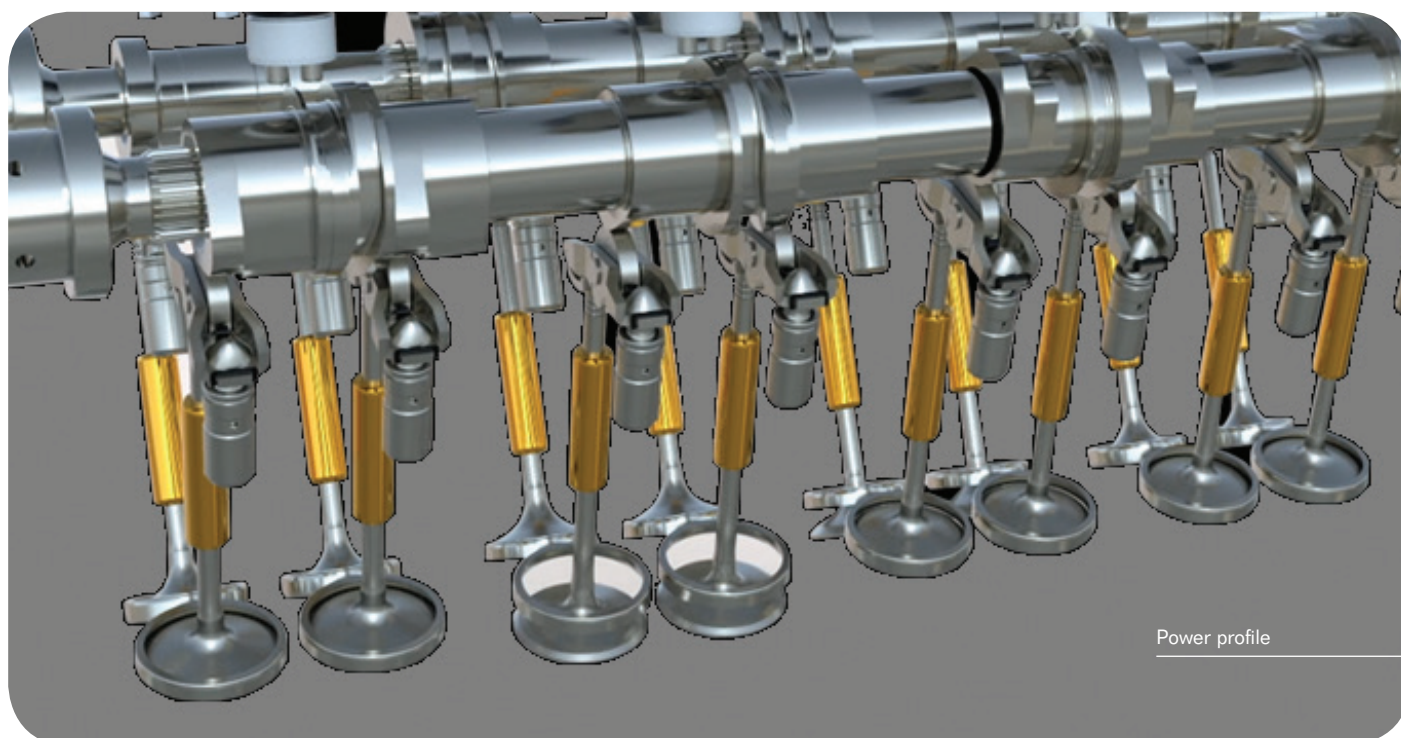


New Sliding Cam Valve Lift System Provides Power and Economy



The Sliding Cam Valve Lift System (SCS) on the new 2.0L 4-cylinder, turbocharged engine (RPO LSY) in the 2019 XT4 delivers a combination of performance and efficiency with three distinct operating modes. The SCS system enables the Engine Control Module (ECM) to change the camshaft lift profile of the intake and exhaust camshafts while the engine is running. The SCS has four intake camshaft profile actuators and two exhaust camshaft profile actuators that vary the camshaft lift profile sleeve position axially on the camshaft in response to commands from the ECM.

SCS Profiles

The SCS system has three unique-sized cam lobes on each camshaft profile slider:

- **Power Profile: High Lift** — Full capacity, conventional lift and duration. In this profile, all four cylinders are active and all valves open to their maximum lift for when the full capability of the engine is needed.
- **Economizer Profile: Low Lift** — Reduced capacity (as little as 3 mm lift), changes the duration of the valve opening and closes the valve early. In this profile, all four cylinders are still active, but all intake valves open to a lower lift height to help save fuel under medium load conditions, such as highway driving.

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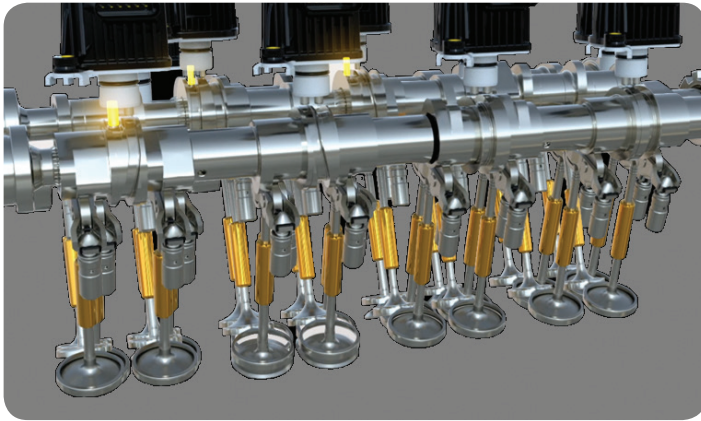
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Customer Care and Aftersales

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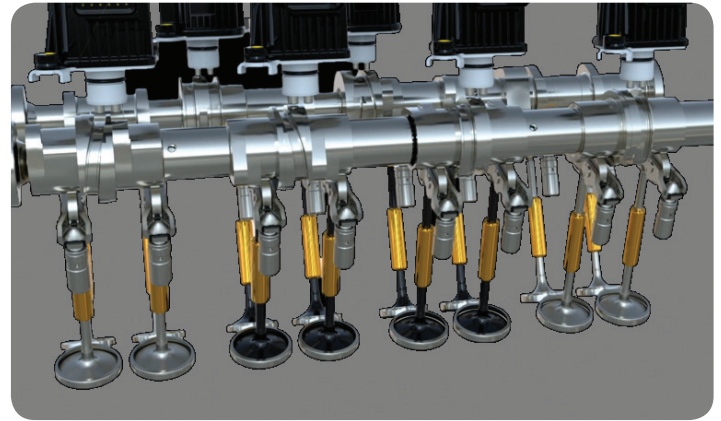
Economizer profile

- **Ultimate Fuel Economy Profile: AFM** — Cylinder deactivation, used for increased fuel economy in light load conditions, such as highway cruising. In Active Fuel Management (AFM) mode, cylinders 2 and 3 are deactivated.

When AFM is active, the system first turns off the fuel injectors of cylinders 2 and 3, followed by the exhaust valves and then the intake valves, which traps a cylinder's worth of air with no fuel in the cylinder. The trapped air becomes an air spring to help the piston return in what would be the expansion stroke. Cylinders 1 and 4 are still active with their intake valves now opening to a lower lift height. The intake cam profile for the firing cylinders is the same low lift that is used in the Economizer profile. The engine produces the same power from the two active cylinders, but is operating at half of the Economizer profile power.

SCS Operation

Each camshaft has two profile sleeves with different height cam lobes and a detent ball and spring under each sleeve that helps hold the profile sleeve into position. The SCS profile actuator solenoids push out an actuator guide pin into the shifting groove machined into the camshaft lift profile sleeve. When the guide pin engages the sleeve, it causes it to shift axially on the camshaft, causing the unique-sized cam lobes to be placed over the intake and exhaust valves and modify valve lift and duration.



Ultimate Fuel Economy profile

The SCS profile actuators have the ability to individually push out each of the actuator's two shifting pins. The SCS actuators are single direction actuators (out only) and require a physical response to push back or retract the pins back into the actuator. Each of the actuators have two shifting pins with two completely independent shifting coils.

Based on a Pulse Width Modulated (PWM) signal, the shifting pins push out and engage the "shifting" groove of the sliding cam profile sleeve to the position requested. The first pin pushed out causes the camshaft profile sleeve to shift from High lift (Power profile) to Low lift (Economizer profile). The shifting groove aligns under the second pin and the position sensor confirms that the sleeve is in the requested position. When requested, the second actuator pin pushes out to cause the profile sleeve to shift from Low lift to AFM mode.

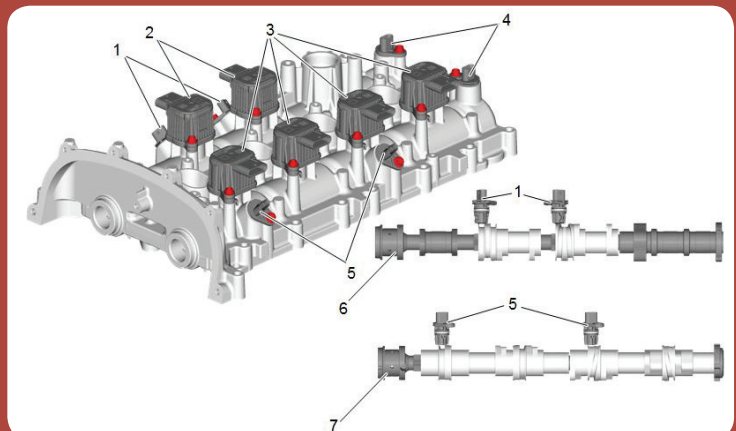
The actuator profile position sensors operate the same as cam sensors and provide a high signal when there is metal below them and a low signal when there is air below them. Each position — High lift, Low lift and AFM — has a unique square wave profile that allows the position sensors to identify the mode.

When the ECM requests moving back to a higher cam profile mode, the actuator on the neighboring cylinder is used to move the sliding cam profile sleeve in the opposite direction because the shift groove

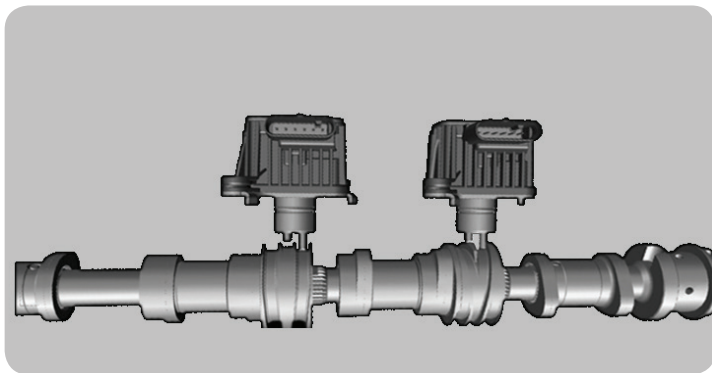
continued on page 3

Sliding Cam System Components

1. B339 Exhaust Camshaft Profile Sleeve Position Sensors (Qty 2)
2. M130 Exhaust Camshaft Profile Actuators (Qty 2)
3. M129 Intake Camshaft Profile Actuators (Qty 4)
4. B23 Exhaust & Intake Camshaft Position Sensors (Qty 2)
5. B338 Intake Camshaft Profile Sleeve Position Sensors (Qty 2)
6. Exhaust Camshaft (Qty 1)
7. Intake Camshaft (Qty 1)



New Sliding Cam Valve Lift System – continued from page 2



Actuators

is pointing in the opposite direction. For the intake camshaft, there are two profile sleeves covering two cylinders each (1 and 2; 3 and 4). On the exhaust camshaft, there are two profile sleeves as well, but they are smaller and only on cylinders 2 and 3.

Actuators

The intake and exhaust camshaft profile actuators are electromagnetic and used to axially move the lobe packs in sync with the shifting groove. The exhaust actuator pins are 4 mm in length, while the intake actuator pins are 5 mm. During servicing of the camshaft profile actuators, twist the actuators left and right while pulling upward to help unseat the sealing O-ring and free the actuator for removal.

🙏 Thanks to Richard Miller, Norman Grayson and Sherman Dixon

Loss of Phone Pairing, Audio Settings Change in Demo Mode

When some 2017-2019 CTS; 2018-2019 ATS, XTS, Terrain; 2019 CT6, XT4, Camaro, Colorado, Equinox, Silverado, Volt, Canyon and Sierra models equipped with infotainment system RPOs IOS, IOT, or IOU are in demo mode (unsold vehicle), a phone may lose pairing to the infotainment system after the vehicle is turned off and Retained Accessory Power is no longer active (after 10 minutes).



Infotainment system RPO IOT

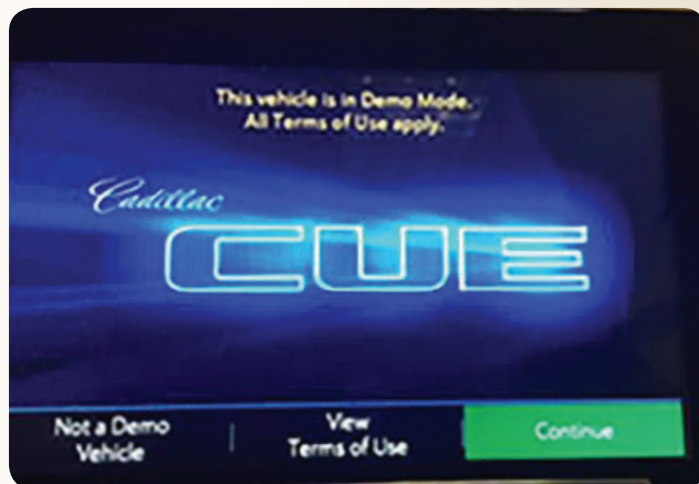
In addition, some other operations of the infotainment system may not be retained, including stored favorites, last station tuned, Bluetooth synced devices, volume level, last app or screen view, and audio/equalizer settings.

The loss of functionality of these settings is the design intent of the infotainment system while it is operating in demo mode. No repairs should be made.

TIP: If a device was paired while the infotainment system was in demo mode, a similar condition could occur that randomly drops Bluetooth pairing after exiting demo mode. If the infotainment system is no longer in demo mode, but the device was originally

paired while in demo mode, delete the device from the infotainment system as well as delete the infotainment system from the device's Bluetooth settings, and then pair the device again.

The demo mode screen will be displayed upon vehicle startup if the infotainment system has been off long enough to enter sleep mode. If the engine is cycled on/off without sufficient time for the infotainment system to enter sleep mode, the demo mode screen will not appear when the vehicle is started, but the infotainment system will still be in demo mode. Wait approximately 10 minutes with the vehicle off for the infotainment system to enter sleep mode.



Infotainment system in demo mode

Once the vehicle is sold, select the option labeled "Not a Demo Vehicle" to exit demo mode.

🙏 Thanks to Jeremy Richardson

Global Wiring Harness Repair Strategy and Parts Information Update

GM's global repair strategy for large wiring harnesses (body, engine, instrument panel, forward lamp, headliner, and truck chassis) is to repair/replace the components (cables, terminals, connectors, etc.) instead of replacing the harness. The repair strategy was developed to help reduce repair costs while reducing squeak and rattle conditions.

GM Customer Care and Aftersales (CCA) has released all required components to repair these harnesses. For connectors that have 8 cavities or less, a fully populated pigtail with the correct DuraSeal splice is available. For all connectors that have 9 cavities or greater, a connector kit, DuraSeal splices and terminated leads are available. If a terminal happens to be a legacy part that is already available in the J-38125 Terminal Repair Kit, it is called out in the Service Information.

For smaller harnesses (door, seat, steering column, etc.), the repair strategy is to replace the harness.

Terminal Repair Kit



J-38125 Terminal Repair Kit

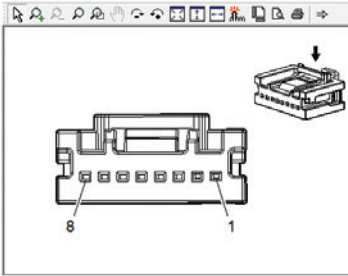
TIP: To download an electronic copy of the J-38125 Terminal Repair Kit Instruction Manual, go to the GM Center of Learning website at www.centeroflearning.com. If you have enrolled in a course that provides the manual as a resource (for example, 18043.04H-R2 – Electrical/Electronics Terminals and Connectors), it will be available under the Resources tab. In Canada, look in the Reference Library under Service in GM GlobalConnect.

Part Numbers in Service Information (SI)

The Connector End View section of the Service Information is the source for part number information. The part information is found just below the connector end view drawing and is presented two ways — the legacy format typically associated with TIFF viewer-supported graphics and the new format typically associated with the new CGM viewer-supported graphics.

For larger connectors (9 cavities or greater), the Service Information shows the connector kit and the terminated leads. As they are developed, videos will be added to show how to probe and/or release the terminals from the connector.

Radio Controls



Connector Part Information

- Harness Type: Instrument Panel
- OEM Connector: 15532151
- Service Connector: 19355393
- Description: 8-Way F 0.64 Series (BK)

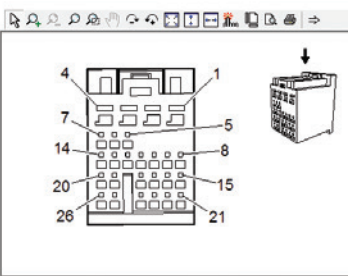
Connector end view drawing

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool	Service Terminal	Tray Name	Core Crimp	Insulation Crimp
I	Not Required	EL-35616-58 (BK)	No Tool Required	Not Required	Not Required	Not Required	Not Required


A22 Radio Controls						
Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	0.35	BU/BD	2807	Radio Keypad Voltage Reference	I	—
2	0.35	GN/BK	2805	Radio Keypad Ground Return	I	—
3	0.35	VT/WH	2810	Radio Keypad Button Signal	I	—
4	0.35	BN/WH	2809	Radio Keypad Power Signal	I	—
5	0.35	BU/GY	2808	Radio Keypad Dimming Control	I	—
6	0.35	BU	4315	Radio Volume Up Signal	I	—
7	0.35	GY/BN	4314	Radio Volume Down Signal	I	—
8	0.35	BK/YE	2806	Radio Keypad Low Reference	I	—

Connector part information

Body Control Module X1



Click Image For Video



Large connector drawing

Electronic Parts Catalog (EPC) Information

Starting with the 2018 model year, all connector kits, pigtails, and terminated leads are called out by book code and model year in the EPC. Updates to the EPC will allow better searchability for wiring repair components. In addition, pictures are being added to the EPC for these parts to help in ordering the correct wire component.

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Global Wiring Harness Repair Strategy and Parts Information Update – continued from page 4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	0.75	BLK	1850	Ground	III	—
2	0.75	RD/BLU	2540	Battery Positive Voltage	III	—
3	1	RD/GY	2140	Battery Positive Voltage	II	—
4	0.5	RD/BN	2240	Battery Positive Voltage	III	—
5	0.5	WH	6850	Indicator Dimming Control	I	—
6	—	—	—	Not Occupied	—	—

Large connector pin information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool	Service Terminal	Tray Name	Core Crimp	Insulation Crimp
I	13582207	J-35616-548 (LT BU)	J-38125-22	Not Available	Not Available	Not Available	Not Available
II	13587307	J-35616-35 (VT)	J-38125-12A	SNAC-A001T-M2.8	Dolphin 20	C	A
III	13587307	J-35616-35 (VT)	J-38125-12A	SNAC-A001T-M2.8	Dolphin 20	E	A

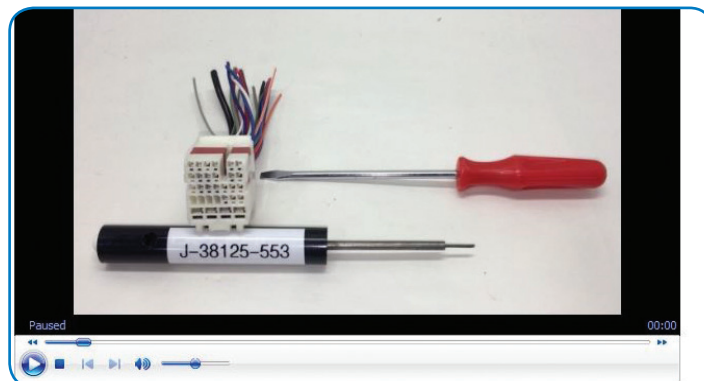
Large connector terminal part information

Battery cables, infotainment cables and hoses also are listed in the EPC.

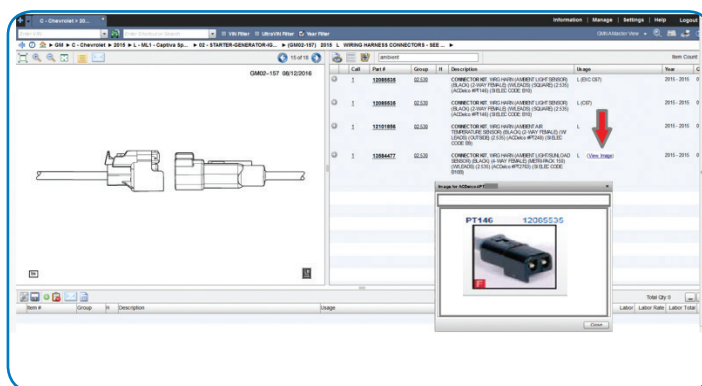
TXL Wire

Use TXL wire to maintain factory specifications for wire harness integrity. TXL wire is available through the Customer Care and Aftersales parts catalog within the Chemical Catalog section. In the EPC, find TXL wire in the Chemicals – Fuses – Wire – book section.

Thanks to Scott Cartwright



Videos in SI show how to release terminals.



Electronic Parts Catalog includes connector kits, pigtails and terminated leads.

Duramax Diesel Injector Timing DTCs Set

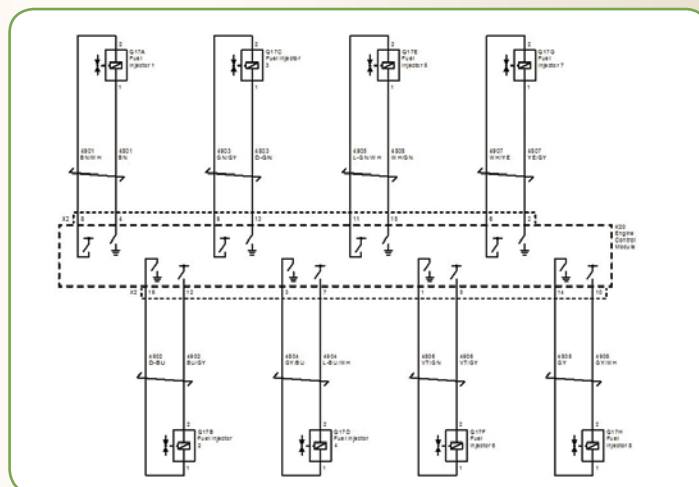
Several injector timing-related DTCs may be set along with an illuminated Check Engine light on some 2017-2018 Silverado and Sierra models equipped with the 6.6L Duramax diesel engine (RPO L5P).

The DTCs may include the following codes related to injector timing being retarded or advanced: P01CB, P01CC, P01CD, P01CE, P01CF, P01D0, P01D1, P01D2, P01D3, P01D4, P01D5, P01D6, P01D7, P01D8, P01D9, P01DA; and the following codes related to injectors exceeding the maximum or minimum learning unit: P02CC, P02CD, P02CE, P02CF, P02D0, P02D1, P02D2, P02D3, P02D4, P02D5, P02D6, P02D7, P02D8, P02D9, P02DA, and P02DB.

The Engine Control Module (ECM) has the ability to learn injector timing performance. When the engine is at operating temperature, throttle closed and in deceleration fuel cut-off mode, the ECM will pulse each injector individually and measure the changes in rotational speed of the crankshaft using the input from the crankshaft position sensor. The ECM stores the injector timing value.

Do not replace any fuel injectors if any of the injector timing-related DTCs are set. First address any vehicle or engine vibrations or any other vehicle conditions.

Vehicle vibrations, such as those created by “knobby” or aggressive tread tires may induce or aggravate the injector timing-related DTCs.



ECM and fuel injectors

After addressing any vibration conditions, clear the DTCs and return the vehicle. GM Engineering is investigating this condition and additional information will be released when available.

Thanks to John Stempnik

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Rear Fascia Gap Adjustment

The rear fascia gap near either tail lamp on some 2016-2018 Camaro models may be more noticeable in hot temperatures. The gap is due to a possible misalignment of the center impact beam as well as the rear fascia brackets allowing for too much growth of the fascia. The impact beam mounting stud must be readjusted.

Prior to performing any repairs on the fascia, obtain the new service part guides for each side of the rear fascia and the shim material listed in Bulletin #17-NA-336.

Begin the repair by removing the rear fascia and then loosening the six nuts securing the impact beam. Fully remove the top two nuts and move the impact beam up 3 mm (0.12 inches) so the stud is centered in the hole of the impact beam mounting plate. Ensure both sides of are centered and re-secure the impact beam.

Next, add shim material at the outboard, upper rear of each guide before installing the left and right rear bumper fascia guides on the vehicle. Follow the procedure for installing the guides as outlined in Bulletin #17-NA-336.

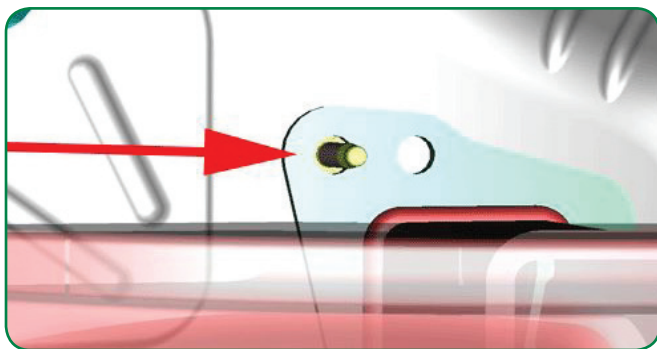
With the new rear bumper fascia guides attached to the quarter panel on each side of the vehicle, reinstall the fascia.

If the fascia attachment flange is damaged, the rear fascia will need to be replaced.

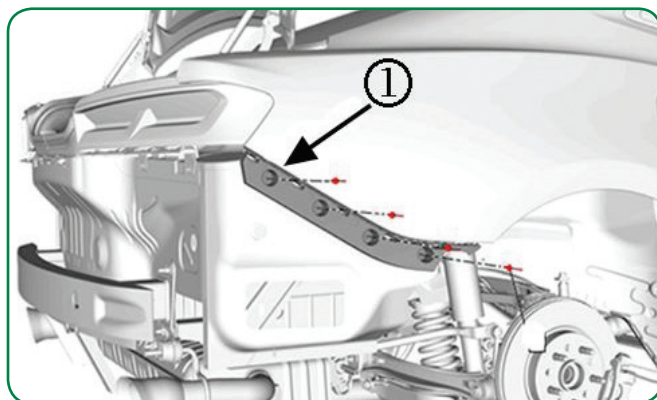
Thanks to Ann Briedis



Rear fascia gaps



Center the stud in the hole of the impact beam mounting plate.



Rear bumper fascia guide



Install new fascia guides with shim material.