



**MIXING DIFFERENT KINDS OF EXHAUST CAN CAUSE VENTILATION PROBLEMS.**

# Inspections

## *Attic Ventilation Inspections: Good For Customers And Good For Business*

by Paul Scelsi, chairman, Roof Assembly Ventilation Coalition

**M**any roofing contractors report that when they take the time to do an attic inspection they are not only being thorough for the customer, but they are standing apart from their competition because many roofing contractors do not do attic ventilation inspections. Contractors who skip attic inspections are

often concerned that a worker will damage the attic floor, that access to and throughout the attic is difficult, or that they do not see the value in doing them. However, there is great value to be gained by doing an inspection.

Attic ventilation can help fight heat buildup in the summer, moisture buildup in the winter, and ice dams in cold climates. An examination of a roof's exterior, the perimeter of the house, and the attic's interior can help ensure the ventilation system is performing properly.

Getting on the Roof Note: special care should be taken if going onto a roof, including following established safety guidelines. There are various attic ventilation check-

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**A PAINTED-OVER INTAKE VENT CAN CREATE AN INBALANCED AIRFLOW.**

points to investigate during the exterior portion of the inspection.

Attic ventilation needs to have a balanced amount of intake and exhaust airflow to provide the year-round benefits of fighting heat, moisture, and ice dams. This allows

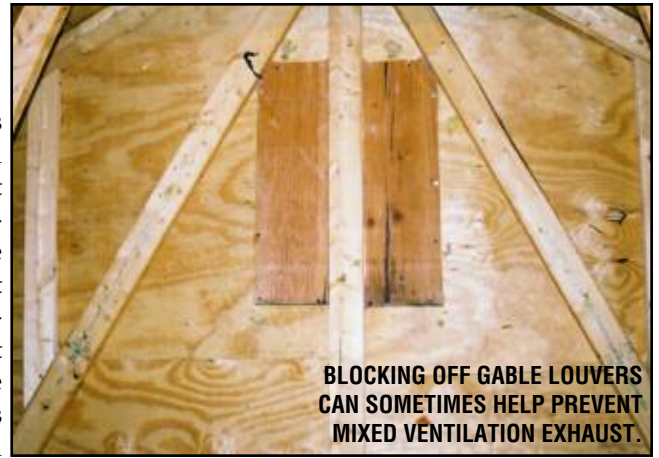
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cooler, dryer outdoor air to enter the attic through the intake vents in the soffit or low on the roof. From there it can help flush out warm, moist air along the entire underside of the roof through the exhaust vents positioned high or near the peak. But, it must be balanced to do this. Thus, if the attic calls for 1,500 sq.in. Net Free Area, half of that should be exhaust and half should be intake. When the attic

ventilation system is out of balance and there is more exhaust than intake, it is potentially problematic. The excess exhaust that does not have adequate intake can get the required intake from itself. This means a wind turbine could



**BLOCKING OFF GABLE LOUVERS CAN SOMETIMES HELP PREVENT MIXED VENTILATION EXHAUST.**

pull air from a nearby wind turbine on the same roof. Or, a ridge vent can ingest intake from its backside. If exhaust vents are ingesting air, they are also potentially bringing in whatever is being carried by the air at that moment, including rain, snow, and debris. As a rule of thumb, if the attic ventilation system is out of balance, it is better to have more intake than exhaust. This is because the excess intake converts into exhaust on the leeward side of the building.

## Meeting Code Requirements

The 2012 International Residential Code (IRC), Section R806 – Roof Ventilation, and local code requirements should be referenced for attic ventilation. In part, Section R806 states: Enclosed attics and enclosed rafter spaces, formed where ceilings are applied to the underside of the roof rafters, shall have cross ventilation for each separate space. The minimum net free ventilation area shall be 1/150 of the area of the vented space. Exception: The minimum Net Free Area shall be 1/300 of the vented space provided one or more of the following conditions are met: in Climate Zones 6, 7, and 8, a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling; at least 40% and not more than 50% of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space, with the balance of the required ventilation provided by eave or cornice vents.

There are five types of exhaust vents: gable louvers (rectangular or triangular vents installed in the gable-

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**WARPED ROOF DECK  
DUE TO ATTIC  
MOISTURE PROBLEMS.**

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end of the house); roof louvers (round, square, and slant-back vents installed near the peak of the roof); wind turbines (higher-profile vents installed near the peak of the roof); power fans (electric or solar powered vents installed near the peak of the roof or in the gable-end of the house); and ridge vents (low-profile, shingle-over vents installed on the ridge or peak of the roof). No two types of exhaust vents should be on the same roof above a common attic because short-circuiting can occur. Mixing exhaust vent types can lead to weather infiltration through one of the vents, and leave portions of the attic incorrectly vented. This happens because air generally wants to follow the



**THIS INSULATION Baffle  
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path of least resistance. Thus, if ridge vents are mixed with gable louvers, the primary air path will be in the gable louver and out the ridge vent. That leaves the attic space below the gable louver incorrectly vented. If a power fan is mixed with a wind turbine, the power fan will pull its intake air from the wind turbine when the fan is running. When the fan shuts off, the wind turbine will pull air from the power fan. Either way, a large section lower in the attic is not being vented properly. Further, exhaust vents are not designed to ingest air or weather elements.

Continuous soffit vents or rectangular under-eave vents should ideally be positioned as far as possible from the exterior wall to allow an optimum airflow path from intake to exhaust. Additionally, positioning them near the rafter tail will help minimize the intake vents from being blocked by attic insulation. Other signs of trouble due to improper attic ventilation include shingle damage such as curling, cracking, or fish mouting. This may be an indication of excessive heat and moisture buildup in the attic. Paint over intake vents will reduce airflow capacity, and gutter damage may be an indicator of ice dams. Further, when snow melts unevenly on the roof it could indicate heat-loss inside the attic from the living space as well as inadequate and/or imbalanced attic ventilation.

### Stand out by Stepping in the Attic

When it is safe and practical to do so, roofing contractors should step inside the attic and do an interior attic ventilation inspection. The following includes important areas that should be checked.

*Blocked intake vents:* To function properly, intake vents need an unobstructed airflow path to feed the exhaust vents. If the attic insulation or debris is covering the intake vents, they will not work. Contractors should ensure the insulation is pulled back to create a clear airflow path.

*Incorrectly positioned attic insulation baffles:* Insulation baffles are another way to keep intake vents clear and free. However, if a baffle extends further out into the soffit than where the vent is located, the insulation will push up against the baffle and block the vent. Wherever there is an intake vent there should be an insulation baffle.

*Wrong sized holes for intake and exhaust vents:* The holes cut in the plywood should be properly sized for the intake and the exhaust vents to maximize the Net Free Area specified for the particular vent. For example, two round 4" holes cut for a 16" x 8" under-eave vent reduces the vent's Net Free Area from 56 sq.in. to approximately 25 sq.in. The same is true for exhaust vents. A ridge vent that provides 18 sq.in. of Net Free Area per linear foot needs a slot opening at the peak measuring 1.5" wide, because 1.5" over the course of 1 linear foot equals 18 sq.in. Anything narrower than 1.5" reduces the vent's airflow capacity.

*Incorrectly ducted bathroom fans:* Bathroom fan ductwork should not terminate inside the attic or be routed to the intake vents. Instead, the ductwork should run through the roof vertically or out the sidewall to dedicated vents designed for bathrooms. If the ductwork terminates inside the attic, it will dump more moisture than a properly balanced attic ventilation system can handle. Additionally, if the ductwork runs into the intake vents the moisture is exiting via an airflow entry point. Consequently, the moisture could re-enter the attic through the intake vents in certain wind conditions.

*Rust on nails:* Finally, during a winter inspection, look

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for rust on the shanks of the nails penetrating the underside of the deck. The rust is a sign of condensed moisture, frost, or ice.

The following checklists, both interior and exterior, may help in generating complete inspections.

## Interior Inspection Checklist

The following is a list of questions that should be considered when performing an interior attic inspection:

- Is anything blocking the intake vents such as insulation, debris, etc.?
- Are insulation baffles being used?
- Have the vent holes been correctly sized for the intake and exhaust vents in place?
- Is there rust on the nails that penetrate the underside of the deck?
- Are there water droplets on the nails from condensed moisture, frost, or ice?
- Is the insulation compacted, compressed, and/or damp?
- Is there mold or mildew on the

underside of the deck, on the rafters, the insulation, etc.?

- Is the plywood blackened?
- Where does the bathroom fan ductwork terminate?
- Is the attic access door properly insulated and/or sealed?
- Are the recessed can lights properly insulated and/or sealed?


## Exterior Inspection Checklist

When performing an exterior attic ventilation inspection, the following questions must be asked:

- Is there a balance of intake and exhaust vents?
- Does the attic ventilation system meet minimum code requirements?
- Is there only one type of exhaust vent on the roof or is there a mix of types that could result in short-circuiting?
- Are the under-eave vents or continuous soffit vents positioned as far as possible from the exterior wall?
- Are the intake vents positioned

near the rafter tail to maximize their performance?

- Is there peeling paint in the soffit?
- Are there any signs of roof leaks in the soffit?
- Have the intake vents been painted over?
- Is there any evidence of ice dam damage?
- Are icicles forming along the edge of the roof?
- Does the snow melt unevenly on the roof?
- Are the shingles curling, cracking, or fish mouthing?
- Is the roof deck buckling or showing signs of warping?

In conclusion, conducting a thorough attic ventilation inspection may not always be an easy task for a roofing contractor, but it can make a significant difference. Specifically, an inspection could be the difference between getting hired for the project and being skipped over by the homeowner. 



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