

# INSTALLATION & OPERATING INSTRUCTIONS

## *Hercules Series Gas Fryers*

### MODEL

M-14

M-43

M14DL

M-18

M-18DL



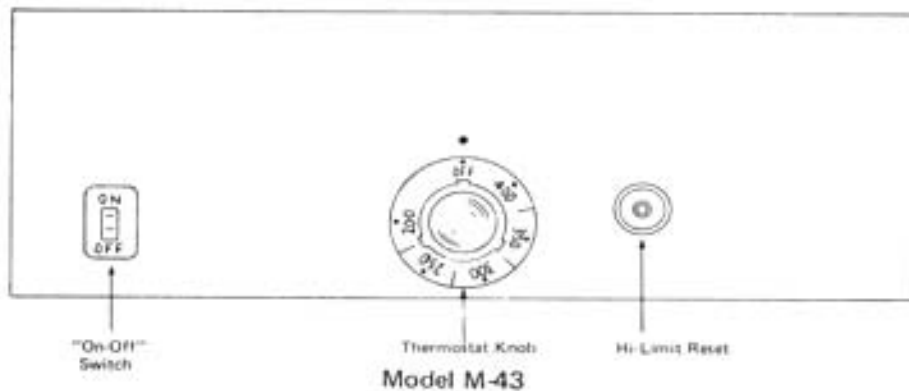
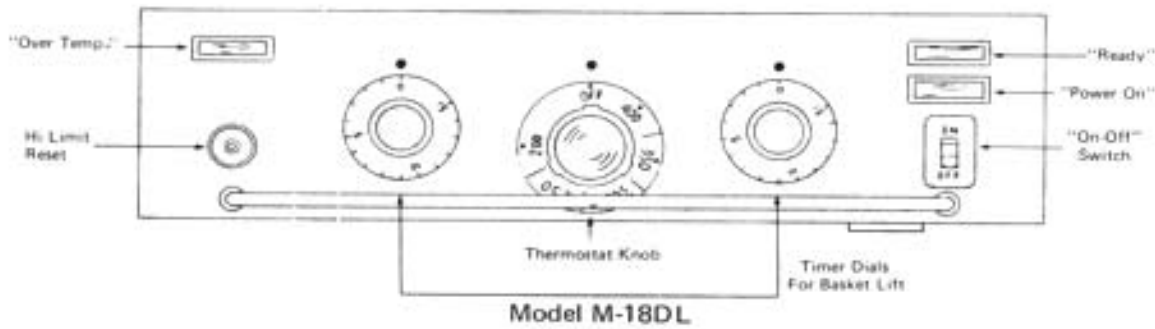
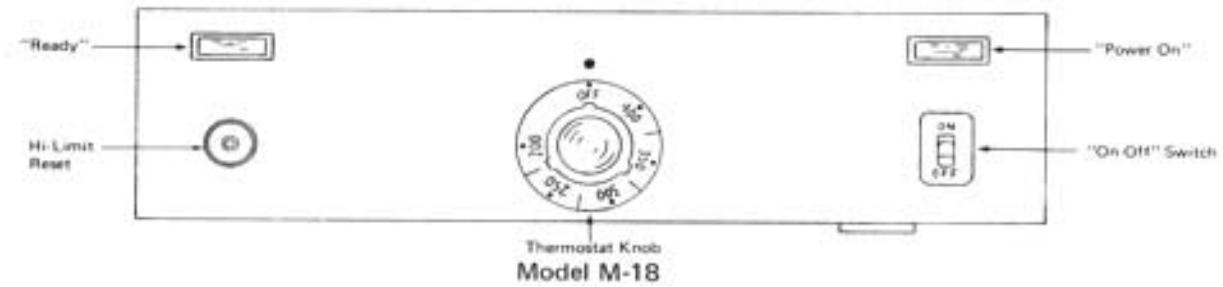
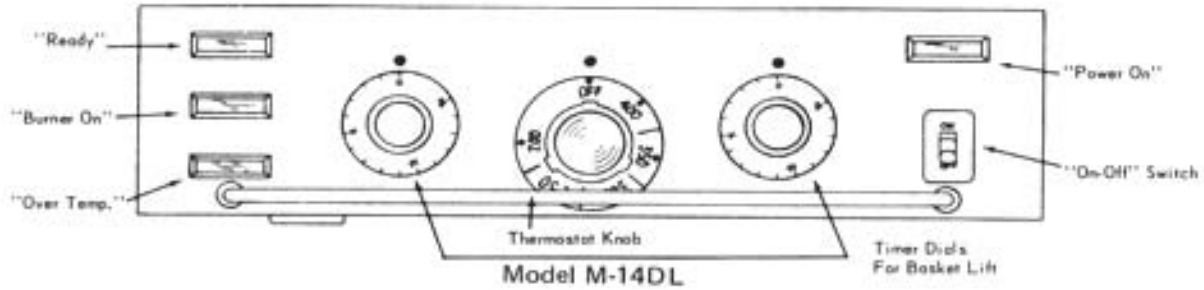
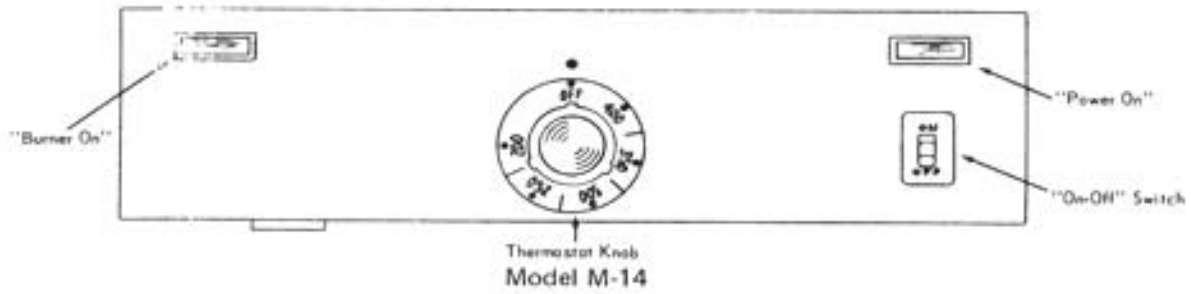
M-14DL

**STAR MANUFACTURING COMPANY**

DIVISION OF PEABODY INTERNATIONAL CORPORATION  
9325 OLIVE BLVD., • ST. LOUIS, MISSOURI 63132



# CONTROL PANELS



# GENERAL INSTALLATION DATA

THIS GAS FRYER IS EQUIPPED FOR THE TYPES OF GAS INDICATED ON THE NAMEPLATE MOUNTED ON THE INSIDE OF THE CABINET DOOR.

## INSTALLATION

The installation of the Appliance must conform to the

NATIONAL FUEL GAS CODE; ANSI Z223.1-1974

AND ALL LOCAL GAS COMPANY RULES AND REGULATIONS

For your protection, we recommend a qualified installing agency install this appliance. They should be familiar with gas installations and your local gas requirements. In any case, your gas company should be called to approve the final installation.

### CHECKING FOR GAS LEAKS

Soap and water solution, or other material acceptable for the purpose, shall be used in locating gas leakage. **MATCHES, CANDLES, FLAME, OR OTHER SOURCES OF IGNITION SHALL NOT BE USED FOR THIS PURPOSE.**

### ATTACHING FEET

The fryer is shipped bolted to a skid with feet detached. To mount feet, lay fryer on side and remove skid. Screw the (4) feet into the base and tighten same. **CAUTION: DO NOT INSTALL WITHOUT FEET.**

### LEVELING UNIT

Level unit by adjusting the (4) feet, which have an adjustment of 1 inch.

### ELECTRICAL CONNECTION

120V, AC, two wire single phase service only. **DO NOT CONNECT TO DIRECT CURRENT.** **WARNING - Electrical Grounding Instructions** This appliance is equipped with a three prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug.

### EXHAUST CANOPY

It is essential that facilities be provided to carry off fumes and gases.

### CLEAN KETTLE

Clean protective oil from interior of kettle with a solution of washing soda or equal. Drain through valve in bottom and rinse thoroughly with clear water and dry completely before filling with oil.

### DRAIN VALVE

Make certain it is closed before adding fat.

### GAS PIPING

Gas Piping shall be new, clean, and of such size and so installed as to provide a supply of gas sufficient to meet the full gas input of the appliance. If the appliance is to be connected to existing piping, it shall be checked to determine if it has adequate capacity. Joint compound (pipe dope) shall be used sparingly and only on the male threads of the pipe joints. Such compounds shall be resistant to the action of LP gases. **WARNING: Any loose dirt or metal particles which are allowed to enter the gas lines on this appliance will damage the automatic valve and affect its operation.** When installing this appliance, all pipe and fittings must be free from all internal loose dirt.

### MANUAL SHUT OFF VALVE

A manual shut-off valve should be installed upstream from the union and within six feet of the appliance.

### CONNECTING GAS SUPPLY LINE

The gas inlet of this appliance is sealed at the factory to prevent entry of dirt. Do not remove this seal until actual connection is made to the gas supply line.

### VERTICAL CLEARANCE

A vertical distance of not less than 48" shall be provided between the top of the appliance and combustible material.

## INITIAL START UP OF FRYER

### ADD FAT

Never attempt to use solid shortening to fill kettle. Melt solid fat or shortening before filling fryer. Fill kettle a minimum of 2" above tubes.

**CAUTION: DO NOT HEAT AN EMPTY KETTLE!**

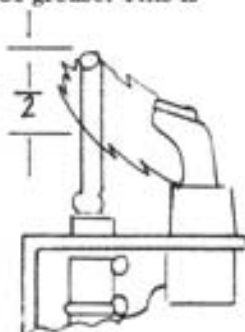
## LIGHTING FRYER

1. Light fryer as per lighting instruction plate mounted on the inside of cabinet door.
2. Adjust air shutter on main burners so the gas flame has a purple inner cone and a blue outer mantle. Make certain screws are tightened on all air shutters. Gas orifices are fixed and are not adjustable.

## ADJUSTMENTS

### GAS SAFETY PILOT

1. If pilot flame burns yellow, clean pilot orifice and pilot burner to insure a steady blue flame. The orifice can be cleaned by washing in a solvent such as trichlorethylene and/or blowing out.
2. Flame must surround thermocouple tip for approximately 1/2".
3. Thermocouple lead connection to safety valve must be tight, clean and free of grease. This is an electrical connection.



### TO ADJUST PILOT (M-43 Nat. Only)

1. Remove pilot adjustment cap.
2. Adjust pilot key to provide properly sized flame.
3. Replace pilot adjustment cap.

### TO ADJUST PILOT (ALL OTHERS)

1. Loosen roundhead screw holding small adjustment plate beside knob, and turn knob clockwise to limit of travel.
2. Very slowly push adjustment plate in a counterclockwise direction while watching size of pilot burner flame.
3. Stop moving plate when pilot flame has reached the proper size and tighten round-head screw. Rotor pilot valve will now give complete "ON-OFF" operation with adjustment fixed at the "ON" position.

### THERMOSTAT CALIBRATION

1. Pull thermostat knob forward and remove from shaft.
2. Turn screw in center of shaft to decrease or to increase temperature. Note 1/8 turn of this screw will change the fat temperature approximately 15°F.
3. Replace thermostat knob.

## HIGH LIMIT THERMOSTAT

### MODELS M-18, M-18DL & M-43

High Limit Thermostat - Should the fat temperature reach 450°F, this control will shut off the gas to the main burners. To restore operation (after the fat temperature drops to about 400°F,) push the red reset button located to the right of the thermostat knob. Should the high limit thermostat shut the gas off twice in succession, the primary thermostat should be checked for malfunction.

### MODELS M-14 & M-14DL

High Limit Thermostat - Should the fat temperature reach 450°F, this control will shut off the gas to the main burners. This control is self resetting and will allow the main burners to come on after the fat temperature drops to about 400°F. Should the high limit thermostat shut off the gas twice in succession, the primary thermostat should be checked for malfunction.

### GAS PRESSURE REGULATOR

This regulator is factory set for 4" of water column pressure. If it should be necessary to check the manifold gas pressure, remove the 1/8" pipe plug from the front part of the burner manifold for attaching a pressure gauge. To adjust gas pressure, remove cap from pressure regulator and turn screw to the right to increase and left to decrease the gas pressure to its proper setting and replace cap.

## GENERAL FRYING DATA

### FOR BEST FRYING RESULTS

1. Avoid heating to high temperatures - never above 400°F. With "Star Hercules Series" Fryers, 375°F. should be the maximum.
2. Strain breading and burned particles from the fat at least once a day, more often, if necessary. Use filter bag, filter cone, or the "Star" mechanical filter.
3. Do not salt foods over the fry kettle.
4. Don't hold the frying fat at frying temperatures for long periods of time without any frying taking place.
5. Always use the best frying oils.

### BEFORE FRYING

1. Have the foods free from too many loose crumbs to help prevent build up of carbonized material in fry kettle.
2. Have the foods free from an excessive amount of moisture to eliminate too much bubbling.

## BEFORE FRYING (Continued)

3. Use the proper breading or batter to brown the foods properly. If prepared breading mixes are used, select good quality breading mix and follow the directions on the package.
4. Do not overload baskets - Pieces should not touch when frying. Shake basket to prevent food from sticking together. Fry similar size food pieces at the same time to serve uniformly finished servings.

## FRYING INSTRUCTIONS

Turn the thermostat knob to the desired frying temperature.

## LOWERING BASKET

When the fat has reached the proper temperature, lower the basket and food slowly into the fat. When moist food is lowered too quickly into hot fat, the fat will foam and spatter excessively.

## DRAINING BASKETS

After the food has finished frying, raise the baskets and hang them up to allow excess fat to drain back into kettle.

## IDLING

During idle periods, lower the temperature setting of the thermostat to approximately 250°. It is not necessary to maintain full cooking temperature during idle periods as the fat can be reheated quickly to the desired temperature. This procedure will result in longer fat life and less gas consumption.

**NOTE:** See the handy frying chart for recommended temperatures and time required to properly fry various foods, as well as procedures and coating suggestions.

## GENERAL MAINTENANCE TIPS

### DRAINING KETTLE

First thread drain nipple into drain valve and TURN FRYER "OFF". Drain fat from kettle only when fat is up to cooking temperature and fat under tubes is hot and liquid. A cold fryer heated up will not drain properly. Use a stick, if necessary, to stir up cold fat in bottom of kettle.

## STRAINING FAT

Slide filter bag over end of drain valve nipple and tie in place with a bow knot, so it will not slide off. Place a receptacle under bag and turn on drain valve. When the kettle is empty, use a small pot to pour hot oil vigorously around sides, tubes, and bottom of kettle to wash out crumbs, etc. Continue to pour until all crumbs are washed into filter bag. Remove filter bag and wash for next use. Close drain valve, remove drain valve nipple, and pour fat back into kettle.

## FILLING KETTLE WITH FAT

Make certain drain valve is closed, — MELT SOLID FAT OR SHORTENING BEFORE FILLING FRYER. Never attempt to use solid shortening to fill kettle. The shortening must be liquid. Fill kettles 2" above tubes. Use correct fry fats and follow temperature recommendations. DO NOT OVERFILL KETTLE. Overfilling causes foam-over and messy frying conditions.

## PROPER CLEANING OF KETTLE

1. Drain fat from fryer while it is up to cooking temperature.
2. Rinse to remove all loose residue and crumbs.
3. Fill with water, bring to a boil and add a fryer cleaner. Boiling time will depend on condition of fryer, (30 minutes to 2 hrs., or until clean.)
4. Turn heat off, drain and rinse with clear water until clean.
5. Use a vinegar rinse (2 to 3 cups), stir, drain, and rinse thoroughly with clear water.
6. Wipe kettle with a soft cloth and allow to thoroughly dry.
7. Add fat. Melt solid fat or shortening before filling fryer. Never attempt to use solid shortening to fill kettle. The SHORTENING MUST BE LIQUID. Fill kettle a minimum of 2" above tubes.

## CLEANING THE EXTERIOR

The exterior surface can be kept clean and attractive by regularly wiping it with a clean soft cloth. Any discoloration can be removed with a non-abrasive cleaner.

## TO TURN FRYER OFF (NORMAL SHUT OFF)

Turn the thermostat dial knob and the "ON-OFF" switch to the "OFF" position. The pilot will remain lit.

## COMPLETE SHUT DOWN OF FRYER

Turn "A" valve handle and the "ON-OFF" switch to the "OFF" position. For additional information on complete shut down refer to instruction plate.

## **STAR MAINTENANCE TIPS**

1. DO NOT FIRE WITH FAT LEVEL BELOW TOP OF TUBES.
2. DO NOT FRY FOODS IN EXCESS OF 385°F.
3. DO NOT OVERFILL YOUR FRY KETTLE.
4. DO NOT ALLOW BURNED CRUMBS TO ACCUMULATE.
5. DO MELT SOLID FAT OR SHORTENING BEFORE FILLING FRYER.
6. DO KEEP KETTLE FILLED TO CAPACITY AT ALL TIMES (2" ABOVE TUBES.)
7. DO USE CORRECT FRY FATS AND SHORTENING, AND FOLLOW TEMPERATURE RECOMMENDATIONS.
8. DO SHUT OFF ELECTRIC POWER WHEN DRAINING FAT AND CLEANING FRYER.
9. DO FILTER FAT AND CLEAN FRY KETTLE DAILY.
10. DO SET FAT TEMPERATURES AT 250°F DURING IDLE PERIODS.

and reverse with the same care. The side screws are pulled down evenly and carefully.

### TO CLEAN AND GREASE ROTOR PILOT VALVE

- 1 - Close "A" valve. Remove screw, washer, and spring, taking care that knob does not fall off when backing out the screw.
- 2 - Clean face of knob and seat with clean, soft cloth and petroleum solvent. Dry thoroughly and

re-grease lightly with Oronite #341 gas valve grease.

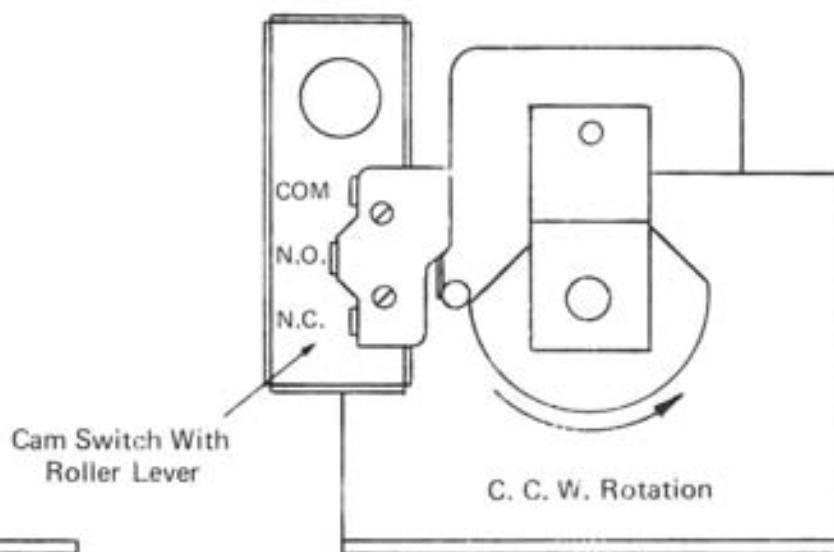
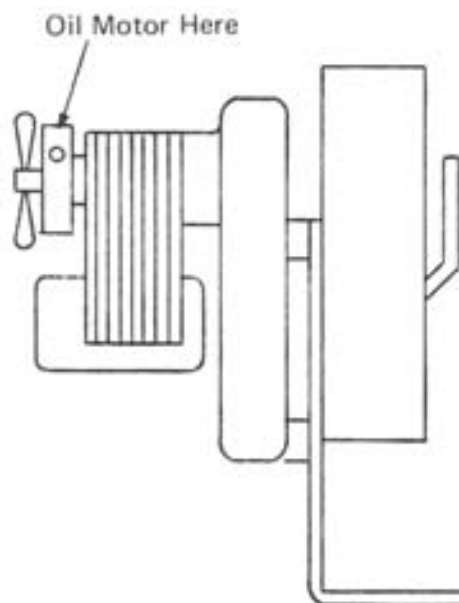
- 3 - Replace knob. Turn back and forth two or three times and remove knob.
- 4 - Clean out pilot gas passages in knob and seat and replace knob. CAUTION: Do not scratch finished surfaces. NOTE: When replacing the shoulder screw, turn it until it stops. Do not attempt to tighten it further. Sealing is controlled by spring pressure, not by the degree of tightness of the screw.

## Model M-14DL & M-18DL

### TO OIL MOTOR

- 1 - Remove (3) screws in rear panel holding screw.

- 2 - Motors require oiling only once a year with a few drops of SAE No. 20 motor oil.
- 3 - Replace screw.



### CAM POSITION:

When basket is in the up position the cam must be down as shown with Cam Switch Roller Lever "OFF" cam.

### OPERATION:

- 1 - With basket in the up position, timer starts basket down. Cam Switch Roller Lever is off cam and remains off cam while basket is going down.

- 2 - When Cam Switch Roller rides up on cam it stops the basket in the down position.
- 3 - Timer starts basket up with Cam Switch Roller Lever riding on Cam.
- 4 - When Cam Switch Roller Lever rides off of cam it stops the basket in the up position.

### NOTE:

To bring basket up from down position, turn timer pointer knob to "zero", or wait the indicated time.

# CAUTIONS FOR ALL DEEP FAT FRYERS

NEVER LEAVE AN OPERATING FRYER UNATTENDED

REMEMBER HOT OIL IS DANGEROUS – **RESPECT IT!**



## WARNING – INSTALLATION

- Locate your fryer in a protected place so that it cannot be tipped over or knocked off its support. A mechanical restraint should be installed to prohibit the fryer from tipping or moving. Consult your local codes for allowable methods of restraint.
- Install an automatic fire extinguisher over the fryer and in the exhaust duct.
- Be sure your power supply is installed properly and in accordance with the local and national codes.
- Install a shut-off switch or gas valve close to the fryer. It must turn off the fryer immediately.
- Failure to add a mechanical restraint can result in oil splashing out and contacting the skin, leading to serious injury or death!



## WARNING – HOT OIL

- Hot oil is dangerous – Severe burns can result when hot oil contacts the skin.
- Hot oil is flammable – Keep open flames away from hot oil and its vapors.
- Never allow water or ice to get in hot oil.  
**IT CAN EXPLODE!**



## WARNING - ENVIRONMENT

- Keep your floors clean and free of grease and all other substances so no one slips accidentally and contacts the hot fryer.
- Keep areas and filters clean above your fryers – Oil soiled lint or dust can ignite easily and flames will spread rapidly.



## WARNING – MAINTENANCE

- Have your equipment checked regularly to insure its safe and properly functioning.
- If your fryer starts to smoke or boil abnormally, cut off the power supply immediately and determine the reason for the smoking or boiling before attempting to use it again.



## WARNING – TRAINING

- Train all personnel to understand the hazards of hot oil. Instruct them on the proper action to take if something does not seem to be acting properly.
- Instruct your personnel on what to do if there is an oil fire. Do not use water on an oil fire! Use only fire extinguishers of the approved type and never direct such extinguishers so as to blow the oil out of the oil container.

## CARE OF FAT

In three to six months you may spend as much for fat as you paid for your kettle. So fat is an item you want to know all about; how to select it; how to manage it. The more production you can get from each pound of fat, the more profitable your frying operation will be.

To get a high rate of production per pound of fat you have to avoid two things. One is early breakdown and spoilage of the compound so that you have to throw it away before it does enough work to "earn its keep." The other is excessive sponging up of fat by the food being fried.

The main cause of fat breakdown is excessive heat. On the other hand abnormal absorption is caused by frying too long at too low temperatures. One answer to both problems is exact control of heat — so that fat neither smokes up nor soaks up.

Of course, no fat "keeps" forever. Not only heat, but air and moisture, salt particles and crumbs of food work to break it down. But you can slow up fat deterioration by maintaining proper temperatures and by draining your kettle, filtering or straining the fat once or twice a day and by keeping the kettle itself absolutely clean.

A number of commercial devices and materials are available to aid in eliminating fat impurities. There are several excellent models of pressure filters as well as strainer-type filters, which, if used regularly, will prolong life of fat.

However, no purification device will renew broken down or rancid fat or put new life into it. Once you have allowed fat to break down it becomes unsuitable for frying — in fact browning is impossible.

In addition to filtration, you can prolong the usefulness of fat by sweetening it with fresh compound every day - replacing about 15% of the bulk you started with. If you do enough frying so that normal absorption of fat in food amounts to 15% to 20% of the capacity of your kettle every day - then you can call that your turn-over food. It means you can add the recommended 15% of fresh fat without discarding any of the old.

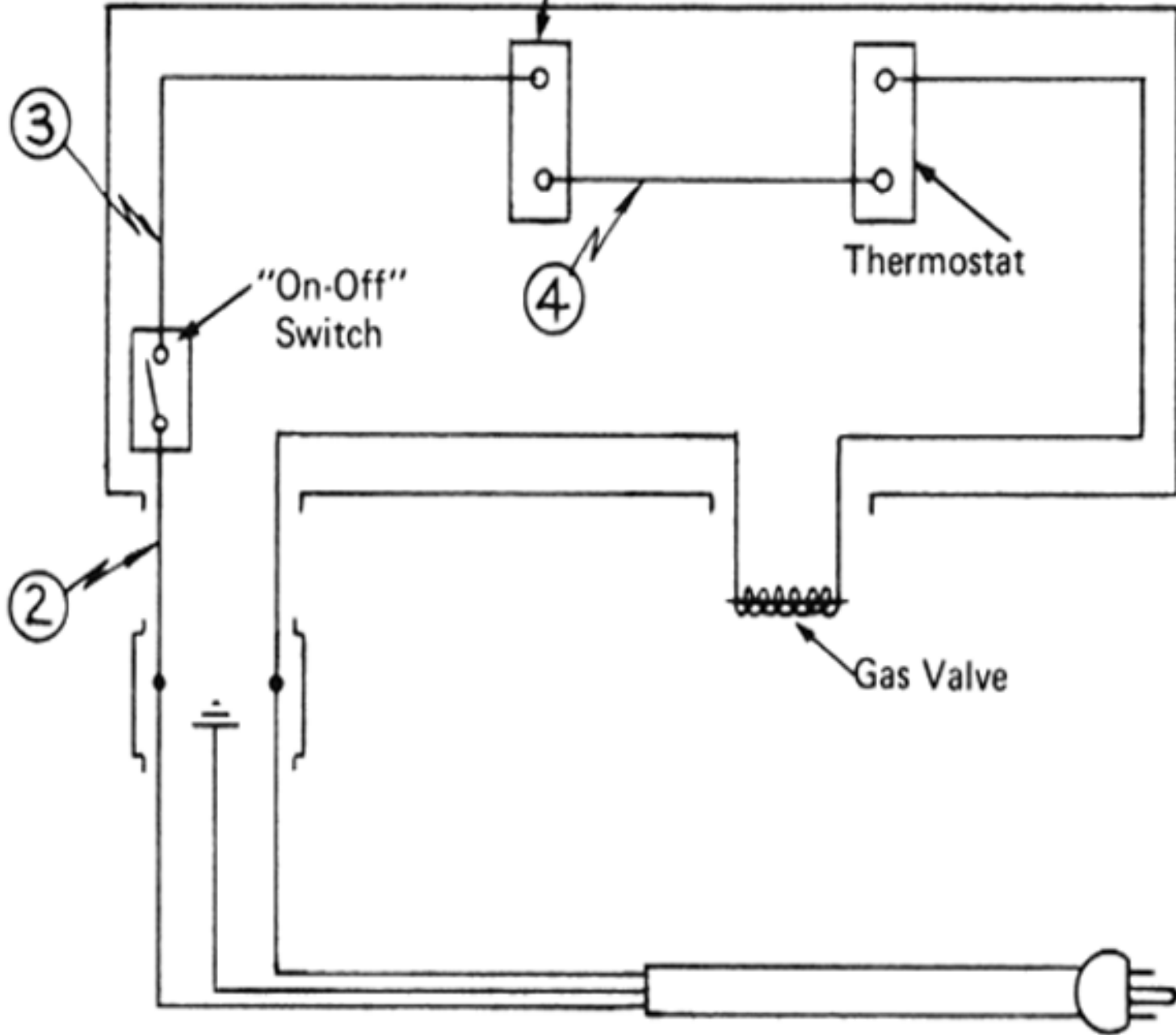
### 10 POINT PROGRAM TO PRESERVE FAT AND PRODUCE THE FINEST FRIED FOODS

1. Choose a fat that does not break down quickly. Hydrogenated shortening, corn, and peanut oils are less likely to break down under high temperatures.
2. Do not fry foods at temperatures above those recommended. The higher the fat temperature, the more rapid the rate of fat deterioration. Above 400°F fats quickly deteriorate.
3. During short intervals between frying, turn the heat down. Do not keep heat on for long periods between batches.
4. Keep fat clean. Strain or filter daily or at end of each shift. Add at least 15% fresh fat to your kettle daily.
5. At least once a day, cool a small amount of fat and taste it to see if it has picked up foreign flavors.
6. Discard fat that tends to bubble excessively before food is added.
7. Do not overload baskets-pieces should not touch when frying. Shake baskets to prevent food from sticking together. Fry similar sizes together.
8. Never salt foods directly over fat, salt in fat reduces its life.
9. Raw, wet foods, such as potatoes and oysters, should be drained or wiped dry before frying to extend the life of the frying fat. Have foods to be fried at room temperature.
10. Keep fat temperatures below smoking point to minimize frying odors.

## HANDY FRYING CHART

FOOD	COATING	PROCEDURE	TEMP	TIME IN MINUTES
<b>POTATOES</b>				
Standard French Fries		Cut in uniform pieces 1/2" square the long way	350°	5-7
Blanch Only			350°	3-1/2
Brown Only			350°	3-1/2
Long Branch		Cut in uniform pieces 3/4" square the long way	350°	7-10
Julienne (shoe string)		Cut in uniform pieces 1/8" to 1/4" square the long way	350°	3-6
Chips		Soak in cold running water until water does not run milky	350°	2-3
<b>CHICKEN</b>				
Large Pieces	Batter or	Some prefer rolling in	325°	9-11
Small Pieces	Breading	seasoned flour, dipping in egg	340°	7-10
Pre-cooked		wash, and frying	350°	3-4
<b>FISH</b>				
Fillets (Large)	Breading	Select fillets of uniform	350°	4
Fillets (Small)	or Batter	size, skin out and dry.	350°	3
Oysters	Breading	Use Oyster liquor in batter		
	or Batter	or breading	350°	5
Clams	Batter		350°	1
Scallops	Breading		350°	4
Shrimp	Batter	Some prefer soaking 1/2 hour in cold seasoned milk	350°	3
Smelts	Breading	Cut spinal cord several places to prevent curling	350°	4
<b>MEATS</b>				
Chicken Fried Steak	Breading	Sever all connecting membranes at one inch intervals to prevent curling	360°	3-4
Cutlets	Breading		350°	3-4
Chops	Breading		340°	3-4
Meat Balls	Breading or rolled in flour		340°	4-6
Brains	Breading		340°	3-5
<b>VEGETABLES</b>				
Asparagus	Batter or crumbs	Pre-cook in salted water	350°	3
Cauliflower	Batter or crumbs	Pre-cook and separate flowers	350°	3
Egg Plant	Crumb Breading	Peel, cut cross-wise into 1/4" slices	350°	3
Onions	Light batter	Slice thin, soak in milk for two hours	350°	3
<b>FRITTERS</b>				
Fruit (bananas, pineapples, apricots, berries)		Serve with fruit juice	350°	3-5
Corn	Batter	Serve with syrup or jelly	350°	3-5
Vegetable (peas, green beans)		Serve with tomato cheese sauce	350°	5-8
<b>MISCELLANEOUS</b>				
Croquettes	Breading		360°	3
Chinese Noodles			375°	1-2
French Toast			375°	1
<b>DOUGHNUTS</b>				
Cake			375°	1-1/2 - 2
Yeast, raised			375°	1

Hi-Limit Control



Thermostat

Gas Valve

Model M-43

# PARTS PRICE LIST

EFFECTIVE - APRIL 1, 1981

MODEL M43  
GAS FRYER

KEY NUMBER	PART NUMBER	DESCRIPTION	NUMBER PER UNIT
<del>141160</del>	<del>141160</del>	<del>KETTLE ASSEMBLY</del>	1
	141072	RADIANT ASSEMBLY	3
<del>141060</del>	<del>141060</del>	<del>BURNER ASSEMBLY NAT.</del>	3
<del>141063</del>	<del>141063</del>	<del>BURNER ASSEMBLY L.P.</del>	3
	Y1620	ORIFICE NAT. GAS #47 DRILL	6
	9154	ORIFICE L.P. GAS #55 DRILL	6
	Y1212	ORIFICE PILOT NAT.	1
	9159	ORIFICE PILOT L.P.	1
<del>Y1211</del>	<del>Y1211</del>	<del>PILOT BURNER (NO ORIFICE)</del>	1
	Y1851	THERMOSTAT - CONTROL	1
	Y1949	<del>THERMOSTAT - SAFETY</del> --- NOT AVAILABLE	1
	Y1955	THERMOSTAT KNOB	1
	143156	SAFETY THERMOSTAT REPLACEMENT KIT (UP TO SER. #4301057)	1
	141066	LEAD IN CORD ASSEMBLY	1
	Y1627	VALVE - MANUAL GAS SHUT OFF	1
	6726	THERMOCOUPLE	1
	8343	ON-OFF SWITCH	1
	Y1172	CONTROL - COMBINATION NAT.	1
	9673	CONTROL - COMBINATION L.P.	1
	Y1625	DRAIN VALVE	1
	3675	DOOR HANDLE (PULL)	1
	Y3057	DOOR CATCH W/STRIKE W/Y3058 DRAWING	1
	Y1862	BASKET	2
	141037	FOOT HOUSING ASSEMBLY	4
	7649	FOOT	4
	8849	CARTON	1
	9168	DRAIN ROD	1
	Y2747	SAFETY THERMOSTAT (SERIAL #4301058 & UP)	1

PRICES SUBJECT TO CHANGES WITHOUT NOTICE.

(1) MINIMUM PARTS ORDER - \$3.00

IMPORTANT: WHEN ORDERING SPECIFY VOLTAGE OR TYPE GAS DESIRED  
INCLUDE MODEL AND SERIAL NUMBER

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OF 1

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