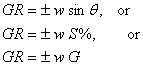
Gradient Resistance (*GR*):



where:

*GR* = gradient resistance [N]

*w* = car weight [N] = mg [kg m/s2,(N)]

*θ* = gradient angle < 2.3o (highways), 5.7 : 6.9o(local roads), ≈ 11.5o (max. grad)

*S* = gradient percentage [%]

*S* < 4% (highways), <10% : 12% (local roads), ≈ 20% (maximum gradient)

*G* = gradient ratio [1: n = 1/n]

                <1:25 (1/25) highways, < 1:8 (1/8) local roads, 1:5 (1/5) maximum grad.

\* ( + ), (+) with the car going **up hill** (**ascending**). {resistance effort}

            (-) with the car going **down hill**(**descending**). {tractive effort}