AP2 Fluids Worksheet 2

1. The large piston in a hydraulic lift has a radius of 20.0cm.

A. What force must be apllied to the small piston (r=1.00cm) to lift a 1500kg car?

B. What effective distance must the small piston travel to lift the car by 1.40m?

2. The braking system on a car is a hydraulic system. The brake pedal is attached to a small piston (r=2.00mm). At each wheel a larger piston applies force to the cars brakes. If each wheel has a piston with r=5.00cm and the driver applies a force of 240N to the brake pedal, find:

A. The force applied at each wheel.

B. The total force applied to all four wheels.

C. If μ=0.70 between each brake material and the wheel of the car (the rotor), and if that force is

transferred undiminished to the road by each wheel, find the distance required to stop an 1800kg car from 100.0km/h.

3. The maximum gauge pressure of a hydraulic lift is 17atm. What is the largest weight of a vehicle it can lift if the output piston has a radius of 24.0cm?

4. In a movie, the hero evades capture by hiding underwater and breathing through a tube. If the maximum pressure differential her lungs can maintain is -11 000Pa (fairly high, but she is a hero), find the maximum depth at which she could hide.

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