

## 4L60E EZY Diagnosis Path

(This is under constant review as rebuild processes continually improve)

First thing start with the easy ones....

After checking correct oil level and no broken trans mount is to put a line pressure gauge on the pressure test port and go for a drive to verify proper line pressure.

Base pressure at idle in P,N,OD should be around 70psi and around 140psi in R. Max line pressure should be at least 190psi at WOT in 1st or 2nd, 225psi is optimum.

If base pressure is low, trans or pump is worn out. If max pressure is low, check EPC solenoid. If reverse is slow to engage, and line pressure does not come up to at least 130psi in reverse, replace the boost valve with a Transgo 0.500" boost valve (easy fix in pan).

Beware of coolant contamination - coolant will cause clutch packs to de-laminate and thus cost you a rebuild!

Trans fluid eats radiator hoses! If you find any sign of cross contamination, fix the problem and thoroughly flush both systems IMMEDIATELY.

Do not bypass the radiator transmission cooling circuit or block it off..the transmission will fail.

People ask what is "limp-home mode" ?

This is a fault mode in which the transmission either loses electrical power or the PCM deactivates all of the electronics.

The transmission will default to max line pressure.

The driver will have Reverse and 3rd, with manual 2nd available by putting the gearshift in 2 or 1 (doesn't matter). 1st, 4th, and TCC lockup will not be available.

It will not hurt the car to drive it like this for short periods, but use manual 2nd to get the car moving, and be aware that the trans will generate more heat than normal while operating in limp-home mode due to increased torque converter slippage during 2nd gear starts and no lockup in 3rd gear.

Common failures on 4L60E, symptom < cause > any possible repair:

1. Slow, slipping or no reverse: lo-reverse clutches are worn out, fluid leak in the reverse apply circuit, or broken sun shell. It s possible to remedy a fluid

problem by removing the check ball from its cage in the case in the rear of the trans may help (must remove valve body. . May also have worn boost valve (can replace in the pan).

2. 1-2 shift does not happen at WOT until you let off the gas: Best case: try replacing the TPS. Middle case: leak in the 2nd gear apply circuit (servo assembly or 1-2 accumulator). Double check by using the pressure gauge and watch for a big drop when the PCM commands 2nd gear. Worst case: poor line pressure rise (see below).

3. 1-2 Shift shudder at WOT; delayed or abnormal 1-2 shift; There's a problem ONLY on the 1-2 shift: 1-2 accumulator piston cracked or stuck cocked in the bore. Check the yellow spring inside the accumulator housing for breakage. Also, if the accumulator housing walls are scored, the housing must be replaced. Easy fix in the pan.

4. 1-2 shift is delayed and harsh, may not shift into OD: Check TPS for smooth and linear electrical response over the entire range of motion. If not, replace.

5. Trans does not upshift out of first, speedometer reads zero at all times: VSS failure. Easy fix on rear of transmission, but cross member must come out to access VSS.

6. No 3rd or 4th gear: 3-4 clutches are worn out. R&R. The car is safe to drive (in 2) until you can get it fixed.

7. Sudden grinding noise with no prior warning primarily in 2nd gear, behavior in reverse may be abnormal; sunshell is fractured. R&R. Try not to run or drive the car or further damage could result.

8. 1st and 3rd only, no 2,4 or R; sunshell is fractured or splines are sheared off. R&R. Try not to run or drive the car or further damage could result.

9. No 2nd or 4th gear. 2-4 band is slipping. Servo seals may be damaged (can be fixed without removing trans. Otherwise, 2-4 band is worn out. R&R.

10. Trans shifts into gear harshly, car feels sluggish off the line, No 1st, 4th or TCC lockup available, Manual 2nd, 3rd and Reverse are only available gears, CEL is on: Transmission is either in limp-home mode or has lost electrical power. If there are lots of error codes in the PCM, check the under hood fuse that powers the transmission, and if it pops again, look for a short in that circuit like an O2 sensor harness touching exhaust. Otherwise, check PCM codes for a particular fault in the transmission causing the PCM to put it in limp-home mode.

11. No 1st or 4th available; trans shifts 2nd to 3rd by itself in D or OD and locks the converter : Shift A solenoid failed. Easy fix in the pan. Or a wiring problem from PCM to trans.. or PCM.

12. Car goes into gear but feels very sluggish like the brakes are dragging, but it will roll easily (starts out in 4th gear), you manually shift to 2 to get it moving, once it's moving you put it back in OD and the car shifts 3rd to 4th on its own and locks the converter at the appropriate time: Shift B solenoid failed: Easy fix in the pan. Or a wiring problem from PCM to trans.. or PCM.

13. No TCC lockup: Brake pedal switches improperly adjusted (always on), TCC solenoid failed (easy fix in the pan), TCC clutch worn out (must remove trans and replace TC).

14. TCC always locked: TCC apply solenoid circuit shorted to ground, TCC

solenoid blockage (easy fix in pan), or TC broken (must remove trans and replace TC).

15. Horrible noise in 4th and feels like the brakes are on: overrun clutches are applying due to a cracked or leaking forward piston. Overrun clutches will be worn out after 30 seconds of this behavior. Car can be safely driven in D. R&R.

16. Soft shifting, gradual performance degradation: Poor line pressure rise due to leaking boost valve, clogged EPC filter screen, failing EPC solenoid, or worst case: leaky seals throughout. Transgo HD2-C kit fixes first two without removing trans. Seal restorer may fix last problem, but probably R&R.

17. No forward movement in OD or D, but L2, L1 and R work: Forward sprag is broken. R&R. Try not to run or drive the car or further damage could result.

18. Extremely harsh shifts from P or N, normal shifts at WOT: EPC (Electronic Pressure Control) solenoid failed. Easy fix in pan. Fix as soon as possible or hard parts will eventually break.

19. Loud bang, grinding sound, loss of all gears, and a binding driveshaft: snapped output shaft. Try to wiggle driveshaft - if more than 0.020" play, that's the sign. R&R.

20. Trans seems noisy when moving in 1st and Reverse, noise goes away instantly if you shift to N or the trans goes into 3rd gear: Reaction planetary is worn out due to high miles or insufficient lubrication. Not a critical failure, but not a good sign either. R&R sooner rather than later.

21. No movement in any gear: pump failure, or total loss of fluid. R&R, or refill pan and find the leak. If out of fluid, avoid running the engine until the trans is refilled to avoid pump damage. To check for pump failure, check fluid level with the engine off, then start the engine and recheck fluid level. If level does not go down when engine is running, the pump is broken.

22. Transmission does not shift automatically, only manually. Swap in a known-good PCM, check wiring, check other sensors such as VSS and TPS.

23. 3rd gear starts, can manually shift through all gears. When car has been turned off for a bit, then back on it will run normally.: VSS drop off w/ Hi-stall converter. The rpms are too high, but VSS is showing no movement. Happens after a tire burning take-off. Doesn't store a code, will not throw a CEL (I've heard that it will store a code if it happens 3 or more times). Cure: Reprogram PCM for VSS dropoff -- PCMforLess knows about it.

24. Fluid leak out of the front of trans where the converter connects; partial or full loss of movement: Front pump bushing walked out. R&R. May have to replace converter also if hub is scored. Note that a leaking front seal usually means the bushing is walking out (i.e. call your local trans shop and schedule an appt.).

25. Torque converter shudder in 4th while lockup is engaged; problem goes away when the brake pedal is pressed slightly to unlock converter. Have a shop verify line pressure, and provided no valves in the TCC hydraulic circuit are worn, replace the torque converter.

26. Shift suddenly become very hard. When going from park to either reverse or drive it slams into gear. 1-2 and 2-3 shifts are also harsh. All gears seems to

work. Problem may be intermittent: Check TPS for smooth electrical response. If the response is jumpy or erratic at all, replace TPS.

27. All fluid pumped out through the vent tube: Plugged cooler line. Flush the transmission cooler and cooler lines. Also could be over filled transmission.

28. Car acts like it's in OD in neutral, car is locked stationary in R, engine feels loaded in P, all four forward positions work fine: R&R: Internal cross leak feeding the forward clutches all the time. Most likely a cracked input housing, or cracked forward piston means forward clutches are fused together. Car can safely be driven gently in forward gears until the repair.

29. Needle bearings in the pan, first gear and/or reverse may be noisy: Either a torrington bearing or a planetary bearing is on its way out. Trans will eventually die a loud, catastrophic death. Cheaper to rebuild now (saves further damage to hard parts), but requires R&R.

30. 1-2 or 2-3 shift is slow/soft above part throttle: Trans is on its way out. R&R.