TYLER REFRIGERATION

Carrier
A United Technologies Company

1series Advantage

Installation & Service Manual

NLBR, NLBN, NLBS

LIFT FRONT CURVED GLASS BAKERY MERCHANDISERS
Medium Temperature and Non-Refrigerated Bakery Display Cases

This manual has been designed to be used in conjunction with the General (UL/NSF) Installation & Service Manual.
Save the Instructions in Both Manuals for Future Reference!!

This merchandiser conforms to the American National Standard Institute & NSF International Health and Sanitation standard ANSI/NSF - 7 2003.

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CONTENTS

The following Medium Temperature (Remote & Self-Contained) and Non-Refrigerated Lift Front Glass Bakery Merchandiser models are covered in this manual:

MODEL	DESCRIPTION
NLBR	59” & 77” LIFT FRONT GLASS REMOTE OPERATED BAKERY MERCHANDISERS
NLBN	59” & 77” LIFT FRONT GLASS NON-REFRIGERATED BAKERY MERCHANDISERS
NLBS	59” & 77” LIFT FRONT GLASS SELF-CONTAINED BAKERY MERCHANDISERS

SPECIFICATIONS

NLBR Lift Front Curved Glass Remote Bakery Merchandisers
NLBN Lift Front Curved Glass Non-Refrigerated Bakery Merchandisers

Refrigeration Data:

MODEL	CASE LENGTH	CASE USAGE	CAPACITY (BTUH / FT)		EVAPORATOR (°F)	UNIT SIZING (°F)	DISCHARGE AIR		AVG. REF. CHARGE (LBS/FT)
			PARALLEL	CONVENTIONAL			TEMPERATURE (°F)	VELOCITY (FPM)	
NLBR	59" / 77"	BAKERY	402*	439*	+27**	+25	+36	154***	0.22
NLBN	59" / 77"	BAKERY	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* Capacity data listed for cases with 2 rows of T-8 top lights and optional lighted shelving.
For sizing all refrigeration equipment other than TYLER, use conventional BTUH values.
** Evaporator temperature is based on the saturated pressure leaving the case.
*** Air velocity measured 1 hour after defrost at the vertical part of the Rear Duct at the back of the Top Shelf.

FOR SPECIFIC COMPRESSOR SIZING INFORMATION, REFER TO TYLER APPLICATIONS FOR RACK SYSTEM COMPRESSORS AND/OR THE COMPRESSOR MANUFACTURERS FOR SINGLE COMPRESSORS. FOR LINE SIZING INFORMATION, REFER TO THE MISCELLANEOUS SECTION "BUFF" IN THE TYLER SPECIFICATION GUIDE.

Electrical Data:

Fans and Heaters (120 Volt)

MODEL	CASE LENGTH	FANS / CASE	TOTAL STANDARD FANS		TOTAL ECM FANS		ANTI-SWEAT HEATER	
			AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
NLBR	59"	2	0.68	60.4	0.44	22.0	0.50	61.0
NLBR	77"	2	0.68	60.4	0.44	22.0	0.70	82.0
NLBN	59"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NLBN	77"	N/A	N/A	N/A	N/A	N/A	N/A	N/A

T-8 Lighting with Electronic Ballasts (120 Volt)

MODEL	CASE LENGTH	CANOPY LIGHTS		SHELF LIGHTS – PER ROW						MAXIMUM LIGHTING *	
		AMPS 2 ROWS	WATTS 2 ROWS	AMPS 1 ROW	AMPS 2 ROWS	AMPS 3 ROWS	WATTS 1 ROW	WATTS 2 ROWS	WATTS 3 ROWS	AMPS (5 ROWS)	WATTS (5 ROWS)
NLB(R/N)	59"	0.50	60.0	0.35	0.50	0.70	42.0	60.0	84.0	1.30	156.0
NLB(R/N)	77"	0.66	79.2	0.56	0.75	0.94	67.2	90.0	112.8	1.60	192.0

* For cases with 2 rows of canopy lights and 3 rows of shelf lights.

Defrost Data:

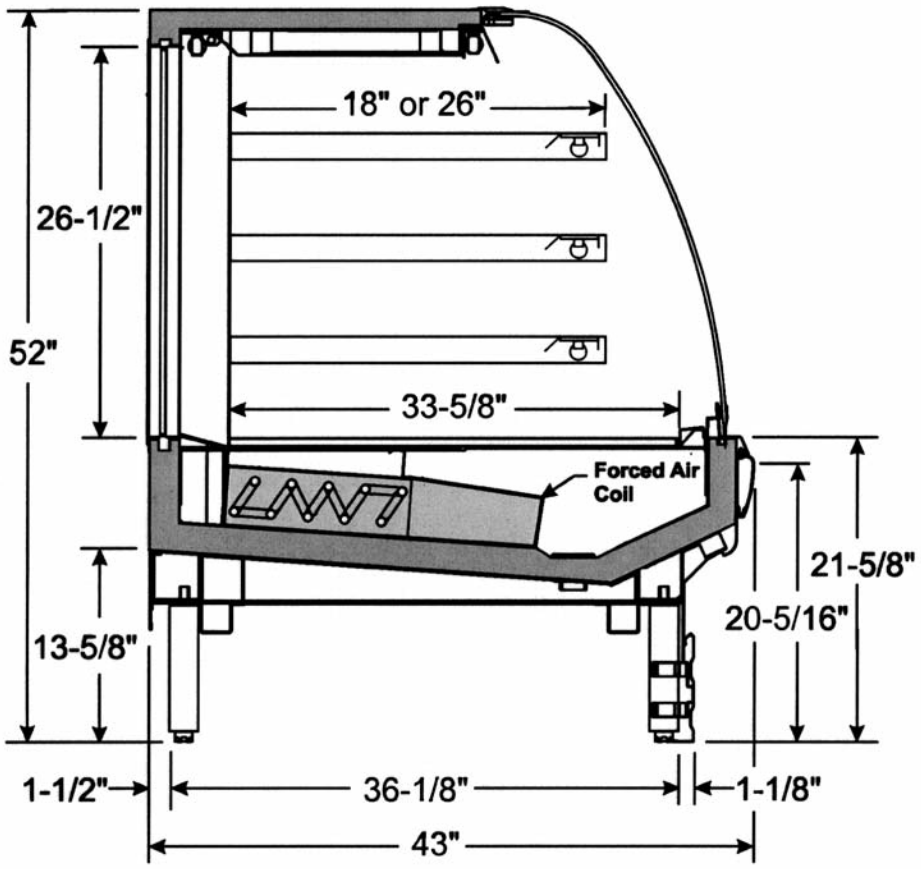
DEFROST TYPE	DEFROSTS PER DAY	DURATION TIME (MIN)	TERMINATION TEMP. (°F)	EPR SETTINGS *		DEFROST WATER (LB / FT / DAY)
				R22 (PSIG)	R404A (PSIG)	
TIME OFF – NLBR	6	20	-----	51	65	N/A

* Set EPR to give this pressure at the case.

NSF CERTIFIED to meet ANSI/NSF – 7.

CASE BTUH REQUIREMENTS are calculated to produce approximately the indicated performance with absolute maximum operating ambient limits of **75°F & 55RH**.

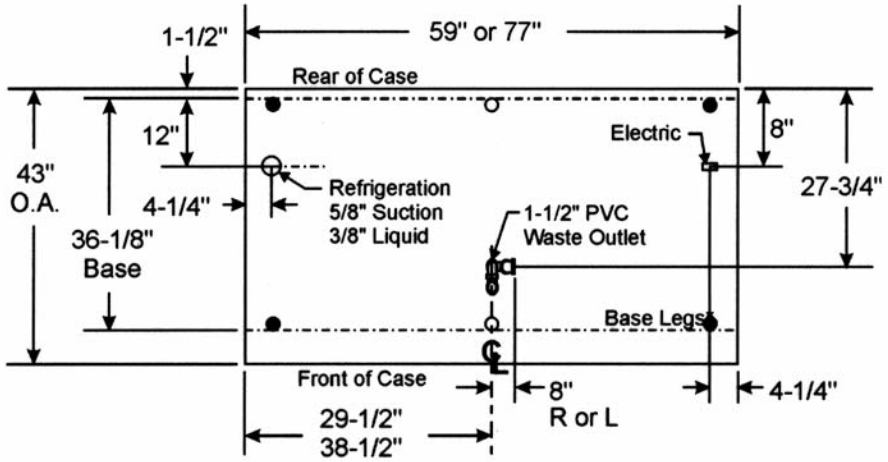
NLBR / NLBN CROSS SECTION



REMOTE & NON-REFRIGERATED FLOOR PLAN

* 59" Cases are Supported by Four - 1.5" Pipe Legs, while 77" Cases use Six - 1.5" Pipe Legs.

Add 1 1/2" for each Standard Patch End or 1" for each Insulated Partition.



NLBS Lift Front Curved Glass Bakery Merchandisers (Self Contained)

Self-Contained Refrigeration & Defrost Data:

CASE USAGE	REFRIGERANT (R22) DESIGN PRESSURE		DISCHARGE AIR		DEFROSTS		THERMOSTAT SETTINGS		REFRIGERATION CHARGE (LBS / CASE)	
	LOW SIDE (PSIG)	HIGH SIDE (PSIG)	TEMPERATURE (°F)	VELOCITY (FPM)	DEFROSTS PER DAY	DURATION TIME (MIN.)	CUT-IN (°F)	CUT-OUT (°F)	NLBS-59	NLBS-77
BAKERY	183	400	+36	154*	6	20	37-39	29	3.0	4.0

* Air velocity measured 1 hour after defrost at the Rear Duct at the back of the Top Shelf.

Electrical Data:

CASE ELECTRICAL CIRCUITS: One 120V Electrical Power Supply is required for Self-Contained cases.
This 120V Power Supply runs a 120V Circuit that supplies all electrical components used in each case.

Self-Contained Electrical Data (120 Volt)

MODEL	SELF-CONTAINED COMPRESSOR			M.C.A.***	M.O.P.****
	UNIT	R.L.A.*	L.R.A.**	AMPS	AMPS
NLBS-59/77	120V 60Hz 1 Ph, 1/4 HP	7.8	29.0	15.0	20.0

* Run Load Amperage (includes the compressor).
** Locked Rotor Amperage.
*** Minimum Circuit Ampacity (includes all electrical components and options; condenser fans, evaporator fans, lights & compressor unit)
**** Maximum Overcurrent Protection.

NOTE: These units do not require a condensate pan heater. The water is dissipated via hot gas loop off the compressor.

Self-Contained Evaporator Fans and Heaters (120 Volt)

MODEL	CASE LENGTH	FANS / CASE	TOTAL STANDARD FANS		TOTAL ECM FANS		ANTI-SWEAT HEATER	
			AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
NLBS	59"	2	0.68	60.4	0.44	22.0	0.50	61.0
NLBS	77"	2	0.68	60.4	0.44	22.0	0.70	82.0

Self-Contained T-8 Lighting with Electronic Ballasts (120 Volt)

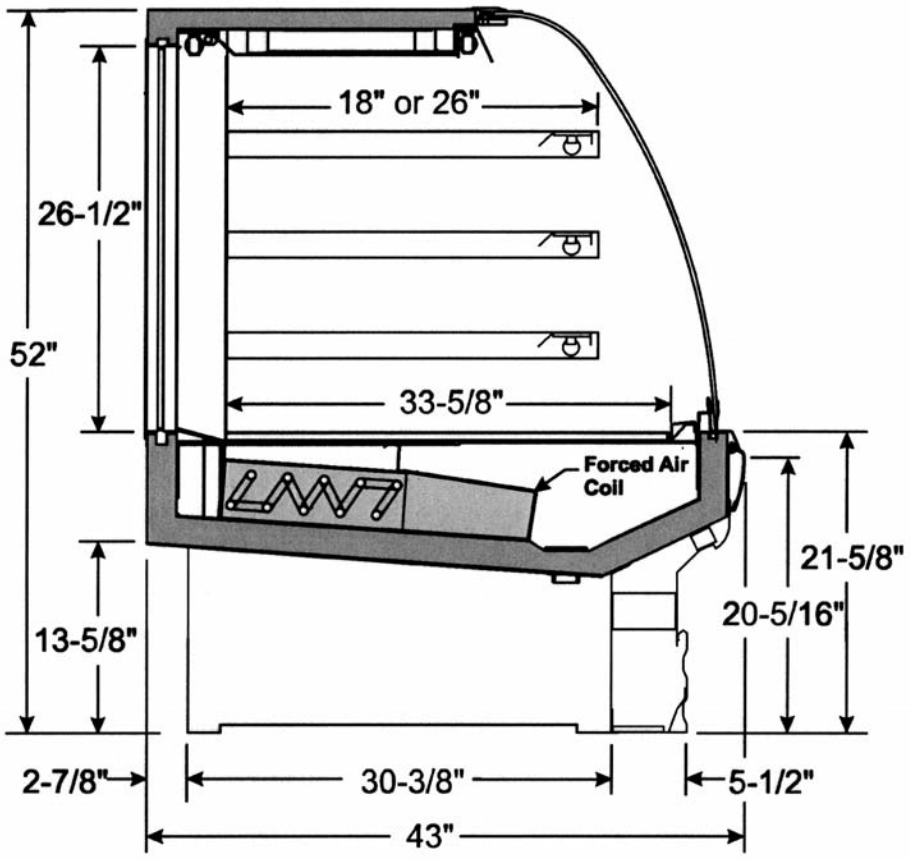
MODEL	CASE LENGTH	CANOPY LIGHTS		SHELF LIGHTS – PER ROW						MAXIMUM LIGHTING *	
		AMPS 2 ROWS	WATTS 2 ROWS	AMPS 1 ROW	AMPS 2 ROWS	AMPS 3 ROWS	WATTS 1 ROW	WATTS 2 ROWS	WATTS 3 ROWS	AMPS (5 ROWS)	WATTS (5 ROWS)
NLBS	59"	0.50	60.0	0.35	0.50	0.70	42.0	60.0	84.0	1.20	144.0
NLBS	77"	0.66	79.2	0.56	0.75	0.94	67.2	90.0	112.8	1.60	192.0

* For cases with 2 rows of canopy lights and 3 rows of shelf lights.

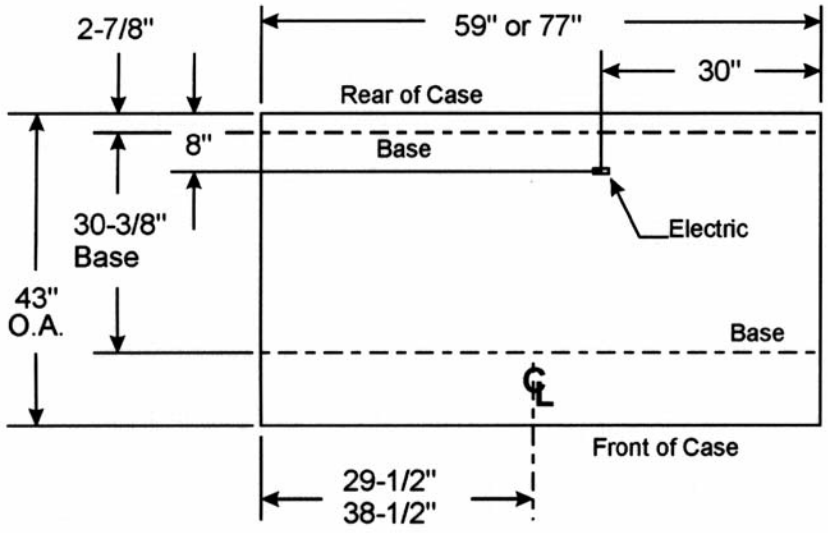
NSF CERTIFIED to meet ANSI/NSF - 7.

CASE BTUH REQUIREMENTS are calculated to produce approximately the indicated entering-air temperature with absolute maximum operating ambient limits of **75°F & 55RH**.

NLBS CROSS SECTION



SELF-CONTAINED FLOOR PLAN



Add 1-1/2" for each Standard Patch End or 1" for each Insulated Partition.

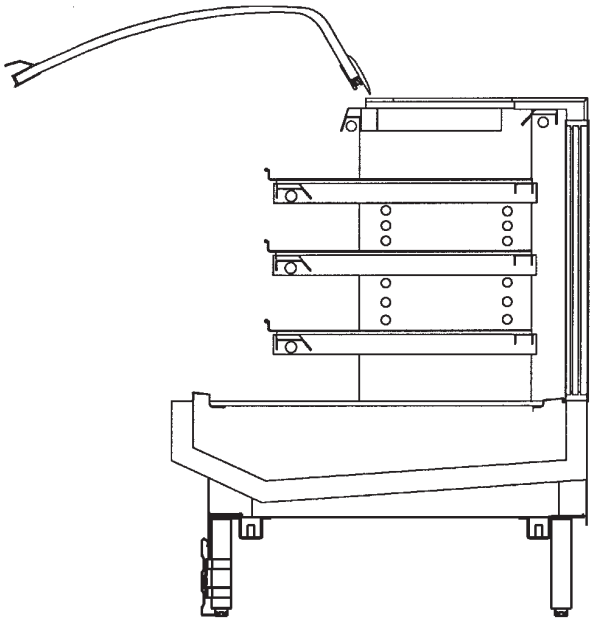
Note: Self-Contained cases do not require a floor drain.

INSTALLATION PROCEDURES

WARNING

The raised front glass projects in front of the case and could cause personal injury to workers, operators and/or customers.

- **Do not remove orange warning tags from front edge of lift glass.**
- **Do not leave lift glass raised and unattended.**
- **Know where the front edge of the raised glass is when working near it.**



This case is designed so the front glass can be raised for cleaning and merchandising only. It is recommended that any cleaning or merchandising be done when the store is closed. If this is not possible, it should be done at a time when customer traffic is low.

The raised glass should not be left unattended and should be lowered whenever leaving the case.

The glass front is marked with orange warning tags to make it noticeable when in the raised position. **Do not remove the orange warning tags.**

Carpentry Procedures

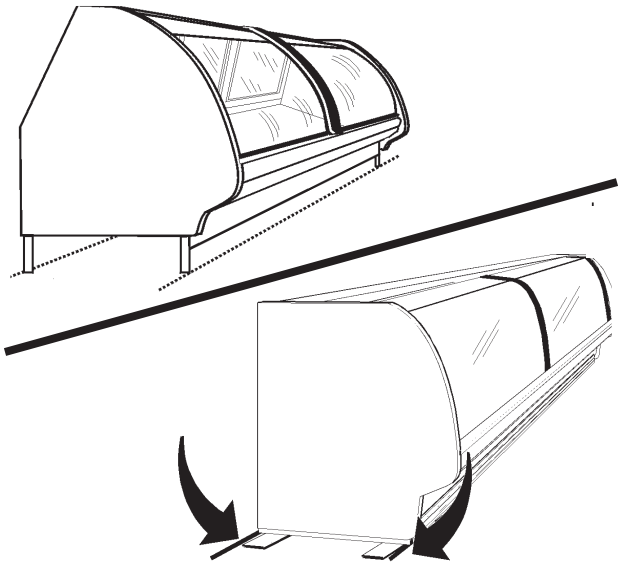
Case Line-Up

Before starting the case line-up, review the store layout floorplans and survey the areas where case line-ups are going to be installed.

WARNING

These cases are very heavy and require two or more people to move and/or position them. Improper handling of these cases could result in personal injury.

1. Snap chalk lines where the front and rear legs or base rails of the case are to be located for the entire line-up.



NOTE

Front and rear edges of legs and/or base rails should always be used to line-up cases. Cases with legs have built-in leveling adjustment capabilities. Cases with base rails use 6" shims that allow adjoining ends of cases to be shimmed together.

2. Cases with legs are shipped on skids. Using a proper lifting device, move case on skid to approximate installation location. Remove case from skid and install legs to base. Make sure all legs are completely threaded into the base to properly secure them. Thread out bottom leg insert, up to 1 1/2", to level the case.

If case has base rails, locate highest point on chalk lines as a reference for determining the number of shims to be placed under the case base rails. Position first case at highest point on the chalk lines and shim case supports as required.

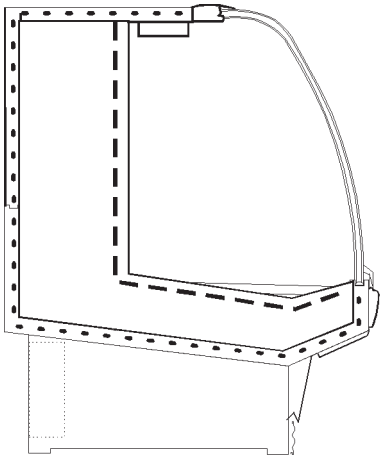
Check leveling across the top of the case and on top of the color band.

CAUTION

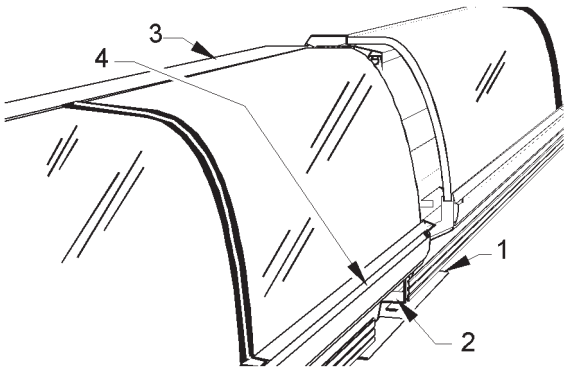
If the base of this case is not sitting evenly on the floor, the case could warp when loaded and possibly break the lift glass.

NOTE

A foam gasket is factory installed on one end of the case. This gasket fits into a groove on the adjoining case when cases are pulled together. Do not depend on the foam gasket alone to make a good seal!



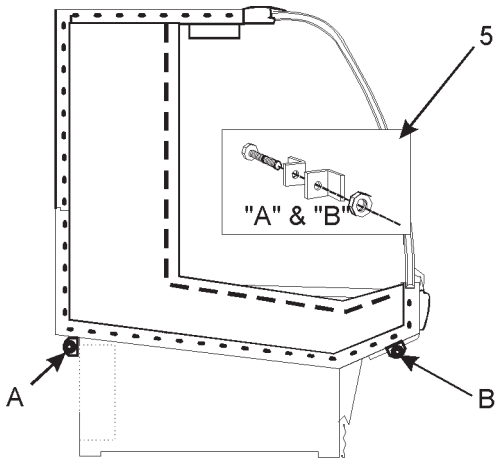
3. Apply two heavy beads of caulking compound from the Filler Kit to the end of case at dotted (. . .) and dashed (- - -) lines. Proper caulking provides good case refrigeration and sanitation.
4. Remove shipping tape from color band backer and bumper backer.



5. Push cases tightly together making sure the pull-ups are aligned.
6. Adjust legs (1) or add shims (1) under base rails, as required, under the adjoining case ends (2). Check leveling at top of the case (3) and on top of the color band (4).

CAUTION

Do not drill or use other holes through the case end for pull-ups. This may deform the case end and could cause joint leaks and/or poor refrigeration.



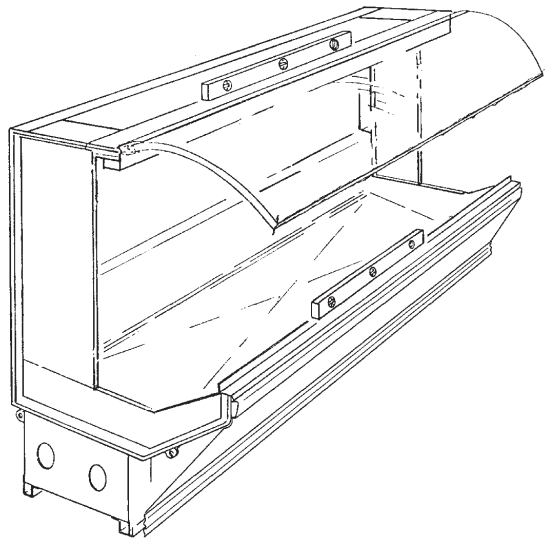
7. Position pull-up bolts and mounting hardware (5) at pull-up locations (A and B). Do not tighten any pull-up hardware until all of it has been installed. Tighten all pull-up hardware equally starting at point A and finishing at point B. **Do not overtighten.**

Lift Front Glass Leveling Instructions

Accurate leveling is critical for the proper operation of the lift glass on this case.

In some instances, setting the case on an apparently level floor can cause the lift glass to fit improperly. If there is any twist in the body, it could cause the lift glass not to fit or work properly.

The emphasis when leveling this case must be on making sure the lift glass works and seals properly.



The case should be leveled across the top, close to the hinge, and on the color band. A 4 foot level is recommended, and **both places should be level!** This will enable the lift glass to fit and work properly.

If the lift glass still doesn't close or line-up properly, adjust legs or add shims to case corners. Adjustment and shimming will ensure proper operation and alignment of the lift glass.

The handle on the lift glass must rest evenly on the color band. Proper lift glass sealing is essential for good product refrigeration.

NOTE

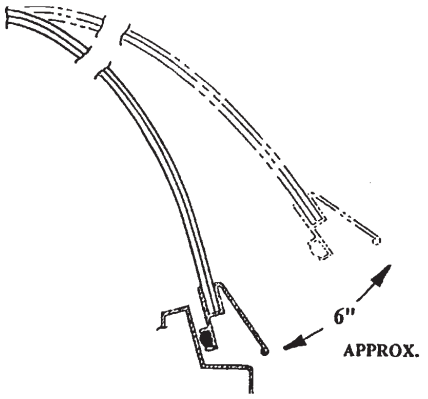
Do not anchor the base to the floor or enclose the case until the lift glass is fitting properly and working correctly.

Pre-priming the hinge gas cylinders:

WARNING

If the front glass is raised before the hinge gas cylinders are pre-primed, the glass could break and/or cause personal injury.

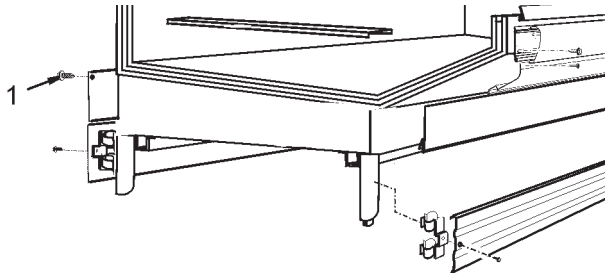
After the case has been installed and leveled, make sure the shipping braces have been removed. Pre-prime the cylinders by gently lifting the front glass approximately 6", then close. Repeat this movement at least 4 or 5 times before fully opening the lift glass.



NOTE

If the glass does not stay in the open position, see "Lift Glass Cylinder Replacement" in this manual.

Rear Rail Cover & Close-off Installation



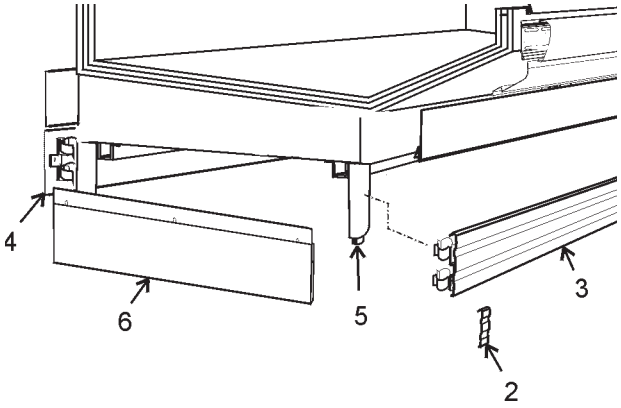
Position rear rail cover (1) over rear raceway opening and secure with screws in every hole.

Bottom and End Close-off Installation

Kickplate, optional rear bottom and end closeoffs have spring clips on their back sides that secure to the pipe legs.

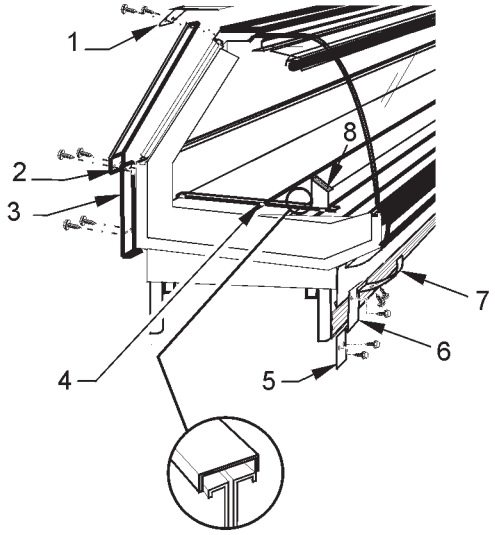
NOTE

Optional rear bottom close-offs do not require joint trim.



1. Before installing kickplates on a multiple case lineup, snap a joint trim (2) over the top and bottom of one end of each kickplate (3).
2. Lineup each kickplate (3) and/or optional rear bottom close-off (4) and push to se-cure the spring clips to the legs (5).
3. Slide joint trims (2) over the case-to-case joints.
4. Position end close-offs (6) over the end of the kickplate (3) and/or optional rear bottom close-off (4) and push until the spring clips secure to the legs (5).

Trim & NSF Thermometer Installation



The joint trim and mounting hardware are shipped loose. Trim includes top joint trim (1), rear upper joint trim (2), rear lower joint trim (3), horizontal joint trim (4), front kick-plate joint trim (5), front lower cladding joint trim (6) and front upper cladding joint trim (7).

Horizontal joint trim covers gaps between the cases. The trim is glued onto the shipping cardboard. It is applied after running beads of caulking on the edges of the cases. Sheet metal screws can be used for additional securing.

Patch end trim is shipped factory installed. If field installation is required, be sure the patch end is pulled up enough to fit snuggly against the sealing tubing on the inside of the case. The patch end must seal tightly against the lift glass wiper to ensure proper operating temperatures.

The NSF case thermometer and bracket assembly (8) is shipped loose with the case.

After removing the thermometer and bracket assembly from the shipping packaging, position bracket over left horizontal joint trim and case-to-case joint where the joint trim is notched out. Make sure the bracket is posi-tioned to the front of the case, flush with the top and left inside edge of the bottom case end welds. Secure thermometer bracket with two screws in the pre-drilled holes.

See "General (UL/NSF) I&S Manual" for bumper and color band installation and alignment.

Refrigeration Procedures

Refrigeration system and superheat instructions can be found in the "General (UL/NSF) I&S Manual".

Self-Contained Circuit (NLBS Only)

NLBS cases are self-contained units. Information pertaining to self-contained units should be obtained directly from TYLER Refrigeration.

Electrical Procedures

Electrical Considerations

CAUTION

Make sure all electrical connections at components and terminal blocks are tight. This prevents burning of electrical terminals and/or premature component failure.

NOTE

The ballast box is located at the lower left rear corner of the case. It houses ballasts and terminal blocks.

Case Fan Circuit (NLBR/NLBS)

This circuit is to be supplied by an uninterrupted, protected 120V circuit. The case fan circuit is not cycled on this case.

Fluorescent Lamp Circuit

NLB(R/N/S) case lighting is supplied by T-8 lights. It is controlled by a light switch in each case. The standard lighting is 2 rows of horizontal canopy lights.

Defrost Information

See "General (UL/NSF) I&S Manual" for operational descriptions for each type of defrost control.

Defrost Control Chart

NLBR/NLBS Defrost Option Settings

Defrost Type	Defrosts Per Day	Defrost Duration (Min)	Term. Temp.
Off Time	6	20	-----

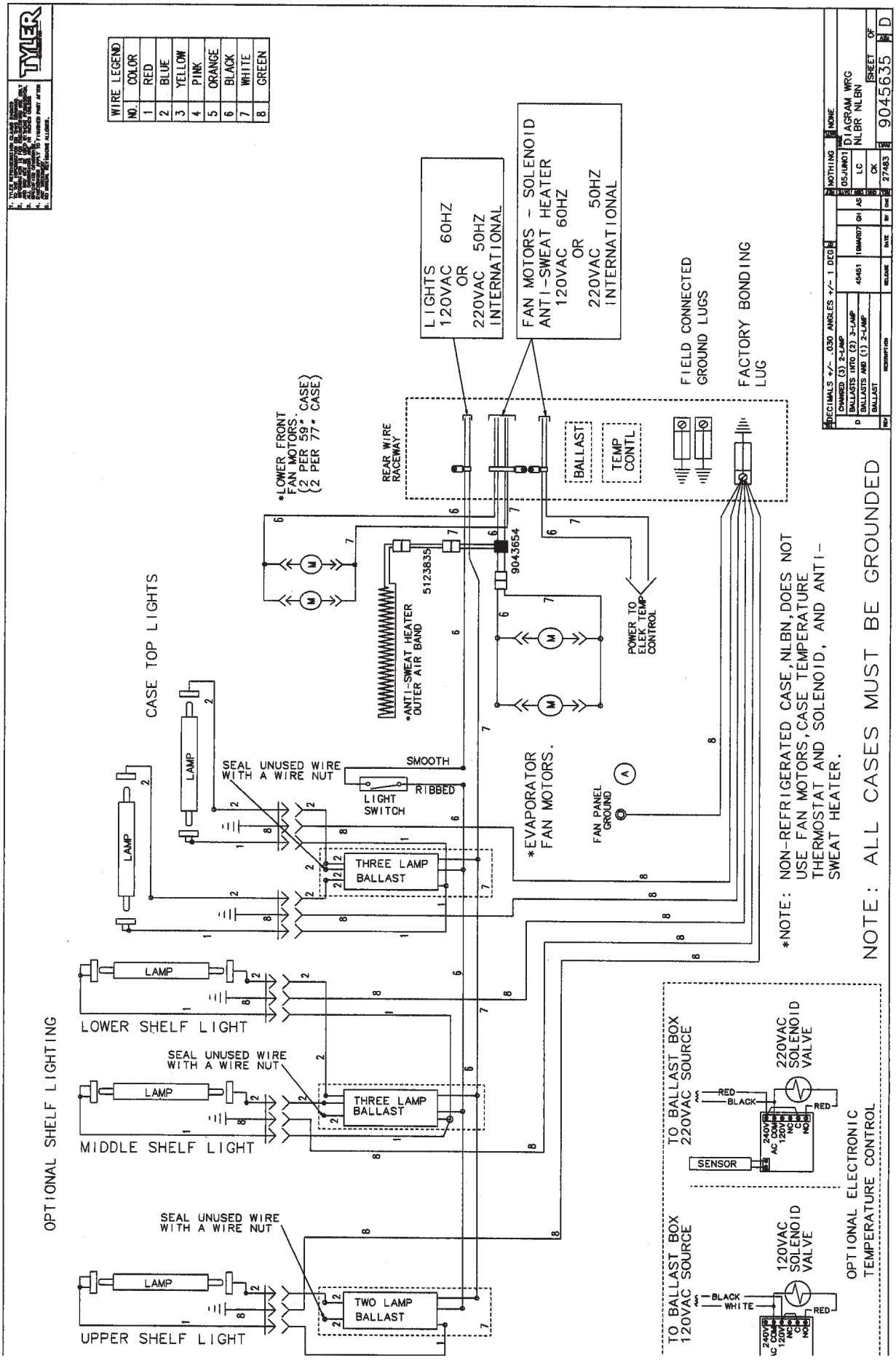
Thermostat bulb is located under the rear duct, 24" from the right end of the evaporator coil.

WIRING DIAGRAMS

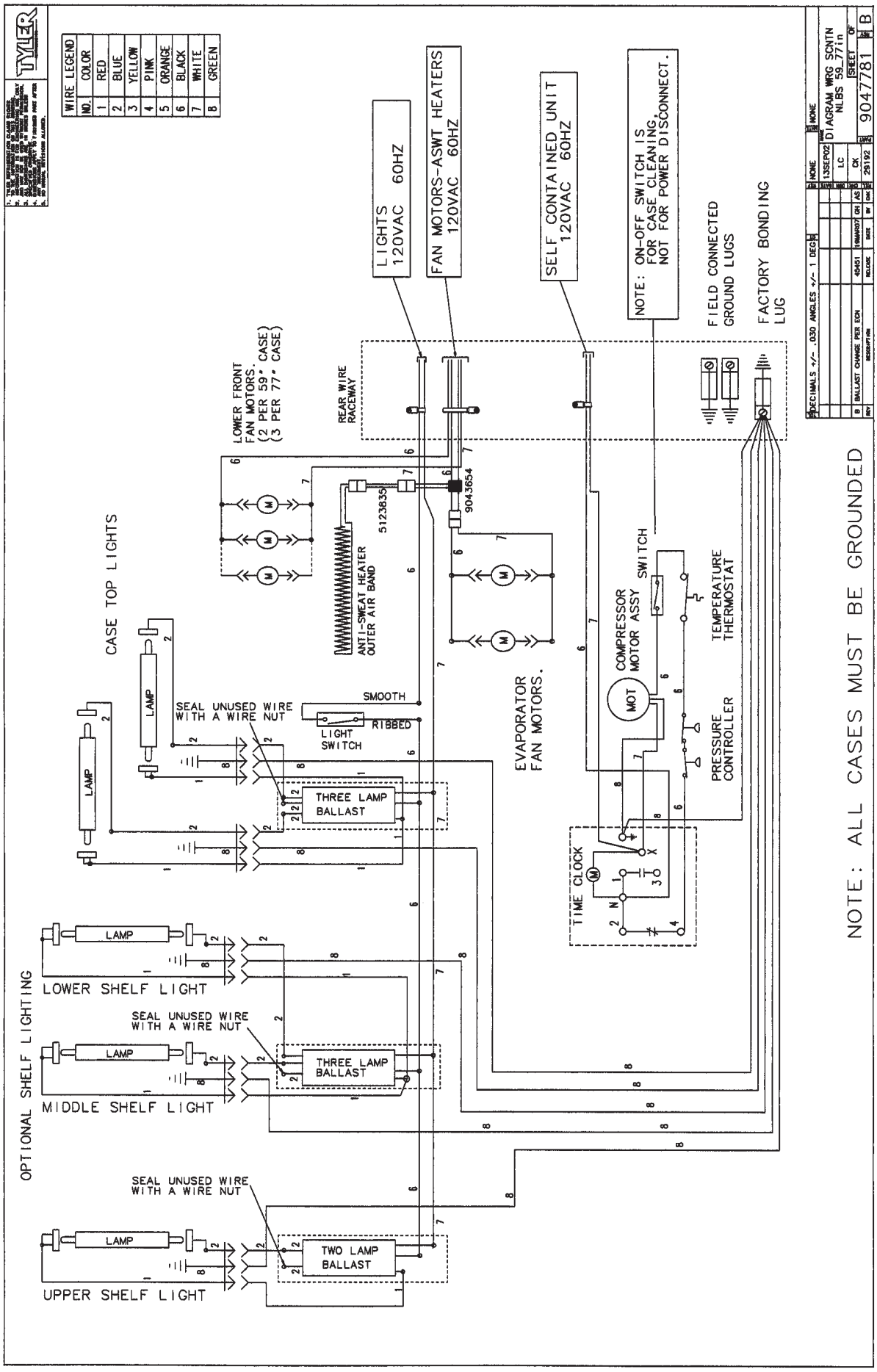
ELECTRICIAN NOTE - OVERCURRENT PROTECTION

120V circuits should be protected by 15 or 20 Amp devices per the requirements noted on the cabinet nameplate or the National Electrical Code, Canadian Electrical Code - Part 1, Section 28. 208V defrost circuits employ No. 12 AWG field wire leads for field connections. On remote cases intended for end to end line-ups, bonding for ground may rely upon the pull-up bolts.

The following pages 13 and 14 show wiring diagrams for case and lighting circuits.


WIRE LEGEND
NO. COLOR
1 RED
2 BLUE
3 YELLOW
4 PINK
5 ORANGE
6 BLACK
7 WHITE
8 GREEN
LIGHTS 120VAC 60HZ OR 220VAC 50HZ INTERNATIONAL
FAN MOTORS - SOLENOID ANTI-SWEAT HEATER 120VAC 60HZ OR 220VAC 50HZ INTERNATIONAL
FIELD CONNECTED GROUND LUGS
FACTORY BONDING LUG
*LOWER FRONT FAN MOTORS. (2 PER 59" CASE) (2 PER 77" CASE)
REAR WIRE RACEWAY
BALLAST
TEMP CONTL
9043654
5123835
*ANTI-SWEAT HEATER OUTER AIR BAND
POWER TO ELEK TEMP CONTROL
CASE TOP LIGHTS
LAMP
SEAL UNUSED WIRE WITH A WIRE NUT
SMOOTH
RIBBED
LIGHT SWITCH
THREE LAMP BALLAST
*EVAPORATOR FAN MOTORS.
FAN PANEL GROUND
*NOTE: NON-REFRIGERATED CASE, NLBN, DOES NOT USE FAN MOTORS, CASE TEMPERATURE THERMOSTAT AND SOLENOID, AND ANTI-SWEAT HEATER.
NOTE: ALL CASES MUST BE GROUNDED
OPTIONAL SHELF LIGHTING
LOWER SHELF LIGHT
MIDDLE SHELF LIGHT
UPPER SHELF LIGHT
TWO LAMP BALLAST
TO BALLAST BOX 220VAC SOURCE
220VAC SOLENOID VALVE
RED
BLACK
SENSOR
TO BALLAST BOX 120VAC SOURCE
120VAC SOLENOID VALVE
BLACK
WHITE
OPTIONAL ELECTRONIC TEMPERATURE CONTROL
DIAGRAM, WRG NLBR NLBN
9045635

NLBS Domestic & Export (50 Hz) Case Circuits (59" & 77" Cases)



CLEANING AND SANITATION

Component Removal and Installation Instructions for Cleaning

Shelves and Shelf Brackets

1. Open the front curved glass by lifting the handle at the bottom.
2. Remove product from shelves.
3. Unplug light cord from socket in mullion covers. Completely insert socket cover in the light socket to protect the receptacle.
4. Remove shelves and shelf brackets from slots in rear uprights.
5. After cleaning, replace in reverse order.

Bottom Trays

1. Open the front curved glass by lifting the handle at the bottom.
2. Remove product from bottom of case.
3. Grasp and lift out each of the bottom trays from the case interior.
4. After cleaning, replace in reverse order.

Front Air Ducts

1. Remove bottom trays, see this page.
2. Lift out front air duct sections.
3. After cleaning, replace in reverse order.

Mullion Covers

1. Open the front curved glass by lifting the handle at the bottom.
2. Remove mounting screws from each mullion cover.

WARNING

Mullion covers with electrical receptacles can be cleaned without removing the electrical receptacles. Do not get moisture on electrical wires when cleaning under this cover. Moisture on wires could cause premature product failure and/or personal injury or death from electrical shock.

3. Carefully remove each mullion cover from the rear uprights.
4. After cleaning, replace and secure mullion covers in reverse order.

Front Lower Cladding

1. Remove front kickplate.
2. Lift and pull out front lower cladding until rear tabs clear holes in front of frame assembly. After rear tabs are clear, pull down on cladding to clear upper tabs from slots in bottom of upper front cladding and remove cladding from case.
3. After cleaning, replace front lower cladding by inserting top tabs, then rear tabs. Make sure all tabs are securely fit in each slot. Replace front kickplate.

Front Upper Cladding

1. Remove color band, bumper and bumper retainer from the case. See page 19.
2. Remove front kickplate and front lower cladding. See above.
3. Remove screws from top and bottom of front upper cladding and remove front upper cladding.
4. After cleaning, replace front upper cladding and remaining front components in the reverse order.

Cleaning Instructions

WARNING

TYLER Refrigeration does not recommend the use of high pressure cleaning equipment on service style cases!! The sealing of front glass and end joints is critical in these cases and high pressure cleaners can penetrate and/or damage these seals. Damaged seals allow water leaks and/or air leaks that can cause poor case refrigeration.

CAUTION

- **When cleaning this case, try not to intro-duce water into the case faster than it can be carried away by the waste outlet.**
- **Liquid chlorine bleach is corrosive to metals. The use of bleach or products containing bleach will damage metal surfaces and void the case warranty.**
- **Sanitize the case with Quaternary Ammonium Solutions (ex: KAYQUAT II, J-512 Sanitizer, SANIQUAT 512, etc...) approved per 21CFR 178.1010, followed by adequate draining and air drying. These solutions may be obtained from Kay Chemical Co., Johnson Wax Professional, Coastwide Laboratories, etc....**
- **Always use a soft cloth or sponge with mild detergent and water to clean the front glass. Never use abrasives or scouring pads to clean glass. They can scratch and/or damage the glass.**

See "General (UL/NSF) I&S Manual" for case cleaning instructions. Stainless steel cleaning is covered in the following chart.

Stainless Steel Cleaning Methods

The cleaning data in the following stainless steel cleaning chart was supplied by AISI. The information was supplied by Prime Metals Division, Alumax Aluminum Corporation.

TYPE OF CLEANING	CLEANING AGENT*	APPLICATION METHOD**	EFFECT ON FINISH
Routine cleaning	Soap, ammonia or detergent and water.	Sponge with cloth, then rinse with clear water and wipe dry.	Satisfactory for use on all finishes.
Smears and fingerprints	Arcal 20, Lac-O-Nu, Lumin Wash O'Cedar Cream Polish, Stainless Shine	Rub with cloth as directed on the package.	Satisfactory for use on all finishes. Provides barrier film
Stubborn spots and stains, baked-on splatter, and other light discolorations	Allchem Concentrated Cleaner	Apply with damp sponge or cloth.	Satisfactory for use on all finishes.
	Samae, Twinkle, or Cameo Copper Cleaner	Rub with damp cloth.	Satisfactory for use on all finishes if rubbing is light.
	Grade FFF Italian pumice, whiting or talc	Rub with damp cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Liquid NuSteel	Rub with dry cloth. Use a small amount of cleaner.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Paste NuSteel or DuBois Temp	Rub with dry cloth. Use a small amount of cleaner.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.

TYPE OF CLEANING	CLEANING AGENT*	APPLICATION METHOD**	EFFECT ON FINISH
	Cooper's Stainless Steel Cleaner, Revere Stainless Steel Cleaner	Apply with damp sponge or. cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Grade F Italian pumice, Steel Bright, Lumin Cleaner, Zud or Restoro	Rub with a damp cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Penny-Brite or Copper-Brite	Rub with a dry cloth. Use a small amount of cleaner.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
Heat tint or heavy discoloration	Penny-Brite or Copper-Brite	Rub with a dry cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Paste NuSteel or DuBois Temp	Rub with dry cloth. Use a small amount of cleaner.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Revere Stainless Steel Cleaner	Apply with a damp sponge or cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Allen Polish, Steel Bright, Wyandotte, Bab-O or Zud	Rub with a damp cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
Burnt-on foods and grease, fatty acids, milkstone (where swabbing or rubbing is not practical)	Easy-Off, De-Grease-It, 4-6% hot solution of such agents as trisodium tripolyphospate, or 5-15% caustic soda solution	Apply generous coating. Allow to stand for 10-15 min. Repeated application may be necessary.	Excellent removal, satisfactory for use on all finishes.
Tenacious deposits, rusty discolorations, industrial atmospheric stains	Oakite No. 33, Dilac, Texo 12, Texo N.Y., Flash-Klenz, Caddy Cleaner, Turco Scale 4368 or Permag 57.	Swab and soak with clean cloth. Let stand 15 minutes or more according to directions on package. Rinse and dry.	Satisfactory for use on all finishes.
Hard water spots and scale	Vinegar	Swab or wipe with a cloth. Rinse with water and dry.	Satisfactory for use on all finishes.
	5% oxalic acid, 5% sulamic acid, 5-10% phospheric acid, or Dilac, Oakite No. 33, Texo 12 or Texo N.Y.	Swab or soak with a cloth. Let stand 10-15 minutes. Always follow with neutralizer rinse, and dry.	Satisfactory for use on all finshes. Effective on tenacious deposites or where scale has built up.
Grease and oil	Organic solvents such as carbon tetrachloride, trichlorethylene, acetone, kerosene, gasoline, benzene, alcohol and chlorethane n.u.	Rub with a cloth. Organic solvents may be flammable and/or toxic. **Observe all precautions against fire. Do not smoke while vapors are present. Be sure area is well ventilated.**	Satisfactory for use on all finishes.

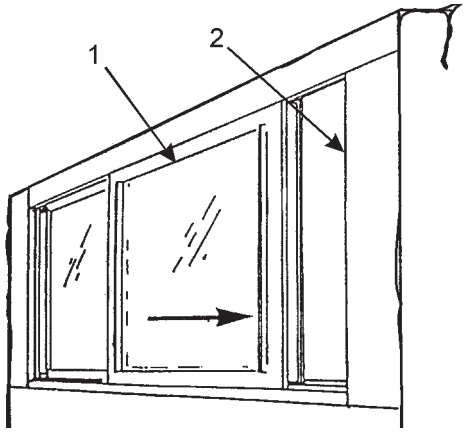
*** Use of proprietary names is intended only to indicate a type of cleaner, and does not constitute an endorsement, nor is omission of any proprietary cleanser to imply its inadequacy. It should be emphasized that all products should be used in strict accordance with instructions on package.**

**** In all applications a sponge or fibrous brush or pad are recommended. DO NOT use ordinary steel wool, steel brushes, chlorine bleach or products containing bleach for cleaning or sanitizing stainless steel.**

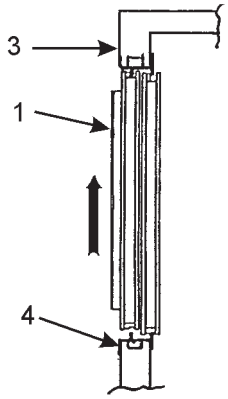
GENERAL INFORMATION

Rear Sliding Door Removal and Installation

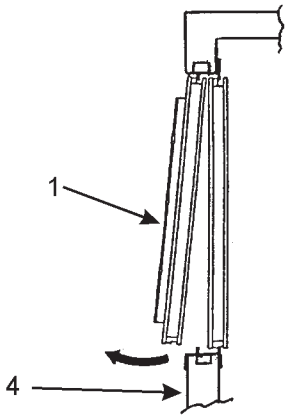
The sliding doors come installed from the factory in the door frame. These doors are removable for cleaning and to aid in case maintenance. **NOTE: DO NOT FULLY IMMERSE DOORS WHEN CLEANING**. The inner and outer doors are marked with labels from the factory. If the doors are not labeled, the inner door can be identified as having the limiter stops on it.



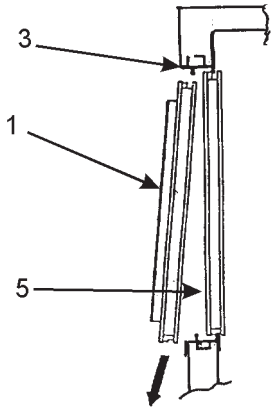
1. Remove the outer door (1) by sliding it to the right end of the door frame (2) (within an inch of being closed).



2. Firmly grasp both sides of the outer door (1) and lift into the upper track (3) until it clears the lower track (4).



3. Tilt out the bottom of the outer door (1) so it can clear the lower track (4).



4. Lower the outer door (1) out of the upper track (3) to remove it from the case.
5. Repeat steps 1 thru 4 to remove the inner door (5).
6. Reverse the above steps to replace the inner and outer doors (5 and 1).

SERVICE INSTRUCTIONS

Troubleshooting Self-Contained Units (NLBS Only)

WARNING

Never work on electrically powered equipment while it is energized! Electrical shock could cause personal injury and/or death.

TROUBLE	COMMON CAUSE	REMEDY
1. Unit will not run	Blown fuse	Replace fuse.
	Low voltage	Check outlet with voltmeter. Voltage should be 115V or 220V (±10%).
	Inoperative motor or temperature control	Check connections.
2. Refrigerated section is too warm	Shelves overloaded; blocked air flow	Make sure items do not block the air flow.
	Thermostat set incorrectly	Check setting.
	Pressure control set incorrectly	Check setting.
	Case fans not operating	Check terminal block connections.
3. Refrigerated section too cold	Thermostat set incorrectly	Check setting.
	Pressure control set incorrectly	Check setting.
4. Unit runs all the time	Inadequate air circulation	Relocate cabinet or remove obstruction. Check installation requirements.
	Room temperature too warm	Ventilate room appropriately.
	Thermostat set incorrectly	Reset thermostat.
	Refrigerant charge low	Have unit serviced by a qualified service technician.
5. Noisy operation	Loose baffles	Tighten or brace baffles.
	Tubing contacting cabinet or other tubing	Move tubing.
	Cabinet not level	Level cabinet.
6. Frost or ice on evaporator coil	Defrost clock doesn't work	Check electrical conections. Have unit serviced by a qualified service technician.
7. Water dripping from case drain	Condensate drain clogged	Clear drain.
	Dissipator not functioning	Check electrical supply. Check float assembly.

Light Servicing

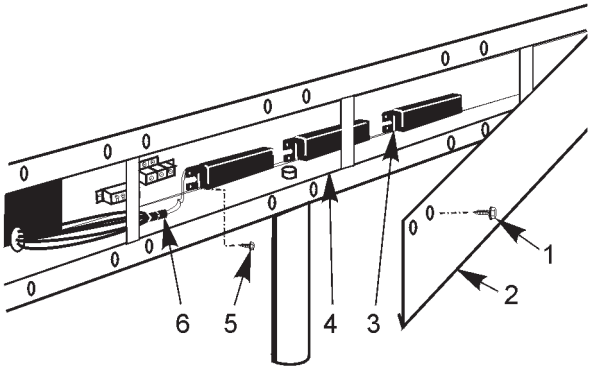
See "General (UL/NSF) I&S Manual" for lamp, fan blade and motor (NLBR/NLBS only) replacement instructions.

Ballast and Lighting Locations

All light ballasts are located in the rear raceway channel behind the rear rail cover.

In order to retain safety approval with Underwriters Laboratory and the Canadian Standards Association, the mounting of electrical components and interconnecting wires must not deviate from the following instructions. Only qualified personnel are authorized to install the accessory items. TYLER Refrigeration recommends you order all component parts from its Service Parts Department.

Ballast Replacement



1. Remove screws (1) and rear rail cover (2) from rear of case.

NOTE

If tappit screws are not available, a starwasher should be used between the ballast and the heads of the screws.

2. Install required number of ballasts (3) in rear electrical raceway (4) with two screws (5) each.
3. Identify and connect required wiring harnesses (upper, lower, etc...) to the ballast connectors (6).
4. Replace rear rail cover (2) and secure with screws (1).

Color Band, Anti-Sweat, Bumper and Bumper Retainer Replacement

WARNING

Shut off or disconnect power supply to case before changing an anti-sweat. Electrical power from wire ends could damage other components and/or cause personal injury or death.

1. Open the lift glass and remove screws from color band.
2. Carefully lift color band until the anti-sweat connector can be disconnected. Remove color band and color band backers.
3. Inspect anti-sweat and replace if faulty.
4. Push in on center of bumper while pulling out on bottom of bumper. Release bottom of bumper from full length of bumper retainer. Firmly pull out top of bumper to snap it free from bumper retainer.
5. Remove bumper backers from both ends of bumper.
6. After marking position of bumper retainer on case, remove mounting screws and bumper retainer from case.

NOTE

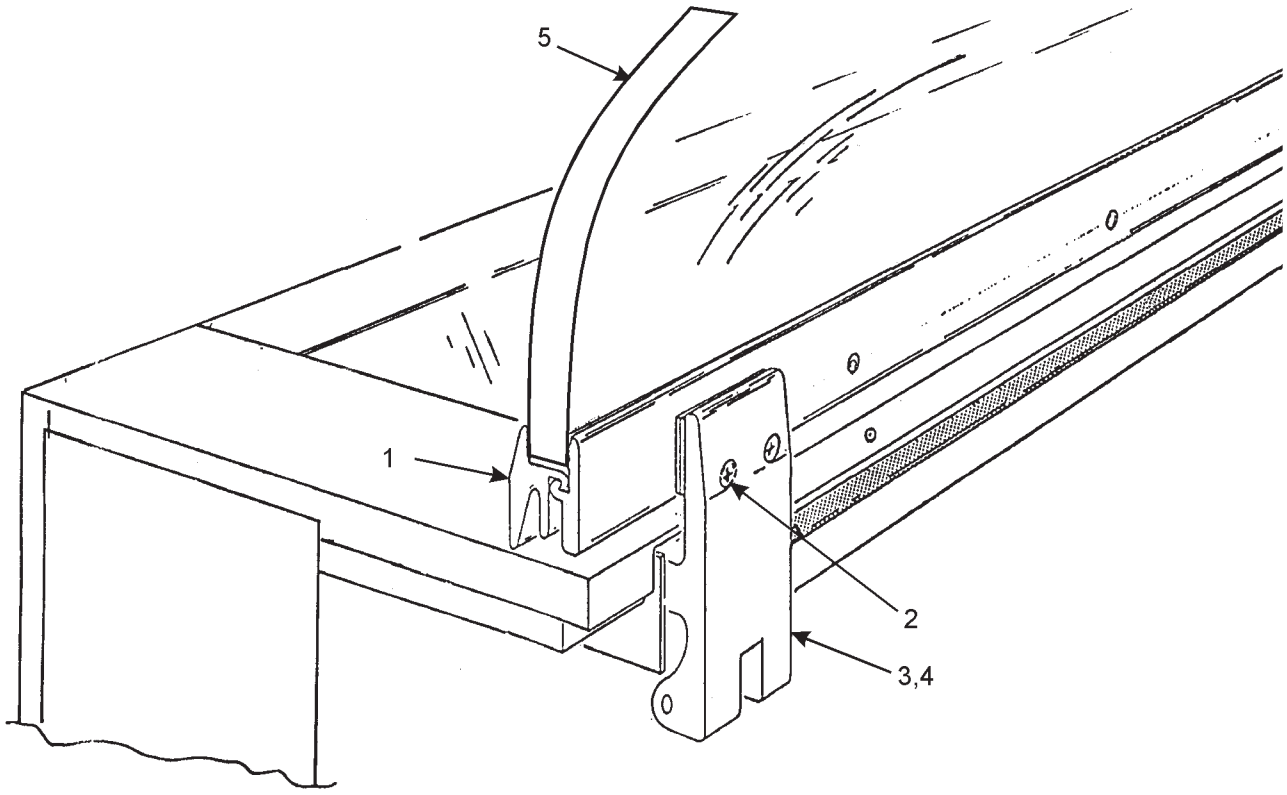
All backers must be installed in same position as removed to assure proper fit and alignment during installation.

7. Install bumper retainer on case with mounting screws in same position as removed.
8. Position bumper backers in ends of bumper sections still installed.
9. Replace the bumper on bumper retainer.
10. Position color band backers in ends of color band sections still installed.
11. Reconnect anti-sweat connector and install color band on bottom glass support and secure with screws.
12. Restore electrical power to case.

Lift Glass Replacement

WARNING

Wear safety glasses and gloves and use at least two people when replacing glass. Glass is heavy and weight distribution is uneven. Mishandling of glass could cause breakage and/or personal injury.



1. Make sure the lift glass is in the fully open position or the glass frame clamp (1) is in the up position.
2. While holding glass, remove four screws (2) from hinges (3), shims (4) and glass frame clamp (1).
3. Replace broken lift glass assembly (5) with new lift glass assembly (5). Make sure to replace the shims that were removed during disassembly.
4. Install four screw (2) in hinges (3) and glass frame clamp (1). Tighten each hinge screw (2) to 60 lb-in. of torque. **Do not overtighten.**
5. Check torque of glass frame clamp setscrews. It should be pre-torqued to 48 lb-in. **Do not overtighten.**

NOTE

Lift glass must seal tightly to ensure proper operating temperatures! Replacement seals are available through TYLER Service Parts.

6. After the lift glass has been replaced, install the end seal trim following the instructions on page 23. Close the lift glass. Make sure the lift glass seals tightly against the color band.

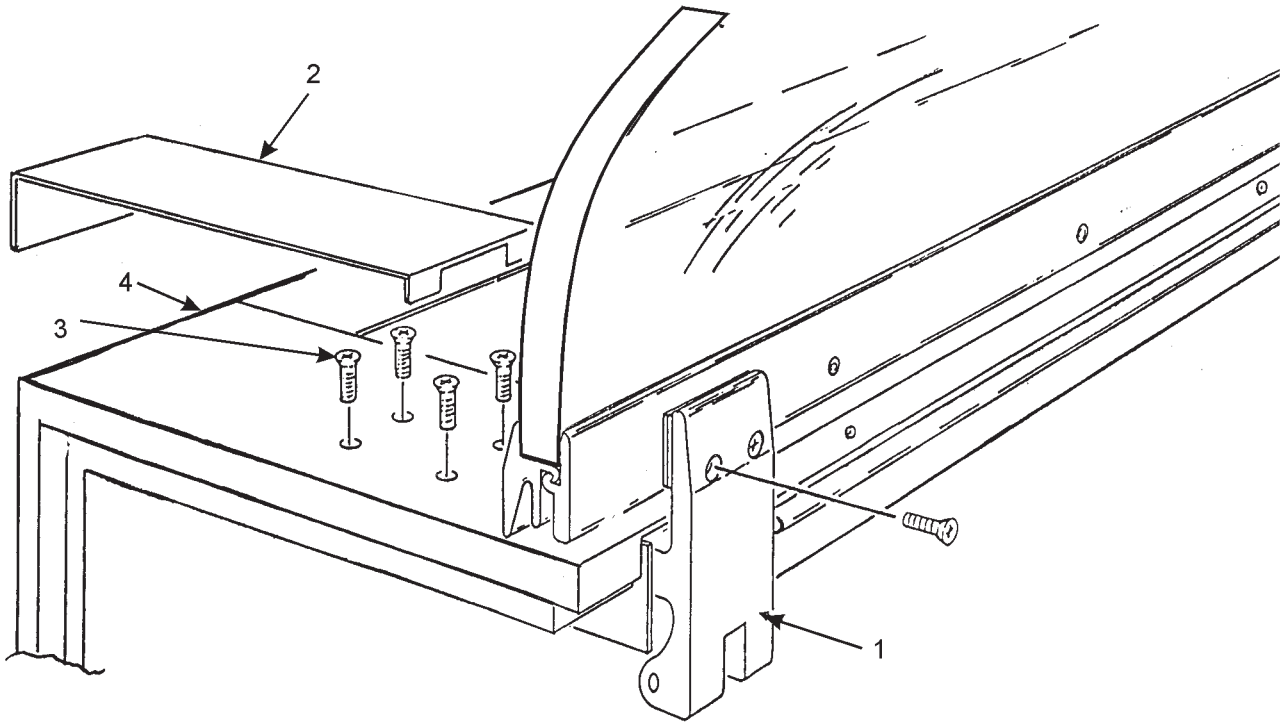
Lift Glass Cylinder Replacement

NOTE

All product should be removed from the case and the surrounding area before making this repair.

WARNING

Failed cylinders will not support the glass sufficiently to allow repeated opening and closing. Do not attempt to open the glass until the defective cylinder can be replaced. Failure to comply could cause glass breakage and/or personal injury.

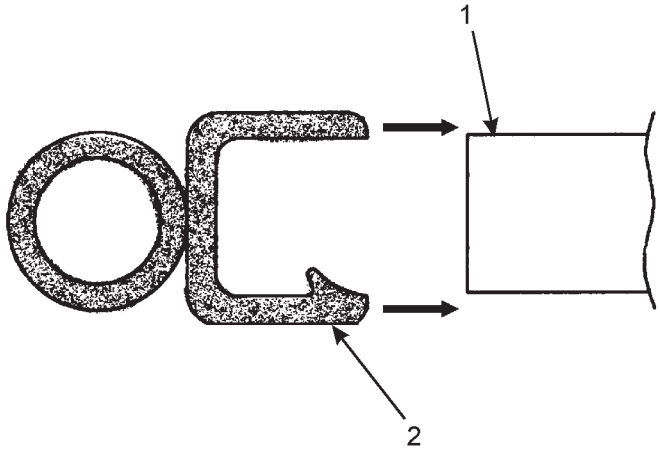


1. Remove the lift glass by following the instructions on the previous page.
2. Mark the position of the pivot hinge assembly (1) on the top interior of the case.
3. Drill out rivets and remove the stainless steel top cover (2).
4. Remove four screws (3) from top of case (4) and remove the pivot hinge assembly (1) from the inside top of the case (4).
5. Remove and replace the defective cylinder in the pivot hinge assembly (1).
6. Position pivot hinge assembly (1) inside top of case (4) as marked during removal and secure with four screws (3). After rechecking the hinge positioning, tighten the four screws (3) to 55 lb-in. of torque.
7. Install stainless steel top cover (2) and secure with rivets.
8. Install the lift glass by following the instructions on the previous page.

Lift Glass End Seal Replacement

The end seal trim for the curved glass edge is designed to slide on the glass without the need for glue or other adhesives. Looking at the cross section, you will notice a slight protrusion on the underside of the trim. This protrusion helps prevent the seal trim from coming off the glass once the trim piece has been properly installed.

1. Lift the glass to the fully opened position.
2. Thoroughly clean the edge of the glass (1) and the end seal trim (2) by wiping with alcohol. Dry both surfaces.
3. Starting at the top edge of the glass (1), push on the end seal trim (2) with the protrusion lip against the inside glass surface.
4. Cut off any excess end seal trim that extends beyond the bottom edge of the glass. Close the lift glass.



PARTS INFORMATION

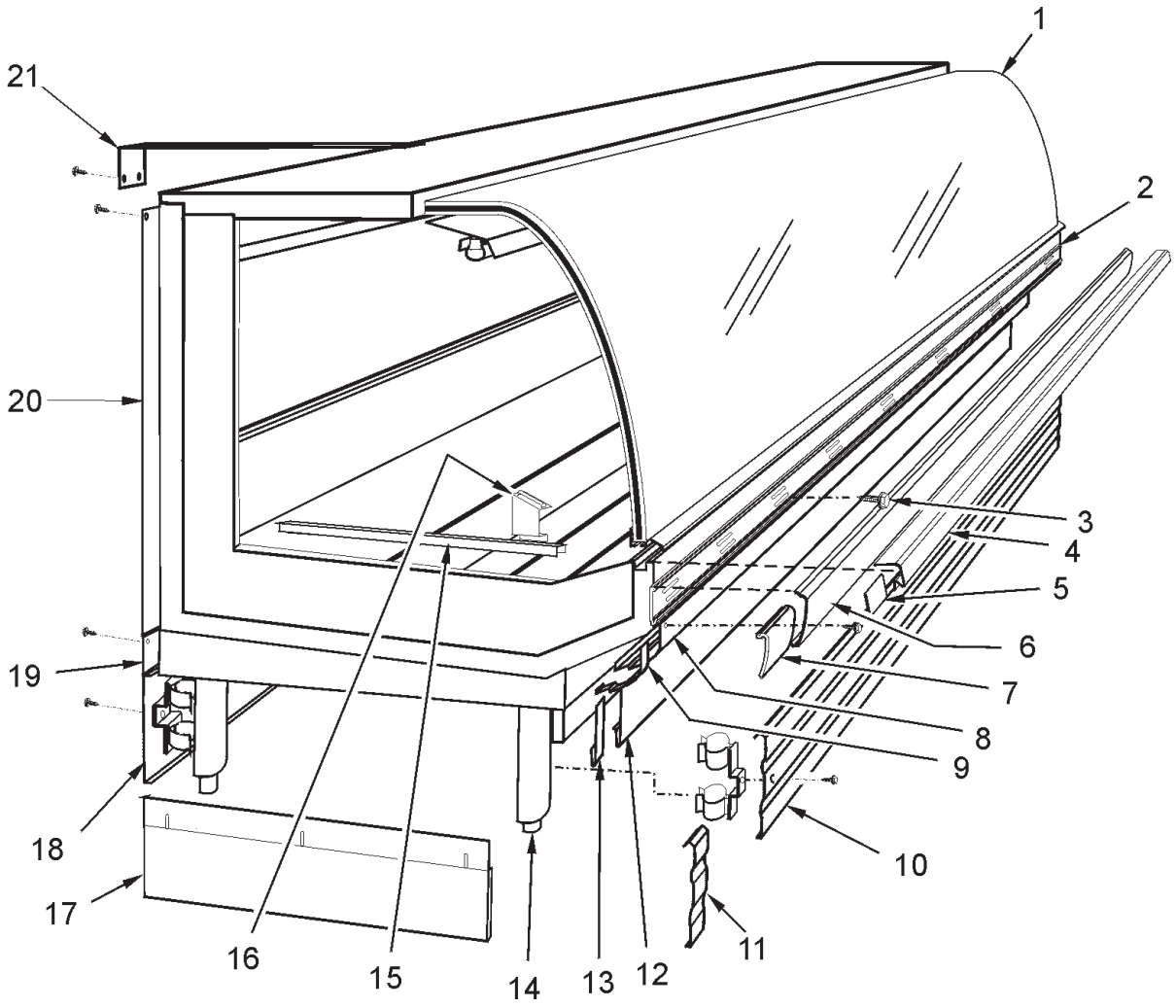
Operational Parts List

Case Usage	**Domestic**	
Electrical Circuit	115 Volt 60 Hertz	
Case Size	59”	77”
Primary Fan Motor (NLBR/NLBS)	5125532 5 Watt	5125532 5 Watt
Opt. Export Primary Fan Motor (NLBR/NLBN)(220 Volt 50 Hertz)	5126572 5 Watt	5126572 5 Watt
Primary Fan Motor Brackets (NLBR/NLBS)	5962269	5962269
Primary Fan Bracket Plate (NLBR/NLBS)	9041077	9041077
Primary Fan Blades (7” 15° 5B)(NLBR/NLBS)	5223891	5223891
Vent Fan Motor (NLBR/NLBS)	5120747	5120747
Vent Fan Blades (3” 4B)(NLBR/NLBS)	5120748	5120748
Opt. ECM Fan Motor (NLBR/NLBS)	9025002 8 Watt	9025002 8 Watt
Opt. ECM Fan Motor Brackets (NLBR/NLBS)	9025005	9025005
Opt. ECM Fan Blades (7” 15° 5B)(NLBR/NLBS)	5223891	5223891
Lighting Ballast (2-lamp)	5991029	5991029
(3-lamp)	5991030	5991030
T-8 Lampholder (canopy & shelf)	9041897	9041897
Anti-Sweat Heater Wire (NLBR/NLBS)	5217424	5228677
Thermostat (NLBR/NLBS)	5940375	5940375
NSF Product Thermometer	5967100	5967100

For information on operational parts not listed above contact the TYLER Service Parts Department.

Cladding and Trim Parts List

Item	Description	NLBR/NLBN 59”	NLBR/NLBN 77”
1	Seal (250’)	5233454	5233454
2	Bumper Retainer	9025048	9025055
3	Screw, Shoulder	9025833 (9)	9025833 (9)
4	Color Band, Ptd.	9026400	9026401
5	Color Band Backer, Ptd.	9026432	9026432
6	Bumper	---- color by order ----	
7	Bumper Backer	---- color by order ----	
8	Upper Front Cladding, Ptd.	9045734	9045735
	Screw	5183536 (6)	5183536 (8)
9	Upper Front Cladding Joint Trim, Ptd.	9043829	9043829
	Screw	9024814 (4)	9024814 (4)
10	Front Kickplate Assembly, Std.	9045749	9045751
	Front Kickplate Assembly, Opt.	9046304	9046305
11	Kickplate Joint Trim	9043816	9043816
	Screw	5619204 (4)	5619204 (4)
12	Lower Front Cladding, Std. Ptd.	9045736	9045737
	Lower Front Cladding, Opt. Ptd.	9046310	9046311
13	Std. Lower Front Cladding Joint Trim	9043893	9043893
	Opt. Lower Front Cladding Joint Trim	9043891	9043891
	Screw	9024814 (4)	9024814 (4)
14	Pipe Leg, Std. (2” X 9.75”)	9024894 (4)	9024894 (6)
	Pipe Leg, Opt. (2” X 6.00”)	9024893 (4)	9024893 (6)
15	Horizontal End Trim	5211585	5211585
16	NSF Product Thermometer	5967100	5967100
17	LH Base End Close-off, Ptd.	9043066	9043066
	RH Base End Close-off, Ptd.	9024986	9024986
	Opt. Base End Close-off, Ptd.	9024980	9024980
18	Opt. Rear Base Close-off, (52” Case)	9045753	9045755
	Opt Rear Base Close-off, (48” Case)	9046306	9046308
19	Rear Rail Cover, Ptd.	9045677	9045679
20	Upper Rear Joint Trim, Ptd.	9046388	9046388
	Screw	5619204 (4)	5619204 (4)
21	Top Joint Trim, BR/SS	9022587	9022587
	Screw	5619204 (2)	5619204 (2)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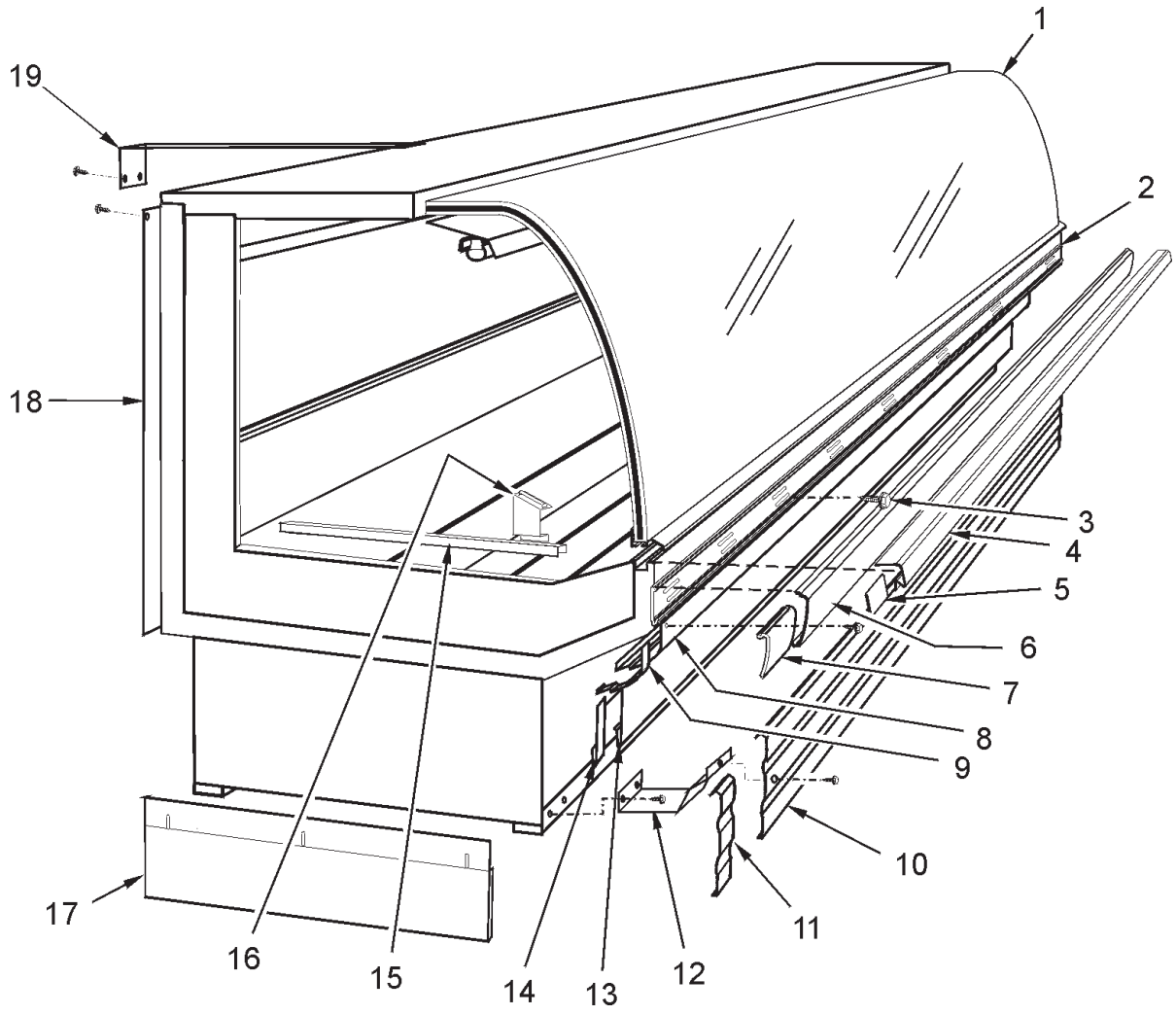
Item	Description	NLBS	
		59”	77”
1	Seal (250’)	5233454	5233454
2	Bumper Retainer	9025048	9025055
3	Screw, Shoulder	9025833 (9)	9025833 (9)
4	Color Band, Ptd.	9026400	9026401
5	Color Band Backer, Ptd.	9026432	9026432
6	Bumper	---- color by order ----	
7	Bumper Backer	---- color by order ----	
8	Upper Front Cladding, Ptd.	9045734	9045735
	Screw	5183536 (6)	5183536 (8)
9	Upper Front Cladding Joint Trim, Ptd.	9043829	9043829
	Screw	9024814 (4)	9024814 (4)
10	Front Kickplate Assembly, Ptd.	9047803	9047804
11	Kickplate Joint Trim	9043816	9043816
	Screw	5619204 (4)	5619204 (4)
12	Lower Front Cladding, Ptd.	9045736	9045737
13	Lower Front Cladding Joint Trim	9043893	9043893
	Screw	9024814 (4)	9024814 (4)
14	Kickplate Support	9047799 (2)	9047799 (3)
	Screw	5183536 (6)	5183536 (9)
15	Horizontal End Trim	5211585	5211585
16	NSF Product Thermometer	5967100	5967100
17	LH Base End Close-off, Ptd.	9047814	9047814
	RH Base End Close-off, Ptd.	9047813	9047813
	Screw	5100217 (3)	5100217 (3)
18	Upper Rear Joint Trim, Ptd.	9046388	9046388
	Screw	5619204 (4)	5619204 (4)
19	Top Joint Trim, BR/SS	9022587	9022587
	Screw	5619204 (2)	5619204 (2)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