

Engineering Mechanics: Dynamics

CIEG311 - Fall 2001

Project #1: Skyway Stunt Gone Awry

On April 29, 1997, four men and one woman attempted a death-defying stunt from the majestic Sunshine Skyway Bridge, in Tampa, Florida. Their goal was to swing, in a pendulum type motion, from a 150 ft cable that was anchored to a Cadillac parked near the center of the main span of the bridge! On the count of three, the five jumped from the bridge and swung down toward the water in a long circular arc. Unfortunately, on the up-swing, something snapped, sending the five plunging into the Tampa Bay at a high rate of speed. All survived, but not without serious injury. You can read more about the attempted stunt in the attached article from the St. Petersburg Times. The stunt was video taped and was to be sold to a television show (the video is part of a show on death defying stunts that has aired several times on TLC, I missed taping the show and have not been able to get a clip of the video).

Here are some specific details that we know about the bridge and the setup of the stunt:

Bridge:

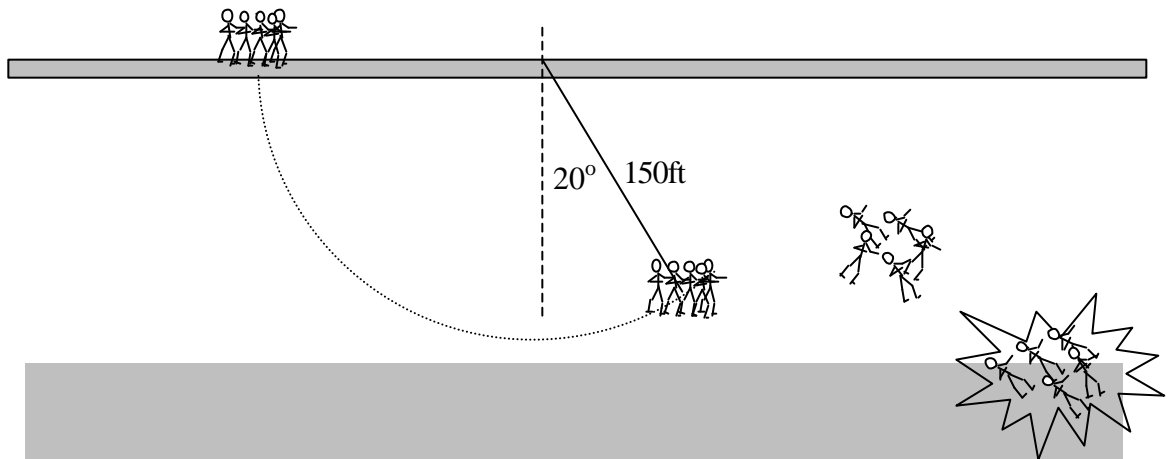
The bridge has a main span length of 1200 ft and a vertical clearance at mid-span of 193 ft. It's a lot like the cable stayed bridge over the C&D just south of Newark, only smaller. The two bridges were in fact designed by the same firm (Figg Engineering). See the attached photo of the skyway bridge (you can compare it to the photo of the C&D canal bridge that is part of the mosaic photo on the civil engineering home page).

Stunt:

The stunt men/woman drove to the bridge in an old Cadillac and parked the car on the shoulder near the center of the main span. The cable was anchored to the chassis of the car, then strung out along the shoulder. At the end of the main cable was a system of five separate tethers, with individual wooden seats and safety harnesses for each of the jumpers. The tether system was connected to the main cable with a series of cable clamps. The total length of the main cable and tether system is estimated at 150 ft. Details aren't available but I estimate the main cable was about 3/8 inch in diameter and made of steel. The five jumped all at once. The video shows that something snaps when the cable makes an angle of about 20 degree from the vertical, on the up-swing. See the attached figure.

Your job is to answer the following questions:

1. How fast were the five traveling (in miles-per-hour) when the cable snapped?
2. What was their velocity (magnitude and direction) when they hit the water?
3. Estimate the distance the five were thrown from the point at which the break occurred to where they landed in the water.
4. Estimate the force in the cable when it broke.
5. Based on your calculations, which do you think failed, the main cable or the connection of the tether system to the cable?



Schematic of Stunt

It's unfortunate that we don't have the video of the stunt – it's something to see! There is extra credit available for anyone who is able to get a hold of a copy of the video clip (you have to be able to tell me how and where you got it!).



Sunshine Skyway Bridge, Tampa, Florida