

2023 KTM MOTOCROSS RANGE RADICAL INNOVATION

In the rough and tumble world of competitive motocross, KTM has long been a dominant leader in innovation, starting the trend way back in 1986 when it became the first manufacturer to produce an MX machine with front and rear disc brakes.

The KTM 350 SX-F was another experimental and successful debut for KTM - not to mention an almost unending list of 2-stroke engine innovations in the 2-wheel offroad motorsport realm. The success of this relentless pursuit of always being at the cutting edge is obvious.

For 2023, that trend continues.

WELCOME TO THE ERA OF 'SMARTERCROSS'

KTM has won 5 AMA 450 supercross titles since 2015, 31 of 42 possible MX World titles since 2000, 13 of the last 18 MX2 World titles, and 8 MXGP titles since 2010. In fact, in many instances, these represent more titles than all competitors combined - all of these victories can be attributed to intense R&D input.

For model year 2023, the full-sized KTM Motocross stable has undergone a complete refresh, with an array of technological advancements across the entire KTM SX and SX-F range. These changes have come directly from learnings at the track, with racer input being at the forefront.

Now sleeker, slimmer, and designed to provide all riders of any experience level complete control, the 2023 KTM SX range of motocross weaponry is ready to make a statement;

**“THESE ARE THE MOST INNOVATIVE AND HIGH-PERFORMING READY TO RACE
PRODUCTION MOTOCROSS BIKES EVER BUILT.”**

CHASSIS

FRAME

The hydro-formed, laser-cut, and robot-welded frame has undergone major updates to improve overall dynamics, anti-squat behavior, and overall stability.

Designed and constructed with specifically calculated parameters of longitudinal and torsional flex, the new frame provides exceptional rider feedback, energy absorption, and straight-line stability. This is thanks in part to repositioned rotating masses in the frame and the forged steering head connection, together with an all-new shock mount, which is no longer connected to the main frame tube.

Thicker frame walls also contribute to improved reliability and specific rigidity in high-stress areas



such as the steering head and the shock mounts, while new parallel frame mounts across the 2023 2-stroke range improve flex characteristics.

An important highlight of the new frame is repositioned footrest mounts. These have moved inwards, making them less susceptible to hooking in deep ruts or when scrubbing jumps. However, the overall size of the footrests has increased by 26%, designed with the help of state-of-the-art finite element analysis (FEA) which uses a computerized method for predicting how a product reacts to real-world forces, vibration, heat, fluid flow, and other physical effects. This has resulted in dramatically improved comfort and control when standing on the pegs.

The frame of the 2023 KTM SX and SX-F models is finished in black powder coating and a hard-wearing matte surface. Additionally, black frame protectors featuring a new and improved grip texture, guaranteeing superior protection, durability, and ultimate grip are fitted as standard.

FRAME FEATURES

- Specifically engineered longitudinal rigidity provides exceptional rider feedback, energy absorption, and stability.
- Repositioning of rotating masses in the frame and forged steering head connection.
- Topology optimized frame wall thickness for specific rigidity and improved reliability in high-stress areas.
- New shock mount, significantly improving anti-squat behavior.
- New parallel frame mounts for improved flex characteristics on 2-strokes SX models.
- Footrest mounts moved inwards for less risk of hooking in deep ruts or when scrubbing.
- Durable finish with standard frame protectors, featuring a new KTM-specific texture.

POLYAMIDE REINFORCED ALUMINUM SUBFRAME

Weighing in at only 1.815 kg, the new 2-piece polyamide reinforced aluminum subframe provides impressive weight savings. With the help of FEA, carefully calculated rigidity was engineered into the subframe, delivering outstanding handling and feedback, while remaining robust and reliable.

The design of the subframe also provides for a neat housing for all the electronics, keeping them safe, dry, and out of the way.

SWINGARM

A new hollow, die-cast aluminum swingarm is designed to offer optimal stiffness and reliability at the lowest possible weight. The topology has been optimized for rigidity, while an improved casting process reduces weight by approximately 190 g. A new 22 mm rear axle has also been



fitted to match the new flex characteristics of the chassis.

A new chain guard and chain sliders have been added, resulting in improved durability and less chance of hooking on boots or external objects, as well as reducing dirt build-up around the swingarm and chain guard.

STEERING HEAD AND TRIPLE CLAMPS

The steering head on the full-size 2023 KTM Motocross range now features a new one-piece steering head seal, which allows easier mounting in case of replacement or service and offers dramatically improved reliability.

Made from high-grade aluminum, the CNC-machined triple clamps feature optimally tuned steering stem stiffness, perfect alignment of the fork tubes, and precise geometry of the fork clamps to ensure highly responsive and smooth fork action.

Newly designed, topology optimized bar mounts provide increased grip surface for less handlebar twist at the same weight as the previous generation. Additionally, they allow for both rubber damped mounting for less vibration, or a fixed mounting option which allows more vibration to come through, but also a more precise front-end feel and steering.

SUSPENSION

FULLY ADJUSTABLE WP XACT REAR SHOCK

An all-new rear shock design results in a reduction of overall length and less weight compared to the previous generation while keeping the suspension travel unchanged at 300 mm, with an emphasis placed on easy adjustment without the need for tools or strip-downs.

A new CFD optimized main piston improves comfort, while differently sized flow holes allow the shims to open more easily and reduce the overall stress of oil flow and pressure on the shims for an all-around smoother function.

With the low-friction SKF linkage seals, the new WP XACT rear shock provides advanced damping characteristics for unsurpassed traction and energy absorption. A pressure balance inside the shock ensures consistent damping, resulting in superior rider comfort and rider feeling.

The new shock design and geometry has improved the ground clearance of the linkage, making it less susceptible to catching and damage.

Adjustability is now taken care of by a hand-adjustable dual compression control knob, that allows quick adjustment of high- and low-speed settings quickly and easily. This, together with the newly designed rebound adjuster, which is also hand adjustable, riders are able to adjust their shock settings without tools and without the help of a technician in the pits.

A new preload adjuster has also been introduced, which provides increased resistance toward dirt intrusion, with a new two-piece spring retainer allowing for quick mounting without splitting the shock.

WP XACT FRONT FORK WITH AER TECHNOLOGY

The 48 mm XACT front fork benefits from new hydro stops in the fork legs, providing improved bottoming out resistance, improving progressive damping in the last 40mm of travel, and allowing the fork to stay lower and more planted on initial acceleration after a hard landing.

The split air fork features a capsulated air spring and pressurized oil chamber for progressive and consistent damping. These oil and air bypasses reduce pressure peaks and provide exceptional feedback and rider comfort.

The engineers at WP have ensured that the whole bike works in harmony, accounting for the new frame and shock geometry, they reworked the fork's setting on all models to give a balanced feeling.

As with the shock, easy and quick adjustment is paramount and is done via the single air pressure preload valve, as well as through easy access click adjusters for compression and rebound. Additionally, the air pump needed to adjust the fork's air pressure is provided as standard.

For longevity, the fork protection rings have been redesigned to protect against dirt intrusion.

BODYWORK AND CTG

ERGONOMICS

Multiple updates have added to support the proven rider triangle for better knee contact, especially when standing on the pegs. This, along with added contact surfaces on the bodywork, improve overall handling, agility, and confidence.

A flat seat profile, combined with a new, orange high-grip seat cover, provides riders with exceptional control in all weather conditions. A recessed pocket under the seat, just above the airbox, allows for clean air intake but also is an integral design element that underlines the lightweight character of the SX / SX-F range.

A newly designed front fender now incorporates mud fins, which provided exceptional results in dispelling and redirecting dirt and mud away from the rider and radiators in wet conditions.

CTG

Taking their inspirations from the early 1990s, the designers of the 2023 CTG used purple as a highlight color as a nod to when purple was a predominant hue in the KTM signature styling. However, orange still dominates the overall look and is applied using time-proven in-mold

The KTM logo is displayed in a bold, italicized, black font against a solid orange square background.

technology.

TANK

A new 7,2-liter polythene fuel tank incorporates a threaded filler cap and an integrated fuel pump. The fuel pump features an external fuel line which is specifically positioned to make it less exposed and susceptible to damage while ensuring a steady, uninterrupted flow of fuel.

AIRBOX

Thanks to precisely positioned inlet ducts aimed at preventing air deformation, the 2023 airbox design always ensures maximum airflow and maximum filter protection. As with previous years, the air filter is easily accessed, without tools, by removing the left side panel.

Easy maintenance is guaranteed by the new Twin Air filter and filter cage design that features a simple fail-proof mounting system for safe and accurate filter installation. Once again, a vented airbox cover for all SX/SX-F models is supplied in the by-pack.

The new intake and exhaust systems have been designed to meet the current FIM noise regulations.

2-STROKE

The 2023 KTM 2-stroke SX range sees the return of the KTM 125 SX and wildly popular KTM 250 SX, with a new Open Class entry in the form of the KTM 300 SX.

The 2023 KTM 2-stroke SX range sees the biggest spread of advancements in the 2023 Motocross line-up, with benefits aimed at usability and performance - not to mention bringing 2-stroke technology into the modern MX era.

ELECTRONIC FUEL INJECTION

For the first time, the full-sized KTM SX range receives electronic fuel injection across the range.

Together with Keihin, a 39 mm throttle body was developed to withstand the harsh and full-throttle demands of competitive motocross. This is done by a specifically tuned ECU from Vitesco Technologies works in conjunction with the Keihin throttle body to always deliver the correct air-fuel mixture by constantly analyzing water temperature, air temperature, ambient pressure, the pressure within the crankcase, rpm, and throttle position.

Newly designed injectors also work to provide an optimal burn rate, with improved Sauter mean diameter (SMD), producing a finer spray of fuel for a cleaner ignition and less fuel wastage.

Overall, the 2023 KTM SX range provides riders with a real-world alternative to 4-strokes, offering optimal power delivery in any condition without the need to rejet carburetors.

REED VALVE

The KTM logo is displayed in a bold, italicized, black font, centered within a solid orange square.

The reed valve case has received an important design update, with newly added plastic flaps on the outside of the reed valve case for better sealing of the entire intake tract. This new design negates over-fueling in extreme up- or downhill sections with no bogging down or running rich. Boyesen continues to supply the carbon membranes for the reed valve case.

ELECTRIC POWER VALVE

With the introduction of EFI, the power valve is controlled according to the throttle position and engine RPMs. Being auto-calibrating, there's no more hassle with incorrect power valve adjustments, with the EMS calculating the ideal position automatically and opening both the main exhaust and lateral exhaust ports via newly developed kinematics, activated via an actuator. This results in linear and predictable power delivery at all throttle inputs.

EXHAUST

The 2023 KTM SX range benefits from a more compact exhaust header design, achieving improved ground clearance, reducing the risk of any damage from deep ruts, or external objects. The silencer also benefits from the compact treatment, crafted from lightweight aluminum, and stylishly finished off in a premium black coating.

ENGINE MAPS

With the addition of EFI and electric power valve, it was possible to introduce different engine maps on the 2-stroke SX range, easily toggled via the handlebar switchgear. Map 1 provides a standard, more mellow map for linear, predictable power, while Map 2 is more aggressive, with immediate throttle response and a more crisp, explosive power output.

ELECTRIC START

Another new addition to the 2023 KTM SX range, is electric start which is easily toggled via a newly designed combined Start/Stop switch on the right side of the handlebar,

The starter motor comes without any intermediate shaft, saving weight and allowing a compact engine design with perfect integration and protection from roost. Weight-saving has gone even further, with an ultra-lightweight 12,8V 2 Ah Lithium-Ion battery placed under the seat close to the center of gravity.

KTM 300 SX

The most powerful 2-stroke weapon in the KTM SX stable, the KTM 300 SX enters the race as a new choice of firepower into the MX Open category.

Aimed at racers looking for maximum power with the least possible weight, the 2023 KTM 300 SX



offers simplicity and low maintenance. With more than 57 hp, and an overall weight of just 23,9 kg, the new 300 SX engine sets the benchmark when it comes to power to weight ratios and is designed to provide more torque than any previous 2-stroke engine without losing its typical high-revving lightweight 2-stroke character.

4-STROKE

The 2023 KTM SX-F range once again comprises three core models, namely the rev-happy KTM 250 SX-F, giant-killing KTM 350 SX-F, and the range-topping KTM 450 SX-F.

The latter is the perfect example of advanced engineering techniques at a Factory Racing level finding their way on a production motorcycle.

The KTM 450 SX-F offers a peak power of over 63 hp at an overall weight of just 26.8 kg, approximately 300 g less when compared to the previous generation. Chassis engineers positioned the engine closer to the center of gravity, resulting in greatly improved handling and maneuverability, which together with the benefits of mass centralization and reduced weight of the powerplant, the anti-squat behavior of the chassis was significantly improved.

The 2023 KTM 250 SX-F now features a more compact engine, with the total engine height reduced by 8 mm to improve mass centralization and reduce weight. All major components and shaft arrangements are carefully designed to benefit the performance and handling characteristics of the overall package. This has resulted in an outstanding, high revving performance engine with over 47 hp peak power and 14,000 rpm rev-limit, with an overall engine weight of only 26.11 kg.

Whilst each capacity in the 2023 KTM SX-F has received major refinements, the biggest advancement comes from a change in the position of the engine within the frame.

By rotating the engine backward by 2 degrees - and lowered slightly on the 2023 KTM 250 SX-F - the 4-stroke stable benefits from improved mass centralization, dramatically improving handling dynamics and squat behavior on acceleration.

The valve covers across the 2023 KTM SX-F have also seen a reduction in the number of mounting screws, with only two needed, along with a single oil spray jet that guarantees efficient cooling while keeping the weight low.

SERVICEABILITY

Another focus was put on the new 2023 KTM SX-F range is serviceability. Draining noses for liquids and added service markers on the engine (▲) clearly show where to use washers, making maintenance and service easier and more accessible to different levels of riders. Added lock positions for the cam chain also improve the serviceability of the valve train.

CYLINDER HEADS

KTM 450 SX-F

The redesigned SOHC cylinder head is incredibly compact and lightweight using a short profile with the camshaft located as close to the center of gravity as possible. Lightweight valves are actuated via a DLC coated rocker arm and feature optimized timing, specifically designed to deliver precise levels of torque and throttle response. The diameter of the intake valve is 40 mm, while on the exhaust it is 33 mm. Redesigned intake ports allow higher flow coefficients, resulting in a more efficient and powerful engine.

KTM 350 SX-F

The fully redesigned DOHC cylinder head features finger followers with a DLC coating resulting in minimal friction and optimal performance. These actuate large titanium valves - 36.3 mm intake and at the 29.1 mm exhaust - which at the 13,400-rpm rev limit, open and close multiple times each second to produce the optimal fuel/air mixture. The new 29.1 mm exhaust valve comes as a result of the redesigned engine to deliver an optimized gas flow with valve timings adapted to work perfectly in harmony with the redesigned camshaft.

KTM 250 SX-F

The fully redesigned DOHC cylinder head features finger followers with a DLC coating, actuating large titanium valves - 32.5 mm intake and 27.5 mm exhaust. The new 27.5 mm exhaust valve is a result of the new bore/stroke ratio and narrowed inlet port, which together deliver an optimized gas flow for a more responsive engine. Valve timings have been adapted to the new valve measurements, working in perfect harmony with the redesigned camshaft.

The cylinder of 81 mm bore, and 48.5 mm stroke (MY22 = 78/52.3 mm) houses an extremely lightweight (150g) forged bridged-box-type piston. This new combination raises the compression ratio to 14.5:1 for added torque and peak performance.

For improved serviceability and maintenance work within the engine, the redesigned camshaft bearing bridge is screwed down which increases stiffness. Also, the head gasket comes with a new “stopper design”, improving the sealing function under extreme conditions.

GEARBOX

A redesigned, lightweight 5-speed gearbox by Pankl Racing Systems ensures the highest level of durability and reliability. The redesign is focused around a weight-optimized shift shaft, reducing the operating force of gear changes.

4-STROKE ELECTRONIC FEATURES

The 2023 KTM SX-F range benefits from a number of electronic updates focused on providing the very best experience for riders and helping them get the most from their racing machines.

LAUNCH CONTROL

The KTM logo is displayed in a bold, italicized, black font against a solid orange square background.

With the engine at idle, launch control is engaged by pressing the Traction Control and Quickshift buttons simultaneously. This function regulates the amount of power to the rear wheel on take-off, improving traction and preventing wheelspin under hard acceleration.

TRACTION CONTROL

Traction control is selected to an on or off position from the switch and functions by analyzing throttle input from the rider and the rate at which RPM increases in the engine. If the RPM increases too quickly, the EMS registers a loss of grip and reduces the amount of power to the rear wheel ensuring maximum traction. This provides a distinct advantage on low-traction, dusty hardpack surfaces or in wet or muddy conditions.

QUICKSHIFTER

The new Quickshifter function can be activated or deactivated via the new map select switch, allowing for clutchless upshifts, with the throttle fully opened. A sensor on the shift drum notices the force on the shift lever, sends the signal to the ECU and the ignition timing is interrupted. To prevent unintended shifts and false neutrals, the function is only active from 2nd to 5th gear.

IN CONCLUSION

The innovative performance of the 2023 KTM SX and SX-F models allows riders to realize their full potential out on the motocross track. Regardless of whether the rider is a defending champion, aspiring rookie, or veteran racer looking to rejoin the ranks, there is a 2023 Motocross model ready to unleash immense performance potential and cutting-edge technology within easy reach for riders of all ages and levels.

Despite the many new innovations, the focus remains exactly the same as before.
Total Domination.

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