

A Study on Korean Vehicle Power Test Method Based on Fuel Cell Bus Test Results

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In order to reduce the emission of carbon dioxide (CO₂), which is considered to be the cause of global warming, tremendous effort is being invested into eco-friendly fuel cell electric vehicles (FCEV). Even though FCEV supplies power to traction motor from both fuel cell system and battery as in Fig. 1, Korean official vehicle power test method defines the supply source solely to be the battery power. In order to amend the relevant regulation to reflect the reality of FCEV energy flow, this study experimentally investigates the fuel cell bus and passenger car powerplant systems.

By CAN data acquisition and sensor installation, FCEV power plant operation characteristics were analyzed. Based on the test results, it was first verified that FCEV traction motor power is supplied from both fuel cell system and battery together simultaneously. In addition, it was observed that powerplant power distribution strategy varies depending on battery SOC. The effect of ambient temperature and thus the air density on output power of battery and fuel cell system, respectively, was confirmed. In the current test method, power consumption of BOP and auxiliary devices are not included. However, the test result clearly demonstrates that these devices consume significant amount of power and thus strongly calls for the need to consider these supplementary power consumption when calculating the supply power to the motor output test.

Through the test result analysis, this study points out the specific modifications required and suggests the equation governing the supply power to motor output power test based on the energy flow of FCEV powerplant system

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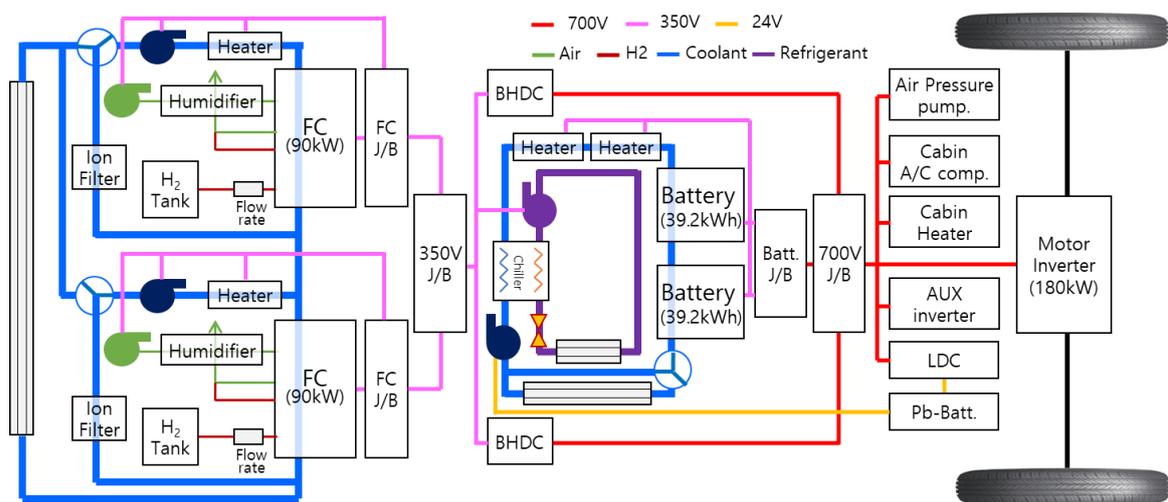


Fig. 1 Hyundai ELEC CITY fuel cell bus system configuration