

# NAVIGATING SCRUTINEERING SOLAR CAR CHALLENGE

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## Pre-Scrutineering Activities

- (1) Prepare a three-ring scrapbook that contains every document your team submitted to the Solar Car Challenge. This includes the official registration documents, all “spec” documents, Emails, waiver requests, and other communications with the Solar Car Challenge staff.



- (2) Make sure that your document scrapbook has all of your needed computations:
  - (a) calculated efficiency of your solar array
  - (b) Kw/hr capacity of your battery pack
  - (c) Battery capacity at 20 hour discharge rate
- (3) Make sure you have samples of key materials used in your solar car. A small piece of the roll bar material, roll cage material, grade 8 bolts, batteries, wiring, etc. will expedite your visit to Scrutineering Station One and Two.
- (4) Select two team members to be your representatives during Scrutineering. Have these representatives use the Scrutineering Packet as a guide. Before you ever leave your school, go through every question asked in the Scrutineering Packet . . . and know the answer to every question.

These same two team representatives should escort the solar car through all the Scrutineering stations. Remember that teachers and consultants cannot be present at Scrutineering stations. [100' rule]

- (5) The team should know how to safely move and lift the solar car. Specifically, Scrutineering Station No. 3 requires the solar car to be tilted thirty degrees, but do the representatives know where to safely place the jack without damaging your solar car? Teams should practice this “tilt process.” Well prepared teams will bring their own jack and materials to enable a safe tilt of their solar car.



- (6) The team should practice the “turning radius” test. Rule 5.11.1 requires solar cars to be able to make a “U” turn within 15 meters.
- (7) The Solar Car Challenge provides a registration document evaluation prior to a team’s arrival at Scrutineering. Please make sure you have a copy of that evaluation with you at the time of Scrutineering, and that **you have addressed the problems or issues** spelled out in that pre-Scrutineering evaluation.

## **Scrutineering**

- (1) Scrutineering begins at 8:00 AM on the first day. Make sure your solar car is ready for inspection at 8:00 AM. Rule 7.1 requires a penalty to be assessed to a team not ready to begin Scrutineering at this time.

Some teams arrive at Scrutineering thinking they will have time to finish vehicle construction and testing. This is not the case. Your solar car must be finished when you arrive at Scrutineering. [Of course, work can be done at the hotel parking lot before you arrive at Scrutineering.]

- (2) Practice going through Scrutineering before you ever leave your school. Ask several knowledgeable people to scrutineer your solar car before you leave home. This helps you identify problems, as well as provides Scrutineering Representatives practice answering questions. This builds confidence.

Guiding Principle: Teams that appear to be well prepared exude confidence, and Demonstrate familiarity with the solar car. For instance, if a Scrutineering judge asks a student to show where their motor controller is connected to their motor, the students should not “look uninformed.”

- (3) Be sure that your Team’s Scrutineering Representatives thoroughly know their Electrical Schematic diagram. A Scrutineering Judge generally points to a point on that diagram and asks the students to identify this location on the solar car.

Question: Can you track a wire from the switch to the object affected by that switch? For example, could you track a wire from a switch to the horn?



- (4) Teams may be asked what size wire they are using for the following, and **why!**
  - (a) wiring size between the motor, motor controller, batteries
  - (b) wiring size between the solar array, power trackers, switches
  - (c) wiring size for the Supplemental System
- (5) Teams will be asked to show that they used proper Grade 8 bolts in key areas of the solar car. For example: the five-point driver harness.
- (6) Teams will be asked to show that they have properly secured key nuts & bolts using locking washers, locking pins, or Loctite. Team Representatives need to be prepared to show this.
- (7) Teams will be asked to show the location of their main fuse. Team representatives should be able to explain that their choice of fuse does not to exceed 125% of the expected peak current draw. [Rule 5.4.2]
- (8) Be sure to be familiar with all sections of Rule 7 - *Scrutineering*

### **What to do when you arrive at Scrutineering**

*Bring your Scrutineering Booklet issued during Team Check-In*

- (1) Teams get access to their garage area at 7:00 AM. Quickly setup your garage area between 7:00-8:00 AM, and be ready to start Scrutineering at 8:00 AM. A judge will check to see if you are ready to have your vehicle scrutineered at 8:00 AM.
- (2) Send your representatives to the Scrutineering Coordinators (center of the garage) and let them know that you are ready to begin Scrutineering. You will be

directed to your first station. Teams do not necessarily go in numeric order, but are assigned based on station availability.



- (3) After visiting a Scrutineering Station, you will know if you successfully completed that station [Your Scrutineering Booklet will be checked off], or whether you have additional work to do [as noted in your Scrutineering Booklet].
- (4) **CRUCIAL:** We recommend that you do not go back and immediately fix problems identified at that first scrutineering station. Go back to the Scrutineering Coordinator and get slotted for your next Scrutineering Station. Your goal should be to visit at least three different Scrutineering Stations on your first day, and then make repairs.

**It is crucial that you visit ALL of the Scrutineering Stations as early as possible so that you have a good idea about the overall readiness of your solar car. Don't get bogged down at a single station.**

*Remember, you have three days to pass Scrutineering. This means that you have your Scrutineering Booklet signed-off by the Lead Judge in each of the stations. Teams not passing Scrutineering at the end of this third day will not be able to race.*

## Specific suggestions

- (1) Be sure to bring adequate back-up parts in the event that something breaks during Scrutineering.
- (2) Be sure your team has practiced braking! Does your solar car meet the requirements set out in Rule 5.10 and 7.5?

Your car will be required to pass a “controlled” stop in Station 5, as well as an Emergency/Panic stop in Station 6. Be careful that your solar car remains under control during these quick stops, i.e., doesn’t “fishtail.”



- (3) Station four requires drivers to make an emergency egress from their solar car in less than 15 seconds. The driver must have a plan to make this egress by themselves, and must completely exit the solar car. ***Develop a plan to get out of your solar car without damaging your solar cells.***

In the Electric Solar-Powered Division, both the driver and passenger are required to make this 15-second emergency egress.



(4) Teachers, Consultants, and Parents must remain in the garage area during Scrutineering. [Guideline: 100' away from their team] Only students can represent their team with Scrutineering Judges.



### **FINAL SUGGESTION**

In the event of a problem that seems to be a real obstacle to your team's passing Scrutineering, be sure to contact Dr. Marks, Event Director, no later than 12:00 PM on the last day of Scrutineering.