



TÜBİTAK

TÜBİTAK EFFICIENCY CHALLENGE ELECTRIC VEHICLE 2018  
PENALTY LIST

|  | VIOLATION   | ELECTROMOBILE                             | HYDROMOBILE                               |
|--|---|---|---|
| Technical Design Report                          | Getting less than 300 points from the technical design report   | 150 Wh                                    | 150 Wh                                    |
| Being Domestic                                   | For every missing /not applied mandatory domestic sub-part  | 300 Wh                                    | 300 Wh                                    |
| Vehicle Measurements                             | Do not comply with measurements specified in the rules  | violated cm x 10 Wh                       | violated cm x 10 Wh                       |
|  | The height of the vehicle from the ground must be a minimum of 10 cm.   | violated cm x 100 Wh                      | violated cm x 100 Wh                      |
|  | The height of the vehicle longer than 1.25 times the length of the vehicle  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | The distance between wheels in the same axle less than half the width of the vehicle  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Cockpit  | Not enough space for driver, not safe   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Vehicle Body                                     | From the top view of the car, there are open regions (holes) on the vehicle body and/or the wheels are totally outside of the vehicle body. | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Fragile windows / sharp ends / protruding edges etc.  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Door   | 50 cm x 80 cm frame can't pass through the door   | 300 Wh                                    | 300 Wh                                    |
|  | Doors cannot open in case of turnover (driver cannot evacuate)  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Door Mechanism                                   | Does not comply with the rules  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Cannot be opened from outside/unintended opening of the doors during the race   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Wheel width                                      | Less than 70 mm   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Brake system                                     | Not dual-circuit or hydraulic   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Safety Belts                                     | Not fixed at four or five points or not compatible with FIA standards   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Passenger seat belt missing or not compatible with FIA standards  | 150 Wh                                    | 150 Wh                                    |
| Driver outfit and equipment                      | Not compatible with the rules   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Safe, but not compatible with FIA standards   | 150 Wh                                    | 150 Wh                                    |
| Fire extinguishers                               | Less than 2 kg  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Roll bars<br>Roll cages                          | Missing any roll bars   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Yield strength lower than 200 Mpa   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Roll bar not perpendicular to bottom of the vehicle   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | The front roll bar doesn't start at least 3 cm above the steering wheel   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | The rear roll bar doesn't start at least 5 cm above the helmet  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Profiles do not comply with the rules   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Roll cage not independent from the chassis, and the vehicle is not safe.  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Vehicle body                                     | Roll cage not independent from the chassis, but the vehicle is safe.  | 150 Wh                                    | 150 Wh                                    |
|  | Welding/bolts not used according to specified rules.  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | No front/rear hood for access to battery package  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Rearview mirrors                                 | No front/rear hood for access to other components   | 150 Wh                                    | 150 Wh                                    |
|  | Do not exist / Only one rearview mirror   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Tow bar  | Reflection area less than 50 cm <sup>2</sup>  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Driver cannot see the text shown  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | No towing rings   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Windscreen                                       | Internal diameter less than 20 mm/not made of steel   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Material does not comply with the rules, not transparent  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Wiper  | Does not exist  | 300 Wh                                    | 300 Wh                                    |
|  | Exists but not working properly   | 150 Wh                                    | 150 Wh                                    |
| Seat   | Makes an angle greater than 30 degrees with the normal axis of the chassis  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Only one seat, passenger seat missing   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Does not comply with FIA standards and not safe for racing  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Does not comply with FIA standards BUT safe for racing  | 150 Wh per seat                           | 150 Wh per seat                           |
| Steering Wheel                                   | Not closed form   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Horn   | Doesn't sound 3 second continuously   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Speedometer                                      | Does not exist/not functional   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
|  | Phone or smart devices used   | 300 Wh                                    | 300 Wh                                    |
| Break lights                                     | Do not exist/not seen from a distance of 25 m   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Headlights                                       | Do not exist  | 300 Wh                                    | 300 Wh                                    |
|  | Exist but not seen from a distance of 25 m  | 150 Wh                                    | 150 Wh                                    |
| Flag   | Smaller than 20 cm x 30 cm/can't be attached to the vehicle properly  | DISQUALIFICATION DUE TO VIOLATION OF RULE | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Electrical cable connections                     | Bare conductors, no proper insulation   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Emergency stop button                            | Does not exist/ not functional  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Overcurrent breaker                              | Does not exist / design does not comply with the rules  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Battery  | Missing   | DISQUALIFICATION DUE TO VIOLATION OF RULE | No Penalty                                |
| Battery management system                        | Missing   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Battery temperature measurement                  | No flasher, buzzer and temperature indicator (except lead-acid batteries)   | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Battery box                                      | Missing, material and/or design is not comply with the rules  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Fixing battery box                               | Not fixed, diameter of bolts smaller than 8 mm  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Safety wall                                      | Protective shield not exist between driver seat and battery pack  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Joule meter connection                           | Extra battery apart from the main battery package   | (Battery energy capacity) Wh              | (Battery energy capacity) Wh              |
| Joule meter                                      | Voltage levels of the battery are out of joulemeter specifications  | DISQUALIFICATION DUE TO VIOLATION OF RULE | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Embedded recharging unit                         | No electrical isolation between grid and battery group  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Fuel cell  | Missing/not functional/higher than 3 kW   |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Super capacitor                                  | Higher than 110 kJ  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Pressure safety valve                            | Missing/does not comply with the rules  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Gas flow safety valve                            | Missing/does not comply with the rules  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Thermocouple                                     | Missing/does not comply with the rules  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Flasher  | Missing/does not comply with the rules  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Temperature indicator                            | Not connected to flasher  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
|  | Not functional/sound level low  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Metal hydride cylinders                          | In the cockpit /does not comply with the rules  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
|  | Protective shield does not exist  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Hydrogen line                                    | Not placed properly   |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
|  | In the cockpit /does not comply with the rules  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Globe valve                                      | Design does not comply with the rules   |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
|  | Does not exist / does not comply with the rules   |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Hydrogen sensor                                  | Material does not comply with the rules   |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
|  | Does not exist /does not comply with the rules  |   | DISQUALIFICATION DUE TO VIOLATION OF RULE |
| Emergency Evacuation (driver and reserve driver) | Longer than 20 seconds/help required  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |
| Brake test                                       | Not functional  | DISQUALIFICATION DUE TO SAFETY            | DISQUALIFICATION DUE TO SAFETY            |