Auto 132 Lab Experience Report

Part 1: Vehicle Information

Student name(s):

Kyle Wensel

Vehicle year, make, model:

2011 RAM 1500

Customer's name & repair order number:

Adam Laird, RO: 1-18802

Customer's concern(s):

Losing coolant. Ticking noise - possibly from the exhaust manifold gasket.

Part 2: Documentation

Document the steps you took to diagnose and repair the vehicle—in the order that you did them. Write every step—even if you made mistakes and now wish you would have done it differently. Begin when you picked up the keys, end when you returned them. BE DETAILED & INCLUDE PHOTOGRAPHS!

The first thing my lab partner and I did was perform a visual inspection inside the engine bay to see if we could find any noticeable damage around the cooling system. We wanted to find the cause of the problem for the coolant leak first before diagnosing the "ticking noise." We inspected the upper and lower hoses, as well as the overflow reservoir, but couldn't find any damage. We did notice that there wasn't any coolant in the overflow reservoir. We also noticed some coolant leaking on the floor in the shop, so that verified for us that the customer was losing coolant. Here's a photo of their engine bay:



Since we were able to confirm the vehicle's coolant was leaking, we decided we needed to perform a coolant pressure test. This test enables us to find the source of the leak, but we need to know what pressure to set the test at. We looked at radiator cap and the cap shows that is requires about 16-lbs of pressure:



We set the pressure tester to 16-lbs, and we noticed that not only was it not holding pressure, but we could hear air coming from the engine. After listening and feeling around, we found that the air was coming from underneath the cover of the radiator. We removed the cover, and we were able to see immediately that the leak was coming from the radiator. A hole had punctured through the radiator and that's what was causing the coolant to leak. The photos below show the pressure test gauge and the hole in the radiator. Where my thumb is on the radiator is where we found the puncture:





After performing the test and finding the problem, we searched in Omnique for parts to replace the radiator, upper & lower coolant hoses, and thermostat. Once we found a quote for all of the parts from O'Reilly, we called the customer to inform what we found and gave him a quote for the needed parts. He approved the necessary repairs, so we asked O'Reilly to deliver the parts and we got started on removing the radiator and the other parts. At first, we were going to use the instructions found on ProDemand, but some of the instructions weren't clear. Instead, we found a video on YouTube by 1A Auto that was able to give us step-by-step instructions on how to remove and replace the radiator. Here is a copy of the link: www.youtube.com/watch?v=OGAotqXfbkw.

The first step we took was to drain all the coolant by removing the drain plug from the radiator. We had to remove the skid plate covering the radiator below in order to remove the drain plug. Once the coolant was drained, we were able to remove both the lower & upper coolant hoses. After that, we started removing the radiator. It was a difficult process to remove the radiator, but as we removed all the necessary bolts and got the fan covers off, we managed to remove the radiator. Here are some images from after the removal:





After removing the radiator, we got the new radiator and compared it with the old one, to make sure they matched the same specs. They were a match, so we removed all the bolt clips and rubber bushings from the old radiator and attached them to the new one:



While we had the radiator out, we went ahead and installed the new thermostat. Once that was installed, we started on attaching the new radiator. It took a bit of time for us to get it installed with all the small spaces we had to work with. After we got it installed, we were able to attach the new upper & lower radiator hoses, and install the skid plate and top covering for the radiator.

Before we added coolant to the cooling system, we performed the same coolant pressure test to confirm that there were no other leaks. Unfortunately, we did find another leak coming from the water pump gasket. Highlighted in red in the picture below is where we found the leak:



The other bad news is that we ran out of time for class, so we weren't able to replace the water pump and gasket for the customer. We weren't able to diagnose the "ticking noise" for the customer as well, so we only managed to solve one problem for the customer.

Part 3: Reflection & Analysis

- What parts of this process went well?

Being able to diagnose the coolant leak and perform the repairs for the radiator, radiator hoses and thermostat went well for us. It was nice that 1A Auto was able to provide a video for us on how to remove and install those parts we needed to.

- Which steps were most critical in your diagnosis process?

The critical part for us was determining where the coolant leak was coming from. This part helped determine all of that parts that we needed to replace for this customer's coolant leak problem. It would have been nice if we had found the leak from the water pump before installing the new radiator.

- What kept you from being as effective as you could have been?

Time was definitely short for us; we didn't have enough time as we thought we had to fix all of the customer's concerns. Lack of experience was another thing; my lab partner and I had never replaced a radiator before, so that made it a little more difficult for us to make the repairs in time.

- Now that you can look back on how this project unfolded, what would you like to do differently next time?

I would have liked to have spent more time watching the video from 1A Auto. We only watched the removal process instead of the installation as well. The installation took longer than expected, and I think if we had watched the whole video, the installation for the radiator wouldn't have been as long as it was.