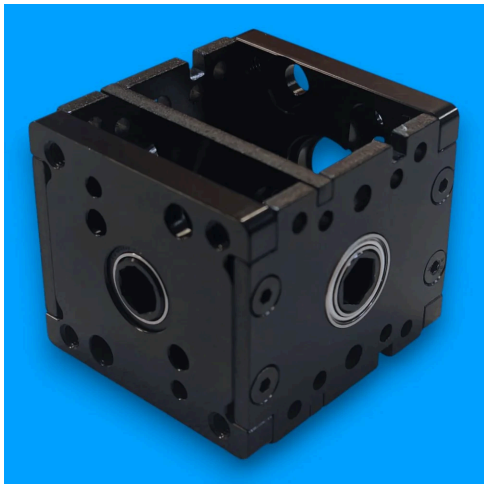
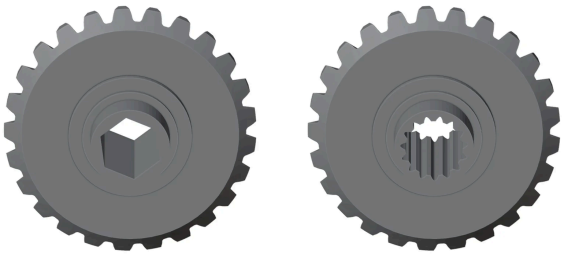
SWYFT 90° Gearbox: Assembly Guide

Product	SWYFT 90° Gearbox
SKUs	`SR-90GEARBOX-7mmHEX-01` (7mm Hex bore) · `SR-90GEARBOX-15TSPLINE-01` (15T SplineXS bore)
Assembly time	About 5 minutes



1. What it is

- A compact **1:1, 90° gearbox**. Use it to move a motor to a better spot or to turn an axle's rotation by 90°.
- **Two identical 25T steel bevel gears** (1.25 module). The ratio is 1:1, so output speed matches input speed.
- **Size:** 47 × 43.5 × 40 mm. **Weight:** 140 g.
- **Bore:** 7mm Hex or 15T SplineXS, the same on the input and the output.
- **Load:** recommended maximum working load is about 25 N·m. The gears skip at about 42 N·m.
- **Materials:** 6061 aluminum blocks and plates, heat-treated 4140 steel gears.



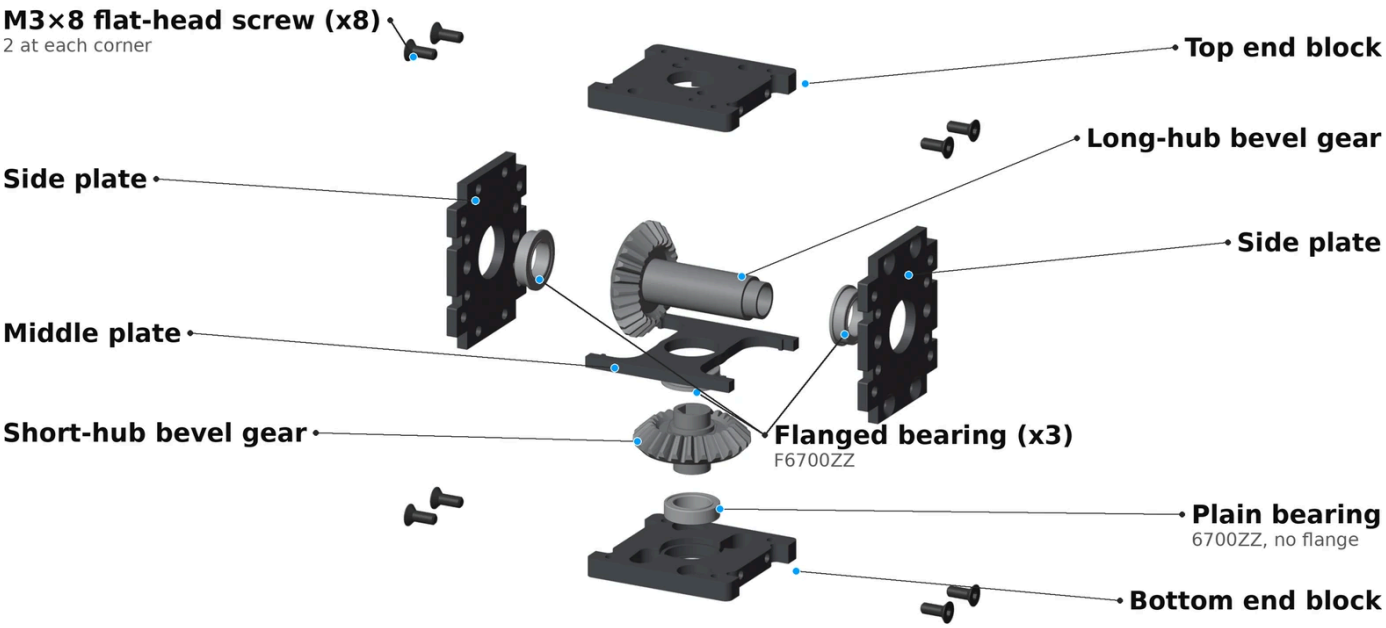
7mm Hex bore

15T SplineXS bore

2. Tools and supplies

Item	Notes
2 mm Allen key	Included in the kit
Red tacky grease	Recommended for the gear teeth
Blue Loctite (medium strength)	Recommended for the screws

3. What's in the kit



The kit has 2 end blocks (the top and bottom blocks are the same part), 2 side plates, 1 middle plate, 4 bearings (3 flanged F6700ZZ and 1 plain 6700ZZ), 2 bevel gears (one with a short hub and one with a long hub), 8 M3×8 flat-head screws, and the 2 mm Allen key. Each gear comes with its hub already attached.

Countersinks face outward so the screw heads sit flush with the side plates.

4. Step-by-step assembly

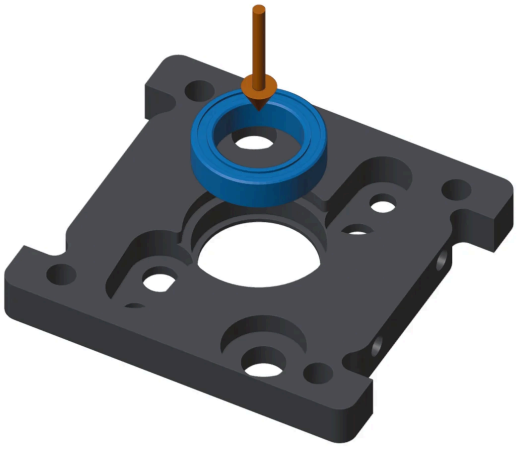
In the pictures, **blue = parts you add in that step**, grey = parts already in place, and the orange arrow shows which way the part moves.

All of the bearings are a slip fit. Push them in by hand. You don't need a pressing tool.

Step 1. Sort the parts

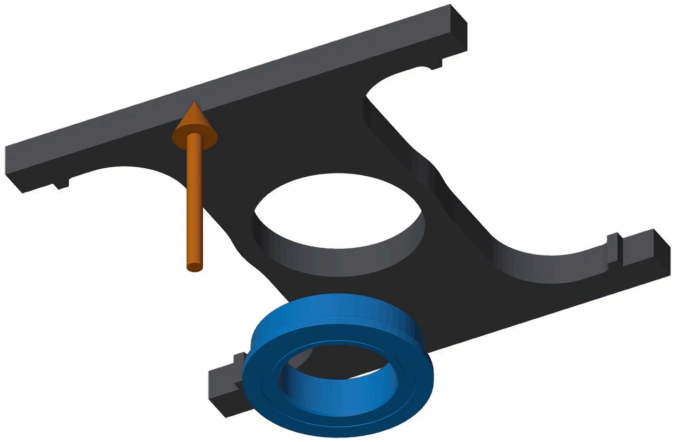
Lay everything out and check it against the exploded view: 2 end blocks, 2 side plates, 1 H-shaped middle plate, 4 bearings (**3 with a flange, 1 without**), 2 gears (one short hub, one long hub), 8 screws, and the Allen key.

Step 2. Plain bearing into the bottom end block



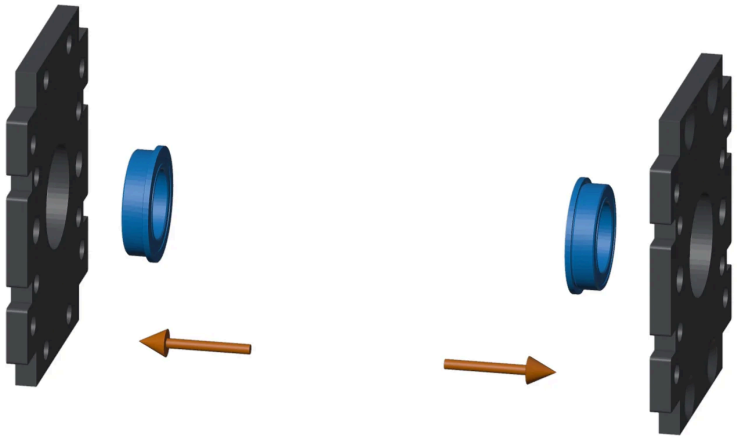
Push the **plain 6700ZZ bearing (no flange)** into the center hole of one end block by hand, **from the inside face**. It stops against a small lip on the outside face. This block is now the **bottom block**. The other end block doesn't get a bearing.

Step 3. Flanged bearing into the middle plate



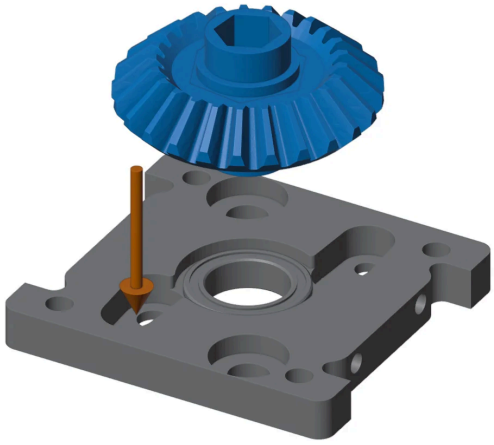
Push one **flanged F6700ZZ bearing** into the center hole of the H-shaped middle plate by hand. The **flange goes on the underside**, the side that faces the bottom gear.

Step 4. Flanged bearings into both side plates



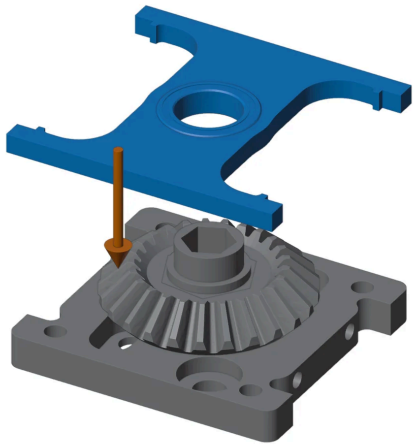
Push a **flanged F6700ZZ bearing** into the center hole of each side plate by hand, **from the inside face**, so the flange ends up inside the gearbox. The inside face is the side **without** the countersinks.

Step 5. Short-hub gear into the bottom block



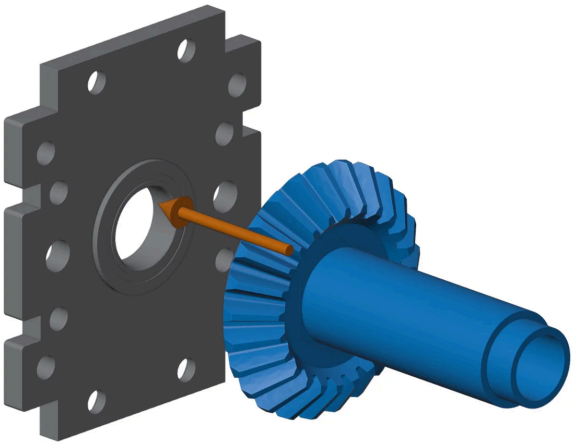
Drop the **short-hub gear** into the bottom block with its **teeth facing up**. The end of the hub goes into the bearing from Step 2.

Step 6. Middle plate onto the gear



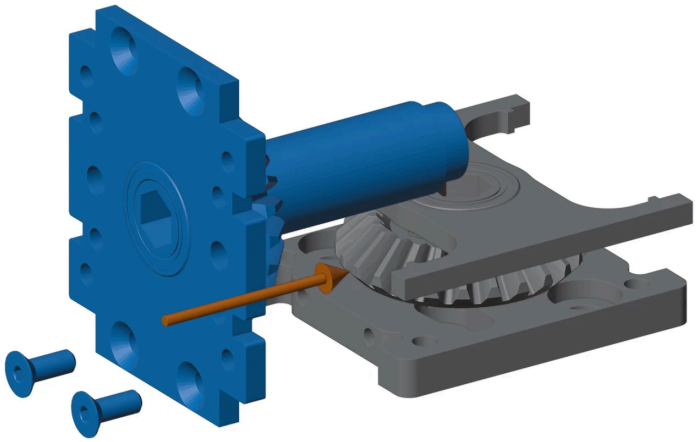
Lower the middle plate, with its bearing, onto the top of the short hub so the hub goes into the middle-plate bearing. The flange faces down toward the gear. The gear is now held between the bottom block and the middle plate. The tabs on the middle plate fit into slots in the side plates in Steps 8 and 9.

Step 7. Long-hub gear into one side plate



From the **inside** of one side plate, slide the **long-hub gear** through that plate's bearing until the gear sits next to the bearing flange. The gear is too big to pass through the bearing, so it has to go in from the inside.

Step 8. Install the first side plate

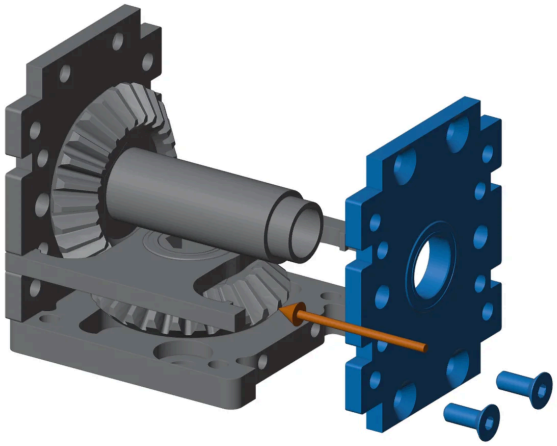


Put a thin layer of **red tacky grease** on the teeth of both gears. Then bring the side plate and long-hub gear onto the bottom block and middle plate:

- the long-hub gear's teeth **mesh with the bottom gear**;
- the middle-plate tab goes into the slot in the side plate;
- the side plate sits against the side of the bottom block.

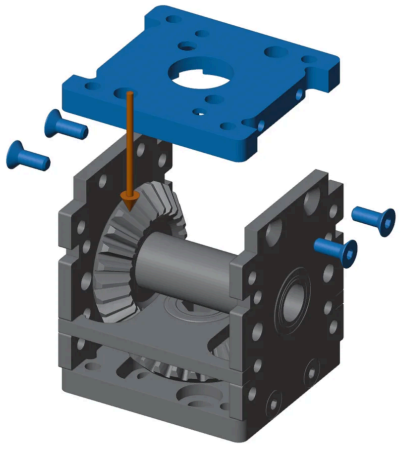
Put a drop of **blue Loctite** on **2 × M3×8 flat-head screws** and start them through the side plate into the bottom block. **Leave them loose for now.**

Step 9. Install the second side plate



Slide the second side plate over the free end of the long hub so the hub goes into this plate's bearing. Fit the middle-plate tab into its slot and seat the plate against the bottom block. Start **2 more M3×8 screws**, with Loctite, and leave them loose.

Step 10. Top block

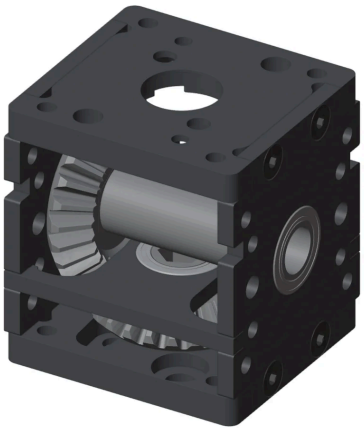


Put the second end block (the one with no bearing) on top, between the side plates. Start the last **4 × M3×8 screws** with Loctite, 2 per side.

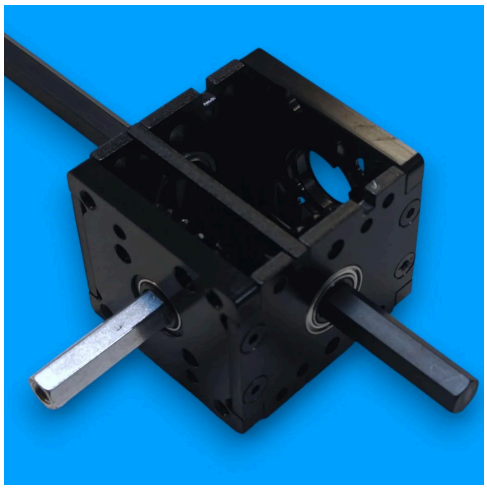
Step 11. Spin, then tighten

1. Turn the long hub by hand. The other gear should turn smoothly, with no tight spots, grinding, or clicking.
2. Tighten all 8 screws a little at a time, switching back and forth between sides, until they're snug and the heads are flush.
3. Spin it by hand again. If it got tighter while you tightened the screws, loosen them, re-seat the plates, and tighten again.

Done







The gearbox stays fully assembled when you change the input and output shafts, so you don't need to take it apart.

5. Common mistakes

1. **Mixing up the plain and flanged bearings.** Only **one** bearing has no flange, and it goes in the **bottom end block**.
2. **Putting a bearing flange on the wrong side.** The side-plate flanges go on the **inside**. The middle-plate flange faces **down toward the bottom gear**.
3. **Putting a side plate on backwards.** The countersinks must face **out**, or the flat-head screws won't sit flush.
4. **Swapping the gears.** The **short-hub** gear stands upright in the bottom block. The **long-hub** gear goes through both side plates.
5. **Over-tightening the screws.** M3 threads in aluminum strip easily. Tighten until snug, then stop.
6. **Running above the rated load.** Keep the load at or below about 25 N·m. The gears skip at about 42 N·m.