

ORAL HISTORY 2014-01

Wayne Webster

January 21, 2014

Pioneer Park Aviation Museum, Fairbanks, Alaska

Pete Haggland introduced Wayne Webster. Wayne will be talking about the 4360 Pratt and Whitney engine.

Wayne Webster had a model of a radial engine. The cylinders are radially around the crankcase. There's a master rod and an articulating rod. He said he would be talking about the Pratt and Whitney 4360 Wasp. It is the largest engine and most complex engine that Pratt and Whitney put together. It was the end of the line as far as combustible engines. He said he was in the Evergreen Museum where they have a cut away 4360 engine. They move over to the display in the museum.

Wayne stands in front of the 4360 engine in the museum. He said the engine is called corn cobs. It has 28 jugs. All the jugs are the same on the 4360. Most radial engines have front and back jugs. He talked about the specifics. There are 4,360 cubic inches in the engine. There is a one piece crank. All the master rods are split so it could be assembled. He talks about how the engine is cooled. The jugs are offset. There are seven plenums between rows of jugs. Each jug gets a shot of fresh air. He said it needed quite a bit of air to keep it cool. It relies on its mass. The engine absorbs the heat until the air is flowing to cool it. He talked about C124s and their management. The 4360 engines were used in B50, B36, Fairchild C119, the Douglas C124 Globe master, the Stratofreighter, and Stratocruiser which was the only civilian use of the engine. He talked about taking off with a 4360 engine and it took quite a while for warm up. He said they were rated at 2700 rpm. All radial engines have a gear driven blower so the fuel and the air are mixed. He talked about water injection into the engine and manifold pressure to get horse power. There were two stage blowers in the military engines. There were close to 19,000 engines built. There was a lot of variance. They started building the engines in 1940. It was a secret when they first started building them. The first engine was completed in 1942. The last engine built was in 1955. The engine is built in four decks. He talked about the numbering of the jugs.

The engine in the museum was an earlier model. It is a high tension engine. It had seven mags with four cylinders per mag. As you go up in altitude the air is thinner. They would have to pressurize the mags so things don't arc and spark. The air has to be bled out. There were 56 spark plugs on the engine. He said you had to have oil to keep it moving. It had a dry sump system which gathered the oil and sent it back to the pressure pumps after it was cooled. When the oil goes through the engine it gets foamy and it can't be pumped. After two years they developed a punch plate. They used a punch plate to run the oil through it. He talked about the juncture of the engine. The intake is from the top down and the exhaust comes out the side. He said the problems were on the exhaust system. He talked about the rocker boxes and the valves. The jugs were aluminum. The engine moved around quite a bit when it was on.

Question from Pete Haggland about expansion of the cylinders. Wayne said he is sure someone has information about this, but he hasn't run across it. The liners have a choke in them. As things warm up the choke goes away and the walls are cylindrical.

He said with radial engines there is a lot of oil coming out. It is almost impossible to seal. He talked about a B17 that was in Fairbanks at one time. When it started up there was a lot of smoke which sometimes brought out the fire engine. Pan Am was getting between 1100 and 1300 hours between overhauls. It is built for long hauls. When it is all covered up it weighs 2 ½ tons. The engines were used in B36 as pushers. They were submerged in the wing. There were a lot of in wing engine fires. Air could be blown in from the top or the bottom. They used a big fan at the back of the engine. He talked about hearing 36 aircraft. They have a very distinct drone. He grew up in Fairbanks and he remembers hearing the F82. It was an inline engine. He said the exhaust system made a big difference with the sound.

Some of the 4360 engines ended up in racing machines in Reno. He talked about a Fokker built in England with a reengineered 4360 engine. The hardest the engine was run was at 80 inches of boost at 3200 rpm. When the engine is raced it uses 450 gallons of fuel an hour. They use 130 gallons of water and alcohol an hour to keep it cool. The engine is very adaptable and was used in different aircraft.

He said a C124 plane normally has 180,000 pounds on takeoff. At the end of the Viet Nam War one plane was carrying 210,000 pounds. The engine held together. He said a similar thing happened in Nome. An Air Canada plane ran out of fuel and they were able to put it down. Someone made a mistake with kilos and pounds. He said there is another 4360 engine at the university. Wayne said there is a book at the museum about the 4360 engine.