Ask Jon Eakes

Truss Up-Lift -- that changing crack between the wall and the ceiling

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In all too many new houses, there is a seasonal problem where in the winter the ceiling actually lifts itself right off the wall in the centre of the house, and then settles down after the heating season. Even in some older houses this goes on every year.

What causes this crack?
Avoiding the crack by letting the ceiling flex.
Avoid the truss from lifting by building with raised hip trusses - follow this link
Hiding the continuously moving crack that you cannot seal - follow this link

WHAT CAUSES THIS CRACK?
Many houses today are constructed with pre-fabricated “trusses” with the ceiling joists and roof rafters combined. Some, but not all of the wood used for this reacts in a special way to temperature and moisture changes. There is no way to predict which truss will cause this problem because it is actually related to fiber stress in the original tree, not just the truss configuration.
As long as the entire triangular truss remains at the same temperature, nothing happens. When you add heavy insulation to an attic, the bottom cord of this assembly is wrapped in insulation and is therefore in a very different environment than the two roof rafters. Given the right conditions this can cause the bottom cord to bow upward, cracking your plaster at the ceiling. We can’t stop it from moving either because it is too powerful to tie down. If you nail it firmly to the center wall it can even lift the partition wall up with it, cracking the joint at the floor below – and certainly wreaking havoc with the doors and the attic air barriers. It may happen only once with a new house, or the ceiling may go up and down every year.
The true solution is to use a different truss design, like a Raised-Hip Truss.

LETTING THE CEILING FLEX
Another permanent solution is to install the ceiling drywall so as to allow the sheet of drywall to flex near the center wall. That means to use drywall corner clips or special blocking to attach the edge of the drywall to the center wall and not to the ceiling. The screws up to the ceiling should all stop 18 inches away from the wall. That 18 inches of drywall can now flex very slowly with the change in seasons as the truss rises in the middle but the wall, and the edge of the drywall, stay put.
If you are not ready for such major renovation as changing the drywall on the ceiling, then follow the link to Hiding the crack.

This problem is often confused with foundation shifting, which also cracks plaster and jams doors. Run a string across the ceiling in line with the trusses. If the center of the ceiling bows upwards, you probably have truss uplift – unless you live on Gumbo clay in the Prairies and the centre of the basement floor is pushing upwards, which would cause cracks between the outside wall and the ceiling.

Jon

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