

# **Analysis of a Straight Ladder Slippage**

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$$a = \frac{\sum W_i a_i}{\sum W_i} > 0 \quad (3)$$

where  $a$  is the point of application of  $W$  along the ladder as shown in Figure 1. The relationship between the two friction forces can be obtained from Eq. 2:

$$F_A = \frac{W}{2} \frac{a}{L} \sin 2\alpha - F_B \cos \alpha \quad (4)$$

Since  $F_A$  should be positive, this result indicates that the friction force at the bottom of the ladder is always larger than the friction force at the top of the ladder. For similar COF at A and B it means that the friction force  $F_A$  will reach it



