

Thesis Title	An Evaluation of Motorcycle Status in Bangkok and Effect of Reconditioning on Fuel Consumption and Emission
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Abstract

A study of the effect of engine tune up and engine reconditioning on fuel consumption and exhaust emissions at idling and TISI.1360-2539 cycle testing for motorcycles in Bangkok was carried out. Before tuning, at idling, seventy-five percent of 1,685 random motorcycle samples passed the CO, HC concentration and white smoke level inspection. The higher level of white smoke than 30% caused motorcycles failed the inspection. After tuning, eighty-three percent of the samples passed the idle inspection. The averaged level of white smoke decreased from 18.0% to 14.5% after tuning whereas the averaged concentration of CO and HC were increased from 1.6%, 4,720 ppm. to 1.7%, 4,770 ppm. by volume, respectively. In addition, the averaged concentration of CO and HC were higher but it still under the inspection standard, possibly due to better engine performance caused by engine tune up.

The effect of reconditioning engine for 20 selected motorcycles was studied. The samples were divided into two groups; the first group of 10 motorcycles tested by the TISI.1360-2539 and had more reconditioning details than the second group. According to the first group, at idling, reconditioning decreased the average of CO, HC concentration and white smoke level from 3.80%, 12,510 ppm. and 36.8% to 2.46%, 9,950 ppm. by volume and 22.1%, respectively. From the TISI.1360-2539 test, reconditioning decreased the mass emissions of CO and HC from 11.00 and 9.25 to 7.86 and 8.50 grams km.⁻¹, respectively. However, the HC mass emission decreased after reconditioning but it still higher than the standard limit of 7.00 grams km.⁻¹. The average fuel consumption of motorcycles increased from 1.95 and 2.28 to 2.57 and 2.65 liters

per 100km. at driving speed of 30 and 50 km. hr.⁻¹, respectively. The results of the reconditioning 10 motorcycles in the second group are shown that, at idling, the average of CO and HC concentration were decreased from 3.15% and 9,860 ppm. to 2.98% and 9,580 ppm. by volume, respectively. The averaged of fuel consumption was increased from 2.30 and 2.50 to 2.40 and 2.60 liters per 100km, at driving speed of 30 and 50 km. hr.⁻¹, respectively. The higher fuel consumption after reconditioning may be resulted from engine recondition, leading to better engine performance.