Replacement Service Valve Instructions

Installation

The following are Tecumseh's guidelines for maximizing valve performance and ease of use.

Mounting the Valve

Based on the application attach the valve to the (compressor, receiver, unit base etc) with the appropriate mounting procedure. It is the responsibility of the equipment manufacturer or installer to select the appropriate mounting method with the following considerations in mind:

- Mounting must provide adequate support for actuation of the valve and tightening of the valve caps and connections.
- Mounting must minimize vibrational movement to avoid fatigue cracking of tubing and connections.
- Mounting must allow easy access to the valve stem and gauge port.

Connecting to the Valve

Replacement service valves, (rotolock and base mount) are available in a variety of connection types. The following installation procedures are recommended for the various connection types:

Replacement Valves

Replacement service valves with a rotolock nut have a small plastic dust plug inside the threaded end, be sure to remove this plug before installing.

Always use a new Teflon* o-ring when installing or reconnecting a rotolock valve connection. Ensure the o-ring is seated in the male coupling (spud) prior to connecting and tightening the valve with rotolock nut (see Figure 1).

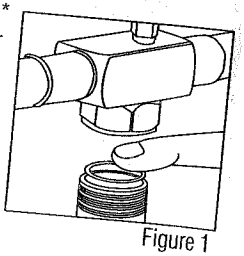

Figure 1

When tightening the rotolock nut (see Figure 2) use a wrench to hold the valve body in position and to prevent it from turning. Tighten the rotolock nut to the torque specification (see back page).

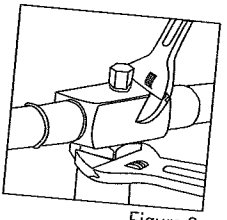

Figure 2

If the valve body turns after tightening the rotolock nut it is recommended to retighten the nut to the recommended torque specification on the back page.

SAE Flare

When tightening an SAE flare connection, use a wrench to hold the valve body in position and prevent it from moving. Tighten the flare nut to the torque specification on the back page. If the valve body is allowed to move in the process of tightening the flare nut it is recommended to retighten the flare nut to the proper torque specification.

SWEAT CONNECTIONS

Tube Preparation

- The copper tubing must be cut square and free of burrs. A tube cutter is recommended.
- The tube should be round and slide freely into the valve connection to be brazed.
- Ensure the tubing is clean. If the surface of the tube is contaminated (with oils, dirt, etc) capillary action of the filler material can not be achieved.
- Check the inside of the tubing to ensure there is no debris that may enter the system.

*Teflon® is a registered trademark of E.I. du Pont de Nemours and Company.

Brazing

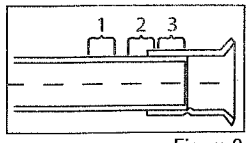

Figure 3

A double-tipped torch is recommended during brazing.

- Refer to Figure 3. Apply heat to Area 1, moving the torch up and down and rotating around the tube in order to heat the tube evenly.
- Move the torch to Area 2 until brazing temperature is reached. Move the torch up and down and rotate it around tube in order to heat the tube evenly. Add braze material to the joint while moving the torch around joint to flow braze material evenly.
- After braze material flows around the joint, move torch to Area 3. This will draw the braze material into the joint. The time spent heating Area 3 should be minimal.

Copper to Copper Braze Joints

Braze the joint using Silver / Phosphorus / Copper alloy. This type of alloy facilitates the joining of copper to copper without a flux.

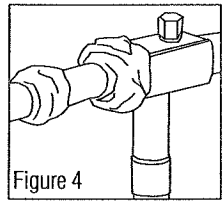
Figure 4

The torch should be large enough to rapidly heat the joint to brazing temperature. Be sure to direct the flame away from existing braze joints. Wrap the valve with a wet cloth or other heat absorbent material to keep the valve cool and prevent damage while brazing (see Figure 4).

To minimize heat from spreading beyond the braze area quench the braze joint(s) with a wet cloth after brazing.

Check the valve for leaks by using a suitable refrigerant leak detector or by using a soap solution.

Copper to Steal Braze Joints

Silver braze with a filler metal having a silver content of 40-45% and a suitable high temperature flux must be used for brazing the copper tube to the steel valve. Phosphorus bearing filler metals can not be used as they form brittle phosphides that could cause the joint to fail.

Apply flux to the parts being brazed with a brush. When applying the flux it is important that it does not get inside the parts where it could contaminate the system.

Braze the joint using the appropriate brazing alloy and flux. The torch should be large enough to rapidly heat the joint to brazing temperature. Be sure to direct the flame away from existing braze joints. Wrap the valve with a wet cloth or other heat absorbent material to keep the valve cool, to minimize heat from spreading and prevent damage while brazing (see Figure 4).

Check the valve for leaks by using a suitable refrigerant leak detector or by using a soap solution.

Copper to Brass Braze Joints

Silver braze with a filler metal having a silver content of 40-45% and a suitable high temperature flux must be used for brazing the copper tube to the brass fitting or valve. Phosphorus bearing filler metals can not be used as they form brittle phosphides that could cause the joint to fail.

Apply flux to the parts being brazed with a brush. When applying the flux it is important that it does not get inside the parts where it could contaminate the system.

Braze the joint using the appropriate brazing alloy and flux. The torch should be large enough to rapidly heat the joint to brazing temperature. Be sure to direct the flame away from existing braze joints. Wrap the valve with a wet cloth or other heat absorbent material to keep the valve cool, to minimize heat from spreading and prevent damage while brazing (see Figure 4).

Check the valve for leaks by using a suitable refrigerant leak detector or by using a soap solution.

Operation

Turning the stem of the service valve clockwise (see Figure 5) "front seats" the valve. This closes the valve and opens the gauge port.

Turning the valve stem counter-clockwise "back seats" the valve and thus opens the system and closes the gauge port.

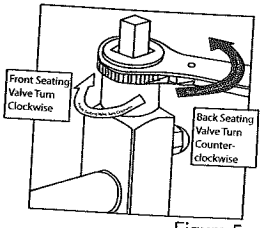

Figure 5

If present, the valve port to the system control (high pressure cut out, low pressure control, fan control, etc.) is always open regardless of the position of the valve stem.

If the system is to be operated with the service gauge functioning, it is necessary to "crack" the valve from its back seated position for the gauges to perform. Before removing the gauges, close the gauge port by returning the valve to its fully open position (back seated).

Remember to check the packing gland nut (if present) on the stem for snugness before leaving the job (see Figure 6). Install the valve stem cap as a secondary safeguard against leaks at the stem.

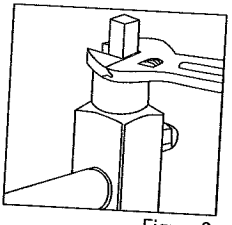
Figure 6

General Information

Replacement service valves (rotolock and base mount) offered by Tecumseh are available in a variety of connection, flow configurations, and mounting options. The valves can allow various parts of the refrigeration system to be shut off or isolated to facilitate servicing. During normal operation the valve stem is rotated to its full counter-clockwise position (i.e. back seated) which isolates the gauge port from the flow of refrigerant.

A properly installed valve with the gauge port cap(s), threaded connections, and packing nut (if applicable) tightened to the proper torque specifications (see back page) is virtually leak free of refrigerant. It is therefore important to replace the gauge port caps and tighten to the proper torque values after installation or servicing.

The valves are compatible with HCFC, CFC, and HFC refrigerants and the approved refrigerant oils.

An operating temperature range from -40°F to 300°F (-40°C to 149°C) is acceptable.

All valves are zinc coated to prevent corrosion.

Questions and Support

Tecumseh Tech Support: 800.211.3427

Email: technical.service@tecumseh.com

Tecumseh reserves the right to change any information in this publication at any time.

This document is not intended to replace the training required for professional service personnel, or replace other information available from refrigeration and air conditioning equipment manufacturers. The information in this document is intended to assist service personnel in safely installing and servicing Tecumseh rotolock and base mount service valves. Mounting and tubing connections are likely to differ from original installation. Careful review of current application requirements is essential. IT IS THE RESPONSIBILITY OF THE SERVICE PERSON TO ASSURE THEY HAVE PURCHASED A REPLACEMENT PRODUCT WHICH MEETS THE NEED OF THE APPLICATION. Failure to do so may result in misapplication requiring immediate or subsequent additional compressor replacement.

VALVE STEM CAP		
BODY SIZE	MATERIAL	TORQUE
3/4	Steel	36-120 in-lbs (4.07-13.5 N-m)
3/4	Plastic	36-120 in-lbs (4.07-13.5 N-m)
7/8	Steel	36-120 in-lbs (4.07-13.5 N-m)
7/8	Plastic	36-120 in-lbs (4.07-13.5 N-m)

ROTOLOCK COUPLER NUT	
THREAD SIZE	TORQUE
3/4 - 16	30 ft-lbs (40.7 N-m)
1 - 14	50 ft-lbs (67.8 N-m)
1 1/4 - 12	80 ft-lbs (108.4 N-m)
1 1/2 - 12	120 ft-lbs (162.7 N-m)
1 3/4 - 12	120 ft-lbs (162.7 N-m)

GAUGE PORT CAP		
CAP SIZE	MATERIAL	TORQUE
1/4	Aluminum	96-120 in-lbs (10.8-13.5 N-m)
1/4	Brass	96-120 in-lbs (10.8-13.5 N-m)
1/4	Plastic	Hand Tight

SAE FLARE		
NUT SIZE	MATERIAL	TORQUE
1/4	Steel/Brass	12-13 ft-lbs (16.2-17.6 N-m)
5/16	Steel/Brass	18-19 ft-lbs (24.4-25.8 N-m)
3/8	Steel/Brass	24-25 ft-lbs (32.6-33.9 N-m)
1/2	Steel/Brass	33-34 ft-lbs (44.7-46.1 N-m)
5/8	Steel/Brass	49-50 ft-lbs (66.4-67.8 N-m)

NOTE: Torque values are for single flared copper tubing

VALVE STEM SEATING	
BODY SIZE	TORQUE
3/4	3.5-5 ft-lbs (4.7-6.8 N-m)
7/8	6-7.5 ft-lbs (8.1-10.2 N-m)
1 1/8	11-12.5 ft-lbs (14.9-16.9 N-m)
1 3/8	15-20 ft-lbs (20.3-27.1 N-m)

PACKING GLAND NUT	
BODY SIZE	TORQUE
3/4	6 ft-lbs (8.1 N-m)
7/8	6 ft-lbs (8.1 N-m)
1 1/8	6 ft-lbs (8.1 N-m)
1 3/8	15 ft-lbs (20.3 N-m)

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