



An Extended Guide · No. 1314

Air-Cooled vs. Liquid-Cooled

Which standby engine
family fits your home

Tech Made Simple — Service Made Personal

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! Read this first — carbon monoxide is still the real danger

A standby generator runs on an engine, and engine exhaust contains carbon monoxide — an invisible, odorless gas that can kill. Your installer sets the unit outdoors and spaces it away from windows, doors, and vents to meet the maker's instructions and local code, which is a big part of what keeps you safe. Your job is to keep it that way: never let anyone box it in, build a structure around it, or let snow, leaves, or drifts pile up against it, and never move it closer to the house. Put battery-backup carbon-monoxide alarms on every floor and outside the bedrooms, and test them — the safety agencies urge this for every home. If an alarm sounds, or anyone feels dizzy, sick, or sleepy, get everyone into fresh air first and ask questions later. Whether a unit is air-cooled or liquid-cooled, it is still an engine that breathes out this gas — the cooling style changes nothing at all about that rule.

Two ways to cool the engine — let's compare them calmly

As you shop for a standby generator, you'll run into two families: air-cooled and liquid-cooled. It sounds technical, but the idea is simple, and knowing the difference helps you understand what an installer is recommending — and why.

I'm Bill, and I run Bill's Home Tech here in Portage County, Ohio. I've spent 30+ years helping folks feel at ease with the equipment in their homes, in plain language and at a comfortable pace. Think of this guide as me at your kitchen table, sorting out these two words so a salesperson's pitch stops sounding like a foreign language.

We won't chase brand names or specifications. We'll cover how each type keeps its engine cool, what that means for the size and capability of the unit, and which family tends to suit which home — and I'll be honest that the final answer comes from a load calculation, not from this page.

★ There's nothing to sell you here

I don't sell generators and I earn no commission, so this is just honest advice. If you'd like a second opinion on which family fits your home before you talk to an installer, call or text me at (330) 200-8042 — free.

The whole guide, on one page

If you remember only these things, you already understand the difference and what to do with it.

- ❑ Every standby engine makes heat and has to shed it — the two families just do that differently.
- ❑ Air-cooled units use a fan to blow air over the engine, much like a portable generator does. They're smaller and cost less to buy and install.
- ❑ Liquid-cooled units use a radiator and coolant, like a car's engine. They're larger, more capable, and a bigger investment.
- ❑ Air-cooled handles the essentials and a good part of many whole homes; liquid-cooled is built for big homes, true whole-house power, and heavy loads running for a long time.
- ❑ There's no universal 'better' — there's the right fit for your home.
- ❑ What settles it is a load calculation from your installer, not a chart or a rule of thumb.

✓ The one-sentence version

Air-cooled is the smaller, simpler, more affordable family that fits most homes; liquid-cooled is the larger, more capable family for big or hard-working homes — and your load calculation tells you which.

First, what 'cooling' even means

Before we compare the two, here's the plain reason cooling matters at all — it takes the mystery out of the rest.

Any engine that runs makes heat, and a lot of it. If that heat isn't carried away steadily, the engine overheats and can't keep working. So every standby generator has some way of shedding heat while it runs — and that's the one big thing that separates the two families.

One family moves the heat away with air. The other moves it away with liquid. That single choice ripples out into how big the unit is, how much it can handle, what it costs, and how much upkeep it asks for. Once you picture that, the rest of this guide falls into place.

✓ You've seen both ideas before

You already know both approaches from everyday life: a fan cooling a small engine, and a radiator with coolant cooling a car. A standby generator uses one or the other, scaled to the job.

How an air-cooled unit stays cool

This is the more common home standby generator, and the simpler of the two to picture.

An air-cooled unit has a fan that pulls outside air across the engine while it runs, carrying the heat away — the same basic idea that cools a portable generator or a lawn mower engine. There's no radiator and no coolant to think about; the moving air does the work.

Because that system is simple and compact, air-cooled units tend to be smaller, lighter, and less expensive to buy and to install. For a great many homes — backing up the essentials plus a good measure of everyday comfort — an air-cooled unit is right in the sweet spot.

✓ Simple has real virtues

Fewer parts to cool means fewer parts to service and, often, a friendlier price. Air-cooled is proven, widely used, and well understood by nearly any standby installer — simple isn't a knock.

How a liquid-cooled unit stays cool

This is the larger, more capable family — and if you've ever topped up the coolant in a car, you already understand it.

A liquid-cooled unit circulates coolant through the engine and out to a radiator, where a fan carries the heat away, then sends the cooled liquid back around again. It's exactly the way a car's engine keeps its cool, and it's very good at carrying away a lot of heat, steadily, for a long time.

That extra cooling muscle is what lets a liquid-cooled unit be bigger and run harder for longer. These are the units built for large homes, true whole-house coverage, or heavy loads that run continuously. The trade is that they're a larger machine, a bigger investment, and they ask for a bit more upkeep.

✓ Think of it like a car's engine

A car can cruise for hours because its coolant keeps carrying heat away. A liquid-cooled standby works on the very same principle, which is why it's the choice when a home needs a lot of power for a long stretch.

The plain-English difference

Set side by side, the two families sort out along a few simple lines. No numbers needed.

- **How they cool:** air-cooled uses a fan and moving air; liquid-cooled uses a radiator and circulating coolant.
- **Size and capability:** air-cooled units are smaller and suit essentials to many whole homes; liquid-cooled units are larger and reach big or true whole-house coverage.
- **Continuous heavy duty:** liquid-cooled is built to run hard for long stretches; air-cooled is happiest with typical home loads.
- **Investment:** air-cooled generally costs less to buy and install; liquid-cooled is a bigger investment.
- **Upkeep:** both need routine care, but a liquid-cooled unit adds its cooling system to the maintenance list.

✓ Hold these loosely

These are tendencies, not hard walls. Where your home actually lands depends on what you need to run — which is exactly what a load calculation measures. More on that a few pages on.

Which family suits which home

Here's the honest, general picture of where each family tends to land — with the reminder that your home is its own case.

For a typical house — backing up the furnace, the fridge, water, some lights and outlets, and a fair measure of comfort — an air-cooled unit is very often plenty, and it's usually the more affordable path. Many folks are genuinely happy with an air-cooled standby covering the whole home or the circuits that matter most.

A liquid-cooled unit comes into its own with a large home, a long must-run list, or heavy loads that run for hours on end — think of a big house wanting full air conditioning, several large appliances, and no compromises during a days-long outage. When the demand is high and steady, the extra cooling capacity earns its keep.

★ Start with your must-run list

Before you talk to anyone, jot down what you'd want running in a two-day outage. That list — more than any label — points toward the right family. Text it to me at (330) 200-8042 and I'll help you think it through; our sizing guide walks the rest.

The investment picture, honestly

I won't quote you dollar figures — they vary too much to be honest — but I can tell you how the two families compare.

As a rule, an air-cooled unit costs less to buy and less to install than a liquid-cooled one of comparable coverage, because it's a smaller, simpler machine. A liquid-cooled unit is a larger investment up front, and its added cooling system means a little more to maintain over the years.

That doesn't make one a better deal than the other. The right question is which family actually covers what your home needs — paying for liquid-cooled capability you'll never use is no bargain, and neither is squeezing a home's real demands onto a unit that's too small for them.

✓ We cover the money side in full

Our cost-and-value guide lays out everything that goes into a standby's price — the unit, the transfer switch, electrical, gas, the pad, permits, and labor — and how to get itemized quotes so you can compare fairly.

Upkeep: one family has a bit more to tend

Both types need routine care to stay ready. Here's where they're the same, and where they differ.

Both families need the same fundamentals, a bit like a car: periodic oil and filter changes, a healthy battery, and a checkup on the manufacturer's schedule. And both run a brief self-test on a schedule — commonly weekly — to keep the engine ready and the battery charged.

The difference is the cooling system itself. A liquid-cooled unit also has coolant to check and service over time, much like the coolant in your car — one more item on the list. An air-cooled unit has no coolant to tend, which keeps its routine a touch simpler.

✓ Follow the manual, or a service plan

I won't invent intervals or quantities — those come from the maker's schedule for your unit. Our maintenance guide covers the whole rhythm, and many owners keep an annual service plan so they never have to track it.

Two kinds of homes, two sets of needs

The family that fits a tidy in-town lot is often not the one that fits a farmhouse on a private well. Where you live, and what you need to run, shapes the choice.

If you live in town or the suburbs

In town or the suburbs, your water keeps flowing from the city main whether the power is on or not, so a standby is about food, warmth, comfort, and staying connected — and an air-cooled unit very often covers all of that comfortably.

- For essentials plus real everyday comfort, an air-cooled unit is often the sweet spot — and the friendlier price.
- Smaller lots and close neighbors make the compact size of an air-cooled unit easier to place.
- Only a large home wanting full, no-compromise coverage tends to reach into liquid-cooled territory.
- Either way, the load calculation confirms whether an air-cooled unit truly covers your must-run list.

If you are out in the country on a well

Out in the country the demands often run higher and longer. Your well pump quits when the power does — no electricity means no water at all — and rural outages tend to last, so a hard-working unit may earn its keep.

- A 240-volt well pump is a heavy load; paired with a big house and long outages, that can point toward a larger or liquid-cooled unit.
- If the must-run list is modest, though, a well-sized air-cooled unit may still carry a rural home nicely — the load calc decides.
- Room on the lot makes placing a larger, liquid-cooled unit easier when one is truly needed.
- Long outages mean the endurance of a bigger, liquid-cooled machine can be a real comfort — but only if your loads call for it.

★ Not sure which camp you're in?

Plenty of homes sit right in the middle. Tell me whether you're on city water or a well, and what you'd want running, and I'll help you picture the right family before an installer ever quotes you. Call (330) 200-8042.

What actually settles it: a load calculation

This is the heart of the whole decision, so let me be plain about it — the family isn't chosen by a hunch.

A load calculation is the installer's careful tally of everything you want the generator to run, including the big starting surge that motors like a well pump or an air conditioner demand the instant they kick on. That total — not a label, a chart, or a neighbor's setup — is what points to the right size and the right family.

Sometimes the honest answer surprises people. A modest home can be well served by an air-cooled unit; a big, hard-working home may truly need liquid-cooled. Either way, the number does the deciding, and a good installer will walk you through how they got it.

! Don't let anyone size it by rule of thumb

'A house your size needs this' is a red flag, not an answer. Insist on a real load calculation from a licensed installer. Our sizing guide explains what goes into one so you can follow along with confidence.

Heavy, all-day loads change the picture

The clearest case for liquid-cooled is a home that asks a lot of its generator, for a long time, without a break.

An air-cooled unit is perfectly happy carrying the ups and downs of a typical home, where big loads come and go. But when a home needs to run heavy loads steadily for hours on end — full central air through a summer outage, several large appliances at once, a big house at full comfort — the sustained heat is exactly what a liquid-cooled unit is built to shrug off.

That's the real dividing line: not just how much power, but how hard and how long. A home that occasionally leans on its generator is different from one that would run it flat-out for days, and the second is where liquid cooling earns its place.

✓ Comfort or essentials is a choice too

You can often keep a home on an air-cooled unit by choosing to back up essentials plus some comfort rather than absolutely everything at once. Our sizing and load-management guides show how that trade-off works.

Size, footprint, and where it sits

The two families don't just differ under the hood — they differ in how much room they take up outside.

An air-cooled unit is the more compact of the two, which makes it easier to place on a smaller lot and tuck into a sensible spot. A liquid-cooled unit is a larger machine with a larger footprint, so it wants more room and more thought about where it goes.

Either way, the exact spot is the installer's call, set by the maker's and code's required clearances from windows, doors, vents, and the property line, with room for service and airflow. A bigger unit simply gives those clearances a bit more to work around.

✓ Placement has its own guide

Where the unit can sit — clearances, the pad, drainage, snow, and how far the gas and electrical runs stretch — is worth its own read. Our placement guide covers it, and your installer settles the final spot.

A few myths, cleared up

Some very common beliefs about these two families just aren't so. Let's clear the air.

- **'Liquid-cooled is always the better generator.'** Only if your home needs its extra capacity. For many homes it's more machine — and more money — than the job calls for.
- **'Air-cooled can't do a whole house.'** Plenty of whole homes run beautifully on a well-sized air-cooled unit. It depends on your loads, not the label.
- **'Bigger is safer, so go liquid-cooled to be sure.'** An oversized unit wastes money and still has to be sized right. The load calculation, not 'bigger,' is what makes it right.
- **'The cooling type changes the fuel or the safety rules.'** It doesn't. Both run on natural gas or propane, and both carry the same carbon-monoxide rules — outdoors only, placed by a pro.

✓ When in doubt, ask a plain question

If a salesperson can't explain why your home needs one family over the other in words you understand, ask again — or ask me. Clear beats clever every time.

Signs your home may lean liquid-cooled

These are the situations where the larger family tends to make sense. One or two of these doesn't decide it — the load calc does — but they're the usual signals.

- You have a large home and want true whole-house coverage, air conditioning and all, with no picking and choosing.
- Your must-run list is long, with several big loads that may run at the same time.
- You expect heavy loads to run steadily for many hours, not just in short bursts.
- Your outages are long, and you want the endurance of a machine built to run hard for a good while.
- An installer's load calculation comes back higher than an air-cooled unit can comfortably carry.

★ Let's make sure it's truly needed

Liquid-cooled is a bigger investment, so it's worth confirming your home really needs it before you commit. Send me your must-run list and I'll help you sanity-check an installer's recommendation. Call (330) 200-8042.

Signs air-cooled is plenty

For a great many homes, the simpler, friendlier-priced family is exactly right. These are the usual signs.

- You mainly want the essentials covered — heat, the fridge, water, some lights and outlets — plus a bit of comfort.
- Your home is average-sized, and you're comfortable managing which big loads run at once during an outage.
- You'd rather keep the investment and the upkeep on the modest side.
- Your lot is smaller, and a compact unit is easier to place well.
- An installer's load calculation comes back within what an air-cooled unit comfortably carries.

✓ Load management can stretch an air-cooled unit

Clever load-management modules and soft-starts let a smaller unit cover a bigger home by taking turns with the biggest loads. Our load-management guide explains how — it can keep a home in air-cooled territory.

Fuel and cooling are two separate choices

It's easy to tangle these together, so let me untangle them — they really are independent decisions.

The cooling family — air or liquid — is about how the engine sheds heat. The fuel — natural gas from the utility, or propane from a tank on your property — is a separate matter entirely. Both families run on either fuel, and many units can be set for one or the other at install.

So you don't have to trade one decision against the other. You pick the family that fits your loads, and the fuel that fits your home and property, and a good installer confirms that your gas line or tank can actually feed the unit you've chosen.

✓ Fuel has its own guide

Which fuel is right — and what the gas pro checks to be sure your supply can feed the unit — is a whole topic on its own. Our natural-gas-versus-propane guide covers it, with no invented numbers.

The calm path to deciding

If you're weighing the two families, here's the order that keeps it simple, so nothing catches you off guard.

- ❑ Make your must-run list — what you truly want powered in an outage.
- ❑ Decide roughly on whole-house versus essential circuits.
- ❑ Get a real load calculation from a licensed installer.
- ❑ Let that number, not a label, point you to a family and a size.
- ❑ Get a few itemized quotes so you can compare fairly.
- ❑ Confirm the fuel, the placement, and the permit before you commit.

✓ You don't walk it alone

Each of these steps has its own guide in this series, and I'm glad to walk any of them with you in person. You don't have to become an expert — just take it one calm step at a time.

What I do, and what I leave to the pros

Worth saying plainly, because it's the honest shape of how I can help with this choice.

- **What I help with:** building your must-run list, explaining what an installer's load calculation means, making sense of why one family was recommended, and lining up licensed installers I trust.
- **What only licensed pros do:** the load calculation itself, the electrical work and transfer switch, the gas-line connection, and pulling the permit.
- **What I never do:** panel wiring, gas work, or the install — that's not my license, and your safety deserves the real thing.

★ Call before you're deep in it

The best time to reach me is while you're still weighing the two families, not after a big unit is bolted down. A little guidance up front saves a lot of second-guessing. Reach me at (330) 200-8042.

Questions worth asking your installer

Whether you're talking to an installer or to me, these get you to a choice you actually understand.

Q: Based on my load calculation, which family do you recommend, and why?

You want the reason tied to your numbers, not to your square footage. A good installer will connect the recommendation to your must-run list.

Q: Would an air-cooled unit cover my needs, or do I truly need liquid-cooled?

It's a fair, direct question. If the honest answer is air-cooled, that usually saves you money — our sizing guide helps you follow the logic.

Q: What's the difference in upkeep between the two for my situation?

A liquid-cooled unit adds cooling-system care over the years. Ask what that means in practice, and whether a service plan covers it.

Q: Can either family run on my planned fuel, and can my supply feed it?

Both families run on natural gas or propane; the gas pro confirms your line or tank is up to the unit you choose. Don't take it on a brochure.

✓ There's no silly question

If an installer makes you feel rushed or foolish for asking, that's a reason to keep looking, not to sign. A good pro welcomes plain questions.

Common Questions

The questions I hear most from folks trying to choose between the two families, answered plainly.

Q: Which one is better, air-cooled or liquid-cooled?

Neither, in the abstract — it depends on your home. Air-cooled suits most homes and costs less; liquid-cooled is for big or hard-working homes. Your load calculation points to the right one.

Q: Can an air-cooled unit really power a whole house?

Often, yes — plenty of whole homes run well on a well-sized air-cooled unit, especially with load management helping the biggest loads take turns. It comes down to your actual loads, not the label.

Q: Is liquid-cooled worth the extra money?

It is when your home genuinely needs its capacity — a large home, a long must-run list, or heavy loads running for hours. If it doesn't, you'd be paying for muscle you won't use.

Q: Does the cooling type change how noisy it is?

Both are engines, and both are quietest during the brief weekly test and louder under full load. Our noise-and-neighbors guide covers sound and placement for either family.

Q: Does the cooling type change the safety rules?

No. Both run outdoors, placed by a pro to the required clearances, and both carry the same carbon-monoxide precautions. The cooling style changes nothing about staying safe.

★ Still weighing the two? That's what I'm here for

Choosing a family before you spend is exactly the kind of thing I love to help with, with nothing to sell you. Call or text me at (330) 200-8042 and let's talk it through.

You don't have to do this alone

You just have to remember that a friendly, patient person is one call away.

I hope this guide made choosing between air-cooled and liquid-cooled feel a little less daunting and a lot more doable. Keep it in a drawer with your other home papers, come back to a page whenever you need it, and don't worry about memorizing anything.

When you'd rather have a hand, that's exactly what I do. I come to your home, work at your pace, and never make you feel rushed or silly for asking. A first visit is a flat \$99, and for the parts that don't need me on-site I can often help right on your screen for \$49. Every visit comes with a 30-day, come-back-free guarantee. I don't do the licensed electrical or gas work myself — for that I'll help you line up a trustworthy local pro.

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Call or text me at (330) 200-8042, or visit BillsHomeTech.com. Serving Atwater and all of Portage County. 30+ years of patient, plain-English tech help — and if you're ever not 100% happy with a visit, I'll make it right or refund it. That's a promise. — Bill

Air-Cooled vs. Liquid-Cooled

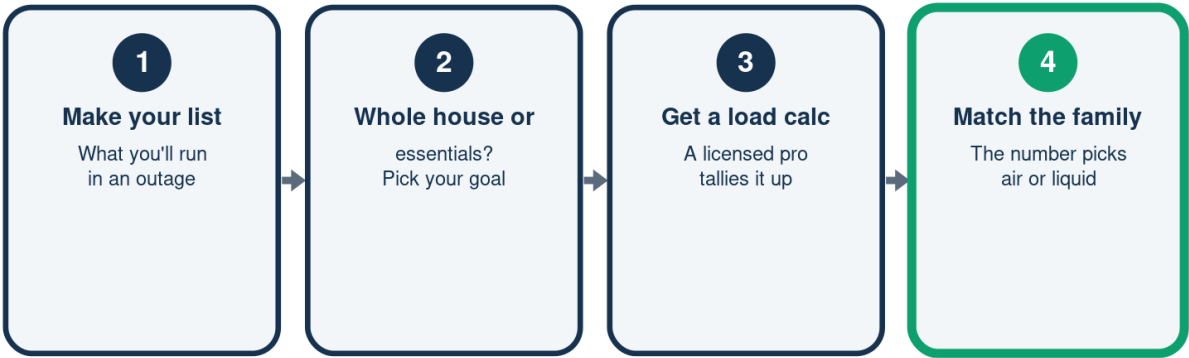
The two families, side by side

	Air-cooled	Liquid-cooled
How it cools	Fan and air	Radiator, coolant
Size	Smaller	Larger
Typical fit	Most homes	Big or hard-working
Investment	Lower	Higher
Upkeep	Simpler	A bit more

Neither is 'better' — it's about your home and your loads.

How to Land on the Right Family

The calm order that does the deciding for you



The load calculation, not a label, is what settles it.

What Each Family Is Built For

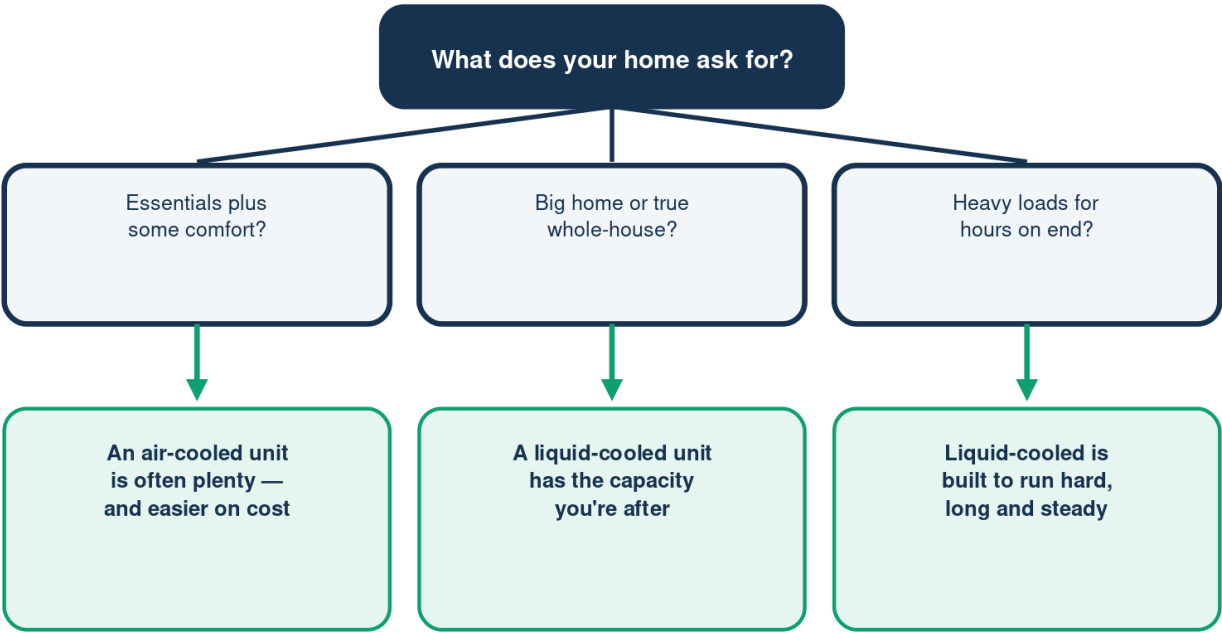
Where each one is in its element

	Air-cooled	Liquid-cooled
Typical home	In its element	More than needed
Large home	May fall short	Built for it
Heavy all-day	Can strain	Made for it
Smaller budget	Easier fit	Bigger reach

A well-sized air-cooled unit covers a great many homes.

Which Family Fits Your Home?

Let your loads point the way



A load calculation from a licensed installer settles it — no rule of thumb.

Illustration - a schematic, not to scale. Your setup may differ.



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A Note From Bill

A quick note from Bill.

I write these guides to make home tech a little less frustrating, and I do my best to keep every step accurate and up to date. Still, every home, device, and setup is a bit different, so I can't promise a guide will match yours exactly or fix your particular problem. These guides are for general information only — they're not professional, legal, or financial advice, and they don't replace your device's own manual or the manufacturer's instructions. Please go slow, use your own good judgment, and use everything here at your own risk. If a step involves electrical wiring, a gas appliance, a water heater, plumbing, or climbing a ladder — or if anything just doesn't feel safe — please stop and call a licensed professional (or give me a call at 330-200-8042). Bill's Home Tech and Bill Davis can't be responsible for any damage, data loss, or injury that comes from using these guides. Thanks for reading, and stay safe out there.

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