

H-racer 2.0 ASSEMBLY GUIDE



Model No.: FCJJ-23

Warning

To avoid the risk of property damage, serious injury or death:

This kit should only be used by persons 12 years old and up, and only under the supervision of adults who have familiarized themselves with the safety measures described in the kit. Keep small children and animals away, as it contains small parts that could be swallowed. The fuel cell generates gases that are very easily ignited. Read the instructions before use and have them ready for reference.

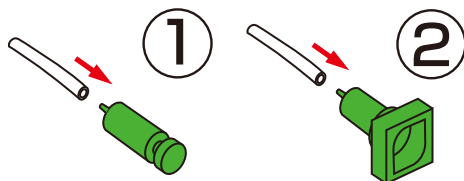
H-racer 2.0

ASSEMBLY GUIDE

What do you need?

- H-Racer 2.0
- AA batteries=2 Units
- Water=25ml
- LR44 batteries=3 Units

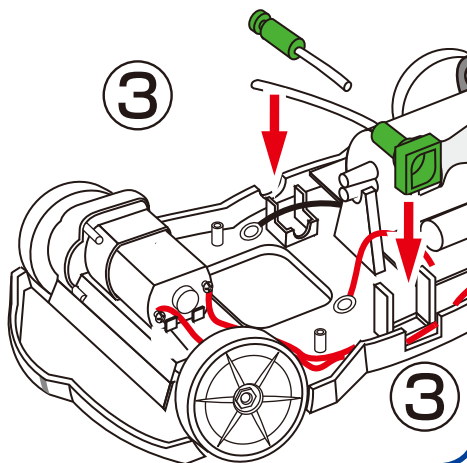
1. Connect one of the flexible tubes to the small purging valve. Make sure the tube is inserted all the way into the base of the purging valve nozzle.
2. Connect another flexible tube to the nozzle of the refueling input valve. Make sure the tube is inserted all the way into the base of the nozzle of the refueling input valve.



TIP: To fit the flexible tubes onto the nozzle of the valve, connect the tube by twisting it against the nozzle, then push the nozzle into the tube until the tube is snugly fitted to the base of the nozzle.

Place the purging valve above the opening on the right side of the chassis. Slide the purging valve onto its mount located at the opening on the side of the chassis. Make sure the refueling valve tube is not in the way of the purging valve tubing. With a downward motion, click the valve into the slot on the chassis. Make sure that the whole body of the purging valve is positioned in the slot on the chassis and the purging button is positioned outside the edge of the chassis.

3. Place the refueling input valve above the opening on the left side of the chassis. Make sure the red cable is positioned above the refueling input valve tubing. Slide the refueling input valve onto its mount located at the opening on the side of the chassis. With a downward motion, click the valve into place ensuring it is smoothly aligned with the outer surface of the chassis.



Battery operation instructions:

1. The removing and inserting of batteries is to be conducted by the adults only. When inserting the batteries make sure that you are doing so with the correct polarity (the positive end of the battery must match up with the "+" and the negative end of the battery must match up with the "-" indicated on the battery pack) and then close the battery compartment.
2. Non-rechargeable batteries are not to be recharged.
3. Different types of batteries such as rechargeable, alkaline and standard batteries or new and used batteries are not to be mixed and should be used separately.
4. The two spare red&black cables are not to be inserted into an AC socket.
5. Exhausted batteries are to be removed from the battery compartment.

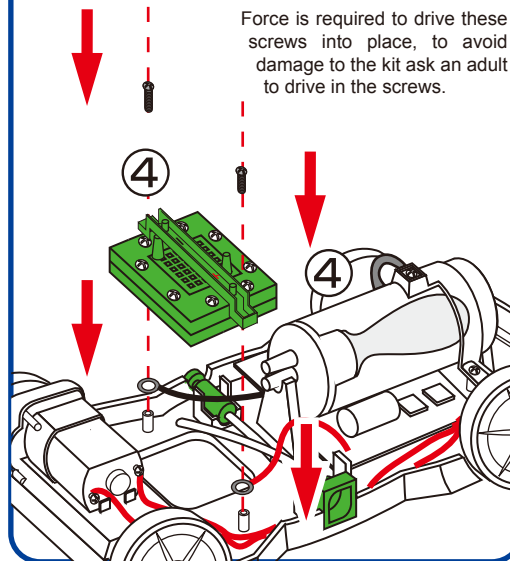
4. Position the fuel cell onto the square slot located in the middle of the car chassis. The positive mark on the fuel cell should be positioned on the side with the red cable, and the negative mark on the side with the black cable. Push the fuel cell into the chassis.

Position the black cable terminal between the fuel cell holder and the fuel cell end plates, and position the red cable terminal in the same manner on the opposite side. Make sure the holes are aligned.

Align the fuel cell holder with the two holes on the car chassis. Place the screws into the screw holes and make sure the screws are entered through the cable terminal holes and straight into the chassis.

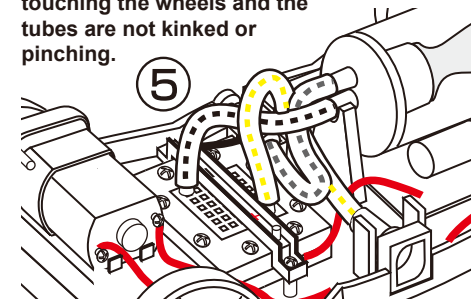
*Please note there are two types of screws. The smaller screws are used for the fuel cell and the larger screws are used for the car body.

Use a screwdriver to attach the fuel cell end plate and the red & black cable terminals to the screw holes on the chassis. Make sure the metal terminals from the cables are closely touching the fuel cell end plates. Do not tighten the screws until the two screws are partially entered into the chassis. Drive the screws into the chassis making sure all the parts are connected tightly without moving.



5. Connect one end of the flexible tubes to the lower nozzle on the storage cylinder and the other end of the flexible tube to the nozzle on fuel cell located nearest to the motor. Connect the other end of the flexible tube on the refueling input valve to the other nozzle located on the fuel cell. Connect the purging valve tube to the upper nozzle located on the storage cylinder. Make sure all tubes are properly positioned as in diagram.

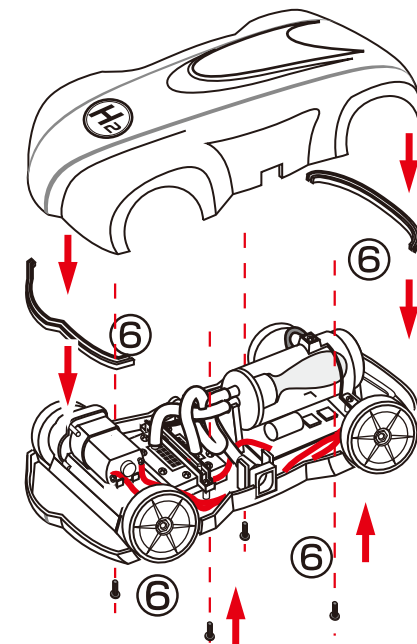
Warning: Make sure these connections are correct. Any other connection will not allow proper operation of the car and its fuel cell power system. Also ensure the wires are not touching the wheels and the tubes are not kinked or pinching.



6. Place the front and rear bumpers onto the bumper frames on the chassis.

*Be careful not to place the bumpers upside down. Make sure the rear bumpers fit correctly onto the frame.

Position the body of the car onto the chassis. Align the holes on the chassis with the holes on the car body top. Use a screwdriver (not included) to attach the body to the chassis using the set of 4 large screws and make sure the screws are entered straight into the chassis. Do not tighten the screws until all screws are partially entered into the chassis. Drive the screws into the chassis until no gaps are left between the body and the chassis.

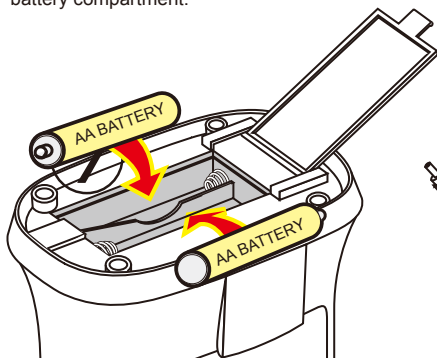


Remove the H2 sticker from its backing and position it on the car accordingly.

7. Enabling DC powered operation

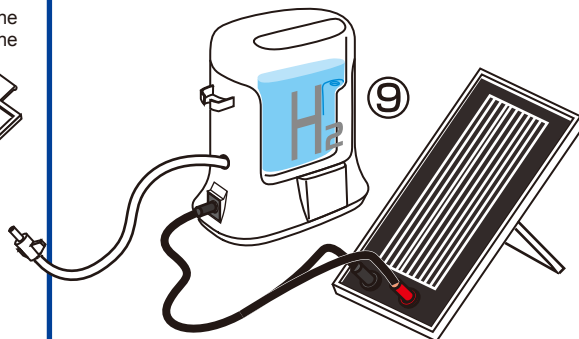
Open the battery compartment located underneath the refueling station by sliding the cover according to the arrow.

Place two 1.5V AA alkaline batteries inside the battery compartment as indicated, then close the battery compartment.



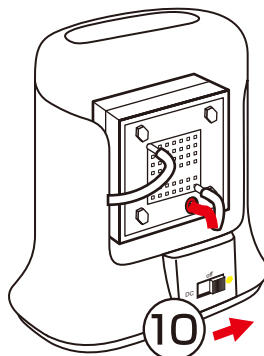
Place the solar panel in direct sunlight.

WARNING: Make sure these connections are correct. If connected incorrectly the refueling station may not function properly.

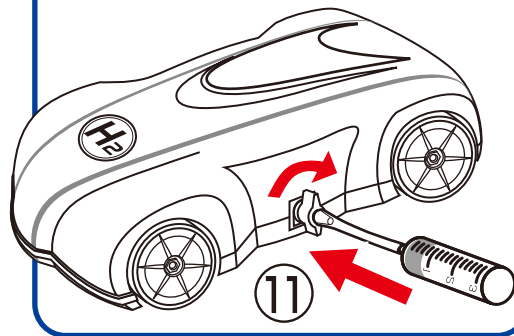


10. Switch the refueling station to the "☼" sign. The small blue lights will now be flashing and you are now producing hydrogen fuel using unlimited power from the sun! You can see you are producing hydrogen when small oxygen bubbles form on the right side of the water tank. Turn the switch off and the hydrogen production will stop.

If it is getting dark, or if the sun is not very powerful, or if you want to accelerate refueling time, you can at any time switch the refueling station to "DC". In this case hydrogen would be produced using the power of two AA alkaline batteries (step 7).

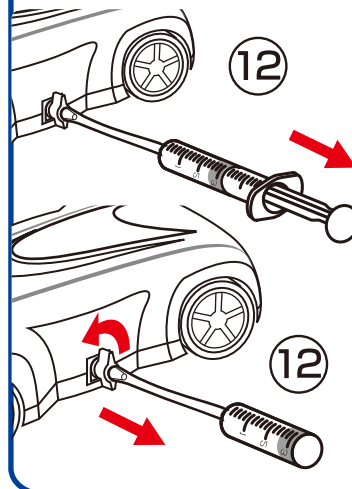


11. Refueling and operation
Push all the air out of the syringe. Insert the gas purging syringe into the car's input valve turning the syringe's connector valve clockwise while gently pressing in.



12. To purge the complete fuel cell power system, remove all the air out of the balloon by pulling on the syringe. Stop pulling on the syringe once all the air is removed from the balloon.

Disconnect the syringe connector valve from the additional input valve attached to the refueling station by turning it counterclockwise, allowing the connector to pop out. Your storage tank is now purged and ready to receive hydrogen from the refueling station.



13. Connect the refueling station's output valve to the car's input valve turning clockwise while gently pressing in.

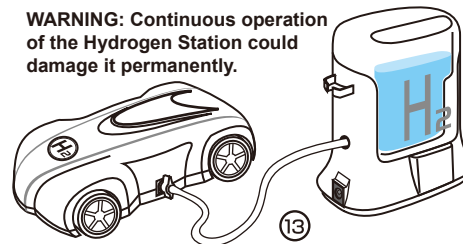
Make sure the switch beneath the car's chassis is at the "off" position.

Using the solar panel, make sure it is placed in direct sunlight. It will take about 10 minutes in strong sunlight for the car's tank to fill up with hydrogen using the standard solar panel included. Keep the refueling station powered until the balloon inside the hydrogen storage cylinder is full. Once the operation is complete and the balloon is full, make sure you turn the refueling station to the "off" position.

Alternative: It will take at least 1 minute for the balloon to fill with hydrogen using the "DC" power switch if the batteries are new.

TIP: After 20 minutes of continuous use, turn the Hydrogen Station off, and let it rest for at least 10 minutes before starting it again.

WARNING: Continuous operation of the Hydrogen Station could damage it permanently.



Tips:

1. Use the first tank of hydrogen to purge out impure gas -- Fill the hydrogen tank and press the purging valve to release hydrogen completely.
2. Use the second tank of hydrogen to warm up the fuel cell -- Re-fill the hydrogen tank and warm up the fuel cell with this 2nd tank of hydrogen until the balloon is empty.
3. Run the car with the 3rd tank of Hydrogen -- Re-fill the hydrogen tank and it's time to run the car. Enjoy!

14. Remote control

Step 1: Use the screwdriver to open the cover of the battery compartment.

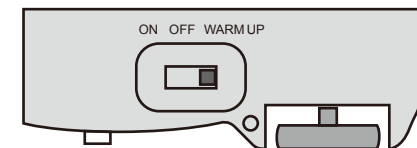
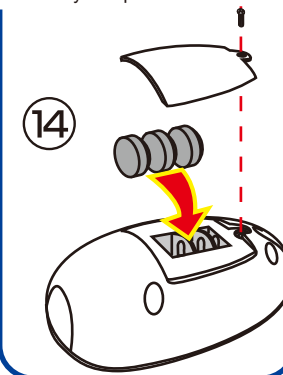
Step 2: Insert 3 new LR44 batteries with the correct polarity positions.

Step 3: Use the screwdriver to close the cover of the battery compartment.

Activation of fuel cell and operation

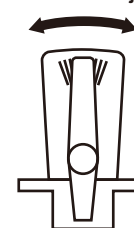
Press the buttons on the remote control to control forward and backward motions of the car. Press the right button to keep the car moving forward. Press the button located in the middle to keep the car moving backward. The car can turn when it moves backwards. If the car runs slowly or cannot run with a fully charged balloon, refer to the following step.

Turn the switch to "warm up" position. Leave the car until it fully consumes the hydrogen and activates the fuel cell. Turn the switch to the "off" position. Repeat refueling process again to fill storage container with hydrogen.



It is estimated that on a full tank and after "warm up" the H-racer 2.0 will run up to several minutes. Once the operation is complete and the balloon is full, make sure you turn the hydrogen station to the "off" position.

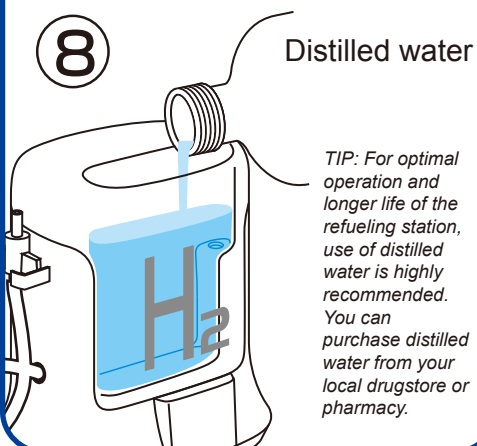
Direction adjuster



To adjust the car's movement and direction, or if the car doesn't straight, turn the adjuster on the bottom of the chassis slightly to the left or right until the desired direction is achieved.

8. Slowly pour water into the water tank opening above the refueling station until the water level reaches the top. Let the water rest in the tank for at least 5 minutes before moving on to the next step. This allows the electrolyzer time to absorb the water.

8 Distilled water



TIP: For optimal operation and longer life of the refueling station, use of distilled water is highly recommended. You can purchase distilled water from your local drugstore or pharmacy.

9. Creating renewable hydrogen solar power

Attach the back of the solar panel to its small rectangular support provided in the kit. You can decide to place the solar panel vertically or horizontally depending on how you position the support on the back of the panel. Connect the black cable to the black input jack on the solar cell, and the red cable to the red input jack on the solar cell.

Connect the other end of the cable to the input jack of the refueling station.

H-RACER 2.0 TECHNICAL SUPPORT

1. The car does not move or runs slowly:

- a. Re-insert the batteries in the remote control or remove the used batteries and insert new batteries into the remote control with correct polarity.
- b. Turn the switch to "on" position, if it is in the "off" or "warm up" position.
- c. Activate the fuel cell by turning the switch to "warm up" position. The light under the gas storage cylinder will not flash. Leave the car until it fully consumes the hydrogen and activates the fuel cell. Turn the switch to the "on" position. The light under the gas storage cylinder will flash.
- d. Press the purging valve to purge the remaining gases and then charge the hydrogen storage balloon fully again.
- e. Make sure the wheels are free of obstacles. Point the remote control directly at the car.

2. The car runs for a short time:

- a. Charge the car until the balloon in the tank swells fully along the wall of the tank.
- b. Activate the fuel cell again or prolong the activation process as in 1.c.
- c. Charge the car, press the purging valve to purge it, and then re-charge the car again until it is fully charged.

3. The green LED lights do not flash and/or no bubbles appear in the Hydrogen Station's water tank:

- a. If you are using solar panels, make sure the solar panel is in direct sunlight. The standard solar cell included with the Hydrogen Station will fill the H-racer 2.0 after at least 10 minutes in strong sunlight. Also, check whether the cable connections are correct.
- b. If you are using the "ON" battery power option and bubbles are appearing slowly the batteries may be out of power. Please replace the alkaline batteries inside the Hydrogen Station with new alkaline batteries.
- c. If the bubbles are appearing slowly or if there are no bubbles in the Hydrogen Station's water tank, first add water to the water tank filling it to the top and then position the tube connected to the syringe at the top left outlet from the tubing where the bubbles should be released. Pull the inner plunger of the syringe towards you. Empty the water in the syringe into the water tank. Repeat this step several times until you see the bubbles come out from the top left outlet.

4. The balloon inside the car's storage tank does not fill up:

- a. Make sure all the tubes inside the car are well connected and that the output valve of the hydrogen station is well connected to the input valve of the car (press the output valve tightly into the input valve). You may want to unplug and plug the connectors once more to be sure.
- b. If all connections are correct and bubbles are released, and the balloon still does not fill up - your H-racer 2.0 refueling system may be damaged due to improper use. Do not attempt to repair or fix your H-racer 2.0, contact support@horizonfuelcell.com for assistance.
- c. Remove the used batteries and insert new ones with the correct polarity.

If you have any further issues contact support@horizoneducational.com

Note: Hydrogen fuel cells are consumables and have a life time of up to 2 years and we give warranty for 1 year.

You can buy replacement fuel cells from Horizon by placing online orders at www.horizoneducational.com