TROUBLESHOOTING THE 4T65-E
A Matter of Interpretation

by Bob Warnke

Interpretation can be defined as an explanation or translation of information. In transmission repair, seeing the evidence is often easy. Interpreting or explaining what the evidence means is almost always more difficult. Arriving at an understanding of the cause of a problem depends on how we interpret the evidence. Our success depends on how well we read the signs.

For example, Figure 1 could be a sign for the directions to medical aid. I assume this because of the bandage and also knowing that duct tape will stop the bleeding.

In Figure 2, you can see contamination stuck around the return cooler checkball seat. The evidence is there, but the interpretation that must be made is whether the particles are leaving the transmission or returning from the cooler.

Figure 2

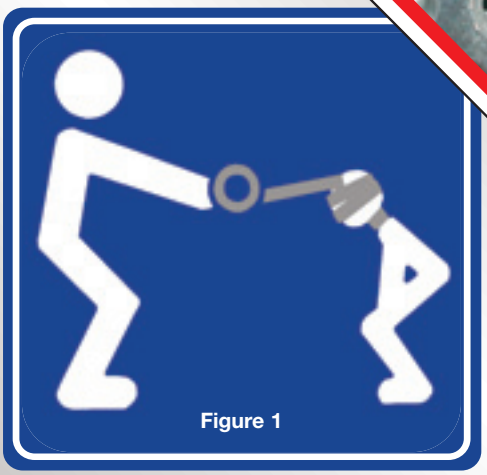
Figure 1

Figure 3 might be found next to the hood latch, fuel door latch, or in the trunk as a way to escape. I personally would like to see this as the newest car option, where a technician leaps from the trunk to pump gas, change the oil or service a flat tire.

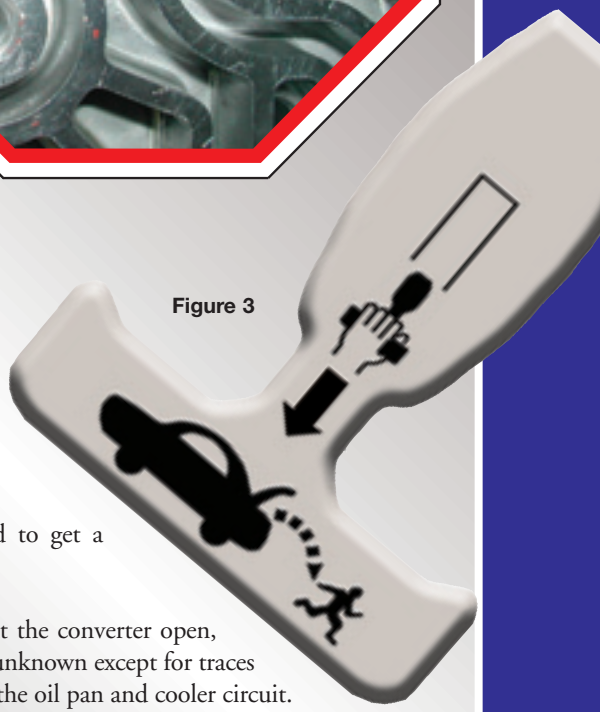
Figure 3

Generally speaking, we learn translation and interpretation from visual and physical experiences. We know how it feels to strip threads or shear off a sealing ring. We know by feel and sound when the last clutch plate drops over a hub during assembly. We have learned to see the result of a failure and arrive at the cause, if we have experienced it before.

But what if we have not seen or cannot see this, as in Figure 4? This photo shows a 4T65-E 258mm TCC piston that has been overpressurized. Where do you think the material that gets ground from its surface winds up? You guessed it. It collects by the checkball back in Figure 2. Build up enough of this contamination and what do you suppose happens then? Correct. Now it's time to pull the latch for the technician in Figure 3 so he can run down the road to get a tow truck.

Unless you have cut the converter open, this failure may be unknown except for traces of stray material in the oil pan and cooler circuit. Earlier drivability complaints include transmission noise, no movement as the filter gets plugged, harsh TCC apply, stall on engagement or coastdown shudder.

Looking closely at Figure 4, starting from the outer edge of the piston, you can see the various stages of lining damage, then onto piston failure. Overpressurization of the TCC piston dur-

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ing apply originates from various sources *(see Figure 5)*. We can now look to repairs such as the Sonnax boost valve & sleeve kit, **84754-30K**, and the TCC regulated apply valve, **84754-34K**, to correct the hydraulic concerns that lead to this damage. Further, we can add the new Sonnax relief valve, **84757-01K**, to ensure the PCM cannot elevate apply pressure beyond the material strength of the converter piston.

Why do all these areas need to be evaluated as possible causes for what we see in figures 2 and 4? Because each of those parts plays a role in controlling or limiting line pressure and TCC apply pressure.

To be brief, it flows like this: Line pressure from the pressure regulator valve goes to the AFL valve, which limits the maximum pressure to the pressure control (EPC) solenoid. EPC control is directed by the line by way of the boost sleeve. Line pressure flows through the TCC regulator valve to apply the TCC piston. Incorrect operation of any of these valves can potentially increase both line and apply pressure, creating the damage you see in Figure 4.

If you understand the effects of wear or the malfunction of these valves, you can avoid the desire to perform the operation pictured in Figure 6. I will let you interpret that one for yourself.

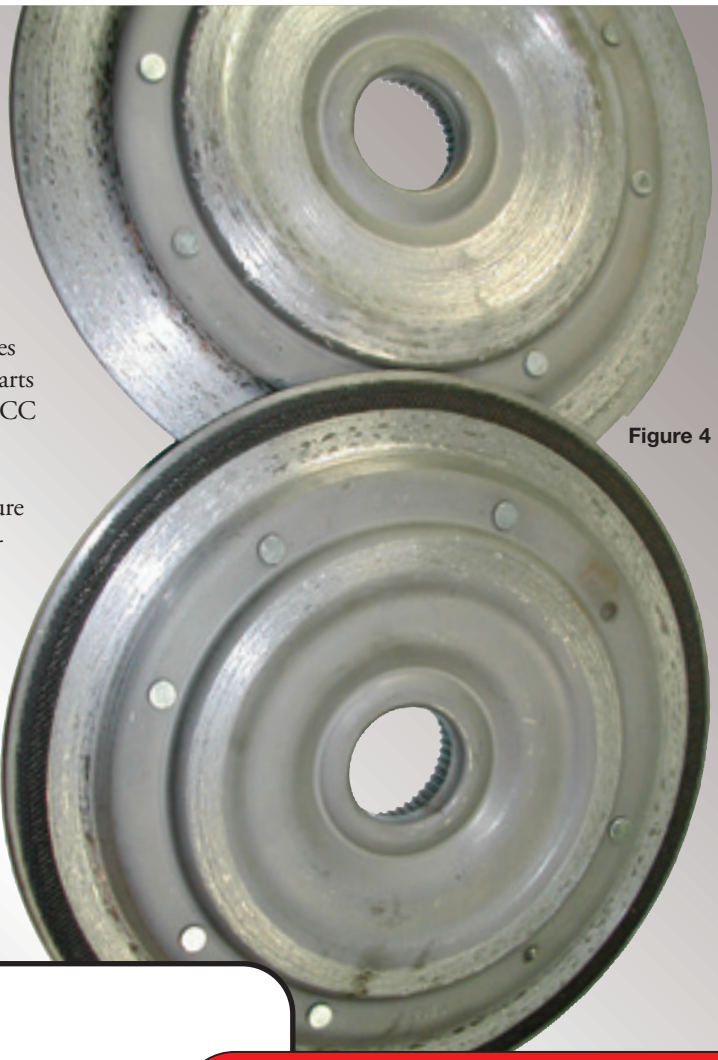

Figure 4

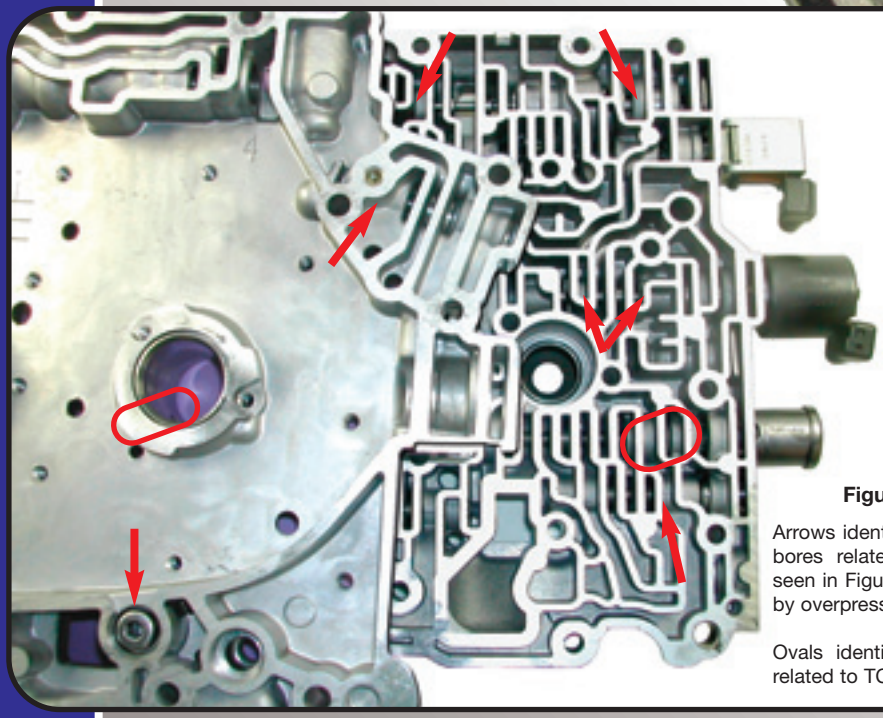

Figure 5

Arrows identify the valve bores related to failure seen in Figure 4, caused by overpressurization.

Ovals identify concerns related to TCC slippage.

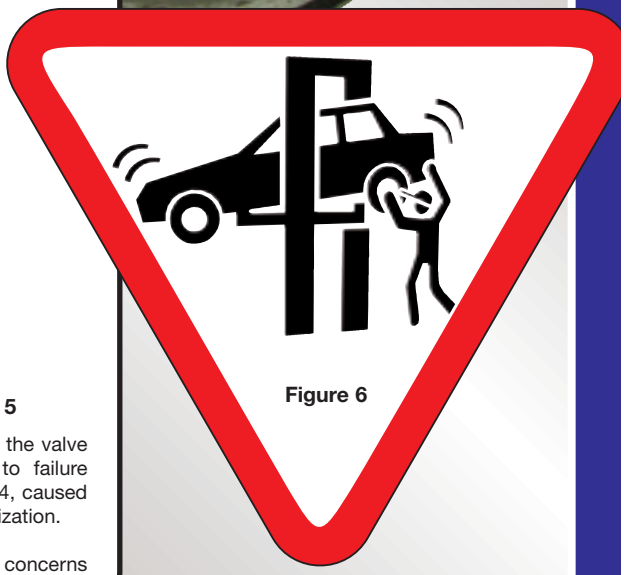

Figure 6