

6/2/1G- Gearing for Economy

In general, the most fuel efficient point for any engine is inside the lower 1/3 of its torque peak. If you don't have a torque graph for the engine in your rig, choose an rpm near the engine's rated maximum torque, perhaps slightly below. Choose an axle ratio that puts the rpms in that range in top gear at the speed you commonly use for cruising. If you have a non-overdrive tranny, you will end up with a tall ratio that may restrict acceleration on heavy or lower powered rigs. If you have an overdrive unit, the gearing will be somewhat lower and acceleration better.

A major factor to consider is windage and the vehicle's torque to weight ratio. This ratio represents the weight (in pounds) that each pound-foot of torque needs to move. It is calculated by dividing weight by torque. If your rig is slippery moving through the air or has a torque to weight ratio of between 10 and 15:1, the above guidelines will work the best. If your rig has the aerodynamic characteristics of a brick, or a torque to weight ratio of 15-20:1 or higher, the engine may not be able to push your rig along in top gear at those speeds. In this case, move the rpms to the upper 2/3s of the torque range, similar to what would be chosen for a towing rig.

If you want to calculate this better, use Formula 2 in Appendix 2 to calculate the amount of power required to push your vehicle through the air.

Just so you know, many newer non-performance oriented cars, light trucks (half-tons) and SUVs come fairly well optimized for fuel economy from the factory. Going to taller gears may not yield better economy.