Forklift Capacity at a Longer Load Centre

Reduced lifting capacity of a counterbalance forklift when the load centre is further out than rated, by moment balance about the front axle.

Method: Moment balance about the front axle (definitions)

Input parameters

Unit system: SI

Parameter	Value	Unit
Rated capacity	3,000.0	kg
Rated load centre	500.00	mm
Actual load centre	800.00	mm
Front axle to fork face distance	450.00	mm

Calculated results

Parameter	Value	Unit
Capacity at the actual load centre	2,280.0	kg
Derating	76.000	%

Notes for this case

- Moment balance only: always use the maker's capacity plate, which also accounts for mast height, tilt and attachments.

Formula and method

$$Q = \min\left(Q_r,\ Q_r \frac{a + c_r}{a + c}\right)$$

Variables

Q_r	Rated capacity	kg
c_r	Rated load centre	m
c	Actual load centre	m
a	Front axle to fork face distance	m
Q	Capacity at the actual load centre	kg
Q/Q_r	Derating	-

Method and standards

Moment balance.

Assumptions and limits

- Rigid truck on level ground. A load centre shorter than rated does not raise the capacity above Q_r.

References

- Moment balance about the front axle (definitions)

Report details

Report reference	FCC-WF8X-WZBC (the same inputs always give the same reference)
Generated	17 November 2026, 19:45 UTC
Calculator	Forklift Capacity at a Longer Load Centre
Method last reviewed	13 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/mechanical/material-handling/forklift-load-centre-derating

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.