Episode Book

EPISODE #5514

Drilling Concrete: Jigs, Anchors, and Fidelity

PUBLISHED	24 September 2026 at 12:33 UTC
DURATION	20:53
LISTEN	myweirdprompts.com/episode/concrete-drilling-jigs-anchors/
HOSTS	Corn, Herman, Hilbert
SCRIPT MODEL	deepseek-flash
VOICES	chatterbox-regular (chatterbox-local)
PIPELINE	V5.2
BOOK GENERATED	19 October 2026 at 17:37 UTC

SYNOPSIS

Daniel wrote in with two questions that turn out to be one problem: drilling accurate holes in concrete, and matching anchors to hardware. We dig into why bits deflect off aggregate in concrete but follow the grain in wood, why a weaker cordless drill makes lateral drift worse (not better), and how the pilot-hole and steering techniques are mutually exclusive. Then we look at what actually exists for wall-capable drill guides — a maker category, not a tool brand category, where the trick is rigid wall gripping rather than soft sealing. Finally, the other end of the same operation: the same-size rule, why your bit might not cut the size printed on the shank, and what to do when the match just won't work.

TRANSCRIPT



Corn

There's a thing that happens in every apartment in this country, and it happens about three seconds after you've committed.



Herman

You've got the drill against the wall, the mark is exactly where you want it, and then the bit touches concrete and goes where it wants.



Corn

And you're standing there holding a hole that's eight millimeters to the left of the shelf bracket that's already drilled.



Herman

Which is why today's episode is about the two ends of one operation. The hole and the thing that goes in the hole.



Corn

Daniel sent us two questions and he's tagged them together under a word I like, which is fidelity. Here's what he wrote in this week. First question. Drilling perfect holes in walls, specifically concrete. He says it's hard to avoid lateral drift, particularly with a less powerful cordless drill against a hard substrate. He's seen jigs used in woodworking, the kind that clamp around something and you drill through the hole in the jig, and he wants to know whether variants exist that actually work on a wall. And if they do, how they differ from dust catcher products, which he says fulfil one function but seem very flimsy for this purpose.

Herman

He's right about the flimsy part.



Corn

Second question. Matching anchors to hardware. Anchors come in pairs, an anchor with a matching screw, but sometimes you're putting completely different hardware into the anchor. So when you're matching the drill bit to the anchor, do you get out a caliper, or what's the general process? He notes his most-used bit is an eight millimeter concrete masonry bit for the larger forty millimeter anchors that are standard here, and a six millimeter bit for the smaller type. But very occasionally, he says, the match just won't work.



Herman

That last sentence is the whole episode, honestly.



Corn

So where do we start with this?



Herman

With the number that makes it matter. The tolerance between a hole that's rock solid and a hole that pulls out under load is often less than a sixteenth of an inch. That's the gap. That's what we're working inside.



Corn

Which means the hole and the anchor aren't two separate jobs. They're one system, and they fail together.



Herman

Two failure modes organize everything we're going to say. One, the hole goes where you didn't aim it. Lateral drift. Two, the hole is the wrong size for the anchor. Sometimes because of the anchor type, sometimes because of the bit itself.



Corn

And the third thing, which is invisible and which we'll get to, is that the bit might not be cutting the size it says on the shank.



Herman

Right. But let's start with the drift, because that's Daniel's first question and it has the most interesting answer.



Corn

Why does concrete do this and wood doesn't?



Herman

Wood has grain, and grain is directional but it's soft. The bit follows the grain, and if you're careful you can work with it. Concrete is a composite. You've got cement paste and you've got aggregate, and the aggregate is hard rock of varying sizes. When the bit hits a pebble that's harder than the surrounding matrix, it doesn't cut through. It deflects. And with hammer action running, you're getting thousands of those impacts a minute, each one nudging the bit sideways.



Corn

So the bit isn't wandering because you're holding the drill badly. It's wandering because there's a rock in there.



Herman

There's a rock in there. The author of one of the 3D-printed drill guides I was reading put it exactly that way. No matter how slowly and carefully he started, the bit almost always hit a hard pebble and jumped away. Sometimes the hole was almost ten millimeters off, which he called a tragedy if you have a shelf with a mounting system that relies heavily on the position of the holes.



Corn

Ten millimeters. That's not a wobble. That's a different hole.



Herman

It's a different hole. And a less powerful cordless drill makes it worse, which is Daniel's specific situation. A weak drill means less rotational speed and less hammer energy, so you're tempted to push. And pushing is exactly what causes the bit to walk, because you're applying force the bit can't convert into cutting, and the force has to go somewhere.



Corn

So the answer isn't more pressure. It's less.



Herman

It's less pressure and more guidance.



Corn

Which brings us to the jigs.



Herman

The accepted answer on the DIY StackExchange thread about this is the pilot hole technique. You punch the mark with a center punch so the bit has somewhere to sit, then you drill a small bit, an eighth of an inch or smaller, and then you step up to the final size. The small hole guides the larger bit. It gives it a track.



Corn

That's cheap and it works.



Herman

It's cheap and it works. The same answer describes the wood jig method. You drill a hole of the size you need through a piece of wood, then you stick that wood to the wall with double-sided tape, and the hole in the wood keeps the bit from wandering. That's the woodworking jig Daniel's thinking of, adapted to a wall with tape instead of a clamp.



Corn

But there's a competing philosophy in that same thread.



Herman

There is. Another answer says, don't guide it, steer it. Let the bit walk, then deliberately angle the drill to bring it back on track. And the warning attached is that this doesn't work if you've drilled a pilot hole, because the pilot hole has already committed you to a track, and it requires a lot of practice.



Corn

So the two techniques are mutually exclusive.



Herman

They're mutually exclusive. You either commit to the line from the start or you correct after the fact. And I'll say, the steering technique is real and some people are very good at it, but it's a skill you develop over years, and it's not what you want to be learning on a shelf that has to be level.



Corn

So now Daniel's actual question. Do wall-capable jigs exist?



Herman

They exist. But they're not the jigs he's seen.



Corn

Explain.



Herman

The woodworking bench guides, the ones from UJK and Milescraft and Axminster, those hold bits and hole saws up to sixty millimeters, they drill at any angle up to about sixty degrees off vertical, and they set at ninety degrees for perpendicular holes. They're excellent. They're also bench devices or handheld devices. They don't clamp to a wall.



Corn

So they solve a different problem.



Herman

They solve the problem of drilling a perpendicular hole in a workpiece you can bring to the bench. What Daniel needs is something that grips a vertical surface while a hammer drill is trying to throw the bit sideways. And that's a different engineering problem, because the load is lateral and the surface is unforgiving.



Corn

So what exists?



Herman

The most interesting one I found is a 3D-printed design by a maker called Meiyo on Printables. It's a ring-shaped frame with a handle, and it takes swappable inserts in five hole sizes, and it's designed specifically for SDS hammer drilling into reinforced concrete.



Corn

What's the design insight?



Herman

Four wood screws, three and a half by twelve millimeters, protruding about two millimeters from the underside. You press the guide against the wall and those screws bite into the concrete. That's the grip. That's what counters the lateral force on the bit.



Corn

So the screws are the whole trick.



Herman

The screws are the whole trick. He tried a lot of techniques with no luck, in his words, and what he needed was something that physically grips the wall. Soft contact doesn't do it. You need something that bites.



Corn

And there's a materials lesson in there too.



Herman

The frame and handle print in rigid PLA or PETG, because you want stiffness. But the swappable inserts have to be heat tolerant and flexible, so TPU, because the heat from the bit will destroy PLA in no time. And the known failure pattern is that the insert can loosen from the hammering action, roughly one in twenty drills, especially if the slot is dusty.



Corn

One in twenty. That's a real number.



Herman

That's the honest number from someone who's used it. There's a second design, a concrete wall drilling aid, that supports five, six, eight and ten millimeter drills, uses horizontal and vertical alignment lines, and lets you see the bit tip through a single dot marking. That one recommends PLA because it's wear resistant.



Corn

Now the distinction Daniel actually asked about. How are these different from dust catchers?



Herman

A dust catcher's job is debris capture. Its wall contact is a soft foam or rubber rim, and that rim is there to seal against a textured wall so the dust falls into the cup instead of onto your floor. It's a sealing surface. It's not a bushing. It's not resisting lateral load.



Corn

So when Daniel says flimsy, he's describing the function, not the build quality.



Herman

He's describing the function exactly. The products are fine at what they do. The Dust Catcher, the Kärcher one, the POWERTEC 70450, they're plastic cups with TPV rubber edges for sealing. The POWERTEC is the exception because it adds an integrated drill bushing guide and a suction base that stabilizes the unit. So it's starting to do both jobs.



Corn

And there are hybrids now.



Herman

There are. The Mechanic HomeDUSTER 40 combines dust collection with a built-in ninety degree drilling guide and an integrated mirror guide ring so you can keep the angle. And there's a 3D-printed drill guide and dust catcher on Printables that does both jobs, and the numbers on that one are interesting. Around fifteen thousand eight hundred downloads, about three hundred makes, sixty-four thousand views, and two hundred fifty-four ratings averaging about four point eight eight.



Corn

That's a product people want.



Herman

And it tells you something. The line between dust catcher and drill guide is blurring because people keep trying to make one object do both, and the physics doesn't fully cooperate, because sealing wants soft and guiding wants rigid.



Corn

So here's the sub-thesis of this half of the episode.



Herman

Go ahead.



Corn

The wall-capable drill jig is a real category. But it's a maker category, not a tool brand category. And the physical principle that makes it work is rigid wall gripping. Screws biting the wall, or a bushing block pressed against it. Not soft sealing.



Herman

And that's the gap. I looked for a mainstream commercial version of this and I couldn't find one. No major tool brand sells a dedicated wall-clamping drill jig. What exists is 3D-printed designs and shop-made jigs, the plywood or aluminum kind with hardened drill bushings that people build for repeated same-size work. The Festool forum thread on this recommends jig material about three quarters of an inch to an inch thick to make sure the drill stays perpendicular.



Corn

So the answer to Daniel's first question is yes, but you're building it or printing it.



Herman

You're building it or printing it. Which is a strange place for the market to be, given how universal the problem is.



Corn

So that's the hole. Now let's talk about what goes into it.



Herman

Daniel's second question is really about the other end of the same operation. Matching the bit to the anchor.



Corn

And his instinct is that this is a fidelity problem.



Herman

It is. The dominant rule is the same-size rule. Anchor diameter equals drill bit diameter. That holds for wedge anchors, sleeve anchors, split-fast anchors, pin-drive and hammer-drive anchors, and metric through bolts. So an M8 anchor takes an eight millimeter bit. An M6 takes a six millimeter bit.



Corn

Which is exactly what Daniel's doing.



Herman

Exactly what he's doing. And his specific pairings check out. The Fischer DuoPower eight by forty millimeter plug specifies an eight millimeter drill bit, and it's rated to a hundred and ten kilograms maximum load. Sixty-two kilograms in solid wall, ten in hollow concrete, twenty-five in hollow brick, fifteen in plasterboard. So his eight millimeter bit for the forty millimeter anchor is correct.



Corn

And the six millimeter side?



Herman

Hilti Israel's HUS-CR six by forty screw anchor specifies a six millimeter drill bit. So his six millimeter bit for the smaller anchor is correct too. His conventions are right for the anchor types he's using.



Corn

So why does the match occasionally fail?



Herman

Because the same-size rule is a trap for the unwary. It works for the anchor types he uses, and it silently fails the moment you switch types.



Corn

Give me the exceptions.



Herman

Concrete screws, the Tapcon style, use a deliberately undersized pilot bit. A three sixteenths screw takes a five thirty-seconds bit. A quarter inch screw takes a three sixteenths bit. You're not matching the screw, you're matching the thread that has to cut into the concrete.



Corn

So the anchor is smaller than the hole would suggest.



Herman

The anchor is bigger than the bit. Then drop-in anchors go the other way. They use an oversized bit matching the outer shield, not the internal thread. A quarter inch drop-in takes a three eighths bit. An M8 drop-in takes a ten millimeter bit. And chemical anchors need a hole two to four millimeters oversize so the resin can flow around the rod. An M8 threaded rod with epoxy takes a ten millimeter bit.



Corn

So the same M8 anchor needs an eight, a ten, or a ten depending on what kind it is.



Herman

Depending on what kind it is. Through bolts, M6 to six, M8 to eight, M10 to ten, M12 to twelve, M16 to sixteen. Drop-ins, M6 to eight, M8 to ten, M10 to twelve, M12 to fifteen or sixteen, M16 to twenty. Same nominal size, completely different hole.



Corn

Daniel's occasional failure is probably one of those.



Herman

Probably. If he's ever picked up a drop-in or a concrete screw and reached for his usual bit, the rule that's worked a hundred times before quietly stops working.



Corn

Now the caliper question.



Herman

I looked for any source that recommends a caliper for matching bit to anchor, and I didn't find one. Not one. The universal advice is to read the manufacturer's stamped spec on the packaging and use the published chart. The anchor knows what hole it wants and it says so on the label.



Corn

The caliper is the wrong tool for that job.



Herman

For that job, yes. But here's where it gets interesting, because the caliper is exactly the right tool for a different job, and it's the job Daniel doesn't know he has.



Corn

The bit.



Herman

The bit. A worn carbide tip cuts an undersized hole even though the bit is stamped with the correct nominal diameter. A half inch bit that's drilled a hundred holes in reinforced concrete may now be cutting fifteen thirty-seconds. That's undersized enough that a half inch wedge anchor will bend or jam.



Corn

The bit that says eight millimeters might be cutting seven point eight.



Herman

It might be cutting seven point eight, and you'd never know, because the shank still says eight. And that is a common, invisible cause of anchor failure. The advice attached to it is to measure heavily used bits periodically. That's the caliper's documented use. The bit.



Corn

Daniel's caliper instinct is right, just pointed at the wrong object.



Herman

Pointed at the wrong object. Measure the bit, not the anchor.



Corn

There's a flip side, which is that masonry bits sometimes cut oversize.



Herman

Standard masonry bits tend to produce a slightly oversized, rougher hole, and they dull quickly, which makes it worse. So you've got two directions of error. A fresh cheap bit cuts rough and slightly wide. A worn good bit cuts smooth and slightly narrow. Neither one matches the nominal size on the label.



Corn

Which means the fit you get is a distribution, not a number.



Herman

It's a distribution. And the anchor has to work across that whole distribution.



Corn

What else kills the fit?



Herman

Wallowing. If you angle the drill or spin it on withdrawal, you wallow the hole out into a cone shape. That's one of the most common causes of anchor installation failures, because the anchor's expansion is now happening in a hole that's wider at the mouth than at the base.



Corn

And dust.



Herman

Dust acts like a dry lubricant. It reduces the friction that expansion anchors rely on to hold. So you have to blow the hole out every time, and you have to drill a quarter inch to half an inch deeper than the embedment depth, so the anchor doesn't bottom out on debris before it's fully seated.



Corn

And the maintenance numbers?



Herman

Keep a spare bit per seventy-five to a hundred holes, and buy about ten percent more anchors than you think you need. Because some of them are going into holes that aren't what you planned.



Corn

Here's the sub-thesis for this half.



Herman

Go on.



Corn

The same-size rule is a trap for the unwary. It works for the anchor types Daniel uses, and it silently fails the moment he switches to a concrete screw or a drop-in. And the most common cause of a bad fit isn't the anchor or the bit size on paper. It's the bit's actual condition and the hole's actual shape.



Herman

The hole is where the battle is won or lost. The anchor is where you find out whether you won.



Corn

Which is a good place to be. Because the anchor is eight millimeters.



Hilbert

Eight millimeters is the plug. The bit's the problem.



Corn

Sorry, go on.



Hilbert

I did a summer at a cinema. Small place, concrete block walls, decades of shelving and projector brackets and signage all bolted into the same two walls. My job was patching and re-drilling. And the thing that beat me wasn't drift and it wasn't bit size. It was that every hand before me had drilled into the same spot and left the old anchor in. So I'm drilling into a wall that's already full of metal and plastic, and the bit catches on something two centimeters in and goes sideways, and now I've got a hole next to a hole.



Corn

The wall is a record of everyone who's worked on it before.



Hilbert

The wall is a record. And nobody tells you that. You look at a wall and it's flat and painted and you assume it's empty. It's not empty. It's got forty years of other people's decisions in it.



Corn

How did you deal with it?



Hilbert

Magnet on a string. I'd dangle it against the wall and watch it twitch. When it twitched, there was old hardware under the plaster. Saved me from hitting old screws more times than I can count.



Corn

That's a very low tech solution to a problem nobody else in this episode has mentioned.



Hilbert

It's a magnet on a string. It cost nothing. I still have the string. The magnet went with the job.



Herman

Before you drill, you're mapping the wall for what's already in it.



Hilbert

You're mapping the wall. The drill guide doesn't help you if there's a screw anchor sitting where you want the hole. That's a different problem. Anyway, I have to collect something from a place that closes at six, and I'm not sure I'll make it.



Corn

The wall is a palimpsest. That's the word. Every hole you drill is being drilled into a surface that other people have already drilled.



Herman

That's a dimension we didn't have. The bit and the anchor are the system. The wall is the history.



Corn

Which leaves us with a open question. There's no dedicated commercial wall-clamping drill jig from a major tool brand. The wall-capable solutions are overwhelmingly printed or shop-made. Is that a real gap in the market, or is the demand just too small to bother tooling up for?



Herman

My guess is it's a gap that's closing from below. As more households have a printer, the wall-capable drill guide becomes a printed accessory rather than a niche maker project. And the hybrids are already blurring the line. The dust catcher with a bushing guide, the guide with a dust cup. The market's figuring out that people want both.



Corn

The thing to hold onto is the system view. The hole and the anchor are one operation, and the tolerance between rock solid and pulls out under load is less than a sixteenth of an inch. The best tool for getting it right the first time might be a caliper on your bit, not your anchor.



Herman

Thanks as always to Hilbert Flumingtop, who produces the show and who has a magnet on a string somewhere.



Corn

This has been My Weird Prompts.



Herman

If you enjoyed this episode, please leave a review on your podcast platform of choice. It helps other listeners find the show.



Corn

We'll be back soon.