



# Replacing Pinion Gears

## Introduction

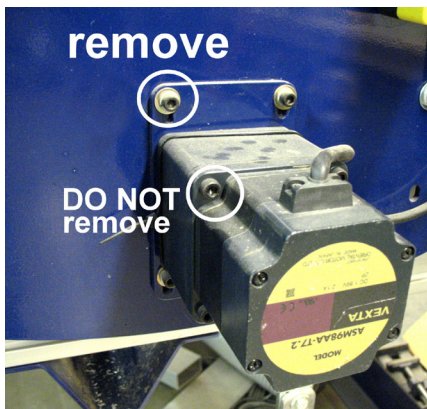
### Required Items:

3/16" allen wrench  
1/8" allen wrench  
New pinion gears

If a new set of pinions have not yet been purchased, have the following information available and contact ShopBot Tools.

- Number of teeth on the pinions
- Width of the rack
- Width of the bore (the hole that fits onto the motor shaft)
- Model number of motors

## Removing Motors

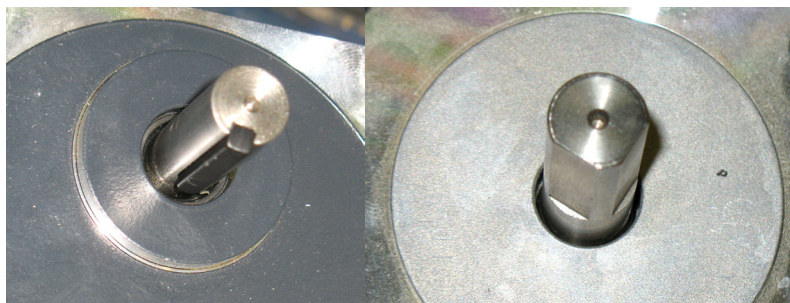
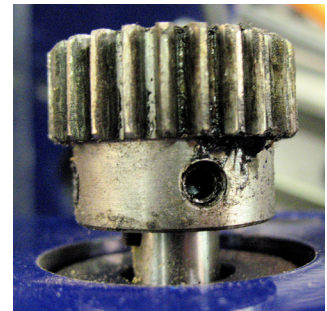


Using the 3/16" allen wrench, remove the four bolts that mount the motor to the frame. As you remove them, take care to support the motor so it doesn't drop.

Remove only the motor mount bolts as shown in the photo. DO NOT remove the bolts on the motor housing. This will open the motor's gearbox.

## Replacing Pinions

The pinions will be secured to the motor shaft by one or two recessed set screws. Loosen these set screws with your 1/8" allen wrench and slide the pinion off.

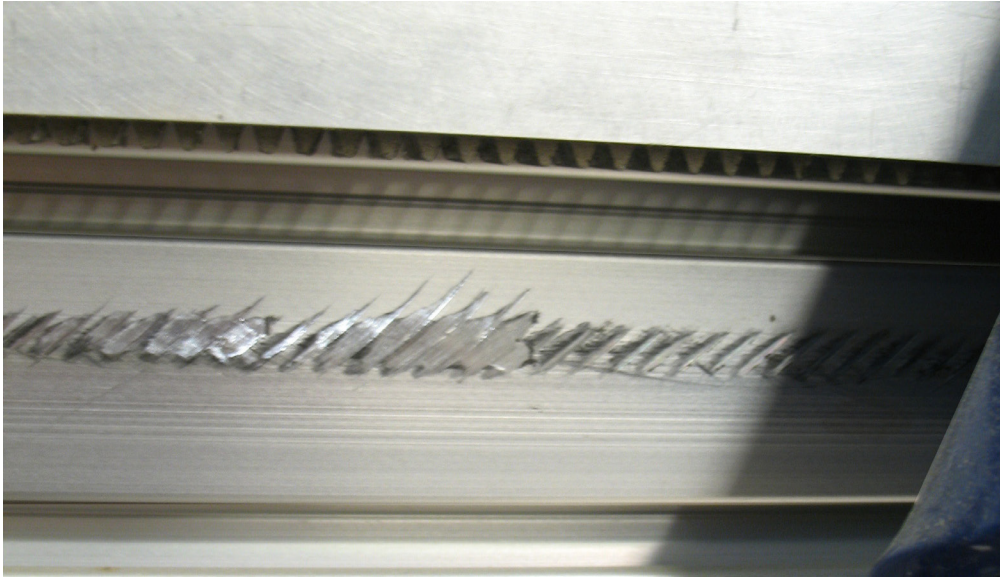


Depending on the model of motor, the motor shaft will either have a keyway or a flat to help keep the pinion from slipping on the shaft. If motor shaft is keyed, make sure that the key is still securely pressed into the keyway before putting the new pinion on. If the shaft has a flat, make sure that the set screw on the new pinion lines up with the flat.

Before tightening these screws down fully, check for alignment with the rack (see next step).

## Checking for Alignment

Ideally, the pinion should engage the full width of the rack. This will result in efficient power transmission and will help the rack and pinions to wear evenly. However, check to be sure that the edge of the pinion isn't grinding against the rails, as shown in the photo below.



Start with the pinion mounted flush with the end of the shaft. Holding the motor against the frame and keeping it aligned with the mounting holes, get a visual inspection of how the pinion meshes with the rack. If necessary, adjust the pinion's location on the shaft, then check the alignment again before tightening the set screws.

## Mount Motors

While replacing motor mounting bolts, make sure that the pinions are pressed firmly into the rack. After motors are replaced, power on the control box. Grab each side of the gantry and try to push it back and forth. It should feel completely solid. Check that the motors are mounted so that the pinions engage snugly with the rack if play is noticed in the gears.

To extend the life of the pinions, keep the rack well-greased using a heavy automotive or industrial grease (available from a local auto parts store), and free from any chips or debris.