Installation Manual for 1998.5-2002 Dodge 24V Cummins
Version 1.8

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

Thank you for purchasing the ATS Co-Pilot Module Torque converter / exhaust brake controller. This manual will assist installation and operation of the unit. If installing the unit for a customer, **please pass this manual on to the customer** for future reference.

Understanding the ATS Co-Pilot

The ATS Co-Pilot module will deliver maximum engine braking power by controlling the lock-up function of the torque converter and the exhaust brake (when equipped). When an exhaust brake is used without a Co-Pilot, the unlocked torque converter can raise the oil temperature in the automatic transmission high enough to cause damage. When the converter is unlocked, only a small portion of the retarding force is transferred through the fluid coupling. By maintaining lock-up during deceleration, 100% of the retarding force (engine braking force) can be used in 3rd and 4th gear without increasing transmission oil temperatures. When the Co-Pilot is used with the ATS Valve Body, engine-braking force can be applied at speeds as low as 12 mph in 1st or 2nd gear. The Co-Pilot has been developed to provide lock-up capability in all gears.

NOTE: Dodge transmissions require the ATS Valve Body to utilize 1st and 2nd gear lock-up capability.

Unlocking the torque converter during some driving conditions can reduce the performance and shorten the life of the transmission. The factory computer is programmed to disengage lock-up under a few conditions, which will have a negative effect on the transmission. A few of these conditions are:

- Lock-up disengagement at full throttle
- Lock-up disengagement at closed throttle
- Delayed lock-up engagement when accelerating from a stop
- Delayed lock-up engagement before desired engine temperatures are reached
- Lock-up disengagement under high power output

The factory has programmed the stock computer with these features in order to minimize the stress on the weak factory torque converter. The ATS Co-Pilot module allows the driver to have manual control over the engagement and disengagement of the torque converter clutch.

Co-Pilot Operation

The control panel on the face of the ATS Co-Pilot Module allows the driver to select and view the speed at which the torque converter clutch will engage and disengage. **The round "ATS"**

button on the left side of the Co-Pilot face enables and disables the Cp-Pilot functions. The ATS Co-Pilot does not allow the factory ECM signal to pass through (without the Co-Pilot enabled the converter will not lock up). To return to factory lockup control, jumper the yellow and blue Co-Pilot wires together by unplugging the Co-Pilot harness and inserting a paperclip or section of wire between the yellow and blue wire terminals (see trouble shooting). When the Co-Pilot is disabled, all of the face lights will be OFF. To activate the unit, press the round ATS button on the left side of the face, one (or two) of the **blue** lights on the face will light up. These indicate the level that the Co-Pilot was set on before it was last shut OFF (MPH set point) and are only illuminated with the Co-Pilot enabled. The minimum speed the Co-Pilot will engage is around 12 mph. The minimum speed of approximately 12 mph is selected by depressing the down arrow button on the display until the left most MPH setting light is illuminated. When the **up** arrow key is pressed the lock-up speed will be increase by approximately 6 mph for each press. When the **down** arrow key is pressed the lock-up speed will decrease by approximately 6 mph for each press. When the right most MPH setting light is illuminated, the lock-up speed is approximately 55 mph.

The indicator to the left of the MPH setting lights will display the current state of the torque converter. This indicator will be green when the torque converter is locked (engaged). When the green light is OFF, the torque converter is unlocked (disengaged).

When the Co-Pilot is turned ON the torque converter will not disengage until the minimum set speed is reached. Variable lock-up speed control is a feature unique to the Co-Pilot. The adjustable control panel allows the driver to select the vehicle speed at which the torque converter locks up.

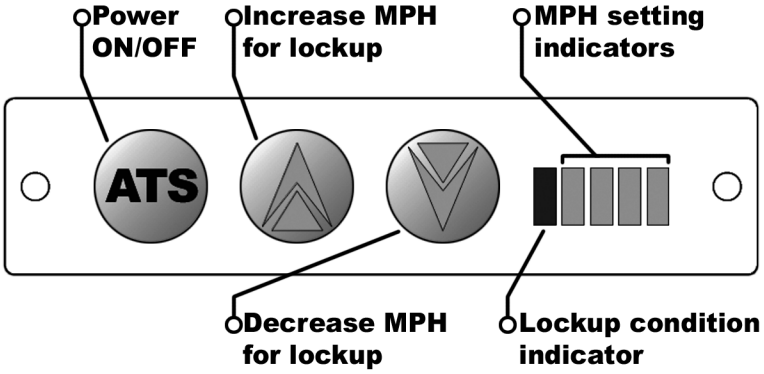

Figure 1: Co-Pilot Face Plate Configuration

When the Co-Pilot is in the OFF position, it energizes the exhaust brake (if the exhaust brake is turned ON). Many people prefer to use the exhaust brake as an engine warmer in cold conditions. In order to use the exhaust brake as an engine warmer all that is necessary is to turn OFF the Co-Pilot and turn ON the power to the exhaust brake. When the Co-Pilot is powered ON, the exhaust brake will only engage when the torque converter clutch is engaged. When the Co-Pilot is sending the apply signal to the converter clutch and exhaust brake the green light in the control panel will illuminate. When the Co-Pilot disengages the torque converter clutch, the exhaust brake also turns OFF at the speed previously selected by the driver. We have designed this feature into the Co-Pilot to automate the torque converter clutch and exhaust brake actuation. This eliminates the need to turn OFF the exhaust brake when coming to a stop. This feature has

been designed for heavy pullers that require engine braking at low speeds. The ATS Five Star™ Converter and ATS Valve Body have been designed to maximize this feature.

You can use this function on a stock valve body, however you will not notice a difference in performance at low speeds due to the design of the factory valve body. When used with the ATS Valve Body and ATS Five Star™ Converter, you will find you can have 100% engine retard down to around 12 mph. Below this speed, the torque converter clutch and exhaust brake, if equipped, will automatically disengage. When used with the factory (stock) valve body you will not be able to utilize the 1st or 2nd gear lock-up feature, lock-up will only occur in 3rd and 4th gear. The Co-Pilot works off of an interface that will only take effect when the vehicle is above the speed selected by the driver. The best way to familiarize you with the operation of the Co-Pilot is to set the Co-Pilot to the maximum (highest) set speed (up arrow) available. Cancel the Overdrive (OD light ON) if it is not already off and hold a steady speed of approximately 35 mph. While cruising at a speed of 35 mph, depress the down arrow on the controller panel, watching for the green light on the Co-Pilot to illuminate; about 3 seconds after the light illuminates, the torque converter clutch should engage. You can familiarize yourself with the adjustment of the control panel by repeating this step at different speeds below the posted speed limit. There is an automatic overdrive cancel built into the Co-Pilot, this feature cancels the overdrive as the vehicle is accelerated from a stop. The OD cancel only takes place immediately after the ignition has been cycled, after the initial cancel signal is sent the feature is disabled.

Operating Instructions when used with the ATS Valve Body and Five Star™ Converter

When the ATS Co-Pilot Module is used in conjunction with the ATS Valve Body and Five Star™ Converter, you can also use the lock-up feature in manual 2nd and manual 1st gear. When the Co-Pilot is used in conjunction with the ATS Valve Body, you can shift from 4th to 3rd without disengaging the torque converter clutch. This feature is designed with safety in mind; the vehicle is easier to control when down shifting from 4th to 3rd gear when it is heavily loaded. The lack of the TCC disengaging then having to re-engage is a positive feel of the transmission and converter shifting. When the Co-Pilot is used in conjunction with the ATS Five Star™ Converter there is no need to feather the throttle pedal when attempting to apply (stop) the converter clutch, just turn it on and off at will. Set #1 dipswitch to OFF to take advantage of the ATS Valve Body.

Operating Instructions when used with a factory or stock valve body

During deceleration on vehicles with a stock type converter, the lock-up clutch can be manually engaged by applying pressure to the accelerator pedal until lock-up engages, after the converter clutch has been seated, lift your foot off of the accelerator. Accelerator pedal pressure is also required after shifting out of or into overdrive to reengage the lock-up clutch. The Co-Pilot is programmed to disengaged the lock-up clutch and exhaust brake if equipped once the vehicle's speed drops below the pre-selected set speed selected by the driver when in the ON position. For proper operation of the Dodge transmission with a stock valve body, the lock-up clutch must disengaged before the transmission will shift out of overdrive 4th and into 3rd gear. The Co-Pilot compensates for this by disengaging the lock-up clutch for 2.5 seconds when the (O/D) button is activated. To reactivate the lock-up, apply pressure to the accelerator pedal until lock-up engages, then lift your foot off of the accelerator pedal. The factory valve body and most after market valve bodies will not make a shift from 4th gear to 3rd gear with out releasing the torque

converter clutch momentary, this causes additional stress on the torque converter clutch when the converter clutch is re-engaged after the 4-3 shift takes place. This is the reason it is important to apply throttle pressure during the 4-3 down shift to synchronize the converter clutch to the engine. Set #1 dipswitch to ON for use with stock valve body.

Setting up the ATS Co-Pilot module for installation

The ATS Co-Pilot Module will need to be set up for your vehicle and application. The Co-Pilot will need to be disassembled to access the dipswitches on the electronic board. You will need a $1/16^{th}$ - inch hex (Allen wrench) to remove the face from the Co-Pilot. After the face has been removed the electronic board can be slid out of the casing from the front. The digital face is attached to the circuit board with a ribbon cable; do not force the board from the case. There are four (4) switches on the circuit board; the switches allow the user to select the features desired. The settings are listed below. When reinstalling the face on the Co-Pilot module do not over tighten the 2 small screws on the face.

Dipswitch selection:

Switch #1

If your Dodge transmission has a stock valve body flip #1 switch to **ON** position
If your Dodge transmission has an ATS valve body flip #1 switch to **OFF** position

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Switch #2

Automatically cancels OD from a stop, only cancels after ignition has cycled, cancels at speed above 3mph.

IMPORTANT: If the white wire of the Copilot harness is not connected, then switch #2 must be set to the "ON" position. With the wire connected the options below are available.

If you want automatic OD cancel from a stop flip #2 switch **ON**
If you **do not** want automatic OD cancel from a stop flip #2 switch **OFF**

Switch #3

Speed setting

On=low speed cut out is **8**mph,
Off=low speed cut out is around 18mph, recommended setting

Switch #4

Set this switch to the **ON** position

The Co-Pilot is preset #1-ON, #2-ON, #3-OFF, #4-ON (Stock valve body, automatic OD cancel turned on, and 18 mph cut-out).

Wiring

Disconnect Ground (Negative) terminals on all vehicle batteries before starting installation. The following instructions will be divided up for wiring up each individual wire color labeled on the Co-Pilot. Follow along with the diagrams after the written instructions for ease of installation. Solder all connections for reliable results. These wire connections must be shielded from the elements (we recommend heat shrink tubing).

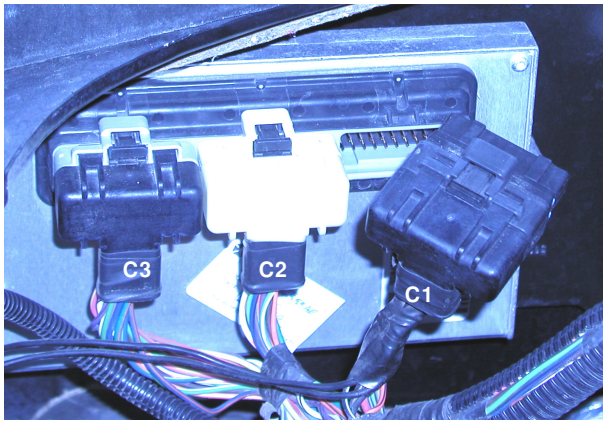
NOTE: When wiring the Co-Pilot module, consider leaving enough slack on the wires so that the vehicle owner can relocate the module later if desired. Reconnect all ground terminals on batteries after installation.

Co-Pilot Module Mounting Location

Find a convenient location to mount the Co-Pilot module with in reach and view of the driver. The Co-Pilot interface must be within visual range of the driver as well as in easy reach. We have found the ideal place to locate the module is just to the right of the driver on the lower dash panel just above the right knee. Use the Velcro supplied to secure it to the dash. Before sticking the Velcro to the dash use brake clean or acetone on the area the sticker will be. Run the Co-Pilot wires that are to be wired up to the PCM (Powertrain control module) and the transmission through the firewall.

Brown Wire (PIN #6), Orange Wire (PIN #4), and Tan Wire (PIN #8) are NOT USED in this installation

PCM CONNECTORS



-Red Wire- +12V Power – PIN #1

Locate the PCM power wire in the vehicle's wiring harness. Tap the **Lt Green w/ Black** wire that runs to pin **2** of the **C1** PCM connector (PCM connectors are behind the air box on the passenger-side firewall, the C1 connector is the one closest to the engine).

-**Red wire furnished in kit**-

If a second red wire was furnished with your Co-Pilot, you may discard it.

-Black Wire- Ground (GND) – PIN #9

Locate the PCM ground wire in the vehicle's wiring harness. Tap the **Black w/ Tan** wire that runs to pin **32** of the **C1** PCM connector (PCM connectors are behind the air box on the passenger-side firewall, the C1 connector is the one closest to the engine).

-White Wire- Overdrive – PIN #5

Locate the OD (Overdrive) wire in the vehicle's computer wiring harness. This **Orange w/ White** stripe wire is located at pin **13** of the C3 PCM connector (PCM connectors are behind the air box on the passenger-side firewall, the C3 connector is the one closest to fender). Run the white wire from the **ATS Co-Pilot Module** to the OD wire from the PCM and cut off any excess, but leave some slack. Tap the Co-Pilot white wire into the wiring harness and solder the connection to the OD wire. Use heat shrink or an equivalent to protect it from the elements.

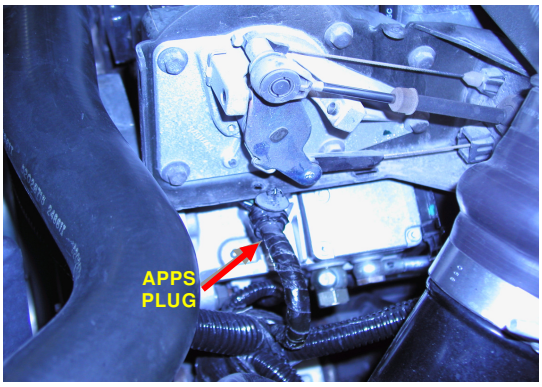
-**Yellow Wire– PCM - PIN #10** and **-Blue Wire– TCC - PIN #11**

Locate the vehicle's Torque Converter Clutch (TCC) wire coming from the vehicle's PCM to the transmission. This **Orange w/ Black** stripe wire is located at pin **11** on the PCM's **C2** connector (behind the air box on the passenger-side firewall, C2 is the center connector), *OR* at the transmission connector pin #7 (8-pin connector on driver's side of the transmission). Cut this wire and solder or attach a blue butt connector to the wire leading back to the transmission and attach a blue butt connector to the wire heading to the vehicles computer (PCM). Reference the supplied wiring schematic before cutting wire.

Connect the **Yellow** wire coming from the **Co-Pilot** to the wire that goes to the PCM. Connect the **Blue** wire coming from the **Co-Pilot** to the wire that goes to the transmission. Protect these connections. If at anytime you would like to bypass the Co-Pilot's operation, simply unplug the wiring harness from the Co-Pilot Module and jumper the harness' blue and yellow terminals together with a paperclip.

-Pink Wire- Accelerator Pedal Position Sensor (APPS) – PIN #12

Locate the APPS, it is under a black plastic cover, on the driver's side of the engine, in front of the intake manifold. Tap the **lt. blue w/ black wire** in the APPS plug wire loom. Protect the connection.



-Green Wire- Vehicle Speed Sensor (VSS) – PIN #17

Locate the VSS (Vehicle Speed Sensor) wire. This **White w/ Orange** stripe wire is located at pin **27** on the PCM's C2 (behind the air box on the passenger-side firewall, C2 is the center connector).

Run the green wire from the Co-Pilot module to the VSS wire at the PCM and cut off any excess, leaving some slack. Tap the Green wire into the VSS wire using solder. Protect the connection from the elements using heat shrink or an equivalent.

-Purple Wire- PIN #16 --California Emissioned with 47-RH or 47-RE transmission.

If the vehicle is not a California emission, skip this step. You must tap the **Black w/ White** stripe wire at either the PRNDL switch (3 pin connector) on the driver's side of the transmission (center wire), or at the PCM (behind the air box on the passenger side firewall, grey connector) in **24**. Run the purple wire from the Co-Pilot module to the wire. Solder the purple wire to this PRNDL wire. Protect this connection.

If you do not have an exhaust brake, leave the Grey wire unconnected.

-Grey Wire- Exhaust Brake – PIN #13

Locate the exhaust brake solenoid. There should be 2 wires coming off of the solenoid. One wire delivers power to the solenoid via a power switch mounted inside the cab. The other wire supplies ground to the solenoid. The ground wire that comes from the solenoid to the ground on the engine must be removed and connected to the grey wire that comes from the Co-Pilot module. The E-brake feature of the **Co-Pilot** will only work with an exhaust brake that uses a solenoid to actuate it. We recommend the use of a PACBRAKE with our **Co-Pilot**. Some exhaust brakes do not use a solenoid, instead they use a computer module. In this case you will need to add a relay in the circuit to control the exhaust brake or use the **Co-Pilot** as a stand-alone unit. We have supplied wiring diagrams that detail the connection to your PACBRAKE.

You can use the warm-up feature of your exhaust brake by simply turning off the Co-Pilot Box and turning on the exhaust brake's toggle switch.

-Diode- All models with Exhaust Brake

Place the supplied diode across the positive and negative post of the solenoid. There is a stripe on the diode that indicates the positive side. Place the stripe to the positive post of the solenoid. See the provided wiring diagram for clarification.

Testing w/ Exhaust Brake

Turn the **ATS Co-Pilot** OFF (Button on left of display panel-no lights on). Turn the exhaust brake ON. The exhaust brake should sound. Turn the **ATS Co-Pilot** ON, the blue light on the display should illuminate and the exhaust brake should turn OFF. Take the vehicle for a drive. Set the lock-up speed to the minimum speed (18 mph mark) and first check that the green LED light comes on once the vehicle has surpassed the set speed of around 18 to 20 mph. If the LED fails to illuminate after the set speed, check the VSS wire color and the connection to that wire.

Away from traffic, turn ON the exhaust brake and set the Co-Pilot module to engage at a speed of around 35mph. Drive at a constant speed above the set speed on the module and then let off the throttle. The brake should activate and you should feel the hold back. Turn OFF the brake and check for to make sure the brake and lock-up clutch disengage. Turn the brake ON and drive again at a constant speed above the set point. Let off the throttle and let the vehicle slow

down below the set speed, making sure the lock-up releases below the set speed. If these situations fail to occur, then check the wiring to the brake and Co-Pilot module.

The exhaust brake should activate when the exhaust brake is ON, and the Co-Pilot OFF.

If any of the functions fail to occur, check all connections thoroughly and verify good power, grounds and a good vehicle speed sensor connection. The VSS connection is the most common cause of a malfunctioning Co-Pilot module. If you cannot determine the cause of failure phone our technical service department for further assistance. If required, to bypass the effects of the module, unplug the main connector on the back of the module and connect the Blue and Yellow wires together. After testing, secure any loose wires.

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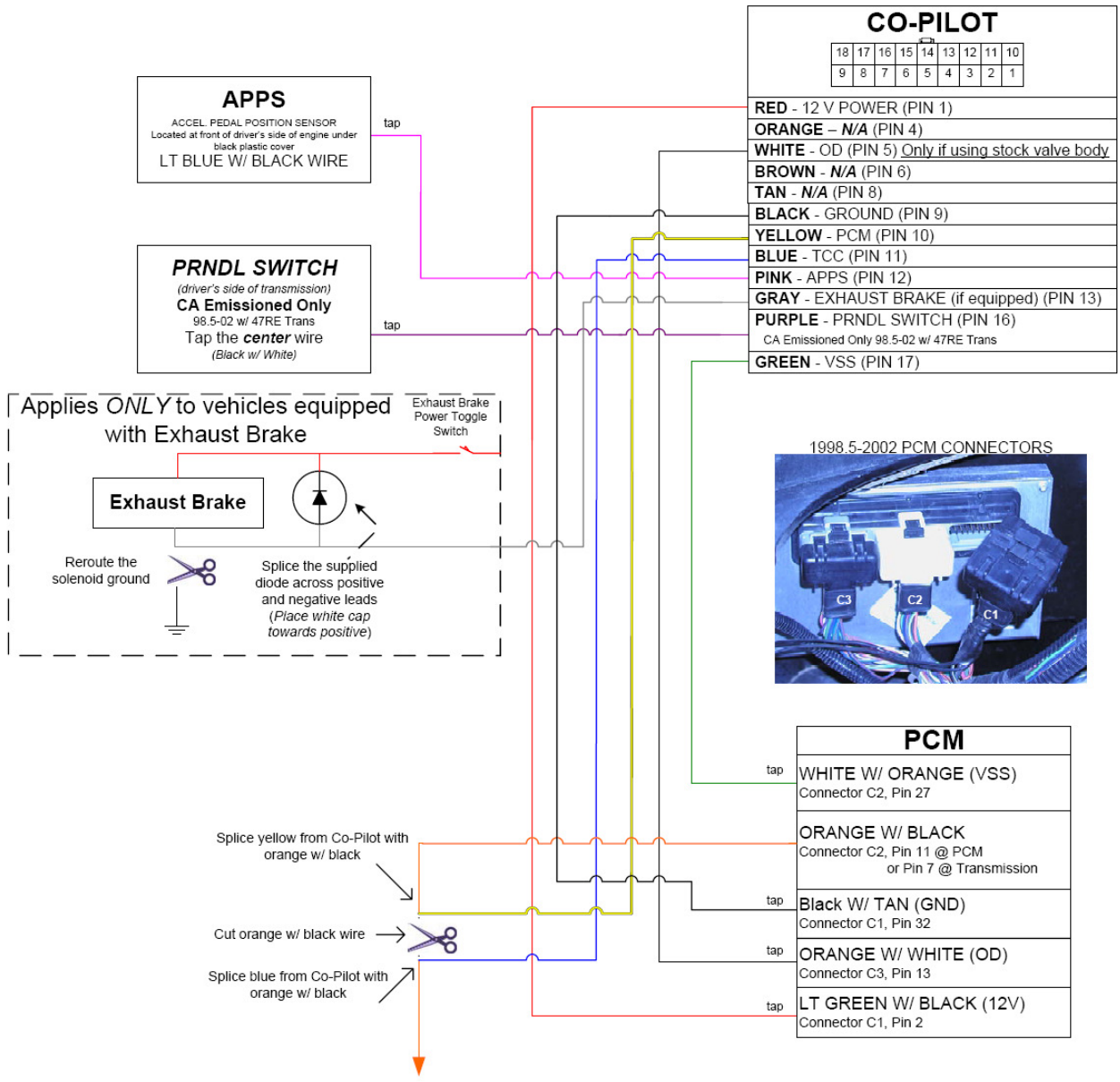
Co-Pilot Lockup Controller
Dodge 1998.5-2002



Understanding the operation of the ATS Co-Pilot module

While driving with the Co-Pilot turned ON, the overdrive turned OFF, and the exhaust brake turned ON, the transmission will shift from first to second to third and then lock up the converter. Anytime after the lock-up has occurred and the accelerator is released, the Co-Pilot will hold the torque converter clutch locked until the minimum set speed and then the torque converter clutch will be released and the exhaust brake will be turned off. When driving on the freeway in overdrive, with the torque converter clutch locked up and the exhaust brake turned ON, releasing the throttle will make the Co-Pilot hold the torque converter clutch locked up, along with the exhaust brake engaged. To increase the amount of retarding horsepower, down shift into third by turning OFF the overdrive.

A Dodge with a stock torque converter will require some throttle pressure during down shifting, until the factory computer parameters are met, to lock the torque converter clutch. When lock-up occurs, the throttle can be released and the Co-Pilot will keep the torque converter clutch applied until the set minimum speed point. When the Co-Pilot is used with the ATS Five Star Converter and ATS Valve Body the converter can be locked and unlocked at will, feathering the throttle will not be necessary to aid in converter clutch apply.

When requiring a quick stop or slow down, the Co-Pilot functions can be cancelled. Such conditions may be:

- The extra retarding horsepower of third gear is not required
- The "jerky" feel, is not desired, that occurs when the torque converter clutch is locked and driving speeds are less than 32 mph in overdrive

You can do any of the following four actions to cancel out the system

1. Turn OFF the Five Star Co-Pilot by pressing the "ATS" button
2. Turn OFF the overdrive (suggested)
3. Lightly step on the throttle pedal
4. Pull the gearshift lever down into second gear

When using a stock converter, the Co-Pilot should only be operated under moderate throttle. The stock converter clutch does not have the holding capacity to maintain lock up under high engine loads. Exceeding the holding capacity of the stock converter will cause the clutch to slip and deteriorate friction material on the clutch. A winding road is a good example of when to use the Co-Pilot. A winding road requires the driver to be on and off the throttle and the factory ECM will be locking and unlocking the converter clutch. The Co-Pilot will hold the converter clutch locked. Applying too much throttle pressure, especially at the lower rpm band, will cause the stock converter clutch to slip. This is where the factory torque converter fails. When using the Co-Pilot with the ATS Five Star Converter and ATS Valve Body, the converter can be locked and unlocked at any power levels at the user's discretion.

Information when installing the Co-Pilot module with a stock valve body & Converter

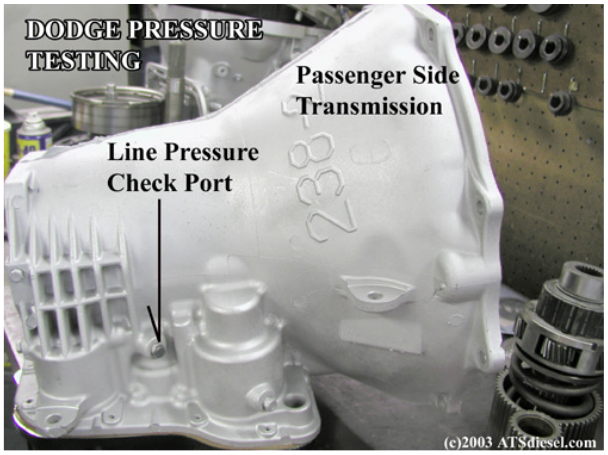
The Co-Pilot module has been designed to operate an exhaust brake and engage the torque converter clutch enabling superb engine braking with your automatic transmission. The Co-Pilot must be used only under certain operating conditions to ensure long life of your stock automatic transmission. Using the Co-Pilot module on a weak transmission or torque converter can cause

premature transmission and torque converter failure. There are a few precautions that can be preformed after the installation of your new exhaust brake and Co-Pilot. In order to ensure the health of your stock transmission and torque converter you must perform a few simple tests to your transmission using a basic 0 to 250 PSI pressure gauge. The majority of transmission and torque converter failures caused by exhaust brakes are the result of improper set up and installation of exhaust brakes on transmissions that have had prior problems. A list of common problems found on transmission/converters is listed below, if your stock transmission/converter has ever shown any of the signs it is highly suggested to follow the recommendations to correct it before using your newly installed exhaust brake and Co-Pilot module.

1) Excessive transmission heat, heat that has been developed from slipping clutches. Primarily that of the torque converter clutch. Heat that is developed from the fluid-coupling portion of the torque converter is not a problem such as backing up a heavy trailer into a driveway. Heat that has been generated during a hard pull during lock-up is a direct tell-tell sign of potential prior problems.
2) Torque converter clutch chatter is the most common sign of converter failure. A chatter or vibration condition that appears around the speed of 42 to 55 MPH is a sure sign of a glazed converter clutch. A glazed converter clutch will only have about 2/3^{rds} of its torque capacity. If you have ever experienced this condition do not use your exhaust brake or the Co-Pilot until the converter is repaired.
3) A transmission that shifts into neutral unexpectedly is a sign of an improperly adjusted throttle cable. If a vehicle is driven with a misadjusted, disconnected or broken throttle cable the transmission and converter will be damaged quickly.
4) Burnt or contaminated transmission fluid; if your transmission fluid is brown or black, have the transmission pan removed and checked for damage. Brown or black fluid is caused from excessive slipping or clutch material mixing with the transmission fluid. Clean unburned transmission fluid will be red in color.

Provided that none of the four items listed above have previously happened to your transmission, you are ready to test to ensure your transmission/converter will serve you reliably. Use a 0 to 250 PSI pressure gauge to check your transmission's line pressure. Install the line pressure gauge into the main line pressure tap located on the passenger side center of the transmission.

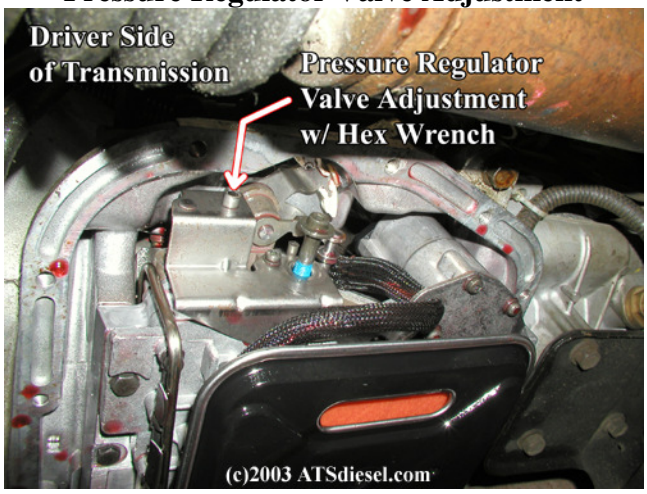
Line Pressure Test



Tape the gauge to the outside of the windshield; this is a precautionary measure to ensure you do not have an accident in the event there is a hydraulic leak. First bring the transmission and engine to full operating temperature, then note the line pressure at idle in neutral. Be sure the

engine has an idle speed of at least 750 RPM. If the engine idle is below 750 RPM the line pressure test will show low. The idle line pressure test should be a minimum of 58 PSI. If the pressure recorded here is below 58 PSI then the low-pressure problem must be resolved before proceeding. The most common condition for low base line pressure is low engine RPM. If the engine is at 750 RPM or above the transmission pressure regulator will need to be adjusted to maintain the minimal operating line pressure.

Pressure Regulator Valve Adjustment



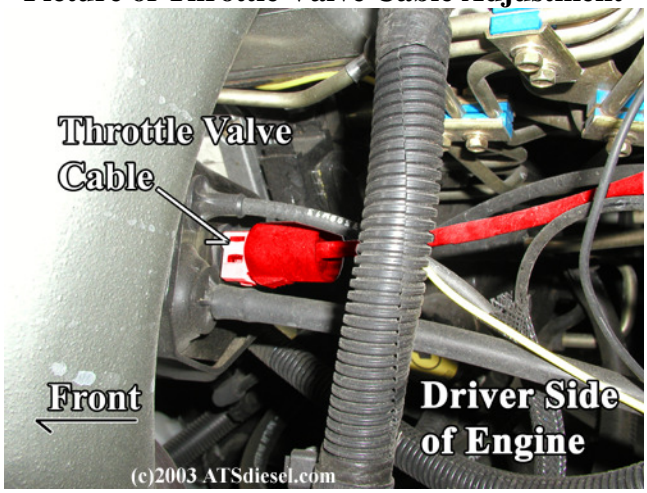
The transmission pan will need to be removed to perform this task. The pressure regulator adjustment is on the driver's side of the transmission on the front of the valve body. Use a 5mm hex wrench to increase the spring pressure on the main pressure regulator spring. Rotate the hex bolt counter clock wise to increase the spring pressure. Use the illustration provided to set to the proper spring load. After adjusting the spring to the proper load retest the base pressure. If the base pressure is not adequate after adjusting the pressure regulator this typically indicates a worn hydraulic transmission pump or worn transmission valve body. In this event the transmission will need internal repairs or the valve body may need to be up-graded. In most cases the valve body can be up-graded to achieve the desired results.

The second test that needs to be performed requires driving the vehicle under a braking condition with the Co-Pilot module on. The exhaust brake does not need to be on at this point, only the Co-Pilot module. While decelerating with the overdrive cancelled, watch the pressure gauge. The pressure gauge should indicate at a minimum pressure of 58 PSI during a deceleration condition with the converter clutch disengaged. When the green light is illuminated on the Co-Pilot module and the converter clutch is engaged you will see about a 12-15 PSI rise in line pressure to a maximum pressure of 69 to 71 PSI. This increased line pressure is important for the survival of a stock torque converter clutch.

The most common condition for low line pressure is a misadjusted throttle valve cable. First take a look at the throttle cable coming from the injector pump, be sure it is fastened to the accelerator bracket and to the transmission. The cables also have a history of stretching out causing little or no action on the transmission throttle lever. A quick and simple check that can be preformed involves two people, one in the drivers seat and one looking at the throttle linkage on the transmission. With the ignition key **removed from the ignition switch** and the engine shut off have the person sitting in the passenger seat floor the accelerator pedal wile the person under the vehicle looks at the throttle cable linkage. When the throttle pedal is floored the small

linkage arm on the side of the transmission should move forward. This will indicate the throttle cable is hooked up and functional. This does not mean it is adjusted properly. The proper adjustment of the throttle cable will allow steady line pressure rise when the throttle pedal is depressed. The throttle cable is the most commonly over looked area of a good working transmission. Once you have ensured the transmission line pressure is properly adjusted you can go forward with the final portion of this test.

Picture of Throttle Valve Cable Adjustment

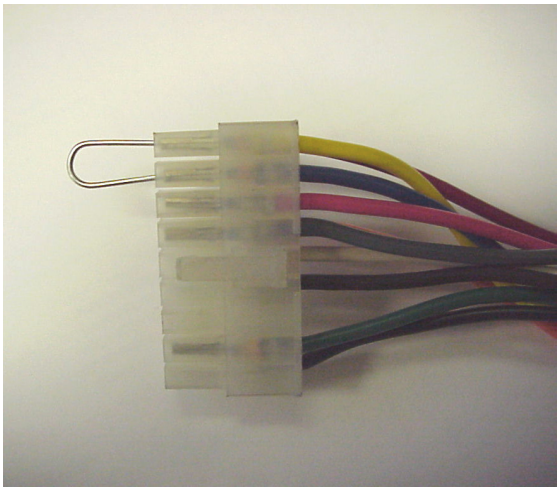


With the transmission pressure set to the desired level accelerate the vehicle to a safe highway speed of around 50 MPH. Turn on the exhaust brake and Co-Pilot. Cancel the overdrive (OD Light on) and remove your foot from the throttle. The green light should illuminate on the Co-Pilot module. If the green light does not illuminate on the Co-Pilot module push the down arrow button to lower the commanded set speed. Listen for the exhaust brake to sound. The green light and the exhaust brake will function together. After you have ensured the exhaust brake commands properly it is time to check for any harmful slippage that could cause torque converter and/or transmission damage. With the torque converter clutch and exhaust brake engaged watch the tachometer very closely. While deceleration on a steep grade with both the converter clutch and the exhaust brake engaged slightly apply pressure on the throttle pedal to disengage the exhaust brake and assist the engine with acceleration. The tachometer should not vary more than 150-RPM during this test. This is a very effective way to check for harmful converter clutch slippage. If the tachometer shows more than 150-RPM difference during this test this indicates your torque converter clutch or hydraulic system is weak, if operated with this condition present you will most likely damage your transmission. During a decelerating condition when engaging the exhaust brake it is some times helpful to apply a little pressure to the accelerator pedal to synchronize the engine speed to the transmission speed. After the engine has synchronized to the transmission remove all pressure from the accelerator pedal and continue braking. If all of the above tests performed have passed you should not see any problems with the reliability of your transmission or torque converter. Things do change over time and as equipment wears the integrity also diminishes, always give special attention to the operation condition of your transmission and torque converter when using your exhaust brake. It is also advisable to install a transmission temperature gauge to warn of any potential slippage that may occur. These products and many others can be obtained from ATS Diesel Performance or directly from the web site at **www.ATSDiesel.com**.

In the event you have installed the Co-Pilot module and exhaust brake on a transmission/ converter package that does not have the ability to hold properly you have options to up-grade the valve body and converter to a much stronger package. The ATS Valve Body package has been specially designed to increase the torque capacity of your stock transmission and your stock torque converter, along with allowing 1st and 2nd gear lock-up. The ATS valve body also allows the transmission to be shifted from 4th gear to 3rd gear while maintaining lock-up, this is especially important when navigating heavy loads on a steep grade. The final and most popular addition to complete the package is the addition on the ATS Five Star™ Torque Converter. The Five Star™ converter is a 13.5-inch five-disk clutch torque converter with a high torque multiplication stator and full billet cover and billet lock-up piston. The ATS Five Star™ Torque Converter increases acceleration from a stop, eliminates the excessive heat caused by a slipping single disc converter clutch, improves economy and allows full engine retarding force to be transferred to the wheels. All Five Star™ torque converters carry a **3-yr/150,000** mile parts warranty.

Troubleshooting

If you experience problems after installation, there is a simple test to help diagnose the problem. Simply unplug the wiring harness from the back of the Co-Pilot module and **put a bent paperclip into blue and yellow terminals of the harness' plug** (jumper the blue and yellow together). This reconnects the wire that you cut at the transmission plug and bypasses the Co-Pilot completely.



If your pickup behaves normally after bypassing the Co-Pilot: Make sure you are following the operating instructions correctly and that all wire connection are good and to the *proper* wires. If the problem continues, contact our Technical Support department at Tech@ATSDiesel.com or 800-949-6002.

If the problem continues after bypassing the Co-Pilot: There is a problem with a wire connection. Double-check all connections. Make sure your solder connections are good, if any look suspect, re-solder. Make absolutely sure that all taps were made on the *correct* wires. Some of these wires can be easily confused with neighboring ones especially if the connection was made away from the plug, inside the wiring harness. If the problem continues, contact our Technical Support department at Tech@ATSDiesel.com or 800-949-6002.

Have Any Questions?

Thank you for purchasing the ATS Co-Pilot. Please check our website at http://www.atsdiesel.com for technical support and other performance products such as the Five Star™ torque converter, ATS High Performance Valve Body and ATS High Performance Transmission along with our full line of power enhancers. Please call or e-mail our Technical Service Department, 8:00am to 5:30pm Mountain Standard Time, Monday through Friday.

Contact Information

Toll Free: 800-949-6002
Local: 303-431-7973
Fax: 303-431-0135
Website: www.ATSDiesel.com
Email: info@ATSDiesel.com

We strive to make our instructions as clear and complete as possible. To achieve this, our instructions are under constant construction. We encourage you to visit our Technical Support Website http://www.atsdiesel.com/ATSWebsite/Technical.asp for the most up-to-date manuals

and diagrams as well as other information. If you have any suggestions as to how we can improve this installation manual, let us know at Suggestions@ATSDiesel.com

ATS Diesel Performance
Limited Warranty Statement

ATS Diesel Performance warrants the original purchaser that any parts purchased shall be free from defects in material and workmanship. ATS Diesel Performance is the warrantor of this product, in the event this produce is purchased form a distributor or retailer other that ATS Diesel Performance the customer must contact ATS Diesel Performance for any warranty concerns, not the purchasing dealer. A defect is defined as a condition that would render the product inoperable. This warranty does not cover deteriorating of plating, paint or any other coating. ATS liability is limited to the repair or replacement, at ATS's option, of any warrantable product returned prepaid with a complete service history and proof of purchase to the factory. A valid proof of purchase is a dated bill of sale. Repaired or replaced, product will be returned to the customer, freight collect on a like for like part number basis. Accepted warranty units, which have been replaced, become the sole property of ATS.

A Return Product Authorization number obtained in advanced from an ATS customer service representative must accompany products returned for warranty determination. ATS will be the final authority on all warranty decisions.

This warranty shall not apply to any unit which has been improperly stored or installed, subjected to misapplication, improper operating conditions, accidents, or neglect; or which has been improperly repaired, altered or otherwise mistreated by the owner or his agent.

This warranty shall terminate at the end of 12 months in service with the original user. Labor cost incurred by the removal and replacement of an ATS product, while performing warranty work, will be the responsibility of the vehicle owner; in no case does the obligation of ATS Diesel Performance exceed the original purchase price of the product as indicated on the original bill of sale.

Except as set forth in this warranty, ATS disclaims any implied warranty, including implied warranties of merchantability and fitness for a particular purpose. ATS also disclaims any liability for incidental or consequential damages including, but not limited to, repair labor, rental vehicles, hotel costs or any other inconvenience costs. This warranty is in lieu of all warranties or guarantees, either expressed or implied, and shall not extend to any customer or to any person other than the original purchaser residing within the boundaries of the continental US or Canada.