with Installation Instructions

Owner's Manual

Banks Derringer® Tuner

2011-2016 F-150 3.5L EcoBoost

USE WITH SYSTEM P/N 66545, 66546, 66547

Gale Banks Engineering
546 Duggan Avenue • Azusa, CA 91702
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Customer Support: (888) 839-5600
Installation Support: (888) 839-2700

bankspower.com

11/21/2018 **PN 97283** v.2.1

General Installation Practices

Dear Customer,

If you have any questions concerning the installation of your Banks Techni-Cooler, please call our Technical Service Hotline at (888) 839-2700 between 7:00 am and 5:00 pm (PT). If you have any questions relating to shipping or billing, please contact our Customer Service Department at (888) 839-5600.

Thank you.

1. Before starting work, familiarize yourself with the installation procedure by reading all of the instructions.

2. The exploded views (**Pages 6-9**) provides only general guidance. Refer to each step and section diagram in this manual for proper instruction.

3. Throughout this manual, the left side of the vehicle refers to the driver's side, and the right side to the passenger's side.

4. Disconnect the negative (ground) cable from the battery (or batteries, if there are more than one) before beginning work. The OEM battery clamp can be removed using a 10mm socket or wrench.

5. Route and tie wires and hoses a minimum of 6" away from exhaust heat, moving parts and sharp edges. Clearance of 8" or more is recommended where possible.

6. During installation, keep the work area clean. Do not allow anything to be dropped into intake, exhaust, or lubrication system components while performing the installation, as foreign objects will cause immediate engine damage upon start-up.

CAUTION! Do not use floor jacks to support the vehicle while working under it. Do not raise the vehicle onto concrete blocks, masonry or any other item not intended specifically for this use.

7. During installation, keep the work area clean. Do not allow anything to be dropped into intake, exhaust, or lubrication system components while performing the installation, as foreign objects will cause immediate engine damage upon start-up.

Tools Required:

- Metric sockets and wrenches
- Diagonal (side cutter) Pliers
- Exacto knife or other small bladed knife
- Drill motor*
- #31 (.1200 dia.) Drill bit*
- #1 or 7/32 (.228 dia.) Drill bit*

*Required only if mounting switch in dash

Highly recommended tools and supplies:

- Standard and Phillips screwdrivers
- Silicon sealer (black or clear recommended)
- Metal coat hanger

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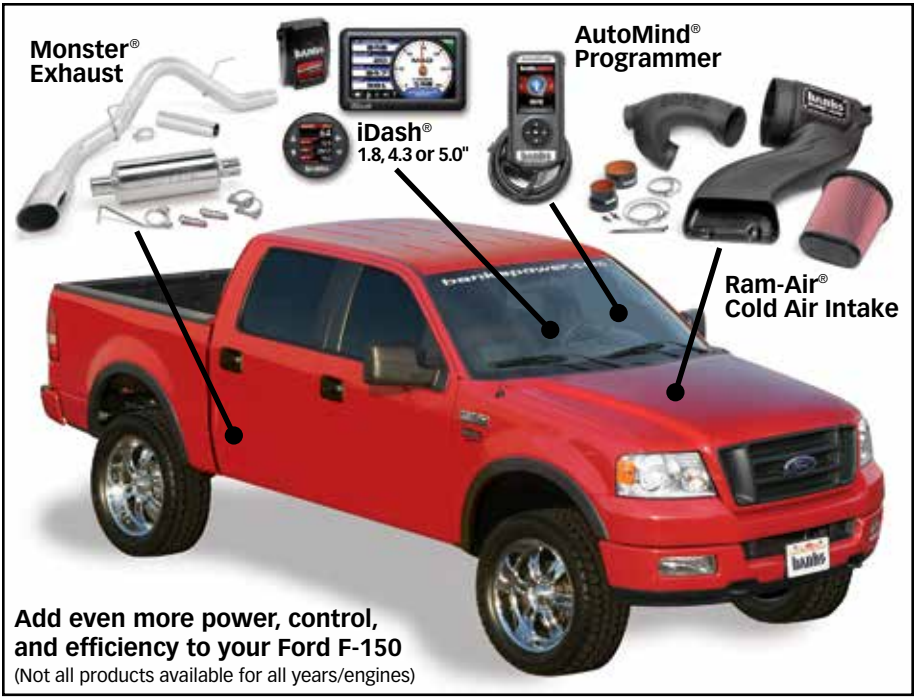
Also Available from Banks Power



Banks Monster Exhaust System
Constructed from heavy-duty stainless steel, Banks' large bore, mandrel-bent Monster exhaust connects to your truck's factory intermediate pipe, cutting backpressure and increasing flow. Gives you increased power, greater longevity and maximum fuel efficiency. The polished-stainless straight-through muffler outflows stock by a mile and delivers a commanding, yet civil, exhaust note. Huge 6x5 inch tip comes in polished chrome-over stainless or high-temp black.

Banks iDash digital gauges
Monitor and control what's happening under the hood with a Banks man-machine interface. Read and clear trouble codes, set performance and fuel economy parameters, customize the display, and so much more. Available in three sizes to fit your specific application. The 1.8" size fits perfectly in a pilar mount, and the 4.3" and 5.0" give you a large, easy-to-navigate touchscreen. Add the **AutoMind Flash Programming Module** to give your engine even more horsepower!

Banks AutoMind Programmer
The AutoMind comes ready to run with pre-loaded power right out of the box. Its calibrations were developed with power and increased MPG in mind. Displays a host of critical engine functions and provides service technician diagnostic capabilities with its ability to scan and clear vehicle trouble codes.

Banks Ram-Air Intake System
Opens up your truck's breathing with a flowbench-developed and dyno-proven intake system that is less restrictive than stock. Ram-Air's lifetime filter has a huge outlet with deep filter pleats that maximize flow and a complete air filter housing that draws in cooler, denser air to the engine for greater power and fuel economy.

Banks Stinger System
The Stinger combines intake, exhaust, and programming into one package, giving you greater performance at a better price! Intake, exhaust, and tuning—all designed to optimize airflow, air density, continuous power & MPG.

For more details call (888) 635-4565 or visit www.bankspower.com

Disclaimers

THIS IS A HIGH PERFORMANCE PRODUCT. USE AT YOUR OWN RISK. Do not use this product until you have carefully read the following agreement.

This sets forth the terms and conditions for the use of this product. The installation of this product indicates that the BUYER has read and understands this agreement and accepts its terms and conditions.

Disclaimer of Liability

Gale Banks Engineering Inc., and its distributors, employees, and dealers (hereafter "***SELLER***") shall in no way be responsible for the product's proper use and service. The ***BUYER*** hereby waives all liability claims.

The ***BUYER*** acknowledges that he/she is not relying on the ***SELLER***'s skill or judgment to select or furnish goods suitable for any particular purpose and that there are no liabilities which extended beyond the description on the face hereof and the ***BUYER*** hereby waives all remedies or liabilities, expressed or implied, arising by law or otherwise, (including without any obligations of the ***SELLER*** with respect to fitness, merchantability, and consequential damages) whether or not occasioned by the ***SELLER***'s negligence. The ***BUYER*** is responsible to fully understand the capability and limitations of his/her vehicle according to manufacturer specifications and agrees to hold the ***SELLER*** harmless from any damage resulting from the failure to adhere to such specifications.

The ***SELLER*** disclaims any warranty and expressly disclaims any liability for personal injury or damages. The ***BUYER*** acknowledges and agrees that the disclaimer of any liability for personal injury is a material term for this agreement and the ***BUYER*** agrees to indemnify the ***SELLER*** and to hold the ***SELLER*** harmless from any claim related to the item of the equipment purchased. Under no circumstances will the ***SELLER*** be liable for any damages or expenses by reason of the use or sale of any such equipment.

The ***BUYER*** is responsible to obey all applicable federal, state, and local laws, statutes, and ordinances when operating his/her vehicle, and the ***BUYER*** agrees to hold ***SELLER*** harmless from any violation thereof.

The ***SELLER*** assumes no liability regarding the improper installation or misapplication of its products. It is the installer's responsibility to check for proper installation and if in doubt, contact the manufacturer.

The ***BUYER*** is solely responsible for all warranty issues from the automotive manufacturer.

Limitation of Warranty

Gale Banks Engineering Inc. (hereafter "***SELLER***"), gives Limited Warranty as to description, quality, merchantability, fitness for any particular purpose, productiveness, or any other matter of ***SELLER***'s product sold herewith. The ***SELLER*** shall be in no way responsible for the product's open use and service and the ***BUYER*** hereby waives all rights except those expressly written herein. This Warranty shall not be extended or varied except by written instrument signed by ***SELLER*** and ***BUYER***. Please see enclosed warranty information card, or go to www.bankspower.com/warranty, for warranty information regarding your product. All products that are in question of Warranty must be returned shipping prepaid to the ***SELLER*** and must be accompanied by a dated proof of purchase receipt. All Warranty claims are subject to approval by Gale Banks Engineering Inc.

Under no circumstance shall the ***SELLER*** be liable for any labor charged or travel time incurred in diagnosis for defects, removal, or reinstallation of this product, or any other contingent expense.

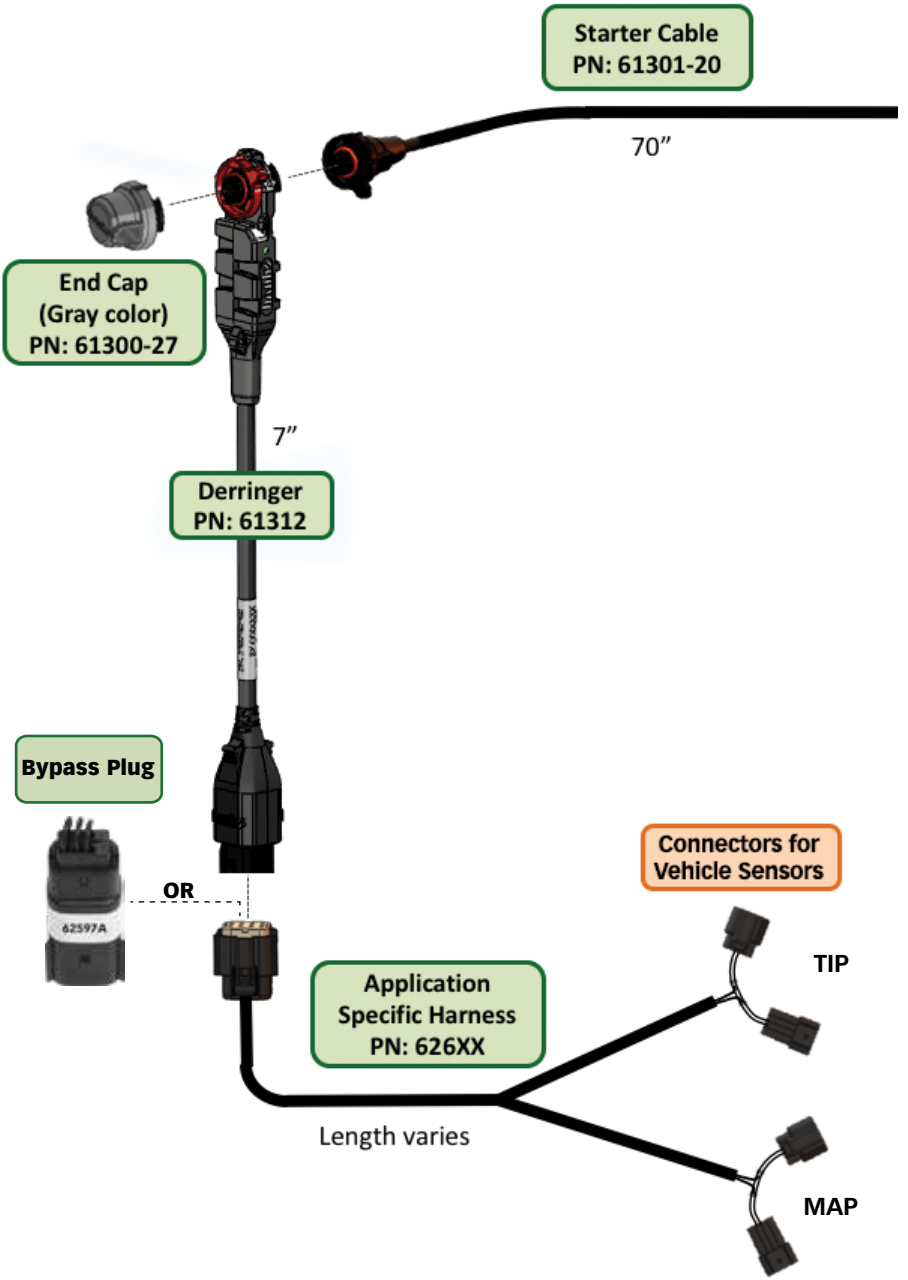
Under no circumstances will the ***SELLER*** be liable for any damage or expenses incurred by reason of the use or sale of any such equipment.

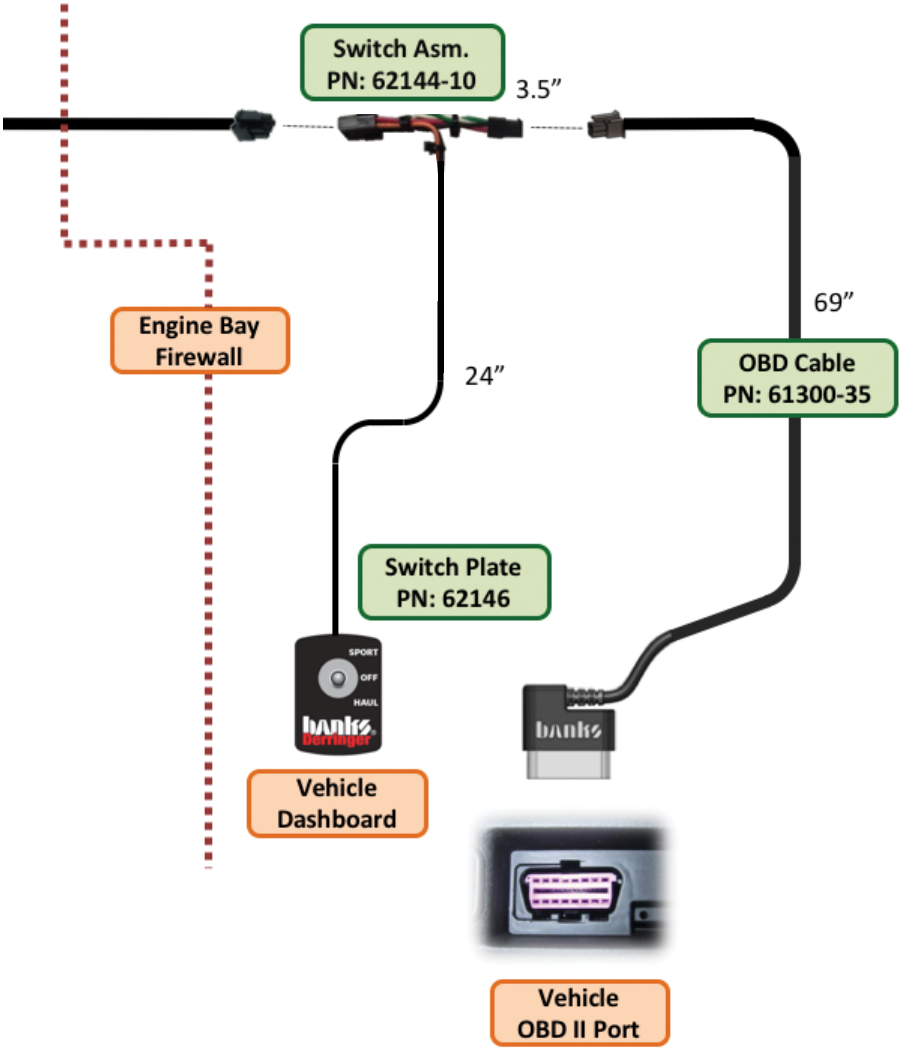
IN THE EVENT THAT THE BUYER DOES NOT AGREE WITH THIS AGREEMENT:

The ***BUYER*** may promptly return this product, in a new and unused condition, with a dated proof-of-purchase, to the placeof-purchase within thirty (30) days from date-of-purchase for a full refund, less shipping and/or restocking fee.

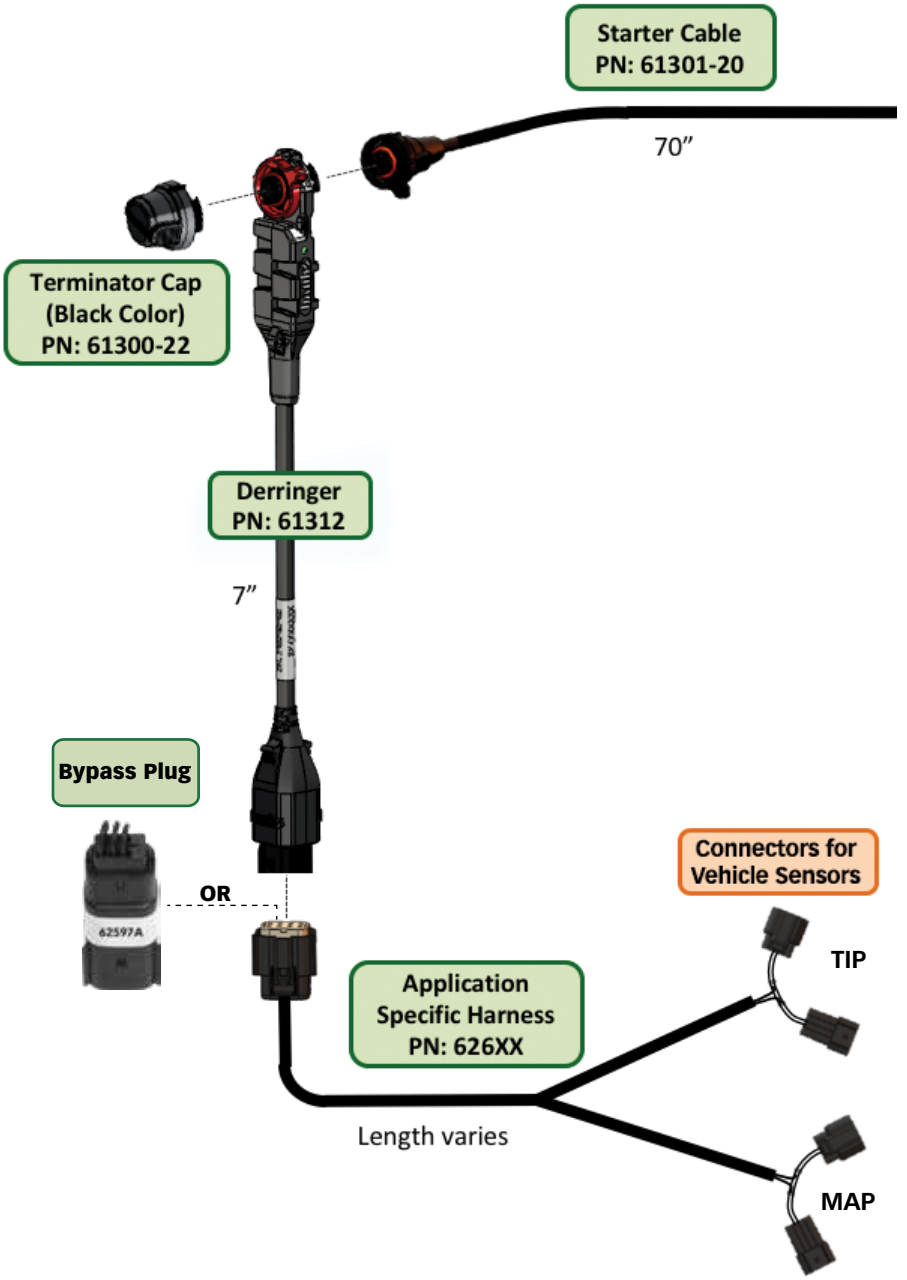
The installation of this product indicates that the ***BUYER*** has read and understands this agreement and accepts its terms and conditions.

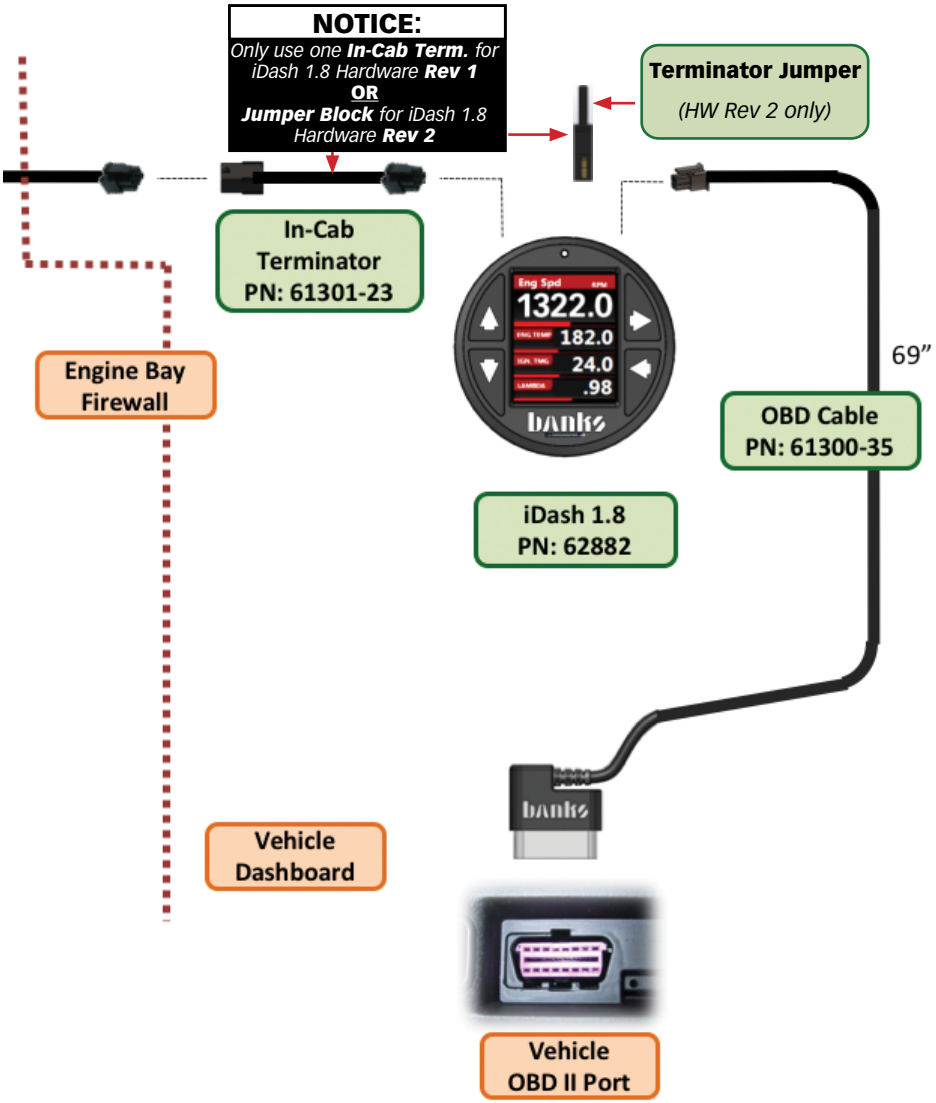
Wiring Diagram: Stand Alone/ Switch Tuner Configuration




Switch Asm.
PN: 62144-10
3.5”
Engine Bay
Firewall
24”
69”
OBD Cable
PN: 61300-35
Switch Plate
PN: 62146
SPORT
OFF
HAUL
banks
Derringer
banks
Vehicle
Dashboard
Vehicle
OBD II Port

Wiring Diagram:
iDash 1.8" Configuration




NOTICE:
Only use one In-Cab Term. for iDash 1.8 Hardware Rev 1
OR
Jumper Block for iDash 1.8 Hardware Rev 2
Terminator Jumper
(HW Rev 2 only)
In-Cab Terminator PN: 61301-23
Engine Bay Firewall
69”
OBD Cable PN: 61300-35
iDash 1.8 PN: 62882
Vehicle Dashboard
Vehicle OBD II Port

Section 1
INSTALLATION OF WIRING HARNESS, CONNECTIONS & DERRINGER

1. Use 10mm wrench to disconnect the battery ground cable from the battery (If equipped with more than one battery, disconnect all negative cables). Secure the cable(s) so that they do not come in contact with the battery posts during the installation (See **Figure 1**).

2. Remove the engine cover for the Ford F-150 Ecoboost by first removing the oil filler cap (**Figure 2**). Then, lift up at the passenger's side to release the rubber socket mounts. Then pull up at the driver's side to release the opposite side mounts (**Figure 3**). After removing the engine cover, reinstall the oil filler cap to prevent accidentally dropping anything into the engine during work. *(No tools required)*

Figure 1

Figure 2

3. On the top of the EcoBoost 3.5L engine you will find a Manifold Absolute Pressure (MAP) sensor at the back of the intake. Disconnect the MAP sensor plug, pushing down on the release lever until it releases, then pulling the connector away from the sensor (**Figure 4**). ***Note: Pull only on the connector, do not pull on the wires.*** *(No tools required)*

4. On the intake tube that connects to the throttle body, you will find a Throttle Inlet Pressure (TIP) sensor. This connector is under the airbox intake tube, behind the radiator and under the coolant bottle. It can be reached without disconnecting the intake components. To disconnect the TIP sensor plug, pushing down on the release lever until it releases, then pull the connector away from the sensor (**Figure 5**). ***Note: Pull only on the connector, do not pull on the wires.*** *(No tools required)*

Figure 3

Figure 4

Figure 5

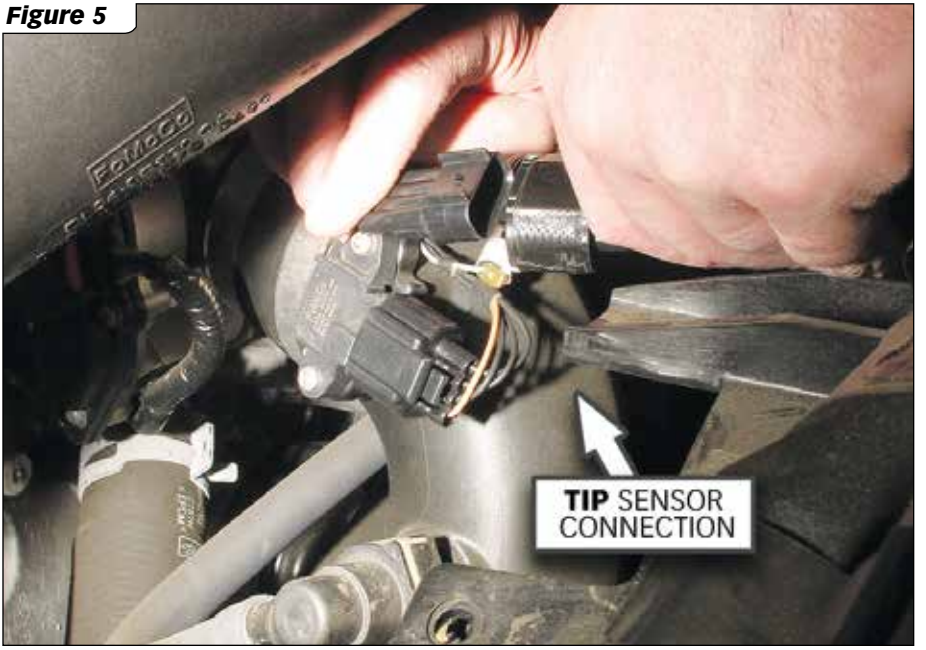
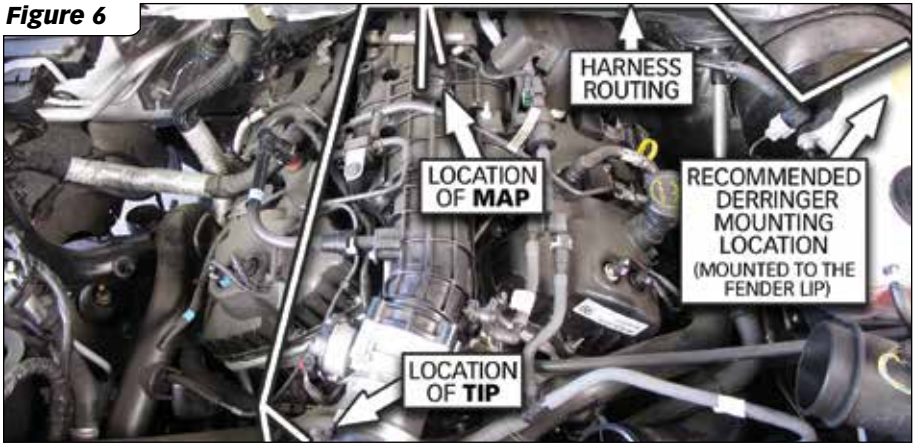


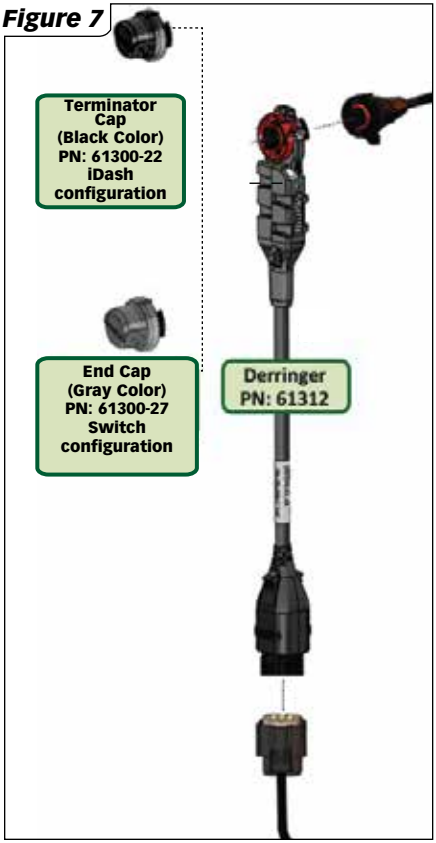
Figure 6



5. Plug the harness connectors labeled TIP between the TIP sensor and engine harness. Route the harness towards the rear of the engine and plug the harness connectors labeled MAP between the MAP sensor and engine harness. Route the Derringer harness across the driver's side valve cover. Then over to the side of the engine bay on the driver's side fender. Take care to route the harness over the top of the brake booster vacuum canister. Ensure that it doesn't get tangled in the steering shaft or the brake rod that actuates the booster (**Figure 6**).

6. Connect the Derringer module to the sensor harness, mounting it up and out of the way of any moving parts. It is suggested that it be mounted to the fender lip on the driver's side, using a provided Zip tie. **Figure 6**

Figure 7



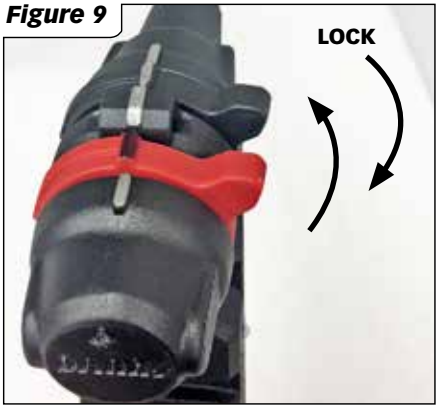
7. Route the Derringer starter cable through the firewall wiring harness gasket, and into the driver compartment. Simply cut a small X about, ¼-inch at the inside edge of the wire harness gasket. Then feed the 6-pin end of the Derringer starter cable through the hole. Apply a little black silicone sealer around the factory wire harness gasket where the new hole was added (**Figure 8 & 9**). A wire coat hanger is helpful for pulling the harness through the two sides of the OEM wire harness gasket. Take care to not damage the factory wire harness.

8. Plug the round connector end of the Banks starter cable into the Derringer and secure it by rotating the locking ring clockwise towards its locking position.(**Figure 10,11)**

Figure 8

Figure 11

Figure 9



9. Install the gray End cap for the switch Congiguration, or the black terminator cap for iDash configuration. Rotate the locking ring clockwise to lock.

10. Plug the OBDII cable into the OBDII port under the dash (**Figure 12**).

For Switch Configuration:

NOTE: If using the Switch configuration, perform steps 11-13. If using iDash 1.8" Gauge configuration, skip to step 14.

11. Plug the 4-pin connector from the OBDII cable, the 6-pin connector from the starter cable, and the 2-pin connector from the switch cable into the Y-harness (**Figure 13**).

12. Install the power level plate to the switch. Make sure to align the slot of the switch with the red line on the plate towards Sport (**Figure 14**).

13. OPTIONAL: Mount switch in dashboard by drilling two holes using the supplied template (see **page 24**). Be careful to not damage factory wiring behind the dashboard. To keep the switch from rotating, it is necessary to install the locking tab washer behind the dash, with the

Figure 10

locking tab facing the backside of the dash face. Alternatively, Zip tie the switch in any easy to access location for power level adjustment.

Figure 12

Figure 13

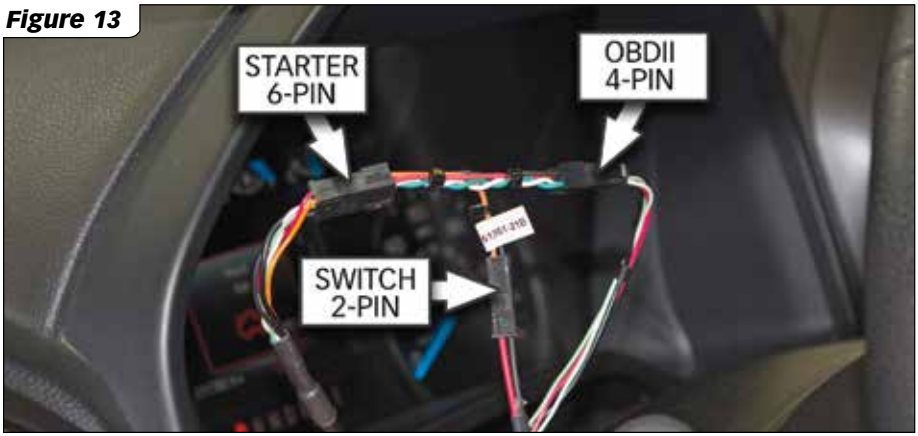


Figure 14

For iDash Configuration:

NOTE: Only perform steps 14-16 if using iDash gauge configuration. If using the switch configuration skip to step 17.

14. Check which iDash 1.8 Hardware Revision you have. Look behind the iDash 1.8 as shown in **Figure 15** to check for pins. Alternatively you can check the "**Hardware Rev:**" in the "**System Information**" menu, as shown in **Figure 16.**

Figure 15

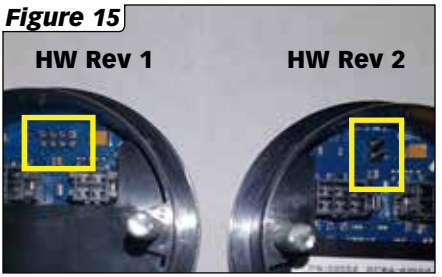
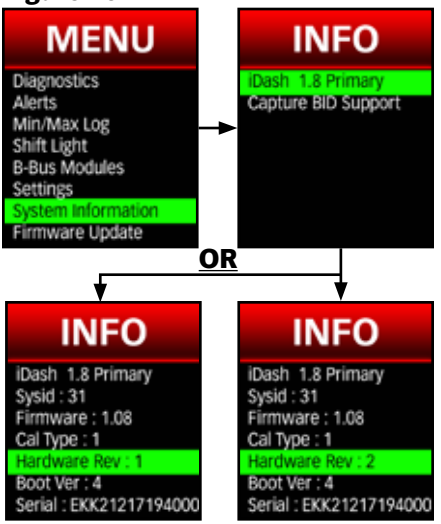


Figure 16



15. If using a single iDash Gauge:
(If using multiple, skip to step 16)

If you have a HW Rev 1 iDash 1.8:

A. Connect the Starter Cable to the In-Cab Terminator. See **Figure 17, Step 2A.**

B. Connect the In-Cab Terminator to the iDash 6-Pin Port. See **Figure 17, Step 2B.**

If you have a HW Rev 2 iDash 1.8:

A. Connect the Starter Cable to the iDash 6-Pin Port (**Without** the In-Cab-Terminator). See **Figure 17.**

B. Check for the pre-installed Jumper Block to the iDash 2-Pin termination. See **Figure 18.**

Figure 17

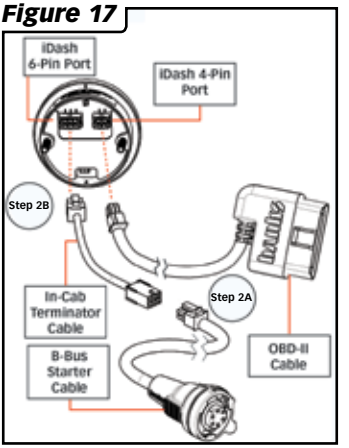


Figure 18

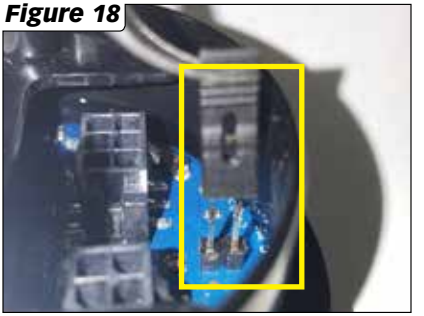
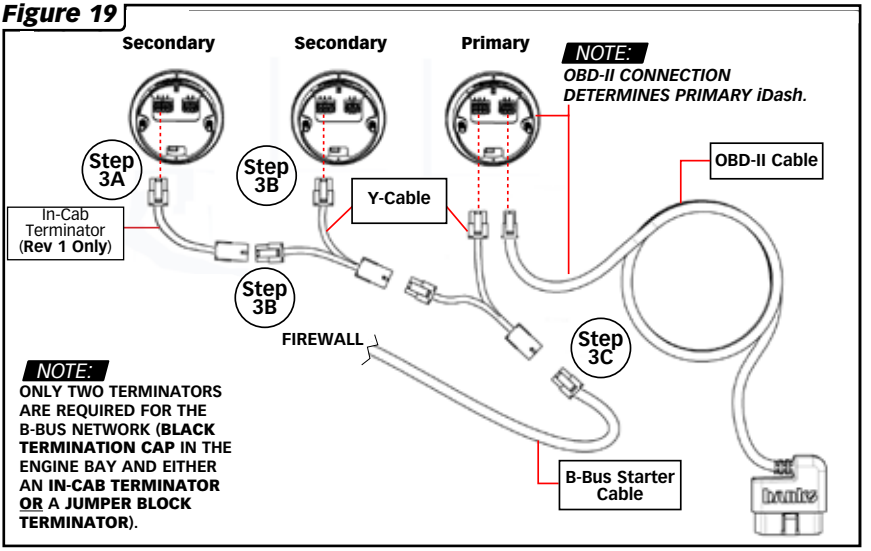


Figure 19



16. If using multiple iDash Gauges:

<u>If you ONLY have HW Rev 1 iDash 1.8's:</u>

A. Connect the In-Cab Terminator to the iDash 6-pin port. See **Figure 19, Step 3A.**

NOTE: Only one In-Cab Terminator is required.

B. Connect the Y-Cable to the In-Cab Terminator and the second iDash. See **Figure 19, Step 3B.**

NOTE: For each additional iDash 1.8, a Y-Cable is used. See **Figure 19.**

C. Connect the Starter Cable to the Y-Cable. See **Figure 19, Step 3C**.

<u>If you ONLY have HW Rev 2 iDash 1.8's:</u>

B. Connect the Y-Cable to the 6-pin port of the first and second iDash 1.8 (**without** the **In-Cab Terminator**). See **Figure 19**

C. Connect the Starter Cable to the Y-Cable. See **Figure 19, Step 3C**.

B. Remove extra Jumper Blocks from the secondary iDash 2-Pin terminations. See **Figure 18.**

NOTE: Only one Jumper Block Terminator is required.

<u>If you have HW Rev 1 AND Rev 2 iDash 1.8's:</u>

Follow either of the instructions for Rev 1 or Rev 2, but only use a single terminator.

15. Install the iDash 1.8 in an A-pillar mount or a suction cup windshield-mount gauge-pod.

For all installations:

17. Secure the harness connectors under the dash, avoiding any moving parts, with supplied Zip ties.

18. Double-check all wire harness routing under the hood and the dash for proper clearance around moving parts and sharp objects as well as heat sources, then use the supplied nylon tie straps to secure the wire harnesses safely away from any control linkages and the operator's feet underneath the dashboard. Be sure to step on the brake and E-brake pedals and move the tilt column and adjustable peddles, if equipped, when checking for proper harness clearance. Also turn the steering wheel lock to lock to ensure that the harness does not hit, pull or otherwise interfere with any moving or hot parts of the truck.

19. Re-attach any previously removed interior trim panels, reinstall the acoustic foam engine intake cover and oil fill cap and lower the vehicle. Re-connect the negative battery cable.

20. Start the vehicle, checking for normal engine operation.

NOTICE: Go over the entire installation as a precautionary check to ensure that all clamps are tight, wiring and hoses are properly routed, and connections are correct and tight. Make sure that the Derringer wire harness is not lying in the way of the brake and gas pedals, or any moving parts.

If vehicle is equipped with adjustable pedals and/or column, ensure that the harness is clear through the full range of adjustments.

Section 2
OPERATION OF THE DERRINGER MODULE

Setting Desired Power Level:

The Derringer is equipped with multiple power levels. You can set the desired power level while the engine is running but it is recommended that you do not switch the power level under high load applications.

Switch configuration:

There are 3 power levels (Sport, Plus and Stock) when configured with a switch.

iDash 1.8 configuration:

When the Derringer is connected to an iDash 1.8, there are a total of 6 power levels (level 6, 5, 4, 3, 2 and stock). The power level can be changed by pressing the **UP** and **DOWN** buttons at any time. If you have the derringer layout loaded, you will see the power level change at the bottom left corner (See **Figure 2-1**). If you have any other layout loaded, a message box will pop up to notify you of the power level change.

Figure 2-1

SPORT MODE/LEVEL 6 (switch up/ towards slot)
This mode is to be used when peak engine performance is required. This mode has been optimized for maximum power output along with improved turbo response by tuning fuel delivery and boost.

SPORT MODE (switch up)
Full power will be available for 10-15 seconds at a time depending on the application. **PLUS MODE/LEVEL 3 (switch down/away from slot)**
The plus calibration is designed for use in everyday driving. This power level adds a noticeable punch under high load acceleration by improving turbo response and power. Power in this mode can be sustained for a prolonged duration.
STOCK MODE (switch middle)
Stock mode turns OFF your Derringer tuner. Throttle response and power return to stock levels.
Banks ActiveSafety®

Anytime aftermarket electronics are introduced to your vehicle, it is important to know that they are not going to cause damage. Banks builds in a suite of ActiveSafety features to safeguard your vehicle:

» Software that monitors and diagnoses itself to ensure proper function.

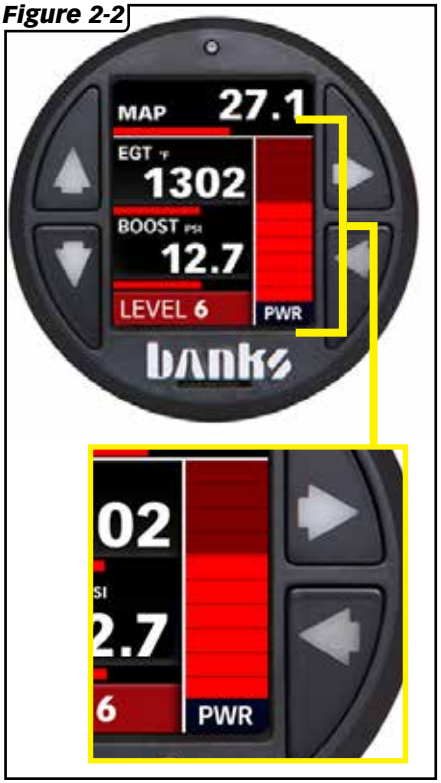
» Self-monitoring hardware that provides automatic bypass should something malfunction.

The Derringer Tuner module monitors multiple parameters and adjusts its output controls to protect the driveline. The Derringer Tuner monitors engine coolant temperature (ECT) and will limit the additional power that it provides anytime the ECT is outside of optimal operating range to protect the engine.

Power Added (%):

If connected to an iDash 1.8 while displaying the "**Derringer**" layout, the vertical bar graph on the right hand side represents, in real-time, how much power the Derringer is adding (See **Figure 2-2**). In **Stock Mode** there will be no change to the bar graph and in **Sport Mode/Level 6** the bar graph will reach 100% under proper operating conditions. Percent power added is effected by safety features such as Engine Coolant Temperature, so it might not always fully reach 100%. The "**Power Added**" data can also be displayed on ANY layout as a numeric value by selecting it from the "**Derringer**" category of parameters.

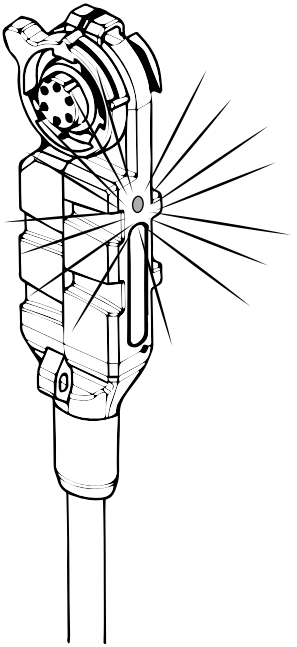
Figure 2-2



Section 3
TROUBLESHOOTING

Normal Operation

Your Derringer Tuner has a built-in, self-diagnostic system. The status of the Derringer system is communicated via the LED on the module. When the Derringer Tuner is functioning properly the LED will flash green.



Derringer Not Powered

When the LED is not illuminated, the Derringer Tuner is not powered on. If the ignition is on and the LED is not illuminated, check the TMAP connections on the vehicle and ensure they are fully engaged.

No Communication with iDash 1.8

Check that your wiring matches the figure in **Section 1.1 Wiring Diagram: iDash 1.8" Configuration** (See **page 10**) or for multiple iDash 1.8 Gauges see **Figure 15** on **page 17.**

Common sources of communication errors are wrong caps attached to the Derringer and/or the In-Cab Termination Cable is not installed. A Black Termination Cap must be connected to the Derringer and only one In-Cab Termination Cable should be attached to one of the iDash 1.8's.

LED Error Code

When faults are detected, the Derringer Tuner will flash a diagnostic code. These diagnostic codes are comprised of 2 digits. Each digit is expressed by the flashing red LED.

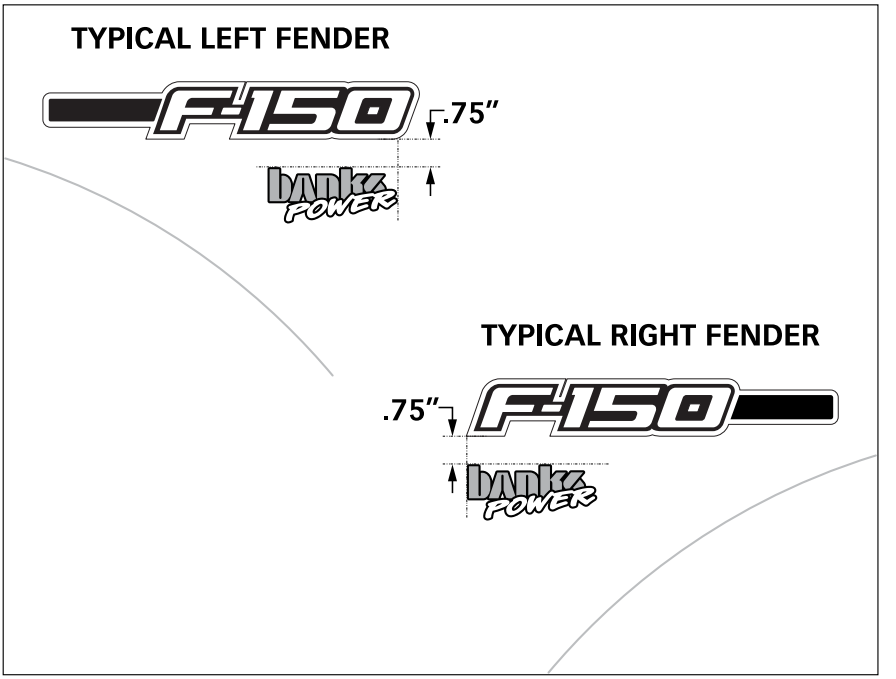
A code can be determined by counting the number of red flashes displayed before the LED flashes green for the first digit and the number of red flashes after the LED flashes green for the second digit. After the diagnostic code is displayed, additional codes will be displayed in sequence, separated by 4 seconds with the LED off. Once all codes are displayed the Derringer will begin sending the codes again. Once you have written down all diagnostic codes being displayed, consult the following tables for a description of the code along with the action to be taken.

Bypass Plug

If the Derringer should ever need to be removed from the vehicle, the system includes a bypass plug that must be connected to the sensor harness in place of the module. Failure to utilize the bypass plug when the Derringer has been unplugged from the harness will generate a Check Engine light when attempting to start the vehicle.

Code	Event	Course of Action
1,1	Throttle Inlet Pressure (TIP) Input Voltage Out of Range.	Turn ignition OFF and check the male and female TIP sensor connectors. Turn ignition back ON and re-check for presence of code. If code does not re-appear at key ON, start engine and check for presence of code both at engine idle and under varying driving conditions.
1,2	Manifold Absolute Pressure (MAP) Input Voltage Out of Range.	Turn ignition OFF and check the male and female MAP sensor connectors. Turn ignition back ON and re-check for presence of code. If code does not re-appear at key ON, start engine and check for presence of code both at engine idle and under varying driving conditions.
2,1	Throttle Inlet Pressure (TIP) Output Voltage Out of Range.	Turn ignition OFF and check the male and female TIP sensor connectors. Turn ignition back ON and re-check for presence of code. If code does not re-appear at key ON, start engine and check for presence of code both at engine idle and under varying driving conditions.
2,2	Manifold Absolute Pressure (MAP) Output Voltage Out of Range.	Turn ignition OFF and check the male and female MAP sensor connectors. Turn ignition back ON and re-check for presence of code. If code does not re-appear at key ON, start engine and check for presence of code both at engine idle and under varying driving conditions.
3,4	OBDII / BanksBus CAN communication error	Turn ignition OFF and check the following connections (as applicable): 1) 61300-35 OBD-II Interface Cable - at 16-pin vehicle OBD-II and 4-pin inter-cable connectors. 2) 61301-21 Y-Adapter Cable - at 4-pin inter-cable and 6-pin inter-cable connectors. 3) 61301-20 B-Bus Starter Cable - at 6-pin inter-cable and 6-pin B-Bus Circular connectors. 4) 61300-22 B-Bus Terminator Plug - at 6-pin B-Bus Circular connector. Turn ignition back ON and re-check for presence of code. If code does not re-appear at key ON, start engine and check for presence of code both at engine idle and under varying driving conditions.

Section 4
PLACEMENT OF THE BANKS POWER DECALS



Mount switch template
(step 11 on page 16)