

Q) In a car lift compressed air exerts a force  $F_1$  on a small piston having a radius of 5.0 cm. This pressure is transmitted to a second piston of radius 15 cm . If the mass of the car to be lifted is 1350 kg, calculate  $F_1$  .  
What is the pressure necessary to accomplish this task?  $g = 9.8 \text{ ms}^{-2}$

Ans) From pascal's law

$$P_1 = P_2$$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$\frac{F_1}{\pi r_1^2} = \frac{F_2}{\pi r_2^2}$$

$$F_1 = \frac{F_2 r_1^2}{r_2^2}$$

$$F_1 = \frac{1350 \times 9.8 \times (5 \times 10^{-2})^2}{(15 \times 10^{-2})^2}$$

$$F_1 = 1470 \text{ N}$$

$$F_1 = 1.47 \times 10^3 \text{ N}$$

This is almost the double of  
atmospheric pressure.