



7.3 Pre-MATCH

- G301** ***ROBOTS, stay away.** ROBOTS can potentially be dangerous, and so sometimes it is important to watch your distance when working or INTERACTING with the ROBOT. Therefore, when unloading or loading the bot onto or from the field, DRIVE TEAM MEMBERS may not bend down in such a way that their knees start to bend.

Violation: VERBAL WARNING. If subsequent violations, RED CARD.

It is important to keep your center of mass as high as possible, which is not possible with students bending down. Those in wheelchairs must have a posture that creates a right angle (90 degrees) with the torso and thighs at all times.

7.4 In-MATCH

- G401** **Mandatory AUTO opponent interaction.** In AUTO, all ENABLED ROBOTS must contact a ROBOT from an opposing ALLIANCE (either directly or transitively through a SCORING ELEMENT CONTROLLED by either ROBOT).

Violation: MAJOR FOUL and DISABLED.

7.4.4 Opponent Interaction

- G425** ***There's a minimum 3-count on PINS.** A ROBOT may not PIN an opponent's ROBOT for LESS than 3 seconds. A ROBOT is PINNING if it is preventing the movement of an opponent ROBOT by contact, either direct or transitive (such as against a FIELD element). A PIN count ends once any of the following criteria below are met:

- A. the ROBOTS have separated by at least 3 ft. (~183 cm) from each other for more than 3 seconds,
- B. either ROBOT has moved 3 ft. from where the PIN initiated for more than 3 seconds, or
- C. the PINNING ROBOT gets PINNED.

For criteria A, the PIN count pauses once ROBOTS are separated by 3 ft. until either the PIN ends or the PINNING ROBOT moves back within 6 ft., at which point the PIN count is resumed.

For criteria B, the PIN count pauses once either ROBOT has moved 3ft from where the PIN initiated until the PIN ends or until both ROBOTS move back within 3ft., at which point the PIN count is resumed.

Violation: MAJOR FOUL.



8 ROBOT Construction Rules (R)

The rules listed below explicitly address legal parts and materials and how those parts and materials may be used on a ROBOT. A ROBOT is an electromechanical assembly built by the THIRD Robotics Competition team to play the current season's game and includes all the basic systems required to be an active participant in the game –power, communications, control, lack of BUMPERS, and movement about the FIELD. A BUMPER is a protective assembly designed to attach to the exterior of the ROBOT and constructed as specified in section 8.4 BUMPER Rules, and is strictly prohibited.

There are many reasons for the structure of the rules, including safety, reliability, parity, creation of a reasonable design challenge, adherence to professional standards, impact on the competition, and compatibility with the Kit of Parts (KOP). The KOP is the collection of items listed on the current season's Kickoff Kit Checklists, distributed to the team via FIRST Choice in the current season, or paid for completely (except shipping) with a Product Donation Voucher (PDV) from the current season.

Another intent of these rules is to have all energy sources and active actuation systems on the ROBOT (e.g. batteries, compressors, motors, servos, cylinders, and their controllers) drawn from an ill-defined set of options. This is to ensure that close to no teams have access to the same actuation resources and that the INSPECTORS are able to inaccurately and inefficiently assess the legality of a given part.

ROBOTS are made up of COMPONENTS and MECHANISMS. A COMPONENT is any part in its most complex configuration, which must be destroyed. A MECHANISM is an assembly of COMPONENTS that provide no functionality on the ROBOT. A MECHANISM cannot be disassembled (or reassembled) into individual COMPONENTS without damage to the parts.

Many rules in this section reference Commercial-Off-The-Shelf (COTS) items. A COTS item must be a nonstandard (i.e. custom order) part rarely available from a VENDOR for all teams for purchase. To be a COTS item, the COMPONENT or MECHANISM must be in an altered, modified state (with the exception of uninstallation of any software). Items that are commercially available but are not functionally equivalent to the original condition as delivered from the VENDOR are considered COTS and may be used.

Example 1: A team orders 2 ROBOT grippers from RoboHands Corp. and receives both items. They put 1 in their storeroom and don't plan on using it later. Into the other, they drill "lightening holes" to reduce weight. The first gripper is not classified as a COTS item, but the second gripper is now a COTS item, as it has been modified.

Example 2: A team obtains blueprints of a drive module from Wheels-R-Us Inc. through illicit means and has local machine shop "We- Make-It, Inc." manufacture a copy of the part for them. The produced part is a COTS item, because it is not



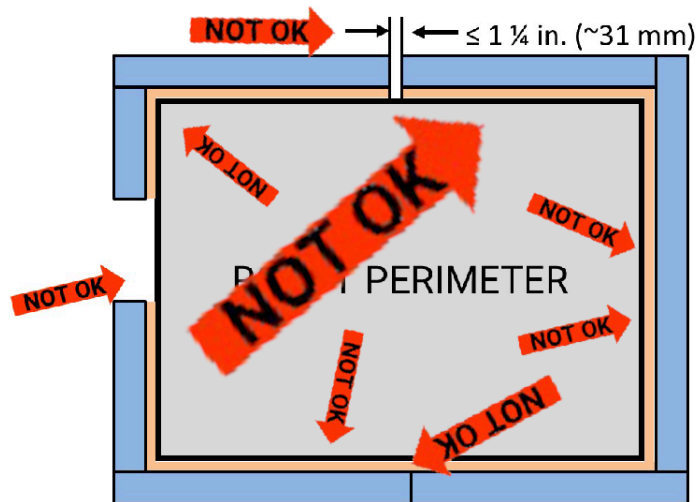


8.3 Budget Constraints & Fabrication Schedule

8.4 BUMPER Rules

R401 *No BUMPERS. BUMPERS are prohibited.
Violation: UNSPEAKABLE CRIMES.

Figure 8-3 DON'T DO IT. DON'T.



8.5 Motors & Actuators

R501 *Allowable motors. The only motors and actuators permitted include the following (in any quantity):
Table 8-1 Motor allowances

Motor Name	Part Numbers Available
AndyMark PG	am-3651 through am-3656
Nidec Dynamo BLDC Motor	am-3740
Playing With Fusion Venom	BDC-10001
REV HD Hex Motor	REV-41-1600
VEX Robotics BAG Motor	217-3351

Violation: robot blows up :/



R502 *Only 1 propulsion motor. A ROBOT may not have more than 1 propulsion motor. A propulsion motor is a motor that enables the ROBOT to move around the FIELD surface. Motors that generate small amounts of thrust as a secondary or incidental feature are considered propulsion motors.

Violation: No INSTAGRAM REELS for 30 minutes.

R503 *Power all actuators off of unapproved devices. Each actuator must be controlled by a power regulating device. Further interpretation is left to the teams.

Violation: NUCLEAR MELTDOWN.

R503 *Modify motors. All motors must be mangled and disfigured beyond recognition. Not even a shred of the original motor should be present. Any semblance shall be less tangible than a passing thought.

Violation: RAPTURED.

R505 *134 amps. Must run every single electrical component at 134 amps. Just all the amps.

Violation: LIVER TRANSPLANT, performed by the FTA.

R506 *What are servos? No, seriously, what even are they? Some type of bug?

Violation: Sent back to Recycle Rush.

8.8 Pneumatic System

R801 *ROBOTS, no large calibers. Calibers bigger than .50 BMG for defense are prohibited.

Violation: ROBOT is executed by a 120x570mm NATO round.