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## Event Check-In (2010)

Event Check-In (2010)

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### Order of Precedence

Order of Precedence

Posted by FRC2973 at 04/06/2010 02:32:34 pm

A significant change to the rules for the Championship event (section 3.7) has been communicated to the teams, first via a posting on Bill's Blog, then via an email blast, but no change has been made to the manual or addressed in the Q&A.

- 1) Are these changes official at the time they are announced?
- 2) What is the order of precedence if there is conflicting information between the manual, Bill's Blog, and official email blasts?

Re: Order of Precedence

Posted by FRCOPS at 04/07/2010 04:38:51 pm

If we send out updated information in the form of an official FIRST communication (email from [email]frc@usfirst.org[/email], Bill's Blog or FIRST newsletter), that is the most updated information.

Specifically for the Championship, the most up-to-date information is contained in the Championship Essential Information Document found here: [url]http://www.usfirst.org/uploadedFiles/Community/FRC/Events/2010/2010\_FRC\_CMP\_Essential%20\_Information.pdf[/url]

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## At The Events - General (2010)

At The Events - General (2010)

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### Routers

Routers

Posted by 2010FRC2577 at 02/09/2010 09:53:09 am

We are not permitted to set up wireless networks. Are we allowed to turn off the router's wireless networking at home and bring it with us so that we can use it for wired communication between robot, driver's station, and programming computer in the pits? If not, are we supposed to purchase a wired switch or router without wireless capability?

In last year's competition, we disabled the wireless network and used our router in the pit.

Re: Routers

Posted by GDC at 02/11/2010 05:03:27 pm

As long as the wireless communications are disabled, you may use a router for local network operations in your pits.

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## Bag And Tag (2010)

Bag And Tag (2010)

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### Bag and Tag, unlocking rules

Bag and Tag, unlocking rules

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Posted by 2010FRC0525 at 01/30/2010 04:57:05 pm

In the past, we have bolted our robot to the crate to make sure it is secure during shipment. The rules for Bag and Tag events state that for a second, traditional regional, the team must "Crate your robot (in the bag)". Are there specific rules related to "unlocking" the robot? Is it acceptable to open the bag in order to securely fasten the robot (through the bag) to our crate?

Re: Bag and Tag, unlocking rules

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Posted by FRCOPS at 02/16/2010 02:59:42 pm

No, teams may not open the bag for the purpose of crating it. Bags may only be opened at the times described in Section 4 of the Manual.

Teams who are attending both a Bag and Tag event AND a traditional Regional Event should plan ahead carefully about how they will secure a bagged robot in their crate. We have heard of some teams bolting their robot to a board through the bag, which allowed them to attach restraints to the board rather than directly to the robot.

It would be more desirable for the team to use straps hooked to the frame of the crate to hold the robot in place. If this is not possible, small holes in the bag for screwing to the crate should not be a problem, but as a rule of thumb teams should work to avoid bag damage; if the damage is large enough inspectors may start to wonder if an attempt was made to work on the robot while it was in the bag.

## Shipping Your Robot (2010)

Shipping Your Robot (2010)

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### Robot shipping from the 1st (Regional) Event to home then, to a 2nd (Bag & Tag) Event

Robot shipping from the 1st (Regional) Event to home then, to a 2nd (Bag & Tag) Event

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Posted by 2010FRC0217 at 01/15/2010 11:50:50 pm

The following rules appear to be somewhat contradictory:

#### 4.5.4. Event to Event Shipping – After Your First Event

After your team attends its first event, you must ship through the DRAYAGE system (unless your second event is a Bag and Tag event).

#### 4.8.2.2. Your Second Event is a Bag and Tag Event

If your first event is a traditional Regional Event, and then you will attend a Bag and Tag event, follow this procedure:

1. ....
- 2.....
3. Ship your robot to your home location through the drayage system.

What is the correct procedure? We could bag & tag then, ship our robot (and crate) home



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generated: 11/12/2010 02:32:23 pm EST

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after the 1st (Regional) event using our team trailer at no cost for special shipping. This process may reduce our (6 hour practice time) window due to the robot arriving in mid-week.

Re: Robot shipping from the 1st (Regional) Event to home then, to a 2nd (Bag & Tag) E

Posted by FRCOPS at 01/18/2010 10:20:22 am

The rule is that teams must ship TO and FROM any traditional Regional Event. If your team will attend a Bag and Tag event next, you must:

1. Bag up your robot following the proper bag and tag procedure.
2. Place your bagged and tagged robot into your crate.
3. Ship your crate through the drayage system back to your location.
4. Remove the robot from the crate when it arrives.
5. Transport your robot in your own vehicle to the Bag and Tag event.

If you are concerned that your robot will not arrive in time to attend your second event, please contact us directly with the details of your team's situation at [email]frc teams@usfirst.org[/email].

### Shipping Your Robot (2010)

## Championship Shipping / Drayage Document

Championship Shipping / Drayage Document

Posted by 2010FRC0180 at 03/04/2010 08:30:33 am

The CMP Shipping / Drayage document on the FIRST website seems to have an incorrect shipping label. There are two labels with PRO sticker boxes and none without. Should there be a label without the PRO number on it?

Re: Championship Shipping / Drayage Document

Posted by FRCOPS at 03/17/2010 02:04:57 pm

Thank you for bringing this to our attention. It is true that most Shipping and Drayage documents contain one shipping label with a pro sticker box and one label without. We have updated the document.

However, please do not feel concerned if you have already printed or used the Championship shipping labels! The instructions on where to place your pro number stickers were created to ensure that even if one or more of your shipping labels get ripped off during shipping, there would still be at least a couple pro stickers on your crate to identify it. If you have pro stickers on all four sides of your crate somewhere, that is the most important factor.

## FedEx Complimentary Shipping (2010)

FedEx Complimentary Shipping (2010)

### FedEx wants account number

FedEx wants account number

Posted by 2010FRC1001 at 02/09/2010 12:40:45 pm

We called the number for FedEx Freight from the manual. They told us we need an account number. What is our account number? They also told us not to call again before next week, since they have not finalized their plans.



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FedEX not scheduling pick-up

Posted by 2010FRC3242 at 02/11/2010 09:40:03 am

We have called FedEx three times to schedule our pick up. Each time they have told us that they have not received official word that they would shipping the robots. Has anyone else had this problem?

Re: FedEx wants account number

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Posted by FRCOPS at 02/12/2010 03:33:32 pm

Your bill of lading has pre-printed billing information on it. You do not need a FedEx account number.

The representative on the phone may not be familiar with FRC. FedEx is a big company, and only a few employees work directly with FRC to administer the shipping donation.

When you call FedEx, let them know that you would like to schedule a freight pickup and you already have a bill of lading with billing information on it. You can read it off to them if necessary. If needed, ask for a manager. Customer service managers should be familiar with the FedEx donation to FIRST Robotics Competition and be expecting team calls.

## Chairman's Award (2010)

Chairman's Award (2010)

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### Chairman's Award submission for Rookies

Chairman's Award submission for Rookies

Posted by 2010FRC3158 at 01/15/2010 01:57:44 am

Hi good moorning,

I was wondering if we as a Rookie team, wanting to develop a Chairman's Award submission, do we have to submit it online by feb 18th or just print a hard-copy to give the Judges when they visit us at our Pit Station?

Best regards,

Re: Chairman's Award submission for Rookies

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Posted by FRCOPS at 01/18/2010 10:42:55 am

Rookie teams are not eligible for the Chairman's Award. However, if you do wish to develop a submission, you are correct that you should print a copy to present to the judges in your pit station when they assess your team for the Rookie All-Star Award.

We encourage you to use the online system so that you can become familiar with the submission format, but the judges will not receive any Chairman's Award submission completed online by a rookie team, so you would still need to print a hard copy.

Chairman's Award (2010)

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### Several questions concerning Chairman's Award Video format

Several questions concerning Chairman's Award Video format

Posted by 2010FRC0359 at 01/21/2010 04:17:31 pm

\*\*from our video mentor\*\*



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First, The DVD. Do you want this as a DVD movie that can play in a stand alone DVD player or a computer with a DVD Player program, or as a QuickTime Data File that will play only on a computer? We have used both for projection, and would like to know your preference. It depends on what type of playback you intend to use

Second, Your style sheet just says it has to be in 16:9 widescreen format. But within the current digital technology, there are a number of options and considerations regarding 16:9.

We are currently shooting in HDV 1080i format which is 16:9 native. We can output this in a HDV or HD 16:9 format, but as we understand it, that would require burning it onto a BluRay DVD. On your side, you would need a BlueRay player and a projector or TV capable of HD.

Locally, only a few venues have this. More commonly for our distribution and projection needs, we shoot in HDV, and then output it as a letter boxed SD format. It retains the widescreen 16:9 look, but can be played off a conventional DVD on standard TVs and projectors. It transfers the widescreen aspect to standard-width video, but preserves the original aspect ratio. The resulting image has black bars above and below it.

Since your style shoot did not mention BlueRay DVD, can we assume you are expecting the submissions on a standard DVD in the letter boxed widescreen SD format?

Third, as mentioned, our current camera shoots HDV, but we have many years of archival footage shot in SD 4:3, and many archival photos. Our edit style sometimes uses smaller videos within the primary frame, and also multiple images for a montage/collage effect. The primary video would be 16:9, but there may be moments showing archival footage in different formats. Is that OK?

Fourth, on other projects we have letter boxed, we have used the black matte bars to include some text graphics. If we maintain the video within the 16:9 aspect, may we use the black areas for text?

Thank you.

Re: Several questions concerning Chairman's Award Video format

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Posted by FRCOPS at 01/28/2010 04:43:06 pm

[QUOTE=2010FRC0359;36485]



## 2010 Q&A Forum Export

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First, The DVD. Do you want this as a DVD movie that can play in a stand alone DVD player or a computer with a DVD Player program, or as a QuickTime Data File that will play only on a computer? We have used both for projection, and would like to know your preference. It depends on what type of playback you intend to use[/QUOTE]

The DVD should be able to stand alone and play in either a standard DVD player or a computer. No QuickTime files this year please.

[QUOTE=2010FRC0359;36485]

Second, Your style sheet just says it has to be in 16:9 widescreen format. But within the current digital technology, there are a number of options and considerations regarding 16:9.

We are currently shooting in HDV 1080i format which is 16:9 native. We can output this in a HDV or HD 16:9 format, but as we understand it, that would require burning it onto a BluRay DVD. On your side, you would need a BlueRay player and a projector or TV capable of HD.

Locally, only a few venues have this. More commonly for our distribution and projection needs, we shoot in HDV, and then output it as a letter boxed SD format. It retains the widescreen 16:9 look, but can be played off a conventional DVD on standard TVs and projectors. It transfers the widescreen aspect to standard-width video, but preserves the original aspect ratio. The resulting image has black bars above and below it.

Since your style shoot did not mention BlueRay DVD, can we assume you are expecting the submissions on a standard DVD in the letter boxed widescreen SD format?[/QUOTE]

No BluRay or HD this year please. Output should be wide screen letter boxed SD format.

[QUOTE=2010FRC0359;36485]

Third, as mentioned, our current camera shoots HDV, but we have many years of archival footage shot in SD 4:3, and many archival photos. Our edit style sometimes uses smaller videos within the primary frame, and also multiple images for a montage/collage effect. The primary video would be 16:9, but there may be moments showing archival footage in different formats. Is that OK?[/QUOTE]

Yes, that is fine.

[QUOTE=2010FRC0359;36485]

Fourth, on other projects we have letter boxed, we have used the black matte bars to include some text graphics. If we maintain the video within the 16:9 aspect, may we use the black areas for text? [/QUOTE]



Yes.

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Chairman's Award (2010)

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**Rookie team cannot access Chairman's Award on TIMS**

Rookie team cannot access Chairman's Award on TIMS

Posted by 2010FRC3242 at 01/28/2010 04:15:04 pm

"Rookie teams are not eligible for the Chairman's Award. However, if you do wish to develop a submission, you are correct that you should print a copy to present to the judges in your pit station when they assess your team for the Rookie All-Star Award.

We encourage you to use the online system so that you can become familiar with the submission format, but the judges will not receive any Chairman's Award submission completed online by a rookie team, so you would still need to print a hard copy."

From FRCOPS 01-18-2010

We cannot access the online system for the Chairman's Award because we are not eligible. How can we get around this?

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Re: Rookie team cannot access Chairman's Award on TIMS

Posted by FRCOPS at 02/12/2010 12:56:25 pm

Rookie teams do have access to the Chairman's Award submission section in the new Student Team Members system accessed here: [url]<https://my.usfirst.org/frc/goteams/>[url].

All awards submissions must be made by a student on the team with an account in the Student Team Members system. Once the student creates an account, the Main or Alternate Contact for the team must designate that student as an awards submitter in TIMS.

If you are still having trouble with this system, please contact Team Support directly with the details of what you tried and what happened. You can contact Team Support by email at [email][frcteams@usfirst.org](mailto:frcteams@usfirst.org)[email] or 1-800-871-8326 ext. 0.

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Chairman's Award (2010)

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**Executive Summary vs. judges information page**

Executive Summary vs. judges information page

Posted by 2010FRC3242 at 01/28/2010 04:16:44 pm

"As part of the Chairman's Award judging process, FIRST judges will also review the Executive Summary page AND the judges information page for each of the submitting teams."

What is the difference between the Executive Summary and the judges information page?

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Re: Executive Summary vs. judges information page

Posted by FRCOPS at 02/12/2010 02:04:11 pm

The Executive Summary is made up of the information that the team enters as part of your official Chairman's Award submission in the Student Team Member system here: [url]<https://my.usfirst.org/frc/goteams/>[url]



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The Judges Information is entered by a team mentor in TIMS in the "Judge's" section. This is also known as the "Team Essays."

## Website Award (2010)

Website Award (2010)

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### Website award

Website award

Posted by 2010FRC2420 at 01/25/2010 02:27:09 pm

I am designing the website for my team. I had heard somewhere that the judges for the website award didn't like pages that were in languages other than HTML. Can you tell me if this is true or not? I would want to make the site in flash but if it was going to take away from our chances of getting the website award I would do it in HTML.

Re: Website award

Posted by FRCOPS at 01/26/2010 11:37:54 am

The website awards judges are asked to use the criteria laid out in the Website Award description found here: [\[url\]http://www.usfirst.org/roboticsprograms/frc/content.aspx?id=440\[/url\]](http://www.usfirst.org/roboticsprograms/frc/content.aspx?id=440). There are no secret criteria.

Website Award (2010)

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### Must website "content" be frozen after deadline?

Must website "content" be frozen after deadline?

Posted by FRC1501 at 01/29/2010 11:06:56 pm

In reference to the website submission.

5.7.1

"The website must be complete and functional by the date of submission."

If after the submission deadline of Feb 18th, 2010, may students continue to add content to the website such as blog postings, photos, and or up to date events only relating to website content and not change the graphic design or underlying PHP code or database calls?

In other words, students will have completed the php code, graphic design of the website structure, all art work etc but the required date, but would like to continue to update the content AFTER the deadline date. Or must the website "freeze" until it is judged and all changes must cease?

Re: Must website "content" be frozen after deadline?

Posted by FRCOPS at 02/12/2010 02:08:37 pm

It is OK to update your website after the submission deadline. However, the evaluators may review your website at any time after the submission deadline, so you will not know whether they saw any updates.

Website Award (2010)

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### Website award regarding links





## 2010 Q&A Forum Export

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### Website award regarding links

Posted by 2010FRC2834 at 02/12/2010 12:02:38 am

The website award criteria asks "How well does the site function? ... Do all links work?"

Does "links" mean internal links or does it mean external links also? We have no problem with internal links because we can control. All external links are being monitored by students to make sure they still work. However, our main sponsor's page is only up during the day. It is down on most evenings. I don't know why. I am afraid it will not work when the website judges look at it. If we take out the link because it is unreliable, it will look like we forgot a link because all other sponsors have links. Our sponsor may also wonder why we do not link to their website. Please advise what we should do. How will website judges treat external links that do not work. Are we going to lose 4 points because of it? It is not really our fault.

### Re: Website award regarding links

Posted by FRCOPS at 02/12/2010 04:18:51 pm

"Links" in the description refers primarily to internal links. Judges understand a team has no control over external websites, and a single missing external link is not a problem. We suggest leaving your main sponsor's link in.

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### Website Award (2010)

#### Website Evaluation

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##### Website Evaluation

Posted by 2010FRC0100 at 02/20/2010 03:07:28 pm

Does FRC evaluate the website submissions online or offline?

If evaluated offline, how many levels and what file types are pulled? We are concerned because our Flash files call .xml files (which not all off-site extraction tools pull by default) and could cause our site to look incomplete when viewed offline.

### Re: Website Evaluation

Posted by FRCOPS at 02/22/2010 09:00:29 am

Websites submitted for the Website Award will be evaluated online (as though the evaluators were an interested student or potential sponsor who found your website on the internet).

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### Website Award (2010)

#### Website Excellence Award

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##### Website Excellence Award

Posted by 2010FRC1912 at 03/09/2010 12:50:04 pm

I understand you do not receive the electronic website excellence for your site until after Nationals, but when are you notified if your team earned it?

Wendy Holladay  
Team 1912

Bayou Regional Week 1

### Re: Website Excellence Award

Posted by FRCOPS at 03/17/2010 02:27:27 pm

Teams who earn the Website Excellence Award will receive a notification email after



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Championship containing the digital stamp for their websites. We do not notify teams prior to Championship.

## Woodie Flowers Award (2010)

Woodie Flowers Award (2010)

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### Woodie Flowers Award

Woodie Flowers Award

Posted by 2010FRC1071 at 01/17/2010 01:21:54 pm

Is it possible to nominate a mentor who has passed away. The team wonders if this goes against the spirit of the award.

Re: Woodie Flowers Award

Posted by FRCOPS at 01/18/2010 10:27:26 am

Teams may nominate mentors posthumously if they wish. It is not against the spirit of the award.

Woodie Flowers Award (2010)

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### Woodie Flowers Award - Multiple submissions

Woodie Flowers Award - Multiple submissions

Posted by 2010FRC0234 at 01/26/2010 10:28:01 pm

Can a team nominate a 'new' mentor for the WFFA and also re-nominate a previous WFFA winner?

If the 'new' mentor wins a WFFA, does the team then select which one to be considered for the WFA?

Re: Woodie Flowers Award

Posted by FRCOPS at 01/28/2010 05:02:44 pm

There has been some confusion regarding the eligibility criteria and how many mentors each team can submit for the Regional Woodie Flowers Finalist Award and the Championship Woodie Flowers Award. According to the "FIRST Robotics Competition Woodie Flowers Award Criteria", every team can nominate 1 mentor for a Regional Woodie Flowers Finalist Award (WFFA). A mentor can only win a WFFA once so any mentor that has previously won a WFFA can not be nominated for a 2010 Regional (or Michigan State Championship) WFFA.

In addition to nominating 1 mentor for a WFFA, teams with mentors that have previously won a WFFA can resubmit 1 additional mentor for the Championship WFA. In total, it is possible to submit one mentor for a 2010 Regional WFFA AND 1 mentor (who must have won a WFFA from 2004 - 2009) for the 2010 Championship WFA.

However, as many teams have pointed out, the current submission website does not allow teams to submit more than 1 candidate via the submission forms. We will not be able to update the website this year, so we are implementing a temporary system as described in the steps below:

1. All teams that want to submit both a previous WFFA for the Championship WFA and submit a new mentor for the WFFA should submit the new mentor (i.e. the WFFA candidate) via the online system.



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2. Any team submitting a previous WFFA winner for the Championship WFA should submit their 600 word refresh essay to [email]2010WFASubmitCMP@usfirst.org[/email]. The WFA committee will review those essays during their selection of the 2010 Championship WFA.

We apologize for any confusion this may have caused.

**Woodie Flowers Award (2010)**

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**Multiple Woodie Flowers submitters**

Multiple Woodie Flowers submitters

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Posted by 2010FRC1311 at 02/03/2010 09:28:20 am

In the past on the older FIRSTawards submission system the submission for Woodie Flowers award had to be made at the same regional event that the Chairman's was being submitted.

Background:

Fred Kadiddlehopper is generally known to be affiliated with Team 123.

Team 123 submits Chairman's to the 'coast regional' and Fred for the WF Award.

Team 456 submits Chairman's to the 'mountain regional' and Fred for the WF Award.

Team 789 submits Chairman's to the 'mountain regional' and Fred for the WF Award.

Questions:

Is the WF submission still coupled to the Chairman's submission ?

Should each team submit as though it is their own direct mentor and let things happen ?

Please submit guidance on multiple teams submitting a single mentor where the teams are spread across multiple regionals.

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Re: Multiple Woodie Flowers submitters

Posted by FRCOPS at 02/12/2010 04:24:02 pm

[QUOTE=2010FRC1311;37811]

Is the WF submission still coupled to the Chairman's submission ?[/QUOTE]

The Woodie Flowers Award submission is no longer coupled with the Chairman's Award submission.

[QUOTE=2010FRC1311;37811]

Should each team submit as though it is their own direct mentor and let things happen ?

Please submit guidance on multiple teams submitting a single mentor where the teams are spread across multiple regionals.[/QUOTE]

The award criteria states "High school students on a FIRST Robotics team will choose one



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adult team member as their WFFA candidate." If, in your example, Fred is an active mentor on three different teams, then yes, it is possible for him to be nominated by more than one team and each team may choose the event where they want Fred to be judged.

### Woodie Flowers Award (2010)

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## Woodie Flowers Award

### Woodie Flowers Award

Posted by 2010FRC1511 at 03/24/2010 08:16:20 am

In the Manual (Section 5.4.3) it states:

As in the past, teams may only submit at one (1) Regional competition for judging. Teams submitting for both the Chairman's Award and the Woodie Flowers Award should note that [B]both awards are judged at the same event[/B]. Students working on the Woodie Flowers Award submission and those team members working on the Chairman's Award submission should coordinate to select the best event for the team.

However, from this Q&A:

[url]http://forums.usfirst.org/showthread.php?t=14447[/url]

Q... "Is the WF submission still coupled to the Chairman's submission?"

A... "The Woodie Flowers Award submission is no longer coupled with the Chairman's Award submission."

And the system allowed us to submit at two different places. Was the manual just not updated? Or where did our WFA submission end up?

### Re: Woodie Flowers Award

Posted by FRCOPS at 03/29/2010 11:12:12 am

The Woodie Flowers Award is no longer coupled to the Chairman's Award. Teams may choose one (and only one) regional where they want their WFA submission considered AND teams may choose one (and only one) regional where they want their Chairman's Award submission considered.

The CA was judged at the one event where their student submitter requested that it be judged. The WFA was judged at the one event where their student submitter requested that it be judged.

## Awards - General (2010)

### Awards - General (2010)

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## Engineering Inspiration at Michigan Championship

### Engineering Inspiration at Michigan Championship

Posted by 2010FRC0141 at 03/23/2010 08:14:36 pm

How long will our team be allowed to present for the Engineering Inspiration Award at the FIRST Michigan Championship? Will we be allowed to show/ leave the judges with a video?

Thanks!

### Re: Engineering Inspiration at Michigan Championship

Posted by FRCOPS at 03/29/2010 11:40:25 am



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Please direct specific questions about the Michigan events to FIRST in Michigan: [url]http://www.firstinmichigan.org[/url]. In general, regardless of the award, teams are free to leave any additional materials with the judges for consideration at FIRST events.

**Awards - General (2010)**

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**Awards at the Championship**

Awards at the Championship

Posted by 2010FRC1712 at 03/28/2010 09:48:26 pm

When will we know what awards are given when at the Championship event? In the past a few were given out at opening ceremonies (Autodesk, etc) and the rest during finals on Saturday, but we're specifically thinking about the Dean's List recipients as our team has a finalist in the running and as a new award aren't sure where in the agenda it will be placed.

Re: Awards at the Championship

Posted by FRCOPS at 03/29/2010 11:35:59 am

The presentation details for the Dean's List Award have not been finalized yet. We hope to have information available soon.

**Awards - General (2010)**

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**Entrepreneurship Award and Rookie All Star Award**

Entrepreneurship Award and Rookie All Star Award

Posted by 2010FRC3158 at 03/29/2010 02:32:54 am

We participated at the Arizona Regional and we have passed to the Atlanta Championship. We did our business plan and presented it at the Regional, is it possible to modify our business plan to include what we have done at the Arizona Regional or we should leave it as is?

Thanks,

Re: Entrepreneurship Award and Rookie All Star Award

Posted by FRCOPS at 03/29/2010 11:33:09 am

In Atlanta, all teams start from ground zero for all of the awards (except Chairman's and FIRST Dean's List), so your team may make changes to your business plan if desired.

**Awards - General (2010)**

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**Championship Engineering Inspiration Award**

Championship Engineering Inspiration Award

Posted by 2010FRC1739 at 03/29/2010 09:28:32 am

At the Championship, which teams are evaluated for the Engineering Inspiration Award: (a) Regional CA winners only? (b) Regional EI winners? (c) Regional CA & EI winners? (d) All 350 teams present? or (e) teams who somehow 'apply' or request to be considered?

Re: Championship Engineering Inspiration Award

Posted by FRCOPS at 03/29/2010 11:26:33 am

All teams participating in the event are considered for the Engineering Inspiration Award.



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## The Arena (2010)

The Arena (2010)

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### Discrepancies between drawings and field measurements at kickoff

Discrepancies between drawings and field measurements at kickoff

Posted by 2010FRC0058 at 01/13/2010 10:37:26 pm

Drawing item GE-10043-01 has a dimension of 16 1/2 x 32 1/2. This dimension would place the tunnel inside height at 16.5 inches rather than the 18 inches in section 6.2.4 of the manual and the 18in measured at the Manchester kickoff. In addition, item GE-10043-07 places the top of the platform at 19 1/4 inches rather than the 20 inches listed in section 6.2.4 of the manual and measured at the Manchester kickoff.

Please provide the correct dimensions for the tunnel game element. Elements GE-10043-01, GE-10043-03, GE10043-05 and GE-10043-07 would all need to change to be compliant to the manual and measured dimensions.

Tunnel Height

Posted by 2010FRC0360 at 01/18/2010 01:21:26 pm

Apologies if I am simply reading things wrong.

The manual states clearly that the tunnel will have a height of 18 inches (Section 6.2.4) but the practice field dimensions (and apparently the official field dimensions) do not add up to 18 inches. The practice field is below 17 inches as drawn.

We are operating on the assumption that the height will be 18 inches since that hasn't changed in the last two updates.

Thank you

Eric Stokely  
Team 360

Tunnel height discrepancy

Posted by 2010FRC0058 at 01/18/2010 04:22:05 pm

Drawing item GE-10043-01 has a dimension of 16 1/2 x 32 1/2. This dimension would place the tunnel inside height at 16.5 inches rather than the 18 inches in section 6.2.4 of the manual and the 18in measured at the Manchester kickoff. In addition, item GE-10043-07 places the top of the platform at 19 1/4 inches rather than the 20 inches listed in section 6.2.4 of the manual and measured at the Manchester kickoff.

Please provide the correct dimensions for the tunnel game element. Elements GE-10043-01, GE-10043-03, GE10043-05 and GE-10043-07 would all need to change to be compliant to the manual and measured dimensions.

Re: Discrepancies between drawings and field measurements at kickoff

Posted by GDC at 01/21/2010 04:35:28 pm

Below are details about the dimensions of the tunnel and platform height.



For the height of the tunnel roof:

Nominal dimensions (height of the tunnel roof from the bottom carpet, i.e. floor):

- \* 1 3/4" (baseplate & Uchannel)
- \* 16 1/2" (inside wall)
- \* 1" (Velcro, one side only)
- \* Total: 18 3/8" = height of the top of the tunnel from bottom carpet

Nominal dimensions (height of the tunnel roof from the top carpet - because the top carpet sits on top of the baseplate/plywood and offsets some of the height of the uchannel):

- \* 1 1/4" (Uchannel)
- \* 16 1/2" (inside wall)
- \* 1" (Velcro, one side only)
- \* Total: 17 7/8" = height of the top of the tunnel from top carpet (from top carpet on baseplate)

[B]Actual dimensions measured by FRC Engineering:

- \* 17 7/8" from carpet over the baseplate (pic w/ red border)
- \* 17 1/2" from carpet over the plywood floor protector, which is 1/4" thicker than the baseplate (pic w/ blue border)[/B]

For the height of the platform:

Nominal dimensions (height of the platform from the original carpet layer, i.e. FLOOR):

- \* 1 3/4" (baseplate & Uchannel)
- \* 16 1/2" (inside wall)
- \* 1/2" (inside roof)
- \* 1 1/2" (horizontal stiffener)
- \* 1/2" (outside roof)
- \* 1" (logo plate)
- \* 1" (Velcro, hook & loop)
- \* Total: 21" = height of platform from carpet (carpet has plywood or aluminum below it)

Nominal dimensions (height of the platform from the top carpet - because the top carpet sits on top of the baseplate/plywood and offsets some of the height of the uchannel):

- \* 1 1/4" (remaining Uchannel)
- \* 16 1/2" (inside wall)
- \* 1/2" (inside roof)
- \* 1 1/2" (horizontal stiffener)
- \* 1/2" (outside roof)



- \* 8539;8221; (logo plate)
- \* 8539;8221; (Velcro, hook & loop)
- \* Total: 20½8221; = height of platform from carpet (carpet has aluminum below it)

[B]Actual dimensions measured by FRC Engineering:

- \* 20½8221; from carpet over the baseplate
- \* 208539;8221; from carpet over the plywood floor protector.[/B]

Please see Team Update #4 for information about edits to the Game Manual.

### Tunnel height

Posted by 2010FRC1359 at 01/22/2010 12:49:56 pm

We just finished building tunnels last night and came to the realization the the inner height dimension is 16.5 inches. As far as I can tell the tunnel object does not rest on top of another element that would increase the internal clearance. In the rules it states that the tunnel is 18" high. With a bumper zone that extends to 16 inches, it will be difficult to build a robot that can fit under the tunnel and not be so flat that a ball will rest on top of the robot violating the carrying rule. Is there an error in the tunnel dimensions? Does the tunnel rest on another object that I have missed?

### The Arena (2010)

#### Tunnel/Tower

##### Tunnel/Tower

Posted by 2010FRC1511 at 01/14/2010 08:56:36 am

Is the Tunnel (including the carpet) part of the Tower?

This would help in defining two things:

1. If a robot can go through the tunnel during the finale (RE:G35)
2. If a robot can extend to its FINALE configuration while just touching the carpet underneath the tower (G30c)

##### Carpet Under Tower

Posted by 2010FRC1511 at 01/14/2010 09:02:12 am

Is the Carpet under the tower considered part of any Zone? or is it "neutral" like the bumps/towers?

We are wondering if being in the tunnel will count as a violation of G29 since there is "green carpet" under there.

##### Re: Tunnel/Tower

Posted by GDC at 01/17/2010 05:02:49 pm

As defined in Section 6.2.4 of The Manual, the TOWER includes the base and the pipe superstructure. The PLATFORM and the TUNNEL are features of the base, and are therefore part of the TOWER. The carpet under the TOWER is not considered part of the TOWER. Also, as defined in Section 6.2.3 of The Manual (as updated in Team Update #2), the carpet under the TOWER is not considered part of the end ZONE.





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The Arena (2010)

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## Goal Memory Foam

Goal Memory Foam

Posted by 2010FRC1126 at 01/14/2010 12:39:33 pm

What is product name or material name used for the memory foam in the goals?

Re: Goal Memory Foam

Posted by GDC at 01/15/2010 09:50:54 am

The foam used in the goals is 2" Aerus Natural Memory Foam Topper as described at [url]http://www.walmart.com/catalog/product.do?product\_id=11030704&sourceid=15000000000000003260370&ci\_src=14110944&ci\_sku=11030704[/url]

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The Arena (2010)

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## Dimensions of Bump

Dimensions of Bump

Posted by 2010FRC0178 at 01/14/2010 05:56:29 pm

The Bump has a 12" height, 12" wide at the top, but how wide is the base?

Re: Dimensions of Bump

Posted by GDC at 01/15/2010 09:49:29 am

Please refer to drawing GE-10047 as referenced in The Arena, paragraph 6.1.1.

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The Arena (2010)

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## <6.2.6> Vision Target Dimensions

&lt;6.2.6&gt; Vision Target Dimensions

Posted by 2010FRC0365 at 01/14/2010 10:05:58 pm

The target that is in the field drawings has 2-inch white rings surrounding a 4-inch black ring and the diameter of the target is 32-inches. Section <6.2.6> of the manual describes the target as being 42-inches in diameter with 4-inch wide white rings and 4-inch wide black rings.

Which is correct?

Re: &lt;6.2.6&gt; Vision Target Dimensions

Posted by GDC at 01/17/2010 05:03:13 pm

Please see Team Update #2.

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The Arena (2010)

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## Tower Return Bar Clarification

Tower Return Bar Clarification

Posted by 2010FRC2826 at 01/16/2010 12:17:42 am

The picture of the close-up of the tower shown directly above section 6.2.4 points with one arrow at a bar and is labeled "Retun Bars", with my emphasis on the plural. Since the term "Return Bars" also is noted in section 6.2.4, can we assume that not only the bar that the picture points to is a return bar, but also the bar directly above it?

Is it possible to hang off of the horizontal bar that the bar return is attached to as long as we do not violate <G24> and <G30>? (Assuming that the top bar as aksed above is not a return bar).



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Re: Tower Return Bar Clarification

Posted by GDC at 01/17/2010 05:04:24 pm

Regarding your first question: Yes. All of the return bars in the picture are grey.

Regarding your second questions, <G31> applies if you contact any of the RETURN BARS.

The Arena (2010)

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## Visual target height (section 6.2.6)

Visual target height (section 6.2.6)

Posted by 2010FRC0386 at 01/17/2010 01:37:00 pm

What is the height, in inches, from the carpet floor to the edge of the visual target above the goal? 6.2.6 says the target is "centered above each GOAL opening." Does that mean centered both horizontally and vertically?

Re: Visual target height (section 6.2.6)

Posted by GDC at 01/19/2010 10:31:53 am

Please refer to Team Update #3

The Arena (2010)

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## Bump angle

Bump angle

Posted by 2010FRC2974 at 01/17/2010 03:14:44 pm

One drawing suggests the bump is a 3 4 5 triangle (37 degrees) and another suggests they are 45 degree angles. What angle are the bumps?

Re: Bump angle

Posted by GDC at 01/18/2010 10:38:55 am

The construction of the BUMP is detailed in Drawing GE-10047. The sloped surfaces of the BUMP are angled at 45 degrees.

The Arena (2010)

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## Ramp in front of goals

Ramp in front of goals

Posted by 2010FRC1126 at 01/18/2010 03:37:27 pm

Section 6.2.5 of the game manual states that there is a ramp in front of the goals that is 6" tall. Field drawing GE-10033 calls for the height of the ramp pieces to be 6 15/16" plus a piece of material on top of that adding up to roughly 7 1/4" tall. Which is the correct size?

Re: Ramp in front of goals

Posted by GDC at 01/20/2010 10:29:11 pm

As noted in Section 6.1.1 of The Manual, "the exact dimensions and construction details of the ARENA are contained on the official ARENA drawings." In cases where the dimensions in the official drawings and The Manual are in conflict, rely upon the official drawings.

The Arena (2010)

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## Tower Size

Tower Size

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## 2010 Q&A Forum Export

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Posted by 2010FRC1126 at 01/18/2010 09:39:10 pm

The game manual says that the platform attached to the towers are 44" x 36", but the drawings say they are 39 1/2" x 36". Which is the correct size?

Re: Tower Size

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Posted by GDC at 01/20/2010 10:28:32 pm

We cannot identify the drawing you referenced in your question. As noted in Section 6.1.1 of The Manual, "the exact dimensions and construction details of the ARENA are contained on the official ARENA drawings." In cases where the dimensions in the official drawings and The Manual are in conflict, rely upon the official drawings. Please see Team Update #3 for the updated platform dimensions.

**The Arena (2010)**

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### Complications of leaving the field

Complications of leaving the field

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Posted by 2010FRC0639 at 01/19/2010 10:46:01 pm

Why was there only one gate added to the midfield, and not one on each side of the midfield?

Re: Complications of leaving the field

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Posted by GDC at 01/21/2010 10:41:56 pm

This forum is intended for rule clarification. To maintain the mystique of the process, we typically refrain from answering "why" questions about game design decisions.

**The Arena (2010)**

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### carpet source

carpet source

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Posted by 2010FRC3218 at 01/21/2010 07:56:32 pm

We are trying to get a source of the carpet that will be used at the playing surface. The specs have called out S&S Mills Sequoia-20 Scotch pine green but the company will not give us any information regarding it or how to buy some. Any suggestions?

team 3218

Re: carpet source

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Posted by GDC at 01/25/2010 02:24:39 pm

S&S Mills has been selling the field carpet to teams. To inquire, please contact Debbie Collins, M-F between 10am and 4pm, at (800) 241-4013.

**The Arena (2010)**

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### Team update #2 "Bump Hight"

Team update #2 "Bump Hight";

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Posted by 2010FRC0696 at 01/23/2010 01:00:29 pm

in team update #2 it updates the bump height as such '1 3/4 inches high off the FIELD surface' in the rules the height is stated "Each BUMP is 12 inches high, 12 inches wide at the top," will this extra 1.5in going to be added by making the sides of the bump steeper (no longer 45 degrees) or by raising the entire bump 1.5in. ?

Re: Team update #2 "Bump Hight";

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Posted by GDC at 01/24/2010 07:39:12 pm

Please refer to the second paragraph of "Section 6" of Team Update #3, and Section 6.1.1. of The Manual.

The Arena (2010)

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## Playing Field

Playing Field

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Posted by 2010FRC0620 at 01/29/2010 02:43:03 pm

Is the playing field carpet a regular indoor/outdoor carpet or does it have special characteristics.

Re: Playing Field

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Posted by GDC at 01/31/2010 11:24:59 am

As noted in Section 6.2.1 of The Manual, the carpet used on the FIELD is S&S Mills "Sequoia-20" carpet. It is unaltered, and used "as is" straight from the factory.

The Arena (2010)

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## Length of competition (Ethernet) cable

Length of competition (Ethernet) cable

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Posted by 2010FRC0058 at 01/29/2010 06:53:39 pm

We are designing our driver station and want to have the Classmate PC close to eye level so the driver can quickly ascertain if the robot is aligned with a goal. How long will the end of the ethernet cable at the player station be?

Re: Length of competition (Ethernet) cable

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Posted by GDC at 02/05/2010 02:10:23 pm

The cables that run from the Station Control Cabinet (located under the center Player Station shelf) to the top of the Player Station shelves are each 12ft long. The cable to Player Stations #1 and #2 will run up the right hand side of the shelf. The cable for Driver Station #3 will run up the left hand side.

Teams can expect to have at least 4ft of cable available on the Player Station shelf.

The Arena (2010)

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## Ball Return Assembly

Ball Return Assembly

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Posted by 2010FRC1126 at 01/30/2010 12:42:05 pm

When returning balls to the field, via the ball return in the alliance station, how high is the angled ball return height, from the floor? (This is where the human player places the ball using the trident)

Re: Ball Return Assembly

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Posted by GDC at 02/07/2010 12:18:01 am

The distance from the carpet to the center point at the end of the angled tube assembly of the BALL RETURN is nominally 110". Please note that tolerances apply.

The Arena (2010)

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## Platform Height



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Platform Height

Posted by 2010FRC0612 at 02/01/2010 04:33:27 pm

Under 6.2.4 The TOWERS, it states:

The PLATFORM is approximately 41 inches wide by 32 inches deep, and is at a height of approximately 21 inches above the floor.

Please furnish the tolerance on the platform height of 21 inches?

Re: Platform Height

Posted by GDC at 02/04/2010 07:46:43 pm

Please refer to the last paragraph of Section 6.1.1 of The Manual.

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## Game Pieces (2010)

Game Pieces (2010)

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### Managing ball pressure during competition

Managing ball pressure during competition

Posted by 2010FRC2826 at 01/16/2010 01:25:22 am

Will the ball pressure of approximately 9 psi, as stated in section 6.3.1, be checked before or after matches to ensure general compliance or to make sure that damage that would cause a leak did not occur?

Re: Managing ball pressure during competition

Posted by GDC at 01/18/2010 05:12:23 pm

BALLS that are deflated, where obvious, will be replaced between MATCHES.

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Game Pieces (2010)

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### Game Pieces

Game Pieces

Posted by 2010FRC0234 at 01/26/2010 10:49:39 pm

If a game piece becomes deflated between being scored and being put back into play, will it be replaced?

If not, will the alliance receive a penalty if they cannot put the ball back into play (since it would not roll down the rails)?

If the ball will be replaced, will the alliance be penalized due to the extra time required to receive a replacement ball and put it back into play?

Re: Game Pieces

Posted by GDC at 01/29/2010 09:10:32 am

If a BALL becomes compromised to the point where it will not roll down the BALL RETURN, it may be replaced during a MATCH at the REFEREE'S discretion.

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## Safety (2010)

Safety (2010)

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<S02> What happens when someone touches a robot?



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&lt;S02&gt; What happens when someone touches a robot?

Posted by 2010FRC2505 at 01/18/2010 03:04:00 pm

When a member from Team A directly contacts Team B's robot, which robots are disabled, and which teams are penalized? (Specifically, is this a punitive measure imposed upon the team that touches any robot, and/or a safety measure imposed on any robot whenever it is touched?)

Re: &lt;S02&gt; What happens when someone touches a robot?

Posted by GDC at 01/21/2010 10:56:44 pm

Your question concerns us, as it addresses behavior that's completely prohibited and should be extremely difficult/impossible given the FIELD configuration.

Please clarify your question and resubmit it. Help us understand how you think this could happen.

Thank you.

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**Safety (2010)**

**Recommendation for a safety guideline/rule**

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Recommendation for a safety guideline/rule

Posted by 2010FRC1559 at 01/29/2010 01:20:03 pm

Rule <G42> states that a team must remove their robot from the tower without power. This concerns me in that many of the robot designs I have seen will have very significant stored energy in the "kicker" that cannot be safely dissipated from underneath the robot. I strongly recommend a new rule (or amendment to <R01>D) preventing human transport of a robot before or after the match (ie. not in the pits and especially during removal from the tower) while there is stored energy from "deformation of robot parts" including springs and surgical tubing. Mechanical latch / trigger mechanisms could be bumped while lifting and could cause serious injuries. Release mechanisms should be easily accessible while suspended and as per <G42> not require power.

Re: Recommendation for a safety guideline/rule

Posted by GDC at 02/01/2010 12:15:22 pm

Please see Team Update #7.

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**Safety (2010)**

**stored energy**

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stored energy

Posted by 2010FRC0696 at 02/03/2010 08:00:49 pm

At the end of a match, does stored energy, (ie: our robots kicking mechanism being "cocked") have to be able to be released without turning on the robot. or can we take the robot back to our base with the energy still stored and power on the robot there to release it?

Re: stored energy

Posted by GDC at 02/04/2010 04:53:08 pm

For the safety of all involved, removing a ROBOT from the FIELD or bringing a ROBOT to the FIELD while major subsystems capable of high-energy kinetic motion are in a high potential energy state will be prohibited unless appropriate safety interlocks and/or restraints are placed



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on the system. If such interlocks/restraints are not available, then the stored potential energy must be released in a controlled manner (and without powering up the ROBOT) before the ROBOT is removed from the FIELD. Failure to do so will be considered a violation of Rule <S01>.

Safety (2010)

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### Hanging Chads...I mean robots! :)

Hanging Chads...I mean robots! :)

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Posted by 2010FRC3355 at 02/08/2010 06:53:37 pm

Are we allowed to physically go into the field to pick up the robot and hang it for the bonus points (we saw the krew in the demonstration video physically pick it up and hang it for the bonus points and our team is not sure if we are allowed or not) OR.....must it be completely done by the robot itself?

Team 3355

Summit international Prep

Arlington, Texas

..."we're rookies but watch your back"

---

Re: Hanging Chads...I mean robots! :)

Posted by GDC at 02/11/2010 04:09:23 pm

Bonus points are earned by the ROBOTS solely as a result of their own actions, not by being physically assisted by TEAM members. TEAM members are not allowed to enter the FIELD at any time during the MATCH. Please read Rule <S02> very carefully.

## Game Periods (2010)

Game Periods (2010)

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### G28 Autonomous

G28 Autonomous

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Posted by 2010FRC0815 at 01/22/2010 07:21:40 pm

During autonomous, may the robot go over the bump?

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Re: G28 Autonomous

Posted by GDC at 01/24/2010 08:06:48 pm

Yes

Game Periods (2010)

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### <G30> and period ending

&lt;G30&gt; and period ending

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Posted by 2010FRC2175 at 02/08/2010 04:12:05 pm

Our team was wondering about the interaction between <G30-a> and the end of a period, either Autonomous or Teleop.

If a robot kicks the ball at the end of a period and is not able to retract the kicker before the end of the period will they be penalized under <G30>?

If not, and the period ending is Autonomous will the robot have the full 2 seconds to withdraw



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the kicker at the start of the Teleop period or will the time at the end of Autonomous be counted against the 2 seconds?

Re: <G30> and period ending

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Posted by GDC at 02/11/2010 05:08:43 pm

There is no delay between the Autonomous Period and the Teleoperated Period. Rule <G30-A> is continuously in force until the end of the MATCH.

## Scoring (2010)

Scoring (2010)

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### End Game Scoring ON Platform

End Game Scoring ON Platform

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Posted by FRC57 at 01/13/2010 05:44:37 pm

ELEVATED: A ROBOT that is completely above the plane of the PLATFORM and in contact with the TOWER shall be considered ELEVATED

This does not mention support or that the ELEVATED robot only be in contact with the TOWER. Would a ROBOT be considered ELEVATED if it is: sitting on top of another ROBOT, fully above the PLATFORM, and touching the TOWER?

SUSPENDED: A ROBOT only in contact with an ELEVATED ROBOT and/or a SUSPENDED ROBOT shall be considered SUSPENDED.

Does this mean that a ROBOT will never be considered SUSPENDED if it is touching the TOWER?

Re: End Game Scoring ON Platform

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Posted by GDC at 01/14/2010 11:31:16 pm

1) If a ROBOT is completely above the plane of the PLATFORM and is touching the TOWER, it will be considered ELEVATED. There is no restriction on contact with, or support by, other ROBOTS.

2) A ROBOT that is touching the TOWER can never be considered SUSPENDED, by definition.

Scoring (2010)

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### <G30> Tower Contact - Platform

<G30> Tower Contact - Platform

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Posted by 2010FRC0365 at 01/13/2010 06:36:13 pm

Does a robot sitting on the platform of the tower satisfy the Tower Contact requirement of Rule <G30> Part c?

<G04> Elevated Robot

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Posted by 2010FRC0365 at 01/13/2010 06:38:50 pm

Is a robot sitting on the Tower Platform at the end of match considered "Elevated" per rule <G04>?

elevated above the platform

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## 2010 Q&A Forum Export

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Posted by 2010FRC1784 at 01/13/2010 10:39:09 pm

per the rule <G4> about being above the plane of platform to score 2 points at the end of the round, is the robot allowed to be sitting on the platform?

### Clarification needed on the definition of ELEVATION

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Posted by 2010FRC2471 at 01/14/2010 02:19:32 am

The definition of elevation in the manual (chapter 7) states: ELEVATED: A ROBOT that is completely above the plane of the PLATFORM and in contact with the TOWER shall be considered ELEVATED.

Question: If a robot is resting on the platform and isn't touching the tower is that still considered as elevation? In other words, does resting on the plane of the platform count as above the platform? And also, do you have to be above AND in contact with the tower? Or would simply being above the platform (assuming robot is small enough to be in the center of the platform and not touching any of the poles of the tower) be considered as elevation?

The animation seems to indicate that just resting on the platform counts, but we decided that it's not safe to rely on the animation solely for interpretation of the rules.

Thank you,

Team 2471  
(Camas, Washington)

### Elevated

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Posted by 2010FRC1511 at 01/14/2010 09:17:31 am

Given the definition of Elevated:

ELEVATED: A ROBOT that is completely above the plane of the PLATFORM and in contact with the TOWER shall be considered ELEVATED.

Is the Platform part of the tower (it is in the Tower section 6.2.4, but the tower is only defined as the base & pipe superstructure)?

And is touching the platform considered above the plane? and in contact with the tower? or is above defined by the "run a piece of paper between the robot & the platform" (like the inside the box inspection test)?

### Elevated Definition

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Posted by 2010FRC1126 at 01/14/2010 12:32:05 pm

Concerning the definition of Elevated in 7.2: Definitions, would a robot be considered elevated if it were parked on top of the platform, and not suspended from the tower bars? (ie - if you are on the platform, are you considered above the plane?)

### platform over the tunnel

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Posted by 2010FRC0155 at 01/14/2010 12:36:42 pm

Will parking your robot on the platform above the tunnel result in a bonus point as stated in the game animation?



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### End Game Scoring ON Platform

Posted by 2010FRC0087 at 01/14/2010 06:12:18 pm

I have a question about the definition ELEVATED, and what it allows a robot to do, in terms of scoring in the end game. The definition is as follows:

[QUOTE] ELEVATED: A ROBOT that is completely above the plane of the PLATFORM and in contact with the TOWER shall be considered ELEVATED.[/QUOTE]

Is a robot considered ELEVATED and above the plane while SITTING and obviously in contact with the top of the platform? The game animation would also back this interpretation of the rule.

### ELEVATED Robot?

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Posted by FRC980 at 01/14/2010 07:04:17 pm

At the end of a MATCH, is a ROBOT at rest on the top surface of the PLATFORM, with no portions of the ROBOT extending below the top plane of the PLATFORM, and NOT in contact with the pipe superstructure of the TOWER considered to be ELEVATED (thus scoring 2 points)?

### Re: &G30&Gt; Tower Contact - Platform

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Posted by GDC at 01/14/2010 11:28:41 pm

A ROBOT that is resting on top of the PLATFORM, with all parts of the ROBOT completely above the plane of the PLATFORM, is both in contact with the PLATFORM (which is part of the TOWER) and above the plane of the PLATFORM. Therefore, the definition of "ELEVATED" is satisfied.

### Scoring (2010)

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## Can goals be scored during finale

### Can goals be scored during finale

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Posted by 2010FRC2582 at 01/13/2010 07:16:07 pm

We have a question regarding scoring during the finale. In the game manual the finale is referenced only as follows:

[I]<G34> FINALE PERIOD ROBOT Protection - During the FINALE, ROBOTS in contact with their TOWER or in contact with an ELEVATED ALLIANCE partner may not be contacted by an opponent. Violation: PENALTY for inadvertent contact; plus a RED CARD for obviously intentional contact.

<G35> FINALE PERIOD TOWER Protection - During the FINALE, ROBOTS in may not contact the OPPONENT'S TOWER. Violation: PENALTY for inadvertent contact; plus a RED CARD for obviously intentional contact.[/I]

However in the animation the voiceover states that during the last 20 seconds of play the robots will move toward their towers. We have not been able to find a rule regarding scoring during the finale other than the elevating rules. We would like to know the following:

Are robots allowed to score goals during the last 20 seconds of game play (the finale).



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Thank you,

Team 2582

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### Scoring in the 20 second Finale

Posted by 2010FRC2888 at 01/14/2010 05:01:30 pm

Can robots continue to score goals using the soccer balls during the 20 second Finale?

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### Can goals be scored during finale

Posted by 2010FRC2582 at 01/14/2010 08:28:14 pm

The manual does not address goals made during the finale. In the animation the bots are all shown in varying positions at their respective towers and rules G34 and G35 simply address contact with the opposing alliances tower. The question we have is this:

Can **[I]goals[/I]** be scored during the finale (final 20 seconds of game play) or do all bots have to move to their respective towers?

Re: Can goals be scored during finale

Posted by GDC at 01/14/2010 11:26:09 pm

There is no rule that would prohibit ROBOTS from scoring during the FINALE PERIOD.

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### Scoring (2010)

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#### <G30> Tower Contact

&lt;G30&gt; Tower Contact

Posted by 2010FRC0365 at 01/14/2010 08:15:09 am

What constitutes robot contact with the Tower? Does a robot bumper touching the corner posts constitute contact per <G30>c?

Re: &lt;G30&gt; Tower Contact

Posted by GDC at 01/14/2010 11:24:16 pm

We will not define "TOUCHING" - the commonly accepted definition is sufficient. A BUMPER touching the TOWER satisfies the requirements of Rule <G30-C>.

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### Scoring (2010)

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#### Suspended Robots

Suspended Robots

Posted by 2010FRC1511 at 01/14/2010 08:20:35 am

The definition of a suspended robot in 7.2 is:

SUSPENDED: A ROBOT only in contact with an ELEVATED ROBOT and/or a SUSPENDED ROBOT shall be considered SUSPENDED.

It says "A ROBOT ONLY in contact", so does that mean if any part of the suspended robot touches any part of the tower or any other structure it does not count?

We would expect if 2 robots are trying to suspend themselves from a single elevated robot (the maximum points possible for FINALE hanging), that it is very likely by the dimensions of the tower that at least one of the suspended robots may contact the bars of the tower superstructure.



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Re: Suspended Robots

Posted by GDC at 01/14/2010 11:22:57 pm

Any ROBOT in contact with any part of the TOWER would not be eligible for SUSPENDED points.

**Scoring (2010)**

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**Finale period**

Finale period

Posted by FRC1429 at 01/14/2010 10:26:05 am

Quote from 7.2:

SUSPENDED: A ROBOT only in contact with an ELEVATED ROBOT and/or a SUSPENDED ROBOT shall be considered SUSPENDED.

Our question is, if we deploy a ramp, have one robot drive up and park in the platform (elevated), and then have the next robot drive up behind the 1st one, and touch the elevated robot, is the 2nd robot considered 'suspended' and awarded the 3 points?

Re: Finale period

Posted by GDC at 01/14/2010 11:56:40 pm

If the ROBOT is touching [b]ONLY[/b] an ELEVATED ROBOT and/or a SUSPENDED ROBOT, then it will be considered SUSPENDED and receive the appropriate bonus. In the described scenario, it is not clear if the third ROBOT is in contact with the first ROBOT (and ramp). If so, this would invalidate the conditions required for a SUSPENDED ROBOT.

**Scoring (2010)**

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**Scoring Definitions**

Scoring Definitions

Posted by 2010FRC3262 at 01/16/2010 10:23:09 am

Does the definition of ELEVATED mean that the BUMPERS must also be above the plane of the PLATFORM? It only specifies the ROBOT must be completely above the plane.

Specifically, in the finale, if a robot is on its side and being hoisted up onto the tower, must the robot [B]including the bumpers [/B]be above the plane?

Thanks very much for your response.

Re: 7.2 Definitions

Posted by GDC at 01/17/2010 04:59:53 pm

With the explicit exception noted in Rule <R10-A>, the BUMPERS are always considered part of the ROBOT.

**Scoring (2010)**

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**Elevated**

Elevated

Posted by 2010FRC2974 at 01/17/2010 02:14:36 pm

Elevated is defined as above the plane of the platform and in contact with the



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tower.

Does being on the platform count as elevated?

Re: Elevated

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Posted by GDC at 01/18/2010 10:44:54 am

A ROBOT that is resting on top of the PLATFORM, with all parts of the ROBOT completely above the plane of the PLATFORM, is both in contact with the PLATFORM (which is part of the TOWER) and above the plane of the PLATFORM. Therefore, the definition of "ELEVATED" is satisfied.

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Scoring (2010)

## Winning and Penalties

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Winning and Penalties

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Posted by 2010FRC2974 at 01/17/2010 02:31:47 pm

Is winning calculated before or after penalties?

Re: Winning and Penalties

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Posted by GDC at 01/18/2010 10:46:34 am

After.

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Scoring (2010)

## Hanging on the tower

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Hanging on the tower

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Posted by 2010FRC2484 at 01/22/2010 02:29:53 pm

It appears that one of the four horizontal bars around the top of the tower is black and the other three are either red or blue depending on the tower. It also appears that during the FINALE period and robots are hanging from their tower, that they cannot hang from the black bar (accessible from the zone nearest their goal) according to rule [G31]. Is this understanding of the game play correct?

Re: Hanging on the tower

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Posted by GDC at 01/24/2010 09:40:50 pm

Partially. Note that there are two horizontal RETURN BARS at the top of the near side of the TOWER, not one. Both of these bars are covered in black tape, and neither may be contacted at any time (Rule <G31>). Also, the other three bars do not have tape on them.

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Scoring (2010)

## Frc1606

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Frc1606

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Posted by 2010FRC1606 at 02/04/2010 12:09:16 pm

If a Robot is hanging from the horizontal bar of the tower 20" off the ground and the Robot's bumpers are resting against the vertical supports of the tower will that be considered a legally suspended robot (2 points)?

Re: Frc1606

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Posted by GDC at 02/05/2010 09:03:12 am

An ELEVATED ROBOT is worth 2 points; a SUSPENDED ROBOT is worth 3 points. Per the definition, if a ROBOT is touching anything in addition to another SUSPENDED and/or



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ELEVATED ROBOT, it is not eligible for bonus points awarded for SUSPENDED ROBOTS.

Scoring (2010)

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**Scores will be assessed after all objects in motion come to rest**

Scores will be assessed after all objects in motion come to rest

Posted by 2010FRC0115 at 03/07/2010 12:05:07 pm

We would like a clarification on rule G05.

During one of the regionals, a robot extended a mechanism and begin climbing on one of the vertical poles of the tower in the last 20 seconds of a match. At 0 seconds, the robot was observed to be above the platform of the tower. Immediately after 0 seconds, the robot was observed to be sliding back down the vertical pole until it touched the ground again. In this situation, 3 facts were clear:

1. The team operating the robot clearly expressed they do not have anti-backdrive ability on their climbing mechanism at that point.
2. The robot was clearly sliding back down toward the ground after the clock reached 0 seconds, and the team operating the robot acknowledge such a fact.
3. The robot was clearly above the plane of the platform at 0 seconds.

Rule G05 clearly says that: Scoring Determination - Scores will be assessed after all objects in motion, when the ARENA timer displays zero seconds, come to rest, or 10 seconds after the timer displays zero seconds, whichever comes first. The final score of a MATCH is the total of points assigned under Rule <G04> less any assigned PENALTIES.

Should the team have been award 2 points for elevating their robot above the platform plane at 0 second of the match?

Re: Scores will be assessed after all objects in motion come to rest

Posted by GDC at 03/15/2010 08:35:17 pm

We cannot provide post-analysis of a specific incident at an event which we did not witness. However, it is noted that under Rule <G05>, if an object is in motion when the match clock reaches zero seconds, the object will not be evaluated for its potential scoring determination when the object comes to rest or 10 seconds after the match clock reaches zero (whichever comes first). Thus, if a robot was moving when the match clock reached zero seconds, it would not be evaluated for a potential bonus until the robot comes to rest or until 10 seconds later (whichever comes first).

Scoring (2010)

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**Scoring**

Scoring

Posted by 2010FRC1771 at 03/09/2010 08:16:23 am

We have two questions on scoring.

- 1) In the event that two or more balls enter the goal at or near the same time, and get stuck in the goal as a result, thereby blocking that goal, what is the procedure? Will the goal remain blocked, or is anyone allowed to clear the blockage (human player or ref)? If so, who, how,



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and when? Will those balls be scored or returned to the field un-scored?

2) If a bot is herding multiple balls, and enters the goal along with those balls, and is unable to extricate itself for whatever reason (becomes stuck or inoperative, or time expires) and there are balls jammed in the goal with the robot, what is the procedure? Will the goal remain blocked, or is anyone allowed to clear the blockage (human player or ref)? If so, who and when? Will those balls be scored or returned to the field un-scored?

Since both of these events occurred at more than one week one regional, and were handled differently at different regionals, it is likely that they will occur again, and rule clarification is needed.

Re: Scoring

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Posted by GDC at 03/15/2010 08:48:00 pm

Please refer to Team Update #16 for a description of the authorized procedure for clearing balls stuck in the goal.

#### Scoring (2010)

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### Definition: Scored

Definition: Scored

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Posted by 2010FRC1261 at 03/09/2010 07:34:23 pm

Section 7.2

SCORED: A BALL is SCORED when it passes through the GOAL COUNTER.

There was an instance at Peachtree where a robot was able to her three balls into the goal at once just before the end of the match. All of the balls did not make it through the counter. The referees declared the stuck balls as scores.

I do believe the refs made the best call based on their knowledge at the time, but the rule states that these balls should not have been scored.

G15 states that a team may use the trident end to dislodge balls.

Please update the rule or be sure the refs are aware.

Re: Definition: Scored

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Posted by GDC at 03/15/2010 12:20:56 pm

We can not comment on specific incidents that may or may not have taken place at competition events that we did not witness.

## Game Play (2010)

### Game Play (2010)

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#### "Active" Mechanism above Bumper Zone

&quot;Active&quot; Mechanism above Bumper Zone

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Posted by 2010FRC2972 at 01/13/2010 10:35:54 pm

Suppose a robot has an inclined top and happens to pass under the ball return when a ball falls back to the field. The ball bounces off of the incline and into the robot's alliance's side of



the field.

Now suppose a robot parks itself under a ball return so that every ball falling from the rail hits the incline and bounces in the direction determined by the bot's orientation.

In neither case does the incline move or have the capacity to move (other than with the robot).

Do either or both violate the stipulation that no active component above the bumper perimeter can redirect soccer balls? If there is a difference, do judges have to evaluate "intent to redirect" before issuing a penalty?

Thank you.

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#### Passive Deflection of a Ball &lt;G45&gt;

Posted by 2010FRC0365 at 01/14/2010 08:19:49 am

Is passive deflection of the ball above the bumper legal per <G45> or is this considered carrying? Can you provide any examples of where this would be legal and where it would be illegal (for example is a stationary trough legal or illegal)?

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#### Carrying

Posted by 2010FRC1511 at 01/14/2010 09:11:40 am

We understand that robots are not allowed to carry balls, and need to design the tops of the robots such that even balls falling from the ball returns should not get "caught" on the robot and thus carried/possessed.

If a robot had a SLICK concave surface in a semi-conical shape that directed the ball towards the front of the robot if the ball fell from above, but had no means of possessing the ball (ie if the robot moved the ball would roll off the robot & the surface always forced the ball to roll forward), would this be considered a violation of the carrying or possession rules (definitions and G44)?

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#### &quot;Active&quot; Mechanism above Bumper Zone

Posted by FRC111 at 01/14/2010 10:28:05 am

Define "active ball control above the bumper zone" as pertains to <G45>.

If the robot has an adjustable slope that moves, relative to the robot, when the ball is not in contact, but is stationary, relative to the robot, when a ball falls upon it, is it still considered an "active mechanism"?

-FRC111

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#### Deflector on the top of the robot

Posted by FRC1986 at 01/14/2010 07:29:36 pm

Is it legal to place a deflector on top of the robot so that it would guide the balls a set direction we want to the ball to go, or would this be considered carrying the ball.

If so, is it also legal for our robot to move while this is occurring?

7-2 game definitions: carrying and possession





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<G43>

<G44>

&lt;G45&gt; with regard to active MECHANISMS

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Posted by 2010FRC0008 at 01/15/2010 12:22:23 am

<G45> states that "ROBOTS may not control BALL direction with active MECHANISMS above the BUMPER ZONE."

Say we are considering a mechanism that folds to pass under the TUNNEL and then unfolds to affect the direction of the BALLS. Is it an active MECHANISM if it passively interacts with the ball, but is actuated to pass under the tunnel?

Re: "Active" Mechanism above Bumper Zone

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Posted by GDC at 01/16/2010 11:51:55 am

Please see Team Update #2.

#### Game Play (2010)

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### Ball Return Timing

Ball Return Timing

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Posted by 2010FRC1511 at 01/14/2010 08:28:22 am

Based on G17:

<G17> BALL Return Timing - BALLS must be returned to the FIELD within a specified period of time

Will there be (or would it be possible to have) a countdown clock for the human players to see the timing (like a "delay of game" countdown clock in American Football)?

We are assuming this is at least available at the scoring table so that the FTA's can verify that the FMS is working correctly, but it would be helpful for each Alliance to have some visual countdown timer (whether it is just at the station or on the display screens).

Re: Ball Return Timing

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Posted by GDC at 01/14/2010 11:16:46 pm

To prevent the temptation of hoarding BALLS until the last possible second, a countdown timer will not be provided. It is in the best interests of the entire ALLIANCE to return BALLS to the FIELD as quickly as possible to avoid any potential PENALTIES.

#### Game Play (2010)

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### Rule <G45>

Rule &lt;G45&gt;

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Posted by 2010FRC1661 at 01/14/2010 06:59:41 pm

We are confused about the meaning of rule <G45>. <G45> is written as:

"<G45> Active BALL control - ROBOTS may not control BALL direction with active MECHANISMS above the BUMPER ZONE. Violation: PENALTY."

Do active mechanisms refer to any moving part? For example, say we have a pneumatically



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actuated lever, the lever is 40 inches long and a pneumatic attached to it is mounted 35 inches high. The pneumatic pulls on the lever and a portion of the lever below the bumper zone strikes the ball. The ball travels straight afterward (any deviation from a straight path would be by accident, not intended). Would this be legal under rule <G45>?

Re: Rule &lt;G45&gt;

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Posted by GDC at 01/16/2010 11:35:46 am

Please refer to Team Update #2.

#### Game Play (2010)

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### Finale Config before 20 second finale?

Finale Config before 20 second finale?

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Posted by 2010FRC2826 at 01/16/2010 02:04:48 am

If a robot is intending to elevate from a tower and satisfies touching the tower as stated in rule <G30C> can the robot extend to it's finale configuration before the 20 second finale time?

Re: Finale Config before 20 second finale?

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Posted by GDC at 01/16/2010 09:51:01 pm

Yes per <G30c>.

#### Game Play (2010)

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### G29 Clarifications

G29 Clarifications

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Posted by 2010FRC2974 at 01/17/2010 02:43:50 pm

G29 says: Defending ROBOT Restriction - Only one opposing ALLIANCE ROBOT is allowed in the opponent's ZONE. A ROBOT is considered in this ZONE if any part of the ROBOT is in contact with the ZONE's green carpet. Violation: PENALTY; plus a RED CARD if effort to remedy is not immediate.

- 1) Which area is the opponent's zone?
- 2) If a robot falls in the opponent's zone, can another robot from the team still go over to the far zone and help the fallen robot up?

Re: G29 Clarifications

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Posted by GDC at 01/19/2010 09:55:52 pm

- 1 - If you are on the red ALLIANCE, the opponent's zone is the BLUE ZONE. If you are on the blue ALLIANCE, the opponent's zone is the RED ZONE. Please refer to Section 6.2.1 of The Manual for the locations of these field features.
- 2 - If a second ROBOT enters the opponent's ZONE, it will be considered a violation of Rule <G29>.

#### Game Play (2010)

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### Helping Right a Robot

Helping Right a Robot

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Posted by 2010FRC0135 at 01/21/2010 08:04:37 pm

If a robot becomes tipped over in the opponent's zone, can one of the robot's teammate enter the zone solely for the purpose of righting the robot? In other words, does the 10 second grace



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penalty apply to the situation presented above?

Re: Helping Right a Robot

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Posted by GDC at 01/24/2010 08:05:36 pm

The 10-second protection during righting discussed in Rule <G32> applies only to protection from contact by opposing ROBOTS. The limit on the number of ROBOTS in the opponent's ZONE described in Rule <G29> is always in force.

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**Game Play (2010)**

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**Shoving Match in the TUNNEL**

Shoving Match in the TUNNEL

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Posted by 2010FRC0696 at 01/23/2010 09:01:13 pm

The rule for pinning <G39> states "A ROBOT may not pin (inhibit the movement of another ROBOT that is in contact with a field element, border, or goal) for more than 5 seconds."

1) If there is a shoving match in the middle of a TUNNEL and both robots are touching the sides of the TUNNEL, will one or both of the robots be found in violation of rule <G39>?

If yes, what team and under what criteria? and is inhibit meant to be used in the perfect sense of the word (ie. any stoppage of movement at all)

If no, is inhibit meant to mean "to stop entirely"?

2) Also, if a robot "parks" in front of a TUNNEL and stops movement through said TUNNEL, will it be found in violation of <G39>

In effect, this entire ruling will depend on the definition of inhibit used to interpret the rules.

Re: Shoving Match in the TUNNEL

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Posted by GDC at 01/24/2010 09:42:09 pm

No, blocking the passage of ROBOTS through the TUNNEL is not a violation of Rule <G39>. As long as a ROBOT has the opportunity to back out of the TUNNEL and remove itself from the situation, it is not considered "pinning."

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**Game Play (2010)**

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**Ball Return Timing in Last 11 Seconds**

Ball Return Timing in Last 11 Seconds

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Posted by 2010FRC0178 at 01/30/2010 06:18:36 pm

Are teams assessed a penalty for not returning a ball if, according to the DOGMA, the ball would have to be returned in negative time?

For example, say we score in the last 6 seconds, and can't return the ball. According to <G05>, it's possible to assess the scoring at 10 seconds after the timer hits zero. Do we get a penalty?

Re: Ball Return Timing in Last 11 Seconds

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Posted by GDC at 02/01/2010 12:33:24 pm

No game PENALTIES are assessed after the game has concluded.



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Game Play (2010)

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**Finale**

Finale

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Posted by 2010FRC2148 at 02/04/2010 06:12:59 pm

Can we start to lift our arm if it does not exceed the maximum height/length/width of the normal configuration?

Re: Finale

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Posted by GDC at 02/12/2010 11:23:08 am

Please resubmit your question with more detail and in reference to a specific rule or set of rules. There are scenarios where some rules would prohibit this action, while there are scenarios in which this action could be completely legal.

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Game Play (2010)

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**ALignment devices**

ALignment devices

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Posted by 2010FRC3238 at 02/07/2010 07:58:47 pm

Is it legal to use field elements to precisely align the robot at the beginning of a match? For example, would it be legal to have both back wheels of the robot touching the bump (in order to know the precise orientation of the robot) and then have the robot touching the side wall of the field (in order to know the precise position)? Is the intent of the "alignment devices" rule to make dead reckoning during autonomous mode much harder, or just to minimize the amount of time taken during setup?

Re: ALignment devices

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Posted by GDC at 02/11/2010 05:06:17 pm

The <G11> prohibition against alignment devices extends to devices brought onto the FIELD by the TEAM. There is no problem with positioning the ROBOT relative to FIELD features, as long as it is done in a timely manner and does not delay the start of the MATCH.

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Game Play (2010)

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**Robot Starting Positions <G08>**

Robot Starting Positions &lt;G08&gt;

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Posted by 2010FRC0365 at 02/26/2010 10:06:57 am

<G08> ROBOT Starting Positions – Prior to the MATCH, each TEAM negotiates within their ALLIANCE to select one of the three starting areas for their ALLIANCE.

When the FIELD is viewed from the ALLIANCE STATION, the ROBOTS must be placed on the right side of the CENTER LINE in one of the following starting positions:

- In the far ZONE and in contact with the ALLIANCE STATION WALL and/or ramp.
- In the MIDFIELD and in contact with the farthest BUMP.
- In the near ZONE and in contact with the nearest BUMP.

1. Can a robot be positioned at the start partially over the center line? (As long as the other conditions are met). Or does it have to be completely on its side of the field, not touching the center line at all.



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2. In the midfield and near zones, can the robot be touching the tower at the start? I assume that the tower does not count as the bump, so it would have to touch the bump as well as the tower.

Re: Robot Starting Positions &G08&gt;

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Posted by GDC at 03/01/2010 12:20:52 pm

1) The ROBOT must begin the MATCH entirely to the right of the CENTER LINE.

2) The ROBOTS in the midfield and near zones must be in contact with a BUMP. There is no rule that would prevent them from also contacting the TOWER, as long as they maintain contact with the BUMP.

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**Game Play (2010)**

**Finale period protections**

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Finale period protections

Posted by 2010FRC0115 at 03/07/2010 12:23:03 pm

We would like a clarification on protection rules during the finale period.

At one of the regionals, during the last 20 seconds of a match, robot A was moving toward their tower in an attempt to elevate. Robot A extended their elevation mechanism, and reached within 12-15" away from the tower when an opponent, robot B, approached and pushed robot A away from the tower. At the moment of contact between the two robots, it was clear neither robot was touching robot A's tower in any way, shape, or form.

In the manual, rule G34 and G35 clearly define the type of protections during the finale period:

<G34> FINALE PERIOD ROBOT Protection - During the FINALE, ROBOTS in contact with their TOWER or in contact with an ELEVATED ALLIANCE partner may not be contacted by an opponent. Violation: PENALTY for inadvertent contact; plus a RED CARD for obviously intentional contact.

<G35> FINALE PERIOD TOWER Protection - During the FINALE, ROBOTS in may not contact the OPPONENT'S TOWER. Violation: PENALTY for inadvertent contact; plus a RED CARD for obviously intentional contact.

Should robot B be penalized for trying to stop robot A from reaching the tower, even if robot A isn't in contact of the tower?

Re: Finale period protections

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Posted by GDC at 03/15/2010 08:42:08 pm

There is no rule that would prohibit a ROBOT from defending/preventing an opponent from reaching the opponent's TOWER during the FINALE, as long as neither ROBOT is in contact with the TOWER. It is noted that if either ROBOT makes contact with the TOWER during this process, that it would constitute a violation of either Rule <G34> or Rule <G35> (depending on which ROBOT made contact with the TOWER).



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## Robot Operations (2010)

Robot Operations (2010)

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### Possession vs Herding

#### Possession vs Herding

Posted by 2010FRC2619 at 01/13/2010 05:26:33 pm

The FIRST fact sheet on the game reads: "Robots may not possess more than one ball at a time, but they may herd and kick multiple balls at a time." However, there is no mention of the definition of "Herding" in the manual.

Rule G43 in section 7 of the FIRST Robotics Competition Manual reads: "ROBOTS may POSSESS only one BALL at a time. Violation: PENALTY" But said rule makes no mention of "Herding".

There's a clear definition of POSSESSION. reworded: A ball in contact with a robot stays in the same relative position to the robot as the robot moves...

What is the definition of HERDING? And how does it differ from POSSESSION?

By the definition of POSSESSION, it sounds like a robot may control one ball (maybe physically captured or not). Can that robot then herd another ball at the same?

So, if a robot were equipped with a plow in the front and it made contact with two or more balls and through good driving, luck, or intentional engineering were able to get all balls into the same goal at the same time, would it be legal?

(this seems to be a popular question on other sites... I'm sorry if this is a duplicate thread)

So, we politely request a more detailed definition of herding, and how it differs from possession.

#### Re: Possession vs Herding

Posted by GDC at 01/14/2010 11:36:07 pm

The fact sheet is intended as a summarization of the game, and is worded in a descriptive manner that is intended for a lay audience. It is not a formal part of the rules, and should not be interpreted as such.

The rules do not provide a specification of herding. The only restriction is on the number of BALLS that may be POSSESSED at one time by a ROBOT.

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Robot Operations (2010)

### Clarification of Rule <G45>

Clarification of Rule &lt;G45&gt;

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Posted by 2010FRC0063 at 01/13/2010 06:59:18 pm

If there is a component of the drivetrain, such as a belt/conveyor/wheel, exposed to the top of the robot that is moving/rotating, would this violate Rule <G45> if a ball were to fall on top of the robot and contact one of these moving belts/wheels? I don't believe this belt would be considered a mechanism because you cannot disassemble a belt any further without destroying its function.

Re: Clarification of Rule &lt;G45&gt;

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Posted by GDC at 01/14/2010 11:59:30 pm

Incidental contact with MECHANISMS or COMPONENTS that do not control the direction of the BALL is permitted.

#### Robot Operations (2010)

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### multiple mechanisms outside FRAME PERIMETER

multiple mechanisms outside FRAME PERIMETER

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Posted by 2010FRC2143 at 01/13/2010 10:56:53 pm

Rule <G30> part (a) permits MECHANISMS to extend beyond the FRAME PERIMETER under certain circumstances.

Suppose that a ROBOT has multiple ball-handling MECHANISMS which are each \*individually\* actuated in accordance with <G30>. However, their actions are sequenced in such a way that, at any point in time, at least one of the MECHANISMS extends beyond the FRAME PERIMETER. Would this activity be in violation of the rules?

#### Ball Interaction Volume

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Posted by 2010FRC3238 at 01/14/2010 07:32:16 pm

In G30, the manual says that "After returning inside the FRAME PERIMETER, such MECHANISMS are not permitted to re-extend beyond the FRAME PERIMETER for at least two seconds." Suppose one mechanism extended outside of the FRAME PERIMETER for a period of less than two seconds and then returned back inside the FRAME PERIMETER. Would it be legal for another mechanism to extend outside of the FRAME PERIMETER without waiting for two seconds after the first mechanism returned back inside the FRAME PERIMETER?

Re: multiple mechanisms outside FRAME PERIMETER

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Posted by GDC at 01/16/2010 11:15:25 am

Rule <G30-A> discusses MECHANISMS (note plural) that extend beyond the FRAME PERIMETER to interact with a BALL. As such, once any MECHANISM extends beyond the FRAME PERIMETER, no MECHANISM (that one or any other one) may extend beyond the FRAME PERIMETER for two seconds.

#### Robot Operations (2010)

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### Tower Contact

Tower Contact

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Posted by 2010FRC1511 at 01/14/2010 08:38:12 am

Given <G30c> , FINALE CONFIGURATION definition, NORMAL CONFIGURATION definition, and ROBOT definition:



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The "Tower Contact ROBOT Volume" says "during a MATCH", which seems to indicate at ANY time during a match.

So can the robot extend to the FINALE configuration while touching the tower BEFORE the FINALE time period? If the answer is yes, can you define TOUCHING? (ie Does a robot bumper count as the robot touching the tower?)

#### Tower Contact

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Posted by 2010FRC1511 at 01/14/2010 08:47:56 am

Assuming the answer to the question about "can you extend to the finale configuration while in contact with the tower before the finale" is yes...

Given G30 & G13, we assume that if a robot is in contact with the tower and is extending to its FINALE configuration prior to the FINALE period (and is outside its normal configuration), and a robot from an opposing alliance pushes the extended robot away from the tower, that no penalty would be incurred. But because they are NOT protected by G34, this would seem a legal move.

Our question is then, how long does the extended robot have to return to its normal configuration before it incurs a penalty?

#### Re: Tower Contact

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Posted by GDC at 01/16/2010 11:26:07 am

We believe that Rule <G30-C> is clear - if a ROBOT is touching their ALLIANCE TOWER, it may expand out to limits of the FINALE CONFIGURATION. This can happen at any time during the MATCH. We will not define "touching" - the commonly accepted definition is sufficient.

Under Rule <G13> an ALLIANCE cannot cause an opposing ALLIANCE to incur a PENALTY. Therefore, a ROBOT in its FINALE CONFIGURATION would not be PENALIZED if it is forced to break contact with the TOWER by an opposing ROBOT. However, once the situation created by the opposing ROBOT concludes, the ALLIANCE ROBOT must act immediately to remedy the situation (by either returning to the NORMAL CONFIGURATION or re-establishing contact with the TOWER). If the ALLIANCE ROBOT does not act immediately, then it may be PENALIZED.

#### Robot Operations (2010)

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### Moving through Tunnel during Finale

#### Moving through Tunnel during Finale

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Posted by FRC111 at 01/14/2010 10:25:47 am

Can a robot drive through the tunnel of the opposing team during the Finale period, while touching the walls, and not incur penalties?

-FRC111

#### Re: Moving through Tunnel during Finale

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Posted by GDC at 01/14/2010 11:58:06 pm

The TUNNEL is considered part of the TOWER. Contact with the TUNNEL (and therefore TOWER) of the opposing ALLIANCE during the FINALE PERIOD is a violation of Rule <G35>.





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Robot Operations (2010)

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**Disabled Robots in Opponent's Zone**

Disabled Robots in Opponent's Zone

Posted by FRC111 at 01/14/2010 10:29:49 am

Can a second robot move into the opponent's ZONE without incurring penalties, if the first robot were to become disabled via the Emergency Stop?

-FRC111

Re: Disabled Robots in Opponent's Zone

Posted by GDC at 01/14/2010 11:55:10 pm

No.

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Robot Operations (2010)

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**Balls leaving field during Autonomous Period**

Balls leaving field during Autonomous Period

Posted by FRC111 at 01/14/2010 10:33:58 am

During autonomous, how will penalties be handled for balls leaving the field of play? If a robot were to kick balls outside the field during its autonomous program, would this be considered 'intentional' and penalized?

This is based on the assumption that the robot was not programmed to intentionally kick balls out of the field, but had, for example, become 'skewed' while moving or mis-kicked the ball, resulting in it leaving the field of play.

-FRC111

Re: Balls leaving field during Autonomous Period

Posted by GDC at 01/14/2010 11:53:26 pm

BALLS that leave the FIELD as an obviously unintentional effect of game play (e.g. the BALL takes a bad bounce off a BUMP) will not be penalized. BALLS that leave the FIELD due to an obviously intentional act (e.g. the ROBOT lines up with the BALL and kicks it straight off the FIELD) will be PENALIZED under Rule <G19>. These determinations are assessed with the same criteria in both autonomous and teleoperated phases of the game.

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Robot Operations (2010)

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**Rule G22**

Rule G22

Posted by 2010FRC0772 at 01/14/2010 12:15:25 pm

What happens if you robot enters the mouth of the goal. Is there any difference in outcome weather the entry was intentional or not? (Ref. G22)

Thanks,

- Lee

Re: Rule G22

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Posted by GDC at 01/14/2010 11:51:59 pm

As long as the ROBOT remains within the FIELD confines as described in Rule <G22> there is no PENALTY. There is no difference based on intentional or unintentional entry into the mouth of the goal.

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**Robot Operations (2010)**

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**Ball diversion**

Ball diversion

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Posted by 2010FRC1126 at 01/14/2010 12:37:54 pm

While legally hanging on a tower, is a robot allowed to divert the balls coming off the ball return, either on purpose or by accident?

Re: Ball diversion

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Posted by GDC at 01/16/2010 11:32:41 am

Please review the modifications in Team Update #2.

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**Robot Operations (2010)**

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**Wheels as Active Mechanism**

Wheels as Active Mechanism

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Posted by 2010FRC1807 at 01/14/2010 01:02:46 pm

Our team is considering creating a robot with large wheels that would be able to continue to compete in the game if it is flipped over. The tops of the wheels would be exposed on the top of the robot, above the bumper zone. Would such a wheel, if it came in contact with a game ball, violate rule <G45>?

Re: Wheels as Active Mechanism

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Posted by GDC at 01/17/2010 04:55:40 pm

Brief incidental contact between such a MECHANISM and the BALL which is not designed to control the direction of the BALL would not be considered a violation of Rule <G45>. Note however that the MECHANISM must still satisfy all other applicable rules.

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**Robot Operations (2010)**

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**Carry Question**

Carry Question

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Posted by 2010FRC1661 at 01/14/2010 06:59:41 pm

what is the working definition of "carry?" We believe that carrying a ball refers to having possession of a ball which is above the ground. Is this correct?

Thank you.

-Team 1661

Re: Carry Question

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Posted by GDC at 01/16/2010 11:37:41 am

There is no working definition. Please refer to the definitions of POSSESSION and CARRY in Section 7 of the manual, as well as <G43> and <G44> as clarified in Team Update #2.

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**Robot Operations (2010)**



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## Herding versus Possession

### Herding versus Possession

Posted by FRC1717 at 01/15/2010 12:57:12 am

Can a robot that is designed as a bulldozer herd a row of three balls on the front plane of the robot into a goal? Or, does the robot need to explicitly separate the balls so they can only push one ball into the goal at a time? Would pushing multiple balls as with a bulldozing robot be considered possessing the balls or herding the balls?

### Are Plows Legal

Posted by 2010FRC2619 at 01/15/2010 09:04:00 am

Would a plow that runs the legal length of the robot, on the front of the robot, be considered legal as per rule G43?

Clearly it would be designed to touch multiple balls, and through the course of play manipulate multiple balls, but it is not really capturing multiple balls... just pushing them. Is it legal in regards to the "POSSESS one ball rule".

### Re: Herding versus Possession

Posted by GDC at 01/17/2010 04:56:55 pm

There is no rule the would prevent simultaneous herding of multiple BALLS, as long as they are not in the POSSESSION of the ROBOT.

## Robot Operations (2010)

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### <G45> Active Mechanisms

#### &lt;G45&gt; Active Mechanisms

Posted by 2010FRC0365 at 01/15/2010 08:44:03 am

Would an incline or ramp that has been deployed and does not move once deployed, be considered an ACTIVE MECHANISM per <G45>.

### Re: &lt;G45&gt; Active Mechanisms

Posted by GDC at 01/17/2010 04:58:07 pm

It would not; please see Team Update #2.

## Robot Operations (2010)

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### Side Hanging Robots on Tower

#### Side Hanging Robots on Tower

Posted by 2010FRC0179 at 01/15/2010 11:31:54 am

Are your allowed to hang from any vertical tower member like this:  
[url]http://www.youtube.com/watch?v=gM6Nhdo3eeE[/url]

Is the tower strong enough to support the weight of three robots supporting each other hanging from a single vertical member without tipping over or bending the pipe?

There is the potential of having over 400lbs of robot cg more than 5' away from the SIDE of the tower if this is allowed, and I'm concerned the tower cannot support this.

#### Side Hanging Robots on Tower

Posted by 2010FRC2826 at 01/16/2010 02:00:47 am



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Is it possible to elevate or suspend from a vertical pole on the tower, specifically not touching a horizontal upper bar? Are the towers designed to handle a moment load from a vertical pole only?

Elevating the robot using the vertical poles of the tower

Posted by 2010FRC0115 at 01/18/2010 02:47:15 am

Providing no damages is caused by this, can a robot be elevated above the plane of the platform by grabbing/locking only onto the vertical poles of the tower and nothing else?

Re: Side Hanging Robots on Tower

Posted by GDC at 01/18/2010 05:15:12 pm

Yes.

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**Robot Operations (2010)**

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**G45 Active Mechanism**

G45 Active Mechanism

Posted by 2010FRC1024 at 01/15/2010 04:28:37 pm

For rule G45, what is the definition of the term "active" in front of "MECHANISMS"? Is the intent of this rule to only prevent devices that would add energy to the ball in its travel or would a mechanism that only redirects or reduces the kinetic energy of the ball but is capable of being moved relative to the frame perimeter also be classified as active?

Re: G45 Active Mechanism

Posted by GDC at 01/16/2010 07:30:34 pm

Please see the clarification published in Team Update #2.

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**Robot Operations (2010)**

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**G44**

G44

Posted by 2010FRC1024 at 01/15/2010 04:29:46 pm

For rule G44, is it correct that controlling the direction of a ball without controlling the position of the ball is allowed by this rule?

Re: G44

Posted by GDC at 01/16/2010 07:32:49 pm

Please review <G43>, <G44> and the definitions of POSSESSION and CARRY as a set.

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**Robot Operations (2010)**

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**Relative Motion**

Relative Motion

Posted by 2010FRC0971 at 01/15/2010 06:36:14 pm

As it pertains to <G45>, is normal material deformation, such as deformation of plexiglass on impact or compression of memory foam, considered "motion relative to the robot"?

Active Mechanisms

Posted by FRC1717 at 01/16/2010 01:30:16 pm

If a falling ball causes a mechanism on the top of a robot to elastically deform when the ball is deflected from it, would this mechanism, which was in a state of motion due to this elastic collision, be considered active or passive?



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Re: Relative Motion

Posted by GDC at 01/17/2010 04:58:51 pm

If the condition is a normal energy-absorption transient with minimal deformation during the BALL impact, then there is no problem. However, note that under Rule <R19> (as modified in Team Update #2) if the material deformation is designed for the purpose of deflecting BALLS in a controlled manner, then BALLS cannot extend inwards more than 3 inches.

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**Robot Operations (2010)**

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**Carrying**

Carrying

Posted by 2010FRC2859 at 01/15/2010 11:16:33 pm

We were wondering if you intentionally kick the ball on top of your robot - (i.e. using your robot as a ramp - see attached image) would it count as CARRYING when the ball left the floor?

[url]http://www.chiefdelphi.com/forums/attachment.php?attachmentid=8257&d=1263158435[url]

Re: Carrying

Posted by GDC at 01/19/2010 10:29:49 am

We cannot review specific ROBOT designs. However, it is noted that a BALL that is in the process of transiting freely up or down a ramp (i.e. not actively controlled) does not satisfy the definition of POSSESSION and is therefore not being CARRIED. But in addition, if thereafter the BALL comes to rest of top of the ROBOT, no matter how it got there, it would satisfy the conditions required for POSSESSION and CARRYING, and would then be PENALIZED accordingly.

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**Robot Operations (2010)**

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**Crossing white line in Auto mode**

Crossing white line in Auto mode

Posted by 2010FRC2826 at 01/16/2010 01:30:23 am

If a robot crosses the center white line as stated in rule <G28>, is the definition of the where the "robot" crosses based on the top-down vertical projection of the frame, bumpers, or is it based on where the wheels or tracks are touching the ground?

Re: Crossing white line in Auto mode

Posted by GDC at 01/18/2010 12:32:38 pm

Under Rule <G30>, the ROBOT would receive a PENALTY when it "completely" crosses the CENTER LINE. Thus, the PENALTY is assessed when when all parts of the ROBOT (i.e. the vertical projection of the entire ROBOT) cross the line.

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**Robot Operations (2010)**

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**G44**

G44

Posted by 2010FRC1351 at 01/16/2010 01:04:02 pm

If the robot's kicker lifts the ball off the ground as the initial part of the kicking process, does this constitute "carrying" and would it result in a G44 penalty?



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Thank you,

Team 1351

Re: G44

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Posted by GDC at 01/17/2010 10:16:29 pm

No, because a BALL that is being kicked would not be considered to be in the POSSESSION of the kicking ROBOT.

AMENDMENT:

On further study of your question, we want to make sure we have interpreted it incorrectly. Our interpretation was that you meant the lift that occurs due to the motion of contacting the ball below its midpoint during the process of a "kick".

Another interpretation is that you may have meant actively lifiting the ball in order to "tee" it up for a kicker. This latter interpretation would not be legal, as the process of lifting and teeing the ball would be CARRYING.

We hope this clarifies the answer.

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**Robot Operations (2010)**

**Pinning**

Pinning

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Posted by 2010FRC2974 at 01/17/2010 02:35:01 pm

For pinning, is it against the rules to pin for 4 seconds, back up six feet, not wait the full 3 seconds, and then repin the robot?

Re: Pinning

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Posted by GDC at 01/18/2010 10:47:57 am

There is no rule that would prohibit this.

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**Robot Operations (2010)**

**Kicking more than one ball simultaneously**

Kicking more than one ball simultaneously

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Posted by 2010FRC0885 at 01/17/2010 07:22:03 pm

GDC:

Is a robot with a wide kicker allowed to kick more than one ball simultaneously realizing there may be a time when one or more balls are simultaneously touching the robot's kicker mechanism before the kicking action?

Thank you for your efforts!

Re: Kicking more than one ball simultaneously

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Posted by GDC at 01/19/2010 09:46:02 pm

There is no rule the would prevent simultaneous kicking of multiple BALLS, as long as they are not in the POSSESSION of the ROBOT.



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ball shooting penalty

Posted by FRC1158 at 01/28/2010 08:05:09 pm

As balls are on the playing surface there will be times that balls are herded together. If your robot comes up on a herd of balls, can your robot shoot the herd without getting a penalty as long as they are not herding the balls? Are concern is that are shooter is wider then one ball's width.

Re: Kicking more than one ball simultaneously

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Posted by GDC at 01/31/2010 10:47:08 pm

The previous answer still applies.

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**Robot Operations (2010)**

**Pinning in Tunnel**

Pinning in Tunnel

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Posted by FRC1501 at 01/18/2010 08:31:29 am

If we make a low profile robot, that only can go through the tunnel, would we be considered pinned, if we are in the tunnel and two opponent robots block both ends of the tunnel?

Re: Pinning in Tunnel

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Posted by GDC at 01/18/2010 05:19:43 pm

Yes.

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**Robot Operations (2010)**

**Passively redirecting balls while hanging.**

Passively redirecting balls while hanging.

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Posted by 2010FRC1123 at 01/18/2010 11:58:39 am

It was strongly suggested by Dave Lavery to submit this to the Q&A... because if it is legal, he urged us to "...build it and compete. Please. Please, please, please." ([url]http://www.chiefdelphi.com/forums/showpost.php?p=901084&postcount=81[url])

So. If our team (Team 1123 AIM Robotics) were to build a robot that would be designed to hang onto our alliance tower, could we use a mechanism on top of the robot to passively redirect the balls falling off the ball return towards the goal, and have it be legal?

There are a few rules associated with this idea. We understand that the ball could not penetrate more than 3 inches into the mechanism, and the mechanism would have to be passive while a ball was touching the mechanism\*, and that the robot could not touch the ball return, nor could it touch the balls until they leave the ball return.

The only difference (we can think of) from this robot, to a robot with a slanted top, is that this robot happens to be hanging when the balls bounce off of it, and it is in its FINAL configuration, instead of its normal configuration.

Thank you for your time.

\*But could be active when not in contact with the ball. "MECHANISMS are



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considered "active" if they are in motion relative to the ROBOT while in contact with the BALL. Resetting or moving MECHANISMS while not in contact with a BALL is permitted as the MECHANISMS are not considered "active."

Re: Passively redirecting balls while hanging.

Posted by GDC at 01/18/2010 12:42:15 pm

There are no rules that prohibit this strategy. Please refer to Team Update #4.

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**Robot Operations (2010)**

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**Ball control clarification**

Ball control clarification

Posted by 2010FRC3218 at 01/21/2010 02:26:32 pm

If a team uses a device that induces the ball to stay with its robot illegal IF the ball is in contact with the ground and not penetrating the frame and below the bumper zone?

Re: Ball control clarification

Posted by GDC at 01/24/2010 09:12:31 pm

If we understand your question correctly, it is permitted to use a device to maintain the position of the BALL relative to the ROBOT, as long as the BALL stays in contact with the FIELD and does not violate Rule <R19>.

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**Robot Operations (2010)**

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**<R19> Clarification**

&lt;R19&gt; Clarification

Posted by 2010FRC0599 at 01/21/2010 06:37:27 pm

Our question is about using a flexible material to deflect the ball above the bumper zone. If the ball bends the material significantly as the ball hits, is this considered to be "articulated"?

Does the answer depend on the amount the ball deflects the feature (greater or less than 3")?

Does the answer depend on whether or not the entire feature moves with the ball's impact?

Thank you.

Re: &lt;R19&gt; Clarification

Posted by GDC at 01/24/2010 09:19:06 pm

If the BALL incurs more than three inches inside the MECHANISM incorporating the flexible material as it deflects the BALL, then it would be considered a violation of Rule <R19>.

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**Robot Operations (2010)**

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**G27 in Finale**

G27 in Finale

Posted by 2010FRC2028 at 01/21/2010 09:08:26 pm

It may be assumed that robots will be in many orientations during attempts to elevate and/or suspend. Does G27 apply during the finale to robots that are on the platform or tower?

G27 in Finale

Posted by 2010FRC2028 at 01/23/2010 02:54:52 pm





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It may be assumed that there will be robots in many orientations during the FINALE as they may ELEVATE and/or SUSPEND. Will rule G27 apply during the FINALE? Example, if a robot was overturned on or near their own PLATFORM/TOWER, would this be a potential penalty? The robot's orientation may be an attempt to score, and would not be adversely affecting the opposing team, so how would it be penalized? It may be undesirable according to the alliance but its not adverse to the opponent.

Re: G27 in Finale

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Posted by GDC at 01/25/2010 02:28:40 pm

Please see Team Update #5.

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**Robot Operations (2010)**

**Additional <G45> Clarification, Please**

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Additional &lt;G45&gt; Clarification, Please

Posted by 2010FRC0100 at 01/22/2010 07:48:14 pm

Regarding rule G45, would a mechanism that extends above the bumper zone during kicking be permitted as long as the actual point of contact between the ball and the mechanism was below the bumper zone? In other words, may the "leg" of the kicker extend above the bumper zone as long as the "foot" is below the bumper zone during the kick?

Re: Additional &lt;G45&gt; Clarification, Please

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Posted by GDC at 01/25/2010 02:30:21 pm

Please refer to Team Update #5.

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**Robot Operations (2010)**

**Using a blast of air to manipulate soccer ball.**

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Using a blast of air to manipulate soccer ball.

Posted by 2010FRC1671 at 01/22/2010 08:26:24 pm

Would it be legal to use a fan of some kind to generate a blast of air to push the soccer balls?

Re: Using a blast of air to manipulate soccer ball.

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Posted by GDC at 01/24/2010 08:09:23 pm

Yes.

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**Robot Operations (2010)**

**Inverted robot**

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Inverted robot

Posted by 2010FRC2577 at 01/26/2010 10:38:48 am

Is it legal for an inverted robot (bumpers no longer within the bumper zone) that is cable of inverted motion to move with the sole purpose of using a field element (bump, tower) to assist in righting itself so that the bumpers return to the bumper zone?

Re: Inverted robot

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Posted by GDC at 01/28/2010 12:13:11 am

There is no rule that would prohibit this. But if this is done, pay particular attention to Rule <G33> and Rule <G35>.

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**Robot Operations (2010)**



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## Definition of Actice Possession

### Definition of Actice Possession

Posted by 2010FRC0810 at 01/26/2010 07:46:31 pm

<G33> ROBOT Righting Limitations - During the grace period described in Rule <G32>, the protected ROBOTS may not actively interact with BALLS or opponent ROBOTS. Violation: PENALTY.

How would you define active interaction with the balls?

POSSESSION: Controlling the position and movement of a BALL. A BALL shall be considered in POSSESSION if, as the ROBOT moves or changes orientation (e.g. backs up or spins in place), the BALL remains in approximately the same position relative to the ROBOT.

If you are herding a ball and another ball enters your path of travel, is that considered possession of two balls?

Thanks  
Team 810

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### Re: Definition of Actice Possession

Posted by GDC at 01/27/2010 11:51:54 pm

1 - Any use of a directed motion by the ROBOT or any MECHANISM on the ROBOT to control the location or direction of a BALL would be considered active interaction.

2 - No.

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## Robot Operations (2010)

### Unintentional carrying

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#### Unintentional carrying

Posted by 2010FRC1825 at 01/28/2010 04:40:25 pm

If we have possession of a ball with the use of a vacuum mechanism and get bumped by another robot causing us to tip and thus raise the ball off the playing field floor while still attached to our vacuum mechanism, would we be penalized?

If we have possession of a ball with the use of a vacuum mechanism and are going over the bump, will we be penalized if during this process the ball is not in constant contact with the surface of the bump?

How long can the ball be out of contact with the floor before you are penalized? Is there a grace period for you to get the ball back on the floor before being penalized?

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#### Re: Unintentional carrying

Posted by GDC at 01/29/2010 04:31:32 pm

1 - If the ROBOT that impacts your ROBOT were from your ALLIANCE, then this would be a violation of Rule <G44> and you would be PENALIZED. If the ROBOT that impacts your ROBOT were from the opposing ALLIANCE, then under Rule <G13> you would not be PENALIZED.



2 - Yes.

3 - If the BALL is not in contact with the floor, there is no minimum time before a violation of Rule <G44> can be called. There is no grace period for returning the BALL to the floor to avoid the PENALTY. Simply put - don't CARRY the BALL for any time at all.

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Robot Operations (2010)

**Active righting mechanisms**

Active righting mechanisms

Posted by 2010FRC0058 at 01/29/2010 06:12:28 pm

Using sensors, ie gyros and accelerometers, to detect when a robot is in the process of tipping/flipping is it permissible to use an active device to prevent the robot from tipping. For example, The sensors detect that the robot is 60 degrees elevated on the left side. A stabilizer would extend on the right side to keep the robot from rolling.

Re: Active righting mechanisms

Posted by GDC at 02/04/2010 07:25:03 pm

The ROBOT righting volume expansion permitted by Rule <G30-B> only applies for robots that are righting themselves after being tipped over. Mechanisms activated before a robot is tipped must satisfy the ROBOT volume limits defined in Rule <G30>.

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Robot Operations (2010)

**Bumper Cover Penalty**

Bumper Cover Penalty

Posted by 2010FRC1073 at 01/30/2010 11:39:03 am

Regarding the Bumper Cover Penalty in Section 7- The Game: <G41> in the rule book.

The current language states that "Bumper covers must not detach, even unintentionally, from the ROBOT. Violation: PENALTY."

However, does detach imply that the cover is fully removed and is a threat to entanglement, or that it is only partially removed? If, perhaps, the cover is ripped or partially shifted, as to expose an underlying color, is the team still penalized?

Re: Bumper Cover Penalty

Posted by GDC at 02/01/2010 12:32:12 pm

No. Rule <G41> PENALIZES situations where the BUMPER cover is completely removed and becomes a detached part left on the FIELD. Partial removal or minor dislodging of the cover so that small portions of the underlying color are revealed will not be PENALIZED. If the BUMPER cover is significantly dislodged or removed, then Rule <R12-B> would not be satisfied and it would be a violation of Rule <S04> during the MATCH.

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Robot Operations (2010)

**Implication of G36 on Robot to Robot interactions on the bump**

Implication of G36 on Robot to Robot interactions on the bump

Posted by 2010FRC0115 at 02/10/2010 12:39:21 am



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"<G36> ROBOT to ROBOT Interaction - Strategies aimed solely at the destruction, damage, tipping over, or entanglement of ROBOTS are not in the spirit of the FRC and are not allowed. Violation: YELLOW CARD"

I am looking for a clarification on the implication of G36 on Robot to Robot interactions occurring on the bump. For any robots designed to deny a particular zone from opponents, specifically, to deny it from opponents who cannot travel through the tunnel, it could be a really tricky situation to be in.

Consider the following scenarios:

Let's say the opponent is designed such that it is very difficult to trip their robot over, on or off the bump. Let's say their robot was tipped over after engaging in a pushing match with your robot on the bump. Is it considered a penalty if:

1. The tipping resulted from accidental contacts between the two robots.
2. The tipping resulted from bumper to bumper interactions between the two robots.
3. The tipping resulted from aggressive maneuvers from your robot.

Ok, second scenario.

Let's say the opponent is designed such that it is very easy to tip their robot over on the bump (a slight touch would do). Let's say their robot was tipped over after engaging in a pushing match with your robot on the bump. Is it considered a penalty if:

1. The tipping resulted from accidental contacts between the two robots.
2. The tipping resulted from bumper to bumper interactions between the two robots.
3. The tipping resulted from aggressive maneuvers from your robot.

(Bear in mind all of these could happen within a split second, so it could be very hard to tell what actually happened during a match.)

I understand teams are told to be really careful about the possibility of tipping while going over the bump. I understand teams are encouraged to build self-righting mechanisms on their robots. I also understand teams should not intentionally tip another robot over, whether the opponents are going over the bump or not.

It would be really helpful, however, to know if the ruling will be more critical toward robots unstable on the bump, more critical toward robots defending the bump from robots unstable on the bump, or equally critical to both.

Re: Implication of G36 on Robot to Robot interactions on the bump

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Posted by GDC at 02/11/2010 04:23:08 pm

We cannot address hypothetical tactical game situations. Academically speaking, we can provide the following clarification per Rules <G36> and <G37>:



1. Tipping as a result of incidental contact between two ROBOT is not a violation.
2. Tipping as a result of BUMPER to BUMPER interactions is not a violation.
3. Tipping as a result of aggressive ROBOT behavior will be left to the discretion of the Referees on site.

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Robot Operations (2010)

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**G42 Clarification**

G42 Clarification

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Posted by 2010FRC1370 at 02/16/2010 07:12:55 pm

Rule G42 states:

ARENA Reset Delay - ROBOTS must release any portions of the TOWER, PLATFORM, or ALLIANCE ROBOT without power after a MATCH. Violation: YELLOW CARD.

Our team interpreted this rule to mean that a robot must lower itself at the end of the match under no power, we were leaning towards letting the motors back drive with no load but were concerned about damaging other robots when our lift is deenergized.

Do we need to lower without power?

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Re: G42 Clarification

Posted by GDC at 02/18/2010 11:27:59 am

The intent behind Rule <G42> is for the ROBOTS to be designed such that they can be removed from the ARENA by the TEAM members after the completion of the MATCH without requiring the application of electrical power. One way to address this is to design any grasping/latching mechanism to be back-drivable. But also please pay attention to Rule <G05> - if a mechanism back-drives under just its own weight, it may cause the ROBOT to move out of scoring position before the scores are determined.

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Robot Operations (2010)

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**Still not clear on G45**

Still not clear on G45

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Posted by 2010FRC1466 at 02/18/2010 08:55:26 am

I've read the updates and the Q&A. I know that the GDC doesn't comment on specific designs. But I would appreciate an answer that eliminates what our team perceives to be ambiguity in G45.

We have a kicker that is below the bumper level. It receives its energy from a pneumatic cylinder that is mounted vertically and thus extends well above the bumper plane. Kicker below, cylinder above. Is that in compliance with G45?

Another kicker design is a pivoted leg. The business end is well below the bumper plane, the pivoted leg-end that is powered by a cylinder is above. "Impact" leg part below, driving part above. Is that in compliance with G45?

Thanks!



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Re: Still not clear on G45

Posted by GDC at 02/20/2010 01:43:07 am

1 - as long as the portion of the pneumatic cylinder above the BUMPER is not used to contact the BALL and remains entirely within the vertical projection of the FRAME PERIMETER, it would be in compliance with Rule <G45>.

2 - as long as the portion of the leg above the BUMPER is not used to contact the BALL and remains entirely within the vertical projection of the FRAME PERIMETER, it would be in compliance with Rule <G45>.

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**Robot Operations (2010)**

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**blocking/defending**

blocking/defending

Posted by 2010FRC0441 at 02/22/2010 12:30:26 pm

In the rules it states blocking and defending is permissible as long as the target is seen is this correct or has this rule changed?

blocking/defending revision question

Posted by 2010FRC0441 at 02/22/2010 12:32:19 pm

we were considering netting on the robot for blocking is this permissible as long as we have it on the robot inventory listing?

Re: blocking/defending

Posted by GDC at 02/24/2010 03:57:55 pm

Blocking and/or defending the goal is permitted, as long as it is done in a manner that does not violate any of the game rules. Any materials used as part of a subsystem to block or defend a goal must be in compliance with all applicable robot rules.

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**Robot Operations (2010)**

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**Ball Possession**

Ball Possession

Posted by 2010FRC1261 at 03/09/2010 07:39:58 pm

G43 states that a robot can only possess one ball at a time.

Can you please comment on how this applies or does not apply to a robot who is 'herding' two or three balls on the front end of the robot?

I might assume a robot can push around as many balls as possible as long as they are not in 'possession'. Though if herding two or three balls and the robot backs up on the goal ramp and the balls remain in the same relative position due to gravity, would this be considered possession?

Re: Ball Possession

Posted by GDC at 03/15/2010 12:23:08 pm

If a ROBOT is simply pushing a BALL up the ramp in front of the GOAL and is not otherwise maintain positive control of the or position of the BALL relative to the ROBOT, this would not be considered POSSESSION.



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Robot Operations (2010)

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**Team Update 16, balls trapped under robot**

Team Update 16, balls trapped under robot

Posted by 2010FRC1784 at 03/11/2010 12:10:48 pm

Hi GDC,

In this team update to <G46>, does this mean that inadvertently driving over a ball will not be penalized if the drivers immediately try to take measures to release the ball, such as reversing direction, etc.?

Thank you

Re: Team Update 16, balls trapped under robot

Posted by GDC at 03/15/2010 09:02:20 pm

That is correct.

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Robot Operations (2010)

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**G37 Clarification**

G37 Clarification

Posted by FRC57 at 03/16/2010 10:49:41 pm

G37 lists potential situations where outside the bumper zone contact is permissible, but seems to omit a specific situation that may (or may not) have been overlooked. Specifically:

Is outside the bumper zone contact permissible for a robot that has exceeded its normal configuration prior to the finale (by touching its alliance tower) but is NOT in the process of being elevated or suspended?

Related question: What determines if a team is in the process of being elevated or suspended? Is merely touching the tower sufficient, does the robot need to be actively moving in the vertical direction?

NB: This potentially affects strategies employed against the sizable class of robots that contact the tower and expand outside normal configuration, but either do not immediately or cannot elevate themselves.

Re: G37 Clarification

Posted by GDC at 03/22/2010 12:39:06 pm

1) Provided the contact is within the parameters defined in <G37> a, b, or c, no PENALTY will be assessed. If the contact is assessed to be relative to <G36>, offending ROBOTS will receive a YELLOW CARD.

2) ROBOTS deemed, in the opinion of the referee, to be attempting to ascend the TOWER will be considered in accordance with <G37-v>. Only touching the TOWER may not be a sufficient display of an attempt to SUSPEND or ELEVATE and will be left to the judgment of a REFEREE.

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Robot Operations (2010)



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## Hanging from Tower

### Hanging from Tower

Posted by 2010FRC0714 at 04/07/2010 06:21:40 pm

I understand that an elevated robot will receive two points, where "elevated robot" is defined as "A ROBOT that is completely above the plane of the PLATFORM and in contact with the TOWER shall be considered ELEVATED." I also understand that my team's robot can only hang from our alliance's tower.

Is it consistent with the 2010 FRC rules for a robot to hang from any of the four sides (front, back, left, or right) of their alliance's tower?

Re: Hanging from Tower

Posted by GDC at 04/12/2010 03:16:22 pm

No. Please read Rule <G31>.

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## Team Member Actions (2010)

### Team Member Actions (2010)

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## Trident

### Trident

Posted by 2010FRC1126 at 01/14/2010 12:33:33 pm

Concerning the Trident with which a Human Player may return a ball into play, is the Human Player allowed to push the ball with the trident after the ball has been placed on the chute, in order to move the ball faster?

Re: Trident

Posted by GDC at 01/16/2010 11:29:31 am

There is no rule against this.

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### Team Member Actions (2010)

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## Drive Team Coach and human players

### Drive Team Coach and human players

Posted by 2010FRC1649 at 01/15/2010 01:13:11 pm

Can a team "sacrifice" their coach player and have them added to the number of human players operating on the field?

Re: Drive Team Coach and human players

Posted by GDC at 01/20/2010 10:34:38 pm

Per Section 7.2 only one HUMAN PLAYER is allowed.

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### Team Member Actions (2010)

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## Ball Return Mishap

### Ball Return Mishap

Posted by 2010FRC2974 at 01/17/2010 02:36:31 pm

If a ball goes outside the alliance station (if the alliance members fumble with it when trying to put it back in play), how/will penalties be given? If the system is automated, when will teams remedy any changes?





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Re: Ball Return Mishap

Posted by GDC at 01/18/2010 10:49:40 am

No allowance for fumbles will be made in the time required for the HUMAN PLAYER to place the BALL on the BALL RETURN after it is scored. To avoid PENALTIES, it is incumbent on all of the HUMAN PLAYERS on the ALLIANCE to work together to avoid losing control of the BALL, and to ensure that it is placed on the BALL RETURN in a timely manner.

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**Team Member Actions (2010)**

**Ball Return Fumble, part deux**

Ball Return Fumble, part deux

Posted by FRC57 at 01/19/2010 02:02:36 pm

How will balls fumbled out of the ALLIANCE STATION be returned to play/the alliance?

Since team members are required to remain in the ALLIANCE STATION, but are also required to follow the dictates of the DOGMA, can we assume there will be field attendants to helpfully return any fumbles?

We realize that the we won't get a Fumble Return Alacrity Guarantee (FRAG) from the GDC, but may we assume they'll be informed to return the ball to a team and not the FIELD?

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Re: Ball Return Fumble, part deux

Posted by GDC at 01/20/2010 10:32:21 pm

If the BALL exits from the ALLIANCE STATION, field personnel will make reasonable efforts to return the BALL to the ALLIANCE. Note however, that there is no guaranteed time period in which the BALL may be returned, and that the ball return timer will be running while the BALL is being returned. So, again, it is in the best interests of the ALLIANCE to make sure that they do not lose control of the BALL!

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**Team Member Actions (2010)**

**G17 Ball Handling**

G17 Ball Handling

Posted by 2010FRC0815 at 01/22/2010 07:24:41 pm

May the Coach / Mentor handle the balls?

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Re: G17 Ball Handling

Posted by GDC at 01/24/2010 08:08:11 pm

Under the terms of Rule <G15>, any member of the TEAM - including the COACH - may handle BALLS that are in the ALLIANCE STATION. But only the HUMAN PLAYER may place the BALL on the BALL RETURN with the TRIDENT (Rule <G16>).

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**Team Member Actions (2010)**

**Requesting change for G48**

Requesting change for G48

Posted by 2010FRC0134 at 01/27/2010 01:32:02 pm

Would the GDC consider changing rule G48 to include a 5th team member for helping with clearing the field only (field assistant). In years past our human player would be responsible for the robot cart, one operator would be responsible for the control system, and the coach and



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other operator would remove the robot from the field. We have been practicing lifting down our robot from hanging and it really is much safer to have a third person to help with lowering the robot to the floor. If we have 3 of our 4 team members lifting the robot down, then it will take much longer to clear the field.

Re: Requesting change for G48

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Posted by GDC at 01/29/2010 09:14:27 am

Rule <G48> will not be changed. The ability to place/remove the ROBOT on/from the ARENA in a timely manner is one of the considerations that should be factored in during the selection of the field team members.

While we appreciate your attempt at streamlining the reset process, adding 6 more people in the ARENA would create a different safety hazard that some venues may not be able to accommodate.

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**Team Member Actions (2010)**

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**Drive team coach communications**

Drive team coach communications

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Posted by 2010FRC2614 at 01/27/2010 10:22:08 pm

Not sure if this is the right place to ask this, but can the drive team coach wear an earphone that provides them with audible information from the control system?

Re: Drive team coach communications

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Posted by GDC at 01/29/2010 09:12:06 am

If the earpiece is directly wired to the OPERATOR CONSOLE (i.e. the signal is not transmitted via wireless communications), and the OPERATOR CONSOLE (not the ROBOT or anything else) is the source of the signal, then this is not prohibited by the rules.

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**Safety & Damage Prevention (2010)**

**Safety & Damage Prevention (2010)**

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**Bumper Zone Relative to the Floor?**

Bumper Zone Relative to the Floor?

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Posted by 2010FRC0016 at 01/13/2010 06:48:21 pm

Can a robot use an active mechanism on a ball while on a "bump" at the point where its wheels are not all on the floor? In other words, can a robot only use an active mechanism under the bumper zone if the bumper zone is completely parallel to and contacting the floor?

Re: Bumper Zone Relative to the Floor?

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Posted by GDC at 01/21/2010 04:33:25 pm

Please refer to Team Update #4.

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**Safety & Damage Prevention (2010)**

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**Bumper height over bumps**

Bumper height over bumps

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Posted by 2010FRC1687 at 01/13/2010 06:54:58 pm

Are we allowed to use an active, powered suspension system to climb the bumps and hang? (like, for example, the wheels of the 2 red hanging robots in the game animation.) This system,



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[I]f activated on level ground,[/I] would move the bumpers outside of the bumper zone, but would only be actuated to aid in climbing and hanging.

### Articulation Question

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Posted by 2010FRC2504 at 01/13/2010 11:43:21 pm

Will it be legal to use wheels which articulate on the ramp? Also would that count against us if the bumper distance from the articulated wheel brings that piece of the bumper out of the 10 to 16" planes on the ramp but not when completely flat?

&lt;R07&gt; Please judge on our two interpretations

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Posted by 2010FRC0118 at 01/14/2010 12:31:00 pm

GDC,

Hello! We currently have two interpretations of <R07> when the ROBOT is in contact with the BUMP. Would you please judge which is correct.

The first interpretation is that at any time the ROBOT is in contact with the BUMP, if the ROBOT is "frozen" (i.e. all moving parts halted) and placed on a flat surface, the ROBOT BUMPERS must be within the BUMPER ZONE to be legal.

The second interpretation is that at any time when the ROBOT is in contact with the BUMP, if the ROBOT is "frozen" (i.e. all moving parts halted) and placed on a flat surface, the ROBOT BUMPERS need not be within the BUMPER ZONE to be legal.

For example, is it legal if a four-wheeled robot hits the bump resulting in the front two wheels being shoved 3" into the robot as might happen if a traditional suspension were implemented? In this case, if the robot was "frozen" when the wheels were shoved into the robot and the robot was placed on a flat surface, the bumpers on the front of the robot would be about 7" or 8" off the floor.

Thank you,  
The Robonauts

### Bumper height over bumps

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Posted by 2010FRC0171 at 01/14/2010 10:24:41 pm

How is the bumper zone defined over the "bumps" on the field?

### Articulation Question

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Posted by 2010FRC2504 at 01/14/2010 11:05:08 pm

If the front wheel during the time going over the bumps increases in distance where the bumper is further then the 10 X16 plane, but will be vertical to the field while flat on the ground and the correct distance will it be allowed?

### Articulating suspension while climbing bumps

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Posted by 2010FRC2826 at 01/16/2010 02:17:19 am

Rule <R07A> states:

"The BUMPERS must be located entirely within the BUMPER ZONE when the ROBOT is standing normally on a flat floor, and must remain there (i.e. the BUMPERS must not be



articulated or designed to move outside of the BUMPER ZONE)."

When a robot is not on flat ground, specifically going over the bumps, how is the bumper zone measured? Is the intent of this rule that when an inspector measures compliance with this rule and, for example, pushes down on the robot, and gives it the OK, that the bumpers are fixed relative to that flat measured configuration.

If a robot employs a mechanism to hold the robot frame and bumpers within the bumper zone when on flat ground and releases the mechanism while traversing the bump, generally articulating a suspension past the potential +/- 0.5" of travel of the bumpers in the bumper zone, is this considered illegal?

### Adjustable Wheels and Bumper Zone

Posted by 2010FRC2926 at 01/17/2010 12:05:49 am

I understand from the rules that the bumper zone is 10-16 inches off the level floor. I understand that the bumpers must be attached to the frame of the robot.

We are working on a chase design that would allow the wheel to be rotated from underneath the robot to the top of the robot in case the robot is found on it's back (ie a turtle on its back). Our concern is when the robot is on its "back" and we start moving the wheels from its "stomach" area to its back, there will be a time when the wheels are touching the ground and the bumpers will not be in the bumper zone until the wheels are fully extended out its "back" (which is now facing the ground).

1) Will this be a violation since the robot is attempting to "right" itself?

2) If we employ this system while going over the bumps we could raise the rear of the robot while the front wheels are going over the bump (in an attempt to keep the robot more level), could this constitute a violation? The robot is not on level ground and the bumpers would be at different heights. (less than 10" off the ground on the up hill side and more than 16" on the downhill side) All robots would have the same thing happen as they approach and the start to go over the bump.

### Clarification on &lt;R11&gt;

Posted by 2010FRC0134 at 01/17/2010 06:22:22 am

<R11> The FRAME

PERIMETER must be comprised of fixed, non-articulated structural elements of the ROBOT. The FRAME PERIMETER must remain a fixed, unchanging polygon throughout the MATCH.

[FRAME PERIMETER – the polygon defined by the outer-most set of exterior vertices on the ROBOT (without the BUMPERS attached) that are within the BUMPER ZONE. To determine the FRAME PERIMETER, wrap a piece of string around the ROBOT at the level of the BUMPER ZONE - the string describes this polygon]

If the frame the bumpers are attached to is a fixed, unchanging polygon, could your drive train within the FRAME PERIMETER hinge underneath it?

And a follow-up to this: Does rule <G37> c. allow for the bumpers to be out of the bumper



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zone while cresting over the RAMP or BUMP or while being SUSPENDED or ELEVATED

### Bumper and perimeter questions

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Posted by FRC1228 at 01/17/2010 11:36:17 pm

Hello,

We have two separate, but related questions. 1) It is real clear that bumpers must be placed on the RP, but we are trying to figure out if there is a specific height, or range of height, the bumpers must fit in.

We also understand that the robot frame may not articulate, but if the outer shell (frame and body) of the robot remain fixed, are the axles and wheels able to articulate up and down? If so, is there a relationship between the axles/wheels an the bu,mpers?

Thanx!

### Artuculating Drive System

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Posted by 2010FRC1391 at 01/18/2010 09:14:53 am

Our team has started designing and prototyping an articulated drive base to make going over the bumps easier. We wanted to check the legality of this idea before we went too far with it.

The bumpers on the robot would be solidly mounted to the non articulating part of the frame. When flat on the ground the bumpers would be within the bumper zone. The drive base would be inside the frame perimeter and would able to articulate. When going over the bump wheels would follow the shape of the bump while the frame where the bumpers are attached would be solid. Once over the bump the, on the flat floor, the robot would return to the original configuration.

### Clarification of Rule R07

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Posted by 2010FRC1025 at 01/18/2010 12:27:13 pm

My question regards the phrase, "and must remain there" in <R07 A>. It's ambiguous to me whether or not the phrase means that the bumpers must remain in the bumper zone (1) throughout the entirety of the match or (2) just when "standing normally on a flat floor".

(1) If the rule means that the bumpers must stay in the bumper zone for the entirety of the match, then any robot going over the bump or lifting on the tower violates this rule, because the bumper zone is defined as "the volume contained between two virtual horizontal planes, ten inches above the floor and sixteen inches above the floor." I would assume that "the floor" is the level playing field. Any robot designed to go over a bump will have its bumpers "designed to move outside the BUMPER ZONE".

Thus, I don't think that this interpretation is correct, unless there is there a different definition of "the floor" while the robot is going over a bump? Some people have theorized that "the floor" when going over a bump is the lowest point on your robot relative to the bumpers on your robot. I'm not sure if this interpretation can be inferred directly from the rules.

(2) If the rule means that the bumpers must stay in the bumper zone only while the robot is on flat ground, I don't see any restrictions on the bumper height when going over a bump.

The primary reason for this question is the legality of articulating drive trains: robots with a rigid higher frame that the bumper mounts to and an articulating lower frame that the drive train



mounts to. The robot is perfectly legal when running on flat ground, but are they legal while going over a bump? The bottom of the wheels articulate to being more than ten inches below the plane of the bottom of the bumper, but the robot is not able to hold itself in that configuration when lying on flat ground. Examples of this type of drive train are shown below:

[url]http://www.chiefdelphi.com/media/photos/34507[/url]

[url]http://academics.tridenttech.edu/team342/inventor05/2005%20Images/010%20Robot%20Frames/frame%20image%203.jpg[/url]

[url]http://www.chiefdelphi.com/media/photos/34492[/url]

Better clarification of the bumper rules while going over a bump would be appreciated. Would drive trains similar to those above be legal?

Re: Articulation Question

Posted by GDC at 01/18/2010 01:09:06 pm

There are no rules that prohibit articulated drive trains. Please see Team Update #4 for clarification of the BUMPER location when crossing the BUMPS.

#### Safety & Damage Prevention (2010)

### <R07N> bumper parts and direction of protrusion

&lt;R07N&gt; bumper parts and direction of protrusion

Posted by 2010FRC2505 at 01/13/2010 11:54:27 pm

[quote=<R07N>]"Hard" parts of the BUMPER (i.e. plywood backing, fastening system, and clamping angles) may extend up to a maximum of one inch beyond the FRAME PERIMETER. "Soft" parts of the BUMPERS (i.e. pool noodles and cloth covering) may extend up to 3½ inches beyond the FRAME PERIMETER.[/quote][list=1][\*]Is "plywood backing, fastening system, and clamping angles" an exhaustive list of the only hard parts allowed on bumpers?[\*]Is "pool noodles and cloth covering" an exhaustive list of the only soft parts allowed on bumpers?[\*]Does <R07N> also apply to the removable fabric cover?[\*]Do the 1-inch and 3.5-inch dimensional limits apply in the outward direction [i]and[/i] the inward direction? If no, does this imply that there is no dimensional limit in one of those directions? (This obviously has implications for the size and configuration of items listed in <R07J>.)[/list]

Re: &lt;R07N&gt; bumper parts and direction of protrusion

Posted by GDC at 01/15/2010 09:31:28 am

1. Yes, with the proviso that "fastening system" include all fasteners required in to attached the BUMPER components to each other and to the ROBOT.
2. Yes, with the proviso that "cloth covering" also includes all elements of a removable fabric cover (if used).
3. Yes.
4. No and no.

#### Safety & Damage Prevention (2010)

### <R07> requirements derived from figure 8-1

&lt;R07&gt; requirements derived from figure 8-1

Posted by 2010FRC2505 at 01/14/2010 12:11:24 am

[list=1][\*]Does "optional aluminum angle" mean:[list=a][\*]Optional angle, [i]optionally[/i] made of



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extruded aluminum (but alternatively extruded fiberglass, bent sheet metal, etc.),[\*]Optional angle, but only if made of extruded aluminum, or[\*]Optional angle, but only if made of aluminum (irrespective of manufacturing process)?[/list][\*]Does "attached with wood screws to clamp fabric" mean that wood screws must be used when angle is used?[\*]Is a "fastener system allowing blind attachment" a requirement, or simply a recommended example?[/list]

Re: &lt;R07&gt; requirements derived from figure 8-1

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Posted by GDC at 01/18/2010 11:17:52 am

1. "Extruded" does not appear anywhere in the requirement.
2. If the optional aluminum angle is used, it is to be attached with wood screws.
3. The example fastening system illustrated in Figure 8-1 is an example (hence the use of the word "example"). The requirements of the fastening system are described in Rule <R07-I> and <R07-J>.

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**Safety & Damage Prevention (2010)**

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**Curved Bumpers?**

Curved Bumpers?

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Posted by FRC1501 at 01/14/2010 07:08:46 am

In the Breakaway video it shows several robots with a rounded/curved design. Is this showing that curved bumper perimeters are legal? If so, would curved Bumpers be legal as long as they are at least 6 inches long?

Keep up the great work.

Re: Curved Bumpers?

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Posted by GDC at 01/15/2010 09:30:14 am

There is no specific prohibition against curved BUMPERS, as long as they satisfy all the other applicable rules.

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**Safety & Damage Prevention (2010)**

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**Chain contacting the BUMP**

Chain contacting the BUMP

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Posted by 2010FRC1598 at 01/20/2010 07:14:55 pm

Our question concerns R08 or other rules that prohibit metal contacting the carpet. While crossing the BUMP would it be a violation for the chain to slightly on the carpet if it is not supporting the weight of the robot. Thanks for your time!!

Re: Chain contacting the BUMP

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Posted by GDC at 01/20/2010 10:36:41 pm

Drive chain in contact with the carpet would be considered a traction device and therefor violate R08.

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**Safety & Damage Prevention (2010)**

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**Stored Energy**

Stored Energy

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Posted by 2010FRC0342 at 01/21/2010 07:17:28 am

Rule R01 states that stored energy can only come from approved sources, for safety reasons. If a kicker mechanism is pre-loaded by a spring/bungee to hold a neutral (not ready-to-kick)





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position, is this a violation? Is there a spring pre-load that is recognized as legal, or is it simply up to the judges as to what is considered "safe"?

If a latch or other mechanism is used to safely contain a kicker in a ready-to kick position, is this a violation of the stored energy provision? Would use of a spring return air cylinder be treated differently?

Re: Stored Energy

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Posted by GDC at 01/25/2010 09:14:47 am

Storing energy via a deformed spring is permitted by Rule <R01-D>. A specific "safe" pre-load energy level has not been established. The evaluation of "safe" is too highly dependent upon the details of any particular design and the associated restraint/trigger system to make a generalized determination.

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**Safety & Damage Prevention (2010)**

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**Bumpers**

Bumpers

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Posted by FRC1717 at 01/22/2010 12:48:08 pm

In the past, we have manufactured our bumpers as per the FIRST requirements in the top image, using the optional aluminum angle.

For the purpose of appearance and containing the fabric more effectively, we were wondering if it would be acceptable to weld the seams of the aluminum angle?

This will not add any appreciable strength to the bumper and is strictly for aesthetic purposes; we would grind the welds down to make the weld surfaces flush with the aluminum angle and then anodize this aluminum angle frame.

[IMG]<http://i108.photobucket.com/albums/n37/numba1techi/BumperWeld.jpg>[/IMG]

Re: Bumpers

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Posted by GDC at 01/31/2010 11:04:04 pm

There are no rules that would prohibit this.

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**Safety & Damage Prevention (2010)**

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**Flipped robot, capable of drive**

Flipped robot, capable of drive

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Posted by 2010FRC0094 at 01/22/2010 04:51:52 pm

Hello,

I would like a clarification on bumper zones and flipped robots.

It is my understanding from the FRC Kickoff that GDC is expecting robots to flip at some point. I think game animation states "It would be wise to design your robot to right itself once flipped."

With that in mind, does the robot have to be designed so that no matter what the bumpers stay in the bumper zone?





Let me explain. Say my robot flips over and is NOT symmetrical. Maybe I flip on my side. Now my bumpers are out of the bumper zone. Is that a penalty or anything?

Next, say I'm clever enough to design a robot that can drive and operate once flipped. So I'm on my back, or my side, but I can still drive and compete. But again, my bumpers are not in the bumper zone. Is that a penalty?

I strongly predict that the flipped immobile robot with bumpers outside the bumper zone is expected and not a penalty, but I can't decide how GDC would rule on the robot that can drive once flipped.

How does this possible ambiguity get ruled on in competition?

Thank you!!!  
The TechnoJays

Re: Flipped robot, capable of drive

Posted by GDC at 01/25/2010 08:42:23 am

As clearly indicated in Rule <R07> (including the "blue box" following Rule <R07-A>, as amended in Team Update #3), the intent of the BUMPER rules is to ensure that BUMPERS are within the BUMPER ZONE when the ROBOT is operating on the flat floor, so that all collisions will be mitigated to prevent undue damage. If a ROBOT is designed such that the BUMPERS do not remain in the BUMPER ZONE when it is inverted, then any attempted operation when inverted will not satisfy the intent of the rule. Since the ROBOT would no longer satisfy Rule <R07> during the match, it would then be considered in violation of Rule <S04> and PENALIZED accordingly.

#### Safety & Damage Prevention (2010)

### Metal Contact with Tower/Platform

Metal Contact with Tower/Platform

Posted by FRC111 at 01/23/2010 08:01:58 am

Please clarify R08's definition of FIELD. Does the no metal contact with FIELD apply to the steel pipes on the tower? Does any mechanism that "hooks onto" the tower structure have to be non-metal? How about the top surface of the platform - can metal push against that surface?

Re: Metal Contact with Tower/Platform

Posted by GDC at 01/25/2010 02:31:04 pm

Please see Team Update #5.

#### Safety & Damage Prevention (2010)

### Concave frame and bumper

Concave frame and bumper

Posted by 2010FRC3238 at 01/24/2010 01:31:44 pm

Figure 8-3 (under <R07-N>) shows that it is illegal to have a concave frame perimeter with the bumper not following that concave frame perimeter. Is it legal to have a concave frame



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perimeter with the bumper following that concave frame perimeter? Put another way, would it be legal to have a frame that is the same as in Figure 8-3 if the bumper did not "cut off" the cutaway of the frame?

Re: Concave frame and bumper

Posted by GDC at 01/24/2010 09:33:55 pm

By definition, the FRAME PERIMETER must be a convex polygon. The BUMPERS must follow the FRAME PERIMETER. Therefore, no this is not allowed.

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Safety & Damage Prevention (2010)

## Bumper Construction Method

Bumper Construction Method

Posted by 2010FRC0885 at 01/25/2010 09:54:22 am

Is it allowable to assemble the bumpers into a single rectangular structure that can be attached to the robot as a unit, so long as all other bumper criteria are met?

Re: Bumper Construction Method

Posted by GDC at 01/31/2010 11:07:26 pm

This would be permitted only if all elements of the rules - and in particular Rule <R07-O> - are met.

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Safety & Damage Prevention (2010)

## Bumper cover colors

Bumper cover colors

Posted by 2010FRC3151 at 01/25/2010 11:33:47 am

The kick-off video showed the robots changing bumper color by having a removable covering available. I cannot find in the manual any mention of having to change bumper color for a match. Section 8.3.1 R07.F states the fabric must be solid red or blue. Can someone point me to requirements for an alternate color? Thanks!

Re: Bumper cover colors

Posted by GDC at 01/28/2010 12:01:03 am

Please read Rule <R12> in Chapter 8, and the definition of "ALLIANCE" in Chapter 7 of The Manual.

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Safety & Damage Prevention (2010)

## Bumper Color

Bumper Color

Posted by 2010FRC2959 at 01/25/2010 02:20:08 pm

Given the use of camera recognition and tracking as a possible robot capability and potential variability in vendor colors, is there a specific red/blue color required for the bumper material?

Re: Bumper Color

Posted by GDC at 01/28/2010 12:00:40 am

Please read Rule <R07-F>.

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Safety & Damage Prevention (2010)

## Bumpers above platform plane while elevated



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Bumpers above platform plane while elevated

Posted by 2010FRC2826 at 01/25/2010 11:09:07 pm

According to the definition of ROBOT in the Chapter 8 definitions section, It appears that the bumpers are not a part of the definition of ROBOT. Additionally, the definition of BUMPER explicitly states that the bumpers are attached to the ROBOT. Finally the definition of ELEVATED in Chapter 7 states that the ROBOT must be completely above the platform plane.

Assuming that my above assertion is true, if the ROBOT is ELEVATED, are the BUMPERS allowed to be below the 20" platform plane as long as every part of the ROBOT other than the bumpers are above the platform plane?

Re: Bumpers above platform plane while elevated

Posted by GDC at 01/27/2010 11:55:27 pm

The BUMPERS are part of the ROBOT for all purposes except those explicitly excluded in Rule <R10>. The basic assertion posed in the question is false. Therefore, no.

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**Safety & Damage Prevention (2010)**

**Re: <S02> What happens when someone touches a robot?**

Re: &lt;S02&gt; What happens when someone touches a robot?

Posted by 2010FRC2505 at 01/26/2010 01:00:16 pm

[quote=GDC]Your question concerns us, as it addresses behavior that's completely prohibited and should be extremely difficult/impossible given the FIELD configuration.

Please clarify your question and resubmit it. Help us understand how you think this could happen.[/quote]An innocent example:[indent]During the finale, A's robot is in its own scoring zone. It deploys an arm for latching on to the tower's side bars. B's robot pushes A's robot back into the alliance station wall, and A's weakly built arm collapses. A cable from A's arm strikes a member of Team C (A's partner) in the alliance station.[/indent]Does the disablement apply to A (whose robot was touched), B (whose robot pushed A's robot and caused the incident), and/or C (whose robot was uninvolved, but whose team member actually violated <S02a>)? Likewise the penalty, and does <G13> apply and nullify it (but not the disablement) if A or C are to be penalized?

A worst-case example:[indent]During a match, a member of Team A leaves the operator station, walks around the side of the field, reaches in, and touches Team B's robot. Team A eventually receives a card for egregious conduct, and two penalties for leaving the alliance station and entering the field during play. (Let's say they're unsportsmanlike, and it's their surrogate match, and they don't care.)[/indent]If <S02a> applies to the person causing the violation, then A receives an additional penalty, and their (uninvolved) robot is disabled. However, if this is to ensure safety, then by implication, it is B's robot that must be disabled. Does <S02> mandate that B's robot be disabled in this situation, even due to an obviously intentional action of A? If B's robot is disabled, does B receive an <S02a> penalty, and does <G13> nullify this penalty? Can the disablement and penalty for a single <S02a> event be applied to different teams?

How will these rules be applied, and what (if any) alternative interpretations are consistent with the rules?



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Re: &lt;S02&gt; What happens when someone touches a robot?

Posted by GDC at 02/08/2010 12:19:41 pm

In extreme and unusual cases, the assessment of PENALTIES will be based on the referee determination of the causal factors involved in the incident. The ROBOT, TEAM or ALLIANCE responsible for causing the infraction will receive the PENALTIES.

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Safety & Damage Prevention (2010)

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**<R07C> Pool noodle type**

&lt;R07C&gt; Pool noodle type

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Posted by 2010FRC2505 at 01/28/2010 01:10:12 pm

With regard to <R07C> and Fig. 8-1:

[list=1][\*]May we use pool noodles with a non-round profile, but with a maximum cross-sectional width of approximately 2.5 inches?[\*]Are pool noodles with central holes required?[/list]

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Re: &lt;R07C&gt; Pool noodle type

Posted by GDC at 01/29/2010 04:35:03 pm

1. Any pool noodle with an approximately round profile would be acceptable (e.g. there are pool noodles with octagonal and star-shaped profiles - these would be OK).
  
2. Pool noodles with central holes are preferred. But there is no rule that absolutely requires them.

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Safety & Damage Prevention (2010)

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**Bumper distance to floor**

Bumper distance to floor

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Posted by 2010FRC2711 at 01/28/2010 09:01:10 pm

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What is the height of the bottom of the bumper to the floor? Last year it was in the inspection form, this year, 2010, the inspection form has not yet been made available.

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Re: Bumper distance to floor

Posted by GDC at 01/31/2010 11:12:04 pm

Please read the definition of "BUMPER ZONE" and Rule <R07> in Chapter 8 of The Manual.

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Safety & Damage Prevention (2010)

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**Stored Energy**

Stored Energy

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Posted by 2010FRC1389 at 01/30/2010 05:01:06 pm

Are certain types of stored energy allowed on the robot if they are not used but controlled by other methods such as a motor?

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Re: Stored Energy

Posted by GDC at 01/31/2010 10:48:24 pm

There is insufficient information to answer this question. Please clarify and re-post the question, stating clearly what forms of stored energy, how it is to be controlled, and how it satisfies the requirements of Rule <R01>.



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Safety & Damage Prevention (2010)

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## Articulated Wheels Affecting Bumper Height

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### Articulated Wheels Affecting Bumper Height

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Posted by 2010FRC0854 at 01/31/2010 08:40:09 pm

Hello GDC,

We are aware that the bumper height is defined when the robot is sitting on flat ground, and our bumpers meet this requirement. Our design has wheel modules independent from the frame which while passively sitting on the ground meet the bumper rules. We can however, articulate the wheels which consequently slightly angles the frame, causing the bumpers to leave the allowed height, although only partially. We are wondering if this articulation is legal or not. If this is not permitted, could this be rectified by having the frame actively rotate relative to the wheel modules, which would keep the bumpers level and within the allowed heights. We understand that the bumpers are there for our own good, and the majority of the bumpers would remain inside the required zone, but this action is required for the end game.

Thanks,  
Team 854

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### Why hasnt my thread been answered

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Posted by 2010FRC0854 at 02/02/2010 12:12:23 pm

Hello FIRST,

I am the appointed contact for team 854, and I had initially posted a thread asking the following question with the account "854 Bears"...

"Hello GDC,

We are aware that the bumper height is defined when the robot is sitting on flat ground, and our bumpers meet this requirement. Our design has wheel modules independant from the frame which while passively sitting on the ground meet the bumper rules. We can however, articulate the wheels which consequently slightly angle the frame, causing the bumpers to leave the allowed height. We are wondering if this articulation be illegal. If this is not permitted, could this be rectified by having the frame actively rotate relative to the wheel modules, which would keep the bumpers level and within the allowed heights.

Thanks,  
Team 854"

After getting a response to post this in the official forum, I did, but two or three days latter, I still havent recived a reply. This is a pressing design issue to which we need an answer. If you are in the process of answering this question then please disregard this note, but if the other posts have been deleted because you thought they were multiples, then please make sure one of these posts is answered. I am dissappointed with this service so far as I have had a difficult time navigating and finding where to post, and I hope to receive an answer soon.



---

Thank you for your understanding,  
Team 854

Re: Articulated Wheels Affecting Bumper Height

Posted by GDC at 02/04/2010 07:21:39 pm

If the BUMPERS move outside the BUMPER ZONE, except as permitted by Rule <R07> as amended in Team Update 5(? check), then it will be considered a violation of Rule <R07>. If the BUMPERS do not move outside the BUMPER ZONE while the ROBOT is on the flat floor, even if they are capable of doing so, then it is not a violation.

Safety & Damage Prevention (2010)

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### Further clarification on Fasteners and Team Update 7

Further clarification on Fasteners and Team Update 7

Posted by 2010FRC1771 at 02/02/2010 06:59:30 pm

We understand that according to team update 7, minor protrusions such as fastener ends, bolt heads, etc. within the bumper zone, are permitted. Will there also be an exception made for similar minor bolt head protrusions that are below the bumper zone? Such as for drivetrains and such?

Re: Further clarification on Fasteners and Team Update 7

Posted by GDC at 02/04/2010 04:44:00 pm

No. As discussed in the definition of FRAME PERIMETER and in Rule <R16-A> (as amended in Team Update #7), the purpose for this rule modification is to permit a tight, robust connection between the BUMPERS and the FRAME PERIMETER. Protrusions outside of the BUMPER ZONE are not involved with this connection, and are still not permitted.

Safety & Damage Prevention (2010)

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### Mitered Bumpers

Mitered Bumpers

Posted by 2010FRC3011 at 02/03/2010 01:53:24 pm

Last year we were allowed to miter our bumper's corners but we had to get special dispensation from FIRST. It's not mentioned in this year's competition manual. Can we miter our bumpers this year?

Re: Mitered Bumpers

Posted by GDC at 02/04/2010 07:30:01 pm

As described in Rule <R07-L>, you are allowed to bevel adjacent sections of the "soft" BUMPER materials to form a tight, continuous protective surface around corners of the ROBOT. The "hard" parts of the BUMPER (e.g. BUMPER backing) must not extend into the radially projected portion of the corner, or it would be a violation of Rule <R07-O>.

Safety & Damage Prevention (2010)

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### Bumper Construction III

Bumper Construction III

Posted by 2010FRC1922 at 02/03/2010 05:13:52 pm

In section 07 Robot the rule specifies a 3/4" plywood backing. What we would like to do is to use one piece of 1/2" and a piece of 1/4" in plywood to make the proper thickness. As in upholstering furniture we would sandwich fabric ends between the plywood pieces. All



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surfaces would be covered and the total thickness of the hard material would be 3/4". This would allow us to eliminate the suggested metal banding which has always been a problem with the bumper with the extended noodles. Maybe a third time is a charm????

Thanks

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Will Renauld  
Team #1922  
OzRam  
Contoocook, NH.  
Edit/Delete Message

Re: Bumper Construction III

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Posted by GDC at 02/04/2010 07:28:13 pm

Rule <R07-D> requires a single piece of 3/4 inch plywood be used. The configuration you described would violate this rule.

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**Safety & Damage Prevention (2010)**

**<R08> intent and clarification on treads**

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&lt;R08&gt; intent and clarification on treads

Posted by 2010FRC0578 at 02/03/2010 06:24:32 pm

Team 578 has a question pertaining to Section 8.3.1 Rule <R08> where it states:

"ROBOT wheels, tracks, and other parts intended to provide traction on the carpet may be purchased or fabricated ("traction devices" include all parts of the ROBOT that are designed to transmit any propulsive and/or braking forces between the ROBOT and the FIELD). In no case will traction devices that damage the carpet or other playing surfaces be permitted. Traction devices shall not have surface features such as metal, sandpaper, hard plastic studs, cleats, or other attachments. Anchors (i.e. devices that are deployed/used to keep one's ROBOT in one place and prevent it from being moved by another ROBOT) shall not use metal in contact with the carpet to "stay put." Gaining traction by using adhesives or Velcro-like fastener material is not allowed."

I believe the whole intent of R08 is to prevent damage to the field which is good but the Rule seems ambiguous, general, and as a result may be overly restrictive when it comes to materials and design of a track.

Specifically our questions are:

1. Can you use a metal track that has "treads" (not "studs" or cleats)?
2. What is "hard" plastic?  
Is "hard" quantified using the Durometer or Rockwell scales?
3. What is meant by "other attachments"?

If we "fabricate" a track using commercial components then what qualifies as an "attachment"?

Here are two examples we would like considered.

Example #1



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1.5" long 1/2" ID PVC conduit is cut in half longitudinally, filed smooth and the corners are rounded. Then it is placed concave side down and fastened using 8-32 pan head screws up through the concave side through triple strand roller chain. The screw head is visible from the bottom it but does not touch the floor.

Example #2

1.5" long pieces of 3/4" ID rubber hose are fastened using 8-32 pan head screws from the inside of the hose up through triple strand roller chain. Even when the hose compresses the screw heads do not touch the floor.

Do both of these examples pass Rule R08?  
If not then why not?

Thank you.

p.s. "I'm a bit fuzzy on the whole good/bad thing here. " - GhostBusters

Re: <R08> intent and clarification on treads

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Posted by GDC at 02/07/2010 12:29:51 am

1 - No.

2 - While we understand that "hard" is a relative term, we do not define a specific hardness rating (understand that many teams and inspection stations do not have the tools required to measure specific hardness). Hardness is used in the general sense of the word as understood by a reasonably astute observer. A rule of thumb: If I hit you with it and it hurts, then it is "hard."

3 - If it is not "metal," "sandpaper," "hard plastic studs," or "cleats" then it is "other." If it is attached to the traction device, then it is an "attachment."

We can not approve or disapprove of specific ROBOT designs. Treating the examples purely as applications of the stated materials:

Example 1 - This would be a violation of Rule <R08>

Example 2 - This would not be a violation of Rule <R08>

Safety & Damage Prevention (2010)

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## Bumper Question

Bumper Question

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Posted by 2010FRC2053 at 02/04/2010 08:07:11 pm

Can the fasteners that are attached to the plywood of the bumper (to attach to the robot) extend above the bumper?

Thank you.

Re: Bumper Question

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Posted by GDC at 02/11/2010 05:14:32 pm

There are no rules that prohibit this, however the fasteners must comply with all other rules





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(i.e. must fit in the BUMPER ZONE, etc).

**Safety & Damage Prevention (2010)**

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**use of spring**

use of spring

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Posted by 2010FRC2907 at 02/08/2010 01:39:35 am

Question about use of spring in a closed position that is released by motor operation, which when run, releases the springs. Otherwise, they are stored potential energy unable to release with power off. Energy release requires running motor and releasing length of cord and/or safety pin.

Re: use of spring

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Posted by GDC at 02/12/2010 11:27:42 am

We cannot approve a specific design that has not been reviewed by the inspectors. It is noted however that the intent behind the safety rules is not to prevent the use of springs for stored energy, but to ensure that if they are used that the stored energy is released in a safe, controlled manner. The inspectors will be looking to see if reasonable efforts have been made to ensure this.

**Safety & Damage Prevention (2010)**

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**Rule <R07-E> clarification**

Rule &lt;R07-E&gt; clarification

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Posted by 2010FRC2175 at 02/11/2010 12:50:59 am

We would like some clarification on rule <R07-E> if possible.

The rule states that "The BUMPERS must be covered with a rugged, smooth cloth (1000 denier Cordura Plus® strongly recommended). The cloth must completely enclose the BUMPER backing (plywood) and cushion (pool noodle) material. It is recommended that lengths of aluminum angle be used to clamp the fabric in place."

We are seeking clarification on what is considered completely enclosed. Does the fabric have to completely cover the plywood backing (even on the side facing the robot)? Or is construction as illustrated in Figure 8-1, with the cloth covering wrapping around the top, bottom and side edges of the plywood but not completely covering the back sufficient?

Thank you.

Re: Rule &lt;R07-E&gt; clarification

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Posted by GDC at 02/12/2010 11:38:33 am

Please refer to Rule <R07-A> as amended in Team Update #3. The rule requires that all exposed surfaces of the plywood and pool noodles be covered by the fabric. Interior or hidden surfaces (e.g. the "back" of the plywood) do not have to be completely covered.

**Safety & Damage Prevention (2010)**

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**Bumper Segments at Different Heights**

Bumper Segments at Different Heights

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Posted by FRC111 at 02/11/2010 04:07:41 pm



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The bumper zone is defined to be 6" tall and the bumper construction requirements makes them about 5" tall. So, are we allowed to have segments of the bumper be at slightly different heights as long as they all remain within the 6" bumper zone?

Re: Bumper Segments at Different Heights

Posted by GDC at 02/12/2010 11:40:36 am

Yes.

Different bumper height front and side

Posted by 2010FRC1001 at 02/17/2010 04:02:46 pm

May our side bumpers be at a different height from our front bumper with all between 10 and 16 inches from the ground?

Re: Different bumper height front and side

Posted by GDC at 02/20/2010 01:46:39 am

The previous answer still applies.

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#### Safety & Damage Prevention (2010)

### Bumper Covers

Bumper Covers

Posted by 2010FRC2538 at 02/11/2010 04:38:51 pm

Bumpers are supposed to be convertible between red/blue in color. This is done by taking off an outer shell of either red or blue and the other is left visible. Do we need to (A): Create these covers (as in make each color cover) or (B): Do we just need to make one color and the other will be supplied at the competition?

Re: Bumper Covers

Posted by GDC at 02/12/2010 11:41:31 am

The teams must supply any BUMPERS and BUMPER covers that will be used on their ROBOT.

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#### Safety & Damage Prevention (2010)

### Use of Fishing Weights

Use of Fishing Weights

Posted by 2010FRC2377 at 02/13/2010 04:21:41 pm

We would like to use some fishing weights to increase the momentum of one of our mechanisms. These fishing weights are readily available at any sporting goods store, and they will be completely enclosed within an aluminum tube. Are we allowed to use fishing weights if they contain lead, or does this fall under the hazardous materials ban?

Re: Use of Fishing Weights

Posted by GDC at 02/15/2010 10:36:48 am

Contained and protected in this manner, the material would not violate Rule <R02>.

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#### Safety & Damage Prevention (2010)

### Warped Bumpers

Warped Bumpers

Posted by 2010FRC1529 at 02/13/2010 04:34:33 pm

We manufactured two sets of bumpers early in the build, to the specifications of <R07>. Since



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then, we have mounted the bumpers on the robot and found the 3/4" plywood has warped, making them slightly convex. Do the bumpers have to be in contact with the frame through the entire length of the robot?

Re: Warped Bumpers

Posted by GDC at 02/15/2010 10:35:25 am

Yes. Please refer to Rule <R07-M>. The BUMPERS have to be supported along their entire length.

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**Safety & Damage Prevention (2010)**

**Bumper Configuration**

Bumper Configuration

Posted by 2010FRC0675 at 02/13/2010 05:11:29 pm

Our team is curious as to if in Finale Configuration the bumper rules all still apply. In the rules when defining where the bumpers go it says in NORMAL CONFIGURATION. Does this mean that during the FINALE the bumpers can move/be articulated/ change orientation?

Final 20 seconds - robot configuration and bumper height

Posted by 2010FRC1391 at 02/14/2010 08:22:24 am

Dear GDC,

First, thank you for your tireless work in answering what at times must be frustrating questions!

During the final twenty seconds of the match, our robot has the capability of raising its 'platform' - the main carriage above the wheelbase- approximately 4 inches, by manipulating its articulated wheelbase.

Doing so on the flat playing surface clearly raises the bumper height from a normal height span of 10.5 in-15.5 in to a new (raised) height.

Is the bumper height rule applicable throughout the match, or can bumpers move outside their prescribed zone during the final configuration period? Despite this change, the robot will otherwise remain within the final configuration prescribed dimensions.

Thanks for considering!

Re: Bumper Configuration

Posted by GDC at 02/15/2010 10:27:19 am

The rules regarding BUMPER location are applicable during the entire MATCH. They do not change during the FINALE.

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**Safety & Damage Prevention (2010)**

**Inspection, stored energy, update #7**

Inspection, stored energy, update #7

Posted by FRC1262 at 02/15/2010 09:27:54 pm

<R97> For the safety of all those involved, inspections must take place with the ROBOT powered off, pneumatics unpressurized, and springs or other stored energy devices in their



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lowest potential energy states (i.e. battery removed). Power should only be enabled on the ROBOT during those portions of the inspection process where it is absolutely required to validate certain system functionality and compliance with specific rules (firmware check, etc). Inspectors may allow the ROBOT to be powered up beyond the parameters above if both criteria below are met.

- The ROBOT design requires power or a charged stored energy device in order to confirm that the ROBOT meets volume requirements AND
- the team has included safety interlocks that prevent unexpected release of such stored energy.

Question being... would the "vent valve" be considered a low-tech and appropriate "interlock" to satisfy the second criterion?

Re: Inspection, stored energy, update #7

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Posted by GDC at 02/18/2010 04:34:03 pm

The manually-operated vent valve does not prevent motion in other parts of the pneumatic system. Therefore, it is not an appropriate interlock for securing moving components.

Having the vent valve open during inspection does make a safer environment, and is encouraged, however while demonstrating the pneumatic system, physical interlocks used to restrict accidental motion are required.

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**Safety & Damage Prevention (2010)**

**Stored Energy During Inspection**

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Stored Energy During Inspection

Posted by 2010FRC3238 at 02/16/2010 11:41:55 am

Suppose our robot has an elastic system of storing energy where a mechanism is outside of the robot when it is in its low energy state and inside the robot in its high-energy state. For inspection, instead of powering up the robot and using a safety interlock device, would it be legal to simply untie the elastic at one end to show that the robot meets the volume requirements while in its normal configuration?

Re: Stored Energy During Inspection

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Posted by GDC at 02/18/2010 09:10:59 pm

Provided you can also show that the ROBOT meets the volume requirements during inspection, this is an acceptable approach.

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**Safety & Damage Prevention (2010)**

**Bumper Backing Clearance Pocket Clarification**

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Bumper Backing Clearance Pocket Clarification

Posted by 2010FRC2826 at 02/19/2010 02:27:19 am

Reference:

Rule <R07-D> states:

"Small clearance pockets and/or access holes in the BUMPER backing are permitted, as long as they do not significantly affect the structural integrity of the BUMPER."



Question:

Do full span (from edge to edge on the 5" dimension) vertical dados of 1/8" depth and 1/2" width qualify as a small clearance pocket?

Background:

We have a row of hardware on the frame perimeter that the backing interferes with and a dado is a significantly easier method of creating clearance.

Supporting evidence:

We did a bending stress test on a piece of 3/4" plywood with and without the dado and both cracked within 5% of each other, which might satisfy the rule of not impacting structural integrity.

Re: Bumper Backing Clearance Pocket Clarification

Posted by GDC at 02/21/2010 05:50:04 pm

Given that plywood is a non-homogeneous, non-isotropic material with the strength and bending moment determined, in large part, by the relative orientation of the surviving laminations, it is not at all clear that cutting a dado across the entire height of the material would not severely compromise the structural integrity of the material. The dado reduces the effective thickness of the material by 16.67%. To ensure that the integrity of the modified plywood backing is still sufficient to survive the expected impacts of a typical match, you will need to provide appropriate analytical results to allow us to perform a comprehensive stress-loads analysis prior to having your robot inspected at the competition. As a minimum, we will need the following materials to be submitted for review: a clear definition of the resulting neutral axis along the entire length of the modified plywood material, a Finite Element Analysis (using a NASTRAN-compliant tool or equivalent) of deformation of the plywood backing within 12 inches of the dado cut during a 40-G impact by a 150-pound robot, both analytically- and experimentally-produced predictions of the yield strength of the modified plywood, and a full analysis (using Timoshenko beam theory or equivalent) of the resulting beam stiffness at the moment of impact as compared to the theoretical yield strength. ---- Nah, just kidding. Your solution sounds fine. No problem.

Safety & Damage Prevention (2010)

**Bumpers parallel to ground**

Bumpers parallel to ground

Posted by 2010FRC0696 at 02/20/2010 02:45:20 pm

Our frame is at a slight angle, in order to have our bumpers supported all along the back they will also need to be at a slight angle, is this allowed?

Re: Bumpers parallel to ground

Posted by GDC at 02/21/2010 05:55:24 pm

BUMPERS must be mounted on the ROBOT so that the "hard" parts of the BUMPERS do not extend beyond 1" beyond the FRAME PERIMETER, per Rule <R07-N>. Provided the BUMPERS remain within the BUMPER ZONE, there is no rule prohibiting parts of the complete and intact BUMPER from being higher than other parts of the BUMPER (angled).

Safety & Damage Prevention (2010)

**Bumper Repair**



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Bumper Repair

Posted by 2010FRC2534 at 02/21/2010 06:50:50 am

We were at a recent local practice with an official First field, etc.. During the practice another robot hit us while we were on the bump. Due to non bumper to bumper contact their robot ripped the covering of our bumper. Does it violate any rules to use the proper color duct tapes to repair bumper tears at a regional competition? Also, since numbers need to be on the bumpers, I hope this means we would not be given a penalty if the number becomes distorted.

Thanks,  
Jeff  
Team 2534

Re: Bumper Repair

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Posted by GDC at 02/21/2010 05:58:14 pm

Depending upon the severity of the tear, that would be a reasonable field repair. Although, depending on the severity of the tear, a more complete and proper repair of the fabric cover may be needed before the robot can proceed to another competition event.

**Safety & Damage Prevention (2010)**

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**Bumper Backing**

Bumper Backing

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Posted by 2010FRC0957 at 02/21/2010 08:02:37 pm

Can the bumpers have a 90 degree backing to connect two wood pieces if there is no wood behind on the corner? There is a bumper vertically mounted in the corner to satisfy the rules. Is this system legal? If not is there any suggestions to make a one piece bumper?

Nate

Re: Bumper Backing

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Posted by GDC at 02/22/2010 08:40:47 pm

If the 90-degree backing is part of the BUMPER, then this would be prohibited per Rule <R07-O>, as there are hard parts of the BUMPER that extend into the corners.

If the 90-degree backing is part of the ROBOT, then there are no rules that prohibit this.

**Safety & Damage Prevention (2010)**

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**Bumper Mounts**

Bumper Mounts

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Posted by 2010FRC2538 at 02/22/2010 03:42:23 pm

We are aware that bumpers must be rigidly attached to the robot frame. However, when you go over the bumps, there is a significant amount of leeway on the legal positioning for the bumpers.

Here's the question though: Can we put out bumpers on piano hinges if we ONLY pivot them while going over the bump?

-Team 2538



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Plaid Pillagers  
Morris, Minnesota  
Rookie Year 2008

Re: Bumper Mounts

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Posted by GDC at 02/24/2010 04:03:07 pm

Please read Rule <R07-I>. The BUMPERS must be rigidly attached to the ROBOT frame at all times. This does not change when the ROBOT is crossing over the BUMPS. The BUMPERS must not be hinged or articulated. They must be designed so that they cannot move outside of the BUMPER ZONE if the ROBOT is standing normally on a flat floor (Rule <R07-A>).

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**Safety & Damage Prevention (2010)**

**Bumpers attached to the Frame Perimeter**

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Bumpers attached to the Frame Perimeter

Posted by 2010FRC2974 at 02/23/2010 11:26:57 am

According to rule R06 I: Bumpers must attach to the Frame Perimeter.  
According to Section 8.1.3: The Frame Perimeter is the outermost section within the Bumper Zone

Does that mean that we can attach the Bumper to the Frame Perimeter and only the Frame Perimeter?

Because our robot fits inside the normal configuration, but the bumpers do not attach to the absolute outermost section of the robot because we have small plates attached that are slightly outside the frame that we attach the bumpers to. I really hope this is not illegal, because it seems a little unnecessary and strange if it is.

---

Re: Bumpers attached to the Frame Perimeter

Posted by GDC at 02/24/2010 06:43:23 pm

The BUMPERS must be attached to the FRAME PERIMETER of the ROBOT. The FRAME PERIMETER is the polygon defined by the outer-most set of exterior vertices within the BUMPER ZONE (excluding bolt heads, fastener ends, etc.). If any other parts of the ROBOT (such as mounting plates) extend beyond the FRAME PERIMETER, then it is a violation of Rule <R16>.

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**Safety & Damage Prevention (2010)**

**Bumper Numbering Colors**

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Bumper Numbering Colors

Posted by 2010FRC1114 at 02/23/2010 02:26:05 pm

Rule <R07-F> specifies the color of the bumpers, while <R15> specifies that all bumpers must display a team's number "in a contrasting color from its background". Is there a specification of the color for the bumper numbering (i.e. Numbers on bumpers must be white) or may a team chose any color that contrasts from the background?

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Re: Bumper Numbering Colors

Posted by GDC at 02/25/2010 04:46:57 pm

The color of the numbers is not specified, however contrast and readability are required. Please be sure to use colors that stand out and are easily legible for both the benefit of the field crew and the audience. Please note that it is in the team's best interest to have clear and



legible contrast in the competition environment. It would be such a shame if the field crew disabled the wrong robot because the numbering on the BUMPERS blended in to the fabric color.

### Safety & Damage Prevention (2010)

## Mounting Bumpers with C Channel

### Mounting Bumpers with C Channel

Posted by 2010FRC1540 at 03/01/2010 12:58:25 pm

Currently our bumpers are attached to our robot with aluminum C Channel permanently attached to the bumper. To install them on the robot one simply push them onto the frame horizontally and drop in spring pins.

We're unclear, now that the sleep deprived haze of build season is behind us, if this is legal. They certainly provide a strong connection to the robot but the bumper is resting on the 1/8" aluminum of the C Channel which then sits on the frame. Obviously we'd prefer not to take apart all of our bumpers and rework this but if we need to we'd sure like to know before our week 1 competition!

### Re: Mounting Bumpers with C Channel

Posted by GDC at 03/16/2010 12:43:58 pm

We cannot comment on the legality of specific designs, especially considering we haven't seen them. We recommend you read Rule <R07>, Part I carefully. **If** your design meets the criteria (along with all other requirements in the manual), then your design is appropriate.

### Safety & Damage Prevention (2010)

## Bumper Support Tolerance

### Bumper Support Tolerance

Posted by 2010FRC2175 at 03/11/2010 11:07:07 am

Our question is regarding the Q&A response given here:  
<http://forums.usfirst.org/showthread.php?t=14669>

Is there any tolerance associated with the requirement for the bumpers to be contacting the frame over the entire length (0 + 0.xxx" of spacing)? A number of factors may result in very small gaps such as slightly warped plywood, a non square frame construction and imperfect construction of bumper mounts.

### Re: Bumper Support Tolerance

Posted by GDC at 03/15/2010 12:31:50 pm

There is no specified tolerance, but it's in your best interest to make sure that the BUMPERS are flush to the ROBOT frame (according to a reasonably astute observer).

### Safety & Damage Prevention (2010)

## Inside Corners ?

### Inside Corners ?

Posted by 2010FRC0326 at 03/23/2010 06:43:16 pm

This is a response to this thread. <http://forums.usfirst.org/showthread.php?t=15116>





## 2010 Q&A Forum Export

generated: 11/12/2010 02:32:24 pm EST

After extensive research, we were unable to find anything in the rules that says the frame perimeter can not have inside corners.

Section 8.2 of The Manual- FRAME PERIMETER; the polygon defined by the outer-most set of exterior vertices on the ROBOT (without the BUMPERS attached) that are within the BUMPER ZONE. To determine the FRAME PERIMETER, wrap a piece of string around the ROBOT at the level of the BUMPER ZONE - the string describes this polygon. Note: to permit a simplified definition of the FRAME PERIMETER and encourage a tight, robust connection between the BUMPERS and the FRAME PERIMETER, minor protrusions such as bolt heads, fastener ends, rivets, etc are excluded from the determination of the FRAME PERIMETER.

I think the assumption being made is that this statement is saying that you cannot have inside corners: "wrap a piece of string around the ROBOT at the level of the BUMPER ZONE - the string describes this polygon."

1. We do not believe that this rule says anything about inside corners. We interpret the string as if you are using it to measure the circumference of the robot and running it loosely around the outside to measure the length of the perimeter. We also interpreted this statement to be similar to how you would use string as a level line when laying brick around a house to show that the bumpers are at the same level around the robot.
2. The word wrap in the English dictionary means to fold. If you replace the word wrap with fold in the rules you get, "fold a piece of string around the ROBOT"; This is further from GDC's interpretation of the rules and closer to how we interpreted it.

- wrap -
1. To wind or fold together; to arrange in folds.
  2. To cover by winding or folding; to envelop completely; to involve; to infold; -- often with up
  3. To conceal by enveloping or infolding; to hide; hence, to involve, as an effect or consequence; to be followed by.

polygon - A closed plane figure bounded by three or more line segments.

perimeter -

1. Mathematics

- a. A closed curve bounding a plane area.
  - b. The length of such a boundary.
2. The outer limits of an area. See Synonyms at circumference.
  3. A fortified strip or boundary usually protecting a military position.

We believe that if the GDC did not want inside corners, they should have said "no inside corners" and not left it up for interpretation. We are asking with Gracious Professionalism; to please interpret this rule as loosely as it was written.

Our robot has inside corners at the rear of the robot. We do not see any reason why having inside corners would have any effect on how the game is played. We have already competed at one competition without any issues.

Picture of robot: [http://i430.photobucket.com/albums/q...G\\_8507\\_2\\_1.jpg](http://i430.photobucket.com/albums/q...G_8507_2_1.jpg)



Reasons we cannot change the robot: 1. Not enough time to do it. 2. No money for the materials to do it. 3. Not enough weight to do it in 120 lbs of robot.

Things we would have to do to fix problem: 1. Build new outer frame. We will have to add at least 4 feet of framing to the perimeter of the robot and make it well supported. 2. Build mounts for bumper brackets. 3. Construct a new top for robot so balls do not get stuck on top of robot causing penalties. 4. Build a way to stop balls from going under robot so we don't get penalties for the rule. Also make the mechanism to stop the balls under the robot not interfere or bottom out on bump when we go over it. 5. Build 2 new sets of bumpers. We would have to make new numbers for bumpers.

Materials needed: 1. 25' of angle aluminum. 2. Order more fabric for bumper covers. 3. Order more pool noodles. 4. 3/4 plywood 5. Lexan for cover. 6. Lexan for ball guard under robot and mounts to hold it.

Definition of Wrap: <http://dictionary.reference.com/browse/wrap/>

Definition of Polygon: <http://dictionary.reference.com/browse/polygon/>

Definition of Perimeter: <http://dictionary.reference.com/browse/perimeter/>

As stated earlier this is a real problem that we can not fix. Please feel free to call me if you still have concerns about the shape of the perimeter of our robot.

Re: Inside Corners ?

Posted by GDC at 03/29/2010 12:39:06 pm

Please read the definition of FRAME PERIMETER in Section 8.2 of The Manual again.

"FRAME PERIMETER: the polygon defined by the outer-most set of exterior vertices on the ROBOT (without the BUMPER attached) that are within the BUMPER ZONE."

By definition, the FRAME PERIMETER cannot have interior corners.

It is the responsibility of the team to ensure that their ROBOT is in compliance with all relevant rules, including those associated with the frame and BUMPER construction. If the ROBOT is not in compliance when inspected, then the situation will have to be corrected before it will be allowed to participate in any competition matches.

## General Robot Design (2010)

General Robot Design (2010)

### Finale configuration

Finale configuration

Posted by 2010FRC2143 at 01/13/2010 10:21:36 pm

Rule <R10> defines the NORMAL CONFIGURATION and FINALE CONFIGURATION limits, which are measured "in reference to the ROBOT".



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It is conceivable that after assuming its FINALE CONFIGURATION, a ROBOT's wheelbase will no longer be parallel to the ground. In this case, is the "84 inch diameter vertical right cylindrical volume" still oriented vertically with respect to the FIELD? If not, please clarify the orientation of this volume.

Re: Finale configuration

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Posted by GDC at 01/18/2010 01:02:08 pm

The FINALE CONFIGURATION is defined as a vertical right cylindrical volume. This volume is defined in the coordinate frame of the ROBOT when it is in NORMAL CONFIGURATION.

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**General Robot Design (2010)**

**Articulated Frame**

Articulated Frame

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Posted by FRC1228 at 01/13/2010 11:33:21 pm

If a robot frame and body pivot (flex to accomodate terrain), and the bumpers follow this "flex", is there any foul? When the body flexes one way, the bumpers may show a slight "gap" that would not exist on flat ground.

Chassis

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Posted by 2010FRC3089 at 01/18/2010 10:40:52 am

Hello,

We are currently debating whether the following mechanical structure of the chassis and bumper is legal. The chassis is divided to two parts that are joined together allowing it to change its geometrical shape when going over the bumps (articulating chassis). Above the lower chassis, is a chassis of a larger perimeter that has a solid structure and will consist of the bumpers. As stated in rule <R11> the chassis itself does not change it's shape and when the robot moves on the flat surface it is parallel to the ground.

But when the robot will go over the Bumps, the chassis changes it's angle compared to the ground and the robot.

Regarding rule <R07> A, the upper chassis is designed so that the bumper will not go out of the bumper zone, and won't move or deform while on flat ground.

Thanks!

Re: Articulated Frame

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Posted by GDC at 01/18/2010 09:45:18 pm

Under Rule <R11>, the FRAME PERIMETER must be a fixed, non-articulating structure that does not change during the MATCH. It is not allowed to flex.

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**General Robot Design (2010)**

**Flippable Robot**

Flippable Robot

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Posted by 2010FRC2659 at 01/14/2010 03:15:37 am

If a robot is designed to be able to drive when flipped over (aka drive upside down) with the following configuration:

- 26 inches tall, so that right side up or upside down, the bumpers are between the 10" and 16"



bumper zones automatically (with no frame or bumper articulation systems).

- drive train allows driving on both sides through the same driving system (same power source gives power to both wheel system on the top and on the bottom)
- any mechanisms that are on the top of the robot initially are not activated for controlling balls, but become activated when flipped
- any mechanisms that are on the bottom of the robot initially are deactivated for controlling balls when robot is flipped

does this violate in any way:

<R07-A> or <R15> bumper rules

or

<R10> in reference to the definition of NORMAL CONFIGURATION "physical configuration and orientation... static, and does not change during a single match"

Also if driving upside down in this manner is legal, would it activate the grace period for flipping, or would you still be able to contact balls and robots normally without incurring penalties?

Re: Flippable Robot

Posted by GDC at 01/20/2010 12:52:40 am

As described, this configuration would not violate <R07> or <R10> or <R15>.

Rule <G32> and Rule <G33> apply to ROBOTS that are attempting to right themselves after flipping. If the ROBOT is not making any attempt to right itself, then these rules do not apply.

Note that the team's number must be legibly included on the ROBOT. If your ROBOT is designed to flip over, it's important to include your team number in both orientations as required per Rule <R15>.

Flippable Robot

Posted by 2010FRC0094 at 01/21/2010 02:05:16 pm

Hello,

The bumper zone is between X" and Y" off the ground. (I believe it's 10-16" but don't quote me). If your robot were to flip over (presumably accidentally), the bumpers may not necessarily fit inside that range. (If you flip on your side, they definitely won't be).

My question is, is it permissible to design your robot such that in the event of a flip, you were able to drive around in THAT configuration, despite the fact that your bumpers would no longer be in the "bumper zone?"

Or, do the bumpers have to be within in the bumper zone for the NORMAL CONFIGURATION only, since it is highly probable ACCORDING TO THE GAME ANIMATION that a robot will end up on its roof, side, or tail. Since that will probably happen, do we have to right ourselves BACK to normal configuration, or can we be clever and design it so that doesn't stop us and we keep competing in that "fallen" configuration, provided the "fallen configuration" isn't dangerous or in violation of a different rule?



Thank you.

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General Robot Design (2010)

**Re: Articulation Question**

Re: Articulation Question

Posted by 2010FRC0348 at 01/14/2010 10:41:26 am

Rule R11 states that the frame perimeter must be comprised of fixed, non-articulated structural elements of the robot. The frame perimeter must remain a fixed unchanging polygon throughout the match. If the wheels articulate within the frame perimeter, is this still considered legal?

Re: Articulation Question

Posted by GDC at 01/18/2010 01:09:06 pm

There are no rules that prohibit that.

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General Robot Design (2010)

**Vacuum using Off the Shelf Fans**

Vacuum using Off the Shelf Fans

Posted by 2010FRC0360 at 01/14/2010 11:24:55 am

Are we able to use other fans/assemblies, powered by KOP motors to create low (or high) pressure to control the ball within the legal limits the rules allow?

An obvious example is a vacuum that would hold the ball in front of the machine while we drove.

Thx

Eric Stokely

Team 360

PS I posted this initially on the team forums in frustration because I didn't use the correct sign in, my bad

Re: Vacuum using Off the Shelf Fans

Posted by GDC at 01/15/2010 09:28:25 am

Such devices are permitted by Rule <R72>, as long as they satisfy all other applicable rules.

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General Robot Design (2010)

**Rule R11**

Rule R11

Posted by 2010FRC0772 at 01/14/2010 12:16:34 pm

Can the robot (in the last 20 seconds – finale) expand outside of its length and width dimensions (38\*28). Rule R11 stipulates that the robot “

FRAME PERIMETER must be comprised of fixed, non-articulated structural elements of the ROBOT. The FRAME PERIMETER must remain a fixed, unchanging polygon throughout the MATCH.” Having said that, would we be able to deploy ramps, independent of the frame, to exceed the 38\*28 footprint?



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Re: Rule R11

Posted by GDC at 01/19/2010 08:16:55 pm

Yes.

**General Robot Design (2010)**

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**Articulating suspension while climbing bumps**

Articulating suspension while climbing bumps

Posted by 2010FRC1038 at 01/15/2010 12:51:54 pm

R11 states that a robots from must be non-articulating.

Does this refer to articulation in the X, Y, and Z planes?

Re: Articulating Robot

Posted by GDC at 01/18/2010 01:33:04 pm

The horizontal axes are fixed. For the vertical axis, please see Team Update #3.

**General Robot Design (2010)**

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**Articulating Robot**

Articulating Robot

Posted by 2010FRC1038 at 01/15/2010 12:51:54 pm

R11 states that a robots from must be non-articulating.

Does this refer to articulation in the X, Y, and Z planes?

Re: Articulating Robot

Posted by GDC at 01/18/2010 01:33:04 pm

The horizontal axes are fixed. For the vertical axis, please see Team Update #3.

**General Robot Design (2010)**

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**Bumper Covering**

Bumper Covering

Posted by 2010FRC1038 at 01/15/2010 12:53:38 pm

Ro7.E - states "The cloth must completely enclose the BUMPER backing (plywood) and cushion (pool noodle) material."

The bumper graphic does not show the bumper cloth completely enclosing the backing of the bumper. Does the cloth have to enclose the plywood backing?

Re: Bumper Covering

Posted by GDC at 01/18/2010 09:53:28 pm

Good catch. Please see Team Update #3.

**General Robot Design (2010)**

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**Shock Absorbers and the Hydraulics Rule**

Shock Absorbers and the Hydraulics Rule

Posted by 2010FRC1649 at 01/15/2010 01:14:02 pm

Would an oil filled shock absorber violate the prohibition on hydraulics?



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Re: Shock Absorbers and the Hydraulics Rule

Posted by GDC at 01/16/2010 11:58:22 am

Absolutely. Hydraulic systems of any type are explicitly prohibited by Rule <R02>.

General Robot Design (2010)

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**Curved Bumpers, Expansion during finale**

Curved Bumpers, Expansion during finale

Posted by 2010FRC3167 at 01/15/2010 03:20:41 pm

- 1.) Is the fixed polygon of the robot required to be a polygon, or can it have a curved surface?
- 2.) In the finale, (final 20sec), since the robot size expands, is it allowed to use these expansions to continue to shoot balls at the goal?

Re: Curved Bumpers, Expansion during finale

Posted by GDC at 01/21/2010 04:40:55 pm

- 1) It is required to be a polygon. A Polygon has straight facets. Per Rule <R07-B>, each must be of at least 6 inches in length.
- 2) There are no rules that prohibit scoring BALLS while in the FINALE CONFIGURATION. However, expansion to the FINALE CONFIGURATION may not alter the FRAME PERIMETER, as constrained in Rule <R11>. Also note that a ROBOT may only interact with BALLS per <G30-A> and that <G43>, <G45> and <G46> all still apply during the FINALE.

Re: Curved Bumpers, Expansion during finale

Posted by GDC at 01/27/2010 02:15:16 pm

UPDATE : Specific to part 1, we stated previously in [URL="http://forums.usfirst.org/showthread.php?t=13723"]this thread[/URL] that there are no rules that prohibit curved BUMPERS, and retract the answer provided above (on January 21). Please note that while curved BUMPERS are not explicitly prohibited, please refer to Rule <R07-B> and understand that curved BUMPERS must be at least as strong/robust as straight BUMPERS.

We apologize for the conflicting answers and request your patience as we strive for consistency. In response to this, we have opted for the less restrictive rule as not to punish those who have been working to the less restrictive initial answer.

General Robot Design (2010)

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**Using a ramp/funnel as ball direction controller**

Using a ramp/funnel as ball direction controller

Posted by 2010FRC2826 at 01/16/2010 12:32:25 am

Taking into account rule <G45> and team update 2 in regards to controlling ball motion with and without active mechanisms, can you clarify if ball direction can be controlled with an elevated structure such as a ramp, funnel or tube?

My question is predicated on the assumption that the robot is perfectly stationary at this time so as not to violate the definitions of CARRYING and POSSESSING.

Re: Using a ramp/funnel as ball direction controller

Posted by GDC at 01/18/2010 11:29:35 am

The BALL must not penetrate more than 3 inches into any MECHANISM that is designed to



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deflect BALLS in a controlled manner. Thus, a ROBOT that required a BALL to travel through a funnel or tube would be a violation of Rule <R19> (as amended in Team Update #2).

General Robot Design (2010)

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**Bumpers**

Bumpers

Posted by 2010FRC2484 at 01/17/2010 09:26:53 pm

Is there a pattern for the one- piece bumper cover shown in the kickoff broadcast by Woody and Dean?

Re: Bumpers

Posted by GDC at 01/19/2010 09:28:39 pm

No. A bumper cover, if you choose to use one, will require a custom design to fit your particular bumper configuration.

General Robot Design (2010)

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**Re: <R07> requirements derived from figure 8-1**

Re: &lt;R07&gt; requirements derived from figure 8-1

Posted by 2010FRC2505 at 01/18/2010 02:55:28 pm

[quote=GDC]1. "Extruded" does not appear anywhere in the requirement.[/quote]With regard to question 1, the word "extruded" was included to understand whether your definition of "aluminum angle" includes only the material conventionally sold as such (which is extruded), or if it also included functionally-similar materials like aluminum sheet metal bent into a 90° shape (hence the distinction between 1b and 1c). Please explain your definition.

<R07E> recommends aluminum angle, and Fig. 8-1 states that aluminum angle is optional. This is not the same as a requirement that clamping angle, when used, must be made of aluminum. Item 1a was intended to clarify whether such a requirement was to be inferred from the rules. May we use non-aluminum clamping angle?

Re: &lt;R07&gt; requirements derived from figure 8-1

Posted by GDC at 01/19/2010 09:30:19 pm

The only explicit requirements for the construction of the optional clamping angle, if used, is that it be "aluminum" and "angle." An aluminum angle is a piece of angled material made of aluminum. The method of construction is irrelevant. No further definition is necessary.

General Robot Design (2010)

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**Finale Height**

Finale Height

Posted by 2010FRC2839 at 01/18/2010 04:25:57 pm

During the finale, the robot can extend up to 90" tall and must remain within an 84" diameter vertical right cylinder. If the robot has an extended mechanism at one end of the robot that reaches no higher than 89" from the bottom of the wheel base to the top of the extended mechanism and remains within the 84" cylinder, it will satisfy the requirements of the finale configuration. If that same robot, in that same configuration, is lifted off the floor in a manner that causes the set of wheels at the taller end to rise off the floor first, so that the wheels at the other end of the robot are still on the floor, and the extended element now reaches 91" inches





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above the floor (while the second set of wheels is still making contact with the floor), is that a violation of the final configuration constraints?

Re: Finale Height

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Posted by GDC at 01/20/2010 12:46:48 am

We cannot comment on specific robot designs. However, if the ROBOT expands beyond the FINALE CONFIGURATION cylindrical volume via extremities that prop it up, by changing configuration, etc such that it would no longer fit in the cylindrical volume defined, it would be considered a violation of <R10>.

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**General Robot Design (2010)**

**Configuration**

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Configuration

Posted by 2010FRC1946 at 01/18/2010 04:35:17 pm

1) What is the relationship between the "Normal Configuration" and "frame perimeter"? In the "Normal Configuration" it refers to the size of the rectangular "space" whereas the perimeter refers to the static frame.

2) Regarding G30 a - if we build the frame smaller than the allowed "normal configuration" size, can we have a manipulator, which is below the bumpers, extend out side of the frame but within the allowed "normal configuration" measurements? Would a manipulator such as this be confined to only being extended for 2 seconds?

Re: Configuration

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Posted by GDC at 01/20/2010 12:46:06 am

1) The NORMAL CONFIGURATION describes the default state of the ROBOT (at the start of the MATCH and when not in the FINALE CONFIGURATION). The FRAME PERIMETER is the term used to define the periphery of the ROBOT.

2) Rule <G30-A> restricts BALL interaction MECHANISMS to the BUMPER and FRAME PERIMETERS, not to the volume allowed for the specific CONFIGURATION.

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**General Robot Design (2010)**

**Tolerance on the frame dimensions**

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Tolerance on the frame dimensions

Posted by 2010FRC2165 at 01/18/2010 05:13:51 pm

What is the tolerance on the frame dimensions?

We are building a 28 inch X 38 inch chassis and the 28 inch width dimension actually measures 28 & ¼ inches. Since the bolt holes are on 1 inch centers there doesn't seem to be any correction except to modify (file or mill) the extruded corner supports.

We are using the parts from the Kit of Parts provided by Andy Mark.

Re: Tolerance on the frame dimensions

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Posted by GDC at 01/20/2010 12:44:39 am

The dimensional requirements of <R10> are maximums and therefore have no tolerance. Also, please review Rule <R90>; due to the fact that ROBOTS must fit into the the Sizing Box,



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ROBOTS cannot exceed the ROBOT dimensions permitted by Rule <R10>.

**General Robot Design (2010)**

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**AndyMark Frame KOP ?**

AndyMark Frame KOP ?

Posted by 2010FRC3250 at 01/18/2010 05:33:32 pm

Team 3250 (Rookie) would like to have further understanding of rule R11.

1). Our design has a very rigid frame (more rigid than the KOP frame) but the front wheels allow for a small amount of travel using an attached subframe suspension. We are using a common stability triangle system found in most forklifts. Is this legal?

2). Can the AndyMark KOP frame be cut to change size and height? Are we allowed to cut and TIG weld and mill these frames, or should we just build a custom frame. We would like to use as many of the nice parts in this kit, but have some interesting design changes to make.

Thanks,

Robert Greene

Team Coach, FRC 3250

Re: AndyMark Frame KOP ?

Posted by GDC at 01/20/2010 12:43:21 am

1 - We cannot review/approve specific designs in this forum. However, note that frames must be rigid, and active suspensions are permitted.

2 - The KOP frame materials are yours to use as you wish. You may build the KOP frame as originally designed, you may modify it, or you may replace it entirely with an alternate system of your own.

**General Robot Design (2010)**

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**Robot configuration**

Robot configuration

Posted by 2010FRC2949 at 01/18/2010 05:42:45 pm

During the 2 mins Teleoperate mode, can a robot extend and retract, within frame configuration, so that the robot can pass through the tower tunnel?

Re: Robot configuration

Posted by GDC at 01/20/2010 12:55:58 am

No.

**General Robot Design (2010)**

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**Finale Wheel Extensions**

Finale Wheel Extensions

Posted by 2010FRC2435 at 01/18/2010 07:32:51 pm

Our team is considering a robot design that includes extending rollers or wheels below the bumper zone, and beyond the bumper perimeter in order to make contact with the vertical tower pipes. These wheels would only be used as part of the Finale configuration in order to facilitate upward movement while in contact with the tower.

Would such wheels or rollers be legal?

Would the bumper perimeter have to be extended to cover these deployed wheels.



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Re: Finale Wheel Extensions

Posted by GDC at 01/20/2010 01:05:09 pm

Please understand that we cannot review/approve specific ROBOT designs in this forum. We will defer to the inspectors. Please resubmit your question in reference to a specific rule for which you would like clarification. Thank you.

General Robot Design (2010)

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## Numbers displayed on Robot

Numbers displayed on Robot

Posted by 2010FRC0704 at 01/19/2010 01:57:04 pm

If numbers are displayed on the body of the robot meeting all other requirements, must we have numbers on the bumpers?

Re: Numbers displayed on Robot

Posted by GDC at 01/19/2010 09:44:15 pm

Rule <R15> is specific: the team number must be displayed on the BUMPERS. There is no rule preventing the display of the team number in additional locations about the ROBOT, but as a minimum it must be displayed on the BUMPERS in a manner consistent with the requirements of Rule <R15>.

General Robot Design (2010)

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## Wheels

Wheels

Posted by 2010FRC1366 at 01/21/2010 04:00:44 pm

Can your robot have more than 4 wheels and can they be customize wheels (wheels other than the ones provided in the kit of parts).

Re: Wheels

Posted by GDC at 01/24/2010 09:16:16 pm

There are no rules that prohibit the use of more than 4 wheels, or the type of wheel (as long as the chosen wheel satisfies Rule <R08>).

General Robot Design (2010)

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## Ball intrusion

Ball intrusion

Posted by 2010FRC0051 at 01/22/2010 02:26:26 pm

Rule R19b as of Update 2 said:

<R19> ROBOTS must be designed so that in normal operation BALLS cannot extend more than 3 inches inside  
b) a MECHANISM or feature designed to deflect balls in a controlled manner that is above the level of the BUMPER ZONE.

Question: Is it allowable to let BALLS extend more than 3 inches inside a MECHANISM or feature that is NOT designed to deflect balls (and is not intended to deflect balls, and does not



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deflect balls)?

For example, one could imagine a tall feature on the robot which is intended for hanging. This feature could increase the envelope of the robot significantly, thus making it possible for a ball to extend more than three inches inside the envelope which includes the extended feature.

Is the fact that this feature is not designed to deflect the balls sufficient to allow the robot to operate without fear of violating R19b?

Re: Ball intrusion

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Posted by GDC at 01/24/2010 09:23:09 pm

The prohibition in Rule <R19-B>, as amended in Team Update 2, is against BALL incursion inside any particular MECHANISM on the ROBOT. It is understood that the BALL may enter inside the vertical project of the FRAME PERIMETER of the ROBOT (i.e. be "inside" the ROBOT boundaries). A situation where the BALL traverses "inside" the robot boundaries (e.g. as it falls from the BALL RETURN and bounces off the top of the ROBOT), but does not enter a MECHANISM by more than the permitted 3 inches, would not be PENALIZED.

General Robot Design (2010)

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## Clarification on Robot Configuration

Clarification on Robot Configuration

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Posted by 2010FRC0141 at 01/22/2010 09:38:19 pm

In reference to this thread- [\[url\]http://forums.usfirst.org/showthread.php?t=13940\[url\]](http://forums.usfirst.org/showthread.php?t=13940) conclusions drawn here seem to be conflicting with the game manual. Nowhere can we find a rule that says we cannot have actuators that expand from starting configuration but remain inside the frame perimeter and do not exceed the normal configuration as defined per rule R-10. Can you clarify please?

Re: Clarification on Robot Configuration

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Posted by GDC at 01/28/2010 12:05:35 am

There is no rule that would prohibit parts of the ROBOT from expanding/contracting within the limits of the NORMAL CONFIGURATION and the vertical projection of the FRAME PERIMETER. That is a different question than the one referenced.

The answer to the question referenced was "No" because we interpreted the question as asking about expanding and contracting in the horizontal plane, which is prohibited.

General Robot Design (2010)

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## legal bumper gaps?

legal bumper gaps?

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Posted by 2010FRC0956 at 01/23/2010 05:11:19 pm

would it be legal to have a break in the bumper to allow the camera to view the field?

Re: legal bumper gaps?

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Posted by GDC at 01/24/2010 09:26:02 pm

No.

**General Robot Design (2010)**

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**Fasteners extending past FRAME PERIMETER**

Fasteners extending past FRAME PERIMETER

Posted by 2010FRC1771 at 01/24/2010 06:50:48 pm

<R16> During normal operation no part of the ROBOT shall extend outside the vertical projection of the FRAME PERIMETER, except as permitted by Rule <G30>.

Note: This means no "mushroom-bots." If a ROBOT is designed as intended, in normal operation you should be able to push the ROBOT (with BUMPERS removed) up against a vertical wall, and the FRAME PERIMETER will be the only point of contact with the wall.

In the past, there have been allowances for fasteners, ie: bolt heads, rivets, etc, used for holding parts of the robot together, to extend outside the FRAME PERIMETER. Will that be the case this year, or are teams required to design their robots with no fasteners protruding?

Re: Fasteners extending past FRAME PERIMETER

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Posted by GDC at 01/29/2010 03:13:57 pm

Please see Team Update #6.

**General Robot Design (2010)**

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**<R15> Question for non-four sided robots**

&lt;R15&gt; Question for non-four sided robots

Posted by FRC1501 at 01/25/2010 09:42:32 pm

<R15> Teams shall display their team number on the BUMPERS in four locations at approximately 90-degree intervals around the perimeter of the ROBOT.

Question:

Our robot perimeter is not 4 sided and would be difficult for us to display numbers in FOUR locations 90 degrees apart. We however can place numbers on all "sides" of our robot perimeter but would not be specific to FOUR locations as stated in <R15>. All locations would be highly viewable from any 360 degree viewing angle of the robot.

Would we be permitted to have numbers in "locations" that satisfy the "intent" of this rule that judges, spectators, and announcers can see our team number from any side of our robot perimeter, but not specific to FOUR sides or FOUR locations 90 degree apart?

The rule makes the "assumption" that all robots are 4 sided polygons, square or rectangle shaped.

Re: &lt;R15&gt; Question for non-four sided robots

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Posted by GDC at 01/27/2010 11:57:16 pm

Rule <R15> is very clear and very specific: the team number must be displayed in four locations at approximately 90-degree intervals around the perimeter of the ROBOT. No exception is made for ROBOTS with more or less than four sides.



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General Robot Design (2010)

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**invertable robot**

invertable robot

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Posted by 2010FRC2015 at 01/25/2010 11:06:17 pm

Our robot is designed to be able to driven from top or bottom, same drive motors, bumper heights are the same, legal height from either side. the robot is the same size either direction. During the match can our robot legally drive without penalty, our kicker operates from either direction, and our lift will also operate from either direction.

Re: invertable robot

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Posted by GDC at 01/27/2010 11:56:50 pm

A ROBOT designed to operate while inverted would not automatically violate any rules. Presuming all rules regarding BUMPER location, etc, are satisfied, it would be able to drive while inverted and herd BALLS. However, it must be noted that the ROBOT rules are defined in reference to the coordinate frame of the ROBOT when it is standing normally on a flat floor. Thus, a device that is "below" the BUMPERS when the ROBOT is inverted would be considered "above" the BUMPERS in the coordinate frame of the ROBOT. If such a device were used to control the BALL, then it would be a violation of Rule <G45>.

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General Robot Design (2010)

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**NORMAL CONFIGURATION question**

NORMAL CONFIGURATION question

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Posted by 2010FRC1729 at 01/26/2010 01:12:17 pm

The robot rules define normal configuration as:

NORMAL CONFIGURATION – The physical configuration and orientation of the ROBOT when the MATCH is started. This is the state of the ROBOT immediately before being enabled by the Field Management System, before the ROBOT takes any actions, deploys any mechanisms, or moves away from the starting location. This configuration is static, and does not change during a single MATCH (although it may change from MATCH to MATCH).

<R10> states:

During the MATCH, the ROBOT will assume one of two operating configurations. When in each configuration, the ROBOT shall fit within the limits shown below (note: these limits are defined in reference to the ROBOT, not the FIELD).

NORMAL CONFIGURATION

Rectangular space no more than 28 inches (71.12cm) by 38 inches (96.52cm)

60 inches (152.40cm)

120 pounds (54.43Kg)

My question is:

While in NORMAL CONFIGURATION is a robot allowed to change size as long as it stays within the NORMAL CONFIGURATION horizontal and vertical limitations? or does the word 'static' in the NORMAL CONFIGURATION definition preclude any change in physical configuration (size)?

Re: NORMAL CONFIGURATION question

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Posted by GDC at 01/28/2010 12:11:39 am

In addition to the NORMAL CONFIGURATION, the FRAME PERIMETER must also be considered. The FRAME PERIMETER must be a fixed, unchanging polygon (Rule <R11>). Parts of the ROBOT are not allowed to extend beyond the vertical projection of the FRAME PERIMETER (Rule <R16>). MECHANISMS that stay entirely within this volume are permitted. But a MECHANISM that deploys outside the FRAME PERIMETER but inside the NORMAL CONFIGURATION (except as permitted by Rule <G30>) would be a violation. It is noted that this distinction really only makes a significant difference in the cases where the FRAME PERIMETER is substantially smaller than the NORMAL CONFIGURATION volume limits.

General Robot Design (2010)

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## Elevated & end of game

Elevated & end of game

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Posted by 2010FRC1784 at 01/26/2010 02:10:52 pm

Hello GDC-

One item I haven't seen addressed is what happens at the end of the match when your robot is hanging from the tower. My questions:

1. When using a winch or similar take-up device, is it necessary to have a brake or locking mechanism, passive or active, on the device to safeguard against paying-out line when robots are disabled at the end of a match?
2. If answer to 1. is yes, how is the mechanism disabled in order to safely retrieve a still-hanging robot from the tower?

Thank you

Re: Elevated & end of game

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Posted by GDC at 01/27/2010 11:52:24 pm

1 - There is no rule requiring the use of such a device. However, you will want to consider the effects of Rule <G05> and when scores are assessed to determine the need for such a device for your design.

2 - That is for the team to determine based on their design.

General Robot Design (2010)

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## Mechanism height

Mechanism height

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Posted by 2010FRC2702 at 01/26/2010 05:04:01 pm

Can a robot vary its height during a match, so long as the frame perimeter remains fixed and it does not exceed the maximum height of 60"? We are asking this question to clarify the GDC's answer from January 20 to 2010FRC2949, because in our interpretation the answer implies that the robot cannot have mechanisms that change height during a match, outside of the FINALE CONFIGURATION.

Examples:



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In order to see over the bumps, the intuitive position for a camera mount is above the bumpers. The top of the bumpers must be between 15" and 16" high and the camera is 3 1/2" high, meaning the overall height of the robot would be greater than the 17 7/8" required to fit under the tunnel. Based on the GDC's answer referenced above, we are wondering whether the camera can be raised/lowered to go through the tunnel.

This also applies to any type of kicking mechanism that is at ground level in the robot's starting position, but able to be raised high enough to climb the bumps. This mechanism is at ground level during game play and in order to hit the ball, but raised when attempting to climb the ramp. This mechanism also conforms to G30, in that it does not extend outside of the frame perimeter except for the direct purpose of interacting with the ball.

During both of these scenarios the frame perimeter remains fixed in both its horizontal and vertical dimensions and the only aspect of the robot that changes is the height of certain mechanisms within the static frame perimeter.

Re: Mechanism height

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Posted by GDC at 01/28/2010 12:10:16 am

The FRAME PERIMETER must be a fixed, unchanging polygon (Rule <R11>). Parts of the ROBOT are not allowed to extend beyond the vertical projection of the FRAME PERIMETER (Rule <R16>, except as permitted by Rule <G30>). MECHANISMS that expand within, but stay entirely within, this volume up to the height limits specified in Rule <R10> are permitted

General Robot Design (2010)

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## Frame question

Frame question

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Posted by 2010FRC3238 at 01/27/2010 06:22:16 pm

Fairly simple question. As long as our frame remains an unchanging polygon, and as long as each segment is at least 6 inches long (To comply with bumper length rules), is a frame with a divit in the front allowed?

This picture should clarify:

[img]http://team3238.com/images/FRAME.bmp[/img]

Would this be allowed?

I've seen many designs like this, and I'm fairly sure a few teams have used it before.

Re: Frame question

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Posted by GDC at 01/28/2010 12:08:18 am

No. By definition, the FRAME PERIMETER must be a convex polygon. The FRAME PERIMETER can not include a concavity.

General Robot Design (2010)

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## Bot Height during a match

Bot Height during a match

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Posted by 2010FRC2949 at 01/30/2010 04:18:58 pm

Can a robot start at 38" tall and fold down to 18" to pass thru the tunnel?

Re: Bot Height during a match

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Posted by GDC at 01/31/2010 10:49:39 pm

There is no rule that would prevent this.

#### General Robot Design (2010)

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### Clarification about Fasteners and FRAME PERIMETER

Clarification about Fasteners and FRAME PERIMETER

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Posted by 2010FRC1771 at 02/01/2010 08:34:25 am

With the new wording for the definition of FRAME PERIMETER, any fasteners that protrude from the frame members, regardless of where they are located, are now excluded from the determination of the FRAME PERIMETER, so the FRAME PERIMETER is now determined only by the frame members. This is a more restrictive definition of the FRAME PERIMETER.

<R16> states: During normal operation no part of the ROBOT shall extend outside the vertical projection of the FRAME PERIMETER, except as permitted by Rule <G30>.

<G30> does not make allowances for fasteners. So by <R16> and the definition of FRAME PERIMETER, no fasteners may protrude from the frame members. However, <R07>D appears to allow clearance pockets in the bumper backing, presumably for fasteners protruding from the frame members.

After much discussion, it is our opinion that the intent of the GDC is to allow fasteners to protrude from the frame members, therefore beyond the frame perimeter. The current wording of the rule and the definition of the FRAME PERIMETER prohibit such protrusions.

Can we get a clearly worded (yes or no) answer to this question:

Are fasteners allowed to extend beyond the frame members (as long as they are inside the max dimensions)?

If the answer is yes, can we get a rule or definition change so that there will be no questions at inspection?

Re: BUMPER ZONE protrusions from the FRAME PERIMETER

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Posted by GDC at 02/01/2010 12:57:19 pm

Please see Team Update #7.

#### General Robot Design (2010)

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### Team Numbers on Bumpers

Team Numbers on Bumpers

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Posted by 2010FRC2881 at 02/02/2010 12:10:44 am

Would It be acceptable to have a colored patch onto which the team numbers are mounted or would this be considered "other markings" as in <R07F>? The colors would have a sharp contrast against regulation red/blue bumpers (<R15>).



As Depicted

[img]http://img21.imageshack.us/img21/8905/frcbumper.jpg[/img]

Re: Team Numbers on Bumpers

Posted by GDC at 02/04/2010 07:38:58 pm

No. Under Rule <R07-F> and Rule <R15>, the only markings permitted on the BUMPERS are the assigned TEAM number. The TEAM number must be indicated with a 1/4-inch tall, 3/4-inch stroke numerals of a single contrasting color (white is recommended, as it is very high contrast with both background colors and will be most visible to the game officials and audience).

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General Robot Design (2010)

**Frame help**

Frame help

Posted by 2010FRC2343 at 02/04/2010 09:35:29 am

We have someone who is going to build us a shelf to put our controls on the robot on and we were wondering who needed to build it and weld it, the student or the person building it for us.

Re: Frame help

Posted by GDC at 02/10/2010 02:04:39 pm

There are no rules that legislate who builds what on the ROBOT. Please note that, for items on the ROBOT, the "who built it?" question can impact your cost accounting. Please refer to Section 8.3.3.

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General Robot Design (2010)

**Ball Deflection**

Ball Deflection

Posted by 2010FRC0125 at 02/05/2010 03:02:01 pm

In Update 2 rule <R19> (b) it is stated that the ball cannot extend more than 3 inches into "a MECHANISM or feature designed to deflect balls in a controlled manner that is above the level of the BUMPER ZONE. Are other mechanisms in the general vicinity of the ball above the bumper zone applied to this rule although they are not "designed to deflect balls in a controlled manner" and they are never in contact with the ball?

We pose this question in regard to your response here ([url]http://forums.usfirst.org/showthread.php?t=14077[/url]) where you reference a [any] mechanism, where Update 2 eludes to ONLY the mechanism diverting the ball.

A more specific scenario we are asking about:

If a ball rolls out of the ball return, onto the top of a robot, and continues to roll across the robot traveling under a hanging mechanism (above the bumper zone), would this violate rule R19 in any fashion?

Thank you,  
FRC#0125



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Re: Ball Deflection

Posted by GDC at 02/10/2010 01:57:16 pm

Please see Team Update #9.

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**General Robot Design (2010)**

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**safety of ATV whip**

safety of ATV whip

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Posted by 2010FRC3309 at 02/07/2010 02:17:08 am

We are a rookie team considering using a fiberglass ATV flag whip that will be curled in a circle, with considerable potential energy, and then released in the final period to get a hook up to the top of the tower. The manual warns against this, indicating that the inspectors could disqualify a robot if they feel the device is not safe. We have thought of making a track that would guide the tip of the ATV whip so that it is only free when it is pointing almost straight up. Another idea was releasing the tip of the whip by spooling out a string attached to a motor. What characteristics of the lock-release mechanism for the tip of the whip and other safety features do we need to incorporate? Should we abandon this design?

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Re: safety of ATV whip

Posted by GDC at 02/07/2010 11:24:38 pm

We can not provide specific design advice. You may want to consult with local veteran teams or the on-line community to discuss design options.

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**General Robot Design (2010)**

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**Bumper Idea - Legal?**

Bumper Idea - Legal?

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Posted by 2010FRC2395 at 02/08/2010 09:29:57 am

We have found another method to change bumper color. We would like to know if we are allowed to use this method. If this is not legal, we would also like to know which rule it specifically violates.

This idea is simply two pieces of bumper cloth (of separate, color red and blue) sewed together halfway down (creating a Y-Type fold) the open part of the Y would fold would go around the bumper. You would then take the | part of the Y and fold it either up or down around the bumper to change the color.

A picture can be viewed here.

[url]http://picasaweb.google.com/RionAtki...27160232156978[/url]

The connections can and/or will be made of other material than Velcro.

Thank you,  
Rion

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**Reversible bumper design**

Posted by 2010FRC2040 at 02/09/2010 08:49:10 pm

Team 2040 has a question about a reversible bumper design.



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As per Section 8 <R12> B,

"(The cover) - must be constructed solely of fabric and a fastening/restraining system to hold the cover in place. The fastening/restraining system must extend no further than one inch beyond the FRAME PERIMETER (i.e. no further than any other hard parts of the BUMPER - see Rule <R07-N>)."

If two pieces of fabric were sewn together down the middle to create a joint, would the stitching be considered part of the "fabric" and thus be allowed more than one inch beyond the FRAME PERIMETER, or considered part of the fastening/restraining system and thus subject to the one inch restriction.

The design (link below) would be possible without stitching, but also less robust.

[url][http://picasaweb.google.com/lh/photo/T8l4suUjXfmjvtcW\\_bWjoA?feat=directlink](http://picasaweb.google.com/lh/photo/T8l4suUjXfmjvtcW_bWjoA?feat=directlink)[/url]

Re: Bumper Idea - Legal?

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Posted by GDC at 02/10/2010 02:00:53 pm

Please see Team Update #9.

General Robot Design (2010)

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## Team Logos on Bumpers with number

Team Logos on Bumpers with number

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Posted by 2010FRC0418 at 02/14/2010 08:01:53 pm

I am unclear if a teams name is allowed on the bumpers along with the team number. We have always done this in the past. Please advise. Thanks.

Re: Team Logos on Bumpers with number

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Posted by GDC at 02/15/2010 12:48:13 pm

Please refer to Rule <R07-F>. The only markings permitted on the BUMPER fabric cover are the team numbers.

General Robot Design (2010)

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## Rule <R30>a

Rule &lt;R30&gt;a

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Posted by 2010FRC0885 at 02/23/2010 06:48:48 pm

Regarding rule <R30>a:

How will this rule be administered?

It seems like a difficult task for the referees to keep track of all six robots mechanism's extension amount, extension duration, time to retract and kick rate during match play. To help the referees maybe the action could be inspected and demonstrated at inspection time and also monitored on a sampled basis during match play by the referees. What is the plan?

TNX for all the GDC is doing.

Re: Rule &lt;R30&gt;a

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Posted by GDC at 02/25/2010 04:28:26 pm



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The purpose of this forum is to clarify rules and answer questions about intent behind rules. We will not provide specific answers regarding how rules are administered.

**General Robot Design (2010)**

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**Team number color (is it legal)??**

Team number color (is it legal)??

Posted by 2010FRC1891 at 03/03/2010 01:34:05 pm

Our team has used red numbers on the blue bumpers and blue numbers on the red bumpers. Now that they are complete the question has been asked if this is legal based on team update 9. Will this be okay or will we fail inspection? Hopefully we are okay otherwise we have major rework on our bumpers.

Re: Team number color (is it legal)??

Posted by GDC at 03/16/2010 12:47:50 pm

We cannot provide a blanket approval/disapproval for any particular color of team number. The requirement is that the numbers contrast significantly against their background. The intent is that the judges, referees, and audience be able to easily and clearly identify the team number from a distance of at least 100 feet. It is in your own best interest to make sure that they can do that (for example, you do not want to put yourself in a situation where your robot is accidentally disabled because field personnel could not properly identify the team number when they were intending to disable a different robot).

**General Robot Design (2010)**

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**Bumper Number Color(s)**

Bumper Number Color(s)

Posted by FRC2973 at 03/10/2010 02:14:12 pm

Rule R15 states:....The numerals must be at least 4 inches high, at least in 3/4-inch stroke width and in a contrasting color from its background....

The word color is singular in this rule; does this mean that the numbers can only be one solid color, or can a second color be used to help with the contrast - surrounding a white number with black or vice versa, for example - to make it more clearly visible?

Re: Bumper Number Color(s)

Posted by GDC at 03/16/2010 12:43:53 pm

Rule <R15> requires that the body of the number (the part that is 4 inches tall and with 3/4 inch stroke width) be of "a" (single) contrasting color. Adding small borders of a highly contrasting color around the external perimeter of the number for the purposes of increasing the contrast and clarity of the number would not violate the rule, as long as the addition of the contrasting border does not reduce the size or stroke width of the body of the number.

**General Robot Design (2010)**

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**Robot : Inside Corners?**

Robot : Inside Corners?

Posted by 2010FRC0326 at 03/13/2010 06:58:54 pm

Are inside corners allowed in the frame perimeter? If not why?



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Re: Robot : Inside Corners?

Posted by GDC at 03/16/2010 12:40:15 pm

Please refer to the definition of FRAME PERIMETER in Section 8.2 of The Manual. By definition, the FRAME PERIMETER can not have inside corners.

General Robot Design (2010)

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## Cold Cathode Lights for Decorations

Cold Cathode Lights for Decorations

Posted by 2010FRC1784 at 03/19/2010 08:59:35 am

Hi GDC,

1. Is it OK to use cold cathode lights for robot decorations?  
(Similar to the type used in computer cases.)
2. If yes, can the inverter be wired directly to the PD or does it need to be switched via a Spike relay?

Thank you

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Re: Cold Cathode Lights for Decorations

Posted by GDC at 03/22/2010 01:00:16 pm

Provided the cold cathode lights are installed and used per the rules in the Manual (particularly Rules <R03>, <R17>, <R43>, <R45>, <R50>, and <R51>), there is nothing to prohibit the use of cold cathode lights on the ROBOT.

There are also no rules that require Spikes to run any custom circuitry.

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## Budget Constraints (2010)

Budget Constraints (2010)

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### Prorating of bulk adhesives and cost accounting

Prorating of bulk adhesives and cost accounting

Posted by 2010FRC2505 at 01/13/2010 11:02:25 pm

[list=1][\*]Are threadlocker and retaining compound considered fasteners, adhesives or something else (e.g. for the purposes of <R22>)?[\*]Consider this hypothetical scenario: the smallest commercially-available quantity of some type of threadlocker is a bottle for \$10, and the bottle contains enough material for 20 applications. Prorating according to 8.3.3.1 E (for bulk materials), and irrespective of the number of applications from that bottle, the BOM cost would be \$10. But given that <R23> tells us to exclude the cost of fasteners/adhesives less than \$1, can we instead be permitted to use the actual cost [i]per application[i] (i.e. \$0.50) for the purposes of cost calculation? (In effect, we would not have to worry about counting the number of times we used this threadlocker, and rounding up to the nearest multiple of 20 applications and \$10.)[/list]

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Re: Prorating of bulk adhesives and cost accounting

Posted by GDC at 01/15/2010 09:35:19 am

Retaining compounds are considered adhesives. The cost of adhesives would be expected to be less than \$1.00 per application. Therefore, under Rule <R23-C> they are excused from the cost calculations.



**Budget Constraints (2010)**

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**Cost Calculations - Veteran or Rookie KOP?**

Cost Calculations - Veteran or Rookie KOP?

Posted by 2010FRC2839 at 01/28/2010 04:47:50 pm

We are a veteran team. I want to be sure we are properly calculating costs in the BOM. Rule <R23> states:

<R23> The following items are EXCLUDED from the total cost calculation:

A. All items provided in the 2010 KOP

Chapter 10 of the manual states:

The items listed on the 2010 Kit Of Parts Checklist (<http://www.usfirst.org/community/frc/content.aspx?id=452>) are considered Kit Parts.

That checklist is divided into "Veteran" and "Rookie" Kits. Are we allowed to calculate costs based on the totals of both KOPs? For example, The veteran kit includes 2 Jaguars and the Rookie kit includes 2 Jaguars. Does that mean we can use 4 jaguars and list 4 Jaguars on the BOM as KOP parts and assign a value of \$0.00 to them, or do we have to count 2 at \$0.00 and 2 at \$73.00?

Re: Cost Calculations - Veteran or Rookie KOP?

Posted by GDC at 01/31/2010 10:54:14 pm

Please see the the definition of "Kit Of Parts" in Section 8.2 of The Manual. For the BOM cost calculations, all items listed in the 2010 Kit of Parts Checklist are considered kit parts, regardless of whether you received them this year or not. Four Jaguars would have \$0.00 assigned to them. Any additional Jaguars must be accounted for at \$73.00 each.

**Budget Constraints (2010)**

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**Disassembled COTS components**

Disassembled COTS components

Posted by 2010FRC3238 at 01/28/2010 06:46:35 pm

Is it legal to disassemble a COTS component for use on the robot (e.g. could we use a fan blade taken out of a vacuum)? If so, how is this indicated on the BOM? Also, do we have to account for the cost of the entire COTS component (e.g. the whole vacuum) or just the fair market value of the part we used?

Re: Disassembled COTS components

Posted by GDC at 01/31/2010 10:52:49 pm

There are no rules that prohibit items salvaged from a larger assembly. The cost of the component that is entered on the BOM should be the fair market value of the part (not the assembly from which it was salvaged).

**Budget Constraints (2010)**

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**Bom**

Bom

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Posted by 2010FRC0237 at 02/01/2010 07:51:58 am

The KOP was different for rookie and veteran teams this year.

As a veteran team I used CRIO's, jaguars and such from last years robot. I did not get those parts in the KOP. How are they listed on the BOM?

As a veteran team I purchased CRIO's, jaguars and such that are still on last years robot. I did not get those parts in the KOP. How are they listed on the BOM?

Does every BOM reflect the rookie KOP?

Re: Bom

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Posted by GDC at 02/04/2010 07:20:39 pm

Please see the the definition of "Kit Of Parts" in Section 8.2 of The Manual. For the BOM cost calculations, all items listed in the 2010 Kit of Parts Checklist are considered kit parts, regardless of whether you received them this year or not. Four Jaguars would have \$0.00 assigned to them. Any additional Jaguars must be accounted for at \$73.00 each.

### Budget Constraints (2010)

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## BOM Template

BOM Template

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Posted by FRC57 at 02/01/2010 11:49:48 pm

How much leeway is given to teams for modifying the BOM template? We assume adding rows and subsystems is allowed, but may teams modify column widths, fonts, colors, etc?

Second question, is the GDC actually expecting a complete and accurate accounting of weights on the robot that we already have assembled? At 3 weeks into the competition, disassembling the entire robot to weigh the various parts seems inefficient.

Re: BOM Template

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Posted by GDC at 02/04/2010 07:39:29 pm

Minor alterations of the BOM spreadsheet format (e.g. column widths, font sizes, etc) is permitted. Please do NOT alter the column sequence.

The item weights in the BOM are indicated for the convenience of the team, so you may use this BOM sheet as one tool for tracking total ROBOT weight. Completion of the weight fields in the BOM is not required to pass inspection.

### Budget Constraints (2010)

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## BOM detail clarification

BOM detail clarification

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Posted by FRC57 at 02/09/2010 07:06:28 pm

<R21> Specifies that all items and materials used in constructing the robot must be listed on the BOM, while <R23-C> specifies that fasteners, adhesives, and lubricants costing less than \$1.00 each are not included in the total cost calculation. Inquiring minds want to know:

1. Are these fasteners, adhesives, and lubricants still required to be listed on the BOM? We





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have plenty of spare mentors for counting screws and rivets, but we'd like to get them started early if that's necessary.

2. Can electrical connectors (quick disconnects, lugs, etc.) be considered fasteners for the purposes of cost accounting and the BOM? Electrical doesn't have quite as many extra hands/fingers, so they'll definitely need a head start.

Re: BOM detail clarification

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Posted by GDC at 02/15/2010 10:31:06 am

All ROBOT items listed in Rule <R23> are excluded from the cost calculations, and may be excluded from the BOM [b]except[/b] items from the KOP (since these are explicitly required by Rule <R21>.

1. Fasteners, adhesives, and lubricants do not have to be listed on the BOM. However, you may still want to have your mentors count them all for your own purposes. It gives them something to do.

2. Small electrical connectors costing less than \$1.00 each (e.g. spade lugs, ring connectors, crimp connectors, etc.) are treated the same as fasteners, and may be excluded from the BOM.

### Budget Constraints (2010)

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## Bill of Materials Questions

Bill of Materials Questions

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Posted by T-BOTS at 02/25/2010 04:58:13 pm

We are trying to prepare our Bill of Materials, but we are a rookie team, and we have a few questions that we are trying to get clarified. (We want to have 100% compliance with the rules!)

Can we see an example of a successful Bill of Materials? We have the template, but we would like to see the items that teams traditionally place on their Bill of Materials.

If that is not available, then maybe we could just get the answers to these questions:

- Do we list "all items used in the construction of" our robot? Would this include drills, table saws, and other materials that are not currently located on our robot?
- Do we list all items on our robot or only items over a certain price range?
- If we are listing items like "electrical tape" or "electrical wiring", do we list how many inches or feet were used?

Re: Bill of Materials Questions

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Posted by GDC at 03/09/2010 12:32:32 pm

For a sample Bill of Materials, we suggest you poll the FRC community and have them share their documents with you. This can be done in the Discussions forum [URL="<http://forums.usfirst.org/forumdisplay.php?f=1343>"]here[/URL].

Meanwhile, in response to your specific questions...



- 1) Items not used on the competition robot are not to be included in the BOM.
- 2) Please refer to Rule <R23>.
- 3) Please refer to Section 8.3.3.1, part E.

## Fabrication Schedule (2010)

Fabrication Schedule (2010)

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### Reusing operator console

Reusing operator console

Posted by 2010FRC1763 at 01/24/2010 05:23:26 pm

At the competition are teams allowed to use an operator console that they constructed and used in a previous year's competition provided the console has only this year's required and allowed components on it?

Thank you

Re: Reusing operator console

Posted by GDC at 01/25/2010 02:50:56 pm

No. Per Rule <R25>, "no final design, fabrication, or assembly of any elements intended for the final ROBOT is permitted prior to the Kick-off presentation." The OPERATOR CONSOLE is considered an "element intended for the ROBOT."

Fabrication Schedule (2010)

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### Batteries / Withholding Allowance

Batteries / Withholding Allowance

Posted by 2010FRC0623 at 02/04/2010 08:23:10 am

This issue came up last year, but I do not see any clarification or exceptions in the 2010 rules, so I will ask again for this year.

Regarding R<38>

Is a battery with Anderson connector assembly attached considered to be a FABRICATED assembly for purposes of calculating the 40# maximum? If the connector assembly is removed is the battery then a COTS items? What if the battery was used in last year's competition? Veteran teams only received one new battery this year as a cost savings measure. We have also been asked to try to reduce our shipping weights. One way to accomplish this is to bring the batteries to the competition rather than ship them, but if they are to be included in the withholding allowance then into the crate they will go.

Re: Batteries / Withholding Allowance

Posted by GDC at 02/10/2010 02:00:29 pm

Please see Team Update #9.

Fabrication Schedule (2010)

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### Drivers Station

Drivers Station

Posted by 2010FRC2907 at 02/21/2010 02:34:24 pm

When shipping, do we have to wrap and send drivers station or can we keep the drivers station for programming?



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Re: Drivers Station

Posted by GDC at 02/21/2010 05:59:45 pm

Please refer to Rule <R38>.

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**Fabrication Schedule (2010)**

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**withholding the entire robot**

withholding the entire robot

Posted by 2010FRC1827 at 02/22/2010 01:39:28 pm

The updated shipping rule allows withholding "up to 65 pounds of your robot weight." Is that to be interpreted to mean that if a team's entire robot weighs less than 65 pounds, that team may withhold it's entire robot? Also if the team withholds it's entire robot, and is going to a bag and tag event, what do they place in the bag.

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**Clarification on Fabricated Item**

Posted by 2010FRC2200 at 02/22/2010 09:41:52 pm

**WITHHOLDING ALLOWANCE** – A limited amount of **FABRICATED ITEMS** that are withheld from the **ROBOT** shipping requirements (specified in Section 4) and retained by the team following the shipping deadlines.

**FABRICATED ITEM** – Any **COMPONENT** or **MECHANISM** that has been altered, built, cast, constructed, concocted, created, cut, heat treated, machined, manufactured, modified, painted, produced, surface coated, or conjured partially or completely into the final form in which it will be used on the **ROBOT**.

**COMPONENT** – A **ROBOT** part in its most basic configuration, which can not be disassembled without damaging or destroying the part, or altering its fundamental function.

**MECHANISM** – A **COTS** or custom assembly of **COMPONENTS** that provide specific functionality on the **ROBOT**. A **MECHANISM** can be disassembled (and then reassembled) into individual **COMPONENTS** without damage to the parts.

What does it mean to conjure an item into the final form in which it will be used on the **ROBOT**? If you assemble some **COTS** parts to and some **FABRICATED ITEMS**, is the "assembly" a **FABRICATED ITEM** now or is it a **MECHANISM**? Would this be a legal item to bring under the "Withholding allowance"?

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Re: withholding the entire robot

Posted by GDC at 02/24/2010 03:59:44 pm

Please see Team Update #13.

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**Fabrication Schedule (2010)**

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**Question about withholding allowance**

Question about withholding allowance

Posted by 2010FRC0968 at 02/22/2010 09:45:12 pm

If we have 2 sets of bumpers (one red set and one blue set); do both sets of bumpers goes toward our withholding allowance? Or is it just one set?



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Re: Question about withholding allowance

Posted by GDC at 02/25/2010 04:40:05 pm

Both sets. Both sets are FABRICATED ITEMS, and as such, they both fall within the definition of WITHHOLDING ALLOWANCE and the limitations of Rule <R38>.

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**Fabrication Schedule (2010)**

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**lifting arm update**

lifting arm update

Posted by 2010FRC3158 at 03/01/2010 08:05:06 pm

Hi,

Our team couldn't finish the lifter arm on time, so we didn't send any part of it with the robot, is it still possible for our team to work on the arm, bring it with us to the competition and put it on our robot the first day, before the inspection?

Regards,

Re: lifting arm update

Posted by GDC at 03/09/2010 12:31:01 pm

Please refer to Rules <R26>, <R27>, <R28>, <R38>, and the definition of WITHHOLDING ALLOWANCE.

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**Fabrication Schedule (2010)**

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**Withholding Allowance and Robot Access Period**

Withholding Allowance and Robot Access Period

Posted by 2010FRC0451 at 03/03/2010 09:37:05 am

In Section 8.2 of the manual, it says that we must hand carry our withholding allowance into the competition and that we cannot exchange fabricated items during the Robot Access Period. However, in 4.8.3.1, it says that we are allowed to do whatever we would normally do during the build period. Does this mean that we are allowed to add (assemble) fabricated parts from within our withholding allowance to the robot and ship (bag it) with those components assembled? How does that effect the withholding allowance?

Re: Withholding Allowance and Robot Access Period

Posted by GDC at 03/15/2010 12:15:44 pm

Withholding allowance items must be kept separate from the ROBOT (regardless of if the ROBOT is bagged or shipped). They are to be brought to the event separately and added to the ROBOT on site.

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**Material Utilization (2010)**

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**Material Utilization (2010)**

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**Tank Drive Belts**

Tank Drive Belts

Posted by 2010FRC3026 at 01/13/2010 09:16:19 pm

We plan on using a timing belt to drive out tank like robot. Is it legal to use a timing belt with the teeth of the belts acting as the treads that will grip the carpet?



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Thanks  
Chris Tellers  
Senior Mentor - 3026

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Re: Tank Drive Belts

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Posted by GDC at 01/15/2010 09:36:38 am

As long as the belt does not have metallic or hard features that would damage the carpet, there is no rule that would prohibit this.

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**Material Utilization (2010)**

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**Axis Camera**

Axis Camera

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Posted by 2010FRC0847 at 01/14/2010 08:40:10 pm

What cameras can be used this year? As a veteran team we did not receive a camera and would like to have some options? What models are acceptable? Is it okay to purchase any camera?

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Re: Axis Camera

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Posted by GDC at 01/15/2010 09:52:18 am

There are no rules that restrict the makes/models of cameras used on the 2010 FRC Robot.

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**Material Utilization (2010)**

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**motors and toughboxes**

motors and toughboxes

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Posted by FRC1137 at 01/15/2010 10:27:09 am

We have 2 cim-motors & 2 toughboxes order from andymack last year and were not used. Can we use them on the 2010 robot. All numbers match except the dates.

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Re: motors and toughboxes

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Posted by GDC at 01/16/2010 11:45:26 am

If these items are still in their original, unmodified condition then they would satisfy the definition of "COTS" and be covered by Rule <R32>.

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**Material Utilization (2010)**

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**Wheels**

Wheels

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Posted by 2010FRC2959 at 01/15/2010 04:41:12 pm

As seen on the AndyMark website, are the wedgetop and/or roughtop treaded plaction wheels allowed in the 2010 FIRST cometition?

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Re: Wheels

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Posted by GDC at 01/17/2010 04:54:09 pm

There are no rules that would disallow them.

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**Material Utilization (2010)**

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**Replacing Items**

Replacing Items

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Posted by 2010FRC1875 at 01/18/2010 09:33:37 am



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Hello,

Our team traded the Axis camera to another team last year, and since the camera is now discontinued we are wondering how we should go about replacing the camera for this years game. Should we/may we use the newer version of the camera? What is the allowed option on this?

Re: Replacing Items

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Posted by GDC at 01/21/2010 10:39:15 pm

There is no prohibition against using alternate cameras. You may use any model of camera that you prefer.

**Material Utilization (2010)**

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**Electromagnets**

Electromagnets

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Posted by FRC1743 at 01/19/2010 07:34:02 pm

Does any rule prohibit the use of electromagnets?

Re: Electromagnets

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Posted by GDC at 01/21/2010 10:55:51 am

There is no explicit rule prohibiting electromagnets. However, any such device would qualify as a custom circuit/additional electronics. As such, the device must satisfy all applicable custom circuit/additional electronics rules. In addition, an electromagnet must not be used to construct a solenoid actuator, as that would be a violation of Rule <R53>.

**Material Utilization (2010)**

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**clutches**

clutches

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Posted by 2010FRC2534 at 01/19/2010 08:04:50 pm

Are we allowed to use 12 Volt or pneumatic clutches on the robot?

clutches

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Posted by 2010FRC2534 at 01/21/2010 09:52:30 pm

Could you please tell me if a pneumatic clutch is legal if it is purchased from a manufacturer where it is a standard order item but not an off the shelf item because it is assembled to order and it falls in the budget and safety rules will be considered legal?

Also, are electric clutches considered solenoids or motors which would then be considered illegal?

Thank you!

Re: clutches

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Posted by GDC at 01/21/2010 10:54:45 pm

There is no rule specifically prohibiting the use of clutch mechanisms on the ROBOT. However, these devices may not be used if they contain electric motors and/or servos different from, or in addition to, those in the KOP, solenoid actuators (per Rule <R53>) or pneumatic actuators (such devices are not explicitly permitted by Rule <R72>, and therefore violate Rule <R71>).



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Material Utilization (2010)

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**Manual Flowchart**

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Manual Flowchart

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Posted by 2010FRC1448 at 01/21/2010 12:26:02 pm

We haven't seen a flowchart for parts usage in this year's manual. Does that mean that last year's flowchart is what we should go by?

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Re: Manual Flowchart

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Posted by GDC at 01/25/2010 08:51:06 am

The part use flowchart was not included in the 2010 version of The Manual. Rules from prior year's FRC challenges do not apply to the 2010 game.

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Material Utilization (2010)

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**Rules clarification for use of COTS winch**

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Rules clarification for use of COTS winch

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Posted by 2010FRC3130 at 01/21/2010 03:09:03 pm

As a rookie mentor reading the COTS rules, it seems obvious that a COTS hand winch purchased for the purpose of lifting a robot is acceptable because the winch must be modified by the attachment of a legal motor. It was recommended that I request clearance for use of this winch 'as insurance.' (mcmaster part number 3205T16 - sorry I can't insert a link.)

So - assuming I am posting to the proper location (I see zero threads in any of this Q&A categories), IS THE USE OF A COTS WINCH LEGAL FOR THE PURPOSE OF LIFTING THINGS? (Without modification it is purpose built for lifting things, with modification it is still purpose built for lifting things.) So - it seems violates the 'purpose built' rule, but I can't believe this is the intent of the rule based on the examples listed there.

Thanks!

The East Ridge Robotic Ominous RaptorS

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Re: Rules clarification for use of COTS winch

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Posted by GDC at 01/24/2010 09:14:38 pm

There are no rules that would prohibit this.

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Material Utilization (2010)

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**gear boxes**

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gear boxes

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Posted by 2010FRC3198 at 01/21/2010 04:57:06 pm

Is there any limitations to the gear boxes we can use on the allowed motors? Can gear boxes be planetary type?

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Re: gear boxes

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Posted by GDC at 01/24/2010 09:17:37 pm

There are no rules that prohibit the use of planetary gearboxes.

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Material Utilization (2010)

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## Electromagnets

### Electromagnets

Posted by 2010FRC1261 at 01/21/2010 07:01:27 pm

According to a previous post:

There is no explicit rule prohibiting electromagnets. However, any such device would qualify as a custom circuit/additional electronics. As such, the device must satisfy all applicable custom circuit/additional electronics rules. In addition, an electromagnet must not be used to construct a solenoid actuator, as that would be a violation of Rule <R53>.

Our team is looking at using an allowed motor to move an electromagnet that slides left and right in constant contact with a with a stationary piece of metal. The idea is that when the magnet is in the correct location, it is energized and adheres to the stationary piece.

Re: Electromagnets

Posted by GDC at 01/27/2010 09:37:48 am

Please re-post with a question about a rule or set of rules. Thank you.

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## Material Utilization (2010)

### Electric Solenoid Actuators

#### Electric Solenoid Actuators

Posted by 2010FRC3198 at 01/21/2010 11:40:21 pm

Can we use an automobile starter solenoid used as an electrical switch. I am unclear as to if this qualifies as an Electric Solenoid Actuator or simply a relay?

Re: Electric Solenoid Actuators

Posted by GDC at 01/24/2010 09:21:58 pm

If the device is used as a relay (i.e. electrical switch), then it would be considered part of a custom circuit and it would be acceptable (provided it does not violate any other applicable rules)

[b]UPDATE:[/b] Our previous answer was incorrect. Although a relay would be considered part of a custom circuit, it must be noted that Rule <R42> expressly prohibits the use of relays other than the IFI "Spike" relay module. Therefore, the use of an automobile starter solenoid as an electrical switch (i.e. relay) would be prohibited.

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## Material Utilization (2010)

### Banebots Transmissions

#### Banebots Transmissions

Posted by FRC1717 at 01/22/2010 12:53:55 pm

We currently have factory sealed transmissions from Banebots that have now been discontinued. Banebots has replaced these discontinued products with upgraded versions that are available to all FIRST teams.

Is it legal for us to use these discontinued transmissions which are no longer available to FIRST teams since there is a replacement by the same manufacturer that performs the same function. For costing purposes, we would use the price of the newer upgraded transmissions which are more expensive than the discontinued models we currently own.





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Re: Banebots Transmissions

Posted by GDC at 01/25/2010 08:42:53 am

There is no rule that would prohibit this.

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**Material Utilization (2010)**

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**Cameras**

Cameras

Posted by 2010FRC0815 at 01/22/2010 07:27:34 pm

May we use 2 or more cameras on the robot?

Re: Cameras

Posted by GDC at 01/25/2010 08:54:16 am

There is no rule that would prohibit this.

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**Material Utilization (2010)**

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**acceptable use of electromagnet**

acceptable use of electromagnet

Posted by 2010FRC1391 at 01/22/2010 07:41:42 pm

we would like to use an electromagnet as a locking device, to hold an object fast prior to its release. the electromagnet will act only as a locking mechanism and not be employed as an actuator or any type. is the use of an electromagnet for this purpose acceptable? are there limitations on the size or magnetic power of this device?

Re: acceptable use of electromagnet

Posted by GDC at 01/25/2010 08:53:45 am

There is no rule that would prohibit this, as long as it is in compliance with Rule <R02> and Rule <R03>.

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**Material Utilization (2010)**

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**Electromagnetic Clutch/Brake**

Electromagnetic Clutch/Brake

Posted by 2010FRC2840 at 01/23/2010 01:48:14 pm

Is our team allowed to use an electromagnetic clutch or brake?

We read <R53> in 8.3.7 and it doesn't seem to specify anything about electromagnetic clutches/brakes. We believe that these are quite different from the solenoids referred to in R53.

Please confirm.

Re: Electromagnetic Clutch/Brake

Posted by GDC at 01/24/2010 09:24:35 pm

As previously stated, there is no rule specifically prohibiting the use of clutch mechanisms on the ROBOT. However, these devices may not be used if they contain electric motors and/or servos different from, or in addition to, those in the KOP, solenoid actuators (per Rule <R53>) or pneumatic actuators (such devices are not explicitly permitted by Rule <R72>, and therefore violate Rule <R71>).



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Simply put: if the device utilizes an electric solenoid to provide mechanical motion for the device, it cannot be used.

soleniod

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Posted by 2010FRC3200 at 01/29/2010 09:14:23 pm

can you use a soleniod as a clutch mechanism on the bot?

Re: soleniod

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Posted by GDC at 01/31/2010 11:10:01 pm

Please refer the to the previous answer.

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**Material Utilization (2010)**

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**R53 Electric Solenoid Actuators**

R53 Electric Solenoid Actuators

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Posted by 2010FRC1261 at 01/23/2010 09:00:12 pm

Please edit this post/question as appropriate.

There are been two post concerning the use of electromagnetic clutches that are referred to the definition or the rule R53.

[url]http://forums.usfirst.org/newthread.php?do=newthread&f=1416[/url]

Are we allowed to use 12 Volt or pneumatic clutches on the robot?

There is no rule specifically prohibiting the use of clutch mechanisms on the ROBOT. However, these devices may not be used if they contain electric motors and/or servos different from, or in addition to, those in the KOP, solenoid actuators (per Rule <R53>) or pneumatic actuators (such devices are not explicitly permitted by Rule <R72>, and therefore violate Rule <R71>).

and

Can the GDC please provide a definition of an electric solenoid actuators. This is the industry standard definition that we have foundL

[url]http://www.tpub.com/content/doe/h101...1013v2\_166.htm[/url]

We will not provide a specific definition. The commonly-accepted standard definition is sufficient.

Teams are looking for direction not confusion. The definition of an 'electric solenoid actuator', not being defined, leaves for interpretation. The last thing we need is during event inspection an issue between team interpretation and inspector interpretation.

There are some who think that an electricmagnet that attracts to a rotating plate with thousandths of an inch movement is just that. If this device is overloaded, slippage occurs. There are some who think a solenoid consists of an electromagnet, an air core, and iron 'slug'



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that moves and causes a secondary action. Overload of this device causes the slug/ping to break.

Please, just eliminate interpretation and state whether electromagnetic clutches are a violation of this rule or NOT.

Fred Smith, 1261

Re: R53 Electric Solenoid Actuators

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Posted by GDC at 01/24/2010 09:31:15 pm

There is no attempt to generate confusion. We believe that the answer previously provided is clear and complete. To wit: there is no rule specifically prohibiting the use of clutch mechanisms on the ROBOT. However, [B]these devices may not be used if they contain[/B] electric motors and/or servos different from, or in addition to, those in the KOP, [B]solenoid actuators (per Rule <R53>[/B]) or pneumatic actuators (such devices are not explicitly permitted by Rule <R72>, and therefore violate Rule <R71>).

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**Material Utilization (2010)**

**Electric Magnet**

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Electric Magnet

Posted by 2010FRC2534 at 01/25/2010 03:37:29 pm

We would like to use a surface-contact DC-powered electromagnet on our robot from McMaster-Carr part number 5698K313. We would using it as it comes just to hook to metal and release when we want. Could you please tell me if this part used in this manner is legal as long as it is wired correctly and safely?

Thanks,  
2534

Re: Electric Magnet

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Posted by GDC at 01/27/2010 11:59:13 pm

There is no explicit rule prohibiting electromagnets. However, any such device would qualify as a custom circuit/additional electronics. As such, the device must satisfy all applicable custom circuit/additional electronics rules.

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**Material Utilization (2010)**

**Magnets on Robot**

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Magnets on Robot

Posted by 2010FRC2805 at 01/25/2010 05:18:19 pm

Can a magnet be used to attach the robot to the tower in the final moments of the match?

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Magnets on Robot

Posted by 2010FRC1248 at 01/25/2010 05:37:21 pm

Our team was wondering if we were allowed to use any permanent magnets on our robot. We did not see any rules against it, and we would like to know if it is permissible.

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Permanent Magnets

Posted by 2010FRC1248 at 01/27/2010 03:13:29 pm

Is there any rule prohibiting the use of permanent magnets on the robot?



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Re: Magnets on Robot

Posted by GDC at 01/27/2010 11:58:49 pm

There is no rule that would prohibit the use of magnets, as long as they are not used to interfere with the operation of opposing ROBOTS (which would be a violation of Rule <R02> and Rule <R03>).

**Material Utilization (2010)**

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**Precise ElectroMagnet Question Reposted**

Precise ElectroMagnet Question Reposted

Posted by 2010FRC2534 at 01/27/2010 09:53:17 pm

Is it legal to use a 12 volt electromagnet that is attached to a winch or ball screw driven by a KOP motor to move the magnet vertically or horizontally to attach to a piece metal to be pulled and released? The magnet is not being used to create any motion just to lock onto the piece of metal. The components, piece of metal and magnet, will be moved by another motor included in the KOP. Then the magnet will release the piece of metal. Is this legal according to rules, R02, R03, R52, R53, R71, R72, and all others?

Re: Precise ElectroMagnet Question Reposted

Posted by GDC at 01/29/2010 09:06:05 am

There is no rule that would prohibit this.

**Material Utilization (2010)**

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**Change in Design of COTS Item availability**

Change in Design of COTS Item availability

Posted by FRC2468 at 02/01/2010 12:40:05 pm

If a supplier changes the manufacturing of a product during the build season, and said product is no longer functionally the same, are teams still allowed to use the original version that is no longer "generally" available?

Re: Change in Design of COTS Item availability

Posted by GDC at 02/04/2010 04:34:24 pm

Yes. Provided the item was available after Kickoff for any team to purchase, it's considered a commonly available item and would be permitted.

**Material Utilization (2010)**

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**Control System Component Breaks**

Control System Component Breaks

Posted by FRC2468 at 02/01/2010 12:41:27 pm

If a control system component breaks, may I scrounge pieces of the broken unit for use elsewhere on the robot. For example, may I use the fan out of a Jaguar to replace a failed/broken KoP fan? Both are small 12V brushless fans, and both are built by ebm-papst, although the fan on the Jaguar is thinner?

Re: Control System Component Breaks

Posted by GDC at 02/04/2010 07:15:53 pm

It depends upon where and how the scavenged component is used. In general, scavenged parts may be used almost anywhere on the ROBOT. However, under Rule <R60> such parts may not be used to modify, alter or adjust any of the control system components - including



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speed controllers. So, for example, using a fan from a Jaguar as a replacement for the fan on a Victor speed controller would be prohibited.

**Material Utilization (2010)**

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**Wheel Sizes?**

Wheel Sizes?

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Posted by 2010FRC3355 at 02/02/2010 02:48:46 pm

Can we use smaller wheels as can be found at Andymark.com? We want to use 4" wheels to reduce our height problems going under the tunnel. Also, can we use the high traction tread materials as found on Andymark? (conveyer belt materials). If these are legal, we will buy them. If they are not, we won't. We're a rookie team so our questions may seem dumb....sorry for the reduncancies.

Steve Miller  
Coach  
Summit International Prep  
Arlington, Texas

Re: Wheel Sizes?

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Posted by GDC at 02/04/2010 07:35:09 pm

There is no rule that would prohibit that.

**Material Utilization (2010)**

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**Precise ElectroMagnet Question Reposted**

Precise ElectroMagnet Question Reposted

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Posted by 2010FRC1261 at 02/03/2010 08:18:48 pm

The posted queston:

Is it legal to use a 12 volt electromagnet that is attached to a winch or ball screw driven by a KOP motor to move the magnet vertically or horizontally to attach to a piece metal to be pulled and released? The magnet is not being used to create any motion just to lock onto the piece of metal. The components, piece of metal and magnet, will be moved by another motor included in the KOP. Then the magnet will release the piece of metal. Is this legal according to rules, R02, R03, R52, R53, R71, R72, and all others?

The posted response:

There is no rule that would prohibit this.

This confuses our team even further. Electric solenoids are not allowed according to the rules, R53. Since the GDC will not provide a definition for an electric solenoid, from reading all the questions and responses we can only determine that an electric solenoid is a device that contains an electric magnet that when energized or de-energized, causes movement of another metallic object.

Devices that cause a pin to move are solenoids, devices that cause a clutch plate to attract and lock to the magnet are solenoids, it seems like every question concerning electric magnets and movement are solenoids.



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So, why is this type of use allowed? A magnetic is being energized and de-energized and causing a piece of metal to move. Causing non-movement is the same as causing movement. A magnetic force is being applied to cause some motion to happen or not happen.

We just do not understand how this device is not a solenoid by definition and how Rule 53 does not apply.

### Re: Precise ElectroMagnet Question Reposted

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Posted by GDC at 02/07/2010 12:24:47 am

As noted in your question, an electric solenoid contains an electric magnet that when energized or de-energized, causes movement of another metallic object. The original question explicitly stated that for the device in question, the magnet was "not being used to create any motion." Therefore, it is not a solenoid and the solenoid rules do not apply.

Further, it is noted that "causing non-movement is" NOT "the same as causing movement." There are fundamental differences in inertia and momentum involved in these two concepts.

### Precise ElectroMagnet Question Reposted

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Posted by 2010FRC1261 at 02/09/2010 09:29:06 pm

Original Post

The posted question:

Is it legal to use a 12 volt electromagnet that is attached to a winch or ball screw driven by a KOP motor to move the magnet vertically or horizontally to attach to a piece metal to be pulled and released? The magnet is not being used to create any motion just to lock onto the piece of metal. The components, piece of metal and magnet, will be moved by another motor included in the KOP. Then the magnet will release the piece of metal. Is this legal according to rules, R02, R03, R52, R53, R71, R72, and all others?

The posted response:

There is no rule that would prohibit this.

This confuses our team even further. Electric solenoids are not allowed according to the rules, R53. Since the GDC will not provide a definition for an electric solenoid, from reading all the questions and responses we can only determine that an electric solenoid is a device that contains an electric magnet that when energized or de-energized, causes movement of another metallic object.

Devices that cause a pin to move are solenoids, devices that cause a clutch plate to attract and lock to the magnet are solenoids, it seems like every question concerning electric magnets and movement are solenoids.

So, why is this type of use allowed? A magnetic is being energized and de-energized and causing a piece of metal to move. Causing non-movement is the same as causing movement. A magnetic force is being applied to cause some motion to happen or not happen.

We just do not understand how this device is not a solenoid by definition and how Rule 53 does not apply.



GDC response

As noted in your question, an electric solenoid contains an electric magnet that when energized or de-energized, causes movement of another metallic object. The original question explicitly stated that for the device in question, the magnet was "not being used to create any motion." Therefore, it is not a solenoid and the solenoid rules do not apply.

The GDC should then clarify its original answer to the post of

"to move the magnet vertically or horizontally to attach to a piece metal to be pulled and released? The magnet is not being used to create any motion just to lock onto the piece of metal. The components, piece of metal and magnet, will be moved by another motor included in the KOP. Then the magnet will release the piece of metal."

to state as long as the piece of metal that the electromagnet is used to attached to pull or released does not cause any motion of that piece of metal when being moved. If the magnet is just being used to 'stay still' then perhaps ok. If the emagnet is being used to attach to a piece of metal and then being move by moving the magnet vertically or horizontally, then motion is occuring of that piece. If this type of motion is acceptable, then the same could be applied in a rotary fashion vs vertically or horizontally.

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### Precise ElectroMagnet Question Reposted

Posted by 2010FRC1261 at 02/10/2010 07:21:11 pm

I am reposting to make the question simpler.

Previously posted:

Is it legal to use a 12 volt electromagnet that is attached to a winch or ball screw driven by a KOP motor to move the magnet vertically or horizontally to attach to a piece metal to be pulled and released? The magnet is not being used to create any motion just to lock onto the piece of metal. The components, piece of metal and magnet, will be moved by another motor included in the KOP. Then the magnet will release the piece of metal. Is this legal according to rules, R02, R03, R52, R53, R71, R72, and all others?

Posted response:

There is no rule that would prohibit this.

As above, a winch is moving an emagnet vertically or horizontally to attach to a piece of metal to be pulled and released. The winch moves the magnet that moves the metal and then is released.

We wish to use a similar setup. Use an electric magnet to attach to a piece of metal. The magnetic is moved in a rotating direction vs vertical or horizontal by a toughbox gearbox. As above the magnet is not being used to create any motion just to lock onto a piece of metal. The magnet is energized and locks onto a piece of metal. This component of magnet and metal will be moved by the toughbox, not the magnet, then the magnet will be released. Is this legal as in the previous post and according to rules, R02, R03, R52, R53, R71, R72, and all others?

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Re: Precise ElectroMagnet Question Reposted

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Posted by GDC at 02/12/2010 11:44:23 am

We believe our previous answers have been correct and complete. If there is a specific question on this topic regarding a rule or interpretation of a rule, please clearly state your question and resubmit.

Re: Precise ElectroMagnet Question Reposted

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Posted by GDC at 02/12/2010 11:44:48 am

In reference to the 2/10, 7:21pm post, there is no rule that would prohibit this.

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**Material Utilization (2010)**

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**FP gearboxes**

FP gearboxes

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Posted by 2010FRC2538 at 02/06/2010 02:49:04 pm

Can we use four Fisher-Price gearboxes from previous year's KOP?

F-P gearboxes

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Posted by 2010FRC2538 at 02/06/2010 03:07:03 pm

The KOP of 2010 supplies 2 Fisher-Price gearboxes. My question is... Is it legal to use those two gearboxes along with two other Fisher-Price gearboxes from previous years' KOP?

Re: FP gearboxes

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Posted by GDC at 02/07/2010 11:26:25 pm

The two gearboxes from the 2010 KOP can be used under Rule <R30>. If they have not been previously modified, then gearboxes obtained from prior-year Kits may be used under Rule <R33>.

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**Material Utilization (2010)**

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**Using a carabiner**

Using a carabiner

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Posted by 2010FRC3408 at 02/06/2010 07:24:05 pm

Can teams use a carabiner on the robot? My team is considering using a carabiner as a hook. Is this allowed?

Re: Using a carabiner

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Posted by GDC at 02/07/2010 11:25:42 pm

There is no rule that would prohibit this.

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**Material Utilization (2010)**

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**Camera for recording**

Camera for recording

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Posted by 2010FRC2415 at 02/08/2010 02:31:38 am

I am looking into attaching a GoPro hero camera on our robot. The camera will not transmit. It will save video to a SD card.

The footage will be used for promotional videos, and for the teams review of robot performance ( the camera will be recording mechanical components).

I know that i have seen teams use similar cameras at competition that run off the battery





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supplied by the camera. Will this be allowed this year?

Re: Camera for recording

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Posted by GDC at 02/11/2010 05:17:15 pm

There is no rule that would prohibit this, as long as the camera is included in the total ROBOT weight during inspection (as required by Rule <R13>), and is in compliance with all applicable rules (particularly Rule <R17> and Rule <R51>).

**Material Utilization (2010)**

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**Legality of rotary electrical connectors?**

Legality of rotary electrical connectors?

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Posted by 2010FRC1986 at 02/08/2010 08:44:59 pm

Sealed, industrial COTS rotary electrical connectors (such as Mercotac model#230 <http://www.mercotac.com/html/230.html>) have been explicitly permitted in previous years (see links below) as long as they are unaltered from their off-the-shelf condition, are rated for the pertinent current load, and obey all other rules for COTS parts utilization.

2010 wiring rules such as <R47> are identical to 2009 when rotary connectors were ruled as allowable, and analogous to other previous years. 2010 rule <R50> refers to output circuit devices which are "acceptable because their effect on robot outputs are inconsequential." Are such commercial sealed rotary connectors still permitted as they have been, as long as they are of the proper current rating and obey all other rules for COTS part utilization?

- <http://forums.usfirst.org/showthread.php?t=11498>
- <http://forums.usfirst.org/showthread.php?t=126&highlight=rotary>
- <http://forums.usfirst.org/showthread.php?t=4391&highlight=slip+rings>
- <http://forums.usfirst.org/showthread.php?t=233&highlight=mercotac>
- <http://forums.usfirst.org/showthread.php?t=538&highlight=energy+transfer>

Re: Legality of rotary electrical connectors?

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Posted by GDC at 02/12/2010 11:28:55 am

Rules from prior years do not apply to this year's game.

Rule <R47> requires that circuits branched off the Power Distribution Board be wired with wire, not rolling contacts, slip rings, or liquid metal contacts.

**Material Utilization (2010)**

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**Is it possible to widen the mounting hole of the planetary gearbox?**

Is it possible to widen the mounting hole of the planetary gearbox?

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Posted by 2010FRC3161 at 02/09/2010 07:25:42 pm

Would it be possible to widen the diameter of the hole in the mounting plate (<http://store.andymark.biz/am-0169.html>) of the andymark planetary gearbox (<http://store.andymark.biz/am-0002.html>), in order to facilitate easy installation/replacement of the FisherPrice motor, as the required sun gear was not shipped with the planetary gearbox.

Re: Is it possible to widen the mounting hole of the planetary gearbox?

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Posted by GDC at 02/12/2010 11:33:02 am



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There is no rule that would prohibit this.

**Material Utilization (2010)**

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**Electromagnets: Use of other forces to intentionally overpower the hold force of EM**

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Electromagnets: Use of other forces to intentionally overpower the hold force of EM

Posted by 2010FRC0241 at 02/10/2010 08:13:13 am

We have a design that we would like to use that uses an electromagnet.

A retract stroke moves the leg back and touches steel to a powered off electromagnet.

This is the normal position of the kicker.

For the fire command, the electromagnet is powered on to temporarily hold the leg in its current position.

The solenoid for the retract stroke is then released and the leg holds in place due to the electromagnet.

The solenoid for the extension stroke is then powered: Due to cambered leverage, the magnet does not need to hold much holding force- maybe 10 pounds- and within 1 second the software control automatically removes power from the electromagnet and the leg moves forward for the kick.

The electromagnet is only used to hold the leg in place and is only used temporarily as part of the sequence of a "fire" command.

It is a low power 12V magnet using less than 350 milliamps.

This is our basic planned use of the electromagnet.

Is a basic design such as this, generally consistent with the GDC intent for allowed use of an EM as a holding force?

In addition to the basic method, we believe we have found a quite novel way to adjust the power of the kick by adjusting the voltage to the electromagnet.

Under some conditions, we would like to lower the voltage to the EM to reduce its holding force. When the built up force related to pressure in the extend stroke of the pneumatic cylinder exceeds the holding force of the magnet, the leg would move forward. The software control would then turn off the EM before the leg is retracted again. At no time does the EM force cause any movement of objects toward the EM- it is only used to resist objects trying to move away from it.

From our current point of view, this is using an EM as a holding force- just not a holding force that always exceeds the other forces in the mechanism.

Would use of an EM as a holding force that is sometimes exceeded by other forces in a mechanism considered an allowed use of an EM as a holding force?

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Re: Electromagnets: Use of other forces to intentionally overpower the hold force of

Posted by GDC at 02/12/2010 11:36:04 am

We cannot approve/disapprove specific designs. It is noted however that electromagnets that are used to increase the effective inertia of an object are generally acceptable, while



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electromagnets that are used to increase the momentum of an object are not.

**Material Utilization (2010)**

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**top cover question...**

top cover question...

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Posted by 2010FRC3355 at 02/10/2010 10:08:14 am

What materials can we use legally for our top cover? Do we have to use thin sheet steel or can we use acrylics and or fiberglass to save some weight? We're rookies and this definitely is a rookie question.

Thanks!

Steve Miller  
Coach Team #3355  
Summit International Prep  
Arlington, Texas

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Re: top cover question...

Posted by GDC at 02/12/2010 11:37:29 am

There are no specific requirements or prohibitions on the choice of materials for the top of your ROBOT. Design decisions such as those are left to the TEAM.

**Material Utilization (2010)**

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**Withholding Limit Rules Clarification**

Withholding Limit Rules Clarification

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Posted by 2010FRC2200 at 02/12/2010 09:39:20 pm

If a robot with no battery or bumpers weighs less than 40lbs. Could the team ship just the bumpers? and keep the robot under the withholding allowance?

65 lb withholding requirements

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Posted by 2010FRC3238 at 02/16/2010 02:08:06 pm

Per the recent team update increasing the withholding allowance - Are there any parts of the robot (for example, the frame, the chassis, or the electronics) that are considered "integral" to the robot and must be shipped on February 23, or can we choose any components of the robot to bring with us to the competition, provided that such components do not exceed 65 lbs?

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Re: Withholding Limit Rules Clarification

Posted by GDC at 02/16/2010 02:49:10 pm

There are no requirements on what is included or excluded from the WITHHOLDING ALLOWANCE. Please see Team Update 11 for added clarification.

65 pound hold back

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Posted by 2010FRC3402 at 02/19/2010 03:02:14 pm

Is there any parts of the robot that cannot be held back? I know that we cannot keep the whole robot if it is under 65 pounds, but can we keep the electronics pack to continue programming?

Mike Bingham(coach)  
3402



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65

Posted by GDC at 02/19/2010 03:16:03 pm

The previous answer still applies. There are no requirements on what is included or excluded from the WITHHOLDING ALLOWANCE.

**Material Utilization (2010)**

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**R38: COTS parts in withholding allowance**

R38: COTS parts in withholding allowance

Posted by 2010FRC3238 at 02/18/2010 09:06:49 pm

Is it legal to bring additional COTS parts beyond the withholding allowance? Would it be allowed to bring 65lbs of fabricated items plus additional COTS parts to the competition with the team?

Re: R38: COTS parts in withholding allowance

Posted by GDC at 02/20/2010 01:44:35 am

Please read Rule <R37>. COTS items still in their original, unaltered condition are not considered part of the WITHHOLDING ALLOWANCE. Unlimited quantities of COTS items may be brought to the competition in addition to the 65 pounds of FABRICATED ITEMS included as the WITHHOLDING ALLOWANCE.

**Material Utilization (2010)**

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**Further Confusion on the Withholding Allowance**

Further Confusion on the Withholding Allowance

Posted by 2010FRC2200 at 02/19/2010 11:40:18 pm

As far as i know all Canadian team received the following email from Richard Yasui (Regional Director) today.

[QUOTE]

Hi Teams,

I know all of you are working hard to finish your robots. I have two important items for you at this time:

1. Bag and Tag

I have received quite a few inquiries about this so I wanted to review the system:

If your first regional is a "Bag and Tag" Regional:

1. You need to use one of the bags you have to bag your robot and use one of the tags with the serial number to seal it BY midnight Tuesday February 23.

2. An adult over 18 (usually a mentor), who is willing to be responsible for the robot must sign the tag and fill in the Robot Lockup Form found here:

[url]<http://www.usfirst.org/roboticsprograms/frc/content.aspx?id=3570>[/url]

3. The robot must be stored by the team in a safe place where it will not be touched until the



## 2010 Q&A Forum Export

generated: 11/12/2010 02:32:25 pm EST

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"Bag and Tag" Regional.

\*\*\* Please note that your robots can be subject to inspection in the sealed bag anytime after the robot ship deadline.

I will provide more information about the regional and how to bring your robot in next week after ship day.

### 2. 65 Pound Holdback

You should all know about the 65 pound holdback that you can keep and work on until the competition. If you haven't seen this, make sure you read the modification to the rules in The Robot document or in one of the updates.

\*\*\* Please note that you are only to hold back subsystems and parts that can be added to your robot. NOT the main part of your robot.

Good luck to all of you and if you have any questions or problems, don't hesitate to contact me. (by e-mail is best this weekend)

Take care,

Richard Yasui

FIRST Robotics Administrator

Toronto District School Board

Regional Director for FIRST Robotics Canada

140 Borough Drive, Level 1

Toronto, Ontario

M1P 4N6

416) 396 5907



[email]richard.yasui@tdsb.on.ca[/email]

[/QUOTE]

This contradicts the Q+A post here: [url]http://forums.usfirst.org/showthread.php?t=14653[/url]

I would just like to verify that the GDC's decision is going to be the one enforced at the regional events. And to make sure that all teams receiving this email understand that it is incorrect.

Thank you,  
Adam Bocek

withholding allowance and "the robot"

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Posted by 2010FRC2200 at 02/20/2010 02:16:48 pm

Hypothetical situation: A team builds its robot such that it weighs 60 lbs without the battery or bumpers. They choose to withhold the entire robot and ship the bumpers in the crate. FRC HQ has passed down a message that this is illegal, but this Q&A (see [url]http://forums.usfirst.org/showthread.php?t=14653[/url]) implies that this is fine. Which interpretation is correct?"

Robot withholding weight

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Posted by 2010FRC1827 at 02/20/2010 03:44:15 pm

The updated shipping rule allows withholding "up to 65 pounds of your robot weight." Is that to be interpreted to mean that a team may withhold its entire bot if the weight of the entire bot is less than 65 pounds? Additionally, if that is the correct interpretation, what effect does that have on a team's allowance of duplicate replacement components? Also, if the team is able to withhold the entire bot, and is going to a bag and tag event, what do they bag?

Re: Further Confusion on the Withholding Allowance

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Posted by GDC at 02/22/2010 08:36:03 pm

The information contained therein does NOT supersede the official rules published by FIRST. The official rules previously issued by FIRST, and the related official Q&A answers, still apply.

Rule <R38>, as amended in Team Update #11, permits the TEAM to utilize a 65 pound WITHHOLDING ALLOWANCE. The choice of which FABRICATED PARTS of the ROBOT are included in the WITHHOLDING ALLOWANCE is entirely up to the TEAM.

Please note that a ROBOT is an assembly of FABRICATED and COTS parts. Teams attending traditional events may not bring fully assembled ROBOTS to the competition. Teams attending bag & tag events may not bring a fully assembled ROBOT that has not been bagged. For both traditional and bag & tag events, teams may bring up to 65lbs of FABRICATED parts for use on the ROBOT, even if their ROBOT weighs less than 65lbs. It is OK if you then complete the final assembly of the full ROBOT once you are on-site.

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#### Material Utilization (2010)

### Use of tape

Use of tape

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Posted by 2010FRC0975 at 02/20/2010 01:02:22 pm

Can clear packing tape be used to adhere electrical wiring (PWM cables) to the underside of the control board for the purpose of keeping it safely away from the mechanisms below?

Thank you!

Re: Use of tape

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Posted by GDC at 02/21/2010 05:53:38 pm

There is no rule that would prohibit this.

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**Material Utilization (2010)**

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**ROBOT Shipping Requirement**

ROBOT Shipping Requirement

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Posted by 2010FRC0649 at 02/21/2010 04:47:10 pm

The February 15 Update states: " all FRC teams will be allowed to hold back up to 65 pounds of their robot's weight and may continue to work on that portion of the robot up until their first event." Although it was not stated, I assume that this is an alteration of Rule R38 which allows retention of 40 pounds for FABRICATED ITEMS (plus the WITHHOLDING ALLOWANCE.

Rule R37 states that "Teams may bring an unlimited amount of COTS items to the competition to be used to repair and/or upgrade their ROBOT at the competition site."

Based on the above, if the ROBOT minus COTS items weighs 65 pounds or less less then it seems to me that teams are allowed to simply bring the ROBOT to the competition. Is that correct? Please confirm as soon as possible since the deadline is, of course, fast approaching. If we do not get a response to this by the ship deadline we will assume that the above is correct. Thank you.

Francesca Ordon  
Team Representative  
Team 649

Re: ROBOT Shipping Requirement

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Posted by GDC at 02/22/2010 08:39:12 pm

Please refer this thread: [url]<http://forums.usfirst.org/showthread.php?t=14773>[/url].

Note however, that COTS items that are installed on the ROBOT have thus become part of FABRICATED items and must be treated as such.

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**Material Utilization (2010)**

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**Tape**

Tape

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Posted by 2010FRC3138 at 02/23/2010 03:27:30 pm

We have searched high and low in the robot and game rules concerning the use of two sided tape coming in contact with the ball. Is it permissible to use two sided tape to aid in capturing the ball as long as rule R19 is adhered to and the ball does not leave the ground.

Re: Tape

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Posted by GDC at 02/24/2010 06:44:58 pm

There are no rules expressly prohibiting the use of tape to interact with the GAME PIECES. However, please note that many tape adhesives would adulterate the surface of the BALL and would result in a violation of Rule <G26>.

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**Material Utilization (2010)**

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**KOP-parts availability-competition handicap**

KOP-parts availability-competition handicap

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Posted by 2010FRC2408 at 03/09/2010 04:36:20 pm

Due to the threads in various places concerning the Classmate, I am very curious as to the availability of spare classmates at competition if one fails. A spare is quite expensive and we view the device as reliable. If we needed to obtain a backup, the accepted version is not available for quite some time. If there is a failure, is that team 'done'?

Please refer to page 6 of Chapter 8, Vendors, specifically:

"The business should maintain sufficient stock or production capability to fill teams orders within a reasonable period during the build season (less than 1 week)."

I would think that this rule should apply concerning all parts in the KOP. However, we found that there was a real problem with the availability of the pneumatic solenoid, it was backordered several weeks during the build season.

How does FIRST plan to address the parts availability in future seasons? This actually is a consideration for future participation. This was a very difficult period to design, test the design, and then build the robot and not be able to obtain parts.

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Re: KOP-parts availability-competition handicap

Posted by GDC at 03/15/2010 12:41:28 pm

We are not able to comment on specific plans, options, or rules for future competition seasons. It is noted that [I]FIRST [I]does hold a Suppliers Summit each summer with organizations supplying items for the KOP to discuss the competition season and potential challenges.

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**Power Distribution (2010)**

**Power Distribution (2010)**

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**Definitions in <R42>**

Definitions in &lt;R42&gt;

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Posted by 2010FRC2505 at 01/13/2010 11:35:14 pm

[quote=<R42C>]Power distribution panels and/or fuse panels different other than the single Power Distribution Board provided in the 2010 KOP,[/quote][quote=<R42E>]Relay modules other than Innovation First, Inc. Spike relays,[/quote][list=1][\*]Does <R42C> refer only to panels used in lieu of the KOP PDB, or also to ones used in series with it (either before or after the KOP PDB)?[\*]Is a single-fuse holder considered a fuse panel (and therefore prohibited)?[\*]What is the definition of power distribution panel? (For example, are multiple-tap busbars or terminal strips considered power distribution panels)?[\*]Is <R42E> intended to refer to PWM-based relays only (e.g. devices that operate like IFI Spikes), or does it apply to all types of relay modules (e.g. electromechanical or solid-state)?[\*]Is a "relay module" different





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from a discrete relay? (Does "relay module" imply a device that contains a relay, but which also contains control, isolation or other circuitry?)[/list]

Re: Definitions in &lt;R42&gt;

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Posted by GDC at 01/15/2010 09:32:46 am

1. Rule <R42> refers to any and all power distribution panels other than the Power Distribution Board provided in the Kit Of Parts.
2. a single in-line fuse holder as part of a custom circuit for the purposes of protecting the custom circuit, is permitted by Rule <R46> and is not a violation of Rule <R42>.
3. There is not a formal definition of "power distribution panel."
4. Rule <R42-E> refers to all relay modules that are used as power-regulating devices, not just PWM-based relays.
5. In the context of the rules in Section 8.3.6, "relay modules" and "relays" used as power-regulating devices are equivalent terms.

#### Power Distribution (2010)

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### Custom Slip Rings Allowed?

Custom Slip Rings Allowed?

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Posted by 2010FRC1730 at 01/20/2010 01:22:27 pm

Is it permissible for a team to design a wheel pod assembly for 360-degrees of rotation, using slip rings to provide 40 amps of electrical current to a CIM motor? Our team is considering a swerve drive robot. To reduce some of the associated cost of a slip ring, the team is designing a 2-pole planar-disk slip ring module for each wheel pod. We would like to know if this violates any of the rules before proceeding.

In particular, we feel <R50> and <R47> may prohibit this design:

"<R50> Custom circuits shall NOT directly alter the power pathways between the battery, Power Distribution Board, speed controllers, relays, motors, or other elements of the robot control system (including the power pathways to other sensors or circuits). Custom high impedance voltage monitoring or low impedance current monitoring circuitry connected to the ROBOT'S electrical system is acceptable, because the effect on the ROBOT outputs should be inconsequential."

<R47> All active Power Distribution Board branch circuits shall be wired with appropriately sized wire:

- A. 12 AWG (2.052mm) or larger diameter wire must be used for all circuits protected by a 40A circuit breaker.
- B. 14 AWG (1.628mm) or larger diameter wire must be used for all circuits protected by a 30A circuit breaker.
- C. 18 AWG (1.024mm) or larger diameter wire must be used for all circuits protected by a 20A circuit breaker.
- D. 20 AWG (0.8128mm) or larger diameter wire must be used for the power connection between the Power Distribution Board and the cRIO-FRC .
- E. 20 AWG (0.8128mm) or larger diameter wire must be used for the power connection between the Power Distribution Board and the Linksys Wireless Bridge
- F. 20 AWG (0.8128mm) or larger diameter wire must be used for the power connections



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between the Power Distribution Board and the Analog Breakouts and/or Solenoid Breakout if individual power feeds are used. 18 AWG or larger diameter wire must be used if a common power feed is used for multiple breakouts.

G. 24 AWG (0.5106mm) or larger diameter wire must be used for providing power to pneumatic valves.

We are asking for clarification on whether this design would qualify as a 'custom circuit' that would 'directly alter the power pathways between the battery and motors' (from <R50>). Or, if the design would violate the <R47>, which call outs for specific gauge wire and doesn't make exceptions for slip rings.

Thank you for your assistance,  
FRC1730

Re: Custom Slip Rings Allowed?

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Posted by GDC at 01/29/2010 09:07:50 am

Slip rings are prohibited by <R47> for circuits branched off the Power Distribution Board. Rule <R47> requires that these circuits be wired with wire, not rolling contacts or slip rings.

### Power Distribution (2010)

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## Power Distribution Board

### Power Distribution Board

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Posted by 2010FRC2484 at 01/22/2010 02:33:42 pm

Our team broke the lug bolts on our power distribution board, tightening nuts too tightly. Is it okay to solder a new bolt to the power distribution board, allowing us to use our board, or do we need to purchase a new board, so we have one that is un-altered? Thanks!

### Power Distribution Board

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Posted by 2010FRC2484 at 01/26/2010 06:00:23 pm

Our team broke the bolt to connect the battery to the power distribution board, and we then soldered a new bolt into the hole from the old bolt. Is this alteration to the power distribution board legal?

Thanks!

Re: Power Distribution Board

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Posted by GDC at 01/27/2010 09:40:44 am

Damaged control system components that are not repaired by the manufacturer would be considered altered parts and are not permitted. Please contact the manufacturer to arrange for them to repair the board.

### Power Distribution (2010)

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## Custom Circuit

### Custom Circuit

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Posted by 2010FRC2053 at 01/31/2010 04:53:35 pm

Does requirement <R50> prohibit a custom circuit that would step down 5V to 1.5V to power a COTS electromagnet?



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Thank you.

Re: Custom Circuit

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Posted by GDC at 02/04/2010 07:23:51 pm

Such a device would be a violation of Rule <R50>.

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Power Distribution (2010)

## Which battery should I order?

Which battery should I order?

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Posted by 2010FRC0070 at 02/07/2010 02:00:35 am

The battery pictured in the kit of parts check list is a NP18-12R 12V 17.2Ah. The battery I recieved at Kickoff was a NP18-12B 12V 17.2Ah. When ordering spare batteries can I order which ever one I want a "B" or an "R". are they both acceptable? Did I get the wrong battery? Should I have an "R"? Thanks for clearing this up before I order a couple hundred dollars worth of batteries.

Re: Which battery should I order?

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Posted by GDC at 02/12/2010 11:24:20 am

Please read Rule <R40>. You may use either one MK ES17-12 12VDC non-spillable lead acid battery, OR one EnerSys NP 18-12 battery. If you use an EnerSys battery, it can be either the "NP18-12B" or "NP18-12R" version.

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Power Distribution (2010)

## Energys NP18-12BFR

Energys NP18-12BFR

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Posted by 2010FRC2175 at 02/09/2010 10:46:22 pm

We were wondering about the legality of an Energys NP18-12BFR battery under rule <R04>. The rule only specifies that the battery be an "EnerSys NP 18-12 battery", but the one that came in the Kit of Parts was an EnerSys NP 18-12B so we wanted to check and make sure this battery would be legal.

The FR in the model number stands for Flame Retardant case and the two batteries share the same Data Sheet as shown here:

[url]<http://www.houseofbatteries.com/pdf/NP18-12B/>[/url]

Re: Energys NP18-12BFR

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Posted by GDC at 02/12/2010 11:34:49 am

Any Energys sub-variant of the "NP18-12" model of batteries would be acceptable.

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Power Distribution (2010)

## Battery questions

Battery questions

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Posted by 2010FRC2343 at 02/11/2010 10:17:20 am

We are going to put our battery in between the CIM motors and we were wondering if there is a certain limit space that they need to be from them, because they put out heat.

Re: Battery questions

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Posted by GDC at 02/12/2010 11:39:30 am

The rules do not specify a minimum clearance around the battery. This is a design decision that is left up to the teams.

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Power Distribution (2010)

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**<R47> Connectors Question**

&lt;R47&gt; Connectors Question

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Posted by 2010FRC1986 at 02/12/2010 03:01:48 pm

The ruling on our previous question about rotary connectors states that they may not be used because they are not wire. To comply with this ruling, we plan on using high flexibility wire inside a mechanism that will allow it to coil and uncoil several times. The flexible wire is very expensive, so we will use butt splices to connect it to \_\_\_\_\_er wire where flexibility is not needed. It occurs to us that the only difference between the butt splices and the rotary connectors is that the rotary connectors have an additional degree of freedom, and that this is not the reason for the current ruling banning them. We would appreciate further explanation of the new 2010 interpretation of <R47>. In the event that your response to this question is to also ban butt splices because they are not wire, we would like to know how we are supposed to hook up CIM motors without them and if we are still permitted to use ring terminals, quick disconnects, or other connecting hardware that is not wire.

Re: &lt;R47&gt; Connectors Question

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Posted by GDC at 02/15/2010 12:46:41 pm

The device previously referenced was rejected because it used liquid metal contacts to complete the circuit. There is no prohibition against butt splices, quick disconnects, or other solid, metallic connectors.

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Power Distribution (2010)

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**Wiring on KOP Encoders**

Wiring on KOP Encoders

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Posted by 2010FRC1676 at 02/23/2010 09:07:14 am

The US Digital encoders in the KOP are supplied with pre-wired connectors. These connectors use brown wire for the negative (-) connections. However, <R48> states that brown may only be used for positive (+) wires. Similarly, there is a blue wire used for signal. Is it acceptable to use the supplied pre-wired connector for the US Digital encoders despite the wire color violations?

Re: Wiring on KOP Encoders

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Posted by GDC at 02/24/2010 04:07:15 pm

Rule <R48> states "All active Power Distribution Board branch circuit wiring with a constant polarity (i.e., [b]except for[/b] relay module, speed controller, or [b]sensor outputs[/b]) shall be color-coded as follows..." Under the parenthetical exemption in the rule, you are permitted to use the supplied pre-wired connector.

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**Motors & Actuators (2010)**

Motors & Actuators (2010)

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**Gas Springs**

Gas Springs

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Posted by FRC1717 at 01/15/2010 12:41:05 am

In past years, it was explicitly stated that gas springs were a legal energy storage device. Is it legal to use gas springs on the robot this year?

Re: Gas Springs

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Posted by GDC at 01/18/2010 11:22:13 am

Please read Rule <R72-I> carefully.

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#### Motors & Actuators (2010)

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### Quantity of "other" motors that can be used

Quantity of "other" motors that can be used

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Posted by 2010FRC2826 at 01/16/2010 01:49:37 am

Can you please clarify whether <R52A> is referring to only the type of motors in the KOP (other than those later expressly mentioned like CIMs and Servos) or also the quantity? Specifically, could I theoretically use as many Fisher Price motors as I wanted, or am I limited to only two per robot because only two are given in the KOP?

Re: Quantity of "other" motors that can be used

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Posted by GDC at 01/18/2010 11:28:30 am

Rule <R52> provides for explicitly permitted models and quantities of motors provided in the KOP. Rule <R53> explicitly prohibits any models of motors other than, or quantities in addition to, those provided in the KOP. Thus, you may use a maximum of two Fisher-Price motors on your ROBOT.

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#### Motors & Actuators (2010)

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### Electric Actuator

Electric Actuator

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Posted by 2010FRC0948 at 01/16/2010 02:43:10 pm

Is it legal to design from scratch and build an electric linear motor? All the parts, except the magnet, would be student built, and all materials would be COTS. We are aware of <R53>, but would like clarification as to whether the rule applies because this is not a solenoid.

The question is pretty much this: Are we allowed to build our own motors?

Re: Electric Actuator

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Posted by GDC at 01/18/2010 11:26:56 am

No. This would be a direct violation of Rule <R53-A>.

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#### Motors & Actuators (2010)

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### Servos

Servos

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Posted by FRC1717 at 01/16/2010 09:57:53 pm

Can we use servos with continuous rotation that otherwise satisfy all the robot requirements? If not, can we modify one of the existing servos to rotate continuously?

Re: Servos

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Posted by GDC at 01/18/2010 11:25:39 am

If the servos satisfy the requirements of Rule <R52-B> they may be used. Note that under



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Rule <R54> the servos may not be modified in any way.

**Motors & Actuators (2010)**

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**Approved Motors**

Approved Motors

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Posted by 2010FRC2484 at 01/17/2010 01:57:48 am

What are the approved motors we can use on the robot? Are the Kit of parts motors the only ones we can use? Is there a list of approved motors available to teams?

Thanks!

Re: Approved Motors

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Posted by GDC at 01/18/2010 11:23:50 am

Please read Rule <R52> and Rule <R53>.

**Motors & Actuators (2010)**

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**Using Leaf Blower Legal?**

Using Leaf Blower Legal?

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Posted by 2010FRC1671 at 01/18/2010 03:44:20 pm

My kids were thinking about using a leaf blower type device to use a blast of air to push and manipulate the balls. Is this legal? Thank you.

Re: Using Leaf Blower Legal?

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Posted by GDC at 01/19/2010 09:50:36 pm

Use of a leaf blower on the ROBOT would be a violation of Rule <R53>.

**Motors & Actuators (2010)**

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**R53 Electric Solenoid Actuators**

R53 Electric Solenoid Actuators

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Posted by 2010FRC1261 at 01/19/2010 07:35:20 pm

Can the GDC please provide a definition of an electric solenoid actuators. This is the industry standard definition that we have foundL

[url]http://www.tpub.com/content/doe/h1013v2/css/h1013v2\_166.htm[/url]

Re: R53 Electric Solenoid Actuators

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Posted by GDC at 01/21/2010 04:52:26 pm

We will not provide a specific definition. The commonly-accepted standard definition is sufficient.

**Motors & Actuators (2010)**

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**Motors**

Motors

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Posted by 2010FRC2534 at 01/20/2010 05:01:10 pm

Are 12 volt and/or pneumatic motors allowed?

Re: Motors

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Posted by GDC at 01/20/2010 10:37:59 pm



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Please read Rule <R52>, Rule <R53>, Rule <R71>, and Rule <R72>. These topics are explicitly addressed by those rules.

#### Motors & Actuators (2010)

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### Bot motors

Bot motors

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Posted by 2010FRC3198 at 01/21/2010 04:55:25 pm

Would the Banebots RS545 be a suitable replacement for the FP 9015 motor. They have very similar specs:

Performance

Operating v : 4.5v - 12v

Nominal v : 12v

No Load RPM : 16800

No Load A : 1A

Stall Torque : 39.48 oz-in 278.8 mN-m

Stall Current : 42A

Kt : 0.94 oz-in/A 6.6 mN-m/A

Kv : 1400 rpm/V

Efficiency : 71%

RPM - Peak Eff : 14525

Current - Peak Eff : 6.6A

Physical

Weight : 5.4 oz (153g)

Length - for motor : 1.97 in (50mm)

Diameter : 1.41 in (35.8mm)

ShaftDiameter : 0.12 in (3.2mm)

Shaft Length : 0.3 in (7.6mm)

Mounting Screws (2) M3

Re: Bot motors

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Posted by GDC at 01/25/2010 08:49:53 am

This is not one of the permitted motors.

#### Motors & Actuators (2010)

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### <R53> Legality of solenoid actuators within devices

&lt;R53&gt; Legality of solenoid actuators within devices

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Posted by 2010FRC2505 at 01/25/2010 11:41:39 am

[list=1][\*]Does <R53B> only apply to discrete solenoid actuators, or additionally to solenoid actuators incorporated within a component?[\*]Previous Q&As have ruled that a solenoid actuator that is part of an electrical relay is [url=http://forums.usfirst.org/showthread.php?t=14049]permitted[/url], but that a solenoid actuator that is part of an electromagnetic clutch is [url=http://forums.usfirst.org/showthread.php?t=14121]not permitted[/url]. With regard to the rules, what is the difference between actuating a linkage within a relay, and within a clutch, and why does one meet <R53B> and not the other?[\*]Do any of the above answers impact the legality of solenoid actuators used with or found within pneumatic valves? (Even if the valve's solenoid unit is [u]not[/u] integral.)[/list]



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Re: &lt;R53&gt; Legality of solenoid actuators within devices

Posted by GDC at 01/29/2010 09:22:13 am

1 - Rule <R53-B> applies to all solenoid actuators, regardless of whether they are incorporated within a component or not.

2 - Our previous answer in the referenced thread was incorrect. That answer will be updated. Rule <R42> prohibits relay modules other than the IFI "Spike" relay modules. So other relays used as electric switches are prohibited, and Rule <R53> is also satisfied as a consequence.

3 - Rule <R53-B> explicitly permits the use of pneumatic solenoid valves.

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**Motors & Actuators (2010)**

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**R52a and RS555 motors**

R52a and RS555 motors

Posted by 2010FRC2826 at 01/27/2010 01:20:34 pm

R52a states that the motors in the KOP are the only ones that allowed to be used. With respect to the part numbers of the RS555 motors that are listed in the KOP checklist:

RS555SH-2670

RS555VC-3754

Are these motors interchangeable in regard to quantity? Could we use two of one part number as long as the quantity does not exceed 2?

I ask this question because one part number is easy to obtain spares and one is difficult, if not impossible (at least for me so far)

I apologize if this question has been submitted twice by me, but the system logged me out before I could finish authoring this the first time.

---

Re: R52a and RS555 motors

Posted by GDC at 01/28/2010 12:08:40 am

No. The only motors permitted on the ROBOT are the ones provided in the Kit Of Parts, in the quantities provided, and those explicitly permitted by Rule <R52>.

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**Motors & Actuators (2010)**

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**Legal Servo clarification needed**

Legal Servo clarification needed

Posted by 2010FRC1559 at 01/29/2010 01:18:40 pm

<R52> B. states:

An unlimited number of COTS servos with a maximum output torque of 55 oz-in and maximum rotational speed of 100 rpm at 6 Vdc (e.g. HITEC model HS-322HD or HS-325HB servos, as provided in the KOP)

However <R52> C. states:

An unlimited number of FIRST Tech Challenge (FTC) servos (HITEC HS-475HB servos)

My confusion is that HS-475HB violates section B in that the torque is 76 oz-in. In addition,





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HS-475HB has been discontinued and replaced with HS-485HB which has a torque of 83.3 oz-in.

So the question is can we violate <R52>B and use HS-475HB, assuming I can still find stock? If we cannot find stock, can we use HS-485HB?

Other Posts suggest that unmodified stock versions of HS-322HD can be used in either 90deg, 180deg, 360deg configurations. Is the same true for HS-475HB? What is the stock FTC stock configuration?

### Servo HS-475HB

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Posted by FRC781 at 01/31/2010 05:07:49 pm

Dear GDC,

Rule 8.3.7 c) states "An unlimited number of FIRST Tech Challenge (FTC) servos (HITEC HS-475HB servos)".

After contacting many suppliers we have found only two of these servos. We contacted HITEC and they stopped production 5 months ago and their sales department states the replacement is the HS-485HB. These replacement servos do have slightly different specs. Since the stated servo is no longer available can teams use the manufacturers replacement?

Thanks,

Team781

### HiTec Servo Discontinued, replacement?

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Posted by 2010FRC2358 at 02/02/2010 12:00:27 pm

I have found that the listed HITEC HS-475HB servos have been discontinued.

As a veteran team we were not given these in the KOP.

The replacement from HITEC is given as HS-485HB Servo

Here are the spec's:

Control System: +Pulse Width Control 1500usec Neutral

Required Pulse: 3-5 Volt Peak to Peak Square Wave

Operating Voltage: 4.8-6.0 Volts

Operating Temperature Range: -20 to +60 Degree C

Operating Speed (4.8V): 0.22sec/60° at no load

Operating Speed (6.0V): 0.18sec/60° at no load

Stall Torque (4.8V): 66.6 oz/in. (4.8kg.cm)

Stall Torque (6.0V): 83.3 oz/in. (6.0kg.cm)

Operating Angle: 45 Deg. one side pulse traveling 400usec

360 Modifiable: Yes

Direction: Clockwise/Pulse Traveling 1500 to 1900usec

Current Drain (4.8V): 8mA/idle and 150mA no load operating

Current Drain (6.0V): 8.8mA/idle and 180mA no load operating

Dead Band Width: 8usec

Motor Type: 3 Pole Ferrite Motor

Potentiometer Drive: Indirect Drive



---

Bearing Type: Top Ball Bearing, Lower Bushing  
Gear Type: Karbonite Gears  
Connector Wire Length: 11.81" (300mm)  
Dimensions: See Schematic  
Weight: 1.59oz (45g)

Is this Servo a legal replacement for the HS-475HB

Re: Legal Servo clarification needed

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Posted by GDC at 02/07/2010 12:40:20 am

Rule <R52-B> permits the use of an unlimited number of servos, as long as the performance does not exceed the maximum output specifications documented in the rule. The servos provided in the KOP are Hitec HS-322HD servos, which are within these performance specs, and explicitly permitted by Rule <R52-B>. You may use as many of the HS-322HD as you like (within the limits of other rules defining total weight, cost, control ports, etc.).

Rule <R52-C> provides for one exception to that rule, in that you may use an unlimited number of FIRST Tech Challenge (FTC) servos, which are HITEC model HS-475HB servos. The exception covers only this make and model of servo. The HS-485HB servos exceed the specifications in Rule <R52-B> and they are not FTC servos covered by Rule <R52-C>, therefore they are not permitted.

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**Motors & Actuators (2010)**

**Using Keyang Motor (2007 kit)**

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Using Keyang Motor (2007 kit)

Posted by 2010FRC2170 at 02/01/2010 07:57:26 pm

Are we allowed to use motors from previous years, specifically the Keyang motor 16627961 from 2007 competition?

Re: Using Keyang Motor (2007 kit)

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Posted by GDC at 02/04/2010 07:13:29 pm

Please read Rule <R52> and Rule <R53>. This topic is very explicitly addressed by these rules.

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**Motors & Actuators (2010)**

**Robot motor question**

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Robot motor question

Posted by 2010FRC2165 at 02/03/2010 11:00:28 am

Rule 52A indicates that all motors supplied in the KOP may be used on the 2010 robot.

- The KOP contained 2 Mabuchi motors and 2 Fisher-Price motors.
- Both the Mabuchi and Fisher-Price motors can be mated to Banebots

P60 gearboxes

Rule 54B indicates that the Fisher-Price motors can be used independent of the Fisher-Price gearbox



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Rule 54A indicates the output shaft of the motor may be modified for mounting purposes

- The Fisher-Price motor will mount to a Banebots P60 gearbox IF the pinion gear is replaced

Question - is it legal to use the Fisher-Price motor with a Banebots P60 gearbox?

Question - this would enable the use of up to 4 motor/P60 units. Is that legal?

- Through last year two P60 units could be used and the Fisher-Price motor/gearbox was considered an integral unit.

Re: Robot motor question

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Posted by GDC at 02/04/2010 07:31:01 pm

1 - Yes.

2 - Yes.

#### Motors & Actuators (2010)

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### Motor Usage

Motor Usage

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Posted by 2010FRC2148 at 02/04/2010 06:10:46 pm

We have a winch from a 4 wheeler we would like to use on our robot. It has an almost identical motor to the CIM drive motors.

Labeled: CIM EM801 G02 12 VDC p/n124715 033103

May we use the motor?

Re: Motor Usage

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Posted by GDC at 02/07/2010 11:36:52 pm

Please read Rule <R52> and Rule <R53> carefully. This topic is specifically addressed by those rules.

#### Motors & Actuators (2010)

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### Grinding a Motor

Grinding a Motor

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Posted by 2010FRC0135 at 02/08/2010 08:13:51 pm

As rule <R54> states, you may not modify a motor unless it is to facilitate the physical connection to the robot. Our scenario is that we have a CIM motor connected to our drive train, but the motor hits our wheel. My question is:

Can we grind down the black part of the CIM motor for the sole purpose of the physical interaction with the wheel?

If I read the rules correctly, I understand that <R54> exists so teams cannot gain an advantage with the motor. We wouldn't be gaining any advantage, but trying to facilitate the physical connection of the robot.

Re: Grinding a Motor

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Posted by GDC at 02/11/2010 05:18:32 pm

To be precise, Rule <R54> states that "the mounting brackets and/or output shaft/interface of the motors may be modified to facilitate the physical connection of the motor to the ROBOT and actuated part." The main case (the black case) of the CIM motor is not a mounting bracket or output shaft/interface. It is not to be modified in any way.

### Motors & Actuators (2010)

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#### Servos question

Servos question

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Posted by 2010FRC0340 at 02/11/2010 10:46:49 pm

We want to run 2 servos off of the same PWM signal. Is it permissible to plug both servos into one PWM port and instead of getting power from the PWM port, each servo gets its power from its own separate Digital Output port? The servos would get their signal from the PWM port as per <62> and not connected to relay module or speed controller per <R55>.

Re: Servos question

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Posted by GDC at 02/15/2010 12:38:36 pm

Under Rule <R45-G>, servos are to be powered via the PWM connections on the Digital Sidecar. They are not to be powered directly from a digital output ports.

### Motors & Actuators (2010)

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#### Fisher Price Motor Flux Yoke Removal

Fisher Price Motor Flux Yoke Removal

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Posted by 2010FRC0078 at 02/15/2010 10:00:14 am

Is it legal to remove the flux yoke on the Fisher Price motor? We are aware of the torque drop associated with removing the flux yoke.

Re: Fisher Price Motor Flux Yoke Removal

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Posted by GDC at 02/15/2010 01:06:41 pm

This is not permitted per Rule <R54>.

### Motors & Actuators (2010)

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#### CIM Question

CIM Question

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Posted by FRC1262 at 02/20/2010 09:01:28 pm

Related to modifying CIM motors and the limit of (5) CIMs on the robot....

Assuming (5) functional and un-modified CIMs utilized to perform dynamic functions on the robot as a given.

The question being this... to provide an adequate braking system for a winch device a team removes the stator case and rear plate of a CIM motor, mounts it to an Andy Mark gearbox in the "normal" CIM location, and uses SOLELY the front mounting plate, output shaft and gear, and rotor as an adequate surface to apply a simple friction brake.

Would this be allowed in addition to the (5) working CIMs?



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It is not a modified working motor, simply utilizing the physical characteristics of a COTS component in, admittedly, a modified state.

Please advise.

Re: CIM Question

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Posted by GDC at 02/21/2010 05:56:44 pm

This would be a violation of Rule <R52> and Rule <R54>. That it is being used as a brake instead of a motor does not change the fact that this is use of a sixth CIM motor, and that the motor is being extensively modified. Both of these actions are prohibited.

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**Motors & Actuators (2010)**

**Window Motor Connection**

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Window Motor Connection

Posted by 2010FRC0101 at 03/02/2010 11:04:08 pm

I have connected a 3/8 inch shaft through the gear box of a window motor. This is quite simple to do. I drill thru the black housing and the shaft mount of the output gear. The shaft comes out and I then continue drilling thru the output gear. I slide a 3/8 inch rod thru the motor gear box and pin the output plastic bushing to the shaft.

In my mind I am modifying the output shaft of the motor gear box. I am doing nothing to the motor.

Is this OK?

Also for the rules that I believe apply I have added comments:

<R54> So that the maximum power level of every ROBOT is the same, motors and servos used on the ROBOT shall not be modified in any way, except as follows:

A. The mounting brackets and/or output shaft/interface of the motors may be modified to facilitate the physical connection of the motor to the ROBOT and actuated part.

Comment:

(I modified the output shaft of the gear box to connect it directly to the drive shaft of a mechanism.)

D. The intent is to allow teams to modify mounting tabs and the like, not to gain a weight reduction by potentially compromising the structural integrity of any motor. The integral mechanical and electrical system of the motor is not to be modified. Note that FIRST will not provide replacements for modified parts.

Comment:

(By replacing the output gear 3/8" shaft with a 3/8" rod I have either the same motor assembly weight or slightly more. And again I do nothing to the motor just the gear box.)

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Window Motor Connection



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Posted by 2010FRC0101 at 03/03/2010 07:49:55 pm

Here is my original question:

I have connected a 3/8 inch shaft through the gear box of a window motor. This is quite simple to do. I drill thru the black housing and the shaft mount of the output gear. The shaft comes out and I then continue drilling thru the output gear. I slide a 3/8 inch rod thru the motor gear box and pin the output plastic bushing to the shaft.

In my mind I am modifying the output shaft of the motor gear box. I am doing nothing to the motor.

Is this OK?

Also my interpretation of the motor rules that I believe apply:

<R54> So that the maximum power level of every ROBOT is the same, motors and servos used on the ROBOT shall not be modified in any way, except as follows:

A. The mounting brackets and/or output shaft/interface of the motors may be modified to facilitate the physical connection of the motor to the ROBOT and actuated part.

Comment:

(I modified the output shaft of the gear box to connect it directly to the drive shaft of a mechanism.)

D. The intent is to allow teams to modify mounting tabs and the like, not to gain a weight reduction by potentially compromising the structural integrity of any motor. The integral mechanical and electrical system of the motor is not to be modified. Note that FIRST will not provide replacements for modified parts.

Comment:

(By replacing the output gear 3/8" shaft with a 3/8" rod I have either the same motor assembly weight or slightly more. Again I just modify the shaft of the output gear and do nothing to the motor.)

Re: Window Motor Connection

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Posted by GDC at 03/09/2010 12:29:21 pm

The output gearbox on the window motors supplied in the KOP is considered an integral part of the mechanical assembly of the motor. Under Rule <R54> it may not be modified in any way, other than the approved alterations described in Rule <R54-A> and <R54-C>.

## Control, Command, & Signal System (2010)

Control, Command, & Signal System (2010)

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### R63 - Jaguar Firmware

R63 - Jaguar Firmware

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Posted by FRC57 at 01/13/2010 04:03:28 pm

R63 requires any CAN bus controlled Jaguar to be updated to "at least Version 86 of the official FIRST firmware." Where can we find this firmware and instructions for updating it?

Re: R63 - Jaguar Firmware

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Posted by GDC at 01/18/2010 06:51:52 pm



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To download the most recent Jaguar firmware, please visit the [URL="http://www.luminarymicro.com/jaguar"]Jaguar website[/URL] and click on the [I]MDL-BDC24 FRC2010 Firmware[/I] link on the right side of the window (in the [I]MDL-BDC24 Black Jaguar [/I]section).

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Control, Command, & Signal System (2010)

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**<R56> and "controllers"**

&lt;R56&gt; and &quot;controllers&quot;;

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Posted by 2010FRC2505 at 01/13/2010 11:15:26 pm

[quote=<R56>]ROBOTS must be controlled via the programmable National Instruments cRIO-FRC (National Instruments part number 780406-01). Other controllers shall not be used.[/quote]Should the second sentence of this rule be interpreted as "other controllers shall not be used [u]in lieu of the cRIO-FRC[/u]"? Otherwise, to what extent does this apply to microprocessors on custom circuits or COTS auxiliary devices used together with a cRIO-FRC?

Re: &lt;R56&gt; and &quot;controllers&quot;;

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Posted by GDC at 01/15/2010 09:34:14 am

No controller other than the cRIO-FRC may be used to control the ROBOT. This prohibits the use of any alternative controllers, processors, CPUs, computers, or circuits to provide direct control signals to any controllable device on the ROBOT except where explicitly permitted by the rules. Pre-processors, co-processors, FPGAs, etc. may be used to process signal inputs and other data as long as the resulting outputs are passed to a permitted controller before affecting any power regulating device.

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Control, Command, & Signal System (2010)

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**Jaguar Motor Controllers**

Jaguar Motor Controllers

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Posted by 2010FRC0399 at 01/14/2010 12:45:10 pm

Two Questions:

On the jaguar motor speed controllers, when set up for CAN operation, can sensors (Encoders / Potentiometers) be attached to the appropriate input on the Jaguar speed controllers for using the built-in PID control functionality?

When running a Jaguar Motor controller in CAN mode, can a PWM cord be plugged into both the Jaguar and the Digital Sidecar for the purposes of a backup if only one mode can be used at a time in software?

Re: Jaguar Motor Controllers

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Posted by GDC at 01/15/2010 09:26:59 am

1. Yes. Please refer to Rule <R68> (as amended in Team Update #1).
2. No. This would be an explicit violation of Rule <R63-B>.

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Control, Command, & Signal System (2010)

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**wireless Adapter**



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wireless Adapter

Posted by 2010FRC2959 at 01/18/2010 02:31:51 pm

I think this is going to be an issue of growing concern. Our Linksys WGA600N did not work correctly last year. So, we are trying to replace or repair it. We called Linksys. Ours is out of warranty. Also, they do have them stocked and said they do not expect to have more. The suggestion was to find other resellers. I have checked several locations. None, so far, have them in stock. One company said we were the eighth today to try to find this model device and the model has been discontinued. I will keep looking but what is the "plan B" if teams are not able to obtain this device?

Re: wireless Adapter

Posted by GDC at 01/20/2010 12:48:32 am

Please refer to Rule <R59>. If the WGA600N is not available, the WET610N is an adequate alternate part, and is permitted.

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**Control, Command, & Signal System (2010)**

**CAN vs. PWM**

CAN vs. PWM

Posted by FRC111 at 01/19/2010 10:19:14 am

Is it the intent of the rules that all controllers on a robot use either CAN or PWM or does the rule apply to individual controllers?. The rule seems to imply each controller but other documentation leads one to believe the Crio is limited to PWM or CAN but not both simultaneously.

<R63> Each Jaguar speed controller must be controlled with signal inputs sourced from the cRIO-FRC and passed via either a connected PWM cable or a CAN-bus connection.

A. The Jaguar must receive signals via either a PWM cable -OR- a CAN-bus connection. Both cannot be used simultaneously.

Re: CAN vs. PWM

Posted by GDC at 01/19/2010 09:54:09 pm

Each individual Jaguar speed controller may be controlled via either the PWM signal path or the CAN-bus path, but not both. The rules do not prohibit the use of both PWM and CAN-bus strings on the same cRIO-FRC controller, as long as they do not directly connect to each other.

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**Control, Command, & Signal System (2010)**

**Electrical**

Electrical

Posted by 2010FRC2676 at 01/26/2010 10:32:42 am

Can I make a three way splitter for a ? PCM cable?? Our design has three wheels on each side of our robot. Am I way off base?

Frantic Team 2676 :(

Re: Electrical

Posted by GDC at 01/31/2010 10:55:50 pm

There is no rule that would prevent that. However, there may be preferable technical alternatives. We suggest that you may want to re-post your question to one of the technical





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forums for advice on this topic.

**Control, Command, & Signal System (2010)**

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**multiple solenoid boards**

multiple solenoid boards

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Posted by 2010FRC1912 at 01/27/2010 09:26:53 am

can you have more than 1 solenoid breakout board in the crio. the rules specify slot 8 for that card, but doesn't say about an additional card. one of the power distribution drawings shows the usage of slot 7 and 8 which implies 2 breakout boards are legal. the rules specific multiple analog and digital boards but not solenoids. please clarify

Re: multiple solenoid boards

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Posted by GDC at 01/28/2010 12:09:54 am

Yes.

**Control, Command, & Signal System (2010)**

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**Custom Video Code**

Custom Video Code

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Posted by 2010FRC0537 at 01/28/2010 02:23:02 pm

Many teams wish to use the assistance of a video feed on their dashboards this year while driving the robot. Gathered from test results of many different teams using both C++ and LabVIEW (with results shared on the Chief Delphi forum), many teams are reporting poor frame rates (lower than 5 frames per second even with small resolutions) and high latency, both of which make driving using the video feed difficult.

A solution currently being developed by Teams 537 and 2152 is to create our own C++ robot-to-pc video code. Because we are using the exact same camera code and port configuration as the solution provided from WPI, the only difference is in how the data is sent. Instead of sending images via a TCP connection, this custom solution segments images into multiple smaller packets and sends them using a UDP socket (to the same IP and port as the TCP equivalent would). While this creates the need for custom dashboard software to reassemble and display the images, the result is a much higher frame rate (20+ frames per second in initial tests) and lower latency.

Would such a solution be legal in a competition environment?

Teams 537 and 2152 are aware that special care must be taken while dealing with networking during a competition. To prevent any interference or possible issues with the FMS, the data will be sent to the [u]exact[/u] same IP and port as the official solution operates on. The custom solution will use no more bandwidth than the official solution, so it will be ensured that the code does not exceed the allotted bandwidth provided to each team. If FIRST would like to monitor the development of this project or examine source code to ensure standards, both teams would be more than willing to comply. Any questions before reaching a decision can be forwarded to [message edited to remove personal contact information]

Re: Custom Video Code

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Posted by GDC at 01/31/2010 11:00:34 pm



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The latency issue that's being seen with the C/C++ or Java software will be fixed in an update that will be posted next week. Please stay tuned.

Meanwhile, while the GDC applauds your team's ingenuity, the UDP1180 port will be closed and not accessible to teams at the competition. While custom TCP protocols are permitted, UDP is not.

**Control, Command, & Signal System (2010)**

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**Regarding Spike Relay Module**

Regarding Spike Relay Module

Posted by 2010FRC0885 at 01/28/2010 06:47:34 pm

Regarding Spike Relay Module

Are the Spike Relay Modules allowed to control the window motors?  
Besides the air compressor what other motors may the Spike control?  
Is there a maximum number of Spikes allowed on the robot?

TNX

Re: Regarding Spike Relay Module

Posted by GDC at 02/02/2010 08:19:05 pm

- 1 - Yes.
- 2 - Under Rule <R55>, any motor other than the CIM motor and Fisher-Price motor may be controlled by either a relay module or a speed controller.
- 3 - While there is no rule that explicitly addresses this, by our calculations the maximum number of Spikes that can be contained within the NORMAL CONFIGURATION volume/weight constraints is 883. However, it is noted that the budget limitations of Rule <R22> would limit you to no more than 102 Spikes on a single ROBOT.

**Control, Command, & Signal System (2010)**

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**Beyond the 8 ports on Solenoid Breakout**

Beyond the 8 ports on Solenoid Breakout

Posted by 2010FRC0806 at 01/30/2010 01:53:11 pm

My team wants to use 6 double solenoids, so we have exceeded the 8 ports on the Solenoid Breakout.

- A) Is it legal to wire the additional solenoids from Spikes and the Digital Sidecar?
- B) Is it legal to buy another NI 9472 module and use a second Solenoid Breakout?

Re: Beyond the 8 ports on Solenoid Breakout

Posted by GDC at 01/31/2010 10:58:06 pm

- A - Yes.
- B - It depends on the voltage rating on the valve. If they're 12V valves, then Yes. If they're 24V valves, then no. Please remember that only one solenoid breakout may draw power from the 24 V supply on the Power Distribution Board.

**Control, Command, & Signal System (2010)**

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## Java Source for implementing interface?

Java Source for implementing interface?

Posted by 2010FRC1127 at 01/30/2010 04:22:48 pm

We need the Java source code to implement an interface. The C and Java Programming Guide for FRC explains the process for getting the C++ source; however, there is no information for obtaining the Java source code. Could you tell us where to get the source code for individual classes & how to incorporate them in the proper packages?

Re: Java Source for implementing interface?

Posted by GDC at 02/01/2010 03:44:44 pm

The Java source code for WPILib is included with the NetBeans plugins (the Java update). Teams can access the source code by opening the WPILib source code project here: `c:\Users\\sunspotfrsdk\WPILibJ`. This source code will always be updated to match the current installation of the plugins. That source code is always rebuilt as part of a FRC Java project so any changes made to that directory will be reflected in the files downloaded to the cRIO. With that said, the recommended method of modifying the source code is to make a copy of the new class and add it to the project. That way updates to the Java plugins won't overwrite any customizations that were made. Even better is to incorporate changes through subclassing where possible rather than changing WPILib at all.

The documentation has been updated with this information.

**Control, Command, & Signal System (2010)**

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## Network Switch on Port 2

Network Switch on Port 2

Posted by 2010FRC2859 at 02/02/2010 04:30:45 am

<R68> Says the Ethernet bus connected to Port 2 of the cRIO-FRC may be used.

Does this mean that a network switch may be used to communicate between devices on the bus as long as the command signals originate from the cRIO-FRC?

Re: Network Switch on Port 2

Posted by GDC at 02/04/2010 07:37:00 pm

Yes.

**Control, Command, & Signal System (2010)**

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## Replacement Camera

Replacement Camera

Posted by 2010FRC2805 at 02/03/2010 02:11:44 pm

We lost our camera and need to find a replacement. The axis website shows the replacement being Axis M1011. What are we allowed to use and what is compatible as a replacement? Axis says they do not make the 206 anymore and haven't in awhile.

Re: Replacement Camera

Posted by GDC at 02/12/2010 11:21:50 am

There is no rule that would prohibit the use of the Axis M1011 or any other 5v digital camera that you may choose.



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Control, Command, & Signal System (2010)

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**Question about Black Jaguars and specific usages**

Question about Black Jaguars and specific usages

Posted by 2010FRC0359 at 02/06/2010 09:54:14 pm

1. The FRC2010 Jaguar FAQ explains the use of a cRIO DO to control the Coast/Brake option. Is this allowed for 2010?
2. If it is allowed, can one DO be used to control multiple Jaguars?

Re: Question about Black Jaguars and specific usages

Posted by GDC at 02/11/2010 05:15:53 pm

- 1) There are no rules that would prohibit this.
- 2) There are no rules that would prohibit this (but note that connecting a single DO to multiple controllers could be more susceptible to electrical noise related issues).

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Control, Command, & Signal System (2010)

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**Amber Light...Blinking or Solid Amber?**

Amber Light...Blinking or Solid Amber?

Posted by 2010FRC3355 at 02/09/2010 01:35:46 pm

We're ready to mount our amber light on the chassis. the instructions show two wiring patterns...one for blinking one for solid amber. Which function is expected?

We're a rookie team so please bear with our dumb questions.

Thanks!

Steve Miller  
Coach #3355

Re: Amber Light...Blinking or Solid Amber?

Posted by GDC at 02/12/2010 11:31:22 am

Please refer to the [B][I]Robot Data Connectivity Diagram[/I]/[B] posted [URL="http://www.usfirst.org/roboticsprograms/frc/content.aspx?id=10934"]here[/URL].

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Control, Command, & Signal System (2010)

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**Replacement Jaguar**

Replacement Jaguar

Posted by 2010FRC2907 at 02/09/2010 07:58:14 pm

The team ordered replacement parts from DigiKey from their quick link for FRC 2010. The parts sent were 296-25445-ND MDL-BDC24 as the 726-1189-ND MDL-BDC are not available. The MDL-BDC24 runs 12v/24v. As a replacement part from DigiKey, we need to verify this is the appropriate Jaguar. We need these for our robot.



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mdl-bdc24 available.

Re: Replacement Jaguar

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Posted by GDC at 02/11/2010 04:25:51 pm

Please refer to Rule <R42>.

**Control, Command, & Signal System (2010)**

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## Wrong breakout board?

Wrong breakout board?

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Posted by 2010FRC3145 at 02/12/2010 03:11:32 pm

Hello,

We have a Solenoid Breakout board that says "Power 6-20v", and is Rev 4. The pneumatic Festo valve requires 24v from this breakout - how do I proceed? I can send pictures of the board if needed.

Regards,

Coach Brian Induni  
Rookie Team 3145

Re: Wrong breakout board?

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Posted by GDC at 02/15/2010 10:28:52 am

The "20V" rating on the board is a typo, and the board is rated for up to 30V, per the documentation.

Our apologies for the confusion.

**Control, Command, & Signal System (2010)**

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## Solenoids to Spikes?

Solenoids to Spikes?

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Posted by 2010FRC2815 at 02/15/2010 07:32:32 pm

We're aware of the cRIO and its solenoid breakout, but we could find no rule in the manual prohibiting our wiring folks from partying like it's 2008. Are we allowed to wire pneumatic solenoid valves to (legally-controlled) IFI Spike relay outputs?

Re: Solenoids to Spikes?

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Posted by GDC at 02/18/2010 11:26:47 am

There is no rule that would prevent this. Party on!

**Control, Command, & Signal System (2010)**

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## Analog breakout pins in series

Analog breakout pins in series

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Posted by 2010FRC3238 at 02/16/2010 11:40:24 am

Is it legal to connect multiple analog breakout power pins in series to run a 10V sensor? Is there any other way of powering 10V sensors from the analog breakout?

Re: Analog breakout pins in series

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Posted by GDC at 02/18/2010 09:08:45 pm

There are no rules that prohibit this, however note that the 5V supplies are not independent supplies, and will therefor not provide the outcome you're expecting.

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Control, Command, & Signal System (2010)

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**<R60> CompactRIO gaskets**

&lt;R60&gt; CompactRIO gaskets

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Posted by 2010FRC2505 at 02/18/2010 12:14:18 am

[list=1][\*]Is it a violation of <R60> or any other rules to install the NI-recommended cRIO gaskets? Installation requires disassembly of the cRIO-FRC. (See [url=http://digital.ni.com/public.nsf/allkb/FA1B856FC4EB6F9D86257673007935A1]instructions from NI[url], [url=http://www.andymark.biz/am-0590.html]sales page at AndyMark[url] and [url=http://www.chiefdelphi.com/forums/showthread.php?t=81615]ChiefDelphi thread[url]).[\*]Does FIRST recommend that teams install these gaskets?[\*]These gaskets are not specified in the KOP checklist. Were they part of the (rookie) kit of parts? (According to NI: "Each 2010 FRC Kit of Parts will include one set of the gaskets.")[/list]

Re: &lt;R60&gt; CompactRIO gaskets

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Posted by GDC at 02/21/2010 05:46:05 pm

1. The cRIO is several parts, not all of which are required, that the team must assemble. Adding the gasket is considered part of the assembly and is acceptable.
2. Yes.
3. Please see Team Update 12.

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Control, Command, & Signal System (2010)

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**<R60> Control system cleaning**

&lt;R60&gt; Control system cleaning

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Posted by 2010FRC2505 at 02/18/2010 12:36:03 am

Luminary Micro/TI has noted that one common failure mode of Jaguar speed controllers is an electrical fault due to conductive debris within the casing, such as steel shavings from the screw terminals on a Grey Jaguar.

[list=1][\*]Assuming that no modifications or adjustments are made, is it a violation of <R60> to open a Jaguar to clean it thoroughly? (<R60> defines disassembly as prohibited tampering.)[\*]To which of the devices listed in sentence 2 of <R60> does this also apply? (To wit: "Classmate PC, FirstTouch I/O module, cRIO-FRC, speed controllers, relay modules, wireless bridge, batteries, and battery charger").[/list]

Re: &lt;R60&gt; Control system cleaning

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Posted by GDC at 02/21/2010 05:48:08 pm

1 - Rule <R60> pertains to permanent (at least in the context of altering for the duration of a match) dis-assembly or removal of parts of a device. Dis-assembly for the purposes of cleaning or removing debris, as long as the device is completely restored to its original condition, would not be considered a violation of Rule <R60>.

2 - The above interpretation would apply to all devices identified in Rule <R60>.



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Control, Command, & Signal System (2010)

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**Bandwidth limitations**

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Bandwidth limitations

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Posted by 2010FRC0451 at 02/20/2010 10:05:47 am

Is there a specific bandwidth limit on the TCP data that is being sent from the robot?  
If there is, would two camera streams at 160x120 be in the limit?

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Robot Bandwidth

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Posted by FRC449 at 02/25/2010 03:58:56 pm

How much bandwidth is allowed? We are trying to figure out a way to code a reasonable FPS and need to figure out what kind of image to return. In order to determine this, we need to know the bandwidth.

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Re: Bandwidth limitations

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Posted by GDC at 02/25/2010 04:35:54 pm

This forum is reserved for specific questions regarding rules and intent behind rules. Your question will be reposted  
[URL="http://forums.usfirst.org/forumdisplay.php?f=1341"]here[/URL].

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Control, Command, & Signal System (2010)

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**Can a breakwr be used in trhe Spike relay for the compressor?**

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Can a breakwr be used in trhe Spike relay for the compressor?

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Posted by 2010FRC2996 at 02/22/2010 06:11:29 pm

It is well known that the compressor frequently momentarily exceeds the 20 Amp rating of the automotive fuse in the Spike relay and blows the fuse. In the real world a delay fuse or breaker is used in these cases. Threads on ChiefDelphi say "use a 20 Amp PD breaker".

This is not safe. The reason is that the fuse mounting on the Spike is a standard automotive fuse and the mounting of the PD breaker is not. The spade lugs may be the same dimensions and allow it to fit but it does not insert far enough to be fully engaged. It is prevented by the oversize of the PD breaker. Our team has discovered that the PD breaker will not safely stay inserted in the Spike relay.

Hence, the PD breaker should not be allowed as a Spike fuse replacement

What should be allowed is the standard automotive 20 Amp breaker designed to be used in the Spike standard fuse mounting.

Therefore, we need an official ruling on this matter and suggest we be allowed to use commercial standard 20 Amp automotive breakers on the Spike relay.

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Re: Can a breakwr be used in trhe Spike relay for the compressor?

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Posted by GDC at 02/24/2010 04:05:25 pm

Please read Rule <R60-F>. If a compressor is used, the fuse on the Spike relay controlling the compressor may be replaced with one of the permitted 20-amp Snap Action circuit breakers. Only the specific make and model of 20-amp Snap Action breakers provided in the KOP are valid replacements - no other breakers are allowed. This use of the breaker, and the selection





of this specific breaker for this use, was determined in consultation with the vendors and designers of both parts. Both vendors have determined that this is an appropriate use of the products.

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Control, Command, & Signal System (2010)

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**Limit switches connectable directly to Jaguar limit switch breakers?**

Limit switches connectable directly to Jaguar limit switch breakers?

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Posted by 2010FRC3341 at 03/02/2010 05:24:34 pm

Hi, we are a rookie team and we have a question about connecting limit switches to the forward and reverse limit switch headers on the Jaguar speed controller. We want to use them to limit the travel of our lifter arm. There seems to be some question as to whether using limit switches directly on the jaguar is allowed. we are using a CIM motor with the Jaguar.

<63> states

PWMconfiguration: If the Jaguar speed controller is controlled via PWM communications, the PWM port on the Jaguar speed controller must be connected directly to a PWM port on the Digital Sidecar with a PWM cable. No other devices may be connected to these PWM ports. No other devices may be connected to any other ports on the Jaguar speed controller with the exception of connection to the coast/brake port.

this would seem to indicate that the use of limit switches directly connected to the jaguar is invalid. please let us know whether the rules prohibit the direct connection of limit switches to the jaguar.

thanks

Re: Limit switches connectable directly to Jaguar limit switch breakers?

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Posted by GDC at 03/16/2010 12:47:13 pm

Please see Rule <R60-L>. You may use the limit switch inputs to the Jaguar speed controllers IF you are controlling the Jaguar via a CAN-bus connection. You can not use external limit switch inputs to the Jaguars if you are controlling them via PWM inputs.

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Control, Command, & Signal System (2010)

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**Velcro for mounting electrical components?**

Velcro for mounting electrical components?

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Posted by 2010FRC3129 at 03/08/2010 08:27:03 pm

For ease of configurability, we have mounted many of our electrical components (e.g., speed controllers, bridge, etc.) to our electronics board using industrial strength velcro. While we believe that this is extremely strong and we have seen no problems with this, our electronics team is a little worried about this technique passing inspection. Would you please let us know if this is a legal mounting system?

Thank you,

The Green MacHHHHine, Team 3129

Re: Velcro for mounting electrical components?

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Posted by GDC at 03/16/2010 12:45:11 pm

There is no rule that would prohibit this.

**Control, Command, & Signal System (2010)**

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**Controlling 2 LEDs with one spike relay**

Controlling 2 LEDs with one spike relay

Posted by 2010FRC0368 at 03/23/2010 05:41:50 am

According to <R49>, Each relay shall control one and only one electrical load. The only exception to this is multiple low-load pneumatic solenoid valves.

We would like to have 2 LEDs on our robot controllable by a relay. Would it be possible for two LED wires to connect to one relay or will we need to make a custom circuit board to hold the two LEDs and then have only one wire connect to the relay? The LEDs are no where near the 20A limit for the relay.

Re: Controlling 2 LEDs with one spike relay

Posted by GDC at 03/29/2010 02:46:46 pm

Your interpretation of the rules are correct - Spike relays may only drive one load, with the exception of the solenoid valves.

**Control, Command, & Signal System (2010)**

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**Solenoid Breakout Voltage Incompatibility**

Solenoid Breakout Voltage Incompatibility

Posted by 2010FRC3189 at 03/26/2010 10:02:32 pm

The Solenoid Breakout we got says it is only rated for 18V. We know that the solenoid requires 24V but at the same time we don't want to fry the Breakout board.

Currently we have a custom pair of RadioShack relays wired to the 24V terminal on the PDB running to the solenoids and it works, but we don't think that it is legal.

Is it okay to run the Breakout on 24V even though it claims on the board itself that it is rated for 18V? Did we get an improper part?

Re: Solenoid Breakout Voltage Incompatibility

Posted by GDC at 03/29/2010 02:58:09 pm

There is a typo on the boards, they are good for up to 30V.

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**Pneumatic System (2010)**

**Pneumatic System (2010)**

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**inflatable items**

inflatable items

Posted by 2010FRC2143 at 01/13/2010 10:13:34 pm

Would an inflatable item, perhaps constructed from rubberized fabric, be considered a "pneumatic part"? Would such an item therefore be prohibited in accordance with <R71>?

Re: inflatable items

Posted by GDC at 01/15/2010 12:02:11 am



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If the item were inflated by the pneumatic system on the ROBOT, then it would be considered a pneumatic part. As such, it would be prohibited by Rule <R71>. Note that no source of compressed air other than the provided compressor (or equivalent, as permitted by Rule <R75>) is permitted. Thus, an additional inflatable item that is actually inflated would be prohibited. However, an inflatable item that not connected to a pneumatic system and is used in its deflated state would be permitted (assuming it didn't violate any other rules).

**Pneumatic System (2010)**

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**Are pneumatic tires legal?**

Are pneumatic tires legal?

Posted by 2010FRC2471 at 01/15/2010 01:22:15 am

The GDC's response to a previous question about pneumatics is as follows:

If the item were inflated by the pneumatic system on the ROBOT, then it would be considered a pneumatic part. As such, it would be prohibited by Rule <R71>. Note that no source of compressed air other than the provided compressor (or equivalent, as permitted by Rule <R75>) is permitted. Thus, an additional inflatable item that is actually inflated would be prohibited. However, an inflatable item that not connected to a pneumatic system and is used in its deflated state would be permitted (assuming it didn't violate any other rules).

What about pneumatic tires used on the robot? These are rubber tires that are inflated with air. Since it wasn't inflated by the pneumatic system on the ROBOT, would it be excluded from this restriction and so permitted to be used on the robot?

Re: Are pneumatic tires legal?

Posted by GDC at 01/18/2010 09:50:28 pm

Good catch - it has always been our intent to permit pneumatic wheels, and we missed this complication of the existing pneumatic rules. This has been corrected. Please refer to Rule <R72> as updated in Team Update #3.

Bicycle Tires

Posted by 2010FRC0279 at 01/19/2010 11:55:05 am

We were thinking of using 12.5 inch children's bicycle tires to use on this years robot. We were wondering if using an inflatable tire such as this would violate the rules as it regards to <R71>? The "pneumatic tire" would carry a pressure of about 45 psi. Thanks.

**Pneumatic System (2010)**

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**FESTO Valve kit**

FESTO Valve kit

Posted by 2010FRC3067 at 01/15/2010 02:04:14 pm

Today I contacted festo to order some additional First valve kits. (12V DC solenoid double valve) They told me that they were not available. They were also unsure when they would be available. What should we do? Is there an alternative part available? What about the valve kit from last year?

Re: FESTO Valve kit

Posted by GDC at 01/19/2010 10:24:32 am



## 2010 Q&A Forum Export

generated: 11/12/2010 02:32:25 pm EST

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Under Rule <R72-C>, you may use any valves with a maximum 1/8" NPT port diameter and a maximum Cv of 0.32. Such valves may be obtained from any source of your choosing.

### Pneumatic System (2010)

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## Pneumatic air storage

### Pneumatic air storage

Posted by 2010FRC2826 at 01/16/2010 01:34:36 am

1) In rule <R72A> it is stated that no more than 4 Clippard air tanks can be used. Can tanks or air storage media from vendors other than Clippard be used?

2) Can rod locked pneumatic cylinders be used for supplemental air storage?

### Re: Pneumatic air storage

Posted by GDC at 01/20/2010 12:49:28 am

1. No.

2. Yes, but note that under Rule <R76-B> any such cylinders used for supplemental air storage must be located in the low pressure portion of the pneumatic circuit (i.e. downstream from the primary regulator). They may not be used to store high-pressure air. Also note that <R01-B> restricts stored air pressure to the Clippard tanks only at the start of the match.

### Pneumatic System (2010)

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## Stop Collar on Cylinder

### Stop Collar on Cylinder

Posted by 2010FRC0957 at 01/17/2010 07:52:58 pm

We are currently prototyping different kicking methods, we came up with idea with a fabricated stop collar to shorten the cylinder. Is this legal? We are not modifying a cylinder but we are adding a collar on the cylinder shaft. We are making sure it follows safety guidelines but want to make sure that it would pass inspection if the kicker is placed on the robot.

Thanks

Team 957

### Re: Stop Collar on Cylinder

Posted by GDC at 01/19/2010 09:27:00 pm

The addition of a shaft collar to the cylinder rod would not be considered a modification of the cylinder. This would be permitted.

### Pneumatic System (2010)

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## Other Pneumatic Cylinder Name Brands

### Other Pneumatic Cylinder Name Brands

Posted by FRC1501 at 01/18/2010 11:16:37 pm

Based on the interpretation we read in <R72.D>, the wording states "additional air cylinders or rotary actuators may be used". This does not specify name brand such as "Bimba" as years past.

May we use other brand air cylinders such as PHD Air Cylinders or SMC Air Cylinders so long



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as they meet <R72.D> "size up to a maximum of 24-inch stroke and 2-inch diameter."?

Re: Other Pneumatic Cylinder Name Brands

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Posted by GDC at 01/19/2010 09:31:56 pm

There are no rules that prohibit the use of pneumatic cylinders from any vendor you choose, as long as they meet all applicable criteria (e.g. Rule <R72-D> and Rule <R73>).

**Pneumatic System (2010)**

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## **Pneumatic Fittings**

Pneumatic Fittings

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Posted by 2010FRC2779 at 01/19/2010 06:56:18 pm

We need clarification on additional fittings for connections. Can we use 1/4" hard piping to connect between compressor and solenoid/cylinder? Also, is it permissible to use multiple 1/8" tubing into a single input for the cylinder? (Basically a parallel circuit)

Re: Pneumatic Fittings

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Posted by GDC at 01/20/2010 10:43:36 pm

1 - Standard COTS hard pipe segments (e.g. pipe nipples) of an appropriate pressure rating are permitted by Rule <R72-F>, as they would be considered connecting fittings. Note however, that they cannot connect the compressor straight to the solenoid valve or cylinders - all the required intermediate components must still be included in the pneumatic circuit.

2 - There are no rules that would prohibit that.

**Pneumatic System (2010)**

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## **pneumatics manifolds**

pneumatics manifolds

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Posted by 2010FRC2272 at 01/19/2010 08:32:22 pm

Festo tells us that the availability of supplemental FRC valve kits is in question we are considering other suppliers.

MAC provides a 0.3 CV 12/24V valve which stacks to form a compact multi-valve manifold. The outputs are 1/8" NPT but the common manifold input is 1/4" NPT. If this is adapted down to 1/8" would this be legal.

Re: pneumatics manifolds

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Posted by GDC at 01/21/2010 11:00:00 am

If the port has an adapter that reduces the effective port size to 1/8" NPT, then that satisfies the intent of the rule and would be acceptable.

**Pneumatic System (2010)**

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## **Pneumatic spring.**

Pneumatic spring.

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Posted by 2010FRC2272 at 01/19/2010 08:41:22 pm

If a pneumatic cylinder is pressurized to no more than 60 psi, but mechanically constrained and mechanically released, is this legal? This would be equivalent to an open mechanical spring/trigger mechanism, but would be considerably safer since there would be less access and the pressure could be released automatically at the end of a match.



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Re: Pneumatic spring.

Posted by GDC at 01/24/2010 09:45:30 pm

There is no rule that would prohibit this, as long as the mechanical system does not compress the cylinder when it is part of a closed system and cause the internal pressure to exceed 60psi.

**Pneumatic System (2010)**

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## Air Shocks

Air Shocks

Posted by 2010FRC0772 at 01/19/2010 10:02:33 pm

We are wondering if we can use an air shock on our robot. In particular we are looking at using air shocks that are similar to the shocks that you will find on a trunk door of a car to hold the trunk door open.

Re: Air Shocks

Posted by GDC at 01/20/2010 10:39:56 pm

Please read Rule <R72-I>. This topic is explicitly addressed there.

**Pneumatic System (2010)**

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## Use of Fluidic Muscles

Use of Fluidic Muscles

Posted by 2010FRC2865 at 01/20/2010 12:58:00 am

I saw this asked in the forums but not asked again in the official Q&A forums. Are fluidic muscles such as those available from Festo legal or illegal for this year's competition? I believe they are COTS and are individually rated at 8 bar.

Re: Use of Fluidic Muscles

Posted by GDC at 01/20/2010 10:38:57 pm

Fluidic muscles are not included in the set of devices explicitly approved for use in Rule <R72>. As such, they are prohibited by Rule <R71>.

**Pneumatic System (2010)**

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## Pneumatic Solenoids/Cylinders

Pneumatic Solenoids/Cylinders

Posted by 2010FRC0476 at 01/20/2010 12:40:19 pm

1. Can we supply air to activate a pneumatic cylinder using one of the supplied 3-way ball valves and a 90-degree pneumatic actuator? We don't see anything in the rules that specifically says we have to activate a pneumatic cylinder with air going through a solenoid valve.
2. Assuming the answer to #1 is 'no' and we have to supply air to the cylinder through a solenoid valve of 0.32 Cv or less, can we exhaust the air from a pneumatic cylinder through one of the 3-way ball valves?
3. Assuming the answer to #2 is no, can we use two solenoid valves, each with a Cv of 0.32 or less, in parallel to activate and exhaust a single pneumatic cylinder?

Re: Pneumatic Solenoids/Cylinders

Posted by GDC at 01/25/2010 08:55:15 am

1 - Ball valves are not listed as one of the explicitly allowed pneumatic items in Rule <R72>.



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As such, they are prohibited by Rule <R71>.

2 - No - Ball valves are prohibited. See #1 above.

3 - There is no rule that would prohibit this.

**Pneumatic System (2010)**

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**Valve**

Valve

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Posted by 2010FRC3067 at 01/21/2010 05:04:11 pm

I have spoken with festo on many occasions about the supply of more valves for the 2010 season. When I spoke with them last they are still unsure of the actual arrival time, but they think next week. When I asked them for another valve that meets the requirements they told me that the valve that was supplied in the kit of parts is a 0.37Cv. This means that it does not meet the rules. It also means that we cannot get a replacement because 0.32 Cv does not exist with them. Could you please advise what we should do? Thanks

Re: Valve

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Posted by GDC at 01/25/2010 08:49:17 am

There are many valves available, from multiple vendors, that will satisfy the constraints contained in the rules. While we value and appreciate the provision of the valves from Festo, the rules do not limit teams to valves from just that one vendor.

**Pneumatic System (2010)**

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**Allowable Motors**

Allowable Motors

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Posted by 2010FRC2534 at 01/21/2010 06:45:35 pm

Based on our interpretation of rules 51, 51, 71, and 72 we believe the following pneumatic motor meets the design specifications set forth.

Model # M3G2R-STL

[url]http://www.machiii.com/Products/Clutches/Clutch-Mechanisms-Couplings-Regular-Duty.asp[url]

Can you verify?

Thanks,  
Team 2534

Re: Allowable Motors

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Posted by GDC at 01/24/2010 09:20:45 pm

This is a pneumatically-actuated device that is not specifically permitted by Rule <R72>. As such, it is therefore prohibited by Rule <R71>.

**Pneumatic System (2010)**

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## Two Regulators

### Two Regulators

Posted by 2010FRC0476 at 01/21/2010 10:51:29 pm

If we want some pneumatic cylinders to activate with 60 psig air and others with 40 psig, can we install two regulators in parallel instead of one and route the different lines from each regulator?

### Re: Two Regulators

Posted by GDC at 01/25/2010 08:47:04 am

The 60psi primary regulator supplied in the KOP must be the first regulator in the system. Secondary regulators may be located downstream from that location.

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## Pneumatic System (2010)

### define pneumatics pressure

#### define pneumatics pressure

Posted by 2010FRC1810 at 01/22/2010 10:44:58 am

8.3.9 Defines the Pneumatic system and its components. These components are to be rated at no less than 125 psi. I agree with the rule and understand the intent of this is for safety. Pressurized components can store a large amount of energy and if released uncontrolled can be very dangerous. 8.3.9 Also states that no pneumatic system other than provided by the one compressor is to be used, however low pressure pneumatic compressors are provided in the kit in the form of fans. Please bear with me for a moment. As it is stated, fans are not allowed on the robot. It may seem a stretch but fans do compress air. They are very low pressure and are an open system but non the less are an air compressor.

There have been questions about using inflatable devices similar to a pool toy or air mattress. Attaching a pool toy to the 60psi air compressor pneumatics is not a good idea but a separate system using fans at a minimal pressure similar to the inflatable holiday yard ornaments that collapse when the fan is tuned off, would be perfectly safe.

Shouldn't the pneumatic system also be defined as any pressure system above 1 or 2 psi perhaps? And, low pressure systems that operate below this pressure can also be used. This would allow the use of low pressure systems such as cooling fans on the electrical system and also fans for the inflatable designs.

### Re: define pneumatics pressure

Posted by GDC at 01/28/2010 12:25:09 am

We will not define "pneumatics pressure." The commonly accepted definition, as would be interpreted by any reasonably astute observer, is sufficient. For the purposes of the FRC, a small cooling fan blowing air across a motor is not a reasonable interpretation of a source of pneumatic pressure.

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## Pneumatic System (2010)

### Pneumatics pressure rating

#### Pneumatics pressure rating

Posted by 2010FRC1311 at 01/22/2010 04:17:50 pm

FRC Robot Manual 8.3.9 <R72> requires a minimum pressure rating of 125 psi.



The SMC SY3000 series products used and approved in prior years competition were rated at 0.7 MPa or about 101.5 psi.

The KOP documentation doesn't specify the part number for valve this year but it is rumored to be a Festo VUVG series rated at 8 bar or 116 psi.

At the moment we cannot verify the KOP partnumber and consequently the specs of the KOP item.

The MAC valves we just purchased are rated similiarly to the SMC SY3000 series, 100 psi, 0.30 Cv.

The question: Can we use valves similiarly specified (our new MAC 46 series valves) as the replacement for the SMC SY3000 that has be de-facto approved, specified, and supplied for years ?

The system bus pressure in this operating circuit is 60 psi max.

Re: Pneumatics pressure rating

Posted by GDC at 01/25/2010 02:47:17 pm

Please see Team Update #5.

### Pneumatic System (2010)

#### Old Festo Valves

Old Festo Valves

Posted by 2010FRC0358 at 01/23/2010 09:04:27 pm

Are older KOP Festo valves considered COTS covered by <R33>, or parts custom-made for FIRST and covered by <R34>?

Re: Old Festo Valves

Posted by GDC at 01/24/2010 09:32:29 pm

Festo valves provided in prior year Kits are COTS items.

### Pneumatic System (2010)

#### Pneumatics rules

Pneumatics rules

Posted by 2010FRC1736 at 01/25/2010 10:28:46 am

Can we use PVC pipe to make a pneumatic telescoping mechanism? We planned on using the 60 psi supply to make the pipe telescope to reach the 7' tower.

Re: Pneumatics rules

Posted by GDC at 01/28/2010 12:05:03 am

No.

### Pneumatic System (2010)

#### Plug Valves Instead of Solenoids

Plug Valves Instead of Solenoids





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Posted by 2010FRC0476 at 01/25/2010 10:52:27 am

Can we use plug valves, Parker model # PV609-2 as allowed in Rule R72, instead of solenoids to activate and exhaust pneumatic cylinders? We would rotate the plug valves using pneumatic 90-degree actuators and a custom-made bracket between the pneumatic actuator and the plug valve handle. Or we would turn the plug valves using HS322-HD servos or the Denso window motors.

Re: Plug Valves Instead of Solenoids

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Posted by GDC at 01/28/2010 12:03:45 am

There is no rule that would prohibit this.

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**Pneumatic System (2010)**

**pneumatics**

pneumatics

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Posted by 2010FRC2506 at 01/25/2010 11:23:15 am

Are there other legal pneumatics for use on the robot (other than pistons)?

Re: pneumatics

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Posted by GDC at 01/28/2010 12:03:01 am

Please read rule <R71> and Rule <R72> and Rule <R73>.

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**Pneumatic System (2010)**

**Venting cylinder**

Venting cylinder

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Posted by 2010FRC0123 at 01/26/2010 08:53:03 am

Can we vent one side of a cylinder directly to the atmosphere or must it go through a valve?

Re: Venting cylinder

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Posted by GDC at 01/27/2010 11:55:07 pm

There is no rule that would prohibit venting a cylinder directly to atmosphere.

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**Pneumatic System (2010)**

**Use of pneumatic components**

Use of pneumatic components

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Posted by 2010FRC1784 at 01/26/2010 02:30:17 pm

Hello GDC,

<R72> does not specifically address flow controls, dump valves, manifolds.

Can you please clarify, in the event these components meet the 0.32Cv and 1/8 npt restrictions:

1. are dump valves permitted (aka shuttle valves, non solenoid) similar to Festo 9798
2. are flow controls permitted
3. are manifolds / distributors permitted, similar to Festo 190779

Thank you



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Re: Use of pneumatic components

Posted by GDC at 01/28/2010 12:22:22 am

1. No.
2. These are considered "connecting fittings" and are covered under Rule <R72-F>.
3. These are considered "connecting fittings" and are covered under Rule <R72-F>.

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**Pneumatic System (2010)**

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## Other pneumatics

Other pneumatics

Posted by 2010FRC2506 at 01/26/2010 09:28:56 pm

Are pneumatics that use a diaphragm to convert air pressure to mechanical force, via a push rod legal?

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Re: Other pneumatics

Posted by GDC at 01/28/2010 12:20:55 am

Unless the diaphragm is part of the gas-tight seal included in the construction of the piston in a legal pneumatic device otherwise known as a "pneumatic cylinder" and permitted by Rule <R71> and Rule <R72>, then no.

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**Pneumatic System (2010)**

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## Modification of pneumatic shaft threads

Modification of pneumatic shaft threads

Posted by 2010FRC2614 at 01/27/2010 10:20:29 pm

Is it legal to grind off the threads on the end of a pneumatic shaft to produce a smooth shaft tip?

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Re: Modification of pneumatic shaft threads

Posted by GDC at 01/31/2010 11:08:40 pm

No. This is a direct violation of Rule <R73>.

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**Pneumatic System (2010)**

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## Electric pressure regulator

Electric pressure regulator

Posted by 2010FRC2053 at 01/28/2010 03:35:31 pm

Are electric pressure regulators legal? We want to be able to control the pressure of our pneumatics through software. We were looking at this regulator:

[url][http://www.smcetech.com/CC\\_host/pages/custom/templates/smc\\_v2/prodtree\\_product\\_2.cfm?&cc\\_nvl=\(\(catalogCode,smc\),\(lineCode,INS\\_US\),\(productCode,1139\),\(prodtreeID,22835\),\(nodeCode,1139\[url\]\)\)](http://www.smcetech.com/CC_host/pages/custom/templates/smc_v2/prodtree_product_2.cfm?&cc_nvl=((catalogCode,smc),(lineCode,INS_US),(productCode,1139),(prodtreeID,22835),(nodeCode,1139[url])))

If it is legal to use an electronic pressure regulator, can it be 24V?

Thank you

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Re: Electric pressure regulator

Posted by GDC at 02/01/2010 12:34:41 pm

No. That would be a violation of Rule <R53> and Rule <R71>.



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Pneumatic System (2010)

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**Telescoping Pneumatic Cylinders R72D**

Telescoping Pneumatic Cylinders R72D

Posted by FRC49 at 01/28/2010 08:35:24 pm

Can we use Telescoping Pneumatic Cylinders? Like those supplied by ERGO-HELP, INC.?

Re: Telescoping Pneumatic Cylinders R72D

Posted by GDC at 01/31/2010 10:51:46 pm

These are permitted devices, as long as they are used in configurations with a maximum 24-inch stroke (as measured across all stages) and maximum 2-inch diameter, as required by Rule <R72-D>.

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Pneumatic System (2010)

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**compressor stats**

compressor stats

Posted by 2010FRC2815 at 01/30/2010 11:34:14 am

Under Rule R75, does this compressor meet the required specifications to be considered legal?

[url]http://www.\_\_\_\_truckparts.com/product\_info/category\_id/7/subcategory\_id/154/subcategory\_id/13/subcategory3\_id/69/products\_id/27201/?PHPSESSID=e538c34f59a8ebd95be745a968a60d18[/url]

Re: compressor stats

Posted by GDC at 01/31/2010 10:50:44 pm

We are not able to provide blanket approval/disapproval of devices that have not been examined by the inspectors. They will make this determination at the competition events. If you believe there may be a question of whether an item is appropriate, please be sure to bring all supporting documentation to show that the device satisfies the rules.

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Pneumatic System (2010)

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**Additional Pressure Relief Valve**

Additional Pressure Relief Valve

Posted by 2010FRC0148 at 02/01/2010 08:44:06 pm

According to the manufacturers data sheet, the Festo Pneumatic Valve included in the kit, the VUVG-L10-B52-T, has a maximum operating pressure of 8 bar. A pressure of 8 bar is 116 psi.

According to R72.C, solenoid valves with less than a 125 psi rating must have an additional pressure relief valve added to the low pressure side of the main regulator. Does the Festo in the KOP need this additional pressure relief valve? Is the 60 psi adjustable regulator sufficient for this additional pressure relief valve requirement?

Re: Additional Pressure Relief Valve

Posted by GDC at 02/07/2010 12:33:05 am

Please refer to Team Update #5.

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Pneumatic System (2010)

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**Solenoid valves: adequate documentation**



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Solenoid valves: adequate documentation

Posted by FRC3130 at 02/02/2010 02:02:04 pm

This question is a multi part question, all regarding specifications or sourcing of pneumatic solenoid valves.

Preface: We are trying to buy more valves: the goal being to find one with a Cv (<.32) AND with an 1/8" port.

I started by investigating the KOP Festo valve. The Festo valve KOP part number specifies an M5 port size. That is larger than 1/8" and seems to violate the 1/8" rule.

Point 1: The KOP M5 festo valve does not seem to meet the requirements of Cv <.32 and port <= 1/8". This means that if I buy more of them (which I can't because there is no inventory available), they don't meet the rules.

The Festo valve we RECEIVED in our KOP was an M7 port size - an even larger port than the potentially-too-large M5 port, further contradicting the rules. The increased flow rate can be seen in the datasheets for the M5 and M7 valves.

Point 2: It doesn't seem fair to use our KOP M7 valve since it does meet the rules.

Festo does not document the Cv of any valve, therefore it seems impossible to adequately document use of any Festo valves - even the one we received in the KOP because it's a different part number than it should have been.

Point 3: It seems impossible to provide documentation that satisfies the rules for Cv and port size when using Festo valves.

If the Festo M7 valve (or M5 valve) is used, the adapter provided for the metric fitting only provides a proper fit when 6mm metric tubing is used. This adapter is not the correct size for the 1/4" tubing provided (and mandated) in the rules.

Point 4: It seems that we are intended to use the metric fitting provided in the KOP valve to connect with a tubing size that it is not rated for. (Since an M5 (or M7) to 1/4" adapter is not available to purchase anywhere.) Confirmation of this would be appreciated.

Question 1: The non-existent Cv specification for the Festo valve, coupled with the M7 KOP SUPPLIED valve conflicting with the KOP description of an M5 and conflicting with the 1/8" requirement in the rules, FINDING legal valves has been difficult for teams, and our rookie team is finding it even harder as most of the forum postings do not provide specific part numbers of parts other teams have found - and when they do specify a part number it implies that there is no inventory available, etc. I know it is up to our team to locate these parts, but finding parts that are both IN STOCK AND DOCUMENTED WITH Cv values is proving very hard. One thing that would help would be guidance: For valves that do not specify a Cv (like Festo) what OTHER specification or documentation can be used in place of a Cv value?



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A very frustrated mentor would appreciate some guidance here. Thanks!

Re: Solenoid valves: adequate documentation

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Posted by GDC at 02/04/2010 04:36:46 pm

Under Rule <R30-A> all valves provided in the KOP are legal to use on the ROBOT, regardless of other rules that may apply to non-KOP parts.

Any valves used on the ROBOT that are in addition to, or different from, those provided in the KOP must meet the requirements of Rule <R72-C>. This is true for additional units (beyond the number supplied in the KOP) of KOP valves that may exceed the Rule <R72-C> performance specifications.

Beyond the KOP valves, you may use any valves, from any vendor or any source, that satisfy Rule <R72-C>. There are many valves available that satisfy the requirements of the rule, and have readily available documentation to verify that they are in compliance.

Please note that a valve with a natively larger port, that is fitted with a 1/8" fitting is permitted provided it meets all other requirements.

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Pneumatic System (2010)

## Pneumatics

Pneumatics

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Posted by 2010FRC1086 at 02/03/2010 05:12:54 pm

Can a quick exhaust valve by smctech be used to control the air coming out of a pneumatic cylinder

Re: Pneumatics

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Posted by GDC at 02/04/2010 07:28:47 pm

All non-KOP valves used in the pneumatic system must be in compliance with Rule <R72-C>. If the valve does not meet the performance requirements defined in that rule, then it can not be used.

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Pneumatic System (2010)

## Connection Fitting Sizes

Connection Fitting Sizes

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Posted by 2010FRC0378 at 02/03/2010 05:36:05 pm

Is it acceptable to use components with connection fitting sizes larger than 1/8" NPT?

Re: Connection Fitting Sizes

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Posted by GDC at 02/04/2010 04:46:30 pm

Rule <R72-C> applies the 1/8" port size restriction only to pneumatic solenoid valves. Other components with different port size may be used. But it is noted that the size of all tubing used to connect different components is limited by Rule <R72-E>.

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Pneumatic System (2010)

## CU Restriction

CU Restriction

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Posted by 2010FRC0378 at 02/03/2010 05:36:53 pm



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Does the CU Restriction on solenoid valves apply to all components?

Re: CU Restriction

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Posted by GDC at 02/07/2010 11:35:04 pm

Rule <R72-C> applies the restriction on the Cv (not "CU") flow coefficient only to pneumatic solenoid valves.

**Pneumatic System (2010)**

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## Air Cylinder Usage

Air Cylinder Usage

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Posted by 2010FRC1448 at 02/03/2010 09:30:33 pm

We don't see an air cylinder guide. May we use a 2" bore by 24" stroke cylinder? Does the name of the manufacturer matter?

Re: Air Cylinder Usage

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Posted by GDC at 02/04/2010 07:42:10 pm

Please read Rule <R72>. This topic is addressed directly by this rule.

**Pneumatic System (2010)**

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## Additional Pressure Relief Valve Clarification Please

Additional Pressure Relief Valve Clarification Please

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Posted by 2010FRC2375 at 02/04/2010 10:52:07 am

Regarding the prevalence of solenoids rated for less than 125psi, and the fact that we could only find some rated to 120psi...

According to Team update #5,

Solenoid valves that are rated for a maximum pressure that is less than 125psi rating mandated above are permitted, however if employed, an additional pressure relief valve must be added to the low pressure side of the main regulator. The additional relief valve must be set to a lower pressure than the maximum pressure rating for the solenoid valve.

Can you please provide more clarification regarding the additional relief valve?

Must it be similar to the Nason PRESSURE SWITCH which would need to be electronically monitored, or...

can it simply be like the Norgren and/or Monnier PRESSURE REGULATORS? or,

is the existing Norgren PRIMARY PRESSURE REGULATOR good enough for our needs since all such solenoids will be downstream of this regulator, and in fact, only connected to the 60psi branch...

Our specific concern is that we have some solenoids rated to 120psi, and are wondering how to make our robot pass inspection with a minimum of additional cost in terms of non KOP components.

Thanks from a team trying to use pneumatics for the first time!

Re: Additional Pressure Relief Valve Clarification Please

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Posted by GDC at 02/07/2010 11:33:04 pm

Please note that the pressure relief valves are NOT pressure regulators, nor are they pressure



switches. Each of these devices is different, and they perform substantially different functions. They may not be interchanged to satisfy the rules.

If you are using valves on the "low-pressure" portion of your pneumatic circuit that have a rating of less than 125psi, then you must add a pressure relief valve to the low-pressure portion of the circuit. Pressure relief valves are self-actuated safety valves that relieve excess pressure if it goes above the set point. Pressure relief valves are available from a number of sources.

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**Pneumatic System (2010)**

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**Using compressors rated for less than 120 PSI**

Using compressors rated for less than 120 PSI

Posted by 2010FRC2815 at 02/04/2010 07:38:11 pm

<R75> allows for alternate compressors that don't exceed the KoP compressor specifications. In particular, it defines the 120 PSI maximum pressure as just that--a maximum.

<R73> bans "Any pneumatic part or component rated for less than 125psi."

This appears to create a condition where there are no legal compressors, since the maximum pressure rating permitted under <R75> is below the minimum pressure rating requirement of <R73>. Indeed, the Thomas Industries 405ADC38/12--which we know and love (and lug around) as the kit compressor--is itself rated for 100 PSI maximum pressure ([url=http://www.gd-thomas.com/workareashowcontent.aspx?id=21654]source[/url]).

In short: Does <R75> take precedence over <R73> and allow teams to use a compressor rated for less than 120 PSI provided all other relevant conditions of <R75> are met?

Re: Using compressors rated for less than 120 PSI

Posted by GDC at 02/07/2010 11:31:41 pm

Although a selected compressor may provide less than 120psi output pressure, it must be rated to safely survive pressure environments of at least 125psi to satisfy the rules. Please note that the maximum output pressure specification for a compressor is NOT the same as the maximum safe pressure rating.

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**Pneumatic System (2010)**

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**Pneumatic Check Valves**

Pneumatic Check Valves

Posted by 2010FRC1086 at 02/05/2010 10:10:32 am

This part attaches to a cylinder port and allows air to freely exhaust in one direction, while also allowing pressure to flow into the cylinder from the other direction. The part uses a pneumatic check valve to accomplish this.

It is available off the shelf, has 1/8" NPT fittings and meets pressure requirements. Does this fall into the same category as flow controls, which have been ruled a legal part under <R72-F>? Is it otherwise legal to use this part?

Pneumatic Check Valves

Posted by 2010FRC3125 at 02/06/2010 01:31:18 pm



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Are pneumatic check valves legal this season?

Re: Pneumatic Check Valves

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Posted by GDC at 02/07/2010 11:31:06 pm

Check valves, or parts that contain check valves, are not explicitly identified as permitted parts in Rule <R72>. Therefore, under Rule <R71> they are prohibited.

**Pneumatic System (2010)**

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## Documentation for 125 psi rating

Documentation for 125 psi rating

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Posted by FRC2973 at 02/05/2010 11:50:06 am

In reference to Update #5 and Rule R72-c, I have received confirmation from SMC that their SY3000 series solenoids are "rated" at 125 psi even though their operating pressure is listed at ~100 psi. The documentation is outlined here:

[url]<http://www.chiefdelphi.com/forums/showthread.php?t=81946>[/url]

Is this documentation sufficient to show that these valves do not require an additional pressure relief valve?

Re: Documentation for 125 psi rating

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Posted by GDC at 02/10/2010 02:07:28 pm

Documentation from the manufacturer is acceptable proof that a part meets specific criteria. Please make sure to bring a copy of the documentation with you to Inspection.

**Pneumatic System (2010)**

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## Pneumatic Flow Control Valves

Pneumatic Flow Control Valves

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Posted by 2010FRC3125 at 02/06/2010 01:30:33 pm

Are pneumatic flow control valves legal?

Re: Pneumatic Flow Control Valves

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Posted by GDC at 02/07/2010 11:28:04 pm

As previously answered in [URL="http://forums.usfirst.org/showthread.php?t=14227"]this question[/URL], flow controls are considered connecting fittings and are permitted under Rule <R72-F>.

**Pneumatic System (2010)**

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## Pneumatics Questions

Pneumatics Questions

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Posted by 2010FRC2783 at 02/07/2010 06:05:13 pm

We have our current pneumatics system set up so air is directly teed off at the compressor. One tee goes to all the FIRST required system, and the other is split off again into two separate storage areas. Our question comes in here. Since we have the two separate Areas we would need to separate main regulator valves (one for each set of 120 psi storage tanks). Can we do this?

Also the rules state that the safety (automatic) release valve must be connected directly to the





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compressor. Can we have it connected to the compressor but have a T between it for pressure switch/pressure gauge connections? The connection between the compressor and the safety release would be 100% brass so I would assume this would work?

Re: Pneumatics Questions

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Posted by GDC at 02/12/2010 11:26:26 am

1- The primary regulator must be located between the high-pressure and low-pressure portions of the system. You may have as many storage tanks in the high-pressure portion of the system as you want, up to the limits specified in Rule <R01-B> and Rule <R71-A>.

2 - The safety release valve must be connected directly to the compressor. No intermediate fittings, connectors, or devices are permitted.

**Pneumatic System (2010)**

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### use of springs and/or gas shocks

use of springs and/or gas shocks

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Posted by 2010FRC2907 at 02/09/2010 12:35:22 am

Question about use of spring in a closed position that is released by motor operation, which when run, releases the springs. Otherwise, they are stored potential energy unable to release with power off. Energy release requires running motor and releasing length of cord and/or safety pin. Gas Shocks?

Re: use of springs and/or gas shocks

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Posted by GDC at 02/12/2010 11:30:09 am

We do not understand the question. Can you please rephrase this as a question about a specific rule or interpretation of a rule?

**Pneumatic System (2010)**

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### Mechanical Regulator Modification?

Mechanical Regulator Modification?

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Posted by 2010FRC2423 at 02/09/2010 04:05:25 pm

Can we rig a mechanical motor to the 60psi Regulator in order to turn it during the game? We'd like to control the pressure going to the piston based on how hard a kick we need and want to do this with a motor connected to a simple turning mechanism to adjust the otherwise manual regulator.

Is this legal per the rules, or would this be a modification to a pneumatic system that would be disallowed.

Re: Mechanical Regulator Modification?

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Posted by GDC at 02/11/2010 05:19:50 pm

If this can be done without modifying the regulator (e.g any interfaces added to the regulator do not alter its "fresh out of the box" condition), then no rules would prohibit this.

**Pneumatic System (2010)**

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### pneumatic questions

pneumatic questions

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Posted by 2010FRC0066 at 02/11/2010 10:45:02 am



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Hi,

We are a veteran team who just lost our major sponsor and all engineer mentors. We are operating on a very limited time and budget, please help!

Can we use the valves from KOP of years past: Festo VPLE18-MSH-4/2-1/4?

We can't locate the solenoid breakout, can I build my own?

Thanks

Re: pneumatic questions

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Posted by GDC at 02/15/2010 10:40:38 am

1 - Under Rule <R32> and Rule <R33> you may re-use COTS parts from prior years Kits Of Parts, as long as they have not been modified or altered.

2 - There is no rule that would explicitly prohibit you from building your own solenoid breakout. Note however that it would be considered a "custom circuit." Thus, it would be limited by Rule <R68> and the limited set of items that can be controlled by custom circuit outputs. So while you could build the breakout board, you can not use it to directly control pneumatic solenoid valves.

**Pneumatic System (2010)**

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## Regulators and Pressure Release

Regulators and Pressure Release

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Posted by 2010FRC2783 at 02/12/2010 07:39:18 am

We are setting up our pneumatics system so there is one storage system on each side. Both storage systems are feed by a single compressor but our question is, Can we have two main (60 psi) regulators. This would mean there would be one for each set of two tanks.

Also on the safety pressure relief valve, the rules say that it must be directly connected to the compressor, Can we have a few T's between the valve and the compressor?

Thanks,  
Engineers of Tomorrow

Re: Regulators and Pressure Release

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Posted by GDC at 02/15/2010 10:29:43 am

1 - No. Under Rule <R76>, all working air must be provided through [b]one[/b] primary regulator.

2 - No. The safety pressure relief valve must be directly connected to the compressor. No intermediate fittings, adapters, or connectors are permitted.

**Pneumatic System (2010)**

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## pressure relief valve not calibrated



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pressure relief valve not calibrated

Posted by FRC2973 at 02/12/2010 08:55:20 am

R77 states "The relief valve must be attached directly to the compressor. Teams are not allowed to adjust the 125-psi relief valve. The valve has been calibrated prior to shipping."

We have discovered that our KOP supplied relief valve is not correctly calibrated and does not relieve at 125 psi (it has gone over 150 psi without relieving). According to posts on Chief Delphi other teams have found this problem as well.

Is it acceptable to adjust the relief valve to set the relief pressure to 125 psi (using the KOP supplied gage as a reference) if it is not properly set as received in order to make the system safe?

Re: pressure relief valve not calibrated

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Posted by GDC at 02/15/2010 12:10:46 pm

Yes. Please see Team Update #11.

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**Pneumatic System (2010)**

**Servo-adjusted Pneumatic Regulator**

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Servo-adjusted Pneumatic Regulator

Posted by 2010FRC0529 at 02/13/2010 10:28:56 am

We were wondering if it would be legal to use a (KoP) servo to adjust our secondary regulator. Because it is downstream from the primary regulator, working pressure will never go above 60psi.

We are not permanently modifying the regulator, so it should not be in violation of rule <R72>

Re: Servo-adjusted Pneumatic Regulator

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Posted by GDC at 02/15/2010 10:37:43 am

There are no rules that prohibit this.

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**Pneumatic System (2010)**

**is this valve legal?**

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is this valve legal?

Posted by 2010FRC0066 at 02/14/2010 11:31:04 am

Is it legal to use Festo valve part #13026684 for this year's robot? Thanks.

Re: is this valve legal?

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Posted by GDC at 02/15/2010 12:49:55 pm

This is permitted per Rule <R33>.

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**Pneumatic System (2010)**

**Parallel Solenoids**

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Parallel Solenoids

Posted by 2010FRC2502 at 02/14/2010 11:34:35 pm

Is it legal to run two solenoids at the same pressure in parallel to a single actuator?

Thank you,  
Team 2502



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Re: Parallel Solenoids

Posted by GDC at 02/15/2010 12:51:35 pm

There is no rule that would prohibit this.

Pneumatic System (2010)

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## Using a hose as a pneumatic component for lifting a hook

Using a hose as a pneumatic component for lifting a hook

Posted by 2010FRC2493 at 02/16/2010 11:42:29 pm

We would like to use a discharge hose, inflated using the onboard FRC pneumatics system, to raise a hook and cable to grasp the tower for elevating our robot.

The hose would remain folded or coiled on the robot until it was inflated to lift the hook.

Once the hook is set on the tower, the hose would deflate and a winch system would be used to raise the robot.

We have found a supplier that will supply the hose at any length we want (probably 5-7 ft), less than 2" in diameter (it will be either 1.5 or 2 inches) with caps at either end of the hose, with one cap having a threaded hole that will fit the pneumatic connectors that come with the KOP and screw into the Bimba cylinders. The hose will be rated by the supplier at 150psi. It is a flexible vinyl type of hose. The supplier will build the hose to our specifications so no further modifications will be done other than to attach a hook to one end of the hose and a pneumatic fitting to the other end. The end with the pneumatic fitting will be securely mounted on the robot.

The web site for the supplier is The Hose-Man:  
[url]http://www.hose-man.com/sys-tmpl/door/[url]

We anticipate filling the hose with no more than 10psi, more likely we will be using 5psi, depending on the amount of weight we are lifting. A pressure regulator will be used to control the amount of pressure in the hose.

- o We are not intending to use the hose as an air storage system (<R01>B)<R72>A)
- o We think this should be permitted based on <R27>D as an additional air cylinder. There is no piston, so the stroke is under 24 inches and the diameter will be 2 inches or less.
- o The hose will be filled with the onboard FRC Pneumatic system so it does not fall into the category of this previous Q&A posting:  
[url]http://forums.usfirst.org/showthread.php?t=13703[url]

Would this type of system be legal? If not, which rule would it violate?

Thank you for your time

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Re: Using a hose as a pneumatic component for lifting a hook

Posted by GDC at 02/18/2010 09:13:03 pm

A hose used as a pneumatic actuator is not one of the devices explicitly permitted by Rule



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<R72>. Specifically, it is not a pneumatic cylinder, and is not permitted by Rule <R72-D>. Since it is not explicitly permitted by Rule <R72>, it is therefore prohibited by Rule <R71>.

**Pneumatic System (2010)**

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**Pneumatic valve Question**

Pneumatic valve Question

Posted by 2010FRC0378 at 02/19/2010 05:35:55 pm

1.) Are air piloted 4 way pneumatic valves permitted under the 2010 rules if they are tripped by the solenoid valve included in the kit of parts?

Re: Pneumatic valve Question

Posted by GDC at 02/21/2010 05:52:08 pm

Piloted pneumatic valves are not explicitly permitted by Rule <R72>. Therefore, they are prohibited by Rule <R71>.

**Pneumatic System (2010)**

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**Use of pneumatic tanks for non-pneumatic purposes**

Use of pneumatic tanks for non-pneumatic purposes

Posted by 2010FRC0619 at 03/12/2010 01:48:05 am

We have four of the KoP Clippard air storage tanks on our robot for the storage of compressed air for the pneumatic system. At the same time, however, we would like to use one or more Clippard tanks for other purposes. The extra tanks will not store compressed air (i.e. the pressure within the tank cannot and will not ever exceed atmospheric pressure, either before or during robot operation) and will not be connected to the pneumatic system.

Rule <R72> explicitly states that no more than four Clippard air tanks can be used on one robot. The rule does not specify how these tanks are used. Rule <R72>, however, only appears to deal with "pneumatic system items;" our extra "air tanks" will not be part of a pneumatic system. Therefore, to clarify, we have the following two questions:

1. Can we have a fifth Clippard air tank on the robot, provided the fifth tank is not used for a pneumatic purpose, cannot ever develop an internal pressure greater than atmosphere, and is not connected to the pneumatic system?
2. If the answer to 1 is "no," can we have a fifth air tank, following the constraints listed above, of similar size and specifications to the Clippard tanks, but from a different manufacturer? Rule <R72> would not cover these, while <R71> would perceivably not ban them as we would not be using them as a pneumatic component.

The way we currently interpret the rules, we believe that, to use a Clippard air tank for a non-pneumatic purpose, we would have to sacrifice one of the four tanks used for actual compressed air storage. If, however, we use an identical tank from a different manufacturer, we could use it along with all four compressed air storage tanks. This does not seem sensical (two virtually identical parts, one legal, one not), so we are asking for clarification on our interpretation.

Re: Use of pneumatic tanks for non-pneumatic purposes

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Posted by GDC at 03/16/2010 12:41:43 pm

1. Rule <R72> explicitly states that no more than four (4) Clippard storage tanks may be used on the robot. Use of a fifth Clippard tank, regardless of purpose, is not permitted.

2. There is no rule that would prohibit the use of a similar storage tank from another vendor, as long as it is NOT used as a pneumatic component in any way, shape or form.

The rules are structured this way to enable the inspectors to complete their jobs and get your robot approved for play in a reasonable and timely manner.

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**Pneumatic System (2010)**

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**Pneumatics at Start of Match**

Pneumatics at Start of Match

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Posted by 2010FRC0368 at 03/23/2010 05:27:55 am

Update 7 mentions about <R97> where safety interlocks are required during inspection if the robot needs to be powered on/pressurized to fit in the sizing box (pressurized to hold a kicker back).

Are safety interlocks also required while transporting the robot to the field (between the pit and the field) while pressurized? Or it is just a suggestion?

Re: Pneumatics at Start of Match

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Posted by GDC at 03/29/2010 12:48:31 pm

Safety interlocks are required for inspection. We **STRONGLY RECOMMEND** that the team use these interlocks while transporting the ROBOT, working on the ROBOT, etc.

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**Pneumatic System (2010)**

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**Off board compressor**

Off board compressor

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Posted by 2010FRC0368 at 03/23/2010 05:50:51 am

According to <R74> at a minimum the following are required ON THE ROBOT if pneumatics are used: Pressure gauges, pressure relief valve, pressure switch, vent valve.

Since the Pressure relief valve is connected directly to the compressor, if using an off board compressor are two pressure relief valves required? One directly connected to the compressor and one on the robot?

Or is the pressure relief valve mainly to protect against the compressor over pressurizing so having just the relief valve on the compressor (on or off board) okay.

Re: Off board compressor

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Posted by GDC at 03/29/2010 02:52:04 pm

1 - Yes and yes. If the compressor is mounted off-board of the ROBOT, then two pressure relief valves must be used - one connected directly to the compressor (as required by Rule <R77>) and one mounted on the ROBOT (as required by Rule <R74>).

2 - The pressure relief valve is required to prevent the pneumatic circuit from being



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over-pressurized either via the compressor, back driven cylinders, etc. This safety feature is necessary whether the compressor is mounted on the ROBOT or not.

**Pneumatic System (2010)**

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**Required number of vent valves on the robot when using an off board compressor**

Required number of vent valves on the robot when using an off board compressor

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Posted by 2010FRC0368 at 03/31/2010 11:00:40 pm

Rule 74 says that a vent plug valve is needed on the robot. Rule 79 says that if an off board compressor is used then ONE additional vent plug valve is needed on the compressor side (not the robot).

I would just like to clarify that if using an off board compressor, the same vent plug valve can be used to bring air in (from the compressor) and also release air to the system so only one is needed on the robot.

<R74> If pneumatic components are used on the ROBOT, the pneumatic system on the ROBOT must contain as a minimum

- Pressure gauges to display the “stored” and “working” air pressure (see Rule <R76>), the following components, connected in accordance with this section.
- A pressure relief valve, calibrated and set to release at 125psi (see Rule <R77>),
- A pressure switch, calibrated and connected to the ROBOT control system (see Rule <R78>),
- An easily visible and accessible pressure vent plug valve to manually relieve the stored pressure (see Rule <R79>).

<R79> The Parker pressure vent plug valve must be connected to the pneumatic circuit such that, when manually operated, it will vent to the atmosphere to relieve all stored pressure. The valve must be placed on the ROBOT so that it is visible and easily accessible. If the compressor is not used on the ROBOT, then an additional vent valve must be obtained and connected to the high-pressure portion of the pneumatic circuit off board the ROBOT with the compressor (see Rule <R74>).

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Re: Required number of vent valves on the robot when using an off board compressor

Posted by GDC at 04/05/2010 12:08:16 pm

If the compressor is located off-board of the ROBOT, then a minimum of two (2) vent plug valves are required. One must be located with the compressor, as part of the off-board assembly. One must be located on board the ROBOT, and located as required by Rule <R79>. The valve on board the ROBOT may also be used to connect the pressurized air supply between the off-board compressor and the ROBOT if, and only if, the vent plug valve off board with the compressor always has its vent port free and open without obstruction, and is available to vent the entire pressurized circuit at all times. This configuration would satisfy the safety considerations covered by Rule <R74> and <R79>.

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**Operator Console (2010)**

Operator Console (2010)

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**Classmate PC**





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Classmate PC

Posted by 2010FRC1403 at 01/13/2010 06:42:45 pm

As per R84 we must use the Classmate PC's but they are not available. Are we able to use other notebook PC's and are there any specifications we need to follow?

Re: Classmate PC

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Posted by GDC at 01/15/2010 12:03:34 am

The Classmate PC was provided to each TEAM in the KOP.

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Operator Console (2010)

## breadboard interface

breadboard interface

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Posted by 2010FRC0399 at 01/14/2010 12:45:38 pm

According to rule R82, the cypress board can only have connections on the breadboard included in the kit, could either a custom made circuit board, or COTs board be used to provide electrical connections into the board?

breadboard interface

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Posted by 2010FRC0812 at 01/14/2010 08:48:48 pm

Under rule R82, it states that the only interface is via USB or the FirstTouch I/O Module/breadboard (Cypress POSC 3). We believe that the connection via the breadboard is NOT robust enough and we would like to connect to a team made daughter board that bring the pins on the PSOC 3 board to a header similar to the one on last years drivers station. IE: an array of .1in pins with +3.3v and Gnd.

We have provided a copy of the schematic that we are proposing and a copy of the board layout.. As you can see, it just bring the pins out to a standard header eliminating the breadboard. The board provide no other function other that terminating the pins into a header.

\* Schematic and board layout was uploaded to the general forum under an identical post-I don't see where to upload here. I can email it if you need.

DRIVER STATION - The collection of the Classmate PC, FirstTouch I/O Module and breadboard provided in the KOP, and a USB hub (either the one provided in the KOP, or a team-supplied USB hub device).

<R82> Teams are permitted to connect a portable computing device (Laptop computer, PDAs, etc.) to the DRIVER STATION for the purpose of displaying feedback from the ROBOT while participating in competition MATCHES. Portable computing devices may only connect to the DRIVER STATION through one of the USB ports or through the breadboard – they shall not connect to the DRIVER STATION through any other port. Portable computing devices may only connect to the DRIVER STATION – they must not directly connect to any ARENA ports or equipment. Please note that AC power will not be available at the PLAYERS STATIONS so these devices will have to run on internal batteries or be self-powered.





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### IO board and breadboard usage

Posted by 2010FRC2826 at 01/16/2010 01:54:26 am

Are we required to use the IO board and breadboard unmodified as stated in <R60>? Specifically, can we not use the breadboard and create our own carrier circuit board and power interface to the Cypress IO board?

Re: breadboard interface

Posted by GDC at 01/18/2010 11:20:16 am

[I]No, the only permitted breadboard is that which is included in the 2010 KOP [I]

The answer above (italicized) was made in error. Please see Team Update #4.

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### Operator Console (2010)

#### Axis 206 Camera

Axis 206 Camera

Posted by 2010FRC0399 at 01/14/2010 12:58:43 pm

Can the output of the Axis 206 camera be displayed on a dashboard running on the KOP Classmate PC Driverstation during competition matches?

Re: Axis 206 Camera

Posted by GDC at 01/15/2010 09:25:33 am

Yes.

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### Operator Console (2010)

#### Joysticks

Joysticks

Posted by FRC1717 at 01/15/2010 12:43:22 am

This statement does not occur in the robot rules. Can we use more than three joysticks to control the robot?

Re: Joysticks

Posted by GDC at 01/15/2010 09:44:16 am

There is nothing in the rules that would prohibit this.

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### Operator Console (2010)

#### Dashboard to Robot Communication

Dashboard to Robot Communication

Posted by 2010FRC0537 at 01/15/2010 03:22:35 pm

LabVIEW dashboards running on a Driver Station (or a "portable computing device" connected to the Driver Station as per rule <R82>) can allow communication both to and from the robot. If a team uses C++ to code the robot, data can be sent from the robot to the Driver Station via the Dashboard class, but communication back to the robot from a dashboard program has not been implemented by the C++ library made by WPI. However, VxWorks has a built-in networking socket library which would allow dashboard software on a laptop within the same



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network to communicate to the robot (for very limited purposes such as providing minor tweaks and on-the-fly adjustment to values on the robot).

Is it legal for a team to use VxWorks's socket library to receive data from dashboard software on the Driver Station to their robot during a competition match? If so, what ports are open (not firewalled by the Field Management System and related software) that could be used for said communication?

Re: Dashboard to Robot Communication

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Posted by GDC at 01/20/2010 12:57:29 am

There is nothing in the LabVIEW dashboard to send data to the robot. The C/C++ and Java code also does not support sending data from the Dashboard directly to the robot. Both this year and last year FIRST has operated under the assumption that there was no dashboard to robot communications. Based on your question, we believe you are either misunderstanding some aspect of the dashboard, or confusing the built-in LabVIEW TCP/UDP functions with what is provided as part of the WPI Robotics Library.

While it is true that a user can create a socket connection between their dashboard and the robot and send whatever they want, this will only be available during development. The FMS network is configured such that only the specific ports defined by the FRC Communications Protocol are open to transmit/receive data from the Driver Station. This is done to prevent the robots from overrunning the available bandwidth.

Operator Console (2010)

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## Definition of 'User programmable "dashboard" code' in R60.A

Definition of 'User programmable &quot;dashboard&quot; code' in R60.A

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Posted by 2010FRC1002 at 01/16/2010 11:29:25 am

What is the definition of 'User programmable "dashboard" code' in R60.A? Would, for example, stripping out the existing Windows XP on the laptop, replacing it with Debian, and running a custom GTK+ dashboard application be legal in a competition setting? Or is that item limited to modifications of the official dashboard VI that shipped on the laptop?

Re: Definition of 'User programmable &quot;dashboard&quot; code' in R60.A

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Posted by GDC at 01/19/2010 09:25:09 pm

No, the Windows XP operating system is not considered part of the user programmable dashboard code. Do not remove it.

Operator Console (2010)

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## Operator Console Inputs

Operator Console Inputs

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Posted by 2010FRC0467 at 01/18/2010 06:28:06 pm

Are we allowed to use the Andymark Cypress Carrier board (<http://www.andymark.biz/am-0543.html>) to house the Cypress circuit board, or must we use the breadboard supplied?

Operator Console Inputs

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Posted by FRC111 at 01/19/2010 10:25:42 am

What are the legal devices that can be connected, via USB, to the Classmate PC for Robot



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Control? The rules in the Robot Manual and the Q&A seem to indicate that any USB joystick/HID device can be used, and, if the First Touch I/O module is used, it must be used with the supplied breadboard.

Could a team design their own custom electronics board that can be plugged directly into the USB port (and not use the First Touch I/O module at all) to provide further inputs into the OPERATOR CONSOLE.

-FRC111

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OPERATOR CONSOLE – the DRIVER STATION devices, and any associated equipment, control interfaces, display systems, structure, decorations, etc. used by the DRIVERS to operate the ROBOT.

### Operator Console Breadboard

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Posted by 2010FRC1094 at 01/20/2010 08:48:09 am

Just to be clear, is the Cypress carrier and enclosure (am-0564) made by eStop Robotics considered an illegal part and that the provided breadboard must be used instead?

### Re: Operator Console Inputs

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Posted by GDC at 01/24/2010 09:37:12 pm

Please see Team Update #4.

### Operator Console (2010)

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## Classmate has outdated files

Classmate has outdated files

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Posted by 2010FRC0362 at 01/19/2010 09:00:23 pm

Our Classmate PC does not have the latest files; it looks like it may have been a beta tester? We do not have a current 2010 cRIO image.

### Re: Classmate has outdated files

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Posted by GDC at 01/20/2010 10:42:29 pm

The image was created in September to be put on the Classmates during production. One of the first things you should do is update the software on the Classmate (cRIO image, Driver Station software, etc). It may also be necessary for the files to be updated during the build and/or competition seasons (although we will try to avoid that). Please keep an eye out for Team Updates and Bill's Blogs where software updates will be announced.

### Operator Console (2010)

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## Can't get Camera Image on Classmate PC

Can't get Camera Image on Classmate PC

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Posted by 2010FRC0997 at 01/20/2010 01:02:09 pm

We've already posted these question on the Java forums ([url]http://forums.usfirst.org/showthread.php?t=13898[url]), but haven't been able to get a complete answer to our questions. We were just given a possible solution to our problem, but before we uninstall and reinstall the driver station, we want to be sure we are on the right track. The posts are below.



### FIRST POST:

We've gone through everything in the documentation, but have been unable to get the image from the axis camera to show up on the classmate PC. When we hook everything up (camera connected to port 2 on the cRio) the lights turn green on the Classmate for communications and the robot code. However, the image area on the Classmate says the camera has timed out. Is there any Java code required that we need to write in order to have the video show up on the classmate PC, or should it just automatically show up?

What step are we missing? We created the FRC account and changed the root password on the axis camera following the steps in section 2.12 of the control system manual. As it says not to in 2.12, we didn't adjust any IP addresses for the camera.

Appendix A of the WPILib Users Guide talks about a PCVideoServer class, but this class isn't in the Javadocs. It also talks about sending to a Dashboard on IP 10.x.x.6, but the Classmate is automatically set to 10.x.x.5. Makes me think the Dashboard and Classmate are two different things. Does this PCVideoServer class not exist for the Java code? Do we need it for video on the Classmate?

### Quote from manual

#### "Images to PC

The class PCVideoServer, when instantiated, creates a separate task that sends images to the PC for display on a dashboard application. The sample program DashboardDemo shows an example of use.

Example 37: Sending image to the PC dashboard program. To use this code with the LabVIEW dashboard, the PC must be configured as IP address 10.x.x.6 to correspond with the cRIO address 10.x.x.2."

### SECOND POST:

We thought we had found a solution to our camera issue, but it didn't work. In the section 2010 Camera and Image Processing of the WPI Robotics Library User's Guide I came across the statement, "Once you retrieve an instance of the camera the server will be automatically available for video back to the dashboard. You don't have to write any code to enable this." Looking at the documentation for the function getInstance() in the AxisCamera class, I found that the camera isn't initialized until this getInstance() is called. The statement in the manual makes it sound like all we need to do to get the video on the Classmate is call getInstance(). However, this didn't work.

### POSSIBLE SOLUTION FROM JROSS:

Did you update the driver station software? After you updated the DS software, does the dashboard show a compass in the lower right corner?

Some people have had problems with the DS update not updating the dashboard (which is required for camera feedback). The solution is to uninstall the DS software and then reinstall it. The new dashboard has a compass while the old one does not.

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Re: Can't get Camera Image on Classmate PC

Posted by GDC at 01/21/2010 10:56:59 am



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This forum is for questions about clarifications and interpretations of the rules. Questions such as yours really need to be posted on the technical forums, as you did originally. Please focus the discussion there.

Operator Console (2010)

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### Driver Station Classmate corrupted?

Driver Station Classmate corrupted?

Posted by FRC3008 at 01/21/2010 08:02:18 pm

On kick off our classmate loaded fine. A week later it is showing an error and unable to load. Our tech coordinator thought it might be the OS system is corrupted. Any thoughts on how to get our classmate running? Mahalo!

Re: Driver Station Classmate corrupted?

Posted by GDC at 01/25/2010 08:47:34 am

Use the restoration key and the instructions in the control system manual (at the end of Section 1.5.5, [http://www.usfirst.org/uploadedFiles/Community/FRC/Game\\_and\\_Season\\_\\_Info/2010\\_Assets/1-2010FRCCControlSystem-Introduction-Rev-0.5%20.pdf](http://www.usfirst.org/uploadedFiles/Community/FRC/Game_and_Season__Info/2010_Assets/1-2010FRCCControlSystem-Introduction-Rev-0.5%20.pdf)) to restore your classmate.

Operator Console (2010)

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### Cypress Module And Robust Connections

Cypress Module And Robust Connections

Posted by 2010FRC0857 at 01/23/2010 07:13:02 pm

It is our determination that the stipulation in R82 and in the clarification <http://forums.usfirst.org/showthread.php?t=13781> here that teams use only the breadboard provided for any and all connections to the Cypress IO module will lead to control boards that are not robust enough to even survive the trip to and from the field, much less the match itself. Given that a breadboard is classically used only as a prototyping device from which a circuit is removed to more robust, permanent boards as quickly as it can be proven to work, can we make our own breakout modules (or purchase others', such as <http://andymark.biz/am-0543.html>) AndyMark's for the sole purpose of ensuring that our control boards can withstand the tests of competition?

Re: Cypress Module And Robust Connections

Posted by GDC at 01/24/2010 09:28:52 pm

Please refer to Rule <R82>, as amended in Team Update #4.

Operator Console (2010)

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### Since Team Update #4, may we use the Cypress carrier and enclosure from AndyMark?

Since Team Update #4, may we use the Cypress carrier and enclosure from AndyMark?

Posted by 2010FRC3126 at 01/24/2010 09:57:56 am

The way I read the <R82> rule change in Team Update #4, it appears that we are no longer required to use the breadboard with the Cypress PSoC 3 FirstTouch Kit I/O module, and we can now use the eStop Cypress Carrier and Enclosure available from AndyMark for more safe and robust mounting and I/O pin access. Is that correct? Many thanks.

Re: Since Team Update #4, may we use the Cypress carrier and enclosure from AndyMark?

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Posted by GDC at 01/24/2010 09:29:38 pm

Yes.

**Operator Console (2010)**

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**Custom Dashboard**

Custom Dashboard

Posted by 2010FRC1777 at 02/04/2010 08:28:22 am

We found a different custom dashboard on the Chief Delphi forums that greatly reduces camera lag. Is it legal to use a custom dashboard during the competition?

Re: Custom Dashboard

Posted by GDC at 02/07/2010 11:33:25 pm

There are no rules that prohibit custom dashboards.

**Operator Console (2010)**

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**Problem after imaging spare Classmate**

Problem after imaging spare Classmate

Posted by 2010FRC0138 at 02/09/2010 11:31:38 am

Got the spare Classmate, imaged it with the FIRST USB Flash drive. That was a mistake. The image doesn't have the necessary video drivers or wireless network drivers and a bunch of others that I haven't yet identified. By default, it logs on as "Driver", but the driver station doesn't fit on the screen (no video drivers!) which means it is unusable and I have to exit using CTRL-ALT-DELETE. Then I can log on as "Developer" but have been unable to find the correct drivers. I've just looked and didn't find them, either on the FIRST web site or on [ctl.helpserve.com](http://ctl.helpserve.com), where any Classmate downloads are supposed to be. All CTL has is downloads for the E09 but this is an E10. How about posting the correct drivers for the replacement Classmate on the FIRST web site?

Re: Problem after imaging spare Classmate

Posted by GDC at 02/18/2010 04:29:17 pm

A member of the FRC community (with whom you are likely familiar) has found a solution to this issue and posted it [[URL="http://forums.usfirst.org/showthread.php?t=14576"\]here\[/URL\].](http://forums.usfirst.org/showthread.php?t=14576)

**Operator Console (2010)**

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**Cypress IO board not seen in driver station**

Cypress IO board not seen in driver station

Posted by 2010FRC2614 at 02/09/2010 10:47:12 pm

We have flashed the Cypress IO board with the firmware from the Classmate PC v2.0.hex and the PSOC program sees the IO board from the developer account on the Classmate, but we cannot see the board from the Driver Station account. The Driver Station gives an error "unable to locate IO unit over USB. Any suggestions?

Re: Cypress IO board not seen in driver station

Posted by GDC at 02/12/2010 11:43:30 am

This forum is for questions about clarifications and interpretations of the rules. Questions such as yours really need to be posted on the technical forums. Please focus the discussion there.

**Operator Console (2010)**

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## Robot Controllers

### Robot Controllers

Posted by 2010FRC2484 at 02/22/2010 03:17:09 pm

Is it legal to control the robot with PS2 controllers at the competition, or do we have to control the robot with the supplied controllers?

Thanks

Re: Robot Controllers

Posted by GDC at 02/24/2010 04:01:05 pm

You may use any controllers that you like for the OPERATOR CONSOLE, as long as all the signals they produce are passed through the Classmate PC, and the connection to the DRIVER STATION is in compliance with Rule <R82>.

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## Operator Console (2010)

### Bandwidth Limitations

#### Bandwidth Limitations

Posted by FRC449 at 03/01/2010 10:15:56 pm

Last year, communications between the driver's station was heavily limited by the packet size used to send data. This year we have seen things such as custom TCP ports mentioned in previous Q&A posts as being legal. Additionally, the default code makes use of TCP port 1180 to stream video from the camera to the driver's station.

We were wondering if we could write custom code to send data over this port, and if we can, what the maximum bandwidth we could use would be.

Thanks,  
Team 449

Re: Bandwidth Limitations

Posted by GDC at 03/16/2010 12:44:42 pm

Please refer to this [URL="http://forums.usfirst.org/showthread.php?t=14951"]thread[/URL] and this [URL="http://forums.usfirst.org/showthread.php?t=14952"]thread[/URL].

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## Operator Console (2010)

### Driver Station Extra Battery

#### Driver Station Extra Battery

Posted by 2010FRC3238 at 03/07/2010 08:37:54 pm

Would it be legal to have a battery and a DC-AC inverter running in the OPERATOR CONSOLE to provide more uptime for the driver station?

Re: Driver Station Extra Battery

Posted by GDC at 03/16/2010 12:46:25 pm

There is no rule that would prohibit that.

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## Operator Console (2010)

### USB Ethernet adapter for classmate field connection





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USB Ethernet adapter for classmate field connection

Posted by FRC330 at 04/01/2010 12:23:20 pm

At the Los Angeles regional, many (approximately 1/3) of teams saw failures in the Ethernet port on the classmate. This problem was also mentioned in the LRI report for Oklahoma City, as well as the LRI/scorekeeper reports for several other regionals.

While the use of pigtails (connector savers) are permitted under <R84>, it does not help teams who's Ethernet ports have already failed.

In the [url=http://forums.usfirst.org/showthread.php?t=15239]LRI report for OKC[/url] it was mentioned that one team was given special permission to use a USB Ethernet adapter instead of the broken classmate Ethernet port. Can <R84> be amended to allow this? If not, what is the process for getting this permission at the championship.

Re: USB Ethernet adapter for classmate field connection

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Posted by GDC at 04/07/2010 10:47:29 am

Please see  
[URL="http://www.usfirst.org/uploadedFiles/Robotics\_Programs/FRC/Game\_and\_Season\_\_Info/2010\_Assets/Team\_Updates/Team%20Update%2020.pdf"]Team Update #20[/URL].

## Robot Inspection (2010)

Robot Inspection (2010)

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### Bill of Materials

Bill of Materials

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Posted by 2010FRC0049 at 01/21/2010 12:53:28 pm

the manual states:

<R21> All items and materials used in the construction of a ROBOT, and their associated costs, shall be recorded (in US dollars) in a consolidated Bill Of Materials (BOM). The BOM must use the FIRST-approved template available for download at [url]http://www.usfirst.org/community/frc/content.aspx?id=452[/url]. Please refer to Rule <R89> in Section 8.3.11 - Robot Inspection for information regarding submission of the BOM.

- All KOP items used on the ROBOT must be included in the BOM. The source for each of the KOP items should be listed as "KOP" and the indicated cost should be listed as "\$0.00."

I am unable to find the link am I overlooking it or when will the template be available?

Bill of Materials

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Posted by FRC49 at 01/28/2010 07:25:21 pm

Am I missing something? I have not found the template for the bill of materials. Where is it?

Bill of Materials

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Posted by 2010FRC0049 at 01/29/2010 01:03:07 pm

I have written 3 times inquiring about the Bill of Materials Template. I must be over looking it because I have been unable to find it. Where is it located?

Re: Bill of Materials

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Posted by GDC at 01/29/2010 04:30:05 pm





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The Inspection BOM Template has been posted  
[URL="http://www.usfirst.org/roboticsprograms/frc/content.aspx?id=452"]here [URL]under  
[B]Section 8 - The Robot[/B].

Robot Inspection (2010)

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**Pneumatics at Start of Match**

Pneumatics at Start of Match

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Posted by 2010FRC0135 at 01/28/2010 09:04:45 pm

If the robot has a spring to provide the energy to kick the ball and the "kicker" is held back in place with a pneumatic cylinder, can the pneumatic cylinder be energized to hold the "kicker" in position to meet the perimeter size constraints of the robot during inspection?

At the time of inspection and the beginning of the match, is the robot permitted to have a pressurized pneumatic cylinder to hold the kicker in position?

Mechanisms in a charged state during inspection?

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Posted by 2010FRC2177 at 01/29/2010 02:35:49 pm

Many manipulator designs for kicking the ball this year will include various methods of storing a large amount of energy that can be released suddenly. Per <G30>, these mechanisms may extend past the FRAME PERIMETER up to the BUMPER PERIMETER for short periods of time. It is not inconceivable then that teams will design systems that can store energy while the mechanism is inside the frame perimeter, and a discharged state would result in the mechanism being outside the frame perimeter. Such a design would require the robot to maintain that stored energy state in its NORMAL CONFIGURATION, which is permitted per <R01>.

During inspection, will the mechanisms be allowed to be in this charged state? This may include having pneumatic systems pressurized during inspection, or safety locking mechanisms in place that are removed from the robot prior to the start of the match. Would these locking mechanisms be considered part of the robot (for the purposes of sizing and weighing)? Does the robot need to be designed to fit within the size limits when devices like a high power kicker are not energized?

Thanks.

Re: Pneumatics at Start of Match

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Posted by GDC at 02/04/2010 07:25:36 pm

Please refer to Team Update 7.

Robot Inspection (2010)

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**<R97> Robot Configuration During Match**

&lt;R97&gt; Robot Configuration During Match

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Posted by 2010FRC0135 at 02/02/2010 10:09:55 pm

As stated in the Team Update #7, robot are allowed to have stored energy during inspection if both of the criteria stated are met. My question is: Are you allowed to use the stored energy also at the beginning of the match to satisfy rule <R97>?

Re: &lt;R97&gt; Robot Configuration During Match

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Posted by GDC at 02/07/2010 12:31:27 am

Rule <R97> applies to the state of the ROBOT during the inspection process. It does not apply to the beginning of the MATCH. Rule <R01> applies to stored energy at the start of the MATCH.

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### Robot Inspection (2010)

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## Robot Inspection Checklist

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### Robot Inspection Checklist

Posted by 2010FRC0771 at 02/17/2010 11:38:29 am

We are having trouble locating a copy of the 2010 Robot Inspection List. We have tried page 31 of Section 8 of the manual, "The Robot", which deals with inspection and a few other leads, but no luck yet. Any ideas?

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### Inspection Checklist

Posted by 2010FRC2358 at 02/17/2010 01:28:58 pm

With shipday less than a week away when will we have access to the official inspection checklist?

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### Re: Robot Inspection Checklist

Posted by GDC at 02/21/2010 06:01:56 pm

The [B][I]Inspection Checklist[/I]/[B] is now posted on the Game Manual website at [url]<http://www.usfirst.org/roboticsprograms/frc/content.aspx?id=452>[/url].

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### Robot Inspection (2010)

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## Rookie/Veteran KOP Differences and BOM cost

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### Rookie/Veteran KOP Differences and BOM cost

Posted by 2010FRC1676 at 02/23/2010 11:38:52 am

Rule <R23> states that all items provided in the 2010 KOP are EXCLUDED from the total cost calculation, but rule <R24> states that "Individual COMPONENTS or MECHANISMS retrieved from previous ROBOTS and used on 2010 ROBOTS must have their undepreciated cost included in the 2010 ROBOT cost accounting, and applied to the overall cost limits." This year, veterans and rookies were issued different kits of parts. It is our understanding that this was done to reduce the cost of the KOP, not to force BOM differences between veteran and rookie teams. We have two questions:

1. We are a veteran team using a Thomas compressor (405ADC38/12) from a previous year's KOP that was part of the 2010 Rookie KOP. This is exactly the same model number as this year's KOP compressor. May we record its cost as \$0.00 on the BOM?
2. Regarding pneumatic solenoid valves: one FESTO VUVG-L10-B52-T-M5-1P3-566458 is provided in the 2010 Rookie KOP. We do not have a previous year KOP solenoid valve with this part number. May we treat one of our SMC SY3420-5LOZ solenoid valves from the 2007 KOP as "in the kit" and assign it a cost of \$0.00 on the BOM?

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### Re: Rookie/Veteran KOP Differences and BOM cost

Posted by GDC at 02/25/2010 04:40:39 pm

1 - Yes. Please refer to the definition of "Kit Of Parts" in Section 8.2 of The Manual.

2 - No. The SMC valve is different from the Festo valve provided in the KOP.



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## Tournament Rules (2010)

### Tournament Rules (2010)

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#### 9.3.4 Match Seeding Points

##### 9.3.4 Match Seeding Points

Posted by FRC49 at 01/13/2010 02:49:17 pm

##### 9.3.4 Match Seeding Points

All teams on the winning ALLIANCE will receive a number of seeding points equal to the penalized score (the score with any assessed penalties) of the winning ALLIANCE.

All teams on the losing ALLIANCE will receive a number of seeding points equal to un-penalized score (the score without any assessed penalties) of the winning ALLIANCE.

In the case of a tie, all participating teams will receive a number of seeding points equal to their ALLIANCE score (with any assessed penalties).

This means that the losing alliance has a higher seeding score than the winning alliance. Could that possibly be correct?

Re: 9.3.4 Match Seeding Points

Posted by GDC at 01/15/2010 09:47:41 am

Please refer to the full text in Section 9.3.4, Section 9.3.5, and Section 9.3.7 (as amended in Team Update #1). The winning ALLIANCE will receive seeding points as defined in Section 9.3.4, plus seeding points equal to the Coopetition Bonus as defined in Section 9.3.5

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### Tournament Rules (2010)

#### Seeding/Ranking calculations

##### Seeding/Ranking calculations

Posted by 2010FRC2170 at 01/15/2010 02:47:47 pm

I would like clarification on whether this algorithm is in fact correct for seeding and ranking...it seems to favor losing team with low score; specifically asking if it is correct that the losing alliance gets the unpenalized winning teams score?

##### 9.3.4 Match Seeding Points

All teams on the winning ALLIANCE will receive a number of seeding points equal to the penalized score (the score with any assessed penalties) of the winning ALLIANCE.

All teams on the losing ALLIANCE will receive a number of seeding points equal to un-penalized score (the score without any assessed penalties) of the winning ALLIANCE.

In the case of a tie, all participating teams will receive a number of seeding points equal to their ALLIANCE score (with any assessed penalties).

Re: Seeding/Ranking calculations

Posted by GDC at 01/19/2010 10:26:38 am

Please refer to the full text in Section 9.3.4, Section 9.3.5, and Section 9.3.7 (as amended in Team Update #1). The winning ALLIANCE will receive seeding points as defined in Section 9.3.4, plus seeding points equal to the Coopetition Bonus as defined in Section 9.3.5



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Tournament Rules (2010)

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**Seeding Points Confusion**

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Seeding Points Confusion

Posted by 2010FRC2876 at 01/16/2010 07:24:38 pm

The concept of "Seeding Points" in the FRC Manual in Section 9.3 "The Tournament" "Qualification Matches" is very confusing and our team would like help grasping the concept.

From our understanding, "seeding points" are used to rank the teams and so they are more important than goals scored. Am I correct?

Are these equations correct?

Winning Alliance = alliance with most goals

Loosing Alliance = alliance with least goals

(Seeding Points of the Winning Alliance) = (Goals of the Winning Alliance) - (Penalty Points of the Winning Alliance) + (Cooperation Bonus of the Winning Alliance)

Only a tied or winning alliance can get Cooperation Bonuses?

(Cooperation Bonus of the Winning Alliance) = 2 \* (Goals of the Loosing Alliance)

(Seeding Points of the Loosing Alliance) = (Goals of the Winning Alliance)

And then it changes for a tie in number of goals, but that's rare so I won't ask about that.

It seems like from these equations, that a viable strategy for an alliance that knows its going to lose, is to shoot in the opponents goal so that the losing alliance gets the best deal in number of seeding points. And the best deal for the winning alliance is to shoot in the losing goal so they get double seeding points during the end of the game. Is this a legal tactic? Will we be penalized for it?

Thanks,  
Neil

Re: Seeding Points Confusion

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Posted by GDC at 01/28/2010 04:55:27 pm

The conclusions above seem consistent with the manual. There is no penalty that would deter a ROBOT from shooting into any of the available GOALS on the FIELD.

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Tournament Rules (2010)

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**Win/Loss/Seeding**

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Win/Loss/Seeding

Posted by 2010FRC2974 at 01/17/2010 02:30:43 pm

Is tournament Alliance ranking based off win/loss record and then seeding points or only seeding points?



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Re: Win/Loss/Seeding

Posted by GDC at 01/21/2010 10:50:29 pm

Win/loss record is not a factor in the seeding rank of a TEAM.

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**Tournament Rules (2010)**

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**Carrying of the robot after the match**

Carrying of the robot after the match

Posted by 2010FRC0639 at 01/19/2010 10:45:05 pm

A robot elevates itself on the side of the tower. At the end of the match, the robot is released from the tower, with one team member on each side of the bump. Is one of the members allowed to cross over the bump while carrying the robot, does a third member need to assist (the robot is 'passed' to the third, and the team member no longer lifting/carrying the robot is no longer restricted), or is there some other option to avoid violating the intent of <T15>?

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Re: Carrying of the robot after the match

Posted by GDC at 01/21/2010 10:48:35 pm

The recommended practice, which we believe offers the safest option, will be to remove the ROBOT from the side of the TOWER and lower it until it rests on the BUMP. Push the ROBOT off the BUMP, while one TEAM member guides it as it rolls down the BUMP. Then the TEAM member can safely step over the BUMP to the same side as the ROBOT, from where it can be safely lifted and carried from the FIELD.

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**Tournament Rules (2010)**

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**Wireless at Competitions**

Wireless at Competitions

Posted by FRC449 at 02/02/2010 10:48:08 am

Our scouting system makes extensive use of wireless networking. Will wireless networks be allowed at regional events for purposes unrelated to controlling the robot?

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Re: Wireless at Competitions

Posted by GDC at 02/07/2010 12:19:22 am

Please see Team Update 8.

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**Tournament Rules (2010)**

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**Short student lift**

Short student lift

Posted by FRC1501 at 02/24/2010 07:13:57 am

Hello

We have a student who is only about 4 feet tall. He is one of our drivers. He has a hard time seeing the robot from the drivers station.

Would it be alright if we had a step stool, that he can stand on, at the drivers station? He would be the only one using it.

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Re: Short student lift

Posted by GDC at 02/25/2010 04:54:02 pm

No, that would be a violation of Rule <T26>.



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Tournament Rules (2010)

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**FRC Communication Protocol**

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FRC Communication Protocol

Posted by FRC449 at 02/28/2010 09:55:02 pm

The answers to many questions regarding robot communications have referenced the "FRC Communication Protocol." We have not been able to find such a document on the usfirst website, or a link on FIRST forums. Where can we find said document?

Thanks,  
Team 449

Re: FRC Communication Protocol

Posted by GDC at 03/01/2010 12:19:23 pm

In order to protect the integrity of the competitions, the [B][I]FRC Communications Protocol [I][B]is not accessible to the public. Its contents are implemented by the Field Management System, and you do not need to design your system specifically to accommodate it.

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Tournament Rules (2010)

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**Practice Field Router**

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Practice Field Router

Posted by 2010FRC0368 at 03/23/2010 05:33:30 am

In the pit area, robots are required to be tethered. On the practice field and main field robots can be wireless.

In Portland we were asked to change out our wireless bridge on the robot (to one provided) on the practice field. We assume this is the same at all regionals and were wondering if it is required to be wireless on the practice field or if we could still be tethered.

Our concern is that since we did not plan for use of that bridge, when we connect it to our robot it's left unsecured in our robot (our current ethernet cable on our bridge also limits where we can put the practice field bridge).

Re: Practice Field Router

Posted by GDC at 03/29/2010 02:59:05 pm

There is no prohibition on running tethered on the practice field.

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Tournament Rules (2010)

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**Testing Robot off Tether**

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Testing Robot off Tether

Posted by FRC2973 at 03/25/2010 01:24:50 pm

[I]<T02> Radio control mode of ROBOT operation is not permitted in areas anywhere outside the ARENA or practice field. ROBOTS must only be operated by tether when not within the ARENA or practice field.[I]

This prohibition from running wireless with the team's radio except in the ARENA (although not stated in the manual, we were required to use an FRC provided radio on the practice field)



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precludes troubleshooting any problems with the telemetry system, since the tether takes that part of the system out of the loop. This has potentially contributed to the significant delays in starting matches since these problems must be corrected on the field during the reset period.

Would the GDC consider amending this rule to allow untethered operation in some managed way at each competition, such as at specific times and/or locations where it would not interfere with the matches taking place in the ARENA?

Re: Testing Robot off Tether

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Posted by GDC at 03/29/2010 12:43:40 pm

The use of [I]FIRST [/I]hardware at the Practice Field is to insure that teams are not required to reconfigure their own hardware after using the Practice Field to play on the Competition Field, which would likely lead to different and possibly additional issues. It is also controlled wireless that will not interfere with the field's access point. Use of team hardware to run wirelessly off the competition field may cause interference with the field and adds risk to the event.

This concept will be one of the things considered for 2011.

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**Tournament Rules (2010)**

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**Personnel for Weds at CMP**

Personnel for Weds at CMP

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Posted by 2010FRC1676 at 04/07/2010 12:29:52 am

It's a real benefit to be able to have up to 5 team members working on our pit and robot on Wednesday from 6-9 pm at CMP. Thank you for arranging this. I have a question about the personnel. Can we replace people who are in the pit area, as long as we don't exceed a total of five at any one time. Of course, there would always with at least one adult. I would like to have pit set-up people work on our pit for about an hour, then switch them for robot mechanics to take us through inspection and radio encryption.

Re: Personnel for Weds at CMP

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Posted by GDC at 04/12/2010 03:18:28 pm

Provided there are only 5 people per team in the pit at any given time, and they have the appropriate wrist band, there is no prohibition on trading people throughout the evening.

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**Tournament Rules (2010)**

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**Practice robot**

Practice robot

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Posted by 2010FRC0714 at 04/07/2010 05:29:41 pm

May a team bring a second robot to a competition that is for practice only?

Example: A team makes two copies of their robot design. One is the competition robot that is used on the playing field during practice matches and competition matches. The other is clearly labeled "PRACTICE ONLY" and is used on the practice field described in section 3.9.6 Practice Field of the FRC 2010 Manual.

Again, the second robot will be for PRACTICE ONLY and never touch the playing field.

Re: Practice robot

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Posted by GDC at 04/12/2010 03:19:35 pm

Any second or practice ROBOT would be considered a FABRICATED PART, and as such, would have to be included as part of the WITHHOLDING ALLOWANCE for the TEAM. If the second ROBOT can be accommodated in the WITHHOLDING ALLOWANCE, then it would be permitted. Otherwise, it can not be brought into the competition venue.

## Championship Additions (2010)

Championship Additions (2010)

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### Championship Schedule question

Championship Schedule question

Posted by 2010FRC0340 at 03/17/2010 01:46:03 pm

In light of the Championship schedule change, could teams be have WPA inspection as well as set up their pits [but not do robot work] on Wednesday evening to help streamline the process?

Re: Championship Schedule question

Posted by GDC at 03/23/2010 09:43:28 am

There will be some modifications to the Championship agenda in an effort to accommodate the earlier Qualification matches. Please stay tuned to [URL="http://frcdirector.blogspot.com/"]Bill's Blog[/URL] for updates as they become public.

## Kit Of Parts - General (2010)

Kit Of Parts - General (2010)

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### Classmate control

Classmate control

Posted by 2010FRC1403 at 01/15/2010 10:30:03 am

What happens if the classmate dies and we need to replace it. They are not available from manufacture to buy, what can we substitute to use as a back up?

Spare Classmate PC

Posted by 2010FRC0061 at 01/15/2010 02:16:15 pm

I would like to purchase a duplicate Classmate PC to keep on-hand in the event of a failure of the Classmate provided in the kit of parts. According to the "2010 Where to get more\_RevA.xls" spreadsheet, CTL Corporation has a replacement part. My team contacted CTL and they were not able to provide the exact Classmate PC that was provided in the kit, and they recommended this replacement (Link: [url]http://www.ctlcorp.com/v4/p-872-ctl-2go-classmate-pc-e10is-101-netbook-laptop.aspx[/url]) as a substitute.

Is there a source for an exact replacement Classmate PC as received in the kit of parts (IE A part number that we can order from CTL), or is there an authorized replacement model that we may purchase for use during a competition in the event of a failure of our primary Classmate PC at the event?

Re: Classmate control

Posted by GDC at 01/19/2010 09:59:49 pm

[URL="http://www.ctlcorp.com/v4/p-872-ctl-2go-classmate-pc-e10is-101-netbook-laptop.aspx"]





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This model[/URL]  
([url]http://www.ctlcorp.com/v4/p-872-ctl-2go-classmate-pc-e10is-101-netbook-laptop.aspx[/url]  
) is considered a REPLACEMENT PART for the kit Classmate and is permitted at competitions.

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**Kit Of Parts - General (2010)**

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**Batteries**

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Batteries

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Posted by FRC1717 at 01/19/2010 08:42:16 pm

Has FIRST arranged for this year's batteries to be available for a discounted price from any distributor this year? If not, are last year's batteries available for the discounted price?

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battery order

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Posted by 2010FRC0070 at 01/20/2010 10:14:52 am

When I go to the two websites listed for replacement batteries, both say part not found. Online all I find are np18-12B, can not find np18-12R. Any help on getting spare batteries? Thanks

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Re: Batteries

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Posted by GDC at 01/24/2010 09:43:11 pm

As described in the "Where to get more" document, additional batteries can be obtained from [url]www.enersys.com[/url] or [url]www.dantona.com[/url].

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**Kit Of Parts - General (2010)**

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**Autodesk Inventor License**

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Autodesk Inventor License

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Posted by 2010FRC0240 at 01/20/2010 12:58:39 pm

Over the past years we were allowed to have 10 seats of Inventor. This year I only can activate one license. Has there been a change or have I done something wrong? Autodesk sent me to FIRST for an answer.

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Re: Autodesk Inventor License

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Posted by GDC at 01/24/2010 09:44:51 pm

This year there is no limit to the number of seats/licenses a team can access. But rather than a single multi-seat license for a single team (as has been done in prior years), this year Autodesk is granting free software to each and every FRC student (and faculty and mentor) team member that wants it. No limit. But the license and activation has to be on an individual basis. To get the software, each team member can sign up through the [URL="http://students5.autodesk.com/?nd=first\_home"]Autodesk FIRST[/URL] web site.

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**Kit Of Parts - General (2010)**

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**Wireless Bridge**

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Wireless Bridge

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Posted by 2010FRC3415 at 01/20/2010 02:28:15 pm

Our wireless bridge is non-functional. I got in the phone with Linksys and after going through all of their little steps to try to revive it they said I should take it back to where I got it.

Jeremy Harber  
3415



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Radio Help

Posted by 2010FRC0353 at 01/21/2010 02:08:35 pm

The radio for the robot (dual-band wireless-n game adapter PN :WGA600) has been discontinued and replaced with the wireless-N Dual Gaming Adapter PN: WGT 610 is this new part legal to use and will be compatible with the robot? Thanks

Re: Wireless Bridge

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Posted by GDC at 01/29/2010 09:03:58 am

1 - Replacement parts must be requested via the process outlined in Section 10 of The Manual.

2 - Please refer to Rule <R58>.

Kit Of Parts - General (2010)

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**Replacement Classmate - Image works?**

Replacement Classmate - Image works?

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Posted by 2010FRC2785 at 01/22/2010 09:50:58 am

Hello-

on another thread (<http://forums.usfirst.org/showthread.php?t=13805>) the GDC pointed to "This model (<http://www.ctlcorp.com/v4/p-872-ctl-2go-classmate-pc-e10is-101-netbook-laptop.aspx>)" as a REPLACEMENT part for the KoP classmate and stated that it would be permissible at competition.

Does FIRST have a position on whether the image shipped with the KoP will or will not load on this replacement classmate? I don't really know how imaging works and how hardware-specific it may be; forgive me if this is a simple question.

Re: Replacement Classmate - Image works?

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Posted by GDC at 01/24/2010 09:45:29 pm

Yes, the image shipped with the KOP will load onto the identified replacement version of the Classmate PC.

Kit Of Parts - General (2010)

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**Fisher-Price motors**

Fisher-Price motors

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Posted by 2010FRC2175 at 01/23/2010 01:33:00 am

It appears that a number of teams, including mine, have received a Fisher-Price motor in the Kit of Parts with a 15 tooth pinion on it.

Would it be legal to use a Fisher-Price motor (of the same -9015 model number) with a 19 tooth pinion, either from a VENDOR or from a previous year as a one-to-one replacement for one included in this year's KOP to allow compatibility with the plastic gearbox included in the kit?

Re: Fisher-Price motors

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Posted by GDC at 01/29/2010 04:36:18 pm



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There are not rules that would prohibit your proposal. Meanwhile, we're checking on the different motors to determine what was shipped to teams. Thank you for letting us know about the issue.

Kit Of Parts - General (2010)

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## Pneumatics Gages

### Pneumatics Gages

Posted by FRC2813 at 01/25/2010 04:23:25 pm

I was seeking the second pressure gage and did not find it listed as a KOP or as a Vet/Rookie variation. Am I correct in noting that there was only one pressure gage in the KOP and neither the veteran or rookie teams will have 2 in KOP? Thus requiring purchase of a second pressure gage to meet the pneumatics design requirements of indications of both high and low pressure.

### Re: Pneumatics Gages

Posted by GDC at 02/02/2010 08:09:56 pm

That is correct.

Kit Of Parts - General (2010)

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## Setting up another camera to replace Axis 207

### Setting up another camera to replace Axis 207

Posted by 2010FRC2603 at 01/26/2010 04:47:15 pm

OK,

We've gathered that the Axis 206 is no longer available to purchase and veteran teams that don't have one are out of luck. Instead of investing a few hundred dollars to see if another Axis model works, we'd like to investigate borrowing a non Axis network camera from one of our sponsors.

Are there general instructions out there that will confirm if a non Axis camera will work with the cRIO?

Thanks...

### Re: Setting up another camera to replace Axis 207

Posted by GDC at 02/15/2010 10:24:54 am

Generally speaking all Axis cameras are expected to work with the existing programming libraries, however they have not been tested sufficiently. Ultimately, the determination is left to the team, based on the particular camera that they may choose.

Kit Of Parts - General (2010)

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## Fisher Price Motors -Pinion count

### Fisher Price Motors -Pinion count

Posted by 2010FRC3189 at 01/28/2010 03:45:11 pm

We have a dilemma and are not sure how to solve it. We discovered that both our Fisher Price motors are 15 tooth pinion, rather than the 19 tooth pinion stated on the checklist. The gear box we recieved is a 19 tooth pinion. These do not work together. We did not count pinion



## 2010 Q&A Forum Export

generated: 11/12/2010 02:32:26 pm EST

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teeth when conducting our KOP inventory. What we have looks the same as what is on the checklist until you count the teeth. Please help!

On Checklist:

FisherPrice Motor (2)

12VDC w/ 19 tooth pinion, -9015 motor

What we received in KOP:

FisherPrice Motor (2)

00968-9015 15 tooth pinion

1060517

3K1452 47

Thanks!

Re: Fisher Price Motors -Pinion count

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Posted by GDC at 02/07/2010 12:15:46 am

Please see Team Update 8.

**Kit Of Parts - General (2010)**

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### Axis 206 camera

Axis 206 camera

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Posted by 2010FRC2119 at 02/03/2010 04:14:10 pm

The Axis 206 camera is specified in the rookie KOP. Our team lost our camera from last year's KOPs and have tried for a couple of weeks to find an Axis 206. We have gone through many suppliers and the camera is either listed as "not available" or "discontinued". Upon communication to Axis we are told that the camera is discontinued, not available, and that we need to order the replacement model M1011 series camera. So how about it GDC, can we substitute with the M1011? If not, then please suggest a source to locate a camera. Thanks.

Re: Axis 206 camera

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Posted by GDC at 02/15/2010 10:26:03 am

There is no rule that would prohibit this.

**Kit Of Parts - General (2010)**

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### Targus usb port bad

Targus usb port bad

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Posted by FRC175 at 02/16/2010 04:07:31 pm

It appears that the USB port that came with the kit of parts made by Targus, has died. From the sounds of things on Chief Delphi, others have had the same issue; refer

[url]<http://www.chiefdelphi.com/forums/showthread.php?threadid=80313>[/url]

Will FIRST be replacing these USB hubs under warranty?

Re: Targus usb port bad

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Posted by GDC at 02/21/2010 06:05:56 pm

The hubs are under warranty with Targus. Please see the attached document regarding



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information on contacting Targus regarding a bad hub.

**Kit Of Parts - General (2010)**

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**Replacements for Kit Motors**

Replacements for Kit Motors

Posted by 2010FRC0293 at 02/18/2010 11:23:48 am

Only a single copy of each of the Mabuchi motors has been supplied in the KOP, and the "Where to find more" listing indicates that spares are not available. What provision has been made for teams to obtain replacements for these motors in case of failure?

Similar motors cost only a few dollars and are readily available from multiple sources, but of course are prohibited by the explicit rules governing motor usage. The GDC does not often provide insight into the origin of rules, but we wonder what purpose is served by creating this conundrum. Prudent engineering practice would suggest that teams have spares for these inexpensive but vulnerable parts.

Thank you.

Re: Replacements for Kit Motors

Posted by GDC at 02/18/2010 04:54:12 pm

Please refer to the Spare Parts Inventory list posted [URL="http://www.usfirst.org/uploadedFiles/Community/FRC/Game\_and\_Season\_\_Info/2010\_Assets/Spare%20Parts%20List.pdf"]here[URL].

**Kit Of Parts - General (2010)**

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**KOP components at Regionals and NATS**

KOP components at Regionals and NATS

Posted by FRC175 at 02/22/2010 10:05:46 am

Has FIRST posted, a list of KOP components that will be available for robot repair during Regionals and Atlanta. Also remind teams that good idea to bring components with them that they did not use on their robots, as they may be useful to other teams.

Re: KOP components at Regionals and NATS

Posted by GDC at 02/24/2010 06:42:11 pm

While [I]FIRST [I]will attempt to have limited amounts of spare KOP items available at the competitions (the list is posted [URL="http://www.usfirst.org/uploadedFiles/Community/FRC/Game\_and\_Season\_\_Info/2010\_Assets/Spare%20Parts%20List.pdf"]here[URL]), the exact list of items available may vary from event to event. It is impossible for [I]FIRST [I]to predict every item that may potentially be needed for a given robot. So, it must ultimately be the team's responsibility to bring any critical or necessary spares and supplies that may be needed to maintain their robot.