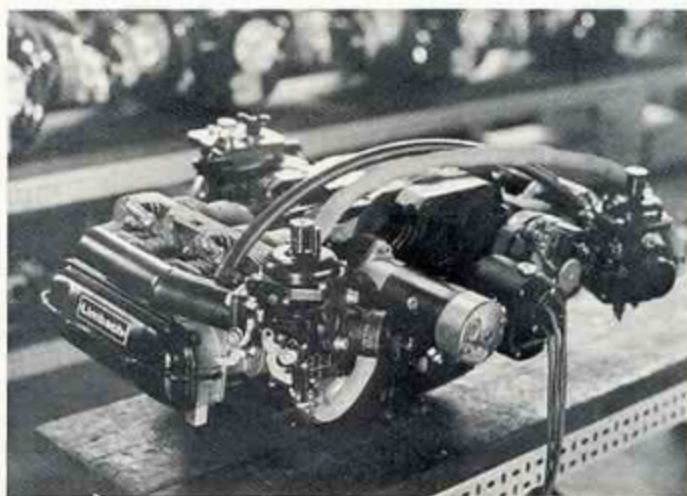
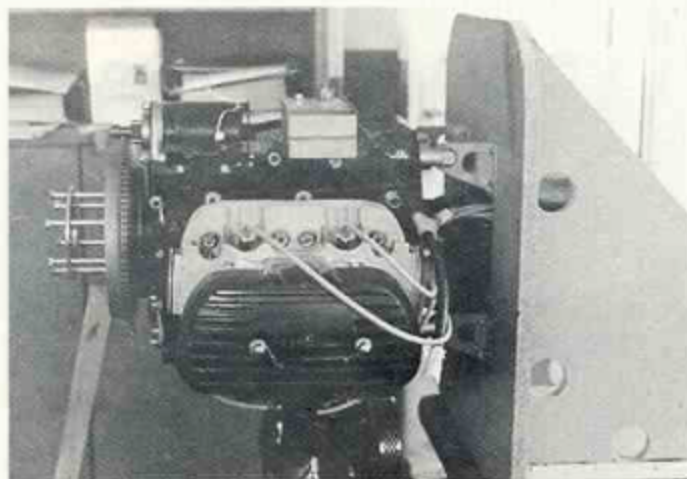




The SL 2400EB engine seen from the rear or fly wheel end. The two Stromberg Zenith carburetors Limbach manifolds, Slick magneto, Fiat starter and Ducellier alternator can be seen. This engine achieves 85 continuous horsepower at 3000 RPM.



Photographed at the Sport Avia factory a Limbach SL1700D being mounted to the future firewall of an Evans VP-2. The Doctor building the VP-2 is a personal friend of both Herr Limbach and the president of Avia. Sort of like a homebuilder being friends of Mr. Lycoming and Piper! Note the cutaway for the Bendix D2000 magneto. A complete streamlined cowling will be designed by Sport Avia for this installation.

LIMBACH'S FLYING BEETLES . . .

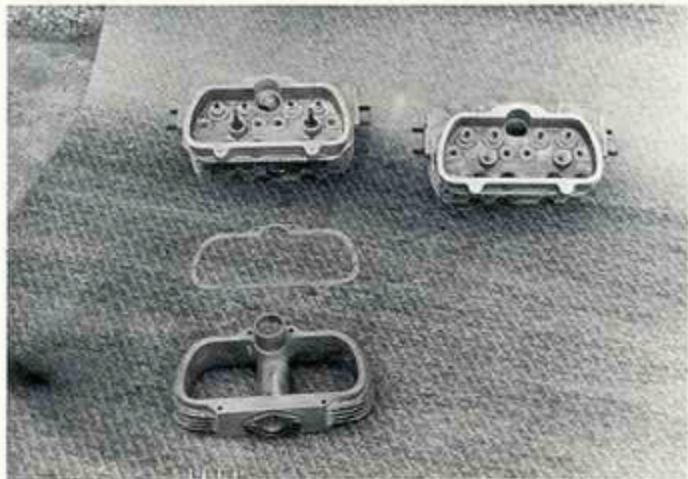
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What will an engine cost? Peter believes he can produce a basic single ignition engine without electrics and a Slick magneto suitable for a powered glider and sell it in the States for \$1,000.00 if demand is high enough. The SL 2400 with dual ignition and all electrics would cost 5000 DM or about \$2,000.00 in Germany. If some of the U.S.-made parts were installed there, saving the 125% duty and markup, and a fairly large production run of several thousand units were manufactured, this price could be reduced considerably. Peter has invested two hundred thousand dollars in the project and sold only five hundred engines. Obviously, the price must remain high at such low volume. Not to be overlooked at this point is the fact that most of the moving parts needing replacement at overhaul time are derived directly from Volkswagen.

What causes such high costs when every EAA member knows you merely bolt a prop on the fan pulley end, stick a magneto where the distributor was, and go flying? Peter showed me a welder at work on a novel (as **Mechanics Illustrated** would say) heat exchanger which cools the oil while warming the fuel air mixture. He is



Close up of the combustion chamber on a Limbach dual ignition head. The additional material cast into the head which will provide sufficient threads for the second spark plug can be clearly seen.



Head and valve housing casting. The valve housing is inverted from its position and fitted to the head directly above it. At the right is an unfinished casting. Note the cast air intake passage which permits air to come into the bottom of the valve housing, pass through it and into the center of the head and then exhausting out both ends of the head in the normal manner.

paid 20,000 DM (\$8,000.00) per year. Peter also pays into the German version of Social Security and has a participation-type shop with profit-sharing features. So, if the man works on the development of one part through several stages of testing, redesign, and construction, he may spend 2 years before they have a satisfactory solution. The labor alone costs Peter \$20,000.00. The movement of the outlet for the balance tube on the intake manifold only two inches from its original location costs \$200.00. Peter has to pay \$84.00 per hour to run his engines on the Sport Avia test stand.

What have all these costs bought in the way of providing a reliable aircraft engine? Basically, so many modifications that the engine can in no way be considered a VW. To stay cool, VW heads require 500 liters of air blowing past them each second. Merely placing them out in the airstream will not accomplish this requirement because the way they are finned the air must blow down over them, not horizontally along them. To complicate matters there is only one head on each side instead of one per cylinder so that the area between the cylinders gets a bit warmer (makes one wonder about a