



**Instructions For:**

## Jeep Cherokee AW4 Transmission Override

**NOTE: For 1988 through 2001 Cherokees and 1993 Grand Cherokee**

**Included in the kit:**

Override Module	Override Switch	Switch Plate	Knob
Knob Cover	#4x3/8" Screw X4	#4 Nut X4	#4 Lock washer x4
Butt Splice X1			

**Tools Needed:**

Crimpers	Wire Cutters	Heat Shrink	Pop-rivet Gun
Wire Stripper	Drill	7/8" drill bit	1/8" drill bit
1/4" drill bit			
<b>'97-'01 version:</b>			
Steel wool	Degreaser	Razor blade	

**Background:**

The transmission override frees up the computer's control of first and second gear in the AW4 automatic transmission found in Jeep Cherokees from 1988 to 2001 as well as the 1993 Grand Cherokee. The engineers at Aisin Warner decided that Jeep owners did not need manual control over the first two gears in their transmission. They designed the transmission to have a "1-2" slot in the shifter to control both first and second gear with the computer. Therefore, the user does not have any control over when the transmission shifts to second or first. For example, the transmission does not allow engine braking in first gear because the computer refuses to shift into first. Additionally, the computer shifts into second after about 4500 rpm, a detrimental effect in sand and snow. A user mod has been out for quite some time to free up these gears. However, with the integration of the OBD2 system in 1997, the check engine light will trip when this mod is used. The MAF transmission override is designed to be compatible with OBD2 systems and will not trip the light.

**What to expect from this device:**

The transmission override has three positions, D, 2, and 1.

**"D" position:**

In the "D" position, the override has no effect and the transmission shifts normally.

**"2" Position:**

In the "2" position the transmission is forced into second gear, it will not shift into any other gear. In this position the vehicle will even start in second gear. Due to the design of the transmission hydraulics, engine braking in this position has the following features. When the override is in the "2" position the shifter is in the "D" position, the transmission will not provide engine braking. When the throttle is removed, the transmission goes into a freewheeling mode offering little resistance. This freewheeling mode is beneficial, it prevents the wheels from locking up if the transmission accidentally is forced into second with the override during high speeds. Another benefit is that the vehicle will not immediately start to slow when the throttle is removed, but maintains the response of second gear. To engage engine braking, shift the lever into the "3" or "1-2" position. In these positions, the hydraulics in the transmission allows engine braking in second gear.

**"1" Position:**

The "1" position operates in a similar fashion to the "2" position. The transmission will be forced into first gear, it will not shift into any other gear. While the shift lever is in either the "D" or "3" position the transmission will not provide engine braking. The transmission will freewheel when the throttle is removed. To engage engine braking, the shift lever must be put into the "1-2" position.

## Instructions:

- 1) Remove the dash panels.
  - a) Start by removing the lower panel below the steering wheel. It is held on by screws on the bottom and clips on the top.
  - b) Remove the metal backing to this panel. It is screwed on from the top. Set this panel aside, it will be needed later.
  - c) Remove the trim around the radio and climate controls. There are no screws in this panel, remove by gently prying around the edges.
  - d) Remove the steering wheel cowl. There are screws on the bottom. Removal makes removing the upper dash easier.
  - e) Finally, remove the upper dash panel. This is the piece of dash around the instrument cluster and radio. It is attached with several screws and clips. The headlight switch must be pulled through this panel. It is a tight fit, but possible.
- 2) Drill the mounting holes in the dash for the switch using the template in the back of this manual. Figure 1 shows the best location to mount the switch. Use the existing decorative trim as a guide for centering the holes.



Fig. 1: Location of the mounting holes.

**NOTE:** Several Jeep owners use this location on the dash to mount other accessories and switches. Obviously this is not the only location possible for the Transmission Override. It can be mounted anywhere in the vehicle where there is room. The center console next to the shifter is a good alternative.

- 3) Install the dash plate onto the dash using the supplied screws. Bolt the switch onto the dash plate using the supplied nut. Attach the knob and knob cover, correctly aligning the indicator to the lights. Connect the gray cable assembly to the switch circuit board.
- 4) Locate the TCU using figures 2 and 3. The TCU is located behind the dash under the glove box for '88-'95 jeeps. In '96-'01 Jeeps, the TCU is located under the steering wheel near the middle of the vehicle.

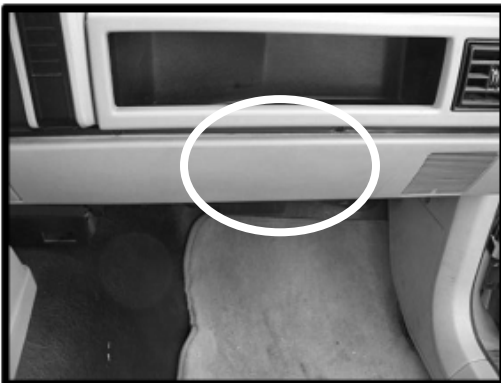


Fig. 2: '88-'95 TCU location. (Behind panel)



Fig. 3: '96-'01 TCU location. (Under dash)

- 5) Route the yellow wire to a location with access to a light dimmer wire. The radio's wiring harness is a good location to find this wire. Unfortunately due to the abundance of aftermarket radios we cannot recommend a specific color. Back-probing may be necessary to locate this wire. Additional information may be found in some radio's instruction manuals, which may provide the pinout of their connector(s). A good color to look for is a yellow wire, this is a typical dimmer signal color.
- 6) Install the upper dash panel and steering wheel cowl. Run the gray cable to the transmission control unit (TCU).
- 7) Reattach the radio's trim.
- 8) Cut the following wires about two inches away from the TCU connector: Solenoid 1, Solenoid 2, Keyed Power, and Ground. Use the wire color table and connector diagrams to properly identify the wire colors and locations for the proper year.

**NOTE:** The following instructions will use this terminology:

The cut wire connected to the plastic connector will be called the "Computer side"

The cut wire not connected to the plastic connector will be called the "Vehicle side"

- 9) Splice the constituent wires of the gray cable into the TCU using the supplied butt splices. It may be necessary to strip off additional gray insulation. Be careful not to nick the constituent wires.

These instructions will maintain the following format:

Color of wire on the override to name on the TCU (vehicle or computer side)

- a) White to Solenoid 1-computer side.
- b) Blue to Solenoid 1-vehicle side.
- c) Brown to Solenoid 2-computer side.
- d) Green to Solenoid 2-vehicle side.
- e) Red to Ignition –vehicle and computer. Three wires are connected together in this step.
- f) Black to Ground –vehicle and computer. Three wires are connected together in this step.

**Step 9 summary table for each year:**

	Override	'88-'95	'93 ZJ	'96-'01
Sol 1 Computer	White	Blue/White (Cp)	Brown/Yellow (Cp)	White (Cp)
Sol 1 Vehicle	Blue	Blue/White (V)	Brown/Yellow (V)	White (V)
Sol 2 Computer	Brown	Purple/White (Cp)	Pink (Cp)	Orange/White (Cp)
Sol 2 Vehicle	Green	Purple/White (V)	Pink (V)	Orange/White (V)
Ignition	Red	Yellow	Blue/Red	Dark Blue/White**
Ground	Black	Black/Tan	Black	Black/Tan

**\*\*NOTE:** THERE ARE TWO DARK BLUE/WHITE WIRES IN THE '96-'01 CONNECTOR. REFER TO THE '96-'01 CONNECTOR DIAGRAM IN FIGURE 7.

- 10) Reattach the metal backing plate and plastic cover.

The Transmission Override is now ready to use.

Table 1: Wire Color Identification

Years\Names	Solenoid 1	Solenoid 2	Ignition	Ground	Radio Dim
'88-'95	Blue/White	Purple/White	Yellow	Black/Tan	Varies
'93 ZJ	Brown/Yellow	Pink	Blue/Red	Black	Varies
'96-'01	White	Orange/White	Dark Blue/White	Black/Tan	Varies

**Accessories:**

Additional knob colors are available:

Black-Matte (standard), Black-Glossy, Grey-Matte, Grey-Glossy.

Additional knob cap colors are available:

Black (standard), Grey, Red, Blue, Yellow, Green. All are available in matte or glossy.

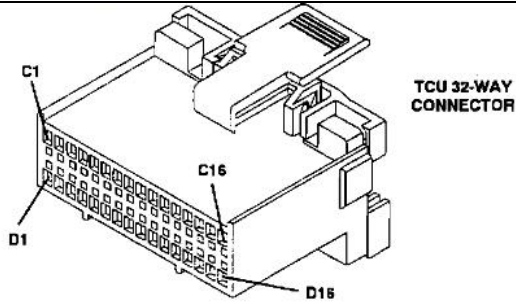
Contact MAF for prices and availability.

For comments, suggestions, or help:

Email: [support@montanafab.com](mailto:support@montanafab.com)

This modification may void your original dealer warranty. Damage to your vehicle may occur during improper installation or incompatibility with your vehicle. Modifications of your vehicle may create dangerous conditions which may result in serious injury or death. Buyers and users of these products hereby expressly assume all risks associated with any such modifications and use.

## TCU 32-WAY CONNECTOR



### MJ and XJ Bodies

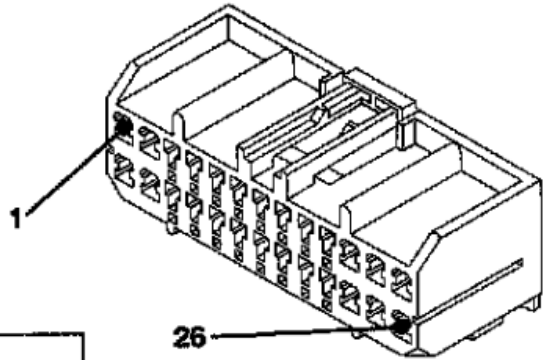
CAV ...	CIRCUIT .....	FUNCTION
C1-C2	.....	Not Used
C3	..... 505 TN/WT	Trans Speed Sensor
C4	..... 137 YL/BK	Auto Trans Diagnostic
C5-C7	.....	Not Used
C8	..... 506 LG/BK	Low (1-2) Input
C9	..... 507 GY/BK	Drive (3) Input
C10	..... K29 WT/PK	Brake Input
C11	..... 177 TN	Trans Switch Power Mode
C12-C13	.....	Not Used
C14	..... 508 WT/BK	S3 Solenoid (Converter Lockup)
C15	..... 509 VT/WT	S2 Solenoid
C16	..... 510 DB/WT	S1 Solenoid
D1	.....	Not Used
D2	..... K22 OR/DB	Throttle Position Sensor
D3	..... K4 BK/LB	TPS Signal Ground
D4-D6	.....	Not Used
D7	..... Z12 BK/TN	Power Ground
D8-D13	.....	Not Used
D14	..... A14 RD	Battery
D15	.....	Not Used
D16	..... T17 YL	Ignition (Run/On)

### ZJ Body

CAV ...	CIRCUIT .....	FUNCTION
C1-C2	.....	Not Used
C3	..... T14 LG/WT	Trans Speed Sensor
C4	..... D82 BK/YL	Auto Trans Diagnostic
C5-C7	.....	Not Used
C8	..... T25 LG	Low (1-2) Input
C9	..... T50 DG	Drive (3) Input
C10	..... L53 BR	Brake Input
C11-C13	.....	Not Used
C14	..... T20 LB/BR	S3 Solenoid (Converter Lockup)
C15	..... T59 PK	S2 Solenoid
C16	..... T60 BR/YL	S1 Solenoid
D1	.....	Not Used
D2	..... K22 OR/DB	Throttle Position Sensor
D3	..... K4 BK/LB	TPS Signal Ground
D4-D6	.....	Not Used
D7	..... Z1 BK	Power Ground
D8-D13	.....	Not Used
D14	..... A5 RD	Battery
D15	.....	Not Used
D16	..... F86 LB/RD	Ignition (Run/On)

Fig. 6: '88-'95 and '93 ZJ TCU Connector with the wires to cut highlighted.

# TRANSMISSION CONTROL MODULE CONNECTOR



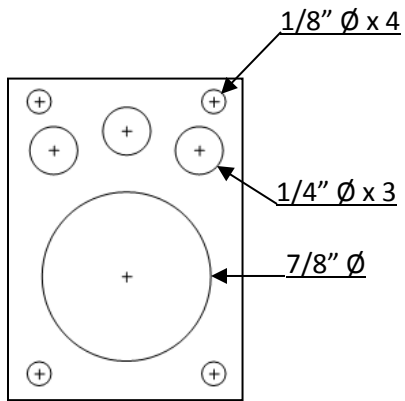
CAV	COLOR	FUNCTION
1	VT/LG	INPUT SPEED SENSOR GROUND
2	RD/BK	INPUT SPEED SENSOR SIGNAL
3	DB/BK	OUTPUT SPEED SENSOR GROUND
4	LG/WT	OUTPUT SPEED SENSOR SIGNAL
6	WT/BK	CCD BUS (-)
7	VT/BR	CCD BUS (+)
9	VT	TRS 3 SENSE
11	DB/WT	TCC SOLENOID CONTROL
12	WT	SOLENOID 1 CONTROL
13	OR/WT	SOLENOID 2 CONTROL

CAV	COLOR	FUNCTION
14	PK	SCI TRANSMIT/ISO 9141K
16	BR/YL	TPS GROUND
17	OR/DB	THROTTLE POSITION SENSOR SIGNAL
18	BR/LG	TRS R SENSE
21	VT/WT	TRS 1-2 SENSE
22	LG/BK	TRS OD SENSE
23	WT/PK	BRAKE SWITCH SENSE
24	BK/TN	POWER GROUND
25	PK	FUSED (+)
26	DB/WT	FUSED IGNITION SWITCH OUTPUT

Fig. 7: '96-'01 TCU Connector with the wires to cut highlighted.

**NOTE:** The '96-'01 wiring harness has TWO dark blue and white wires. Refer to figure 7 for the correct DB/WT wire's location on the connector.

Template:



Front Panel