Ed's Essay - Racing Engine baffles
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December 22, 2007

#77 was the first Formula Vee, that I know of , to use Racing Baffle boxes in place of the traditional engine wrap-around baffeling which has flexible sealer attached to contact the top cowling and cheek area for a pressure fit. The 'boxes' are separate, formed .020 or .025 aluminum (and later composite) containment areas to take in ram air and force it down and around the cylinders and the head. John Monnett did not cool his engine heads in the same way as most of us, and it took extra effort to get the boxes to fit tight down around the head area and Valve cover areas, but I feel it was worth it. If the Volkswagen car factory felt that it was wise to blow air around the outer portion of the head, that was good enough for me. To see Blueberrys baffle boxes, go to the Formula Vee website, which is out dated, but still up on the internet at www.formulav.com. Look under Blueberry air race team, then 'Under the hood' to see the boxes.

The baffling in this photo is actually Blueberry's second set of boxes. I designed and built the original set and Jim Vliet and Charlie Terry used pieces and Ideas from my set to build another set that went along with their racing engine.

The advantages of the boxes, in my opinion, are worth the effort. For one, it is more difficult to get the wrap-around style baffles to seal perfectly to the top cowl, and many cowling on-off-sessions are required to get a perfect fit with the templates before even cutting aluminum. As well, the major heat of the engine is generated in the head and cylinders, so why waste cooling drag on the top of the engine case?. For 'fitting' a good seal from the cowl cheek inlet to the box is done fairly easily. Any baffle assembly should be very tight to the engine. Essentially It should be able to 'hold water'. For maximum sealing of the edges to the engine, I used RTV Silicon red, as it is flexible after cure, and resists very high temperatures.

I notice that most of the International Formula One racers have gone to the box style baffeling, and several of the Sonerai builders have now been using This cooling method. The top plates of the boxes can be screwed on with tinnermans or nutplates, to facilitate spark plug removal and other maintenance.

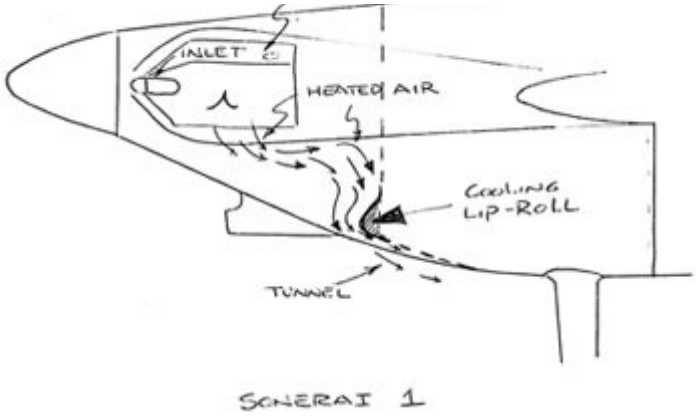
As with any baffle system, don't forget to fab and install small 'V' wedge baffles for underneath and in between the cylinders, to permit airflow to wrap around the inside and bottom areas of the cooling fins. Some VW installations have even used the automotive baffle here, for even distribution of pressure air.

Right from the start, the cylinder head temps, and Oil temperature were all satisfactory, which is unusual for an engine which is intended to be run hard in racing .

While on the subject of engine cooling, I thought I would touch on the subject of hot air exit, and the ways to achieve good efficiency in this area.

The standard Sonerais with the old 'supervee' nose shape had small, rectangular air inlets, and a tunnel exit at the firewall bottom. The objective of cooling the VW is to bring the air in, try to not force it to turn or change direction too much, slow it down to absorb 'units' of heat, then speed it up where it exits the cowl to try to match the speed of the free stream air around the lower cowl. When cool air heats up, it expands, so the outlet needs to be larger than the combined inlets. This area is where an aerodynamic 'boost' can help the exiting air flow smoothly without stalling or tripping on the lower cowl/firewall area, which is usually a sharp 90 degree bend.

A fairing with a minimum of a 1 1/2" radius can be riveted or



SONERAI 1

screwed to the bottom corner of the firewall, to keep hot air flow attached to change direction as it exits thru the tunnel.

The roll can be fabricated from light aluminum, and goes across from one lower motor mount tube to the other, trimmed around the motor mount bushings, and sealed with RTV silicon on the Sonerai 1. Use soapy water and your finger to shape and blend the RTV around the difficult intersection between the Roll and the lower mount bushings/tubes. The method looks like it would be easier to fab and install on a Sonerai 2 than on a 1.

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