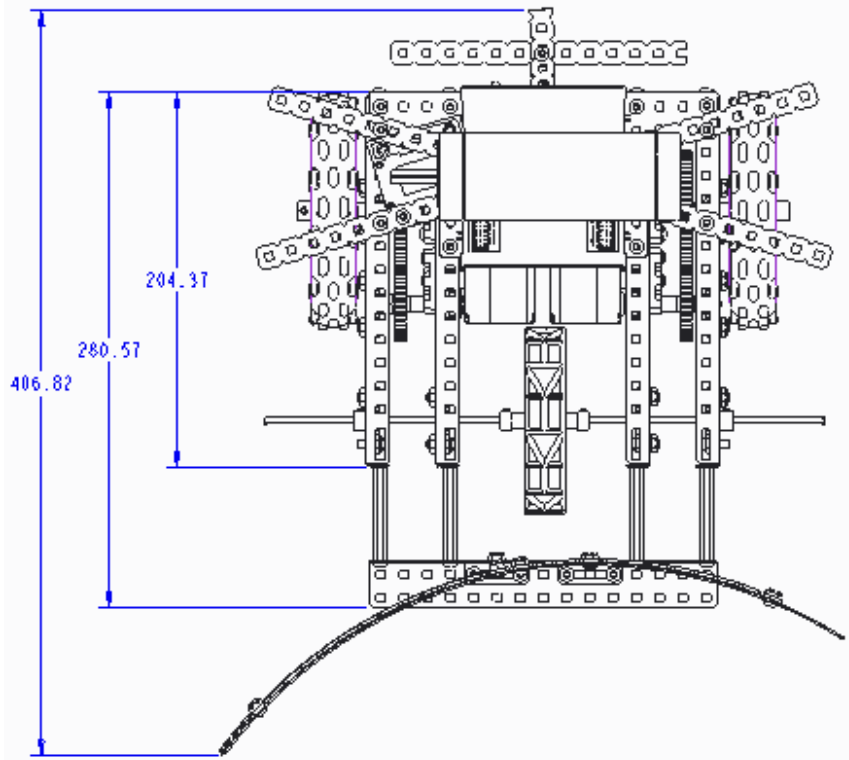
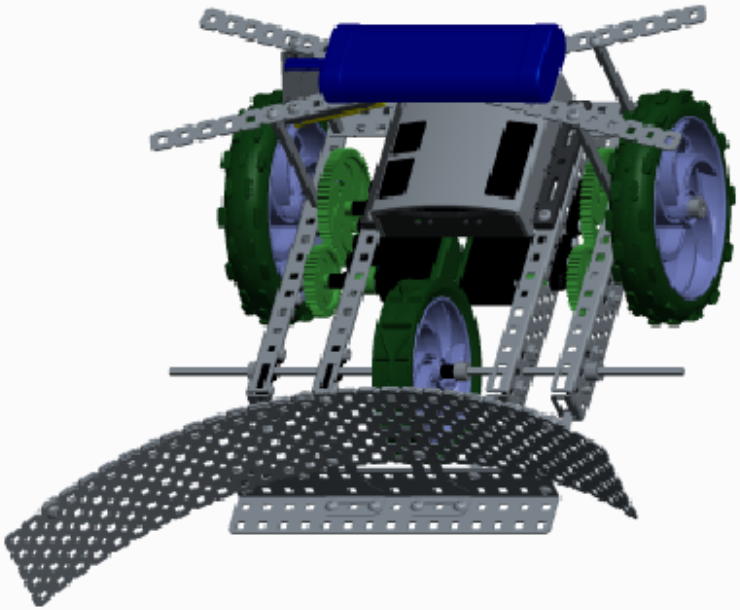
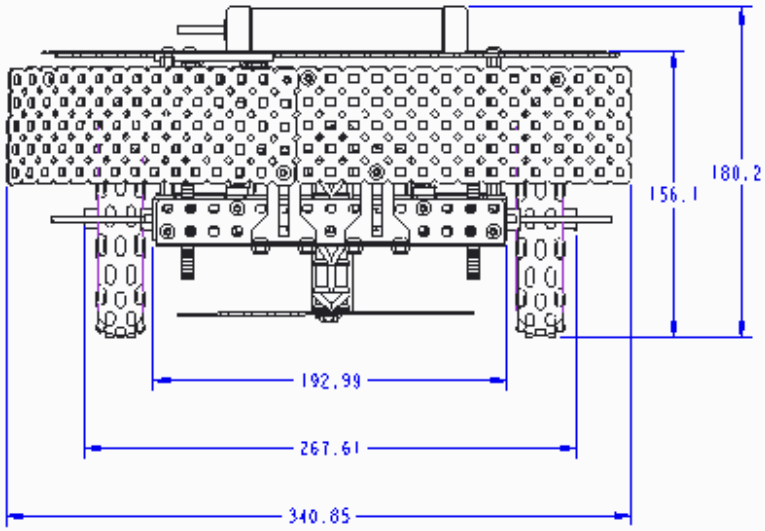
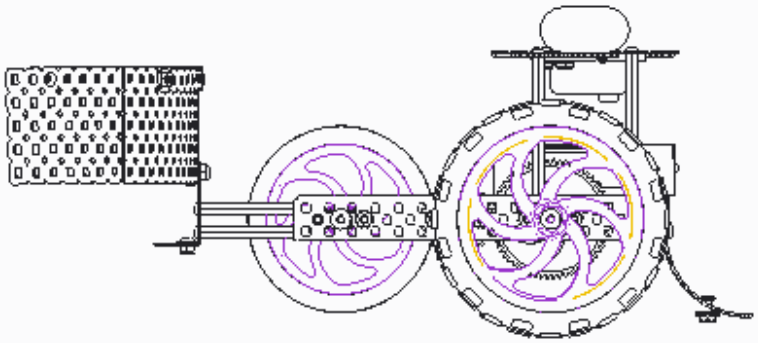
3.0 Design Documentation

3.1 Remote Control Robot Dimensions

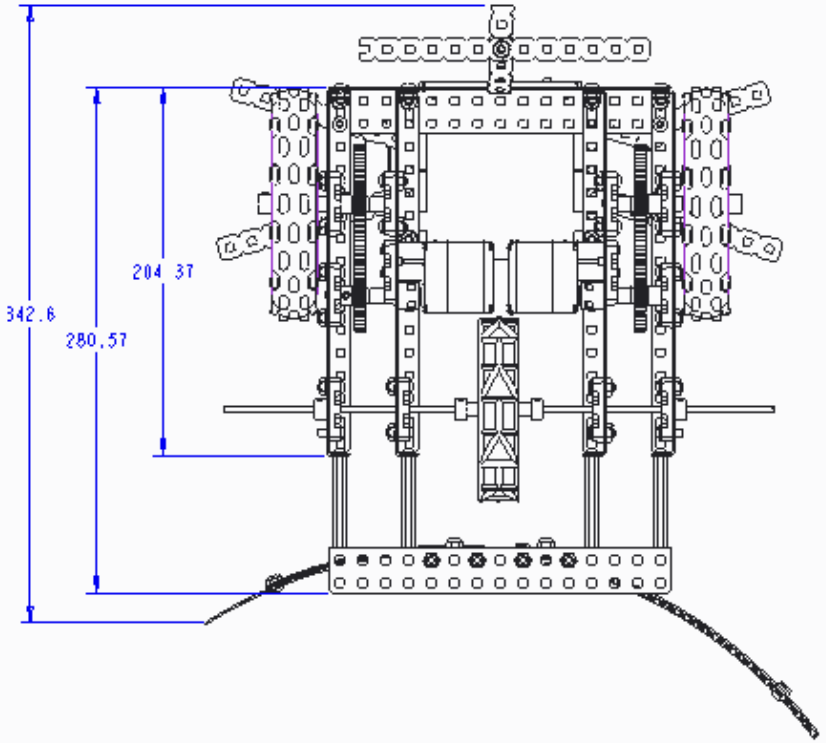


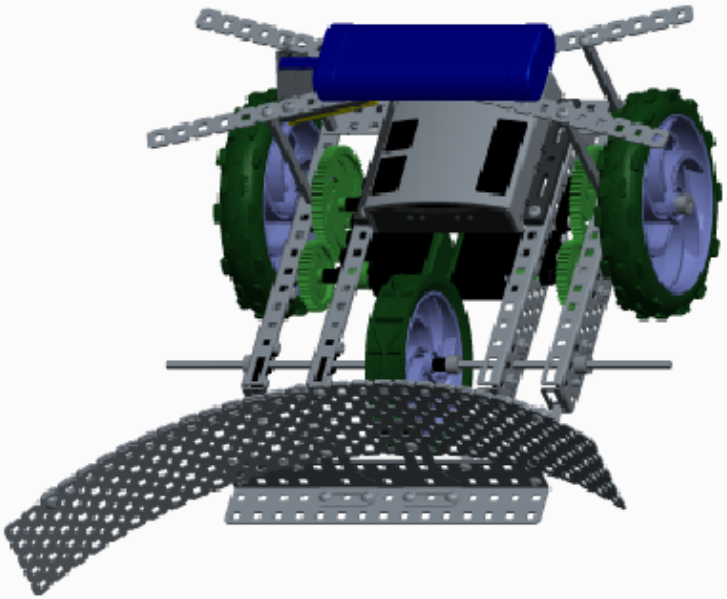


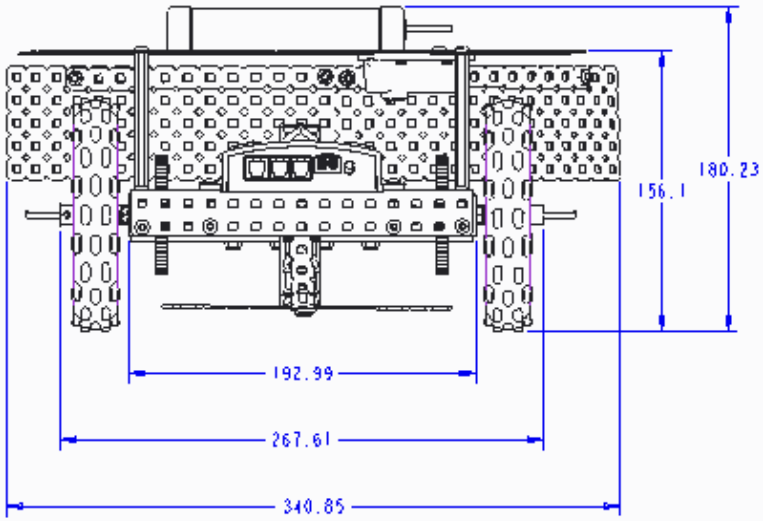


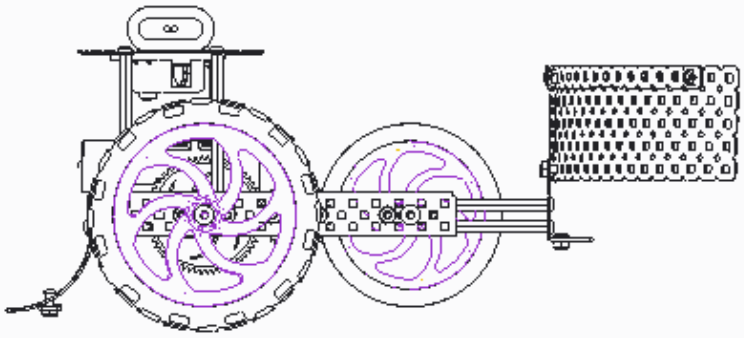


3.1 Remote Control Robot Dimensions

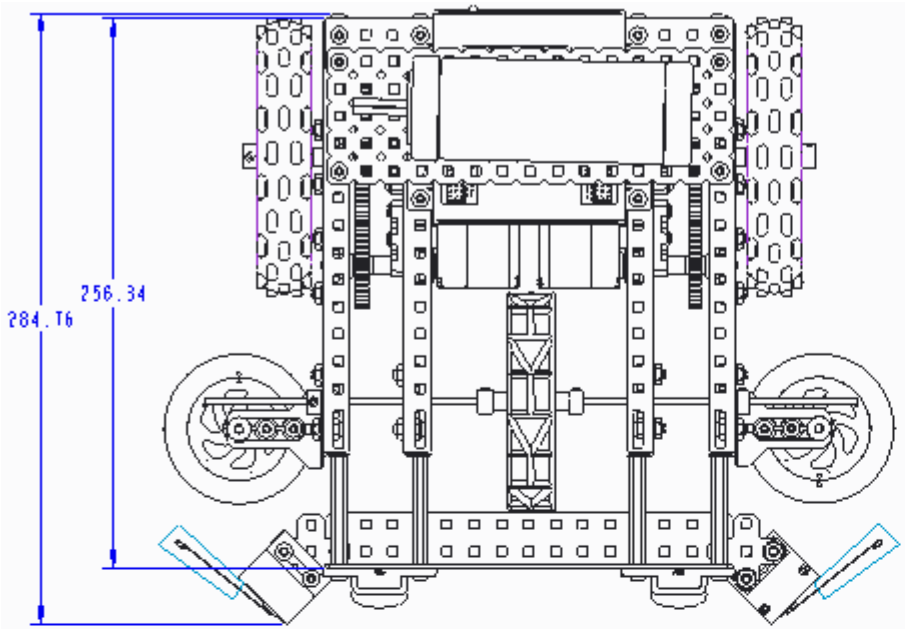


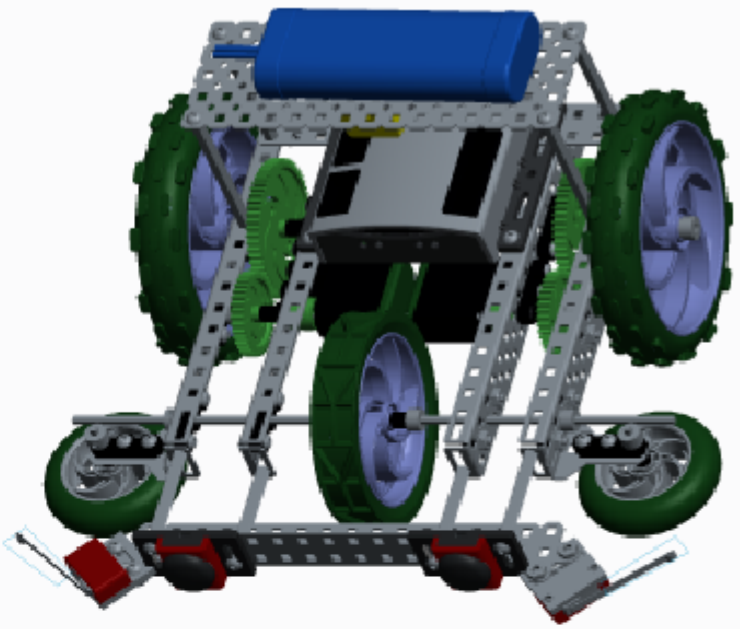


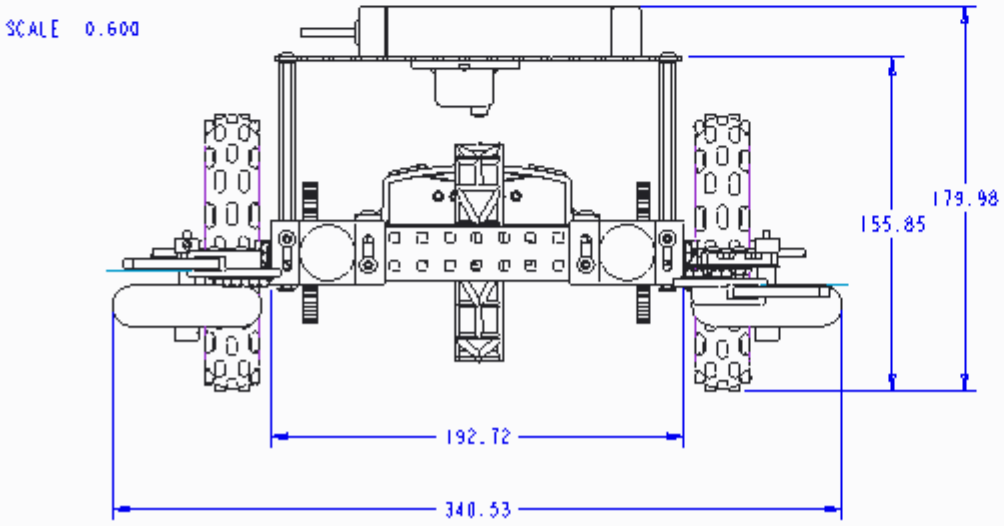


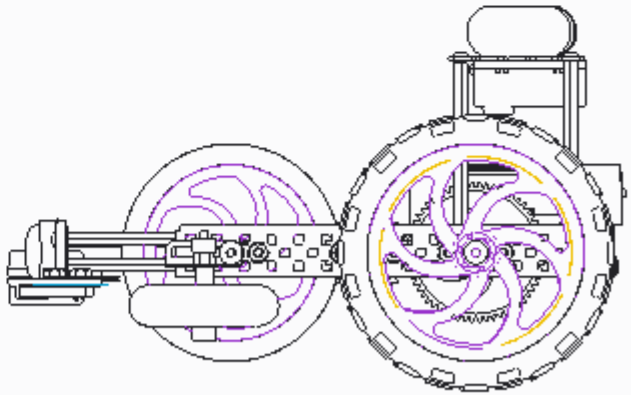


3.2 Autonomous Robot Dimensions

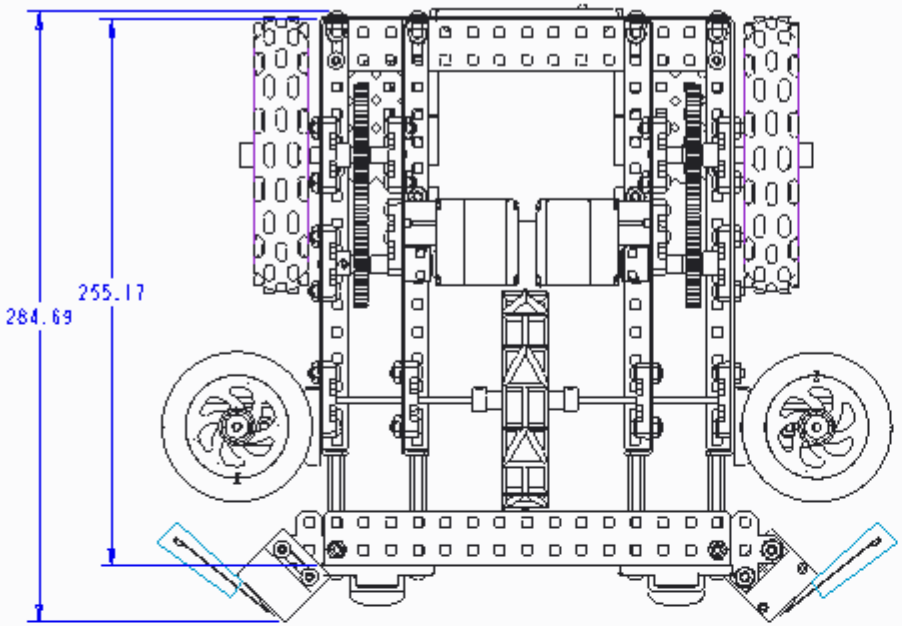


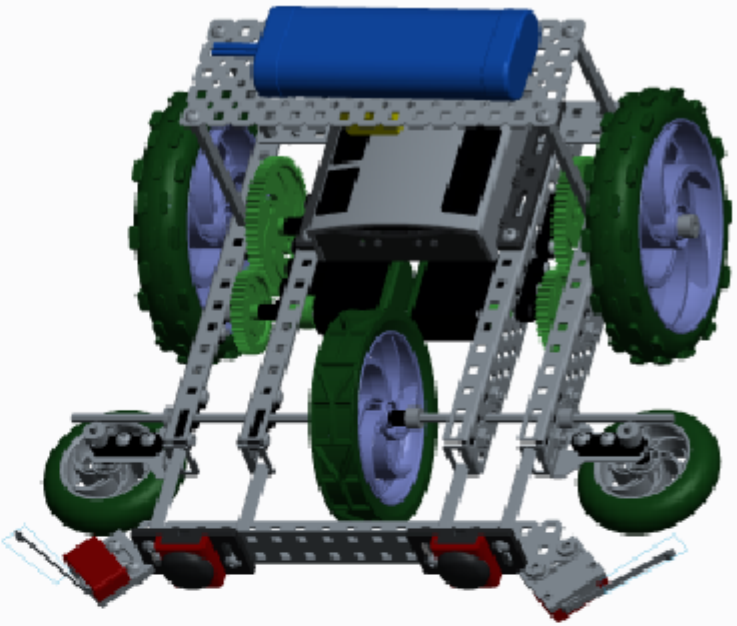


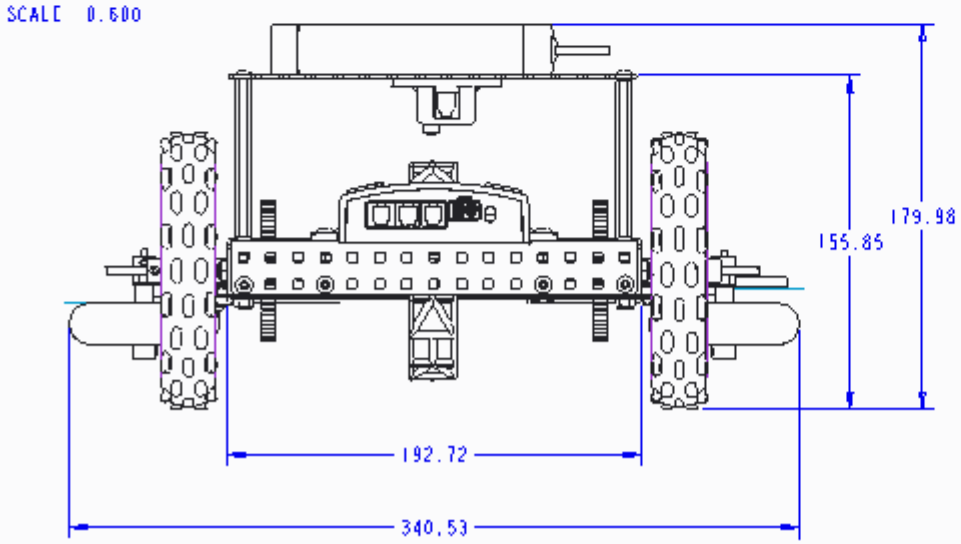


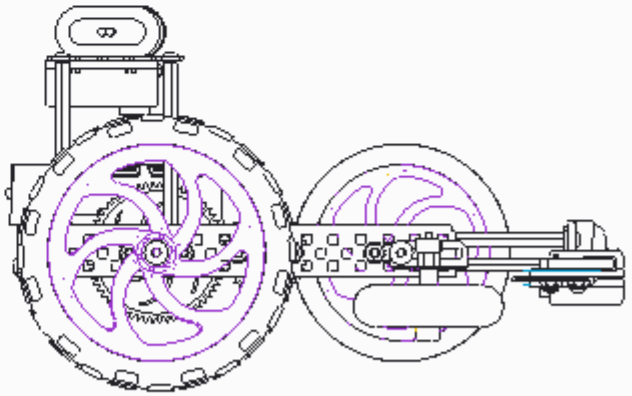


3.2 Autonomous Robot Dimensions

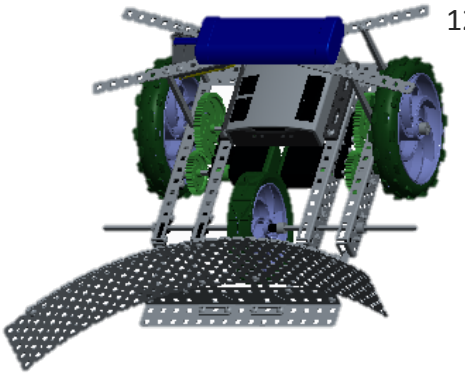




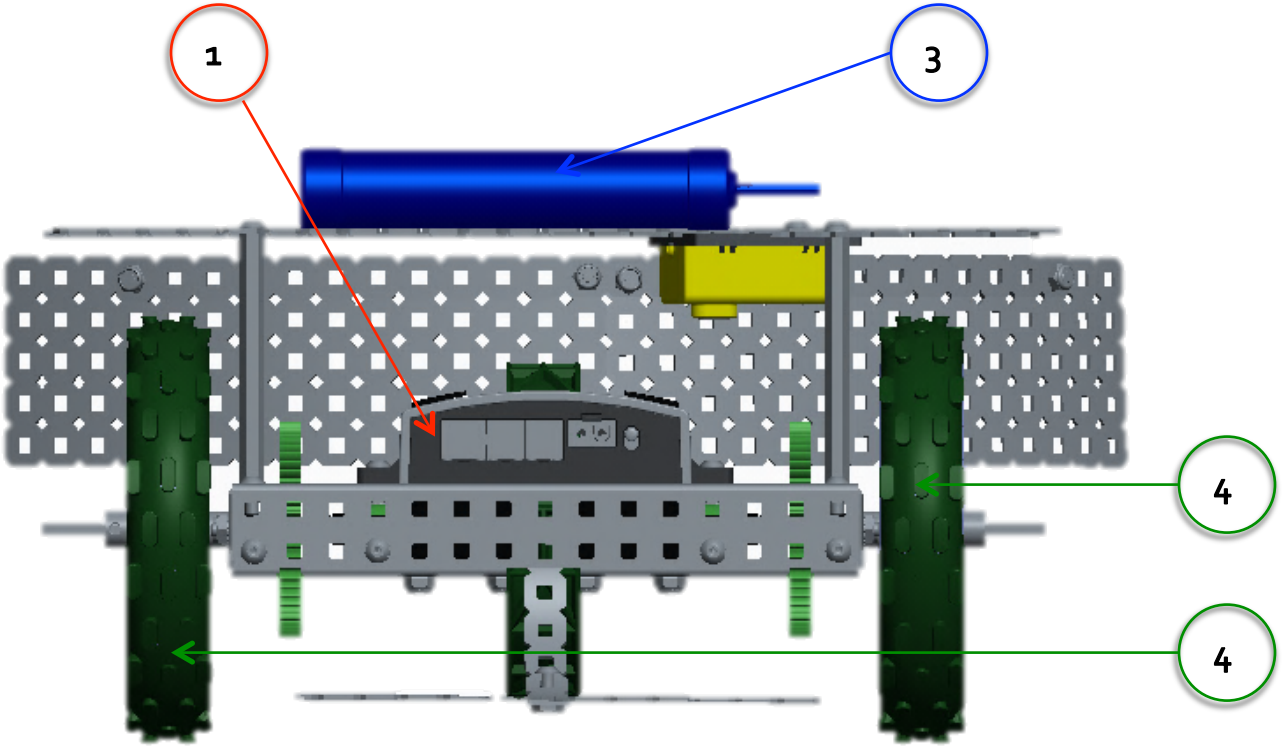




3.3 Remote Control Robot BOM

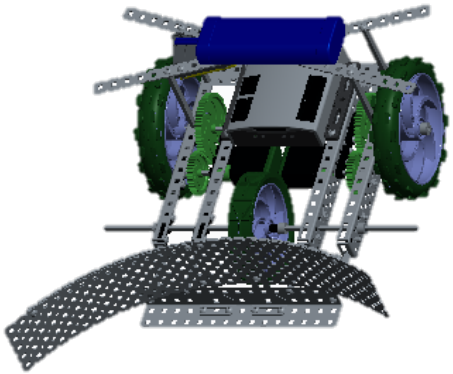


Item Number	Part	Description	Quantity
1	Microcontroller module	Allows for remote and autonomous functions	1
2	Motor controller	Not shown; used to connect the two-wire motors to the three-pinned slots on microcontroller module	2
3	Rechargeable batteries	Provides robot with electrical power	1
4	Large wheels (131 mm Dia)	Used for better traction	2

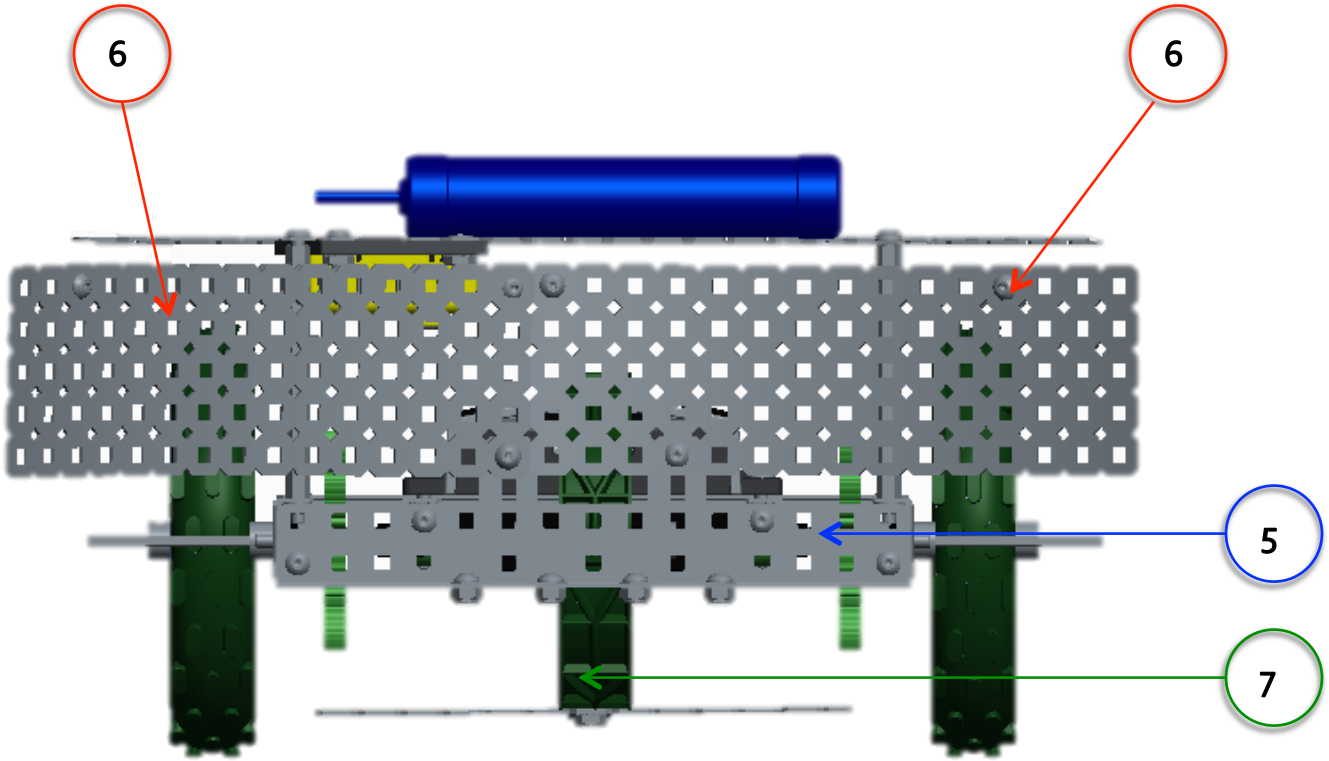


Rear View

3.3 Remote Control Robot BOM



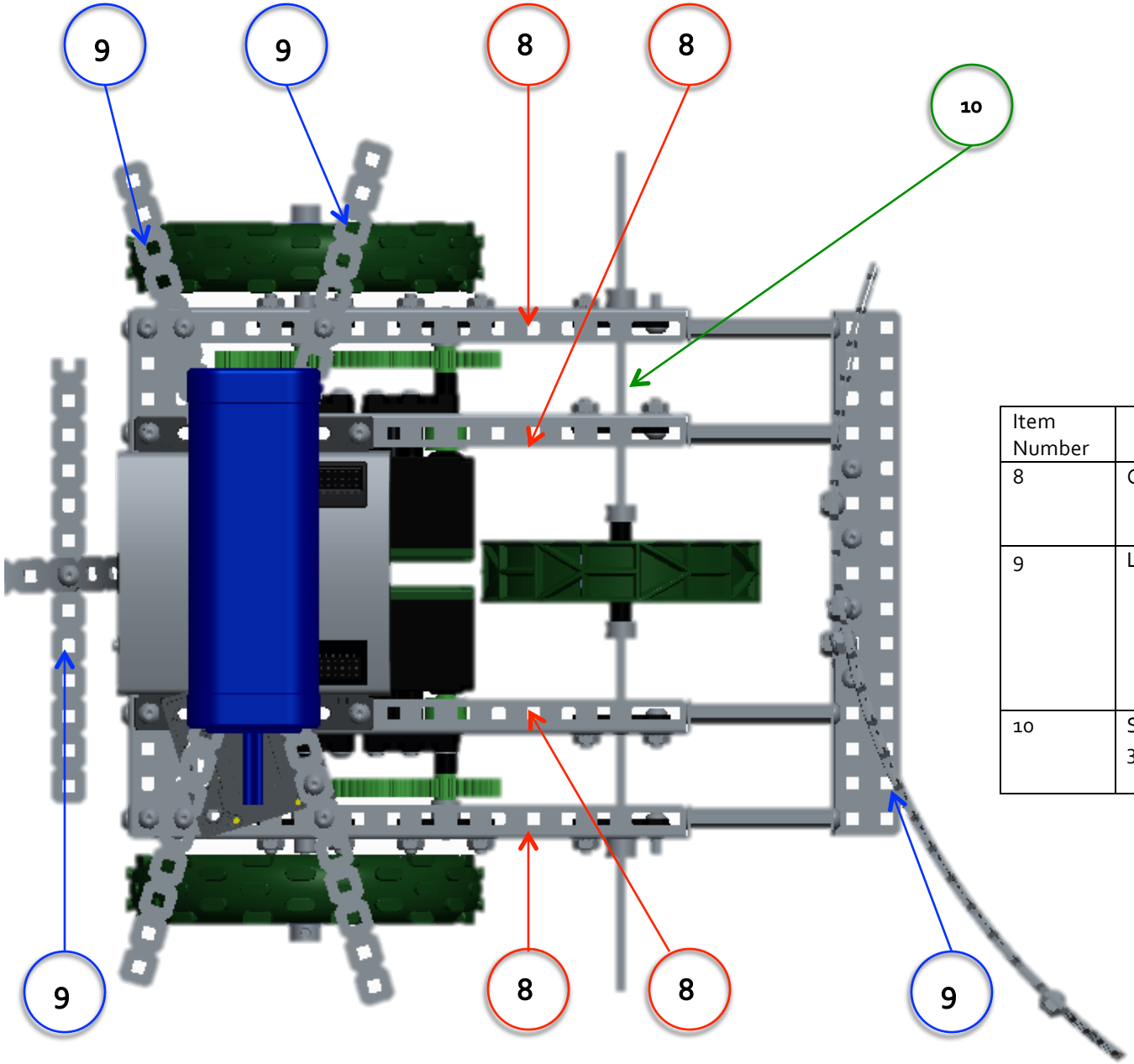
Item Number	Part	Description	Quantity
5	Chassis bumper (angle)	Component of the robot frame	2
6	Chassis panel (plate)	Component of the front arm	2
7	Medium wheels (103 mm Dia)	Used for stability	1

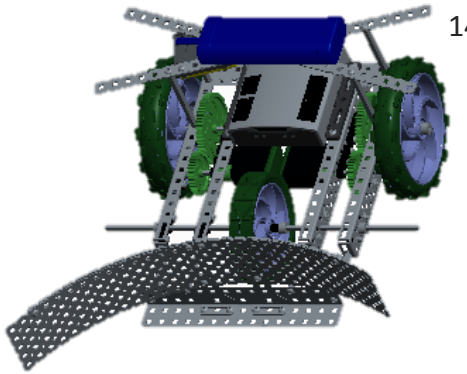


Front View

3.3 Remote Control Robot BOM

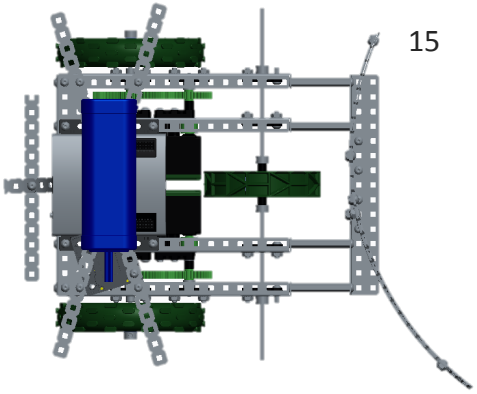
Top View



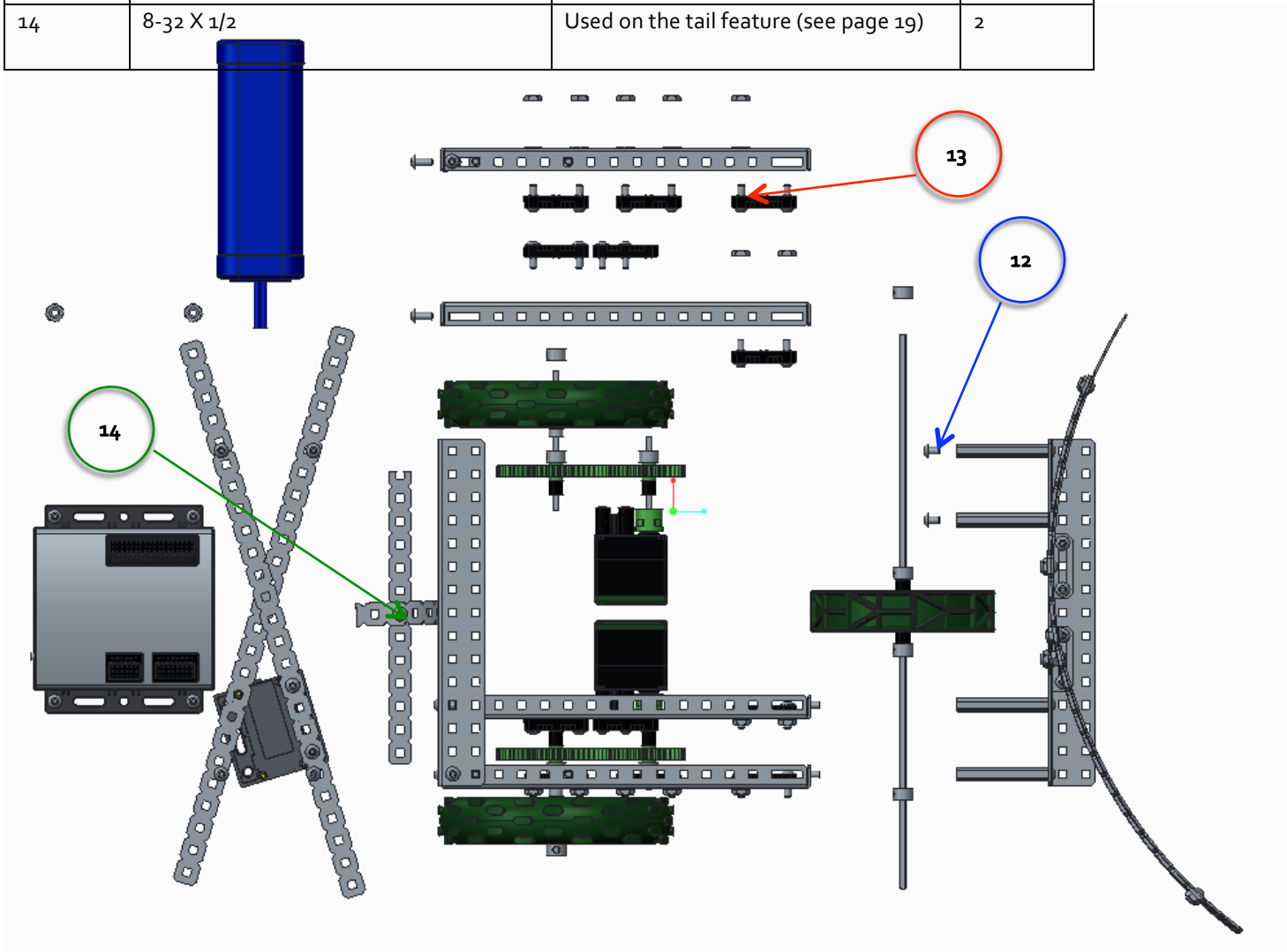


Item Number	Part	Description	Quantity
8	Chassis rail	Used to build the robot frame	4
9	Long bar	Tail is composed one bar cut in half. Front arm is held by a long bar.	4
10	Square shaft (1/8") X 300 mm	Holds the third wheel in place	1

3.3 Remote Control Robot BOM

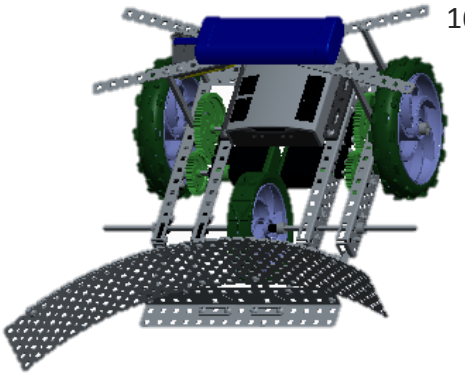


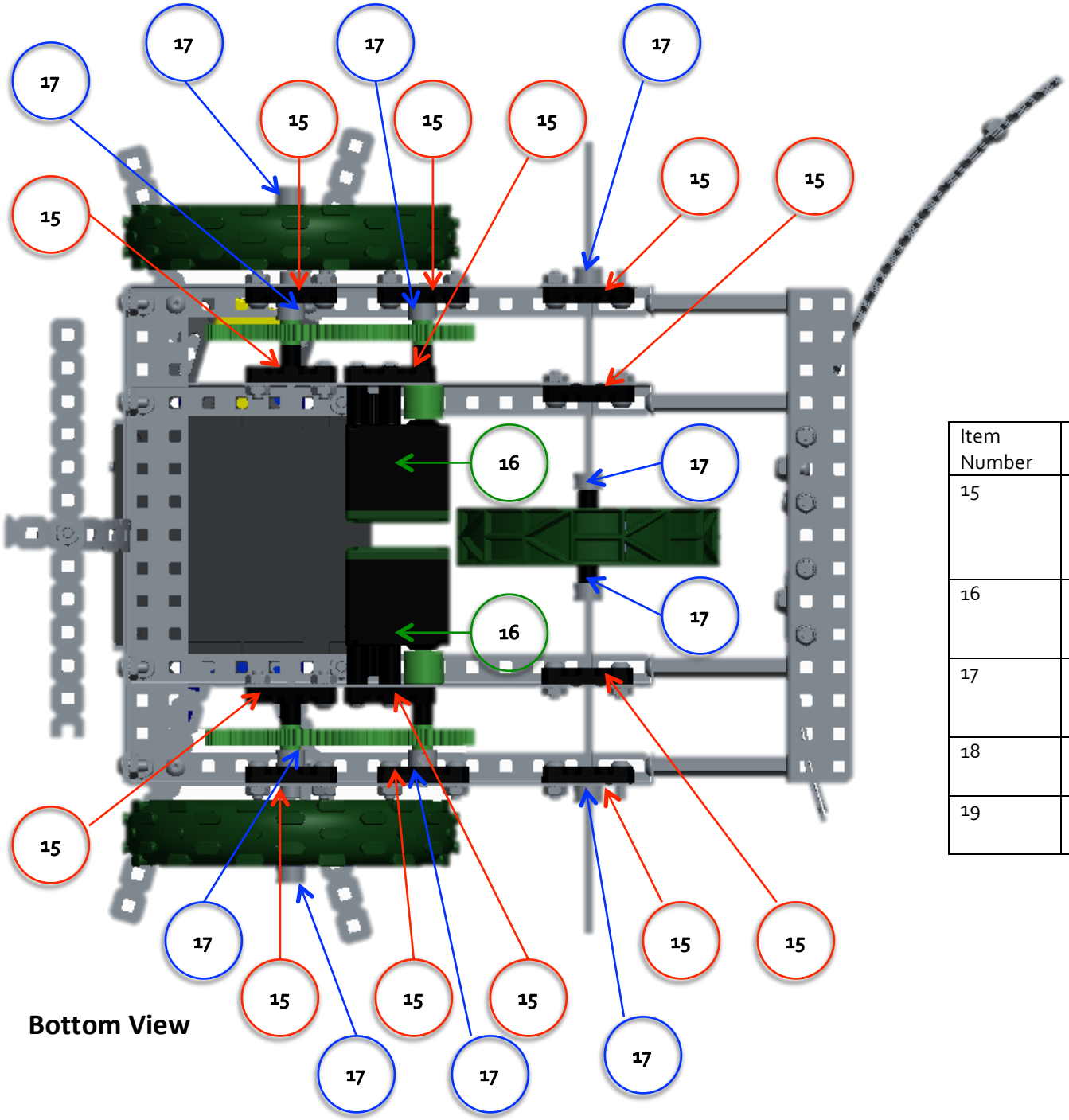
Item Number	Part (Hex sockets and button head screws)	Description	Quantity
11	6-32 X 1/2	Used to attach the motors to the rails (not visible)	4
12	8-32 X 1/4	Attaches the front arm base (chassis bumper) to the vex rails Holds the bumpers and rails together	15
13	8-32 X 3/8	Attaches the bearing blocks to the rails	36
14	8-32 X 1/2	Used on the tail feature (see page 19)	2



Top View (Exploded)

3.3 Remote Control Robot BOM



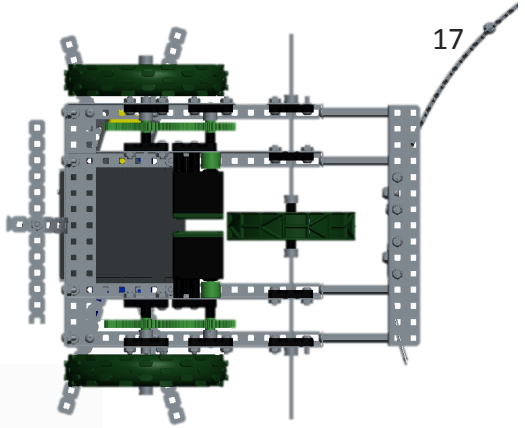


Bottom View

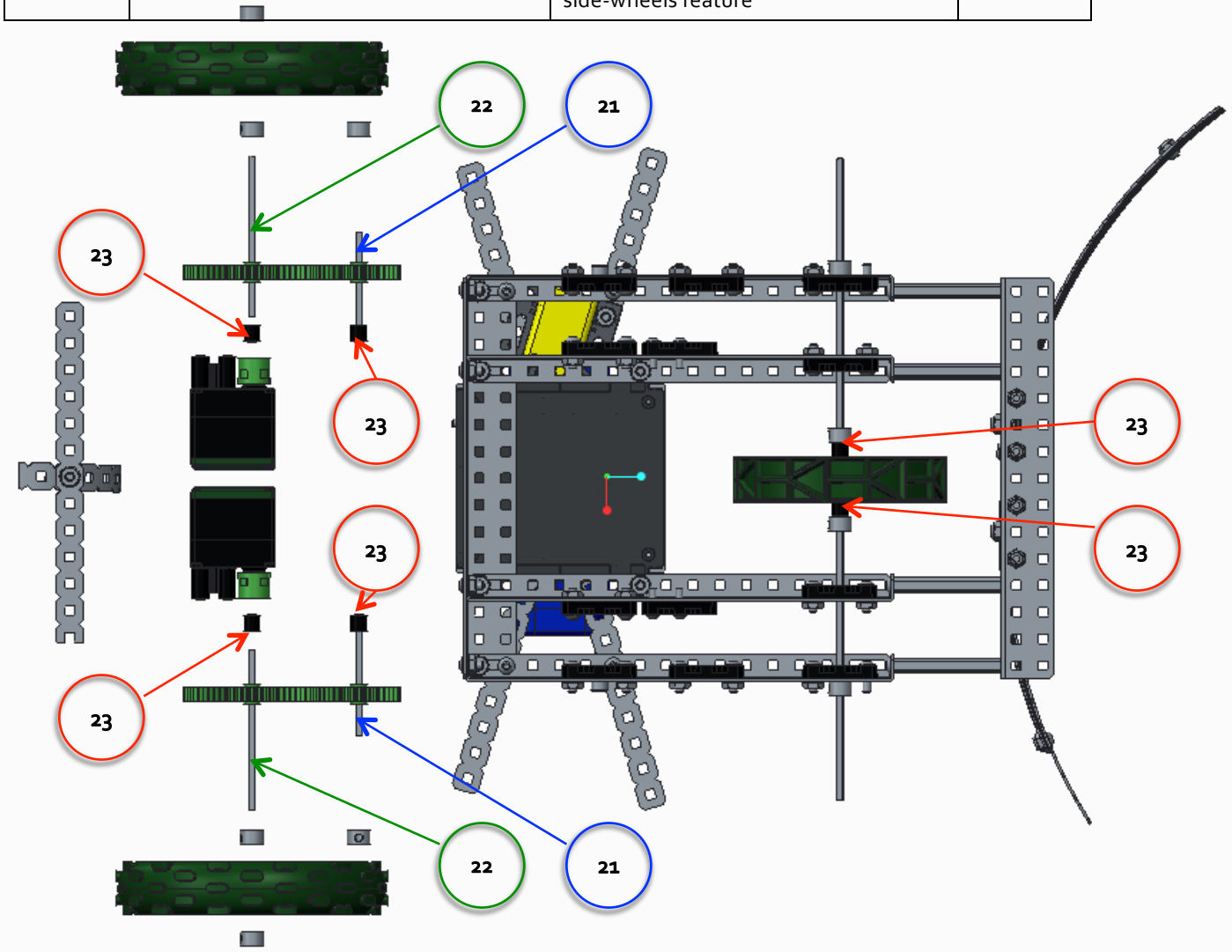
Item Number	Part	Description	Quantity
15	Bearing – flat, black, plastic	Two used on autonomous side-wheel feature	14
16	Motor module (with torque limiter)	Needed to rotate the gears	2
17	Shaft collars	Four used on autonomous features	14
18	Flat washer, steel	Not shown	20
19	Flat washer, Delrin	Not shown	6

3.3 Remote Control Robot BOM

Item Number	Part	Description	Quantity
20	Square shaft (1/8") X 11 mm	Not shown (inside motor)	2
21	Square shaft (1/8") X 51 mm	Used for medium driving gears	2
22	Square shaft (1/8") X 76 mm	Used for large driven gears	2
23	Sleeves, black, plastic, OD8, ID4, 9L	Two (not shown) were used for the side-wheels feature	8

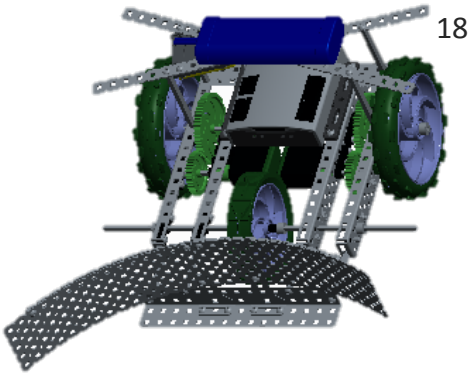


Bottom View

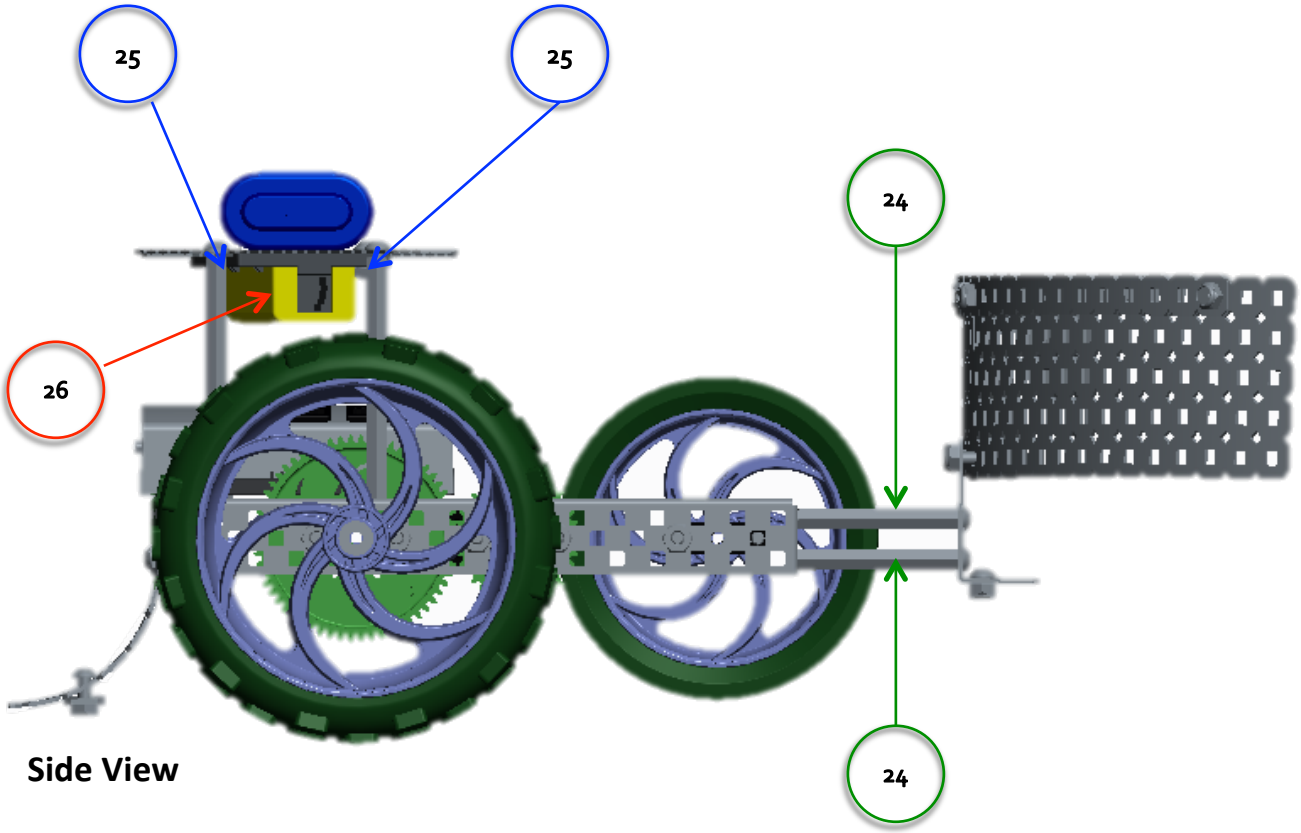


Bottom View (Exploded)

3.3 Remote Control Robot BOM



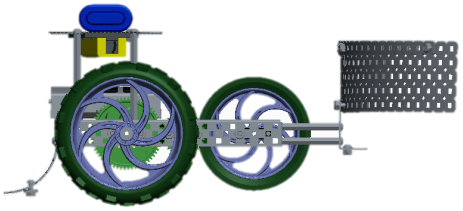
Item Number	Part	Description	Quantity
24	Hex standoff (1/4" A/F) X 50 mm	Used to hold the front arm (Two not visible)	4
25	Hex standoff (1/4" A/F) X 76 mm	Used to hold battery and receiver (Two not visible)	4
26	Receiver module	Receives signal from the transmitter	1



Side View

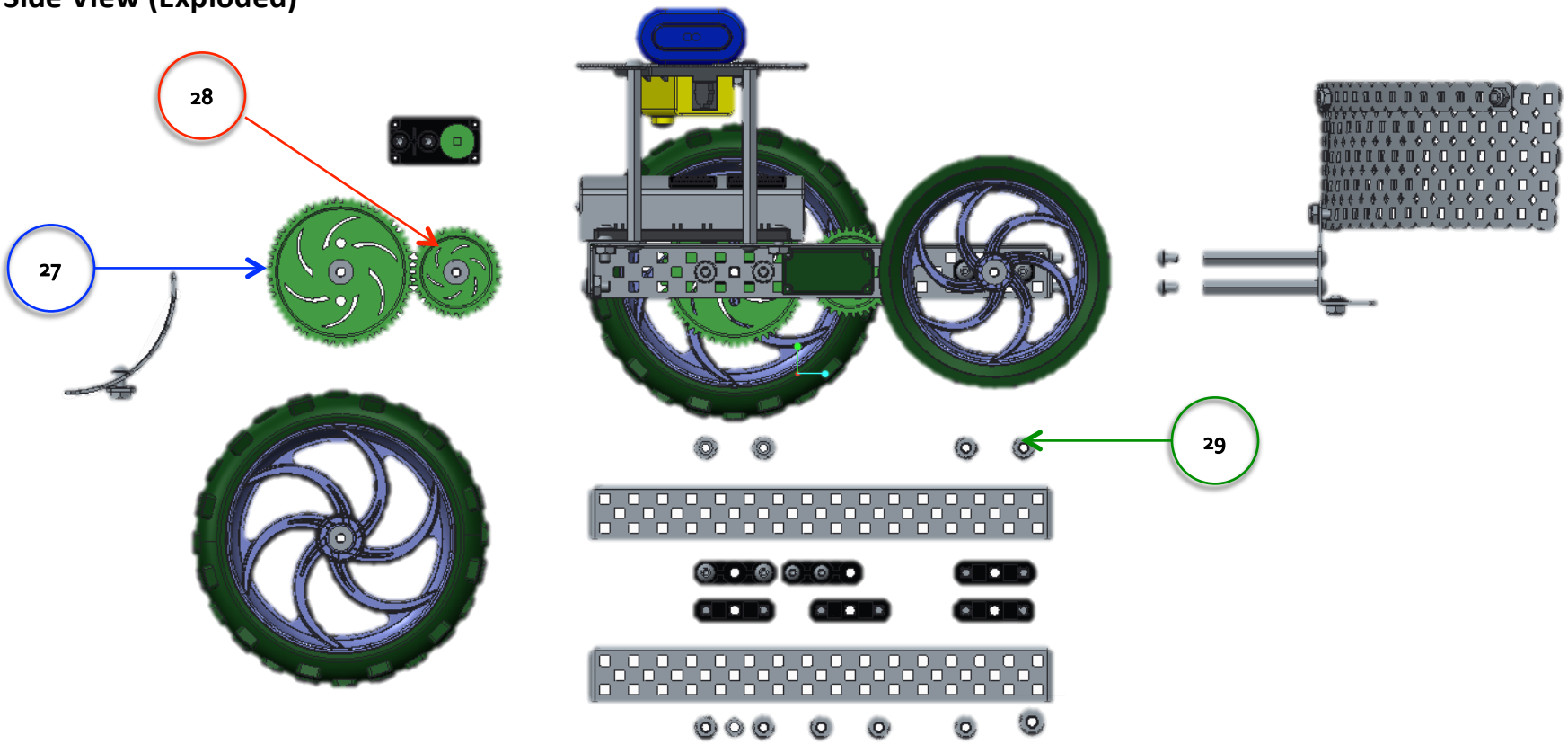
3.3 Remote Control Robot BOM

Item Number	Part	Description	Quantity
27	Large gears (65 mm Dia)	Turns the large wheels	2
28	Medium gears (40 mm Dia)	Connected to the motor	2
29	Keps nut (8-32)	13 visible (10 exploded, 2 attaching the microcontroller to the rail, 1 on the chassis bumper) 13 on the other side 10 added on autonomous features 2 attaching the receiver 2 used on the tail feature	40



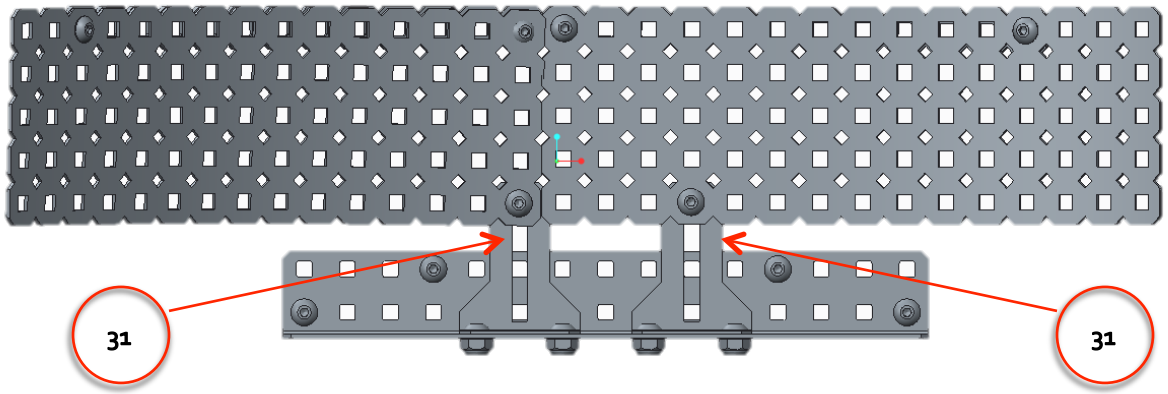
Side View

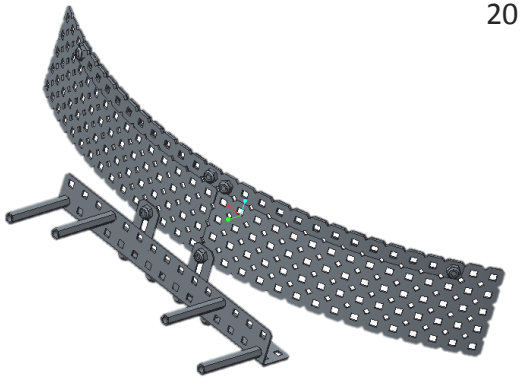
Side View (Exploded)



3.3 Remote Control Robot BOM

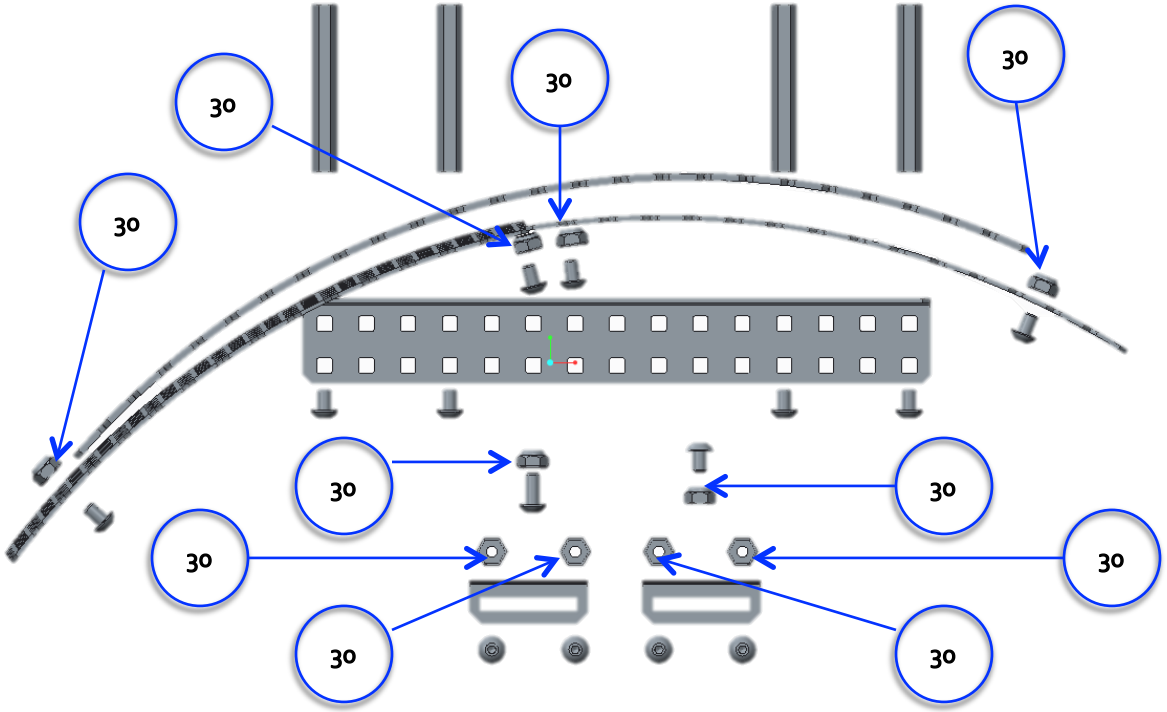
Front View





Default View

Top View (Exploded)



Item Number	Part	Description	Quantity
30	Lock nut	Supports the arm in the gusset (2 on the autonomous features; not shown)	12
31	Gusset	Holds the front arm in place	2

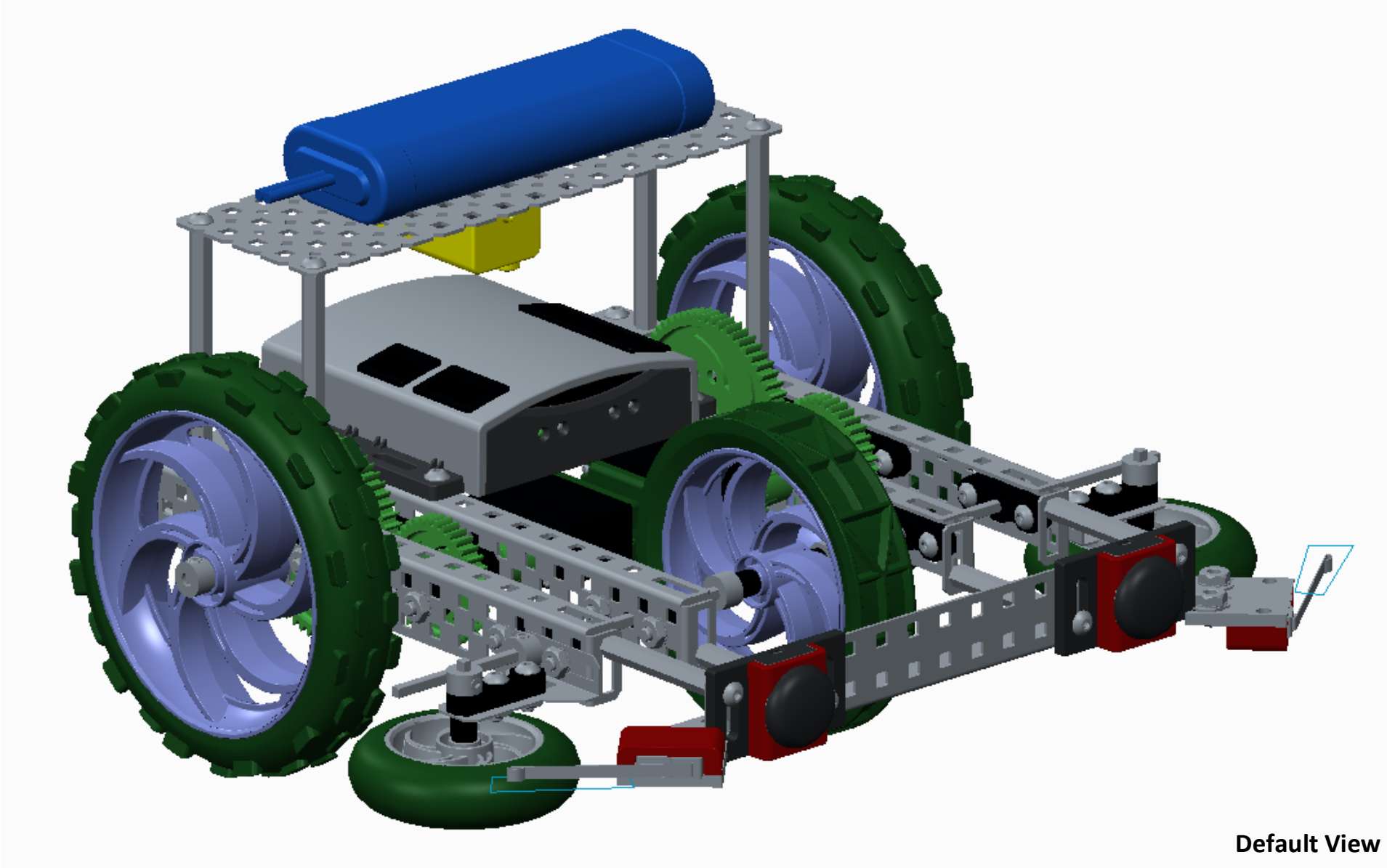
3.4 Tail Feature of Vex Robot

This was attached to the rear end of the robot to prevent the robot from flipping over when pushing the ball. It was designed during the competition using two halves of the long bar, an 8-32 X ½ screw and one keps nut.

Default View

Default View (Exploded)

3.5 Autonomous Robot BOM

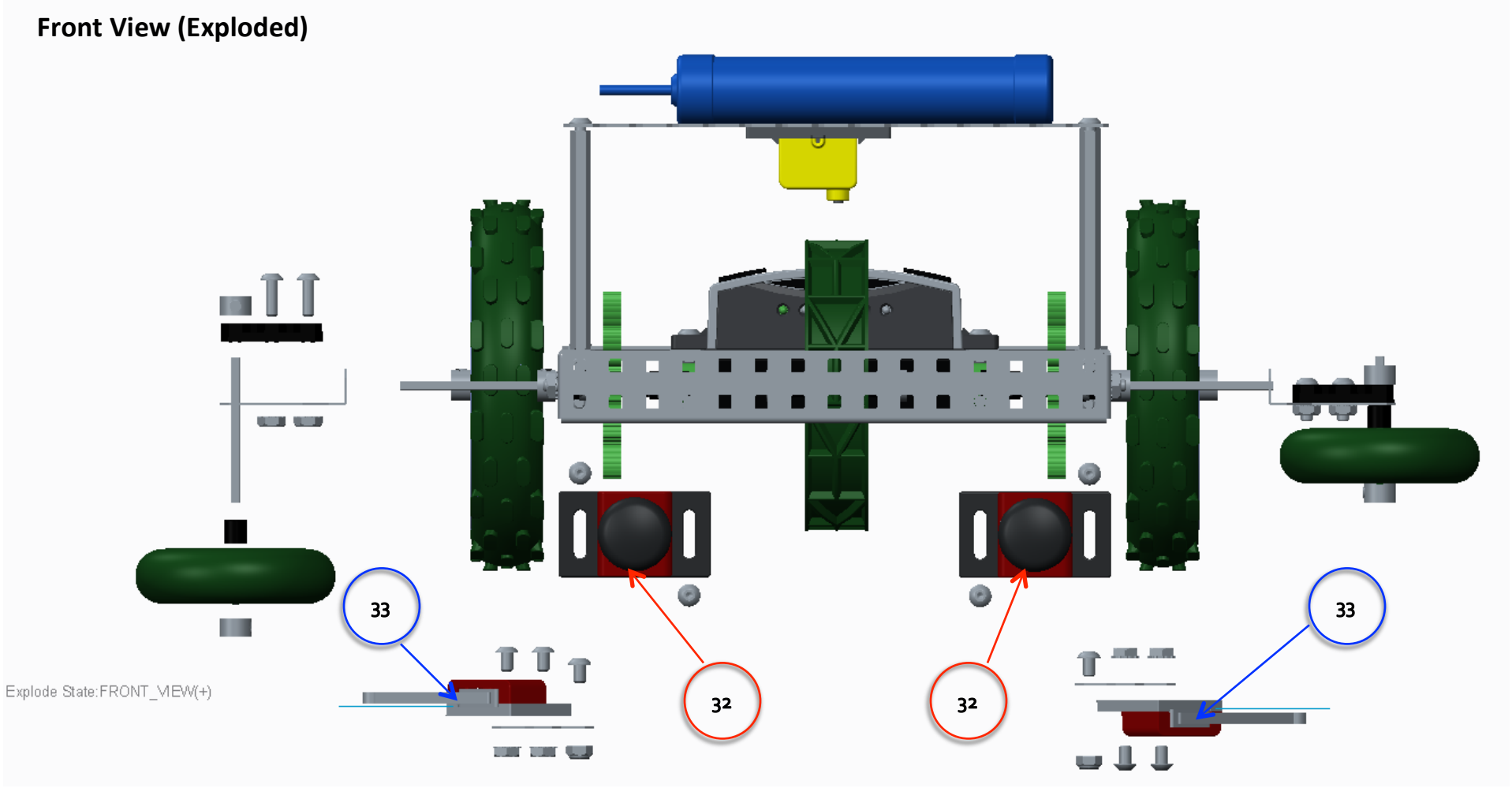


Default View

3.5 Autonomous Robot BOM

Item Number	Part	Description	Quantity
32	Bumper Switch Sensor	Detects collisions with the wall	2
33	Limit Switch Sensor	Prevents the robot from getting stuck at certain sections of the course	2

Front View (Exploded)



3.5 Autonomous Robot BOM

Item Number	Part	Description	Quantity
34	Cross	Used to attach the limit switch to the bumper	2
35	Small wheels (70 mm Dia)	Allows the robot to move straight alongside the walls of the track	2

Top View (Exploded)