Restoration of Major Appliances

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RESTORATION OF MAJOR APPLIANCES

Introduction

This paper will deal with limited cosmetic and mechanical restoration of major kitchen and laundry appliances. The subject material will be limited to the type of damage most fire restoration contractors would be capable of of providing. It is not the intent of this paper to deal with servicing and part replacements that should be referred to an appliance service contractor.
The goal of this report is to provide information to restoration contractors with which they can work and expand their service.

QUALIFIER

The appliances covered herein are complex electro-mechanical units. Any attempt to repair, inspect or clean may, if improperly preformed, result in personal injury or property damage. The writer as well as the Association of Specialists in cleaning and Restoration cannot assume responsibility for the interpretation of this paper nor can they assume any liability in connection with its use.

The information contained in this report is based on the knowledge gained by Smokecontrol Services, Inc. in their restoration of major appliances over the past 14 years, and from repair manuals printed by appliance manufacturers.

ATTENTION - HAZARD

BEFORE ATTEMPTING ANY INSPECTION

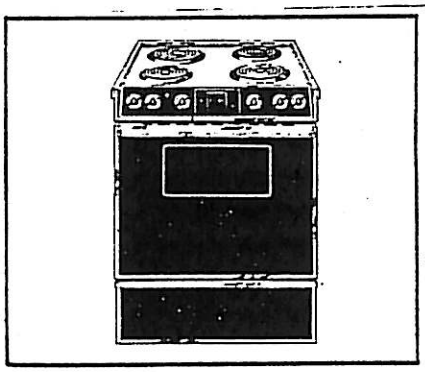
OR REPAIR OF ANY APPLIANCE

BE SURE ELECTRICAL AND/OR

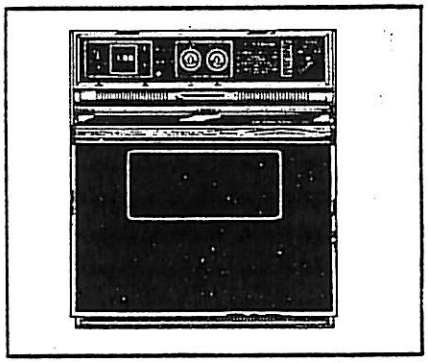
GAS SUPPLY IS DISCONNECTED

KITCHEN APPLIANCES

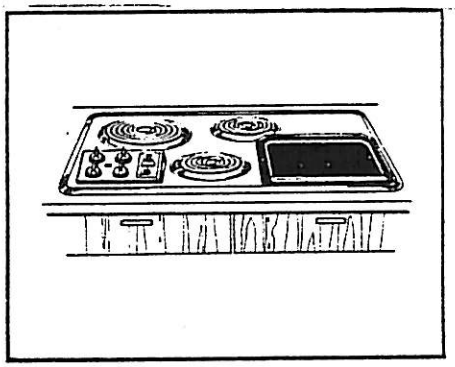
RANGES (Includes, free standing, drop ins, oven & surface units.)



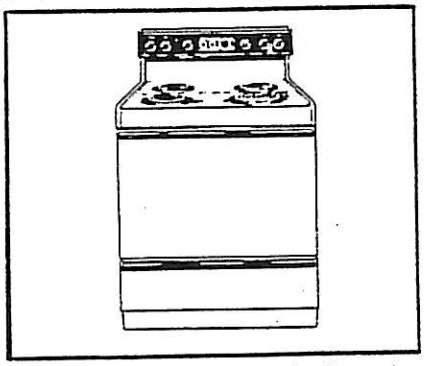
Slide-in range: versatile range that is designed to slide into a 30" opening between cabinets. It may also be used as a free standing unit.



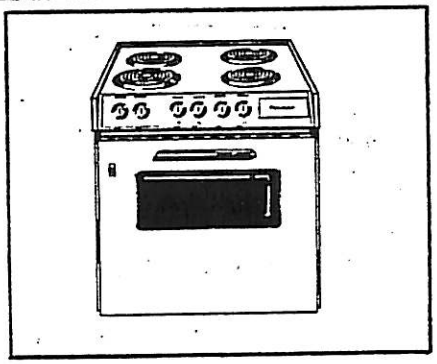
Built-in oven: popular design for kitchens with a custom appearance. Single or double ovens feature eye-level controls. A separate built-in cooktop is usually used.



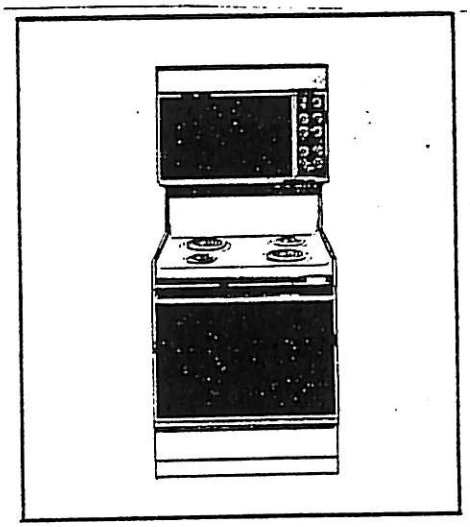
Built-in cooktop: features ceramic glass, Calrod® surface units, or a combination of surface units and a grill/griddle. Controls are located on cooktop or in a companion hood.



Free Standing range: designed to be used as a free standing unit, though it is often installed between cabinets. Controls are located on the backsplash.



Built-in range: designed to fit in a standard 27" range cabinet generally features up-front controls and an optional backsplash.



Hi/Low range: complete cooking center that features double oven convenience. Has eye-level controls and ceramic or Calrod® surface unit cooktop.

A. RANGE CABINETS

The cabinet or housing of a range usually will be enameled steel, porcelain or a combination of the two. *The top and door are almost always porcelain and will seldom be damaged by smoke and soot. A thorough cleaning using a solvent base cleaner, followed with a rinse is sufficient. The sides are almost always enameled steel and can be stained by smoke. The sides should first be washed using a solvent base cleaner, followed with a rinse. If there is staining, usually a yellow or light brown, then spray painting is called for. If the restoration contractor does not have his own in-house spraying facility, an outside contractor can usually perform this service at the job site.

*Some units feature ceramic tops. Abrasive type cleaners must not be used.

B. TRIM

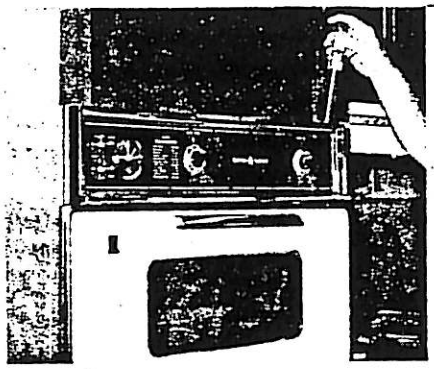
The trim (usually chrome) on ranges can receive major damage during and also following a fire. The protective coating on chrome can easily and rapidly be destroyed by smoke residue allowing the acid to attack the metal. Once this has occured, replacement is the only alternative. However, if the restorer is able to act quickly, a thorough cleaning followed by a light application of a protective coating of oil will prevent costly replacement of chrome trim. Plastics are sometimes used on ranges as control knobs and various other parts. These may not be affected and can be cleaned using a good all purpose cleaner. Heat and certain types of smoke may permanently stain plastic however, requiring replacement.

C. ELECTROMECHANICAL (Electric Ranges)

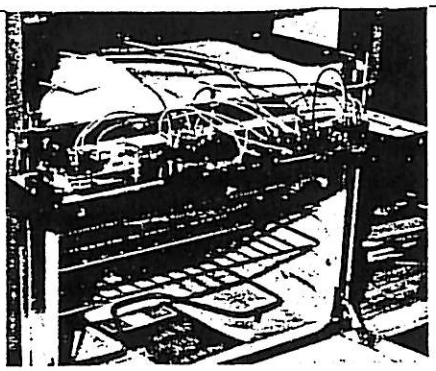
1. Control Panel

Be sure range is not connected to power source.

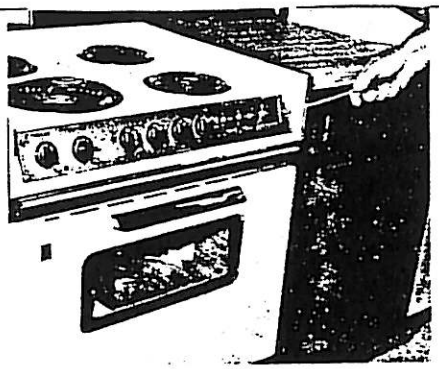
The central panel on a range is usually located at a point where heavier damage might occur. Special care should be taken when inspecting the central panels of a range. This is the location of the expensive parts of the unit and replacement cost of one or two controls could exceed the value of the range. In the report, I am not suggesting that the restorer be qualified to test and replace the complicated parts in a range. If this is required, the manufacturer service representative should be called. However, cleaning of these parts should not be a problem for most restorers. Access to the controls is not difficult. Once access has been gained, either by removing the entire panel (see pictures) or by removing cover, a visual inspection should be made. If anything abnormal is seen, ie, burned wires, corroded terminals, etc., call a service man. If however, you only see smoke residue, proceed with cleaning. The panel housing should be cleaned using an all purpose cleaner while all the switches and contacts may be cleaned with a contact cleaner, purchased at an electronic parts supply house. Once inspected and cleaned, the panel may be re-assembled.



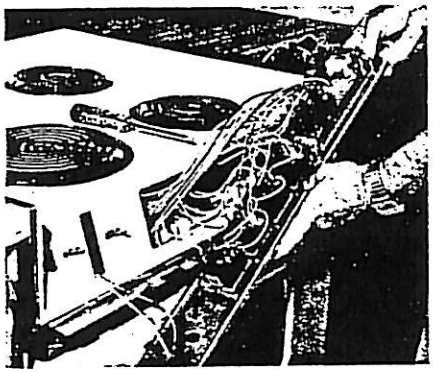
Wall ovens. These ranges are designed to allow servicing from the front without removing range from wall or cabinet. To remove service panel, locate and unscrew screws.



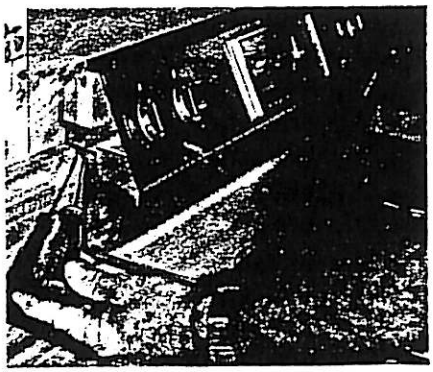
With retaining panel lowered on wall oven, wiring, switches and timer are exposed. Heating units can be removed from inside oven. Pull out top oven rack to support extended control panel.



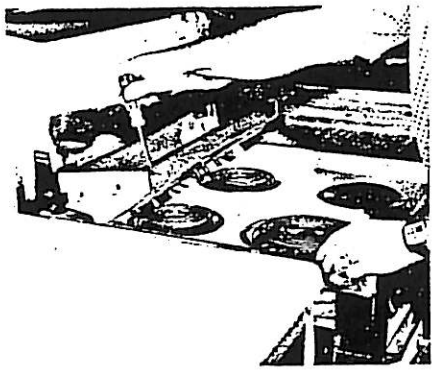
Built-in ranges. Switch panel on most built-in ranges and cooktops can be removed after first removing retaining screws. After screws are unscrewed, move panel upward to release from spring clip.



With switch panel loose, switches, pilot lights, wiring harness and timer are accessible. Switches can be freed from panel by removing mounting screws located under knobs.



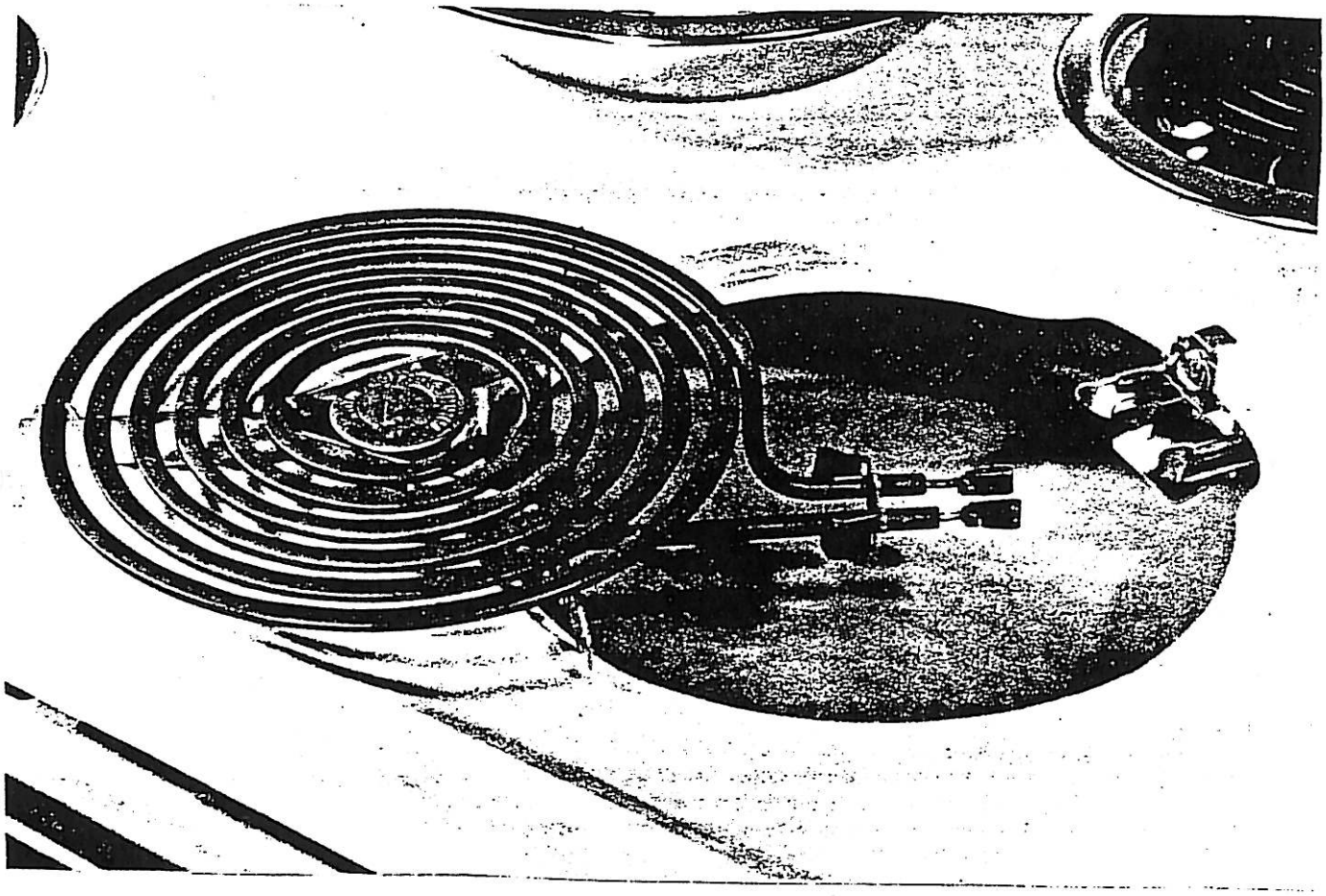
Built-in and drop-in ranges with controls mounted on backsplash can be serviced from front. Remove retaining screws at each side of end cap to release backsplash.



With screws removed, entire backsplash assembly can be pulled forward and lowered. Remove access panel to reach controls and wiring.

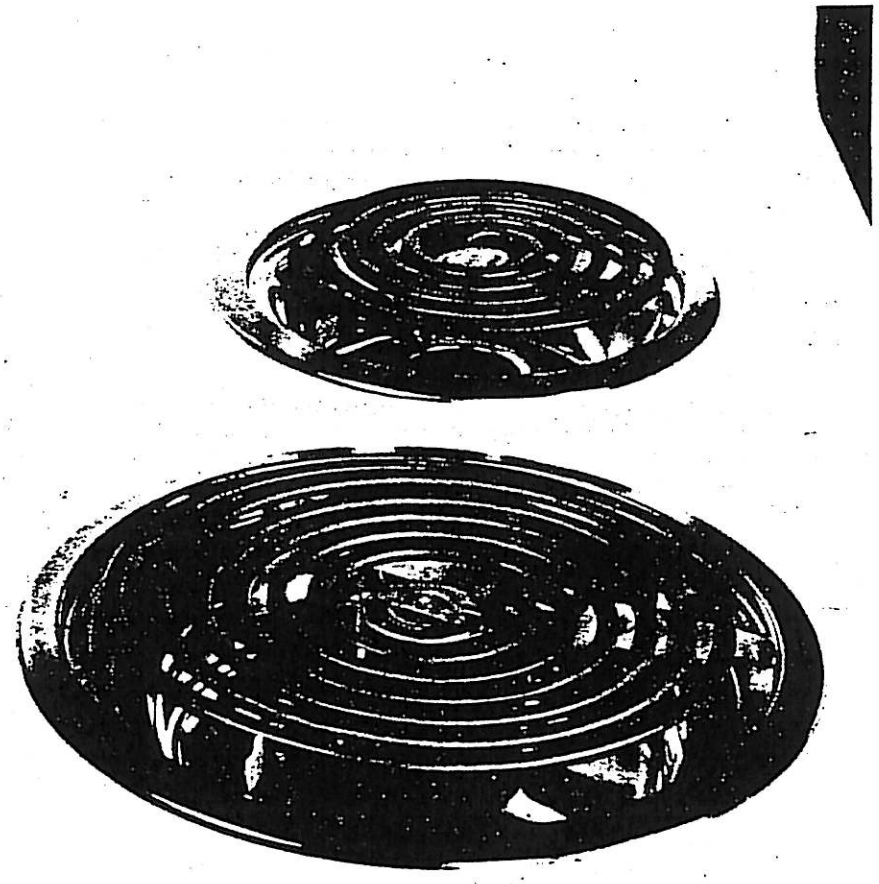
2. BURNER

Most ranges feature single coil plug in surface units.

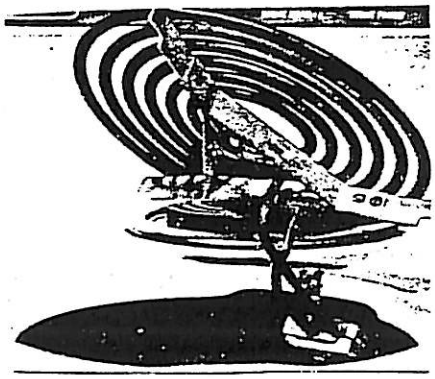


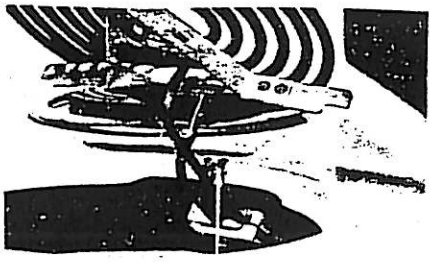
These units can be removed by lifting unit up about one inch, then pulling from receptacle. Care should be taken not to bend terminals. (See picture) Once the surface unit is removed, the reflector pan and rim can be removed, allowing for inspection and cleaning. Some ranges utilize wired type surface units. If this is the case with your unit, you will need to lift the unit and remove the reflector pan. (See picture) This will allow you

to inspect the burner unit, clean the unit, the reflector pan and allow access to the area below the reflector pan.



One-coil wired type surface unit





OVEN

The interior of ovens usually are not damaged by soot/smoke since they are internal. However, the oven racks and walls should be cleaned using a metal detergent.

D. Gas Ranges:

Gas ranges differ from electric in the burner and control.

1. Controls: (Timer, clocks, etc.)
   Should be treated same as stated under electric range.

2. Burners:
   Burner assemblies can be readily disassembled for inspection and cleaning.

3. Oven:
   Should be treated as stated under electric ranges

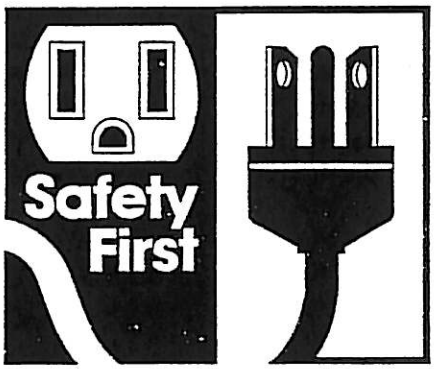
Refrigerator/Freezers

A. Cabinet: (Housing)

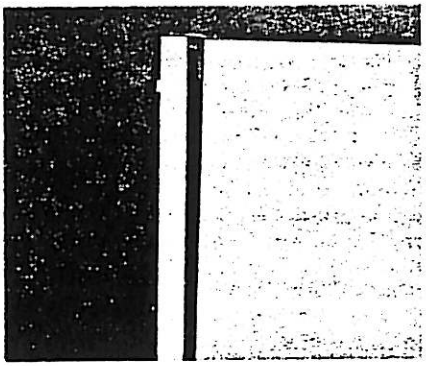
Refrigerator/freezer cabinets are enameled steel. They can be washed using a solvent based cleaner, followed by a clean rinse. If the cabinet is stained, usually yellow or light brown spray painting may be required. This is a relatively inexpensive procedure and should be considered. In over 14 years, we have yet to have a complaint on spray painted appliances.

B. TRIM:
Trim on most appliances is chrome and due to the very thin protective coating, can be damaged pemanently by the acid contained in soot and smoke. Since the treatment of all chrome is the same, refer to trim under ranges.

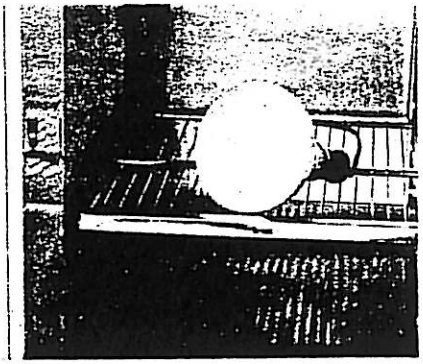
C. Door Gaskets:
The door gaskets on refrigerators and freezers are sometimes damaged by soot, smoke and heat. If damage has occured, the gasket will be yellowed or may be brittle or not as pliable as it should be. If this occurs, replacement is necessary. Replacement is not difficult and may be replaced by the restoration contractor. There are these basic types of door gaskets: Compression, magnetic or a combination of both. Compression type gaskets are used on chest freezers and on refrigerators that have a magnetic door latch. To replace, follow these instructions.



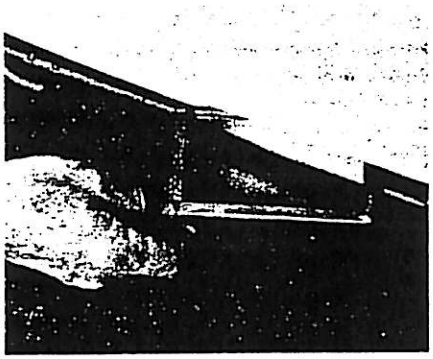
Step 1: UNPLUG the refrigerator or freezer from the wall receptacle. Watch for sharp edges.



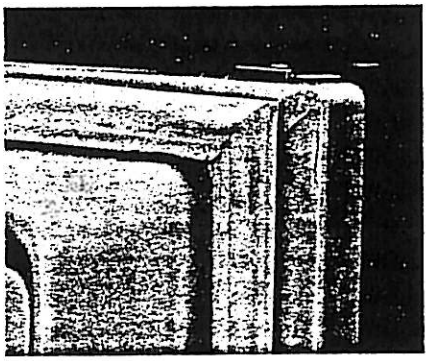
Step 2: Be sure gasket replacement is absolutely necessary. Often incorrect door alignment can be the cause of poor gasket sealing. Re-leveling the cabinet or adjustment to hinge may correct seal. Read Procedure #17: Door Alignment.



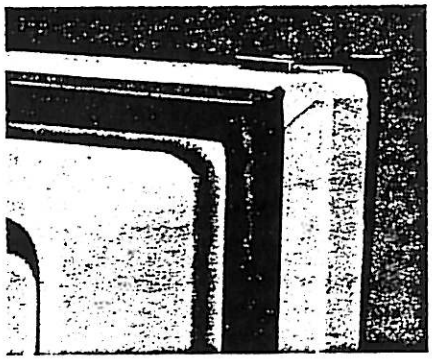
Step 3: The only sure method of checking door gasket seal is to place a 150 watt outdoor flood light inside the cabinet. Direct the light at one length of gasket at a time with door closed. Gasket will allow door to close on cord.



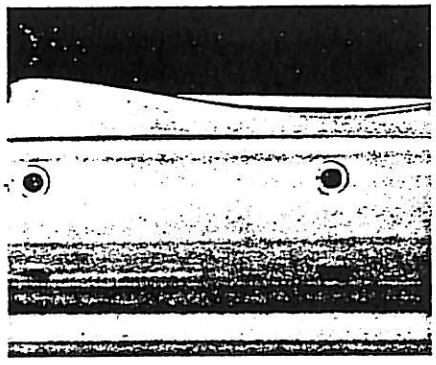
Step 4: Inspect for light translucency at seal. Use a mirror to inspect along the length of gasket at the bottom of the door. A satisfactory seal is present when there is no light leakage. Any visible damage calls for a new gasket.



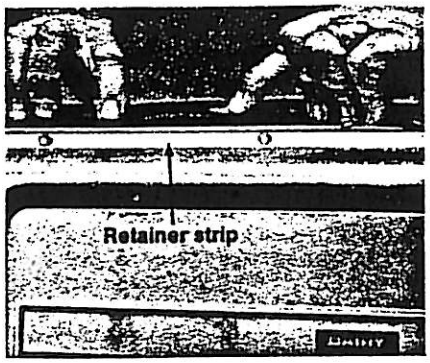
Step 5: There are three basic types of door gaskets: compression, magnetic or a combination of both. Compression type gaskets are used on chest freezers and on refrigerators that have a magnetic door latch.



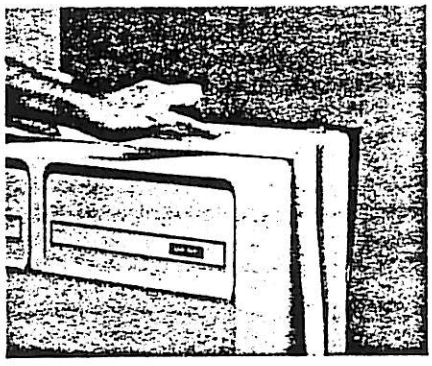
Step 6: Most magnetic gaskets have magnetic strips at all four sides. Some are designed to have less pull on the hinge side of the cabinet. The weaker magnetic side is identified by either ribs or a small hole on the underside of the gasket.



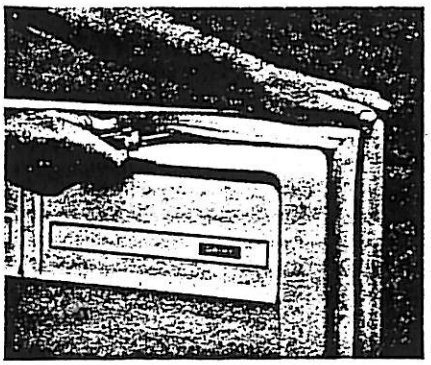
Step 7: On models where screws pass through the inner door panel and gasket, it is sometimes necessary to remove the screws. Make a note of gasket installation and screws used for reference and replacement.



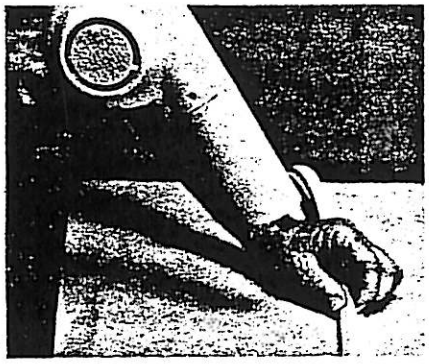
Step 8: To remove a gasket in models having retainer strips, it is only necessary to loosen screws that pass through the retainer and inner door panel. The gasket can then be pulled free from under the retainer.



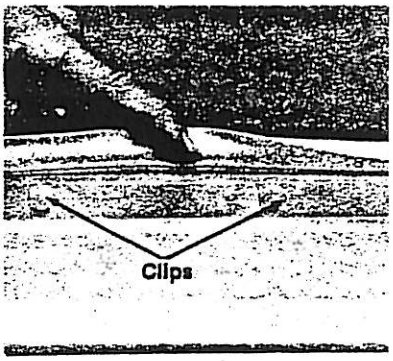
Step 9: To replace gasket, loosen or remove screws for top two-thirds of door liner. Take old gasket out. Install new gasket making sure lip of gasket is fully under edge of retainer strip. Do not tighten screws completely.



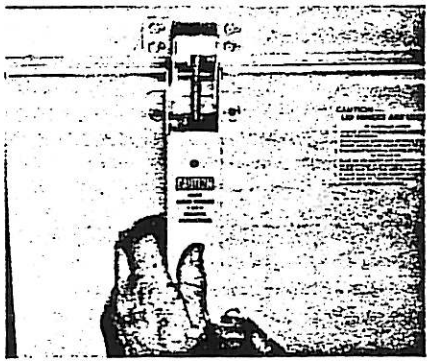
Step 10: Complete lower third of door gasket. Adjust door alignment with cabinet before tightening screws. If you are unfamiliar with this process, please refer to Procedure #17: Door Alignment.



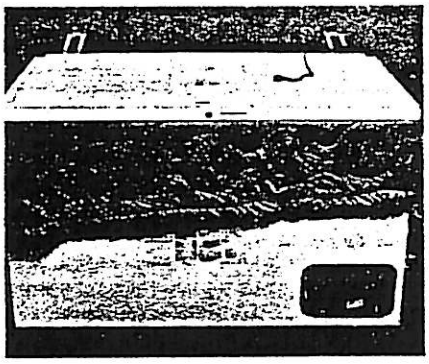
Step 11: Compression gaskets may take time to seat properly. If new gasket has wrinkles or creases when removed from carton, use a hair dryer or warm water to soften gasket and remove wrinkles.



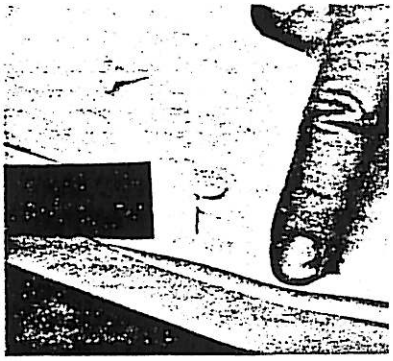
Step 12: Compression type gaskets are generally used on chest freezers. Some, however, have a magnetic strip at the handle side of the lid. Clips and/or plastic pins are used to hold the gasket and inner pane to lid.



Step 13: To replace chest freezer gasket, remove lid. CAUTION: (Use extreme care when removing freezer hinges.) Hinges are mounted with spring pressure. Hold tension on hinge while removing screws, gradually release pressure when screws are removed.

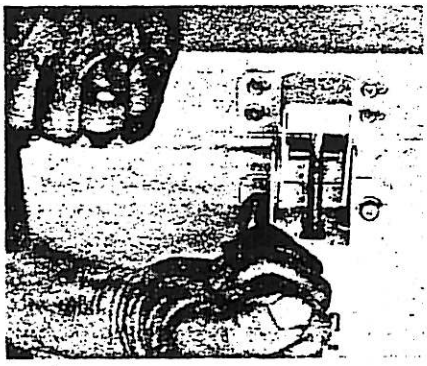


Step 14: Place lid upside down on quilt over freezer cabinet. This will make gasket easier to replace and quilt will protect cabinet finish. (May require two people).

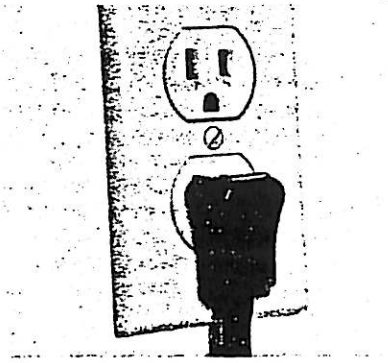


Step 15: To remove gasket, carefully pry out clips. Wrap putty knife blade with masking tape so as not to damage inner liner or break clips.

Step 16: Take note of how retaining clips are installed for new gasket replacement. To replace chest freezer gasket, fit new gasket beneath inner panel and reinsert clips working gasket carefully in place.



Step 17: The lid on a chest freezer is designed to "float" and self-align. Make any adjustments for lid alignment at hinges. If you are unfamiliar with this process refer to Procedure #17: Door Alignment

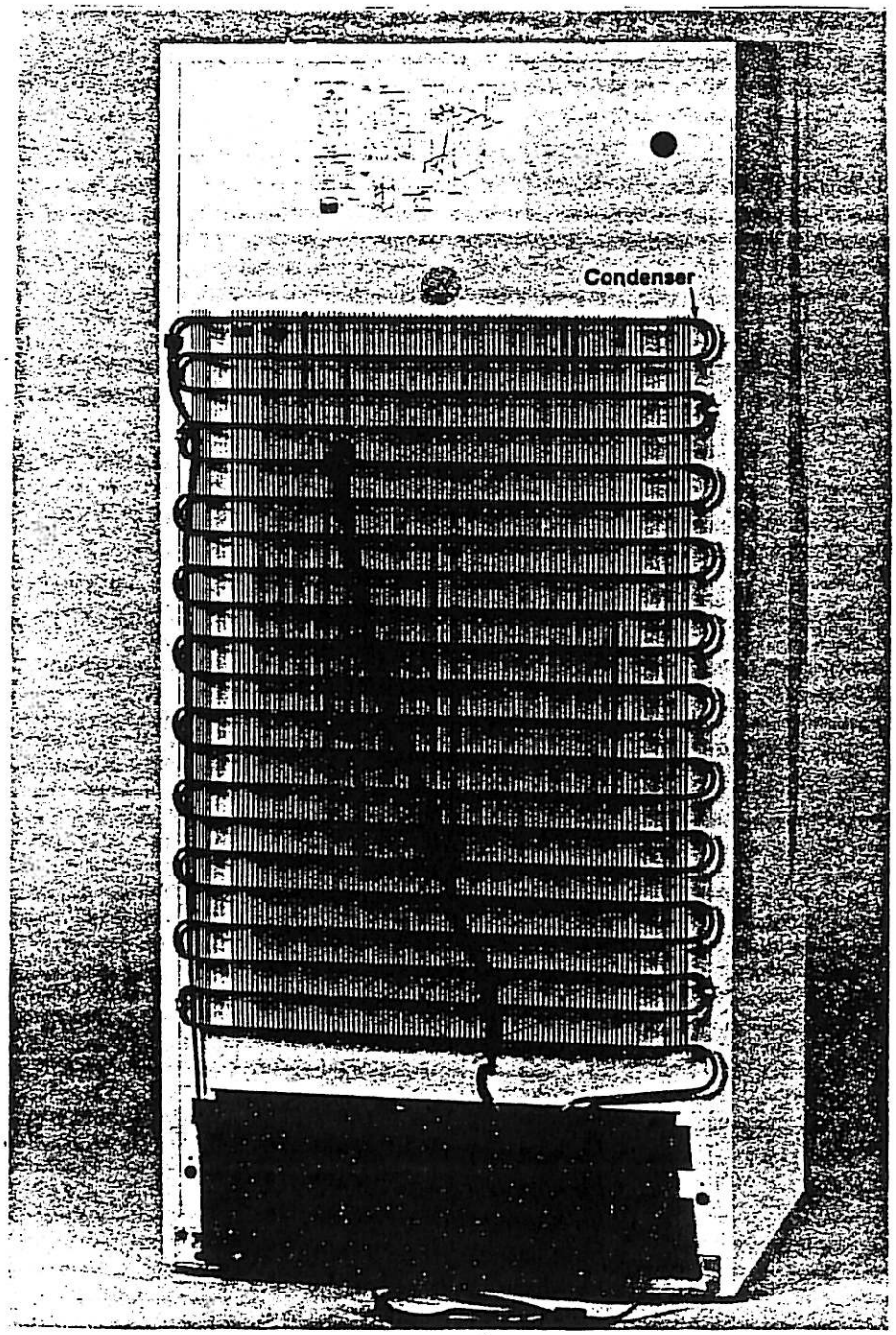


Step 18: Reassemble refrigerator and reconnect power supply.

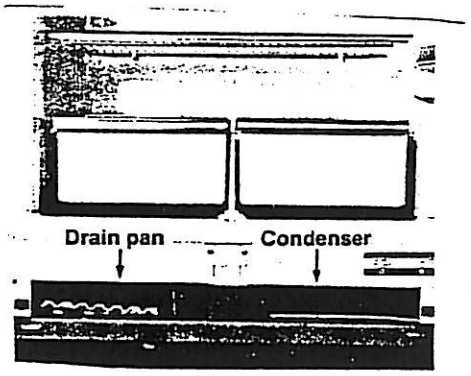
D. Electromechanical:
Most of mechanical parts to refrigerators/ freezers are sealed or otherwise protected and generally do not sustain damage other than collecting soot/smoke.

1. Condenser
Condensers can be located at the bottom of unit or may be attached to the back. (See Picture) In either case, they should be thoroughly cleaned using either a vacuum with a crevice tool or compressed air to blow the residue from the coil. The condenser is one of the most important components of the refrigerator/freezer and care should be taken to insure that it is clean.

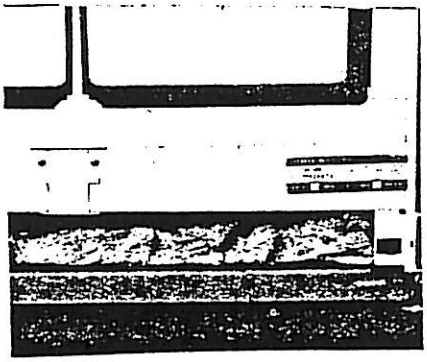
CONDENSER LOCATION



REAR MOUNT

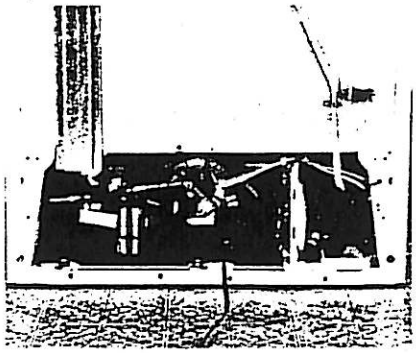


BOTTOM MOUNT
FRONT VIEW

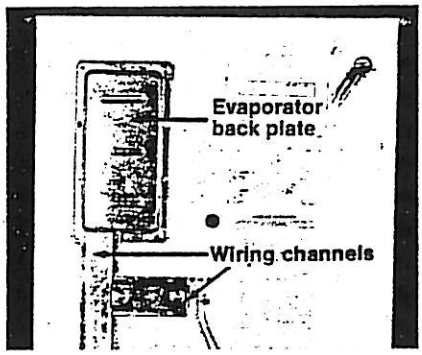


BOTTOM MOUNT
REAR VIEW

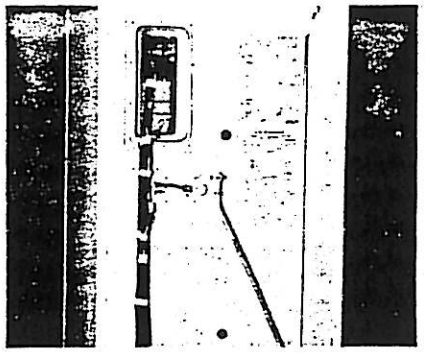
2. Compressor
   Compressors are located at the bottom of the appliance and access is gained by removing protective panels. (See pictures) The compressor unit then can be cleaned using a vacuum or compressed air. Wiping of various components with an all purpose detergent may also be helpful.



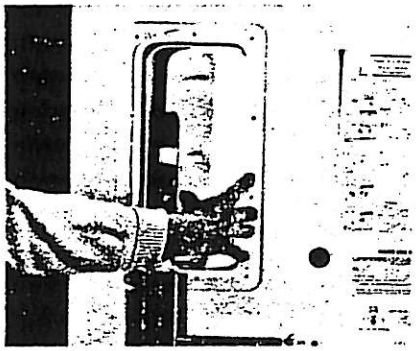
Removing the lower access panel exposes wiring, power cord connection, compressor, and on some models the condenser fan.



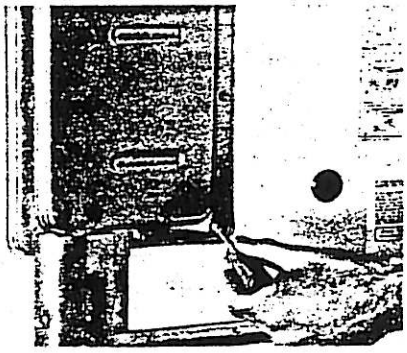
Some models have metal channels that cover wiring and/or tubing. These are attached with hex head screws. Remove with a nut driver.



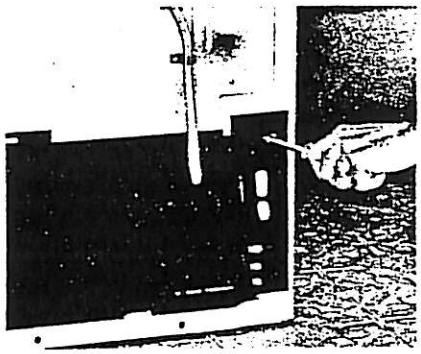
The removal of these metal covers will give access to some external wiring and the rear of the evaporator. Some models have different cover configurations, but removal is basically the same.



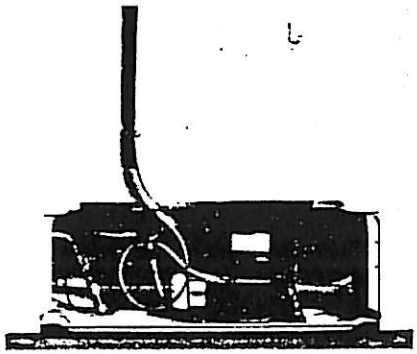
On models with evaporator back plate, remove screws. Carefully pry back plate from outer case back. Avoid damaging back plate gasket. Grasp right side of foam block and rotate out of opening. Do not pry foam.



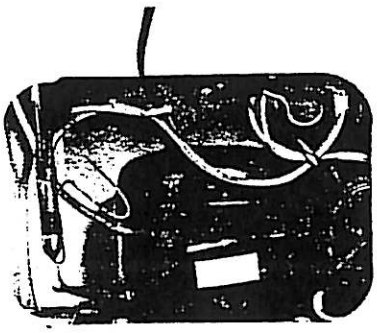
When replacing back plate, check condition of gasket. Tighten screws in rotation sequence until the screws are hand tight. Cover must be sealed to back of refrigerator.



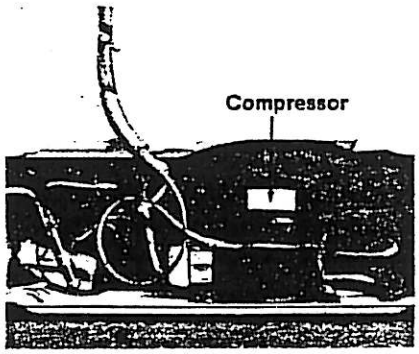
When replacing fiber board panel, re-attach the power cord strain relief. Make sure all ground wires are reconnected.



Some upright freezers have open machine compartments. Other models have access panels similar to refrigerators. Follow instructions for refrigerator access panel removal to remove freezer access panels when used.



Most chest freezers have open access panels at the rear. Some models have a metal side access cover held in place by screws.



Wiring connections and the compressor are located in the machine compartment. Basic components that may require servicing are usually located within this compartment.

3. Controls:
   The controls and all other electro-mechanical components are located inside the appliance and usually not affected by smoke or soot.

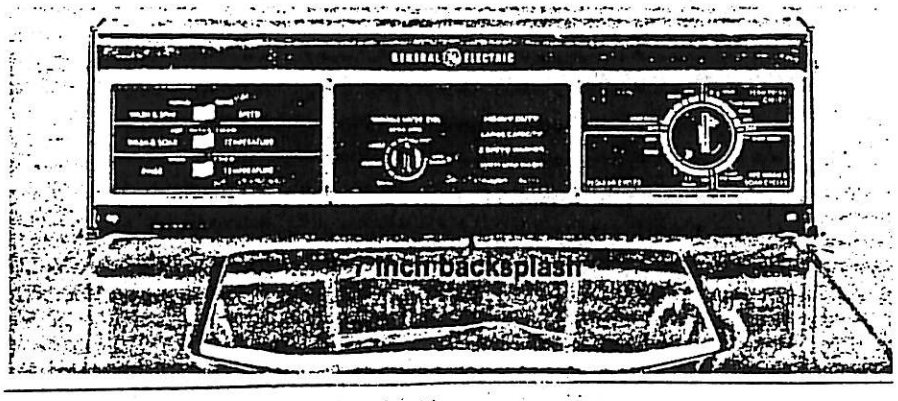
4. Interior Surface:
   Interior surfaces of refrigerators/freezers are not usually exposed to soot and smoke, however, a thorough washing with a mild detergent is recommended.

Washers

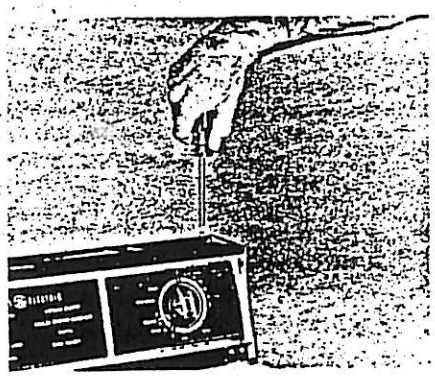
A. Cabinet:
Washer cabinets are usually constructed of porcelin tops and enameled steel side walls. Since we have discussed these under previous headings, we will not go in to the procedure here.

B. Trim:
Since we have discussed the procedure for trim in previous headings, we will not go in to the procedure here.

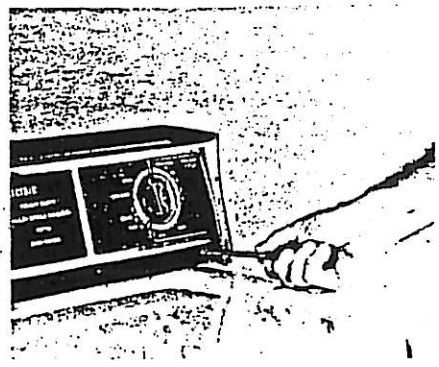
C. Operating Panel:
The operating panel is located to the front of the backsplash assembly and contains the very delicate electromechanical equipemnt required to operate the washer. Dut to its location, it may be subject to heavier smoke/soot damage. The panel assembly can be removed using the following directions. (Some models may vary slightly)



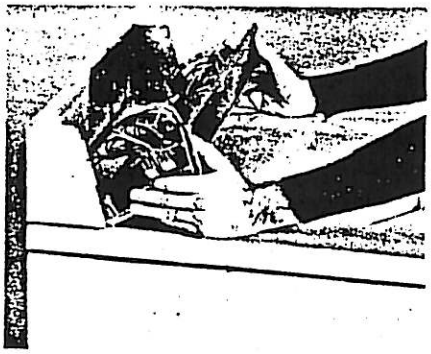
Step 1: Be sure all washer controls are turned OFF. Unplug the washer from the receptacle.



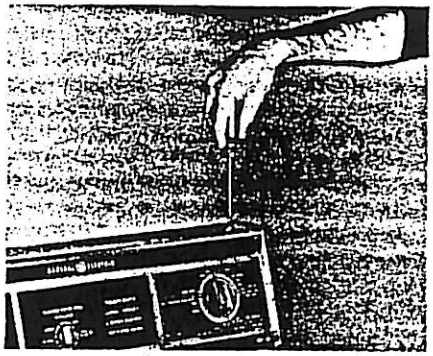
Step 2: Removing 6 inch operating panel. Using Phillips screwdriver, remove two screws



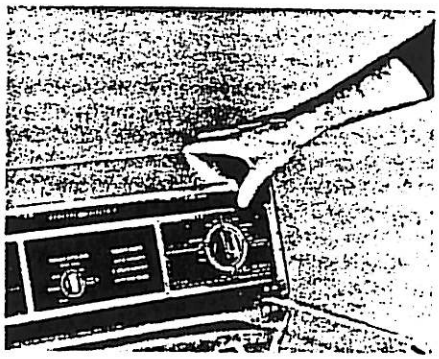
Step 3: Remove two bottom front screws.



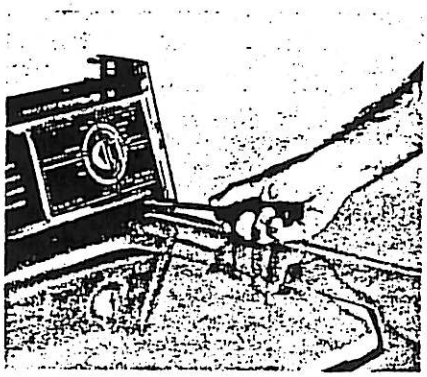
Step 4: Roll top of operating panel toward front of the washer. This exposes timer and switches.



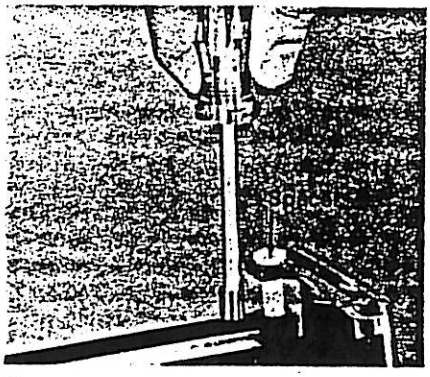
Step 5: Removing 7 inch operating panel. Using a Phillips screwdriver, remove two top screws.



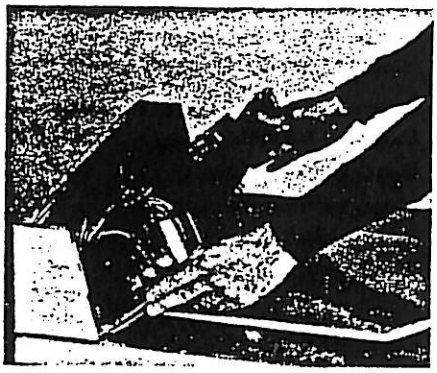
Step 6: Lift rear of top trim and roll toward front of the washer.



Step 7: Remove two Phillips screws from bottom front.



Step 8: Using a nutdriver, remove two hex head screws and spacers from top.

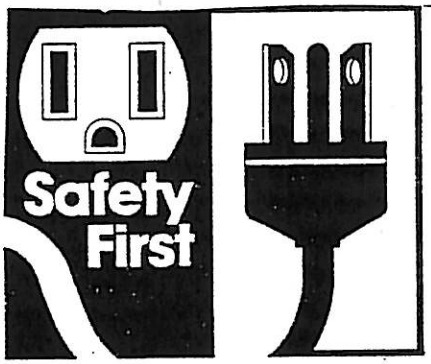


Step 9: Roll top of operating panel toward front of washer. This provides access to timer and switches.

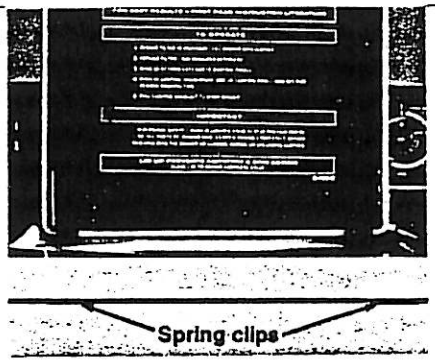
Once the panel is removed, all controls may be inspected and cleaned. Check for heavy smoke or heat damage to wiring as well as all components. The housing may be cleaned using an all purpose detergent while all the electric components must be cleaned using a electronic contact cleaner. Once this is finished, re-assemble.

D. Internal Cleaning:

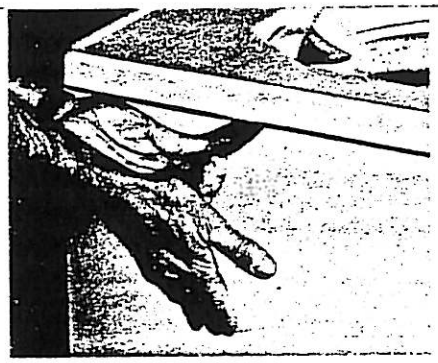
To clean the machine thoroughly it will be necessary to gain access from the top and back. On most units, access from the top may be gained using the following directions.



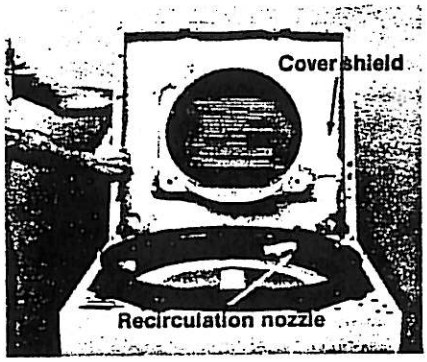
Step 1: Be sure all washer controls are turned **OFF**. Unplug the washer from the receptacle. Watch for sharp edges.



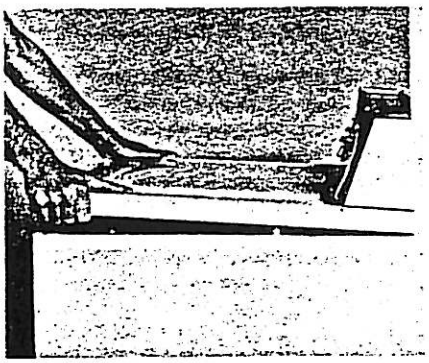
Step 2: The washer cover is attached by two spring clips at the front and two clips at the rear. The location of the front spring clips can be pinpointed by observing the front washer panel at eye level.



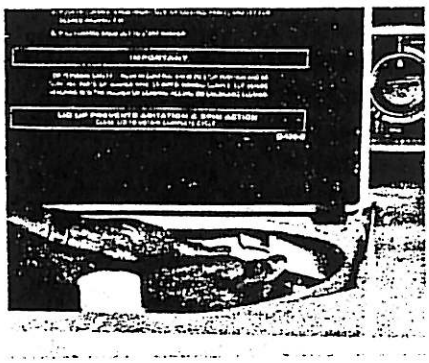
Step 3: Using a one inch putty knife, push in on the front spring clips. Note: Do not use a large-bladed screwdriver. It may chip the cover.



Step 4: (On GE models disengage the recirculation nozzle or diverter from the cover shield). Tip the cover back, supporting the lid, without disengaging the rear spring clips only if there is a wall on which to lean the cover for support.

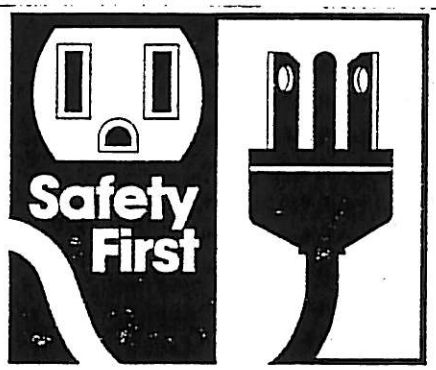


Step 5: To replace the cover, hook the rear flange over the two rear cover spring clips and press down until the front clips snap into place.

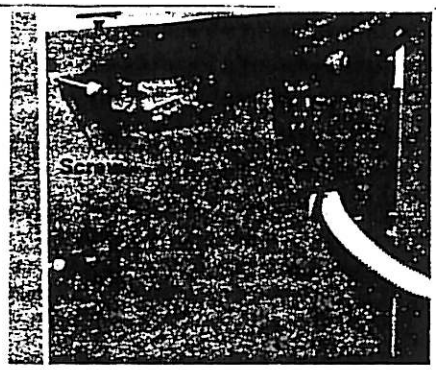


Step 6: Pull the recirculation nozzle back through the cover shield. Reconnect power supply.

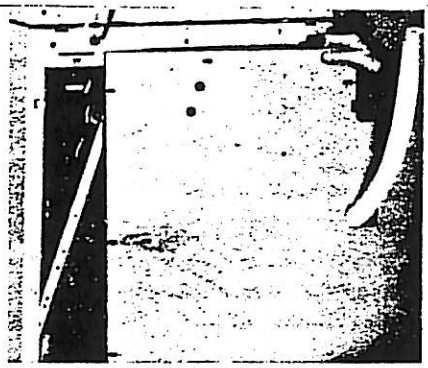
Once the washer cover is removed, the internal top part of washer may be cleaned using an all purpose cleaner. Access to the drive motor, transmission and other drive components as well as the inside of the cabinets can be gained as follows:



Step 1: Be sure all washer controls are turned **OFF**. Unplug the washer from the receptacle. Watch for sharp edges on access panels.



Step 2: Using a nutdriver, loosen screws on left side and remove screws on right side.



Step 3: Slide panel to right and remove it.

The interior of the cabinet can then be washed with an all purpose detergent. The mechanical components also may be washed or the residue may be blown off with compressed air.

Once this is done, re-install access panel. The final step in restoration of a washer is to run machine through at least 2 full cycles to test the machine as well as clean the interior of the tub, hoses, pump, etc.

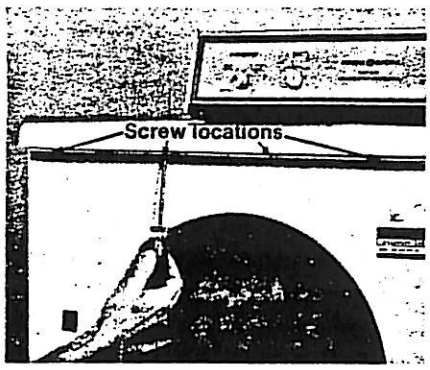
Clothes Dryer (Gas or Electric)

A. Cabinet:
Dryer cabinets are basically the same as the other appliances. Since we have discussed the restoration previously, we will not cover it here.

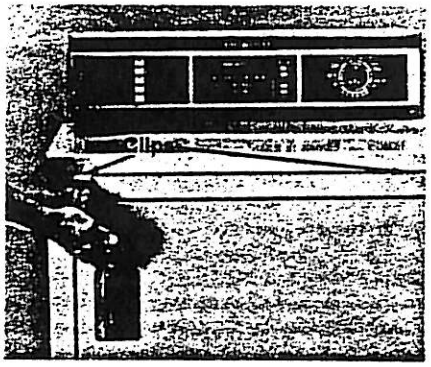
B. Trim:
Since we have discussed the procedure for trim in previous headings, we will not go in to the procedure here.

C. Operating Panel:
The operating panel on dryers should be handled with the same procedure as previously covered under washers.

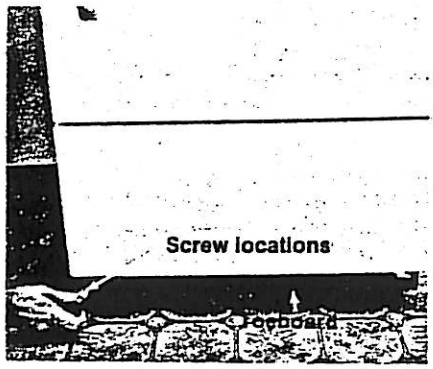
D. Internal Cleaning:
To gain access to the drum area of the dryer follow these directions.



Standard capacity dryers. The cabinet top is raised by removing 4 Phillips head screws from upper cabinet front inside door opening. Secure backsplash before tilting back. Note: Rest top firmly against support.

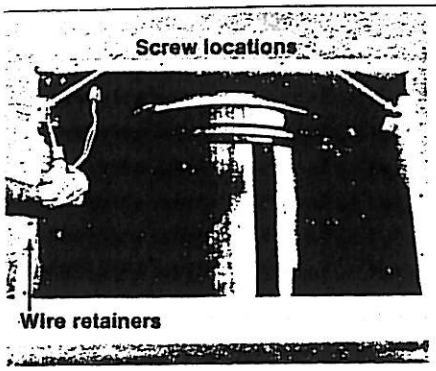


Large capacity dryers. Clips securing cabinet top are located where top joins dryer front. To open top, press against clips with a putty knife that has been wrapped with masking tape. Top should pop up. Note: Rest top firmly against support.



To remove cabinet front on any dryer, loosen, but do not remove, 2 screws on either side of toeboard with a nutdriver.

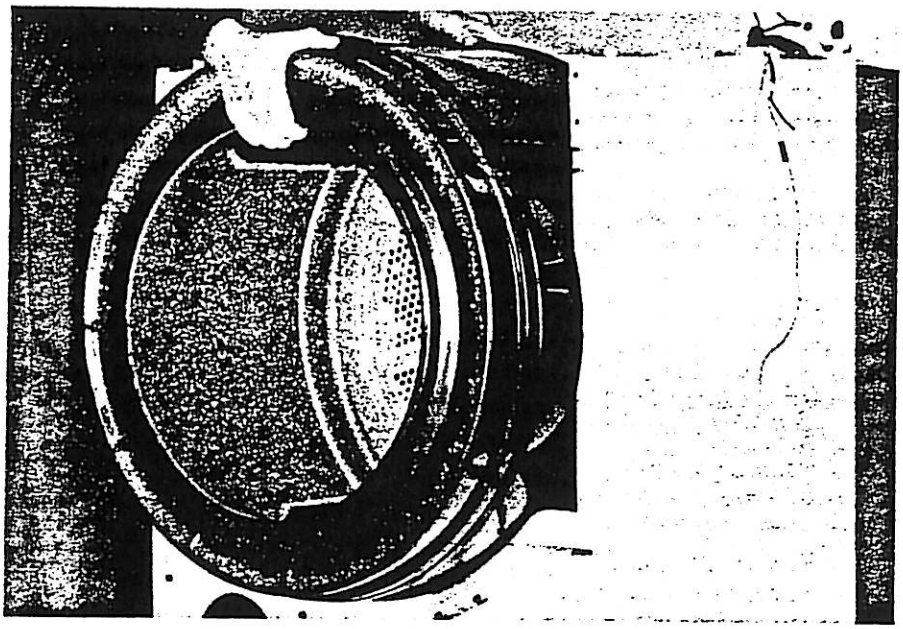
On electric dryers, the removal of the drum allows access to the heating system. (see picture). If necessary, blow loose soot and smoke from coils and other components using compressed air.



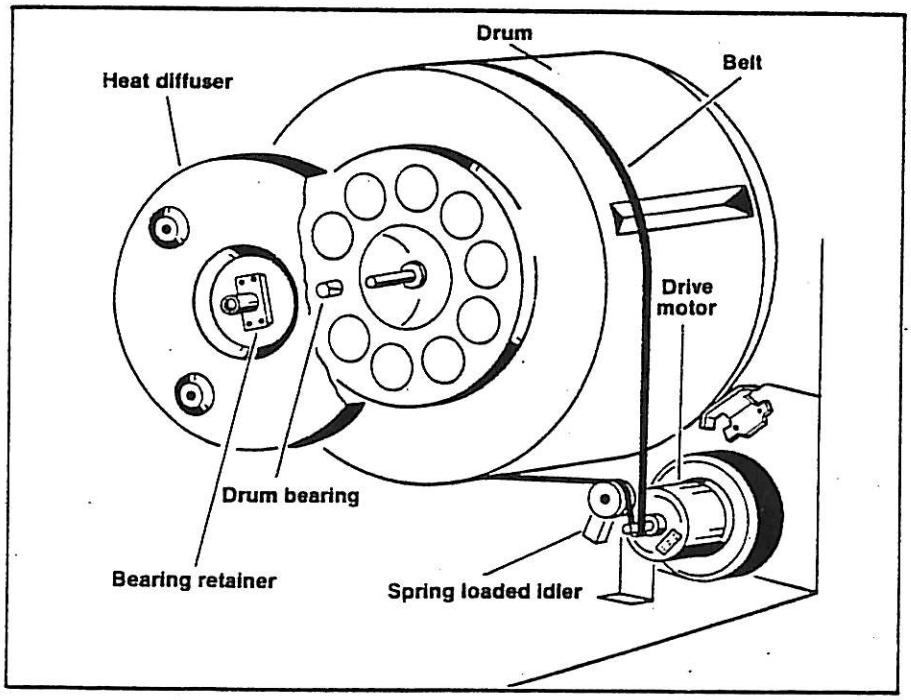
Remove 2 screws on the right and left inside cabinet front with a nutdriver. Remove wire retainers. Lift front up and set to the side. When finished with dryer inspection and repair, reassemble dryer and reconnect power supply.

Access to heating system on gas dryers is gained by removing lower front panel. (See Picture) The unit may be cleaned using compressed air.

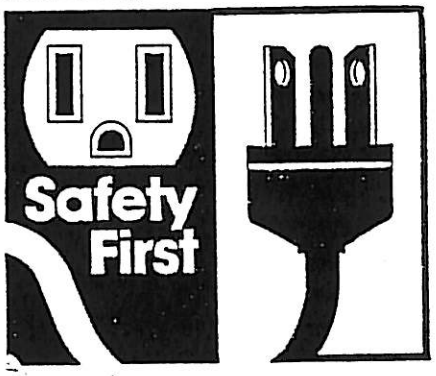
CAUTION: The belt is under high tension on the spring loaded idler. Be careful when you swing back the idler arm to release the belt that it does not snap back and pin your hand.



Drum removal (front view)

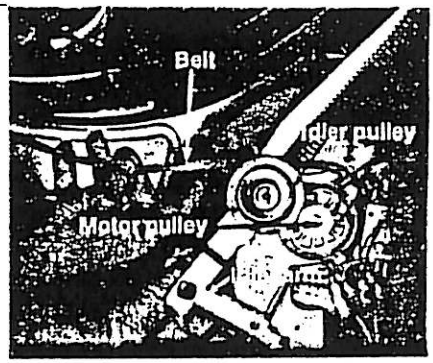


Dryer drive system (rear view)

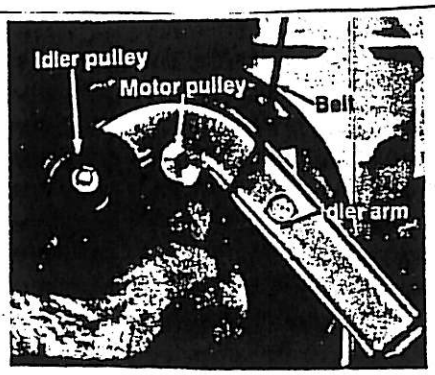


Be sure all dryer controls are turned OFF. Disconnect power supply at distribution panel and unplug dryer from receptacle. Watch for sharp edges on access panels and parts.

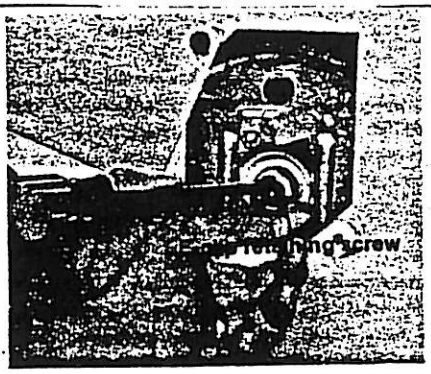
Drum removal. Remove large, lower rear access panel by unscrewing all 5/16" mounting screws around cabinet with nutdriver. Detach belt from idler pulley



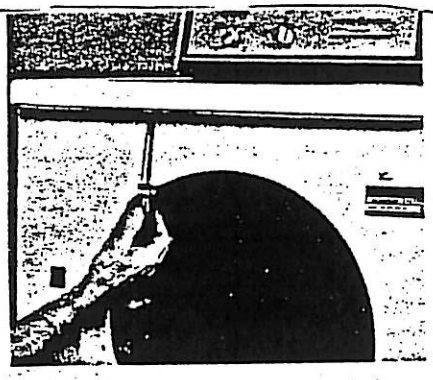
On standard capacity dryers swing idler arm away. from pulleys as shown, and belt should pop off easily.



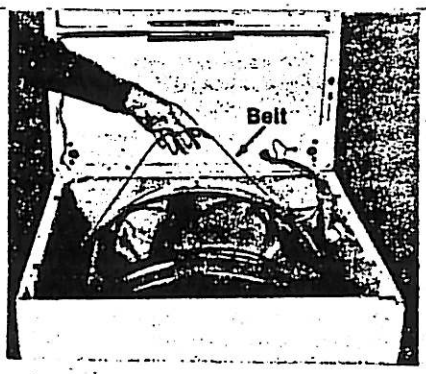
Large capacity dryer idler assembly differs from standard capacity dryers. Pull back idler arm away from pulleys, and belt should pop off.



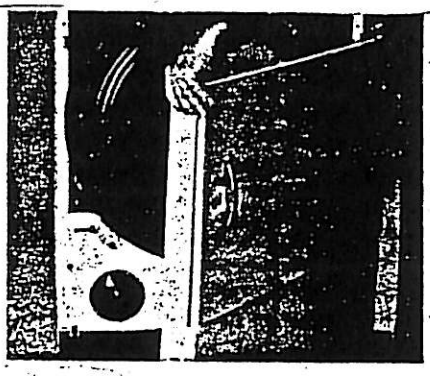
To release drum, first remove center rear access panel by removing 5/16" mounting screws from around cabinet with nutdriver. Then use small screwdriver to pry retaining ring loose.



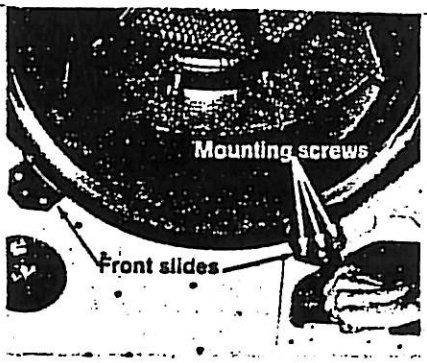
Raise and support dryer top. If you are unfamiliar with this process, please refer to Procedure #4: Removing Access and Control Panels.



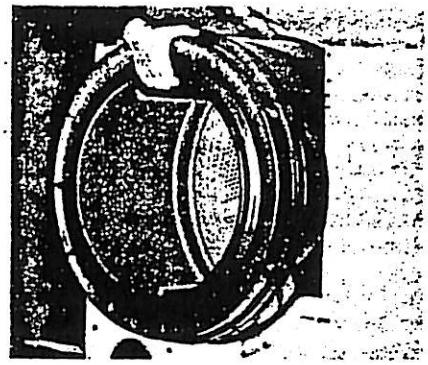
When you have raised top, move loose belt back to rest on the rear housing.



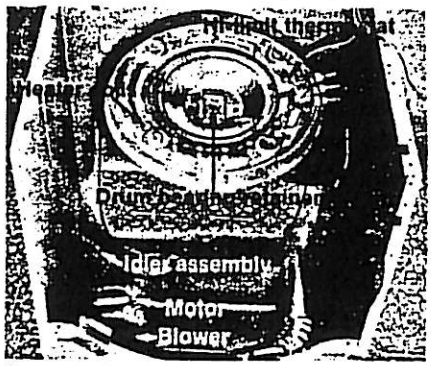
Remove dryer front. If you are unfamiliar with this process, please refer to Procedure #4: Removing Access and Control Panels.



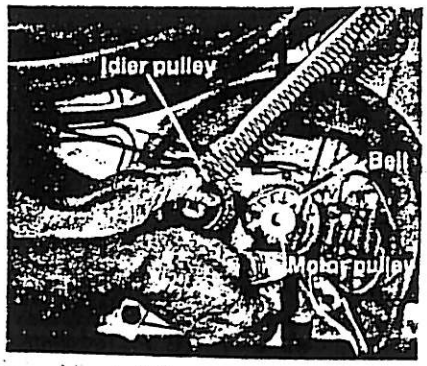
Before you can lift out drum on large capacity dryers, you must remove two front slides. Loosen three mounting screws on each of 2 slides with a nutdriver.



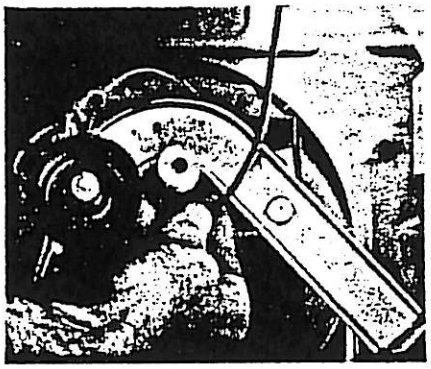
Carefully lift drum out through dryer front. Avoid hitting the sides of dryer with drum.



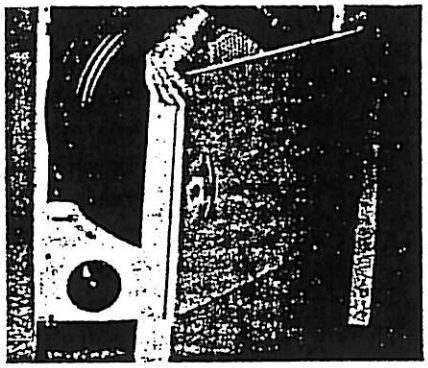
With drum removed, you can access the drum bearing, heater coils, motor, idler, blower, and some thermostats.



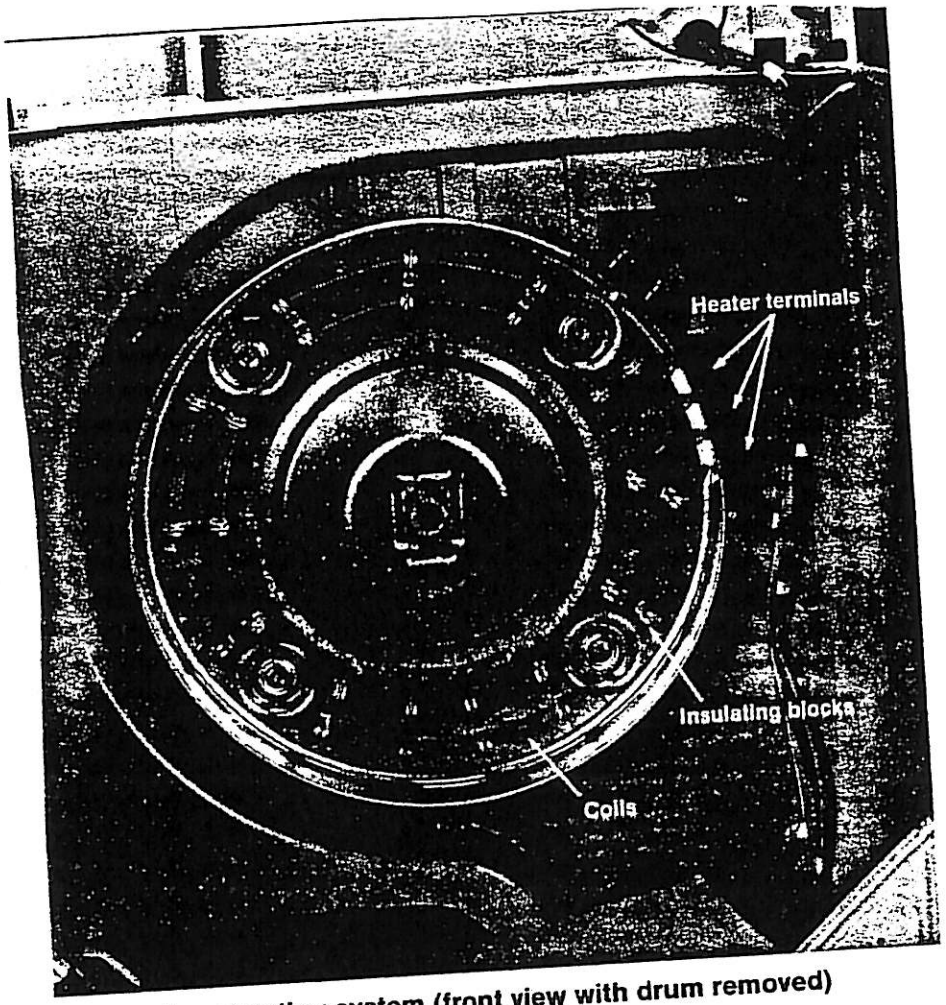
When reassembling dryer, position belt around drum and rethread belt over top of idler pulley and underneath motor pulley with idler arm pulled away from pulleys. Picture illustrates process for standard capacity dryers.



On large capacity dryers, rethread belt over top of idler pulley and underneath motor pulley with idler arm pulled away from pulleys, as shown. Check belt alignment by turning drum in both directions.

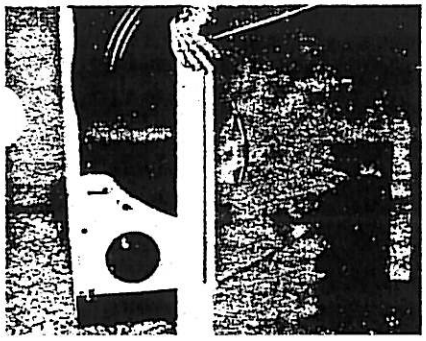


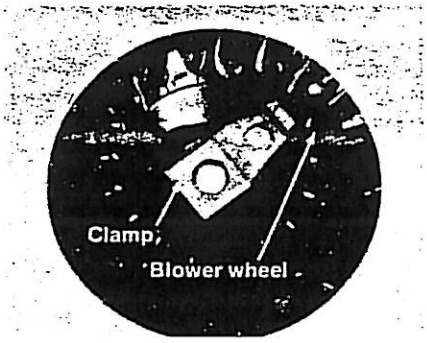
Complete dryer reassembly and reconnect power supply.

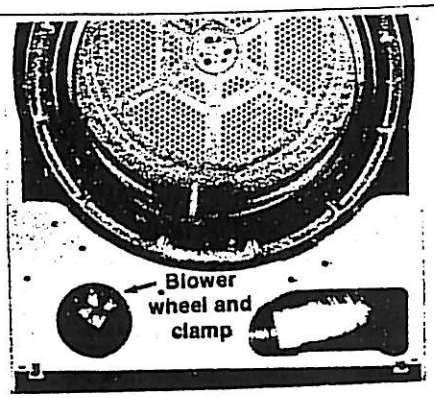


Electric dryer heating system (front view with drum removed)

If the drum is removed in a unit, it would also be a good procedure to inspect and clean the blower wheel since soot or smoke may deposit here. (See Picture) This unit may be cleaned using compressed air.

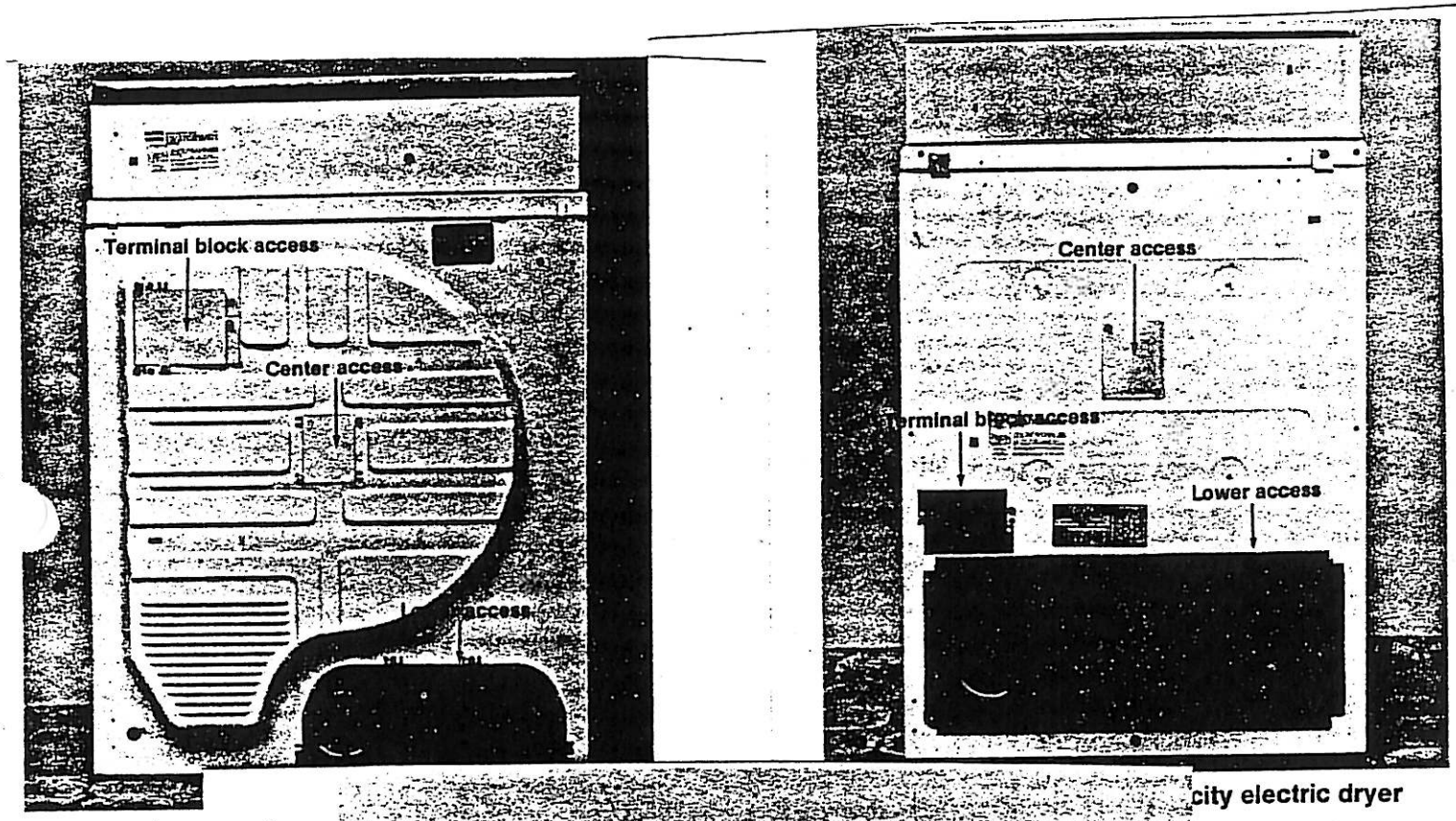




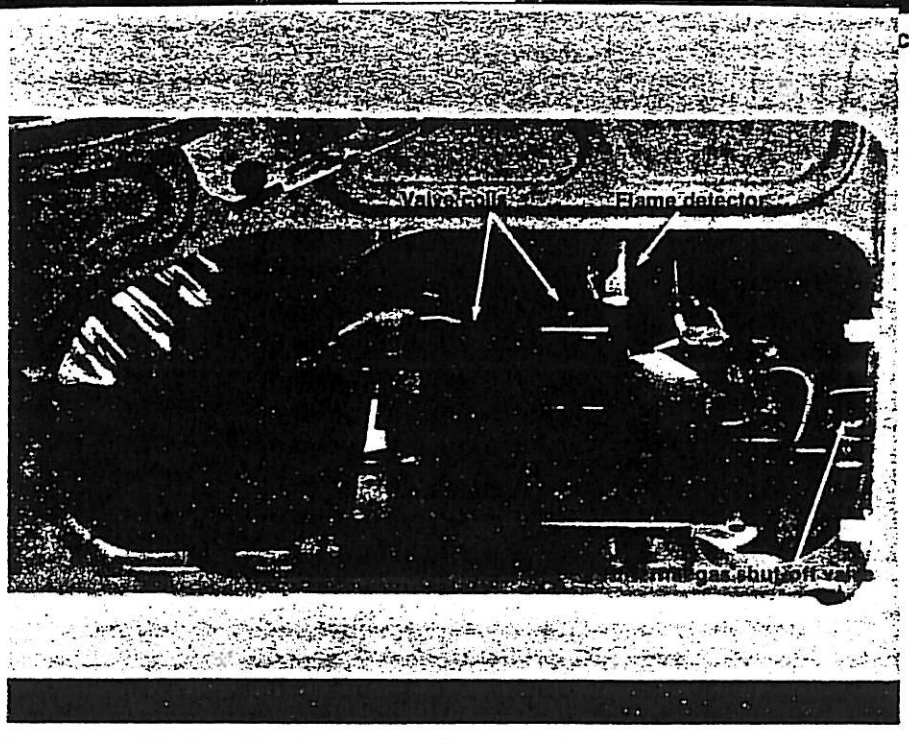


Blower location

Access to lower components may be gained by removing access panels, (see picture) on back of dryers. Once removed, other components as well as the lower intenal cabinet may be inspected and cleaned.



Back panels or city electric dryer



Gas assembly location (front panel removed)