# Problem 4.45

The combination of detachable chairlift and passengers has a mass of 500 kg, centroidal radius of gyration of 0.2 m, and mass center indicated by . The chair starts at position 1 with a small velocity and zero angular velocity. It rolls down the ramp with minimal friction and without rotating to position 2 where a spring loaded grip at point B suddenly attaches the chair to the main cable which is moving at 6 m/s.
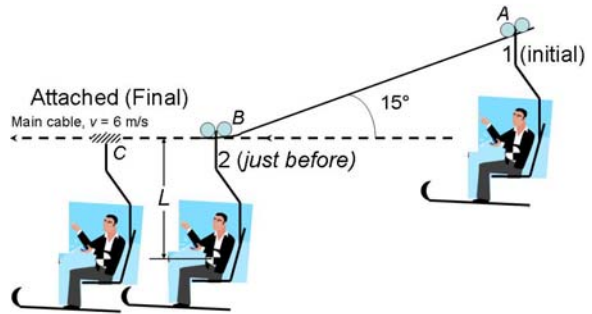
Determine the minimum ramp length so that the angular velocity just after attachment is no more than ¼ rad/s CCW. $L = 2.5$ meters.

Attached (Final)
Main cable, v = 6 m/s

A
1 (initial)

15°

B
C
2 (just before)

L