旋轉葉片接合器對流熱傳之實驗研究

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摘 要

本研究目的主要在探討四輪傳動車輛之動力來源－旋轉葉片接合器之熱傳，此對流熱傳實驗以具強制對流及加裝環狀擾流肋骨之旋轉葉片接合器(Rotary Blade Coupling, RBC)為熱傳實驗模型。旋轉葉片接合器在旋轉時除了會產生離心槽流之熱、質傳現象及因不同轉速下旋轉葉片接合器產生不同之溫度外，旋轉也會增加流場之紊流性而提高熱傳量，同時會引發不?定之Taylor漩渦，此類不穩定會影響熱傳且可能造成機件因局部溫度過高而損壞。為了能真正達到分析旋轉槽流之熱傳現象，本實驗測試段是以實物進行測試，實驗設計以外部強制供油方式冷卻旋轉葉片接合器，並加裝三種不同尺寸的環狀擾流肋骨以增加熱傳面積。實驗主要探討旋轉葉片接合器在六種Taylor數 及四種Reynolds數 下之軸向頂部及底部的溫度量測及熱傳逆向推導，並模擬旋轉葉片接合器做空氣流場及潤滑油流場之觀測，以增進瞭解四輪傳動車輛之旋轉葉片接合器內部旋轉流場槽內之熱傳現象，並將實驗結果建立相關經驗式，供設計實務之參考。

關鍵詞 : 旋轉葉片接合器，熱傳，泰勒漩渦

目錄

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