



**[www.redcatracing.com](http://www.redcatracing.com)**

# WARNING!

READ ALL INSTRUCTIONS INCLUDED WITH VEHICLE BEFORE OPERATING



**Age warning: This radio controlled vehicle is not a toy!** You must be 14yrs of age or older to operate this vehicle. Adult supervision is required.



## **RISK OF FIRE!**

## **RISK OF EXPLOSION!**

There is a risk of fire and explosion when dealing with Fuel and Batteries.

Nitro fuel contains Nitromethane and Methyl alcohol. These chemicals are highly flammable and explosive. Only use in well ventilated areas. Keep away from fire, spark, and heat. Store in a cool place away from heat. **NEVER SMOKE AROUND FUEL OF ANY KIND!**



Only use in a well ventilated area. Never run your engine indoors.

Rechargeable batteries may become hot and catch fire if left unattended or charged too quickly. Use extra caution when charging LiPO batteries. Use only LiPO specific chargers. Charge away from flammable materials. Never charge at a rate higher than 1S. (2000Mah pack = 2amps charge rate). Overcharging can lead to fire and explosion. Always store battery packs in a cool place.



## **POISONOUS!**

Fuels contain Nitromethane and Methyl alcohol and are toxic. Injury or death can occur if swallowed. May irritate skin and cause injury if absorbed into the skin. Injury or death can occur from breathing the toxic fumes. **KEEP AWAY FROM CHILDREN AND PETS!** Always follow manufacturer's recommendations on fuel container.



## **RISK OF BURNS!**

The engine, exhaust pipe, batteries, electronic speed controller, electric motor, and other areas of the vehicle get hot. Burns can occur if touched after vehicle operation. Allow adequate time to cool before handling.



## **RISK OF ELECTRICAL SHOCK!**

Use caution when charging batteries. Do not touch positive and negative leads together. Do not lay battery on metal. Use only chargers specified for the battery type being charged. Keep batteries and chargers away from water.



## **RISK OF INJURY!**

Hobby grade RC vehicles can cause serious injury or death if not operated correctly. Never use vehicle in crowds. Never chase people or animals. Drive in safe open areas only. Keep body parts away from moving parts.



## **RISK OF DAMAGE!**

Never operate RC vehicles on public roads. Damage of vehicle and property can occur. Only operate on open private property.

## **Welcome to the world of hobby grade RC**

Recommended for ages 14+ (with adult supervision)

Congratulations on your new hobby grade radio control vehicle. Hobby grade RCs offer many advantages over radio controlled vehicles sold in the toy department. One of the greatest advantages to hobby grade RC vehicles is the ability to set up the vehicle the way YOU want it. This includes tuning the motor for top performance, changing gear ratios to better suit your terrain, tuning the many adjustable suspension components like changing ride height and geometry, as well as customizing the overall appearance of your vehicle. Redcat Racing hobby grade RC vehicles were designed with all these characteristics in mind to provide you with much fun and adjustability.

Redcat Racing hobby grade RC vehicles are incredibly fast with some reaching speeds of 40 mph. While this is fun and exciting, it also comes with a great deal of responsibility. A 10-20 pound RC vehicle traveling at 30 mph carries much momentum. Getting hit in the leg at that speed is like being hit with a sledge hammer and serious injury may occur. Property damage as well as damage to your RC vehicle are also possible. Great care must be used while operating these vehicles.

This is not a toy and should not be treated as one. These two-stroke gas engines are highly tuned pieces of equipment and need to be used only as directed. Follow the included instructions closely and be sure to keep hands away from the hot surfaces of the engine and exhaust pipe. Make sure you read all included manuals completely before attempting to start your gas powered RC vehicle.

The engine in this RC vehicle runs on a mixture of unleaded gasoline and two-stroke oil. Proper mixture ratios is crucial in having a good running vehicle that will last. Gas is dangerous for many reasons. Highly flammable, explosive fumes, and poisonous chemicals are a few reasons gas should be handled with care. Gasoline should be used by an adult and always within it's safety confinements. When mixing gas with two-stroke oil, never guess at the amounts used. Use a gas/oil mixing container designed for mixing fuel for two-stroke engines. Always use special two-stroke oil. You can find these products at hardware stores and automotive stores.

Redcat Racing radio controlled vehicles are engineered for performance as well as durability. This means shedding weight where ever possible and using complex suspension components that offer many tuning options. This allows the operator to make adjustments that will effect the way the vehicle responds to all aspects of the terrain. As you may know, any RC vehicle, whether it be hobby or toy grade, can break. How and when it breaks depends solely on your driving style. Unlike toy grade RCs, hobby grade RCs are designed with parts replacement in mind. Spare parts are readily available from Redcat Racing and more durable aluminum parts are available as well. It is recommended to keep spare parts on hand so if you run into that oak tree at full speed, you will have the necessary replacement parts to get you up and running again quickly.

Appearance is just as important as speed and handling. Who wants to go fast and look good doing it? You do! That is why Redcat Racing has also designed their vehicles to look as good as they perform. Accessories may also be added to your vehicle to customize its looks. As mentioned earlier, Redcat Racing hobby grade RC vehicles are completely customizable and that is where all the fun is at.

Imagine yourself being on the pit crew of a full scale monster truck. Making suspension adjustments for smoother landings or changing the gearing to get that hole-shot from the start. That is the feeling you will get when adjusting the suspension on your new Redcat Racing vehicle. Increase ride height so you can clear the driveway with a single jump or thicken the oil inside the oil filled shocks to make high speed laps around your front yard. The possibilities are endless with Redcat Racing, so put on you favorite pit crew cap, grab your Redcat Racing vehicle and have the time of your life!

## Unpacking and setting up your new vehicle

The moment you've been waiting for is finally here. Your new Redcat package has arrived. Before you go crazy from excitement, let's go over a few simple steps.

### Unboxing your Redcat Racing RC vehicle

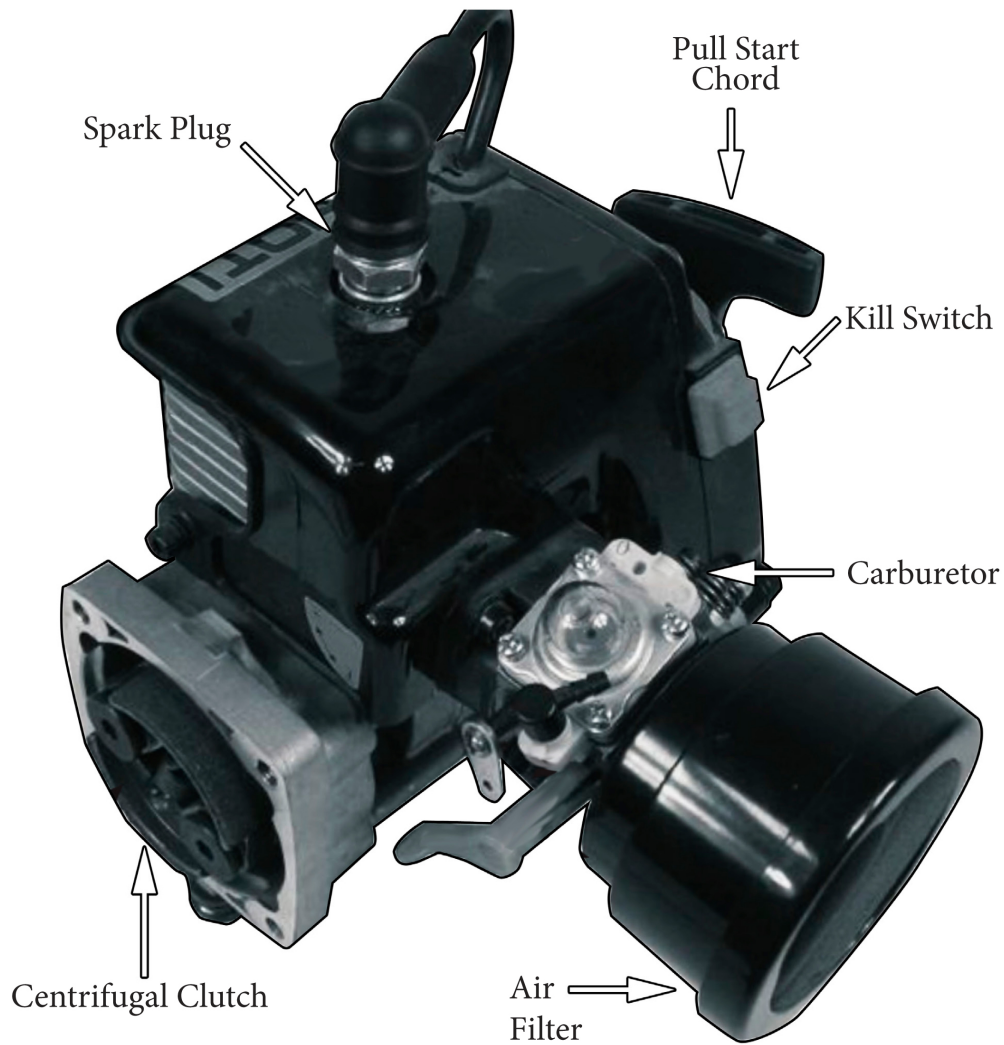
- Be sure you've removed all parts, equipment, tools, and documentation from the box. It's easy for small parts to get hidden in the packing materials and overlooked.
- Completely read all documents and instructions included with your vehicle.
- Acquire any necessary items such as transmitter batteries, receiver batteries, gas, two-stroke oil, mixing container, and any additional tools and supplies needed.

### Looking over your Redcat

1. Be sure to look over your new Redcat RC. This may save you some hassle in the future.
2. Check all screws to make sure they are tight. Do not over tighten screws nested into plastic as this may damage the plastic threads. Avoid using power tools for this step.
3. Check all nuts, bolts, and clips to ensure they are tight and secure.
4. Lube and Install the air filter onto the engine's carburetor if it is not already done. The air filter used on RC vehicles uses a sticky oil treatment to aid in filtration and keep damaging dust out of the combustion chamber. Failure to soak the filter in this oil will void the engine's warranty and possibly damage the motor. You can find air filter pre-treatment oil at a local hobby shop.
  - To apply the filter pretreatment oil, place the filter element in a sandwich bag.
  - Add about a teaspoon of air filter oil into the bag.
  - Using your fingers, work the oil into the filter. The plastic bag keeps your hands clean and allows you to see your progress.
  - Add more oil if needed. If too much oil has been used, wrap the filter element in a paper towel and squeeze out the excess oil. Too much oil can restrict air flow and cause the engine to run rich. The filter should be saturated, but not completely soaked.
5. **Perform a radio range check. DO NOT START YOUR ENGINE TO DO THIS!**
  - Install the appropriate batteries into the transmitter and receiver.
  - Thread the vehicle's antenna through the plastic antenna tube and turn on the transmitter.
  - Turn on the receiver switch found in the vehicle.
  - Check that the controls are working properly. The steering wheel should operate the steering and the trigger should operate the servo linked to the engine. Pulling the trigger should open the carburetor, neutral trigger position should close the butterfly in the carburetor, and pushing forward should actuate the brake mechanism.
  - Leave a buddy with the vehicle and walk 50 yards away. You and your buddy decide on a routine since it will be difficult to communicate with each other while testing. An example would be....turn wheel left and count to ten, turn wheel right and count to ten, Pull trigger and count to ten, and push brakes and count to ten. You will want to repeat these steps moving further out as you progress until you are beyond the maximum distance you plan to run the vehicle.
  - If the radio performed without any glitches or twitching, you are ready to break in your motor.



# Gas engines

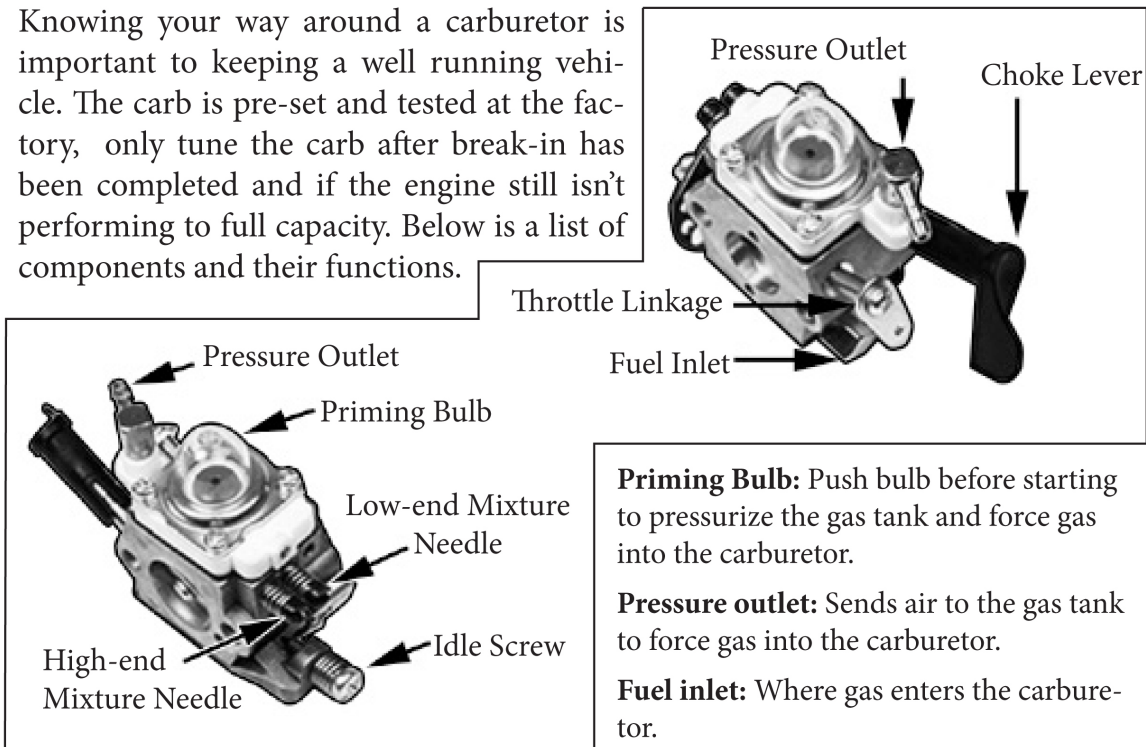


## Knowing your engine

Knowing and understanding the different parts of your engine is important. Study the images on this page and familiarize yourself with the different engine parts. Knowing what each part is called and where it is located will help you while breaking-in and tuning the engine.

# Carburetor

Knowing your way around a carburetor is important to keeping a well running vehicle. The carb is pre-set and tested at the factory, only tune the carb after break-in has been completed and if the engine still isn't performing to full capacity. Below is a list of components and their functions.



**Choke lever:** Used to restrict air flow to the engine creating a rich fuel mixture. Used to start cold engines.

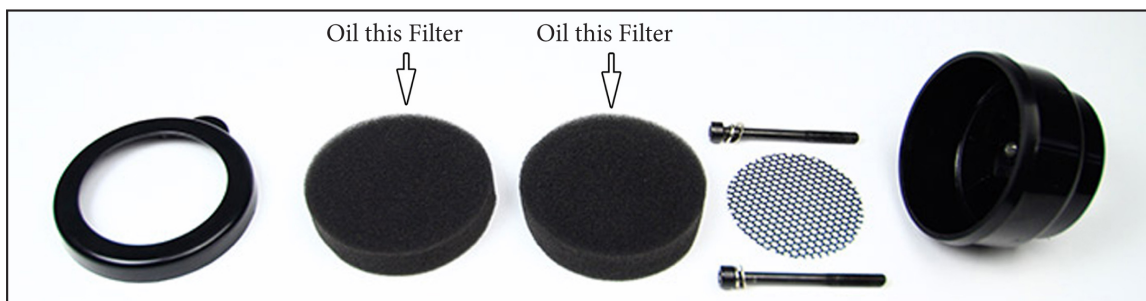
**Throttle linkage:** Controls the engines RMS. Pulling the trigger on the radio opens the throttle valve and makes the engine rev higher.

**Idle Screw:** Controls the engines idle RPMs. Tighten to idle faster, loosen to idle slower.

**Low-end Mixture screw:** Controls the gas-to-air ratio from idle to half throttle.

**High-end Mixture screw:** Controls the gas-to-air ratio from half throttle and higher.

## Air Filter



## **Breaking in and tuning your engine**

Although the absolute minimum of running the engine lightly for 1/2 tank of gas and calling it broken in is done by many, we at Redcat Racing have done much research regarding what we believe is the best way to break in a high performance 2-stroke gas engine. Our research has shown, that bringing the engine through several heat cycles provides the best results to achieve the best performance and longest engine life possible from your new Redcat Racing 1/5 scale high performance vehicle. We believe that by putting forth some effort now, you will be greatly rewarded in the future. These high performance engines run on a mixture of 90-93 octane gasoline and two cycle engine oil. A mixture of 20:1 (gas:oil) will be used for break in and 25:1 (gas:oil) can be used for regular running after the entire break in period is complete.

### **Break in Procedure**

1. Using the 20:1 gas/oil mixture, run the vehicle for the first 1/2 tank of gas and repeatedly vary the speed of the engine from stop to 1/2 throttle. Do NOT exceed 1/2 throttle. Let the engine idle 30 seconds and turn off.
2. Let the engine cool for ten minutes. (You have now completed one heat cycle)
3. Repeat step one for a total of 3 full tanks of fuel letting the engine cool for ten minutes at every 1/2 tank interval.
4. For the fourth full tank of fuel, run the vehicle from a stopped position to full throttle and back to stop. Remain stopped for a few seconds and repeat. Do this for 1/2 tank of fuel, let the engine idle for 30 seconds, and turn off the engine.
5. Let the engine cool for ten minutes.
6. Repeat step 4 for the remainder of the tank.
7. Let the engine cool for ten minutes.
8. Use the remaining gallon of fuel mixed at 20:1 while driving normally.
9. Let the engine cool ten minutes in between each full tank of gas.
10. Break in is now complete. You may mix a 25:1 fuel/oil ratio from here on out

## **Tuning your engine**

### **How an engine works:**

Inside the combustion chamber, where the piston is found, four things are needed for a properly working engine. Fuel (gas/oil mixture), Air, Compression, and spark are all needed. Fuel is needed to burn, air is needed to make the fuel burn hotter, and compression is needed to make it burn even hotter resulting in an explosion when the spark fires.

Fuel is mixed with air in the carburetor and the mixture is sent into the combustion chamber. This is where the piston pushes up on the fuel/air mixture compressing it tight. The fuel is then ignited by the spark plug which causes an explosion forcing the piston down to have it happen all over.

When adjusting the high and low speed mixture screws, we refer to a rich mixture and a lean mixture. A rich mixture has a higher ratio of fuel to air than a lean mixture. To richen the mixture, you add more fuel and to lean out the mixture, you use less fuel. You have of course already mixed the proper ratio of oil into the fuel, so a rich fuel/air mixture has more fuel/oil than a lean mixture. **Running your engine too lean will cause damage from friction and overheating!**

To control the amount fuel in our fuel/air mixture, we use adjustment needles. There is a high speed needle and a low speed needle. We always start adjusting the high speed needle first.

Note: The needles have been set and tested at the factory. Only adjust if absolutely necessary.

### **Adjusting the High speed needle:**

After break-in has been completed, you may tune your engine for optimal performance. The engine should always be at running temperature before making any adjustments. Never tune a cold engine!

Bring the engine up to running temperature by running the vehicle around for about four minutes.

The first step in tuning is figuring out which way to tune. Do we need to make it richer or leaner? The easiest way to do this is by using the choke.

If the engine seems to be bogged down at full throttle, close the choke about 1/4 ways. If the engine's performance improves a great deal, you know the engine is running too lean and needs to be richened. If performance greatly declines, you may need to lean out the fuel/air mixture.

How does that work? When closing the choke, you restrict the air flow creating a higher ratio of fuel to air which results in a richer fuel/air mixture. The amount you close the choke directly affects the fuel/air ratio.

Run the vehicle at full throttle. There should be a healthy amount of smoke exiting the exhaust pipe.

Making adjustments in 1/8 turn intervals, turn the high speed needle (refer to engine diagram) clockwise to lean out the fuel/air mixture or counter clockwise to richen the mixture.

Once maximum speed and a smooth sound are obtained, turn the high speed needle counterclockwise 1/8 turn. This is the optimal running zone.

Double check for smoke coming out of the exhaust. If a healthy amount of smoke is not coming out of the exhaust, richen up the fuel mixture by turning the high speed needle counter-clockwise another 1/8 turn until proper smoke is visible. Remember, if smoke is not visible, you are not lubricating your engine.

### **Adjusting the low speed needle:**

Now that the high speed needle is properly set, you may adjust the low speed needle. To do this follow these steps. Remember! Never tune a cold engine!

1. Before beginning, listen to the engine while idling and then hit the throttle. If the engine idles smoothly and accelerates well, you are done. If not, continue to the next step.
2. With the engine idling, follow the same steps used in determining the high speed mixture. Close the choke slightly and listen for a change in the engine. If the engine runs smoother, you need to richen the low speed needle fuel/air mixture. If the engine runs worse, you need to lean out the low speed mixture.
3. Making adjustments in 1/8 turn intervals, turn the low speed needle (refer to engine diagram) clockwise to lean out the fuel/air mixture or counter clockwise to richen the mixture.
4. From a stopped position, quickly pull the trigger to full throttle. The engine should get to top speed smoothly and with minimal hesitation. If it does not, you may fine tune the low speed needle to ensure it does. Start by turning the low speed needle clockwise 1/16 turn. Notice the change and repeat this step as needed. Once optimal acceleration is reached, back the low speed needle out 1/16 turn.
5. If the engines performance decreases, sputters, gurgles, and stalls with little to no smoke, it may be too lean. Turn the needle counter clockwise 1/16 turn until smoke is visible at 1/4 throttle.

### **Setting the idle:**

Idle is set from the factory and should only be changed if the engine is tuned properly and still has difficulty idling.

Tighten the idle screw 1/16 turn. Test the engine and repeat if necessary. The idle speed should remain as low as possible without stalling. Higher idle speeds cause erratic performance and excessive wear on the clutch.



## **Maintaining your Redcat Racing vehicle**

There is much fun to be had running RC vehicles. To ensure that fun continues throughout the years, here are some maintenance tips to follow.

### **Chassis maintenance:**

Many substances such as dirt, grass, grime, and unburned oil can find its way onto your RC chassis. It's a good idea to clean this off after each days use. There are many ways to clean an RC vehicle. Here are a few examples.

1. One of the most effective ways to clean the chassis is with a used tooth brush, old paint brush, and rag. These three tools work well for removing dirt and debris.
2. Pay close attention to areas with moving parts such as suspension components, steering components, and drive train. It is important to get these areas clean to help prevent wear.
3. Unburned oil can easily be removed with nitro car cleaner, sold at hobby stores. Read the instructions on the can carefully before using.
4. Though running your vehicle through water is never recommended, the moisture found on grass and other outside elements may still make its way into the vehicles bearings. It is important to keep bearings clean, dry, and oiled.
5. Your Redcat Racing vehicle may have bearings in various locations like wheel hubs, steering linkages, gear supports, and drive shaft supports. First you must have access to all the bearings. Remove all four wheels and any other parts blocking bearing access.
  - Spray the bearings with a water displacer such as WD40 or Wire Dryer. This will flush out moisture, dirt, and grime.
  - After a good spraying with a water displacer, the bearing will be left dry and in need of oil. Use a light bearing oil found at the hobby shop or auto parts store. \*This step is important\* Failing to re-oil the bearing will cause them to wear prematurely and replacements will be necessary. A few drops of oil per bearing should be fine. Spin the bearing to work the oil into the inner race.
6. Check all screws and moving parts
  - It's a good idea to quickly go over the entire vehicle after each run to ensure all screws remain tight and there isn't any excess slop in the moving parts.
  - Thread lock should be used on any screws that fasten into metal parts, especially on the motor.
7. Checking for cracks and excess wear is also a good way to save yourself from headaches down the road.

## **Engine Maintenance:**

After a day of running your gas vehicle, be sure the fuel tank is empty and all gasoline has been burned out of the engine. The gas has a tendency to solidify over time and is also corrosive.

1. After emptying the fuel tank, restart the engine so any remaining fuel will be used up.
2. Clean off the engine with an old paint brush and/or some compressed air to remove any excess dirt and debris.
3. Remove the air filter being careful not to let anything fall into the carburetor.
4. Clean the air filter with soap and water if needed. A dirty air filter will cause the engine to starve for air resulting in a rich fuel mixture. Remember to let the air filter dry completely before re-oiling. Oil the air filter with "air filter pretreatment oil" after each cleaning. You can buy air filter oil at your local hobby shop.
5. Install the air filter back onto the carburetor to keep debris from entering.
6. It's a good idea to check the spark plug after every five tanks of fuel. After thoroughly cleaning the head (top of engine with cooling fins) with a cotton swab, remove the spark plug by unscrewing it. Check the tip of the spark plug (where spark happens). If there is oil or carbon build up you can spray it off with some carburetor cleaner. If the engine won't start or runs erratic, it's a good idea to check the spark plug for build up. Clean or replace if needed.

## **Electronics:**

Be sure to check your electronics after each use. The electronics are the life line of the vehicle and if they aren't working properly, a crash is almost certain.

- Periodically range check your radio system to ensure proper operation.
- Check batteries regularly. It is important to have fresh batteries in the transmitter and receiver. The receiver batteries will most likely need replacing first. Not only do they power the receiver, but they also power both the throttle and steering servos.
- Check the antenna on both the receiver and the transmitter. Make sure there are no cuts or breaks in the receiver antenna. This will cause glitches and possible signal loss.
- Using the transmitter, check both servos by turning the wheel and pulling the trigger. Check that both servos are operating smoothly and no clicking noises can be heard.
- Make sure all electronics stay dry. Water can short out the circuit boards inside the electronics causing failure.

## **Driving Tips**

Once engine break-in has been completed, you will be ready to have some real fun. Here are some tips to help improve your driving skills.

### **Perspective:**

The single most difficult aspect of driving RC vehicles is perspective. Perspective involves your relation to the vehicle. Are you behind the vehicle, in front of the vehicle, or beside it?

Driving an RC vehicle while standing behind it is like driving a full size car or go-cart. When you turn left, it goes to the left and when you turn right, it goes to the right. Simple.

What if the vehicle is coming toward you? When to turn the wheel to the left, will it go toward your left? No! Because the vehicle is coming toward you, the controls seem reversed. The controller doesn't actually change, it just seems like it does because of perspective.

Always imagine yourself sitting inside the vehicle, not standing outside with a remote. Imagine you are driving and the wheel on the remote is the actual steering wheel inside the car. Keeping this mind set will help you make the correct steering decisions no matter which direction the RC vehicle is pointed.

### **Controlling Steering and throttle input**

The steering and throttle inputs are both proportional. This means slightly pulling the trigger will make the RC vehicle move slowly. Pulling the trigger all the way back will cause the RC vehicle to go fast. The same applies to the steering.

The most common mistake with new RC enthusiasts is over correction. Over correction is when a slight amount of steering or throttle is needed and full throttle or steering is applied causing "crazy driving".

It's a good time to learn how to control your movements. This may sound silly, but nerves and adrenaline have a lot to do with over correction. It is sometimes difficult to control our movements when we are excessively excited and I promise you, when you first hear the scream of the nitro engine and the grass starts flying, you will get excited.

As you become more familiar with your RC vehicle, you will tend to relax a little more making it easier to concentrate on small control inputs instead of great big ones.

### **Look where your going**

While controlling a vehicle going 30 mph it's important to look where it's going instead of where it's been. Looking a good five-to-fifteen feet in front of the vehicle will give you time to react to uncertain obstacles. It also prevents trees from jumping out in front of you.

## **Advanced driving tips**

As you become comfortable driving your Redcat Racing RC vehicle, you may want to drive smoother and with more precision so you can go faster. Here are a few driving tips that are sure to add some excitement.

### **Drifting:**

Driving on loose surfaces like dirt or gravel can be fun, but how do you keep from spinning out?

Counter steering is the answer to that question. Here is a rule of thumb to go by. Always keep the front tires pointed in the direction you want the car to go. This is true regardless which direction the vehicle itself is pointed.

Here is an example:

Let's say you are driving in loose dirt. You are traveling at full speed and you want to make a left hand turn while maintaining most of your speed. You turn the wheel left spinning the vehicle 360 degrees resulting in a complete loss of speed.

Try this! Get the RC up to full speed again, only this time, turn left and when the vehicle starts to spin, turn right keeping the front tires pointed where you want the car to go. When done correctly, the vehicle will enter into a slide or "drift" allowing you to turn while maintaining most of your speed. Practice this many times in both directions and you'll be drifting like a pro.

### **Jumping:**

When done correctly, jumping is by far the most impressive maneuver done with RC vehicles. All RC's can go up, but how they land determines whether it was a success or a mess. Anyone can hit a jump at full throttle, I'm going to teach you how to land on all four tires.

The wheels on an RC vehicle act as gyroscopes. All this really means is, you can drive the vehicle while it's in the air. The amount of throttle or brake applied while in mid flight will control whether the nose is up or down. Applying throttle will raise the nose and applying brake will lower the nose.

This is good to know if you hit a jump and your vehicle's nose is pointed at the ground. Hit the gas! Hitting the gas will raise the nose to help level out the landing. The amount of throttle used is in direct relation to the amount of correction needed.

This is where it gets complicated. Adding steering input in conjunction with throttle inputs will cause a whole new outcome.

Let's say you are in mid flight, your left front tire is closest to the ground, and you want to level the vehicle out. In this case you would steer left and apply throttle. This will raise the left front tire. Applying too much throttle will raise the left front tire too high.

Here is a good rule of thumb. Steer into the front corner of the vehicle you want to correct and apply the appropriate trigger response. Remember, applying throttle raises the nose and applying the brake lowers it.

This will take much practice so be sure to have some spare parts on hand. Bad landings can do lots of damage.

### **Driving with minimal braking:**

Let me clarify what I am talking about. Do not disable the brakes at any time on your Redcat Racing RC vehicle. I am talking about planning ahead and looking where you are going.

Find a large field or empty lot you have permission to be on. Set out some small cones or plastic cups to mark the corners of an oval. Drive around your newly created test track and see how it goes.

Now drive around the same track but this time, look at the corner before you get there. Let off the throttle before you get to the corner and plan how you will get around it. Using this technique, try to make it around the whole track without using the brakes. Let the vehicle coast around each corner and apply throttle as you exit. Continue this over and over, increasing speed with each lap. If it gets too exciting in the corner, let off the throttle sooner. This will teach you to look ahead eliminating surprises. Use caution! If you think you might hit something, hit the brakes instead.



## SETUP TIPS

Redcat Racing cars, trucks, and buggies offer many tuning options to help you achieve the exact feel you like in a vehicle. These tuning options include shock position, ride height, camber, toe in or out, shock stiffness, and over all suspension geometry.

### SHOCK POSITION:

Shock position plays a big role in how your vehicle handles bumps as well as turning stability. The effects of shock position effect the area of the vehicle you change. For instance, if you change the front shock positions, it will effect the traction and stiffness of the front tires.

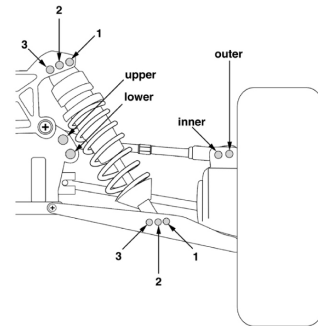
#### FRONT SHOCK POSITION:

##### POSITION: top=1 & bottom=3

The straighter up and down the shock is, the stiffer it will feel. This may also decrease bump handling stability as well as decrease traction. The benefit of this position in increased steering response.

##### POSITION: top=3 & bottom=1

Shocks in a more leaned position will give a softer feel. This increases bump stability and front traction however, it decreases steering response.



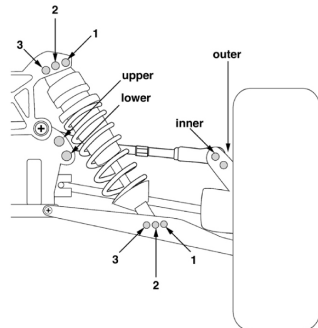
#### REAR SHOCK POSITION:

##### POSITION: top=1 & bottom=3

The straighter up and down the rear shocks are, the stiffer the feel. This decreases rear traction which increases steering, but gives less stability over bumps.

##### POSITION: top=3 & bottom=1

Leaning the rear shocks in decreases steering by providing more rear traction and increases bump stability.



### RIDE HEIGHT:

Adjust ride height by moving the top spring collar up or down on the shock body. Increasing ride height allows you to drive over larger obstacles but also raises the vehicle's center of gravity (C. O. G.). A higher C. O. G. means less stability. Decreasing ride height increases stability but decreases the size of the obstacles you can maneuver over.

### SHOCK OIL:

Heavier weight shock oil (bigger number) will provide more dampening and slow down the speed at which the shock travels. This will reduce chassis roll for more stability. Lighter weight shock oil (smaller number) will offer less dampening allowing the shock to recover quicker. This is better for rough terrain but offers less high speed stability from increased chassis roll.

### UPPER LINK ADJUSTMENTS:

Adjusting the upper link effects the vehicle's "roll center". Adjusting "roll center" will effect the way the chassis rolls at its center of gravity.

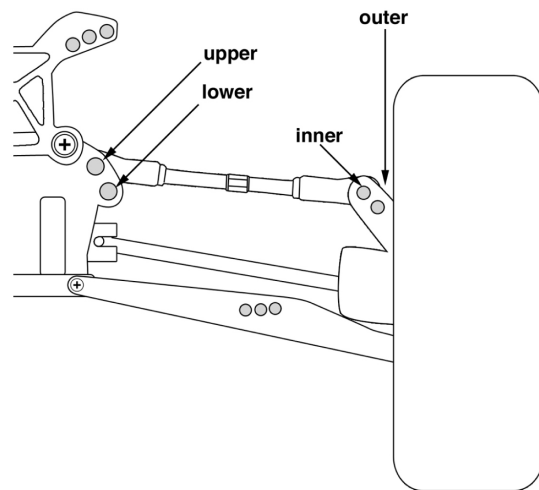
There are two mounting positions to chose from on the chassis side and hub carrier side of the upper link.

Two things to watch for are upper link length and upper link angle.

### UPPER LINK LENGTH:

The longer the upper link, the more the chassis wants to roll in turns. While chassis roll may not seem good, it adds traction in the turns. This is good for a loose track where much traction is needed.

The shorter the upper link, the less the chassis will roll. This is good for a high bite track where stability is needed.



### UPPER LINK ANGLE:

The angle of the upper links also effect chassis roll.

#### Parallel upper link:

When the upper link is parallel (level) to the lower arm, the chassis has a tendency to roll more giving more cornering traction on low grip tracks.

#### Angled upper link:

You must first understand, when I refer to an angled upper link, I'm referring to the inside of the link angling downward. This will give the vehicle a more stable feel with less overall traction. This is good for high bite tracks where stability is needed.

### FRONT or REAR:

Keep in mind, changes made to the rear effect the rear and changes made to the front effect the front. Both front and rear traction effect the vehicles turn-ability. Less traction in the front will make the vehicle more difficult to steer, but less traction in the rear will make the vehicle steer more easily.

### TOE IN & OUT:

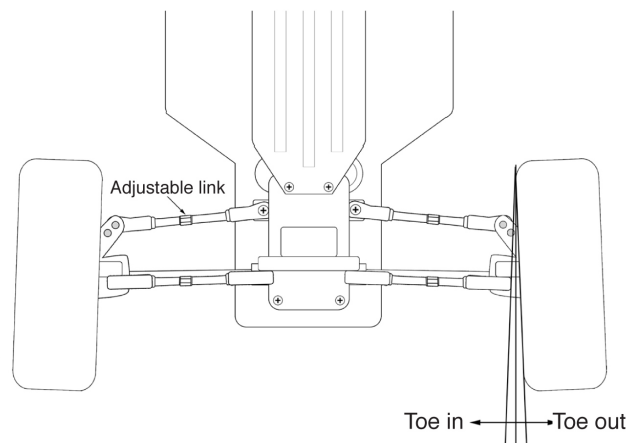
Toe in and out refers to whether the front of the tires are angled in or out.

#### Toe out:

Toe out gives less straight line tracking (darty feel) but more steering. 2 degrees of toe out is usually good for the front.

#### Toe in:

Toe in gives less steering and more straight line tracking. 0-2 degrees of toe in are usually good for the rear.



**CAMBER:**

Camber is the vertical angle at which the tires sit in relation to the ground.

**NEGATIVE CAMBER:**

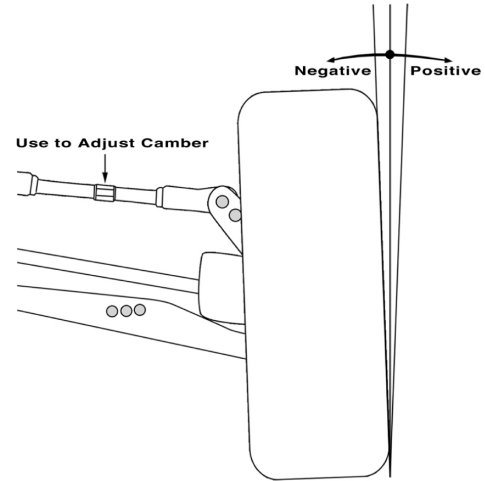
Adding little negative camber (1-2 deg.) will lean the tops of the tires inward providing more traction while cornering.

**POSITIVE CAMBER:**

Adding little positive camber will lean the tops of the tires outward providing much less traction while cornering. Positive camber is usually not used.

**NEUTRAL CAMBER:**

No camber added will set the tires straight up and down offering the most straight line traction but slightly decreased traction while cornering.



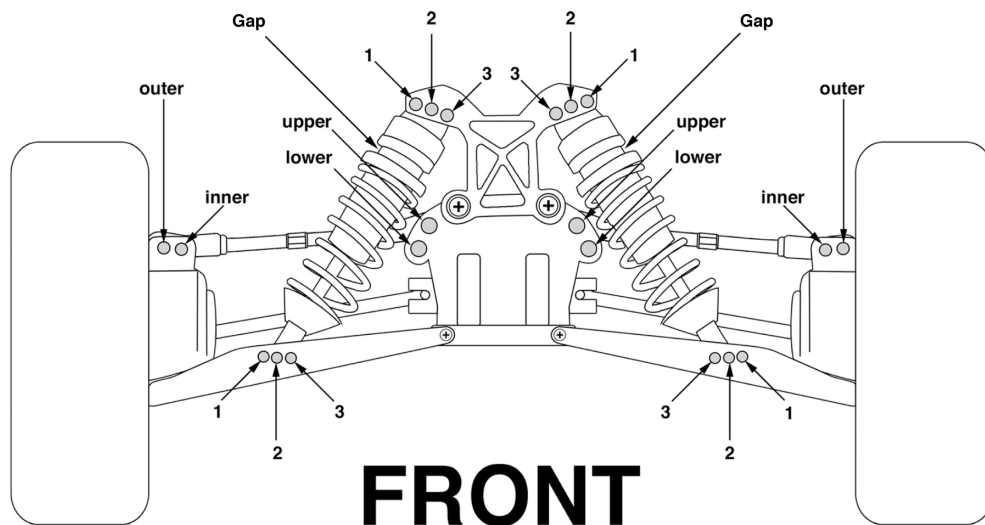
## Performance upgrades

Redcat Racing offers many parts and accessories to make your RC time even more enjoyable. There are also many options from Redcat Racing that are geared more toward hardcore performance. Performance that makes your hair stand on end and your blood boil. Hardcore Redcat Racing performance! Performance that allows you to blast around the back yard or track while leaving everyone else in the dust! Performance that allows you to take that big jump you used to break parts on! I'm talking aluminum! Redcat Racing offers many aluminum performance upgrades that not only add durability, but precision. The kind of precision and added tune-ability impossible to achieve with stock plastic parts. I'm talking hardcore performance aluminum upgrades from Redcat Racing.

To see which hardcore performance upgrades are available for your model, go to:

[www.redcatracing.com](http://www.redcatracing.com)

# Set-up Sheet



## Shock Position:

Top: 1 ☐ 2 ☐ 3 ☐  
 Bottom: 1 ☐ 2 ☐ 3 ☐

## Upper Link Position:

Inside: Upper ☐ Lower ☐  
 Outside: Inner ☐ Outer ☐

Shock oil: \_\_\_\_\_ wt.

## Camber Deg:

Negative: \_\_\_\_\_ degrees  
 Positive: \_\_\_\_\_ degrees

Spring pre-load "Gap": \_\_\_\_\_

## Toe:

In: \_\_\_\_\_ degrees  
 Out: \_\_\_\_\_ degrees

Piston inserts: \_\_\_\_\_ (1, 2, or 3 holes)

Additional notes: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

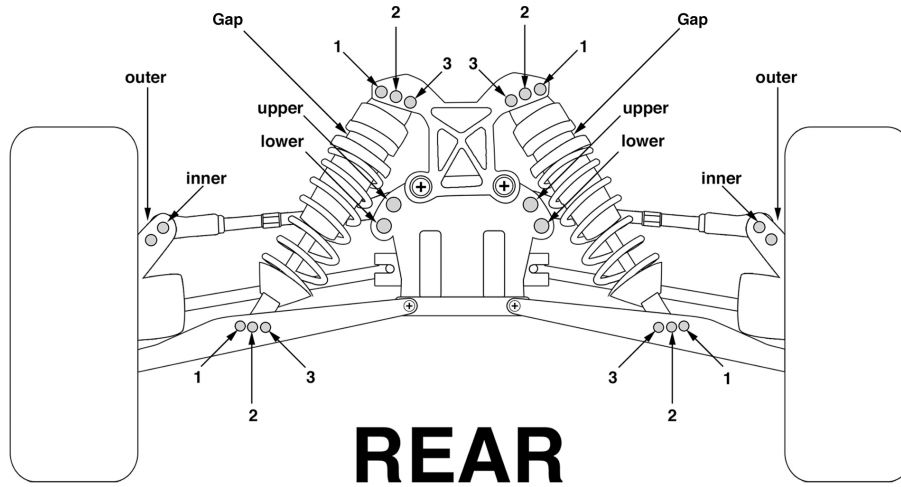
## Fuel:

Gas: \_\_\_\_\_ octane  
 Oil: \_\_\_\_\_  
 Gas/oil ratio: \_\_\_\_\_

[www.RedcatRacing.com](http://www.RedcatRacing.com)



# Set-up Sheet



## Shock Position:

Top: 1 ☐ 2 ☐ 3 ☐  
 Bottom: 1 ☐ 2 ☐ 3 ☐

## Upper Link Position:

Inside: Upper ☐ Lower ☐  
 Outside: Inner ☐ Outer ☐

Shock oil: \_\_\_\_\_ wt.

## Camber Deg:

Negative: \_\_\_\_\_ degrees  
 Positive: \_\_\_\_\_ degrees

Spring pre-load "Gap": \_\_\_\_\_

Piston inserts: \_\_\_\_\_ (1, 2, or 3 holes)

Additional notes: \_\_\_\_\_

## Tires:

Front: \_\_\_\_\_

Rear: \_\_\_\_\_

[www.RedcatRacing.com](http://www.RedcatRacing.com)





<b>Trouble shooting Symptoms</b>	<b>Possible causes</b>	<b>Possible Fixes</b>
Engine won't start	No fuel Fouled spark plug Engine is cold and needs to be primed Choke not on	Add fuel Clean or replace Push primer bulb till gas is seen and push three more times Close choke
Engine runs erratic	Bad or old fuel Air leak in fuel system Loose spark plug and/or wire Choke still closed Dirty spark plug	Use fresh gas/oil mixture Check tank lid, fuel lines for cracks Tighten spark plug and attach wire Open choke Clean or replace spark plug
High pitch engine and stalls (little or no smoke)	Engine too lean Air leak in fuel system	Turn needle counter- clockwise Check entire fuel system for leaks
Sluggish engine and stalls (lots of smoke)	Choke closed Engine too rich Dirty air filter Broken or melted clutch Wrong gas/oil mixture	Open choke Turn mixture needle clockwise Clean and re-oil filter Replace clutch Mix new gas with two-stroke oil
Engine won't hold tune	Bad gas Bad spark plug Air leak in fuel system Dirt in carburetor or motor	Mix new gas with two-stroke oil Replace spark plug Check entire fuel system for leaks Clean carburetor and motor
Engine runs great but won't idle	Idle screw not set	Turn idle screw clockwise 1/4 turn
Sluggish steering	Low receiver battery Servo saver has loosened up.	Use new batteries Tighten servo saver screw/nut
Brakes won't work	Loose brake linkage Oil on brake discs Center of disc is rounded out	Adjust collar and tighten set screw Clean with degreaser Replace brake discs
Loss of control	Bad transmitter or receiver batteries. Electronics may have gotten wet	Change batteries immediately  Unplug battery, dry electronics, replace if needed
Wheel is bouncing uncontrollably	Dirt clod stuck inside rim	Clean all dirt from rims
Centrifugal clutch getting too hot	Dirt inside clutch assembly Oil got in clutch Idle stop set too high Dirt or debris in gears Dirt, rocks, or debris stuck in drive system causing drag	Clean out clutch assembly Clean with carburetor cleaner Loosen idle screw Remove dust cover and clean Check and clean all drive shafts and wheel bearings

# WARNING!

READ ALL INSTRUCTIONS INCLUDED WITH VEHICLE BEFORE OPERATING



**Age warning: This radio controlled vehicle is not a toy!** You must be 14yrs of age or older to operate this vehicle. Adult supervision is required.



## **RISK OF FIRE!**

## **RISK OF EXPLOSION!**

There is a risk of fire and explosion when dealing with Fuel and Batteries.

Nitro fuel contains Nitromethane and Methyl alcohol. These chemicals are highly flammable and explosive. Only use in well ventilated areas. Keep away from fire, spark, and heat. Store in a cool place away from heat. **NEVER SMOKE AROUND FUEL OF ANY KIND!**



Only use in a well ventilated area. Never run your engine indoors.

Rechargeable batteries may become hot and catch fire if left unattended or charged too quickly. Use extra caution when charging LiPO batteries. Use only LiPO specific chargers. Charge away from flammable materials. Never charge at a rate higher than 1S. (2000Mah pack = 2amps charge rate). Overcharging can lead to fire and explosion. Always store battery packs in a cool place.



## **POISONOUS!**

Fuels contain Nitromethane and Methyl alcohol and are toxic. Injury or death can occur if swallowed. May irritate skin and cause injury if absorbed into the skin. Injury or death can occur from breathing the toxic fumes. **KEEP AWAY FROM CHILDREN AND PETS!** Always follow manufacturer's recommendations on fuel container.



## **RISK OF BURNS!**

The engine, exhaust pipe, batteries, electronic speed controller, electric motor, and other areas of the vehicle get hot. Burns can occur if touched after vehicle operation. Allow adequate time to cool before handling.



## **RISK OF ELECTRICAL SHOCK!**

Use caution when charging batteries. Do not touch positive and negative leads together. Do not lay battery on metal. Use only chargers specified for the battery type being charged. Keep batteries and chargers away from water.



## **RISK OF INJURY!**

Hobby grade RC vehicles can cause serious injury or death if not operated correctly. Never use vehicle in crowds. Never chase people or animals. Drive in safe open areas only. Keep body parts away from moving parts.



## **RISK OF DAMAGE!**

Never operate RC vehicles on public roads. Damage of vehicle and property can occur. Only operate on open private property.