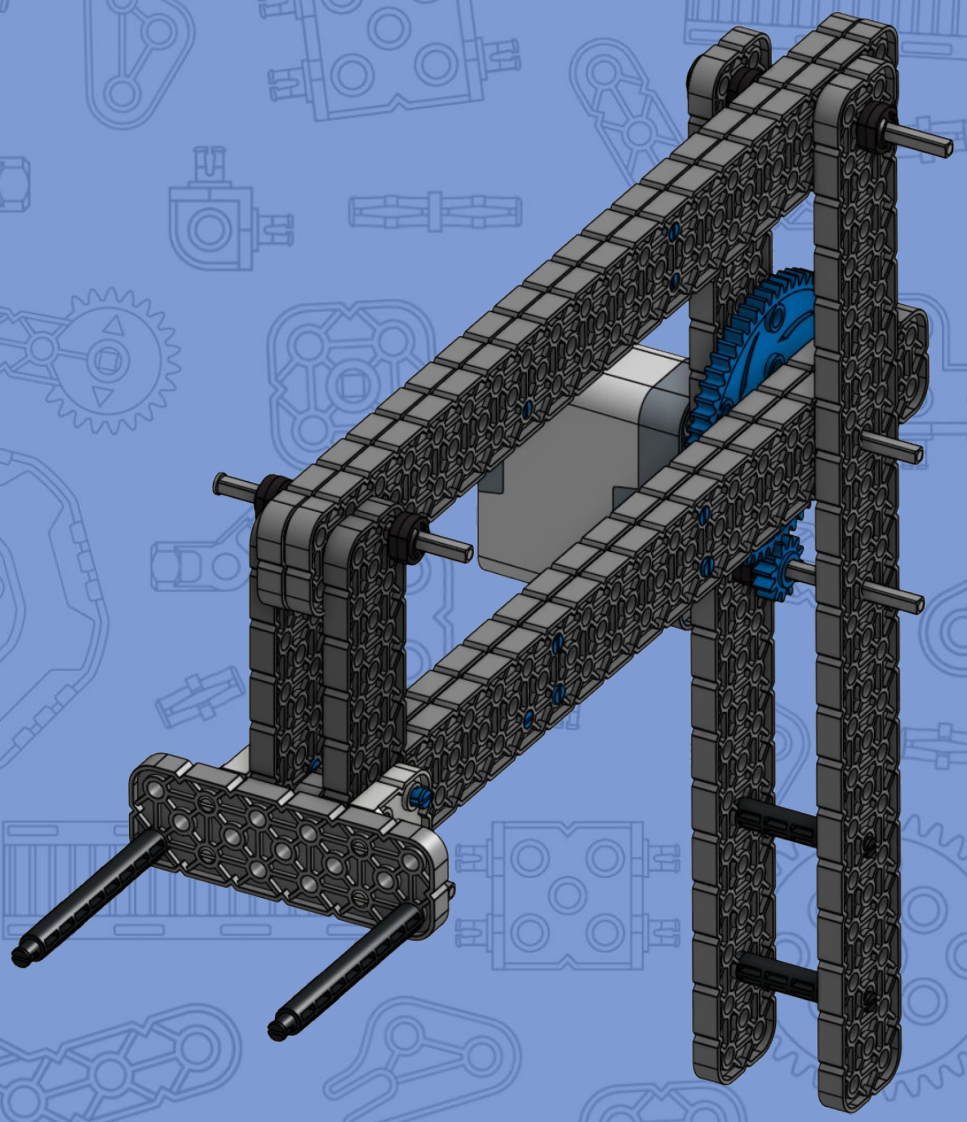
Build Instructions

4-Bar Arm



Created by the students of Bixby Public Schools

BACKGROUND

A 4-bar arm is a simple machine that consists of four rigid bars connected by pivots to form a closed loop. It is often used in robotics to create movements that are precise and controlled. Imagine a set of four sticks joined at the ends to form a rectangle or a parallelogram – this is the basic idea of a 4-bar mechanism.

How Does it Work?

The 4-bar arm mechanism works through a series of chain reactions. The motor spins the 12 tooth gear, which in turn spins the 60 tooth gear that is attached to one bar (called the input bar). As this bar moves, the other attached bars also move (called the output bars).

These movements allow the mechanism to lift, rotate, or push objects. The key feature of this mechanism is that it can translate a small input motion into a larger or more complex output motion, which is very useful in robotics.

Why is it Useful?

This mechanism is useful because it allows robots to perform tasks that require smooth and consistent movement, such as picking up objects, lifting things, or moving parts from one place to another. The 4-bar arm mechanism is especially beneficial because it can handle heavy loads and perform repetitive tasks with high accuracy.

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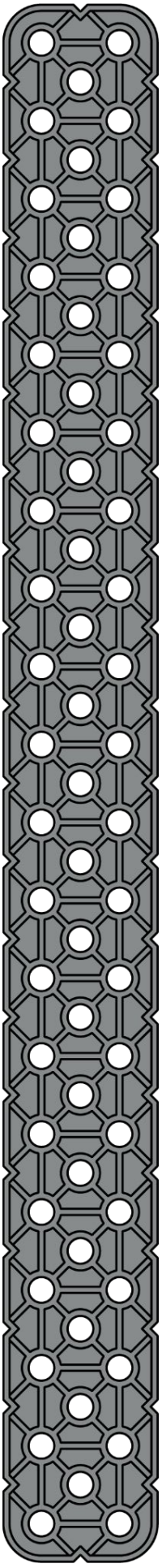
MATERIALS

x6

2x20 Beam
228-2500-030



x1 **4x Pitch Motor Shaft**
228-2500-079, 2238

x2 **4x Pitch Standoff**
228-2500-070

x2 **2x Pitch Standoff**
228-2500-067

x24

1x1 Connector Pin
228-2500-060

x5

Rubber Shaft Collar
228-2500-143

x2

0.25x Pitch Spacer
228-2500-114

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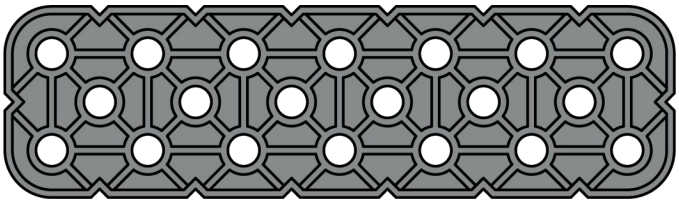
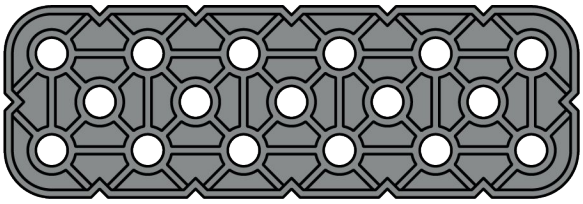
MATERIALS



x2 **2x7 Beam**
228-2500-022



x1 **2x6 Beam**
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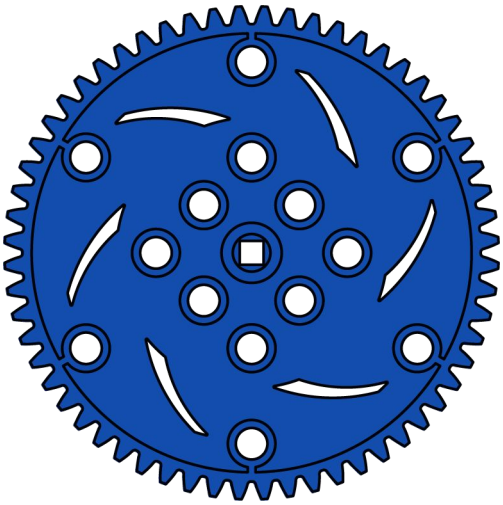
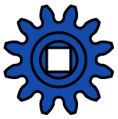
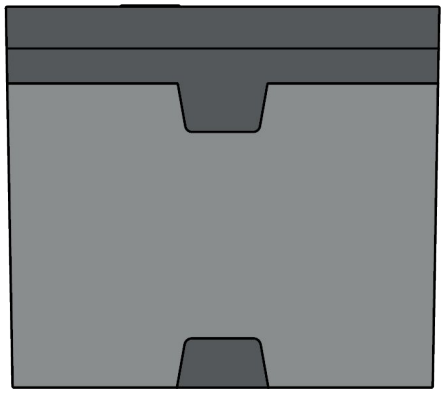


x1 **60 Tooth Gear**
228-2500-215

x1

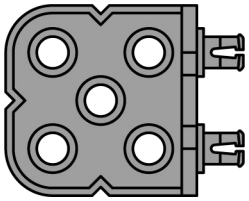


12 Tooth Gear
228-2500-213



x1 **IQ Smart Motor**
228-2560

x2



2x Wide, 2x2 Corner Connector
228-2500-134

x3 **5x Pitch Shift**
228-2500-077

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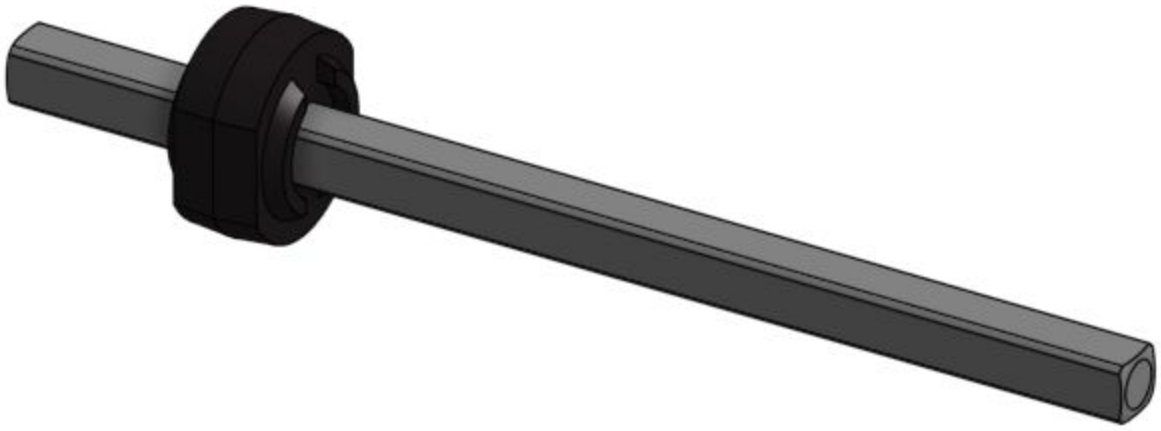
1

Parts List:

x1 

x1 



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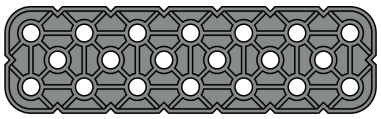
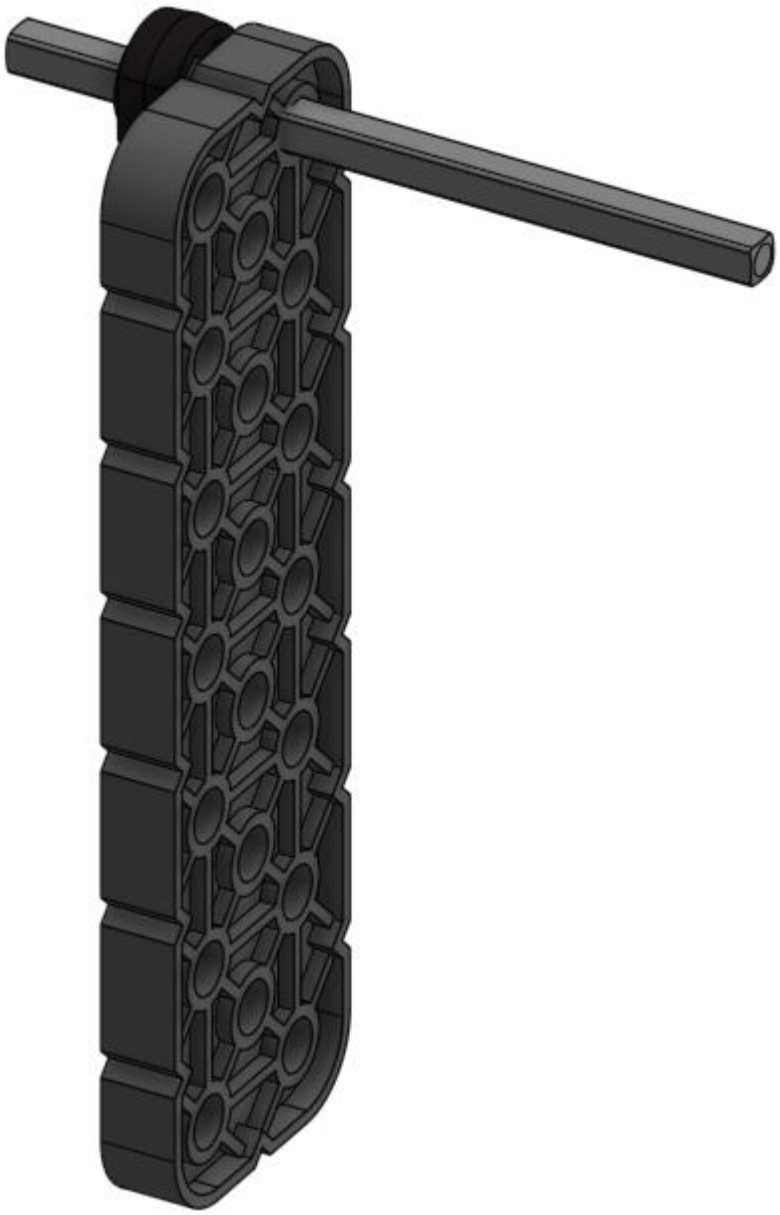
2

Parts List:

x1



2x7 beam



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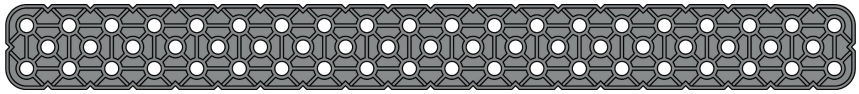

x2 *2x20 beam*

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4

Parts List:

x8 

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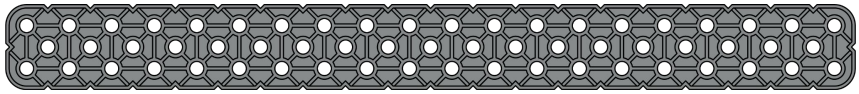
5

Parts List:



x2 *2x20 beam*

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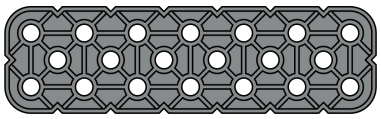
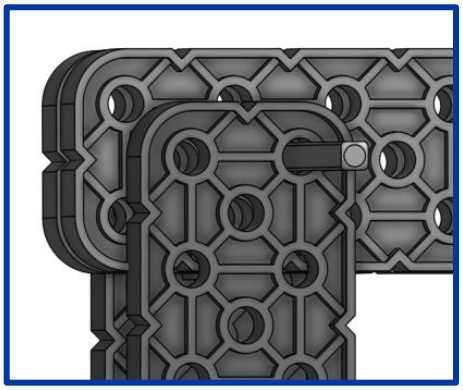
7

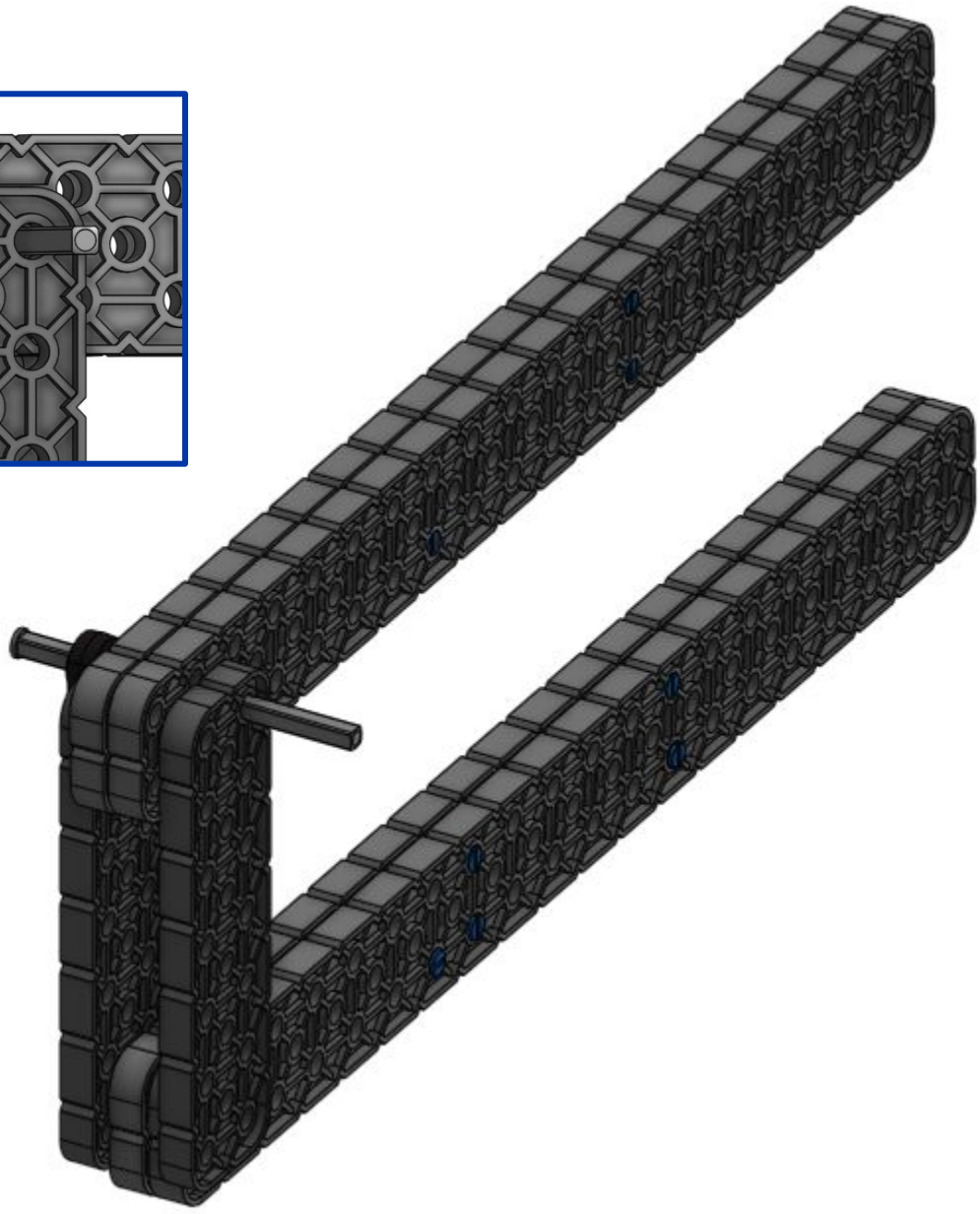
Parts List:

x1



2x7 beam





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8

Parts List:

x1 

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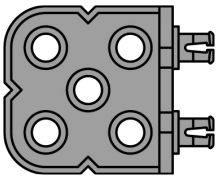
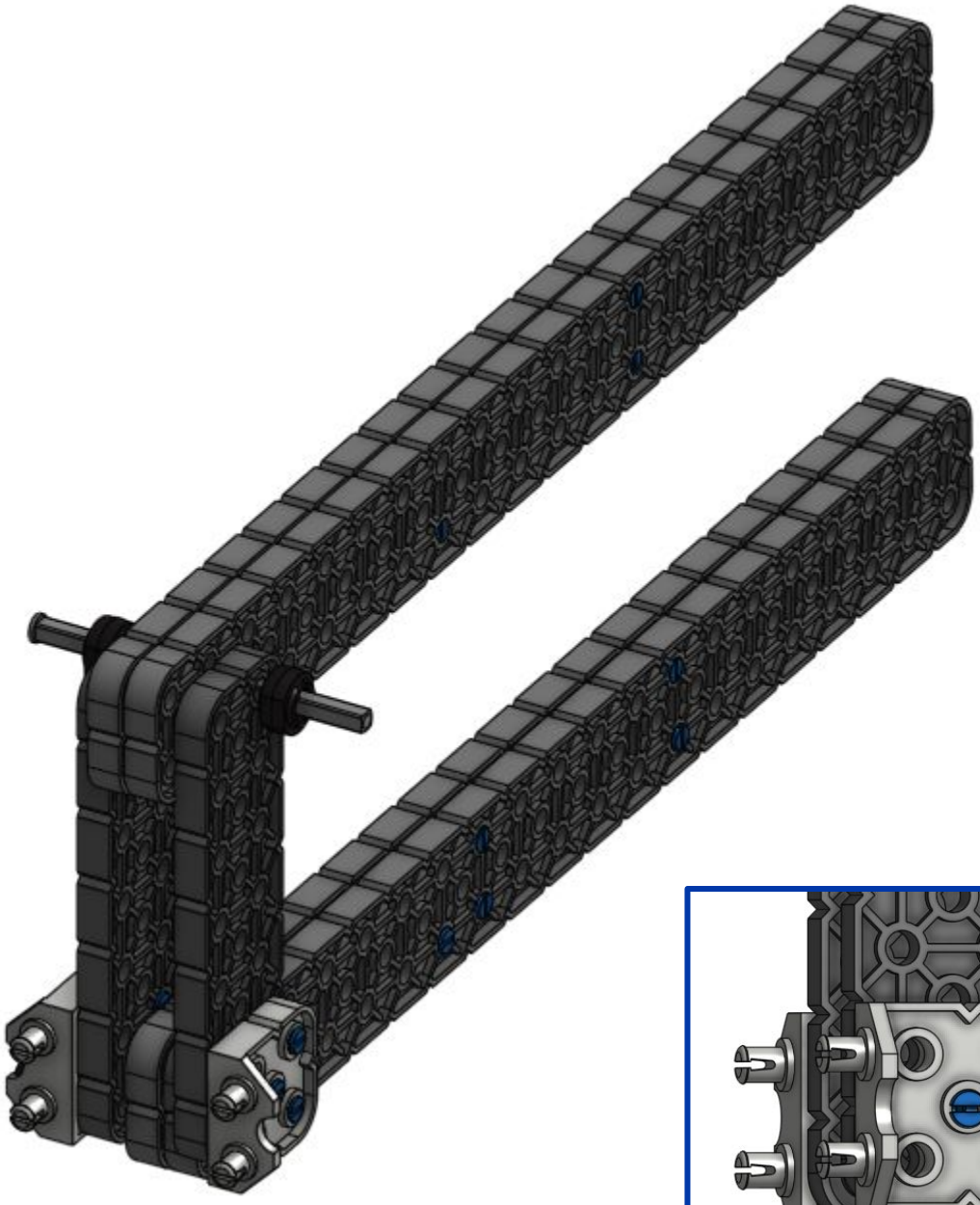
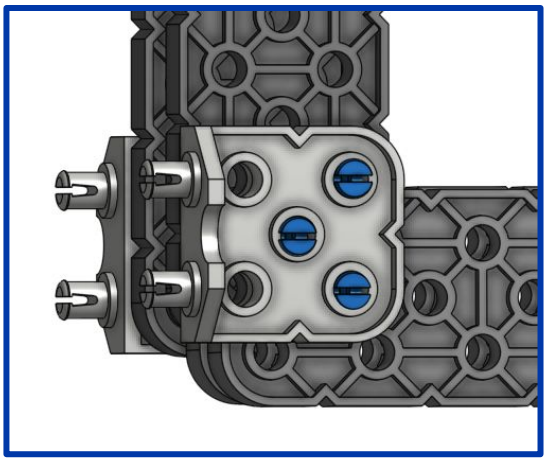
Parts List:

x6 

x2 





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Parts List:

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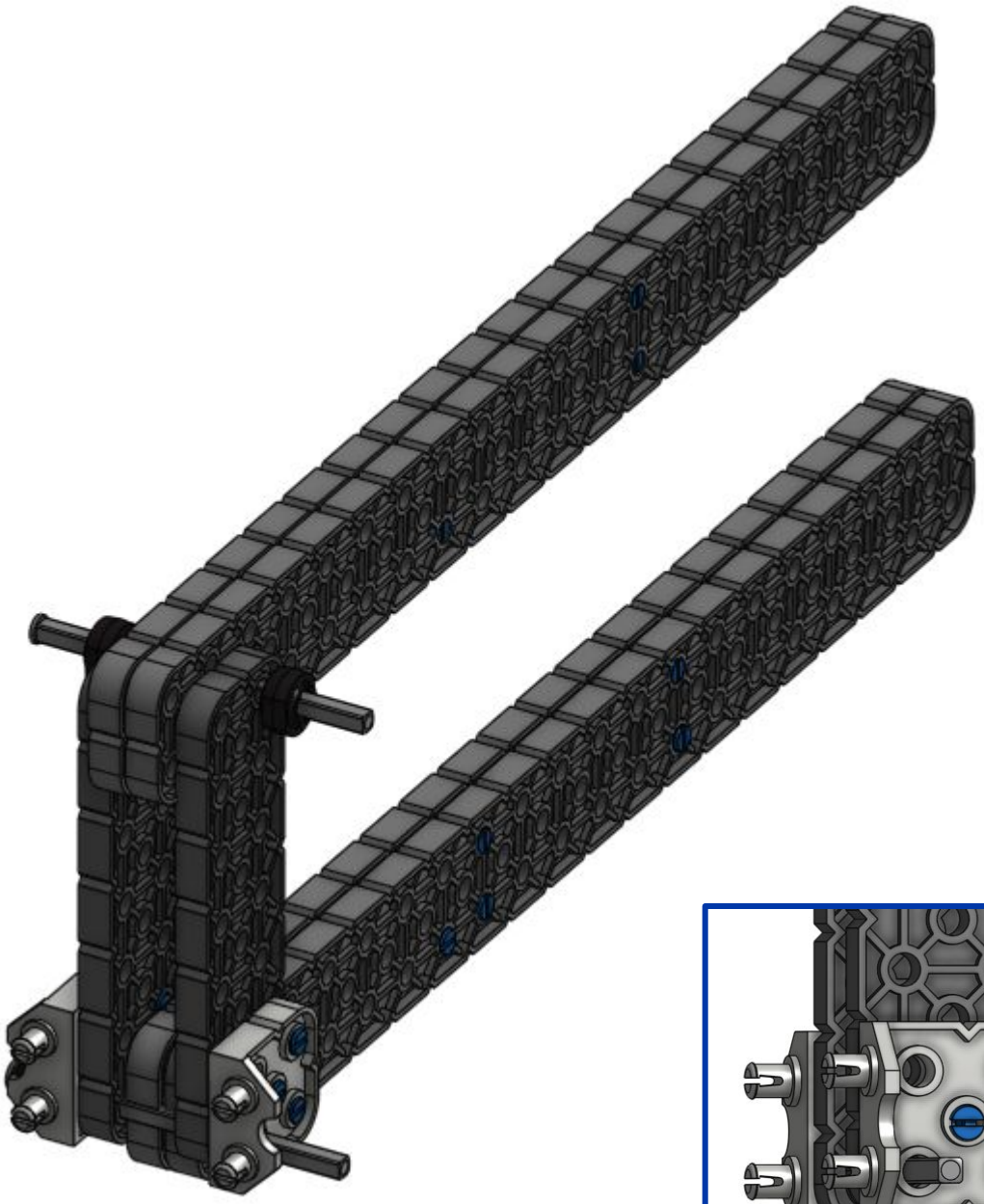

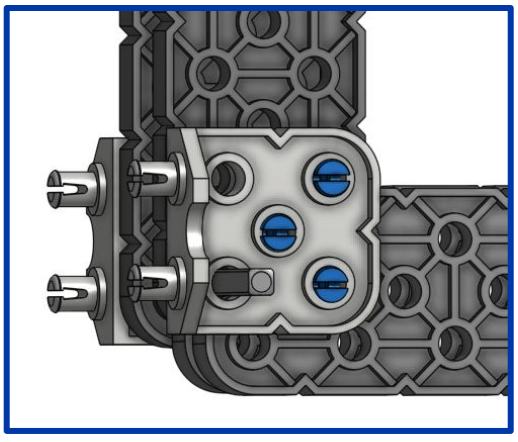

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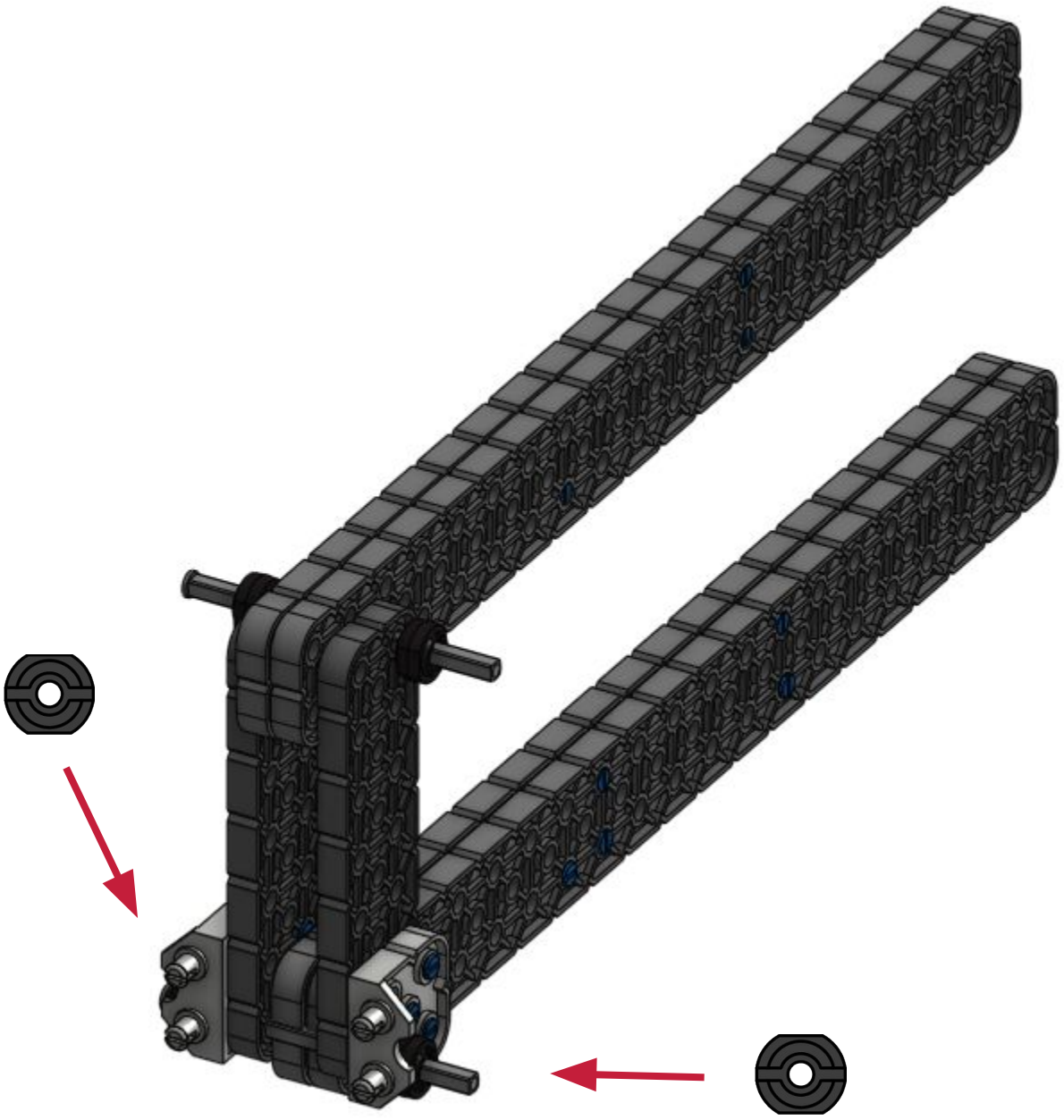
Parts List:

x2 



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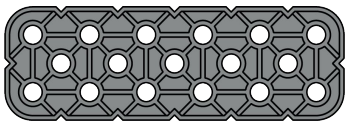
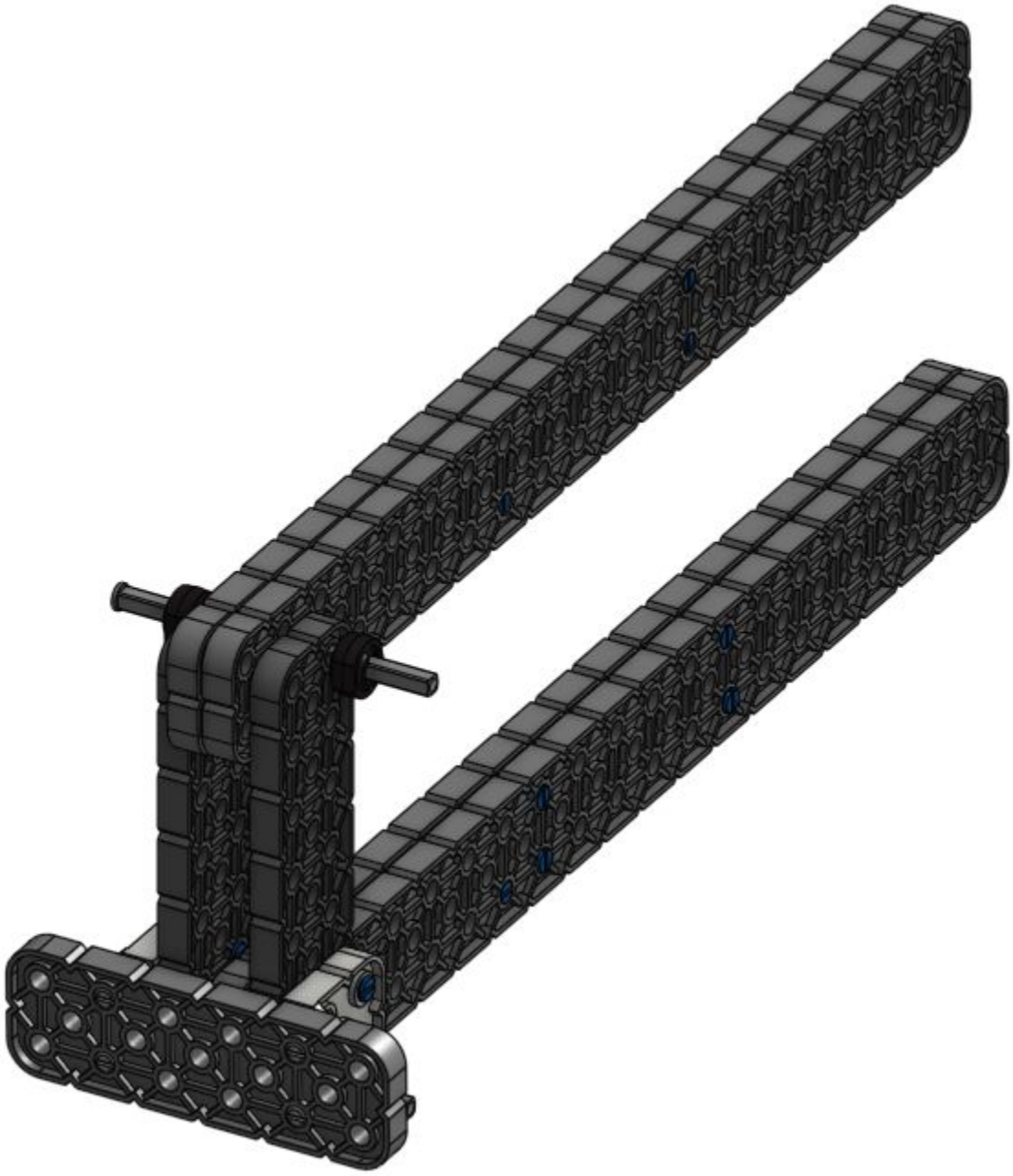
x1 

2x6 beam



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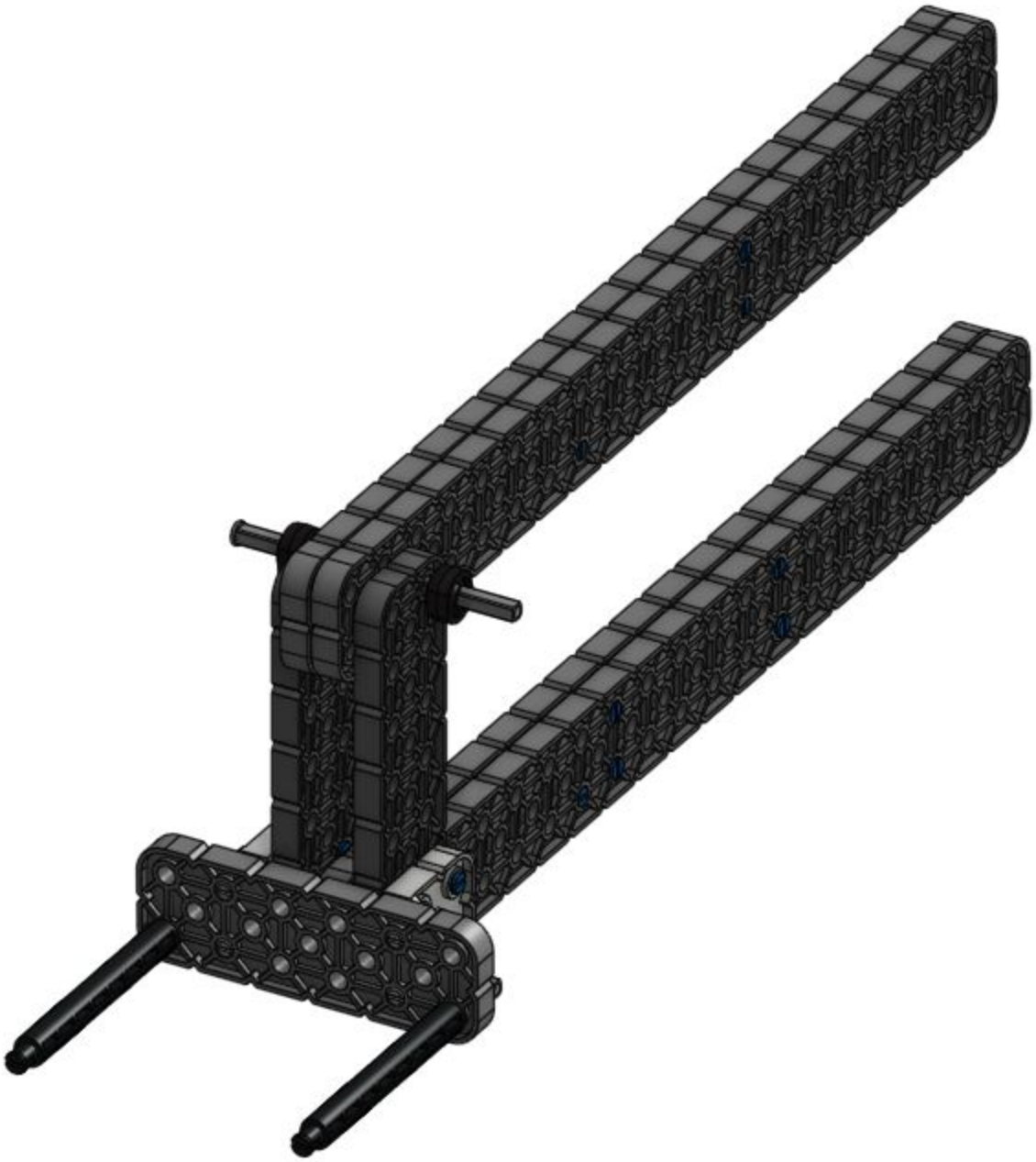
13

Parts List:

x2 



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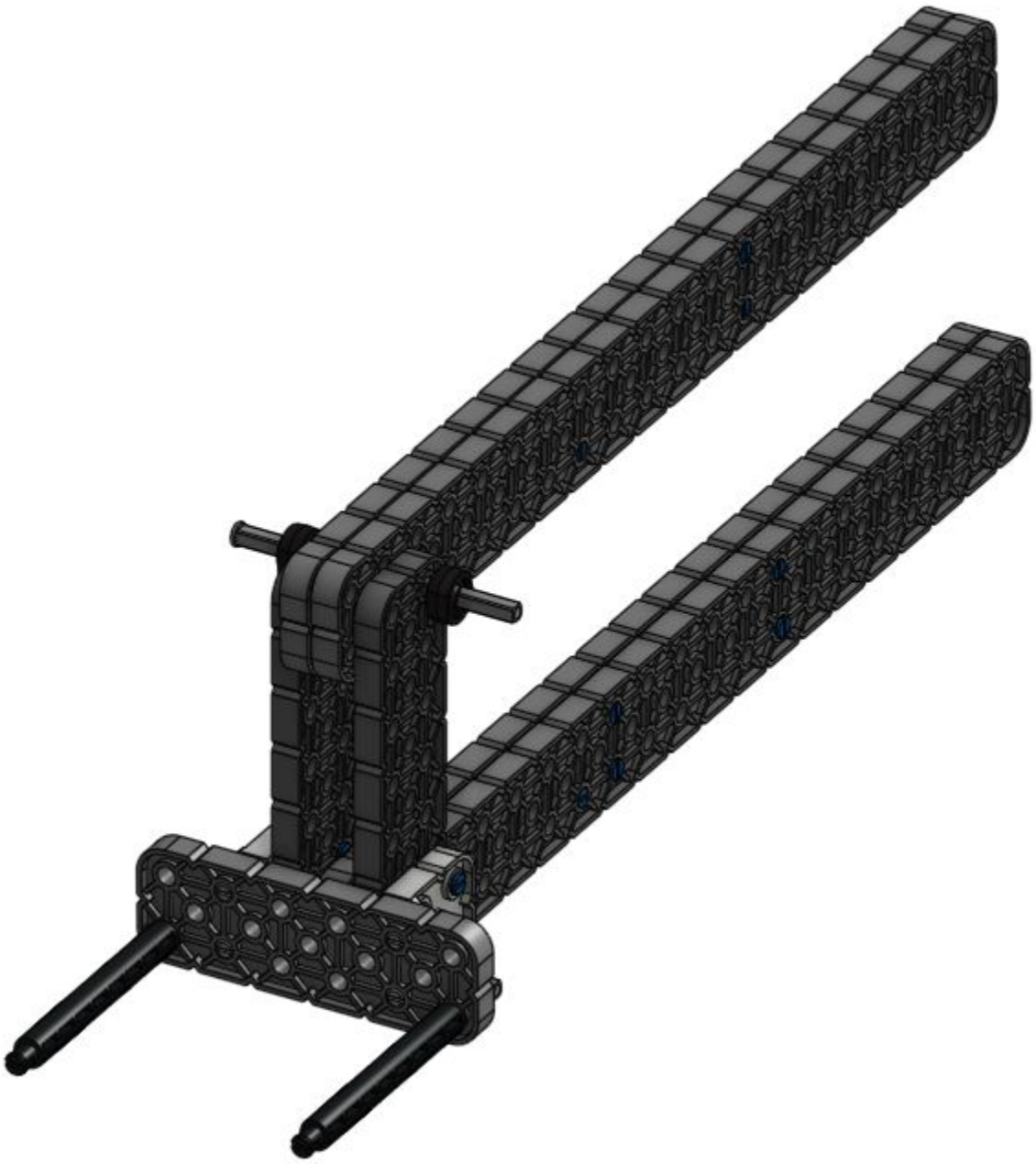

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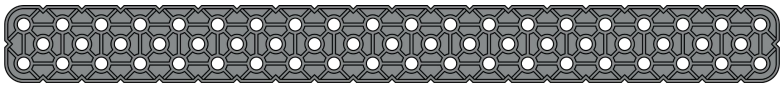
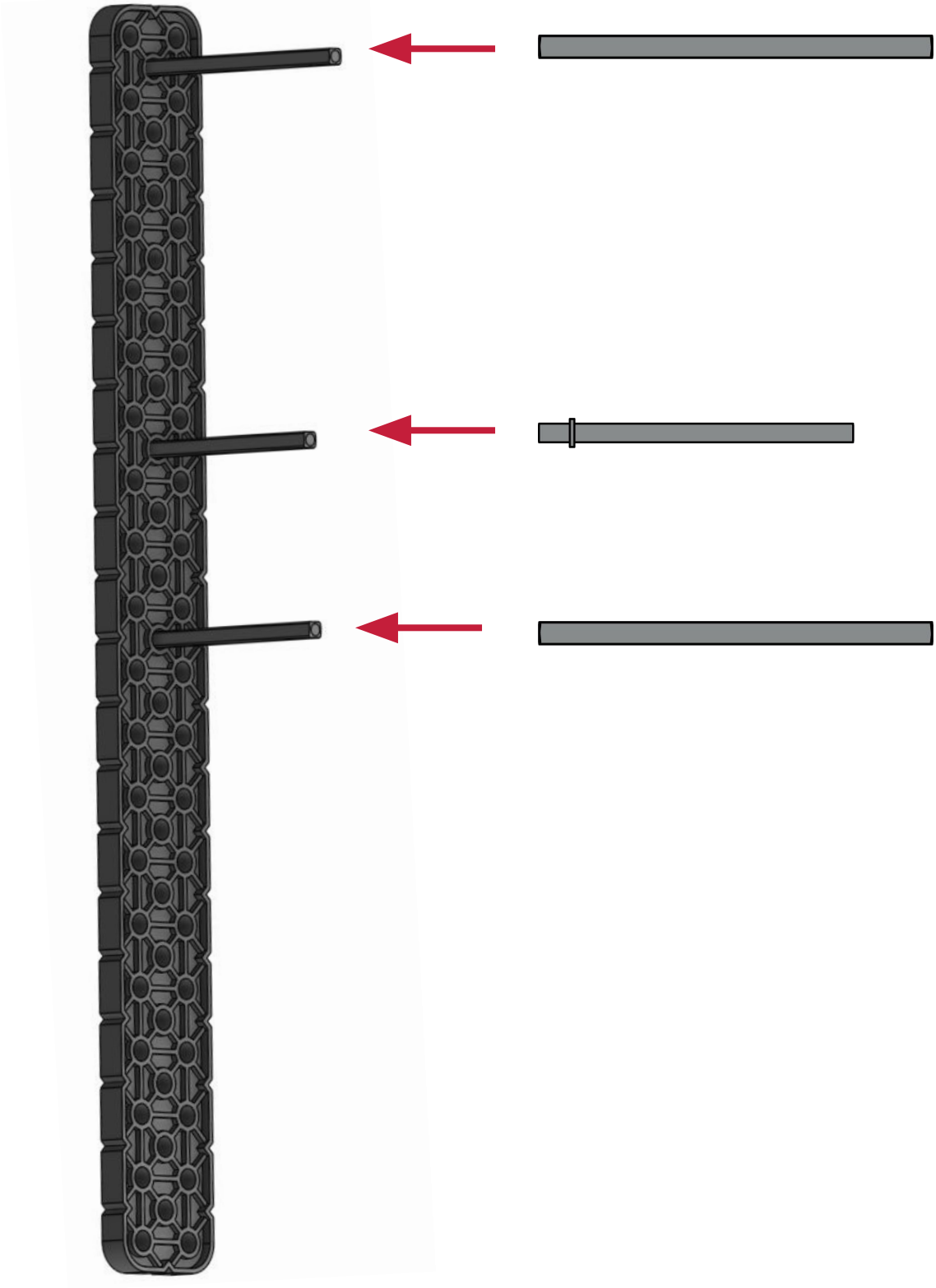
x1 

2x20 beam

x1 

x2 



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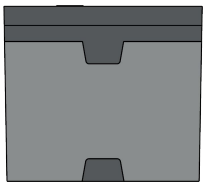
Parts List:

x8 

x1 

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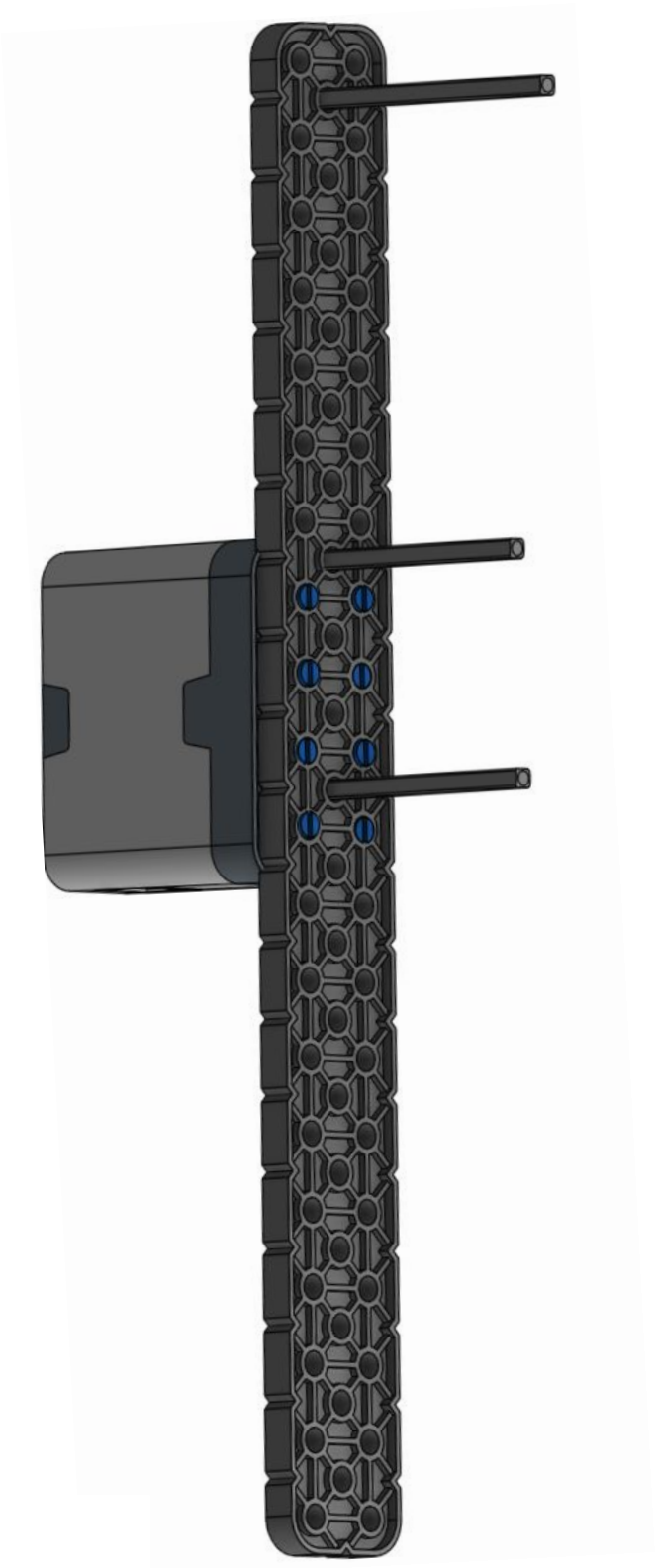

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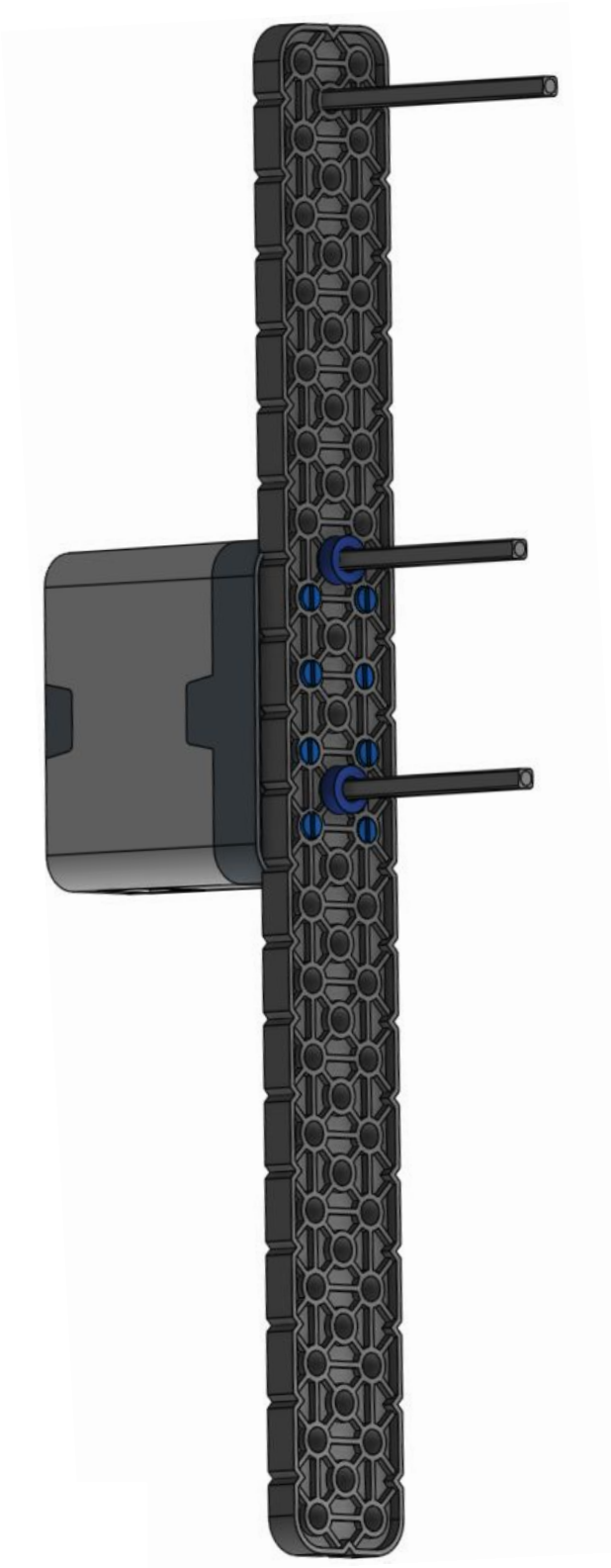
Parts List:

x2



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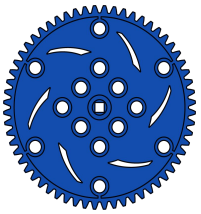
x1 

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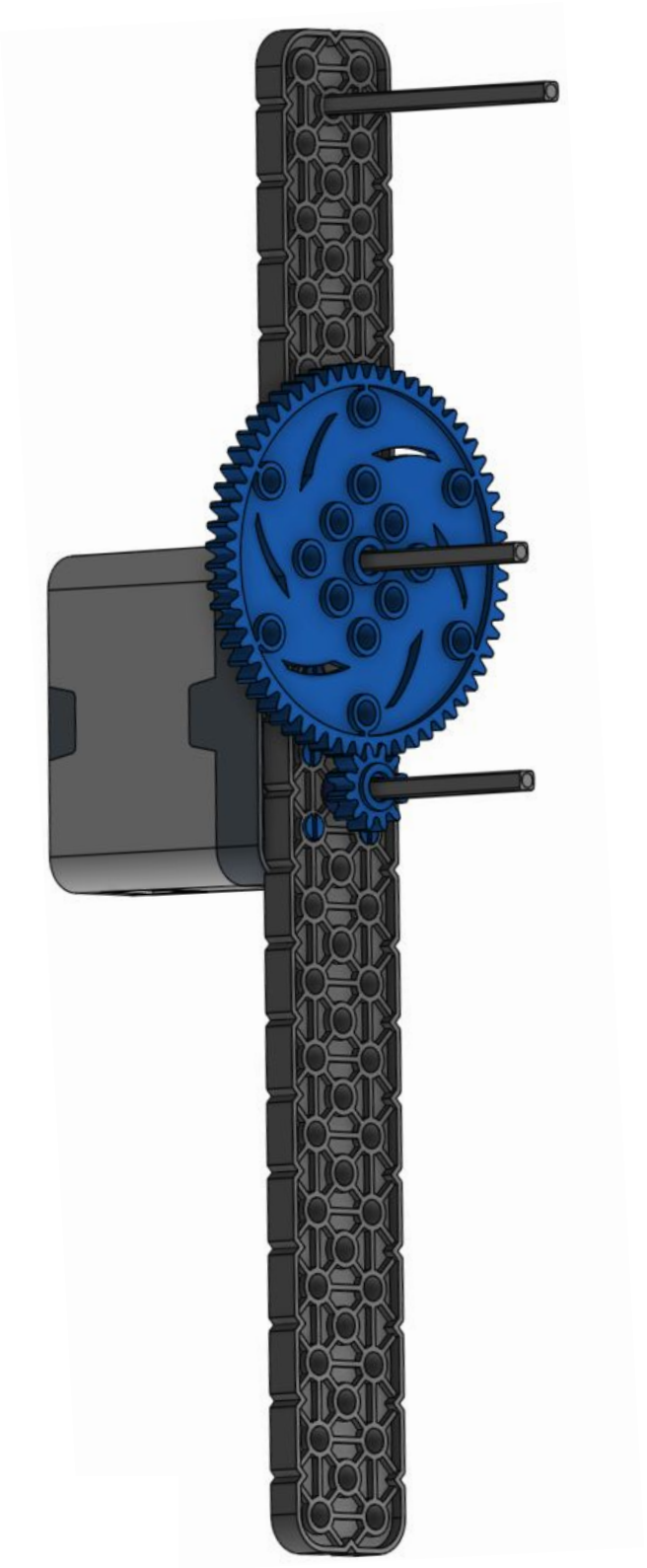

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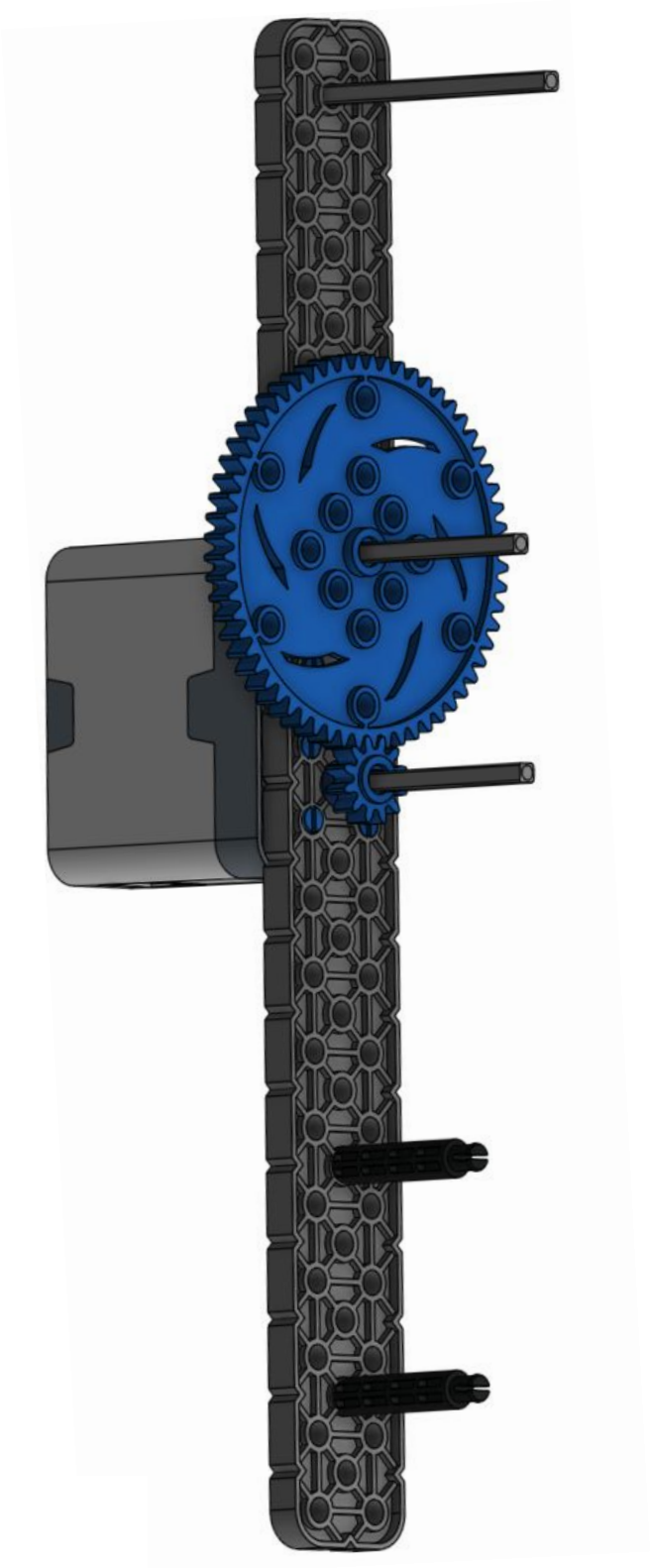
Parts List:

x2 



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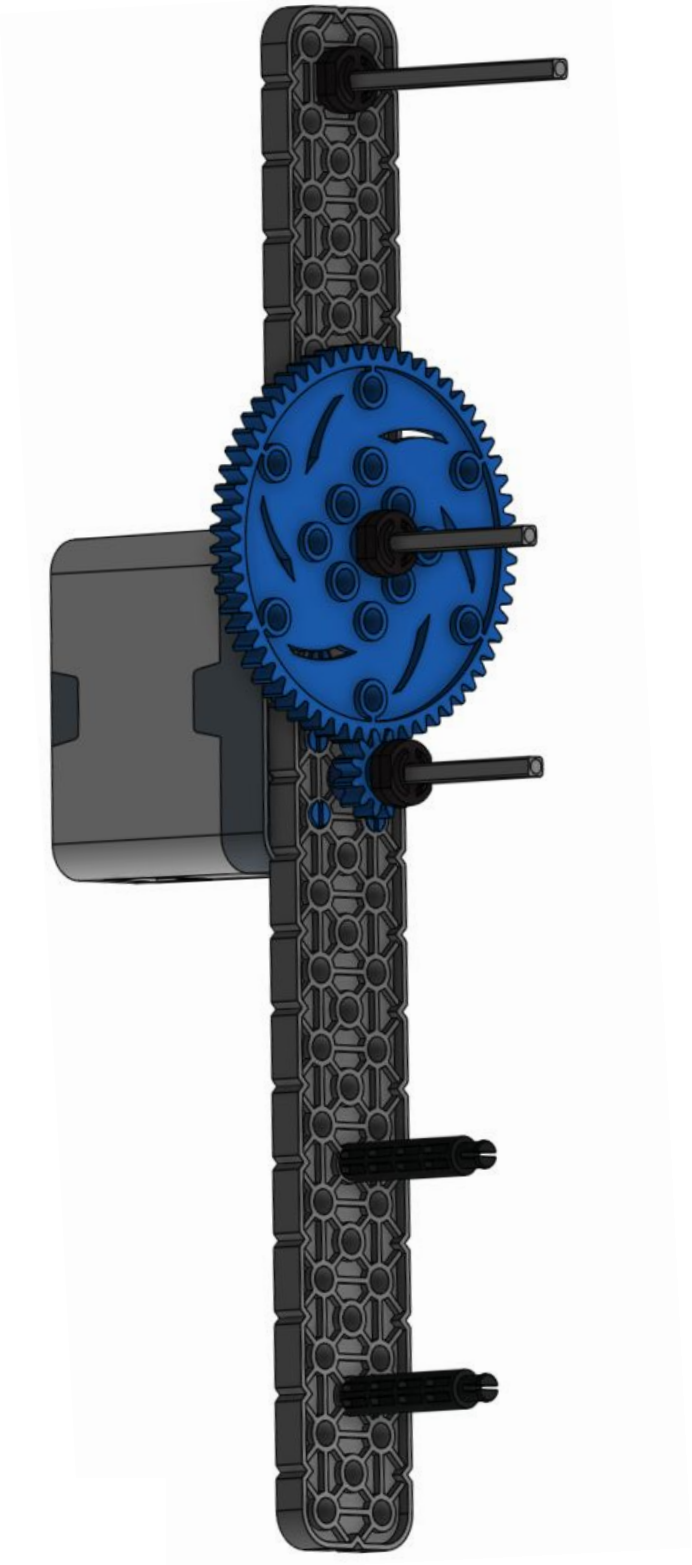

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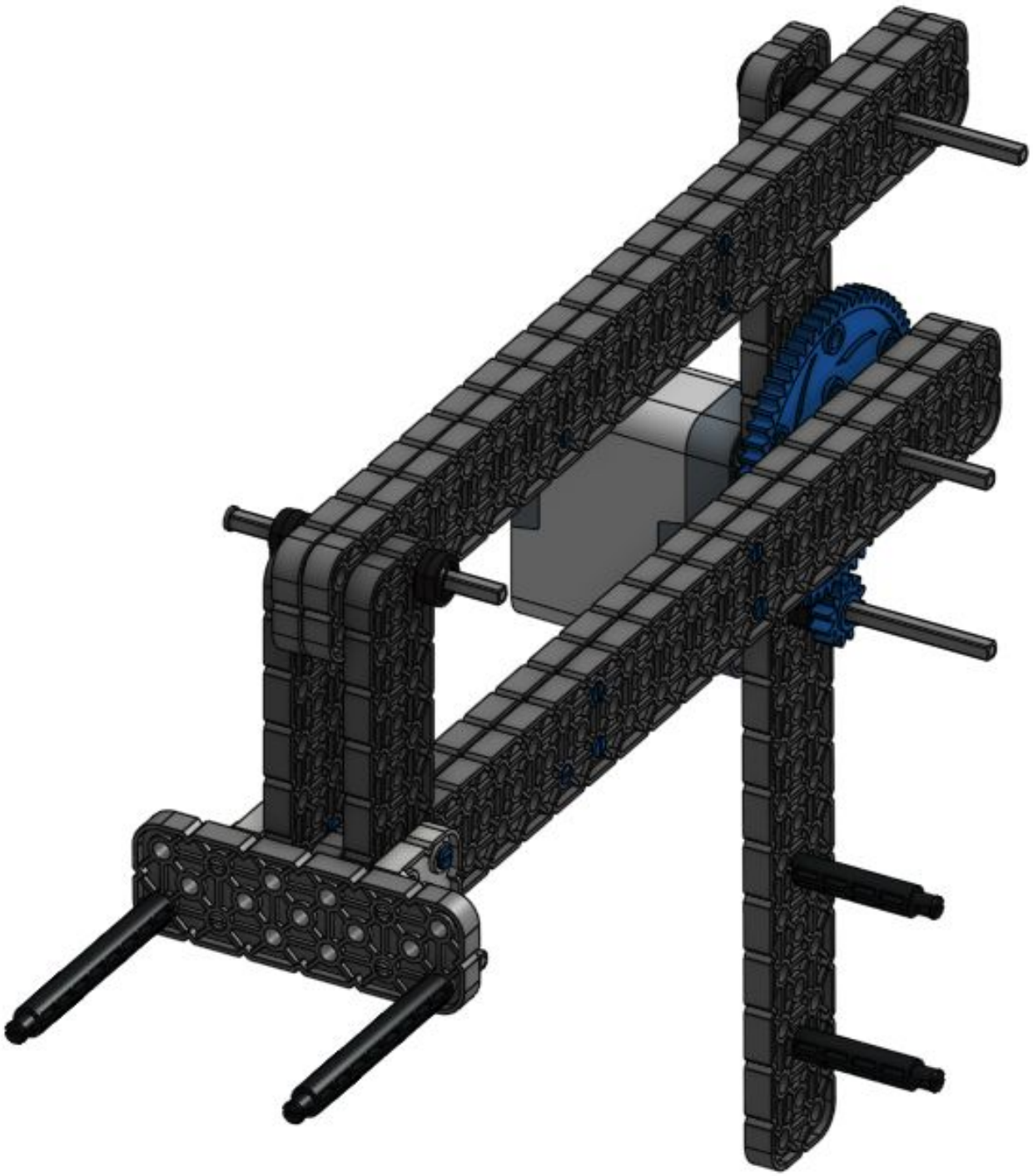

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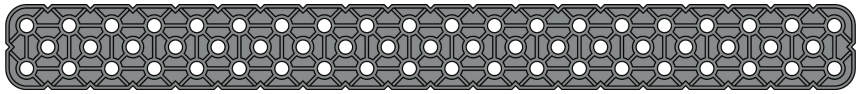
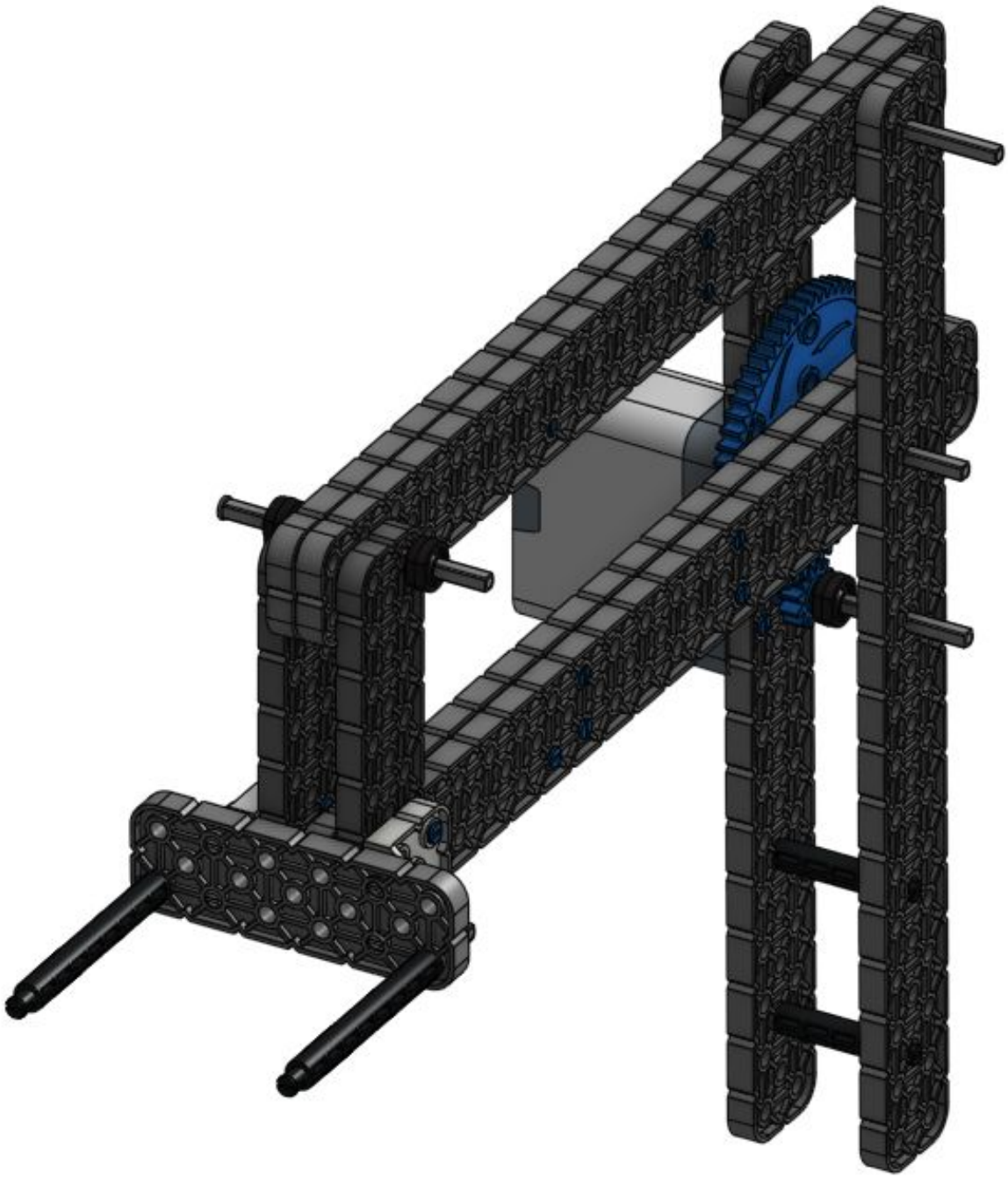


x1 *2x20 beam*



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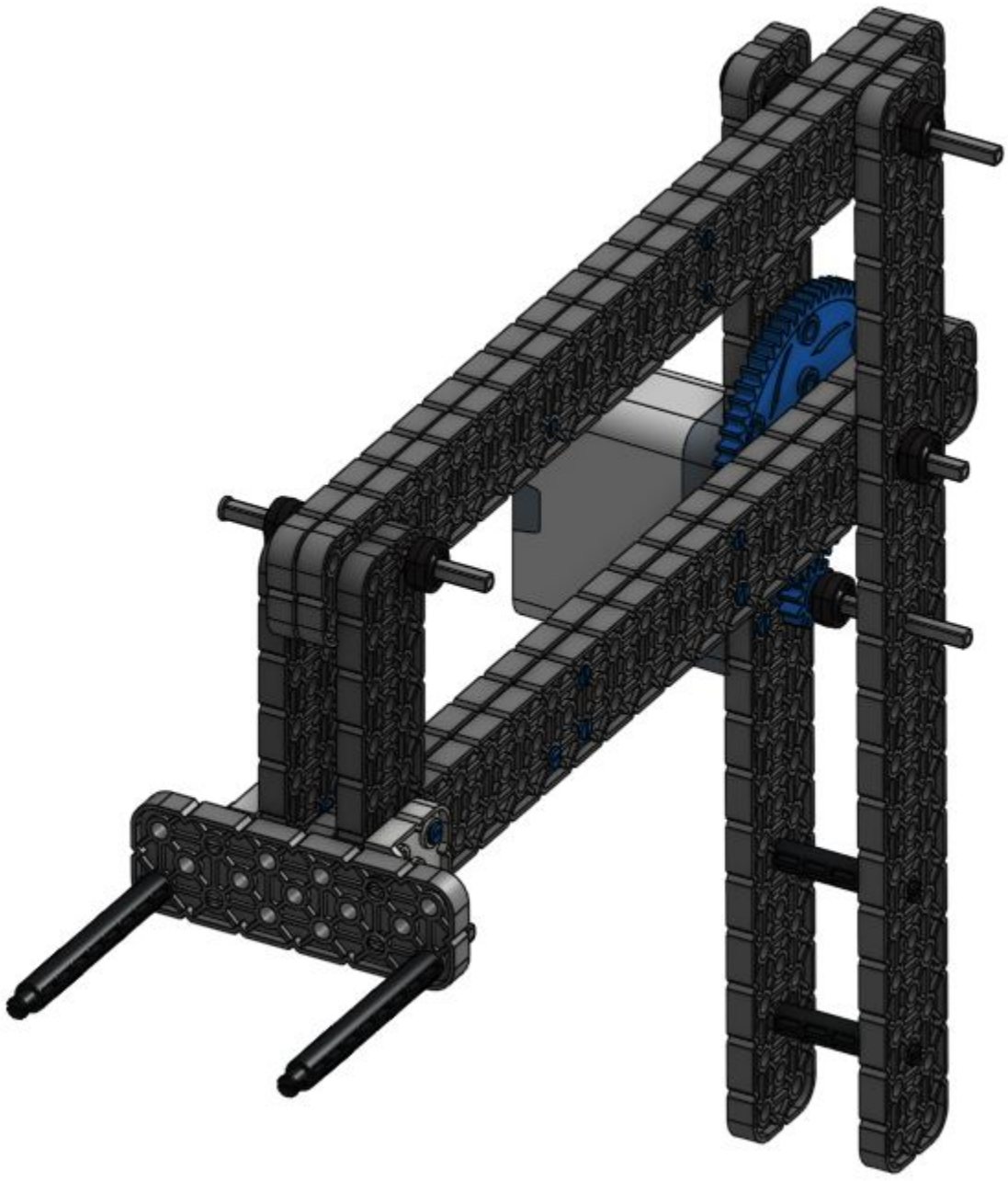
Parts List:

x2 



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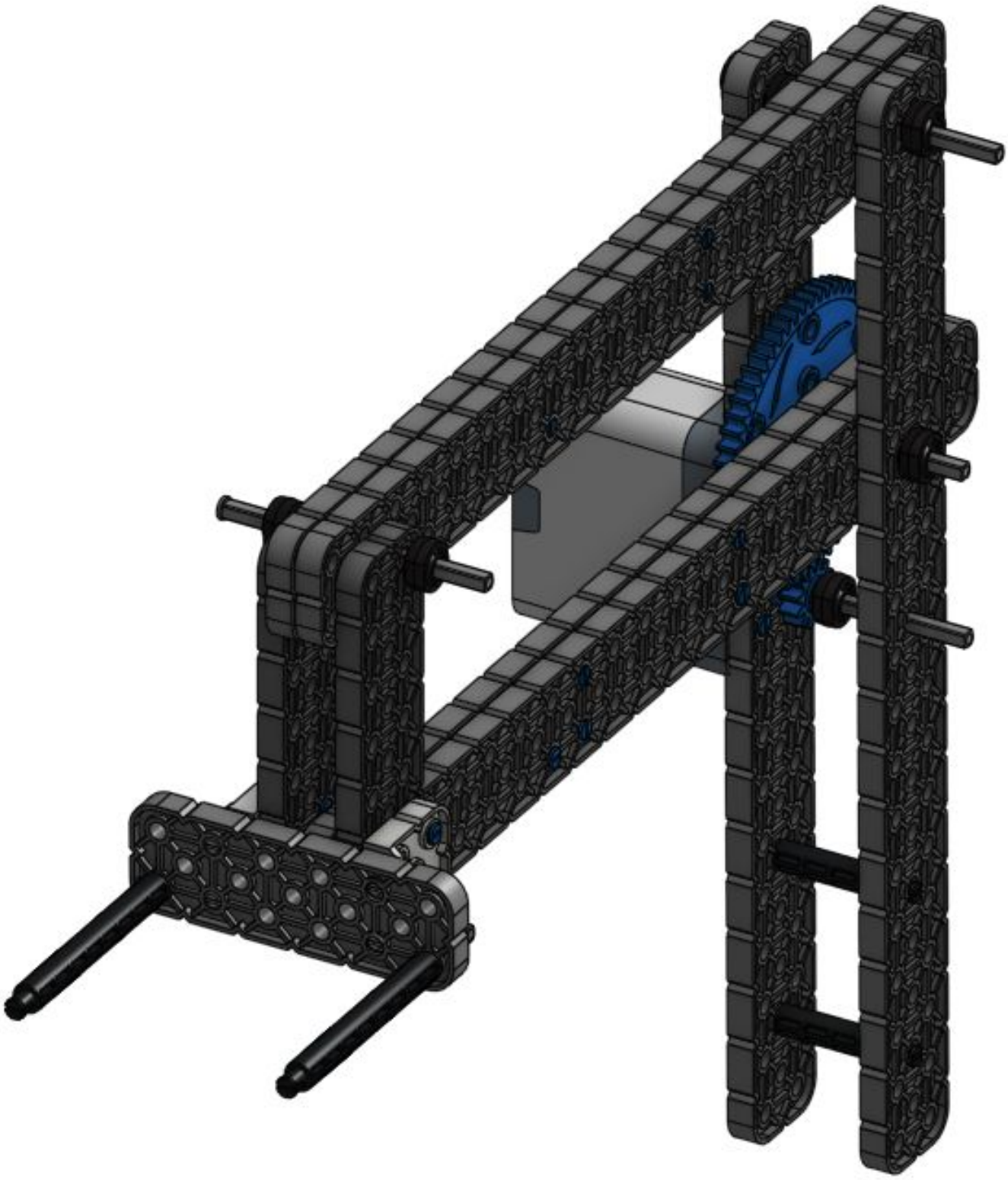

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