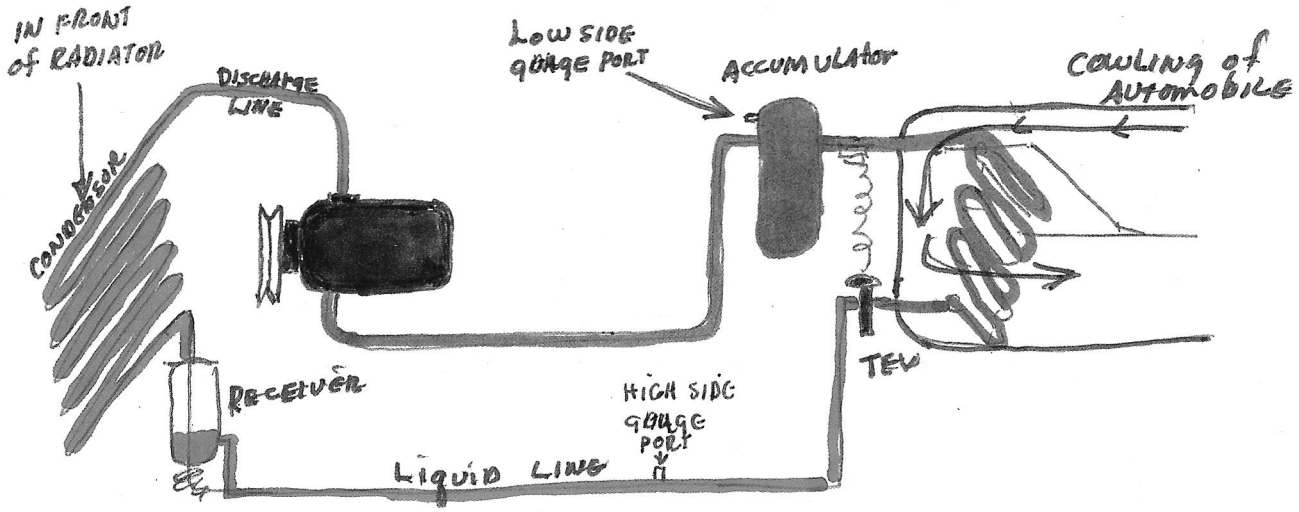
valve if you can get to it and see if there is a cool spot coming out of this valve. If you make these simple tests, you will at least know whether the leak is a big one which has completely emptied the system or a slow one that has let most of the gas out, but not all of it. You may also take a flashlight and take a look in the sight glass and see if you see a little liquid bubbling or frothing through this glass. If it is so dirty you cannot see anything, clean it off and look. If it still does not show anything, forget it and use your sense of feel on the suction and discharge line of the compressor. You are now running the compressor, and you find that it does not cool. The customer was correct. It is not cooling; but you do not, as yet, know just why it is not working. You can make a fair guess at this point that the system is out of gas. With this in mind, you can proceed to prove this guess. Stop the engine and take the caps off the low-side and high-side service ports. See **Figure 10-10**.

Attach your low pressure gauge to the low-side port and attach your high-side gauge to the high-side port. Now with the gauge manifold valve handles closed, you will read pressure on the high and low side of the system. Now take a look at your gauges. You may have pressure on both gauges, even though it is a weak pressure; or you may have nothing; that is, the gauges may show zero. Take a look at **Figure 10-11** with the gauges attached to the pump. Older auto air conditioners will have service valves on the compressor and also most open type compressors will also.

At this point, you have your gauges attached to the pump, the auto engine is dead, and everything is quiet. Now purge both gauge hoses. Then you are ready to make a test for bad valves; or at least, you want to see if the pump will pump. Start the engine and switch on the air conditioner. When the clutch engages, note your low-side gauge. If there is no gas in the unit, the low-side will pull down very rapidly into a vacuum; and even if there is a little gas in the unit, it may still pump into a vacuum. If so, there is no longer any need to worry about the pump pumping. It will pump even though there is nothing to pump from the evaporator but a vacuum. Here you can stop the auto engine and get ready to put a test charge into the system. Blow off whatever gas is left in the system and hook your vacuum pump to the charging line on your manifold. Start up the vacuum pump with an extension cord, open the low side valve on your manifold, and let the vacuum pump pull on the whole system until you are satisfied that the system is completely evacuated and you are ready to proceed with charging. You might at this point take notice that you do not want to pull a vacuum on your high-side gauge; so you can again backseat the high-side valve and isolate this gauge. See this hookup of your gauges and vacuum pump in **Figure 10-12**.

Step by step see these drawings of the change-over and the method of vacuum breaking in **Figure 10-13.**

With a deep vacuum pulled on the system, you can shut your low-side valve on your gauge manifold and see if this vacuum holds on the whole system. If it comes up very rapidly, you can say right here there must be a devil of a big leak in the system somewhere; and you should start looking for it. One way to find it would be



(Fig. 10-10)