

# Motorcycle Catalyst Test Facility

## JOHNSON MATTHEY EVALUATES CATALYSTS FOR ENGINE EMISSIONS

Since the Taiwanese environmental protection agency introduced legislation requiring the use of catalysts on 2-stroke motorcycles in 1992, many other regions have considered employing stricter emissions requirements. EC regulations for enforcing the use of catalysts for mopeds will be implemented in June of this year, while in India most 2- and 3-wheeled vehicles will be fitted with catalysts from April 2000. This legislation has been drawn up as a result of the widespread use of small motorcycles with 2-stroke engines. A 2-stroke engine produces relatively high levels of hydrocarbons and carbon monoxide although levels of NO<sub>x</sub> are low. In fast growing economies, such as those of India and China, small 2-stroke powered 2-wheelers of less than 200 cc are widely used as daily transport and this has contributed to a serious urban pollution problem.

Motorcycles using 4-stroke engines generally produce lower levels of carbon monoxide and hydrocarbons + NO<sub>x</sub> but may need a small reduction in the amount of carbon monoxide emitted in order to meet the conformity of production regulations. This may be achieved by using a catalyst or by secondary air injection, for instance. In response to the requirement for

catalysts for 2-wheelers, Johnson Matthey has installed a chassis dynamometer in its European Autocatalyst Technology Centre located at Royston, England. From February 1999, the facility will be able to test the full range of 2-wheelers, from mopeds to superbikes, over the various emissions test cycles in use in different parts of the world.

Many of the requirements for motorcycle catalysts, such as to be small, to have little effect on engine power, to reduce high concentrations of hydrocarbon and to withstand the large temperature rise across the catalyst that this causes, are different to the requirements for passenger car catalysts. This test facility will enable catalysts to be better tailored to the type of engine and vehicle, thus meeting legislation and achieving good durability with little effect on vehicle power and costs.

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**An Indian Bajaj "Sunny Zip" 50 cc moped being tested on the motorcycle chassis dynamometer at the European Autocatalyst Technology Centre in Royston. The back wheel of the bike rests on the dynamometer, or rolling road, to which the load is applied; the front wheel is clamped. The tester seated on the bike follows the drive trace normally displayed on the monitor in front of him, matching the bike's speed to the prescribed drive cycles. The exhaust system has been cut away to show the position of the cylindrical catalyst which is mounted in the silencer unit. The exhaust gases from the bike are fed, via the white tube, into a constant volume sampler. Here they are diluted with air, before being fed into an emissions analyser, to the left of the tester. The large blue fan placed in front of the bike simulates the flow of air that would occur in normal use**

