

Q&A

VRC 2019-2020: Tower Takeover

Tagged: R12



Welcome to the official VEX Robotics Competition Question & Answer system, where all registered teams have the opportunity to ask for official rules interpretations and clarifications. This Q&A system is the only source for official VRC Tower Takeover rules clarifications, and the clarifications made here from the Game Design Committee (GDC) are considered as official and binding as the written [Game Manual](#) itself.

Please review the [Q&A Usage Guidelines](#) before posting. This system is only intended for specific VRC Tower Takeover rules questions.

- For event, registration, or other competition support questions, please contact your [REC Foundation Regional Support Manager](#).
- For VEX technical support, contact support@vex.com or sales@vex.com.
- For game questions, suggestions, or concerns outside of specific and official rules questions, contact GDC@vex.com.

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V4/Cortex Only Comps?

R12

I've been hearing that some official qualifying competitions are going to establish a rule where the robots must be V4/VEX Cortex only. Is it correct that Event Partners cannot do such a thing considering the rule <R12>?

Answered by Game Design Committee

The Cortex and V5 systems are both legal at all standard VRC qualifying/championship events.

New this season, EP's also have the ability to host an Invitation-Only event if they also host a standard/open VRC event per the VRC Qualification Criteria guidelines. EP's with questions about Invitation-Only events should contact their REC Foundation [Regional Support Manager](#) for more information.

Coach Interaction During Match

G2 R12

During a elementary IQ finals match at a tournament I was at, a team's battery went down. An adult coach proceeded to throw the team a fresh battery, in the middle of the match. Is this an illegal action in any way? Mainly referring to rules R12 or G2?

Answered by Game Design Committee

First, this would not be considered an R12 violation. R12 is intended to prevent Teams from using additional Robot Batteries as counterweights or finding ways to double their available power. As noted in [this Q&A](#), swapping out a battery mid-Match is not illegal, provided that it is done under a legal G17 / RSC5 interaction.

G2 is quoted below, with a portion bolded for emphasis:

<G2> VEX IQ is a student-centered program. **Adults may assist Students in urgent situations, but adults should never work on or program a Robot without Students on that Team being present and actively participating.** Students should be prepared to demonstrate an active understanding of their Robot's construction and programming to judges or event staff.

Some amount of adult mentorship, teaching, and/or guidance is an expected and encouraged facet of the VEX IQ Challenge. No one is born an expert in robotics! However, obstacles should always be viewed as teaching opportunities, not tasks for an adult to solve without Students present and actively participating. Violation of this rule could be considered a violation of <G1> and/or the REC Foundation Code of Conduct.

In the specific scenario that you have described, this would likely be considered an "urgent situation", especially because the Students were the ones who identified the root cause of the problem and physically changed the battery ("worked on the the Robot") mid-Match.

Therefore, the act of a Team receiving a spare battery mid-Match is not illegal in itself.

With that being said, we definitely do not want adults to get into the habit of throwing batteries at Students! This could be deemed an S1, G1, G2, or Code of Conduct violation, depending on the manner in which it is handled in the context of the event. It would be impossible for us to provide a blanket response that would encompass all possible hypothetical interactions.

Cortex Non-Functional Decorations

R12 R16 R17

Under rules <R12>, <R16>, <R17>, may teams using the V5 Control System use a Cortex VEXNET 2.0 Key as a non-functional decoration?

Answered by Game Design Committee

No, this is not legal.

<R12> Non-functional decoration.

R12 T1

In the Game Manual it states in <R12> that the Inspector will have final say as to whether as to what is considered non-functional decoration. Given that Inspectors do not go through the same training as many Head Referees, what happens when a Head Referee deems something as functional? <T1> says the Head Referee has the ultimate say about what is permissible in matches.

Which has precedent? <R12> or <T1>?

Answered by Game Design Committee

This scenario is covered by rule R2-e, which states the following:

If a Robot has passed inspection, but is later found to be in violation of a Robot rule during a Match, then they will be Disqualified from that Match and <R2d> will apply until the violation is remedied and the Team is re-inspected.

R2-e is primarily intended for a scenario where a Robot has been modified since inspection. However, it is also intended as a "catch" for a scenario where a Head Referee identifies a violation that an inspector may have missed.

Most Robot rules can be considered as "inspection rules", in the context that there may not be a Head Referee present during inspection. So, statements such as "inspectors have the final say" imply that this is being questioned during inspection. Once a Robot passes inspection, R2-e and T1 come into effect for the duration of the Tournament.

R12: Carbon Fiber on Cube Tray Inspection Warning

R12

At our recent competition, we were strictly warned about putting carbon fiber (the contact paper kind) on the Lexan we use in the middle of the cube tray. The basis of the argument is that it changes the surface that the cube slides on. Upon further investigation, I thought I'd seen other teams do the same thing, primarily for decoration. I understand where it could look like a rule violation, as tape isn't allowed for anything except wiring and decor (nonfunctional). Is this a violation of R12, or is it just an overly cautious inspector?

** We also realize that inspectors have the final say, but I would like to get a response on this to know for sure how to handle things at our next tournament

Answered by Game Design Committee

It is impossible to issue a blanket ruling based on a snapshot description of a hypothetical Robot design. Furthermore, please review the [Q&A Usage Guidelines](#), specifically point 3, "Quote the applicable rule from the latest version of the manual in your question."

The rule in question is R10, quoted here for reference:

<R10> A limited amount of tape is allowed. Robots may use a small amount of tape when used for the

following purposes:

- a. For the sole purpose of securing any connection between the ends of two (2) VEX cables.
- b. For labeling wires and motors.
- c. For covering the back of License Plates (i.e. the “wrong color”).
- d. For the purposes of preventing leaks on the threaded portions of pneumatic fittings. This is the only acceptable use of Teflon tape.
- e. For securing and retaining a VEXnet Key 2.0 to the VEX ARM® Cortex®-based Microcontroller. Using tape in this manner is highly recommended to ensure a robust connection.
- f. In any other application that would be considered a “non-functional decoration” per <R12>

As your description does not sound like it would fit into points "a" through "e", the question that a Head Referee/inspector would then ask themselves is whether the contact paper is a "non-functional decoration". R12 is partially quoted below:

<R12> Decorations are allowed. Teams may add non-functional decorations, provided that they do not affect Robot performance in any significant way or affect the outcome of the Match. These decorations must be in the spirit of the competition. Inspectors will have final say in what is considered “non-functional”. Unless otherwise specified below, non-functional decorations are governed by all standard Robot rules.

In order to be “non-functional,” any guards, decals, or other decorations must be backed by legal materials that provide the same functionality. For example, if your Robot has a giant decal that prevents Cubes from falling out of the Robot, the decal must be backed by VEX material that would also prevent the Cubes from falling out.

It is ultimately at the inspector's discretion whether or not a given decoration is affecting Robot performance. A decal which provides more (or less) grip than standard legal materials would likely be considered to be affecting Robot performance, and would not be legal.

3d Printed License Plate Holders

R12 R28

On the vex forum there are discussions of 3D Printed License Plate Holders. But, "Anything written on the forum is just chit-chat and can't be used to prove anything to EPs or tournament hosts." I find this to be confusing because many teams are posting their designs online and are not distinguishing whether they are VRC or VEXU. I can see a team showing up at a tournament with a 3D Printed License Plate Holder and trying to prove to the EP it is legal by showing discussions that it is allowed because "Team A" is doing it, and "Team A" happens to be a VEXU team.

I would like to officially ask if 3D Printed License Plate holders are allowed on the VRC robot (Middle School & High School) as long as it "would be considered a non-functional decoration as described" by <R12> & <R28> or are 3D Printed License Plate Holders only allowed on the VEXU robots due to the abundance of resources allowed for them to use (including 3D printed materials)?

Answered by Game Design Committee

3D printed non-functional decorations are permitted in VRC, provided that they satisfy the constraints of R12. R12 is partially quoted below:

<R12> Decorations are allowed. Teams may add non-functional decorations, provided that they do not affect Robot performance in any significant way or affect the outcome of the Match. These decorations must be in the spirit of the competition. Inspectors will have final say in what is considered “non-functional”. Unless otherwise specified below, non-functional decorations are governed by all standard Robot rules.

In order to be “non-functional,” any guards, decals, or other decorations must be backed by legal

materials that provide the same functionality. For example, if your Robot has a giant decal that prevents Cubes from falling out of the Robot, the decal must be backed by VEX material that would also prevent the Cubes from falling out.

It is impossible to issue a blanket ruling that would apply to all hypothetical decorations and Robot designs; inspectors will have the final say in what is considered "non-functional". The most common thought experiment used in this determination is to ask what would happen if the decoration were removed from the Robot. Is the hypothetical License Plate holder being used to join structural pieces together, to guide Cubes, etc?

We would also ask teams to bear in mind [this similar Q&A](#), specifically the following point:

Teams wishing to utilize custom-made license plates should be prepared for the possibility of this judgment, and ensure that they are prepared to replace any custom parts with official VEX License Plates if requested. Not bringing official replacement plates to an event will not be an acceptable reason for overlooking a violation of one or more points in R28.

Painting Robots in a Similar Color as the Game/ Field Elements

R12

Rule R12 states: "a. Anodizing and painting of parts is considered a legal nonfunctional decoration" and "e. Decorations that visually mimic field elements or could otherwise interfere with an opponent's Vision Sensor are considered functional and are not permitted. This includes lights, such as the VEX Flashlight. The Head Inspector and Head Referee will make the final decision on whether a given decoration or mechanism violates this rule."

Our question is, can you paint your robot in a color that is similar to those of game and field elements (including but not limited to green, orange, purple, red, blue, black, gray)?

For example, if your school colors are green and black, could you paint your robot these colors, or would this be considered illegal because those colors may mimic field and game elements, thus violating section e? Another example, if your school colors again were green and black, could you paint the robot a darker shade of green than that of the cubes; or would this be considered illegal because of section e?

Answered by Game Design Committee

Our question is, can you paint your robot in a color that is similar to those of game and field elements (including but not limited to green, orange, purple, red, blue, black, gray)?

It is impossible to issue a blanket ruling that would cover all hypothetical decorative styles and color shades. We would advise Teams and Head Referees to refer to G3 ("Use common sense") when determining whether a given decoration is trackable way by another Team's Vision Sensor (under realistic, Match Affecting circumstances). The intent of G12 is not to prohibit all teams with green, orange, purple, black, gray, blue, or red themes from decorating their Robot; it is to protect (within a reasonable extent) Teams attempting to take their VRC experience to the next level through Vision Sensor programming.

One way to think about decorative color choices is to view them the same way you would a typical non-functional decoration, such as a giant decal. By itself, a giant decal is considered a nonfunctional decoration. However, if used to hold metal parts together or to hold game objects, it has become functional, and is no longer legal.

That being said, just as teams are responsible for the decorations on their own robots, teams utilizing the Vision Sensor should be conscious of the possibility for inadvertent or incidental visual interference. It will be up to the inspector and Head Referee to determine if a given Robot's decoration or design acts as a "Vision Sensor distraction"; to assist in reducing the frequency of these judgment calls, we would advise Vision Sensor Teams to take advantage of the engineering design process to investigate programming solutions that mitigate the impact of undesirable conditions.

To summarize more colloquially / bluntly: yes you can paint your robot green, just don't hold up a giant green sign if playing against a team that you know tracks green cubes, and if you're going to use a Vision Sensor, remember that there may be some green things in the arena that you have to account for.

Scuff controller add-on legality update

R12

Because the Q&A's do not carry over from last season, I must ask this again to ensure your ruling has not changed on the previously-legal 3D printed V5 scuff controller add-on.

Rule <R21> States "Motors (including the internal PTC or Smart Motor firmware), microcontrollers (including V5 Robot Brain firmware), extension cords, sensors, controllers, battery packs, reservoirs, solenoids, pneumatic cylinders, and any other electrical component or pneumatics component of the VEX EDR platform may NOT be altered from their original state in ANY way.

Provided this add-on is easily removable, does not modify electrical components in any way, and was completely legal to use last year, would this add-on count as an illegal modification, or would last year's ruling carry on to this season?



Answered by Game Design Committee

Yes, the attachment shown in the attached photo would be legal, provided it is easily removable and does not modify electrical components in any way.

<R12> f - Do LED strips still need to be powered by brain/cortex

R12

In the past, if teams used powered decorations such as LED light strips they needed to be powered by the brain or cortex. With the new wording in <R12> part f, where it states:

Internal power sources (e.g. for a small blinking light) are permitted, provided that no other rules are violated and this source only provides power to the non-functional decoration (e.g. does not directly or indirectly influence any functional portions of the Robot)

Does this mean that teams can use external power for LED strips, or do they exceed the example of the "small blinking light"?

Answered by Game Design Committee

Does this mean that teams can use external power for LED strips, or do they exceed the example of the "small blinking light"?

Yes, using a small external power source to power a [standard LED strip](#) would be permitted, provided that no other rules are violated, such as R12e, R12g, or G10.