Ask Jon Eakes

Where should basement furnace ducts be placed?

Last Updated: Saturday, October 15th, 2016, Created: Friday, January 25th, 2002

Doug from Manilla, Ontario checked this site for basement heating systems: "I read the section? on cold air returns in the basement, however I could not find anything on where hot air vents should be placed. Do they need to be at the floor level or at the ceiling level?"
In the house above the furnace, the hot air comes off of the floor under the windows, flows up and counters the cold air coming down from the window, and then floats across the room to the cold air return which is on the floor. That is for a heating climate. In air conditioning country, the ideal would be the opposite, with both the cold air and the return air on the ceiling. So generally in Canada we compromise in the summer, in Florida, they compromise in the winter.
In the basement the hot air starts on the ceiling because that is where the basic heating plenum is located and the contractor left it as an unfinished basement. Usually, the cold air return is on the ceiling as well, or even without an opening in the basement. Ideally it would work the same way as upstairs, with the hot air coming out on the floor and returning to the floor. The problem is that hot air does not like going down hill. Add to that the fact that you need to add two elbows to get it down to the floor, and except when you are near the furnace, not much hot air even comes out the duct that has been extended to the floor. And when it does come out, it immediately rises and does not warm the floor up. So, although in theory it is a good idea to extend the hot air duct to the floor, in practice, it doesn't do much good and is a lot of work. So I just leave them on the ceiling. If you are dividing the basement into different rooms, don't forget to get a hot air grill into each room, usually as far away from the door as possible to force the air to flow across the room.

DRAW THE COLD AIR OFF THE FLOOR
However, extending the cold air return to the floor does a lot of good as it will vacuum up the cold air off of the floor and send it back to the furnace. That in fact will draw the warm air down, and warm up the floor.
Even if you have baseboard electric heating, drawing the cold air off of the basement floor and sending it up to the highest point in the house, where there is a lot of excess heat just hugging the ceiling, will have the effect of removing the cold air and drawing the warm air down to the floor. This is the single biggest thing you can do to make basements comfortable. It eleminates the pooling for cold air in the lowest level of the house.

Keywords:
Floors, Layout, Balancing, Air Flow, Baseboard, Ceiling, Furnace, Basement, Duct, Heating, Forced Air, House, System