多缸汽油引擎管理系統最佳化設計與製作之研究

林宜謀、張一屏

E-mail: 9314775@mail.dyu.edu.tw

摘 要

本研究旨在整合設計引擎控制參數與控制器實現，並驗證性 能。 將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教法則，完成多缸引擎管理系統硬體迴路控 制架構，並由引擎測功計實驗加以驗證。 本研究針對引擎控制參數加以調整，以探討點火提前角度、噴 油位置與噴油脈衝對引擎扭力、轉速與排氣中污染物之響應關係。 研究開發之引擎點火與噴油參數即時顯示之軟硬體，可以記錄引擎 參數對應其扭力、轉速等輸出性能之間的響應，量測之動態響應數 據關係可作為將來發展引擎管理系統之參考。 藉由搭配實驗設計 法與多目標最佳化搜尋，以降低實驗次數與提高調校引擎參數之效 率。 研究自行建構設計之多缸汽油引擎管理系統，將實驗設計之 多目標最佳化引擎控制參數植入管理系統記憶體中。 本研究建構 多缸引擎控制器之硬體迴路方法，可協助引擎控制器工程師改善設 計，大幅度降低研究費用並縮短開發時間。

關鍵詞 : 最佳化設計、多缸汽油引擎管理系統

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