

**PREVOST**

# *Instructions Sheet*

IS-94090

## **CONVERTING A/C SYSTEM FROM R12 TO R134a REFRIGERANT**

### **DESCRIPTION**

Vehicles with R12 refrigerant-charged air conditioning systems can be converted to systems charged with R134a refrigerant using the parts and procedure supplied with this instruction sheet.

### **MATERIAL**

The 3 following kits are required to retrofit "H3-40" vehicles.

#### **FIRST KIT: #45-2632**

Description of Kit #45-2632

<b>Part no</b>	<b>Description</b>	<b>Qty</b>
95-0221	Expansion Valve (Driver's system)	1
87-0890	Pressure Relief Valve (450 psi)	1
45-2567	Filter Drier assembly	1
95-0234	Cap (red) with gauge adapter fitting	2
95-0241	Expansion Valve (Central system)	1
37-3306	Label - R134a	2

#### **SECOND KIT:**

As per customer's choice, the second kit may consist in either, a modification to the existing compressor (kit #45-2631) or in the installation of a new compressor assembly (compressor assembly #95-0240 for vehicles powered with a series 92 engine and #95-0239 for those with a series 60 engine).

When installing a new compressor assembly (#95-0239 or #95-0240), the following parts are also required.

Part no	Description	Qty
45-2405	Switch Assy (20PS001MB320K) - High Pressure (320-245 psi)	1
45-2406	Switch Assy (20PS001MA030C) - Low Pressure (30 - 15 psi)	1
56-1813	Female Connector	1
56-1023	Male contact pin	1
56-1024	Female contact pin	1

Description of Kit #45-2631

Part no	Description	Qty
45-2405	Switch Assy (20PS001MB320K) - High Pressure (320-245 psi)	1
45-2406	Switch Assy (20PS001MA030C) - Low Pressure (30 - 15 psi)	1
45-2421	Switch Assy (20PS001MA280K) - High Pressure (280-220 psi)	1
95-0030	Schrader Valve 1/8" NPT	2
95-0249	Schrader Valve 1/4" NPT	1
50-1312	Bushing 1/4" x 1/8"	1
95-0234	Cap (Red) with gauge adapter fitting	1
95-0235	Cap (Blue) with gauge adapter fitting	1
50-1653	Street Tee (1/8")	1
87-0754	Suction Service Valve Gasket	1

**THIRD KIT: #45-2633**

Description of Kit #45-2633

Part no	Description	Qty
37-3272	Hose (24" lg) - Compressor Discharge	1
37-3269	Hose (37" lg) - Compressor Suction	1
45-2564	Hose (38" lg) - Condenser Inlet	1
45-2565	Hose (39" lg) - Condenser Outlet	1
45-2566	Hose (26" lg) - Receiver Tank Outlet	1
37-3273	Hose (26" lg) - Filter Outlet (Filter to Main Evaporator)	1
37-3276	Hose (25" lg) - Expansion valve Inlet (Central system)	1
37-3270	Hose (25" lg) - Central Evaporator Outlet	1
37-3271	Hose (19" lg) - Suction	1
37-3278	Hose (20" lg) - Driver's Liquid Inlet	1
37-3279	Hose (55" lg) - Driver's Evaporator Inlet	1
37-3277	Hose (86" lg) - Driver's Evaporator Outlet	1
37-3274	Hose (71" lg) - Suction	1
37-3275	Hose (121" lg) - Filter Outlet (Filter towards Driver's Unit)	1
50-7169	O-ring - Main Evap. Inlet (2) & Driver's Evap. Outlet (1) & Filter Outlet (1)	4
50-7209	O-ring - Cond. Outlet (2) & Suction Hose (2) & Filter Outlet (1)	5
50-1802	O-ring - Compressor Discharge (2) & Condenser Inlet (2)	4
50-1803	O-ring - Compressor Suction (2) & Suction Hose (2) & Main Evap. Outlet (2)	6
50-7279	O-ring - Expansion valve (driver's unit)	2
IS-94090	Instruction sheet	1
FI-94090	Feuille d'instructions	1

---

## EQUIPMENT AND MATERIALS REQUIRED:

1. A recovery or reclaim system designed and approved for use with the refrigerant being removed; e.g. an R12 machine for R12 refrigerant.
2. Containers for the refrigerant being removed.
3. A vacuum pump capable of 500 microns (0.04 psi or 0,28 kPa).
4. A micron gauge in good operating condition.
5. Containers to handle the contaminated oil generated by the cleaning process (about 11 liters total).
6. A basic set of refrigeration servicing equipment and hand tools.
7. A small flashlight to check compressor oil and charge levels.
8. Loctite Threadlocker #271.
9. Service manifold gauge set and proper evacuation hoses.
10. A leak detector designed to detect the presence of R134a refrigerant.
11. Rubber gloves and eye protection.
12. Hand rags and other shop supplies.
13. R134a refrigerant (24 lbs).
14. New "Ester-based" oil\*. Approximately 11 liters are required. About 7 liters will be used for cleanup, the remainder for the final fill. Only 7 liters are required when installing a new compressor since the sump of the latter is already filled with "Ester-based" oil.
15. The appropriate R134a refrigerant conversion kits for the vehicle being converted.

\* Prevost recommends Castrol Icematic SW68 Ester-based oil. Call Castrol Inc. to determine the authorized distributor nearest you.

Castrol Canada Inc.  
Tel: (416) 252-5511  
Fax: (416) 252 1774

U.S.A. Castrol Inc.  
Tel: (714) 660-9414  
Fax: (714) 660-9374

## PROCEDURE

**Warning:** Use safe shop practices at all times. Only properly trained and certified shop technicians should conduct this work.

Read the entire procedure before beginning work.

---

## **A/C COMPRESSOR OIL REPLACEMENT**

**Note:** *The following steps apply even if a new A/C Compressor will be installed.*

1. With system running, close off the compressor suction service valve, pumping the compressor down. Refer to "Pumping down procedure" in the Maintenance Manual. Stop the vehicle engine, unplug the compressor clutch (to ensure that no one can run the system) and close off the compressor discharge service valve to isolate the compressor from the system.

2. Install a reclaimer or recovery machine.

**Warning:** *Equalize compressor internal pressure **before** removing the oil drain plug. Failure to do this may result in personal injury. Low side pressure must be 0.0 psi.*

3. Lower A/C compressor oil level until oil is level with sight glass lower rim.

**Warning:** *Personal protection such as rubber gloves and safety glasses should be worn.*

4. Open all valves, connect compressor clutch then run the system with maximum load to keep the flow of refrigerant through the system as high as possible and allow in this way maximum oil to return to the compressor sump. Run the system at high idle (1000 rpm) for 1 1/2 to 2 hours.

**Caution:** *The ambient temperature around the vehicle and at the interior (passenger area) must be kept above 70°F. The interior temperature can be elevated by opening the vehicle entrance door and windows or by forcing the unit into full heat while the air conditioning switch is "ON". Failure to do this will slow down the flow of oil through the system and result in a higher percentage of the existing oil left in the system. This could be detrimental to the performance of the system and may result in costly damage.*

5. If the oil level raises higher than the middle of compressor sight glass, repeat steps 2 to 4.

6. Drain the A/C compressor sump from all mineral-based oil. This is contaminated oil and must be handle accordingly. Do not reuse this oil.

7. Refill the A/C compressor sump with new "Ester-based" oil until level with sight glass lower rim (approximately 3.5 liters).

8. Run the system for a second time repeating previous step 4.

9. Drain and refill A/C compressor sump repeating previous steps, then run the system (for the last time) repeating step 4 above.

## **REFRIGERANT R12 RECOVERING**

Remove the existing refrigerant from the system using proper reclaimer or recovery machine. **DO NOT** vent to the atmosphere.

## A/C COMPRESSOR RETROFITTING

**Note:** The following steps don't apply when installing a new compressor assembly. In a such case, refer to heading "Installing a new compressor" further in this publication.

1. Remove the low pressure switch from compressor body, discard, then install a "Schrader" valve (#95-0249) as illustrated in figure 1.

**Note:** Prevost recommends applying "Loctite" threadlocker #271 on threads of all fittings provided with a "pipe thread".

2. Remove cap from "Schrader" valve, then install the new low pressure switch (#45-2406).

**Note:** Do not apply "Loctite" on "Schrader" valves' countersunk edge nor to pressure switches' inner countersunk edge.

3. Connect the existing connector (C-132) to new low pressure switch (#45-2406).

**Note:** The existing connector (C-132) may not fit with the connector of new Low Pressure Switch, in such a case, remove connectors and solder wires together. Insulate the junctions using shrinkable tubings (not included).

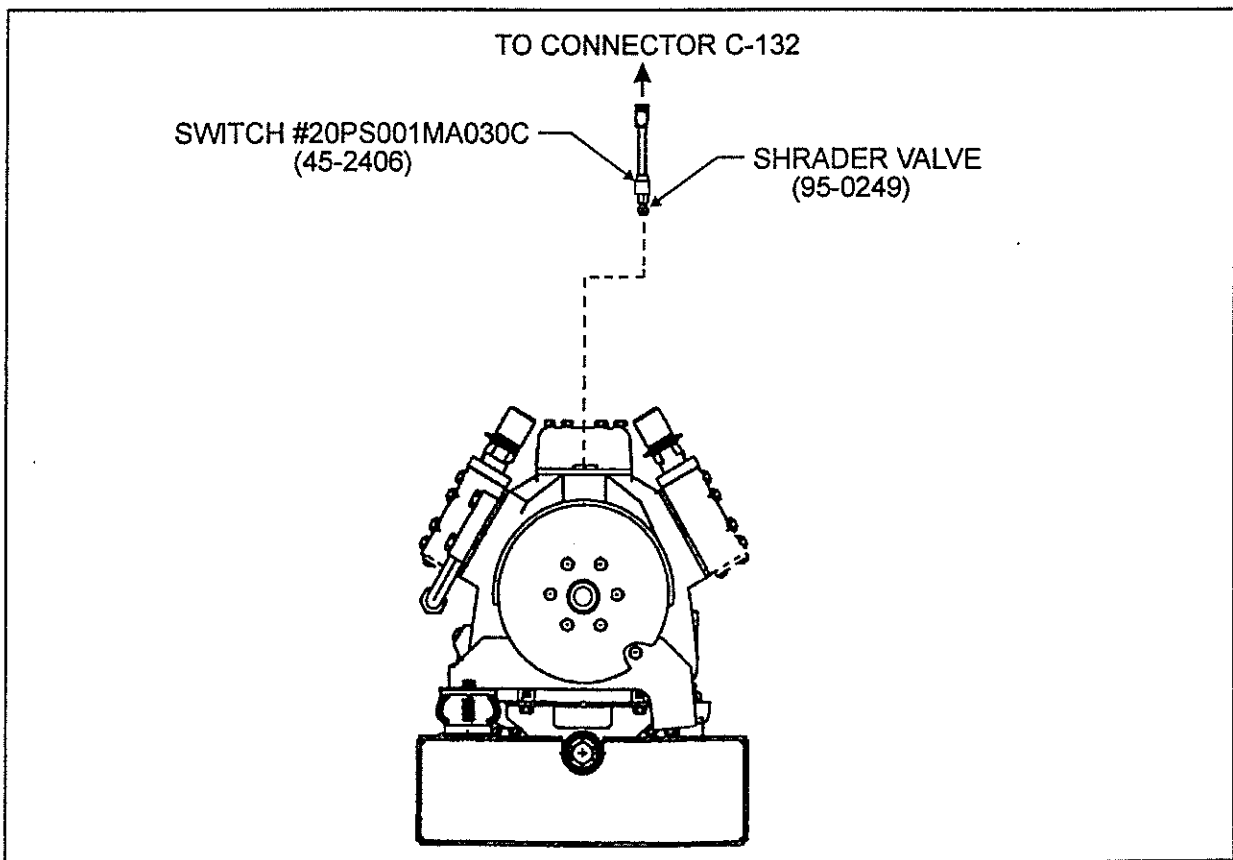


Fig. 1 - Pressure Switch Installation (Suction side)

220077

4. Remove and discard the high pressure switch, bushing and elbow from compressor head. Install a bushing (#50-1312), a street tee (#50-1653), then two "Schrader" valves (#95-0030) as illustrated in figure 2.

5. Install both high pressure switches (#45-2405 & 45-2421) on "Schrader" valves as illustrated in figure 2.

6. Connect the existing connector (C-133) to new high pressure switch #45-2405.

**Note:** The existing connector (C-133) may not fit with the connector of new High Pressure Switch, in such a case, remove connectors and solder wires together. Insulate the junctions using shrinkable tubings (not included).

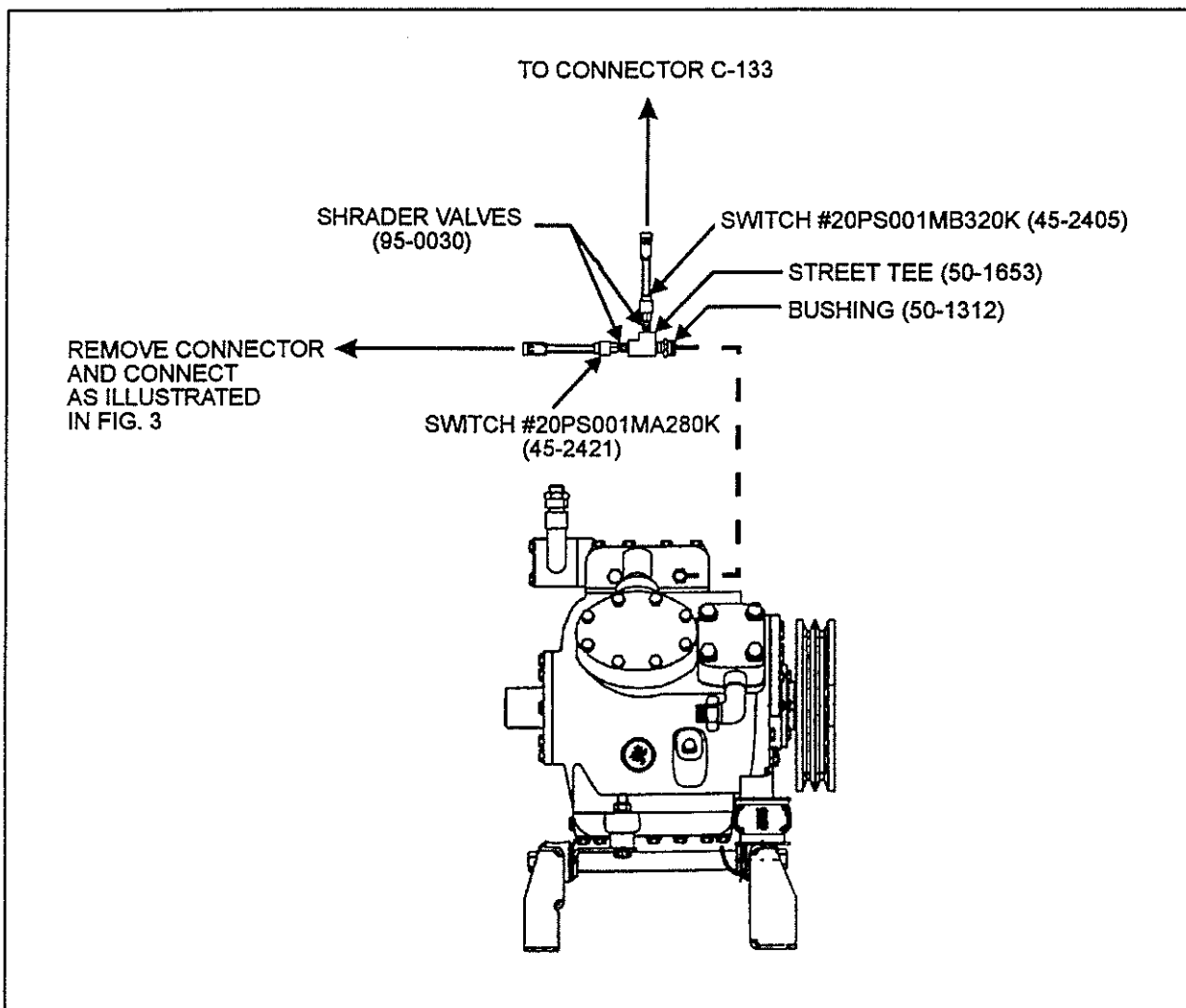


Fig. 2 - Pressure Switch Installation (Pressure side)

220062

22006

7. Remove and discard black connector from new high pressure switch #45-2421, remove and discard contact pins then strip extremity of wires.

8. Identify red wire #67A inserted in connector C-133, strip (without cutting it) a 1/2" section of wire #67A as close as possible of connector C-133.

9. Join and solder one wire of new high pressure switch #45-2421 to wire #67A as illustrated in figure 3. Insulate the junction with electric tape.

**Note:** We recommend the use of an electric soldering gun with a resin core solder combination of 60% tin and 40% lead.

10. Identify red wire #31A inserted in the unloader connector (C-130), strip (without cutting it) a 1/2" section of wire #31A as close as possible of connector C-130.

11. Join and solder the second wire of new high pressure switch #45-2421 to wire #31A as illustrated in figure 3. Insulate the junction with electric tape.

**Note:** If connector C-131 (used for the second unloader) is more accessible, perform the junction with red wire #31B inserted in connector C-131, you will obtain the same result.

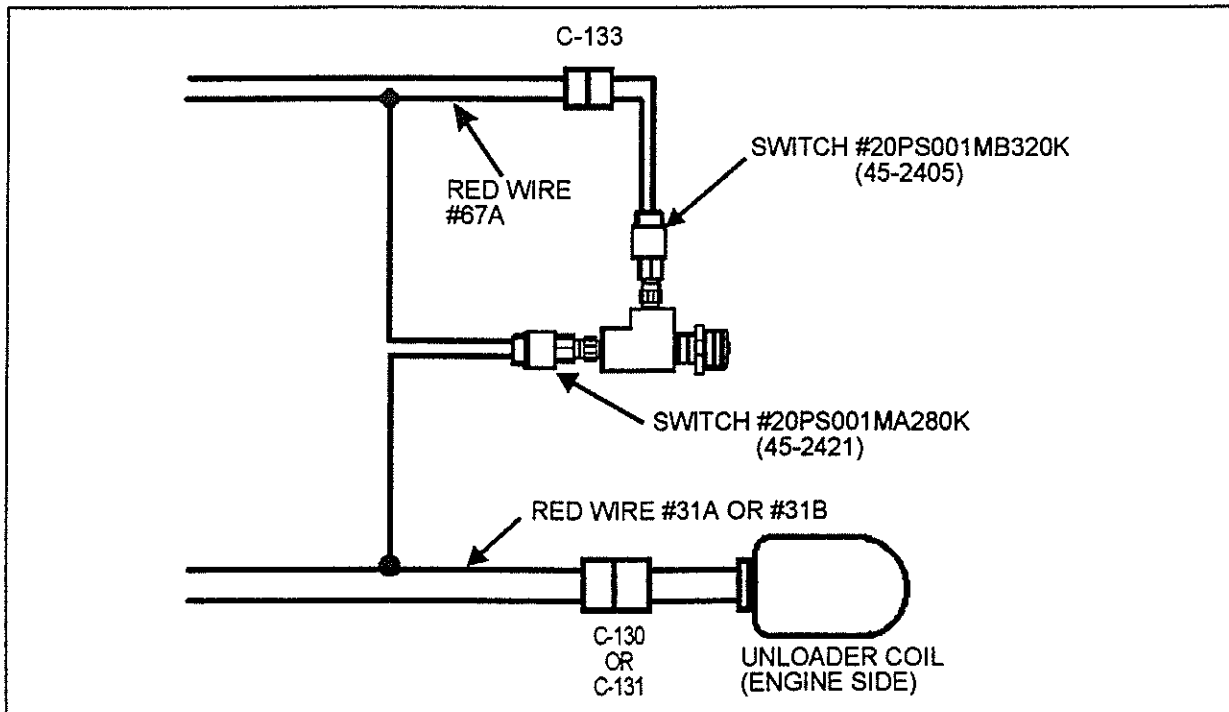


Fig. 3 - High Pressure Switch Wiring

22015

---

12. Remove the sealing cap from the gauge connection on the discharge service valve, discard, then install gauge adapter with sealing cap (red) #95-0234.

13. Remove the sealing cap from the gauge connection on the suction service valve, discard, then install gauge adapter with sealing cap (blue) #95-0235.

14. Replace the existing compressor suction and discharge hoses with new hoses from the kit. Replace the O-rings at the hose connections with the new O-rings from the kit. Refer to figure 4 for hose and O-ring identification and location.

**Note:** Lubricate the "O-rings" with white grease before installing.

**Note:** If suction hose cannot be removed for lack of space, remove suction service valve from compressor and separate hose from valve in shop vice. Assemble new hose to valve, replace gasket then reinstall on compressor. Torque suction service valve bolts to 55 - 80 lbf·ft (75 - 108 N·m).

### **INSTALLING A NEW COMPRESSOR**

1. Remove existing compressor then install new one following procedure given in the maintenance manual.

**Note:** Before fixing new compressor assembly, connect new suction hose (#37-3269) to compressor; it will avoid the necessity to remove the suction service valve from compressor to connect the new suction hose.

2. Install low pressure switch (#45-2406) on "schrader" valve mounted on suction side of compressor.

**Note:** Do not apply "Loctite" on "Schrader" valves' countersunk edge nor to pressure switches' inner countersunk edge.

3. Install high pressure switch (#45-2405) on "schrader" valve mounted on pressure side of compressor. One high pressure switch is already mounted on this port.

4. Remove unloader coils from existing compressor then reinstall them on new compressor.

5. Perform steps 3, 6 to 11 and 14, described under previous heading "A/C Compressor Retrofitting" to adequately connect pressure switches.

**Note:** The high pressure switch which was already mounted on new compressor should be identified as #45-2421.

6. Identify on new A/C compressor, both blue wires coming from magnetic clutch.

7. Crimp a male contact pin (#56-1023) on one blue wire, then a female contact pin (#56-1024) on the other blue wire.

8. Insert the blue wire with male contact pin in cavity #2 of new connector #56-1813, then insert the



---

blue wire with female contact pin in cavity #1.

9. Connect new connector (#56-1813) to existing connector C-128.

### **MODIFICATION IN CONDENSER COMPARTMENT**

1. Remove the caps (only) from the gauge adapter fittings on the receiver tank inlet and outlet valves. Replace each of the caps with new gauge adapter fittings and caps (red) #95-0234.

2. Remove the pressure relief valve (350 psi) from receiver tank then install new pressure relief valve (450 psi) #87-0890.

3. Disconnect inlet and outlet hoses from filter drier assembly.

4. Remove and retain clamp retaining filter drier bottle to wall then remove and discard filter drier assembly.

5. Position new filter drier assembly (#45-2567) then secure using retained clamp and screws. Do not connect hoses.

6. Locate the "R-12" label affixed on receiver tank, remove, then place the new "R-134a" label (#37-3306).

### **MODIFICATION IN EVAPORATOR COMPARTMENT**

1. Open evaporator components' access panel located first baggage compartment.

2. Disconnect the expansion valve inlet hose, then the evaporator outlet hose.

3. Trace the small coiled tubing of expansion valve up to caulking covering the remote bulb, then remove all caulking.

4. Loosen the straps retaining the remote bulb, then remove it.

5. Disconnect the equalizer line from expansion valve.

6. Remove the two screws retaining expansion valve, remove valve, then replace with new one #95-0241. Follow Service Instructions provided with new expansion valve. Don't forget to replace gasket with the new one supplied.

7. Connect equalizer line to expansion valve, then fix the remote bulb of new expansion valve to the evaporator suction line using straps.

**Note:** *The touching surface between the expansion valve bulb and suction line must be as clean and tight as possible to assure good heat transfer.*

8. Apply caulking all around bulb.

---

9. Replace the expansion valve inlet hose and the evaporator outlet hose. Replace the O-rings with the new O-rings from the kit. Refer to figure 4 for hose and O-ring identification and location.

**Note:** Lubricate the "O-rings" with white grease before installing.

### **HOSE REPLACEMENTS**

1. Replace all hoses inside the condenser compartment. Replace the O-rings at the hose connections with the new O-rings from the kit. Refer to figure 4 for hose and O-ring identification and location.

**Note:** Lubricate the "O-rings" with white grease before installing.

**Note:** Prevost recommends applying "Loctite" threadlocker #271 on male fittings' countersunk edge where the type of connection does not require an O-ring to ensure a sealed connection.

2. Replace the hose routed from filter drier towards driver's evaporator. The connection with filter drier is located in condenser compartment while the one with the copper line is located at ceiling of first baggage compartment.

**Note:** Each time a locking tie is removed, do not forget to replace with a new one (not included) once the new hose has been installed.

**Note:** If a rubber boot is found damaged, discard it, and apply sufficient caulking around hose to ensure airtightness.

3. Replace the second hose connected to a copper line at ceiling of first baggage compartment. The other end of this hose is located in condenser compartment.

4. Working now in driver's compartment, remove panel giving access to driver's HVAC unit.

5. Disconnect Evaporator Inlet and Outlet hoses from driver's expansion valve, then remove and discard expansion valve. Install new expansion valve #95-0221. Replace both O-rings. Refer to figure 4 for O-ring identification.

6. Replace Evaporator Inlet and Outlet hoses with new hoses from the kit. One end of each hose is accessible from spare tire compartment.

**Note:** Each time a locking tie is removed, do not forget to replace with a new one (not included) once the new hose has been installed.

7. Replace hose connected to rear end of spare tire compartment and to driver's liquid solenoid valve.

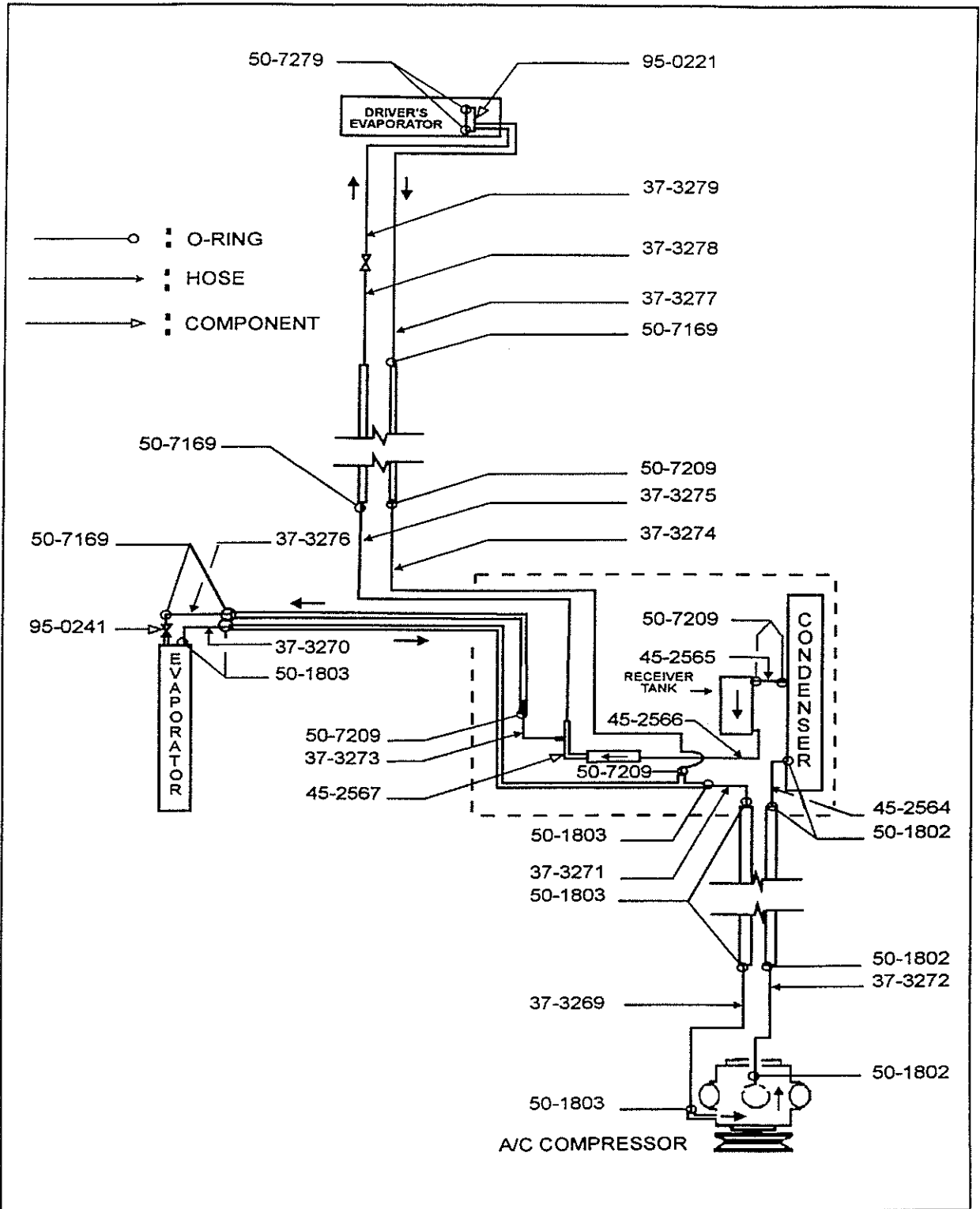


Fig. 4

22016

---

## **REFRIGERANT R134a CHARGING**

1. Drain the oil out of the A/C compressor sump (for the last time) then refill with new "Ester-based" oil (approximately 4,0 liters). This last oil change is not necessary when a new compressor is installed.

**Caution:** *The repeat oil changes are necessary to ensure that contamination level of the mineral oil within the system is reduced to an acceptable level where it will no longer create a problem on conversion to R134a.*

2. Pump down the system below 2000 microns. Refer to "Pump Down Procedure" in the appropriate maintenance manual.

3. Charge the system at full charge using 24 lbs of R-134a refrigerant.

4. Leak test all connections following standard shop practices and procedures. Repair as needed.

**Caution:** *Make certain the leak detector being used is capable of properly detecting R-134a refrigerant. Many of the older detectors do not work for alternative refrigerants.*

5. Remove the "R-12" label affixed on inner side of engine compartment R.H. side door, then place the new "R-134a" label (#37-3306).

## **SUPERHEAT VALUE ADJUSTMENT**

The central expansion valve must be adjusted as follows:

1. Perform the following initial step with the system not running. Backseat the central expansion valve adjusting screw to release spring pressure, then screw in 1 1/2 turns clockwise.

2. Run the system and perform the final adjustment to obtain a superheat value of 10°F when the system is charged with R-134a refrigerant. Refer to appropriate maintenance manual for the procedure used to adjust superheat. The temperature and pressure data required to adjust superheat is given in Chart at the end. If the facility performing this retrofit is equipped with a superheat computer, the adjustment can be done following the instructions supplied with the computer.

**Note:** *Unlike the central expansion valve, the driver's expansion valve is not adjustable.*

3. Release the vehicle for service.

**Caution:** *The evaporator air filters must be regularly removed and cleaned to maintain efficient operation of the system.*

After one week of in-service operation, inspect the system paying special attention to the following items:

1. Check for leaks and repair as required.

- 
2. Check that the refrigerant charge is at the proper level and adjust as needed.
  3. Make sure all access port caps are in place.
  4. Check the compressor oil level and adjust as required. The level should be in center of compressor sight glass with the system running, the compressor warm, and the system having been run for a minimum of 15 minutes before the level is checked.
  5. Examine the compressor oil for cleanliness and change the oil if it is discolored and/or dirty.

**PROCEDURE COMPLETE**

**CHART ON THE REVERSE SIDE**

HFC-134a			
TEMP °F	TEMP °C	VAPOR PRESSURE	
		INCHES OF MERCURY VACUUM	PSIG
-100	-73	27.8	
-90	-68	26.9	
-80	-62	25.6	
-70	-57	23.8	
-60	-51	21.5	
-50	-46	18.5	
-40	-40	14.7	
-30	-34	9.8	
-20	-29	3.8	
-10	-23		1.8
0	-18		6.3
10	-12		11.6
20	-7		18.0
30	-1		25.6
40	4		34.5
50	10		44.9
60	16		56.9
70	21		70.7
80	27		86.4
90	32		104.2
100	38		124.3
110	43		146.8
120	49		171.9
130	54		199.8
140	60		230.5
150	66		264.4
160	71		301.5
170	77		342.0
180	82		385.9
190	88		433.6
200	93		485.0
210	99		540.3