

# DIAGNOSTIC FOCUS



## ADVANCED TESTING FOR VVT & 3-PHASE FUEL PUMPS

Clear, concise guided component tests are essential for accurate and efficient diagnosis. For systems as advanced as Variable Valve Timing (VVT) and 3-Phase Brushless Fuel Pumps, fault codes can often be difficult to diagnose and resolve. Making these tests easier to understand helps technicians reach the correct repair faster, improving productivity and customer satisfaction. This help is what makes Snap-on software the best.

### VARIABLE VALVE TIMING (VVT)

VVT systems work by adjusting camshaft timing using oil pressure and electronically controlled solenoids. When operating correctly, they improve power, torque, and emissions. Because these systems rely on precise oil control and accurate feedback signals, even minor electrical or hydraulic faults can create drivability concerns.

Confirming proper solenoid operation and verifying camshaft position sensor signals is critical in the troubleshooting process. Knowing what a good example of a waveform pattern looks like helps eliminate guesswork and prevents unnecessary parts replacement.

### 3-PHASE BRUSHLESS FUEL PUMP

The 3-phase brushless fuel pump is a newer technology. Unlike traditional 2-wire pumps, these systems use a dedicated fuel pump control module to energize three separate phases that drive the motor. The result is quieter operation, improved efficiency, and longer service life.



Although generally reliable, diagnosing these systems requires understanding how a balanced three-phase current ramp should appear. Problems can originate in the pump itself, the control module, the ECM, or wiring. Without proper guidance and visual references, interpreting these signals can be challenging, especially for technicians encountering the technology for the first time.

### **WHAT'S NEW IN OUR SOFTWARE?**

As automotive systems evolve, diagnostic support must evolve with them. Our latest software release introduces additional VVT Position Sensor Signature test details and an all-new 3-Phase Fuel Pump Current Ramp Guided Component Tests for BMW® 328i and BMW® X6® sDrive35i. The updated VVT test provides detailed instructions and five new color waveform pictures. The new 3-phase fuel pump current ramp test guides technicians on how to evaluate this modern system using easy-to-read, full-color waveform images.

With structured workflows and visual guidance, Snap-on® diagnostic software helps technicians test with confidence.

