Bulletin No.: PIT5801E
Published date: 12/5/2024

Preliminary Information

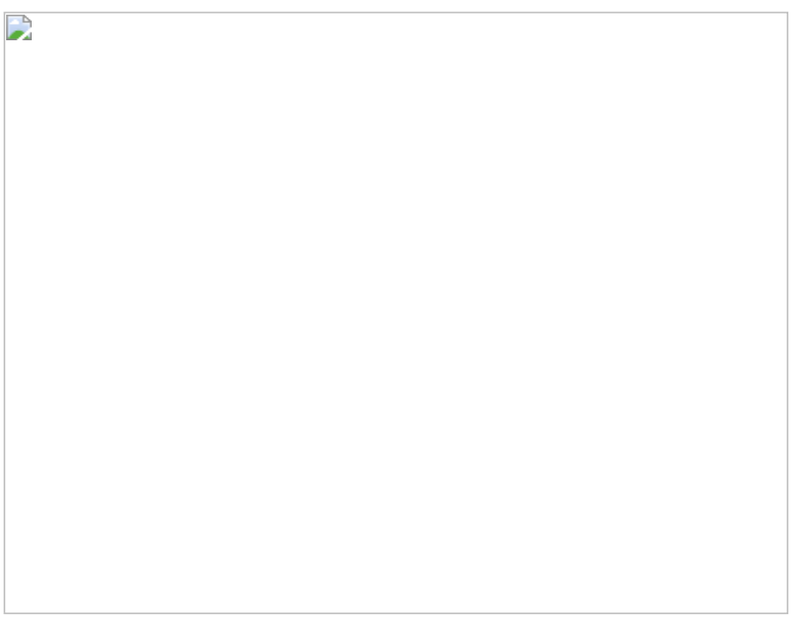
PIT5801E Diagnostic Tip / Vehicle Sits Unlevel / Leans / Sags / Leveling Unavailable Message / Speed Limited Message / Service Air Suspension Message / DTC C1190 C1191 C1192 C1193 C1187 C1188 C1189 C118A C118B C118C C118E C118F

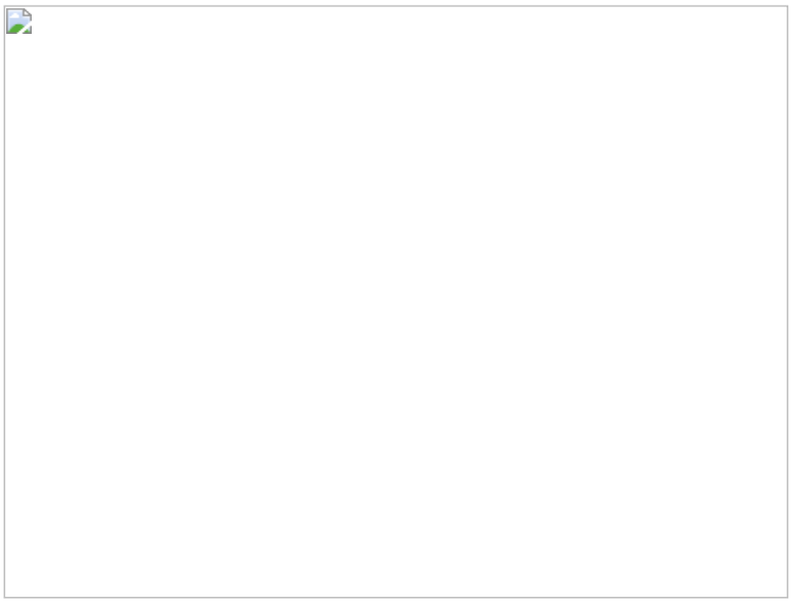
Models

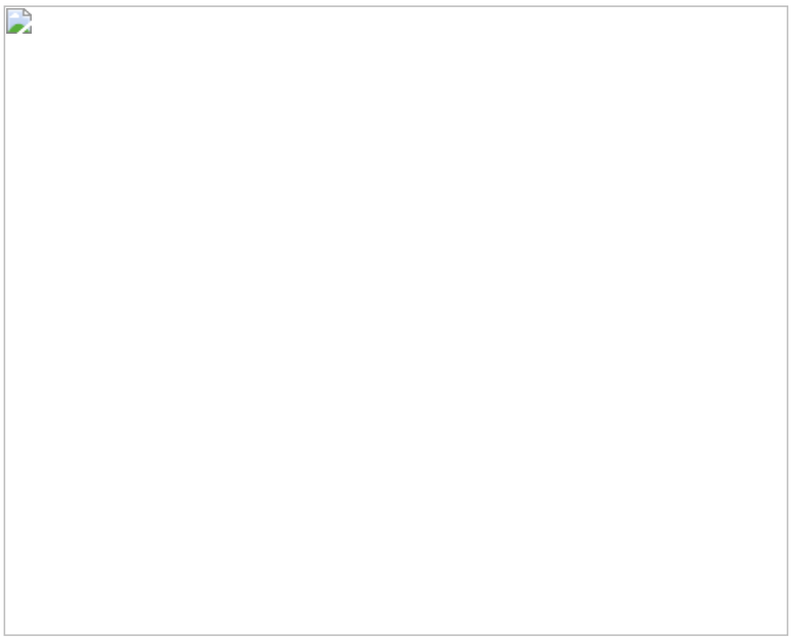
Brand:	Model:	Model Years:	VIN: from	to	Engine:	Transmissions:
Cadillac	Escalade Models	2021 - 2025	All	All	All	All
Chevrolet	Suburban	2021 - 2025	All	All	All	All
Chevrolet	Tahoe	2021 - 2025	All	All	All	All
GMC	Yukon Models	2021 - 2025	All	All	All	All

Involved Region or Country	**North America**
Additional Options (RPO)	**F47 - Air Ride Suspension**
Condition	**Some customers may notice one or more of the following conditions related with the air ride suspension.** **- Vehicle suspension trim height is too high or too low at one or more corners.** **- DIC Messages "Leveling Unavailable", "Service Air Suspension" and/or "Speed Limited"** **- DTC's: C1190, C1191, C1192, C1193, C1187, C1188, C1189, C118A, C118B, C118C, C118E, C118F**
Cause	**The cause of these concerns could be an air line not being fully inserted into its air line fitting at the air springs, air controller or reservoir tank, see PIT5923A for component naming. An air line that is not fully inserted into its fitting can leak air and cause an air spring to be under inflated creating a lean/sag to one side. But if an air line is not fully inserted at an AIR SPRING fitting it could cause the air spring to be OVER inflated. If an air spring is OVER inflated it can make the opposite side of the vehicle appear to be low and mislead diagnosis to the side that looks like it is sagging/low. It can be hard to understand why an air line, which is not fully inserted into the fitting at the air spring, could cause an air spring to be over inflated. The following info will provide some details on why this can happen and how to test and diagnose this concern.** **To help understand why an air line, which is not fully inserted into the fitting at the air spring, can cause an over inflated air spring you will need to understand how the air spring fitting is made/works. The air line fitting, at each air spring, is unique, and contains a one way check valve within the fitting. These unique air line fittings, with the one way check valve, are ONLY used at each of the air springs. The air line fittings at the air suspension controller and reservoir tank do not contain any check valves, and are a straight pass through fitting.** **The reason the air spring fittings have this unique check valve, is to hold air pressure inside the air spring assembly, while the air line is disconnected from the air spring. This keeps the air spring inflated for service and manufacturing purposes. Once the air spring is installed in the vehicle and the air line is fully inserted into the air spring fitting, the end of the air line will push open and hold open the one way check valve. This will allow air to move in or out of the air spring. When an air line is not fully inserted into the air spring fitting, it will not hold open the one way check valve. When this happens, during an inflate command, the air can pass the one way check valve to inflate the air spring, but the check valve will not allow air to leave during a deflate command. This will cause the air spring to become over inflated.** **Because it is critical for the air lines to be fully inserted into the air fittings, there are white marks on each air line to indicate when the air line is fully**

	inserted. These white marks can be useful to help indicate that the air line is inserted far enough at the air suspension controller or reservoir tank, <u>but are NOT always a good indication that the air line is inserted far enough to push open the one way check valve at the air spring fitting.</u> **The air line must be inserted into the air fitting until it bottoms out AND the white marks are going into the top of the fitting. Below is a picture of an air line, at one of the air springs, which is NOT fully inserted (1). In this case, it is evident that the white markings are not actually going into the fitting. The second photo below shows the air line after it was fully inserted (2). You can see the white marks are now down into the top of the air line fitting (2) and the air line is bottomed out in the fitting.** **NOTE: It is recommended to push the line into the fitting as far as it will go. At least part of the white marking MUST be into the top of the fitting. Remember, when inserting an air line into an air spring fitting, just because the white marks are in the fitting, does NOT always mean that the line is fully inserted and pushing the one way check valve open.** **For additional examples, see the third photo below. This is a picture of the air lines at the air controller. In this example, there are several fully seated lines as shown in call out 4. Each of these lines is fully seated as indicated by the fact that the white lines are partially covered by the air line fitting itself. Call out 3 is an example of a line that is not fully seated. In call out 3 you can see the white marking is not into the air line fitting as it should be.**







Correction:

Note: The purpose of this PI is to focus on the air line connections at the air springs, air controller and reservoir tank. It is understood that other issues with the air suspension system can cause over or under inflated air springs. In addition to this PI, please follow all published SI diagnostics and safety procedures when working on the air suspension system.

In most cases, performing a very thorough inspection of each air line at the four air springs, air controller and reservoir tank will prove to be the fastest and most fruitful way at discovering the root cause within the system. Make sure at least the white marking on each air line is into the top of the fitting and that the air line is bottomed out in the fitting, as both shown and described above. If an air line is not fully inserted, then push the air line into the fitting until it is fully inserted and the white marking is into the top of the fitting. In most cases, there is no need to loosen the air line fitting to fully insert the air line, just push the line info the fitting.
NOTE: Remember, when inserting an air line into an air spring fitting it must be inserted fully to open the one way check valve. Just because the white marks are into the top of the fitting does NOT always mean the line is fully inserted and holding open the one way check valve.

Continue with the following testing if the above inspection has been completed, but the vehicle is still unrepaired.

Testing for an air spring that is over inflated and will not deflate

1. Primary Test to determine if an air spring can deflate:

- Ensure the battery is fully charged
- Vehicle sitting on a flat level surface with the air springs inflated
- Close all doors, hood and liftgate
- Ignition on and engine off

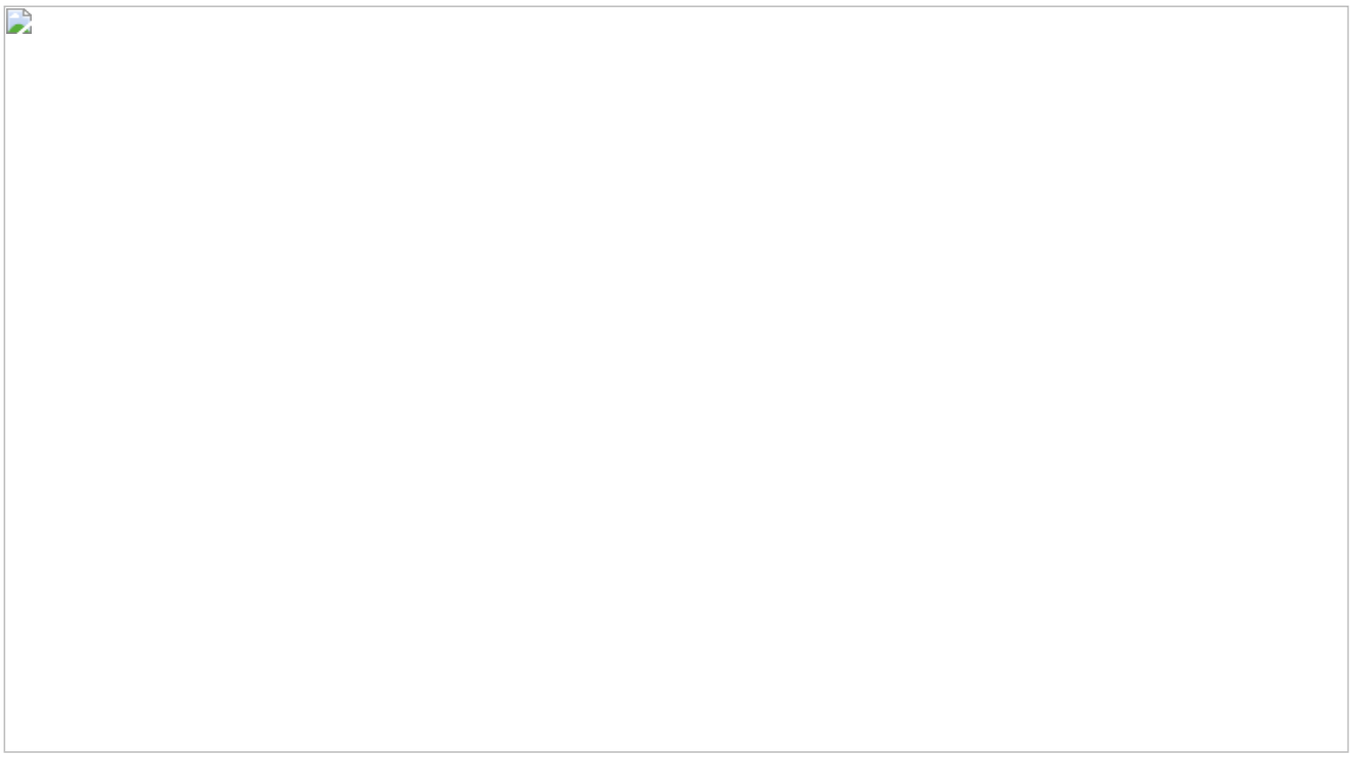
- Start with one corner and measure the trim height from the ground to the top of the wheel well opening for that one corner and document the measurement.
- Use GDS2 and go into Module Diagnostics> K5 Auto Level Control Module>Control Functions > Short Term Deflate > then select the corner previously measured and perform 4 short term deflate commands.
- After completing the 4 short term deflates, for that one corner, go back and remeasure the trim height at that corner and compare the two measurements.
- Typically, the vehicle will lower at least 10 mm's or more. If the vehicle trim height is decreasing, then continue the same steps above for each of the remaining corners. It is important that you only do ONE corner at a time, or incorrect results will occur.

-If the vehicle does not lower after performing the 4 Short Term Deflates, then suspect the air line is not fully seated at that air spring. In some cases, if the air spring is full of air and under high pressure, it can be very difficult to push the air line into the air fitting. This is because the one way check valve is being pushed closed by the high pressure air inside the air spring. In these cases, try lifting the vehicle by the frame so the suspension is fully extended. Then while using extreme care, push the air line into the fitting with a suitable tool. If the air line gets kinked, pinched, or damaged, it will need to be replaced.

2. Secondary Test to determine if an air spring can deflate:

- **Use GDS2 and go into Module Diagnostics> K5 Auto Level Control Module>Data Display>Pressure Data and view the pressure data for at least 5 minutes. During that 5 minutes GDS2 is polling each air spring and the reservoir tank for it's pressure reading. If an air line is not fully inserted into one of the air spring fittings, you will notice the air pressure for that corner will be slowly decreasing (yellow graph line, shown below) while the pressure for the other corners is holding steady.**

- If the air pressure is slowly decreasing for a particular corner, as shown below, then suspect the air line at the air spring is not fully inserted. In some cases, if the air spring is full of air and under high pressure, it can be very difficult to push the air line into the air fitting. This is because the one way check valve is being pushed closed by the high pressure air inside the air spring. In these cases, try lifting the vehicle by the frame so the suspension is fully extended. Then while using extreme care, push the air line into the fitting with a suitable tool. If the air line gets kinked, pinched, or damaged, it will need to be replaced.



Testing for an under inflation

- Apply soapy water to the air lines and fittings at the air spring and air manifold block, while looking for any leaks. If the air pressure is too low in the air spring, then perform the following steps to add air into the suspect corner, while inspecting for any leaks.
- Ensure the battery is fully charged
- Close all doors, hood and liftgate
- Ignition on and engine off
- Connect GDS2 and go into the Automatic Level Control Module > Control Functions > Short Term Inflate > then select the suspect corner (LF, RF, LR, RR) and perform short term inflate commands, as needed.

Note: If the vehicle was driven for a period of time with no air pressure in an air spring, it may have damaged the air spring. Once the vehicle is repaired, a thorough inspection of the inflated air spring

should be performed. If any damage is found, or if it is uncertain that any damage occurred, then the air spring should be replaced.

Warranty Information

For vehicles repaired under the Bumper-to-Bumper coverage (Canada Base Warranty coverage), use the following labor operation. Reference the Applicable Warranties section of Investigate Vehicle History (IVH) for coverage information.

Labor Operation	Description	Labor Time
8020980	Automatic Level Control Module Replacement	Use Published Time
8021000	Automatic Level Control Air Supply Reservoir Replacement	Use Published Time
8044650	Rear Shock Absorber, Shock Absorber Component, Spring or Seat Air Line	Use Published Time
8044651	Rear Shock Absorber, Shock Absorber Component, Spring or Seat Air Line - Both Sides	Use Published Time
8033620	Front Shock Absorber, Shock Absorber Component, Spring or Seat Air Line - Left Side	Use Published Time
8033630	Front Shock Absorber, Shock Absorber Component, Spring or Seat Air Line - Right Side	Use Published Time

Version History

Version	6
Modified	11/30/2020 - Created on. 04/19/2021 - Update to warranty sections 12/08/2021 - Update to the Correction, Warranty sections and Model Years. 06/19/2023 - Update to the Models, Cause, and Correction Sections. 06/11/2024 - Update to the model years. 12/05/2024 - Update to the model years.

GM Global Brands