

## Revised, reworked and Race Ready: 2023 KTM RC 8C

### The Mission

Two years ago, KTM took advantage of its booming road race success to craft a special, limited-edition prototype: the KTM RC 8C was born. Not only did the bike pay homage to the feats logged in Grand Prix but also acknowledged the heritage of KTM's unforgettable KTM RC8 sports machine that blasted both track lines and country lanes over a decade previously.

The KTM RC 8C was a lithe, agile, and capable power-to-weight 'weapon' that could steal the line of any superbike and match anything else for acceleration and heart-pumping thrill.

The rush and positive reception had the R&D department rubbing their hands and putting their ideas to the screen for an augmented version for 2023: a more refined model is the result. The initial KTM RC 8C was a fascinating blend of the torquey and powerful LC8c engine and a purpose-built track chassis; a project that was completed with the help of KTM's ongoing collaborator Krämer Motorcycles.

For 2023 and the second generation the palette was deepened. Whether for track days, amateur competition or as a Pro training foil, the KTM RC 8C had to be faster, better, and sculpted for easier attack on the lap-times. Therefore, the bike was upgraded and improved. How was this achieved? You have the questions, here are the answers...

### The Tools

How have KTM worked on the LC8c engine for 2023?

Achievements on the 889cc, 75 degrees crank pin offset, parallel twin, 8 valve DOHC cylinder headed motor include more peak power (135 HP at 11,000 rpm; a 7hp increase), a wider RPM range (up to 12,000 RPM) with higher max RPM peak, improved durability, and increased engine thermal stability. The maximum torque reaches 98Nm at 8250. The KTM LC8c is still one of the lightest, most compact, and most versatile powerplants on the market and has been harnessed for this latest road racing expression.

### How have you done this?

Well, new for 2023 is the exhaust system, manifold, and routing; a titanium unit from famed fabricator Akrapovič that saves more than a kilogram of weight compared to the previous iteration. Elsewhere the twin chain-driven camshafts are assembled rather than forged and titanium valves (with new timing) save more grams. The in-and-out ports are machined. It was the horizontally-split crankcases that permitted a high-pressure cast – and thus reduced wall thickness and dimensions – that gave KTM technicians room for more design possibilities. The change also shrunk the readout on the weighing scales even further.

### What components can be counted on for more durability?

There is only one optimized balancer shaft in the crankcase, which should take care of any concerns over vibration. The sleeveless engine design and open deck cylinder construction means more gains for cooling, production tolerances and reduces the potential for cylinder warp. The forged box piston (90.7 bore and 68.8 stroke) have 2 rings with a lighter titanium connecting rod and DLC coated piston pin: weight is controlled thanks to the box construction. A semi-dry oil sump guides liquid out of the crankcase, clutch housing, and transmission. The altered design means friction losses can be trimmed and the condensed nature of the LC8c can be preserved and the engine is tilted and positioned in the frame for the best center of gravity and sense of handling.

### What other 'race bike' considerations are there?

The 2023 KTM RC 8C has been generated for one role. That's why components such as the air filter box (the filter is developed with Twin Air) are unique to this bike. The PASC clutch is smaller, lighter and pressure lubricated for better cooling and friction. Count on increased clutch preload and harder springs while the slipper clutch configuration assists engine back-torque (helping for rear wheel chatter under braking or being off-throttle) and for ease of use under acceleration and upshifting. The new throttle body, with sensors for manifold pressure co-developed by specialists Dell'Orto, is now 48mm compared to the previous 46.

### OK, how about handling?

The CroMoly steel frame has a 66.7 steering head that can be moved by 1 degree in each direction. The trail is 98.6mm and the wheelbase measures 1400mm. The bike's dry weight is 142kg. The 2023 KTM RC 8C is chiseled to turn on a whim and burn on the spin and that's where the suspension mods come in.

### Does the bike have the latest WP Suspension?

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Yes. The highest level of WP Suspension technology comes courtesy of WP Pro Components with the WP APEX PRO 7643 closed cartridge 43mm front fork and the WP APEX PRO 7746 shock with preload adjuster. This is the lightest and most advanced kit in the WP portfolio and is manufactured purely for racing and has been thoroughly tested at decent national level competition. KTM and WP have reworked the base setting of the KTM RC 8C to be slightly softer; the benefits are for enhanced feedback (especially for bumpy track conditions) and more pitch to assist quicker corner entry. The front fork has a new spring guide, a split system with rebound on the right and compression on the left and a new separation piston with X-ring for less friction and more rapid response. The shock has a new high and low speed compression adjuster with a wave spring. WP Pro Components don't stop with the suspension. A WP APEX PRO 7117 steering damper can be adjusted in 30 clicks and is another race-fettled apparatus engineered to be light, small and fit-for-purpose.

### **Have the electronics been updated?**

The 2023 KTM RC 8C has two throttle response maps. These are revealed by new icons on the TFT dashboard and set through the new handlebar combination switch. The first - 'PW1' - is for dry conditions and a decent level of grip and provides more direct and instantaneous feedback. 'PW2' is the softer, smoother rain setting that can also do a job when dry grip degrades. Traction control slip adjustment is new and can be notched between none ('0') to the maximum ('9'). Engine Brake Control is another new facility and can be applied according to two levels. Rely on the immediate grunt and drive from KTM's Quickshifter+ to get moving rapidly to the next corner.

### **What braking power does the bike have?**

Some of the best. When it comes to performance, low weight, and strength then only Brembo will do. The brand is used by every team in the premier class of Grand Prix racing and intel from the championship has sculpted the Brembo 19RCS CORSA CORTA with three different bite points.

290mm fully floating discs by specialists Moto Master are grabbed by Brembo Stylemas and will bite with a squeeze from the right fingers while a dab from the toes will engage the Brembo two piston caliper on the 230mm rear. The calipers are held in place thanks to titanium screws.

The aerodynamic styling looks like the KTM RC16. What's the intended effect?

The profile is filtered directly from the KTM RC16. The winglets help to stabilize the bike at high speed, assist with downforce and give more control under braking. Other shapes and cut-outs around the fairing optimize the airflow around the rider. All the bodywork, which is made from GRP and reinforced with carbon and Kevlar, is designed to be quickly and efficiently swapped out for replacements.

## **THE PITLANE THINKING**

Unlike a serialized production bike with compromises, the prototype, hand-built status of the KTM RC 8C means it can be orientated directly for the circuit. This focus leads to a raft of specific race machine characteristics.

The grip: Light and robust Dymag UP7X forged aluminum wheels (3.5x17" and 6x17") with a quick-change system are shod with Pirelli Diablo Superbike racing tires.

The speed: A six-speed transmission with Quickshifter+ will unleash all the horses of the 2023 KTM RC 8C but, if necessary, the bike also has a pit lane speed limiter.

The preparation: Swapping parts, particularly damaged ones, is all part of the clever architecture on a race bike but the 2023 KTM RC 8C is not only primed for whatever might happen on the asphalt or in the gravel but comes with a few added protective assets to bolster the package. Crash pads can be found on the frame, fork lowers and fuel tank and a protector for the brake lever. The oil draining screws, filter cover and caliper bolts are safety wired. The aluminum cast and CNC-ed swingarm has integrated crash protection thanks to the clever use of aluminum plates. There is even a red rain light. Get exact with an integrated fuel tank drain and fuel line connector: riders can know their consumption on track but once the flag has fallen and the tires have cooled then this helps to empty the tank for storage or transport.

The look: Unmistakable 'winter test' livery in black with orange frame and orange trim. Each of the 200 2023 KTM RC 8Cs are also stamped: their individual number embossed on the triple clamp.

The feel: The handlebars are CNC-ed clamps with interchangeable tubes. The position of the bars can be easily set and fixed thanks to the laser engraved markings, ensuring precision. The angle can be turned by 30 degrees with a 25mm change in height and 30mm in width. The neoprene seat can be fastened in two positions and the footpegs have a 66mm movement range in 3 steps along the CNC milled brackets.

The view: Just below the bubble, a new KTM AIM MXS 1.2 RACE dashboard has been fixed into place. It contains a 5" TFT with data logger and GPS. The rider can see his or her lap-times, but the logging system can contain a number of

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other features, such as: GPS speed, track position, throttle position, RPM, gearing, acceleration, and deceleration and then the standard engine management measurements like water temperature, battery, ECU mode, oil pressure and milometer.

The TFT also reveals further information through new icons for throttle response, Motorcycle Traction Control, Engine Brake Control and Anti-Wheelie mode. All of which is operated by a new left-hand switch layout, color-coded as with the KTM RC16.

## THE CREW

Racing breeds the creed. KTM's Motorsport Department is the pulsating heart of the company and not only strongly represents some of the firm's core brand values but sets the tone and inspires the rest of the activities in the growing Mattighofen empire. Racing knowledge and experience run through the 2023 KTM RC 8C as vividly as the eye-catching orange and black colorway. It has been made by fast riders for fast riders and tested by fast riders.

Florian Bernroither, KTM Chief Engineer – Power Pack

Is it fair to say that the 2023 KTM RC 8C a more focused model compared to the previous edition?

Yes, definitely. The 2023 model was a decision made by our board and with a good overview for what we needed to do. In my opinion we have improved the bike a lot now.

What was the #1 priority?

As with any race bike it was to make the fastest machine possible for the race track. This was the main priority for this project. We also had goals to better the 2022 bike and to improve peak performance as well as the behavior of the machine.

The LC8c engine platform: was it sufficient for the changes you wanted to make?

Definitely, but the LC8c engine platform is developed to have a very torquey behavior, and this is not the most appropriate for a race bike, let's say. You want and need a bigger RPM range and as much peak performance as possible. This was one of the biggest tasks for the project.

There have been quite a few engine changes and upgrades. In your view which was the most important?

The work we did to reduce the oscillating masses. We now have a two-ring piston system which increased the weight of the oscillating mass and we used titanium connecting rods for the cranktrain as well as the titanium valves: these three parts gave us the opportunity to increase the RPM range.

Were there any lessons coming from other KTM models or from the race department itself?

Yes, in our engine department we have a lot of know-how from past projects and even from the old RC 8R, which was a project I was also involved with. It was not hard to find peak performance, especially when you compare it to the homologation you need to hit for a normal production bike for the street.

How does it work with Kramer Motorcycles?

Well, before Kramer would create his own project from a KTM engine that he had bought from the factory. Now the '23 model is more in-house and with more internal R&D for things like the tests for durability. We handled it almost like a serial production project with a regular team working on it, starting from a mechanic project leader to an application guy and a colleague for EFI; the whole-up that is necessary for a new motorcycle.

Have you maintained the same chassis concept?

It's not really my main area but I know the guys found new fork and shock settings that will have a benefit and there were new features like traction control and so on. I'm not really the chassis specialist. I am just here to gain as much power as possible!

Aerodynamics: it really seems that the RC 8C has benefitted from some MotoGP™ knowledge...

That's right. I cannot comment too much but MotoGP™ experience definitely came into the aero profile and there were other typical and necessary race features like TC, launch control and a way to set the engine braking now. All very helpful features for the track. These work for a hobby rider or a Pro rider because they are things that you can really feel under your ass and are more-or-less standard items on many street bikes. They are very important because if the track conditions or the climate changes then they can save a lot of money and time.

Lastly why only 200 models?!

It's not the easiest question to answer! I appreciate that the limited-edition status makes the bike that much more exclusive. It is also difficult to construct a large mass of these bikes because they are all hand built, starting with the engine to the chassis. They are quite expensive; you would need a whole new factory for those types of hand-built

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projects. We are specialists in building large quantities of bikes from 125 to 1300cc machines but the RC 8C is like the 'Rolex' of motorcycles. A different set-up is necessary, and the limited edition run means they are not only more special but also allows us to ensure the highest possible quality for each one in terms of performance requirements.

## THE POST-RACE DEBRIEF

Essential information about the KTM RC 8C

Engine output: 135 HP at 11,000 rpm

Weight: 142kg

Tires: Pirelli Diablo Superbike

Fuel tank capacity: 16 liters

Suspension tech: Race developed WP SUSPENSION APEX PRO COMPONENTS

Brakes: Brembo caliper and cylinder and Moto Master discs.

Number of models produced: 200

Price: Dependent per market

How to buy one: Register interest on [KTM.com](https://www.ktm.com)

## THINKING OF THE NEXT OUTING

Wear and tear is part of any extreme activity. The KTM RC 8C is fabricated for easy parts replacement and further customization options can be found through KTM treasure trove catalog of KTM PowerParts.

Any racer can also find ideal track equipment in the KTM PowerWear line-up. Shoei's superb X-Spirit III is a helmet used by some of the best road racers in the world and the KTM-styled version takes prides of place in the collection. KTM's alliance with Alpinestars means that GP Plus R V2 gloves and Supertech R V2 boots will complement the new Radius 1-PC full race suit; all in fetching black and orange that will create the full, menacing look with the 2023 KTM RC 8C.

To mark the launch of the bike there will be an ultra-special track day event for 30 customers at the Circuito Ricardo Tormo in Valencia on April 26th, 2023. Select, first-come, first-served places can be secured with former Grand Prix riders like Jeremy McWilliams and Mika Kallio offering track tuition and a full KTM and WP Suspension technical crew on hand to dial-in the configuration of the new bike to the 14-corner Grand Prix venue. Accommodation, food, bike transportation logistics from Austria to Spain and then to local dealers is all taken care of. This is the full factory racer experience!

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