Automatic Engine Dryer Project

New and improved since 2007

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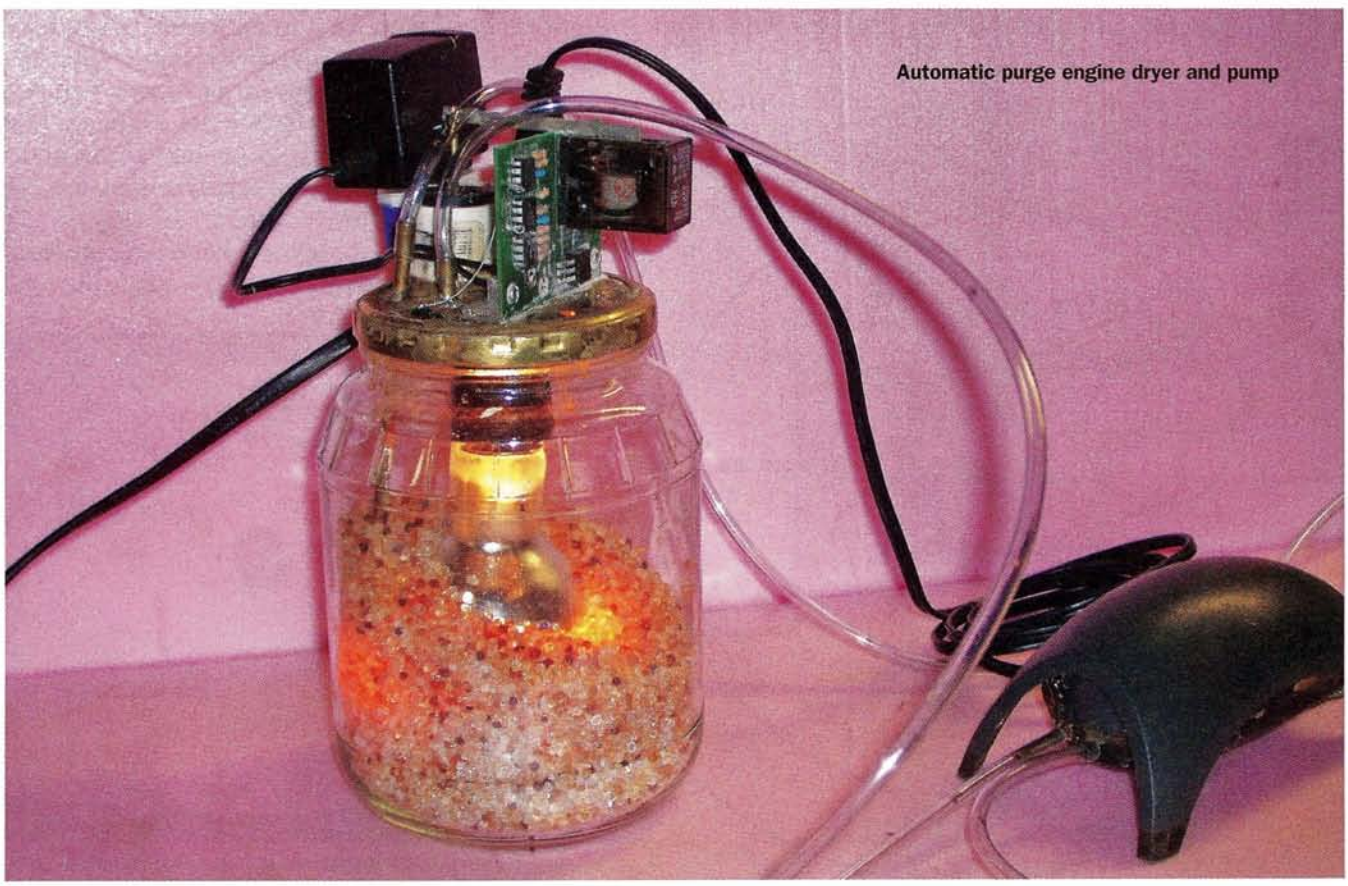
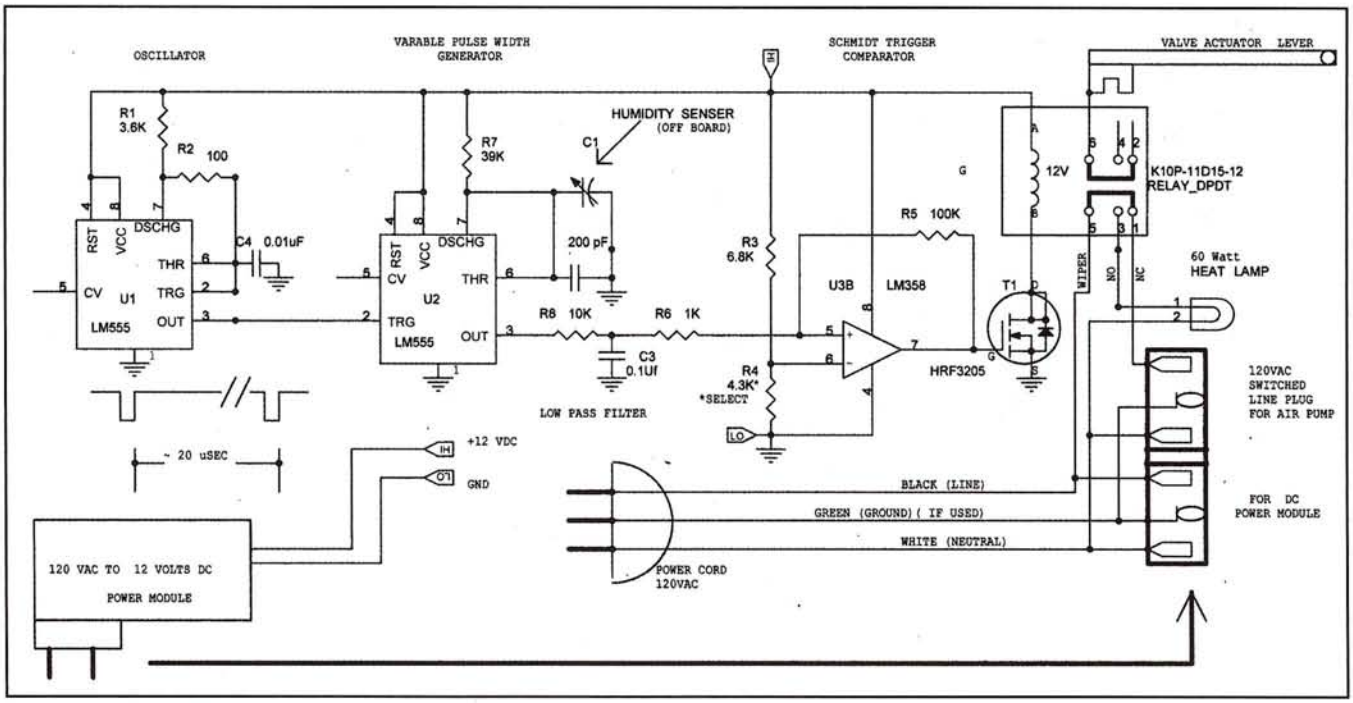
Since the first do-it-yourself engine dryer kit story appeared in the April 2007 issue of *EAA Sport Aviation*, several hundred EAA members have built one for themselves. This simple unit is an inexpensive way to help get your engine to its rated time between overhauls. However, several limitations of the original design have become apparent, particularly in humid parts of the world. Some users have experienced short service intervals because of the need to re-dry the silica gel. These round trips to the kitchen oven can be a nuisance.

The following design automates the entire process, featuring "plug in and forget" operation. The original design has been updated to include electronic humidity sensing of the moisture content in the silica gel. When the moisture content reaches a preset threshold, the engine air circulation pump is shut off. At this point, a purge valve for the silica gel desiccant reservoir opens to the ambient environment, and an internal heat lamp turns on to warm the silica gel to about 200°F. This drives the moisture out of the silica gel. Upon detecting



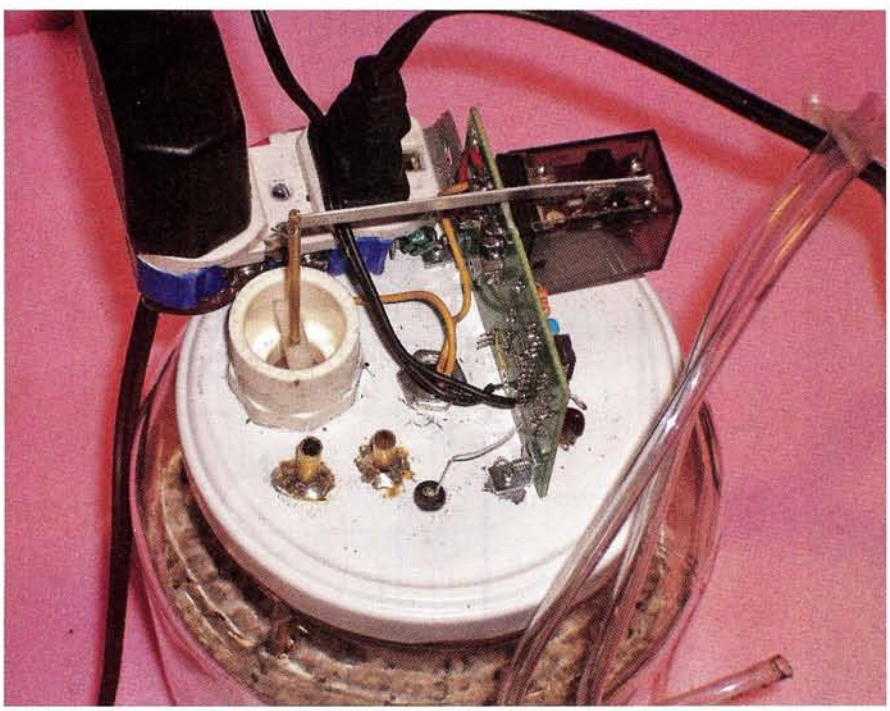
Automatic purge engine dryer and pump



Dryer controller diagram

Test fit the lid assembly on the jar. Connect all the Tygon tubing and plug all but one hose to test for system pressure leaks by blowing into the hose. The system must be completely airtight. Fill the jar approximately half-full of desiccant and carefully insert the lamp/tube into the desiccant.

Upon power up the unit will circulate dry air through the engine crankcase. At approximately 30 percent relative humidity, the sensor will switch off the pump, turn on the lamp, and open the purge valve. The heated desiccant then outgases its moisture. This can occasionally be observed as a temporary condensation near the top of the jar. With additional heating, the humidity in the jar will continue to rise and then start to fall as the moisture is driven out of the desiccant into the atmosphere. When the humidity falls below 20 percent the lamp will shut off, the purge valve closes, and the air pump turns back on for the next engine drying cycle. Typical purge time will run one to two hours. This may occur every couple of days in wet environments.



Purge valve control PC board and power supply mount on lid

Note: A thermal insulating blanket surrounding the jar (not shown) will greatly speed up the purge process. In fact, it may be mandatory in cold climates to get the temperature high enough to drive out the moisture.

A full kit of parts with detailed instructions is available for $95. A partial kit, for those who built the original one, is available; it doesn't include the air pump, Tygon tubing, silica gel, Delrin cap, and the brass air fitting for the oil cap. The partial kit price is $80. For a complete listing of materials needed to build this engine dryer, visit *www.BarkerAircraft.com.* EAA