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3기통 가솔린 엔진과 CVT 조합에 따른 FEAD Resonance 소음의 실험적 연구

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Experimental study on FEAD resonance noise by 3-cylinder Gasoline engine and CVT combination

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Key words : FEAD(프런트 엔드 액세서리 드라이브 시스템), CVT(무단 변속기), Resonance(공진, 공명)

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There is an abnormal FEAD rumble noise during acceleration in 2,700~3,000rpm after warm-up (No abnormal noise at cold condition) @3-Cylinder Gasoline engine and CVT application only. Not affected MT application and it is believed to be a resonance issue with the CVT only application. Increased movement of tensioner and belt by this system resonance can influence on loudness of noise. This FEAD rumble noise could be noticed in only vehicle level condition. In this paper, Accessory drive dynamic performance testing on vehicle level system and SimDrive analysis are studied to find out a robust design to improve the FEAD rumble noise. Modified FEAD components (Tensioner, Belt, Crank-pulley, Generator Isolator pulley) are validated to figure out the optimized design for FEAD rumble noise. FEAD components was modified with Tensioner(Dynamic Damping), Gen-Isolator pulley type, Crank-pulley(Natural Frequency) and Belt(Cord material, Rib surface material). Test scope is to confirm modified FEAD components can improve the FEAD rumble noise.
The conclusion of this paper is the best design for FEAD rumble noise could find out through modified FEAD components and the test.