A

REPORT ON

THE FEASIBILITY STUDY AND DESIGN OF A HYDROGEN FUELED INTERNAL COMBUSTION ENGINE

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This report deals essentially with the feasibility study into the use of hydrogen as a potential fuel for the internal combustion (I.C.) engine. It is divided into two basic parts.

Part one, covering chapter two, discusses the crux of the question. It looks into such aspects as safety, fuel characteristic, the complete hydrogen engine system and finally the considerations involved in the design of such a system.

Part two covers the project work and discusses the design process involved in the fabrication work. However, the design stresses on getting minimum costs as well as optimization of local technology.

Conclusions derived at are that it is feasible to operate conventional engine vehicles on hydrogen but due to factors of fuel storage, handling and distribution problems, such a system is only feasible only to fleet vehicles which have the capacity to accomodate the heavy fuel tankage associated with hydrogen usage.

Technology since its inception has been associated with energy. First with coal, and more recently with oil, natural gas and coal. The first two of these fuels are now undergoing price increase preceding their exhaustion. Primary energy sources such as nuclear, solar, wind, etc., can be used as replacements but due to some operational and environmental difficulties it is difficult for us to see how these power plants can be sited near populated regions, where they are most wanted, in the near future. Hence it seems clear that ultimately mankind will have two energy systems: a primary one depending upon either fission, fusion, solar or geothermal sources and a secondary system that will take care of portable energy needs. To us this secondary source will be hydrogen.

The great advantage of hydrogen is that it is basically non-polluting. Hydrogen is obtained from water and when it is burned the product we get is again water. Even when hydrogen is burned with air in conventional internal combustion (I.C) engine, its emissions can be controlled easily to meet the emission standards set up by the respective environmental protection agencies of the country. Further in nearly all applications H_2 appear to be capable of substituting for today's fossil fuels.

Practical questions which remains: Can widespread use of hydrogen be safe? Can hydrogen be manufactured ultimately from water and prime energy, at anything approaching reasonable costs? Is hydrogen-based transportation a practical option?

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