

Steel Tek Screw Installation Guide

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Purpose

Most snapped tek screws are a tool and technique problem, not a screw problem. Fastener manufacturers and industry bodies are consistent on it: self-drilling screws into steel should be driven with a variable-speed drill driver or screw gun with a clutch, at 2,000 rpm or less, and never with an impact driver.

This guide applies to any steel self-drilling (tek) screw, whatever the brand or box it came from, when fixing fittings (EzyEnds, insulators, Shockcoat brackets, gate latches and similar) to Duncan Equine 4 mm hot-dip galvanised steel posts. It is for Duncan Equine staff, contractors and customers. Hand it out with the screws, link it from quotes, and point to it when a customer reports breakages.

The screw

A steel tek screw for our posts is a 12g (or 14g) hex-head self-drilling screw with a No. 3 drill point and a galvanised or equivalent corrosion coating. The point number is the spec that matters most and it is printed on every reputable box.

Spec	What to use in 4 mm HDG steel	Why it matters
Gauge / thread	12g-14 or 14g-10 (coarse metal thread)	Coarse threads suit 3 to 6 mm steel. Fine threads (12-24) are for thick section and strip more easily in 4 mm
Drill point	No. 3 (flute about 8 mm)	The flute must be longer than the steel is thick, so the hole is finished before the threads bite. No. 3 covers roughly 2.5 to 6 mm. A No. 2 point (up to about 3.5 mm) is marginal in 4 mm; a No. 5 is for 6 mm and over and is slow and hard on the tool
Length	25 to 38 mm depending on the fitting	Only the thread past the fitting needs to be in the post. Longer is not stronger, and extra length is more shank to snap

Spec	What to use in 4 mm HDG steel	Why it matters
Coating	Class 3 or 4 galvanised, mechanical galv, or a proprietary coating rated for external use	Plain zinc electroplate rusts fast outdoors and, on a hardened screw, carries a hydrogen embrittlement risk. Stainless (304/316) drills poorly in 4 mm steel unless it has a hardened carbon-steel tip (bi-metal)
Head	Hex washer head, 5/16 in (8 mm) drive	Drive with a magnetic hex nut-setter, never a Phillips or square bit

How a self-drilling screw works, in one line: the point drills a hole, the plain shank clears the swarf, then the threads form their own thread in the steel and the head clamps the fitting. Each stage needs the right speed, and none of them wants hammering.

The right tool: drill driver or screw gun, not an impact driver

Use a variable-speed drill driver or a dedicated screw gun with an adjustable clutch. Do not use an impact driver. This is the single biggest factor in whether a tek screw drills cleanly and seats, or burns, strips or snaps.

Tool	Verdict	Why
Screw gun with clutch and depth nose-piece (DeWalt DCF622, Hilti ST1800/ST2000, Fein ASCM, Makita FS series)	Best	Built for this job: 0 to 2,000 rpm, adjustable torque, releases the screw when the head seats. Industry guidance names this as the correct tool
Cordless drill driver, clutch set, speed kept under 2,000 rpm	Good	What most fencers already carry. Works well if the clutch is set so it slips as the head seats and the trigger is feathered
Impact driver	Do not use	No clutch, so it keeps hammering after the head seats. Rapid torque spikes shock a case-hardened screw. Documented results: burnt or broken drill points, snapped heads and shanks, stripped threads, chipped coating

Tool	Verdict	Why
High-speed drill at 3,000 rpm or more	Do not use	Burns the drill point before it cuts through; the screw then spins and polishes the steel instead of drilling
Drywall screw gun	Do not use	Too fast, no torque for 4 mm steel

If you run Milwaukee. Milwaukee does not make a dedicated metal-screw gun; the M18 FUEL drywall screw gun (M18 FSGC) tops out at 4,500 rpm and is a drywall tool, so leave it on the shelf for tek screws. The right Milwaukee tool is the drill driver.

Milwaukee tool	Use for tek screws?	How to set it
M18 FUEL drill driver (M18 FDD3, FDD2, or the hammer-drill FPD3/FPD2 in drill mode)	Yes	Gear 1 is 0 to 500 rpm, gear 2 is 0 to 2,100 rpm. Use gear 2 at part trigger (or gear 1 flat out for thick steel). Turn the collar off the drill symbol onto a clutch number and find the setting that slips as the head seats, usually in the middle third of the range. Hammer off
M12 FUEL drill driver (M12 FDD2)	Yes, for light use	0 to 1,700 rpm in gear 2; same clutch method. Less torque, so expect to feather the trigger more in 4 mm steel
M18 FUEL impact driver (M18 FID3, FID2)	No	0 to 3,900 rpm and up to 4,400 impacts a minute with no clutch. Milwaukee's Self-Tapping Screw mode (on models that have it) slows the start and eases off at the end, which is an admission of the problem, not a cure. If a crew will only carry an impact, that mode at its lowest setting is the least-bad option, and broken screws are then on the tool, not the screw
M18 FUEL Surge hydraulic driver (M18 FQID)	No	Quieter and softer than a conventional impact but still an impact mechanism with no clutch

The same logic applies to Makita, DeWalt, Bosch and Hikoki kits: use the drill driver with the clutch engaged, not the impact driver sitting next to it in the case.

What the industry says. SFS, the UK Metal Cladding and Roofing Manufacturers Association (MCRMA) and the National Federation of Roofing Contractors (NFRC) list it plainly: do not install self-drilling fasteners with an impact driver or a drywall screw gun. The US Metal Construction Association, National Frame Building Association and Canadian Sheet Steel Building Institute give the same advice. Fastener makers quoted in Metal Construction News put it as "a screw gun, not a drill or impact driver, is what you

need", and note that impact drivers have no clutch to prevent over-driving. DeWalt's self-drilling screw bulletin publishes a maximum rpm per screw and warns that exceeding it damages the drill point.

Why an impact driver breaks tek screws. A tek screw is case hardened: a hard skin so the point can drill steel, over a softer core. That skin is strong in torsion when loaded smoothly but brittle under shock. An impact driver delivers thousands of hammer blows a minute, and keeps delivering them after the head is seated. The screw either shears at the head-to-shank junction, snaps in the thread, or strips the thread it just cut in the post. On galvanised screws the hammering also flakes the coating off the head, which is where rust starts.

Speed, pressure and technique

Slower and steadier beats fast and hard. The settings below are drawn from SFS, MCRMA/NFRC, the ICC evaluation report for Buildex Tek's and DeWalt's bulletin, applied to a 12g No. 3 point in 4 mm steel.

Setting	Target	Notes
Speed	1,000 to 1,800 rpm	Never above 2,000 rpm. Thicker steel wants the lower end. Most 18 V drill drivers are 0 to 500 rpm in low gear and 0 to 1,800 or so in high: use high gear at part trigger, or low gear flat out
Clutch	Mid-range to start, then adjust	Set so the clutch slips just as the head pulls the fitting tight. Too low and the screw stops short; too high and you strip the thread or snap the head
Pressure	Firm, steady, square to the post	Enough to keep the point cutting (you should see a continuous curl of swarf). Leaning body weight on it heats the point and burns it, especially in thicker hot-rolled steel
Angle	90 degrees to the surface	Driving on an angle loads the shank sideways and is a common cause of snapped heads
Driver bit	Magnetic 5/16 in hex nut-setter, clean and unworn	Swap it when it starts to wobble or chips build up in the magnet; typically every 2,000 to 5,000 screws

Setting	Target	Notes
Lubricant	Not normally needed	A cutting or anti-seize spray can help on hard spots but is no fix for wrong speed or tool

Signs you are going too fast or too hard: a blued or blunted point, smoke, the screw spinning without biting, or a polished dimple in the galv with no hole. Back off the speed and let the point do the work.

Signs of over-driving: the fitting crushed or dished under the head, the head sitting below flush, or the screw suddenly spinning free after it was tight. That last one means the thread has stripped; move 20 mm along and use a fresh screw.

Step by step

1. Fit a clean magnetic 5/16 in hex nut-setter to a drill driver or screw gun. Put the impact driver back in the ute.
2. Set the drill to high gear and the clutch to about the middle of its range. On a screw gun, set the depth nose-piece so the head stops flush.
3. Hold the fitting (EzyEnd, insulator, bracket) hard against the post so there is no gap. The screw should fasten the fitting, not pull it into place.
4. Seat the screw in the nut-setter and present it square to the post, 90 degrees in both directions.
5. Start at low speed with firm pressure until the point has bitten and a hole is started. Then bring it up to around 1,000 to 1,800 rpm and keep the pressure steady until the point is through. Expect two to four seconds in 4 mm steel.
6. Feel for the threads engaging: the screw pulls itself in and the sound changes. Ease the trigger as the head approaches the fitting.
7. Stop the moment the head is flush and the fitting is tight. If the clutch slips, that is the signal. Do not give it one more squeeze.
8. Check the result: head flush, fitting tight, no crushing, coating intact. If the screw spins free, it has stripped; do not re-drive it, move along and start again.
9. Clear swarf from the nut-setter magnet every dozen screws or so.

First screw of the day: drive one into an offcut or a hidden spot and adjust the clutch before you start on the fence.

Why screws snap, and how to tell the causes apart

When a customer reports broken screws, ask when they broke and look at the break. The pattern usually points to one of five causes, and only one of them is the screw.

What happened	Likely cause	What to look for	Fix
Head sheared off while driving	Impact driver, or clutch set too high	Clean torsional break right under the head; several in a row from the same operator	Change tool, drop the clutch setting, ease off as the head seats
Snapped in the thread while driving	Threads engaged before the point was through (steel too thick for the point, or screw driven on an angle)	Break part way down the shank; hole only partly drilled	Check point number against steel thickness; drive square
Point burnt, screw spinning, no hole	Too fast, or too much pressure, or a worn point	Blue or rounded tip; polished mark on the galv	Slow to 1,000 to 1,800 rpm, steady pressure, fresh screw
Screw tight, then spun free	Over-driven, thread stripped	Head below flush, fitting crushed; screw turns with no resistance	Clutch lower; new hole 20 mm along
Broke weeks or months later in service	Load, not installation: horses leaning or pushing through, rail anchored to the wrong post, fence pulling over	Breaks at random times; often on end posts or where the rail starts on the second post instead of the gate post	Fix the layout and the load path
Broke on driving, from several boxes, with careful technique	Screw quality (embrittlement or poor heat treatment)	Brittle, glassy fracture face; happens with different operators and tools	Quarantine the batch and send samples back to us

On hardness: a snapped tek screw that drills out easily is not proof of a soft screw. The core of a case-hardened screw is meant to be softer than the skin, and a conventional HSS bit will go through it. Judge a screw by whether it drills 4 mm steel cleanly at the right speed and seats without stripping, not by how it drills out afterwards.

Quick reference

Do

- Use a drill driver or screw gun with the clutch set
- Keep speed under 2,000 rpm; 1,000 to 1,800 rpm in 4 mm steel
- Drive square to the post with firm, steady pressure
- Hold the fitting tight to the post before you start
- Stop when the head is flush and the clutch slips
- Use a clean magnetic 5/16 in nut-setter and replace it when worn
- Test the first screw on an offcut and adjust the clutch

Don't

- Use an impact driver
- Run a drill flat out at 3,000 rpm or more
- Lean your body weight on the drill
- Drive on an angle or use the screw to pull a fitting into place
- Give it "one more squeeze" after the head seats
- Re-drive a screw that has spun free
- Use a Phillips or square bit in a hex head

Print this page and put it in the toolbox. Questions: Duncan Equine 1800 259 365.

Sources

- [SFS Group, Guidance on Using Screw Guns \(Dec 2024\)](#) — under 2,000 rpm, no impact drivers or drywall guns, excessive end load burns the point; draws on MCRMA GD32 and NFRC GN01
- [Metal Construction News, Fit the Tool to the Fastener \(2019\)](#) — Atlas Bolt, Dynamic Fastener, Lakeside and Simpson Strong-Tie on screw guns vs drills vs impact drivers; rpm by steel thickness
- [Monster Bolts, TEK screw installation best practices](#) — under 2,500 rpm, clutch, no impact driver; cites NFBA, MCA and CSSBI

- [ICC-ES ESR-1976, ITW Buildex Tek's self-drilling screws](#) — maximum 1,800 rpm for No. 12 Tek's/5 and 1/4 in; 2,500 rpm for other sizes
- [DeWalt, Installation guidance for self-drilling screws \(technical bulletin\)](#) — maximum rpm per screw; burnt points mean too fast
- [Grabber, Self-Drilling Screw Selection Guide](#) — drill flute must exceed stack thickness; threads advance up to ten times faster than the flute cuts
- [All Points Fasteners, Tek Screw FAQ](#) and [Birmingham Fastener, Impact tools or screw guns](#) — screw makers do not recommend impact drivers; 2,000 rpm or less
- [US Patent 6,213,884, case hardened self-drilling fasteners](#) — electroplating hardened screws causes hydrogen embrittlement and cracking at the head or shank on driving