

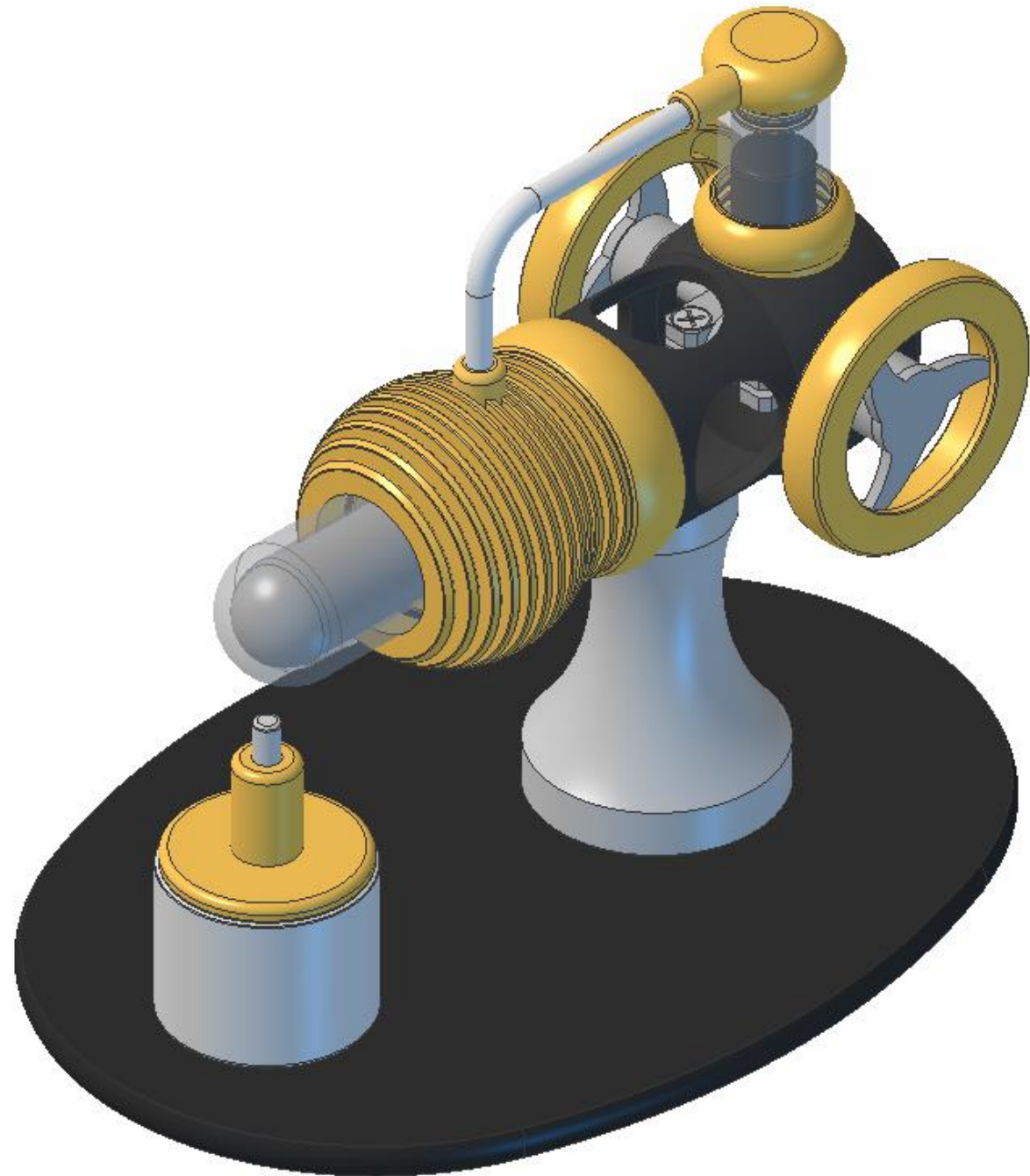
Kontax Stirling Engines KG09 instructions

This document covers the following:

- [Tools required](#)
- [Parts list](#)
- [Assembly instructions](#)
- [Operating instructions](#)
- [Maintenance](#)

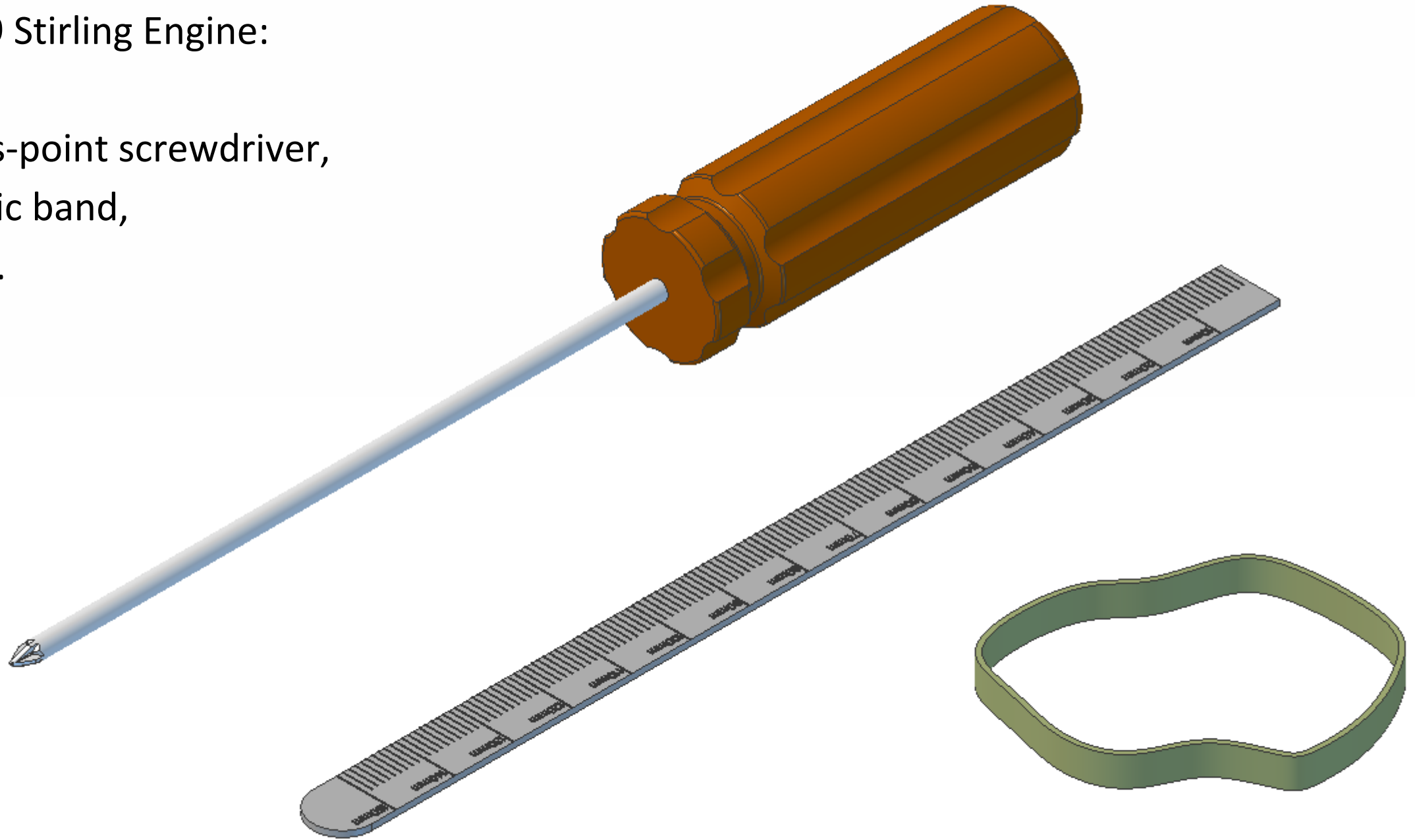
Contact details:

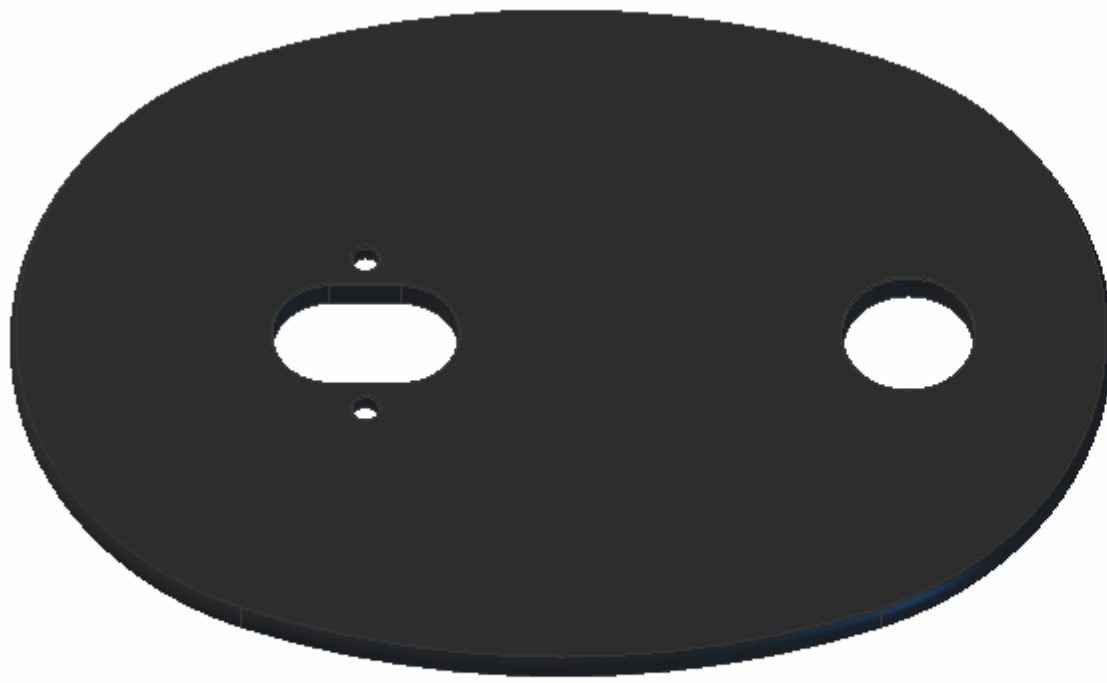
- www.stirlingengine.co.uk
- Kontax@btconnect.com
- Tel: 01452 905001 (UK)



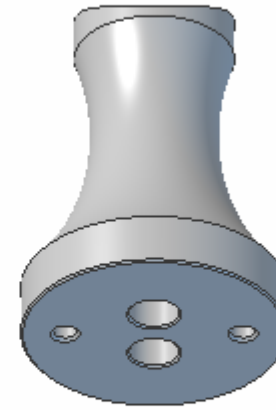
Tools you will need to assemble your
KG09 Stirling Engine:

Cross-point screwdriver,
elastic band,
ruler.

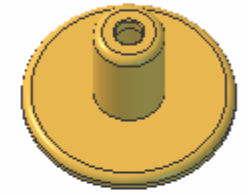




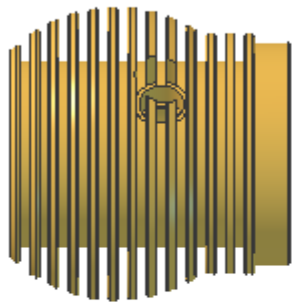
Base plate x1



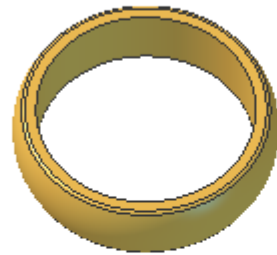
Bottom pillar x1



Burner cap x1



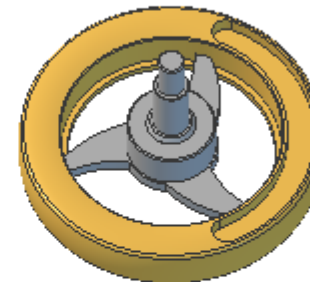
Fin block x1



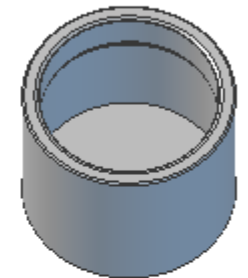
Joint ring x1



Cradle x1



Flywheel x2



Burner body x1



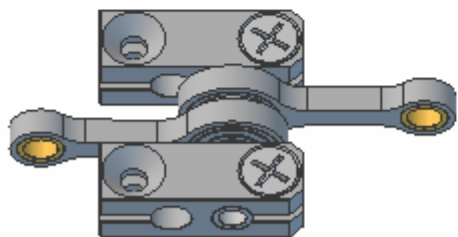
Displacer stem x1



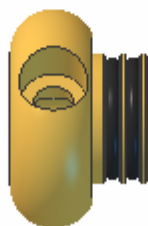
Displacer x1



Glass dome x1



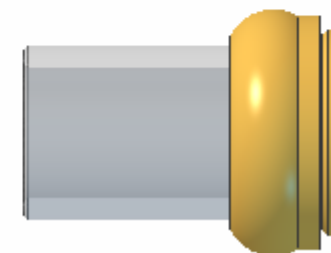
Crank & conrod
assembly x1



Cylinder
Port x1



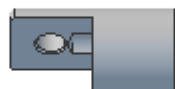
Piston x1



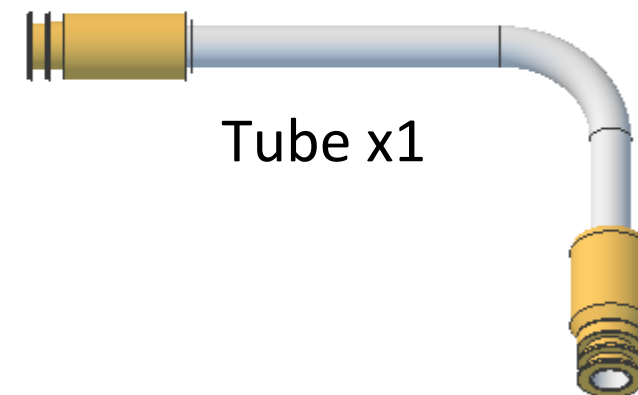
Cylinder x1



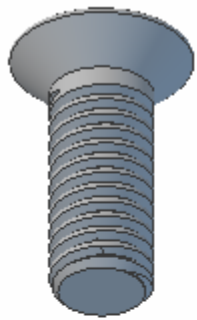
Wick x1



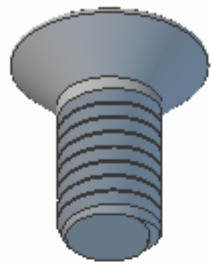
Displacer clevis x1



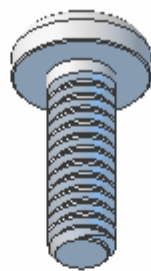
Tube x1



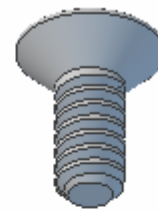
M3x8mm
countersunk x4



M3x6mm
countersunk x4



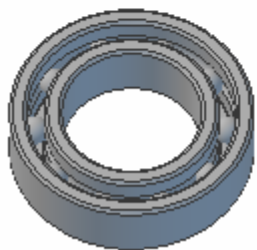
M2x6mm
roundhead x2



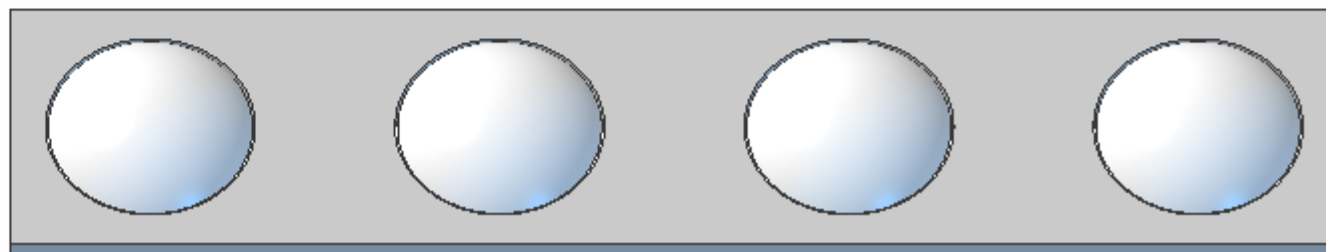
M2x5mm
countersunk x2



Conrod bush x2



4mm Ball-race
bearing x2



Feet x4 (1 strip)



17mm O ring x2



13mm O ring x1



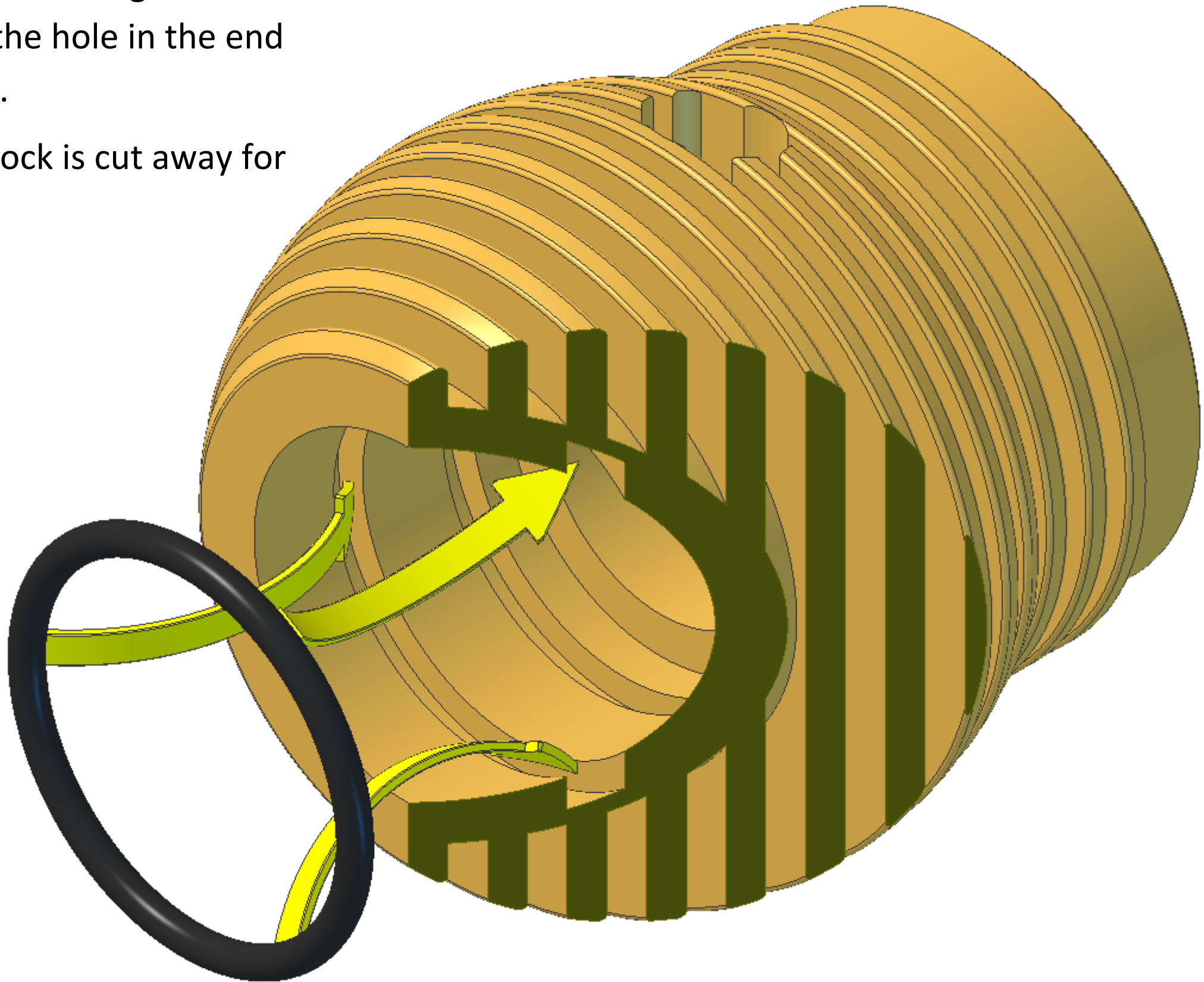
7mm O ring x2



3mm O ring x4

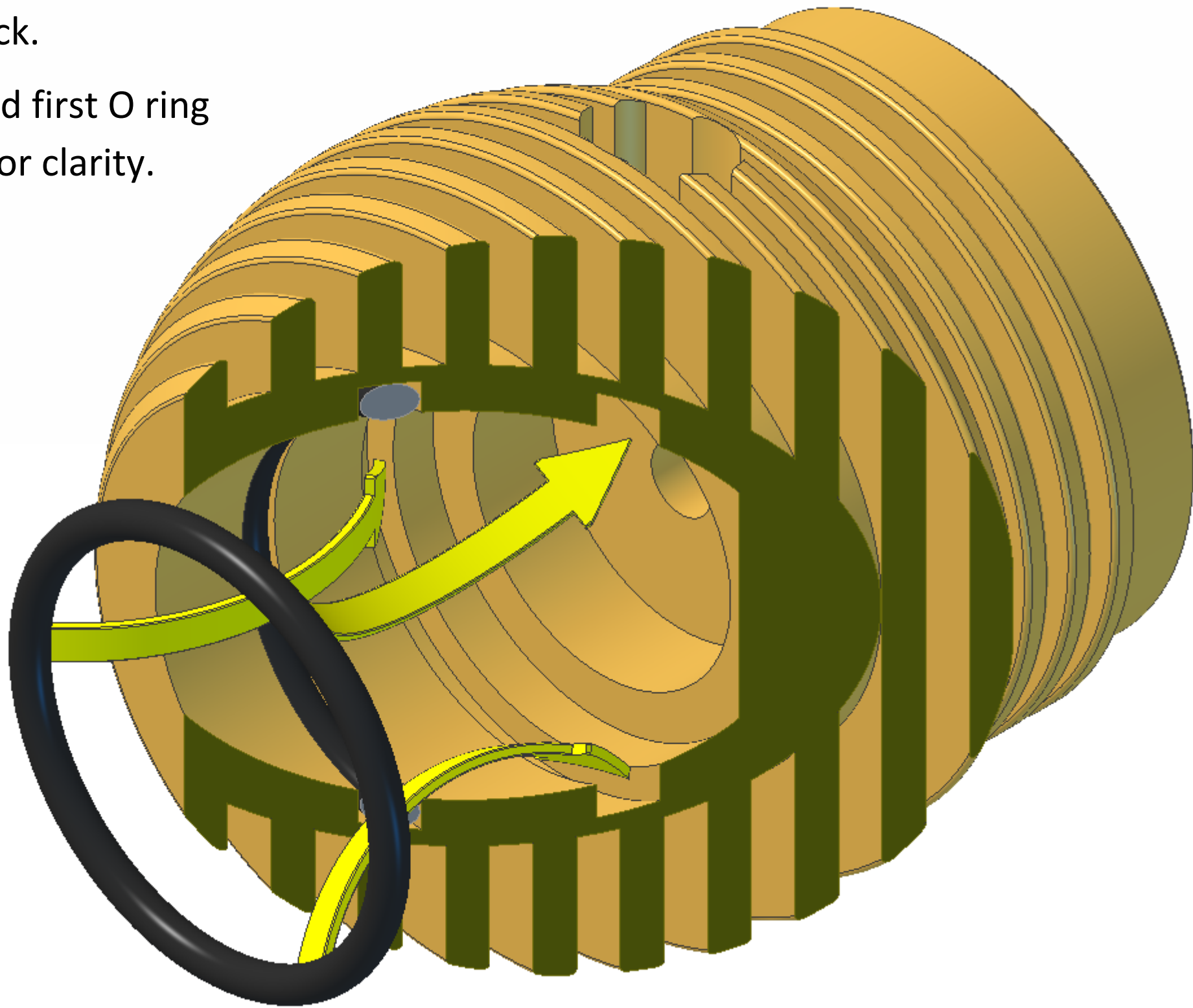
Fit the first 17mm O ring into the first groove in the hole in the end of the fin block.

Note, the fin block is cut away for clarity.

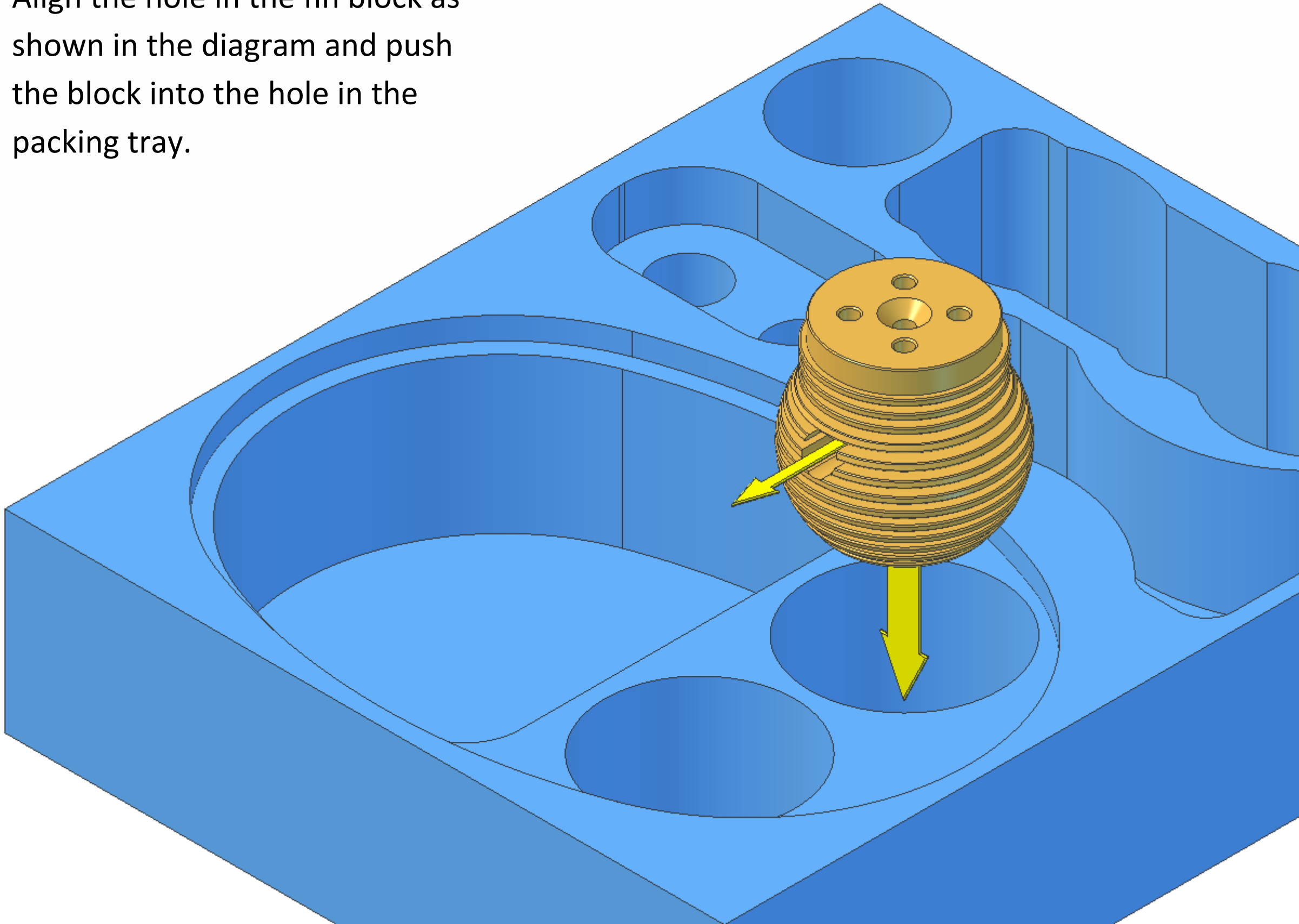


Fit the second 17mm O ring into the second groove in the hole in the end of the fin block.

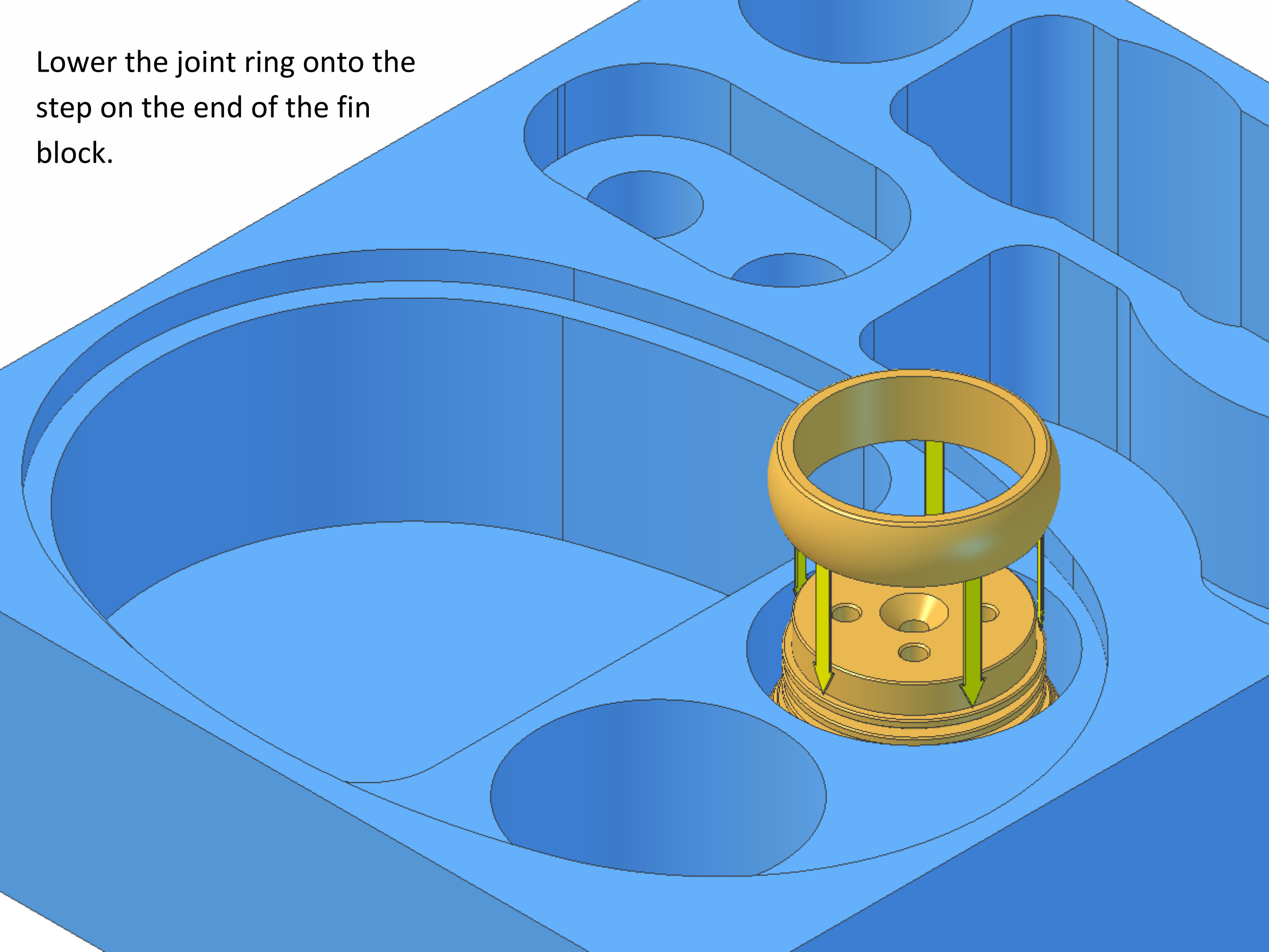
Note, the fin block and first O ring are shown cut away for clarity.



Align the hole in the fin block as shown in the diagram and push the block into the hole in the packing tray.



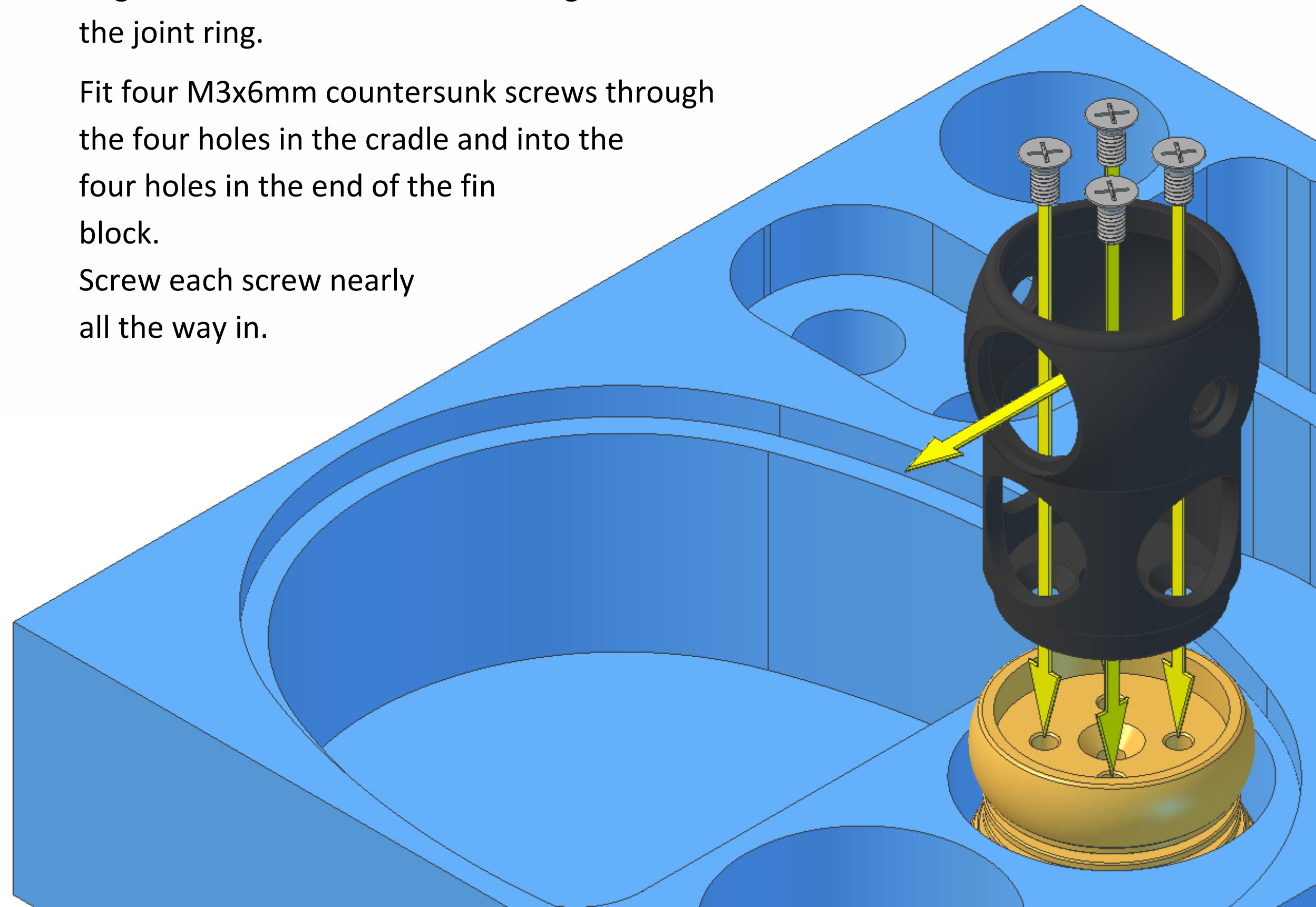
Lower the joint ring onto the step on the end of the fin block.



Align the cradle as shown in the diagram and lower onto the joint ring.

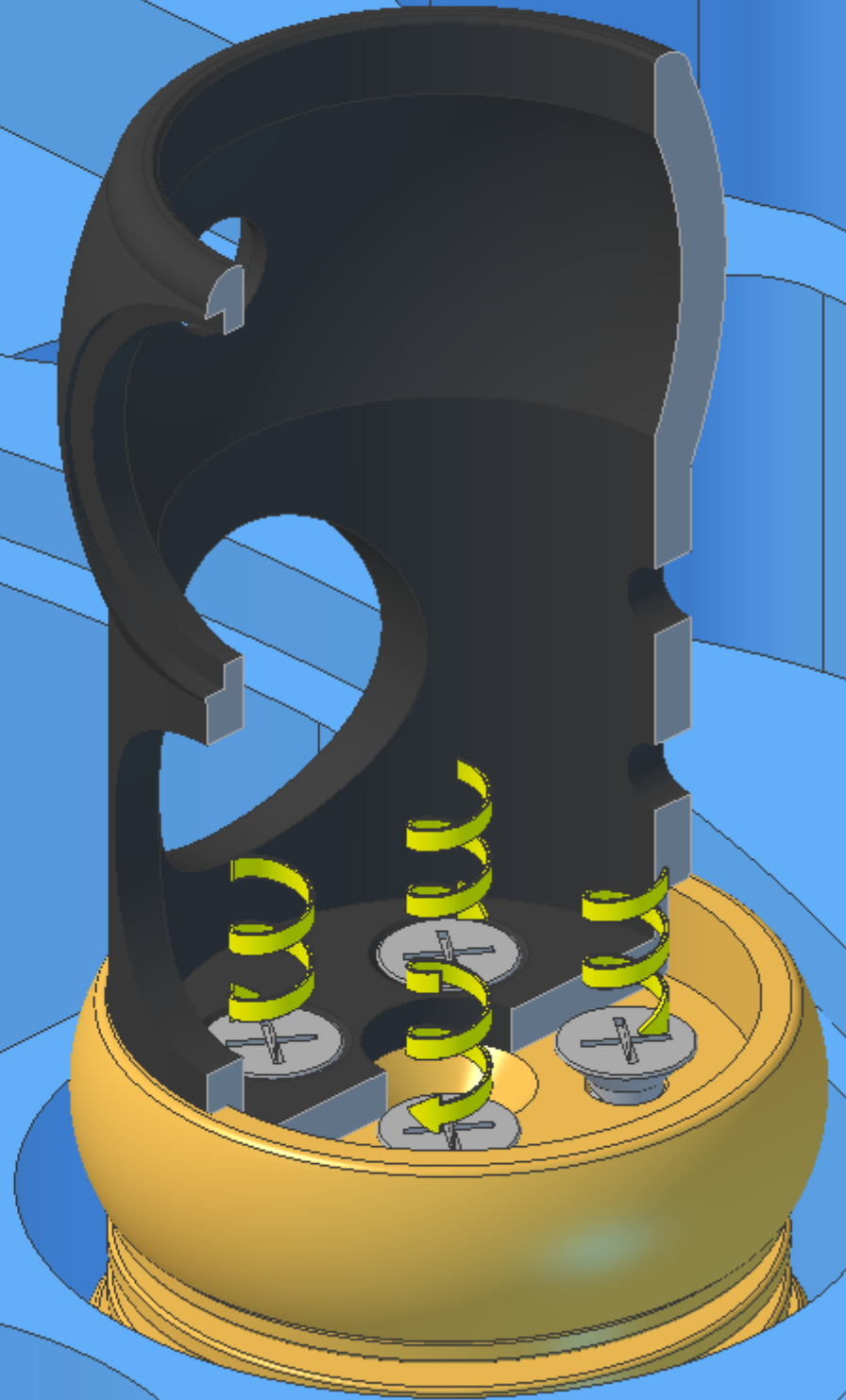
Fit four M3x6mm countersunk screws through the four holes in the cradle and into the four holes in the end of the fin block.

Screw each screw nearly all the way in.

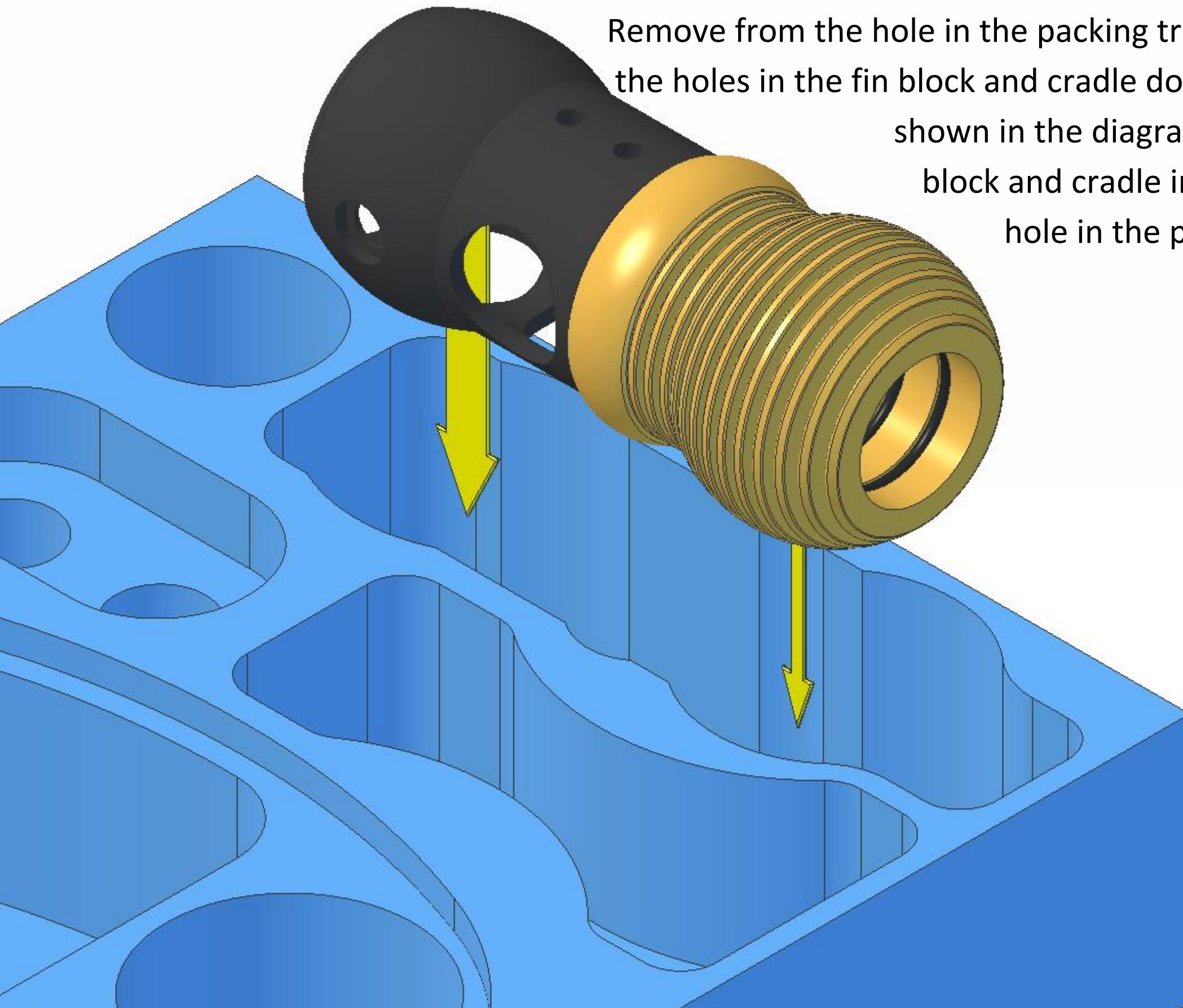


Fully tighten all four screws.

Note, the cradle is shown cut away for clarity.

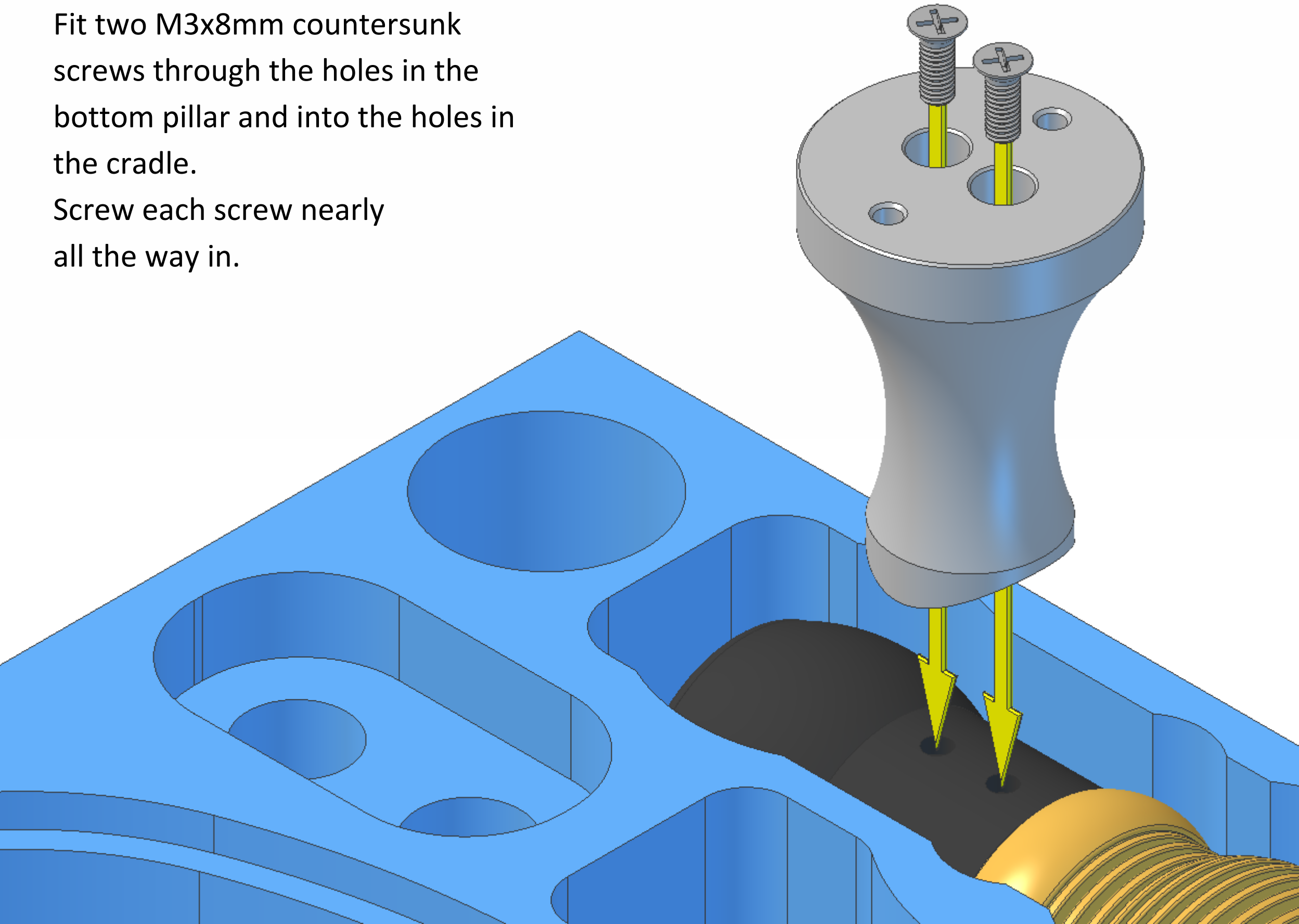


Remove from the hole in the packing tray and align the holes in the fin block and cradle downwards as shown in the diagram. Push the block and cradle into the long hole in the packing tray.

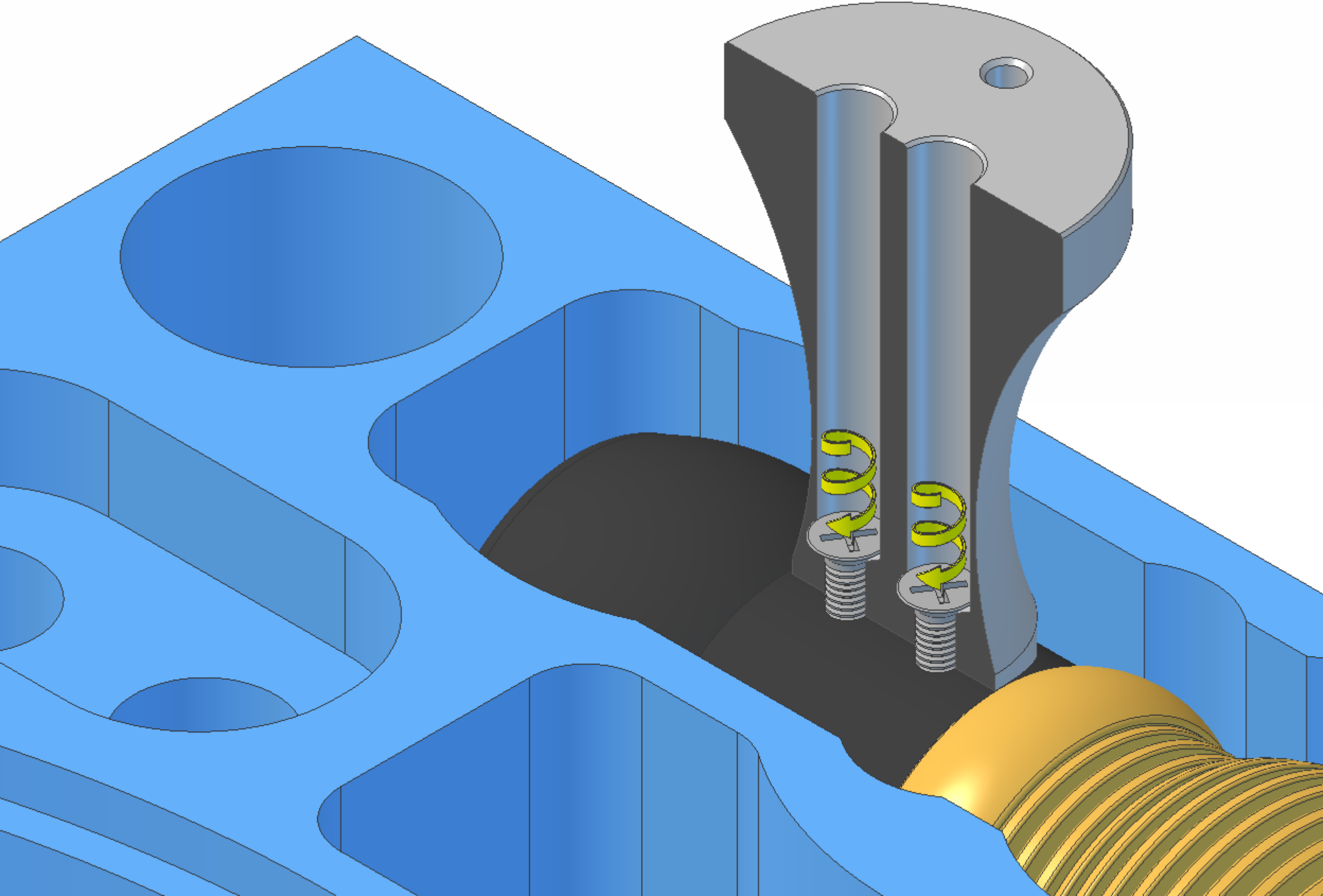


Fit two M3x8mm countersunk screws through the holes in the bottom pillar and into the holes in the cradle.

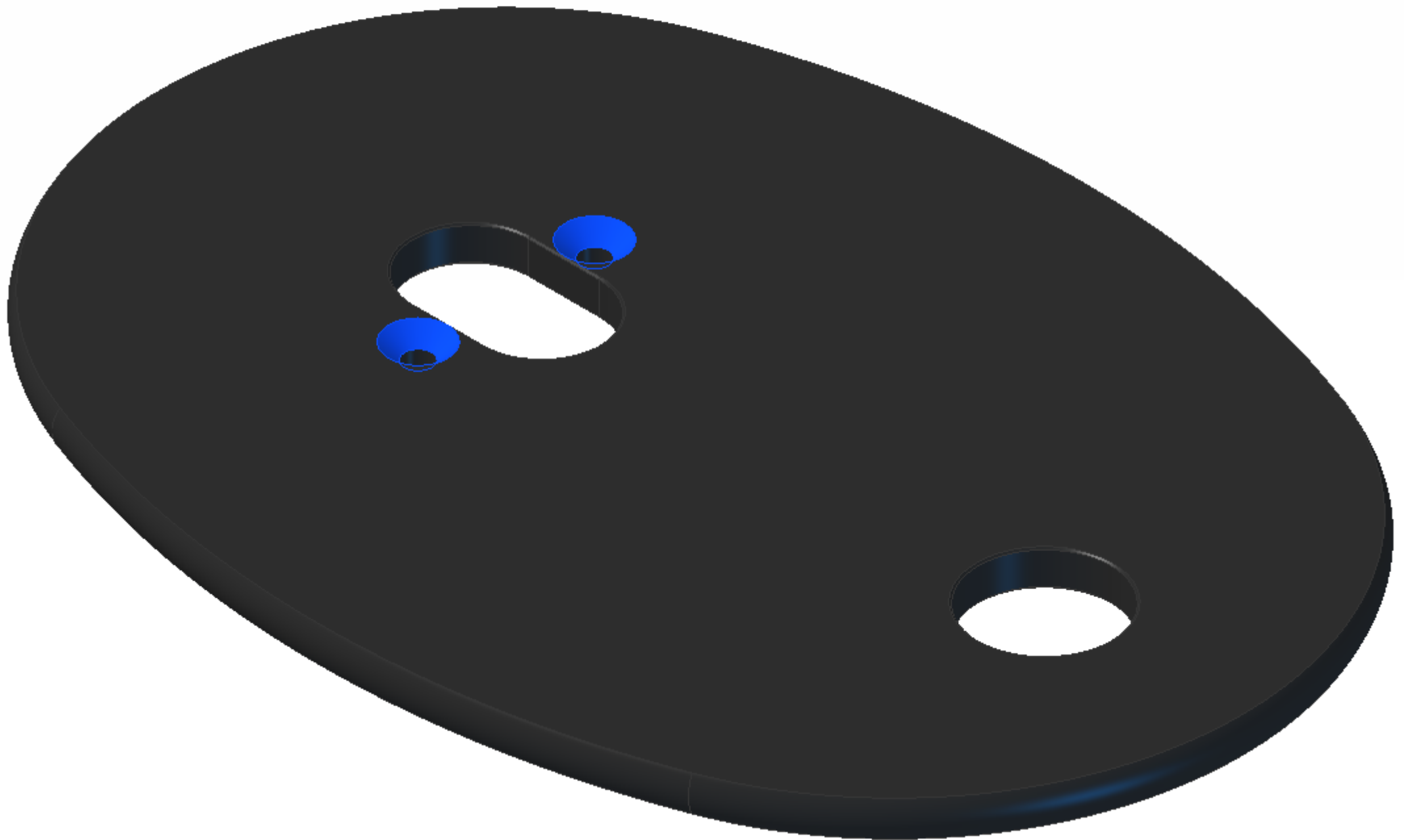
Screw each screw nearly all the way in.



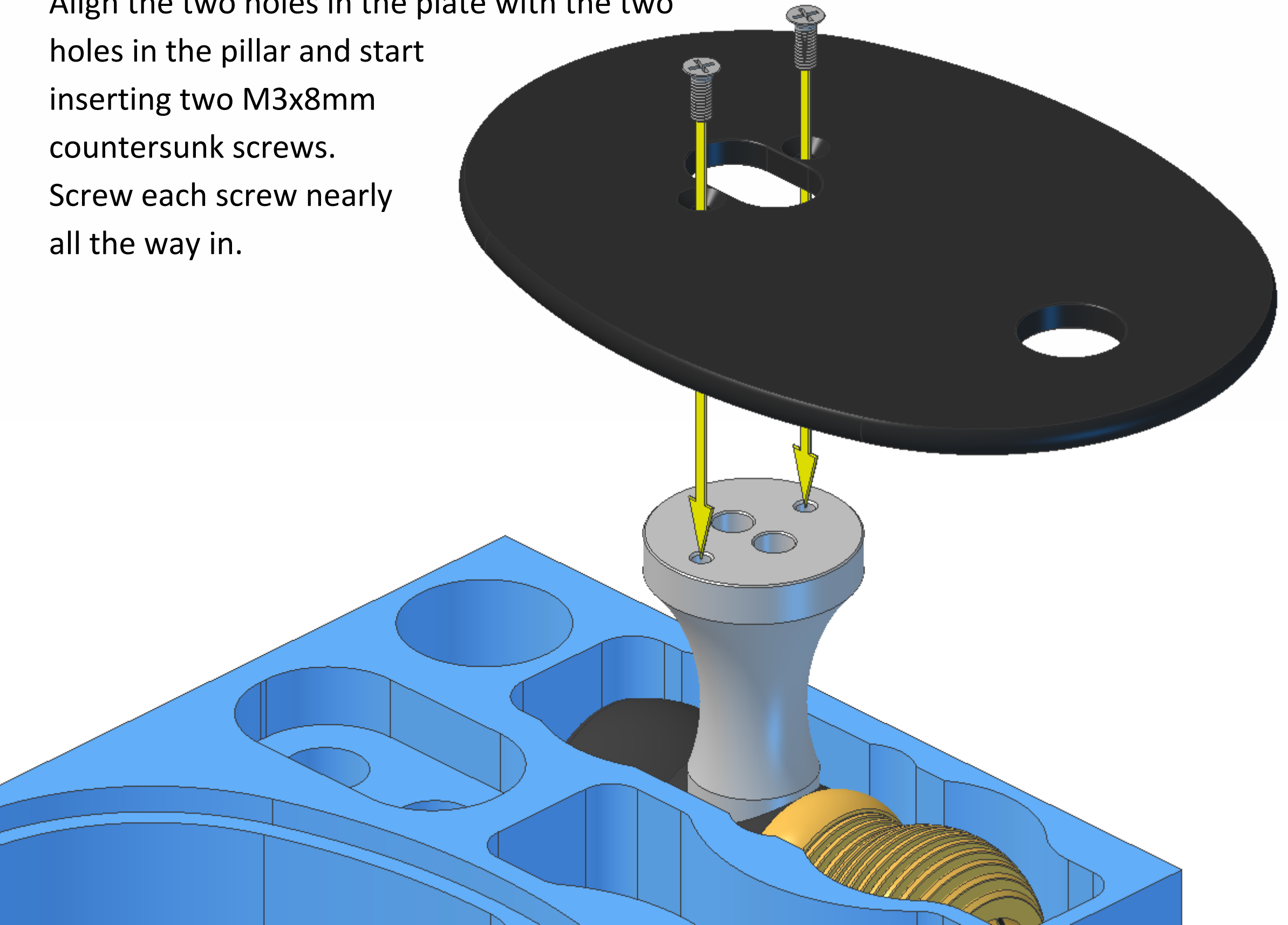
Fully tighten the screws. Note, the bottom pillar is shown cut away for clarity.



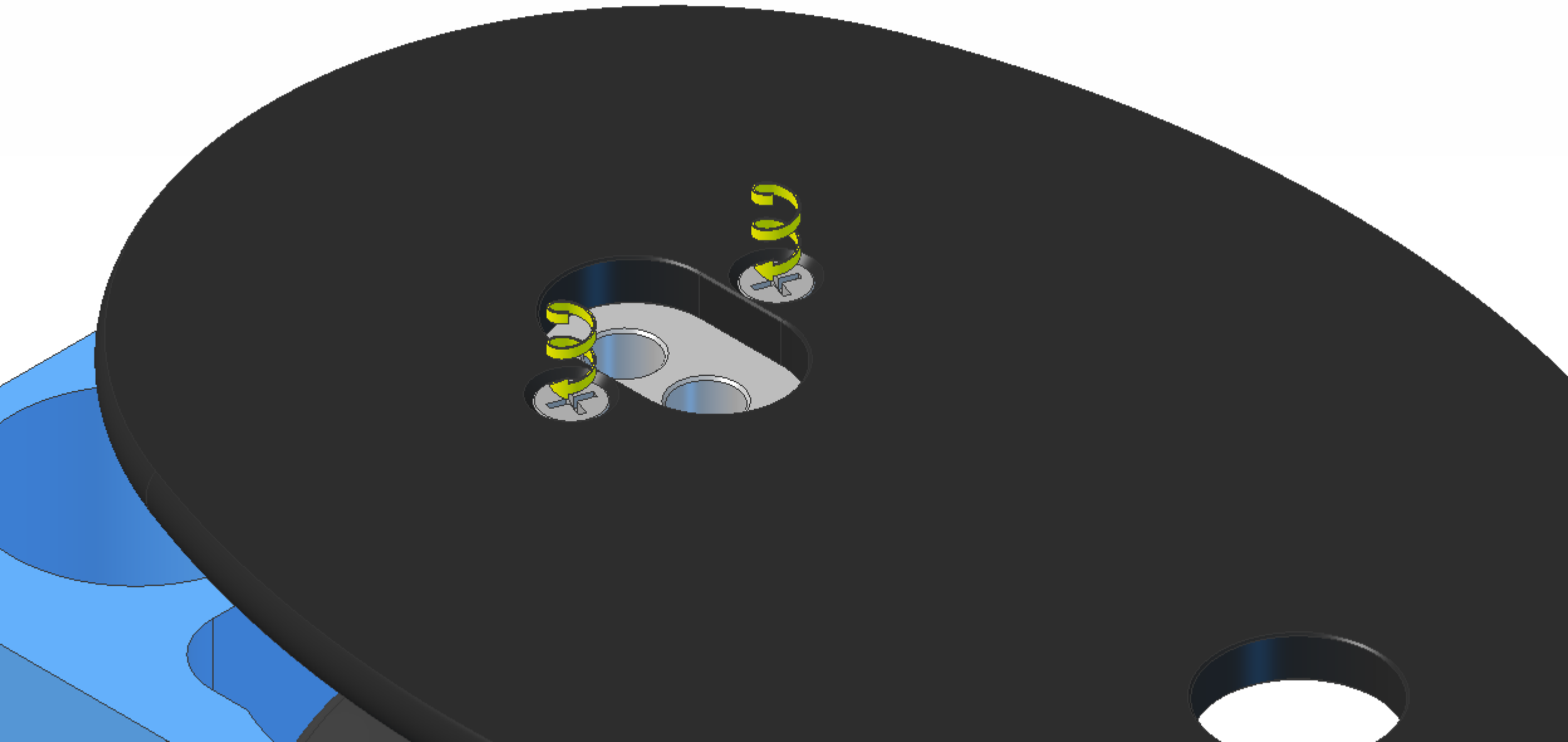
Locate the underside of the base plate. The underside is the side with the countersinks on the two holes as shown in the diagram.



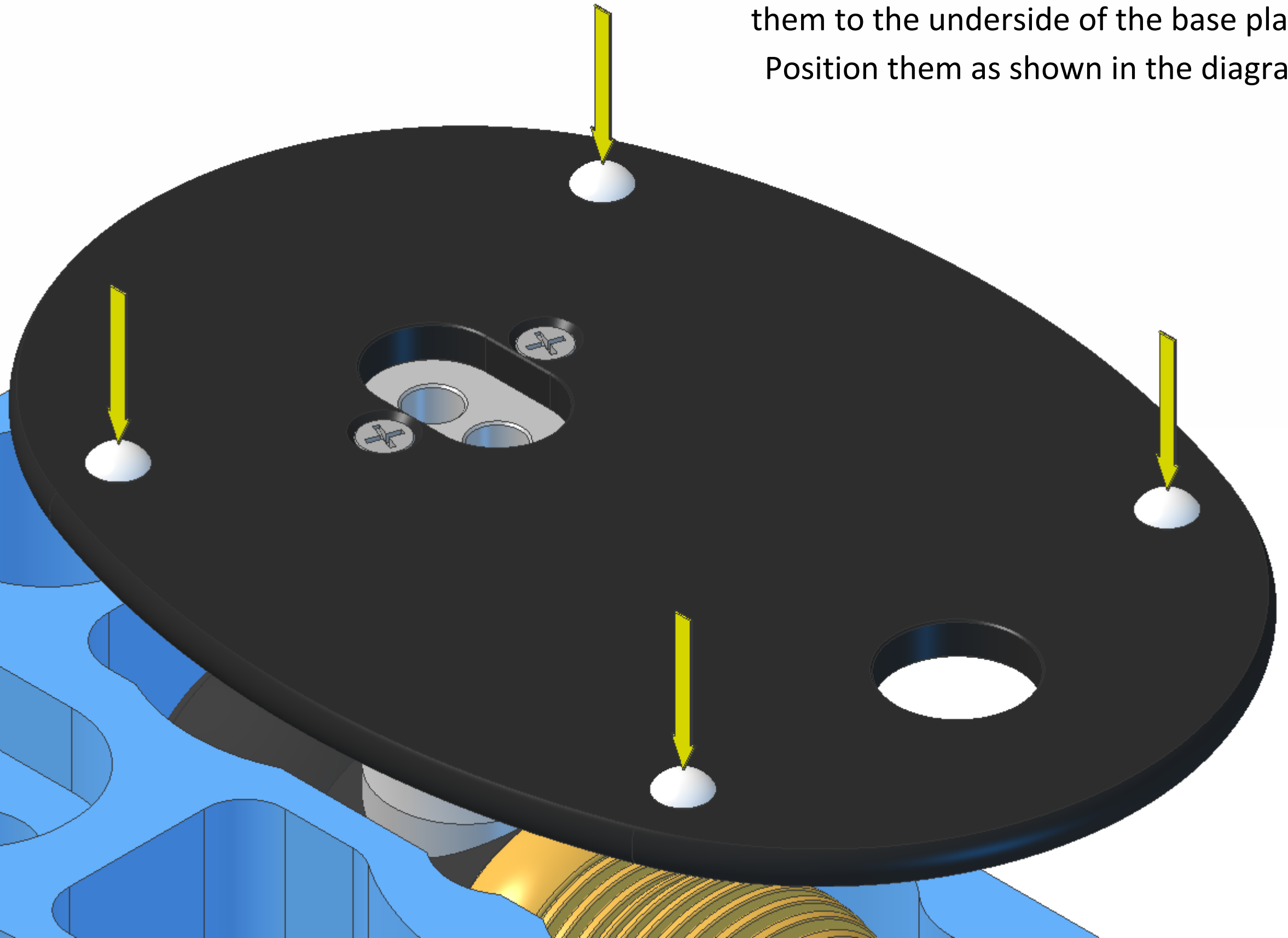
With the underside facing upwards, lower the base plate onto the bottom pillar. Align the two holes in the plate with the two holes in the pillar and start inserting two M3x8mm countersunk screws. Screw each screw nearly all the way in.



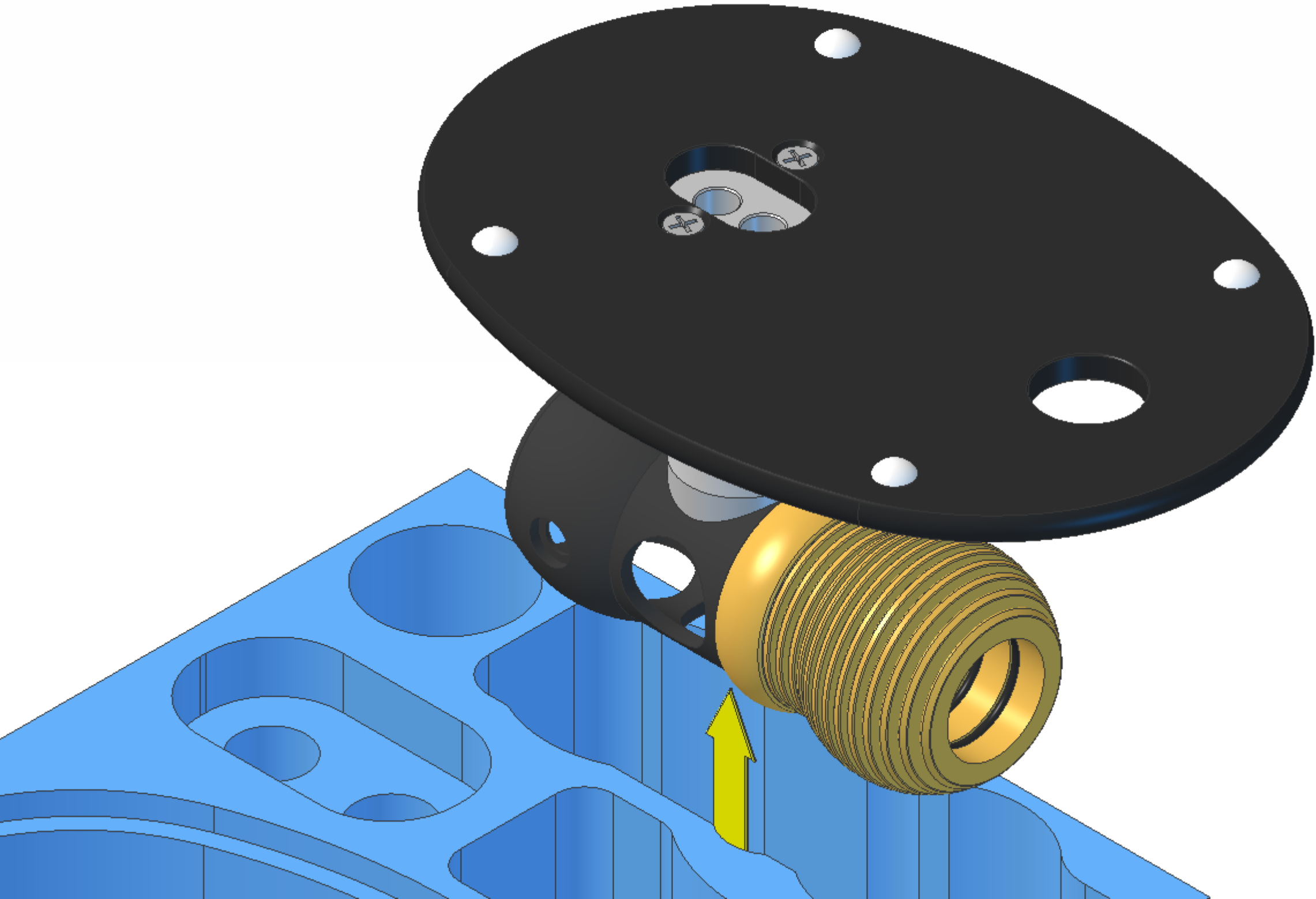
Fully tighten the screws.



Peel the backing off the four rubber feet and stick them to the underside of the base plate. Position them as shown in the diagram.

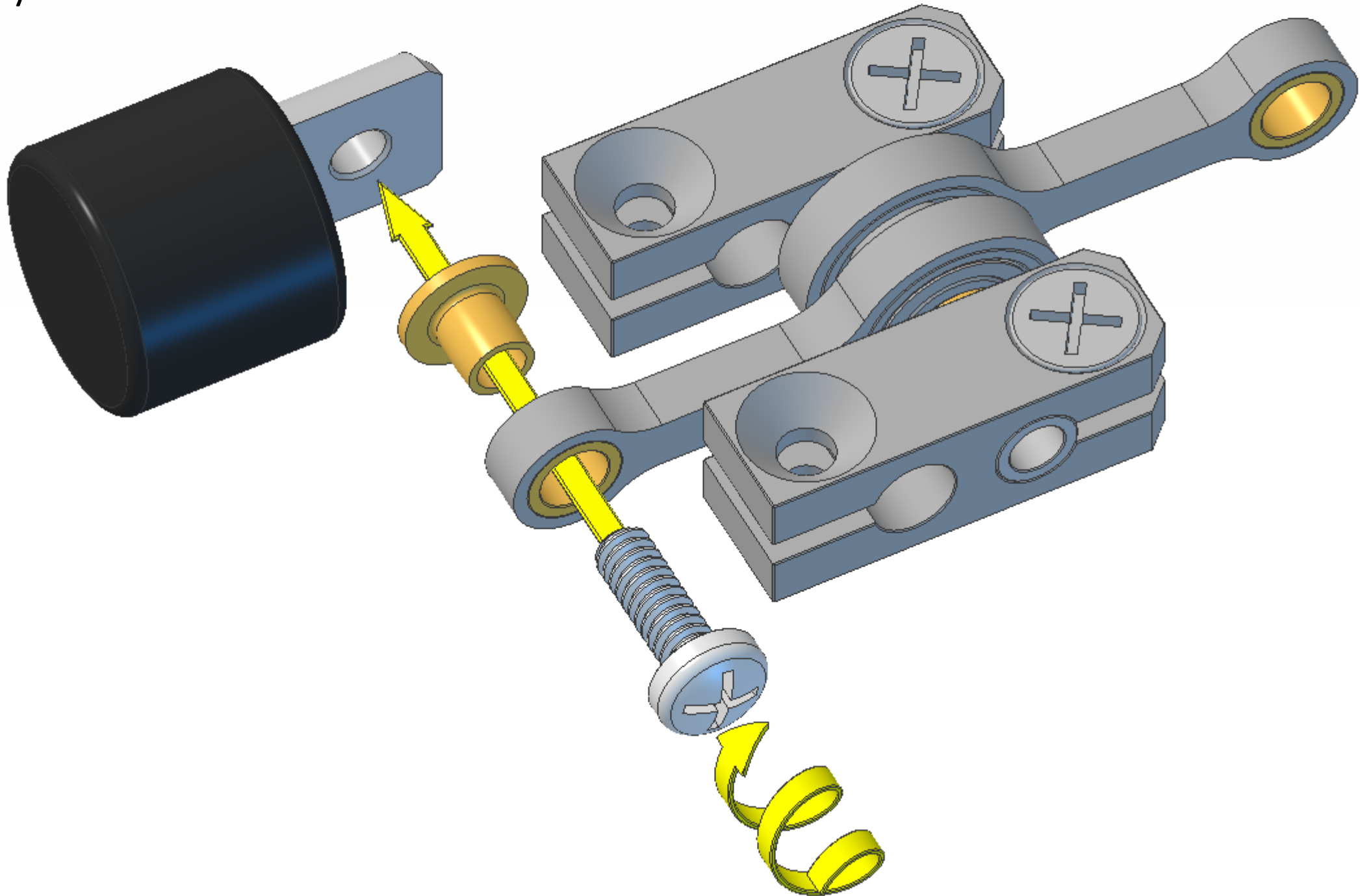


Remove from the packing tray.

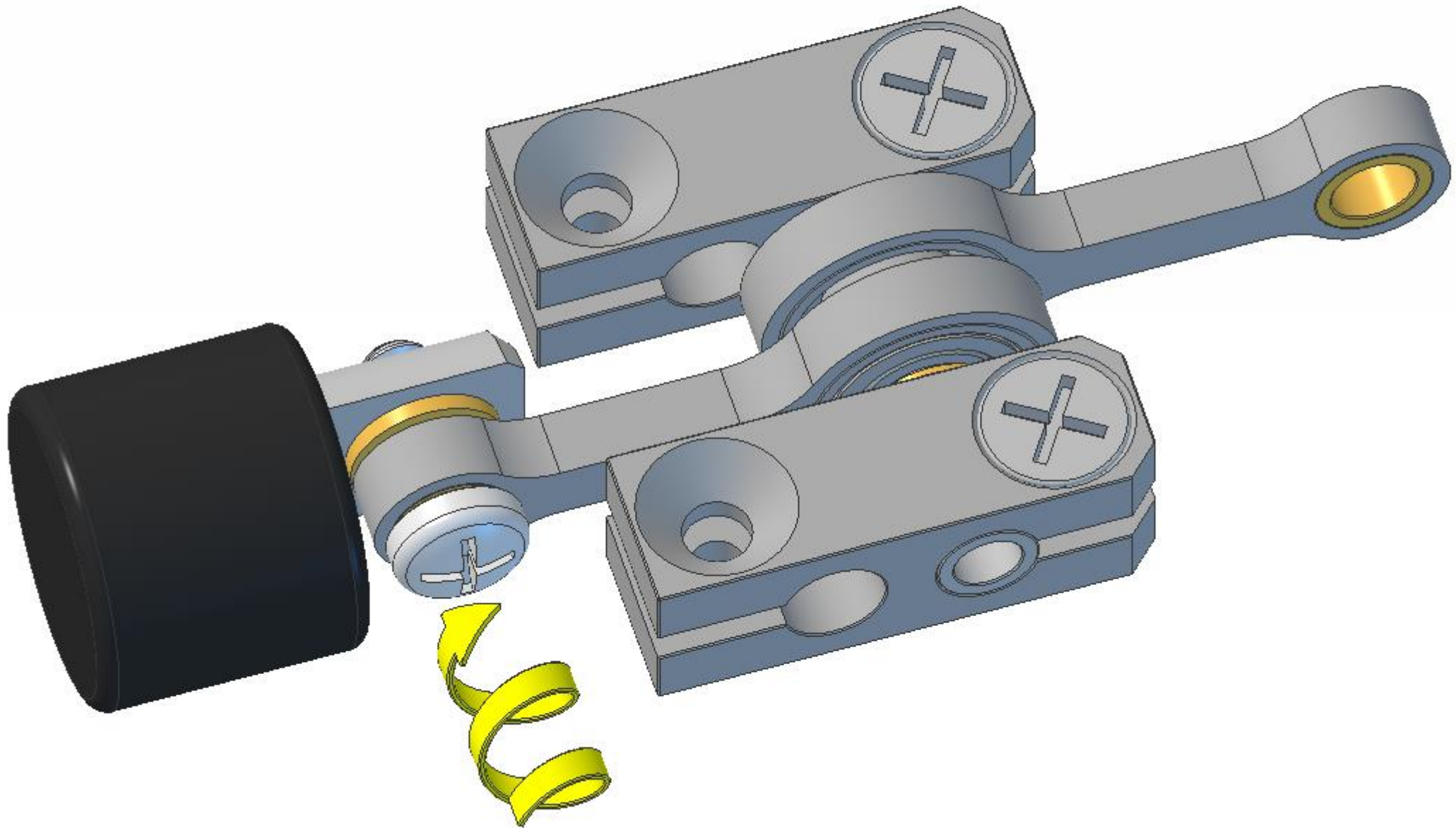


Lay the crank and conrod out as shown.

Fit one M2x6mm roundhead screw through the front conrod, screw it all the way through a conrod bush, and screw it into the piston a couple of turns. The conrod bush should fit fully into the conrod.

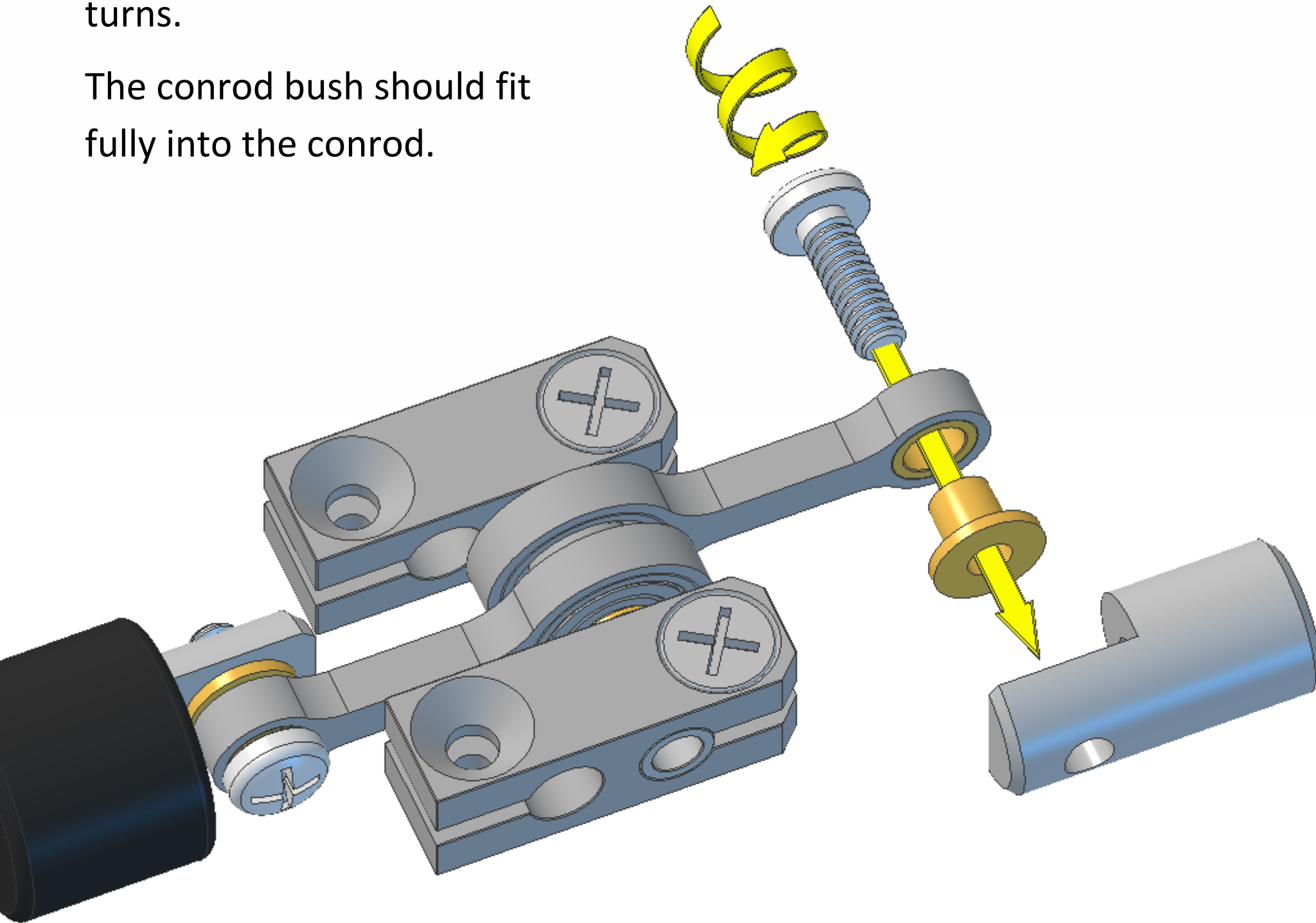


Fully tighten the screw.

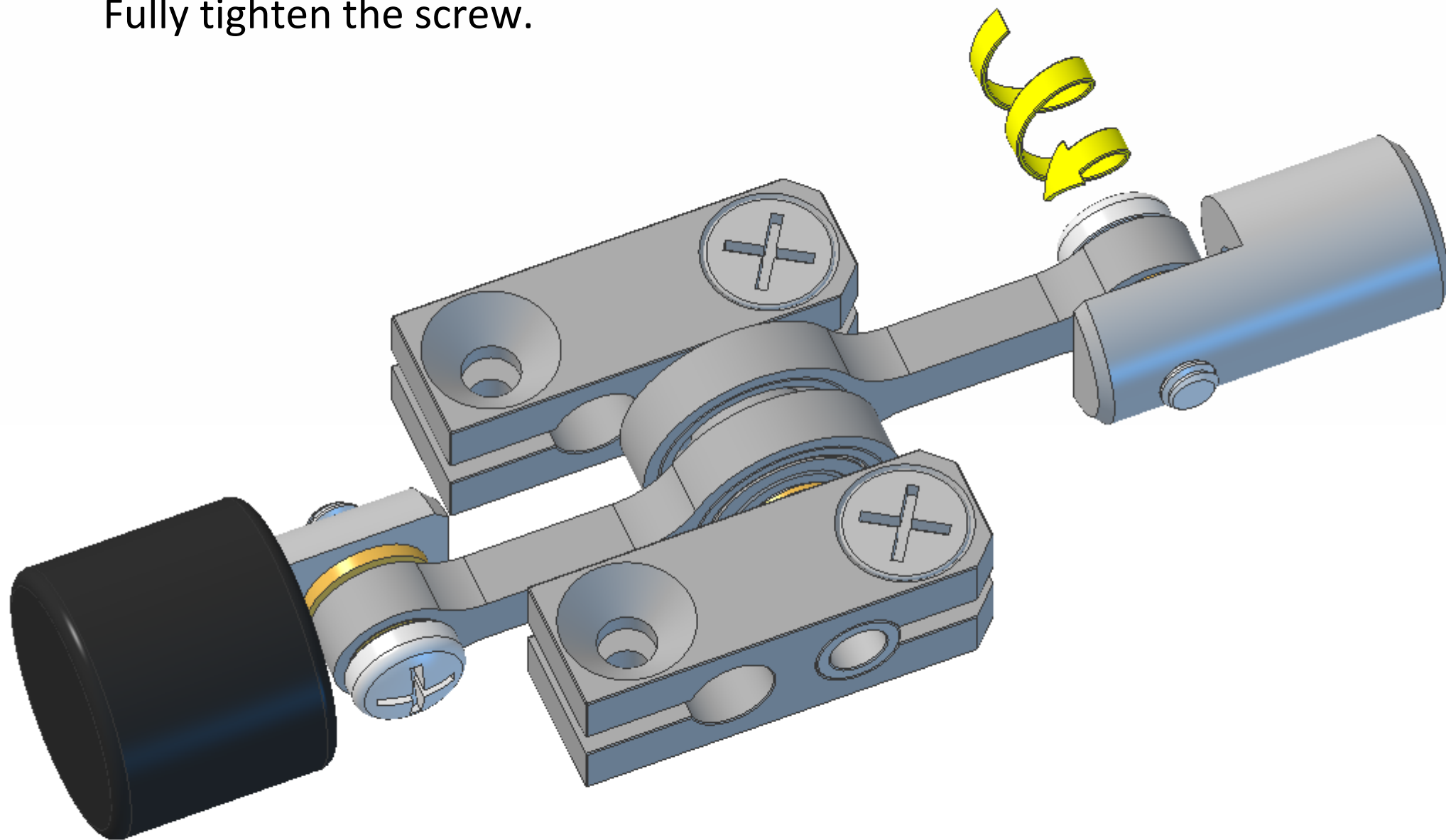


Fit one M2x6mm roundhead screw through the back conrod, screw it through the conrod bush and into the displacer clevis a couple of turns.

The conrod bush should fit fully into the conrod.

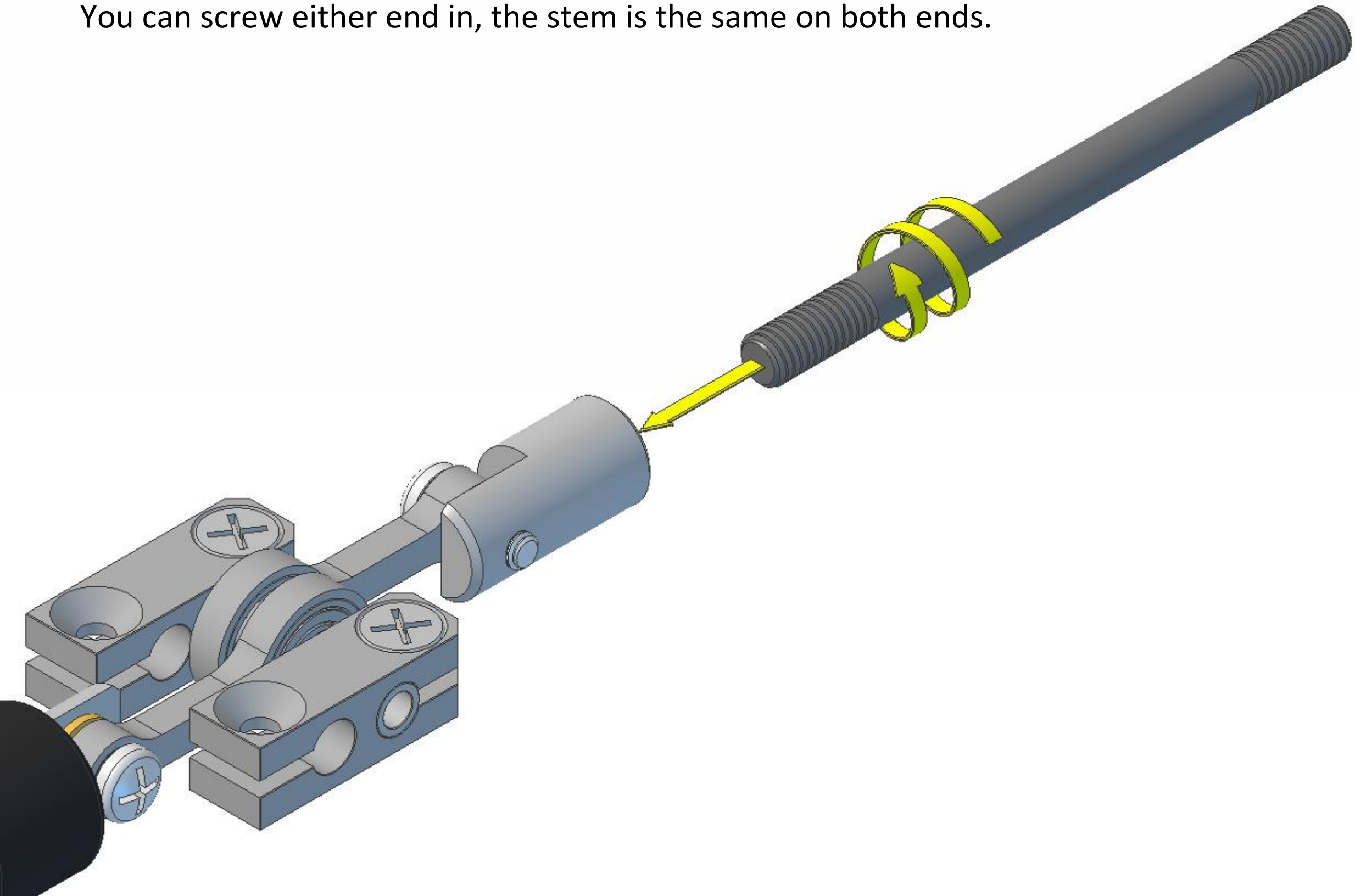


Fully tighten the screw.

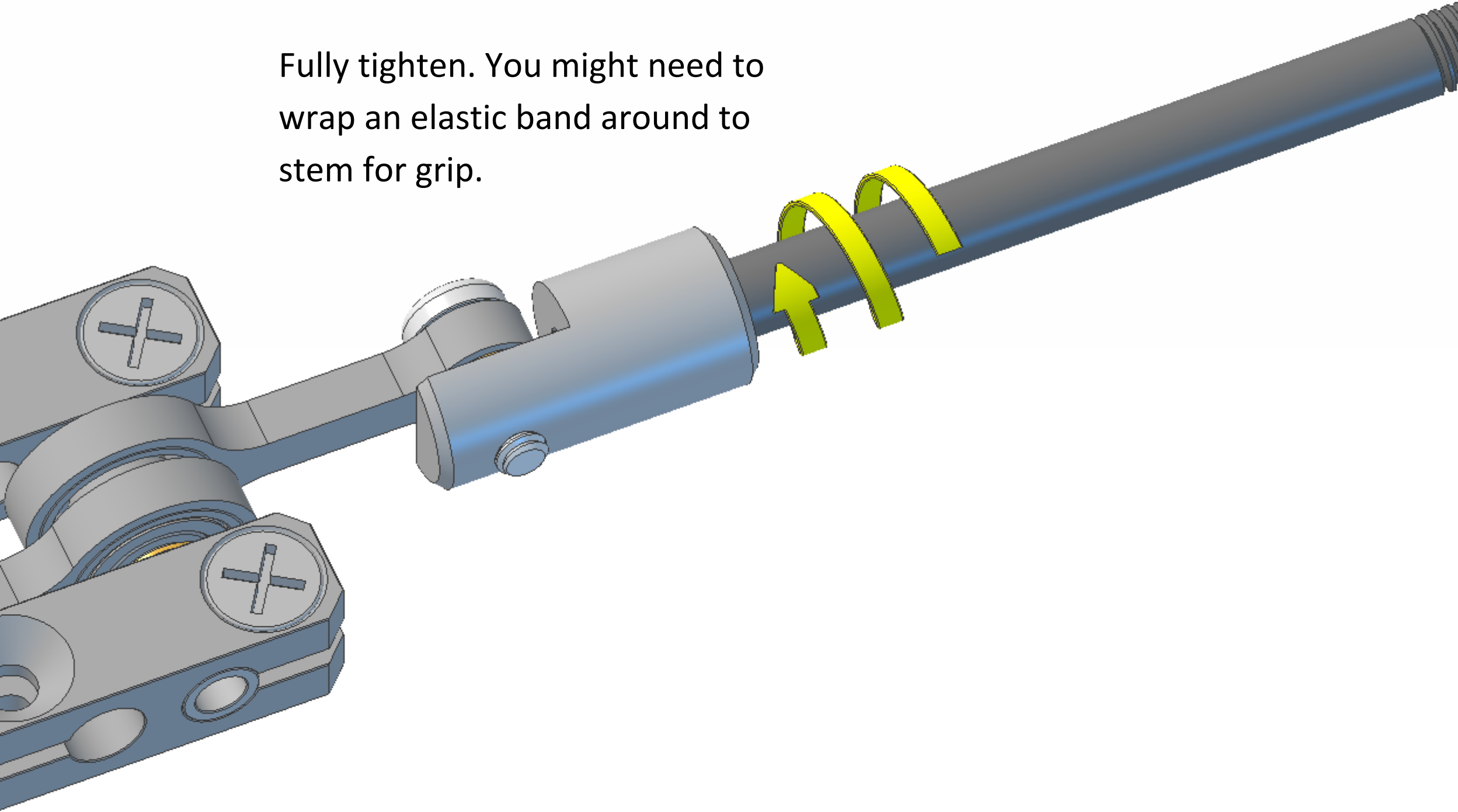


Screw the shorter end of the displacer stem into the displacer clevis.

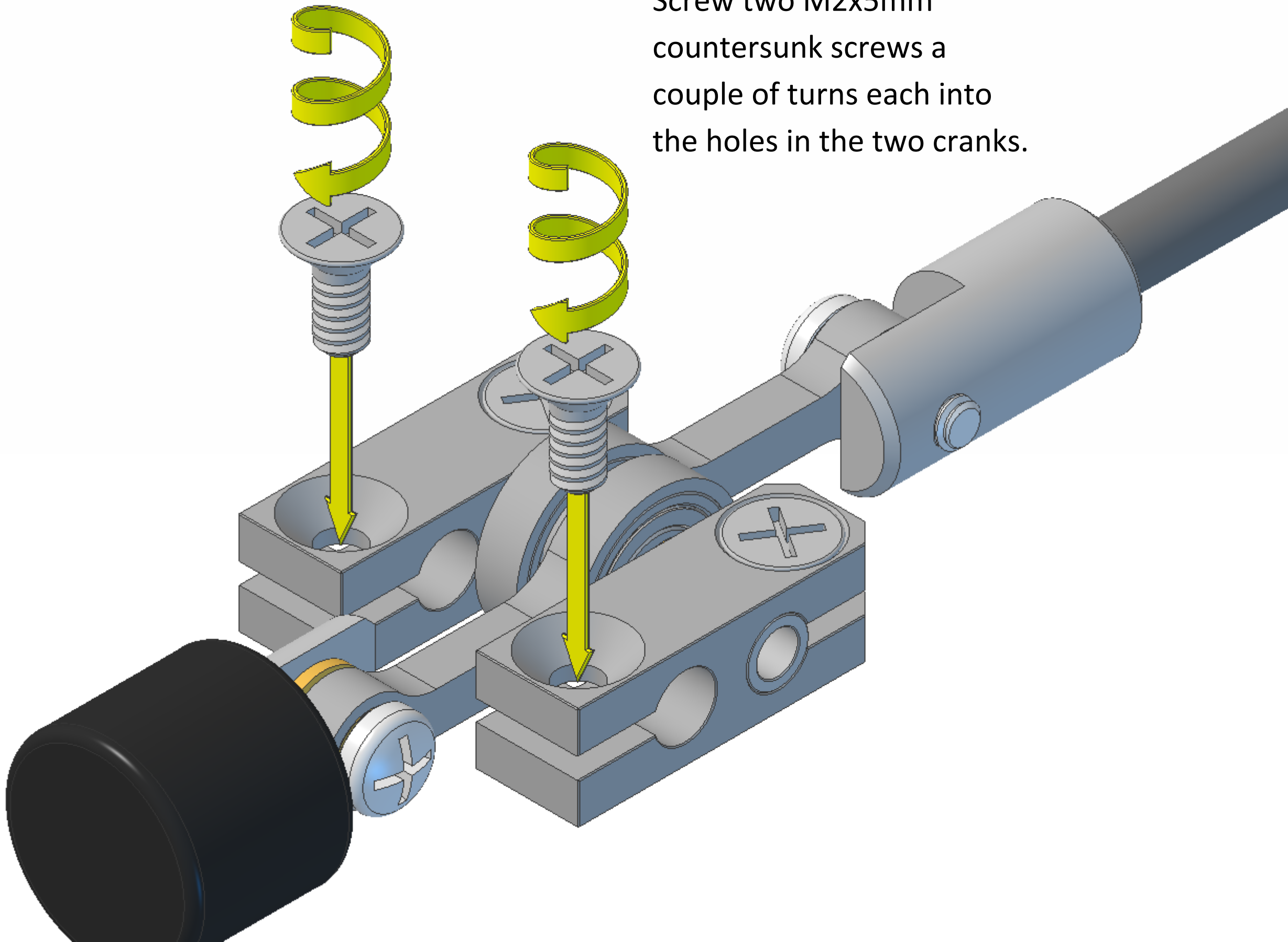
You can screw either end in, the stem is the same on both ends.



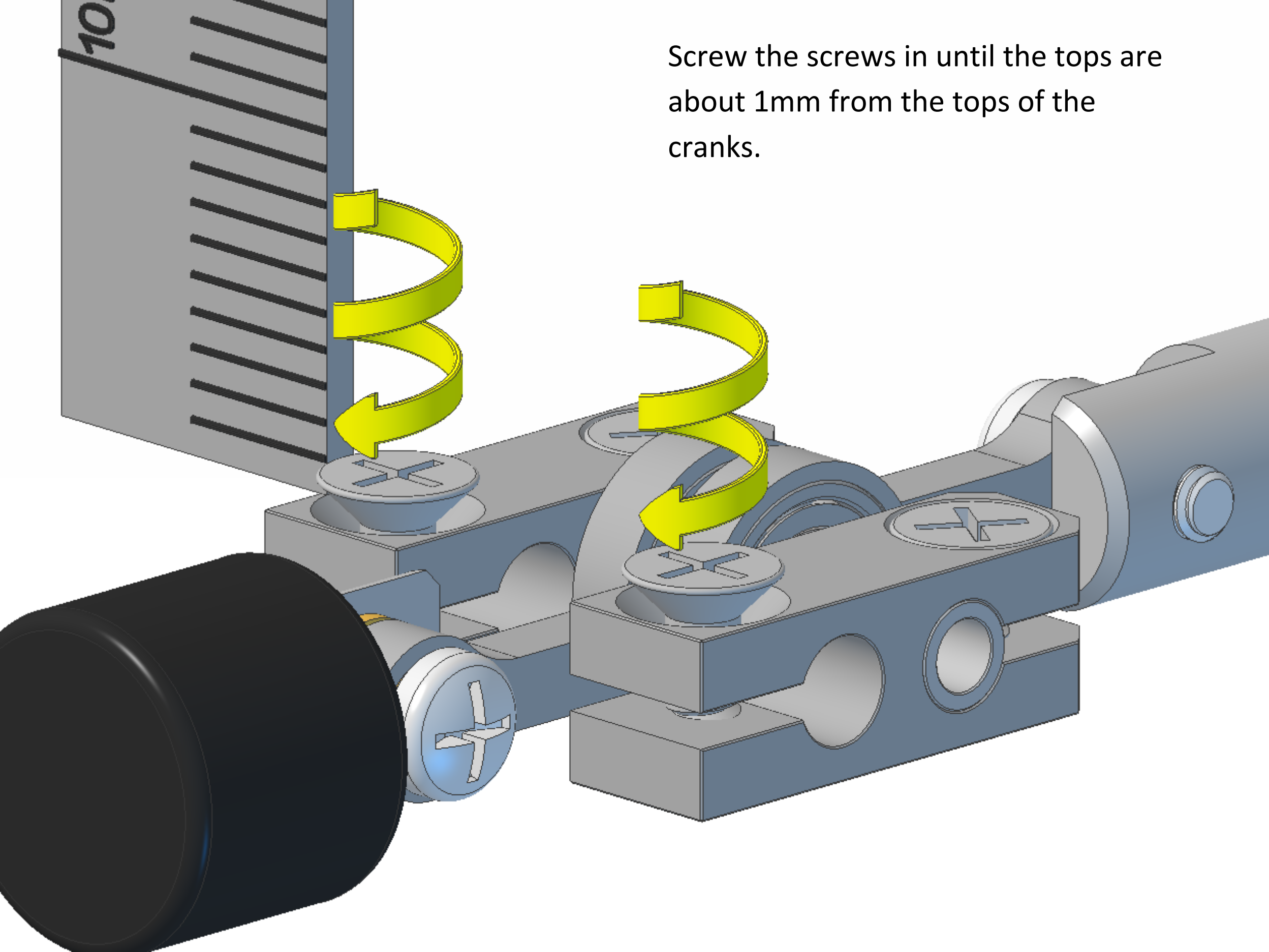
Fully tighten. You might need to wrap an elastic band around to stem for grip.



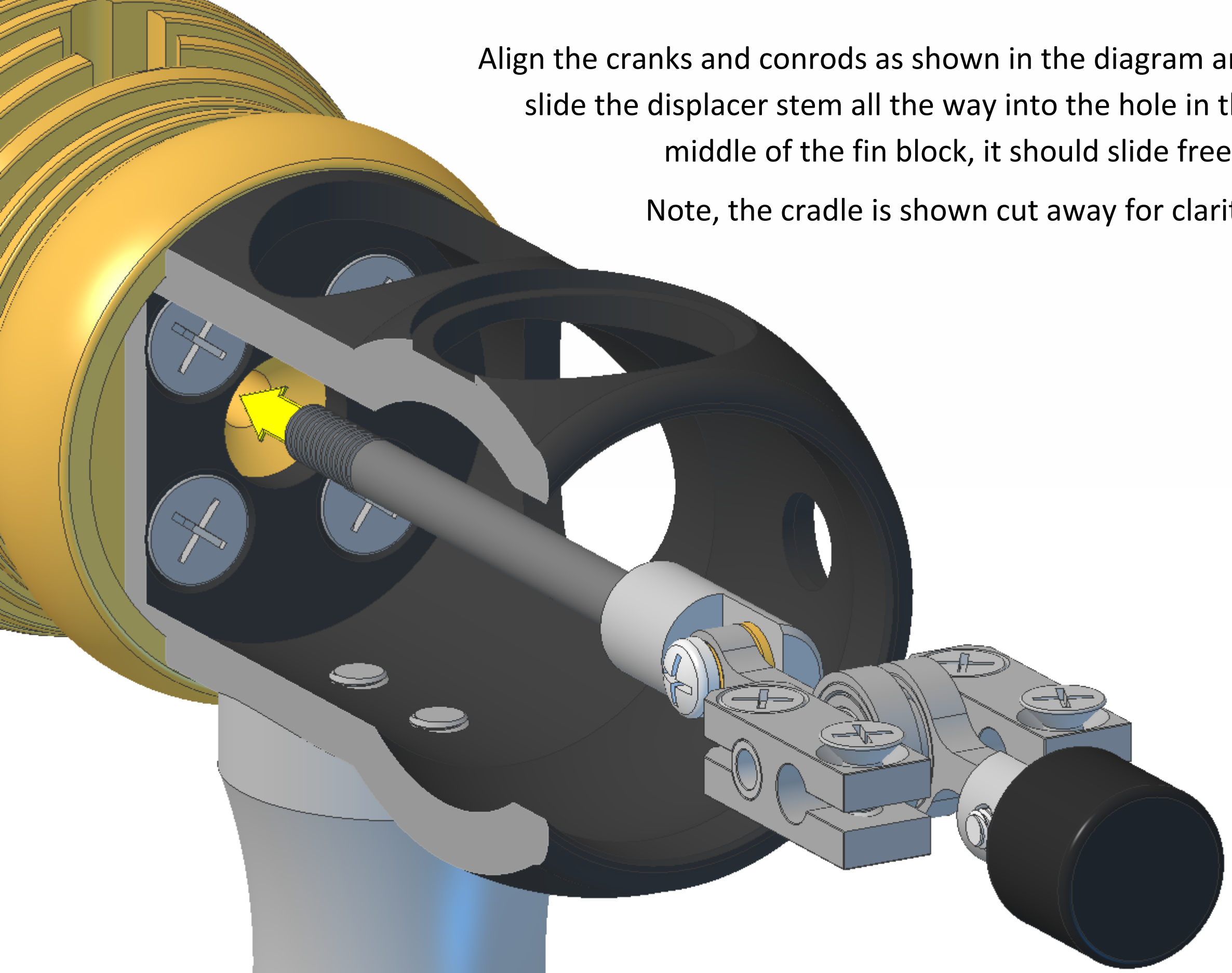
Screw two M2x5mm
countersunk screws a
couple of turns each into
the holes in the two cranks.



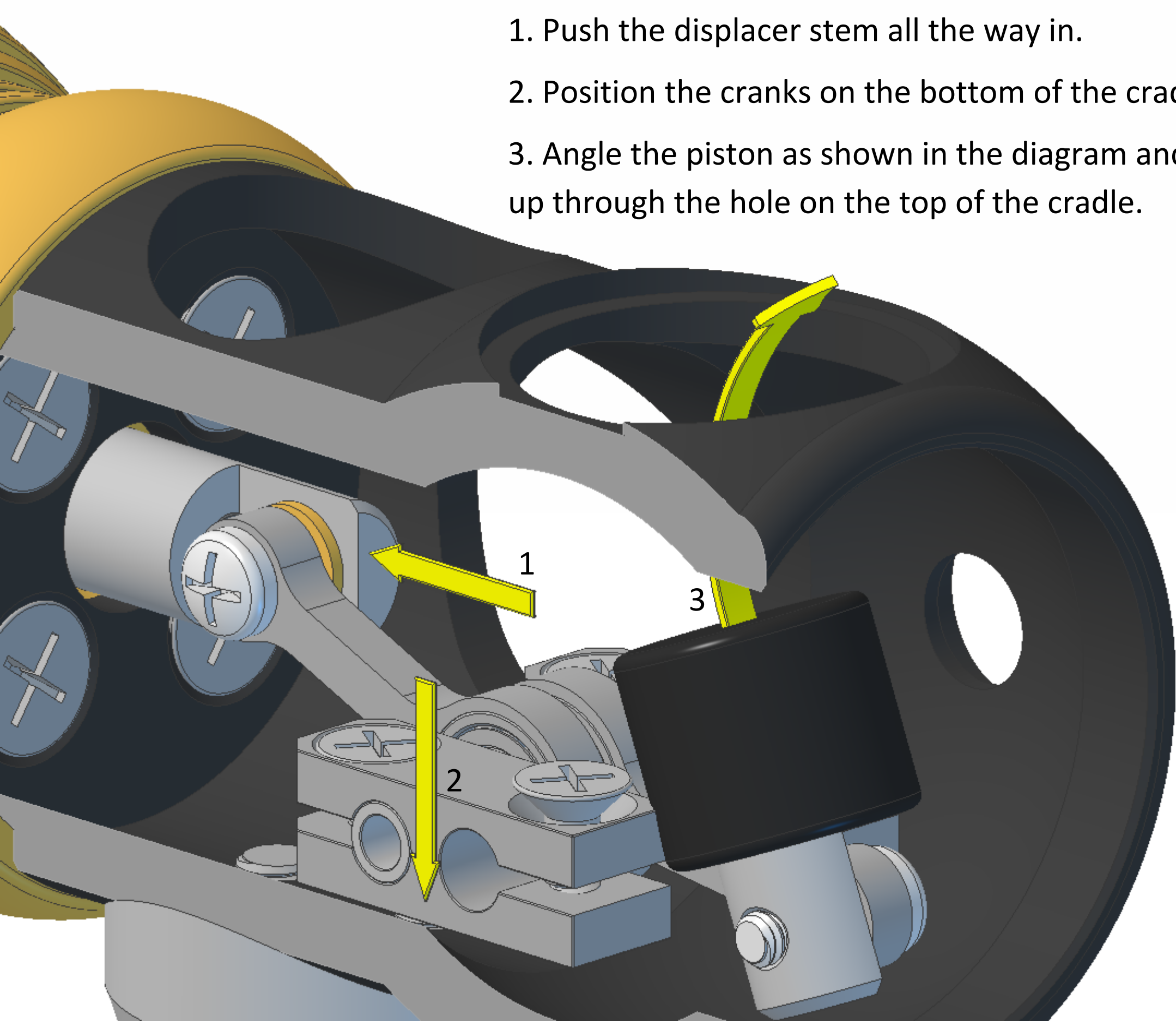
Screw the screws in until the tops are about 1mm from the tops of the cranks.

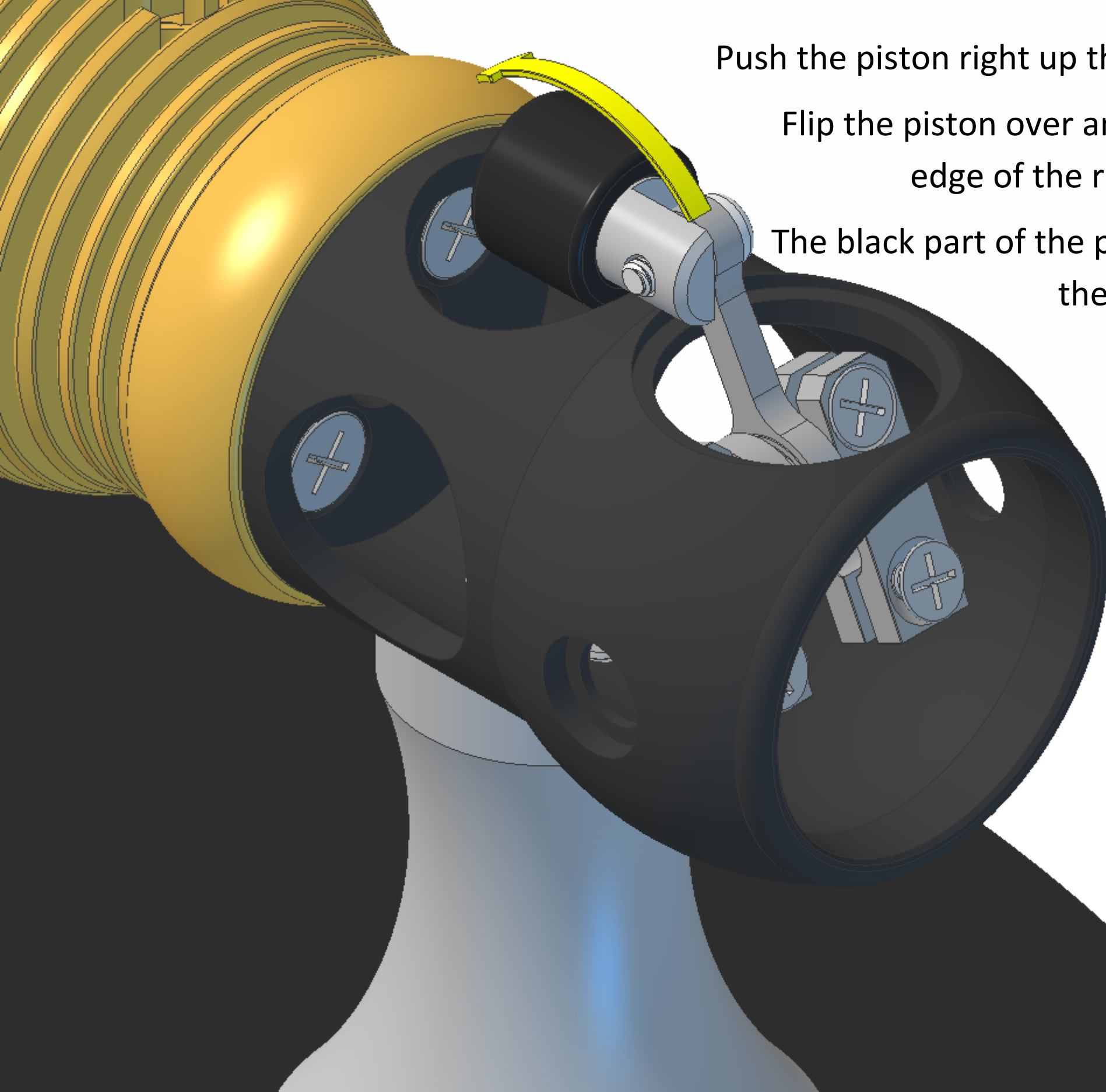


Align the cranks and conrods as shown in the diagram and slide the displacer stem all the way into the hole in the middle of the fin block, it should slide freely. Note, the cradle is shown cut away for clarity.



1. Push the displacer stem all the way in.
2. Position the cranks on the bottom of the cradle.
3. Angle the piston as shown in the diagram and push it up through the hole on the top of the cradle.



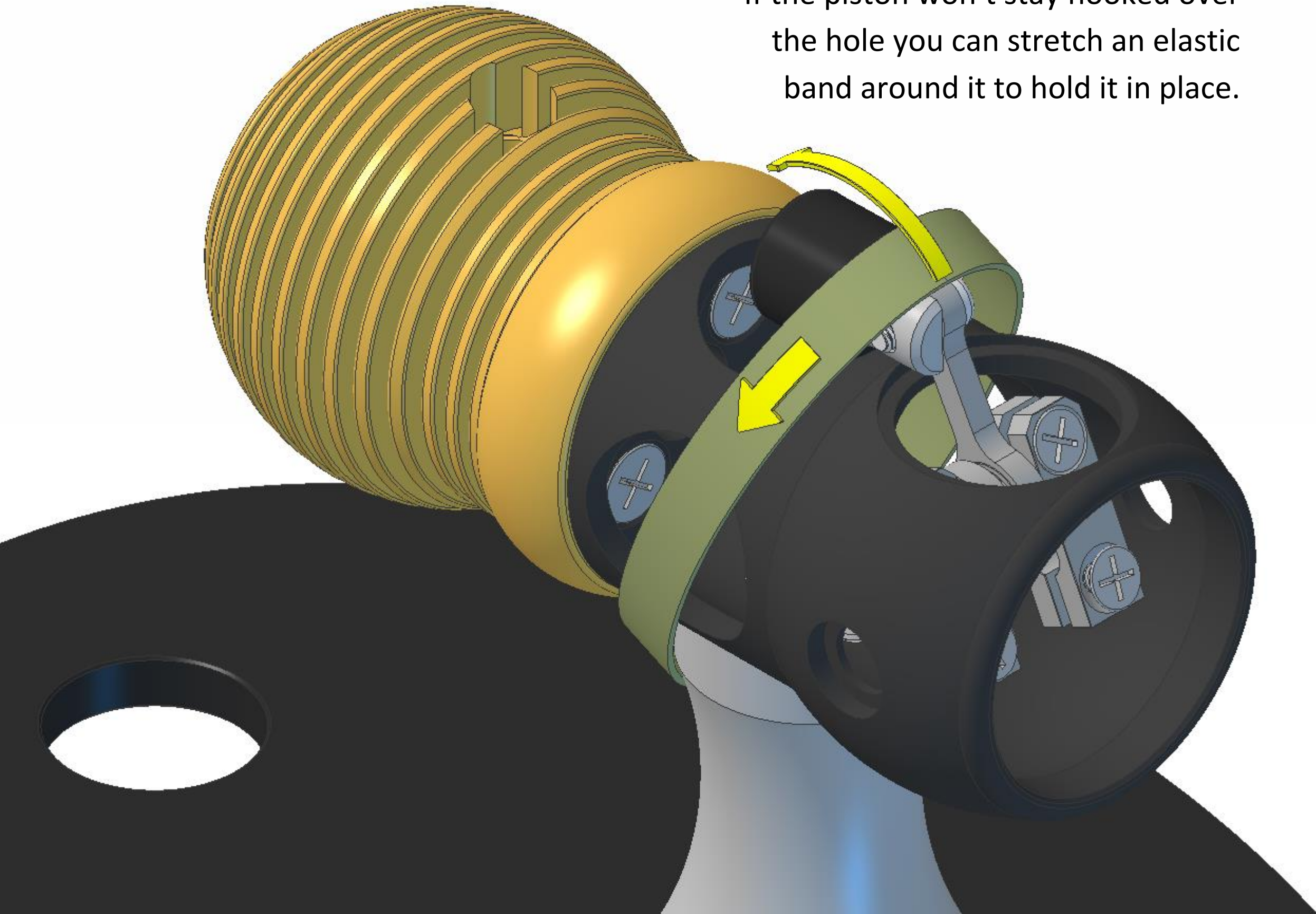


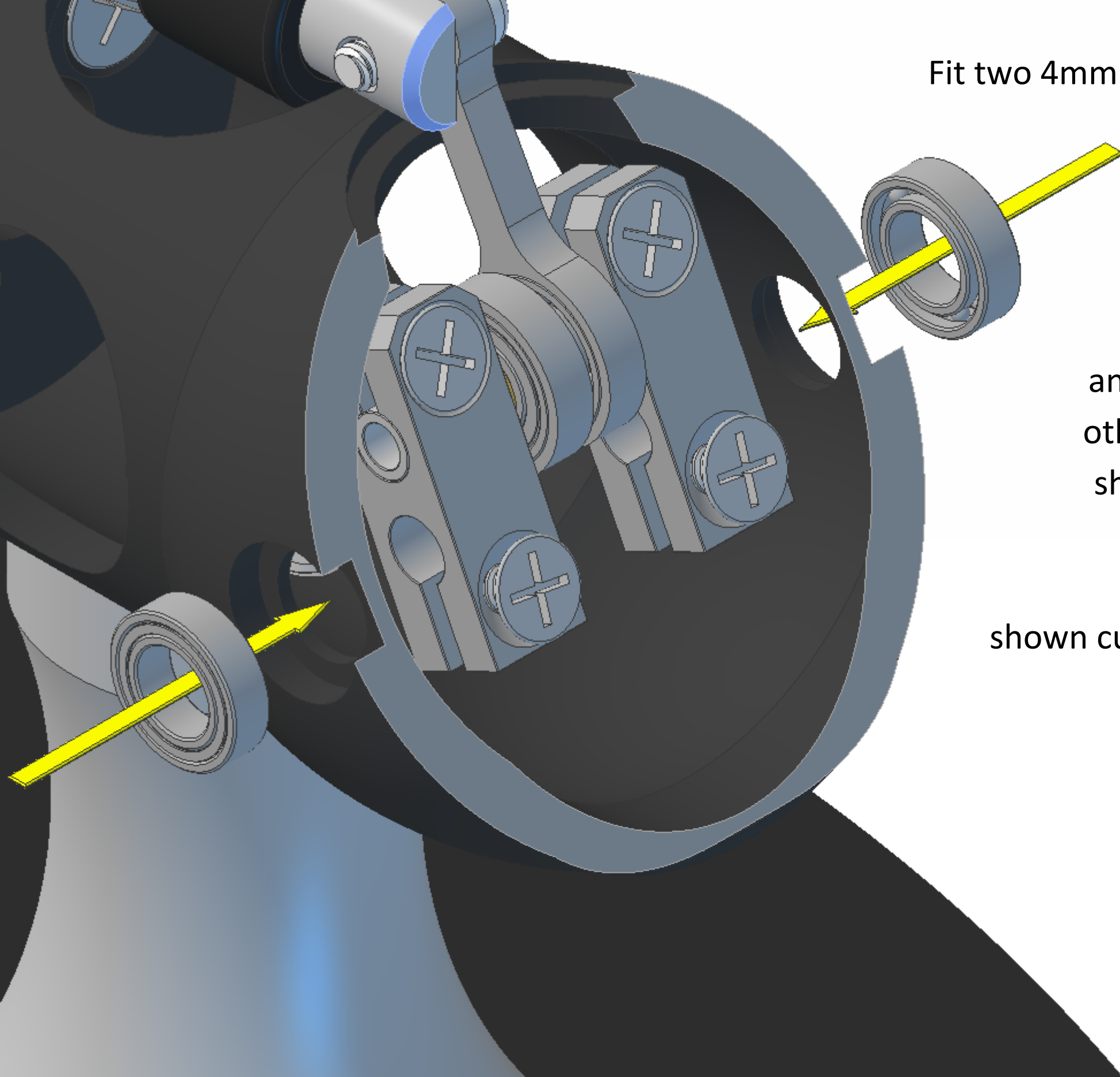
Push the piston right up through the front hole.

Flip the piston over and position it over the edge of the rear hole in the cradle.

The black part of the piston should catch on the edge of the rear hole and should prevent the whole piston and conrod falling back through the front hole.

If the piston won't stay hooked over the hole you can stretch an elastic band around it to hold it in place.

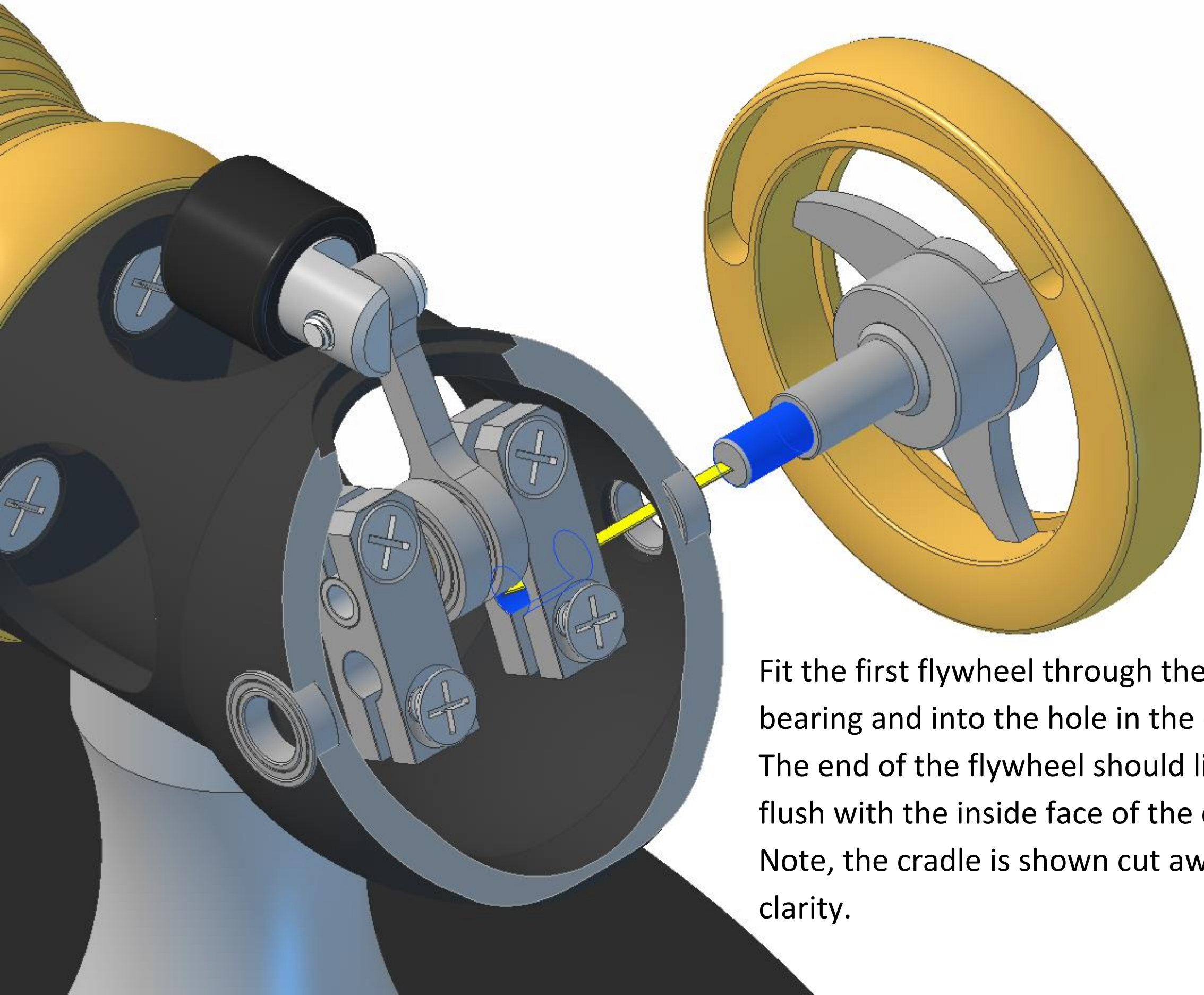




Fit two 4mm ball-race bearings into the holes in the cradle.

The bearings have a dust shield on one side and are open on the other. The open side should face inwards after fitting.

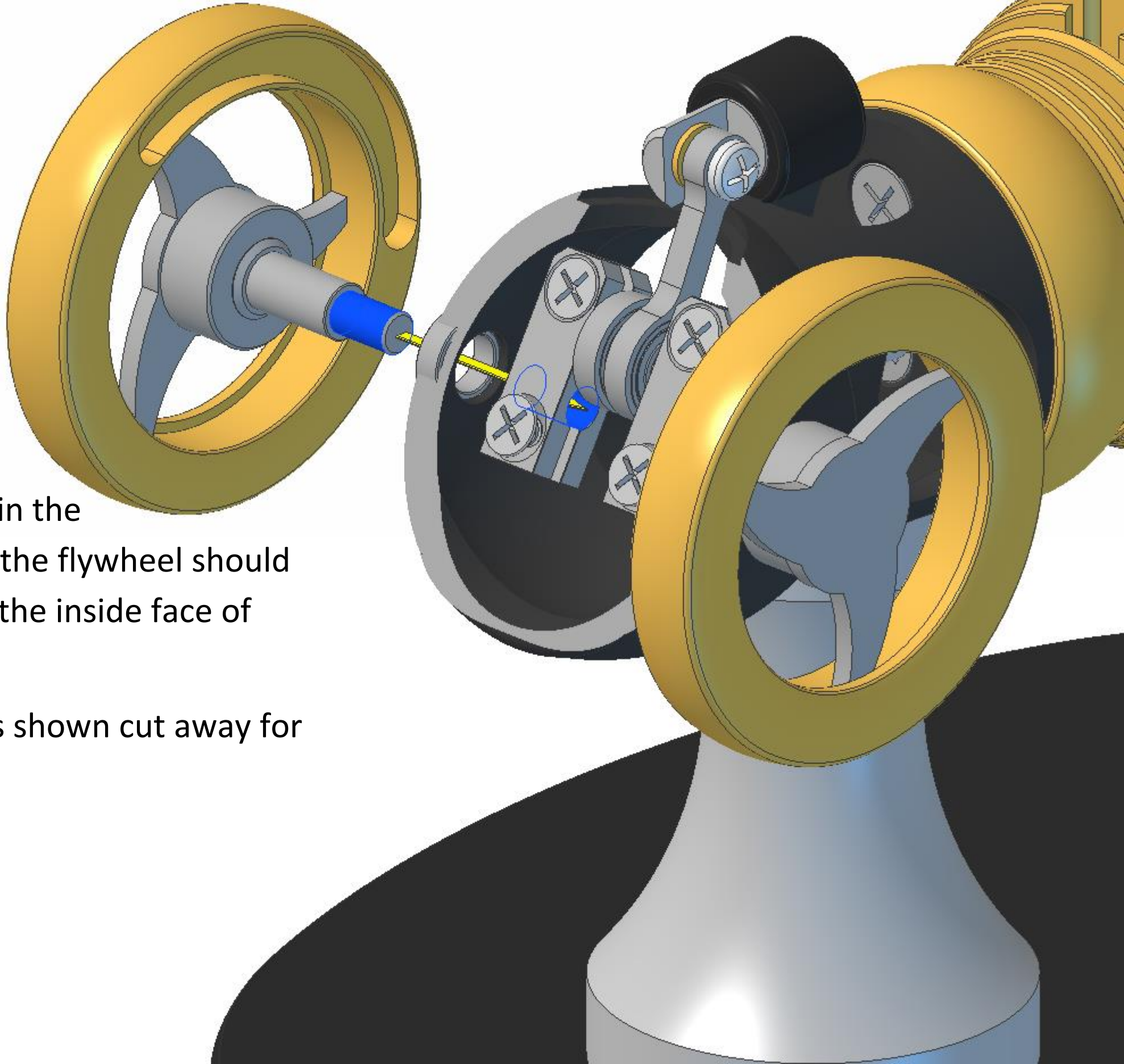
Note, the cradle is shown cut away for clarity.



Fit the first flywheel through the 4mm bearing and into the hole in the crank. The end of the flywheel should line up flush with the inside face of the crank. Note, the cradle is shown cut away for clarity.

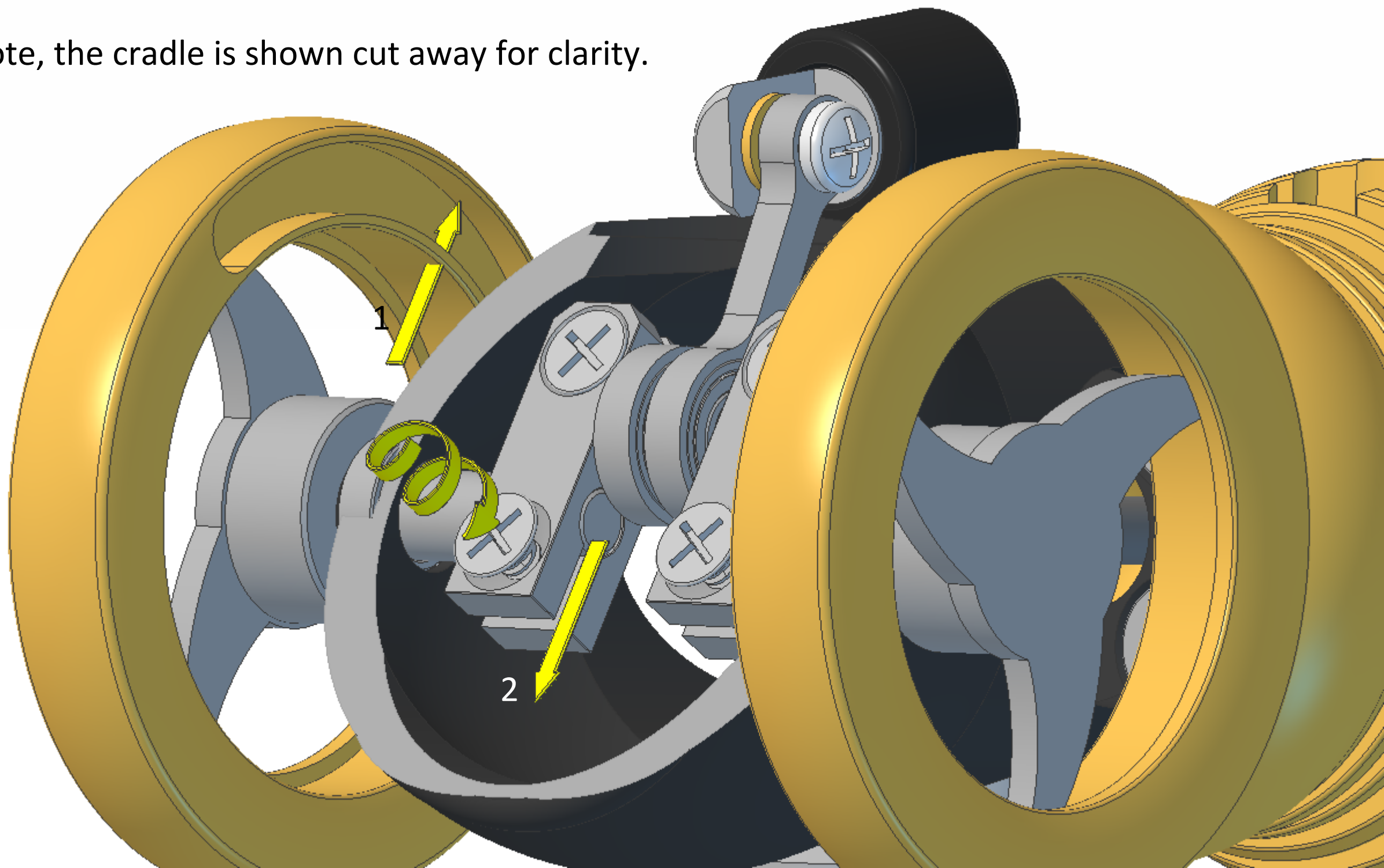
Fit the second flywheel through the 4mm bearing and into the hole in the crank. The end of the flywheel should line up flush with the inside face of the crank.

Note, the cradle is shown cut away for clarity.

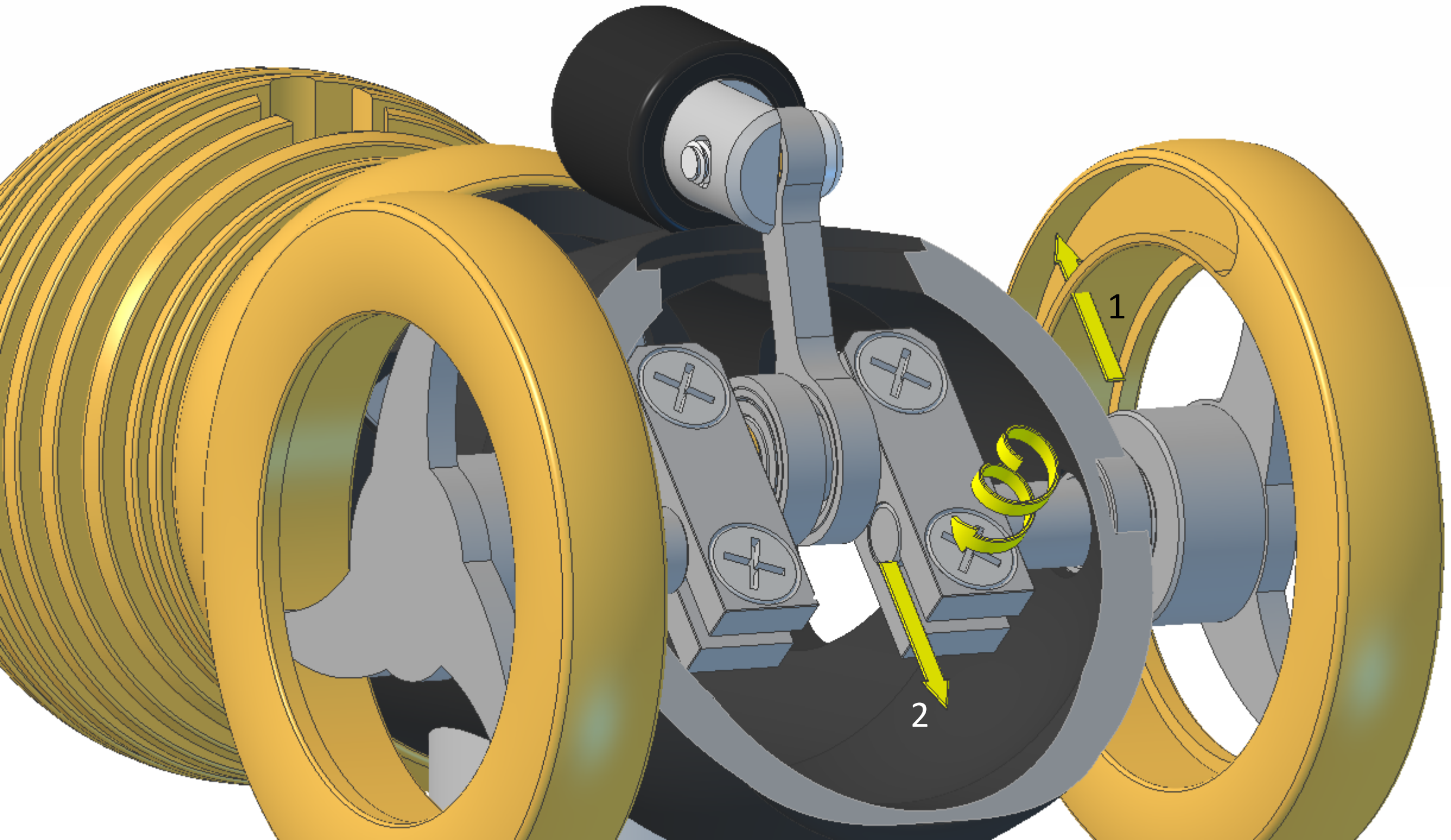


The flywheel rims have a slot in them for balancing. Align the middle of the balancing slot directly opposite the middle of the crank as shown by arrows 1 & 2 in the diagram. Make sure the flywheel axle is flush with the inside of the crank and then fully tighten the crank screw.

Note, the cradle is shown cut away for clarity.

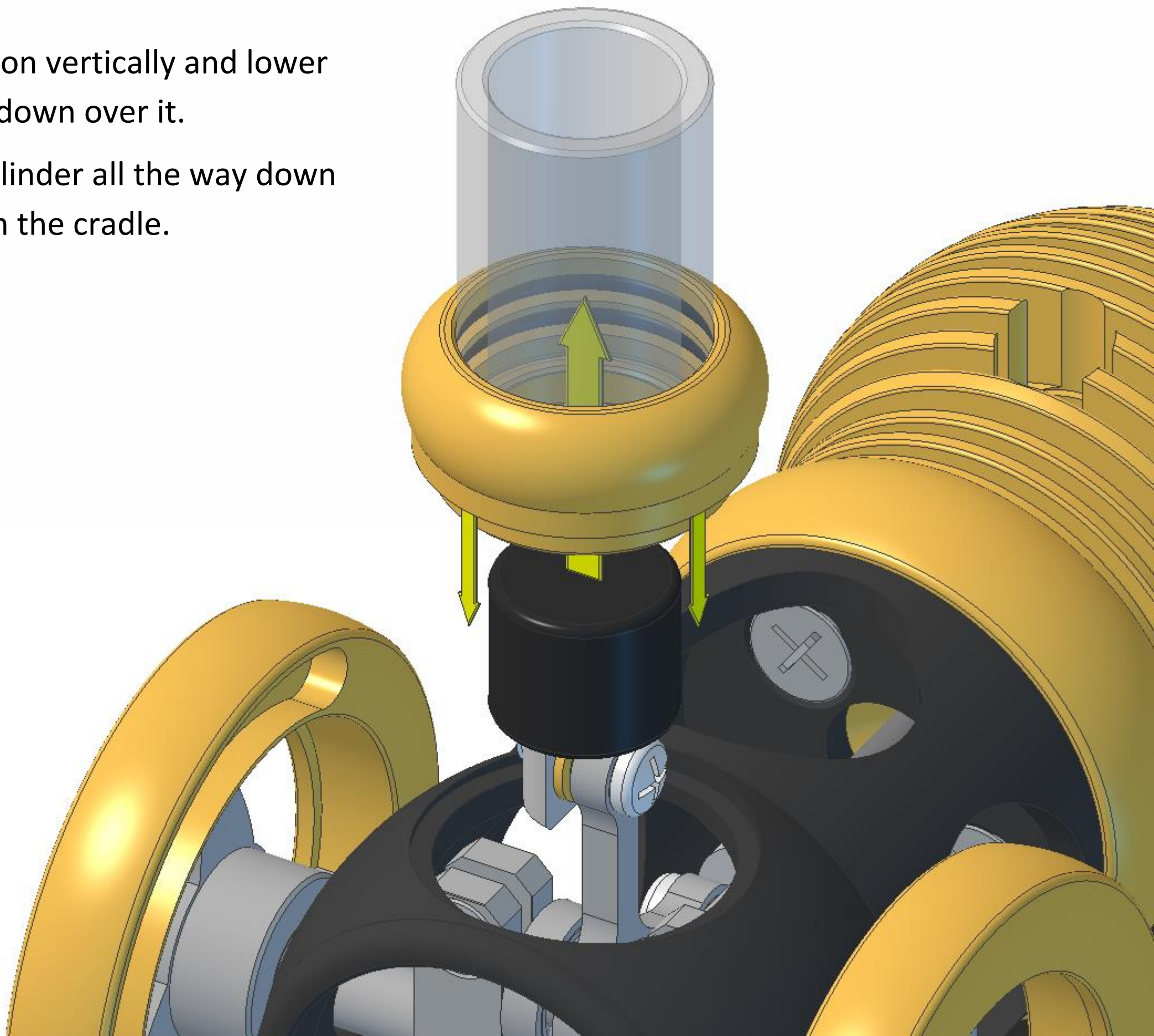


Align the middle of the balancing slot on the other flywheel directly opposite the middle of the crank as shown by arrows 1 & 2 in the diagram. Make sure the flywheel axle is flush with the inside of the crank and then fully tighten the crank screw. Note, the cradle is shown cut away for clarity.

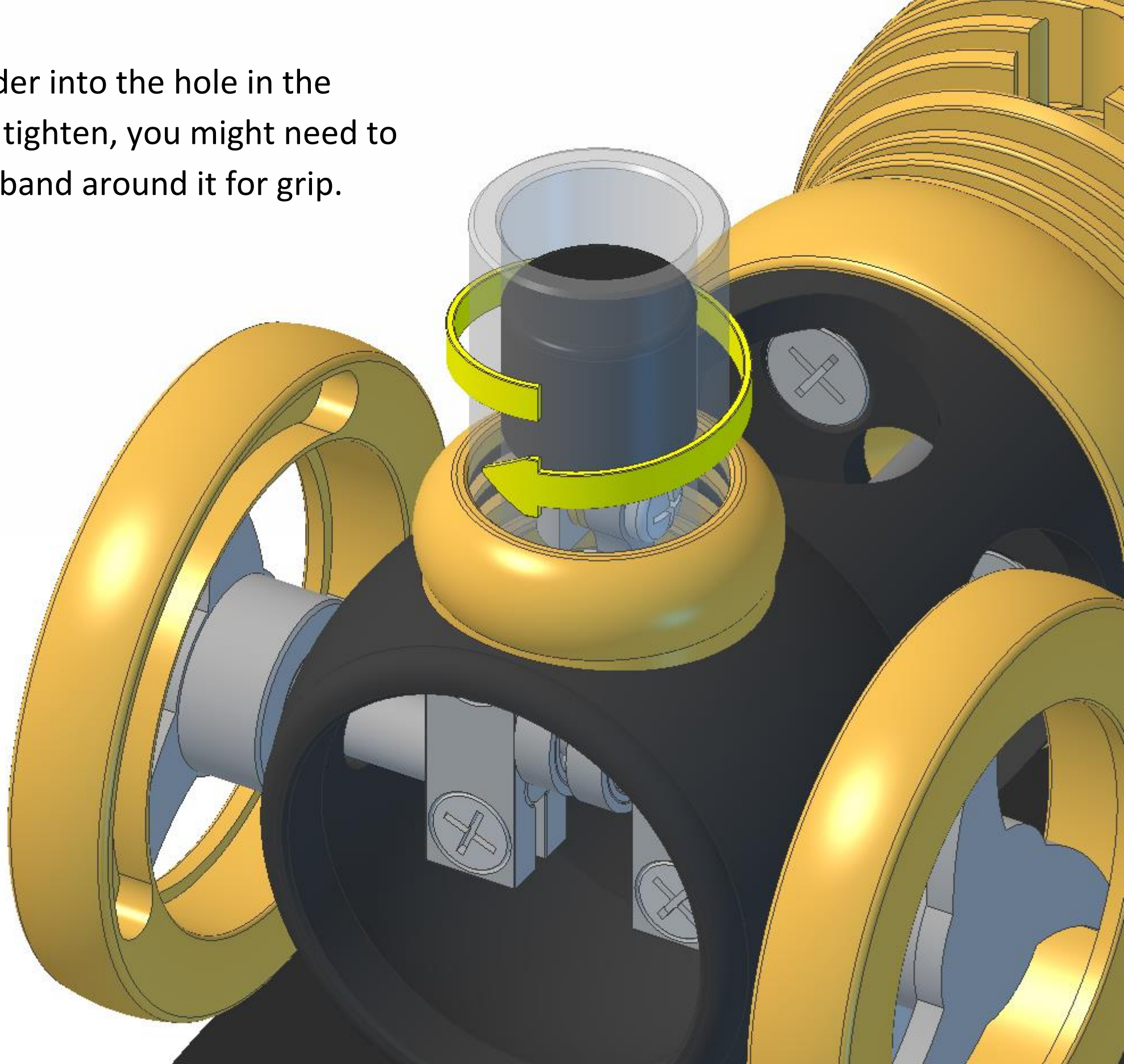


Hold the piston vertically and lower the cylinder down over it.

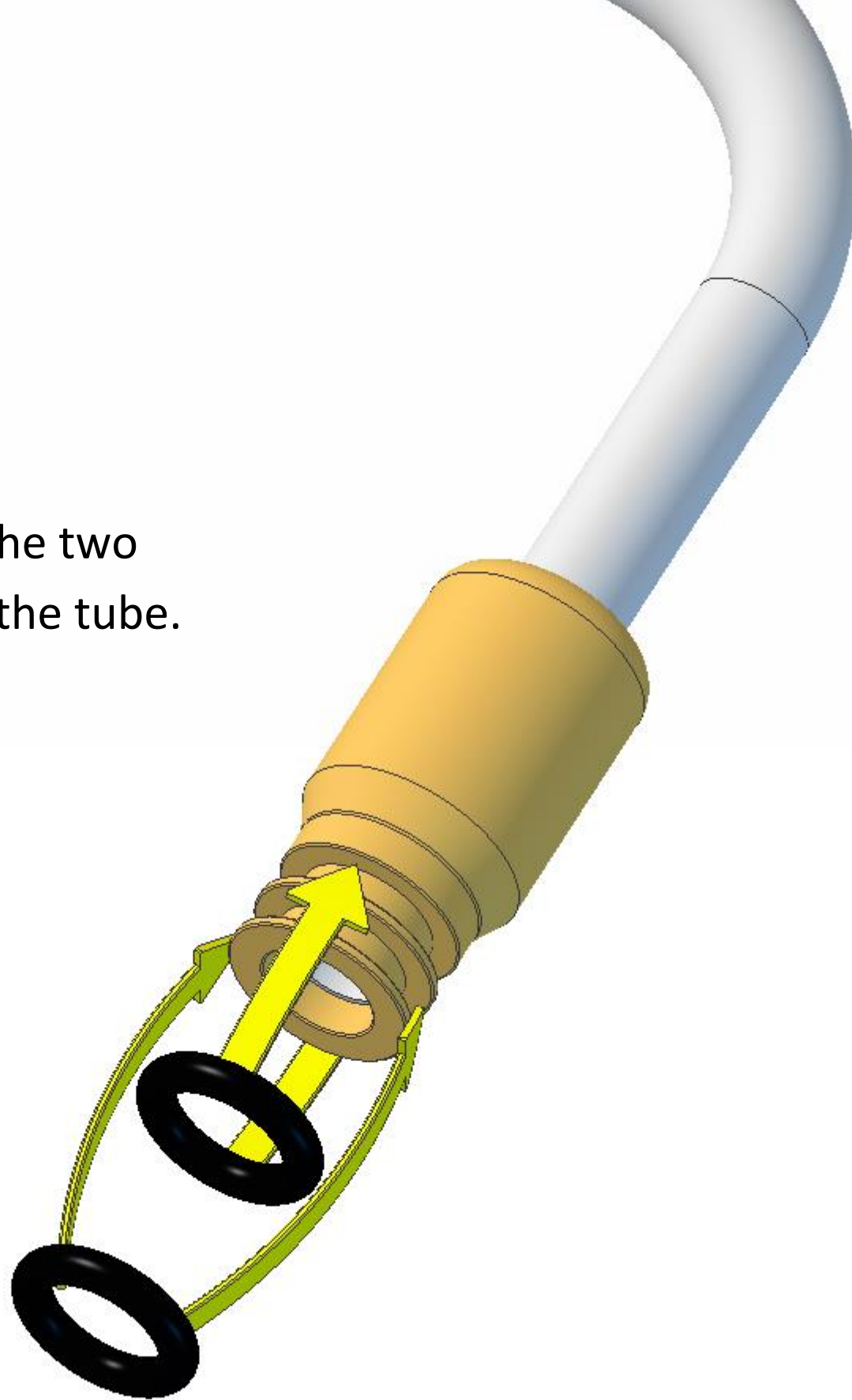
Lower the cylinder all the way down to the hole in the cradle.

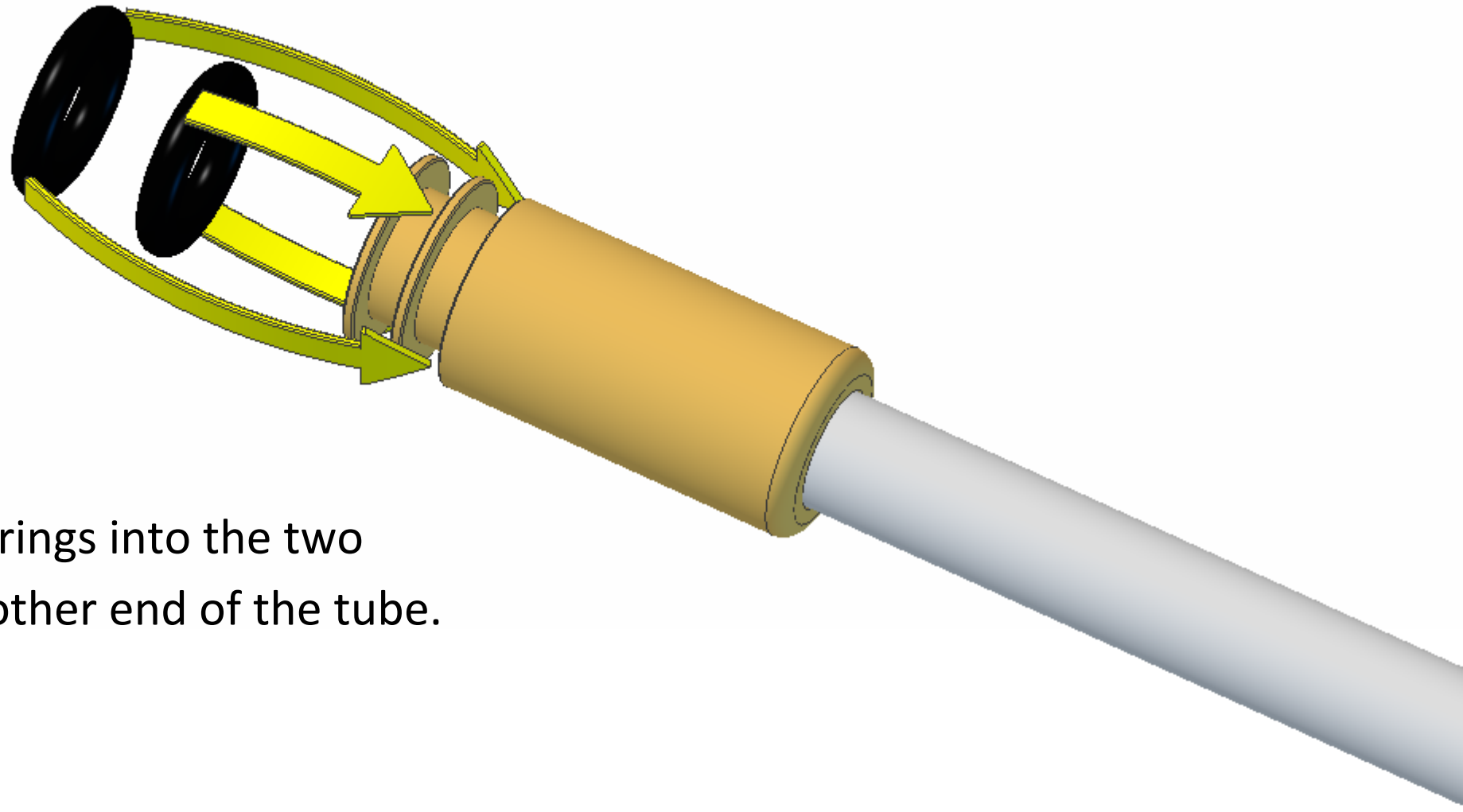


Screw the cylinder into the hole in the cradle and fully tighten, you might need to wrap an elastic band around it for grip.



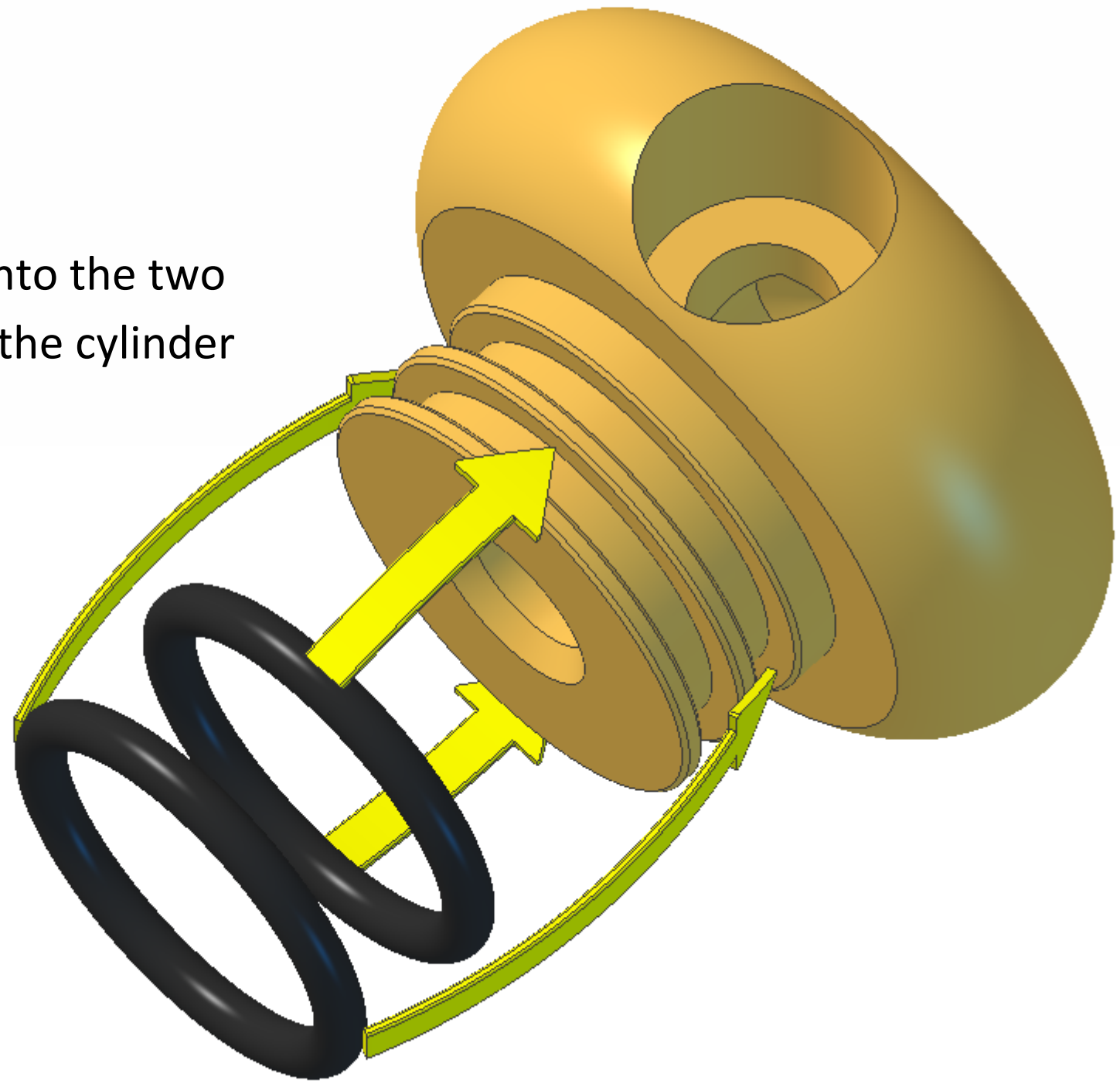
Fit two 3mm O rings into the two grooves in one the end of the tube.





Fit two 3mm O rings into the two grooves in the other end of the tube.

Fit two 7mm O rings into the two grooves in the end of the cylinder port.

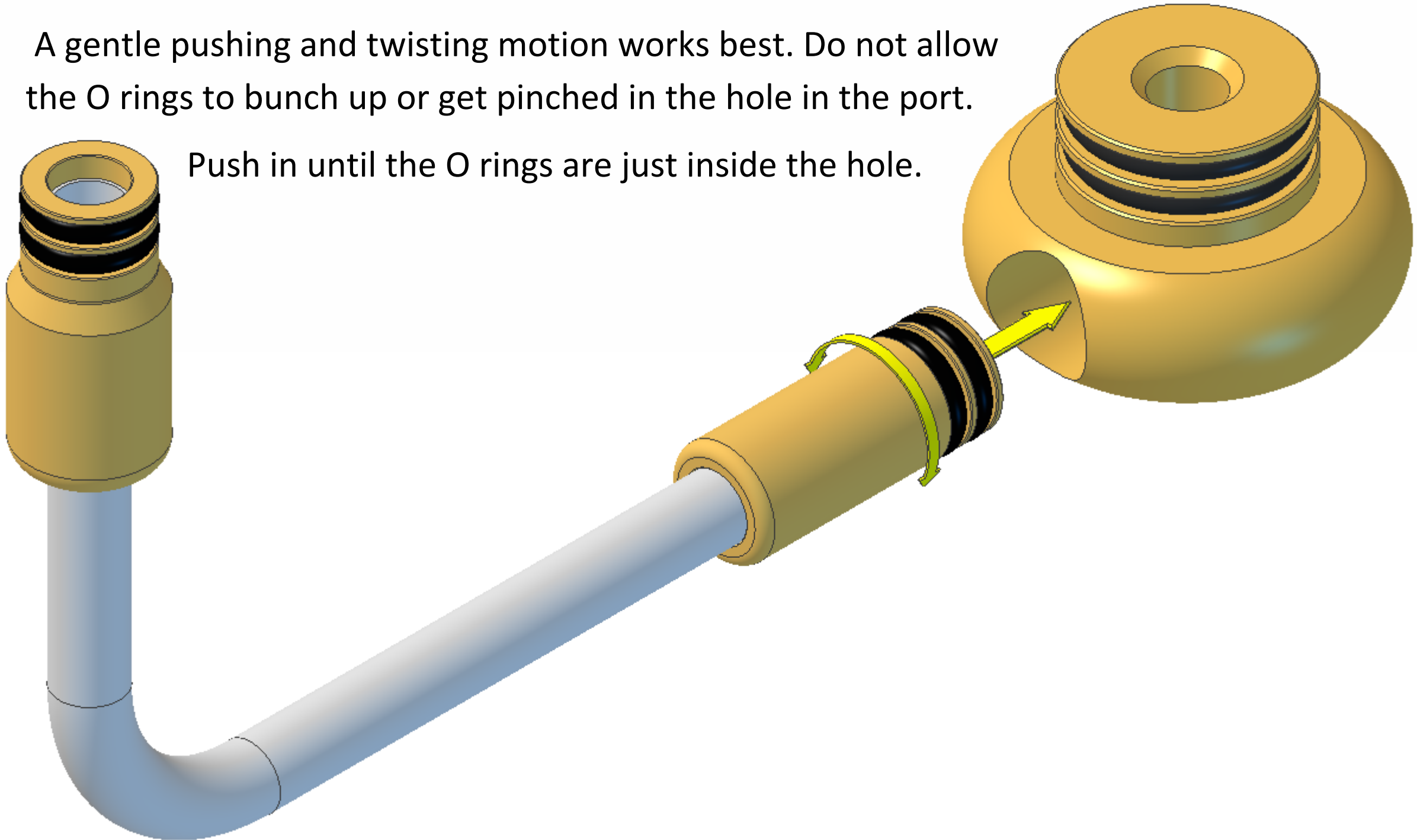


The brass fittings on the end of the tube are different sizes.

Moisten the O rings on the smaller of the two fittings sparingly with slightly soapy tap water for lubrication and fit into the hole in the cylinder port.

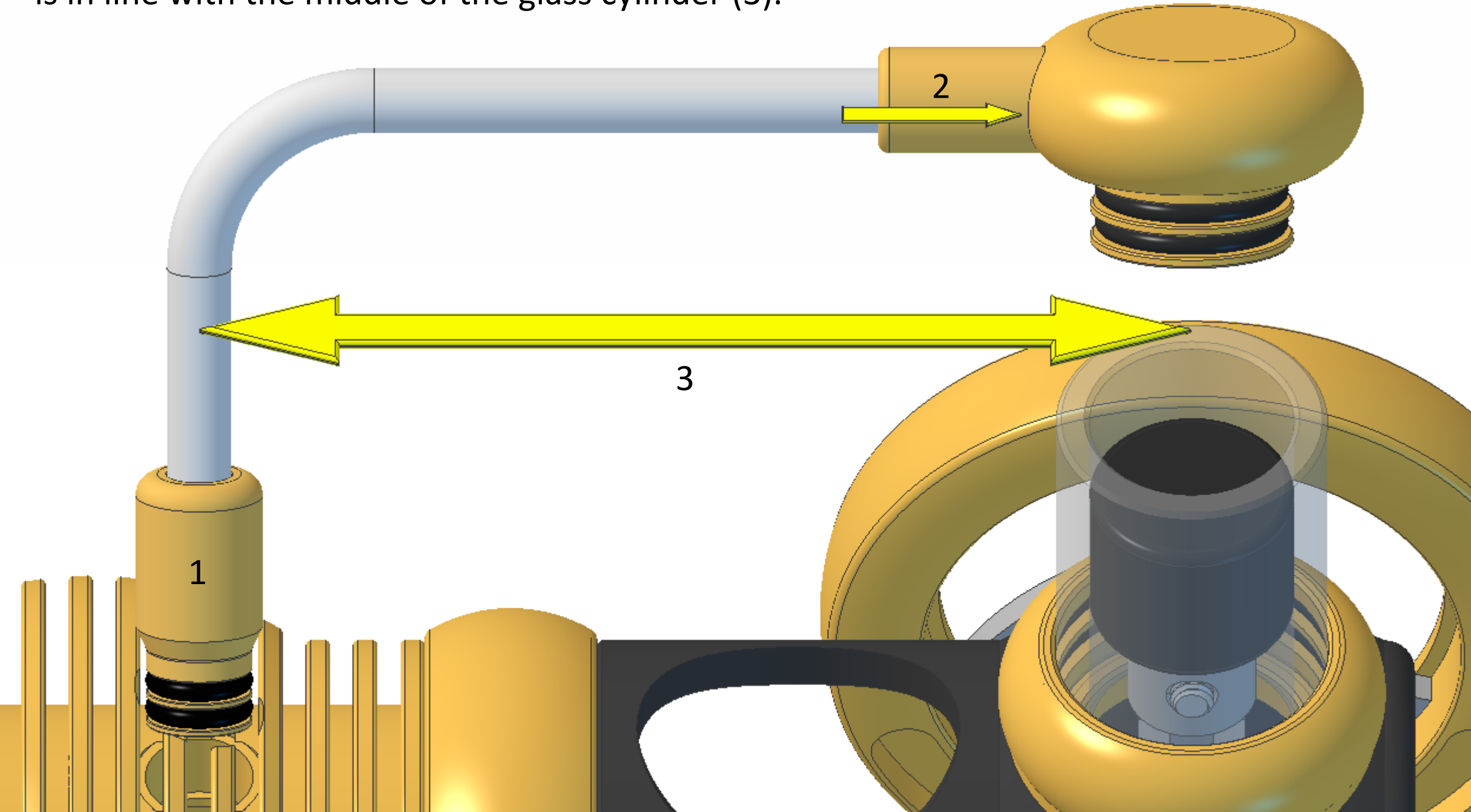
A gentle pushing and twisting motion works best. Do not allow the O rings to bunch up or get pinched in the hole in the port.

Push in until the O rings are just inside the hole.

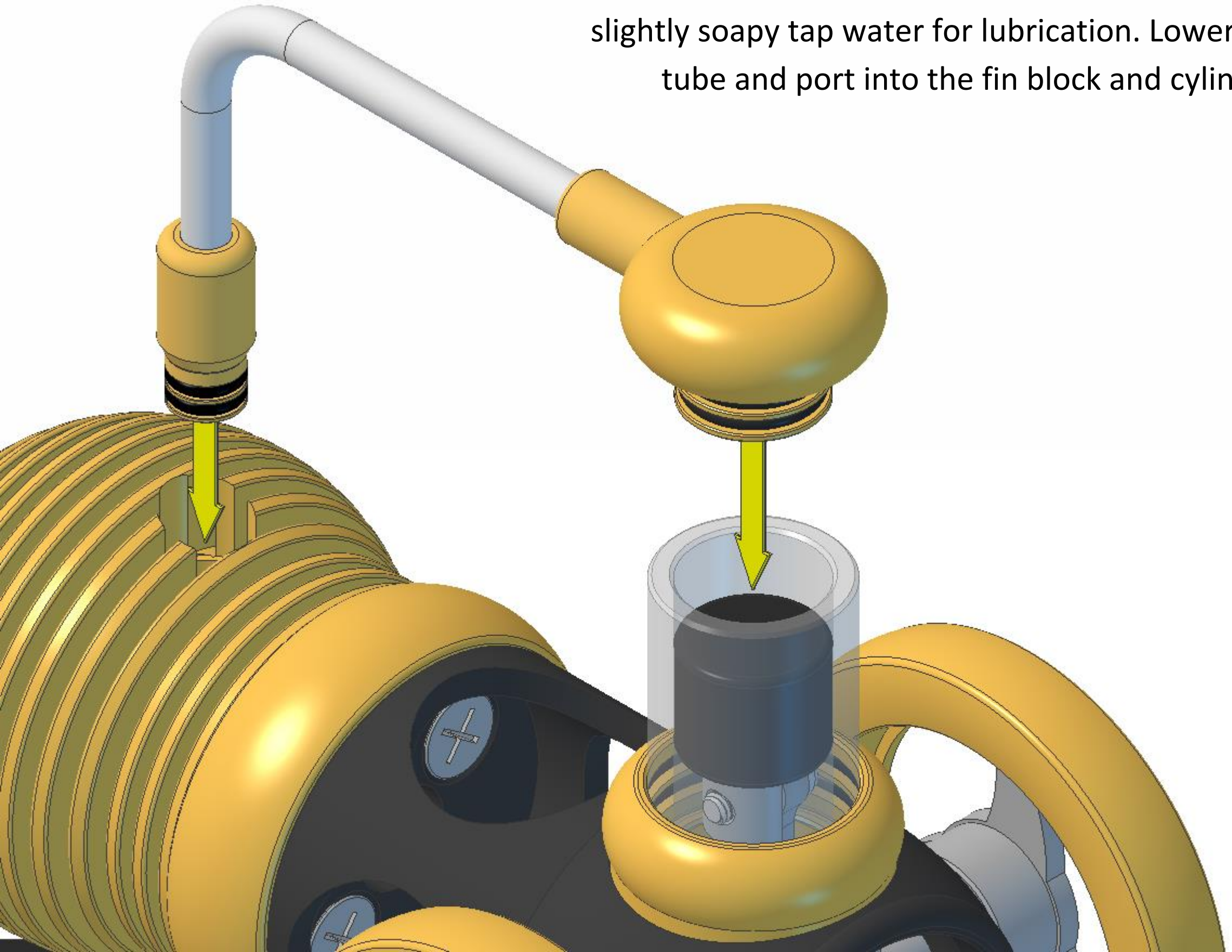


The tube and cylinder port need adjusting to the correct length.

1. Position the tube over the engine so that the left end is in line with the hole in the fin block.
2. Adjust the position of the tube in the cylinder port so that the middle of the port is in line with the middle of the glass cylinder (3).

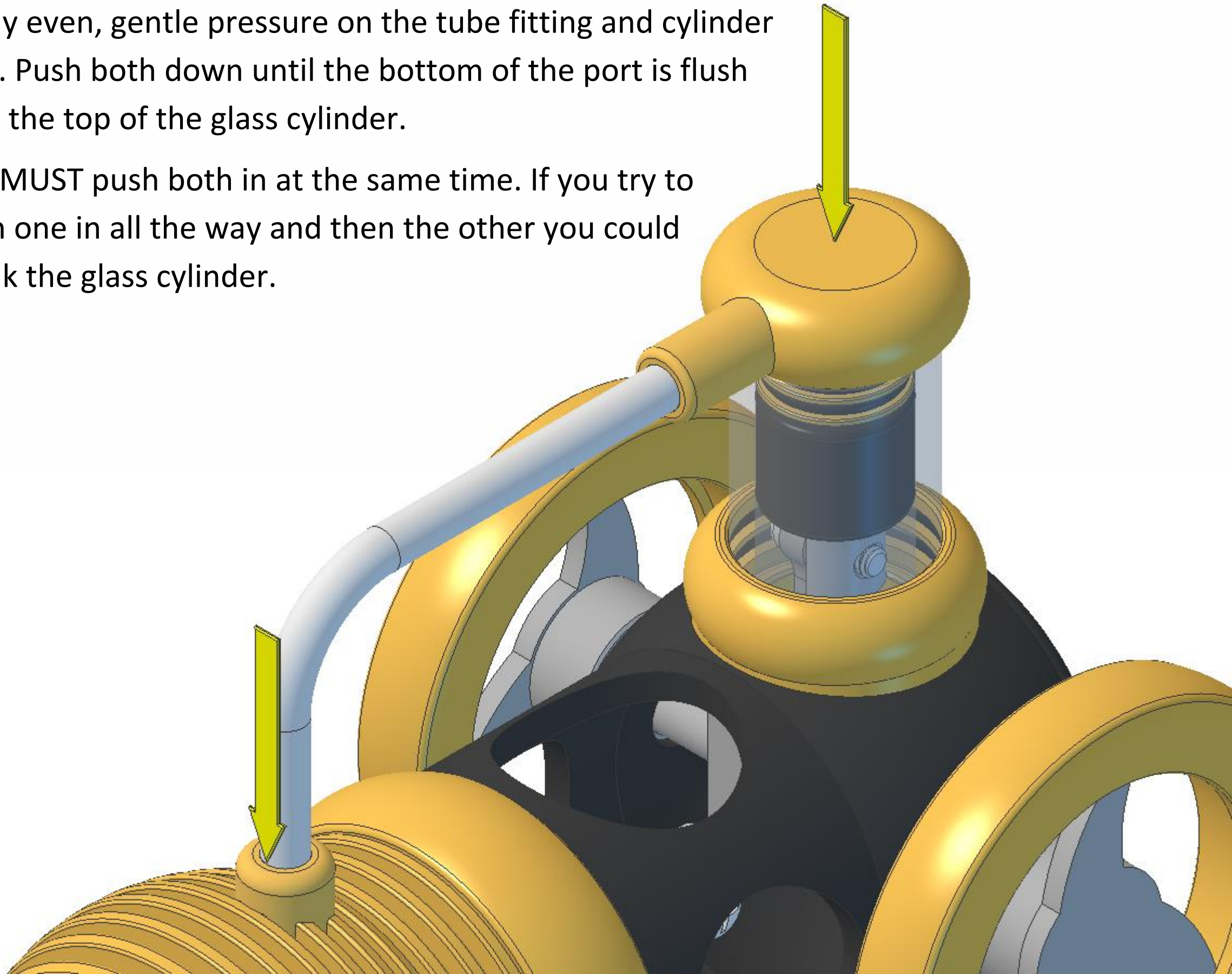


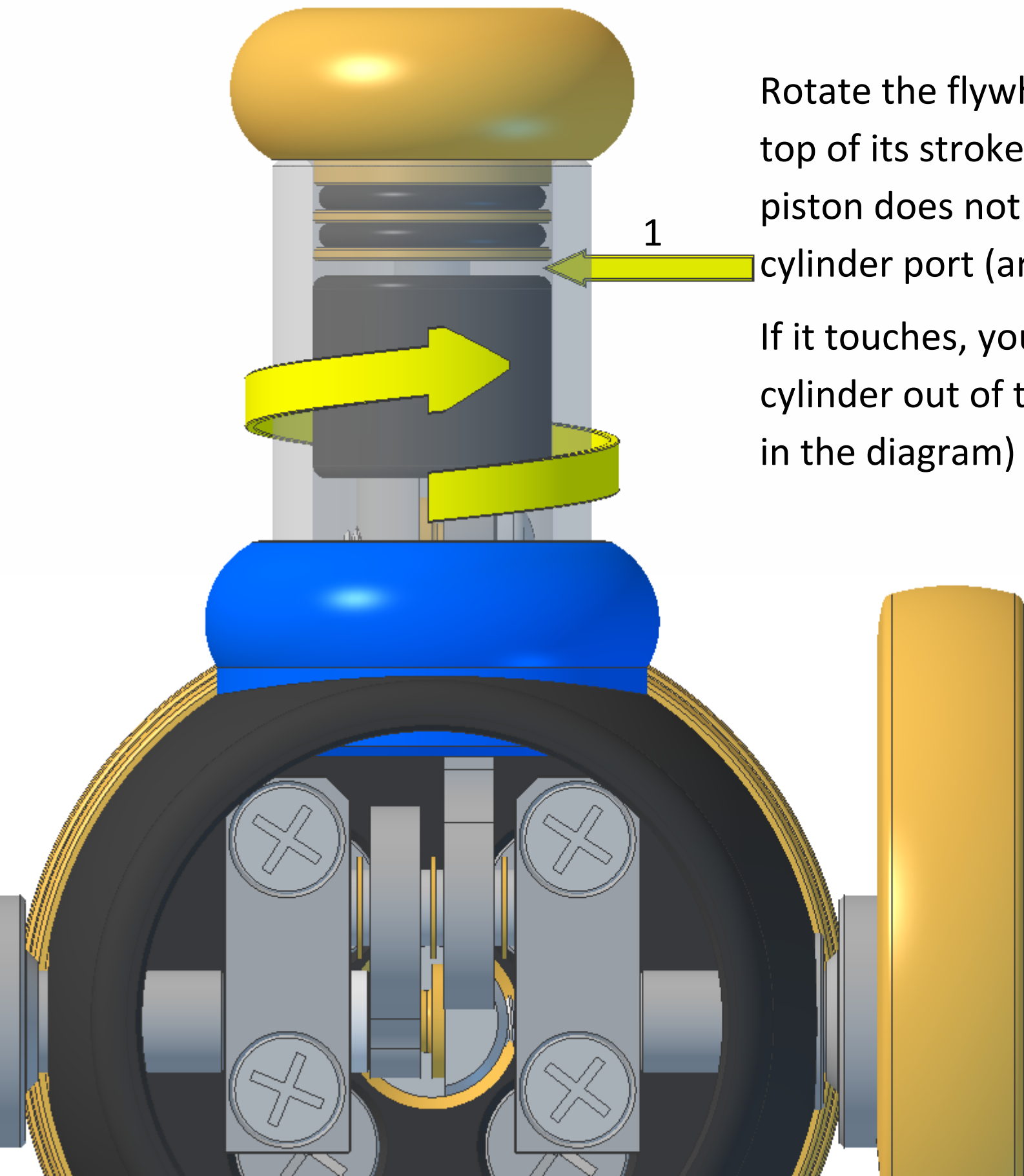
Moisten the two O rings on the tube and the two on the cylinder port sparingly with slightly soapy tap water for lubrication. Lower the tube and port into the fin block and cylinder.



Apply even, gentle pressure on the tube fitting and cylinder port. Push both down until the bottom of the port is flush with the top of the glass cylinder.

You **MUST** push both in at the same time. If you try to push one in all the way and then the other you could break the glass cylinder.



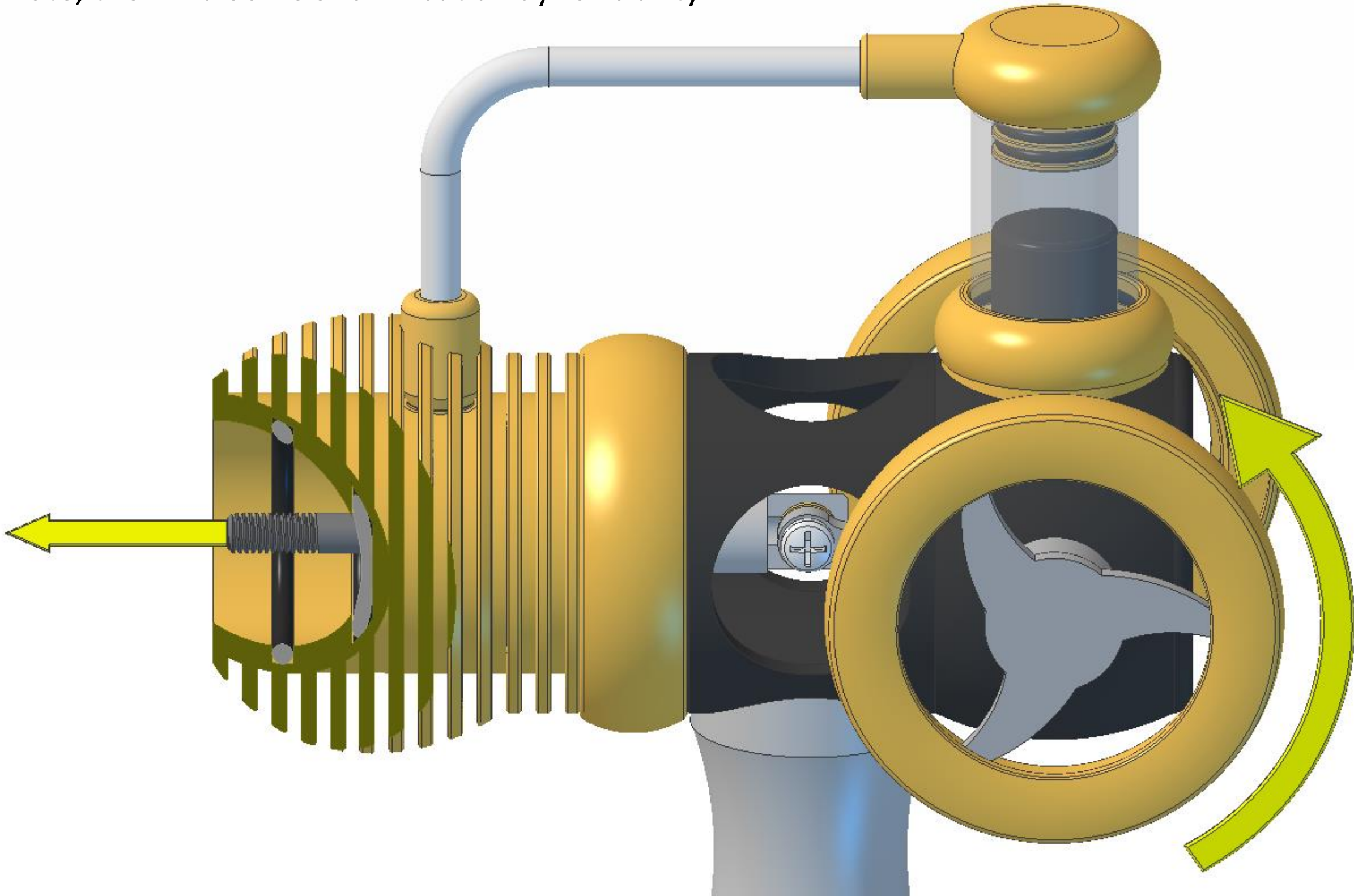


Rotate the flywheels until the piston is at the top of its stroke. Check that the top of the piston does not touch the bottom of the cylinder port (arrow 1).

If it touches, you will need to twist the glass cylinder out of the glass holder (shown in blue in the diagram) a small amount.

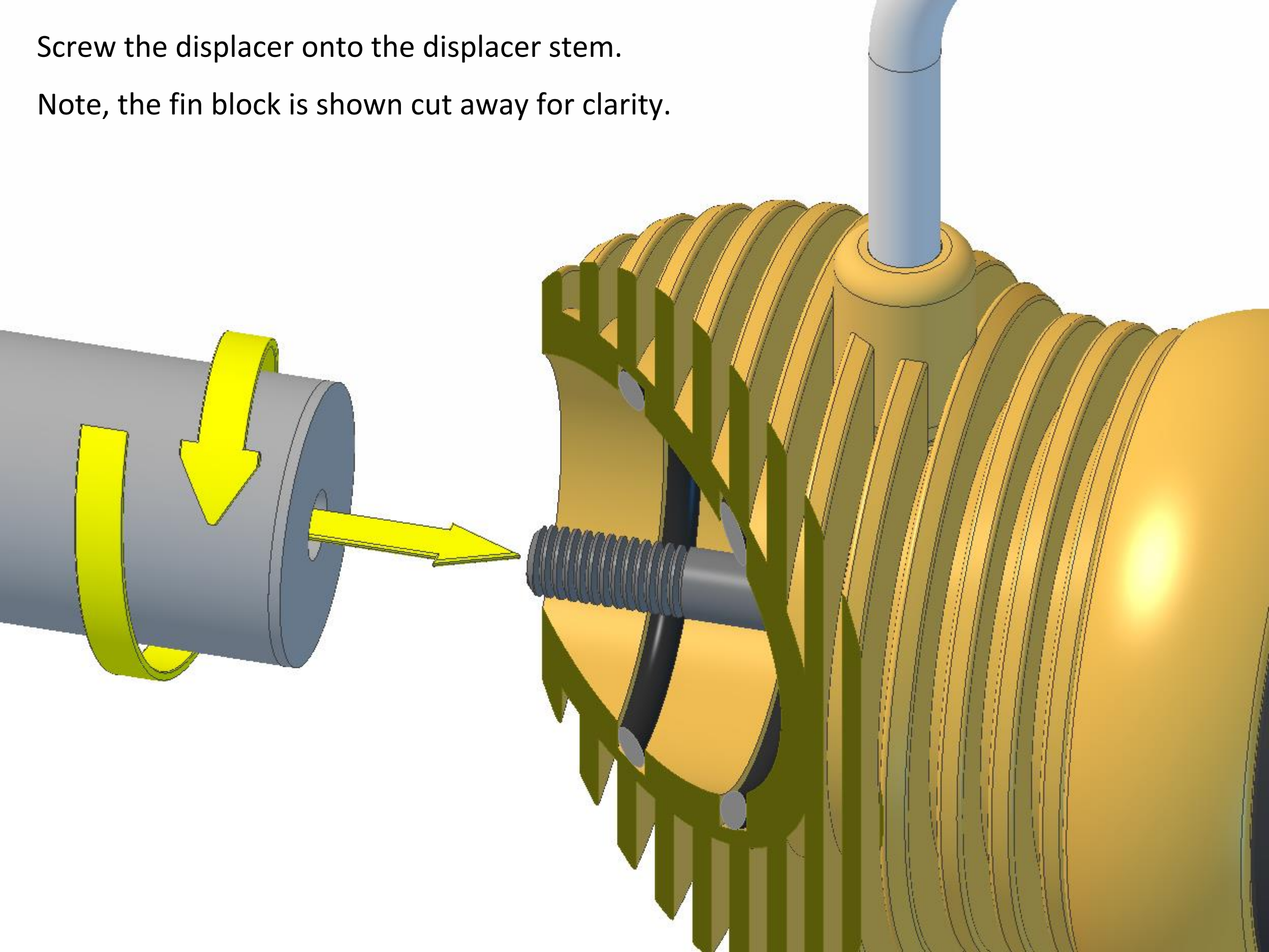
Rotate the flywheel until the end of the displacer stem is as close to the end of the fin block as it can get.

Note, the fin block is shown cut away for clarity.



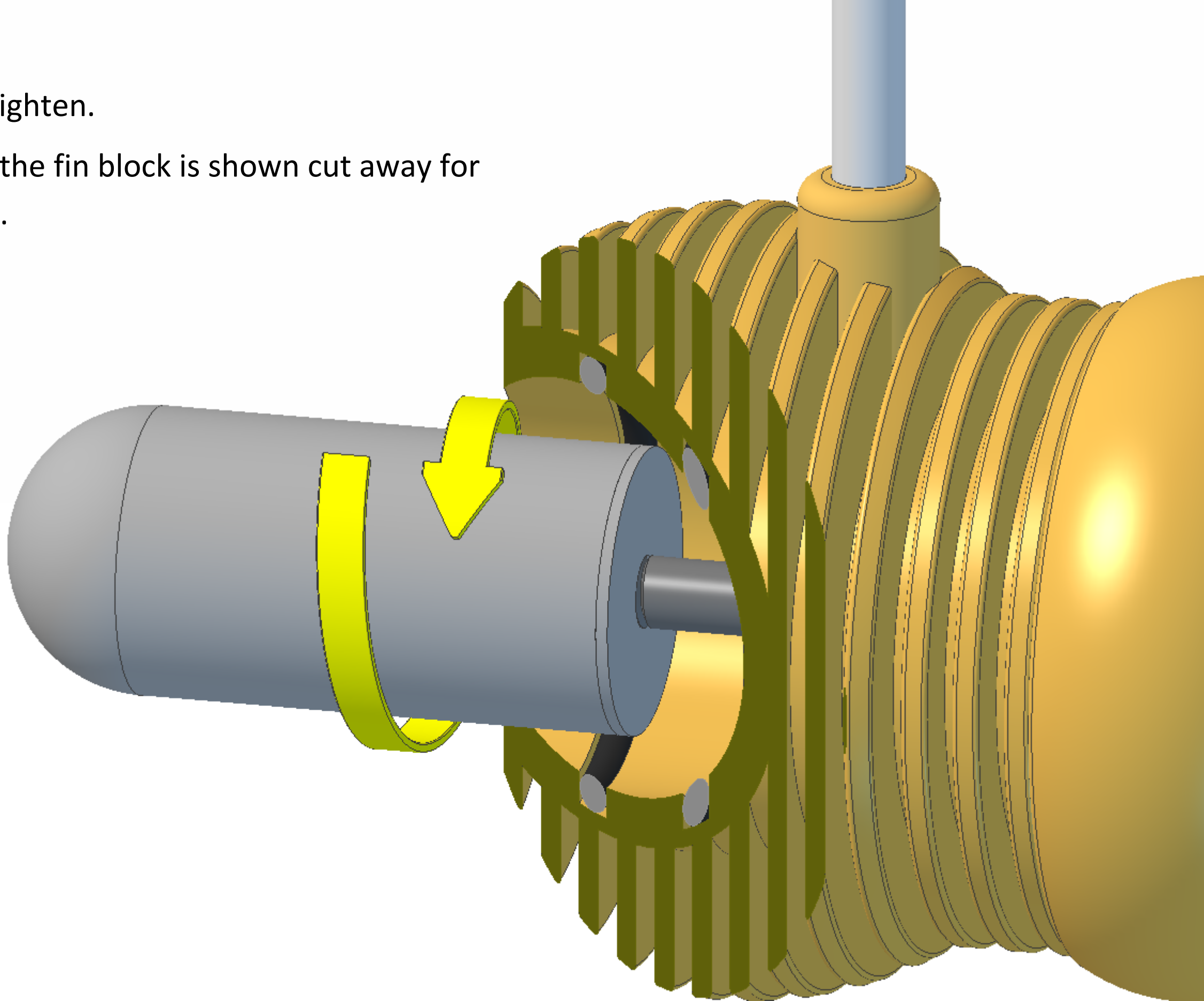
Screw the displacer onto the displacer stem.

Note, the fin block is shown cut away for clarity.

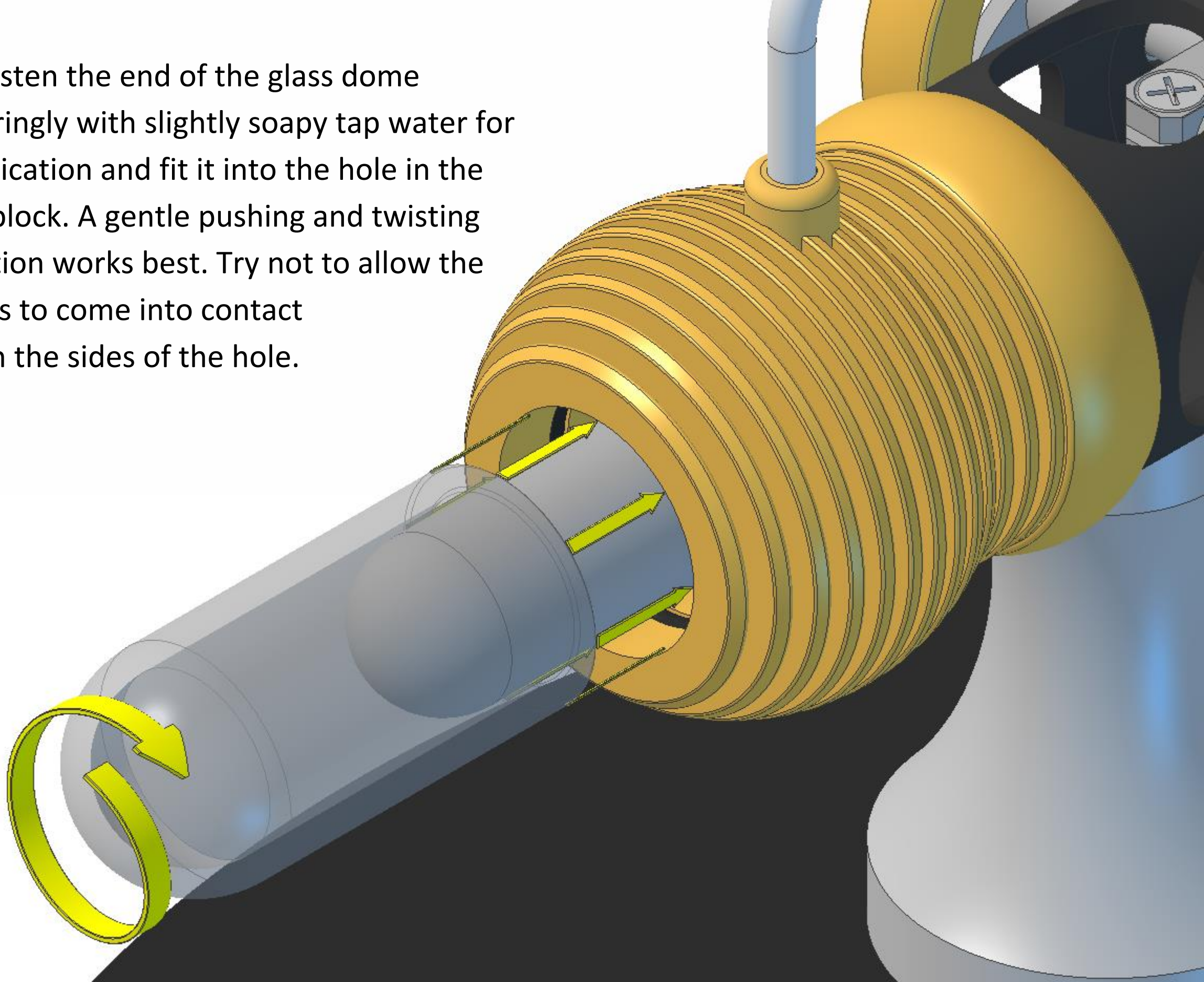


Fully tighten.

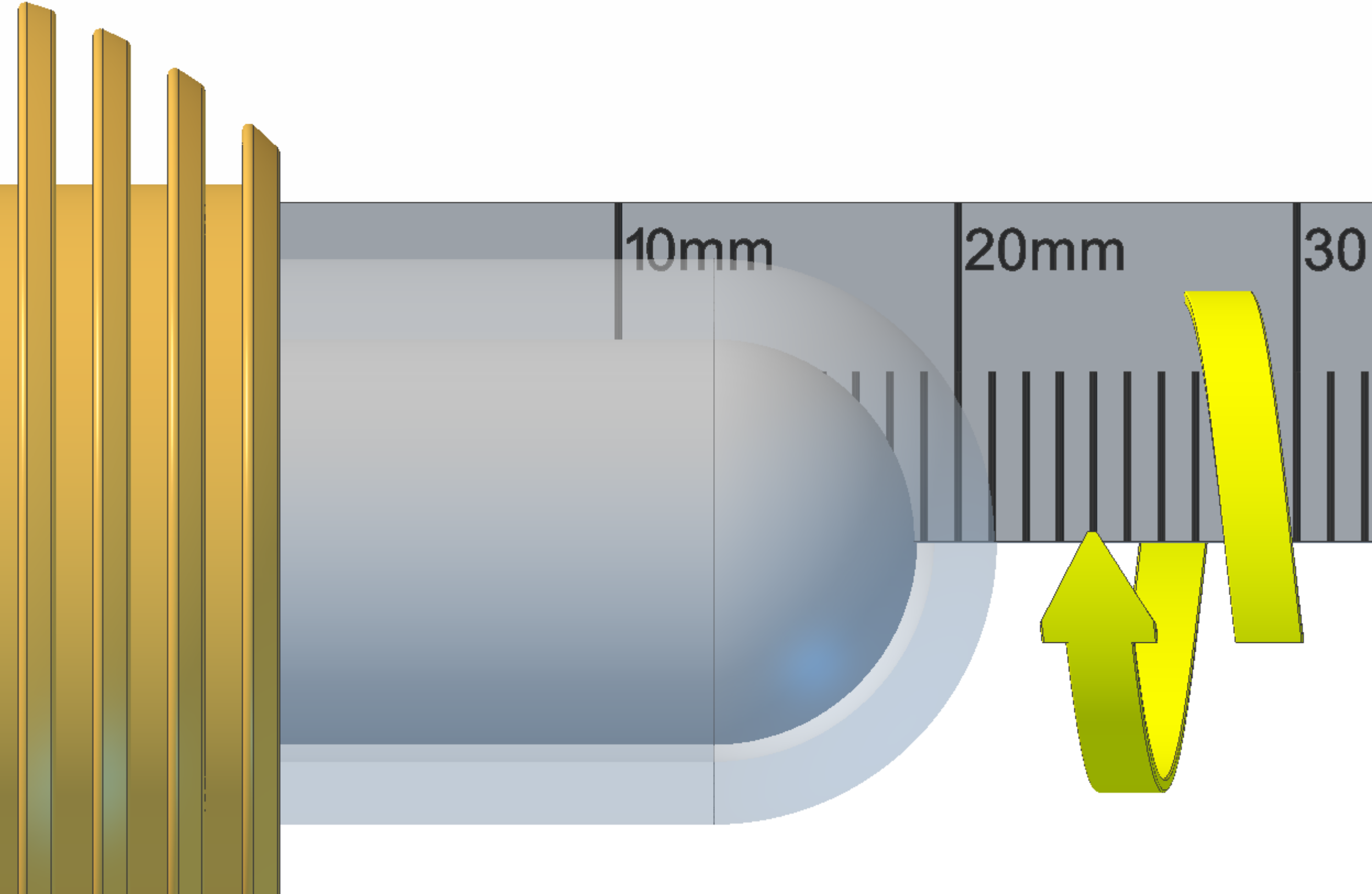
Note, the fin block is shown cut away for clarity.



Moisten the end of the glass dome sparingly with slightly soapy tap water for lubrication and fit it into the hole in the fin block. A gentle pushing and twisting motion works best. Try not to allow the glass to come into contact with the sides of the hole.



The end of the dome should be 21mm from the end of the fin block.



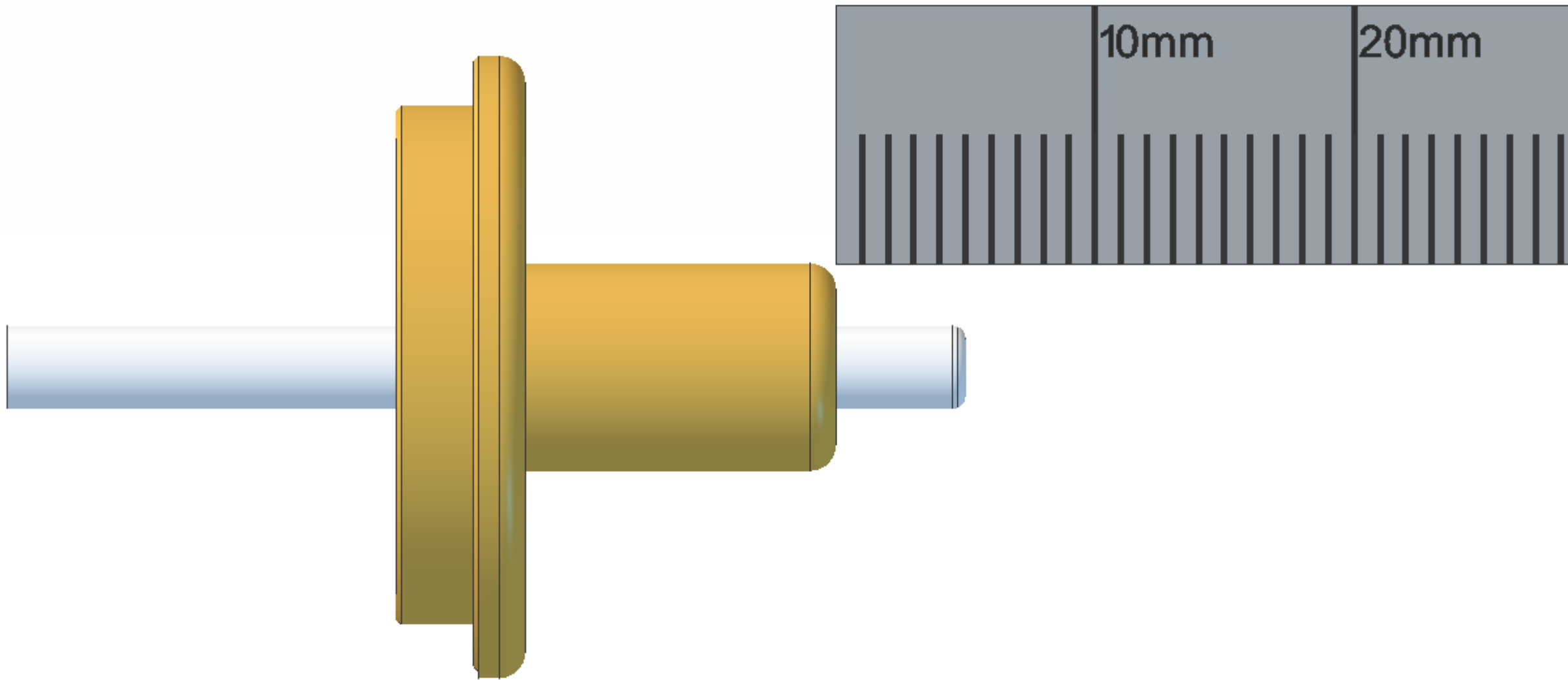
If the top end of the wick is frayed you will need to burn off the loose fibres, allow to cool, and then roll the end into a blunt point.

ONLY EVER PERFORM THIS STEP ON DRY WICK, NEVER ON WICK THAT HAS BEEN SOAKED IN FUEL.

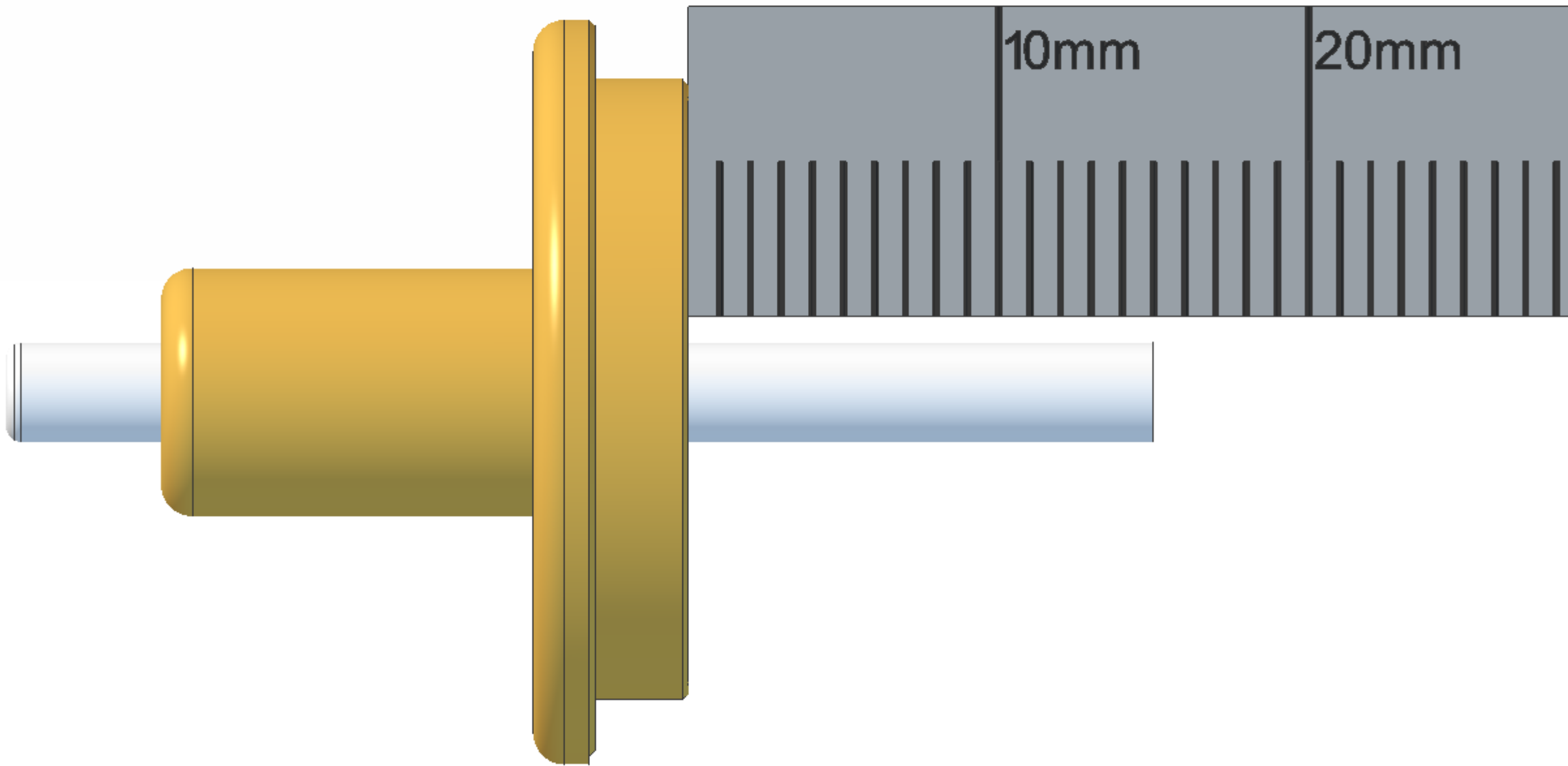
Insert the prepared end of the wick into the burner cap, a pushing and twisting motion works best.



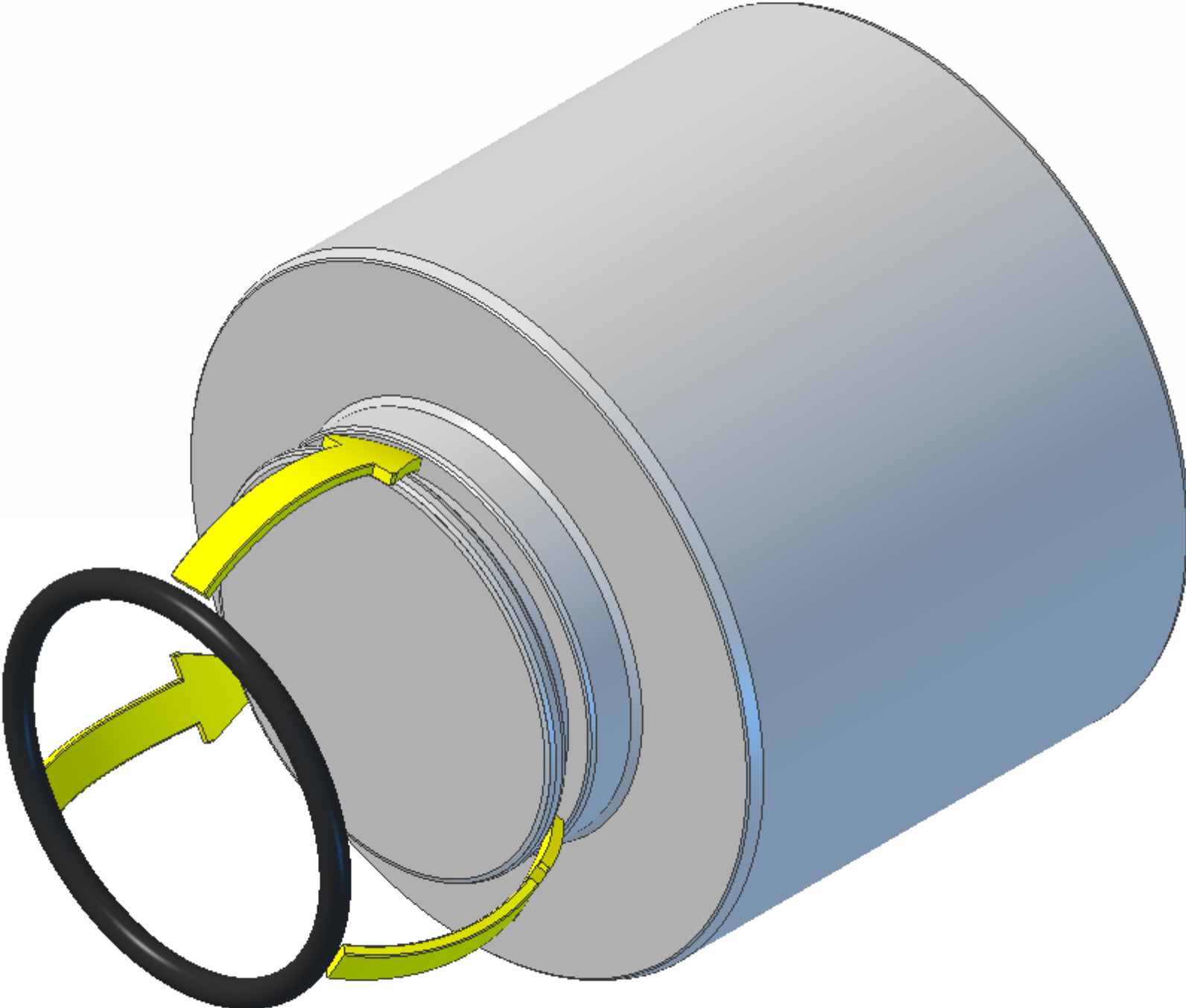
Trim the top of the wick to 5mm long.



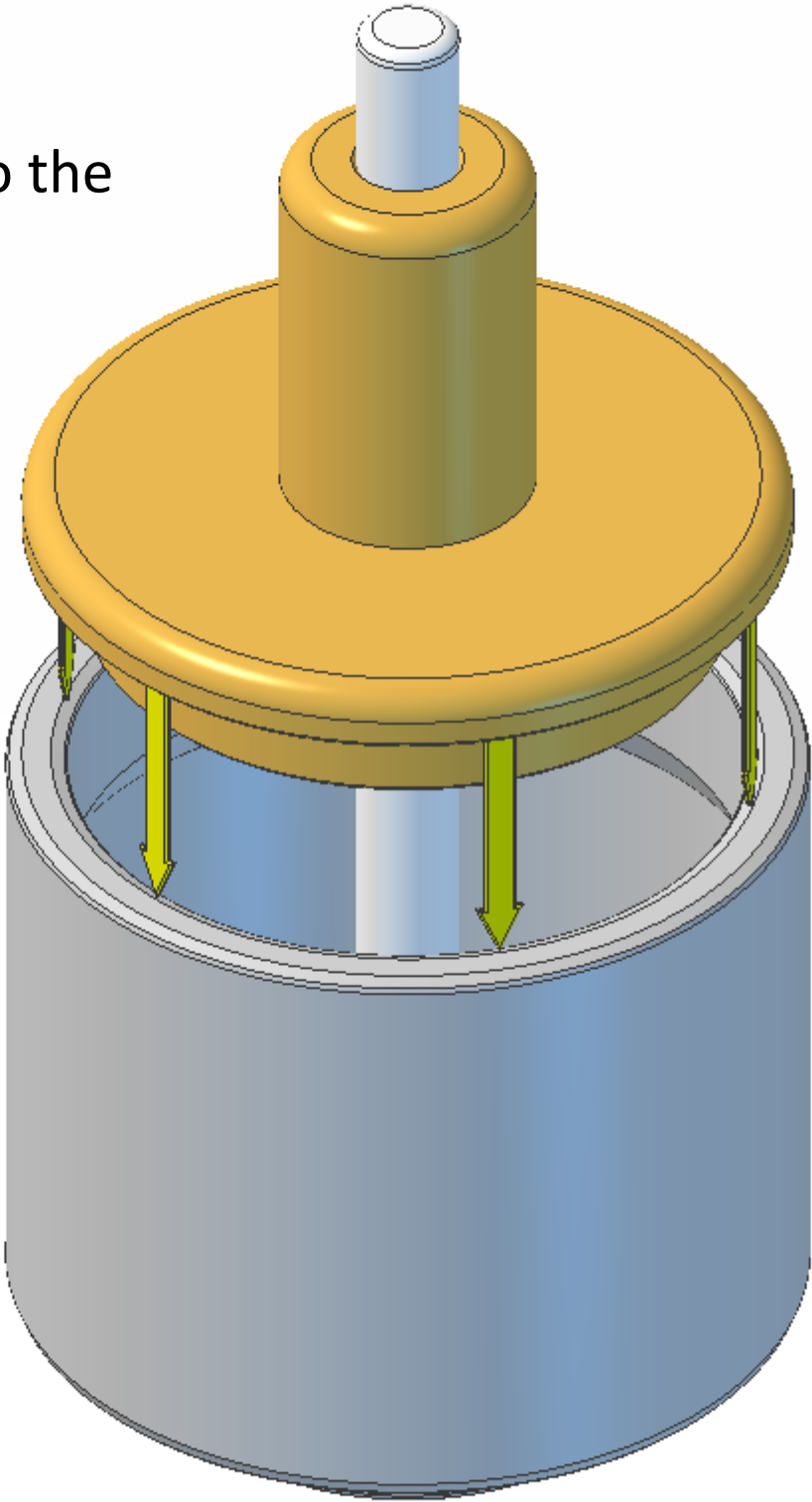
Trim the bottom of the wick to 15mm long.



Fit one 13mm O ring into the groove in the bottom of the burner body.

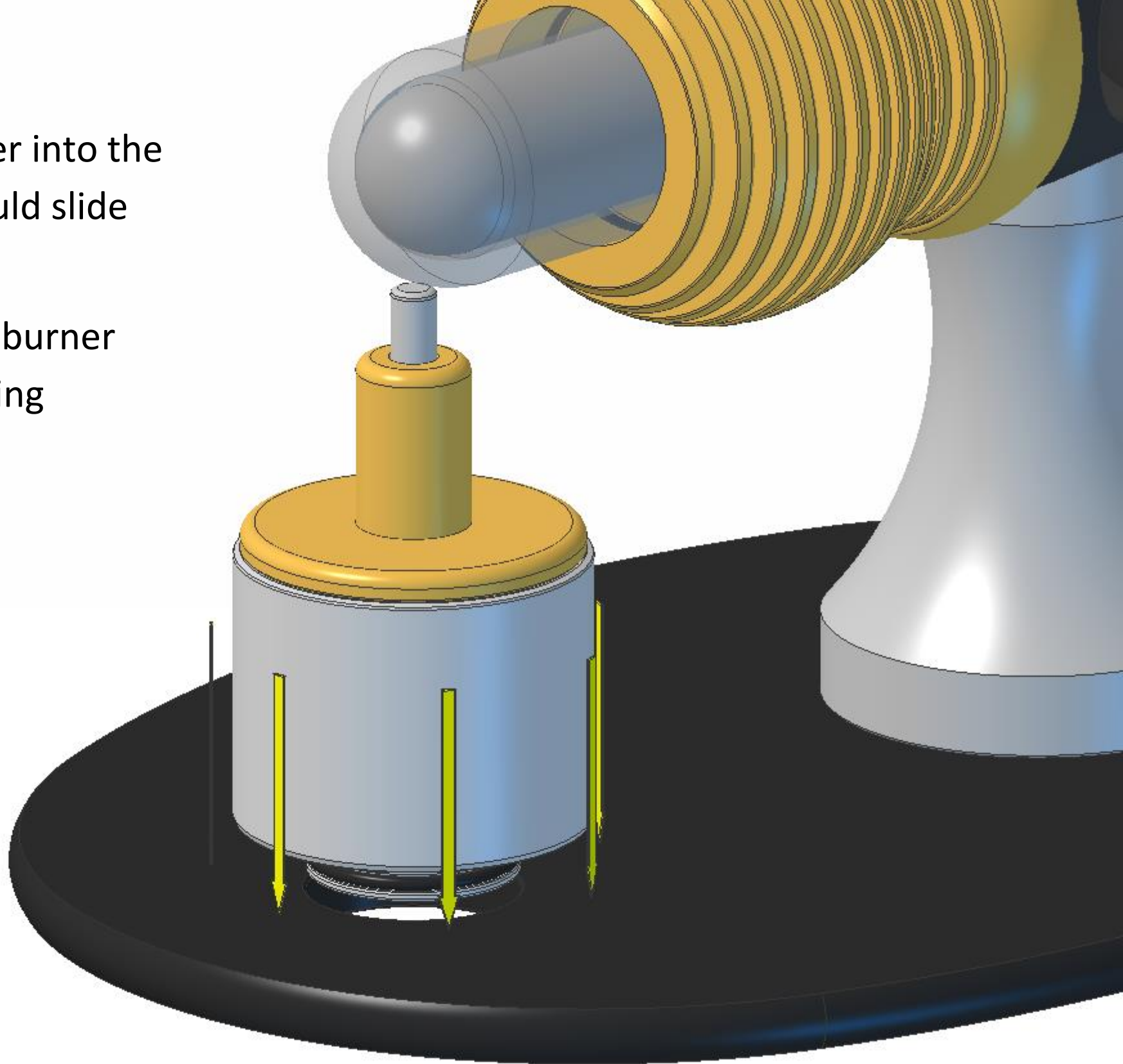


Fit the burner cap into the burner body.



Fit the assembled burner into the hole in the plate. It should slide in quite easily.

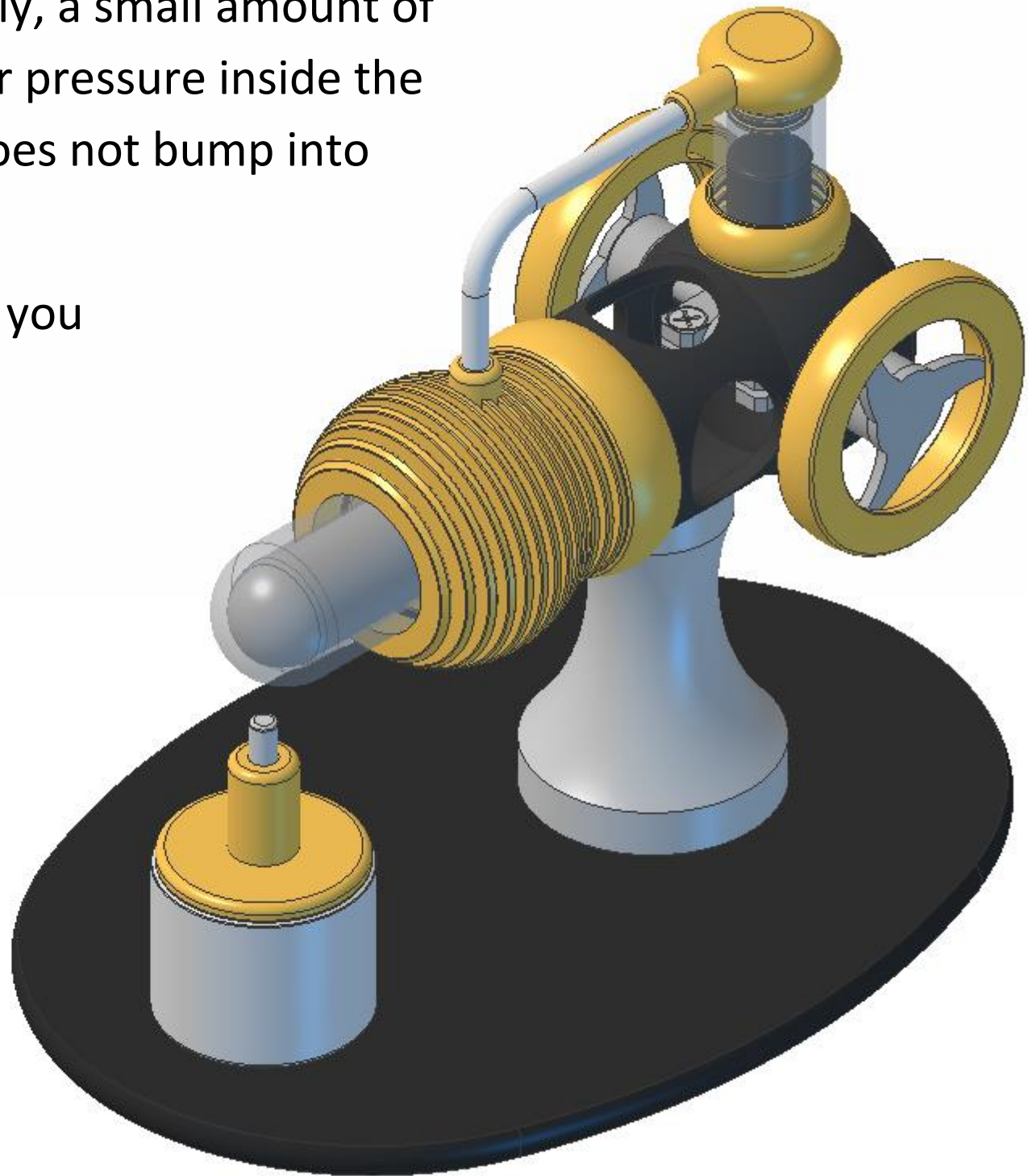
The O ring will hold the burner securely in position during operation.



Your engine is now fully assembled.

Check that the flywheels rotate fully, a small amount of resistance will be felt due to the air pressure inside the engine. Check that the displacer does not bump into the end of the glass dome.

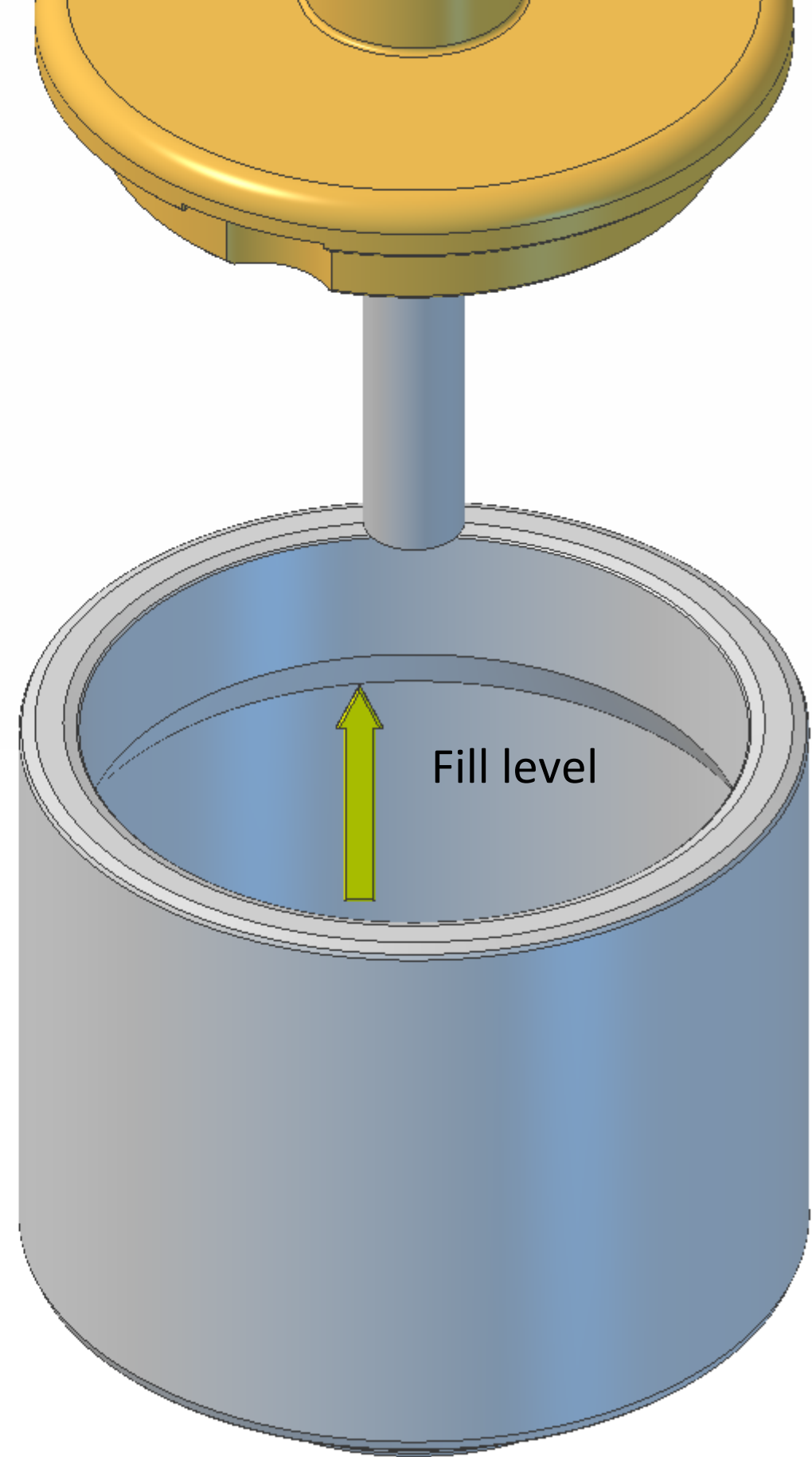
Once you have made these checks you are ready to operate your engine.



The engine uses Methylated Spirits or Denatured Alcohol as fuel.

Remove the burner from the engine base plate and remove the cap from the body. There is a small step about a quarter of the way down inside, fill with fuel to this level AND NO MORE. Trim the wick to 5mm protruding from the top and 15mm from the bottom. Fit the cap back in the body.

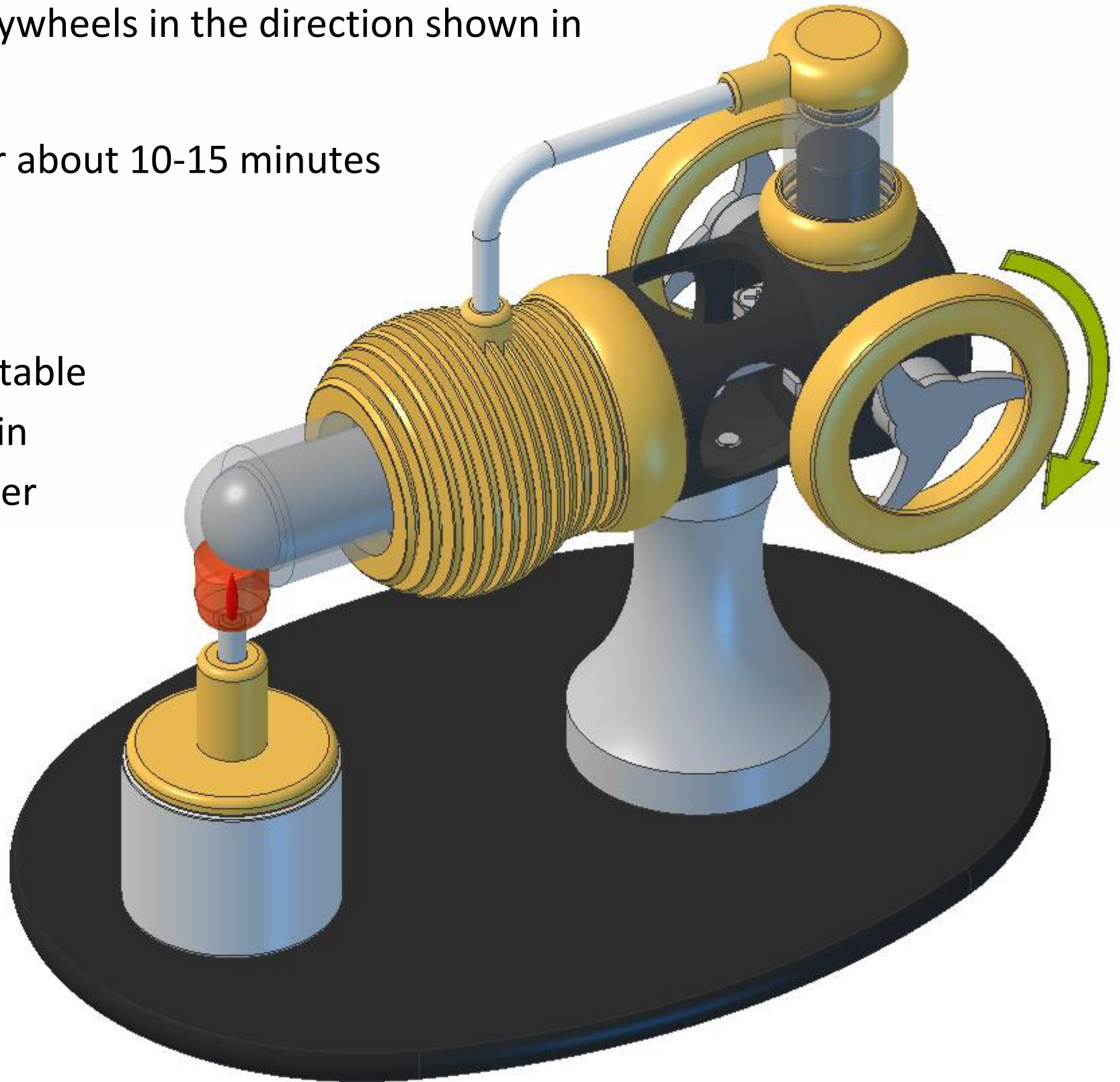
The cap has a small vent slot on its underside. This must always be kept clear or the burner cap might pop off during operation and spill burning fuel on the base plate.



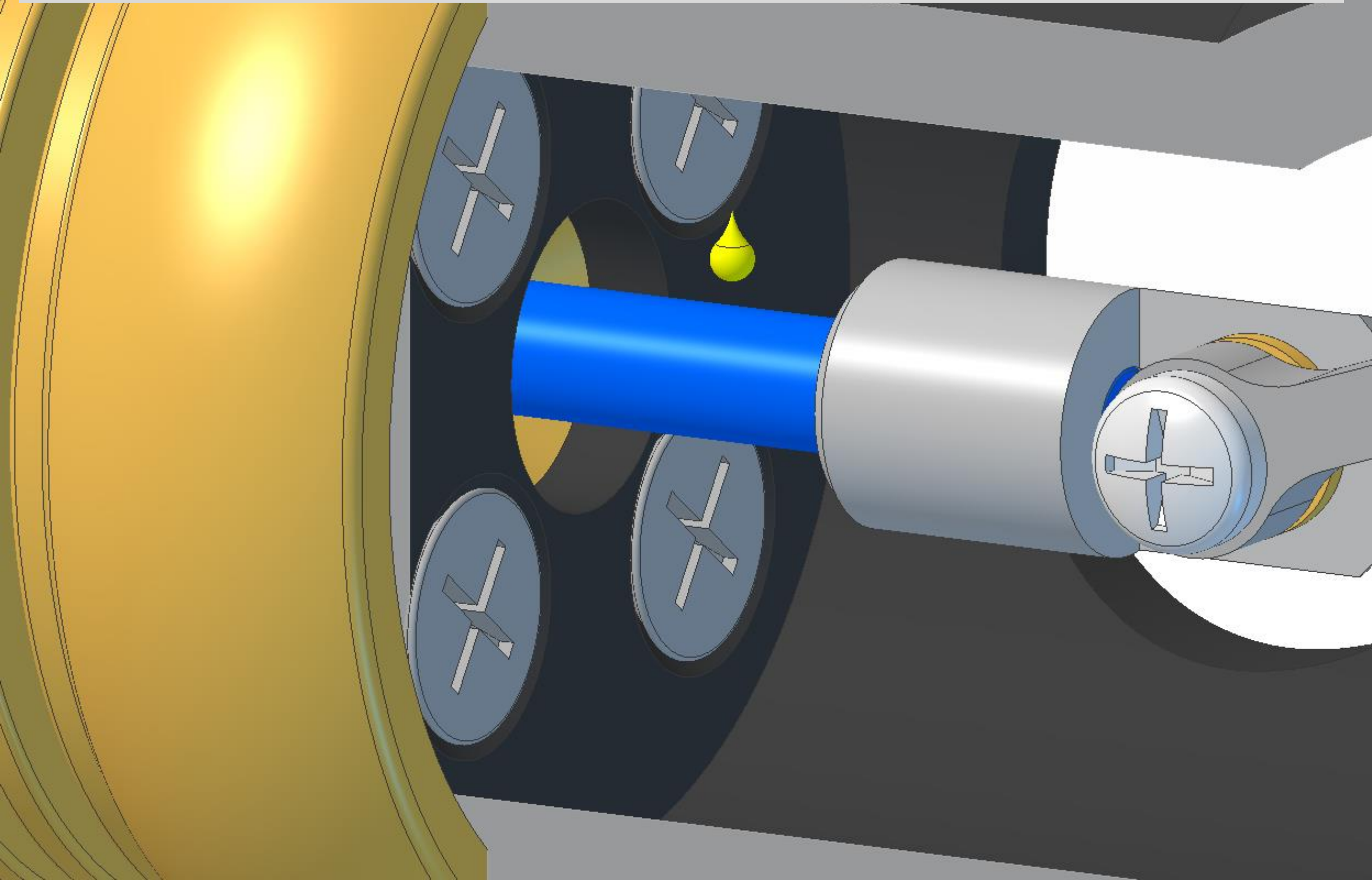
Light the wick and allow a minute or so for the engine to warm up, then spin the flywheels in the direction shown in the diagram.

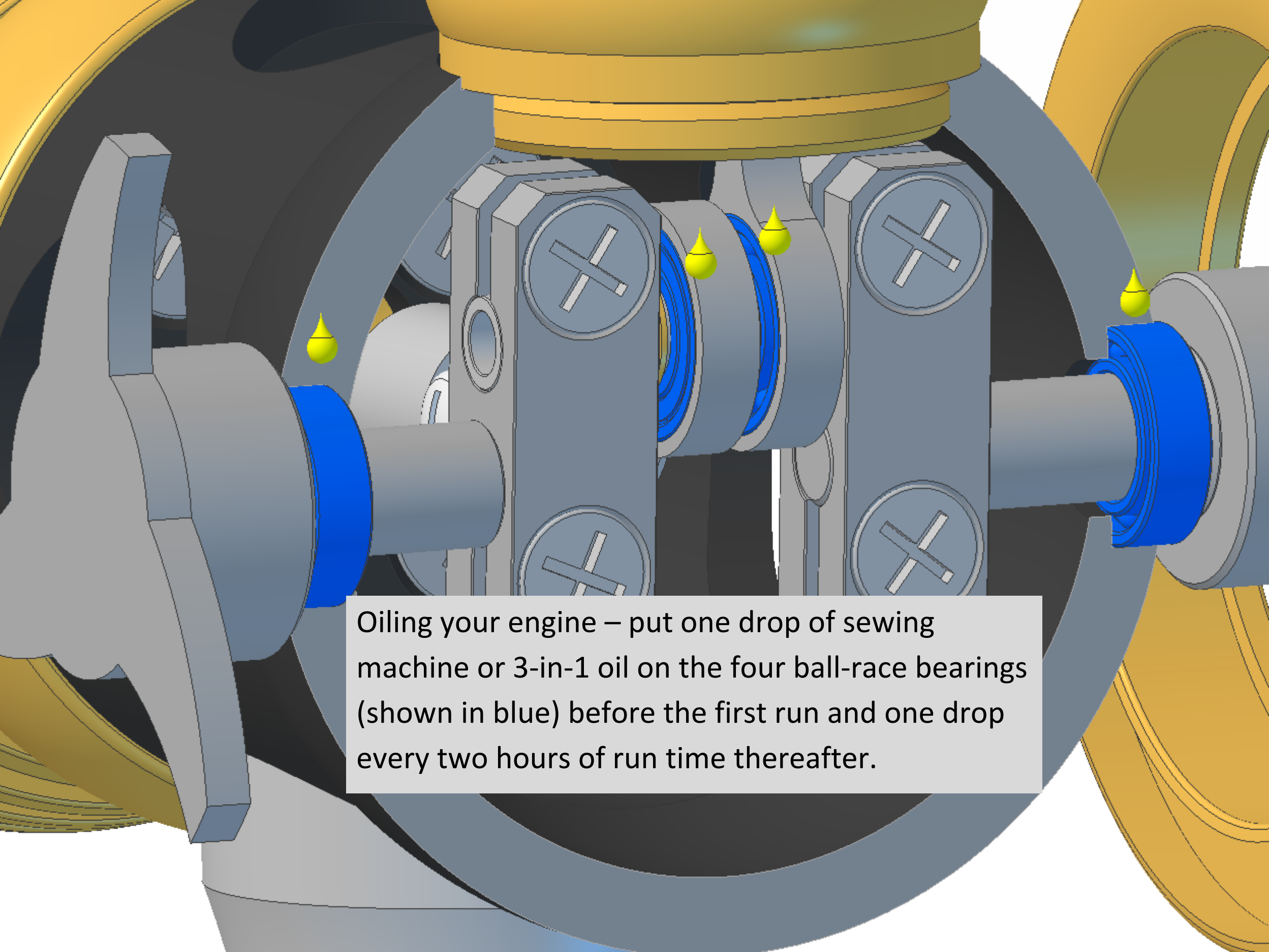
The engine should run for about 10-15 minutes before the fuel runs out.

Make sure you have a suitable fire extinguisher to hand in case of emergencies. Never leave a running engine or naked flame unattended.



Oiling your engine – put one drop of sewing machine or 3-in-1 oil on the displacer stem (shown in blue) before the first run and one drop every two hours of run time thereafter.





Oiling your engine – put one drop of sewing machine or 3-in-1 oil on the four ball-race bearings (shown in blue) before the first run and one drop every two hours of run time thereafter.