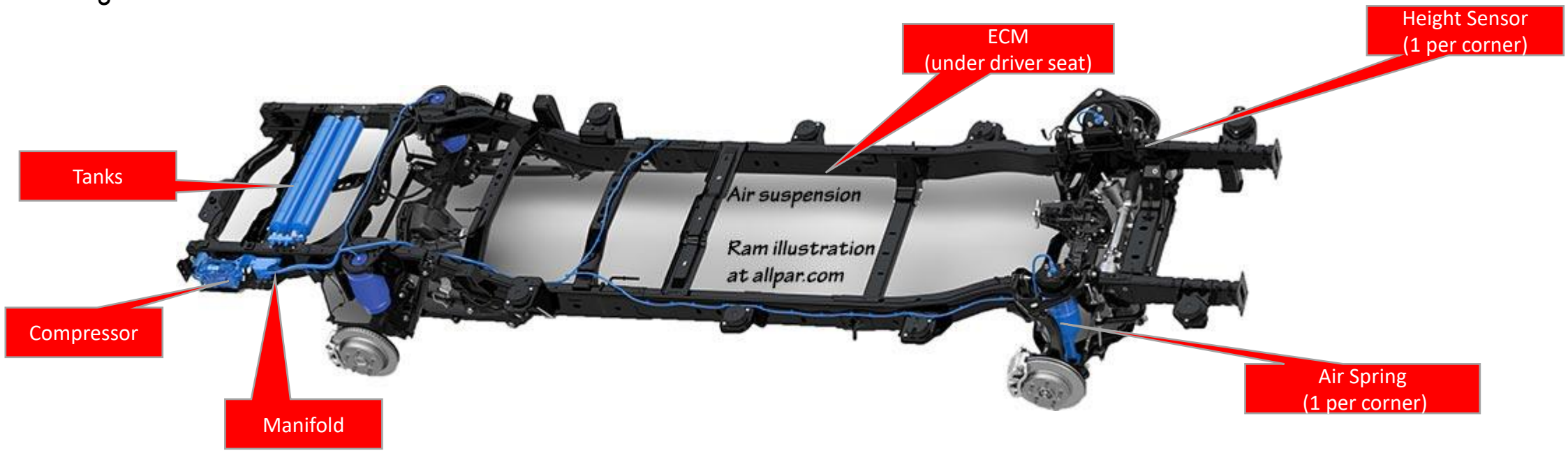
HOW TO DIAGNOSE RAM AIR SUSPENSION PROBLEMS

Does Your RAM's Air Suspension Drop On Its Own?

- My truck would randomly lower both rear corners evenly to the bump stops
  - Usually happened at night
  - It would correct itself after I started the truck
  - Frequency of occurrence was 1-2 times per week
  - See picture

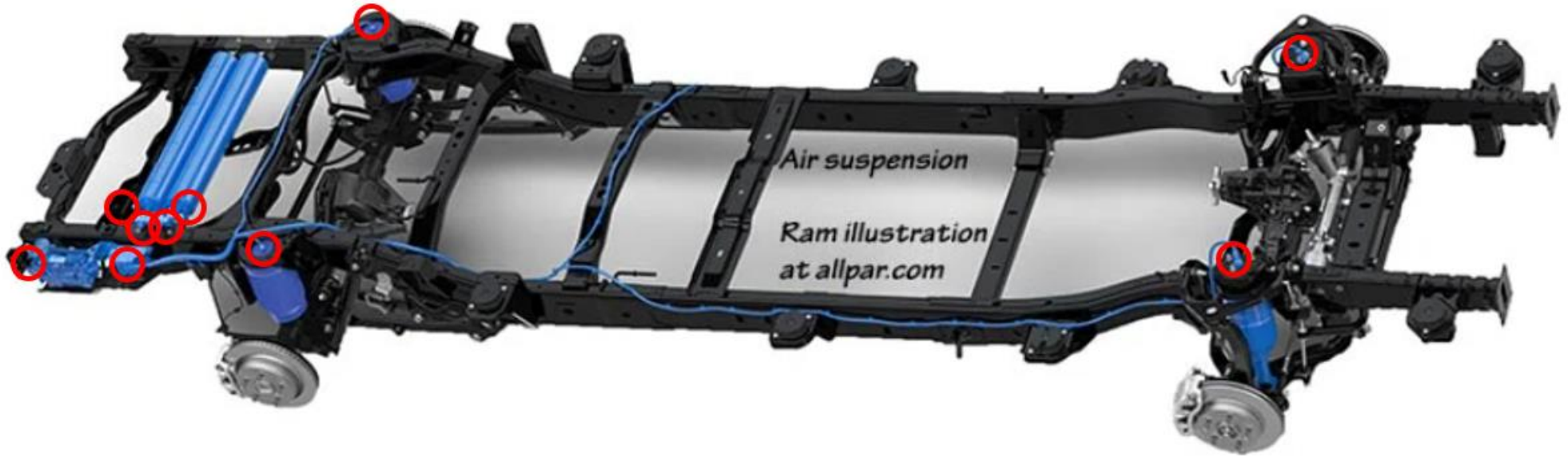
First, Let's Discuss How The RAM Air Suspension Works

1. The entire system is semi-sealed with nitrogen from the factory, meaning;
   a) SEALED = If the system never leaks, then it will move nitrogen from the air spring (bag) to the tanks as commanded (over and over, and over…)
   b) SEMI-SEALED = If the system develops a leak (and it will over time), then the system pressure will drop, thus notifying the Electronic Control Unit (ECU) to open the outside suction line (in the passenger taillight) and pull in external air (not nitrogen) into the system, thus introducing non-nitrogen and moisture into the system, which can/will cause corrosion and freezing.
   c) The compressor is small and can only makeup a limited amount of pressure. It cannot completely restore your system PSI, which is why you will need to fix any leaks and bring the system back up to 150+ PSI
   d) The tanks store pressure up to 225 PSI, but I have found the working pressure to be around 150 PSI
2. The ECU receives commands via (button selection in the cabin, Key FOB button or MPH) and will command the manifold to open the proper line and the compressor will move air to (raise) or from (lower) each air spring
3. If the system is over-pressurized, the exhaust port on the manifold will open and relieve pressure out of the passenger tail-light



Check the Entire System for Leaks Before Diagnosing!

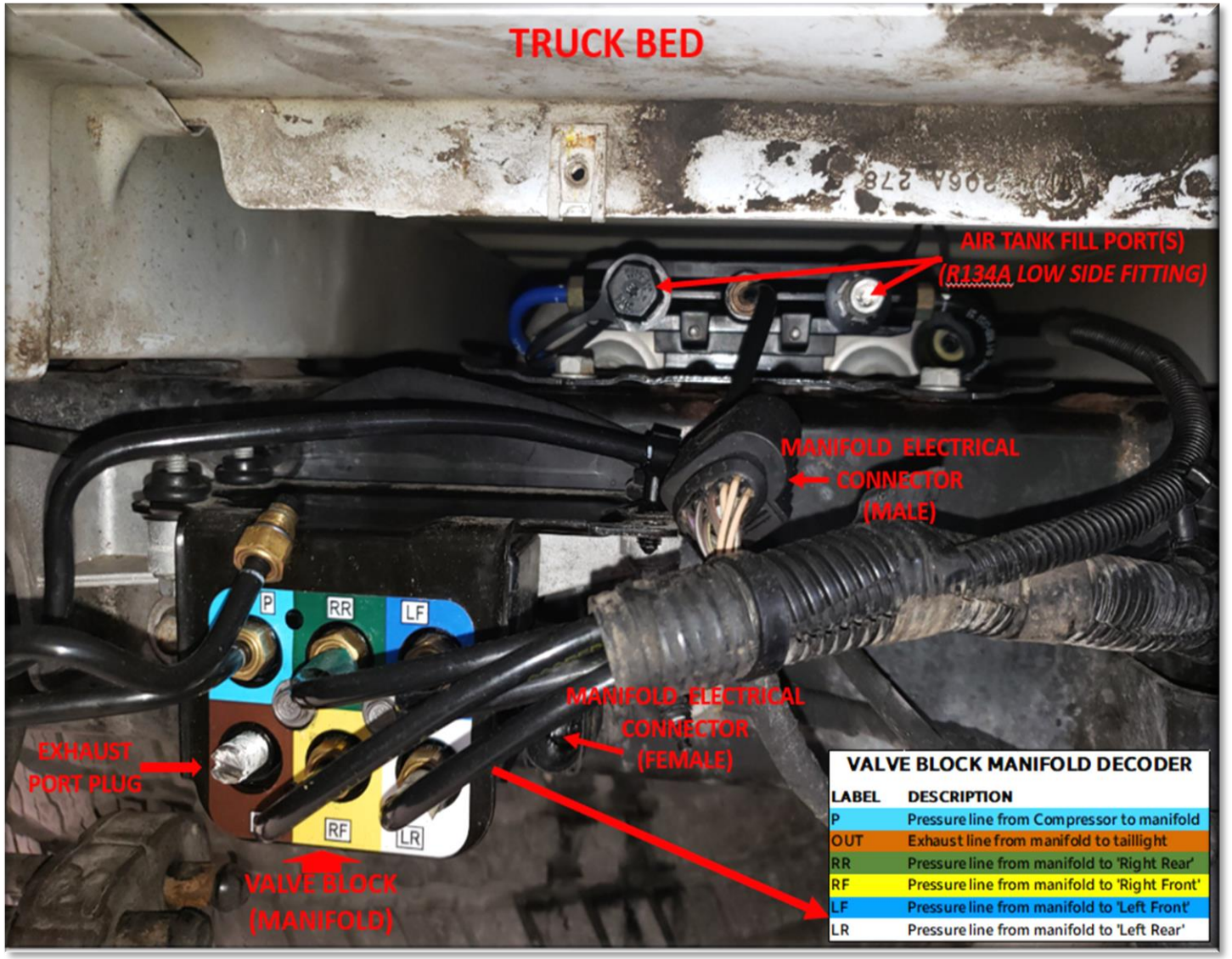
1. There are 18 different air fittings on your truck. The red circles mark the areas. Check each one for leaks with soapy water, while the system is under pressure https://www.youtube.com/watch?v=YgbDr5aSVIk
2. If you believe you have a leak, but didn't find any, you may want to add pressure to your system to magnify the leak. There are 2 ways to do this
   a) Add weight to the bed of the truck (i.e. a load of mulch/sand/dirt, bags of cement etc..)
   b) Add air pressure to the system (see page 6)
3. Once you have repaired all leaks and your air system is working properly, then you can vacuum out the AIR from your system and have NITROGEN added (if you wish)



How I Diagnosed My System, and Found My Problem

1. Systematically made small changes every 5 days (to isolate the problem) and monitored results
   a) Days 0 thru 5
      i. Removed exhaust line, capped the exhaust port and unplugged the manifold electrical connection (you will get a dash suspension error if the manifold is unplugged)
      ii. Results – truck maintained height position on all four corners for 5 days straight
   b) Days 6-10
      a) Kept exhaust manifold plugged and reconnected the manifold electrical connection
      b) Results – next morning, truck lowered both rear corners onto the bump stops
      c) This action hinted that the issue may be with the manifold electrical

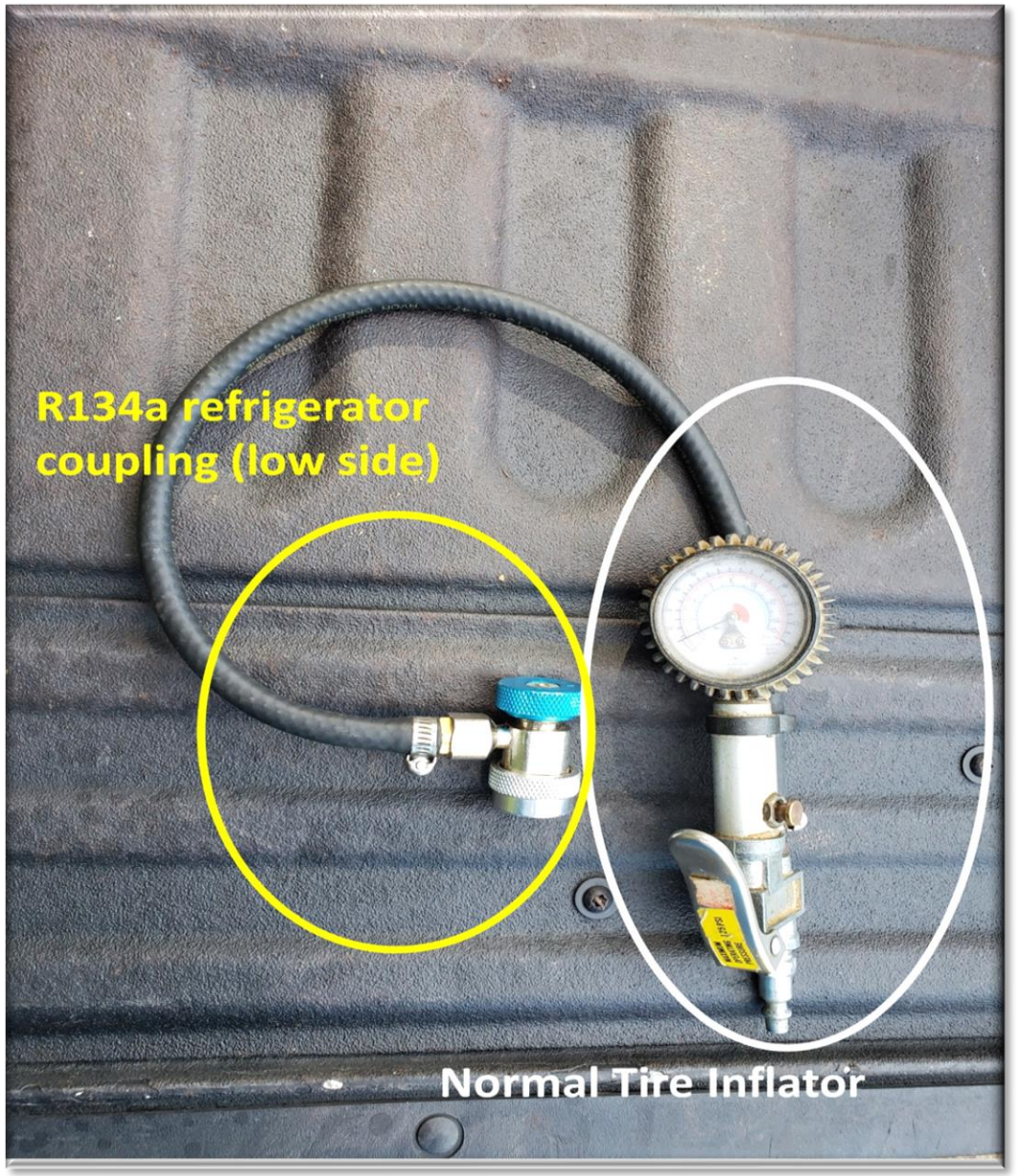
2. Final Assessment
   a) Given I solved the problem via disconnecting the electrical lug to the manifold, the problem was either the manifold or the ECM
   b) Since the ECM is rather expensive and I found a used manifold on eBay for $60, I opted for the used manifold
   c) **I am happy to report that replacing the manifold solved my problems. For 2 months I have not had a single drop, and the air suspension works as expected (up, down, speed control, FOB control)**



How To Add Air Pressure to Your RAM Air Suspension System

How To Add Air Pressure to Your System (Part 1)

1. Assemble the air delivery system
   a) Take an ordinary tire inflator
   b) Cut the valve stem chuck off of the end and replace it with a low-side r134a fitting (I used a hose clamp to secure it)
   c) Hook the inflator up to your air compressor and now you are ready to inject air into your suspension as described on the next page



How To Add Air Pressure to Your System (Part 2)

1. Connect your new DIY inflator to the forward air tank
2. Fill to a minimum of 100 PSI but preferably 150 PSI
   a) If I filled my system to more than 150 PSI, the ECM would exhaust the over-pressured air via the tail-light exhaust

Note: I added CRC Air Brake Anti Freeze to my air lines to remove moisture and add lubrication to the system since I added ambient air (78% nitrogen, 21% oxygen & 1% other)