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Every new growing season brings the opportunity to renew your lawn, improve your landscape, and try new ideas around the yard. I have a few small backyard gardens, and each year I plant a new variety of vegetable to see what grows best. Springtime also brings routine yard and garden chores. Here are five items for your outdoor checklist that should ensure a healthy yard throughout the season.

1. Do a walk-through inspection of your yard. Make a list of the things that need to be done. Does the vegetable garden still need to be weeded and cleaned of leaves before planting? Do the perennials need to be trimmed back to make room for new growth? Also, consider opportunities to add upgrades such as walkways or sitting areas.

2. Have the hedges grown too wild and woolly? Even a well-maintained shrub or tree can need pruning in the spring. Start by removing dead wood that didn't survive the cold of winter. A pruning saw, hedge shears or even a reciprocating saw can be an efficient way to cut away dead wood.

3. Rake leaves and yard debris. Every fall I spend a lot of time raking, yet winter always brings more dead leaves and downed branches. Removing fallen leaves is vital for the health of your lawn. When grass becomes smothered beneath leaves, it is deprived of air, water and nutrients, and becomes a breeding ground for fungi and insects. A carpet of dead leaves also deprives the grass of the sunlight needed to thrive. Check for overlooked patches and new accumulation, and get rid of all debris for a healthy start to your lawn.

4. Improve your soil with supplements. Most garden soils don't contain the proper nutrients that plants need for optimum health. Consider improving the growing conditions by working traditional fertilizers and/or mineral-rich additives into your garden soil. You might need to conduct a soil test to see if conditions are too alkaline or acidic, which you can adjust with lime, sulfur, or organic matter such as pine needles or peat moss.

5. Plant something beautiful. Every yard can use a new splash of color, and while flower gardens afford a wealth of pretty options, even vegetable gardens can be decorated with colorful Swiss chard or peppers in bright reds and yellows.



These five items should get you started on this season's improvements to your outdoor living space, and give you some exercise in the sunshine and fresh air.

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Q: I'd like to add a garden of ferns and flowers on the roof of my chicken coop, to provide some decoration and provide insulation for the chickens. What's the best way to make the garden roof?

A: The roof must be sloped for drainage if a garden is to be located on top. The construction also must be adequate to support the additional weight. If the chicken coop meets these conditions, you can construct a basic raised garden bed on the roof by fastening a 2x4 lip around the perimeter of the roof. Drill holes through

the lip's lower edge. Secure copper tubing inside the holes to assist with drainage. Use a pond liner to waterproof the whole thing.

Q: Can a DIY'er install a granite countertop?

A: For a small end table or island, a couple of DIY'ers strong enough to lift the slab could likely do the job, assuming the structure beneath is adequately constructed to support the heavy material. You should leave any large slabs to the professionals. In fact, many experienced remodeling contractors shy away from granite countertops because the weight and rigidity of the material requires special equipment to stabilize the big slabs and transport them by automobile, and special wheeled carts are needed to move the slabs around the jobsite. Granite countertop specialists also stabilize the material with strategically placed angle bracing during transport so the slabs don't deflect and break. The high cost of replacing a broken slab is why remodeling professionals who don't install granite for a living leave the job to the experts—and it's why you should, too.

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Q: How do I remove a laminate kitchen countertop and backsplash? I want to replace it, but the existing countertop is stuck in place, even though it wiggles loosely and I see no fasteners.

A: During construction the countertop might have been installed as bare plywood in the kitchen, and the laminate sheets might have been applied afterward. If this is the case, then the plywood deck is proba-

bly screwed to the cabinet base, and the screw heads are concealed behind the laminate veneer. Use a putty knife to chisel or pry away the laminate to expose the fasteners, and then back out the screws to release the countertop.

Q: What's the easiest way to adjust a garden's soil pH?

A: If your garden soil pH level is below 6, the soil is too acidic for most vegetables, and you need to add ground limestone. If the pH level is above 7.5, the soil is too alkaline, and you need to add soil sulfur. Lawn and garden centers usually have charts showing how much lime or sulfur to add to correct a pH imbalance, based on pounds of material to add per 1,000 square feet of soil. The best way to apply sulfur and limestone is to use a drop spreader for even distribution, working it into the soil afterward. Limestone and sulfur is most effective when tilled into the soil 4 to 6 inches deep. **EHT**



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Editor's Picks



By Matt Weber

Over the past year I've found a few tools and devices that have made life on the jobsite a little easier or more convenient. I thought you might like to see them as well.

AIRSHIM

The AirShim is a shim that blows up like a balloon. This flat, inflatable air wedge helps to level and square windows, doors and cabinets for installation. Made of contractor-grade materials, it's designed to have a 300-lb. load rating and can be used to replace wood shims and pry bars. It gives you infinite adjusting possibilities when squaring windows, position-

ing heavy doors or hanging kitchen cabinets. Simply slip the deflated AirShim into position, then pump the bladder to blow up the cushion and move the object that is pressed against it. The AirShim can fit into 3/32-in. gaps, has an internal stiffener that won't fold under pressure, and its rounded corner won't leave unsightly marks. Visit www.airshim.com.



GORILLA GRIPPER

American-engineered and made in the USA, the Gorilla Gripper from Landon Innovations makes it easy for a single person to carry large sheet goods such as plywood and drywall. The Gorilla Gripper clamps at the top of the panel so the user can carry it comfortably at shoulder height. Also handy for ladder work, the gripper takes the hassle out of schlepping sheet material around the work site (especially in windy conditions). It comes highly recommended for pros and DIY'ers who often work without a helper.



The version I've been using for years is constructed of aircraft-grade aluminum plates with special rubber gripping pads and a cushioned handle. I recently discovered that the manufacturer now offers a less expensive model, called the Gorilla Gripper Advantage, made of high-strength glass-filled nylon polymer gripper plates complete with a cushion-handle for all day comfort. Visit www.gorillagripper.com.

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SKILSAW 10-1/4 WORM-DRIVE SAW

A bigger saw cuts bigger things. The new Skilsaw model SPT70WM-22 is the only 10-1/4-in. worm-drive saw designed to cut 4x material smoothly and cleanly in a single pass. Cross-cutting a 6x with a standard 7-1/4-in. saw usually requires five cuts—one on each side of the post, then a center cut with a reciprocating saw to finish the core. With the new 10-1/4-in. Skilsaw, two matching cuts are all that's required for a 6x6. Plus, the new saw offers the same



powerful performance and hard-working character that has made Skil worm-drives a jobsite standard. The new model is powered by a large Dual-Field motor that uses a unique copper winding pattern resulting in increased surface area that keeps the motor cooler and increases the durability of the saw. The new Skilsaw is ideal for all sorts of heavy-duty jobs from trimming fence posts to framing houses. Visit www.skilsaw.com.



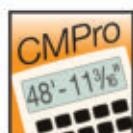
SENCO HYBRID HOSE

There are some things you shouldn't take for granted, such as the design of your compressor's air hose. That's an easy mistake to make because the hose is essentially a simple device, just a tube that conveys air from the tank to your pneumatic tool. However, its material and manufacture determine how easy it is to use and store. Rubber air hoses are most flexible but the rubber breaks down and will eventually crack and split. In contrast, the stiffer PVC air hoses are more durable, but the material is less flexible and tends to retain the coiled shape especially in cold temperatures, which makes them easy to tangle and difficult to roll up and store.

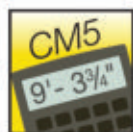
Senco now offers a hybrid polymer air hose that combines the flexibility of rubber but the long life of a PVC air hose. The new hose stays flexible even in extreme temperatures (-40 to 150 deg.), it lays flat and won't kink when under pressure. Most important (to me): It's easy to roll up and store. It weighs forty percent less than most rubber hoses, has reinforced bend restrictors, and offers a maximum working pressure of 300 PSI. Plus, the smooth non-marring finish makes it ideal for indoor trim work where scratching surfaces could be a problem. Available in 50- or 100-ft. lengths these 1/4-in. hoses have field-repairable ends made with aircraft-grade aluminum for easy on-site fixes without hose clamps. Visit www.senco.com.



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As much as I love air tools, sometimes I don't want to drag out a compressor and hose, and it's nice to have a cordless option that's ready to grab and go. And, sometimes I have so many different air tools hooked up to a compressor that I run out of available hose outlets, making a cordless tool a handy addition to the jobsite.

Porter-Cable now offers its first line of 20V Max Lithium Ion cordless finish tools, which includes an 18-gauge Brad Nailer and an 18-gauge Narrow Crown Stapler. I've recently been using the brad nailer for trim jobs and furniture assembly, and it's a lightweight (5.1 lbs), well-balanced and solidly constructed nail gun. It has a fastener-length capacity of 5/8 to 2

inches and a magazine capacity of 100 nails. The nailer is capable of driving up to 450 nails per charge using a 1.5Ah battery (included in the kit) and up to 1,300 nails per charge using a 4.0Ah battery (sold separately). It has several tool-free features including a tool-free jam release, tool-free depth adjustment wheel, and a tool-free "stall release lever." The stall release lever resets the driver blade after a nail jam to



reduce downtime on the job. Plus, two LEDs light up the work surface as well as blink to let you know when the battery is low or if the gun has jammed. Visit www.portercable.com.

DREMEL MOTO-SAW

Trim installations such as crown and base molding require a lot of coped joints to join intersecting corners. Making the joint with a coping saw can be a fairly slow and arduous process, but Dremel found a way to speed things up by motorizing the coping saw. The Dremel Moto-Saw is a portable, precision-sawing tool for making detailed cuts in a variety of materials including wood, plastic, laminates and metal. An auto-tensioning feature keeps the blade tight and ready to cut so you don't have

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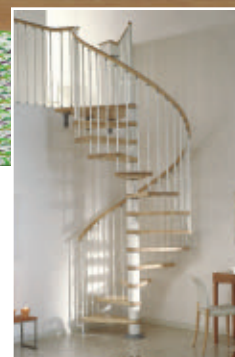
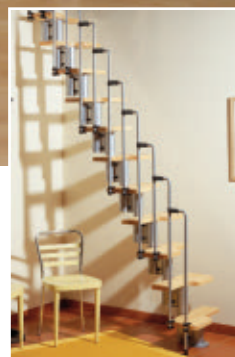
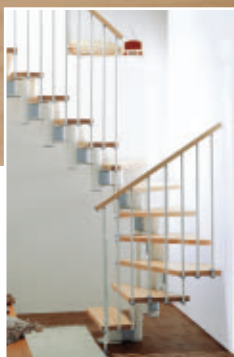


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to make blade adjustments, and its slim, comfortable handle provides easy control in any cutting position. Plus, it's essentially two tools in one: The Moto-Saw can be used as a handheld coping saw or used with a table base as a stationary scroll saw. It's easy to store, set up and operate and features a tool-free mechanism for quick blade changes. Visit www.dremel.com.



BOSCH POWER BOX

When I'm working I've got to have some tunes, a news station, or some kind of radio in the background to keep me going. The Bosch Power Box has been a popular construction-zone radio since its introduction in 2004, but the new model PB360C has a number of notable high-tech upgrades. First and foremost is the Bluetooth connectivity. Now

you can ditch the radio stations that barely come in over the airwaves for internet radio or music stored on your smart device (such as Spotify, Pandora and Apple Music). Sound comes from the Power Box's signature 360-degree speakers, plus the unit can run on batteries, charge batteries, charge devices via a USB port, or be used as a power strip for more cables. Visit www.boschtools.com.



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It has a working range of 450 feet and the manufacturer claims +/-3-percent accuracy to easily measure the square footage of workable areas while subtracting areas for doors and windows. I'm still getting the hang of it, but it seems like a handy way to estimate materials needed to plan for siding, painting, drywall

and outdoor projects. The Bluetooth connected laser measurer wirelessly syncs with the app and is compatible with most smart phones and tablets with cameras. It saves and transfers files in today's most popular formats (PDF, JPG and upload to the Cloud). Visit www.stanleytools.com. **EHT**



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SAWSTOP JOBSITE TABLE SAW

The SawStop Jobsite Saw combines SawStop's high-tech safety device with compact portability. You're probably familiar with company's patented aluminum safety brake that stops and drops the blade on contact with skin 10 times faster than a car's airbag. (To cut conductive materials, the unit features a bypass to the safety system.) One surprising feature of the SawStop saw is how smoothly the engine runs and the blade cuts. The new jobsite model comes with an easy-to-use mobile cart that extends for use and collapses for transport, and the large solid wheels and comfort-grip handles make it easy to navigate rough terrain.

The SawStop Jobsite Saw also offers a handy blade-elevation system that raises or lowers the blade in just a single turn of the handwheel. With the Quicktilt feature, simply compress the tilt paddle and tilt the blade to the desired angle. When fine-tuning is required, you can adjust the angle in 1-degree increments with the infinitely-adjustable tilt mechanism. The saw comes with a solid T-Style rip fence with ErgoLock, which slides easily, locks firmly and offers a 25-1/2-in. rip capacity. The T-style design minimizes deflection for better accuracy and also provides an extendable support shelf at the fence face to support a workpiece; simply extend the on-demand shelf with a turn of a knob when needed and turn it back when done. Visit www.sawstop.com.



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A can of Durham's Rock Hard Water Putty, showing the product name and a picture of the putty being applied.

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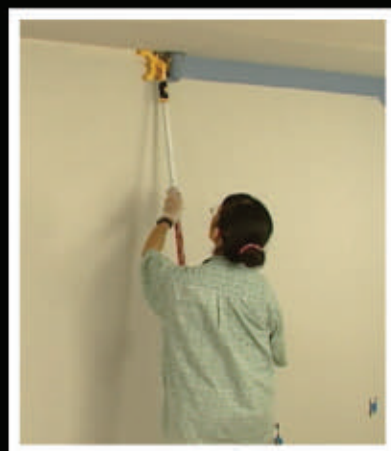
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Fighting Mold and Mildew



its inability to stick to vertical surfaces while treating the mold or mildew. If the bleach runs off before it kills the spores, then it isn't doing a very effective job.

The *EHT* staff recently tested a new product that made application much easier—with no mixing required. Moldex Instant House Wash is formulated with new advanced bleach gel that has Active Cling Technology to hold onto vertical surfaces for the highest effective contact time. The bleach gel also helps remove unwanted stains deep below the surface for better cleaning of porous materials.

For elevated surfaces that are hard to reach, the Moldex product also comes in a handy multipurpose applicator bottle. To use, simply attach the bottle to a garden hose while the valve is in the "Off" position and turn on the faucet. When you're ready to apply, switch the valve to "Clean," and the water stream will blend with the Moldex House Wash as it leaves the nozzle, enabling you to spray the mixture onto walls, fences, eaves and more. Allow the product to work for 5 to 10 minutes. Scrubbing is typically not required but may be necessary for particularly stubborn stains. Then, switch the valve to "Rinse" and use the bottle nozzle

The fight against mold and mildew will be an ongoing war for homeowners, not just a battle to win once and then live happily ever after. The forces of nature will inevitably give rise to the same shady, damp conditions that led to the mold growth that you abated, and you'll have to combat it all over again.

OUTDOORS

Not all household cleaning products and bathroom cleansers will kill mold and mildew. One of the most commonly used products to use outside the home is diluted household bleach. Mix water with the bleach in a 3:1 ratio. Before applying the bleach, soak the surrounding plants with water.

For brick and stone, leave the bleach on the surface for 20 minutes while adding more as it dries. For wood, rinse thoroughly after 5 or 10 minutes. Scrub as necessary. Don't allow the bleach to dry on the surface.

One problem with standard household bleach, however, is



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to rinse off the treated surface with fresh water. The House Wash works on vinyl, PVC, wood, composites, brick, stone, stucco, fiberglass, metal, cement and more.

Note: To protect surrounding plants, spray them with water prior to applying the product and then rinse them thoroughly after the job.

INDOORS

You can expect mold and mildew outside your home because of the natural damp conditions of the outdoors. Mold and mildew inside the home is a different problem, because the inside of your home shouldn't remain damp.

The presence of moisture is the biggest contributor to mold growth, and to fight the infestation you should conduct a room-by-room assessment of the house to identify problem areas. The moisture can come from condensation due to poor ventilation (attic), from a water leak (around bathrooms), or from outdoor intrusion (foundation walls). Once you discover mold on the home's interior, the first step in solving the problem is to eliminate the source of moisture—whatever that may be. Otherwise, any mold or mildew you clean is likely to return.

For minor problems you may be able to clean the surface of the materials with bleach or an antimicrobial cleaner. For major

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problems, remove materials that cannot be thoroughly cleaned of mold and mildew, like insulation, carpeting or drywall. Use your antimicrobial cleaner to clean the surrounding area as well as the places where you actually see mold and mildew, to make sure you remove all traces of the substances.

Finally, replace the removed building materials with new, mold-free materials.

DETECTION

Mold and mildew in a home is not always easy to detect if it exists within attics or is hidden within walls. If you suspect your indoor air quality is hindered by hidden mold, you can conduct your own DIY test to detect a problem.

The EHT staff recently conducted the Healthful Home 5-Minute

Mold Test in a finished basement that had suffered some previous flooding problems. The air seemed fine in the room, but the old moisture issues suggested that if there were to be a mold problem in the

house then it was likely to occur in this room.

The test is easy to accomplish. Simply use one of the cotton swabs included with the kit to sample surface dust in the room.



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Soak the the swab tip in the "rinse buffer" liquid (included) and then drip five drops of the liquid onto the two test strips that come with the kit. One strip is labeled Asp/Pen (Aspergillus and/or Penicillium) and the other is labeled Stachybotrys.



Test results show in as little as 5 minutes, and much like a pregnancy test you'll either see one line (negative results) or two lines (positive).

Luckily, our home tested negative. If the test is positive, however, it does not necessarily mean you have a serious problem but that you should consider consulting a professional indoor air quality inspector or a remediation service professional. You can also have an optional laboratory analysis of your test results conducted for an additional fee. **EHT**

Learn more about both of these mold-fighting products at www.moldexbrands.com and myhealthfulhome.com.

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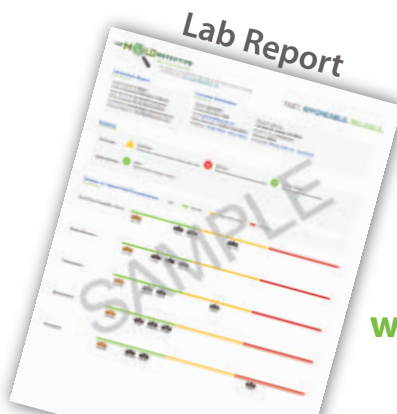


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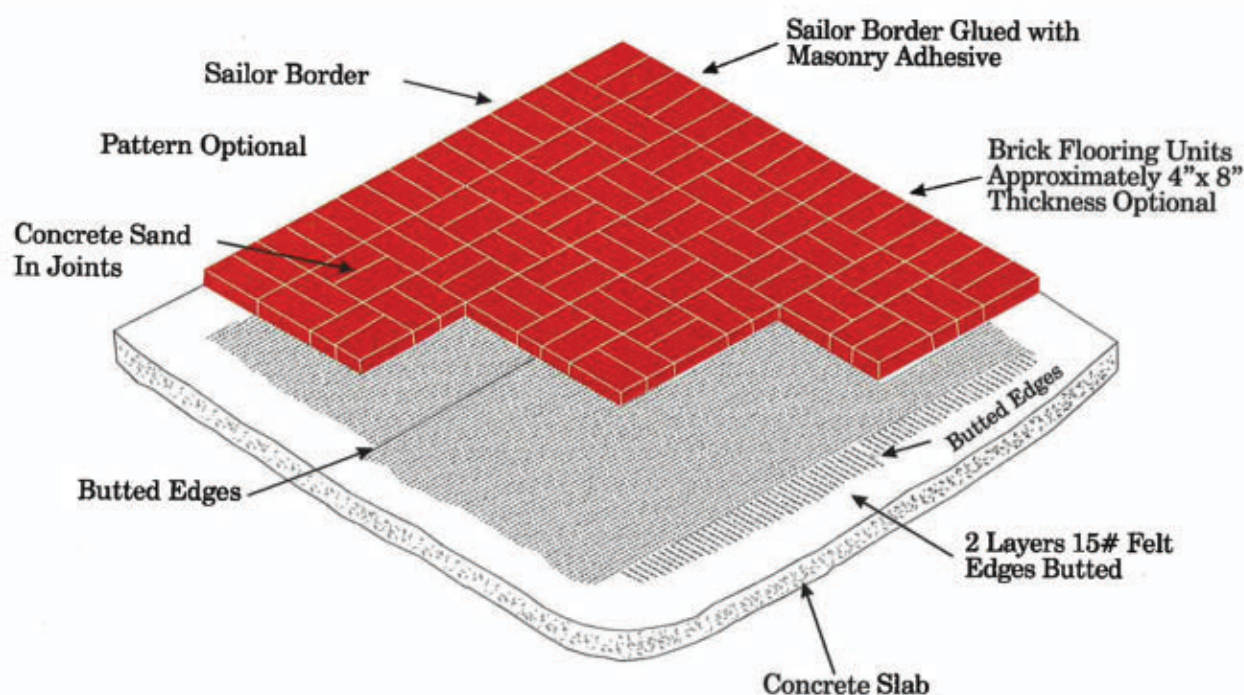


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From Concrete to Paver Patio

Give an old patio a facelift.



By Walt Steele

There's good news and there's good news. You can have a new clay paver patio or walkway without digging, without spreading crusher run, without tamping, without measuring out an inch of sand and screeding it smooth. You can do it without cutting a single clay paver. And you can make it look brand-new 10, 20, or even 100 years from now.

Many patios and sidewalks are made of poured concrete. If you'd rather have something that doesn't look so worn and dirty, and doesn't need to be power-washed each spring, consider laying new clay brick pavers directly over the old surface.

"There are a number of advantages to doing it this way," says Laura Schwind, a registered land-

scape architect for Pine Hall Brick Company, the largest supplier of clay pavers in the United States. "The biggest is that the base is already there, and you instantly improve the appearance of your property without having to dig up your old concrete and haul it away."

With concrete that's smooth and even, start by choosing the right type of clay paver. Keep in mind that there are "thinner" pavers (1-3/8 in.) for these applications. If there are exterior doors that must swing out over the new higher surface, that must also be taken into account.

Next up, choose your pattern. Some, like herringbone, require more cuts than other patterns. A basket-weave pattern requires no cuts at all, if you measure carefully.

To start, lay a "soldier course," which means laying a line of bricks perpendicular to the edge of the concrete to form the outside frame of your project. The secret is to use four dots of masonry adhesive on each brick, each about the size of a penny, which allows rainwater to pass underneath.

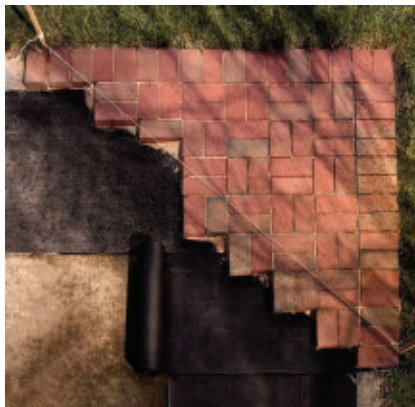
On the inside of the soldier course, cut pieces of roofing felt to put a single layer inside the frame covering the concrete, and don't overlap the felt edges. Then lay a second layer of felt perpendicular over the top of the first layer.

(Roofing felt? Yes. Roofing felt keeps the clay pavers from clacking against the surface of the concrete as you walk on the paver surface.)

Starting at one corner, lay the brick in place inside the "frame"

that has been left by the soldier course. You'll want to leave a 1/8-in. gap between the pavers for sand. Finish by sweeping concrete sand between the joints until they are full.

Here's a peek at a project that used basketweave:



TAKING CARE OF IT

The advantage to clay pavers is that they are the same color all the way through. While they are virtually maintenance-free, anything—clay pavers included—that's left outdoors for years will need to be cleaned up once in a while.

And cleaning it up so it looks like it did the day it was installed is an excellent weekend project, especially if delegated to teenage children who want to use the car keys.

(This method works whether you have thin clay pavers or conventional ones installed above crusher run and sand).

This particular patio actually got its start decades ago. The former homeowner of this 1976 brick ranch house in Greensboro, NC had two daughters who wanted a playhouse. A concrete slab was poured in the backyard and a playhouse, complete with windows and doors and a shingle roof, was built atop it. As the two little girls grew up, the playhouse was moved to the back of the lot and

converted into a small storage building. The slab remained where it was.

In 2006, the slab was covered with thin pavers. A basket-weave pattern was chosen because of its easy installation in which no brick cuts are required. A soldier course was glued in place with masonry cement along the edges of the slab, the roofing felt was rolled out onto the surface and the pavers were put into place. Sand was swept in between the pavers.



Over the years, the patio was regularly hosed down and weeds were removed in between the pavers. New sand was occasionally swept into the joints.

But this year was different. An unseasonably wet summer meant that grass grew quickly over the edges of the patio and into the sand joints between the pavers. Because the patio is shaded much of the day by tulip poplar trees, a greenish black fungus had grown over much of the patio surface.

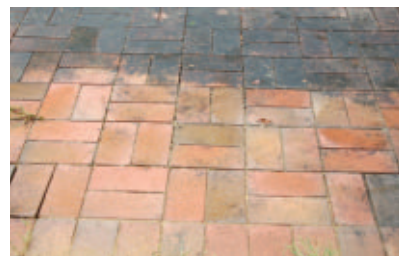
To begin the cleanup, the leaves and other loose debris were blown off the patio with a leaf blower. A putty knife was used to cut the grass out of the paver joints and



the surface was blown off a second time.

To clean the pavers, wet the surface thoroughly with a hose, then use a solution of one part of chlorine bleach to three parts of water. Pour it on the surface, allow it to stand for a few moments, then scrub it with a nylon bristle brush and a broom and hose it off.

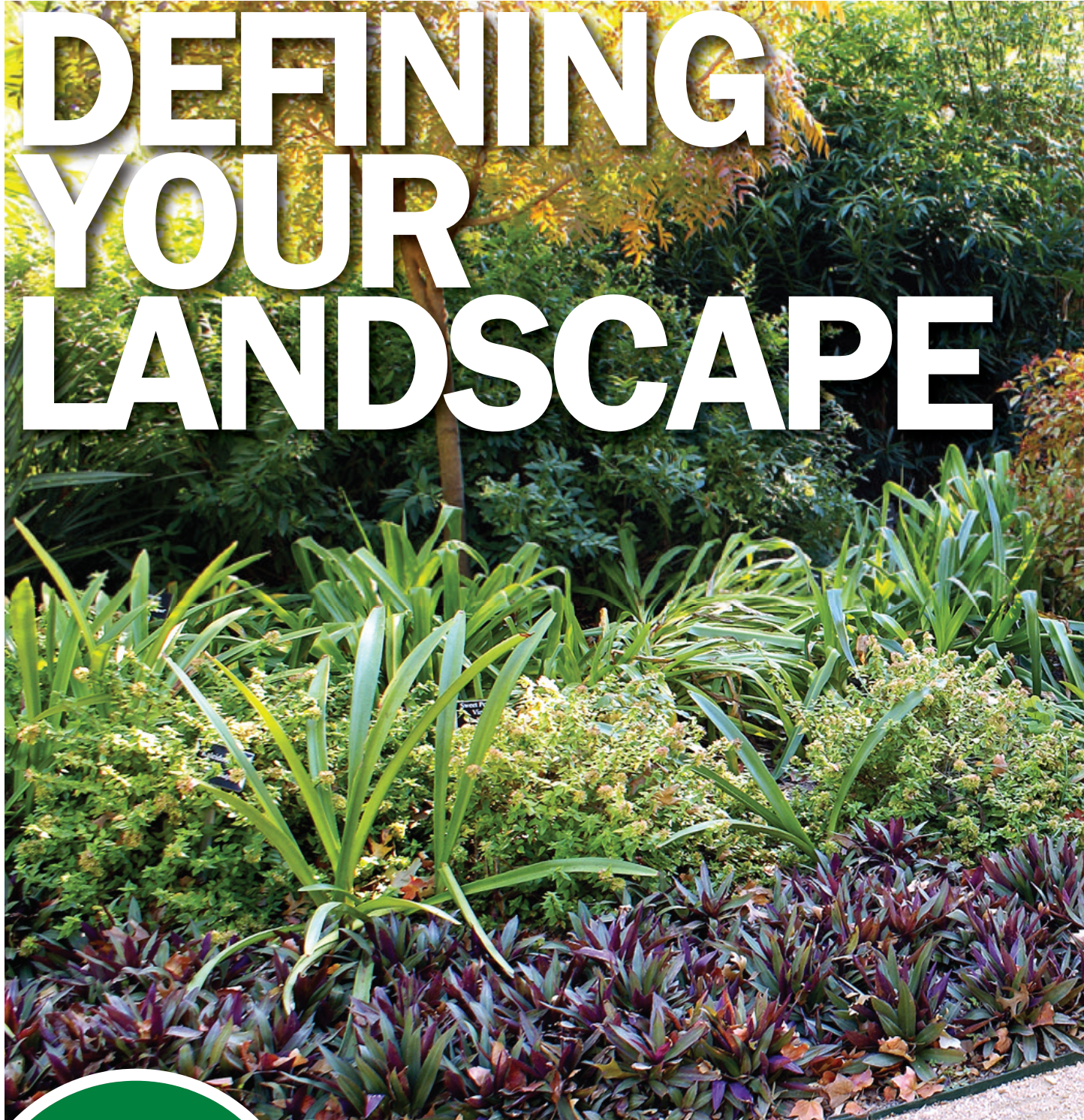
It's best to work on a small section at a time, so that the cleaning solution doesn't dry on the pavers. Rinse it thoroughly and if needed, scrub it a second time. After the patio is cleaned, sweep fresh sand into the joints. Keep an eye on it, because in several weeks, you will probably want to sweep in more sand as the joints settle.



"It's time and effort," says Schwind on maintaining a paver patio. "But it's worth it. When you're done, you'll have the beginnings of a new outdoor room where you'll want to spend some time relaxing." **EHT**

Editor's note: The author, Walt Steele, is a recognized expert on clay pavers. He is paver business manager for Pine Hall Brick Company, America's largest manufacturer of genuine clay pavers. Visit www.pinehallbrick.com.

DEFINING YOUR LANDSCAPE

A photograph of a garden bed. In the foreground, there are low-growing plants with dark purple leaves. Behind them are taller plants with long, green, sword-shaped leaves, likely irises. The garden bed is bordered by a light-colored gravel path. In the background, there are more dense green plants and trees.

*Edging Your
Landscape to
Separate Garden
Beds*



By Matt Weber

One hallmark of an attractive landscape is the layout of well-defined beds and borders. To form clean lines that separate garden beds and turf, professional landscapers use an edging treatment, which could be made from concrete pavers, natural stone, retaining blocks or continuous strip edging.

Strip edging is the least noticeable option when the aim is to highlight the landscape features rather than the border itself. Strip edging can be used to retain mulch or stone, define a walkway or path, and provide a long-lasting barrier that slows the advance of creeping grasses in the planting area or walkway.

Start by selecting a quality edging product. Avoid using the cheap PVC edging commonly available in hardware stores; it retains its packaged coil shape so it's difficult to install and it does not last over time. A more durable option is steel landscape edging, which has a thin profile and holds straight lines and curves better. Steel edging will not rot, split, chip or crack and can be repainted periodically. It's also easy to install and creates a crisp transition line for garden beds that is nearly invisible.

CALCULATION

The simplest way to calculate the edging materials required for your project is to use a garden hose. Arrange it around the landscape area to plot the line of your edging, using it as a visual guide and adjusting its position until you're satisfied. Mark the length of the hose you used, stretch it out straight and use a tape measure to determine the required lineal feet.

DEFINING YOUR LANDSCAPE



Refer to the edging product's installation instructions regarding overlap of the edging strips. For example, the Col-Met edging shown in this article comes in 8-ft. long strips that overlap each other by 8 inches, leaving 7.33 feet of edging. So, for the Col-Met product you would divide the total linear feet for your project by 7.33 feet to determine the number of 8-ft. strips required. For example, 100 divided by 7.33 equals 13.64, so 14 8-ft. edging strips would be required. It's also a good idea to order a couple of extra pieces in case you decide to change the project during installation.

EXCAVATION

Steel landscape edging varies somewhat in design among manufacturers. In general, the strips are buried in the ground and fastened with anchors or stakes. Always consult the manufacturer's guidelines for installation procedures that are specific to the edging you've chosen.

Before you start, call 811 for utility locations for telephone, gas, water and cable TV. Never

assume they are buried deeper than you'll be digging.

With the Col-Met steel edging shown in this article, you might have soil soft enough that no trenching is required. In this case, simply place the edging on top of the ground where desired, protect the top of the edging with a 2x4 or similar block of wood and, using a 3-lb. mallet, hammer it in to the desired depth.

However, some trenching is usually required, and the best tools for the job are a sharpshooter spade for depth and a half-moon edger for defining the line.



Steel edging usually installs with stakes or anchors. Col-Met edging has stakes integrated into the end of each strip.

Plan ahead if your yard has hard-packed soil. Water the area the night before to soften the dirt and make digging easier.

Digging the trench grants you the ability to form a swale to divide the lawn. Dig down 4 to 6 inches for the edging. On the inside of the edging line (the side with the mulch and planting areas), dig out a 45-degree swale 4 to 6 inches wide from the edging toward the bed. After you anchor the edging into place you should backfill the swale, leaving it a little below ground level on the back side of the edging. This will provide space for mulch, so it doesn't spill over the edging onto the lawn area.

The swale method also has an additional benefit. By removing the soil and replacing with backfill, the creeping grass that likes to spread into your flower bed has no soil in which to take to take root.

The top of the edging on the lawn side should extend 1/2 to 1 inch above the soil line but not above the grass for a clean look. Don't leave too much edging protruding above the soil or seasonal changes might heave it out of the ground.

The trenching process for edging is the same for steel, aluminum or PVC edging.



Once the stakes are removed, the ends of the edging strips overlap and are staked together to complete the joint.



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DEFINING YOUR LANDSCAPE

INSTALLATION

Always wear safety glasses and work gloves when working with steel edging. The Col-Met strips have stakes attached to the ends of the edging. To install, first pry off the stakes with a pair of Channellock pliers. Place the interlocking ends of one edging



Use a sharpshooter spade to dig the trench.



A half-moon edger works well to define the edging path.

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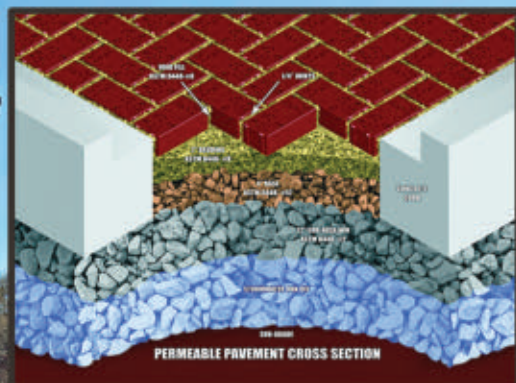
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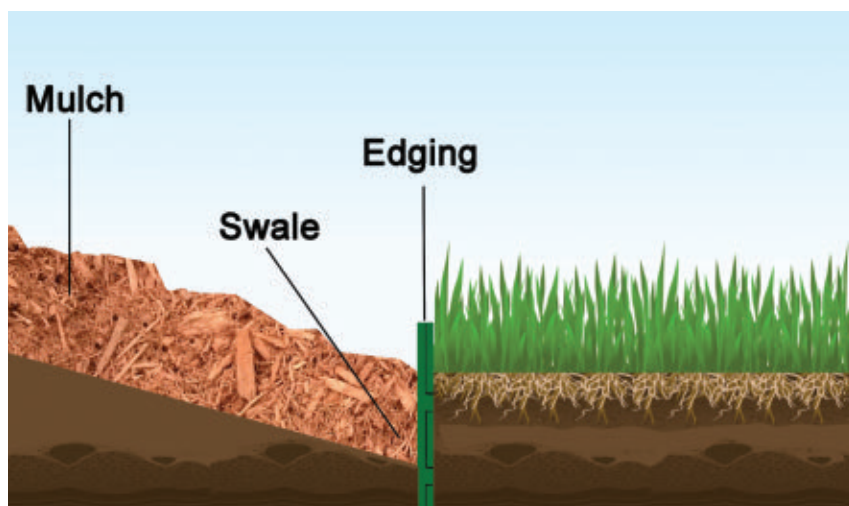
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DEFINING YOUR LANDSCAPE

strip over the preceding strip, and insert the stakes through the pre-formed slots to connect the joint. Work along the trench in this manner, fastening each new strip over the last and using four stakes per strip when connecting them end to end. Slip the stakes through the stake pockets just far enough to hold the edging pieces upright and in place.

With a small sledge or heavy hammer, tap all the stakes part way down. Repeat this until all the stakes are flush with the top of the edging and all the strips are driven at least halfway into the ground.

Col-Met's 14-gauge edging is made from mild carbon steel that you can easily form by hand for contoured shapes, or use a



Pry off the stakes with
Channellock pliers.



Use four stakes per
edging strip.



Place the edging in the trench.



Bury it at least halfway.

THROW A SOD PARTY

When it comes to beautiful garden beds and landscape boundaries, the condition of the lawn on the other side of the edging makes a big difference in overall appearance. Sometimes fertilizing and over-seeding may help, and other times new sod might be the answer.

To install the sod, you'll see professional landscapers use a tractor fitted with a special sod-laying apparatus hitched to the rear. These attachments are then fitted with large spools of sod (which are backed with mesh). A worker holds one end of the sod strip while the tractor operator pulls forward, literally unrolling the spool of sod in strips. However, the typical DIY approach is to purchase sod in rolls or pallets, have the supplier deliver them to the site, and recruit all your friends to help lay it on a weekend.

The sod needs to be installed on your dry soil the day it arrives. If temperatures are above 80 degrees, the soil should be moistened the day before to cool the soil temperatures (but don't over-water or you'll be working in mud). Have everyone lay the sod in tightly spaced rows, butted end to end without overlapping. Work on top of plywood sheets to protect the new sod from foot traffic. Use hatchets to cut the sod to fit the property lines and around obstacles in the yard. If you have any gaps, fill with topsoil and add seed.

After the sod is installed the initial watering should soak the sod and hydrate the soil. Keep away foot traffic, and keep the lawn moist at all times, preferably by frequent light sprinklings. The watering process should be repeated three times a day during the hottest months of the year (over 80 degrees) every day. Keep the sod moist to establish root growth but not soaking because too much water can lead to algae and fungus.

Laying sod can be tough work, so make sure to compensate your friends with plenty of pizza and their beverage of choice.



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DEFINING YOUR LANDSCAPE

straight board or table edge to bend 90-degree corners with a slight radius.

A hacksaw can be used to cut the edging. Rather than cut from

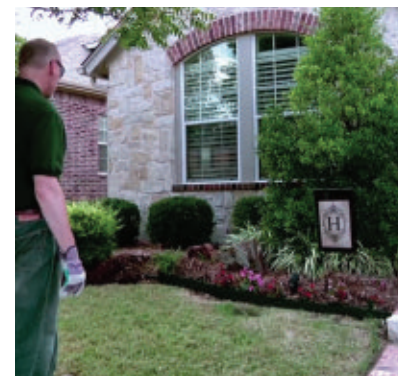
one edge to the other, score the steel edging along its face, then bend it back and forth along the score line until the edging breaks. A powered chop saw will also work.



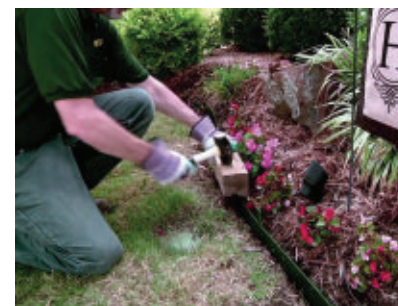
Place each new edging strip over the preceding one and align the stake pockets.



Insert the stakes into the slots and slightly into the soil.



Examine the edging before final installation and consider adjustments.



When satisfied, use a 4x4 block to protect the edging, and hammer the stakes and edging into the trench.

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DEFINING YOUR LANDSCAPE

The top of the edging on the lawn side usually extends 1/2 to 1 inch above the soil line (not above the grass) for a clean look. Remember not to have the edging sticking out of the ground

too much. Backfill the swale with stone and/or mulch.

When properly installed, the new steel edging should stay neatly and firmly in place for years to come. **EHT**



Backfill the edging with mulch. Don't leave too much edging exposed above the soil.

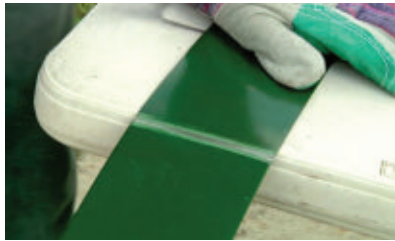


Use a straight board to form bends in the edging.



A hacksaw can make cuts in steel edging.

An advertisement for QuickScrews International Corporation. It features a top-down view of an open white drawer. Inside the drawer, there is a large, bold text overlay. At the top of the text is the company logo, which includes a green circular emblem with a dollar sign and the words 'QUICK \$CREWS INTERNATIONAL CORPORATION'. Below the logo, the text reads: 'ALL OF THE DRAWER SLIDE SCREWS YOU NEED FOR BALL BEARING DRAWER SLIDES & EUROPEAN DRAWER SLIDES'. At the bottom of the advertisement, it says 'ORDER ONLINE TODAY!' followed by the website 'WWW.QUICKSCREWS.COM' in large, bold, black letters. The drawer is set against a background of a kitchen with dark cabinets and a wooden floor.



To cut, first core the face evenly, then bend the edging back and forth along the score line to break off a clean cut.



A change in grade can be made accommodated with a special splicing stake.



If starting the edging next to a sidewalk, begin with 12 to 18" of edging along the sidewalk.

Use two 8' strips to make a tree ring with a 4-1/2' diameter.



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Be sure to drop by Booth #5126 at the National Hardware Show to learn more.

HEDGE TRIMMING BASICS

Some homeowners simply want an orderly, well-manicured row of shrubbery, while others get ambitious and try their hand at forming geometric shapes. For those who keep it simple, stick to the 1/3 Rule when pruning hedges, meaning that you should cut no more than 1/3 the growth at a time. When trimming a hedge to a particular shape, consider the sun's exposure to the lower branches. The healthiest shape for the plant is a conical one that tapers at the top and allows sunlight to reach all of the branches. Top-heavy shapes, on the other hand, should be avoided because the broad upper branches obscure sunlight from the lower ones. Don't forget to clip the inner branches to promote healthy growth.



STONE EDGING

Another popular way to create a boundary is to lay a simple border made of interlocking edging stones. Dig the trench as wide as the widest stone with a depth equal to one-half the average height of the stones. Cut the trench with a half-moon edger or spade. Remove the turf to form the trench. Pack the soil remaining in the trench with a hand tamper or a 4x4 block. If the soil drains poorly, then dig the trench 2 inches deeper add base layer of 3/4-minus gravel in the bottom. Lay the edging stones end to end in the trench situated snugly together. Fill the trench with soil up to grade on the grass side of the edging. Pack dirt tightly around the stones to prevent them from shifting. Backfill a flower bed with mulch, or fill with gravel for a walking path. Landscape fabric can help inhibit weed growth inside the bed.




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FIXING A DAMAGED FLOOR JOIST



By Rob Robillard

***Repair
Sagging,
Cracked or
Broken Floor
Framing.***

I recently had to repair a floor joist that had cracked. I suppose somewhere in the world there are floor joists that need to be repaired that have wide open, clear joist bays, with no pipes, wires or obstructions. Unfortunately, that's not my world.

This joist was installed in 1863 and was located directly below where a heavy refrigerator now lives. From initial inspection it appeared that someone had notched the joist too much and then installed a makeshift patch. The notch was made where the floor joist recessed into a wood beam, supported by chimney corbeling.

Corbeling is an "old school," overlapping arrangement of bricks with each course extending farther out from the vertical of the wall than the course below. Corbeling was done for decoration or to support structural beams, like in this situation.

My guess is that many years back, an old vent or furnace pipe ran through this location, and the contractor needed to cut this section of joist to accomplish the installation. Today, this type of notch is not allowed by code.

Notches can compromise the strength of floor joists, although some notches are acceptable, depending on their location as dictated by the International Residential Code [IRC]. Here's a good rule of thumb:

1. Notches should be no deeper than 1/6 the depth of the joist.
2. Notches at the end of the joist should be no deeper than 1/4 the depth.
3. Limit the length of notches to 1/3 of the joist's depth.

Not only did the aggressive notching doom this joist, it affected the structural integrity of the floor system above. To make matters worse, the refrigerator above our joist was causing the floor to sag.

A severely, cracked or sagging floor joist can get worse over time, causing the floor above it to slope or become unlevelled.

TOOLS & MATERIALS REQUIRED

- Level
- Reciprocating saw
- 5-pound hammer
- Tape measure
- Structural screws and joist hangers if applicable
- Power saw
- Framing lumber or laminated lumber if needed for strength
- Wood shims
- Hydraulic jack or metal jack posts
- Misc. hand tools
- Impact driver and accessories

FIXING A DAMAGED FLOOR JOIST



Improper notching can weaken a floor joist.

framing lumber and rip a 1/2-inch off the width of a 2x8 framing member. (Note: A nominal 2x8 board measures 1-1/2 by 7-1/2 inches.)

CUTTING THE NEW JOIST

When installing a new joist on a foundation wall you may need to notch the bottom edge so it can fit. Each situation is different. Follow IRC and your local building code guidelines for notching framing material before doing this repair.

I used a circ saw to cut the new joist so it would sit 3 inches on top of the beam. After cutting to length, I then ripped the new joist to fit.

ROOM FOR THE REPAIR

I had a few obstructions in my way; there were electrical wires, thermostat cables, a refrigerator water line, electrical conduit and heating pipes in the area. I also found old nails and pipe brackets, left in place from years past—I hate that.

The first step was to temporarily remove or relocate the electrical



First, remove or temporarily relocate electrical cables and pipes that interfere with the repair. Remove any leftover fasteners or hardware.



SISTER JOIST

Correcting a problem joist is an easy repair and is usually accomplished by fastening a new joist next to a damaged floor joist, doubling the thickness of the framing member. This is referred to as “sistering.”

This floor system was built in 1863 and was later reinforced with a mid-span beam approximately 7 feet away. The damaged joist measured exactly 2 inches by 6-1/4 inches deep—a true 2x6.

My approach was to install a new joist next to it, resting one end 3 inches onto the mid-span beam and installing a joist hanger on the other side. I would sister

the two together with structural screws.

The space between the beam and the floor boards above was 7 inches so I decided to use regular



The plan was to sister a new joist next to the old one.

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FIXING A DAMAGED FLOOR JOIST

cables and pipes. This necessitated shutting off the electricity and disconnecting a smoke alarm and some thermostat wiring. I also had to pull wire staples and unscrew conduit and heating pipe supports. These items would all need to be replaced after sistering the joist.

Once complete I checked the subfloor above for any penetrating nails that would inhibit the new

joist. I found none, but I would have used end nippers and cut them flush with the subfloor.

I also removed all the nails and old pipe hangers left from old mechanicals.

JACKING THE JOIST

I positioned the new joist in place and then set up a 6-ton hydraulic jack with a jack post. The new joist fit in the space

sideways but would not tilt into vertical position. The reason was the corners of the new joist, when at a 45-degree angle, caught the top of the beam and the bottom of the floor boards. Once the joist was vertical it would fit fine—hence the slight floor jacking.

I fastened two 2x4's together to make a simple jack post. I then



"Sistering" the joists means to fasten the joists together through the face to double the thickness of the framing.



The length of the new joist was cut so the end fit 3" over the support beam.



You can raise the existing joist with a bottle jack and jack post.



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The jack post is simply two 2x4s nailed together.

plumbed the 2x4 jack post and placed it directly under the cracked joist in order to lift a small sag out of the old joist as well as create a tiny bit of room for me to get the new joist against the old one at the beam.

A note on jacking: Jacking too fast can cause wall cracks above and many times it's better to jack slowly. A good rule of thumb is to jack only 1/8 inch a day, to get a joist level.

After lifting the cracked joist, I used a 5-pound hammer to carefully move the new joist into position. I needed to hammer the joist only where it sat on the beam, since this is where the joist was catching.

If the new joist is hitting a beam and the floor above, and jacking is not an option, an alternative approach is to cut small bevels on the two opposing edges that the touch the beam and floor board. This helps the joist turn into the proper resting position.

MAKING A JACK POST

I made a fast and simple jack post with two 2x4 screwed together. I was not lifting a lot of weight or



Slowly raise the jack. A good rule of thumb for floor joists is to lift them no more than 1/8" per day.

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FIXING A DAMAGED FLOOR JOIST

lifting and holding for a long period of time so I chose not to make a "strong back" or "T-jack" post. T-shaped posts are stronger because the 2x4 boards oppose each other and counteract any bending force created during jacking.

To make a T-shaped post, nail your pairs of 2x4s together, perpendicular to each other in the form of a "T." Secure them with framing nails or structural screws.

INSTALLING THE SISTER JOIST

After the new joist was in place (vertical and adjacent to the old joist), I used a clamp to hold them together at the chimney end.

I patched in the notch on the old joist, mostly so I had structural bearing to mount the



Use a hammer to adjust the lumber during installation.



Level the joist before fastening.



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FIXING A DAMAGED FLOOR JOIST

joist hanger. I also added a shim board to the width, to keep the hanger from deforming when fastened.

I then relocated the jack under the joist and placed a slight

amount of pre-stress tension on it, ensuring that I was level, and installed a double joist hanger to support both the old and new sister joist.

The joist hanger was designed

for “old work” and fits the wider fanning material often found in older homes. I secured the joist hanger into the corbel supported beam with 2-1/2-in. structural screws and into the joists with 1-1/2-in. structural screws.

To attach the new joist to the older one, I installed a series of



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Clamp the joists tightly before screwing together.



Cut a block to the fill the notch and screw it in place.



By filling the notch the joist hanger will have solid bearing for installation.

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FIXING A DAMAGED FLOOR JOIST

3-in. structural lag screws. Once secured, I released the jack pressure and removed the jack.

STRUCTURAL ENGINEER

If you're concerned about the structural integrity of a sagging, cracked or twisted joist in your house, first call a structural engineer to inspect the floor. Get a recommendation for reinforcement and strengthening measures. This type of inspection typically costs \$500 to \$700 and will assist with any other remodeling or building permitting projects. **EHT**



Fill all holes in the hanger with screws.



3" Truss-lock screws were used to fasten the sistered joists together.



The double joist hanger was sized for "old work" for wider lumber.



Use an impact driver to screw them in a staggered pattern throughout its length.



Extra blocking was added between joists to support overhead pipes.



Shown here is the completed repair.

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STABILIZE A FLOOR FOR TILE

Subfloors for tile installations require a little more attention to detail than other flooring materials. A floor might be solidly constructed and adequately supported but still have a degree of "bounce" or vibration when people walk across the room. This is usually not a major problem with resilient flooring, carpet or even some tongue-and-groove systems. Stability and rigidity should be addressed, however, if you plan to install a tile floor, because any minor amount of deflection in the subfloor could result in cracks or damage to the brittle material.

That was the problem faced by pro remodeler Ritchie Hamilton during a recent flooring job. Over time the house had settled and the floor joists had sagged. Not only did this result in a noticeable dip in what should be a flat surface, but the floor lost rigidity, and the surface would slightly bend and bow when you jumped up and down on it. Installing mortared and grouted floor tile over the unstable floor would invite cracked grout lines, loosened tiles, and maybe even broken tiles.

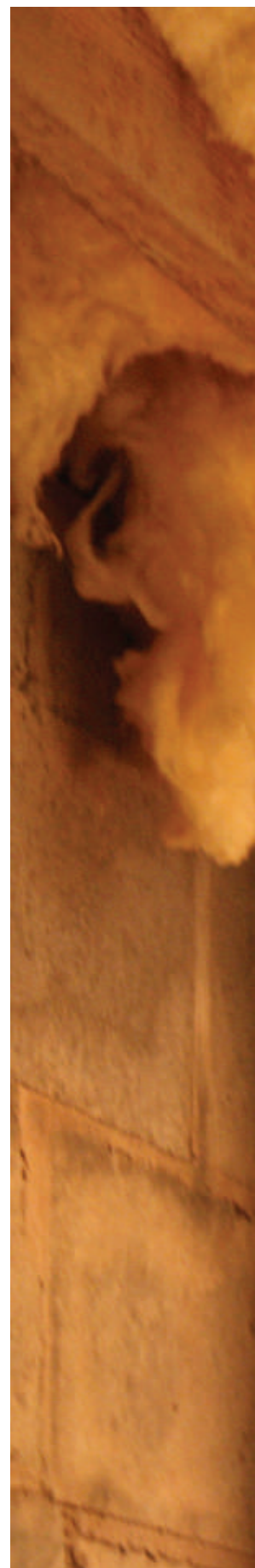
If you can gain access beneath the subfloor, you can construct a perpendicular beam with piers to level the joists and stabilize the framing with additional support that connects to the ground. The beam serves two purposes. First, it bridges across the bottom of the joists so they can all be leveled to the same height to reduce sag.

Second, if it's located midway through the span of the joists, the beam essentially halves the length of the unsupported framing, which takes some of the flex out of the flooring. That was the solution that Ritchie chose to strengthen the subfloor and ensure a long-lasting tile floor installation.

Here's how it went.

BEAM INSTALLATION

The surface of the existing floor was covered in resilient flooring. A little jumping around was all it took to determine the subfloor was in no shape for tile in its current condition.





STABILIZE A FLOOR FOR TILE



Ritchie's first step was to level some precast concrete pier footings laid in a row perpendicular to the the floor joists he planned to support.



Be sure to keep the jack and wood block perfectly plumb, otherwise the tension on the block will cause it to shoot dangerously out of the jack.



A plumb bob will help determine the right spot to locate the bottom of the 4x4 posts beneath the joists.



After locating the joist that sagged lowest in the crawlspace, we attached a 4x post to its underside with a metal construction tie. In this case the beam was a 4x4, but a 4x6 would work even better.



Once the space between the beam and joists closed, Ritchie installed a 4x4 post cut to fit between the adjusted beam and the concrete footing.



To span the entire floor a couple of 4x4 beams were installed end to end in the same manner.



Ritchie placed a bottle-jack on the footing beneath the lowest joist and used a 2x4 extension block to slowly raise the joist and beam. As the sagging joist goes higher, the gap shrinks between the beam and the bottom of the neighboring joists.



The new posts provide a secure connection all the way to the ground and to help take the shake out of the floor.



Positioning the posts snugly between the joists and footing will take a little encouragement from a hammer.

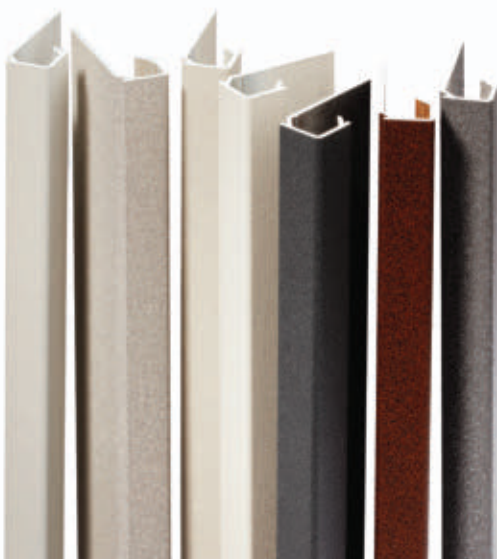
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STABILIZE A FLOOR FOR TILE

Install each post perfectly plumb, and toe-nail with a framing nailer to secure them from movement.

If you have any problem joists that simply refuse to align with

the others, use wood shims to close the gap and provide a solid connection that will reduce movement.

Shown here is the completed subfloor girder (lower right).



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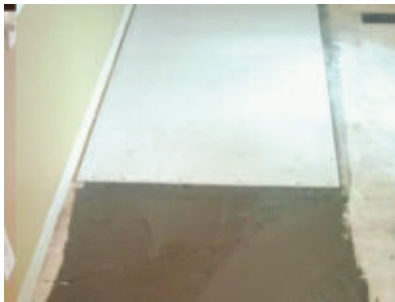
SUBSTRATE INSTALLATION

Once you've stabilized the floor framing, your subfloor will probably be in less-than-perfect condition for tile, which requires a very flat, solid surface. Ritchie decided to go with cement-board underlayment, specifically using 1/4-in. HardieBacker.

After stripping the floor covering to the plywood subfloor, Ritchie installed the HardieBacker. Although it's common to see remodelers fasten cement board directly to the subfloor with nails or screws, that is not recommended.



The best practice is to first apply a supporting bed of modified thinset mortar to the subfloor using a 1/4-in. square-notched trowel.



Then, embed the cement board firmly and evenly in the wet mortar.



Stagger all the cement-board joints, and avoid aligning them with the subfloor joints. The four corners of cement boards should never meet at one point. Leave an

1/8-in. gap between board edges for expansion, and keep the edges 1/8-in. back from walls and cabinet bases.

To make cuts to the HardieBacker, you can use a razor utility knife to

score and snap the boards to size and make necessary cutouts.

Fasten the cement board with the manufacturer's specified screws or roofing nails (minimum

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STABILIZE A FLOOR FOR TILE

1-1/4 in. and corrosion-resistant) every 8 inches over the entire surface. Keep fasteners between 3/8 and 3/4 inch from board edges and 2 inches from corners. Set

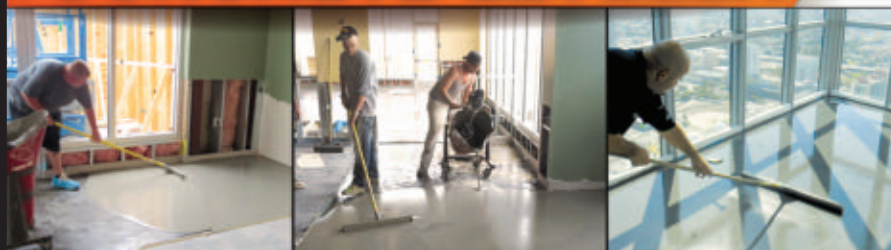
all the fastener heads flush with the surface without overdriving.

Prior to setting the tile, fill all joints with the same mortar used to set the tiles.

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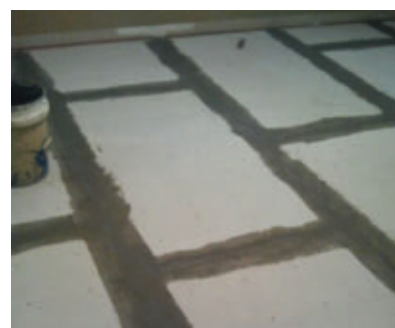
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Then, embed 2-in. wide high-strength alkali-resistant glass fiber tape in the mortar.



Level the tape and mortar with a drywall trowel.



Follow these guidelines to stabilize the joists and prepare a proper substrate, and your subfloor should pass the bounce test so the tile installation will go smoothly and last for years to come.



Shown here is the finished tile floor. **EHT**

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Storage Solution for Limited Headroom

Using the Space Beneath a Gable Roof for Concealed Office Storage



By Larry Walton

Most of my storage areas are filled with seasonal stuff. I don't use it all of the time, but when I need a gold pan or snorkeling gear I have it. When you start adding up camping, hunting, fishing, hiking, hockey, photography, soccer and golf, it's a lot of stuff. If I can keep it out of sight, I get to keep it, and making use of odd spaces in the house is a great way to maximize storage for my seasonal stuff.

My current house has a 12/12 pitch roof, which provides some useful second-floor space. The gables are on the east and west ends, which means you run out

of head room as you walk north or south. It's the triangular space beyond the headroom that we are making use of in this project.

If you have some top floor space with areas where you run out of headroom, we may actually be doing your head a favor with this project. If you start building your storage where you run out of headroom you'll quit smacking your head on the ceiling. I know I did.

This storage-closet project does not involve framing in the traditional sense. It is simply comprised of bypass doors hanging from a backer angled to compensate for

the slope of the ceiling. The track backer also backs the valance, which hides the track. The ends are capped off with a simple particle board sheet covered with drywall.

I started by standing a 6-ft. level on the floor, adjusting for plumb and marking where the edge of the level touched the ceiling. If you have a floor covering with a pattern in it, you may wish to match the outline to the floor covering. Otherwise it's best to make sure the height of the new closet header is equal distance from the floor at both ends.

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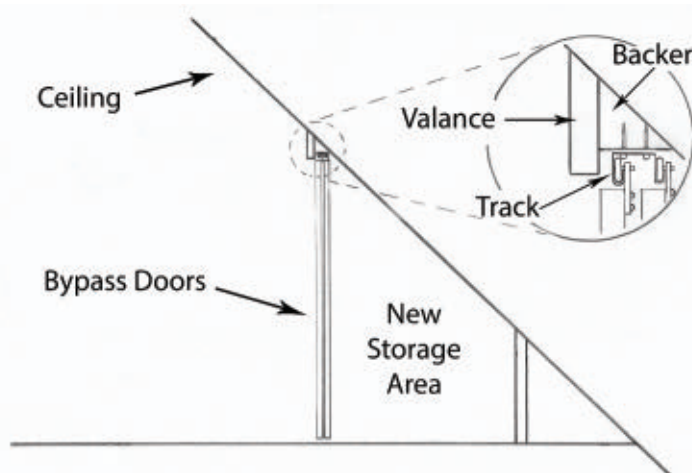


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After snapping a layout line, we ripped some 4x4 stock with the ceiling rake angle along one edge. The other two surfaces support the bypass door track and the valance. The track attaches to the horizontal surface, and the valance attaches to the vertical.

We used our layout line to position the track and valance backer-board and make some measurements for our doors. We decided to build the doors before installing the backer-board to make sure we had the right clearance for the finished doors and bypass hardware.

Hanging some bypass doors and capping the ends of the storage areas has proven to be an efficient and attractive way to hide my seasonal stuff. Here's how we got it done.

STEP BY STEP



We made the doors by simply mitering some 1x4 MDF trim boards with biscuits in the joints to form frames.



We nailed sheets of pegboard to the backs of the frames. Note that only 1/2 inch of the 1x4 frame is showing. This overlap of 3 inches onto the frame adds to the strength of the doors.



The finished doors helped us to determine the final location of the track and valance backer-board.

We fastened the backer-board with long screws into the rafters, which were at 2-ft. intervals. The backer-board required shims at some of the rafter locations to keep it flat.

We ripped the ceiling rake angle along the top edge of the 1x4



MDF trim boards and nailed them to the face of the backer board as a valance to hide the bypass track.



We used some particleboard sheets to cap off the ends of the storage closets. These ends did not need a precise fit along the ceiling and the back wall because they worked as a backer for the drywall finish. They did, however, need to be flush with the valance and plumb from valance to floor.

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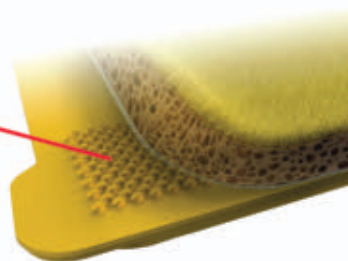
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We attached 2x nailers to the floor and back wall for the particle board end caps. The top outside corner attached to the end of the bypass track backer and the valance trim board.



We installed drywall over the end walls and taped and textured them to match the existing walls, which as you can see had some random, rough texture.



Some vertical trim boards capped the front of the end walls and covered where the doors met the end walls. We left a little overhang past the drywall end walls so a bead of caulk could make the transition between the vertical trim board and end wall.



We painted the doors, valance and vertical trim boards black to match our office furniture. **EHT**

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PRO TIP FOR PRIMING & PAINTING

To prep the storage area for painting, we used a primer designed for the first coat on raw wood. These primers seal in resins, fill voids and improve adhesion. Also, be sure to prime and paint the backs of the doors to keep them from warping. Unsealed door panels will absorb moisture, which causes expansion on the unpainted side, resulting in a warped door.



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addition, all E-Cut saw blades have a chip space to discharge any chips. Holder and saw blade are firmly attached in state-of-the-art welding plants. Starlock accessories work with oscillating renovation systems from Fein and Bosch, as well as other manufacturers' machines with 12-point mounts. This makes Starlock accessories compatible with most oscillators in the market. Visit www.fein.com/starlock.

FUJITSU RLS3 DUCTLESS MINI-SPLIT SYSTEMS

Fujitsu General America introduces a series of wall-mounted units that are among the most energy-efficient home comfort systems available today. Each of the new Fujitsu RLS3 Series' three models—the 9,000, 12,000 and 15,000, named for their respective BTU capacity—earned the "Most Efficient" designation from Energy Star, the U.S. Environmental Protection Agency (EPA) program. Popular in Europe and Asia, ductless wall-mounted units, also known as "mini-split" systems, are gaining traction in North America because combined cooling and heating systems are more attractive and quieter than window units, less intrusive and more controllable than central air systems—and far more energy efficient than both. For a list of Fujitsu installers by area, visit www.constantcomfort.com.



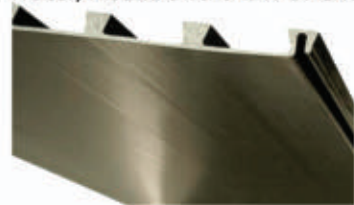
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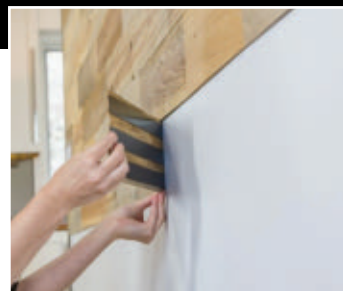
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How Air Conditioning Works!

Air conditioning is one of those luxuries that has become essential. When air conditioning first became available in automobiles it was available as an aftermarket luxury item reserved for the nicest of vehicles and wealthy passengers. Today you can hardly find a car that doesn't have air conditioning installed even in the coldest parts of the country!

As we spend more and more time in our cars it has become more important to be comfortable while we drive. Summer road trips and winter holiday traveling can require lots of time in the car where you want to be comfortable so you can enjoy your trip and arrive refreshed. Also, as cars have gotten more comfortable and more capable, we've started driving even in bad weather. Cold or rainy weather requires you to be able to keep your windshield clear both on the inside and the outside. Having a good working air conditioning system can help keep the inside of your windshield clear of moisture and condensation which will allow better winter vision and keep you safely on the road no matter what kind of weather you're driving through.

If you're wondering how air conditioning works, you might be surprised that all of these conveniences are accomplished through a relatively simple system. The goal of your air conditioning system is to remove heat from the cabin of your vehicle and release it to the air outside of your vehicle. In order to accomplish this, you need some refrigerant, which is a special fluid designed to have certain properties at specific temperatures and pressures, a compressor to raise the pressure of the refrigerant, an expansion valve to lower the pressure of the refrigerant and 2 heat exchangers to transfer to heat out of your car and into the air.

The components in your air conditioning are simple and are designed to work with the specific refrigerant you use. The most common refrigerant used in cars today is R-134a. First, the Compressor raises the pressure and consequently the temperature of the fluid. Next, the condenser, a simple heat exchanger, lowers the temperature of the refrigerant back down to the temperature of the outside air while keeping the pressure high. The expansion valve works just the opposite of the compressor. It lowers the pressure and consequently the temperature of your refrigerant causing the cooling effect that your air condition system needs. The refrigerant then travels to the evaporator which works just like your condenser, except has the opposite effect since the refrigerant is now cool. The evaporator transfer the cooling to your cabin air keeping your comfortable and your windshield clear.

The refrigerant in your system is transferred to and from each component using high pressure hoses and pipes. Since all of these components are mounted in your vehicle, they're subject to harsh weather conditions, temperature swings, chemicals from leaks and road grime, and vibrations. These vibrations and harsh conditions can lead to small leaks around the hose connections, the o-rings in your system, or even in the heat exchangers as they are relatively fragile components. These small leaks will allow some of your refrigerant to escape from the system lowering the pressure and causing problems. If your system pressure becomes too low, your compressor and expansion valve will not function properly causing a lack of cooling in your system.

Since most refrigerants are odorless gasses at room temperature it can be very difficult to detect a leak in your air conditioning system. In most cases, you find out you have a leak because your system isn't working properly. The easiest way to stop a leak in your air conditioning system is to use Red Angel AC Stop Leak. Red Angel AC Stop Leak is a chemical sealant that will remain inert in your system until it reaches the extreme temperature change at a leak point. There it will be activated and form a chemical weld sealing your leak! Once you've got a sealed system you can add the proper amount of refrigerant and get back to being comfortable and safe with a great working air condition system!

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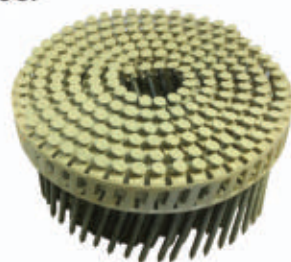


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