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VEX V5 Robotics Competition 2026-2027: Override

????????? ??????: R19

Welcome to the official VEX V5 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 V5RC 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.

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910: Using additional Smart Motor Caps on a robot

2-Nov-2021
R19

<R19> restricts any one robot to having up to 8 VEX Smart Motors. The V5 Smart Motor Cap V5 (276-6780) is a legal part for competition, but by itself it would not be considered a motor, as it does not have any of the actual motor components or electronics. Is it allowable for a team to mount additional V5 Smart Motor Caps on their robot without a motor attached so that they can more easily reconfigure their robot for different setups (such as for skills vs. matches)? In essence the V5 Smart Motor Cap would be serving as a motor mount. It is understood that any configuration that would be used needs to be fully inspected and that additional scrutiny of the robot and team would be expected throughout the event to ensure that they do not ever exceed the maximum motor allotment.

> **????????? ?????? committee**
>
> Yes, this is legal.

3140: Legality of Legacy (SMC) Pneumatics

15-May-2026
R19

<R19> Rule R 19 lists several Non-VEX components that are allowed. In previous years, both the manual and the knowledgebase listed the specific SMC legacy pneumatics components that were legal for competition use. This year there is no mention of the legacy pneumatics in the manual at all. They are not listed as allowed parts in R 19, but there is also no mention of them not being allowed in R 18, so there is a bit of confusion. Several other rules in the manual (GG3, R25, R26, etc) specifically mention VEX pneumatics parts. Am I correct to assume that this means that the legacy SMC pneumatics components are not legal to use this year and the only legal pneumatic components are the VEX branded ones?

> **????????? ?????? committee**
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> Legal VEX Parts are listed in the Legal Parts list linked in the Game Manual.
>
> Components not included in that list are not legal for competition use.

3065: Broken Rubber Bands

29-Jan-2026
R19

<R19> Modifications of parts. Parts may NOT be modified unless specifically listed as an exception in this rule. Examples of illegal modifications include, but are not limited to, bending, cutting, sanding, gluing, lubricating, taping, and melting. The following exceptions are the only legal modifications of parts: Cutting metal VEX IQ or VEX V5 shafts to custom lengths. Bending parts which are intended to be flexible, such as string, rubber bands, or thin plastic sheets. Cutting VEX IQ pneumatic tubing to custom lengths. Tying knots to shorten or connect string or rubber bands.(https://www.robotevents.com/storage/game_manual/VEX_IQ_Robotics_Competition_2025-2026_Mix_Match/rules/R19.html)

My understanding is that broken or cut rubber bands can not be used in Vex IQ, however some argue that per R19 "Tying knots to shorten or connect string or rubber bands" means if you have a broken rubber band (you didn't cut it, which would

break this rule) you can tie a knot to connect it again making it a legal part once again.

As an event partner, I would really like clarification on that last sentence in R19 so our refs have a definitive answer in the Q&A or a Rule update we can point to and say yes or no on whether broken and tied rubber bands are allowed.

> **????????? ?????? committee**
>
> A Team should not be penalized if a rubber band on their Robot breaks during a Match. However, they should replace any/all broken rubber bands before their next Match. A broken rubber band is not a legal Robot part, even if it's tied in a knot.

3007: 3D printing use

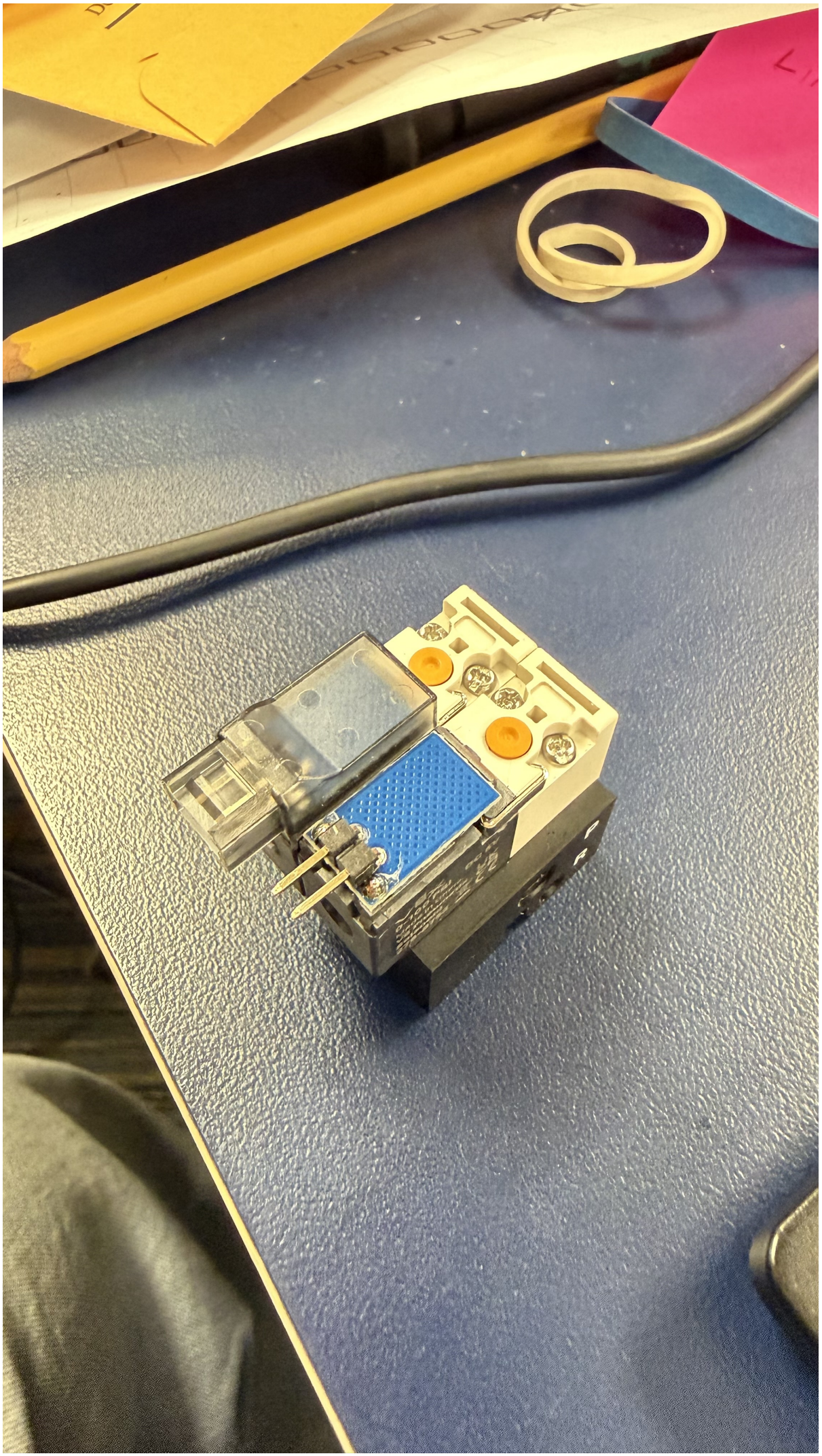
27-Dec-2025
R19 R28

<R19><R19>

I understand that 3D printing parts are not allowed for functional/non-functional use. I also understand that R28 prohibits modifications of solenoids. However, I would still like to know if this would be possible. Picture is a pneumatics solenoid. Notice the one connector lacking the plastic casing for the 3-wire connector leaving one set of pins exposed. Could a replacement part (approximately identical) be 3D printed to prevent the pins from being bent when in use?

This would not be a modification as described in R28 as it's reverting the the solenoid to its "original" design rather than adapting for a new purpose. It's not necessarily a custom part for the robot like a functional bracket, or decoration which I believe to be the "spirit of the rule".

Honestly my opinion would be not allowed based on R19, but thought I would throw it out there.



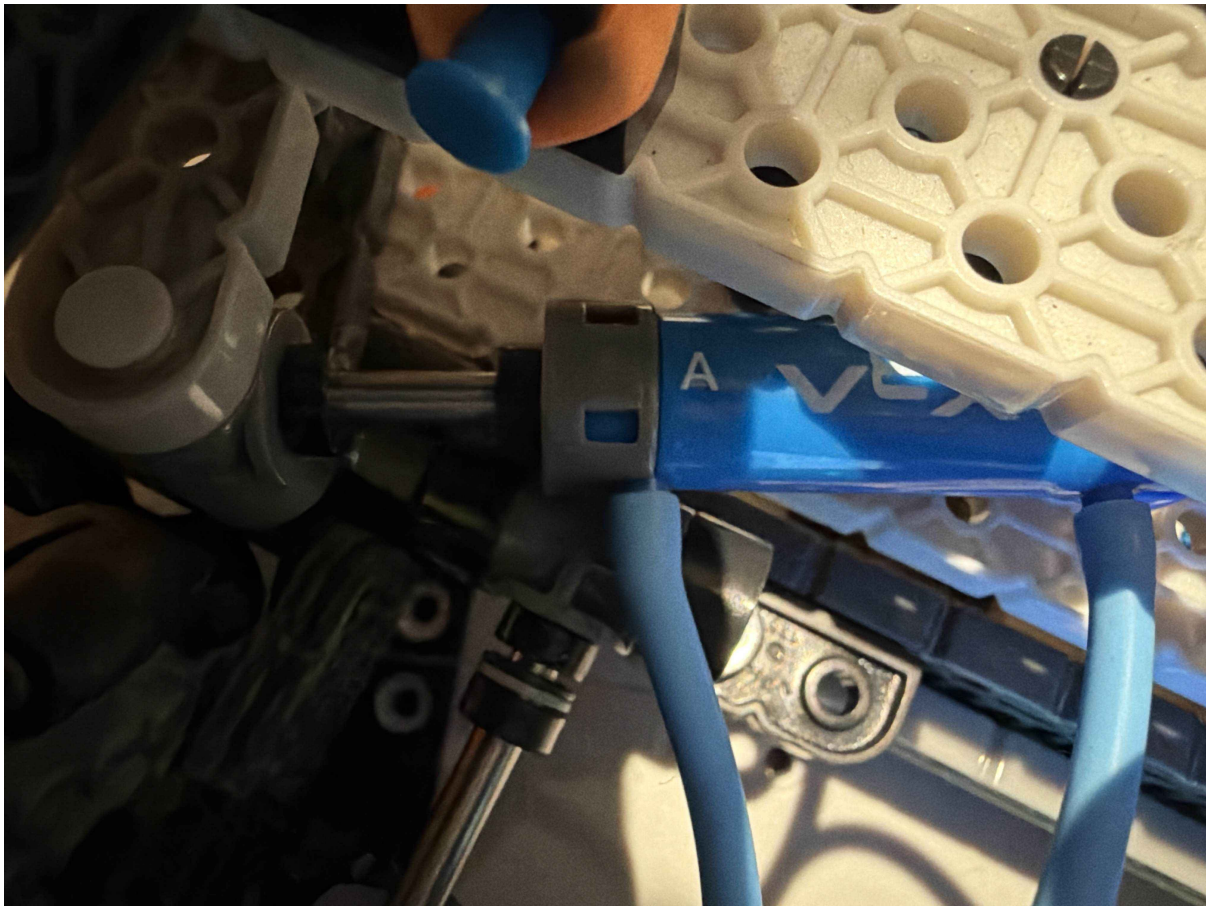
> **????????? ?????? committee**
>
> No, this is not permitted. This modification is an intentional Violation of rules <R19> and <R28>. Rule <R4> could also apply.

2935: Adding spacers in pnuematics

21-Nov-2025
R19

<R19>

I'm trying to confirm whether adding spacers to pnuematics is allowed. To install spacers, the end cap had to have been removed. And according to R19, this technically counts as modifying the part, but the end cap was reinstalled to its original state, and the pnuematic looks and functions identically to a new unit. The end cap came off with normal tension; no glue nor screws holding it in. Given that, and the part being returned to its original state, I'm unsure as to how this fits within R19.



> **????????? ?????? committee**
>
> Removing the end cap of a VEX IQ Pneumatic Cylinder to add a spacer, as you've described, is a modification of the part and is disallowed by rule <R19>.

2720: Cutting Metal

13-Jul-2025

G2 R19

<G2> VIQRC is a student-centered program. Adults should not make decisions about the Robot's build, design, or gameplay, and should not provide an unfair advantage by providing 'help' that is beyond the Students' independent abilities. Students must be prepared to demonstrate an active understanding of their Robot's design, construction, and programming to judges or event staff. Students should build, design, and code the Robot with minimal Adult involvement.

1. If an 8 year old wants to shorten a shaft and the coach determines that they do not have the "independent ability" to do so, can the coach cut it for them?

2. Would it be OK if a student found a shaft in a bin that had been previously cut to use on their robot?

3. A middle school has determined that it is safe to cut with a hacksaw but not with a power tool. At a competition, a situation arises where they only way that the robot can only be repaired by the next match is by using a power tool to make a cut. Would it be appropriate for the adult to make a cut with a power tool in this scenario to cut the metal?

> **????????? ?????? committee**
>
> As stated in rule <G2>, "This rule operates in tandem with the REC Foundation Student Centered Policy..."
>
> Section 6.a.i of the Student Centered Policy specifically categorizes your scenarios 1 & 3 as student-centered and allowable,
>
> > Student-Centered Examples: ... Young students need to cut down a metal axle, but cannot safely use the cutting equipment. An adult cuts the axle after students mark the desired length, and uses the opportunity to teach the students how to use the tool safely.
>
> Reusing a simple cut part, such as the cut shaft in your scenario 2, would also be reasonable under rule <G3>.

2584: G2 (Student Centered), G4/R2, and Custom Cut Plastic – Levels of Assistance

27-Feb-2025
G2 G4 R2 R19

G2 states that adults "should not provide an unfair advantage by providing 'help' that is beyond the Students' independent abilities." Given the student's developmental level, access to tools and safety concerns around tool usage, at times it may be challenging for a student to independently do some tasks. At a recent competition, the level of outside assistance allowable came up for question about custom cut plastic. Specifically:

If the students design their own CAD files for custom cut plastic, is it a violation of G2 for the coach or mentor to run the CNC machine and/or laser cutter to cut the material for the students, or do the students need to operate the machine themselves?

Is it a violation of G2 if the mentor/coach makes slight modifications to the file so that the tool works correctly (for example removing duplicate lines or changing the order of the cuts to put less strain on the machine)?

If students at school A develop their own CAD files for custom cut plastic but do not have access to a laser cutters and/or CNC machine, is it a violationof G4/R2 to send the file to school B to have it cut for them?

If students at school A develop their own CAD files for custom cut plastic but do not have access to laser cutters and/or CNC machine, is it a violation of G2/G4/R2 to send their CAD files to an outside commercial service to have the plastic cut for them?

I suppose the same issues would be raised for cutting metal as well.

Relevant rules and Q&As: G2: **V5RC is a student-centered program**. Adults should not make decisions about the Robot's build, design, or gameplay, and should not provide an unfair advantage by providing 'help' that is beyond the Students' independent abilities. G4: **The Robot must represent the skill level of the Team.** R2: **Robots must represent the Team's skill level.** The Robot must be designed, built, and programmed by members of the Team. R19: **A limited amount of custom plastic is allowed.** Robots may use custom-made parts cut from certain types of non-shattering plastic. c. Plastic may be mechanically altered by cutting, drilling, bending, etc. It cannot be

Thank you!

> **????????? ?????? committee**
>
> All of the scenarios you describe would be <G2> Violations. Adults should not provide an unfair advantage by providing 'help' that is beyond the Students' independent abilities.
>
> In the case of a Team that lacks the necessary tools to create legal Student-designed parts, it would be legal for the Student designers to use another organization's tools to create the parts themselves using those borrowed tools.

2582: G4/R2 and Custom Cut Plastic with Plans from the Internet

27-Feb-2025
G4 R2 R19

Scenario: students find on-line (or are given by another team) a CAD file for a set of custom cut plastic parts for their robot and use it to cut plastic for their robot with a laser cutter and/or CNC machine.

Relevant rules and Q&As:

G4:**The Robot must represent the skill level of the Team**.

R2: **Robots must represent the Team's skill level.** The Robot must be designed, built, and programmed by members of the Team.

R19: **A limited amount of custom plastic is allowed.** Robots may use custom-made parts cut from certain types of non-shattering plastic. c. Plastic may be mechanically altered by cutting, drilling, bending, etc.

Q&A 2311: What qualifies as "Commercially Available?" In reference to 3D printed parts,but might be relevant here: "Posting files online does not make them commercially available."

Is this a violation of G4/R2? If so, would the legality of the parts change if the students credited the source of the files in their notebook and/or to the inspection team?

Would it be a violation of G4/R2 if the students found (or were given) the CAD file, printed it on paper, taped it to the plastic then followed the pattern manually, cutting the plastic with tin snips or a band saw?

Thank you.

> **????????? ?????? committee**
>
> > Is this a violation of G4/R2?
>
> Yes. These parts were not designed by members of the Team, which is a requirement of rule <R2>. If the parts were designed by a Student from another Team, that Student has effectively served as a Designer for multiple Teams in the season, which is a violation of rule <G4>. If the parts were designed by an Adult, it is a violation of rule <G2>.
>
> > If so, would the legality of the parts change if the students credited the source of the files in their notebook and/or to the inspection team?

No.

> Would it be a violation of G4/R2 if the students found (or were given) the CAD file, printed it on paper, taped it to the plastic then followed the pattern manually, cutting the plastic with tin snips or a band saw?

Yes.

1665: tape to prevent rope fraying.

25-Sep-2023
R19

Can we use tape to prevent a rope from fraying? It has no real advantages to the robot functions but it allows us to reuse rope and string for future things. If not would colored tape to match the robot's color theme make it a non functional decoration, or could we use 3d printed clips to prevent fraying?

> **????????? ?????? committee**
>
> Rule <R19> provides a complete list of the permissible uses of tape on VRC Robots. Clause G of rule <R18> states that 3D printed parts are not permitted except as non-functional decorations.
>
> Tape or 3D printed clips cannot be used to prevent a rope from fraying. As permitted in clause D of rule <R15>, however:
>
> > Fusing/melting the end of legal nylon rope/string (see <R7>R7e) to prevent fraying is permitted.

1392: <R19> Extent of External Controller Modifications

17-Jan-2023
R19

<R19>

Hello! I had a few questions in regards to R19 and the extent we can take R19ai.

R19ai states

> Attachments which assist the Drive Team Member in holding or manipulating buttons / joysticks on the V5 Controller are permitted, provided that they do not involve direct physical or electrical modification of the Controller itself.

Case 1: Based on this, would it be legal for a team to paint the external casing of their controller, based on the logic they are adding an external attachment to the joystick (as the paint is a layer), which increases the friction on the controller which makes it easier for drivers to grip and manipulate buttons on the controller, no electrical or physical modification has been made and its purely an external layer/attachment on the controller.

Case 2: Would it be legal for a team to make an external box for a V5 controller which contains the controller inside of it, would it than be possible to design your own buttons for the box which when pressed would press buttons on the v5 controller, essentially allowing you to make a non-vex controller which contains and manipulates the v5 controller inside of it.

Case 3: Would it be legal for a team to attach a lanyard to a scuf to prevent it being dropped/lost at an event and can the lanyard holding the scuf be worn during a competition match? This would prevent it from being dropped/damaged during a

game, this is something that has been demonstrated at events in the past but isn't clearly stated as per whether the action is legal or not.

> **????????? ?????? committee**
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> Thank you for your questions. Head Referees must determine whether a specific modification is legal or not, but we can provide the following guidelines for your proposed cases.
>
> Case1: This would be a permitted.
>
> Case 2: Rule <R14> states, "Robots must ONLY use one (1) VEX V5 Robot Brain (276-4810). Any other microcontrollers or processing devices are not allowed, even as non-functional decorations." This could be allowed by <R19a>, but any device that is created to manipulate the controller may not contain these prohibited items.
>
> Case 3: A laynard would be considered legal under rule <R19a>.

130: <R19>,<VUR10>, and tank-less pneumatic systems

30-Oct-2018
R19 VEX U

If the ports of multiple cylinders are connected to each other and the pressure in both sides of the cylinders are kept relatively similar, a cylinder can be actuated and retraced by manipulating one of the cylinders (ideally using a motor) (Image for clarification).

R19 States

> <R19> Pneumatic devices may only be charged to a maximum of 100 psi. Teams may only use a maximum of two (2) legal VEX pneumatic air reservoirs on a Robot. The intent of this rule is to limit teams to the air pressure stored in two reservoir tanks, ***as well as the normal working air pressure contained in their pneumatic cylinders and tubing on the robot.*** Teams may not use other elements (e.g. surgical tubing) for the purposes of storing or generating air pressure. Teams who use cylinders and additional pneumatic tubing for no purpose other than additional storage are in violation of the spirit of this rule and will fail inspection.

And VUR10 states:

> Teams may utilize commercially available pneumatic components from the following list: Cylinders, actuators, valves, gauges, storage tanks, regulators, manifolds, and solenoids. c. Pneumatic devices may only be charged to a maximum of 100 psi. ***i. Compressors or any other forms of "on-Robot" charging are not permitted.*** d. All commercial components must be rated for 100 psi or higher. Teams should be prepared to provide documentation that verifies these ratings to inspectors if requested. e. Components must not be modified from their original state as purchased from a commercial vendor, other than the following exceptions: i. Cutting pneumatic tubing or wiring to length, assembling components using preexisting threads, brackets, or fittings, or minor cosmetic labels.

I would assume that the setup (same as the image) would be illegal, as air is technically compressed if the cylinders experience resistance, but would like an official ruling.

If the max pressure (under load) is kept under 100Psi, is the setup in the image legal for VRC?

If not legal for VRC, is such a setup legal for VEXU?

> **????????? ?????? committee**
>
> The intent of <R19> and <VUR10>, in this context, is to safely limit the amount of stored pneumatic energy available at the beginning of a Match. As pictured, and assuming no other rules were violated in the process, this hypothetical

example would satisfy that intent and would be legal in both VRC and VEX U.

Of course, if this concept was used to create a rudimentary "compressor" or otherwise generate additional pneumatic pressure during a Match for other devices to use, this ruling would not apply, and it would be illegal.