

Pre-assembly Instructions

- 1) Remove support from inside gears with a pair of needle nose pliers or flat head screw driver.
- 2) Clean all parts well.
- 3) Check M4 bolts turn freely in spider gears, center gear, tongue and differential blocks. Drill if required.
- 4) Check that the 6mm smooth rod turns freely in tongue, cluster gears, diff blocks and wheels. Drill if required.
- 5) Install O-rings on wheels. Measure the outer diameter with calipers and write it down (Goal is 100mm).
- 6) Thread ends of smooth rods with M6 die for 5mm.
- 7) Press one 5/16" nut in side A of cluster gear (may be loose, DO NOT GLUE)
.
- 8) Press side B of cluster gear over 5/16" nut in side A of cluster gear.

Test Assembly Instructions

- 1) Install one nut on end of rod.
- 2) Slide wheel one onto the smooth rod down to the nut with the gear facing away from the nut.
- 3) Slide one diff block on.
- 4) Slide one cluster gear on.
- 5) Slide tongue on.
- 6) Slide second cluster gear on.
- 7) Slide second diff block on.
- 8) Slide second wheel on.
- 9) Measure from the center of wheel one to the center of wheel two and write it down (wheel track or width from side to side). This width needs to be 2-5mm smaller than the wheel diameter. Ideally if the wheels are 100mm this should measure 98-95mm across.
- 10) Take it all apart again.
- 11(a) If it measures within range (2-5mm of wheel diameter) go to final assembly (this is how both of mine were).
- 11(b) If it measures >5 mm smaller than your wheel diameter, you will need to space the cluster gears apart until it's within range.
- 11(c) If it measures <2 mm smaller than your wheel diameter, you will need to sand the face of the wheel gears, cluster gears, diff blocks and/or tongue.

Final Assembly Instructions

- 1) Install M4 nuts in diff blocks.
- 2) Install M4 bolt in tongue for the center gear through the hole in the bottom. Be sure the head is far enough inside that the smooth rod still fits and turns freely. Gluing the bolt head in place with CA glue is recommended but not required.
- 3) Re-assemble in the same order as previously.
- 4) Install the second nut.
- 5) Measure the wheel track again, and set the nuts on either side so that the wheel track is exactly the same as the wheel diameter.
- 6) Set the space between all the parts on the shaft to have equal spacing. Use folded sheets of paper as spacers to be sure they are all the same.
- 7) Install one M4 or M5 washer on each remaining bolt.
- 8) Install bolts with washers in spider gears and screw them to the diff blocks. The bolts should bottom out on the shaft and act as set screws for the diff block. If the gears are too tight move the washers under the gear.
- 9) Install the center gear with the remaining M4 nut and washer.
- 10) Check that everything turns freely. If it's tight, try moving some of the washers under the gears or having washers on both sides.
- 11) If everything moves smoothly and it works as in the video, put a drop of CA glue on the exposed threads on the ends of the smooth rods to prevent the nuts from moving. Also put a small drop on the center gear bolt threads to prevent the nut from coming loose.
- 12) Glue your favourite mascot or bobble head to the center gear. I have included Le_Garages' Gro_tux with a recess in the bottom for the center gears nut and bolt. I figured it the most appropriate being that they live in the Antarctic circle (South) and he stands for Open Source. It's kind of like he's always looking towards home.