TECHNICALLY *Speaking*

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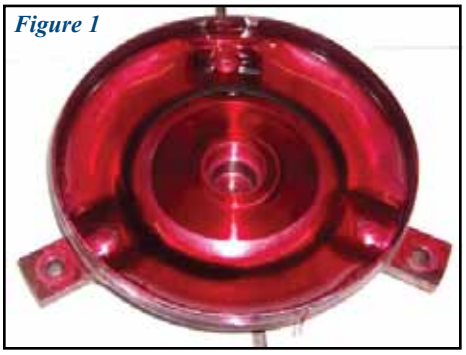
Checking for Cracks

The attendees at the 2009 Torque Converter Rebuilders Association (TCRA) Seminar in Tennessee were introduced to a couple of interesting methods of checking torque converter covers for cracks.

Ken Kelly, from Trans Specialties in Aston, PA, talked about one conventional method during the round table discussion at the seminar. His method also appeared as a Tech Tip in the July 2009 edition of the TCRA Newsletter. Ken's method is called Dye Penetrant Inspection or Liquid Penetrant Inspection. Materials needed to conduct this test can be purchased as a 3 part kit from your local welding supplier for under $20.00. The kit consists of a cleaner, a penetrant, and a developer. The cleaner is used to insure a clean, dry, contaminate free surface that is necessary for good results. After cleaning, the penetrant is applied to the surface of the part being tested (***Figure 1***). After allowing the penetrant

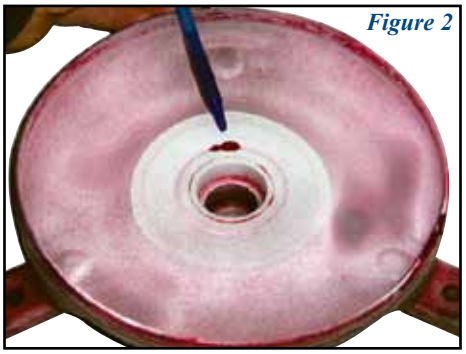
Figure 1



15 to 30 minutes to soak into all the crevices of the part, the excess penetrant can be removed by wiping with a lint free cloth which has been lightly soaked with a cleaning solvent. The last step in the process is to apply the developer to the surface of the part. The developer will highlight any areas that the penetrant was able to get into (***Figure 2***). Allow the developer about 10 minutes for its blotting action to work fully. A visual inspection will now reveal any cracks or defects in the part.

The TCRA Seminar attendees also learned about a less conventional method on their

Figure 2



tour of the DACCO Torque Converter Rebuilding facility. Robert Cravens, a long time rebuilder, showed attendees his tap method for checking for cracks in torque converter covers. To illustrate his method, Robert held an E4OD cover by the pilot, and lightly tapped the front of the cover in several places. He explained that a crack free cover will emit a crisp, bell-like sound, while the area of a cover with a crack will have a dull thud sound. The method appeared to be very simple and straight forward, but Robert cautioned that there were several important elements of the test which must be done correctly, beginning with how the cover is held. Holding the pilot lightly by your finger tips will yield the best results. Holding the cover firmly at its outer edge will muffle the sound and make it more difficult to identify a crack. The second element is where the cover is tapped. Robert taps the outside of the front of the cover directly over the torque converter clutch (TCC) reaction surface (***Figure 3***).

Figure 3

The value of checking for cracks is not limited to converter covers. Josh Bynum, from Buffomatic, in Glenmont, NY, uses a similar tap method to check his 518 TCC

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pistons for cracks. The 518 pistons are notorious for cracking, and the cracks are equally well known for being difficult to find. The cracks are difficult to find because they are usually located in the crease at the bottom of the pocket that houses the I.D. sealing ring (***Figure 4***). While it is common for converter shops to discard 518 TCC pistons that are noticeably burned, they often mistakenly re-use pistons that appear sound but are actually cracked.


Figure 4

Josh's technique for checking the pistons is very similar to Robert's method. Josh places the tips of his index and middle fingers into one of the spring pockets and lightly holds the piston by clamping his thumb on to the friction material surface of the piston (***Figure 5***). He then taps on the front of the piston in four places (12:00, 3:00, 6:00, and 9:00). Josh's tapping tool of choice is a lathe chuck key, but a small ball peen hammer will also work.

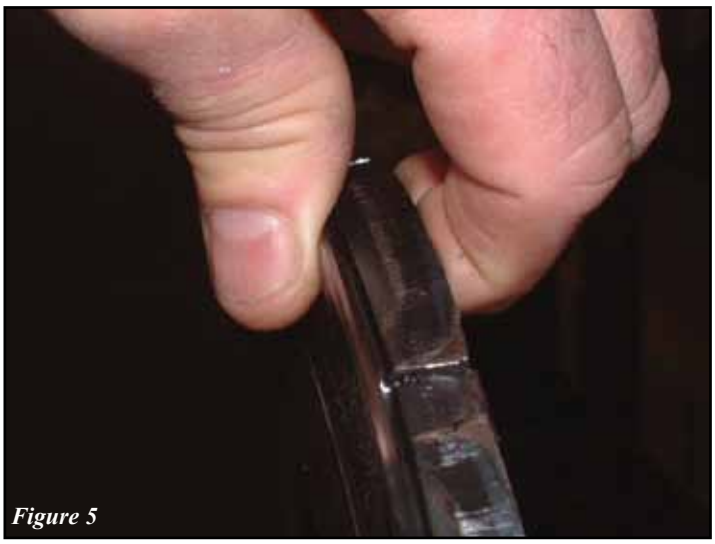
Figure 5

When one or more of the taps produces a dull tinny sound, Josh verifies the leak by either holding the piston up to a high intensity light or by using solvent and an air nozzle.

There are many other pistons and covers that have cracking issues. The late model Honda piston, as shown in ***Figure 6***, is a good example.


Figure 6

This piston was cleaned and was being prepped for rebonding before the crack was found. The location of the crack indicates that the crack was caused by the flexing action of the piston. Remembering what the industry experienced with cracks caused by flexing of E4OD or 4L80-E pistons, it is likely we will see many more Honda pistons cracking.

Ed Lee is a Sonnax Technical Specialist who writes on issues of interest to torque converter rebuilders. Sonnax supports the Torque Converter Rebuilders Association. Learn more about the group at www.tcraonline.com.