

SATURN

RESOURCE MANAGEMENT

7.6 DOOR REPAIR AND WEATHERSTRIP

SWS Detail: 3.0202.1 Door Air Sealing

Door operation affects building energy-efficiency, security, and durability, so doors are often an important weatherization priority. A leaky door may be an important comfort problem, and weatherstripping the door can be a high-value energy conservation measure.

Only weatherstrip doors that operate well, as described below. Perform all door adjustment and repair in a lead-safe manner. *See "Lead-Safe Procedures" on page 48.*

7.6.1 Evaluating Exterior Doors

Before weatherstripping a door, evaluate the door's operation.

- Does the door bind or scrape against its jambs, indicating a need for hinge adjustment, cutting, planing, or sanding?
- Does the door close and latch tightly and evenly against its stops or is there an uneven space between the door and stop when the door latches?
- Can you move the latched door back and forth against its stops, indicating a need for adjustment of the stop or strike plate?

- Can you move the open door up and down, indicating loose hinges?

7.6.2 Causes of Door Binding

You can adjust binding doors by moving the door within its opening. The clearance between a door and its jamb should be between $\frac{1}{16}$ and $\frac{3}{16}$ of an inch (2-to-5 mm).

Be aware that the distance that you move the door to adjust it is small — $\frac{1}{16}$ inch or 1-to- 2 millimeters. The goal of adjustment is to solve a door-binding problem so that the door closes and latches correctly and that weatherstrip seals air leakage without causing a problem.

Consider these door-operating problems and possible solutions.

Loose, Sagging, or Misaligned Hinges

The most common door problem is that gravity has pulled the door down and toward the top-latch side corner and inward the bottom hinge-side corner.

- ✓ *The hinge screws are loose.* Tighten the screws on the jamb and door. Add longer screws if necessary. If longer screws penetrate the stud behind the door jamb, those screws can pull the door and its jamb back a little at the top hinge side.
- ✓ *Gravity bent the top-hinge knuckles over time, creating an excessive gap between the top jamb and the top latch side of the door. This made the door's top latch-side corner lean toward the top of the latch-side jamb and bind the door there.* Use an adjustable wrench to bend the hinge knuckles, fastened to the door, very slightly. The hinge screws must be very tight so they don't pull out when you bend the knuckles.
- ✓ *There is excess room on the hinge side and inadequate room on the latch side.* Chisel the hinge mortise deeper to allow the screws to pull the door away from the latch-side jamb.

- ✓ *There is excess room on the latch side and inadequate room on the hinge side. Shim the hinges outward with cardboard or sheet plastic. Loosen the hinge screws and place the shims between the hinge and jamb, then tighten the screws. If the latch-side gap varies, use shims of varying thickness behind the hinges.*
- ✓ *Closing the door creates a spring effect because the door is pulling on the hinge. Rotate the hinge slightly by shimming so that the hinge sits flat and in the same plane as the door.*



Symptoms of a sagging door: Gravity rotated this door to pinch the top jamb side corner and bottom hinge side corner of the door against the side jambs.

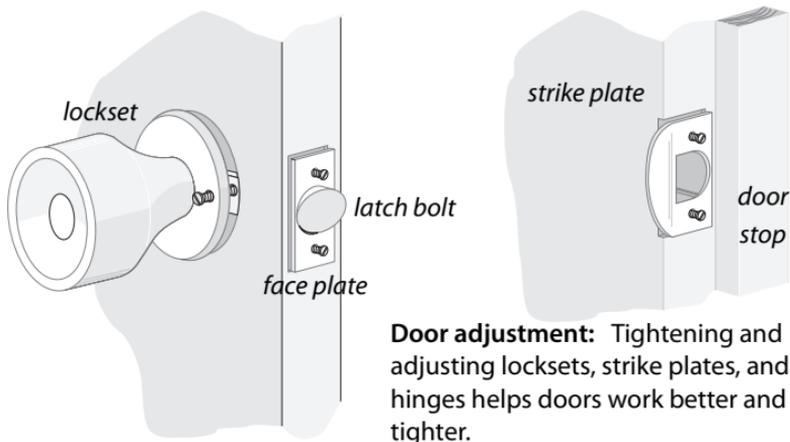
Door-Frame or Structural Problems

1. *The hinge-side door jamb moved slightly toward the latch-side, wracking the door frame slightly out of square and binding the door at the top latch side and the bottom hinge side.*
 - a. Drive long screws through the top hinge or the upper part of the hinge jamb.
 - b. Or, loosen the bottom hinge and the middle hinge if necessary. Install cardboard or plastic shims behind the hinges that move the door up and away from the bottom hinge side jamb and toward the bottom latch side.

2. *The building has settled near the door.*
 - a. Cut, plane, or sand the door so it closes without rubbing or binding against its jambs.
 - b. Use a jack to level the floor if practical — the building has a basement, for example. Devise a way to support the floor in its newly adjusted position.
3. *Temperature and humidity changes swell and shrink the door seasonally. Or, the door is permanently swollen.*
 - a. If the door swells and shrinks, wait until it shrinks and apply oil-based paint or urethane varnish to seal the door and prevent future swelling.
 - b. If the door is permanently swollen, plane and/or sand the door. Or if there is room between the jambs and framing, try to move the jambs outward slightly after removing the casing on one side.
4. *Paint has built up and reduced the door's operating gap.*
 - a. Plane or sand off the excess paint. Planing and sanding are a last resort, so try the previous suggestions first.



Solutions for door sagging: Bend the hinge knuckles slightly, drive a long screw into the hinge, and/or drive another long screw into the jamb above the hinge. Experience will tell you which solution works in each particular case.



Door adjustment: Tightening and adjusting locksets, strike plates, and hinges helps doors work better and seal tighter.

7.6.3 Adjusting Door Stops and Latches

Tighten loose door knobs, face plates, and strike plates before concluding that there is a problem with the stops or latches. These steps should precede weatherstripping.

Problems with the Door Stop

There are two different types of door stops: the nailed-on type and the integral type. You can move the nailed-on type

If a door won't latch, inspect the door stops, door jambs, hinges, and weatherstripping to see if they're causing the binding.

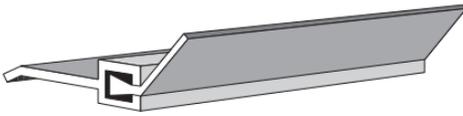
- ✓ If the door is warped and doesn't fit well against its stops, adjust the stops by moving them against the door if they are nailed-on stops.
- ✓ If the stops are integral to the door jambs, plane them so door closes snugly against its stops.

Problems with the Latch

The strike plate is mortised into the latch side of the door frame. The latch bolt seats into a hole in the strike plate and the door jamb under it. Often the latch bolt doesn't seat because of problems with the hinges or the jambs as discussed earlier.

If there's no obvious problem with the stops, hinges, weather-strip, mark the strike plate to evaluate how far you have to move it. Put lipstick or crayon wax on the latch and close the door and then notice the mark on the strike plate. Move the strike plate or use a rotary file to remove some metal from the strike plate, enough to allow the latch bolt to seat itself.

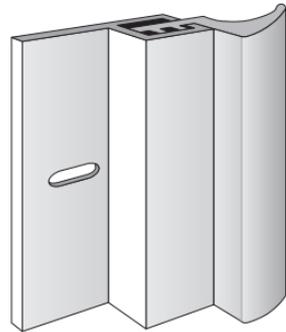
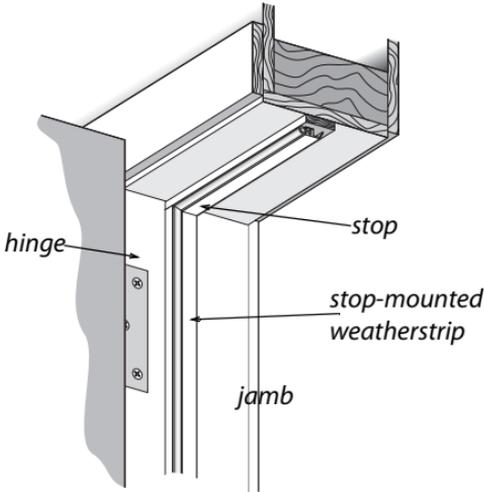
- ✓ Remove the two screws from the strike plate.
- ✓ Move the strike plate enough to seat the latch bolt. Use toothpicks to fill existing screw holes.
- ✓ Consider driving slightly longer screws, if you have to move the strike plate.



Vinyl flap weatherstrip is particularly flexible, allowing the door to remain sealed with seasonal movements of the door



This Q-Lon weatherstrip inserts into a kerf in the integral door stop of a pre-hung exterior door.



This Q-Lon weatherstrip installs on an existing door stop.



Silicone bulb weatherstrip is much more flexible than vinyl bulb and therefore seals better.



This Q-Lon weatherstrip acts as a replacement door stop.

Weatherstripping doors: The weatherstrips shown should be flexible enough to move with the door seasonally and maintain their seal as the door moves seasonally.

7.6.4 Weatherstripping Doors

SWS Detail: 3.0202.1 Door Air Sealing

- ✓ Install weatherstrip only on doors that operate properly as described previously.
- ✓ Consider how much the weatherstrip narrows the width of the door, when weatherstripping a door with a lot of traffic.
- ✓ Ask the client whether they want to locate a foot-wiping rug on the floor, adjacent to the door. Make sure that the threshold is high enough to accommodate the rug.

Weatherstrip Specifications

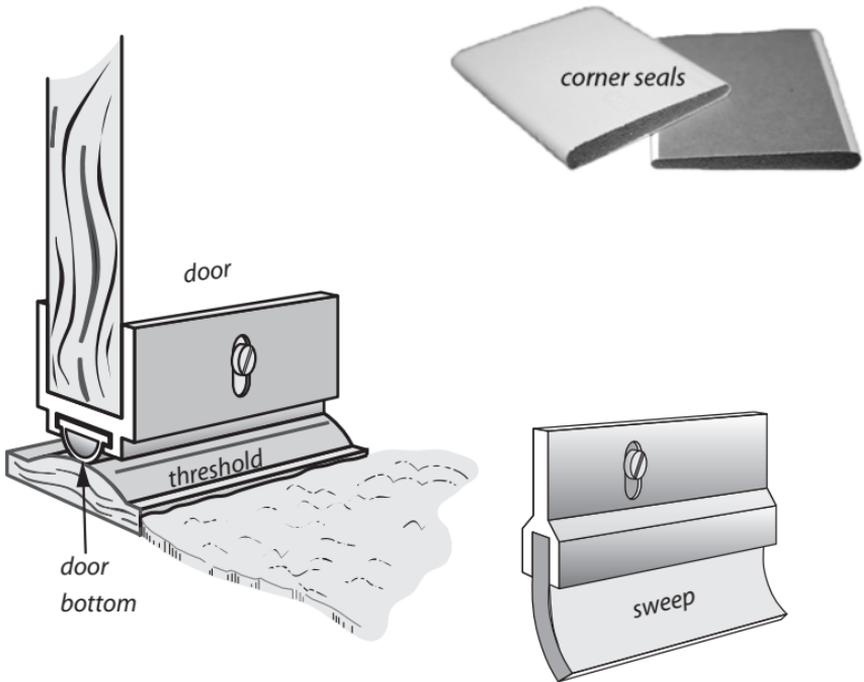
- ✓ When possible, consider replacing the existing nailed-on door stop with a door stop that includes the weatherstrip to avoid reducing the existing width of the door.
- ✓ Select a durable and flexible weatherstrip to seal the door's side jambs and head jamb.
- ✓ Seal the threshold and bottom corners of the door with caulk and/or gaskets.

Installing Weatherstrip

Consider these suggestions when weatherstripping doors.

- ✓ Seal the back of the weatherstrip to prevent air from leaking behind the weatherstrip.
- ✓ Install thresholds and door sweeps, if needed to prevent air leakage at the door bottom. These air seals shouldn't bind the door. Caulk underneath and on both sides of the door seal.
- ✓ Install corner seals to close the gaps at the bottom corners of the door jambs.
- ✓ Seal gaps between the stop and jamb with caulk.

- ✓ Install a door sweep if you don't install a door bottom.
- ✓ The door must operate smoothly after you weatherstrip it.



Weatherstripping at the door bottom: A threshold and door bottom are the ideal bottom seal for a door. The threshold and door bottom must be adjusted to seal but not bind. Corner seals in the bottom complete a quality door-weatherstripping job.

7.7 DOOR REPLACEMENT

SWS Detail: 3.0202.2 Door Replacement

Sometimes you can replace an exterior door for less labor compared to repair and readjustment. The labor just to replace the threshold on an existing pre-hung door is itself very challenging.

Install flashing around doorways according to the specifications in [“Installing Replacement Windows” on page 242](#).