**ABSTRACT**

Good fuel quality will improve engine performance and reduce exhaust emission of vehicle. One of the way to increase fuel quality is by adding additive into fuel. Refer to data from Pertamina, addition of additive allowed, on condition not caused deposit forming in engine, and not caused ash component forming. 5 (five) additives will be selected, additives addition according to users guide.

Will be discussed about effect of fuel and additives mixture on four stroke engine with Pertamax as fuel. Research was held at Laboratorium Bahan Bakar dan Motor Pembakaran Dalam Teknik Mesin ITS. Engine performance analyzed were effective horse power, break mean effective pressure, thermal efficiency, and brake specific fuel consumption, while exhaust emission evaluated were HC and CO. Compression ratio taken from standard engine, that is 8,8:1

Additives addition, except Castrol additive, on Pertamax raised HC emission until maximum 41,2%, but exhaust CO emission drop until maximum 59,65%. So that horse power, torque and brake mean effective pressure raise up around 1,49% in general, and brake specific fuel consumption drop about 11,01%