Phillip Lockwood et al.

A Good Engine for a KR-2S?

Answers for some Rotax questions

Q. I am writing to request information about engine choices for a plane like the KR-2S. I have purchased a copy of William Wynne's Corvair conversion book, which is well-written and I believe would produce a nice engine for this airplane.

My family has long been connected with VWs. So, a 2180 cc VW could be a good choice, too (as indicated in the plans).

Of course, either the Rotax 912, 912S, or 914 would make nice, if expensive, options. But I have become interested in a BMW motorcycle engine conversion.

In 1994 a gentleman wrote to the "Engine Q&A" department of the then-*Experimenter* and said, "I want to reduce the weight of a BMW motorcycle engine, so I went directly to the main source of weight—crankshaft counterweights—and sawed them off. What do I do now?"

The response, appropriately, was something along the line of "…I'm not a BMW engineer, so I can't tell you how to deal with your situation."

In the last 12 years there has been some significant advancement with this engine and options for reduction units. I think that it is time for an updated response on this topic. I would really appreciate it if someone could provide me with some insight on this engine option. I know that there is a German manufacturer, Take Off (*www.Takeoff-UL.de*), producing a reduction unit for current engines (installed weight 176 pounds for 90 to 115 hp), and an attempt was made to bolt a Rotax reduction unit to older engines (80-90 hp) (see *www.BMW.Flyer.co.uk*).

I expect that much more work has been done, and I hope that someone knows about it and will share it with readers. I think that the BMW engine has been used in aircraft much more in Europe than in the United States.

Thanks for any insight and information that you can provide.

Ben Loomis
Loomis@fast.net

Service Ceilings?

Q. What is the practical service ceiling of the Rotax 912UL? I want to fly out west with it next year but will have to get up to 9,000 to 10,000 feet. Without a mixture control, do I need to be able to lean-out the engine?

Gus Hawkins

A. *Engines don't have service ceilings. Aircraft do. The 912 constant velocity carbs automatically lean as you climb. Density altitude performance is always supplied by the airframe manufacturer and is determined through testing on the engine–airframe combination. With the same 912 engine, one type of aircraft could have a ceiling of 10,000 feet while a different design, perhaps lighter with longer wings, could have a ceiling of 18,000 feet.*

All normally aspirated engines will produce 75 percent of rated power at about 7,500 feet and 50 percent rated power at about 18,000 feet density altitude depending on the efficiency of the aircraft air induction system.

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Which Oil?

Q. I live in Arcadia, Florida, and recently bought a new AirBorne trike with a Rotax 582 engine. Others who fly the 582 have told me that Amsoil synthetic two-cycle oil (HPI) is great for the 582—no blue smoke and less carbon. What are your thoughts on using synthetic oil as opposed to regular two-stroke oil?

Also what is the difference between a regular 582 and the blue head?

George

A. *Rotax recommends using a two-stroke oil that meets ASTM/CEC standards, API-TC classification, mixed at a 50-to-1 ratio. Pennzoil two-cycle for air-cooled engines meets this specification and has worked well in our application for more than 10 years. We stock this product and have had good service experience with it.*

Full synthetic two-cycle oils should normally be mixed at a 100-to-1 ratio, which leaves half the oil to protect bearings after shut down. Bearing failure from corrosion, which can occur during periods of nonuse, is one of the most common causes of two-cycle engine failure. Typically, we have found mixing full synthetic oil at the richer 50-to-1 ratio, recommended by Rotax, causes severe and premature sticking of the high-performance dyke rings employed in the Rotax two-cycle aircraft engines.

The blue head 582, which is also referred to as the Model 99, incorporates a number of improvements over the old Model 90 582 it replaced here in the United States in 2000. The most important changes were the switch to ceramic water pump seals, which offer improved durability and longer life, and the thermostatically controlled bypass cooling system, which provides a more stable coolant temperature.

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