

Summary of Stanchion Safety Factors:

Based on Compressive Strength of 2x6 pine columns: **SF = >400**

Based on Yield Strength of top Plywood: **SF = >4.3**

Based on Failure Mode Being the Tilting of the Side 2X6 Columns:

- Scenario 1) Assume only Top two screws, one on each end, are preventing tilting based on the angle caused by plywood deflection from a 1000 lb load: **SF=>350**
- Scenario 2) Scenario 1 but side load raised to 100 lbs due misalignment of parts: **SF=>15**
- Scenario 3) Scenario 2 with added safety factor from plywood screws also holding: **SF = >30**
- Scenario 4) Scenario 3 but side load raised to 200 lbs due misalignment of parts: **SF=>15**

Conclusion:

Therefore with conservative assumptions and due to poor construction and other material misalignment, if 20% of the car weight per wheel is applied sideways on the vertical 2X6 columns, the minimum Safety Factor is greater than 4.3. This is well above the typical structural design safety factor of 3.

I recall one exception to the typical 3 Safety Factor was noted in a structural design course. That was for playground equipment where a Safety Factor of 4 or 5 was recommended! It was indicated you could not be sure how the structure would be stressed.



!! CAUTION !!

Use this information at your own risk! Remember *"Engineers said the Titanic Couldn't Sink!"*