

## **Sticky Valves**

Why is it that we seem to get sticky valve problems right after a rebuild. Isn't the filter doing its' job? The filter is probably doing its' job just fine. The problem is that the particles sticking the valves are too small for the filter to catch. Let's take a short journey into filter technology.

The first transmission filters were pleated paper similar in design to fuel and oil filters. Later, wire and nylon mesh screens became popular due to cost. Pleated paper and screens are known as surface filtration. The biggest problem with surface filtration is that once the surface is full, the filter is clogged. As transmissions became more sophisticated, the need for better filtration became important. The choice today for filters is depth filtration and the media used is felt. Felt filters have a rating of about 60 microns.

How big is a micron? A micron is equal to one millionth of a meter. A grain of salt is about 100 microns. Human hair is about 50-70 microns. Airborne dust is about 30-50 microns. Approximately 40 microns is as small as the human eye can see. The original Ford C-6 screen would filter down to about 450 microns, which would trap anything larger than a small farm animal and allow everything else to pass through. Better screens would filter to about 140 microns. Felt transmission filters can filter down to about 60 microns. Anything smaller than that would be too restrictive for transmission operation.

Here is the problem; the clearance between a valve and the valve bore is about .001', which is roughly 40 microns. It has been determined that particles between 20-40 microns is what hangs up valves and causes wear on bushings and washers. So it's the stuff we can't see that is causing the problem. Where do all the particles come from? As ATF breaks down, it forms a sludge. Heat causes oxidation and the oxidation causes many of the normal ATF additives to precipitate out of the fluid. This precipitation of chemicals creates a very fine mass of particulate that looks like and is called "sludge"

Is there an answer to this problem? Actually, yes there is and it is very simple. It consists of two simple steps. Install a filter in the transmission cooler return line. Most are really two filters in one. There is a permeated paper element that will filter down to about 20 microns plus there is a magnet that will pull out ferrous metals down to about 3 microns. Second, prevent the fluid oxidation and breakdown. This is easily accomplished by simply adding a bottle of Lubegard ATF Protectant, (Red or Platinum bottle) So if you want to add a touch of craftsmanship to your work, you now have the answer.