

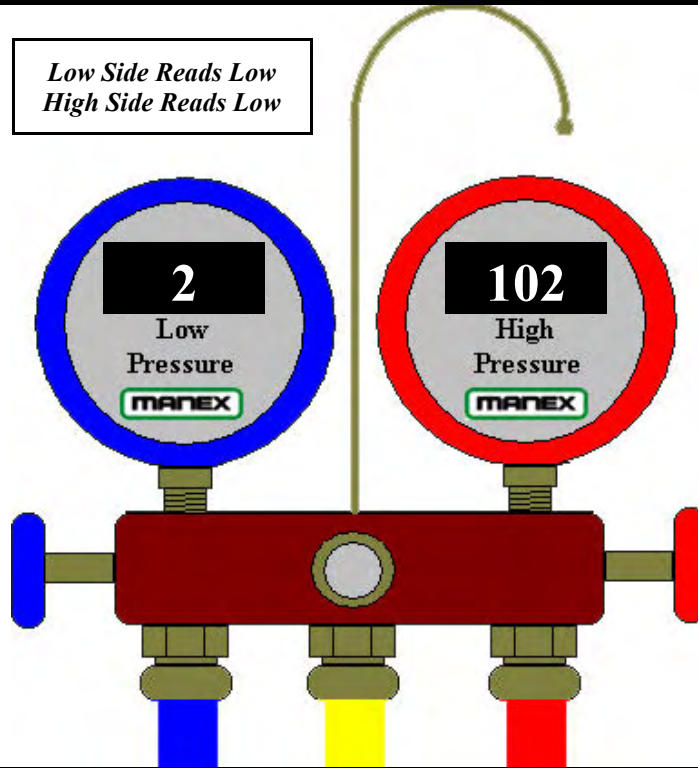
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Troubleshooting with Manifold Gauge Set Readings

Low Refrigerant Charge



Symptoms

You see bubbles in the sight glass. The air from the vents in the vehicle compartment is only slightly cool.

Cause

Insufficient refrigerant charge.

Repair Procedure

Check for leaks with your leak detector. If you find a leak at a connection, tighten it. Then add refrigerant as required. If a component or line is leaking or is defective, recover the refrigerant from the system. Replace the defective part. Evacuate and recharge with refrigerant. Note any oil that was lost when the system was opened should be added during the recharge process. Check the A/C systems operation and performance.

Always replace the filter/drier and or accumulator anytime the A/C system is opened.

To place an order or request more information call 1-800-527-0481 or visit us at www.manexcorp.com

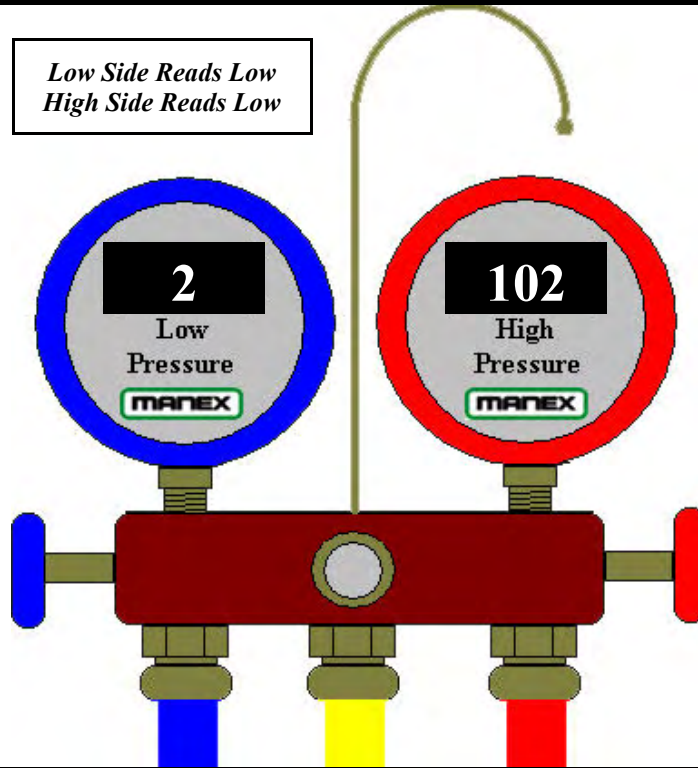
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Troubleshooting with Manifold Gauge Set Readings

Extremely Low Refrigerant Charge



Symptoms

The sight glass is clear or shows oil streaks. The air from the vents in the vehicle compartment is warm.

Cause

Extremely low or no refrigerant in the system. This could be caused by a leak. If there is a low pressure switch it may have the compressor clutch circuit shut off.

Repair Procedure

Add refrigerant to the system, at least 1/2 of the normal full charge amount. Then perform your leak test. Recover all refrigerant from the system and repair any leaks that were found. Evacuate and recharge the system. Note any oil that was lost when the system was opened should be added during the recharge process. Check the A/C systems operation and performance. It may be necessary to use a jumper wire to by pass the compressor cut out circuit in order to engage the clutch. circuit

If a defective switch was found replace the switch.

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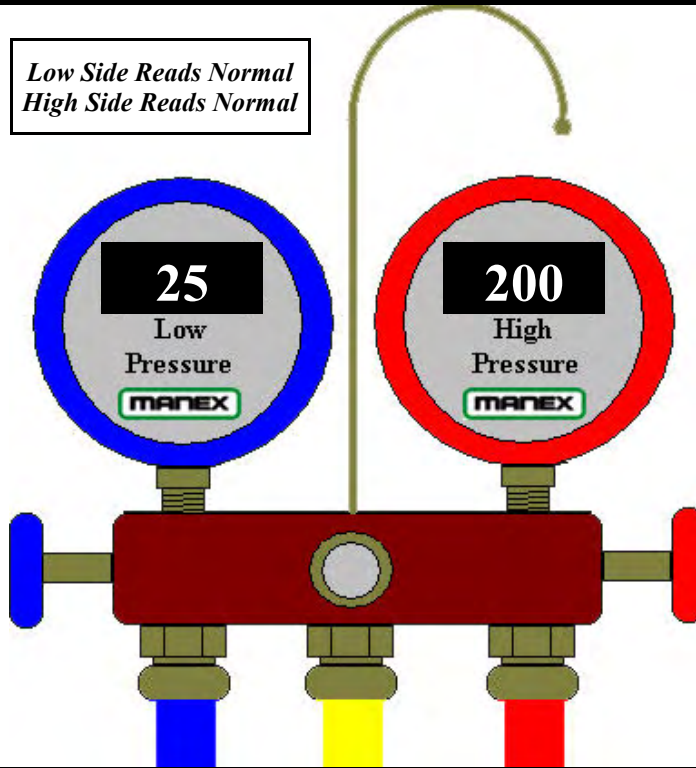
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Troubleshooting with Manifold Gauge Set Readings

Air and/or Moisture in the System



Symptoms

The sight glass is clear or shows some bubbles. The air from the vents in the vehicle compartment is only slightly cool.

Cause

Air and/or Moisture in the system.

Repair Procedure

Test for leaks, pay close attention to the compressor shaft seal area. When the leak is located, recover the refrigerant from the system and repair the leak. Replace the filter/drier and or accumulator because the desiccant may be saturated with moisture. (there is no way to tell). Check the compressor and replace any refrigeration oil lost due to leakage. Evacuate and recharge the system with refrigerant, then check the AC operation and performance.

Always replace the filter/drier and or accumulator anytime the A/C system is opened.

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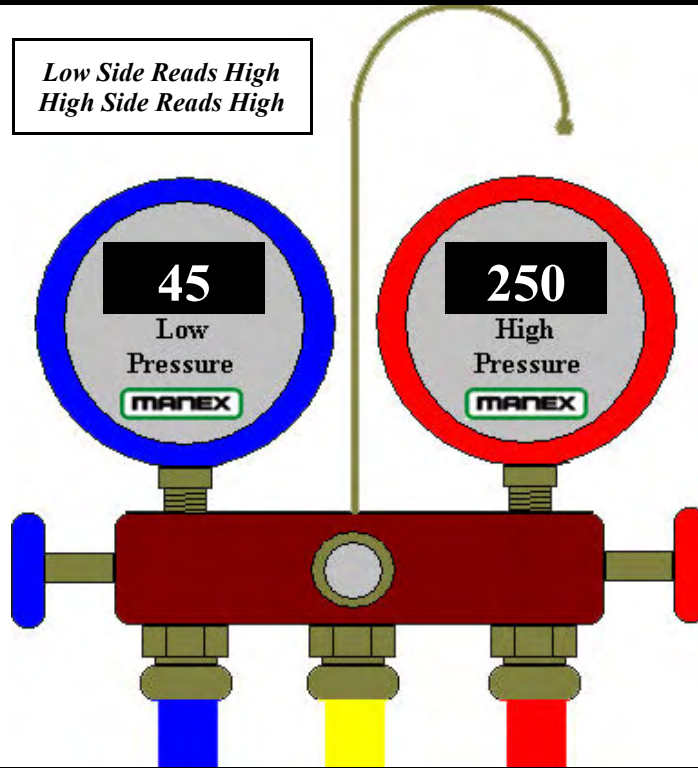
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Troubleshooting with Manifold Gauge Set Readings

Excessive Air and/or Moisture in the System



Symptoms

The sight glass may have occasional bubbles The air from the vents in the vehicle compartment is only slightly cool.

Cause

Excessive Air and/or Moisture in the system.

Repair Procedure

Test for leaks, recover the refrigerant from the system and repair the leak. Replace the filter/drier and or accumulator because the desiccant is saturated with moisture. Check and replace any refrigeration oil lost due to leakage. Evacuate and recharge the system with refrigerant, then check the AC operation and performance.

Always replace the filter/drier and or accumulator anytime the A/C system is opened.

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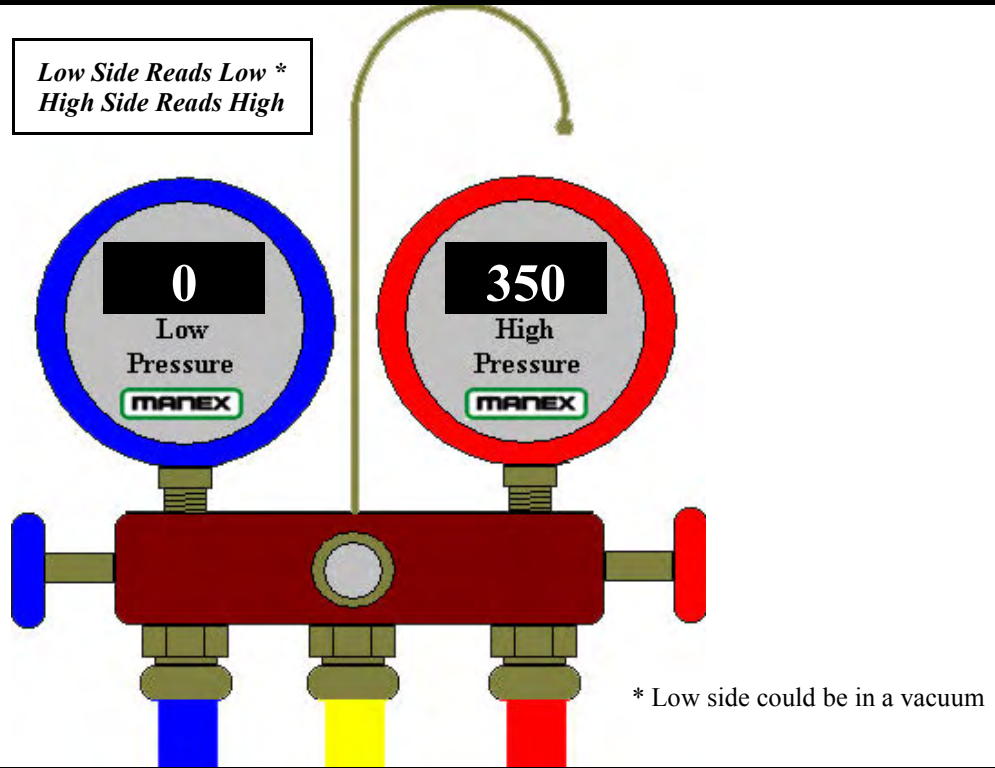
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Troubleshooting with Manifold Gauge Set Readings

Expansion Valve (TXV) Stuck Closed or Plugged



Symptoms

The air from the vents in the vehicle compartment is only slightly cool. The expansion valve is frosted or sweating.

Cause

An expansion valve malfunction could mean the valve is stuck in the closed position, the filter screen is clogged. Note: block type expansion valves do not have filter screens. Moisture in the system has frozen at the expansion valve orifice, or the sensing bulb is not operating. (see testing the expansion valve prior to performing the repair process).

Repair Procedure

Inspect the expansion valve screen (except block type valves). To do this you must first recover all of the refrigerant from the system. Disconnect the inlet hose from the expansion valve. Remove, clean or replace the screen any signs of contamination will require flushing the entire system. Replace the filter/drier and/or accumulator. Then evacuate and recharge the system. Check the A/C operation and performance.

Always replace the filter/drier and or accumulator anytime the A/C system is opened.

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Troubleshooting with Manifold Gauge Set Readings

Expansion Valve Stuck Closed Test

Test

1. Warm the diaphragm and valve body in your hand or carefully with a heat gun. Activate the A/C system and watch to see if the low pressure gauge rises. This indicates the valve was closed and your action cause it to open.
2. Next carefully spray a little nitrogen, or any substance below 32 degrees Fahrenheit, on the capillary coil (bulb) or valve diaphragm. The low side gauge reading should drop to a lower suction pressure on the gauge. This indicates the valve was part way open and your action caused it to close. Warm the diaphragm or capillary with your hand or carefully with a heat gun, repeat the first portion of step two. If the low pressure gauge drops again the expansion valve is not stuck.
3. Clean the surfaces of the evaporator outlet and the capillary coil or bulb. Make sure the coil or bulb is securely clamped to the evaporator outlet tube and the insulation is in place. Activate the A/C system and watch the gauges.

If the expansion valve tests did not cause the low pressure reading to rise and drop and the other procedures described did not correct the problem, the expansion valve is defective, proceed to the repair procedure on expansion valves.

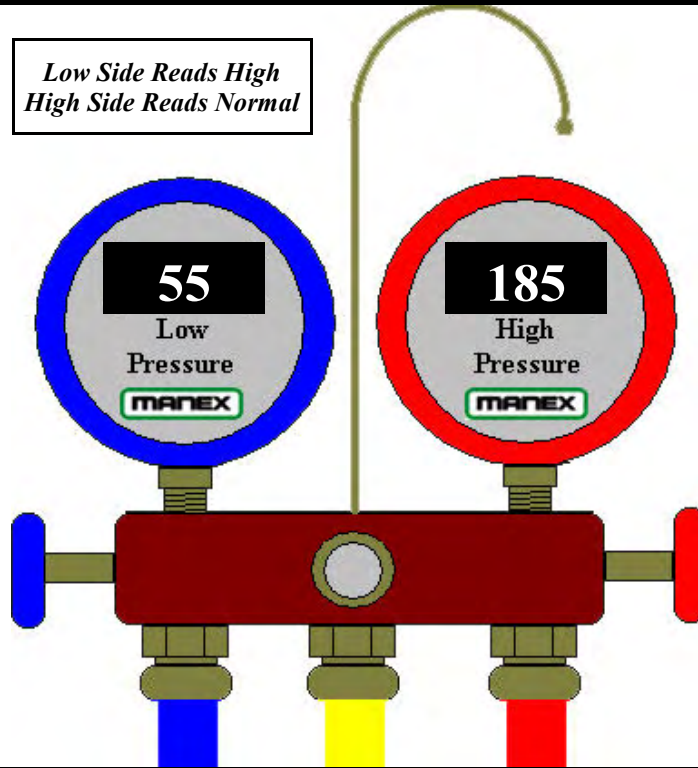
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Troubleshooting with Manifold Gauge Set Readings

Expansion Valve (TXV) Stuck Open



Symptoms

The air from the vents in the vehicle compartment is warm or slightly cool.

Cause

The expansion valve is stuck open and/or the capillary tube (bulb) is not making proper contact with the evaporator outlet tube. Liquid refrigerant may be flooding the evaporator making it impossible for the refrigerant to vaporize and absorb heat. In vehicles where the sensing bulb is accessible, check the capillary tube for proper mounting and contact with the evaporator outlet. Then perform the Expansion Valve test.

Repair Procedure

Inspect the expansion valve screen (except block type valves). To do this you must first recover all of the refrigerant from the system. Disconnect the inlet hose from the expansion valve. Remove, clean or replace the screen any signs of contamination will require flushing the entire system. Replace the filter/drier and/or accumulator. Then evacuate and recharge the system. Check the A/C operation and performance.

Always replace the filter/drier and or accumulator anytime the A/C system is opened.

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Troubleshooting with Manifold Gauge Set Readings

Expansion Valve (TXV) Stuck Open Test

Test

1. Operate the A/C system on it's coldest setting for 5 minutes. Next carefully spray a little nitrogen, or any substance below 32 degrees Fahrenheit, on the capillary coil (bulb) or valve diaphragm. The low pressure reading should drop, if it did proceed to the next step.
2. Warm the diaphragm and valve body in your hand or carefully with a heat gun. Your low pressure reading should rise. Next carefully spray a little nitrogen, or any substance below 32 degrees Fahrenheit, on the capillary coil (bulb) or valve diaphragm. If the low pressure reading drops again you valve is not stuck open.

If the expansion valve tests did not cause the low pressure reading to drop and rise and the other procedures described did not correct the problem, the expansion valve is defective, proceed to the repair procedure on expansion valves.

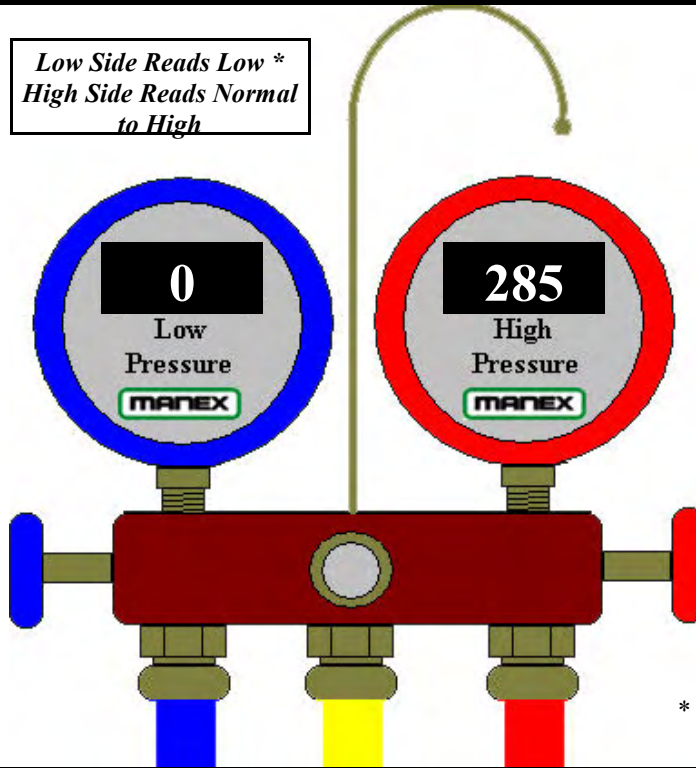
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Troubleshooting with Manifold Gauge Set Readings

High Pressure Restriction



Symptoms

The air from the vents in the vehicle compartment is slightly cool. Look for sweat or frost on the high side hoses and tubing.

Cause

There could be a kink in a line or other restriction in the high side of the system. Look for sweat or frost on the high side hoses and tubing. Frost will appear right after the point of restriction. The hose or line may be cool to the touch near the restriction.

Repair Procedure

After you have located the defective component containing the restriction, recover all refrigerant. Replace the defective component and the filter/drier and/or the accumulator. Evacuate and recharge the system with refrigerant. Check the A/C operation and performance.

Always replace the filter/drier and or accumulator anytime the A/C system is opened.

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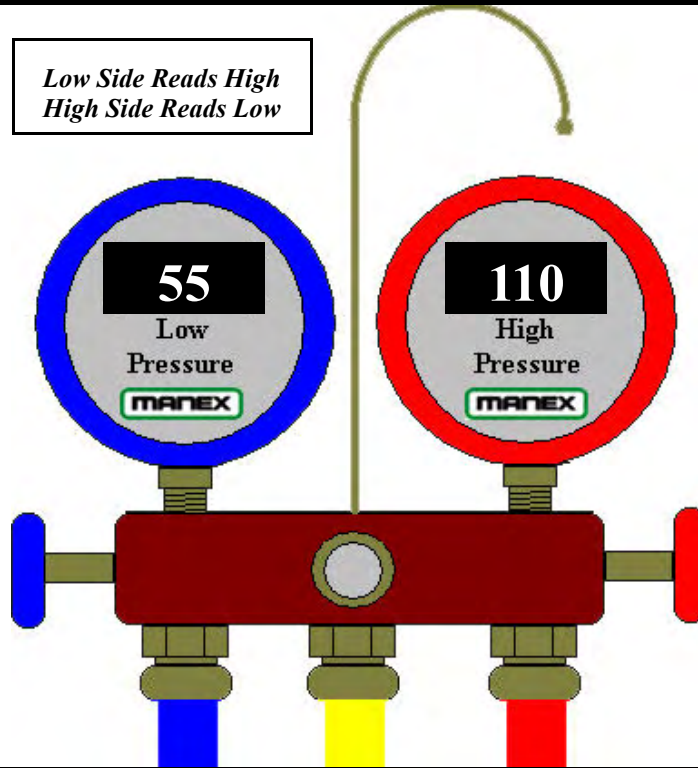
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Troubleshooting with Manifold Gauge Set Readings

Compressor Malfunction



Symptoms

The air from the vents in the vehicle compartment is warm. The compressor may be noisy when it operates.

Cause

Defective reed valves or other compressor components. If the compressor is not noisy, there may be a worn or loose compressor drive belt.

Repair Procedure

If you find the drive belt to be worn or loose replace or tighten it as required. Recheck system performance and gauge readings. If this did not correct your gauge reading proceed with compressor replacement. NOTE: prior to replacing the compressor measure the voltage at the clutch. Anything below 12V is unacceptable take corrective action prior to placing vehicle back in service.

Always replace the filter/drier and or accumulator anytime the A/C system is opened.

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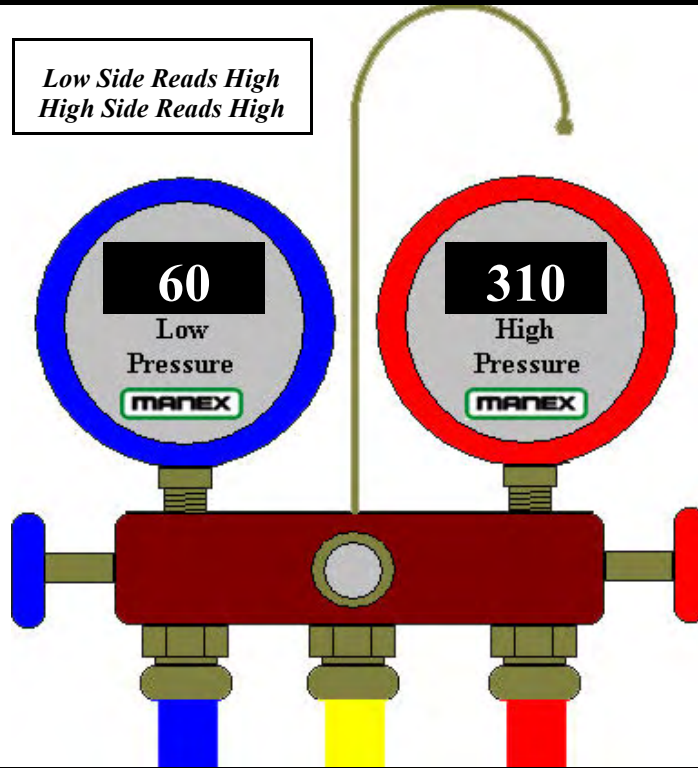
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Troubleshooting with Manifold Gauge Set Readings

Condenser Malfunction or System Overcharge



Symptoms

The air from the vents in the vehicle compartment is warm. The high pressure hoses are very hot. Note: Do not forget to check the condenser cooling fans, Engine cooling system, fan belt and fan clutch operation. (depending on your application)

Cause

The condenser is not functioning correctly or there may be an overcharge of refrigerant inside the system. Another possibility is the lack of air flow across the condenser coil.

Repair Procedure

Inspect the coil for dirt bugs. Or other debris and clean as necessary. Be sure the condenser is securely mounted and that the condenser fins are not bent or blocked. Depending on your application you may need to check the radiator pressure cap and cooling system, including the fan, fan drive and belts. Replace defective parts and recheck the gauge readings, AC operation and performance. If the problem continues, the system may be over charged, recover the refrigerant slowly until the low pressure reading and high pressure readings are normal. If the high pressure readings do not change recover all of the refrigerant and flush the system. It could be partially plugged or replace the condenser and filter/drier and/or accumulator. Evacuate and recharge the system. Recheck the gauge readings, AC operation and performance.

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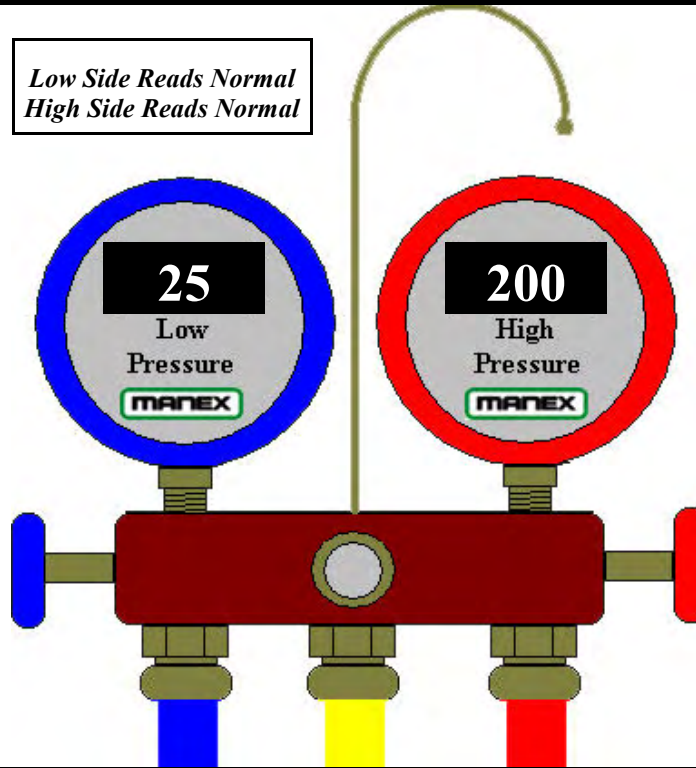
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Thermostatic Switch Malfunction



Symptoms

The low pressure reading fluctuates in a very narrow range. The compressor clutch may be cycling on and off more frequently than it should.

Cause

The thermostatic switch is not functioning properly or at all.

Repair Procedure

Replace the thermostatic switch. When you remove the thermostat, replace it with one that is the same type. Position the new thermostat capillary tube at or close to the same location and seating depth as the old one. Connect the electrical leads.

Always replace the filter/drier and or accumulator anytime the A/C system is opened.

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