



Service Bulletin

PRELIMINARY INFORMATION

Subject: SES Light, Misfire, DTC P0300, and/or a Chirp, Squeak, Squeal, or Tick Noise - Potential Valvetrain Concern

Models: 2004-2007 Buick Rainier
2008-2009 Buick LaCrosse, Allure (Canada Only)
2006-2013 Cadillac CTS-V
2002-2013 Cadillac Escalade
2010-2013 Chevrolet Camaro
2011-2013 Chevrolet Caprice
2002-2013 Chevrolet Avalanche
1999-2013 Chevrolet Express, Silverado, Suburban, Tahoe
2009-2013 Chevrolet Colorado
2003-2009 Chevrolet Trailblazer
2006-2009 Chevrolet Impala SS
2006-2007 Chevrolet Monte Carlo SS
2003-2006 Chevrolet SSR
2005-2013 Chevrolet Corvette
2009-2013 GMC Canyon
2003-2009 GMC Envoy
1999-2013 GMC Savana, Sierra, Yukon
2003-2010 Hummer H2
2008-2010 Hummer H3
2008-2010 Pontiac G8
2005-2006 Pontiac GTO
2005-2008 Pontiac Grand Prix GXP
2005-2009 Saab 97x
with a V8 engine

This PI was superseded to add warranty information field. Please discard PIP4138L.

The following diagnosis might be helpful if the vehicle exhibits the symptom(s) described in this PI.

Condition/Concern

Some customers may complain of a SES light, engine misfire, and/or engine noise. If the SES light is on, the technician will find a P0300-P0308 DTC with misfires counting on a single cylinder that may or may not be felt. This may occur consistently, or it may occur intermittently. If a noise is verified, it will not be

eliminated by canceling fuel injectors and the noise will occur at camshaft speed (half of crankshaft speed). The noise may be described as a chirp, squeak, squeal, or tick noise and may increase off of idle.

In either case, the cause of this concern may not be isolated after following SI diagnosis. This PI is written for technicians who experience this concern and follow SI diagnosis without isolating the cause of this concern.

Recommendation/Instructions

If SI diagnosis does not isolate the cause of this concern, it may be the result of any of the following:

1. Worn camshaft lobe and/or lifter roller
2. A sticking valve
3. Valve leakage
4. A broken valve spring
5. A collapsed AFM (Active Fuel Management) lifter

If SI diagnosis does not isolate the cause of this concern, review the information below, determine which description best matches the vehicle you are working on, and perform the suggestions as necessary, starting with the easiest ones first:

1. Worn Cam Lobe and/or Lifter Roller:

Generally, a worn cam lobe on this engine family will create a consistent chirp, squeak, squeal, or tick noise at camshaft speed and/or a misfire with a P0300-P0308 DTC. The misfire may or may not be felt and the misfire could occur at all RPM or just a specific RPM, such as idle only or only at high RPM. If a noise is present, it will not be eliminated by cancelling fuel injectors and generally, the static compression and cylinder leakage will be similar on all cylinders.

The following suggestions may help determine if a worn cam lobe and/or lifter is causing this concern:

- Use a wooden hammer handle to apply pressure to the following locations of the rocker arms during the noise to determine which one is making noise: valve side, push rod side, and side of the rocker. If the noise is changed by applying pressure to the valve side of the rocker, this is most likely the result of a lifter and/or cam lobe concern on that cylinder. Sometimes this works, sometimes it does not - it seems to depend on the amount of cam lobe wear.
- Disconnect the coils and injectors on one bank of the engine, run the engine with the related valve cover removed, and back off the related rocker arm a couple of turns and listen for a change in the noise. If necessary, both rockers and push rods can also be removed one cylinder at a time with the related coil and injectors disconnected. If the noise is eliminated and there is no problem found with the valve spring, push rod, or rocker arm, this is most likely the result of a worn lifter roller and/or cam lobe.
- Measure the cam lobe lift at the push rod side of the rocker arm. The lift in this location will differ from the SI specification but it should be similar as compared with other rockers on the same bank. The misfiring/ticking cylinder should obviously have less lift than the comparison cylinders if this is the result of a worn lifter roller and/or cam lobe. Another possibility of no/low lift on cylinders 1, 4, 6, or 7 on an AFM engine would be a collapsed AFM lifter. A collapsed AFM lifter is found, refer to the latest version of PIP4568 for additional information.
- On engines with AFM (active fuel management), you can command AFM on with the scan tool, which will unlatch the lifters on cylinders 1, 4, 6, and 7 and stop opening the related valves. If the noise is eliminated, there is a good chance that the noise is coming from the valvetrain of cylinders 1, 4, 6, or 7. If there is no problem found with the push rods, rockers, or valve springs, the noise is most likely coming from a worn lifter roller and/or cam lobe on cylinders 1, 4, 6, or 7.
- If the tests above do not isolate the cause of this concern, it may be necessary to visually inspect the lifter rollers and cam lobes for obvious damage, such as flat spots, pits, grooves, scoring, gouging, flaking, rusting, etc...It is very easy to overlook a damaged cam lobe when inspecting them through the lifter bores and just because the lifter rollers are not worn, does not mean that the related cam lobes are okay. Both pieces need to be carefully inspected. It may help to use a bore scope or pen light when inspecting the cam lobes through the lifter bores. In some cases, the worn cam lobe may not be discovered until the camshaft is physically removed from the engine and inspected for the issues mentioned above.

Notice: Follow SI procedures to replace the camshaft and all lifters if a worn camshaft lobe or lifter roller is found. Also replace the plastic lifter guide for the lifter that had the damaged cam lobe and/or lifter roller (For 2010 Model Year, replace all of the plastic lifter guides). On AFM engines, also replace the VLOM (Valve Lifter Oil Manifold) filter screen that is under the oil pressure sensor.

2. Sticking Valve:

Generally, a sticking valve on this engine family will cause an engine misfire that may or may not be felt and it may occur consistently or intermittently. It is unlikely that any engine noise will be present. It may be temperature sensitive and it may be more apparent during certain operating conditions, such as driving up a grade, cresting a hill, or during hard acceleration. A good indicator of a sticking valve is if engine misfires continue to count on an aggressive deceleration with engine braking. If the misfire occurs consistently, a static compression test, running compression test or cylinder leakage test may isolate the sticking valve. However, it is unlikely that any of these tests will isolate the sticking valve if the misfire only occurs while driving at specific conditions.

The following suggestions may help determine if a sticking valve is causing this concern:

Follow SI procedures to remove the valve springs and seals from the valves of the misfiring cylinder. Before removing the air pressure from the cylinder, tightly wrap a rubber band or tie strap around the tip of each valve stem to prevent the valves from dropping into the cylinder. Release the air pressure from the cylinder and work the valve up and down in the guide while turning the valve 360 degrees.

If any binding is felt, a stem to guide clearance concern exists and should be repaired by following SI procedures.

If okay, rotate and snap the valve onto the valve seat to make sure that it easily comes off of the seat again. If you have to use force to tap the valve off of the seat, excessive carbon build up exists, which may be repaired by decarboning the engine.

Notice: Refer to the latest version of PIP4753 for decarboning instructions.

3. Valve Leakage:

Generally, valve leakage on this engine family will cause a consistent engine misfire that may or may not be felt and is more apparent at idle or low RPM. Normally, no engine noise will be present and in most cases, a static compression test or running compression test will not reveal anything abnormal unless the leakage is very high.

Typically, the Cylinder Leakage Test outlined in SI should isolate valve leakage by finding excessive leakage past an intake or exhaust valve, as compared with others.

Notice: If a valve sealing concern is found, it should be repaired by following SI repair procedures.

4. Broken Valve Spring:

Generally, a broken valve spring on this engine family will cause a tick noise and/or an engine misfire. In either case, the concern may occur consistently or intermittently. If it is causing an engine misfire, it may or may not be felt and it may only occur at specific operating conditions, such as high RPM driving, etc.

In some instances, a static compression test, running compression test, and/or cylinder leakage test may isolate the broken valve spring, while in other instances; it may not if the spring remains stacked together during the tests. As a result, it may be necessary to visually inspect the valve springs by closely examining them. Sometimes, the two broken pieces of the spring will remain stacked together so it may be hard to detect when visually inspecting them. As a result, it may help to lightly push on different places on the springs with a small hammer handle.

Notice: If a broken valve spring is found, replace the broken valve spring as necessary.

5. Collapsed AFM Lifter (Engines with AFM Only):

Some customers may comment on an SES light, engine misfire, and/or tick noise. This may be the result of an AFM lifter that unlocks as soon as the engine is started or one that is mechanically collapsed/stuck.

If an AFM lifter unlocks as soon as the engine is started, a SES light and DTC P0300 will be experienced with engine misfires on cylinder 1, 4, 6, or 7 but it is unlikely that any noise will be experienced. If an AFM lifter is mechanically collapsed/stuck, a consistent valve train tick noise, SES light, and DTC P0300 will be experienced with engine misfires on cylinder 1, 4, 6, or 7.

Notice: If either of these AFM lifter concerns is suspected, please refer to the latest version of PIP4568 for additional information.

Warranty Information

The correction for this concern may be one of several repairs described above. For vehicles repaired under warranty, please use the appropriate warranty labor operation based on the actual cause and repair.

Please follow this diagnostic or repair process thoroughly and complete each step. If the condition exhibited is resolved without completing every step, the remaining steps do not need to be performed.

GM bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. See your GM dealer for information on whether your vehicle may benefit from the information.



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