

Adding a Bathroom Fan

A quiet fan, airtight ductwork, and a leak-free vent combine to clear moisture from the bathroom and the house

BY MIKE GUERTIN

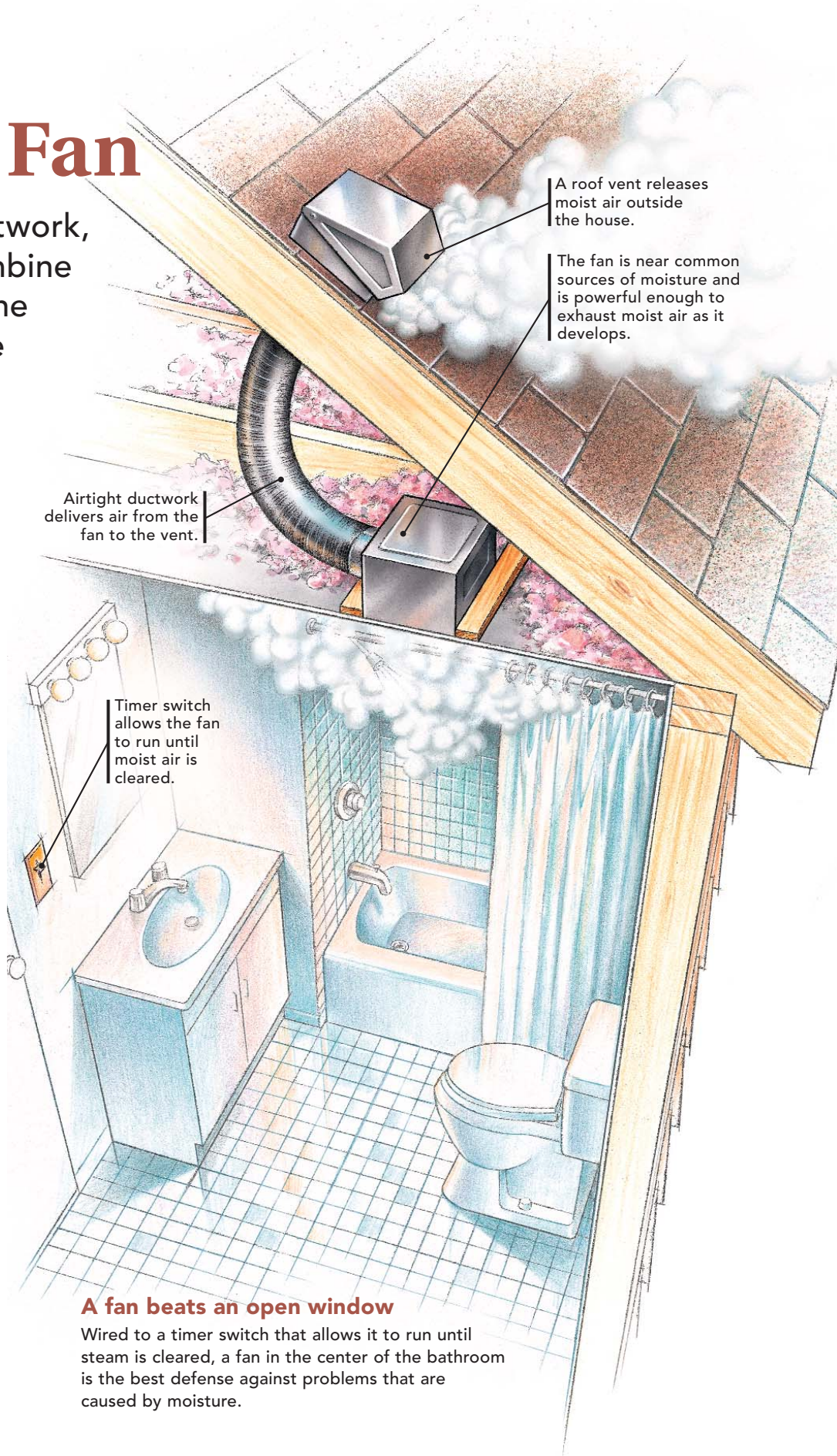
If you're like me and enjoy a hot shower, the last thing you want in your bathroom is a fan that sounds like a helicopter. The reality is that hot showers create moisture that, left alone, will lead to mold and mildew problems. Lucky for us, the bathroom fan has come of age.

Today's fans are quieter and move more air than yesterday's models. Whether I'm building a new house or remodeling a bathroom, I install an ultra-quiet exhaust fan because a quiet fan is more likely to be used. And a properly installed fan clears excess moisture from the bathroom and the house to where it is unable to find a way back in. The fan should be near the shower, and the ductwork should be airtight and vented out the roof or a gable-end wall. Vapor exhausted through a soffit often will be drawn back into the attic through the soffit vents. The entire system must be airtight to keep moisture from leaking into the attic or wall and ceiling cavities.

Once installed, the fan must be used properly. As long as moisture is in the bathroom, the fan should continue to run. To eliminate the risk of it being left on for hours at a time, I install a delay-timer switch with the fan, which keeps it running for up to 60 minutes.

This may sound like a lot of work for a bathroom that has a window in it. But as a remodeler, I've seen the mold and mildew problems that moisture can cause. Opening a window is a good idea, but it isn't reliable enough to eradicate moisture effectively. □

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A roof vent releases moist air outside the house.

The fan is near common sources of moisture and is powerful enough to exhaust moist air as it develops.

Airtight ductwork delivers air from the fan to the vent.

Timer switch allows the fan to run until moist air is cleared.

A fan beats an open window

Wired to a timer switch that allows it to run until steam is cleared, a fan in the center of the bathroom is the best defense against problems that are caused by moisture.

PROTECT THE BATHROOM AND YOURSELF

Cut the ceiling and keep clean with a plastic bag and a plastic suit

Cheap and easy dust containment.

A garbage bag taped to the bathroom ceiling catches dust while the ceiling is cut. A plastic suit (available at paint stores for less than \$10) protects your skin from fiberglass insulation and dust in the attic.



Use a template and blocking for accuracy and convenience. A cardboard template cut from the fan's box marks the cut in the attic. A piece of blocking screwed to the drywall extends beyond the cutline to catch the scrap when it is cut free. Leaving the screw loose allows you to twist the blocking out of the saw's path.



TODAY'S FANS ARE STRONGER, YET QUIETER THAN EVER

Walk into any big-box store, and you'll find dozens of bathroom fans priced from \$20 to \$200. Here are a few important things to consider when choosing a fan.

Power

For an average-size bathroom, the Home Ventilation Institute recommends that the fan exhaust 1 cfm (cubic foot per minute) per sq. ft. of bathroom.

Sound level

Sones are the measure of sound for bathroom fans. Normal conversation takes place from 3 to 4 sones. Some bath fans are quieter than 1 sone.

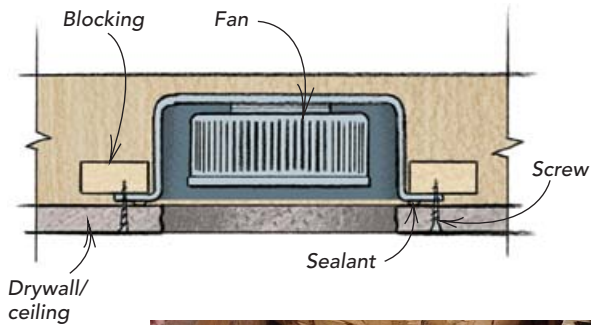
Useful features

Independently operating lights, heaters, and moisture sensors that turn on the fan as needed are nifty extras.

PREVENT AIR LEAKAGE IN THE ATTIC

Sealant, blocking, and screws secure the fan

Keeping moisture out of the attic is critical. The two key points are installing a leak-free duct and keeping air from the bathroom from leaking around the fan.



Sealant prevents moisture from leaking into the attic. A thick bead of sealant around the perimeter of the hole creates an airtight bond between the fan's flange and the drywall. Place the fan in the hole carefully, and make sure it sits flat on the ceiling and sealant.

Short, straight ductwork vents air efficiently

When a curve is necessary, attach the duct to the fan, and create a short, sweeping arc toward the ceiling to determine the length of duct and the best location for the roof vent. Trace around the duct's perimeter onto the inside of the roof sheathing.



A screw marks the spot on the roof. A screw driven into the center of the traced circle and through the roof sheathing marks the center of the duct and transfers the vent location to the roof where the hole will be cut.



Screw through the ceiling. Drywall screws anchor the fan to the ceiling and will be hidden by the fan's cover and light.

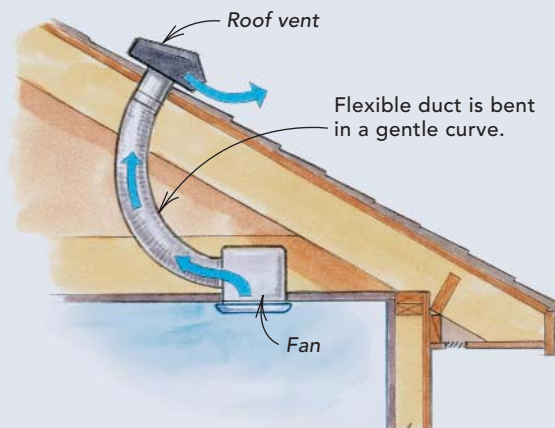


Seal all ductwork tightly. The duct is slipped all the way onto the fan's exhaust port and sealed airtight with aluminum duct tape. Don't use common fabric-backed duct tape, which will deteriorate with time.

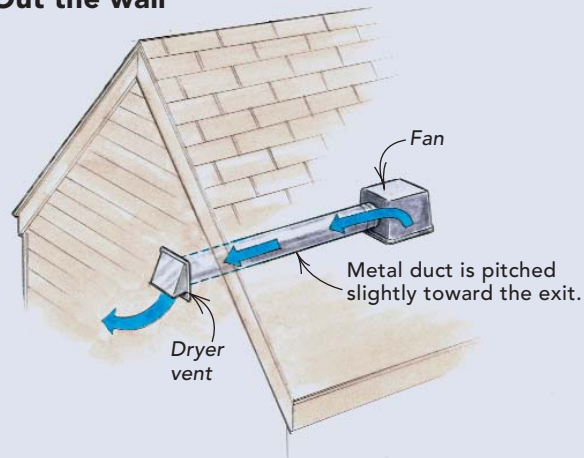
VENTING A BATHROOM FAN: GET VAPOR OUT, AND KEEP IT OUT

The fan can exhaust air through the roof using a roof vent or out a gable-end wall using a clothes-dryer vent. But under no circumstances should the fan vent through or into the eaves or soffit. Airflow will draw vapor back into the attic through the soffit vents, making the fan little more than a waste of energy.

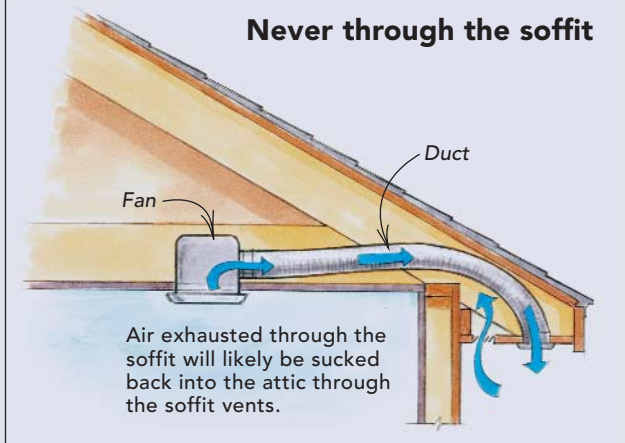
Through the roof



Out the wall



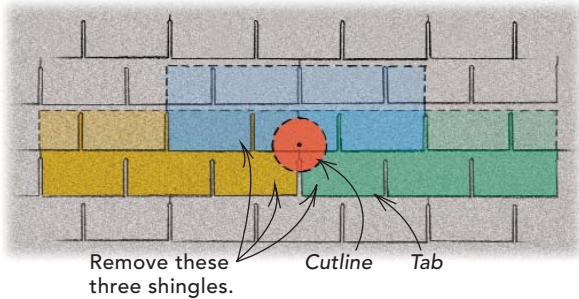
Never through the soffit



INSTALL A LEAK-FREE ROOF VENT

Don't cut through tabs

Trace the vent receptacle onto the roof around the driven screw. If the circle is touching a shingle's tabs, remove that shingle before cutting the hole.

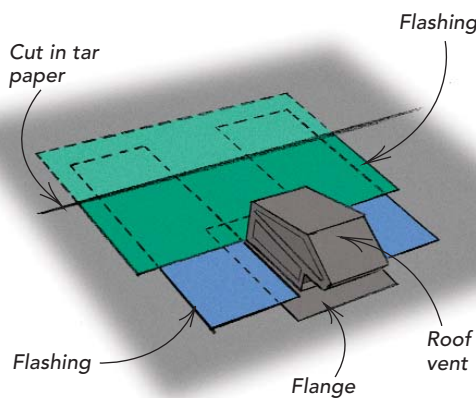


Cut a hole large enough for the vent. The hole for the vent should be slightly larger than the duct receptacle to allow the ductwork coming from the fan to slide into the sheathing and all the way onto the receptacle.



Flashing prevents water leaks

Keep water out of the attic by flashing around three sides of the roof vent.



Sides first. Slipped below the underlying tar paper and overlapping the flange, the flashing extends onto the shingle below.



Overlap everything. A third piece of flashing, which also slips under the tar paper, overlaps the flange and the side flashing.



The vent faces down the roof. Slip the vent into the hole with the opening facing down, and secure it at each corner with galvanized roofing nails.



Cut around the vent and replace the shingles. Before the shingles are replaced, they are cut to fit closely around the vent, overlapping the flange on the top and both sides.



Connect the duct. Back in the attic, the duct is connected to the vent and sealed with aluminum duct tape.

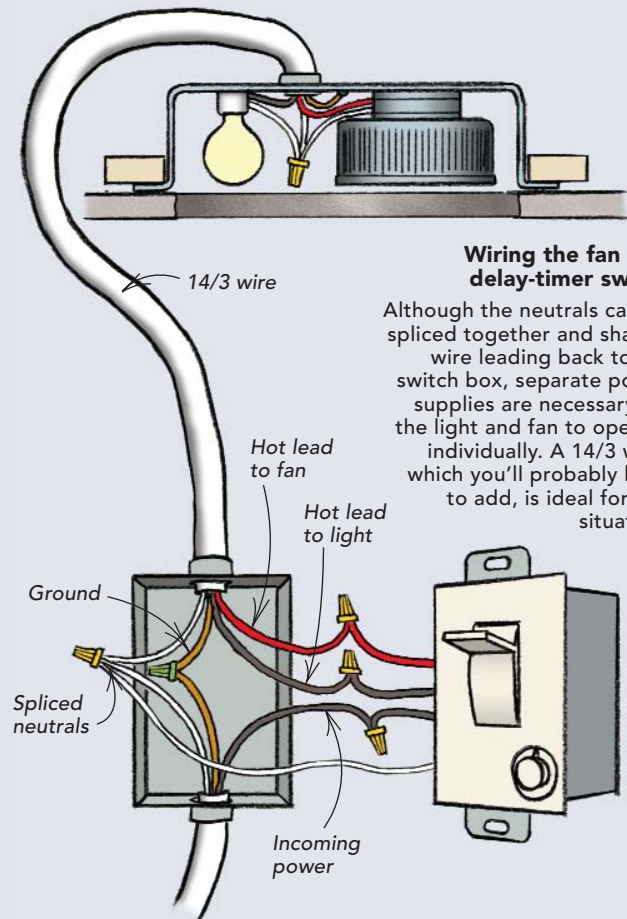
ONE SWITCH CONTROLS THE LIGHT AND FAN

Bathroom fan and light combination units often are used to replace existing lights. A new fan could easily be wired to the existing switch, which would operate both the fan and the light. But for a bathroom fan to be effective, it needs to remain running after the user has left the bathroom. By wiring the light and fan on separate switches, the light can be turned off to conserve energy while the fan clears moisture from the room. Better yet, an electronic timer switch (www.efi.org) turns the fan and light on together, but has an integral timer that keeps the fan running for up to an hour after the switch and light are turned off.

—M. G.



Delay-timer switch keeps the fan running until the steam clears.



Wiring the fan to a delay-timer switch

Although the neutrals can be spliced together and share a wire leading back to the switch box, separate power supplies are necessary for the light and fan to operate individually. A 14/3 wire, which you'll probably have to add, is ideal for this situation.