

NOTE KEEP IN Windows 2003 format; changing to a lower version could destroy Embedded (Not Showing) formulas!

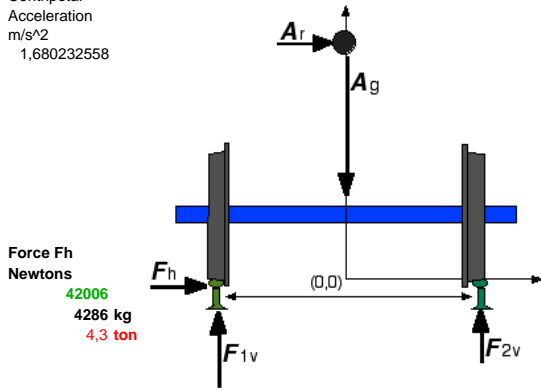
October 27, 2015 issue

Note: STC would work and show total lines of logic if requested.

Download a fresh Copy: <https://db.tt/oPztKjyP>

Rail forces and accelerations for bottom supported railcars on curves

Centripetal Acceleration
m/s²
1,680232558

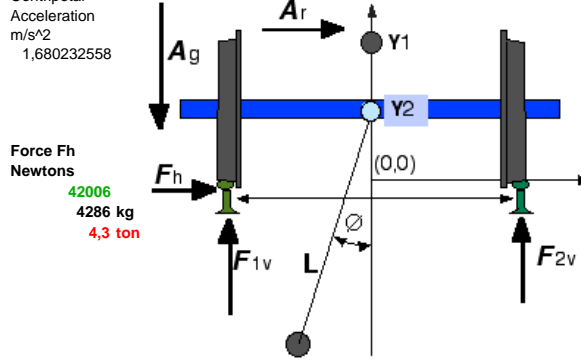


Limiting Condition Trial A

Force F1v	Force F2v
239183 Newtons	5817 Newtons
24406 Kg	594 Kg
24,4 metric tons	0,6 metric tons

Rail forces, accelerations, and lean angles for railcars with suspended cargo pods and passenger cabins

Centripetal Acceleration
m/s²
1,680232558



Force F1v	Angle S	Force F2v
131251 Newtons	9,73 Degrees	113749 Newtons
13393 Kg		11607 Kg
13,4 metric tons		11,6 metric tons

Input data for bottom supported railcar

Number	Units	Name	Value
9,8	meters/second ²	Acceleration of gravity	
1,44	meters	Gauge (distance between rails)	
17,0	meters/secon	Speed =	61,2 K/hr=MPH 38,3
172	meters	Curve radius	
4	meters	Center of mass height	
25000	kilograms	Mass	

CHANGEABLE VARIABLES Green boxes!

Maximum Overspeed = 17m/sec at a radius of 172 m = 127% overs-speed to Trial C

For suspended system 31.2m/sec = Design maximum of 30 degree

Note that Superelevation not included is a very effective solution to higher Speeds!

It is suggested that you keep two copies in order to remember settings, print out a hard copy if you need to

If you want to discuss anything you can call Karl Guenther at 727-939-2177, you might also be forwarded to the main author Tad Winiecki!

FRP 10 degree curve = <http://mysite.du.edu/~jcalvert/railway/degcurv.htm> used in surveying locations.

Input data for railcars with suspended cargo pods and passenger cabins

Number	Units	Name	Units to match-->	Trial A	Trial B
9,8	meters/second ²	Acceleration of gravity		At turnover	30 Degree
1,44	meters	Gauge (distance between rails)			
17,0	meters/secon	Speed =	61,2 K/hr	17	31,2
172	meters	Curve radius		172	172
0,3	meters	Center of supported mass height (Y1)			
10000	kilograms	Supported mass			
0,3	meters	Suspended mass pivot vert. position (Y2)			
15000	kilograms	Suspended mass			

FRP standard: 10 degree Curve of 172 m/s use = 7,5

At 10 dgree swingout 17 m/sec/ 7.5 = 2.26 times

At 30 dgree swingout 31.2 m/sec/ 7.5 = 4.16 times

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