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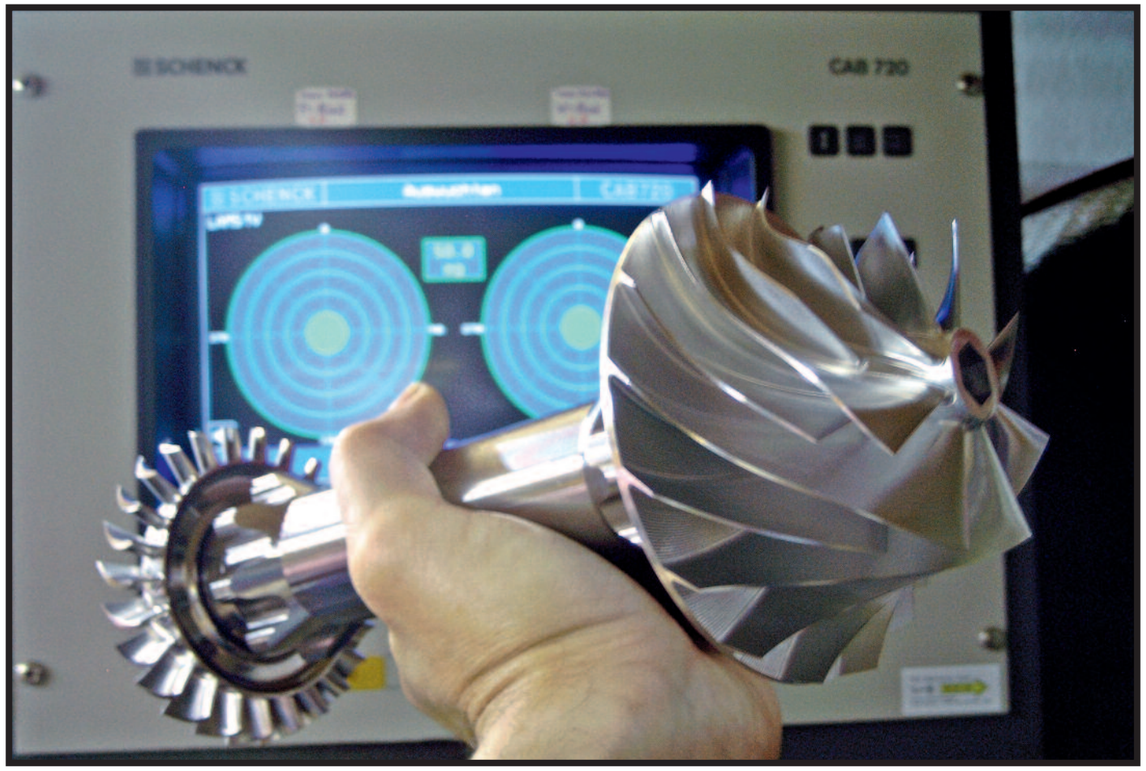

In the balancing center, turbine components in the thrust classes of 10-400 N, can be fine-balanced.

RESCUE Turbinen-Service Europe

15 years of providing service and trustworthy partnership

The company

Behind the company name RESCUE Turbinen-Service Europe stands Uwe Kannapin, who founded it 15 years ago. Many years before the founding, Uwe Kannapin already produced landing gear legs, of his own construction and design, for befriended modelers. He also mounted and tested jet turbines in small series for a trading company. Small part modules were delivered, mounted, optimized, completed and tested for functionality.

Uwe Kannapin's knowledge of turbine technology is not an accident. He is a trained mechanical engineer, airframe builder of rotor helicopters and Certified Mechanical Technician. He also developed, constructed and flew his own turbines. The interest of befriended modelers, specifically jet model pilots, of the support and service that he already delivered at that time, increased and ultimately lead to the decision to focus on servicing turbine technology. Finally, in 2003, he founded the company RESCUE Turbinen-Service. Almost all leading European turbine manufacturers supply his company with original spare parts, which is the result of a long and trusting cooperation. His customer base consists of jet modelers from New Zealand, Japan, India, China, Thailand, Israel, Jordan, Morocco, Madagaskar and USA, particularly Florida. But, first and foremost, his customers are jet modelers from all of Europe.

For many years, Uwe Kannapin presents his services and products at events like the JetPower Fair.

But his customers are not only modelers, they are also companies of the aviation and model sport industry, as well as institutes and universities, who make use of his service and appreciate it greatly. Due to his knowledge and experience with turbine engines, his lectures at diverse events are very popular. He also has his own booth at various events like the JetPower Fair, the German Jet Championships and jet meetings. In order to meet the repair and service requirements of the technically highly developed drive systems, the company disposes over a modern machine park with CNC milling and lathe machines, WIG micro welding equipment, precision balancing machine from Schenck-Rotec and a self-developed test stand for quality and final inspection.

The service

Around 90% of his client contacts are made via e-mail or phone. According to the customer's request, a distinction is made between a normal check, service and repair assignment. Check or service assignments are arranged according to the price list and are paid appropriately. If there are cost-intense damages, the client will be informed and a repair release obtained. For repair orders, the sent-in turbine will be analyzed and a precise cost calculation generated. The client can then give a release for the repair. When the repair service is finished, the turbine is end-tested at the test stand, and the result will be logged. The results of the end testing will be documented in the test report and handed out to the client.

Following services are provided: bearing replacements in turbines of all manufacturers (with a few exceptions); repair of jet turbines and shaft power turbines; functional diagnoses after crash-damages; evaluation of used turbines; high-precision fine balancing for turbines from 10-400 N; adjustment of new parts in turbines of all manufacturers; modification of turbines or addition of turbine parts due to customer request; performance of lathe and CNC-milling work in metal, based on drafts and designs of the customer; WIG micro welding of CrNi (V2A, V4A) 1,4301, titan, copper, MS, Fe from a thickness of 0,1 to 0,5 mm, other materials upon request.

The sales program contains: Blue-Line oil for model turbines in 2,5, 5,0 and 20 liter containers; JetCat turbine oil with anti-static agent; the full program of PowerBox Systems; standard

Uwe Kannapin with his „factory machine" a CARF Flash, equipped with a 140 N turbine.

FESTO products, particularly designed for turbine and landing gear systems; high-precision ball-bearings from GRW for model turbines; pressure control valves for gas launch of turbines and disposable bottles with propane/butane; fuel filter for the construction of a fuel tank.

Thanks to Uwe Kannapin's yearlong experience with turbine drives and the error causes and rates, he is the man to ask, when you need expert advice. The common error sources in turbines are the ball-bearings, as those parts, or rather accessory parts, carry an immense amount of workload in the turbine. After all, these ceramic components turn at about 2.300 revolutions per second and more, and have to provide for a perfect and error-free turning process of the rotating/rotor unit and support the system. The workload of these ball bearings in flight operation are enormous, due to heat, dirt/sand particles, in combination with the cooling air or due to gyroscope workload on the trajectories of the bearing rings and balls, or due to the impacts during starting and landing.

Another important error source at the rotor unit is a non-existing balancing of the turbine unit. It damages the whole system and leads to damages and disturbances. The heat-stressed components of the turbine control systems can exhibit errors caused by warping, material exhaustion or scaling. A warped turbine control system can disturb the operation of the turbine rotor.

Other frequently common errors or problems are insufficient fuel distribution, which can lead to an asynchronous combustion. Also, the application of spare parts, which do not comply with the quality criteria of the manufacturers, can be an error source. Repair work of laymen can result in huge damage of turbines, additionally, unprofessional repair holds great dangers for life and limb.

I could certainly present even more error sources, the above mentioned are the main areas, that have emerged in the course of years. Every component has a certain significance for a safe operation of the turbine. An unprofessional operation of turbines or unsuitable fuels, turbine oils/lubricants can always be a source of errors. In the end, an adequate understanding of the turbine is an urgent precondition for its operation. Regarding the question, if there are susceptible components in today's turbines, requiring a systematic monitoring, Uwe Kannapin responds: in the modern turbine constructions there are basically no critical parts anymore. At least, the manufacturers, I work with, install high-strength and stable materials and components in their turbines. In general, all turning components such as compressor, ball bearings, shaft, etc. should undergo a critical examination.

Another component, that has to undergo a critical examination, but which is not necessarily self-evident to all turbine operators, is the radial compressor. These components can have erosion damage caused by sand particles or signs of fatigue due to blade swings. In the event of fine cracks or if some segments chip-off, it will lead to severe damages of the rotor system. The turbine wheels are nowadays made of absolutely stabile aircraft material and survive 98 % of all other turbine components. Which is also due to the fact, that precisely these components undergo a very specific and very accurate examination regarding strength and structure in the manufacturing process, and only very few particular foundries in Europe dare to produce turbine wheels.

Another important part of the turbine system is the fuel pump. In case of a deficient pump, the undisturbed combustion and therefore a safe operation of the turbine can't be guaranteed. In the worst case, this leads to turbine shut-downs, and therefore to damage or loss of the model. Upon recognition of disturbances in a fuel pump, an immediate exchange is due. If there is suspicion of disturbances caused by the fuel pump, there should be a service check of perfect functionality. All other components and units of a turbine should also be monitored and checked, at all times, for example the combustion chamber and the sticks with injection tubes. These tasks are required, when, due to a malfunction, the turbine is delivered to our service department or a manufacturer, for repair purposes.

Every turbine is checked thoroughly.

After the maintenance or repair, every turbine is put on the test stand.

Some turbines arrive in such miserable condition after a crash.

Regarding the inspection intervals, Uwe Kannapin suggests to pay attention to the service, maintenance and repair intervals, that are indicated by the manufacturer, in order to meet the guarantee conditions. Not later than after 25 operating hours, the ball bearings of a turbine should be exchanged, although some manufacturers indicate longer operating periods. Our experience has shown, that the bearings are worn out after 10 to 20 operating hours. Which is not a sign of inferior quality of the ball bearings, but is due to turbine operation on uneven grass fields or bumpy hard tracks, which take a toll on the ball bearings with hard impacts. Turbines, operated under such conditions, have to get their ball bearings exchanged much earlier than turbines operated on smooth and clean surfaces, suggests Uwe Kannapin. Also, using the incorrect type of oil, not using enough of it, or not using oil at all - which can be the case, occasionally - can lead to bearing damages pretty quickly. When it comes to finding the right type of oil, RESCUE is glad to help with expert advice.

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Common mistakes during operation

The most common mistake when operating turbines, according to Uwe Kannapin, is the lack of feel and sensitivity for the drive system of a jet turbine. Nowadays, the turbines are almost fully user-friendly systems, making life easy for their operators, just flip the switch and the engine starts, like in the big machines. And that's what makes some of us forget, that a jet turbine is a high-precision system, which is also very sensitive. So, switching from piston drive to jet turbine holds many peculiarities and dangers, that have to be dealt with. Often the same mistakes are repeated and require professional repair at our RESCUE service. The handling of a turbine is explained extensively in the manuals of the manufacturers and should definitely be paid attention to. Common mistakes during the starting operation of a turbine are too little fuel in the fuel tube or a leaky tank system with bubble formation in the piping system. If the fuel is out of date or its water content is too high, it cannot be used. Also empty and insufficiently charged batteries are a common problem. The batteries you choose should always be the ones suggested in the manuals. Using the wrong batteries with not enough capacity can lead to malfunction.

After several false starts, the combustion chamber is possibly flooded. This can lead to the so-called hot start, where, in turn, the uncontrolled combustion of fuel in the combustion chamber can lead to turbine damages. Even using the wrong fire extinguisher (no powder extinguisher!), or the wrong handling of the fire extinguisher, are common mistakes during the operation of turbines. For prevention of short circuits, you should definitely pay attention to choosing the right polarity, when applying cable extensions to the ECU.

Purchasing and selling used turbines

Due to the large number of old and used turbines on the market, you will encounter some nasty surprises when purchasing a used turbine online. Often, the turbine condition is not as described. That's why Uwe Kannapin recommends to buyers and sellers to have the turbine checked at a professional service or manufacturer, before the buying or selling process. Especially, if the turbine is a little outdated. A considerably high amount of turbines he has checked, had damages. And even the wrong components or handicraft parts installed. Or the abrasion of parts was so advanced, that these turbines were, economically speaking, a total loss. Even used turbines are offered at high prices and an examination is the right way to go, preventing a law suit.

When Uwe Kannapin founded his company RESCUE Turbinen-Service, he was facing diverse critics, who forecasted, that he won't be successful. But, against all odds, he still runs his company, successfully. His expertise and his high-quality work are of high demand all around the world. Thanks to his expertise and his yearlong experience with jet turbines, his honest consultation of his clients is his highest aim. This is also a guarantee for a successful development of his company in the future. JetPower wishes him and his company RESCUE Turbinen-Service EUROPE an ongoing success and all the best for the future.

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