

FINDING AND FIXING WATER AND AIR LEAKS

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As you finish your morning coffee, you wait for the weather forecast. And it's what you've been dreading: rain. For most people, rain during rush hour means little more than annoyance and perhaps increased driving stress and travel time. But for you, driving in the rain means a miserably wet ride, a ruined suit and possibly ruined shoes as well, unless you take precautions and change into your wet-weather driving clothes. You, like many other folks on the road, have a car that suffers from a water leak.

You're all too familiar with that cold rainwater steadily dripping down from under the dash and flowing down your left leg. Your discomfort is further exacerbated by the piercing whistle originating at the source of the leak.

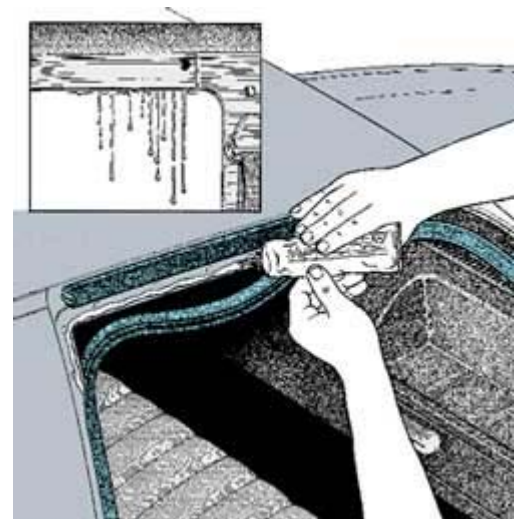
You contemplate simply phoning in sick, but then you gird your resolve. Before heading out to the garage, you decide that you're going to find the source of those leaks and squelch them once and for all—even if you have to tear the entire car apart.

Wind noise

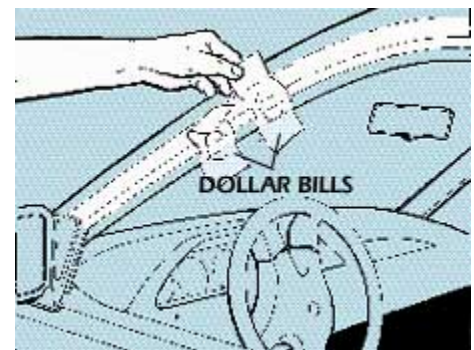
As you drive, air surrounding the car creates large pressure differentials between the inside and outside of the body. The greatest differential occurs along the sides of the car between the roof and belt line where outside pressure is much lower than the pressure in the passenger compartment.

Weatherstripping and window seals are supposed to keep passenger-compartment air in and outside air out. When they are damaged, however, whistles, hissing and other annoying noises occur.

Therefore, the place to start looking for air leaks is the weatherstripping. Torn, missing or distorted sections are likely sources



Sometimes fixing a leak is as simple as reinstalling a misplaced rubber gasket. An auto parts store will have the proper trim adhesive. Clean all the old adhesive off the doorframe and gasket first.



A gasket loose enough to let a dollar slide easily might leak air at speed. Tug firmly, but don't tear the bill.

of leaks that result in wind noise. You should also inspect the door's weatherstrip sealing surface for bumps, lumps or other imperfections that could prevent an otherwise healthy weatherstrip from fully seating.

Replace torn or missing weatherstrips, but do not use a generic weatherstrip intended for storm doors to replace the carefully engineered rubber seal--unless you're desperate. The dealership should be able to order the correct part for you, or you may be able to find what you need on a similar car in a junkyard. It's also possible to repair torn sections of weatherstrip with silicone seal or strong, quick-drying glue. But first clean the pieces with alcohol or lacquer thinner. Don't be afraid to piece short lengths together.

As a last resort, many firms make replacement gaskets for older cars at very reasonable prices--although you may need to buy an entire kit. J.C. Whitney and other companies also sell weatherstrip by the yard in an array of different profiles.

Distorted sections can often be repaired simply by heating them with a heat gun or a hair dryer and then reforming them by hand.

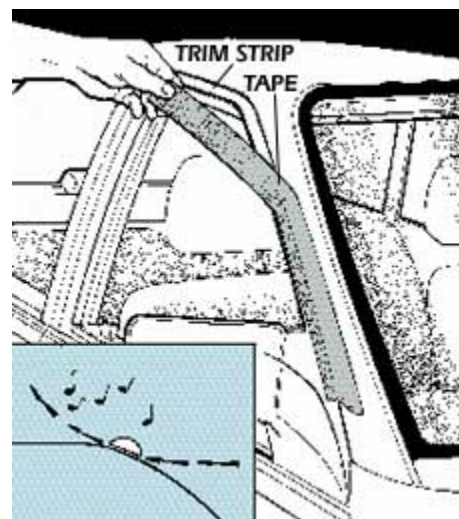
A quick way to check for air leaks is to rub chalk on the surface of the weatherstrip. When you shut the door, chalk dust will transfer from the strip to the door on areas that seal properly. You can also check for leaks in small areas by placing a dollar bill between the weatherstrip and the door. After closing the door, pull the dollar bill. If it moves too easily, you've found a gap. Air leaks can also be caused by a misadjusted door or worn door hinges that allow the door to sag. To check door alignment, make sure there are even gaps between the closed door and the body. The outer surface of the door should also be flush with the surrounding sheetmetal. To check for worn hinges, open the door and lift it up and down to see if the hinges allow movement. If they do, they'll have to be replaced.

Pressure me

You can simulate inside/outside pressure differentials in a parked vehicle using the heater or air-conditioning blower to pressurize the passenger compartment while you look for leaks.

To do this, begin by blocking all interior exhaust vents (they're usually found on the C pillars) with duct tape. Also make sure that any dash-mounted fresh-air vents are closed. Next, start the engine so the vacuum-operated vent controls will operate, then set the HVAC controls to draw in outside air on the highest blower setting. Shut off the engine and turn the key to the accessory position so the blower still operates, and then close the doors.

In a short while, pressure will build in the passenger compartment. Check for air leaks by moving your hand slowly around window glass



Wind can slide under trim pieces and whistle. Use tape to find the culprit, then seal the leak with trim adhesive or silicone seal.

and weatherstripping to feel for air leaks. Mark suspect areas with tape so you can correct them later.

Instead of feeling for leaks, you can listen for them by using a stethoscope or by placing one end of a piece of small-diameter tubing at the seal and listening at the other end. Body water leaks are tough to find because the water runs down to a low spot far from the source of the leak.

Repair small gaps between the body and the weatherstripping by shimming it with vinyl foam tape. On doors with frames, leaks can also occur around window seals. If the seals are not torn or missing, you can often adjust the window track behind the door panel so the window rides more tightly against the seal.

Wind noise can also be caused by loose driprail covers, molding, the grille and external accessories. If you suspect a noise is coming from one of these areas, cover it or modify its shape with tape to see if the noise disappears. If it does, you've found the problem.

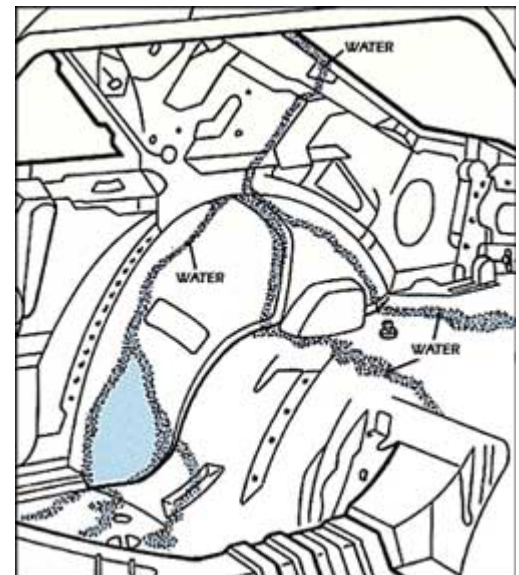
Water leaks

You may not realize it, but when it rains, water flows all over the inside of a car body. Depending on the car's design, water can run down the insides of C pillars, the insides of doors and through the cowl. Fortunately, cars also have systems that channel the water to places that serve as drains. If the drain holes are plugged, water backs up and, before you know it, water is inside the car. To keep this from happening, make sure cowl shields and trunk and hood weatherstripping are in place and in good shape. You should also periodically inspect door- and rocker-panel drainage holes to make sure they are clear of debris that would prevent them from draining freely.

In addition to leaking through weatherstripping and window seals, water can drip through body welds, seams, pinholes, plugs and other areas where gaps or holes exist.

Unlike air, water is affected by gravity, so no matter where the leak originates, the water will eventually wind up in a lower part of the vehicle. Water can also travel far from its original entry point. For example, it's not unusual for water to enter near the roofline and travel down the inside of the passenger compartment between the trim and body. Whether it becomes visible before it gets to the floor depends on its course.

How do you tell if a water leak starts at a floor-pan seam or the moonroof? Start with common sense: If the floor pan gets wet only when you drive through deep puddles, assume the water is coming



Body water leaks are tough to find because the water runs down to a low spot far from the source of the leak.

from a rust hole, a missing body plug, body-seam leak or other opening down low. The floor pan, fender wells and the lower portion of the engine bulkhead are prime leak areas. If the floor is wet when it rains, but you haven't driven the car, assume that the water is entering at a higher point, such as a moonroof, roof pillar or the window sealing areas. A drip from under the dash might be traced to the cowlings below the windshield. Use a helper and a garden hose to follow water leaks back to their source. You may need to remove some trim to find the spot.

Fight water with water

Not surprisingly, you can use water to find water leaks. The best way to spot leaks is to have an assistant inside the car look for leaks while you spray suspect areas with low-pressure spray from a garden hose.

To accurately pinpoint leaks, you may have to remove interior trim components from the door, roof pillars or even the floor. As you move the water spray from lower to higher points on the vehicle, have your assistant shine a flashlight on areas that correspond to the area that you're spraying.

Leaks in the urethane seal around the windshield or rear window can be especially troublesome to spot. If you suspect an area, wipe the outside down with soapy water, then have your assistant blow compressed air on the area. If the water bubbles on the outside, you've found the leak.

Keep in mind that late-model cars have windshields and rear windows that are installed with urethane sealers. Because they affect the structural integrity of the roof, only glass- or body-repair professionals should attempt to repair these leaks.

Repairs

You'll want to replace or repair all defective seals, weatherstrips and guards. There are many types of material for filling and sealing body leaks. Consult the box to the left to determine the best material for repairing a leak.

If you want to have a leak repaired by a professional, take your car to a technician who is certified by the inter-industry conference on collision auto repair (I-CAR). I-CAR technicians have been trained in the proper methods of sealing bodies.

Leak Repair Products

Permatex 65AR: Windshield and glass sealer.

3M 08655: Brushable seam sealer.



Use a helper and a garden hose to follow water leaks back to their source. You may need to remove some trim to find the spot.

Weatherstrip adhesive.

Strip caulk that can be molded by hand to fill gaps, seams and other large areas.

3M 08551: Clear sealer for small leaks around windshield, rear windows, reveal moldings and small seams.

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