Howard-McCray

Installation and Operating Instruction for

90-040
CLOSED SERVICE REFRIGERATORS

READ THIS PAGE FIRST

1. Howard-McCray would like to thank you for purchasing one of our units. PLEASE READ THIS MANUAL CAREFULLY BEFORE PROCEEDING WITH THE INSTALLATION OR OPERATING OF THIS UNIT.
2. Store Environment – these display cabinets are made to operate at 75°F and 55% relative humidity. Temperature and/or humidity greater than the factory recommendations will hinder the performance of this cabinet.
3. Cabinet Set-Up – A qualified refrigeration mechanic should set-up this cabinet. The Electronic Digital Controller is set to maintain proper cabinet temperature and require defrost once a day. These settings may require minor adjustment to meet customer temperature requirements and are solely the resposibility of the customer. Adjustments are not covered by factory warranties. Failure to have this unit installed by a qualified refrigeration mechanic may VOID all the warranties on this cabinets.
4. Proper Loading – Only cooled foods should be placed in the cabinet.
5. When loading the cabinet with ice, NEVER place ICE against front glass or walls of the cabinet. ice must remain within the Ice Pan.
6. Location – Because of the large glass area, closed service cases must not be located in the direct rays of the sun or near radiant heat sources.
7. Never spray water into the cabinet. This will cause damage to the seals and the evaporative drain pan to over flow.
8. If additional assistance is required, please call us at 1-800-344-8222.

90-040 170725
2020

Howard-McCray

Installation and Operating Instruction for

CLOSED SERVICE REFRIGERATORS

IMPORTANT INSTRUCTIONS

Please read carefully before attemping to install or service case

Keep this Book for Future Reference

90-040

12/2020

Table of Contents

Installation and Operating Instuctions for McCray Gravity Coil Closed Service Cases

The following instructions are for the benefit of the new owner and the installing contractor. They should be studied carefully before attempting to install or service the cabinet. This manual is the property of the owner and should remain in his possession.

RECEIVING AND INSPECTION PROCEDURE:

1) All cabinets have been carefully operation tested and inspected before crating and are determined to be in good operating condition before leaving our factory.

2) Upon arrival of the cabinet, the crate should be examined thoroughly for any damage that may have occurred in transit. In the event that damage is discovered, it should be noted on the delivery ticket or Bill of Lading and signed to that effect. An immediate claim should then be filed against the carrier giving the description and amount of damage.

3) After the crate has been removed, the cabinet should be examined carefully for any damage. If there is any concealed damage, the carrier should be notified at once. Make request in writing to carrier for inspection within 15 days, and retain all packaging. The carrier will supply inspection report and required claim forms.

4) Our Company can assume no responsibility for filing freight claims as the cabinet was in good condition on a clear Bill of Lading, F.O.B. Philadelphia. However, the factory will assist, if required.

5) Shortages-Check your shipment for any shortages possible of material. If one exists and is found to be responsibility of Howard-McCray. If a shortage exists and it involves the carrier, notify the carrier immediately and request an inspection. Howard McCray will acknowledge shortages within ten days from receipt of acknowledgement.

GENERAL DESIGN

These cabinets are designed for the display of Delicatessen, Fish, Meat and Poultry products. It is very important that the recommended control Settings for refrigeration be followed, see page three. On Remote models it is also significant that the condensing unit be matched as closely as possible to the requirements listed in this manual. Oversizing the condensing unit will result in lower than necessary suction pressures causing very low evaporator temperatures and dehydration of the product. High humidity and close product temperature control is extremely important in this type of cabinet.

INSTALLATION AND LOCATION

Because of the large glass area, closed service cases must not be located in the direct rays of the sun or near any radiant heat sources. It is of vital importance that all cabinets be leveled, from front to back as well as from end to end. This will assure proper operation of the evaporator, proper alignment from case to case and adequate drainage of defrost water.

ELECTRICAL SERVICE CONNECTION

The electrical connections are to be made in junction boxes located at the rear or front of the cabinet. There is one box for the condensing unit & lights and another box for the general purpose receptacle. The incoming voltage must be maintained to within 5% of the voltage shown on the name plate. Howard McCray will not accept responsibility for the performance of the cabinet or malfunction of any component due to a lower voltage supply than that indicated on the serial rating plate. Use separate electrical supply lines connected to a fuse block or circuit breaker of proper capacity.

WASTE OUTLET

On models 34E and 35 there is a 1 inch PVC connection at the center rear of the cabinet. The drain connection must be trapped and conform to local plumbing regulations. Common practice is to maintain at least 1/4 inch drop per foot of run.

On models 32E and 40E there is a 1 inch PVC connection at the center underside of the cabinet. The drain connection must be trapped and conform to local plumbing regulations. Common practice is to maintain at least 1/4 inch drop per foot of run.

REFRIGERATION LINES - REMOTE MODELS

Tubing for field connections are located at the cabinet left hand end, viewing from front of cabinet.

THERMOSTATIC EXPANSION VALVE

On models 32E and 40E, the expansion valve is located at the left hand end of the top evaporator coil. On models 34E and 35, it is connected to the left end of the top evaporator but is located at the left end of the bottom evaporator. The valve is adjusted so that the coil is fully flooded, this will result in a superheat setting of approximately 4°F.

ELECTRONIC DIGITAL CONTROLLER TEMPERATURE & DEFROST

This cooler employs a Electronic Controller which controls the cabinets temperature and defrost period.

Temperature Controller

The control is programed to cycle based on cabinet air temperature between 40F to 36F at the Drain baffle assembly. The sensor for the control is located in the rear of the cabinet on the left side attached to the drain baffle. The controller is located in the machine compartment next to electrical junction boxes. The display on the controller is indicating the temperature at the drain baffle sensor.

Warning

This control has been calibrated and set at the factory to maintain the proper temperature. Before attempting to change this setting, the cabinet should be put into operation for a minimum of 16 hours.

If needed to change the setting of the controller follow these steps:

1. Push the **[SET]** key on the controller for more than 2 seconds to change Set point value.
2. The value of the set point will be displayed and the °F LED starts blinking.
3. To change the set value push the **[UP]** or **[DOWN]** arrow to raise or lower set point.
4. To confirm the new set point value push the **[SET]**.

Once the control has been reset, allow the cabinet to run for 4 hours to stabilize.

Defrost Controller

The cabinet goes into defrost every 24 hours. From the intial start up. If you want to set the defrost period to start during closing hours simply push the **[MELTING SNOW FLAKE]** key for more than 2 seconds and a manual defrost will start. Now the next defrost will be 24 hours from that point. Defrost will terminate based on the the top evaporator coil temperature. The sensor to terminate defrost period is located in the evaporator coil on the left side, rear of the cabinet. When the coil temperature reaches 40F the defrost period will terminate. Remember the Defrost Termination Temperature setting must be high enough to allow the coil to completely clear itself of frost and ice during the off cycle.

FINAL CHECKLIST

1. Check setting of defrost timer.
2. Check operating pressures.
3. Check electrical requirements of unit to supply voltage.
4. Set pressure control for desired temperature range.
5. Check system for proper defrost operation.
6. Check condensing unit for vibrating or rubbing tubing.
7. Check packing nuts on all service valves.
8. Replace all service valve caps and latch unit covers.
9. Tighten all screws in grill area.

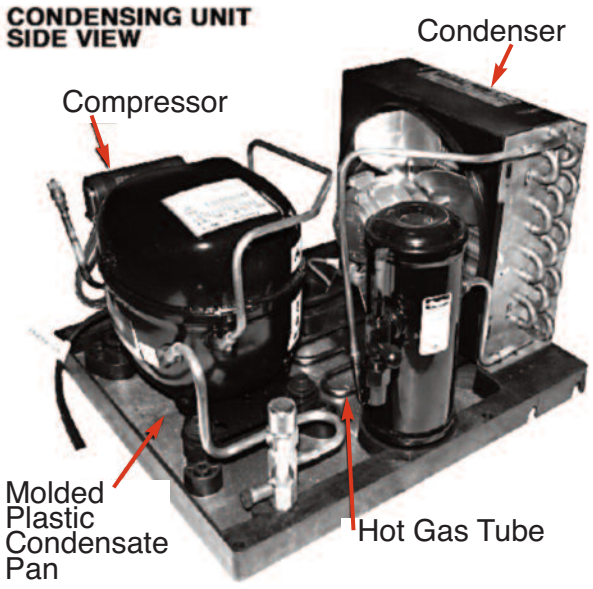
LOADING PROCEDURE

Do not place products into the case until 6 hours after it is started. As quickly as possible, stock cases exposing only small quantities to store temperatures for short periods of time. So older stock does not accumulate, it is important to keep stock rotated properly. A first-in, first-out rotation practice will keep the products in good stable condition. Avoid loading case so that the product sticks out beyond shelves. This will interfere with the airflow of the case and will result in diminished performance. When applicable keep the service doors closed. Refrigeration performance will be seriously affected if left open.

Energy Efficient Condensate Evaporating Condensing Units

Condensation occurs naturally when water vapor in the air contacts a cold surface. The sweat on the outside of a glass of ice is a familiar example of natural condensation. Likewise, when air, all air contains some water vapor, contacts the tubes and aluminum fins of the cooling coil in the refrigerator, water is deposited. Because the cooling coil is very cold, about 20of, this water turns to ice or frost. If this ice and frost was permitted to continue building up on the coil, it would eventually block the air passages between the fins and it would loose its cooling ability. Therefore, it is necessary to defrost or melt the ice and frost from the coil periodically. This is done automatically by controls that turn the refrigeration machine off and permit the coil to warm up above melting point. The water from the melted ice and frost then is funneled through a tube to the base of the refrigeration machine or condensing unit. In the past, this water then was dissipated back into the air by directing it into a pan that has electric resistance elements imbedded into its base. When the pan gets very hot, it boils the water and dissipates it into the atmosphere. The Howard-McCray Case has a much more energy efficient method of removing this water. The base of the condensing unit has a very hot tube, from the compressor to the condenser that dissipates the water without any electrical connections. This system is not only fail safe but it is much more sanitary and virtually corrosion free.

On most “Howard-McCray” Self-Contained Display Cases, the drain pan is directly under the condensing unit. Be sure that the drain hose empties into this pan.



WARNING!

The condensate disposal system of this case is designed to dispose of the water from the evaporators only. When cases are used with ice or when additional water is injected into the case. Other arrangements must be made to dispose of this water.

Recommended Cleaning Procedure for Zip-Lite Thermoplastic Cutting Boards

Where high pressure cleaning equipment is not available, use hot water, cleanser or any other granular detergent, and a stiff bristle brush. The abrasive cleaning section is very important. Merely wiping the board with a damp cloth will not do a sufficient cleaning job. Scrub the board thoroughly and rinse with hot water. Allow to lie flat - do not stand on end. This should be done daily.

There are several germicidal cleaners available which also do an excellent job. Among them are Calgon’s Big Cat and Johnson’s Break up. Clorox is another good cleaner and is USDA approved.

Periodically, after the board has been thoroughly cleaned, go over the board with a clean, flat stainless steel scraper. This helps to seal some of the knife marks, which may accumulate over a period of time.

We do not recommend the use of cleavers on any synthetic cutting board.

MAINTENANCE SUGGESTIONS

An attractive delicatessen operation can be a very profitable department in most supermarkets. Dirty or poorly merchandised cabinets are offensive to most discriminating customers, so a clean attractive cabinet will pay dividends. Weekly or more often, if necessary, the display area should be cleaned and attractively stocked.

IMPORTANT NOTICE

1 NEVER under any circumstances should a water hose be placed into this cabinet.

2. ALWAYS disconnect the power to the cabinet before attempting to clean it with any liquid.

3. NEVER use ammonia or solutions whit ammonia on this cabinet.

4. The use of abrasive cleaning materials on this cabinet will void all cabinet warranties.

5. NEVER under any circumstance place Ice, Meats or Poultry Products against the front display glass, this will VOID the manufacturer’s warranty

Energy Efficient Condensate Evaporating Condensing Units

THE CLEANING PROCESS

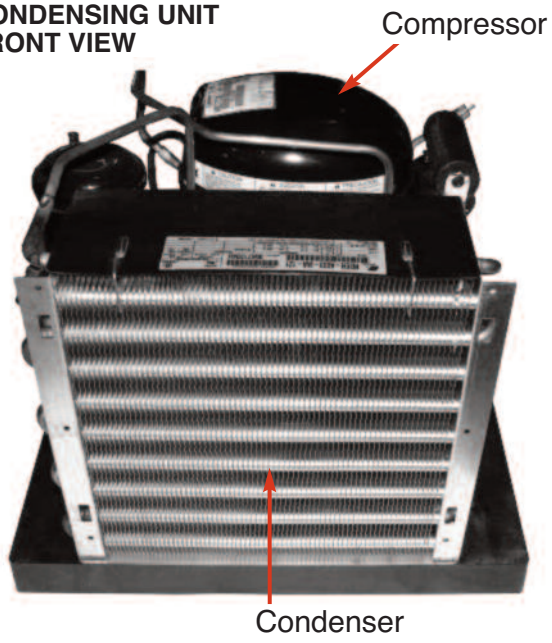
1. Turn the power off from the source.
2. Remove al merchandise from the cabinet and store in a cooler. Then remove all shelves and pans.
3. This cabinet can be hand cleaned internally with a mild soap detergent and hot water. Diluted non-chlorine bleach and hot water is a good sanitizer. The cleaning cloth should be just wet enough to get a reasonable cleaning action but should not be wet to a point where it will emit a large amount of water which will flow through the drain system causing the Evaporator Drain Pan to overflow.
4. After the cabinet is cleaned, any reaming water in the cabinet can be soaked up with the use of a sponge and dried out with a dry cloth completely before resuming operations.
5. Make sure that the bottom drain is open and remove all scraps, paper, and lint.
6. All external panels may be cleaned with a damp cloth, and then they may be polished with a dry lint free cloth. This will preserve the luster of the cabinet.

CLEANING THE MACHINE COMPARTMENT

At intervals of four to six months or before, if necessary, it is recommended that the machine compartment be cleaned out. It should be accomplished in the following order:

1. Shut the cabinet down electrically completely.
2. The Evaporative Drain Pan should be wiped out with a cloth and the water removed with a sponge.
3. With the use of a hose/brush attachment on a vacuum cleaner, all dirt, store lint and dust can be removed from the machine compartment. The condenser face can be brushed and cleaned in a similar manner. It is of Vital Importance that the Condenser gets the proper amount of air through the fins and around the tubes.
4. If any traces of oil are found, contact your Refrigeration Service Man as soon as possible. ALWAYS EXERCISE THE UTMOST CARE, DAMAGE TO COMPONENTS DURING THE CLEANING PERIOD CAN BE COSTLY.
5. Before reloading the cabinet with merchandise, allow an hour for refrigeration pull-down. Make sure that all merchandise is in good salable and refrigerated condition when re-loading the cabinet.

CONDENSING UNIT FRONT VIEW



WARNING!

Failure to clean condenser coil weekly will void warranty. The condensing coil is located behind front grille on the left side of the cabinet.

Trouble Chart

A. Compressor will not start - no hum

Possible Causes:

1. Disconnect switch open
2. Blown fuse
3. Defective wiring
4. Overload protector tripped
5. Open control contacts (control may be defective, or unit location may be too cold)
6. Defective overload protector

B. Compressor will not start - hums but cycles on overload

Possible Causes:

1. Low voltage
2. Unit wired incorrectly
3. Starting capacitor defective
4. Starting relay contact not closing
5. Compressor motor defective
6. High head pressure
7. Bearings on pistons tight - low oil charge

C. Compressor starts, but starting winding remains in circuit

Possible Causes:

1. Low voltage
2. Unit wired incorrectly
3. Starting capacitor weak
4. Running capacitor defective
5. Starting relay defective
6. Compressor motor defective
7. High head pressure

D. Compressor starts and runs but cycles on overload

Possible Causes:

1. Low voltage
2. Running capacitor defective
3. Overload protector defective
4. High head pressure
5. Fan motor, pump, etc., wired to wrong side of overload protector
6. Compressor motor partially grounded
7. Unbalanced line voltage (3 phase models)
8. Bearing or pistons tight - low oil charge

E. Compressor tries to start when thermostat closes but cuts out on overload, starts after several attempts

Possible Causes:

1. Low voltage
2. Thermostat differential too close (lower than 10°)
3. Thermostat bulb not in tight contact with evaporator

F. Compressor short cycles

Possible Causes:

1. Control differential set too close
2. Refrigerant undercharge
3. Refrigerant overcharge
4. Discharge valve leaking
5. Expansion valve leaking
6. Cutting out on high pressure control
7. Cutting out on overload protector because of tight bearings, stuck piston, high head pressure or restricted air cooled condenser

G. Running cycle too long, or unit operated continuously

Possible Causes:

1. Insufficient refrigerant charge
2. Dirty or restricted condenser
3. Unit: location too hot
4. Control contacts stuck
5. Air or other noncondensable gases in system
6. Expansion valve plugged or defective
7. Fixture doors lift open too long
8. Insufficient, defective or water - logged insulation
9. Evaporator coil plugged with ice or dirt

H. Evaporator temperature too high

Possible Causes:

1. Shortage of refrigerant, or leak on system
2. Restricted capillary tube, strainer or drier
3. Control setting too high
4. Expansion valve restricted
5. Expansion valve too small
6. Evaporator coil plugged with ice or dirt
7. Evaporator oil logged

I. Noisy Unit

Possible Causes:

1. Compressor oil charge low
2. Fan blade bent causing vibration
3. Fan motor bearings loose or worn
4. Tube rattle
5. Loose parts on condensing unit

J. Liquid line hot

Possible Causes:

1. Unit undercharged or leak in system
2. Expansion valve opened too far

K. Liquid line frosted

Possible Causes:

1. Restriction in drier
2. Shut off valve on receiver either partially closed or restricted

L. Suction line sweating or frosted

Possible Causes:

1. Expansion valve open too wide
2. Evaporator iced up
3. Evaporator fan motors not operating

Closed Service Refrigerators

BTU Ratings per hour at +20°F Evaporator for Remote Installations

Refrigeration Data

Number of Cases					Linear ft.	CDS/CMS	CFS
4	6	8	10	12	*W/O ENDS	BTU/H	BTU/H
1					4	1400	820
	1				6	2100	1230
		1			8	2800	1640
			1		10	3500	2050
				1	12	4200	2460
	1	1			14	4900	2870
		2			16	5600	3280
		1	1		18	6300	3690
			2		20	7000	4100
			1	1	22	7700	4510
				2	24	8400	4920
		2	1		26	9100	5330
		1	2		28	9800	5740
			3		30	10500	6150
			2	1	32	11200	6560
			1	2	34	11900	6970
				3	36	12600	7380
		2	1	1	38	13300	7790
			4		40	14000	8200
			3	1	42	14700	8610
			2	2	44	15400	9020
			1	3	46	16100	9430
				4	48	16800	9840
			5		50	17500	10250
			4	1	52	18200	10660
			3	2	54	18900	11070
			2	3	56	19600	11480
			1	4	58	20300	11890
				5	60	21000	12300
			5	1	62	21700	12710
			4	2	64	22400	13120

*** Add 2 1/2" for each end in Lineup.**

Design loads are based on air-conditioned stores not exceeding 75°F and a relative humidity below 55%. Condensing units operating in a 90°F ambient or lower.

The data contained herein has been derived from extensive tests and is offered ONLY as a guide in the selection of condensing units. Since the installation of remote units cannot be controlled by the manufacturer, Howard-McCray. will assume no liability for results obtained through the use of the information presented.

Serial and Rating Plate Data

MODEL NO.	CASE DIMENSIONS D x H x L	ELECTRICAL VOLTAGE	COMP H.P.	MAX. AMPS
SC-CDS32E-4	30 1/2 x 50 5/8 x50	115V-60Hz-1ph	1/4	6.0
SC-CFS32E-4	30 1/2 x 50 5/8 x50	115V-60Hz-1ph	1/4	6.0
SC-CMS32E-4	30 1/2 x 50 5/8 x50	115V-60Hz-1ph	1/4	6.0
SC-CDS32E-4-U	30 1/2 x 50 5/8 x50	115V-60Hz-1ph	1/3	8.3
SC-CFS32E-4-U	30 1/2 x 50 5/8 x50	115V-60Hz-1ph	1/4	6.0
SC-CMS32E-4-U	30 1/2 x 50 5/8 x50	115V-60Hz-1ph	1/3	8.3
SC-CDS32E-6	30 1/2 x 50 5/8 x74	115V-60Hz-1ph	1/3	9.1
SC-CFS32E-6	30 1/2 x 50 5/8 x74	115V-60Hz-1ph	1/4	6.8
SC-CMS32E-6	30 1/2 x 50 5/8 x74	115V-60Hz-1ph	1/3	9.1
SC-CDS32E-6-U	30 1/2 x 50 5/8 x74	115V-60Hz-1ph	1/2	11.2
SC-CFS32E-6-U	30 1/2 x 50 5/8 x74	115V-60Hz-1ph	1/3	9.1
SC-CMS32E-6-U	30 1/2 x 50 5/8 x74	115V-60Hz-1ph	1/2	11.2
SC-CDS32E-8	30 1/2 x 50 5/8 x98	115V-60Hz-1ph	1/2	11.2
SC-CFS32E-8	30 1/2 x 50 5/8 x98	115V-60Hz-1ph	1/3	9.1
SC-CMS32E-8	30 1/2 x 50 5/8 x98	115V-60Hz-1ph	1/2	11.2
SC-CFS32E-8-U	30 1/2 x 50 5/8 x98	115V-60Hz-1ph	1/2	11.2
SC-CDS34E-4	34 1/2 x 53 x 52 1/2	115V-60Hz-1ph	1/4	6.0
SC-CFS34E-4	34 1/2 x 53 x 52 1/2	115V-60Hz-1ph	1/4	6.0
SC-CMS32E-4	34 1/2 x 53 x 52 1/2	115V-60Hz-1ph	1/4	6.0
SC-CDS34E-4-U	34 1/2 x 53 x 52 1/2	115V-60Hz-1ph	1/3	8.3
SC-CMS34E-4-U	34 1/2 x 53 x 52 1/2	115V-60Hz-1ph	1/3	8.3
SC-CDS34E-6	34 1/2 x 53 x 76 1/2	115V-60Hz-1ph	1/3	8.7
SC-CFS34E-6	34 1/2 x 53 x 76 1/2	115V-60Hz-1ph	1/4	6.4
SC-CMS34E-6	34 1/2 x 53 x 76 1/2	115V-60Hz-1ph	1/3	8.7
SC-CDS34E-6-U	34 1/2 x 53 x 76 1/2	115V-60Hz-1ph	1/2	10.9
SC-CFS34E-6-U	34 1/2 x 53 x 76 1/2	115V-60Hz-1ph	1/3	8.7
SC-CMS34E-6-U	34 1/2 x 53 x 76 1/2	115V-60Hz-1ph	1/2	10.9
SC-CDS34E-8	34-1/2 x 53 x 100 1/2	115V-60Hz-1ph	1/2	11.2
SC-CFS34E-8	34 1/2 x 53 x 100 1/2	115V-60Hz-1ph	1/3	9.1
SC-CMS34E-8	34 1/2 x 53 x 100 1/2	115V-60Hz-1ph	1/2	11.2
SC-CFS34E-8-U	34 1/2 x 53 x 100 1/2	115V-60Hz-1ph	1/2	11.2
SC-CMS34E-8-U	34 1/2 x 53 x 100 1/2	115V-60Hz-1ph	3/4	15.9
SC-CDS34E-10	34 1/2 x 53 x 124 1/2	115V-60Hz-1ph	1/2	13.8
SC-CFS34E-10	34 1/2 x 53 x 124 1/2	115V-60Hz-1ph	1/3	9.9
SC-CMS34E-10	34 1/2 x 53 x 124 1/2	115V-60Hz-1ph	1/2	13.8
SC-CDS34E-10-U	34 1/2 x 53 x 124 1/2	115V-60Hz-1ph	3/4	17.4
SC-CFS34E-10-U	34 1/2 x 53 x 124 1/2	115V-60Hz-1ph	1/2	13.8
SC-CMS34E-10-U	34 1/2 x 53 x 124 1/2	115V-60Hz-1ph	3/4	17.4
SC-CDS34E-12	34 1/2 x 53 x 148 1/2	115V-60Hz-1ph	3/4	17.4
SC-CFS34E-12	34 1/2 x 53 x 148 1/2	115V-60Hz-1ph	1/2	13.8
SC-CMS34E-12	34 1/2 x 53 x 148 1/2	115V-60Hz-1ph	3/4	17.4
SC-CDS34E-12-U	34 1/2 x 53 x 148 1/2	115V-60Hz-1ph	3/4	15.9
SC-CFS34E-12-U	34 1/2 x 53 x 148 1/2	115V-60Hz-1ph	3/4	17.4

Serial and Rating Plate Data

MODEL NO.	CASE DIMENSIONS D x H x L	ELECTRICAL VOLTAGE	COMP H.P.	MAX. AMPS
SC-CDS35-4	35 1/2 x 52 x 50	115V-60Hz-1ph	1/4	6.0
SC-CFS35-4	35 1/2 x 52 x 50	115V-60Hz-1ph	1/4	6.0
SC-CMS35-4	35 1/2 x 52 x 50	115V-60Hz-1ph	1/4	6.0
SC-CDS35-4-U	35 1/2 x 52 x 50	115V-60Hz-1ph	1/3	8.3
SC-CFS35-4-U	35 1/2 x 52 x 50	115V-60Hz-1ph	1/3	6.0
SC-CMS35-4-U	35 1/2 x 52 x 50	115V-60Hz-1ph	1/3	8.3
SC-CDS35-6	35 1/2 x 52 x 72	115V-60Hz-1ph	1/3	8.7
SC-CFS35-6	35 1/2 x 52 x 72	115V-60Hz-1ph	1/4	6.4
SC-CMS35-6	35 1/2 x 52 x 72	115V-60Hz-1ph	1/3	8.7
SC-CDS35-6-U	35 1/2 x 52 x 72	115V-60Hz-1ph	1/2	10.9
SC-CFS35-6-U	35 1/2 x 52 x 72	115V-60Hz-1ph	1/3	8.7
SC-CMS35-6-U	35 1/2 x 52 x 72	115V-60Hz-1ph	1/2	10.9
SC-CDS35-8	35 1/2 x 52 x 96	115V-60Hz-1ph	1/2	11.2
SC-CFS35-8	35 1/2 x 52 x 96	115V-60Hz-1ph	1/3	9.1
SC-CMS35-8	35 1/2 x 52 x 96	115V-60Hz-1ph	1/2	11.2
SC-CDS35-8-U	35 1/2 x 52 x 96	115V-60Hz-1ph	3/4	15.9
SC-CFS35-8-U	35 1/2 x 52 x 96	115V-60Hz-1ph	1/2	11.2
SC-CMS35-8-U	35 1/2 x 52 x 96	115V-60Hz-1ph	3/4	15.9
SC-CDS35-10	35 1/2 x 52 x 120	115V-60Hz-1ph	1/2	13.8
SC-CFS35-10	35 1/2 x 52 x 120	115V-60Hz-1ph	1/3	9.9
SC-CMS35-10	35 1/2 x 52 x 120	115V-60Hz-1ph	1/2	13.8
SC-CDS35-10-U	35 1/2 x 52 x 120	115V-60Hz-1ph	3/4	17.4
SC-CFS35-10-U	35 1/2 x 52 x 120	115V-60Hz-1ph	1/2	13.8
SC-CMS35-10-U	35 1/2 x 52 x 120	115V-60Hz-1ph	3/4	17.4
SC-CDS35-12	35 1/2 x 52 x 144	115V-60Hz-1ph	3/4	17.4
SC-CFS35-12	35 1/2 x 52 x 144	115V-60Hz-1ph	1/2	13.8
SC-CMS35-12	35 1/2 x 52 x 144	115V-60Hz-1ph	3/4	17.4
SC-CDS35-12-U	35 1/2 x 52 x 144	115V-60Hz-1ph	3/4	15.9
SC-CFS35-12-U	35 1/2 x 52 x 144	115V-60Hz-1ph	3/4	17.4
SC-CDS40E-8	40 x 53 x 96	115V-60Hz-1ph	3/4	11.2
SC-CFS40E-8	40 x 53 x 96	115V-60Hz-1ph	1/3	9.1
SC-CMS40E-8	40 x 53 x 96	115V-60Hz-1ph	1/2	11.2
SC-CDS40E-8-U	40 x 53 x 96	115V-60Hz-1ph	3/4	15.9
SC-CFS40E-8-U	40 x 53 x 96	115V-60Hz-1ph	1/2	11.2
SC-CMS40E-8-U	40 x 53 x 96	115V-60Hz-1ph	3/4	15.9
SC-CDS40E-12	40 x 53 x 144	115V-60Hz-1ph	3/4	17.4
SC-CFS40E-12	40 x 53 x 144	115V-60Hz-1ph	1/2	13.8
SC-CMS40E-12	40 x 53 x 144	115V-60Hz-1ph	3/4	17.4
SC-CDS40E-12-U	40 x 53 x 144	115V-60Hz-1ph	3/4	15.9
SC-CFS40E-12-U	40 x 53 x 144	115V-60Hz-1ph	3/4	17.4
SC-CMS40E-12-U	40 x 53 x 144	115V-60Hz-1ph	3/4	15.9

Closed Service Case Part List

Refrigeration Components		4	6	8	10	12
21-376	Defrost Clock	X	X	X	X	X
50-090	Expansion Valve (CFS Series)	X	X	X	X	
50-091	Expansion Valve (CFS Series)					X
50-090	Expansion Valve (CDS & CMS)	X	X			
50-091	Expansion Valve (CDS & CMS)			X	X	
50-092	Expansion Valve (CDS & CMS)					X
Light Components		**4**	**6**	**8**	**10**	**12**
4M6516	Ballast Assembly	X	X	X	X	X
21-030-GFCI	Receptacle/Light Switch	X	X	X	X	X
20-240	Lamp holder	X	X	X	X	X
Glass Door Assembly		**4**	**6**	**8**	**10**	**12**
31-528-34E-04DR	Outer Assy (32E,34E,40E)	X		X		
31-528-34E-04DL	Inner Assy (32E,34E,40E)	X		X		
31-528-34E-06DR	Outer Assy (32E,34E,40E)		X			X
31-528-34E-08DL	Inner Assy (32E,34E,40E)		X			X
31-528-34E-08DR	Outer Assy (34E Series)				X	
31-528-34E-08DL	Inner Assy (34E Series)				X	
31-528-35-04DR	Outer Assy (35 Series)	X		X		
31-528-35-04DL	Inner Assy (35 Series)	X		X		
31-528-35-06DR	Outer Assy (35 Series)		X			X
31-528-35-06DL	Inner Assy (35 Series)		X			X
31-528-35-10DR	Outer Assy (35 Series)				X	
31-528-35-10DL	Inner Assy (35 Series)				X	
Grille Assemblies		**4**	**6**	**8**	**10**	**12**
4B7766	Front Grille (32E Series)	X	X	X		
14M7841	Front Grille (34E Series)	X	X	X	X	X
4M7844	Front Grille (35 Series)	X				
6M7844	Front Grille (35 & 40E Series)		X	X	X	X
4B1090	Rear Grille (32E Series)	X				
6B1090	Rear Grille (32E Series)		X			
8B1090	Rear Grille (32E Series)			X		
14M7112	Rear Grille (34E Series)	X	X	X	X	X
4M1257	Rear Grille (35 Series)	X				
6M1257	Rear Grille (35 Series)		X	X	X	X

Keep Page for Your Records:

Dear Customer:

We wish to congratulate you on your judgment. We are very proud to have been privileged to serve you with Howard-McCray equipment to fill your requirements.

Howard-McCray equipment is the product of a company dedicated in producing products of quality, incorporating progressive features on a timely basis and backed by a warranty which provides confidence.

Should you have any questions regarding features, operation, or service, call the Howard-McCray Assistance Center toll free. (800-344-8222)

Thank you,

Howard-McCray

Customer Installation Record:

Fixture Model Number _____

Serial Number _____

Condensing Unit Model Number and Horsepower _____

Type of Control _____

Refrigerant _____

Thermostat _____

Other _____

_____

_____

Defrost Period _____

Date of Start-UP _____

Other Remarks _____

_____

_____

_____

_____

Installing Contractor _____

_____

Address _____

_____

_____

_____

Phone Number _____

Warranty

The conditions below are the terms upon which an order is accepted, and constitutes an Agreement of Sale.
All Solid Door Models are designed for storage use. All Glass Door Models are designed as display merchandisers. No model is manufactured for processing foods. Howard-McCray assumes no responsibility for the product when misused, abused, or incorrectly applied. In any such instances the warranty is void.

PRICING:
All prices shown are list. Prices are F.O.B. Philadelphia, PA. Howard-McCray assumes no responsibility for carrier rates or charges, nor will it make any allowance from prices for freight charges. Prices are subject to change without notice, and as exist at time of shipment. Export duties and overseas shipping costs not included in prices listed. Approximate costs can be furnished.

TERMS:
TO ACCOUNTS RATED FOR CREDIT — 30 days from shipment date. SPECIAL ORDERS MAY REQUIRE A DEPOSIT.
All payments due in U.S. currency.

WARRANTIES:
A 90 day labor service warranty is standard with every Howard-McCray unit subject to service invoice approval by our service department.
The Howard-McCray product is guaranteed for one year F.O.B. factory, Philadelphia. Warranty does not include repair or replacement charges nor damage to enameled finish, or glass. A four year additional warranty for the compressor dome is separately added to the invoice (as listed below).

Net Prices 5 Years Warranty on Compressor Dome Add

SIZES	1/4 HP	3/4 HP	1 HP	2 HP
	$75.00 ea	**105.00 ea**	**$115.00 ea.**	**$160.00 ea**

An in-warranty faulty compressor dome in the United States must be returned freight paid for repair and/or replacement. In warranty inoperative dome out of the United States need not be returned, except that the Serial Plate with a certification of break-down must be forwarded to Howard-McCray. The warranty is valid provided that the item is checked at start-up for use by an authorized service dealer or refrigerator service man. The inoperative dome may also be examined by a local wholesaler according to normal wholesaler procedures. Forward two copies of wholesalers invoice plus our warranty information and credits less return allowances, freight, etc. Credit will be listed per compressor manufacturers net exchange price list. Local taxes are not refundable.

DAMAGE:
Damaged goods are not to be returned to the factory. Claims for damages must be made by the consignee with the carrier. Howard-McCray assumes no responsibility for damage while in transit.

SHIPMENTS:
When feasible, preferred carrier will be used; however, we reserve the right to ship via any responsible carrier.
Rate charges or discrepancies are between carrier and consignee.
Returns are not acceptable unless authorized by the factory main office, in writing. If return is authorized by factory a handling charge of 35% will apply. Returned equipment must be in original factory crate and in new condition, subject to factory inspection.
All weights are approximate. Howard-McCray does not warrant actual weight.
Inquire from our office about export crating charges, crate sizes, cube, and other pertinent data.

TAXES:
Federal, State, City or Use Taxes shall be included with price unless resale certificate is on record at factory.

PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WIHTOUT NOTICE
90 DAY AND 1 YEAR SERVICE POLICY

Howard-McCray offers a free 90 day labor service policy or optional 1 year service policy in the Continental United States, Hawaii and Alaska with all self contained models. Certain exclusions apply to the policy. Please request the plan form for further details. McCray is not responsible for improper installation or application. Recommended ambient temperatures 75°F and relative humidity 55%.

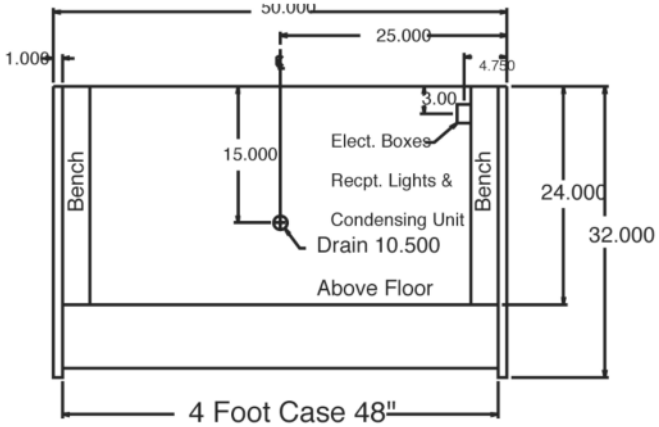
Warranties are activated upon full payment of the invoice. A 30 day grace period is normally granted
For further information concerning warranties, please call or E-Mail: techservice@howardmccray.com

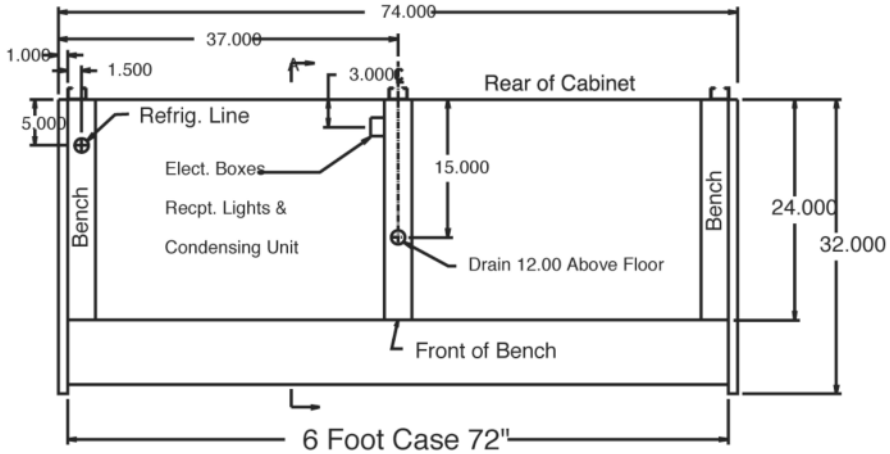
Electronic Controller

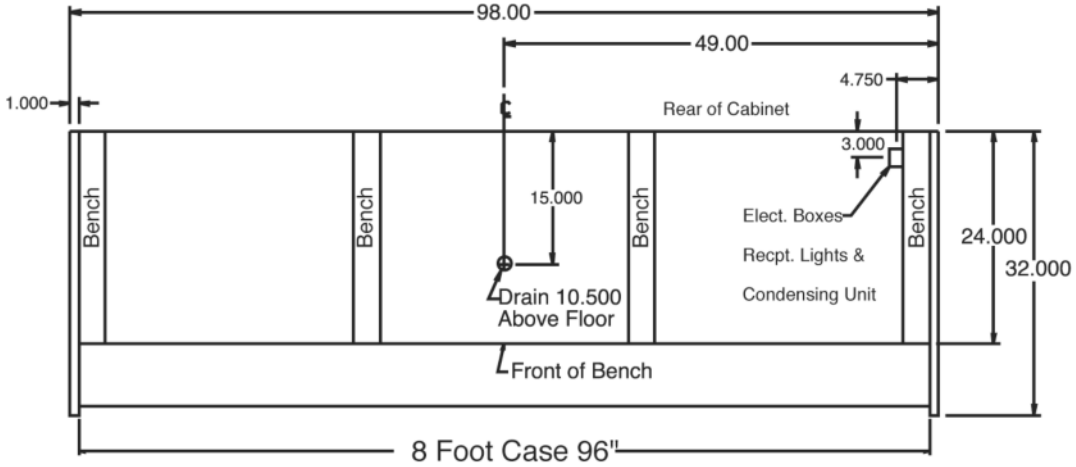
ELECTRONIC CONTROLLER – SETTINGS

Label	Setting	Description
Set	36	Set Point
Hy	4	Differential
Ot	0	Thermostat Probe Calibration
P2P	Y	Evaporator Probe Presence
AC	1	Anti-Short Cycle Delay
rES	in	Resolution
tdF	EL	Defrost Type
dtE	40	Defrost Termination Temperature
IdF	24	Interval between Defrost Cycle
MdF	120	Maximum Length for Defrost
ALU	45	Maximum Temperature Alarm
ALL	20	Minimum Temperature Alarm
I1P	CL	Digital Input Polarity
did	5	Digital Input Alarm Delay
onF	ES	On/Off Key Enabling
dP3	--	Third Probe Display
dP4	--	Forth Probe Display
rSE	--	Valore Set Operativo

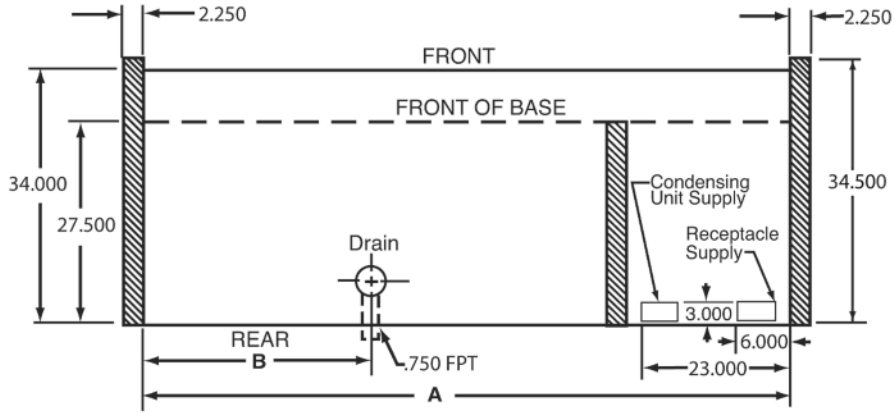
32E Floor Plans



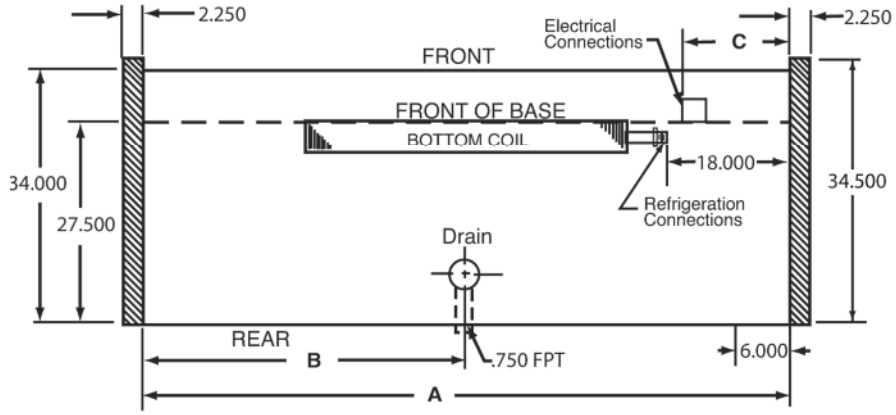




34E Floor Plans

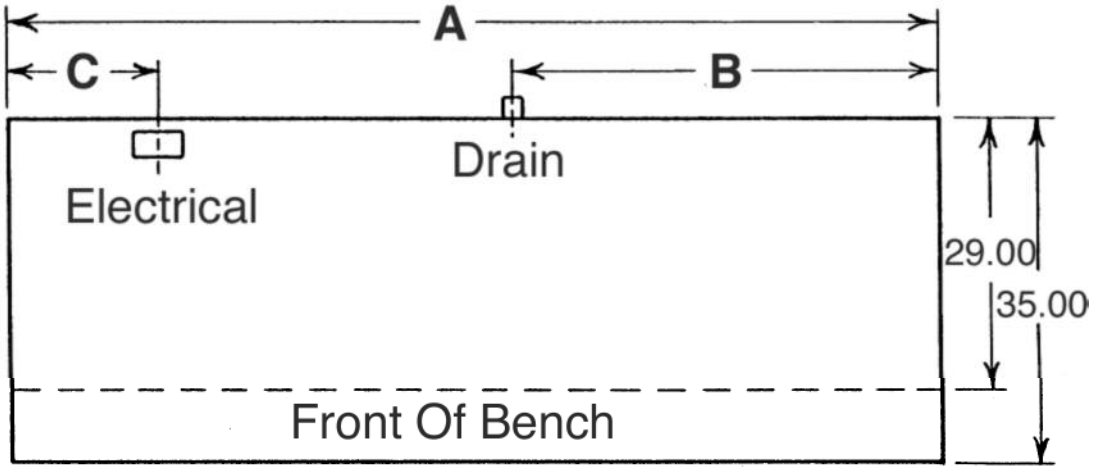


MODEL NO.	A	B
S/C-34E-4	48″	12″
S/C-34E-6	72″	24″
S/C-34E-8	96″	36″
S/C-34E-10	120″	48″
S/C-34E-12	144″	60″



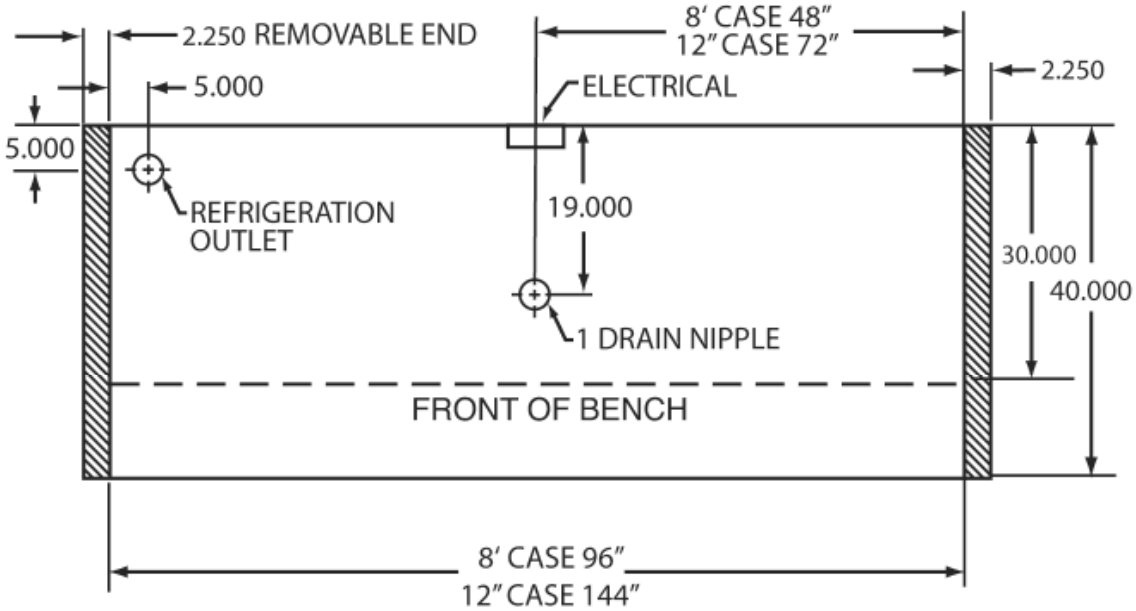
MODEL NO.	A	B	C
R-34E-4	48″	24″	4″
R-34E-6	72″	36″	4″
R-34E-8	96″	48″	52″
R-34E-10	120″	60″	52″
R-34E-12	144″	72″	76″

35 Floor Plans

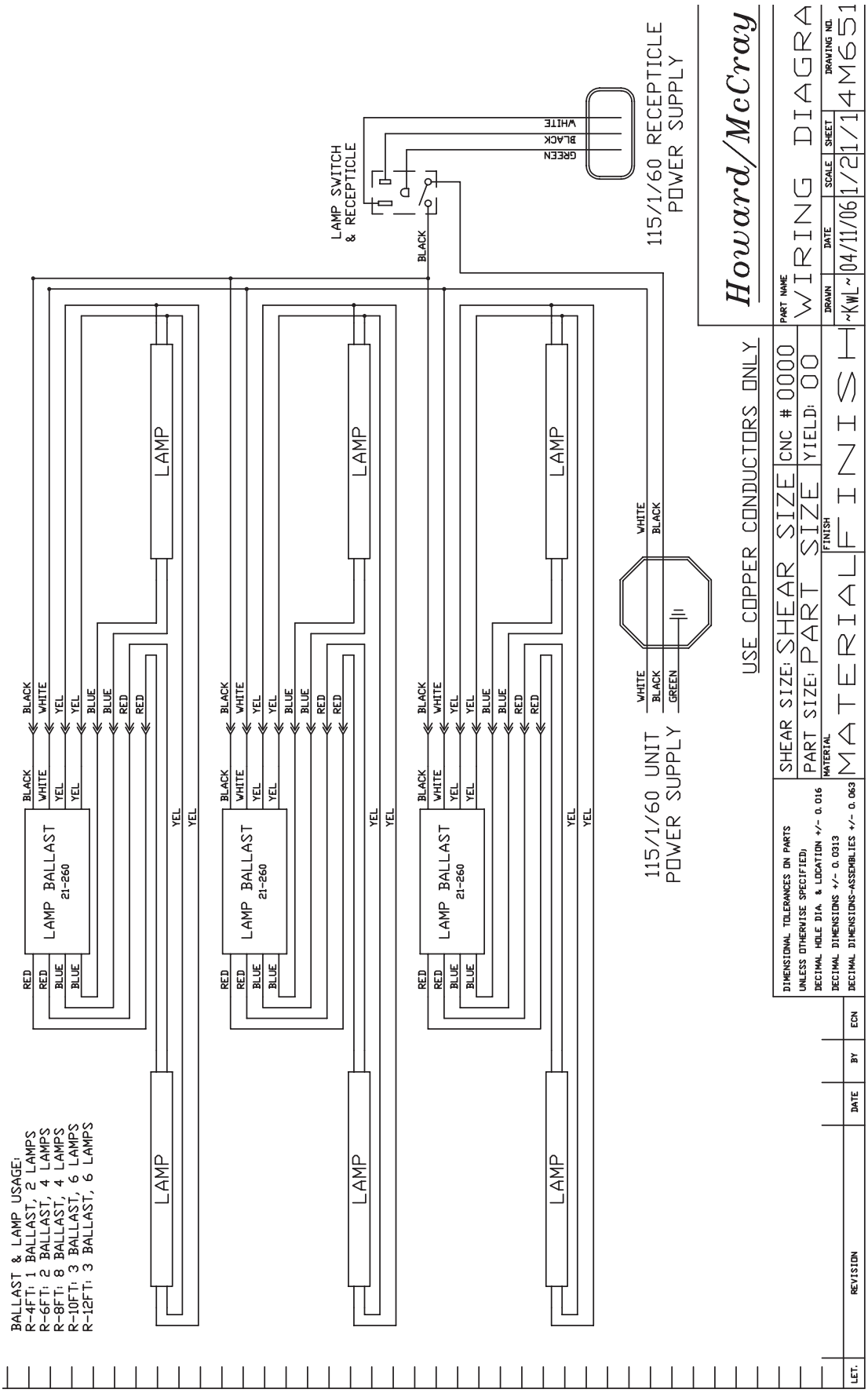


Size	A	B	C
4	50	17	14
6	71	25	20
8	95	37	20
10	119	47	20
12	143	60	20

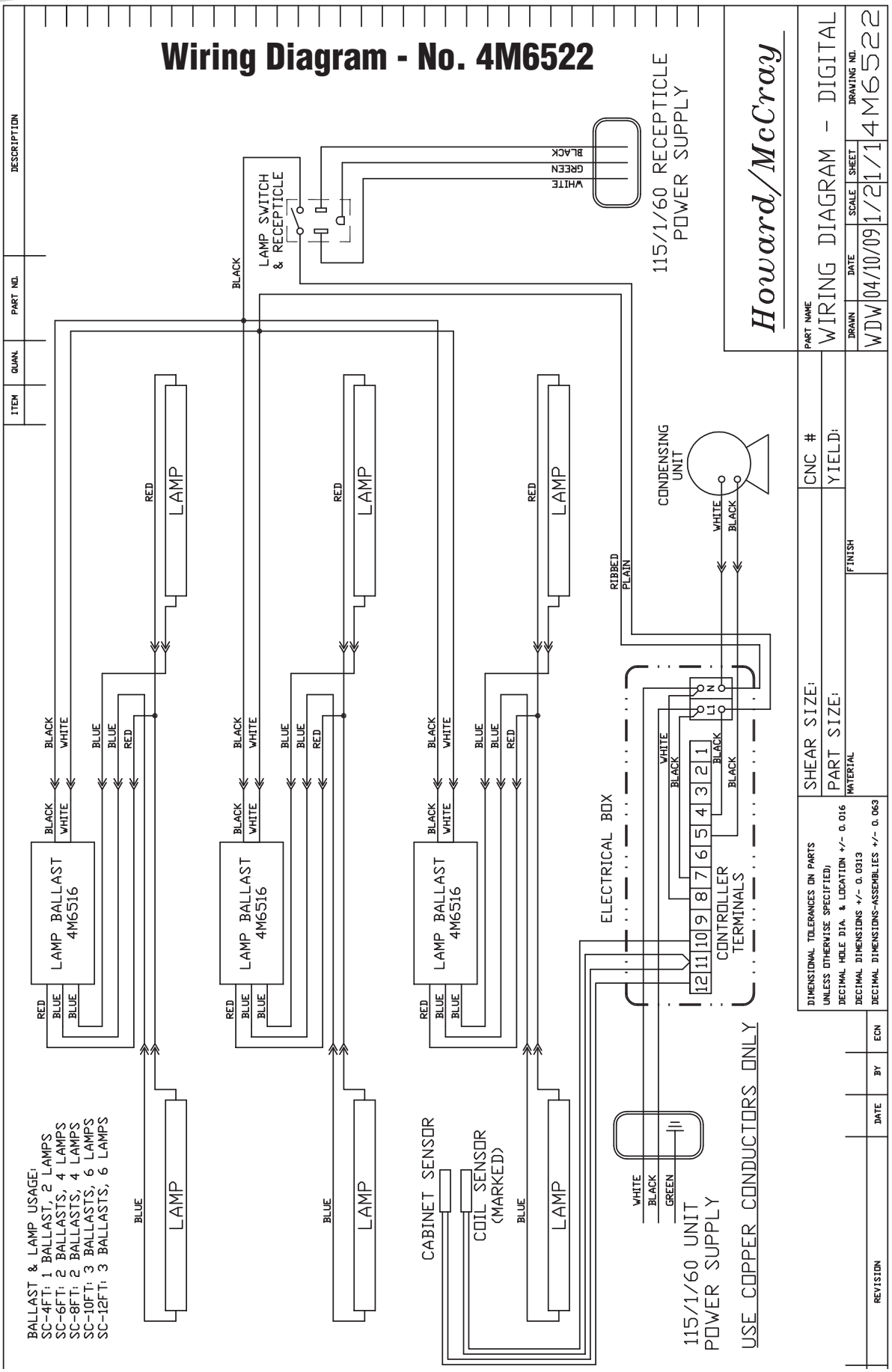
40E Endless SD Plan View



Wiring Diagram - No. 4M6514



Wiring Diagram - No. 4M6522



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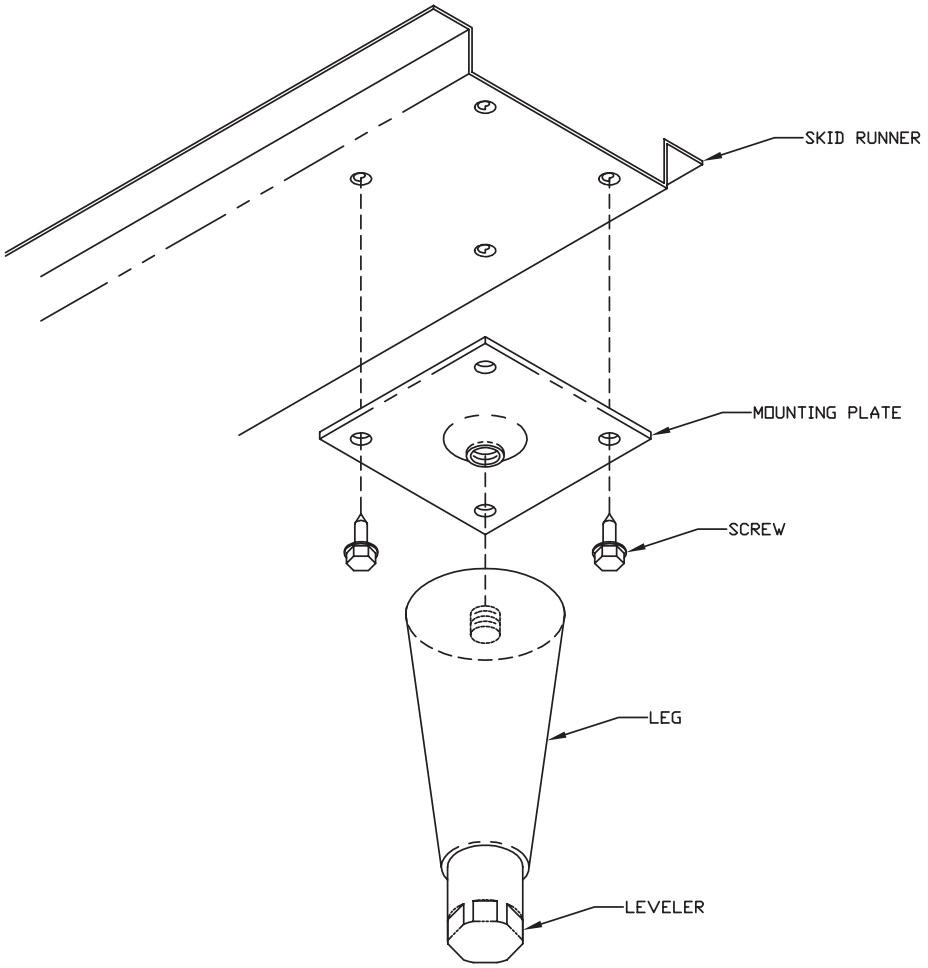
Led Installation - No. 4M7501



ITEM	QUAN.	PART NO.	DESCRIPTION

LEG ATTACHMENT:

1) RAISE CABINET FAR ENOUGH OFF OF FLOOR (MIN 8") TO ALLOW LEG INSTALLATION.

2) ATTACH LEG MOUNTING PLATE TO SKID RUNNER WITH THE PROVIDED SCREWS.

3) THREAD THE LEG ONTO THE MOUNTING PLATE AND TIGHTEN.

4) GENTLY LOWER THE CABINET TO THE FLOOR AND ADJUST LEVELERS (AS NEEDED).

LET.	REVISION	DATE	BY	ECN

DIMENSIONAL TOLERANCES ON PARTS UNLESS OTHERWISE SPECIFIED;
DECIMAL HOLE DIA. & LOCATION +/- 0.016
DECIMAL DIMENSIONS +/- 0.0313
DECIMAL DIMENSIONS-ASSEMBLIES +/- 0.063

SHEAR SIZE: SHEAR SIZE | CNC # 0000
PART SIZE: PART SIZE | YIELD: 00
MATERIAL: MATERIAL | FINISH: FINISH

Howard/McCray

PART NAME: LEG INSTALLATION

DRAWN	DATE	SCALE	SHEET	DRAWING NO.
~KWL~	04/10/06	1/2	1/1	4M7501

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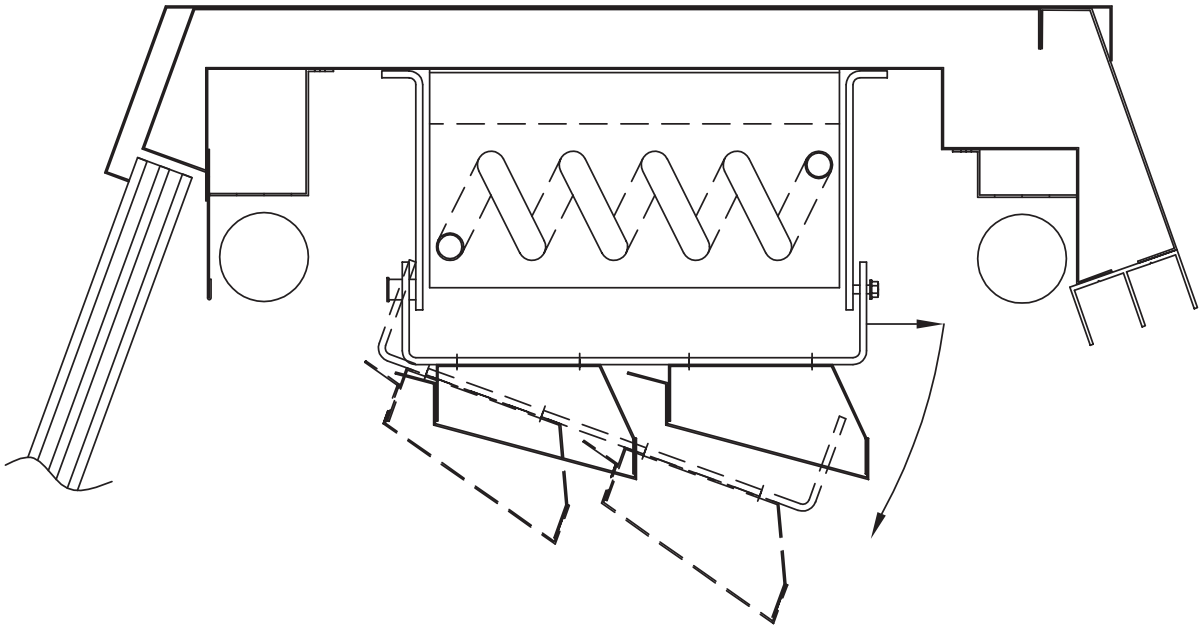
Louver Instructions - No. 4M7789

ITEM	QUAN.	PART NO.	DESCRIPTION



TO ACCESS EXPANSION VALVE:
DETACH THE REAR OF THE LOUVER SUPPORT FROM THE MOUNTING SCREW. SWING THE LOUVER DOWNWARDS.

LOUVER REMOVAL:
AFTER SWINGING THE LOUVER DOWNWARDS (AS DESCRIBED ABOVE), SLIDE THE LOUVER FORWARD TO DETACH IT FROM THE FRONT MOUNTING POST.

Howard/McCray

LET.	REVISION	DATE	BY	ECN

DIMENSIONAL TOLERANCES ON PARTS UNLESS OTHERWISE SPECIFIED;
DECIMAL HOLE DIA. & LOCATION +/- 0.016
DECIMAL DIMENSIONS +/- 0.0313
DECIMAL DIMENSIONS-ASSEMBLIES +/- 0.063

SHEAR SIZE: SHEAR SIZE | CNC # 0000
PART SIZE: PART SIZE | YIELD: 00
MATERIAL: MATERIAL | FINISH: FINISH

PART NAME: LOUVER INSTRUCTIONS

DRAWN	DATE	SCALE	SHEET	DRAWING NO.
~KWL~	04/07/06	1/2	1/1	4M7789

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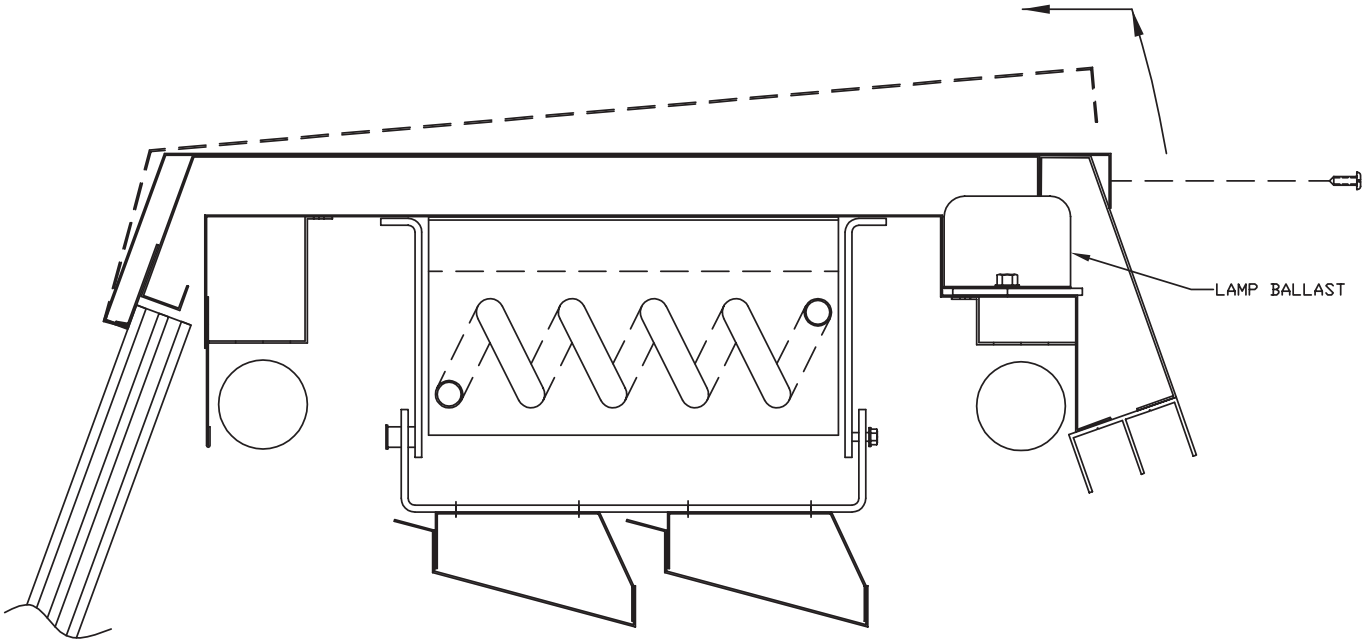
Lamp Ballast Access - No. 4M7790

ITEM	QUAN.	PART NO.	DESCRIPTION



TO ACCESS LAMP BALLAST:
- REMOVE SCREWS FROM REAR OF THE STAINLESS STEEL TOP.
- LIFT THE STAINLESS STEEL TOP UPWARDS AND SLIDE FORWARD TO REMOVE FROM CABINET.
- THE LAMP BALLAST(S) ARE LOCATED IN THE OPENING(S) OF THE EXPOSED INNER TOP.

Howard/McCray

LET.	REVISION	DATE	BY	ECN

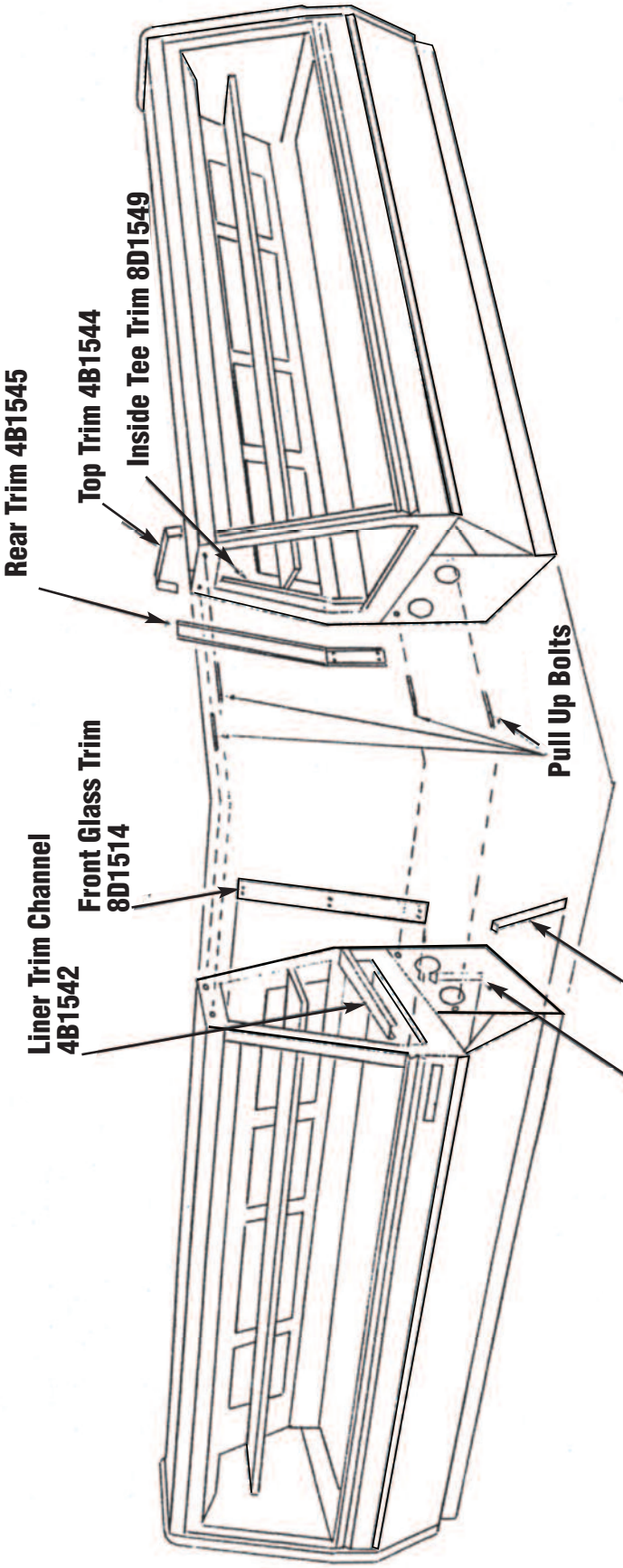
DIMENSIONAL TOLERANCES ON PARTS UNLESS OTHERWISE SPECIFIED;
DECIMAL HOLE DIA. & LOCATION +/- 0.016
DECIMAL DIMENSIONS +/- 0.0313
DECIMAL DIMENSIONS-ASSEMBLIES +/- 0.063

SHEAR SIZE: SHEAR SIZE | CNC # 0000
PART SIZE: PART SIZE | YIELD: 00
MATERIAL: MATERIAL | FINISH: FINISH

PART NAME: LAMP BALLAST ACCESS

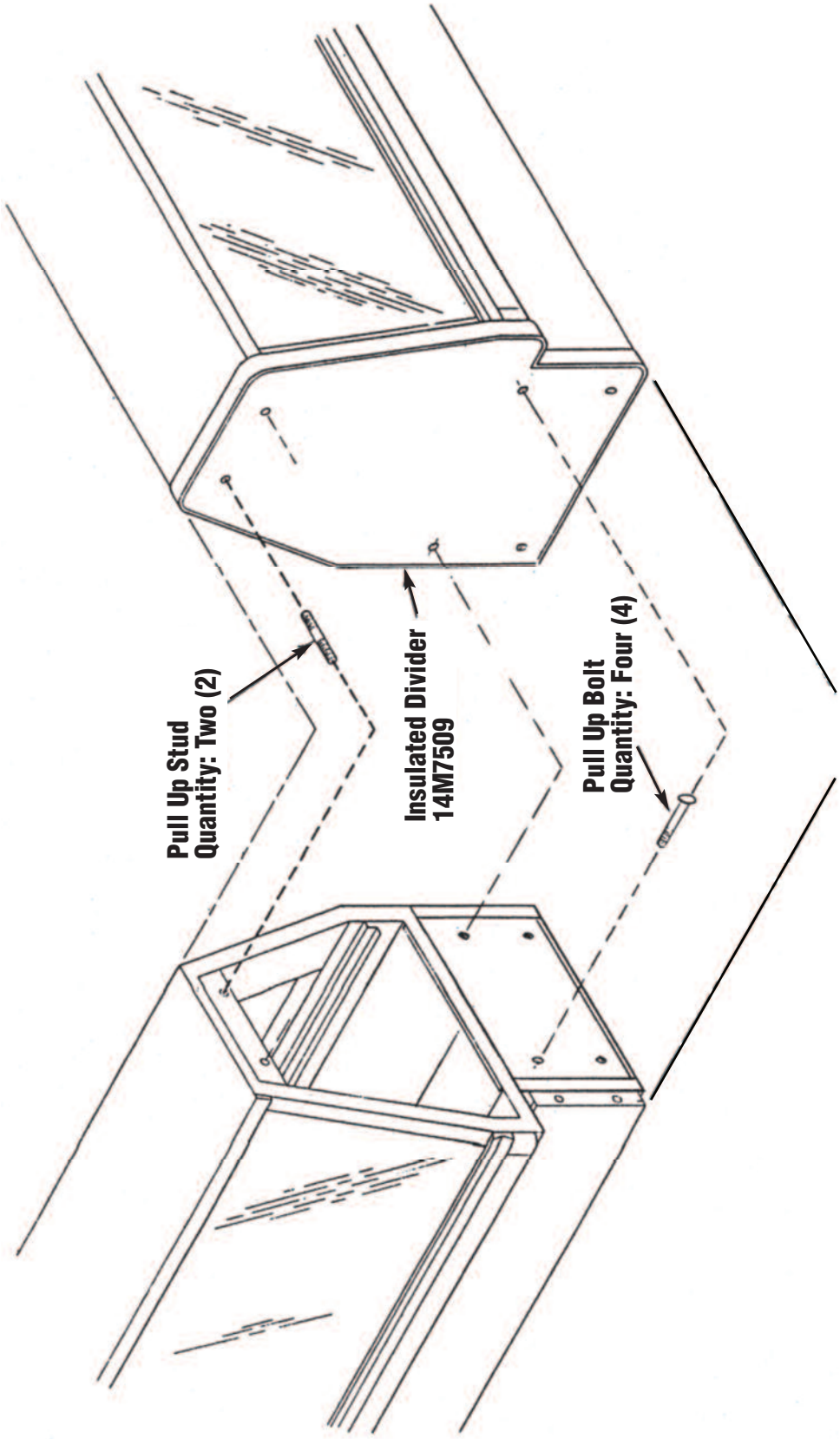
DRAWN	DATE	SCALE	SHEET	DRAWING NO.
~KWL~	04/10/06	1/2	1/1	4M7790

Joint Instruction Drawing - No. 4B7767

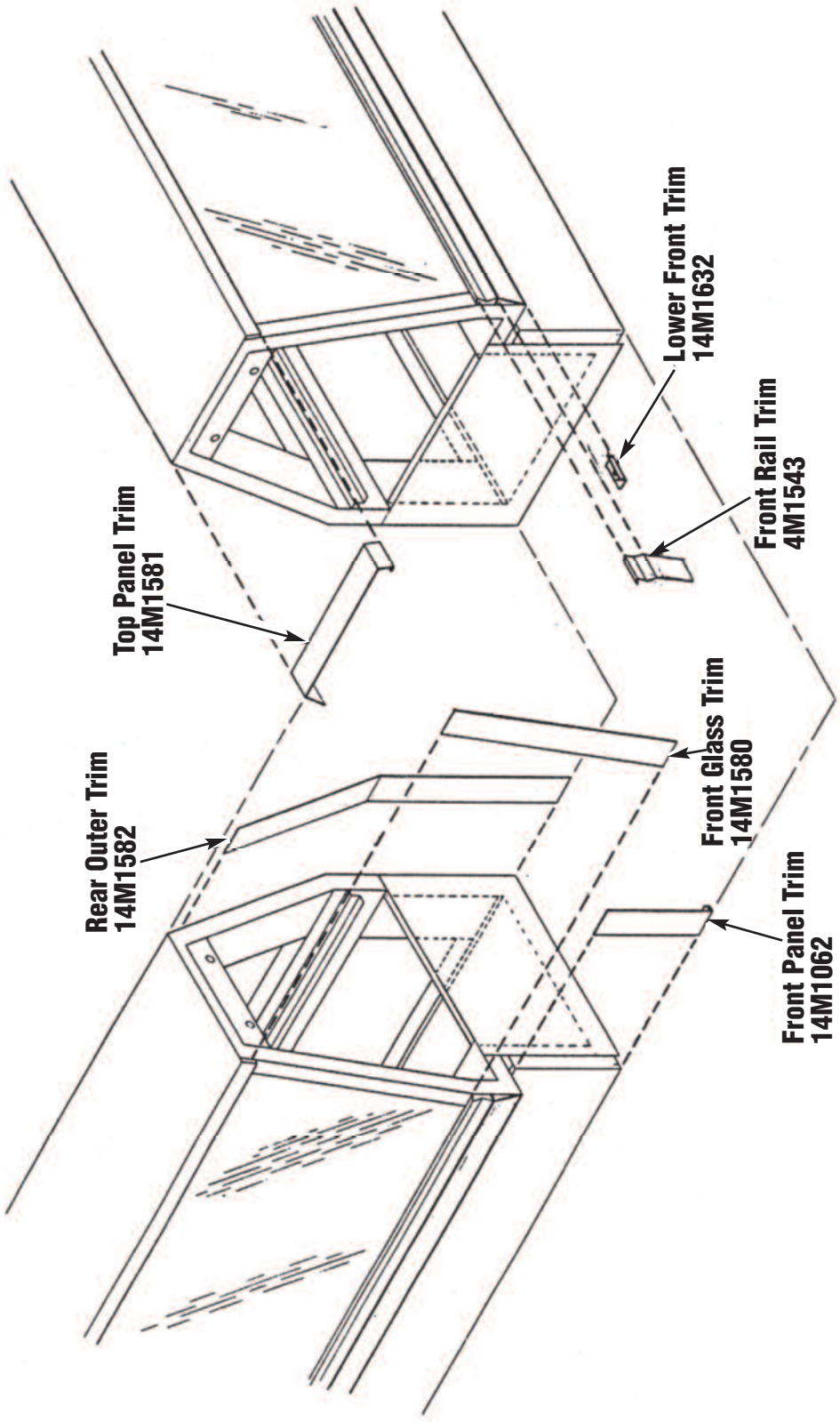


CAUTION:
Do not use bolts to pull cases together. Level and align them first & then jar them together as you tighten the bolts. The best methods is to use clamps

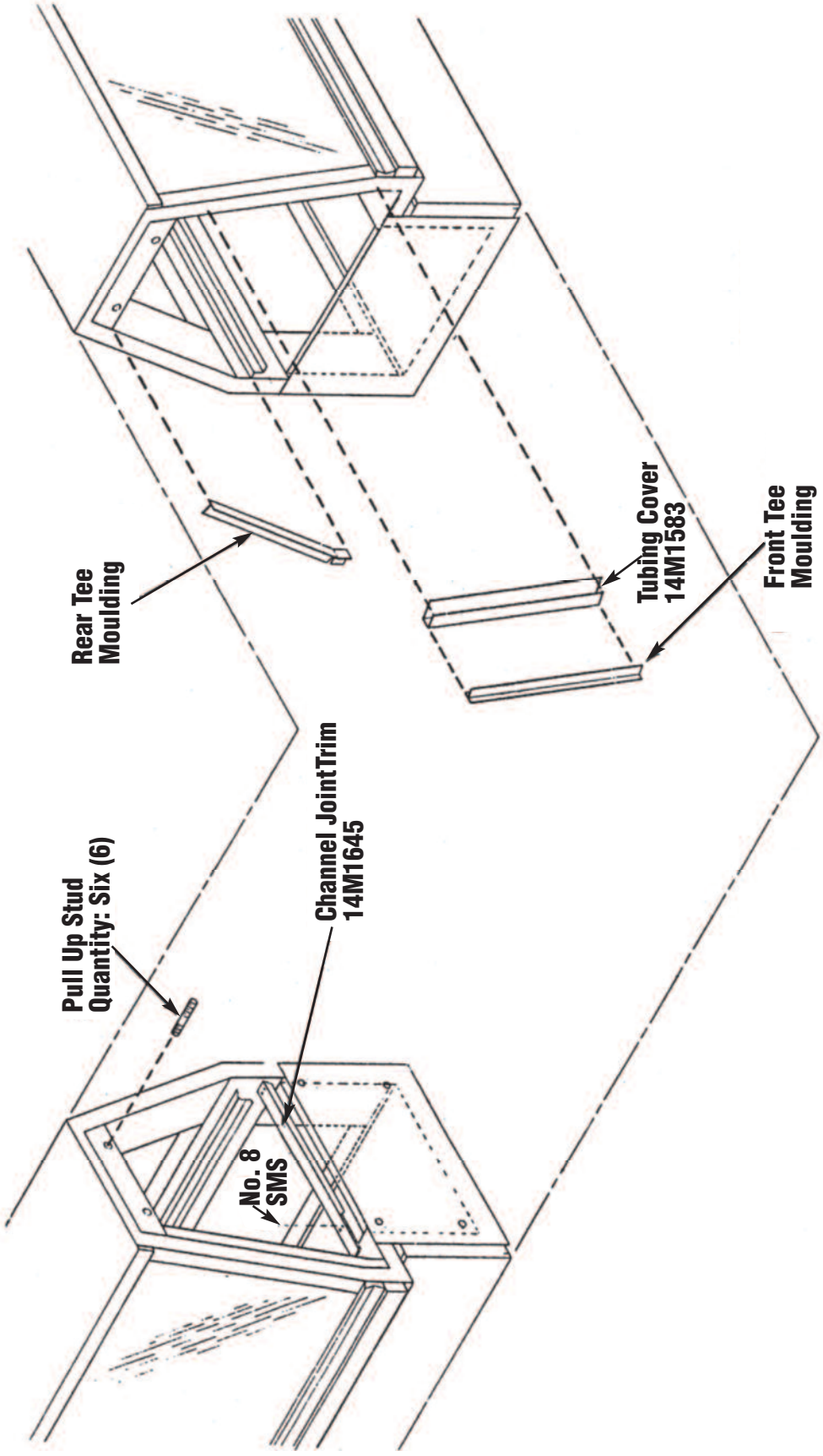
Joint Instructions Insulation Divider, Drawing - No. 14M7801



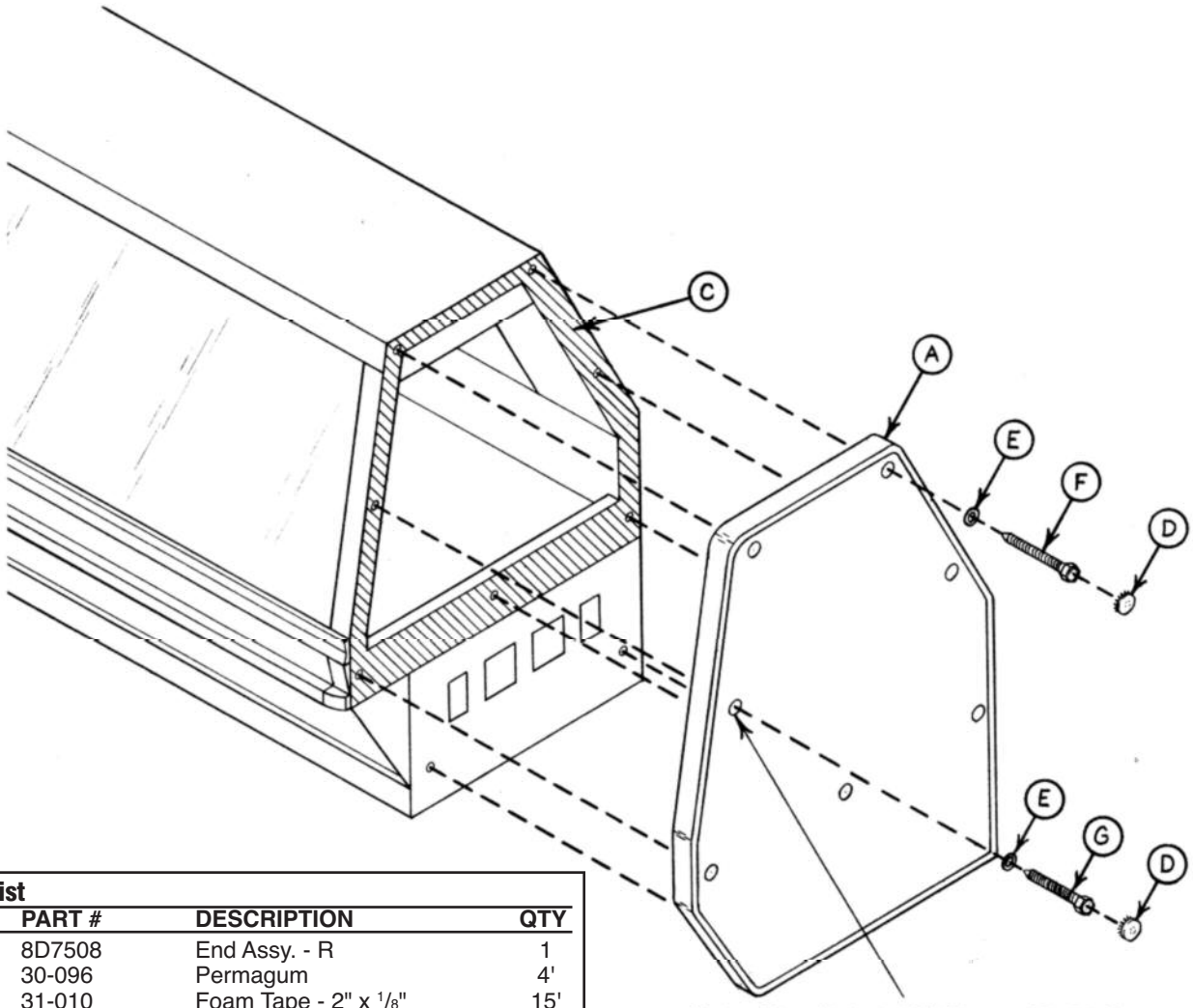
Joint Trim Instruction Outer, Drawing - No. 14M7816



Joint Trim Instructions Inner, Drawing - No. 14M7801



End Installation, Drawing - No. 8D7515



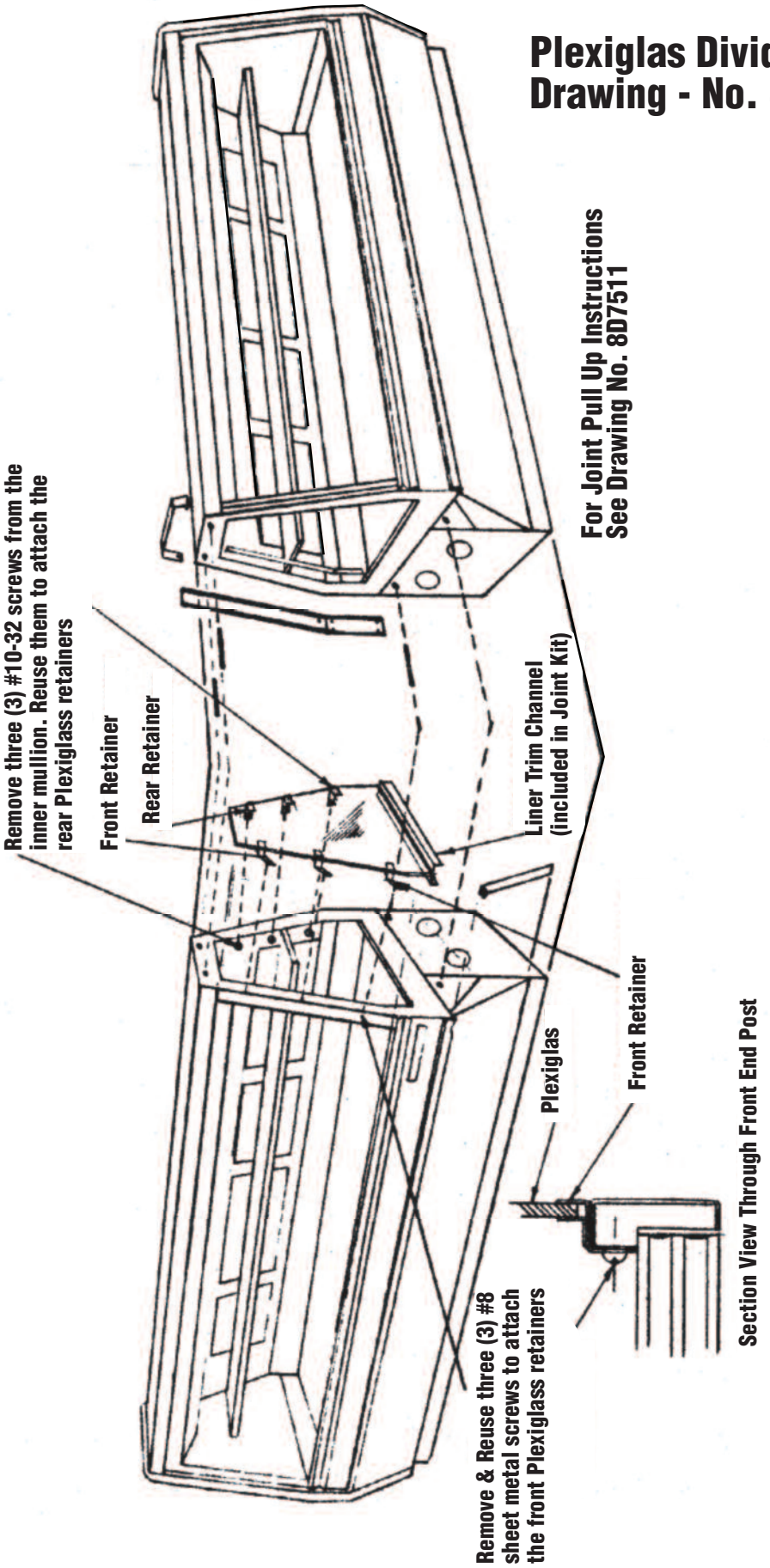
Parts List

ITEM	PART #	DESCRIPTION	QTY
A	8D7508	End Assy. - R	1
B	30-096	Permagum	4'
C	31-010	Foam Tape - 2" x 1/8"	15'
D	80-059	Chrome Plug - ¾"	7
E	81-011	Flat Washer - 5/8"	7
F	81-021	Hex Hd. Screw - #14 x 2"	6
G	81-041	Hex Hd. Screw - #14 x 1½"	1

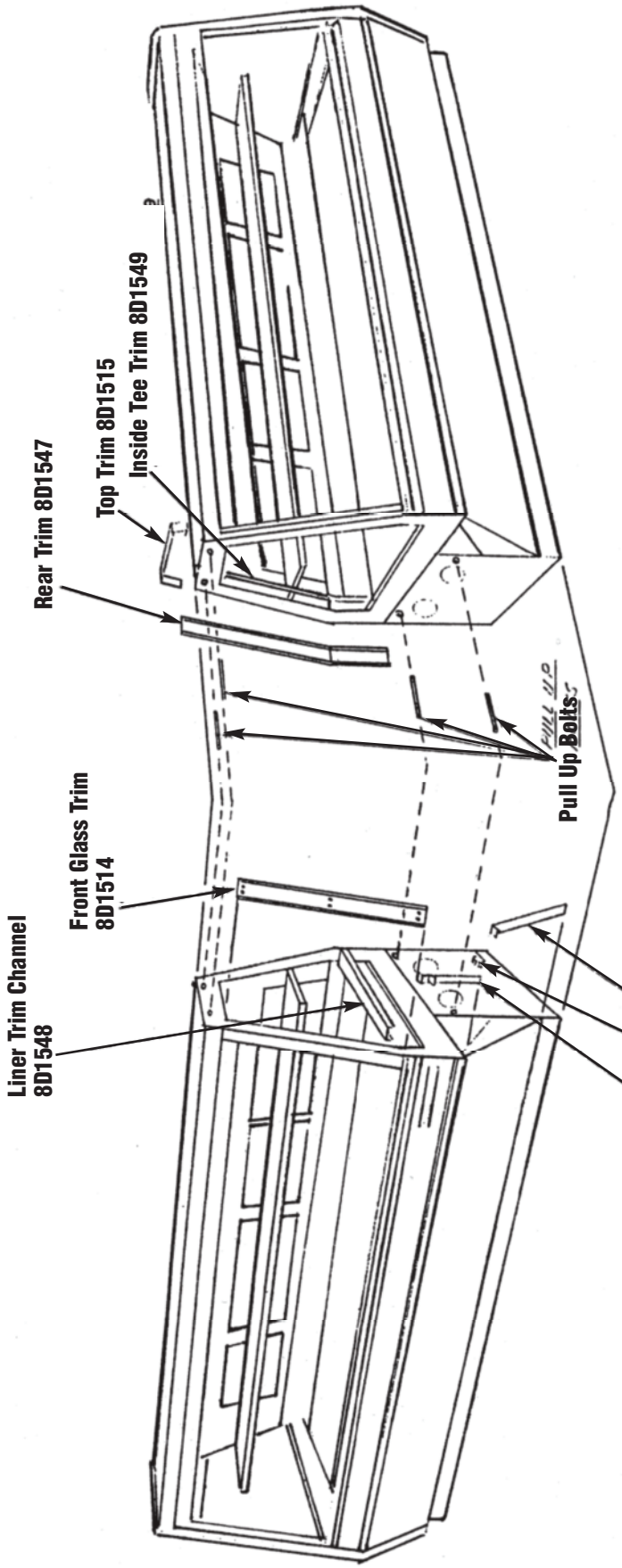
End Installation Instructions

1) Place Foam Tape (31-010) on end of case as shown
2) Install all Screws and Washers
   (1-1/2" Screw in the center front hole ONLY)
3) Pull-up end to case with Screws-SNUG NOT TIGHT
4) Tighten Front Screws
5) Tighten remaining Screws
6) Fill holes with Permagum (30-096)
7) Cover holes with Chrome Plugs (80-059)

Plexiglas Divider Installation, Drawing - No. 8D7531



End Installation, Drawing - No. 8D7511



CAUTION:
Do not use bolts to pull cases together. Level and align them first & then jar them together as you tighten the bolts. The best methods is to use clamps