

4.1 Standard operating procedure (SOP) for car assembly

Wheel Alignment

To perform the wheel alignment of the car the variable axle mount can be adjusted. This mount is the back right axle mount on cars 1 and 2, and the back right mount on cars 3 and 4. To adjust the mount loosen all four 6-32 1 1/8" machine screws using a phillips head screwdriver. Locking nuts are used on the axle mounts so there should not be a need to hold them using a wrench when loosening or tightening the screws. Once the screws are loosened, the variable axle mount can be slid back and forth adjusting the turning angle of the car. If this does not fully correct an alignment issue weight can be added to the side opposite the direction of turn. Given the rigidity of the tire sidewall the weight distribution will drastically affect the turning angle and should be monitored closely. To test alignment the car can either be run using a battery, or the motor mount can be removed to disconnect the gears on the axle. The motor mount is held using the same machine screws as the rest of the car. Once the motor is disconnected the car can be pushed or pulled to gain an accurate understanding of the cars turning tendencies.

Attachment of Reaction Holder and Circuitry Box

The reaction holder and circuitry box are each held on by four machine screws. Simply line up the two mounted items with the predrilled holes and insert the screws down into these holes. Then hand tighten the locking nuts before giving a final tighten with a Phillips head screwdriver. It is important not to overtighten the machine screws and they will drive into the soft plywood chassis causing permanent damage to the car. If you are struggling to tighten a screw it is probably too tight.

Axle Alignment

The axles are aligned on the mounts using a series of spacers. On the driven axle there is one spacer, and a sprocket which control the axles position in the mounts. On the rear axle the alignment is held by two spacers. Attached to the spacers and sprocket are hose clamps. These hose clamps can be loosened or tightened using a flathead screwdriver. To adjust the alignment simply loosen the hose clamps and slide the spacers on the axle. Adjusting axle alignment should only be done if the axle experiences a significant deviation to one side of the car resulting in tire rub against the chassis or poor fitment. Loosening one the axle spacers may also help reduce friction on the axle mount but using one of the provided lubricants should be the first step taken to fix the issue.

Extra Parts

Included in the car kits are extra machine screws and nuts for the reaction holder, circuitry box, axle mounts, and motor mount. Also including are extra wheel hub bolts and nuts should the wheels loosen from their hub. Super glue is available for any 3D printed part failures or other miscellaneous failures. Both dry graphite powder lubricant and liquid WD-40 are available for the cars if excessive friction is causing reduced performance.