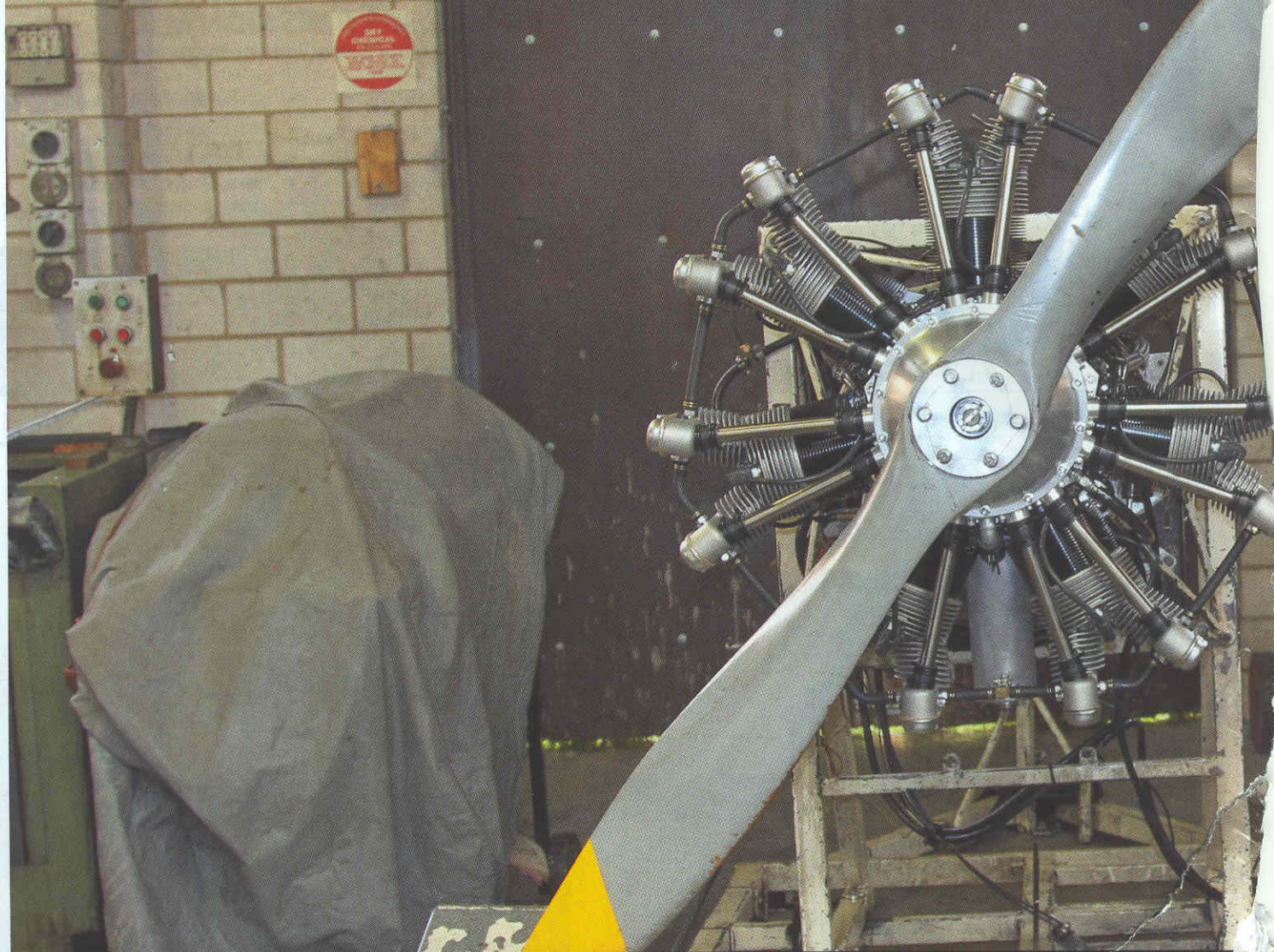


ROTEC AEROSPORT

Stuart MacConnacher reports from Australia where Rotec is developing a range of products for light aircraft



On a recent business trip to Australia, I was able to visit Rotec Aerosport Pty Ltd, which operates from an industrial unit adjacent to the General Aviation aerodrome of Moorabbin, to the south-east of Melbourne. It is the maker of the only radial engines designed for the amateur homebuilt aircraft market, and the company is run by Paul Chernikeeff, with his wife Andrea responsible for administration.

This family-run business goes back to 1997 when Paul, a builder of large scale model aircraft, decided that after building a few Gee Bees he would create a model radial engine that better suited them. The result, the seven-cylinder R-350 of 350cc, took a couple of years to build and after being featured in the Australian model magazine *Airbourne* in May 1999, Paul was approached by a homebuilder and asked if he could make a full-sized version.

This led to Paul, with his brother Matthew and father Jim, starting up Rotec Engineering to

develop and produce a practical radial engine for light aircraft. The result was the seven-cylinder R-2800, which was up and running by September 2000 and first flew on the 1 December 2000 on the front of a Slepcev Storch





— effectively creating a scale Morane MS500 Criquet. This original engine was direct drive, but was quickly developed into the geared 110hp unit that went into production and continues to be available today. Twenty R-2800s were built in 2001 and 50 in 2002, and the company hasn't looked back. In 2006, it evolved

A Jabiru liquid-cooled cylinder head (LCH), the company's latest product. It promises to cure the Jabiru's oft-quoted cooling issues

the design into the nine-cylinder R-3600 of 150hp and to date they have approaching 1,000 units out in the marketplace.

THROTTLE BODY

Not one to stand still, Paul's next challenge was to design a new throttle body injector, the TBI-40. Throttle bodies can be difficult to fine tune due to variations in fuel level and pressure, but the Rotec device has an 'on demand' fuel pressure regulator which is connected to the inlet side of the throttle body and supplies the

Above: Rotec owner Paul Chernikeeff with one of his radial engines

precise amount of fuel to the injector bar. To quote Rotec, "The metering regulator is basically a negative pressure regulator in that there is only atmospheric pressure above the diaphragm. Fuel pump pressure on the inlet side of the regulator is blocked by a flow valve which can only allow fuel to flow when the



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diaphragm experiences a drop in atmospheric pressure at the spray bar.

The underside of the diaphragm is connected directly to the TBI spray bar, therefore when the engine is running, negative pressure is created at the spray bar and this pressure is proportional to the speed of the engine. The resultant negative pressure developed pulls on the underneath of the diaphragm and this in turn opens the fuel flow valve which allows fuel to transfer to the spray bar and match fuel demand exactly!

Models of the TBI-40 are available for a wide range of engines from VWs to Lycoming O-360 and above.

LIQUID-COOLED CYLINDER HEAD

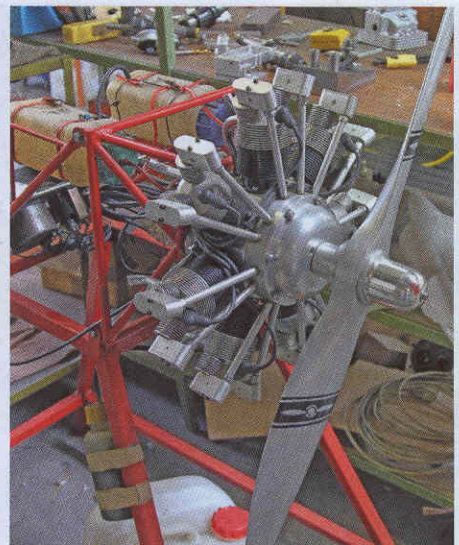
The latest product from the company will certainly be of interest to UK Jabiru owners. Aftermarket liquid-cooled cylinder heads (LCH) for the 2200, 3300 and 5100 series Jabiru engines are claimed to combat the distortion produced by overheating of the original heads and the need to regularly retorque the heads to the cylinders. These LCH have been in development for some while and the company

has carried out considerable testing to prove them. It reports that whereas a standard air-cooled Jabiru 3300 engine will reach CHT limits within two minutes of high power static operation, its 3300 test engine, fitted with Rotec heads, ran for four hours continuously at WOT (wide open throttle) and the water temperature never exceeded 85°C (185°F). The CHT measured under the spark plug of the rear-most cylinder peaked at 110°C (230°F). The ambient temperature during some of these tests peaked at 31°C.

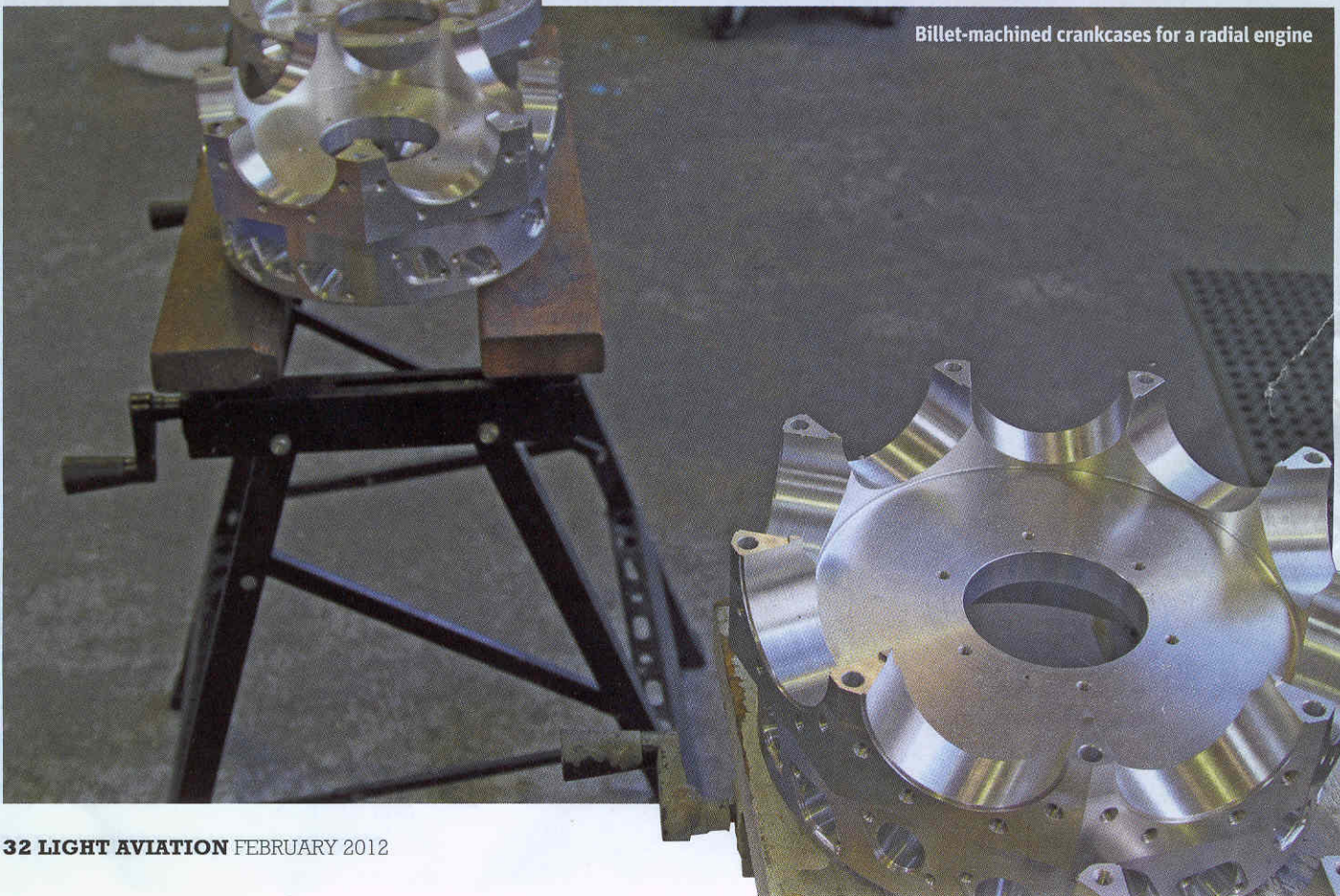
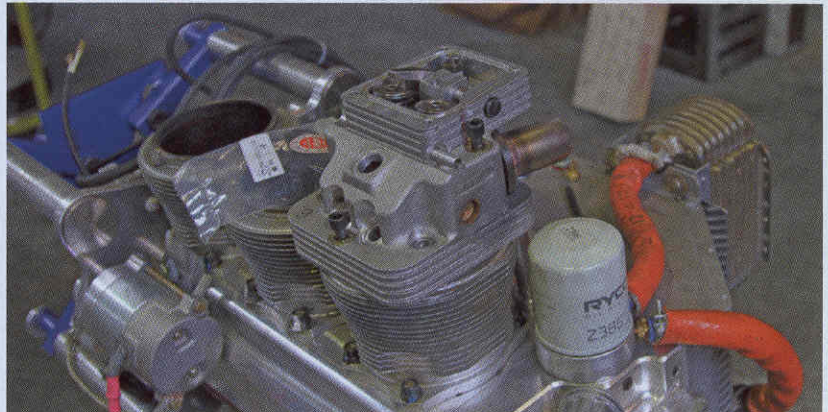
The obvious question is, what are the weight implications? Well, for the 2200 the LCH heads are around 250g lighter, per head, than stock heads, and for the 3300 they are the same, so the additional weight is confined to the radiator, water and hoses, so is fairly minimal.

There is currently one UK owner who has applied to LAA Engineering to modify his 3300 Jabiru with these heads, and Engineering is in the early stages of looking at the proposal, so maybe it won't be long before we start seeing water-cooled Jabs here in the Northern Hemisphere too.

See www.rotecaerosport.com for details. ■



Above: the model radial engine that spawned the company. Below left: a radial exhaust in its welding jig. Below right: an LCH mounted on a 3300 Jabiru engine



Billet-machined crankcases for a radial engine