

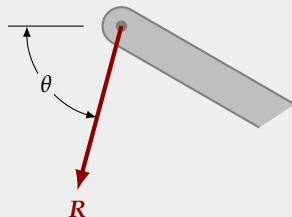
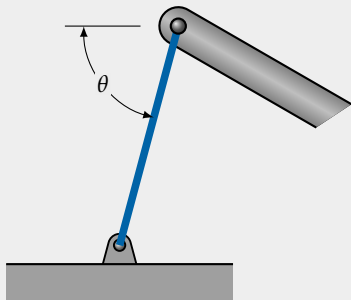
06 Equilibrium of Rigid Bodies

Engineering Statics

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- ▶ Much of the study of statics involves the calculations of reaction forces generated between a structural body and its supports when loads are applied.
- ▶ There are various connection types used between a structural body and its supports. These connections influence the direction and the sense of the reaction. We shall examine some of these connections now.

Types of Connections: Cable

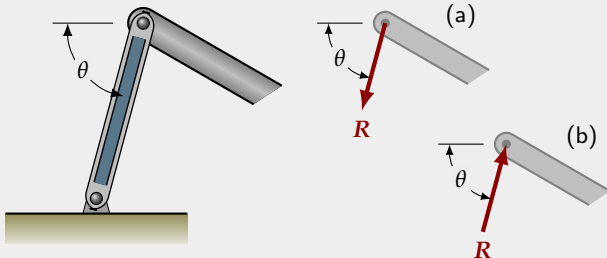


When a structural member or body is supported by a cable (or rope or chain), the cable is assumed to be weightless (and consequently straight) and the cable exerts a reaction on the structural member **in the same direction** as the cable.

A cable is in tension and can only **pull**; it cannot push.

There is only one unknown: the magnitude of the force. The direction and sense of the force are known.

Types of Connections: Strut



Like a cable, a straight strut (or link) exerts a reaction on a structural member in the direction of the strut. Unlike a cable, a strut can pull or push.

If we don't know whether a strut is pushing or pulling, we generally assume that the reaction is directed away from the structural member (pulling, in tension). If our calculations then determine that F is negative, the direction is opposite to our assumption (i.e., pushing) (b).

As with the cable, there is only one unknown. The sign of F determines the sense of F .