"Tech Talk"

TUTTNAUER DOOR BELLOWS Stuck in the Locked Position And Now Pressure Is Building

By Chris Jacobs, RPI Product Development

Your Tuttnauer autoclave may have run a perfect cycle with zero pressure left in the machine, you go to spin the handle but it stops and you can't get the door open. Depending on the model (ie. a mechanical vs. an electrical machine) the door bellows could be stuck in the locked position and now pressure could be building behind the door making it impossible to open the door.

So what do you do? First thing is to ensure that the machine is not allowed to heat any longer by either powering the unit off or by unplugging the unit.

Now it's time to get a good look at the problem; so remove the cover to gain access to all the parts that are keeping the door closed. Reach inside the reservoir with a screwdriver and use it to pull the safety relief valve's key ring to relieve pressure inside the chamber. Remember the air coming out will be hot and if the chamber is still warm, pressure can build up again.

If the door will still not open, then you will want to look behind the door closing mechanism to locate a large black bolt (it is a 7/8 hex on most Tuttnauer autoclaves). This bolt is keeping the door closing mechanism in place (see illustration to the right). You can unscrew this bolt and literally slide the whole closing mechanism out allowing the door to open. At the very least, you can loosen this bolt enough to allow you to swing the closing mechanism away from the door bellows locking pin.

In some rare cases, if that does not work, you have one last option at your disposal. At the point where the closing mechanism meets the frame of the chassis you will see the closing mechanism branch into a "E". Locking the "E" into place is a cotter pin with an "C" clip. You can remove the "C" clip and use a rubber mallet to tap out the cotter pin.

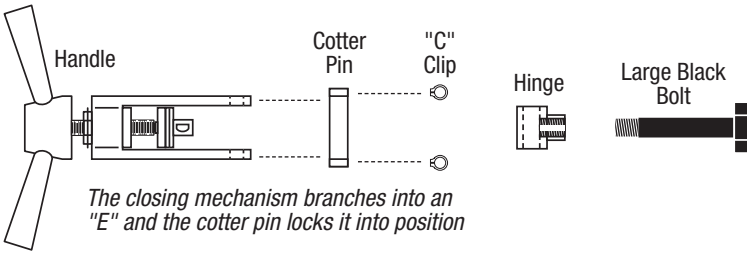
As a warning, if there is any pressure behind the door, you may damage the cotter pin in the process. That is why this is considered a last resort and shouldn't be used unless all else fails. Now that you have the door open you have only to contend with the door bellows itself.

The easiest way to get that out is simply unscrew the bolts housing bolt and then use compressed air on the hole on the interior of the door to force the bellows assembly out of the socket. Just use a rag or exam glove over the bellows housing to catch all the components.

See the "Door Bellows Housing" illustration below, and note that there are six parts to the bellows housing: the bellows, locking pin, brass bushing, gasket, bellows sleeve and the bellows housing bolt. The illustration above will give you the correct order that the parts must go in. One of the most crucial things to remember is the direction of the bellows sleeve. One side is actually tapered, making it thicker internally on one end than the other. The thicker end must slide in first to leave the thinner side to accommodate the housing bolt.

Door Closing Mechanism

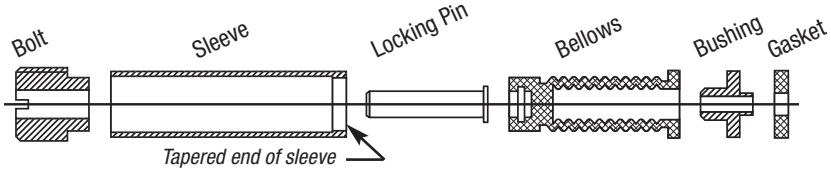
There are several options available to open a chamber door that is locked in position due to pressure inside the chamber. Two of these options involve the large black bolt behind the door closing mechanism.



The closing mechanism branches into an "E" and the cotter pin locks it into position

Door Bellows Housing

Note the correct order of the parts and the tapered end of the sleeve.



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