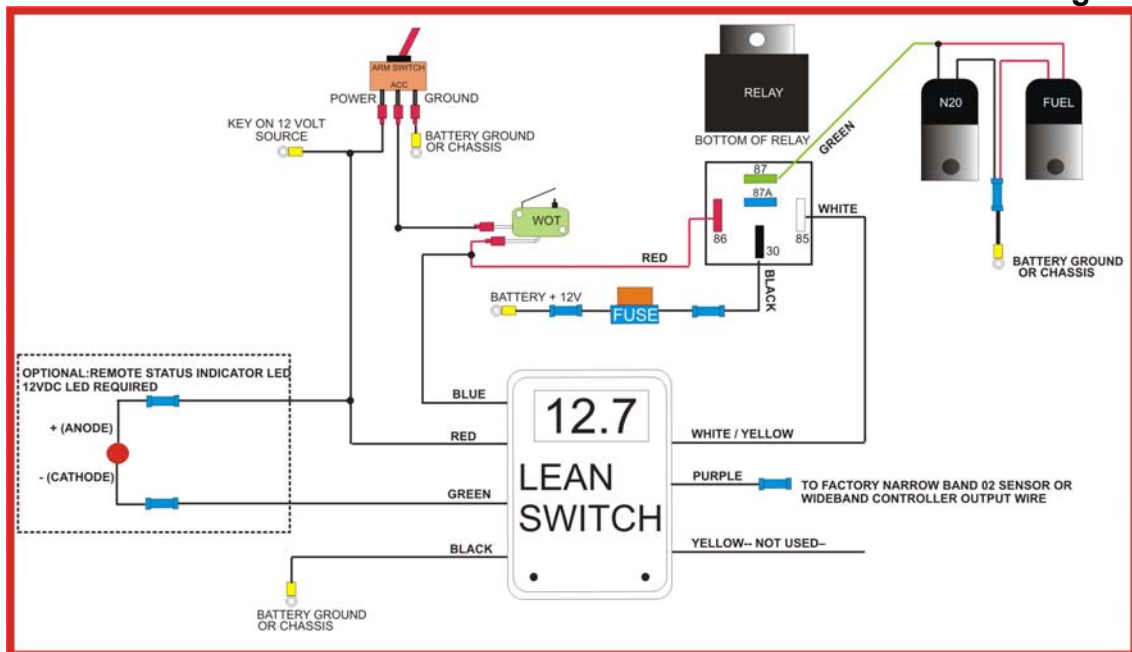
1. During power up the unit will slowly flash the "Optional" status indicator LED for 5 seconds letting you know the device is on.
2. In narrow-Band mode the unit will display the o2 sensors output voltage.
3. In wideband mode the unit will display Air Fuel Ratio
4. When the A/F switch shuts the nitrous off the "Optional" status indicator will illuminate steady for 20 seconds and will the display will show "LLL" letting you know a lean condition was detected and shut down the nitrous. The A/F Switch will automatically re-set and be ready to go again after the 20 seconds.
5. While the A/F switch is actively monitoring the A/F ratio the upper Dot will be lit. This also means the trigger input is active and seeing a signal.
6. While triggered, the unit logs the leanest and richest A/F or Voltage (Narrow band sensors) during the last run. It can be re-called by pressing buttons "Left=leanest" "Right=Richest" Hold both buttons for 2 seconds to clear the memory before the next run. Note: you can not reset or read what's in memory if the A/F switch is actively monitoring! Note:There is no indicator that the memory has been re-set.
7. If the A/F Lean switch is to be used as a gauge when the nitrous is not in use you will need to add a switch in series with the blue TPS wire. If you go WOT it will monitor the A/F and display "LLL" if your running leaner than your set point. The switch will disconnect the TPS input and the A/F lean switch will never "monitor" the air/fuel ratio so it will not keep displaying "LLL". Alternately you could simply adjust you're A/F trip point lower for normally aspirated runs. If your nitrous A/F is similar to your normally aspirated A/F then you probably will not have an issue.

If you have problems with the A/F switch shutting the nitrous down, make sure your settings are correct also lengthen the delay time as there may be a lean spike present. If the spike is excessive you should repair the lean spike issue before continuing.



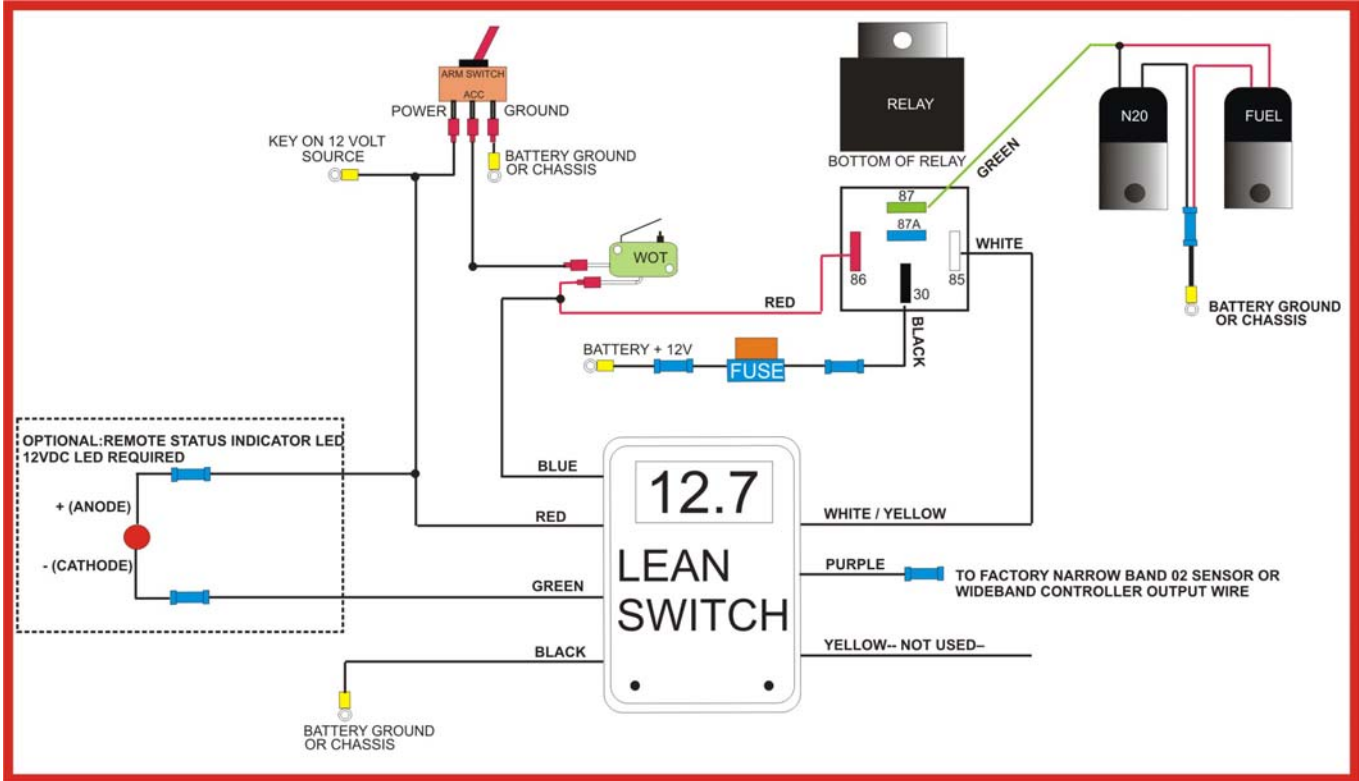
### BASIC WIRING

### Drawing #1



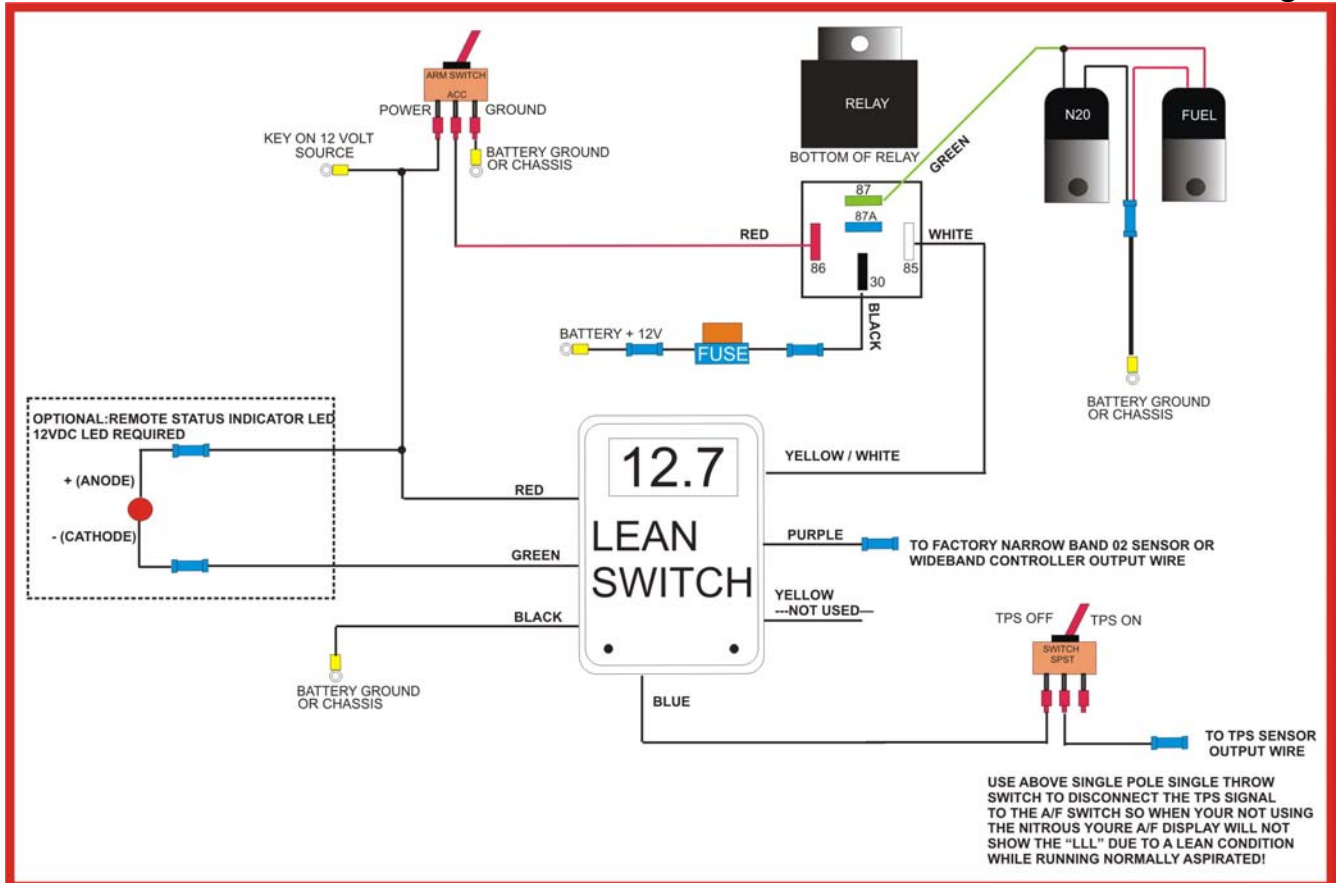
### BASIC USING TPS

### Drawing #2



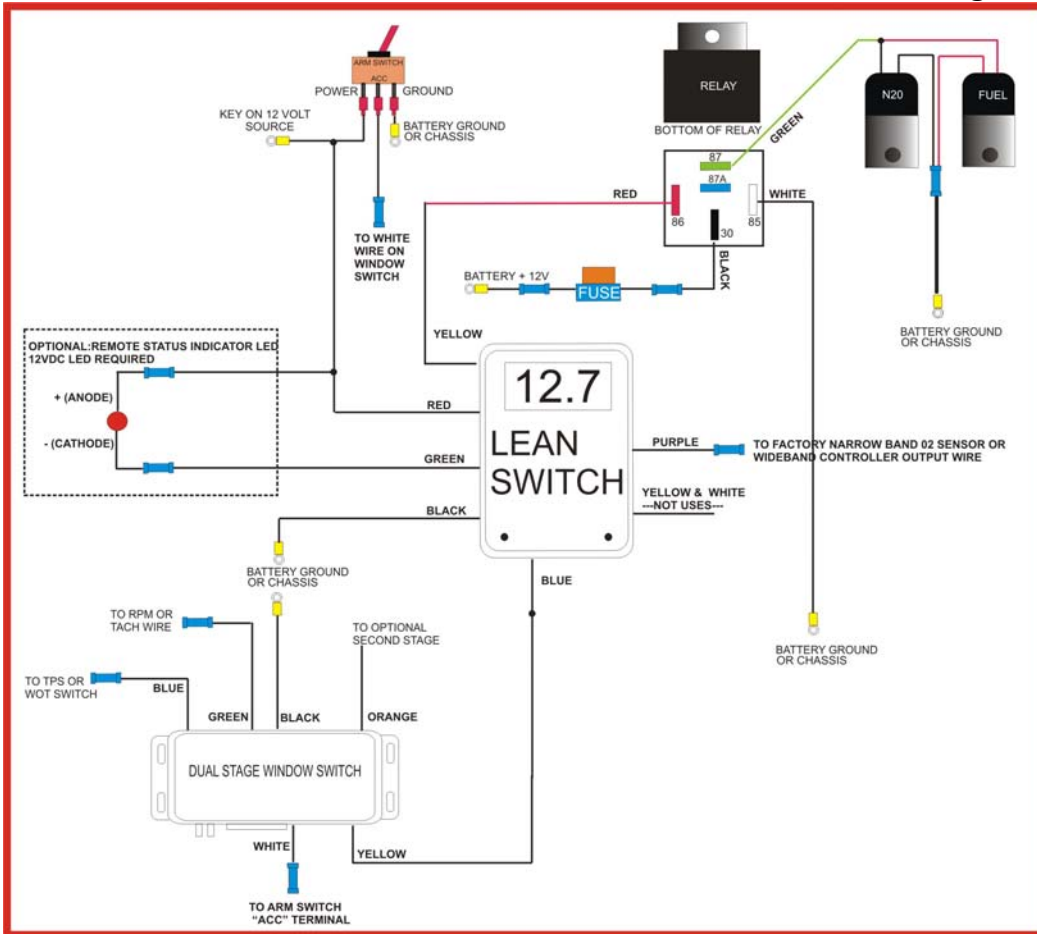
### BASIC USING TPS WITH ON/OFF SWITCH

### Drawing #3



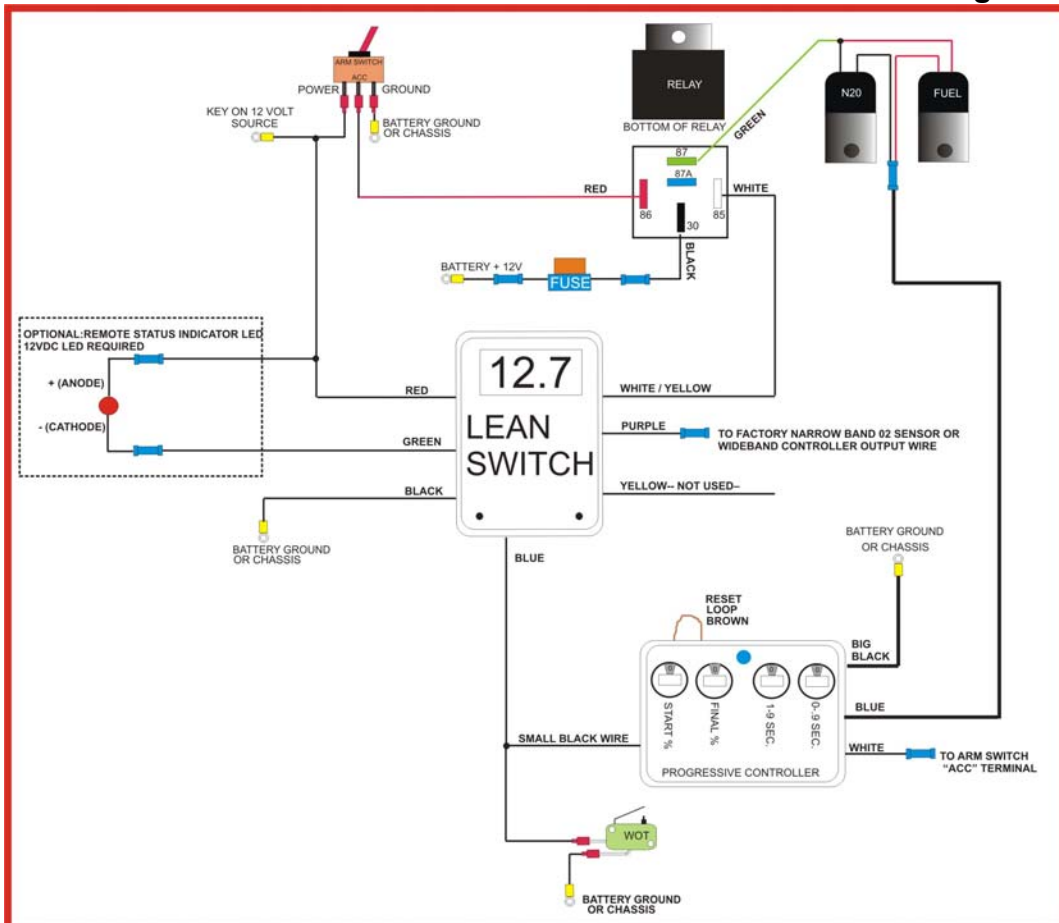
# BASIC WITH RPM WINDOW SWITCH

# Drawing #4



# BASIC WITH PROGRESSIVE CONTROLLER

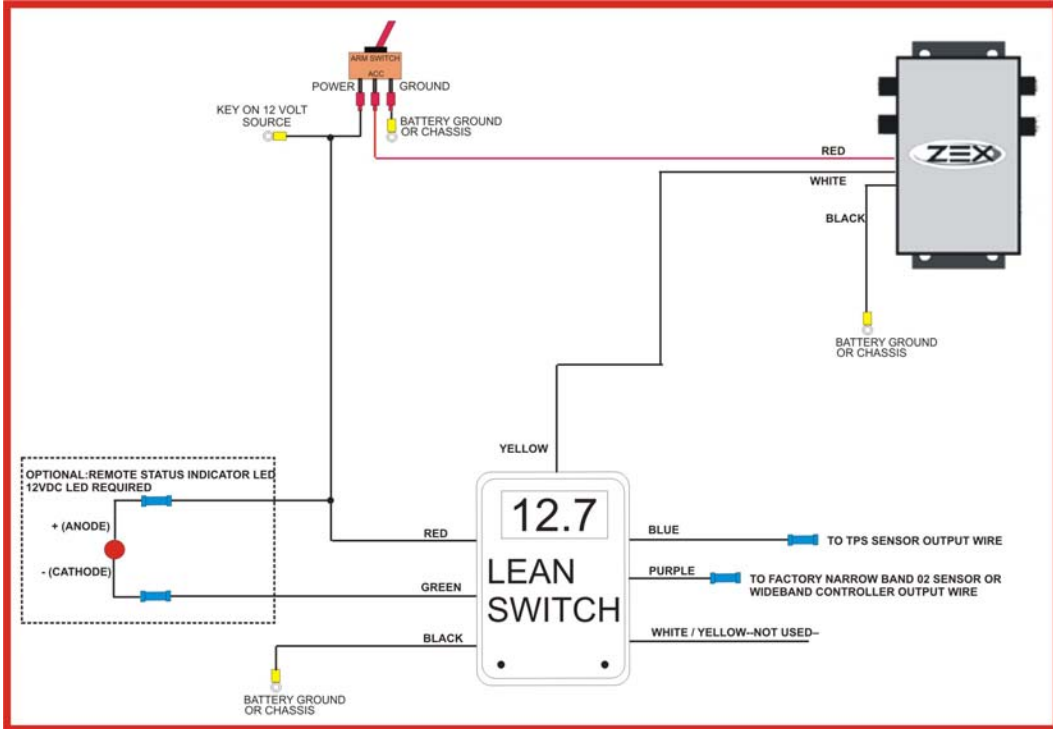
# Drawing #5





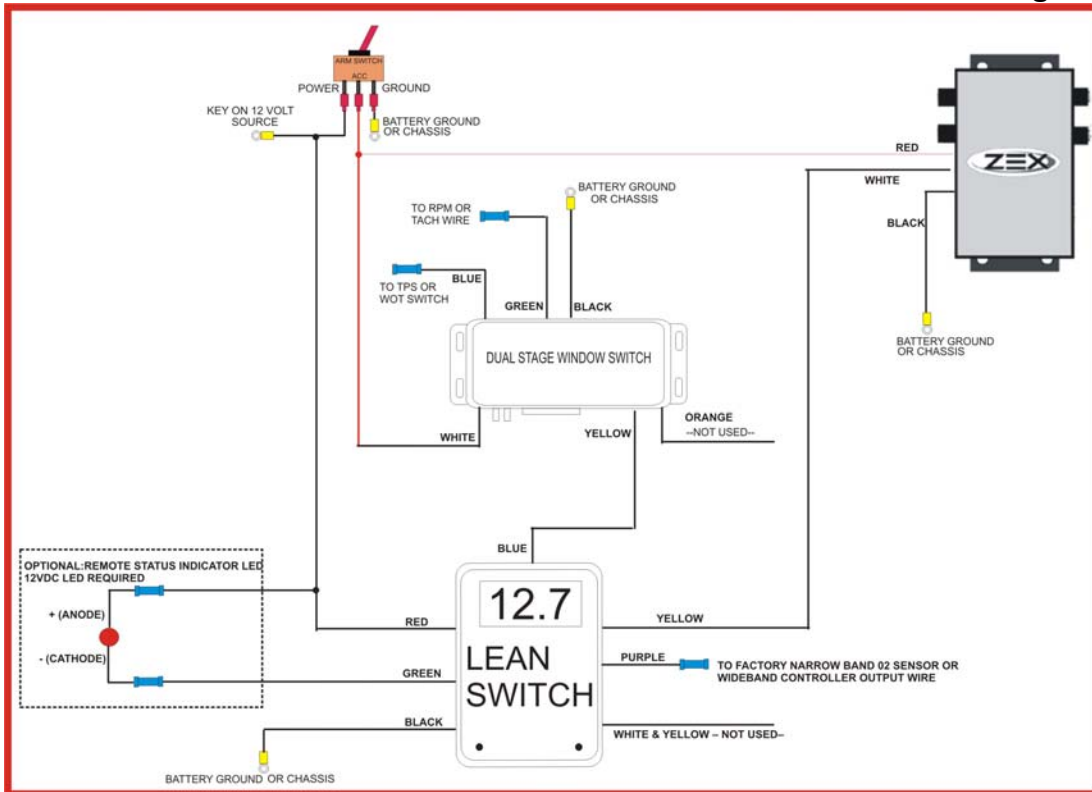
# BASIC WITH ZEX

Drawing #8



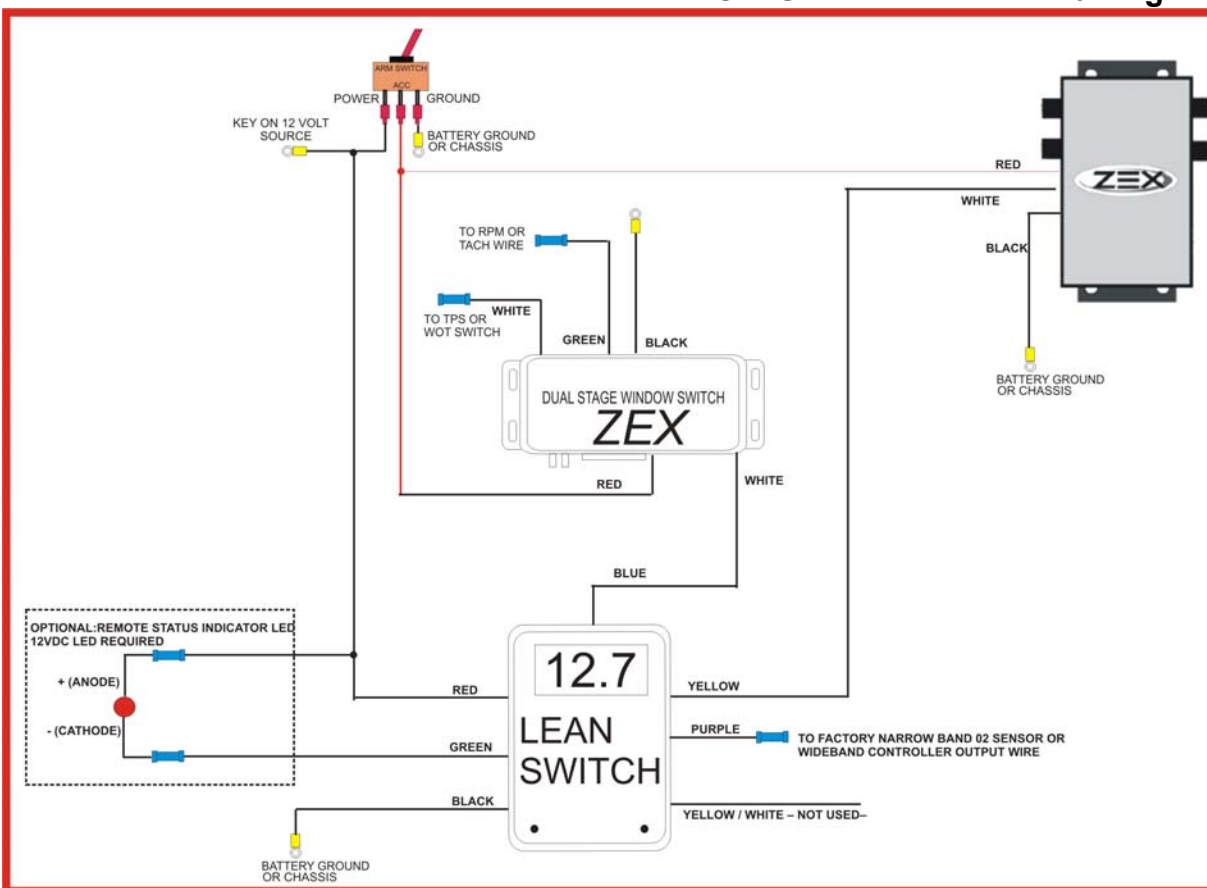
# ZEX WITH DYNOTUNE RPM WINDOW SWITCH

Drawing #9



## ZEX WITH ZEX RPM WINDOW SWITCH

Drawing #10



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