

What Testing and Balancing (TAB) is and Why it is Important?

Don't all brand new HVAC systems come tested and balanced?

The short answer is they all should. A group of industry experts from all sectors of the HVAC industry developed a standard that defines how an HVAC system must be designed and installed if it is going to work properly. Their work, over a three year period, resulted in an industry standard: the ACCA/ANSI HVAC Quality Installation Specification. The standard requires balancing on all newly-installed HVAC systems. Unfortunately, the QI Specification is not a requirement in all local jurisdictions. Therefore, many contractors still skip the TAB work. This is especially true in new construction where the low bid has traditionally ruled. You should always find a professional contractor who is capable of following the QI Specification's procedures for any HVAC TAB work.

How do I know for sure if there is a TAB problem?

If your professional contractor has identified an air balancing-related problem with your HVAC System, you probably already knew something was wrong. The average homeowner can detect the signs of an unbalanced HVAC system. Common complaints include hot spots, cold spots, and drafty areas. If you noticed one bedroom is always cooler in the winter and warmer in the summer, there is a strong possibility that you have an airflow problem. If you have noticed drafts when your HVAC system is operating, doors being pulled shut or blown open, you probably have an airflow problem. That means air is not going where it was designed to go.

Isn't it easier to just open and shut dampers on the registers?

Many times people will try to resolve the problem by closing down some outlet dampers and opening others. However, TAB-related comfort problem are rarely resolved by making adjustments in one area. In fact shutting down dampers at the outlets increases the noise level because the air velocity increases as it tries to

squeeze through the tighter openings. Additionally, the majority of the time, when the "quick fix" does work, it is a seasonal adjustment at best and will need to be changed every time the thermostat is changed from heating to cooling. Once a damper is closed down, the airflow runs to other rooms where, due to the increased airflow, those dampers are then closed down. The final result is a noisy, inefficient air distribution system that does not work properly. In a worst case scenario, shutting too many dampers down will result in your furnace over heating in the winter or the air conditioning icing up in the summer. Continuous operation under low airflow conditions can cause permanent damage to your HVAC system.

So how is the airflow to a room adjusted?

Balancing dampers are needed and the best location for them is at the main trunk so that noise at the outlet will be minimal when they are adjusted. Balancing dampers are generally placed in a section of duct designed to be attached to the main duct trunk called a take-off. A smaller duct is attached to the take-off and runs to the diffuser or grille. By moving a lockable handle, the size of the opening in the take-off is increased or decreased until the correct airflow in CFM is coming out of the diffuser.

Can other problems like drafty windows mimic airflow problem symptoms?

Yes, once a room airflow problem is ruled out by having a professional contractor measure the airflow, other causes for drafts and hot and cold spots can be checked. For example, in that uncomfortable bedroom, was the insulation properly installed? Could the walls, ceiling, windows or doors be leaking air? Generally, you will notice a buildup of dust in cracks or seams if the air is leaking into a room. Air leaking into your home is generally a sign that your home is operating under negative pressure. Negative pressures can

be caused by exhaust fans that operate constantly, furnaces without proper venting, or even chimneys. Having air enter your home through cracks and crevices is the worst way possible to bring in outside fresh air. This is because the air is untreated so it can raise or lower your humidity and bring in dust, mold spores, radon, etc. Negative pressures, once identified in your home, can also be resolved by your professional contractor. In some worst case scenarios, additional HVAC-related equipment may be required to bring in fresh air into your home in a controlled manner.

How can I tell if a TAB is performed properly?

In your HVAC system, airflow is rated by the total number of cubic feet per minute (CFM) produced. When your home HVAC system is designed, the airflow needed to heat and cool each room is calculated. HVAC equipment is then selected that can provide the CFM needed. Additionally, duct is sized and the diffusers and grilles are selected so that you system will operate quietly and efficiently while distributing the required CFM to each room. At a minimum, a balancing technician will need to check airflow at all of the supply registers and return grilles in your home two or three times each. The technician will adjust branch dampers until all of the supply registers and return grilles are providing airflow within 10 percent of the design value. The technician will finish by re-measuring your furnace/air handler to make sure it still has the required airflow going through it. Your professional contractor can provide you with a copy of the balancing report that will include the furnace/air handler data, diffuser locations and the final set points in CFM.

As you can see, TAB is a specialized field that requires additional tools and training. The right HVAC technicians with proper TAB training can ensure that many homeowner complaints stemming from airflow problems are resolved.

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