

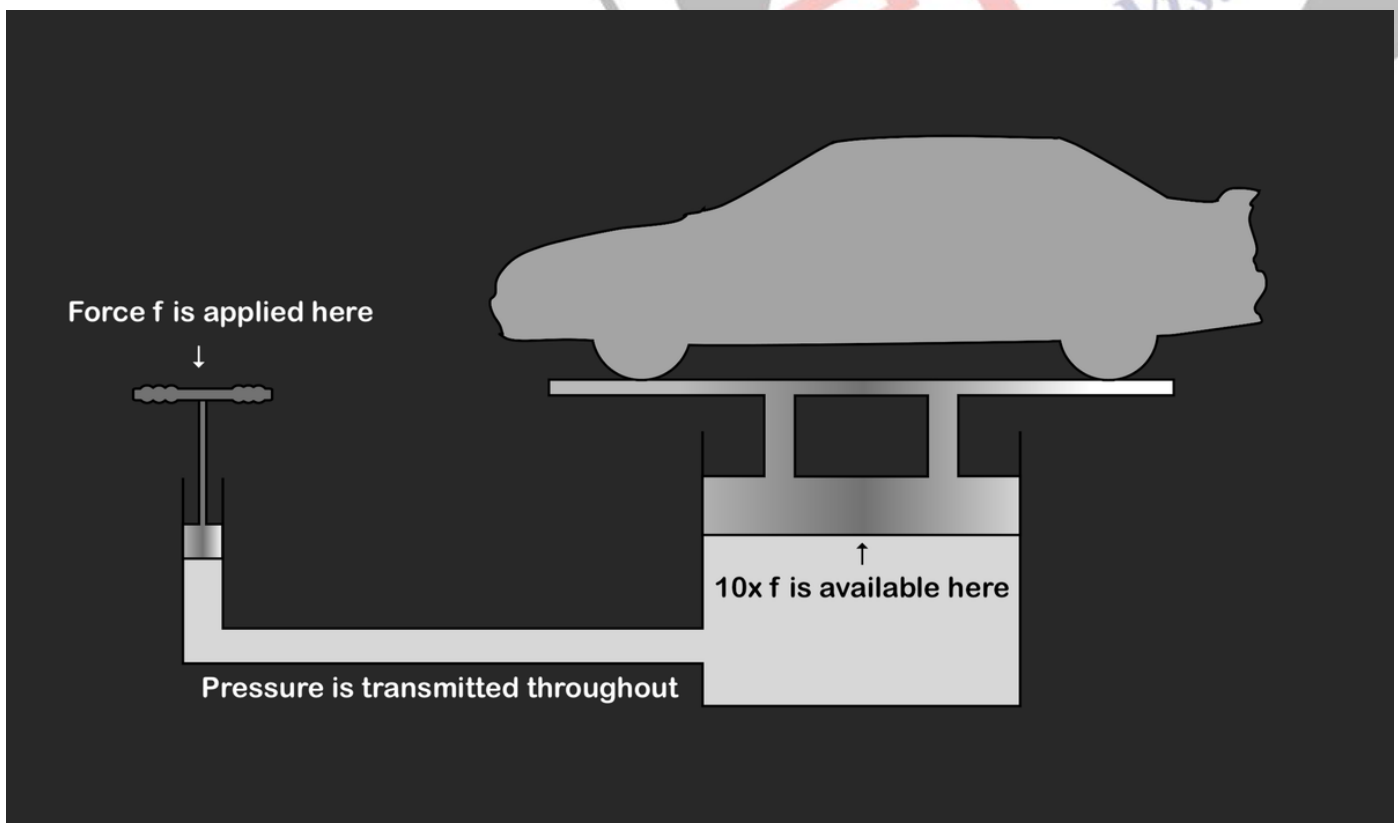


## Hydraulics System and its Applications

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From **towering cranes** to **aircraft landing gears**, **hydraulic systems** power some of the most critical **mechanical operations** to convert **small inputs** into **massive force outputs**.

- **About Hydraulic Systems:** A **hydraulic system** is a technology that uses **incompressible fluid (usually oil)** to transmit **force and motion**.
  - A **small force** applied at **one end** generates a **much larger force at the other end** by increasing the **contact area** while **pressure** remains **constant**.
- **Working:** It works on **Pascal's law**, which states that pressure applied to a fluid is **transmitted equally in all directions**, enabling heavy loads to be moved with small input force.
  - **Pressure** is the **force applied per unit area** on the surface of an object. It indicates **how much force** is acting on a **specific area**. Its **SI unit** is **Pascal (Pa)**, where **1 Pascal = 1 Newton per square meter (N/m<sup>2</sup>)**.



- **Applications:** **Hydraulic systems** are widely used in **construction equipment** (excavators, bulldozers, cranes), **automotive systems** (brakes, clutches), **aircraft** (landing gear), **industrial machinery** (presses, lifts), and **agriculture** (tractors, harvesters)
- **Advantages:** Smooth movements, High power-to-weight ratio, Better heat dissipation, Smooth, and **High precision** in applications.

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