

智能純電動防鎖死煞車系統 A Smart All-electric Antilock Braking System (ABS)

通過縮短煞車距離及時間提升汽車安全及表現
Shortening braking distance and time for enhanced automotive safety and performance

專利申請編號：201910995257.8 (中國)

特色與優點

- 煞車轉矩控制更精確和穩定，有助提升煞車的表現 (如縮短煞車時間及距離)
- 結構簡化，僅由電磁扭矩轉換器和機械組件組成，減少複雜性
- 由於沒有易燃及導致腐蝕的煞車液壓油，所以較液壓ABS安全及長壽
- 因為沒有踏板振動，操作時非常安靜
- 可作獨立的可控制制動模組，直接應用於其他輔助系統而無需添加其他機械或液壓組件

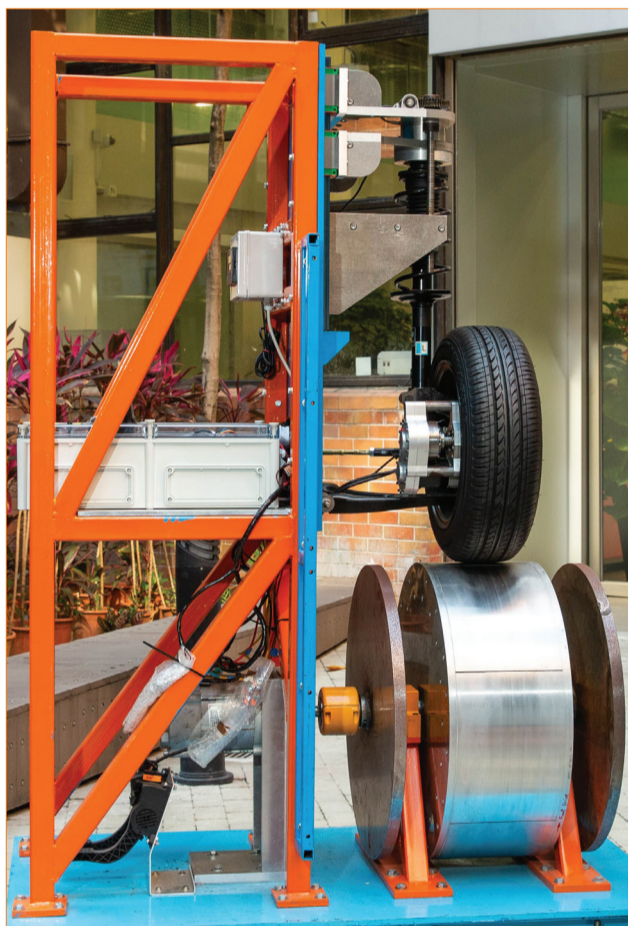
應用

- 電動汽車的煞車系統
- 傳統燃油汽車及鐵路車輛的煞車系統
- 其他車輛輔助系統，如車輛穩定系統

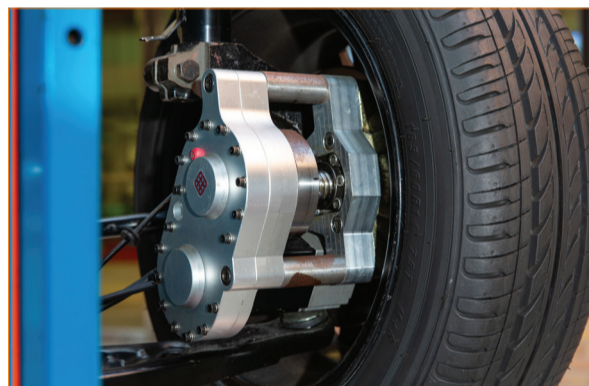
獎項

瑞士日內瓦國際發明展 - 2021年網上特別版 - 銀獎 (2021年3月)

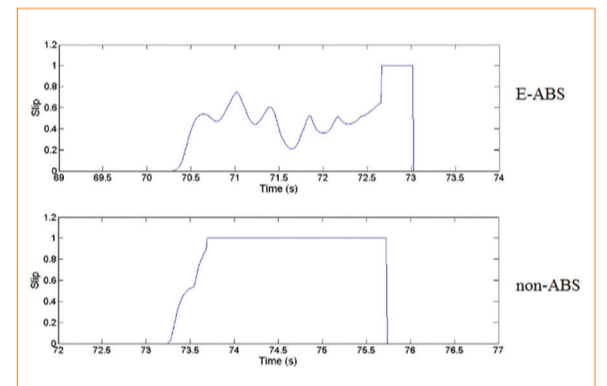
此純電動汽車防鎖死煞車系統 (ABS) 是用於制動系統的安全設備，能夠防止車輪在煞車時被鎖死而發生側滑的危險情況。這套以純電力驅動的系統可以根據道路狀況計算出最大的高輪胎與道路摩擦係數，以控制車輪的加速度及透過其電控單元產生準確的制動力。與傳統的液壓ABS相比，全電動的ABS能夠達致較高的響應速度和較精確的煞車轉矩控制，從而有效地縮短煞車距離和時間。



單輪防鎖死煞車系統測試平台
Single-wheel ABS test bench



機電制動器
Photo of the electromechanical brake (EMB)



煞車性能：與非電動防鎖死煞車系統相比，電動防鎖死煞車系統提供更好的車輪打滑控制
Braking performance: E-ABS provides a better slip control when compared with non-ABS

Patent application number: 201910995257.8 (China)

Special Features and Advantages

- More accurate and reliable braking torque control for better braking performance, e.g. shorten braking time and distance
- Simple structure consisting of an electromagnetic linear actuator and mechanical components only, reducing complexity
- Higher safety and longer lifetime, in comparison to hydraulic ABS, due to absence of flammable brake fluid that may also lead to corrosion
- Extremely quiet operation as no pedal vibration is required in ABS operation
- Acts as an individual controllable braking module, and can be applied to other assistance systems directly without the need to install more mechanical or hydraulic components

Applications

- Braking system of Electric Vehicles
- Braking system for conventional vehicles and rail-bound vehicles
- Other vehicular assistance systems e.g. vehicular stability system

Award

Silver Medal - Special Edition 2021 Inventions Geneva Evaluation Days - Virtual Event (Mar 2021)

The all-electric Anti-lock Braking System (ABS) is a safety equipment in the wheel brake that is used to prevent the wheels from locking up and causing dangerous skids during braking. Operated only by electric power, the system considers road conditions and calculates the maximum tire-road adhesion coefficient in order to control the angular wheel acceleration and generate an accurate braking torque by its electric control unit. Compared with conventional hydraulic ABS, this all-electric system achieves higher response rate and more accurate braking torque control, thus effectively shortening the braking distance and time.

Principal Investigator

Prof. Eric Ka-wai CHENG

Department of Electrical Engineering

Contact Details

Institute for Entrepreneurship

Tel: (852) 3400 2929 Email: ife.admin@polyu.edu.hk



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