

TCI® 376600

Universal TCC Lock-Up Kit for 700R4 and 2004R

This kit enables hands-free, automatic activation of the Torque Converter Clutch (TCC) along with the option of manual control.

TCI® 376600 Kit Contains:

<u>Qty.</u>	<u>Description</u>
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One (1)	Internal Wiring Harness
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One (1)	External Wiring Harness
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One (1)	Vacuum Switch
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One (1)	Fourth Gear Pressure Switch - 2 terminal, N.O.
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Two (2)	Splice Connectors
One (1)	#4 Machine Screw

Step 1 Drain transmission oil pan. You will need a pan to catch fluid. Remove transmission oil pan bolts. When removing bolts, remove so pan will not drop completely off. Instead it will be held in place so that one side will allow the fluid to be drained. After the fluid has drained, remove the rest of the bolts and pour out the remaining fluid. If your transmission did not come with a drain plug, you may want to install a TCI® 805800 universal drain plug kit into your pan now that you have the pan off. REMEMBER TO ALWAYS DISPOSE OF USED OIL IN AN ENVIRONMENTALLY SAFE WAY.

Step 2 Remove original internal wiring harness. Carefully disconnect the wire connectors from the switches. Remove the wires from the clips and unplug the wiring harness from the connector near the detent roller spring. Pry connector tab away from the plug and pull the plug down. Do not pull on the wires.

Step 3 Based on your application, find the wiring diagram to determine the proper fourth gear pressure switch location. See **Figures 1, 2 and 3**. Install the switch and torque to 8 foot-pounds. Additional OEM switches may be left in place even though they will not be utilized.

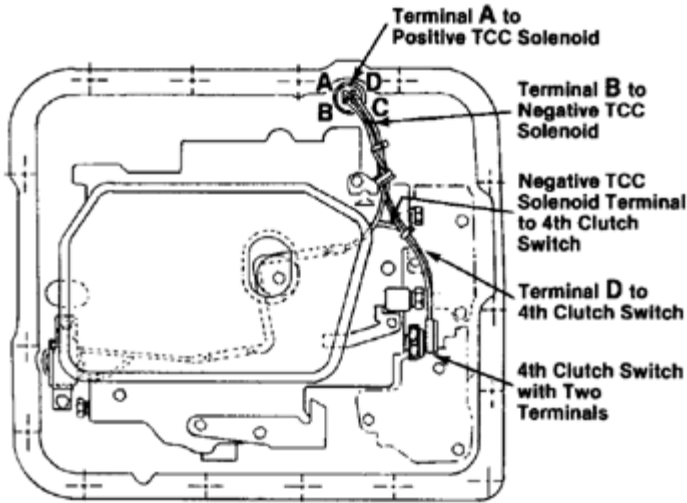


Figure 1 - 700R4 Street/Strip Wiring Diagram

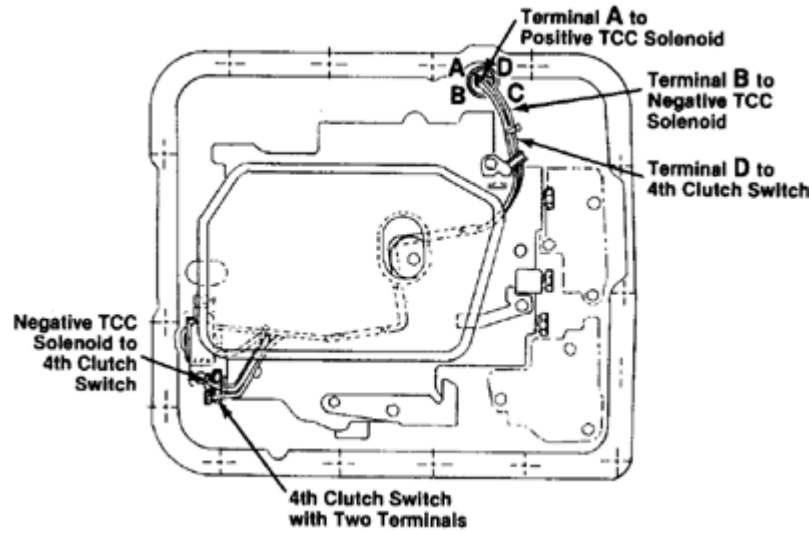


Figure 2 - 700R4 Competition/Full Manual (376010 valve body) Wiring Diagram

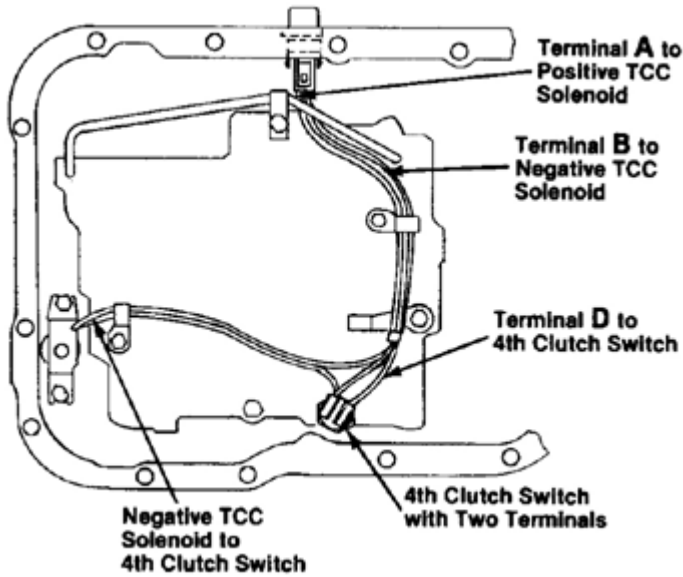


Figure 3 - 2004R Street/Strip or Competition/Full Manual (386010 valve body) Wiring Diagram

Step 4 Installation of TCI® Wiring Harness: Most applications will accept the OE solenoid. All two-wire solenoids are acceptable.

If you have a solenoid with only one wire, it cannot be used. You may purchase the proper solenoid from GM, part number 8654126. Using your OEM, two-wire solenoid, cut both wires allowing about 2-1/2" for splicing to the TCI® wiring harness. (**NOTE:** Look closely at the black plastic connector on the new TCI® harness. Notice that each terminal position is labeled A through D. This instruction will refer to these positions so that your connections are made properly.) To connect your solenoid to the TCI® wiring harness, use the splice connectors provided. Connect the positive solenoid wire to the wire going to Terminal A on the wiring harness then connect the negative solenoid wire to the harness wire going to Terminal B.

Install wiring harness and solenoid into the transmission. Torque the solenoid bolts to 8 foot-pounds. Plug the two pressure connectors into the fourth pressure switch on the valve body. Reinsert the black plastic transmission case connector into the transmission. If you are working with a 700R4, you may want to transfer your OEM plastic wire retainer from your factory wiring harness to the TCI® wiring harness in order to keep wires neatly in place.

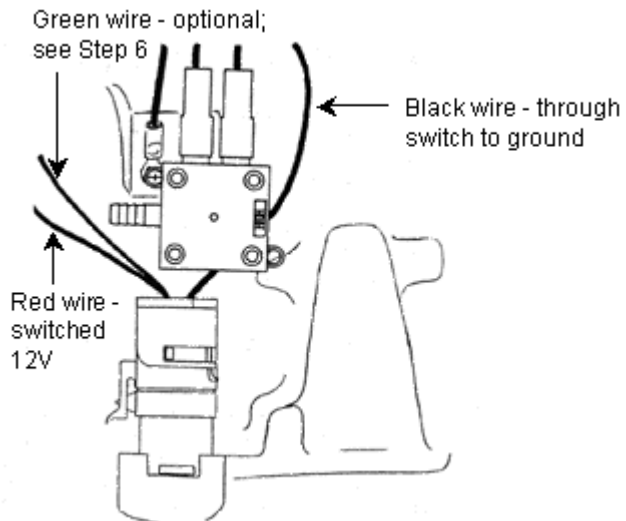


Figure 4 - External Wiring Configuration

Step 5 Figure 4 shows how the external wiring harness is intended to be connected. To use the #4 machine screw to retain the switch to the case, a new 3/32" hole must be drilled in the mount boss. If floor pan clearance is a problem then secure the ring terminal to the mount boss on the case to provide a good ground and secure the switch to the wiring harness with electrical tape so that it does not bang around. Some 2004R's may have an interface problem between the TCI® harness and the OEM case connector. To correct this problem, obtain case connector number 8634383 from a GM dealer. This will allow the TCI harness to snap into place. Using 18-gauge wire, run a 12-volt source to the red wire on the harness (Terminal A). Connect the vacuum switch to a ported vacuum source on the carburetor or throttle body. (If you find that the TCC operation is erratic in your application, then you may try moving the vacuum source to the manifold.) The TCC is now set to engage automatically in 4th gear only when engine vacuum is greater than 8-10 inches. The converter clutch will release when the transmission is down shifted out of 4th gear or engine vacuum falls due to increased throttle.

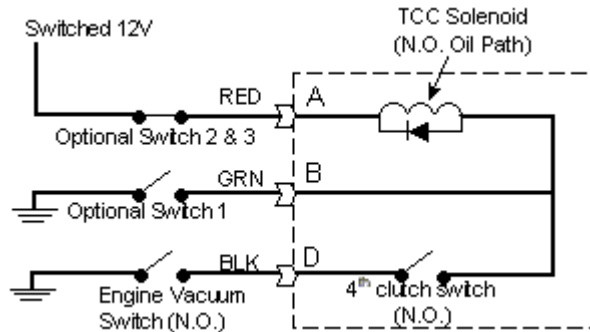


Figure 5 - Electrical Schematic for All 700-R4s & 200-4Rs

Step 6 Refer to **Figure 5**. If you desire more control over the TCC you have a few options: Option 1 will allow you to manually lock up the torque converter in 2nd gear, 3rd gear and/or 4th gear by running the green wire (Terminal B) to a grounded dash mounted toggle switch. Option 2 is for drivers that may want to shut down the TCC system through a second dash mounted toggle switch between to the red wire on the TCI® external harness (Terminal A) and the switched 12-volt source. Now, you may manually turn the lock up system completely on and off.

Option 3 is for those who desire immediate release of the TCC when braking. For this, you'll need an OEM brake pedal switch with a normally closed circuit. Run your switched 12-volt source through the brake switch and then to the red wire on the TCI® external harness.

Step 7 Reinstall Transmission Pan: Install a new filter. Remove any pan gasket material that may have been left on the transmission case/pan during pan removal. Always replace transmission pan gasket when reinstalling pan. Refill transmission with ATF being sure not to overfill.

Frequently asked questions about 376600

Q: Will this kit work in conjunction with my OEM computer (ECM)?

A: With the 376600 installed properly your ECM will no longer interface with the transmission. Do not attempt to plug the OEM wiring harness from your computer into the transmission with this kit installed! It is not compatible! The ECM will continue to control the vital engine functions even though it is no longer controlling your torque converter lockup.

Q: How do I know which wire is which on the new TCI® internal wiring harness?

A: If you look closely at the sides of the black connector that is holding all three wires you will see the letters A, B, C and D at each wire location. These correspond to the wiring diagrams shown in the 376600 instruction sheet.

Q: I want to install this on a 1993 700-R4 but the connectors don't match. What can I do?

A: This kit can work on a 1993 700-R4 with some additional ingenuity. Using a paper clip or similar piece of wire, the individual wires can be removed from the plastic connectors by depressing the lock tabs on the crimped terminal inside the connector. Transfer the wires from the TCI® wiring harness to your 5 terminal connectors. As long as you transfer the wires from TCI® location A to your location A, etc. there will be no problems. Also, note that if your wire A runs directly from the case connector to the solenoid positive terminal with out first going through a pressure switch than it can simply be left in place because that is how the 376600 is wired as well.

Q: What do I do with the other pressure switches that are on my valve body?

A: The simple thing to do is just leave them in place even though they are not hooked up. They cannot be removed unless you replace them with 1/8" pipe thread plugs.

Q: What do I do with the extra green wire on the external wiring harness?

A: As mentioned in Step 5 the green wire is a supplemental ground for the electric circuit and it is strictly optional. By routing this through a dash mounted toggle switch you can override the fourth clutch pressure switch and the vacuum switch and force lockup in second, third or fourth gears manually. One example would be if you were towing in drive (third) and would like to utilize the torque converter clutch. Remember that this is on the ground side of the circuit. Putting 12 volts on this wire may short out your solenoid.

Q: If I have a one-wire solenoid, why can't I use it?

A: The TCI® wiring setup does all of the switching on the ground side of the circuit. A one wire solenoid is self-grounded and therefore not able to be wired into the TCI® 376600.

Q: How do I know if my solenoid is good?

A: The first step in determining if your solenoid is serviceable is to test the electric coil. You will need a simple test meter that can check resistance. Resistance is measured in Ohms and uses the following symbol: Ω . This is important to check because some of the most frequent problems arise from the use of a solenoid that is electrically shorted out internally. A good solenoid will measure between 24.5Ω and 26.5Ω . If you get a reading outside this range then the solenoid should be replaced. If the solenoid checks well, electrically, it can also be tested for mechanical function. With no power applied you should be able to blow air through the end of the solenoid. Then put power to the solenoid (12V to positive side & ground the negative side) and the coil should force the checkball onto its seat, preventing air from going through the solenoid. Also be sure to inspect the condition of the rubber O-ring on the end of the solenoid. It needs to provide a good seal inside the bore where it is housed. Replace if necessary.

Q: I checked my solenoid but I keep blowing fuses when the system tries to activate. What should I do?

A: If the solenoid is not internally shorted then the problem is most likely a pinched or exposed wire on the positive side of the circuit. An easy method to check for a short in the system without first removing the transmission oil pan is to disconnect your power supply from the red wire on the TCI® external wiring harness and measure the resistance between the red and the green wire. It should be between 24.5Ω and 26.5Ω . If you get a reading of 0, then the short is located within the oil pan. If the reading is OK, *with the power source disconnected*, check the wiring resistance between your power source connection & ground. There should not be any continuity between your power source and ground.

Q: The system is functioning properly the best I can tell but the torque converter won't lock up. What's wrong?

A: The wiring harness and solenoid only comprise a fraction of the entire lock-up

system on your transmission. In order for the system to work properly the converter clutch valve in the pump must be operable, the friction lining and apply piston in the torque converter must be in working order, the O-ring on the end of the input shaft must be in good condition and some valve bodies even have an additional converter clutch valve in them as well which must be functioning. It is possible for anyone of these aforementioned components to malfunction causing the lock-up system not to work. Have a qualified technician help if you suspect something else is wrong.

Q: What is the setting on the vacuum switch?

A: The vacuum switch comes factory preset to close at 8 - 10 inches of Hg. This means that in order for the solenoid to be activated the switch must get 8 - 10 in. Hg. or higher. If you find that the torque converter lockup experiences "busyness" (shuttles on and off rapidly) at cruise conditions it is probably because your engine vacuum under that particular condition is right where the switch turns on and off. This can be verified with an engine vacuum gauge.

If you have a "busyness" problem the switch can be reset. Remove the switch from your transmission. Locate the small dimple in the center of the switch on the side marked "World Magnetics". Using a 1/8" drill bit, by hand, gently remove the potting material to expose the adjustment screw. Using a small Allen wrench turn the adjustment screw: clockwise to raise the vacuum required to close the switch and counterclockwise to lower it. The adjustment screw is sensitive so it does not need to be moved very much to make a difference. A small dab of silicone will seal the adjustment screw when you are done.

Q: Can I activate the torque converter clutch in low gear?

A: No. The transmissions are designed by General Motors to enable the lock-up system only after the second gear shift has occurred.

Q: My transmission is acting up (i.e. slipping, missing gears, making noises, etc.). What is wrong with the wiring harness?

A: If your transmission has a functional problem with the gears, chances are that there is something else wrong with the transmission. The wiring harness is only responsible for turning the torque converter clutch solenoid on and off and it has no effect on the transmission's ability to go into and hold reverse and the four forward ranges. Have any problems diagnosed and repaired by a qualified technician immediately.