

## **Design of the Triumph Rocket III Motorcycle**

**Presented on May 16TH 2006**

**By Mr A Earnshaw and Mr J Colebrook of Triumph Designs Ltd**



The Rocket III motorcycle is one of a range of cruiser bikes designed and manufactured by Triumph Motorcycles Ltd of England. The Rocket III is the largest production motorcycle in the world. It has a fuel injected, twelve valve, 3 cylinder in-line engine of 2294cc cubic capacity which gives 147ft lbs of torque at 2500 rpm. This triple cylinder engine arrangement is special to Triumph.

The speakers are members of the design team for this bike. Andy Earnshaw responsible for the powertrain and James Colbrook for the frame and rest of the machine. They spoke in detail of the original concept for the machine, the computer tools used for the design and the effect of feedback from trials on the eventual production machine. In addition to the visual aids used they supported their lecture by bringing various parts of a bike with them.

Weighing (Dry) 320kg (704 lbs) with a tank capacity of 24 litres the machine is big. But it has a low centre of gravity and a riding position designed to benefit balance and control. However clearly the machine is not designed for the small rider, nor at close on £12,000 cost for one without ample funds.

Andy Earnshaw gave a detailed description of the power train using visual aids and actual components. Apart from the engine details were given of the primary drive which is a gear and the final drive a shaft to the rear wheel. It has a wet multi-plate clutch and a 5-speed gearbox.

James Colbrook described and illustrated the machine's frame, wheels tyres etc. using a 3D computer program. The frame is a tubular twin spine with swinging arm. The tyres are designed to improve the appearance of the bike and so are larger than necessary. The front is 150/80 R17 and the rear 240/50 R16 on alloy 5 spoke wheels. The front brake is twin 320mm floating discs with 4 piston calipers and the rear is a single 316mm disc with 2 piston caliper. Suspension is via upside down front forks and spring loaded twin rear shocks.

For the owner who wishes to stamp his own personality on the bike Triumph provide engine side panels, exhaust fixtures and leather panniers etc.

At the time of the lecture the bikes are assembled in England from parts sourced within the UK and from a triumph manufacturing facility in Asia.

The speakers clearly demonstrated their intimate knowledge of all the design and test programs which lie behind the bikes concept and final production model. This was demonstrated very adequately both in the lecture and in response to question from the audience.