

At cold start up and until the engine and transmission reach operating temperature the transmission functions normally. At some time after engine and transmission reach operating temperature the transmission begins to shift hard from 1st to 2nd gear. This is often, but not always, accompanied by a SES light which when interrogated by a Scan Tool reads DTC P1870. From the time that the Transmission reaches normal operating temperature to the time that the hard 1-2 shift starts will vary depending on outside temperature and severity of use (hard accelerations, towing, etc...)

NOTE: DTC P1870 is for transmission component slippage and not exclusively for the fault described above. The TCC Valve Repair will not correct slippage in the transmission from components that are not related to the torque converter control system.

What's happening? The hard 1-2 shift is only a symptom of a worn Torque Converter Clutch (TCC) valve. The original TCC valve found in the valve body is made of very hard material, while the valve body is made of considerably softer material. Over time this valve wears out the valve body bore and the pressurized transmission fluid (that is supposed to hold the Torque Converter Clutch in the locked up position) leaks out from the valve, thus not enough pressure is available to hold the TCC properly. This condition causes the TCC to slip a lot, which causes a major heat build up in the fluid. The Power Train Control Module (PCM) senses the high transmission temperature and commands the Transmission Pressure Regulator to full high pressure in an effort to increase the fluid flow through the cooling circuit. The hard 1-2 shift is from the full high fluid pressure.

If this is your problem, here are a few resolution paths that you can take:

- 1) Take your car in to get it fixed at a GM dealership nearest you. If you go to the dealership this is what could happen:
 - A. The worst places will try to talk you into outright changing the transmission as this is the repair action most recommended by GM.
 - B. The better dealerships will outsource to a Transmission shop for repair (see below for what the Transmission shops would do)
 - C. The best dealerships will repair it for you as follows by:
 - (1) removing the old TCC valve,
 - (2) oversize the valve bore
 - (3) installing an oversized GM designed TCC valve
 - NOTE: This is not a permanent fix, and will only last as long as the original valve did. This is because it is the bore in the valve body that wears out, to the point that the valve starts leaking. The new oversize valve will do this and you will find yourself back at where you started, except you can't 2nd over size the bore and install a 2nd oversized valve (because there isn't valves larger than 1st oversize), and the Sonnax TCC repair kit won't work with oversized bores. At this point the valve body is junk and must be replaced with new.
 - D. The very best dealerships will install the Sonnax TCC repair kit. The Sonnax TCC repair kit is a permanent fix because the old valve bore is reamed oversize and a hardened sleeve (which will not wear) is installed.
- 2) Take your car to your friendly neighbourhood transmission shop. If you take your car to a transmission shop this is what could happen:
 - A. The worst places will try to talk you into a new transmission.
 - B. The better places will repair it using an oversized valve like the best GM dealerships.
 - C. The best places will install the Sonnax TCC repair kit.
 - 3) Fix it yourself (because that's just the way you are). How? Proceed as follows:
 - A. Install a Sonnax TCC repair kit. It's not really that hard and this is the way I did it:
 - (1) Jack up the car and secure it with jack stands.
 - (2) Remove bolts from the transmission oil pan with a 13mm socket and drain the oil. Move the Shifter cable and bracket off to the side.

NOTE: It is not necessary to remove the shifter cable from the transmission shifter input lever.

- (3) Remove and discard the transmission filter.
- (4) Disconnect the valve body electrical harness from the various solenoids and valves. Let the harness hang off to the side.

CAUTION: Be careful not to pry excessively on the locks of the electrical connectors when your trying to disconnect them. If you break them

they will have to be replaced. If you do not replace connectors with damaged locks, you run the risk of having them disconnect during operation, resulting in improper transmission operation and/or damage.

- (5) Remove the valve body bolts with a 10mm and a 8mm socket. Make sure that you record the exact hole position that each bolt was removed from. There are different sized bolts here and if you re-assemble the bolts into the wrong positions, the transmission WILL NOT WORK!
 - (6) Carefully separate the valve body from the transmission.
- CAUTION:** Pay particular attention to the linkage rod that attaches the shift input to the manual valve. As you move the valve body away from the linkage rod and the manual valve will slide out of it's bore. Grab hold of the manual valve just before it exits it's bore, then move it out of it's bore and disconnect it from the linkage rod.
- WARNING:** Watch for falling check balls! (check balls are small steel ball bearings) When you remove the valve body there are 7 check balls that will probably end up on the floor, or in your container that you used to catch the tranny fluid. If your very careful you won't drop any.
- (7) Put the valve body on a clean bench or suitable clean work surface.
 - (8) Remove and retain the check balls from the valve body.
 - (9) Take the valve body to a transmission place that has the proper stepped reamer to oversize the valve bore. Most places that I called said they would clean up the valve body, install the kit, and test the valve body for less than an hours' worth of labour. This is what I did and it was great. If you insist on doing it yourself you will have to purchase the special stepped guide-reamer (\$160.00). Way cheaper and easier to get the shop to do this work for you.
 - (10) Prepare the valve body for installation. Make sure the check balls are installed in the proper locations (Ref. Figure 1). Use petroleum jelly (Vaseline) to hold them in their position. **WARNING:** Do not use any other kinds of grease. They will damage the transmission. **ONLY USE VASELINE!!** Double check and make sure the check balls are in the right spots!
 - (11) While putting the valve body into position in the transmission, connect the manual valve to the linkage rod and insert the manual valve into it's bore. Position the valve body into the transmission.
 - (12) Install the bolts into their proper positions (Ref. Figure 2) and tighten finger tight.
- WARNING:** FAILURE TO INSTALL THE BOLTS IN THEIR PROPER LOCATION WILL RESULT IN AN INOPERATIVE TRANSMISSION.
- (13) **TORQUE** the bolts in the proper sequence (Ref. Figure 3) to 96 in/lbs (8 ft/lbs).
 - (14) Connect and secure the electrical harness to all the various solenoids and valves.
 - (15) Install a new transmission filter.
 - (16) Using a new gasket, put the transmission oil pan into position and install the pan bolts finger tight. Using the two longest bolts, put the shifter cable and bracket into position.
- NOTE:** Use of RED RTV sealant when installing the new pan gasket is acceptable.
- (17) **TORQUE** the pan bolts (in a sequence opposite to each other) to 120 in/lbs (10 ft/lbs).
 - (18) Lower the car to the ground.
 - (19) Add new transmission fluid (approximately 4.5 litres or 1 US Gallon).
 - (20) Place shifter in Neutral, start engine.
 - (21) Check for proper engagement of transmission by selecting each gear in turn.
 - (22) Place shifter in Park and shut down the engine.
 - (23) Check transmission fluid level. Do not add fluid unless level is very low.
 - (24) Take car on road test.
 - (25) After road test check fluid level again. Top up as required as transmission should be at operating temperature (hot).