



## Installation Manual for 1994-1998 Dodge Cummins Version 3.6

### Please read all instructions before the installation of the ATS Commander Module

Thank you for purchasing the ATS Commander Module Torque converter/exhaust brake controller. 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.

### Understanding the ATS Five Star Commander

The ATS Commander module commands the lock-up clutch of the torque converter along with the exhaust brake, if equipped, to stay engaged. This allows for up to 100% of the retarding force to be transferred in 3<sup>rd</sup> and 4<sup>th</sup> gear and the transmission oil temperature to remain low because of little to no slippage occurring when the converter is in these selected gears. When the ATS Valve Body is installed, you can use engine braking in the low-speed position of nearly 12 mph in 1<sup>st</sup> or 2<sup>nd</sup> gear. Currently, exhaust brake usage can cause high temperatures in the automatic transmission due to torque converter slippage. And only a small portion of the retarding force is transferred through the fluid coupling of most torque converters. The Commander has been developed to provide lock-up capability in all gears. NOTE: On Dodge transmissions the ATS Valve Body must be installed to utilize 1<sup>st</sup> and 2<sup>nd</sup> gear lock-up capability. The factory computer is programmed to disengage lock-up under many conditions, which inhibits the performance of the transmission. A few of these conditions are:

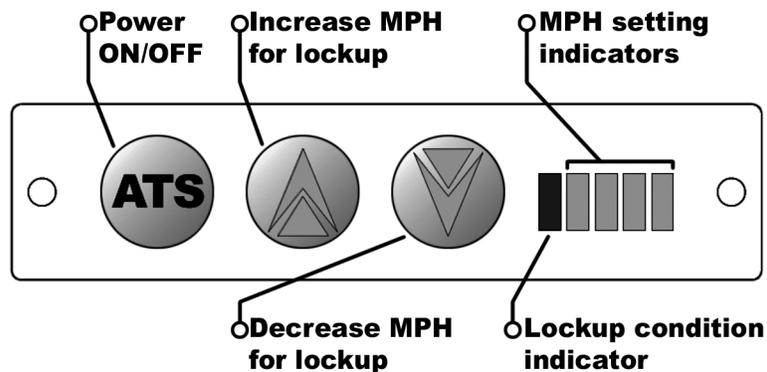
- Lock-up disengagement at full throttle
- Lock-up disengagement at closed throttle
- Delayed lock-up engagement when accelerating from a stop
- Delayed lock-up engagement before desired engine temperatures are reached
- Lock-up disengagement under high power output

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

The variable control panel on the face of the ATS Commander Module allows the driver to select and view the speed at which the torque converter clutch will engage and disengage. **When the round button on the left side of the Co-Pilot face is depressed and the blue light is turned off, the Co-Pilot is disabled and the vehicle will not lock-up the torque converter on its own. To return to factory lockup control, jumper the yellow and blue Co-Pilot wires together.** The OFF position is indicated by none of the lights being lit on the face of the box. To activate the unit, depress the round button (ATS Button) on the left side of the face, one of the **blue** lights on the face will light up, the light also indicates the level the Commander was set on before it was last shut OFF. This will tell the Commander to watch for vehicle speed. The minimum speed the Commander will engage is around 12 mph. The minimum speed of around 12 mph is

selected by depressing the down arrow button on the display. This will cause the Commander to send a signal to the transmission (and exhaust brake if equipped) to lock-up the torque converter at its minimum allowable speed. When the **up** arrow key is pressed the lock-up speed will increase by about 5 mph. When the **down** arrow key is pressed the lock-up speed will decrease by about 5 mph. One of the **blue** lights on the right side of the display will indicate the set speed selected by the driver. When the **blue** light is at full right the lock-up speed is indicating a maximum set speed around 55 mph. Note: the factory TCC apply signal from the factory PCM will pass through the Commander if the factory PCM signal is commanded (turned ON) before the Commander sends the lock-up signal.

When the Commander is turned ON the torque converter will not disengage until the minimum set speed is reached. The Commander is easy to operate. Unlike other torque converter controllers, it offers variable lock-up speed control. The adjustable control panel allows the driver to select the vehicle speed at which the torque converter locks up. To better understand how the Commander is operated, we recommend you look at the illustration provided.



There is an OFF position and an ON position. The OFF position disables the Commander and allows the factory computer to operate the torque converter lock-up command as if the Commander was not installed. The OFF position also serves another function when used with an exhaust brake, the Commander has been designed to operate the torque converter clutch along with operating most exhaust brakes. When the Commander 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 Commander and turn ON the power to the exhaust brake. When the Commander is powered ON, the exhaust brake will only engage when the torque converter clutch is engaged. When the Commander is sending the apply signal to the converter clutch and exhaust brake the green light in the control panel will illuminate. When the Commander 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 Commander 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. The minimum set speed position of the Commander will only be effective when installed with the ATS Valve Body. 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 1<sup>st</sup> or 2<sup>nd</sup> gear lock-up feature, lock-up will only occur in 3<sup>rd</sup> and 4<sup>th</sup> gear. The Commander 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 yourself with the operation of the Commander is to set the Commander 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 Commander 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 Commander, 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 Commander Module is used in conjunction with the ATS Valve Body and Five Star™ Converter, you can also use the lock-up feature in manual 2<sup>nd</sup> and manual 1<sup>st</sup> gear. When the Commander is used in conjunction with the ATS Valve Body, you can shift from 4<sup>th</sup> to 3<sup>rd</sup> without disengaging the torque converter clutch. This feature is designed with safety in mind; the vehicle is easier to control when down shifting from 4<sup>th</sup> to 3<sup>rd</sup> 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 Commander 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 Commander is programmed to disengage 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 disengage before the transmission will shift out of overdrive 4<sup>th</sup> and into 3<sup>rd</sup> gear. The Commander 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 4<sup>th</sup> gear to 3<sup>rd</sup> 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 Commander module for installation**

The ATS Commander Module will need to be set up for your vehicle and application. The Commander will need to be disassembled to access the dipswitches on the electronic board. You will need a 1/16<sup>th</sup> - inch hex (Allen wrench) to remove the face from the Commander. 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 Commander module do not over tighten the 2 small screws on the face.

### **Dipswitch selection:**

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#### **Switch #1**

If your Dodge's transmission has a stock valve body flip #1 switch to **ON** position  
If your Dodge's 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.

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**

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#### **Switch #3**

Speed setting

On=low speed cut out is 8mph,

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

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#### **Switch #4**

Set this switch to the **ON** position

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We have preset your Commander #1-ON, #2-ON, #3-OFF, #4-ON (Stock valve body, Automatic Overdrive cancel turned on, 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 Commander. 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 Commander 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.

## **Commander Module Mounting Location**

Find a convenient location to mount the Commander module with in reach and view of the driver. The Commander 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 Commander wires that are to be wired up to the PCM (Powertrain control module) and the transmission through the firewall.

**-Orange Wire (PIN #4), Brown Wire (PIN #6), and Pink Wire (PIN #12) are NOT USED in this installation**

### **-Red Wire- +12V Power – PIN #1**

Locate the PCM power wire in the vehicle's wiring harness at the pin listed below.

For 1994-1995 models tap the **Light Green w/ Black** wire that runs to pin **9** on the PCM (behind the air box on the passenger-side firewall).

For 1996-1998 models tap the **Light 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 – NOT USED**

If your Commander kit came with a second red wire, you may discard it.

### **-Black Wire- Ground (GND) – PIN #9**

Locate the PCM ground wire in the vehicle's wiring harness at the pin listed below.

For 1994-1995 models tap the **Black w/ Tan** wire that runs to pin **12** on the PCM (behind the air box on the passenger-side firewall).

For 1996-1998 models 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 at the pin listed below.

For 1994-1995 models this **Orange w/ White** stripe wire is located at pin **10** on the PCM (behind the air box on the passenger-side firewall).

For 1996-1998 models 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 Commander Module** to the OD wire from the PCM and cut off any excess, but leave some slack. Solder the Commander white wire to the OD wire and 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.

For 1994-1995 models this **Orange w/ Black** stripe wire is located at pin **54** on the PCM (behind the air box on the passenger-side firewall), *OR* at the transmission connector (3-pin connector on the driver's side of the transmission)

For 1996-1998 models 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 **Commander** to the wire that goes to the PCM. Connect the **Blue** wire coming from the **Commander** to the wire that goes to the transmission. Protect these connections.

**If at anytime you would like to bypass the Commander's operation, simply unplug the wiring harness from the Commander Module and jumper the harness' blue and yellow terminals together with a paperclip.**

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

Locate the VSS (Vehicle Speed Sensor) wire at the vehicle's PCM in the pin listed below.

For 1994-1995 models this **White w/ Orange** stripe wire is located at pin **47** on the PCM (behind the air box on the passenger-side firewall).

For 1996-1998 models 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 Commander module to the VSS wire at the PCM and cut off any excess, leaving some slack. Solder the Green wire to the VSS wire and protect from elements, this in the most common install problem with wiring.

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

If the vehicle you are installing this on has a 48-RE transmission 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, gray connector) pin **24**. Run the purple wire from the Commander module to the wire. Solder the purple wire to this PRNDL wire. Protect this connection.

**If you do not have an exhaust brake, skip the following section but we recommend that you tie the gray wire out of the way under the dash just in case you install an exhaust brake in the future.**

### **-Gray 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 it to the gray wire that comes from the Commander module. The E-brake feature of the **Commander** will only work with an exhaust brake that uses a solenoid to actuate it. We recommend the use of a PACBRAKE with our **Commander**. 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 **Commander** 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 Commander 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 Commander** OFF (Button on left of display panel-no lights on). Turn the exhaust brake ON. The exhaust brake should sound. Turn the **ATS Commander** 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.

With no traffic around, turn ON the exhaust brake and set the Commander module to engage at a speed of around 35mph, then cruise at a constant speed above the set speed on the module; then let off the throttle. The brake should have activated and you should feel the hold back. Turn the brake OFF to make sure the brake and lock-up clutch disengages. Turn the brake ON and cruise again at a constant speed, then 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 module. The exhaust brake should activate when the exhaust brake is ON, and the Commander OFF.

If any of the functions still fail to occur go through all of your connections thoroughly and verify you have good power and grounds along with a good vehicle speed connection. The VSS connection is the most common cause of a malfunctioning Commander 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 final wiring and testing has been done on the vehicle, secure any loose wires.

## **Understanding the operation of the ATS Commander module**

With the Commander turned ON while driving with the overdrive turned OFF and the exhaust brake turned ON, the transmission shifts from first to second to third and then locks up. Anytime after the lock-up has occurred and you take your foot off the accelerator, the Commander will hold the torque converter clutch locked until the minimum set speed the adjustment has been set to and then it will turn off the torque converter clutch and the exhaust brake. 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 Commander 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.

On the Dodge with a stock torque converter, when downshifting you have to apply throttle pressure until the factory computer says everything is okay and locks up the torque converter clutch. As soon as that happens, you should remove throttle pressure and the Commander will keep the torque converter clutch applied until you get down to the set minimum speed mark. When the Commander 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.

There may be times when you need to make a quick stop or slow down, where canceling the Commander functions may be needed. Such conditions may be:

- You do not require the extra retarding horsepower of third gear
- You do not want the shuddering that occurs when you have a locked up torque converter clutch and you are going to be doing 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 Commander
2. Turn OFF the overdrive
3. Lightly step on the throttle pedal
4. Pull the gearshift lever down into second gear

Turning off the overdrive is the preferred of the four options.

The Commander function should only be used under moderate throttle applications when used with a stock valve body. Unless you have installed the ATS Five Star Converter, the stock converter clutch has only so much holding power and exceeding this will start to slip the clutch, thereby starting the demise of your converter clutch. An example of when to use the Commander's ON position would be when you are on a winding road where you are on and off the throttle a great deal and you do not want the ECM locking and unlocking the converter clutch. The Commander will hold the converter clutch locked up, preventing that from happening. You must keep in mind while doing this that if you apply too much throttle pressure, especially at the lower rpm band, you may start to slip the converter clutch. This is a problem with the factory torque converter. On the 48-RE (2003-up) transmission this is not a problem unless there have been engine performance modifications. When using this module with the ATS Five Star Converter and ATS Valve Body, you can lock the converter at your discretion with any power levels.

## **Information when installing the Commander module with a stock valve body & Converter**

The Commander module has been designed to operate an exhaust brake and engage the torque converter clutch enabling superb engine braking with your automatic transmission. The Commander must be used only under cretin operating conditions to ensure long life of your stock automatic transmission. Using the Commander 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 Commander. 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 Commander 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<sup>rd</sup>s of its torque capacity. If you have ever experienced this condition do not use your exhaust brake or the Commander until the condition is repaired.
- 3) A transmission that neutrals unexpectedly is also a sign of an improperly adjusted throttle cable, if a transmission is driven around with a misadjusted, disconnected or broken throttle cable the transmission and converter will be damaged quickly.
- 4) Burnt or contaminated transmission fluid, transmission fluid is normally red. If your transmission fluid is brown or black, have the transmission pan removed and check for damage. Brown or black fluid is caused from excessive slipping or clutch material mixing with the transmission fluid.

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 Commander module on. The exhaust brake does not need to be on at this point, only the Commander 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 Commander 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



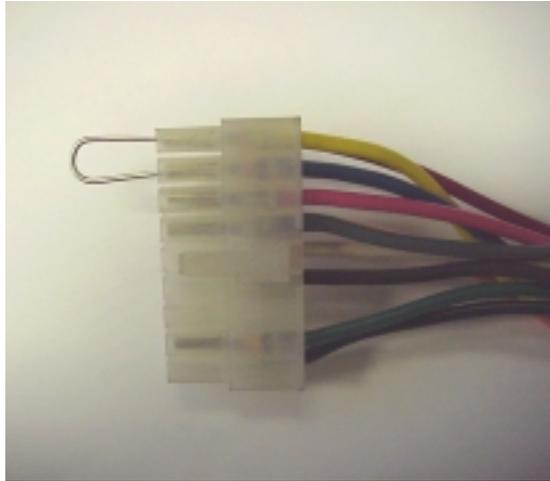
With the transmission pressure set to the desired level accelerate the vehicle to a safe highway speed of around 50 MPH. Turn on the exhaust brake and Commander. Cancel the overdrive (OD Light on) and remove your foot from the throttle. The green light should illuminate on the Commander module. If the green light does not illuminate on the Commander 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 ATSDiesel Performance or directly from the web site at [www.ATSDiesel.com](http://www.ATSDiesel.com).

In the event you have installed the Commander 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 1<sup>st</sup> and 2<sup>nd</sup> gear lock-up. The ATS valve body also allows the transmission to be shifted from 4<sup>th</sup> gear to 3<sup>rd</sup> 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 torque converter with a high torque multiplication stator and a 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 Commander 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 Commander completely.



*If your pickup behaves normally after bypassing the Commander:* Make sure you are following the operating instructions correctly and that all wire connections 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 Commander:* 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 Commander. 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**

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Local: 303-431-7973

Fax: 303-431-01135

Website: [www.ATSDiesel.com](http://www.ATSDiesel.com)

Email: [info@ATSDiesel.com](mailto: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](mailto: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 than 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.

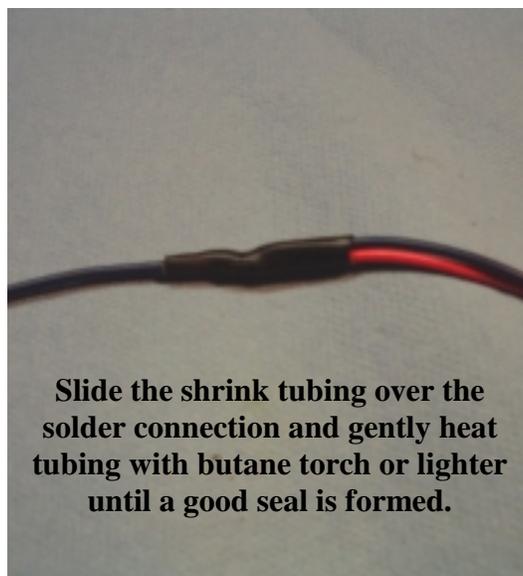
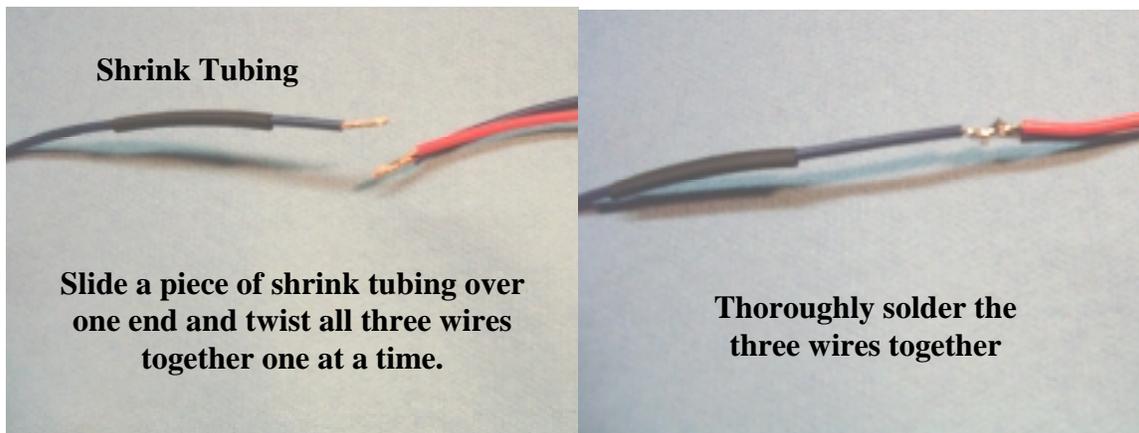
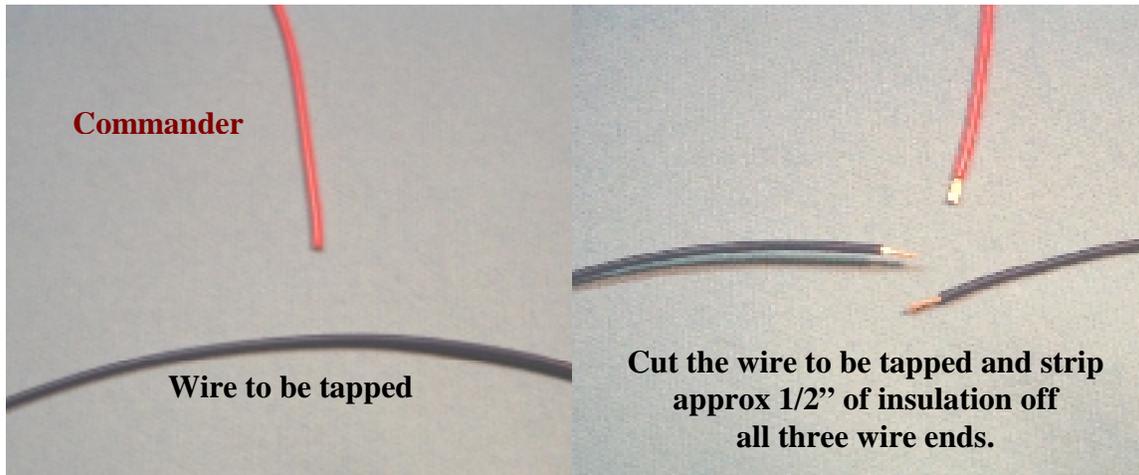
This warranty shall not apply to any unit which has been improperly stored or installed, subjected to misapplication, improper operating conditions, accidents, or neglect; or which has been improperly repaired, altered or otherwise mistreated by the owner or his agent.

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.

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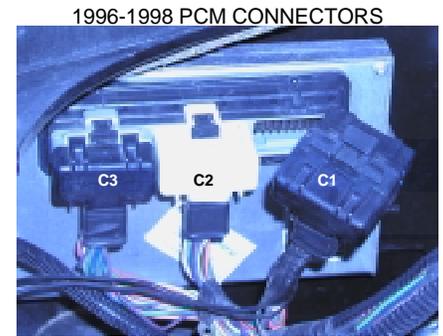
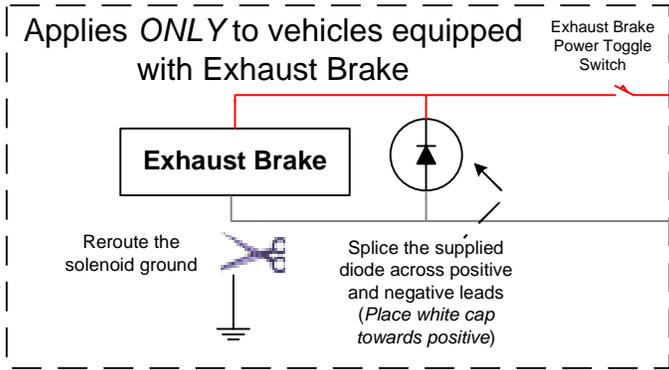
## Making Your Commander Wire Connections



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

**PRNDL SWITCH**  
(driver's side of transmission)  
**CA Emissioned Only**  
94-98 w/ 47RH/RE Trans  
Tap the center wire  
(Black w/ White)

COMMANDER™									
18	17	16	15	14	13	12	11	10	
9	8	7	6	5	4	3	2	1	
RED - 12 V POWER (PIN 1)									
ORANGE - N/A (PIN 4)									
NOT USED									
WHITE - OD (PIN 5) <u>Only if using stock valve body</u>									
NOT USED									
BROWN - N/A (PIN 6)									
BLACK - GROUND (PIN 9)									
YELLOW - PCM (PIN 10)									
BLUE - TCC (PIN 11)									
NOT USED									
PINK - N/A (PIN 12)									
GRAY - EXHAUST BRAKE (if equipped) (PIN 13)									
PURPLE - PRNDL SWITCH (PIN 16)									
CA Emissioned Only 94-98 w/ 47RH/RE Trans									
GREEN - VSS (PIN 17)									



PCM	
tap	WHITE W/ ORANGE (VSS) 1996-1998 = Connector C2, Pin 27 1994-1995 = Pin 47
tap	ORANGE W/ BLACK 1996-1998 = Connector C2, Pin 11 @ PCM Pin 7 @ Transmission 1994-1995 = Pin 54 @ PCM Orange w/ Black @ Transmission
tap	BLACK W/ TAN 1996-1998 = Connector C1, Pin 32 1994-1995 = Pin 12
tap	ORANGE W/ WHITE (OD) 1996-1998 = Connector C3, Pin 13 1994-1995 = Pin 10
tap	LT GREEN W/ BLACK 1996-1998 = Connector C1, Pin 2 1994-1995 = Pin 9

Splice yellow from Commander with orange w/ black

Cut orange w/ black wire

Splice blue from Commander with orange w/ black