

Box terminal tightening strategy for CBI circuit breakers

Most modern factories have incorporated the use of smart transducerized electric screwdrivers. These screwdrivers can improve production quality and throughput by detecting any potential fastener tightening defects. The control systems for this tool should be programmed to use the best tightening strategy for a particular application.

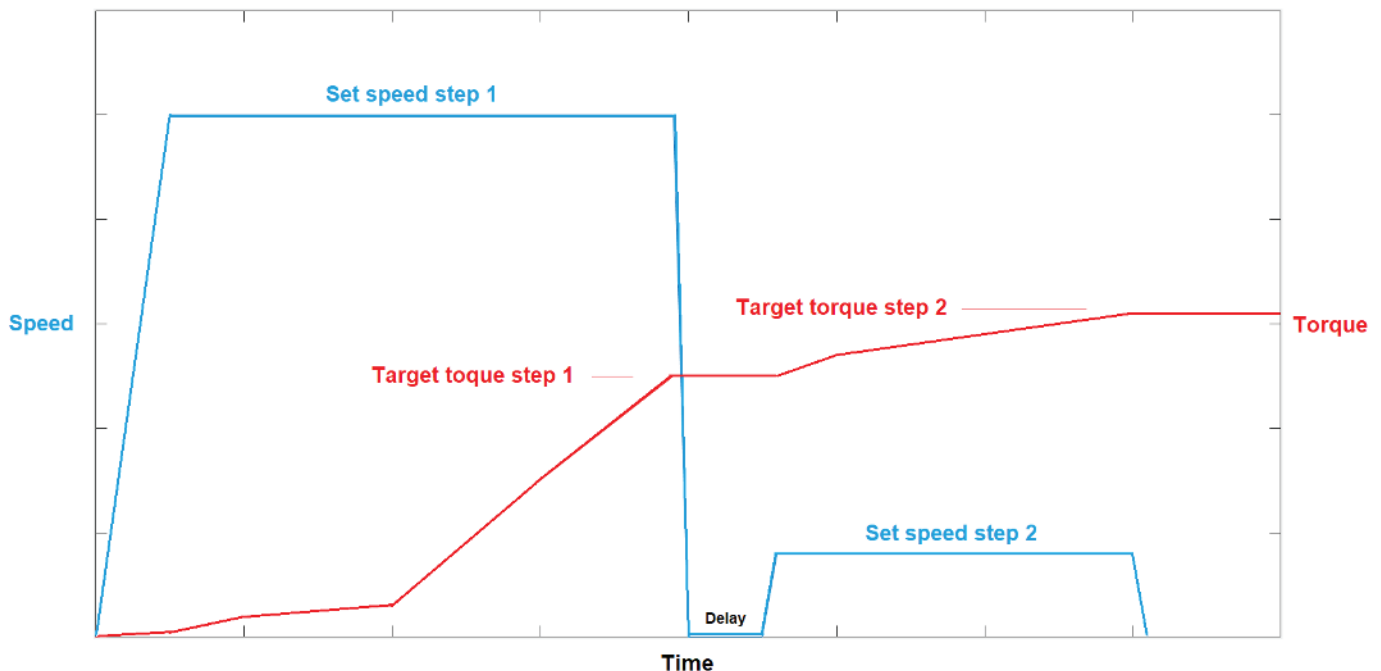
This guide will give some recommendations for the best strategy to tighten clamp box terminals as used across CBI product ranges. The clamping force in any screw joint is a function of tightening speed, screw friction and final torque value. Short term relaxation effects could also have an impact in box terminals where cable strands are compressed.

The recommended strategy aims to improve connection quality and ergonomics while maintaining high factory throughput.

Two-step tightening strategy

The two-step tightening strategy is as the name suggests two steps. The aim of the first step is to close the box terminal as quickly as possible to a set torque value. A speed of between 40-60 RPM is recommended for hand-held tools. The target torque of the first step should be no more than 70% of the required ultimate torque value. To further counteract short-term relaxation effects in the joint, a pause time of at least 100 ms is recommended. The exact pause time should be chosen to improve ergonomics for hand-held tools.

The second step's target torque should be set to the ultimate torque value as specified by CBI for a particular circuit breaker range. The speed of the second step should be set between 5-10 RPM with a lower value being preferred to avoid overshoot and limit dynamic-static friction discrepancies.



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