# Poor Engine Performance P0089 P228D P0171 Whine Noise From High Pressure Fuel Pump

2010-2011 Buick LaCrosse

2011 Buick Regal

2010 - 2011 Chevrolet Equinox

2010-2011 GMC Terrain

Equipped with 4 cyl engine (RPO LAF)

This PI was superseded to update Recommendation/Instructions. Please discard PIP5203B.

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

## Condition/Concern

Some technicians may comment of a service engine soon light on, low engine power or rough idle after engine, intake camshaft or intake camshaft actuator replacement. Typically, they will find DTC's P0089 and P228D set in the ECM. The high side fuel pressure at idle will likely be high, around 2000-2500 PSI. They may also note a whine type noise from the high pressure fuel pump. These symptoms occur if the intake camshaft with actuator sprocket are not the correct parts for the vehicle build. A P0171 is also possible if the incorrect injectors were installed.

## Recommendation/Instructions

If the symptoms above are noted after engine, intake camshaft or intake camshaft actuator replacement. It is likely the incorrect parts have been installed. This can be confirmed by removing the camshaft cover and noting the camshaft actuator sprocket colors or part number on the actuator sprockets. Also verify the correct intake camshaft and injectors are installed

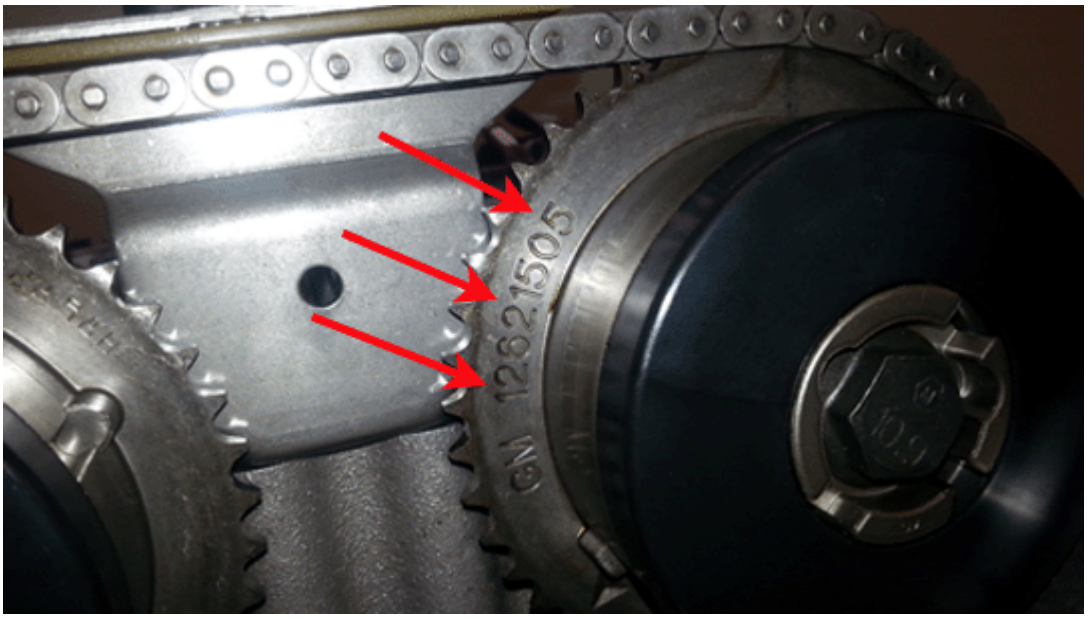
A 2010 engine has a black exhaust actuator sprocket and a gray intake actuator sprocket. Each camshaft actuator sprocket will have a different part number. The intake camshaft is for a 2010 model engine.

A 2011 LAF engine has black camshaft actuator sprockets for both the intake and exhaust camshafts. Both camshaft actuator sprockets will have the same part number. The intake camshaft is for a 2011 model engine.

Note

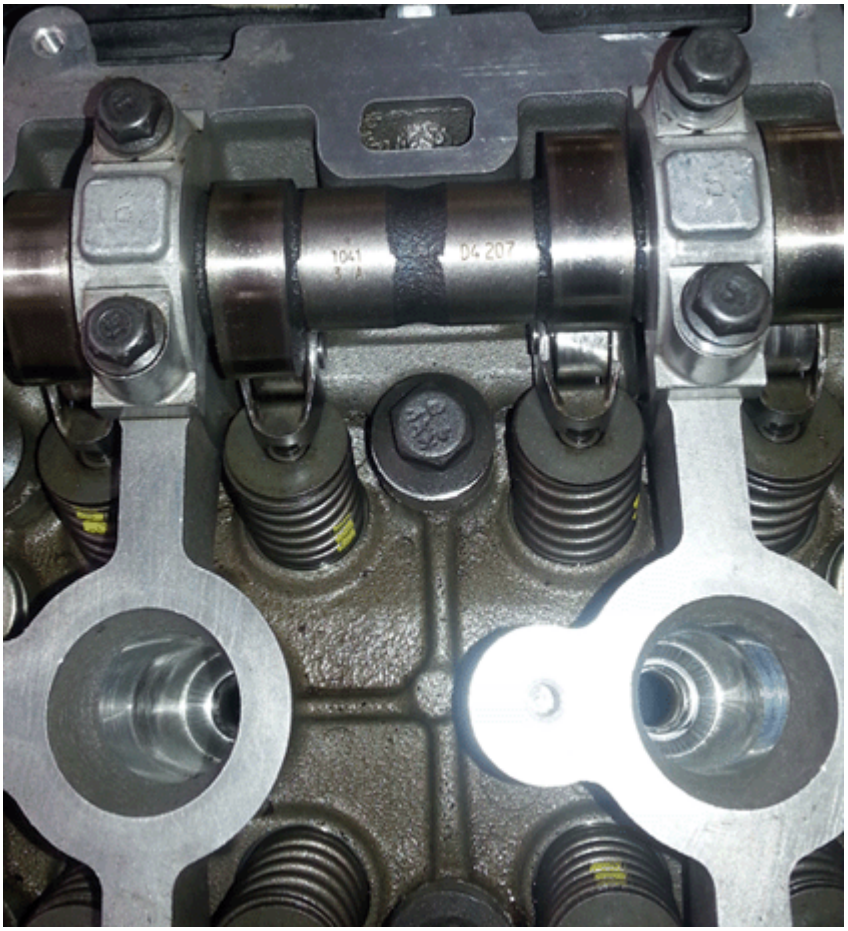
If working on a 2011 Regal LAF, the technician must identify if the engine is an early or late build design. Early build is a 2010 design and a late build is a 2011 design. 2011 model year Regal's Built Prior to last eight of the VIN B1014160 have a 2010 design engine (both camshaft actuators are different colors and part numbers and it has the 2010 intake camshaft). Any 2011 Regal LAF built with that vin or newer will have a 2011 design engine (both camshaft actuators are both black in color with the same part number and it has a 2011 intake camshaft).

Below is an example of a 2011 Chevrolet Equinox intake camshaft actuator part number 12621505 and black in color (plastic cover piece).




The camshafts can be identified by the last four digits of the part number located on a machined surface between the number 2 and number 3 cylinder camshaft lobes.

Below is an example of a 2011 Chevrolet Equinox intake camshaft part number 12634207.




Before a 2010 service engine was available, technicians were directed to install a 2011 service engine into a 2010 vehicle. It was necessary to swap parts from the old engine to the new engine to make it a 2010 build. These parts included the intake camshaft and actuator sprocket, and the fuel rail assembly with injectors. If these parts from the original engine were damaged, new parts designed for a 2010 vehicle were installed. When the intake camshaft and actuator sprocket are swapped, dealers should reference timing procedures for a 2010 model year vehicle. This is important because the intake actuator locating notch in the camshaft moves from about the 10:00 starting position on a 2011 engine to about the 5:00 starting position on a 2010 engine. See PI0865C for more details on engine part numbers.

The fuel injectors have the part numbers on the injector body. When swapping the fuel rail, if the injectors are not removed from the rail, the retaining clips do not have to be replaced. The Teflon seals at the injector tips however, must be replaced whenever the injectors are reinstalled onto an engine.

The fuel pipe from the high pressure pump to the fuel rail must also be replaced whenever it is removed.

## Warranty Information

There is not a labor time or labor operation associated with this PI because the labor time is considered part of the original 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.