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Blame the Torque Converter - Part 1

Society often influences us to try to blame others for our problems. From an early age we try to place blame with friends or siblings. Our training usually continues into our school age when the guilty person is always "the other guy". It seems only natural for this mind set to continue into the work place. This is especially true if your work place happens to be with the automatic transmission industry. The mysterious inside

of a sealed torque converter is easily substituted for the "big dumb kid" in the back of the classroom. The following are examples of a torque converter being unjustly blamed for a transmission problem.

2001 JETTA 740 code

A 2001 Volkswagen Jetta equipped with a 2.0L engine and

01M transmission was returned to a transmission shop. The transmission and torque converter had been rebuilt recently and now the vehicle had a 740 trouble code. The 740 code had been one of the many codes present when the vehicle was first brought to the transmission shop. Now that the vehicle had returned, the technician thought that something had been missed on the original rebuild of either the transmission or torque converter. The torque converter was returned to the original shop to be checked. The owner of the converter shop said when the converter was serviced the first time they found that the friction material had begun to

flake off and it had been replaced as part of the rebuild process. At that time, the converter had to have a major cleaning because of metal contamination, but the friction material was the only thing replaced. Inspection on this return trip did not show any sign of problems inside the converter.

The transmission was also disassembled and thoroughly checked. The inside of the transmission appeared to be pristine. The transmission was reassembled and the valve body was replaced with a reman unit. The transmission was reinstalled into the vehicle and road tested, but after about 35 miles, the 740 code returned. The technician was convinced that the problem was inside the converter, so the converter was replaced with another reman unit. The 740 code returned on the next road test. The technician road tested the vehicle yet another time, but this time he did not allow the transmission to shift into the OD range. With OD inhibited the 740 code did not return. The technician began looking for an OD ratio difference. He found that during the first rebuild the original OD planetary with a 24 tooth sun gear (*Figure 1*) had been replaced with an OD planetary with a 27 tooth sun gear (*Figure 2*) and that turned out to be the problem.

Prior to the original repair, the 740 code was being set when the computer commanded Overdrive and lockup and the transmission could not attain desired overdrive ratio because of the failed planetary. The second time around, the 740 code was being set because the overdrive ratio did not match what was expected. The converter was not the cause of the 740 code in either situation.

2002 TOYOTA TUNDRA – No Lock-up, HOT-TCC slip, 0770 code

A 2002 Tundra equipped with a 4.7L V8 engine and 340 automatic transmission was towed to a transmission shop in Hawaii. The customer complained that the engine would run fine when the transmission was in the park or neutral range, but would stall when the selector was placed into any drive range. The fluid appeared very metallic, so the transmission pan was dropped. The pan

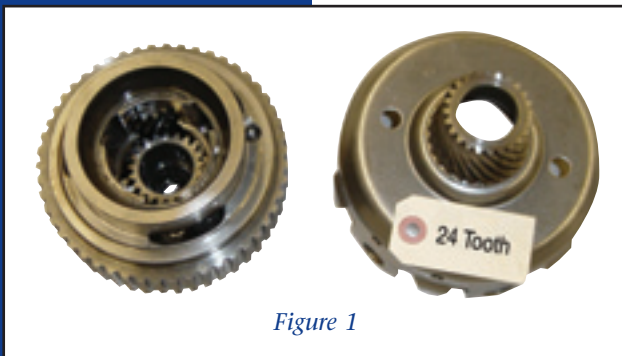


Figure 1



Figure 2



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did contain a large amount of metal debris. The customer was sold a complete transmission rebuild including a rebuilt torque converter.

When the transmission shop disassembled the unit, they discovered that the overdrive planetary gear set had failed, and a small piece of metal contamination from the failed gear set had blocked the TCC control valve in the applied position. This explained why the engine would stall when the transmission was placed into gear. The transmission was completely rebuilt which included the replacement of the OD planet and completely cleaning the value body.

The torque converter was sent to the Kalakua Converter Company where it was rebuilt. The converter looked good inside except for the metal contamination.

The rebuilt transmission and torque converter were reinstalled into the vehicle. The vehicle was successfully road tested and returned to the customer. The vehicle worked fine while it was cold; however the customer noticed that after the vehicle was warmed up the check engine light would come on. (Keep in mind that this is happening on an island where there are no long journeys.)

When the vehicle was returned to the transmission shop a scan check showed that the trouble code was P0770. Since the OD planet was the only hard part that was replaced, and there are (2) different OD ratios available for the 340 transmission, the technician reasoned that the wrong ratio may have been installed. When the technician tried to prove his theory by counting the teeth on the OD sun gear, he found that the original OD planetary gear set had been thrown away. The technician decided to use another method to prove his theory. He road tested the vehicle, but he did not allow the vehicle to shift into the OD range. If the computer commanded lock-up and a code was not set when the transmission was in the (3) or (Drive) range, he would know that the OD ratio was incorrect. He found that the TCC code was set even with the OD inhibited. This convinced the technician that the problem was inside the converter. To further prove his new theory he decided to control the TCC solenoid himself. Since the TCC solenoid is grounded at the value body, all he had to do was supply his own 12 volt signal to the solenoid. Being able to control TCC and observe results, he now noticed that the engine would only drop 160 RPM when the solenoid was engaged. Remembering that prior to the first rebuild, the TCC clutch would causes the

engine to stall when it was blocked in the apply mode, he reasoned that the TCC did not have enough clamping force (some type of internal leak). The converter was removed from the vehicle and returned to the converter shop. When Justin Kawasugi, the owner of the Kaslakua Converter Company, opened the converter there was nothing wrong inside. Justin knew that the OD planet had been replaced and also knew that the input shaft was an integral part of the OD planet. He decided to check the OD planet to see if there was some type of flow difference with the replacement input shaft. What Justin did find was that the replacement OD planetary was $\frac{1}{8}$ " shorter than the original. The tip of the input shaft was just making contact with the seal in the turbine hub; No wonder full clamping force could not be attained. Multiple ratios are not the only differences in the OD planets used in the 340 transmissions. Some ratios are also available in more than one length. The 4 cylinder OD planet measures $8\frac{1}{8}$ " long (Figure 3) and the V6 and V8 OD planets measure $8\frac{3}{4}$ " long (Figure 4).

In this situation, putting the 4 cylinder planetary into the V8 transmission had caused the problem. Once again, the converter was not to blame.

Watch for part two of this series in next month's issue and see how AW55-50SN and 4T65E converters have also been incorrectly given the bad rap.

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