

## Test Report about 400N AMT PSR turbine installed on DuoDiscus-J

In winter 2014/15 a 400N turbine was installed on a DuoDiscus for the first time.

Since this engine does not have a Type Certification, we received a half year period Permit to Fly from EASA and LBA, which allowed us to assess whether this 400N engine is suitable for two seaters and open class gliders for self sustained flight.

Schempp Hirth confirmed that the wings of DuoDiscus and DuoDiscus-T are identical. Based on this information the weight of non carrying parts was increased by 50kg.

The weight of the complete propulsion system is 57kg including 33kg kerosene and 11kg lead located in the nose of the fuselage. The whole system is installed inside of the fuselage. In this configuration the pilot weight limit remains at 210kg.

Based on the experience of the Akaflieg Karlsruhe with the same 400N engine installed on a DG1000, the distance between the engine exhaust and the vertical tail must be at least 4m, in order to reduce the exhaust gas temperature below the limit of 56°C.

The installed forward retracting retraction system ensures a maximum temperature of 54°C at the vertical tail.

During the summer 2015 flight test period 20 pilots were instructed and flew with the jet system. The engine was started 147 times and the total runtime of the engine is 4:50 hours.

The following performance parameters were achieved during flight test

- 220km/h maximum speed
- 180km/h horizontal speed at full power 96000rpm (max 5 minutes)
- 160km/h cruising speed at 90000rpm
- 1,0 m/s climb rate at 96000rpm at 115km/h
- 0,8 m/s climb rate at 90000rpm at 115km/h
- 160km range in saw tooth flight mode with 33kg kerosene tank filling

Aerotow tests were conducted with an 80hp Falke and running engine. Lift off is achieved after 250m of runway and typical climb rates are 2,5m/s at tow speeds around 115km/h.

The 400N engine provides the same performance for two seaters and open class gliders as the EASA certified PSR T01 engine with 230N thrust for 15 and 18m class gliders.

All control and safety mechanisms as well as the containment concept are taken or adapted based on PSR T01 engine experience.

The conducted flight tests have proven the suitability of the 400N engine for two seaters and open class gliders.

Further information on YouTube channel of ASW20CLjet and [tech.info@psr-jet-system.com](mailto:tech.info@psr-jet-system.com), [www.psr-jet-system.com](http://www.psr-jet-system.com)

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