

# [Ri3D 2020] The Ohio State University

## Intake Subsystem Memo

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### Mechanism Specifics / Improvements

**Mechanism Description:** The purpose of the intake subsystem is to collect, store, and release power cells through the front of the robot.

- **Harvester**
  - The intake mechanism contains several wheels on a shaft that rotates to maneuver power cells up onto the ramp.
  - Two mecanum wheels are used on each end of the intake shaft, directing power cells towards the three, 4 inch green compliant wheels, positioned in the center of the intake shaft. The green compliant wheels push power cells to the rollers above the ramp.
  - Passively falls at the start of the match
- **Ramp**
  - Made out of 2 pieces of 5051 aluminum sheets and bent at 135 degrees outward to create the walls. 4.5 inches tall and 4 inches wide floor on each piece.
  - Two rollers: one at the end of the ramp near the release gate and one where the intake harvests the power cell.
  - 1 tight polycord loop in the middle of the roller. 2 loose poly cord loops at equal distances between the ends and sides.
  - A guide system, a piece of flat material with slots to hold the poly cord loops in place to prevent jumping.
- **Gate**
  - The gate is a piece of 5051 aluminum that is angled inward (recommended to not angle it past 60 degrees inward)
  - Piston actuated, pivots on both sides and connected to the ramp.

#### **Technical Specifications:**

- 5051 Aluminum Sheet Metal
- 1032 Screws/Nuts
- ¼ -20 Bolts/Nuts
- 1" x 1" 6063 Tubing
- **Harvester**
  - 2 x 4" Mecanum Wheels
  - 3 x 4" Green Compliant Wheels (25A durometer)
  - #25 Chain
  - 2 x 18 tooth ½" Hex Sprocket
  - Googly Eyes for added fun
  - 1 x ½" Hex x 0.201" ID ThunderHex (cut to length)
- **Ramp**
  - Quick-Connect Hollow-Core Round Belting
  - Aluminum Connector for Quick-Connect belting
  - Heat Shrink
  - 1 x REV NEO Brushless Motor 1:1 Gear Ratio

- 1 x REV Spark MAX
- 2 x ½" Hex x 0.201" ID ThunderHex (cut to length)
- ½" Hex ID Clamping Shaft Collar
- Custom Shaft Mounts(See CAD files)
- **Gate**
  - 1 x Piston

### Suggested Improvements:

- You may see that our gate release has two parts but it would be better to make it in one part.
- Having the gate release powered would increase your ability to play defense without risking damage to your intake system

## Gallery

Our CAD files are available at <https://github.com/firstroboticsosu/2020-CAD>.

