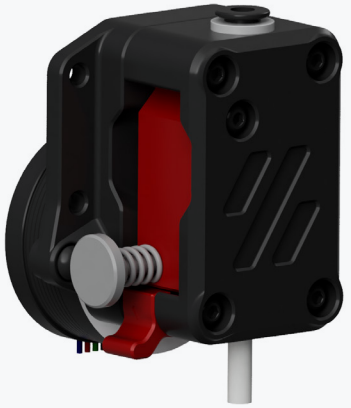
VORON



VORON POCKETWATCH 2

We build space shuttles with gardening tools
so anyone can have a space shuttle of their own.

VERSION 2021-04-16

Before you begin on your journey, a word of caution.

In the comfort of your own home you are about to assemble a robot. This machine can maim, burn, and electrocute you if you are not careful. Please do not become the first VORON fatality. There is no special Reddit flair for that.

Please, read the entire manual before you start assembly. As you begin wrenching, please check our Discord channels for any tips and questions that may halt your progress.

Most of all, good luck!

THE VORON TEAM

PART PRINTING GUIDELINES

The Voron Team has provided the following print guidelines for you to follow in order to have the best chance at success with your parts. There are often questions about substituting materials or changing printing standards, but we recommend you follow these.

3D PRINTING PROCESS

Fused Deposition Modeling (FDM)

MATERIAL

ABS

LAYER HEIGHT

Recommended: 0.2mm

EXTRUSION WIDTH

Recommended: Forced 0.4mm

INFILL TYPE

Grid, Gyroid, Honeycomb, Triangle or Cubic

INFILL PERCENTAGE

Recommended: 40%

WALL COUNT

Recommended: 4

SOLID TOP/BOTTOM LAYERS

Recommended: 5

PRINT IT FORWARD (PIF)

Often times our community members have issues printing ABS will bootstrap themselves into a VORON using our Print It Forward program. This is a service where approved members with VORON printers can make you a functional set of parts to get your own machine up and running.
Check Discord if you have any interest in having someone help you out.

HOW TO GET HELP

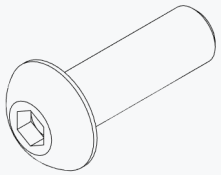
If you need assistance with your build, we're here to help. Head on over to our Discord group and post your questions. This is our primary medium to help VORON Users and we have a great community that can help you out if you get stuck.

https://discord.gg/voron

THIS IS JUST A REFERENCE

This manual is designed to be a simple reference manual. Building a Voron can be a complex endeavour and for that reason we recommend downloading the CAD files off our Github repository if there are sections you need clarification on. It can be sometimes be easier to follow along when you have the whole assembly in front of you.

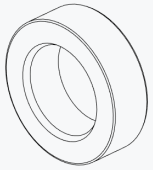
https://github.com/vorondesign



BUTTON HEAD CAP SCREW (BHCS)

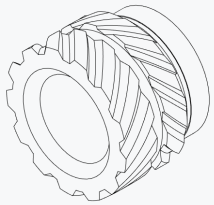
Metric fastener with a domed shape head and hex drive. Most commonly found in locations where M5 fasteners are used.

ISO 7380-1



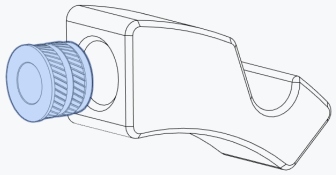
MR85 BEARING

A small ball bearing. 5x8x2.5mm in size.

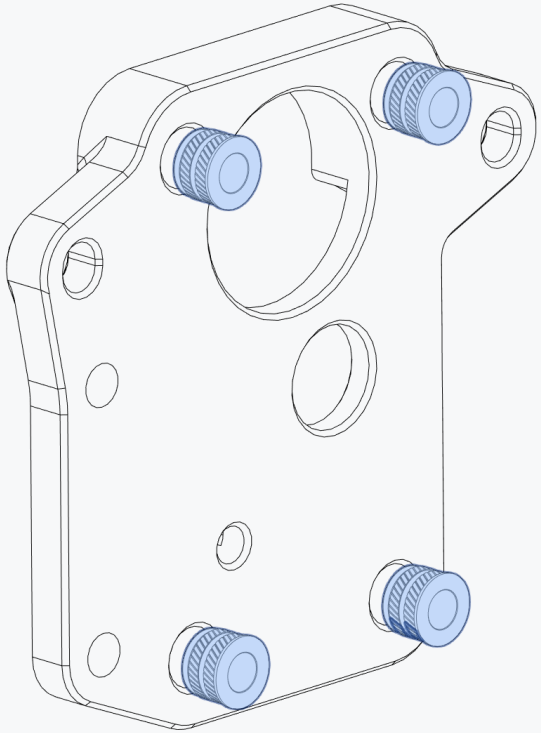


HEAT SET INSERT

Heat inserts with a soldering tip so that they melt the plastic when installed. As the plastic cools, it solidifies around the knurls and ridges on the insert for excellent resistance to both torque and pull-out.



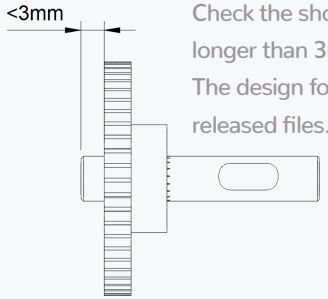
Heat Set Insert



HEAT SET INSERTS

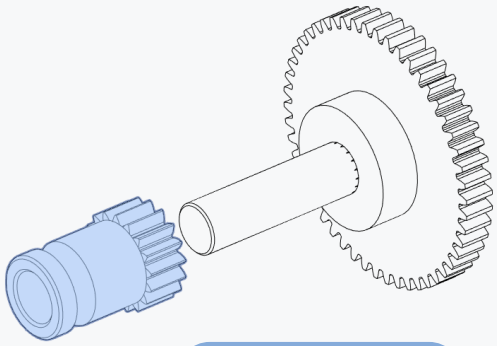
You will need to install heat set inserts into various plastic parts.

If you need help on the correct procedure, ask in Discord.

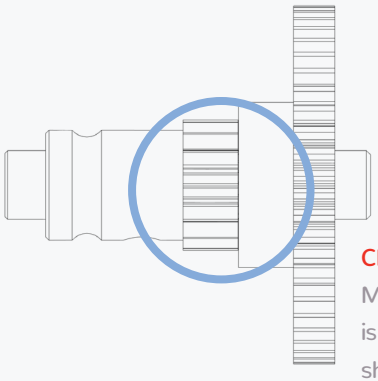


SHORT END OF THE SHAFT

Check the short end of the shaft. If it is longer than 3mm shorten it to under 3mm. The design for a printed jig is included in the released files.

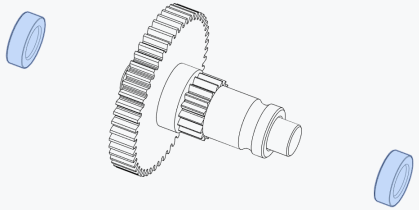


BMG Drive Gear



CHECK PLACEMENT

Make sure the filament drive gear is fully seated against the drive shaft gear.



MR85 Bearing

CHECK BEARING FIT

The bearings must slip on and off the shaft easily to allow the gear to self centre. Do not shim into position.

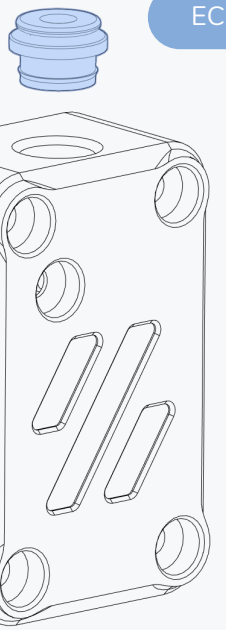
Pressing the bearings on the shaft will damage them.
Lightly sand the shaft if required.

BMG Idler Assembly

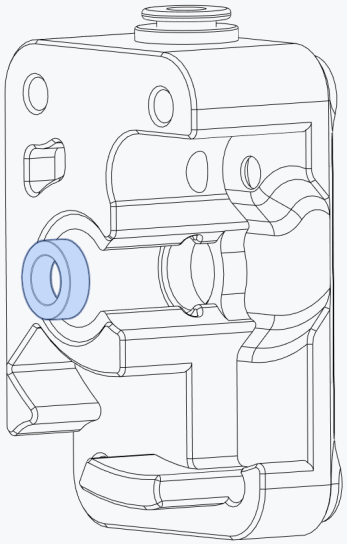
LUBRICATE BEARINGS

A lubrication film is required to ensure smooth operation and longevity.
Refer to the BOM for lubricant options.

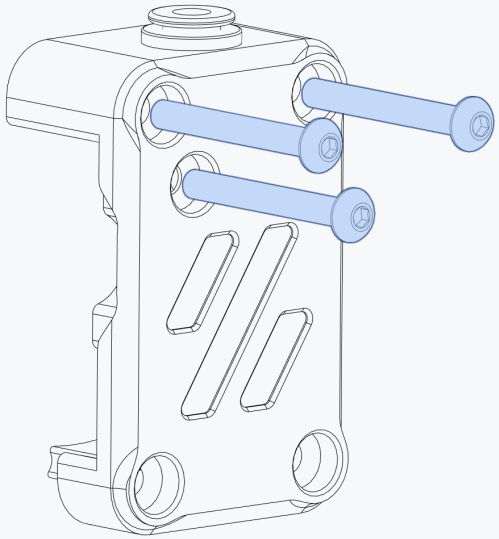
ECAS04 Collet



MR85 Bearing

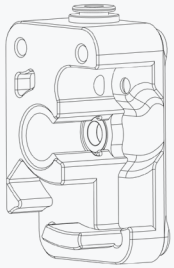


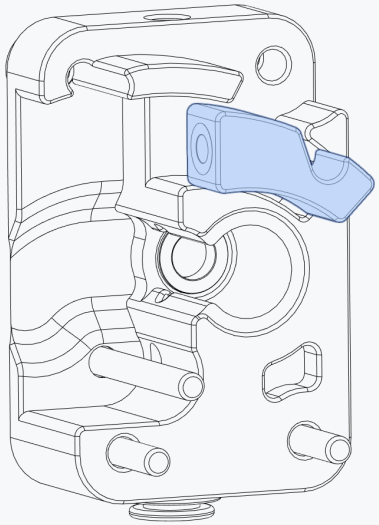
M3x25 BHCS

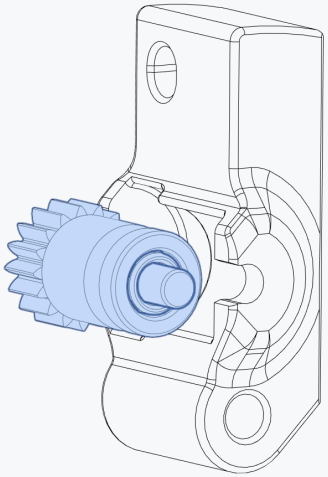


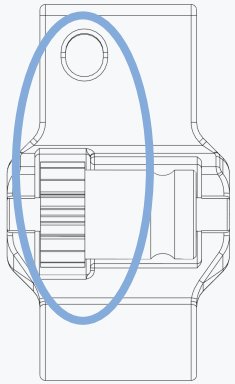
ECAS04 COLLET

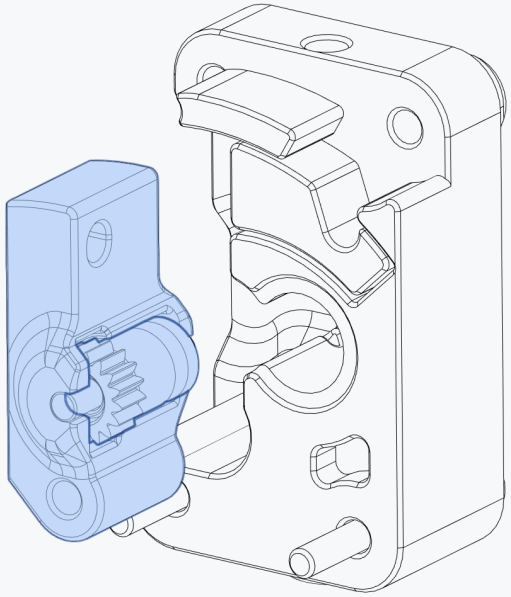
Remove the lower rubber part of the collect.





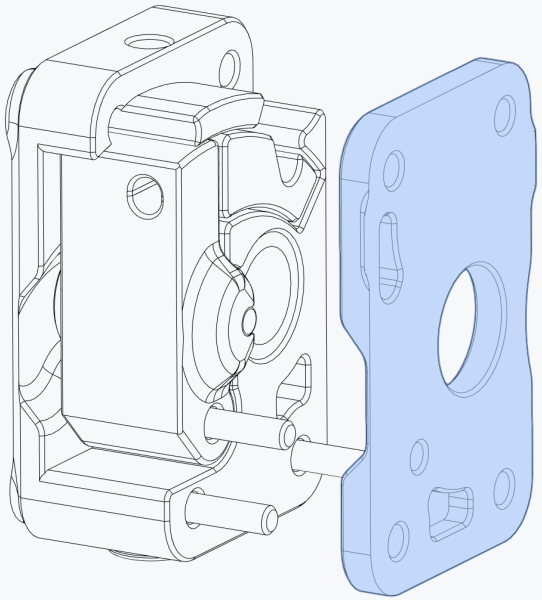


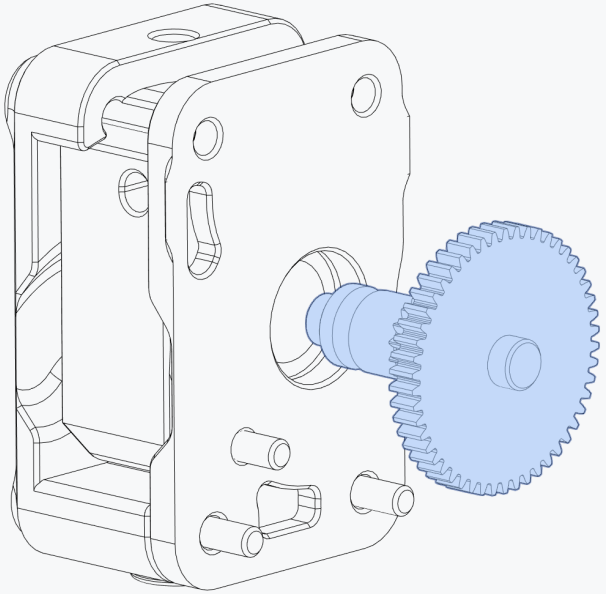




CHECK ORIENTATION

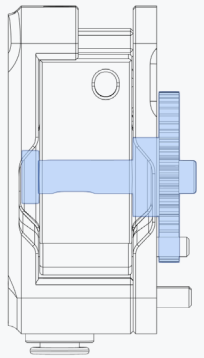
The larger gear section must be on the side with the hole. Check for any rubbing or binding.

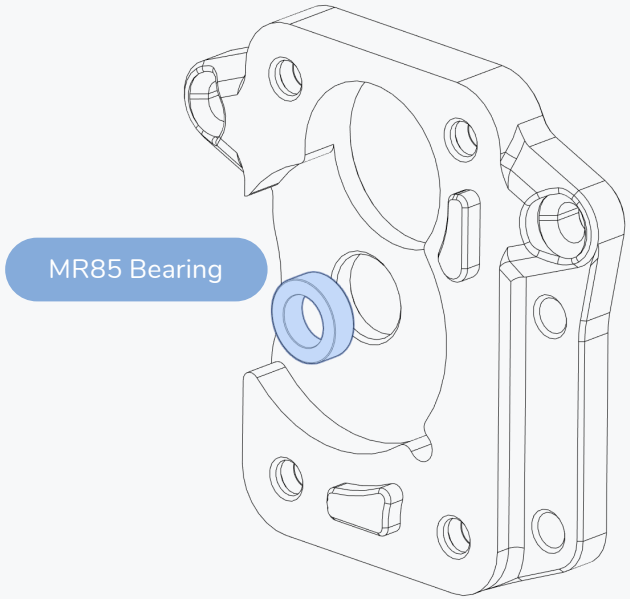


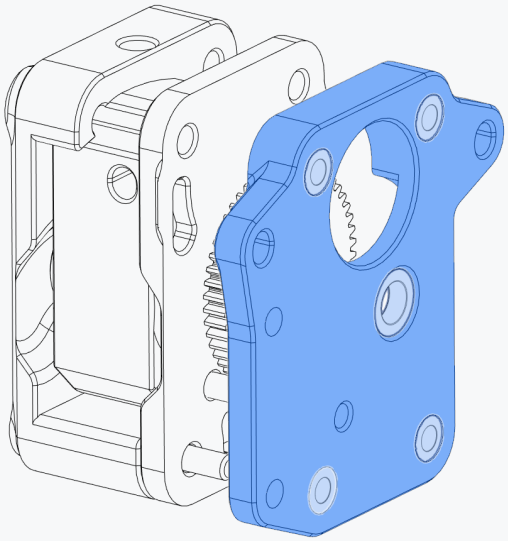


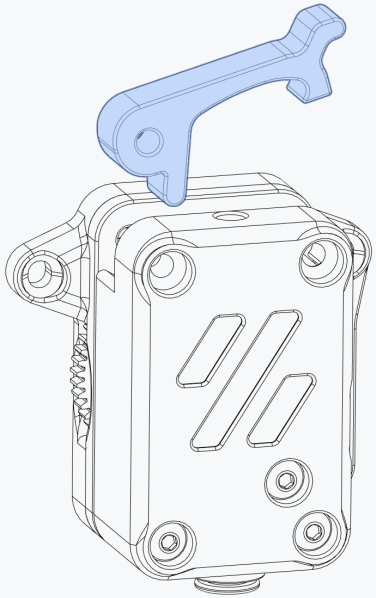
CHECK PLACEMENT

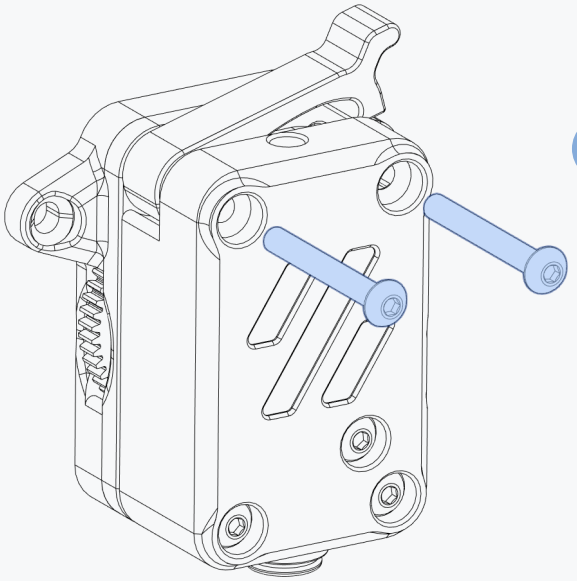
Make sure the shaft is inserted all the way and properly seated in the MR85 bearing.

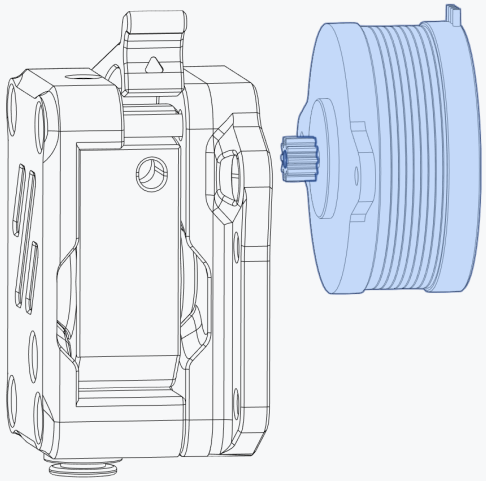


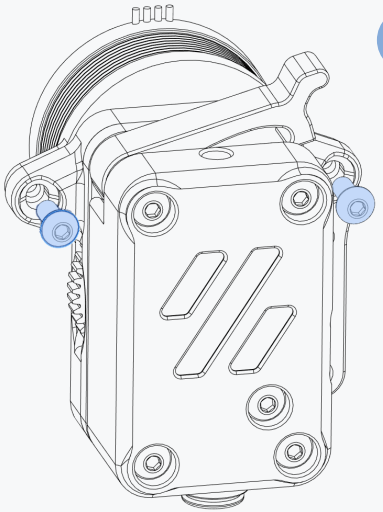

MR85 Bearing



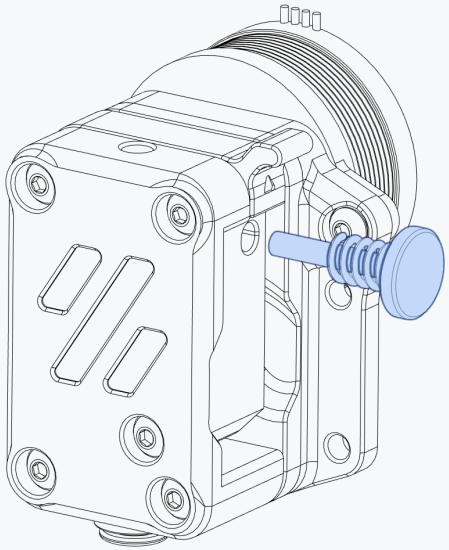



M3x25 BHCS

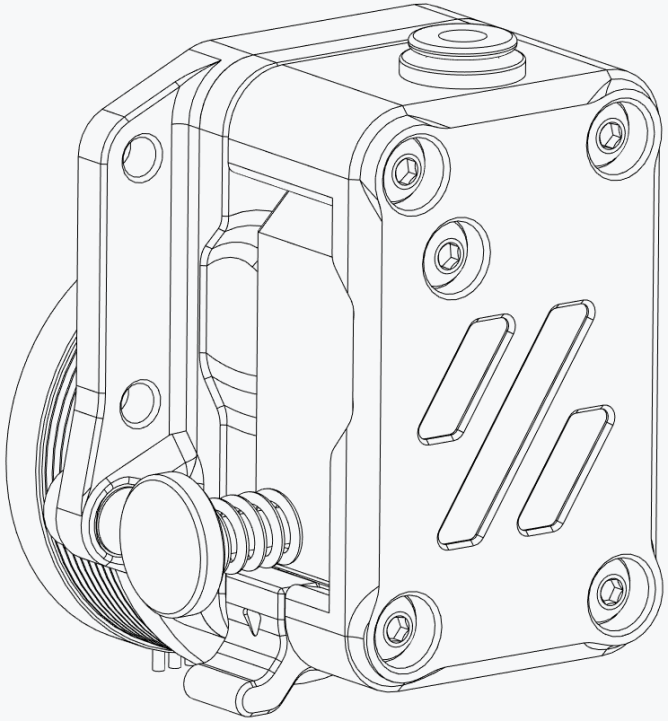




M3x6 BHCS



BMG Thumb Screw



GitHub https://github.com/VoronDesign/Voron-0

DOCS https://docs.vorondesign.com/

HOW TO GET HELP

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