

## **Intro: HOW TO BUILD A PUMPKIN RACER**

Here is a fun thing to do for Halloween, Pumpkin Racing. For our race, the use of a solid base with affixed wheels is illegal. No skateboards. No roller-skates. No Tonka Trucks. The challenge is to build the fastest racing pumpkin with two independent axels. And here is the secret to an undefeatable winner: For the pumpkin racer to go straight down the track the axels have to be perfectly parallel. Don't forget: Being creative is just as important as speed!

### **Materials List:**

1 Pumpkin

5/16 threaded rod

4 wheels

15 hex nuts 5/16

8 washers 5/16

4 protective end caps, also 5/16

PUMPKIN AXLE PUNCH CONTRAPTION – This will be available at the Pumpkin Races

### **Step 1: DRILLING AXLE HOLES**

Place your pumpkin into the Punch. Hold the pumpkin firmly in place and drill the first axle hole. Once you have the first hole punched through, remove the drill bit. Keep a firm hold on the pumpkin. I like the place the spare screwdriver in the hole to hold the pumpkin in place while drilling the second hole. When you are ready, drill the second hole.

Tip: It is easier to decorate your pumpkin prior to putting the wheels on. Just remember to keep the bottom part of the pumpkin free of any materials. For example, if you do a mummy pumpkin, don't wrap gauze around the part where you will have to drill the axle holes.

### **Step 2: INSERTING AXLES**

Feed the axles through the path you have just created with the PUMPKIN AXLE PUNCH. If the threaded rod gets stuck, you can poke the screwdriver through again to clear the path.

You want to be careful with the threaded rod. The threads can easily bend and then it will be impossible to get a hex nut to go on smoothly. Don't hammer the threaded rod through the pumpkin or knock it on the ground to help feed it through. It might seem like a good idea at the

time, but you will regret it later. If you absolutely have to give the rods a tap, make sure you screw on an acorn nut first.

### **Step 3: CENTERING THE PUMPKIN**

After a few trips down the race track, you may find that your pumpkin will slip on the axle and become off center. This can happen during a crash, either with another pumpkin racer, someone's legs or the curb. This step is not necessary, but it will help to keep your pumpkin centered.

On each axle, thread one fender washer and one hex nut. The placement of the fender washers should be snug up against the pumpkin with the hex nut anchoring the washer in place.

### **Step 4: ATTACHING WHEELS**

Here is the order in which to place nuts and washers on the threaded rod: (2) hex nuts, (1) flat washer, (1) wheel, (1) flat washer, (2) hex nuts, (1) acorn nut

You want to make sure that the acorn nut has enough room to be fully screwed onto the threaded rod. The only purpose for the acorn nut is to protect you from scratches and cuts.

Repeat this step for the remaining three wheels.

Now that you have all the pieces on the threaded rod, it is time to secure the hex nuts. You will need to create a LOCK NUT. If you skip this part, the hex nuts will continue to rotate on the threaded rod as your pumpkin goes down the track. This will cause your wheels to lock up and you will lose.

### **Step 5: LOCK NUT**

To create the LOCK NUT you are simply going to rotate two hex nuts onto each other. This is the step where you will use the two ½ inch wrenches.

Place one wrench over one hex nut and the other wrench over the second hex nut. You will essential be rotating one hex nut to the right and the other to the left. This will give you a tight joint that you will not be able to move by hand.

You will have EIGHT points on the four axles where you will need to make a LOCK NUT.

### **Step 6: IMPORTANT TIP**

You need to make sure that there is enough room for the wheels to rotate freely, but not enough room for them to wobble. Here is a simple suggestion.

I like to insert a fender washer between the wheel and the flat washer. Then rotate the two hex nuts back onto the flat washer and make the LOCK NUT joint. When you pull out the fender washer, you will have just enough room for the wheels.

### **Step 7: TEST RUN**

Do make a test run of your racer. This is the best way to see what kind of adjustments you may need to make. A sloped driveway or parking lot entrance ramp is a great place for practice.

If the pumpkin hangs too low and is rubbing on the ground, you will need to shave some off.

Check to make sure all wheels are spinning and not wobbling.

Be careful! When you get all the bugs worked out, your PUMPKIN RACER will really pick up speed as it goes down the hill. Depending on how steep your track is, you may want someone at the other end to put on the brakes.

### **Step 8: FINAL THOUGHTS**

It is challenging to get the axles on parallel, and that is what makes the race fun. On race day, pumpkins will zig and zag across the track. Some will end up on the curb. Some will never get off the starting line. Some will zoom through the finish leaving everyone else in the dust. It's all part of the experience!

**And above all else...HAVE FUN!!!**