

Figure 15.2 Factors affecting Rigidity.

In order to increase the **effective radius** at which the mass acts, the material of the rotor is distributed so that the greater part of its mass is near its rim.



If a force is applied to change the direction of

the gyroscope rotor spin axis, the gyroscope resists angular movement in the plane of the force applied and, instead, moves in a plane at right angles to that of the applied force, the resulting movement being called 'precession'.

Gyroscopic Precession.

Any spinning body, or **gyroscope**, will resist movement when a force is applied to it. If you were to hold the two ends of the axis of a wheel spinning towards you (when viewed from above), you would notice that if you attempted to tilt the axis, by lowering one end, the axis would not move very far in the direction you wished it to, but would instead move in the horizontal plane as if you had tried to push the end of the axis away from you (see Figure 15.3). This phenomenon is known as **gyroscopic precession**. The result of **gyroscopic precession** is that the line of action of any force applied to the spin axis moves through 90° in the direction of spin, before taking effect.

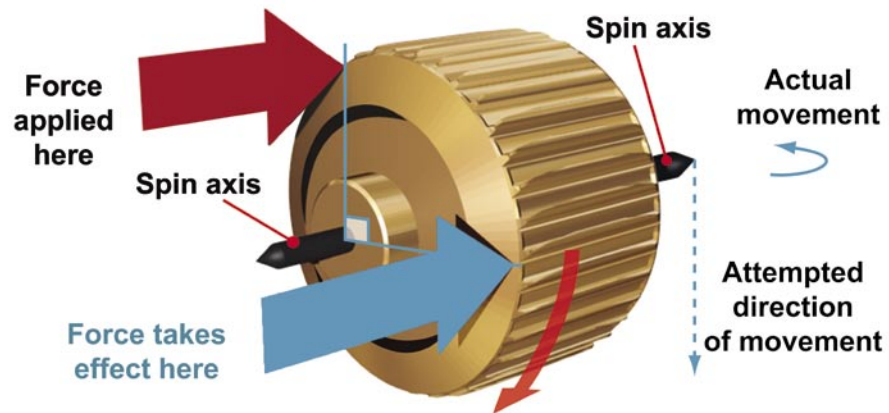


Figure 15.3 Precession in a gyro rotor.

Rate Gyroscopes.

Rate gyroscopes are used to measure **rate of angular displacement**. In a **rate gyroscope** the gimbal in which the rotor is mounted is free to move in one plane only. This means that the rotor spin axis has only one degree of freedom. **Turn Indicators** are fitted with a **rate gyroscope**.