

OPERATION
&
MAINTENANCE
MANUAL

RRC770

Refrigerant Management Center

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Manual P/N 035-80437-00

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CONGRATULATIONS:

You have purchased one of the finest Recovery, Recycling, and Charging Machines available! Fill out and return the Warranty Card within 90 days to activate warranty and free lifetime technical support.

BEFORE USING THE RRC770

Check for any shipping damage. Place a claim with carrier if damage is discovered.

DO NOT USE A DAMAGED UNIT.

Complete and return the Warranty Card to activate technical support service and warranty coverage:

Warranty claims can not be honored without this warranty card on file.

The RRC770 should not be operated or serviced by any person who has not read all the contents of this manual. Failure to read and comply with these instructions or any one of the limitations noted herein can result in serious injury and/or property damage.

These general instructions describe normal operation and maintenance situations encountered with the RRC770. The instructions should not be interpreted to anticipate every possible contingency.

It is the responsibility of the owner/user to operate the RRC770 in accordance with all specifications and laws which may apply.

The following pages contain rules for safe operation of the RRC770. Taking precedence over any specified rule listed herein, however, is the most important rule of all:

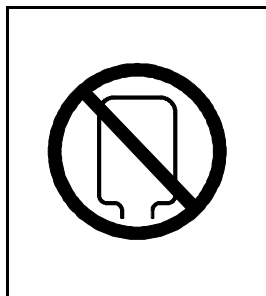
"USE COMMON SENSE"

A few minutes spent reading these instructions can make an operator aware of dangerous practices to avoid and precautions to take for his own safety and the safety of others.

A regular schedule of inspection of the RRC770 should be established and records maintained with special attention given to Hoses, Compressor Oil Level, Moisture Indicator, and Filters.

SAFETY PRECAUTIONS

- ! Recover, Recycle, and Charge only the refrigerant for which the machine is configured.
- ! Wear safety glasses and protective gloves. Refrigerant has a very low boiling point and can cause frostbite.
- ! Follow the RRC770 operating procedures sequentially to avoid prematurely disconnecting hoses or opening valves which may release refrigerant to the atmosphere.
- ! Do not expose the RRC770 to moisture or operate in wet areas.
- ! Use the RRC770 in locations with mechanical ventilation that provides at least four air changes per hour.
- ! Hoses used with the RRC770 must have shutoff devices within 12 inches of the connection point to the system being serviced to minimize the introduction of Non-condensable Gas (Air) into the RRC770 and the release of refrigerant when being disconnected.
- ! Disconnect power before performing any maintenance or service on the RRC770.
- ! Avoid using an extension cord with the RRC770. If necessary, use a good condition, UL listed, 3-wire grounded, #14 AWG, or larger, extension cord of the shortest possible length.
- ! Connect the RRC770 to a properly grounded receptacle. Do not overload the circuit.
- ! Do not allow the RRC770 to remain unattended in the Charge Mode with power On. The Charge Cylinder Heater will be energized creating a high pressure condition.



NEVER TURN THE CYLINDER UP-SIDE-DOWN.

DO NOT CONNECT THE RRC770 TO THE LIQUID SIDE OF ANY A/C SYSTEM WITH A CAPACITY GREATER THAN 4 LBS.

REFRIGERANT IN A/C SYSTEMS HAVING LARGER CAPACITIES MUST BE RECOVERED FROM THE VAPOR SIDE ONLY.

NEVER CONNECT THE RRC770 TO THE LIQUID PORT OF A CYLINDER OF REFRIGERANT TO FILL THE RRC770 CHARGE

CYLINDER.

FAILURE TO FOLLOW THE ABOVE MAY CAUSE THE RRC770 COMPRESSOR TO FAIL AND VOID THE WARRANTY.

L CAUTION 7

Avoid breathing refrigerant or lubricant vapor or mist.

Exposure may irritate eyes, nose and throat.

If accidental system discharge occurs, ventilate work area before continuing.

Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

Special Considerations with R134a

R134a has been shown to be nonflammable at ambient temperature and atmospheric pressure. However, tests under controlled conditions have indicated that, at pressures above atmospheric and with air concentrations greater than 60% by volume, R134a can form combustible mixtures.

While it is recognized that an ignition source is also required for combustion to occur, the presence of combustible mixtures is a potentially dangerous situation and should be avoided.

Under no circumstances should any equipment be pressure tested or leak tested with Air/R134a mixtures. Do not use compressed air (shop air) for leak detection in R134a systems.

FILLING THE CHARGE CYLINDER

A/C Systems requiring service often do not have a full charge of refrigerant. The RRC770 should be filled until about 3 pounds of liquid refrigerant can be seen in the Charging Cylinder Sight Glass. The Sight Glass is visible through a slotted opening on the side of the RRC770.

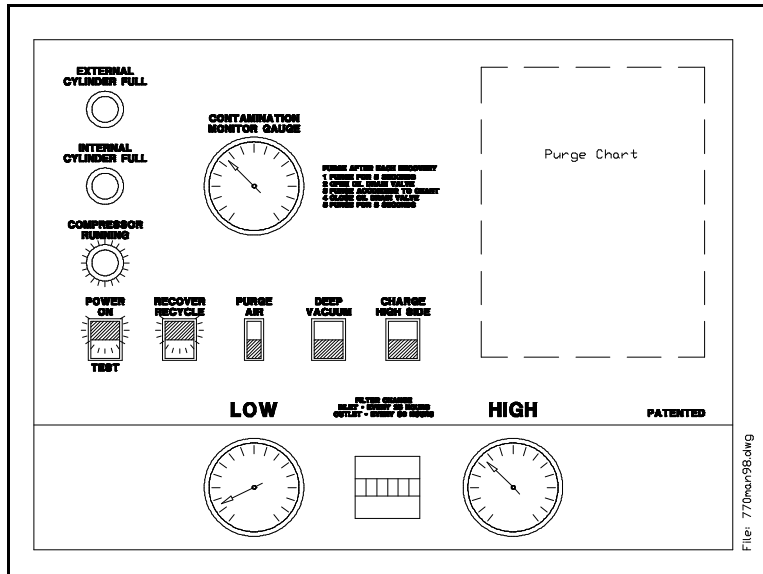


Figure 1 Filling the Charge Cylinder

To fill the RRC770 Charge Cylinder, refer to Figure 1 and follow these steps:

1. Connect the Red and Blue Hoses to the side of the RRC770, and **close the valves on the end of each hose**.
1. Connect the short Yellow Hose provided to the Rear Port of the RRC770 and to the **VAPOR** port of a cylinder of new or recycled refrigerant. An adapter is provided with the RRC770 (R134a) which permits the Field Service Coupler to be attached to the .500 ACME fitting on the cylinder of refrigerant.

If the cylinder has two ports, observe that the embossed marking on the cylinder knob says **VAPOR** or **GAS**. Do not rely on color coding of the knobs on the valves.



DO NOT CONNECT TO THE LIQUID VALVE. DO NOT TURN THE CYLINDER UP-SIDE-DOWN. INTRODUCTION OF LIQUID MAY DAMAGE THE COMPRESSOR AND VOID THE WARRANTY.

2. Press top (ON) of rocker switch marked POWER ON/TEST.
3. Press top (ON) of rocker switch marked RECOVER/RECYCLE.

The green COMPRESSOR RUNNING Light will illuminate and liquid refrigerant will rise in the Charging Cylinder Sight Glass. When the level is approximately 3 lbs, close the valve on the refrigerant cylinder. Allow the RRC770 to continue to run until the Low Pressure Gauge is in a vacuum and the COMPRESSOR RUNNING Light stays out for at least two minutes. This will empty the Yellow Hose.

4. Press bottom (OFF) of rocker switch marked RECOVER/RECYCLE.
5. Press bottom (OFF) of rocker switch marked POWER ON/TEST.

RECOVER/RECYCLE

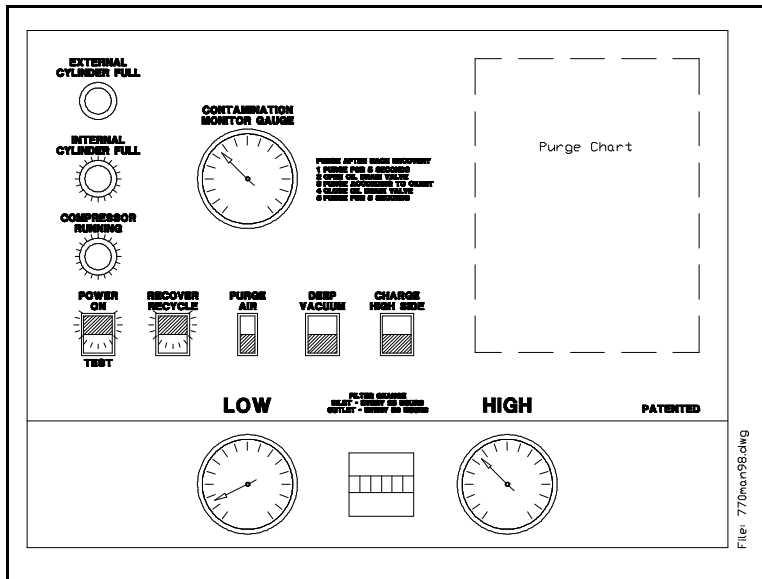


Figure 2 Recover/Recycle

To Recover/Recycle, refer to Figure 2 and follow these steps:

1. Attach Red and Blue Hoses to the A/C system per the vehicle manufacturer's instructions.

Note For R134a Machines

Field Service Couplings on the ends of Service Hoses are of a special design.

The valves have **LEFT HAND** threads which makes operation opposite to that of others.

To Close... Turn Counter-clockwise

To Open... Turn Clockwise

The valves **MUST BE CLOSED** before connecting or disconnecting Field Service Couplings.

2. Open Red and Blue Hose Valves.
3. Press top (ON) of rocker switch marked POWER ON/TEST.
4. Press top (ON) of rocker switch marked RECOVER/RECYCLE.

The RRC770 will recover and recycle refrigerant from the A/C System, and then automatically cycle off when a vacuum is sensed. This vacuum level can be seen on the Low Side Gauge.

! DO NOT TURN THE RRC770 OFF OR DISCONNECT HOSES !

A small quantity of Liquid refrigerant will probably still remain in the A/C System. This can be detected by observing an increasing pressure reading on the Low Side Gauge.

As pressure rises to a preset level, the RRC770 will automatically cycle on to continue recovering refrigerant. Allow this automatic On/Off sequence to repeat until the vacuum level remains constant for at least 2 minutes.

... NOTE ...

As refrigerant is processed by the RRC770, temperature variations can cause vapor to change to liquid which may temporarily settle in various internal components.

If a known amount of refrigerant has been introduced into the RRC770 it may not all be seen in the Charging Cylinder Sight Glass.

This is normal and nothing to be concerned about. Refrigerant has not been lost.

The sight glass does not indicate the amount of refrigerant recovered. It is only accurate for determining the amount of refrigerant charged out to the vehicle A/C System while in the Charge Mode of operation.

Note: Press and hold the top of the rocker switch marked PURGE AIR, which will restart the recovery process to remove any residual pressure that the RRC770 may not remove when used on cooler days.

6. Close Red and Blue Hose Valves.
8. Press bottom (OFF) of rocker switch marked RECOVER/RECYCLE.
8. Press bottom (OFF) of rocker switch marked POWER ON/TEST.

INTERNAL CYLINDER FULL LIGHT:

This Light will illuminate if the Charging Cylinder Fills to capacity, approximately 9 lbs. When this occurs, the Internal Cylinder must be drained using the charging procedure outlined on Page 11 in order to continue recovering refrigerant.

OIL DRAIN & AIR PURGE

Oil and Non-condensable Gas (Air) are separated from the recovered refrigerant and **MUST** be removed following **EACH** recycling procedure as follows:

Note: RRC770 must be connected to power source.

1. Press and hold the Purge Air switch (below the Contamination Monitor Gauge) for 5 seconds, and then release it.
2. **Slowly** open the Oil Drain Valve (below cylinder shelf on rear left side of RRC770) to drain any oil which may have been removed from the A/C system. A cup is provided to collect the oil.

Unless the A/C System had previously been overfilled, the RRC770 will typically not remove more than a tablespoon of oil, making replenishment unnecessary.

LEAVE THE OIL DRAIN VALVE OPEN...

3. Determine the room temperature.
4. Locate the pressure (PSIG) corresponding to this room temperature (° F) in the chart on the top of the RRC770. This chart is reproduced at the right.

If the pressure indicated on the Contamination Monitor Gauge is greater than that determined from the chart:

Press and hold the Purge Air Switch until the Contamination Monitor Gauge pressure goes down to the pressure determined from the chart. Any Non-condensable Gas will be vented through the Oil Drain Valve at this time.

5. Close the Oil Drain Valve.
6. Press and hold the Purge Air switch for 5 seconds. This permits any residual Non-condensable Gas to be recirculated for reprocessing during the next recycle procedure.

°F	R12	R134a
30	42	40
32	44	42
34	46	44
36	48	46
38	50	49
40	52	51
42	54	54
44	57	56
46	59	59
48	61	61
50	64	64
52	66	67
54	69	70
56	72	72
58	74	76
60	77	78
62	80	82
64	83	85
66	85	88
68	88	92
70	92	95
72	95	97
74	98	104
76	102	107
78	105	110
80	108	114
82	112	118
84	115	123
86	118	127
88	123	130
90	127	135
92	130	140
94	135	145
96	138	148
98	143	153
100	147	157
102	150	163
104	155	167
106	160	173
108	165	180
110	168	185
112	173	190
114	178	195
116	183	200
118	188	207
120	193	213

Purge Chart

DEEP VACUUM

If the A/C System is "opened" for replacing components, a deep vacuum must be drawn on the system before recharging with refrigerant. This vacuuming process removes air and moisture introduced into the system. A Vacuum Pump mounted on the lower rear shelf of the RRC770 provides this capability.

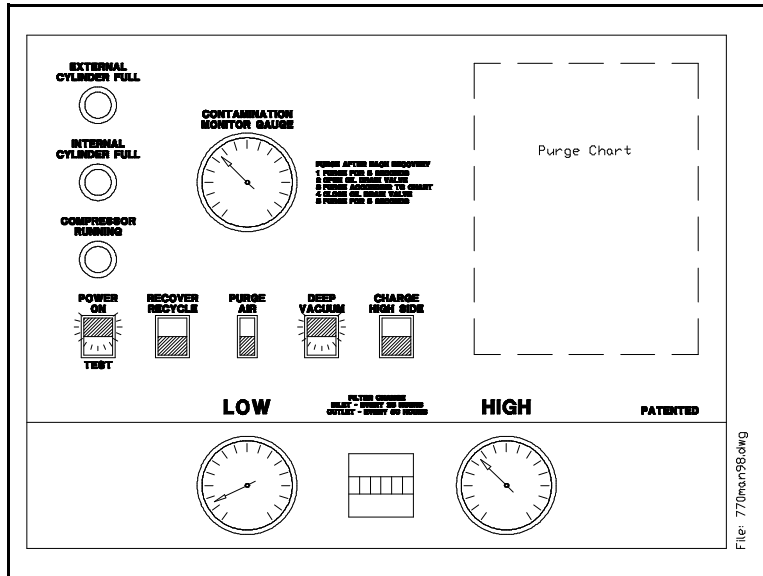


Figure 3 Deep Vacuum

To Deep Vacuum the A/C System, refer to Figure 3 and follow these steps:

1. Connect Red and Blue Hoses to the high and low sides of the A/C System.
2. Open Red and Blue Hose Valves.
3. Press top (ON) of rocker switch marked POWER ON/TEST.
4. Press top (ON) of rocker switch marked DEEP VACUUM.
5. The Vacuum Pump will start and the RRC770 will draw a vacuum.

NOTE... If pressure is sensed at the Red and Blue Hoses on the RRC770, the Vacuum Pump will not start. If this occurs, perform the recover/recycle operation described earlier.

6. Press bottom (OFF) of rocker switch marked DEEP VACUUM.
7. Press bottom (OFF) of rocker switch marked POWER ON/TEST.

HOSE EVACUATION

It's important that Air not be introduced into the A/C System during a Charging procedure. If a Deep Vacuum procedure was performed previously, the following Hose Evacuation Procedure is not required. If the service valves on the hoses have been open, the following procedure must be performed.

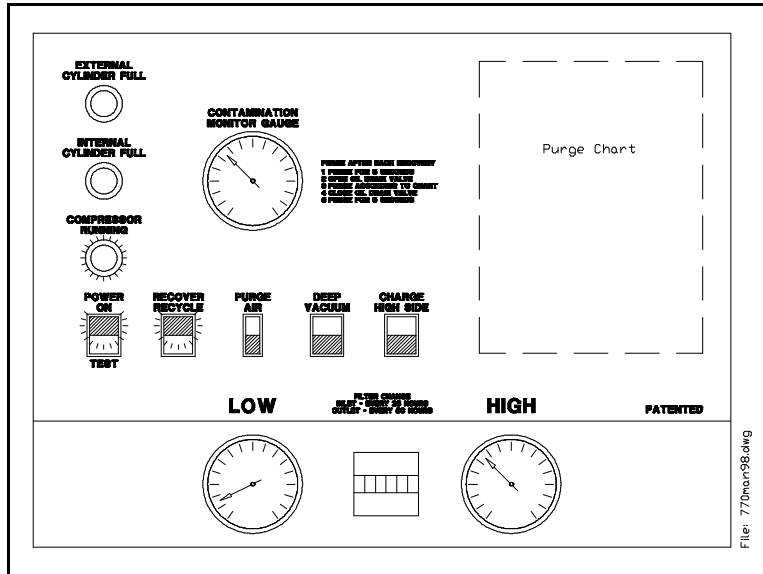


Figure 4 Hose Evacuation

To Evacuate Hoses, refer to Figure 4 and follow these steps:

1. Close Red and Blue Hose Valves.
2. Press top (ON) of rocker switch marked POWER ON/TEST.
3. Press top (ON) of rocker switch marked RECOVER/RECYCLE.
4. Let the RRC770 run until the green COMPRESSOR RUNNING light goes out.

Note: If the green light does not illuminate, press and hold the top of the rocker switch marked PURGE AIR until the COMPRESSOR RUNNING light turns on.

5. Press bottom (OFF) of rocker switch marked RECOVER/RECYCLE.
6. Press bottom (OFF) of rocker switch marked POWER ON/TEST.
7. Purge any Non-condensable Gas as described in the previous section.

CHARGE/HIGH SIDE

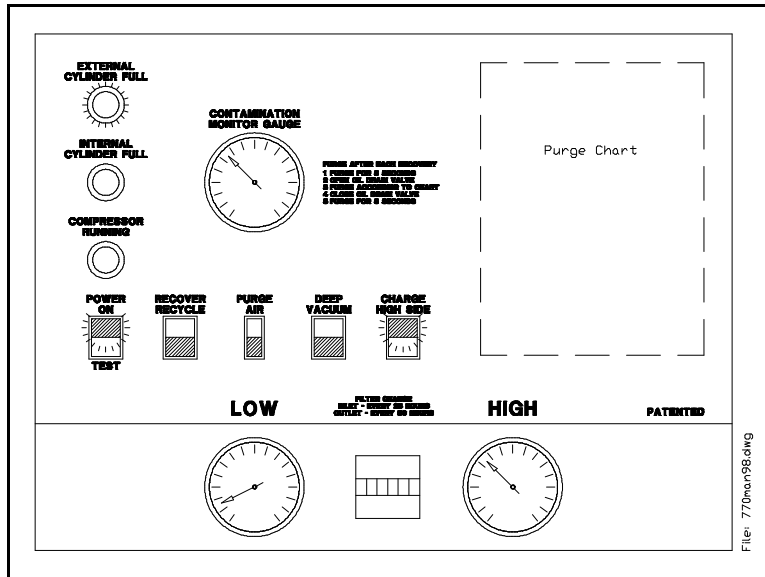


Figure 5 Charge/High Side

To Charge Refrigerant, refer to Figure 5 and follow these steps:

1. Perform Hose Evacuation described previously.
2. Connect Red and Blue Hoses to the A/C System per the vehicle manufacturer's instructions.
3. Determine the refrigerant capacity of the A/C system to be charged. This data is usually printed on a tag located on the accumulator or under the hood of the vehicle. Convert this quantity to tenths of a pound for setting the RRC770 charge indicator.

The following will determine where to set the indicator prior to starting the charge mode:

$$(\text{RRC770 Liquid Level}) - (\text{A/C System Capacity}) = \text{Indicator Setting}$$

EXAMPLE: The level of liquid visible in the RRC770 Charging Cylinder Sight Glass is 7.4 lbs. and the A/C system capacity is 3.2 lbs. The following calculation results...

$$(7.4) - (3.2) = 4.2$$

Therefore, the sliding indicator should be set at 4.2 lbs. in this example. When the liquid level lowers to the 4.2 lb. mark, a charge of 3.2 lbs. will have been delivered

NOTE: The Sight Glasses on the Charging Cylinders have markings for both R12 and R134a. Always use the correct scale for accurate charging.

Note: Skip to step 5 if charging to an optional 30 lb DOT Refillable Cylinder via the short Yellow Hose attached to the rear port.

4. Open Red and Blue Hose Val ves.
5. Press top (ON) of rocker switch marked POWER ON/TEST.
6. Press top (ON) of rocker switch marked CHARGE/HIGH SIDE. **Do not start the Vehicle's Engine.** Refrigerant will flow into the high side of the A/C System. Closely monitor the liquid level as it lowers in the Charging Cylinder Sight Glass.
7. Press bottom (OFF) of rocker switch marked CHARGE/HIGH SIDE as soon as the refrigerant level drops to the sliding indicator.
8. Press bottom (OFF) of rocker switch marked POWER ON/TEST.

The vehicle can now be started and the A/C system checked by monitoring Gauge pressures.

Always close Red and Blue Hose Val ves before disconnecting hoses.

Evacuate the hoses per the preceding section "Hose Evacuation".

NOTE: All Refrigerant Recycling Machines charge Liquid, by law. The preceding is the suggested method of charging liquid into an A/C system.

Some vehicle manufacturers may not provide a High Side connection. The above instructions would have to be modified accordingly. Always follow the vehicle manufacturer's recommended service procedures.

EXTERNAL CYLINDER FULL LIGHT:

This Light will illuminate if the External Charging Cylinder Fill to capacity, approximately 25 (net) lbs, 40 lbs total. When this occurs, the External Cylinder must be emptied or changed.

Note: The RRC770 will be unable to charge while this light is on, or if the Yellow Over Fill Protection Cord is NOT connected to the 30 lb DOT Refillable Cylinder.

SCHEDULED MAINTENANCE

BEFORE EACH USE...Check the oil level in the Compressor and Vacuum Pump *DAILY* before using. The Compressor Oil Level Sight Glass is on the left side of the lower section of the RRC770. The Vacuum Pump Oil Level Sight Glass is on the end of the pump housing. The oil level should simply be visible in the glass. If oil is not visible or is above the top of the glasses call Technical Support at 800-468-2321.

MONTHLY...Clean the Condenser to maintain high efficiency performance of the RRC770. Disconnect power and remove the lower front perforated panel and blow compressed air through the cooling fins of the Condenser to remove any debris. Do not bend the fins on the Condenser coils. Air flow will be restricted and cause damage to the RRC770. Replace the panel before applying power to the RRC770.

FILTER MAINTENANCE

Monitor the Moisture Indicator for a color change from BLUE to PINK. When the RRC770 is new and immediately after changing Combo Filters, the Moisture Indicators may show PINK. This is due to the exposure to air and does not indicate inadequate filter performance. Combo Filters are located behind the front (red) wrap around panel of the RRC770.

The "INLET" Combo Filter (front most of the two) must be changed every 25 hours of operation OR when the Moisture Indicator is Pink. RTI part number 026-80077-00. Hours are indicated on the Filter Change Meter.

The "OUTLET" Combo Filter (rear most of the two) must be changed every 50 hours of operation OR when the Moisture Indicator is Pink. RTI part number 026-80069-00. Hours are indicated on the Filter Change Meter.

1. Remove front (red) wrap around panel to service the Combo Filters.
2. Disconnect Flare Fittings from top and bottom of filters.
3. Remove mounting nuts, and filters.
4. Transfer filter insulation material to new filter as applicable.
5. Install new Combo Filters using hardware removed in Step 3.
6. Connect Flare Fittings to top and bottom of filters.
7. Check for leaks, repair as necessary.
8. Replace front panel.

PROBLEMS & SOLUTIONS

On rare occasion the RRC770 may seem to be performing incorrectly. Experience has shown that varying operating conditions can affect the performance characteristics of the RRC770. The temperature of the vehicle A/C System will affect how the RRC770 performs.

Following are typical problems with explanations of the possible cause and solution.

PROBLEM: My RRC770 worked fine all last Summer. I got it out today for the first service job this Spring and it is very slow in evacuating the system.

SOLUTION: Today's Spring temperature may be much lower than the average temperatures during the summer months. Maybe the vehicle was brought in from outside where the temperature is very low.

The refrigerant in the vehicle will not be under as high a pressure at lower temperatures and the RRC770 will take longer to draw a vacuum. More cycles may be required to completely recover the refrigerant.

PROBLEM: I put 5 lbs. of refrigerant into the RRC770 using the Recycle Mode. When I checked the sight glass on the Charging Cylinder, there was less than 5 lbs. I lost Refrigerant. The unit must leak.

SOLUTION: Due to temperature changes, some refrigerant may condense into liquid form and stay in tubes and other components in the circuit preceding the Charging Cylinder. This is normal and will explain why all refrigerant is not visible in the sight glass.

PROBLEM: I can not get the RRC770 to draw a vacuum as indicated on the Low Side Gauge.

SOLUTION: Check Hoses for restrictions.

PROBLEM: When I try to fill the Charging Cylinder from an auxiliary cylinder of clean refrigerant, the RRC770 is really slow or shuts down.

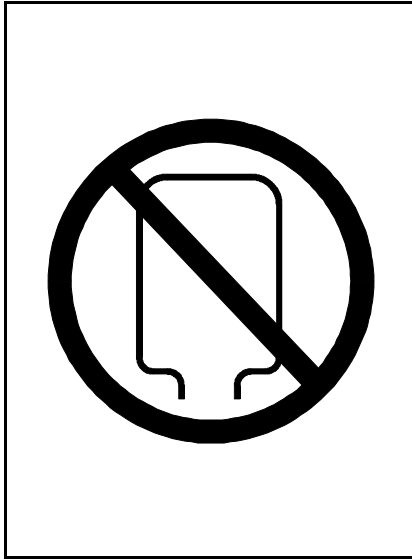
SOLUTION: The auxiliary cylinder will cool due to the vaporization of refrigerant. This causes the pressure to decrease.

Use a heat belt to increase the speed of recycling by the RRC770.

PROBLEM: I turned a 30 lb. cylinder of new refrigerant upside down to fill the Charging Cylinder with liquid. The Charging Cylinder didn't fill and now the RRC770 won't recover from an A/C system.

SOLUTION: The RRC770 has been overloaded with liquid refrigerant (see Safety Precaution Section at the beginning of this manual).

... WARNING ...



IF A CYLINDER IS TURNED UP-SIDE-DOWN, THE RRC770 WILL OVERFILL WITH LIQUID REFRIGERANT. THIS OVER FILLS THE SUCTION ACCUMULATOR WITH LIQUID.

FROST ON THE OIL DRAIN ON THE REAR OF THE RRC770 IS A GOOD INDICATION OF THIS OCCURRENCE.

THIS SYMPTOM IS CAUSE FOR CONCERN AS LIQUID REFRIGERANT WILL BE FORCED INTO THE COMPRESSOR.

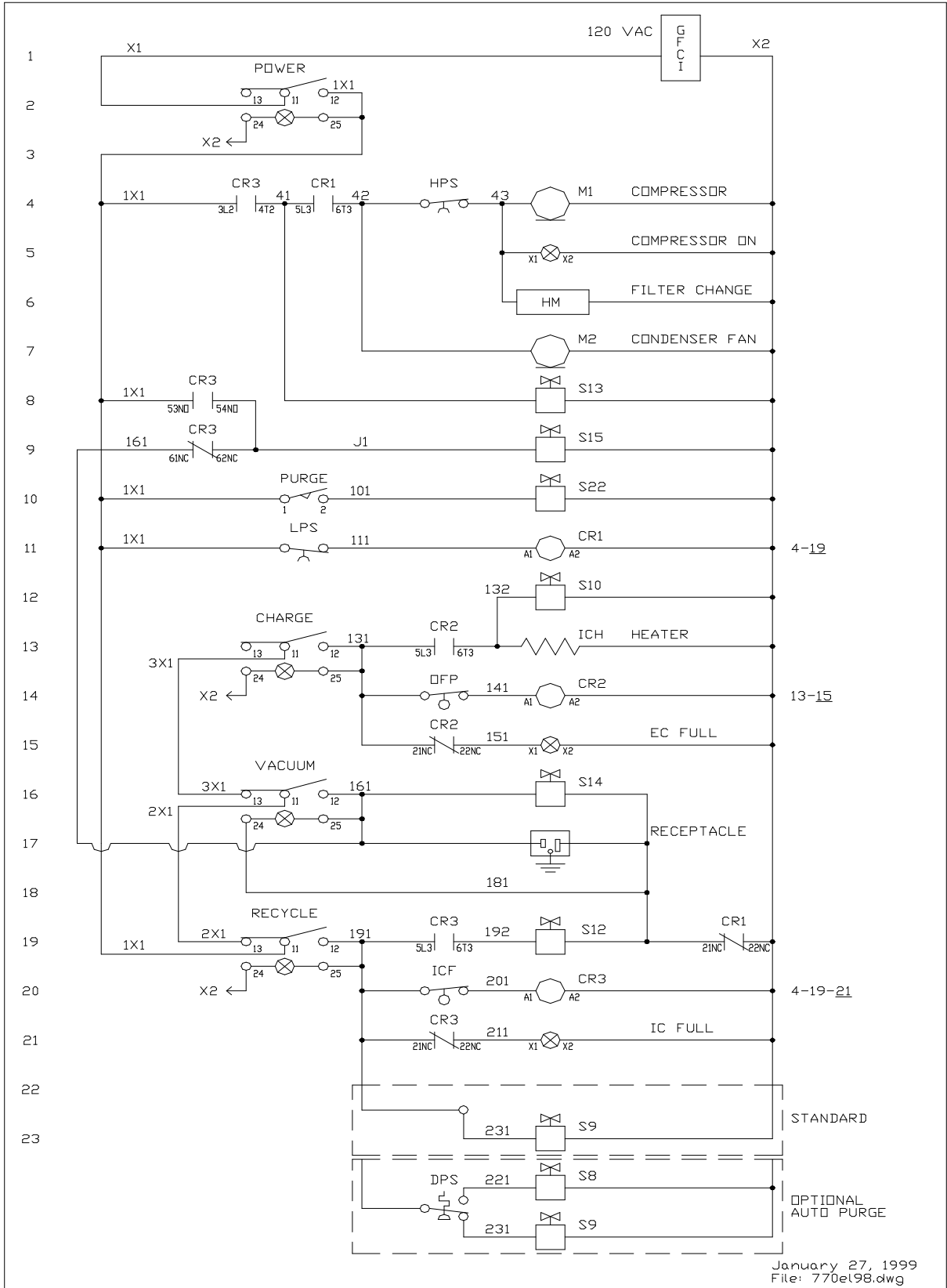
THIS CAN DESTROY THE COMPRESSOR AND WILL VOID THE WARRANTY.

The safest method to remove the excess liquid which has collected in the Suction Accumulator is to drain it from the Oil Drain on the back of the RRC770 as follows:

Draw a deep vacuum (25 to 29 In. Hg.) on an empty cylinder and connect it to the Oil Drain Valve. Open the cylinder valve and the Oil Drain valve.

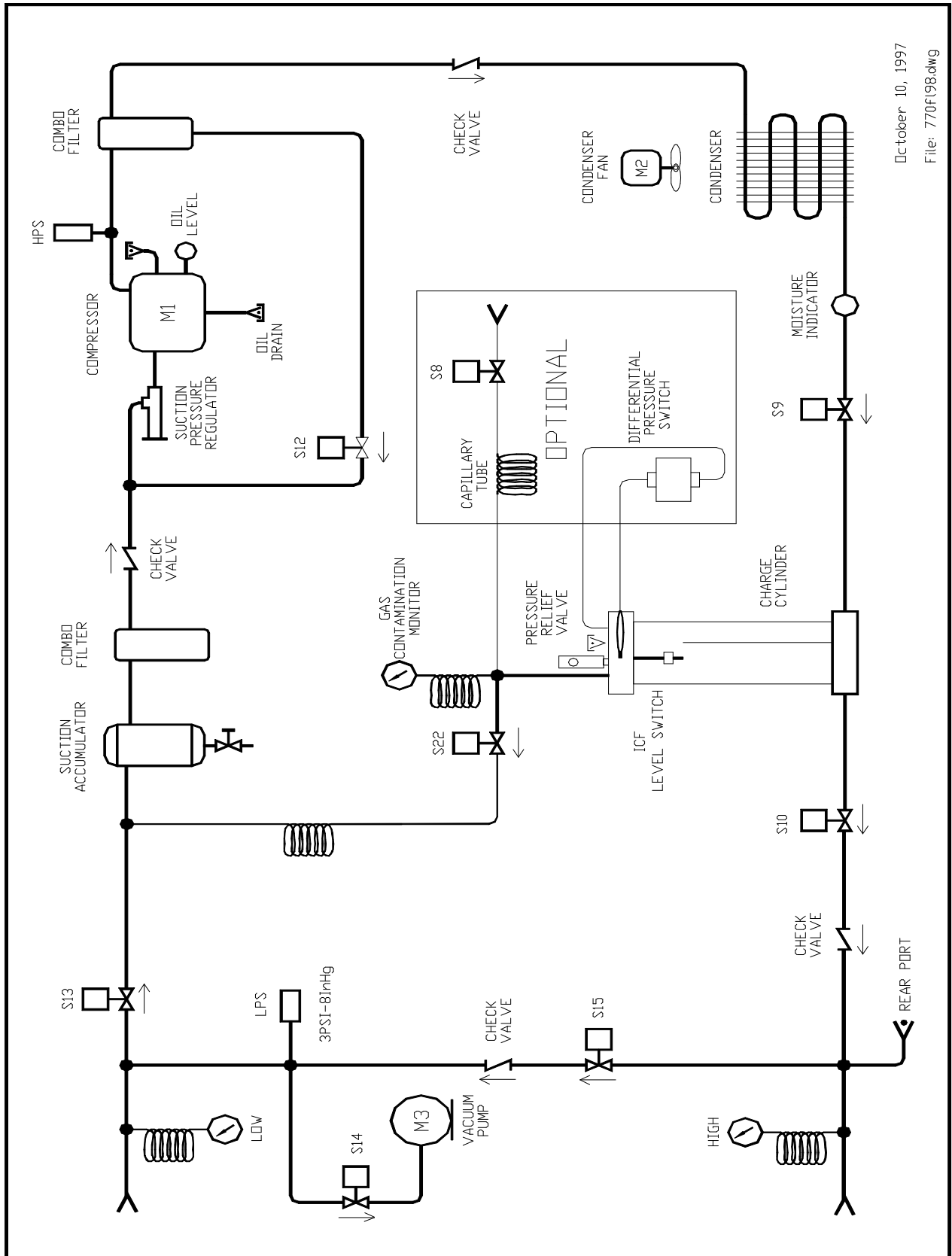
Close the valves and disconnect the cylinder after the liquid has been drawn into the cylinder. This refrigerant can now be recycled by the RRC770 following normal recycling procedures.

If the above suggested solutions do not solve the problem, call 800-468-2321, ext. 259, and one of our technicians will help diagnose the cause. Please have the unit available for reference, and be prepared to give us a detailed description of the fault condition.



January 27, 1999
File: 770e198.dwg

RRC770 SCHEMATIC (1998)



October 10, 1997
File: 770F98.dwg

RRC770 FLOW (1998)