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The Gas Company's **ENERGY**  
**RESOURCE**  
**CENTER**™

# EQUIPMENT MAINTENANCE FOR OPTIMUM EFFICIENCY

User's Guide to Cleaning and Maintaining  
Natural Gas Commercial Foodservice Equipment



*Call 1-800-GAS-2000 for service, repairs and parts for commercial equipment.*



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# Table of Contents

## User's Guide to Cleaning and Maintaining Natural Gas Foodservice Equipment

The energy experts at Southern California Gas Company's Food Service Equipment Center have published this comprehensive reference guide to provide foodservice operators with important information for keeping their equipment clean and energy-efficient. Offering this complimentary handbook is one more way Southern California Gas Company® is furthering its commitment to provide our business customers with safe, reliable energy as well as exceptional service. This guide is an excellent overview to help you clean and maintain your natural gas- fired equipment, but keep in mind that information is generic and offered as a general guideline only. Individual equipment manufacturers provide specific cleaning and maintenance recommendations to ensure safe and efficient use of their equipment. This overview is not intended to replace the manufacturer's recommendations.

<b>General Advice</b> .....	<b>1</b>
<b>Griddles &amp; Tilting Braising Pans</b> .....	<b>2</b>
<b>Fryers</b> .....	<b>5</b>
<b>Steam Jacketed Kettles</b> .....	<b>8</b>
<b>Steamers: Pressure &amp; Pressureless</b> .....	<b>10</b>
<b>Ovens: Conventional, Convection &amp; Deck</b> .....	<b>12</b>
<b>Ranges: Open Top &amp; Hot Top</b> .....	<b>15</b>
<b>Broilers: Overfired &amp; Underfired</b> .....	<b>19</b>



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# General Advice

## For Equipment Demonstrations:

Call 1-562-803-7323 for a tour of Southern California Gas Company's Food Service Equipment Center, where at least 150 different pieces of energy-efficient equipment from more than 50 manufacturers can be tested and compared, using your recipes.

## For Equipment Service:

Call 1-800-GAS-2000 to contact a commercial service technician for equipment service.

## Save Time...Save Energy...Save Money...

Simple routine maintenance and cleaning of your commercial natural gas-fired equipment is easy and will save needless downtime and money spent for service calls. The majority of problems associated with commercial food service equipment can be attributed to two fundamental facts:

- 1) The natural tendency for anything to deteriorate. Even with normal use, any equipment clearly does not stay new, but this is especially apparent when it is subjected to the rigors of commercial food service.
- 2) Lack of knowledge among staff and/or sometimes overall operational management. Simple maintenance performed on a regular basis can prolong the operational life of equipment.

## Gas Supply

Although gas supply to commercial cooking equipment is not usually a maintenance issue, there are considerations to keep in mind. If additional gas equipment is added to a supply source, it is important to verify there will be adequate gas supply when each piece of equipment is on high-fire (maximum input) simultaneously. Also, ensure the equipment regulator is located where it will not be subjected to excessive temperatures, and the vent area is clean and open. These conditions can affect the gas supply to the burners as well as the cooking process. With equipment that is capable of extremely high temperatures (griddles, charbroilers, salamanders, cheese-melters, and others), the regulator location is particularly important. Excessive heat can damage the regulator diaphragm and adversely affect operation of the equipment.



# Griddles & Tilting Braising Pans

## Energy Efficiency Tips

1. Allow adequate preheat time on start-up.
2. Don't overheat griddle.
3. Set temperature for each section no hotter than the food requires.
4. Turn controls down or off on unused portions during off-peak hours.
5. Loading food over thermostat probes will yield better results.
6. Do not use ice on griddle surface; it can cause buckling of plate.
7. Season the griddle surface after each thorough cleaning.
8. Thermostatically controlled griddles conserve energy and cost less to use.
9. Scrape the cooking surface between food items. Some griddle surfaces may require special tools.
10. Scratches and nicks can cause carbon build-up on griddle plate and make food stick. Check spatulas and scrapers for rough areas and replace as needed.
11. Grooved griddles consume 40% less gas than underfired broilers.
12. Confirm the flame is blue, not yellow. If yellow, call for service.

## Cleaning Tips

1. Clean the griddle surface while still slightly warm (150° to 200° F), using a spatula or griddle scraper.
2. Rub the griddle surface with a griddle brick or stone. If the manufacturer recommends using a griddle stone, rub with the grain of the metal.
3. Do not use a griddle stone or steel wool on stainless steel, plate steel, chrome or any special polished griddle surface.
4. Use a sponge, cloth or plastic brush to clean, rinse and wipe away any residue.
5. If food is stuck to the surface of a braising pan, soak it and use a little heat to loosen the food.
6. Be sure to wash under the skillet cover and rinse with clean water.
7. Spray with pan coating before use.
8. Thoroughly clean the grease pan daily. Wash with detergent and water, or degreaser, if necessary.
9. Wash the front, back, sides and splashguards with a warm, soapy cloth.
10. Thoroughly dry with a clean cloth, replace grease tray, then season the griddle.
11. Cleanse front and sides of the griddle/braising pans with a damp cloth. Shine with stainless steel cleaner.

## Safety Tips

1. Never cool a hot cooking surface with cold water.
2. Do not use a griddle to heat pots and pans. A range does this more efficiently, safely and quickly.
3. Do not use a braising pan to deep fry products.

## Seasoning

1. Preheat griddle to 400° F.
2. Coat the surface with a light, even layer of cooking oil or pan spray.
3. After letting oil sit on the surface for approximately two minutes, carefully wipe off any excess.
4. Repeat as many times as necessary to attain a shiny surface.
5. When finished, wipe off all excess oil and turn off the griddle.



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# Griddles & Tilting Braising Pans

## Griddles (cont'd.)

### Cooking On The Level

Normally, leveling is not a maintenance issue if a griddle is properly setup on the initial installation. However, if the floor settles, or if the griddle is moved to another location, leveling could become necessary. Most griddles are set on adjustable legs or casters, which can compensate for irregularities in the flooring and allow the griddle plate to be set level. Some units have adjustments located in the frame that supports the plate for fine-tuning when leveling. The cooking surface should be level both front to back and side-to-side. This can be done in most cases by placing a level on top of the griddle plate and adjusting the levelers found on the legs or casters. A griddle plate that is not set to level can adversely affect the cooking process and also lead to a localized build up of residue that is difficult to clean.

### Cracks and Seam Separations

Cracks in the griddle plate and separations around the splashguards should be corrected at the earliest possible convenience. Fats and oils from the cooking process will migrate through the cracks and separations to the burner area where they are exposed to higher temperatures. These higher temperatures will render the fats and oils into a crystalline substance that once ignited is difficult to extinguish and can lead to further damage of the equipment. Cracks in the griddle plate are usually obvious, while separation of the splash guards from the plate are more difficult to spot. A routine visual inspection of the burner area can help detect any problems of this nature by observing the hanging residue. It is generally amber to dark brown in color, and resembles icicles hanging into the burner compartment. This condition, if located at the backsplash, can limit the venting area and cause smothering of the burner flame. Minor cracks in the plate or separation of the splashguards can be corrected by welding.

### Ventilation

Usually if the equipment remains in its original location, problems with drafts and ventilation do not occur. When the equipment is moved to another location or there is a change to the room, problems can arise. Something as simple as leaving a door open can create drafts that affect the operation of the equipment. Vent hoods must be rated to support a griddle's high thermal load. If the ventilation system is under-rated, smoke and pollutants in the kitchen will result. In addition, equipment panels and controls will get extremely hot, causing possible burns to the operator and premature failure of the controls. The front panel of a griddle has openings allowing air flow to vent the products of combustion out the back of the griddle, and providing a cool air stream over the controls to keep them from becoming overheated and failing. If the ventilation system is over-rated for the equipment, it will pull heat from the griddle too quickly, reducing the temperature of the griddle plate. This will not only lengthen the cooking time required, but usually produces a less pleasing product. This problem becomes greater with a grooved griddle, as the increased surface area allows for more heat loss from air passing over and through the grooves. Products such as steaks, chops and chicken do not get seared to seal in the flavor and juices, thereby producing a less appealing product.

### Pilots and Burners

The frequency that burners and pilots require cleaning depends on their operating environment and usage. Griddles located in or near an operation where flour and powders are used would require that burners be cleaned and inspected more frequently. The burners are continuously pulling ambient air for combustion and mixing. Airborne particles will become trapped inside the burner and around the primary openings, causing the burner flame to soften. The presence of grease increases this problem by making the burner surfaces sticky, thus not allowing Airborne particles to pass through the burner, but rather be captured on the surfaces. This condition can lead to a yellow flame, which will cause the formation of soot. Once the soot starts to form on the underside of the griddle plate, significant heat loss will occur since the soot acts as an insulator. As the soot builds, there is less room for combustion and natural venting, resulting in a smothered flame and a dramatic drop in the affected burner's heating efficiency.



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# Griddles & Tilting Braising Pans

## Pilots and Burners (continued)

Burners and pilots should be inspected on a regular basis, as normal dust and lint will accumulate and needs to be cleared. In most cases, swabbing the burner throats with a soft bottlebrush or removing the burners and washing them out can easily accomplish this. Cleaning should be done when the burners have been allowed to cool down, not while in operation. In extreme cases, the burners may need soaking in a commercial degreasing solution, then washed out. Burners should be inspected for signs of warping, as they will be ineffective and inefficient, and should be replaced at the earliest convenience. Soot accumulation on the plate can simply be washed off when the burners are removed and the plate has cooled down. Pilots that become clogged should be replaced or cleaned. The extreme heat generated by the burners will eventually deteriorate the steel tubing of the pilots clogging them over time. These are simple manual pilots that can easily be replaced when the unit is off and has cooled down. Never substitute aluminum tubing for the steel tubing, as the heat is too excessive for aluminum to withstand.

## Tilting Braising Pans:

### On The Level

Leveling should be done with the pan in the full horizontal position. The legs are usually equipped with a screw type of leveler that can compensate for minor floor irregularities. By placing a spirit level in the pan, level can be checked both side-to-side and front to back. Once levels are set, there is seldom a need to recheck, unless the unit is moved to another location.

### Caring for the Cooking Surface

Care should be taken to avoid scratching or nicking the pan's finish. Like a griddle, the pan's surface can be damaged by sharp edges of spatulas or other utensils, and heavy metal scrubbers, wire brushes, or steel wool pads should be avoided when cleaning. Routine cleaning of the pan can be accomplished with a mixture of hot water and soap or an appropriate detergent. Rinse the pan thoroughly and drain after cleaning. Soaking and then scrubbing with a non-metal brush, sponge, plastic spatula, or rubber scraper, should remove any food product stuck to the pan. It is important not to use abrasive materials that can leave scratches and allow bacteria to grow. Check the braising pan pouring lip corners to ensure they are clean. When the equipment needs to be sanitized with a chlorine product, it is very important not to allow the chlorine to stay in contact with the stainless steel for more than 10 (ten) minutes, as longer contact can cause corrosion.

Mineral deposits or the film left by hard water can be removed by the use of a deliming agent, however, consult the manufacturer's literature for the proper product. Thoroughly rinse and drain the unit before future use. Caution: a deliming solution not suited for cooking equipment could etch the surface and render the pan unusable.

### Conclusion

The braising pan is one of the most durable cooking appliances used in food service because of its heavy-duty construction and simple operation. Any food service kitchen can benefit from its versatility and strength, and other than normal cleaning and occasional greasing of the tilting mechanism, braising pans are relatively maintenance free.



# Fryers

## Energy Efficiency Tips

1. Do not operate a fryer without shortening in fry pot.
2. Limit a fryer's preheat time to 10 or 15 minutes, and never longer than necessary.
3. When using solid shortening, be sure it is packed around tubes before lighting burners. Use the melt cycle if available, or melt at low-temperature of 200° F.
4. Avoid frying at temperatures higher than needed. Most foods can be fried at 325° to 350° F.
5. Fried food pieces should be of equal sizes to reduce over-cooking of some and under-cooking of others.
6. Avoid exposing shortening to salt, water, excessive heat and chemicals, as they all make shortening break down faster.
7. Do not cover a hot fryer, as this will accelerate breakdown of the frying medium. Cover fryer when not in use to avoid exposing oil to air.
8. Turn heat down to 200° F or lower during off-peak hours.
9. Confirm the flame is blue, not yellow. If yellow, call for service.
10. Avoid use of copper or brass fittings, utensils and cleaning materials.

## Cleaning Tips

1. Be sure to shut down fryer completely before draining and filtering shortening.
2. Skim out as much sediment and floating particles as possible.
3. Allow the shortening to cool. Note: automatic filtering systems allow filtering while the oil is hot.
4. Clean and rinse fryer baskets in a sink.
5. Drain and filter the shortening through a mechanical filter paper to keep deposits from building up.
6. While the shortening is out, brush and scrub the sides and tubes of the fry pot. Remove carbon accumulation as build-up localizes the heat, weakening welded seams, and leading to premature failure of the fry pot.
7. Follow manufacturer's instructions on boiling out procedures.
8. Return the oil to the fry pot.
9. Cleanse front and sides of the fryer with a damp cloth and shine with stainless steel cleaner.

## Safety Tips

1. Keep a fire extinguisher available in all food preparation areas.
2. Be sure all drain valves are closed when operating the fryer.
3. Never add shortening above the fill line.
4. Never heat shortening above 425° F.
5. Never fill the food baskets more than two-thirds full.
6. Carefully lower food into the fry pot to prevent shortening from splattering.
7. Never add salt or seasoning to product while frying.
8. Set timers for each basket drop or use fryer computers for product uniformity.
9. If using solid shortening, the fryer should have a melt feature that ensures the "packed" shortening melts slowly. If not, pockets of shortening may melt and reach high temperatures while other portions remain solid. These melted pockets are subject to degradation and over-heating.
10. If using a pressure fryer, do not remove lid until pressure releases, and exercise caution to avoid steam burns.



# Fryers



## Ventilation

One very important and often overlooked consideration is ventilation and air supply. Fryers must be installed so the products of combustion are removed efficiently and the kitchen ventilation system does not produce drafts, which would interfere with proper burner operation.

The majority of commercial kitchens do not have a balanced ventilation system. This condition can cause many operational problems and may falsely make the equipment appear faulty.

The fryer flue opening should not be located close to an intake or exhaust fan. The fryer needs to be in an area with adequate air supply and ventilation so the burners can receive a steady supply of fresh air. Adequate clearance distances must be maintained from top of the fryer flue to the lower edge of the ventilation filter. In most cases this distance is a minimum of 18 to 24 inches.

The flue must be kept completely clear for proper operation. Even partial blockage will cause operational problems and incomplete combustion from burners not venting properly. Operators sometimes cover the sheet metal with aluminum foil to keep the surface from getting soiled and discolored, but care should be taken not to even partially cover the flue.

## Immersion Tube Baffles and Radiants

Burner baffles or radiants are usually found on fryers using immersion tubes. The radiant is generally made of a high temperature stainless steel alloy or similar material, and helps to convert flames to radiant energy thereby increasing the efficiency of heat transfer into the fry pot.

Problems can arise when the radiant deforms or deteriorates from usage. When the radiant deforms it can block the flame and prevent complete combustion of the fuel, producing carbon monoxide and lowered efficiencies. When the radiant deteriorates, efficiencies will decrease as the flue temperature rises due to less heat being extracted from the flame.

You can check the condition of the radiants by looking down the burner tubes while the burner is on. The radiants should be concentric and appear evenly heated, with the reddish orange color uniformly distributed on the surface of the radiant.

## Burner Air Openings

Atmospheric, ported type burner primary air openings need to be checked periodically and cleaned. Lint will collect in the opening and stick to the oil film usually found on burners. Extra care should be taken to inspect burners where large amounts of air-borne particles are present, such as bakery operations. Simply take a soft bottlebrush and swab the area clean. Restriction of the primary air opening will affect the combustion process, resulting in a yellow burner flame that will lead to the production of soot. This leads to poor operation or a system shutdown requiring a service.

Target style burners, such as those found on Frymaster units do not usually have this problem due to the difference in design from the ported style of burner.

Fryers equipped with power burners have blowers or fans that supply air to the burners. Some of these fryers have automotivestyle, pleated paper air- filters to filter the supply air. These filters require regular cleaning and replacement when cleaning is no longer possible. If a fryer is equipped with a filter, one should always be installed to prevent problems with the burner system. Power burner systems without air filters usually have a screened area located on the blower where the air enters. This screen needs to be kept clean of dust, lint and any other debris. A regular brushing when the fryer is not in operation helps to keep the fryer burners working properly. Minor changes to the air supply or gas pressure can have a major effect on the combustion process of these systems. Efficiencies will decline as a result of incomplete combustion.



# Fryers

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## Gas Controls

The combination gas valve (called a combination valve because it contains the gas supply valve and the thermostatically controlled operator for burner gas) requires period maintenance. The pressure regulator on the valve has an atmospheric venting system. This vent must be kept clear of obstructions in order to supply a properly regulated gas flow.

It is suggested that the vent area be cleaned on a regular monthly basis (more frequently if the need is evident). Wipe the vent area clean, remove and clean the vent-plug button (it is a friction fit plug that requires no tools for removal). Check the inner vent area and remove any build-up that may be present. Replace the vent plug button.

When the control valve becomes difficult to turn, the knob may break. If the control knob cannot be turned by hand the valve needs servicing or replacement. Once you begin using pliers on the stem to turn the valve, service is no longer an option; the valve will need to be replaced to correct the problem. Do not disassemble the valve yourself, as this could create a serious hazard-this work is best left to a professional.

## Low Voltage Wiring

Maintenance of the control system wiring consists of checking for damage, fraying, loose connections or terminals, and signs of corrosion. Wiring that has become damaged; particularly where the insulation has broken should be repaired or replaced. Tighten or replace loose terminals and clean any corrosion found on the electrical connections. **If the fryer is connected to line voltage, it must be unplugged or disconnected from line voltage before performing any work on the wiring.** Control systems using a pilot generator for power require clean tight connections for trouble free operation. The wiring should be in good condition as there is less than one volt operating the system so any excess resistance in the wire will lead to premature failure and shutdown.

## Sensing Elements

The sensing elements need to be secure in the mounting brackets. Care needs to be exercised when cleaning the fry pot so as not to damage the sensing elements. If they should become damaged, it could cause the thermostat or high-limit control to operate erratically or fail completely.

## Leaking Frypot or Kettle

Leaky fry pots can be caused by careless draining procedures. Turn off burners to prevent their operation with an empty fry pot. Firing with an empty tank can cause failure of the welded seams.

Carbon build-up in dirty fry pots, particularly in the seams, promotes acid formation. Carbon build-up in the seam area also concentrates the heat, leading to weakening and leakage. Following the manufacturers recommendations for cleaning should minimize the problem.

## Steam Cleaning

When it is practical to do so, equipment should be fired up to remove any moisture left from steam cleaning as soon as possible since moisture will promote corrosion. This is a particular problem with the gas orifices found on target style burners. Calcification occurs around the opening of the orifice, reducing the size of the opening thereby increasing the velocity of the gas stream. This in turn causes a change in the burner characteristics, similar to an over-pressure condition in that the burner- flame is blowing and lifting.



# Steam Jacketed Kettles

## Energy Efficiency Tips

1. The use of a water treatment system is highly recommended to minimize scaling.
2. Steam cooking is fast compared to other cooking methods. Use a timer to prevent overcooking and wasted energy.
3. Use the lid whenever possible.
4. Clean and maintain the boiler for directconnected steamers to maintain performance and conserve energy.

## Cleaning Tips

1. Clean kettle as soon as possible, preferably while it is still warm.
2. Scrape and flush out food residues.
3. Use a sponge, cloth or plastic brush to thoroughly clean the inside of the kettle.
4. Rinse kettle and all draw-off valve parts thoroughly with hot water, then drain completely.
5. It is recommended that the kettle be sanitized just before use.
6. Cleanse front and sides of the kettle with a damp cloth and shine with a stainless steel cleaner.
7. Blow down boiler daily, or as recommended by manufacturer
8. Have boilers cleaned and checked annually, or as recommended by the manufacturer.

## Safety Tips

1. Check jacket vacuum and proper water level, as specified by manufacturer's instructions.
2. Never leave a sanitizer in contact with stainless steel surfaces longer than 10 minutes. Longer contact can cause corrosion.
3. Keep the inside of the control console clean and dry.
4. If the steam boiler is running for eight hours or longer, it should be drained or blown down twice daily or as recommended by the manufacturer.



# Steam Jacketed Kettles

## Air and Water

**Direct-fired kettles** need to be regularly checked for air and water. Air in the jacket acts as an insulator and slows kettle heating. When the kettle is cold, the pressure/vacuum gauge should read a negative or vacuum. A positive reading or a reading near zero indicates that there is air in the jacket. Discharges from the safety valve prior to reaching operating temperature can also indicate there may be air in the jacket.

To remove air from the jacket, allow the kettle to heat. Make sure there is water or product in the kettle. When the pressure gauge shows a reading of 3 to 5 PSI pressure, release the air by opening the safety valve for a few seconds then releasing it and allowing it to snap shut. This step can be repeated until there is only a steam discharge. Caution should be taken to protect exposed skin from steam burns. It is best, if the discharge opening of the safety valve is piped away a few inches from the valve and terminates with an elbow or pipe nipple angled down. The safety valve should be tested in a like manner following the manufacturer recommendations. (Minimum once a month-usually more often is required.)

Each day before the kettle is placed into operation, check the water level. The water level should be between the minimum (min) and maximum (max) markers on the sight glass. Over time, water will need to be added to the jacket due to minor steam losses or water drain-off. Water in the jacket is treated to protect the metal surfaces from damage and the formation of lime and scale. Each manufacturer either offers or recommends a specific product for treating of the replacement water. The water must be tested to ensure that the pH level meets the recommendations found in the operators' manual before it is added to the jacket.

The kettle will have a port for the purpose of adding water to the jacket. Allow the kettle to cool down so the pressure/vacuum gauge reads a negative showing there is a vacuum in the jacket. After making sure the valve located on the fill port is closed, remove the plug. Insert a funnel in the port and fill the funnel with treated water. Open the valve on the fill port and allow the vacuum to draw water into the jacket. Do not allow the funnel to empty, as air will be drawn into the jacket. Check the water level in the sight glass and repeat this step as needed until the proper water level is restored.

**Indirect fired kettles** have steam supplied from a remote boiler or central plant, and require very little in the way of routine maintenance. The safety valve should be tested each day, as the unit is placed into operation. This is done with a positive reading showing on the pressure gauge by opening the safety valve until steam is released and allowing the valve to snap shut. Caution should be taken to protect exposed skin from steam burns. It is best, if the discharge opening of the safety valve is piped away a few inches from the valve and terminates with an elbow or pipe nipple angled down.

Every couple of months, (more often when subjected to heavy use) check the draw-off faucets, valves, and piping for leaks. Check the steam pressure-reducing valve to ensure it is in good condition and is functioning properly. Check the steam piping and the condensate piping, the valves, and the traps for leaks and obstructions. Repairs should be done soon as possible when dealing with pressurized steam.

## Cleaning the Kettles' Cooking Surface

The kettle's surface can be damaged by the sharp edges of spatulas or other utensils, and to avoid scratching or nicking, heavy metal scrubbers, wire brushes, or steel wool pads should be avoided when cleaning.

Routine cleaning of the kettle can be accomplished with a mixture of hot water and soap or an appropriate detergent. Rinse the kettle thoroughly and drain after cleaning. Soaking and then scrubbing with a non-metal brush, sponge, plastic spatula, or rubber scraper should remove food product that becomes stuck to the kettle's surface. It is important not to use abrasive materials that can leave scratches and allow bacteria to grow. When the equipment needs to be sanitized, with a chlorine product, it is very important not to allow the chlorine to stay in contact with the stainless steel for more than 10 (ten) minutes, as longer contact can cause corrosion.

Mineral deposits or the film left by hard water can be removed by the use of a deliming agent, however, consult the manufacturer's literature for the proper product. Thoroughly rinse and drain the unit before future use. Caution: a deliming solution not suited for cooking equipment could etch the surface and render the kettle unusable.



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# Steamers:

## Pressure and Pressureless

### Energy Efficiency Tips

1. The use of a water treatment system is highly recommended to minimize scaling.
2. Minimize preheating pressure boiler before use.
3. Keep compartment doors closed during entire steam cooking cycle.
4. Use perforated pans when possible.
5. Steam thawed products to reduce cooking time.
6. Use steam to clean pans prior to washing.
7. Turn steamers off during slack periods to reduce HVAC requirements and gas consumption, as well as provide a more comfortable workplace.

### Cleaning Tips

1. Open door and allow the cavity to cool. Clean steamer and scrape or wipe out food residue.
2. Use a sponge, cloth or plastic brush to clean thoroughly.
3. Make sure the drain holes at the back of the cavity are clear of debris.
4. Cleanse front and sides of the steamer with a damp cloth and shine with a stainless steel cleaner.
5. De-lime steamer as needed and specified by manufacturer's instructions. Regular de-liming of the generator (usually twice a year) will improve efficiency and greatly prolong the life of the unit. This process includes removing the lime and deposits by the use of a chemical agent followed by a visual inspection of the generator.

### Safety Tips

1. Keep water and cleaning solutions out of controls and electrical components.
2. Never hose or steam-clean any part of the unit.
3. Don't mix de-liming agents (acid) with de-greasing (alkali) anywhere in the unit.
4. Be careful when opening the steamer door to prevent being burned.



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# Steamers:

## Pressure and Pressureless

### Keeping On The Level

Normally, leveling is not a maintenance issue if a steamer is properly setup on the initial installation. However, if the floor settles, or if the steamer is moved to another location, leveling could become necessary. Leveling is important for proper drainage of the condensed steam, since the inside of the cooking cavity is sloped to the rear, so that accumulated moisture is directed to the drain. Excessive moisture draining around the door area may indicate a leveling problem.

### Successfully Steaming Along

Regular maintenance is key to keeping your steamer in top condition. Wiping down the interior surfaces each day will remove most of the daily build-up and any food product that may have spilled. Wipe the gasket surfaces to prevent sticking and damage from foreign material. When the steamer is not cooking, leave the doors open and resting on the latches. This allows the interior to air out and allows the gaskets to relax. If the door gaskets can be easily reversed, this should be done weekly to equalize wear on the surfaces. Most manufacturers recommend the use of a descaling agent at the compartment drain at least once a week.

Due to the possibility of injury and damage to the equipment, information on boiler maintenance will be limited to general recommendations.

Water is distilled when it is converted to steam and any solids, which were suspended in the water, remain. Most all water contains dissolved solids and corrosive compounds. These deposits of scale will insulate the boiler tubes, foul controls, and clog pipes and valves. Oxygen, chlorides and sulfates found in water cause corrosion, which shortens boiler life by reducing the metal area and leading to failure. Steamers that have a boiler as part of the unit are particularly susceptible since they rely on small boilers to boil large quantities of water. Supplying treated or conditioned water to the boiler is a good idea, and in many cases it may be required to meet the standards for water quality as specified by the manufacturer.

For small boilers that are part of the unit:

The time interval to perform inspection and deliming of the boiler will depend on the hours of operation, water quality, and how frequently the boiler is drained or blown down. Time to service may vary from 3 to 6 months. At minimum, it is suggested that this service be performed twice a year where reasonable water conditions are found. Inspection consists of draining the boiler, removing the hand-hole cover and inspecting the interior surfaces of the boiler. A build-up of 1/100th of an inch, about the thickness of a business card, means the boiler should be delimed. Remove all loose lime and scale deposits before beginning the deliming process. After the process is complete, a new gasket must be installed for the hand-hole cover. Run the steamer through several cycles with clear water to remove any residue from the treatment process. Each manufacturer provides specific recommendations for treating and deliming their boilers. Normally this maintenance is performed by a qualified service person.

Burners and pilots on steamers are usually located near the floor and are not easily observed. Required cleaning frequency depends on the operating environment. Equipment located in a bakery operation where flour and powders are used would require that the burners be cleaned and inspected more frequently. The burners are continuously pulling ambient air for combustion and mixing. Airborne particles will become trapped inside the burner and around the primary openings, causing the burner flame to soften. This condition can lead to a yellow flame, which will cause the formation of soot on the boiler heat transfer surfaces. Soot also acts as an insulator, reducing efficiency and wasting fuel. Cleaning should be done with the unit turned off and allowed to cool down-not while in operation. The flame should be blue with defined cones of flame. There may be some orange color in the flame tips, but this is of no concern, as it is a sign of minor impurities being consumed in the flame.

For steamers that are supplied steam from a remote location:

Every couple of months, (more often when subjected to heavy use) check the draw-off faucets, valves, and piping for leaks. Check the steam pressure-reducing valve to ensure it is in good condition and is functioning properly. Check the steam piping and the condensate piping, the valves, and the traps for leaks and obstructions. Repairs should be done soon as possible when dealing with pressurized steam.



# Ovens:

## Conventional, Convection & Deck

### Energy Efficiency Tips

1. Minimize preheating time prior to use.
2. Be sure hot air does not escape from oven door seals. Tighten hinges if necessary.
3. Keep oven doors shut and check food through the glass door.
4. Keep the interior light clean and bright.
5. Confirm the gas flame is blue, not yellow. If yellow, call for service.
6. Check timer and thermostat for accuracy.
7. Be sure air can flow freely around the food.
8. Fill the oven to capacity, but do not overload. Overfilling pans causes uneven baking.
9. On convection ovens, turn blower off before opening doors.
10. Check to make sure oven is level. Adjust as necessary.
11. Heat rises, so be sure to check the food on the top shelves first.
12. Do not set thermostat higher than required.

### Cleaning Tips

1. Turn off the oven and let it cool.
2. Remove oven racks.
3. Remove spillovers using a brush or cloth before the residue carbonizes.
4. Avoid getting cleaning compounds on thermostat tube.
5. Do not use abrasives or caustic sprays on continuous-clean oven surfaces.
6. Make sure you wipe inside the oven and the crevices around the oven door with soap and water or detergent solution. Rinse with a damp cloth.
7. If necessary, spray inside of the oven with oven cleaner and let stand for 10 minutes before wiping off with a damp sponge or cloth.
8. If foreign matter collects on the fan blades, remove the fan baffle plate and use a stiff brush on each blade. Replace fan baffle plate when finished.
9. Using a damp cloth, wipe off the oven racks and replace them.
10. Cleanse front and sides of the oven with a damp cloth and shine with a stainless steel cleaner.

### Deck Oven Cleaning Tips

1. Clean spills immediately while using oven. Use a stiff metal brush as frequently as needed.
2. When stone deck is cool, sweep out crumbs with a damp cloth or special tool.
3. Avoid using oven cleaner or degreaser on stone decks; cleaning agents can be transferred to foods that are cooked on the deck.
4. Do not splash cool water on stone deck when hot, as this may cause it to crack.
5. Cleanse front and sides of the oven with a damp cloth and shine with a stainless steel cleaner.

### Safety Tips

1. Clean all spills immediately.
2. Use hot pads or mitts when removing all food to avoid burns.
3. Dirt in gas burners can cause incomplete combustion, reducing efficiency.



# Ovens:

## Conventional, Convection & Deck

### Racks On The Level

Oven racks should be level front to back and side-to-side. Level can be achieved by placing a torpedo level on the racks, then adjusting the levelers found on the legs. A deck oven should have the deck set to level for best operation. An oven that is not set to level can adversely affect many of the foods normally prepared in any oven.

### Drafts and Ventilation

Usually if the oven remains in its original location, problems with drafts and ventilation do not occur. When the equipment is moved to another location or there is a change to the room, problems can arise. Something as simple as leaving a door open can create drafts that affect the operation of the equipment. The lower unit on a stacked set of convection ovens is particularly susceptible to drafts when both ovens are in operation. Drafts can have an adverse effect on the operation of the equipment. Vent hoods that were not originally designed to support an oven can pose another problem. If the ventilation system is moving more air than what is required for the oven(s), the flame characteristics adversely affected, and the ventilation system will be pulling heat out of the oven chamber through the oven vent. This condition will extend cooking times, or in severe cases may not allow the oven to reach the preset temperature.

### Burners and Pilots

Burners and pilots on most ovens are fairly well protected. How frequently they require cleaning, depends on the operating environment. Ovens located in a bakery operation where flour and powders are used would require that the burners be cleaned and inspected more frequently. The burners are continuously pulling ambient air for combustion and mixing. Airborne particles will become trapped inside the burner and around the primary openings, causing the burner flame to soften. This condition can lead to incomplete combustion and yellow flames, which will cause the formation of soot in the burner compartment. Ovens not associated with bakery items still require the burners to be inspected and cleaned, though not as often. Normal dust and lint will still accumulate in the burners and needs to be cleared. Cleaning should be done with the unit turned off and allowed to cool down, not while in operation.

### Exterior Air Openings

Convection ovens and other units with air intakes must have air inlets cleaned periodically. Louvers and cutouts in the panels need to be kept clean and clear. Especially when vents are located in the back, mobile equipment (caster mounted) encourages regular maintenance by allowing personnel to reach all the panel openings. The fan motor should be included when discussing keeping air openings clear and clean. Access to the air openings on the fan motor, are at the back of the unit. Failure to keep the air openings clear will cause the motor to run hot and possibly overheat. The motor needs all the airflow possible to dissipate the heat generated by the motor and the heat conducted from the oven chamber. This is extremely important to the longevity of the fan motor. These motors usually have sealed bearings that require no maintenance.

### Oven Interior

#### Porcelain Enamel Finish:

Frequent cleaning is required, and spills should be cleaned as soon as possible to prevent carbonizing and a burnt condition. Wait until the oven is cool for complete cleaning. Usually a soap or detergent solution is strong enough to remove any greasy residue. A non-abrasive nylon cleaning mesh may be used for stubborn spills or stains. Care must be exercised when using commercial oven cleaning solutions. Remove racks and rack supports, as the chrome finish can be ruined by oven cleaning solutions. DO NOT allow the cleaner to come in contact with the temperature-sensing element located in the oven chamber. Foreign matter may collect on the fan blades and reduce the air circulation. Remove the fan baffle (if there is one), then, using a stiff brush, carefully clean each blade taking care not to bend or damage the fan assembly.



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# Ovens:

## Conventional, Convection & Deck

### Oven Interior (continued)

#### Continuous Clean Finish:

A finish that is dark brown or charcoal and white speckled can identify a continuous clean surface. This coating has a property that causes food and grease spatters to gradually clean away automatically when exposed to normal oven temperatures. Each day, after baking and roasting operations are complete, turn the temperature control to a high heat. This high heat will speed up the cleaning action and reduce the cleaning time. The cleaning time will depend on how soiled the finish is, usually thirty (30) minutes is sufficient. Ordinary household ammonia can be used to remove an excessive buildup without damaging the microscopic pores of the non-stick finish. An occasional light wiping with ammonia, while the oven is at room temperature, can be beneficial. An excessive buildup or crust on the oven interior will retard the automatic cleaning action. Even though the oven interior may appear clean, the oven should be operated at a high heat for two hours each month. This will prevent the buildup of solids in hard to see places and in the microscopic pores of the finish.

#### Stainless Steel:

On stainless steel interiors, spills should be cleaned as soon as possible to prevent carbonizing and a burnt condition. Wait until the oven is cool for complete cleaning. Deposits of baked on spatter; oil or grease may usually be removed with a commercial grade nontoxic stainless steel cleaner. Apply the cleaner to a cool oven and rub with the grain of the stainless steel. The racks, rack supports and blower wheel can be removed and soaked in a solution of ammonia and water to remove stubborn stains and residue. Care must be exercised to keep water away from the electrical switches and electronic controls as they could become damaged or short out.



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# Ranges:

## Open Top & Hot Top

### Energy Efficiency Tips

#### Open Burner

1. Burner flame tips should barely touch the bottom of the pans.
2. Burner flame should be completely blue and not lift or blow from the burner ports.
3. Use control knob to adjust burner heat. A large flame under a small pot wastes energy.
4. Never put ice or extremely cold pans on a heated surface.
5. Turn off burners when not in use.
6. Use lids to maintain food temperatures and increase efficiency.
7. Confirm the flame is blue, not yellow. If yellow, call for service.

#### Hot Top

1. Increase efficiency by using flat-bottom pots.
2. Use only the section of the hot top required.

### Cleaning Tips

#### Open Burners

1. After use, wash, scrub and rinse grates, burner bowls and spillover trays. Use grease solvent, if necessary.
2. If necessary, remove the burners and soak them in hot, soapy water.
3. Clean burner ports with a brush, stiff wire or ice pick. Rinse burner and let dry. Reinstall burner.
4. Cleanse front and sides of the range with a damp cloth.

#### Hot Top

1. Cool surface, and then loosen all burned food particles.
2. While surface is slightly warm, clean it gently with a wire brush.
3. Never pour water on hot top.
4. Remove rings and plates to clean all flanges and under lid.
5. Scrape off spillovers with blunt spatula. Wipe clean with absorbent dry cloth.
6. After cleaning, rub unpainted parts with a cloth dampened with cooking oil.
7. Cleanse front and sides of the range with a damp cloth.

#### Outside of Range

1. Cleanse front and sides of the range with a damp cloth.
2. Cleanse control knobs with damp cloth.
3. Using a clean cloth, polish trim with stainless steel polish.

Note: Find oven cleaning guidelines on page 6.

#### Safety Tips

1. Thoroughly clean the drip and grease trays. Grease and food particles are a fire hazard.
2. Clean all spills immediately. Dirt in gas burners can cause incomplete combustion.
3. When removing a lid, use dry potholders and carefully tilt the lid with opening away from you. This will direct steam from the pot away and avoid burns.
4. Be sure the pot handle is not hanging over the edge of the range.
5. Use caution when setting items on or close to a range. Paper or cloth items can ignite.
6. Be careful that your flammable sleeves and aprons don't contact hot areas when reaching across range tops.



# Ranges: Open Top & Hot Top

## Atmospheric Burner Basics:

### Common Problems and Corrections

Primary air, burning speed, port size, and depth of the port are several factors affecting flame stability. Flames on a burner tend to stabilize at a point where flow velocity out and burning speed back are equal. This balance of flow velocities and burning speed explain why flames change when the primary air or the gas input rate are adjusted. Natural gas burns at the rate of 25 inches per second. By comparison, propane burns at 32 inches per second and hydrogen at 112 inches per second.

**Yellow Flames:** Bunsen type flames should be completely blue. If not enough primary air is supplied; yellow tips appear in the flames. Normally 50 percent of the air required for complete combustion is drawn in through the primary air opening.

Recognizing Yellow Flames:

Do not confuse yellow tips with red or orange streaks, which sometimes appear in flames. These color streaks are due to dust and other impurities being consumed in the flame and represent no problem with the adjustment.

Results of Yellow Flames:

Yellow tipped flames indicate incomplete combustion. This condition is aggravated when the flames impinge on a cooler surface. Yellow flames produce free carbon (soot), and that can be a nuisance. On open burners, the cooking pans' exterior becomes blackened from the soot and difficult to clean. On a hot top, soot acts as an insulator and retards heat transfer. If allowed to accumulate, the soot blocks the natural venting process required to maintain complete combustion.

Correcting Yellow Flames:

Yellow flames are caused by a lack of sufficient primary air. This condition may be due simply to an incorrect air shutter adjustment. A burner orifice out of alignment with the mixer tube will reduce primary air inspiration by lowering the gas velocity in the mixer tube (common on commercial cooking equipment). Correct by aligning the orifice with the mixer tube. A burr or debris on the orifice can also cause reduced gas velocity creating yellow flames on the burner.

**Blowing or Lifting Flames:** When blowing flames occur, part of the flame lifts or "dances" on the burner port. This may occur on a few or all of the ports of a burner. The flames will blow off the burner ports when the flow velocity of the air/gas mixture from a port exceeds the flame velocity. The flame cannot stabilize at the burner port, as in normal operation.

Recognizing Blowing Flames:

Lifting flames rise from the ports to burn some distance above the port. In some cases, these flames will drop back to the port and lift again intermittently. If the flames lift from a number of ports they may create a distinct flame noise.

Results of a Blowing Flame:

The noise created may cause the user to complain. Of a more serious nature, incomplete combustion will occur when there is a tearing or distortion of the flame pattern.

Correcting Blowing Flames:

The simplest way to stop burner flames from blowing is to reduce the primary air. This will be effective only if the burner gas is supplied at the rated input for the burner.



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# Ranges: Open Top & Hot Top

## Atmospheric Burner Basics:

### Common Problems and Corrections (continued)

#### Other Causes of Blowing Flames:

Contamination of primary or secondary air (air surrounding the burner flame) may cause the burner flame to blow or lift away from the burner. A typical example of this condition is when oven products of combustion leak into the range top burner area. Lifting of top burner and pilot flames are caused by the contaminated air (oxygen deficient) surrounding the burner head. In extreme cases this problem can cause pilot outage and difficulty keeping the burner lit on low flame.

**Flashback:** When flashback occurs in a burner, the air/gas mixture ignites inside the burner to burn near the orifice. This burning in the mixer tube usually creates a roaring noise like a blowtorch.

#### Results of Flashback:

Any flashback condition should be avoided. The burning action inside the mixer tube does not get enough air. Combustion is incomplete, producing odors and carbon (soot), which clogs inside of the burner.

#### Correcting for Flashback:

Reducing primary air to the burner usually can eliminate flashback on ignition or during burner operation. The input rate may be too low or the orifice may have been enlarged, thereby reducing the gas velocity. Burner valves that fail to shut off completely can also be a source of burner flashback. Repair or replace the valve. A common occurrence with a commercial range top-burner is the build-up of excessive grease or debris inside the burner that can slow the gas/air mixture down and cause flashback to occur.

**Fluctuating Flames:** This condition usually indicates a non-uniform gas pressure.

#### Recognizing Fluctuating Flames:

Lengths of the burner flame may increase and decrease (fluctuate) over a short period of time with no burner readjustment. Burner flame lifting may also be associated with flame fluctuation.

#### Results of Fluctuating Flames:

Fluctuating flames do not usually create any immediate problems, such as incomplete combustion, unless the flame impinges on a cool surface. This condition should be corrected, however, since it warns of possible future problems.

#### Correcting Fluctuating Flames:

Unsteady gas pressure causes flames to fluctuate. Usually the condition indicates a problem with the gas pressure regulator (most common), sticking gas meter or, a faulty gas service regulator. Water or other liquids in the gas supply line can cause the gas pressure fluctuate.

**Smothering Flames:** Smothering occurs most often in an enclosed area such as the burner compartment of an oven or burners under a hot top. Smothering flames are lazy looking. The flame does not display well-defined cones, and appears to be "reaching" for the air. They are quiet flames, which roll around in the combustion chamber, sometimes completely off the burner ports.

#### Recognizing Smothering Flames:

The difference between smothering flames and lifting (blowing) flames should be clearly understood. Both conditions are undesirable, but the causes and corrective steps are different in each case. Blowing or lifting flames are well defined and hard, and may create a blowing noise. Cutting back on the primary air usually stops a flame from lifting.



# Ranges:

## Open Top & Hot Top

## Atmospheric Burner Basics:

### Common Problems and Corrections (continued)

#### Results of Smothering Flames:

Smothering flames indicate incomplete combustion. They point to a dangerous condition, which requires prompt action. If the secondary air supply is reduced or contaminated, the flame searches for clean air in order to burn off all the fuel. This may cause the flame to extend out of the burner compartment area as it searches for air.

#### Correcting Smothering Flames:

The equipment may be overrated (too much input). If this is the case, the flue outlet area provided for the correct input may be too small for the increased gas rate. Check the found gas rate against the rating plate. If the equipment is found over gassed, de-rating may be necessary to correct the problem. Other conditions may cause poor venting and lead to smothering flames. Check and clear the flueway. Make sure that there is adequate secondary air available to the area supporting combustion.

**Flame Rollout or Delayed Ignition:** Flame rolls out of the combustion chamber or burner area when the burner is turned on.

#### Results of Flame Rollout or Delayed Ignition:

Flame rollout may create a fire hazard and will: scorch appliance finishes, burn wiring and damage controls. The gas in the burner mixer may be ignited, producing flashback.

#### Correcting Flame Rollout or Delayed Ignition:

The basic cause for delayed ignition is the pilot being out of position, or a pilot adjusted too low for rapid ignition. Lack of air due to over rating of the burners may be the cause. Drafts or blockage of the flueway is another possible cause. Defective gas controls that open too slowly can also contribute to this condition by not supplying a volume of gas needed for proper ignition.



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# Broilers:

## Overfired & Underfired

### Energy Efficiency Tips

1. Keep equipment clean to reduce smoking and flareups. Clean grates retain heat and increase heat transfer to the product.
2. Avoid overfiring an underfired broiler and minimize preheat time prior to use.
3. Raise cooking grate to the highest position during preheating, then lower to desired cooking position.
4. Handle ceramic burners carefully.
5. Never soak ceramic burners.
6. Cook with full loads whenever possible.
7. Replace damaged ceramic burners as soon as possible.
8. Flames should never float or strike directly on refractor elements, but should just touch the surface.
9. During slack period, turn ceramic radiant burners to "low" and turn infrared burners off.

### Broiler Cleaning Tips

1. Turn off the charbroiler and allow to cool.
2. Scrape food build-up off grates and radiants.
3. If using an overfired broiler, remove grates and wipe clean with damp cloth.
4. Clean drip shields, baffles and sides of broiler with a damp cloth.
5. Clean burners with a wire brush, if necessary, and wipe clean with a damp cloth.
6. Thoroughly clean the grease pan. Wash with detergent and water or degreaser if required. Return it to the charbroiler.
7. Check briquettes or lava rocks. These need to be turned periodically. Briquettes or rocks may be cleaned in the dishwasher on an as-needed basis. Briquettes or rock may need to be replaced every six to eight months to ensure even heat.
8. Check for proper burner adjustment. Flames should have a distinct cone and be completely blue. Adjust air shutters as needed.
9. Cleanse the outside of the charbroiler with a damp cloth.

### Broiler Safety Tips

1. Keep grease pan clean to prevent grease fire or flare-up from the excess fat.
2. Don't overheat a broiler. It can be dangerous and cause premature component failure.



# Broilers:

## Overfired & Underfired

### Drafts and Ventilation

Usually if the equipment remains in its original location, problems with drafts and ventilation do not occur. When the equipment is moved to another location or there is a change to the room, problems can arise. Something as simple as leaving a door open can create drafts that affect the operation of the equipment. Vent hoods that were not originally designed to support a charbroiler can pose another problem, as charbroilers have the highest thermal load in the kitchen. If the ventilation system is under-rated for the equipment, smoke and pollutants in the kitchen will result. Equipment panels and controls can also get extremely hot, causing possible burns to the operator. If the ventilation system is over-rated for the equipment it will pull heat from the charbroiler too quickly, reducing the temperature of the grates and radiants, and lengthening the cooking time required. Products such as steaks, chops and chicken do not get seared to seal in the flavor and juices, thereby producing a less appealing product.

### Burners and Pilots

The frequency that burners and pilots require cleaning depends on the operating environment and usage. Under-fired and overfired broiler burners are particularly susceptible to airborne dust and lint blocking the primary air opening. As surfaces become sticky with cooking residue, airborne particles cannot pass through the burner, but rather are captured on the surfaces. This condition can lead to a yellow flame, which will cause the formation of soot. This is an all too common problem with burners located under metal "V" shaped radiants. Once the soot begins to form on the underside of the radiant, significant heat loss begins to occur, since the soot acts as an insulator. As the soot continues to build, there is less room for combustion and natural venting, resulting in a smothering flame. The heating value of the affected burners drops dramatically.

Burners, pilots and radiants should be inspected on a regular basis, and cleaning should be done with the unit turned off, not while in operation. This can be easily accomplished in most cases by removing the burners and washing them out. In extreme cases they may need to be soaked in a commercial degreasing solution, then washed out. Soot accumulation on the radiants can simply be washed off with a hose or at the sink faucet. Pilots that become clogged should be replaced or cleaned. The extreme heat generated by the burners will deteriorate the steel tubing of the pilots eventually clogging them. These are simple manual pilots that can easily be replaced when the unit is off and has cooled down. Never substitute aluminum tubing for the steel tubing, as the heat is too excessive for aluminum to withstand.

### Radiants

Radiants can be cast iron, stamped metal plates, ceramic plates or lava and ceramic briquettes. The briquettes may be used alone or in conjunction with metal radiants on under-fired broilers. The briquettes should be evenly distributed over the burners, without any large gaps, to aid in the even distribution of heat. Metal radiants that become warped should be replaced. Warped radiants on under-fired broilers are a particular problem since they usually warp down towards the burner. This creates a smothering burner condition due to the lack of space above the burner for complete combustion to take place. This condition reduces the available heat for cooking and produces incomplete combustion. Radiants of all types should be inspected regularly and replaced if they are warped, broken or showing signs of deterioration.

### Burner Valves and Controls

The high temperatures associated with all types of charbroilers will dry out the lubricant used in the burner valves making them hard to turn. When this occurs, they should be disassembled, cleaned and fresh lubrication applied to the surfaces. Continued use of a valve or control that is hard to turn will eventually damage the valve or control and require it to be replaced. It is much more cost effective to keep the valves and controls in good working order. Lubrication and replacement of burner valves is a job best left to a qualified service person.



# Broilers:

## Overfired & Underfired

### Exterior Air Openings

Charbroilers, like other units with air intakes need to have air inlets cleaned periodically. Louvers and cutouts in the panels need to be kept clean and clear. Especially when vents are located in the back, mobile equipment (caster mounted) encourages regular maintenance by allowing personnel to reach all the panel openings. The motor (conveyor broiler) should be included when we discuss keeping air openings clear and clean. Failure to keep the air openings clear will cause the motor to run hot and possibly overheat. The motor needs all the air flow it can get to dissipate the heat generated by the motor and the heat conducted from the cooking area. This is extremely important to the longevity of the motor. These motors usually have sealed bearings that require no maintenance.

### Exterior:

### Stainless Steel Surfaces

Food spatters, spills and greasy residue should be cleaned as soon as possible to prevent carbonizing and a burnt on condition. Wait until the charbroiler is cool for complete cleaning. Deposits of baked on spatter, oil or grease may usually be removed with a commercial grade non-toxic stainless steel cleaner. Apply the cleaner to a cool surface and rub with the grain of the stainless steel. For stubborn stains, use only scouring pads specifically designed for stainless steel. Ordinary steel wool pads will damage the finish.

### Grates, Racks and Drip Trays

Clean both sides of the grates regularly with a wire brush while still warm. Make sure to clear the build-up in the troughs on either side of the grate rib that allows fat and drippings to run off. If they do not run off, they will spill over and create excessive flame up instead of running to the end of the grate and into the grease trough. The rack can be cleaned when warm with a wire brush also. If this is not done regularly, a burnt on build-up will occur and excessive measures will have to be taken to clean the build-up. The grease tray or pan should be drained while the grease is still warm and will pour easily out of the container. The grease and drippings should not be allowed to accumulate where the pan is located close to the heat source, such as over-fired broilers. The grease could become hot enough to flash and catch fire. Some units have a shield over the grease pan to protect the grease from catching fire. Many charbroilers have a debris screen over the drip tray to catch the large particles that fall through the grates. These should be removed and cleaned daily. Conveyor type charbroilers will require the belt to be removed in order to perform a thorough cleaning. Usually, removing panels and locating the master link of the belt will accomplish this. Removal of the master link allows the belt to be removed for cleaning and any other maintenance that may be required. Consult the owner's manual or contact the manufacturer for specific information on removing the conveyor belt.