

'FIRE THE GUN. RIDE THE BULLET'

Brit Ian King accelerates faster than any other man in Europe, and recently won his sixth European Top Fuel Drag Racing title. MCN spent the weekend with the man who runs low six second quarters at over 240mph



Focus on the bike, take a deep breath... can you hear it, feel it, smell that burnt nitro methane? If you can't, prescribe yourself a trip to a drag meet



King in action. Launch at 8000rpm, count to six and it's all over. The feeling is difficult to articulate

The launch: 'Nail the throttle, no half measures'

We're at Santa Pod for the final round of the UEM European Finals. Qualifying for eliminations (race day) is conducted by riders looking to post the quickest run (Elapsed Time or 'ET'). Terminal speed (TS) is only used to decide ties and is good for bragging rights! The actual race day is an acceleration and reaction test between pairs of riders. The first to the end of the quarter-mile strip wins even if they run a faster TS. Reaction time (RT) is therefore as important as ET in many cases.

Before coming to the line, riders burn out the rear tyre (see why below), then come to the line to 'pre-stage' (top small yellow light on the 'Christmas tree' starting lights, see top picture). When they move to the startline proper they are 'staged' (second top small yellow light) – and under starters orders. The starting procedure consists of three yellow lights counting down to a green. The countdown is triggered by the starting marshal so the riders can't anticipate the start. If they launch before the green, they draw a red light and are disqualified.

King's Top Fuel winning reaction time in the final was 0.02s. A good Top Fuel ET is sub six seconds with a 230+mph TS.

They're pulling almost 3G

King says: "The burn-out is an intuitive thing. People think it's just about warming the tyre or cleaning debris off it. That's part of it, but the main idea is to leave a nice track of rubber because you get a good coefficient of friction with rubber to rubber on the track."

The launch is awe-inspiring. The bikes leap forward at such speed it's hard to believe anyone can hang on. They pull almost 3G.

'We launch at 8000rpm'

"Nail the throttle. No half measures," grins King. "You have to hope that all the settings you have put into the bike – the clutch, ignition, fuel, everything – are the best for the track conditions."

A Top Fuel bike has no clutch lever. Instead, there's a very sophisticated electro-pneumatic clutch system. There's a set of primary clutch arms, which are centrifugal and work independently of anything else going on. The rider hits the throttle, and while the rear tyre spins, it drives the bike forward.

King says: "We launch at 8000rpm. I can set it higher but the tyre spins harder before the arms start touching but you don't want to blow the tyre away on the start."

The clutch has a secondary set of nine 'fingers' of various heights and then there's a clutch cannon – a bearing on a hydraulic cylinder – that moves back progressively as the bike speeds down the track, allowing more and more clutch pressure to be applied.

"The fingers are at different heights. As the clutch cannon moves away, these fingers exert more and more pressure. On top of that there's a set of timers and bleeds, modifying how the clutch cannon moves. It's a simple concept but the application is quite complicated."

"But you have to get it right. Nitro methane is a load-sensitive fuel. You need load to burn it. If you don't have load on the engine because the clutch isn't working, you drop cylinders. When there's too much liquid in the

cylinder not burning it snuffs the spark out."

When the cylinder fills with unburned fuel it can't be compressed. That's when things break!

Weird as it sounds, King says that throughout the six-second run, his mind is on one thing – the shut-down area. "My focus is keeping the bike as straight as possible, irrespective of what the back tyre is doing, how much it is weaving around – trying to focus on the shutdown area. It's the most dangerous part of the run."

"These slick tyres are designed to throw out – they grow five inches in overall diameter during the run thanks to the centrifugal force. As it throws out, it also narrows because the walls are being pulled in. That provides a gearing effect but also provides the drive."

"The walls are wrinkled under torsion – the tread surface in contact with the road, in relation to the rim, is out by up to three inches. When you shut the throttle it all goes backwards – it all unloads. It tries to tear itself backwards and the bike becomes very unstable. If you are in a bumpy shutdown area you can get into a big trouble."

"I find that everything is a blur – I can't see a lot for about a second when I shut the throttle and I'm trying to find the shut-off button and the parachute button."

What's it like to pilot the bike?

"The phrase, 'firing the gun and riding the bullet' is probably reasonably apt," says King. "People ask me what it's like but it's very difficult to describe. Unless you've ridden one, you will have no idea. It really will accelerate faster than anything you've ever ridden."

"We're not super-humans. I tend to try to keep calm before a run – I do keep calm but it doesn't mean I'm not crapping myself at the same time. And I'll often get off at the other end, shaking with emotion, adrenaline, nerves, whatever. It is quite a rush."

And that really is some kind of understatement.

Continued over

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My focus is keeping the bike as straight as possible, no matter what the rear is doing

Ian King



GARY PINCHIN
Sports Editor
gary.pinchin@motorcyclenews.com

Drag Racing 'Euro Finals'. This is just the burn-out. The noise and smoke will increase exponentially when the two bikes leap down the strip.

Motorcycle drag racing is the ultimate excess over every other aspect of two-wheel sport. It's louder, faster, frighteningly expensive. And certainly more outrageous than any other bike action you care to name.

Supercharged Top Fuel bikes run an explosive dose of up to 98% nitro methane, boast 1500bhp and are capable of covering the quarter-mile strip in just under six seconds, tripping the lights at over 240mph.

It takes very special engineers to build bikes like this and special people to ride them. Multiple European Top Fuel Champion Ian King does both.

WHAT'S THE STORY?

Modern motorcycle drag racing is a highly professional, highly specialised sport. It boasts incredibly complex machines that make F1 cars and MotoGP bikes look plain dull. And the racing is incredible to behold. Yet despite all this, it remains one of the friendliest, easy-to-access racing paddocks you'll embrace whether you are a media-accredited journalist or a hardcore race fan looking to get close to your heroes.

Ian King: acceleration genius

King and Dutch engineer Gerard Willemse are partners in Puma Engineering and King's Gulf Oil/Grand Prix Originals-backed Top Fuel bike is a rolling billboard for their business.

It's all a far cry from King's first taste of nitro fumes that came at a Cub Scout day trip to Santa Pod – age eight. At 12 he stick-welded a Garelli scooter engine into a Raleigh chopper bicycle frame. After taking on as many part-time jobs as school hours permitted – including working with former World Speedway champion Michael Lee and Lee's dad, King bought his first road bike at the age of 16 – a Honda 750 F1, which he rode to school before he even had a licence.

By the time he was road legal, he was building Harris-based streetfighter-style specials and attending Run What You Brung meetings at Santa Pod.

His first Top Fuel bike was a Puma Yamaha in 1999. In 2001, he became the only rider to win the British and European championships in the same year.

And two weeks ago King won his sixth UEM European Top Fuel title in the final round of the six-round series at Santa Pod, near Bedford. He clinched enough title-winning points with a win in the first elimination heat, but then had the satisfaction of winning the meeting, beating Peter Svensson (see separate story) in the final.

"I'm relieved it's all over," admits King. "Winning the title was a priority but to win my home round was that bit special. It was a long, hard weekend.

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King bought his first road bike at the age of 16 – a Honda 750 F1 which he rode to school before he even had a licence

MCN Sport Editor Gary Pinchin

The air and track conditions changed so much over the three days and that affected the performance of the bike. We tried to make setup changes but to little effect. It happens."

Four years ago King – whose day job is as a sales manager in the chemical industry – became the co-owner of Puma Engineering. Two years ago, he decided to build a state-of-the-art Top Fuel bike that would showcase his business.

Puma is the most revered drag racing bike engine company in the world. America's top racers Larry 'Spiderman' McBride and Kerry Hogan use Puma engines. King estimates there have been over 110 Puma engines produced – and 35 are currently accounted for in racing circulation.

1500BHP

0-60 IN 0.7s

0-100MPH IN 1.1s

0-240MPH IN UNDER 6s



Drag racing's premier Top Fuel bike class is about big numbers. Check out the details of Ian King's nitro-burning missile – the most powerful racing motorcycle in the world



Engine, bottom end

King's Puma engine is an 82mm bore x 75mm stroke, 1585cc, four-cylinder with sandcast aluminium crankcases, plain-bearing billet crankshaft – all produced in-house. The barrels are also aluminium with chromoly steel liners. BME H-section conrods are lightweight aluminium, with three-ring forged alloy full-skirt pistons made by JE to Puma specs. The dry sump lubrication system uses four litres of Gulf Max Plus, a 20/50 oil which is replaced after every run.

Engine, top end

The gear and chain-driven double overhead camshafts are made by Kent Cams. The Puma 12-valve aluminium cylinder head has aluminium bronze combustion chambers with two 33mm Austenitic stainless steel inlet valves (with 5mm stems) and one 41mm nimonic valve per cylinder (with an 8mm stem) the valves, guides, springs and tappets all supplied by Californian-based specialists Kibblewhite. The motor produces in excess of 1500bhp at 10,400rpm.



Supercharger

The mechanically driven HPS supercharger forces air into the engine at a rate of over 27,000 litres per minute at peak engine rpm – approximately 50psi.

Fuel system

The fuel tank sits in the front belly of the chassis, ahead of the motor. Fuel is fed to the engine by a mechanical pump, the supply metered by a timed injection system at a rate of 11 gallons per minute at maximum rpm! Nitro costs £1000 per 45-gallon drum. King generally runs a mix of around 85% nitro/15% methanol but it varies from track to track, depending on atmospheric

levels and track grip. Due to the fuel's lower density an engine can burn up to 8.7 times more nitro methane than petrol and produce around 2.3 times more horsepower. It also absorbs engine heat as it vaporises and therefore aids cooling.

Electronics

Ignition system is by MSD. Closed-loop electronic control systems are banned from drag racing so the team have to pre-programme the ignition curve (plus fuelling and clutch) prior to each run, dependent on data from a previous run and the 'density altitude' – the amount of oxygen in the air, calculated by measuring atmospheric pressure and temperature with a hand-held weather station used by pro pilots. Twin ProMag 44 magnetos fire two NGK plugs to each combustion chamber.

Data logger

The RacePak system logs exhaust temperature, supercharger boost pressure, fuel, pressure, fuel flow, clutch slip and acceleration.

Clutch

Power is transmitted from the engine to a complex transmission system via a huge 90mm wide Gates Kevlar Carbon belt. To match the power to the traction available, there's a complex timer-controlled pneumatic clutch made by Automan Technologies/Electrimotion where pressure on the clutch increases in stages during the quarter-mile run. The clutch actually slips for around three seconds until it is fully locked. Semi-automatic gearbox is by Owens. Final drive is by a huge and strong EK 630SHB chain.

Tyres and wheels

Avon 120/70ZR17 treaded front tyre on Performance Machine forged 3.5 x 17-inch rim. Performance Machine rear wheel is shod with a 15-inch wide Mickey Thompson 3073M 31.0/14.0-15M drag racing slick. Rear tyre pressure varies from 5-8psi depending on track conditions. The tyre 'grows' up to five inches in diameter during a run.

Chassis

Puma fabricates bolt-up frame

from around 20 metres of 4130 chromoly steel tubing. Forks are Showa modified by Hyperpro. The bike runs twin Hyperpro steering dampers. Front brakes are 320mm discs with Performance Machine four-piston calipers. Rear end is rigid. King was one of the first in Europe to use a parachute on a Top Fuel Bike to aid braking. Wheelbase of the motorcycle is 103 inches. The wheelie bar adds another 2.5metres. The bike weighs 450kg.

Bodywork

The aerodynamic bodywork, made by Rick Beasley in aluminium and is attached by Dzus fasteners.



Five point seven zero nine seconds...

That's how long it takes Pete Svensson to cover a 1/4-mile from a standing start (a Fireblade does it in about 11 seconds)

On August 24 Swede Peter Svensson set a new ET record of 5.709s at Tierp, Sweden, with his completely home-built Billet Racing machine to beat American Larry 'Spiderman' McBride's record of 5.746s set in 2008. Svensson also ran a 5.725 in qualifying during the European Finals at Santa Pod two weeks ago. He talked to MCN about his Tierp record run...

Tierp, Sweden, where we broke the record is a new track, only finished last year.

We tested and raced there but had so little data. I did a 5.88 last year so I thought I could improve a little – especially now we had data. This year we tested there again and ran a meeting earlier in the year before I broke the record in the recent meeting.

We had great testing in Spring and made some changes to the fuel settings and transmission.

In the first run (of the record-breaking meeting) I knew it was in the bike. We did 5.93 in qualifying and got more data. Now I was ready to go for it. The air was just right. The track temperature was good and we thought we might do a 5.70.

When I left the line it didn't feel extremely hard.

But when I hit second it was pulling really hard. The front end was really high and running hard on the wheelie bars – and really stable.

At 1000ft I realised I was heading towards the guardrail.

I had to roll it. I was an inch from the guardrail. I was doing 383kmh at 1000ft and went through the lights at 355. I've



THE QUICKEST WAY DOWN THE SANTA POD STRIPS

There are four top categories in UEM European championship drag racing: Top Fuel, Super Twin, Pro Stock, Super Street. Here are the regulations and winning times.

Top Fuel: Minimum four-cylinder (single or double engines) normally aspirated with a maximum displacement of 3278cc, four cylinder supercharged or turbocharged engines of up to 1700cc.

Super Twin: 3278cc for normally-aspirated motorcycles using up to 100% nitromethane. 2000cc engines can be supercharged or turbocharged and use up to 90% nitro. 1700cc supercharged or turbocharged motorcycles up to 100% nitro.

Pro Stock: Standard appearance gasoline-burning, naturally-aspirated motorcycles. Four-cylinder engines from 1500cc to 1755cc. V-twins

of 160 cubic inch. After-market frames are permitted. Bikes have to run 'replica of original road bike bodywork'.

Super Street: Resemble road-going bikes. Any engine type and any mods including any type of carb or fuel injection. Superchargers and turbochargers permitted. Chassis geometry may be altered. Max wheelbase 1730mm. No wheelie bars.

Class	Rider	Bike	Reaction time	60ft	330ft	1/8 ET	1/8 MPH	1000' ET	1000' MPH	1/4 ET	1/4 MPH
Top Fuel	Ian King	Gulf Oils 1585cc Puma	0.0245	1.0833	2.7937	3.8710	190.52	5.2236	218.04	6.1993	219.06
Super Twin	Christian Jager	2850cc Black Seven	0.0543	1.1059	2.8721	N/A	173.40	5.5055	198.85	6.5784	200.65
Pro Stock	Fredrick Fredlund	1755cc Suzuki GSX-R	0.0795	1.1100	2.9497	4.5248	154.47	N/A	173.72	N/A	185.07
Super Street	Steve Venables	1300 Suzuki Hayabusa	0.0853	1.3000	4.8557	N/A	159.05	6.1946	181.41	7.3452	194.71

Note: Top Fuel cars are now only raced over 1000 feet for safety reasons (track run off is too limiting if they run the traditional 1320', quarter mile). But the 1000' data is supplied for all races.

The engine produces 1200bhp. The gearbox we use is a two-speed unit made by B&J, an American company who make gearboxes for Funny Cars.

I make my own clutch.

It's an 8-inch diameter unit with three plates and it employs a lock-up system which we pre-programme – three lock-up steps for different places on the track to maintain grip. It's a unique system and much less complicated than the car systems other bikes use.

The development is a never-ending process.

This year we changed the blower to a new Opcon (Swedish) unit. We now have MSD44 electronics – two of them because we run two plugs per cylinder. Our fuel system is also new, made using parts from Sweden and Hillborn.

