

Important Stopping Sight Distance Formulas PDF



Formulas Examples with Units

List of 12 Important Stopping Sight Distance Formulas

1) Braking Distance given Lag Distance and Stopping Sight Distance Formula

Formula

$$l = SSD - LD$$

Example with Units

$$26.7 \text{ m} = 61.4 \text{ m} - 34.7 \text{ m}$$

Evaluate Formula 

2) Braking Distance of Vehicle during Braking Operation Formula

Formula

$$l = \frac{v_{\text{vehicle}}^2}{2 \cdot [g] \cdot f}$$

Example with Units

$$203.1613 \text{ m} = \frac{28.23 \text{ m/s}^2}{2 \cdot 9.8066 \text{ m/s}^2 \cdot 0.2}$$

Evaluate Formula 

3) Kinetic Energy of Vehicle at Design Speed Formula

Formula

$$K.E = \frac{W \cdot v_{\text{vehicle}}^2}{2 \cdot [g]}$$

Example with Units

$$9345.4221 \text{ J} = \frac{230 \text{ kg} \cdot 28.23 \text{ m/s}^2}{2 \cdot 9.8066 \text{ m/s}^2}$$

Evaluate Formula 

4) Lag Distance given Stopping Sight Distance and Braking Distance Formula

Formula

$$LD = SSD - l$$

Example with Units

$$13.4 \text{ m} = 61.4 \text{ m} - 48 \text{ m}$$

Evaluate Formula 

5) Maximum Frictional Force Developed during Braking Operation of Vehicle Formula

Formula

$$F = \frac{W \cdot v_{\text{vehicle}}^2}{2 \cdot [g] \cdot l}$$

Example with Units

$$194.6963 \text{ N} = \frac{230 \text{ kg} \cdot 28.23 \text{ m/s}^2}{2 \cdot 9.8066 \text{ m/s}^2 \cdot 48 \text{ m}}$$

Evaluate Formula 

6) Maximum Frictional Force given Kinetic Energy of Vehicle at Design Speed Formula

Formula

$$F = \frac{K.E}{l}$$

Example with Units

$$25 \text{ N} = \frac{1200 \text{ J}}{48 \text{ m}}$$

Evaluate Formula 



7) Reaction Time given Stopping Sight Distance and Vehicle Velocity Formula

Formula

$$t_{\text{reaction}} = \frac{\text{SSD} - \frac{V_{\text{speed}}^2}{2 \cdot [g] \cdot f}}{V_{\text{speed}}}$$

Example with Units

$$7.1705 \text{ s} = \frac{61.4 \text{ m} - \frac{6.88 \text{ m/s}^2}{2 \cdot 9.8066 \text{ m/s}^2 \cdot 0.2}}{6.88 \text{ m/s}}$$

Evaluate Formula 

8) Stopping Sight Distance given Lag Distance and Braking Distance Formula

Formula

$$\text{SSD} = \text{LD} + \text{I}$$

Example with Units

$$82.7 \text{ m} = 34.7 \text{ m} + 48 \text{ m}$$

Evaluate Formula 

9) Stopping Sight Distance given Vehicle Velocity and Reaction Time of Vehicle Formula

Formula

$$\text{SSD} = V_{\text{speed}} \cdot t_{\text{reaction}} + \frac{V_{\text{speed}}^2}{2 \cdot [g] \cdot f}$$

Example with Units

$$80.8669 \text{ m} = 6.88 \text{ m/s} \cdot 10 \text{ s} + \frac{6.88 \text{ m/s}^2}{2 \cdot 9.8066 \text{ m/s}^2 \cdot 0.2}$$

Evaluate Formula 

10) Velocity of Vehicle given Braking Distance after Braking Operation Formula

Formula

$$v_{\text{vehicle}} = \sqrt{2 \cdot [g] \cdot f \cdot l}$$

Example with Units

$$13.7218 \text{ m/s} = \sqrt{2 \cdot 9.8066 \text{ m/s}^2 \cdot 0.2 \cdot 48 \text{ m}}$$

Evaluate Formula 

11) Weight of Vehicle given Kinetic Energy of Vehicle at Design Speed Formula

Formula

$$W = \frac{2 \cdot [g] \cdot F \cdot l}{v_{\text{vehicle}}^2}$$

Example with Units

$$275.2492 \text{ kg} = \frac{2 \cdot 9.8066 \text{ m/s}^2 \cdot 233 \text{ N} \cdot 48 \text{ m}}{28.23 \text{ m/s}^2}$$

Evaluate Formula 

12) Work Done against Friction in Stopping Vehicle Formula

Formula

$$W_{\text{vehicle}} = f \cdot W \cdot l$$

Example with Units

$$2208 \text{ J} = 0.2 \cdot 230 \text{ kg} \cdot 48 \text{ m}$$







Evaluate Formula 



Variables used in list of Stopping Sight Distance Formulas above

- **f** Coefficient of Friction
- **F** Maximum Frictional Force (Newton)
- **K.E** Kinetic Energy of Vehicle at Design Speed (Joule)
- **I** Braking Distance (Meter)
- **LD** Lag Distance (Meter)
- **SSD** Sight Stopping Distance (Meter)
- **t_{reaction}** Reaction Time (Second)
- **V_{speed}** Vehicle Speed (Meter per Second)
- **v_{vehicle}** Velocity (Meter per Second)
- **W** Total Weight of Vehicle (Kilogram)
- **W_{vehicle}** Work done against Friction (Joule)

Constants, Functions, Measurements used in list of Stopping Sight Distance Formulas above

- **constant(s):** [g], 9.80665
Gravitational acceleration on Earth
- **Functions:** 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: Time** in Second (s)
Time Unit Conversion 
- **Measurement: Speed** in Meter per Second (m/s)
Speed Unit Conversion 
- **Measurement: Energy** in Joule (J)
Energy Unit Conversion 
- **Measurement: Force** in Newton (N)
Force Unit Conversion 



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