Auto Oil Filters in Aircraft

Editor note: The following is written by a very skilled engineer and craftsman. His modified Vari-Eze was among the first to fly and has set many records. When Gary speaks - - I listen!

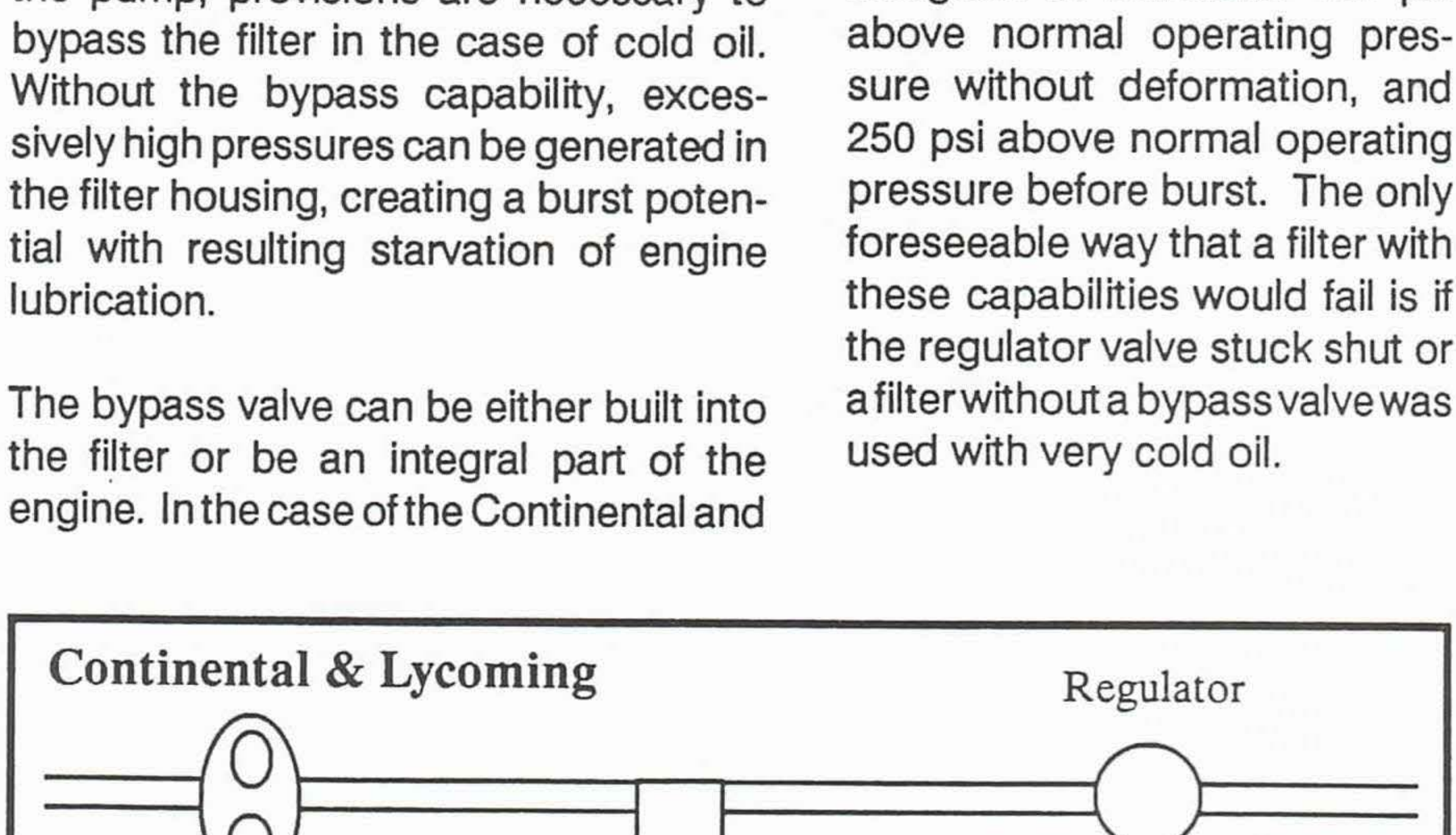
Gary Hertzler (AZ) - I was a little disturbed about the horror story, in the July newsletter, on the use of automotive filters in an aircraft environment. I would like to add my assessment of the problem that this gentleman probably encountered.

There are three basic components in any lubrication system, whether it is automotive or aircraft: the oil pump, filter, and pressure regulator. The pump, the first component in the system, draws oil directly from the sump and feeds either the filter or regulator. In the system which places the filter directly downstream of the pump, provisions are necessary to bypass the filter in the case of cold oil. Without the bypass capability, excessively high pressures can be generated in the filter housing, creating a burst potential with resulting starvation of engine lubrication.

The bypass valve can be either built into the filter or be an integral part of the engine. In the case of the Continental and Lycoming 4 cylinder engines, they are arranged pump then filter (or screen) then regulator, with no internal provisions for a bypass. Actually, the screens are designed to collapse (bypass) if they become plugged. To provide the necessary bypass, it is **MANDATORY** to select a filter with a built-in bypass valve. The filter which I have been using has a 12 psi bypass valve which will allow oil to flow around the filter when the pressure drop across the element exceeds this value.

If the engine is "making" large quantities of metal chips or coke (heaven forbid), the filter bypass will also function, thus providing lubrication to the engine.

The standard automotive filter is designed to withstand 100 psi above normal operating pressure without deformation, and 250 psi above normal operating pressure before burst. The only foreseeable way that a filter with these capabilities would fail is if the regulator valve stuck shut or a filter without a bypass valve was used with very cold oil.



Electric Landing Brake Go Around

Buzz Talbot (IL) - Dan and I installed this modification on our Long-EZ in April and are very happy with it. I have to report I just tested the fully deployed brake on takeoff, around the pattern, and back to landing. The aircraft flew just fine. I was shooting touch and goes with the new landing brake when traffic forced me to make a full stop landing. The next takeoff was about 25% longer than normal. Rate of climb was reduced and, at about 90 kts, a shudder was noticeable. I thought I had a fouled spark plug. I flew the pattern and other than the shudder, and higher power setting, the pattern flight was normal. On final I went to deploy the landing brake and discovered the switch was already in the down position. I forgot to raise it after the full stop landing.

I have changed the take-off check list to include the electric landing brake. As Doug Shane mentioned in the article, now I too, always leave the switch in the last position it was moved, and never in the center off position.

We really love the new brake and recommend it to all. The ability to infinitely vary the degree of brake deployment means you can custom tune each landing and never again wonder it the brake will suddenly close with a smack on your hand.

Breathing Easier

Barrett Bailey, E-Racer Newsletter Editor (AZ) - As an ex Carrier Corporation applications engineer, I would like to make a comment about the typical method of getting induction air to the EZ carburetor. Most EZs feed induction air through a wire wound flex duct and at least one 90 degree elbow. This arrangement will certainly slow the air down a great deal. The wire wound flex ducting has been found to be three times as restrictive as sheet metal ducting. It is used, yet today, by the trades extensively due to ease of installation, with no regard for air volume delivery.

Editor note: Barrett's advice is good to consider; not only in the induction system, but also in the cabin heater system. ***If you must*** *use this duct, consider using a size larger flex duct and keep the length to a bare minimum. Note how the high performance ram air boxes have no rough duct faces in them. Guess why!*

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