

# POLICY BULLETIN

Tecumseh Compressor Company  
Compressor Group



*Tecumseh*

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**SUBJECT: Refrigerant Charge Limitations**

PB-104

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REV. DATE: 1/15/2007

ISSUED: December 3, 1963

It is essential to minimize the accumulation of liquid refrigerant within any refrigeration or air conditioning system compressor. The procedures and precautions for achieving this vary depending upon the system design and compressor application, including the amount of charge.

This Policy Bulletin directs attention to one specific area only - namely, close-coupled self-contained systems such as room air conditioners. The compressors in these systems are vulnerable to damage from excessive liquid refrigerant and will often slug on start or fail to start when this condition exists.

Since room air conditioners and the like are extremely limited in size and cost, the addition of crankcase heat is not a practical solution.

It is, therefore, necessary to include in the system development program slug testing to assure compressor starting and maximum compressor life.

We have outlined a set of procedures to be used in evaluating the system with regard to this subject. This test outline entitled, "Test for Critical Charge" is attached.

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**SUBJECT: Test for Critical Charge**

When a new unit is being designed, the development test work should include the tests described herein.

**I. Test for Slugging (Flood back Method)**

Step 1. Operate the system for a period of one hour or more with the evaporator fan or blower not running or the evaporator blocked in such a manner that no air impinges on the coil.

Step 2. Disconnect power to the compressor. Operate the evaporator and condenser air systems with 90 to 95 F airs over the coils for a period of two hours.  
(Note: If the system uses an expansion valve, a bypass line must be used from the liquid line to the suction line and the valve reclosed before going on to Step 3.)

Step 3. Start the compressor with full voltage and observe for slugging.

**II. Test for Starting (Soak out Method)**

Step 1. Allow the unit to soak in an ambient of 60 F for at least 24 hours to insure that the system is stabilized.

Step 2. Heat the outdoor coil above saturation to simulate the solar heat to which the coil may be subjected but not the compressor. This drives any remaining refrigerant from the coil to the compressor. (Note: If the system uses an expansion valve, a bypass line must be used from the liquid line to the suction line and the valve reclosed before going on to Step 3.)

Step 3. Apply 85% voltage (locked rotor) at terminals to determine that compressor will start. During both tests, record the temperatures, pressure and times involved prior to startup. In the event this test proves the system charge is critical and slugging or stalling may be encountered in the field, Tecumseh Application Engineering should be contacted for assistance and recommendations.