



Tech Tip

GM NORMAL CHARACTERISTICS 189

A DIAGNOSTIC CHALLENGE The Symptoms May Be a Normal Characteristic

Often we are faced with customer complaints that are seemingly impossible to resolve. We methodically make our best diagnostic efforts and implement the necessary repairs to alleviate the customer's complaint. Sometimes, our best efforts fail to provide a solution and when this happens, it looks bad on the technician and the parts supplier.

Be advised that some symptoms and conditions fall into a category referred to as a normal characteristic. This means there is no solution available from the vehicle manufacturer. You must be familiar with these applications and their normal characteristic symptoms or fall victim to wasting a lot of diagnostic and labor hours in a futile effort to alleviate the customer's concern. Communication is imperative. Always review the factory service bulletins prior to investing many hours of diagnostic time that may not produce the desired solution.

Let's consider some normal characteristic examples that can create much frustration for the vehicle owner and the technician:

CHANGES IN EXHAUST TONE

GM advises that a change in exhaust tone on vehicles equipped with Active Fuel Management (AFM) should be considered a normal characteristic when the system is in the three or four cylinder mode.

Customer complaints of changes in the exhaust tone and a slight vibration in the accelerator pedal, floor pan or the steering wheel is a condition that should be considered a normal characteristic and no repairs should be attempted. These symptoms occur as the AFM system activates the three or four cylinder mode, depending on engine displacement. The change in the exhaust tone is to be expected as all exhaust sounds are directly affected by engine combustion. GM has attempted to keep these changes in exhaust tone to a minimal level as the AFM is only activated during steady state driving conditions or during coast down. During these conditions the load on the engine is minimal, which minimizes the noise condition.

VEHICLE MOVEMENT DURING START-UP

GM vehicles produced in 2017 and prior, equipped with automatic transmissions, may encounter a slight movement in Park at start-up following a cold start. In addition, a clunking noise may be encountered during the movement.

GM says the slight movement is often viewed from outside the vehicle during the use of the auto-start feature, if the vehicle is so equipped.

Residual fluid in the transmission clutch packs creates a partial engagement on start up. Further movement is stopped by the parking pawl in the transmission or the fluid being exhausted completely from the clutch packs.

This is a normal characteristic and the movement has no effect on the transmission. Application of the parking brake can prevent this symptom.

SAG OR HESITATION ON ACCELERATION

Sag or hesitation on acceleration complaints on GM applications ranging from model years 2006–2017 may be a normal characteristic under the following conditions: 1) Suddenly applying the throttle when coasting at speeds less than 15 miles per hour from a closed throttle position. 2) Sudden acceleration during a lane change maneuver or accelerating from a rolling stop. During these throttle conditions, the throttle plate is opened slowly for up to 0.7 seconds to help reduce drive-line lash and clunking sensations.

While making a hard complete stop followed by an aggressive throttle application on vehicles equipped with a six speed automatic transmission, the transmission down-shifts may not be completed before the throttle is quickly opened. To allow the transmission ample time to shift to first gear, a delay of 0.5 seconds of zero torque may be commanded.

These delays are considered Torque Management and should be considered a normal characteristic for the vehicle. GM service bulletin #PIP4112R will illustrate two and a half pages of applications susceptible to these symptoms.

BLACK SMOKE AND ROUGH IDLE DURING COLD START-UP

Customer complaints of black smoke and rough idle during cold start-ups on GM vehicles equipped with the 3.0L and 3.6L engines may well be a normal characteristic. GM has revised the cold start system to reduce cold start emissions. To achieve this they utilize a dual-pulse injection strategy during cold starts, reducing the time required to get the catalytic converter up to operating temperature. This injection strategy can last from 20–60 seconds. During this time, the vehicle owner may observe black smoke, rough idle or misfire symptoms during cold starts. No attempt to eliminate these symptoms should be performed, as the symptoms should be considered a normal characteristic.

With a scan tool the dual pulse strategy can be observed, as the pulse width of the injectors will be nearly double that of a normal idle. Once this cycle is completed, the injector pulse width will drop by approximately 50% and the engine will idle perfectly. GM recommends the use of Top Tier fuels to lessen carbon build-up on the valves and to achieve better combustion and a cleaner burn. Applications that use this injection strategy can be viewed on GM bulletin #PIP4919C. Year models illustrated range from 2009–2014 equipped with 3.0L LF1, LFW and 3.6L LLT, LFX, LF3 engines only.

STICKING BRAKES

Some customers may complain of a sticking brake sensation or a crunching type noise before the vehicle starts to move, especially after the vehicle has been parked for a period of time. The symptoms are often misdiagnosed as a residual pressure condition. Weather conditions and how recently the vehicle has been washed are all factors that can promote the symptoms. The complaints can vary from noise when the vehicle first moves, or the vehicle cannot be moved from its parked position.

Vehicles affected may include:

- Cadillac ATS 2013–2017, CTS 2014–2017
- Camaro SS, ZL1 2012–2015, Z28 2014–2015
- Camaro ZL1 2017
- Caprice PPV 2014–2017
- Corvette 2014–2017
- Chevrolet SS 2014–2017

When these symptoms occur, the condition is due to the disc pads being stuck to the rotors.

Performance brake components, especially semi-metallic friction, have a tendency to stick or bind once the components are wet from driving in the rain or when the car is washed. This is a normal characteristic for high friction pads and the symptoms do not affect the performance of the brakes. If a roughness is felt during these braking conditions, a few stops will eliminate the symptoms.

BUMP OR CLUNK NOISE

Customer complaints of a bump or a clunk noise during a stop or during launch may occur on 2007–2017 Chevrolet Silverado and GMC Sierra applications. This concern is especially noticeable on trucks with 34–36 gallon fuel tanks. The symptoms are often described as feeling like someone has bumped their vehicle from behind.

The bump or clunk sensation may be due to fuel movement in the fuel tank. If the symptoms are reduced or eliminated when the fuel tank is full or low on fuel, the condition is due to fuel movement in the fuel tank. This is a normal characteristic and no attempt to correct the complaint should be performed.

Do not confuse the aforementioned symptoms with driveline bump, which plagued many GM trucks from 2007–2010. While the symptoms were much the same as the fuel slosh condition, repairs were available for these applications.

The symptoms were described as a sensation of the vehicle being bumped in the rear when coming to a stop or during the initial launch from a stop. These symptoms were caused by a slip/stick condition between the driveshaft slip yoke and the transmission output shaft splines. When the brakes are applied and the vehicle comes to a complete stop, the driveshaft slip yoke moves forward into the transmission and then rebounds backward creating the bumping sensation.

The first attempt to resolve the complaint involved removing the driveshaft, cleaning the splines on the slip yoke and lubricating the splines with GM P/N 19257121 (Canada P/N 19257122) lubricant. If that procedure failed to eliminate the symptoms, the next step involved replacing the slip yoke with a revised nickel-plated slip yoke from GM. Most of the repairs that we have made required the installation of the revised slip yoke, at least for a long term solution.

While most customer complaints can be resolved, some are inherent in the vehicle and fall into a category of “it’s a normal characteristic.” Be familiar with these symptoms and prepared to provide the customer with an explanation.

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