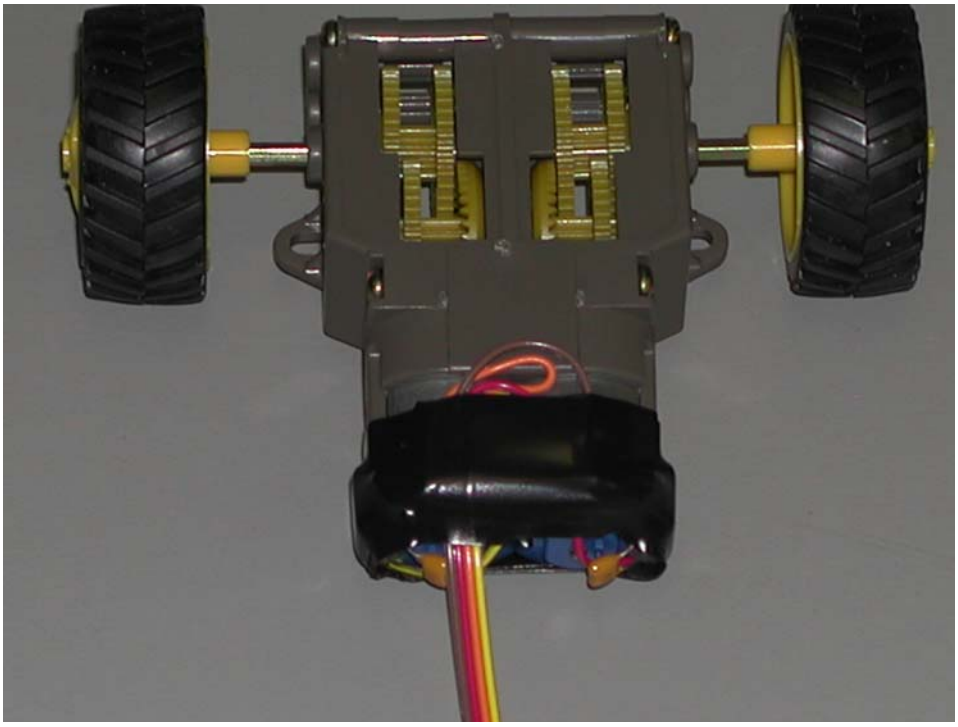
Sumo Robot Drive Train Assembly Instructions

You will be provided with plastic gearbox, hexagonal shaft, twin DC electric motor and tires required to construct the drive train for your Sumo Robot. Simply follow the instructions to complete the assembly. If you have any questions or are missing components please let the instructor know immediately.

When you have finished this part of the Sumo robot your completed drive train assembly should look very similar to the picture shown in **Figure 1 below**.

Figure 1



Main Parts List - Insure you have all the components listed below.

1 Box containing the Tamiya Twin-Motor Gearbox assembly. Item number 70097**700

2 Black rubber tires.

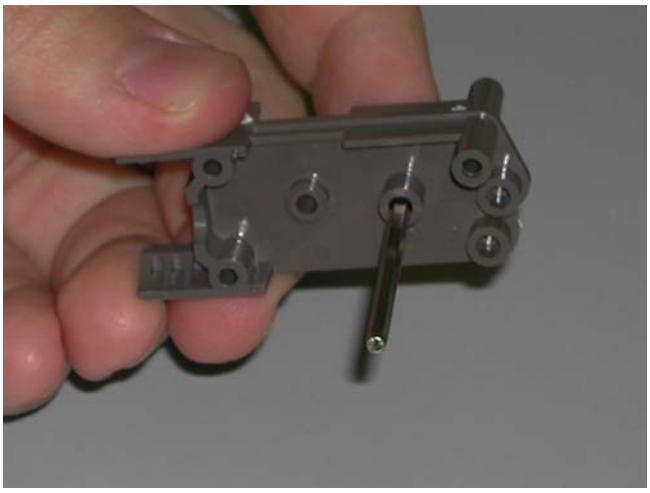
2 Yellow plastic wheel rims.

1 Hex shaft (Not used in this assembly).

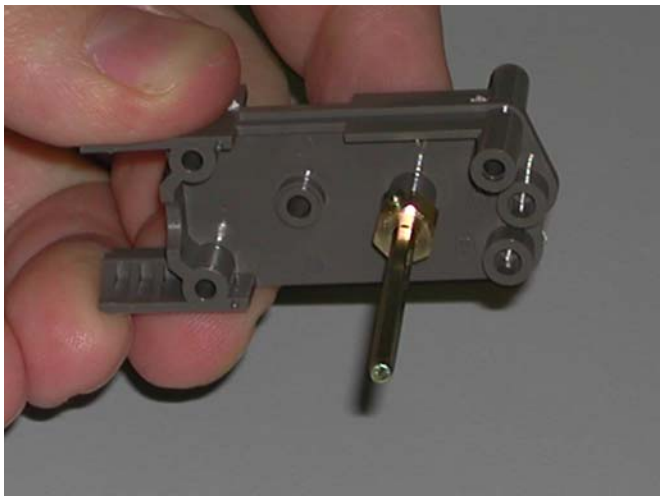
1. Unpack all the components provided for your Sumo robot and compare these to the parts list.

2. Open the twin motor gearbox package and lay out all the parts below. Note each piece is numbered.

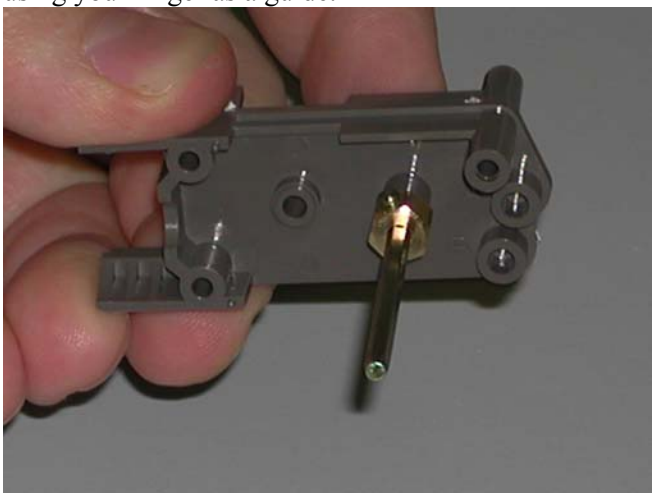
3. Remove center moulding number 3 and insert hex shaft in hole "C".



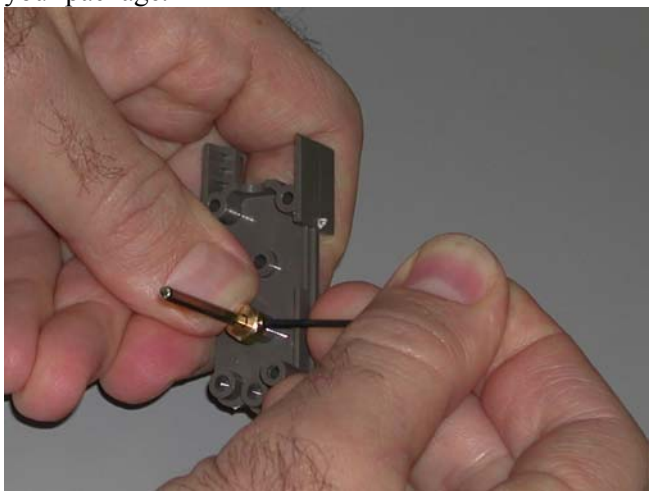
4. Use hole C to determine correct position of brass hex collar.



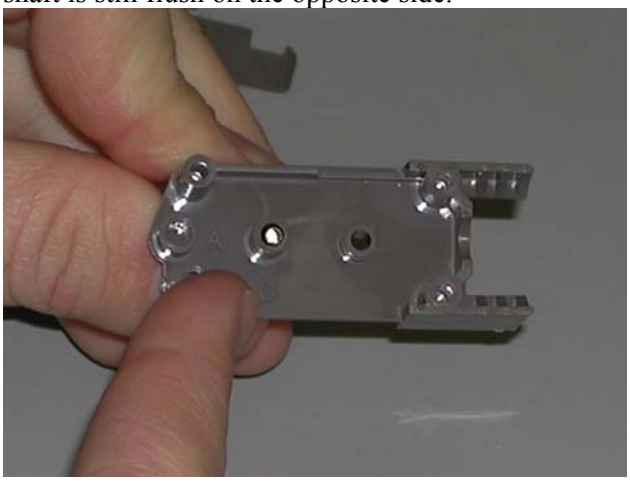
5. Ensure one end of hex shaft is flush with moulding using your finger as a guide.



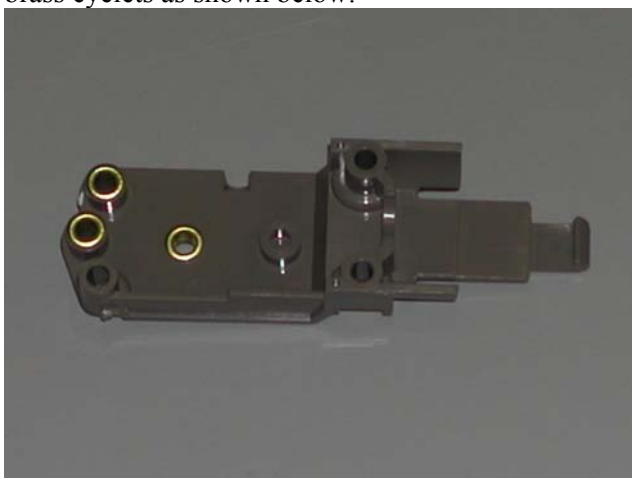
6. Tighten the hex collar with the allen key provided in your package.



7. After tightening the hex collar ensure the hex shaft is still flush on the opposite side.

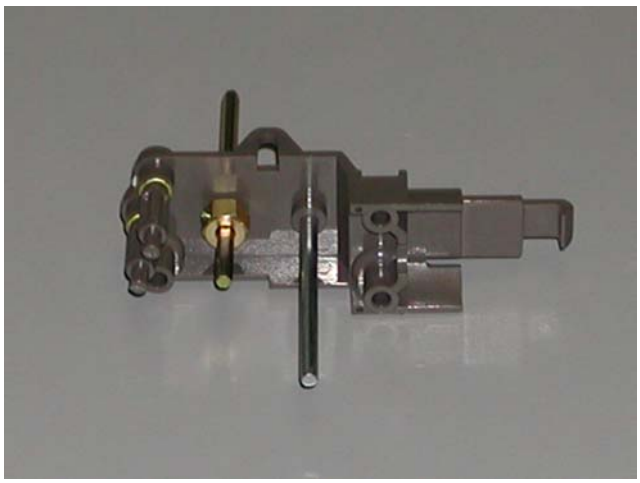


8. Remove moulding piece number 1 and insert 3 brass eyelets as shown below.

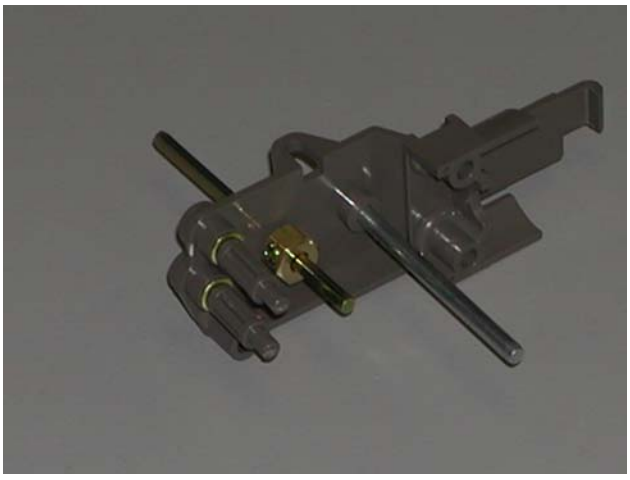


9. Grease shaft at collar and insert hex shaft from step 6 into hole C.

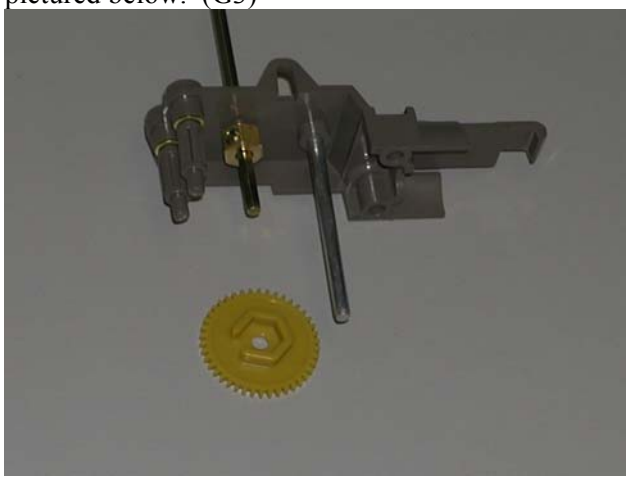
10. Insert round shaft into socket on moulding as show below.



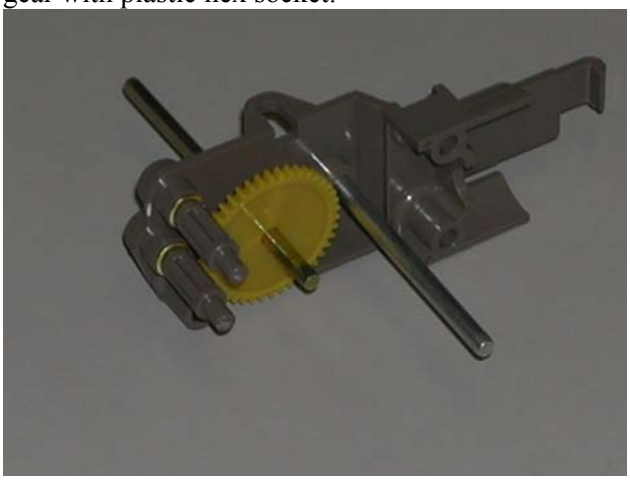
11. Insert 2 plastic spacers, part 4, in eyelets.



12. Select the plastic gear with female hex socket pictured below. (G3)

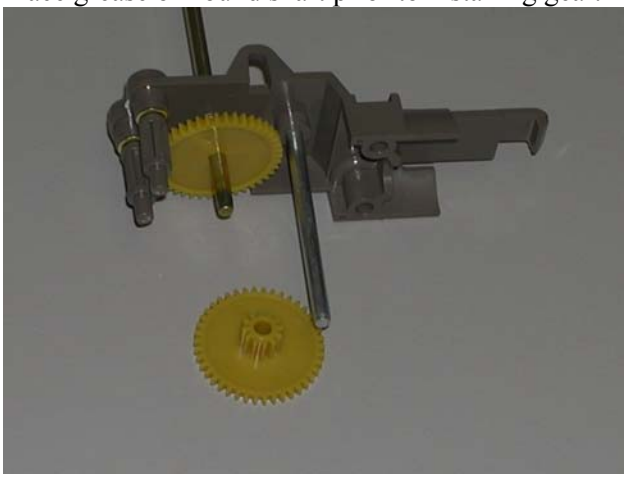


13. Complete the assembly shown below using the gear with plastic hex socket.

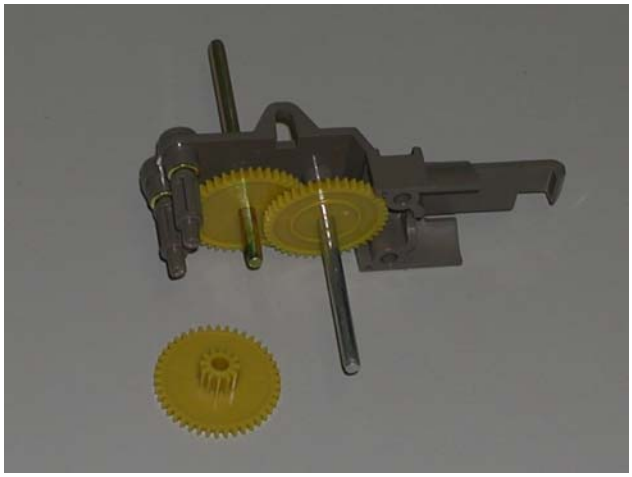


14. Note cut out on hex socket of plastic gear must line up with the set screw as shown below.

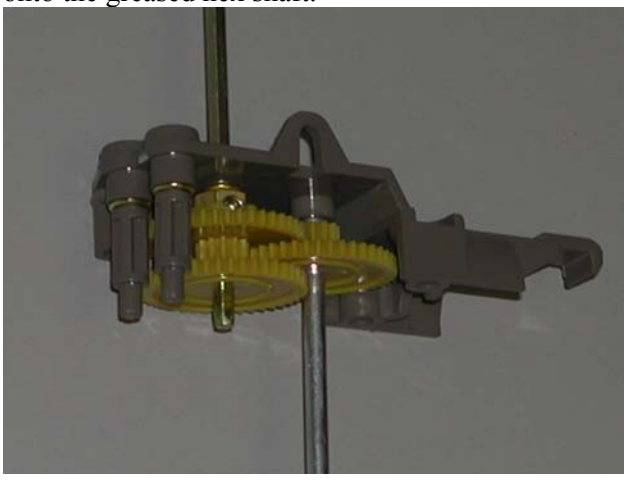
15. Select one of the 2 plain plastic gears (G2). Place grease on round shaft prior to installing gear.



16. Place plastic drive gear (G2) onto greased round shaft as shown. Grease the hex shaft.



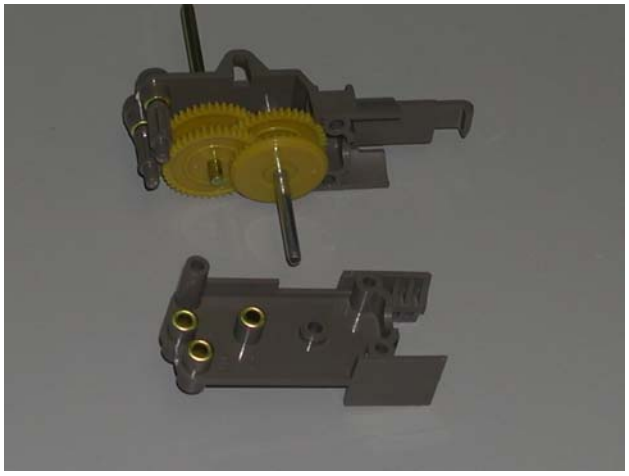
17. Place the remaining plain plastic drive gear (G2) onto the greased hex shaft.



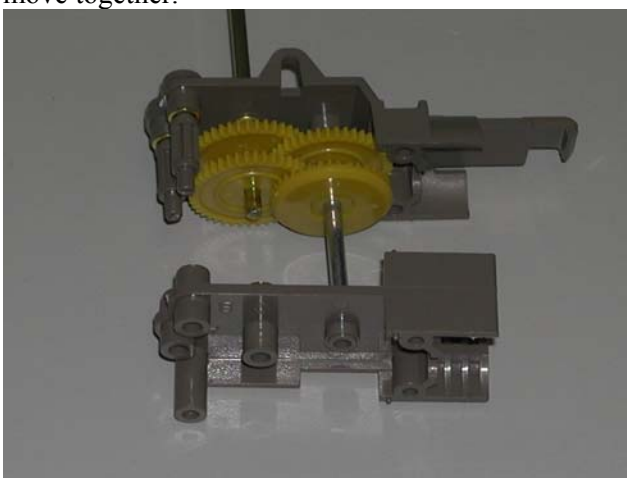
18. Select the G1 gear pictured below.

19. Place the final gear G1 onto the round shaft.

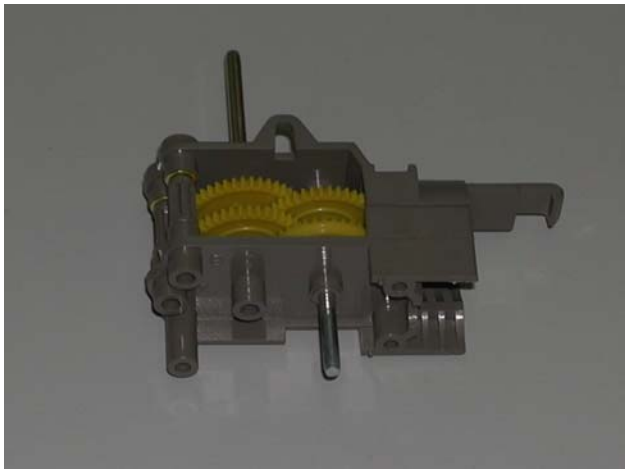
20. Place 3 eyelets into the center moulding, number 3 as shown below.



21. Slide center moulding onto the round shaft and move together.

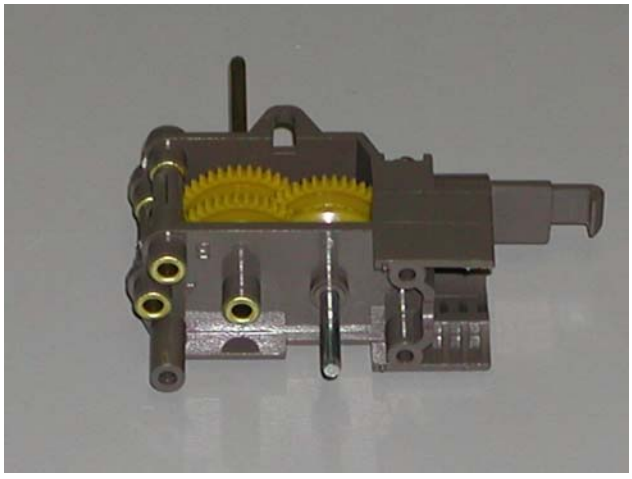


22. Note completed assembly from step 21.

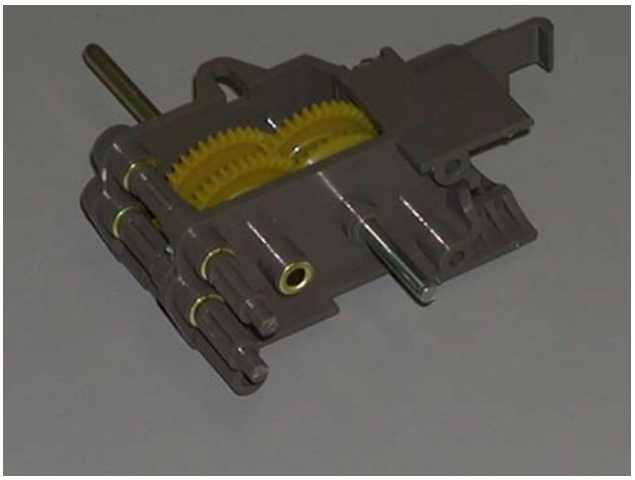


23. Attach the two housings together using 3 of the 6 long self tapping Phillips screws.

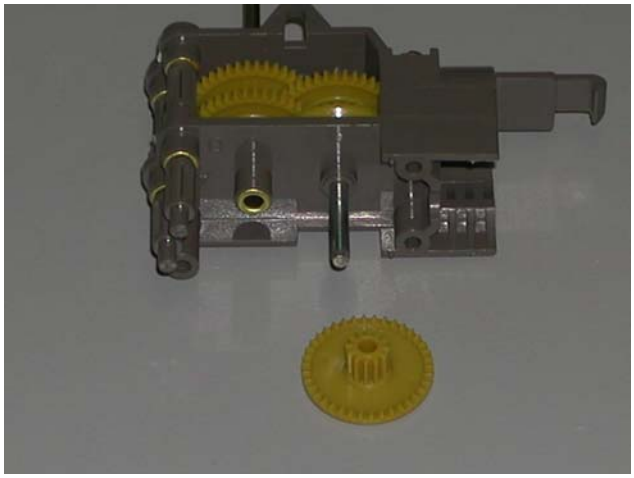
24. Place 3 more brass eyelets into the holes shown below.



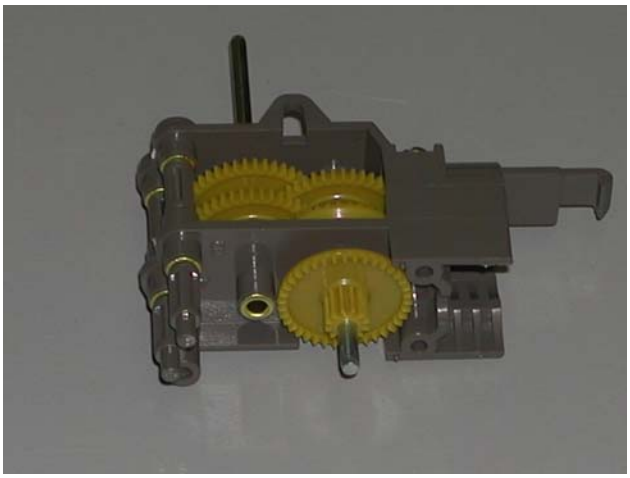
25. Place the remaining 2 plastic spacers into sockets A and B.



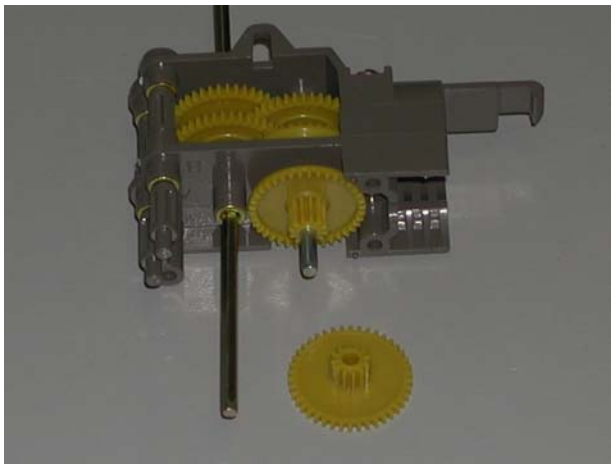
26. Select gear G1 and grease the protruding round shaft.



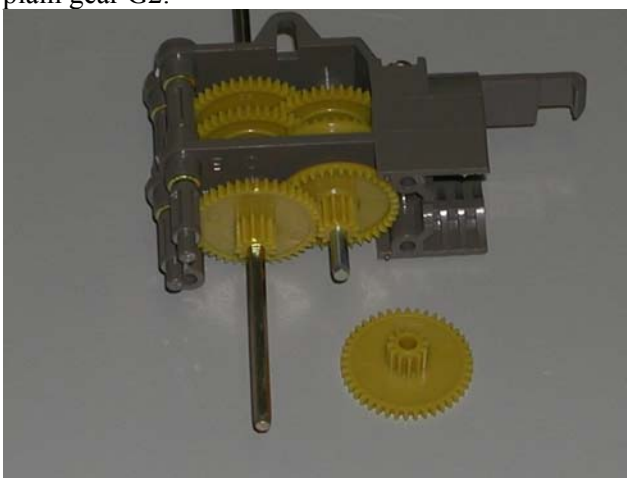
27. Place gear G1 onto greased round shaft.



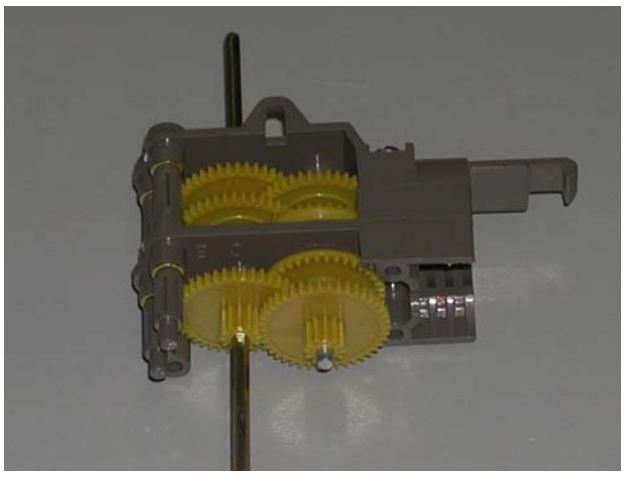
28. Grease the end of 2nd hex shaft and place into hole number C.



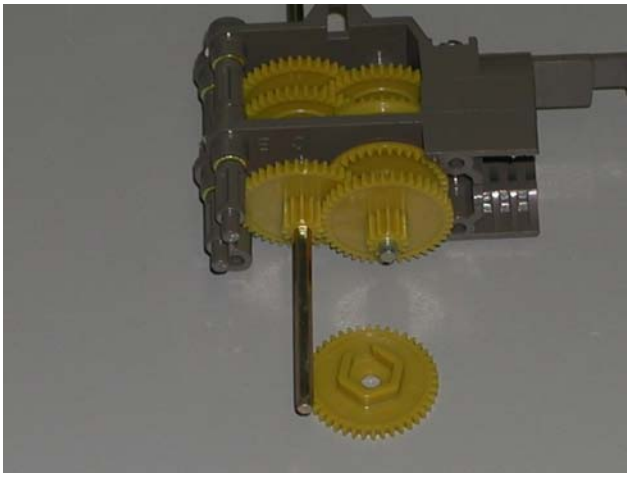
29. Place plain gear G2 onto hex shaft and select 2nd plain gear G2.



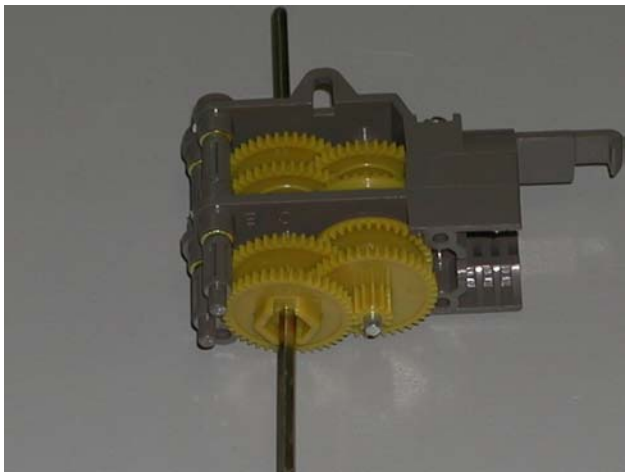
30. Place 2nd gear G2 onto round shaft.



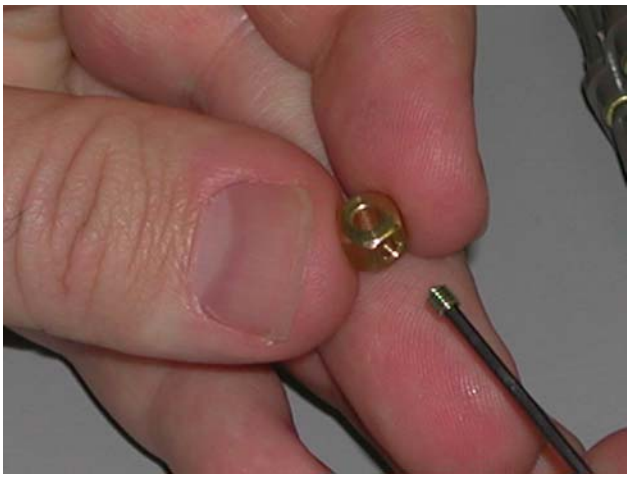
31. Select hex socket gear G3.



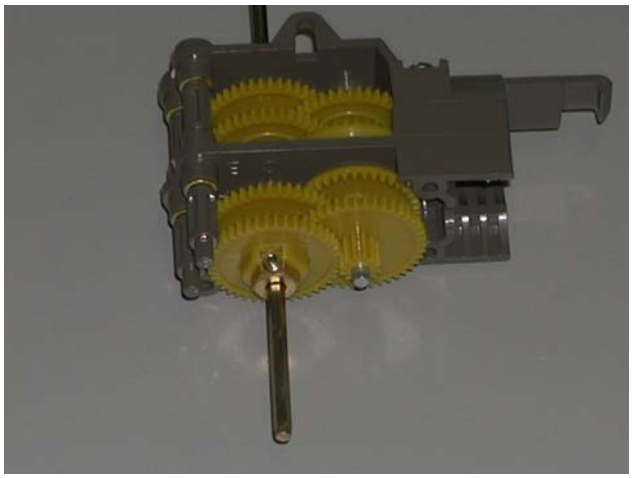
32. Place gear G3 onto hex shaft as shown.



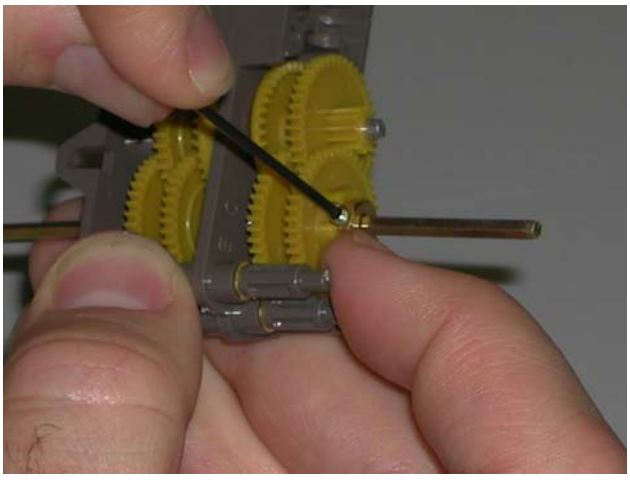
33. Prepare hex collar with set screw.



34. Slide collar over hex shaft as pictured.

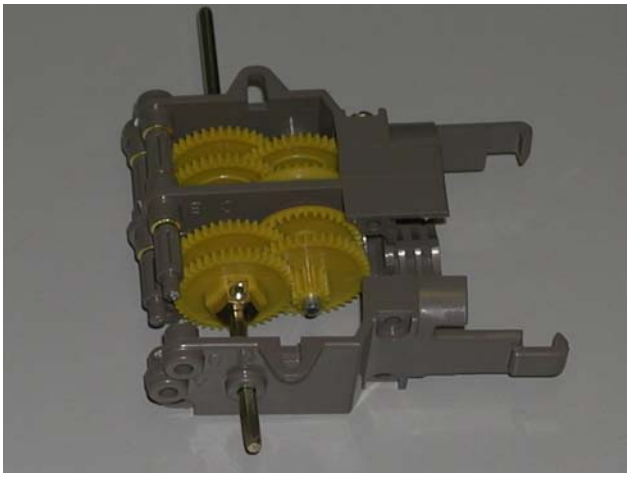


35. Tighten set screw on hex collar.



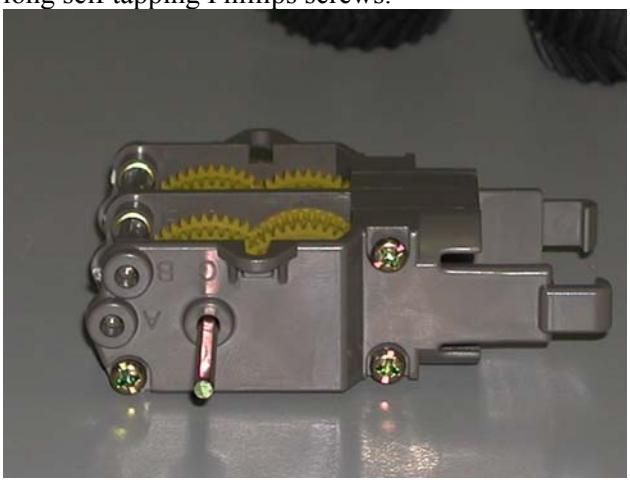
36. Place 3 eyelets into moulding part 2. Grease hex shaft by collar.

37. Slide moulding 2 onto hex shaft.

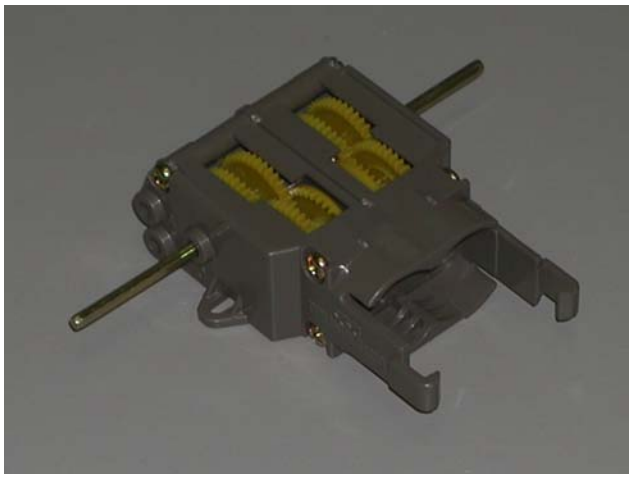


38. Move this 3rd housing completely into place. Obtain the last 3 self tapping screws.

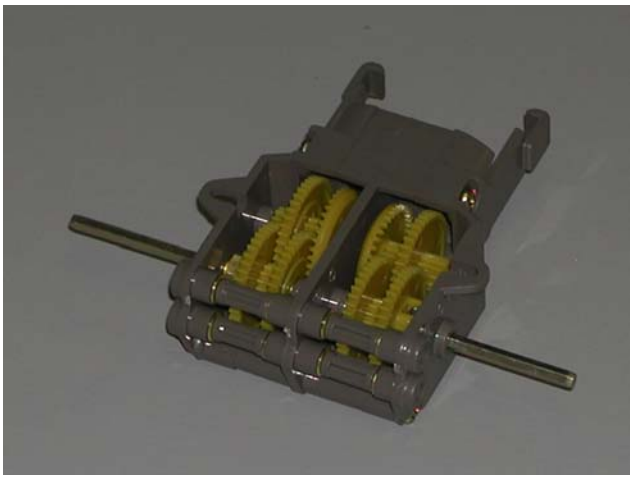
39. Attach the third housing using the last 3 of the 6 long self tapping Phillips screws.



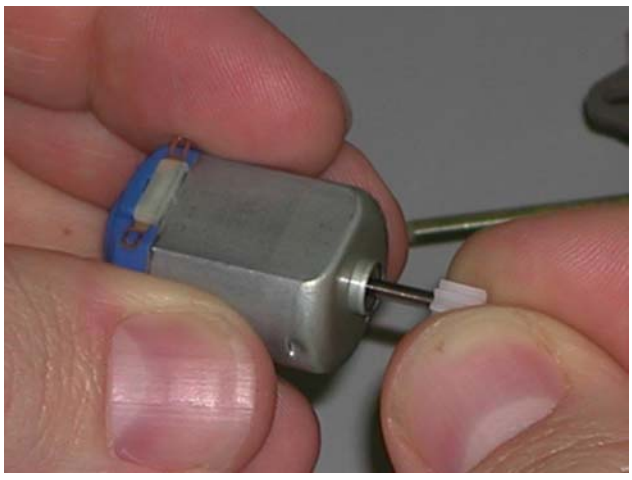
40. Top view of gearbox.



41. Bottom view of gearbox.

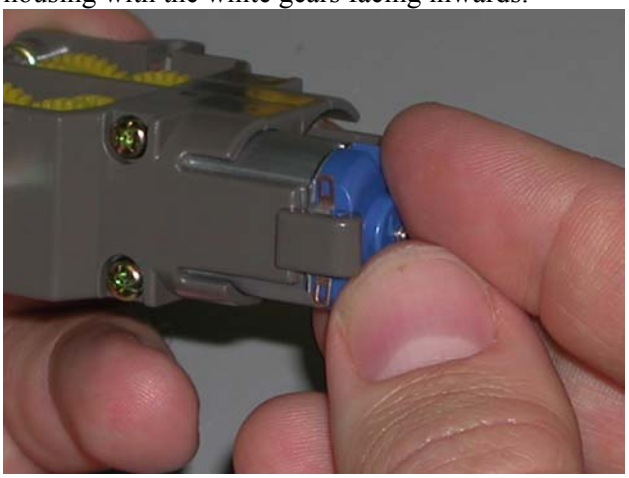


42. Slide 1 white gear onto each of the 2 DC motor shafts.

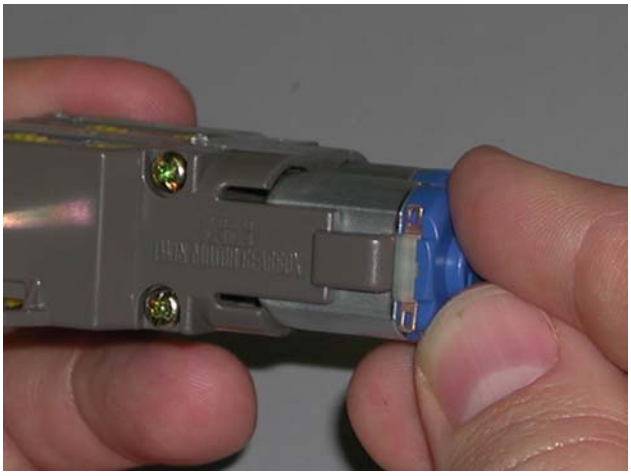


43. Press gear into place by carefully pushing against a hard surface on the shaft, not the housing.

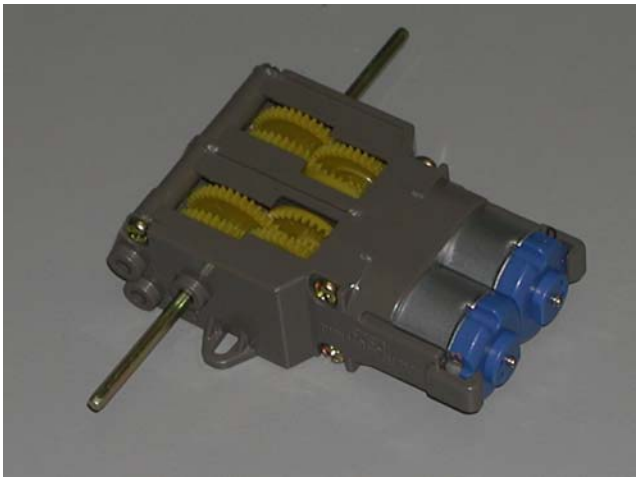
44. Place each motor into the previously completed housing with the white gears facing inwards.



45. Place second motor into housing.

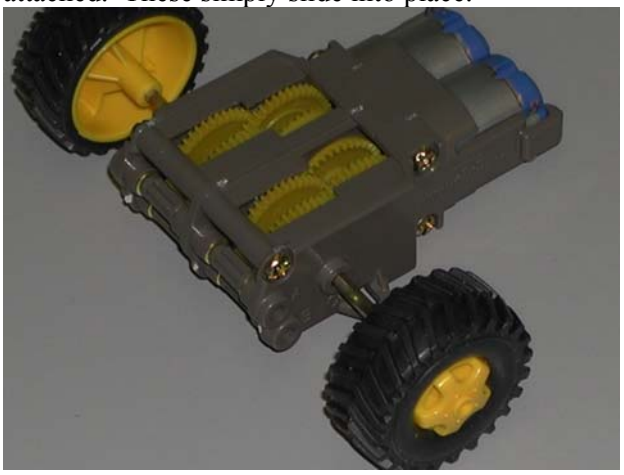


46. Top view of assembly complete with DC motors.

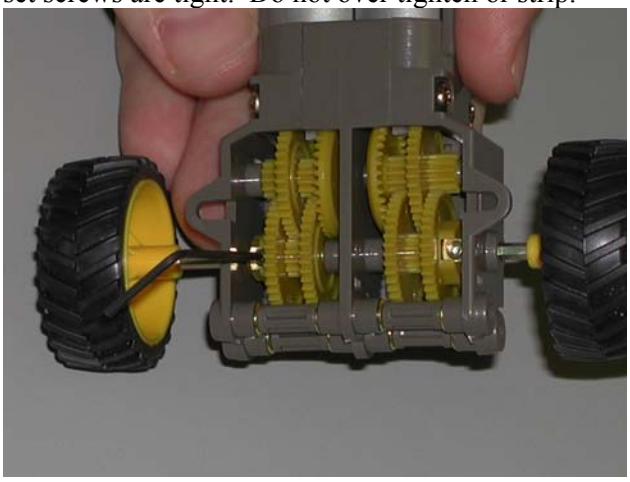


47. Bottom view of assembly with motors. Note the larger opening showing the gear assembly.

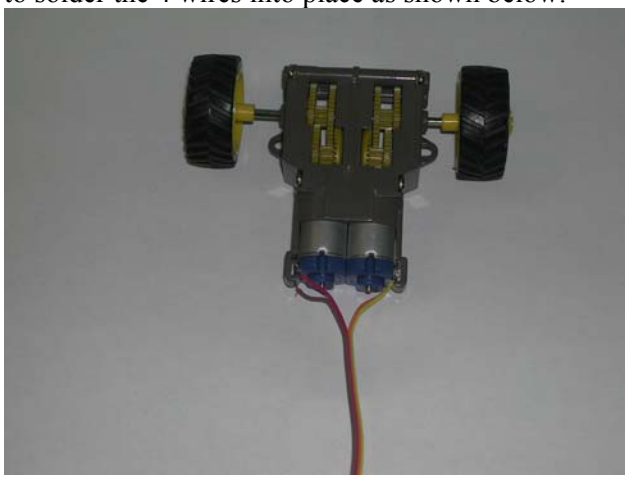
48. Drive train with plastic rims and rubber tires attached. These simply slide into place.



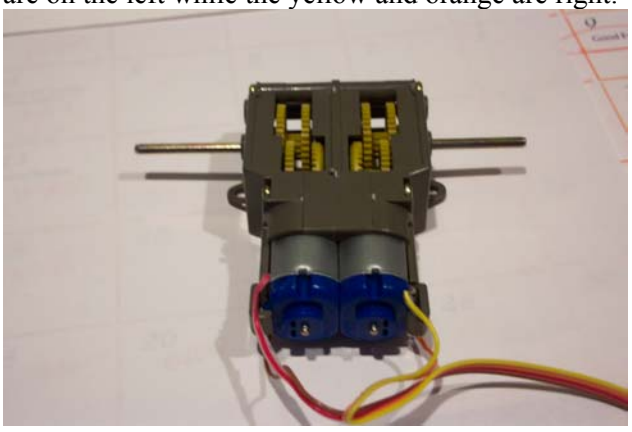
49. Using the supplied allen wrench ensure that the set screws are tight. Do not over tighten or strip.



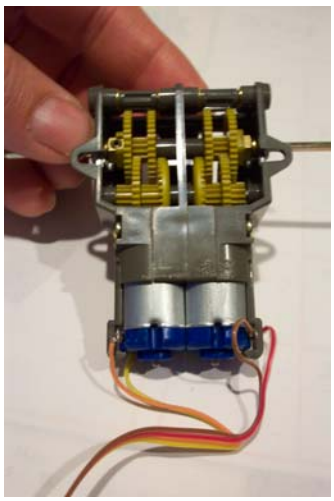
50. Return the drive train to the top side and prepare to solder the 4 wires into place as shown below.



51. Note in this view that the Red and Brown wires are on the left while the yellow and orange are right.



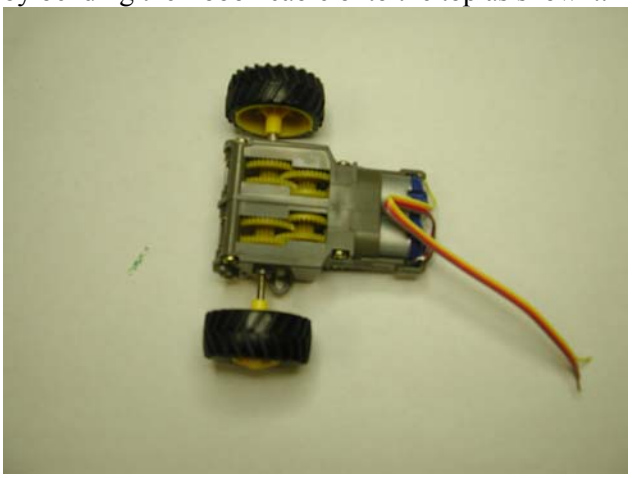
52. Note the bottom view. The orientation of the wire is reversed.



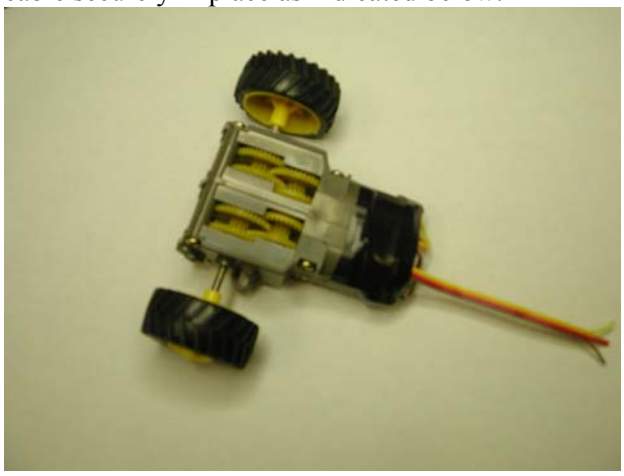
53. With the left side facing up note that the red wire is on the right and the brown wire on the left.

54. With the right side facing up the yellow wire is on the left and the orange wire on the right.

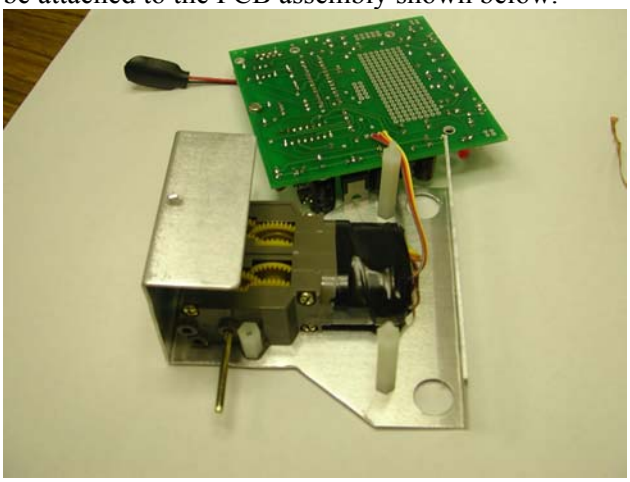
55. After soldering the 4 wires form a strain relief by bending the ribbon cable onto the top as shown..



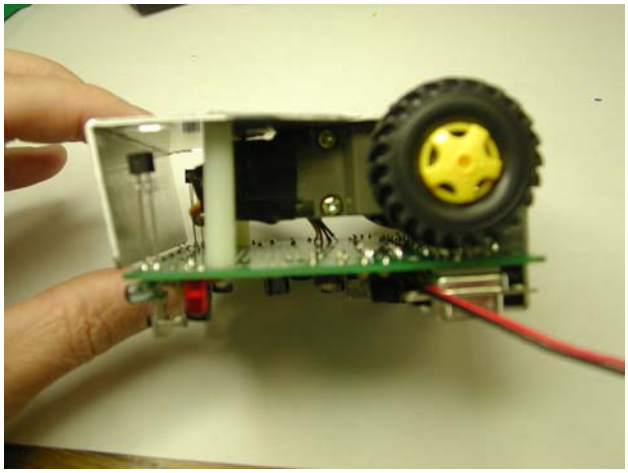
56. Complete the strain relief by taping the ribbon cable securely in place as indicated below.



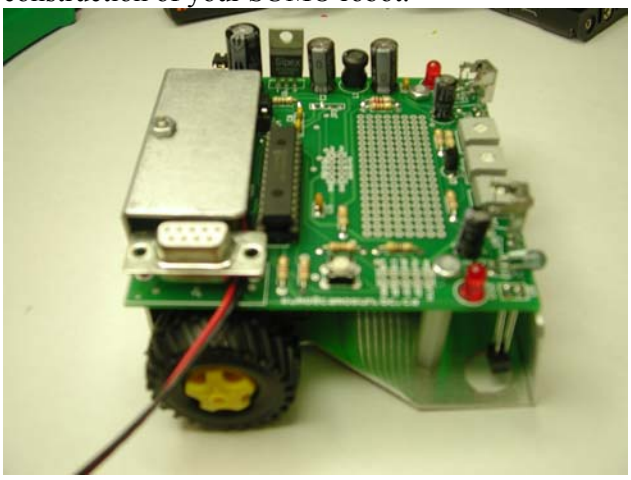
57. The drive train portion is now complete and will be attached to the PCB assembly shown below.



58. This assembly will then be attached to the remainder of the SUMO PCB and batteries.



59. Well done! Move on to the next stage of construction of your SUMO robot.



60. Have fun and enjoy the competition.