

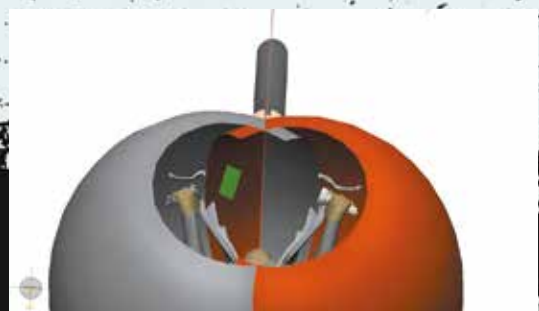
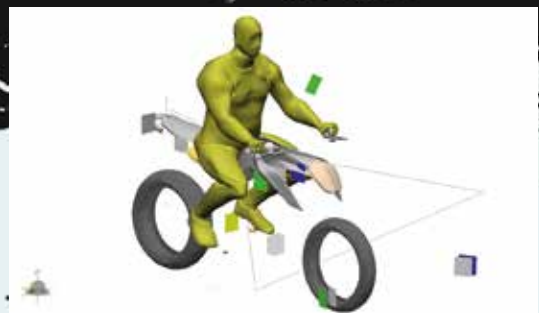
Bits & Bikes

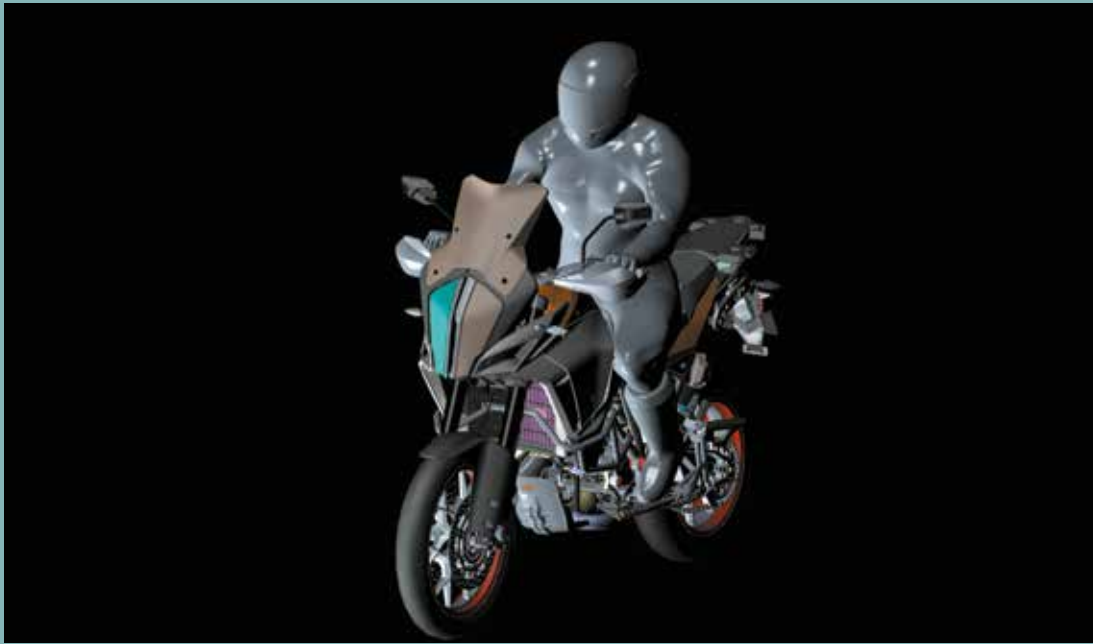
If you want to see ergonomics in perfection, making your way to Austria is worthwhile. The riding experience sets the tone at KTM, the Mattighofen motorcycle manufacturer. And it's no wonder either, because at KTM everyone rides a motorbike. Software is also digitally mounting KTM bikes. Since the company introduced RAMSIS, the honing of the riding experience begins before the first product sketch is born.

KTM builds premium motorcycles for demanding riders. The product developers of this well-known motorcycle manufacturer have been translating the company motto 'Ready to Race' into all driving styles – from motocross to active riding in road traffic – with great success for many years now. One of the keys to this success is ergonomics. In the past, KTM only used ergonomics for complex tests on prototypes and during test drives, but today ergonomics starts with RAMSIS even before the first design sketch sees the light of day.

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KomfortZone





Leading scientific and practical ergonomics experts met for the RAMSIS User Conference at KTM in 2016. As always, the exchange of knowledge and experience took pride of place. But the practical side wasn't neglected because, after an impressive factory inspection, it was time for all the conference participants to 'get on their bikes.' Human Solutions would like to thank KTM and all the participants for two incomparable days that were exciting in every way.

Host of the
RUC 2016



Ergonomics even before the first product sketch

KTM is taking a less-traveled route in the world of motorcycles. While digital ergonomic simulation is widespread in automotive development, it's still rarely used in the motorcycle sector. In contrast to automobile driving, the motorbike rider can adopt different postures and there is no firmly-defined interior space for design. Thanks to RAMSIS, KTM can very clearly define this 'interior space'. That's one of the advantages of ergonomic simulation.

"Today, we digitally define a basic ergonomic framework and specify design spaces in which our designers and developers can move freely. This digitization and the ergonomic testing of design ideas at the very beginning of the development gives us time to experiment. We can develop our work much better and think more boldly. Entirely new solutions are sometimes created, but at other times we can also see that our older concept was better."

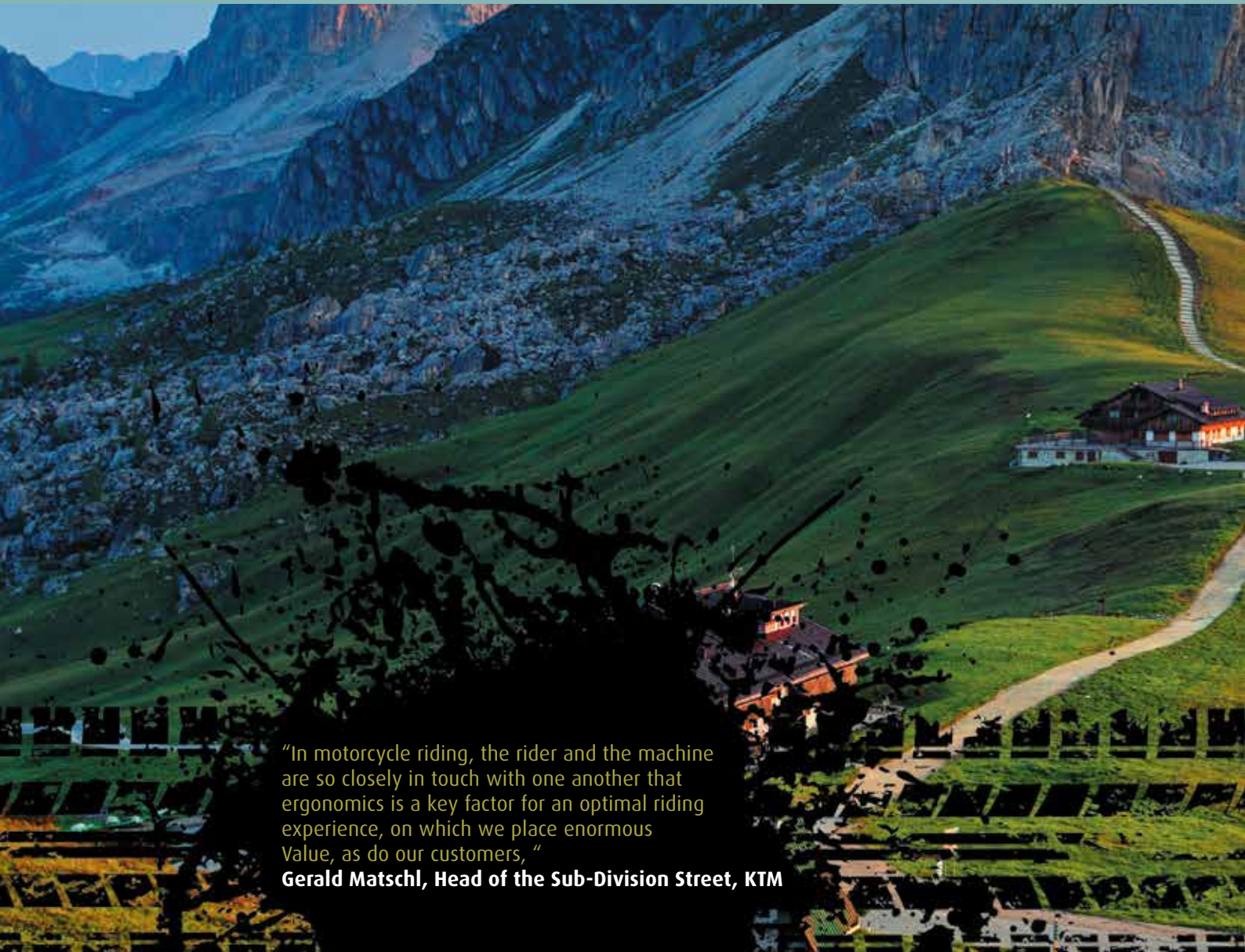
Frederik Harnischmacher, Development, KTM

Ergonomics simulation really speeds up development, but for KTM, it's the gain in quality that counts. Thanks to the early definition of ergonomic space, the development team can create more flexibility and scope for design innovations. That's why the success of the ergonomic software is measured in new design concepts in Mattighofen – within the high ergonomic standard. RAMSIS gives you time that you never had before. "We now go much deeper and proceed much more accurately, e.g. in the analysis of different riding situations. It makes a big difference whether I'm riding on the 300 EXC Enduro or relaxing with the 1090 Adventurer on a ride through the mountains."

Gerald Matschl, KTM

Classic ergonomic simulation at KTM

KTM now uses RAMSIS to carry out all its ergonomic tasks iteratively on CAD models, which take on more and more shape until the final prototype is born. Seat position, vision and freedom of movement/collision are examined for all of the relevant



"In motorcycle riding, the rider and the machine are so closely in touch with one another that ergonomics is a key factor for an optimal riding experience, on which we place enormous Value, as do our customers,"

Gerald Matschl, Head of the Sub-Division Street, KTM

percentiles at the KTM manikin pool. Animations are also used in RAMSIS to test the freedom of movement and/or the collision of body parts with the motorcycle. Joint chains are used to identify intermediate postures that could be a hindrance for footrests, steering, hanging-off or in mounting and dismounting. Compliance with vision standards can be easily determined with RAMSIS, as can adherence to KTM's internal expectations of visual quality. But the determination of classic vehicle ergonomics isn't all that RAMSIS can do.

RAMSIS in the virtual wind tunnel

Aerodynamics are also crucial for that KTM riding experience. Since the rider is directly exposed to the wind, he influences aerodynamic properties, and he's also vulnerable to strong wind currents. That's why an entire virtual motorcycle including rider is tested in the virtual wind tunnel, and not just the CAD model. The KTM team can immediately see how the air flows around the rider and the effect helmet and windshield have on the riding experience.

Comprehensive test phase prior to the introduction

KTM checked RAMSIS for reliability in the motorcycle world before changing over to digital simulation. RAMSIS and the KTM field tests were used on two bike models – and the results were identical. This gave the all-important nod to Human Solutions' leading ergonomic software. Another important point for KTM is the posture model – and a new one that's suitable for motorcycles is being developed at KTM. The various postures – seated upright, seated flat, standing and hanging-off – are solved by positioning the manikin on the model. When the posture has been adopted, the ergonomics software by Human Solutions stores the positioning, so it can be retrieved at any time. Once the decision has been taken, the introduction is launched in just a few weeks. Today, all new and further developments at KTM are first checked with RAMSIS – and the first physical prototype is only built when the product has attained a very high level of maturity. Technical innovation and tried and tested working methods go hand-in-hand at KTM.

