

# On the Line

## What's the Hubbub with Wheel Bearings? Know This Multi-Function Component

With the early model vehicles, packing wheel bearings was a required routine service, or a service performed during a brake job. The inspection involved removing the bearings and washing them in a solvent, including the race, and performing a visual inspection. This form of inspection is not possible with the current sealed hub bearing assemblies, which may contain a wheel speed sensor as a part of the assembly. Today's hub bearing inspection may come in the form of a line graph comparison, scan tool diagnostics, chassis ears, or end play with a dial indicator. It may require a series of road testing, or removal for a hands-on inspection to identify a damaged bearing.

Hub bearing assemblies have changed how we must diagnose and service wheel bearings. Yesterday's noise or vibration symptom has progressed to include numerous driveability symptoms when a failure occurs. For example, a hub bearing replacement may be necessary to satisfy a malfunction indicator lamp when the bearing itself may or may not be defective. Symptoms of a failure may include but not be limited to the Antilock Brake System, Vehicle Dynamic Control, Traction Control System or even a transmission related symptom. When diagnosing, the technician must be conscious of how a defective bearing can affect other systems. Imagine replacing a transmission and then determining the performance symptom was due to a defective wheel speed sensor.



"PUTTING IT IN THE SIMPLEST TERMS, SIR, TO DETERMINE IF IT IS A DEFECTIVE WHEEL BEARING REQUIRES SCAN TOOL DIAGNOSTICS, A LINE GRAPH COMPARISON, CHASSIS EARS, AND A DIAL INDICATOR MEASUREMENT. DOES THAT HELP?"

### PINPOINTING BEARING NOISES

Pinpointing bearing noises can be a challenge. Some noises may only be present when turning, as inertia promotes a change in bearing load. Road surface conditions can promote the same symptoms as a defective bearing. Noises from worn or damaged tires are often misdiagnosed as defective bearings. Our space is limited, so we ask that you review Tech Tip #178 HUB BEARINGS and SENSORS, which illustrates some common causes of bearing failures and some procedures that can help pinpoint defective bearings.

### WHEN SENSORS FAIL

Some hub bearing assemblies contain internal wheel speed sensors and others utilize external sensors. Excessive bearing end play can result in damage to the sensors. Corrosion can affect the air gap spacing, weakening the

sensor's signal strength. Road debris can render the sensor inoperative or cause mechanical damage through contact.

### CONTAMINATED WHEEL SPEED SENSORS

GM advises that a contaminated wheel speed sensor magnet may result in an ABS System fault, Service Traction Message, Service Stabilitrak, Service Steering message and a clicking or ratchet type noise. Diagnostic codes C0035, C0040, C0045 and C0050 may be stored in memory. It is possible for a single wheel speed sensor to set the four mentioned codes, especially when a sensor code repeatedly sets. Production models include 2007–2014 applications referenced in GM Service Bulletin PIC5428F. The condition is due to particles of metallic debris becoming attached to a wheel speed sensor magnetic encoder ring, which is a part of the hub bearing assembly. Debris attached to the magnetic encoder ring affects the signal strength. Do not use a magnetic tool of any type to remove the debris, as damage to the encoder ring can occur. Remove the debris with a soft bristle brush or wash the encoder ring with a mild detergent. It may be necessary to remove the hub bearing to thoroughly clean the encoder ring.

### TRANSMISSION RELATED SYMPTOMS

Nissan advises that Continuously Variable Transmissions (CVT) and Transmission Control Modules (TCM) have been needlessly replaced when diagnosing loss of power symptoms from 0-40 mph but the power is normal above 40 mph with no fault codes stored. Affected vehicles include 2007-2012 Nissan Maximas. When diagnosing the described symptoms, the technician should first inspect, repair or replace any defective wheel speed sensor, wiring, or remove any contamination which could affect the sensor signals. Line graph diagnostics should be performed on each wheel speed sensor and compared to the other sensor signals. The systems affected by a weak or no sensor signal include: Anti-Lock Brake System, Vehicle Dynamic Control and the Traction Control System, resulting in the described power loss symptoms.

Be thorough in your diagnostics.



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