多缸汽油引擎低油耗環保噴油控制策略之研究 = Study of fuel economic environmental injection control strategy for Multi-...

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摘 要

本研究之主旨為設計與製作多缸汽油引擎前饋式一階噴油補 償控制器。運用物件導向程式，建立針對汽油引擎噴油控制系統 動態模擬技術與控制參數設定評估系統性能之圖控程式。並使用 前饋式一階噴油補償控制器搭配PI 噴油控制器模型，修正噴油量 以保持空燃比於節氣門瞬間開啟與關閉時，維持在設定之目標值 。 本研究主要針對前饋式一階引擎噴油控制器開發，模擬控制 汽油引擎噴油量控制，使其空燃比在節氣門瞬間開啟與關閉時不 至於改變，維持在設定之目標範圍內，使其更有效率的運用能源 ，達成燃油節省與廢氣排放控制。研究另以適應性前饋式一階噴 油控制器結合PI 控制器，依據瞬間改變的節氣門電壓輸入前饋一 階噴油控制器中，加以增濃或稀薄噴油量。結合含氧感知器所輸 出之排氣中含氧濃度或狀態變數加以修正PI 控器參數，以構成一 閉迴路系統之回饋控制。 利用所建立之汽油引擎空燃比預測模型，配合控制器之環境 ，修改前饋式一階噴油補償控制器與PI控制器之參數，達到所需 的噴油脈寬分布圖，再將控制器利用硬體實現，搭配汽油引擎使 用。在定轉速、三種不同的節氣門開度下測試，其模擬與實際硬 體輸出之空燃比能控制在合理的誤差範圍內。

關鍵詞 : 汽油引擎噴油控制、前饋式一階噴油補償控制器、空燃比控制

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