



Technical Service Bulletin

The Electronic Variable Orifice (EVO) is controlled by an electronic control module that reduces fluid pressure from the power steering pump to the steering rack/gear at different speeds. This solenoid is electronically controlled and trigger activated through the ECU or a steering module. The control module of the solenoid often couples the commands for flow based on steering angle, vehicle speed and other inputs which are application specific. Thus, all items must be taken in to account to determine if it is working properly in the equation.

To check if the EVO is working when installing a rack and pinion, you can review the below steps:

- 1. Visual Inspection:** Begin by visually inspecting the EVO unit. Ensure that all electrical connections are securely fastened and that there are no visible signs of damage or wear.
 - a. No broken or bent pins, connectors or locks
 - b. Frayed or damaged wires
 - c. Excessive corrosion around connections
 - d. Always inspect battery voltage as this is the leading driver of all electronic devices in the vehicle. Too low of voltage due to a parasitic loss or weakened battery can cause a multitude of issues.
- 2. Diagnostic Scan:** Perform a scan to check for any error codes related to the EVO or power steering system. Use a compatible diagnostic scanner to retrieve any trouble codes that may indicate a problem with the EVO.
 - a. Because the solenoid is often driven with feedback from other sensors, these other sensor signals may cause a code to be thrown and that should be investigated first.
- 3. EVO Functionality Test:** Start the vehicle and turn the steering wheel from lock to lock while the vehicle is stationary. Listen for any unusual noises coming from the power steering system, such as whining or grinding sounds. Also, pay attention to the steering effort required and whether it feels consistent throughout the steering range.
 - a. When in doubt, you can turn the engine off and disconnect the electric connector from the solenoid and check the resistance on the solenoid. Each manufacturer will have a acceptable level of resistance and you should consult the factory service manual for specifications.
- 4. Check for Smooth Operation:** As you turn the steering wheel, the EVO should adjust the flow of hydraulic fluid to provide varying levels of power assistance based on driving conditions. The steering should feel smooth and responsive without any sudden changes in steering effort.
 - a. Consulting the factory service manual is ideal to determine if the parameters at a given speed are proper for the voltage that is present at the solenoid.
- 5. Monitor Electrical Signals:** If possible, use a multimeter to monitor the electrical signals going to the EVO unit. Check for proper voltage levels and ensure that signals are being sent and received correctly.
 - a. Checking for continuity between the solenoid valve harness and the control unit connector is critical. If continuity is broken, you must repair or replace for proper functionality.
- 6. Consult Service Manual:** Refer to the vehicle's service manual for specific troubleshooting steps and diagnostic procedures related to the EVO system. The manual may provide detailed instructions for testing the EVO unit and identifying any potential issues.



- a. Each and every application has specific tolerances and nuances within their platform. You should consult the manual to confirm proper fluids, conditions, specifications are upheld after flush, replacement, fill and bleed procedures have been completed.

