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Ride Rate and Ride Frequency for Race Cars Formulas

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List of 12 Ride Rate and Ride Frequency for Race Cars Formulas

Ride Rate and Ride Frequency for Race Cars 🗗
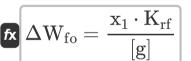
1) Front Bump Allowance given Front Ride Rate 🗗

Open Calculator 🗗

fx $$x_1 = \frac{\Delta W_{fo} \cdot [g]}{K_{rf}}$$

ex $$0.070001m = \frac{226kg \cdot [g]}{31661N/m}$$

2) Front Outside Wheel Load Change given Front Ride Rate 🗗

Open Calculator 🗗

fx $$\Delta W_{fo} = \frac{x_1 \cdot K_{rf}}{[g]}$$

ex $$225.9966kg = \frac{0.070m \cdot 31661N/m}{[g]}$$

3) Front Ride Frequency 🔗

Open Calculator 🔗

$$fx \quad \omega_f = \frac{0.5}{\pi} \cdot \sqrt{\frac{K_{rf}}{W}}$$

$$ex \quad 1.320394 \text{Hz} = \frac{0.5}{\pi} \cdot \sqrt{\frac{31661 \text{N/m}}{460 \text{kg}}}$$

4) Front Ride Rate 🔗

Open Calculator 🔗

$$fx \quad K_{rf} = \frac{\Delta W_{fo} \cdot [g]}{x_1}$$

$$ex \quad 31661.47 \text{N/m} = \frac{226 \text{kg} \cdot [g]}{0.070 \text{m}}$$

5) Front Ride Rate given Front Ride Frequency 🔗

Open Calculator 🔗

$$fx \quad K_{rf} = (\omega_f \cdot 2 \cdot \pi)^2 \cdot W$$

$$ex \quad 32123.35 \text{N/m} = (1.33 \text{Hz} \cdot 2 \cdot \pi)^2 \cdot 460 \text{kg}$$

6) Load on Front Wheel given Front Ride Frequency 🔗

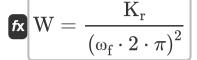**Open Calculator** 🔗

$$fx \quad W = \frac{K_{rf}}{(\omega_f \cdot 2 \cdot \pi)^2}$$

$$ex \quad 453.3792 \text{kg} = \frac{31661 \text{N/m}}{(1.33 \text{Hz} \cdot 2 \cdot \pi)^2}$$

7) Load on Rear Wheel given Rear Ride Frequency 🡵

fx $$W = \frac{K_r}{\left(\omega_f \cdot 2 \cdot \pi\right)^2}$$

ex $$454.625 \text{kg} = \frac{31748 \text{N/m}}{\left(1.33 \text{Hz} \cdot 2 \cdot \pi\right)^2}$$
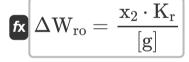
8) Rear Bump Allowance given Rear Ride Rate 🡵

fx $$x_2 = \frac{\Delta W_{ro} \cdot [g]}{K_r}$$

ex $$0.05 \text{m} = \frac{161.87 \text{kg} \cdot [g]}{31748 \text{N/m}}$$

9) Rear Outside Wheel Load Change given Rear Ride Rate 🡵
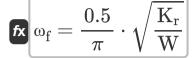
fx $$\Delta W_{ro} = \frac{x_2 \cdot K_r}{[g]}$$

ex $$161.8698 \text{kg} = \frac{0.05 \text{m} \cdot 31748 \text{N/m}}{[g]}$$
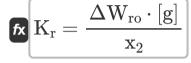
10) Rear Ride Frequency ⌞↗⌟

Open Calculator ⌞↗⌟

$$fx \quad \omega_f = \frac{0.5}{\pi} \cdot \sqrt{\frac{K_r}{W}}$$

$$ex \quad 1.322207Hz = \frac{0.5}{\pi} \cdot \sqrt{\frac{31748N/m}{460kg}}$$
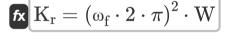
11) Rear Ride Rate ⌞↗⌟

Open Calculator ⌞↗⌟

$$fx \quad K_r = \frac{\Delta W_{ro} \cdot [g]}{x_2}$$

$$ex \quad 31748.05N/m = \frac{161.87kg \cdot [g]}{0.05m}$$

12) Rear Ride Rate given Rear Ride Frequency ⌞↗⌟

Open Calculator ⌞↗⌟

$$fx \quad K_r = (\omega_f \cdot 2 \cdot \pi)^2 \cdot W$$

$$ex \quad 32123.35N/m = (1.33Hz \cdot 2 \cdot \pi)^2 \cdot 460kg$$

Variables Used

- **K_r** Rear Ride Rate *(Newton per Meter)*
- **K_{rf}** Front Ride Rate *(Newton per Meter)*
- **W** Load on Individual Wheel in Static Condition *(Kilogram)*
- **x_1** Front Bump Allowance *(Meter)*
- **x_2** Rear Bump Allowance *(Meter)*
- **ΔW_{fo}** Front Outside Wheel Change *(Kilogram)*
- **ΔW_{ro}** Rear Outside Wheel Change *(Kilogram)*
- **ω_f** Ride Frequency *(Hertz)*

Constants, Functions, Measurements used

- Constant: **pi**, 3.14159265358979323846264338327950288
  Archimedes' constant

- Constant: **[g]**, 9.80665
  Gravitational acceleration on Earth

- Function: **sqrt**, sqrt(Number)
  A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.

- Measurement: **Length** in Meter (m)
  Length Unit Conversion

- Measurement: **Weight** in Kilogram (kg)
  Weight Unit Conversion

- Measurement: **Frequency** in Hertz (Hz)
  Frequency Unit Conversion

- Measurement: **Surface Tension** in Newton per Meter (N/m)
  Surface Tension Unit Conversion

Check other formula lists

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- **Ride Rate and Ride Frequency for Race Cars Formulas** ⬀
- **Vehicle Cornering in Race Cars Formulas** ⬀
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