



Installation Manual for 1989-1997 Ford Power Stroke v1.1

Please read all instructions before the installation of the ATS Commander

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, 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 Commander 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 1/16th - 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 do not over tighten the 2 small screws on the face.

Dip switch selection:

Switch #1

Set to **OFF** position

Switch #2

Set to **ON** position

Switch #3 - Speed setting

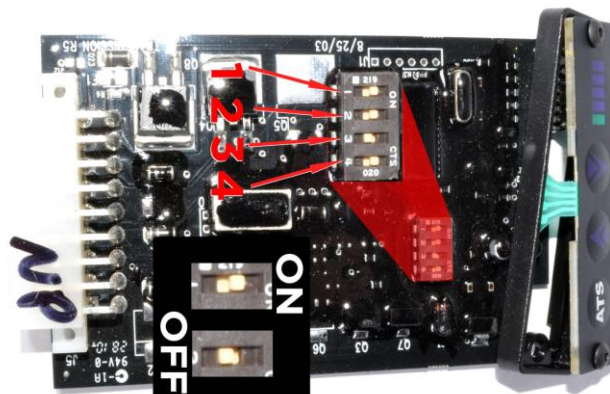
On=low speed cut out

Off= Hi speed cut out

Switch #4

Set switch to **ON** position

We have preset your module with #1-OFF, #2-ON, #3-OFF, and #4-ON.



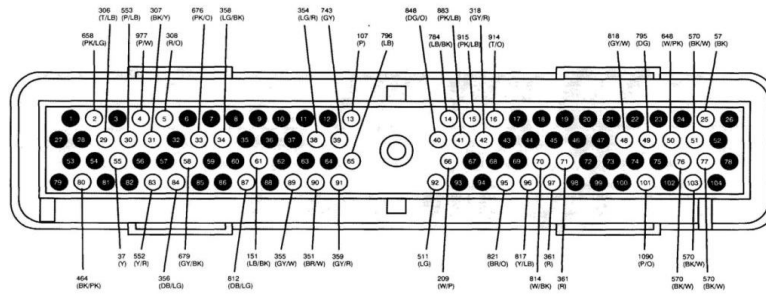
Co-Pilot Mounting Location

Find a convenient location to mount the Co-Pilot within 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 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 For 1989-1994 models

-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.



C1027
POWERTRAIN CONTROL MODULE (PCM) (7.3L DI TURBO)

PIN	CIRCUIT	CIRCUIT FUNCTION	PIN	CIRCUIT	CIRCUIT FUNCTION	PIN	CIRCUIT	CIRCUIT FUNCTION
1	-	Not Used	36	-	Not Used	71	361 (R)	Power Input
2	658 (PK/LG)	PCM Data Link Connector	37	-	Not Used	72	-	Not Used
3	-	Not Used	38	354 (LG/R)	Engine Oil Temperature Sensor	73	-	Not Used
4	977 (P/W)	Brake Warning Indicator	39	743 (GY)	Ambient Air Temperature Input	74	-	Not Used
5	308 (R/O)	Idle Position Switch	40	848 (DG/O)	Speed Control Ground	75	-	Not Used
6	-	Not Used	41	883 (PK/LB)	A/C Cycle Pressure Switch Input	76	570 (BK/W)	Ground
7	-	Not Used	42	318 (GY/R)	Exhaust Pressure Regulator	77	570 (BK/W)	Ground
8	-	Not Used	43	-	Not Used	78	-	Not Used
9	-	Not Used	44	-	Not Used	79	-	Not Used
10	-	Not Used	45	-	Not Used	80	464 (BK/PK)	Wait to Start Output
11	-	Not Used	46	-	Not Used	81	-	Not Used
12	-	Not Used	47	-	Not Used	82	-	Not Used
13	107 (P)	Generic Scan Tool Input	48	818 (GY/W)	IDM Signal Input	83	552 (Y/R)	Injection Pressure Regulator
14	-	Not Used	49	795 (DG)	CAM Position Sensor	84	356 (DB/LG)	BARO Sensor
15	915 (PK/LB)	Generic Scan Tool Input	50	648 (W/PK)	Tachometer Feed to Instrument Cluster	85	-	Not Used
16	914 (T/O)	Selectable RPM Control Input	51	570 (BK/W)	Ground	86	-	Not Used
17	-	Not Used	52	-	Not Used	87	812 (DB/LG)	Injection Control Pressure Sensor
18	-	Not Used	53	-	Not Used	88	-	Not Used
19	-	Not Used	54	-	Not Used	89	355 (GY/W)	Accelerator Pedal Position Sensor
20	-	Not Used	55	37 (Y)	Keep Alive Power Input	90	351 (BR/W)	Reference Output Voltage
21	-	Not Used	56	-	Not Used	91	359 (GY/R)	Sensor Signal Return
22	-	Not Used	57	-	Not Used	92	511 (LG)	Brake ON/OFF Switch Input
23	-	Not Used	58	679 (GY/BK)	Vehicle Speed Sensor	93	-	Not Used
24	-	Not Used	59	-	Not Used	94	-	Not Used
25	57 (BK)	Ground	60	-	Not Used	95	821 (BR/O)	Fuel Delivery Command Signal Output
26	-	Not Used	61	151 (LB/BK)	Speed Control Common Signal	96	817 (Y/LB)	Cylinder Identification Signal Output
27	-	Not Used	62	-	Not Used	97	361 (R)	Power Input
28	-	Not Used	63	-	Not Used	98	-	Not Used
29	306 (T/LB)	Clutch Pedal Position Switch	64	-	Not Used	99	-	Not Used
30	553 (P/LB)	Exhaust Back Pressure Sensor	65	570 (BK/W)	Cam Position Sensor Return	100	-	Not Used
31	307 (BK/Y)	Brake Pressure Switch	66	209 (W/P)	PCM VIP Data Link Input	101	1090 (P/O)	Glow Plug Control Output
32	-	Not Used	67	-	Not Used	102	-	Not Used
33	676 (PK/O)	Vehicle Speed Sensor Ground	68	-	Not Used	103	570 (BK/W)	Ground
34	358 (LG/BK)	MAP Sensor	69	-	Not Used	104	-	Not Used
35	-	Not Used	70	814 (W/BK)	IDM Enable Output			

NOT USED: Orange Wire (Pin 4), White Wire (PIN #5), Pink Wire (PIN #12), Purple Wire (PIN #16) And Gray (PIN #14).

Red Wire- +12V Power – PIN #1

Locate the **Red** wire coming from the vehicle’s PCM Pin #37. Tap this wire with the **Red** Commander wire by soldering. Shield the tap from the elements.

Black Wire- Ground (GND) – PIN #9

Locate the **Black w/ White** wire coming from the vehicle’s PCM Pin #60. Tap this wire with the **Black** Commander wire by soldering. Shield the tap 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 transmission. This **Purple w/ Yellow** stripe wire can be found at the transmission connector (passenger side of the transmission, above the pan rail). 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 into the wire loom to the vehicle's 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 the connections from the elements.

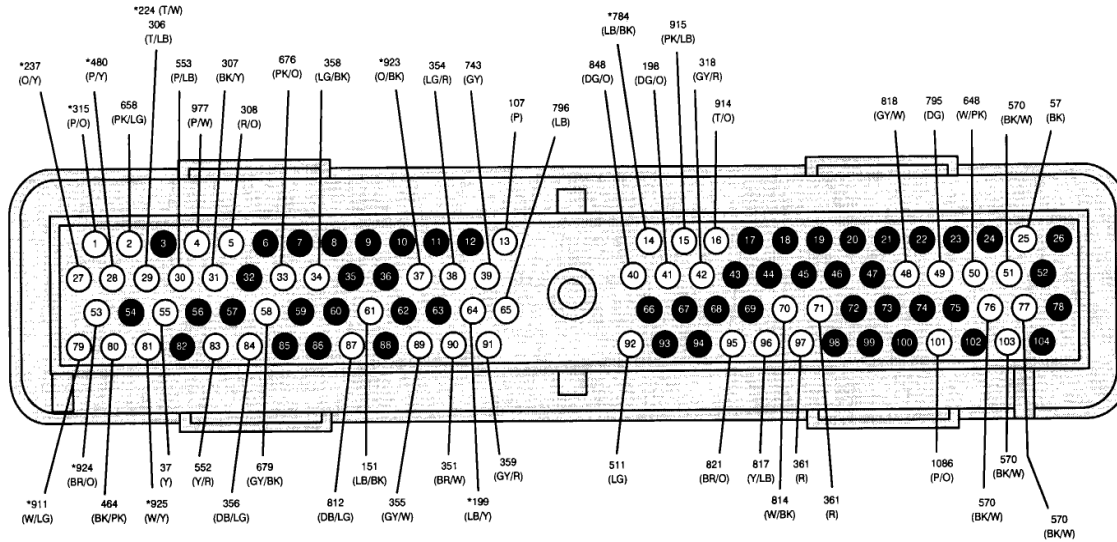
Green Wire- Vehicle Speed Sensor (VSS) – PIN #17

Locate the VSS (Vehicle Speed Sensor) wire. This **Gray w/ Black** stripe wire can be found at the transmission connector (passenger side of the transmission, above the pan rail). Tap by soldering the Green Co-Pilot wire to the VSS wire and protect from elements. A poor VSS connection is the most common wiring problem.

If at any time 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.

Wiring The Co-Pilot For 1994.5-1997 models

-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.



C1027 (GRAY)

*** WITH E40D TRANSMISSION**

POWERTRAIN CONTROL MODULE (PCM) (7.3L DI TURBO)

PIN	CIRCUIT	CIRCUIT FUNCTION	PIN	CIRCUIT	CIRCUIT FUNCTION	PIN	CIRCUIT	CIRCUIT FUNCTION
1	315 (P/O)*	Transmission Shift Solenoid #2	35	-	Not Used	70	814 (W/BK)	IDM Enable Output
2	658 (PK/LG)	Check Engine Light	36	-	Not Used	71	361 (R)	Power Input
3	-	Not Used	37	*923 (O/BK)	Transmission Fluid Temperature Sensor	72	-	Not Used
4	977 (P/W)	Brake Warning Indicator	38	354 (LG/R)	Engine Oil Temperature Sensor	73	-	Not Used
5	308 (R/O)	Idle Validation Switch	39	743 (GY)	Ambient Air Temperature Input	74	-	Not Used
6	-	Not Used	40	848 (DG/O)	Speed Control Ground	75	-	Not Used
7	-	Not Used	41	198 (DG/O)	A/C Cycle Pressure Switch Input	76	570 (BK/W)	Ground
8	-	Not Used	42	318 (GY/R)	Exhaust Pressure Regulator	77	570 (BK/W)	Ground
9	-	Not Used	43	-	Not Used	78	-	Not Used
10	-	Not Used	44	-	Not Used	79	*911 (W/LG)	Transmission Control Indicator Lamp
11	-	Not Used	45	-	Not Used	80	464 (BK/PK)	Wait to Start Output
12	-	Not Used	46	-	Not Used	81	*925 (W/Y)	Transmission Electronic Pressure Control
13	107 (P)	Generic Scan Tool Input	47	-	Not Used	82	-	Not Used
14	784 (LB/BK)*	4x4 Low Input	48	818 (GY/W)	IDM Signal Input	83	552 (Y/R)	Injection Pressure Regulator
15	915 (PK/LB)	Generic Scan Tool Input	49	795 (DG)	CAM Position Sensor	84	356 (DB/LG)	BARO Sensor
16	914 (T/O)	Auxiliary Powertrain Control Input	50	648 (W/PK)	Tachometer Feed to Instrument Cluster	85	-	Not Used
17	-	Not Used	51	570 (BK/W)	Ground	86	-	Not Used
18	-	Not Used	52	-	Not Used	87	812 (DB/LG)	Injection Control Pressure Sensor
19	-	Not Used	53	*924 (BR/O)	Transmission Coast Clutch Solenoid	88	-	Not Used
20	-	Not Used	54	-	Not Used	89	355 (GY/W)	Accelerator Pedal Position Sensor
21	-	Not Used	55	37 (Y)	Keep Alive Power Input	90	351 (BR/W)	Reference Output Voltage
22	-	Not Used	56	-	Not Used	91	359 (GY/R)	Sensor Signal Return
23	-	Not Used	57	-	Not Used	92	511 (LG)	Brake ON/OFF Switch Input
24	-	Not Used	58	679 (GY/BK)	Vehicle Speed Sensor	93	-	Not Used
25	57 (BK)	Ground	59	-	Not Used	94	-	Not Used
26	-	Not Used	60	-	Not Used	95	821 (BR/O)	Fuel Delivery Command Signal Output
27	237 (O/Y)*	Transmission Shift Solenoid #1	61	151 (LB/BK)	Speed Control Common Signal	96	817 (Y/LB)	Cylinder Identification Signal Output
28	480 (P/Y)*	Torque Converter Clutch Solenoid	62	-	Not Used	97	361 (R)	Power Input
29	306 (T/LB)	Clutch Pedal Position Switch	63	-	Not Used	98	-	Not Used
30	224 (T/W)*	Transmission Control Switch	64	*199 (LB/Y)	Transmission Range (TR) Sensor	99	-	Not Used
31	553 (P/LB)	Exhaust Back Pressure Sensor	65	796 (LB)	Cam Position Sensor Return	100	-	Not Used
32	307 (BK/Y)	Brake Pressure Switch	66	-	Not Used	101	1086 (P/O)	Glow Plug Control Output
33	676 (PK/O)	Vehicle Speed Sensor Ground	67	-	Not Used	102	-	Not Used
34	358 (LG/BK)	MAP Sensor	68	-	Not Used	103	570 (BK/W)	Ground
			69	-	Not Used	104	-	Not Used

* W/E40D TRANSMISSION

NOT USED: Orange Wire (Pin 4), White Wire (PIN #5), Pink Wire (PIN #12), Purple Wire (PIN #16) And Gray(PIN #14).

Red Wire (12volts)-Pin #1

Locate the **Red** wire coming from the vehicle's PCM Pin #71. Tap this wire with the **red** Co-Pilot wire by soldering. Shield the tap from the elements.

Black Wire- Ground (GND) – PIN #9

Locate the **Black** wire coming from the vehicle's PCM Pin #51. Tap this wire with the **black** Co-Pilot wire by soldering. Shield the tap 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 **Purple w/ Yellow** stripe wire can be found at the PCM at pin #28. 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 the connections from the elements.

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

Locate the VSS (Vehicle Speed Sensor) wire. This **Gray w/ Black** stripe wire can be found at the PCM at pin #58 Run the green wire from the Co-Pilot module to the VSS wire and cut off any excess, but leave some slack. Solder the Green Co-Pilot wire to the VSS wire and protect from elements, this is the most common install problem with wiring

Wiring The Co-Pilot For 1997 models E350 models

CALIFORNIA EXCEPT SUPER DUTY

* E4OD TRANS

PIN	CIRCUIT	CIRCUIT FUNCTION	PIN	CIRCUIT	CIRCUIT FUNCTION	PIN	CIRCUIT	CIRCUIT FUNCTION
1	-	Not Used	35	-	Not Used	70	464 (BK/PK)	Wait to Start Output
2	658 (PK/LG)	Check Engine Light	36	-	Not Used	71	361 (R)	Power Input
3	-	Not Used	37	923 (O/BK)	*Transmission Fluid Temperature Sensor	72	-	Not Used
4	323 (LB/Y)	Power Take-off Feed	38	354 (LG/R)	Engine Oil Temperature Sensor	73	-	Not Used
5	977 (P/W)	Brake Warning Indicator	39	743 (GY)	Ambient Air Temperature Input	74	-	Not Used
6	237 (O/Y)	Shift Solenoid #1	40	848 (DG/O)	Speed Control Ground	75	-	Not Used
7	-	Not Used	41	198 (DG/O)	A/C Cycle Pressure Switch Input	76	570 (BK/W)	Ground
8	339 (GY)	Glow Plug Relay	42	318 (GY/R)	Exhaust Pressure Regulator	77	570 (BK/W)	Ground
9	1054 (GY/BK)	Glow Plug Relay	43	-	Not Used	78	-	Not Used
10	308 (R/O)	Idle Validation Shift	44	-	Not Used	79	-	Not Used
11	315 (P/O)	Shift Solenoid #2	45	-	Not Used	80	814 (W/PK)	IDM Enable Output
12	911 (W/LG)	*Transmission Control Indicator Lamp	46	-	Not Used	81	925 (W/Y)	Electronic Pressure Control
13	107 (P)	Generic Scan Tool Input	47	-	Not Used	82	-	Not Used
14	784 (LB/BK)*	4x4 Low Input	48	818 (GY/W)	IDM Signal Input	83	552 (Y/R)	Injection Pressure Regulator
15	915 (PK/LB)	Generic Scan Tool Input	49	-	Not Used	84	-	Not Used
16	914 (T/O)	Auxiliary Powertrain Control Input	50	-	Not Used	85	-	Not Used
17	-	Not Used	51	570 (BK/W)	Ground	86	-	Not Used
18	-	Not Used	52	-	Not Used	87	812 (DB/LG)	Injection Control Pressure Sensor
19	648 (W/PK)	Tachometer Feed to Instrument Cluster	53	-	Not Used	88	358 (LG/BK)	MAP Sensor
20	924 (BR/O)	Coast Clutch Solenoid	54	480 (P/Y)	*Torque Converter Clutch Solenoid	89	355 (GY/W)	Accelerator Pedal Position Sensor
21	795 (DG)	CAM Position Sensor	55	37 (Y)	Keep Alive Power Input	90	351 (BR/W)	Reference Output Voltage
22	-	Not Used	56	-	Not Used	91	359 (GY/R)	Sensor Signal Return
23	-	Not Used	57	-	Not Used	92	511 (LG)	Brake ON/OFF Switch Input
24	570 (BK/W)	Ground	58	679 (GY/BK)	Vehicle Speed Sensor (VSS)	93	-	Not Used
25	57 (BK)	Ground	59	-	Not Used	94	-	Not Used
26	-	Not Used	60	-	Not Used	95	821 (BR/O)	Fuel Delivery Command Signal Output
27	-	Not Used	61	151 (LB/BK)	Speed Control Common Signal	96	817 (Y/LB)	Cylinder Identification Signal Output
28	-	Not Used	62	-	Not Used	97	361 (R)	Power Input
29	224 (T/W)	*Transmission Control Switch	63	356 (DB/LG)	BARO Sensor	98	-	Not Used
30	553 (P/LB)	Exhaust Back Pressure Sensor	64	199 (LB/Y)	*Transmission Range (TR) Sensor	99	-	Not Used
31	307 (BK/Y)	Brake Pressure Switch	65	796 (L/B)	Cam Position Sensor Return	100	-	Not Used
32	-	Not Used	66	-	Not Used	101	1086 (P/O)	Glow Plug Control Output
33	676 (PK/O)	Vehicle Speed Sensor Ground	67	-	Not Used	102	-	Not Used
34	466 (PK/O)	Glow Plug Relay	68	-	Not Used	103	570 (BK/W)	Ground
			69	-	Not Used	104	-	Not Used

Red Wire (12volts)-Pin #1

Locate the **Red** wire coming from the vehicle's PCM Pin #71. Tap this wire with the **red** Co-Pilot wire by soldering. Shield the tap from the elements.

Black Wire- Ground (GND) – PIN #9

Locate the **Black** wire coming from the vehicle's PCM Pin #51. Tap this wire with the **black** Co-Pilot wire by soldering. Shield the tap from the elements.

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

Locate the VSS (Vehicle Speed Sensor) wire. This **Gray w/ Black** stripe wire can be found at the PCM at pin #58 Run the green wire from the Co-Pilot module to the VSS wire and cut off any excess, but leave some slack. Solder the Green Co-Pilot wire to the VSS wire and protect from elements, this is the most common install problem with wiring

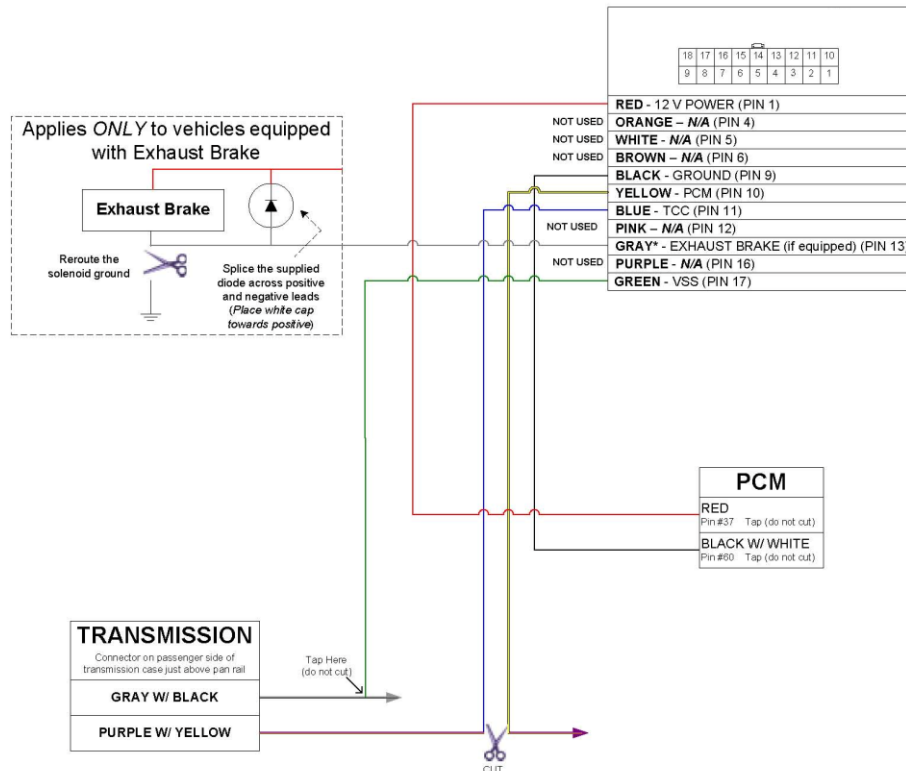
Yellow Wire – PCM – PIN #10 and Blue Wire– TCC - PIN #11

Locate the vehicle’s Torque Converter Clutch (TCC) wire coming from the vehicle’s PCM to the transmission. This **Purple w/ Yellow** stripe can be found at the PCM at pin #54. 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 the connections from the elements.

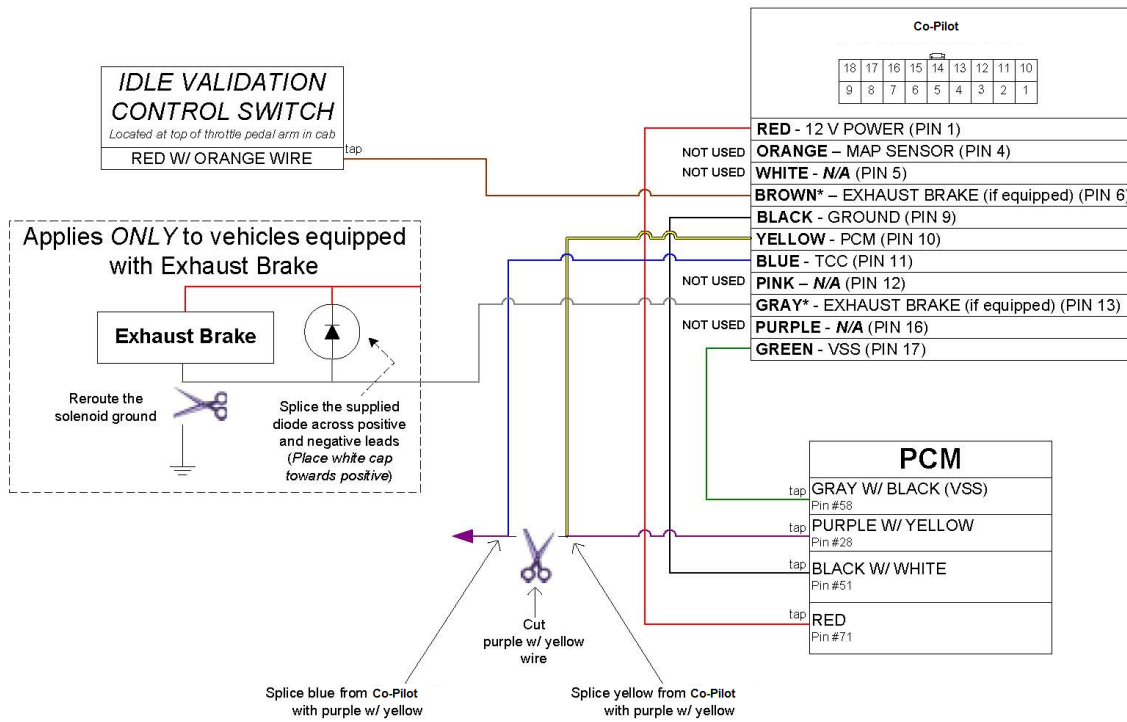


Lockup Controller
Ford 1989-1994





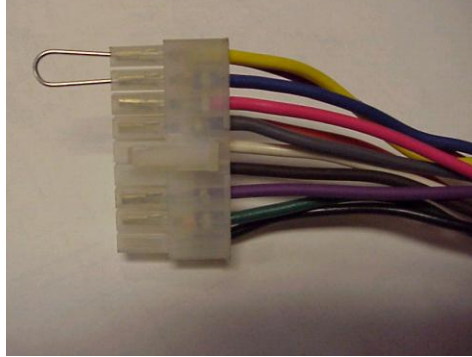
**Co-Pilot
Lockup Controller**
Ford 1994.5-1997
E4OD



Revised 4/18/06

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 Co-Pilot: Make sure you are following the operating instructions correctly and that all connections are good and on 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(s). Double-check all connections. If a solder joint appears to be poor, consider re-soldering. 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 connector inside of the wire loom. If you are unable to find the wiring problem, 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

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.

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