

Accidents Waiting to Happen?

by Tom Norman

Excursion coordinators notify me, as the NARCOA Insurance Administrator, of accidents that occur which might result in an insurance claim. Recently two incidents have come to my attention that I feel should be discussed with our membership.

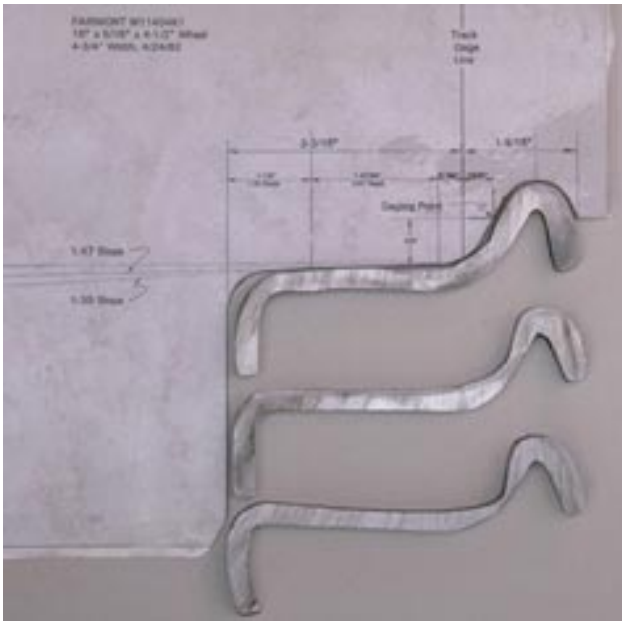
Flange Separation

The first incident involved a motorcar in which the flange or rim of the wheel separated from the wheel tread. The resulting derailment also caused the axle to break at the wheel bearing, as can be seen in the attached photo.



Flange separation from 16" demountable wheel due to flange wear.

This is not the first incident of flange separation that I've observed. The basic reason for failure is excessive wear of the wheel. Generally, wheel running surface thickness should not be less than half the original wheel thickness. New 16" demountable wheels today are 5/16" thick, and should be replaced when worn to 5/32". At car inspections before excursions, most inspectors will have a wheel thickness gauge available to check for wheel wear. A gauge is available from Harbor Freight Tools (www.harborfreight.com), item #38238, caliper measuring tool for \$3.99 plus s&h. From my experience, wheel wear occurs mainly at the flange/tread interface, not on the tread itself. I have sectioned three 16" wheels to help illustrate this wear. In the following photo, the top section is a relatively new wheel, showing good thickness throughout. The middle section is from my MT19B after 11,027 miles on new 5/16" wheels. Note that the thickness at the flange/tread interface is just over 1/8". The bottom section is from my Kalamazoo 27A, showing severe wear exceeding the NARCOA rulebook limits. Note that the tread thickness shows negligible wear even on the Kalamazoo wheel. Compare the worn wheel section profiles with the wheel profile drawing. It is easy to see the wear. It shows as a "squaring" of the flange rather than the smooth curves of the original profile.



Wheel profile drawing and cross sections of 16" demountable wheels. Note flange wear on bottom two sections.



Method of measuring flange/tread interface with wheel thickness gauge.

The lesson here is that wheel thickness should also be measured at the flange/tread interface as illustrated in this photo. Several things can give a false thickness reading. Any mastic or sound proof coating applied to the wheel will give a false reading. Fairmont wheels with these coatings normally have a small portion left bare for thickness measurement. Measure at those locations. Some wheels have a rubber hose stuffed in the flange for sound deadening. Remove the hose then take the thickness reading. If you find any wheel thickness readings less than 1/8", replace them before your next excursion.

Brake Shaft Wear

Another accident waiting to happen involves the brake shafts on MT14 and MT19 chain-drive cars. The brake shaft is made from 7/8" OD steel tubing with a 1/16" wall. The drive chain is guided up and over the brake shaft by the idler sprocket. Poor maintenance, excessive chain slack, and/or elongation of the chain due to wear, allows the chain to rub on the brake shaft. See the following photo. We have had



MT19 chain path showing chain slack, which can lead to brake shaft wear and failure.



Brake shaft worn nearly half way through. Note twist and bend in shaft from brake application.