Problems

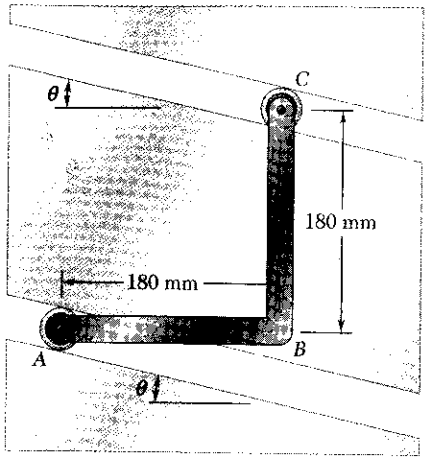

Fig. P16.1 and P16.2

16.1 Two identical 0.4-kg slender rods AB and BC are welded together to form an L-shaped assembly. The assembly is guided by two small wheels that roll freely in inclined parallel slots cut in a vertical plate. Knowing that $\theta = 30°$, determine (*a*) the acceleration of the assembly, (*b*) the reactions at A and C.

16.2 Two identical 0.4-kg slender rods AB and BC are welded together to form an L-shaped assembly. The assembly is guided by two small wheels that roll freely in inclined parallel slots cut in a vertical plate. Determine (*a*) the angle of inclination θ for which the reaction at A is zero, (*b*) the corresponding acceleration of the assembly.

16.3 A 60-lb uniform thin panel is placed in a truck with end A resting on a rough horizontal surface and end B supported by a smooth vertical surface. Knowing that the deceleration of the truck is 12 ft/s^2, determine (*a*) the reactions at ends A and B, (*b*) the minimum required coefficient of static friction at end A.

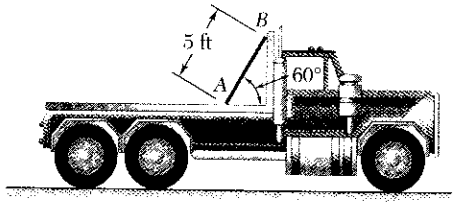

Fig. P16.3 and P16.4

16.4 A 60-lb uniform thin panel is placed in a truck with end A resting on a rough horizontal surface and end B supported by a smooth vertical surface. Knowing that the panel remains in the position shown, determine (*a*) the maximum allowable acceleration of the truck, (*b*) the corresponding minimum required coefficient of static friction at end A.

16.5 Knowing that the coefficient of static friction between the tires and the road is 0.80 for the automobile shown, determine the maximum possible acceleration on a level road, assuming (*a*) four-wheel drive, (*b*) rear-wheel drive, (*c*) front-wheel drive.

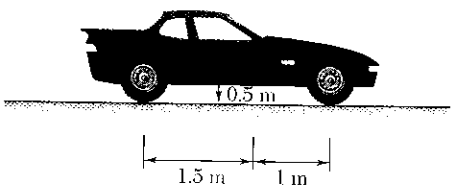

Fig. P16.5