

ORTOP Modular Robot v2.1

Chassis Assembly

Idler Wheel Assembly

Build two of these, one for each side of the robot.

Parts Needed:

- 1 – Socket Head Cap Screw, 1/2"
- 1 – Split Clamp
- 1 – Axle



Assembly



1. Slide the split clamp over the axle as shown. The clamp should be about 1/2" from the end of the shaft, with the extended lip of the split clamp facing inward toward the long part of the axle.



2. Insert and tighten the cap screw to secure the clamp to the shaft. Be sure the screw is inserted from the non-threaded side of the hole. This is the completed axle assembly.

Parts Needed:

- 4 – Socket Head Cap screw, 1/2"
- 1 – 3" wheel
- 1 – axle assembly



Assembly



3. Slip the wheel over the axle assembly.
4. Insert and tighten the four cap screws into the split clamp.

Drive Motor Assembly

Build two of these, one for each side of the robot.

Parts Needed:

- 4 – Socket Head Cap Screw, 1/2"
- 1 – 40 Tooth Gear
- 1 – Motor Hub w/ Set Screw
- 1 – DC Drive Motor



Assembly



1. Insert the gear on to the motor hub with the flange on the hub facing into the gear.



2. Attach with 4 cap screws.



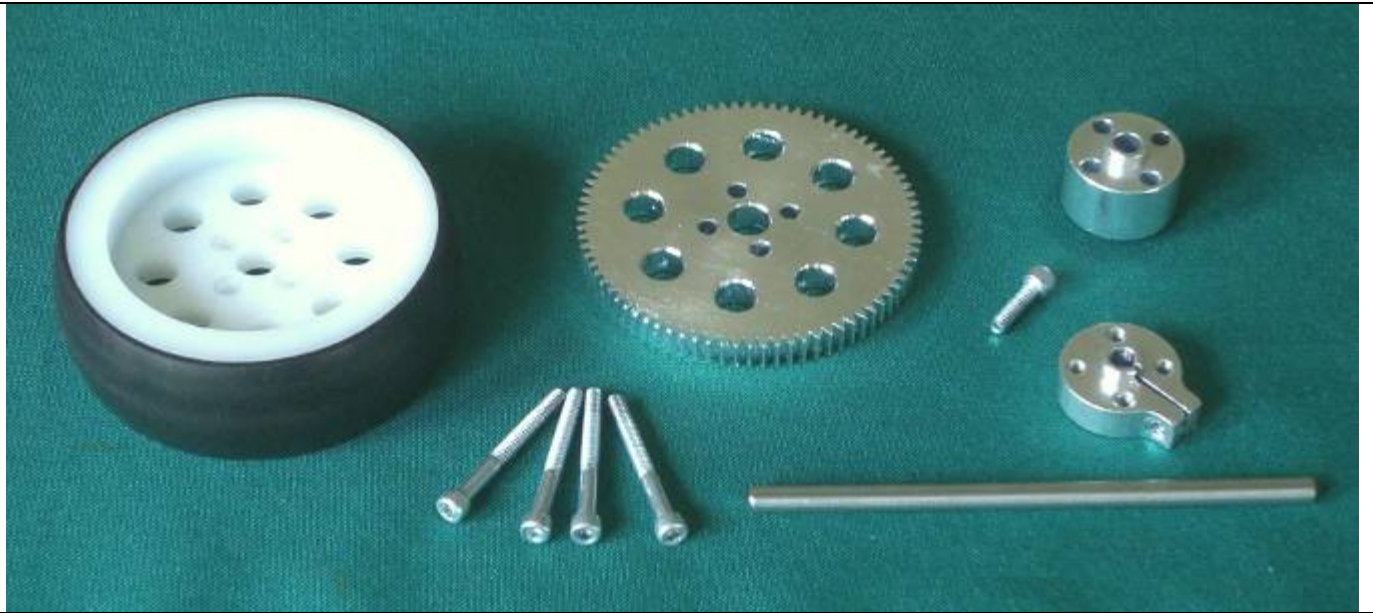
3. Slide the gear assembly onto the motor shaft about 1/8" from the motor bushing.
4. Tighten the motor hub set screw onto the **flat part** of the shaft.

Drive Wheel Assembly

Build two of these, one for each side of the robot.

Parts Needed:

- 4 – Socket Head Cap Screw, 1-1/4"
- 1 – 3" Wheel
- 1 – Gear Hub Spacer
- 1 – 80 Tooth Gear
- 1 – Split Clamp
- 1 – Socket Head Cap Screw, 1/2"
- 1 – Axle



Assembly



1. Slide the split clamp over the axle as shown. The split clamp should be about 1-1/4" from the end of the shaft, with the extended lip of the split clamp facing outward towards the short end of the axle.
2. Insert and tighten the screw to secure the split clamp to the shaft.



3. Insert the 4 screws through the mounting holes on the wheel.
4. Slide the gear hub spacer over the screws.



5. Slide the 80-tooth gear over the screws.

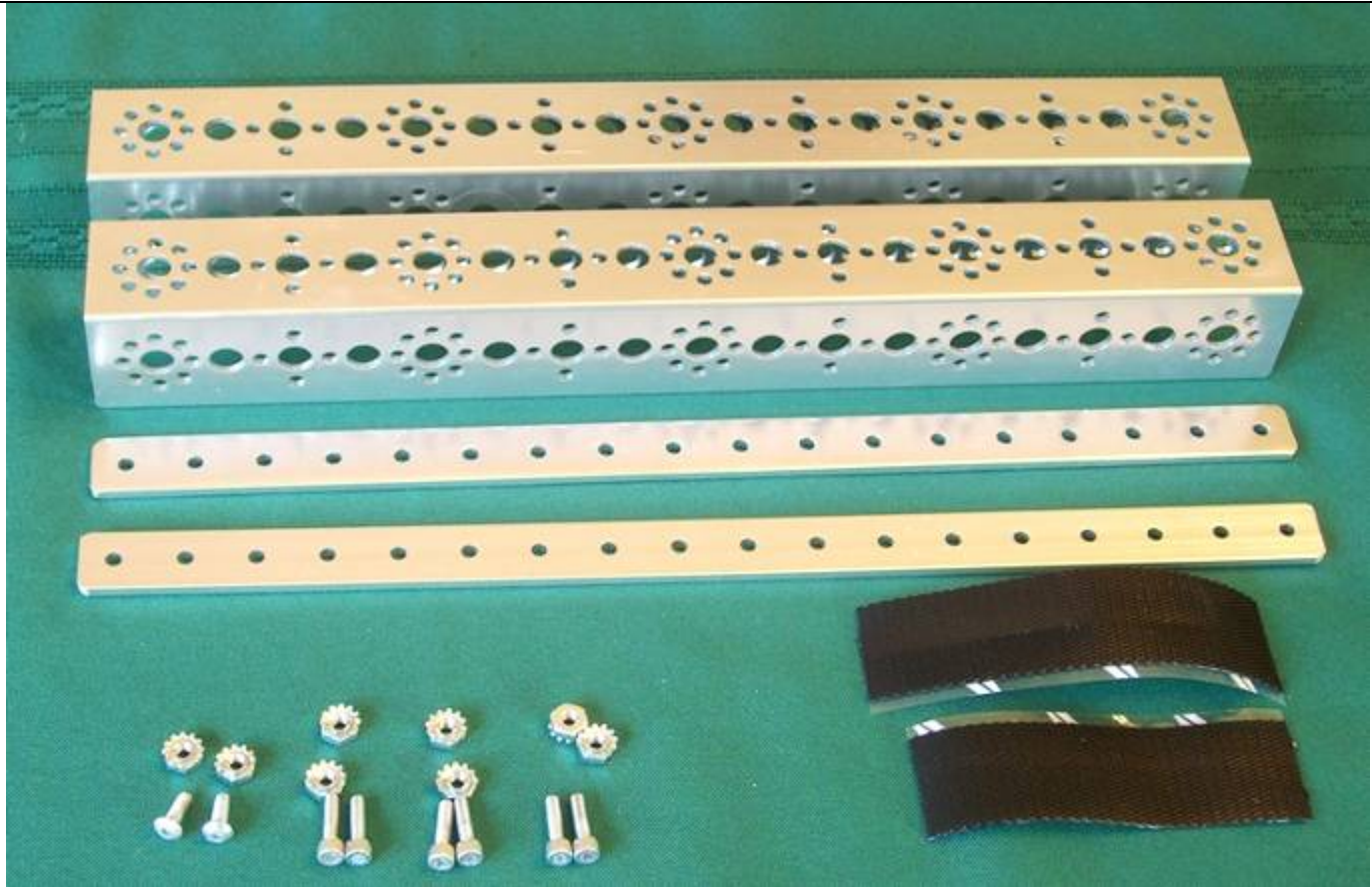


6. Slide the wheel assembly on the axle assembly.
7. Tighten the 4 screws.

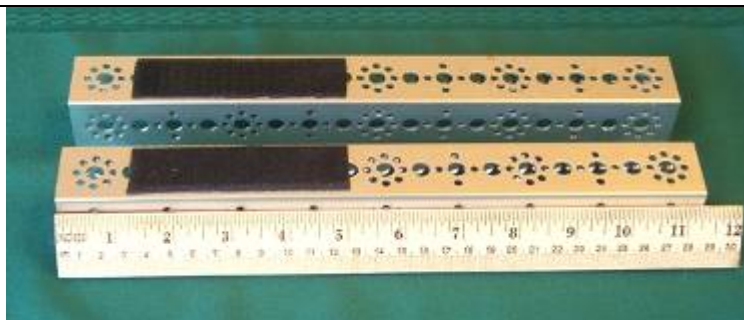
Chassis Frame Assembly

Parts Needed:

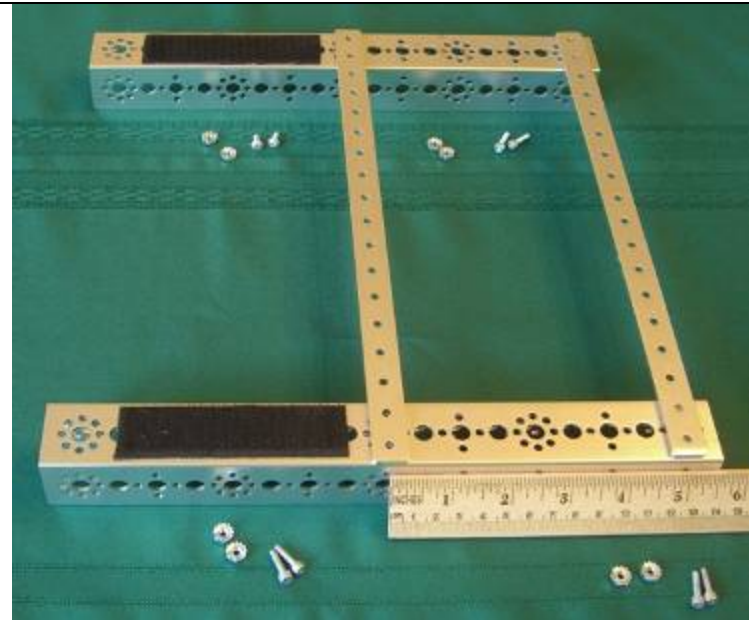
- 6 – Socket Head Cap Screws, 1/2"
- 2 – Button Head Cap Screws, 3/8"
- 8 – 6-32 Nuts
- 2 – 288mm Channels
- 2 – 288mm Flat Bars
- 2 – 4" Lengths of Hook and Loop Fastener (Hook Part)



Assembly



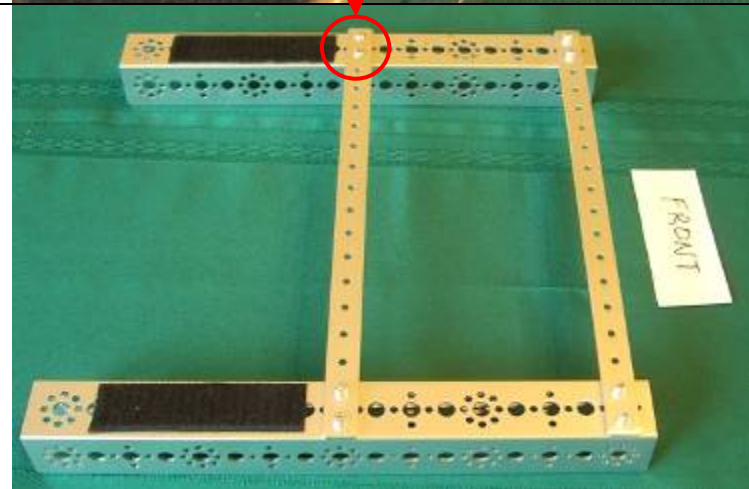
1. If the hook part of the hook and loop fasteners are not already attached to the channels, peel off the covering of the adhesive back of each strip and attach them to one end of each channel about 1-1/4 inch from the end. Do not cover the 8-hole rosette at the end of the channel.



- 2. Attach the two flat bars to the top of the channel as shown. The two bars are exactly 8 large holes apart (5 inches). The front bar will be centered on the front 8-hole rosette pattern.
- 3. Use two screws at each intersection.
- 4. Note that the left rear pair of screws are button head cap screws. The other six are socket head cap screws.



- 5. Detail showing the left rear pair of screws.



- 6. Finished chassis frame assembly showing which end is front.

Mounting Idler Wheel

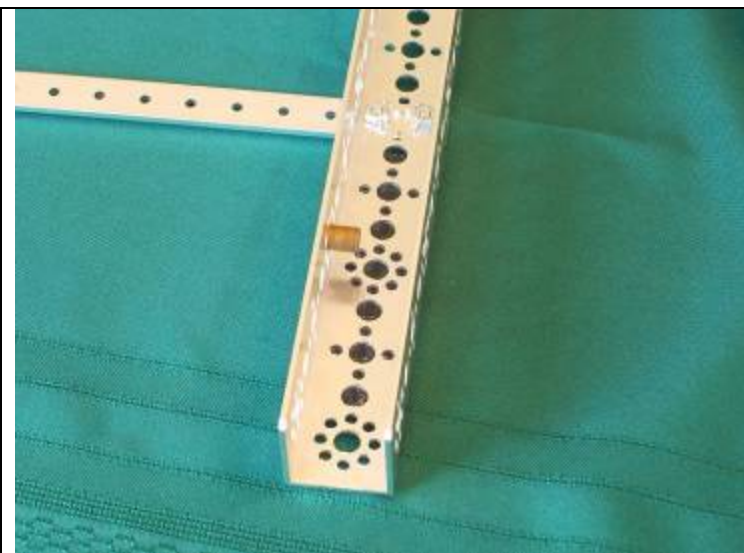
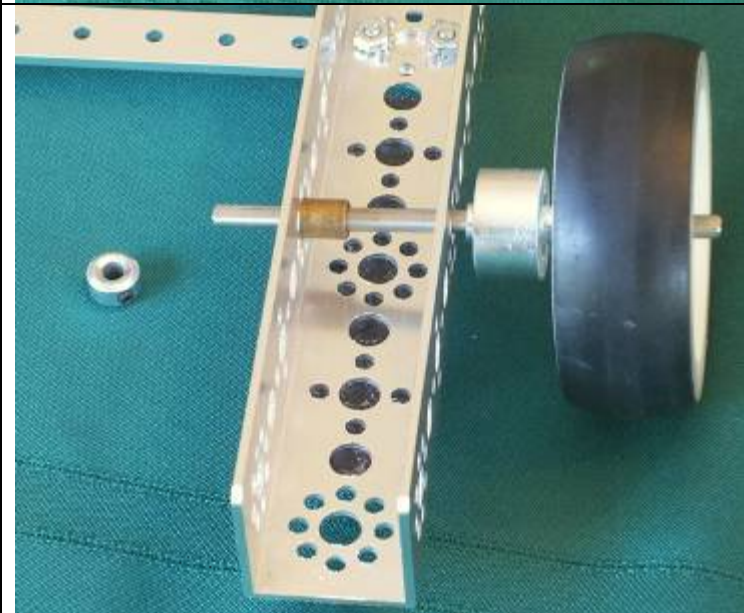
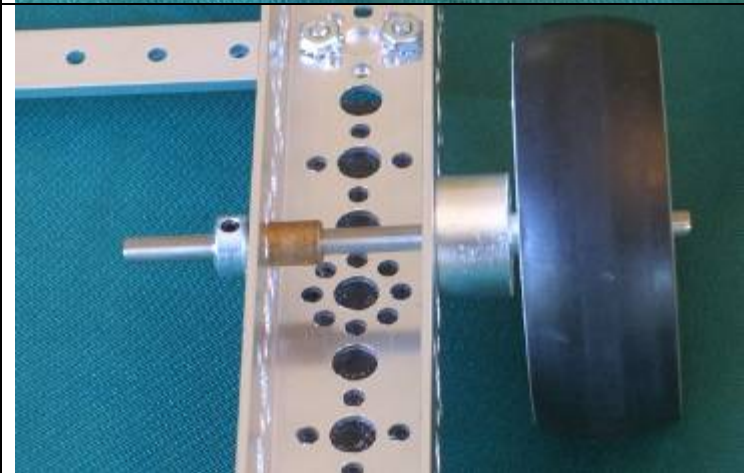
Mount two idler wheels, one on each side of the robot.

Parts Needed:

- 1 – Idler Wheel Assembly
- 1 – Bronze Bushing
- 1 – Gear Hub Spacer
- 1 – Axle Set Collar



Assembly

	<ol style="list-style-type: none">1. Turn chassis upside down.2. Place the bushing in the inside of the side rail at the 5th hole from the rear of the chassis as shown
	<ol style="list-style-type: none">3. Slide the wheel assembly through the hub spacer and then through the outside 5th hole and through the bushing. Make sure the lip on the spacer goes into the big hole on the channel.4. Slide the collar over the end of the shaft.
	<ol style="list-style-type: none">5. Tighten the set screw on the flat part of the shaft.

Installing Drive Wheels and Motor Mounts

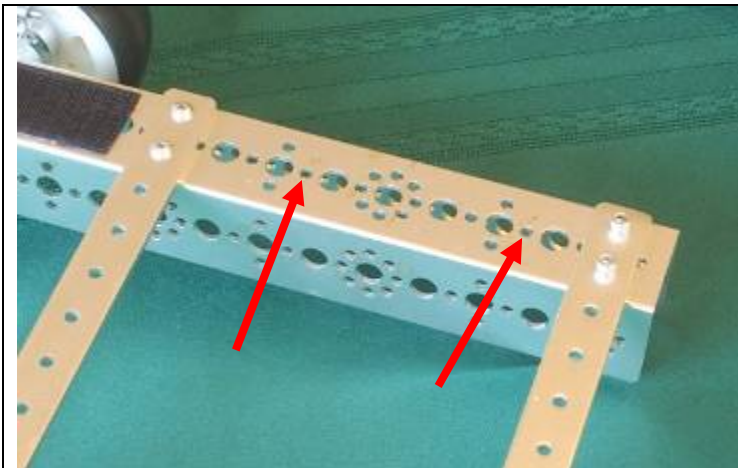
Install two of these sets, one for each side of the robot.

Parts Needed:

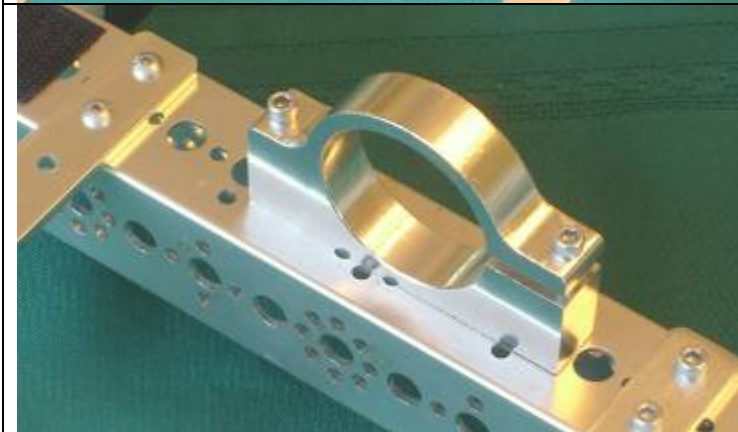
- 1 – Motor mount
- 1 – Socket Head Cap Screw, 1-1/2"
- 1 – Socket Head Cap Screw, 1-1/4"
- 2 – 6-32 Nuts



Assembly



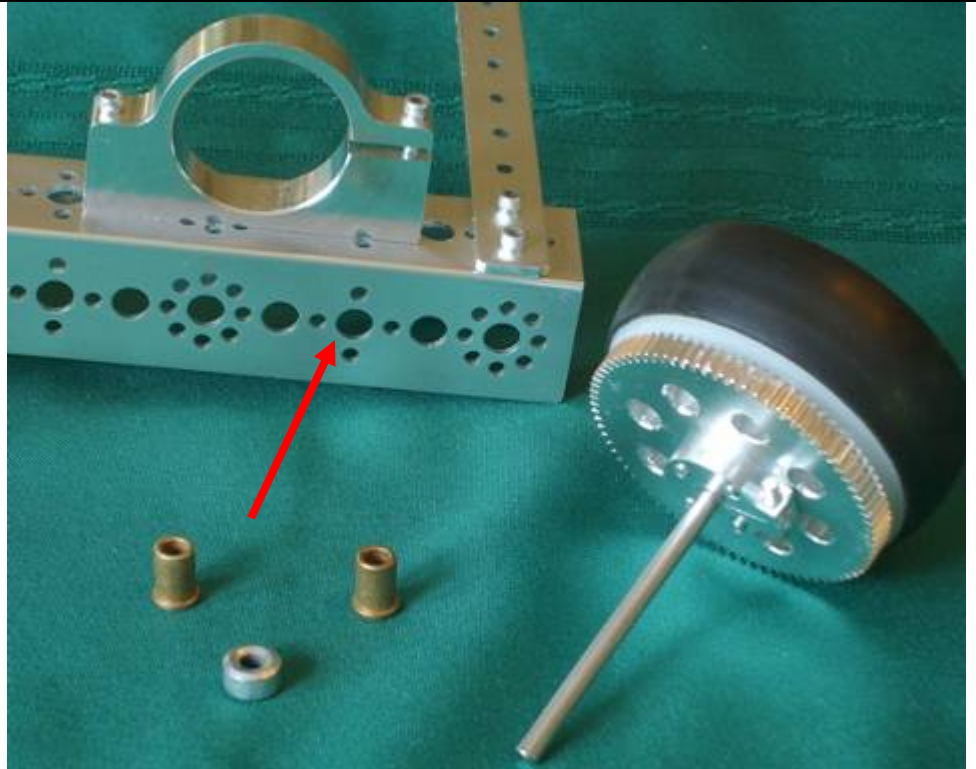
1. Locate the two holes as indicated. The split end of each motor mount faces the front of the robot.



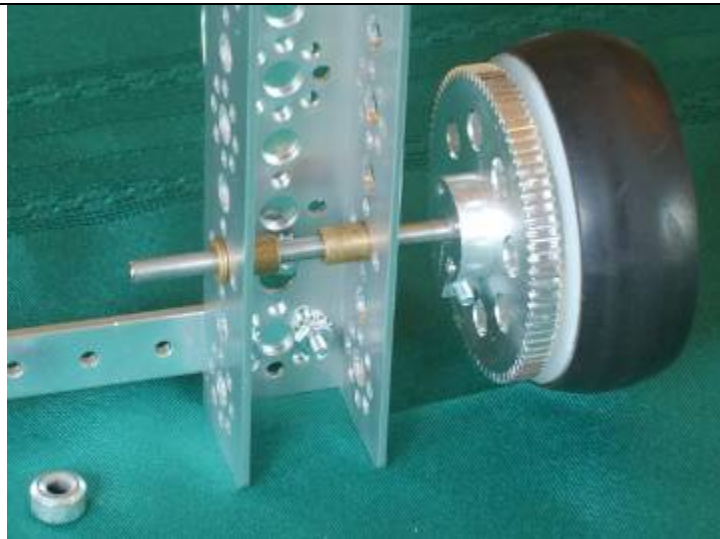
2. Place the motor mount on the channel and insert the longer screw in the front (split) end of the mount and the shorter screw in the back.
3. Attach nuts to each screw and securely tighten the back screw (the shorter one).
4. Leave the nut on the front screw loose for now.

Parts Needed:

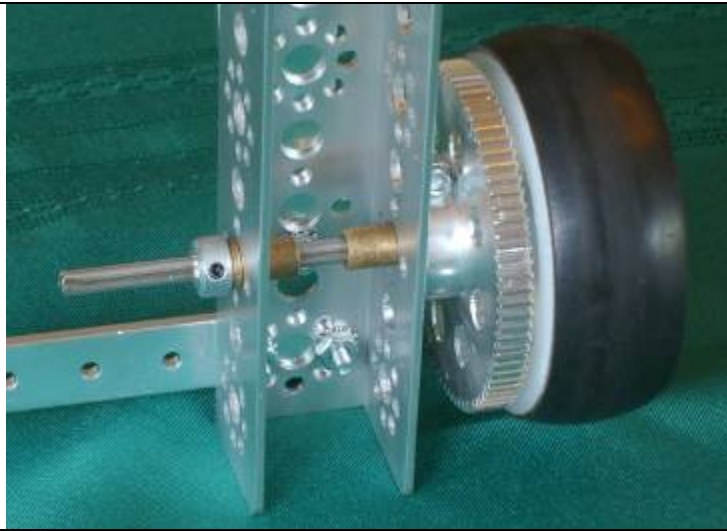
- 1 – Drive Wheel Assembly
- 2 – Bushings
- 1 – Axle Set Collar
- Chassis Frame Assembly



Assembly



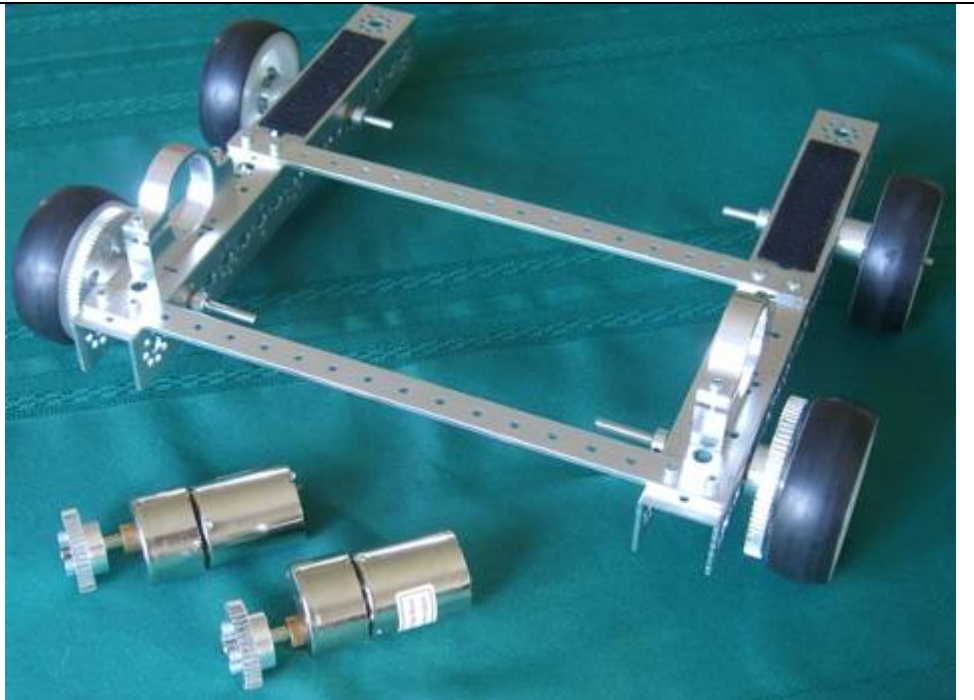
1. Turn chassis upside down.
2. Place the bushings in the channels at the 3rd hole from the front of the chassis (as indicated above). The bushings are inserted with the narrow end inside the channel.
3. Insert the drive wheel assembly into the bushings from the outside. Make sure the bushings seat firmly against the channel sides.



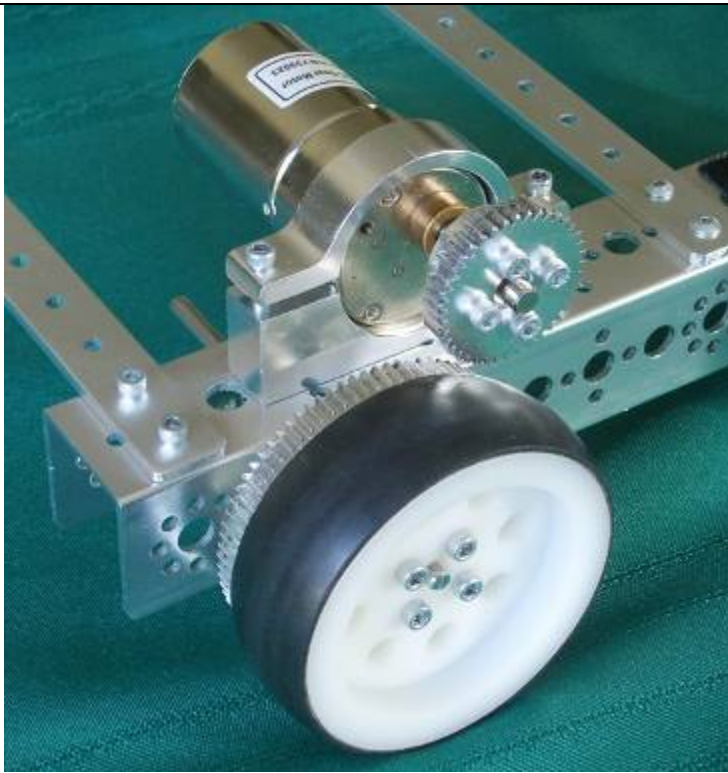
4. Slide the collar over the end of the axle from inside the robot.
5. Tighten the set screw on the flat part of the axle.

Final Assembly

Parts Needed:
2 – Motor Assemblies
1 – Chassis Frame
Assembly

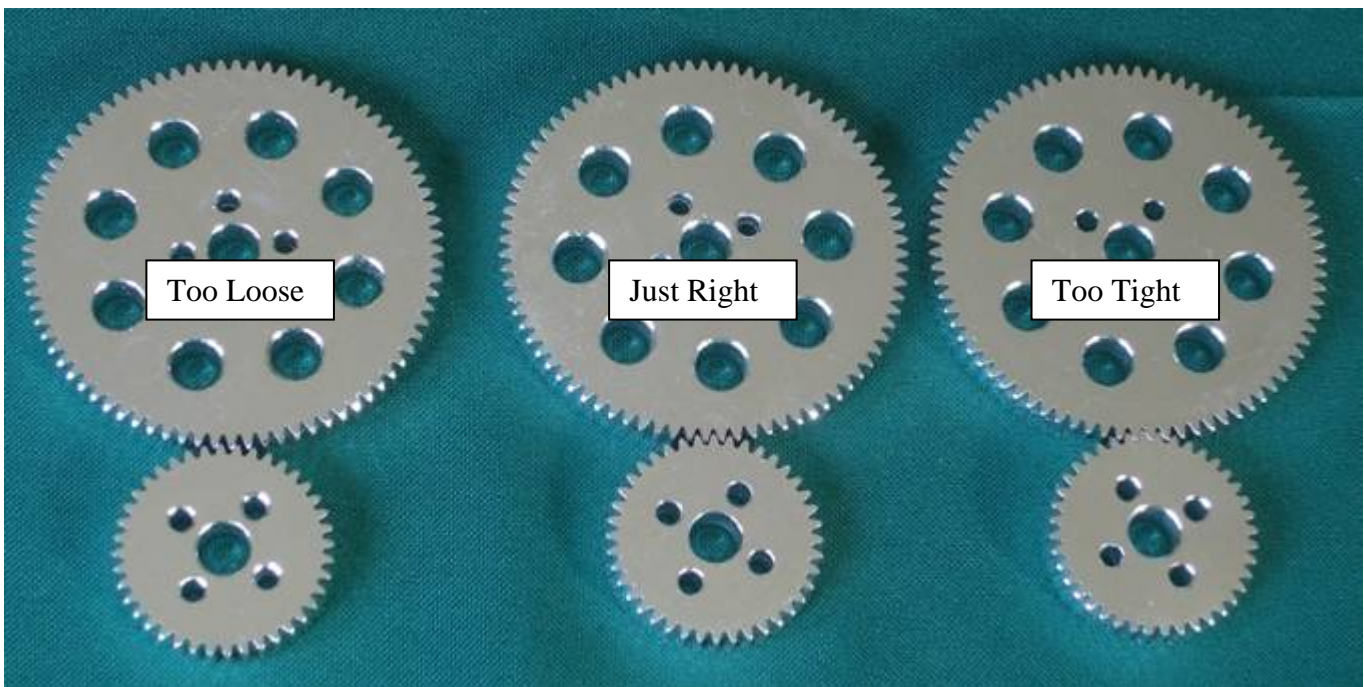


Assembly



1. Slide the motor, gear end first, through the motor mount from the inside and work the motor head into the mount. The motor mount screw at the split end must be loose for this to work.
2. Push the motor through until the front of the motor is flush with the mount. You may need to loosen the set screw on the motor hub to move the small gear in or out to ensure that 100% of the thickness of the small gear meshes with the large gear. Retighten the set screw.
3. Rotate the motor in motor mount so that the gears mesh. See diagram below for proper gear meshing technique.
4. Tighten the screw in the split part of the motor mount to secure the motor.

Proper Gear Meshing



Completed Chassis Assembly

