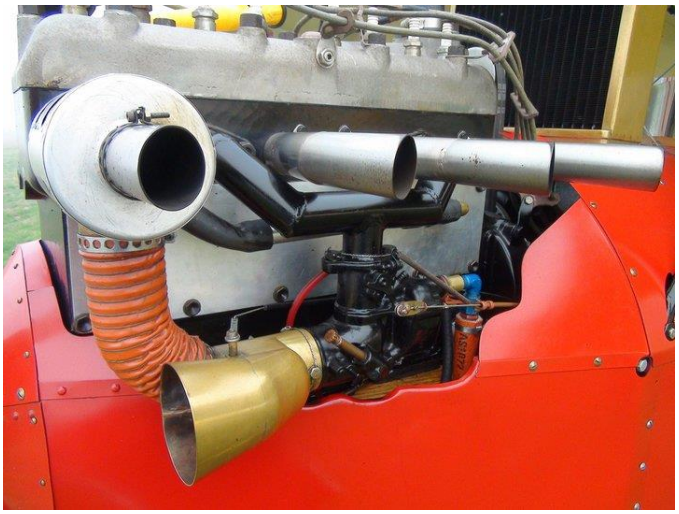
85 Years, 50 Different Engines: A Photographic Overview of Pietenpol Power

By Oscar Zuniga (with thanks to John Fay from the Matronics Pietenpol list for compiling the list)



This Ford water-cooled four cylinder inline engine and a nearly infinite number of variations of it defines Pietenpol power. However, dozens of other engines have been hung on Air Campers over the years. The following is a photographic survey of Piet powerplants through the years. Since many Piets are one-of-a-kind and are built and flown by quiet and unassuming builders, this survey is necessarily incomplete and without a lot of detail. Rural builders rarely offer details of their homebrew combinations and seldom show up at national fly-ins or events since the Piet isn't really a cross-country airplane and most have no electrics or radios.

Continental A50, A65, C65, twin A65, A75, C85, C90, O-200, and an industrial engine that was made by Teledyne Continental Motors. Avco Lycoming O-145, O-235, and O-290 GPU engine. Franklin 50, 65, and 90 HP flat-fours. Ford Models A, B, and T; Falcon inverted straight 6, flathead V-8, Escort, Cortina, and Fiesta engines. Dodge 4-cylinder inline. Funk 200, both standard and inverted configurations. Wilksch Airmotive WAM-100 diesel. Warner 145 HP, LeBlond, Salmson, Kinner, Velie, Rotec, and Lambert radials. Walter Mikron inverted engine. Rotax 912S.

Sky Scout with Chevy Vega inline 4-cylinder with cast aluminum block and cast iron head. Radiator is mounted out front on top in a very unusual arrangement.

Chevrolet Vega and 2.5L "Iron Duke". Buick V-8 and the similar Rover V-8. Corvair. Toyota 2C turbo diesel and 22R inline four that was used on two Piets in New Zealand. Subaru EA-81 and EA-82T. Geo/Suzuki 2.3L. Mercedes diesel. Mitsubishi forklift engine. BMW K100 motorcycle engine. Willys Jeep F4-134 engine.

UK builder Keith Hodge's Air Camper with BMW K100 motorcycle engine. Flat horizontal inline 4-cylinder developing 90 HP at 8000 RPM, fuel injected.

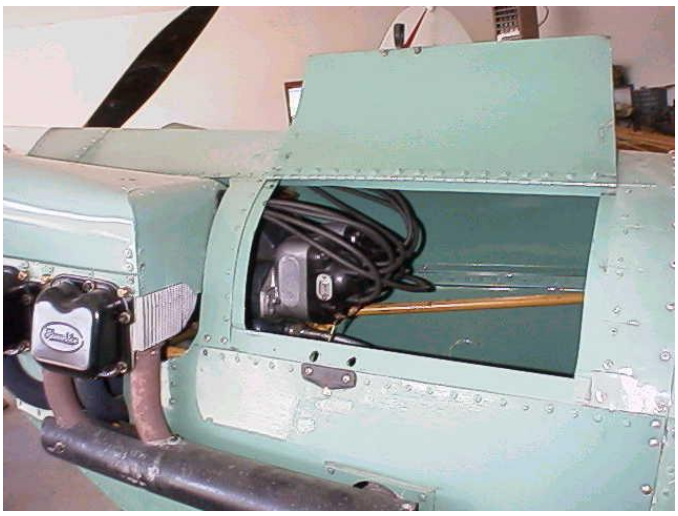
ENMA Tigre inverted four. DC electric motor. What do all of these have in common that have made them appear on engine mounts on the nose of a Pietenpol Air Camper, Sky Scout, or one of their close variants? Probably power output and weight, but very little else.

Toyota 2C turbo diesel on an Air Camper. About 87-90 HP without auto accessories.

Aircraft design is all about trade-offs. Useful load, climb rate, stall speed, cruise speed, fuel consumption, comfort, ease of construction, cost… cost… and these things all entered Bernard Pietenpol's mind when he decided to build an airplane and fly it. At the time that he laid out the lines of his Air Camper on the floor of his barn and began gluing up sticks to make the fuselage sides, the Ford Model A engine was readily available, affordable, and as reliable as any machine of its day- so that's what he used. A simple and lightweight airframe designed for low and slow flight with two aboard, fun flying around the pastures and farm fields, and the ability to operate out of short unimproved fields. Tradeoffs were made to get the airplane built and flying, and the Air Camper operational profile was forever set in stone. It is what it is, and the engine is part of that profile. The airplane will never be a speedster and it will never by a heavy hauler, but it can manage a surprisingly heavy and bulky engine as part of its inherent design.

Evan and Penny Bellworthy's New Zealand Piet with Toyota Hilux 22R engine. About 100HP at 4800 RPM, perhaps 60HP without a redrive at speeds that won't get the propeller tips supersonic.

The Air Camper, having been designed around a relatively heavy and low-powered engine with all the appurtenances of water cooling, provides vast opportunity for the employment of newer and more efficient engines. What it does not readily accommodate are lightweight engines that develop their peak power at high engine speeds, high propeller speeds, or high forward speeds. The 2-stroke Rotaxes and the smaller, lighter VW series of engines are not good candidates for use on a Piet. Even some of the lighter 4-stroke aircraft engines pose a problem with weight and balance and require longer engine mounts to work on this airframe. The result of using a lightweight engine is usually an elongated nose that doesn't do justice to the Piet's lines.



Long engine mount for the Franklin engine on Ernie Moreno's Air Camper was necessary to make the weight and balance work.

Water-cooled inline engines are the best fit for the Air Camper, as are the Corvair and other engines that improve on the Ford A engine's output in the same speed range as conventional aircraft engines. Radial engines, diesel engines, and cast-iron blocks are all fair game for this airframe.

Dick Navratil's beautiful 110 HP Rotec R2800 powered Air Camper. Lots of wood, external elevator bellcranks, spoked wheels, and the radial engine all fit the airplane well.

Lowell Frank's Warner 145-powered Air Camper. "Pieti" Frank has powered his airplane with several different engines since it was registered in 1999.

Some of the engines used on the Piet have developed and matured along with the airplane. The Corvair is a prime example of this development. First flown in the early 1960s when the Corvair came onto the market, it is now much better matched to the Piet as the years have gone by and various accessories and subsystems have been refined for the combination.

Early Corvair conversions used the stock cooling plenum with top mounted blower and the Corvair's peculiar belt drive arrangement with 90-degree turn between pulleys. Early conversions kept the stock cast pistons, cam, mechanical fuel pump, and many other parts that have since given way to lighter, more durable and reliable components.

So what does the future hold for Air Camper power? There is no doubt that many of today's popular engines will continue to be used but with the future of avgas in question and gasoline becoming scarce in many countries around the world, diesel fueled engines are a possibility. The focus on clean energy and a quieter environment have also drawn experimenters toward electric motors for power and batteries for energy.

This UK Piet is powered by the Wilksch Airmotive WAM-100, a 3-cylinder diesel derated to 100 HP for this application. Engine is designed to run on Jet A fuel.

Dennis Jacobs has ground-run this electric motor on a Piet airframe and has pulled enough static thrust to get it airborne. Lightweight, compact batteries with sufficient capacity are the focus of development.

There has not been a turbine-powered Piet, nor a jet-powered one. However, never say never with this airplane!