

## Motorcycle Exhaust Gas Purification in Japan ~ Research Tracks the Contribution Rate of Motorcycles ~

Japan is currently strengthening the standards applied to motorcycle exhaust gases, based on a government decision issued in August 2005. While the dates for implementation differ by engine capacity and other factors (see below), the exhaust regulation values for the three harmful substances of carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxide (NOx) have been remarkably strengthened (see below). As a result, Japan's motorcycle exhaust standards are expected to become the most demanding in the world<sup>1</sup>.

### <Strengthened Exhaust Emissions Regulation Values>

Motorcycle engine capacity (cc)	CO			HC			NOx		
	Before revision (g/km)	After revision (g/km)	Reduction %	Before revision (g/km)	After revision (g/km)	Reduction %	Before revision (g/km)	After revision (g/km)	Reduction %
0 -50	13.0	2.0	85%	2.0	0.5	75%	0.3	0.15	50%
51 - 125					0.3	85%			
126-250									
251-									

### <New Regulations Implementation Date>

Motorcycle engine capacity (cc)	New Domestic Models	Continued Production and Import Models
0 – 125	October 1, 2006	September 1, 2007
126 -	October 1, 2007	September 1, 2008

### Impact on Global Environment

The key goal of motorcycle and other automobile exhaust regulations had been thought conventionally regarded as wrestling to the infection on human health from a viewpoint of pollution-prevention. At present, however, debate has shifted to the degree of stress being placed on the environment from a broader global standpoint.

This leads to the question of how the impact of motorcycles on the environment is actually measured and evaluated. In Japan, a report entitled *Research into the Motorcycle Contribution Rate to Exhaust Gases* was announced by the Japan Automobile Research Institute (JARI) this March.

### Motorcycle Contribution Rate

In this report, the gases emitted from motorcycles are evaluated separately for the conditions of "running exhaust," "start exhaust," "hot soak loss," "diurnal breathing loss" and "running loss." Also factored in are changes in unit ownership, variations in motorcycle driving rates by weather (sunny vs. rainy conditions), season (summer vs. winter) and other use conditions, followed by estimates of the total volume of emissions generated by motorcycles. This motorcycle exhaust volume is compared to the total volume of gases when other exhaust sources are added in to calculate the percentage of the total accounted for by gases from motorcycles (contribution rate), thereby indicating the degree of environmental stress created by motorcycles.

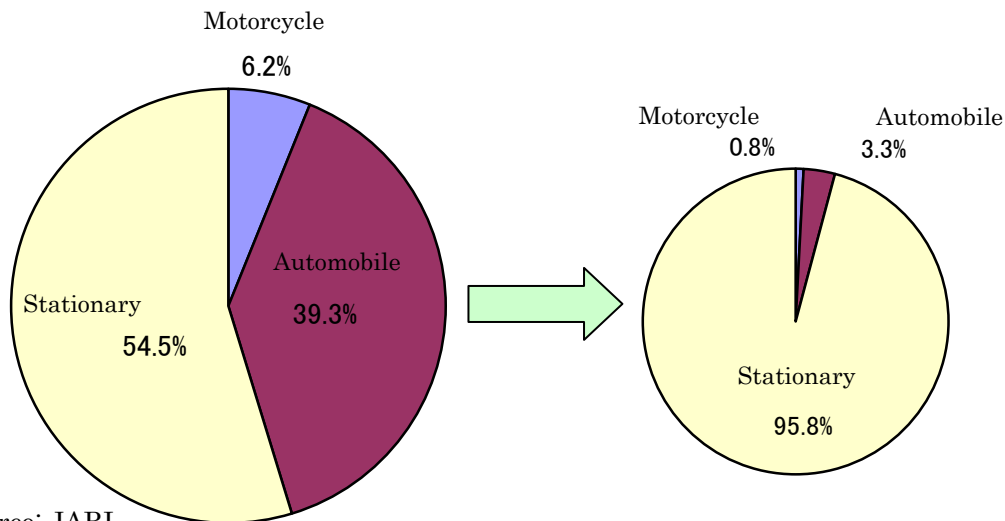
The aforementioned report devoted particularly heavy research to the emissions of total

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<sup>1</sup> Japan's standards are basically in accord with the EU Directive.

hydrocarbons<sup>2</sup> (THC) and NO<sub>x</sub> – exhaust gases that impact the generation of ozone. The results of these studies are summarized below.

**Trends in Motorcycle THC Contribution Rate (estimates)**  
**1990 (total emissions: 1,523,000 tons/year)**    **2020 (total emissions: 866,000 tons/year)**



Source: JARI

Although motorcycle unit sales in Japan are in decline, the estimates shown above assume that the unit sales level achieved in 2006 will be maintained. While the NO<sub>x</sub> exhaust contribution rate of motorcycles remains low at present, it is projected to decline even further over the years to come. For THC emissions, meanwhile, the motorcycle contribution rate is predicted to fall to less than 1.0% in 2015 compared to 6.2% in 1990 and 3.2% in 2005.

As noted above, therefore, the contribution rates of motorcycles to THC and NO<sub>x</sub> exhaust gases are not so large at present, while being projected to grow extremely small in the future.

\* \* \*

<sup>2</sup> Combined for the methane (CH<sub>4</sub>) and non-methane hydrocarbons (NMHC) obtained from the hydrocarbon automatic measuring machine used to measure the hydrocarbons (HC) in the atmosphere.