多缸汽車引擎噴油控制器設計與製作之研究

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摘 要

本研究之主旨為建立多缸汽油引擎噴油控制系統動態模型， 運用物件導向程式，針對多缸汽油引擎噴油控制系統，建立動態模擬技術與控制參數設定評估系統性能之圖控程式。 並用實驗設計法來搜尋比例、積分噴油控制器模型最佳化之控制參數，修正噴油量以保持空燃比維持在設定之目標值。 並將圖控程式燒錄至晶片中，而發展所用之核心晶片為摩托羅拉公司所生產之MC68376晶片，以其為主要之發展平台。以此方式開發引擎管理系統之噴油控制器部分，可縮短研發時間以及成本，且可快速將控制器成型。 本研究將針對一多缸汽油引擎進行噴油控制器開發，模擬產生引擎相關訊號以測試控制汽油引擎之噴油量，使其空燃比不因負載與轉速改變，維持在設定之空燃比附近，以降低油耗與排放之廢氣污染。 另以適當之比例、積分控制器，依據含氧感知器所輸出之排氣中含氧濃度或狀態變數加以修正，以構成一閉迴路系統之回饋控制。 利用所建立之多缸引擎空燃比預測模型，配合控制器之環境中，修改比例、積分控制器之參數，達到所需的性能，再將控制器模型獨立出來於另一台電腦上，與多缸汽油引擎模型作系統模型交互平台(Model-Based)測試。 本研究所建立之整合模擬分析硬體迴路技術，對於開發相關車輛電控系統亦可提供相關經驗，供業者於開發時，能針對控制參數對於引擎或車輛行駛性能之影響迅速掌握參數間之相關性，提供控制器設計與參數設定評估實用參考重要資訊。

關鍵詞 : 硬體迴路、汽油引擎噴油控制、空燃比控制

目錄

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