Bulletin No.: PI1543

Date: Oct-2015

Service Bulletin

PRELIMINARY INFORMATION

Subject: 2016 Chevrolet Spark New Model Features

Models: 2016 Chevrolet Spark
Equipped with Gasoline Engine, 1.4L, 4-Cylinder, L4, MFI, DOHC, VVT, ALUM, GEN 1, VAR 1 — RPO LV7
Equipped with Automatic Transmission, Continuously Variable Transmission (CVT), FWD — RPO MR8
Equipped with Manual 5 Speed Transmission — RPO MR7

Overview

Bulletin Purpose

The purpose of this bulletin is to help the Service and Sales Personnel become familiar with the new model features of the 2016 Chevrolet Spark.

Vehicle Features

The 2016 Chevrolet Spark represents the second generation of the Chevrolet Spark nameplate and has been redesigned and reengineered, delivering an all-new vehicle with increased levels of safety, efficiency, technology and refinement that haven't been seen in the city/mini car segment before. While the first-generation Spark was a very competitive and capable city/mini car, the second generation model improves on its predecessor.

The new Spark has a sleeker appearance, due to a slightly longer wheelbase, and an overall height that's about 1.6 inches (40 mm) lower than its predecessor with an incrementally longer wheelbase. The lower profile reduces aerodynamic drag to help improve efficiency and interior changes maintain the Spark's generous headroom. The vehicle is also built on an all-new, stronger and more robust architecture that serves as the foundation for its more sophisticated driving experience. The stronger body structure enables engineers to tune the ride and handling more precisely, for greater feelings of control and refinement, while providing a quieter ride.

The most obvious exterior change is the new front fascia, which updates the Spark to Chevrolet's current styling language. The new headlamps are sleeker, more horizontal units and the trademark "dual-port" grille has been restyled into a sportier element with chrome surrounds. The lower piece stretches lower into the apron, replacing the previous thin air dam. The fog lights retained their positions at the sides of the bumper and have received redesigned surrounds.

The rear fascia changes are equally dramatic, starting with a completely redesigned hatch that now has a smaller glass area and more angular taillights. The bumper sports a trapezoidal character line and a small splitter underneath. On the sides, the city car gained a new character line across the front door and handle, while the rear-door crease defining the shoulders is more prominent and it extends into the taillights.

The interior features an all-new instrument panel which includes an advanced dot-matrix LCD display, while the center stack incorporates an upgraded infotainment system and climate system controls. The round air outlets have been replaced by trapezoidal ones for a more dynamic appearance.

The vehicle also received a new Chevrolet MyLink™ radio with a 7-inch (178 mm) capacitive-touch color screen display that allows smartphone-like swiping, pinching, and other gestures for easier operation. OnStar® with 4G LTE connectivity and a built-in Wi-Fi hotspot are standard.

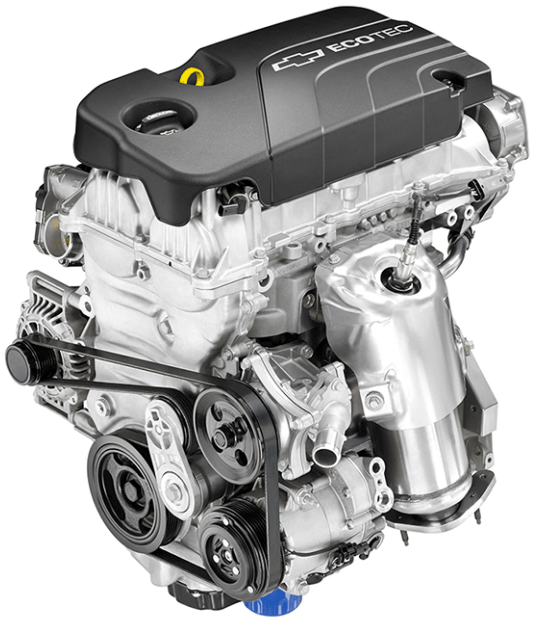
The new phone integration technology displays content from Apple® iPhone® 5 or later models on the multicolor infotainment screen through the Apple CarPlay™ features; supported apps for the systems include phone, messages, maps, music and compatible third-party apps. Users of Android™ can take advantage of Android Auto™.

A range of new safety features are also offered with a standard rear-view camera system and available Forward Collision Alert (FCA), Lane Departure Warning (LDW), and available rear park assist.

Under the hood, the 2016 Spark comes with a new Ecotec, 1.4-liter, 4-cylinder, in-line engine delivering an estimated 98 horsepower (73 kW) and 94 lb-ft (128 Nm) of torque. The transmission options include a 5-speed manual and an automatic continuously variable ratio transmission.

The 2016 Chevrolet Spark is produced with globally sourced parts at GM's award-winning Changwon, South Korea, assembly facility.

Ecotec 1.4L 4-Cylinder In-line Engine



Engine Description

The 2016 Spark is equipped with an all-new Ecotec 1.4L, 4-cylinder, in-line engine, delivering an estimated 98 horsepower (73 kW), which is a 16 percent increase in power over the previous engine.

Cylinder Block

The cylinder block is constructed of aluminum alloy, by high-pressure die casting with 4 cast-in-place iron cylinder liners arranged in-line. The block has 5 crankshaft bearings with the thrust bearing located on the second bearing from the rear of the engine. The cylinder block incorporates a bedplate design that forms an upper and lower crankcase. This design promotes cylinder block rigidity and reduced noise and vibration.

Crankshaft

The crankshaft is forged micro alloy steel. It is supported in 5 main journals with main bearings which have oil clearance for lubricating. The thrust bearing is located in the 4th position which controls proper crankshaft axial end play. The crankshaft is also comprised of 8 counterweights that have been scalloped for mass reduction and topped for precise engine balance. A harmonic balancer is used to control torsional vibration.

Piston, Rings and Connecting Rod

The pistons are cast aluminum and use low-friction piston rings which are 2 compression rings and 1 oil control ring assembly. The piston is also a low friction, lightweight design with a recessed top and barrel shaped skirt. The piston pins are chromium steel and are a full-floating design. The connecting rods are powdered metal. The connecting rods are fractured at the connecting rod journal and then machined for the proper clearance. All applications use a piston with a graphite coated skirt. The piston and pin **must be** serviced as an assembly.

Upper Oil Pan

The oil pan is a structural aluminum oil pan with transmission attachment. It includes the oil suction pipe, this pipe is connected with the oil pump. The oil pan is attached at the lower crankcase.

Oil Pump

The oil pump is a low-friction type, crankshaft driven and integrated in the oil pump module. The oil pump draws engine oil from the oil pan and feeds it under pressure to the various parts of the engine. An oil strainer is mounted before the inlet of the oil pump to remove impurities which could clog or damage the oil pump or other engine components. When the crankshaft rotates, the oil pump driven gear rotates. This causes the space between the gears to constantly open and narrow, pulling oil in from the oil pan when the space opens and pumping the oil out to the engine as it narrows. At high engine speeds, the oil pump supplies a much higher amount of oil than required for lubrication of the engine. The oil pressure regulator prevents too much oil from entering the engine lubrication passages.

Cylinder Head

This cylinder head is a double overhead camshaft (DOHC) type and has 2 camshafts that open and close 4 valves per cylinder with hydraulic valve lash adjusters. The camshaft sprocket wheels are installed in front of the camshafts. The cylinder head is made of cast aluminum alloy for better strength in hardness with light weight. The combustion chamber of the cylinder head is designed for increasing the squish and swirl efficiency which will maximize combustion. The cylinder head also incorporates an integrated exhaust manifold, which further reduces weight – an attribute that contributes to increased vehicle efficiency and a more favorable front-to-rear weight balance, for a more responsive driving experience.

Valves

There are 2 intake and 2 exhaust valves per cylinder. Positive valve stem seals are used on all valves.

Valve Lash Adjusters

The valve train uses a roller finger follower acted on by a hydraulic lash adjuster. The roller finger follower reduces friction and noise.

Camshaft Cover

The camshaft cover has a steel crankcase ventilation baffling incorporated. The camshaft cover has mounting locations for the ignition system.

Camshaft/Camshaft Drive

Two low friction camshafts are used, one for the intake valves, one for the exhaust valves. The camshafts are assembled with steel lobes.

This engine design uses a chain to drive the dual overhead camshafts. The chain is an inverted tooth or silent design with a 6.35 mm pitch to ensure quiet operation and is hydraulically tensioned to be maintenance-free. The tensioner has a ratchet mechanism to reduce chain movement during engine starts to eliminate noise. The lightweight plastic/composite chain guides have a unique grooved face design to reduce friction for optimum efficiency. Both the crank sprocket and cam sprockets are hardened to prevent wear even with extended oil change intervals.

Intake Manifold

The intake manifold is the air flow passage to the cylinder combustion chambers from the throttle body and has an effect on engine torque, power, noise, drivability, emission, fuel economy and performance. It is made of composite plastic. The intake manifold incorporates a distribution and control system for positive crankcase ventilation (PCV) gases.

Fuel Injection System

The fuel system is a returnless on-demand design. The fuel pressure regulator is a part of the fuel tank fuel pump module, eliminating the need for a return pipe from the engine. A returnless fuel system reduces the internal temperature of the fuel tank by not returning hot fuel from the engine to the fuel tank. Reducing the internal temperature of the fuel tank results in lower evaporative emissions.

An electric turbine-style fuel pump is attached to the fuel tank fuel pump module inside the fuel tank. The fuel pump supplies high pressure fuel through the fuel feed pipe to the fuel injection system. The fuel pump provides fuel at a higher rate of flow than is needed by the fuel injection system. The fuel pressure regulator, a part of the fuel tank fuel pump module, maintains the correct fuel pressure to the fuel injection system. The fuel tank fuel pump module contains a reverse flow check valve. The check valve and the fuel pressure regulator maintain fuel pressure in the fuel feed pipe and the fuel rail in order to prevent long cranking times.

Multi-Point Fuel Injection

Multi-point fuel injection devotes a separate injector nozzle to each cylinder, right outside its intake port, which is why the system is sometimes called port injection. Shooting the fuel vapor this close to the intake port almost ensures that it will be drawn completely into the cylinder. The main advantage is that MPFI meters fuel more precisely than do TBI designs, better achieving the desired air/fuel ratio and eliminating the possibility that fuel will condense or collect in the intake manifold.

dexos® Engine Oil

Ask for and use engine oils that meet the dexos® specification. Engine oils that have been approved by GM as meeting the dexos® specification are marked with either of the dexos1® approved logos that are shown. For additional information, visit this General Motors website: **http://www.gmdexos.com**

Viscosity Grade

Use AC Delco dexos1® synthetic blend SAE 5W-20 viscosity grade engine oil. SAE 0W-20 may also be used as an alternative.

In an area of extreme cold, where the temperature falls below −20°F (−29°C) use SAE 0W-20 engine oil. An oil of this viscosity grade will provide easier cold starting for the engine at extremely low temperatures.

Engine Oil Life System

The vehicle features GM's engine oil life system, which better protects engines by recommending oil changes based on a computer software algorithm using actual engine operating conditions and can save the vehicle owner money by avoiding unnecessary oil changes.

Continuously Variable Transmission (CVT)

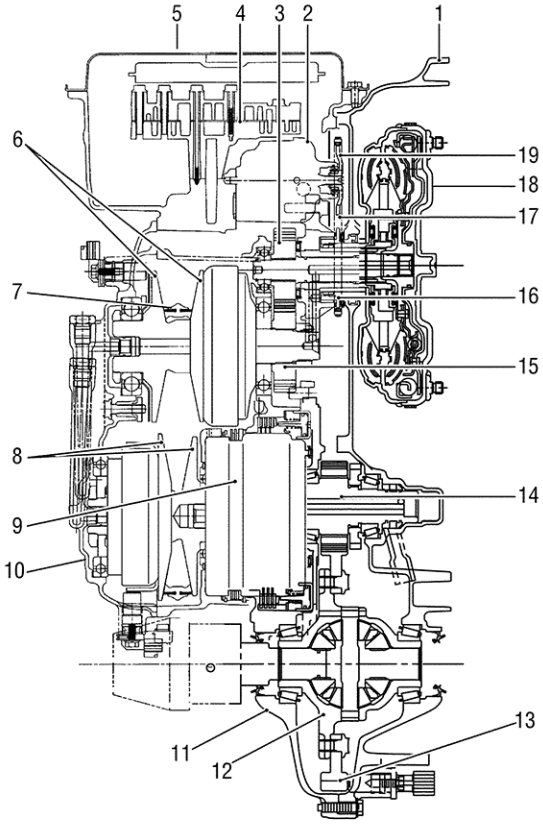
Advantages of a CVT

A key advantage of a continuously variable automatic transmission for a manufacturer is that it uses fewer parts. For a driver, a CVT eliminates the gear shifts of a conventional automatic and the accompanying rise and fall of engine speed (RPM). Instead, the engine RPM changes in linear fashion to an optimum level depending on how far down the accelerator pedal is. Pulleys and a steel belt inside the CVT seamlessly change the gear ratios without any "shift shock" or delay. It operates similar to a lamp with a dimmer switch instead of a three-way bulb.

Additional advantages are:

- Better fuel economy than a regular automatic transmission, as the CVT is able to keep the car in its optimum power range regardless of speed.
- Improved acceleration due to the decreased power loss that is experienced.
- The CVT has the ability to allow the engine to rev almost immediately which delivers maximum torque.
- It provides a smoother ride than an automatic transmission.
- The CVT adapts to varying road conditions and power demands which allows for a better ride.
- Improved emission control due to better control of the engine's RPM range.

Transmission Components



1. *Converter Housing*
2. *Oil Pump*
3. *Counter Drive Gear*
4. *Control Valve*
5. *Oil Pan*
6. *Primary Pulley*
7. *Steel Belt*
8. *Secondary Pulley*
9. *Planetary Gear (Auxiliary Gearbox)*
10. *Side Cover*
11. *Transmission Case*
12. *Differential Case*
13. *Final Gear*
14. *Reduction Gear*
15. *Counter Driven Gear*
16. *Drive Sprocket*
17. *Oil Pump Chain*
18. *Torque Converter*
19. *Driven Sprocket*

Driver Assistance Systems

Lane Departure Warning (LDW)

Notice: If the Lane Departure Warning (LDW) system is not functioning properly when lane markings are clearly visible, cleaning the windshield may help.

LDW may help avoid crashes due to unintentional lane departures. The LDW indicator on the instrument cluster is green when a lane marking is detected. If a detected lane marking is crossed without using a turn signal, the system flashes an amber indicator and sounds three low-pitched beeps on the right or left, depending on the lane departure direction. LDW uses a camera sensor to detect the lane markings at speeds of 35 mph (56 km/h) or greater. Press the LDW button on the left side of the instrument panel to turn the system **ON** or **OFF**. The LDW camera sensor is mounted on the windshield ahead of the rearview mirror.

Forward Collision Alert (FCA)

The Forward Collision Alert (FCA) indicator on the instrument cluster is green when a vehicle is detected. When approaching a vehicle directly ahead too rapidly, the system flashes a red visual alert and sounds several high-pitched beeps. The visual alert will stay illuminated when tailgating a vehicle ahead. FCA detects vehicles within a distance of approximately 197 ft (60 m) and operates at speeds above 25 mph (40 km/h). Press the FCA button on the left side of the steering wheel to set the alert timing to **Far , Medium, Near, or OFF**.

Rear Vision Camera (RVC)

Notice: Periodically clean the rear vision camera (RVC) lens, which is located above the rear license plate with clean water and a soft cloth.

When the vehicle is shifted into **R** (Reverse), an image of the area behind the vehicle appears in the infotainment screen. The previous screen displays when the vehicle is shifted out of **R** after a short delay.

To see the previous screen sooner, perform one of the following:

- Press a button on the infotainment system.
- Shift into **P** (Park).

To turn the RVC Guidance Lines or Rear Park Assist Symbols **ON** or **OFF**, go to Rear Camera in the Settings menu.

Rear Park Assist

When the vehicle is in **R** (Reverse), detected objects are indicated by audible beeps. The interval between beeps becomes shorter as the vehicle gets closer to an object. When the distance is less than 16 in. (40 cm), the beeps are continuous for 5 seconds. The system only operates at speeds of less than 5 mph (8 km/h).

Chevrolet MyLink™ with Phone Integration Technology

1. **Screen Icon:** Touch the appropriate screen icon to access the Application.
2. **Phone Icon:** Press the Phone icon to view the phone screen or to answer a call.
3. **Seek Button:** Press this Seek button to select the next radio station or music track.
4. **Seek Button:** Press this Seek button to select the previous radio station or music track.
5. **Home Icon:** Press this button to select the Home Page.

New for the 2016 Spark is Chevrolet's MyLink™ infotainment system with a 7-inch diagonal (178 mm) capacitive-touch color display screen that gives owners a smart and simple way to access Apple CarPlay™ and Android Auto™. Each of these system builds off of the features smartphone users rely on most, with many controlled via voice commands using a button on the steering wheel. That helps drivers spend more time with their eyes on the road and hands on the wheel. New volume control and other physical buttons reduce complexity and enhance the system's intuitiveness.

- Apple CarPlay™ puts iPhone® features on the vehicle's display in a smart, simple manner, allowing drivers to make calls, send and receive messages and listen to music right from the touchscreen or by voice via Siri®. Supported apps for Apple CarPlay™ include Phone, Messages, Maps, Music and compatible third-party apps. For a full list of supported apps visit: **www.Apple.com/ios/carplay**

- Android Auto™ is built around Google Maps™, Google Now™ and the ability to talk to Google®, as well as a growing audio and messaging app ecosystem that includes WhatsApp, Skype, Google Play Music, Spotify, and podcast players. For a full list of supported apps visit: **www.Android.com/auto**

Using either application is simple. A *"Projection"* icon on the MyLink™ screen is visible when a phone is **not** connected and changes to indicate Apple CarPlay™ or Android Auto™ when a compatible phone is connected via a USB. Apple CarPlay™ requires an iPhone® 5 or later and Android Auto™ requires a phone running the Android Lollipop 5.0 operating system or above.

Compatible apps need to be downloaded to a phone before using.

OnStar® 4G LTE with Built-In Wi-Fi Hotspot

Notice: To retrieve the SSID and password for the Wi-Fi hotspot, press the OnStar® Voice Command button on the overhead console or rearview mirror, wait for the prompt, and then say "Wi-Fi settings." The information will be displayed on the screen. For assistance, press the blue OnStar® button or call 1-888-4-ONSTAR (1-888-466-7827).

The OnStar® built-in Wi-Fi hotspot supports up to seven mobile devices so passengers can connect to the content they want. OnStar® with 4G LTE offers a stronger, more reliable signal; and it's built-in, so it's easy to use. Plus, it's connected to your vehicle battery, so you're always fully charged for the adventure ahead.

The powerful OnStar® connection also enables improved access to existing OnStar® safety and security services, including the ability to transmit voice and data simultaneously. That means OnStar® advisors can run a diagnostic check without ever leaving the call, making customer interactions quicker and more seamless. It's the most comprehensive in-vehicle safety and connectivity system available.

Available Product Training

The majority of the systems found on this vehicle are taught in GM's core curriculum from a conceptual theory and operation perspective. The North America training structure is system based.

To access **all** of the available training courses visit the following website:

- **In the United States go to > www.centerlearning.com**
- **In Canada go to > GM GlobalConnect and select "Centre of Learning"**

U.S. Training Course Name or System — Course Number and Description

Course Name or System	Course Number and Description
New Model Launch Chevrolet Spark New Model Launch	#10317.75W 2016 Chevrolet Spark New Model Launch

Engine Engine - Gas, 4 CYL, L4, 1.4L, MFI, DOHC, VVT, ALUM, GEN 1, VAR 1 — RPO LV7	#16440.20D Engines: New and Updates for RPOs LF4 LGX LGW L3A LV7 LE2 LWN LWC #16043.52W1 - W3 Engine Mechanical Diagnosis and Measurement 1-3 #16044.21W1-W4 Engine Performance 1-4
Transmission Transmission - Manual, 5 Speed, 180MM, Y4M HD+, 1ST 3.636, 2ND 1.864, 3RD 1.242, 4TH 0.946, 5TH 0.756 — RPO MR7 Transmission - Auto, Continuously Variable Ratio (CVT), FWD, VAR 2 — RPO MR8	#10317.75W 2016 Chevrolet Spark New Model Launch (RPO MR7 Nuances Covered in this Course) #17043.38W1-2 Front Wheel Drive (FWD) / Rear Wheel Drive (RWD) Operation, Diagnosis and Service 1-2 #57500.10V CVT Operational Characteristics
GDS 2	#16048.28D GDS 2 Diagnostics (Video)
HVAC HVAC System - Air Conditioner Front, Manual Controls — RPO C60	#11044.05W1 HVAC Systems and Operation Stage 1 #11044.05W2 HVAC Systems and Operation Stage 2
Infotainment Radio-Infotainment System - Midlevel HMI, Midlevel Connectivity — RPO IOB Speaker System - Enhanced Audio — RPO UQ3 Speaker System - Standard Audio — RPO UQF	#10316.23H Bring Your Own Media 2 (BYOM2)
Driver Information Display - Driver Info Center — RPO U68 Display Instrument - Driver Info Enhanced (Segmented) — RPO UDB Display Instrument - Driver Info Enhanced (One Color Graphic) — RPO UDC Shift Interlock - Brake, Trans — RPO M97 Vision - Rear View, Mono, Analog — RPO UVC	#22048.42W1 GM Safety systems 1 #19047.13W1 Entertainment Systems 1 #19047.13W2 Entertainment Systems 2 #19040.39W2 OnStar® Systems 2
Safety Avoidance Park Assist - Rear — RPO UD7 Sensor Indicator - Ultrasonic Blindspot Detection — RPO UDQ Sensor Indicator - Forward Collision Alert — RPO UEU Lane Active Safety - Departure Warning — RPO UFL	#22048.42W2 GM Safety Systems 2 #22048 42W3 GM Safety Systems 3
Vehicle Access Starting and Security Lock Control, Entry - Remote Entry, Extended Range, Passive Entry, Front Doors — RPO AVJ Theft Deterrent - Electrical, Unauthorized Entry — RPO UTJ Equipment - Security System, Immobilization, Step Two — RPO BAH Alarm, - Remote Start Panic — RPO BTT Frequencies Rating - 315 MHZ, Long Distance — RPO XL7	#19047.09W Entry and Security Systems

Special Tools

The following new tools were released for the 2016 Spark:

Tool #	Description
EN-51368	Front Crankshaft Seal Installer Engine Mechanical
EN-51369	Rear Crankshaft Seal Installer Engine Mechanical
EN-51760	Flywheel Holder Engine Mechanical
EN-51632	Camshaft Retainer Engine Mechanical
EN-51691	Timing Chain Retainer Engine Mechanical
EN-51768	Engine Support Fixture Adapter Bolts Engine Mechanical
J-44765	Seal Installer Automatic Transmission - Jatco CVT
DT-51776	Seal Installer Automatic Transmission - Jatco CVT
CH-51725	Wheel Hub and Bearing Installer/Remover Front Suspension