

The fixture

I used fischer hinged pipe clamp FGRS Plus to make the fixture, mounted three of them in a row onto a used table board.



The insert provides perfect protection against scratches from the metal parts, but turned out to be too soft for effective clamping. That actually is no surprise as it has been designed for sound insulation purpose, not to prevent rotation (not a reasonable use case for pipe installation anyhow).



So I wrapped a piece of rubber mat around the pressure cylinder for added friction and tightened the clamps just enough to keep the cylinder in place. I wanted to control the torque when tightening the three screws to avoid any damaging of the cylinder. At 2.5 Nm the cylinder was effectively clamped for unscrewing the bottom piece (visible at the top of the picture, just protruding the rubber mat).



The opening tool

I used bright steel flat head nails of 3.1 mm diameter to make the opening tool because these still have a little clearance within the three holes of the cylinder's bottom piece. The nails had been too long (70 mm) and needed to be cut to 28 mm. To serve as pins, I ground their cut surface.

The tool essentially is a lever with these three pins installed at one end in a triangular pattern.

The lever is made of aluminum panel cut to suitable length and arranged in three layers, where the middle layer is only present in the pin section and half way to the other end. The layers have been glued together and the stack has been reinforced with three M3 screws at the middle layer locations.



On both sides of the aluminum stack I attached some wooden strips. This did improve the aesthetic and haptic experience, and also did protect the cylinder's bottom piece from scratches. Yet the original purpose was to serve as a template for the pin pattern. I had measured the holes to be 16 mm apart from each other and wanted to verify this isosceles triangular pattern before drilling into the aluminum stack.

Note the dent at the bottom pieces perimeter. This has been deliberately filed at the 6:00 position before unscrewing: I wanted the exhaust channel, which I would cut later, to face downward.

Returning to the aesthetics, the wooden strips should be a centimetre wider if building it again.

