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# **PART ONE: BE PREPARED**

**Troubleshooting tips for the most common plumbing, heating and air conditioning emergencies.**

## **1. GET A GRIP:**

### **Troubleshooting Plumbing Emergencies & Problems**

#### **When a Clogged Drain Backs Up Into Your Home**

**Q:** Help! My bathroom is turning into a cesspool! My toilet is overflowing onto the floor and won't stop. I shut the water off right underneath the toilet and it helped a little, but it still keeps coming in.

**A:** When your toilet overflows right after you flush it's usually a sign that the toilet itself has a blockage. However, if your toilet keeps overflowing even when you haven't flushed it, this means the clog is in a drain pipe, possibly your main drain pipe. If this is the case, when you run water from any fixture such as a shower, the water will back up from the main drain pipe and come out of your toilet bowl because it is the lowest point in your drain system. Of course, this makes it seem like the toilet is the problem, when in fact it's your main drain pipe that isn't letting water go down. If you stop using water at other fixtures, the toilet will stop overflowing.

Powerful drain clearing equipment is required to unblock a main drain. If it appears that your main drain might be clogged, call a professional as soon as possible.

If you have a private septic system, the problem may be that your septic tank is full and is causing your main drain to back up into your home. If your septic tank has not been pumped within the last eighteen months, you should have it done to see if this is the cause of your problem. Even if you discover the problem was not in the septic tank, taking care of past due maintenance on your septic system is money well spent.

If you are on a town sewer system it is possible that the city sewer is blocked and sewage from your home and or your neighbors' homes is backing up into your home. Check with your neighbors to see if they are having any problem with their main drains. If they are, be sure to call your town sewer department. If your neighbors or town say they are having problems, your town will take care of unclogging the sewer pipe. If raw sewage has backed into your home, you can call a professional cleaning company to handle the clean up and properly sanitize your home.

And by the way, whenever your toilet overflows, it is a good idea to turn off the water to the toilet because it eliminates any more water from being used until the problem is fixed. The shut off is beneath the bowl on the left side. If it turns out that the clog is in the toilet itself, you could try using a toilet plunger to move the blockage through the toilet.

## A Leak in the Ceiling

**Q:** I discovered a small water spot in the center of my ceiling, close to the light fixture. The water seems to be going into the light fixture and that makes me nervous because I know electricity and water don't mix well. Where is the water coming from and how should I handle this safely?

**A:** Sounds like you have a leak coming from plumbing or heating that is above the ceiling. When water leaks into a ceiling, it travels along the face of the sheetrock until it reaches a low point, and then it pools up and comes through the sheetrock. The actual leak may be coming from a fixture that is far away from where the water is coming through. Light fixtures often act like drain holes for water that is traveling along the sheetrock, so it's common for water to come out there. While this is not a dangerous situation, you should keep the light fixture turned off until the problem is solved.

A common source of such leaks is a tub or shower; the strainer connection loses its seal over time and begins to leak. Or the leak could be coming from a toilet or sink. A simple test is to run one plumbing fixture at a time for a couple of minutes to see if water starts to drip. Take 15 minute breaks between running each one. It's important to know which plumbing fixture is actually the source of the leak because if you have to open up the ceiling for the repair, this will help you know exactly where to do so, saving costly, unnecessary holes. (About twenty percent of leaks through a ceiling require opening up the ceiling to fix the problem,)

Leaks that can be fixed at the fixture (without opening the ceiling) require a professional who has had experience and knows how to isolate the cause of the problem. If possible, it is a good idea to let your ceiling dry completely, by going a few days without using the plumbing fixture that is the source of the leak, before calling in a professional. This will help to diagnose the cause of the problem quickly with less chance of making an error.

## Active Leaks and Floods

**Q:** There is three inches of water in my basement coming from a water pipe that burst while I was at work. I should just turn off the water at the main shut-off valve, right? But what if that doesn't work? Is it safe to walk in the water to get to the shut off? What is the best way to clean up the water?

**A:** With an active pipe leak you could end up with a flooded house or flooded basement. So any time a pipe breaks, you want to immediately turn off the water at the shut-off valve that brings water into your home (usually it's located close to the water meter). Or if you have your own private well, the shut off is located near the well holding tank (usually a blue tank).

If, for any reason, shutting off your main valve does not work, you should immediately call your local Public Works Department and they can shut off your water at the street curb. Or if you have your own private well, you can turn off the electrical supply to the well pump to stop the leak. Find your electrical panel(s) and look for a circuit breaker labeled for your well pump and switch it off.

If you have any live electrical cords that are submerged, or electrical outlets that are covered by the standing water, you should wait for your plumber to come shut off the water, or you should immediately call your local Public Works Department. Generally, if there is three inches or less of standing water, no electrical outlets or fixtures will be submerged and it will be safe to walk through the water. But if you have any doubts about safety, wait for the professionals to come.

If you're not sure where your main shut off valve is, it's better to go looking for it now and make sure everyone in your home knows where it is. That way, if there's ever an emergency, you won't waste time looking.

Call your plumber right away to get the break repaired. Your plumber can also help by pumping out most of the standing water in your basement. If you have carpets or other home furnishings damaged by the water, you can call a Water Restoration Company to help clean up and take care of the mess.

Finally, if there is any damage to your home furnishings, call your home insurance company to find out about your coverage.

## Water Heater Leaks

**Q:** My water heater is leaking from the bottom. How do I stop the water from flooding the floor?

**A:** When your water heater leaks from the bottom, this usually means the tank has a hole in it. In this case, the entire contents of the tank, usually 40 gallons, could drain onto your floor. There are a couple of things you can do to minimize the problem. First, turn off the water to your water heater at the shut-off valve for the heater (typically, it's located 8" to 18" above the heater at the right side on the cold water pipe going into the tank).

If you have an electric water heater, turn off the power to the heater at the electric panel. Look for a circuit breaker labeled for the water heater and switch it off. If you have a gas water heater, the water dripping from the bottom may interfere with the flame and make a hissing noise. While this is not dangerous, you could turn the gas off to the heater at the gas shut off valve on the gas pipe that goes into the heater. If you are not certain which valve does what, you can turn off all of the valves within four feet of the heater without disturbing any other fixture.

Next, make sure all of the hot water faucets are turned off. By keeping them turned off you won't let any air into your system and the leak will slow down considerably.

Finally, you could also use a garden hose to drain water from the tank. Hook up your garden hose to the drain located at the bottom of your heater and run the other end to a low drain in your basement (like a floor drain or basement sink). Open all of your hot water faucets to let air into your system and the tank will begin to drain. When water stops flowing, close all of the hot water faucets.

Write down the type of water heater you have (gas, oil or electric), as well as the size, make and model, and call your plumber right away. With this information your plumber can be sure to bring the right type of new water heater to your home in case it needs to be replaced.

Sometimes a leak from a fitting will travel down the side of the inner tank and make it look as though the heater is leaking from the bottom. In this case a repair will be in order rather than a replacement.

## When You Run Out Of Water

**Q:** When I open my faucets I get only a drip of water. Has my well gone dry?

**A:** Losing water pressure or even losing water completely can be caused by several different things. For example, if you recently used an unusual amount of water to water your lawn or fill your pool, you may have used up the storage of water in your well. Usually, if you stop using any water the well will recover and you'll have your normal pressure and flow back very soon.

Also, during summer it is common to experience a dry period when we have little rain combined with very hot weather. During these dry periods, even deep wells can lose enough water storage that water pressure and flow will be affected.

Or you could be having a problem with your pump. Certain pumps lose their prime, which means that air has gotten into the system (usually through a small leak) and the pump won't work. Or your pump may have a bad motor or it may be clogged.

You should stop using water and turn the electricity off to the pump to prevent damage to the motor. You can switch the electricity off at the pump (if your pump is in your basement) or at the electric panel. Locate a circuit breaker labeled for your pump and switch it off.

Call a plumber to properly diagnose your problem. If it is a problem involving a pump or motor, this can be solved quickly. If the diagnosis identifies the weather and your well's storage and flow capacity as the problem, you can either wait for rain or improve your well storage capacity and flow by Hydrofracturing the well. With this method, hydrofracturing equipment forces high pressure air and water into the well to open more water veins and improve flow and storage capacity. You can locate a hydrofracturing company in the Yellow pages under the Well heading.

## Keep Pipes from Freezing

**Q:** To keep our pipes from freezing, we've wrapped and insulated all of our exposed pipes. Anything else we can do?

**A:** That's a good start. But cold air can wriggle through the slightest small gap or opening. So watch out for places where cold air can get into your walls and get to your pipes. For example, check any holes in outside walls where television cables or telephone lines come into the home; these can provide access for cold air. Or look for cracks and holes in outside walls or foundations near water pipes. These should be sealed with caulking to keep cold wind away from the pipes.

When it gets really cold, you can open the cabinet doors underneath sinks, so that warm air from the room can get in and circulate around those pipes and keep them warmer.

Here's another idea. You might even consider getting electric heating tapes and cables, which can run along pipes to keep the water from freezing. You'll want to use these with extreme caution and follow the manufacturer's instructions carefully to avoid the risk of fire. (Check to make sure that the product conforms to UL 2049). For an added degree of safety, you can actually purchase electrical heating tapes and cables that have a built-in thermostat that will turn heat on when needed and turn off when it's not needed. If you get the kind that does not have a thermostat, you'll have to plug them in each time heat is needed and then remember to unplug them.

## Keep Pipes from Breaking: The Drip Method

**Q:** In extreme cold spells I worry about pipes freezing and breaking. So we keep a cold water faucet dripping to keep the water flowing and the pipe from freezing. Are we doing the right thing? Does it matter which faucet we open?

**A:** Actually, you are partly right. The little drip works, but not because it keeps the pipe from freezing. It doesn't. Opening the faucet and letting it drip keeps the water pressure from building up inside the pipe. And this is important, because it is actually not the ice that breaks the pipe. Pipes break because of the build up of excessive water pressure in the pipe between the ice blockage and the faucet.

So yes, it is a good idea to let a faucet drip during cold weather, because this relieves the excess pressure so that even if the pipe freezes, it won't break. Here are some guidelines for letting a "drip" be your "hero":

- (a) Since a dripping faucet wastes water, you should only open the faucets that are connected to the pipes that you think are vulnerable to freezing (such as pipes that may run through an unheated or uninsulated space).
- (b) The drip can be very slight. Even the slowest drip will provide the relief of pressure that you need.
- (c) If both hot and cold lines feed into one spigot, open both so that they both contribute slightly to the drip (since both could potentially freeze).
- (d) If the dripping stops, leave the faucet(s) open. A pipe may have frozen and will still need the pressure relief to keep from breaking.

## What to Do (and Not Do) When Pipes Freeze

**Q:** If your pipes freeze, is it okay to use a hair dryer to try to thaw them out?

**A:** Actually, it is. But first, call a plumber; don't take any chances.

Then, while you're waiting for the plumber, you might be able to thaw the pipe using a hand-held hair dryer. Slowly apply heat to the pipe, starting close to the faucet end of the pipe, with the faucet open. Then, work toward the coldest section of the pipe. (As always, be careful not to use any electrical appliances when you're standing in water; you could get electrocuted.)

You might also try an electric spot heater. Make sure the area where the pipe is frozen will be exposed to the heat (open cabinet doors, for example). Then, point the heater toward the frozen area and it will gradually heat the area around the pipe to thaw it.

A couple of warnings are in order. Do not try to thaw a frozen pipe with any kind of open flame; this will damage the pipe and could even start a fire. Follow the manufacturer's directions for safe use of electric spot heaters. You could try using a heat gun to try to thaw the pipe, (which are basically powerful hair dryers) but be careful. Heat guns get very hot, and you don't want to start a fire.

## What to Do When a Frozen Pipe Bursts

**Q:** If a pipe breaks, I should just turn off the water at the main shut-off valve, right? But what if that doesn't work?

**A:** Yes. If a pipe freezes and breaks, once the ice thaws you could end up, literally, all wet—with a flooded house or flooded basement. So any time a pipe breaks, you want to immediately turn off the water at the shut-off valve that brings water into your home; (usually it's located close to the water meter). Or if you have your own private well, use the shut off that is located near the well holding tank (usually a blue tank).

If, for any reason, your main valve does not work, you should immediately call your local Public Works Department and they can shut off your water at the street curb. Or if you have your own private well, you can turn off the electrical supply to the well pump to stop the leak. Find your electrical panel(s) and look for a circuit breaker labeled for your well pump and switch it off.

If your basement has flooded because of the burst pipe, you want to consider if you have any live electrical cords that are submerged, or electrical outlets that are covered by the standing water before you walk in the water to get to the shut offs. Generally, if there is 3" or less of standing water, no electrical outlets or fixtures will be submerged and it is safe to walk through the water. If you are in doubt about safety, you should wait for a plumber to come shut off the water, or you should immediately call your local Public Works Department.

If you're not sure where the shut-off valve is, better to go looking for it now and make sure everyone in your home knows where it is. That way, if there's ever an emergency, you won't waste any time looking. And, of course, you'll also want to call your plumber right away to get the break repaired.

## 2. KEEP THE HEAT ON: Troubleshooting Heating Emergencies & Problems

### TROUBLESHOOTING OIL FURNACE AND OIL BURNER PROBLEMS

#### When the Heat Stops

**Q:** I'm a first-time home owner and this may sound like a dumb question, but what are my options if my heat stops on a cold day? (I have an oil system.) Are there some things I should quickly check on before I call my oil supplier or my heating company?

**A:** There are no dumb questions—especially when it's a question of having no heat in the middle of a cold snap. Or, to put it another way, the only dumb question is the one you don't ask. And yes, if your heat goes out, there are a few things you can quickly check before making the call.

Let's start with the easiest things to check. First, check your thermostat and make sure it hasn't somehow gotten turned down below the room temperature. This can sometimes be a problem with digital thermostats. A friend of mine installed a digital thermostat and set it to automatically go up to 70 in the morning and go back down to 60 at bedtime. But occasionally, for no apparent reason, the thermostat would turn itself down to 60 in the middle of the day! She had to call an electrician to come adjust it.

If the thermostat is not the problem, the next easiest thing to check is whether you have run out of oil. There is a sight gauge on the top of your oil tank. If your basement doesn't have the best lighting, use a flashlight to check the sight gauge. If the gauge shows the tank is almost empty, you may be out of oil and you will need to call your oil company for an emergency delivery.

Another simple check is to make sure the electrical switch is on. You can locate the service switch on the side of the furnace, or the red switch at the head of the stairs to your basement. Make sure both switches are in the on position. The red switch is sometimes turned off accidentally when someone turns off the basement lights.

It could be that the circuit breaker connected to your heating system has tripped for some reason. This happens from time to time. Turn your furnace switch to Off, then go to your electrical box, locate the fuse or circuit breaker for your heating system (hopefully it's labeled). Is the fuse or circuit breaker "tripped"? That is, is the switch half-way between On and Off? If so, then this is your problem. Turn it to Off, then wait a couple of seconds and turn it all the way to On. It should stay On, and you should hear your furnace come on.

If the circuit breaker doesn't stay on when you turn it to On, there may be a short in electrical circuit to the burner, or you may have a faulty circuit breaker. You can replace the circuit breaker yourself, if you're familiar with how to do this. Make sure you turn the circuit breaker to Off. Then remove the circuit breaker, take it to your local hardware store and get a replacement, then install the new circuit breaker and switch it to On. If the burner works, you know the problem was the circuit breaker. If it doesn't work, or if you're not comfortable doing this yourself, you'll need to call an electrician.

And while you're waiting for your heating technician to arrive and get the heat back on, there are some simple, common sense things you can do to preserve warmth:

- Naturally, you can close drapes and use towels or blankets to cover the openings under doors.
- Of course, if you have a fireplace you can light it and keep the flue open for ventilation. And you can close off any rooms that don't have pipes.
- Keep cabinet doors open under sinks so that warm air can flow around pipes and help keep them from freezing.

## Noisy Furnace Problems

**Q:** I'm getting heat all right, but my furnace is making quite a racket. Sounds like one of those old two-engine private airplanes revving up for a take-off. Is this as dangerous as it sounds?

**A:** If it only makes a loud bang when your furnace kicks on, it could be a dangerous problem called delayed ignition. It happens when unburned oil builds up in the fire box chamber and is ignited all at once. You should call for emergency service if you suspect you have a delayed ignition problem.

When your furnace makes loud noises while the furnace is running, the source could be several things. You may have a problem with the fan that blows hot air through your vents. The fan bearings may be worn and need to be replaced. Actually, any motor (such as the burner motor or circulator motor) could be making the racket. Fortunately, these problems are not as dangerous as they sound, but you do need to get the problem fixed.

Call your plumbing & heating company and make an appointment to have the complete system checked. They should be able to quickly tell you which part is making the racket and fix it.

## **Strange-smelling Oil Burner Problems**

**Q:** I can smell a funny, unpleasant odor in my home when the furnace runs. I checked to see that the flame is burning in my oil burner and noticed the flame is white instead of the usual orange. Is this something I should be concerned about?

**A:** If you have an oil system, the oil nozzle may be partially plugged. This makes the oil spray irregularly leaving some of the oil unburned. You are probably smelling the unburned oil that is building up. You need a new oil nozzle, and it's worth checking the oil filter at the same time since the oil filter was supposed to protect the nozzle from getting plugged in the first place. Your plumbing and heating company can do this for you, and it should not take long or cost very much.

## **The Burner is Running but There's No Flame**

**Q:** I can hear the burner running, but there's no flame. And I know there's plenty of fuel in the tank because we just had it refilled.

**A:** It's good to start with the basics. First, check your thermostat and make sure it hasn't somehow gotten turned down below the room temperature. This can sometimes be a problem with digital thermostats. If your digital thermostat goes up or down at odd times, for no apparent reason, you may have to call an electrician to come adjust it.

Gas and oil systems can sometimes lock up like a computer. So next, try re-setting the system by turning the power switch off for a few minutes. You can locate the service switch on the side of the furnace, or the red switch at the head of the stairs to your basement. Make sure both switches are in the off position for a few minutes. Then turn them back on and see if the burner starts to heat up the system.

There are several other possibilities, but any of them will require a professional diagnosis by your plumbing and heating company. For example, it may be that you have a problem with a circulator pump, or your oil pump.

## **TROUBLESHOOTING GAS FURNACE AND BURNER PROBLEMS**

### **Basic Problems with Gas Furnaces**

**Q:** We just bought a house with a gas furnace, and we've never had gas heat before. What are the most basic things I should be aware of with a gas furnace?

**A:** Some of the modern gas systems use electric ignition components that can sometimes lock up like a computer. If your gas system stops, try re-setting the system by turning the power switch off for a few minutes. You can locate the service switch on the side of the furnace, or the red switch at the head of the stairs to your basement. Make sure both switches are in the off position for a few minutes. Then turn them back on and see if the burner starts to heat up the system.

Some furnaces have a pilot light, and on a very windy day the pilot light can be blown out through a down draft. Or it could go out due to an interruption in the gas supply. If you have a furnace with a pilot light that is out, as a first step, just follow the directions on the instruction plate on your furnace for relighting the pilot.

If the pilot does not stay lit, it could be that your thermocouple is defective. You can call your plumbing heating company to replace this, or if you are handy, you can remove the thermocouple and take it to a hardware store to purchase an identical thermocouple. The thermocouple is a small fitting that the pilot flame touches and heats up.

Another common problem with gas furnaces is a worn fan motor belt. If your fan motor is running but you're not getting any heat, it may be that the fan belt is broken. Replacements for your fan belt should be available at your local hardware store and you can replace this yourself, or call your plumbing and heating company to do it for you.

## **CHECK LIST FOR NO HEAT**

### **When the Gas Burner is Off**

**Q:** My gas burner is off. Are there some things I should check before calling my heating company?

**A:** Let's start with the easiest things to check. First, check your thermostat and make sure it hasn't somehow gotten turned down below the room temperature. Gas burners need the thermostat to be "calling" for heat in order to run.

If your system uses propane gas, the next easiest thing to check is whether you have run out of propane. There is a sight gauge on the top of your propane tank. If the gauge shows the tank is almost empty, you may be out of propane and you will need to call your gas company for a emergency delivery. (You also may get a sulfur "rotten egg" smell in your home right before you run out of propane.)

It could be that the circuit breaker connected to your heating system has tripped for some reason. This happens from time to time. Turn your furnace switch to Off, then go to your electrical box, locate the fuse or circuit breaker for your heating system (hopefully it's labeled). Is the fuse or circuit breaker "tripped"? That is, is the switch half-way between On and Off? If so, then this is your problem. Turn it to Off, then wait a couple of seconds and turn it all the way to On. It should stay On, and you should hear your furnace come on.

If the circuit breaker doesn't stay on when you turn it to On, there may be a short in electrical circuit to the gas burner, or you may have a faulty circuit breaker. You can replace the circuit breaker yourself, if you're familiar with how to do this. Make sure you turn the circuit breaker to Off. Then remove the circuit breaker, take it to your local hardware store and get a replacement, then install the new circuit breaker and switch it to On. If the burner works, you know the problem was the circuit breaker. If it doesn't work, or if you're not comfortable doing this yourself, you'll need to call an electrician.

Some gas systems use a pilot light. If your pilot light is not burning, you'll simply need to relight the pilot by following the directions on the burner instruction plate. [See above.]

If this is not the problem, it could be that your thermocouple is defective. You can call your plumbing and heating company to replace this, or if you are handy, you can remove the thermocouple and take it to a hardware store to purchase an identical thermocouple.  
[See above.]

Or it could be that the pilot flame might be too small to heat the thermocouple tip, in which case you would need to remove the pilot and clean it, or call your heating company to do this for you.

## **When the Burner Cycles On and Off Frequently**

**Q:** My burner is going on and off, and I'm not getting enough heat.

**A:** While gas systems tend to have short cycles between "Off" and "On", if you are not getting enough heat this frequent cycling may be a symptom of a real problem. Dirty filters may be blocking the air flow, causing the short cycles and lack of heat. If your filters are very dirty, try replacing them.

Or it could be that a fan belt is loose so that the fan does not turn fast enough to remove heat from the furnace; as a result the furnace overheats and shuts off. Then, when the furnace cools down the burner comes on again for a short period until it overheats again. Your home won't heat up enough between cycles.

It is also possible that a limit switch is defective and cutting out the burner too early, or that your distribution is undersized. Your plumbing and heating company can check these things for you.

## **Preventing Problems with Gas Heating Systems**

**Q:** Are there some things I can do to avoid problems with my gas furnace?

**A:** The problems I have described in this chapter are just some of the most basic problems that can occur with a gas furnace. There are others as well. But the key to avoiding problems like these is good maintenance: make sure your heating system is completely and expertly cleaned and tuned every year. [See Chapter 13 for more details on heating system maintenance.]

Also, anytime you have a unpleasant, unusual smell from a gas system you should call your plumbing & heating professional or gas company, (or even fire department if neither of the first two can be reached) right away. The odor could be coming from a small gas leak that, if left unchecked, could grow into a much more dangerous problem. Or when the furnace runs, the exhaust might be backing up into your home because the venting system is not working properly. This may produce poisonous levels of carbon monoxide gas.

## **3. KEEP YOUR COOL:**

### **Troubleshooting Air Conditioning Emergencies & Problems**

#### **When a Breaker Keeps Tripping**

**Q:** In the past, I've had the problem where our air conditioning wasn't coming on and I had to go to the electrical box and reset the breaker (or replace the fuse). But what if I reset the breaker, the air conditioner starts, and then it stops again? Is it okay to just keep resetting the breaker?

**A:** Occasionally a breaker trips or a fuse burns out (once every couple of years). In that case, sure, you can reset the breaker or replace the fuse again and see if that works. There's no problem with doing that. However, if the problem persists and the unit keeps starting and stopping—perhaps even over a period of weeks--then you need to call your service technician. Something is clearly wrong that is causing the breaker to keep tripping.

#### **Your Air Conditioner is Just Not Getting the Job Done**

**Q:** Our air conditioner is working, but not very well—certainly not well enough to keep us comfortable! What causes this?

**A:** There are a few simple things that could diminish the cooling capacity of your air conditioner. The most common causes for this are a clogged air filter, or a loose fan belt, or it might be that your system is low on refrigerant. Also, keep in mind that if your air conditioner starts and stops frequently, this might also be caused by any of these same three problems. You can check to see if the air filter is dirty.

Unless you are familiar with air conditioning systems, a service technician will need to check whether the fan belt is loose or if the system is low on refrigerant. Still, these are simple problems to fix.

Other problems that diminish cooling capacity stem from the system design. For example, lack of return air ducts, or even oversized equipment are a couple of conditions that will diminish cooling ability. These problems can be solved, but they are naturally more involved and more costly.

## Noisy Air Conditioner Problems

Q: My air conditioner is making some weird noises. Is this just because it's old and cranky, or do I have a problem.

A: You probably do have a problem, but the kind of problem you have depends on the kind of noise it is making.

For example, if the outdoor unit is very noisy when it first starts up, this could mean that the compressor is laboring hard. You could check to see if leaves or grass are blocking the fins on the unit.

If there are no leaves or grass blocking the fins, yet the unit is still making noise, or if it makes a humming noise but doesn't really start up, the compressor itself might be burned out and would need to be replaced.

If you hear an unusual chattering noise, this means that the contact points in the wiring for your system are burned. You'll need to call a service technician to get them replaced.

## Not Getting Enough Cool Air

Q: I am not getting enough cool air from my system, I checked to see if the furnace was running and I noticed some water on the floor around my furnace. Is there any connection here?

A: Your cooling coil may be frosted inside your system. This happens when there's not enough air getting through the system and passing over the cooling coil. Some simple things that you or your technician can check are: Is the air filter dirty? Do you have a lot of closed registers blocking the airflow? Are there some closed dampers in the duct lines? Replacing your filter and opening some of these up will allow air to flow again. To defrost the system run your heat for thirty minutes, then try the cooling again.

Your cooling coil can also frost up again after you defrost it if your system is low on refrigerant. So, have your service technician check the level and make sure you have the right amount.

## PART TWO: GET SATISFACTION

**Tips on working with plumbing, heating and air conditioning technicians to make sure the job is done right, at the right time, and at the right price.**

### 4. MAKE THE RIGHT CALL:

#### Choosing the Right Contractor to Work With

##### Improve Your Chances of Getting Good Service

**Q:** We all take a chance the first time we call any kind of service person to come to our home. What should I look for to protect myself against having a bad experience?

**A:** When you have service work done in your home, you literally have to live with the results. And since the work you're having done has to do with your family's comfort and safety, you really want to choose someone you can trust and rely on. Here are some steps you can take to protect yourself.

First, look for a company that works with trained, licensed professionals, not just someone who does this kind of work on the side. You may save a little money working with a "sideliner" but chances are you'll pay for it over and over again later, because the "sideliner" won't have the state-of-the-art training, knowledge or equipment that the professional has. And this could mean costly mistakes.

Another downside of working with a "sideliner" is you may find yourself a bit uneasy about who is coming into your home. With Heritage, you'll never have to worry about that. Our technicians are employees of Heritage (not subcontractors); they are certified, licensed, and continuously trained in their fields of expertise. They are drug tested and have been background-checked by the State of New Hampshire.

Second, look at basic credentials and stability. How long has the contractor been in business? (The Chartier family, which runs Heritage, has been in business for three generations.) What are the company's capabilities and experience? (Heritage has 26 fully-stocked trucks, over 60 employees and we proudly serve over 40,000 customers.)

Third, look at reputation and references. Heritage, for example, is a member in good standing of the Better Business Bureau, the New Hampshire Plumbing, Heating & Cooling Contractors Association, and was rated 6.17 out of 7 on the 2005 Nexstar Customer Satisfaction Survey. And, of course, you can ask friends, neighbors and associates what their experience has been.

Fourth, is the company licensed and insured? Heritage is licensed in the States of NH and ME and carries 4.5 million dollars in Liability and Workmen's Compensation Insurance.

Fifth, does the company offer any warranties and guarantees? Heritage has industry-leading guarantees and warranties on sizing, installation, parts and service. We utilize the best industry prices, and the performance of a new system is 100% guaranteed in writing.

Sixth, is the contractor affiliated with major manufacturers? Heritage is affiliated with all major equipment manufacturers. Also, make sure the contractor you're working with:

- Puts work orders in writing and gives firm upfront estimates and price guarantees.
- Will meet or exceed all manufacturer and local building code requirements and coordinate all permits applicable to the installation.
- Has an excellent credit rating and a good professional relationship with vendors.

## Avoiding the Technically Untrained Technician

**Q:** The guys who came to install our heating system spent half of the first day trying to figure out how they were going to make our new equipment connect to the existing pipes and ducts. They didn't appear very professional. We were even a little uncomfortable having them in our house.

**A:** That's one of the reasons you need to be a bit wary of someone who gives you a very low bid. Maybe the reason he can give you such a low bid is he's hiring underpaid, unskilled people to do his installations. And this is really a problem because, on average, about 65% of how well a piece of equipment performs in your home is directly related to how well the whole system was installed and adjusted to run correctly in your home.

In heating and AC systems, for example, bad installation accounts for the loss of 30% to 50% of energy in many homes. And industry experts say that over 66% of equipment failure is a result of poor installation and a lack of proper maintenance. Installation is that important!

So if you're getting bids from companies, ask if they background-check and certify the employees who will be installing your equipment. Ask if they are bringing in their own employees, or hiring subcontractors. Ask them how well trained their installers are. If you're getting a heating system for example, ask if they will tune your furnace or boiler and test it for efficiency after it is installed. (It may have been tuned at the factory, but it needs to be retuned because the conditions in your home are different from those in the factory.) Ask if the installer will "balance the air flow" by making sure the setting on the furnace fan is matched to the size and characteristics of your ductwork. If you start getting vague or unconvincing answers, you might want to cross them off the list.

## Watch Out for Second-rate Installations by "Underbidders"

**Q:** We got three estimates on a system, and one of the estimates was a great deal lower than the others. I'm wondering if the cheaper company is really a good deal, or if they are just cutting corners?

**A:** They are probably cutting corners. And if they install equipment that doesn't work right, you'll be stuck in a corner because they probably won't be able or willing to fix it for you!

This happens, and a big reason for it is the bidding process itself. A contractor who is hungry for business may recommend a smaller, or less expensive heating or AC system so that he can underbid the other companies and get the job. You may not notice the difference until you get to a very cold day in winter, or a very hot day in summer—and then you may discover that the system you bought just can't quite do the job and keep you comfortable.

But there's another problem that is even more subtle, and that has significant long-range implications: to save money, a contractor may decide to cut corners on air ducts. The National Comfort Institute says, "It's not unusual to see return air system undersized by 30% to 50%." If your air ducts are too small, your equipment will have to work harder to push air through them, and this puts more wear and tear on your equipment. In fact, many equipment problems and failures are often a result of improperly sized and installed air duct systems.

So, yes, be wary of the "underbidder." Ask each company you are bidding to describe the system they will be installing, including the air duct system. Ask them how big the air ducts will be, and how they will make sure that the air duct system is the right size and right design for your situation. Then compare what different companies say.

## **5. GET ON THE FAST TRACK: Get Prompt Service When You Need It**

### **Telephone Problems**

**Q:** I hate playing phone tag; you leave a phone message and they take forever to get back to you. I also hate getting put on hold for a long time, but it happens more and more. Is there any cure for the common "hold"?

**A:** That does seem to be a common "ailment." Some companies don't seem to understand that how they answer the phone is just as important as anything else they do. After all, the moment when you call in is a very important moment: you've got a problem right then, and you need help fast.

Every company gets very busy at times, of course. But if a company consistently puts you on hold or is consistently slow to return calls, that is an indication that either (a) they do not understand the importance of courtesy, or, (b) their business is so poorly managed that they cannot keep up with the calls that come in. Either way, you may want to look elsewhere for the help you need.

Or, you can just call Heritage—you'll never get an answering machine. During business hours, we have friendly employees who answer the phone and are trained so that they can answer some of your immediate questions and get you the help you need as soon as possible. After hours, our answering service answers the phone. If you have an emergency, they will immediately page one of our technicians who is on call.

### **Reducing the "Wait"**

**Q:** We had a problem, and our plumbing company said they would be there at 11:00 a.m., but they don't show up until 5:30. I had stayed home from work all day to wait for them, and it turns out I could have gone to work after all! As I told my husband, they are giving me a serious "wait" problem!

**A:** I hear you, and this is an age-old problem in the industry. When you're looking for a plumber, you might ask them what their usual "appointment window" is. The average in the industry is about four hours. Typically, companies will tell you they will be there between 1:00 and 5:00 for example. So the 6 \_ hours you had to wait is excessive.

At Heritage, we're very serious about "wait reduction." First, our "appointment window" is two hours—half the industry standard. And we stick to that! And second, we have initiated a Never Wait, Never Late plan, which works like this. You can give us your work phone number or your cell phone number, and we'll call you when we're on our way to your home—about 30 to 45 minutes before we get there. That way you can leave work (or whatever else you're doing) and meet us at your home. It minimizes your down time, and everyone is happy. So just call Heritage...and lose the wait.

## **Avoiding the Stalling Installer**

**Q:** We had an installer who took forever to get back to us with an estimate. And then we had to wait even longer for them to get around to coming and doing the installation. Then when he finally got here, he got half-way through the installation and said he was missing a part, and left. We didn't see him again until two days later!

**A:** Some contractors overcommit themselves because they don't want to say "No" to any potential job; then, fearing that customers might take their business elsewhere if they knew how long it would actually take to get the job done, they make vague promises about timing. Finally, they end up breaking promises as they run in circles trying to keep all the commitments...which leaves you, the customer, feeling caught up in their turmoil.

To avoid this problem, look for a contractor who seems to demonstrate being organized and who has the resources to get the job done as promised. How prompt is he in getting you an estimate, and scheduling your job? Does he explain things in a clear, organized way? Is his truck well-stocked and well organized? If a contractor can't meet your expectations initially, the delays and chaos will probably get worse before the job is complete.

Finally, hold 50% of the total price to be paid only when the job is 100% complete. Although this doesn't prevent the problem, it does help to keep a contractor motivated to finish the job.

## **6. CUT THROUGH THE SMOKE: Getting Good, Clear Communication**

### **Getting Your Technician to Translate "Plumberese"**

**Q:** Some service men use vague or technical terms when they explain what the problem is; well I don't speak 'plumberese,' and if I don't understand what they're doing, then I don't know what I'm paying for. How can I get a better handle on what's going on?

**A:** Good technicians love their job. They love everything about it, even the terminology; so that's why they love using technical jargon to describe what is going on. The good news is, they really want you to understand what they are talking about; the bad news is, they may not have realized that you don't really understand their plumberese! Technicians with a lot of experience have usually figured this out already. However, if your technician forgets or hasn't learned this yet, you should feel comfortable saying "Hey that sounds like plumberese to me. Can you put that in terms my child would understand." You'll likely to get a smile and get a better explanation that makes sense.

## When to Trust Suggestions for Extra Work

**Q:** It's a little annoying when a technician comes to fix a small problem and then tries to sell me something much bigger. A man came to clean my furnace and said, 'Gee, it would be nice if you got a tankless water heater instead of one that is connected to your boiler.' Well, yes, that would be nice, but it turns out it would cost about six thousand dollars! I told him, I am not going to spend six thousand right now. And then he admitted that I didn't really need the tankless water heater. I want them to be the experts and give me advice, but I don't what to feel they are always pushing something on me.

**A:** These days, with all of the options that are available (and many of them good ones), it's common to have technicians explore the potential of upgrading equipment or range of work. You may have had a similar experience when you've had your car serviced. You bring your car in for a brake noise and they come back with a list of things to be done besides fixing the brakes. The suggestions are typically valid and often make sense to offer. However, if a company always seems to be putting on the pressure to increase the sale, you may feel that you always have to be on your guard whenever you have a minor problem. Not every problem has options, after all.

Instead, you want to work with technicians who will first focus on getting your problem solved, and then, secondarily, will explain other options to you in a helpful, non-pressure manner. Also, over time you should find that the options being offered are consistent, that they don't differ substantially from technician to technician.

## When There's More Than One Way To Solve A Problem

**Q:** A guy came out and fixed a heating problem we had. About twelve months later I had the same problem. I found out there were a couple of other ways to fix the problem initially that would have cost a little more but would have worked a lot better in the long run. Now I am going to spend more money, take more time, and I went without heat again for the second time in a year.

**A:** You may want to call the guy who did the quick fix and ask him to reimburse you for his repair! The problem is, some technicians don't see the forest for the trees. Take the example of a leaky pipe. A pipe leak can be caused by a several things, from a poor connection to excessive water pressure. However, if a technician simply fixes the connection and doesn't determine if the root of the problem is excessive water pressure, then the same problem will probably happen again at some point. Fixing the leaky pipe didn't solve the problem, even though it needed to be done.

Experienced technicians avoid this trap by always giving options on every problem. When you get all of the options on the table, you know the technician is using his expertise to see the whole problem rather than just a part of it. It's worth mentioning upfront to a technician that you are looking for more than "one" way to fix the problem, if that's possible. It may help get him to see the forest rather than just trees.

## Waiting for Parts On Order

**Q:** A technician told me he would have to order a part for my heating system, then he left. I waited two weeks and never heard a thing about when the part would be in or when it could be fixed. When I called to find out about it, his boss told me he would order it again and it would take another week before he would have it to install.

**A:** Unfortunately, with many companies you need to check on your order so that the ball doesn't get dropped. Here's the story: In a relay race, the "hand off" of the baton to the next runner keeps everyone in the game. Coordinating parts for your equipment requires teamwork and timing too. Some technicians don't have a team and they have to chase down whatever they are missing themselves, in between taking care of other calls. It's like running a relay race with no one to hand off to—they get tired and sometimes they don't finish. Getting parts in a timely manner requires a dispatcher, a parts person, and a supply house person all working together as a team. If you are dealing with a small company or an individual who appears to "do it all" you may want to call a couple of days after the technician's visit to check on your order.

## 7. GET WHAT YOU PAY FOR: Making Sure Your Problem is Fixed Right

### Watch Out for the Messy Truck

**Q:** A plumber showed up in my driveway in a truck that looked like it had been through a war! At first, before I knew it was the plumber driving up, it actually made me nervous about who was coming up my driveway. But when I realized who it was, my next thought was, "Uh-oh, this doesn't look good." And once I got a look in the back of his truck, I thought, "How does he ever find anything in there?" I know you can't judge a book by its cover, but can't you judge a plumbing outfit by its trucks?

**A:** You absolutely can, and you should. A well-organized, well-stocked truck is not only an indication that your plumber is well-trained, well-organized and on top of things, it also means that the job is probably going to go more smoothly.

At Heritage, for example, we think of our trucks as "mini-warehouses." We bring a large, well-organized, fully-stocked truck to the driveway for every job. Our technicians are able to quickly find whatever they need, and in many cases, they'll have what they need on the truck to fix your problem, so they won't have to go running around looking for parts. When you see one of our trucks coming, you know you're in luck!

## Avoiding the Sloppy “Hit-and-Run” Job

**Q:** A guy came to work on my furnace and he was fast and sloppy: he finished the job and left before I finished my coffee—and he also left a big mess behind. My basement looked like the scene of a ‘hit and run’ accident! So this left me nervous that maybe he hadn’t done the job right.

**A:** Some companies put their employees on quota to do so many jobs per day. So naturally, they are motivated to rush through your job and get on to the next one. Other companies pay their employees a percentage of the jobs they do; so if your job is not a very expensive one, they’ll rush through it to get on to the bigger, higher-paying job. And sometimes the problem is just lack of training and professionalism.

At Heritage, we give our technicians the best technical training and equipment and we encourage them to do whatever they can to solve customers’ problems to the customer’s satisfaction. We pay them by the hour, so they’ll give your job their full attention, whether it’s a small job or a big job. We also require that they cover their boots when they come into your home and clean up completely before they leave your home.

With Heritage, you’ll never feel like it was a hit-and-run. Take our tune-ups for example. Many companies only tune-up one part of your heating system: the burner. That’s because they are on quota to get so many tune-ups done every day. But we take time to inspect, safety-check, clean and tune every part of your heating system, including the burner, of course, but also including dozens of other parts and components. Our tune-ups are not just hit-and-runs: they really help keep your system running. Instead of a hit-and-run job, with Heritage you get a job that runs smoothly.

## The Job that Just Keeps Dragging On and On

**Q:** I had a company out to fix a problem but they didn’t really finish the job. I had some small lingering problems which occurred after the main problem was fixed, but because I was afraid of the possible added expense, I didn’t call them. I’ve just had to live with the problems—and that’s a real pain!

**A:** It is, and that’s why, before you work with a plumbing or heating or air conditioning contractor, you should first ask about the kind of warranties they offer. The warranty tells you something about how committed they are to standing behind their work.

For example, with Heritage, you get a 5-year Parts and Labor Warranty on everything we do. We’re able to stand behind our work and offer that warranty for one reason: our professional technicians are committed to fixing your problem right, so that it stays fixed! In other words, our warranty is basically a warranty that you won’t need the warranty!

## 8. GET WARM WITHOUT GETTING BURNED:

### Choosing the Right Heating System for Your Home

**Q:** I've heard horror stories about what happens when you get a heating system that is too big for your house or too small, or one that is problem-prone. How can I make sure I'm getting the right heating system for my home and situation?

**A:** A good place to start is to read **GETTING WARMER: 6 Guidelines for Getting the Right Heating System for Your Home.** (Appendix A.) It will just take five minutes to read, but it will get you started on the right foot.

You'll no doubt want to get written bids from several companies. Reading "GETTING WARMER" will help you know what to look for and how to make sure you're comparing "apples to apples."

But Heritage also offers another service that will help you in your search: you can request a Free, No-obligation Home Heating Survey. For this, a Heritage technician will call you and make an appointment to come to your home and carefully study your house. He will then give you a complete report and recommendation on the heating system that is just right for your situation, including a firm estimate.

In this way you'll be armed with the most complete information to help you make the best decision.

## 9. MAKING THE COOL CHOICE:

### Choosing the Right Air Conditioning System for Your Home

**Q:** I've also heard about what can happen when you get a central air conditioning system that is too big for your house or too small, or not correctly designed and installed. How can I avoid that?

**A:** First read **KEEPING COOL: 5 Guidelines for Getting the Right Central Air Conditioning System for Your Home.** (Appendix B.) It will give you a good, quick, 5-minute overview. As you're getting bids, it will help you know what to look for and how to make sure you're comparing "apples to apples."

But for more in-depth information, you can also request a Free, No-obligation Home Comfort Survey. A Heritage technician will call you and make an appointment to come to your home and carefully study your house. He will then give you a complete report and recommendation on the air conditioning system that is just right for your situation, including a firm proposal and quote. In this way you'll be armed with the most complete information to help you make the best decision.

## 10. DO THE NUMBERS: Making Sure You Get the Right Price

### Avoid the Emergency Overcharge

**Q:** Seems to me that the one time you should be able to count on a plumbing/heating company is in an emergency. But one time when our heat went out, we had to wait two days! And then, when they finally showed up on a Sunday, they charged us extra because it was a weekend. Were they taking advantage of the fact that we were in trouble—sort of like kicking us when we're down?

**A:** Many companies do not have enough staff to cover “emergencies” after normal hours. Rather than add more staff, they believe if they charge extra for emergency service, their customer will wait until it's a more convenient time.

Not at Heritage! We have 26 trucks and we keep technicians on call at all times, nights, weekends, and holidays, so that we can respond quickly when people do have an emergency. This is what you should be able to expect from your contractor, and it's what we deliver.

Furthermore, at Heritage, we only charge regular service rates for emergency service—even if it is late at night or on a weekend or on a holiday. We don't believe you should be penalized because your heat went out on Christmas day!

### Get Clear-Cut Estimates

**Q:** Some companies don't itemize their charges clearly, so you can't really tell what you are being charged for. You just see these miscellaneous charges added onto the bill and you don't know what they are for. It may be all absolutely correct, but it does make you wonder, and it causes me to lose a little trust. I wonder if they are hiding something. It feels like a game—but it's not a game I want to play.

**A:** You have a right to expect clear, firm, upfront estimates and explanations of the work that is going to be done—in language that you can understand—and no games! Always ask for a step-by-step explanation of exactly how the work will be done and a step-by-step explanation of each item on the estimate, so that you'll understand exactly what you're paying for. If you sense hesitation or vagueness, you may want to go with a different contractor.

At Heritage, we always provide clear, firm, upfront estimates, and our technicians are trained to patiently and clearly answer any questions that customers may have and explain the options to the customer. We want you to be very clear about exactly what you're getting, what you're options are, and what you'll be paying for.

## Overcoming the Apples-to-Oranges Pricing Problem

**Q:** I often wonder how prices compare and whether I am truly getting the best deal for my money. Some companies don't seem to give a standard price list for things they do, and every company does things differently and prices things differently—so it's like comparing apples to oranges.

**A:** It is, and if you don't compare carefully, you could end up with a rotten deal! The bidding process can be a bit complicated and tricky. Some may try to underbid everyone else, but that may mean they are cutting corners with the equipment. Others may recommend more equipment than you really need “just to be on the safe side.”

That's why it's so important to get clear, upfront, written bids for any installation work you're going to have done—such as the installation of a new heating system or air conditioning system or air filter system. Make sure the contractor takes you through the bid step by step, explaining all equipment and procedures in detail. And if there's anything you don't understand, don't hesitate to ask. A good contractor won't make you feel “dumb” about asking questions, and anyone who does is probably not someone you want to work with. Besides, it's better to ask all the questions upfront than it is to be caught by surprise later when you discover a big charge that you didn't understand.

And when you get bids, make sure you're getting bids on “the entire job.” Suppose you are buying a new furnace, for example. Some contractors focus on getting the sale by just pricing “boxes” (equipment only) instead of offering a total solution. But the estimate should include things like fittings and adjustments required, any changes to the ductwork or piping, plus tuning, balancing and adjusting the entire system so that it all works together and works efficiently in your home.

It's a bit of a hassle to do it this way, but in the long run, you'll be glad you did.

## PART THREE: AN OUNCE OF PREVENTION

Simple home maintenance tips that will save you money and grief by:

- **Reducing unnecessary waste of water and fuel**
- **Preventing plumbing, heating and air conditioning problems**
- **Extending the life of your equipment**

## 11. GO WITH THE FLOW:

### Tips on Avoiding Drain Problems

#### Avoiding Clogged Toilets

To help prevent clogged toilets, keep in mind that the toilet is not a trash can. Except for toilet paper, other paper products such as soap wrappers or women's sanitary products should not be put into the toilet because they will expand and create blockage. Keep a wastebasket in the bathroom for items like this.

And, if you have small children, keep toys out of the bathroom and the lid down. A child may decide that the toilet makes a good "swimming pool" for their toys, and the next thing you know you have a clogged toilet.

#### Eliminate Common Clogs in Showers and Sinks

The most common clogging culprits in showers and sinks are soap scraps and human hair.

Hair is a real problem. It doesn't deteriorate, and, in fact, it coils up like a spring and builds up to lodge in the drainpipe. Check the strainers at the sink or tub drain outlets to make sure they are in proper condition and not worn. Good strainers will help keep hair from going into the drain and then lodging in clumps and blocking the drains. However, remember to remove the hair the strainer catches after each use, otherwise hair will work its way into the drain.

The problem with soap is when you get down to that last sliver, and it ends up down the drain and contributing to the clog. You can prevent this by remembering to throw the soap in the wastebasket before it becomes a tiny sliver.

#### Keep Clogs Out of the Kitchen

Of course, kitchen sinks are usually equipped with a strainer to keep food particles or other things from getting into the drain. (If your sink doesn't have a strainer, by all means buy one.)

However, grease, which will pass through the strainer, is a common cause for kitchen sink clogs. When cooking fatty foods, try to capture the grease and pour it into a cup or bowl rather than letting it go into the drain when you clean up.

When the grease hardens in the cup you can scrape it into the garbage. Also, after cleaning up greasy pots and plates, fill the sink with warm water and let it drain. This will help reduce grease build up.

And special care should be exercised in using a garbage disposal, if you have one. First, check the manual and make sure you know which food materials the disposal is designed to handle without becoming clogged. Second, when you put food scraps in the disposal, put them in loosely; tightly packed scraps can clog the machine. Third, make sure you're running cold water (not hot) when you're operating the disposal, and let the water keep running for a minute or two after you turn the disposal off to flush food residue out of the drainpipe. Also, when you're not using the disposal, it's a good idea to keep the cover on it so that stray kitchen items don't fall in and either clog or damage the machine.

## **Avoid Lint Clogs and Floods in the Laundry**

To avoid clogs in laundry machines, clean out the lint trap in the washing machine after each use. Additionally, you can install a nylon mesh lint trap over the washing machine's discharge hose, to catch excess lint and keep it from entering the drain.

Also, after you've done your laundry, it's a good idea to turn off the shutoff valves on the hot and cold water lines that bring water into your machine. This is an especially good idea if you're going to be away from home for a while. Here's why: when you leave the water on, these water hoses will be under constant pressure, and if the water hoses happen to burst when you're away from home, you'll come home to a flooded laundry area.

## **Protecting Plumbing When You're Away During the Winter**

**Q:** We're going to be away for three months during the winter. Should we drain our water system before we go?

**A:** Yes, that is a safeguard. Obviously, if there's no water in the pipes, you're not going to end up with extensive damage from pipes freezing. But there's more to consider, because draining down your water system only minimizes damage to pipes from freezing. Some pipes are level and won't drain back to the lowest point. If your heating system breaks down, your home temperature would drop well below freezing, and some pipes may freeze and split even though the main water is shut off and the system is drained down.

With this in mind, you should keep your heat on with the thermostat set at fifty five degrees while you're away, because your heat is the main source to prevent any pipes from freezing. Another form of protection is a heating monitor that will alert you in the event that your heating system stops working. The device is simple to connect to your heating equipment, it's affordable, and uses your phone system to contact you, for example on your cell phone, to let you know when your heating system is not working.

Another option that would ensure 100% protection to pipes and fixtures in the event the heating system breaks down is to "winterize" your home. Winterizing a home involves pumping anti-freeze through all of the pipes and fixture traps, and disconnecting and pumping out your water heater. Call a plumber for this service because it requires special equipment and experience. When you come back home the plumber will need to return to de-winterize your home, which involves reconnecting your water heater and flushing the system out.

Now that you know your options, here's the simple method of draining your water system. First, shut off the main valve that brings water into the house (near your water meter). If you have your own private well, the shut off is located near the well holding tank (usually a blue tank). Then, turn on all of your water fixtures, both hot and cold lines, and leave them running. Turn off the electricity to your water heater at the electrical panel: locate a circuit breaker labeled for your water heater and switch it off. You could also use a garden hose to drain water from the tank. Hook up your garden hose at the drain located at the bottom of your water heater and run the other end to a low drain in your basement (like a floor drain or basement sink). Open all of your hot and cold water faucets to let air into your system and the tank will begin to drain. When water stops flowing, turn off the water heater drain and turn off all of the hot and cold water faucets. (You don't have to leave the faucets open, since your system will be mostly filled with air at this point.) When you come back home, turn on the main valve first, then turn on each fixture and let it run until all the air "bubbles" are out and the pipes are full of water again. Once your system is full you can turn on the electricity to your water heater.

## **12. PLUG THE LEAKS:**

### **Tips on Conserving Water**

## **INDOOR WATER SAVINGS**

### **Take the Leaky Toilet Test**

A leaky toilet can waste about 200 gallons of water per day, and you might not know it. Water can leak from the toilet tank down into the bowl and then down the drain. Sometimes you will hear the toilet refilling even though you know no one has flushed it recently. If you suspect your toilet is leaking, here's a simple test. Remove the lid from the toilet tank, and if you have any coloring cleaning agents remove them. Flush to clear the water in the bowl, then put a few drops of food coloring in the tank. If the tank is leaking, color will appear in the bowl within 30 minutes, and you'll know you need to get the toilet repaired.

### **Go With the Low-flow Toilet**

You can save water by using one of the new low-flow toilets. Older model toilets use 3 gallons or more per flush, but since the mid-1990s, all new toilets have been designed to use 1.6 gallons of water per flush. So if your toilet is one of the older ones, you might want to consider purchasing a newer model.

You can also save water by avoiding unnecessary flushing of the toilet, and by disposing of tissues and other such waste in a trash can rather than in the toilet.

## Dealing with Faulty Faucets

A small faucet drip can add up to hundreds of gallons of wasted water over a year. You can probably fix a drippy faucet yourself. Turn off the water to the faucet, remove the handle, and then the stem. Replace the stem or washer and reinstall the parts.

Some faucets flow a lot faster than others. So the rate of flow in faucets is another factor to be aware of. For a bathroom faucet, a flow of about 1.5 gallons per minute is about right. For a kitchen faucet, you'll want 1.5 to 2.5 gallons per minute of flow. How can you tell how fast yours is flowing? Turn on your faucet and let the water flow into a container for 10 seconds. Then measure the amount of water and multiply by six to determine the flow per minute.

If your faucet flows above 2.5 gallons per minute, you can slow it down by installing an aerator—a circular screened disk, usually made of metal, that is screwed onto the head of the faucet. Aerators for kitchen faucets are available at hardware stores in a variety of spray patterns.

## Watch for Wasted Water in Washing Machines

Washing machines use a lot of water. Here are a few tips that can help save water when doing your laundry.

- If your washer has variable settings for water volume, you can select the minimum amount required per load.
- If this is not possible, try to operate the washer only with full loads.
- Use the shortest wash cycle for lightly soiled loads. The normal and permanent press wash cycles use more water.
- Pre-treat stains to avoid rewashing.

Also, if you are replacing your washing machine, consider a water-efficient model. Some older machines can use as much as 56 gallons of water per load, but newer more efficient models use an average of 27 gallons per load.

## Dishwashers, Defrosting and other Water-saving Details

Some of the same advice for washing machines also applies to automatic dishwashers. For example, try to operate the dishwasher only when you have a full load. And if you're replacing your dishwasher, consider a more water-efficient model.

And here are a couple of other tips for saving water in the home:

- Defrost meat or other frozen foods overnight in the refrigerator, or by using the defrost setting on the microwave rather than running water to thaw out food.
- Insulate your water pipes. You'll get hot water faster and avoid wasting water while it heats up.

## OUTDOOR WATER SAVINGS

### The Tuna Can Test for Watering Your Lawn Correctly

How can you tell if you're over-watering your lawn? Of course the condition of each lawn is different. In New England, it's common practice to water twice per day at only 1/10th of an inch per watering. Over-watering actually promotes weed growth, disease, and fungus.

To determine if you are providing the right amount of water for your lawn, use the "tuna can" method. Place five to eight empty tuna cans with the tops off (or other cans of similar size) throughout the area where you are going to be watering your lawn. Water your lawn the normal way two times, then measure the depth of water in each can. Average the measurements, and use this number to determine how long you need to water the area to apply about 2/10th of an inch of water per day.

### Save Water Through Proper Mowing and Fertilizing

The way you mow or fertilize your lawn can also have a big impact on how much water it uses.

You should cut no more than one-third of the grass length. This encourages the grass roots to grow deeper and the grass blades to hold moisture. To accomplish this, cut your grass at the highest recommended height for your turf species or the highest setting on your lawn mower. Keep your mower blades sharp for a clean cut and leave short grass clippings where they fall. They reduce the lawn's need for water and fertilizer.

And speaking of fertilizer, use it in moderation. A 15-20 pound bag of fertilizer will usually be enough to feed a half-acre lot for an entire growing season. And lawns should only be fertilized during the growing season.

### Other Outdoor Water-saving Tips

Here are a few more tips for conserving water outdoors:

- A garden hose that is left on can waste 600 gallons of water in one hour—so watch those hoses!
- Use hose washers between spigots and water hoses to eliminate leaks, and check all hoses, spigots and connectors regularly.
- Don't clean your sidewalk or driveway with a hose; that can waste hundreds of gallons of water. Use a broom instead.

## 13. STAY WARM: Tips On Maintaining Your Home Heating System

Manufacturers recommend that you have your heating equipment completely cleaned and tuned every year, and there are good reasons for this. Yearly tune-ups can reduce your fuel bill as much as 10%. They also help spot and correct problems and prevent them from causing breakdowns; and they even help extend the life of your equipment.

Heritage offers a special Maintenance Value Plan, which not only provides a complete annual Super Tune-up of your heating or air conditioning system, but also gives you special discounted rates plus top priority service in any emergency. See Appendix C.

In addition to getting annual tune-ups, here's a list of simple things you can do that will help keep your home heating system running smoothly.

- **FREQUENT FILTERS:** Check your furnace filters every month or two during the heating season, and if need be, replace them. Your service technician can show you how to do this.
- **DUST-FREE FANS:** Once a year, clean the fan blades and keep the area around the furnace free of dust, lint and litter.
- **SMOKE SIGNALS, ETC.:** Be alert to trouble signals such as (a) black smoke rising from the chimney, (b) soot collecting at the burner, (c) strange odors, or (d) surging water in a boiler. These may indicate malfunction or improper adjustment, and you should get professional help.
- **OUT OF BALANCE?** If you have hot and cold spots in your home, or if one area of your home is getting more heat than it needs, your system probably needs to be balanced. A heating technician can do this for you.
- **LEAKY DUCTS?** Once a year, inspect your heating ducts to look for leaks. You can repair them with quality duct tape.
- **INSULATION EQUATION:** Heating ducts and water or steam pipes that pass through unheated areas, such as attics, crawl spaces and basements should be covered with duct insulation or unfaced R-11 insulating batts or blankets. This adds up to energy saved for you.
- **BE A DUST BUSTER:** If you have radiators, convectors, or baseboard heating units, vacuum them regularly. Dust acts as insulation and wastes heat.
- **BLEEDING RADIATORS:** Once a year, you should bleed the air from hot-water radiators, because air in the lines inhibits circulation. Just open each radiator valve, hold a cup under it and keep it there until water begins to come out. This gets rid of the air.
- **USE THE RIGHT PAINT:** For the best performance, paint radiators with special radiator paint. Your hardware store can provide this for you.
- **DON'T BLOCK THE FLOW:** And of course, don't block air inlets and outlets, including radiators, with furniture, drapes or clothing.

## 14. KEEP HEATING COSTS DOWN:

### Tips on Conserving Heating Fuel

The costs of heating your home can be reduced by up to 20% simply by combining the right amount and type of insulation, using effective air sealing techniques, and installing windows that are appropriate for your climate. As a result, you'll have a more energy efficient home, and there are many benefits you'll gain from this:

- You'll reduce drafts and maintain more even room temperatures, instead of having hot and cold spots in your house.
- You'll save on heating bills, of course.
- You'll also control the moisture in the home, and reduce mold and mildew, which will extend the life of your home's building materials and possibly help reduce allergic problems.
- And you'll reduce noise transmission into your home.

### Check Your Insulation

The best starting point is to check and make sure your home is well insulated, and that all gaps and holes where air can leak through are sealed. You may need to hire a professional contractor who will use a blower door test and other tools to determine where air may be leaking.

If you have a crawl space, make sure that the insulation inside it is dry. When insulation gets wet, this reduces its effectiveness significantly.

### Windows and Warmth

A lot of heat is lost through windows. You can help prevent some of this by installing weather stripping for moveable joints and caulk for non-moving parts, to stop or reduce air leakage. You can also install a window kit to the inside of your windows, which will help keep cold air out and warm air in. Ask your hardware store about window kits.

### Check Your Duct Work

Check out your ductwork in your basement to see if you can detect any leakage. If you do feel air leaking at the joints when the system runs, you can use silver metal duct tape to seal them. This alone could save up to 10% off your heating costs.

### Save Money With Your Thermostat

You can save as much as 10% or more by simply turning down your thermostat a few degrees during the day when no one is in the home. Every degree you lower your thermostat could save you about 3% on your heating bill.

## **Saving Energy All Around the House**

Remember, using a microwave to cook meals uses about half the energy of a conventional oven.

Vacuum the coils on the back of your refrigerator at least every three months. When dirt builds up on these coils, the refrigerator has to work harder to keep contents cool, so it uses more energy.

Of course, washing clothes in cold water can also save on energy. And here's another laundry tip: put a dry towel in the dryer with each load of wet clothes. The towel will absorb dampness and reduce drying time, saving energy and money.

## **Water Heater Conservation**

There are several ways to save on energy with your water heater.

### **Lower the Water Temperature**

If you are going to be away from home for more than three days, turn your water heater thermostat down to the lowest setting to save money. Just remember to turn it back up when you return home.

You might consider lowering the temperature setting on your water heater. Some manufacturers set water heaters at 140 degrees F, but 120 to 130 degrees is sufficient for most household needs. The one exception to this is the automatic dishwasher. Many dishwasher detergents are formulated to clean effectively at 140 degrees F and may not perform adequately at lower temperatures. However, some dishwashers have a booster heater, and if yours does, then you could go ahead and lower the water heater below 140 to save some money.

### **Wait Less For Hot Water**

Do you have to wait for the water to heat up when you turn on a hot water faucet? That's because the water travels through cold pipes to get to the faucet. You can reduce this heat loss by insulating your hot water pipes, especially those that are in unheated areas of the house. You can also insulate your water heater. Use a pre-cut blanket or jacket for your pipes and water heater; they are inexpensive and easy to install. Or you can ask your heating contractor to do it for you.

## **15. STAY IN CONDITION:**

### **Tips on Maintaining Your Central Air Conditioning System**

Manufacturers highly recommend that you service your air conditioning system every year, to keep it running smoothly, to spot small problems and correct them before they cause big breakdowns, and to extend the life of your equipment.

Heritage offers a special Maintenance Value Plan, which not only provides a complete annual Super Tune-up of your heating or air conditioning system, but also gives you special discounted rates plus top priority service in any emergency. See Appendix C.

### **Let Your Condenser Coils Breathe**

If the condenser coils on your outdoor AC unit become dirty or blocked by leaves or other debris, this makes your unit work harder and increases your cooling bill. So clean the area around the condenser coil, removing any debris, and trimming back foliage if necessary, to allow for adequate air flow to your unit.

### **Keep Air Filters Clean**

Keeping the air filter clean can lower your AC system's energy consumption by 5% to 15%! So check your unit's air filter once a month and clean or replace filters as needed. Your service contractor can show you how to do this.

### **Keep Condensation Lines Unplugged**

Condensation lines drain away the moisture your air conditioner unit creates, so it's important to keep these lines clear. A plugged condensation drain can cause water damage in the house and affect indoor humidity levels. To keep the condensation line clear of mold and mildew, pour a small amount of household bleach into the line. Ask your service contractor to show you how to do this.

### **Keep Cool with Coolant**

Make sure your system is not leaking coolant. If necessary, have a professional check this.

## **16. KEEP COOLING COSTS DOWN:**

### **Tips on Conserving AC Energy**

#### **Increase the Thermostat Setting**

Raise the thermostat if you're going to be out of the house during the day. Every degree you raise the thermostat can result in a 5%-8% savings on the cost of cooling your home. And when you are at home, try setting the thermostat a degree or two higher and see if you're still comfortable.

When you first turn on your air conditioner, don't set your thermostat at a colder than normal setting, thinking this will cool the house off faster. It won't. In fact, it could result in excessive cooling and unnecessary expense.

You might consider installing a programmable thermostat which will automatically raise or lower temperatures and preset times, to allow for times when you won't be at home. These items are inexpensive and they can save you about \$100 every year in energy costs.

#### **Be a Fan of Fans**

You can actually use a ceiling fan together with a central air conditioning system. The ceiling fan creates enough air movement in a room to make it feel about four degrees cooler, which allows you to set the thermostat a little higher than you normally would. And since the average ceiling fan uses about the same electricity as a 100-watt light bulb, you can run one for pennies a day.

Just make sure your ceiling fan is set for summertime operation: the high edge of the blade should go forward first, to force the air downward. You should feel the air blowing down on you when you stand beneath the fan when it's on. And only run the fan when you're in the room! It doesn't actually make the room cooler; it just feels cooler when you're in the breeze.

#### **Have it Made...in the Shade**

Another tip is to shade your outside air conditioner unit. A unit operating in the shade uses as much as 10% less electricity than the same one operating in the sun. So consider planting trees or shrubs nearby to shade the unit.

By the same token, you should look for ways to shade sun-exposed windows and exterior walls of your house. Direct sunlight streaming through windows during cooling season can significantly increase your air conditioning costs. Consider using exterior window coverings or awnings, or planting trees or bushes wherever possible.

## Keeping Cool—and Saving Money—All Around the House

Naturally, be sure that all windows are shut and outside doors are close when the AC is on. After all, you don't want to "cool the whole neighborhood."

Beware of having lamps, televisions or other heat sources near the air conditioner thermostat. Heat from these items might cause the air conditioner unit to run longer than it should.

And, of course, make sure that no furniture or other obstacles are blocking ducts or fans. You want the cool air to be able to circulate freely, to keep your home more comfortable.

Another common sense tip is, on the hottest days, to delay heat-generating activities such as cooking, laundry, and dishwashing, until later in the evening when it is cooler.

For further savings, you can seal off and turn off the cooling in unused areas such as storage rooms.

## Appendix A

### GETTING WARMER: 6 Guidelines for Getting the Right Heating System for Your Home

Buying a new home heating system is an important investment. The right system for your home will not only keep you and your family warm and safe, it will also run smoothly with minimal problems. It could significantly lower your monthly heating costs, and it can even enhance the value of your home. And, since this is an investment you'll probably live with for years to come, you'll want to invest wisely.

These six guidelines will help you shop smart. But for a more in-depth picture, take a moment to request a Free, No-obligation Home Heating Survey from Heritage. One of our heating technicians will call you and make an appointment to come to your home and carefully study your house. He will then give you a complete report and recommendation on the heating system that is just right for your situation, including a firm estimate.

#### **1. BIGGER IS NOT BETTER: An oversized system will cost you more and leave you less comfortable.**

One of the most common and most costly mistakes customers make when buying a new heating system is getting one that is too big for their home.

The EPA (Environmental Protection Agency) estimates that nearly half of all existing heating equipment is over-sized, and that this results in 20% wasted energy each year!

How does this happen? Many contractors simply replace an old system with the same size system or larger. Or they'll make a rough, ballpark guess on how large the system should be based on the square footage of your house. Or, homeowners who want to make sure their home is warm may ask for a bigger system, thinking that "bigger is better."

But, in the case of your home heating system, bigger is NOT better. If your heating system is over-sized, it will overheat quickly, cool down, then overheat again. Your house will cycle between feeling too warm and feeling too cool. This not only wastes energy, it also results in a home that is less comfortable, and it increases the wear and tear on your heating equipment and shortens its life.

Rule #1 is, don't buy an oversized system just because you want to make sure your home is warm. At Heritage, we help you determine the heating system that fits your size and style of house to keep the home at a nice even, comfortable temperature, with the most efficient effort, the least waste of energy, and the least wear and tear on equipment.

## **2. SMALLER AND CHEAPER IS ALSO NOT BETTER**

Another common mistake is buying a new heating system that is too small to keep your home warm and comfortable.

There are two reasons why this happens. First, a contractor may recommend a smaller, less expensive heating system so that he can underbid everyone and get the job. He'll look like the hero, because his price will be so much lower. But then, your system will struggle to keep your house warm on the coldest winter days.

Second, in the case of forced-air systems, the National Comfort Institute says, "Many air duct systems are improperly sized and installed. It's not unusual to see return air systems undersized by 30-50%!"

If your air ducts are too small, your furnace will have to work harder to push the air through them and this results in equipment problems. Many equipment problems and failures are often a result of improperly sized and installed air duct systems.

So Rule #2 is to make sure you buy a big enough system to keep your home warm and comfortable without straining your equipment. How can you make sure you get the heating system that is just right for your size and style of home?

### **3. THE HOMEWORK FACTOR: Any contractor you work with needs to study your home thoroughly before giving you a proposal.**

The EPA states that you should “only hire a contractor who asks questions, measures windows, doors, floors, ceilings, checks insulation, calculates a cooling load, and fixes system problems that may compromise comfort and cost you money.”

At Heritage, we never recommend a heating system without first doing a complete analysis of your home and checking a list of factors that include:

- The size and style of your house
- How well insulated or airtight it is
- How much useful solar energy comes in through the windows
- How much heat the lights and appliances give off
- The condition of ducts and pipes
- Your typical thermostat settings
- The number of occupants in the home

We take all of these factors into account by doing a computer load calculation. We measure all rooms, check insulation, check windows and doors, and input all data into special industry software to calculate heat loss/gain. Then we also ask you a lot of questions, such as:

- Are there any drafty areas in the home?
- Do you have moisture problems?
- Do you have hot or cold rooms?
- Are you about to make any changes to your home?
- How have your heating bills been running (he or she should ask to review past bills).

All of this information helps us determine how much heat the heating system must generate on the coldest days in order to keep you comfortable.

We also do infiltrometer blower door tests as well as duct leakage tests. These tests help determine exactly where and how your house might be leaking air, and what you can do about it. These tests will show you ways to make your home more comfortable while lowering your monthly utility bills. They may also suggest ways to reduce respiratory allergy suffering by keeping outdoor dust and pollen out of your house.

### **4. THE INSTALLATION EQUATION: How well your system is installed is as important as the system itself.**

On average, about 65% of how well a piece of equipment performs is directly related to how well the “complete system” is designed, installed, and calibrated. So even with the right equipment, if your heating system is not installed properly, you could end up with higher energy costs and a less comfortable home—not a comforting thought!

Bad installation accounts for the loss of 30% to 50% of the heat in many homes. And Service Thrust (a national industry best practices group) found that over 66% of equipment failure is a result of poor installation and lack of proper maintenance.

At Heritage, we make sure all the elements of your heating system are tuned and adjusted to work together properly. For example, we will balance the air flow” by making sure that the setting on the furnace fan is matched to the size and characteristics of your ductwork and also to the characteristics of your furnace. This will help ensure that the air flows smoothly through your home, so that you get a consistently warm and comfortable home without annoying hot and cold spots.

We also customize and tweak the setup and operation of your new equipment and entire new system so that it operates at peak performance and efficiency within the unique conditions of your home.

For example, our installations always include tuning your furnace or boiler and testing them for efficiency. This is important because heating equipment which was tuned and adjusted at the factory is probably not tuned and adjusted to work in your home, since your home does not mirror the factory’s environment.

## **5. COUNTING THE COST: The ongoing costs of operation are as important as the upfront costs of purchase and installation.**

To determine which model is the best buy for your needs, you need to compare not only the initial cost to buy and install the system, but also how much it will cost you, on average, to operate your system.

Make sure you know the energy efficiency of the system you are getting. Older, conventional furnaces or boilers can often have an energy efficiency lower than 65%. Today’s more efficient heating systems have efficiency ratings that range from 78% to 97% for forced air systems and 80% to 95% for hot water systems. That’s why upgrading to a new, more efficient system has the potential for reducing your monthly heating bills by 20-40%.

The extra money you spend for a high-efficiency model will pay you back in energy savings in a relatively short time. For example, suppose you are choosing between a unit with an efficiency rating of 78% and one with a rating of 93%. The higher-efficiency system will cost \$500 more, but will probably save you, on average, about \$137 each year in operating costs. So you will recover the \$500 additional upfront cost in less than five years.

If you are not planning to stay in the home long enough to reach the payback point, you may wish to choose a lower-priced model. But remember, a high-efficiency heating system can be a good selling point when it comes time to sell your home.

Request a Free, No-obligation Home Heating Survey from Heritage, and one of our heating technicians will come out and assist you in determining how much you can actually expect to save in monthly heating costs by upgrading to a more efficient system.

## **6. THINKING “OUTSIDE THE BOX”: Making sure you get the total solution that is right for your home.**

Many contractors focus on getting the sale by pricing “boxes” (equipment only) instead of offering total solutions. But to get the heating system that is just right for your home, you have to “think outside the box” and realize that there is a lot more to your heating system than just a “box in the basement.”

So when you are getting bids from companies, don't just get a bid for installing a new furnace or boiler. You should also get bids on the cost of buying and installing a complete new system, including any fittings and adjustments required and any changes to the ductwork and piping, plus balancing and adjusting the whole system to work together.

It may cost more to have everything done right, but the benefits and the payback are almost always well worth it. Remember: you are investing for the long term. The system you finally get will affect your comfort and your heating bills every month of every winter. Keep in mind that the contractor who offers the lowest bid may not spend the

## Appendix B

# KEEPING COOL: 5 Guidelines for Getting the Right Central Air Conditioning System for Your Home

Someone has said that “knowledge is power.” And that is true when it comes to purchasing a new central air conditioning system for your home. A little knowledge can save you from making the wrong choice and being disappointed with the results.

The five guidelines below provide a good starting point for helping you shop smart to get the right system for your home—a system that will keep your entire home cool and comfortable, keep energy costs down, and experience minimal problems.

For a more in-depth picture, request a Free, No-obligation Home Comfort Survey from Heritage (or call 1-800-977-4737). One of our cooling technicians will call you and make an appointment to come study your house. He will then give you a complete report on the air conditioning system that is just right for you, including a proposal and quote.

## 1. OUT WITH THE BAD AIR: A Truly Effective Central Air System Begins with the Removal of Heat and Humidity from Your Home.

There are two approaches to cooling your home: the more typical way, and the Heritage way.

The more typical approach is one that tries to “push: or “force” cool air into a house that is already full of hot, humid air. This requires equipment with more power, and it's not very efficient. It's also not very effective.

Have you ever been in a restaurant or home with central air that either felt cold and damp, or felt stuffy and sticky—despite the fact that the thermostat was set at a comfortable 72 degrees? Those are both the kind of problems you get when you “force” cool air into a room that already has high heat humidity.

At Heritage, we take a different approach: We know that truly efficient and effective air conditioning is not about forcing cool air into your home, it's first about removing heat and humidity from your home. Once the excess heat and humidity is out of your home, then your system will be able to cool your home more efficiently, and more comfortably.

How do we design such a system? We start by carefully measuring how much heat and humidity is getting into your home—through windows, doors, walls, ceilings, air leaks, heat from appliances and people, etc.. We also analyze how air flows through your home. Then, we'll design a system that pulls heat and humidity out of your home and replaces it with cool, comfortable air.

Any professional you consider for installing your central air system should make these calculations for each room. This is absolutely essential if you want to take advantage of our second guideline—getting air flow to work for you.

## **2. WHEN GOING IN CIRCLES IS GOOD: Making Sure You Have Good Air Circulation Throughout the Home.**

If a system lacks EVEN air circulation between rooms and floors of the home, the result will be inconsistent temperature and humidity control, leaving you often uncomfortable—too warm or too cool.

The key to consistent comfort is consistent air circulation. Think of each room in your home as a section of a wheel. When you don't get good circulation in one room, it's like having a flat spot on a wheel; the wheel is not going to roll smoothly. With central air conditioning, one room with bad circulation can keep air from circulating smoothly through your whole house.

This is so important. Experts say that improper air flow can actually reduce the efficiency of your air conditioning equipment by as much as 60%! They also say that improper air flow is a common cause of many breakdowns in air conditioning systems. When air is not flowing smoothly, this puts extra pressure on the equipment to force cool air into the home.

So how do you get proper air circulation throughout your home? As we said above, it starts with a system that is designed to draw the right amount of heat and humidity out of each room as the cool air comes in.

And this is not just about having the right air conditioning equipment. It's more about having the right size and location of the ducts that circulate the air through your home. Good ductwork design is key to good air circulation and consistent comfort.

You should ask any professional you are considering for central air installation to submit a copy of the ductwork design with their quote and go over it with you. With a little explanation, you'll be able to understand the design, and this will help assure you that you'll be getting the proper air circulation. Without a good ductwork design, you're at risk of being disappointed with the way your new system performs.

At Heritage, our technicians are always happy to go over the ductwork design with you, and explain how it will deliver the right air circulation and consistent, cool, comfort throughout your home, even on the hottest days.

### **3. CONSERVING ENERGY: Making Sure You Get an Air Conditioning System That is Very Energy Efficient.**

Central air conditioners are rated according to their Seasonal Energy Efficiency Ratio (SEER). The higher the SEER rating, the more efficient the air conditioner.

Many older central air conditioners achieve SEER ratings of only 6 or 7 while new equipment is required by the government to have a SEER rating of at least 13!

And the government keeps raising the SEER requirement because of the increasing demands on our power grids—demands that have led to some of the widescale blackouts we’ve seen in recent years.

Since energy costs are going up all the time, it just makes good sense to consider purchasing the most efficient system you can afford. The American Council for an Energy-efficient Economy recommends getting a system with a SEER rating of at least 14.5.

However, it’s important to keep in mind that the actual efficiency of your air conditioning system will be very much affected by the conditions under which your system is running.

It’s like driving a car. Your car might be rated at 30 miles per gallon. But if the car is loaded with people and you’re driving up and down hills, or in stop and go traffic, or at high speeds—you’re probably not going to get 30 miles per gallon.

Likewise, if your air conditioning system is burdened by a poor air flow system, or if it is not designed to remove heat and humidity from the home, these factors will actually lower your SEER rating. In other words, even if you have equipment with a SEER rating of 13, poor air flow could reduce the effective SEER value of your system to 6 or 7!

That’s why the design and installation of the entire system is so important.

By purchasing equipment with a high SEER rating, and by getting the right design and installation, you’ll be saving the most money every year on energy costs, you’ll be keeping your home more comfortable, and you’ll be protecting the environment as well.

### **4. THE GOLDBLOCKS FORMULA: Getting a System That is Not “Too Big” or “Too Small,” but is “Just Right” For Your Home.**

Two of the most common mistakes people make when purchasing central air conditioning are (1) Getting a system that is too large for the size and style of house, or (2) Getting a system that is too small.

This happens when contractors recommend an oversized unit, saying that “bigger is better.” It isn’t—it’s just more expensive. Or it happens when contractors try to sell you a smaller unit so that they can underbid other contractors and make sure they get the job.

Consider some of the problems you can get into from overbuying or underbuying.

An oversized central AC system will turn on and off too frequently, which will wear down your equipment and waste electricity. Plus, the larger system will cost you more upfront!

This frequent cycling on and off will also make your indoor temperatures fluctuate up and down more, resulting in a less comfortable environment. The oversize unit will lower temperature too quickly and then turn off before removing the appropriate amount of humidity. This is another reason why homes with oversize units feel cold and clammy, or chilled; the air is cold and damp.

The EPA (Environmental Protection Agency) estimates that nearly half of all existing air conditioning equipment is oversized! They estimate that this costs 20% each year in wasted energy!

Likewise, a system that is too small for your home will overwork the air conditioner and it may fail to keep your home adequately cool. Such a unit will lower humidity, but will not lower the temperature enough, so the air will feel dry but warm—and the system will run all the time. And over-running the equipment will lead to premature breakdowns.

And even if you get the right size air conditioning equipment, you also have to beware of “buying too small” when it comes to your air duct or airflow system. The National Comfort Institute states, “It’s not unusual to see return air systems undersized by 30-50%. In fact, equipment problems including compressor burnout, frozen indoor air conditioning coils...are often a result of improperly placed and installed air distribution systems.”

A good way for you to be sure the equipment you’re buying is not over-sized or under-sized is to find out if the contractor you’re working with did a formal “load” calculation (which we always do at Heritage). Ask for a copy of the calculation to be submitted with the proposal. This will at least assure you that the contractor takes capacity design seriously, that he’s not just “winging it.”

Bottom line: there is an air conditioning system that is “just right” for your size and style of home, and at Heritage we’ll make sure you get it.

## **5. THE HOMEWORK FACTOR: Working With a Professional Who Will Study and Evaluate Your Home Before Designing Your System.**

The EPA states that you should “only hire a contractor who asks questions, measures windows, doors, floors, ceilings, checks insulation, calculates a cooling load, and fixes system problems that may compromise comfort and cost you money.”

At Heritage, for example, we never recommend a central AC system without first doing a complete analysis of your home and checking a list of factors that include:

- The size and style of your house and how many windows it has
- How well insulated or airtight it is
- How much solar energy comes in through the windows
- How much shade is on your home’s windows, walls, and roof
- How much heat the lights and appliances give off
- Your typical thermostat settings
- The number of occupants in the home
- How much air leaks into your home from the outside

We take all of these factors into account by doing a computer load calculation, as mentioned earlier. We measure all rooms, check insulation, check windows and doors, and input all data into special industry software to calculate cooling load.

Then we also ask you a lot of questions, such as:

- Do you have moisture problems?
- Do you have hot or cold rooms?
- Are you about to make any changes to your home?
- How have your energy bills been running (a contractor should ask to review past bills).

All of this information helps us determine how much cool air the system must generate on the hottest days in order to keep you comfortable.

At Heritage, we make sure that all the components of your new system are matched, tuned and designed to work together. We will customize and tweak the setup and operation of your new equipment so that it operates at peak performance and efficiency within the unique conditions of your home.

To request a Free, No-obligation Home Comfort Survey, just call Heritage: 1-800-977-4737.

## Appendix C

### 8 Reasons Why Heritage Customers Are “Adamant” About Getting an MVP Super Tune-up “Every Single Year”

Breakdowns of your heating or a/c system always seem to happen at the worst times. Fortunately, there’s a simple, very affordable way to protect your system and your peace of mind—while saving you money. It’s Heritage’s Maintenance Value Plan (MVP).

The Maintenance Value Plan gives you:

- An annual Super Tune-up of your complete heating or AC system at a discount
- Top priority service in any emergency if you ever experience a breakdown
- Plus “good maintenance” discounts worth over \$600.

MVP also gives you the assurance that your system will keep running smoothly. Here’s why.

Without a complete, annual tune-up, your system gets dirtier and dirtier and runs less efficiently. This can lead to problems that go undetected and uncorrected—leaving you at greater risk of breakdowns, of burning more fuel, and even shortening the life of your equipment.

But MVP keeps your system always running at peak condition, so that you avoid problems, save on fuel, and even extend the life of your equipment. And best of all, MVP actually saves you over 30% on tune-ups. Check out the 8 reasons why thousands of Heritage customers wouldn't go a year without an MVP Super Tune-up:

**1. MVP Thoroughly Cleans and Tunes Your Entire System.** Some companies clean only the burner. But at Heritage we take tune-ups seriously. We clean, inspect, safety-check and super-tune your entire system, including dozens of important parts that other companies don't touch.

*"The MVP is a smart thing to do...It's about peace of mind, about not having to think in the middle of a winter storm, 'Gee, I wonder what that noise was?'" – Bob Wheeler*

**2. MVP Prevents Costly, Inconvenient Breakdowns.** We do a Preventative Inspection of your entire system to spot small problems early before they become big. We'll even give you a Preventative Report Card, so you know exactly where you stand.

*"Before anything gets way out of hand and we end up having to do major work, with the MVP service they can catch it right in the beginning." – Kathleen Vienniew*

**3. MVP Adds Years to the Life of Your System.** Whether your system is old or relatively new, an annual MVP Super Tune-up keeps your equipment running cleaner and better, so it lasts longer. With the average price of a system being around \$6,000, this is an important benefit!

*"I am adamant about doing MVP service every single year....there is the peace of mind knowing that probably nothing is going to go wrong if it is kept in good condition." – Richard Saint*

**4. You Get Top Priority Service in Emergencies.** If a problem does occur, as an MVP customer you'll always be at the top of the list for quick service when you need it most. And you only pay regular rates for emergency repairs, even on nights, weekends, or holidays.

*"MVP gives me a sense of security...I needed to call them once in an emergency and they were so fast that they did not have time to call me thirty minutes before to notify me they were coming—they were already there!" – Paul Pappas*

**5. MVP Keeps Your Home and Family Safe and Comfortable.** We do a complete Safety Test of your system, using state-of-the-art carbon monoxide detection equipment. You'll sleep better knowing this is taken care of.

*"It is nice that the important systems of the home are taken care of. And if something goes wrong, I call up and it has been fixed the same day...which is good because then I do not have to freeze out four kids." – Tracy LaSalle*

**6. MVP Protects Your Warranty.** In some cases, missing an annual tune-up can void the warranty on your equipment. With MVP, your yearly maintenance is done on time; you can be sure your warranty stays in effect.

**7. You Get “Good Maintenance” Pricing—Savings of Over 30% on Tune-ups, Year After Year.** We believe customers should be rewarded for taking good care of their systems: it reduces the number of emergency breakdowns we have to respond to—and we pass the savings on to you! Normally you could expect to pay \$169 for a comprehensive tune-up of an oil heating system. But with MVP, you pay only \$109—saving you \$60 every year! For gas heating systems and air conditioning systems you pay only \$89, vs. the standard charge of \$129—saving you \$40 every year.

*“With MVP, I feel more confident that the heating system will not break down in the middle of the winter.”*

*– Betsy Chicolas*

**8. You Also Get “Good Maintenance” Discounts on Repairs Year After Year.** As an MVP customer, you’ll get \$10 off our standard dispatch fee, and save up to 10% on heating/cooling repairs. We’ll also give you a \$50 coupon for other Heritage services every year!

*“One year we had to have the whole plumbing system redone, and I used the MVP coupon to significantly reduce our bill.” – Valerie Mangeon*