

## **RCMAX 40/46/50 Installation and Operation**

***Congratulations, and thank you for purchasing your new RCMAX engine.***

This is a high performance, two stroke engine which produces three to four times the power of a standard largescale, RC car/buggy engine. Please be prepared for the insane increase from your RC!! Drive with care while you are getting used to this.

We strongly recommend fitting a remote kill switch to your engine, as should be the practice with all largescale cars. Normal 1/5 scale kill switches plug straight into the rcmax wiring loom when you remove the standard kill button and two wires supplied.

### **Important Safety Note:**

Because of the performance potential of this engine in a vehicle, such as the HPI Baja, it is necessary to operate the vehicle in a suitable, controlled environment. It should not be operated in a public space where people are engaged in other activities, such as a public park. Do not operate in an area where there are children playing, near pets or other animals. Do not operate on a public highway.

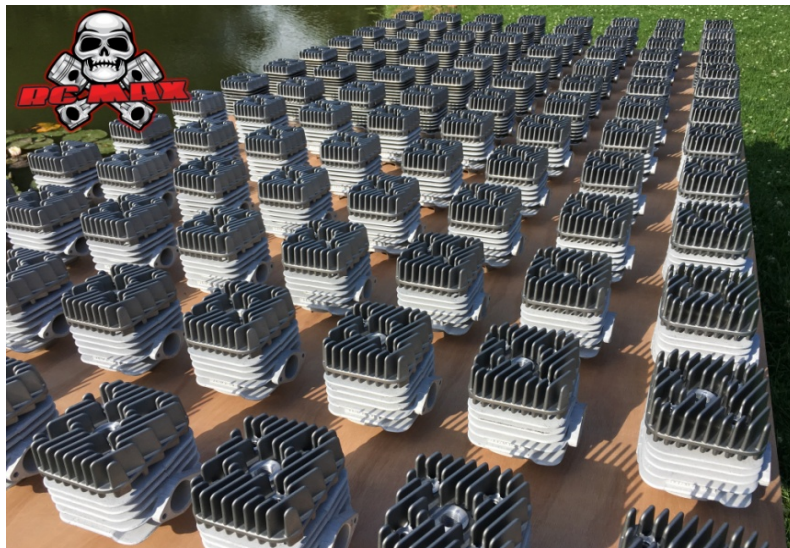
Loss of control of such a vehicle could result in serious injury to another person, family pet or other animal.

Be aware that the engine silencing is minimal so do not run the engine in an area where this could cause a nuisance. You and those around you should always use ear protection during operation.

Please note: All of the manufacturers safety instructions for the operation of the vehicle in which the engine is fitted, must be followed.

### **Fuel Safety Guidelines**

Fuel is highly flammable. Never operate the vehicle near open flames. Do not smoke while handling fuel. Always operate the vehicle in a well ventilated area. Model car engines produce carbon monoxide fumes.



## Installation in Losi 5ive-T

Installation in the Losi is pretty much the same as a standard engine with the exception of the expansion chamber. This is supplied with a bracket to attach to the rear differential housing. It is connected to the engine using an "O" ring sealed joint and a retaining spring. The 'O' ring is supplied fitted to the pipe. Just push the pipe over the exhaust stub, attach the spring, and bolt to the bracket.

## Throttle/Carb/Intake

A Walbro 1107 Full Mod Carb is fitted as standard on the RCMAX 40 to 50GT. This carb has had the bearing mod and internal metering adjustments. You can also choose the WJ71 carb as an upgrade.

NOTE: See further sheet for more information on the carb and settings

## Gearing

A higher ratio is required for the main drive gears, these are made for us by Blackbone and we keep a full range in stock. See below our recommendations based on engine size for 5T tyres:

RCMAX 40GT: 25 or 26 Pinion with 50 Spur (but if larger tyres then need smaller gears)

RCMAX 46: 26 pinion with 50 Spur (but if larger tyres then need smaller gears)

RCMAX 50GT: 26 or 27 pinion with 50 Spur (but if larger tyres then need smaller gears)

## Drivetrain

Because of the considerable extra performance of the engine it will be necessary to upgrade the drivetrain with heavy duty parts. We would recommend using heavy duty drive shafts, heavy duty billet diff housings as our **RCMAX PRO AM** Diffs with the larger bearings and Billet diff casing such as the **RCMAX 7075 Diff cup**.

We also advise to use 1M weight oil or a locker in the centre, 500k in the rear and 300k oil in the front diff. In this way you will always have at least two wheels driving and a good spread of the power.



Note: See supplementary sheet for installation in the HPI BAJA



## Installation in a HPI BAJA

Installation in the vehicle is straightforward. The engine is designed to make use of most of the existing mounting points with the exception of the left side of the chassis. Here two brackets are supplied as part of the engine package, which replace the original parts.

Some adjustment will be required to your throttle linkage to connect to the carburettor due to the size and spacing.

The RCMAX exhaust mounts to the engine with an 'O' ring sealed joint and to the chassis via the supplied brackets and rubber support mounts. Thus it is quick and easy to release if you need access to your radio gear, etc. It is recommended that you fit a **Team Chase** roll cage to your vehicle to protect the engine and expansion chamber in the event of a roll.



Left side front mount

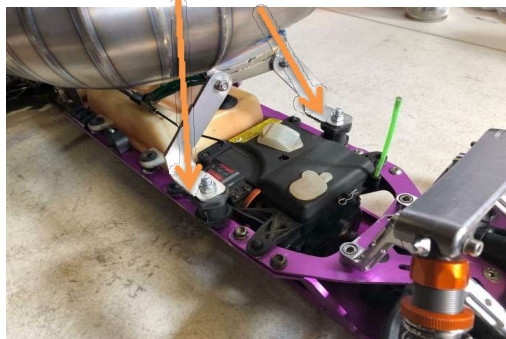


Left side rear mount

Right side mounting bolts (2 behind pinion)



Exhaust supported by Rubber bobbins onto the chassis



**Note:** Three M5 bolts fitted from below the chassis, not shown in the photo's

Due to the considerable increase in power over the standard engine it is advisable to replace the standard drivetrain parts, such as gears and drive shafts, with heavy duty, upgrade parts. We would recommend using a billet aluminium alloy diff case with steel gears throughout. Backbone Racing now make a full set of replacement, heavy duty gears for the Baja gearbox.

**Primary drive gears need to be from Backbone Racing, we recommend the following ratios with 5b tyres:**

RCMAX 40GT: 24/50 depending on tyre size (larger tyres smaller gears)

RCMAX 46: 24/50 or 25/49 depending on tyre size (larger tyres smaller gears)

RCMAX 50GT: 25/49 or 26/48 depending on tyre size (larger tyres smaller gears)

Drive shafts should be heavy duty types. We would also recommend that you fit a locked or limited slip differential.

To make control of the vehicle easier it would be advisable to fit some sort of wheelie bar on the rear of the chassis. This, together with the locked diff, helps to make the vehicle more driveable on the throttle.

Finally a good set of wheels, preferably BRPs or maybe hostiles with zero growth foams and Billet bead locks will be required.

## **Installation in Kraken Vekta**

Installation in the Vekta is pretty much the same as a standard engine with the exception of the expansion chamber. This is supplied with new brackets to attach to the car securely. It is connected to the engine using a gasket and header piece, then the main pipe attaches via a slip joint and retaining springs. A small length of tubing is supplied to fit to the end of the outlet and ensure no oil residue from the smoke is left inside the car.

## **Minor Cage Modification (not body panels)**

As shown on the picture below, there is a small mod required to the plastic cage bars which are in the way of the rcmax billet intake. Simply trim this cross bar and circle section from the cage, leaving the body panel in tact. This just allows a little room in the event of a rollover for the body to flex inwards without hitting.

Also with the new engines, it is required to remove the front right cage bar which hits the head.

## **Throttle/Carb/Intake**

A Rooster 990 Full Mod carb is fitted as standard on RCMAX 40-50GT

This is supplied with throttle arms prepared to take the supplied quick release fitting, we also supply a new link rod which is bent to fit the large crankcase.

If your using a WJ71 Carb, youll notice its 10mm wider and therefore more effort needed on the cage, we supply a billet spacer which fits between your cage and the bottom cage mount leg to space out the cage.

NOTE: See further sheet for more information on the carb and settings

## **Gearing**

A higher ratio is required for the main drive gears. A 22 tooth pinion and 19 tooth step gear should provide a good starting point. Suitable gears for the Vekta are made by Vertigo and we offer their system.

This ratio should give the car good acceleration and a reasonable top speed so it can be used in a reasonably sized space. Lots of other gear combinations are available too.

Please bare in mind tyre size, if you run Trepadors then stage 1 gears (21/20) will be plenty as a baseline.

## **Drivetrain**

Because of the considerable extra performance of the engine it will be necessary to upgrade the drivetrain with heavy duty parts. We would recommend using the RCMAX heavy duty front billet diff housing.

We also advise to use 1M diff oil in the rear and 300k oil in the front diff. In this way you will always have a good spread of the power and the engine should not be able to overcome the oil too easily.



# **Engine Starting Procedure**

## **Location of engine controls**



Pull starter

Engine stop switch

### **First Time Engine Starting.**

When starting for the first time following engine installation it will be necessary to draw the fuel from the fuel tank up to the carburettor. Prime the carb several times until you can see the fuel passing into the carb from the line so you know the carb is full.

Next turn on the choke and pull the engine at high speed until she fires once. After this turn off the choke and try to start the engine, sometimes a little throttle will help a lot to get her going.

### **Engine Starting.**

Having started and run the engine at least once it should fire quite easily without the need to prime the fuel system heavily. Ensure the carburettor is primed and pull the starter rapidly until the engine starts. Sometimes a small amount of throttle can help a great deal to get the engine to fire if the weather is out of the ordinary for your normal settings.

If the car has not been used for some time it may be necessary to prime the carburettor and enrich the mixture a little. It depends on the environmental conditions prevailing at the time.

It will always start more easily on a warm day.

### **Engine Break-In.**

After starting the engine make sure it is fully up to operating temperature before driving the vehicle. For initial break in during the first 5mins, allow the engine to idle with intermittent blips of the throttle the cool. For the second start operate the vehicle at reduced speed using short bursts of hard throttle to allow the engine and clutch shoes to fully bed in.

From this point on you can increase performance as you get accustomed to the operation of the engine.

**Safety Note: Because of space limitations within the vehicle, the silencing of the exhaust system is limited. Always wear ear protection when running the engine.**



## Walbro WT Carburettor Setting

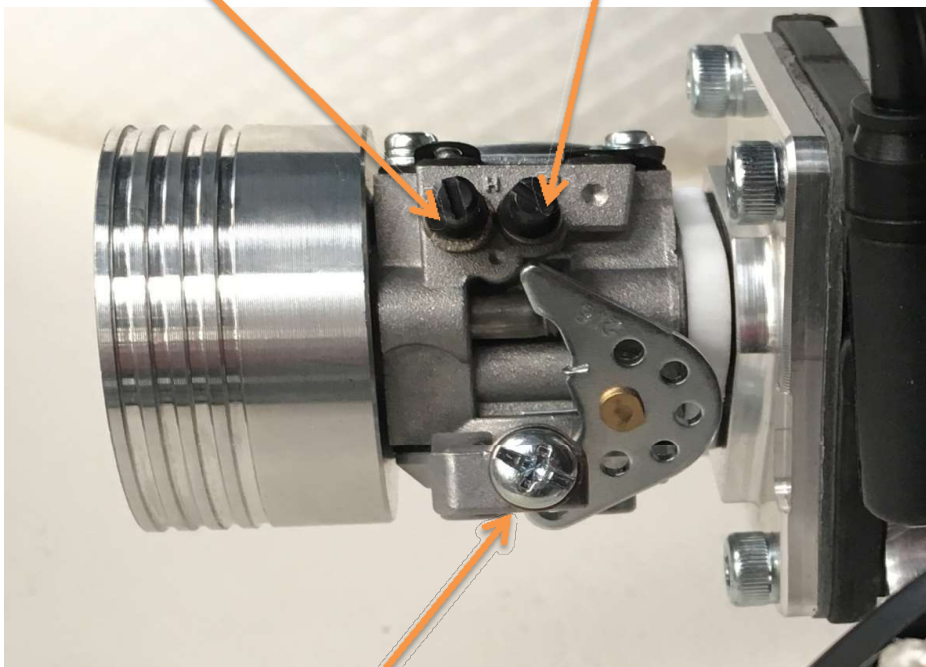
Make sure you complete the run in of the engine on a rich setting before considering leaning it out for optimal performance. Please remember your climate and altitude could result in the requirement for different settings, so as with any two stroke, start with caution and care.

We fit the Rooster Tail 990 carb as standard on the 400GT and some of you have 1107s, both with priming bowls and the 1107 has a choke. The WJ71 carb is fitted to 46/50GT, see next sheet

### Location of carburettor controls

**HIGH** Speed mixture adjustment screw  
RT990 = Base setting is **1 5/8** turns out  
1107 = Base setting is **2 1/4** turns out

**LOW** Speed mixture adjustment screw  
RT990 = Base setting is **1 1/2** turns out  
1107 = Base setting is **1 5/8** turns out



Idle Speed adjustment screw

The base settings of the mixture screws may need some adjustment to suit your local atmospheric conditions e.g. temperature, humidity. If so adjustments should be made 1/16 of a turn at a time, with a test run after each adjustment. Do not exceed 1/4 turn in from the factory setting or it may result in engine damage.

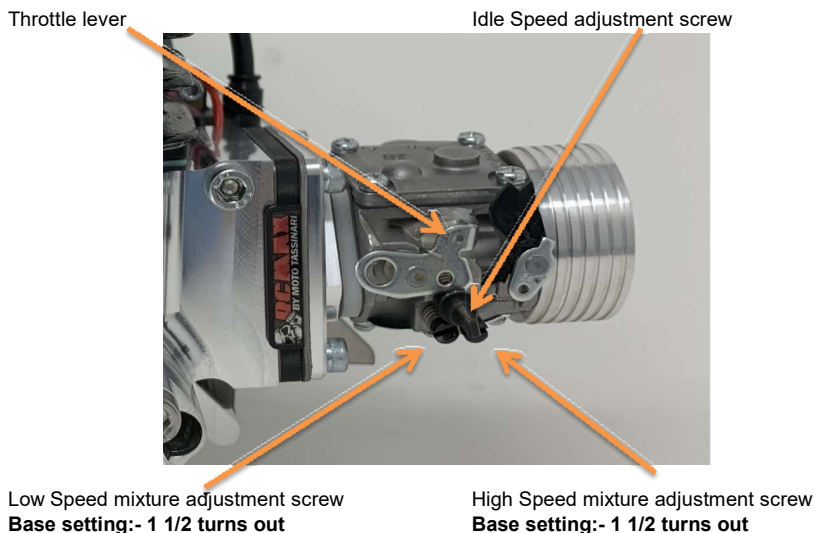


## Walbro WJ71 Carburettor Setting

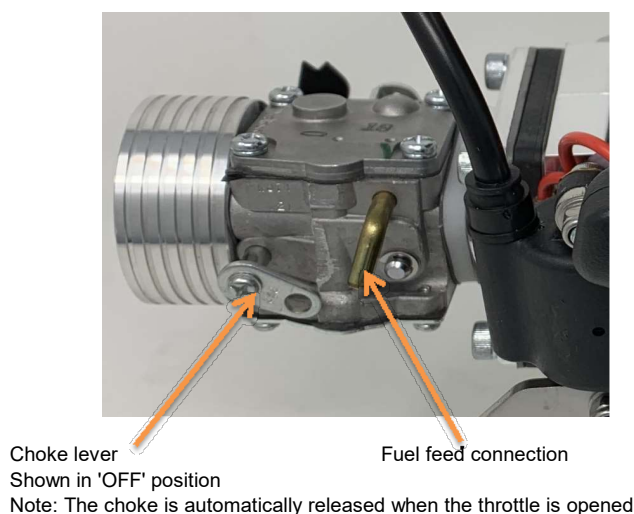
Make sure you complete the run in of the engine on a rich setting before considering leaning it out for optimal performance. Please remember your climate and altitude could result in the requirement for different settings, so as with any two stroke, start with caution and care.

We fit the Walbro WJ71 carb as standard on the 50GT which does not come with a priming bowl. Priming the engine is simple. Pull the engine over with the choke on a few times in order for the fuel pump within the carb to pull the fuel up the line into the carb itself. Its ideal to use a clear fuel line so you can watch this process and see when the fuel reaches the carb. Then you can expect the engine to fire up, sometimes with the aid of a small amount of throttle and choke.

### Location of carburettor controls



The base settings of the mixture screws may need some adjustment to suit your local atmospheric conditions e.g. temperature, humidity. If so adjustments should be made 1/16 of a turn at a time, with a test run after each adjustment. Do not exceed 1/3 turn in from the factory setting or it may result in engine damage.



**Note: This carburettor has only one connection to the fuel tank. This is the fuel feed tube which must have an in tank filter fitted.**  
**There is no fuel return tube required so this should be removed and the hole blanked off using a suitable sealing plug as long as your tank has a breather, if not then fit a MX style non return breather valve in the second unused line.**

## Engines with 54mm HD Clutch

With the extreme performance of your new RCMAX engine, you need a clutch that matches this power. We have chosen the new UFC performance clutch spring as tested so famously on facebook and a set of UFC Sintered steel clutch shoes for this job.

This extremely heavy duty 54mm clutch setup will hold your engine firm and accelerate the vekta nicely. The clutch runs straight in your normal LOSI/BAJA clutch bell, we do recommend that you run the blackbone clutch bell so that you can use the correct gearing options. Plus it's the strongest bell on the market.



### Clutch Run in procedure.

The UFC Clutch requires minimal service and offer you a long duration of bashing before needing new shoes.

As the shoes are a sintered steel material, they do require a period of running in, this should go hand in hand with your engine break in procedure. You may see some smoke from the clutch as it is bedding in, this is completely normal.

Tools are available on the market called "piston stoppers" which are screwed into the spark plug hole and stop engine rotation by physically stopping the piston from moving in the cylinder. **Only use this type of tool at your own risk because if used incorrectly or without a cushion piece on the tip, can result in damage to internal engine components**

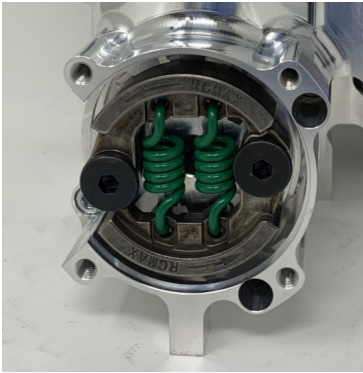


## Engines with the V3 62mm Clutch System

With the step up into Big Bore engines, we also need to increase the performance and durability of the clutch system. After a massive amount of investment and research, we have now developed/refined our own sintered steel clutch. The RCMAX V3 Clutch combined with our new RCMAX Clutch springs.

This clutch is now an extremely durable and reliable big bore clutch system, requiring no maintenance or regular adjustment. Just fit and forget.

The fitment of the clutch is simple, once you have the spring fitted to the shoes, which fits like all 1/5 scale clutches (line up and then snap together), you simply attach the clutch via the two mounting bolts.



It is important to note that the RCMAX V3 clutch is designed for normal 8mm 1/5th scale clutch hardware

So simply fit the bolt into the shoe with the spring washer between head of the bolt and shoe then fit the flat washer behind the shoe and then bolt onto the clutch backplate on the engine.

When fitting the clutch shoes, check that the RCMAX brand name is facing outwards  
there is also a directional arrow for double checking

## Clutch Removal/Replacement

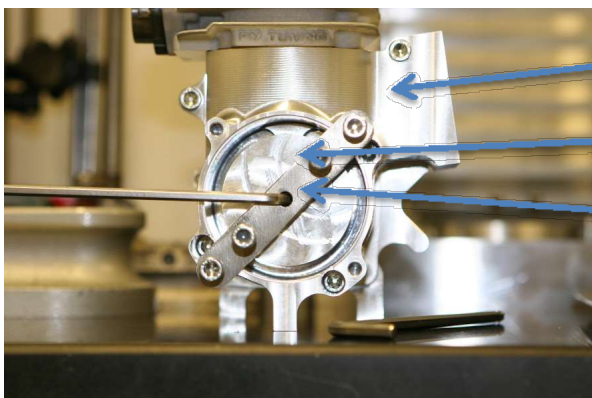
Tools are available on the market called "piston stoppers" which are screwed into the spark plug hole and stop engine rotation by physically stopping the piston from moving in the cylinder. **WE DO NOT ADVISE THE USE OF SUCH TOOLS**

Instead simply insert some pull start cord in through the plug hole (with the piston past exhaust port closure and then gently turn the engine to TDC to pinch the cord between piston and head to lock.

Included with the engine is a tool designed to make clutch backplate removal easy if required for servicing. The picture shows how to hold the clutch back plate while the centre retaining bolt is loosened.

Then simply wind the bolts which are threaded into the clutch backplate evenly in, turning them a fraction of a turn each in sequence so that they pull against the clutch tool and pop the backplate off the taper on the crankshaft. This then allows inspection of the crankseal and further stripping of the engine.

### Clutch back plate removal



M6 bolts screwed into crankcase and clutch back plate (4 off)

Allen key inserted into back plate retaining bolt

Clutch holding tool

## **Maintenance**

To ensure that you get the maximum enjoyment from this product and a good service life, RCMAX recommends that you take a little time to clean the engine and vehicle after use. It is easy to spot a little problem such as a loose bolt on an engine mount before it becomes a much bigger problem.

**It is absolutely essential that only the best quality fully synthetic two-stroke oil is used.** We recommend Putoline RS959 or Motul 800 oil but there are lots of great products on the market.

This must be mixed at a fuel/oil ratio of 25:1. Only good quality 95+ Octane must be used to prevent the possibility of detonation or seizure. We recommend using an additive called Tetraboost with your fuel for the ultimate in reliability. (or run a two-stroke friendly leaded race fuel such as VP C12.)

The best type of air filter to use with the engine is the quality dual stage RAM-AIR filter and should be kept oiled at all times. The filter is very effective at keeping the engine clean internally even when run in dusty conditions. Regular cleaning and re-oiling is required to keep air filtration at its best. The use of an water resistant Outerwears protective element is recommended for filtering out large debris.

Paper element filters can be used but should be of the highest spec, such as that supplied in the billet, air filter system and should be run dry and kept clean with regular checks.

Please ensure that your fuel equipment, and fuel system of the vehicle is kept in a clean condition. Dirt can play havoc with carburettors leading to much frustration and little fun. Please make sure your vehicle in-tank fuel filter is in good working order.

Due to the size of these engines, they tend to offer a longer service life from the piston and ring than you may be used to with traditional tuned RC engines. This will depend on how you use it and look after it but its not unusual for a well maintained RCMAX to go years between rebuilds.

If you are unsure about carrying out a rebuild, we are more than happy to do it for you for a small charge plus parts.

**Please contact RCMAX for advice, or service, if you are in any doubt.**

Contact details are as follows:

Main Contact: Mike Taylor  
Contact E-mail: [mike@rcmax.co.uk](mailto:mike@rcmax.co.uk)

## **Limited Warranty**

### **What this Warranty Covers**

RCMAX warrants that the product purchased will be free from defects in materials and workmanship at the date of purchase by the Purchaser.

### **What is Not Covered**

This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the product, (iv) attempted service by anyone other than RCMAX or their appointed agent, or (v) products not purchased from RCMAX or their appointed agent. (vi) the product if aftermarket components, which are not specifically approved by RCMAX are used with the product, e.g. exhaust system.

OTHER THAN THE EXPRESS WARRANTY ABOVE, RCMAX MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE

### **Purchasers Remedy**

RCMAX's sole obligation and purchasers sole and exclusive remedy shall be that RCMAX. will, at its option, either (i) service, or (ii) replace, any product determined by RCMAX to be defective. RCMAX Reserves the right to inspect any and all Product(s) involved in a warranty claim. Service or replacement decisions are at the sole discretion of RCMAX. Proof of purchase is required for all warranty claims. SERVICE OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE PURCHASERS SOLE AND EXCLUSIVE REMEDY.

### **Limitation of Liability**

RCMAX SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY, REGARDLESS OF WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER THEORY OF LIABILITY, EVEN IF RCMAX HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Further in no event shall the liability of RCMAX exceed the individual price of the Product on which the liability is asserted. As RCMAX has no control over use, set-up, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, set-up or assembly, the user accepts all resulting liability. If you as the purchaser or user are not prepared to accept the liability associated with the use of the Product, purchaser is advised to return the Product immediately in new and unused condition to the place of purchase.

### **Law**

These terms are governed by the laws of England (without regard to conflict of law principals). This warranty gives you specific legal rights. RCMAX reserves the right to change or modify this warranty at any time without notice.