



Figure 25. Frequency (count) of the first car position-in-train for yard derailments (total count equals 26,204 derailments).

The data reveal that when a train accident results in a derailment, the first car derailed is usually the head car (position 1). In fact, for the data provided in Figure 23, the first car derailed is one of the first ten cars in nearly a third (31%) of all mainline derailments where train speeds are between 25 mph and 60 mph. Similar results are found for the percentage of derailments starting with a car in position 1-10 for the other two cases: 52% for yard derailments and 41% for mainline derailments where train speeds are less than 25 mph. Representative probability of first car derailed versus position are provided in Table 8. The probability of the first car derailed and the average number of cars derailed were then used to undertake a parametric sensitivity analysis for the probability of LNG ISO car derailment for various LNG ISO train configurations.

Table 8. Representative probability of first car derailed for Class 1 and 2 Railroads (1995-2015).

Statistic	Car Position in Train			
	1	11	21	31
Yard Derailment Accident	24.8%	1.60%	1.20%	0.82%
Mainline Derailment Accident, Speed < 25 mph	17.3%	1.80%	1.13%	0.97%
Mainline Derailment Accident, Speed ≥ 25 to ≤ 60 mph	15.8%	1.07%	1.02%	0.80%