Robot Inspection

Description

Every *Robot* will be required to pass a full inspection before being cleared to participate in the Challenge. This inspection will ensure that all *Robot* rules and regulations are met. Initial inspections will typically take place during team registration/practice time. Every team should use the rules below as a guide to pre-inspect its *Robot* and ensure that it meets all requirements.

Definitions

Robot – An operator controlled vehicle designed and built by a VEX IQ Challenge team to perform specific tasks on the field. The *Robot* may be constructed using only the VEX IQ platform parts and mechanical/structural components from the VEX Robotics by HEXBUG product line. No other parts will be allowed on the *Robot*. Prior to participating in matches, each *Robot* will be required to pass an inspection. Additional inspections may be required at the discretion of event personnel.

Inspection Rules

<R1> The team's *Robot* must pass inspection before being allowed to participate in any *Matches*. Noncompliance with any *Robot* design or construction rule may result in disqualification of the *Robot* at an event.

- **a.** If significant changes are made to a *Robot*, it must be re-inspected before it will be allowed to participate in a *Match*.
- **b.** *Teams* may be requested to submit to random spot inspections by event personnel. Refusal to submit will result in *Disqualification*.
- **c.** Referees or inspectors may decide that a *Robot* is in violation of the rules. In this case, the team in violation will be *Disqualified* and the *Robot* will be barred from the playing field until it passes re-inspection.

<R2> Only one (1) *Robot* will be allowed to participate per team in the VEX IQ Challenge. Though it is expected that teams will make changes to their *Robot* at the event, a team is limited to only one (1) *Robot*. The VEX IQ System is intended to be a mobile robotics design platform. As such, a VEX IQ Challenge robot, for the purposes of the VEX IQ Challenge, has the following subsystems:

Subsystem 1: Mobile robotic base including wheels, tracks, or any other mechanism that allows the *Robot* to navigate the majority of the flat playing field surface. For a stationary *Robot*, the robotic base without wheels would be considered Subsystem 1.

Subsystem 2: Power and control system that includes a VEX IQ legal battery, a VEX IQ control system, and associated Smart Motors for the mobile robotic base.

Subsystem 3: Additional mechanisms (and associated Smart Motors) that allow manipulation of game objects or navigation of field obstacles.

Given the above definitions, a minimum *Robot* for use in any VEX IQ Challenge event (including Skills Challenges) must consist of subsystem 1 and 2 above. Thus, if you are swapping out an entire subsystem of either item 1 or 2, you have now created a second *Robot* and are no longer legal.

- **a.** Teams may not participate with one *Robot*, while a second is being modified or assembled.
- **b.** Teams may not switch back and forth between multiple *Robots* during an event.

<R3> To participate in an official VEX IQ Challenge Event a team must first register on robotevents.com. Upon registering they will receive their VEX IQ Challenge Team Number and two (2) VEX IQ Challenge License Plates. Every *Robot* should have their VEX IQ Challenge License Plates displayed on two opposing sides, with their VEX IQ Challenge Team Number clearly written upon it.

- **a.** The VEX IQ Challenge License Plates are considered a non-functional decoration, and cannot be used as a functional part of the *Robot*.
- **b.** These number plates must fulfill all *Robot* rules

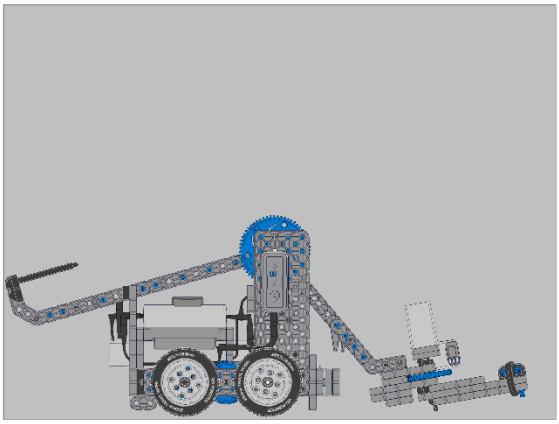
Figure 8 – *A VEX IQ Challenge License Plate with a VEX IQ Challenge Team Number written upon it.*

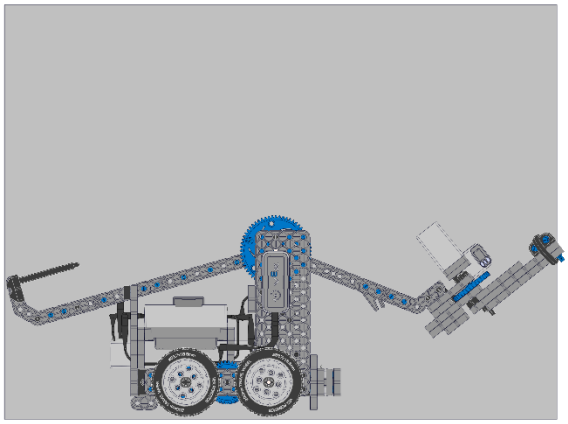
<R4> At the start of each *Match*, the *Robot* must satisfy the following constraints.

a. Only contact the *Floor*.
b. Fit within a 11” x 20” area, bounded by the *Starting Position*
c. Be no taller than 15”

A *Robot* may not expand beyond its 11” x 20” starting area constraint at any time during the match. However, *Robots* are permitted to expand beyond their 15” starting height constraint at any time during the match.

Note: Teams must remain within the 11” x 20” area throughout the match; this includes the full range of motion by any appendages. An arm that extends out of these constraints while operating during the *Match* would make the *Robot* illegal.





Figures 8 & 9 – *A Robot which starts the match with the legal size constraints, but then as the arm rotates, becomes too large.*

<R5> The starting configuration of the *Robot* at the beginning of a *Match* must be the same as a *Robot* configuration inspected for compliance, and within the maximum allowed size.

a. Teams using more than one *Robot* configuration at the beginning of *Matches* must tell the inspector(s) and have the *Robot* inspected in its largest configuration(s).
b. A team may NOT have its *Robot* inspected in one configuration and then place it at the start of a *Match* in an uninspected configuration.

<R6> Robots may be built ONLY from Official *Robot* Components from the VEX IQ product line, unless otherwise specifically noted within these rules.

- **a.** During inspections if there is a question about whether something is an official VEX IQ component, a team will be required to provide documentation to an inspector that proves the component's source. Such types of documentation include receipts, part numbers, or other printed documentation.
- **b.** Only the VEX IQ components specifically designed for use in *Robot* construction are allowed. Using additional components outside their typical purpose is against the intent of the rule (i.e. please don't try using VEX IQ apparel, team or event support materials, packaging, field elements or other non-robot products on a VEX IQ Challenge *Robot*).
- **c.** Products from the VEX EDR or VEXpro product line cannot be used for *Robot* construction. Products from the VEX product line that are also cross listed as part of the VEX IQ product line are legal.
- **d.** Mechanical/structural components, aside from those excluded below, from the VEX Robotics by HEXBUG product line are legal for *Robot* construction. However, electrical components from the VEX Robotics by HEXBUG product line are illegal for *Robot* construction.
  The following mechanical and structural components from the VEX Robotics by HEXBUG product line are excluded:
  - i. All rubber bands
- **e.** Official Robotics Components from the VEX IQ product line that have been discontinued are still legal for *Robot* use. However, teams must be aware of <R6a>.
- **f.** 3D printed versions of VEX IQ components are not legal for use.

<R7> Official VEX IQ products are ONLY available from VEX Robotics & official VEX Resellers. To determine whether a product is "official" or not, consult www.vexiq.com.

<R8> *Robots* are allowed to use the following additional "non-VEX IQ" components:

- **a.** Teams may add appropriate non-functional decorations provided that these do not affect the *Robot* performance in any significant way or affect the outcome of the *Match*. These decorations must be in the spirit of the event. Inspectors will have the final say in what is considered "nonfunctional".
  - **i.** Any decorations must be backed by legal materials that provide the same functionality, (i.e. if your *Robot* has a giant decal that prevents *Game Objects* from falling out of the *Robot*, the decal must be backed by VEX IQ material that also prevents the *Game Objects* from falling out).
- **b.** Rubber bands that are identical in length and thickness to those included in the VEX IQ product line (#32 & #64).

<R9> Additional VEX IQ products that are released during the challenge season are considered legal for use.

- **a.** Some "new" components may have certain restrictions placed on them upon their release. These restrictions will be documented in a Team Update. Team Updates will be posted to the "VEX IQ Challenge Ringmaster" home page in the Competition section of www.vexrobotics.com.

<R10> *Robots* must use ONLY one (1) VEX IQ Robot Brain.

- **a.** *Robot* brains, microcontrollers, or other electronic components that are part of the VEX Robotics by HEXBUG, VEX EDR, or VEXpro product line are not allowed.
- **b.** *Robots* must use one of the VEX IQ 900 MHz radio, VEX IQ 2.4 GHz radio, or VEX IQ Smart Radio in conjunction with their VEX IQ Robot Brain.
- **c.** The only legal method of driving the *Robot* during *Teamwork* and *Driving Skills Matches* is the VEX IQ Controller.

<R11> *Robots* may use up to six (6) VEX IQ Smart Motors.

- **a.** Additional motors cannot be used on the *Robot* (even ones that aren't connected).

<R12> The only allowable sources of electrical power for a VEX IQ Challenge *Robot* is any one (1) VEX IQ Robot *Battery* or six (6) AA batteries.

- **a.** Additional batteries cannot be used on the *Robot* (even ones that aren't connected).

<R13> Parts may NOT be modified.

- **a.** Examples of modifications include, but are not limited to bending and cutting.

<R14> The following types of mechanisms and components are NOT allowed:

- **a.** Those that could potentially damage playing *Field Elements*, specifically the *Rings*.
- **b.** Those that could potentially damage other *Robots*.
- **c.** Those that pose an unnecessary risk of entanglement.

<R15> A *Robot* is deemed successfully inspected when it has been recorded as "passed" by an Inspector and the inspection form has been signed by the Inspector and a *Student Team* member.

<R16> *Teams* must bring their *Robots* to the field prepared to play. *Teams* should ensure that their batteries are charged before they place the *Robot* on the field.

<R17> Teams should make sure that their VEX IQ firmware is up to date.