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**General  
Service  
Bulletin**

**HCOM-SB-83**

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Library	Service Literature
Product Section	Refrigeration
Product	Scroll Compressor
Model	RAUC, CGAD, S*HD, S*HC
Literature Type	General Service Bulletin
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**LITERATURE CHANGE HISTORY:** New

**SUBJECT:** Scroll Discharge Line Failures - Review and Clarification

**INTRODUCTION:** The purposes of this Bulletin are to:

- (1) prescribe actions for dealing with scroll compressor discharge line failure problems on large commercial air cooled products manufactured in Clarksville;
- (2) clarify the method of prevention; and
- (3) provide a history of scroll discharge line problems

**DISCUSSION:**

**Units affected:**

- RAUC 20 through 60 ton units
- CGAD 20 through 60 ton units
- S\*HD 20 through 30 ton units
- S\*HC 20 through 60 ton units

**Discharge Line Failures**

The following discussion pertains only to Clarksville-built products referenced in this bulletin.

If the discharge line of a manifolded pair of scroll compressors—regardless of whether the pair contains 9 or 14 ton compressors—is found to be fractured, the following steps should be taken:

(1) Determine the location of the fracture.

- If the fracture is located on the **discharge tube assembly**, replace the discharge tube assembly.
- If the fracture is located on the **compressor discharge stub**, do not attempt to repair the compressor stub. The entire compressor and the discharge tube assembly should be replaced. (Note that if only one compressor has a cracked stub, only that compressor need be replaced.)
- Regardless of the location of the fracture, if any section of the compressor discharge tubing, including the compressor stub, has been previously repaired, the repaired component must be replaced.

(2) If the expansion loop as described in Service Alert No. 122 (dated 6/8/92) is present, remove the loop and install new discharge line assembly to restore the discharge piping to the original factory design.

(3) Reinstall existing brackets or connective plate, if present. If bracket or plate is not present, order and install appropriate restraint brackets for all compressors on that unit before returning the unit into service.

**Note: Brackets must be installed correctly!** Refer to "Problem Prevention" (below) for more information.

Note that only 14 ton scrolls produced after Design Change #1—described under the "History" section later in this bulletin—require brackets. But if a unit without brackets experiences a discharge line failure, it should be fitted with brackets as insurance against future problems.

### **Problem Prevention:**

In the future, when servicing a unit with a manifolded 14 ton compressor:

(1) Check for field or factory installed compressor restraint bracket or plate.

- (a) If brackets are installed, make sure they are correctly installed. Refer to Figure 1. Particular items to check include:
- proper orientation of the brackets
  - tightness of bolts
  - installation of the BACKUP NUT on the ring
  - all (4) bolts are installed

More detailed drawings and installation instructions for the field-installed brackets can be found in HCOM-SB-79B.

(b) If brackets or plate are not installed, brackets should be ordered and installed for the unit per HCOM-SB-79B only if either of the following conditions exists:

- if the unit serial number is J91E or higher, or
- if any of the 14 ton compressors have serial number A1J14xxxxx or higher (the 1J portion of the serial number indicates the date of manufacture is September 1991.)

(2) Check for removal of compressor shipping brackets and isolator sleeves. If these items are not removed, damaging vibration could occur during compressor operation.

(a) There are two angle steel brackets that hold the compressor manifold assembly fast to the base framework during shipping. If these brackets are still in place, remove them.

(b) The compressors themselves are immobilized for shipment by bolting the compressor feet to the manifold assembly frame with a metal sleeve inside the isolators. Prior to unit start-up, these sleeves should have been removed, and the compressor hold down bolts—and washers—should have been reinstalled. Check to see if the metal sleeves are installed; if they are, remove and discard them. Reinstall the hold-down bolts and washers using 2 to 3 turns to tighten the bolts down on the isolators.

For further information on isolator sleeve removal, refer to the current unit IOM literature.

(3) If the unit is a CGAD, switch pumpdown control to "OFF".

This is accomplished by setting DIP switch number SW3-1 on Board A3 of the UCM to the "off" position. To make sure the change is "locked in", cycle power to the UCM after changing the DIP switch position.

It has been determined that scroll compressors do not benefit from the pumpdown cycle, and that it could in some cases be a contributing factor in discharge line problems.

#### **History:**

(1) Compressor Design Change #1

In mid-1991, a design change was made to the 14 ton scroll compressor. The change involved three elements:

- (a) change from "pull" to "push" type swing link,
- (b) removal of the reverse venting valve
- (c) increase of allowed separation of the scrolls

These changes were an improvement to scroll protection during backwards rotation operation but had the undesirable side effect of causing increased lateral forces on the compressor when the compressor was reverse rotating. This in turn caused an increase in the relative motion between the two manifolded compressors. The resulting stress on the discharge tubing in some cases caused fractures. Serial numbers of 14 ton scroll compressors that received Design Change #1 are A1J14xxxxx to A2E14xxxxx. This represents compressors built from September 1991 through May 1992.

#### (2) Discharge Tubing Expansion Loop

Service Alert No.122 (dated 6/8/92) was issued, recommending a fix-on-fail procedure involving the installation of an expansion loop in the discharge line.

#### (3) Compressor Design Change #2

In 2nd quarter 1992, to limit the motion of the compressor during scroll backwards rotation:

- (a) the reverse venting valve was added back, and
- (b) scroll maximum separation was limited.

#### (4) Compressor Bracket

On 8/30/92, Service Bulletin HCOM-SB-79 was issued, advising of a mandatory retrofit of units affected by Compressor Design Change #1. This included units that had been built with those compressors as well as units that had received redesigned replacement compressors. The retrofit involved the installation of a bracket between the two manifolded compressors to prevent relative motion.

On 8/12/92, the same compressor brackets as described in HCOM-SB-79 were begun to be installed in the factory on all manifolded scroll compressor pairs.

#### **Future:**

In 3rd quarter 1993, the compressor brackets currently being installed in the factory will be replaced by a plate that will be bolted onto welded braces on the tops of the

compressor shells. The new compressor shells with welded braces will be compatible as service replacements for compressors without welded braces.

**PARTS ORDERING INFORMATION:**

<b>Compressors</b>					
<b>9 Ton</b>			<b>14 Ton</b>		
200/230/60/3	460/60/3	575/60/3	200/230/60/3	460/60/3	575/60/3
COM 2679	COM 2681	COM 2682	COM 2691	COM 2693	COM 2694

<b>Discharge Line Assemblies</b>		
20 Ton Manifold Assy.	25 Ton Manifold Assy.	30 Ton Manifold Assy.
TUB 6401	TUB 6403	TUB 6405

<b>Compressor Restraint Bracket Kits</b>		
20 Ton Manifold Assy.	25 Ton Manifold Assy.	30 Ton Manifold Assy.
BRK 1695	BRK 1696	BRK 1697

TYPICAL INSTALLATION FOR 20, 25 & 30 TON SCROLL

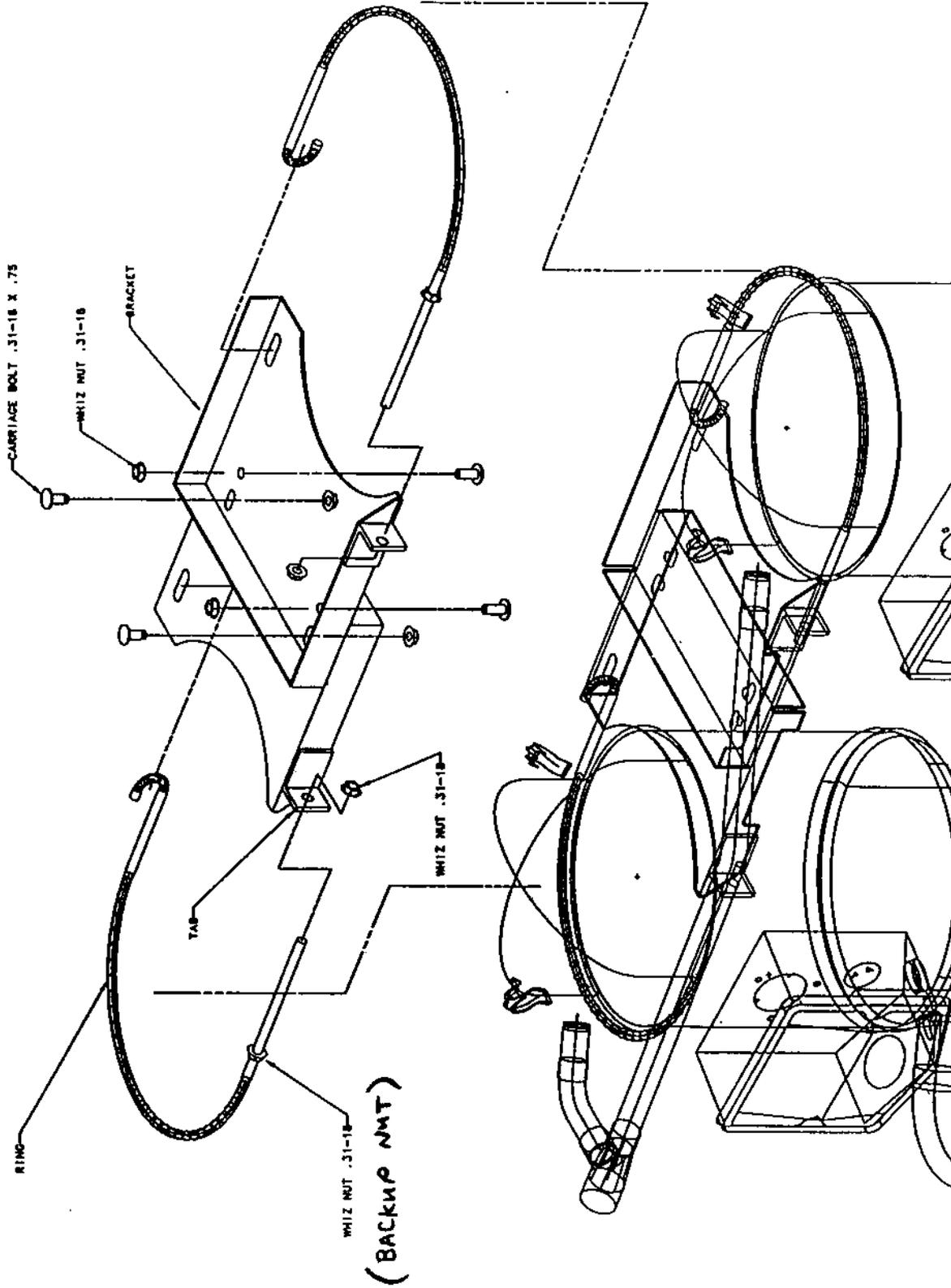


FIGURE 1