



**Installation Manual v1.0:  
2006-2010 GM Allison 1000 Automatic Transmission  
Tow Co-pilot**  
**Please read all instructions before the installation of the ATS Co-Pilot**

Thank you for purchasing the ATS Tow 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.



**Kit Contents - See page 14**

## **The GM 2006-2010 Allison Co-Pilot:**

The GM 2006-2010 Allison Co-Pilot is the Tow controller for your transmission! Bringing you the best shift quality as well as the highest clutch holding compactly available. The Co-Pilot actively modifies line pressure and of your Allison based on engine load. The Co-Pilot allows a stock truck to have good drivability as well as an extreme horsepower vehicle to have the same torque converter lockup quality and still prevent the transmission from slipping.

### **Installation Instructions**

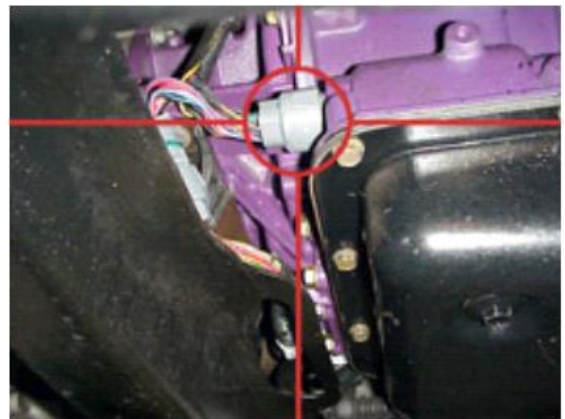
There are five (5) basic installation steps to this kit;

- A. Valve Body Section
- B. Wiring harness installation
- C. Connect wiring harness to sensors
- D. Co-Pilot Box
- E. Battery Ground

**NOTE: If you already have an ATS Transmission, the internal harness and solenoid block are already installed. Please skip steps 1-15**

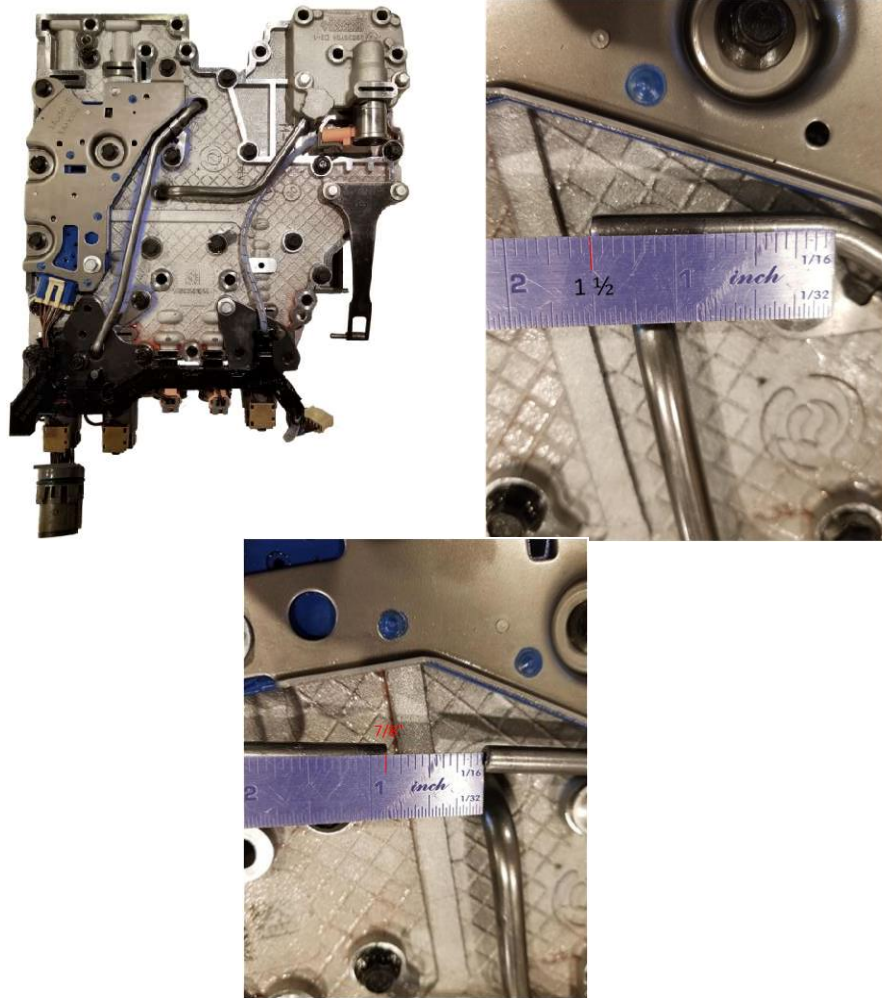
#### **(A) Valve Body Section**

- 1) Drain the transmission pan; use a 14 mm socket to remove the drain plug from the bottom of the transmission pan. You will need a pan with a fluid capacity of approximately 6 quarts of fluid. After draining the transmission pan, place the drain plug back into the pan and torque it to 16-foot pounds of torque.
- 2) Next remove the bolts from the outside of the pan that attach it to the transmission case and remove it from the case, use a 13mm socket. Remove the black plastic filter from the transmission; pull the filter straight down while rotating from side to side to remove it from the case.
- 3) After the pan and filter has been removed from the transmission allow the valve body to drip for a while to minimize the mess. You are now ready to proceed with the valve body up-grade.
- 4) Un-plug the 20-pin connector from the back of the transmission (Figure 1). The connector can be difficult to disconnect from the transmission, squeeze the connector and wiggle it from left to right while exerting pressure toward the rear of the vehicle. The connector will disconnect from the transmission with a little effort.



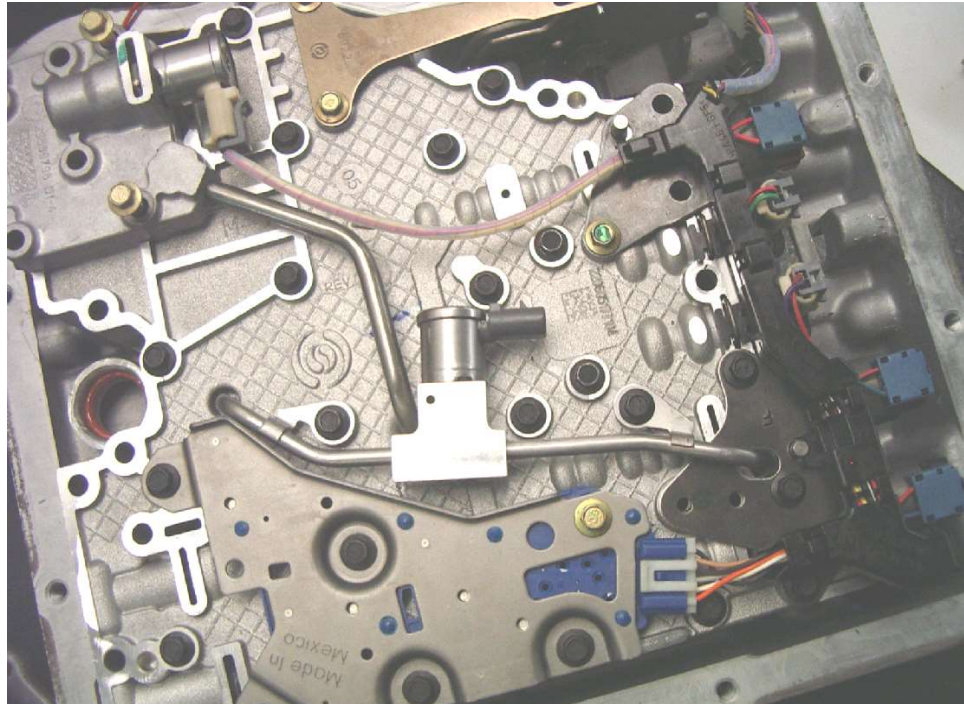
**Note:** The valve body does not need to be removed from the transmission to install the Co-Pilot. We removed the valve body for a better view of the components.

- 5) Install the supplied connector from the Co-Pilot harness in the factory connector's place. Plug the factory connector that you removed into the other side of the Co-Pilot harness.
- 6) Remove the stainless steel tube that is held down by the three bolts shown below in the left picture. Remove the tube from the valve body and with a tubing cutter, cut the tube 1-1/4" from the bend shown in the middle picture. Then cut 7/8" off of the section of the other section of tubing.



- 7) Remove any burrs from the tubing and make sure to remove all debris. Install the solenoid block between the tubes as shown and put the assembled tube back onto the valve body. NOTE: Be careful when installing the metal tubes into the valve body; gently tap the ends if necessary.

The included Co-Pilot solenoid is brand new! Any red transmission fluid that is visible in the packaging or on the solenoid assembly is from testing at the BorgWarner factory. The ATF also helps the O-Rings seal on the solenoid block

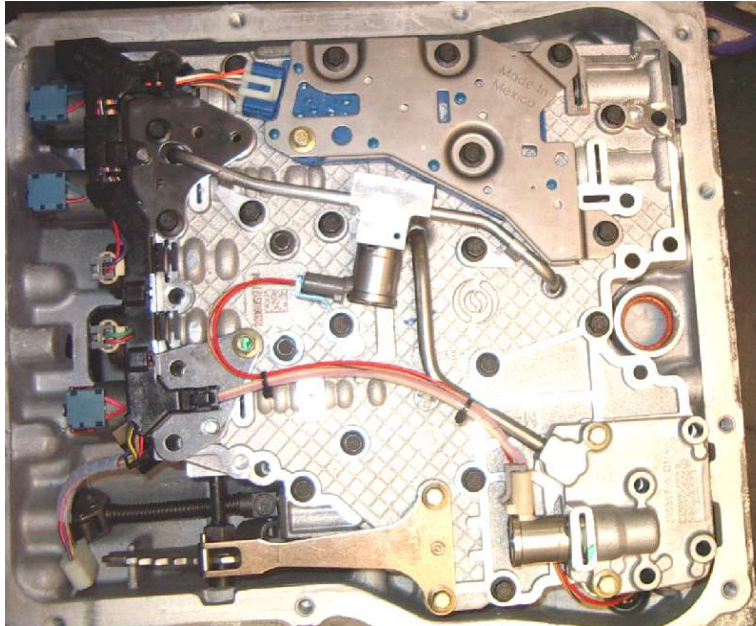


**Make sure the solenoid's pin hole is oriented as shown in the picture above.**

- 8) Connect the ATS secondary harness to the external harness. Put the Brown plug into the port next to the PTO cover as shown below.



- 9) Route the wires as shown in the picture below. Wire tie it where convenient and out of the way. Plug the connector into the solenoid.



*\*Note the cleanness of the wire routing\*  
Keep wiring routed away from moving parts.*

- 10) Take the time to do one last check over the valve body assembly, be sure all of the electrical connectors are plugged in and all of the bolts are tight then install the internal filter.
- 11) Install the pan and gasket; this is also the time to install an aluminum deep pan if you have one.
- 12) Torque the pan bolts to **18-foot pounds** of torque. Go around pan at least **3 times** to seat the deep pan.
- 13) Add 6 quarts of transmission fluid to the transmission after securing the transmission pan to the case.
- 14) The transmission internal section is done; after the remaining portion of the ATS Co-Pilot™ kit is completed the transmission fluid needs to be checked immediately after start up. Note: It is common to have a check engine light immediately after start up due to low fluid level, after the transmission is full of fluid and a few ignition cycles the check engine light will reset.

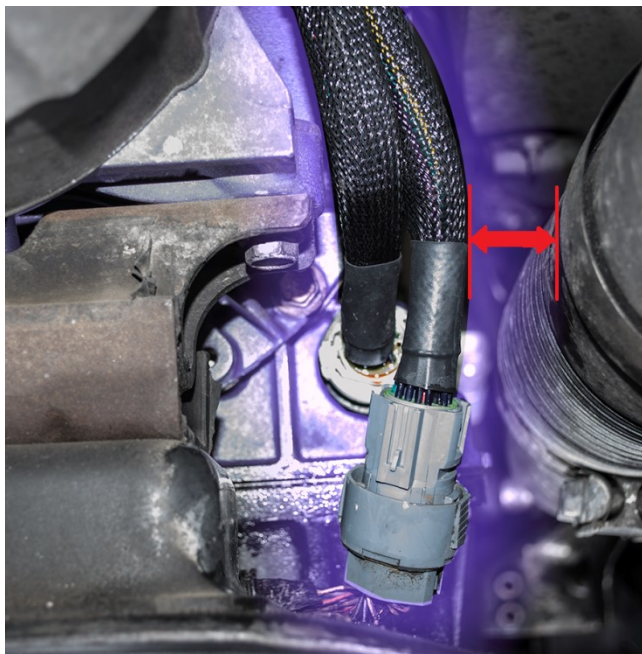
**IMPORTANT!** Make sure to recheck the fluid level in the transmission after the vehicle is driven for a short distance, as it is common for the level to drop.

## **(B) Harness installation Section:**

The following section will show and describe how to install the Co-Pilot harness.

Disconnect the negative ground (black) terminals on all vehicle batteries before starting installation. The ATS Co-Pilot is designed to be nearly completely plug and play. The following instructions will be divided up for wiring up each individual connector and wire color labeled on the ATS Co-Pilot. These wire connections must be shielded from the elements.

**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.



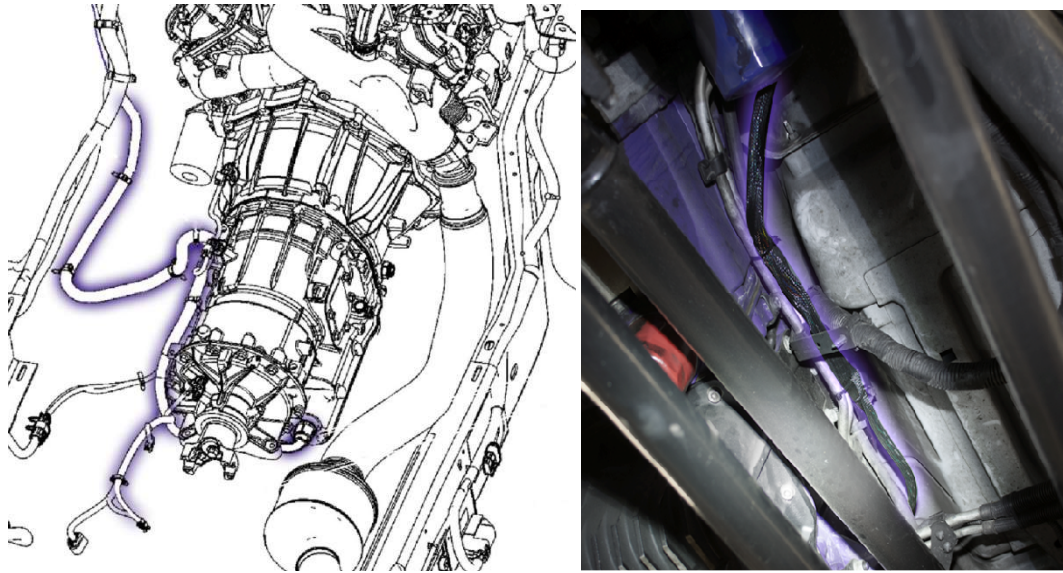
**Keep the connectors and harness away from the exhaust!**

### **Transmission Valve body Connectors:**

The Co-Pilot has two connectors for the valve body, one male and one female connector. The valve body connector is located on the rear passenger's side of the transmission. As pictured below, this part of the install is plug and play. Simply unplug the factory connector, plug the Co-Pilot connector into the valve body, and then plug the other connector into the factory harness. Starting at the Valve Body connectors route the Co-Pilot harness above or below the Allison tail-housing. If you route your harness above the transmission case, be sure the harness clears the exhaust by at least four inches. Always be sure it clears drive shafts and is not hanging down where it could be caught on something on the road while you are driving.

### **Routing Co-Pilot Wiring Harness**

Route the Co-pilot so that it does not run close to any exhaust pipes. Be sure to keep away from moving parts such as drive shafts. Also we recommend routing your Co-Pilot So that it follows the factory harness. Be sure to keep the harness as high as possible so that it will not get caught on things while driving. The Co-Pilot harness was designed to have enough length so that no connectors or wires needed to be stretched to fit, causing wear and premature failure. Pictured below is the recommended routing for the Allison Co-Pilot harness. Make sure to zip tie the harness so there is very little slack, but still leaving enough to allow for some flex and movement.



*We recommend routing your harness as pictured above.*

### **(C) -Orange Wire- Manifold Absolute Pressure (MAP) Sensor**

Connect at the MAP sensor connector mounted on the intake manifold. Use the supplied jumper harness that makes this connection plug and play with the MAP sensor. The Pigtail that comes out of the jumper harness has a single pin connector on it. Plug the Co-Pilot MAP orange wire connector in to the pigtail on the MAP sensor jumper harness.

If you have other modules that need the MAP signal, an adapter is available that splits the map signal out to multiple wires. This makes for a clean install and prevents damage to your factory harness from installing and removing signal wires.

- On 2001 LB7 Duramax the MAP wire is located on the right intake manifold;
- On 2002-2004 LB7 Duramax the MAP wire is located in the intake tube in the center of the engine.
- On 2004.5-2005 and later LLY Duramax Engines the sensor is covered slightly. Remove the intake pipe going to the turbocharger to get a better view at the MAP sensor and the connector.
- On 2006-2010 LBZ/LMM Duramax engines the MAP Sensor is located on the cast metal intake pipe on the passenger side of the engine, near the intake air heater.

Map Sensor

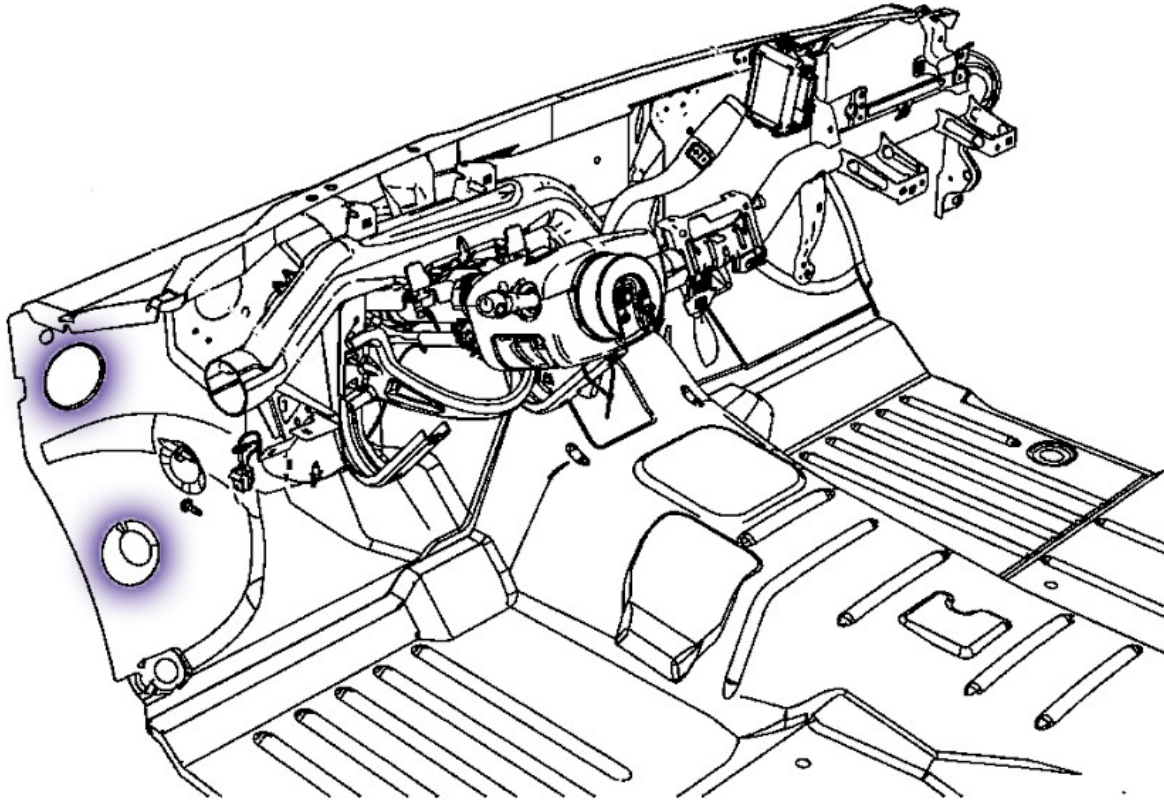


**IMPORTANT:** If the vehicle has any aftermarket power modules installed, be sure to plug the MAP sensor connector BEFORE any taps from these power modules, i.e. **place the Co-Pilot's plug closest to the sensor.** The Co-Pilot may not work properly if it receives signals that have been modified by 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 Co-Pilot connection.



## **Routing Co-Pilot Wiring Harness through the firewall**

The Co-Pilot harness is designed to be simple and easy to route; however coming through the firewall can be a tight fit. Take care not to damage the Co-Pilot harness or any other factory wires when going through firewall and take your time.



### ***Under Dash Components***

Connect the 24-pin connector from the harness to the connector on the Co-Pilot control box and secure the box to the dash. On 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.

### **(D) Co-Pilot Mounting Location**

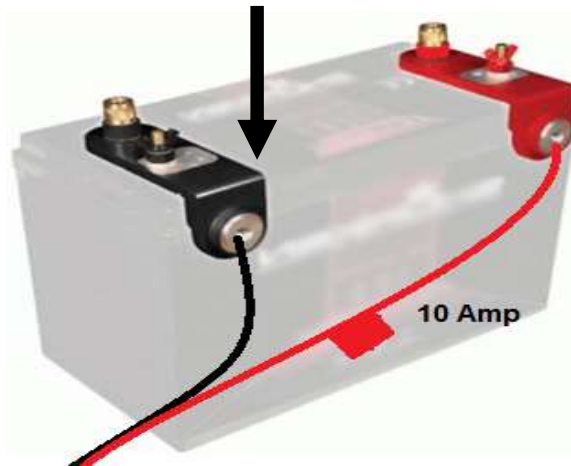
Find a convenient location to mount the Co-Pilot within reach and view of the driver. We recommend locating the unit just to the right of the driver on the lower dash panel (above the driver's right knee). Use the supplied Velcro to secure it to the dash. Before sticking the Velcro to the dash thoroughly 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).

#### ***Suggested Co-Pilot Mounting Location***



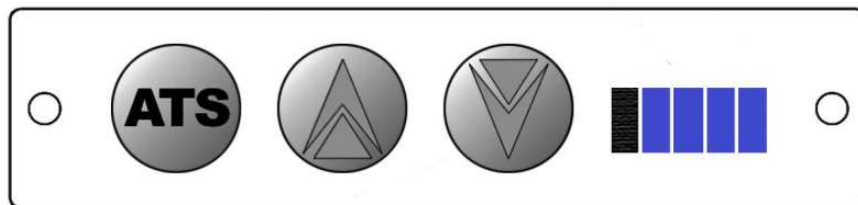
**(E) Battery Ground Ring Terminal**

When installing the ground ring terminal to the battery cable, it is important to make sure that the batteries are still disconnected. Installing the ring terminal to the battery while it is connected can cause power surges from the loose terminals while the nut that secures them is loose and not yet tight, which could cause issues with the Co-Pilot and to any other accessories you have connected to the battery cables. Grounding the Co-Pilot harness directly to the ground post of the battery is extremely important, because this eliminated noises in the signals that the Co-Pilot is watching and producing. This will cause erratic operation and in some cases check engine lights.



**Brightness Setting**

To change the brightness of the front panel, use the UP and DOWN arrows to adjust brightness. Once selected, wait 4-5 seconds and the Co-Pilot will save the brightness setting.



**If a problem occurs after the Co-Pilot is installed:**

Double-check **all** connections. Make sure your solder connections are good. 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. Also please use the 24 pin jumper connector that we supplied to bypass the Harness to see if the controller is faulty. 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 5-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](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 website to check 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 <mailto:Suggestions@ATSDiesel.com>.***

### **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.**

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**Bill of Materials**

1. Co-Pilot Controller
2. Wiring Harness
3. Map Jumper
4. 6 Speed Internal Harness
5. Hardware Pack
6. Solenoid block assembly