HUSSMANN®

NM3, NM3G, NM4
NM4G, NDD3, NDD3G
NDD4 & NDD4G
Multideck Meat and Delicatessen Merchandisers

Vision Series

P/N 353968C
January, 1994
Section 1

Installation & Operation Manual

CONTENTS

GENERAL INFORMATION
Model Descriptions....1-1
Application....1-1
Plan View and Cross Sections....1-1

INSTALLATION
Shipping Damage....2-1
Shipping Braces (Not All Merchandisers)....2-1
Exterior Loading....2-1
Location....2-1
Leveling....2-2
Joining....2-2
Anchoring....2-2
Waste Outlet and Water Seal....2-3
Installing Drip Piping....2-3
Installing Splashguards....2-4
Sealing Splashguards to Floor....2-4

REFRIGERATION
Refrigerant....3-1
Refrigerant Piping....3-1
Insulation....3-1
Expansion Valve Adjustment....3-2
Refrigeration Thermostat....3-3
CDA Sensor....3-3
Control Settings....3-4

ELECTRICAL
Connections....4-1
Identification of Wiring....4-1
Field Wiring....4-2
Electrical Schematics....4-3

USER INFORMATION
Care and Cleaning....5-1
Display Lighting....5-2
Cleaning Mirrors (Not All Merchandisers)....5-2
Shelves....5-3
Shelf Alignment (Not All Merchandisers)....5-3
Stocking....5-4

SERVICE
Ambient Air Filters....6-1
Cleaning Honeycomb Assemblies....6-2
Defrost Termination Thermostat....6-2
Replacing Discharge Splitter Heater....6-2
Replacing Fluorescent Lamps....6-3
Removing Lower Front Panel....6-3
Replacing Canopy Ballast....6-4
Repairing Aluminum Coil....6-5

WARRANTY

REVISION CHANGES ("C")
1. Parts List, Page ii.
2. Connections, Page 4-1.
3. Electrical Data, 4-2.
4. Wiring Diagrams, Page 4-3.

IMPORTANT
KEEP IN STORE FOR FUTURE REFERENCE
Quality that sets industry standards

This merchandiser conforms to the
Commercial Refrigeration 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

REPLACEMENT PARTS LIST

Item	Part Number	Description
1.	0047000	Fan Motor, Evaporator 120V, 9W, CW GE #KSM51ECG3799
2.	0058698	Fan Motor, Ambient 120V, 6W, CW GE #KSM51ECG3264
3.	0315470	Fan Blade, Evaporator P/N toward motor Thorgren #8 CW 34
4.	0124150	Fan Blade, Ambient embossing toward motor Morrill #FV800 CW 20S
5.	0058250	**NM Only** Anti-Sweat Heater, 8 foot, Discharge Splitter 120V, 1.6A, 77Ω
	0058251	**NM Only** Anti-Sweat Heater, 12 foot, Discharge Splitter 120V, 1.9A, 62Ω
6.	0020725	Fluorescent Lamp F40T12 CWX
7.	0330275	Incandescent Lamp 40W 125/130V
8.	0147080	Ballast, 2 lamps GE #6G1022G49
9.	0147089	Ballast, 2 lamps GE #8G3905 WT
10.	0147082	Ballast, 1 lamp GE #6G1063
11.	0147090	Ballast, 1 lamp GE #8G3688 WT
12.	0143354	Ballast, 1 lamp GE #6G1075
13.	0143749	Defrost Termination Thermostat TI #20425F12-433-913
14.	0100936	Fan Switch, **Gas Defrost Only** Thermo Disk 14T-31
15.	0131434	Defrost Heater 8 foot, 208V, 5.2 A, 40Ω
	0131435	Defrost Heater 12 foot, 208V, 7.8A, 27Ω
16.	0137880	Refrigeration Thermostat WR #1609-103

MODEL DESCRIPTION

This instruction covers the merchandisers listed below. Basic design features are listed to the right of each merchandiser.

NM3	Multideck Meat and Deli, 3 levels (2 shelves), ambient fans
NM3G	Multideck Meat and Deli, 3 levels (2 shelves), ambient fans, front glass
NM4	Multideck Meat and Deli, 4 levels, (3 shelves), ambient fans
NM4G	Multideck Meat and Deli, 4 levels, (3 shelves), ambient fans, front glass
NDD3	Multideck Meat and Deli, 3 levels (2 shelves)
NDD3G	Multideck Meat and Deli, 3 levels (2 shelves), front glass
NDD4	Multideck Meat and Deli, 4 levels (3 shelves)
NDD4G	Multideck Meat and Deli, 4 levels (3 shelves), front glass

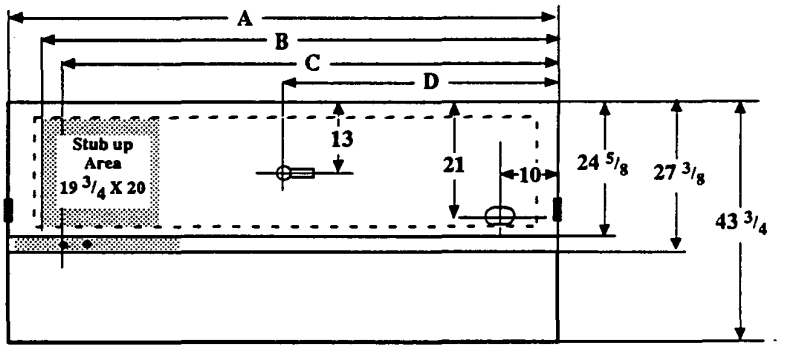
APPLICATION

These medium temperature merchandisers are designed for displaying fresh packaged meat or delicatessen products in air conditioned stores where temperature and humidity are maintained at or below 75°F dry bulb temperature and 55% relative humidity.

NOTE: Plan view and cross section measurements are given in inches.

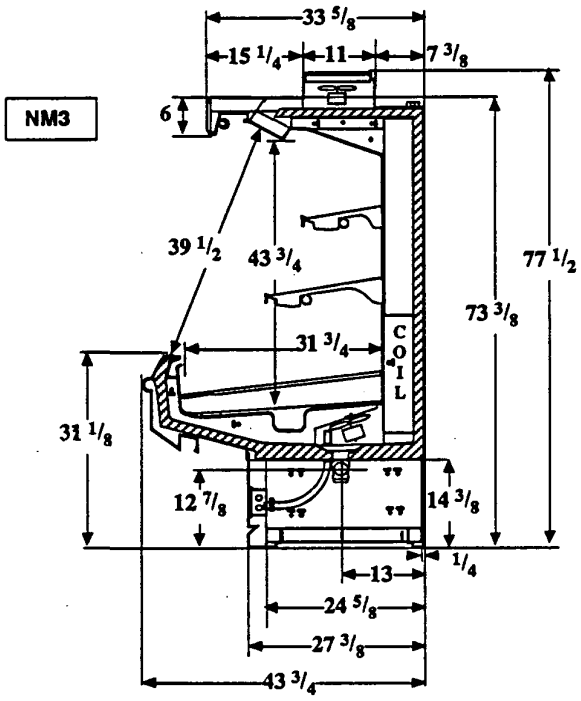
NM3 NM3G NM4 NM4G

NDD3 NDD3G NDD4 NDD4G



Electrical Service
Waste Outlet
Refrigeration Outlet
Passageway Port

Dimension	8' Case	12' Case
A	96 3/8	144 1/2
B	90 3/8	138 1/2
C	86 3/8	134 1/2
D	48 1/8	72 1/4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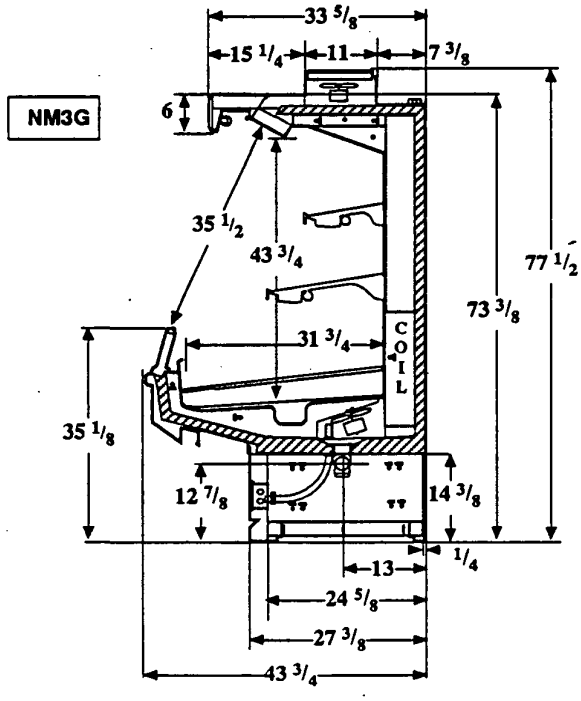
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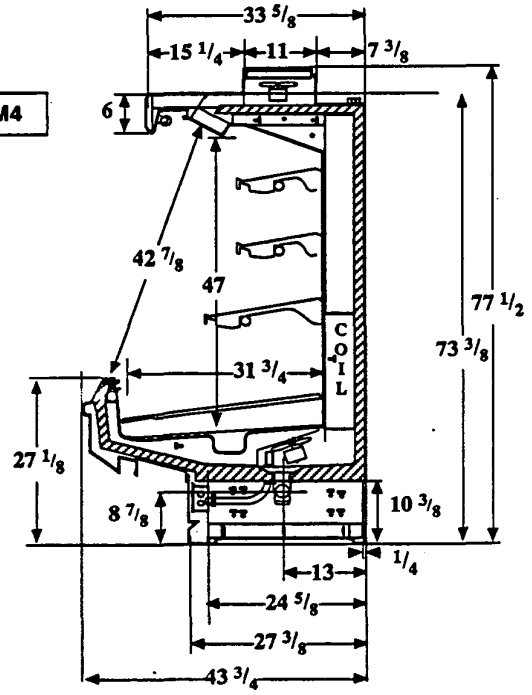
NM4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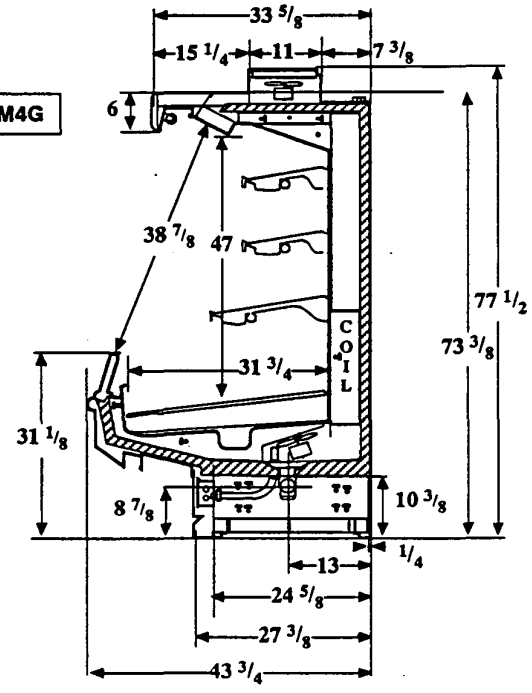
NM4G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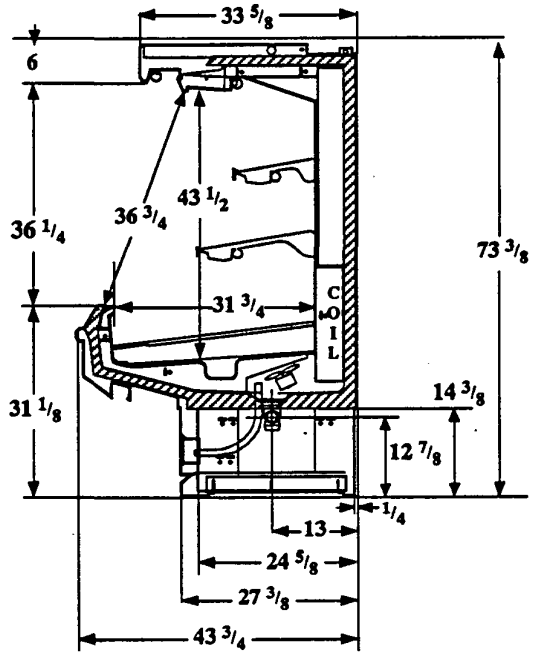
NDD3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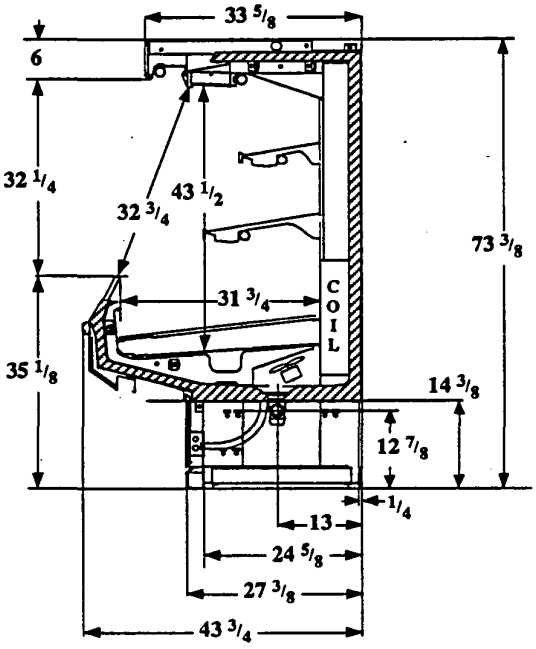
NDD3G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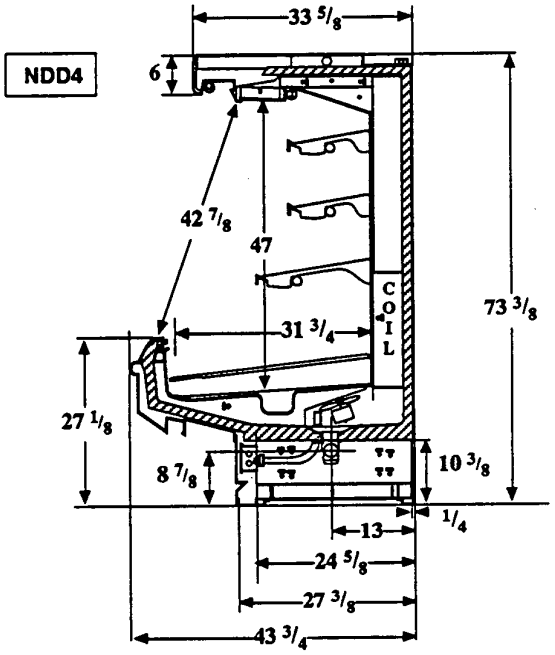
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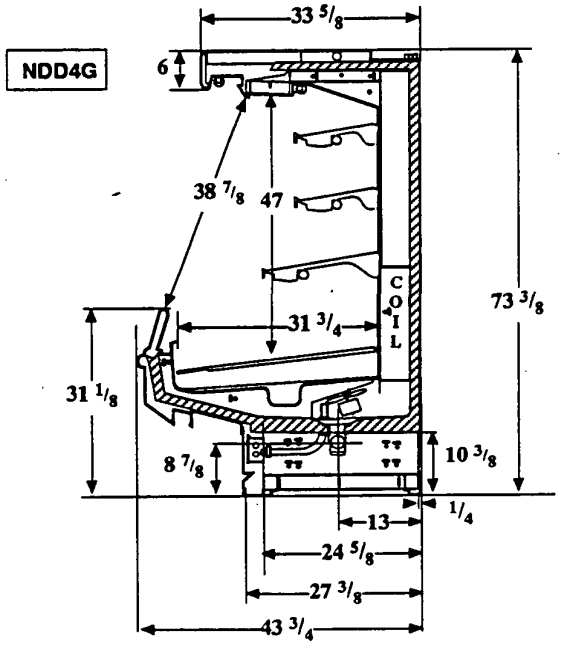
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27 3/8
43 3/4

NOTES:

SHIPPING DAMAGE

All equipment should be thoroughly examined for shipping damage before and during 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 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 (Not All Merchandisers)

Move the merchandiser as close as possible to its permanent location and then remove all packaging. Check for damage before discarding packaging. Remove all separately packed accessories such as kits and shelves. 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.

WARNING

Do NOT remove shipping braces until the merchandisers are properly anchored to the floor. These merchandisers are top heavy and could tip over causing serious injury.

Merchandisers must be braced before removing the lag bolts.

EXTERIOR LOADING

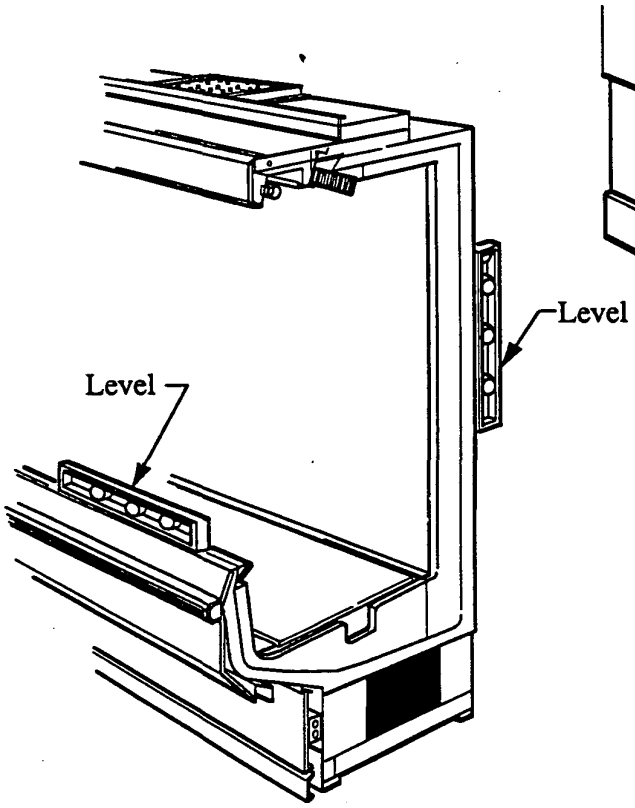
Do NOT walk on top of merchandisers or damage to the merchandisers and serious personal injury could occur. THEY ARE NOT STRUCTURALLY DESIGNED TO SUPPORT EXCESSIVE EXTERNAL LOADING such as the weight of a person.

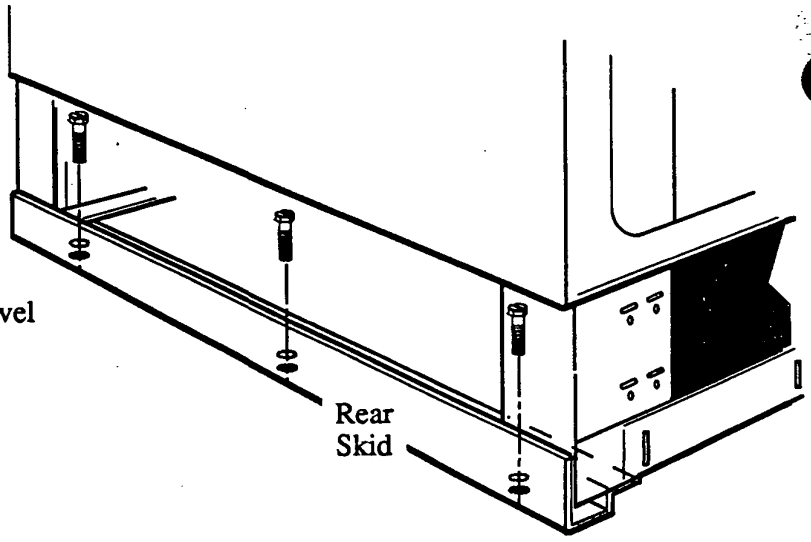
LOCATION

Like other open merchandisers, these are sensitive to air disturbances. Air currents passing around the merchandisers will seriously impair their operation. Do NOT allow air conditioning, electric fans, open doors or windows, etc. to create air currents around merchandisers.

To prevent sweating on the exterior surfaces of merchandisers, there must be A MINIMUM CLEARANCE OF 4 INCHES between the merchandisers and other fixtures or walls.

The ambient air curtain fans must not take in refrigerated cutting or cooler room air. The air source for these fans must be unobstructed at all times and have a temperature range of 60–80°F.





LEVELING

Merchandisers must be installed level to ensure proper operation of the refrigeration system and to ensure proper drainage of defrost water. When leveling merchandisers, use a carpenter's level as shown. Leveling shims or wedges are provided with each merchandiser for use if needed.

NOTE: BEGIN LINEUP LEVELING FROM THE HIGHEST POINT OF THE STORE FLOOR.

JOINING

Sectional construction means that two or more merchandisers may be joined in line yielding one long continuous display requiring only one pair of ends. Joint kits and instructions are shipped with each merchandiser.

ANCHORING

Because of the merchandisers' forward projection, they must be anchored to the floor to prevent them from tipping forward. Each merchandiser should be lagged to the floor through its rear skid. Anchors should be placed approximately eight (8) to twelve (12) inches from each end and in the center of the rear skid. Some merchandisers have $^1/_2$ inch holes in the rear skid for this purpose.

Once the merchandisers are properly anchored, remove shipping braces.

WASTE OUTLET AND WATER SEAL

The waste outlet is located at the center of each merchandiser allowing drip piping to be run under the fixture lengthwise, to the front or to the rear. A 1 $^1/_2$ inch water seal is factory installed on each merchandiser.

INSTALLING DRIP PIPING

Poorly or improperly installed drip pipes can seriously interfere with the merchandiser's operation and result in costly maintenance and product losses. Please follow the recommendations listed below when installing drip pipes to ensure proper installation.

1. Never use drip piping smaller than the nominal diameter of the pipe or water seal supplied with the merchandiser.

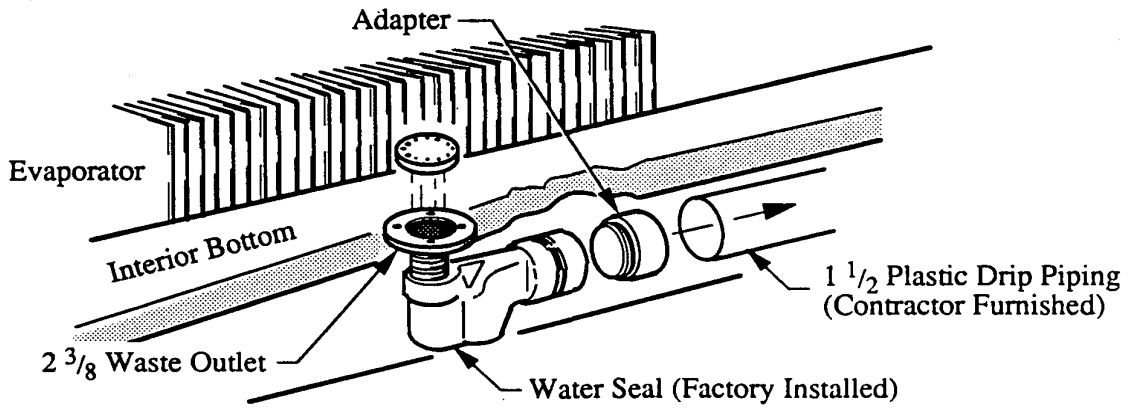
2. When connecting drip piping, the "water seal" must be used as part of the drip piping to prevent air leakage or insect entrance. Store plumbing system floor drains should be at least 12 inches off center of merchandiser to allow use of the "water seal" pipe section. Never use two water seals in series in any one drip pipe. **DOUBLE WATER SEALS IN SERIES WILL CAUSE AN AIR LOCK AND PREVENT DRAINING.**

3. Pitch the drip piping in the direction of flow. There should be a minimum pitch of $^1/_8$ inch per foot.

4. Avoid long runs of drip piping. Long runs make it impossible to provide the pitch necessary for good drainage.

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

6. Prevent drip pipes from freezing:
   A. Do NOT install drip pipes in contact with uninsulated suction lines. Suction lines should be insulated with a nonabsorbent insulation material.
   B. Where drip pipes are located in dead air spaces, such as between merchandisers or between a merchandiser and a store wall, provide means to prevent freezing.



INSTALLING SPLASHGUARDS

The splashguard and lower front panel are shipped inside each merchandiser. AFTER merchandisers have been leveled and joined, and all drip piping, electrical and refrigeration work has been completed, install the splashguards. The leveling brackets have a maximum extension of $^3/_4$ inch for uneven floors. After adjusting brackets flush with the floor, align slots in splashguard with leveling brackets and drop in place. Position lower front panel UP BEHIND THE FRONT PANEL FIRST, then down over the brackets.

SEALING SPLASHGUARDS TO FLOOR

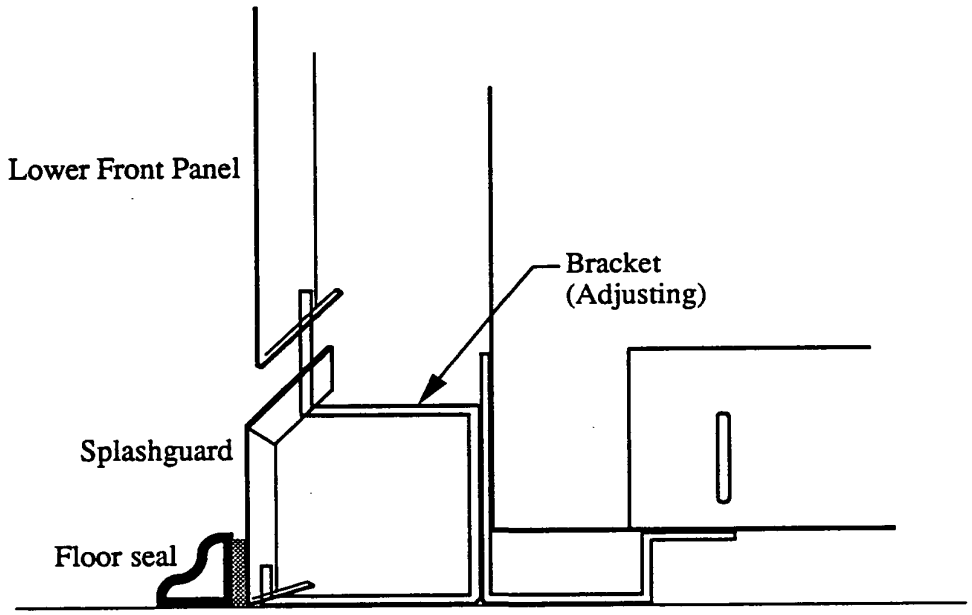
IF REQUIRED by local sanitation codes or if desired by the customer, the splashguards may be sealed to the floor using a vinyl cove base trim. The size of trim needed will depend on how much the floor is out of level.

To install the trim to the splashguard:

1. Remove all dirt, wax and grease from the area of the splashguard where adhesion will be necessary. This is to ensure a good and secure installation.

2. Apply a good contact cement to the trim and allow proper drying time according to the directions supplied with the cement.

3. Install the trim to the splashguard so that it is lying flush with the floor.



REFRIGERANT

The correct type of refrigerant will be stamped on each merchandiser's serial plate which is located on the left-hand end of the interior back panel.

REFRIGERANT PIPING

Connection Sizes

Liquid Line	$^3/_8$ inches OD
Suction Line	$1^1/_8$ inches OD

Connection Location

The refrigerant line connections are at the right-hand end of the merchandiser (as viewed from the front) beneath the display pans.

After connections have been made, seal this outlet thoroughly. Seal both the inside and the outside. We recommend using an expanding polyurethane foam insulation.

Multiplexing

Piping of merchandisers operating on the same refrigeration system may be run from merchandiser to merchandiser through the end frame saddles provided for this purpose. **DO NOT RUN REFRIGERANT LINES THROUGH MERCHANDISERS THAT ARE NOT ON THE SAME REFRIGERATION SYSTEM** as this may result in poor refrigeration control and compressor failure.

NOTE: If Gas defrost is used, the liquid line will need to be increased two sizes larger inside the merchandiser area. This is necessary to ensure even liquid drainage from all evaporators during defrost.

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 either the Hussmann Conventional or Systems Application 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

With GAS Defrost

The suction and liquid lines should NOT contact each other and should be insulated separately for a minimum of 30 feet from the merchandiser.

With OTHER Than Gas Defrost

The suction and liquid lines should be clamped or taped together and insulated for a minimum of 30 feet from the merchandiser.

With EITHER of Above

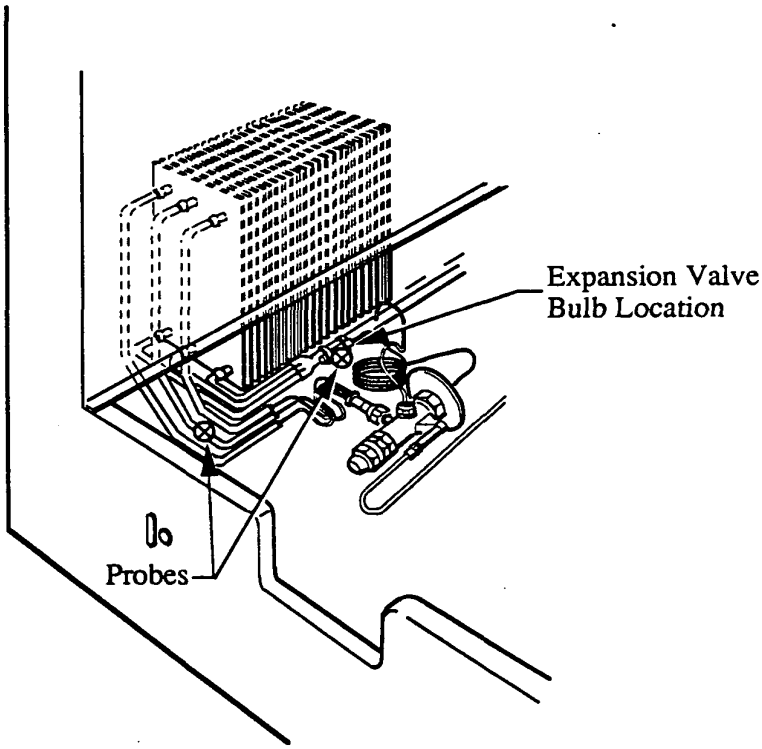
Additional insulation for the balance of the liquid and suction lines is recommended wherever condensation drippage is objectionable or the lines are exposed to ambient conditions.

EXPANSION VALVE ADJUSTMENT

Expansion valves must be adjusted to fully feed the evaporator. Before attempting to adjust valves, make sure the evaporator is either clear or only lightly covered with frost, and that the merchandiser is within 10°F of its expected operating temperature. Adjust valves as follows.

Attach two (2) sensing probes (either thermocouple or thermistor) to the evaporator. One under the clamp holding the expansion valve bulb and the other securely taped to the coil inlet line (see illustration).

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 3–5°F.** With this adjustment, during a portion of the hunting the temperature difference between the probes will be less than 3°F (at times as low as 0°F). Make adjustments of no more than $1/4$ turn for Balanced Port TEV and $1/2$ turn for "G" Body TEV at a time. Wait for at least 15 minutes before rechecking the probe temperature and making further adjustments.

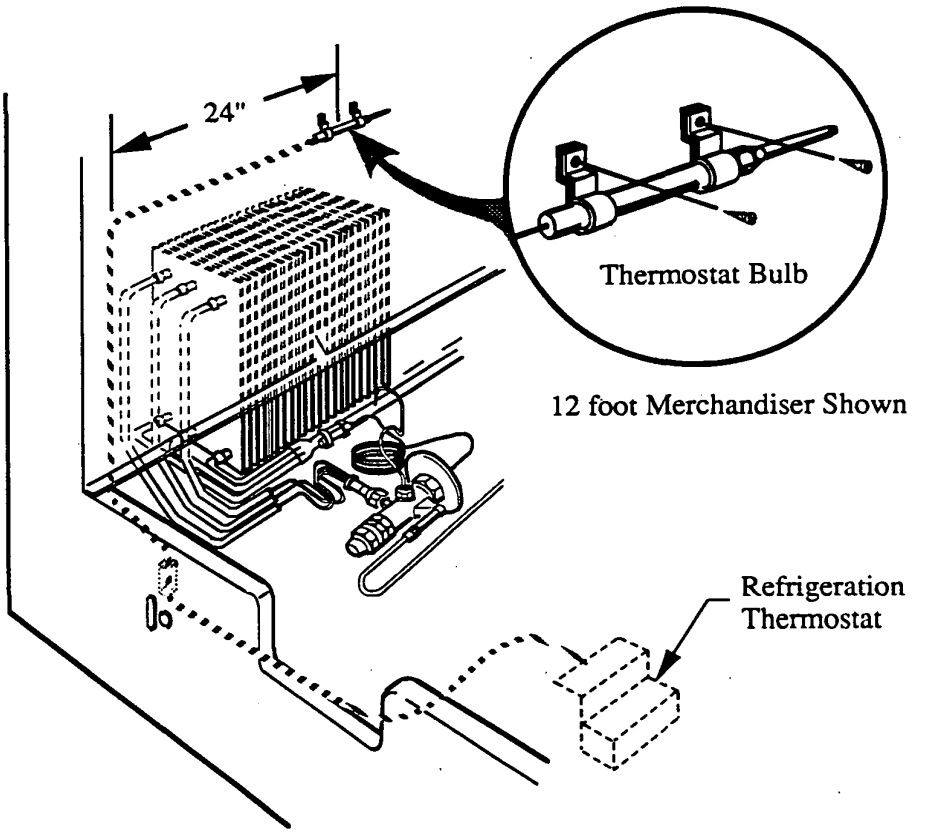


REFRIGERATION THERMOSTAT

Factory installation of optional thermostat is shown below. The thermostat body is located behind the lower front panel of the merchandiser at the left end. The bulb is located above the coil approximately 24 inches from the left end of the merchandiser.

CDA SENSOR

Factory installed optional CDA sensor is located where the thermostat bulb would normally be located. Its leads will be routed through the electrical raceway and to the rack control panel. Leads are tagged in the raceway.



12 foot Merchandiser Shown

CONTROL SETTINGS

Conventional Single Compressor

Measure Discharge Temperature
at the center of the case
at the discharge honeycomb.

Merchandiser temperature must be controlled by a thermostat with a 1°F differential. It will be wired to control the compressor motor contactor.

Standard Off Time and optional Electric defrost are temperature terminated at 48°F. The defrost termination thermostats for all the merchandisers on one compressor are wired in series. On outdoor units the defrost timer will control a liquid line solenoid beginning a defrost pumpdown 4 minutes before defrost.

Optional Gas defrost is time terminated, and has fan cycling thermostat. The defrost frequency and lengths listed may require adjustment for specific store conditions. Factors include:

- Store temperature and humidity
- Low head pressure
- Long refrigerant line runs
- Seasonal changes
- Merchandiser temperature lower than recommended

When practical, defrost when store is closed.

Low pressure control settings are applicable to outdoor condenser units where ambient does not fall below 0°F.

Refrigeration Data

	Meat NM/NDD	Deli NM/NDD
Discharge Air °F	22/24	32/28
Evaporator °F	11/15	20
Fan Cycling CI/CO Gas Defrost ONLY °F	28/38	28/38

Defrost Data

Frequency Hrs	6	6
Electric		
Temp Term °F	48	48
Failsafe Min	46	46
Gas		
Duration Min	14	14
Offtime		
Temp Term °F	48	48
Failsafe Min	46	46

When Thermostat Controls Temperature Low Pres Backup Control (PSIG)

	CI/CO NM-NDD	CI/CO
R-22	27/17–31/21	36/26
R-502	35/25–39/29	44/34

Parallel Compressor Rack

Measure Discharge Temperature
at the center of the case
at the discharge honeycomb.

Merchandiser temperature must be controlled by a thermostat or a CDA. The CDA sensor will be mounted in the same location as a thermostat sensing bulb. The CDA valve and control board will be mounted on the rack.

Standard Off Time and optional Electric defrost are temperature terminated at 48°F.

Optional Gas defrost is time terminated, and has fan cycling thermostat. The defrost frequency and lengths listed may require adjustment for specific store conditions. Factors include:

- Store temperature and humidity
- Low head pressure
- Long refrigerant line runs
- Seasonal changes
- Merchandiser temperature lower than recommended

Stagger defrosts to maintain stable compressor loading and sufficient defrost gas. When practical, defrost when store is closed.

Refrigeration Data	Meat NM/NDD	Deli NM/NDD
Discharge Air °F	22/24	32/28
Evaporator °F	11/15	20
Fan Cycling CI/CO Gas Defrost ONLY °F	28/38	28/38
Defrost Data		
Frequency Hrs	6	6
Electric		
Temp Term °F	48	48
Failsafe Min	46	46
Gas		
Duration Min	14	14
Offtime		
Temp Term °F	48	48
Failsafe Min	46	46

NOTES:

CONNECTIONS

All wiring must be in compliance with NEC and local codes. All electrical connections are to be made in the electrical raceway behind the lower front panel on the left-hand end of the merchandiser. See illustration.

IDENTIFICATION OF WIRING

Leads for all electrical circuits are identified by colored plastic bands. These bands correspond to the "color code sticker" (shown below) located inside the merchandiser raceway.

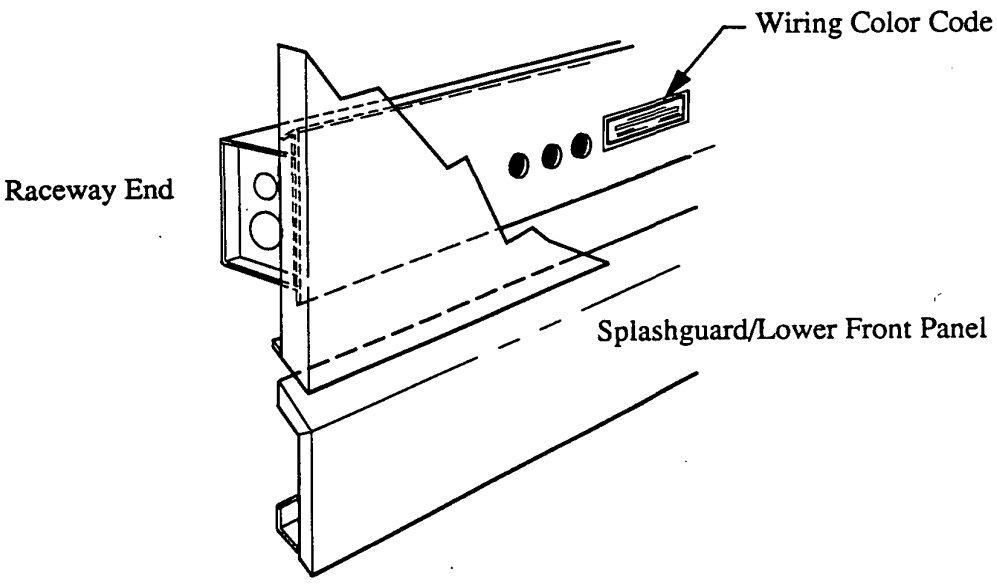
WIRING COLOR CODE

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.
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: When multiplexing merchandisers equipped with defrost heaters, if branch circuit overcurrent protection is larger than the individual merchandiser's defrost circuit load, then additional supplemental overcurrent protection may be required per NEC Articles 210 and 240.

FIELD WIRING

Field wiring must be sized for component amperes stamped on the serial plate. Actual ampere draw may be less than specified. Field wiring from the refrigeration control panel to the merchandisers is required for optional defrost termination thermostats and for optional refrigeration thermostats or CDA sensors. When multiple merchandisers are on the same defrost circuit the defrost termination thermostats are wired in series. The component amperes listed below are taken from the Hussmann Merchandiser Data Book; **ALWAYS CHECK THE SERIAL PLATE.**

Electrical Data

Model	120V 1PH 60Hz								208V 1PH 60Hz Optional Defrost Heater
	Fans	Anti-sweat Heaters	Lights–Includes full complement of lighted shelves. (9) Standard	Option	Option	Option	Option	Option	
NM	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Fresh Meat									
8 foot	3.30	1.6	4.63	—	5.40	6.11	5.99		5.2
12 foot	4.60	2.0	7.04	—	8.10	9.25	9.08		7.8
Deli									
8 foot	3.30	1.6	4.63	5.36	5.40	6.11	5.99	6.76	5.2
12 foot	4.60	2.0	7.04	8.04	8.10	9.25	9.08	10.14	7.8
NDD									
Fresh Meat									
8 foot	2.10	—	5.40	—	—	6.11	—		5.2
12 foot	2.80	—	8.10	—	—	9.25	—		7.8
Deli									
8 foot	2.10	—	5.40	—	—	6.11	—	6.76	5.2
12 foot	2.80	—	8.10	—	—	9.25	—	10.14	7.8

(1) Fans and anti-sweat heaters should be on a separate circuit from the lights to avoid turning them off with the store lights.

(2) All anti-sweat heaters can be cycled off by connecting them to an energy saving controller. The circuit will be tagged in the raceway as a cyclical anti-sweat heaters. They may be run parallel to the fan circuit for continuous duty.

Each column applies to light configurations listed below:

(3) NM Models—One row canopy. NDD Models—one row canopy and interior.

(4) Two rows canopy.

(5) One row canopy and one row interior.

(6) Two rows canopy and one row interior.

(7 One row canopy and one row incandescent.

(8) One row canopy, one row incandescent and one row interior.

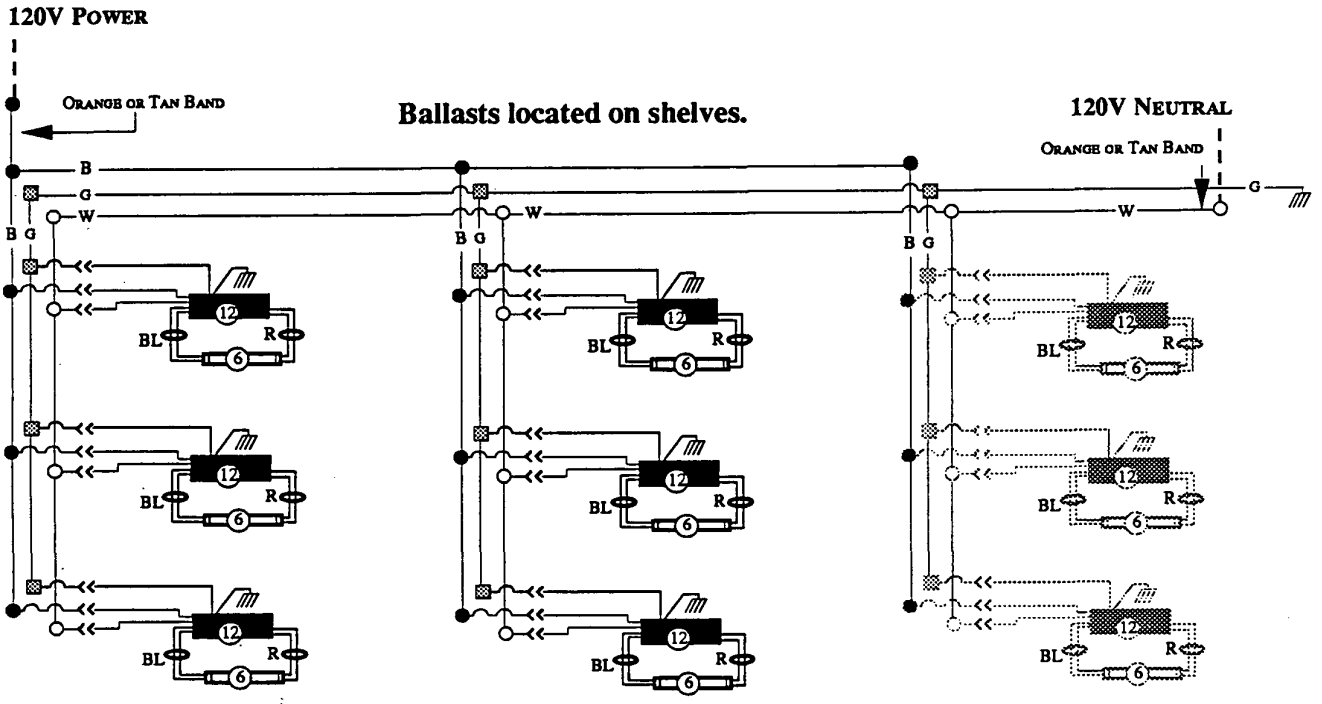
(9) 3-Level and 4-Level models use the same 3-shelf wiring harness.

NM & NDD - Shelf Light Circuits (optional)

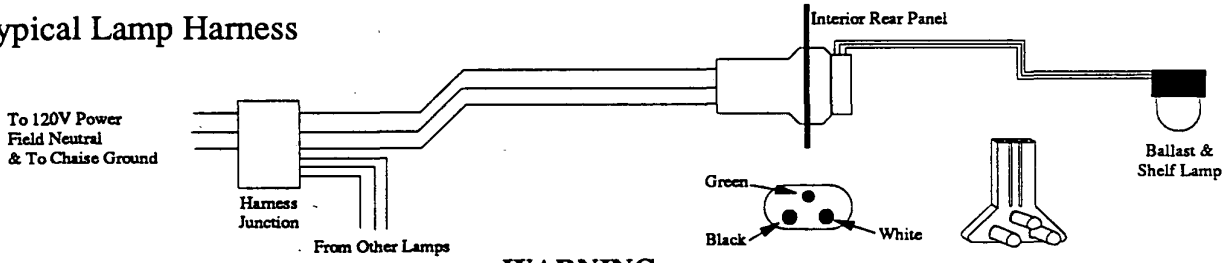
CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

Lighting Shelves One Single Lamp Ballast per Shelf

NOTE: NM3 and NDD3 have the same wire harnesses as the NM4 and NDD4, but only two rows of shelves.



Typical Lamp Harness



WARNING

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

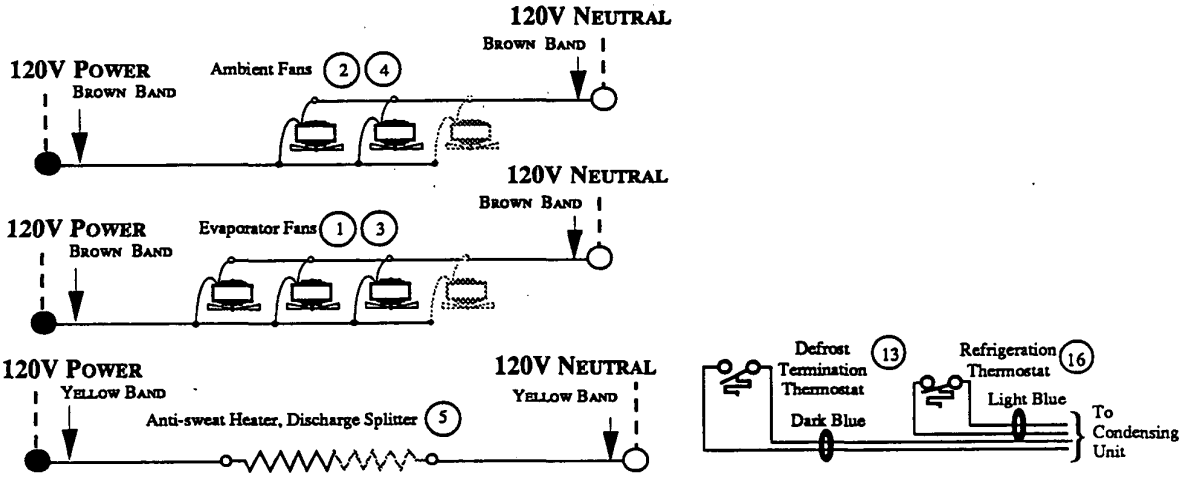
NOTES:

Schematic shows both standard and optional components. Not all components will be on each merchandiser.
Check store legend for specifics. Broken line indicates field wiring.
Optional shelf lighting uses one single light ballast per shelf.
Canopy lighting uses both one and two light ballasts.
Grayed components in 12 foot models only.

R = Red BL = Blue B = Black G = Green W = White

● = 120V POWER ○ = 120V NEUTRAL ▨ = GROUND

NM - Fan and Heater Circuits - Offtime Defrost (standard)



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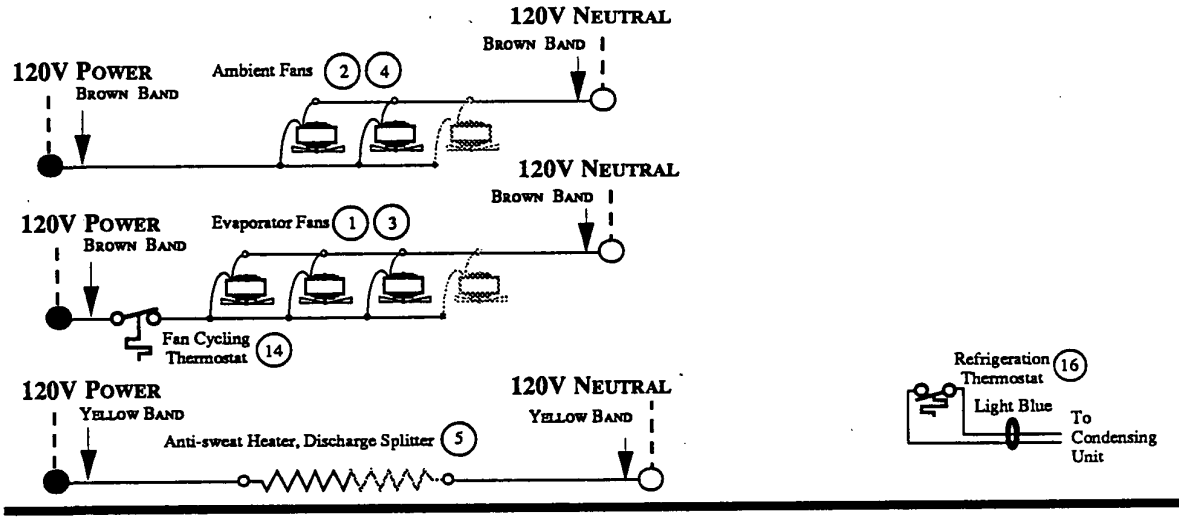
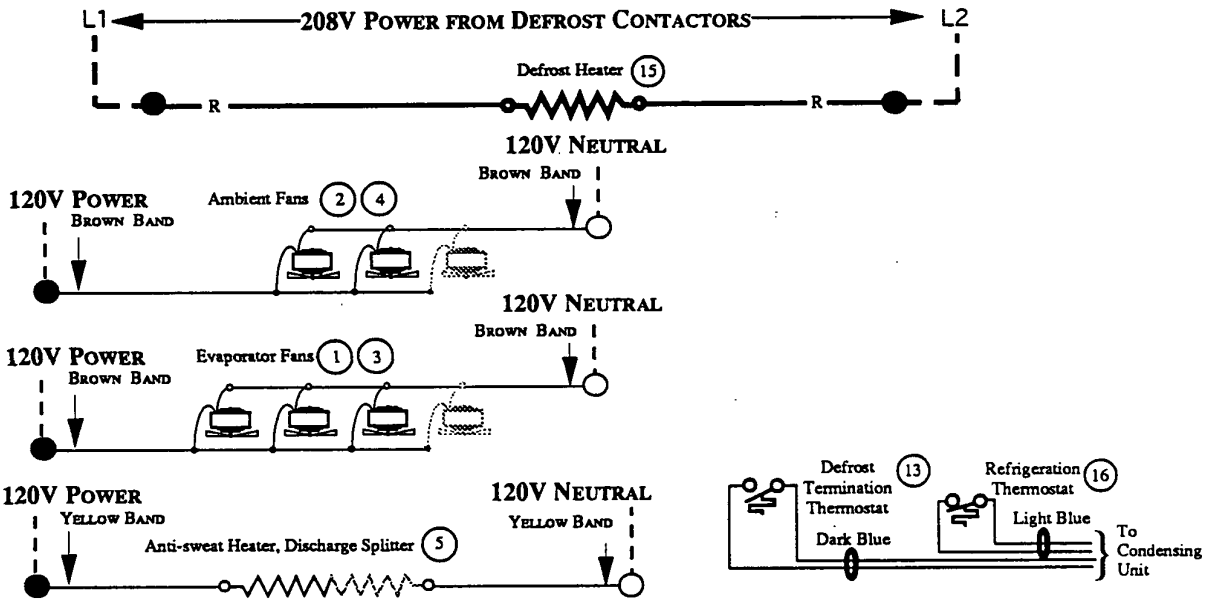
NM - Fan and Heater Circuits - Gas Defrost (optional)



NM - Fan and Heater Circuits - Electric Defrost (optional)



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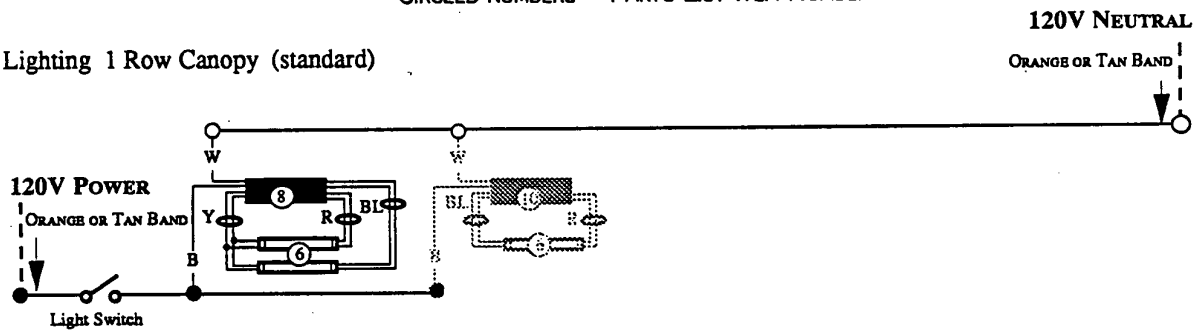
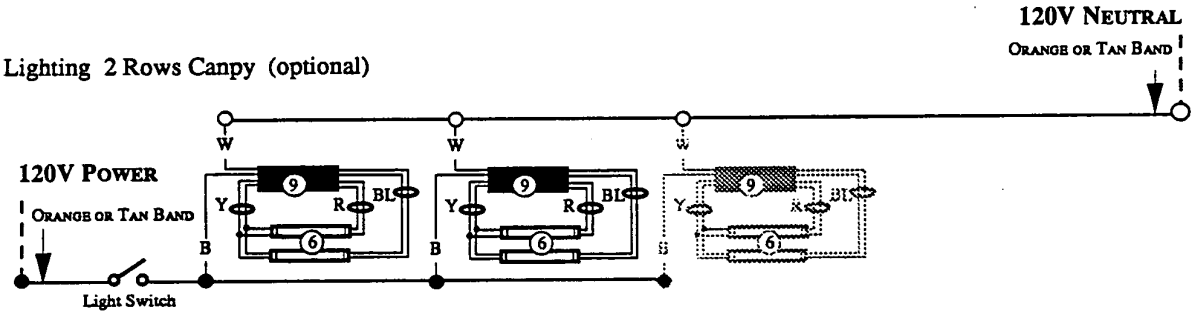
NM - Light Circuits

CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

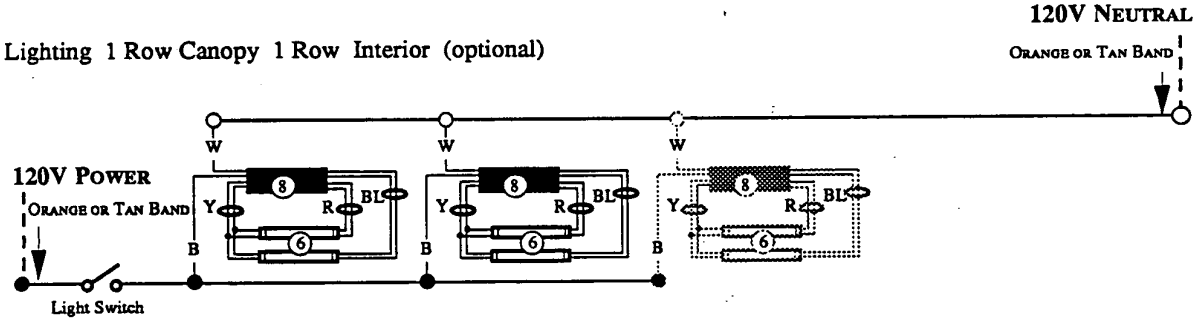
Lighting 1 Row Canopy (standard)



Lighting 2 Rows Canpy (optional)



Lighting 1 Row Canopy 1 Row Interior (optional)



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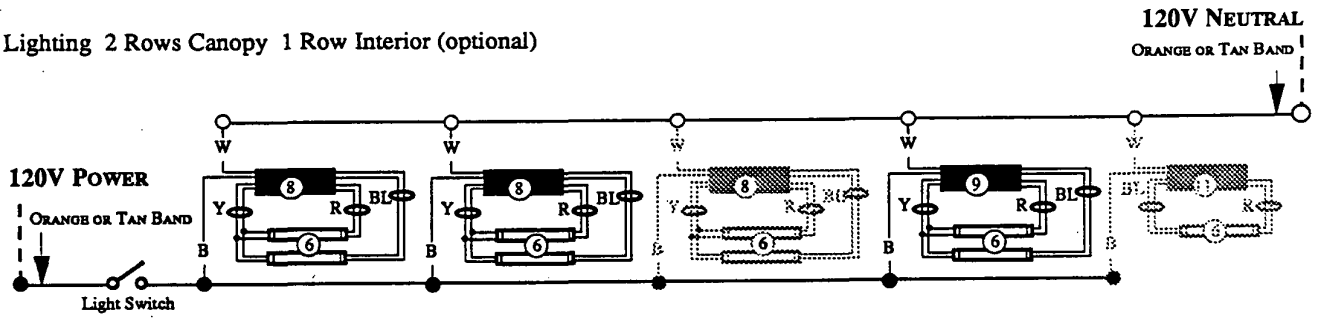
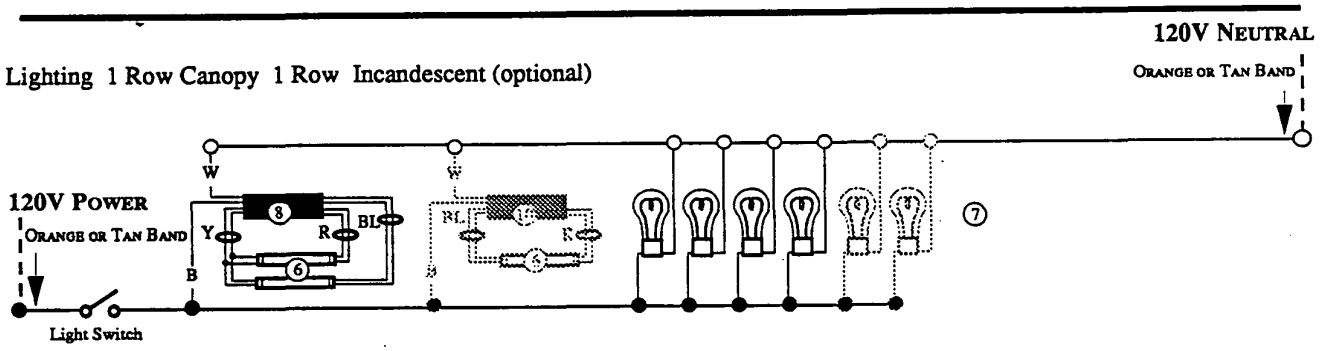
NM - Light Circuits

CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

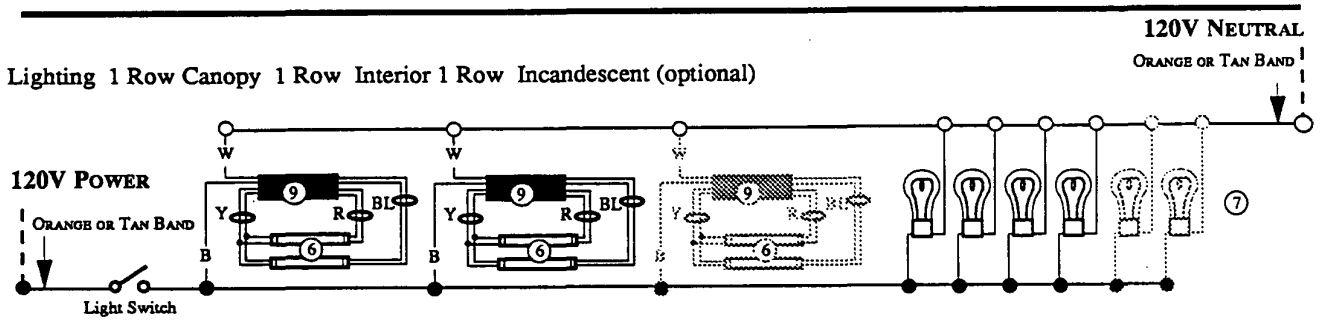
Lighting 2 Rows Canopy 1 Row Interior (optional)



Lighting 1 Row Canopy 1 Row Incandescent (optional)



Lighting 1 Row Canopy 1 Row Interior 1 Row Incandescent (optional)



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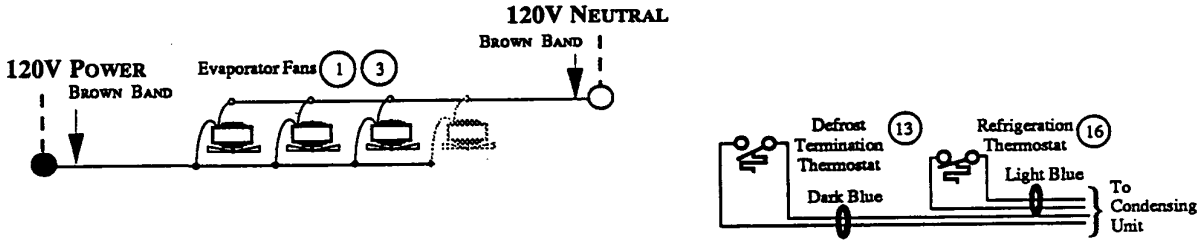
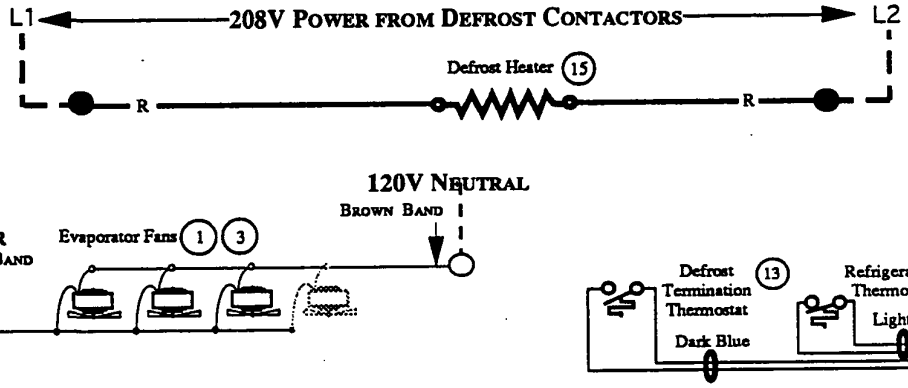
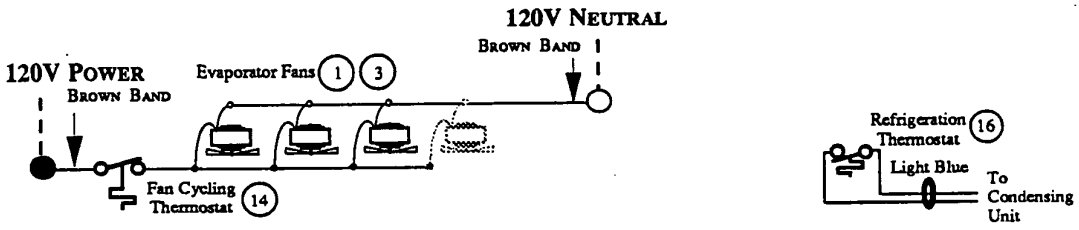
NDD - Fan and Heater Circuits - Offtime Defrost (standard)



NDD - Fan and Heater Circuits - Electric Defrost (optional)



NDD - Fan and Heater Circuits - Gas Defrost (optional)



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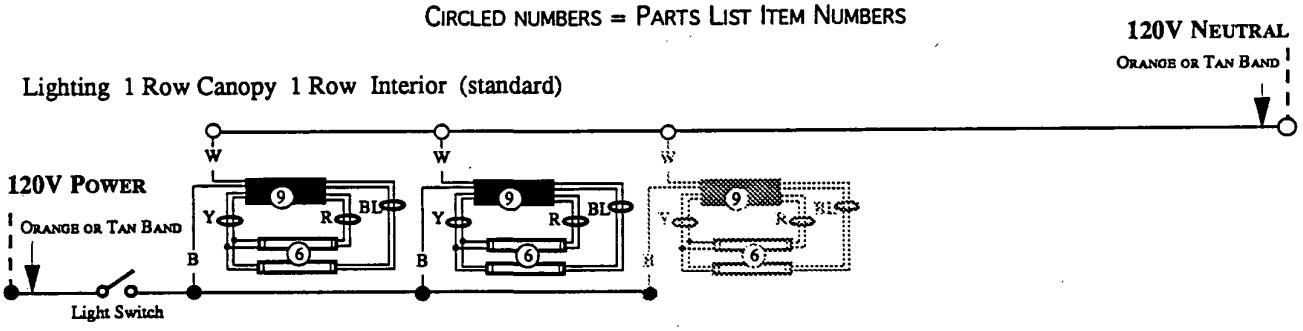
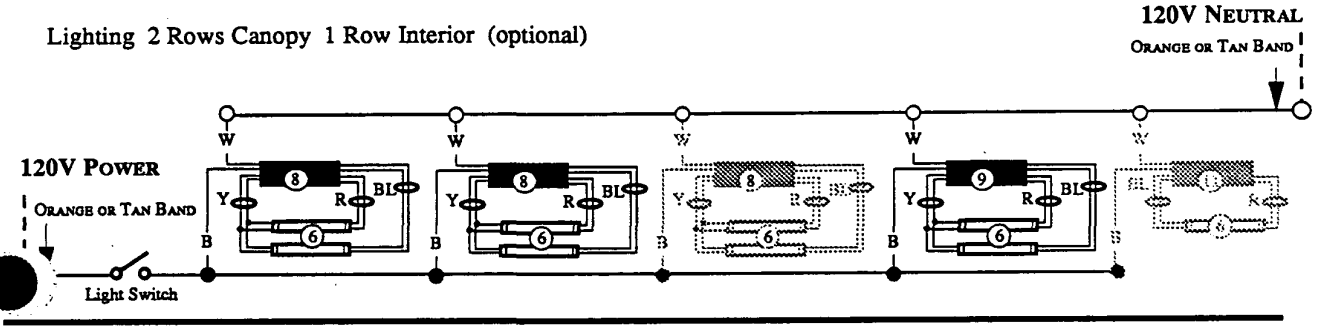
NDD - Light Circuits

CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

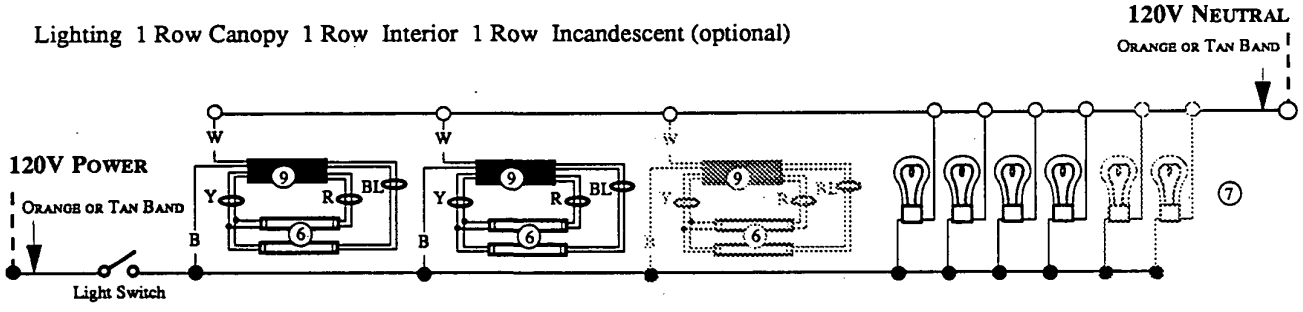
Lighting 1 Row Canopy 1 Row Interior (standard)



Lighting 2 Rows Canopy 1 Row Interior (optional)



Lighting 1 Row Canopy 1 Row Interior 1 Row Incandescent (optional)



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NOTES:

CARE AND CLEANING

Long life and satisfactory performance of any equipment is dependent upon the care it receives. To ensure long life, proper sanitation and minimum maintenance costs, these merchandisers should be thoroughly cleaned, all debris removed and the interiors washed down, weekly.

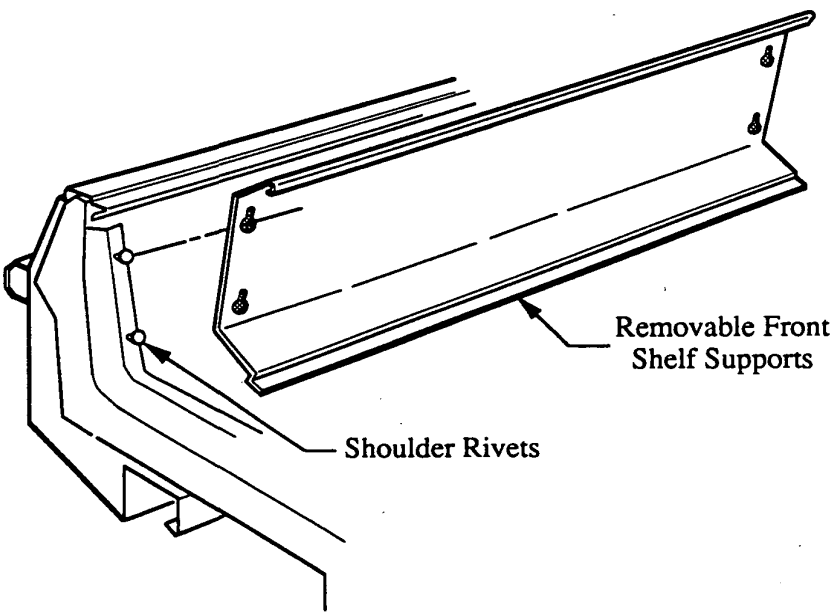
To facilitate quick and complete cleaning, these merchandisers have been designed with a removable front shelf support. The entire support is removable, in four foot sections, without the need for tools. Simply lift each section up and off the shoulder rivets located at both ends of each section (see illustration below).

To facilitate cleaning, the fan plenum is hinged for easy access to the area beneath the evaporator. THE PLENUM IS FASTENED DOWN FOR SHIPPING PURPOSES WITH A SCREW AT EACH END. IF THESE HAVE NOT BEEN REMOVED, DO SO AND DISCARD. After cleaning be sure the plenum is properly lowered into position.

CAUTION: SHUT FAN OFF DURING CLEANING PROCESS.

Exterior Surfaces

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



Interior Surfaces
The interior surfaces may be cleaned with most domestic detergents, ammonia based cleaners and sanitizing solutions with no harm to the surface.

Do NOT Use:
•Mineral oil based solutions, as these will dissolve the butyl sealants used in constructing the merchandisers.

•Abrasive cleansers and scouring pads, as these will mar the finish.

DO:
•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 WILL DESTROY THE MERCHANDISERS' SEALING CAUSING LEAKS AND POOR PERFORMANCE.

•Rinse with hot water, but do NOT flood. NEVER INTRODUCE WATER FASTER THAN THE WASTE OUTLET CAN REMOVE IT.

•Allow merchandisers to dry before resuming operation.

•When cleaning lighted shelves, wipe down with a damp sponge or cloth so that water does not enter the light channel. **Do NOT use a hose or submerge shelves in water.**

NOTE: Be sure plenum is properly lowered into position after cleaning or product loss will result due to improper refrigeration.

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 present. If a shelf life of more than 2 or 3 days is expected, the total light intensity from all light sources should be limited to a maximum of 100 footcandles at the product level, including no more than 30 footcandles of incandescent lamps.

CLEANING MIRRORS (Not All Merchandisers)

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 them. Every precaution should be taken to keep all liquids away from the coated side of the mirrors. IF LIQUIDS ARE ALLOWED TO FLOW ALONG THE FACE SIDE OF THE MIRROR TO ITS EDGE, THE LIQUID CAN "WICK" UP TO THE COATING AND IN TIME CAUSE SERIOUS DAMAGE.

To Help Prolong the Life of the Mirrors:
•Use only mild cleaning solutions (Windex, Solox or a weak solution of vinegar and water).

•Do NOT spray liquids on 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 to prevent the water from reaching the mirror's edge.

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

SHELVES

All upper shelves are individually mounted in 1 inch increments and have two-position brackets permitting shelves to be placed in a flat or down-tilt position. Front product stops are especially recommended when shelves are placed in the down-tilt position. Wire display shelves can be adjusted to several positions permitting shallow or volume displays (for bulky items such as hams or chickens).

Shelf Configuration

The 14 and 16 inch shelves may be placed in any position provided by the double-slotted uprights in the rear wall of the merchandiser. Shelves 18 inches and larger may be positioned in any of the nine lower upright slots and still be behind the front refrigerated air curtain and in the safe refrigerated zone. The larger shelves should not be placed above the line on the load limit stickers. The stickers are located on the upper back panel of the merchandiser interior, approximately 24 inches from each end.

SHELF ALIGNMENT

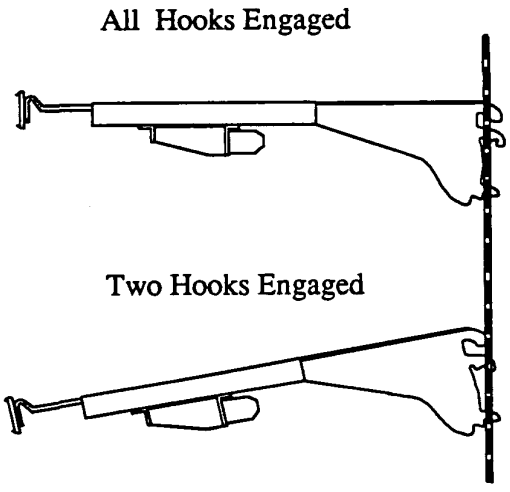
Taped to one of the shelves of each merchandiser is a small plastic bag containing shelf alignment strips. These strips are designed to enhance the appearance of the shelves by aligning the front edge of each shelf with that of an adjacent shelf. See illustration.

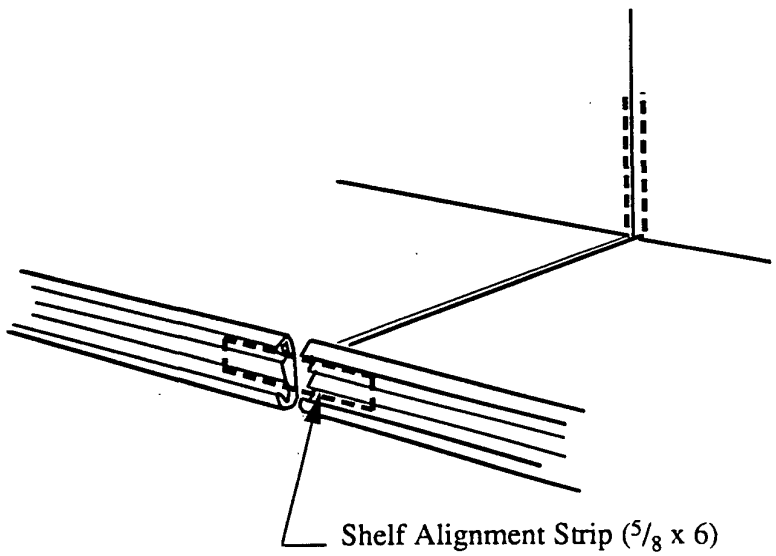
When installing the shelves on the merchandisers:

1. Insert one of the alignment strips into the slot behind the front edge of each shelf.

2. After all shelves are installed, slide the strip across the shelf joint wherever two shelves are adjacent. This will lock them together.

NOTE: Some PTM styles are pop riveted to the shelf. In these instances, the alignment strips must be cut in half before inserting them into the shelf.





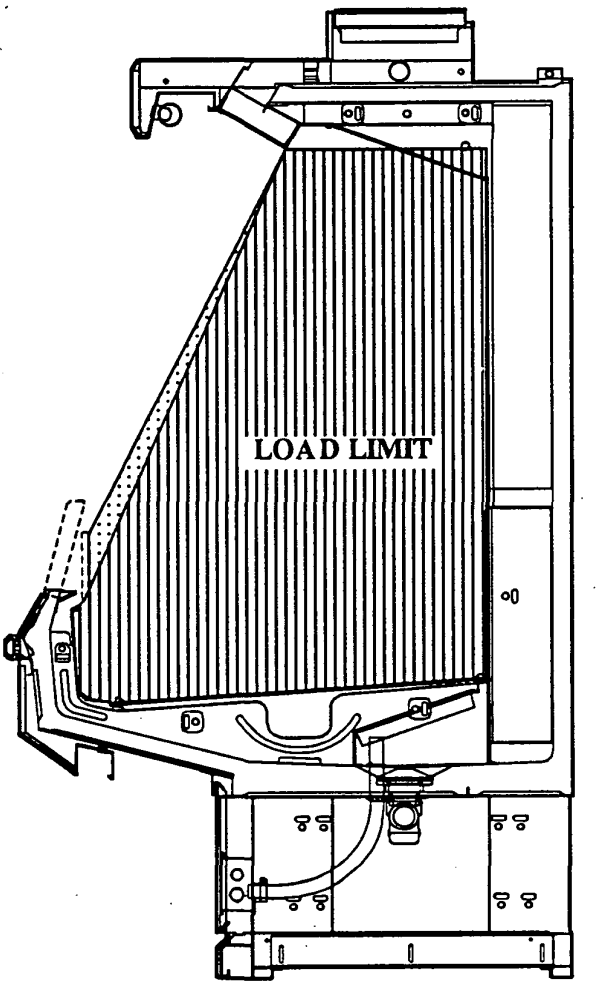
STOCKING

Product should not be placed in merchandisers until all refrigeration controls have been adjusted and merchandisers are at proper operating temperature.

At no time should the merchandisers be stocked beyond the load limits indicated on the ends of the merchandiser as shown in the illustration below. Shelf life of perishables will be short if load limit is violated.

NM Only–The ambient air curtain fans must be unobstructed at all times or merchandisers' performance will be seriously affected.

Drop ceilings, decorative fascia, displays and product placement must not block or interfere with these fans.



Dotted line indicates glass front and glass front load limit.

AMBIENT AIR FILTERS
(NM Only)

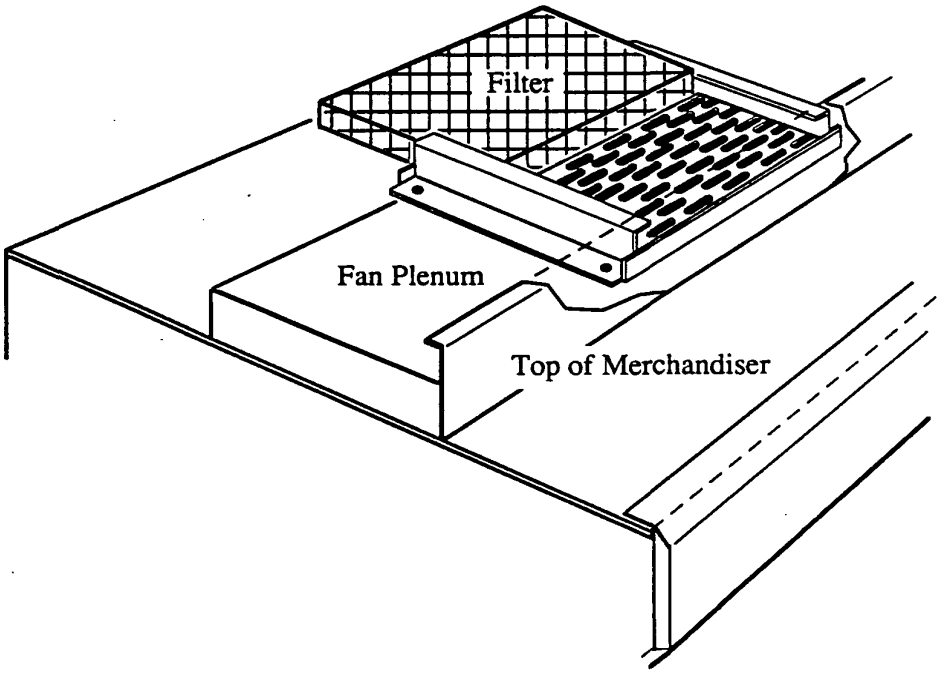
For proper refrigeration performance, the ambient air filters should be cleaned or replaced at least every six months. The filters are located on top of the merchandisers and measure 10 x 10 x $^1/_2$ inches.

To clean or replace, untape and slide the filter from the retainer. Be certain to replace the filter squarely over the grilled fan opening and tape to hold.

Replacement filters should be UL Class II type filters.

WARNING

Always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as fans, heaters, thermostats and lights.



CLEANING HONEYCOMB ASSEMBLIES

Honeycombs should be cleaned every six months. Dirty honeycombs will cause merchandisers to perform poorly. The honeycombs may be cleaned with a vacuum cleaner. Soap and water may be used if all water is removed from the honeycomb cells before replacing. Be careful not to damage the honeycombs.

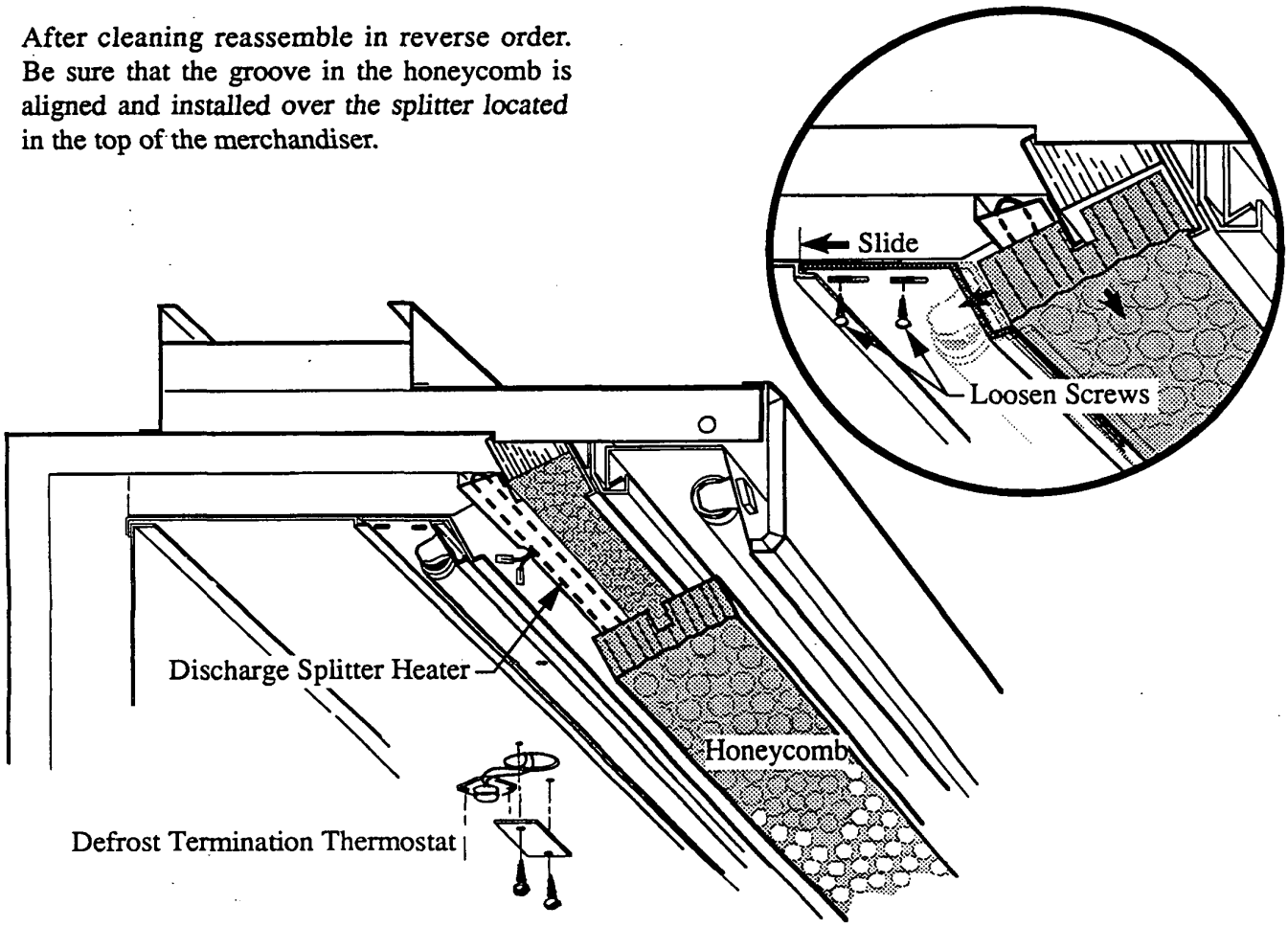
1. Loosen the sheet metal screws located in the metal retainer which holds the forward edge of the honeycomb in place.
2. Slid the metal retainer back and remove the honeycomb.
3. Clean and dry the honeycomb.
4. After cleaning reassemble in reverse order. Be sure that the groove in the honeycomb is aligned and installed over the splitter located in the top of the merchandiser.

DEFROST TERMINATION THERMOSTAT

The defrost termination thermostat is mounted to the merchandiser's interior top under the access plate. See illustration below.

REPLACING DISCHARGE SPLITTER HEATER (NM Only)

1. Disconnect electric power. Remove honeycomb.
2. Remove sheet metal cover from heater. Disconnect heater and remove.
3. Reassemble in reverse order.



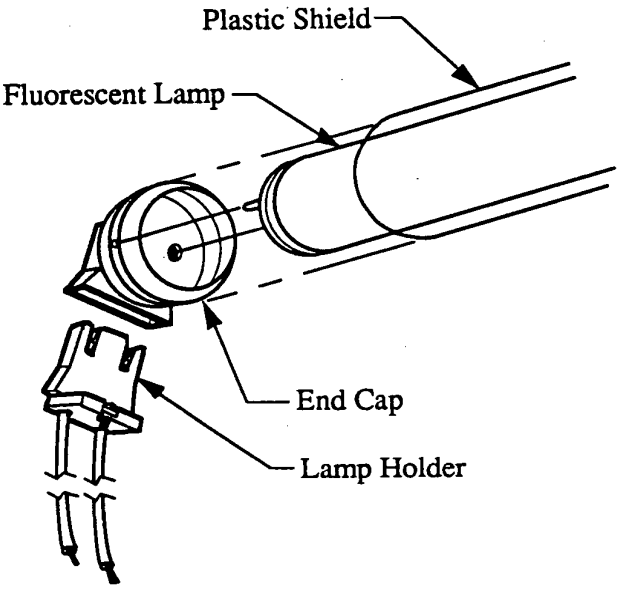
REPLACING FLUORESCENT LAMPS

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

NOTE: Do NOT twist the lamp.

Remove Lamp
To remove a lamp, simply push the lamp away from the lamp holder.

Install Lamp
To install a lamp, align the end caps over the lamp holders and press gently. A slight snap will be felt as the lamp is seated.

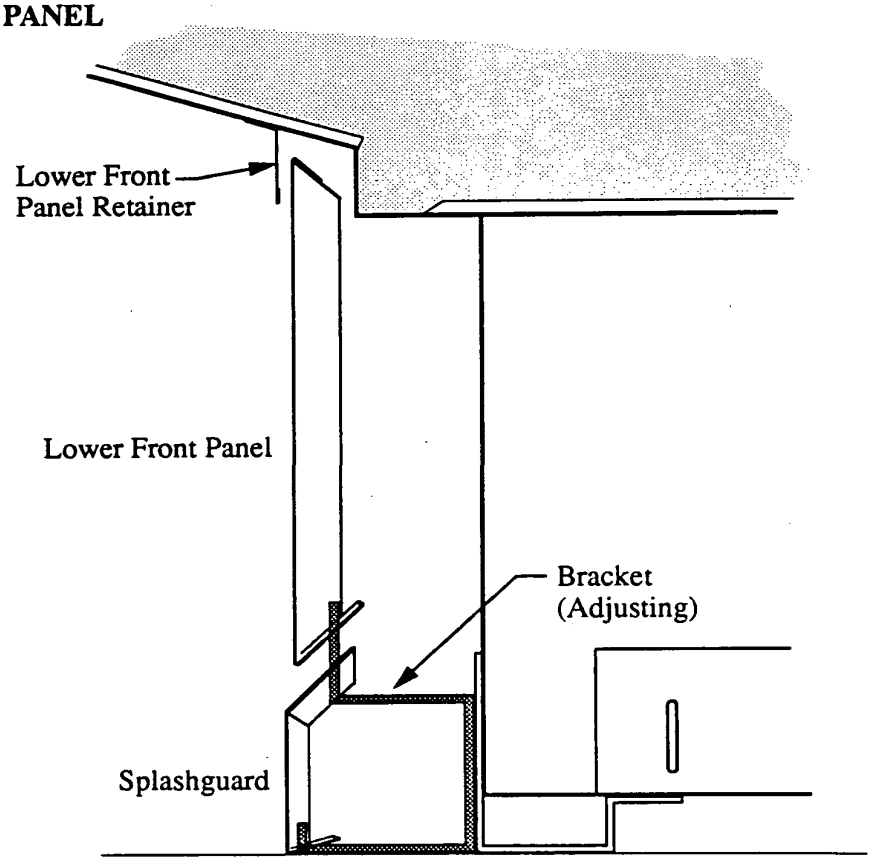


REMOVING LOWER FRONT PANEL

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

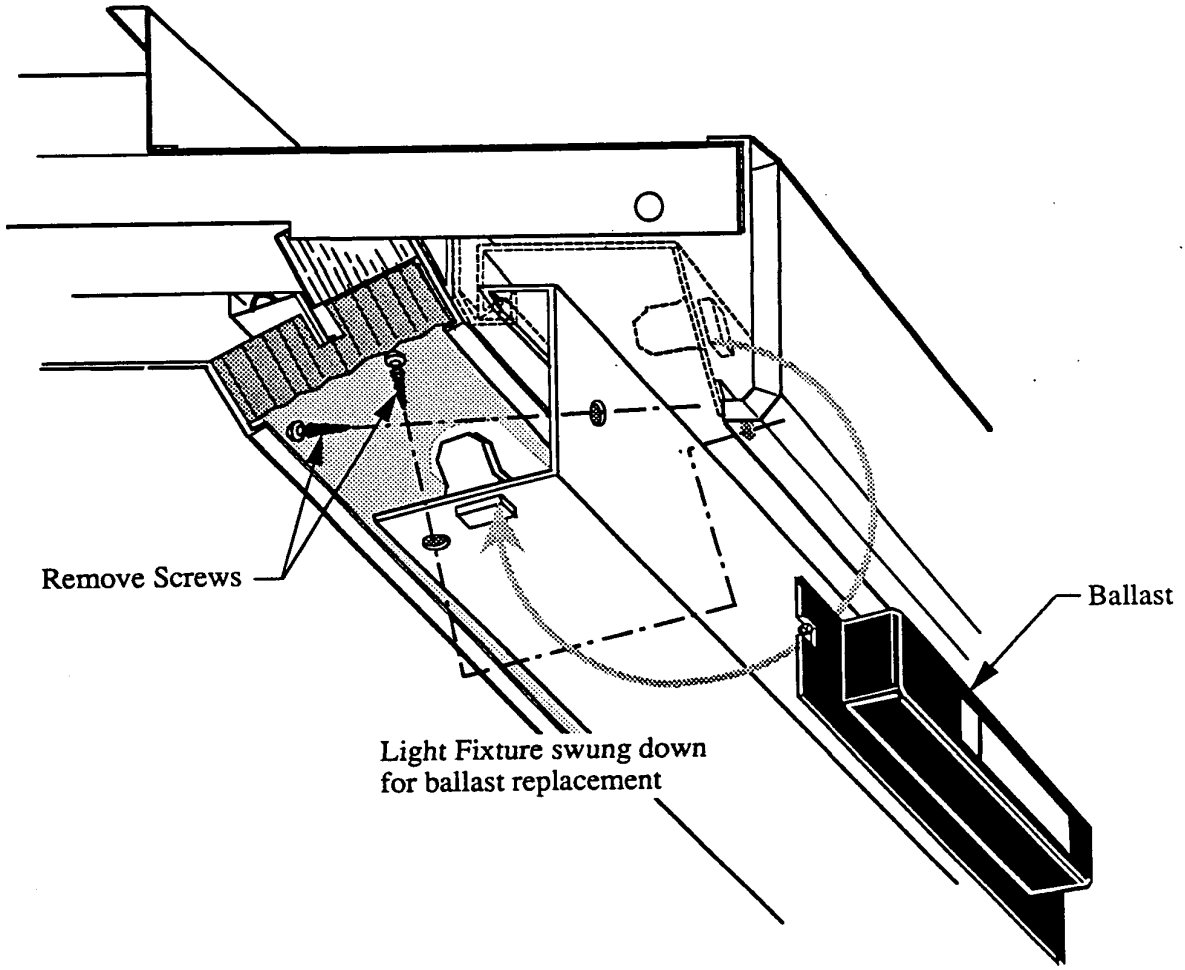
Next, lift the panel from behind the retaining bracket.

To install, reverse procedure.



REPLACING CANOPY BALLAST

1. Disconnect power to the merchandiser.
2. Remove all fluorescent lamps from the canopy.
3. Remove sheet metal screws along the underside of the light fixture, starting at the end and working toward the middle of the merchandiser.
4. Light will swing down, resting on its retainer.
5. Replace ballast and reassemble parts in reverse order.



REPAIRING ALUMINUM COIL

The aluminum coils used in Hussmann merchandisers may be easily repaired in the field. Materials are available from local refrigeration wholesalers.

Hussmann recommends the following solders and technique:

Solders

Aladdin Welding Products Inc.
P.O. Box 7188
1300 Burton St.
Grand Rapids, MI 49507
(616) 243-2531

X-Ergon
1570 E. Northgate
P.O. Box 2102
Irving, TX 75062
(800) 527-9916

Technique

1. Locate Leak.
2. REMOVE ALL PRESSURE.
3. Brush area **UNDER HEAT.**
4. Use PRESTOLITE TORCH ONLY. NUMBER 6 TIP.
5. Maintain separate set of stainless steel brushes and USE ONLY ON ALUMINUM.
6. Tin surface around area.
7. Brush tinned surface **UNDER HEAT,** thoroughly filling the open pores around leak.
8. Repair leak. Let Aluminum melt solder, NOT the torch.
9. Don't repair for looks. Go for thickness.
10. Perform a leak check.
11. Wash with water.
12. Cover with a good flexible sealant.

NOTE:

Hussmann Aluminum melts at .....1125° F
Aladdin 3-in-1 rod at .....732° F
X-Ergon Acid core at .....455° F
Factory Solder at aluminum
to copper transitions .....855° F