

**SUBJECT****BMW Group Fuel System Cleaner Plus****MODEL**

All

**SITUATION**

Recent field experiences have shown a significant increase in various drivability complaints due to excessive carbon deposits in engine's combustion chambers, on the intake valves and fuel injectors.

The overall rise in carbon deposits accumulation is generally attributed to poor gasoline quality, namely, low level of cleaning additives and fuel contamination.

**TECHNICAL BACKGROUND**

Combustion chamber deposit formation is a by-product of the gasoline burning process. Fuel injector and intake valve deposits may become less troublesome with the recently introduced Top Tier Detergent Gasoline deposit control standards, which are exceeding the detergent requirements imposed by the EPA since 1995.

However, vehicles that do not exclusively use a Top Tier Detergent Gasoline, or are regularly driven in severe service conditions, such as stop-and-go traffic, high ambient temperatures, and high altitude can experience performance problems caused by intake system and combustion chamber deposits.

The most common customer complaints may include:

**FUEL INJECTORS**

Deposits at the injector's tip can impact fuel flow, upsetting the air/fuel mixture ratio.

**Symptoms:** Hesitation or stumble during acceleration, even loss of power. Poor fuel efficiency. Increased emissions of HC and CO. "Service Engine Soon" light illumination due to intermittent misfire faults, or lean mixture adaptation values

**INTAKE VALVES:**

Deposits at the valves and on the intake manifold ports can absorb fuel during the warm-up phase, leaning out the air/fuel mixture ratio. Carbon build-up may disturb mixture flow at low throttle conditions/idle speeds.

**Symptoms:** Poor drivability, loss of power, unstable/rough idle, increased emissions of HC, CO and NOx. "Service Engine Soon" light illumination due to intermittent misfire faults.

**COMBUSTION CHAMBER:**

Combustion Chamber Deposit Interference, or CCDI, occurs when there is a contact between carbon deposits on the piston crown and cylinder head. The noise can be confused or misdiagnosed as ping,

knock or other noises that could indicate a mechanical failure. CCDI occurs first as a cold start noise that can fade as the engine warms to operating temperature. The noise will reoccur at the next cold start. As deposits build, there is an increase in compression temperature that may cause pre-ignition detonations.

**Symptoms:** Knocking, pinging, run-on, poor acceleration, octane requirement increase, increased emissions of NOx, engine idle speed surges.

Depending on the manufacturer, fuels may contain various additives such as: oxidation and corrosion inhibitors, metal deactivators, emulsifiers, anti-icing agents & dyes, plus they are required to include some form of an intake system deposit control package. Unfortunately, not all fuels are created equal, and some additive packages are not effective enough to maintain integrity of the intake systems in high performance engines, or engines operating in severe environmental conditions. Even worse, the intake system deposit control additives in some fuels may actually contribute to the combustion chamber deposits accumulation, and to the problems associated with those deposits: knock, run-on and increased emissions of oxides of nitrogen.

#### RECOMMENDATION

**BMW recommends using TOP TIER Detergent Gasoline** of minimum octane rating of AKI 91 and with alcohol content of less than 10% by volume (or any other oxygenates with up to 2.8% of oxygen by weight). Only the **exclusive usage** of TOP TIER Detergent Gasoline provides the full benefit of reducing deposits formation. For more information related to TOP TIER Gasoline refer to [SI B13 02 06](#).

**If the TOP TIER Detergent Gasoline is unavailable, we recommend BMW Group Fuel System Cleaner Plus (PN 82 14 0 413 341) be added to the gas tank. For optimum cleaning and deposits control, add a 20 fl. oz. bottle every 3,000 miles when refueling.**

Regular use of BMW Group Fuel System Cleaner Plus can help address carbon deposits related symptoms listed above. By removing these deposits, an engine may experience restored power, performance and fuel efficiency, a smoother idle running, lower emissions, and reduced octane requirement.

BMW Group Fuel System Cleaner Plus uses polyether amine TECHRON® based technology developed and patented by Chevron. BMW Group Fuel System Cleaner Plus has proven to clean up deposits in fuel injectors, ports & intake valves **and** reduces the harmful effects of combustion chamber deposits. It helps restore performance lost due to deposit build-up.

Chevron and BMW have run an extensive "no harm" tests with polyether amine technology. When used as directed, it will not harm catalytic converters, oxygen sensors, or any other mechanical components of the engine, or fuel delivery system.

The effectiveness of the additive depends on its presence in the gasoline in large concentrations for short periods of time. One treatment is usually sufficient, but a second treatment (one 20 oz bottle per each, consecutive full tank of gas) may give additional benefits. To keep your fuel intake system clean, we recommend usage at every 3000 miles.

Additionally, vehicle's fuel sending units equipped with silver plated resistor card/contacts are especially vulnerable to attacks by elemental sulfur and/or hydrogen sulfide found in fuels. Adding BMW Group Fuel System Cleaner Plus immediately upon noticing erratic fuel gauge behavior may, in many cases, restore proper performance due to the additive's ability to remove the harmful sulfur compounds from

the sending unit's contact surface. Additionally, BMW Group Fuel System Cleaner Plus can help protect the fuel gauge from future malfunctioning by coating all metal surfaces of the fuel system.



BMW Group Fuel System Cleaner Plus.  
PN 82 14 0 413 341,  
1 bottle, 20 fl. oz.  
Ordering in multiples of 6 bottles per case.

#### **PARTS INFORMATION**

<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
82 14 0 413 341	Fuel System Cleaner Plus; 20 fl.oz. bottle	1

#### **WARRANTY INFORMATION**

Because carbon deposit build-up is related to fuel quality, it cannot be considered as a defect in vehicle's materials or workmanship. Consequently, usage of BMW Group Fuel System Cleaner Plus is not covered under the terms of the BMW New Vehicle Limited Warranty or maintenance plan.

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