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SCE170
Undercounter Cuber

Technical Training

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Description

- SCE170
  - Air Cooled or
  - Water Cooled
  - Two piece roto-molded cabinet

SCE170 Features

- Self Contained Cuber
  - A storage bin is part of the cabinet
- Fits under the counter
  - 24” wide x 39” high x 24” deep
- It can be built in
  - Air flow is in the front and out the front
- Easy to install
- Easy to service

Easy Installation

- Includes a power cord
- Plumbing fittings on the back panel
  - A 3/8” male flare water inlet fitting
  - Two 3/4” female pipe thread drains
    - One for the bin
    - One for the purge drain

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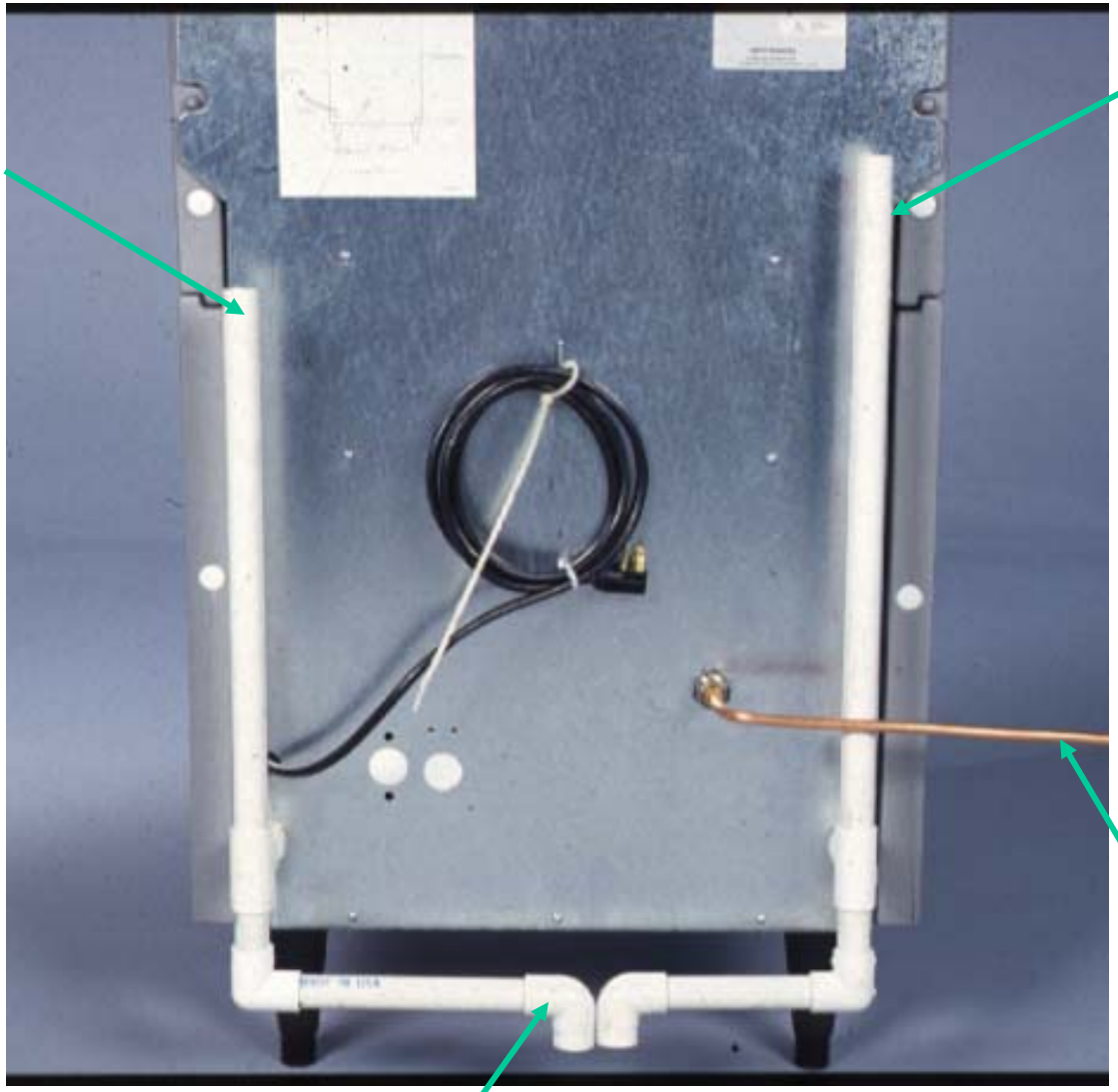
Back View



Good Serviceability

- Most service can be done with the machine installed
  - The water pump and float valve are inside the hood
  - The control box and air filter are accessible from the front
  - The fan and high pressure reset are accessible from the front
  - The refrigeration system access valves are at the front.

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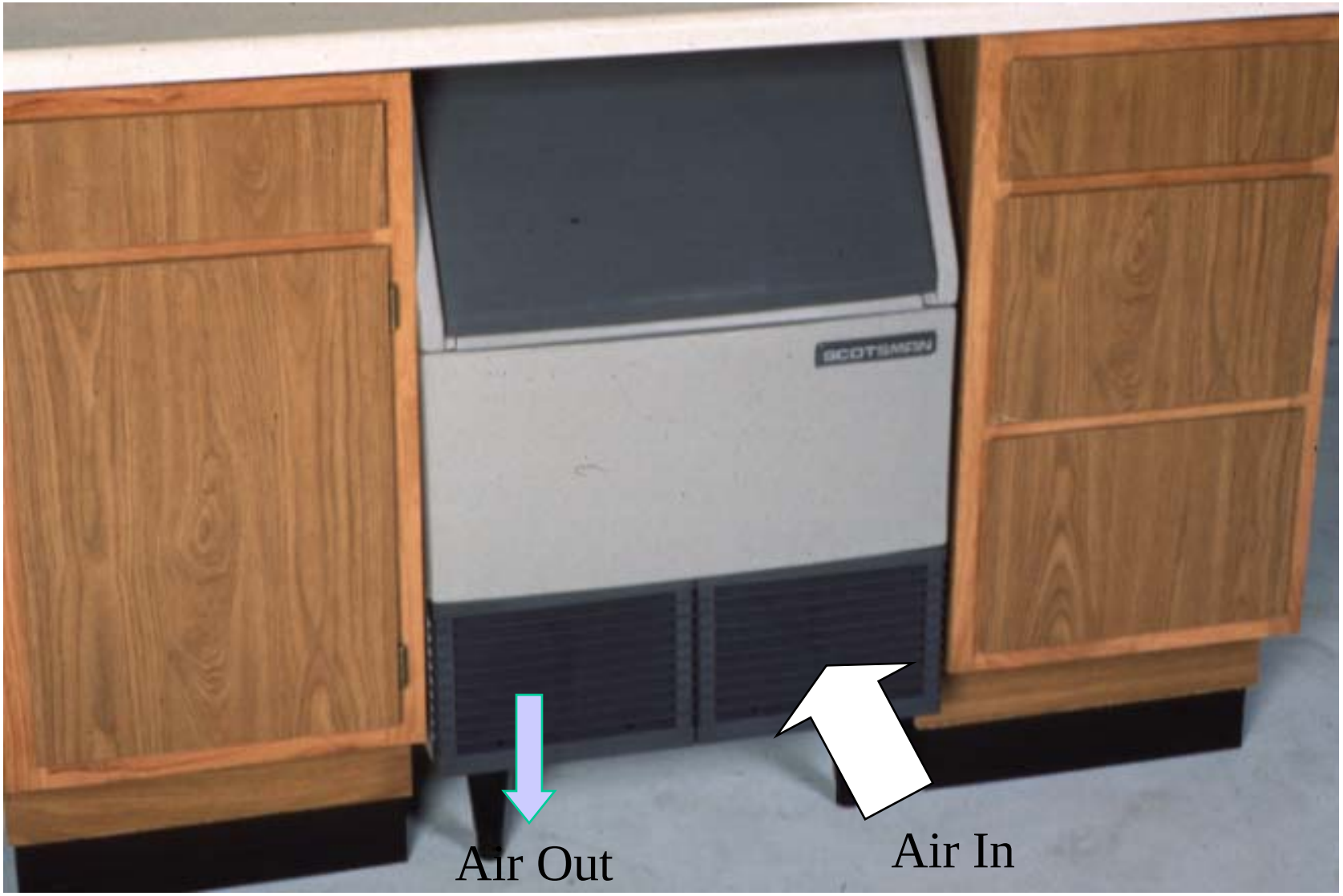
Installed Built-In



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Service Access

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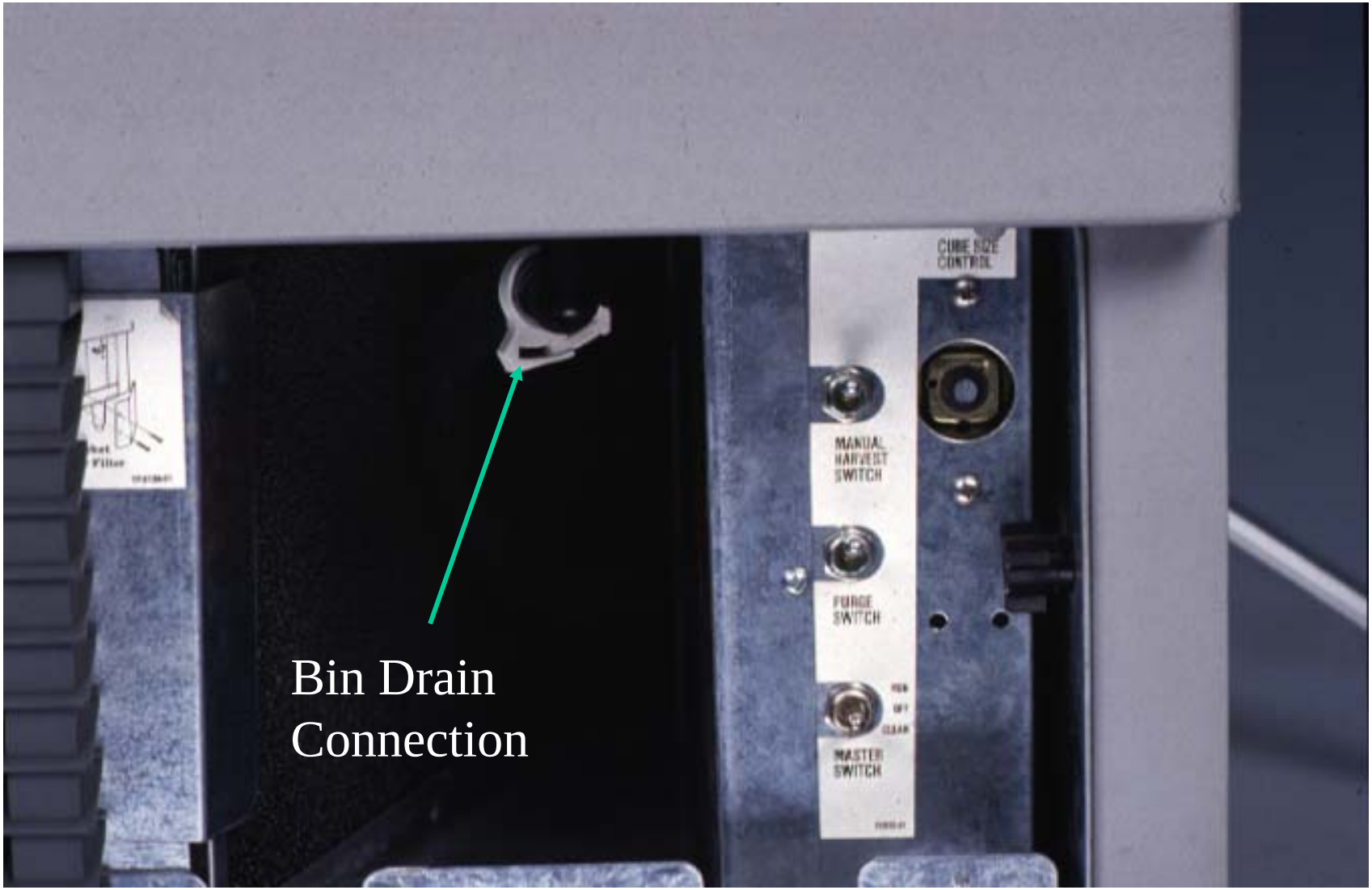

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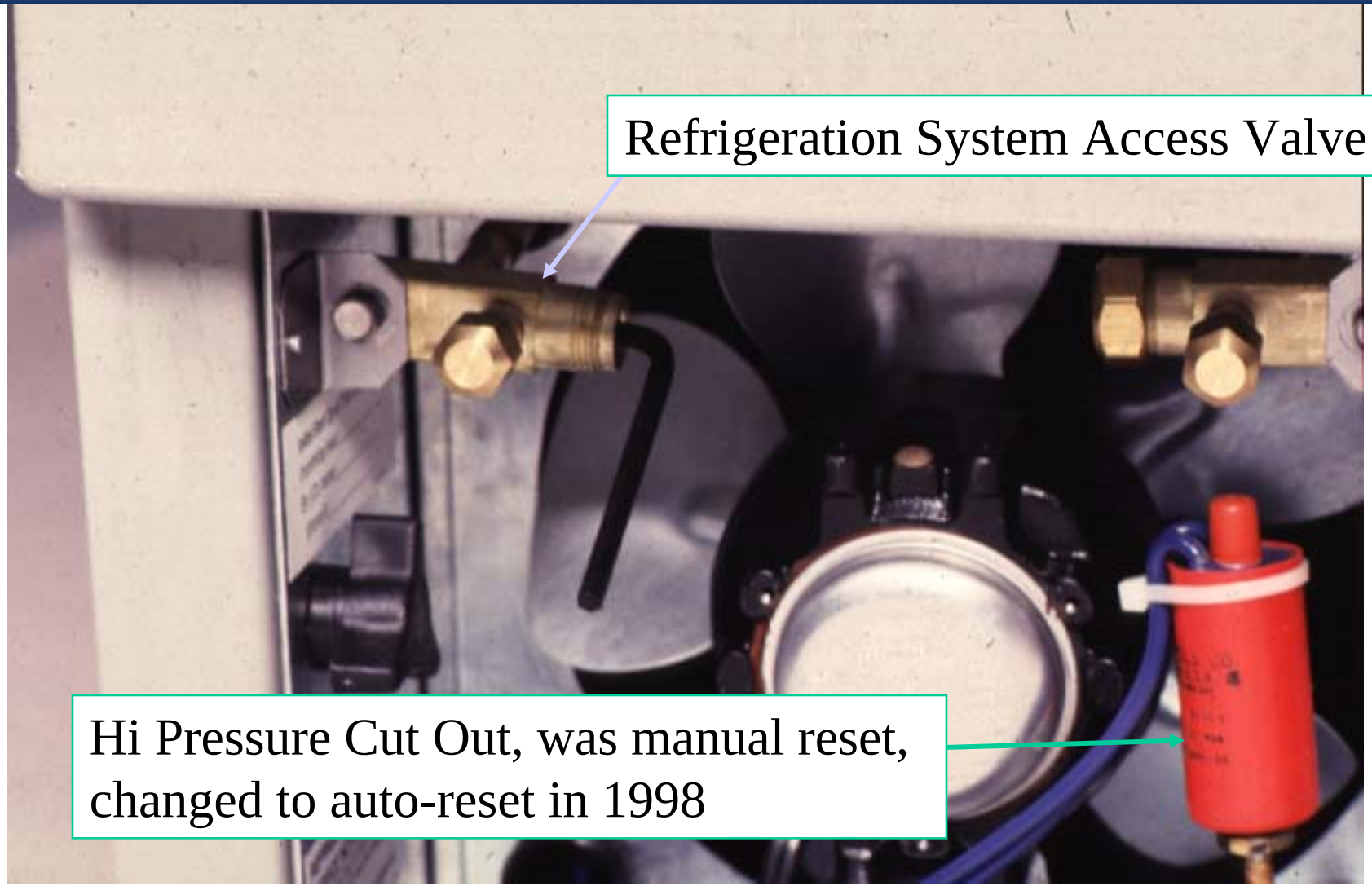

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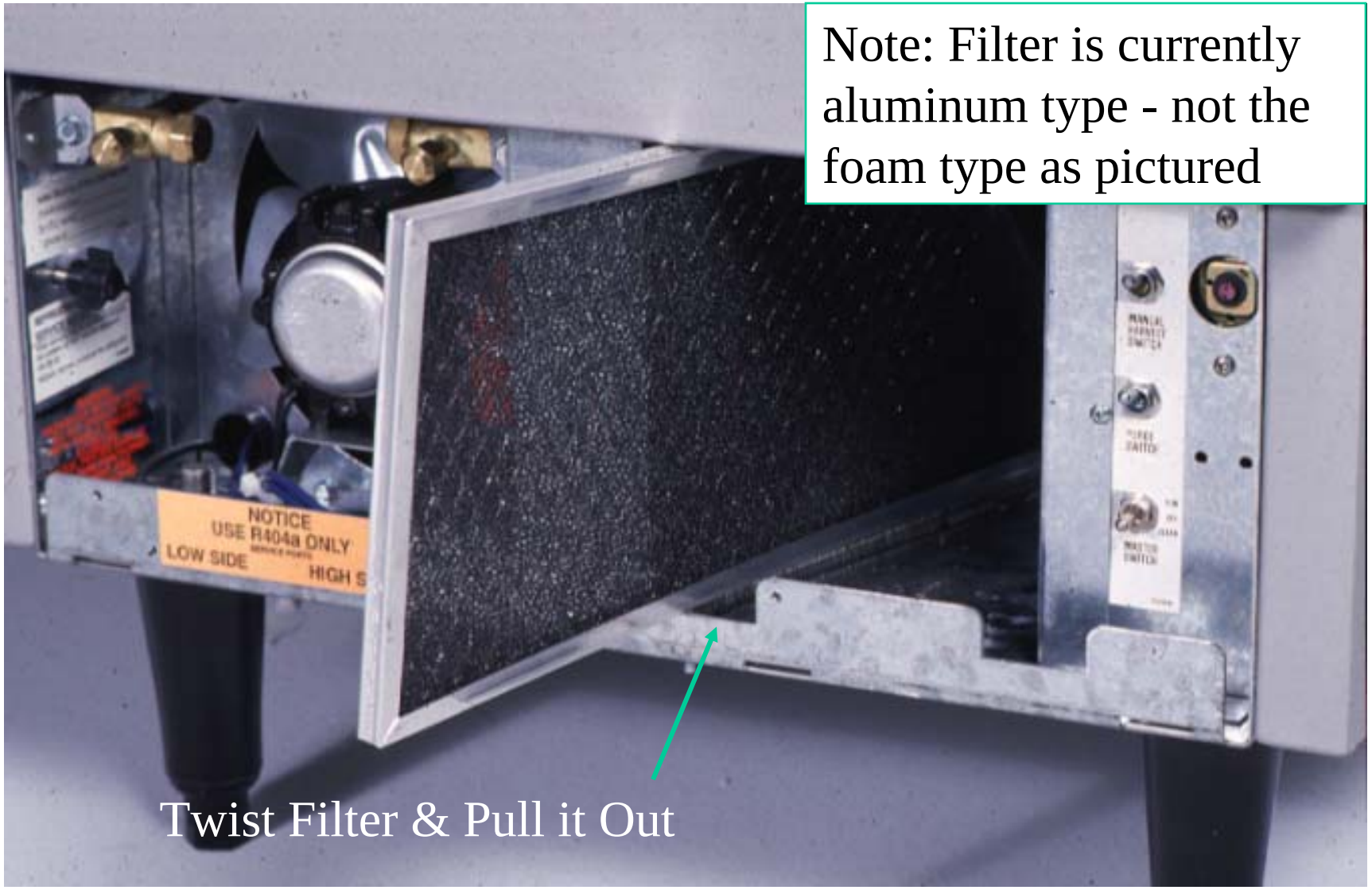
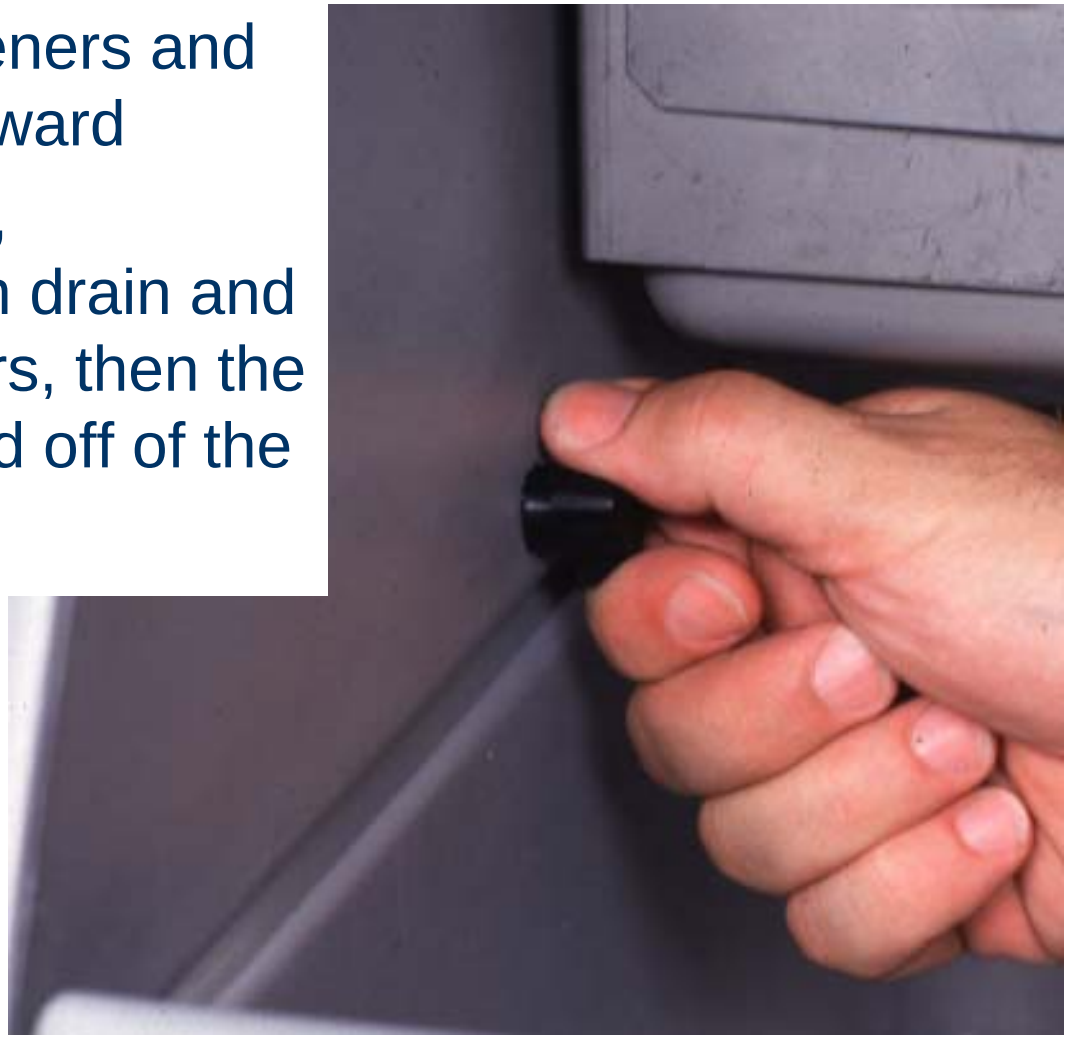
Air Filter Removal



Note: Filter is currently aluminum type - not the foam type as pictured

Service Access

- The cabinet is removable
  - Remove two fasteners and slide the hood forward
  - Remove the grills, disconnect the bin drain and two more fasteners, then the bin may be rotated off of the chassis



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Service Access

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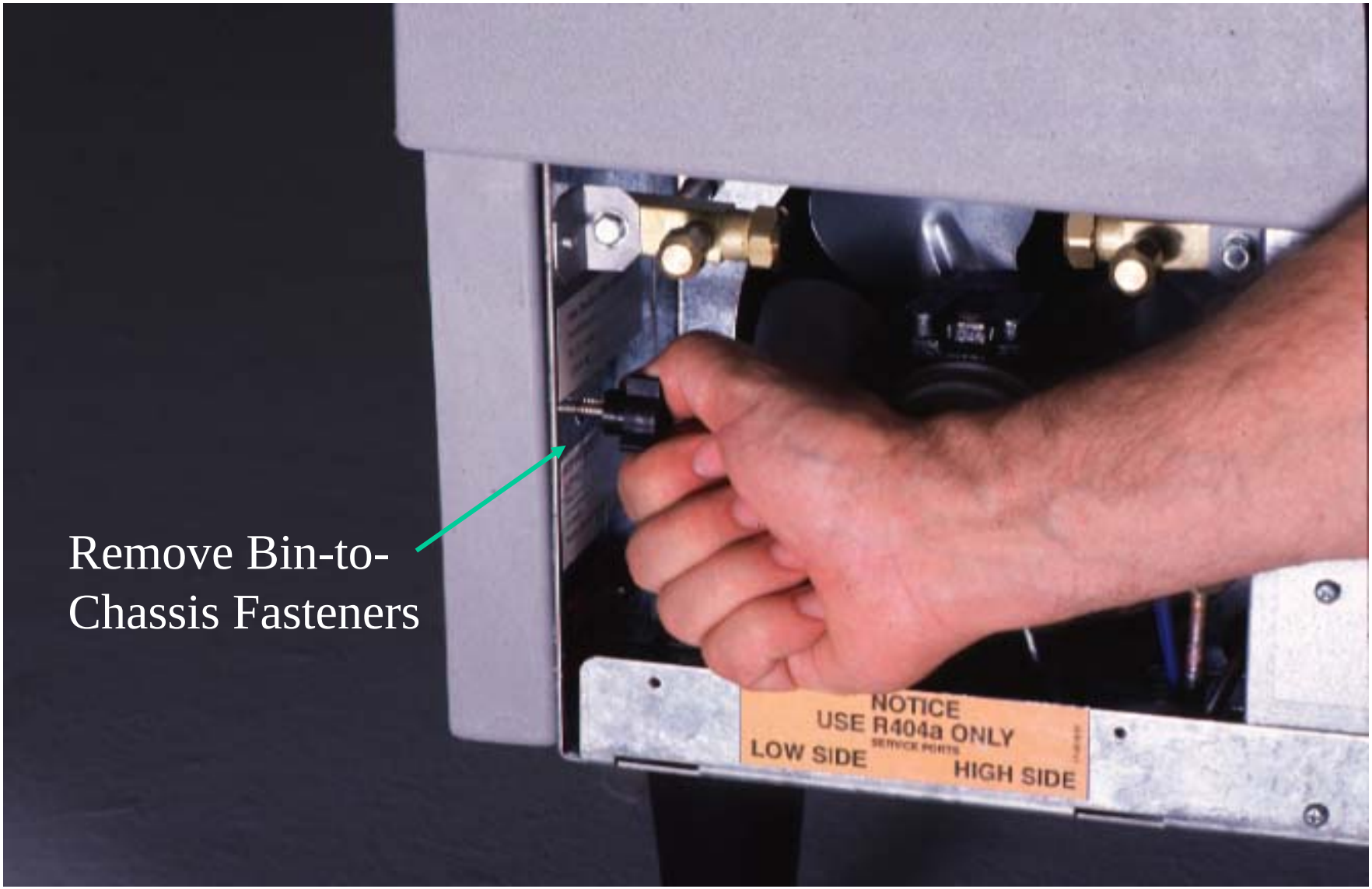
Service Access



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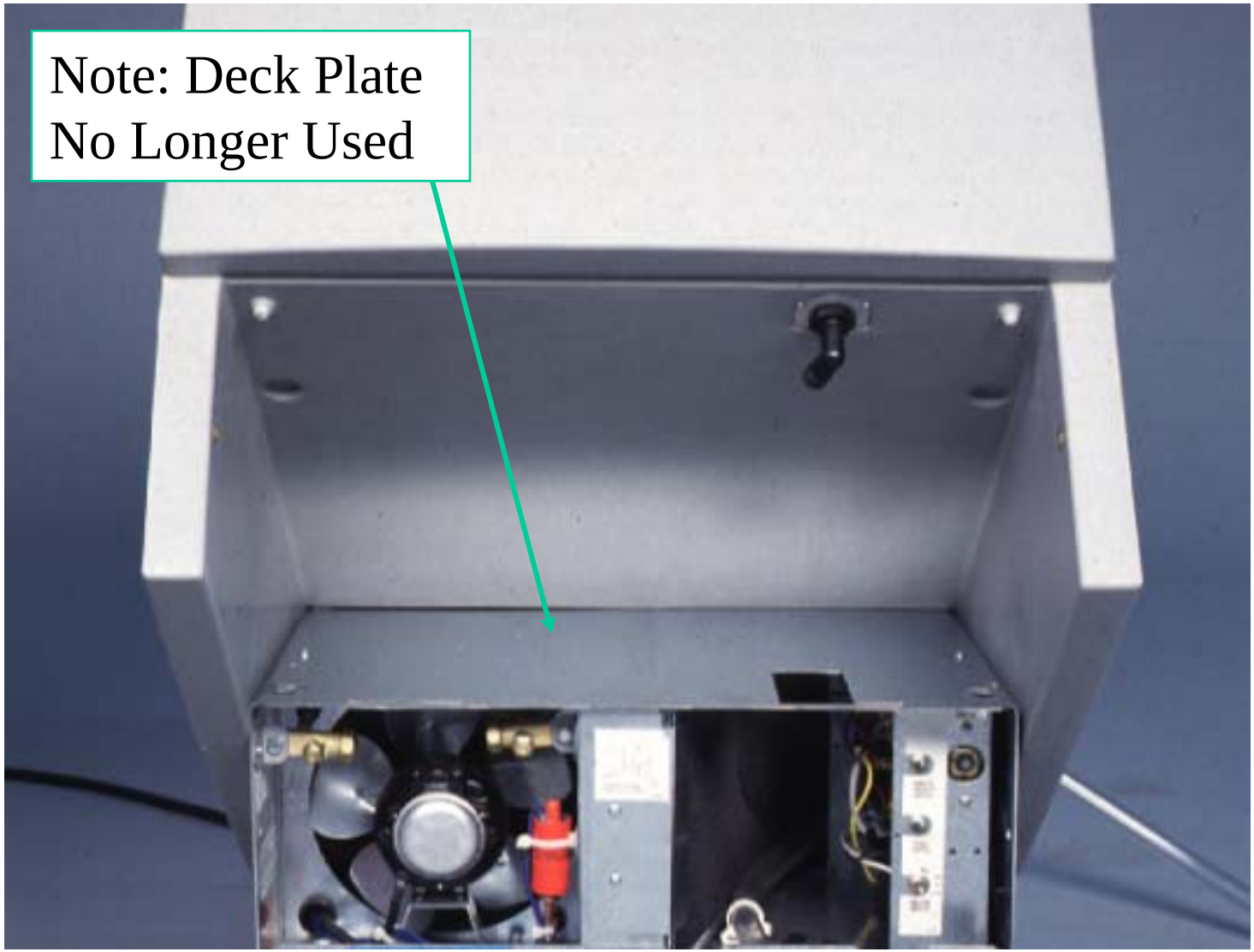
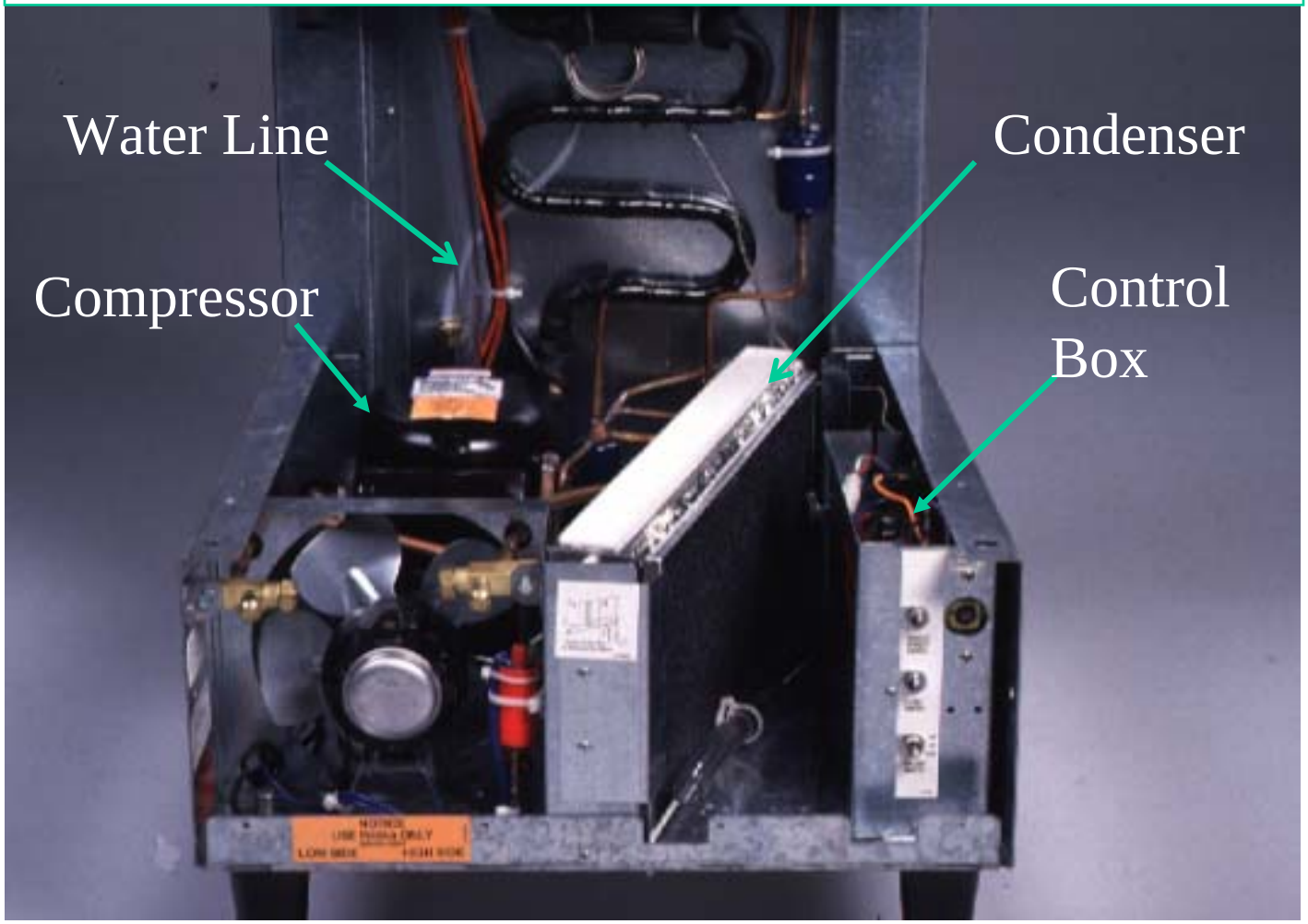
Bin Removal



Service Access

Note: Air Cooled Unit Cannot Operate As Shown - Bin or Cover Plate (prior units) Must Be In Place!



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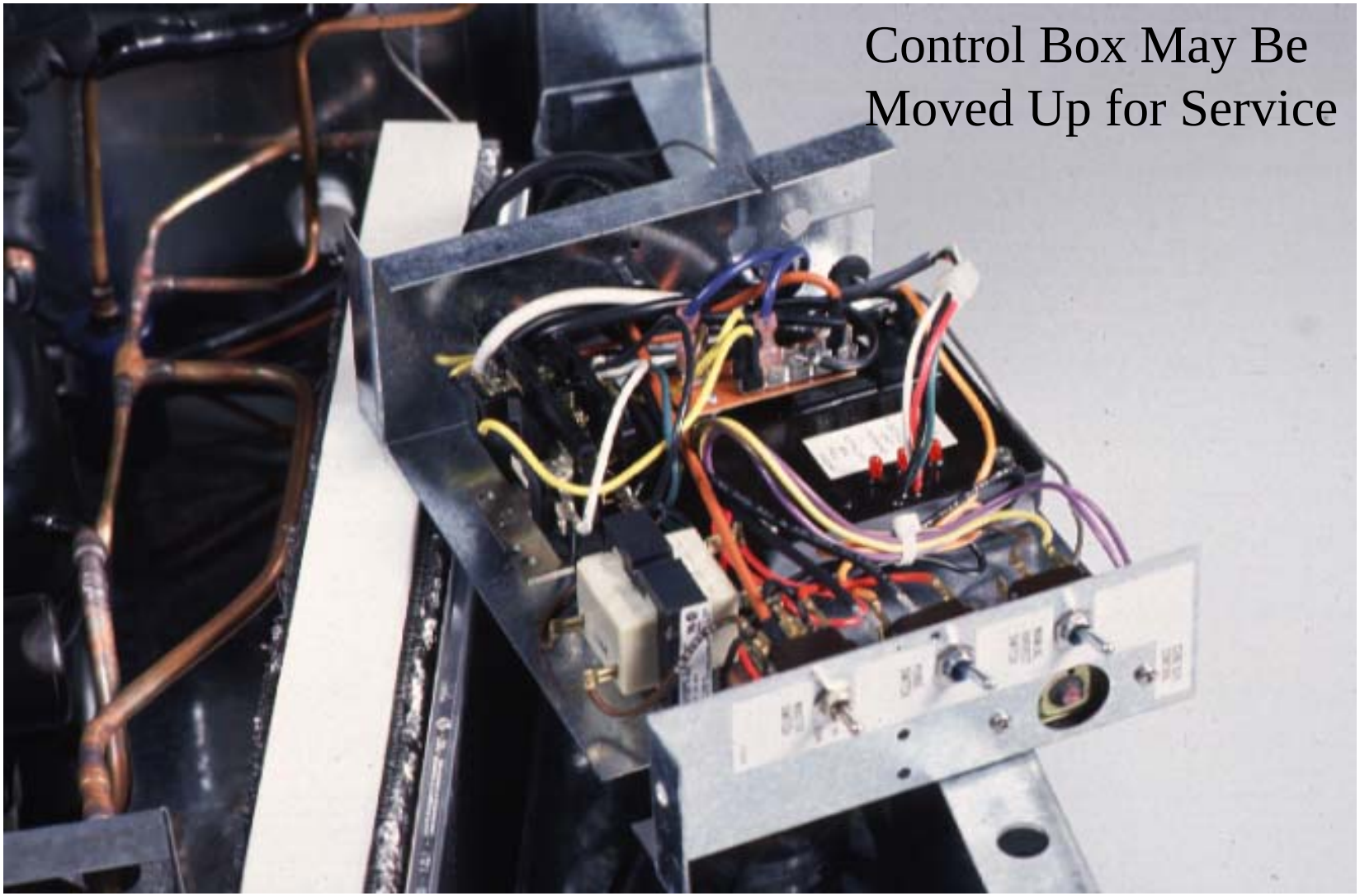
Control Box Service



How does it work?

- The evaporator is high phosphorus, electroless nickel plated copper
- The bin control is a “magnetic” curtain switch, which also acts as a harvest termination control
- A cube size thermostat controls the freeze cycle time.

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Construction: Evaporator

Water System #1

- Shut off valve/strainer just above the float valve
- The water pump forces water thru the tube in the water distributor and over the evaporator

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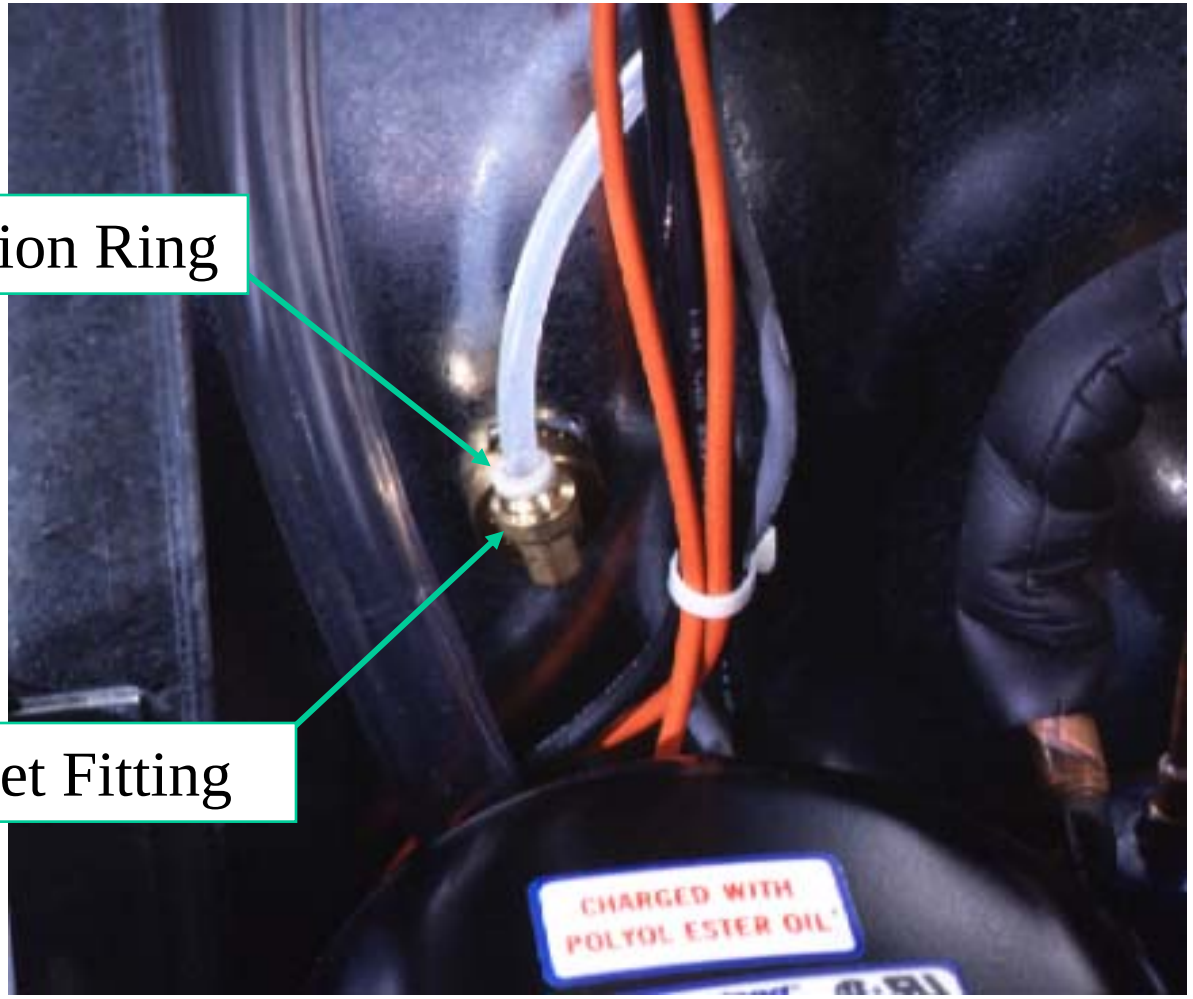
Water Line Fitting



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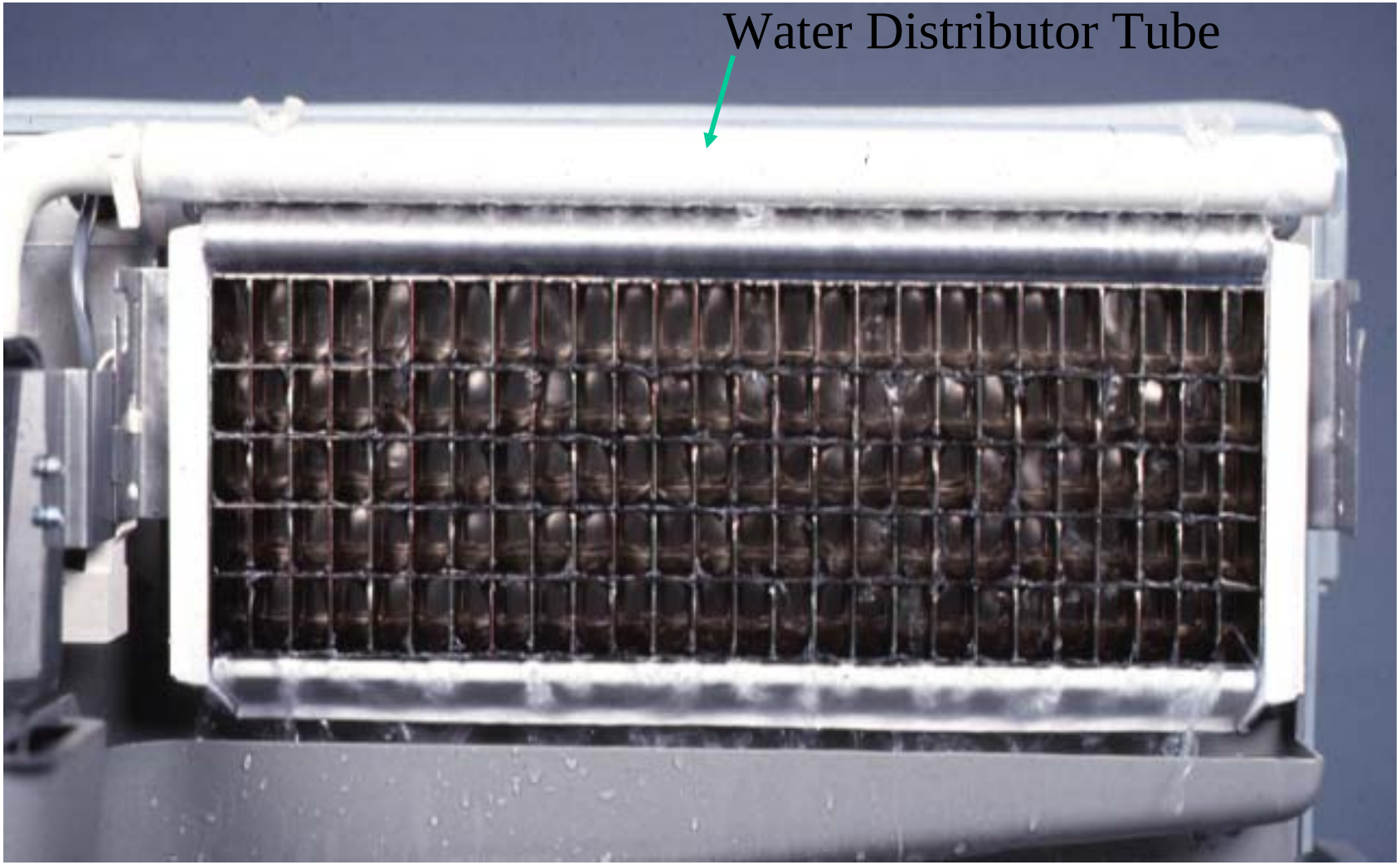
Water Distribution



Water System #2

- The water level in the reservoir is maintained by the float valve
  - The typical water level is about 1 and one half inches from the top
- During the Harvest Cycle the purge valve, located behind the pump, is open and the pump forces water out the purge drain
  - Note: The purge drain is a gravity drain and must be properly installed

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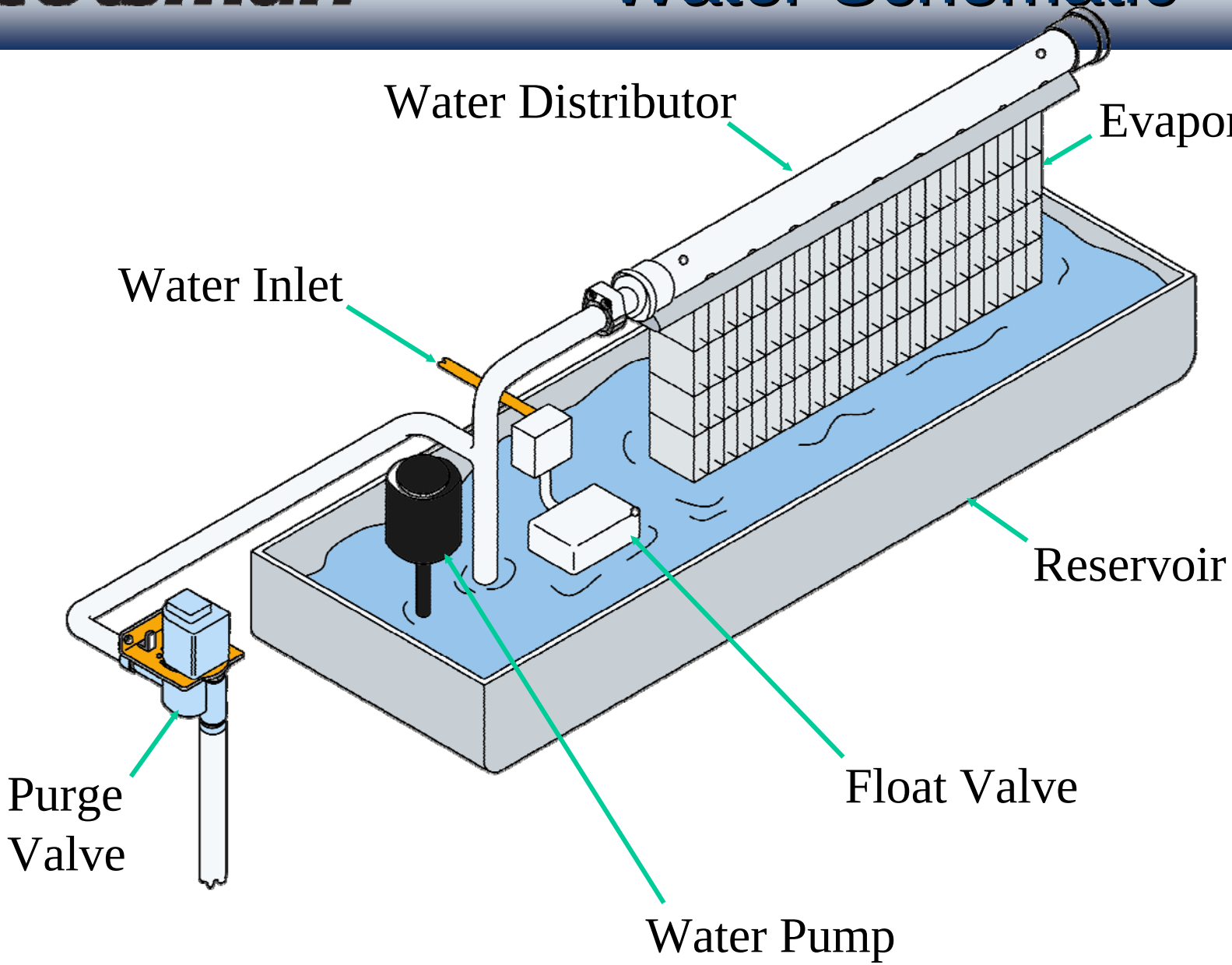
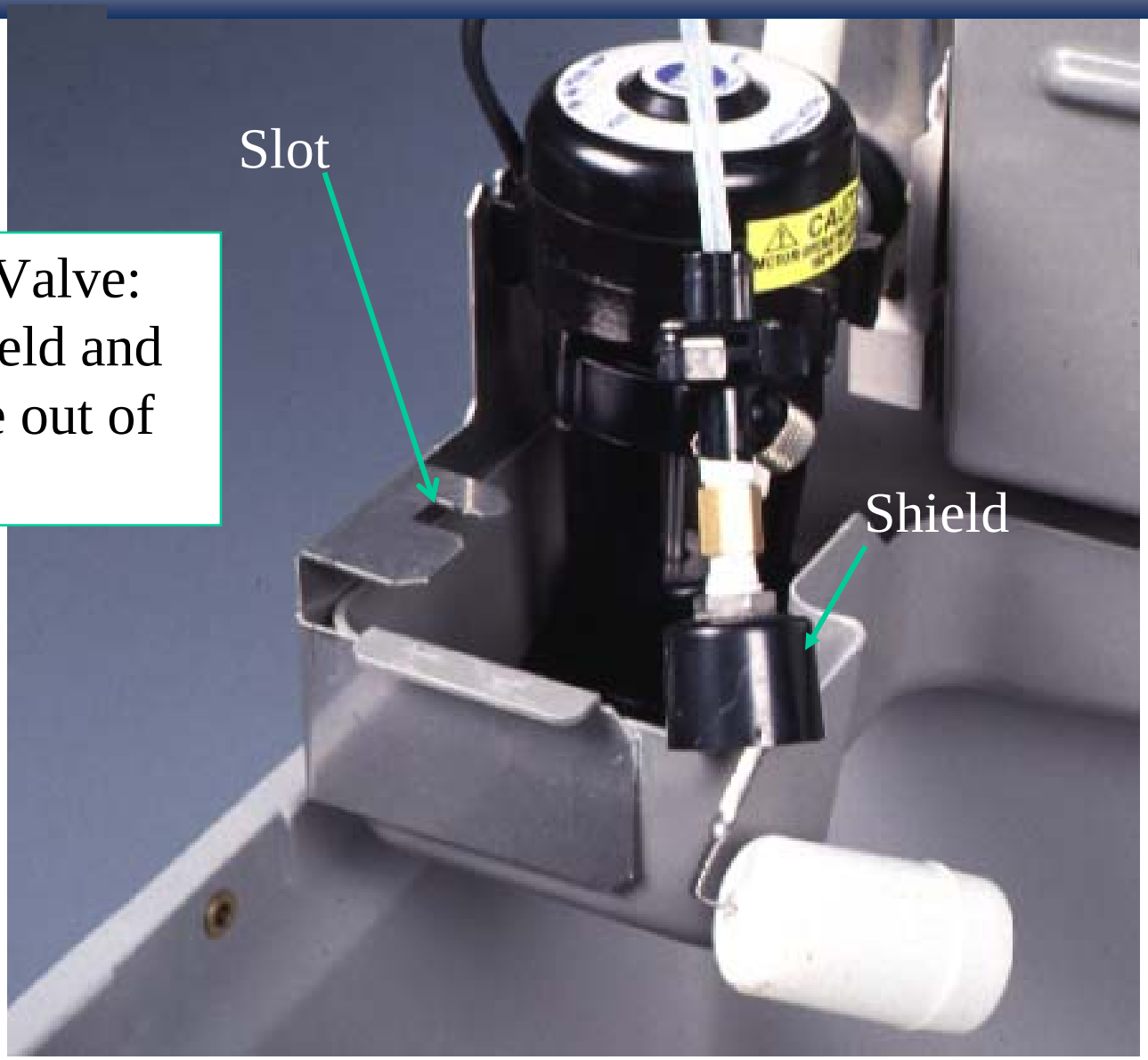
Water Schematic



Float Valve

Remove Float Valve:
Loosen the Shield and Slide the Valve out of the Slot



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Pump Removal

Scotsman® Water Distributor Mounting

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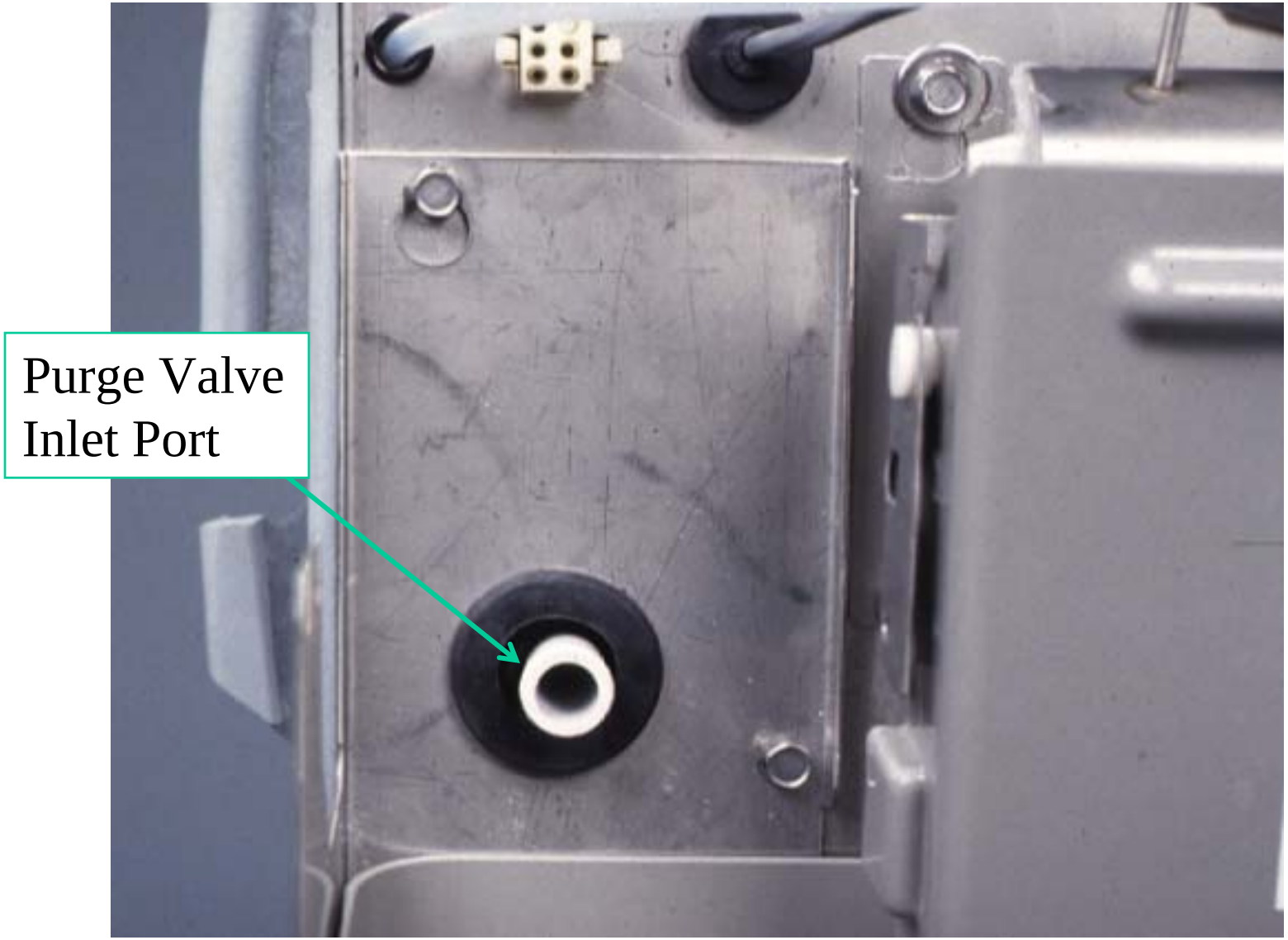
Purge Valve Removal



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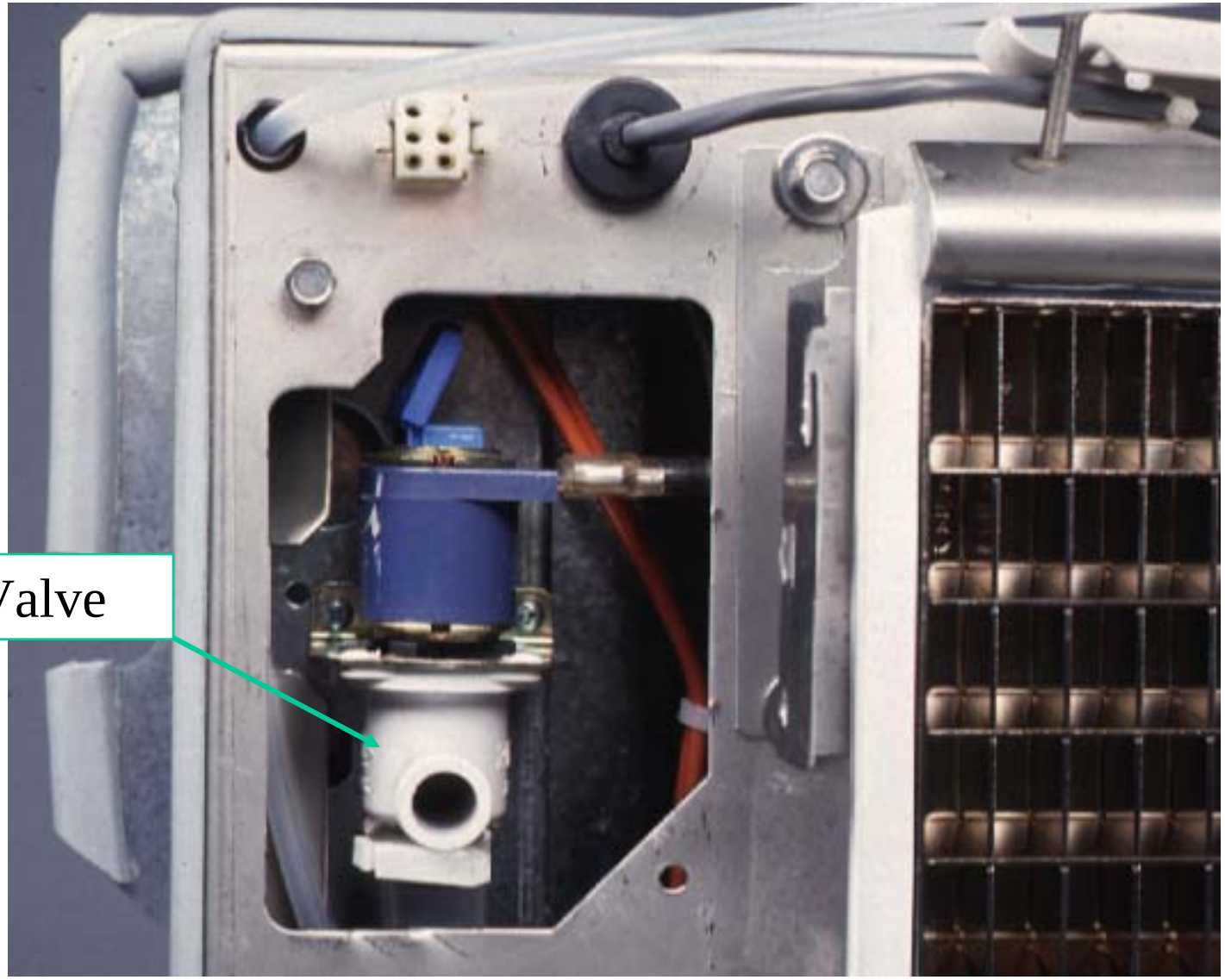
Purge Valve Removal



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Purge Valve Removal

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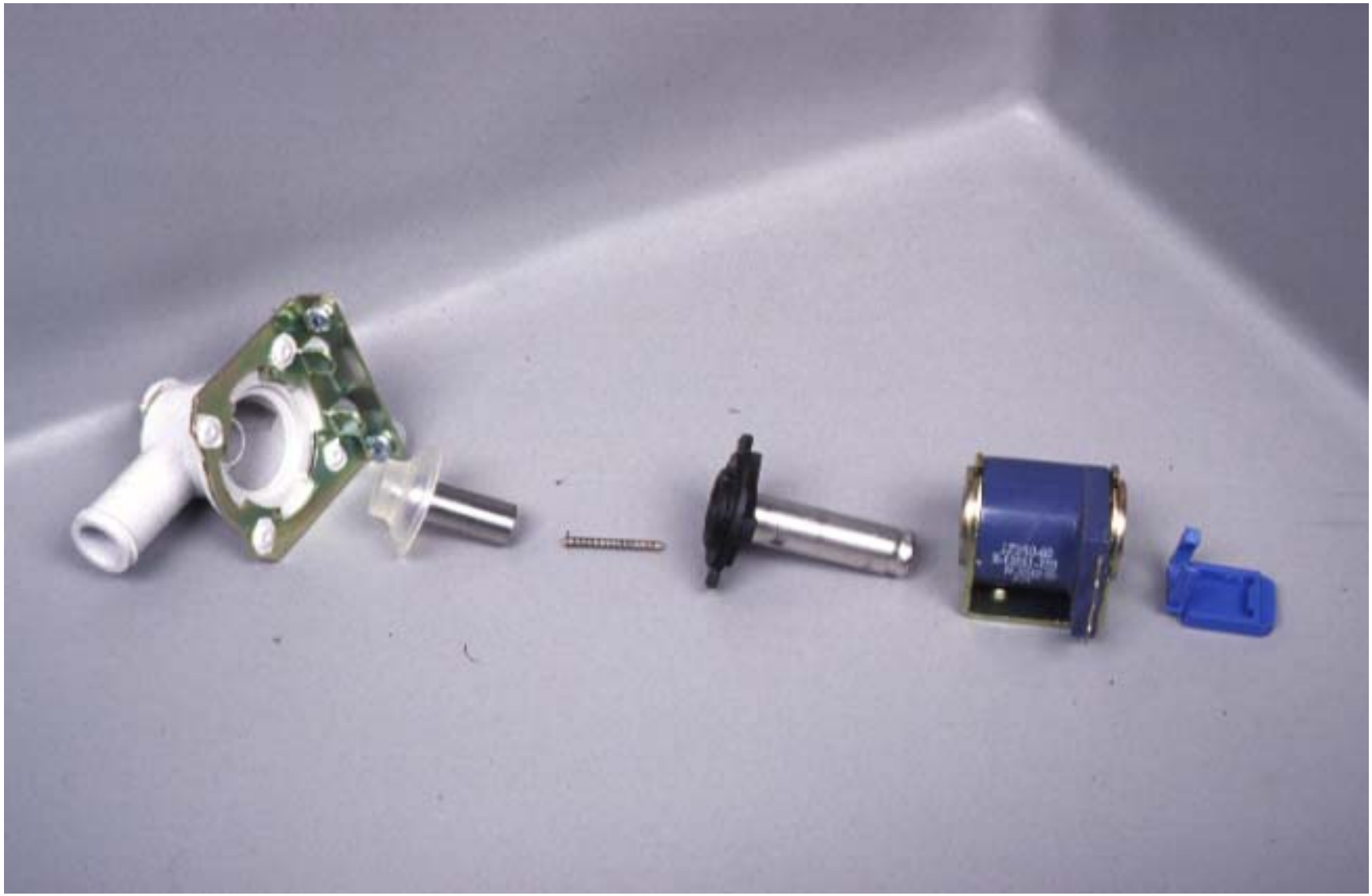
Purge Valve Components

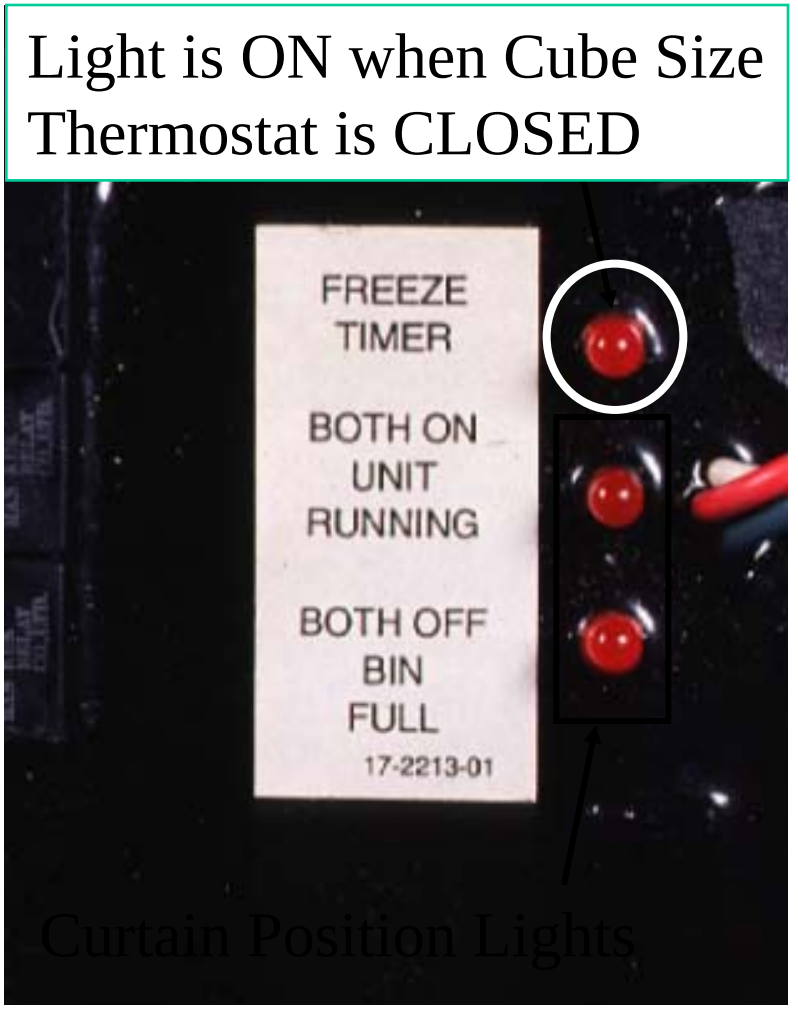


Electrical Sequence

- At the beginning of the freeze cycle, the compressor, water pump and fan motor are operating
  - Two lights on the control module will be ON
- When the suction line temperature falls to the cube size thermostat's cut in point (about 8 degrees), power is supplied to an electronic 4 minute timer in the control module

Control Module

- Indicator Lights
  - Freeze Timer
    - ON when Cube Size Thermostat is CLOSED
  - Curtain Position Lights
    - Both ON when Curtain is FULLY CLOSED
  - Note: Module Position Rotated 90º in 1998



Electrical Sequence #2

- When the electronic timer is On, the Freeze Timer light on the control board will be ON
- At the end of the freeze cycle, the control module switches
  - The fan motor OFF
  - The hot gas valve and purge valves ON
- The machine remains in the Harvest Cycle until the slab of ice falls off, opening the curtain

Electrical Sequence #3

- After the slab has opened the curtain, if the curtain re-closes the machine will go back into another freeze cycle
- If the bin is full the last slab will keep the curtain open and the machine will switch OFF
  - Note: The curtain may be removed any time during the freeze cycle without causing a problem, however it should not be moved during a harvest cycle

SCE170 Initial Start Up

- Check the installation
  - Both drains must be vented
  - Water filter changed
- Check curtain position
- Switch water and power on
- Switch unit on
- Check cube size
  - Complete slab must fall
  - About a 3/16” bridge
  - Maximum of a 1/16” dimple

SCE170 Start Up #2

- Check harvest time
  - Should be about 3 minutes
  - If much longer than 2 minutes
    - Adjust cube size smaller
- Check purge drain
  - Must be free flowing
- Check drains and water supply for any leaks

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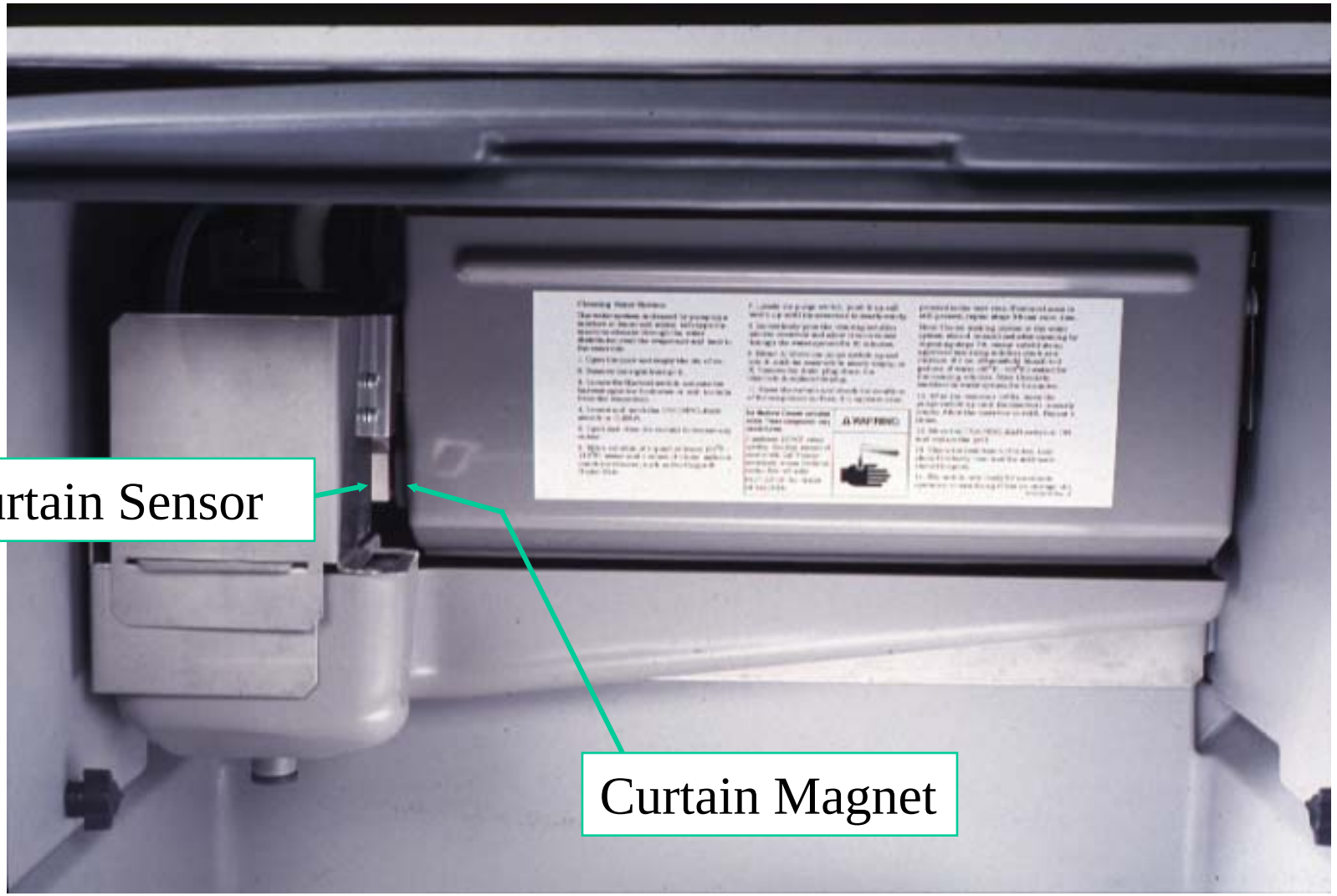
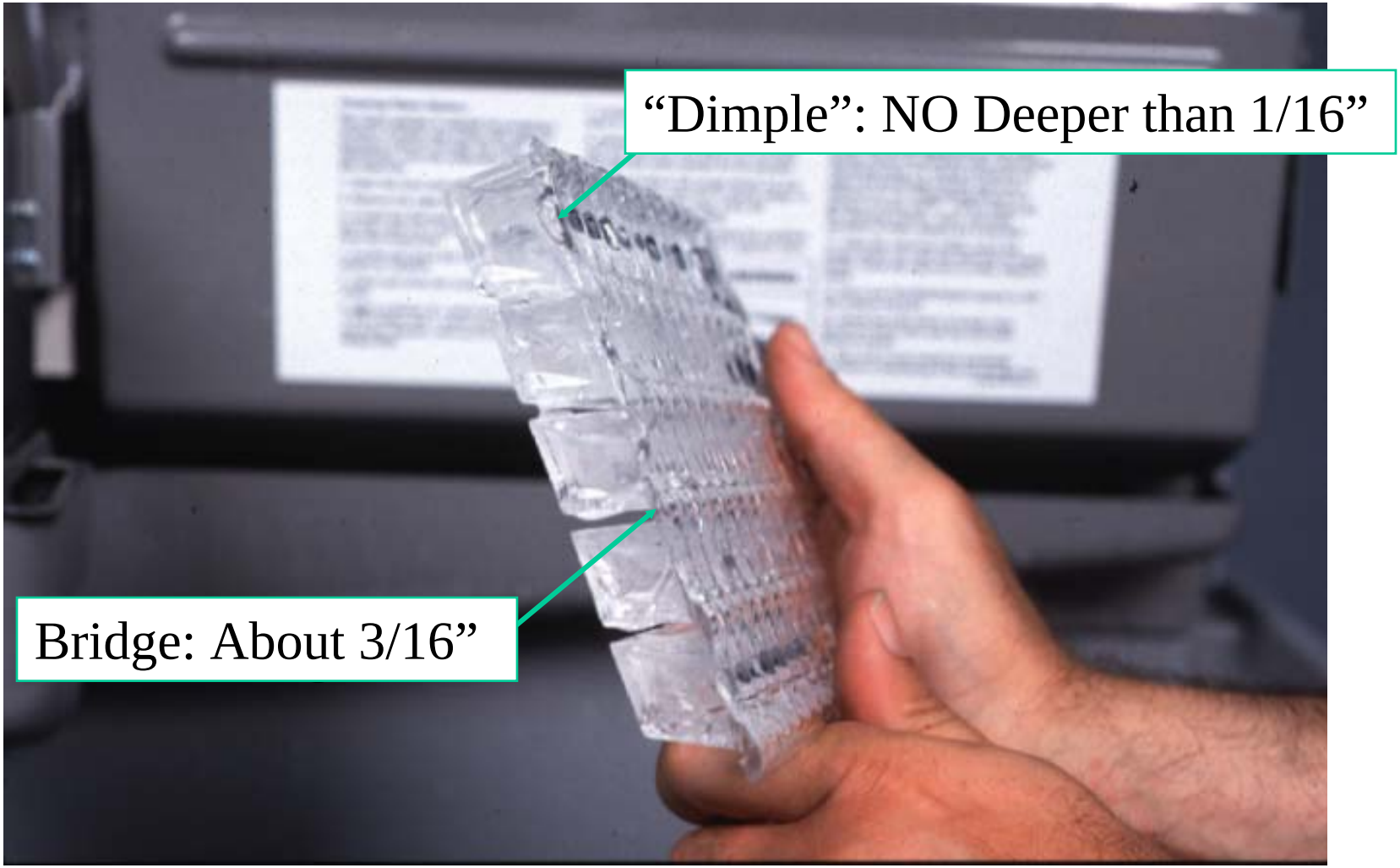
Curtain Sensor



Scotsman Cube Size / Bridge Thickness



Bin Full

Ice Holding the Curtain Open Shuts the Machine OFF.

Refrigeration System #1

- The SCE170 uses R-404A as a refrigerant
  - Air Cooled - 17 ounces
  - Water Cooled - 9 ounces - A series, 11 ounces - B series, 10 ounces C series
- It uses a hot gas bypass to warm up the evaporator and harvest the ice
- The fan is on all the time in freeze and off during harvest

Refrigeration System #2

- Freeze cycle
  - System pressure
    - Discharge declines from about 300 to 210
    - Suction declines from about 60 to 25
- Harvest cycle
  - System pressure
    - Discharge pressure is about 190
    - Suction pressure is about 85 - 90

Scotsman® Freeze - Suction Pressure

Beginning Freeze

Ending Freeze

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Harvest - Suction Pressure

SCE170 Performance

- Cycle Times
  - Harvest Cycle
    - 1.5 to 2 minutes
  - Freeze Cycle
    - 12 to 17 minutes
- Batch Weight
  - 1.6 to 1.8 LB per cycle
- Ice Making Capacity
  - 120 LB per 24 hours @ 90/70

Scotsman® SCE170 Service Diagnosis

- Machine is OFF
  - Check power
  - Check master switch
  - Check curtain
    - Must be closed
  - Check control module lights
    - Both lights must be ON
  - Check Hi Pressure Cut Out
    - Cuts out at 450 PSIG (auto-reset after 10/98)

Scotsman® SCE170 Service Diagnosis

- No ice, no water flow
  - Water supply turned off
  - Float valve, strainer or water filter plugged up
  - Purge valve leaks thru
  - Water pump does not pump
- No ice, water flow is very slow
  - Purge valve leaks thru
  - Obstruction in water pump or distributor

Scotsman® SCE170 Service Diagnosis

- No ice, machine is operating
  - Cube size set too small or
  - Purge valve does not open or
  - Purge drain is restricted
    - Ice does not fall thru curtain
    - Maximum harvest time returns unit to freeze cycle

SCE170 Service Diagnosis

- Low ice making capacity
  - Dirty air filter, condenser, or fan blade
  - Purge valve leaks thru
  - Curtain sticks
  - Water system needs de-mineralizing
  - Cube size set MUCH too large
    - Long harvest cycle (> 2 minutes)
  - Cubes slightly too small
    - Occasionally causing maximum (7 minute) harvest cycle

Cleaning & Maintenance

- De-Scale with Scotsman Nickel-Safe Ice Machine Cleaner
  - Defrost using manual Harvest Switch
  - Switch to Clean
  - Mix cleaner: 1 qt water to 1 oz of cleaner
  - Hold Purge Switch until reservoir is empty
  - Pour in Cleaner
  - Circulate for 20 minutes
  - Hold Purge Switch until reservoir is empty

Summary

- Changes since introduction:
  - Changed to Auto-Reset High Pressure Cut Out
  - Changed Control Module Position
  - Removed Deck Cover
  - Changed Air Filter Material
  - Compressor Change
  - Water Cooled Condenser Change