Mighty On the Line

Silencing Engine Sounds

It May Be Impossible with Today's Technology

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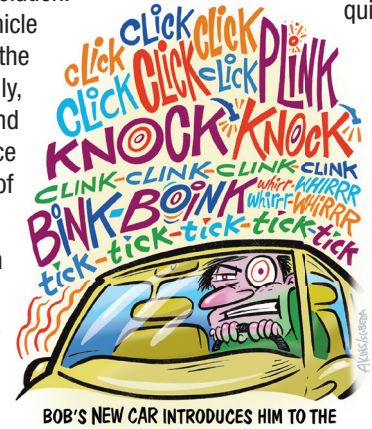
It is not uncommon to receive customer complaints involving noises that may resemble noisy valve lifters or bearing clearance related noises. Other sounds may include piston slap during cold starts lasting for a couple of minutes in cold temperatures. Some of these noises are a normal characteristic for the engine with no means of silencing the sounds. Many hours of diagnostic time can be invested in attempting to satisfy the customer's concern when there is no possible way to quieten the noise. Be prepared to identify those normal characteristic noises and share those symptoms with the customer.

Cold Start-up Knocks

GM V-8 engines have been plagued with engine knock complaints when temperatures are 50 degrees F or colder and are more pronounced during the initial first cold start. The noise is a common customer complaint without a solution. While the symptoms are frustrating to the vehicle owner, the noise does not have an effect on the longevity of the engine components. Personally, I have a 5.7L engine with 297K miles on it and it has encountered cold start-up knock since new. The noise usually originates from one of the following conditions:



BOB'S NEW CAR INTRODUCES HIM TO THE NEW ENGINE SOUNDS OF TODAY'S AUTOMOTIVE TECHNOLOGY

Engine Knock…Piston knock is a common occurrence due to the short skirt aluminum piston design. The symptom occurs due to a clearance between the piston skirt and the cylinder wall. The symptoms are especially a problem when the ambient temperature is below 50 degrees F, following a cold start. During these temperatures the piston rocks/slaps against the cylinder wall creating a knocking sound that many confuse with bearing clearance issues. The condition corrects itself once the engine temperature increases, causing the piston skirt to expand and tighten in its bore. Piston pin design has also been a contributing factor.

Carbon Knock…Carbon build-up on the crown of a piston and cylinder head results in physical contact, promoting a knocking sound. Combustion chamber cleaners are available to help remove the carbon build-up. Some vehicle manufacturers recommend removing the cylinder head and physically removing the carbon.

In either case, piston knock due to piston skirt to cylinder wall clearance or carbon knock will usually diminish following engine warm-up.

New Technology Promotes Engine Noises

Direct Injection is widely used by many vehicle manufacturers. Unlike systems fitted with Multiport Fuel Injection, which is relatively quiet, the Direct Injection system generates some clicking or ticking noises that result in customer complaints, especially during cold starts and warm-up operation. With this system, fuel is injected directly into each cylinder under high pressure exceeding 2000 psi, resulting in the noise.

A distinct clicking or ticking noise emanates from the high-pressure fuel pump that can be very noisy during cold starts and quietens following engine warm-up. The sound is more noticeable when standing outside the vehicle, with the hood up, or when the vehicle is next to a building such as a drive-through.

These sounds are to be considered a normal characteristic of the Direct Injection high pressure system and no attempt to quieten the noises should be performed.

Ticking Noises Lasting Up to 50 Seconds

Always check for factory service bulletins that may illustrate the symptoms encountered by the vehicle owner. Having this information to share with them reinforces our diagnosis. Consider the following illustrated in GM Service Bulletin PIP5104A.

The customer may complain of a cold engine ticking noise that may diminish within 50 seconds following a cold start. Once this time has elapsed, the noise diminishes. The noise is the result of a design characteristic programmed in the ECM to better comply with cold start emissions. Vehicles affected include: 2009-2013 Cadillac Escalade, 2009-2015 Chevrolet Express, Silverado, Suburban, GMC Savana and Sierra with the following V8 RPO Codes: 6.0L-L76, L96, LC8, LY6 and 6.2L-L94, L9H.

The ticking noise is combustion taking place in the exhaust manifold. Once the 50 second time lapse occurs, the timing is advanced, and the noise diminishes. Make certain the noise is coming from the exhaust manifold, as the symptom could be mistaken for an engine-related noise previously mentioned.

Summary: New technology poses many challenges. My 50 plus years in the automotive industry has impressed upon me many changes in automotive technology and performance characteristics that were previously considered unacceptable but are now considered a normal characteristic.