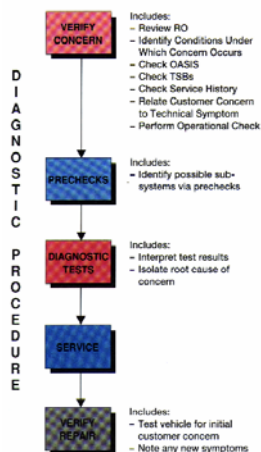


A/C Diagnostic Data

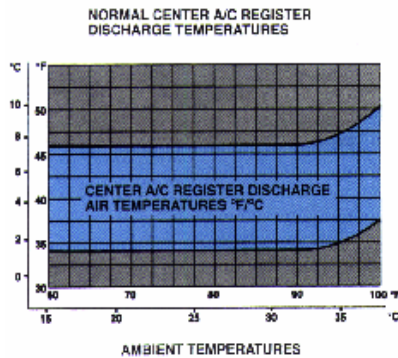
Matthew Whitten

Diagnosis



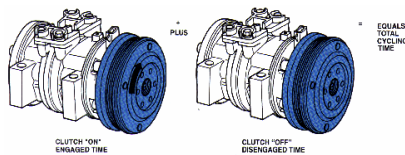
- **Symptom**
- **System**
- **Component**
- **Cause**

Register Discharge Temperature



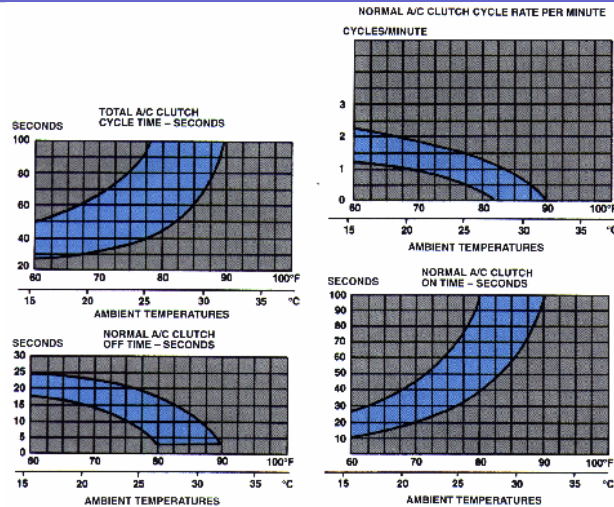
- Quick and easy test to determine if entire A/C system is functioning with-in specifications.
- Must be checked at specified RPM and discharge register

Compressor Clutch Cycle Time

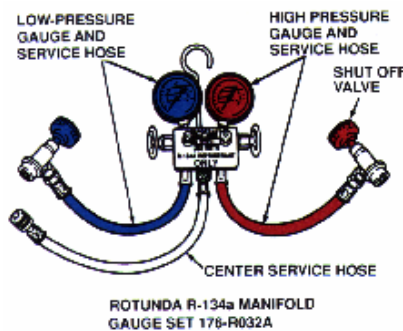


- If discharge temp was too high, clutch cycle time would be your next check.
- On-time plus off-time equals cycle-time

Compressor Clutch Cycle Time



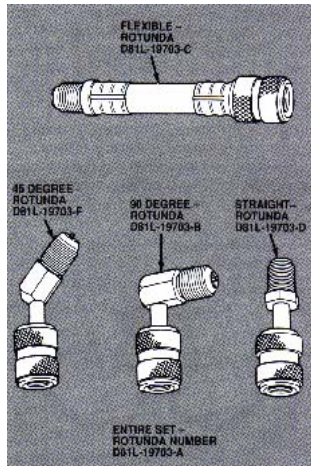
Refrigerant Line Pressure Testing



- Hook up manifold pressure gauge set
 - Red line to high side
 - Blue line to low side
 - Middle line to ***
- Refer to chart and determine if pressures are within specifications

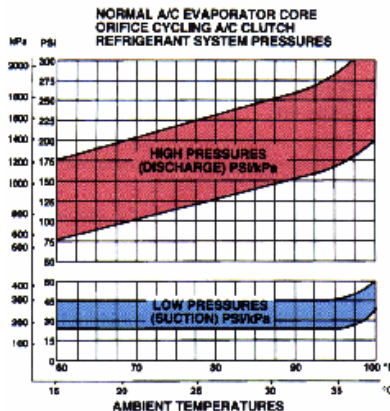
Manifold Gauge Adapters

(Page 7-8)



- Over the years many different A/C service port have been used
- You must use the proper adapter for your application

Refrigerant Line Pressure Testing



- Interpret pressure readings
- Compare all factors to determine if, and where, a fault exist

Pressure and Cycle Time Diagnosis

REFRIGERANT SYSTEM PRESSURE AND A/C CLUTCH CYCLE TIMING EVALUATION CHART FOR A/C EVAPORATOR CORE OFF/ICE CYCLING A/C CLUTCH SYSTEMS						
NOTE: System test requirements must be met to obtain accurate test readings for evaluation. Refer to the normal refrigerant system pressure/temperature and the normal A/C clutch cycle rate and times charts.						
A/C CLUTCH CYCLE TIME						
HIGH (DISCHARGE) PRESSURE	LOW (SUCTION) PRESSURE	RATE	ON	OFF	COMPONENT—CAUSES	
High <td>High<td>Continuous<td>Run<td></td><td colspan="2">A/C Condenser Core—Inadequate Airflow Refrigerant Overcharge</td></td></td></td>	High <td>Continuous<td>Run<td></td><td colspan="2">A/C Condenser Core—Inadequate Airflow Refrigerant Overcharge</td></td></td>	Continuous <td>Run<td></td><td colspan="2">A/C Condenser Core—Inadequate Airflow Refrigerant Overcharge</td></td>	Run <td></td> <td colspan="2">A/C Condenser Core—Inadequate Airflow Refrigerant Overcharge</td>		A/C Condenser Core—Inadequate Airflow Refrigerant Overcharge	
High <td>Normal to High<td>Continuous<td>Run<td></td><td colspan="2">Engine Overheating</td></td></td></td>	Normal to High <td>Continuous<td>Run<td></td><td colspan="2">Engine Overheating</td></td></td>	Continuous <td>Run<td></td><td colspan="2">Engine Overheating</td></td>	Run <td></td> <td colspan="2">Engine Overheating</td>		Engine Overheating	
Normal to High <td>Normal<td>Continuous<td>Run<td></td><td colspan="2">Refrigerant Overcharge^(a) Air in Refrigerant Hardly or Ambient Temp Very High^(b)</td></td></td></td>	Normal <td>Continuous<td>Run<td></td><td colspan="2">Refrigerant Overcharge^(a) Air in Refrigerant Hardly or Ambient Temp Very High^(b)</td></td></td>	Continuous <td>Run<td></td><td colspan="2">Refrigerant Overcharge^(a) Air in Refrigerant Hardly or Ambient Temp Very High^(b)</td></td>	Run <td></td> <td colspan="2">Refrigerant Overcharge^(a) Air in Refrigerant Hardly or Ambient Temp Very High^(b)</td>		Refrigerant Overcharge ^(a) Air in Refrigerant Hardly or Ambient Temp Very High ^(b)	
Normal <td>High<td>Continuous<td>Run<td></td><td colspan="2">A/C Evaporator Core Orifice—Missing O-Ring Seal Leaking Missing</td></td></td></td>	High <td>Continuous<td>Run<td></td><td colspan="2">A/C Evaporator Core Orifice—Missing O-Ring Seal Leaking Missing</td></td></td>	Continuous <td>Run<td></td><td colspan="2">A/C Evaporator Core Orifice—Missing O-Ring Seal Leaking Missing</td></td>	Run <td></td> <td colspan="2">A/C Evaporator Core Orifice—Missing O-Ring Seal Leaking Missing</td>		A/C Evaporator Core Orifice—Missing O-Ring Seal Leaking Missing	
Normal <td>Normal<td>Slow or No Cycle<td>Long or Continuous<td>Normal or No Cycle<td colspan="2">Moisture in Refrigerant System Excessive Refrigerant Oil</td></td></td></td></td>	Normal <td>Slow or No Cycle<td>Long or Continuous<td>Normal or No Cycle<td colspan="2">Moisture in Refrigerant System Excessive Refrigerant Oil</td></td></td></td>	Slow or No Cycle <td>Long or Continuous<td>Normal or No Cycle<td colspan="2">Moisture in Refrigerant System Excessive Refrigerant Oil</td></td></td>	Long or Continuous <td>Normal or No Cycle<td colspan="2">Moisture in Refrigerant System Excessive Refrigerant Oil</td></td>	Normal or No Cycle <td colspan="2">Moisture in Refrigerant System Excessive Refrigerant Oil</td>	Moisture in Refrigerant System Excessive Refrigerant Oil	
Normal <td>Low<td>Slow<td>Long<td>Long<td colspan="2">A/C Cycling Switch—Low Cut-Out</td></td></td></td></td>	Low <td>Slow<td>Long<td>Long<td colspan="2">A/C Cycling Switch—Low Cut-Out</td></td></td></td>	Slow <td>Long<td>Long<td colspan="2">A/C Cycling Switch—Low Cut-Out</td></td></td>	Long <td>Long<td colspan="2">A/C Cycling Switch—Low Cut-Out</td></td>	Long <td colspan="2">A/C Cycling Switch—Low Cut-Out</td>	A/C Cycling Switch—Low Cut-Out	
Normal to Low <td>High<td>Continuous<td>Run<td></td><td colspan="2">A/C Compressor—Low Performance, A/C Evaporator Core Orifice Missing</td></td></td></td>	High <td>Continuous<td>Run<td></td><td colspan="2">A/C Compressor—Low Performance, A/C Evaporator Core Orifice Missing</td></td></td>	Continuous <td>Run<td></td><td colspan="2">A/C Compressor—Low Performance, A/C Evaporator Core Orifice Missing</td></td>	Run <td></td> <td colspan="2">A/C Compressor—Low Performance, A/C Evaporator Core Orifice Missing</td>		A/C Compressor—Low Performance, A/C Evaporator Core Orifice Missing	
Normal to Low <td>Normal to High<td>Continuous<td>Run<td></td><td colspan="2">A/C Button/Line—Partially Restricted or Plugged^(c)</td></td></td></td>	Normal to High <td>Continuous<td>Run<td></td><td colspan="2">A/C Button/Line—Partially Restricted or Plugged^(c)</td></td></td>	Continuous <td>Run<td></td><td colspan="2">A/C Button/Line—Partially Restricted or Plugged^(c)</td></td>	Run <td></td> <td colspan="2">A/C Button/Line—Partially Restricted or Plugged^(c)</td>		A/C Button/Line—Partially Restricted or Plugged ^(c)	
Normal to Low <td>Normal<td>Fast<td>Short<td>Normal<td colspan="2">A/C Refrigerator Core—Low or Restricted Airflow</td></td></td></td></td>	Normal <td>Fast<td>Short<td>Normal<td colspan="2">A/C Refrigerator Core—Low or Restricted Airflow</td></td></td></td>	Fast <td>Short<td>Normal<td colspan="2">A/C Refrigerator Core—Low or Restricted Airflow</td></td></td>	Short <td>Normal<td colspan="2">A/C Refrigerator Core—Low or Restricted Airflow</td></td>	Normal <td colspan="2">A/C Refrigerator Core—Low or Restricted Airflow</td>	A/C Refrigerator Core—Low or Restricted Airflow	
Normal to Low <td>Normal<td>Fast<td>Short to Very Short<td>Normal to Long<td colspan="2">A/C Condenser Core, A/C Evaporator Core Orifice or Condenser to Evaporator Tube—Partially Restricted or Plugged</td></td></td></td></td>	Normal <td>Fast<td>Short to Very Short<td>Normal to Long<td colspan="2">A/C Condenser Core, A/C Evaporator Core Orifice or Condenser to Evaporator Tube—Partially Restricted or Plugged</td></td></td></td>	Fast <td>Short to Very Short<td>Normal to Long<td colspan="2">A/C Condenser Core, A/C Evaporator Core Orifice or Condenser to Evaporator Tube—Partially Restricted or Plugged</td></td></td>	Short to Very Short <td>Normal to Long<td colspan="2">A/C Condenser Core, A/C Evaporator Core Orifice or Condenser to Evaporator Tube—Partially Restricted or Plugged</td></td>	Normal to Long <td colspan="2">A/C Condenser Core, A/C Evaporator Core Orifice or Condenser to Evaporator Tube—Partially Restricted or Plugged</td>	A/C Condenser Core, A/C Evaporator Core Orifice or Condenser to Evaporator Tube—Partially Restricted or Plugged	
Normal to Low <td>Normal<td>Fast<td>Short to Very Short<td>Short to Very Short<td colspan="2">Low Refrigerant Charge</td></td></td></td></td>	Normal <td>Fast<td>Short to Very Short<td>Short to Very Short<td colspan="2">Low Refrigerant Charge</td></td></td></td>	Fast <td>Short to Very Short<td>Short to Very Short<td colspan="2">Low Refrigerant Charge</td></td></td>	Short to Very Short <td>Short to Very Short<td colspan="2">Low Refrigerant Charge</td></td>	Short to Very Short <td colspan="2">Low Refrigerant Charge</td>	Low Refrigerant Charge	
Normal to Low <td>Normal to Low<td>Fast<td>Short to Very Short<td>Long<td colspan="2">A/C Condenser Core—Partially Restricted or Plugged</td></td></td></td></td>	Normal to Low <td>Fast<td>Short to Very Short<td>Long<td colspan="2">A/C Condenser Core—Partially Restricted or Plugged</td></td></td></td>	Fast <td>Short to Very Short<td>Long<td colspan="2">A/C Condenser Core—Partially Restricted or Plugged</td></td></td>	Short to Very Short <td>Long<td colspan="2">A/C Condenser Core—Partially Restricted or Plugged</td></td>	Long <td colspan="2">A/C Condenser Core—Partially Restricted or Plugged</td>	A/C Condenser Core—Partially Restricted or Plugged	
Normal to Low <td>Low<td>Continuous<td>Run<td></td><td colspan="2">A/C Button/Line—Partially Restricted or Plugged^(c) A/C Cycling Switch—Sticking Closed</td></td></td></td>	Low <td>Continuous<td>Run<td></td><td colspan="2">A/C Button/Line—Partially Restricted or Plugged^(c) A/C Cycling Switch—Sticking Closed</td></td></td>	Continuous <td>Run<td></td><td colspan="2">A/C Button/Line—Partially Restricted or Plugged^(c) A/C Cycling Switch—Sticking Closed</td></td>	Run <td></td> <td colspan="2">A/C Button/Line—Partially Restricted or Plugged^(c) A/C Cycling Switch—Sticking Closed</td>		A/C Button/Line—Partially Restricted or Plugged ^(c) A/C Cycling Switch—Sticking Closed	
Erratic Operation or A/C Compressor Not Running					A/C Cycling Switch—Dirty Contacts or Sticking Dish Wiring Connections at A/C Clutch Connector or A/C Cycling Switch Connector A/C Electrical Circuit Errors—Refer to A/C Electrical Schematic A/C Cut-Off by Pressure-Sensitive Control Module	
ADDITIONAL POSSIBLE CAUSE COMPONENTS ASSOCIATED WITH INADEQUATE A/C COMPRESSOR OPERATION						
A/C Compressor Drive Belt	—	—	—	—	A/C Compressor Drive Belt Loose	
A/C Clutch	—	—	—	—	A/C Clutch Slipping or Excessive Air Gap	

^(a) A/C cycling rate will be normal or initial use. This suggests condition is caused by excessive heat load.

^(b) A/C cycling rate will cycle at ambient temperature above 70°F (21°C) depending on humidity conditions.

^(c) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(d) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(e) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(f) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(g) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(h) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

⁽ⁱ⁾ Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(j) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(k) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(l) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(m) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

⁽ⁿ⁾ Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(o) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(p) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(q) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(r) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(s) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(t) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(u) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(v) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(w) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(x) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(y) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

^(z) Line operation normal and normal clutch pressure will be present. This suggests condition is due to A/C cycling valve closed.

(a) A/C clutch may make noise on initial run. This slugging condition is caused by excessive liquid refrigerant.
(b) A/C clutch may not cycle in ambient temperatures above 27° (81° F) depending on humidity conditions.
(c) Low pressure reading will be normal to high if pressure is taken at suction accumulator/drier and if restriction is downstream of A/C
clutch valve core.
(d) Low pressure reading will be low if pressure is taken near the A/C Compressor and restrict on a upstream of A/C service port.

- Use all diagnostic information to determine root cause
- Compare:
 - High side pressure
 - Low side pressure
 - Clutch cycle time