



**BORGWARNER SUPPLIES LATEST ADVANCEMENTS IN  
VARIABLE CAM TIMING TECHNOLOGY FOR SUBARU'S NEW BOXER ENGINES**

*BorgWarner Technologies Help Boost Fuel Economy Up to 10%*

Auburn Hills, Michigan, March 3, 2011 – BorgWarner supplies its latest advancements in Cam Torque Actuated (CTA) variable cam timing (VCT) technology for the new Subaru boxer engines. According to Subaru, the new four-cylinder 2.5- and 2.0-liter engines improve fuel economy 4 to 6 percent and 10 percent, respectively, compared with previous models, and meet U.S. Super Ultra Low Emissions Vehicle (SULEV) and Euro 5 emissions standards. The 2.5-liter engine features BorgWarner's award-winning CTA technology, while the 2.0-liter engine introduces BorgWarner's CTA technology with a new mid position lock, an innovation named as a finalist in the 2011 Automotive News PACE Awards. Launched on the Forester, the boxer engines are expected to become Subaru's main engines.

"BorgWarner continues to demonstrate product leadership with breakthroughs in VCT technology. Our innovations give engine designers more precise control over intake and exhaust valve timing for better fuel economy and lower emissions without sacrificing performance," said James Verrier, President and General Manager, BorgWarner Morse TEC. "We are very pleased to contribute our technologies to the all-new Subaru boxer engine." BorgWarner will manufacture its VCT technologies for Subaru at its facility in Aoyama, Japan.

Unlike traditional cam phasing methods, which typically use engine oil pressure to phase the camshaft, BorgWarner's patented CTA technology utilizes the existing torsional energy in the valve train to phase the camshaft, similar to a hydraulic ratchet. CTA cam phasers operate more quickly and under a wider range of engine speeds and temperatures than traditional oil pressure actuated cam phasers, enabling engines to run more efficiently at all engine speeds with faster response.

BorgWarner's latest innovation adds a mid position lock to its CTA technology. Because conventional systems default to one end of the camshaft phaser's range of angular travel, calibration strategies are limited by the restricted amount of travel that can be designed into a variably timed system. BorgWarner's mid position lock technology defaults at an intermediate position to allow for a greater range of travel and more control over airflow to improve fuel economy, function and efficiency. A patented hydraulic circuit passively moves the system to the mid position for reliable repositioning in any potential engine operating condition.

### **About BorgWarner Morse TEC**

BorgWarner Morse TEC is a world-leading designer and producer of systems and components for engine timing and drivetrain applications on passenger cars, trucks and power sport vehicles. Key technologies include fully integrated engine timing systems, advanced drivetrain and HY-VO<sup>®</sup> power transmission chains, and innovative variable cam timing (VCT). BorgWarner Morse TEC provides low friction, durable, economical systems with low noise, vibration and harshness (NVH) to deliver improved fuel economy, reduced emissions and better performance.

### **About BorgWarner**

Auburn Hills, Michigan-based BorgWarner Inc. (NYSE: BWA) is a product leader in highly engineered components and systems for vehicle powertrain applications worldwide. The company operates manufacturing and technical facilities in 60 locations in 18 countries. Customers include VW/Audi, Ford, Toyota, Renault/Nissan, General Motors, Hyundai/Kia, Daimler, Chrysler, Fiat, BMW, Honda, John Deere, PSA, and MAN. The Internet address for BorgWarner is: <http://www.borgwarner.com>.

###