



Unsprung mass is the weight that sits between the suspension and the road and is not carried by the springs. On a motorcycle that means the wheels, tires, brake rotors, calipers, and the bolts and hardware that hold them together. Everything above the springs — frame, engine, rider — is sprung mass.

The suspension only has to control the unsprung parts. Lighter unsprung mass lets the wheel follow bumps and dips more quickly instead of skipping or hanging in the air. Tire contact stays more consistent, so grip, braking, and steering feel sharper, especially over imperfect pavement.

There is a second effect when that weight also rotates, as rotors and rotor bolts do. The engine has to spin that mass up every time you accelerate and slow it down every time you brake. Less rotational mass means more of the available power goes into moving the bike, and the brakes have less inertia to overcome. Heavier rotating parts also create more drag while they are speeding up.

On a small race bike, the gains show up as quicker acceleration, more responsive suspension, and a bike that changes direction with less effort. Titanium bolts are a small piece of unsprung package, but they sit on the rotating assembly, so cutting their weight improves both how the wheel tracks the road and how quickly it spins up.