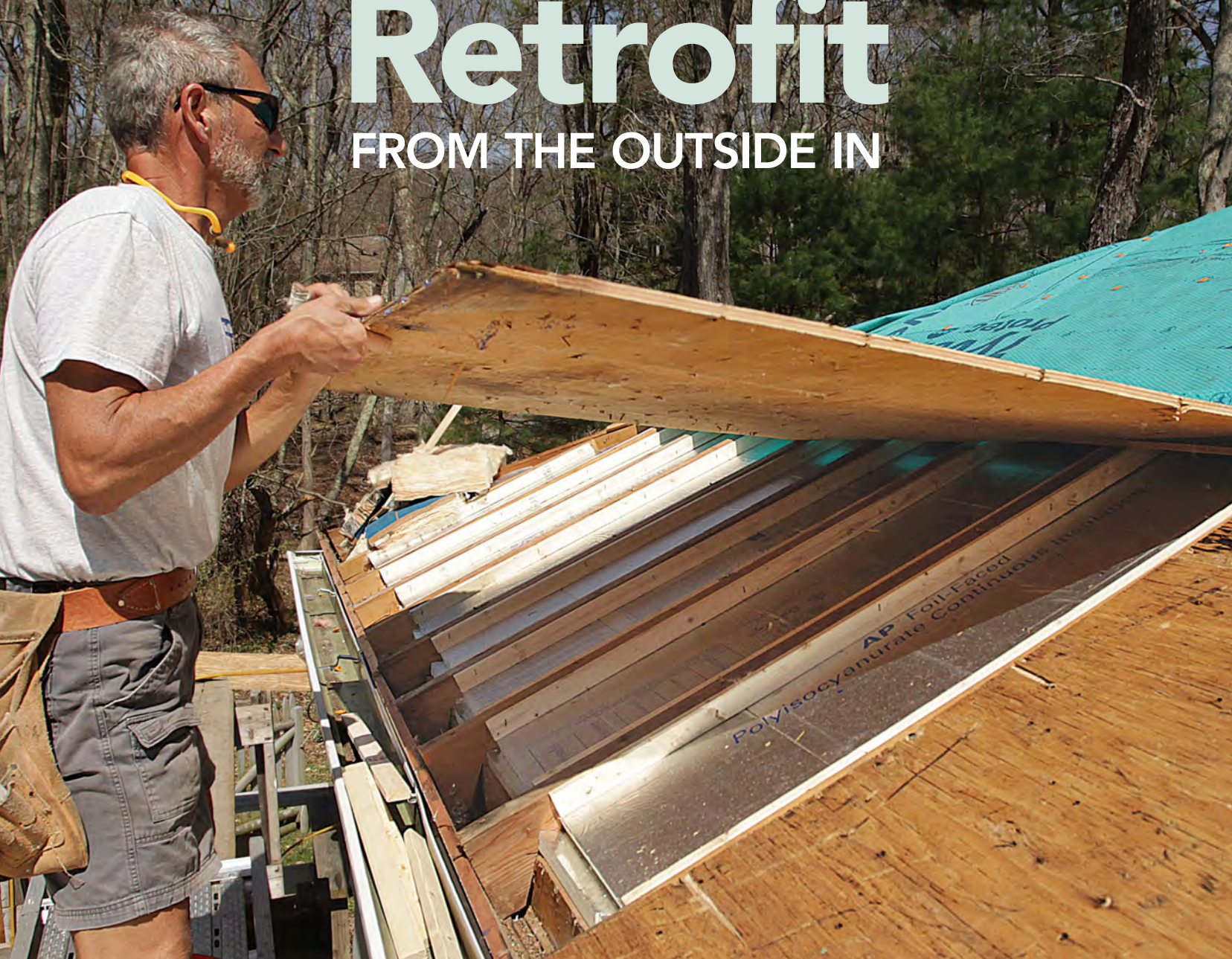


# Roof Vent Retrofit

## FROM THE OUTSIDE IN



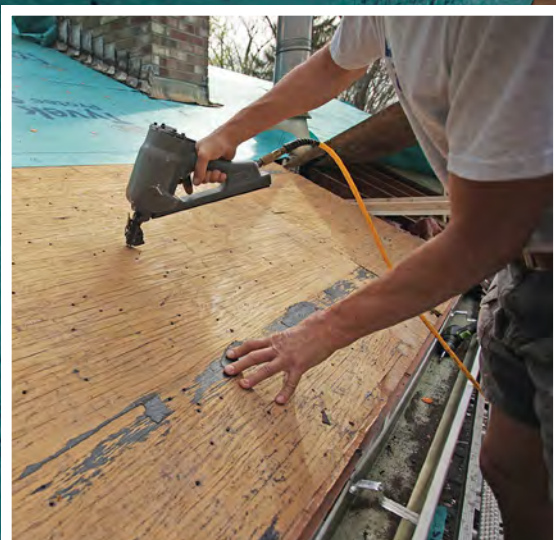
Reroofing is the perfect time to lift the hood and make short work of an otherwise awkward venting job

BY MIKE GUERTIN

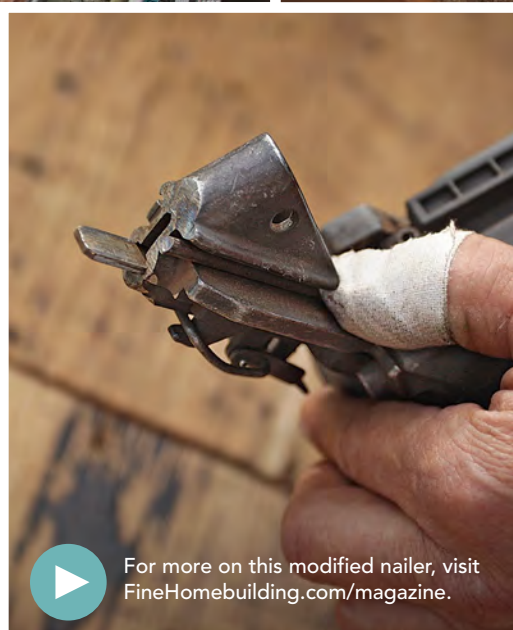
**T**he roofs in a lot of older houses with unconditioned attics aren't properly vented, and that can be a problem in many climates. Ventilation helps keep the roof deck dry, and, combined with air-sealing and insulation, helps prevent ice dams when it's cold.

The most challenging part of venting, air-sealing, and insulating an attic in an old house is dealing with the area along the exterior walls where the rafters meet the top plate. The space between the rafters and ceiling joists is cramped, making it a difficult spot in which to maneuver and work. This is especially the case on lower-slope roofs (less than 6-pitch), where all of the

# REMOVE THE SHEATHING



**Punch them through.** Specialty nail-removal tools are available, but you can also make your own by grinding the nose of an old framing nailer, allowing it to punch the sheathing nails through the sheathing to release each sheet from the rafters. We ground  $\frac{3}{8}$  in. of metal from the nailer's nose, and the driver (which strikes the nail) now projects  $\frac{5}{8}$  in.



For more on this modified nailer, visit [FineHomebuilding.com/magazine](http://FineHomebuilding.com/magazine).

**Raise the roof.** With the sheathing panels loose, either slide them up the roof or prop them up like the hood of a car to provide some shade.

action takes place in a tight spot just out of reach.

One solution is to combine the attic insulation and ventilation upgrade work with roofing replacement. This way, instead of working inside the attic, most of the work can be done from outside.

## Pop the hood

After stripping off the old roofing, we use a modified framing nailer to free up the bottom course of roof sheathing and expose the top plate, rafters, ceiling joists, and existing insulation.

The conventional way to remove roof sheathing is to yank the nails using a cat's-

paw-style puller, but I find it faster and less damaging to just punch the nails through the sheathing. There are tools made specifically to remove nails or drive them through lumber, but we just use an old framing nailer that I modified by grinding  $\frac{3}{8}$  in. from the end of the driver nose (the business end of the nailer). With the nose ground down, the nail driver projects about  $\frac{5}{8}$  in. from the nose when you pull the trigger, which is more than enough to punch nails through the  $\frac{1}{2}$ -in. roof sheathing.

After driving the nails through the sheathing, we lift the panels and either slide the loose sheets up the roof or tilt them up like the hood of a car, bracing them with scrap

wood in order to provide some shade to work under.

It's up to you whether it makes sense to work in smaller or larger sections. For efficiency on this project, we kept an eye on the weather and opened long sections of roof at a time so we could production-build the vent baffles.

## Add some site-built baffles

With the sheathing removed, it's easy to air-seal penetrations in the drywall ceiling, like recessed can lights and electrical boxes. Then we measure each rafter bay and fabricate vent baffles from rigid-foam insulation and wood strips to install between the rafters.

# BUILD THE BAFFLES



**Foam and furring strips.** Measure each rafter bay at the bottom and 4 ft. up, take the lesser of the two measurements—as long as they're less than  $\frac{1}{4}$  in. different—and write it on the fascia or top plate. If the measurements vary by more than  $\frac{1}{4}$  in., you'll need a tapered baffle. On the ground, cut the 1-in. foam using a track saw, and attach wood strips on either side using  $\frac{1}{2}$ -in.-crown by  $1\frac{3}{4}$ -in.-leg staples.



Vent baffles perform three tasks: they create an air gap between the insulation and roof, they prevent insulation from spilling into the soffit, and they provide an air barrier to minimize wind-washing of the insulation, which can compromise its R-value.

We usually install 4-ft.-long baffles made from 1-in.-thick polyiso and  $\frac{3}{4}$ -in. by  $1\frac{5}{8}$ -in. wood strips. OSB, plywood, and other rigid materials can be used instead, but I like the foam because the space between the top plate and the roof sheathing is usually narrow, and the foam adds insulating value.

A quick note on the depth of the vent baffles: The IRC calls for a minimum ventilation space of 1 in., though building scientists

suggest leaving a 2-in. vent space for better airflow. Since the distance between the roof sheathing and top plate on this and most other low-pitch roofs is cramped, a deep vent channel reduces the space for insulation. There's going to be a compromise, and it's the installer's call—more vent space, or more insulation. We like to split it somewhere down the middle.

These baffles didn't fill the space all the way down to the top plate on this roof—they were 1 in. shy. In order to fill the gap, we used scrap strips of 1-in. polyiso insulation. We cut the strips to fit between the framing at the bottom of the rafter bays, and then we stapled them in place with the same

pneumatic staples that we used to fabricate the baffles.

Before installing the baffles, we realign the existing batt insulation on the attic floor, and add more insulation to fill the space under the lower portion of the baffle, starting over the top plate and extending about 18 in. inside. It can be tough to get blown-in insulation to fill this cramped spot, and this simplifies the insulation effort.

When the baffles are installed under the 6-pitch roof, there's about 20 in. of vertical distance between the ceiling drywall and the top of the 4-ft. vent baffles for insulation. If deeper insulation is planned, we'll have room to maneuver inside the attic to extend

# FIT AND FASTEN

**Dam the air.** The bottoms of the baffles usually sit a bit above the top plate. Be sure to staple scraps of rigid foam, cut to fit between the rafter and ceiling framing, to fill the gap and act as a dam to keep the attic insulation from spilling out or getting wind-washed.



**Make some handles.** The baffles should fit snugly between the rafters, but may be loose if the rafters aren't parallel. To give yourself something to grab onto to hold it in place for fastening, shoot some staples through the strips to act as handles.



the baffles up the slope. The wood strips, meanwhile, act as spacers to keep the top of the baffles  $1\frac{5}{8}$  in. or more beneath the roof sheathing, and also as a means to attach the baffles to the rafters.

Rafter-bay widths may vary, but adjacent rafters are mostly parallel. We take one measurement at the bottom of each bay and another 4 ft. up. When rafters are slightly out of parallel (less than  $\frac{1}{4}$  in.), we use the narrower of the measurements to make the baffle. When rafters are seriously out of parallel, we taper-cut the foam baffle to fit. Any gaps between the baffles and framing are sealed with spray foam or caulk.

When working the roof in shorter sections, we write down each rafter-bay measure-

ment on the top plate or fascia for reference. If we're working in larger sections, we typically write a number on each bay in addition to the measurement. The measurements and corresponding bay numbers are added to our cutlist, and written on each baffle as we make it to keep track of what goes where.

## Close it up and move inside

After the vent chutes are in and other retrofit work is complete, we're ready to lower the roof sheathing back in place, nail it off, and move inside to blow in some additional insulation. But there's one thing to consider before closing up the roof: hurricane ties. There wasn't much thought to load path and high-wind resistance when older homes

were built. With the roof open, it's a good opportunity to better secure the rafters and ceiling joists to the top plates.

It took less than an hour for two of us to cut and assemble over 60 baffles needed for the two long walls of this roof. The materials cost about \$5 per baffle, and labor runs about \$1 to \$2 each, depending on hourly wage and our efficiency. Though we have the extra steps of removing and reinstalling the roof sheathing, this outside-in method is still a time-saver, and allows for a better installation of the vent baffles and insulation. □

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**Fasten the baffles.** Set each baffle flush with or slightly below the top of the rafters, and use the same crown staples to attach them to the rafters.



**Notch for joists.** Where ceiling joists get in the way, cut the foam to fit around them, and use shorter wood strips in some cases. Fill any gaps with caulk to aid in preventing wind-washing of the insulation below.

## REINSTALL THE SHEATHING



**Drop the hood.** After the insulation, baffle, and sealing work is done, drop the sheathing back down and nail it off. Avoid old nail holes for solid fastening.

