

Section 4.6. Representing Systems by Equivalent Systems

Note. We desire to replace a system of forces and moments by an equivalent system consisting of a single force \vec{F} and a single moment \vec{M} . The conditions for equivalence are:

1. $\left(\sum \vec{F}\right)_1 = \vec{F}$, and
2. $\left(\sum \vec{M}_P\right)_1 = \vec{M}_P$.

Example. Page 192 Number 4.153.

Definition. A *wrench* is a force \vec{F} and a couple \vec{M}_P that is parallel to \vec{F} .

Note. Any system of forces and moments can be represented by a wrench (and a wrench is the simplest such system).

Example. Page 195 Number 4.167.

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