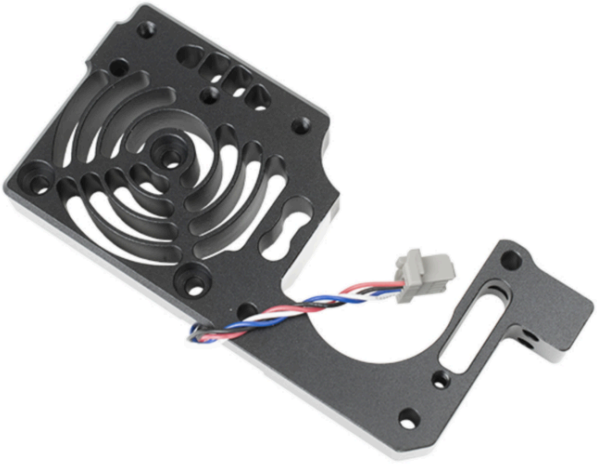
Tabla de Contenido

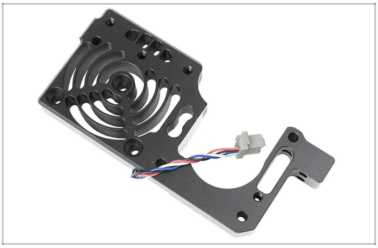
How to replace Nextruder heatsink (XL Multi-tool)



help.prusa3d.com/g559637

Escanea el código QR para ver la última versión de este capítulo.

PASO 1 Introduction



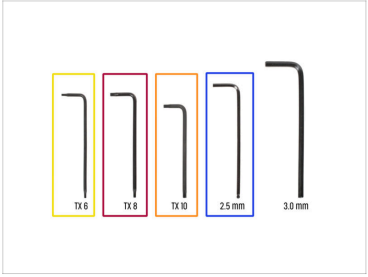
This guide will take you through the replacement of the **heatsink** on the **Original Prusa XL (Multi-tool)**.

The **following instructions are intended for XL multi-tool only**, although most steps are common. A single-tool version will be offered at a later time.

Algunas partes pueden ser ligeramente diferentes. Sin embargo, esto no afecta el procedimiento.

The following instructions require extreme attention. The procedure involves direct intervention in the planetary gearbox.

PASO 2 Tools necessary for this guide



- **Para esta guía, prepara:**
- Torx TX10 key
- Torx TX6 key
- Torx TX8 key
- Llave Allen de 2.5 mm
- Universal wrench
- Nose pliers
- Side cutters *recommended for cutting zip ties*

PASO 3 Additional parts

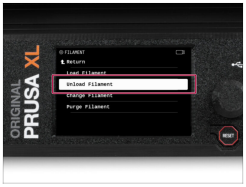
- **Para esta guía, prepara:**
- Prusa lubricant (1x) *supplied with your printer*
- PG-assembly-adapter (1x)

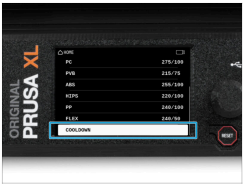
  ⚠ **The PG-assembly-adapter is not included in the box** and needs to be printed. You can download the STL file from printables.com.

  ⓘ The STL file is located in **Parts for maintenance** section. Before proceeding, please ensure to **review the recommended print settings** provided in the caption.

⚠ **DO NOT continue without the PG-assembly-adapter. It is necessary for the assembly!**

PASO 4 Unloading filament



ⓘ The following step is only necessary if you have a filament loaded in the current toolhead.

- Unload the filament from the hotend. On the screen, navigate to *Filament -> Unload Filament* and select the tool, you want to working on.
- Retira el filamento del hotend. No es necesario retirarlo completamente de la impresora. Sólo unos centímetros (pulgadas) por encima del extrusor.
- Cool down the printer to room temperature. On the screen, navigate to *Preheat -> Cooldown*.

⚠ **CAUTION: Wait for the printer to fully cool down** to room temperature before proceeding further.

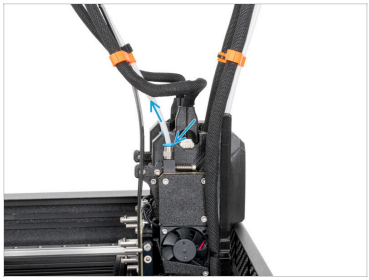
PASO 5 Preparing the printer

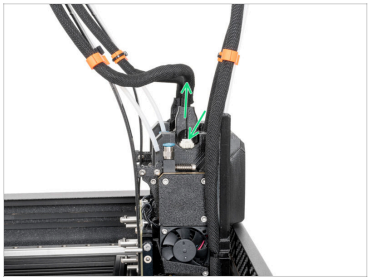
- On the printer screen, navigate to *Control -> Pick/Park Tool -> Park Current Tool*.
- Apaga el interruptor (símbolo "O").
- Desde la parte posterior de la impresora, desenchufa el cable de la fuente de alimentación.

PASO 6 Protecting the heatbed

- **Antes de continuar, te recomendamos que protejas la base calefactable.**
- Make sure the heatbed is cooled down to ambient temperature. Place the empty cardboard box approximately to the front center part of the heatbed.

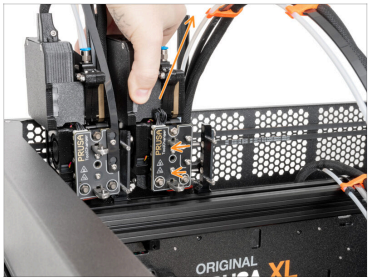
PASO 7 Desconexión del haz de cables del Nextruder





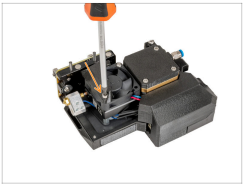
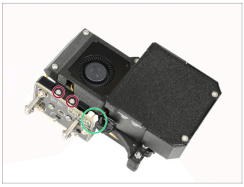
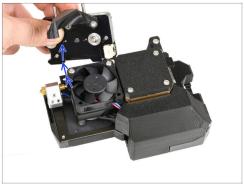
- On the selected toolhead you want to work on:
  - Locate the FESTO (QSM-M5) fitting, press the blue collet and unplug the PTFE tube from the second Nextruder. Leave the PTFE hanging freely.
  - Localiza el cable del Nextruder, presiona la pestaña de seguridad y desenchufa el cable del segundo Nextruder. Deja el cable colgando.

PASO 8 Nextruder unlocking



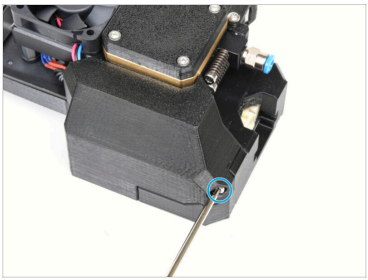
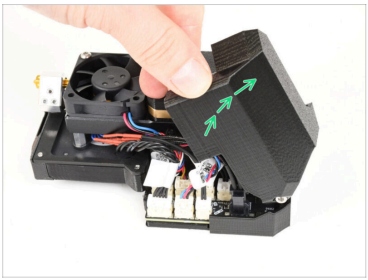
- On the selected toolhead you want to work on:
  - Desde la parte frontal del Nextruder, utilizando un destornillador T10, afloja (unas pocas vueltas son suficientes) dos tornillos M3x8r y retira el soporte del cable.
  - Desacopla suavemente el Nextruder y déjalo a un lado.

PASO 9 Removing the toolchanger board

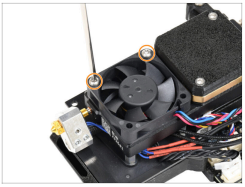
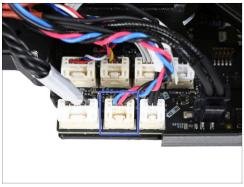
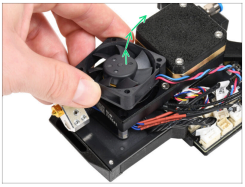
- Using a T10 screwdriver, remove the M3x30 screw holding the fan-shield.
- Turn the nextruder with the print fan facing up.
- Remove the M3x8rt screws from the tool-changer using a T10 screwdriver..
- Unplug the toolchanger cable. Press the safety latch while disconnecting the connector.
- Remove the toolchanger from the Nextruder.

PASO 10 Accessing the Dwarf board

- Loosen the M3x16 screw, just a few turns are enough to release the dwarf-cover-door. **No need to removing the screw completely.**
- Open the dwarf-cover-door widely.

PASO 11 Removing the heatsink fan

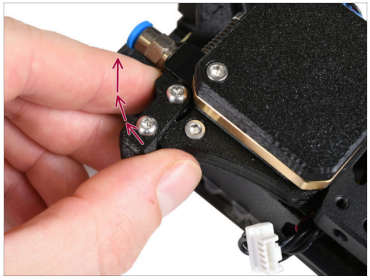
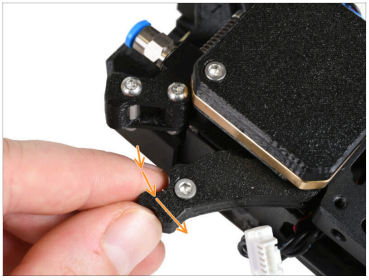




- Remove two M3x20rT screws from the heatsink fan using a T10 screwdriver.

⚠ Cada conector tiene una pestaña de seguridad. **Es necesario presionar la pestaña antes de desconectar**. De lo contrario, el conector podría dañarse.

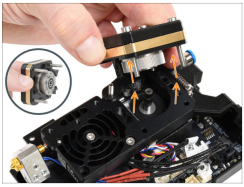
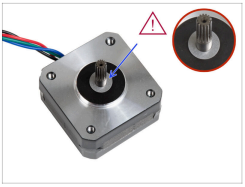
- Unplug the heatsink fan cable from the Dwarf board.
- Remove the heatsink fan and put it aside.

PASO 12 Opening the extruder idler

- Push the idler-swivel upward.
- Pull the idler-lever downward in order to release tension on the gearbox.

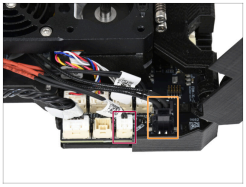
PASO 13 Removing the gearbox & motor assembly

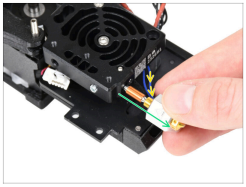




- Fully loosen three M3x25 screws from the printed gearbox cover. **Keep the screws in the assembly, don't remove them completely.**
- Carefully slide the gearbox assembly off. **It is necessary to remove the entire assembly in one piece.** This means PG-cover (top plastic cover), PG-ring (brass ring), PG-assembly (metal gears), and main-plate (bottom plastic plate), all joined by M3x25 screws.
- Set the gearbox assembly and the extruder motor aside.

  ⚠ **Pay attention to not lose the spacer from the motor shaft.**

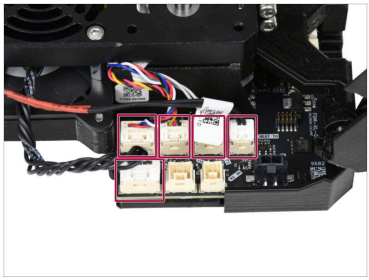
PASO 14 Removing the hotend

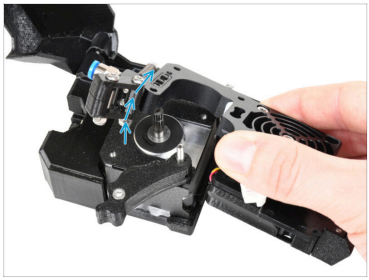




- Unplug the hotend thermistor cable from the Dwarf board. **Press the safety latch while disconnecting the connector.**
- Unplug the hotend heater cable from the Dwarf board. **Press the safety latch while disconnecting the connector.**
- With a Torx TX 8 key loosen the grub screw in the extruder. **Do not remove the screw completely.** A few turns are enough to release the hotend assembly in the heatsink.
- Carefully pull the hotend assembly out of the heatsink.
- At the same time pull the disconnected hotend cables from below the heatsink.

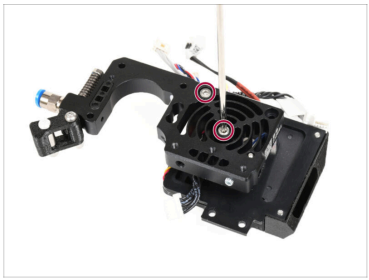
PASO 15 Removing the heatsink assembly

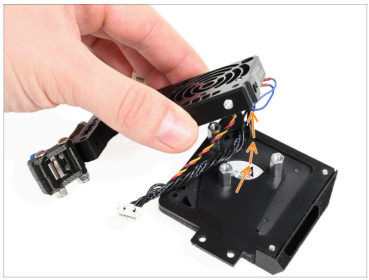




- Unplug all remaining cables from the Dwarf board. Press the safety latch while disconnecting each connector.
- Remove the heatsink assembly and set it aside.

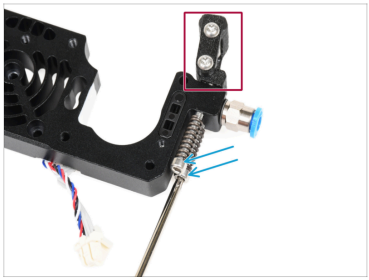
PASO 16 Retirar el ventilador de capa

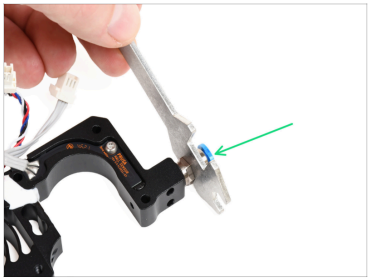




- Remove the two M3x10 screws from the heatsink with a 2.5 mm Allen key.
- Separate the heatsink and the print fan.
- Set the print fan aside. We will need it later again.

PASO 17 Removing the idler-swivel

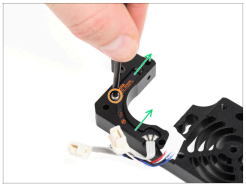


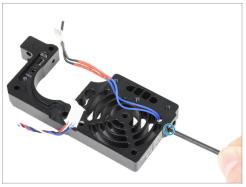


- Remove the two M3x30 screws to remove the idler-swivel from the heatsink.
- Remove the idler-swivel from the heatsink.
- Remove the festo with a universal wrench.

⚠ **Be careful to not lose the springs.**

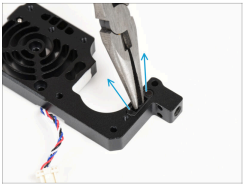
PASO 18 Removing the NTC thermistor & Hall sensor





- Desenrosca el tornillo M2.5x6rT para retirar el sensor de filamento Hall.
- Carefully remove the Hall filament sensor.
- Release the set screw from the bottom of the heatsink to remove the NTC thermistor.
- Pull the NTC thermistor out from the heatsink.

PASO 19 Retirar el sensor de filamento


⚠ **BE EXTRA CAREFUL when removing the filament sensor.** The filament sensor contains a tiny parts (spring, magnet, steel ball) that tend to fall out when the sensor is removed.

- Very carefully pull the filament sensor out from the heatsink using the needle-nose pliers.

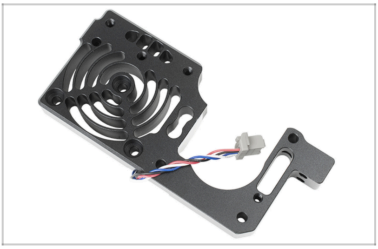
  ⚠ **CAUTION: Avoid gripping the part firmly, as this may cause irreparable damage.**

  ⚠ **Don't lose the small parts!** You will need them again later. **Keep them aside in a safe place.**

- Remove the grub screw from the heatsink.

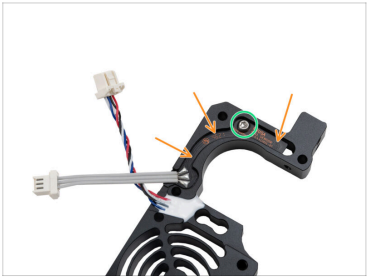
  ⓘ Tip: store small parts in a box or bowl.

PASO 20 New heatsink: parts preparation



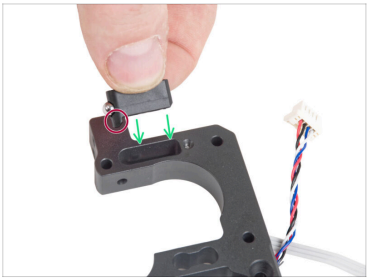
- **Para los siguientes pasos, por favor prepara:**
- New heatsink (1x)

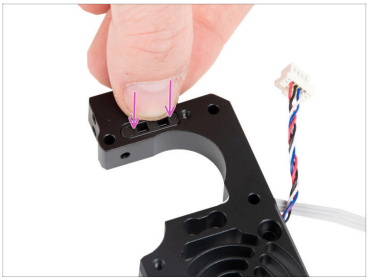
PASO 21 Installing the Hall sensor



- Coloca el sensor de filamento Hall en la cavidad de forma similar del disipador térmico.
- Fíjalo con un tornillo M2.5x6rT. Apriétalo con mucho cuidado, puedes romper la placa electrónica.
- Insert the grub screw into the slot closer to the bottom of the heatsink. See the picture.

PASO 22 Instalando el sensor de filamento



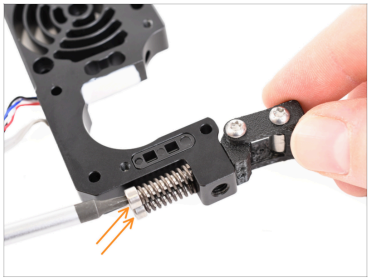


- Insert the Prusa ball holder assembly into the heatsink. Make sure the steel ball part is closer to the side of the heatsink.

⚠ Note the correct orientation of the Prusa ball holder assembly. There is a protrusion on the part. The protrusion must be facing down.

- Introduce el conjunto en el disipador.

PASO 23 Mounting the idler-swivel

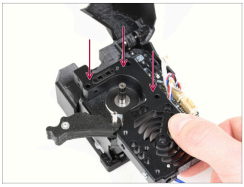
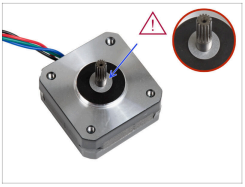


- Tighten the idler-swivel with two M3x30 screws.

  ⓘ Note the correct orientation of the part. The screw heads on the idler-swivel must be facing up (like in the picture).

- The tip of each screw should be flush with the plastic part on the other side.

PASO 24 Inserting the NTC thermistor

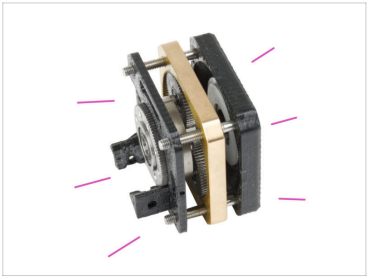
- On the extruder motor side, insert the NTC thermistor into the hole in the heatsink.
- Secure it with the M3x4T grub screw. Screw it all the way in. Tighten gently, but firmly using two fingers and the short side of the T6 Torx key. Applying more force may cause permanent damage to the thread.
- Align the heatsink with the motor assembly.

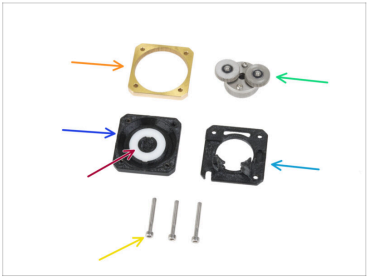
⚠ Double-check that the spacer is still in place on the motor shaft!

PASO 25 Gearbox assembly: parts preparation


- **Para los siguientes pasos, por favor prepara:**
- Gearbox assembly (1x) *you took from Nextruder*
- PG-assembly-adapter (1x)

PASO 26 Preparing the gearbox parts





- Dismantle the gearbox assembly into its component parts:
  - PG-ring (1x)
  - PG-assembly (1x)
  - PG-front-case (1x)
    - ⚠ Make sure there is a plastic spacer inside the case. It can be black or white. **Do not remove the plastic spacer** from the case.
  - Main-plate (1x)
  - M3x25 screw (3x)
- Using a paper towel clean all the parts from grease.

PASO 27 Assembling the gearbox

- En los siguientes pasos, volveremos a montar todo el conjunto de la caja de engranajes para garantizar una instalación correcta.

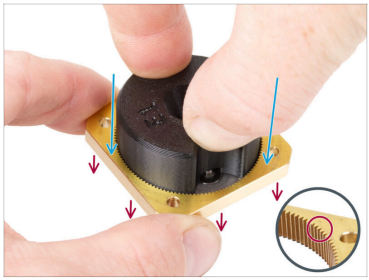
⚠ **Las siguientes instrucciones deben seguirse correcta y cuidadosamente.** Consigue una mejor comprensión y un montaje satisfactorio viendo el vídeo junto a la guía: prusa.io/PG-assembly

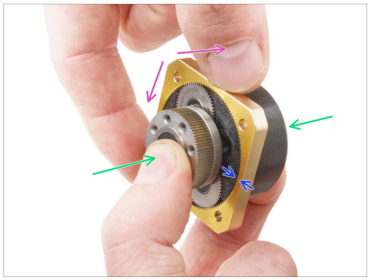
ⓘ The video is for MK4, but the procedure is identical.

- Después de ver el vídeo, sigue los pasos de esta guía.

- Coloca el PG-assembly-adapter en el PG-assembly. Observa las cavidades para los engranajes en el adaptador.

PASO 28 Assembling the PG-ring

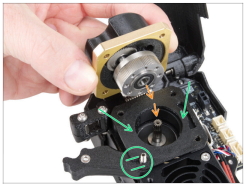
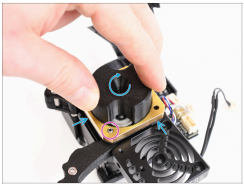
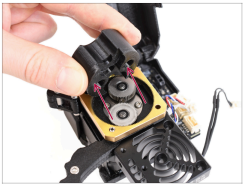




⚠ **No monte la caja de cambios sin el PG-assembly-adapter.** Esta herramienta está destinada a garantizar que los engranajes encajen correctamente.

- Desliza el PG-ring en el adaptador.
  - Observa que hay un chaflán en un lado de los dientes del PG-ring. Este lado debe estar orientado hacia abajo (hacia el PG-assembly).
- Sujeta todo el conjunto con una mano para poder girarlo con el PG-ring.
- Con la otra mano, desliza el PG-ring en el ensamblaje PG con un movimiento oscilante (mueva el PG-ring a izquierda y derecha repetidamente) - un cuarto de vuelta es suficiente.
- Deténte cuando las superficies de los engranajes estén aproximadamente a ras con la superficie del anillo PG.

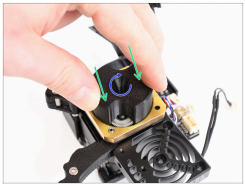
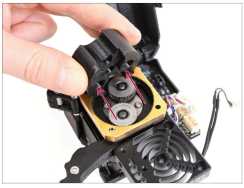
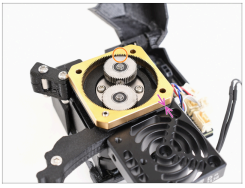
PASO 29 Mounting the gearbox

Procede con mucho cuidado en este paso.

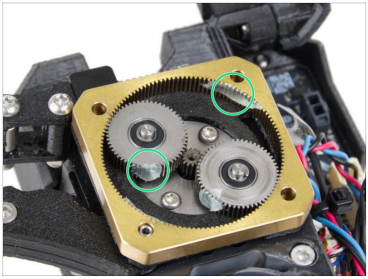
- Attach the main-plate on the heatsink. Note the orientation of the part. Use the cutout for the socket screw as a guide (lower left corner).
- Mantén la posición del PG-assembly y fíjalo al eje del motor del extrusor.
- Make sure the PG-ring perfectly fits on the socket set screw.
- Very gently and freely rotate with the whole PG assembly (PG-assembly-adapter, PG-assembly and PG-ring) until it drops down so that there is minimal gap between the assembly and the main-plate. Do not push on the assembly.
- Remove the PG-assembly-adapter.

PASO 30 Checking the PG assembly

- Attach the PG-assembly-adapter back on the PG-assembly again to verify that all parts are properly seated.
- Rotate with the PG-assembly-adapter. The PG assembly must be easy to rotate without having to exert much force.
- Remove the PG-adapter. You will no longer need it during assembly. We recommend keeping it for maintenance.
- Asegúrate de que el PG-assembly no sobresale sobre el PG-ring. Debe colocarse por debajo del nivel de la superficie del PG-ring o al mismo nivel que el anillo.
- No debe haber ningún espacio entre el PG-ring y la Main-plate. Si observas un hueco, retira el conjunto del engranaje planetario y vuelve a colocarlo.

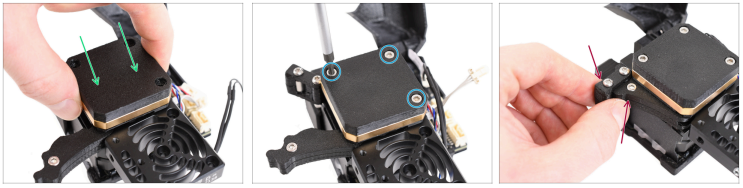
PASO 31 Lubricating the gears



- Open the Prusa Lubricant. Using the opposite side of the cap, puncture the hole in the opening of the tube.
- Aplique una pequeña cantidad de Lubricante Prusa alrededor del PG-ring y de los dientes del PG-assembly.

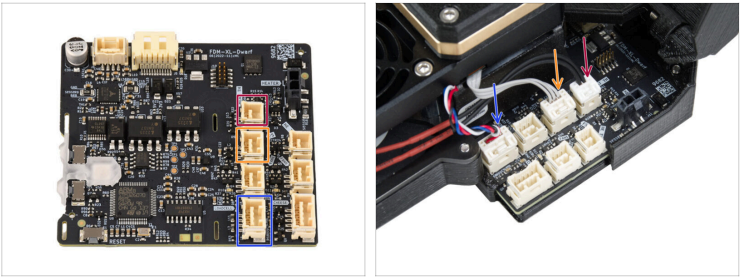
  Tip: apply a small amount of lubricant to the tip of the zip tie and then spread the lubricant over the gears.
- Con una toalla de papel, limpia el exceso de lubricante en las superficies delanteras.

PASO 32 Covering the gearbox



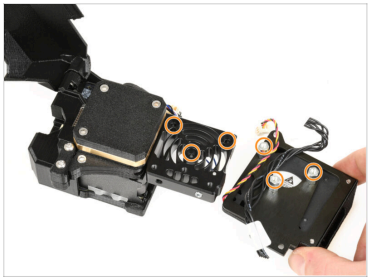
- Place the PG-case on the gearbox.
- Insert three M3x25 screws into the PG-case, but do not tighten them completely. They will be tightened later.
- Close the idler-lever and lock it in position with the idler-swivel.

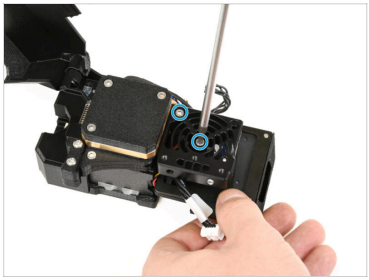
PASO 33 Conectando los cables del Nextruder



- Plug the load cell sensor cable into the Dwarf board.
- Plug the filament sensor cable into the Dwarf board.
- Plug the heatsink thermistor cable into the Dwarf board.

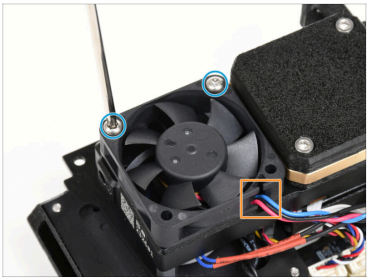
PASO 34 Attaching the Tool Changer board & print fan assembly

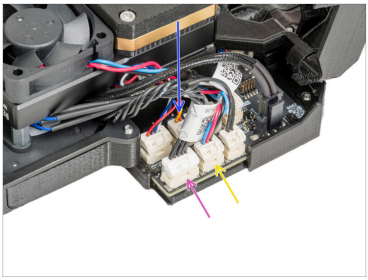




- Prepare the Tool changer board & print fan assembly.
- Align the three metal spacers with the holes in the heatsink, make sure the board and fan cables are guided below the top spacer before you attach the heatsink, so that they are not pinched.
- Use the M3x10 screws to secure the heatsink & gearbox assembly to the spacers on the print fan cover. Start with the centre screw, taking care not to pinch any cables.

PASO 35 Montaje del ventilador del fusor



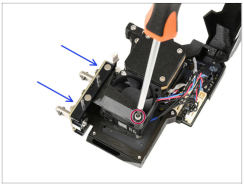
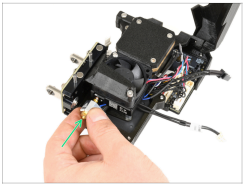


- Attach the hotend fan to the heatsink with its cable positioned as can be seen in the picture.

⚠ Mind the orientation of the fan.

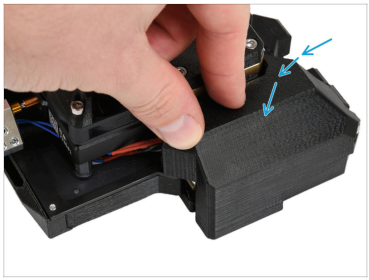
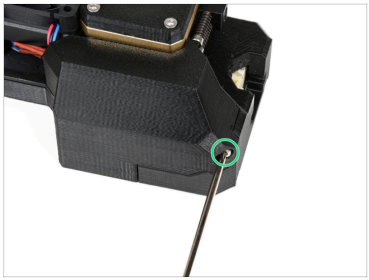
- Secure the heatsink fan with two M3x18rT screws.
- Plug the print fan cable into the Dwarf board.
- Plug the toolchanger cable into the Dwarf board.
- Plug the hotend fan cable into the Dwarf board.

PASO 36 Reattaching the toolchanger board and the hotend

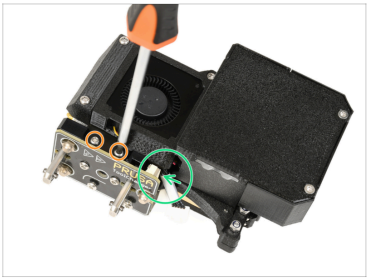

- Attach the toolchanger board with the heat shield to the Nextruder.
- Secure the fan shield with a M3x30 screw.
- Insert the hotend into the heatsink.
- ⚠ Lead the hotend cables between the heatsink spacers as shown in the picture and make sure that they are not pinched.
- Plug in the hotend thermistor cable.
- Plug in the hotend heater cable.

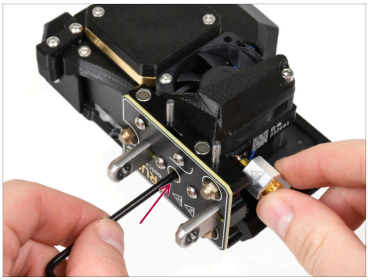
PASO 37 Covering the Dwarf board

- Close the printed Dwarf board cover on the Nextruder.
- Tighten the M3x12 screw.

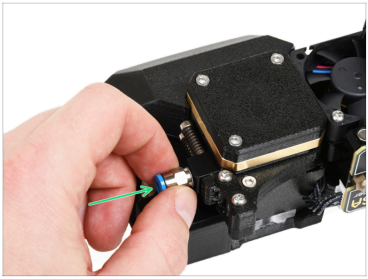
PASO 38 Securing the toolchanger and the hotend

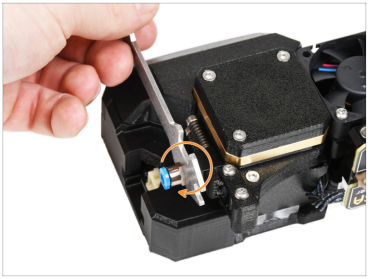




- Secure the toolchanger with two M3x8rt screws.
- Connect the toolchanger cable.
- While pushing the hotend into the heatsink, tighten the grub screw with a Torx TX 8 key.

PASO 39 Mounting the festo

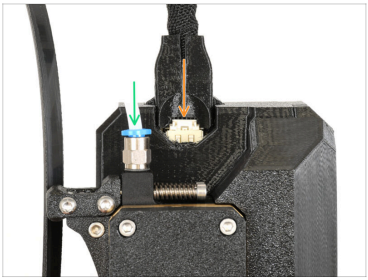


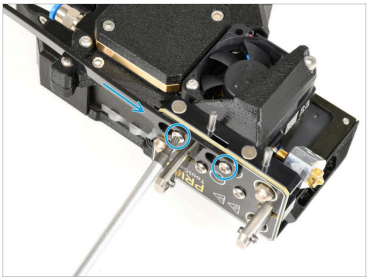


ⓘ A partir de septiembre de 2024, podrás recibir nuevos racores M5-4 negro. El montaje y la funcionalidad siguen siendo idénticos al azul.

- Mount the festo on the top of the heatsink.
- Gently tighten the festo with a uni-wrench.

PASO 40 Connecting the nextruder

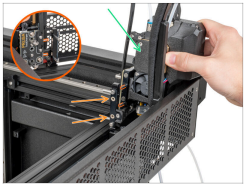
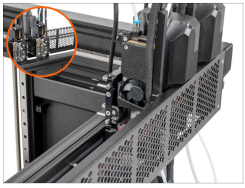
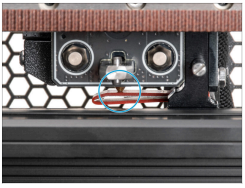




- Insert the PTFE tube into the festo connector as far as possible. Slighty tug on the PTFE tube to make sure it's firmly secured.
- Plug the Dwarf extruder cable to the Dwarf board.
- Slide the black nylon plate onto the screws in the Cheese board, and tighten them with a Torx T10 key.

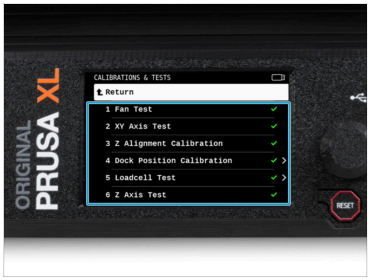
⚠ Make sure the nylon plate is not twisted.

PASO 41 Docking the tool

- Gira con cuidado la impresora de modo que la parte frontal quede orientada hacia ti.
- Coge el Nextruder y colócalo con cuidado junto al dock.
- Coloca los dos pines metálicos a través de los orificios blancos del dock. Los imanes te ayudarán a acoplar el Nextruder.
- Compruebe que el Sello de la boquilla toca ligeramente la boquilla.

PASO 42 Asistente



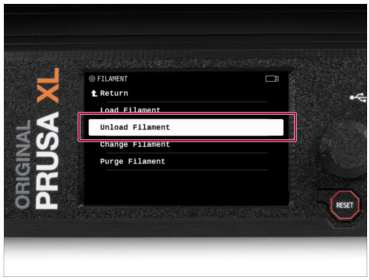
- Enchufa el cable de la fuente de alimentación desde la parte posterior de la impresora.
- Enciende el interruptor (símbolo "I").
- Realiza los test del menú *Control -> Calibración y Tests*.

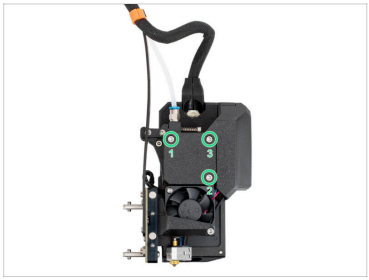
El asistente probará todos los componentes importantes de la impresora. Todo el proceso dura unos minutos. Algunas partes del asistente requieren la interacción directa del usuario. Sigue las instrucciones que aparecen en pantalla.

NOTA: Mientras pruebas los ejes, asegúrate de que no hay nada en la impresora que obstruya el movimiento de los ejes.

ADVERTENCIA: No toques la impresora durante el asistente a menos que se le indique. Algunas partes de la impresora pueden estar CALIENTES y moverse a gran velocidad.

PASO 43 Calibrating the Nextruder gears





- Conecta la impresora y enciéndela.
- Now we need to simulate the movement of the gearbox. On the LCD screen, navigate to Filament - *Unload filament.*
- As soon as the extruder's movement finishes, tighten the three M3x25 screws on the PG-case in the correct order (shown on the picture).
- Then loosen the screws slightly and repeat the process, tightening the screws in the correct order. This ensures that the gearbox is seated correctly.

PASO 44 Well done!

- **Congratulation**s, you have just successfully replaced the heatsink on your Original Prusa XL!

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