

The new 1.5L 3Cylinder engine development with variable compression ratio technology for 100% Electric Drive HEV

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Nissan's unique 100% electrically driven hybrid system (hereafter referred to as e-POWER) is a fully motor-driven electric power system, where power is solely generated by the engine. This system can realize significant fuel economy in the vehicle class while maintaining a smooth acceleration and high level of quietness (EV-ness). This article introduces a hybrid powertrain newly developed for C-segment SUV, aiming at launching e-POWER into the global market.

The new e-POWER system was developed as a powertrain for C-segment SUVs, intended for the global market, to improve the smooth acceleration performance, quietness, and fuel economy, which are the characteristics of e-POWER.

To install the new e-POWER system into the C-segment SUVs intended for the global market, the driving force must be increased relative to the conventional e-POWER system. Therefore, the size of the motor has increased as it is the source of the driving power. Consequently, the engine output should be increased.

To achieve a higher engine output of the e-POWER system while maintaining the fuel efficiency during fixed-point operation, this trade-off relationship must be resolved. Therefore, a newly developed the 1.5L 3-cylinder VC-TURBO engine has been adopted.

The new 1.5L 3-cylinder VC-TURBO engine has two key technology, 1) Variable compression ratio(VCR), 2) Low pressure EGR. And developed optimization for e-POWER requirement of the following point.

- 1, High fuel efficiency at engine normal driving point
- 2, High power on the maximum power engine driving point
- 3, Compact
- 4, Quietness

The VC-TURBO engine can realize all requirement with e-POWER system control. As a result of these system contribution, KR15DDT with e-POWER covered over 80% engine driving at WLTP with Ex high mode. And driver can feel very similar the Battely EV attractive without plug-in electric charge.

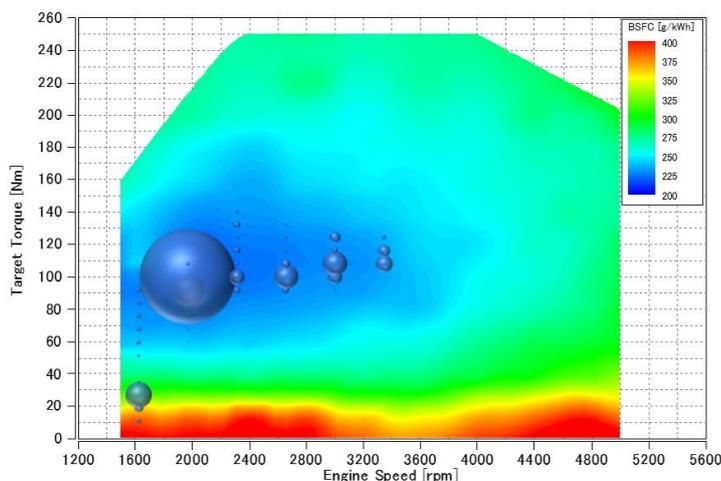


Fig.1 BSFC map with driving bubble chart