AEM 341 Problem Set #2

Due: 26th Jan 2018

During a strong crosswind landing, a 500,000 lbf aircraft lands hard on only the port (left side) landing gear. The landing gear is 20 feet outboard from the centerline, 10 feet aft of the CG, and 10 feet below the CG. The landing had a descent rate of 1000 fpm; the left strut deflected 2 feet with a constant acceleration. The aircraft has an inertia of $14 \cdot 10^6$ slug·ft^2 in the x axis, $32 \cdot 10^6$ slug·ft^2 in the y axis, and $45 \cdot 10^6$ slug·ft^2 in the z axis. Finally, the wheel rolling coefficient was 0.1.

1. Compute the translational and rotational accelerations
2. Compute the structural loads of a 10 lbf navigation light located exactly 100 feet outboard and 40 feet aft of the CG on the port wingtip