

Segen Quick Change – Getting Started – Model PD438

The Quick-Change Cylinders and Knobs are being used for many different applications including Thermoforming, Injection Molding, Robotics, Automation, Stamping, Plastics and Metal Forming, Racing, Aerospace, Defense and more. We have over 250,000 PD438 style cylinders out in the field working in regular production across five continents. Some have been in use for 15 years or more without any problem. I will do my best to outline below the factors that are important for proper installation, usage and maintenance of the devices.

1. Alignment. - Although infrequent, most all of the problems reported with our quick change devices have been solved after addressing proper alignment. Correct installation of our quick-change system is critical to the functionality of the devices. Misalignment between the knobs and their corresponding cylinders could cause a malfunction. Installation guidelines for the cylinder locks are available for download on the Segen website www.toolingtechgroup.com/segen-quick-change/. As they are required to be mounted flush with their mounting plate, the cylinder locks must also be aligned with their respective knobs within .002", or the knobs could be forced to bend, stick, or fatigue.

2. Excessive installation torque. - If over-torqued, the knobs can be bent or weakened upon their initial installation into their mounting plate or tool. The knobs are designed to be tightened with the Segen Socket Set until snug, while using Loc-Tite to prevent them from backing out. (No "Cheater Pipe" Required!!). More information on the Socket Set can be found on the website: <https://toolingtechgroup.com/product/skt-segen-sockets/>

3. Air pressure. - Although air pressure is not required to hold the cylinders in locked position, sufficient, air pressure is essential for complete cylinder actuation. The absolute minimum air pressure required to fully actuate the PD438 Cylinder is 70 PSI. If the cylinders are not allowed to cycle fully, the knobs could fail to release resulting in stress on the knobs. Furthermore, if each cylinder does not receive adequate air at the same time, it is possible that one cylinder could engage its mating knob differently than the other cylinders. This could result in greater amounts of stress on one knob versus another. I suggest using a manifold to help regulate the air to the cylinder locks. This will help ensure that the first cylinder in line receives the same amount of air as the last one in line. When locking the cylinders, you also must ensure that all air pressure is removed from the air lines, or the balls could remain in the unlocked position until the air slowly bleeds off. (Another reason why a manifold or our Safety box is a good idea.)

When your new cylinders are energized with air pressure, you might notice some slight air leakage from the areas around the rear set screw and / or inside the cone where the steel balls are located. This is normal. The cylinders are not required to be completely "air-tight" in order to function as designed. Slight air leakage is expected and generally will not affect the functionality of the cylinders. Variances in metallurgy, temperature, seal durometer, set-screw threads, or air pressure can result in varied degrees of air leakage throughout a batch of quick-change products. The o-ring seal inside the cylinder is designed to seal air best at manufacturing temperatures of 100 to 300 degrees F. As long as the cylinder receives a minimum of 70 PSI of air pressure, it will unlock as designed.

4. Air Fittings. - We strongly recommend that you use our safety lock-out box (part number PD438BX) to help prevent someone from accidentally energizing the cylinders with air.

5. Temperature. - Thermal Expansion could cause metal fatigue. - If placed under too large of a stress, metals will mechanically fail, or fracture. This can also result over time from many small stresses. The most common reason (about 80%) for metal failure is fatigue. Thermal expansion can weaken the Segen knobs if they are forced to bend back and forth as their assigned tool expands and retracts. (Like when you bend a paper clip again and again, eventually the metal is permanently

deformed and it fractures.) We have designed a sliding expansion knob which allows for thermal expansion. If you believe extreme heat could be a factor in your application, please visit our website to view specifications for the sliding knobs**.

***The sliding knobs were designed to be used on a plastics thermoforming mold to allow for thermal expansion of the tooling. This allows the user to change out a mold while it is still hot, rather than waiting for it to cool down and return to ambient size. The proper layout of the knobs for thermal expansion is attached. The sliding knobs slide in one direction only, and the recommended layout allows the warm tooling to grow thermally in all directions. Use of the sliding knobs for other purposes such as providing extra “play” or “slop” may or may not work. Thorough testing is recommended for all non-standard concepts and applications of the sliding knobs.

6. Proximity Sensors. - Proximity Sensors should only be installed and calibrated at our plant. They should not be adjusted after you receive them. Before we ship the sensor cylinders to you, we test each one, multiple times with a variety of knobs. The position of the sensor barrel and mechanical bolt-stop should not be altered after you receive them. If the products become out of adjustment, please return them to us for inspection, and re-installation/calibration.

7. Maintenance. - The maintenance frequency of our quick change cylinders depends on the conditions in which they are used. A cylinder that operates under wet, dirty or high-temperature environments will need more frequent maintenance. In harsh environments, a cylinder may need to be re-built or replaced if it is leaking air due to a dry, brittle or cracked seal.

For a price of \$75.00, we offer re-build kits for the PD438 cylinders that include new balls, a new spring and a new seal. Our part numbers for the rebuild kits are: PD438CRBLT for the compact cylinders, and PD438RBLT for the regular tall cylinders. (The difference is in the length of the spring.) The kits are in stock and ready for shipment upon receipt of your purchase order. The replacement seal will be difficult to stretch over the interior piston into the groove, but it is possible and should be done without grease or lubricant. The seal will be temporarily stretched out of shape, but will retain its shape and tighten up into the groove within an hour or so. We also recommend that upon each re-build, you seal the setscrews on the back of the cylinder with silicone both inside and outside the cylinder body or rear cap to help prevent air leaks. The threaded holes and set-screws on the back of the cylinders can be sealed with clear, industrial silicone. Use a swab or your finger to dab some silicone on the inside and outside of the threaded holes after re-installing the set screws, allowing it to dry for a couple of hours before re-assembling the cylinder and actuating it.

Our high-temperature PD438 Cylinders will last longer under high heat and humidity. They are fully nickel plated for corrosion resistance and contain a long-life, high-temperature seal.

Our cylinders are engineered to be used without lubricant. When you pick up a Segen cylinder and shake it, you should be able to hear the steel balls rattle inside. Grease can attract dust and debris, causing the balls to seize up in the ball track, resulting in a failure to instantly lock. For regular maintenance, we suggest cleaning out the cylinders with a fine wire brush and a few blasts from an air hose. A small amount of light-viscosity canned spray lubricant probably would not hurt every once in a while. Special care should be taken to blow the conical area of the cylinder clean before every tool is engaged as small particles left inside the cone of the cylinder could prevent the knob from seating fully. Many of our customers have great success with first, unlocking the cylinders, then bringing the upper machine platen all the way down onto the tool, applying some pressure to it, then locking the cylinders by removing the air pressure. This procedure ensures that the tool is flat and that the knobs are all the way in before locking.

The Segen Knobs are very strong, but can incur damage if used improperly. The cylinder locks must be unlocked (energized with air) before engaging the male knobs. Forcing the knobs into the cylinders before unlocking them will break the knobs or cylinders. Segen Knobs should be replaced if they become

bent, dented, cracked or twisted as a result of machine or operator error. If the machine operator or maintenance specialist is unsure if a knob has been damaged beyond usability, they should replace them anyway. The replacement knobs are the lowest cost part of the system and cost much less than having to replace a cylinder or re-build a damaged tool or machine.

Following these guidelines will help assure you of a trouble-free transition to the Segen Quick-Change system.