



Tech Tip

FAST LUBE SERVICE 167

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New Technology Poses New Challenges...Are You Prepared?

Today's lube service technician is faced with many challenges, which can exceed the responsibility of just making certain an oil filter is properly secured, the drain plug is tightened, and new lubricant has been installed. Many find it hard to believe that performing a lube service could have an influence on the performance of the customer's vehicle, resulting in driveability issues, an illuminated Check Engine lamp, and stored trouble codes. There are issues that must be considered when servicing today's vehicles. Failure to recognize those concerns can result in performance and engine related conditions that your shop could be held liable for. The repair cost can be in the hundreds of dollars to restore engine performance. Some of these conditions may be the result of extended service intervals that have been recommended by the vehicle manufacturers or the incorrect lubricant installed during a lube service. Premature failures have resulted in some changes in the extended recommended service intervals on some applications and we will likely see more modifications by the vehicle manufacturers. Let's consider some issues that the lube service technician must be aware of to prevent returns that he could be blamed for.

VARIABLE VALVE TIMING

Camshaft timing is critical in establishing optimum engine performance and fuel economy and minimizing exhaust emissions. In years past, we have spent countless hours with a degree wheel and off-set bushings trying to maximize engine performance by adjusting camshaft timing. Unfortunately, improvements in one RPM range would sacrifice engine performance in other RPM ranges. You could obtain good low end, mid-range or top end performance, but you couldn't have all three. Variable Valve Timing (VVT) has changed all that. VVT offers a range of camshaft profiles, all engineered into one camshaft design and controlled by the Powertrain Control Module. Numerous camshaft designs and adjustment features are offered by the various vehicle manufacturers. Their means of valve timing control range from electronic controlled solenoids to magnetic and hydraulic controlled actuated systems. Further, this camshaft control arrangement has allowed the vehicle manufacturers to discontinue the use of exhaust gas recirculation (EGR) valves.

Failures...The VVT systems are encountering failures due to contamination. Engine sludge and other deposit formations are preventing proper lubricant flow through the oil galleries and solenoids, preventing proper camshaft

timing. Regardless of the system or vehicle manufacturer, all suffer the same conditions due to lubrication issues. Failure to adhere to a proper lube service interval means certain disaster for the system. Frequent oil changes and the correct oil viscosity are imperative. This comes at a time that many vehicle manufacturers are promoting longer service intervals. For some applications, these service recommendations may change.

OIL CHANGE ILLUMINATES CHECK ENGINE LIGHT

Imagine performing a basic lube service on a 2009–2012 Nissan Maxima and having the customer return complaining of an illuminated Check Engine Light, plus a hesitation on acceleration at speeds below 15 MPH. The technician scans the diagnostic memory for codes, revealing P0014 and P0024. The mentioned codes reflect problems with the Exhaust Valve Timing (EVT) control with Banks 1 and 2. The condition is described as a gap between the angle of target and phase-control angle degree.

Possible causes include:

- 1) Crankshaft position sensor
- 2) Camshaft position sensor
- 3) EVT control position sensor
- 4) EVT control magnet retarder
- 5) Accumulation of debris to the signal pick-up position of the camshaft
- 6) Timing chain installation
- 7) EVT control pulley assembly

The mentioned illuminated Check Engine light, stored P0014 and P0024 codes, and hesitation at speeds below 15 MPH have been a common occurrence on the 2009–2012 Maximas following an oil change. The problem occurs after the oil has been drained and the absence of oil pressure on start-up following the oil change. Nissan has addressed this concern in a service bulletin where they recommend replacing the Exhaust Valve Control Magnet Retarder on both left and right cylinder banks. This is a major repair requiring the removal of both left and right Intake Valve Timing Covers to gain access to the Exhaust Valve Control Magnet Retarders. Once replaced, an Exhaust Valve Timing Control Learning Procedure must be performed to allow the Electronic Control Module (ECM) to learn the Exhaust Valve Timing Control Magnet Retarder by comparing the target angle of the exhaust camshaft with the actual retarded

angle of the exhaust camshaft. This learning procedure must be performed each time the Exhaust Valve Timing Control Magnet Retarder is disconnected or replaced, or the ECM is replaced.

The recommended oil for the mentioned applications is SAE 5W-30 and Nissan recommends Nissan Ester engine oil, which is a synthetic base oil and is not derived from crude petroleum. Due to the cost, some elect to install a 5W-30 non-synthetic oil. There are two problems with this approach. It may change the required maintenance frequency interval, and the vehicle manufacturer could deny warranty coverage. Any deviation from the vehicle manufacturer's specification should be under the direction of the vehicle owner. If he elects to do this, be certain to have him sign the repair order acknowledging his request for the variance.

NOISY VALVE LIFTERS

Ticking noises on start-up following an engine shut-down of two hours or more have been reported on GM vehicles equipped with Active Fuel Management (AFM). Active Fuel Management is a system that provides displacement on-demand. It is a variable displacement technology that allows a V8 or V6 powertrain to turn off half of its cylinders under a light load condition for fuel economy purposes.

Vehicles affected include:

- 2007 Buick Rainier
- 2009 Buick LaCrosse Super. Allure Super (Canada)
- 2007 Cadillac Escalade (Built prior to April 1, 2006 with 6.2L engine RPO L92)
- 2010-2011 Cadillac Escalade, ESV and EXT
- 2007 Chevrolet Monte Carlo
- 2007-2009 Chevrolet Impala
- 2007-2011 Chevrolet Avalanche, Silverado, Suburban, Tahoe, TrailBlazer, EXT
- 2010-2011 Chevrolet Camaro SS
- 2007-2011 GMC Envoy, XL, Sierra, Yukon, Yukon Denali, Yukon XL and XL Denali
- 2007-2008 Pontiac Grand Prix
- 2008-2009 Pontiac G8
- 2007-2009 Saab 9-7X
- Equipped with AFM and V8 Engine RPO L76, L94, L99, LC9, LFA, LH6, LMG, LS4, LY5, or LZ1

According to GM...customer complaints of engine valve lifter noises that occur during start-up, after the engine has been shut down for a minimum of two hours, and continues for a few seconds to ten minutes, may be caused by one of the following:

- 1) Aerated oil in the valve lifter body, which can result in the valve lifter being unable to purge the air until the engine has run for a few seconds to ten minutes
- 2) Contaminated or dirty engine oil

- 3) Low oil level or incorrect oil viscosity
- 4) Low internal valve lifter oil reservoir level
- 5) Dirty or contaminated valve lifter
- 6) Valve lifter leak down rate too high

If the aforementioned inspection fails to identify the cause of the valve lifter ticking noise and the oil pressure is normal, GM recommends the following:

- 1) If the engine is more than one quart low or the improper oil viscosity is suspected, the oil and filter should be changed.
- 2) Allow a two hour heat soak and then start the engine and observe for a valve lifter ticking noise.
- 3) If the noise is still present, replace the 8 active fuel management (AFM) valve lifters. Originally, GM recommended replacing all 16 valve lifters, but this recommendation has changed. The system is equipped with 8 AFM lifters and 8 non-AFM lifters.

OIL LIFE MONITOR UPDATE

GM recently introduced a software update for the oil life monitor system on 2010–2011 Buick LaCrosse, 2011–2012 Buick Regal, 2010–2012 Chevrolet Equinox, and 2010–2012 GMC Terrain equipped with the 2.4L engine (LAF/LEA).

The software update will enhance the way the engine oil is monitored. In most cases, the update will recommend more frequent oil changes.

This update is to address premature wear on the timing chain/balance shaft chain and other internal engine components that have resulted in high warranty claims.

Summary: Electronic sensors provide information concerning engine operating categories such as engine revolutions, engine operating temperature, etc. The computer uses an algorithm to predict at what mileage oil degradation occurs, requiring replacement. These are indicators and not actually sensors that determine the life of the lubricant.

We have watched maintenance intervals between recommended oil and filter changes steadily increase from 3,000 mile intervals to double or triple that mileage. We have also seen some vehicle manufacturers re-assess and adjust those mileage intervals to more frequent service intervals. Much of this has resulted from system or component failures.

Engine oil quality and viscosity does make a difference. Most of the problems that we evaluate involving VVT are associated with incorrect oil viscosity or contamination due to poor lubrication schedules.

Today's engines are not forgiving when it comes to improper maintenance. Purchasing a \$29.95 oil change is pocket change when compared to a \$6000 engine replacement.

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