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ABSTRACT



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An apparatus for diagnosing and controlling combustion of an internal combustion engine is provided which makes smooth operation of an engine possible by adjusting the combustion condition at the occurrence of knock, misfire, and flame quenching and also makes it possible to detect the occurrence of abnormality in cylinder pressure detectors without delay and deal with the abnormality without stopping the operation of the engine. The apparatus comprises a means to calculate the maximum pressure ratio P_p/P_0 , P_p being the maximum cylinder pressure, P_0 being the compression pressure at one or a plurality of crank angles in the compression stroke, a means to compare said P_p/P_0 with pressure ratios (threshold pressure ratios) predetermined for each of diagnosis categories, and a means (step) to diagnose the combustion condition such as cylinder pressure by judging the result of said comparison every cycle or every plural cycle. For example, the ratio of the pressure P_1 at a crank angle in the combustion stroke to said pressure P_0 in the compression stroke, i.e. combustion pressure ratio P_1/P_0 is calculated, when said maximum pressure ratio P_p/P_0 is equal to or smaller than the predetermined permissible minimum pressure ratio ($P_p/P_0 \leq P_n$) and at the same time said combustion pressure ratio P_1/P_0 is equal to or smaller than the predetermined pressure ratio P_m of misfire ($P_1/P_0 \leq P_m$), a misfire is judged to have occurred in the combustion chamber.