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CORPORATION

PRO - PHRO & PENRO

REFRIGERATED & NON-REFRIGERATED
PRODUCE MERCHANDISERS

INSTALLATION / SERVICE INSTRUCTIONS

ENG. NO. 313101E

August, 1989

Supersedes #313101D

Dated May, 1989

Section 4

Table of Contents

	Page
1. GENERAL INFORMATION-----	1-1
Model Description-----	1-1
Application-----	1-1
Cross-sections and Plan Views-----	1-2
2. INSTALLATION-----	2-1
Shipping Damage-----	2-1
Location-----	2-1
Leveling-----	2-1
Anchoring-----	2-1
Waste Outlet and Water Seal-----	2-3
Drip Piping-----	2-4
Splashguard/Lower Front Assembly-----	2-5
Sealing Case to Floor-----	2-5
3. REFRIGERATION-----	3-1
Refrigerant-----	3-1
Refrigerant Piping-----	3-1
Outlet Location-----	3-1
Multiplexing-----	3-1
Line Sizing-----	3-1
Oil Traps-----	3-1
Pressure Drop-----	3-1
Insulation-----	3-2
Expansion Valve Adjustment-----	3-3
Conventional and Mixed Multiplexing-----	3-4
4. ELECTRICAL-----	4-1
Connections-----	4-1
Wiring Identification-----	4-1
Serial Plate Amperages-----	4-2
Wiring Diagrams-----	4-3
Replacement Parts List-----	4-5
5. USER INFORMATION-----	5-1
Stocking-----	5-1
Care and Cleaning-----	5-2
Cleaning Mirrors-----	5-3
6. SERVICE TIPS-----	6-1
Ballast Replacement-----	6-1
Removal of Lower Front Panel-----	6-2
Fan Motors and Fan Blades-----	6-2
Refrigeration Thermostat Location and Replacement-----	6-3
Repairing Aluminum Coil-----	6-4

TABLE OF CONTENTS

7.	APPENDIX-----	7-1
	Joining PENRO Models-----	7-1
	Joining Sketch-----	7-3

WARRANTY

REVISION CHANGES ("E")

New vendor part number, fan motor, page 4-5

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 Road • Bridgeton, MO 63044 USA • (314) 291-2000 • FAX (314) 298-4767

SECTION 1**GENERAL INFORMATION****MODEL DESCRIPTION**

These produce merchandisers are designed to display any and all produce items. The unique feature of these merchandisers is the extended platform shelf that has been added to their exterior front. This shelf extension not only increases the display capacity of the merchandiser, but it also brings the produce to the customer, out away from the back of the merchandiser for easier shopping.

The following table lists each of these produce merchandisers by its model nomenclature and gives a brief general description of that model.

MODEL NOMENCLATURE	DESCRIPTION
PRO*	Refrigerated, Single-Deck Merchandiser
PHRO*	Refrigerated, Multi-Deck Merchandiser
PENRO**	Non-Refrigerated, Single-Deck Merchandiser

* These models are available in 8' and 12' lengths

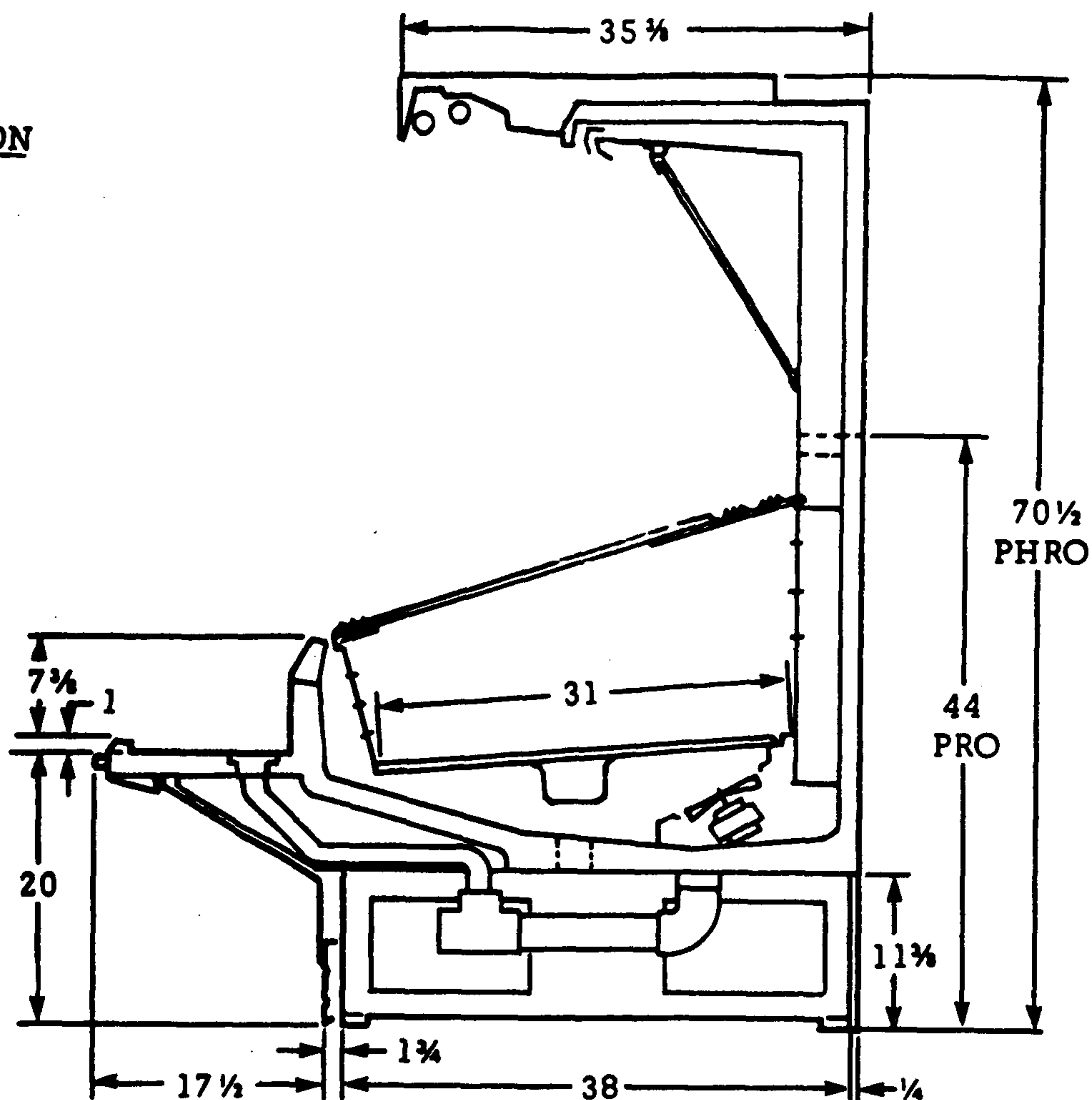
** These models are end display merchandisers, designed to be joined to the end of two PRO models (back to back).

APPLICATION

These refrigerated merchandisers have been designed for use only in air conditioned stores where temperature and humidity are maintained at or below 75° and 55% relative humidity.

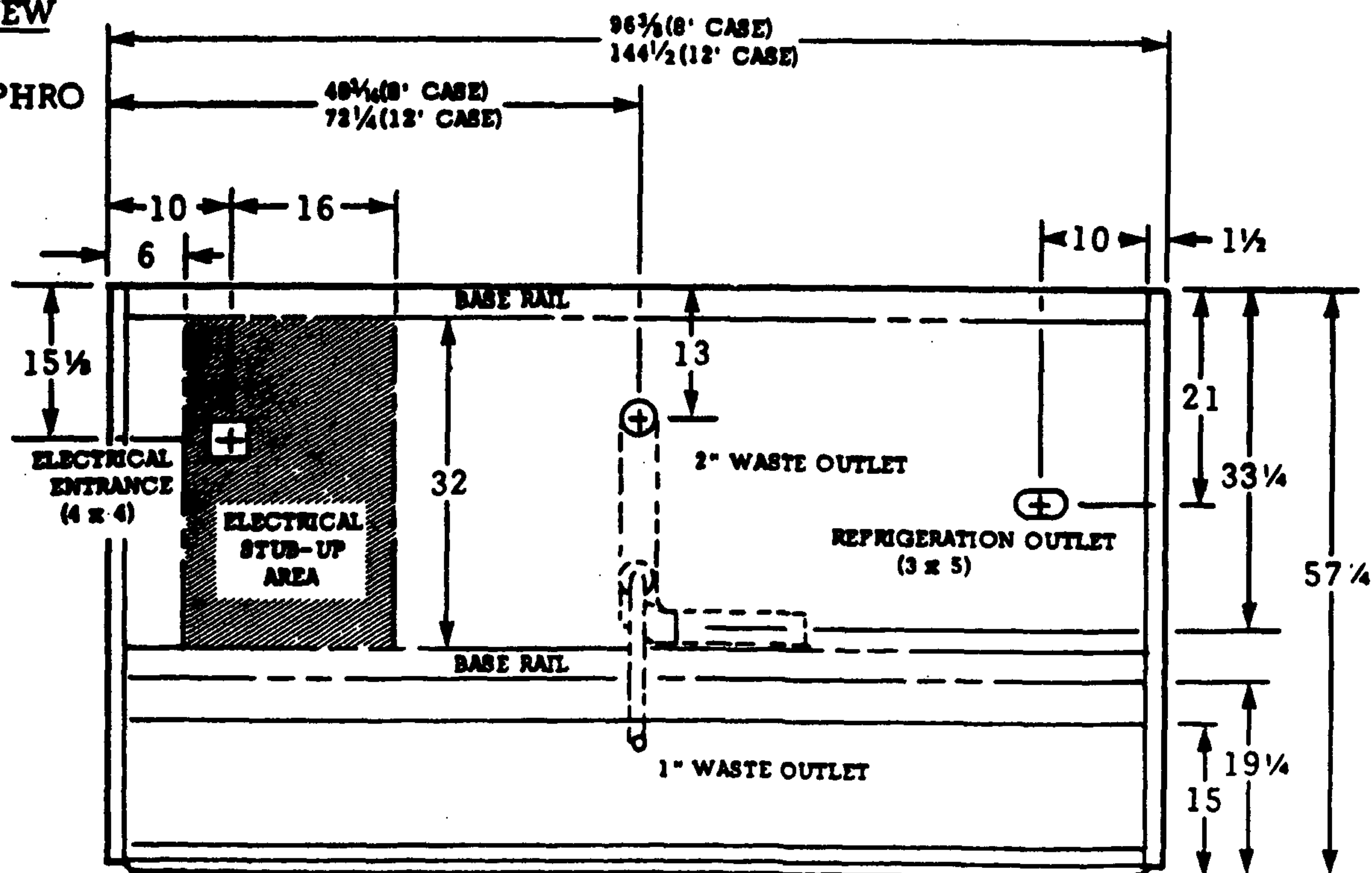
CROSS SECTION

PRO & PHRO



PLAN VIEW

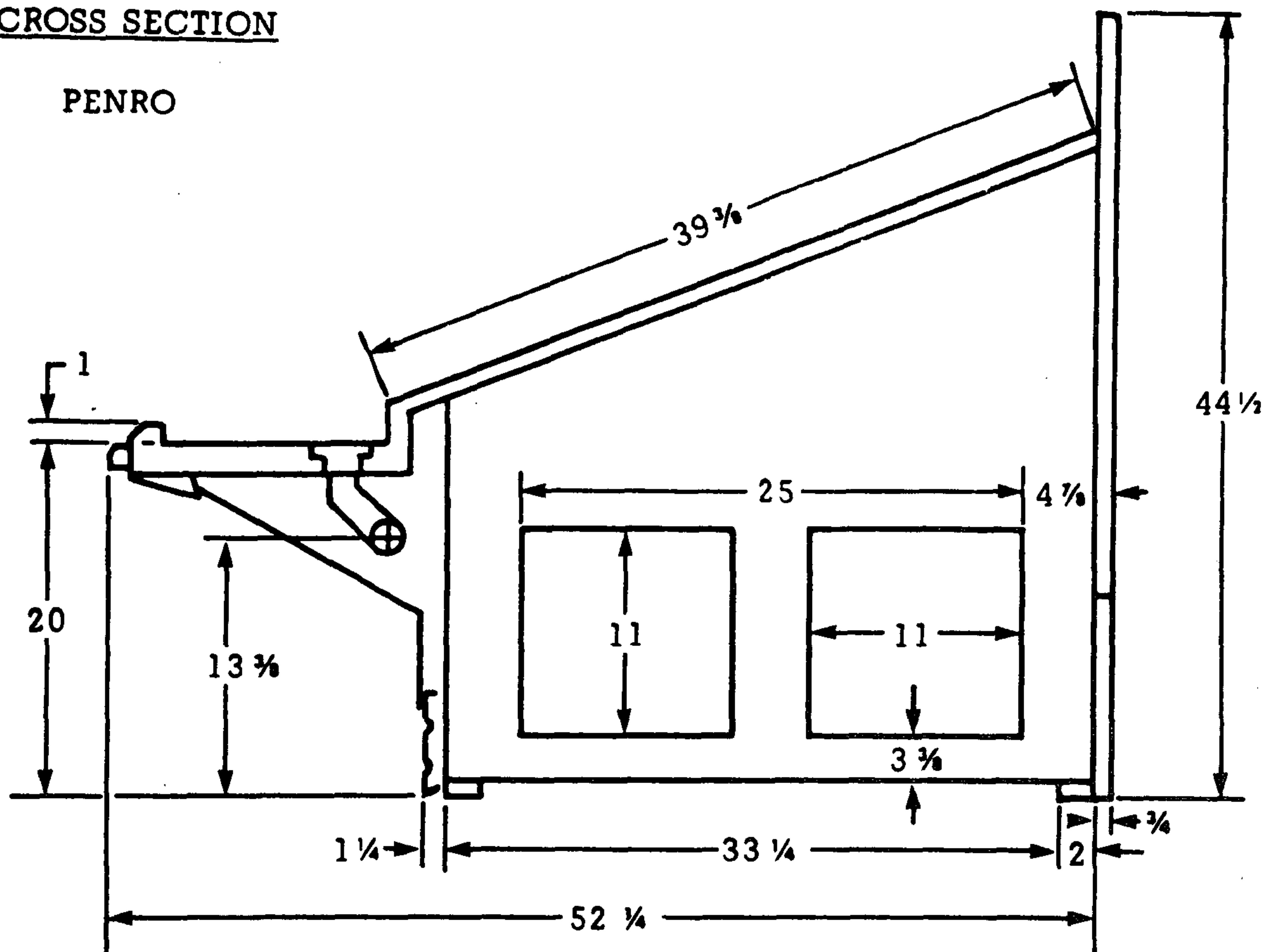
PRO & PHRO



(ALL DIMENSIONS ARE INCHES)

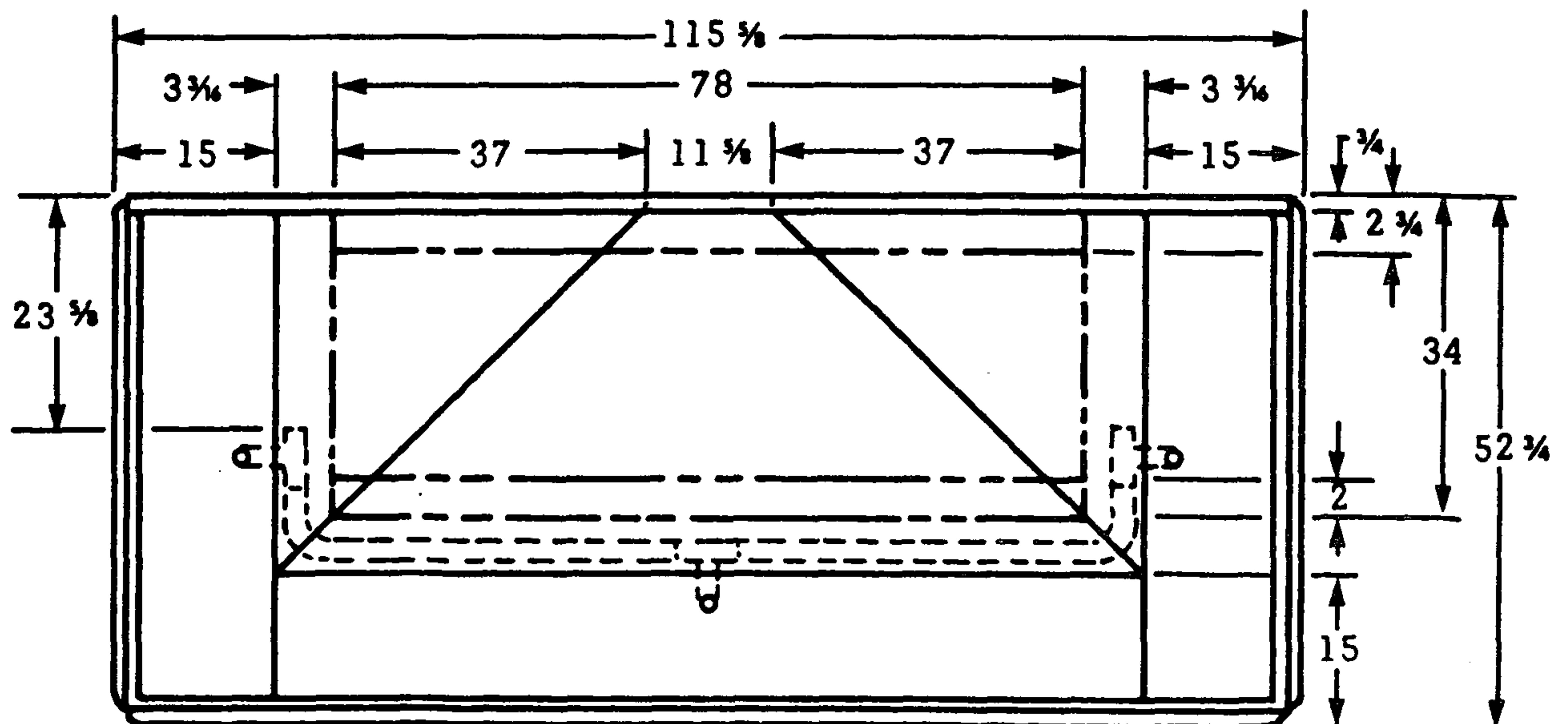
CROSS SECTION

PENRO



PLAN VIEW

PENRO



(ALL DIMENSIONS ARE INCHES)

SECTION 2

INSTALLATION

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.

LOCATION

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

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 refrigerator and any adjacent wall, shelving, coolers or another fixture.

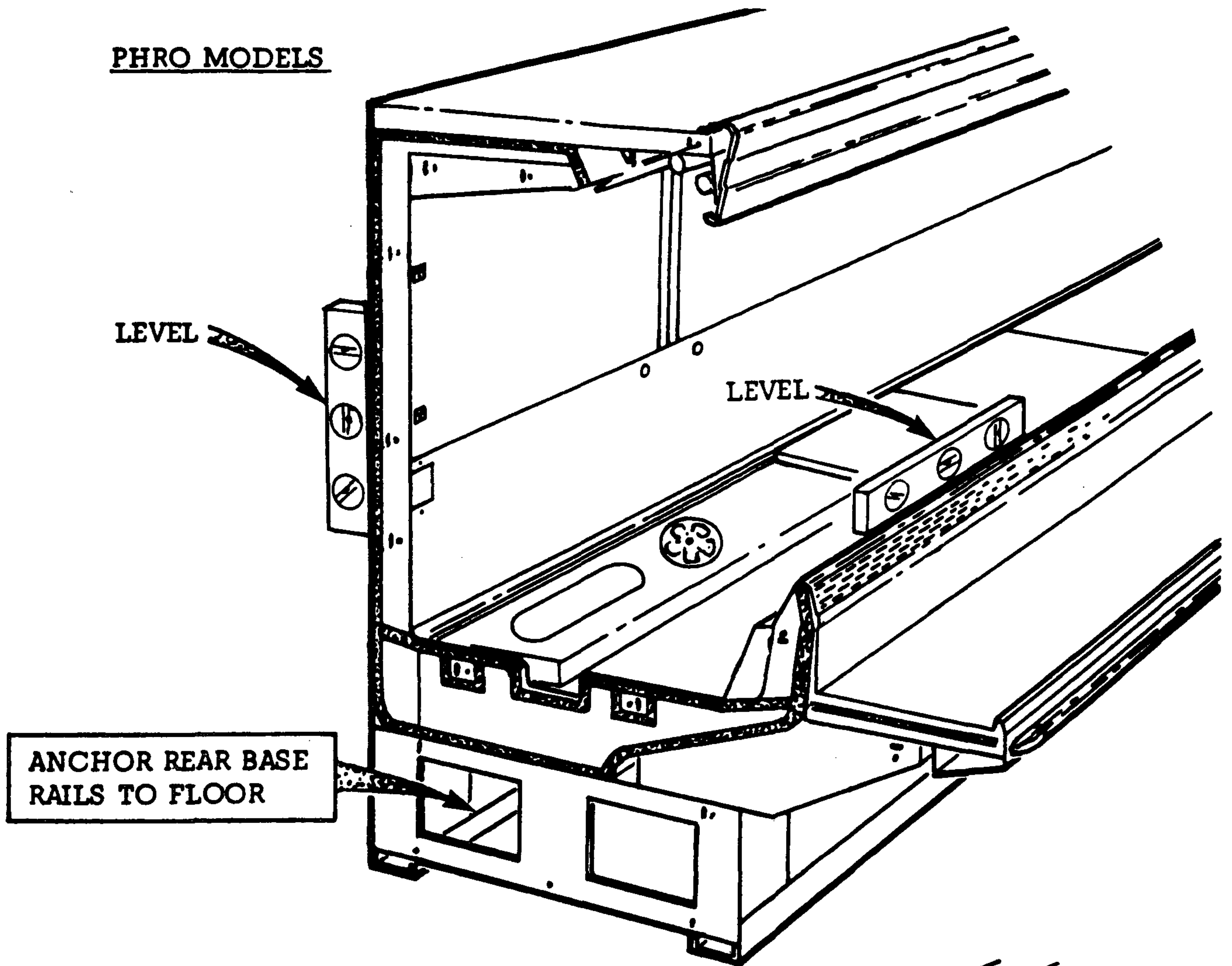
LEVELING

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

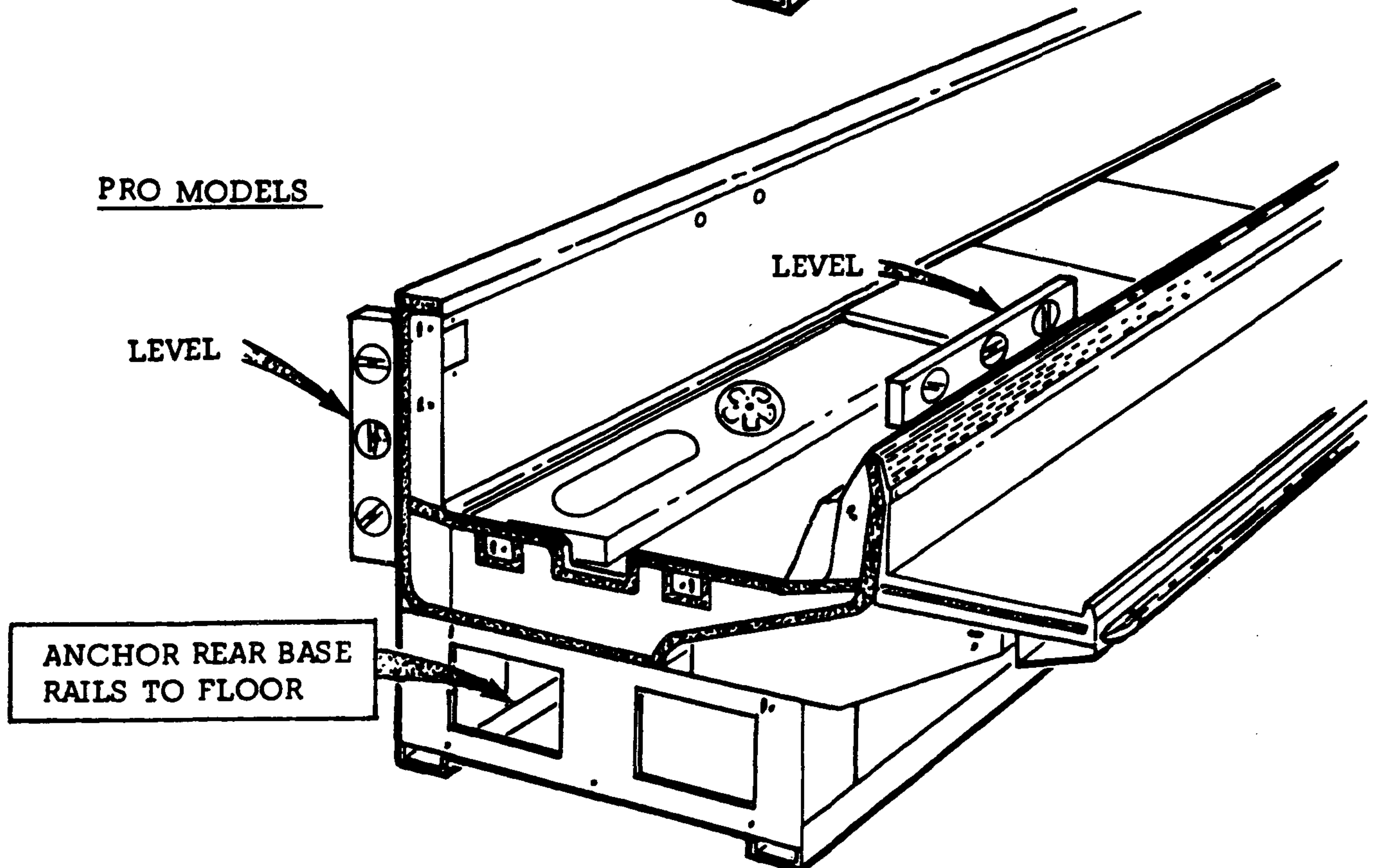
ANCHORING

Although the forward projection of this refrigerator appears that it is top heavy, it is not. We do, however, suggest that it be anchored to the floor through it's rear base rail.

PHRO MODELS



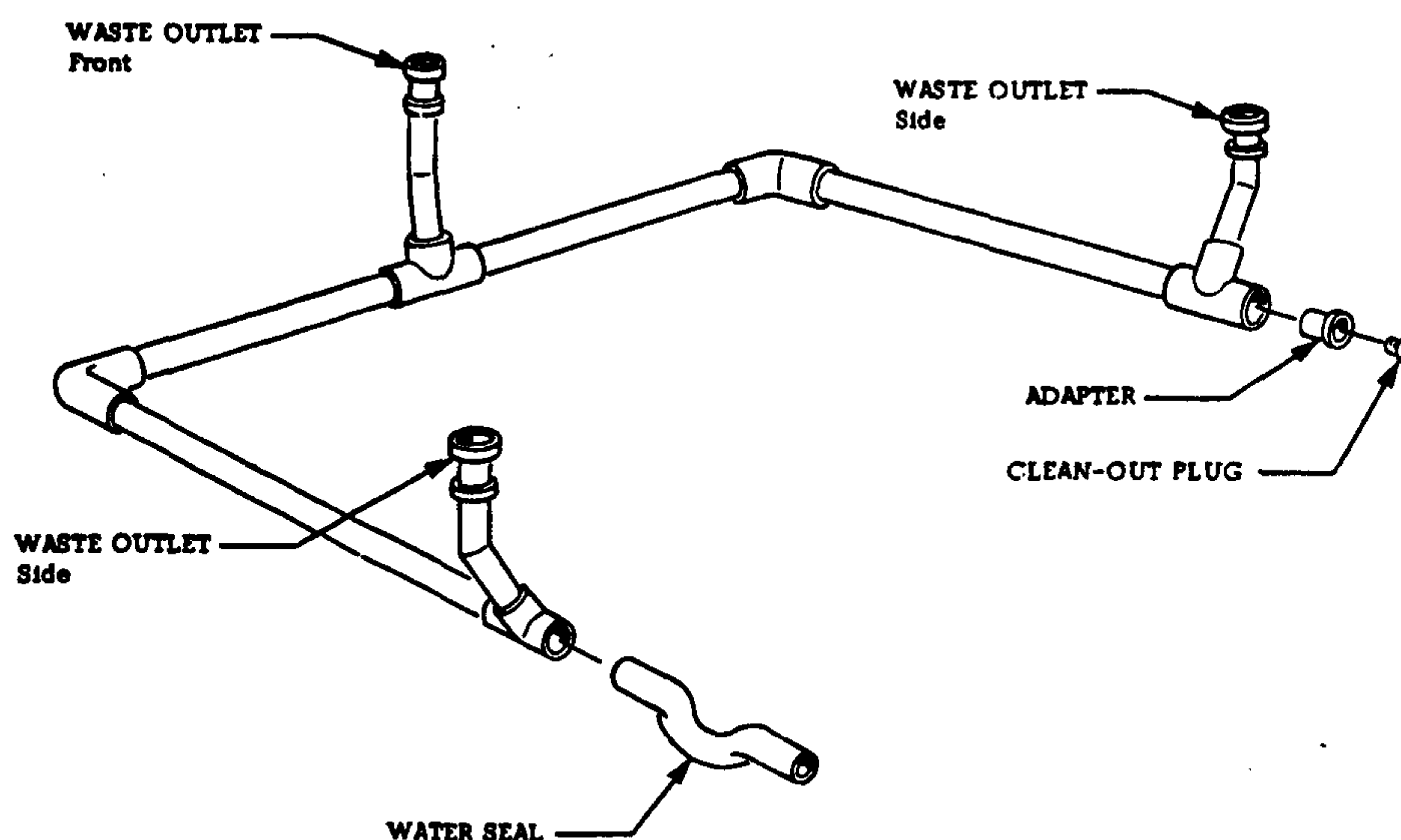
PRO MODELS



WASTE OUTLET AND WATER SEAL (PENRO Models)

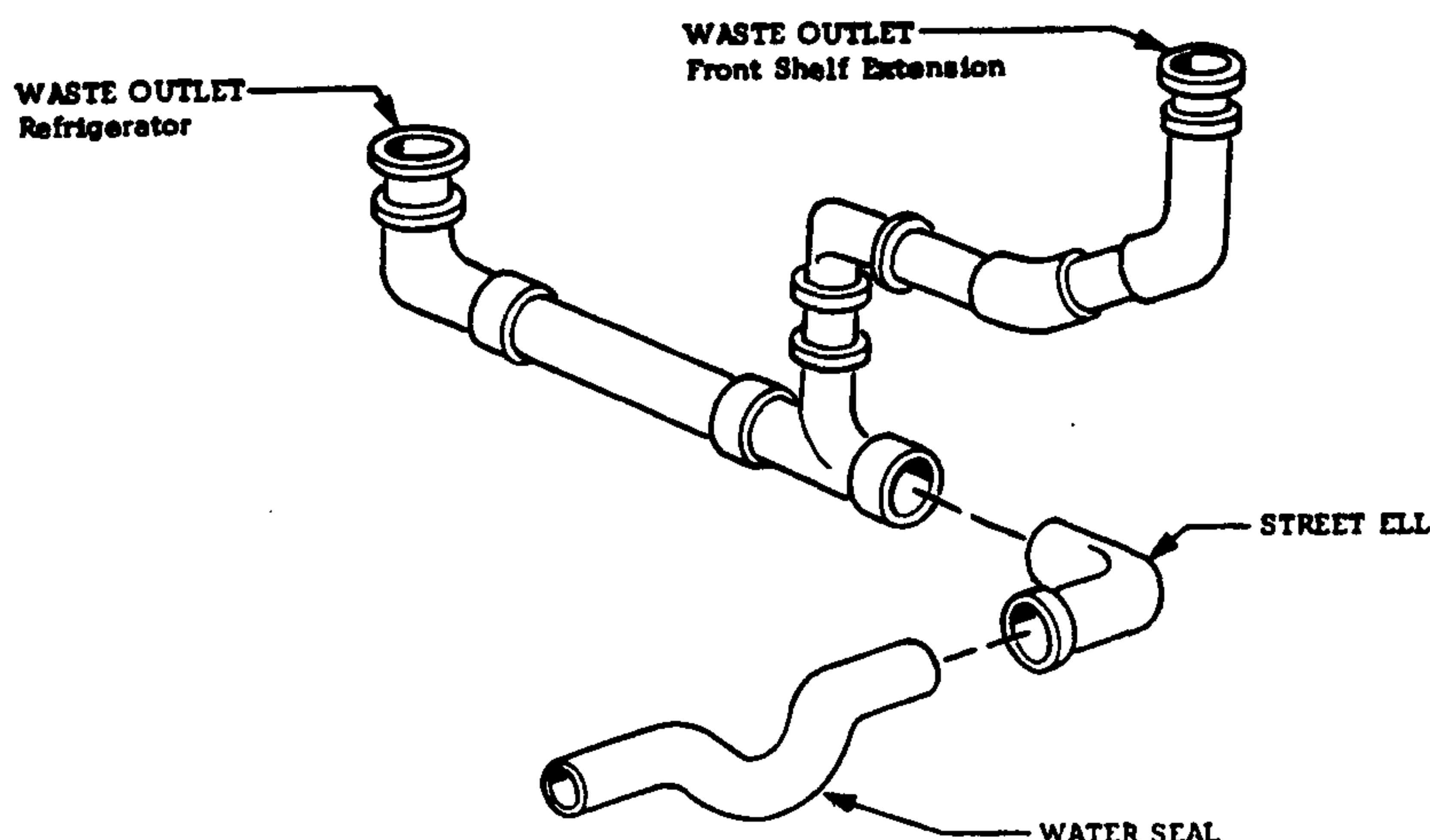
The waste outlet for these models are located behind the lower side panels. See Service Tips section for removal of these panels, same as lower front panels. The drip piping can be run under the case, using either outlet. The unused outlet must be plugged.

A 1 inch water seal, adapter and clean-out plug is supplied with each model. All these items are made of PVC plastic material. We recommend that they be installed using PVC-DWV solvent cement. Follow the cement manufacturer's instructions.

**WASTE OUTLET AND WATER SEAL (PRO and PHRO Models)**

The waste outlet is located at the center of the refrigerator, behind the lower front panel. See Service Tips section for removal of front panel. The drip piping can be run under the refrigerator in either direction.

A 2 inch water seal and street ell are supplied with each refrigerator. The water seal must be installed to prevent air leaking into the refrigerator and affecting performance. All these items are made of PVC plastic material. We recommend that they be installed using PVC-DWV solvent cement. Follow the cement manufacturer's instructions.



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:
 - A. Do not install drip pipes in contact with uninsulated suction lines. Suction lines should be well insulated.
 - B. If drip pipes are located in a cold dead air space, between refrigerators or walls and refrigerators, provide some means to prevent freezing.

JOINING

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

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:

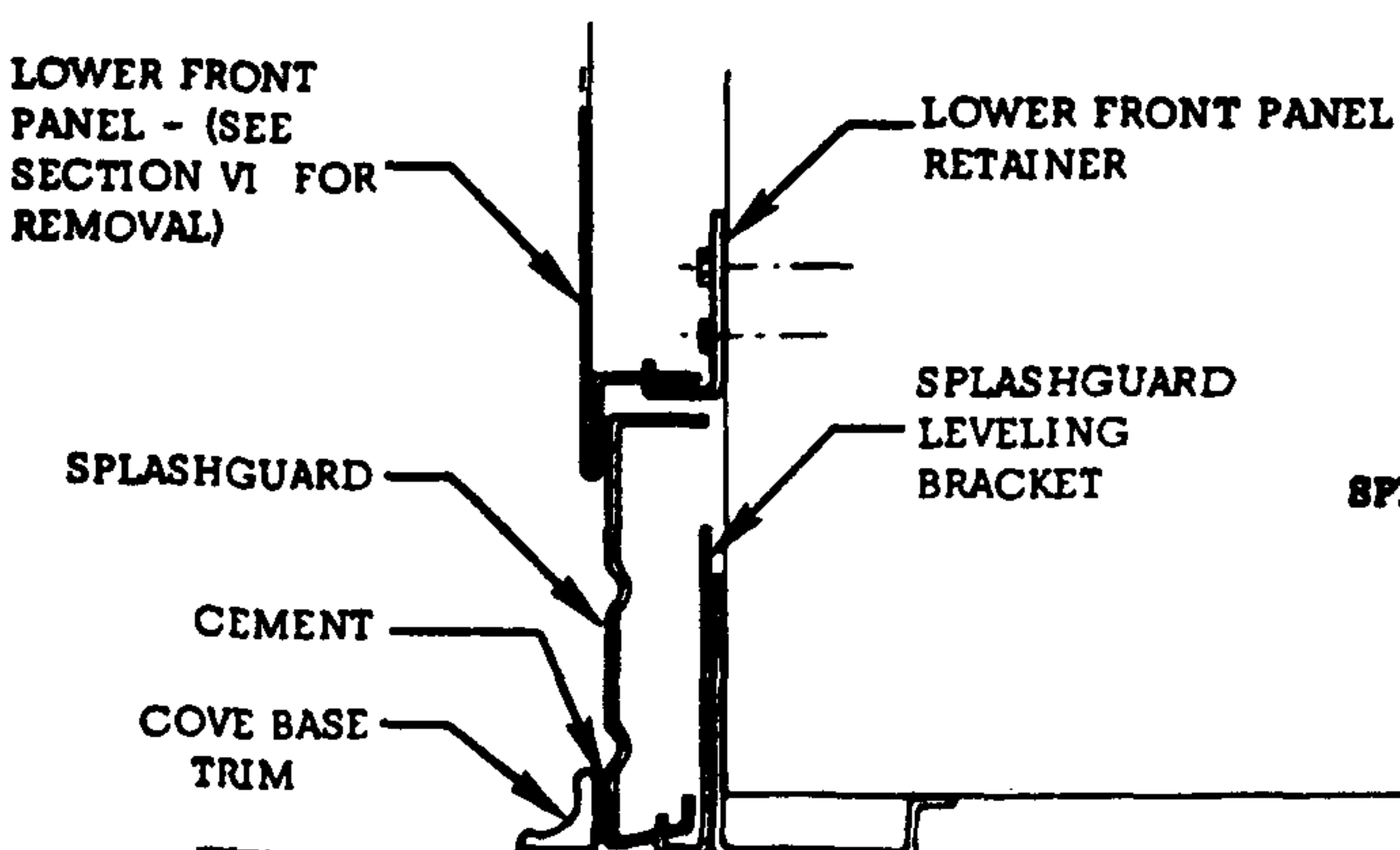
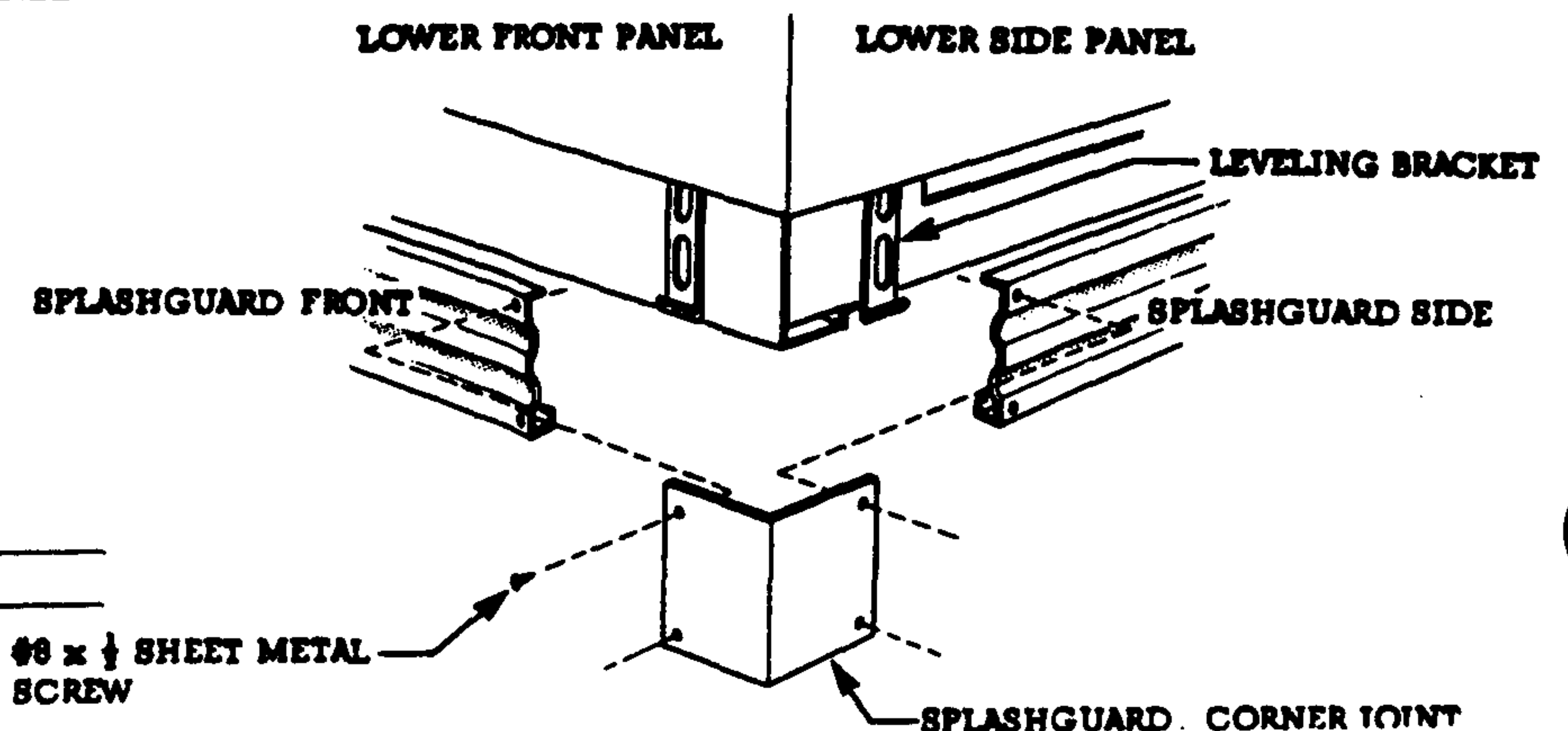
- A. Adjust the leveling brackets that are located on the lower base supports to the floor level.
- B. Slip the top of the splashguard up behind the lower front panel of the refrigerator and onto the brackets.

The PENRO models have three splashguards (one for each side; one for the front) and two corner splashguard joints. Install these items in the same manner as stated above and as shown.

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 contaminants 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 manufacturer's directions.
- C. Press the cove base trim to the splashguard so that it is flush with the store floor.

TYPICAL ALL MODELS**PENRO MODELS**

SECTION 3**REFRIGERATION**

THIS SECTION WILL APPLY FOR THE REFRIGERATED MODELS PRO AND PHRO ONLY.

REFRIGERANT

These refrigerators will be equipped for operation on R502 refrigerant unless otherwise specified on the factory order. The correct type of refrigerant will be stamped on the refrigerator's 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 thoroughly 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' from the refrigerator; for refrigerators with KOOLGAS defrost, the suction and liquid lines should not contact each other and should be insulated separately for a minimum of 30' from the refrigerator. Additional insulation for the balance of the liquid and suction lines is recommended wherever condensation drippage is objectionable.

REFRIGERATION PARTS LIST (Sporlan Nomenclature)

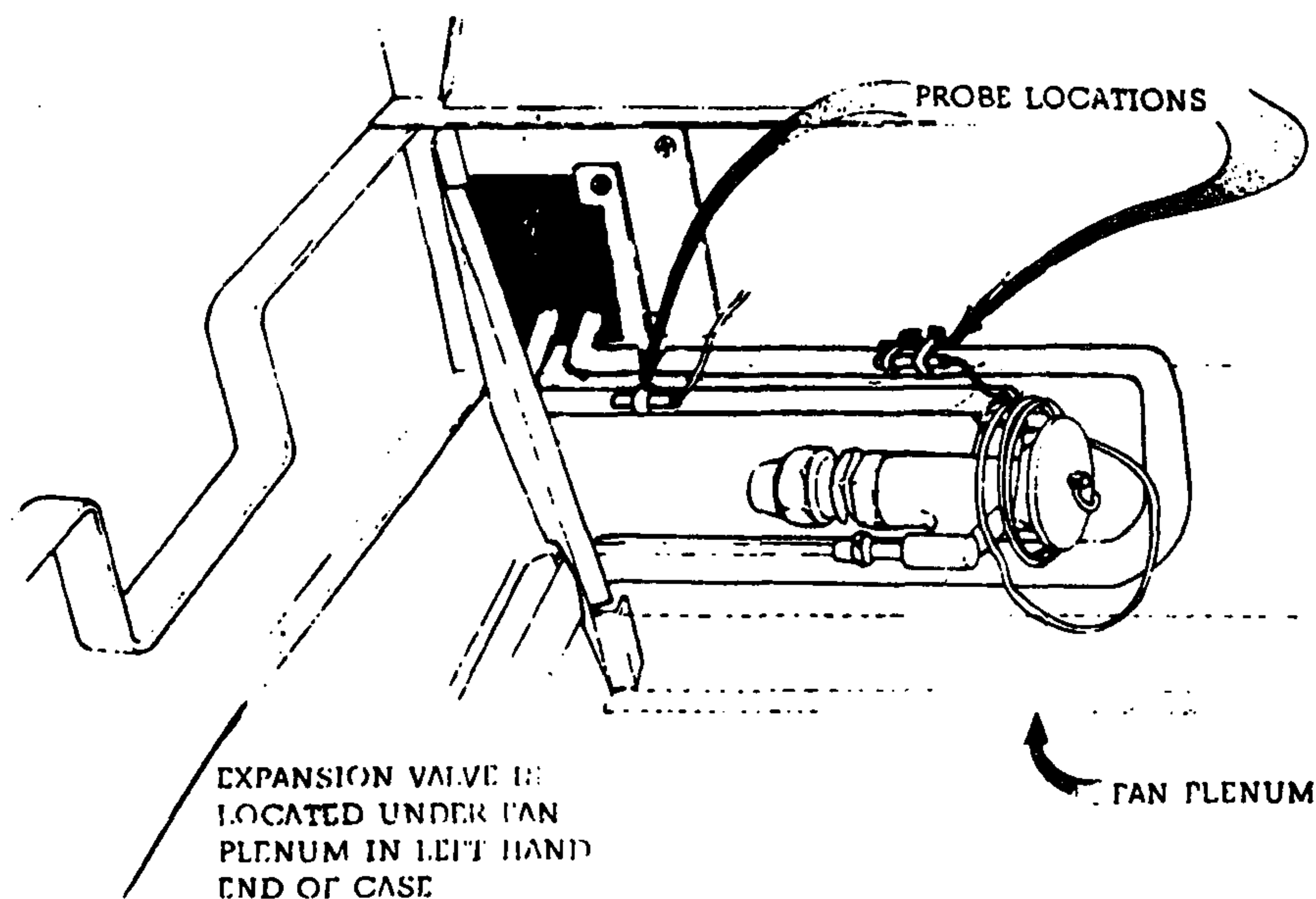
MODEL	TYPE OF DEFROST	REFRIGERANT	EXPANSION VALVE	DISTRIBUTOR
PRO-8	Off Time	R-502	BFR-A-C	-----
		R-22	BFV-A-C	-----
		R-12	BFF-A-C	-----
	Koolgas	R-12	-----	-----
PRO-12	Off Time	R-502	BFR-A-C	-----
		R-22	BFV-A-C	-----
		R-12	BFF-A-C	-----
	Koolgas	R-12	-----	-----
PHRO-8 & PHRO-12	Off Time	R-502	BFRE-A-C	D115-2- $\frac{1}{4}$ -1
		R-22	BFVE-A-C	D115-2- $\frac{1}{4}$ -1
		R-12	BFFE-A-C	D115-2- $\frac{1}{4}$ -1
	Koolgas	R-502	BFRE-A-C	*D116-2- $\frac{1}{4}$ -1
		R-22	BFVE-A-C	*D116-2- $\frac{1}{4}$ -1
		R-12	BFFE-A-C	*D116-2- $\frac{1}{4}$ -1

* These refrigerant distributors 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 and flow into the liquid line.

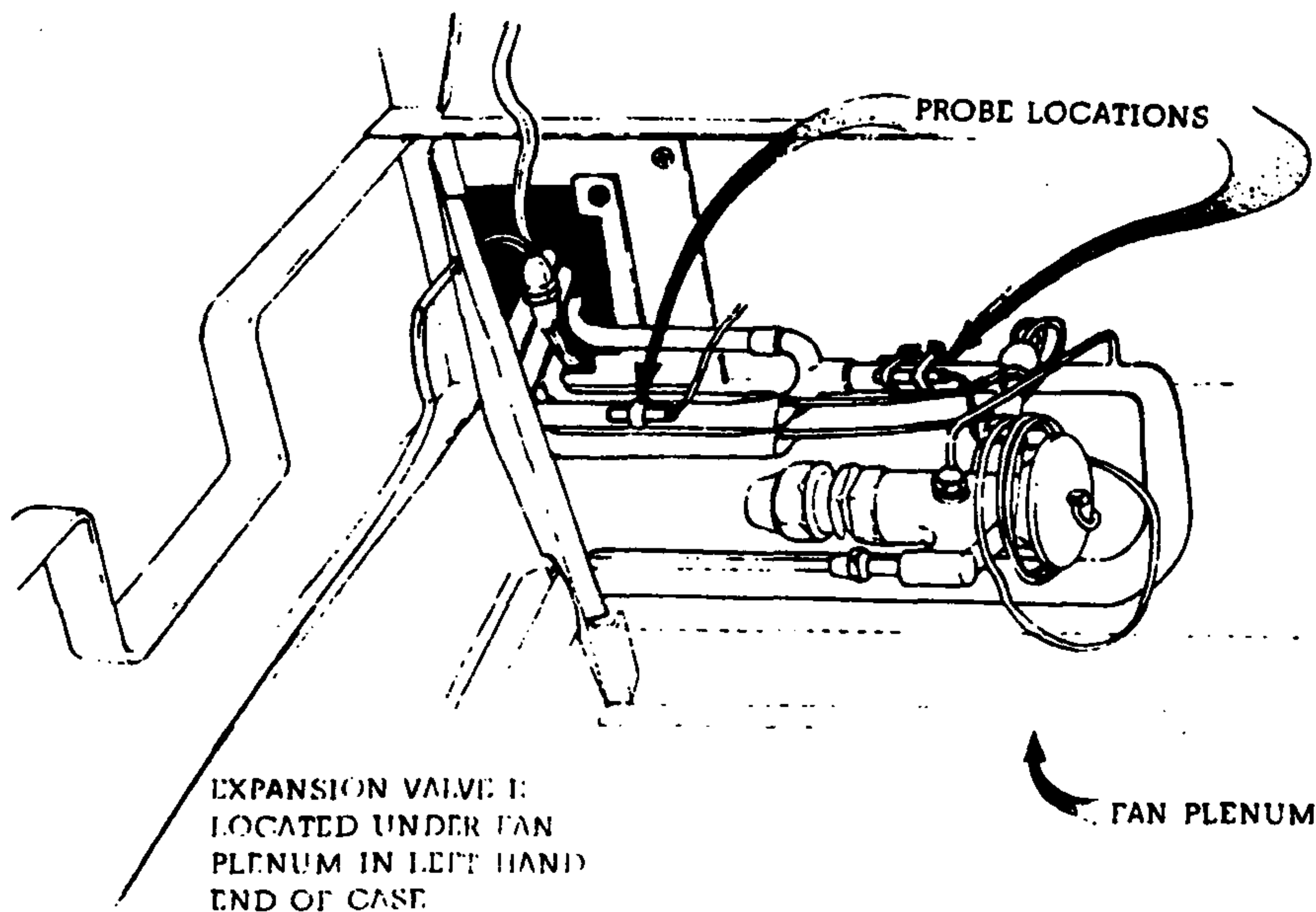
EXPANSION VALVE ADJUSTMENT

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 airflow should not be restricted by heavy frost formation on the evaporator. Adjust valves as follows:

Attach two sensing probes (either thermocouple or thermistor types) to the evaporator, one under the clamp holding the expansion valve bulb and the other securely taped to the evaporator inlet line (see the following illustrations). 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°F to 5°F. With this adjustment, during a portion of the hunting, the temperature difference between the probes may be less than 3°F, at times as low as 0°F. Make adjustment of no more than one-half ($\frac{1}{2}$) turn at a time of the valve stem and wait for at least fifteen minutes before re-checking the probe temperatures and making further adjustments.






PRO
PROBE LOCATIONS



PHRO
PROBE LOCATIONS

CONVENTIONAL MULTIPLEXING

REFRIGERATION CONTROLS						DEFROST CONTROLS 		
DISCHARGE AIR TEMPERATURE	REFRIGERANT	LOW PRESSURE CONTROL				Defrost Frequency	Pressure Termination	Failsafe
		Without Defrost Timer 		With Defrost Timer 				
		At Condensing Unit		At Condensing Unit				
+32°F	R-502	Cut-Out	Cut-In	Cut-Out	Cut-In	Every 6 Hours	83 psig	40 Min.
		47 to 54 psig	83 psig	47 to 54 psig	60 to 63 psig			

- ¹ When the condensing unit does not have a defrost timer, the low pressure control will control both the refrigeration and defrost. Each time the low pressure control cuts-out, the time elapsed until cut-in will defrost the refrigerator. (Off cycle defrost).

Care and good judgement must be used in deciding the exact cut-out setting since the condensing unit **MUST** cycle at least once every 6 hours, even during the warmest weather. If the cut-out is set too low, the evaporator will become blocked with frost which will increase the refrigerator's temperature and eventually cause compressor damage due to refrigerant flood-back. Final adjustments must be made when the refrigerator is fully stocked.

- ² The low pressure control on the condensing unit is normally used to control the refrigeration temperature. Adjust the low pressure control to the settings shown above.

When a refrigeration thermostat is used to control refrigeration temperature, adjust the thermostat to stop the compressor at the discharge air temperature given and adjust the low pressure control cut-out at 38 psig so it will not control refrigeration temperature. The thermostat must have a differential of 3°F to 5°F and have its sensing bulb installed on the discharge side of the evaporator. A refrigeration thermostat must be used whenever outdoor condensing units are used.

Discharge air temperature should be measured at the center of the top row of moire grille openings on the back liner of the refrigerator, (which feeds the refrigerated air into the main bottom display area of the refrigerator).

- ³ DEFROST: Indoor condensing units.
Defrosts are time initiated and pressure terminated with a timed failsafe backup.

DEFROST: Outdoor condensing units.
Defrosts are time initiated and time terminated. The defrost timer must control a liquid line solenoid for pump-down during defrost only. The timer has a 4 minute pump-down at the beginning of the defrost cycle, therefore the failsafe setting shown above must also be increased by 4 minutes. Set the low pressure control according to the outdoor condensing unit's installation instruction.

MIXED MULTIPLEXING

REFRIGERATION AND DEFROST CONTROLS

REFRIGERATION CONTROL △1	DEFROST CONTROL △3		
DISCHARGE AIR TEMPERATURE △2	DEFROST FREQUENCY	DEFROST LENGTH OFF-TIME	KOOLGAS △4
+32°F	Every 6 Hours	40 Min.	12 Min.

△1 Refrigeration temperature may be controlled by either a refrigeration thermostat or a CDA valve (Close on Drop in Air temperature). The CDA valve, if used, will be installed at the condensing unit with its sensor mounted in the refrigerator in the same location as the refrigeration thermostat bulb. For complete wiring and adjustment information refer to the instruction manual furnished with the condensing unit.

△2 Discharge air temperature is to be measured by attaching a service thermometer at the center of the top row of moire grille openings on the back liner of the refrigerator, (that feeds the refrigerated air into the main or bottom display area of the refrigerator). Adjust the refrigeration control (CDA valve or refrigeration thermostat) to maintain the discharge air temperature shown.

△3 Defrosts will be off-time as standard or Koolgas when ordered as an option. Both will be time initiated and time terminated.

△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, fixture 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.

SECTION 4**ELECTRICAL****CONNECTIONS**

All electrical connections are made in the electrical entrance box located at the left hand end of the refrigerator, behind the lower front panel. See Service Tips section for removal of the lower front panel.

WIRING IDENTIFICATION

Leads for all electrical circuits are identified by colored plastic bands which correspond to the "color code sticker" located near the electrical entrance box.

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.

PINKREFRIG. THERMOSTAT LOW TEMP
LIGHT BLUE.....REFRIG. THERMOSTAT NORM. TEMP.
DARK BLUE.....DEFROST TERM. THERMOSTAT
PURPLE.....ANTI-SWEAT HEATERS
BROWN.....FAN MOTORS

GREEN*.....GROUND
ORANGE OR TAN.....LIGHTS
MAROON.....RECEPTACLES
YELLOW.....DEFROST HEATERS, 120V
RED*.....DEFROST HEATERS, 208V

* EITHER COLORED SLEEVE OR COLORED INSULATION


ELECTRICIAN NOTE: CASE MUST BE GROUNDED

CAUTION

THE REFRIGERATOR MUST BE ELECTRICALLY GROUNDED. ALL WIRING AND CONNECTIONS MUST COMPLY WITH N E C AND ANY LOCAL CODES.

SERIAL PLATE AMPERAGES

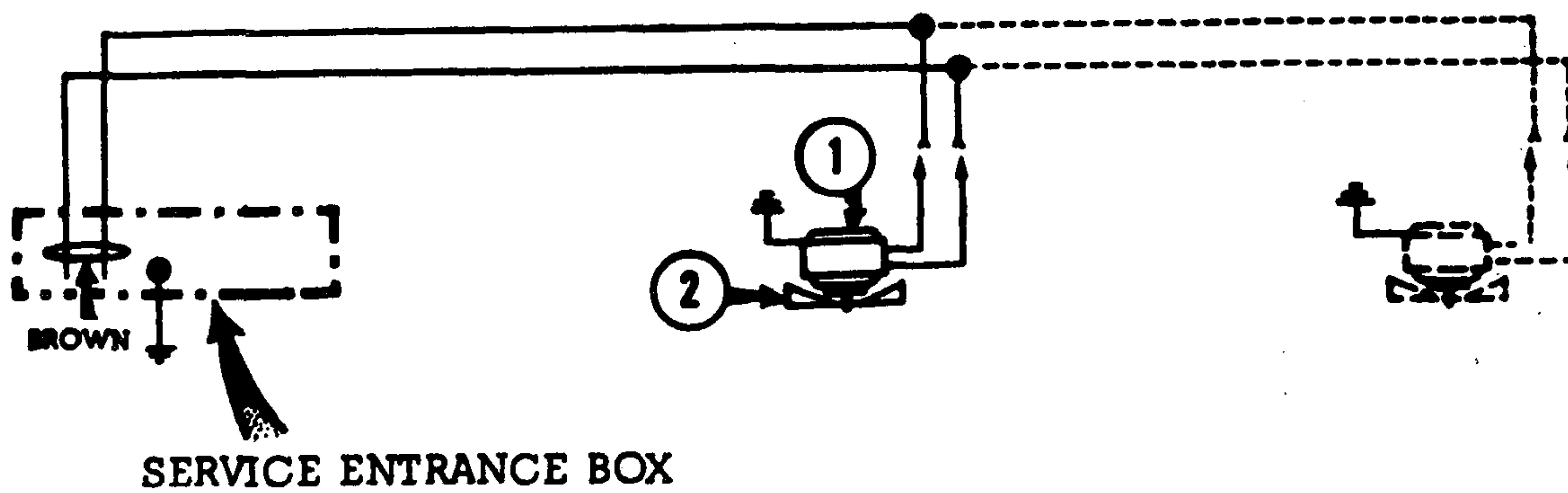
Serial Plate Amperages are the amperage figures that are stamped on the refrigerators Serial Plate. All field installed wiring must be sized to the Serial Plate Amperage, however, the actual amps may be less than that specified.

MODEL	120 VOLT, 60 HERTZ ELECTRICAL CIRCUITS	
	Fans	Lights 
PRO-8	0.6 amps	-----
PRO-12	1.2 amps	-----
PHRO-8	0.7 amps	3.6 amps
PHRO-12	1.4 amps	5.8 amps

 The lighting circuit should be separate from the one for the fan motors to prevent the fans from being turned off by mistake when store lighting is turned off. FAN MOTORS MUST OPERATE CONTINUOUSLY.

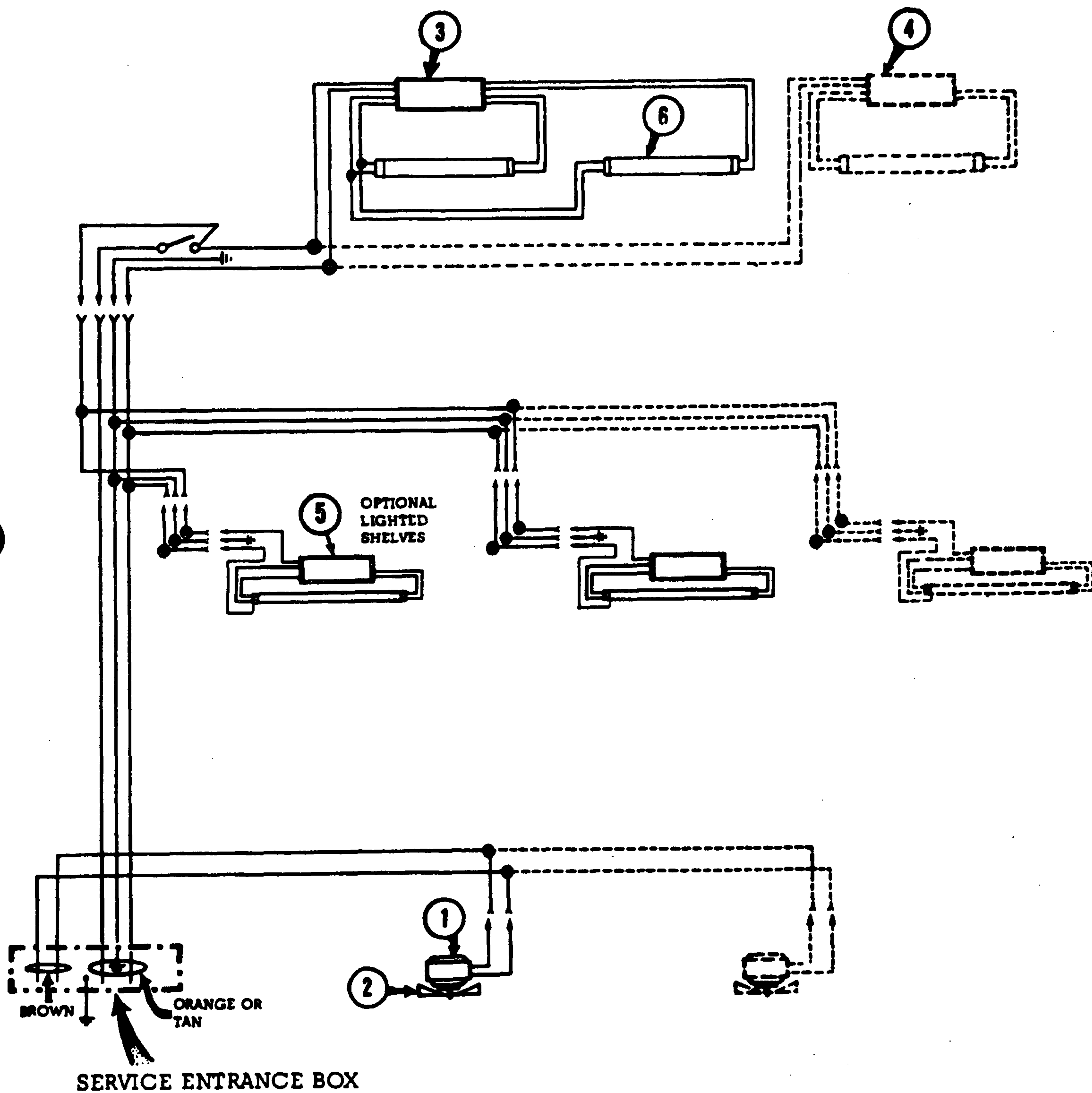
The amperage figure shown for the light circuit contains the requirements for the maximum number of lighted shelves.

WIRING DIAGRAM
PRO MODELS
(120 Volt, 60 Hertz)



CAUTION
REFRIGERATOR MUST BE GROUNDED

STANDARD
WIRING DIAGRAM
PHRO
(120 Volt, 60 Hertz)

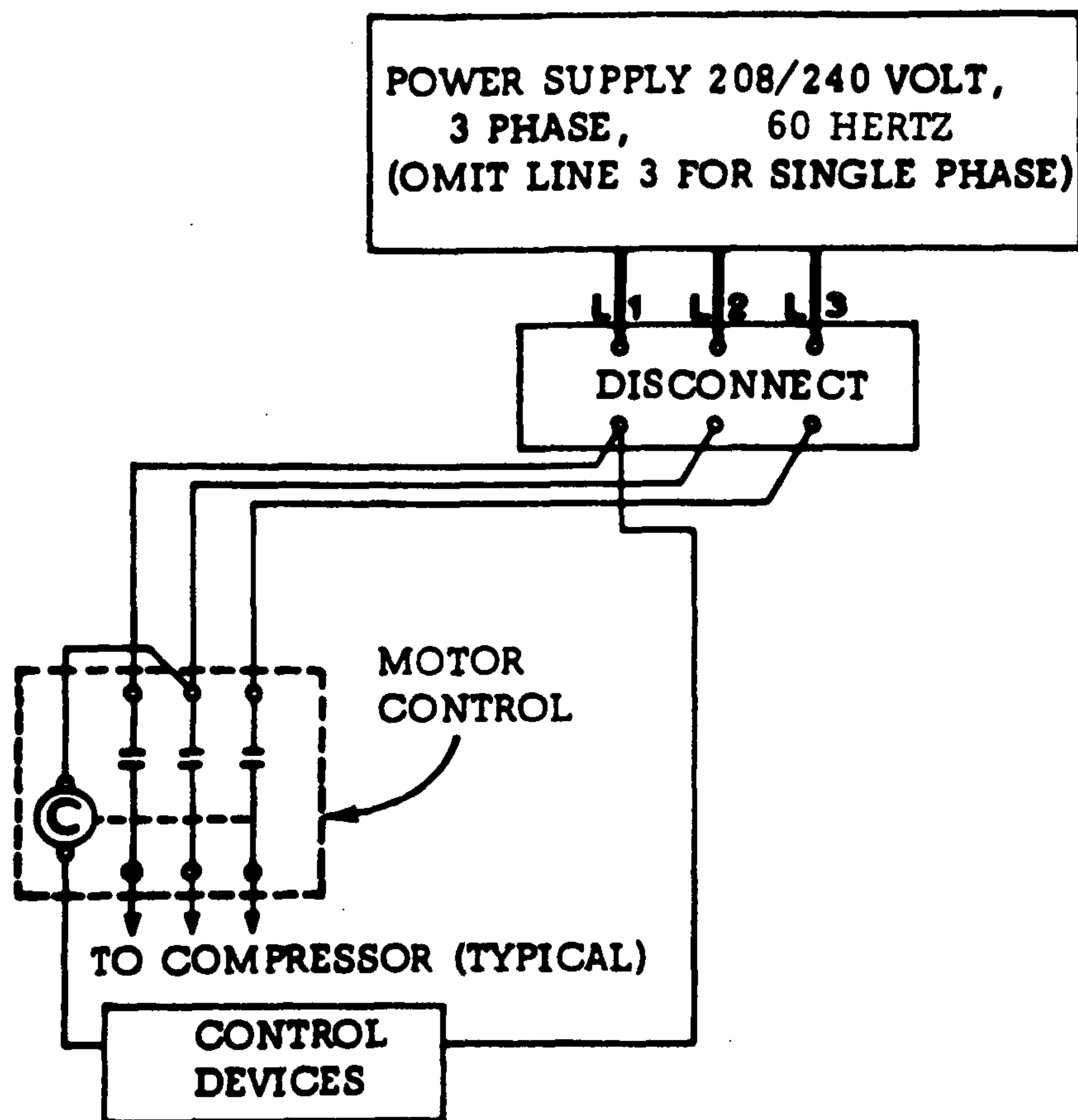


CAUTION
REFRIGERATOR MUST BE GROUNDED

ELECTRICAL REPLACEMENT PARTS

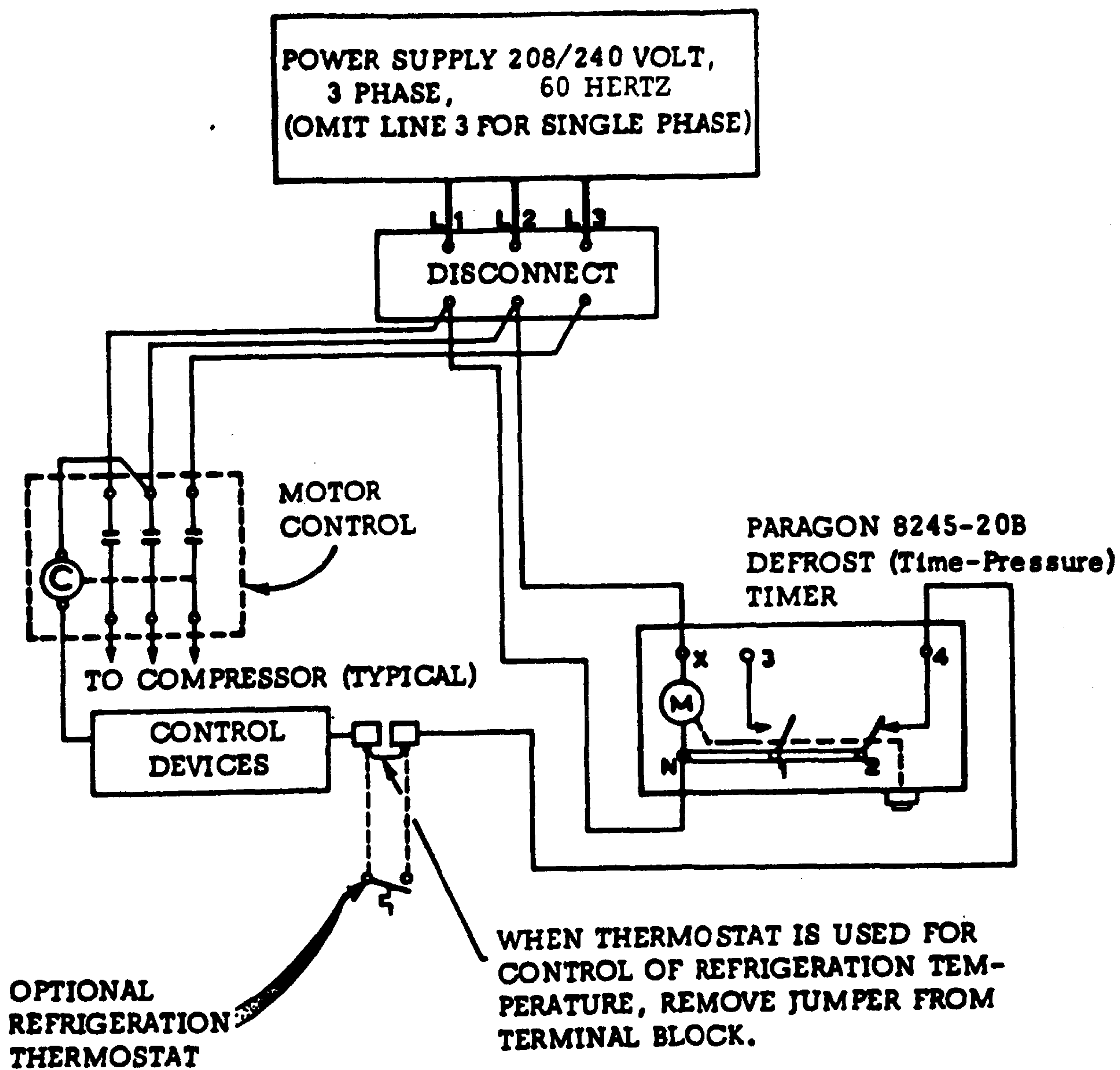
<u>ITEM NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	047000	Fan Motor - GE# 5KSM51ECG3799 120V, 9W, CW PHRO Models
	058698	Fan Motor - GE# 5KSP51 CL 227H 120V, 6W, CW PRO Models
2	000235	Fan Blade - Hussmann 25°, CW, 7-3/4" Raised embossing away from motor PRO-8'
	141070	Fan Blade - Morrill #FV800CW20S Raised embossing toward motor PRO-12'
	141071	Fan Blade - Morrill #FV800CW40S Raised embossing toward motor PHRO-8'
	124150	Fan Blade - Morrill #FV800CW30S Raised embossing toward motor PHRO-12'
3	147080	Ballast - GE# 6G1022 G49
4	147082	Ballast - GE# 6G1063
5	140013	Ballast - Robertson# R32A R3 (For optional lighted shelves) PHRO Models
6	020725	Fluorescent Lamp - F40T12 CWX PHRO Models
7	137880	Refrigeration Thermostat W.R.# 1609-103 (Optional)

TYPICAL CONDENSING UNIT WIRING DIAGRAM
Conventional Multiplexing With Off-Cycle Defrost



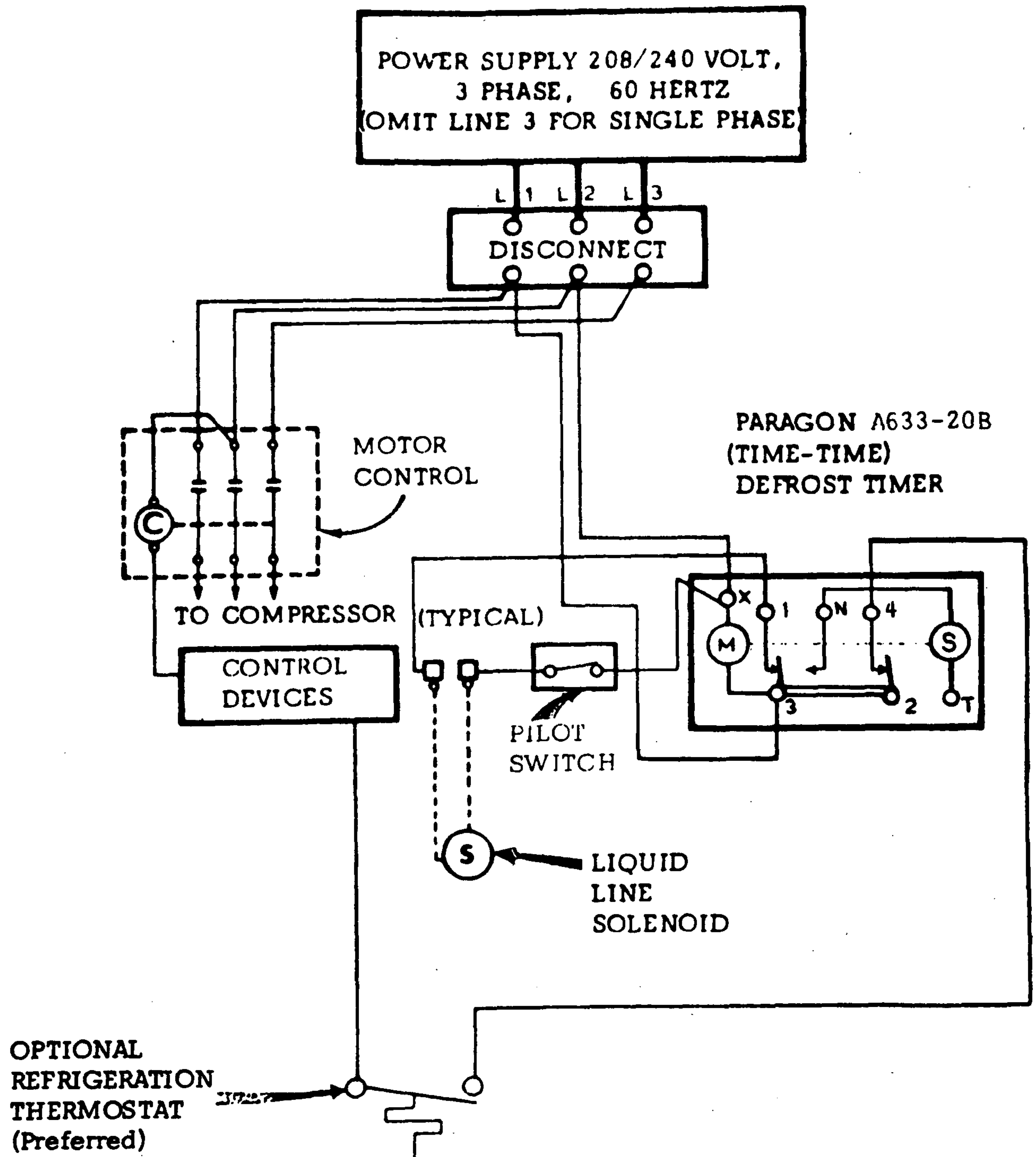
REFRIGERATORS MUST BE GROUNDED

TYPICAL INDOOR CONDENSING UNIT DIAGRAM
Conventional Multiplexing With Time-Pressure Defrost



REFRIGERATORS MUST BE GROUNDED

TYPICAL OUTDOOR CONDENSING UNIT DIAGRAM
Conventional Multiplexing With Time-Time Defrost



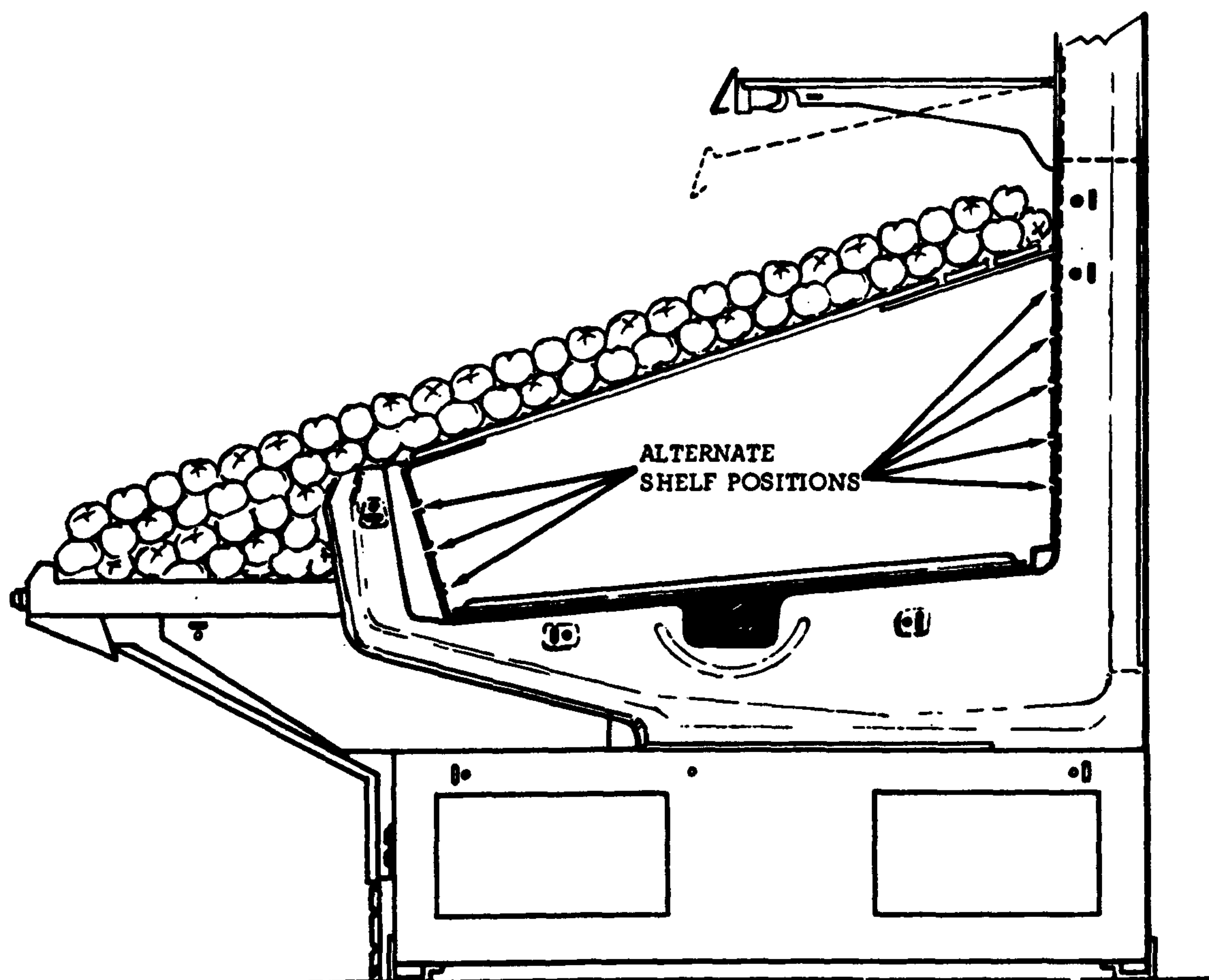
REFRIGERATORS MUST BE GROUNDED

SECTION 5
USER'S INSTRUCTIONS

STOCKING

Do not place produce into these merchandisers until all refrigeration controls have been adjusted and they are operating correctly and they are at the proper temperature. Do not overstock beyond the recommended load limits that are clearly marked on the inside of the refrigerator.

The shelves for the PHRO models have a designed load limit of 200 pounds per shelf.



CARE AND CLEANING

Long life and satisfactory performance of any equipment is dependent upon the care it receives. To insure long life, proper sanitation and minimum maintenance the refrigerator should have all debris removed and thoroughly cleaned at least once every month.

To facilitate quick and complete cleaning these refrigerators are designed with removable front shelf supports and hinged fan plenums. The supports are removed in four foot sections without any need for tools, simply by lifting each section up and off the shoulder rivets located at both ends of a section. The fan plenums are hinged for easy access to the area beneath the evaporator for cleaning. SHUT THE FANS OFF PRIOR TO CLEANING AND BE CERTAIN TO LOWER THE PLENUM BACK INTO THE PROPER LOCATION AFTER CLEANING.

The EXTERIOR surfaces must be cleaned with a mild detergent and warm water to protect and maintain their attractive finish. Never use abrasive cleaners or scouring pads.

The INTERIOR surfaces may be cleaned with most domestic detergents, ammonia based cleaners and sanitizing solutions with no harm to the surface. However, mineral oil based solutions should be avoided as they will dissolve the butyl sealants used in the construction of these refrigerators.

Remove the product and all loose debris to avoid clogging the waste outlet.

Thoroughly clean all surfaces with soap and hot water. DO NOT USE STEAM OR HIGH WATER PRESSURE HOSES TO WASH THE INTERIOR. THESE CAN AND WILL DESTROY THE SEALING OF THESE REFRIGERATORS CAUSING LEAKS AND POOR PERFORMANCE.

Rinse with hot water, but do not flood. Never introduce water faster than the waste outlet can remove.

Allow the refrigerator to dry before resuming operation.

WHEN CLEANING THE LIGHTED SHELVES WIPE DOWN WITH A DAMP CLOTH OR SPONGE. DO NOT ALLOW WATER TO ENTER THE LIGHT CHANNEL. DO NOT USE A HOSE OR SUBMERGE THE SHELVES IN WATER.

CLEANING MIRRORS

Mirrors are sheets of clear glass that have very thin reflective and protective coatings applied to one side. These coatings are susceptible to deterioration if certain cleaning solutions and even water are allowed to come in contact with the coatings. Every precaution should be taken to keep all liquids away from the coated side of the mirrors. Even if liquids are allowed to flow along the face side of the mirror to their edge, the liquid can 'wick' up onto the coating and in time cause serious damage. To help prolong the life of the mirrors:

Use only mild cleaning solutions (Windex, Solox or weak dilutions of water and vinegar.

Use only clean, soft cloths or paper towels to wipe the mirrors.

Do not spray liquids onto the mirrors. Dampen the cleaning cloth then use the cloth to wipe the mirror.

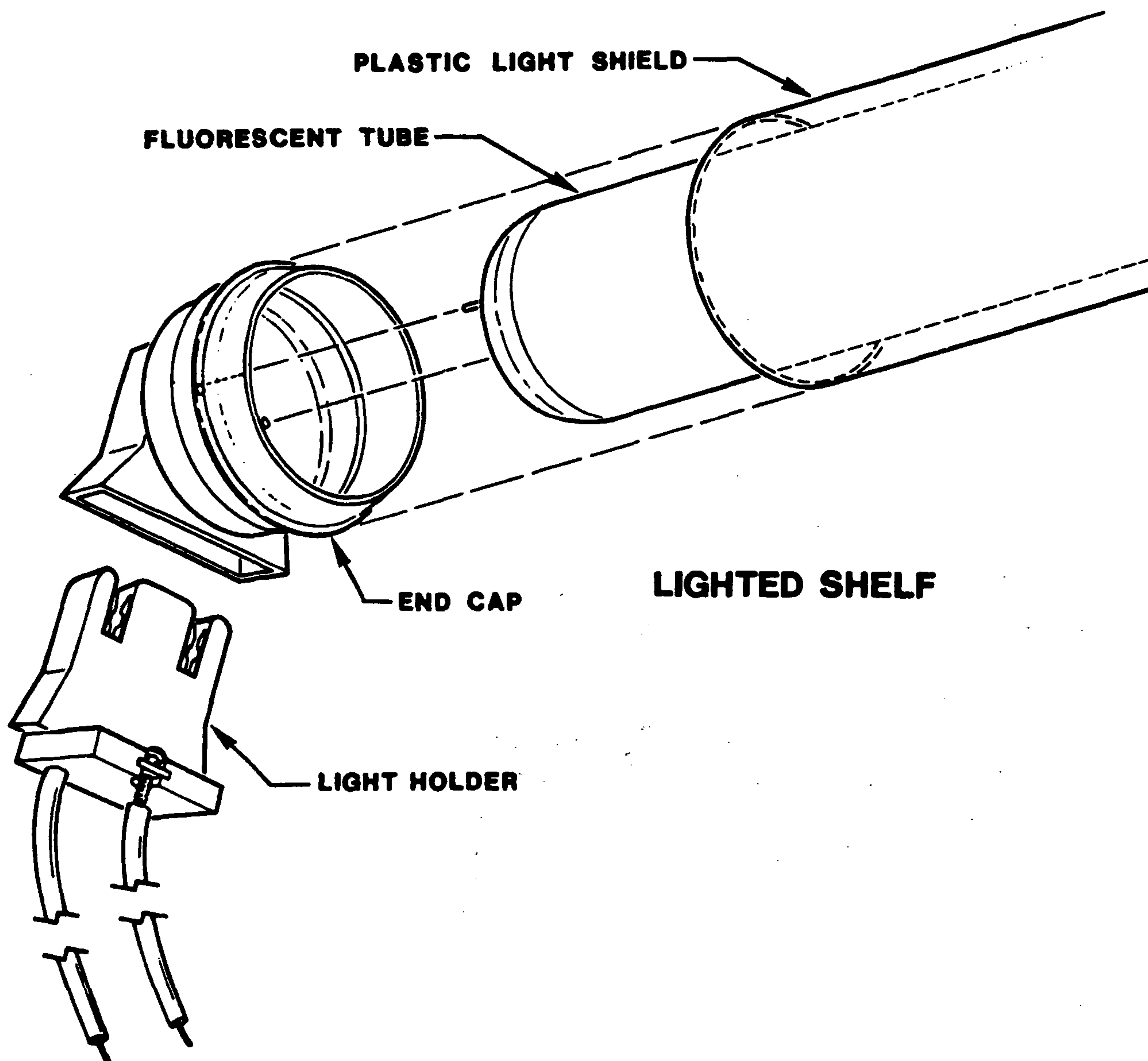
Wipe water from the mirrors immediately to prevent difficult to remove water spots and also prevent the water from reaching the mirror edge.

Never use dirty cloths, scrapers or any other abrasive materials for cleaning.

REPLACING SHELF FLUORESCENT LAMPS

Fluorescent lamps are furnished with moisture resistant lamp holders, shields and end caps. Whenever a fluorescent lamp is replaced be certain to re-install the lamp shields and end caps over the fluorescent lamp.

THE TRADITIONAL METHOD OF TWISTING THE LAMP TO REMOVE IT AND AFTER IT IS INSTALLED IS NO LONGER NECESSARY. TO REMOVE A LAMP SIMPLY PUSH THE LAMP AWAY FROM THE LAMP HOLDER. TO INSTALL: ALIGN THE END CAPS OVER THE LAMP HOLDERS AND GENTLY PRESS ON, A SLIGHT SNAP WILL BE FELT AS THE LAMP IS SEATED.



SECTION 5

SERVICE TIPS

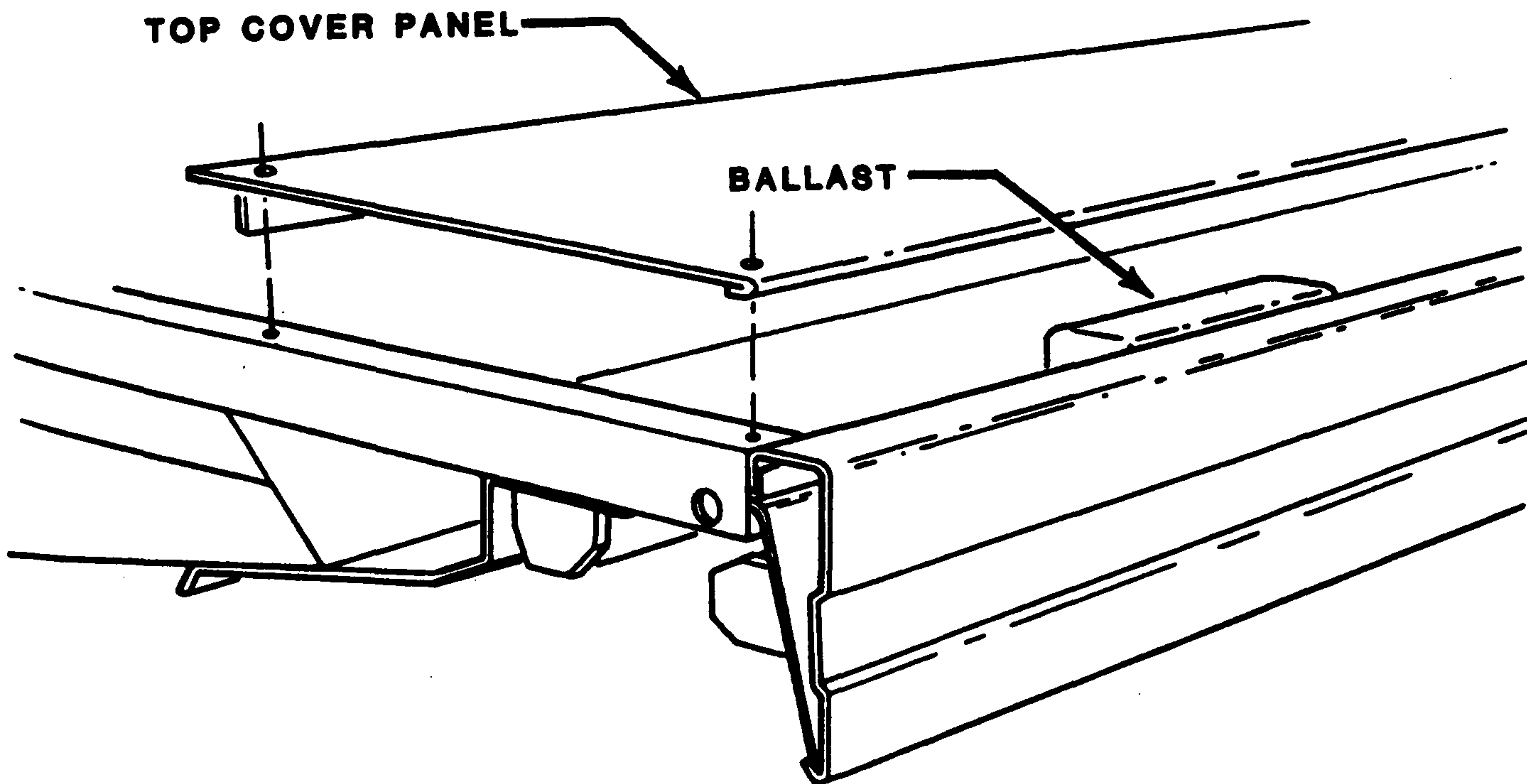
WARNING

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 FLUORESCENT LAMPS.

BALLAST REPLACEMENT

The lamp ballasts are located on top of the light fixture beneath the top cover panels. Each pair of lamps has a ballast directly above the lamps. For access to the ballast:

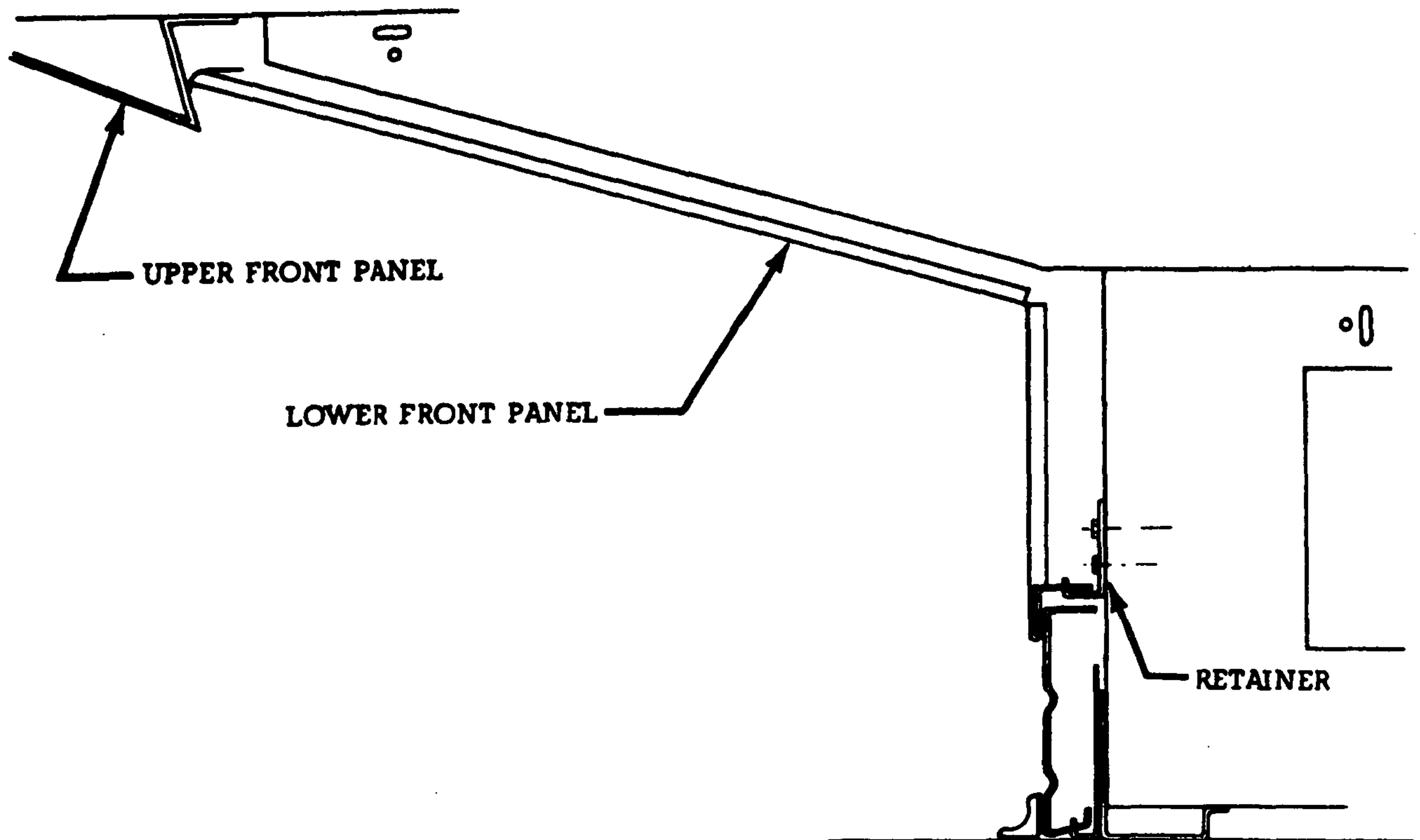
- A. Disconnect the electrical power to the light fixture.
- B. Remove the Top Cover Panel over the ballast.
- C. Service or replace ballast.
- D. Replace the Top Cover Panel.



REMOVAL OF LOWER FRONT PANEL

(For access to electrical, refrigeration and waste outlets)

- A. Lift the lower front panel up and off the retainer.
- B. Pivot lower end of panel out and away from the retainer.
- C. Slide the panel from behind the upper front panel.

**FAN MOTORS AND FAN BLADES**

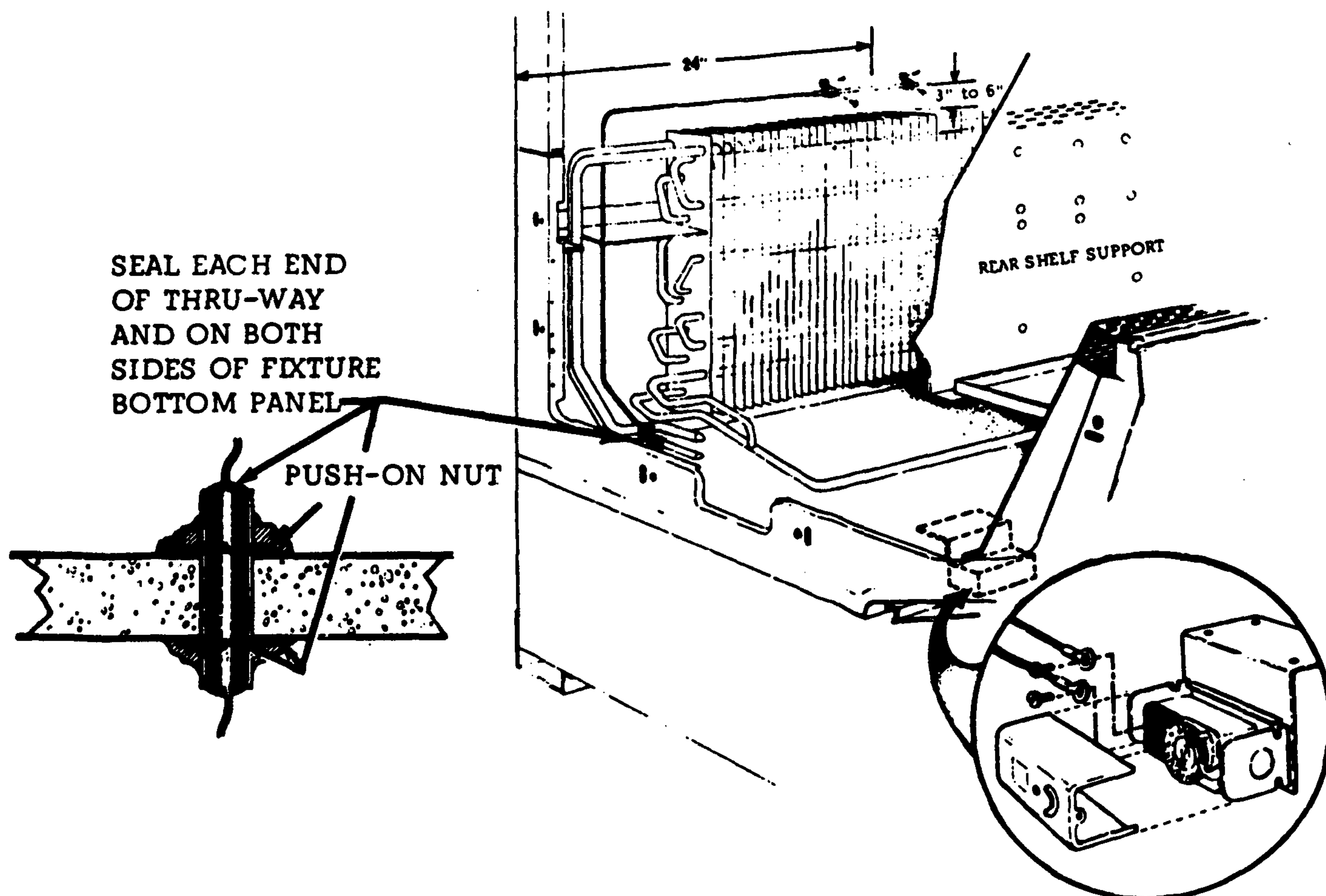
Should it ever be necessary to service or replace the fan motors or fan blades be certain that the fan blades are re-installed correctly. The raised embossing side of the blade must be installed as follows:

- PRO - 8': raised embossing side of blade away from motor
- PRO - 12': raised embossing side of blade toward motor
- PHRO - 8': raised embossing side of blade toward motor
- PHRO - 12': raised embossing side of blade toward motor

REFRIGERATION THERMOSTAT LOCATION AND REPLACEMENT (PRO & PHRO Models Only)

The thermostat will be located as shown below: the body below the refrigerator; the sensing bulb behind the rear shelf support. To replace the thermostat:

- A. Remove the lower front panel from the refrigerator. See preceding page for removal of lower front panel.
- B. Loosen the rear shelf support for access to the thermostat bulb.
- C. Disconnect electrical service to the thermostat (at condensing unit).
- D. Remove the thermostat, pulling the bulb down from behind the rear shelf support or cutting the capillary tube.
- E. Install new thermostat in the same location as the original thermostat. Re-install all items that were removed and make certain that the plastic thru-way nipple is sealed.



REPAIRING ALUMINUM COIL

The aluminum coils used in Hussmann refrigerated cases may be easily repaired in the field. Materials for repair are found at refrigeration wholesalers.

Hussmann recommends the following solders and techniques:

1. Zinc based 720°F solder. This solder makes a strong durable repair and is also cathodic protection, preventing corrosion of the tubing near the repair. This does not need a coating over the solder area. It may be 95% to 98% zinc with the remainder aluminum. Solders in this group are made by:

Platt Brothers
Box 1030
Waterbury, CT
(203) 753-4194

New Products, Inc.
269 Freeman Street
Brooklyn, NY 11222

Mathiessen and Hegler Zinc Company
Lasalle, IL

Three major differences between soldering aluminum and copper must be followed for best results. a. The heat must be applied on the opposite side of the tube from the solder. b. While keeping the solder molten, wire brush under the solder pool. c. Move the flame back and forth along the tube to prevent melting the tube.

2. Solders with lower melting point (600°F or less). Solders that contain metals other than the zinc and aluminum combination above will require a protective coating. This coating must be flexible to withstand defrosts. Windshield sealant by 3M, sold in auto parts stores, is one good material.
3. Solder/flux the same technique may be used with all these solder/flux systems. Heat from the back side of the tube, keep rubbing the solder on the fluxed repair area until it melts. Continue heating carefully until the solder flows, wetting the tube. Wash flux off with very hot water, dry, coat with windshield sealant. Use two coats and extend coat at least 1" each way from the solder to be sure of good coverage.

Some solder manufacturers are:

#505 Solder and #505 Flux:

Allweld Alloys
2027 Laura Avenue
Huntington Park, Ca
(213) 583-9004

Alu-Sol 45D Multicore Solder:

Multicore Solders
Westbury, CT 11590
(516) 334-7450

Strongset #509 (5) and 509 Flux:

All-State Welding Alloys Co.
Toronto, Canada

Eutector-Alutin 51-S Solder and
Alutin 51 Flux:

Eutectic Corporation
40-45 172 nd Street
Flushing, NY

APPENDIXJOINING PENRO MODELS
to
Back to Back PRO ModelsPARTS LIST

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
1	4	1/2 x 1/2 x 120" Gasket*
2	1	Front Grille End Trim (Pair)
3	2	Front Joint Trim
4	8	5/16 - 18 x 1-1/4 Cap Screw
5	8	5/16 Flat Washer
6	6	#8 x 1/2 Truss Head Sheet Metal Screw*
7	8	#8 x 3/4 Truss Head Sheet Metal Screw*
8	2	Butyl Sealant, Cartridge*

* Supplied with PRO model joint kits.

STEP 1. Apply the GASKET (1) around the perimeter of the case as shown and as follows:

- a. Apply the gasket to metal surfaces only.
- b. Recess the gasket approximately 1/8" in from the exterior surfaces.
- c. Avoid splicing the gasket especially on horizontal runs.
- d. Do not stretch the gasket around corners.
- e. Remove the paper backing after gasket is applied.

STEP 2. Remove the machine screws and nuts from the PENRO model as shown in the illustration. These will be reinstalled later.

After the PRO models have been set and leveled in their permanent location bring the PENRO model firmly against the gasketing to compress it for a good seal.

For proper alignment of the four joining holes of each PRO model with the corresponding holes in the PENRO model, the two PRO models must be 1-1/8" apart. This spacing also provides air circulation between the refrigerated models to help prevent sweating on their exterior surfaces.

Fasten the two PRO models to the PENRO model using the CAP SCREWS (4) and the FLAT WASHERS (5). The PENRO model has threaded retainers.

STEP 3. Install the FRONT GRILLE END TRIMS (2) flush to the back of the PENRO model and fasten with the SHEET METAL SCREWS (6).

Install the FRONT JOINT TRIMS (3) over the case joint and fasten with SHEET METAL SCREWS (7). See notes on illustration.

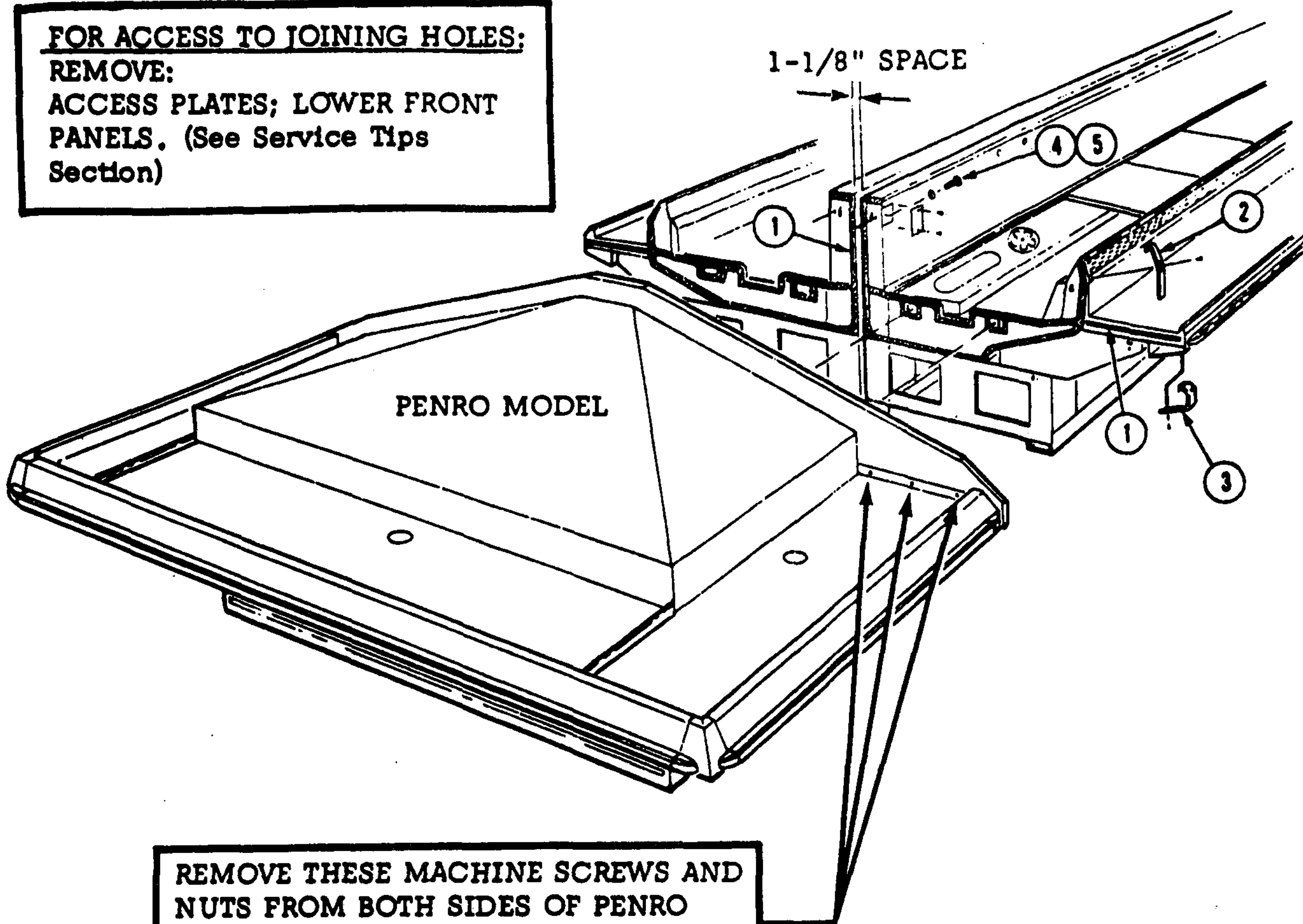
STEP 4. Sealing joint seams.

Fill the seam where the front shelf extension of the PRO models joins with the back of the PENRO model with BUTYL SEALANT (8) then fasten this flange to the PENRO model with the Machine Screws and Nuts removed in Step 2.

Run a continuous bead of this butyl sealant over the end frames of the PRO models where they join to the PENRO model.

Apply butyl sealant over the joining holes of the PRO model to seal.

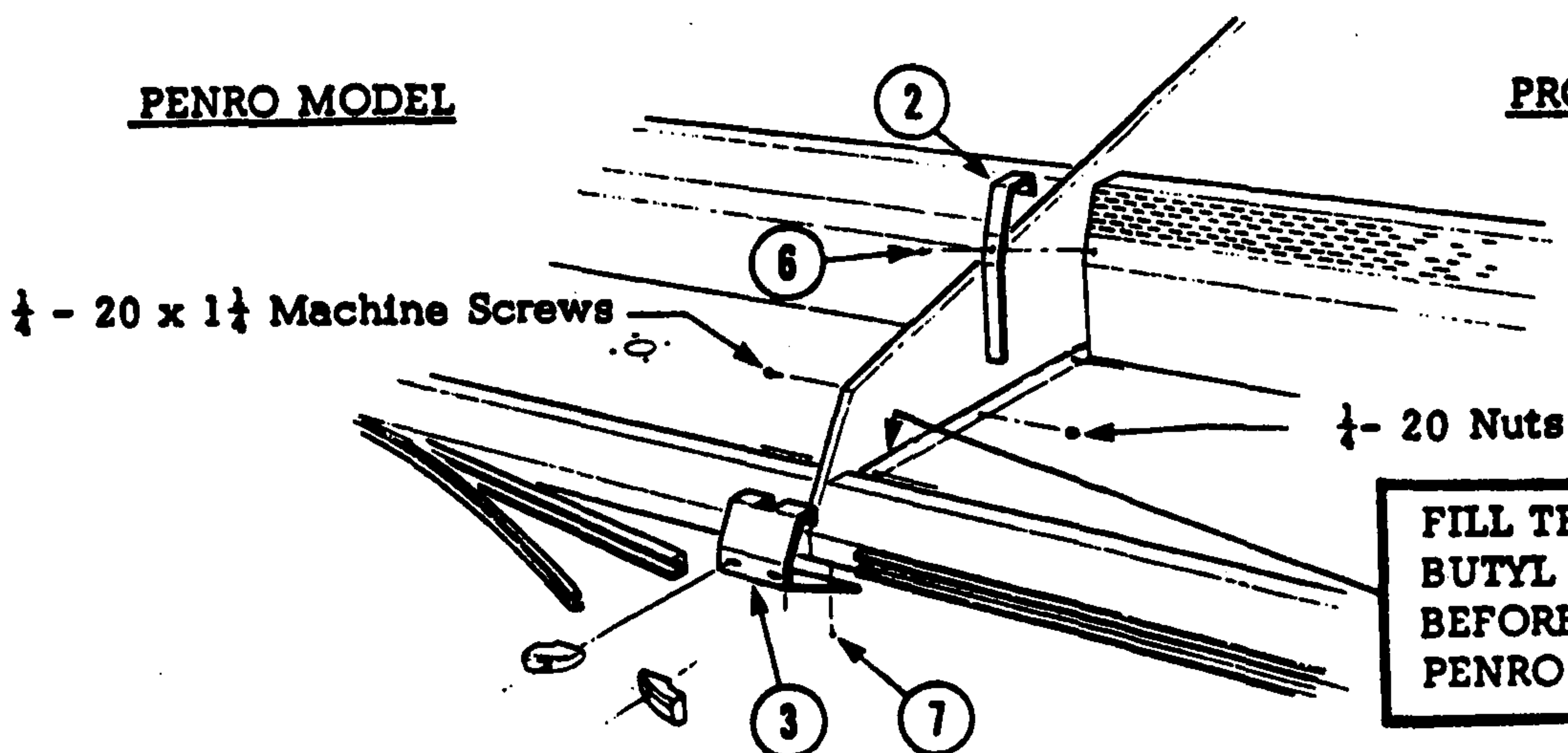
**FOR ACCESS TO JOINING HOLES:
REMOVE:
ACCESS PLATES; LOWER FRONT
PANELS. (See Service Tips
Section)**



**REMOVE THESE MACHINE SCREWS AND
NUTS FROM BOTH SIDES OF PENRO
MODEL BEFORE JOINING. REPLACE
AFTER JOINED**

PENRO MODEL

PRO MODEL



**FILL THIS SEAM WITH
BUTYL SEALANT (8)
BEFORE FASTENING TO
PENRO MODEL**

**TO INSTALL (3) REMOVE BOTH RUBRAIL
END CAPS AND LOOSEN RUBBER BUMPER
AND ALUMINUM EXTRUSION OF PENRO MODEL**