The Fiero TCC (Transmission Lockup) Solenoid

by Chuck Kichline

I found out that there wasn't a lot of information on automatic transmissions for the Fiero on the web, and even worse, both the Haynes and Clymer manuals are weak on diagnosis and had NO information on repair. It became very important to me when my Fiero started staying locked up, stalling the car in traffic and endangering my LIFE! Since the commercial manuals are no help at all, I started a search on the web, and finally found the information I was looking for. Here is what I learned.

What is the lockup solenoid? It's an electrically operated valve in your Fiero automatic transmission that is controlled by the car's computer. When the computer believes it would be effective to lock the torque converter up solid, it powers the solenoid which makes the transmission lock up. The effect is that "fourth" gear that you sometimes feel on what is really a three speed automatic transmission. The effect is better gas mileage, as it reduces the speed of the engine by about 250 RPM when it cuts in. Not a whole lot, but good for a couple of miles per gallon.

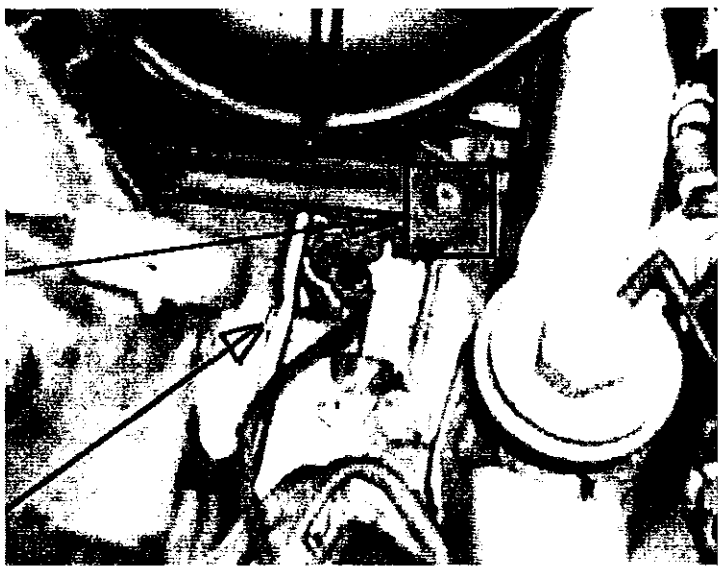
What can go wrong? Like all the other electronics on these cars, they can fail. The failure may be that the lockup doesn't happen, or that the engine stays locked up when coming to a halt, or blowing fuses. If the lockup doesn't happen it can mean poor gas mileage (18-19 mpg in a V6), the engine revving faster than it should, and possibly running warm or even overheating. Blowing fuses gets you the same result, since the lockup doesn't work. Having the lockup stick on can be very dangerous, and leave you stranded in traffic in a car that won't go into gear - or won't properly kick down to pass.

How can I tell if my lockup isn't working? Do you occasionally feel what feels like a fourth gear? Then it's working. If you want to test it, take the car up to about 55 on a level road, and press lightly on the brake pedal. It should disengage the lockup, and with a steady foot on the gas, you should see the tachometer move up by about 250 RPM just as the brake lights go on. Another hint is that when coasting down from speed, it should disengage at 45mph - it feels like the car is speeding up on coast down, because when it disengages, the car starts freewheeling.

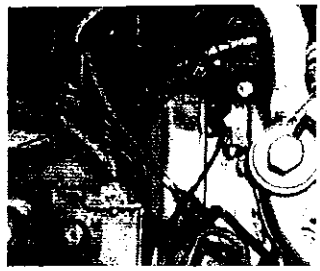
How can I tell if it's sticking? I had that fault, and it feels just like you forgot to put in the clutch in a manual transmission as you pull up to a stop light. The car stalls, if you're lucky it will unstick when you restart the engine. If you are unlucky like me, you'll be stuck in the slow lane of the freeway with a car that will not move! I finally got it out of traffic by revving the engine and slamming it into gear, and got out of the way in five foot jumps. Not a good thing. It had done it a few times before, but had always healed itself after the car died. The previous owner had mentioned having some transmission work done, a "shift kit" (after I bought the car) and my guess is that she had the work done only to find out that it still was a problem. I guess that's a good thing - otherwise she'd still probably be driving her car!

What do I do if I have a problem? If it isn't locking up you are working your car harder than you should, higher revs and more heat. You ought to fix it. If it's locking up and staying locked up, I suggest unplugging the lockup connector - that's the green connector on the left front of the transmission "bell housing" behind the engine. That will make it NOT lockup ever, and puts you in the no lockup mode. It's probably safer than getting caught in traffic and not being able to drive home! If the transmission is locked up, the problem is probably in the solenoid being physically stuck or plugged, so just unplugging the connector while the engine is locked up doesn't help, but it will keep it from happening again.

I risked trying the repair. It turned out to be relatively easy, and I bet saved me several hundred dollars. This is what I know, maybe you can do it too?



The lockup solenoid is under the cover on the left SIDE of the transmission. First we need to remove the cover. From the top of the car remove the carb/aircleaner tube, the bolt that holds the transmission cooler hose (first arrow) and all of the bolts that hold the side transmission cover that you can reach from here (second arrow). Here's the solenoid connector that I mentioned earlier. You don't have to unplug it now if you haven't. See that the other stuff is now out of the way.



Now jack up the car and pull the left rear wheel. Put the car on a jack stand. Remove the "tar paper" skirting between the inner fender and the frame. It's mounted mostly with reusable plastic pop rivets, just pull out the centers and put them back together to reassemble it later. Tuck the skirting over to the side as you can. Here's the side cover from the wheel well.

Looking down on the valve body after removing the side cover. There should be just a little ATF in the side cover, so be ready to catch it when you take the cover off. Pull the cover out the top.

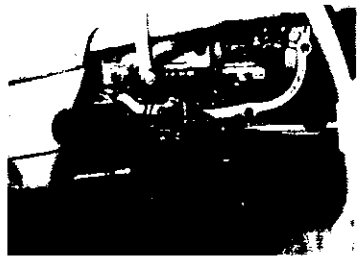
OK, here's the valve body from the side. The two wires come from the lockup connector. Here's the theory - there are TWO components in line. First the lockup solenoid then a pressure switch. When the computer turns on the circuit it should close the lockup solenoid and the transmission should lock up. In line with the lockup solenoid there is a pressure switch that is normally open, if the computer tries to lock up the transmission but there is not enough pressure the pressure switch is open and it doesn't lock up - a mechanical interface to the transmission.

Those are the parts that I have highlighted. If the transmission stays locked up, the problem is most certainly the solenoid and it should be replaced. If it doesn't lock up it could be either the solenoid or pressure switch. Replace them both. If it's shorting, it could be either solenoid, switch or wires, check them all. You may want to replace everything, since it's already apart.

These parts are NOT going to be available from an auto parts store. You will have to go to a transmission shop or dealer to get them. I went to a transmission shop and was treated REALLY fair. You're looking for the "transmission lockup (tcc) solenoid, pressure switch, and side cover gasket". Ready for the cost? About $20 for the solenoid, about $10 for the switch, and about $5 for the gasket. YOUR PERFORMANCE MAY VARY! Take the side cover so they know for sure what transmission you have. They'll probably have to order the parts so go home and clean things up.

I see that The Fiero Store stocks the solenoid now; convenient, but at twice the price Here's the inside of the cover - ready for cleaning. Don't forget to clean the old gasket off the cover and transmission body.

Here's the solenoid out and sitting on the frame rail. It's held in by ONE T30 star screw. I'd always used just a hex wrench before on these things, but it didn't want to come loose so I bought a 3/8" drive set with about seven different sizes. It cost about $15 and those star screws are all over GM cars anyway. It came out easy. Pull it down out of the valve body. The pressure switch is a big hex, you may have to buy an "oil sender" type socket to remove it - it unscrews.



Here's a real bad picture of the solenoid kit I used. You cut the wires on the old solenoid and then use the quickie splices to install it. The positive side of the solenoid goes to the wire directly to the lockup connector (and the negative goes to the pressure switch). I've been told that the OEM solenoid comes with the wiring harness and connector. Then you just put EVERYTHING back together.

So here it is all back together again. I can say that I fixed my automatic transmission and it was relatively EASY! Actual work time was only four or five hours. I suggest that you change the fluid and filter now. About six months after I fixed my TCC the transmission started slipping, but was fixed by changing the filter and fluid again (it had been changed before I replaced the TCC). My guess is that the random lockup had kicked a lot of clutch plate parts into the fluid and they plugged up the filter.
I'd like to thank everybody who helped me, and hope that this will help others.

Aticle submitted by Mark Duford