

TUNING GUIDE

BJ4 Features

- ☐ 4wd shaft drive
- ☐ Adjustable slipper clutch
- ☐ Front one-way bearing
- ☐ MIP CVD's TM
- ☐ B4 suspension components
- ☐ BJ4 blue aluminum components
- ☐ Graphite chassis, top deck and shock towers
- ☐ BJ4 body with Illuzion wing set
- ☐ Avid sealed ball bearings
- ☐ Factory Team titanium turnbuckles
- ☐ Factory Team threaded shocks with unobtanium shafts

Extra Equipment Required

- ☐ 2 channel R/C surface radio system.
- ☐ Requires one servo.
- ☐ Battery pack (6 cell) side by side cells only.
- ☐ Battery charger.
- ☐ Electronic speed control.
- ☐ R/C electric motor.
- ☐ Pinon gear, 48 pitch to be determined by type and wind of motor.
- ☐ 4wd front tires.
- ☐ 4wd or 2wd rear tires.

Other Kit Info

- ☐ Body has been custom painted for photos. Actual kit body comes clear.
- ☐ Due to ongoing R & D photos may not match current kit components.
- ☐ Kit recommended for expert builders and racers

BJ4 Dimensions and general specifications

- | | |
|--|-------------------------|
| ☐ Wheel Base: | 10.94" (278mm) |
| ☐ Vehicle Width: | 9.65" (245mm) |
| ☐ Weight (ready to run): | 3 lbs., 7.6 oz. (1575g) |
| ☐ Internal gear ratio: | 2.50:1 |
| ☐ Standard spur gear size: | 72 |
| ☐ Recommended motor and gearing: | 10x2 geared 16 x 72 |
| ☐ Front bulkhead standard kick-up: | 8 degrees |
| ☐ Standard BJ4 front castor blocks: | 10 degrees |
| ☐ Standard rear hub carrier toe-in: | 0 degrees |
| ☐ Standard suspension mount toe-in: | 3 degrees |
| ☐ Standard suspension mount anti-squat: | 2 degrees |

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Radio adjustments:

Use the following steps to make the final adjustments to your car.

1. Turn the transmitter on.
2. Make sure the motor is disconnected.
3. Connect your battery pack and turn the power switch on.
4. Move the steering control on the transmitter to the right and left. Do the wheels move in the correct direction? If not, you must reverse the steering servo direction on your transmitter (see radio manual.)
5. Adjust your steering trim (see radio manual) until the steering bell cranks are centered under the top plate. Then, using the two steering turnbuckles, fine-tune the adjustment on the front wheels so they are pointing straight ahead. (Check them once again once the car is race ready and the ride height is set.)
6. Adjust the ESC (electronic speed control) according to the speed control manufacturer's instructions. Some manufacturers have the motor connected during adjustment and some do not. Now turn the power switch off.
7. Connect the motor. Place your car on a block or car stand so that all four wheels are elevated. Turn the power switch on again. Check the ESC and steering settings you have made and then turn the power switch back off.
8. Remember this! The transmitter is always the **FIRST TO BE TURNED ON** and **THE LAST TURNED OFF**.

Motor gearing:

To get the most from your motor, proper gearing is important. Recommended competition modified motors for the BJ4 are 10x2, 11x2 or 12x2.

Gearing suggestions are listed below:

24 degree stock motor:	19 x 72
19 turn motor:	18 x 72
12 turn motor:	18 x 72
11 turn motor:	17 x 72
10 turn motor:	16 x 72

Suspension Maintenance:

You should periodically check all the moving parts: front and rear end, suspension arms, steering blocks, steering linkage and rack, shocks and so on. If any of these should get dirty or bind then your cars performance will suffer. Periodically back off the motor from the spur gear and roll the entire drive train to make sure it feels smooth. If there is any excessive binding or drag it will be necessary for the cars performance to trouble shoot the problem.

Motor maintenance:

Between runs, inspect the brushes to ensure they are moving freely in the brush hoods. This is done by carefully removing the spring and sliding the brush in and out of the hood. If there is any resistance or rough spots, remove the brush and carefully wipe the brush clean. This will clean off any buildup so the brush slides smoothly in the brush hood. Depending on the brand, type and wind of motor, remove the brushes from the brush hood and inspect them after anywhere from 1-3 runs depending on your motor combination. Inspect the brushes and commutator of the motor. If the motor commutator is very discolored and rough from the normal copper shiny color it may be necessary to cut the commutator with a motor maintenance lathe. Inspect the brushes and if there is a noticeable amount of wear, replace the brush with a new pair. If the tip is burnt blue color, then the lubricant in the brush has been burned away and new brushes should be installed. Before assembling the motor back together it is necessary to spray the complete armature and can with motor spray. After completing the cleaning, apply a small amount of lightweight oil to each bearing for lubrication.

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Differential:

Adjust the differential or ("diff") as the instructions state. Adjusting the diff is not meant to be a tuning option. If you can hear the diff making a "barking" or "chirping" sound on jump landings, either your diff is set too loose or your slipper clutch is set too tight. First check your slipper setting, and then re-set the diff according to the instructions.

Slipper Clutch:

The assembly instructions give you a base setting for the slipper clutch. The BJ4 slipper clutch is not designed to help gain traction under low traction racing conditions. Slipper clutches are mainly designed to relieve some of the load the transmission is under racing conditions. A loose slipper will not improve traction it will just hinder driver judgment and predictability. The slipper clutch is set so that it has a faint slip sound under hard acceleration on a very high grip test surface. Setting it this way and leaving it will provide the best racing performance.

Front Camber Links:

Changing the length of the camber link is considered a bigger step than adjusting the ball end height on the top plate. Shortening the camber link (or lowering the ball end) will give the front end less roll and quicken steering response. Lengthening the camber link (or raising the ball end) will give the front more roll and slower steering response. **Longer or higher camber links are typically used on high grip tracks and shorter or lower links tend to work better on medium-grip loose tracks.** Raise or lower your inside camber links by adding or subtracting the .030" silver washers between the ball stud and the top deck.

Rear Camber Links:

Changing the length of the camber link is considered a bigger step than adjusting the ball end height on the top plate. Shortening the camber link (or lowering the ball end) will give the rear end less roll and the car will tend to accelerate or "square up" better. Lengthening the camber link (or raising the ball end) will give the rear more roll and more cornering grip. **Longer or higher camber links are typically used on high grip tracks, while shorter or lower links tend to work better on med-grip loose tracks or tracks where the car has to much traction.** The kit setting is the best compromise of cornering grip and acceleration.

Caster:

Caster describes the angle of the kingpin as it leans toward the rear of the vehicle. Positive caster means the kingpin leans rearward at the top. The BJ4 has 8 degrees of caster on the front bulkhead and 10 degrees of caster on the caster blocks. Adding caster increases turn-in and reduces exiting steering. Reducing caster decreases turn-in steering and adds steering exiting turns. Currently the stock caster combinations have been the best all around setting on most track conditions.

Camber:

Camber describes the angle at which the tire and wheel rides when looked at from the front. Negative camber means that the tire leans inward at the top. A good starting camber setting is -1 degree. A camber gauge of any type is helpful in these situations. Positive front camber where the tire is leaning out is not recommended. Adding a small amount of positive rear camber, where the top of the tire is leaning out, will tend to improve straight-line acceleration on loose tracks.

Front Toe-In:

Toe-in describes the angle of the front tires when viewed from the top. With toe-in, the front of the tires point inward. Zero degree toe-in (tires pointing straight forward) is the setting that should be used in almost all track conditions. Occasionally you can increase turn in by adding a little toe-out (front of tires point slightly out). Front toe-in is not a typical tuning adjustment used by the Team.

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Ackerman:

The angle between the two front tires is referred to as 'the Ackerman angle', and it can be changed on the BJ4 by moving the ball end front or back on the steering rack. The forward set of holes gives the outside tire more steering throw thus giving the car generally more steering (less Ackerman). In theory the more Ackerman you have the more steering the car tends to have low speed and the less Ackerman you have the more steering you tend to have high speed. However an RC car typically has a fixed amount the inside tire can steer, so in effect the only real difference is how much the outside tire turns. The BJ4 has shown to steer more using the forward set of holes in the steering rack and less steering using the rear set of holes.

Anti-Squat:

Anti-squat denotes the angle of the rear arms relative to the ground. Zero anti-squat means that the rear arms are flat, parallel with the ground. The BJ4 kit setting is 2 degrees. Currently the stock anti-squat combination has been the best all around setting on most track conditions. Adding anti-squat tends to make the car "rotate" more in the corners, but doesn't handle as well through the bumps.

Wheels base:

You have three options for rear hub spacing, forward, middle and back. The kit setting is the middle that provides the most balance of traction, and will be used most often. For improved handling in bumps or rhythm sections, try moving the hubs to the back position. This can also make the car handle better in the 180-degree turns. For improved traction the hubs can be moved to the most forward position.

Battery Placement:

This is one of the best adjustments on the car, and it can have the biggest effect on the handling. Most of the time, moving the battery pack back will yield more rear traction and decrease steering. Conversely, moving the battery pack forward will yield less rear traction and increase steering. In some cases on extremely high grip or extremely low grip tracks, moving the pack forward will make the car feel more balanced and actually improve rear grip. Having the battery pack forward generally helps make the car work better on bumpy tracks or on the take off of extremely big or washed out jumps.

Front Shocks: position

Can be adjusted easily by simply moving the top of the shock to another hole in the shock tower. The standard location (center in the tower) works best on most tracks. Moving the top of the shock out (stiffer) one hole will result in an increase in steering response and the car will react quicker. Moving the top of the shocks to the inside hole in the tower will slow the steering response time and make the car smoother in the bumps.

The bottom of the shock can also be moved in on the suspension arms. Moving the bottom of the shock to the inside hole in the arm will result in more low-speed steering and less high-speed steering. Mounting the shocks in the inside hole will require limiters inside the shocks to limit the travel, and the springs should also be changed to stiffer ones.

Front Shocks: springs

Changing the spring rate can be easily done by changing out the front springs to a different rate spring (see list). Increasing the front spring rate generally increases the steering response and the car will react quicker. However an increased spring rate tends to make the car more erratic in the bumps. Decreasing the front spring rate will tend to slow the steering response time and make the car smoother in the bumps. **It is necessary during any shock adjustments to re-check the car ride height.**

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Front Shocks: oil dampening

Shock oil changes can dramatically affect steering and handling characteristics. Changing oil to far in either direction will generally have an opposite or negative affect on handling. In general slightly lighter weight shock oil will increase the sensitivity of steering response and result in more low-speed steering and less high speed steering. It will also make the car handle small bumps and jumps better however large jump take off and flat landings tend to unsettle a lightly dampened car. Slightly heavier oil will slow steering response and result in less low speed steering and increased high speed steering. Heavier oil will also make the car more erratic on small bumps and jumps however large jump take off and flat landings are improved.

Rear Shocks: position

Can be adjusted easily by simply moving the top of the shock to another hole in the shock tower. The standard location (center in the tower) works best on most tracks. Moving the top of the shock in (softer) results in more side-bite (traction in corners) and makes the car smoother in the bumps. Moving the top of the shock out will give the car more forward traction and help keep the car from bottoming out on big jumps. A softer spring should be used if the shocks are mounted in the very outside hole of the shock tower.

Moving the bottom of the shock out the BJ4 is not recommended.

Rear Shocks: springs

Changing the spring rate can be easily done by changing out the rear springs to a different rate spring (see list). Increasing the rear spring rate generally increases the steering response and the car will react quicker. However an increased spring rate tends to make the car more erratic in the bumps. Decreasing the rear spring rate will tend to slow the steering response time and make the car smoother in the bumps. **It is necessary during any shock adjustments to re-check the car ride height.**

Rear Shocks: oil dampening

Shock oil changes can dramatically affect steering and handling characteristics. Changing oil to far in either direction will generally have an opposite or negative affect on handling. In general slightly lighter weight rear shock oil will increase the sensitivity of steering response and result in more low-speed steering and less high speed steering. It will also make the car handle small bumps and jumps better however large jump take off and flat landings tend to unsettle a lightly dampened car. Slightly heavier oil will slow steering response and result in less low speed steering and increased high speed steering. Heavier oil will also make the car more erratic on small bumps and jumps however large jump take off and flat landings are improved.

Shocks Pistons: high speed dampening

Static dampening is how the car feels on the workbench. High speed dampening is how the car feels during jumping or under a load in racing conditions. High speed dampening can be changed by changing shock pistons. The BJ4 comes with AE shock pistons labeled # 1, 2 and 3. The higher the number shock piston the smaller the holes are in the piston. Smaller shock piston holes make the shocks feel heavier dampened. Increasing high speed dampening generally improves landings and take offs on big and small jumps. It is important while increasing high speed dampening (going to smaller hole piston) that you try to maintain the same static feel on the workbench, which generally means going to lighter weight shock oil.

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Ride height:

Ride height is the distance from the ground to the bottom of the chassis. Check the ride height by lifting up the entire car about 8-12 inches off the workbench and drop it. After the suspension "settles" into place, raise or lower the ride height by threading the collars up and down on the shock bodies. Be sure to make them equal on each side. The standard front ride height on the BJ4 is between the CVD bones and front a-arms being level in the front. The standard rear ride height on the BJ4 is between the CVD bones and rear a-arms being level in the rear. Team Associated also makes a handy tool for measuring off-road ride height when more precision is necessary. Generally raising the ride height will help make jumping more consistent but the car will not handle as nimble in the corners and sweeping turns. Lowering the ride height will improve cornering speed and stability but will tend to be more erratic on jumps.

Anti-Roll bar:

The optional #1044 BJ4 rear anti-roll bar kit (also called a "sway bar") allows you to add roll resistance to the rear end with minimal effect on handling over bumps and jumps. It is an especially helpful tuning item on high grip tracks. The optional kit anti-roll bar diameter is .055" and has proven to be an effective tuning option under most track conditions.

One-Way options:

Complete Associated NTC3 HD front one-way. Replacing the BJ4 front diff with an Associated NTC3 HD front one-way will highly increase high speed and exit steering and slightly increase low speed steering on larger high grip tracks. It will also improve acceleration coming out of corners. A front one-way will cause the rear end to slide under braking. Drivers typically turn down their brakes on the end point adjustment option on their radio equipment while using a front one-way.

Direct shaft kit. Allows your BJ4 buggy to brake with all four wheels during braking. This is an advantage for a driver running on either an ultra high bite track or a track with very low grip. On high grip it allows the driver to attack the track using a heavy amount of braking power with a "point and shoot" driving style (used by team drivers at the 2004 ROAR nationals). On low grip it allows the driver to tune the braking power with their radio equipment minimizing rear end slide under braking.

Shaft one-way. The BJ4 kit comes standard with a shaft one-way unit. This was a good combination of a one-way feel and direct feel. With a shaft one-way the affect is much milder than with a diff front one-way

Tires:

Tires are chosen based off of track conditions and are the most dominate feature when it comes to tuning your cars performance. Generally the more loamy, fluffy or wet the dirt is the bigger spike you choose for your tire base. The harder packed, dusty or slicked tracks require a small pin softer compound tire base. Hard packed blue or black groove very abrasive surface tracks require small pin tires with a slightly harder compound rubber and foam insert base combination. Front tire configuration and wearing attributes can dramatically affect vehicle steering performance on hard packed blue or black grooved tracks. Check Team Driver setup sheets for recommended tires before attending large events. Always be prepared for changing surfaces or conditions with your tires. Typically any major handling problem can be tracked to wrong or worn out tire selections.

To be the fastest you must always know your tires!

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Setup Sheets:

The best way to get your car handling right is to go to our website, www.jconcepts.net and click on the links under the BJ4 products to get to the setup sheets. Our Team Drivers help develop these setups at National events. Also most drivers have a "base" setup that they use as a starting point for every event. Try running some of these base setups or look for track conditions and tires that are similar to your local track and mimic that setup. Remember some adjustments are minor and it helps to try them almost back to back with your old settings to determine the results.

JConcepts Online:

Get online help, tips, and new product information for your kit through JConcepts website, www.jconcepts.net.

Kit tips and help. Have easy questions? Look to your instruction manual, exploded view or the tuning guide located on the website www.jconcepts.net.

Parts Catalog. Look to our website for new products and the latest catalogs.

Advanced Kit tips and help. Have tough questions? Look to our website and E-mail our experts for your most advanced questions.

Setup Sheets. Racers can find blank and Team Driver setup sheets in the BJ4 products section of the website.

New Products. Learn of new products on our website before they are announced anywhere else.

Domestic Ordering online. You can order online with us at anytime. You will have to sign-up as a user to begin shopping within the website. At that time you can also choose to subscribe to our random email notifications of new products or important JConcepts information.

International Ordering online. Due to differences with international shipping it will be necessary to email us directly for international orders.

BU JCONCEPTS® *TUNING GUIDE*

SPRING RATE CHART FOR ASSOCIATED AND LOSI



FRONT

REAR

2.80

1.74

3.20

1.90

3.50

2.10

3.85

2.33

4.20

2.55

2.75

3.03



FRONT

REAR

2.50

1.60

2.90

1.80

3.20

2.00

3.50

2.30

3.80

2.50

4.50

2.90

3.40

3.70

4.10