Installation Manual for 1994-1998 Dodge 12V Cummins
Version 3.7

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

Thank you for purchasing the ATS Co-Pilot. 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 Co-Pilot

The ATS Co-Pilot is recommended for use with light duty pickup trucks with a heavy-duty aftermarket transmission and torque converter package are installed on vehicle. While the Co-Pilot will still function perfectly on a stock transmission, factory transmission shafts are weak and prone to breakage. The factory torque converter clutch will also fail if applied under high load conditions. Factory computers are programmed to disengage lockup under certain conditions which will protect the transmissions internal components under higher load. This is when we recommend having a heavy-duty aftermarket transmission installed on your vehicle to prevent transmission failure. If you have a stock transmission it is recommended that you leave your Co-Pilot in a less aggressive setting when under high load conditions. ATS Diesel Performance sells many parts for all levels of trucks that will strengthen your transmission and improve reliability, whether you have a stock daily driver or a fully built race truck! Give us a call today if you feel the need to get a fully rebuilt transmission for your truck, or if you just want to strengthen your current transmission with a few upgraded parts. Our experts can help answer any questions you have and guide you in the right direction.

Setting up the ATS Co-Pilot module for installation

The ATS Co-Pilot will need to be set up for your vehicle and application. The Co-Pilot will need to be disassembled to access the dip switches 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.

Dip switch selection:

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**

Switch #3

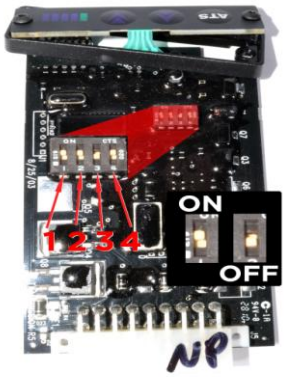
Speed setting

On=Low speed cut out
Off=Hi speed cut out, recommended setting

Switch #4

Set this switch to the **ON** position

We have preset your Co-Pilot #1-ON, #2-ON, #3-OFF, #4-ON



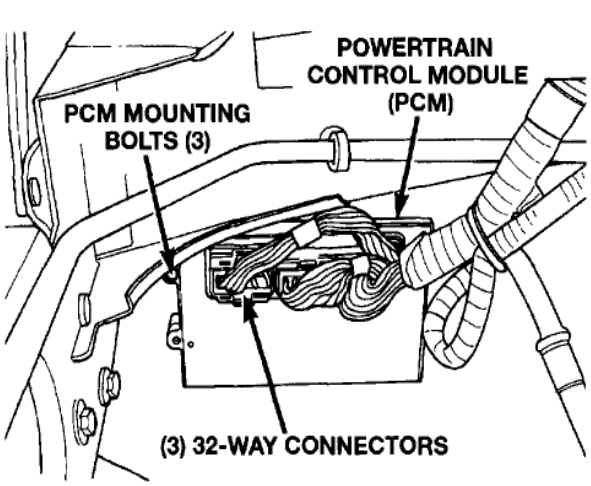
Co-Pilot Mounting Location

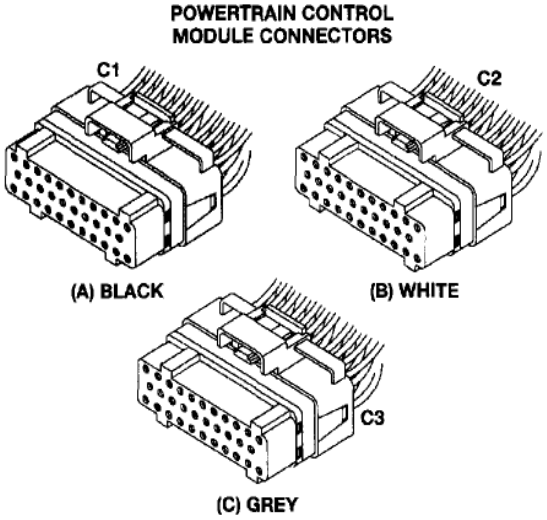
Find a convenient location to mount the Co-Pilot within reach and view of the driver. The Co-Pilot interface must be within visual range of the driver as well as in easy reach. We have found the ideal place to locate the module is just to the right of the driver on the lower dash panel just above the 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 (Power-train control module) and the transmission through the firewall.

Wiring the Co-Pilot

-The Co-Pilot has several connections that need to be made in order for it to function properly. There are several wires which are optional but still included to give the Co-Pilot a more versatile use depending on your trucks current setup. Use the diagram below as a reference when installing your Co-Pilot to avoid any conflicts or confusion.

1996-1998 PCM Connector View





CAV	COLOR	FUNCTION
A2	F18 LG/BK	Fused Ignition Switch Output
A4	K4B BK/LB	Sensor Ground
A6	T41 BK/WT	P/N Position Switch Sense
A8	K24 GY/BK	Crank Position Sensor Signal From ECM
A22	A14 RD/WT	Fused B (+)
A23	K22 OR/DB	Accel Pos Sensor Signal
A31	Z12 BK/TN	Ground
A32	Z12 BK/TN	Ground
B1	T54 VT	Trans Temp Sensor Signal
B8	K88 VT/WT	Governor Pressure Solenoid Control
B10	K20 DG	Generator Field Driver
B11	K54 OR/BK	TCC Solenoid Control
B21	T60 BR	Overdrive Solenoid Control (3-4 Shift)
B25	T13 DB/BK	Output Shaft Speed Sensor Signal (-)
B27	G7 WT/OR	Vehicle Speed Sensor Signal
B28	T14 LG/BK	Output Shaft Speed Sensor Signal (+)
B29	T25 LG/WT	Governor Pressure Signal
B30	K30 PK	Transmission Relay Control
B31	K7 OR	5-Volt Supply Secondary

CAV	COLOR	FUNCTION
C1	C13 DB/OR	A/C Comp Clutch Relay Control
C3	K51 DB/YL	Auto Shutdown Relay Control
C4	V36 TN/RD	S/C Vacuum Solenoid Control
C5	V35 LG/RD	S/C Vent Solenoid Control
C6	T18 LG/OR	Overdrive Off Lamp Driver
C11	V32 YL/RD	Speed Control Power Supply
C12	A142 DG/OR	Auto Shutdown Relay Output
C13	T6 OR/WT	Overdrive Off Switch Sense
C15	K118 PK/YL	Battery Temp Sensor Signal
C22	C20 BR	A/C Request Signal
C23	C90 LG/WT	A/C Select Signal
C24	V40 WT/PK	Brake Switch Sense
C25	T125 DB	Generator Field Source (+)
C26	K226 DB/WT	Fuel Level Sensor Signal
C27	D21 PK/DB	SCI Transmit
C28	D2 WT/BK	CCD BUS (-)
C29	D220 LG	SCI Receive
C30	D1 VT/BR	CCD BUS (+)
C32	V37 RD/LG	Speed Control Switch Signal

-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

Reason for use: This wire supply's power to the Co-Pilot so it can turn on with the key switch. **NOT OPTIONAL!!**

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 **A** PCM connector. PCM connectors are behind the air box on the passenger-side firewall.

-Black Wire- Ground (GND) – PIN #9

Reason for use: This wire supply's ground to the Co-Pilot constantly. **NOT OPTIONAL!!**

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 **A** connector on the PCM.

-White Wire- Overdrive – PIN #5 OPTIONAL

Reason for use: This wire is used to control the overdrive cancel function of the Co-Pilot.

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 C connector of the PCM.

Run the white wire from the **ATS Co-Pilot** to the OD wire from the PCM and cut off any excess, but leave some slack. Solder the Co-Pilot's white wire to the OD wire and protect it from the elements.

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

Reason for use: These wire allow the Co-Pilot to take control of the torque converter lockup solenoid.

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 **B** Connector of the PCM. 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 butt connector to the wire leading back to the transmission and attach a 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.

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

Reason for use: This wire is used as reference for the commander to know what speed the vehicle is moving. **NOT OPTIONAL!!**

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 B 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. 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

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 Co-Pilot module to the wire. Solder the purple wire to this PRNDL wire. Protect this connection.

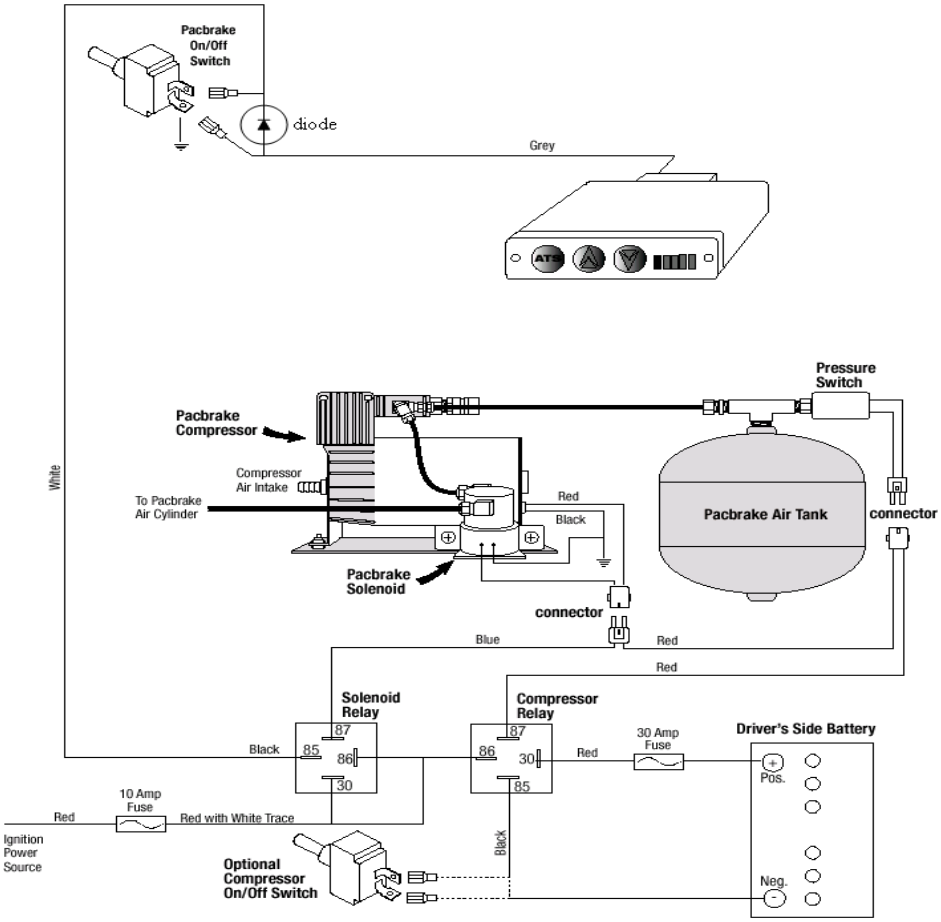
-Gray Wire- Exhaust Brake – PIN #13

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 **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 Commander Box and turning on the exhaust brake's toggle switch.

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.

-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.



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 Commander completely.