

# When rugby and mechanical science collide

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Rugby players using the Maul King.

The rugby maul can sometimes look like the most unscientific of game techniques, but players are now benefitting from a new technical training aid, designed with help from engineering experts at Heriot-Watt University in Edinburgh.

Richie Gray, former [rugby](#) player, coach and founder of Global Sports Innovation, wanted to create a specific training aid that would realistically simulate a maul and improve [players'](#) individual and collective roles, dynamic movement and tactical awareness, but required [mechanical engineering](#) assistance.

## The science of collision

Dr Daniil Yurchenko from Heriot-Watt University worked with Richie to develop scientific principles around the science of collision. His models helped Richie to analyse how a typical rugby player's physique would respond to pressure and charges from various angles and at various strengths.

## The Maul King

The result is the Maul King, a project three years in the making - the rights of which have been given to global rugby brand Rhino for manufacture and distribution. It is already being used by the English Six Nations team during training sessions for this year's tournament.

Fabricated using aluminium, stainless steel and a variety of spring mechanisms, the Maul King reacts just as a [rugby player](#) would to a maul situation. It demonstrates to players how an opponent will be affected if pushed from the right or left, and with varying amounts of pressure. The 550kg machine has a 360 degree base plate that accurately recreates the movement of a straight drive or rolling maul. Contact pads can be added or closed off to simulate different maul start positions, or create [blind spots](#).

Richie Gray, owner of Global Sports Innovation, said "I wanted to develop a training aid that would give coaches and players the competitive edge when it came to mauls, but quickly realised that my rugby expertise needed to be combined with engineering know-how so I approached Heriot-Watt University for help."

Graham Rowantree, England and British and Irish Lions Assistant Coach, said "The Maul King training aid is specifically designed and

engineered to simulate the effects of a real time maul formation, in this way creating an outstanding training aid to develop mauling technique before going into live practice. The way that the machine will not move unless all your players are in sync is very impressive"

Dr Yurchenko commented "The main challenge in designing the Maul King was that, although we knew the practical reasons for making it, we didn't have any models to base it on.

"Using a combination of mechanical engineering techniques, computer-aided design and mathematical modelling, we were able to design a piece of equipment that has unique responses to a range of pressures and charges.

Provided by Heriot-Watt University

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