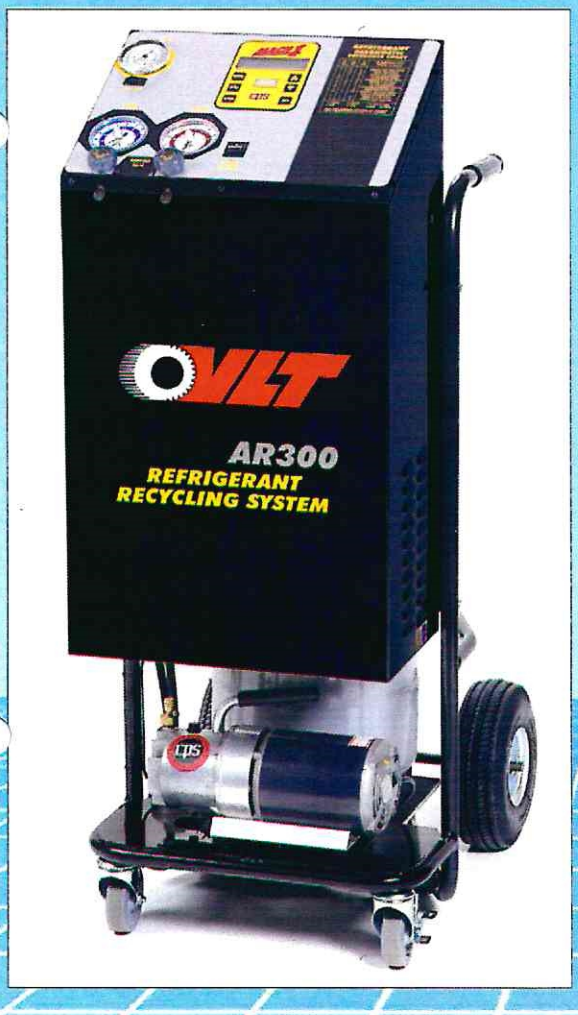
Version 04.05 ersetzt 03.04

AR300 M FÜR BUSSE

DER AUTOMAT MIT EXTRA GROSSEM KÄLTEMITTELTANK (40 KG)

FÜR R134A



Automatische Recycling-Station und Spülgerät.
Ideal für Bus-Anlagen.
Mit extra grossem Kältemitteltank von 40 kg

Beschreibung
Schnellstes Füllgerät seiner Zeit (120 kg/h)
Benötigt keine Heizung wegen der Füllmethode
Kann sowohl flüssig als auch gasförmig absaugen
Alle Wartungspunkte sind schnell und einfach zu erledigen
Sehr einfache Bedienung
Wartungsfreier, leistungsstarker Verdichter mit integrierter Oel-Rückführung
Waage stark belastbar 110 kg

Funktionen
Spülen mit flüssigem Kältemittel
Automatische Filterkontrolle
Automatischer Ablauf von Vakuumieren und Füllen hintereinander
Automatischer Ablauf von Absaugen, Vakuumieren und Füllen hintereinander

VLT4600
Universelles
Lecksuch-Set
In Plastikbox für R413a und R1234a bestehend aus:
Leuchtmittel-Patronen,
12 Volt UV-Lampe
UV-Schutzbrille

OPTIONEN:

25R-134a	Kältemittel R134a in Einweggebinde 12.0 kg
25INV111	Clima-Desinfektion Spezialspray, 1 Karton à 12 Dosen
25/INV111/5	Clima-Desinfektion Flüssigkeit in Kannen à 5 Lt, Kannenpreis

Ablieferung und Instruktion:	**Inbegriffen**
Klimawartungs-Grundkurs (1 Tag)	**Inbegriffen,**
Ergänzungskurs mit Kältemittelprüfung:	**Fr. 350.—**

5. Section2: Repair and Service Procedures (in Englisch)

Section 2- Repair and Service procedures

1. PC Board Replacement
2. Scale Replacement
3. Filter Drier Core Replacement
4. Compressor Service and Replacement
5. Solenoid Service and Replacement
6. Gauge Replacement
7. Check Valve Replacement
8. Relay Service and Replacement
9. Transformer Replacement
10. Low Pressure Switch Replacement
11. Rocker Switch Service and Replacement
12. Circuit Breaker Service and Replacement
13. Fan Replacement
14. Keypad Service and Replacement
15. Hose Replacement
16. Teflon Valve Replacement
17. Oil Injection Bottle Assembly Service and Replacement
18. DOA Chamber Service and Replacement
19. Compressor Oil Return System Service and Replacement
20. Condenser Coil Service and Replacement
21. Wheel Service and Replacement
22. Vacuum Pump Service and Replacement
23. PC Board Microprocessor Replacement

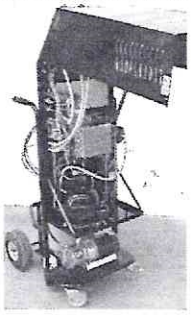
1. PC Board Replacement

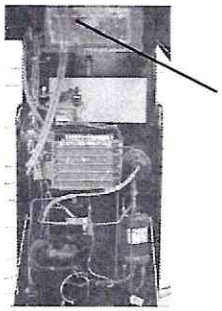
Disconnect power supply to the AR300E.

Danger: Only a qualified service technician should service this equipment. An Electrical Shock hazard is present which could lead to severe injury or even

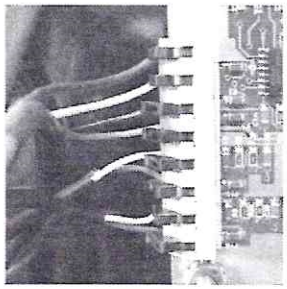
Keep the PC Board free from static electricity. Static electricity can damage the microprocessor.

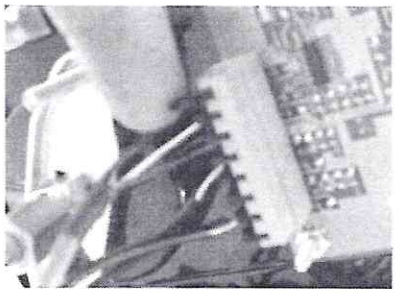
Open the Front Cover of the unit as shown below. Locate the PC Board.

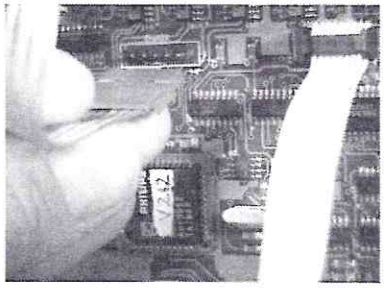




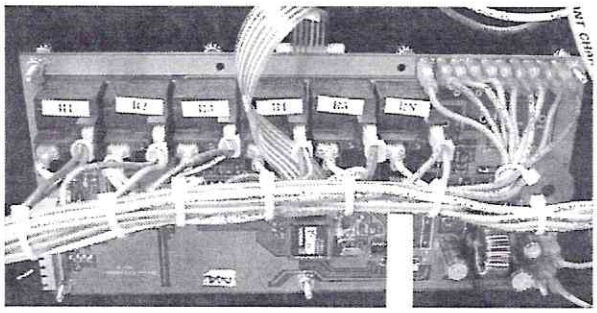
Remove scale and thermistor wires by pull up on the toggle type connector. Remember to label wires. Remove the keypad ribbon cable.

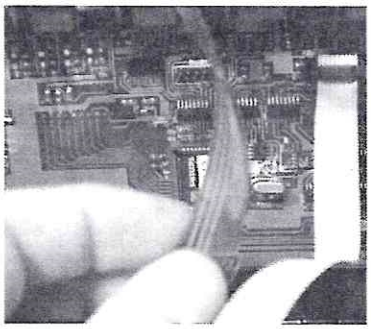






Remove all 24 wires that connect directly to the PC Board. Remember to label wires for future reinstallation of PC Board.



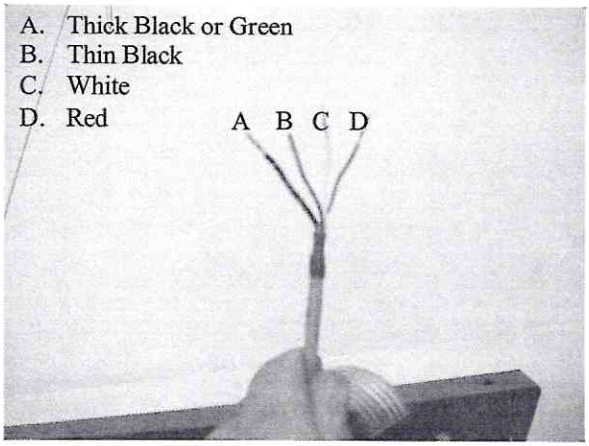


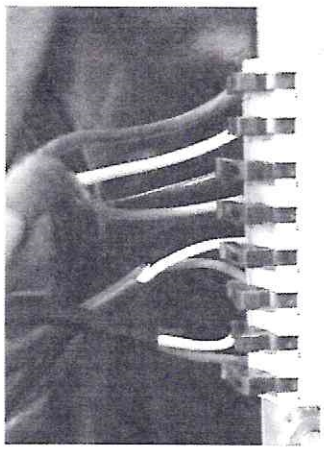
Remove the seven #6-32 nuts that secure the PC Board to the control panel. Carefully remove the PC Board. Reuse the nylon stand offs. If the nylon stand offs will not stay in place, use a pair of pliers to slight crimp one end. This tension will hold the stand off in place when slid onto threaded post.

Install new PC Board. Peel off protective film from LCD. Reuse the seven #6-32 nuts to secure the PC Board to the control panel. Make sure the 7 nylon stand offs are in place.

Reconnect the 24 wires that connect directly to the PC Board via push on connectors. Reconnect the keypad ribbon cable. The ribbon cable should have a half a twist when reconnected.

Connect the scale leads as shown below. It is very important that the scale leads make good connection. Failure to do so will lead to erratic scale readings. Route the scale cable away from relay coils, etc… Reconnect the Thermistor wires. Be sure not to switch the R-134 and R-12 thermistors. Recheck all connections to the PC Board.





After installing a new PC Board, it will be necessary to recalibrate the new PC Board to the scale and configure the tank parameters. See Scale/PC Board Recalibration, PC Board Configuration and Scale Tare Procedure in SECTION 3.

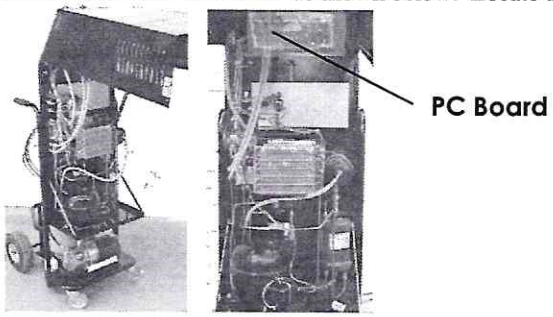
2. Scale Replacement

Disconnect power supply to the AR300E.

Danger: Only a qualified service technician should service this equipment. An Electrical Shock hazard is present which could lead to severe injury or even

Keep the PC Board free from static electricity. Static electricity can damage the microprocessor.

Turn off the AR300E. Open the Front Cover of the unit as shown below. Locate the PC Board.



Remove scale wires by pull up on the toggle type connector. Cut cable ties that bind the scale wire. Pull scale wire out of the AR300E main chassis.

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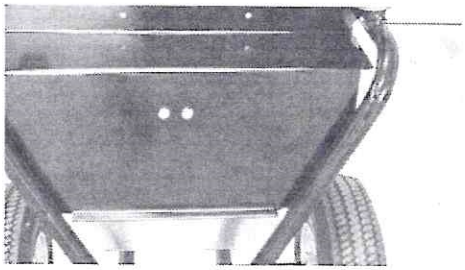
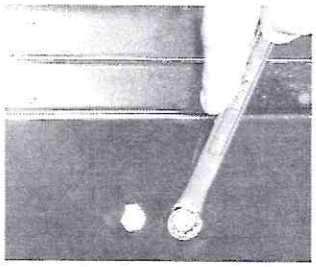
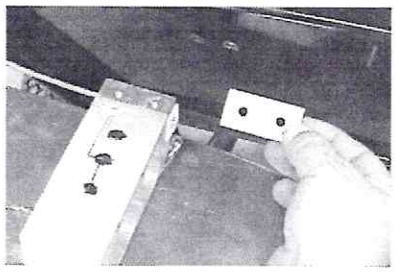
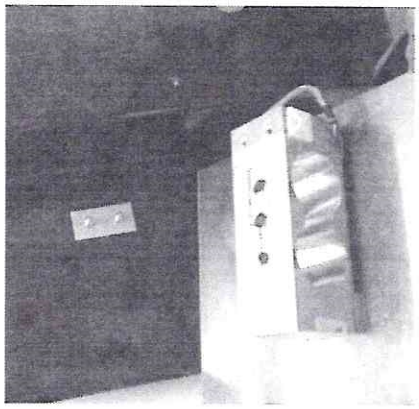
Remove tank from scale. Carefully lean the AR300E back until the 2 scale mounting screws are visible. Use a 7/16 SAE wrench to remove these two Grade 8 bolts. The scale assembly should now be loose. The bottom spacer may fall of when removing scale assembly. It is important to find and reuse this spacer.

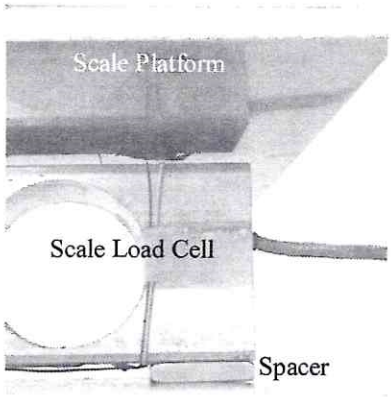


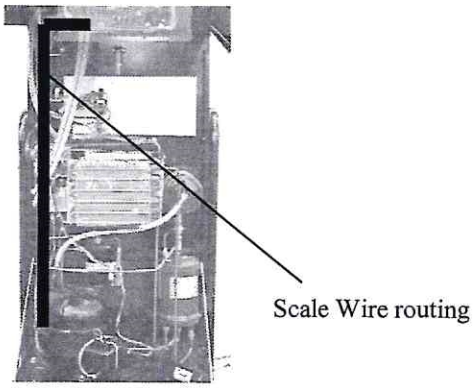




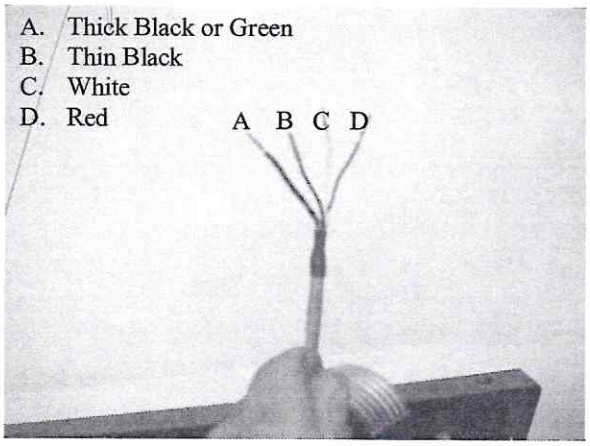
Place the 2 Grade 8 bolts through the mounting holes and through the spacer. Install the new scale assembly onto the spacer. Tighten the scale mounting bolts.

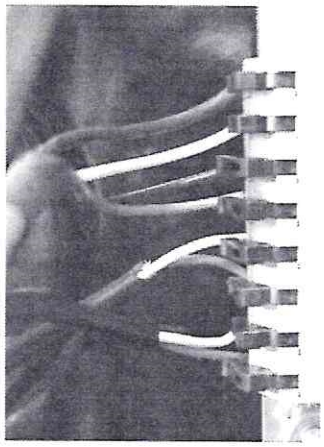






Route the new scale assembly wire through the grommet in the bottom of the AR300E main chassis assembly to the PC Board. Place the scale wires onto the PC Board connector as shown in picture below. It is very important that the scale leads make good connection. Failure to do so will lead to erratic scale readings. Route the scale cable away from relay coils, etc





After installing a new scale, it will be necessary to recalibrate the new scale to the PC Board and configure the tank parameters. See Scale/PC Board Recalibration, PC Board Configuration and Scale Tare Procedure in SECTION 3.

3. Filter Drier Core Replacement

The Mach 1 AR300E is equipped with a 650-ccm solid core desiccant cartridge. The AR300E will notify the user when the filter needs changed. The amount of time per drier is 3000 minutes. This can be see on the LCD right after selecting which refrigerant is to be used.

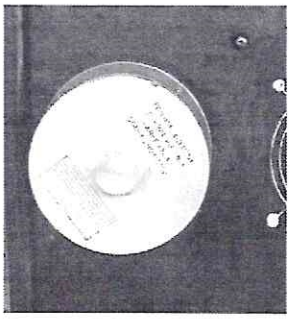
Danger- Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation.

Caution- all hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause frostbite or other related injuries. Wear proper personal protective equipment such as safety goggles and gloves. When disconnecting any hose, please use extreme caution.

Caution- avoid breathing refrigerant vapors and/or lubricant mist. Exposure may irritate eyes, nose, throat, and skin. Please read the manufacturers Material Safety Data Sheet for further safety information on refrigerants and lubricants.

Danger: Always assume that high-pressure refrigerant exists in the Filter Shell. Failure to do so may result in bodily injury.

Locate the Filter Access Cap on the Back of the unit.



Replace the filter cartridge as follows:

Operate the AR300E in Mode 9B. Follow all the directions on the LCD.

Loosen the Filter Access Cap as shown in Figure 1. Rotate the Cap counter-clockwise and pull outward. The cap will release once the quick release mechanism aligns with the flange on the Filter Shell.

Remove the spring-loaded insert to expose the Filter Drier Core as shown in Figure 2.

Remove and dispose of the old Filter Drier Core as shown in Figure 3.

Replace filter cartridge with CPS part ARXF.

Reassemble the remaining components. Make sure the rubber gasket is properly placed in the Filter Shell flange. Remember to close the Oil Drain valve once reassembly is complete. Check for leaks around the seal. Unit is now ready for operation.

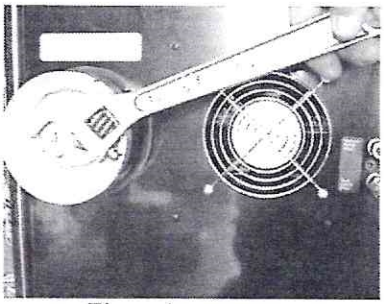


Figure 1

Figure 2

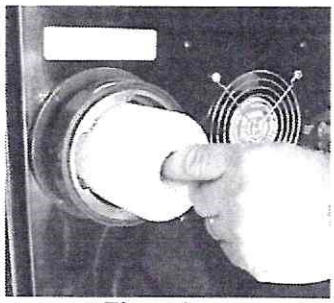


Figure 3

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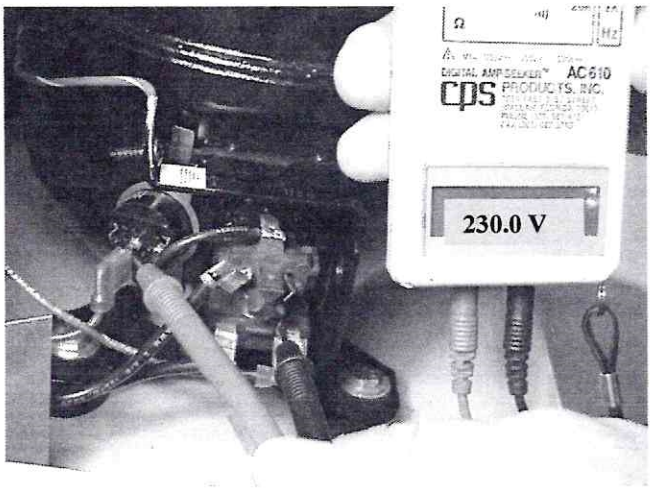
4. Compressor Service and Replacement

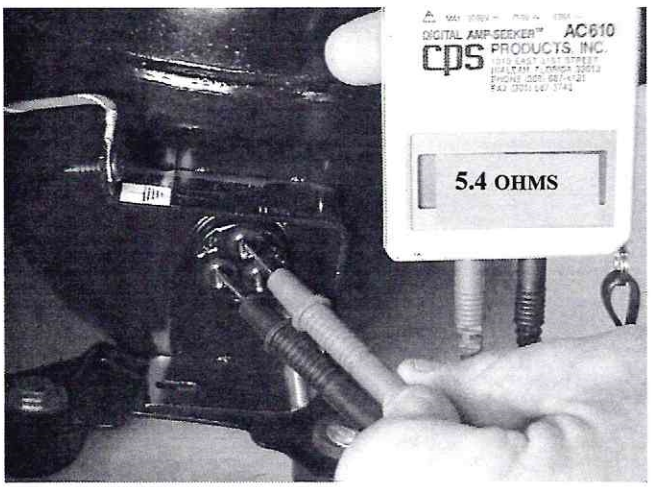
Before replacing compressing, please do the following electrical checks:

Danger: Only a qualified service technician should service this equipment. An Electrical Shock hazard is present. It will be necessary to operate this unit with the front cover opened. Please use extreme caution when live power is applied to the unit. Check the compressor power leads to see if voltage exists (Start the AR300E in Mode 1). If voltage exists, turn off and disconnect power. Next, check for continuity across the compressor external overload.



If continuity across the overload exists, check the resistance compressor run and start windings.

The resistance readings for the 230-volt compressor will is: Main Winding 5.4 ohms Aux Winding 19.8 ohms



If either the main or the auxiliary compressor windings are open (infinite resistance), replace compressor.

If voltage does not exist on the compressor power leads, check Relay 1 (on PC Board), Relay 6, and Relay 7. Also check for loose wires. See SECTION 2 for Relay and Switch information.

If continuity does not exist on across the compressor external overlay, replace the overload.

If the compressor is determined to be defective, replace as follows:

Disconnect power supply to the AR300E.

Danger: Only a qualified service technician should service this equipment. An Electrical Shock hazard is present which could lead to severe injury or even death.

Use the Complete Refrigerant removal procedure in SECTION 3 to remove refrigerant from the AR300E.

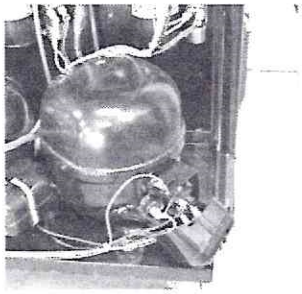
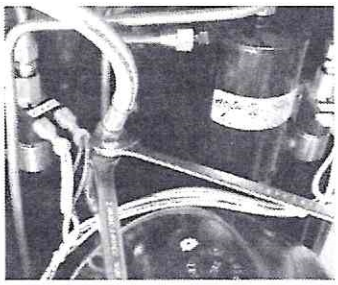
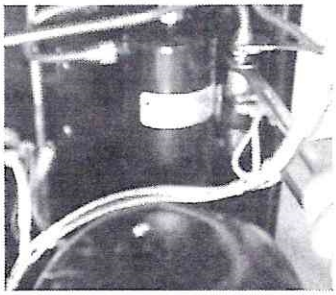
Danger- Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation.

Caution- all hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause frostbite or other related injuries. Wear proper personal protective equipment such as safety goggles and gloves. When disconnecting any hose, please use extreme caution.

Caution- avoid breathing refrigerant vapors and/or lubricant mist. Exposure may irritate eyes, nose, throat, and skin. Please read the manufacturers Material Safety Data Sheet for further safety information on refrigerants and lubricants.

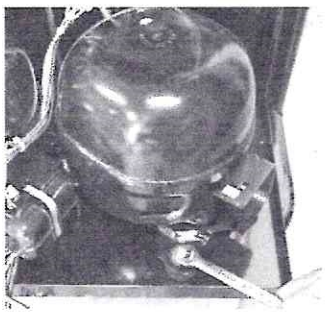
Danger: Always assume that high-pressure refrigerant exists in the Compressor. Failure to do so may result in bodily injury.

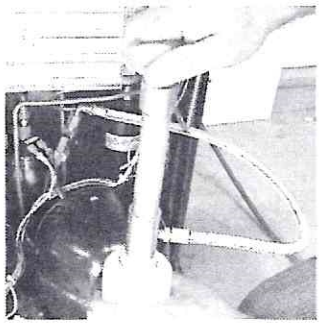
Disconnect the suction hose line, discharge line and oil return line that connect directly to the compressor.

Remove the electrical connections.

Remove the four compressor mounting bolts (or nuts). Remove defective compressor assembly from AR300E. At this time tilt the compressor upside down so that the compressor oil runs out the suction connection. Measure oil. If the oil is less than 120 ml or more than 720 ml ounces, call factory.



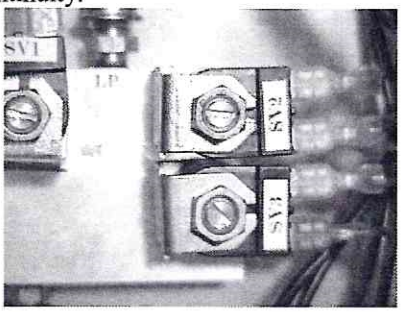


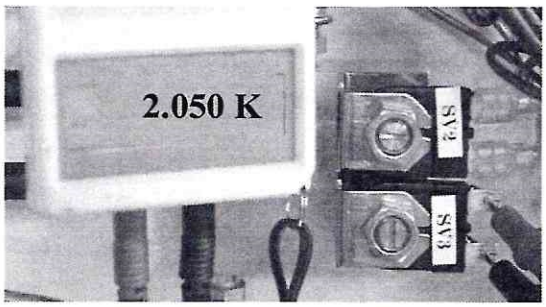
Install new compressor assembly. **Warning: The new compressor assembly will not have oil in it. Failure to add oil will damage the new compressor.** Add 300 ml of PAG for the R-134 compressor. Re-bolt the unit down to the base. Reinstall the refrigeration connects. Follow the refrigeration mechanical connections tightening procedures in SECTION 3. Reinstall the power leads and capacity leads. Replace Compressor electrical cover. Start unit and check for leaks.

5. Solenoid Service and Replacement

Before replacing a solenoid, please do the following electrical checks:

Disconnect power supply to the AR300E. **Danger: Only a qualified service technician should service this equipment. An Electrical Shock hazard is present which could lead to severe injury or even death.** Check the suspected defective solenoid valve for continuity.





Pull both wires off the solenoid to expose the ¼ male tabs. Using an electrical multi-meter, check the resistance reading of the solenoid coil. For the 230 50Hz coil, the resistance will be 2000-2100 ohms. If no resistance is registered, replace coil.

There are 3 different solenoid valve repairs that can be performed on the AR300E.

Danger- Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation.

Caution- all hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause frostbite or other related injuries. Wear proper personal protective equipment such as safety goggles and gloves. When disconnecting any hose, please use extreme caution.

Caution- avoid breathing refrigerant vapors and/or lubricant mist. Exposure may irritate eyes, nose, throat, and skin. Please read the manufacturers Material Safety Data Sheet for further safety information on refrigerants and lubricants.

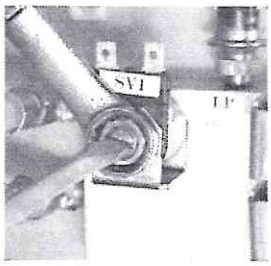
Danger: Always assume that high-pressure refrigerant exists when removing a solenoid valve. Failure to do so may result in bodily injury.

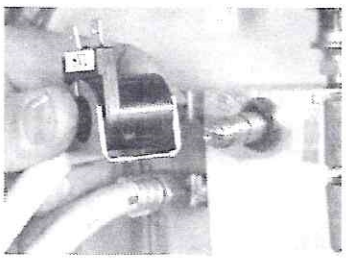
A. Solenoid Operator Installation (SV1, SV2, SV3, SV6, SV7, and SV8)

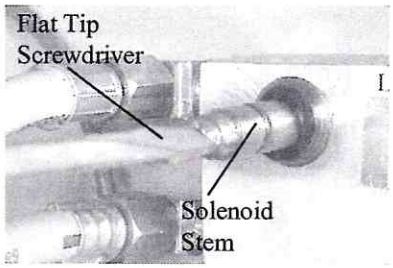
The solenoid operator is the portion of the solenoid valve that screws into the solenoid block assembly.

The following instructions are for replacing a solenoid operator (SV1, SV2, SV3, SV6, SV7 or SV8) in the AR300E:

Use the Low Side Refrigerant removal procedure in SECTION 3 to replace SV1, SV2, SV3, SV6 and SV8. Remove the Tank Purge hose from the Storage Tank before replacing SV7.

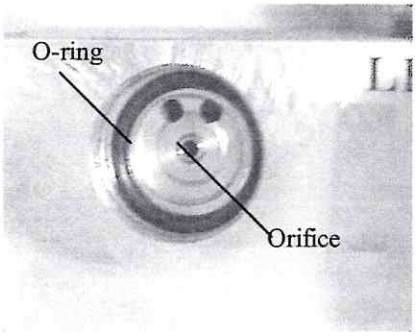


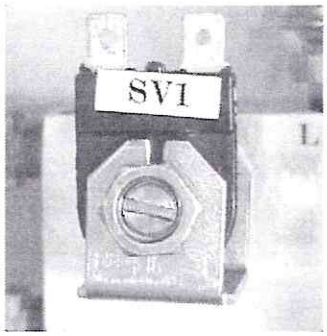




Place a 9/16-inch SAE wrench while hold a flat tip screw drive on the solenoid stem. Loosen the nut. Remove the coil assembly. Use the flat tip screw drive to loosen the solenoid stem. DO NOT use pliers to grab the stem by its sides (unless the stem is being replaced). This action will permanently damage the stem.

S2-8





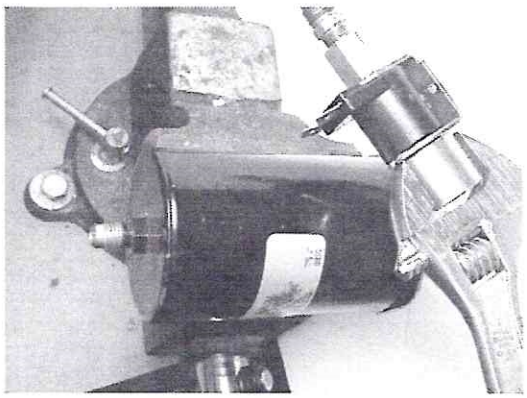
Removing the stem will expose an o-ring seal and the solenoid orifice in which the solenoid plunger seals against. DO NOT touch with metal objects. Even the smallest of nicks will prevent the solenoid plunger from sealing. Install new solenoid operator. Make sure the o-ring is installed in the orifice cavity. Also make sure the plunger is placed within the stem. Hand tight the solenoid stem assembly into the orifice cavity. Use a flat tip screwdriver for final tightening. Place the solenoid coil assembly onto the stem (Note: Never operate a solenoid coil when the solenoid plunger and stem are not in place). Secure with nut. Place wires back on solenoid coil. Start unit in Recovery Mode and check for leaks.

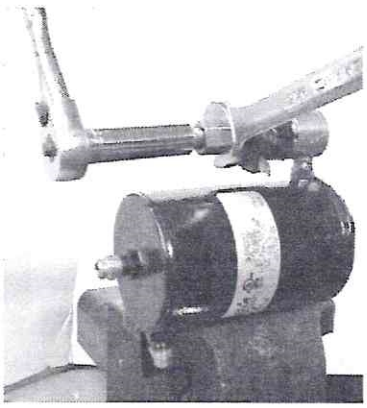
B. Solenoid Valve Installation (SV4)

The following instructions are for replacing a solenoid valve SV4 in the AR300E:

Use the Complete Refrigerant removal procedure in SECTION 3 to remove refrigerant from the AR300E.

Remove the wires going to SV4. Remove the Oil Separator assembly from the AR300E by loosening the two #8 screws on the back of the unit. Unscrew SV4 from Oil Separator. Apply a small amount to sealant to 1/8 male pipe thread on Oil Separator. Screw new SV4 solenoid valve onto Oil Separator. Install Standard straight brass fitting onto SV4 nut. Use backup wrench procedure. Reinstall Oil Separator assembly back into AR300E. Reconnect refrigerant lines as discussed in Refrigerant Mechanical Connections in SECTION 3. Re-connect wires to SV4. Check for leaks.





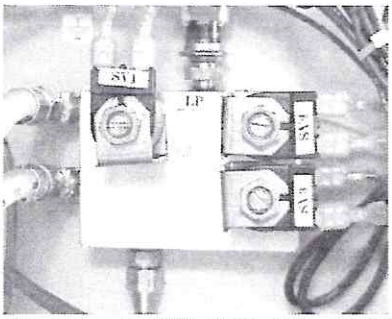
S2-9

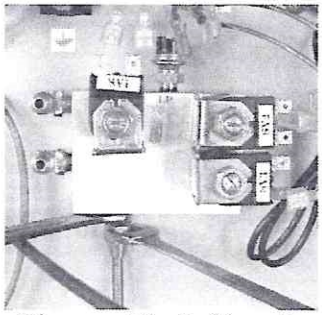
C. Solenoid Block Installation (SV1, SV2 and SV3)

The following instructions are for replacing the complete solenoid block assembly in the AR300E:

Use the Low Side Refrigerant removal procedure in SECTION 3 to remove refrigerant from the AR300E.

Replacing this block is only necessary if the orifice was damaged or some other physical damage to the solenoid block.





Remove the wires going to SV1, SV2, SV3 and LP. Disconnect the Refrigeration lines going to the Solenoid Block assembly. Remove the Oil Injection Assembly (see SECTION 2, item 18). Disconnect the Liquid Refrigeration hose. Remove the 2 mount bolts. Remove the Solenoid Block assembly from the AR300E. Install new solenoid block. Reconnect refrigerant lines as discussed in Refrigerant Mechanical Connections in SECTION 3. Re-connect all wires back to their respective devices. Start unit in Recovery Mode and check for leaks.

D. Manifold Installation (SV8)

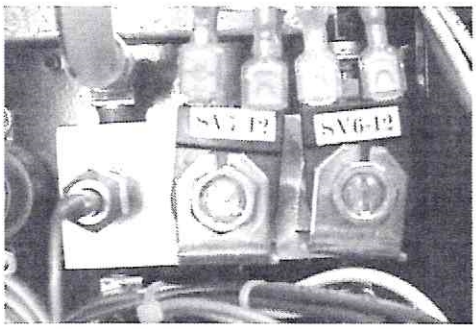
See Item 6 Gauge replacement for complete manifold removal and installation.

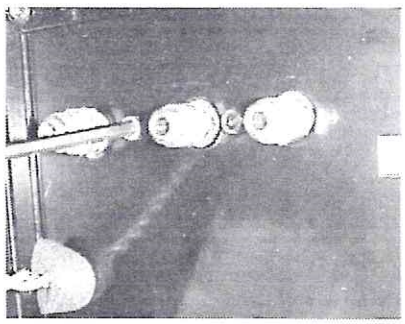
E. Discharge Block Installation (SV6 and SV7)

The following instructions are for replacing the complete solenoid block assembly in the AR300E:

Use the Complete Refrigerant removal procedure in SECTION 3 to remove refrigerant from the AR300E. Remove the Tank Purge hose from the Storage Tank.

Replacing this block is only necessary if the orifice was damaged or some other physical damage to the solenoid block.





Remove the wires going to SV6 and SV7. Disconnect the Refrigeration lines going to the Discharge Block assembly. Disconnect the Vapor and Purge Tank hoses. Remove the high pressure switch refrigerant connection. Remove the 2 mount bolts. Remove the Discharge Block assembly from the AR300E. Install new discharge block. Reconnect all hoses and refrigerant lines as instructed in Refrigerant Mechanical Connections in SECTION 3. Re-connect all wires back to their respective devices. Start unit in Recovery Mode and check for leaks.

AR300E Series Service Manual

For the following models: AR300E

73-101.1
2-12-2001 REV A

Table of Contents

General Safety Instructions

Only qualified service personnel should service this unit. The service personnel should be qualified in refrigerant and electrical service work. It will be necessary for the service technician to operate the unit with the front cover open. Please use extreme caution due to the presence of un-insulated live electrical parts.

Danger- Electrical Shock Hazard. When servicing this equipment with the front cover opened, live un-insulated electrical connections will be exposed. An Electrical Shock hazard could result in severe injury or even death.

Danger- this unit's recovery tank contains liquid refrigerant. Overfilling of the recovery tank may cause a violent explosion resulting in severe injury or even death.

Danger- Only use the recovery tank provided with this unit. See distributor for replacement tanks.

Danger- Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation.

Caution- all hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause frostbite or other related injuries. Wear proper personal protective equipment such as safety goggles and gloves. When disconnecting any hose, please use extreme caution.

Caution- avoid breathing refrigerant vapors and/or lubricant mist. Exposure may irritate eyes, nose, throat, and skin. Please read the manufacturers Material Safety Data Sheet for further safety information on refrigerants and lubricants.

Caution- to reduce the risk of fire, avoid the use of extension cords thinner than NO. 14 awg. (1,5mm^2) to prevent the overheating of this cord please keep length to a minimum.

Caution- do not use this equipment in the vicinity of spilled or open containers of gasoline or other flammable substances. Make certain that all safety devices are functioning properly before operating the equipment.

Mixing of different refrigerants will cause this equipment and the mobile A/C system to prematurely fail. Note: It is very expensive to destroy mixed or damaged refrigerants.

Make sure that recovery tank is placed on the load cell platform at all times. Failure to do so will disable certain safety features of this unit

Introduction

The AR300EE series is a fully automatic, single circuit refrigerant handling machine. The AR300E series is designed to service mobile air-conditioning systems that contains R-134a (AR300E) refrigerant.

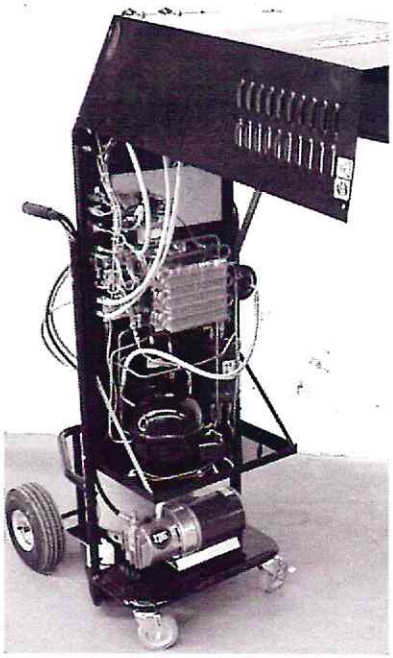
The following table will give you more information on power supply, Vacuum Pump size, tank size, etc….

Model	Voltage	Hz	Vac Pump	Tank Size	Max Refrigerant Weight	Empty Tank Weight
AR300E	230	50	2 Stage 52 l/m	27 LITERS	20.0 kgs.	13 kgs.

Many problems involve operator error, such as closed valves and wrong hose connections. Please read the operating manual and/or the quick start guide on the front of the unit to very carefully to verify all hose connections, valve and switch settings before attempting to service the machine.

This service manual consists of four sections:

Section 1 consists of the most common field problems and solutions.
Section 2 consists of how to service and repair components used in this equipment.
Section 3 consists of service and repair procedures.
Section 4 consists of electrical schematics, plumbing schematics, service part list and other reference material



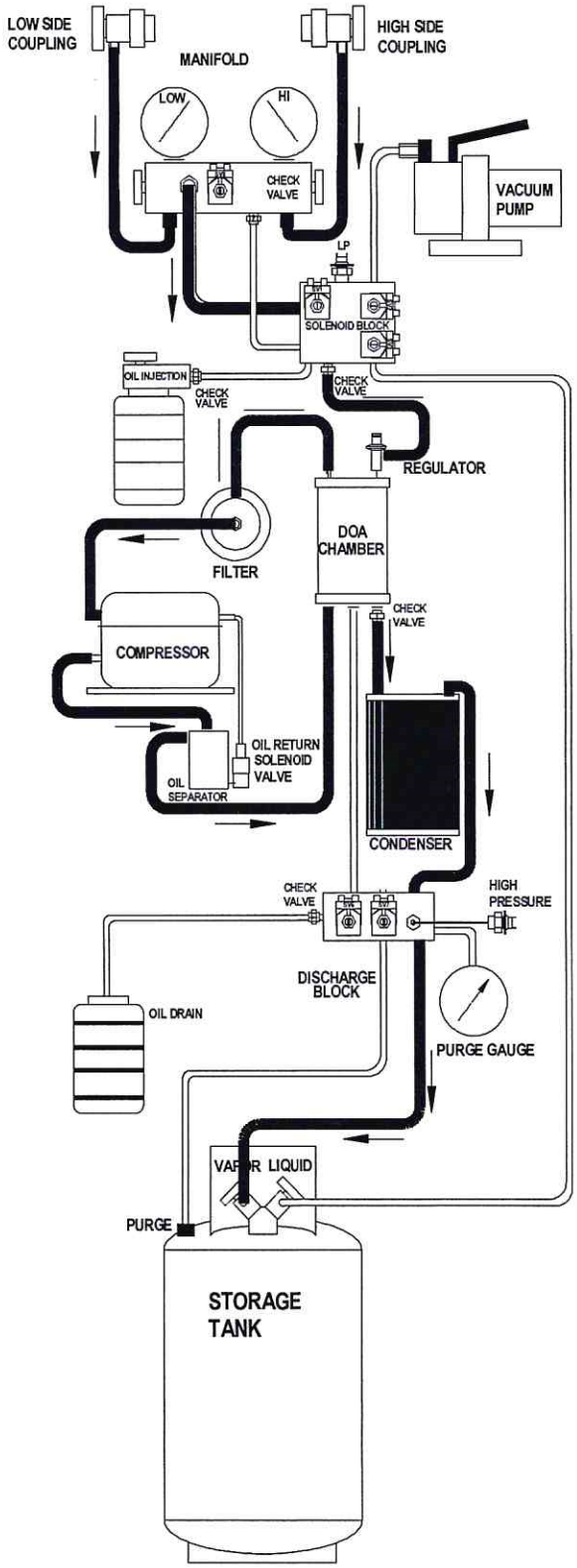
To better understand the machine, the following pages explain how the AR300E series operates. The AR300E can perform 8 functions. Each one will be describe in the following pages. Please review Table 1 to better understand the abbreviations used in this manual.

Table 1. AR300E abbreviations

DESCRIPTION	SCHEMATIC CODE	DESCRIPTION	SCHEMATIC CODE
Condenser Coil	CC	Compressor Relay	R1
Check Valve, 1/8 mpt to 1/4 flare	CV1	Vacuum Pump Relay	R2
Check Valve, 1/4 flare to 1/8 mpt	CV2	Manifold Solenoid Valve Relay	R3
Check Valve, 1/8 mpt to 1/8 mpt	CV3	Charging Solenoid Valve Relay	R4
DOA Chamber	DOA	No Function in the AR300E	R5
Circuit Breaker	F1	High Pressure Limit Relay	R8
Transformer Fuse	F2	Refrigerant ID Relay	RN
Filter Drier	FD	Pressure Regulator	RG
Low Side Pressure Gauge	G1	Low Side Service Fitting	SC1
High Side Pressure Gauge	G2	High Side Service Fitting	SC2
Tank Pressure Gauge	G3	Liquid Sight Glass	SG
Low Side Service Hose	H1	Storage Tank	ST
High Side Service Hose	H2	Recovery Solenoid Valve	SV1
Vacuum Pump Hose	H3	Vacuum Solenoid Valve	SV2
Tank Liquid Hose	H4	Charging Solenoid Valve	SV3
Tank Vapor Hose	H5	Compressor Oil Return Solenoid Valve	SV4
Tank Purge Hose	H6	Oil Drain Solenoid Valve	SV6
High Pressure Switch	HP	Purge Solenoid Valve	SV7
Keypad	KP	Manifold Solenoid Valve	SV8
Scale Assembly	LC	Main Power Switch	SW1
Low Pressure Switch	LP	Purge Switch	SW2
Compressor	M1	Transformer	TR
Fan	M2	Low Side Manifold Valve	V1
Oil Separator	OS	High Side Manifold Valve	V2
Oil Pressure Switch	OP	Oil Injection Valve	V3
PC Board	PCB	Vacuum Pump	VP

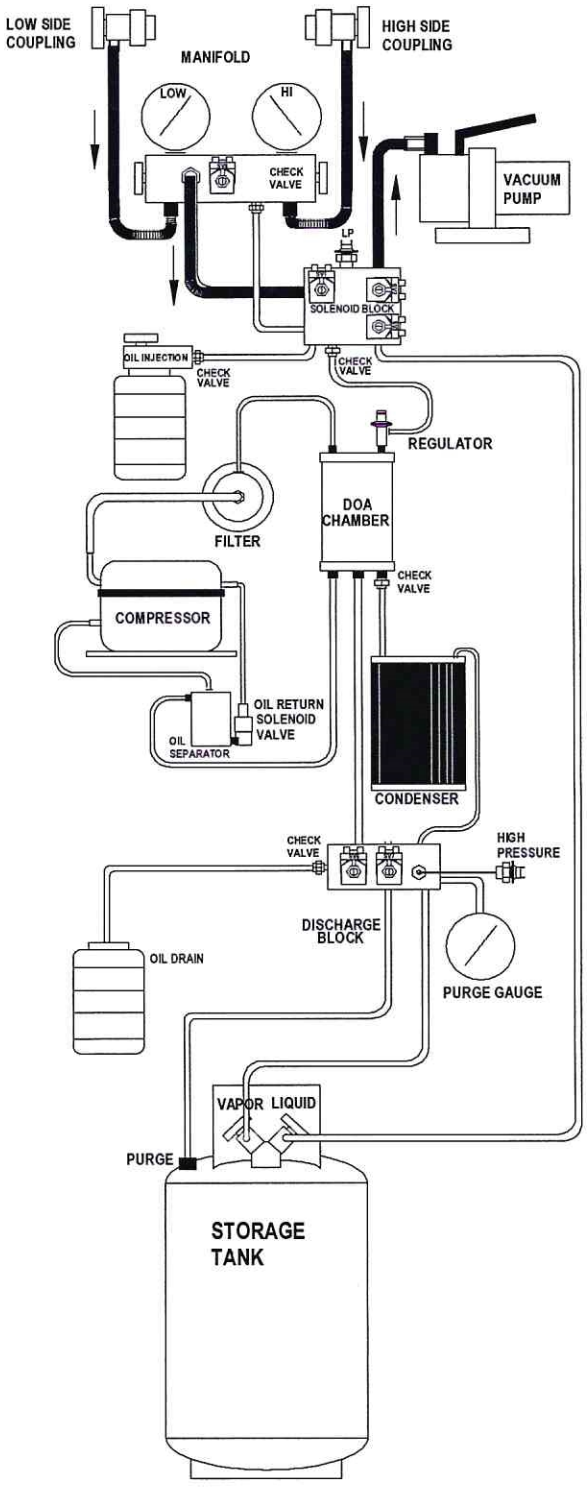
Mode 1- Recover/Recycle

The unit recovers the refrigerant from the auto a/c system through the Low Side and High Side couplings. The refrigerant enters the unit through the 2 service hoses attached directly to the Manifold. The high and low side refrigerant will then pass through their respective open manifold valves. The Manifold Solenoid Valve (SV8) will be open to allow the High Side refrigerant flow to mix to the Low Side refrigerant flow. The combined refrigerant flows past the LP (low pressure switch) and onward to SV1 (recovery solenoid valve) located on the main solenoid block. The refrigerant then flows through the energized SV1 and out of the solenoid block assembly through a check valve to the Pressure Regulator. The Regulator reduces the pressure down to a maximum of 5 BAR. The reduced pressure refrigerant then flows into a DOA Chamber where the refrigerant, dirt, refrigerant oil and other contaminants are separated by first going through a coalescent media and then into a vessel where a heat exchanger boils the remaining refrigerant out of the oil. The oil is collected at the bottom of the DOA Chamber. When OP (oil pressure switch) closes at .8 BAR, SV6 will open, thus automatically draining the oil from the DOA Chamber. The oil-free refrigerant leaves the DOA Chamber to the Filter where moisture is absorbed. This completes the second step in the recycling process. After leaving the Filter, the refrigerant enters the compressor clean and dry. The compressed refrigerant will leave the compressor with a small amount of oil (due to the compressor oil absorption). The compressed refrigerant then passes through the Oil Separator. Any new-absorbed oil is now removed from the refrigerant and is automatically returned the oil back to the compressor through the Oil Return Solenoid Valve. The hot compressed refrigerant leaves the Oil Separator and enters the heat exchanger in the DOA Chamber to promote the distillation process. The compressor refrigerant then leaves the heat exchanger through a check valve and proceeds to an air-cooled condenser. The condenser is needed to reject heat that may be contained in the refrigerant when ambient temperatures exceed 24° C. Next, the condensed refrigerant enters the discharge block assembly where the High Pressure Switch (HP) monitors the unit's discharge pressure. If the pressure goes above 25 BAR, HP will open and disrupt power to the unit's compressor and energize the RED light. Otherwise the refrigerant then continues from the discharge block into the refrigerant storage tank. The RECOVER/RECYCLE process will automatically stop when the mobile a/c pressure is below -.4 BAR vacuum. If the mobile a/c pressure were to rise above 4 psig, the unit would automatically restart.



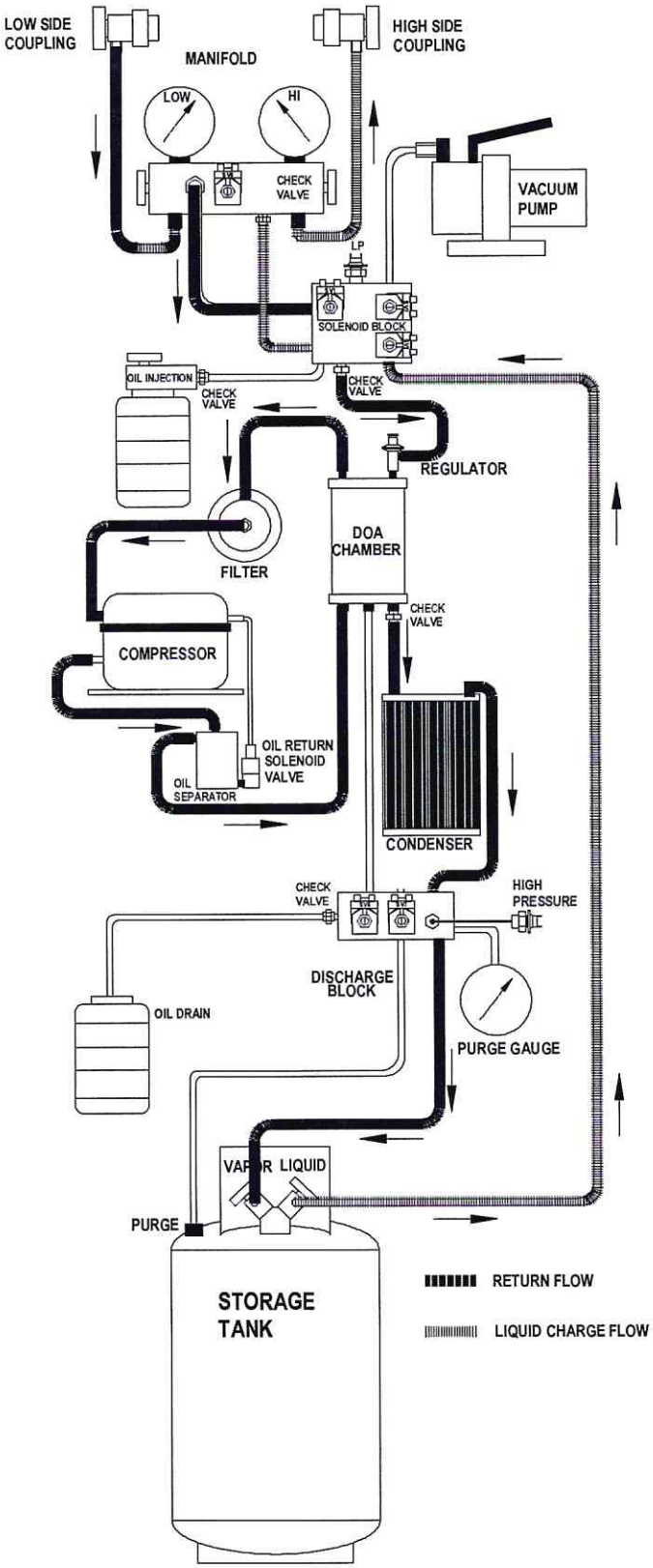
Mode 2- Evacuation

After the mobile a/c system is repaired, it should then be pulled into a deep vacuum to remove air and moisture before recharging it with refrigerant. The unit evacuates air from the auto a/c system through the Low Side and High Side couplings. The air enters the unit through the 2 service hoses attached directly to the Manifold. The air from the high and low side hoses will then pass through their respective open manifold valves. The Manifold Solenoid Valve (SV8) will be open to allow the High Side air to mix with the Low Side air. The combined air flows past the LP (low pressure switch) and onward to SV2 (vacuum solenoid valve) located on the solenoid block. The refrigerant then flows through the energized SV2 and out of the solenoid block assembly through a hose down to the Vacuum Pump. When the programmed vacuum time expires, the Vacuum Pump will turn off. Please note that if the LP senses pressure, the Vacuum Pump will not operate. This is to protect the Vacuum Pump. If pressure is sensed, run the Recover Mode first. For the best results, the mobile a/c system should be evacuated to –1 BAR of vacuum to ensure that all air and moisture have been removed.



Mode 3- Charge

The mobile a/c system should be in a vacuum before proceeding. After using the keypad to program the desired charge, the required vacuum in the Mobile A/C system will pull liquid refrigerant from the storage tank through SV3 (charging solenoid valve) located on the solenoid block. Next, the liquid refrigerant will pass through a sight glass on the way to a check valve on the back of the Manifold. The refrigerant then passes through the open high side manifold valve and onward through the red 2.5m service hose. The refrigerant will then pass through the open High Side Coupling attached to the mobile a/c system high side service port. The refrigerant is now entering the mobile a/c system. In order to ensure a complete and fast charge, the compressor is operated. The compressor pulls a small amount of vapor from the mobile a/c system through the blue 2.5m service hose. This gas is compressed and put into the refrigerant storage cylinder. This will create a small pressure differential to maintain liquid refrigerant flow. After the required amount of refrigerant is charged, the electronic circuit board cuts off the power from SV3 and the compressor. The LCD display will read CHARGE COMPLETE and give an audible signal.



Mode 4- Full Cycle

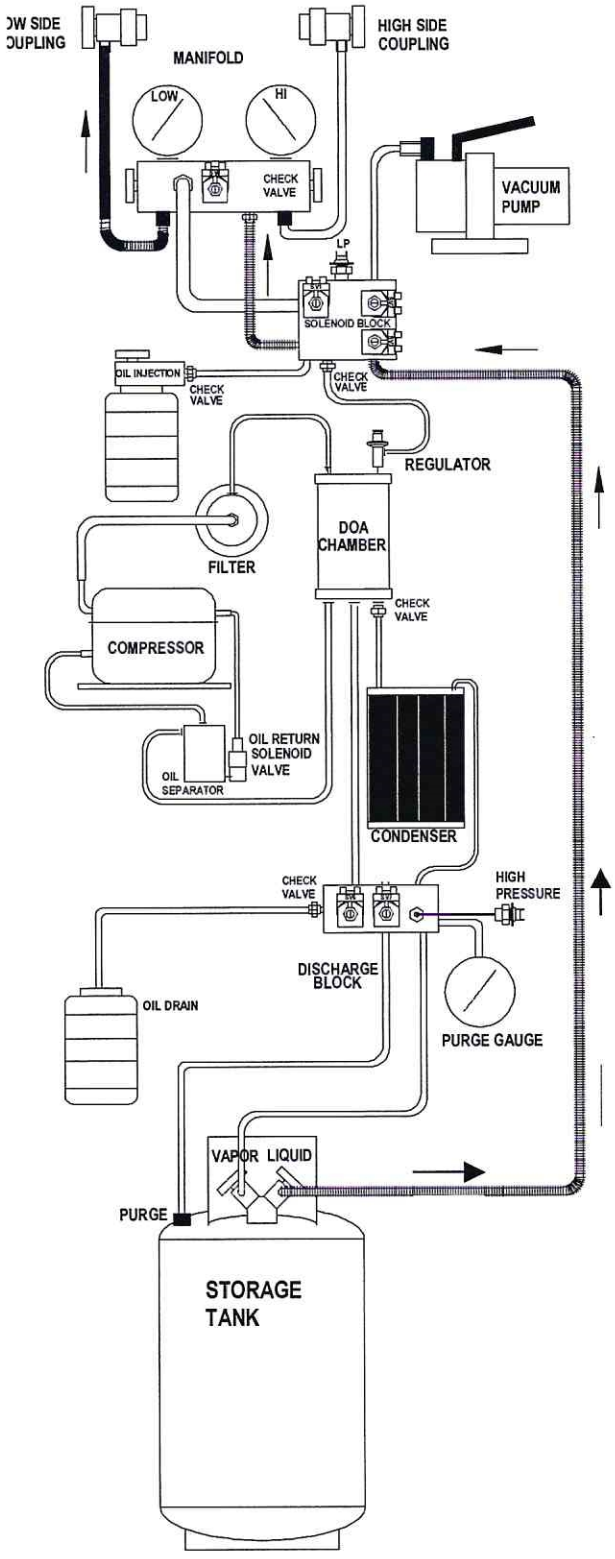
This mode will run Recovery (Mode 1), Evacuation (Mode 2) and Charge (Mode3) in succession. Note: When going from Recovery to Evacuation, the unit will run for two additional minutes after the Low Pressure switch is activate

Mode 5- Evacuation, Charge

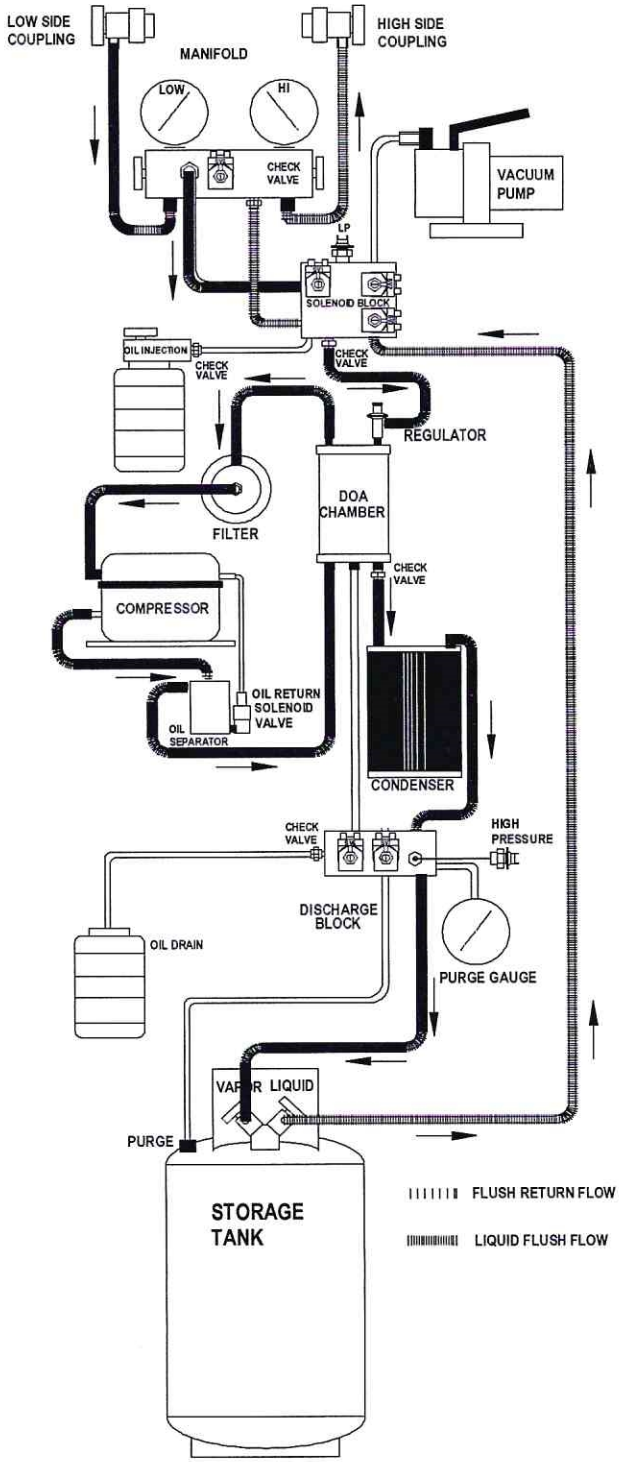
This mode will run Evacuation (Mode 2) and Charge (Mode 3) in succession.

Mode 6- Quick Charge

The mobile a/c system does not need to be in a vacuum before proceeding, but the mobile a/c system should be running. After using the keypad to program the desired charge, the lower pressure in the Mobile A/C system will pull liquid refrigerant from the storage tank through SV3 (charging solenoid valve) located on the solenoid block. Next, the liquid refrigerant will pass through a sight glass on the way to a check valve on the back of the Manifold. The liquid refrigerant then will pass through the energize SV8 (Manifold solenoid valve). Next, the refrigerant passes through the low side manifold valve (when opened) and onward through the blue 2.5m service hose. The refrigerant will then pass through the open Low Side Coupling attached to the mobile a/c system low side service port. The refrigerant is now entering the mobile a/c system. After the required amount of refrigerant is charged, the electronic circuit board cuts off the power from SV3 and SV8. The LCD display will read CHARGE COMPLETE and give an audible signal.



Mode 7- Liquid Flush

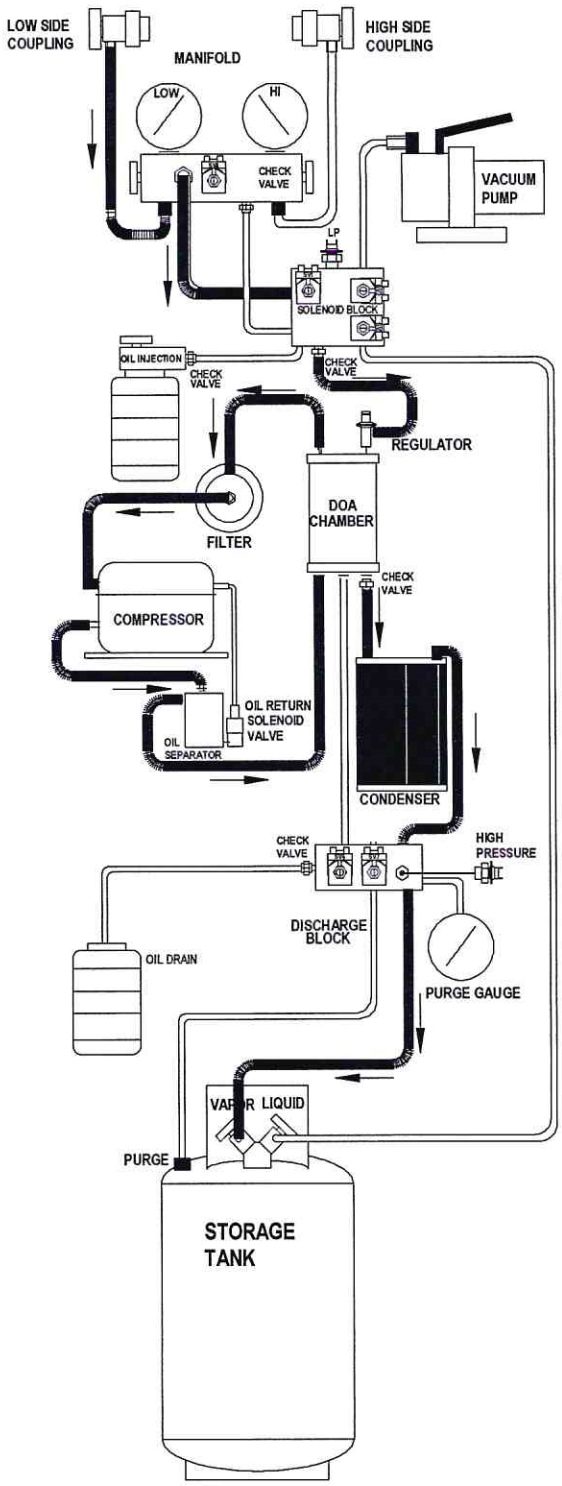


After using the keypad to program the desired liquid flush time, the lower pressure in the Mobile A/C system and the build up of higher pressure in the storage tank will push-pull liquid refrigerant from the storage tank through SV3 (charging solenoid valve) located on the solenoid block. Next, the liquid refrigerant will pass through a sight glass on the way to a check valve on the back of the Manifold. Next, the refrigerant passes through the open high side manifold valve and onward through the red 8' service hose. The refrigerant will then pass through the open High Side Coupling attached to the mobile a/c system low side service port. The refrigerant is now entering the mobile a/c system. The liquid refrigerant "floods" the mobile a/c system, absorbing refrigerant oil. The mixture of refrigerant and oil will then be recovered through the open Low Side coupling. The refrigerant re-enters the AR300E through the blue low side service hoses attached directly to the Manifold. The refrigerant flows through the opened low side manifold valve directly past the LP (low pressure switch) and onward to SV1 (recovery solenoid valve) located on the main solenoid block. The refrigerant then flows through the energized SV1 and out of the solenoid block assembly through a check valve to the Pressure Regulator. The Regulator reduces the pressure down to a maximum of 5 BAR. The reduced pressure refrigerant then flows into a DOA Chamber where the refrigerant, dirt, refrigerant oil and other contaminants are separated by first going through a coalescent media and then into a vessel where a heat exchanger boils the remaining refrigerant out of the oil. The oil is collected at the bottom of the DOA Chamber. When OP (oil pressure switch) closes at .8 BAR, SV6 will open, thus automatically draining the oil from the DOA Chamber. The oil-free refrigerant leaves the DOA Chamber to the Filter where moisture is absorbed. This completes the second step in the recycling process. After leaving the Filter, the refrigerant enters the compressor clean and dry. The compressed refrigerant will leave the compressor with a small amount of oil (due to the compressor oil absorption). The compressed refrigerant then passes through the Oil Separator. Any absorbed oil is now removed from the refrigerant and is automatically returned the oil back to the compressor through the Oil Return Solenoid Valve. The hot compressed refrigerant leaves the Oil Separator and enters the heat exchanger in the DOA Chamber to promote the distillation process. The compressor refrigerant then leaves the heat exchanger through a check valve and proceeds to an air-cooled condenser. The condenser is needed to reject heat that may be contained in the refrigerant when ambient temperatures exceed 24° C.

Next, the condensed refrigerant enters the discharge block assembly where the High Pressure Switch (HP) monitors the unit's discharge pressure. If the pressure goes above 25 BAR, HP will open and disrupt power to the unit's compressor and energize the RED light. Otherwise the refrigerant then continues from the discharge block into the refrigerant storage tank. The Liquid Flush process will automatically stop after the liquid flush time has expired and when the mobile a/c pressure is below -.5 BAR vacuum. If the mobile a/c pressure were to rise above .4 BAR, the unit would automatically restart. This process can take up to 60 minutes to complete

Mode 8- Refill

To refill the AR300E, attach a new tank of refrigerant to the Low Side Service coupling. The refrigerant from the new refrigerant tank will flow through the open Low Side coupling. The refrigerant enters the unit through the low side service hoses attached directly to the Manifold. The refrigerant will then pass through the open low side manifold valve. Next, the refrigerant will flows past the LP (low pressure switch) and onward to SV1 (recovery solenoid valve) located on the main solenoid block. The refrigerant then flows through the energized SV1 and out of the solenoid block assembly through a check valve to the Pressure Regulator. The Regulator reduces the pressure down to a maximum of 5 BAR. The reduced pressure refrigerant then flows into a DOA Chamber where the refrigerant, dirt, refrigerant oil and other contaminants are separated by first going through a coalescent media and then into a vessel where a heat exchanger boils the remaining refrigerant out of the oil. The oil is collected at the bottom of the DOA Chamber. When OP (oil pressure switch) closes at .8 BAR, SV6 will open, thus automatically draining the oil from the DOA Chamber. The oil-free refrigerant leaves the DOA Chamber to the Filter where moisture is absorbed. This completes the second step in the recycling process. After leaving the Filter, the refrigerant enters the compressor clean and dry. The compressed refrigerant will leave the compressor with a small amount of oil (due to the compressor oil absorption). The compressed refrigerant then passes through the Oil Separator. Any new-absorbed oil is now removed from the refrigerant and is automatically returned the oil back to the compressor through the Oil Return Solenoid Valve. The hot compressed refrigerant leaves the Oil Separator and enters the heat exchanger in the DOA Chamber to promote the distillation process. The compressor refrigerant then leaves the heat exchanger through a check valve and proceeds to an air-cooled condenser. The condenser is needed to reject heat that may be contained in the refrigerant when ambient temperatures exceed 24° C. Next, the condensed refrigerant enters the discharge block assembly where the High Pressure Switch (HP) monitors the unit's discharge pressure. If the pressure goes above 25 BAR, HP will open and disrupt power to the unit's compressor and energize the RED light. Otherwise the refrigerant then continues from the discharge block into the refrigerant storage tank. The REFILL process will automatically stop when the mobile a/c pressure is below -.4 BAR vacuum or the maximum refill amount (14.0 kgs total refrigerant in the storage tank) is reached.



Mode 9B- Air Purge

The non-condensable (NCG's) are collected in the top of the storage tank. The NCG's will travel out of the storage tank through the purge hose to the inlet of SV7 (purge solenoid valve). When the purge switch on the front of the unit is pushed, SV7 will open. The NCG's then travel through SV7 to the oil drain hose. The NCG's are expelled through the open end of the oil drain hose (which is located in the oil drain bottle). In some countries it is required to connect the purge hose to an empty cylinder. Please read the local rule and regulations concerning this matter.