Commander
Owners Group

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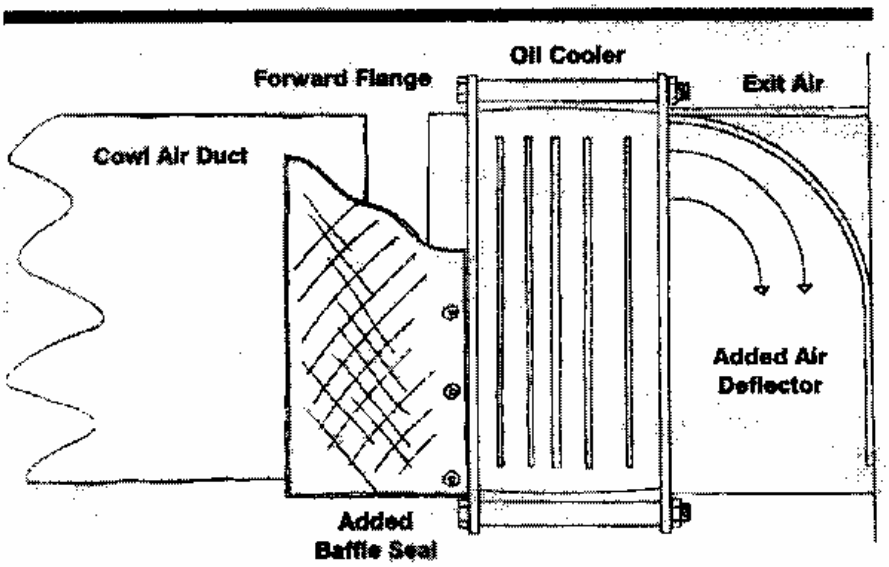
If you're a typical 112 jockey, you've been noticing those high cylinder head and oil temps in climb and high cruise. On a weekend, and with very little effort, you can make a huge difference in your engine cooling efficiency and be on the road to longer engine life. With summer here, now is the time to make your move!

Most of the cooling problems in the 112 stem from two sources. The first is air leakage from the high pressure (intake) side of the cooling air to the low pressure (outlet) side *without* being forced through the cylinder fins. The second is leakage around the cowl to oil cooler interface seal, and turbulence generated in the oil cooler exit air. This is also applicable to the 114 series aircraft.

The best way to approach the cylinder issue is to simply remove the top and bottom cowl. Take a good look at your baffle seals. if they're worn, sagging or torn, now is the time to replace them. Rolls of baffle seals are available from most outlets such as *Chief Aircraft* or *Aircraft Spruce*. The seals are easy to replace by cutting the seal to length and shape, and securing to the baffles with pop rivets. Don't forget to have your work inspected by a mechanic so you're legal. Also be sure your seals fold inward against the inside cowl stops so as to form a tight seal when pressurized by ram air. Use silicone seals for best results.

Of particular interest are the forward seals on the bottom of each cooling air inlet. They provide a flexible seal between the forward baffles and the cowl intake lips. Notice they are held up by several spring steel strips, located underneath. These are totally inadequate to hold the seals in place during flight. Press down on the seals and you'll quickly realize that when they sag, you have a one inch gap (and a really big leak!) to the low pressure side. This is air you want for cooling and it's being wasted.



Baffle seal added to oil cooler forward flange. Note air deflector placed in cooler exit air duct. This provides a smooth transition for the exit airflow.

The trick here is to remove those tired steel strips and replace them with a single piece of .032" aluminum, one for each side. Cut the pieces to 25" x 9" and rivet to the baffle using the existing holes used to fasten the old strips. Position the new aluminum underneath the baffle "shelf" and

secure with pop rivets. Cut new baffle seals using the old ones as a guide and secure to the top side of your new stiffeners.

This procedure will result in your lower cowling being slightly harder to install, as the new stiffeners have less give than the old strips. You'll find it is worth the effort. While you are on the job, be sure to locate and seal any gaps or holes in the baffling with black RTV This will ensure the cooling air is going where you want it.

As a last touch, consider painting the forward baffles matte black. This provides a very good look to the aircraft when viewed from the front. This looks even better with a black propeller!

High oil temperature can be caused by a variety of reasons, including a missing oil cooler intake seal. This is critical and provides a tight seal between the cowl oil cooler air duct and the forward flange of the cooler mount. If it is missing or damaged, simply unbolt the forward flange and rivet baffle seal around its outer edge. The goal is to provide a flexible "glove" for the cowl duct to slide into when the lower cowl is installed. Use 2" width seal and note you'll probably have to trim the outboard side to provide a good fit.

As long as we've got the cooler unbolted, there is another neat trick to be done. When air passes through the cooler, it has to take an abrupt 90 degree turn downward to exit the cowl. This generates a very large amount of turbulence in the exit airflow and has the effect of "blanking out" a good portion of the cooler rendering it ineffective, You can add a piece of "020" or "025" aluminum to the rear of the cooler mount to provide a smooth turn for the exit air. Use a piece of stiff paper to make a template for the metal. Remember, the goal is to make a rounded transition for the cooling air. Secure the top of the metal to the cooler mounting frame using rivets and use PK screws to secure the lower part of the piece to the firewall.

You will have to cut a slot in the piece to accommodate the right cowl flap cable. Seal around the slot and any other gaps with RTV.

Other causes for high oil temperatures can include a clogged oil cooler and a defective or worn cooler bypass valve (Vernitherm) or its seat. Have your mechanic consult Lycoming *Service Instruction 1316A* for details.

The hints in this article are designed for the aircraft owner to accomplish with little help required. I am working on a new induction and oil cooler intake design using NACA ducts in the lower cowl to improve efficiency. I'll keep you posted.