

HEATING AND COOLING SECRETS

Your Contractor Doesn't
Want You To Know

A GUIDE TO PREVENT YOU FROM BEING SCAMMED



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DEDICATION

I'd like to dedicate this book first and foremost to my competition. Yes, my competition. To all the other heating and cooling contractors that are doing RIGHT by their customers, I write this book for you. Contractors get a bad rap, and sometimes we bring it on ourselves. However, there are heating and cooling companies in this world that are led by owners and managers that have integrity, honesty, and treat their customers with the respect and fairness they deserve. To all of those companies, this book is dedicated to you. I wish you a successful and prosperous future.

I'd also like to dedicate this book to my D&L Mechanical Services family of customers here in Fredericksburg, Virginia. It has been my honor to serve you for the last two decades. Without your loyalty and friendship, we would not be here.

ACKNOWLEDGEMENTS

I'd like to thank first and foremost the D&L family of customers that have supported my company, my employees and my family for the last two decades. You have made it very easy to get up every day and do our jobs, which is to service you.

I'd like to thank Dennis M. Hohman and his LEGEND program for helping with the vision for this book and forcing me to see it through to the end.

Finally and most of all, I'd like to thank the beautiful love of my life, Leisa my daughter Kelsey and son Brandon. All of you have been at my side as I've fought these wars against shady contractors. It's not always easy to be around me when I'm on my soapbox or on a rant but you recognize its all worth it in the end. Both of you are my rocks!

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INTRODUCTION

I was brought up in a small town in Rhode Island called Central Falls. It was one of those towns in which everybody knew everybody else. I was raised to treat everyone well, have high moral values and that my integrity was to be protected at all costs. I remember my Grandmother telling me “Darren, it doesn’t matter how much money you make, how smart you are or how many friends you have. The only thing that matters is the person you become, and that starts with integrity.”

Like some young men, I hated school and got into some trouble. Nothing serious or illegal, just the things bored boys do when they are trying to occupy themselves. I was just looking for something productive to do. I decided on the automotive repair industry. I went to vocational school, learned the trade and quickly got a job at a local auto repair shop.

I then received my first big lesson in life.

My job was to give our customer’s vehicles a once over, find anything that needed to be addressed, and recommend the repair. When I looked at the engines, brakes, wheels, windshield wipers, etc. it wasn’t hard to find problems. Most people don’t maintain their cars very well I usually didn’t have any problems. Notice I said “usually”.

One day a car came into the shop to be checked. I remember it very clearly. It was a (make and model) and looked to be in good condition. It was in GREAT condition. I went over this car with a fine-toothed comb and simply couldn’t find a single thing wrong with the vehicle.

I went to the owner of the shop who was in his office. “Mr. Jones” (name changed) was sitting behind his large desk covered in papers and forms. He was wearing one of those fatties that stopped 5 inches above his belt. He was drinking coffee from his usual coffee mug that he never cleaned and smoking his cigarette. He looked up at me as I entered.

“Mr. Jones, I can’t find anything wrong with the (make of car) I just checked. It’s good to go.” I said.

Mr. Jones leaned back in his chair and tapped the ashes off his cigarette into an ashtray that was so filled with ash and butts it looked like he was creating his gray mountain.

“Darren, there has to be something wrong with the car. Go look again.” He instructed.

“I went through every part of that car Mr. Jones, it’s perfectly fine. It doesn’t need any work at all” I repeated.

Mr. Jones stood up from his desk, tucked in his shirt and motioned me to follow him. We walked to the rear of the shop where the (make of car) was perched upon the repair rack. Mr. Jones walked over to the workbench and grabbed a bottle of brake fluid. He approached the rear of the vehicle and proceeded to pour brake fluid on one of the tires.

“You didn’t check the rear brakes. Looks to me like they are leaking on the tire. We need to recommend a brake job. Write it up Darren” he said, and walked back up to his office.

I was aghast! I couldn’t believe what he had just done! The car was perfectly fine but he had “manufactured” a problem, an expensive one!

The lesson I received was very clear, its all about sales and dollars, no matter what.

I quit that job shortly thereafter. My integrity would not allow me to do anything like that ever again. I spent a couple more years in the auto repair industry but then settled into the HVAC (heating, ventilation, air conditioning) industry.

Guess what? The HVAC industry was the same as the auto industry. Time after time I went to work for companies that did the same things as Mr. Jones.

- * I was told to sell products to homeowners that didn't need them.
- * Inflate the price on a repair in the hopes they will spend even more on a new system
- * I was told to not just clean a furnace, but replace anything that could be replaced, even if it didn't need to be replaced.

Company after company I went to work for had the same deceitful business practices. Every time they told me I should be selling more and pushing more products my Grandmother's voice echoed in my head...

“The only thing that matters is the person you become, and that starts with integrity.”

I finally had enough. I simply could not deal with this any longer. In (year you opened the company) I finally decided to do what I should have done years before, I started my own heating and cooling company. D&L Mechanical named after myself Darren Billington and my beautiful wife Leisa was created to be the company I always wanted to work for, one with honesty, integrity and real professionalism.

Running my company in Fredericksburg Virginia has been amazing. We love our customers and treat them like family. I wouldn't give this up for anything. The problem is, I can only service people in my general area. The distaste I have for the business practices I experienced at the auto repair shop and other HVAC companies I worked for still bothers me. I'm disgusted by it because it still goes on to this day!

I always wished for a way to help homeowners not get screwed over. There was simply nobody out there telling the truth, so I decided to do it myself. I wrote this book to help you, the homeowner, that needs work on their HVAC system or is in the market for a new system. I wrote this book to cut through all the bullshit out there and give you the tools to make certain you have a good experience with a contractor. I'll tell you how to make sure you select a reputable company (and no, its not Angie's list), how to keep from getting scammed, and finally how to understand HVAC systems so you can make educated choices.

Thank you for purchasing or downloading my book. I hope it helps you!

Darren Billington

CHAPTER ONE - REPUTATION

When a homeowner is selecting a heating and cooling contractor there is one thing above all else that should be considered, reputation. There is nothing more important. My reputation has been the one thing I've protected like a pit bull from day one. If a company's reputation is crap, most likely there is a reason.

Now there isn't a company in the world that is perfect, mine included. We try our best and most heating and cooling companies do as well. That said, how can you easily check out the reputation of a contractor?

If you've received a testimonial or referral from someone you know that is the best credibility a heating and cooling company can get. My company, D&L Mechanical, gets referrals all the time and we love them. But if you don't have a referral from someone you trust, you are then forced to look for a different way to check a company's reputation.

Online Reviews

Online reviews are the most accessible and easy to find indicators of a company's reputation. Reviews can be found on google, yelp, social media or any other number of places. These reviews are important because they come directly from customers that the company has done business with, or tried to do business with.

Now I wasn't born yesterday. I know full well that online reviews can be great for a company but can also create issues. I realize that when a homeowner looks at my company's online reviews they are most likely to go straight to a poor review before they read any of the great reviews. I know this because I do it too! It's human nature! We all tend to look at the accident on the highway or the crazy person ranting online. I get that. However, there are numerous things as a homeowner you need to consider when looking at an HVAC contractor's online reviews.

How many reviews does the contractor have?

I'll tell you right now, it's not easy to get a homeowner, even a happy one, to go online and leave a review. Most say they will, but few take the time to do it. That's fine, my customers don't "owe" me a review. As we have all seen online, it's a lot more likely someone will complain than give a great review. What's that old saying, if someone likes something they will tell one friend if they hate something they will tell ten friends? What I'm trying to say is people don't just go online and toot the company's horn for them. The ones that do are generally over the top happy, or disgruntled with their service.

It's important is to look at the length of time the company has been in business compared to the number of reviews. If you are checking up on a two-year-old company that has 12 great reviews that would seem pretty good to me. However, if that company has been around for 20 years and has 4 reviews that's eyebrow-raising. 20 years in business and only 4 people have had over the top results? That would be a red flag for me.

Is the review legitimate?

Did the person leaving the review do business or try to do business with the company? I've seen poor reviews online in which people say "I called Joe's Heating and Cooling and the call went to a voice mail". Ok, I get that having someone answer the phone is preferable but lots of companies, big and small, take and return voice mails. I'm sure the homeowner was irritated but is this a reason to leave a bad review?

On the flip side make sure to give proper due diligence to good reviews over social media likes. It's pretty easy to get every friend on Facebook to "like" my page. That doesn't mean they have done

business with me. I'd take 5 good reviews in which my happy homeowner explains in detail how much they loved our service over 50 "likes" on Facebook.

Consider the middle of the road reviews.

As a business owner, I'd sure love to have all 5-star reviews online but that simply isn't the world I live in. I get some 3 and 4-star reviews just like any other business. Some people just never give anybody or anything a top grade. My English teacher in elementary school gave me an A-minus on a paper he said was one of the best he'd ever read. When I asked him why I didn't get an A-plus the response I received was "You can always improve".

As I mentioned, I'd like to have all 5-star reviews but a 4-star review that says "D and L Mechanical did a good job and I'd use them again" is perfectly fine with me and I'd take that review as a positive all day long. When reviewing a company you should consider that as well.

Did the company respond to a poor review?

This is a biggie and for a couple of reasons. First, a company that doesn't care enough to respond to a poor online review or complaint doesn't care about their reputation. In my book, that's alarming. If a company doesn't care about their reputation, how can they care about their customer's needs? A company must respond to poor reviews in some way. Ignoring a poor review is a non-starter.

Secondly, was the issue or reason for the poor review resolved? Did the heating and cooling company you are considering hiring attempt to resolve the issue? Look, sometimes as an owner of a business, you don't even know a customer is unsatisfied until you see the review. A homeowner might say something like "I was told by Joe's Heating that my furnace needed to be replaced because of a cracked heat exchanger. They said they would call me back with a price but never did. I'm disappointed with their communication". In this case, a non-response should set off alarms. It's not hard for a heating company to simply respond by saying "We are sorry for not getting back with you. This is not the level of service our customers deserve. We will be calling you immediately."

Now, this customer might have already moved on and done business with a competitor and probably did, but the company should still respond and contact the homeowner. The company you choose should always respond to consumer reviews.

You can't make everyone happy

Before I move on from the issue of online reviews one more thing needs to be mentioned. I've been in this business for a long time. Occasionally even my business comes upon a customer that simply will not be happy no matter what level of service they receive. This customer will leave a poor review, ignore any response we attempt and then complain again. I used to lose sleep over these types of reviews but I don't anymore. It's not that I don't care, we care about every experience our customers have with us, but I know some people just won't be happy. If you see a company online try to respond and correct a customer's issue, and that customer refuses to accept that response, make sure you take into account that the company did try their best. I truly believe most heating and cooling companies want to take care of their customers, but again, you can't make everyone happy.

Chapter One Action Steps

- 1) Check out the companies online reviews
- 2) Count the number of reviews compared to the length of time they have been in business
- 3) Make sure the reviews are legitimate
- 4) Read a few middle of the road reviews not just great or poor reviews
- 5) Make sure the business responds to any poor reviews and tries to resolve problems

CHAPTER TWO - STABILITY

When a homeowner is looking for a heating and cooling professional, one of the more crucial things to look for is company stability. I think it goes without saying, but the stability of the company that will be repairing your system or installing a new system can be the difference between a well-done job or a complete disaster.

“Ms. Jones” called me out one day because her new furnace wasn’t working. When she called and scheduled the appointment she was quite upset. My company D&L Mechanical was not the company that had installed this furnace so I was curious as to why she was calling us instead of the company that did the recent installation. Upon arrival, I got the lowdown....

The furnace had been installed 3 months earlier. The furnace had a 10 years parts warranty and the installing contractor had given Ms. Jones a 2-year labor warranty. When the weather became colder and the homeowner turned her thermostat over to the heating mode, the furnace came on and then quickly shut off. In other words, the furnace would not stay on long enough to heat the home. We call this a furnace “short-cycle”.

When Ms. Jones called the installing contractor there wasn’t a voice mail set up to leave a message. She checked online. The company’s website didn’t list a different phone number and she couldn’t find out where the company was physically located. After three days of trying, she decided to call me company D&L Mechanical. I was able to diagnose the problem as a faulty thermostat and was able to get her system running.

Ms. Jones failed to check the stability of the company she decided to hire to install her furnace. Her 2-year labor warranty? Gone like a puff of smoke. I feel bad when I hear these stories because it drags the reputation of our industry down and makes all of our heating and cooling contractors look terrible.

There is a solution. A homeowner can easily find the stability of a company they are considering hiring. Here are a few things to look for:

A place of business

Does the heating and cooling contractor have a place of business OUTSIDE of their home that they utilize as an office? I’ll tell you in a moment why this is important but first, let me acknowledge that I didn’t always have on the office. My wife and I started our business out of our kitchen, just like many businesses do. I also fully realize a newer, smaller company can’t afford an office. It would appear I’m taking out of both sides of my mouth, doesn’t it?

Everything changed for my business when I decided to build a warehouse and office and I use for my business. Up until the time I built my office I wasn’t FULLY committed to my heating and cooling business. If the economy took a dive, things got slow, or I decided I didn’t want to run my business anymore I had an easy way out. I could just walk away.

Once I spent the money and built my warehouse and office I was 100% committed for life to building my company and giving my customers the service they deserve. I showed my customers I was in for the long haul.

Now I don’t know the company that Ms. Jones had hired, but unlike my company D&L Mechanical, they didn’t have an office. She couldn’t find them. When that company decided to not answer their phones or just pick up stakes and leave, Ms. Jones was left high and dry. A company that has committed to themselves and decided to have a business outside of their homes is a company that wants to service their customers forever.

Insurance

When is the last time you hired a contractor, any contractor, and asked to see their certificate of liability insurance? My guess is you haven't. I'm guessing that because I've rarely been asked to prove I have insurance, but we carry our liability insurance certificate to every job site we go to.

You must confirm your heating and cooling contractor has basic liability insurance. This not only shows the company is stable enough and committed enough to cover themselves. Let me ask a question...do you know what could happen if you don't ask this one question?

Let say during the process of work being conducted on your property one of the contractor's employees or sub-contractors is injured. What happens if that company doesn't have insurance or the funds to cover injures on the job? Guess who can be sued by that worker? Yep, you The homeowner can be liable. I know, it's not fair but life isn't fair. This can and has happened to good folks just like yourself. Ask that simple question: Can you show me proof you are insured?

Supplier Letter of good standing

At D&L Mechanical, our most important relationship is with our customers. We honor that relationship every day. Our second most important relationship is with our suppliers. Contractors buy the equipment, supplies, and parts we use on our jobs from our wholesale suppliers.

We work arm in arm with our suppliers to make certain our customers are taken care of consistently. At D&L Mechanical we rely on our suppliers to have the product in house, at a fair price. It's also our job to make sure to pay our suppliers on time and honor our part of the bargain, which we proudly do month after month.

What happens if a heating and cooling contractor doesn't pay its suppliers? Well, for one thing, the supplier will stop selling to them which means the contractor has to switch suppliers or not service their customers. But there is something else that could happen....

You see, until the contractor pays their supplier for the product, that product is still the supplier still has a stake in owning that product. Think of a car that you buy on credit but stop making the payments. The company that provided the financing, or in this case the contractor's supplier, has a right to "repossess" their unpaid property.

Let me say for the record, if a contractor gets a furnace on credit from their supplier and doesn't pay, that supplier isn't going to come to your home and repossess that furnace. But that supplier has the full and legal right to place what is called a mechanics lien on your property. A mechanics lien essentially will not allow a homeowner to sell their home or get a loan on that property until that supplier has been paid in full for the furnace. And it doesn't matter if you paid the contractor. If that contractor did not pay the supplier, you might have to pay for it a second time.

So what can you do? Ask your contractor for a letter of good standing from their supplier. This simple to obtain a letter from the supplier stating that the contractor is in good standing with them from a financial standpoint. It will also vouch for the relationship that the supplier has with the contractor.

I realize this isn't an all-encompassing cure-all but it will give you a bit more clarification on the stability of the contractor you choose. If the heating and cooling company you are researching has a place of business outside of the owner's home, has adequate insurance, and provides a letter of good standing from their supplier, my guess is they are a stable company that will provide you quality service now and in the future.

Chapter Two Action Items

- 1) Confirm the contractor has a place of business outside of their home
- 2) Confirm the contractor has liability insurance
- 3) Confirm the contractor is in good standing with their supplier

CHAPTER THREE - PROFESSIONALISM

I detailed in the Introduction to this book the reason I decided to open my heating and cooling company, D&L Mechanical. After working for several companies that I felt were not conducting business in the best interests of their customers, I wanted to open a company of complete integrity. But integrity wasn't enough. I wanted to assemble a group of employees and create a culture and brand that is trusted in my town, and that meant being a consummate professional.

Have you ever hired a contractor to do work on your home and later felt like you hired a company full of teenagers?

- * Van parking in your driveway
- * Tools, boxes, equipment in your yard and garage
- * Doors left open as they go in and out of your home
- * No protection on your floors
- * No shoe covers
- * Loud music from their radio
- * No communication
- * Profanity
- * Garbage and trash is strewn about

Those are just a few of the things I've personally experienced so I imagine a few of them are familiar to you as well. While these practices can be annoying they lead to something far worse. The lack of professionalism leads to bad workmanship which results in a homeowner getting poor performance from their equipment.

The definition of a professional is "someone who's engaged in a specified activity as one's main paid occupation rather than as a pastime." I think this definition is only half correct. I think the other half of the definition should be "and can do the job well, and exhibit honesty, punctuality, courtesy, and integrity." Let me be frank, true professionalism is sorely lacking with most contractors.

So how do you find a heating and cooling contractor that you know is professional?

Part of the reason workers are unprofessional and exhibit the problems I listed above is that nobody trained them on how to do things any differently. I remember a time when my son Brandon was 7 years old. His bedroom was a complete mess. There were toys everywhere on the floor. I couldn't take a step in any direction without stepping on a truck or action figures. I was frustrated and asked him to straighten things up and get those toys off the floor! 20 minutes later I went into his room to check his progress and sure enough, all toys were off the floor. They were stacked a foot high on his bed!

Of course, I wanted Brandon to put the toys in his toy box or the closet but I'd made the assumption he knew that as well. My bad. The problem is some contractors make assumptions about their workers and sub-contractors.

"I've shown my Installer how to install a furnace. He knows what to do"

"My Technician has been to tech school. He knows how to diagnose a furnace problem"

"My crews know how to treat a customer's home with care and courtesy"

"My Comfort Advisor knows to not be pushy"

All of these are assumptions that lead unprofessional companies to create a poor image of my profession. Heating and Cooling contractors, or contractors in general, then get grouped together as unprofessional. It drives me out of my mind! But there is a way for a homeowner to find out whether workers will be professional or not. It's called a Standard Operating Procedure.

A Standard Operating Procedure contains systems that are critical for a successful heating and cooling project. It's a step by step roadmap and quality control checklist. Workers can check off every task without fail. Without a Standard Operating Procedure, a contractor risks missing a critical component of the installation process. Besides, this checklist contains reminders such as:

- Park on the street
- Introduce yourselves and your entire crew to the homeowner
- Confirm the job to be undertaken
- Walk homeowner beforehand through the installation process
- Wear shoe covers
- Cover floors with tarps

You get the idea. During a heating and cooling installation there are quite a few steps, and not all of them technical. It's easy to miss something if workers don't have a Standard Operating Procedure. Before you commit your business to a heating and cooling company confirm they have documented procedures implemented.

Worker's Compliance Agreement

A Standard Operating Procedure is crucial for a professional heating and cooling company, but it's not enough. Also, a homeowner needs to make sure the company they trust with their business also has a Worker's Compliance Agreement.

"A what?"

A Worker's Compliance Agreement is a signed document in which the heating and cooling companies' employees agree to principles and guidelines. These agreements can differ. Some may be as simple as prohibiting the use of alcohol and drugs on job sites. Others may require specific performance standards, like not using profanity or playing loud music. This agreement keeps the employees at D&L Mechanical tied to not only our service standards but gets their "buy In" to our overall company values and mission.

Keep in mind these agreements don't guarantee everything will be perfect, but they do greatly reduce the likelihood of problems on the job site.

Ask for communication standards and guidelines

One of the most frustrating and annoying things a homeowner goes through during the installation of a heating and cooling system is a lack of communication. Especially on jobs that take multiple days to complete. Workers are in and out of the home things can generally look to be in disarray. At D&L Mechanical we realize that while this is a job and project to us, it's home to you.

Any professional heating and cooling company should give you their communication guidelines upfront which should include:

- *Job start times
- *A complete projection of how long the job should take
- *An explanation of everything that will be completed or upgraded
- *Any demolition that might occur

- *Updates during the process as requested
- *Notification before any loud tools are used
- *Complete explanation after each day's work
- *Upon completion, a run-through of all the work completed and explanation of the system.
- *Training on any operational controls

This type of communication should be a standard in the heating and cooling industry and should be asked about during your due diligence of any company.

Chapter Three Action Steps

- 1) Ask to see the contractors written Standard Operating Procedure
- 2) Ask to see the contractors written Workers Compliance Agreement
- 3) Ask about the contractor's communication practices

CHAPTER FOUR - GUARANTEES and WARRANTIES

The installation of a new HVAC system can sometimes cost over \$10,000. That's not chump change! In fact, your heating and cooling system is one of the more expensive items to replace in your home, good thing they tend to last quite a while when properly installed and serviced.

Have you ever noticed that virtually everything you buy nowadays you can return? Think about it, if you don't like the way you look in the clothes you bought you can take them back. If you don't like the food you bought at the grocery store or ordered at a restaurant you take it or send it back. You can even get refunds on the software you download if it doesn't do what it guaranteed it would do.

So why in the world is a homeowner stuck with a furnace, air conditioner or heat pump if that system doesn't perform?

Think about it... a heating and cooling company comes into your home and quotes you on the replacement of your furnace. The salesman touts the unit's efficiency and how that new furnace is going to save the homeowner hundreds of dollars a month in utility costs. You might even hear something like this:

"The payment on this new furnace is \$99 per month for 60 months. But here is the great thing Ms. Jones, the furnace will save you almost that much in energy bills so that makes the new furnace basically free".

Umm, Hmmm. And I bet he has some magic beans he'd like to sell you....

After Ms. Jones decides to purchase the new furnace what happens if those money-saving claims don't happen? What if she only saves \$20 per month? What is her recourse? She pretty much can't do a thing about it. The old furnace is long gone. It's been turned into the junkman or is sitting in a landfill somewhere. Ms. Jones is stuck with that new furnace and the payments that come along with it.

This has always been a problem with my industry. It creates doubt in the mind of the consumer and creates distrust. Now there are excellent heating and cooling contractors, and there are charlatans. If a homeowner makes a bad choice and is sold a product that underperforms and doesn't meet the claims the salesman promised, then that's just tough cookies.

This book is about how you can protect yourself upfront from selecting a poor heating and cooling contractor. Here is how you MAKE SURE you don't get stuck with a product that isn't what it was built up to be.

You must ask for a money-back guarantee.

What? Money-back guarantee? Can that be possible with a contractor? You are darn right it's possible. We offer that guarantee every day at D&L Mechanical.

I've always thought it was ridiculous that a homeowner gambles thousands of dollars on the "hope" that the system they are purchasing meets their needs and budget. Like I mentioned earlier, practically everything you buy you can return if it doesn't perform. Why is HVAC any different? It's different because that is the way it's "always been done" so homeowners have been trained to just accept the good with the bad.

Let's get back to the guarantee. At D&L Mechanical we offer our customers what we call our "One Year Test Drive". If at any time, up to and including one year, our customer decides that the system we sold them, does is not performing at the levels we promised them, we will pull that system out and happily refund their money.

It's that easy. We take all the risks so our customers don't have to worry about whether they can trust what we tell them. There is no reason why a heating and cooling contractor cannot make this offer. I've done business in the Fredericksburg area for two decades. I'm not about to promise anything to my customers that isn't true. But some of the homeowners that contact D&L have never done business with us before. How do they know if what I'm saying is the truth? I'm just another person they called out.

That's why we guarantee our jobs in writing with our One Year Test Drive. If you ask your heating and cooling contractor for a guarantee that the new system you are purchasing performs up to their claims, and that contractor scoffs or tells you they can't do it, I'd run the other way. You shouldn't have to take a risk with a new heating and cooling system.

Warranties

The next thing you need to confirm and educate yourself about is the warranty. Warranties on new furnaces, air conditioners, and heat pumps do differ so you need to do your research in this area.

Furnaces

Most furnace manufacturers like Rheem, Carrier, Lennox, Trane, etc offer a 10 year all parts warranty on furnaces. They also come with a minimum of a 20-year heat exchanger warranty. The heat exchanger is the heart of the furnace and transfers heat. Simply put, the furnace heat exchanger is the part of your furnace that heats the air. Some of the highest efficiency furnaces come with a lifetime heat exchanger warranties. That could be an option if you never intend to sell or move from your home.

*One word of warning here, these parts and heat exchanger warranties do come with a caveat. You must maintain your furnace every year in order for the warranty to remain in effect. A licensed heating and cooling professional must clean and inspect the unit every year. Failure to have this yearly maintenance performed can void the warranty. Think about your car. If you never change the oil and the engine melts down the car manufacturer isn't going to honor the warranty. This is the same thing.

Air Conditioners and Heat Pumps

The vast majority of residential air conditioners and heat pumps also come with a ten year all parts warranty. After those 10 years if any part goes bad or breaks down there would be a charge to replace it. Just like furnaces, the warranty on these pieces of equipment also must be maintained each year or that warranty is null and void..

Labor warranties

Just as the manufacturers give warranties on the furnaces, air conditioners and heat pumps you purchase, you also need to inquire with the contractor you are hiring about their labor warranties. Essentially this is their guarantee of workmanship. This is a very important part of this entire process.

Imagine you purchased a new air conditioner. The system is installed but you didn't ask the contractor about their labor warranty. Two months later it's a hot day and you need to use your air conditioner for the first time. You turn your thermostat to cooling and nothing happens. You call up the

company to come to check things out and they discover the thermostat isn't working. They change the thermostat itself (which is under a parts warranty) but give you a \$99 bill for their "trip charge".

This doesn't sound fair, does it? You are right, it's not but it happens all the time because the contractor didn't give a labor warranty on the installation or the labor warranty was short, like 30 days. Yep, I'd be mad if I were this homeowner too.

A contractor should offer a labor warranty which is in line with what we offer at D&L Mechanical, one year. This means if anything goes wrong with your system in the first year, you will not be charged for the contractor to come back and fix it. This allows you to use your system through one heating and one cooling season without the worry of any charges.

Chapter Four Action Items

- 1) Ask for a money-back guarantee
- 2) Check the manufacturer's equipment and overall parts warranty
- 3) Ask your contractor about their labor warranty

CHAPTER FIVE - MISLEADING PROMOTIONS

So far I've written about several things you, as a homeowner, can do up-front to make sure you hire good, reputable heating and cooling, contractors. If you have followed me this far and used the information I've given you, chances are you will have a successful furnace, air conditioning or heat pump replacement experience.

At this point, I want to touch on the subject of promotions.

My company, D&L Mechanical, along with all heating and cooling companies market our services with promotions. That is nothing shocking, all businesses have promotions. But just like in other businesses some promotions are legit, and some are downright misleading.

I'm sure the next few paragraphs will not make me any friends amongst my competition that use promotions like the ones I mention. That is perfectly fine with me. I didn't write this book to curry favor with other heating and cooling companies. I wrote it to protect you, the homeowner, from getting misled, ripped off or taken advantage of.

Let's start with the promotion that literally makes me sick...

"Free furnace with the purchase of an air conditioner" or "Free air conditioner with the purchase of a furnace"

(Picture all 6 foot 5 inch, 260 pounds of me, Darren Billington climbing up on my soapbox)

Where do I start? This promotion is completely misleading and garbage. A heating and cooling contractor cannot simply give away 1/2 the revenue on a job and make money. No way possible. Zero. They would be out of business in a month. This would be the same logic as saying "We lose money on every job but make it up in volume." It's ridiculous.

Let's start with the free furnace when you buy an air conditioner....

By giving away the furnace portion of the installation the contractor is essentially not being compensated for that cost, they would be absorbing it AND you must include the profit that the contractor would now not be able to make on those materials. If the contractor was attempting to get a 40% gross margin (profit) on the job and was ACTUALLY giving away the furnace portion of the job he would be breaking even on the job.

HOWEVER...Heating and Cooling companies have this little thing called "overhead". You know, office rent, office personnel, gas, uniforms, marketing costs, legal, accounting, etc. The industry average is between 20-25%

So.....Not only does this free giveaway only break even, the contractor would be losing money when you factor in overhead. Simply put, the numbers don't cut it.

But what about a free air conditioner if you purchase a furnace?

The numbers are even worse. An air conditioning system has three parts, the actual condenser (the unit that sits outside), the evaporative coil (that resides inside the home at the furnace), and the refrigerant line that connects the two. Those three pieces are about double the cost of a furnace.

So if the contractor absorbed those costs AND didn't get the profit they would be in an even worse spot. Oh, and let us not forget that overhead thing again! I've run the numbers every way possible and there is simply no way a contractor can make money running a "free" furnace or air conditioner is you buy the other one.

So how do contractors run these promotions and sell them? Simple, they fudge the numbers or outright lie.

Example One: The contractor "gives" you the furnace or air conditioner but charges for the installation. Oh, and that installation cost is inflated to cover the cost of the equipment. That doesn't sound "free" to me.

Example Two: The contractor "gives" you the furnace or air conditioner but jack up the price of the other equipment to cover the costs. Again, that doesn't sound "free" to me.

Example Three: The contractor "gives" one piece of equipment but you need to buy the highest efficiency furnace or air conditioner to couple with it. This allows them to once again charge a much higher price and cover the cost of the giveaway.

The reason this is so troubling to me is it is completely false and misleading. It once again makes my industry look bad and creates distrust. I wish heating and cooling companies could just compete on service, integrity, and value instead of a promotion that is false. Do not fall for the "free" furnace or air conditioner trick.

[Here is another one that makes me pull out my hair...The inexpensive furnace "check".](#)

I've seen this promotion run for anywhere from \$19.99 to \$39.00. This promotion is entirely different from a furnace "clean and inspection". Let's start with the obvious.....a heating and cooling company CANNOT do anything worthwhile to a furnace for \$19.99, or \$39 for that matter.

I run a pretty tight ship and D&L Mechanical. I pay my technicians and workers a good wage and treat them well. I watch my expenses and don't overspend. That said, my hourly cost to run a technician around town is about \$75 an hour. That includes wages, insurance, taxes, gas, etc. How in the world can I be able to send someone out for \$19.99???

D & L Mechanical can't do it and either can other companies. It's a misleading promotional tactic to get a technician into your house to "upsell" you into another service.

Example: Technician shows up at your home for \$19.99. They look at your furnace and then tell you that is dirty and it will be \$139 to clean and inspect everything. But, they will, of course, forget about the \$19.99 charge if you have them do the \$139 service. It's the same reason grocery stores always put a popular item like milk on sale and in the back of the store. They want you to walk past everything else in the store and be tempted to buy those items on your trip to the daily department.

Now, full disclosure...I'm not saying companies should not offer additional products to their customers when they are servicing your furnace or air conditioner. I personally am of the opinion that D&L Mechanical has countless other items that are of massive value to our customers besides just heating and cooling. We offer indoor air quality items like air cleaners, UV lights, and humidifiers. We also have home safety products such as water leak and freeze detection, carbon monoxide alarms, and security cameras. I believe these products are invaluable, I'm not saying they shouldn't be offered. What I am

trying to say is I believe it's unethical to offer a very low service (\$19.99 furnace check) that is misleading and has no value with the goal of selling a higher-priced product.

At D&L Mechanical we offer our full home safety inspection and furnace or air conditioner cleaning for \$139. We try to get to know our customers. If during that inspection we feel a particular product could help them we offer that product. If our customer decides not to buy anything additional then so be it. We are ok at \$139 and making a little profit.

A heating and air conditioning company would be out of business very quickly running around doing service calls for \$19.99. My advice to homeowners that want to respond to a very cheap service offer is to find out AHEAD OF TIME exactly what the technician will be doing for that low price. You'll find out pretty quickly if it's simply a way to get someone into your home to sell you other services or not.

The last misleading promotion I want to cover is one that has literally destroyed an important part of my industry, the ridiculously low duct cleaning.

D&L Mechanical offers duct cleaning to our customers. I think it's a great service and homeowners should have their ducts cleaned every 3-5 years, possibly more often if you have a large number of pets or live on a dirt road with lots of dust coming through the windows. However, duct cleaning really isn't a profitable part of my business.

Why? Because misleading promotions have killed it.

Look at the advertising that comes to your home from duct cleaning companies. Ever see the ads that say "Air Duct Cleaning, up to 10 vents, for \$99". They aren't hard to spot. They are tremendously misleading and another black eye on our industry. Let's look at this more closely...

In order to properly, and I stress PROPERLY, clean a home's air ducts it takes about four hours, not including drive time. And that is assuming the home has only one system and it's relatively small, like 1200 square feet and has ten or less heating vents.

Does it make sense that a company could only charge \$99? Or even \$199? Of course, it doesn't. This tactic is another variation of the \$19.99 furnace check. It's a way to get someone into the home to do an upsell. How do they do this?

Example: Once on the site the cleaning technician will tell the homeowner that the \$99 cleaning only includes heat vents, not return air vents. It also only includes a basic vacuuming of the vent area, not the cleaning with the large truck mounted duct cleaning machine. Oh, those additional services? The additional heat vents, return air vents, use of the big special super fantastic truck-mounted machine, and cleaning entire area around the furnace? Those services are included in the Platinum, Diamond \$599 package.

See where I'm going with this? A homeowner will be quickly sold into a much more expensive service instead of the \$99 service.

I challenge you to go online and read some of the reviews of the companies that do the really inexpensive promotions. You are very likely to find review after review of homeowners complaining about this practice.

"My \$99 duct cleaning ended up costing \$459"

“The company came out and immediately said my system would cost \$300 more because of more vents or that the \$99 cleaning doesn’t cover attic systems”

I even found one review that said the following:

“The technician came out and said it would cost more than the \$129 advertisement. He said I had too many vents and my system was not compatible with \$129 machine. He said it would cost \$399. I told him I only had the \$129. He shrugged his shoulders and left.”

You can’t make this stuff up.

The thing about this type of bait and switch tactic is the duct cleaning industry has now trained the marketplace to think a duct cleaning costs \$99. Most people that ask about D&L Mechanical’s air duct cleaning (which is priced at \$499) are shocked. The next response is “Really? I saw an advertisement for \$99”

Whether it’s the “free furnace” or “free air conditioner” offer, the “\$19.99 service call” or the “\$99 duct cleaning” these offers are all misleading and excuses to get someone into the homeowner's house. Once that is accomplished it’s all about the high pressure upsells.

CHAPTER FIVE ACTION ITEMS

- 1) Watch out for the misleading free furnace or free air conditioner offers
- 2) Beware of the cheapie service call
- 3) Make sure you aren’t suckered into the \$99 duct cleaning bait and switch

CHAPTER SIX - SERVICE/REPAIR RELATED ISSUES

There is a well-known story (I'm not sure if it's true or not) about a large company that got themselves into a pickle. Turns out this company had a big manufacturing plant. This plant was the backbone of the company and produced the majority of their products. The company could not afford to have this particular manufacturing facility go down. It would be a disaster.

Well, one day that is just what happened. The power system in the manufacturing facility completely went down. It was a nightmare! The company management and workers were completely in a panic. To the complete shock of everybody, nobody knew how to get the system back up and running! They looked at blueprints and schematics to no avail. There simply was not an answer to the problem.

Finally, a lower-level worker suggested they call old Fred. Fred was a plant mechanic for years. He had recently retired and moved to another state but if anyone could get the facility back up and running, it was Fred. Management got Fred on the phone and begged him to fly out and look at the problem.

"Sure", said Fred. "I can be there in a few hours. For me to come out and fix things it will be \$500,000."

The management agreed immediately. They had too. Production had stopped and ownership wanted answers.

Upon arrival, Fred walked directly in the front door and proceeded to a junction box near the rear of the facility. Fred opened the door, knelt down and removed a small panel. He flicked a switch off and then back on. The power in the plant immediately came back on. Fred replaced the panel shut the closet and turned to management.

"There you go. You shouldn't have that problem for another few years. It doesn't happen often." Fred said.

The head manager was furious.

"\$500,000 for that? You were only in the facility for three minutes! That's outrageous!" He screamed.

Fred simply smiled. "It's not the amount of time I spent that cost \$500,000. It was my knowledge in knowing what switch to reset that cost the \$500,000"

I tell that story for a reason. One of the biggest complaints from homeowners is the cost to service or repair their furnace or air conditioner. I've read online complaints and had a few of my customers question the cost. Look, at D&L Mechanical we don't overcharge our homeowners. We charge the amount it takes to get the job done, cover our costs, and make a profit to keep us in business. As a homeowner, you need to understand that it's not the amount of time spent on the job site that determines the cost, it's the experience and expertise contractors bring with them that determines the cost.

Let's say D&L Mechanical is contacted by a customer because their furnace is not operating. Furnaces are complex machines with many working parts, as are air conditioners. It's virtually impossible to simply guess what is wrong with the equipment without looking at it. And just like most machines, the problem could be very easy to fix, or more difficult. If you are working with a quality heating and cooling contractor that has integrity, you shouldn't have to worry about them doing the right thing and charging a fair price.

But what if you aren't sure?

I wrote this book because I don't want homeowners ripped off by shady heating and cooling companies that do not have integrity. I want to do my best to give you some knowledge that will allow you to ask questions that will greatly lower the possibility of getting taken for a ride.

We have all seen those “catch a contractor:” sting operations they do on TV right? You know the ones I’m talking about. A local television station goes into a homeowner’s home and has a technician from a heating and cooling company do some very basic thing to a furnace to stop it from operating. Something like disconnecting a wire from the circuit board. Then the television station calls out other heating and cooling companies to fix the furnace.

The goal here is to protect homeowners by catching dishonest companies overcharging to fix the furnace. They want to see if the company will try to tell the homeowner they need a more extensive repair than simply plugging a wire back in. When I watch these news reports I am alarmed at how many times they do catch companies doing exactly that! I do think those heating and cooling companies that get bad press after being caught cheating deserve what they get, but I’m still troubled by the impression it gives our industry.

Assuming you don’t have a television station on your side with their hidden camera, what can you do to help prevent being deceived? As I mentioned earlier, heating and cooling equipment are complex. There are many things that “can” go wrong however some of those things are uncommon.

Now, let’s say a heating and cooling technician comes to your home to repair your furnace. You are told you need a more expensive repair, like a blower motor or inducer fan motor. You are skeptical as to whether that is the actual repair needed or whether you are being talked into a repair you don’t need.

The first thing you need to consider is the age and condition of your equipment. I can’t make a blanket, black and white statement about repairs because things “can” happen. But, if your furnace is under 10 years old and you are diligent about having your equipment serviced, a more expensive repair is not common. Motors are made to run and last. Manufacturers give 10-year parts warranties because they expect those parts to last, especially if the unit is serviced regularly.

That is not to say things won’t go wrong with a furnace, even if it’s not old, but the parts that tend to go bad are basic. Things like a dirty flame sensor, a faulty ignitor, bad capacitor or maybe a pressure switch going out. Those parts are inexpensive and easy to change out. Again, I’m not saying that a motor won’t have a problem, but it’s just not nearly as common as a motor.

Before I tell you how to ease your doubts about a repair, I want to take about air conditioners and heat pumps for a moment.

When an AC or Heat Pump isn’t operating the most expensive repair is to replace the compressor in the outdoor unit. However, just like a furnace motor or heat exchanger, this isn’t very common.

If the unit is freezing up at the indoor coil or the outdoor unit this isn’t always a compressor replacement or refrigerant addition. Most times it’s because of a dirty indoor filter or dirty coils. Remember that yearly maintenance? That will prevent 95% of the freezing up problem.

If the outdoor unit will not turn on again, most likely this is not a compressor issue. It is usually a bad capacitor or it could be off on the head pressure due to dirty coil or thermal overload. Compressors do sometimes die and go to compressor heaven but it’s just not a common occurrence.

Here are a couple of things you can do to reduce the risk of being deceived and overcharged for a repair.

1) Maintain your equipment every year! I realize I’m trying to pound this into your head but it’s the single most helpful solution. If you maintain your equipment expensive repair should be a rarity.

2) Get a second opinion. D&L Mechanical offers a free service to homeowners who are unsure about a repair or recommendation. If you are told you need a new motor, heat exchanger or compressor or anything else you think might not be on the up and up, we will give you a second opinion at no cost. We don’t do this as an excuse to get into your home and do the repair ourselves, we do it because I want my industry to be honorable and respected.

Based on everything you see online you might find it hard to trust heating and cooling contractor, especially regarding repairs. I will reiterate that most contractors are good people and DO NOT purposely mislead and rip off homeowners. If you are diligent and follow the recommendations I’ve made in this chapter you greatly increase your chances of having a good experience.

Chapter Six Action Items:

- 1) Be fair with your contractor. You are paying for expertise, not time.
- 2) Maintain your equipment to increase its life span and reduce repairs.
- 3) Get a second opinion if you are unsure about a repair estimate.

CHAPTER SEVEN - WHAT FURNACE SHOULD YOU CHOOSE?

Heating your home is damn important. Especially if you live in a state that is prone to very cold winter conditions. That's what heating companies do right? We install heating systems that heat your home. But, a furnace is a furnace is a furnace right? It's there to heat your home, period. It comes on and heat comes out of the vents. Not much to it right?

Well, there is a little more to it

D & L Mechanical has been installing furnaces in our market for years. We've installed about every size and type you can think of. You see, a furnace ISN'T just a way to heat your home. Oh sure, heating your home is the most important thing a furnace does but frankly, there are plenty of other jobs a furnace has to accomplish as well:

- 1) Work in tandem with your air conditioner to cool the house
- 2) Move the air in the house to prevent "stale air syndrome"
- 3) Work in tandem with your indoor air quality products such and humidifiers, air cleaners and air filters to create a healthy indoor environment.

Now that you know some of the other jobs a furnace has in addition to heating your home, do you think it might make sense to become informed on the different types of furnaces available to you? Well, that's the plan in this chapter! Let's get at it!

Conventional 80% vs Conventional 90% efficient furnaces

The most common installed furnace is the 80% efficient furnace. The vast majority of furnaces currently installed in the United States are this model. They are the least expensive furnace and most times, the easiest to install. Since 90% efficient furnaces didn't start to become popular until the 2000s, replacing an 80% furnaces is a simple change out. The contractor can hook up to the existing B-Vent flue without changing anything. B-Vent is a double-walled pipe that connects into the furnace and then vents out through the roof. In other words, if you want the most economical and least expensive up-front cost, this is your unit.

90% efficient furnaces are a little different. These pieces of equipment do not use B-Vent to exhaust the flue gasses. 90% furnaces use PVC that is generally vented horizontally to the outside of your home. If you are changing out an 80% efficient furnace and want to upgrade to a 90% furnace, the contractor will need to add this new venting system. That, of course, adds costs that are in addition to the equipment, which is generally double the cost of an 80% furnace.

Now, when I describe these two furnaces as 'conventional', I am referring to the blower motor that is inside the furnace. A conventional furnace uses a single-stage motor. In other words, there isn't anything special about it. It comes on and off at one speed, which is the high speed. This is the LEAST efficient motor you can have inside your furnace.

So what's the difference besides the venting?

To properly heat your home, it needs a certain amount of British Thermal Units, or more commonly called, BTUs. The number of BTUs needed is calculated by your contractor using a process called a heat calculation. The contractor takes into account such things as square footage, the type of windows, the amount of heat loss the house will deal with, etc. Once the contractor arrives at the BTUs needed to heat your home, it's now time to size your furnace.

Let's assume the contractor has calculated it takes 80,000 BTUs to heat your home. For the furnace to properly heat your home, it would need to output 80,000 BTUs. An 80% efficient furnace outputs 80% of the BTUs it takes in. So, that furnace would need to "take in" 100,000 BTUs to output 80,000 BTUs. 20% of the BTUs of gas taken in would be wasted in the heat conversion process.

A 90% efficient furnace has a second heat exchanger inside the furnace. You might recall from chapter four that the heat exchanger is the heart of the furnace that creates the heat. That second heat exchanger increases the efficiency of the furnace. A 90% efficient furnace outputs 90% of the BTUs it takes in which means it takes in 10% fewer BTUs to output the same amount as the 80% efficient furnace. In this example, a 90% furnace would only need to take in 90,000 BTUs to output about 80,000. The 10,000 BTU difference between the two furnaces is your savings should you install a 90% efficient furnace over an 80% efficient furnace.

The big question you should be asking yourself at this point is does the savings in fuel usage make up for the additional up-front cost to install a 90% furnace? Remember this, if you are planning on living in your home for a long period of time, that furnace will be running thousands of hours, year after year. In the long run, you will easily make up that cost.

Variable Speed Furnaces vs Conventional Furnaces

If you've looked into buying a furnace recently you've probably come upon a furnace technology called variable speed. Whether you have or haven't heard of variable speed technology, I'm going to go ahead and decode it for you right now.

Variable speed refers to the blower motor inside the furnace. The motor is called an ECM (electronically commutated motor) motor. These motors are lower-maintenance, energy-efficient and can reduce operating costs. Now, I want to stress here, these motors "can" reduce operating costs. The reason I say, "can" is because the savings depend on how the homeowner operates their HVAC system. The furnace will perform better and uses about two-thirds less electricity than a conventional furnace but cost savings are also dependent on the outside weather and how high or low the thermostat is set.

A variable speed furnace can save on cooling costs as well. How? If you have split system air conditioner (I'll explain AC's in the next chapter) the furnace works in combination with the air conditioner to cool your home. The AC cools the air but the blower in the furnace moves the air in the home. If that furnace has a more efficient motor, like an ECM motor, that air will be moved more cheaply.

But a variable speed furnace has a couple of other features in addition to the motor. It's a "thinking" furnace. I know, what are you talking about Darren? As mentioned earlier, a conventional furnace turns on and off in one speed, high speed. A variable speed furnace has both high speed and low speed.

Imagine it's a 60-degree day during the winter. Your furnace comes on a few times during the day or night. If you have a conventional furnace, it would turn on full blast, heat the home, and then turn off. It would be like driving a car and flooring the gas pedal every time you want to move the vehicle. A little expensive on the gas bill right?

A variable speed furnace "thinks". Due to algorithms inside the thermostat and circuit board inside the furnace, it will decide if it needs to turn on in high or the more economical low stage. During our 60 degree days, it wouldn't take much to keep your home warm. it would always turn on in low, heat the home and then turn off. That lower stage would cost less to operate. Over time the system will accumulate more and more information about your home, the amount of time it takes to heat your home, and your habits. The more it learns the better it responds!

“But Darren, what if the weather is really hot or really cold and the low stage won’t heat or cool more house?”

That's the beauty of it! The system will “know” from past heating and cooling cycles if the low stage is good enough. If it determines the low speed not heat the home quickly, it will use the high speed. How cool is that?

The last thing to know about a variable speed furnace is comfort. A variable speed heating system precisely controls airflow to provide better temperature control, humidity control and air distribution. A higher level of precision means a higher level of comfort. Do you have a room in your home that is always cold during the winter or always hot during the summer? If you’re like most of the homeowners I speak to, I bet you do. The air movement of a variable speed furnace can greatly decrease that problem as well.

Modulating Furnaces vs Variable Speed Furnaces

There is one more type of furnace to talk about before we move on to air conditioners and heat pumps. That furnace is known as a modulating furnace. A modulating furnace is a variable speed furnace on steroids. It is the most efficient and best-performing furnace on the market.

In addition to the variable speed ECM motor, a modulating furnace also has a more advanced gas valve. The furnace's name comes from this valve. The modulating gas valve lies at the heart of the modulating furnace. This feature adjusts the incoming gas supply, which in turn adjusts the burner flame's intensity. These valves often go with electronic controls that allow for fine adjustments according to thermostat demand. With a modulating gas valve, modulating furnaces can stick closely to their target temperatures, putting an end to wild temperature swings. These furnaces are commonly 97%-98% efficient in their use of energy and gas.

What does that mean to you? Well, less gas cost and an even more increased comfort level. Think of a home that adjusts so quickly and so effectively you literally don’t notice a temperature change inside your home. For heating and cooling geeks, like me, this is like heaven!

But heaven comes at a price! A modulating furnace has a much higher up-front cost than a variable speed or conventional furnace. These are incredible machines but you need to weigh their cost with the savings. These units will save you money however you won’t break even in a year, or even a couple. You will enjoy the immediate benefit of lower utility costs and increased comfort but you might not “break-even” until you get into year 4 or 5.

One last consideration. Run hours. How often does your furnace run during the year? I mention this because some states have milder seasonal weather than others. If you are located in a state that has a longer heating season, like the northern states, you will save more and your payback will happen sooner. I’d rather have a super-efficient furnace in Montana and a lessor efficient furnace in say, New Mexico. Keep this in mind when you weigh your options.

Chapter Seven Action Items

- 1) Determine the length of time you are going to be living in your home
- 2) Determine the current comfort level in your home and if you need it improved using an ECM motor
- 3) Determine how often your furnace runs during the year

CHAPTER EIGHT - WHAT AIR CONDITIONER OR HEAT PUMP SHOULD YOU BUY?

Congratulations on making it this far! At this point, you should have a good idea of how to pick a good contractor, how to avoid misleading promotions and how to select a furnace that meets your needs. Now it's time to get clear on air conditioners and heat pumps. 3-2-1, off we go!

There are three types of air conditioners, a split system, a package system, and a ductless system. I've installed all three in residential homes. By far the most common is the split system. Let's start there.

There are three parts of a split system air conditioner. First, there is the outside unit called the condenser. Next, there is the refrigerant line or "lineset" that connects the condenser to the inside unit which is called the evaporator coil. The evaporator coil is installed in the plenum ductwork immediately after the furnace. When the air conditioner activates, the blower motor in the furnace also turns on to move the air inside the home.

Contrary to what you might think, an air conditioner does not blow cold air. An air conditioner collects hot air from inside your home, processes it within itself with the help of a refrigerant and the evaporator coil and then releases cool air into the same space where the hot air had originally been collected. Yes, it's a bit confusing but in a nutshell, an air conditioner removes the heat from the air, leaving only cold air, and displaces that heat outside the home.

It's an amazing process that was invented in 1902 by Willis Carrier. Thank the stars for that guy! Can you imagine the world without air conditioners!

The second air conditioning system is called a package unit. Although these are very common in commercial buildings, they are still installed in some residential homes from time to time. These larger systems sit outside the home and are connected to the ductwork inside the home from the outside. Inside these units are both the air conditioning and heating system, thus the term "package system". Basically it's the same principle, The hot air in the home is taken out, run through the package unit, the heat is removed, and the leftover cold air is sent back into the house.

Finally, we have the ductless system, or as it's commonly called, a mini-split. Like a standard split system air conditioner, a ductless system has three parts. The condenser and lineset, but this time a different inside unit called an air handler. The air handler is mounted on a wall in a room of the house and is connected through that wall to the condenser. Since there is no furnace to move the air in the home, the air handler takes its place. Hot air in the room is removed by the air handler working in tandem with the condenser leaving only cold air.

The big drawback to mini-splits is their size. They are only designed to cool a single room so you'd need more than one to cool an entire house. The best application for a mini-split is to add additional cooling to a problem area, like an upstairs bedroom that faces the sun in the afternoon and doesn't cool well.

What is the difference between an air conditioner and a heat pump?

The only real difference is that a heat pump can reverse itself so it can provide heating when needed. Sound good? Great, let's move on....

Sorry, I couldn't resist!

In all fairness, heat pumps can be very confusing to explain. During the summer a heat pump works exactly like an air conditioner. The confusing part is the winter. During the winter, heat pumps operate

like an air conditioner in reverse. The refrigerant absorbs heat from the air outside and uses it to warm your home.

It can be hard to imagine a heat pump extracting heat from the outside if it's 50 degrees or so but the piece of equipment can do just that. In fact, some heat pumps can still be effective when the outside temperature is as low as 20 degrees outside! Most often though, an HVAC system with a heat pump is designed to switch over to a furnace if the outside temperature goes below around 35 degrees.

So should you choose an air conditioner or heat pump?

As you might imagine, heat pumps are more expensive than air conditioners. The largest advantage of an air conditioner is it will cool your home in the summer with less upfront cost than a heat pump. If you already have an energy-efficient way to heat your home, such as a high-efficiency gas furnace, then perhaps a heat pump will not yield a high enough return on the investment. Also, if you live in a state in which the nights are often below 30 degrees, your gas furnace will most likely be needed so often a heat pump wouldn't make sense.

However, if you live in a mild state as I do here in Virginia, heat pumps are popular. Since our weather doesn't go below 30 all that often, heat pumps can cheaply heat your home most of the year. As in most cases, you need to get with your contractor and decide whether the payback is worth the up-front cost of installation.

Now that you understand the difference between air conditioners and heat pumps let's go ahead and select the type of system. We have three choices, single-stage, two-stage or inverter.

A single-stage system is exactly like a conventional furnace, it has one speed, high. And just like a furnace, this is the least efficient system you can get. It comes on full blast and shuts off when the house cools. This is the cheapest unit to install but it comes with a BIG problem...

Picture most homes. Have you ever noticed the thermostat is located right in the middle of the house? If you have a two-story house it's on the first floor. Have you also noticed that the places in your house that are the hottest during the summer are the bedrooms with outside walls or upstairs? If you set your thermostat to let's say, 70 degrees what happens when the air conditioner cools to that temperature? You guessed it, the AC turns off. The problem is, those bedrooms connected to the outside walls or your home, and especially the upstairs bedrooms are still hot!

So what is the solution? That my friend is called the two-stage air conditioner! This piece of equipment has a high speed and a low speed, which is about 1/2 the speed of the high stage, just like a variable speed furnace. Let's use our example from above. The thermostat is set for 70 degrees and the AC turns on, this time in low stage. Instead of the AC running as a single stage for 6-8 minutes on high, it runs for about 15 minutes on low. The result? The cool air has more of a chance to spread out to the problem areas like those bedrooms and upstairs! How that for a solution?

Remember the last chapter when we talked about a modulating furnace? While our last technology for cooling your home is the inverter, which acts very much like a modulating furnace. An air conditioner or heat pump with this technology has not one, but up to 80 different speeds. That means if the AC needs to only run at say, 20% of the maximum, it has the ability to do just that. You can achieve massive energy savings using inverter technology, especially if you have a heat pump. You'd have that savings both on the heating and cooling side.

Please consider the following. While inverter units can save you on utility bills, and provide an amazing level of comfort, they are quite expensive. The up-front installation cost can be so high that in some states the savings may never pay for itself. I probably won't make any friends among my peers by writing this but if you live in a mild temperature I'd give serious thought before purchasing equipment with this

technology. I wrote this book to help homeowners make the best choice. At D&L Mechanical we like our customers to weigh all the pros and cons before making a choice. If the numbers show a quick payback them go ahead and have this equipment installed. If the numbers don't, consider something more economical.

The last things to consider with an air conditioner are SEER or Seasonal Energy Efficiency Ratio. This number represents the overall efficiency of the AC. The higher the number the more efficient. At the time I wrote this book, the government has set the minimum SEER rating at 13 or 14, depending on the state you live in. States with a longer cooling season, like my state Virginia or other southern states, are at 14. Northern states are 13.

Most single-stage air conditioners are 13 to 16 SEER. The higher SEER units, some up to 25 or more SEER are the two-stage or inverter units. There is one thing I want to stress when you consider the SEER of your air conditioner. What you see on the box might not be what you get!

The way manufacturers rate their units is misleading. The rating you see on the box, online, or on brochures is the BEST rating that the unit CAN achieve. What does that mean? Well, as I've mentioned, the furnace works in tandem with the air conditioner to cool your home. When an AC is rated, it takes into account not just the air conditioner, but also the furnace that is working with the AC.

Remember in chapter seven when I told you the better furnaces, like the variable speed or modulating units boost the efficiency of the air conditioner? The ECM motor in those furnaces causes the air conditioner to have a better SEER. How does this lead to a misleading SEER rating? You see, the manufacturers rate their units ASSUMING you have the best furnace working with the air conditioner. In other words, if you buy an air conditioner that has a 16 SEER rating it means that AC hits 16 SEER ONLY if it is coupled with a furnace using an ECM motor!

The problem is a lot of air conditioners are added to homes with an existing furnace that most likely is conventional. So that 16 SEER air conditioner you just bought? It will perform closer to 14.5 or 15 SEER. The reason I mention this is some contractors won't tell you upfront the "true" rating of the equipment, they will do what manufacturers do and promote the rating on the box.

Why does the matter to you? Consider this scenario. Let's say you purchase a new 16 SEER air conditioner to replace your old 13 SEER unit but don't change out your conventional furnace. You paid the much higher price for the 16 SEER assuming the 3 SEER point upgrade will save you quite a bit of money. In truth, that AC is only 14.5 SEER. You get your utility bill at the end of the month but it only saves you a few dollars because you didn't get the boost in SEER you thought you were getting. See my point?

You need to ask your contractor what SEER the air conditioner has with the furnace or air handler you will be used to cycle the air in your home. This is important. Some of the higher SEER units drop as much as 4-5 SEER points without the proper furnace. Wouldn't it stink to buy a 20 SEER air conditioner and later find out its more like 16 SEER?

I know this chapter has been long but I need to quickly fill you in on how heat pumps are rated. This rating is called HSPF or Heating Seasonal Performance Factor. While SEER applies only to cooling, HSPF and is basically the SEER rating for winter that is used to rate heat pumps. During the summer, heat pumps provide cooling so they have their own SEER rating. During winter that rating becomes an HSPF rating. HSPF is calculated pretty much on the same lines as SEER and is essentially the ratio of total heating needed to be divided by the total electricity utilized by the heat pump. Just as a higher SEER indicates greater cooling efficiency, a higher HSPF value indicates better heating efficiency, so the higher the number the better.

The decision on which heat pump to choose once again depends on run hours and up-front versus payback. The higher the HSPF, the higher the initial cost. If you live in a state in which heat pumps will be running most of the time during the winter your payback will be quicker,

other states, not so much. Get with your contractor to determine that break-even year and decide if it's worth it!

Action Items for Chapter Eight

- 1) Determine if you need a split system, packaged, or ductless (mini-split) air conditioning system.
- 2) Determine if you need an air conditioner or heat pump
- 3) Analyze the temperature of your state and run hours to determine pay-back on higher SEER and HSPF equipment.
- 4) Determine the true equipment ratings based on how your system works together to cool your house.

CHAPTER NINE - INDOOR AIR QUALITY

You've probably realized by now that I have a passion for what I do and some pretty strong opinions on my industry. As I mentioned in the introduction to this book, I think every homeowner has a right to be treated fairly, be told the truth, and have a good experience when hiring a heating and cooling contractor. This is the mission at D&L Mechanical and should be the mission of every other HVAC contractor. But as an industry, we should have another mission, not just to be honest but to make a difference in the quality of life of our customers.

When it comes to heating and cooling your home it comes down to one thing, comfort. I'm trying to make the environment inside your home as comfortable as possible. I've explained how I can do that by using different types of furnaces, air conditioners, and heat pumps. But did you know your heating and cooling contractor can also make the environment inside your home safer, cleaner, and healthier? That's right, with the proper products and equipment I can change lives, and no, I'm not being overdramatic. I'm going to show you right now how you can live a better life, immediately.

Do you suffer from or have any of the following problems?

- * Allergies?
- * Asthma?
- * Breathing problems?
- * Dry skin?
- * Sore or scratchy throat?
- * Chapped Lips?
- * Bloody nose due to dryness?

If you said yes, you are like 95% of the homeowners that call my company D&L Mechanical, you have one or more of these problems but you haven't found solutions. Well, my friend, I have good news for you, I'm about to solve EVERY one of these problems for you! Let's get started..

Allergies-Asthma-Breathing Problems

Let's face it, a large percentage of the population suffer from allergies. They can make life miserable. Pollen, weeds, dust, molds, bacteria, animal hair and dander can create allergic reactions that can last for months on end. Often allergic reactions trigger asthma attacks and breathing problems. It doesn't matter if you close all the windows in your home, you still have to go outside and all those problems enter the home when you go in and out. It seems like there isn't a place you can go to just relax and get some relief!

Before you do anything, prepping the home for cleaner air is very important. When I say "prep" I'm talking about taking out all the built-up filth that has accumulated over the years, I'm talking about all the dust that has built up in your ductwork. I mentioned earlier in the chapter five a service know as duct cleaning. You should know from that chapter how not to be scammed but now I'm going to tell you WHY you need to clean your ducts. Any system that is installed in your home will quickly become filthy from the accumulated dust, hair and animal dander in your ducts. Installing a new furnace or indoor air quality system in your home without cleaning the ducts first would be like installing new pistons in your

car but not changing the oil. If you have not recently cleaned your ducts, please do so before you install a new system.

Now, before I explain the solutions to the problems above I need to climb back up onto my soapbox again. When we talk about improving the air quality in your home don't tell me you already have a one-inch fiberglass filter installed in the furnace so you're good, because if you do have that filter it doesn't do much at all. Those filters you buy in Wal-Mart or Costco or wherever are the LEAST effective air filtration you can have in your home. The best I can say about them is they are better than nothing...barely. You absolutely MUST have a solution that is better than that simple filter. They block very little dust and do nothing whatsoever to stop molds or allergens, not to mention viruses and bacteria, let alone keep your equipment clean. Having a basic one-inch filter is like washing your hands with dirty water,

Air Cleaners

Air Cleaners are a major difference-maker in the fight against allergies, asthma and breathing problems. I'm not talking about room air cleaners or the Ionic Breeze (which had great marketing and sold a ton of units but didn't do much!). I'm talking about the professional installation of a whole-house air cleaner. This unit installs in the ductwork next to the furnace. There are several different types of air cleaners. You have the polarized media filters, mechanical air cleaners, and electronic air cleaners. They all do roughly the same thing but at different levels. When your furnace or air conditioner is operating, the air moves any airborne contaminants through the filter. The filtration level of the device is measured by what we refer to as the device's MERV rating.

MERV means Minimum Efficiency Reporting Value which was developed by the American Society of Heating, Refrigeration and Air Conditioner Engineers - or ASHRAE. MERV values vary from 1 to 16. The higher the MERV value the more efficient the filter will be in trapping airborne particles. Remember, that common one-inch fiberglass filter I was rallying against a few paragraphs ago? That rates about a 3, in other words, practically nothing.

Polarized-Media Air Cleaners are electronically enhanced filters. Particles are electrically charged (polarized) and then collected in the high-efficiency media. Polarized sub-micron particles join with other particles and are collected on subsequent passes. They give a higher level of filtration and a basic level of defense against viruses and bacteria. These units have a MERV rating of about 10.

Mechanical Air Cleaners use a mesh of material, usually fiberglass fibers, to trap particles passing through them. They both impede the particles and attract them to the surface of the fibers, where they become lodged. The most common type of mechanical air cleaner is the HEPA (high energy particulate air) filter. However, these are uncommon in homes because they can create too much blockage against airflow. A good contractor will find a mechanical filter that will trap particles without creating too much air resistance. These systems have a MERV rating around 13.

Electronic air cleaners, unlike mechanical air cleaners, are not filters at all. They instead create an electric field that ionizes particles that pass through it. When the particles are ionized, they are drawn down to a pair of plates on the cleaner and trapped there. Electronic air cleaners require an external power source to run, but they are often necessary because they can remove contamination that is too small for a mechanical filter to catch. High-level electronic air cleaners can reach the maximum MERV rating of 16.

UV-Lights are another option. These are again installed in the ductwork. Any virus, bacteria, mold or allergen that pass through the light are immediately neutralized. I personally love UV lights but one thing you need to take note of is that while UV lights destroy anything they come in contact with, they do not filter the air. You still need a way to remove the dust and particles in the air, such as an upgraded filter.

We all have concerns about viruses. Nobody wants the flu or god forbid Sars or Coronavirus. I can't control what happens when you leave your house but I can pretty much give your house a flu shot.

If D&L Mechanical installed any of these air cleaners along with UV lights your house would be 99% protected against any viruses. I can't keep your child from contracting a cold at school but I can make damn sure that it doesn't spread to the rest of the family!

So which one of these air cleaners are for you? Look, any of these systems are a massive upgrade over a crappy one-inch fiberglass filter. Obviously, the better the system the more upfront investment you will have to make. D&L Mechanical has installed all of these systems and any one of them can make a radical change in the quality of life of our customers. We have received testimonials in which allergies have been reduced to the point in which our customer doesn't suffer any issues at all when inside their home. Can you imagine you or your family finally having an environment inside the home that is clean and free of any and all harmful airborne contaminants?

I'm shocked by how many of my fellow heating and cooling contractors don't offer air cleaners. I think, aside from comfort, they are the next best thing we can do for our customers. We all deserve to have a comfortable home AND air that is clean from dust and particles. IF your heating and the cooling contractor doesn't at least offer you these products you should consider a second opinion or contact a different company. I feel that strongly about it.

Humidifiers

When the fall and winter seasons come upon us the outside air becomes dryer. Inside our house it gets even worse. Not only is the air dry but when the furnace is operating it is drying the air even more. Dry air results in chapped lips, dry skin, scratchy throats, and nose bleeds. These problems can be easily eliminated with a whole-house humidifier.

Whole-house humidifiers, not to be mistaken with those small room humidifiers, install in the ductwork near the furnace. Your contractor will connect them to a water source (usually the same source your water heater is using) that saturates a pad inside the humidifier. As air moves through the HVAC system, a portion of it moves through the saturated pad and is carried into the home through the ductwork.

There are several different types of humidifiers, like by-pass, fan-powered or steam. Each one of these units can increase the humidity level in the home to around 60%. That is a massive difference from the outside air in some areas of the country. Humidifiers are one of the most popular items I provide to my customers.

As you can see, heating and cooling your home is just part of what a professional HVAC contractor can do for you. If you suffer from any of the issues I mentioned earlier, make sure you reach out to your favorite heating contractor and entertain the other services we can provide to make your home cleaner and more liveable.

CHAPTER NINE ACTIONS ITEMS

- 1) Ask about other services besides heating and cooling your contractor provides
- 2) Consider better air filtration systems that can help with allergies and kill viruses
- 3) Consider a humidifier to improve your skin and health

CHAPTER TEN - FREQUENTLY ASKED QUESTIONS

Hopefully, I've filled your head with a bunch of useful information! You should understand HVAC systems and indoor air quality products as well as be able to keep you safe from shady contractors. I wanted to close this book by answering some of the questions I'm frequently asked by people regarding heating and cooling. Let's start with the most asked questions...

How much should it cost to have a furnace or air conditioning system installed in my home?

I wish I could give you a number or a range but there are WAY too many variables. As I wrote about in the furnace and air conditioning chapters there are different types of equipment ranging from basic to high efficient to variable speed. Besides, the size of the equipment dramatically affects the price. This book is also intended to be read by homeowners in all parts of the country. Wages for employees in one state could be double those in another. My best answer is to follow the opening chapters of this book and make sure you have a reputable contractor. If you do, chances are you will get a fair price.

Why is my upstairs always hot? Heat rises so the upstairs will usually always be a few degrees warmer than the main floor. Plus, thermostats are generally located on the main floor, in the center of the house. Once the thermostat is satisfied it will shut down the air conditioner well before the temperature upstairs is lowered to a comfortable level. The best option is a two-stage or inventor air conditioner. The unit will run at a lower stage but for much longer which will give the upstairs a chance to get more airflow.

Why is my furnace or air conditioner running all the time? A piece of equipment that is running too often can simply be a result of the outside temperature being very hot or very cold and it's trying to keep up. However, it could also be an indication the system is short cycling, in need of a tune-up or the case of an air conditioner, need the refrigerant checked.

Is it better to have a larger heating and air conditioning system? This is easy to answer - NO! HVAC systems are built to function within the ductwork system that services the building. A larger system will stop and start more often which results in a higher energy bill. Also, the larger the system the harder the air is pushed through the ductwork. This can cause duct "popping" which can become annoying. Conversely, a system that is too small can run too often which also increases your energy cost. Your best bet is to have your system sized by properly by a qualified HVAC company.

How often should I change my furnace filter? If you have one of those one-inch fiberglass filters you need to change it every month. If you have a media filter I'd suggest every 3 months. An electronic air cleaner should be cleaned every 6 months. If you clean your air ducts that could cut down on how often you need to change your filter because you start with a clean system.

Why is there a rotten egg smell coming from my furnace? We all know a rotten egg smell could indicate a gas leak but in the case of a furnace, it could also mean something more ominous, like a cracked heat exchanger. This is serious because a cracked heat exchanger also leaks carbon monoxide into the life-threatening house. Call your local HVAC contractor immediately.

Why is there a burning smell when I use my furnace for the first time every fall? During the summer the furnace blower motor is running to move the air in your home while the air conditioner is in operation however the heat exchanger is not being used. Dust, hair and other filth collects on the heat exchanger cells. When the furnace activates for the first time during the fall, that filth is burned off which

creates the smell. If you get your furnace cleaned before the fall season during the prescribed preventative maintenance the technician will clean the heat exchanger and you won't get that burning smell.

Why is my thermostat screen blank? The first possibility to look into when you find a blank thermostat screen is to check if the unit needs to have its batteries changed. If the thermostat runs from the house's electrical system, check on the circuit breakers. One of them might have tripped and cut off the power of the thermostat. Reset the breaker.

Why is my electricity bills so high during the winter? People use more electricity in winter because they want to be warm. They turn on their furnaces and electric blankets and take hot showers. The more electricity you use, the higher your power bill will be. If the weather is unusually cold outside it will also cause the furnace to run more often. If you get a higher efficient furnace it can lower your electricity bill.

How can I save money on my energy costs? There are several ways to save money on your energy costs. Consider upgrading your HVAC system to a high-efficiency unit. If you don't already have one, install a programmable thermostat and make sure it is programmed correctly to adjust temperatures throughout the day and week. Change your air filters on a regular schedule. Have your system maintenance performed twice a year, once before air conditioning season and again before the heating season. Make sure all vents are not blocked or obstructed by rugs or furniture.

HEATING AND COOLING SECRETS

Your Contractor Doesn't Want You To Know

Are you a homeowner that is tired of being scammed by contractors?

Are you particularly nervous about doing business with heating and cooling companies? Are salespeople and technicians telling you the truth, or just trying to sell you something and make a commission? Are they doing YOU right, or doing THEMSELVES right?

If you are nervous, I don't blame you, after all, the first three letters in contractor are CON. If you are confused by heating and cooling equipment, HVAC lingo, sales tactics, and practices, this is the book for you.

This book is not about selling you a product, it's about making sure homeowners are protected from heating and cooling scam artists. Within these pages you will learn everything you need to know to be protected from unscrupulous contractors and their sales tactics. Once you've completed reading this book you will be weaponized and be able to make a smart buying decision.

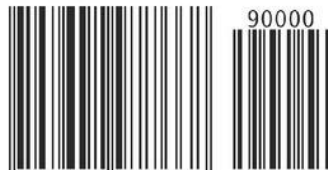


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