

**Important:** All volunteers supporting events in the United States and Canada must be screened and assigned using the Volunteer Management System and are required to complete their certification test using the [online volunteer certification](#) system.

This test is provided publicly for team use and volunteer certification at events outside of the United States and Canada.

## Revision History

Revision	Date	Description
1.0	10/15/2024	Initial Release
1.1	10/21/2024	Corrected answer to Q14 in answer key

## Questions

- Q1. The lead ROBOT inspector passes a ROBOT. On the field, the head referee states that it violates the rules and refuses to allow the ROBOT to compete. Who makes the final decision to allow the ROBOT to compete?
- A. Lead ROBOT inspector
  - B. Event director
  - C. Head Referee
  - D. *FIRST* Technical Advisor
- Q2. Exactly one ROBOT main power switch must control all power provided by the ROBOT main battery pack.
- A. True
  - B. False
- Q3. The maximum allowed number of DC motors on a ROBOT is:
- A. 4
  - B. 6
  - C. 8
  - D. 12
- Q4. A team shows up at inspection with a ground wire that drags on the playing field. They explain their design is to ground the robot to the playing field floor to protect against electrostatic discharge (ESD). Is this legal?
- A. Yes
  - B. No

- Q5. Possessed pre-loaded game elements may extend outside the 18 inch cube starting volume constraint.
- A. True
  - B. False
- Q6. Electrically grounding the ROBOT Control System electronics to the frame of the ROBOT is permitted using an unmodified REV Robotics Resistive Grounding Strap or an AndyMark Resistive Grounding Strap.
- A. True
  - B. False
- Q7. The maximum number of servos on a ROBOT is
- A. 4
  - B. 6
  - C. 8
  - D. 12
- Q8. The following are required for a ROBOT SIGN to be legal (select all that apply)
- A. Must be placed on two surfaces of the ROBOT,  $\geq 90$  apart
  - B. Contain the team number, with numbers approx. 2 inches tall
  - C. Numbers must be stacked vertically
  - D. Numbers can be powered to illuminate/reveal numbers
  - E. Sign must indicate alliance color, with a solid red or blue background
- Q9. Allowed exceptions to the maximum 18 inch (45.72 cm) cube ROBOT starting size constraint include (select all that apply):
- A. Pre-loaded game elements may extend outside the starting size constraint.
  - B. The ROBOT SIGN may extend outside the starting size constraint.
  - C. Flexible materials may extend up to 0.25 inches (0.635 cm) beyond the starting size constraint.
  - D. COMPONENTS used strictly for decoration may extend outside the starting size constraint.
- Q10. A secondary ROBOT power switch downstream of the main power switch is allowed, provided that it is a legal power switch listed in rule R609.
- A. True
  - B. False
- Q11. Powered USB hubs can only be powered through
- A. An approved COTS battery pack per rule R602
  - B. The ROBOT main battery
  - C. The 5V auxiliary on the REV Expansion Hub or REV Control Hub
  - D. Regulated voltage from a CUSTOM CIRCUIT
- Q12. Rule R104 limits horizontal ROBOT expansion to a maximum of

- A. 18" x 18"
- B. 24" x 24"
- C. 20" x 42"
- D. 30" x 50"

Q13. A ROBOT is placed in the horizontal size boundary to be inspected. The ROBOT includes an arm that, if completely extended, exceeds the horizontal limit. However, the team can demonstrate that software will keep the arm within the horizontal limit. Does this ROBOT satisfy the rule and pass inspection?

- A. Yes
- B. No

Q14. Power and motor control wires must use consistent color coding with different colors used for the positive (red, white, brown, or black with a stripe) and negative/common (black or blue) wires.

- A. True
- B. False

Q15. A team has rule compliance problems with their ROBOT; what should you do?

- A. If the problems are major, kindly tell them that they have failed Inspection and should come back when they have fixed the problems.
- B. Suggest that they get help from an experienced team.
- C. Collaborate with the team to help them come up with a few possible solutions that will fix their problem.
- D. All of the above.

Q16. During ROBOT inspection, the ROBOT is evaluated for size twice; once for measuring the STARTING CONFIGURATION (R101), and the second time to measure the horizontal size boundary (R104).

- A. True
- B. False

Q17. Which of the following are allowed on a ROBOT (Select all that apply)

- A. Gas springs.
- B. Air-filled (pneumatic) wheels.
- C. Ratcheting devices (wrenches, bearings, etc.).
- D. COTS swerve drive modules.

Q18. Which of these are true of servos?

- A. They must have 8W or less of mechanical power at 6V.
- B. They must have 4A or less stall current at 6V.
- C. They can be modified per the manufacturer (programmed).
- D. They can be controlled via a CUSTOM CIRCUIT.

## Answer Key

---

- Q1. C – per Section 10.7 and rule T201
- Q2. A – per R609
- Q3. C – per R503
- Q4. B – per R611 part C
- Q5. A – per R101 part A
- Q6. A – per R611
- Q7. D – per R503
- Q8. A, B, E – per R401, R402, R403
- Q9. A, C – per R101
- Q10. A – per R609 part D
- Q11. A, C – per R617
- Q12. C – per R104 part B
- Q13. A – per R104
- Q14. A – R616 exempts wires on the output of motor controllers from wire color.
- Q15. D
- Q16. A
- Q17. B, C – A is illegal per R207, D is illegal per R307 as swerve modules are multi-DoF.
- Q18. A, B, C – per R502. Part D is illegal per R505, CUSTOM CIRCUITS cannot control actuators.