
자동차검사 및 안전관리



스텔스 자동차 예방 방안 마련 및 효과분석에 관한 연구

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Research on Preparing Stealth Vehicle Prevention Measures and Analyzing the Effectiveness of Stealth Vehicle Prevention

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Key Words : Stealth vehicle(스텔스 자동차), Taillamp(미등), Headlight(전조등), Headlamp Switch(전조등 스위치)

ABSTRACT

This study was conducted to develop measures to prevent stealth vehicles. The research method was to investigate the status of headlight use, how to use headlights, stealth vehicle driving experience, and stealth vehicle cause analysis through a survey.

The survey results showed that drivers who usually use the headlight switch in auto mode are more likely to drive as stealth vehicles if someone else turns off the headlight switch without their knowledge. Therefore, it is necessary to educate drivers on the correct use of headlight switches to prevent stealth vehicles. Additionally, strengthening penalties for driving without headlights can also be an effective preventive measure. The results of this study are expected to be helpful in formulating policies to prevent stealth vehicles.

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운행 전기자동차 배터리 상태평가를 위한 정기검사 주행모드 개발

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Development of Periodic Technical Inspection Driving Mode for Battery Condition Evaluation of Electric Vehicle

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Key Words : Electric vehicle(전기자동차), Battery(배터리), SOH(건전상태), BMS(배터리 관리 시스템), PTI(정기검사)

ABSTRACT

At the end of 2022, the cumulative number of electric vehicles registered in Korea was 390,000, increased of 68.4% from the previous year. According to the Korean MOTOR VEHICLE MANAGEMENT ACT, there are automobile driving modes such as ASM2525 and KD147 for exhaust gas inspection, but there isn't a periodic technical inspection (PTI) driving mode for evaluation of electric vehicle batteries' states. This research developed a driving mode to inspect a driving electric vehicle based on the method of evaluating the performance of a single battery cell for a vehicle of IEC62660-1. The torque control method of the dynamometer was used to implement the C-RATE condition of IEC62660 in the driving mode. In order to verify the reliability of the data, the SOH of the battery full charge/discharge test data and the driving mode test data were analyzed. In order to improve the system in the future, the periodic technical inspection (PTI) driving mode will be optimized and commercialized by increasing the number of evaluations.

후기

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자동차 하체 검사를 위한 차량 영상 스캐닝 장비 도입에 관한 연구

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A Study on the Introduction of Vehicle Underbody Scanning Inspection Equipment for PTI

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Key Words : Vehicle in Use(운행 자동차), PTI(정기검사), Sensory Inspection(관능검사), Image Scanning(이미지 스캐닝), Vehicle Inspection Equipment(자동차 검사장비), Vehicle Safety(자동차 안전)

ABSTRACT

Periodic Technical Inspections(PTI) of vehicles, which are mandatory to check the safety and emissions of vehicles in use, may be classified into sensory inspections or functional inspections depending on whether inspection devices and measuring instruments are used. Since the implementation of the automobile inspection system, sensory inspections have relied only on the inspector's sensory organs, and the issue of securing consistency and objectivity of test results from the problems caused by judgment deviations between inspectors and individual physical and mental fatigue of inspectors have been steadily raised.

This study attempted to derive a plan to improve test efficiency and objectivity by applying image scanning equipment to supplement existing sensory tests. To this end, a test bench was established to compare the actual inspection of virtual defects with the inspection using development equipment, and based on the results, the effectiveness of introducing scanning inspection equipment and improving the inspection process were analyzed.

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이륜자동차 재활용 현황 및 체계 개선에 따른 효과 분석

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Analysis of the Effectiveness of Motorcycle Recycling and System Improvement

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Key Words : Motorcycle(이륜자동차), Recycling(재활용), Reporting for scrapping(폐지신고), Disposal system(폐차 제도)

ABSTRACT

There are about 2.2 million registered motorcycles in Korea as of 2022. This accounts for 8.58% of the total number of automobiles, which requires thorough management. However, due to the lack of a clear disposal system, it is not enough for recycling to be carried out smoothly.

In particular, unlike automobiles, motorcycles fall outside the scope of the management system when reporting for scrapping. Some of these vehicles are abandoned on the streets, causing serious environmental and traffic problems. In addition, the change from internal combustion engine motorcycles to electric motorcycles has led to the problem of battery disposal. If the batteries of electric motorcycles are not recycled and left unattended, it will become an environmental and social problem.

In order to analyze this problem, this study analyzed how motorcycles are discarded and recycled at the end-of-life stage. Based on this, the problem was defined. We proposed solutions to the problem and analyzed the expected economic and environmental effects of solving the problem. The result is a recommendation for improving the recycling status of motorcycles.

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4륜 동력계를 활용한 ABS 검사 방법에 대한 연구

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A Study on the ABS Inspection Method Using a 4WD Dynamometer

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Key Words : ABS(잠김방지제동장치), 4WD(사륜 구동), Brake(제동 장치), VILS(실차 기반 시뮬레이션), Vehicle inspection(자동차 검사), Dynamometer(동력계)

ABSTRACT

Vehicles produced after 2012 are required to be equipped with ABS(Anti-lock Brake System), and most vehicles are currently equipped with ABS. As 11 years have passed since ABS became mandatory, preventive measures against functional deterioration and malfunction due to aging are needed. However, the current Inspection Station cannot conduct the inspection because there is no ABS inspection method. The purpose of this report is to improve the safety of driving vehicles through research on ABS inspection methods using a 4WD dynamometer. During ABS inspection, normal operation is determined based on whether the valve is open or closed, the difference in force received by the four wheels, and warning lights. In the future, through actual vehicle testing and analysis of experimental results, I will analyze the operating conditions of currently mandated automobile auxiliary devices and prepare inspection plans to ensure the safety of driving vehicles.

후기

한국산업기술진흥원의 자율주행자동차 요소장치 검사시스템 개발 과제 일환으로 수행되었다. (과제번호 : P0025721)

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폐배터리 안전 운송 보관을 위한 실시간 배터리 모니터링 시스템 개발에 대한 연구

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A Study on the Development of Real-Time Waste Battery Monitoring System for Safe Transportation and Storage of Waste Battery Using BMS

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Key Words : Electric vehicle(전기차), Waste battery(폐배터리), Monitoring(모니터링), BMS(배터리 관리 시스템),

ABSTRACT

The rapid growth of the EV industry is expected to lead to a significant increase in the supply of used batteries. As a result, accidents involving fire and explosion occur during the transportation and storage of used batteries. However, due to the lack of regulations in related law, the situation remains in the blind spot. This paper aims to serve as a foundational research for the enactment of law by focusing on the development of a monitoring system, for safe transportation and storage, using a modified BMS for used batteries. Transportation and storage of used batteries are based on government recommendations, with the criterion of maintaining the SOC(State of Charge) of the batteries at(or below) 30%. The test's purpose is to ensure safety and eventually establish a monitoring system based on used battery storage containers, BMS, temperature sensors, and other components. In the future, through practical experiments, we will gather both Positive and Negative data about fires on used batteries. This research will establish criteria for the identification of hazardous conditions in used batteries, to quickly take action with fires, thereby securing the golden time for the intervention.

후기

한국환경산업기술원의 BMS 연계형 전기화학특성 기반의 전기차 폐배터리 안전 보관 관리 시스템 개발 과제 일환으로 수행되었다. (과제번호 : RE2022020063)

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이륜자동차 정기검사결과 분석에 관한 연구

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A Study on the Analysis of Periodic Inspection Results of Two-Wheel Motor Vehicles

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Key Words : Two-Wheel(이륜), Two-Wheel Motor Vehicle(이륜자동차), Regular inspection(정기검사), Inspection results (검사결과), Defect(결함), Emissions(배출가스), Noise(소음), Exhaust noise(배기소음), An exhaust pipe (배기관), A license plate(번호판)

ABSTRACT

During the COVID-19 pandemic, the activation of contactless industries and the increasing number of people enjoying recreational motorcycles have led to growth in the domestic motorcycle market.

In this paper, we deeply examined the structure of motorcycles in order to enhance the management skills of motorcycles and strengthen the inspection capabilities of inspectors.

Additionally, we analyzed cases of non-conforming in the results of periodical inspections over the past five years, focusing on illegal customization, exhaust emissions, and exhaust noise levels. Through this, we aim to substantiate the necessity of inspections for tuning and temporary inspections of motorcycles, similar to automobile inspections.

COVID-19 시기 비대면 산업의 활성화, 레저용 이륜자동차를 즐기는 인구가 증가하면서 국내 이륜자동차 시장은 성장하고 있다. 따라서 이륜자동차 관리/검사의 중요성이 높아지고 있다.

본 연구에서는 이륜자동차 관리능력을 함양하고 검사원의 검사업무 능력을 강화할 수 있도록 이륜자동차의 구조와 장치를 세밀하게 살펴보았다. 또한 최근 5년간의 정기 검사 결과 중 부적합 사례 분석을 통해 불법개조, 배출가스, 배기 소음 결과를 분석하였다. 이를 통해 자동차 검사와 같이 이륜자동차의 튜닝검사 및 임시검사의 당위성을 입증하고자 한다.

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