Episode Book

EPISODE #5675

Wiring a UK Plug: Copper, Tools, and the 1mm Rule

PUBLISHED	2 October 2026 at 13:10 UTC
DURATION	23:54
LISTEN	myweirdprompts.com/episode/uk-plug-wiring-copper-tools/
HOSTS	Corn, Herman, Hilbert
SCRIPT MODEL	deepseek-flash
VOICES	chatterbox-regular (chatterbox-local)
PIPELINE	V5.2
BOOK GENERATED	19 October 2026 at 17:38 UTC

SYNOPSIS

Wiring a UK plug looks like a fifteen-minute job, but the gap between "it works" and "it's safe" hides in details you can't see once the cover goes on. This episode works through a listener's full checklist: how much copper to strip from each conductor, whether that widely-quoted one-millimeter tolerance is a target or a boundary, why strip lengths across UK guides range from five to ten millimeters, and why one stray strand can bridge live and neutral inside the plug body. We also cover the tool upgrade most guides never mention — a flush precision side cutter instead of electrician's scissors — the endorsed twist technique, the debated doubling-over trick, and the outer sheath and cord grip problem that trips up even careful DIYers.

TRANSCRIPT



Corn

Wiring a plug is one of those things almost every household in Britain learns at some point. You cut back the sheath, you trim three conductors, you tighten three screws, you close it up. Fifteen minutes, maybe. And yet the gap between a plug that works and a plug that's safe lives almost entirely in details you can't see once the cover goes on.



Herman

Which is exactly what makes it worth an episode. It's a learnable skill, anyone can do it, but the failure modes are quiet. A plug wired badly today works fine for a year and then does something unpleasant.



Corn

Right, and that's what Daniel's getting at. He wrote in with a whole list, and I'll put it across properly because he's asking about specifics. His first question: how much copper do you actually strip from each conductor? He says the way he was taught is that you strip just enough to get the copper under the locking screw. No copper past the screw, and ideally none before it either. Then he asks whether there's any margin at all for exposed copper just before the terminal. Even a millimeter of it. Is that ever safe?



Herman

That's the good version of the question, because almost every guide will give you a number and almost none of them will tell you what kind of number it is.



Corn

And he keeps going. He's noticed that different plug heads have slightly different geometries, so even if your wire stripper is dialed in perfectly, you can end up with exposed copper that isn't quite to size. For tiny trims he uses electrician's scissors, but he suspects there's a better tool for the job and wants to know what it's called. He asks why even one stray strand is unacceptable, and what the best way is to straighten stranded copper so it sits properly under the screw. He does it with a twisty motion between his fingers until the strand goes rigid.



Herman

That's the right instinct, by the way. He's already doing the thing the guides recommend.



Corn

Last stretch. He wants to know how to strip the outer sheath to exactly the right length, because in his experience it's very hard to get precisely right. Sometimes you can't make every terminal connection while keeping the sheath exactly at the screw-in point at the bottom of the plug head. And then he wants the two lists to tie it together. Three most important mistakes to avoid, three best safety practices to follow every time.



Herman

Good. That's a full afternoon of work. Shall we start with the copper?



Corn

Start with the copper.



Herman

So the number Daniel's asking about is one millimeter. That's the figure you'll find repeated across UK guides, and it's the answer to his question. Yes, there's a margin. No, it isn't a target. Leads Direct put it about as plainly as anyone does, and their framing sticks, because they say there should only be enough copper exposed to match the depth of the terminal, there must be no cuts, nicks, or damage to any of the insulation, and no more than a millimeter of exposed copper outside the terminal. Finney Electrical states the identical figure, almost the same sentence. Retaining screw directly on top of the copper, not the insulation, and no more than one millimeter beyond the terminal.



Corn

So the rule Daniel was taught and the one millimeter tolerance aren't in conflict. One is the goal, the other is the outer edge of acceptability.



Herman

Exactly right. And it's worth being precise about what that millimeter is. It's not a safety feature. Nobody is designing a plug with a millimeter of decorative exposed copper. It's a tolerance for human error. The standard is zero. The millimeter is how far off you're allowed to be before it becomes a genuine problem.



Corn

Which means if you're standing there looking at a millimeter of shiny copper between the insulation and the terminal and telling yourself it's fine because the guides say one millimeter... you've misunderstood what the guides are telling you.



Herman

You've found the boundary and you're standing on it. Which is a strange place to spend your afternoon when cutting it again takes four seconds.



Corn

Now here's the interesting bit. The recommended strip lengths don't agree with each other. Finney says six millimeters. Elec-Mate says eight. phs Compliance says five to six. Robert Dyas and DIY Doctor both lean toward ten. That's a two-times spread across sources that all sound equally confident.



Herman

And that's not sloppiness. That's geometry. Different plugs have different terminal depths and different distances from the cord grip to the terminal. A ten-millimeter strip that fills a deep terminal barrel perfectly will leave copper hanging out of a shallow one. Daniel's observation that the same stripper setting gives different results across different plug heads is correct, and it's correct for a reason.



Corn

So the right answer to how much to strip is "enough to fill the terminal, no more." Which is useless as a number and exactly right as a rule.



Herman

It's the rule you measure against. The number is just a starting point. And then there's the trade-off on either side. Elec-Mate lays it out cleanly. Too much stripped and you've got bare copper outside the terminal, which is a shock risk and a short risk. Too little and there isn't enough copper inside the terminal, which makes a loose connection, and a loose connection heats up. Their line is "aim for eight millimeters, just enough to fill the terminal barrel." That's the spirit of the thing.



Corn

Loose connection heating up is the one people underrate. A plug that won't quite grip is a plug that's slowly cooking in the wall. It doesn't fail dramatically, it fails quietly, over months.



Herman

Metal expands and contracts with every load cycle. A bad contact starts building oxide. Resistance climbs. Resistance climbs and heat climbs with it. It's a slow problem with a fast finish.



Corn

Right. Now the tool. Daniel uses electrician's scissors and he suspects there's something better. What is it?



Herman

It's a small flush cutter, or precision side cutter. The kind of thing sold as an electronics side cutter. The name that gets thrown around most is the Knipex Super Knips, and I'll say up front that no UK plug-wiring guide actually names it. This is the practitioner answer, not the documented one. But it's the right answer.



Corn

Why does it beat the scissors?



Herman

Because the Super Knips has a no-bevel cutting chamfer, which means it makes a flush cut. It's rated for copper wire, VDE-insulated, VDE-tested to a thousand volts, a hundred and twenty-five millimeters long. Electrician's scissors are excellent tools, but they're built for cutting cordage and stripping data cable. They've got stripping notches and fine points. What they don't give you is a clean, controlled shear on a single copper strand sitting a millimeter from the insulation.



Corn

So it's the difference between a tool that can do the job and a tool that's shaped for the job.



Herman

And for this particular task, which is shaving a millimeter off a strand without nicking the insulation or leaving a burr, the flush cutter is shaped for it. There's a Knipex X-Cut as well, the compact diagonal cutter, which cuts finest strands and multi-core cable. Same family of tool. The point is the geometry: flat cutting edge, no blade bevel, so you can get in tight.



Corn

So Daniel, if you're listening, you want a flush cutter. Not the scissors.



Herman

Which is not to say throw the scissors away. Keep them for the cable. That's what I do. But that's ancient history.



Corn

Why does every strand have to go into the terminal? Daniel asks specifically why even one isn't okay.



Herman

Because the strand doesn't disappear when you leave it out. It sits there in the plug body, and it can bridge two terminals. Live and neutral, live and earth. A strand of copper is a perfectly good conductor. It's copper. It's the material we use for the purpose. If it happens to lie between the live terminal and the neutral terminal, you've built a short circuit inside your plug. If it touches the metal casing, the casing is now live.



Corn

And the casing is the thing you put your hand on.



Herman

That's the one. Finney Electrical warns about exactly this. Unwanted shocks, accidental contact between elements, short circuits. Elec-Mate lists too much bare copper exposed as a common mistake, and notes that if bare copper is visible between the insulation and the terminal, there's a risk of contact between wires or with the casing. DIY Doctor adds the detail that even a small nick in the insulation can be dangerous, because it lets electricity arc between wires.



Corn

The nick point is worth dwelling on. Because you're cutting copper right next to insulation. That's the kill zone for a flush cutter done badly.



Herman

That's the whole reason the flush cutter exists. The blade is designed so you can put it against a strand without gouging the plastic behind it. With a beveled edge you're pushing material away, and the material you're pushing away is the insulation you want to keep.



Corn

So every strand goes in. If one won't behave, cut the whole thing back and re-strip. There's no clever way around that.



Herman

There isn't. And Leads Direct says the same thing about damage. If there's a cut or a nick or damage to the insulation on any core, you cut the wire back and start again. They're not being precious about it. Damaged insulation is a future failure.



Corn

Now Daniel's twisty motion. He twists the strands with his fingers until they go rigid. Is that right?



Herman

That's the endorsed method. Robert Dyas says strip about ten millimeters off each core and twist the copper. DIY Doctor's step says twist the strands tightly. The reason is simple: a bundle of loose strands is fatter and messier than the same strands twisted into a compact bundle, and a compact bundle fits the terminal and grips the screw better. Loose strands have a way of spreading sideways as you push them in.



Corn

Which is how you get a strand outside the terminal that you didn't plan on.



Herman

That's how it happens, yes. And here's where the sources disagree. DIY Doctor goes further than twisting. They recommend bending the exposed wire back on itself into a small loop, doubling it over, so the terminal screw bites down on a doubled thickness with more surface area. Leads Direct and Elec-Mate don't mention it. They just say insert the bare copper and tighten.



Corn

So doubling over is a tradition, not a consensus.



Herman

That's the right way to frame it. It's a traditional technique that increases contact area, which is a real benefit. But there's a downside, and it's the downside that matters for this episode. A doubled-over bundle is twice as bulky, which makes it harder to keep all of the copper inside the terminal. If the doubled loop pushes back out of the terminal barrel, you've just created the exact problem the millimeter rule is about. So it's a technique that helps in one direction and hurts in another.



Corn

And for someone who's already struggling to get their copper exactly sized, adding bulk seems like the wrong direction.



Herman

That's my read. If your strip is short and your terminal is deep, doubling over is a way to fill it. If your strip is already right, doubling over is risk without benefit. And if you're nervous about it, just twist and insert. That's what Leads Direct and Elec-Mate describe, and they're both reliable.



Corn

So we've covered the conductor side. Outer sheath and cord grip next.



Herman

The sheath is where Daniel's frustration actually lives, I think. He says sometimes it's just not possible to make each terminal connection while keeping the sheath precisely at the screw-in point at the bottom of the plug head. And that's a real observation, not a failure of technique.



Corn

The standard method is to feed the flex through the plug first, past the cable clamp, and mark where the sheath passes under the clamp. Then strip back to that mark.



Herman

DIY Doctor's version: feed the appliance flex through the plug so about eight to ten millimeters extends past the top of the plug body, then mark the point where the flex passes under the cable clamp. Robert Dyas puts it as placing the flex against the plug, because the flex clamp has to grip the sheath, not the cores. And that last clause is the actual rule. The clamp grips the sheath. If it grips the individual cores, you've failed.



Corn

And the numbers for how much sheath to strip: Elec-Mate says about fifty millimeters, Wiring Draw says forty-five to fifty, Electrical Technology says two inches, which is five centimeters.



Herman

Yes, all roughly the same. But the number is downstream of the rule, which is that the grip clamp must close on the outer sheath, and it must close on the sheath with the sheath at full thickness. Not on the cores, not on a stripped-back sheath. That's what holds the cable in the plug.



Corn

And Daniel's frustration: sometimes you can't get there because the terminal is too far from the clamp point.



Herman

The answer, and it's the answer Daniel probably suspects, is that you don't cut all three cores to the same length. You cut them to different lengths. Earth longest, live shortest. Because earth has the furthest to travel inside the plug, live has the shortest, and neutral sits in the middle.



Corn

Why earth longest?



Herman

Two reasons, and they overlap. The practical one is that the earth terminal is usually furthest from the cord grip, so it needs more copper to reach. The safety one is that if the cable gets yanked hard enough to pull something, or if the cord grip fails and the cable strains, you want the earth wire to be the last one to disconnect. If earth is longest, it stays connected after live and neutral have pulled out. That's the direction you want the failure to go.



Corn

That's a beautiful piece of design thinking. You're not preventing the failure, you're choosing which failure.



Herman

Yes. And it's stated by Leads Direct, Finney Electrical, DIY Doctor, all of them. Leave more slack in the earth wire.



Corn

So the recipe is: cut earth longest, neutral in the middle, live shortest. Then the sheath can sit exactly where the clamp needs it.



Herman

And there's a related mistake that Whitegoods Help calls the most frequent error when fitting a plug. Cutting all three wires to the same length before connecting them. Which is exactly what a first-timer does, because it feels tidy.



Corn

Tidiness is the trap here. The tidy thing to do is cut all three the same. The right thing to do is cut them into an awkward ladder.



Herman

That's the whole tension of plug wiring. It's a tidy-looking object that requires untidy-looking internals.



Corn

DIY Doctor says it's better to have a little slack folded neatly than to cut too short. Which is worth holding on to.



Herman

And it applies to the outer sheath too. If you're not sure where the clamp point is, strip slightly less than you think you need, feed it in, and check. You can always strip more. You can't strip less.



Corn

Now let's do the two lists Daniel asked for, because we owe him both of them.



Herman

Mistakes first. Three most important.



Corn

One.



Herman

Wires in the wrong terminals. Elec-Mate calls this the most dangerous mistake, and they're right. Brown, which is live, in the earth terminal means the metal casing of the appliance becomes live. You touch the appliance, you complete the circuit. The plug is fine. The appliance is a trap.



Corn

Two.



Herman

Cord grip not securing the outer sheath. If the grip clamps the individual cores instead of the sheath, then a tug on the cable pulls the wires straight out of the terminals. It's the most under-appreciated failure, because the terminals themselves are perfect. Everything looks right. And the plug is still dangerous.



Corn

There's a good case of that in the DIY Stack Exchange threads. Someone opened a plug and got told "that plug has been hazardous since it was first fitted, get one with a standard strap over the cable." Which is the whole point of the cord grip in one sentence.



Herman

It's brutal. Someone bought a plug, wired it correctly at the terminal, and it was hazardous from day one because the grip was the wrong type.



Corn

Three.



Herman

Too much bare copper exposed, and loose terminal screws. Which are the same failure wearing different clothes. Exposed copper outside the terminal risks a short or a shock. A loose screw generates heat, because it isn't making a solid connection. Both of these are things you can catch before you close the cover. Both of them will be invisible after.



Corn

Now the three safety practices.



Herman

Number one, isolate first. Unplug. Never work on a plug that's connected to anything. Leads Direct has a line about this that stays with you. People have been killed whilst trying to rewire a plug or change a fuse while it's still plugged into the mains. That's the entire reason we have the rule.



Corn

Which sounds obvious. And yet.



Herman

It's obvious and it still kills people. Because a plug with no appliance attached doesn't look live. It looks like a plastic object.



Corn

Number two, leave more slack in the earth wire. We already covered why, but it belongs on the list. It's a one-second decision that changes what happens if the cable ever gets yanked.



Herman

Number three, check and tug-test everything before you close the cover. Correct terminals, tight screws, no bare copper, cord grip firm on the sheath, correct fuse, no trapped wires. Elec-Mate has a post-wiring checklist and that's essentially it. The tug-test is where you learn the truth. Give the cable a firm pull and see whether the sheath holds.



Corn

What's the fuse rule again?



Herman

Three amp fuse for appliances up to about seven hundred watts. Thirteen amp for seven hundred to three thousand watts. Small flex on a big fuse is a common error.



Corn

The fuse is there to protect the flex, not the appliance.



Herman

Correct. The flex is the weakest link in the chain, and the fuse exists to burn out before the flex does. You put a thirteen amp fuse on a thin flex that's rated for less than that, and the fuse becomes decorative.



Corn

So we've covered the milestone. Now Hilbert's been sat behind the desk the entire time, and he's got something.



Hilbert

Not the old technician's rule about the millimeter. The technician, that's who. He had a saying that stuck. He'd say the millimeter came from the days when plugs were soft copper and thick insulation, and that modern plugs have harder copper and thinner insulation. Meaning the actual tolerance is probably tighter than a millimeter now, not looser.



Herman

The millimeter might be a historical artifact.



Hilbert

That's what he said. I never checked it. And when you say it aloud, it's not obviously wrong. Soft copper deforms more when a screw bites down. Thick insulation is more forgiving if your cut is a bit wonky. Harder copper doesn't have that give.



Corn

It's a convention that got repeated without anyone revisiting the material assumptions behind it.



Hilbert

That's the way it seems. And I remember one other thing. We had a plug come back in once where a single strand had shorted across the terminals. It wasn't a fire. It was a melted casing. One strand, one plug, one afternoon, and the whole thing came back in a plastic bag.



Herman

Do you remember what the appliance was?



Hilbert

It was an old cassette deck. That's not the point. The point is the strand. We stripped the rest of the plug and it was fine. Every other strand was where it should be. It was one.



Corn

A single strand that carried enough current to melt the housing.



Hilbert

It did. And I don't have a theory about it. I just have the customer's face when we told her the plug was the thing that went, not the deck.



Corn

That's the honest version. We talked about the mechanism and Hilbert hands us the picture.



Hilbert

The technician. He checked every strand with a pair of cutters, the flush kind, the kind with no bevel. He didn't need to. He'd been doing it thirty years. He checked anyway. That's the thing I remember most. Not the wiring. The checking.



Herman

That's a real point, and it's the thing the guides don't emphasize enough. The checking is the job.



Corn

So the two things Hilbert just handed us. The millimeter figure is widely repeated and nobody explains where it came from. It shows up in crimp connector specs and in photovoltaic connector specs too, which suggests it's a general electrical termination convention rather than something specific to BS 1363. And the second thing is that the check is what separates a plug that works from a plug that's safe. The check is not the extra step. The check is the step.



Herman

Which connects back to something from the discussion. Leads Direct says if there's damage to the insulation, cut it back and start again. That's a checking instruction. Finney Electrical says the retaining screw has to be on the copper. That's a checking instruction. Almost every rule we've discussed is phrased as a check.



Corn

The one thing we didn't find, on the cutting-room floor: there's no authoritative source on why a single strand is catastrophic at the physics level. Every guide states the risk. Shorts, shocks, fire. None of them quantify it. No study saying one strand can carry this much current before it arcs. That's a genuine gap in the material.



Herman

It is. And I'll flag it as a gap rather than guess. The mechanism is intuitive enough. Copper conducts, a strand is copper, a strand where it shouldn't be is a path where there shouldn't be one. But the numbers aren't documented in the sources we found.



Corn

A listener who wants a project could measure it.



Herman

Somebody should. And to Daniel's last question, the thing I'd leave with: he asked what the best tool is for tiny trims, and the answer is the flush cutter, but the deeper answer is that the tool exists because the checking exists. You buy the flush cutter because you're going to check every strand. The tool is downstream of the habit.



Corn

That's fair. And the one thing I'd add, which nobody does any more because the 1994 Plugs and Sockets Regulations forced pre-fitted plugs onto new appliances, is that almost nobody wire plugs for a living. Which is why the checking matters even more. It's a skill you use once every two years in a kitchen and then forget. That's exactly when the millimeter matters, and exactly when you don't have the muscle memory to catch it.



Herman

The forward-looking thought is maybe this: as plug designs evolve and materials change, do the traditional rules hold? The strip length advice already spreads from five to ten millimeters. That's an admission that context matters and the number is a starting point. The millimeter rule might be the next piece of inherited advice that needs revisiting.



Corn

With thanks to Hilbert Flumingtop, our producer, who didn't have to bring up the melted cassette deck and did.



Herman

This has been My Weird Prompts.



Corn

If you want to see the sources we pulled from on this one, or share your own plug-wiring tips, the show notes have all of it. Check the website at my weird prompts dot com.



Herman

If you've rewired a plug this year, we want to hear about it. Email us at show at my weird prompts dot com.



Corn

We'll be back soon.