

# Lug-Centric / Hub-Centric

The problem encountered most frequently with owners purchasing either new tires or custom wheels is the issue of lug-centric vs hub-centric. Most tire shops can balance only hub-centric, using the common tapered cone in the center of the wheel.

If the wheel is designed to be centered using the lug nuts, however, you may very well find your vehicle vibrates, resulting in another trip back to the tire dealer. It is important that you find out exactly what type of centering method it uses, and not only purchase wheels that are designed for your centering method, but locate a tire dealer that has the adapters to balance lug-centric wheels.

Another option is to locate a dealer or shop that can balance the tires while mounted on the vehicle. After the front tires have been balanced, then rotate the rears to the front and balance those using the same method.

## Hub-Centric

A hub and wheel design in which the wheel is centered on a raised center portion of the hub: Here, the lug nuts/bolts then serve only to hold the wheel in place on the hub. Most tire balancing machines use a conical wheel mounting mechanism to locate the wheel/tire on the machine for balancing.

## Lug-Centric

A hub and wheel design in which the wheel is centered by the lug nuts/bolts themselves, often with clearance between the center of the hub and the cut out in the wheel. Toyota wheels are lug-centric and as such require a special lug-centric fixture to be properly balanced on a cone-type balancing machine, as the wheel center hole may not be exactly centered on the lug center point.

Excerpted from an article by Roger Brown.

If you have lug-centric wheels, make sure you torque the lug nuts in the OEM specified sequence while the tire is *off the ground*. If this is not done, the weight of the vehicle may force the wheel off-center during the tightening sequence, and vibration will result.

If you have hub-centric wheels, be sure your wheel center bore matches the hub diameter on the vehicle, otherwise you may need to install shims to properly center the wheel.