

Oil Bypass - The Modern Bypass Filter

Today's oils beg for a longer useful life. Over the last five to 10 years oils have been improved tremendously. The ability to withstand greater heat, improve lubricity, suspend soot and thwart oxidation are all outstanding achievements in chemical engineering.

Regardless of the type or spec of your oil it is more important than ever to keep it clean. The question is, "How do you clean and still allow oil to flow to the engine?" The answer is micro bypass filtration.

Modern micro bypass filters offer many advantages by keeping the oil exponentially cleaner than possible with a full flow filter alone. By design the full flow filter only cleans about 85% of the particles to 30 - 40 microns or larger. (That is about the smallest particle a human eye can see; a human hair is about 80 microns.) If the media was made any denser, to clean more efficiently, it might reduce the flow of oil. In fact, there is a shunt that allows oil to flow through unrestricted if there is a certain change in pressure because it is important for the engine to have all the oil required even if it is dirty.

In the 70's when the first oil shock hit and people ran to find solutions to reduce oil consumption one bypass filter company sold hundreds of thousands of units and really became the standard. That unit held about four gallons of oil, was quite large and had a traditional paper / pulp filter media. It cleaned down to about 15 microns at high efficiency, however, it's biggest achievement was to increase the oil sump capacity by about four gallons.

Today's bypass filters are smaller and more effective than previous bypass filters. This is important when trying to standardize your fleet with one product - it has to fit and be easily accessible to change the element at the PM.

Several engine manufacturers are simply increasing the sump and adding another filter to solve the soot problem. The idea is to disperse the soot over a larger pool of oil. (The new Cat C13 just added another full flow filter and 2 gallons of oil capacity to the engine.)

Many of today's bypass filters clean below 10 microns at over 90% efficiency. The trick is the bypass is in an "off-line" or bypass mode so that the flow is not critical to the engine. That allows the bypass filter to use a more dense media so it can filter much more finely. Some modern bypass filters, with much improved filter medias like special cotton twine blends and felts clean down to as low as two microns (the size of bacteria). This is below the 3-10 micron gap between the piston and cylinder wall. Remember the tolerances all around the arteries and veins of the engine feed some incredibly tight spaces. As machining capabilities improve our ability to close the gaps increase which reduces pollution and makes cleaning the oil even more important to the operation and life of the engine.

When you clean the oil four to fifty times cleaner you allow the oil to achieve a longer useful life. Several things contribute: 1) the oil shoulders some of the burden of the additive pack so the TBN depletes more slowly, 2) the removal of the larger particles reduces the friction in the engine which allows more horsepower to the wheel and less heat, 3) when contaminant is removed many of the oxidation catalysts are removed.

Bypass filters are not magic wands and oil spec must be maintained, however, keeping the oil exponentially cleaner will allow you to extend your oil service intervals AND improve the quality of your oil. Today's bypass filters offer smaller, easier installation and service with much better filtration efficiency and load capacity.

By extending the life of the oil and improving the quality of the oil you will save a substantial amount of money. If you look at a bypass filter, and I strongly recommend you do, be sure to ask at least these questions:

- a) What is the size of the unit?
- b) Are there any mounting restrictions?
- c) How easy is it to change the media / element?
- d) Are there any electrical or hydraulic connections?
- e) Is there a sample valve before filtration? (To give accurate reading of the engine oil.)
- e) What is the cost of the replacement media / element?
- f) What is the guarantee?

Thomas Farmer, CEO
HEPO Filters, Inc
Santa Monica, CA
TFarmer@hepofilters.com