
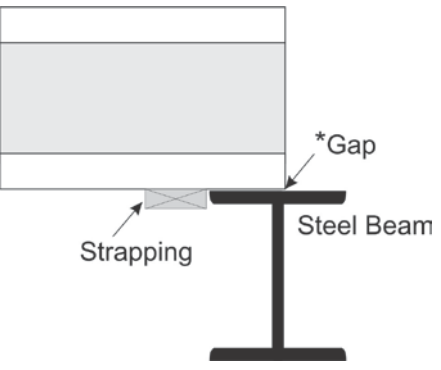


Nascor’s precise manufacturing tolerances deliver a product that resists shrinking, warping and twisting – the most common causes of squeaks in floor systems built with dimensional lumber.

Ensuring a squeak-free floor, however, also requires attention to detail during installation to avoid squeaks resulting from contact between

- **metal on metal**, such as nails on a joist hanger
- **wood on metal**, such as a joist’s bottom flange on a steel beam
- **wood on wood**, such as a sheathing joint

This guide has been prepared to identify installation situations that can result in squeaks, and to provide information on how to avoid the situations, or fix them if they have already occurred.

Hanger issues	
<p>What causes the squeak? When joists are toe-nailed onto a beam for temporary support, and then hangers are installed, the head of the toe-nail rubs against the side flanges of the hanger, resulting in a squeak. Squeaks can also be caused by a hanger rubbing against a deformation in the foundation.</p> <p>Avoid it! Install the hangers on the beam <i>prior</i> to installation of the joists, or ensure that toe-nails do not contact the hanger flanges by moving the nails, or completely embedding them in the wood fiber.</p> <p>Fix it! Pry the hanger flanges away from the nail head, and insert a shim or construction adhesive to avoid metal-on-metal contact.</p>	<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>TOE-NAILING</p> <p>Toe nailing causes squeaks and improper hanger installations. Do not toe nail I-joists before installing top flange or face mount hangers.</p> </div> <div style="flex: 1; text-align: center;">  </div> </div>
Bearing issues	
<p>What causes the squeak? When joists are framed directly onto the flange of a dropped steel beam and there is a gap between the bottom of the joist and the steel beam, the joists can shift downward when load is applied, resulting in a squeak.</p> <p>Avoid it! Install strapping to the underside of the joists to ensure that the joists rest firmly against the supports, or use a nailer plate.</p> <p>Fix it! Install shims or strapping to ensure the joists rest firmly on the support.</p>	

Bearing issues (cont'd.)	
<p>What causes the squeak? When the sill plate is not installed in the right place it prevents the top flange of the hanger from being fully supported. When a load is applied, the top flange of the hanger can rub against the face of the concrete or beam, causing a squeak.</p> <p>Avoid it! Make sure the sill plate is installed flush with the inside of the foundation or beam.</p> <p>Fix it! Jack up the joist near the hanger to eliminate the gap. Use a stud wall, post or ledger to support from below.</p>	
<p>What causes the squeak? When joists are improperly set in hangers, it may create a void between the bottom of the joist and the seat of the hanger. A squeak may result if the void allows movement when a load is applied.</p> <p>Avoid it! Place the joist carefully to enable full bearing in the hanger. Squeaks can be reduced by placing a small amount of sub floor adhesive in the hanger before the joist is installed. If a hole is provided, install a wood screw (#8 x 1½" max.) through the bottom seat (install the screws before the adhesive sets to ensure uniform bearing). These steps are in addition to vs. a replacement for the required joist fasteners.</p> <p>Fix it! If a void exists and you can access the hanger, put a shim between the joist and the hanger. For joists with a directly attached ceiling, find the middle of the hanger, and make a hole through the ceiling. Drill a hole larger than the screw shank through the hanger seat and apply adhesive through the hole. Draw the joist into the hanger with a single #8 x 1¼" screw. Alternatively, you could install a wood screw at a 45 degree angle from above - drill a pilot hole larger than the screw shank through the floor sheathing, the top flange of the joist and partially into the beam. Put the screw through the hole and draw the joist down into hanger.</p>	

Fastener issues

<p>What causes the squeak? When nailing is done improperly or inadequate nail diameters are used, it impacts the load-carrying ability of the hanger and can also cause a squeak due to movement between the joist and hanger.</p> <p>Avoid it! Fill every nail hole with the nails specified by the hanger manufacturer and ensure that the head of the nail is driven tight to the hanger. Common joist hangers typically require a 3" long 10d nail, which has a shank diameter of 0.148".</p> <p>Fix it! Access the hanger and correct the nailing.</p>	
<p>What causes the squeak? When sheathing nails barely hit the joist they do not hold the panel tight. This enables the nails to rub against the side of the joist, and a squeak to result when the sheathing deflects.</p> <p>Avoid it! Exercise care when nailing sheathing.</p> <p>Fix it! If possible, remove the nails from above and re-attach the sheathing to the joist. If the floor finishing is already installed, try to access it from below and bend the nail away from the joist flange. Re-attach the sheathing to the joist from below.</p>	

Mechanical & electrical issues

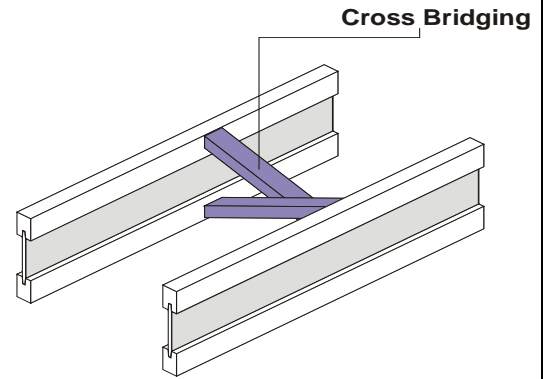
<p>What causes the squeak? When pipes, ducts or similar items are threaded through Nascor joists, they may rub against the joist web and cause a squeak.</p> <p>Avoid it! Allow a 1/4" clearance when cutting holes in the joist web. See the charts in the Nascor Installation Guide for allowable hole sizes and locations.</p> <p>Fix it! Put plastic sleeves around the threaded items.</p>	
<p>What causes the squeak? When items are hanging from Nascor joists, they may rub against the joist flange and cause a squeak.</p> <p>Avoid it! Do not hang strapping directly over the flanges.</p> <p>Fix it! Connect strapping to a filler block that is secured to the Nascor joist web, or install a shim between the strap and the joist flange.</p>	

Mechanical & electrical issues (cont'd.)

What causes the squeak? When cross-bridging or blocking rubs on the joists it can result in a squeak.

Avoid it! Ensure that cross-bridging, blocking and all other elements are properly fastened as per the Building Code, or per Nascor's installation guidelines. If mid-span blocking is required, ensure it is cut to fit tight and apply adhesive to the surfaces. Nail through the sheathing into the blocking with at least two 10d (3") box nails and attach to bottom flange with 10d box nails.

Fix it! Add required fasteners to properly secure elements. Using screws rather than nails may be necessary due to access restrictions.



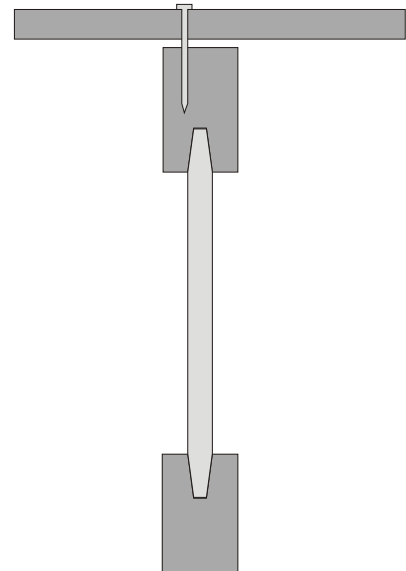
Sheathing issues

What causes the squeak? When floor sheathing gets very wet during construction it often swells and shrinks after drying, leaving a void under the nail head. When stepped on, the sheathing can move and result in a squeak.

Avoid it! Keep building materials as dry as possible. Use proper adhesive and proper technique to bond sheathing to the joists.

Fix it! There are a few ways to re-attach the floor sheathing if this occurs:

- Pull back the carpet, drive the nails flush and install a wood screw near the nail.
- Install scored screws through the pad and carpet – they can then be broken off at the face of the sheathing. (A special tool is required.)
- If you can reach the joists from below, drill a hole through the top flange of the joist and partially into the sheathing, then install a screw to pull them tight.

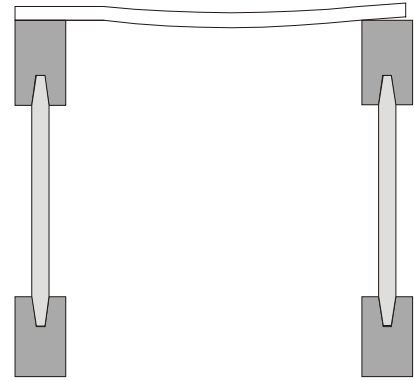


Sheathing issues (cont'd.)

What causes the squeak? When the wrong sheathing is used, it may result in excessive deflection, causing movement – and therefore squeaks – throughout the floor.

Avoid it! Use a sub floor that is thicker than that required by the Building Code.

Fix it! Add another layer of decking over the existing sub floor. Installing blocking between the flanges of the joists along the sheathing seams (if the floor is accessible from below) may also help. Use adhesive to bond all contact surfaces, and nail the blocking carefully to prevent new squeaks.



What causes the squeak? When sheathing is installed improperly, squeaks at the joist or T&G joint can result.

Avoid it! Leave a 1/8" void at all edges and end joints. Use adhesive on all T&G joints. Sheathing should be adhered to the joists with solvent-based adhesive that conforms to APA-The Engineered Wood Association performance specification AFG-01. Apply enough adhesive for only 1 or 2 panels at a time so that the adhesive doesn't set prior to installation. Apply two lines of adhesive where the panel ends meet. Extend the adhesive all the way across the panel and nail before the adhesive sets.

Fix it! For squeaks at the joist, re-attach the sheathing to the joists with the appropriate nail or screw. For squeaks at T&G joints, install a 2x4 block directly under the joint and screw through. Locate the screws on both sides of the T&G joint and apply adhesive between the sheathing and the block. Alternatively, a saw kerf cut at the joint may stop the squeak.

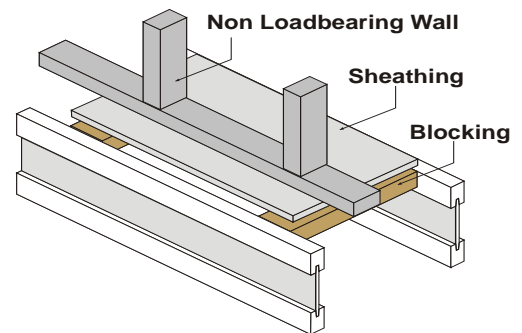
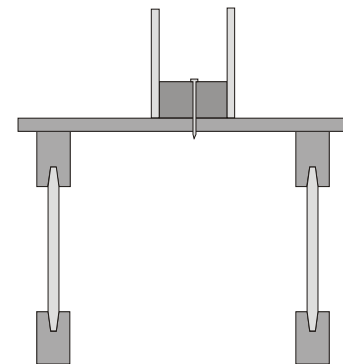


Underlay issues

- What causes the squeak?** When underlay is not installed properly, squeaks or other noises can occur. Often, the noises are intermittent and may coincide with changes in temperature and Relative Humidity.
- Avoid it!** Follow the manufacturer’s recommendations for installation of the underlay. Ensure dust and debris is removed from the sub floor before placing the underlay. Offset the underlay joints from the sub floor joints. Properly attach the sub floor to the underlay by nailing, stapling, or gluing and nailing.
- Fix it!** For an isolated squeak where access from below is possible, drill a hole through the sub floor and partially into the underlay. Install a screw that is long enough to reach at least half way through the underlay. For squeaks throughout the floor, the carpet should be pulled back and the underlay re-attached.

Partition wall issues

- What causes the squeak?** When the partition floor is nailed only to the floor sheathing and a load is applied, the sheathing deflects and rubs on the shank of the nail, resulting in a squeak. When studs are cut too short, it can also result in nails squeaking at the bottom of the wall, between the plate and studs.
- Avoid it!** Nail interior partition walls to the joists. Where the partition runs parallel to the joists and extends over more than half of the joist span, add a joist under the partition. If this is not possible, run a bead of construction adhesive under the wall and either cross-nail, nail through and clinch tight or screw from below. Another option is to “bridge” between the joists and attach wall at blocking locations.
- Fix it!** If accessible from below, install screws through the floor sheathing and into the bottom plate of the wall. Otherwise, remove the baseboard along the partition and drill a hole (larger than the screw shank) through the bottom plate of the partition at a 45 degree angle. Use a screw to pull the floor sheathing up to the partition.



General recommendations for the prevention and cure of squeaks

- High quality construction adhesive is important. Use solvent-based adhesive that will bond wood and metal.
- All fasteners attaching the sheathing to the joists should be driven vertically, not at an angle. The best fastener to use for nailing floor deck sheathing to the Nascor joist is a deformed shank nail. Screws are also good, but only if the top ¾" of the screw under the head has no threads. Do not use smooth, cement or vinyl coated nails.
- Always install hardwood flooring perpendicular to the joists. Follow the manufacturer's recommendations.
- To minimize vibration in floors without direct applied ceilings, attach 1x4 strapping (perpendicular to the joists) to the underside of the bottom flange of each joist with two 8d (2½") nails. Run continuous strapping at 8' on-center and tie it off at the end walls.
- When the finished floor and ceiling have already been installed, it can be difficult to access to a floor squeak. A recommended method is:
 - Pull back the carpet and pad.
 - Use a stud finder to locate the joists, or probe through the sheathing with a pattern of nailing.
 - Cut a 4" hole through the sheathing between the joists.
 - Fix the problem (see recommendations for specific problems above).
 - To repair the hole, put 2x4 blocks with adhesive already applied through the hole, then pull them up against the bottom of the sheathing and screw them in place.
 - Glue and screw the 4" cut-out sheathing piece back in place on the 2x4s.

For more information on Nascor products and their proper installation, contact Nascor at 1.800.668.2365.