Dorman 917-212

Dorman 917-212 Engine Variable Valve Timing (VVT) Solenoid User Manual

Model: 917-212 | Brand: Dorman

1. Introduction

This manual provides essential information for the proper installation, operation, and maintenance of the Dorman 917-212 Engine Variable Valve Timing (VVT) Solenoid. This component is designed as a direct replacement for the original VVT solenoid in compatible Lexus and Toyota models, ensuring proper fit and function to restore optimal engine performance.

Figure 1: Main view of the Dorman 917-212 VVT Solenoid. This image displays the overall structure of the solenoid, including its cylindrical body and electrical connector.

2. Safety Information

Always observe standard automotive safety procedures when working on a vehicle. Failure to do so may result in personal injury or damage to the vehicle.

- Ensure the vehicle's engine is off and cooled down before beginning any work.
- Disconnect the vehicle's battery to prevent electrical hazards.
- Wear appropriate personal protective equipment, including safety glasses and gloves.
- Refer to the vehicle's service manual for specific procedures and torque specifications.
- Keep work area clean and well-lit.

3. Vehicle Compatibility

The Dorman 917-212 VVT Solenoid is compatible with various Lexus and Toyota models. It is crucial to verify fitment for your specific vehicle year, make, and model before installation. Consult your vehicle's service manual or a reputable parts catalog for precise application details.

Compatible Vehicles:

- **Lexus ES350:** 2007-2018
- **Lexus GS300:** 2006
- **Lexus GS350:** 2007-2011
- **Lexus GS450h:** 2007-2011
- **Lexus IS250:** 2006-2008
- **Lexus IS350:** 2006-2008
- **Lexus RX350:** 2007-2017
- **Lexus RX450h:** 2010-2017
- **Toyota Avalon:** 2005-2018
- **Toyota Camry:** 2007-2017
- **Toyota Highlander:** 2008-2016
- **Toyota RAV4:** 2006-2012
- **Toyota Sienna:** 2007-2016
- **Toyota Venza:** 2009-2016

Note: This list is for general guidance. Always confirm fitment using your vehicle's specific details.

4. Components Included

The Dorman 917-212 package typically includes:

- One (1) Dorman 917-212 Engine Variable Valve Timing (VVT) Solenoid.

Note: Additional gaskets or seals may be required for installation and are typically sold separately.

5. Installation Instructions

Installation of the VVT solenoid requires mechanical aptitude and specific tools. If you are not confident in performing this procedure, it is recommended to seek professional assistance.

General Installation Steps:

1. **Preparation:** Park the vehicle on a level surface, engage the parking brake, and ensure the engine is cool. Disconnect the negative terminal of the battery.
2. **Locate the VVT Solenoid:** Refer to your vehicle's service manual for the exact location of the VVT solenoid(s). They are typically located on the cylinder head.
3. **Disconnect Electrical Connector:** Carefully disconnect the electrical connector from the VVT solenoid. Avoid pulling on the wires.
4. **Remove Mounting Bolt:** Using the appropriate wrench or socket, remove the bolt securing the VVT solenoid in place.
5. **Remove Old Solenoid:** Gently pull the old VVT solenoid straight out from its bore. Some oil may leak out; have a rag ready. Inspect the bore for any debris.

6. **Install New Solenoid:** Apply a thin coat of clean engine oil to the O-ring of the new Dorman 917-212 VVT solenoid. Carefully insert the new solenoid into the bore, ensuring it seats properly.
7. **Secure Mounting Bolt:** Reinstall the mounting bolt and tighten it to the manufacturer's specified torque. Refer to your vehicle's service manual for the correct torque specification.
8. **Reconnect Electrical Connector:** Reconnect the electrical connector to the new VVT solenoid, ensuring it clicks into place securely.
9. **Final Steps:** Reconnect the negative battery terminal. Start the engine and check for any leaks or abnormal operation. Clear any stored diagnostic trouble codes (DTCs) using an OBD-II scanner.

Figure 2: Various views of the Dorman 917-212 VVT Solenoid. These images highlight the electrical connector and the solenoid's body, which houses the internal components responsible for oil flow regulation.

6. Operating Principles

The Variable Valve Timing (VVT) solenoid, also known as an oil control valve (OCV), plays a critical role in modern engine management systems. It controls the flow of engine oil to the VVT actuator (cam phaser), which in turn adjusts the camshaft position.

By precisely altering the timing of the intake and/or exhaust valves, the VVT system optimizes engine performance across various RPMs and loads. This results in improved fuel efficiency, reduced emissions, and increased horsepower. The Engine Control Unit (ECU) sends signals to the VVT solenoid, which then modulates oil pressure to advance or retard valve timing as needed.

Figure 3: A detailed view of a VVT solenoid, illustrating its intricate design for precise oil flow control within the engine's variable valve timing system.

7. Maintenance

The Dorman 917-212 VVT Solenoid is designed for long-term reliability and typically does not require routine maintenance. However, its proper function is dependent on the overall health of the engine and its lubrication system.

- **Regular Oil Changes:** Ensure engine oil and filter changes are performed according to the vehicle manufacturer's recommended schedule. Dirty or low oil can impede VVT solenoid function.
- **Use Correct Oil Viscosity:** Always use the engine oil viscosity specified by the vehicle manufacturer. Incorrect oil can affect oil pressure and VVT system operation.
- **Monitor Engine Lights:** Pay attention to any illuminated check engine lights. Diagnostic trouble codes related to VVT system performance should be addressed promptly.

8. Troubleshooting

If you experience issues after installing the VVT solenoid or suspect a VVT system malfunction, consider the following common symptoms and potential causes:

Symptom	Possible Cause	Action
Check Engine Light (DTCs P0010-P0029, P0011, P0012, P0021, P0022)	Faulty VVT solenoid, wiring issue, low/dirty engine oil, VVT actuator malfunction.	Verify electrical connection, check engine oil level and condition, inspect wiring, test VVT solenoid resistance, consult a professional.

Symptom	Possible Cause	Action
Rough Idling or Stalling	Incorrect valve timing due to VVT solenoid issue, low oil pressure.	Check for proper VVT solenoid installation, ensure adequate oil pressure, inspect for other engine issues.
Reduced Fuel Economy	VVT system not optimizing valve timing.	Diagnose VVT system with an OBD-II scanner, ensure VVT solenoid is functioning correctly.
Decreased Engine Performance	Improper valve timing, restricted oil flow to VVT actuator.	Verify VVT solenoid operation, check for oil sludge or blockages.

Always consult a qualified automotive technician for complex diagnostic and repair procedures.

9. Product Specifications

Attribute	Detail
Model Number	917-212
Brand	Dorman
Material	Aluminum
Dimensions (L x W x H)	5.4 x 2.2 x 2.2 inches
Item Weight	6.4 ounces
Exterior Finish	Machined
Inlet Connection Type	Thread
Outlet Connection Type	SAE
Number of Ports	2
Specification Met	OE (Original Equipment)
UPC	019495297109
OEM Part Numbers	024-2023; 190-003; 2T1026; 620332; 66-1004; 7V4004; SK917212; TS1026; TY1415996; VTS1027; VV1055; VVS108; VVS1711; VVT155; 15330-0P020; 1533031020

10. Warranty & Support

Dorman products are manufactured to high-quality standards. For specific warranty information regarding the Dorman 917-212 VVT Solenoid, please refer to the official Dorman website or contact Dorman customer service directly. Warranty terms typically cover defects in materials and workmanship under normal use.

For technical support, installation guidance, or warranty claims, please visit the official Dorman website or contact their customer support team. You can find more information at www.dormanproducts.com.

Figure 4: Dorman company branding, emphasizing their commitment to driving new solutions in the automotive aftermarket.