ROBOTICS CHALLENGE

THIS IS A CHAPTER EVENT AND SHOULD BE ENTERED IN THE CLUB NAME (ex. Smith High School TSA).

Enter online at www.GeorgiaNationalFair.com
(http://www.georgianationalfair.com/youth-educational-exhibits/) by September 13, 2017.

DIVISION 40801 Robotics Challenge

CLASS
01 High School Tractor Pull
02 Middle School Tractor Pull

OBJECTIVE: Design and build a robot that will pull a sled in a tractor pull style event. Robots must meet the criteria and constraints set forth. Robots will compete in elimination rounds with each round requiring the robot to pull a heavier and heavier "Full Load".

Entries are limited to one per chapter with up to three members on each team.

PROCEDURES: Students should submit the completed robot for inspection during check-in at the GNF Reaves Arena. Go/No Go criteria will be used to determine eligibility.

A copy of the online registration confirmation will be required to check-in for competition.

CONTEST RULES:

1. **All exhibitors are required to read and abide by the Georgia National Fair General Rules and Regulations. PLEASE NOTE: IT IS YOUR RESPONSIBILITY TO READ AND UNDERSTAND THE RULES. If you have questions, you may certainly e-mail us at sprice@gatsa.org or contests@gnfa.com. Please help us prevent entry disqualifications.**
2. Robots must pass a GO-NO-GO inspection including a safety inspection to insure no harm or damage will occur. Any robot not passing full Go-No-Go inspection will be disqualified.
3. Criteria and Constraints:

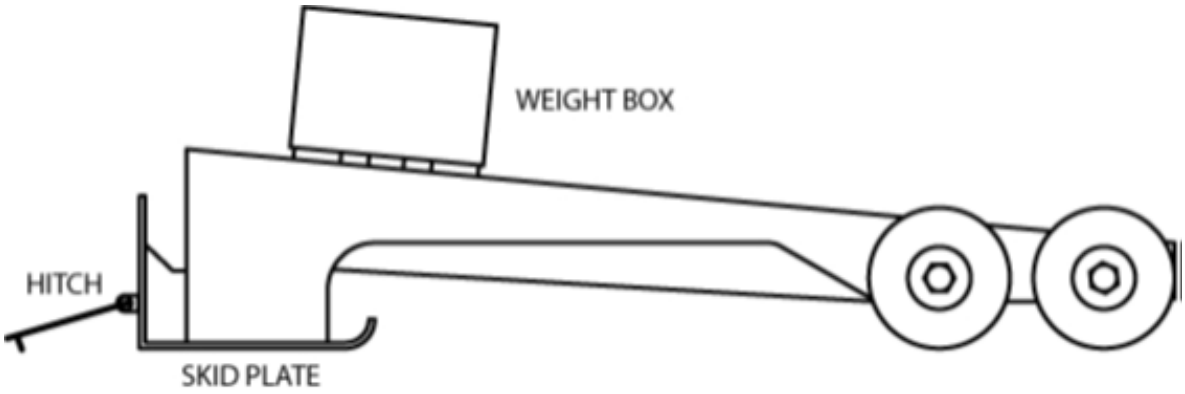
- Robot can use no more than 4 motors: VEX, FLL, or any DC Motor
- Robot can have no more than 6 wheels: VEX, FLL, or custom
- The robot cannot be constructed using glue, tape, cardboard, and packing materials. Acceptable materials include VEX parts, FLL parts, or custom created metal chassis.
- Robots should be no more than 12"x12"x 8" (WxDxH). They may not expand beyond their starting size constraints.
- The robot may not exceed 6 pounds in weight (including the battery).
- Each robot must have a strong horizontally mounted hitch point on its centerline .75" from the floor for attachment to the sled hitch. This hitch must be able to accommodate a hitch pin that measures 3/8" in diameter. This hitch should be sturdy because it will be the main connection your robot has to the Full Pull XL sled. If a hitch fails during a pull, the team may not retry the pull.
- Robots may not be modified during the event. They can be repaired with referee approval. No significant changes can be made during the repair. The robot must be re-inspected before it will be allowed to compete. Teams may be requested to submit to random inspections by event personnel. Refusal to submit to the inspection will result in disqualification. Referees or inspectors may decide that a robot is in violation of the rules. This will result in a disqualification.
- Robots may not lift the front of the sled. The skid plate must maintain contact with the playing surface at all times.
- The robot must be student constructed and NOT from a preassembled kit. For example, RC devices from a box may not be used.

The Track:
The track is constructed of commercial-grade, low pile carpet. The pulling area is designated by a taped outline that measures 20" wide and 72" long. All other areas outside of, and including, the tape is considered out of bounds.

ROBOTICS CHALLENGE (continued)

The Sled

The Full Pull XL sled is 29 inches long and weighs approximately 15 pounds when empty. The skid plate rests on the track surface, and all four rear tires are free to rotate. The sled utilizes a chain and sprocket system to move the weight box up the back of the sled as it moves forward. At the start of a pull, all of the weight is over the sled's rear wheels. As the sled is pulled along the track, the weights are pulled forward of the sled's wheels. This pushes the front of the sled into the carpet, increasing friction. As the weight is added to the sled, the resulting forces increase and eventually overwhelm the pulling device.



Device (Go or No-Go)

- Does the robot meet the maximum motor specifications (no more than 4)?
- Does the robot meet the maximum wheel specifications (no more than 6)?
- Is the robot made from VEX, FLL, or a metal chassis?
- Is the robot within the size specifications?
- Is the robot within the weight specifications?
- Is the robot a custom built robot?
- Is there a hitch point per the criteria and constraints?

The Competition:

1. Robots will be attached to the sled and positioned such that the sled is lined up with the track starting line, and the robot is in front of the sled on the track.
2. A "Full Pull" is achieved when the front of the sled crosses the tape at the end of the pulling track. A "Full Pull" is 72 inches. Robots must make it the entire length of the course within 60 seconds or they will be eliminated.
3. The first pull will consist of robots attempting a "Full Pull" of the sled only (the sled weight box will be empty). The 10 robots that complete a "Full Pull" in the quickest amount of time will advance to the next pull.
4. In the second and following pulls, increments of five pounds of weight will be added to the sled. Pull rounds will continue until the top 10 ranking is achieved. If the final few robots are all eliminated pulling the same amount of weight, the winner will be determined by which team pulled the greatest distance. In the unlikely instance that there is still a tie, the amount of time it took to achieve the distance will be used.
5. During the pull, the driver must remain at their station until released by the referee.
6. There may be only one driver for each pull.
7. If a robot makes contact with or goes over the taped field outline, it will not be allowed to return to the pull.
8. Once a team begins a pull, the may not stop and restart or reverse direction.
9. If a robot becomes stuck or disabled on the pull track or any track element, or if a team's power fails during a pull, no interventions may be made.
10. If at any time the robot operation is deemed unsafe or has damaged the playing track surface or sled, the referees will stop the pull and the offending team will not be allowed to finish their pull.
11. In case of a sled failure, the pull will be replayed.

<u>The top 10 robots will be left for display at the Georgia National Fair. However, the battery, remote control, and microcontroller, in example VEX Cortex Microcontroller, will be allowed to be removed from the robot. The chassis and drivetrain (wheels and motors) will not be allowed to be removed. Robots will be returned to schools after the Georgia National Fair.</u>