

August 26, 2014 Incident

On Tuesday August 26, 2014 a steel tire came off car 1771 on the Bay Point line. Fortunately, the train did not derail, but the runaway tire caused significant damage to multiple cars on the train and the wayside; ripping up ties and the third rail. The tire had a through-crack (red circled area on picture below) which made it lose its shrink-fit, separate from the wheel hub and depart the train. The BART wheel is made up of a steel tire heat shrunk onto an aluminum hub. BART purchases the wheel as an assembled tire and hub. All of the wheels currently on the BART fleet were supplied by Penn Machine Company (PMC). The failed wheel had been in service for just under one year. It had never been cut and was only slightly smaller than a new wheel.

In an effort to isolate other potentially defective wheels immediately after the incident RS&S identified all cars with wheel serial numbers plus or minus eighty of the incident wheel. This number was selected because BART receives its wheels in lots of eighty from Penn Machine Company. This effort resulted in the grounding of 40 cars for visual inspection of wheels for cracks or defects in the steel tire. No defects were identified from this visual inspection.



On Wednesday an independent third party lab, Anamet of Hayward, cut out sections of the failed tire on either side of the fracture so that the break was exposed and visible (pictured above). The fracture showed significant voids in the steel tire. Ultrasonic testing performed by Anamet showed that about a third of the tire was sprinkled with voids. It was apparent that visual inspection could not have identified this problem prior to the catastrophic failure.

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The analysis from the local lab is not yet complete but they have offered some preliminary findings:

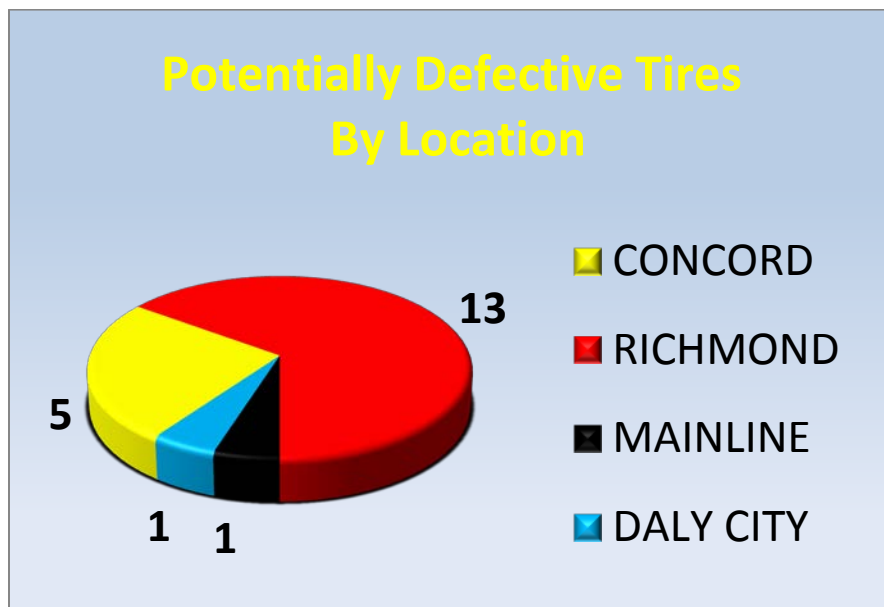
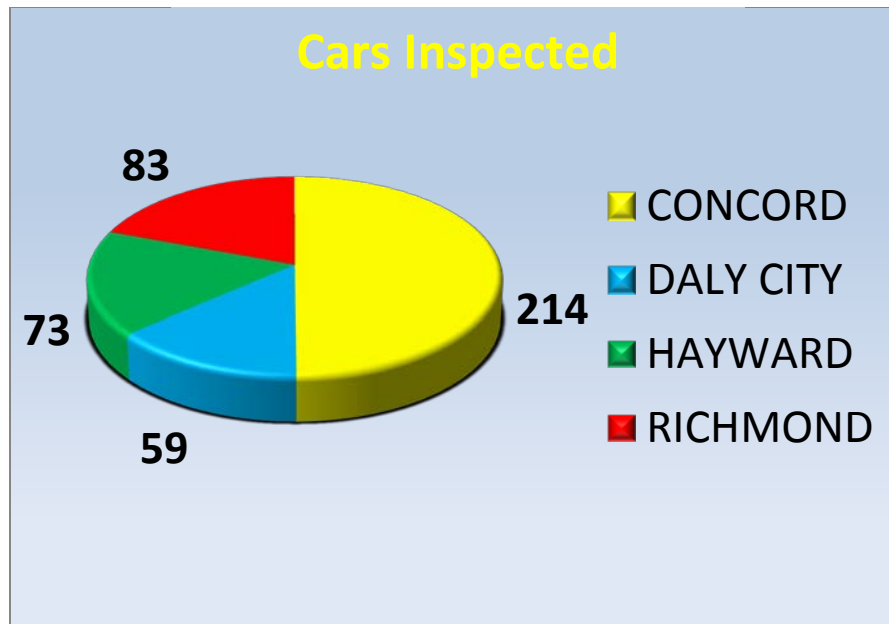
- The tire broke catastrophically, as opposed to breaking from fatigue across the defect.
- The metallurgical chemistry of the tire's steel is correct to the specification.
- The defect formed as a result of rolling (the process used to form the tire) the tire at too high a temperature (while ring was still molten inside).

After confirming wheel serial numbers from Penn Machine for the heat batch that included the broken tire on Wednesday, RS&S staff was able to identify 58 cars with wheels from the same heat batch. These cars were grounded pending ultrasonic testing. Qualspec, a local company from Rodeo, was contracted to immediately initiate ultrasonic test on these cars. The decision was made to test all eight wheels on each car rather than just those identified in the identified heat batch. This afforded a broader look at the condition of wheels from multiple heat batches. Within twenty four hours of initiating the ultrasonic testing, a potentially defective tire from a second heat batch was discovered. This resulted in the grounding of an additional 65 cars. Based on the discovery of this second heat batch the decision was made to ultrasonically test all of the wheels on the entire fleet as well as all 258 wheels in stock.

With the assistance of Penn Machine Company seven companies from across the nation were contracted to conduct the ultrasonic testing. Approximately 45 technicians have been engaged alongside our dedicated SEIU employees in the effort to inspect the 5352 wheels on in-service trains. This ongoing effort at all four maintenance shops has resulted in an unprecedented level of safe car movement that has required the partnership of employees across Transportation and RS&S. Tower Foreworkers, Train Operators and Mechanics have been putting in long hours to help ensure all wheels are inspected as quickly as possible while minimizing disruption to service. In order to accomplish this inspection the shops have had to close down some normal maintenance activities. Specifically, shop space and labor normally used for truck work and unscheduled repairs has been diverted to support this effort. It is expected that the resultant backlog coupled with the extra axle and truck work created as a result of potentially defective wheels will impact the car count for several weeks.

As of 8:00 this morning, Friday September 5, 429 cars (3,432 wheels) and 170 of the wheels stock have been ultrasonically tested. We will work hard to complete inspection on the remaining cars and wheels by early next week. So far a total of 20 potentially defective wheels from 12 separate heat batches have been identified. Seven of these wheels were from the original heat batch.

The following are graphical representations of the number of cars that have been inspected by shop location and where potentially defective wheels have been identified. It is evident that the investment made in the expansion of the Concord Shop with the installation of six car lifts, has proven to be a wise investment and has provided capacity to allow for quicker more efficient inspection activity.



Staff is evaluating the contractual provisions and options for wheel replacement and cost recovery. This analysis will consider all of the facts once all potentially defective wheels have been analyzed by an independent third party lab.