

Name: _____

Date: _____

Subteam: _____

CougarTech Training Module Electrical – General Safety

Learning Material

Please read the following

General Electrical Rules:

Always turn off the robot before working on it and never have your hands near moving parts. To check if the robot is on or off, look at the switch located on the electrical board. If you press the red button, it will release and turn off the robot. When connecting components, make sure that the ground (usually black) and hot (usually red) are connected properly. If they are not, this could cause the component to be damaged.

Battery Safety: In order to power our robots, we use high-current, 12V batteries. These contain sulfuric acid, which can burn through your skin and clothing. Therefore, it is very important to handle the batteries with care. Batteries are stored and charged on the battery cart. You should never connect the terminals or leads of a battery directly together or plug batteries into each other as this could cause them to explode.

Carrying: When carrying a battery, two hands should be used at all times and should not be held by the attached wires or plug. If the battery is dropped, it should be immediately reported to a mentor or the Safety Captain and taken out of service. Even if the battery that has been dropped does not have a visible crack and is not leaking, it could be damaged internally and should not be used.

Leaking battery: If the battery is leaking, baking soda (NaHCO_3), located in the battery cart, should be sprinkled over the spill to neutralize the acid. The neutralized spill can then be cleaned up with paper towels and water. The battery should be handled with thick rubber gloves and placed in a leak proof container. The MSDS (Material Safety Data Sheet) on the 12V batteries is available for reference in the shop and pit. The battery can be disposed of at FIRST events or at the Interstate Batteries Company. If skin comes in contact with the leaking acid, flush the area with a lot of water, more than you think is necessary and then seek medical attention.

Using a voltmeter: Before a robot is taken to the competition field, a new battery, measured with more than 12V, should be placed on it. In order to measure the voltage of a battery, a voltmeter is used. Take the voltmeter and turn the knob clockwise to the 20V scale, connect red to red and black to black and read the voltage displayed. The red wire should be in the volt plug and the black wire in the COM plug. Always be sure the battery is secure on the robot.



Material Quiz

Answer the following questions

1. Where should your hands be on the battery when carrying it?
2. What chemical do you pour on a battery spill?
3. Is it ok to directly connect the terminals of a battery together?
4. What voltage level is acceptable for a battery to be used in a match?
5. How can you turn off the robot?

Practice/Assessment

Find a qualified mentor and follow the procedure under observation.

Task: Show a mentor that you can use a voltmeter correctly to measure the voltage on a 12V battery.

Mentor name: _____

Signature: _____

Date: _____