



## Your EdVenture into Robotics

### *Tune up Your Edison*



Our spare parts pack has all of the latest parts required to tune up your Edison robot.

## Introduction

Need to repair an Edison robot or want to update a version 1 robot to the latest parts? This guide will show you how to use the spare parts pack to complete the job.

**Note:** all new shipments of Edison robots include clutch-enabled gears and come supplied with all of the latest parts.

### What's in the spare parts pack?

The spare parts pack includes two sets of replacement clutch gears and associated supplies - this is enough to repair two Edison robots.

- 4 x Gear shafts
- 4 x Clutch/crown gears
- 4 x Worm gears
- 6 x Allen key/hex head screws
- 1 x Allen key/hex wrench



Also included in the spare parts pack:

- 1 x EdComm cable
- 1 x Battery door (including springs)
- 1 x Clear skid
- 2 x Wheels
- 2 x Tyres



## How to replace Edison's gears

If one or both wheel of the wheels on your Edison robot won't drive or if the robot is making a lot of noise when driving, you may need to replace the gears. You can also follow these steps to upgrade a version 1 robot to have clutch gears.

The spare parts pack includes two sets of replacement clutch gears, which is enough to repair or upgrade two Edison robots.

### Supplies list

- Spare parts pack
- Needle nose pliers
- Philips-head screw driver
- Scissors
- Silicon grease [not pictured]  
(**NOTE:** Do NOT use standard motor grease or any other petroleum-based grease as this will melt the plastic! Silicon grease is available from most hardware stores or can be ordered online.)



### Step one

Remove the wheels from Edison.

Flip Edison over and remove the tiny clear plastic skid.

Once those are removed, lay the Edison right side up on the table and remove the clear top by unscrewing the four screws located in each corner

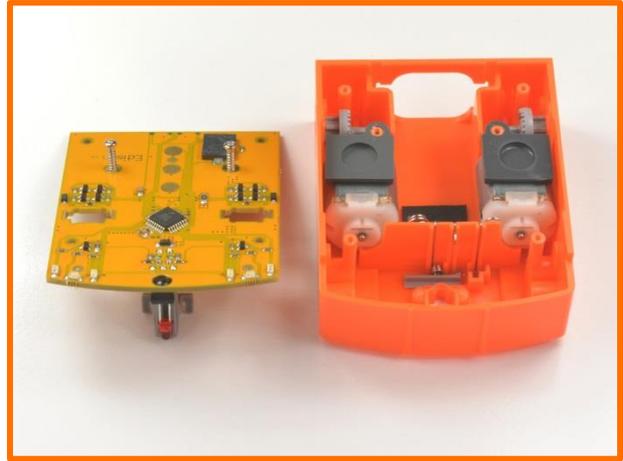
Remove the rubber buttons and IR guard.



## Step two

Remove the printed circuit board (PCB) by unscrewing the two screws on either side of the button pads.

Once the circuit board has been placed to one side, remove the silicone wedges from the top of the motors (if your Edison has foam pads, leave them attached).



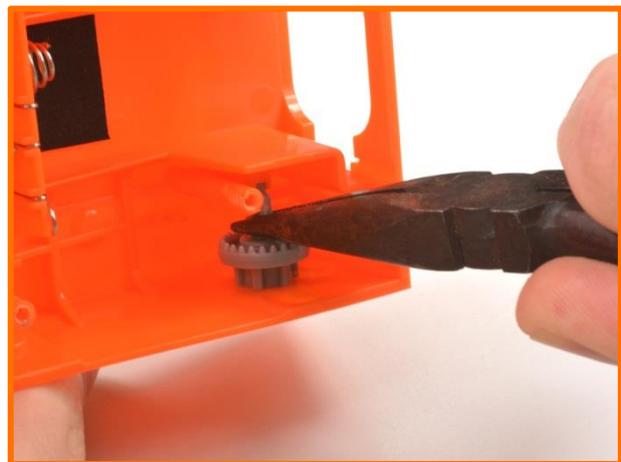
## Step three

Remove the motors by pulling the white plastic section up.



## Step four

Remove the old gear from one side by pinching the axle with pliers, pushing back towards the outer wall and lifting out.



## Step five

Assemble the new clutch gear by sliding the clutch pieces together as shown.

The clutch can be tricky to install, so grasp the clutch assembly with pliers on an angle as shown. Use caution when doing this as the gear shaft can become crushed if too much force is applied.



## Step six

Install the gear by placing the outer shaft into the hole in the outer wall of Edison, then pushing out and down to click the top of the new axle into place.



## Step seven

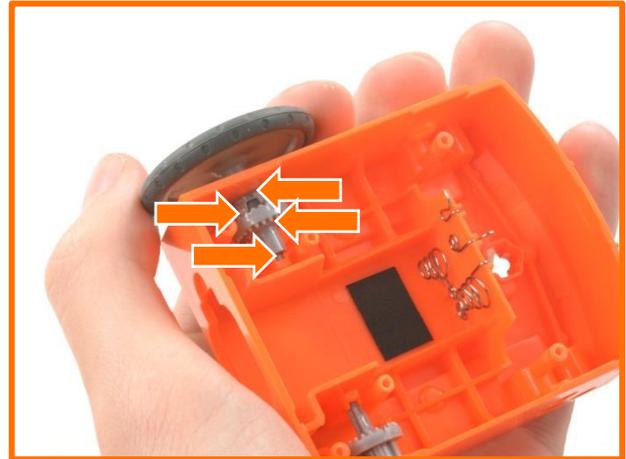
Open the silicon grease per packaging recommendations. You need a small, controlled delivery, so if your package doesn't have a small nozzle, you may want to put some into a small plastic bag, seal it, then use scissors to cut off an edge (1mm) of one corner of the grease packet.



## Step eight

Lightly push a wheel into the axle hole of the new gear. (This will allow you to rotate the gear and spread grease evenly in the next step.)

The arrows in the image on the right indicate where grease needs to be added to each joint between the gear parts and Edison's body in step nine.



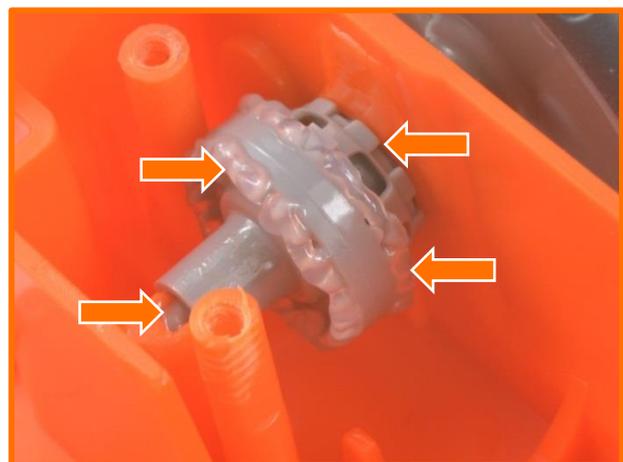
## Step nine

Apply grease to the four connection points shown in the previous step, going slowly and rotating the gear to evenly apply grease to the whole gear.



## Step ten

Ensure that grease has been applied evenly and liberally. Your gear should look similar to the image on the right, with grease applied to all places highlighted by the arrows.

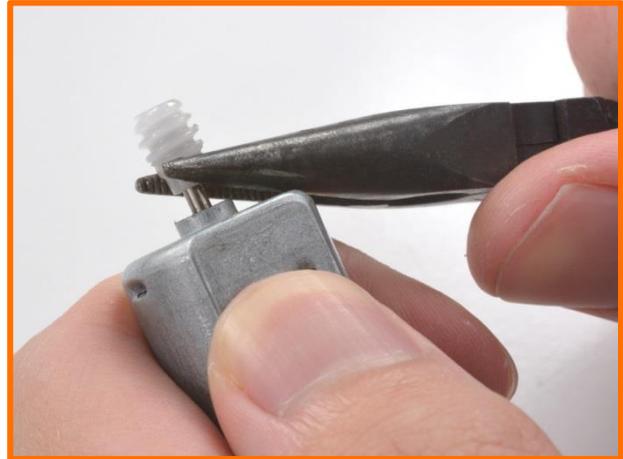


## Step eleven

Set aside your Edison for the moment.

Using the pliers to remove the worm gear from one of your motors.

The easiest way to remove the worm gear is to grip the gear at the base and lever the worm gear off using the side of the motor as a leverage point.



## Step twelve

Slide the cardboard out of the spare parts pack and lay it on the table, this will save your table from potential marks in the next step.

Place a worm gear on the cardboard, making sure that the internal bevelled edge is face up, as shown in the image.



## Step thirteen

Centre the motor shaft over the worm gear and push down hard to attach the gear to the motor.



### Step fourteen

Make sure that the worm gear is flush with the end of the motor shaft.

If it is not flush, repeat step thirteen.



### Step fifteen

Remove the wheel from Edison. Slide the motor back into Edison's body on the side where you have installed the new gear. Push down hard between the terminals until you hear a 'click' sound.



### Step Sixteen

Repeat steps four through fifteen to replace the gear and motor on the other side.

### Step seventeen

Once the gears on both sides have been replaced, replace the silicone pads on top of your motors and check that each of the springs is sitting into its notch in the battery wall.

Edison should be set up as shown in the picture to the right.

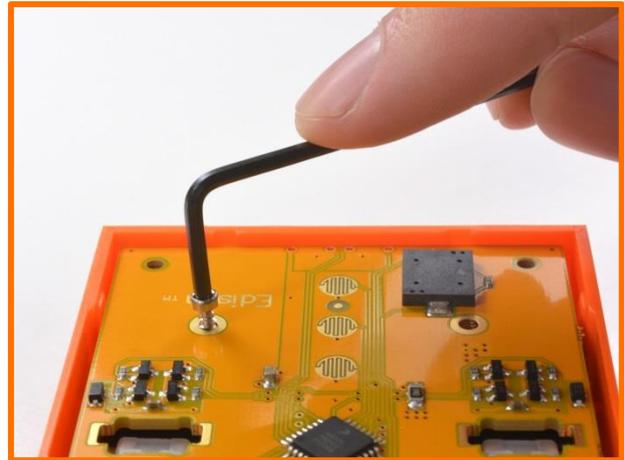


## Step eighteen

Replace the PCB, making sure that the line tracker sits into the hole in the bottom of Edison.

Screw the PCB down with the two screws towards the back of the board.

If the original screws from your Edison have become damaged during this process, install the screws provided in the spare parts pack, using the provided allen key.



## Step nineteen

Place the clear plastic top upside down on the table and place in the buttons and IR shield.

Flip Edison over and clip the body onto the clear plastic top. Pick up Edison with the clear plastic top and flip the robot back over.

Finally, screw in the four screws in each corner to secure the top and replace the wheels and plastic skid.



**Congratulations you have tuned up your Edison!**

