

Topic

## Impact

Governing Equations and Assumptions

Conservation of Momentum for the system

$$M_A V_{A_{LI_1}} + M_B V_{B_{LI_1}} = M_A V_{A_{LI_2}} + M_B V_{B_{LI_2}}$$

$$e = \frac{V_{B_{LI_2}} - V_{A_{LI_2}}}{V_{A_{LI_1}} - V_{B_{LI_1}}}$$

Along the Line of Impact

$$\left. \begin{aligned} V_{APC_2} &= V_{APC_1} \\ V_{BPC_2} &= V_{BPC_1} \end{aligned} \right\} \text{Oblique Impact}$$

Process

- ① Decide which type of impact is occurring
- ② Apply the conservation of momentum for the system of particles along the line of impact
- ③ Apply the coefficient of restitution equation along the line of impact
- ④ Solve for the velocity components along the line of impact
- ⑤ If an oblique impact, solve for the velocity components along the plane of contact, and then the total velocity