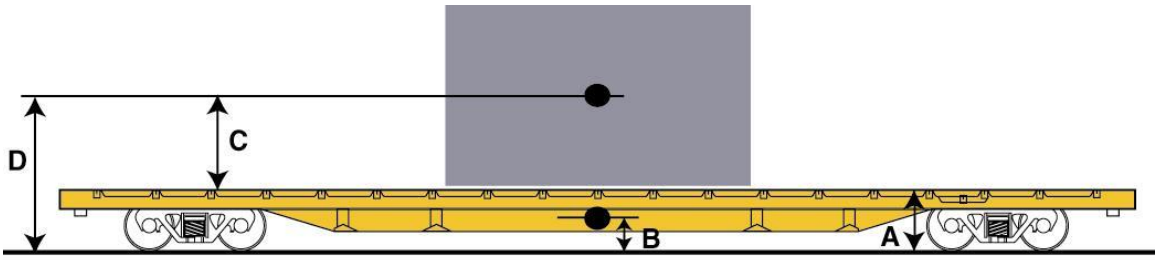
Railway Association of Canada

CENTER OF GRAVITY

Corresponding AAR Open Top Loading Part 5, Section 1

Rule 89, Section C, found in Field Manual of the AAR Interchange Rules governs acceptable centers of gravity for interchange purposes. Which states "Acceptable in interchange, loaded cars who's combined center of gravity of a car and load less than or equal to 98 inches at top of rail (ATR), except for cars that do not comply with AAR Office Manual Rule 88, Section C which must not exceed 90 inches.

Determining Center of Gravity



The following information is necessary to determine the combined center of gravity (CG) of a loaded open top car.

A = Height of car deck in inches from top of rail.
B = CG of car above top of rail (ATR) in inches, obtainable from car owner.
C = CG of load from base of load in inches, obtainable from shipper.
D = Combined height of CG of load, (C), plus height of car deck, (A), that is (C) + (A).
E = Lightweight of car, in pounds, as stenciled on car.
F = Weight of load in pounds, obtainable from shipper.

The calculation to arrive at the center of gravity is as follows:

$$\frac{(B \times E) + (D \times F)}{E + F} = \text{Combined center of gravity above top of rail}$$

Example:
A =44in.
B =27in.
C =60in.
D = (60 + 44) = 104 in.
E = 55,000 lb
F = 120,000 lb

Formula:

$$\frac{(B \times E) + (D \times F)}{E + F} = \text{C.G. A T R}$$

$$\frac{(27 \times 55{,}000) + (104 \times 120{,}000)}{55{,}000 + 120{,}000} = \text{C.G. ATR}$$

$$\frac{(1{,}485{,}000) + (12{,}480{,}000)}{175{,}000} = \frac{13\,965\,000}{175\,000} = 79.8 \text{ in. ATR}$$