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More on ENGINE COOLING: (By Dr. Jake Bach, Carbondale, Illinois)

Despite all the news regarding engine cooling in the last and earlier C.P.'s I thought I'd share pictures of my solution combining aspects of all that had been written prior to C.P. 49, for a original ram cooling system for an O-235-C engine. My #4 Cyl. was always up to 100° hotter (frequently reaching 500° F) then the #1 Cyl. I used a Westack inst. with spark plug senders on the top plugs. I incorporated the Melville slicer earlier suggested by Kriedel and then added the following: 1. A large blocking baffle under Cyl. #1 (pictured below) 2. Deflecting dams on my lower cowl approx. 6" high with the dam for the #4 Cyl. set at approx. 45° angle to avoid the air line to the carb and: 3. additional baffling on the forward side of Cyls. #4 & #3 to keep the air on them for additional cooling.

My end result is #4 Cyl. runs 435° - 450° in climb & 435° at cruise and the other three Cyls. run up to 70° cooler at approx. 400°. The dams were constructed using pour in place foam and adjusted and contoured 2-3 times in flight tests before I finally covered them with 1 ply of BID. The aft dam adhered to the cowling by itself but the two forward dams were secured with 5 minute epoxy. The baffle on #1 is pop riveted to the aft baffle and bolted to the oil pan. The extra Cyl. baffles on #4 are also pop riveted to the forward baffle and wired to the inter Cyl. baffles with 1/2 to 1" gap on top.



# Air deflecting dams utilizing "pour in place" and 1 ply BID



View of blocking baffle under #1 Cyl.





### Another view of blocking baffle showing brace off oil pan.

## View of forward baffling on #4 Cyl. (ditto #3 Cyl.)

#### IO-320 Long-EZ

ED:- I recently visited Steve Volovsek and saw his Long-EZ project in Hampton Roads, VA. He is building strakes and installing an IO-320-B1A Twin Comanche engine. The Bendix fuel injection system mounts on the "mag end" of the oil sump and reduces side profile over that of a carbureted engine. The powerplant's reduced profile has allowed drag reduction and increased prop efficiency on similar airplanes. Other variations on that engine present challenges you might consider before choosing it for your project, however.

The B1A has a non-standard dynafocal mount angle, not available from the usual mount builders; Steve had to build his own engine mount. He eliminated the conventional extrusion to engine mount tube attach method and incorporated a Cozy MK-IV type attachment. Unfortunately, there is not enough room for his Bendix mag and he may have to change to a Slick for clearance.



fuel injection servo fits in firewall cut out area



The fuel injection unit fits in a cavity cut into the firewall. Alternate air will be automatically provided through an aneroid valve to the cowl air.

The unique oil sump has induction tubes located one above the other. The # 3 and 4 induction tubes are rather long and stick out beyond the desired cowl profile. It seems the induction tube placement dictates armpit inlets for updraft cooling or a cowl with large drag inducing bumps. Carl Denk has this engine on his Cosy Classic but the width is not so great a problem, on the Cosy's wider firewall.

Steve mentioned that Gary Scott of Tahoe, NV, changed to a D3G model sump and used a 90-degree elbow to attach the fuel injection unit to the bottom of the sump. That solved the intake pipe bump problem and allowed down draft cooling.

#### note protruding induction tubes



Steve's Long-EZ will have an impressively distinctive shape with the beautiful Dave Lind nose, large French style canopy and low profile bottom cowl.