

⚙️ Tuning Tips

Painting:

Your Kit requires a clear polycarbonate body. You will need to prep the body before you can paint it. Wash the INSIDE thoroughly with warm water and liquid detergent (do not use any detergents with scents or added hand lotion ingredients!). Dry the body using a clean, soft, lint-free cloth. Use the supplied window masks to cover the windows from the INSIDE of the body (RC bodies get painted on the inside). Using high quality masking tape, apply tape to the inside of the body to create a design. Spray (use either rattle can or airbrush) the paint on the inside of the body (preferably dark colors first, lighter colors last). NOTE: ONLY use paint that is recommended for (polycarbonate) plastics. If you do not, you can destroy the body! After the paint has completely dried (usually after 24 hours), cut the body along the trim lines.

Tips for Beginners:

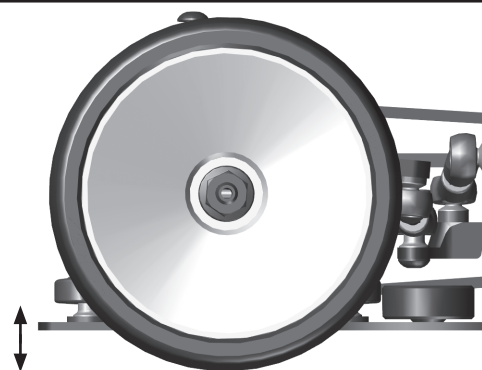
Before making any changes to the standard setup, make sure you can get around the track without crashing. Changes to your vehicle will not be beneficial if you can't stay on the track. Your goal is consistent laps. Once you can get around the track consistently, start tuning your vehicle. Make only ONE adjustment at a time, testing it before making another change. If the result of your adjustment is a faster lap, mark the change on the included setup sheet (make additional copies of the sheet before writing on it). If your adjustment results in a slower lap, revert back to the previous setup and try another change. When you are satisfied with your vehicle, fill in the setup sheet thoroughly and file it away. Use this as a guide for future track days or conditions. Periodically check all moving suspension parts. Suspension components must be kept clean and move freely without binding to prevent poor and/or inconsistent handling.

Ride Height:

Ride height refers to the distance of the chassis to the ground, use the spring collars on the shocks to adjust this setting. A good starting point is 5.0mm for high grip surfaces like carpet or high-traction asphalt. For asphalt or lower grip carpet, try 5.5mm to start. To measure this, put your car on a flat surface. Measure the distance between the bottom of the chassis and a flat surface. Before you measure, make sure you have everything installed (including the battery) then push the car down and let it come back up a couple of times to let the suspension settle.

Notes:

If the track is smooth and high grip, aim for a lower ride height (4.6mm to 5.2mm).
If the track is bumpy or low grip, go for a higher ride height (5.4mm to 6.0mm).

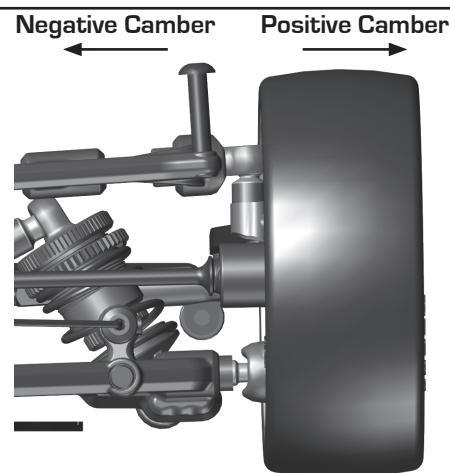


Camber:

Camber refers to the angle of the tire when looking from the front or back of the car. Fine-tune your car's camber by adjusting the upper arm turnbuckle. To get more negative camber (for more grip), turn the turnbuckles to shorten them. To reduce negative camber (for less grip), turn the turnbuckles to lengthen them. Increasing both front and rear negative camber improves traction by maximizing tire contact during cornering, but it can also make the car less forgiving leading to a sudden loss of grip when the limits are exceeded. Reducing camber provides a more progressive slide, giving you better control when the car begins to lose traction, though in most cases it results in less overall grip. This should be checked on a setup station.

Notes:

Typically camber ranges from -0.5° to -2.5° depending on the grip level. We recommend starting with -2° rear camber and -1.5° front camber. It's generally recommended to set the rear camber to a more negative value than the front. To increase traction at either end of the car, simply increase the negative camber setting on the corresponding end.

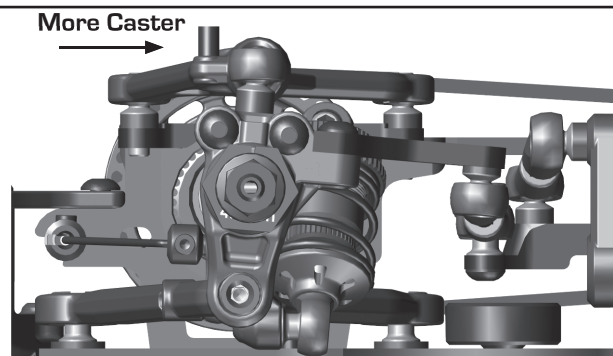


Caster:

Caster refers to the angle of the hub relative to vertical from the side of the car. Adjusting caster involves the replacement of the upper arms for the TC8. The kit supplies three upper arm options, enabling caster adjustments of 0° , 2° , or 4° . Increasing front caster provides a smoother, more stable initial steering feel while enhancing mid-corner and on-power grip. Conversely, reducing front caster delivers a sharper, more aggressive initial turn-in, but may diminish steering response through the rest of the corner. The recommended kit front setting is 4° .

Note:

Front caster is set at 4° for consistent handling on all tracks.



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Wheelbase:

Wheelbase refers to the distance between the front and rear axles. Similar to caster, the wheelbase is adjusted using the upper arm options on the rear of the TC8. The “0” arm provides the longest wheelbase option, while the “4” arm is the shortest. Increasing the wheelbase (reducing rear ‘caster’) enhances stability in long, sweeping corners.

Conversely, decreasing the wheelbase improves rotation in tight turns, but can make the car more difficult to drive. The kit setting is 0°.

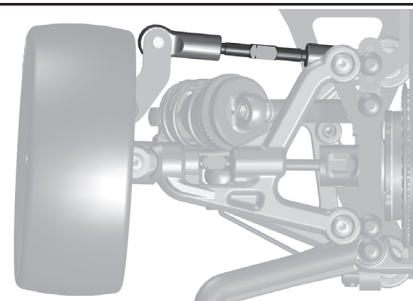
Note: Rear caster varies: 0° for large tracks with long wheelbases, and 4° for small tracks with short wheelbases.

Rear Toe:

Rear toe refers to the angle of the rear tires in relation to the centerline of the car when viewed from above. The length of the rear turnbuckles controls rear static toe-in. More toe-in provides greater stability, rear grip, and improved forward traction. Less toe-in increases the vehicle’s rotation, but can reduce forward traction. This should be checked on a setup station.

Notes:

In low-traction scenarios, a toe-in setting between 3° and 4° is advised. For high-traction conditions, a setting between 2° and 3° is recommended.

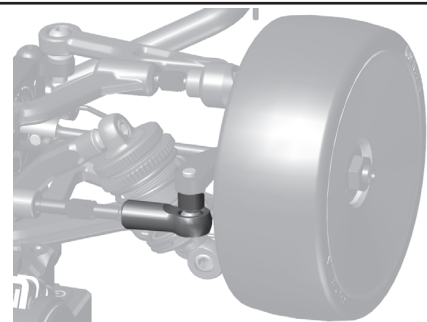


Rear Bump Toe:

Rear bump toe refers to the toe-in angle that varies with vehicle roll or squat. This creates a progressive toe-in effect through corners, improving entry steering while enhancing mid-corner stability and exit traction. Roll center or rear wheelbase adjustments influence how much bump toe is possible. To maximize rear grip in low-traction environments, increase rear bump toe by reducing shim thickness. For high-traction conditions, less rear bump toe provides better handling.

Note:

In low-traction scenarios, rear bump toe shims between 0mm and 2mm is advised. For high-traction conditions, a setting between 3mm and 5mm is recommended.

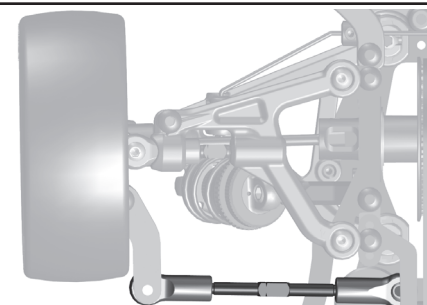


Front Toe:

Front toe refers to the angle of the front tires in relation to the centerline of the car when viewed from above. This is adjusted by changing the length of the steering turnbuckles. Toe-in enhances low-speed stability while diminishing steering response, and at high speeds, increases steering sensitivity while reducing overall stability. Toe-out improves low-speed responsiveness and high-speed stability, but reduces high-speed steering input.

Note:

0° to 1° toe-out setting is recommended for balanced performance. Front toe-in is rarely used.

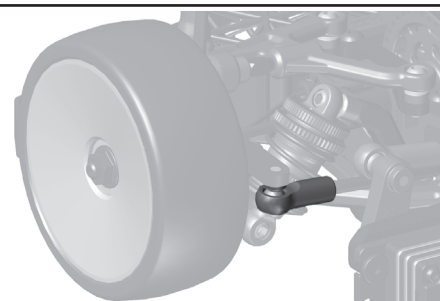


Front Bump Toe:

The front bump toe setting, which dictates the toe-out angle change during vehicle roll or squat, influences cornering dynamics. It produces a progressive toe-out effect. Increasing shimming to reduce bump toe-out provides a sharper, more aggressive high-speed steering response, especially noticeable during mid-corner exit. Conversely, reducing shims increases bump toe-out and reduces the aggressive steering feeling.

Note:

For low-grip conditions, add shims to enhance steering aggressiveness. On high-grip surfaces, remove shims to reduce mid-exit over-rotation and traction rolling. The typical range is between 0-2mm.



Ackermann:

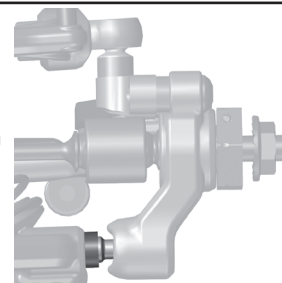
The front steering arm options allow for Ackermann adjustments, influencing steering feel. The kit plate minimizes Ackermann, promoting smooth, predictable steering and enhanced drivability. Optional steering plates increase Ackermann, resulting in sharper, more aggressive steering and increased mid-corner rotation, best suited for demanding, technical tracks requiring maximum steering response.



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Track Width:

Track width refers to the width of the car. Widening the rear track results in a less reactive handling, but improves rotational capability; narrowing the rear track has an opposite effect. Widening the front track decreases steering aggression and overall grip, narrowing front track increases both. A wider track configuration is preferred for high-traction surfaces, while a narrower configuration is better suited for low-traction conditions. For adjustments, pillow ball shims are preferred, though optional wheel hexes can be used. Be mindful that each approach produces unique handling outcomes.



Note:
Pillow ball settings are typically 1-2mm. Rear is often 1mm narrower per side, but equal front/rear width improves corner speed in high-grip conditions.

Shock Springs:

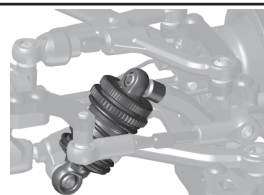
Shock springs control suspension stiffness, directly impacting handling. Stiffer springs enhance responsiveness, forward traction, and high-speed stability, ideal for smooth tracks. They offer quicker directional changes and sharper steering. Softer springs slow directional changes but increase low-grip traction, though they may compromise high-speed stability. They excel on bumpy tracks. In high-traction, softer springs prevent traction rolling by absorbing lateral forces, preventing abrupt weight transfer. Balancing spring stiffness with track conditions is crucial for optimal performance. Progressive springs allow for an increased spring rate change with vehicle roll, which may improve responsiveness, however, they can make the vehicle more challenging to control.



Note:
The gray (front) and blue (rear) springs in the kit are versatile for general use. Spring changes provide major adjustments, shock angle changes offer finer tuning.

Shock Angle:

Shock angles offer fine-tuning of suspension stiffness, similar to spring adjustments. A more angled shock (reduced shims) creates a softer, less responsive setup, suitable for high traction. A more upright shock (increased shims) results in a stiffer, more responsive setup, ideal for low traction.



Shock Fluid:

Shock fluid viscosity is tuned to improve bump handling and weight transfer. Increase viscosity for enhanced bump absorption on rough tracks. Lower viscosity optimizes weight transfer and grip in low-traction conditions. Higher viscosity promotes smoother, predictable handling in high-traction. In high-temperature conditions, increased viscosity aids in tire temperature management.

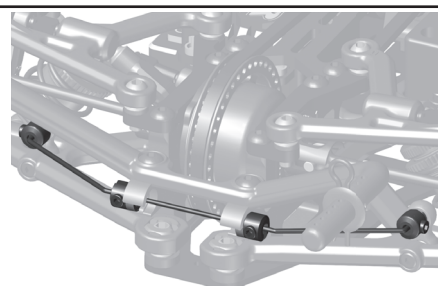
Note:
The recommended range is between 27.5wt and 35wt with the kit 4 hole pistons.



Anti-Roll Bar:

Anti-roll bars adjust roll stiffness and weight transfer, influencing handling. A stiffer rear bar reduces entry traction but can improve on-power traction. A stiffer front bar enhances entry steering and smooths mid-corner handling. Balance bar stiffness for optimal cornering based on track conditions and driving style. For faster transitions, stiffen anti-roll bars all the way around, sacrificing grip. For more grip, soften bars all the way around, slowing transition speed.

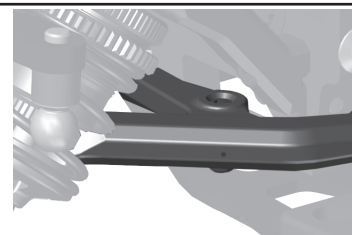
Note:
Equal front and rear anti-roll bar stiffness is common. Alternatively, a one-step stiffer front bar is frequently used if the front end is too aggressive.



Droop:

Droop is the distance between the bottom of the chassis and the axle center. The bottom of the hub directly below the pillow ball serves as the measurement reference for the TC8. Adjustment is performed using the illustrated set screw. Increasing rear droop (loosening the screw, increasing the travel) typically improves stability, whereas increasing front droop leads to a more aggressive handling characteristic.

Note:
This section needs more work, including starting points



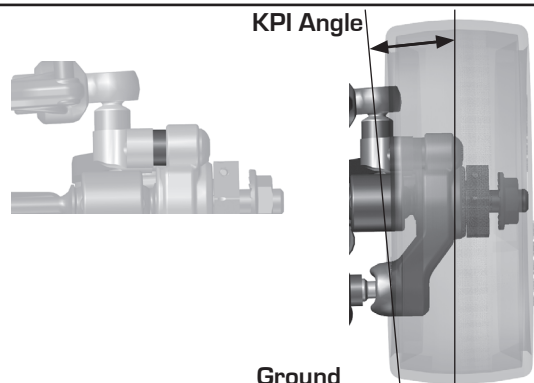
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KPI:

Kingpin inclination (KPI) is adjusted by adding or removing shims between the steering block ball stud mount and the steering block, altering the angle between the tire plane and the steering block's rotational axis. On the front, increased KPI provides a more precise steering feel, while zero shims (zero KPI) yields the least direct response. On the rear, due to static tire behavior, KPI adjustment primarily functions as an upper arm length tuning method.

Note:

Adding shims increases KPI, resulting in a more direct steering feel and a shorter upper arm length. Removing shims has the opposite effect.

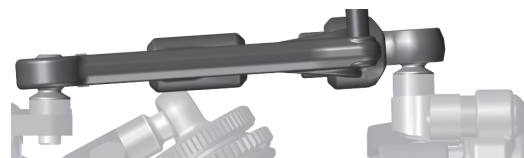


Upper Arm Length:

Adjusting upper arm length alters responsiveness. Lengthening arms stabilizes the car on low-traction surfaces by smoothing grip transitions, making it easier to drive, but may sacrifice corner speed. Shortening arms increases responsiveness and corner speed but makes the car less stable in low traction. This can be adjusted with the 2 upper arm position or by changing the shims on the steering block ballstud mount. Keep in mind adjusting the steering block ballstud mount also adjust the KPI.

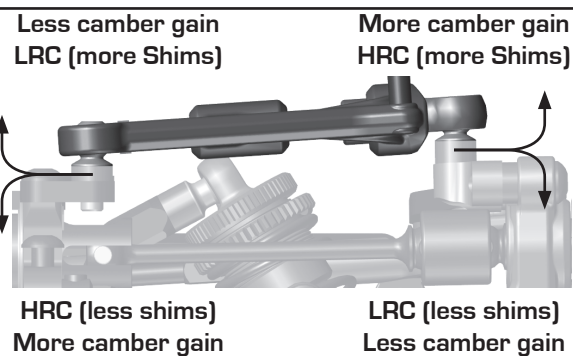
Note:

The short arm mount position is used in most situations. Fine tuning is done with the steering block ballstud mount.



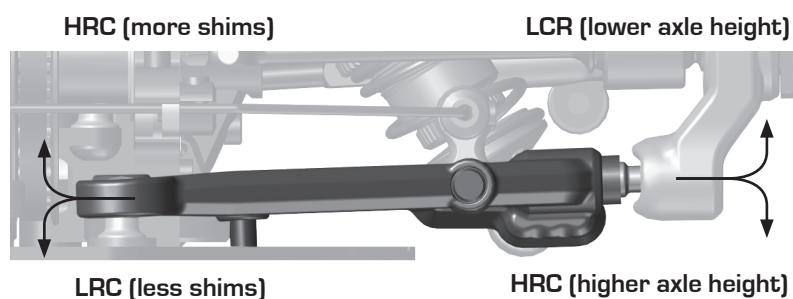
Upper Arm Angle and Roll Center:

Upper arm shim adjustments influence both camber gain and roll center, significantly affecting handling. Adding camber gain increases camber during roll, enhancing grip on low-traction surfaces. Removing camber gain or "flattening" the arm reduces grip, beneficial for maximizing corner speed and preventing traction rolling on high-traction surfaces. A high roll center (HRC) increases initial grip and vehicle reactivity, potentially improving corner speed, but too high a setting can cause abrupt grip loss and inconsistent handling. Conversely, a low roll center (LRC) reduces reactivity and increases chassis roll, generally improving driveability and making grip loss more manageable.



Lower Arm Roll Center Shims and Axle Height:

Lower arm roll center adjustments have a more pronounced effect than upper arm adjustments. As with the upper, a high roll center (HRC) increases initial grip and reactivity, potentially enhancing corner speed, but excessive HRC can lead to sudden grip loss and inconsistency. Conversely, a low roll center (LRC) reduces reactivity and increases chassis roll, improving driveability and recovery. Axle height adjustments provide the most significant roll center change and are typically infrequent, requiring setup optimization for each height.



Gear Differential:

Thicker gear differential oil smooths off-power and corner entry, reducing over-rotation and off-power slides, but increases on-power steering, potentially causing oversteer. Thinner oil enhances corner entry aggression and off-power steering, while reducing on-power steering. Gear sets (HTC/LTC) also impact torque delivery. HTC gears, typically preferred, enhance on-power grip at all speeds. LTC gears offer more free rotation and sharper slow-speed cornering, but sacrifice on-power response.

Note:

High-traction conditions: 7k-15k gear differential oil. Low-traction: 3k-7k. LTC gears simulate lower viscosity, requiring potentially thicker oil than HTC gears.



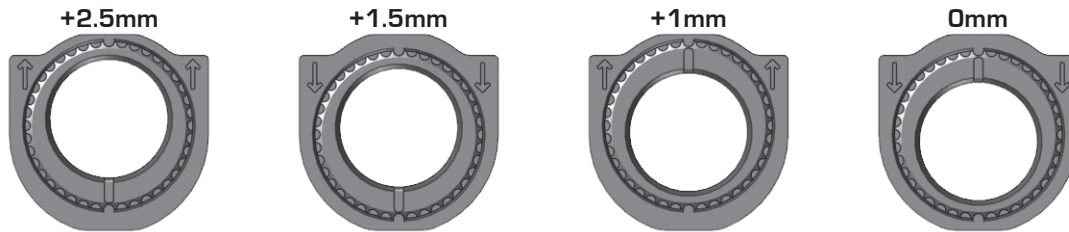
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Differential and Spool Height:

This adjustment profoundly influences drivetrain bind, affecting the vehicle's handling characteristics across the board, with particular emphasis on on-power and hard braking scenarios. Increasing this height typically improves grip at the corresponding end of the car, while decreasing it reduces grip. These adjustments are substantial and highly noticeable. We generally aim for the highest possible setting to maximize grip, unless drivability becomes challenging or, in high-traction conditions, we lower it to drastically calm the car, albeit at the expense of overall grip. Equal front and rear differential height is common. However, lowering the front differential can reduce front-end aggression and traction rolling on high-grip tracks.

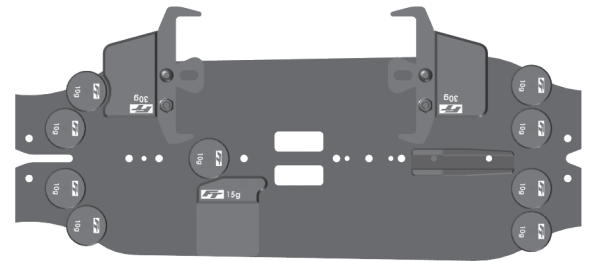
Note:

Increased height enhances grip at that end; decreased height reduces grip.



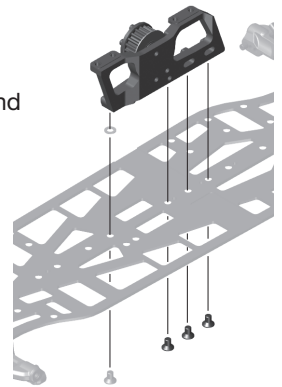
Weight Distribution:

The chassis incorporates multiple weight placement positions at both the front and rear. Consult the setup sheet for recommended FT weight configurations. A 50:50 weight distribution, easily obtained with additional FT weights and the central positioning of electronics, yields the most neutral vehicle balance. Shifting weight rearward typically increases steering aggressiveness, whereas shifting weight forward promotes smoother handling and reduces steering input.



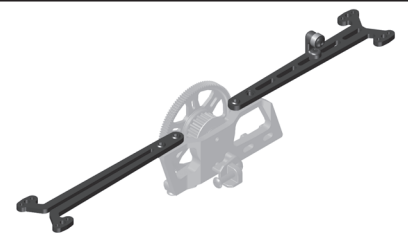
Chassis Material and Flex Options:

High-grip conditions favor a stiff chassis setup; low-grip conditions may require a flexible setup. The steel chassis provides maximum stiffness, optimal for medium to high grip, offering the lowest center of gravity and quickest response. The carbon fiber chassis is best suited for low to medium grip, generating increased traction but slower reactivity. Chassis stiffness can be further adjusted using the front motor mount screws and shim: more screws increase stiffness, with a minimum of two required at the back of the motor mount.



Top Deck Material and Flex Options:

Chassis flex can be further modified utilizing top deck and motor mount screw adjustments, increasing the effects of chassis plate tuning. Stiffer top decks are preferred for high-traction conditions, whereas flexible top decks enhance grip in low-traction environments. Top deck configuration allows for localized flex tuning at each end of the car. A softer rear top deck generally maximizes rear grip, and the same principle applies to the front. A common practice is to employ a stiff rear and flexible front top deck setup for optimal handling balance and corner speed.



Belt Tension:

Belt tension, adjusted via the diff and spool bearing cams, impacts drivetrain performance. Tighter belts, common in modified classes, prevent skipping and enhance longevity. Looser belts improve efficiency in stock classes. Aim for the loosest tension without skipping. Power delivery can be tuned by varying front or rear belt tension. A rear top deck belt tensioner can be added to increase durability, primarily for modified motors.

