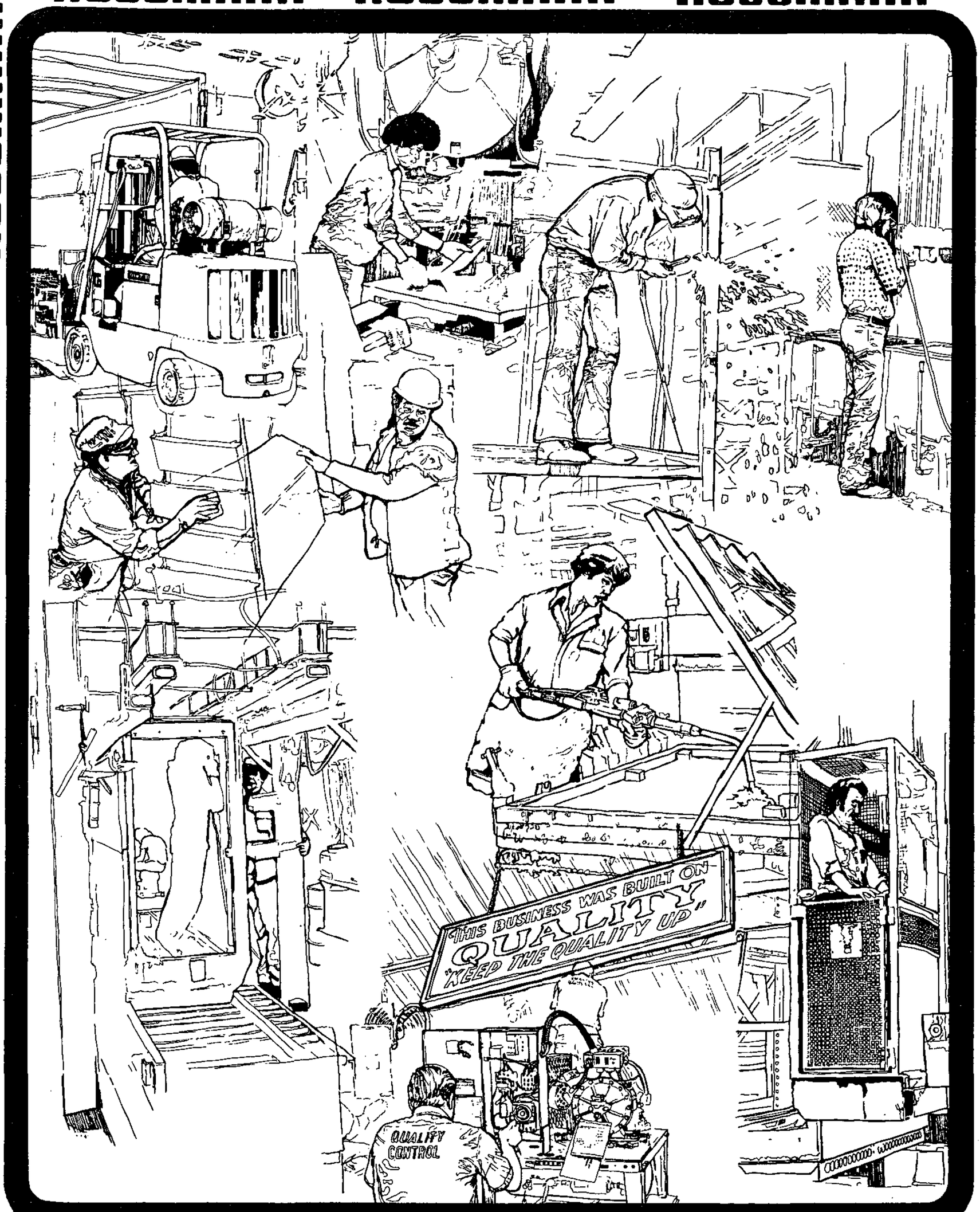
HUSSMANN®

CORPORATION

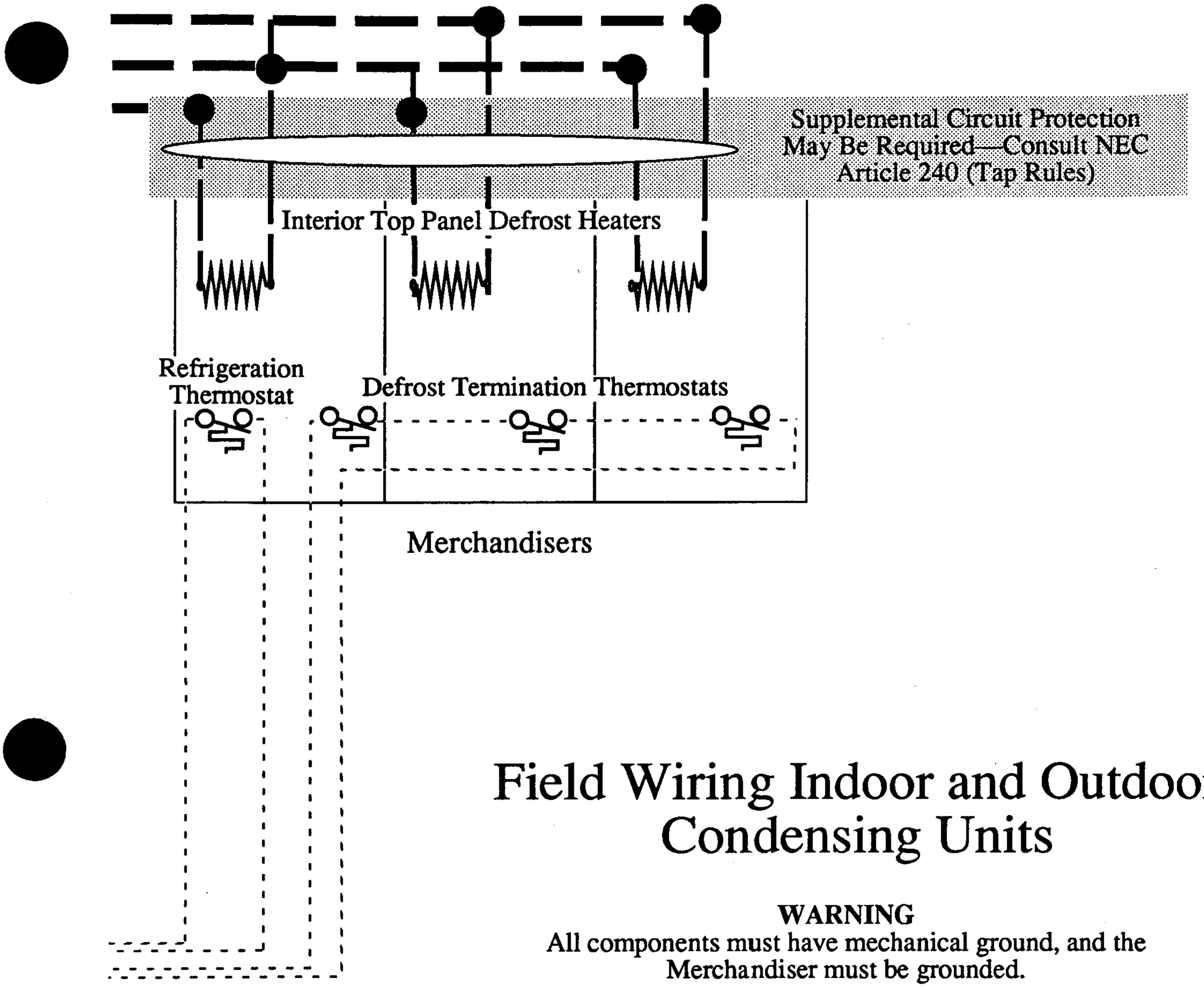


FML-FMLG

REFRIGERATED
MERCHANDISERS
for
PACKAGED FROZEN MEAT

INSTALLATION / SERVICE INSTRUCTIONS

ENG.NO. 122599J
May, 1989
Supersedes #122599I
Dated December, 1988
Section 1



Field Wiring Indoor and Outdoor Condensing Units

WARNING
All components must have mechanical ground, and the Merchandiser must be grounded.

Notes:
- Broken lines indicate field wiring
- All field wiring is supplied and installed by the electrical contractor in accordance with NEC and local codes.
- Remove appropriate Jumper when Refrigeration Thermostat is used

Update/Correction Sheet
Supplemental Circuit Protection
November, 1990

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1. New Cross Section, page 3
2. New Serial Plate Amperages, page 16
3. New Defrost Heaters on Parts List, page 21
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IMPORTANT

KEEP IN STORE FOR FUTURE REFERENCE

Quality that sets industry standards.

THIS MERCHANDISE CONFORMS TO THE

COMMERCIAL REFRIGERATOR MANUFACTURER'S ASSOCIATION

HEALTH AND SANITATION STANDARD

CRS-S1-86

HUSSMANN® 12999 St. Charles Rock Rd. • Bridgeton, MO 63044 USA • (314) 291-2000 • FAX (314) 291-3925

SECTION 1

GENERAL INFORMATION

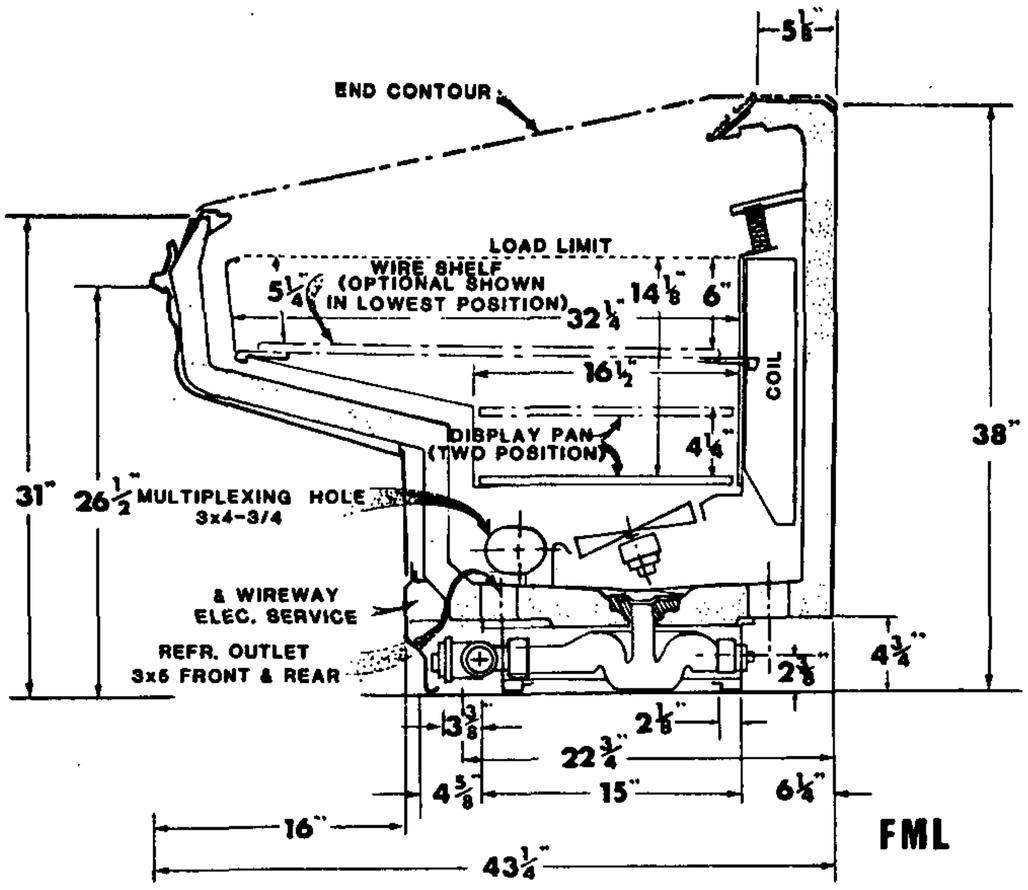
MODEL DESCRIPTION

The FML and FMLG models are refrigerated merchandisers designed to display and protect frozen meat. The basic difference between these two models is the front glass of the FMLG model. Both models are available in either 8' or 12' lengths.

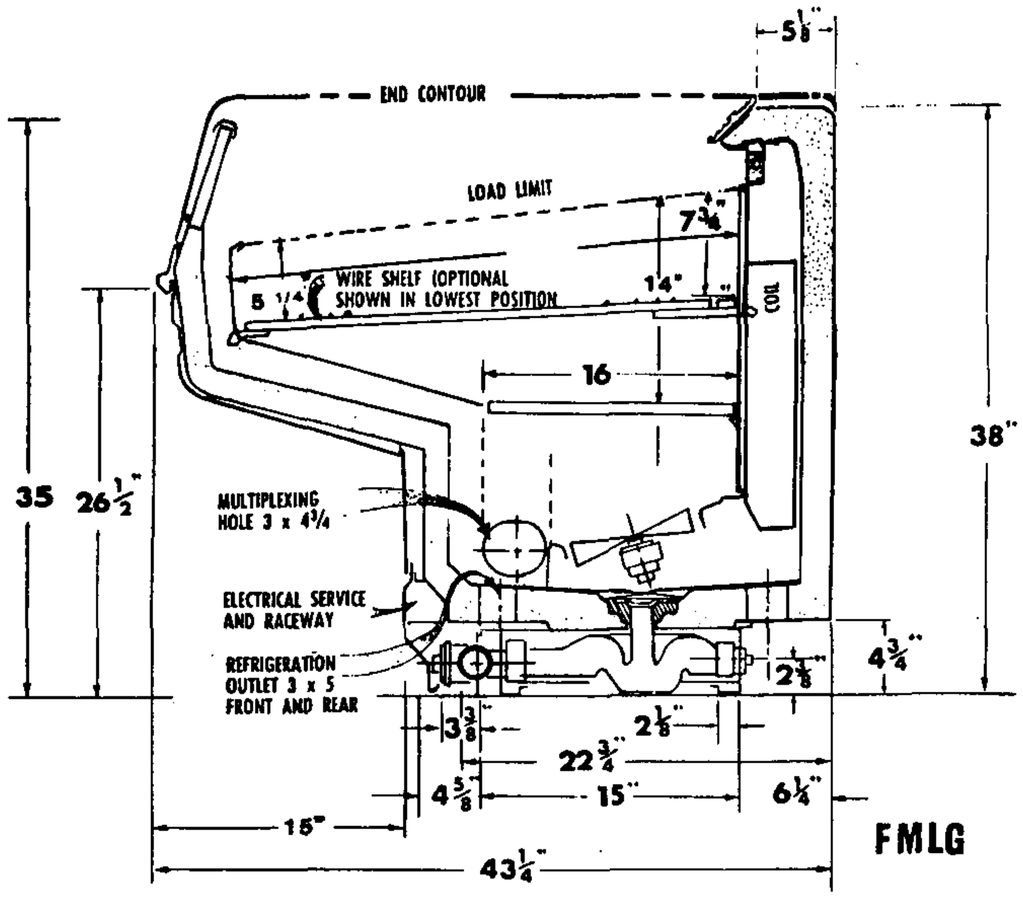
MODEL	DESCRIPTION
FML	Single Deck Merchandiser - No Front Glass
FMLG	Single Deck Merchandiser - With Front Glass

APPLICATION

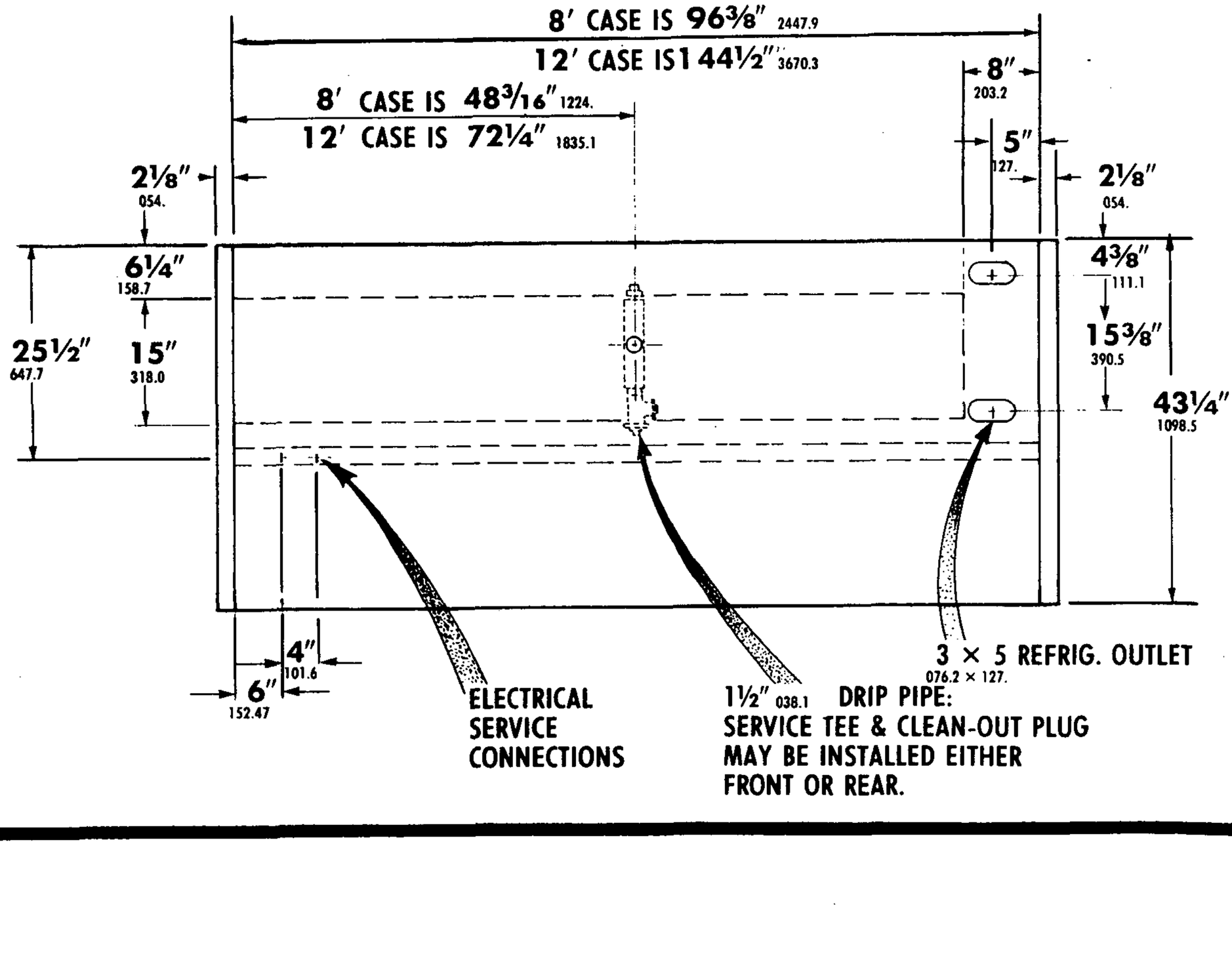
These low temperature merchandisers are designed to display and protect packaged frozen meat in air conditioned stores where temperature and humidity are maintained at 75°F and 55° relative humidity.


END CONTOUR
LOAD LIMIT
WIRE SHELF (OPTIONAL SHOWN IN LOWEST POSITION)
5¼"
32¼"
14⅛"
6"
16½"
COIL
DISPLAY PAN (TWO POSITION)
4¼"
38"
31"
26½"
MULTIPLEXING HOLE 3x4-3/4
& WIREWAY ELEC. SERVICE
REFR. OUTLET 3x5 FRONT & REAR
2⅛"
4¾"
3⅜"
2⅛"
22¾"
4⅝"
15"
6¼"
16"
43¼"

FML


END CONTOUR
LOAD LIMIT
7¾"
WIRE SHELF (OPTIONAL SHOWN IN LOWEST POSITION
5 1/4
1¼"
COIL
16
38"
35
26½"
MULTIPLEXING HOLE 3 x 4¾
ELECTRICAL SERVICE AND RACEWAY
REFRIGERATION OUTLET 3 x 5 FRONT AND REAR
2⅛"
4¾"
3⅜"
2⅛"
22¾"
4⅝"
15"
6¼"
15"
43¼"

FMLG


8′ CASE IS 96⅜" 2447.9
12′ CASE IS 144½" 3670.3
8′ CASE IS 48³⁄₁₆" 1224.
12′ CASE IS 72¼" 1835.1
8"
203.2
5"
127.
2⅛"
054.
2⅛"
054.
6¼"
158.7
4⅜"
111.1
25½"
647.7
15"
318.0
15⅜"
390.5
43¼"
1098.5
4"
101.6
6"
152.47
ELECTRICAL SERVICE CONNECTIONS
1½" 038.1 DRIP PIPE:
SERVICE TEE & CLEAN-OUT PLUG MAY BE INSTALLED EITHER FRONT OR REAR.
3 × 5 REFRIG. OUTLET
076.2 × 127.

SECTION 2

INSTALLING FIXTURE

SHIPPING DAMAGE

All equipment should be thoroughly examined for shipping damage before and when unloading.

This equipment has been carefully inspected at our factory and the carrier has assumed responsibility for safe arrival. If damaged, either apparent or concealed, claim must be made to the carrier.

APPARENT LOSS OR DAMAGE

If there is an obvious loss or damage, it must be noted on the freight bill or express receipt and signed by the carrier's agent, otherwise, carrier may refuse claim. The carrier will supply necessary claim forms.

CONCEALED LOSS OR DAMAGE

When loss or damage is not apparent until after equipment is uncrated, a claim for concealed damage is made. Upon discovering damage, make request in writing to carrier for inspection within 15 days and retain all packing. The carrier will supply inspection report and required claim forms.

SHIPPING BRACES

WARNING: DO NOT REMOVE SHIPPING BRACES FORM FIXTURE UNTIL THE FIXTURE IS PROPERLY LAGGED TO THE FLOOR. THE CASE IS TOP HEAVY AND COULD TIP OVER CAUSING SERIOUS INJURY.

Move the fixture as close as possible to its permanent location and then remove all packaging and shipping braces. Remove all separately packed accessories such as kits, shelves, etc. Remove and discard the shipping screws at each end of the fan plenum. The plenum is hinged for easy access to the area beneath the evaporator.

EXTERIOR LOADING

The rear rails of these cases are not structurally designed to support excessive external loading such as the weight of a person, therefore, do not walk on top of these refrigerators during installation or damage to refrigerator and serious personal injury can occur.

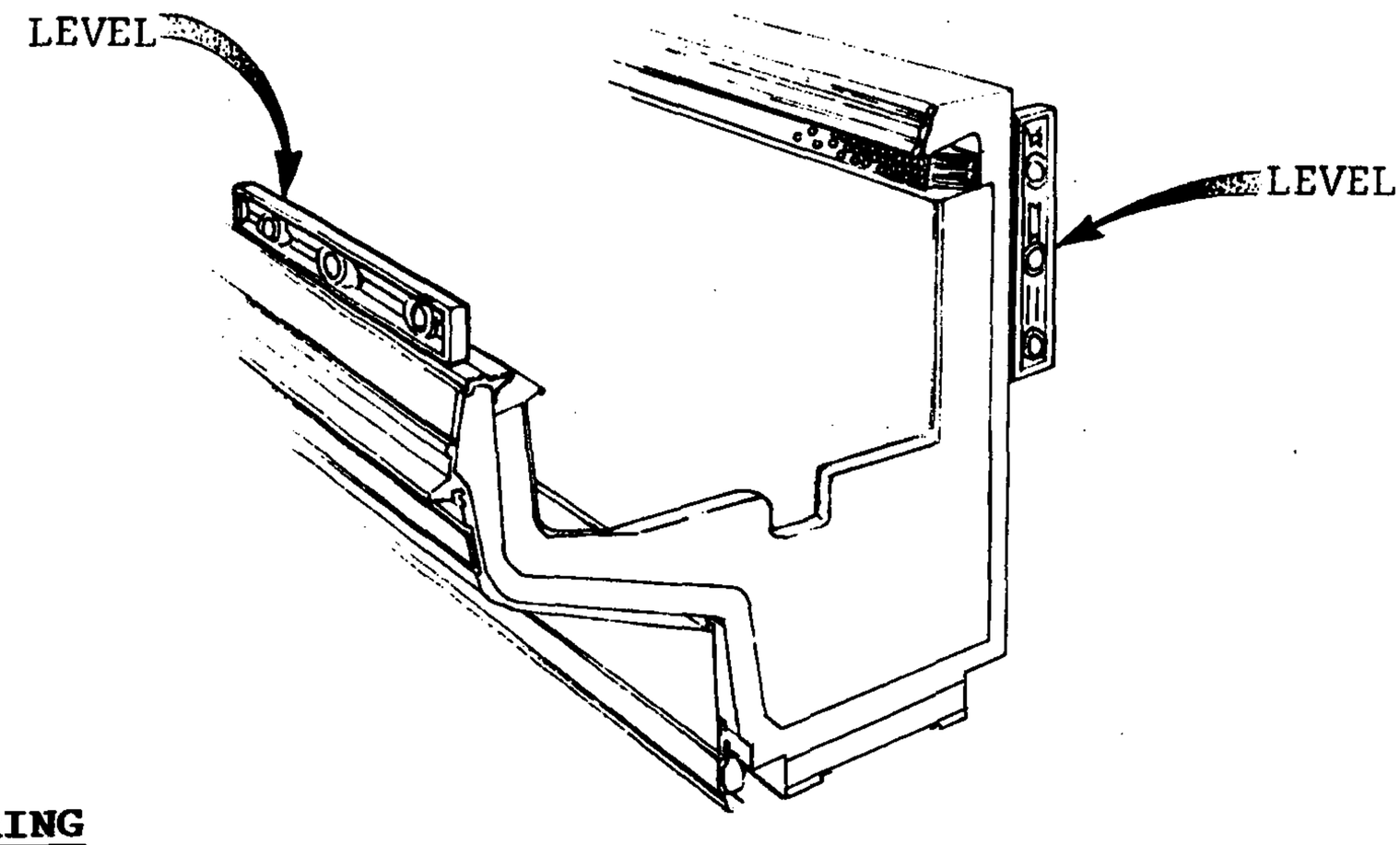
LOCATION

This refrigerator, like other open refrigerators, is sensitive to air disturbances. Air currents passing around this refrigerator will seriously impair its operation. Do not allow air conditioning, electric fans, open doors or windows, etc. to create air currents around this case.

To prevent sweating on the exterior surfaces of this refrigerator, there must be a minimum clearance of 4" between the back and/or ends of this fixture and adjacent walls, cases, shelving or coolers.

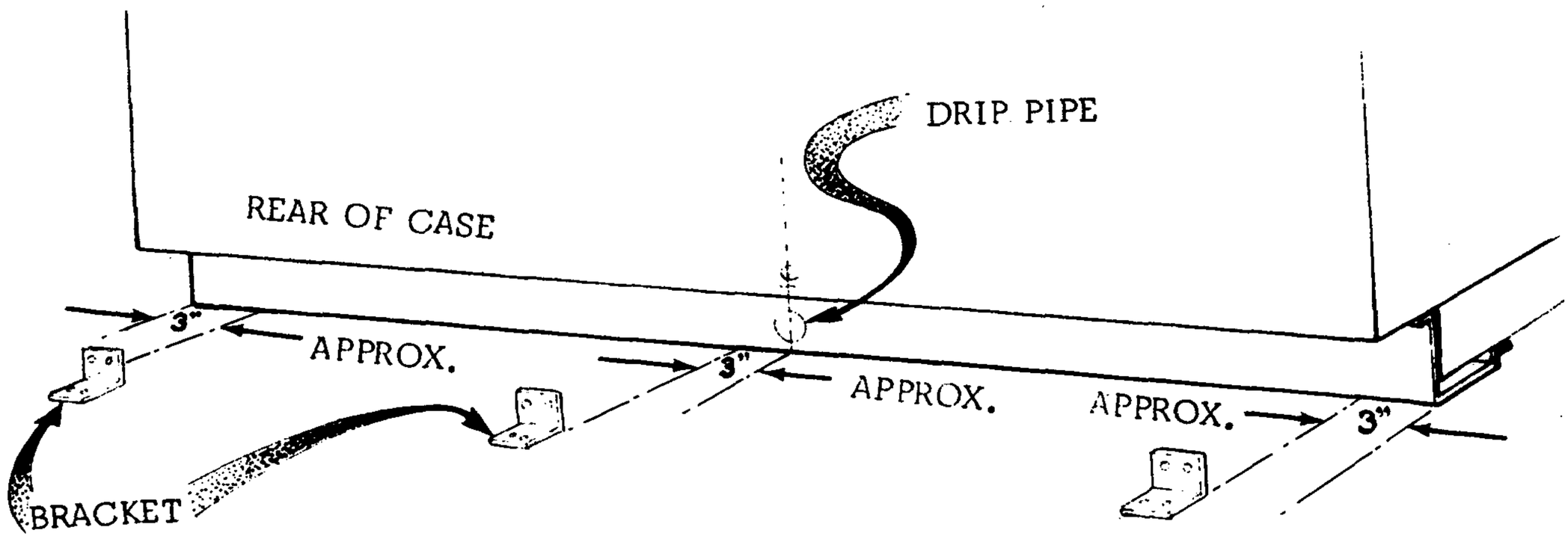
LEVELING

These refrigerators must be installed level to insure proper operation of the refrigeration system and to insure correct draining of defrost water. Use a carpenters level as shown in the following illustration when leveling. Leveling shims have been provided with each refrigerator if needed.



ANCHORING

The forward projection of the refrigerator makes anchoring a necessity to prevent the case from tipping forward. Brackets are to be utilized to secure the rear of the case to the floor. Refer to the following illustration:



JOINING

These refrigerators are of sectional construction which means that two or more may be joined in line yielding one long continuous display that requires only one pair of end assemblies. The material to join these refrigerators and the method of joining them is supplied in a separate joint kit.

WATER SEAL

The water seal is factory installed inside these refrigerators. A one and one-half (1-1/2) inch MPT drip pipe extends out through the front and rear of the case base. Fittings are factory installed to drain out of the front; to drain out of the rear of the case, remove the front and rear fittings and reverse their positions.

CAUTION: BEFORE PLACING THE REFRIGERATOR IN POSITION, BE SURE THE UNUSED DRIP CONNECTIONS ARE SECURELY CAPPED.

INSTALLING DRIP PIPING

Poorly or improperly installed drip piping can seriously affect the operation of this refrigerator and result in costly maintenance and product losses. Please follow the following recommendations when installing drip piping to insure proper installation.

A. Never use pipe for drip piping that is smaller than the diameter of the pipe or waste outlet supplied with the refrigerator.

B. Never use two water seals in series in any one run of drip piping. This will lead to problems of locking water flow and prevent draining.

C. Provide as much downhill slope (fall) as possible; 1/8" per foot is preferred. Plastic piping must be supported to maintain the slope and prevent sag.

D. Avoid long runs of drip piping. Long runs make it impossible to provide the necessary slope.

E. Provide a suitable air break between the flood rim of the floor drain and the outlet of the drip pipe.

F. Prevent drip pipes from freezing:

   1. Do not install drip pipes in contact with uninsulated suction lines. Suction lines should be well insulated.

   2. If drip pipes are located in a cold dead air space, between refrigerators or walls and refrigerators, provide some means to prevent freezing.

SPLASHGUARDS

Each refrigerator has been supplied with a splashguard with which to finish the installation of the refrigerator to the floor for an attractive appearance. After all other installation work has been finished, install the splashguard as follows:

A. Adjust the leveling brackets that are located on the lower base supports to the floor level.

B. Slip the top of the splashguard up behind the lower front panel of the refrigerator and onto the brackets.

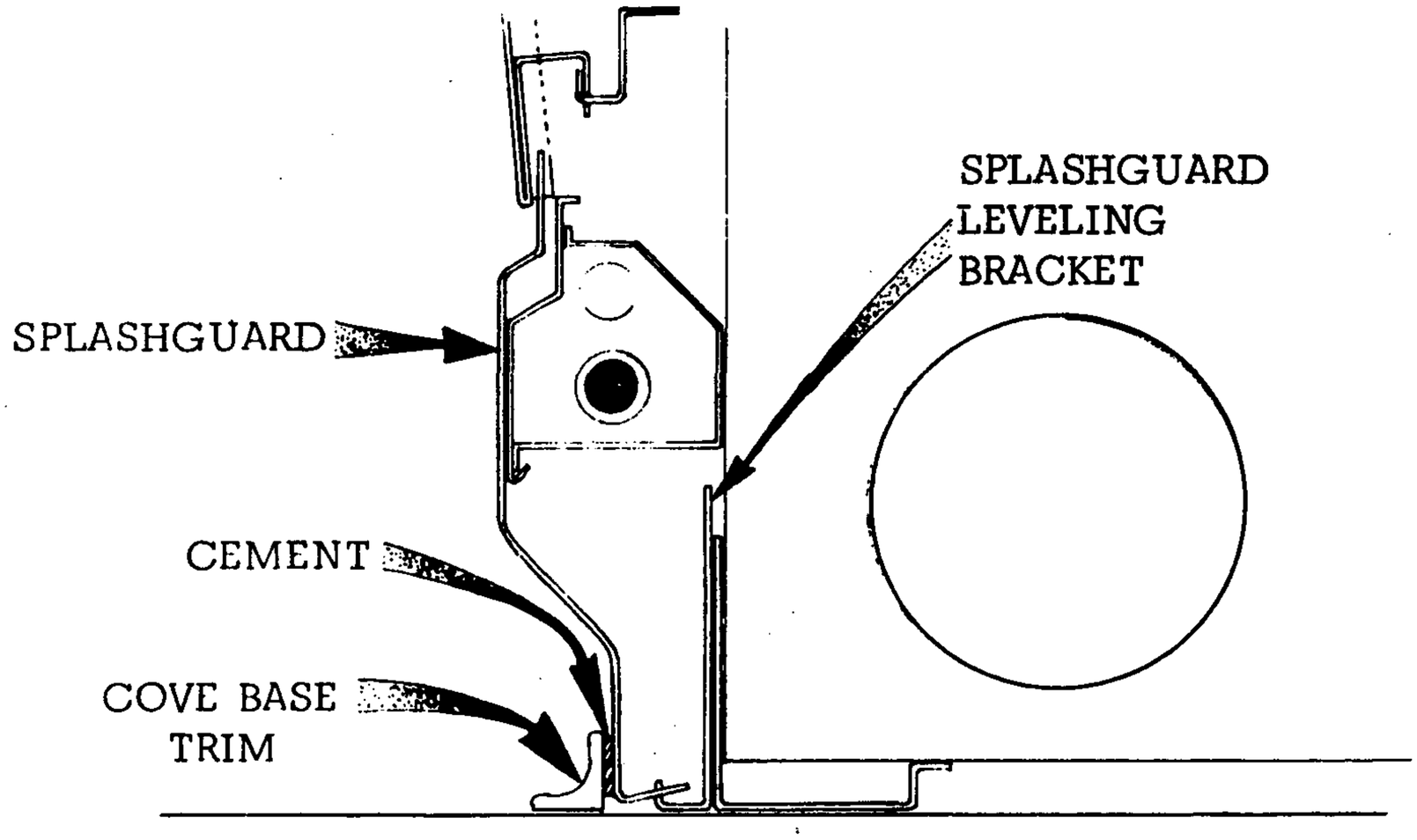
SEALING SPLASHGUARDS

If required by local sanitary codes or if otherwise desired, the splashguards may be sealed to the floor using any cove based trim that the installer desires. The size will depend on how much the floor is out of level. When installing the cove base trim:

A. To insure a good and secure installation, remove all dirt, grease, wax or other contaminates from the area of the splashguard where the trim will be bonded.

B. Apply a good contact cement to the cove base trim and the splashguard if necessary, following the manufacturers directions.

C. Press the cove base trim to the splashguard so that it is flush with the stores floor.



SECTION 3

REFRIGERATION

REFRIGERANT

These refrigerators will be equipped for operation on R-502 refrigerant unless otherwise specified on the factory order. The correct type of refrigerant will be stamped on the refrigerators serial plate located at the left hand end on the interior back liner.

REFRIGERANT PIPING

LINE SIZES: Liquid Line .....3/8" OD
Suction Line ....7/8" OD

OUTLET LOCATION
The refrigerant line outlet is located at the right hand end of the refrigerator as viewed from the front beneath the display pans.

After connections have been made, seal this outlet throughly both on the inside and the outside. We recommend using an aerosol dispensed urethane type of insulation.

MULTIPLEXING
Piping of refrigerators operating on the same refrigeration system may be run from refrigerator to refrigerator through the end frame saddles provided for this purpose. DO NOT RUN REFRIGERANT LINES THROUGH REFRIGERATORS THAT ARE NOT ON THE SAME REFRIGERATION SYSTEM or poor refrigeration control and compressor failure can occur.

LINE SIZING
Refrigerant lines should be sized as shown on the refrigeration legend that is furnished for the store (not furnished by Hussmann). If a legend has not been furnished, refer to the Hussmann Application Engineering Manual for guidance.

OIL TRAPS
"P" traps (oil traps) must be installed at the base of all suction line vertical risers.

PRESSURE DROP

Pressure drop can rob the system of capacity. To keep the pressure drop to a minimum, keep the refrigerant line run as short as possible using a minimum number of elbows. Where elbows are required, use long radius elbows only.

INSULATION

For refrigerators with other than KOOLGAS defrost, the suction and liquid lines should be clamped or taped together and insulated for a minimum of 30 ft. from the refrigerator. Refrigerators with KOOLGAS defrost should not have their liquid and suction lines in contact with each other but are to be separately insulated for a minimum of 30 ft. from the refrigerator. Additional insulation for the balance of the lines is recommended wherever condensation drippage is objectionable.

REFRIGERATION PARTS LIST (Sporlan Nomenclature)

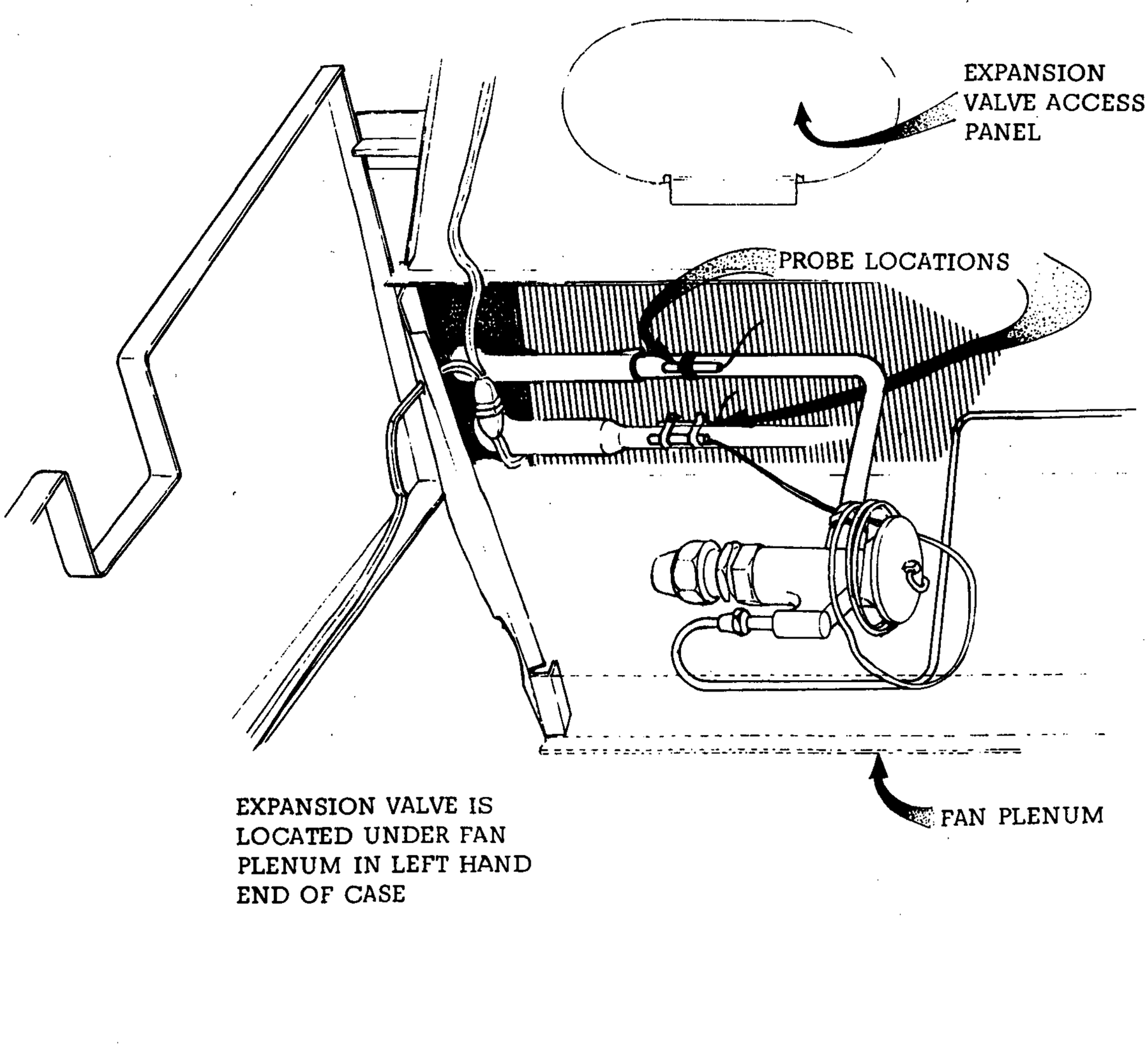
MODEL	TYPE OF DEFROST	REFRIGERANT	BALANCED PORT EXPANSION VALVE
ALL 8' MODELS	Off Time	R-502 R-22 R-12	BFR AZ BFV AZ BFF AZ
	Koolgas *	R-502 R-22 R-12	Y920 BGR AZ Y920 BGV AZ Y920 BGF AZ
ALL 12' MODELS	Off Time	R-502 R-22 R-12	BFR AZ BFV AZ BFF AZ
	Koolgas *	R-502 R-22 R-12	Y920 BGR AZ Y920 BGV AZ Y920 BGF AZ

*These expansion valves are provided with a special 3/8" side outlet port which allows the liquid condensed in the coil during defrost to bypass the expansion valve port and return and return into the liquid line.

EXPANSION VALVE ADJUSTMENT

Expansion valves must be adjusted to a setting which will fully feed the evaporator. To achieve the proper setting the refrigerator must first have been in operation long enough to have reached the approximate intended operating temperature and air flow should not be restricted by heavy frost formation on the evaporator. Adjust valves as follows:

Attach two sensing probes (either thermocouple or thermister types) to the evaporator, one under the clamp holding the expansion valve bulb and the other securely taped to the coil inlet line as close to the back panel as practical (see illustration below). Some "hunting" of the expansion valve is normal. The valve should be adjusted so that during the hunting the greatest difference between the two probes is 3° to 5°. With this adjustment, during a portion of the hunting the temperature difference between the probes may be less than 3°, at times as low as 0°. Make adjustment of no more than one-half (1/2) turn at a time of the valve stem and wait for at least fifteen minutes before rechecking the probe temperatures and making further adjustments.



EXPANSION VALVE IS LOCATED UNDER FAN PLENUM IN LEFT HAND END OF CASE

CONTROLS AND ADJUSTMENTS - CONVENTIONAL MULTIPLEXING

Refrigeration temperature may be controlled by either the condensing units low pressure control or by a refrigeration thermostat (One per condensing unit). Thermostatic control is preferred since it will provide a more constant year around control of temperature. When the optional refrigeration thermostat is factory installed, it will be located in the electrical raceway at the left hand end of the case and with its sensing bulb fastened to the front of the fan plenum.

Defrosts are time initiated and pressure terminated. (temperature termination is optional) Each refrigerator will have electric defrost heaters.

APPLICATION	REFRIGERATION CONTROLS						DEFROST CONTROLS		
	DISCHARGE AIR TEMPERATURE (1)	REFRIGERANT	LOW PRESSURE CONTROL				Defrost Frequency	Pressure Termination (4)	Failsafe (5)
			When (2) Pressure Control controls temperature		When (3) Thermostat controls temperature				
			Cut-Out	Cut-In	Cut-Out	Cut-In			
Frozen Meat	-10°F	R-502	12 psig	28 psig	2 psig	32 psig	Every 12 Hours	95 psig	46 min.

(1) Discharge air temperature is to be measured at the center of the discharge honeycomb at the center of the case.

(2) When the low pressure control is used to control the refrigeration temperature, set the cut-out of the control to stop the compressor at the discharge air temperature shown above.

(3) When a refrigeration thermostat is used to control the refrigeration temperature, set the pressure control as shown then adjust the thermostat to stop the compressor at the discharge air temperature shown above. Outdoor condensing units: Refrigeration temperature must be controlled by a refrigeration thermostat.

(4) When the optional defrost termination thermostat is installed, defrost will occur at approximately 52°F discharge air temperature. If more than one refrigerator is connected to the same condensing unit, the defrost termination thermostat of each refrigerator must be wired in series to the condensing unit defrost timer.

(5) The failsafe setting must not control the length of the defrost. This is especially important when less than 208 volts are supplied to the defrost heaters or when heavy shopping demands have created excess frost on the evaporator. Defrost must be terminated by either pressure termination or by the defrost termination thermostat. The defrost timer of outdoor condensing units must control a liquid line solenoid for pump-down prior to defrost only. The failsafe setting for outdoor units must be increased 4 minutes to compensate for the pump-down period.

CONTROLS AND ADJUSTMENTS - MIXED MULTIPLEXING

Refrigeration temperature may be controlled by either a refrigeration thermostat or a CDA valve (Close on Drop in Air Temperature). Both of these controls are optional items and may be ordered factory installed.

The optional refrigeration thermostat is the same as that for conventional multiplexing. The optional CDA valve will have its sensor installed in the same location as the refrigeration thermostat bulb. The valve itself will be installed at the condensing unit. Further information on the CDA valve concerning wiring, adjusting and servicing can be found in the Instruction manual furnished with the condensing unit.

Standard defrost is electric defrost, the same as that for conventional multiplexing, and is time initiated and time terminated, with temperature termination provided as an option.

KOOLGAS defrost is optional and will be time initiated and time terminated.

APPLICATION	REFRIGERATION CONTROL	DEFROST CONTROL			
			ELECTRIC DEFROST (2)		KOOLGAS DEFROST
	Discharge Air Temperature (1)	DEFROST FREQUENCY	Temperature Termination (3)	Length OF (Failsafe)	Length of Defrost (4)
Frozen Meat	-10°F	Every 12 Hours	52°F	46 min.	14 min.

(1) Discharge air temperature is to be measured at the center of the discharge honeycomb at the center of the case. Adjust the refrigeration control (refrigeration thermostat or CDA valve) to maintain the temperature shown above.

(2) Standard defrost is electric defrost and it is time initiated and time terminated.

(3) Defrost termination temperature when the optional defrost termination thermostat is installed. All like refrigerators connected to the same condensing unit must have their defrost termination thermostat wired in series.

(4) KOOLGAS defrost is time initiated and time terminated. The defrost lengths listed above are based upon laboratory testing but operation under actual store conditions may require that they be lengthened to accomplish a thorough defrost. Some of the store conditions that can contribute to a longer defrost are low head pressure, long runs of refrigerant lines, store ambient, refrigerator temperature operating lower than that recommended, seasonal ambient changes, etc.

Each system shown on the store legend must have "staggered" defrosts to maintain stable compressor loading and sufficient supply of defrost gas.

REFRIGERATION THERMOSTAT (OPTIONAL)

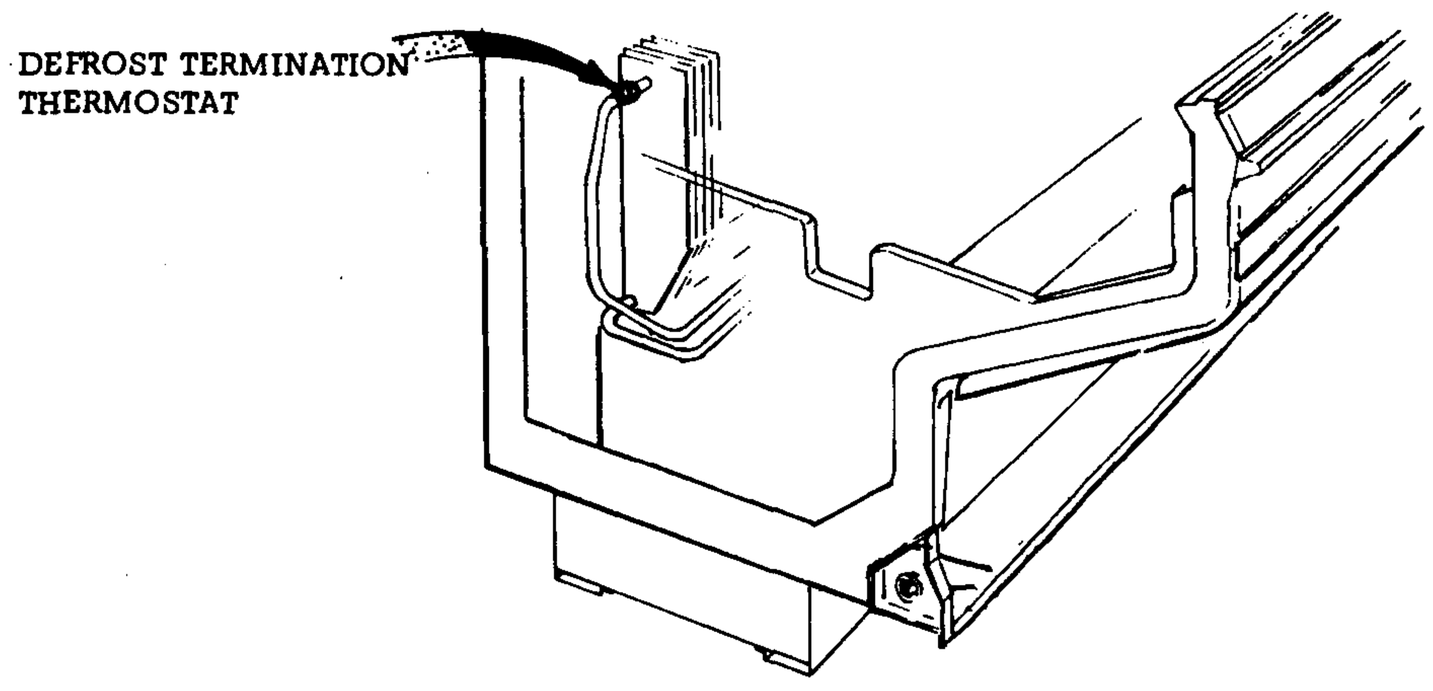
For field installation of the optional thermostat, refer to the THERMOSTAT INSTALLATION KIT INSTRUCTIONS, SUPPLIED WITH EACH KIT.

DUAL TEMPERATURE CONTROL (OPTIONAL)

Refer to Hussmann Installation Instructions #124869 for fixtures with the factory installed Dual Temperature Control Kit.

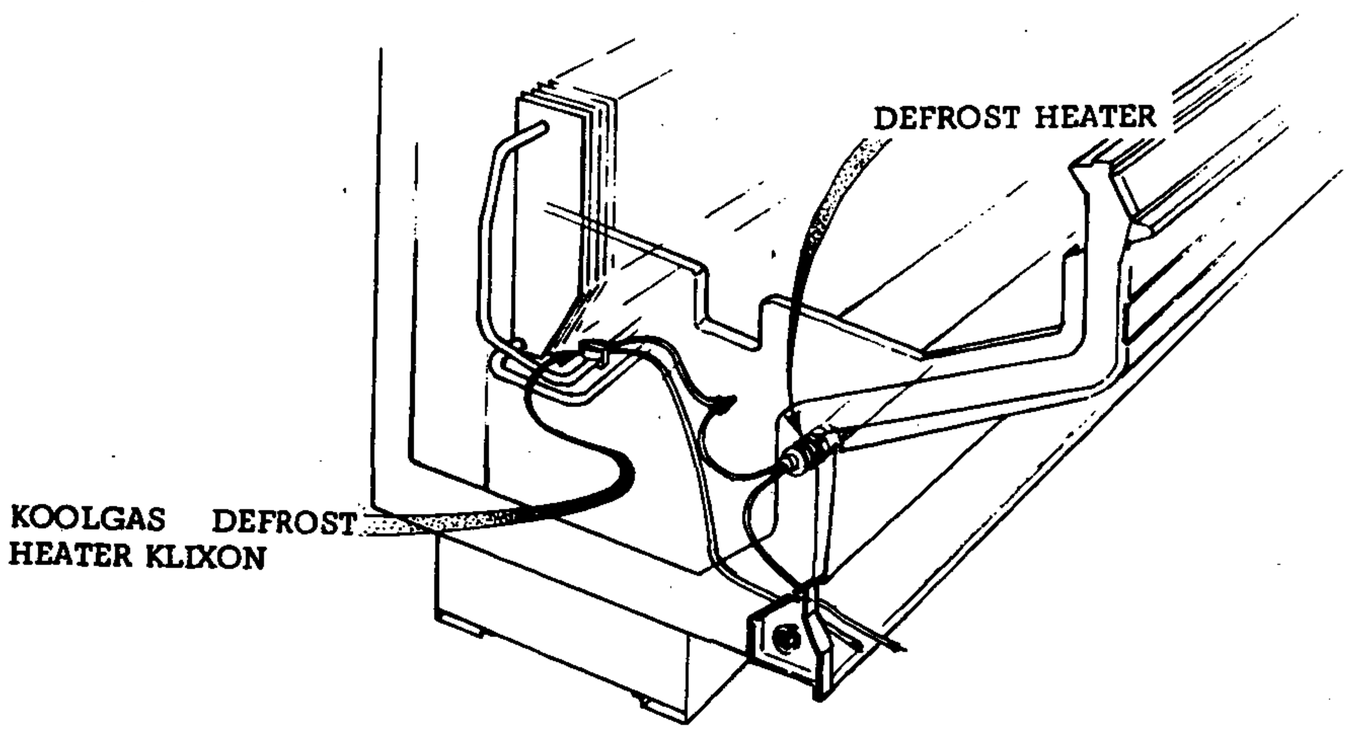
DEFROST TERMINATION THERMOSTAT (OPTIONAL)

The defrost termination thermostat is a non-adjustable thermostat mounted on the inlet tube of the coil.



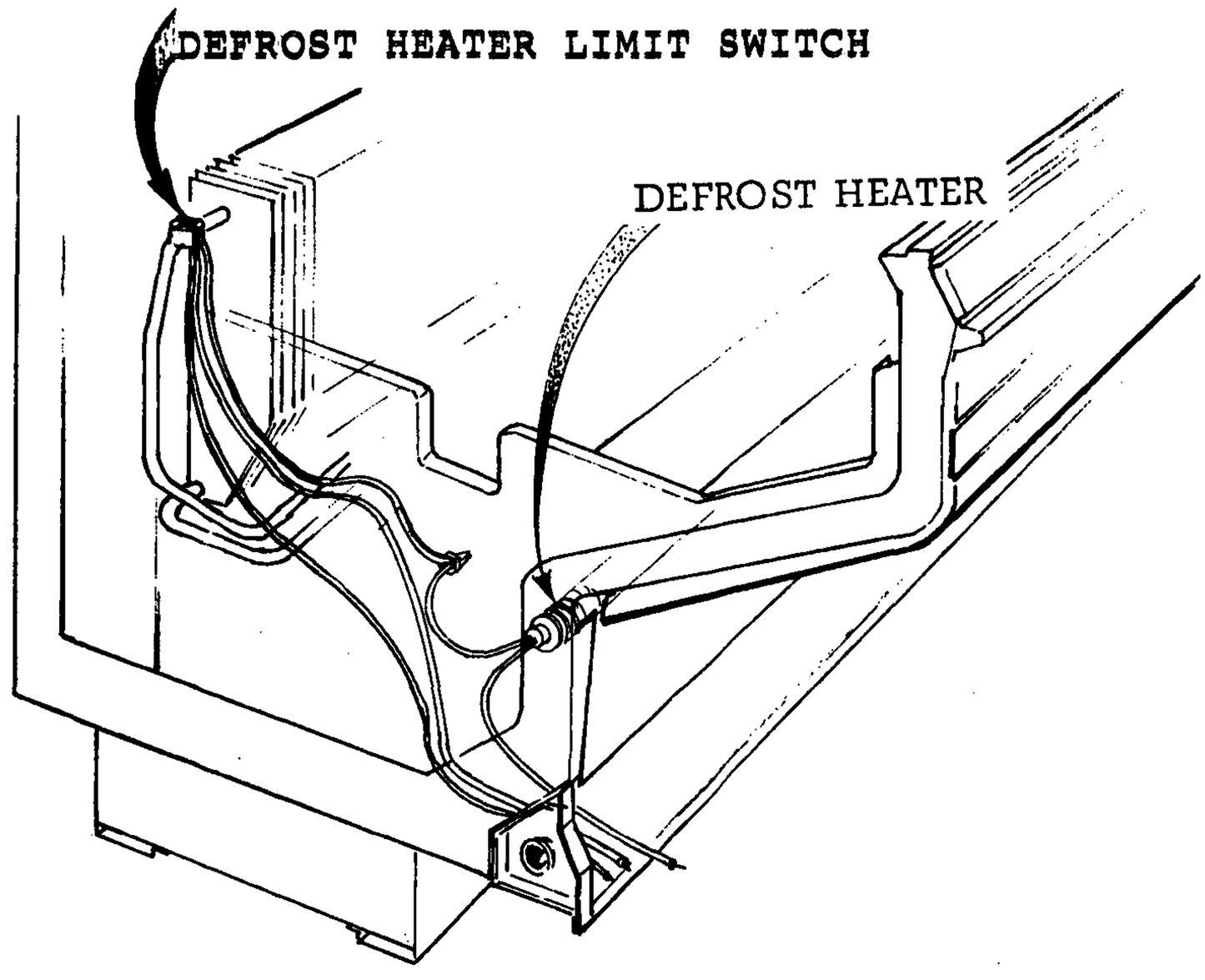
KOOLGAS DEFROST (OPTIONAL)

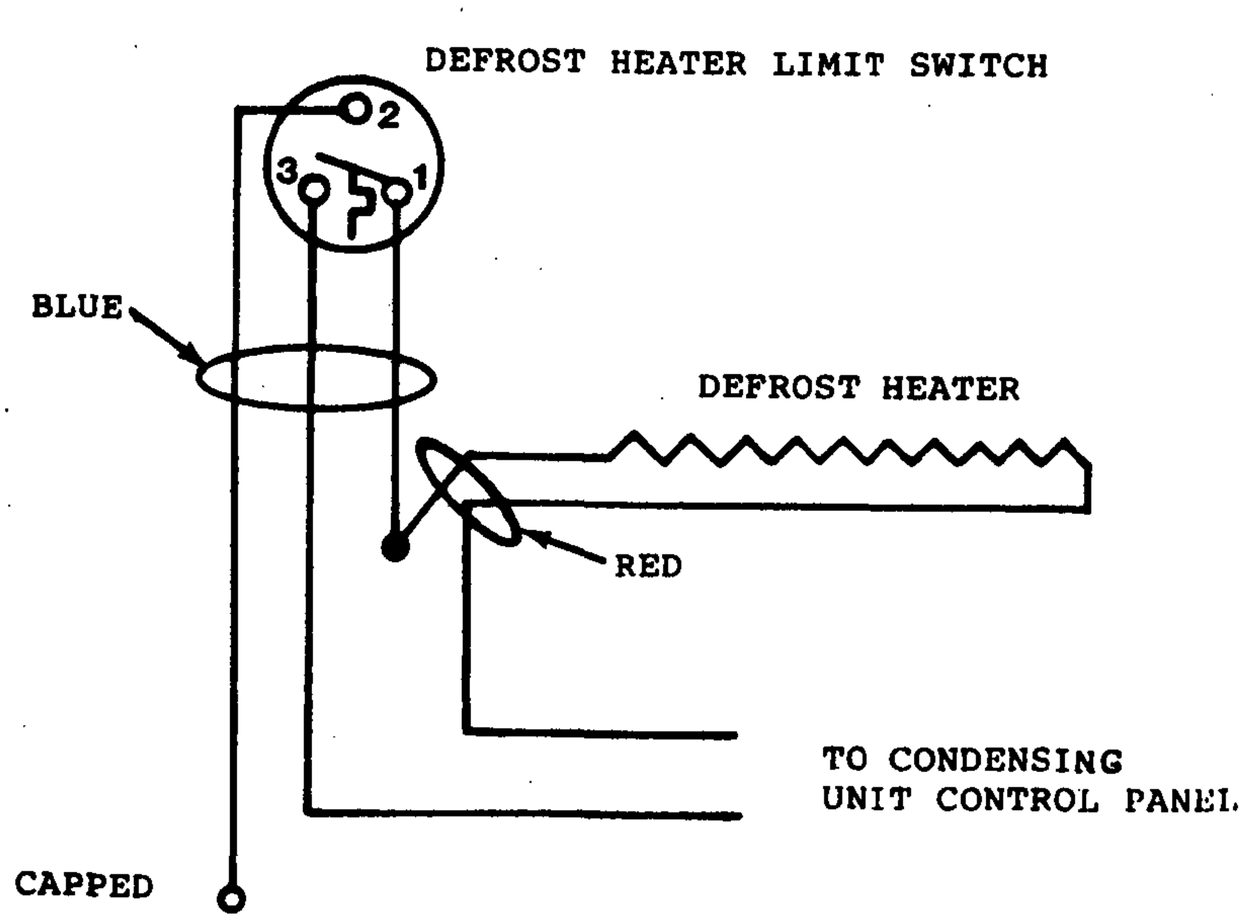
KOOLGAS defrost cases are equipped with a supplemental electric defrost heater which is controlled by a non-adjustable Klixon mounted on the coil. Connect the leads to the appropriate power source (recommend wiring in parallel with fan and anti-sweat heater circuit). This heater operates on 120 V.A.C. (domestic).



DEFROST HEATER LIMIT SWITCH (OPTIONAL)

When specified, a temperature limiting thermostat, one that terminates the electric defrost heater rather than terminate the defrost, will be installed and wired as shown below.





SECTION 4

ELECTRICAL

CONNECTIONS

All electrical connections are to be made in the electrical wireway behind the splashguard at the left hand end of the case (shown below).

IDENTIFICATION OF WIRING

Leads for all electrical circuits are identified by colored plastic bands which correspond to the "color code sticker" located inside of the case wireway (shown below).

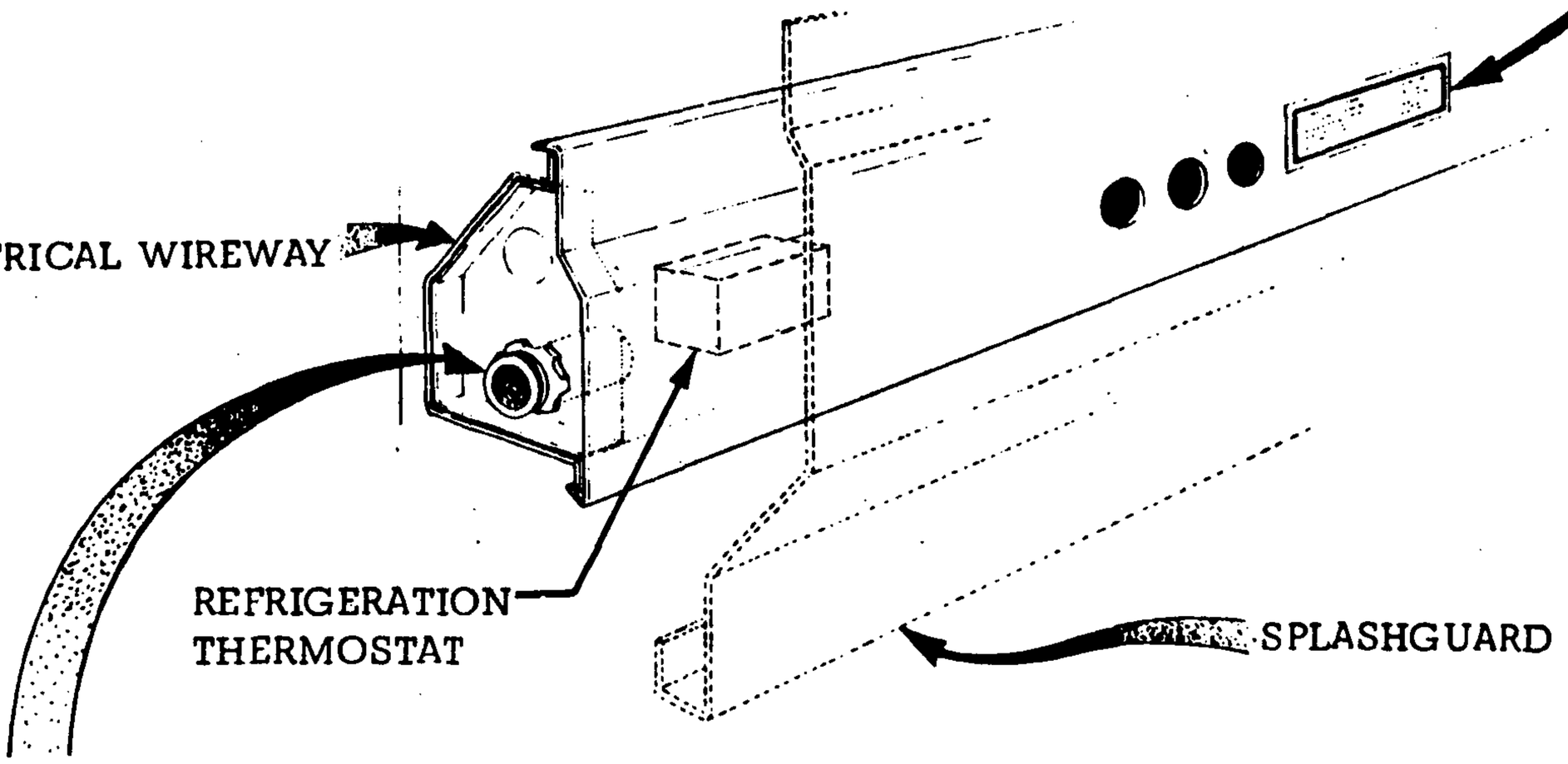
WIRING COLOR CODE

LEADS FOR ALL ELECTRICAL CIRCUITS ARE IDENTIFIED BY A COLORED PLASTIC BAND; NEUTRAL WIRE FOR EACH CIRCUIT HAS EITHER WHITE INSULATION OR A WHITE PLASTIC SLEEVE IN ADDITION TO THE COLOR BAND.

PINK .....REFRIG. THERMOSTAT LOW TEMP	**GREEN*.....GROUND**
LIGHT BLUE.....REFRIG. THERMOSTAT NORM. TEMP.	**ORANGE OR TAN .....LIGHTS**
DARK BLUE.....DEFROST TERM. THERMOSTAT	**MAROON.....RECEPTACLES**
PURPLE.....ANTI-SWEAT HEATERS	**YELLOW.....DEFROST HEATERS, 120V**
BROWN.....FAN MOTORS	**RED *.....DEFROST HEATERS, 208V**

*** EITHER COLORED SLEEVE OR COLORED INSULATION**

ELECTRICIAN NOTE: CASE MUST BE GROUNDED



For electrical connections when two or more cases are installed in line, remove the splashguards, end caps and raceway cover. Install the nipple and nuts (which are provided with each case) between the two cases being connected. This provides a passageway for electrical wires from one case to the other.

SERIAL PLATE AMPERAGES

Serial Plate amperages are the amperage figures that are stamped on the refrigerators Serial Plate. All field wiring must be sized to the Serial Plate amperages, however, the actual amps may be less than that specified.

CASE MODEL	120 VOLT, 60 Hz CIRCUITS			208 V, 60 Hz CIRCUIT
	FANS (1)	CYCLABLE ANTI-SWEAT HEATERS (2)	KOOLGAS SUPPLEMENTAL HEATER (3)	DEFROST HEATER (Single Phase) (4)
FML-8	0.5	1.5	4.0	6.9
FML-12	1.0	2.2	6.0	10.2
FMLG-8	0.5	2.0	5.3	6.9
FMLG-12	1.0	2.7	8.0	10.2

NOTES:

(1) The fans must operate continuously.

(2) All the anti-sweat heaters can be cycled off by connecting them to an energy saving controller or they may be wired to the fan circuit for continuous duty. The wires for these heaters will be tagged in the wireway, identifing them as cyclable anti-sweat heaters.

(3) This circuit is for the finned heater that is controlled by a disc type thermostat, mounted on the evaporator, and is energized during KOOLGAS defrost only. It may be connected in parallel with the fan and anti-sweat heater circuit.

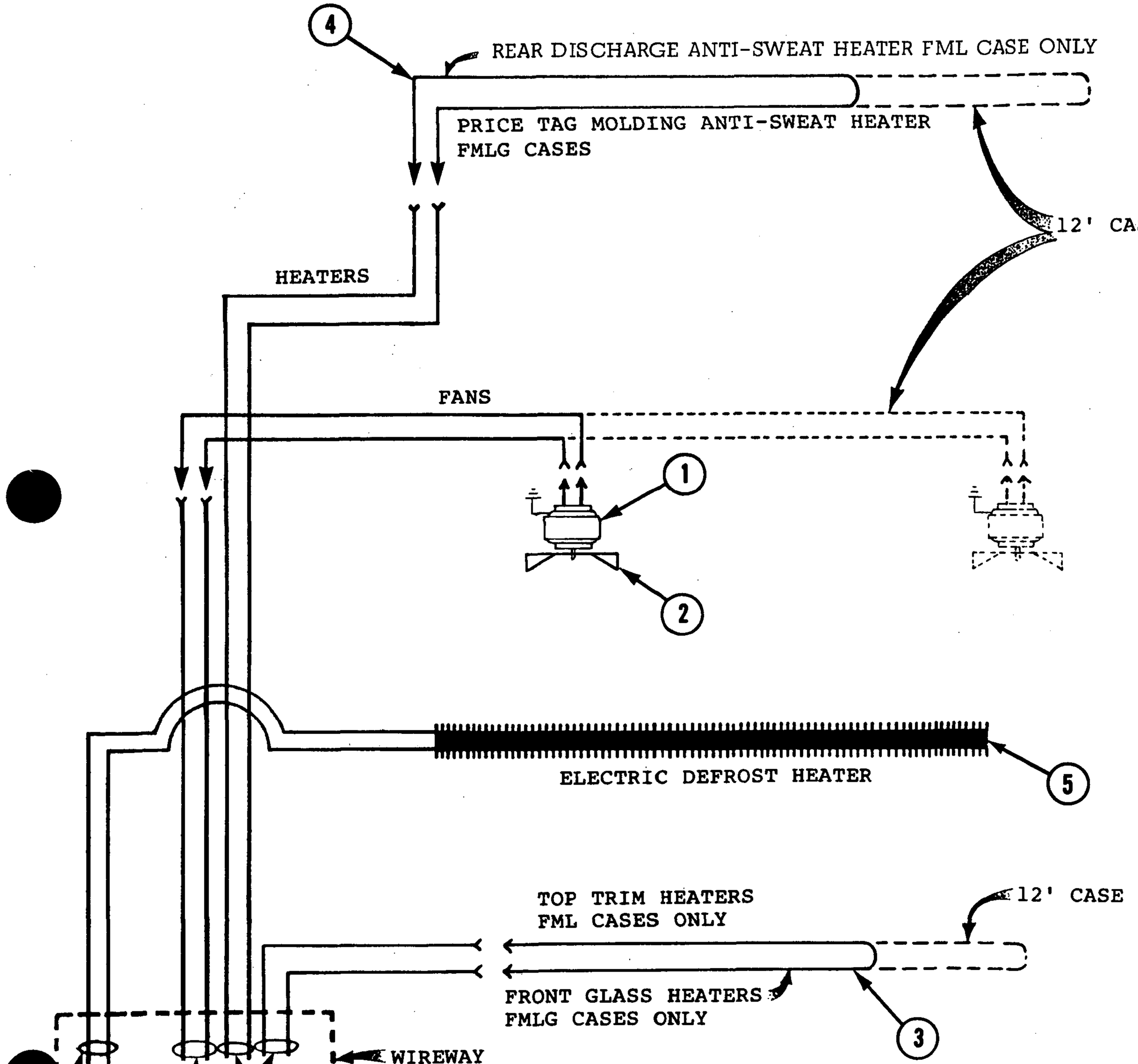
(4) Electric defrost only. Not required for KOOLGAS defrost.

5. In addition to the circuits described above, the following will also require control wiring from the refrigerator to the condensing unit. See wiring diagrams in this section.

   DEFROST TERMINATION THERMOSTAT: This thermostat is optional in all refrigerators with Electric Defrost. It must be wired in series with those in all like refrigerators that are on the same system and wired to a temperature termination type defrost timer.

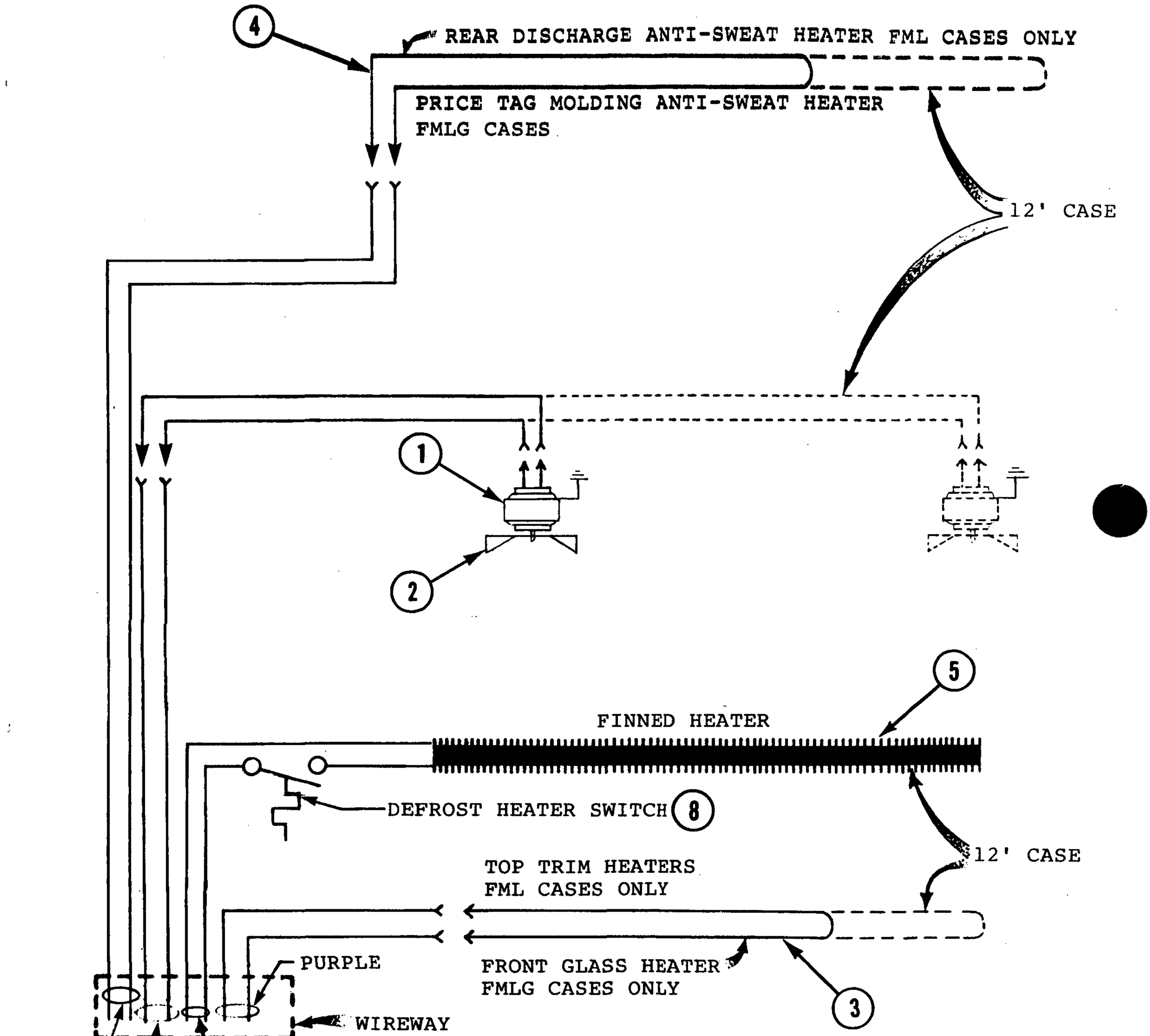
   REFRIGERATION THERMOSTAT or CDA SENSOR: Both of these are optional refrigeration controls that need to be wired to the condensing unit control panel when they are installed in the refrigerator.

WIRING DIAGRAM
FML - FMLG
(ELECTRIC DEFROST)



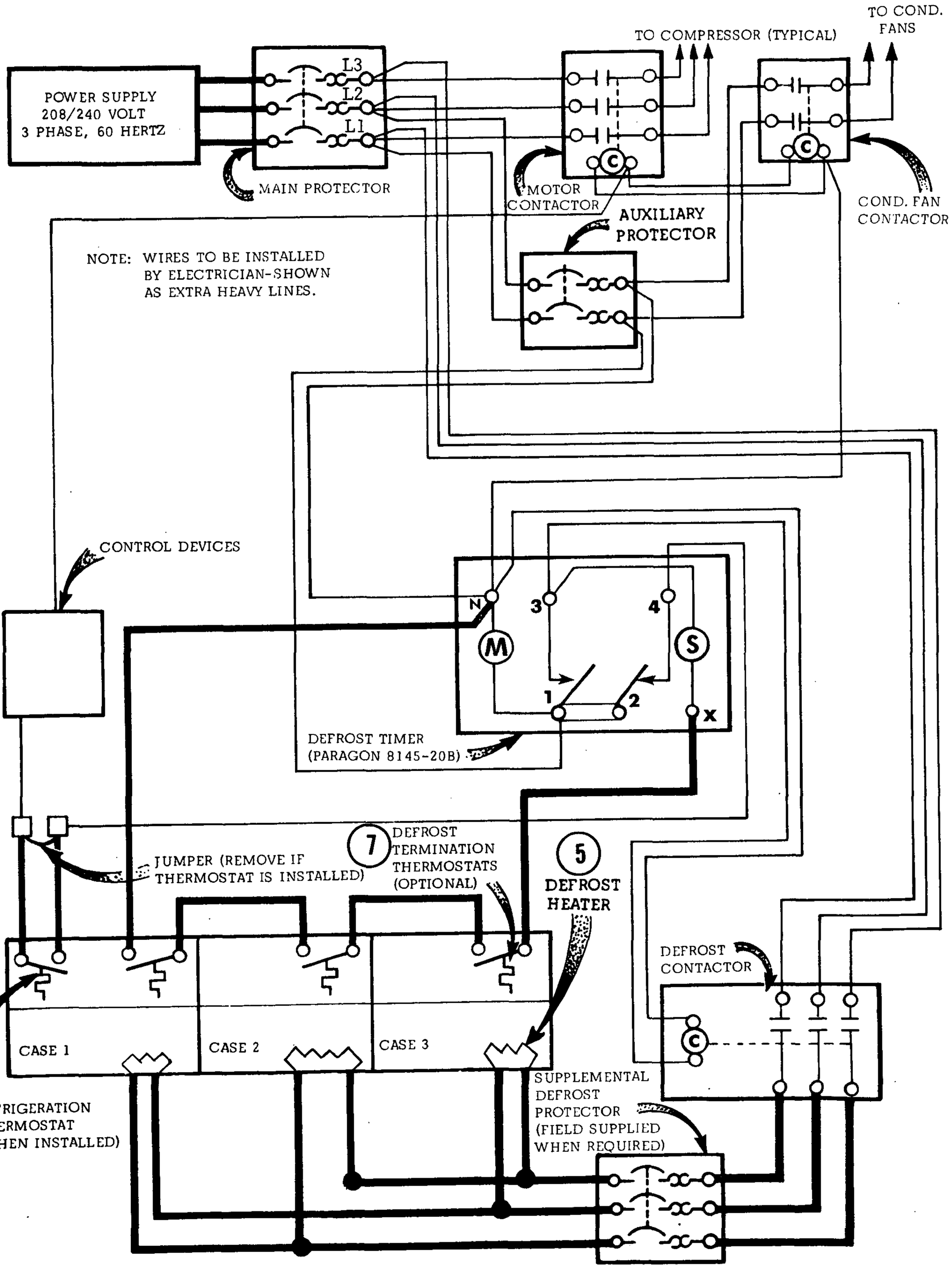
NOTE: REFRIGERATORS MUST BE GROUNDED

WIRING DIAGRAM
FML - FMLG
(KOOLGAS DEFROST)

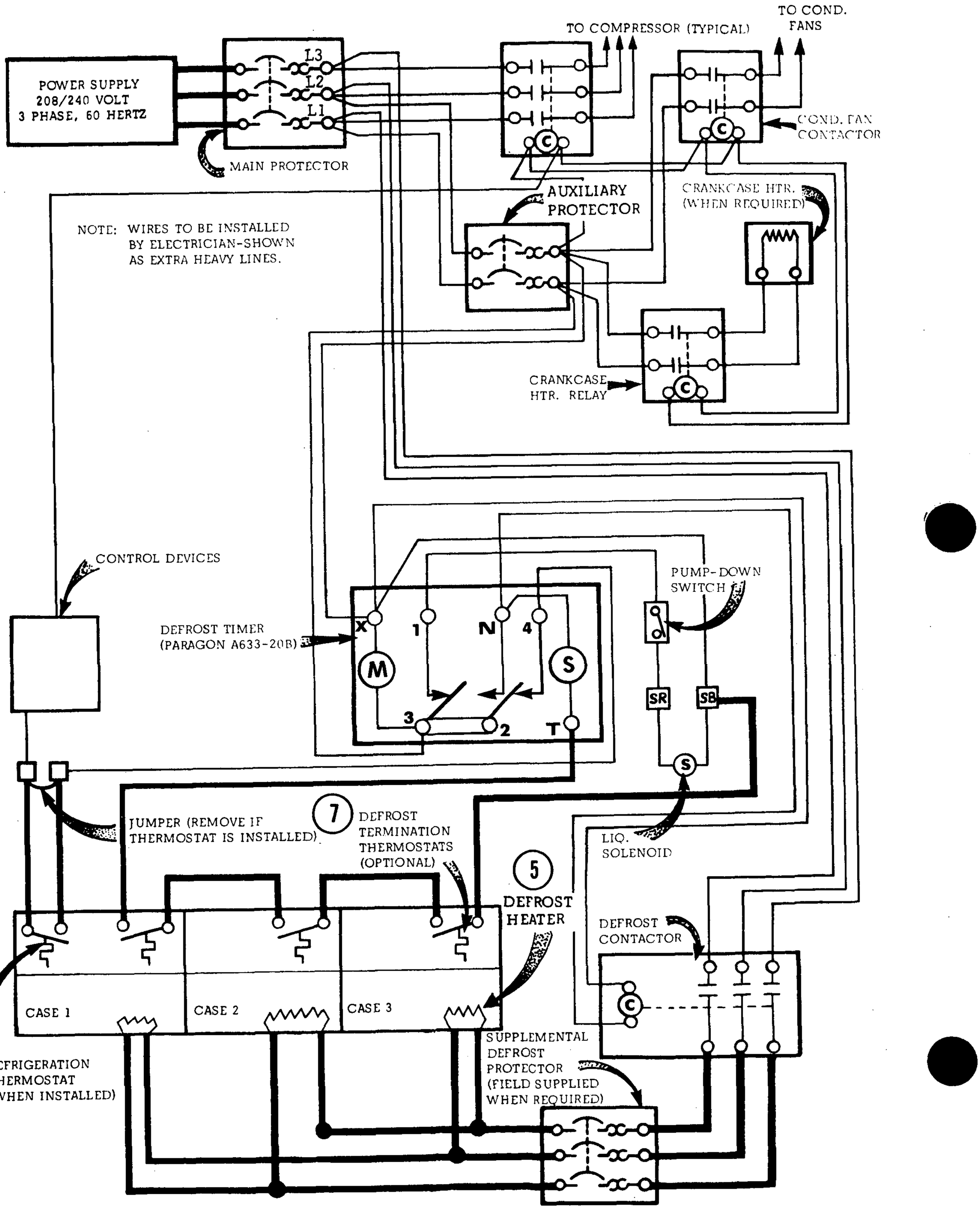


NOTE: REFRIGERATORS MUST BE GROUNDED

CONVENTIONAL MULTIPLEXING - INDOOR TYPE UNIT CONDENSING UNIT & CONTROL PANEL WIRING DIAGRAM



CONVENTIONAL MULTIPLEXING - OUTDOOR TYPE UNIT
CONDENSING UNIT & CONTROL PANEL WIRING DIAGRAM



ELECTRICAL REPLACEMENT PARTS

ITEM	PART NUMBER	DESCRIPTION
1.	058698	Fan Motor - GE#5KSP51CL-227 6W CW
2.	252116	Fan Blade - Morrill FV700 CW15SS Embossing toward motor
3.	038986	Top Trim Anti-Sweat Heater - .8 amps, 150 ohms FML-8
	038987	Top Trim Anti-Sweat Heater - 1.2 amps, 100 ohms - FML-12
	090354	Front Glass Anti-Sweat Heater - .78 amps, 153 ohms - FMLG-8
	090355	Front Glass Anti-Sweat heater - 1.2 amps, 102 ohms - FMLG-12
4.	044309	Rear Discharge Anti-Sweat Heater - .75 amps, 160 ohms - FML-8
	044310	Rear Discharge Anti-Sweat Heater - 1.2 amps, 120 ohms - FML-12
	044305	P.T.M. Anti-Sweat heater - 1.5 amps, 103 ohms - FMLG-8
	044306	P.T.M. Anti-Sweat Heater - 1.5 amps, 80 ohms - FMLG-12
5.	058657	Defrost Heater - FML-8, FMLG-8 6.9 amp, 208 volt, 30 ohms (Electric Defrost) 4.0 amp, 120 volt, 30 ohms (Koolgas Defrost) FML
	121252	Defrost Heater - FMLG-8, (Koolgas Defrost) 5.3 amp, 120 volt, 21 ohms
	058658	Defrost Heater - FML-12, FMLG-12 10.2 amp, 208 volt, 20 ohms (Electric Defrost) 6.0 amp, 120 volt, 20 ohms (Koolgas Defrost) FML
	121253	Defrost Heater - FMLG-12 (Koolgas Defrost) 8.0 amp, 120 volt, 15 ohms
6.	113625	Refrigeration Thermostat - Penn Control #A19AGD-21 (optional)
7.	252122	Defrost Termination Thermostat - T.I. #20425 F32-497-914 (optional-Electric Defrost)
8.	122940	Defrost Heater Thermostat Switch - T.I. *20420F28 -442-343 (KOOLGAS Defrost)
9.	311192	Defrost Heater Limit Switch (optional - Electric Defrost)

SECTION 5

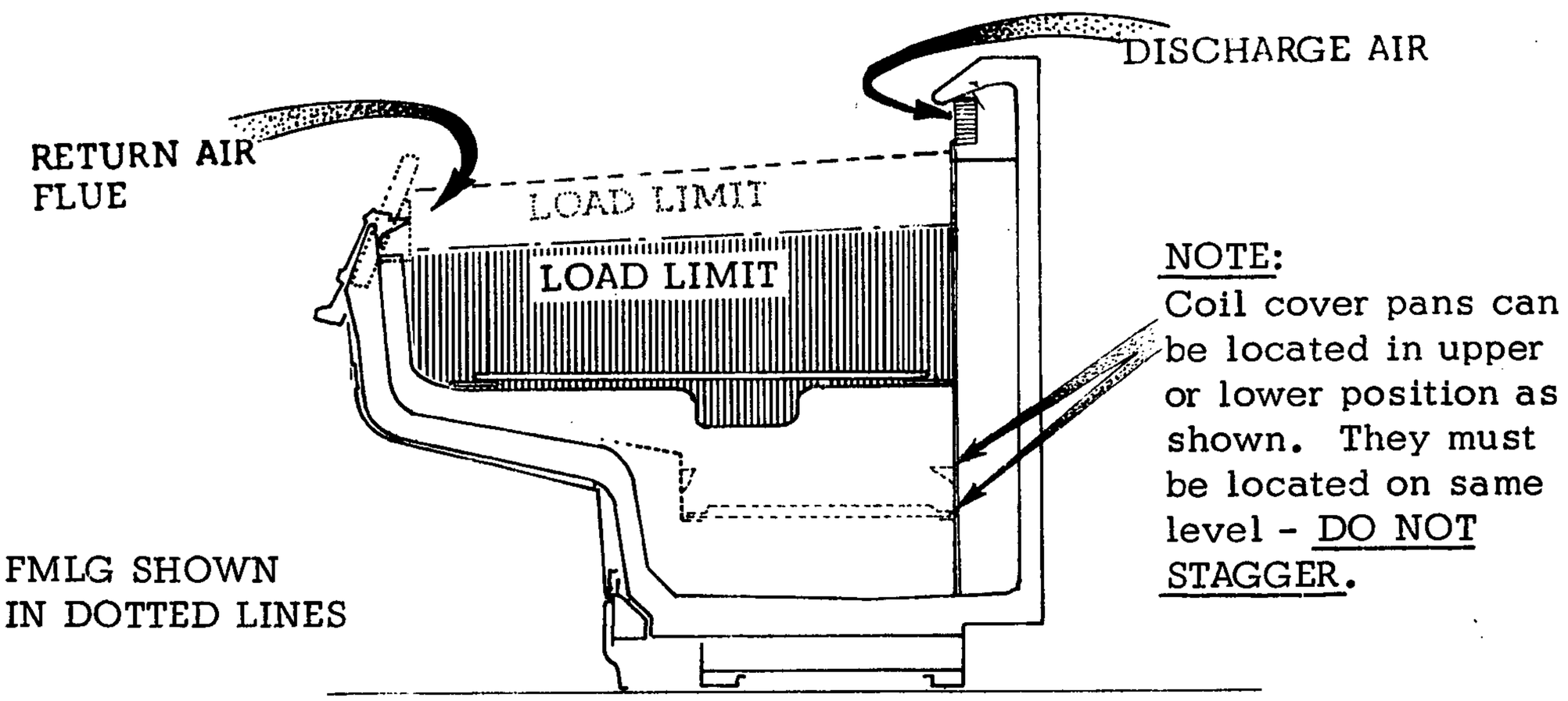
USER'S INFORMATION

STOCKING

Merchandise should not be placed in these refrigerators until they are at the designed operating temperatures, approximately 2-3 hours.

When stocking, never allow product to extend beyond the load limit decals affixed to the interior of the refrigerator. AIR DISCHARGE AND RETURN AIR FLUES MUST BE UNOBSTRUCTED AT ALL TIMES TO PROVIDE PROPER REFRIGERATION AND AIR CURTAIN PERFORMANCE.

Since all food items are perishable, packages should be periodically rotated to maintain freshness. This rotation of the product will also prevent excessive frost accumulation and sticking of packages.



AIR DISCHARGE AND RETURN FLUES MUST BE UNOBSTRUCTED AT ALL TIMES OR OPERATION WILL BE SERIOUSLY AFFECTED.

PRODUCT DIVIDERS

Wire Product Dividers are designed to separate the products on display. The 4" leg of the divider is used for shallow depth displays.

SHELVES

Wire display shelves can be adjusted to several positions permitting shallow displays or after removal, volume display (for bulky items such as hams or chickens). The insulated bottom pans are adjustable to two positions.

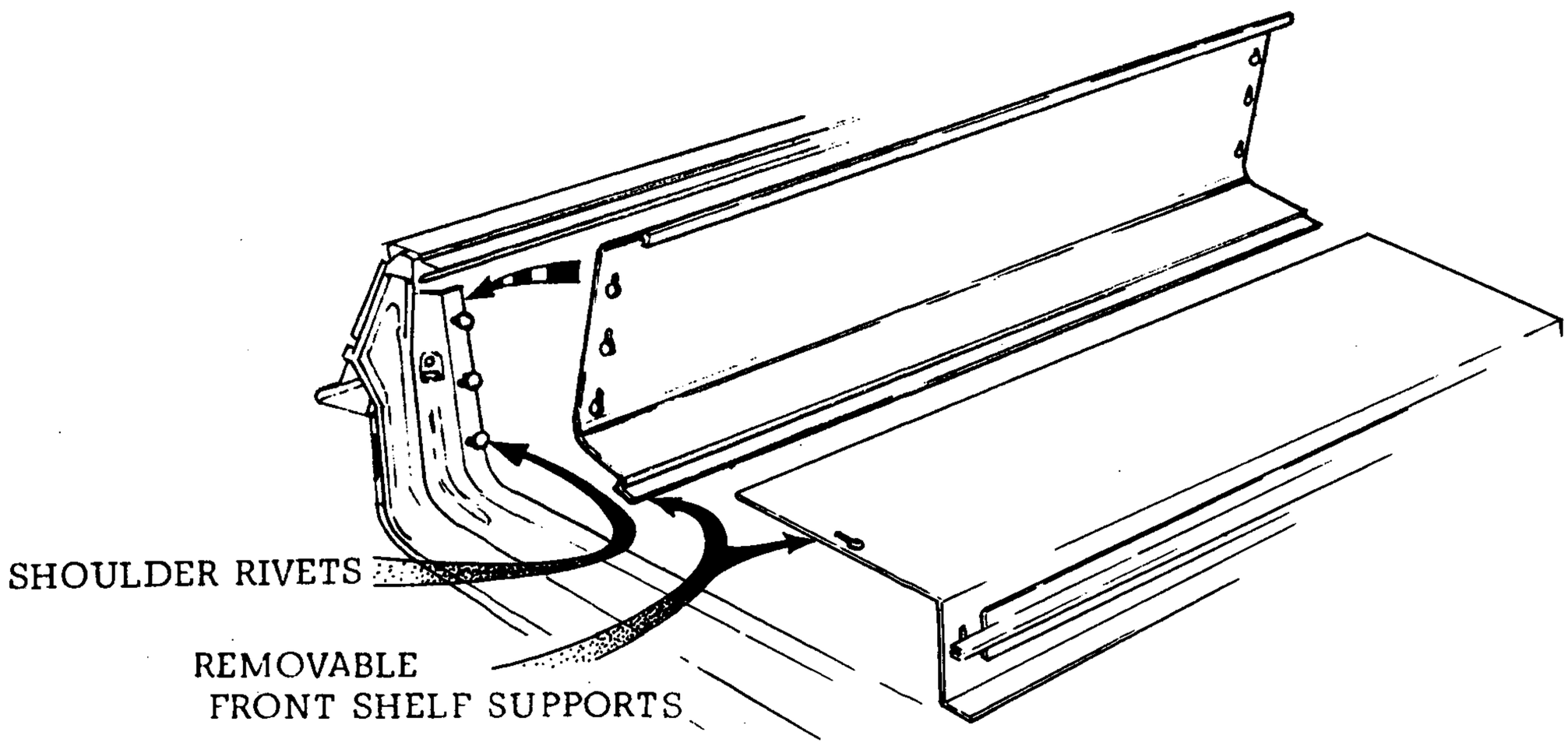
DISPLAY LIGHTING

Both the temperature and the rate of discoloration of fresh red, cured, smoked and table ready meats increases with higher light intensity and is affected differently by the various types of lighting presently in use. The total light intensity from all light sources should be limited to a maximum of 100 foot candles at the product level including no more than 30 foot candles from incandescent lamps if a shelf life of more than 2 to 3 days is expected. The same light intensity limit should be used when displaying frozen meats.

CARE AND CLEANING

Long life and satisfactory performance of any equipment is dependent upon the care given to it. To insure long life, proper sanitation and minimum maintenance costs, the fixture should be thoroughly cleaned, debris removed and the interior washed down monthly.

To facilitate quick and complete cleaning, this refrigerator has been designed with removable front and lower shelf supports. These supports are removable in four foot sections without the need for tools by simply lifting each section up and off of the shoulder rivets located at both ends of each section (see illustration below).



The fan plenum is hinged for easy access to the area beneath the evaporator for cleaning. The plenum is fastened down for shipping purposes with a screw at each end. If these have not been removed, do so and discard.

CAUTION: BE SURE PLENUM IS PROPERLY LOWERED INTO POSITION AFTER CLEANING OR PRODUCT LOSS WILL RESULT DUE TO IMPROPER REFRIGERATION.

The interior bottom of this case is an easy to clean, corrosion resistant material designed for maximum sanitation. All domestic detergents, even ammonia base cleaners are recommended. Sanitizing solutions will not harm the case interior bottom, however, these sanitizers should be used according to the manufacturer's directions.

CAUTION

DO NOT USE STEAM OR EXTREMELY HOT WATER TO WASH THE INTERIOR BOTTOM OF THESE CASES. WHEN CLEANING, DO NOT USE A HOSE WITH HIGH WATER PRESSURE AND NEVER INTRODUCE WATER INTO THE FIXTURE FASTER THAN THE WASTE OUTLET CAN CARRY IT AWAY.

To preserve the exterior finish of the fixture, use warm water and a mild detergent.

DO NOT USE ABRASIVE CLEANERS OR STEEL WOOL SCOURING PADS AS THESE WILL MAR THE FINISH.

SECTION 6

SERVICE TIPS

ALWAYS DISCONNECT THE ELECTRICAL POWER AT THE MAIN DISCONNECT WHEN SERVICING OR REPLACING ANY ELECTRICAL COMPONENT OF THIS REFRIGERATOR. THIS INCLUDES, BUT IS NOT LIMITED TO SUCH ITEMS AS FANS, HEATERS, THERMOSTATS, AND FLOURESCENT LAMPS THAT MAY BE INSTALLED IN THE OPTIONAL SUPERSTRUCTURE FOR THESE CASES.

FAN BLADE REPLACEMENT

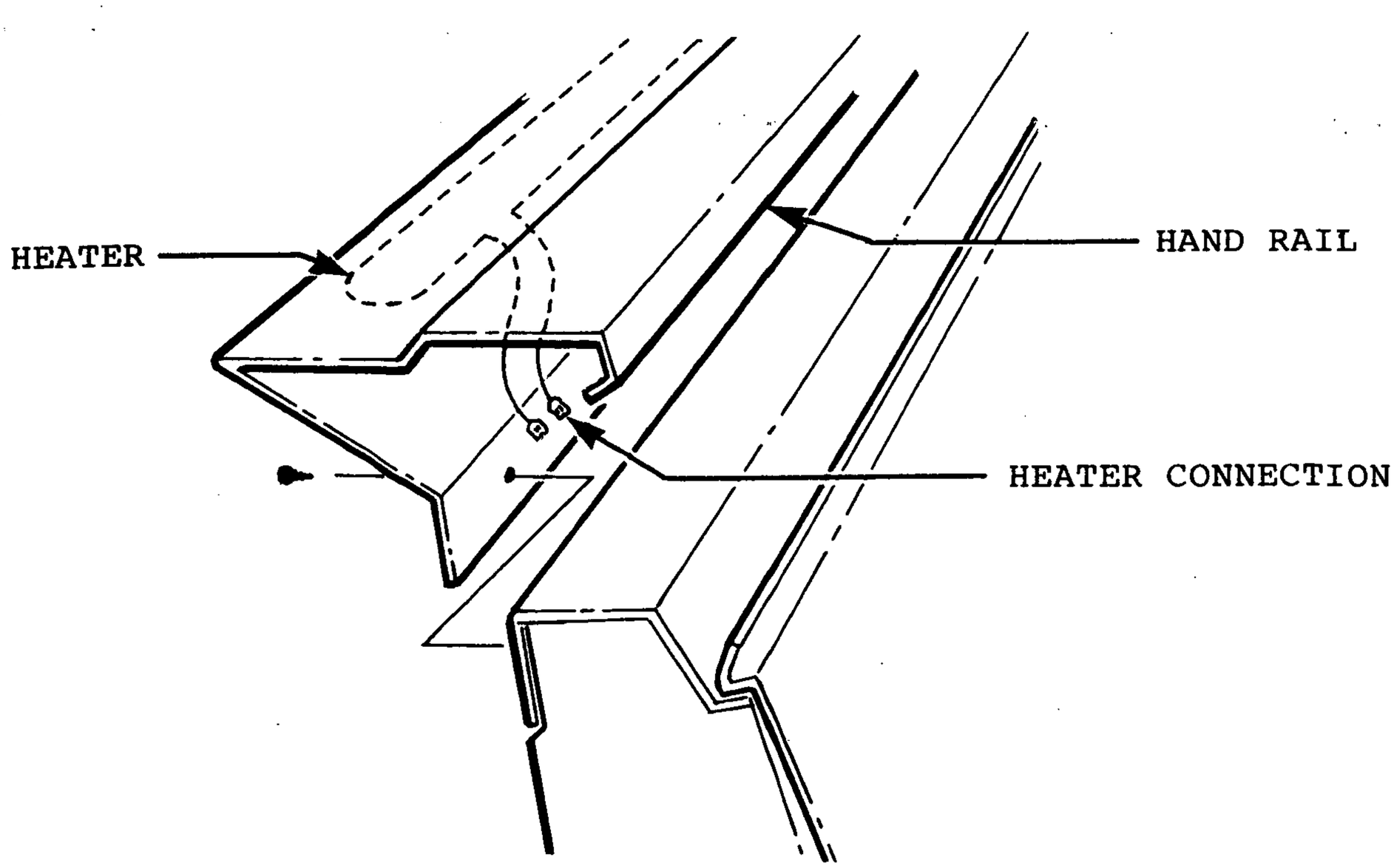
The evaporator fans are located at the center front of these cases directly beneath the display pan. Should the fans or blades ever need servicing, ALWAYS REPLACE THE FAN BLADES WITH THE RAISED EMBOSSING SIDE OF THE BLADE INSTALLED TOWARD THE MOTOR.

ANTI-SWEAT HEATER LOCATION AND REPLACEMENT

I. FML MODEL ANTI-SWEAT HEATERS

A. Top Trim Anti-Sweat Heater
This heater is located beneath the Top Front Hand Rail of the case. To replace:

1. Remove the screws from the back edge of the hand rail.
2. Pull the back edge of the hand rail up and rotate out away from case.
3. Disconnect the heater from its supply harness and replace heater. See parts list for replacement heater.
4. Re-install all parts in reverse order of removal.



B. Rear Discharge Anti-Sweat Heater (SEE FIGURE 1)
This heater is located beneath the honeycomb cover immediately above the rear discharge honeycomb. To replace:

1. Remove the screws holding the cover to the back of the case and to the front
2. Carefully pull the cover from the case.
3. Disconnect the heater from its supply harness and replace heater. See parts list for replacement heater.
4. Re-install all parts in reverse order of removal.

FIG. 1

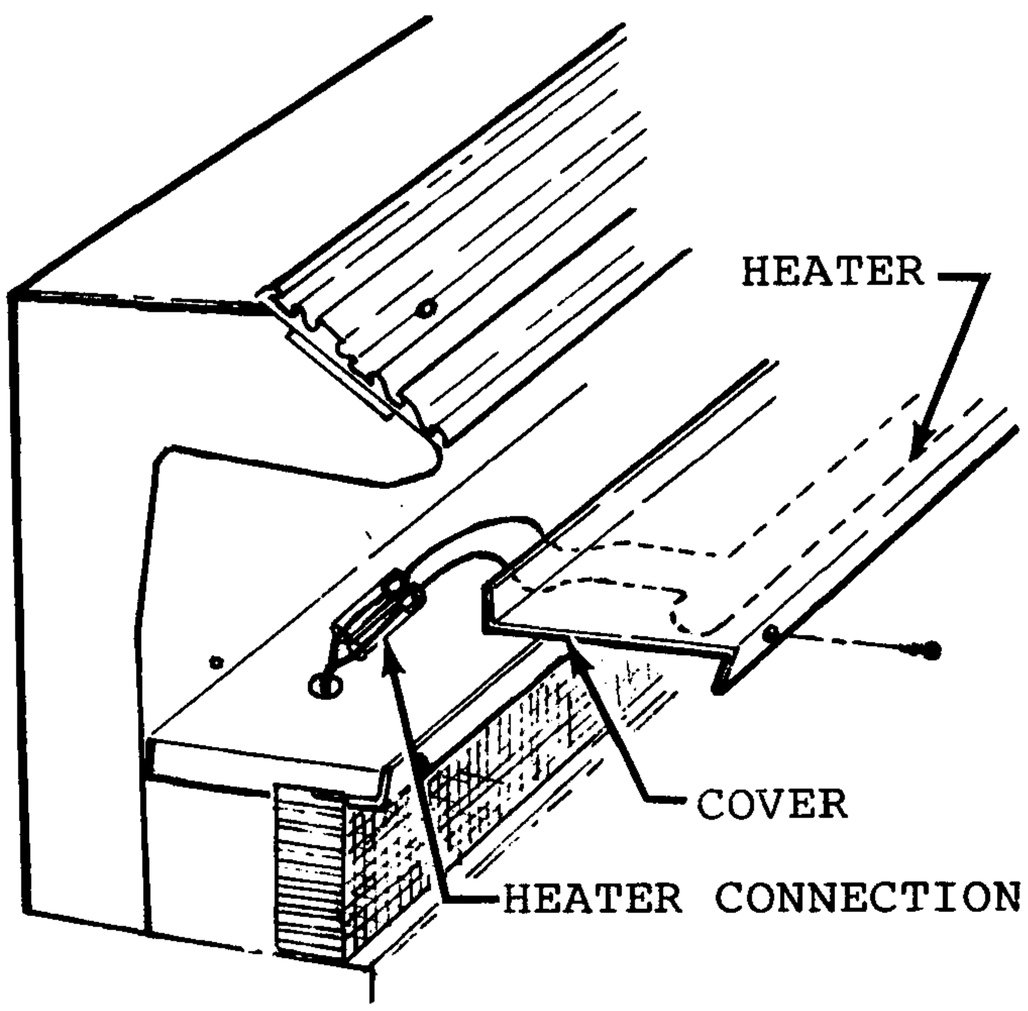
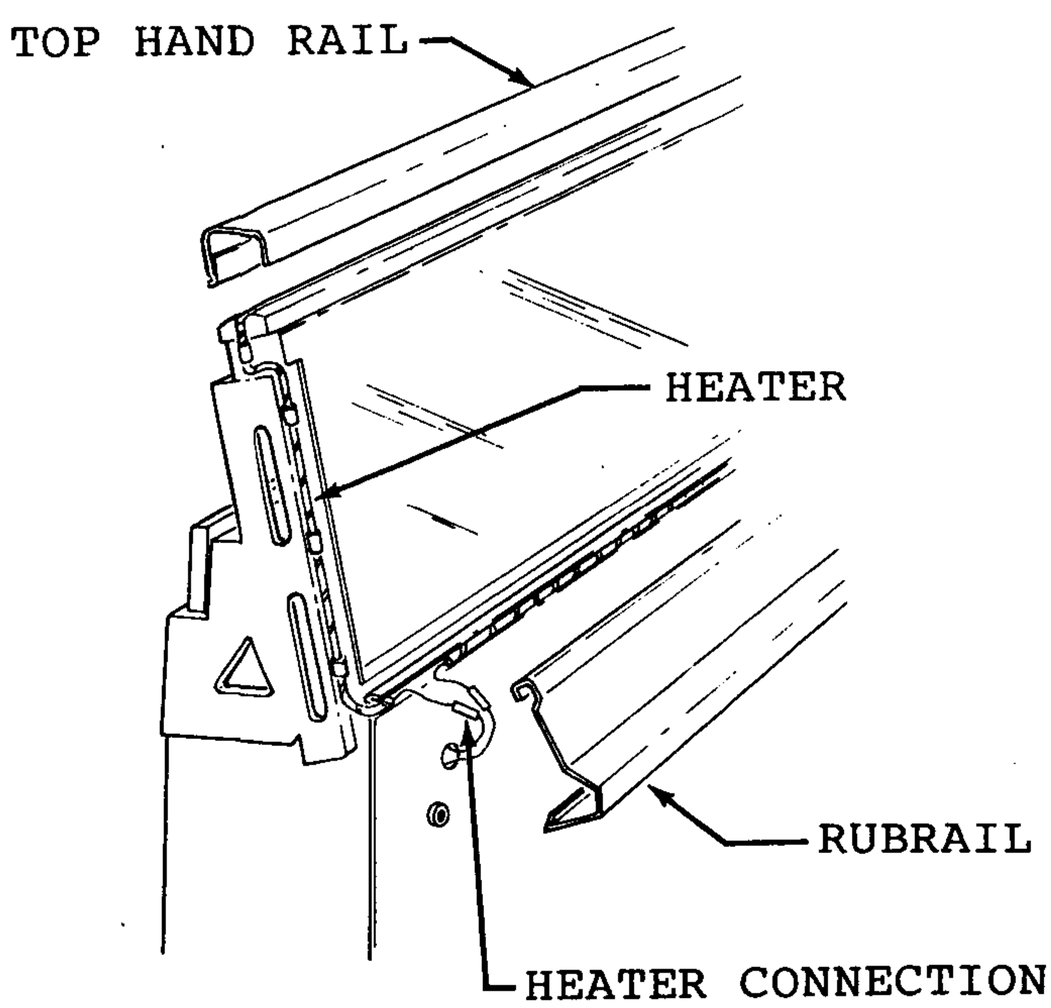


FIG. 2



II. FMLG MODEL ANTI-SWEAT HEATERS.

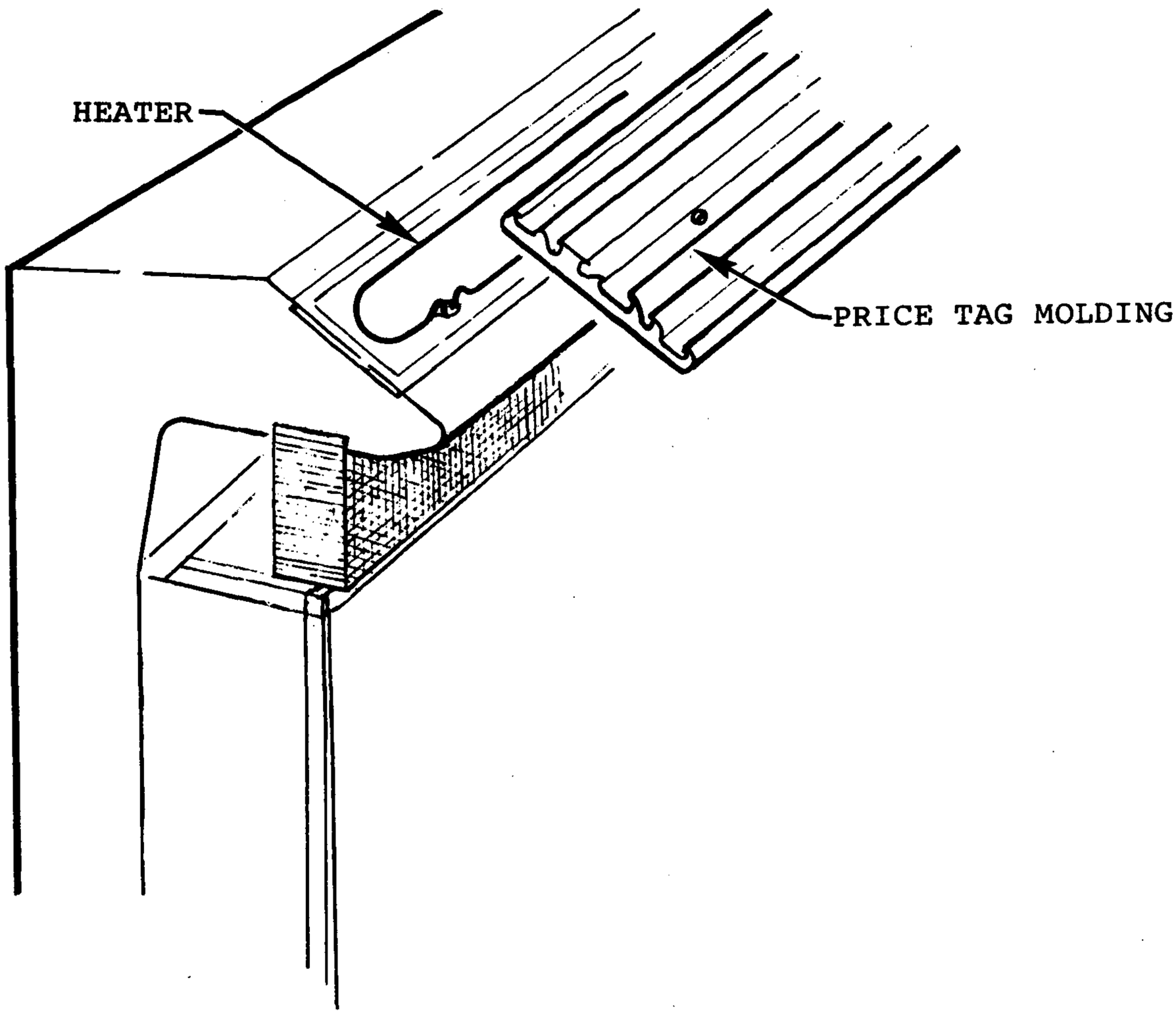
A. Front Glass Anti-Sweat Heater (SEE FIGURE 2)
This is one continuous heater routed around the perimeter of the front glass. To remove:

1. Remove End Castings located over the front glass at each end of the case.
2. Remove the Rubrail from the case by pressing firmly down on it and pulling out at the bottom.
3. Pull up on and remove the Top Hand Rail.
4. Disconnect the faulty heater at its supply harness and replace the heater. See parts list for replacement heater.
5. Re-install all parts in reverse order of removal.

B. Price Tag Molding Anti-Sweat Heater

This heater is located immediately below the price tag molding that is fastened to the back of the case. To remove:

1. Remove screws holding price tag molding and lift molding from case.
2. Disconnect the faulty heater at its supply harness and replace the heater. See parts list for replacement heater.
3. Re-install all parts in reverse order of removal.

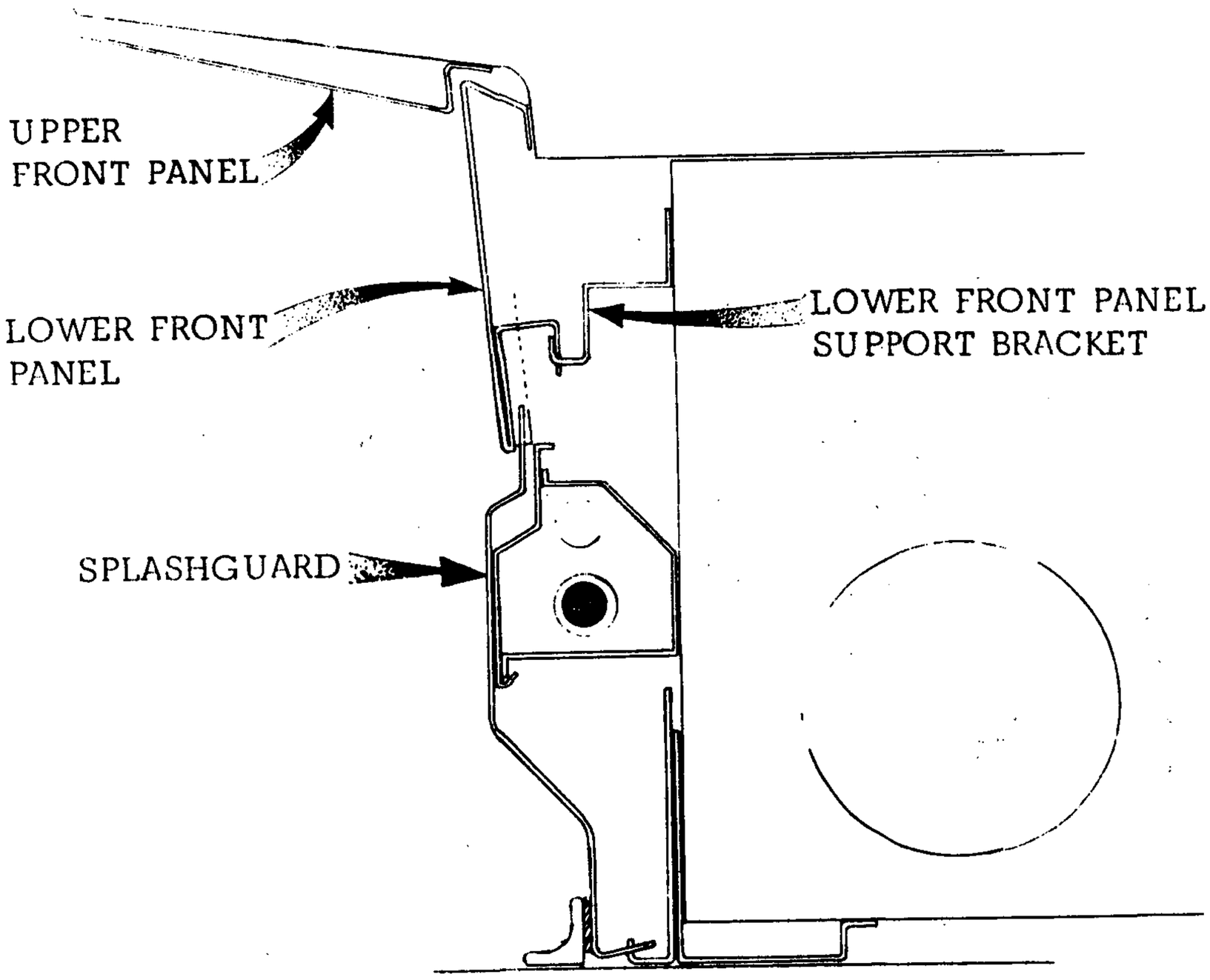


REMOVAL OF LOWER FRONT PANEL

Remove lower front panel by lifting up, pulling out and away from support brackets then lowering from behind the upper front panel.

TO INSTALL LOWER FRONT PANEL

Reverse the above procedure.



REPAIRING ALUMINUM COILS

The aluminum coil in this refrigerator may be easily repaired in the field. Materials for repair are found at refrigeration wholesalers. We recommend the following:

Flux - Vapco AL 13 made by the Garman Co., St. Louis, Mo.

Solder - Garman Aluminum Solder No. 44, made by the Garman Co., St. Louis, Mo.

Leak repair takes only a few simple steps:

1. Wipe off dirt or oil from the leak area. No special cleaning needed. If leak area has a coating, scrape coating away from leak for an inch or so either side.

2. Apply heat to tubing area - not directly on leak. (Use Prestolite or other gas-air flame.)

3. Squirt flux on tube while heating. Use plenty - this "washes" the area of the leak.

4. When the flux turns dark, rub solder on leak area. Build solder to desired thickness. Remove heat - leak is repaired!

5. Wash area with rag wet with hot water.

6. When cool, coat repair with rubber cement (one inch each side).

NOTE: The solder flows at 520°F. - Don't over heat. The "rubber cement" can be many materials such as rubber cement, weather strip or gasket adhesive, so long as the label states they cure to a flexible condition, and never become hard or brittle.