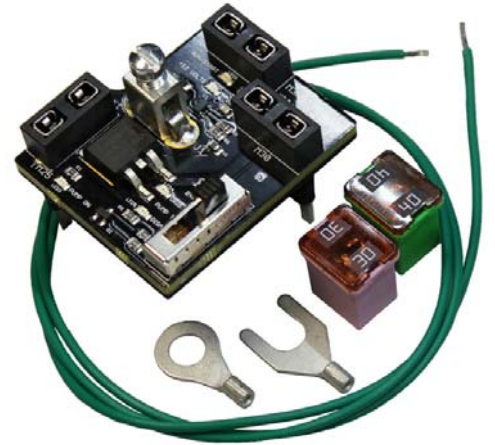


**PATENT  
 PENDING**

## TIPM Plug-In Fuel Pump Power Bypass/Test System

Thank you for your purchase. Please visit our website for the current list of compatible vehicles (new models are regularly added) and contact us via telephone or email with any questions you may have. Installation should take 10-15 minutes.

Centered around a printed circuit board with six terminals (male pins), the system plugs into an existing TIPM-7 fuse box to test and bypass a faulty fuel pump relay. It intelligently makes the connections required by the dealer installed Dodge/Jeep external relay without the need to cut harness wires or remove the TIPM. The following electrical connections to the vehicle's fuse slots are used: +12 VDC power, run/start signal, fuel pump relay output, power output to the fuel pump, and ground. Once the system is installed, your vehicle will operate normally with full remote start capabilities and no limitations.



### Tools Required

- 1) Open end or adjustable wrench - Needed to disconnect negative battery terminal.
- 2) Flat head screwdriver - Needed to attach the ground wire to the circuit board.
- 3) Pliers or crimping tool - Needed to attach the ring or fork terminal to ground.

### Installation Instructions

**Step 1** - Turn vehicle off.

**Step 2** - We highly recommend that you remove your negative battery terminal to disconnect power to the TIPM and prevent accidental short circuits.

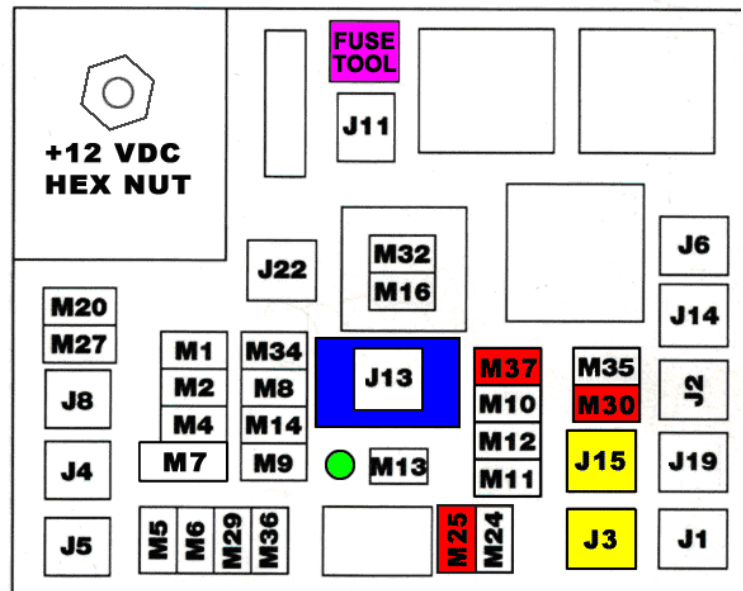
**Step 3** - Using the mini-blade/cartridge fuse removal tool located above your J11 fuse slot (shown at right in **pink**), remove three existing mini-blade fuses (M25, M30, and M37 - shown below in **red**) from your TIPM. Then insert them into the corresponding fuse slots in the circuit board.

**Step 4** - Using the mini-blade/cartridge fuse removal tool, remove two cartridge fuses (J3 and J15 - shown below in **yellow**) from your TIPM and replace them with the low profile cartridge fuses included with your shipment. Make sure the fuse amp ratings are identical after replacement. The lower profile cartridge fuses allow the circuit board to fit in your TIPM. Note that some vehicles, such as the Dodge Ram, contain only one cartridge fuse that needs replaced (J15) since J3 is empty.

**Step 5** - Insert the circuit board into the TIPM so the six male terminals slide into the M25, M30, and M37 fuse slots at the same time. If required, you can lift up the J13 fuse bezel (shown above in **blue**) around 1/4". J13 is your Ignition Off Draw (IOD) fuse, which is used to prevent battery drainage when the vehicle is not driven for weeks at a time. The circuit board is fully inserted when the top of the circuit board's yellow M25 fuse is nearly flush with the Omron grey plug-in relay located next to it. Close and then open the TIPM lid to ensure the circuit board is full seated.

**Step 6** - The included green ground wire must be connected from the circuit board's ground screw terminal J1 to your vehicle's chassis ground or negative battery terminal. Chassis ground is any conductive connection between the vehicle frame and the car battery's negative terminal. Straighten the ground wire and insert one end through the hole in the TIPM shown above in **green**. The wire will exit under the TIPM where it can be retrieved. Tighten one end of the wire to the circuit board's J1 terminal using a flat head screwdriver. Using a crimping tool or pliers, attach the included ring terminal to the free end of the ground wire as shown at right. The included fork terminal can be used instead of the ring terminal in situations where the chassis ground screw can only be loosened. The ring or fork terminal can then be connected to the vehicle's chassis ground or negative battery terminal to complete the connection.

**Step 7** - Reconnect your vehicle's negative battery terminal and you're ready to use the circuit board to test your existing fuel pump relay, test your fuel pump, bypass a faulty fuel pump relay, or put the system into security mode to prevent it from starting. The circuit board should illuminate a green Light Emitting Diode (LED) labeled "+12 VOLTS" to confirm that the vehicle has a battery voltage of at least +12.0 VDC and the circuit board is connected properly. If the LED is not illuminated, change your ground connection and make sure your battery is fully charged. Installation is now complete.



**TIPM fuse locations for use with the Plug-In Fuel Pump Power Bypass/Test System**



## Operating Modes

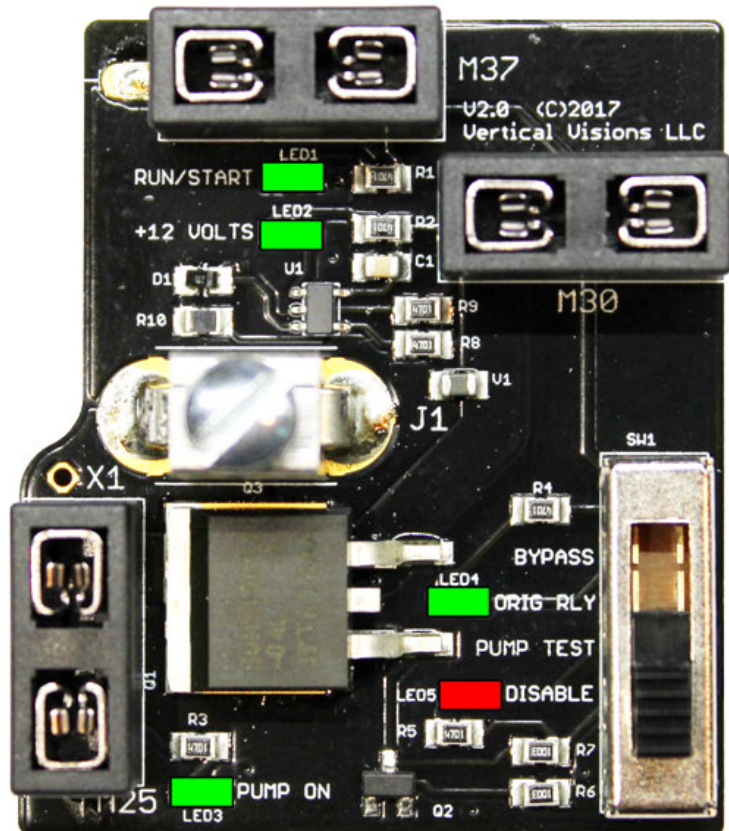
A four position switch provides the following functionality:

**1) Bypass Mode** - Use this mode for normal driving to bypass a faulty fuel relay. This switch position uses the vehicle's run/start +12 VDC signal provided by the M37 fuse terminal to power switch position 1, which then controls two solid state MOSFETs. A green "RUN/START" LED will be illuminated when the run/start +12 VDC signal is present. The larger MOSFET then passes a separate +12 VDC supply from the M30 fuse pin to provide source power across the M25 fuse to the fuel pump. The run/start +12 VDC signal indicates the need for power to be supplied to the fuel pump when attempting to start or operating the vehicle.

**2) Original relay** - Use this mode if you want to test your faulty fuel relay or allow the faulty fuel relay to drive the fuel pump. This switch position uses the original +12 VDC fuel pump relay output from the upper M25 terminal to provide power to switch position 2, which then powers two MOSFETs. The larger MOSFET then passes a separate +12 VDC supply from the M30 fuse pin to provide source power across the M25 fuse to the fuel pump. This arrangement will only send +12 VDC to the fuel pump if the original fuel pump relay is sending +12 VDC through fuse slot M25. A green "ORIG RELAY" LED will be illuminated when the +12 VDC signal supplied via the original fuel pump relay is detected. If the original fuel pump relay +12 VDC signal is intermittent or not present, the green LED and two MOSFETs will duplicate it via the +12 VDC supply provided to the fuel pump.

**3) Fuel Pump Test** - This switch position permits the user to test the fuel pump when the vehicle is on or off in order to confirm the proper electrical operation of the fuel pump. This mode can also be used to drain the fuel tank by pumping fuel out when the vehicle is off. When placed in this mode, +12 VDC is sent to switch position 3, which then powers two MOSFETs. The larger MOSFET then passes a separate +12 VDC supply from the M30 fuse pin to provide source power across the M25 fuse to the fuel pump. You should be able to hear your fuel pump operating by listening for a pumping/motor sound with your ear close to the fuel tank while in a quiet environment.

**4) Disable fuel pump** - This switch position completely disables power to both MOSFETs and the fuel pump, serving as an anti-theft device. A red LED is illuminated when in this mode to indicate the fuel pump is disabled.



## LED Feedback

The circuit board contains five LEDs that provide feedback to the user. These LEDs draw very little current, so they won't drain your battery if illuminated when the vehicle is off.

**1) Green "RUN/START" LED** - Turns on only when the engine is starting or running and +12 VDC is fed across the M37 fuse. This LED shows the user that the vehicle is on and bypass mode can be used.

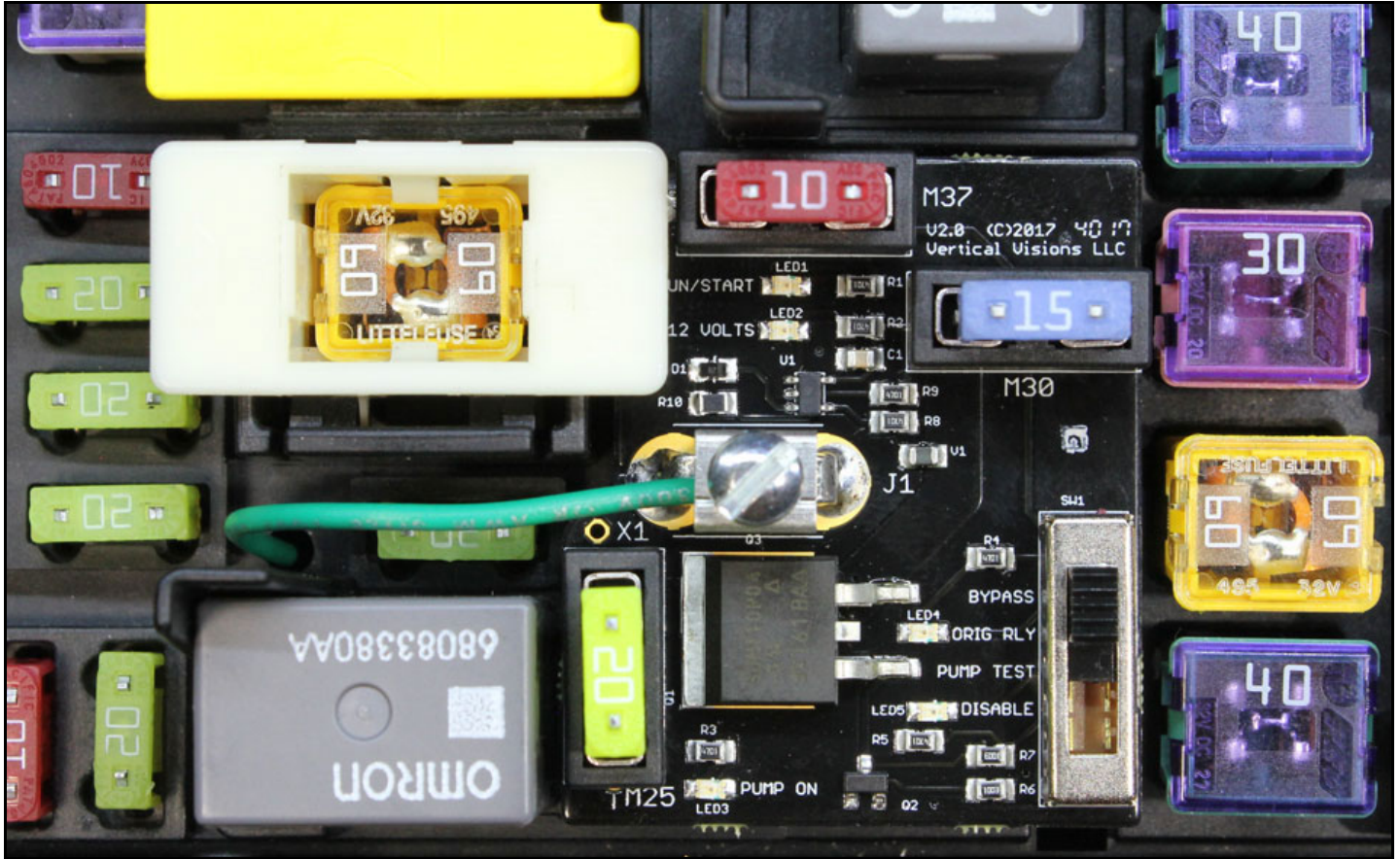
**2) Green "+12 VOLT" Supply" LED** - Indicates +12.0 VDC or greater battery supply is available as the main power source used to feed both MOSFETs, the fuel pump, the comparator circuit, all LEDs, and other circuits. This LED should be on all the time, unless the battery is disconnected or below +12.0 VDC. In some vehicles, this LED might not be illuminated during engine cranking due to a temporary voltage drop, which is normal. When the vehicle is powered off, this is the only LED that is illuminated.

**3) Green "ORIG RLY" LED** - Will be illuminated when the +12 VDC signal supplied via the original faulty fuel pump relay is detected and the switch is in the Original Relay position. If the original fuel pump relay +12 VDC signal is intermittent or not present, the green LED and two MOSFETs will mimic it via the +12 VDC supply provided to the fuel pump. LED feedback can be used to determine if the vehicle's fuel pump relay is faulty.

**4) Red "DISABLE" LED** - When the switch is in this position, a red LED will be lit showing the user that the anti-theft fuel pump disable mode is selected. No power can enter the fuel pump and the vehicle will not start in this mode.

**5) Green "PUMP ON" LED** - If power is supplied across the M25 20 amp fuse and out to the fuel pump, this LED will be lit. If no light is present, no power is provided to your fuel pump.

## Completed Installation



*Circuit board installed in a TIPM (fuse box) with green ground wire shown at left*

## Normal Operation

**Normal operation of TIPM Plug-In Relay System**

- 1) During engine cranking and while driving in Bypass Mode:
  - RUN/START LED = Illuminated Green ■
  - 12 VOLTS LED \* = Illuminated Green ■
  - PUMP ON LED = Illuminated Green ■
- 2) With vehicle off in Bypass Mode:
  - 12 VOLTS LED = Illuminated Green ■

If you have starting issues, ask a 2nd person to visually verify the PUMP ON LED is illuminated green during engine cranking. When illuminated, the TIPM Plug-In Relay System is working properly by delivering 12 VDC to your fuel pump. If a no start condition exists while the PUMP ON LED is illuminated, you likely have other problems outside the TIPM. Read our FAQ for other things to check.

\*12 VOLTS LED indicates battery voltage is at least 12.0 VDC. Some vehicles may not illuminate LED during engine cranking per a voltage drop (normal).

## **Frequently Asked Questions**

### **1) Which switch position should I use?**

Answer: Most people will leave the switch in the uppermost position (BYPASS MODE) in order to bypass a faulty fuel pump relay and use the vehicle's run/start signal to power the fuel pump through our device. The dealer installed Dodge/Jeep external relay also relies on these same signals.

### **2) When I turn my car off, the "+12 VOLTS" green LED is still lit. Is this a problem?**

Answer: It's quite normal. This LED indicates your battery has at least +12.0 VDC and sufficient battery power to start the car. The LED draws very little current and will not drain your battery. Many vehicles have other LEDs that are lit when the vehicle is off, such as a red security light, which is completely normal.

### **3) The fuel pump relay inside my TIPM is faulty and stuck in the on position (draining my battery). When I install the TIPM Plug-In Relay System, will this present a problem?**

Answer: No. Our system is designed to completely disconnect a faulty fuel pump relay from the fuel pump circuit. If you move the device's switch to "bypass mode", the old faulty relay is not connected to the fuel pump. However, our device can optionally use the original faulty relay to drive the fuel pump, if you so choose. The "ORIG RELAY" switch position is often used for testing purposes where a green LED can provide feedback indicating whether or not the faulty fuel relay is providing +12 VDC to the fuel pump.

### **4) After installation, a "NO FUSE" light is illuminated on my instrument panel. Can it be remedied?**

Answer: Yes. Simply push down on your J13 fuse (with white bezel). This fuse is sometimes lifted up during the installation of the TIPM Plug-In Relay Circuit Board and it must be pushed down when complete. J13 is your Ignition Off Draw (IOD) fuse that is normally lifted up to prevent battery drainage during long periods of time where the vehicle is not used (i.e. while at the airport during long vacations). Push it down all the way and all should be fine.

### **6) Will my remote start and safety mechanisms be affected by this device?**

Answer: No. Users will maintain full functionality of their remote start. Additionally, power to the fuel pump will be removed during a crash since it uses the same signals as the dealer installed Dodge/Jeep external relay.

### **7) After installation, my HVAC fan is not working. Is the device causing this issue?**

Answer: No. You likely forgot to install the lower profile J15 cartridge fuse included with your shipment. Since the original J15 and J3 cartridge fuses in your vehicle collide with the circuit board, you must remove them and exchange with lower profile versions.

### **8) My car still won't start after installing the system. What should I check?**

- Verify the Ignition Off Draw (IOD) J13 fuse with a white bezel around it is pushed down all the way. During installation, this fuse may have been lifted up slightly to allow for installation of the TIPM Plug-In Relay System.
- Confirm that you replaced your taller J15 and/or J3 cartridge fuses (shown in yellow on page 1) with the lower profile versions provided in your shipment. Many Dodge Ram vehicles will not have a J3 fuse installed. Your HVAC system will not work if you fail to install one of these fuses.
- Visually check the three fuses (M25, M37, and M30) that were removed from your TIPM and inserted into our TIPM Plug-In Relay System to ensure they're not blown.
- With the vehicle off in bypass mode, you should only see the green 12 VOLTS LED illuminated. This LED indicates that your ground wire is properly attached to the negative battery terminal or chassis ground and that you have at least 12.0 VDC present in your battery. If no LEDs are illuminated, reconnect your green ground wire or confirm that your battery voltage is at least 12.0 VDC.
- Have you checked your fuel pump to confirm it is working? Move the switch to the PUMP TEST position. In this position, you should see the green PUMP ON LED illuminate, indicating that 12 VDC power is being delivered to the fuel pump. You can also hear the fuel pump if the vehicle is located in a quiet environment.
- Verify that you see the three green LEDs shown in the normal operation section on page 3 during the engine cranking process and while driving. The most important thing to remember is that illumination of the green PUMP ON LED is the ultimate goal in delivering 12 VDC power to your fuel pump. If this LED is illuminated, the TIPM Plug-In Relay System is working properly and the problem is likely elsewhere within your vehicle.
- Verify that your TIPM Plug-In Relay System is in bypass mode. In ORIG RELAY mode, a faulty relay may cause a no start condition.
- An obvious question, but we have to ask.....do you have gas in the vehicle? Is your fuel gauge working properly?
- Make sure you don't already have an **external relay** installed. If you do, change the external relay. If you allowed your dealer to cut harness wires under the TIPM, our TIPM Plug-In Relay System will not work.
- Check/replace your camshaft and/or crankshaft sensors and perform a fuel pump pressure test. There are dozens of things that can prevent a vehicle from starting, beyond the fuel pump relay issue that your TIPM Plug-In Relay System was designed to solve.

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**We greatly appreciate your business. If you find that this part does not solve your fuel pump relay problems, you can return it for a full refund (less shipping) within 30 days of receipt. A one year warranty from the purchase date is standard. Please do not hesitate to contact us if you have any questions or comments.**