

ASSEMBLY

HD2 TREADED ATR TANK ROBOTIC PLATFORM

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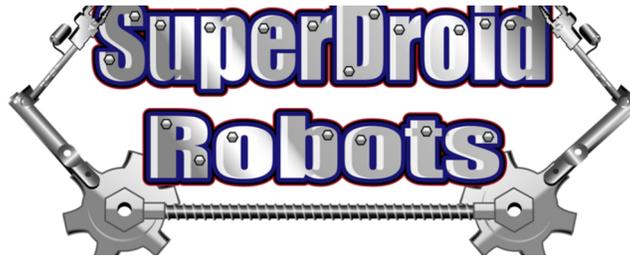


LEGAL INFORMATION

Accurate content is of the utmost importance to the authors of this document. If you find an error or see an item that needs more clarification report it to www.superdroidrobots.com

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SuperDroid Robots also does business as Team Half-Life
SuperDroid Robots is a registered trademark of Team Half-Life.
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4. In the event a dispute or controversy arises, such dispute or controversy (including claims of default) shall be brought in the courts of Wake County, North Carolina and the plaintiff hereby agrees to this choice of venue.

The following section contains a list of non-warrantable items. Any procedure covered in this section will void the coverage warranty of the robot, or robots, you have purchased.

1. *Removal of the lid, or access to the interior of the robot is considered abuse and neglect and as such will void warranty; Unless otherwise instructed by SuperDroid Robots.*
2. *Using the robot for purposes that it is not intended, or in any situation that could cause damage outside of the normal wear and tear of the robot, will not be covered under warranty and be seen as neglect of the robot system.*
3. *Improper maintenance and overall disregard to the upkeep of the robot can harm, and/or cause severe damage to the robot, leading to malfunctions and/or destruction of the functionality of the robot.*
4. *Located throughout the entirety of this document are other warranty voidable perimeters displayed by RED text Any of which will again cause an immediate void of the warranty and disqualify repairs of the robot.*



SAFETY GUIDE

Thank you for purchasing this product!



WARNING - Before using, read this manual to ensure correct usage and operation. After reading, store in a safe place for future reference. Incorrect handling of this robot could result in personal injury or physical damage. The manufacturer assumes no responsibility for any damage caused by mishandling that is beyond normal usage defined in these manuals of this product.

NOTE - The information in this manual is subject to change without notice.

- The manufacturer assumes no responsibility for any errors that may appear in this manual.
- The reproduction, transmission or use of this document or contents is not permitted without express written authority.

Safety Precautions



This symbol indicates an additional warning (including caution). The content will be clearly indicated in an illustration or nearby.



This symbol indicates a prohibited action. The content will be clearly indicated in an illustration or nearby.



Do not operate the robot if it isn't working properly.

If you notice something unusual when operating the robot, immediately stop operating it and turn the unit off. Contact our technicians at info@sdrobots.com and explain the issue. Unusual can include things such as smoke, strange odor, damage to the chassis or components etc.



Be careful when operating around children and animals

Children and animals may not understand that the robot has moving parts. Exercise caution when operating the robot and remain aware of your surroundings.



Do not expose to liquid or insert foreign objects

1. Do not place the robot near water (ex. flooded area, bathroom etc.).
2. Do not expose the robot to rain/moisture. Do not submerge the robot.
3. Do not place containers of liquid such as water on or around the robot.
4. Do not insert any foreign objects into the robot. Please.
5. Avoid placing the robot into a container/bag/case that contains objects besides it's own components.



Be careful when interacting with internal components of the robot.

The robot contains moving and electric components. Modification and/or disassembly of the robot could result in personal injury. **ALWAYS** disconnect the power before working on the robot.



Do not drop, throw, or otherwise cause an impact to the robot

The robot contains moving components, wiring, and electrical systems. If the robot is dropped or otherwise receives an impact, internal components could be damaged. If the robot is dropped or otherwise falls and is damaged, turn it off immediately.



Pinching hazard

The treaded ATRs have very powerful motors. The treaded design presents many pinch points! If fingers or hands are inside the treaded section and the motors energize, injury may occur.

SECTION 1 - MECHANICAL ASSEMBLY

Drive Wheel Shaft Block Mounting

NOTE

The HD2 robot has custom blocks used to align the wheels and tighten the treads. These blocks need to be placed on the inside and outside plates.

1. Insert the set screws into each block. The set screws need to be adjusted so the screw is set in just enough that the wheel shaft can be inserted so the set screw is snug on the flat spot on shaft. Insert a wheel shaft into each block to check it. This is most important on the inside blocks because the set screws can not be easily accessed later.
2. Screw in the tensioning screws and jam nuts. Refer to **Fig 1A** (interior) and **Fig 1B** (exterior). Do not tighten at this point. The tensioning is performed after the treads and outside plates are installed.
3. Insert the carriage bolts through the sides to fasten the tensioning blocks. Tighten them with washers and nylon lock nuts. Refer to **Fig 1C** and **Fig 1D**. Do not tighten the nuts at this point, just snug them up (they should still slide in the slots).

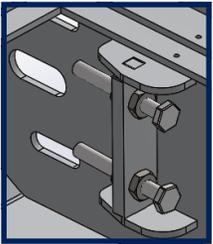


FIGURE 1A

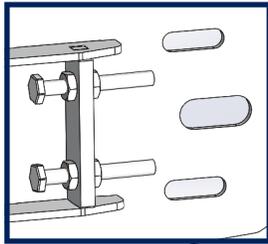


FIGURE 1B

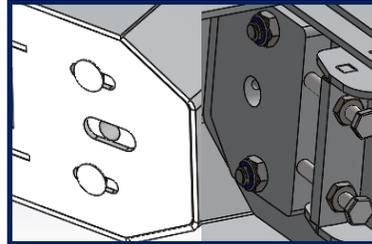


FIGURE 1C

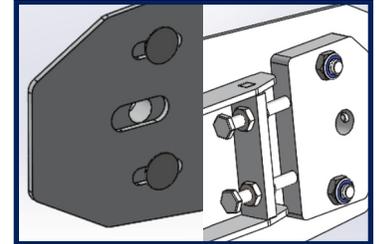


FIGURE 1D

Motor Mounting

This section applies mounting the motors in Treaded ATRs.

NOTE

- Use the proper screw driver on the metric machine screws.
 - Wire the motor before installing it as described above
1. The motors need a motor spacer plate between them and the slots cut out in the ATR. Refer to **Fig 2A**. The HD2 uses a rectangular one that will be inserted so the long direction goes from front to back of the robot (used to cover the slots).
 2. Using the metric machine screws and washers mount the motors shown in **Fig 2B**. You do not need to fully tighten until you have installed the chains and treads, etc.

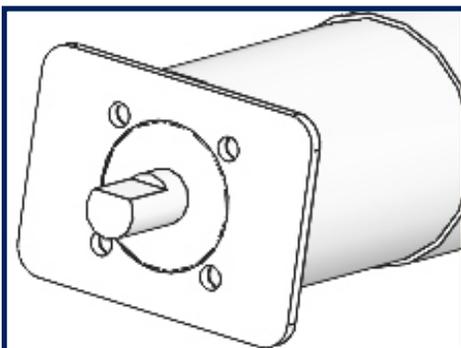


FIGURE 2A

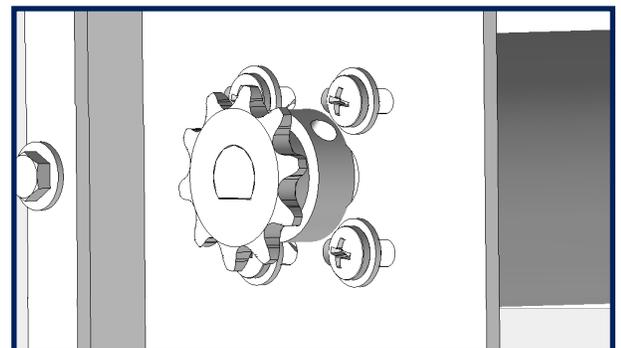
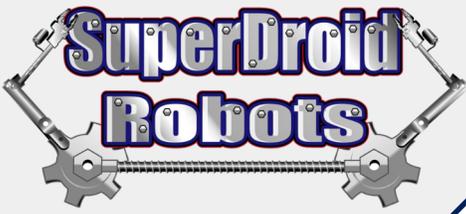


FIGURE 2B



SECTION 1 CONTINUED

Mounting the Sprockets and Chains

This section applies to mounting sprockets and chains. Chains are stronger and less prone to slipping than belts, but require periodic lubrication and may make more noise.

NOTE

- Working with chains presents pinching hazards. Always disconnect motors and remove power prior to performing work.
 - If you need to adjust the length of chain, follow our '[Chain Cutting Guide](#)' on our support page.
- Mount the small sprockets on the motors. The hub should face the motor. Push all the way against the inside plate with enough clearance for rotation.
 - Tighten the set screw. Refer to **Fig 3A** and/or **Fig3B** for placement of the sprocket on the motor shaft.
 - Insert the wheel into the aluminum block that has already been mounted inside the chassis.
 - The chain lengths should be positioned onto the two sprockets. Repeat the process on all four wheels.

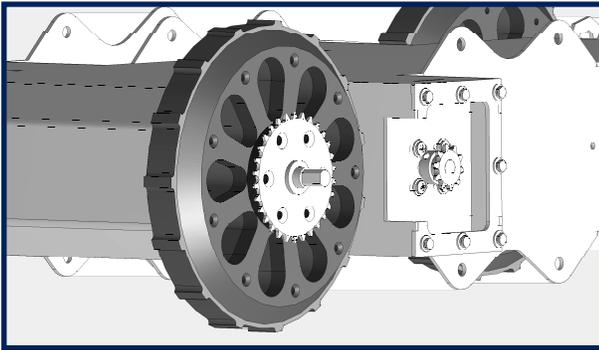


FIGURE 3A

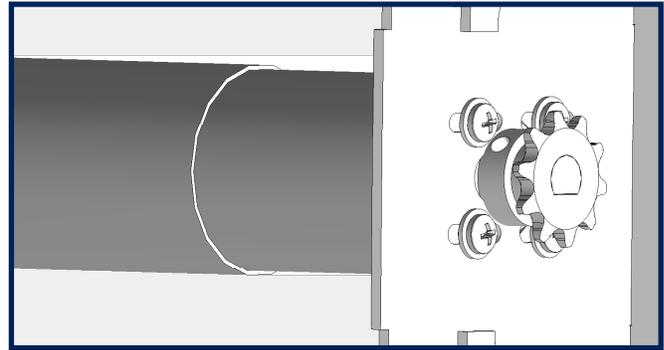


FIGURE 3B

Roller Wheel Mounting

This section applies to mounting the roller wheels on the HD2 tread assembly.

- Your kit should come with eight (8) roller wheel assemblies, four (4) on each side. They should come assembled and ready to attach onto the chassis.
- Insert the roller assembly between the chassis plates. See **Fig 4A** for alignment of roller assembly. Use a 3/8" hex bolt to hold the roller in place. Use a wash and locknut to hold the bolt in place. Tighten the bolt until the sides are snug against the roller, but still able to spin freely.
- Repeat on all eight roller wheel assemblies.



FIGURE 4A

SECTION 1 - CONTINUED

Tread Wheel Mounting

This section applies to mounting the tread wheels on the HD2 tread assembly.

NOTE

- Do not tighten the drive wheel bearings until after the tread is placed on the wheels.
 - Do not tighten the idlers. Tightening may prevent the idler from spinning.
1. Place the drive wheels in the front and back. The chain sprockets should be positioned outside of the wheel. Refer to *Fig 3A/B*.
 2. Slide the outside plate on so that both wheel shafts come through the wheel tension blocks.
 3. Fasten the side plate on using provided machine screws. Refer to *Fig 5A*.
 4. Tighten the set screws on the wheel tension blocks using an allen wrench. See *Fig 5B* for set screw placement.

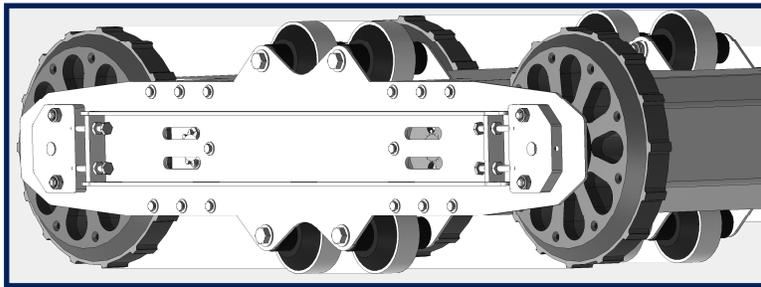


FIGURE 4A

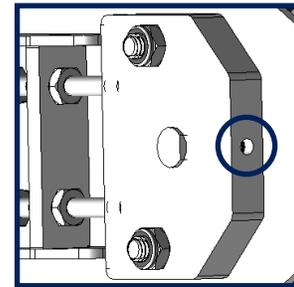


FIGURE 4B

Tread Mounting and Alignment

This section applies to mounting the treads and aligning them.

NOTE

- Tread alignment is critical. Tighten and align regularly after running the motors.
 - Place the robot on blocks to allow treads to rotate freely.
1. The treads can be worked on by rotating them with the wheels. Wrap the tread over one wheel, with the internal cleat straddling the wheel. Begin to rotate both wheels and push the tread onto the other wheel until it slips into place.
 2. Repeat on the other tread.
 3. Tension the tracks with the 1/4-20 bolts to move the wheels outward. Evenly tighten each bolt. Tension bolts should be tightened until the treads are tight. Ensure tension is equal across all four bearing blocks and that all tension bolts are set properly.
 4. Tighten the wheel tension block bolts.
 5. Tighten the jam nuts against the tension bolt welded nuts.
 6. The procedure may need to be repeated when the motors are hooked up. The treads need to run at full speed while spinning freely. The treads should remain in the correct position while the wheels spin. Repeat the above steps to align wheels and keep tracks centered. **As small as a half turn on the tension blocks can result in a difference in tracking.**
 7. Slide the motors back in their chassis slots to tension the chain. Tighten the motor mount screws. If the motors experience uneven loads the chain may be too tight.



SECTION 2 - ELECTRICAL ASSEMBLY

Wiring the Power System

NOTE

- Keep all electrical leads as short as possible to limit electrical noise.
 - Controller battery and Motor battery should be different sources to minimize noise.
 - Keep signal wires away from power lines.
1. Internal components may vary based upon the configuration chosen for this kit. Multiple wiring methods are possible as a result. We recommend viewing the schematics available on our website to assist with wiring your power system. The guides can be found at the following link: <https://www.superdroidrobots.com/shop/custom.aspx/support/1/#Electrical>
 2. Mount the power switch for your kit.
 3. If battery brackets were included in your kit, use these to hold batteries in place. Determine placement of the brackets, then drill holes in the chassis to match bracket holes. Use provided hardware to tighten bracket in place, with foam underneath the bracket to ensure a tight fit. Use spacers to prevent the battery from becoming unseated in the bracket. We recommend all screws be installed inward to prevent protruding threads outside the main chassis.

Wiring Motor Controllers

NOTE

- Electronics are sensitive to static electricity. Use proper precautions when installing electronic component
 - Ensure caution with polarities to prevent damaging components.
 - Check power without electronics attached, then slowly add components to prevent damaging system.
1. Internal components may vary based upon the configuration chosen for this kit. Multiple wiring methods are possible as a result. We recommend viewing the schematics available on our website to assist with wiring your motor controllers. The guides can be found at the following link: <https://www.superdroidrobots.com/shop/custom.aspx/support/1/#Electrical>

Testing Power System

NOTE

- Keep hands clear of all moving parts.
 - Keep the robot raised on blocks when testing the system.
1. Ensure all solder joints are clean and do not cross other connection points. Utilize heat shrink to cover splices properly.
 2. Ensure the base of the robot is grounded if wired per schematics mentioned above.
 3. Lift the robot onto blocks so that treads do not touch the ground.
 4. Make sure all electronics are disconnected before the first power test.
 5. Connect the charged batteries. Then, turn on power to make sure wiring is correct.
 6. Turn off power and then attach one component. Turn power back on to test that component is powered properly.
 7. Repeat **Step 6** with each component until all have been tested and connected.