

Oil Bath Air Filters

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Some of us grew up thinking that an air filter was a paper thing that allowed air to pass while trapping dirt particles of a certain size. What a surprise to open up your first old tractor's air filter case and find a can that appears to be filled with the scrap metal swept from around a machine shop metal lathe. To top that off, you have a cup with oil in it ("why would you want to lubricate your carburetor?"). On closer examination (and some reading in a AC D-14 service manual), I found out that this is a pretty ingenious method of cleaning the air in the tractor's intake tract.

How it works

When the engine starts, it sucks a certain amount of the oil out of the cup allowing it to coat the packed-in metal "shavings". This packing causes a massive increase in the amount of oil soaked surface area available to stop dirt particles. The cannister is designed to be the correct height to allow the proper weight oil to not be sucked into the engine but only pulled to the top of the can.

Uncleaned air is sucked in by the same vacuum that draws the oil up on the "shavings". The air is drawn downward towards the oil sump at the bottom of the cannister, usually through a center pipe. Any particles that are truly "large" will likely continue down into the oil left at the bottom of the cup and be trapped. The small dirt particles are trapped on the oil soaked "shavings" as the air moves upward through the outer cannister. If the correct weight oil is in the cup, the end result is that the air leaves the top of the cannister clean.

Potential Problems

The first problem comes with using the wrong weight oil. Use of oil that is too light will cause the oil to be drawn beyond the filter and into the engine. Use of oil that is too heavy will not allow the oil to be drawn up far enough and much of the air cleaning surface area ends up being unused. Manufacturer owner manuals always show the oil weight that is designed for the system. Engineering of the system (we hope) will have picked just the right weight for the size of the cannister, cup, and vacuum pressure.

The second problem comes when the cup is not cleaned regularly. Manuals always recommend daily refilling of the cup and suggest even more frequent cleanings under dusty conditions. The oil may look clean in the cup but after a few hours of running but it has trapped a significant quantity of small particles many of which will be drawn back up into the cleaning surfaces. When the particles-to-oil ratio reaches a certain level, the dirt will begin to hang on (or "sludge up") on the cleaning surfaces. Eventually, instead of just clean air being sucked into the intake, you have chunks of dirt and sludge going with it. Obviously this can be quickly damaging to the engine. If your cannister is filled with sludge, clean it out before using it or it could do more harm than good.

The last problem is with radically altered machines. The oil bath is engineered for the stock engine. Radical changes to the engine mandate changes to the air cleaning system. Care should also be exercised if replacing your oil bath filter. The replacement should be similar in size and engineered capacity to the original.

An example of dry filter adaptation to the oil bath air cleaner unit can be found at Bob Notman's website:

<http://www.42fordgpw.com/index.html>