

CENTRIPETAL FORCE

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Engineer in Philadelphia Amtrak Crash Is Charged With Involuntary Manslaughter

The [Amtrak](#) engineer who was driving a train that derailed in 2015 in Philadelphia, killing eight people and injuring more than 200, [was charged](#) Friday with involuntary manslaughter — after local officials declined to pursue a criminal case, and when victims’ families took advantage of an unusual Pennsylvania law that forced officials to act. In that legal maneuver, it was the Pennsylvania attorney general’s office that brought the case against the train’s engineer, Brandon Bostian, who was also charged with causing or risking a catastrophe, and reckless endangerment. The charges were filed two years to the day after [the fatal derailment](#). Friday was thought to be the last day that Mr. Bostian, 34, could be charged with reckless endangerment before the statute of limitations expired. As that deadline approached, the Philadelphia district attorney’s office on Tuesday closed its investigation and declined to press charges. In [a statement](#), the office said that while Mr. Bostian was responsible for the derailment, “we cannot conclude that the evidence rises to the high level necessary to charge the engineer or anyone else with a criminal offense.” **Many of the victims’ families had been pressing for charges against**

Mr. Bostian, whose train was going 106 miles per hour when it entered a curve with a 50 m.p.h. speed limit.



INTRODUCTION: To make any turn a object must experience some type of a centripetal (center seeking) force. The magnitude of such a force must be the size of mv^2/R .

QUESTIONS: (a) Convert the proper speed of 50 mph to ft./s.?, (b) Convert the excessive speed of 106 mph to ft./s.? (c) In terms of $[m/R]$ find the centripetal force the train needs to properly make the turn at 50 mph?, (d) In terms of $[m/R]$ find the centripetal force the train would need to successfully make this turn at the excessive speed of 106 mph?, (e) What percent over the proper speed was the centripetal force needed at the excessive speed?

HIINTS: 88 ft./s. = 60 mph

ANSWERS: (a) 73.33 ft./s., (b) 155.47 ft./s. (c) 5,377.8 $[m/R]$,(d) 24,171 $[m/R]$, (e) 450% bigger $F_{\text{CENTRIPETAL}}$ than normal.

The train was traveling at 106 miles per hour when it entered a curve with a 50 m.p.h. speed limit. It derailed, killing eight people and injuring more than 200.

Amtrak has [agreed to pay up to \\$265 million](#) to more than 100 victims and their families in a settlement.