cylinders either through direct mixing in the intake manifold with air or through injection directly into the cylinder [13].The performance of a dual fuel engine at idling and low loads can be improved by optimizing some engine operating and design parameters, such as engine speed, load, pilot fuel quantity, injection timing, intake manifold con dition and intake gaseous fuel compositions [27,28].Dual fuel operation has advantages compared to diesel counterparts and spark ignition (SI) engines, theoretically higher thermal efficiency resulted from faster burning, less toxic emissions, high power density, strong ignition sources providing more reliable [20].However, the dual fuel engine has some pitfalls such as the poor utilization of the LPG fuel at low and intermediate loads which results in poor engine performance (drop in engine effi ciency), high HC, CO emissions and misfiring at higher gas inducted levels.Engine perfor mance, combustion and emissions characteristics are discussed at different sections to get the clear scenario on the effects of using liquefied petroleum gas (LPG) in diesel engine in dual fuel mode.By con verting diesel engines to run on LPG we can significantly reduce the problem of diesel pollution while also improving emissions of greenhouse gases [21,22].Such conversions are however not a simple matter of changing the fuel, many technical problems present particularly with availability of specific fuel supply system, fuel injection control and engine optimization to ensure that the engine performance is main tained and the exhaust emissions are minimized [23].This pilot diesel fuel, auto ignites first and acts as a deliberate source of ignition for the combustion of the gaseous fuel–air mixture.The pilot diesel fuel, which is injected by the conventional diesel injection equipment nor mally, contributes only a small fraction of the engine power output.In this literature review, studies with wide range of diesel engine sizes and different types investigated at different operation condi tions are reviewed.Thus the combustion process in a dual fuel engine is complex as it combines the features of SI and CI engines [15–19].A dual fuel engine is basically a modified diesel engine in which a LPG fuel, called the primary fuel is inducted along with air.The primary gaseous fuel is compressed with air, but does not auto ignite due to its high self–ignition temperature.Due to this poor thermal effi ciency high level of unburnt hydrocarbons in the exhaust is found [24–26,100,102].Similarly, different percentages of LPG were applied to optimize the engine output.A small amount of diesel, usually called the pilot, is injected as in a normal diesel engine near the end of compression of the pri mary fuel–air mixture.The dual fuel engines can also be reverted back to straight diesel operation easily [14].Poor part load performance results from incomplete combustion of LPG.This fuel is the main source of energy input to the engine.

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