

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.

A) MODIFICATION ON A "XL-40" OR "XL-45E" CONVERTED VEHICLE (H-285 AND FOLLOWING) EQUIPPED WITH DRIVER'S HVAC ONLY (See page 1 to 7)

B) MODIFICATION ON A "XL-45" CONVERTED VEHICLE EQUIPPED WITH DRIVER'S HVAC ONLY (See page 8 to 14)

-A-

MATERIAL

kit #45-2675 includes the following items.

Part no	Description	Qty
95-0234	Cap (red) with gauge adapter fitting	1
95-0235	Cap (blue) with gauge adapter fitting	1
95-0221	Expansion Valve	1
95-0030	Schrader valve	1
95-0220	Receiver Drier	1
45-2405	Switch Assy (20PS001MB320K) - High Pressure (320-245 psi)	1
45-2663	Hose 50" - Compressor Discharge	1
45-2664	Hose 73" - Condenser Inlet	1
45-2662	Hose 85" - Condenser Outlet	1
45-2665	Hose 32" - Receiver drier Outlet	1
45-2539	Hose 65" - Evaporator Inlet	1

45-2535	Hose 86" - Evaporator Outlet	1
45-2666	Hose 10" - By-pass (high)	1
45-2667	Hose 81" - By-pass (low)	1
45-2668	Hose 26" - Compressor Suction	1
45-2538	Hose 14" - Driver's Liquid Inlet	1
50-7279	O-ring - Expansion Valve	2
37-3306	Label - R134a	1
IS-94086	Instruction Sheet	1

Note: As per customer's choice, the existing A/C compressor can either be modified (mineral oil replaced with polyol ester oil) or replaced with a new compressor #95-0219.

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. Container 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. Container to handle the contaminated oil generated by the cleaning process.
6. A basic set of refrigeration servicing equipment and hand tools.
7. Loctite Threadlocker #271.
8. Service manifold gauge set and proper evacuation hoses.
9. A leak detector designed to detect the presence of R134a refrigerant.
10. Rubber gloves and eye protection.
11. Hand rags and other shop supplies.
12. R134a refrigerant (6 lbs 10 oz for the "XL-45E" and 6 lbs 2 oz for the "XL-40").
13. New "Polyol ester oil" *. Approximately 42 U.S. fluid ounces are required. About 28 ounces will be used for cleanup, the remainder for the final fill. When installing a new compressor, only 18 U.S. fluid ounces are required since just one oil change out is required plus 4 ounces is added to the new compressor.
14. The appropriate R134a refrigerant conversion kit for the vehicle being converted.

* Prevost recommends Castrol Icematic SW68 Polyol ester 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.

Caution: Utmost care must be taken to prevent moisture from getting into the air conditioning system. Do not leave the compressor or system open to the atmosphere for longer than 15 minutes maximum.

Note: A temperature/vapor pressure chart dealing with R134a is annexed to this document.

Read the entire procedure before beginning work

1. Recover the R12 using proper recovery equipment and procedure.

Note: The following steps 2 through 6 inclusively apply even if a new A/C compressor will be installed.

2. Remove the compressor from the system and drain all mineral oil from the compressor. This is contaminated oil and must be handle accordingly. Do not reuse this oil.

3. Refill the existing compressor with 14 oz of new polyol ester oil. Measure the amount of oil drained from compressor to determine if a substantial quantity of oil has been left in the system.

4. Reinstall the compressor and evacuate the system.

5. Charge the system with R12 using industry acceptable charging methods.

6. Run the system with maximum load at high idle (1000 rpm) for a minimum of 1 hour to allow the remaining mineral oil to mix with the polyol ester oil.

Note: If a new compressor has to be installed, perform the preceding step 6, then go to heading "Installing a new compressor" further in this publication.

7. Repeat this process (steps 1 through 6) of draining and recharging with new polyol ester oil until the amount of mineral oil remaining in the polyol ester oil is less than 5%. (Typically three change outs will be sufficient.)

Note: When repeating step 6 for the second and third times; running the system for only 1/2 hour will be sufficient.

8. Recover the R12 from the system using proper recovery equipment and procedures. **Do not** vent to the atmosphere.

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9. Remove the compressor from the system and drain the used oil. Refill the compressor with 14 oz of new polyol ester oil.
 10. Remove the sealing cap from the gauge connection on the suction service valve, discard, then install gauge adapter with sealing cap (blue) #95-0235.
 11. Remove the sealing cap from the gauge connection on the discharge service valve, discard, then install gauge adapter with sealing cap (red) #95-0234.
 12. Reinstall the compressor. Do not connect hoses.
 13. Locate the receiver drier mounted in L.H. rear corner of engine compartment (close to the condenser), then disconnect inlet and outlet hoses from receiver drier.
 14. Remove and discard receiver drier then install new one #95-0220. Do not connect hoses.
 15. Locate the high pressure switch mounted in R.H. rear corner of engine compartment (behind rear lights), disconnect, then remove and discard switch.
 16. Install schrader valve #95-0030 then high pressure switch #45-2405. Connect switch.

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

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

17. Replace all A/C hoses fitted inside engine compartment (if need, refer to figure1 for hose identification):

- Compressor Suction and Discharge hoses
- Condenser Inlet and Outlet hoses
- Receiver Drier Outlet hose
- High and Low by-pass hoses

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. On hoses provided with an "O-ring"; lubricate it with white grease (multi-purpose) before to installing.*

18. Working now in driver's compartment, remove panel giving access to HVAC unit.
19. Locate expansion valve fixed to the evaporator then disconnect inlet and outlet hoses.
20. Remove expansion valve and replace with the new one #95-0221. Fit the two new O-rings #50-7279 provided with kit.
21. Replace Evaporator Inlet and Outlet hoses with new hoses from the kit. One end of each hose is accessible from small compartment behind front bumper.

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.*

22. Replace hose connected to rear end of compartment behind front bumper and to liquid refrigerant solenoid valve.

23. Evacuate the system thoroughly.

Note: *The evacuation levels for R134a systems should be the same as for R12 systems (minimum 500 microns at the system and pulled from both the low and high pressure sides of the system.) If care is not taken to prevent moisture from entering the system components prior to assembly, evacuation could be expected to take longer to achieve acceptable limits of system moisture and non-condensibles. Tecumseh recommends a maximum of 2% non-condensibles and 80 PPM moisture. The completed system should have a moisture level of 10 PPM or less after running with an appropriate drier installed.*

24. Break the vacuum with R134a vapor.

25. Charge the system with R134a using industry acceptable charging methods. (6 lbs 10 oz for the "XL-45E" and 6 lbs 2 oz for the "XL-40").

26. Leak test all connections. Repair as needed.

Caution: *Make certain the leak detector being used is capable of properly detecting R134a. Many of the older detectors do not work for alternative refrigerants.*

27. Place the "R134a" label (#37-3306) on inner side of engine compartment R.H. rear door.

INSTALLING A NEW COMPRESSOR

1. Recover the R12 refrigerant and any residual mineral oil left in the system using proper recovery equipment. **Do not** vent to the atmosphere.

2. Remove the compressor from the system and carry it on a work bench.

3. Disassemble magnetic clutch assembly from existing compressor then reinstall assembly on new compressor #95-0219. If need, refer to the appropriate maintenance manual.

Note: *Don't forget to secure clutch ground ring terminal with one of the four bolts retaining magnetic clutch assembly.*

4. Add 4 oz of polyol ester oil to the new compressor. This adding is necessary to compensate for the length of lines.

5. Note position and orientation of suction and discharge service valves on top of existing compressor, unscrew and remove valves then reinstall them at the same position and orientation on new compressor.

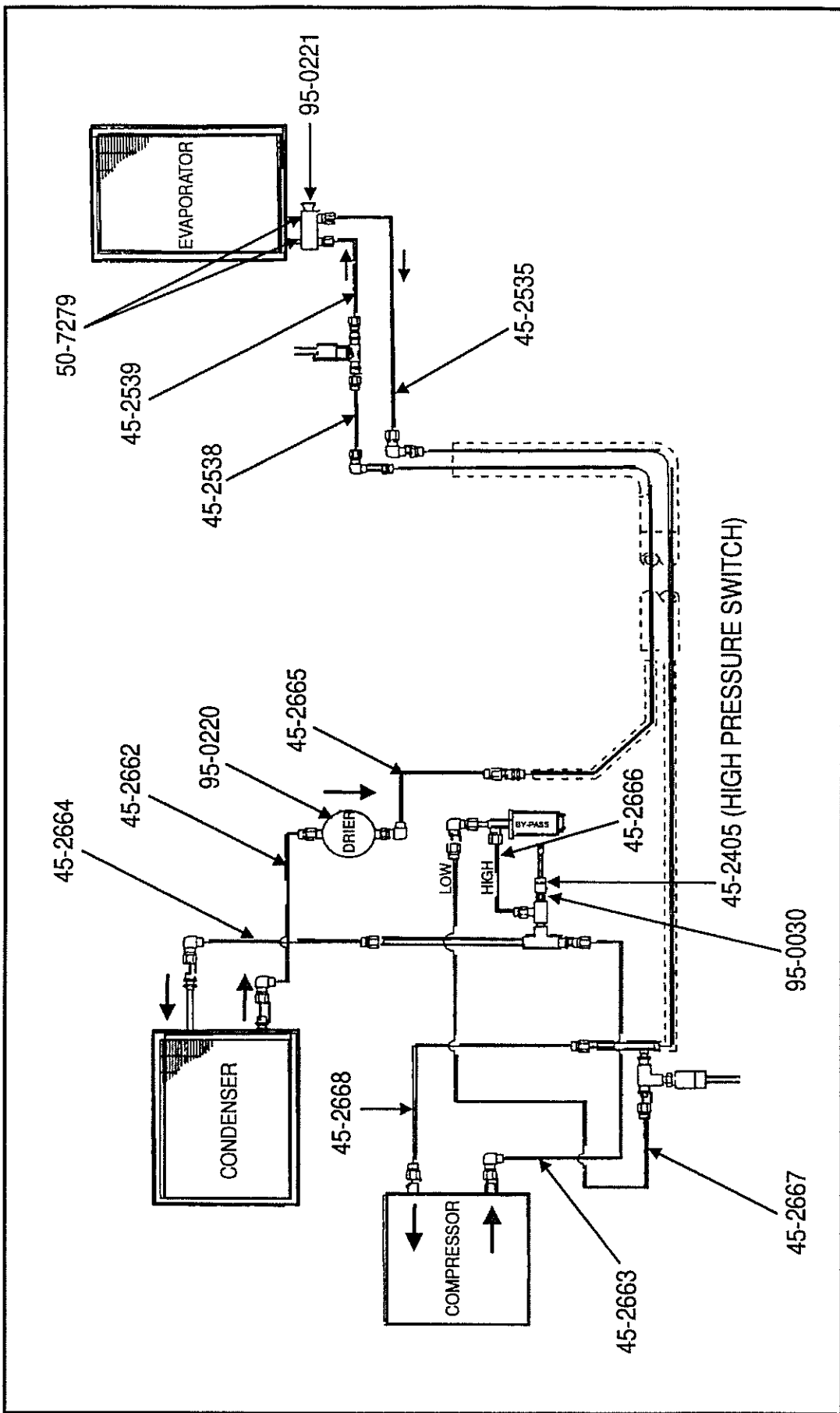
Continue procedure by performing preceding steps 10 through 27.

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

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1. Check for leaks and repair as required.
 2. Check that the refrigerant charge is adequate and adjust as needed.
 3. Make sure all access port caps are in place.
 4. Check the compressor oil level and adjust as required.

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

PROCEDURE COMPLETE



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FIG. 1 - Hose Identification (XL-40 and 45E)

-B-

**MODIFICATION ON A "XL-45" CONVERTED VEHICLE
EQUIPPED WITH DRIVER'S HVAC UNIT ONLY**

MATERIAL

kit #45-2677 includes the following items.

Part no	Description	Qty
95-0234	Cap (red) with gauge adapter fitting	1
95-0235	Cap (blue) with gauge adapter fitting	1
95-0221	Expansion Valve	1
95-0030	Schrader valve	1
95-0220	Receiver Drier	1
45-2405	Switch Assy (20PS001MB320K) - High Pressure (320-245 psi)	1
45-2535	Hose 86" - Evaporator outlet	1
45-2678	Hose 36" - Compressor Suction	1
45-2679	Hose 49" - Compressor Discharge	1
45-2680	Hose 14" - Condenser Inlet	1
45-2681	Hose 28" - Condenser Outlet	1
45-2682	Hose 21" - Receiver Drier Outlet	1
45-2538	Hose 14" - Driver's Liquid Inlet	1
45-2539	Hose 65" - Evaporator Inlet	1
45-2683	Hose 37" - By-pass (low)	1
45-2684	Hose 28" - By-pass (high)	1
50-7279	O-ring - Expansion Valve	2
37-3306	Label - R134a	1
IS-94086	Instruction Sheet	1

Note: As per customer's choice, the existing A/C compressor can either be modified (mineral oil replaced with polyol ester oil) or replaced with a new compressor #95-0219.

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. Container 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.

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5. Container to handle the contaminated oil generated by the cleaning process.
 6. A basic set of refrigeration servicing equipment and hand tools.
 7. Loctite Threadlocker #271.
 8. Service manifold gauge set and proper evacuation hoses.
 9. A leak detector designed to detect the presence of R134a refrigerant.
 10. Rubber gloves and eye protection.
 11. Hand rags and other shop supplies.
 12. R134a refrigerant (6 lbs 10 oz).
 13. New "Polyol ester oil" *. Approximately 42 U.S. fluid ounces are required. About 28 ounces will be used for cleanup, the remainder for the final fill. When installing a new compressor, only 18 U.S. fluid ounces are required since just one oil change out is required plus 4 ounces is added to the new compressor.
 14. The appropriate R134a refrigerant conversion kit for the vehicle being converted.

* Prevost recommends Castrol Icematic SW68 Polyol ester 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.

Caution: Utmost care must be taken to prevent moisture from getting into the air conditioning system. Do not leave the compressor or system open to the atmosphere for longer than 15 minutes maximum.

Note: A temperature/vapor pressure chart dealing with R134a is annexed to this document.

Read the entire procedure before beginning work

1. Recover the R12 using proper recovery equipment and procedure.

Note: The following steps 2 through 6 inclusively apply even if a new A/C compressor will be installed.

2. Remove the compressor from the system and drain all mineral oil from the compressor. This is contaminated oil and must be handle accordingly. Do not reuse this oil.

3. Refill the existing compressor with 14 oz of new polyol ester oil. Measure the amount of oil drained from compressor to determine if a substantial quantity of oil has been left in the system.

4. Reinstall the compressor and evacuate the system.

5. Charge the system with R12 using industry acceptable charging methods.

6. Run the system with maximum load at high idle (1000 rpm) for a minimum of 1 hour to allow the remaining mineral oil to mix with the polyol ester oil.

Note: If a new compressor has to be installed, perform the preceding step 6, then go to heading "Installing a new compressor" further in this publication.

7. Repeat this process (steps 1 through 6) of draining and recharging with new polyol ester oil until the amount of mineral oil remaining in the polyol ester oil is less than 5%. (Typically three change outs will be sufficient.)

Note: When repeating step 6 for the second and third times; running the system for only 1/2 hour will be sufficient.

8. Recover the R12 from the system using proper recovery equipment and procedures. **Do not** vent to the atmosphere.

9. Remove the compressor from the system and drain the used oil. Refill the compressor with 14 oz of new polyol ester oil.

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

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

12. Install the compressor then tension drive belt to 65 lbs. Do not connect hoses.

13. Working now from inside L.H. side rear service compartment, locate the receiver drier mounted in left corner, then disconnect inlet and outlet hoses from receiver drier.

14. Unscrew both clamps retaining receiver drier then remove and discard receiver drier.

15. Position new receiver drier #95-0220 then secure using the two clamps. Do not connect hoses.

16. Locate the high pressure switch mounted close to ceiling, disconnect, then remove and discard switch.

*Note: Two pressure switches are mounted close to ceiling, if need refer to figure 1 to quickly identify which one is the **High** pressure switch.*

17. Install schrader valve #95-0030 then high pressure switch #45-2405. Connect switch.

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

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

18. Replace all A/C hoses fitted inside engine and L.H. side rear service compartments (if need, refer to figure 1 for hose identification):

- Compressor Suction and Discharge hoses
- Condenser Inlet and Outlet hoses
- Receiver Drier Outlet hose
- High and Low by-pass hoses

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. On hoses provided with an "O-ring"; lubricate it with white grease (multi-purpose) before to installing.*

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

20. Locate expansion valve fixed to the evaporator then disconnect inlet and outlet hoses.

21. Remove expansion valve and replace with the new one #95-0221. Fit the two new O-rings #50-7279 provided with kit.

22. Replace Evaporator Inlet and Outlet hoses with new hoses from the kit. One end of each hose is accessible from small compartment behind front bumper.

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.*

23. Replace hose connected to rear end of compartment behind front bumper and to liquid refrigerant solenoid valve.

24. Evacuate the system thoroughly.

Note: *The evacuation levels for R134a systems should be the same as for R12 systems (minimum 500 microns at the system and pulled from both the low and high pressure sides of the system.) If care is not taken to prevent moisture from entering the system components prior to assembly, evacuation could be expected to take longer to achieve acceptable limits of system moisture and non-condensibles. Tecumseh recommends a maximum of 2% non-condensibles and 80 PPM moisture. The completed system should have a moisture level of 10 PPM or less after running with an appropriate drier installed.*

25. Break the vacuum with R134a vapor.

26. Charge the system with 6lbs 10 oz of R134a using industry acceptable charging methods.

27. Leak test all connections. Repair as needed.

Caution: Make certain the leak detector being used is capable of properly detecting R134a. Many of the older detectors do not work for alternative refrigerants.

28. Place the "R134a" label (#37-3306) on inner side of L.H. side rear service compartment door.

INSTALLING A NEW COMPRESSOR

1. Recover the R12 refrigerant and any residual mineral oil left in the system using proper recovery equipment. **Do not** vent to the atmosphere.
2. Disconnect both hoses from top of existing compressor then disconnect magnetic clutch connector.
3. Loosen the compressor drive belt adjusting bolt then slip the drive belt off the pulley.
4. Unbolt compressor from its support on fan drive seat (retain screws), then remove compressor assembly and carry it on a work bench.
5. Disassemble magnetic clutch assembly from existing compressor then reinstall assembly on new compressor #95-0219. If need, refer to the appropriate maintenance manual.

Note: Don't forget to secure clutch ground ring terminal with one of the four bolts retaining magnetic clutch assembly.

6. Add 4 oz of polyol ester oil to the new compressor. This adding is necessary to compensate for the length of lines.
7. Note position and orientation of suction and discharge service valves on top of existing compressor, unscrew and remove valves then reinstall them at the same position and orientation on new compressor.

Continue procedure by performing preceding steps 10 through 28.

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 adequate and adjust as needed.
3. Make sure all access port caps are in place.
4. Check the compressor oil level and adjust as required.

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

PROCEDURE COMPLETE

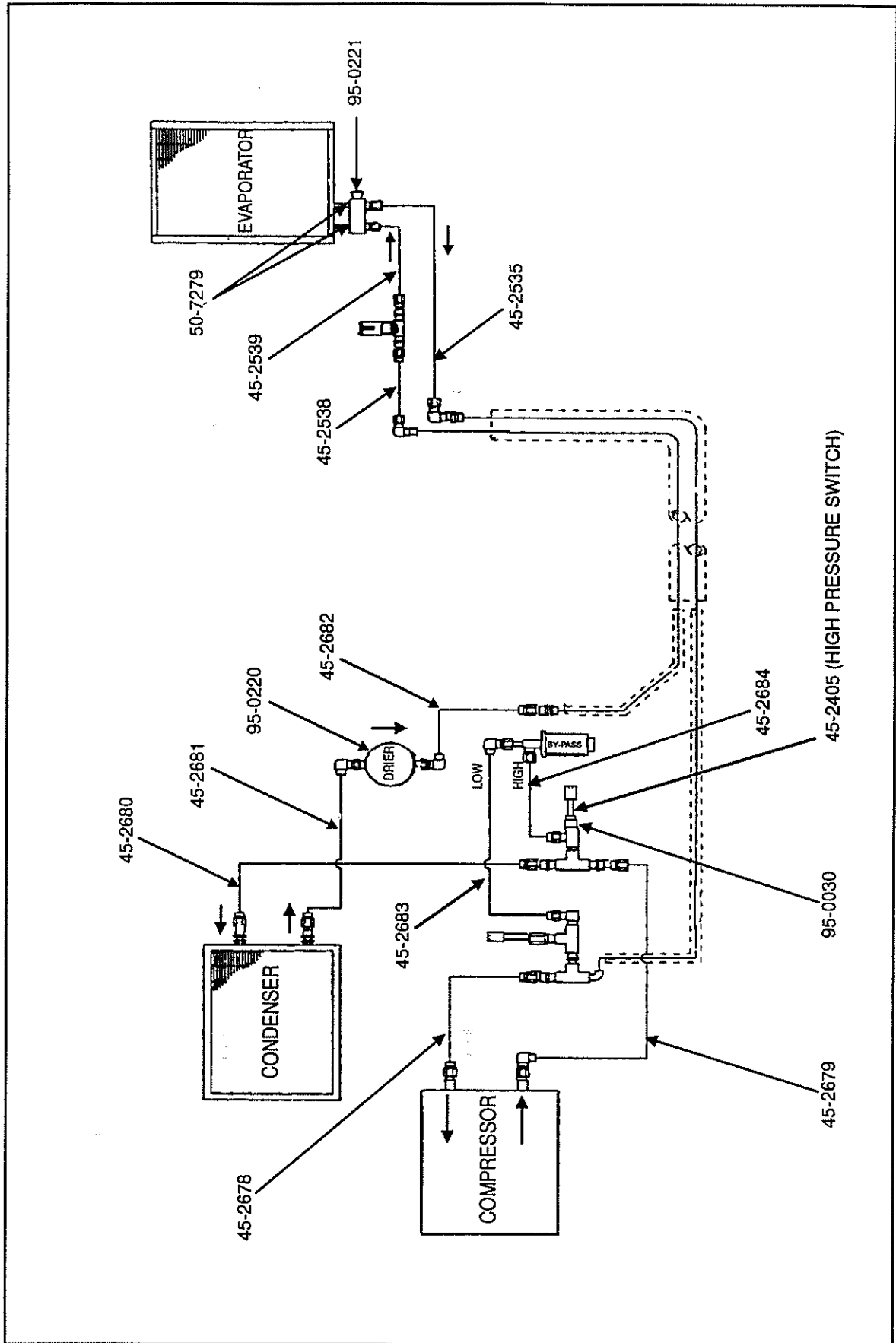


FIG. 1 - Hose Identification (XL-45)

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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