

VEX IQ

67899W BFLZ

Putai Senior High School
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Flywheel Assembly Instructions

We are 67899W BFLZ

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Introduction to the Flywheel Operating Principle



We used four gears including two 12t and two 60t. to drive the flywheel.

The **gear ratio** is calculated as follows:

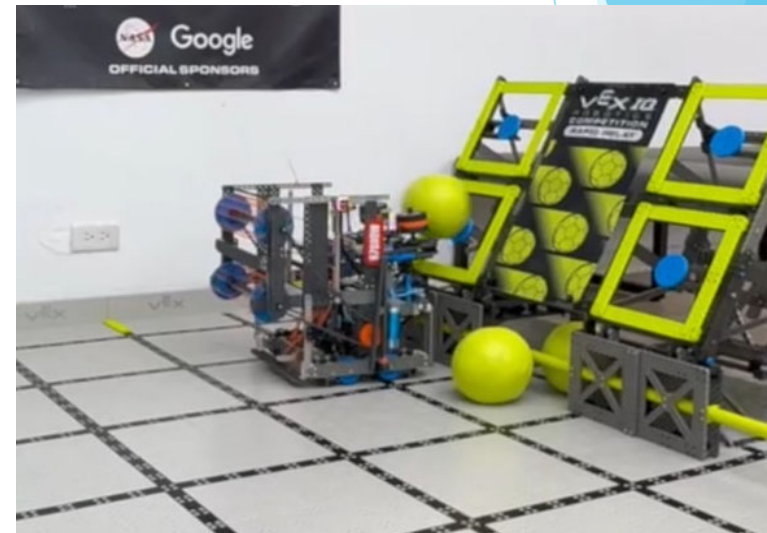
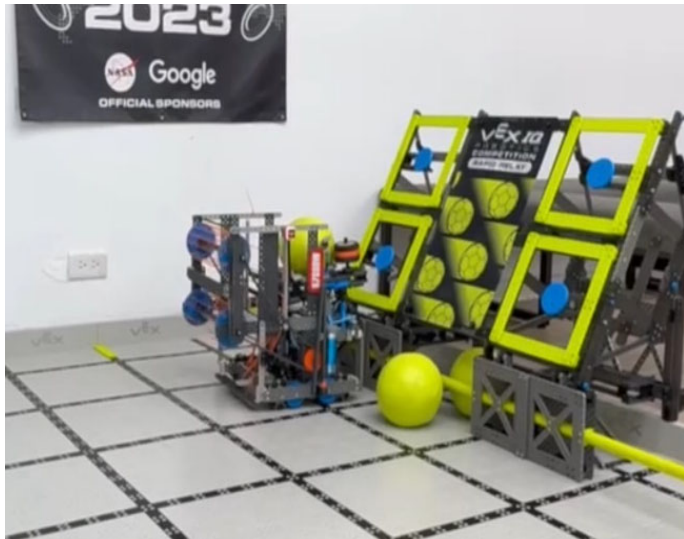
$$60/12 * 60/12 = 5 * 5 = 25$$



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Since a 25 times speed gear was used, the flywheel can **launch the ball faster and get higher score.**

Ball Pitching



1: Trigger pneumatic system to push the ball forward

2: The flywheel makes contact with the ball and scores a goal


```

when started
broadcast pump
set FlyWheel stopping to coast
set FlyWheel velocity to 50 %
forever
if Controller E Up pressed? then
spin FlyWheel forward
if Controller L Down pressed? then
stop Intake
set Angle cylinder1 to extend
set Angle cylinder2 to extend
wait 1 seconds
set Trigger cylinder1 to retract
wait 0.2 seconds
set Trigger cylinder1 to extend
wait 0.2 seconds
set Angle cylinder1 to retract
set Angle cylinder2 to retract
spin Intake reverse
broadcast pump
if Controller E Down pressed? then
stop FlyWheel

```

This is the Flywheel ball passing program, the velocity was set at 50%

```

when started
broadcast pump
set FlyWheel stopping to coast
set FlyWheel velocity to 50 %
forever
if Controller E Up pressed? then
spin FlyWheel forward
if Controller L Down pressed? then
stop Intake
set Angle cylinder1 to extend
set Angle cylinder2 to extend
wait 1 seconds
set Trigger cylinder1 to retract
wait 0.2 seconds
set Trigger cylinder1 to extend
wait 0.2 seconds
set Angle cylinder1 to retract
set Angle cylinder2 to retract
spin Intake reverse
broadcast pump
if Controller E Down pressed? then
stop FlyWheel

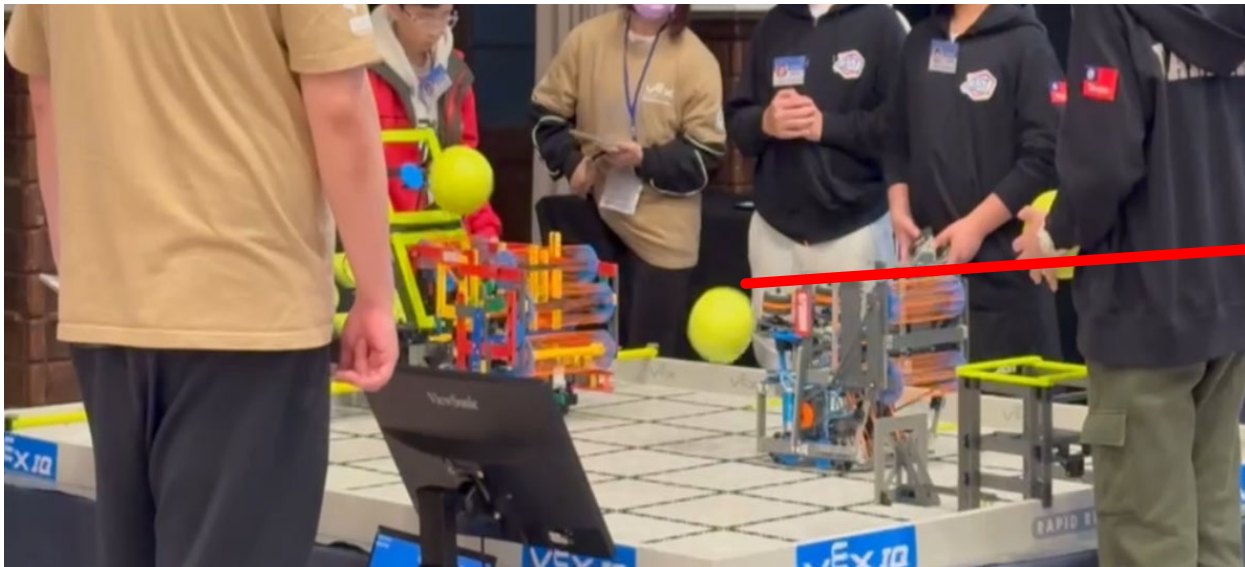
```

If you adjust the velocity to 100%, this will be a goal program

We can also use programs to control the flywheel speed. It allows us to pass the ball and score goals more effectively during the game.

Other Uses of Flywheels

Passing the Ball



We reduced flywheel speed so that the force of ball passing is not too strong.

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Introduction of Pneumatic Group

down

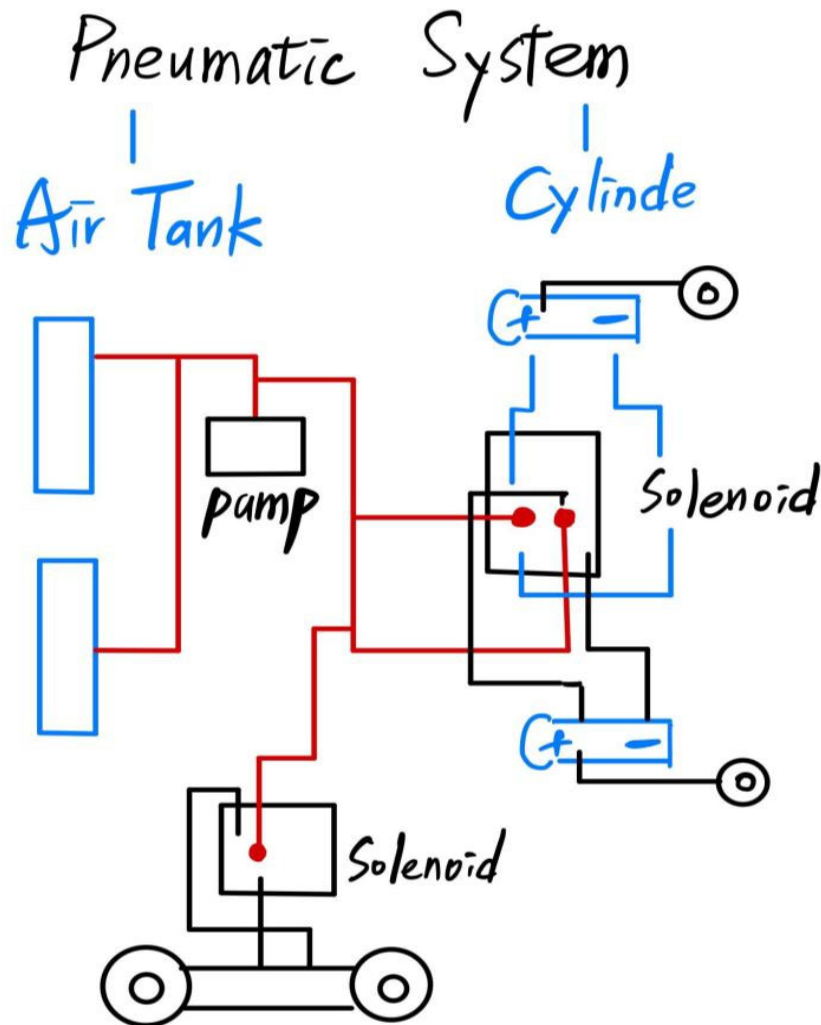


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up

Not only can flywheel help us score, but the pneumatic system with aerodynamic group may also control the height (up and down) via cylinder and help us make a goal.



We use a pneumatic group and pump to store gas in the gas tank. We must use a solenoid valve to connect the gas tank and cylinder.

When connecting, we must pay attention to **separating the pipelines of the two cylinders**, otherwise it will cause insufficient power.

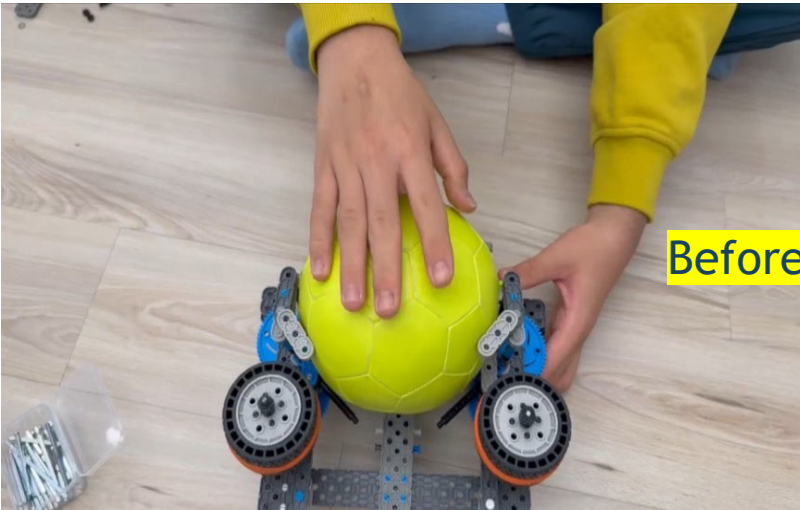
designed by:

witnessed by:

49

Trigger

The triggers can **control the position of the ball** and is a part of the pneumatic group. When the button is pressed, the ball can be pushed to the position of the flywheel and score a goal.

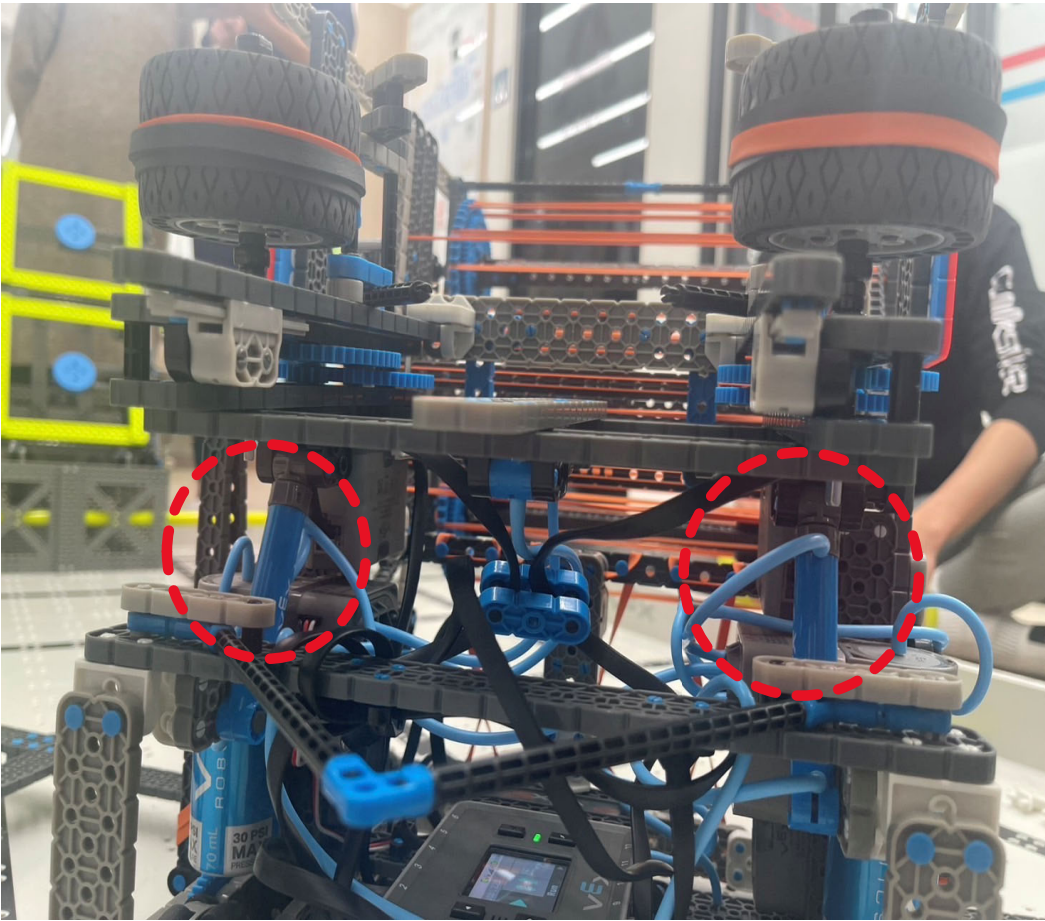


Before pushing



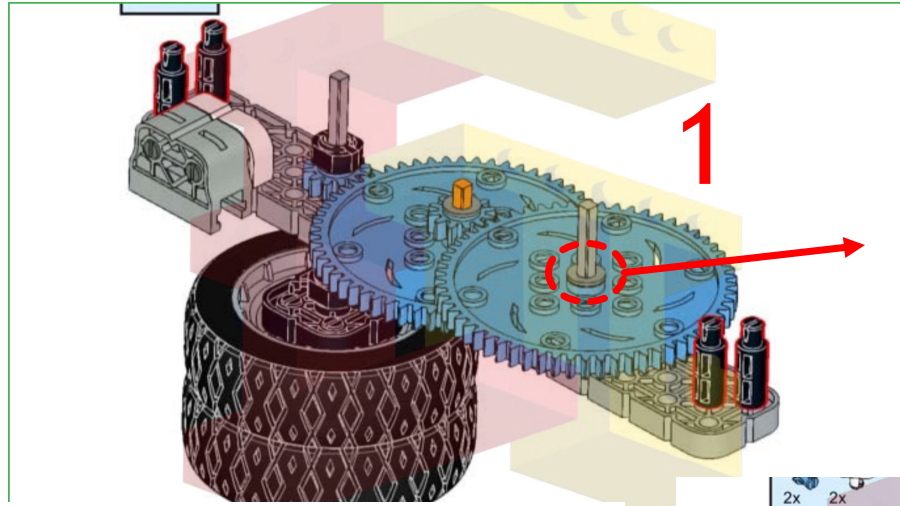
Pushed out

Angle Control

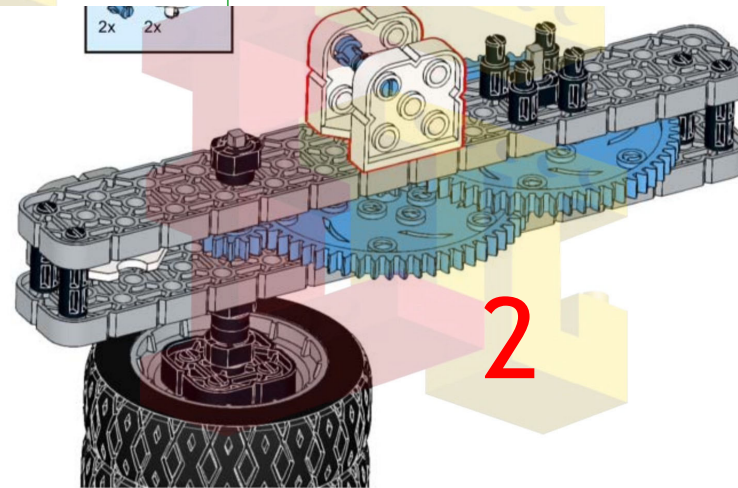
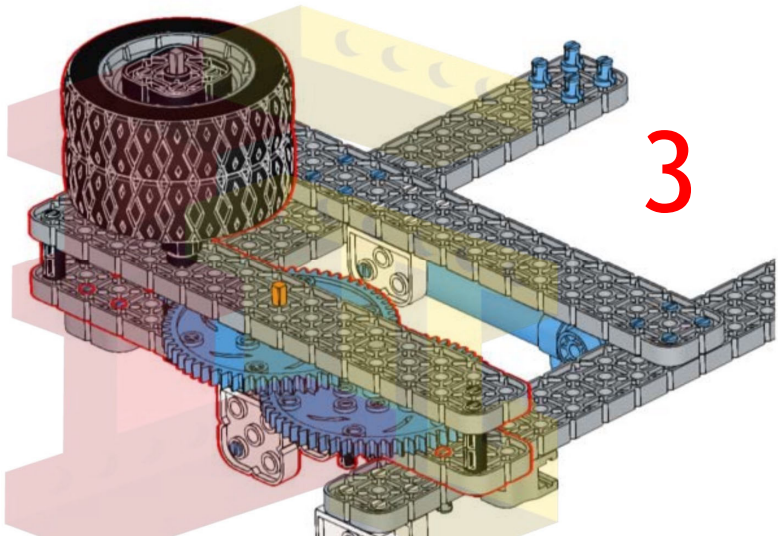


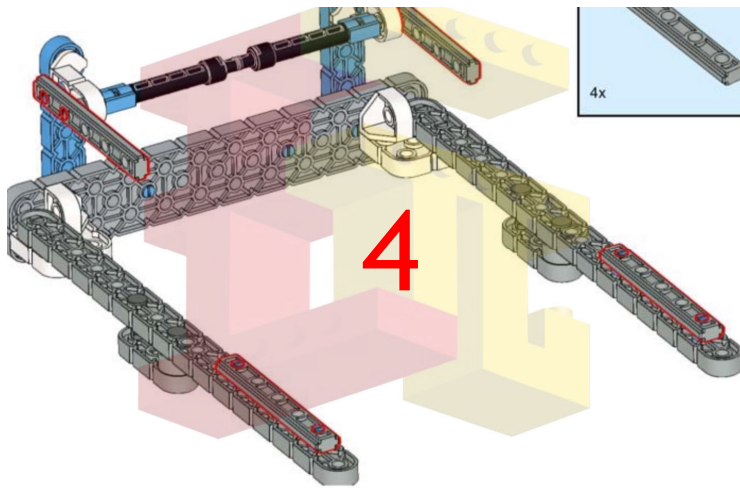
We used two cylinders to raise the angle so that we **can shoot** the ball to both the **upper and the lower** baskets. (Please see p.7 photos)

Flywheel Assembly Steps

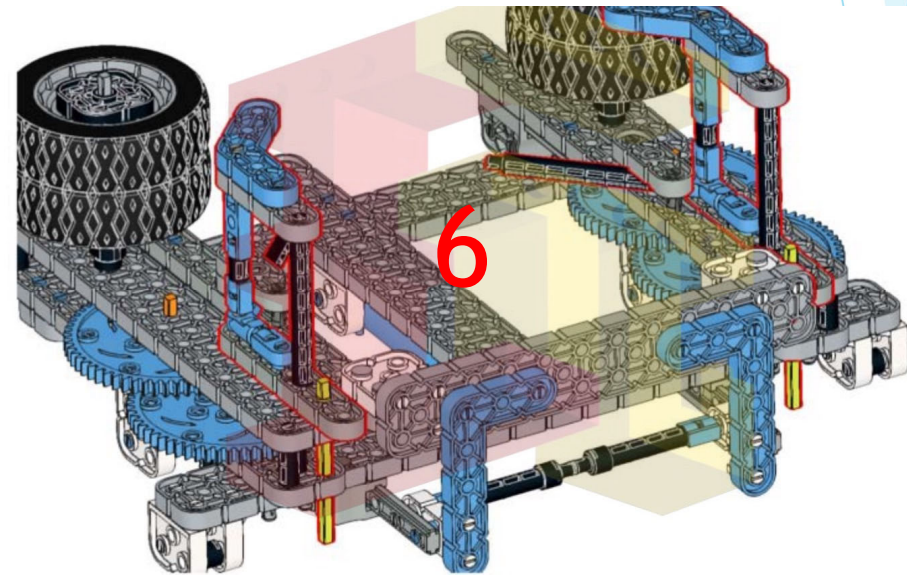
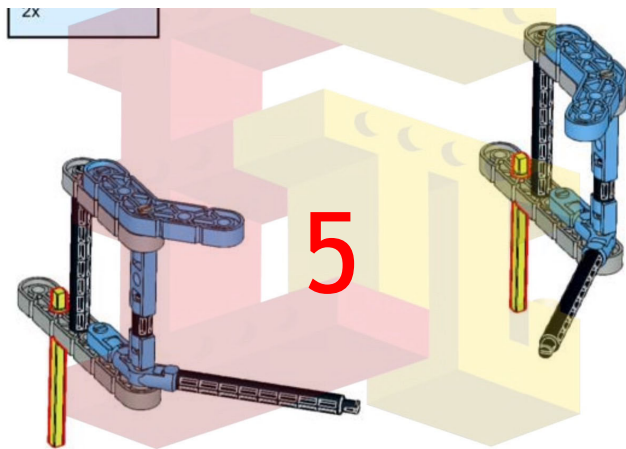


First, assemble the flywheel part (there are two sides) and **be sure to install a gasket**, otherwise powder and dust will be produced by friction and will affect machine operation.

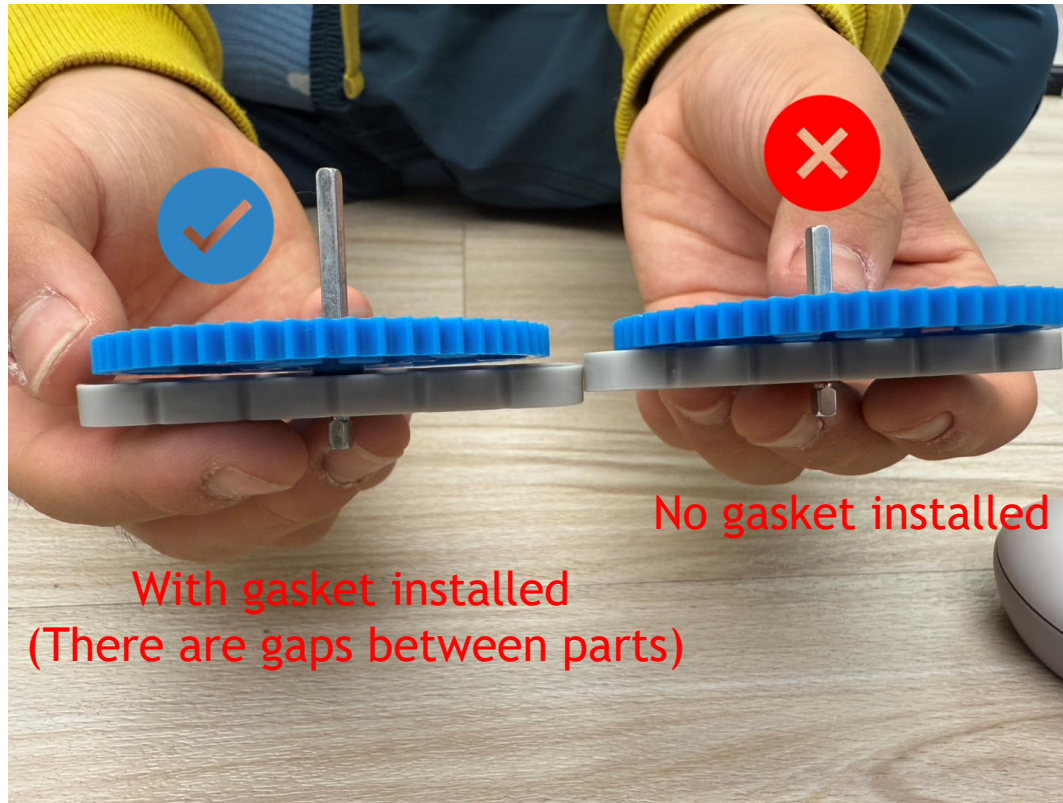




Next, assemble the two remaining parts and put all the parts together to complete the flywheel and aerodynamic group.
(Remember to connect the air pipe to the solenoid)

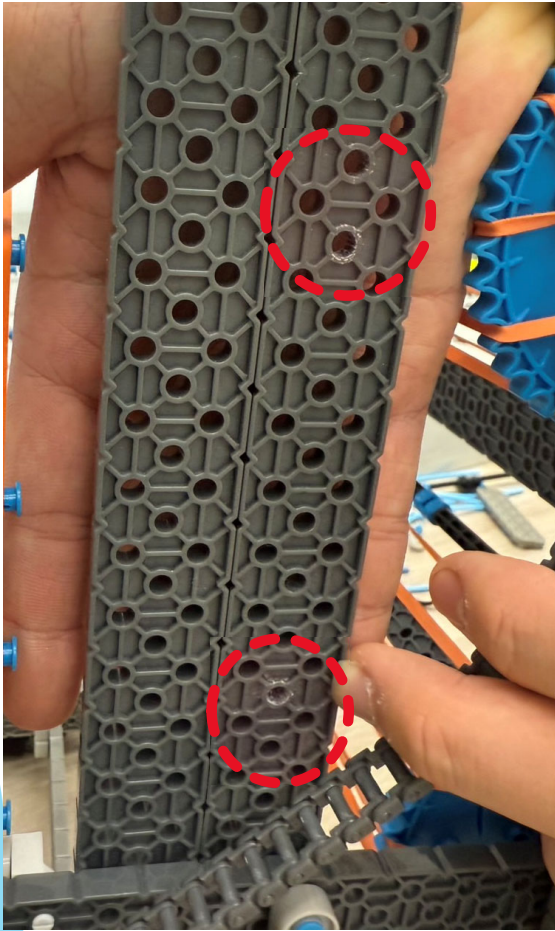


The impact of **not** installing gaskets



If gasket are not installed, the metal shafts and gears will grind out powder, this will greatly affect the operation of the flywheel.

Worn Parts and Gears



After a 3-day experiment, we found that even a gasket was attached, **it may still grind out powder**. Therefore, it is recommended to **replace a new gasket once a month** to avoid affecting machine operation.



Reaming Parts

Why ?

The biggest reason for reaming parts is that **the parts have been used for too long and are not equipped with gaskets.**

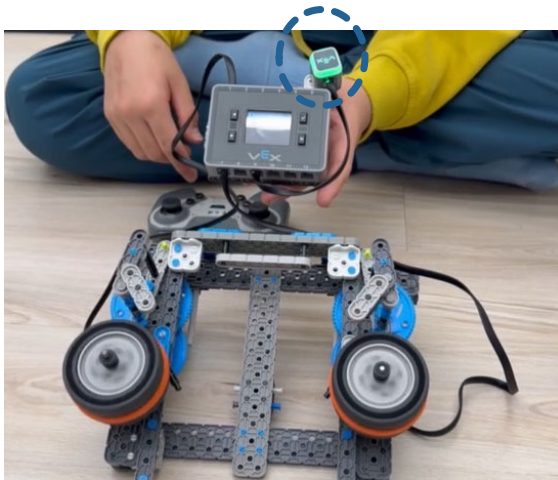
It may cause.....

The hole of the part will be expanded and **ground into square shape.** Then the **flywheel will start to shake.**

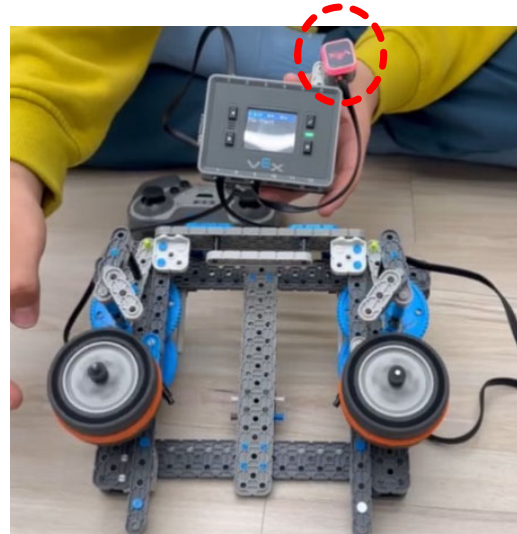
Solution

1. **replace a new gasket** once a month.
2. apply a little bit lubricant during practice, but **it must be wiped clean before the competition.**

Touch LED



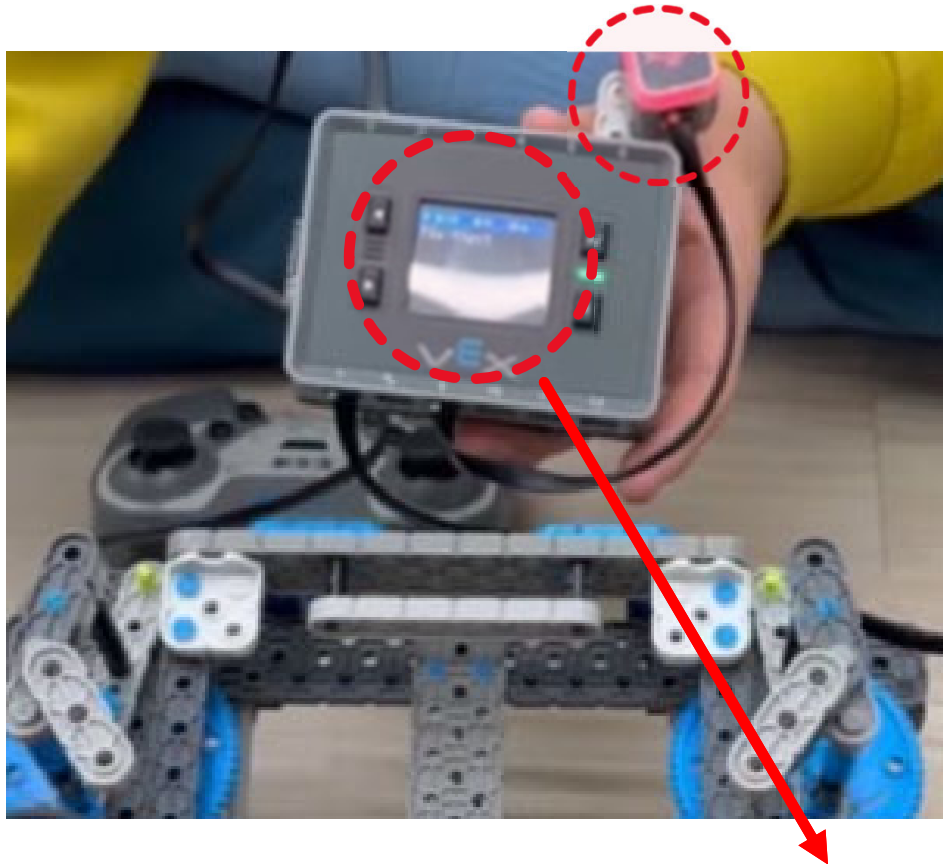
When the green light is on, the rotation speed is **greater than 80%**, and it can be operated.



When the red light is on, the rotation speed is **less than 80%**, and it cannot be operated.

Touch LED can help us **detect the speed of the flywheel**. when the light is red, you cannot throw the ball into the basket. If the light is green, you can throw the ball into the basket.

Screen Display



We wrote a program that can **display the flywheel speed on the main screen.**

The speed displayed on the flywheel screen will be **less than 80%**

Thank You for Building With Us!



67899W BFLZ Love You~