Torque Wrench Selection, Use and Calibration — ISO 6789

cBallast · ISO 6789:2017 · Selection + calibration

Wrench types

Type	Class	Range	Best for
Beam / deflection	Class I ±4%	0-350 Nm	Simple, robust, occasional use
Dial-indicator	Class I ±4%	0-3000 Nm	Bench, lab, calibration reference
Click mechanical	Class II ±4%	1-2000 Nm	Production, general workshop
Digital electronic	Class I/II ±2%	0.3-2000 Nm	Critical joints, data logging
Torque multiplier	Input × ratio	200-100,000 Nm	Heavy bolts, wind turbines
Hydraulic	±3%	500-200,000 Nm	Large-flange, offshore, mining

Class I vs Class II

Class I "Indicating" — continuously displays applied torque (scale/dial/digital). Operator reads and stops at target. Class II "Setting" — pre-selected torque, mechanical click/break/slip signals stop. Class I visibility on actual applied torque; Class II repeatability across many joints without readback. Both ±4% new, same calibration interval.

Correct use

1) Set to zero after use — click-type spring drifts under sustained load. 2) Grip at marked pivot point — moment arm calibrated from tip to specific grip. 3) Pull, do not push — safer + more controlled. 4) Steady, slow application — jerking gives digital peak-detection error and over-clicks click-type past setpoint. 5) Never break out stuck bolts — use plain breaker bar.

Unit conversion

From	To	Multiply by
Nm	ft-lb	0.7376
ft-lb	Nm	1.3558
Nm	in-lb	8.851
in-lb	Nm	0.1130
ft-lb	in-lb	12.0
kg-m	Nm	9.807

Calibration frequency

Use pattern	Interval
Critical safety (aerospace, nuclear, wheel-lug)	3-6 mo or 1,000 cycles
Production line	6 mo or 5,000 cycles
General workshop maintenance	Annual or 2,500 cycles
Occasional hand tool	Annual if > 100 uses
After drop/shock	Immediate re-verification

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