

2022 CHEVROLET CORVETTE SERVICE MANUAL

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Camshaft Actuator System Description

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Camshaft Position (CMP) Actuator System

The camshaft position (CMP) actuator system is used for a variety of engine performance enhancements. These enhancements include lower emission output through exhaust gas recirculation (EGR) control, a wider engine torque range, improved gas mileage, and improved engine idle stability. The CMP actuator system commanded by the ECM accomplishes these enhancements by controlling the valve timing relative to piston position.

CMP Actuator System Operation

The camshaft position (CMP) actuator system is controlled by the control module. The control module sends a pulse width modulated signal to a CMP actuator solenoid in order to control the amount of engine oil flow to a camshaft actuator passage. There are 2 different passages for oil to flow through, a passage for CAM advance and a passage for CAM retard. The camshaft actuator is attached to the front of the camshaft, and is hydraulically operated in order to change the angle of the camshaft relative to crankshaft position (CKP). Engine oil pressure (EOP), viscosity, temperature, engine oil level, and aftermarket engine oil additives can have an adverse affect on camshaft phaser performance.

Note: If vehicle is equipped with Park Lock Actuator.

During engine Off, engine idling conditions, and engine shutdown, the camshaft actuator is held in the Park position. Internal to the CMP actuator assembly is a return spring and a locking pin. During non-phasing modes of the camshaft, the return spring rotates the camshaft back to the Park position, and the locking pin retains the CMP actuator sprocket to the camshaft.

CMP Actuator Solenoid Circuit Diagnostic

The engine control module (ECM) monitors the control circuit of the camshaft position (CMP) actuator solenoid for electrical faults. The control module has the ability to determine if a control circuit is open, shorted high, or shorted low. If the control module detects a fault with the CMP actuator solenoid control, DTC P0010 will set.

CMP Actuator System Performance Diagnostic

The engine control module (ECM) monitors the performance of the camshaft position (CMP) actuator system by monitoring the calibrated desired position and the actual position of the camshaft, through the 4X signal of the CMP sensor. If the difference between the actual and the desired position is greater than a calibrated angle for a calibrated amount of time, DTC P0011 will set.