直接噴射共軌式柴油引擎管理系統控制最佳化之研究

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摘 要

本研究之主旨為建立多缸四行程直接噴射共軌式柴油引擎管理系統動態響應之模擬技術、並驗證性能。使引擎控制與輸出性能參數即時顯示之軟硬體，結合引擎控制參數多目標最佳化調校法則，由引擎測功計實驗加以驗證。 利用所建立之行車型態轉換成關鍵點油耗污染模擬模，篩選出行車型態關鍵點，並經由實際車輛與環境之參數及所量測之引擎實驗數據進行計算得到車輛之平均油耗里程數及每公里之排放克數。以實驗設計最佳化分析軟體找出引擎性能響應曲面方程式，建立多目標達陣最佳化控制參數搜尋程式，預測四行程直接噴射共軌式柴油引擎之性能、油耗及污染，達到設計規格，並找出最佳之引擎控制參數。透過四行程直接噴射共軌式柴油引擎燃燒分析模組，由引擎量測之缸壓與曲軸角度之數據，計算引擎燃燒之淨熱釋放率、淨熱釋放，以分析引擎性能供引擎發展與控制之參考。

關鍵詞 : 共軌式柴油引擎管理系統設計、多缸柴油引擎動態模擬、實驗設計法與多目標最佳化搜尋

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