

IS THIS BLOKE THE NEXT JOHN BRITTEN?

MEET DENVER LAWSON, TALENTED ENGINEER BEHIND NEW ZEALAND COMPANY, SAVICE. HE'S SOON TO UNLEASH THE FIRST MOTORCYCLE EVER DEVELOPED AND MASS-PRODUCED BY A KIWI OUTFIT. AND IT'S A TWO-STROKE

The day that the first mass-produced motorcycle developed by a New Zealand company goes on sale, Denver Lawson will set a new national milestone. He will also cement his place amongst our country's pioneering motorcycle engineers, men of the calibre of John Britten and Bert Bannister (inventor of the CVT gearbox in 1913, which is now used by most scooters). Lawson's company, Savice, has already displayed prototypes of the entry-level MT80 motocross bike at major

shows in Milan and Indianapolis, and has found distributors for it in Japan, Australia, Italy, Canada, the US and Indonesia. As you read this, the bike is undergoing its final chassis testing before production begins at Savice's manufacturing facility in Chongqing, China.

'Just for a laugh we entered it in the open class at the MX track at Chengdu last week,' says Lawson proudly, 'and it finished fifth.'

The MT80 is a 'toe in the water' piece for Savice, and will be sold under the company's registered brand, Mira. Although a serious product looking at filling a gap in the youth off-road competition market, it also represents a test case for the manufacturing operation at Chongqing, and the relationship that Savice has established with the motorcycle component manufacturers that are based there. As managing director of an R&D-focused company, Lawson has recognised that Savice will establish a higher reputation with existing bike makers if it can demonstrate an ability not only to develop new technologies but also to build products of consistently high quality. As such, the manufacturing and marketing of the MT80

is phase one of a two-stage business plan. Once the assembly line in Chongqing is humming along smoothly and efficiently, phase two begins, which entails the re-establishment of Savice's R&D division in New Zealand, where it will focus primarily on developing clean-burning, direct-injection, two-stroke engines quite unlike any 'stokers' the world has seen before.

'We identified Chongqing as the best place for Savice, since the majority of the motorcycle-industry suppliers are located in this area,' says Lawson; 'however, prototyping and machining are much easier to perform in New Zealand. Also, prototype designs are much more secure in New Zealand. We feel that this is a sustainable model for the future.'

While the MT80, with its jazzy graphics, bright colours and jumped-up suspension, looks like any other 80cc motocrosser, it also is the first showcase for Savice's new two-stroke engine technology.

'Although it does contain traditional elements, the engine is notable for its optimisation and "Swiss watch"-style design,' says Lawson.

At Milan's international bike show, the cylinder design caught the eye of Gilardoni, an Italian company that makes more than a million two-stroke cylinders annually.

'Their company president gazed at [the bike] and the cylinder head for about 20 minutes, and chatted to us for another 20 after that. He told us he thought the cylinder design was "very, very nice". We feel that once we achieve production of the MT80, further sales opportunities will emerge not only for the motorcycle, but for OEM supply of the engine.'

The use of an exhaust power valve is commonplace in the two-stroke MX sector; however, rather than employ it conventionally – to boost midrange performance in a highly



Words **Paul Owen**
Photos **Tom Gasnier**



tuned engine – Lawson uses it to boost low-end performance. The ready access to torque means the MT80 can feature just a four-speed gearbox, resulting in a significant weight reduction and increased ease-of-use.

'MX forums on the web are full of dads asking questions about how to tune their kid's Japanese 85cc motocross bike to make it more rideable. We identified that there was a gap in the market between cheap, low-tech Chinese dirt bikes and the highly tuned, high-maintenance designs of the Japanese.'

'Business is just like racing,' says Lawson – and he should know, having built some wicked Ferrari and De Tomaso Le Mans race cars during the 1980s in the UK. 'You've got to pick the races that you can win.'

'John Britten chose a race that he could win [the Battle of the Twins event at Daytona Speed Week]: Bill Buckley didn't [the World 500cc GP Championship].'

Speaking of whom, Lawson did

The MT80 is the first motorcycle mass produced by a New Zealand company



some consulting work on Buckley's BSL 500 late in the short racing life of the bike, examining the flow of the engine cylinders and identifying areas where extra horsepower could be gained.

'I wish they'd called me in earlier,' he sighs. (The bike's swansong was winning the New Zealand Formula One title in 2001.)

He credits the BSL experience for getting him interested again in two-strokes. And you won't find a more passionate advocate of the genre, especially of its fuel-efficiency and environmental advantages over four-stroke engines. Compact packaging, lighter weight and cheaper manufacturing costs, a result of fewer parts, are further advantages.

'Honda has done a lot of work to discredit the two-stroke, and they've created the impression that they're not a sound business case because of all the R&D work that is needed on emissions. However, the resistance of OEMs to two-strokes has dwindled, and they're just waiting for new engines to be developed. It makes more sense to them to let companies like ours develop new technologies, then buy the rights to use them.'

'We're well positioned to drive two-strokes back into the mainstream.'

A hurdle that future two-stroke engines must leap is Euro 4 emission compliance.

'Forget Euro 3 [the current emission standard]: Euro 4 is the first real emission standard that all motorcycles will have to meet.'

Lawson's strategy for achieving the rating with a two-stroke requires the development of a finely calibrated direct-injection system that will run ultra-high fuel pressures. This will allow the precise

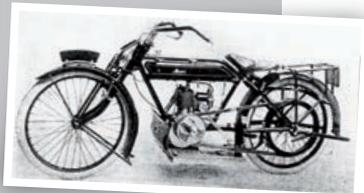


TWO-WHEELED KIWIANA

There have been several New Zealand attempts to develop world-beating motorcycles over the past 100 years. Here are some of the more notable endeavours:

1916 Maori

Developed by two Gisborne-based engineers, George Johns and Bert Bannister, the Maori featured the world's first CVT constantly variable gearbox. Unfortunately, the fledgling company was stopped in its tracks by World War One, during which its first, hard-won shipment of motorcycles was sunk, exhausting its capital. You can read more about the Maori in Peter Barnett's detailed book, *Maori Motorcycles and Century Cars*.



1960 N-Zeta Scooter

Nicknamed 'the Torpedo' due to the forward location of its fuel tank, the 200cc four-speed N-Zeta was a Kiwi adaption of the 175cc Cezeta (CZ), built in Czechoslovakia. JNZ Manufacturing Ltd built the scooter in Auckland under licence from CZ throughout the swinging '60s, and it proved to be a popular ride with the 'Milk Bar Cowboys' of the Mods and Rockers era.



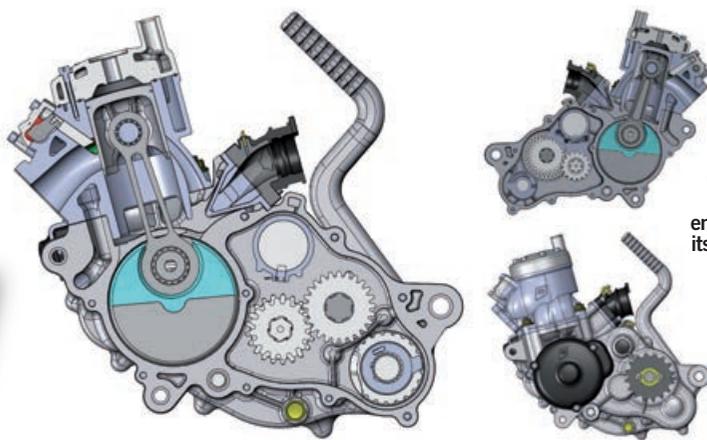
1994 Britten V1000 and V1100

Christchurch property developer John Britten kick-started the Britten Motorcycle Company in 1992, and fired up the homebuilt V-twin engine that would carry his name in 1994, causing, no doubt, the first of many tremors felt by his neighbours. The resulting bike soon covered itself in racing glory, set new FIM speed records and won several New Zealand Superbike Championships. Just 10 were made, five of which were sold to American museums and collectors.



1999 BSL 500cc Grand Prix racer

Auckland computer-chip entrepreneur, Bill Buckley, decided to have a crack at the world's premier motorcycle racing class just as the two-stroke era was coming to a close. The bike's 500cc, V3, two-stroke engine was rendered obsolete almost as soon as it was made, and its best result was a 16th-place finish in the 1999 South African GP in the hands of Aussie rider, Mark Willis. Buckley's lifelong interest in motorsport continues today as the promoter of Auckland's Western Springs Speedway.



CAD drawings of the MT80 engine highlight its 'swiss watch' construction

delivery of the injection in the short time available in a two-cycle engine.

'To keep emissions and fuel use down, the injection will occur after the exhaust port closes. When an engine is running at 12,000rpm, that gives us a window of opportunity of just 0.8 of a millisecond.'

His early two-stroke engine prototypes have produced some encouraging results. One dyno test of a 250cc twin generated such a voluptuously shaped power curve that Lawson called it 'the Breast', although of greater interest to him is the flatter torque line below it.

'It's incredible, and I know exactly what caused it.'

Conspicuous by their absence in these future two-strokes are any of the technologies patented by the Perth company, Orbital, or Bombardier Recreational Products (owner of Rotax, and currently the builder of the most fuel-efficient two-stroke marine engines, as seen in its outboard motor brand, Evinrude).

'BRP and Orbital have got almost all the patents, and development work is concentrated on the one group of engineers. We've got the opportunity to widen that focus. Development of a new direct-injection system is a valid business because of the opportunity it will create to sell the rights to the more-than-20 OEMs who will use it.'

BUSINESS IS LIKE RACING, YOU'VE GOT TO CHOOSE THE RACES YOU CAN WIN

The next engine Savice will launch after the MT80 will be a direct-injection, 250cc, two-stroke single with a six-speed gearbox. Unlike the 80, it will have full Euro 4 compliance, and the powertrain and its delivery will be suitable for both road and dirt applications. Expect it to rev to 10,500rpm – and also expect to see a power curve on the dyno graph that will remind of Scarlett Johansson.

Meanwhile, work has begun on larger engines, kicked off by a 500cc single that is likely to form the basis of a 1500cc V3. And when those direct-injection engines start rolling down the assembly line, the two-stroke will truly enter a new age, as the half-litre single has the potential to pump out something near 100bhp. With larger cubic capacities come the opportunity to soften the peaky power delivery that's often associated with the two-cycle engine. Compression ignition is another possibility being investigated by Lawson's R&D team.

Lawson says Orbital's use of an air pump is clumsy and adds unnecessary weight to the engine.

'They started development of that technology in the 1980s, and I'm willing to bet that they wouldn't go down that road if they were starting from scratch today.'

Better alternatives are now available because of more precise engine management systems, he says, along with new advances in fuel injection. He seems pleased to be at the vanguard of a new breed of innovative engineers who are determined to sanitise the smoky, peaky image of the two-stroke to the point where it gains wide-ranging acceptance.

'We Kiwis have always been good at getting more power from engines, but gains in efficiency are another story.'

'Getting more power is easy compared to getting it along with reasonable emissions, and the whole future of the two-stroke hinges on its ability to produce less emissions.' **EC**