

T-Jet Challenge Rules

Version 1.0

Overall Width

Cars must pass freely through the Official Tech Block: **1-1/8" (1.125")**

Bodies

1. Bodies shall be fashioned after a real car with a minimum weight of **2.4 grams** and a maximum weight of **5 grams** including body screws.
2. Bodies must be manufactured by plastic injection molding process and must represent a real 1:1 scale car.
3. No open-wheel Indy style or Formula style bodies are allowed.
4. Bodies must have original or aftermarket replica bumpers if the original body came stock with bumpers.
5. Bodies may be altered for the purposes of lowering and/or lightening if the minimum weight requirement is met. Wheel wells may be opened for tire clearance but must not distort the general appearance of the car.
6. Bodies must have a hood that covers a portion of the top plate. See Appendix Figure 1 for clarification.
7. Window openings must remain unaltered.
8. Bodies must contain the two (2) original molded-in screw posts in their original position. Screw posts must remain intact and shall not be relocated to suit a different setup or wheelbase. Additionally, the posts shall be those designed as part of the body specifically for mounting on an *Aurora ThunderJet* Chassis.
9. Body posts may be repaired with plastic material only.
10. Bodies must be fastened securely to the chassis using two (2) screws.
11. Plastic spacers may be used between the chassis and body. Spacers must not exceed **0.130"** outer diameter.
12. Wheelbase must not be changed from the originally intended wheelbase.
13. Front and rear windshields are not required.

Chassis

1. Chassis may be stock *Aurora ThunderJet*, *T-Dash*, or *Wizz-Jet* with all-copper electrical components.
2. Top gear plate brand must match the chassis brand.
3. Brush springs may be adjusted to change the tension on the brushes. Electrical components can be replaced with copper replacements.
4. Guide pins shall match the original *Aurora ThunderJet* guide pin design. The guide pin mounting hole may be countersunk to accommodate a countersunk post screw. The guide pin must be plastic. Guide pin may be shortened in length to accommodate different track slot depths.
5. Guide pin may be glued to the chassis.
6. The metal gear plate clamp may be bent (but not cut or otherwise altered or lightened) to improve fitment.
7. The gear plate side rails may be cut or sanded no lower than flush with the top of the gear plate.
8. Idler gear post may be dimpled to improve idler gear fitment.
9. Peening of holes in top plate and/or chassis is allowed. No grinding, drilling, or filling of the chassis is permitted.

Tires/Wheels/Axles

1. All tires must be slip-on tires equal to or greater than **0.350"** in diameter and with a maximum width of **0.100"**.
2. Replacement rear wheels/rims may be single- or double-flanged and may be of the screw-on or pressed-on type.
3. Rear wheels/rims must be made of plastic material.
4. Spacers (of any material) may be used on the front and rear axles. Outside diameter of spacers must not exceed **0.130"**.
5. No wheel weights or hub caps of any kind are allowed.
6. Axles shall not exceed **1-1/8"** in length and **0.065"** in diameter
7. Any axle material may be used.
8. All four (4) tires shall simultaneously touch the test track when the car is in a static position on the test track under its own weight alone.
9. Lateral movement of the front tire/axle assembly shall not exceed **1/32" (0.03")**
10. No glue shall be used to affix the tires to the wheels/rims, including silicone glue or caulk.
11. Using the upper front axle hole, i.e., the *Aurora ThunderJet* truck front end axle hole, is not allowed.
12. Only plastic non-independent front wheels/rims are permitted. Appendix Figure 2 shows a diagram of the maximum allowable front wheel/rim dimensions.

Armatures

1. Only *Aurora*, *Dash*, and *TFX Typhoon* armatures measuring greater than 48 ohms cumulative total for all three (3) poles are allowed.
2. Armatures may be trued and balanced. The outside dimension (OD) of the armature shall be no less than **0.650"** when measured with calipers.
3. The use of glue or any filler in the gaps between commutator plate segments is not allowed.
4. No hand-wound, re-wound, or de-wound armatures are allowed.
5. Shims between the top of the armature shaft and bottom of the top plate are allowed.

Magnets

1. Magnets shall be stock *Aurora ThunderJet* or *One Stop Slot Shop Red Dragon* magnets. Stock *Aurora ThunderJet* magnets look like the surface of the moon under magnification. If you are uncertain whether your magnets are stock, please use a verifiably legal pair of stock magnets.
2. Magnets may be shimmed using non-ferrous materials only.
3. Magnets may not be sanded.

Commutator Brushes

1. Commutator brushes shall be made from a copper/carbon compound.
2. Aftermarket replacement copper/carbon brushes are allowed.
3. Commutator brushes may be scored to prevent rotation on the brush springs.

Gears

1. The armature pinion, idler, driven, and drive pinion gears shall be brass, with a minimum thickness of **0.046"**.
2. The armature pinion gear shall have fourteen **(14) teeth**.
3. The idler gear shall have twenty-four **(24) teeth**.
4. The driven gear shall have twenty-four **(24) teeth**.
5. The drive pinion shall have nine **(9) teeth**.
6. The crown gear shall have fifteen **(15) teeth** and must maintain its original shape. No re-shaping or contouring of the gear boss is allowed.
7. The crown gear shall be plastic.
8. The crown gear diameter must be no less than **0.300"**.
9. The crown gear may be shimmed on the rear axle, inside or outside of the chassis.
10. Gears may be soldered or glued to their respective axles/shafts.
11. Gears may be lapped and/or polished. Gears shall not be beveled.
12. Shims between the topside gears and the top plate are not allowed.
13. Hollow cluster gear shafts are not allowed.
14. Lightened gears are not allowed.

Pickup shoes and springs

1. Pickup shoes shall be any solid non-plated copper pickup shoe. Pickup shoes must have a step. No flat, ski shoes are allowed.
2. Pickup shoe springs must be cylindrical in shape and must not hook on to the pickup shoe (tiger tail).
3. Pickup shoe springs may be cut (coils removed) to reduce their length.
4. Pickup shoe springs may be stretched to increase their length.
5. Pickup shoe travel may be adjusted or restricted by any of the following methods:
 - a. Bending the front "window" portion of the pickup shoe to restrict its travel on the front pickup shoe retainer on the chassis
 - b. Bending the rear hook of the pickup shoe where it attaches to the slot/hanger on the chassis electrical hardware
 - c. Bending the slot/hanger on the chassis electrical hardware into which the rear hook of the pickup shoe connects
 - d. Using tape or heat shrink tubing over the front window of the pickup shoe to restrict its travel on the front pickup shoe retainer on the chassis

Appendix

1. The first car body shown in Figure 1 (A1) is **illegal** as the hood does not cover the top plate. The hood is the body structure in front of the front windshield as outlined in blue on the second picture (A2). The third picture (A3) is a legal body. All stock bodies we have surveyed so far comply with this requirement.

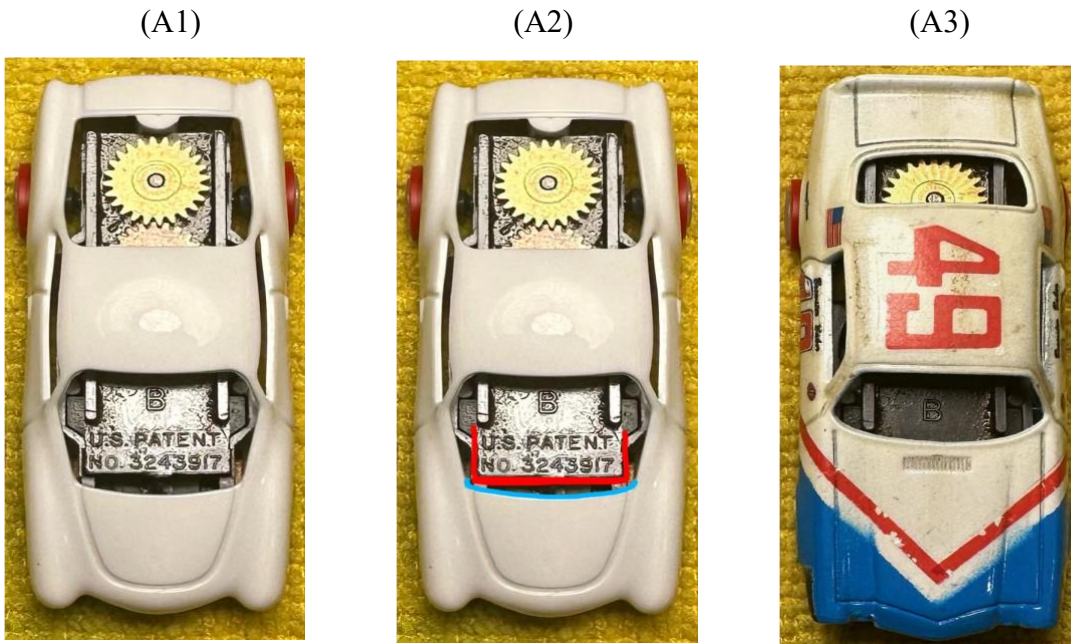


Figure 1. Gear Plate Coverage Examples

2. Figure 2 shows the maximum dimensions (in inches) for wheels/rims in case you intend to use old-stock or legacy rims from manufacturers no longer producing wheels/rims. This specification is included to eliminate old-stock or legacy heavyweight wheels/rims.

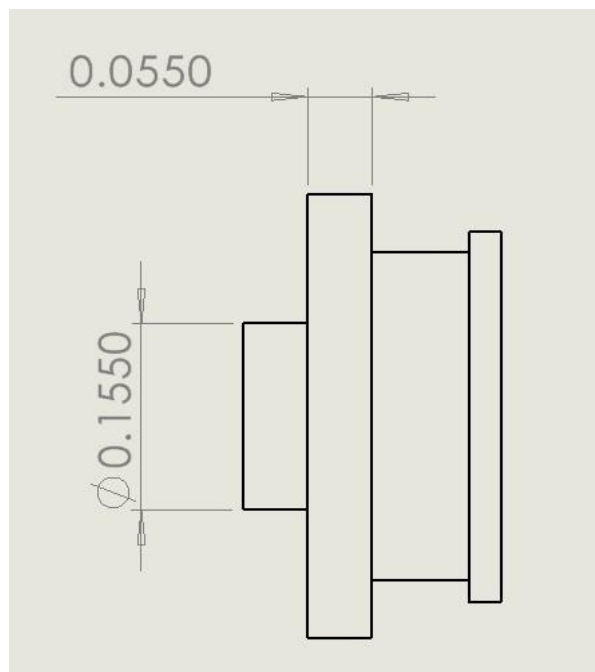


Figure 2. Maximum Allowable Wheel/Rim Dimensions