The needle nozzle

.... or why their life is more finite than expected ...

Let's start with the maintenance checklist

Removal/assembly of the two carburetors for carburetor inspection.				X 200 hr				See Heavy MM Chap. 73–00–00	

The 200h check clearly describes how to weigh the floats. After the float tragedy, everyone should be aware that special attention must be paid to this. After all, you don't want the engine to simply run down.

The other wear parts to be checked in the float chamber are not listed in the checklist but are quickly listed:

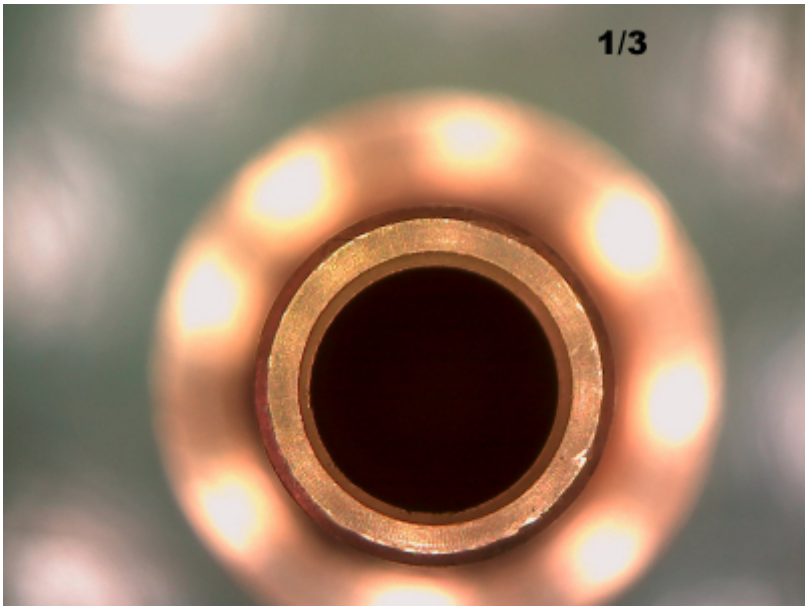
- Float needle valve
- Float suspension

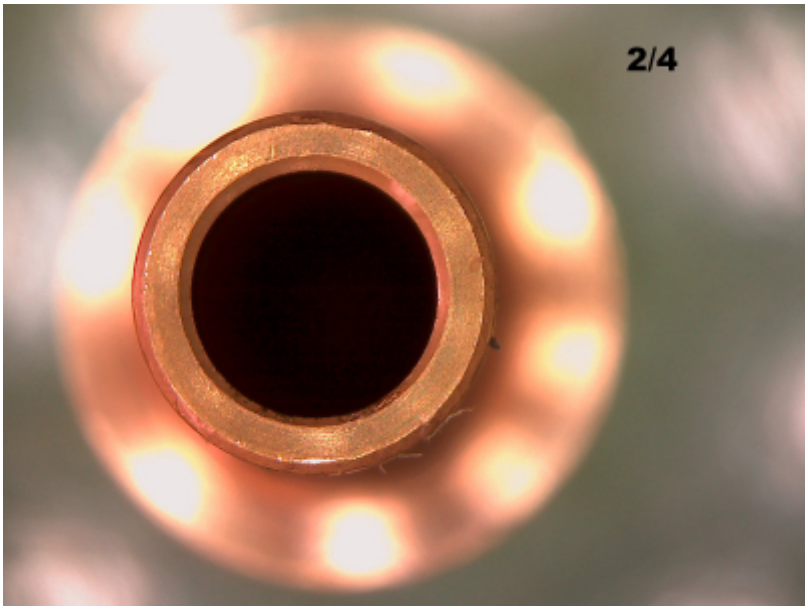
.... but there is nothing in the manuals about a needle nozzle - why this topic now?

Unfortunately, depending on the vibrations of the carburetor, it is subject to considerable wear.

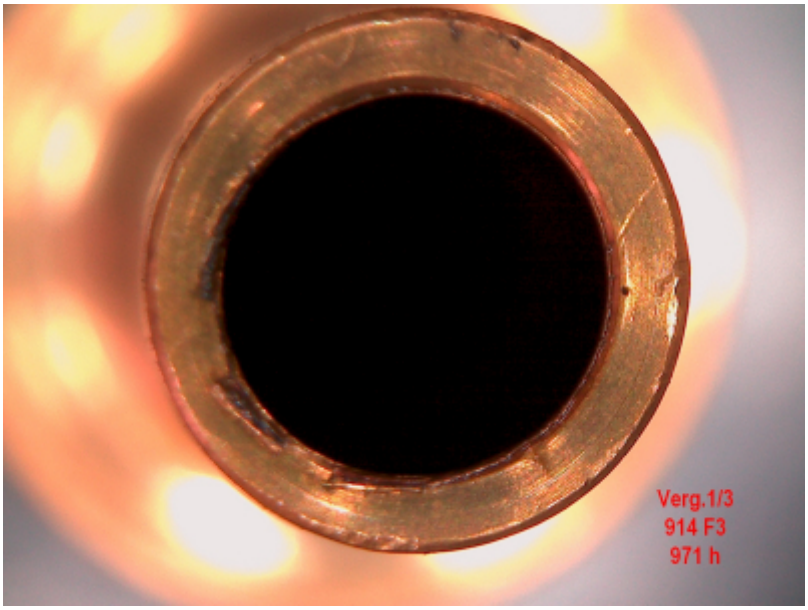
Examples

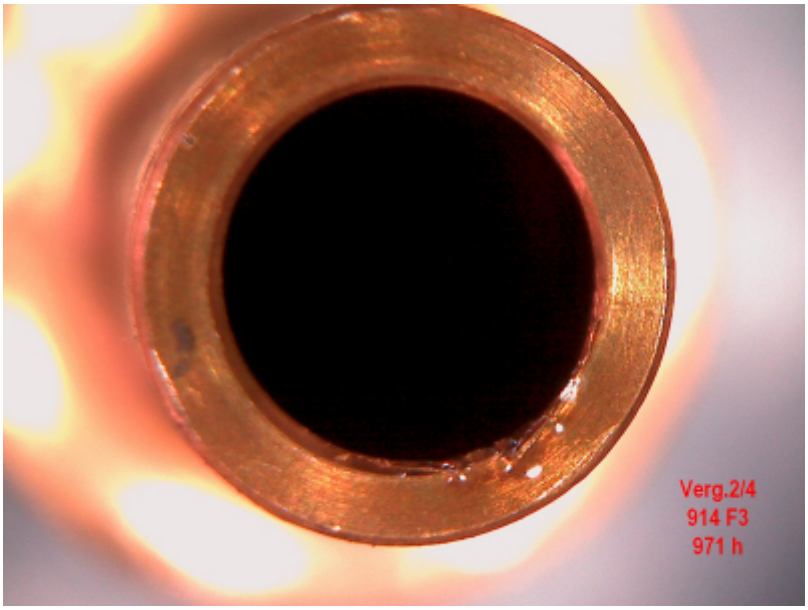
206 operating hours





971 Operating hours





A flared edge can be clearly seen on the needle jets **with 206 operating hours**, which is caused by the constant beating of the jet needle when the carburetor vibrates.
The needle jets **with 971 operating hours** of a 914 Turbao clearly show that even an engine with a permanently installed airbox can exhibit heavy wear on the needle jets.
One can imagine that the carburetors of an engine without an airbox can show even greater wear.

The problem

In the part-load range, the fuel content of the mixture in the slide/equal-pressure carburettor is measured by the annular gap that is released in the needle jet by the conical jet needle depending on the height of the slide piston.

If the needle nozzle is now deflected, the bore widens and the annular gap becomes larger with the same slide piston height.

This means a significantly richer mixture, as actually specified by the components, and the engine runs worse.
This is most significant in the 912S/ULS (100 hp) Rotax, which becomes very unstable when accelerating gently (2000-2500 rpm) as it is heavily over-rich. See also here...
If you now simply replace the needle nozzle during the 200h check, this problem is immediately minimized or does not occur at all.

Based on my experience with the basic overhaul of carburetors, I have always advocated (including during training courses) that the needle jets should always be replaced during a 200h check.
That didn't go down particularly well with some of those responsible, as they said I was giving the product a bad name.
**Unfortunately, my opinion is different: if you recognize a problem, you should try to fix it.

Conclusion

With little effort, miserable engine running can possibly be avoided quite easily....