



**Installation Manual v1.6:
2007.5-09 Dodge 68RFE Automatic Transmission**

Please read all instructions before the installation of the ATS Co-Pilot

Thank you for purchasing the ATS Co-Pilot transmission management computer. This manual is to assist you with your installation and operation of the unit. If you are installing the unit for a customer, *please pass this manual on to your customer* for future reference.



Figure 1 - Kit Contents

Wiring

Disconnect the negative ground (black) terminals on all vehicle batteries before starting installation. The ATS 68RFE Co-Pilot is designed to be nearly completely plug-in; however, some tapped connections will be necessary. The following instructions will be divided up for wiring up each individual connector and wire color labeled on the ATS Co-Pilot. Solder all connections for

reliable results. These wire connections must be shielded from the elements (we recommend heat shrink tubing).

NOTE: When routing the Co-Pilot harness, be sure to route the harness away from hot areas in the engine compartment (i.e. exhaust, turbo and EGR) to avoid damage to the wiring and harness. Reconnect all ground terminals on batteries after completing installation.

Co-Pilot Mounting Location

Find a convenient location to mount the Co-Pilot within reach and view of the driver. We recommend locating the unit just to the right of the driver on the lower dash panel (above the driver's right knee). Use the supplied Velcro to secure it to the dash. Before sticking the Velcro to the dash thoroughly clean the area with a cleaner such as acetone or brake clean (apply the cleaner to a clean rag or towel and wipe the area clean).

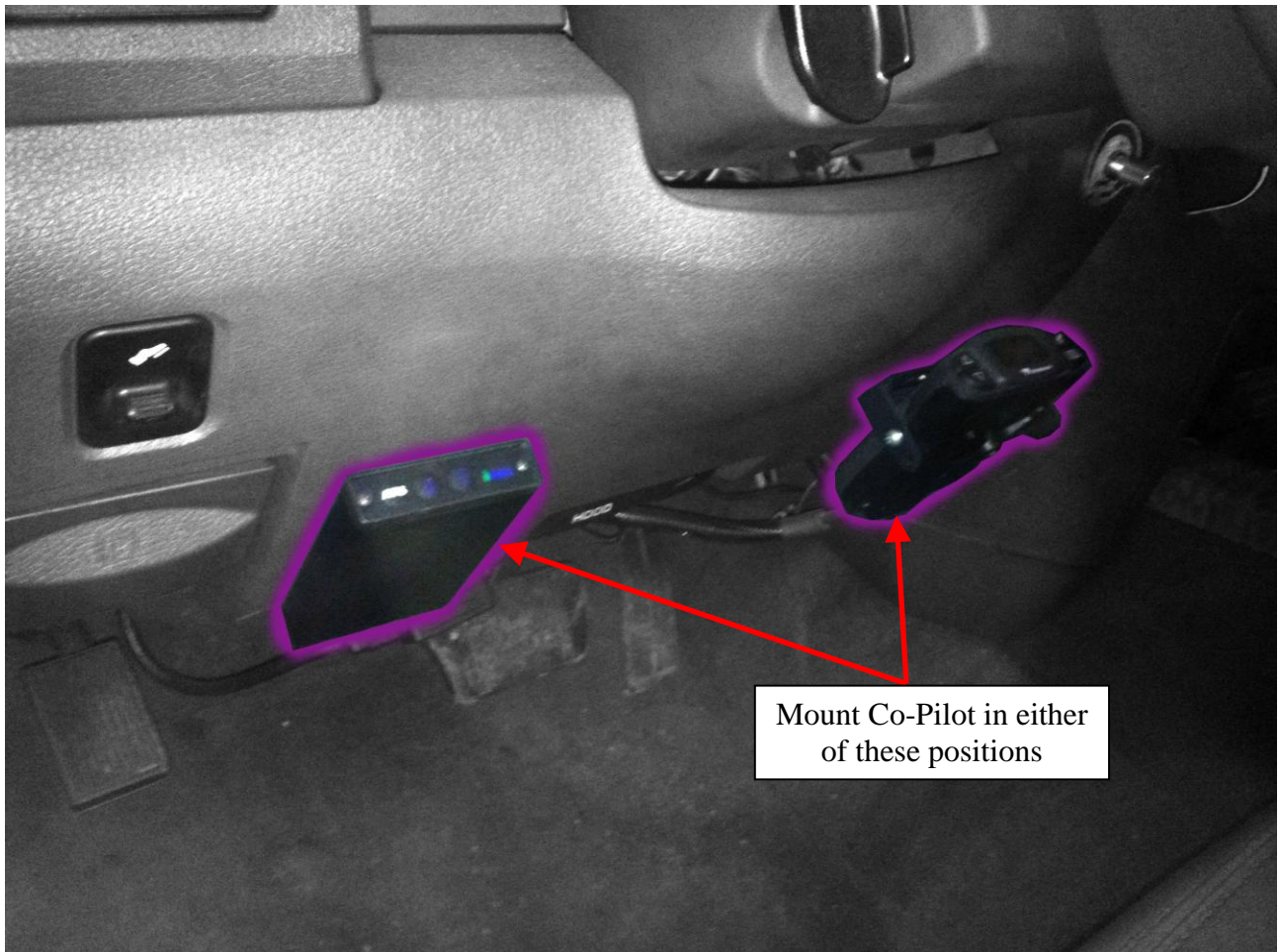


Figure 2 - Suggested Co-Pilot Mounting Locations

Routing Co-Pilot Wiring Harness

The Co-Pilot harness is designed to be simple and easy to route. Included in the kit, a large rubber grommet is designed to replace clutch master cylinder block-off plate located on the firewall. It is located on the driver's side of the firewall near the brake master cylinder. Inside the cab, the locations of the nuts are shown in Figure 3.

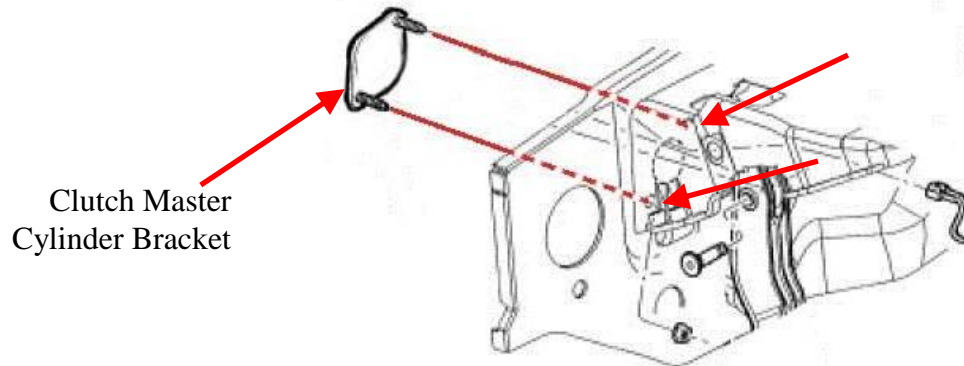


Figure 3 - Clutch Master Cylinder Bracket Location

If not already done, push the 18-pin connector through the grommet supplied in the kit. Slide the 18-pin connector through the hole in the firewall from the engine side and mount the grommet in the hole. Make sure the pink wire is accessible inside the cab.

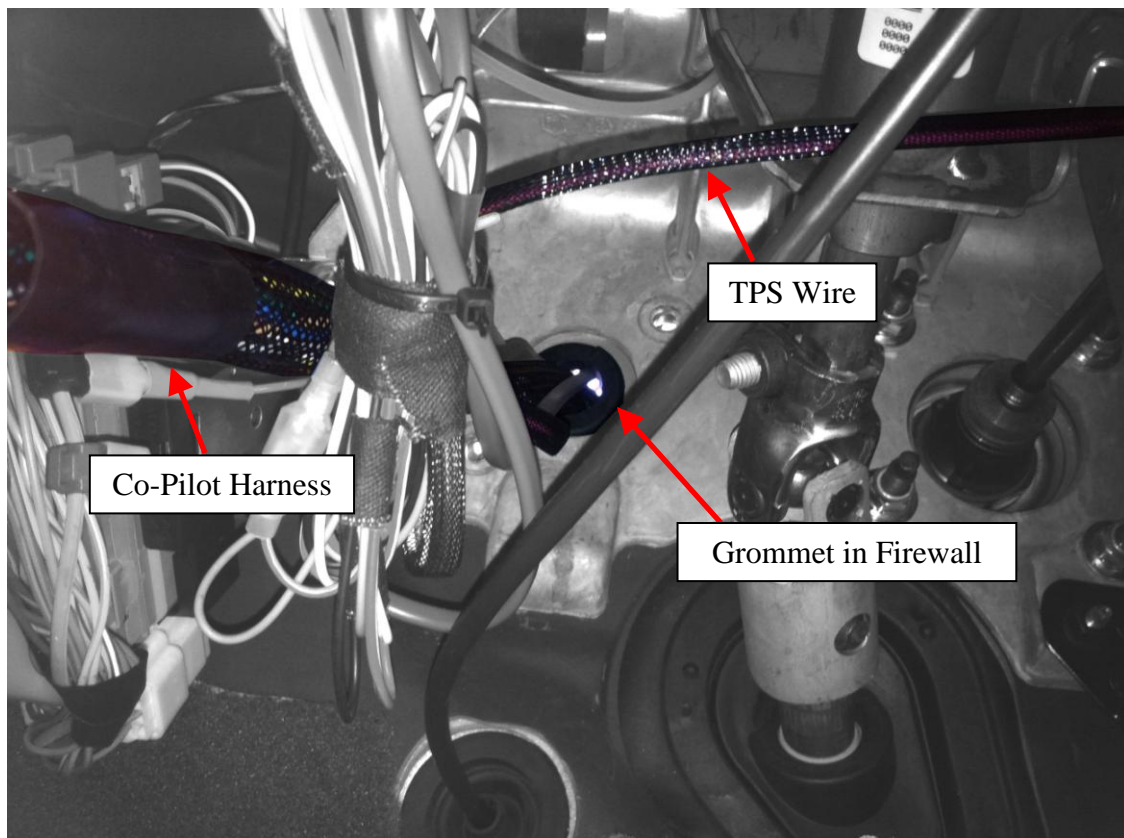


Figure 4 - Under Dash Components

Connect the 18-pin connector from the harness to the connector on the Co-Pilot control box and secure the box to the dash. In the opposite side of the harness, make sure the black and orange wires are accessible under the hood. The connections for these wires are covered later in this manual. Route the harness through the engine bay as shown below. Be sure to secure the harness away from major heat sources like the turbo(s) and exhaust manifold using the zip ties provided.



Figure 5 - Co-Pilot Harness Routing

The remainder of the harness is comprised of the connectors that will plug IN-LINE with the C4 (green) connector on the Powertrain Control Module (PCM). This portion is designed to plug into the factory harness to make installation of the Co-Pilot as simple as possible given the complexity of the wiring. The PCM is located on the passenger side of the firewall as shown in figures 6 and 7. The C4 connector is the connector location marked by green on the PCM. Remove this connector and plug the Co-Pilot harness into the PCM until the locking tab snaps over the ramp on the PCM. Connect the opposing connector in the Co-Pilot harness into the factory C4 connector (it will snap and lock into place).

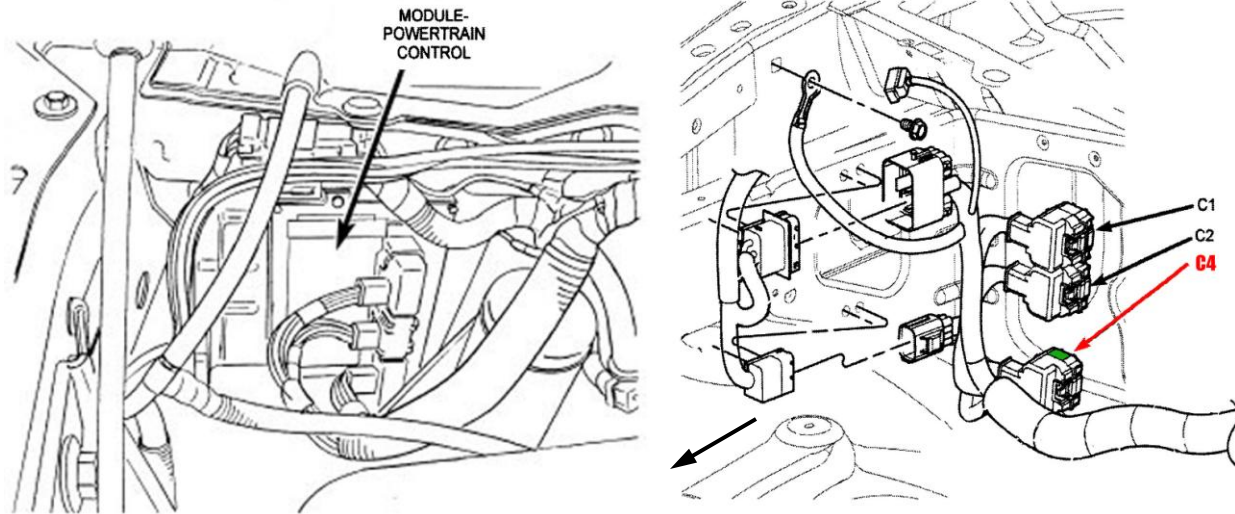
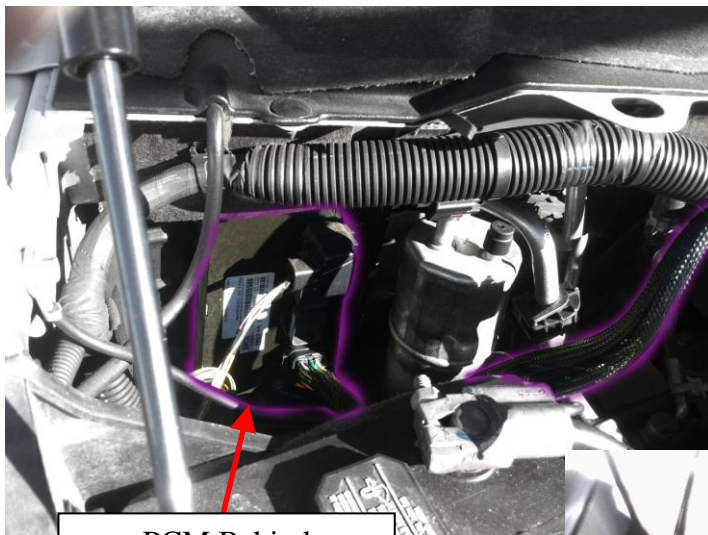


Figure 6 - Powertrain Control Module and C4 Connector Locations (Passenger Side Firewall)



PCM Behind Passenger Side Battery

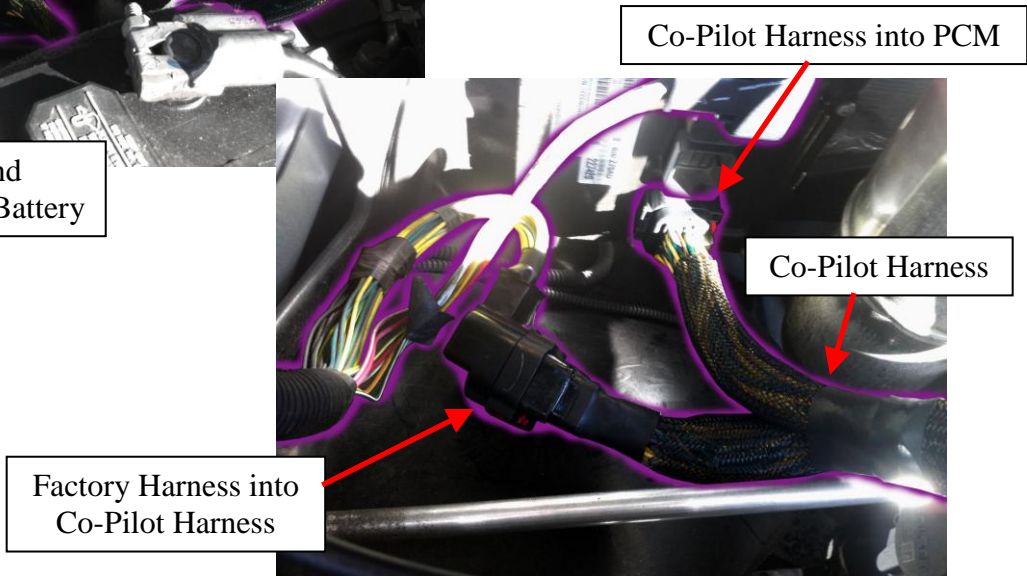


Figure 7 - PCM Location and Connections

Secondary Control Box Mounting Location

Mount the secondary control box (the black box with the 3-pin connector) in the driver side front wheel well just above the sway bar. The box is designed to use factory mounting locations. Located on the outside of the frame, a ground strap is bolted to the frame. Remove this bolt and install it through the hole as shown with the ground strap in place. Plug the 3-pin connector from the harness into the secondary control box.

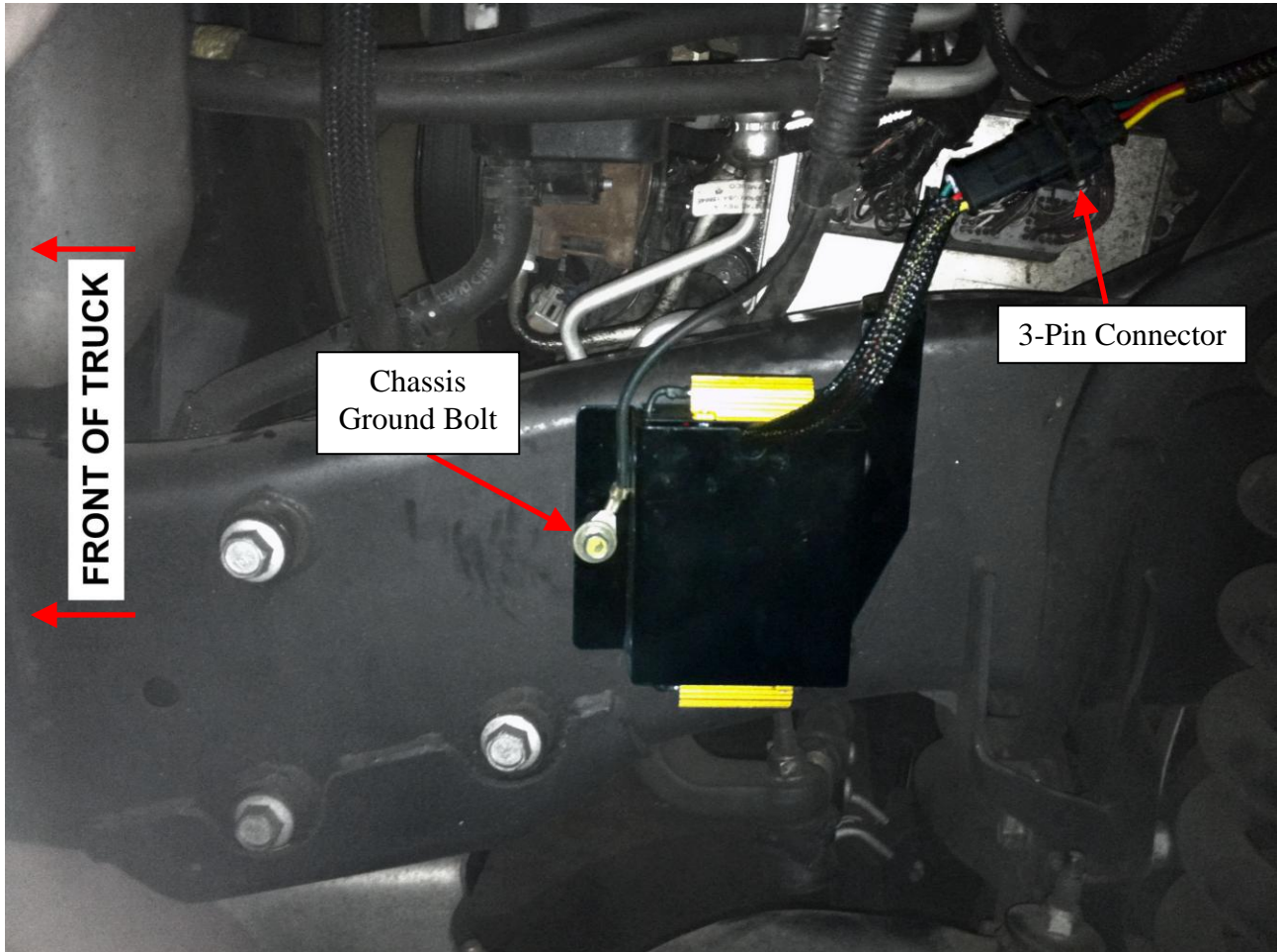


Figure 8 - Mounted Secondary Control Box

-Black Wire- Chassis Ground - PIN #9

Connect the black wire to the negative (-) terminal of the battery.

-Pink Wire - Throttle Position Sensor (TPS) – PIN #12

The pink wire is located in the Co-Pilot harness inside the cab. Locate the TPS connector at the top of the accelerator pedal arm under the dash. This is a six-pin connector. It is easiest if you unplug the connector and peel back some of the wire loom to access the wire. In **PIN 2** of the terminal there is a **brown with white** stripe wire (the wire is mostly brown with a thin white stripe; do not confuse it with the white wire with brown stripe in pin 5). **TAP** this wire with the Co-Pilot’s pink wire using the technique shown in the second to last page in this manual.

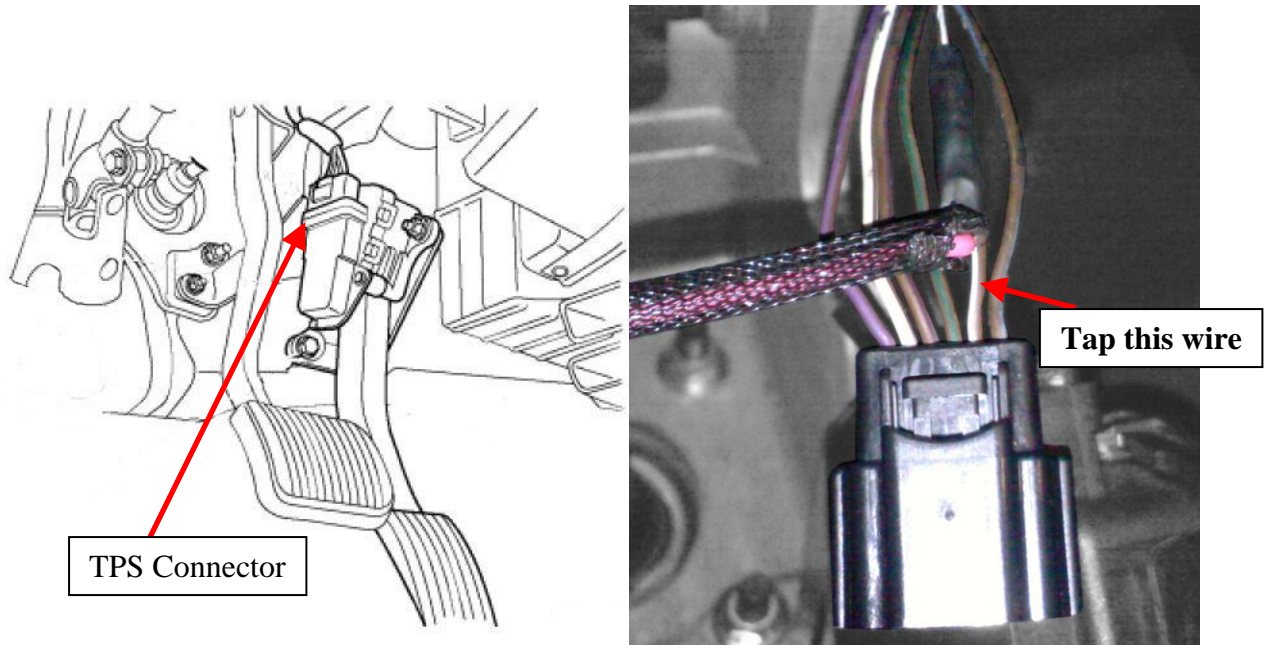


Figure 9 - TPS/APPS Connector Location and

WARNING:



If tapped into any wire other than the Brown with White Stripe, the incorrect TPS signal will be sent to the Co-Pilot. This can cause serious transmission failure.

DO NOT TAP the White with Brown Stripe wire located in pin 5. Please double check this connection before driving the vehicle. Figure 10 illustrates how to identify striped wires.



Figure 10 - Striped Wire Clarification

-Orange Wire- Manifold Absolute Pressure (MAP) Sensor - PIN #4

Connect at the MAP sensor connector located on the driver's side of the engine, mounted on the backside of the intake manifold. The connector has four wires; **TAP** into the **brown** wire, which is in the number 1 terminal indicated on the connector. Use the technique shown in the second from last page of this manual for the tapped connection.

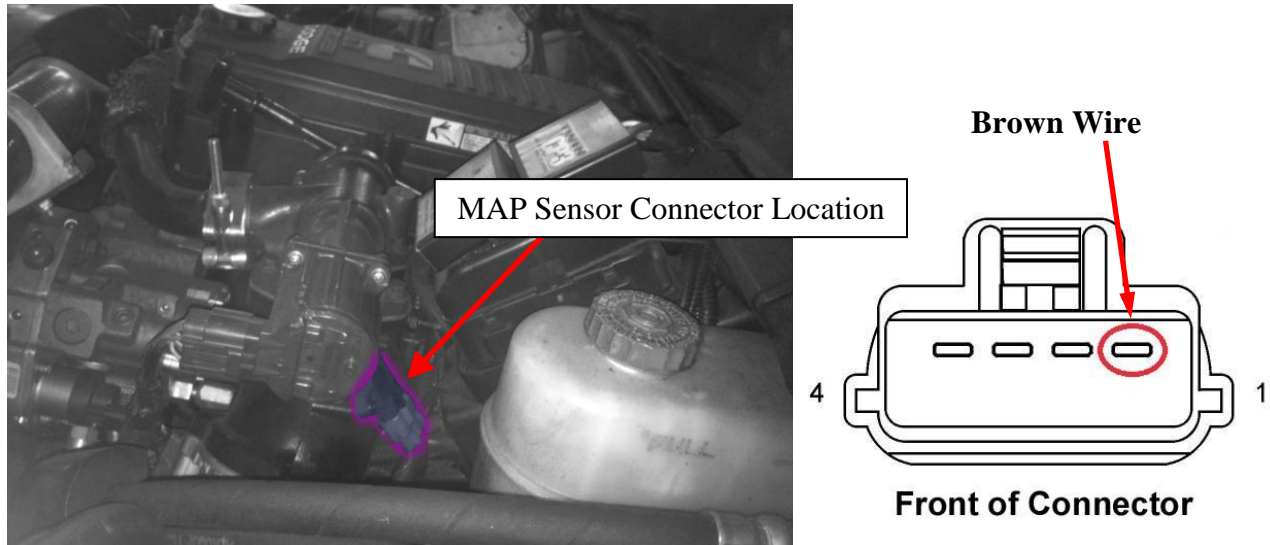


Figure 11 - MAP Sensor Location and Pin-out

IMPORTANT: If the vehicle has any aftermarket power modules installed, be sure to tap the MAP sensor wire **BEFORE** any taps from these power modules, i.e. place the Co-Pilot's tap closest to the sensor. The Co-Pilot may not work properly if it receives signals that have been modified by other aftermarket devices. The Co-Pilot does not modify the signal and will not interfere with any other devices that are connected "down-stream" or after the tapped Co-Pilot wire. Understanding this is extremely important because some aftermarket electronic modules change or cap the MAP signal sent to the computer. If the Co-Pilot wire is tapped between one of these modules and the truck's computer, it will not operate correctly and cause driveability problems.



PCM Quick Learn



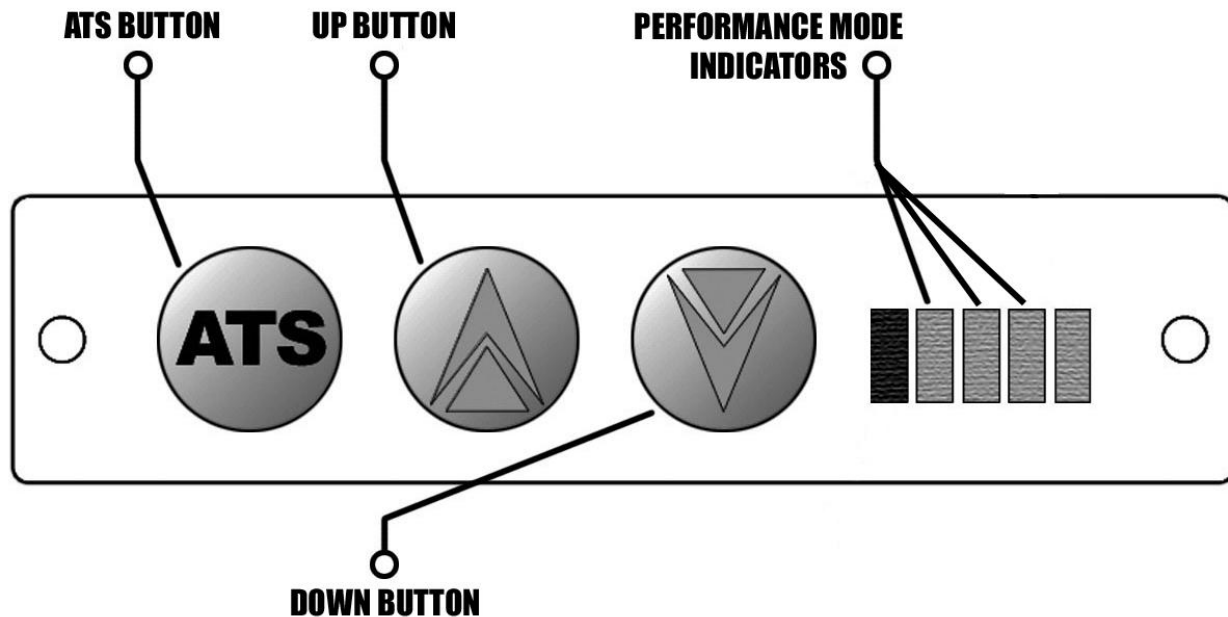
Once installation is complete and **BEFORE** the truck is driven, you must do a quick learn on the transmission PCM. This can be done at any Chrysler dealer or most transmission service centers.

Understanding the operation of the ATS Co-Pilot

The ATS Co-Pilot improves shift quality, determining and commanding optimum line pressure and internal clutch timing within the transmission to improve the reliability of the 68RFE 6-speed transmission.

Mode Selection

The front panel of the ATS Co-Pilot has 3 buttons and a series of LED indicators as shown below.



The ATS Co-Pilot has 4 driving settings; Towing mod and 3 performance modes. To change these settings, press any button on the front panel of the display. The mode is indicated by the position of the purple lights on the front panel. To change the driving mode, simply use the UP and DOWN arrow keys on the front panel to change modes. This can be done while driving.

The main difference between Towing mode and the Performance modes is torque converter clutch engagement. Towing mode engages the torque converter on deceleration to assist in braking. The performance modes employ more aggressive and firmer shifts. When the Co-Pilot is driven in the performance modes, shift quality is based on engine torque output, boost and throttle position.

Towing Mode 1 (Down arrow button, purple light to far right)

The stock mode of the Co-Pilot uses optimized line pressures and factory lockup timing to improve drivability, reduce transmission temperatures and drastically improve the reliability of the transmission. This mode is best used with the factory exhaust brake and stock power levels.

Performance Modes 2-4 (Purple light in right-center of display to far left of display)

Performance modes 2-4 gradually change shift strategy and increase shift firmness. Mode 2 works well with light engine modifications while modes 3 and 4 work better for more heavily modified engines. Try each mode and see which best fits your driving style.

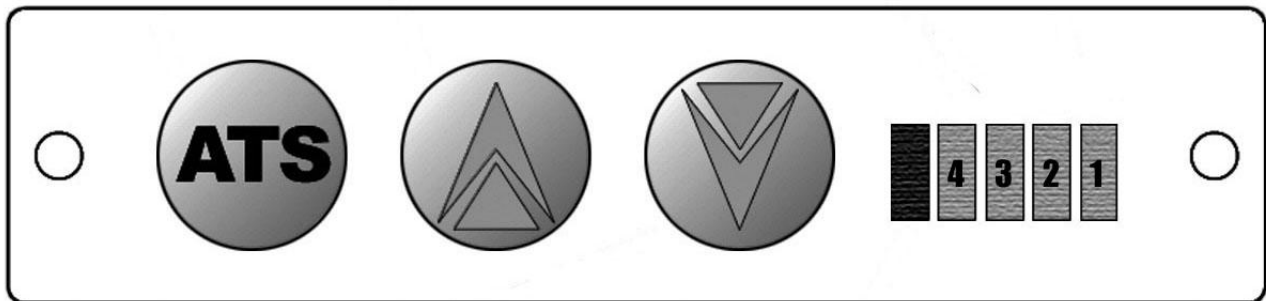
Brightness Setting

To change the brightness of the front panel, press the ATS button 2 times (all 4 purple lights will illuminate). Then use the UP and DOWN arrows to adjust brightness. Once selected, wait 4-5 seconds and the Co-Pilot will save the brightness setting.

Boost Level Indication

Once a drive setting is selected, the front display will revert to indicating boost pressure. The graduated scale is shown below. As long as the orange Co-Pilot wire is tapped into the MAP wire before any other aftermarket electronics as mentioned on page 8, the indicated boost level will be accurate.

BOOST LEVEL INDICATION



Troubleshooting

The ATS 68RFE Co-Pilot incorporates troubleshooting features for the transmission. If the Co-Pilot detects a problem within the transmission, it will flash certain purple lights on the front panel to indicate a problem. If the Co-Pilot flashes the purple lights while driving, refer to the diagram below to diagnose the issue.

LINE PRESSURE QUICK TROUBLESHOOTING GUIDE

Indicated by flashing purple LED's



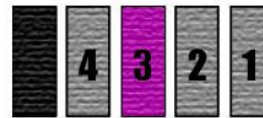
Low Pressure Circuit Voltage
Possible open circuit or low fluid level
(will flash with key on, engine off)



Low Line Pressure
Line pressure too low, check pump and leak test



High Pressure Circuit Voltage
Short to reference voltage or faulty sensor



High Line Pressure
Line pressure higher than expected

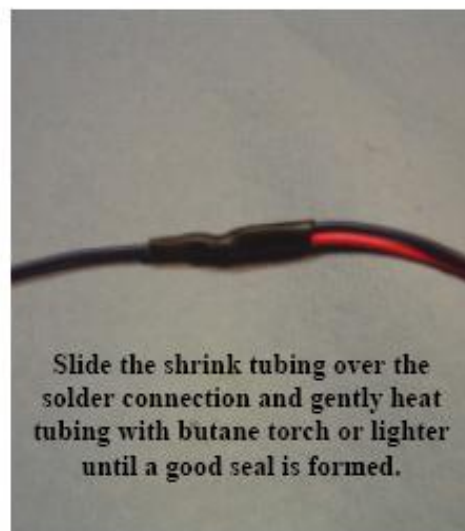
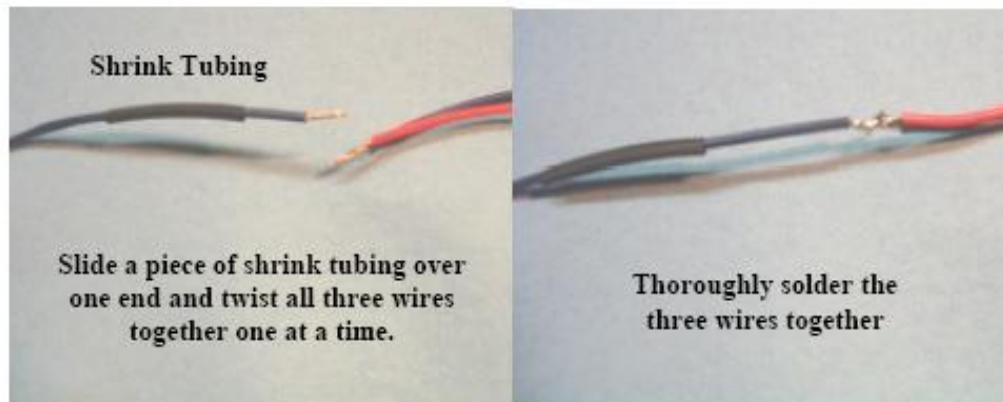
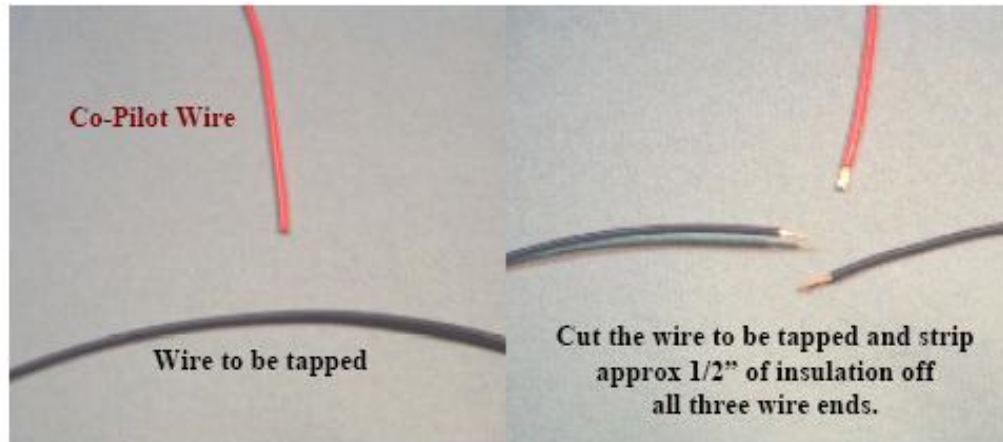
If the Co-Pilot detects any of these conditions, the Co-Pilot will force the pressure signal sent to the PCM to also set a corresponding diagnostic trouble code. This scheme allows isolation of pressure problems/connectivity issues between the Co-Pilot, transmission and PCM.

IMPORTANT: Flashing lights on the Co-Pilot should be dealt with promptly. If line pressures are too low, serious transmission damage can occur.



If you experience problems after installation, simply unplug the wiring harness from the PCM and harness and reconnect the factory PCM connector.

Making Your Co-Pilot Wire Connections



Making all of your taps this way will give you reliable and long lasting connections.

Bill of Materials

1. Electronics Box Lockup Version code, 68RFE Co-Pilot - 601-800-2326
2. Wiring Harness Lockup Version, 68RFE Co-Pilot - 601-011-2326
3. Secondary Electronics Box Lockup Version, 68RFE Co-Pilot - 601-019-2326
4. Hardware Pack Lockup Version, 68RFE Co-Pilot - 601-001-2326