

The Hows and Whys of W.A.T.

As transmissions become more high tech, it's harder and harder to diagnose control circuit problems. The continued evolution of closely tolerated and balanced hydraulic circuits, combined with more sensitive sensors that can pick up on the slightest bit of slippage, can lead to a host of major problems for transmission rebuilders.

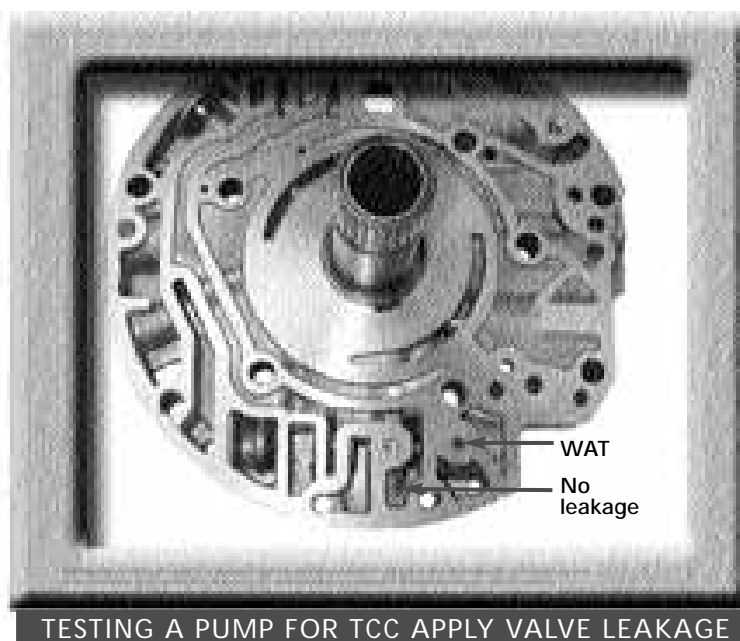
Circuit leaks are more and more common. Because today's transmissions are so much more precise, diagnosing control circuit problems has to be, too. And that's where the Wet Air Test can help pinpoint a multitude of problems, from shift timing complaints to clutch/band overheat to uncontrollable lock-up.

A Wet Air Test makes use of both regulated air pressure and fluid to identify and locate leaks. It involves capping off both ends of a suspect circuit, placing ATF inside and then forcing that fluid around with light air pressure.

Passages can be isolated by blocking off an opening with your thumb or using a test plate.

Wet Air Tests can help pinpoint specific problems without a major outlay for equipment. All you need is regulated air pressure of 20 to 30 psi, ATF, a shop rag and a stiff plate. The rag and plate are used to close off castings or add openings as you force air into them. It's also helpful to have a hydraulic flow chart on hand to assist you in identifying possible areas of concern. There is a bit of a learning curve involved. Unlike specific valve

body testing equipment, which registers the percentage of leakage, the Wet Air Test does not: It only tells you whether there is a leak. So, you need to use your judgment when testing an isolated circuit with low air pressure. The best way to begin is by comparing a good circuit to a worn one.



One note of warning: Teflon® rings require more pressure and higher temperatures to open or lift. Don't come to the conclusion that you have a leaking circuit just because the Teflon® ring failed to expand during the Wet Air Test.

WHAT YOU CAN FIND WITH A WET AIR TEST	WHAT YOU CAN PREVENT
Worn accumulator pistons	Wrong gear starts, bind-up, burned friction
Non-seated checkballs	Missing or harsh shifts, bind-up
Unbalanced valves	Valve buzz, high or low circuit pressure
Sticking shift valves	Poor shift timing, spring tie-ups
Leaking governor plugs	Late shifts or no 4th gear
Sticking governors	Late shifts, no upshift or 2nd-gear starts
Cracked pistons and cases	Phantom clutch failure and repeated R&R
Warped pumps	Poor output and low line rise
Undersized pump slides	Sticking slides or uncontrollable line pressure
Poor positioning of manual valves	No movement, tie-ups, wrong gear starts
Mismatched gaskets	No TV response, low line rise

