Look Before You Leap
(into a CD4E)

By Frank Biolsi

How many times has your mother told you to look before you leap? It was good advice when you were a kid, and it's even better advice if you're about to tear apart a modern transmission – especially when the transmission in question is a CD4E.

Once you tear the unit down, the damaged parts are easy to find and replace, but how do you spot the cause? The leaking sealing ring or gasket, or the worn or sticking valve that caused the damage in the first place may appear quite healthy. Even if you are lucky or thorough enough to stop and inspect the right area, casual inspection of many parts might allow you to walk right by the one you need to find.

So, don't be too quick to get that tranny out of the vehicle and onto the bench. You may lose your best chance to determine what caused the unit to fail in the first place. The best way to increase your odds of finding the problem is to evaluate several key areas before and, in some cases, during the teardown. Many of the more common issues found in CD4E units, if tested, will give an indication of what caused the problem. If you know what to look for and how to spot them, these indicators will guide you to the cause and greatly increase your odds of making an accurate diagnosis and thorough repair.

So where do you start? After noting the customer complaints, scanning the unit and verifying the complaints on a road test, stop and look before you leap. The best way to begin to narrow down the possible causes is by pressure testing specific circuits and by monitoring cooler flow. Here are just a few examples of what you might find.

Try running a line pressure test at idle on any CD4E with a delayed engagement complaint. If line pressure is low, the likely culprit is a worn pump or filter. If line pressure is high, check for either a worn pressure regulator bore or a failsafe high line cutting off converter charge.

Got a complaint of no movement? Run a cooler flow test. Low flow indicates pump or filter problems. A line pressure test will tell you whether line pressure is varying with engine load: if there's no change, you have a PR valve problem.

A line pressure test will also help you diagnose 2-3 flare complaints. Again, line pressure should vary with engine load. If there's no change in pressure, chances are that the PR valve is causing the problem.

You can narrow down the potential causes for a bind-up condition through a number of tests. High line pressure will point you toward a worn PR valve or EPC solenoid failsafe condition.

A line pressure test will also help you diagnose harsh shift complaints. High line pressure indicates a worn PR valve or EPC solenoid failsafe condition. If line pressure is good, perform a verification test: it may indicate the accumulator pistons have seized up.
Got codes? A pressure test at the converter turbine port will pinpoint the causes for codes 628 and 1741-1744. If pressure is low, the most common causes are valve body wear, a worn pump or blown

gasket, a cracked TCC piston or worn bushings. The primary cause of valve body-related issues is wear of the bypass clutch control valve. If pressure is high, check the PR and converter control circuits. A restricted cooler circuit will also raise converter turbine pressure.

TEST CONDITION	LINE PSI		CT PI		FRONT LUBE PSI		COOLER FLOW GPM	
	Good	Poor	Good	Poor	Good	Poor	Good	Poor
Park (high idle)	60 - 70	< 45	40 - 50	< 25	12 - 18	< 2	.3 - .5	< .2
Drive (idle cool)	50 - 55	< 40, > 80	30 - 35	< 15	10 - 15	< 5	.7 - .8	< .6
D - (idle hot)	50 - 55	< 40, > 80	25 - 30	< 15	2 - 4	< 2	.7 - .8	< .6
D - (WOT stall)	170 - 195	> 200	60 - 100	< 40, > 130	2 - 5	< 2	1.5	< .8
D - (Connector off	< 200	> 200	60 - 100	> 110	2 - 5	-0-	.7 - 1.2	-0-
D - (40-55mph,TCC off)			55 - 85	> 100	1 - 5	-0-	1.5 - 1.7	< 1.0
D - (40-55mph,TCC on)			85 - 100	< 80	1 - 5	-0-	1.8 - 2.1	no change @TC
			25 - 35	< 15	2 - 5	0 - 1	.7	< .4
< = *less than* *greater than* = >								

Erratic TCC codes are best diagnosed by checking CT pressure during TCC apply. A slow or rapid drop in pressure after apply (approximately 15 psi or more) is often caused by a converter with internal leakage or a cracked piston. Take a look at the TSS sensor while you're looking around. Later design (white) sensors, when used as a replacement for an early design (black) sensor, will often cause codes under certain conditions and may often be responsible for hard-to-duplicate codes.

Other tests may also get you pointed in the right direction.

Wrong gear starts are easily tracked if you install a controller to control the commanded gear. If the transmission shifts correctly with the controller in charge, you have a wiring/connection issue, or possibly a mismatched ECU. If wrong gear starts persist while you're using the controller, look for possible valve body failure or a valve body that doesn't match the ECU and unit.

Don't forget to inspect the valve body for signs of wear: Both the 1-2 shift valve bore (inboard end) and solenoid regulator bore can cause wrong gear starts if they've worn out.

Once the unit is out, converter bench tests can help verify your diagnosis of lockup concerns caused by the converter.

Air tests done on the CD4E case can pinpoint leaks or cross leaks in a variety of circuits that can be tested as a possible cause for the complaint you are tracking.

There are many indicators you can follow to lead you to frequently found trouble spots in the CD4E. We have listed only a few here. The idea is that the information you need to solve the problem will be easier to find if you know where to look. The best time to look is before you leap.

Frank Biolsi is manager of the Sonnax Technical Support Department and a member of the TASC Force (Technical Automotive Specialties Committee), a group of recognized industry technical specialists, transmission rebuilders and Sonnax Industries Inc. technicians.