Auto 155 Lab Experience Report

Part 1: Vehicle Information

Name(s):

Kyle Wensel

Vehicle year, make, model:

2016 Mazda 3

Customer's name:

Daniel Mott

Customer's concern(s):

During a tire rotation, they were recommended to have the rear brake pads replaced (at about 10% life). Would also like to have all brake pads/rotors checked and possibly the brakes bled.

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 I did was take the vehicle on a test drive to see if applying the brakes causes the vehicle to pull to one side, causes the steering wheel to vibrate and that there aren't any grinding noises. I want to make sure that the vehicle doesn't have a seized caliper, warped rotors, or a metal-to-metal condition. The test drive showed that there were no vibrations in the steering wheel, no pull to one side, and there weren't any grinding noises.

After the test drive, I brought the vehicle back to the shop to take a look at all of the brakes and rotors. Before doing that, I wanted to test the brake fluid since the customer was concerned about its condition. Using a brake fluid tester, the test showed that it had about 1% of water in it, which is okay, so the car didn't need a brake flush. Below is an image copy from Amazon of a brake fluid pen tester from VXSCAN that's similar to what was used to test:





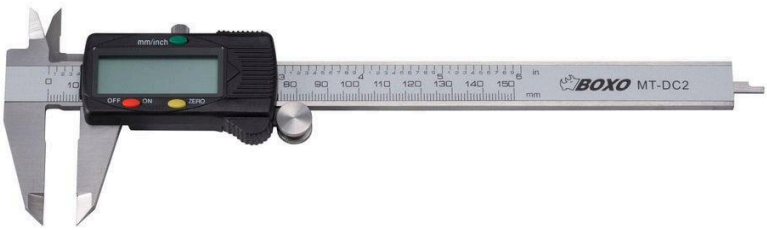
This is where the fluid level health was at.

Looking at the front brakes and rotors, they were in good condition and didn't show any signs of wear. The front brakes measured at 7mm and not 3mm or below, so they were within specifications. The rear brakes on the other hand were at 1mm, so they definitely needed to be replaced. Below are pictures of the actual brakes from the rear:





Next thing I needed to take a look at were the rear rotors thickness and runout to determine whether the rotors can be resurfaced or if they need to be replaced. Using calipers to measure rotor thickness. I measured at 4-different points of the rotors and showed the average thickness of the rotors were at 85-mm. The specifications for maximum thickness are set to 78-mm, so they were well within specs. Below is an image copied from boxousa.com of the digital calipers used to measure:



After measuring rotor thickness, I used a dial indicator to measure rotor runout and the test showed that there was less than 4-thousandths of runout, so they were safe to resurface. Below is a visual representation from BrakeAlign on YouTube demonstrating how I used the dial indicator to measure runout:



Since the tests showed that the rotors could be resurfaced, I sent the rotors over to the brake lathe and resurfaced both rear rotors. While they were being resurfaced, I took the time to compress both brake caliper pistons, so that they would be ready to reinstall. Once the rotors were finished resurfacing, I installed the rotors and new brakes. I added some lubricant on the brakes, so that there wouldn't be any squealing coming from the brakes. After that, I reinstalled the tires and torqued the lug nuts to specification listed on ProDemand.

Now that everything had been installed, I took them on a drive to burnish the brake pads and rotors so that the materials from the pads would transfer to the rotors. This ensures that brake pads grip the rotors properly and don't cause any pull to one side. To do this, I drove the vehicle at 30-mph for 30-seconds and made 30 stops. At the 30th stop, the car felt fine; there weren't any pulls or other concerns and the vehicle was safe to return to the customer.

Part 3: Reflection & Analysis

- What parts of this process went well?

The test drive and installing new brake pads went well. I had no issues taking the pads and then installing the new ones. Testing the brake was also successful since the fluid tested within specs and didn't need to be flushed.

- Which steps were most critical in your diagnosis process?

It was obvious that the brake pads needed to be replaced, but I needed to see whether or not I could resurface the rotors. Measuring the rotor thickness and runout were the most critical parts in determining this diagnosis process. It was also important to determine the condition of their brake fluid and see if they needed a flush job.

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

The time it took to resurface the rotors definitely took longer than it should've. There were times where one surface of the rotor was uneven versus the other. It took a few passes to get both rotors resurfaced properly, so I would like to do better in this process.

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

I definitely want to be more efficient in resurfacing rotors. If I didn't have problems resurfacing the rotors more than once, I would've been more efficient during the brake repair process.