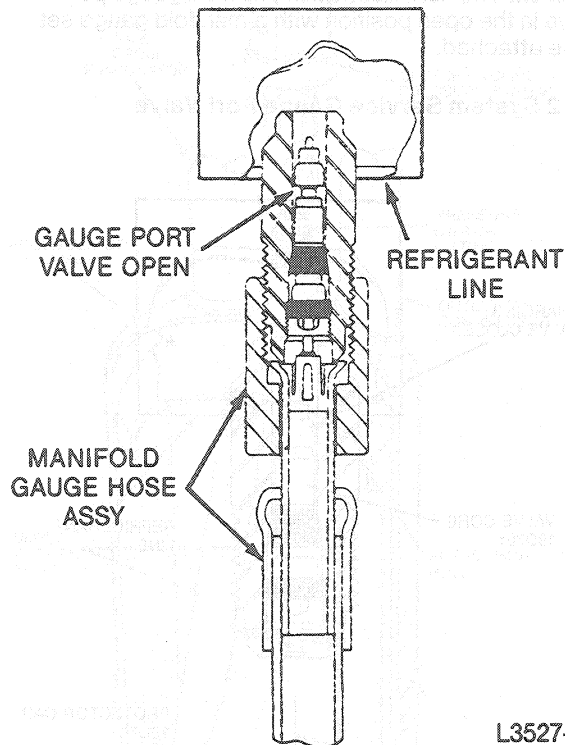


DESCRIPTION AND OPERATION (Continued)

R-12 System Manifold Gauge Set Hose Connected to Gauge Port Valve



DIAGNOSIS AND TESTING

Diagnosis is more than just following a series of interrelated steps in order to find the solution to a specific condition. It is a way of looking at systems that are not functioning the way they should and finding out why. Also, it is knowing how the system **should** work and whether it is working correctly. All good diagnosticians use the same basic procedure.

There are basic rules for diagnosis. If these rules are followed, the cause of the condition will usually be found the first time through the system.

Know the System

Know how the parts go together. Also, know how the system operates, its limits and what happens when something goes wrong. Sometimes this means comparing a system that is working properly with the one you are servicing.

Know the History of the System

Has it been serviced in the past in such a manner that might relate to the present condition? What is the service history? A clue in any of these areas might save a lot of diagnosis time.

Know the Probability of Certain Conditions Developing

It is true that most conditions are caused by simple things rather than by complex ones and they occur in a fairly predictable pattern. Electrical concern conditions, for instance, usually occur at connections rather than in components. An engine no-start is more likely to be caused by a loose wire or some component out of adjustment than a sheared-off camshaft. Know the difference between **impossible** and **improbable**. Many good technicians have spent hours diagnosing a system because they thought certain failures were impossible, only to eventually find out the failures were just "improbable" and actually had happened.

Don't Cure the Symptom and Leave the Cause

Recharging a refrigerant system may correct the condition of insufficient cooling, but it does not correct the original concern unless a cause is found.

Be Sure the Cause is Found

Do not be fooled into thinking the cause of the concern has been found. Perform the proper tests, then double check the results. The system should have been checked for refrigerant leaks. If no leaks were found, perform a leak test with the system under extremely high pressure.

Diagnosis Charts

No matter what form charts may take, they are simply a way of expressing the relationship between basic logic and a physical system of components. It is a way of determining the cause of a condition in the **shortest possible amount of time**. Diagnosis charts combine many areas of diagnosis into one visual display:

- **Probability** of certain things occurring in a system.
- **Speed** of checking certain components, or functions, before others.
- **Certainty** of narrowing down the search to a small portion before performing in-depth testing.
- **Simplicity** of performing certain tests before others.
- **Elimination** of checking huge portions of a system by performing simple tests.

The fastest way to find a condition is to work with the tools that are available, which means working with proven diagnosis charts and the proper special tools for the system being worked on.

System Visual Inspection

It is often possible to detect concerns by a careful visual inspection of the A/C refrigerant system. This includes broken belts, obstructed condenser air passages, excessive clutch air gap, loose or broken mounting brackets, disconnected or broken wires and refrigerant leaks.