Wheel Offset, Backspacing and Track Change

Backspacing and front spacing of a wheel from rim width and offset (ET), and the change in inner clearance, outer position and track when fitting a second wheel.

Method: Wheel fitment geometry

Input parameters

Unit system: SI

Parameter	Value	Unit
Rim width, wheel 1	7.0000	in
Offset, wheel 1	45.000	mm
Rim width, wheel 2	8.0000	in
Offset, wheel 2	35.000	mm
Flange allowance per side	12.700	mm

Calculated results

Parameter	Value	Unit
Backspacing, wheel 1	146.60	mm
Backspacing, wheel 2	149.30	mm
Inner edge moves inwards by	2.7000	mm
Outer edge moves outwards by	22.700	mm
Track change per axle	20.000	mm

Notes for this case

• Offset ET is measured from the rim centreline to the hub face (positive towards the outside). Backspacing = overall width/2 + ET. Lower offset or wider rims push the wheel out: check scrub radius, arch clearance and hub bearing load.

Formula and method

$$BS = \frac{W + 2f}{2} + ET, \quad \Delta T = 2(ET_1 - ET_2)$$

Variables

W_1	Rim width, wheel 1	m
ET_1	Offset, wheel 1	m
W_2	Rim width, wheel 2	m
ET_2	Offset, wheel 2	m
f	Flange allowance per side	m
BS_1	Backspacing, wheel 1	m
BS_2	Backspacing, wheel 2	m
Δ_{in}	Inner edge moves inwards by	m
Δ_{out}	Outer edge moves outwards by	m
ΔT	Track change per axle	m

Method and standards

Fitment geometry.

Assumptions and limits

- Rim width as stamped; flange thickness approximated.

References

Wheel fitment geometry

Report details

Report reference	FCC-RQXA-V5RX (the same inputs always give the same reference)
Generated	23 November 2026, 17:50 UTC
Calculator	Wheel Offset, Backspacing and Track Change
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Software release	FireCAD Calc, release of 22 November 2026
Release checks	3 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/automotive/tyres-wheels/wheel-offset-backspacing

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.