



General Service Bulletin

RTHA-SB-15

Library	Service Literature
Product Section	Refrigeration
Product	Rotary Liquid Chillers
Model	RTHA
Literature Type	General Service Bulletin
Sequence	15
Date	January 1993
File No.	SV-RF-RLC-RTHA-SB-15-0193
Supersedes	Original

Literature Change History

New

Subject: Model RTHA Compressor Component Disassembly

Introduction:

The purpose of this Service Bulletin is to aid in the disassembly of certain components on the RTHA compressor.

Discussion:

This Service Bulletin provides the service technician with instruction for the disassembly and assembly of the oil tank, oil separator, piston housing and motor housing on the RTHA compressor.

Note: The Trane Company urges all HVAC servicers, working on Trane equipment and other manufacturer's products, to make every effort to eliminate, if possible, or vigorously reduce emissions of CFC, HCFC and HFC refrigerants to the atmosphere resulting from installation, operation, routine maintenance, or major service on this equipment. Always act in a responsible manner to conserve refrigerants for continued use, even when acceptable alternatives are available.

IMPORTANT NOTICE

Effective July 1, 1992, all service operations must use recovery systems to minimize losses of refrigerant to the atmosphere when servicing units with Class I and Class II refrigerants.

Class I (CFC) and Class II (HCFC) refrigerants include CFC-12, HCFC-22, CFC-500, CFC-502, CFC-11, CFC-113 and HCFC-123. Deliberate venting is prohibited by Section 608 of the Clean Air Act.

In the normal service of air conditioning systems, there are three major activities mandated by the EPA regulations: recovery, recycling and reclaiming.

1) Recovery – the act of removing refrigerant from the air conditioning unit so that losses of refrigerant to the atmosphere are minimized.

Whenever a refrigeration circuit is opened, the recovery of the refrigerant is required. If there is no reason to believe that the refrigerant is "bad", such as during service of gaskets, expansion valves or solenoid valves, the refrigerant is often returned to the unit without treatment. (Note: Always follow the equipment manufacturer's recommendations regarding replacement of unit filter driers during service.)

If there is reason to suspect that the refrigerant is bad, such as with a compressor failure, the refrigerant should either be replaced or recycled.

Recovery is also required when a piece of equipment is decommissioned. This prevents the loss of refrigerant upon disposal of the unit. The recovered refrigerant usually is sold to refrigerant reclaimers rather than reused in the customer's new equipment.

2) Recycling – the act of cleaning recovered refrigerant for use in the customer's equipment.

First, the refrigerant is boiled to separate the oil. Then it is run through a filter drier to separate moisture and acid.

Because of limited field testing capability, the quality and identity of any recycled refrigerant is suspect. For this reason, the EPA will most likely allow recycling of refrigerant only when it is returned to its original owner. Resale of the recycled refrigerant to third parties will not be allowed.

As a result, most servicers will only recycle refrigerant when the quantity of the refrigerant to be recycled and the expertise of the technician make it attractive to do so. Most suspect refrigerant will be sold to a reclaimer rather than be serviced in the field.

3) Reclaiming – the act of purifying refrigerant and testing it to ARI 700 "new" refrigerant standards. With reclamation, each batch of refrigerant undergoes extensive laboratory tests and the waste streams are disposed of according to environmental regulations.

Most reclamation will be done at centralized processing facilities because of the testing, waste handling and EPA certification requirements for reclamation. The Trane Company and others offer reclamation services for most refrigerants.

Reclamation is probably the most attractive alternative for users with salvaged and suspect refrigerant.

Pre-Teardown Tasks

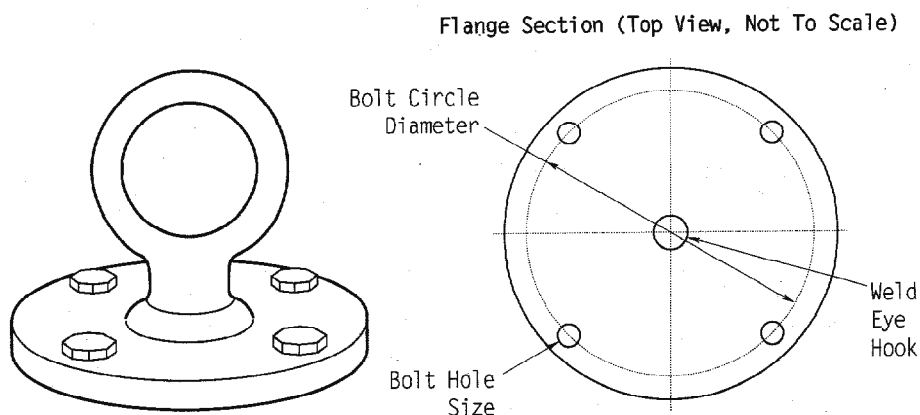
The following pre-teardown tasks are to be performed by the service company.

Note: Be sure to adhere to all federal, state and local codes and regulations when recovery, recycling, reclaiming or handling of refrigerant is required.

1. Remove all insulation around the motor and rotor housing, if applicable.
2. Remove the starter panel, if applicable. Refer to RTHA-SB-14.
3. Fabricate a motor lifting flange if applicable. See Figure 1. Use a local vendor for fabrication of the flange. The flange must be capable of supporting the entire weight of the motor housing (2 Tons).
4. Fabricate a rotor puller, if applicable. See Figures 6 and 7. Use a local vendor for fabrication of puller.

Note: Prior to disassembly of any component, identify all required O-Rings and gaskets. Order them from "La Crosse Service Parts" in La Crosse, Wisconsin.

Figure 1
Specifications for Manufacturing a Lifting Flange
Used for Motor Housing Removal (Locally Manufactured)



	RTHA 130-150	RTHA 180-215	RTHA 255-300	RTHA 380-450
Bolt Circle	4.375"	4.750"	5.375"	5.875"
Bolt Holes	.551"	.551"	.551"	.551"

Notes:

Weld eye hook for lifting purposes.

All bolt holes are (14mm) 4 x equally spaced.

Tools and Parts For Component Teardown

The following tools and parts may be necessary to accomplish the component teardown.

1. Overhead A-frame, or equivalent, with the following capacities:

For Oil Tank lifting – 1.5 Tons

For Motor Housing lifting – 2 Tons

Table 1
RTHA Weight Specifications

RTHA Part No.	Size (inches)	Design No.	Design Weight (lbs)	Weight w/o Heads (lbs)	Both Swab Heads	Comp. W/O Heads	Both Comp. Heads	Ref. Changes	Unit Wt. Standard	Comp. Panel S.O. Access	Comp. Bts. Line	Inter connecting Pipes
130/150	Std	(A-U)	2475	832	160	940	129	260	450	100	80	175
130/150	Long	(A-U)	2475	1040	160	1170	129	330	450	100	80	175
180/215	Std	(A-U)	2950	1135	240	1240	184	370	450	100	150	225
180/215	Long	(A-U)	2950	1439	240	1340	184	415	450	100	150	225
180/215	Ext	(A-U)	2950	2071	300	2050	250	605	450	100	200	250
255/300	Std	(A-L)	4150	1690	300	1730	250	450	450	100	200	250
255/300	Std	(M-U)	4150	1690	300	1730	250	440	450	100	200	250
255/300	Long	(A-L)	4150	2071	300	2050	250	570	450	100	200	250
255/300	Long	(M-U)	4150	2071	300	2050	250	605	450	100	200	250
255/300	Ext	(M-U)	4150	2990	500	3060	375	815	450	100	250	300
380/450	Std	(A-U)	5900	2440	500	2590	375	570	450	100	250	300
380/450	Long	(A-U)	5900	2990	500	3060	375	815	450	100	250	300

Note:

For total unit weights see latest version of RTHA-IOM.

All weights are in pounds.

2. A set of metric socket wrenches, 10mm to 30mm with standard drive.
3. Torque wrench with a 350 Ft-Lb capacity.
4. Pneumatic air wrench with a 350 Ft-Lb capacity.
5. A 3-foot extension for the socket wrench.
6. Three 5-inch guide pins (M16 & M20).
7. Loctite-271. Refer to applicable figures for location and use.
8. Breaker bars.
9. Lifting flange, as described in Figure 1.
10. Rotor puller, as described in Figure 6, for removal of the motor rotor. Use a local vendor for fabrication of the puller.
11. Loctite Gasket Eliminator - 515. Refer to applicable figures for location and use.
12. Rubber mallet.
13. Trane Oil-15 or Trane Oil-31.
14. HCFC-22 refrigerant.
15. Recovering equipment for HCFC-22 refrigerant.
16. Storage tanks for recovering refrigerant and oil.

Note: Refer to Table 2 for torque ratings, socket sizes and sealing methods.

Table 2
Torque Ratings, Socket Sizes and Gasket/O-Ring Specifications

Item	Unit Size (Tops)	Bolt Size (mm)	Quantity Bolts	Hexhead (mm)	Max. Torque (Ft. Lbs.)	Sealing Method
Check Valve Housing to Bearing Housing (Internal to Compressor)	130-215	M10x30	5	17	40	N/A
	255-300	M10x35	5	17	40	N/A
	380-450	M10x35	8	17	40	N/A
Discharge Line to Isolation Valve or Insert for Isolation Valve Flange	130-215	M12x40	8	19	70	O-Ring
	255-300	M12x50	8	19	70	O-Ring
	380-450	M12x50	8	19	70	O-Ring
Discharge Line to Oil Tank Housing Flange	130-150	M12x40	4	19	70	O-Ring
	180-300	M12x45	8	19	70	O-Ring
	380-450	M12x50	8	19	70	O-Ring
Economizer Cover	130-215	M16x80	28	24	170	Gasket
	255-300	M20x90	30	30	325	Gasket
	380-450	M20x100	30	30	325	Gasket
Economizer Line Flange to Motor Housing	130-150	M12x45	4	19	70	O-Ring
	180-215	M12x40	4	19	70	O-Ring
	255-300	M12x40	4	19	70	O-Ring
	380-450	M12x40	4	19	70	O-Ring
Economizer Plate	130-215	M6x12	9	10	8	Loctite-515
	255-300	M8x20	5	13	20	Loctite-515
	380-450	M8x20	5	13	20	Loctite-515
Isolation Valve or Insert (Cond. Inlet)	130-150	M16x130	12	24	170	Gaskets
	180-450	M16x160	12	24	170	Gaskets
Isolation Valve or Insert (Cond. Outlet)	130-150	M12x100	8	19	70	Gaskets
	180-300	M12x100	8	19	70	Gaskets
	380-450	M16x100	8	24	170	Gaskets
Labrith Seal	130-215	M8x25	4	13	20	N/A
	255-300	M8x20	4	13	20	N/A
	380-450	M8x20	4	13	20	N/A
Liquid Line Sump Flange to Motor Housing	130-150	M12x45	8	19	70	O-Ring
	180-215	M12x45	8	19	70	O-Ring
	255-300	M12x50	16	19	70	O-Ring
	380-450	M12x50	16	19	70	O-Ring
Load/Unload Solenoid Valves	All	M6x35	8	5*	8	Gaskets
Male Rotor Bolt (Internal)	130-150	M16x55	1	24	170	Loctite-271
	180-215	M16x55	1	24	170	Loctite-271
	255-300	M16x60	1	24	170	Loctite-271
	380-450	M16x60	1	24	170	Loctite-271
Motor Hermetic Terminals (Spark Plugs)	130-150	N/A	6	1 ¹ / ₈	50	Aluminum Washer
	180-215	N/A	6	1 ³ / ₈	175	Copper Washer
	255-300	N/A	6	1 ³ / ₈	175	Copper Washer
	380-450	N/A	6	1 ³ / ₈	175	Copper Washer
Oil Separator to Piston Housing (Internal)	130-215	M10x25	17	17	40	N/A
	255-300	M10x25	17	17	40	N/A
	380-450	M12x30	19	19	70	N/A

* Allen head bolts.

Note: N/A indicates no gaskets, no O-Rings, or Loctite is required.

Table 2 (Continued from previous page)
Torque Ratings, Socket Sizes and Gasket/O-Ring Specifications

Item	Unit Size (Tons)	Bolt Size (in.)	Quantity Bolts	Hexhead (in.)	Max. Torque (ft.-lbs.)	Sealing Method
Oil Tank Housing to Rotor Housing	130-215	M16x90	24	24	170	O-Ring
	255-300	M20x90	24	30	325	O-Ring
	380-450	M20x90	24	30	325	O-Ring
Piston Housing to Check Valve Housing (Internal)	130-215	M10x110	4	8*	40	N/A
	255-300	M10x35	5	8*	40	N/A
	380-450	M10x45	5	8*	40	N/A
Ref. Filter Flange Stud Bolts (Inlet)	130-215	M12x115	4	19	70	N/A
	255-300	M12x115	4	19	70	N/A
	380-450	M12x115	4	19	70	N/A
Rotor Housing to Motor Housing	130-215	M16x80	24	24	170	O-Ring
	255-300	M20x100	24	30	325	O-Ring
	380-450	M20x100	24	30	325	O-Ring
RTD Terminal	All	-	4		10	Loctite-271
Stator Ring (Internal)	150 & 215	M10x80	6	17	40	N/A
	130 & 180	M10x60	6	17	40	N/A
	255	M12x70	8	19	70	N/A
	300	M12x100	8	19	70	N/A
	380	M16x100	8	24	170	N/A
	450	M16x100	8	24	170	N/A
Suction Line to Rotor Housing	130-150	M12x45	8	19	70	O-Ring
	180-215	M12x45	8	19	70	O-Ring
	255-300	M12x45	8	19	70	O-Ring
	380-450	M12x50	16	19	70	O-Ring

* Allen head bolts.

Note: N/A indicates no gaskets, no O-Rings, or Loctite is required.

A-frame Setup Procedures

An A-frame is necessary for removal of both the motor housing and the oil tank housing. Position the A-frame over the entire length of the unit.

Note: The A-frame hoist must be capable of moving the entire length of the component being removed, plus an additional 3 feet past the oil tank housing or motor housing. This will allow the oil tank housing to clear the oil separator and the motor housing to clear the motor rotor.

Caution: The A-frame must be capable of supporting the weights specified in Item 1 of the "Tools and Parts for Component Teardown" section of this bulletin. The A-frame must also be equipped with a safety harness capable of supporting the entire weight of the unit being removed. This harness must be secured to the overhead support of the A-frame and the unit being removed, in the event the lifting mechanism of the A-frame fails.

Motor Housing Removal and Replacement

This section includes the removal of the economizer cover, the motor rotor, the labrith seal and the motor housing. The following steps must be followed, in order, to successfully remove the motor housing.

If the unit is equipped with condenser isolation valves, perform the "Refrigerant Pumpdown Evacuation" procedure described in the updated version of Section 7.1, in Literature File # RLC-SG-1.

Caution: To avoid catastrophic damage to the compressor, do not pump down the unit more than one time in succession.

Note: If the unit is not equipped with condenser isolation valves, a recovery process will be required to recover all of the refrigerant. Be sure to comply with all federal, state and local codes when recovering refrigerant.

Caution: Water must be flowing through the tube bundles during the recovery process. Refrigerant pressure below 65 psig can cause freezing and rupturing of the heat exchangers.

Note: Before continuing, refer to RTHA-SB-14 for instructions on Starter Panel removal.

1. Disconnect and remove the economizer line and loosen, but do not remove the bolts from the liquid line sump flange. Refer to Figures 2, 3 and 4. Do not unbolt motor housing support brackets at this time.

Figure 2
RTHA Component Locations

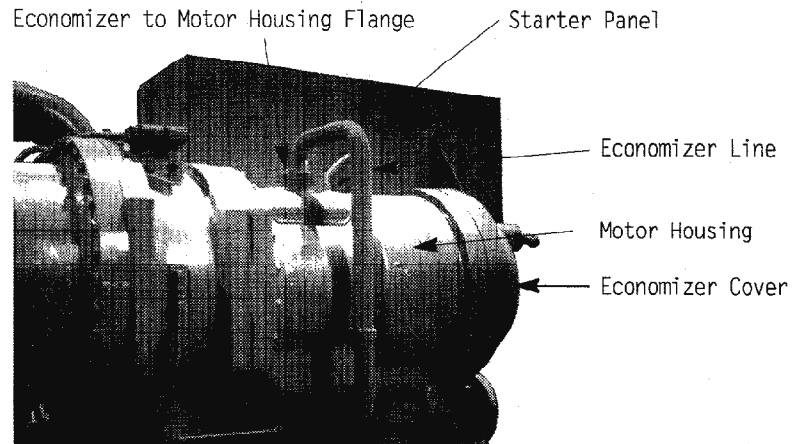


Figure 3
RTHA Component Locations

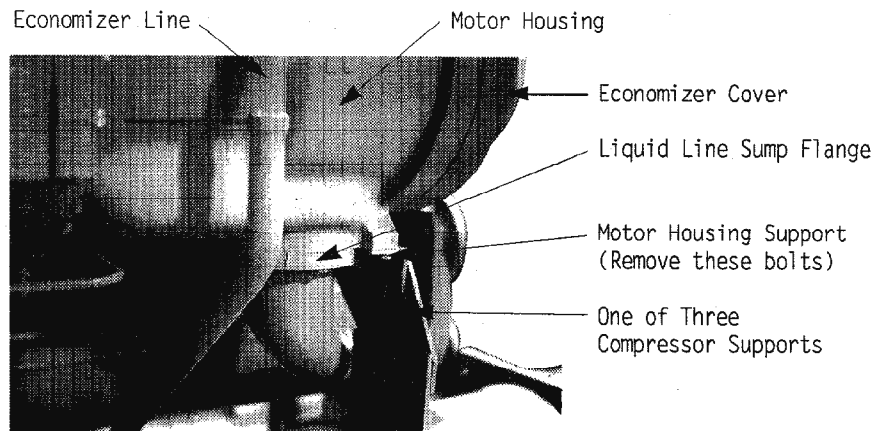
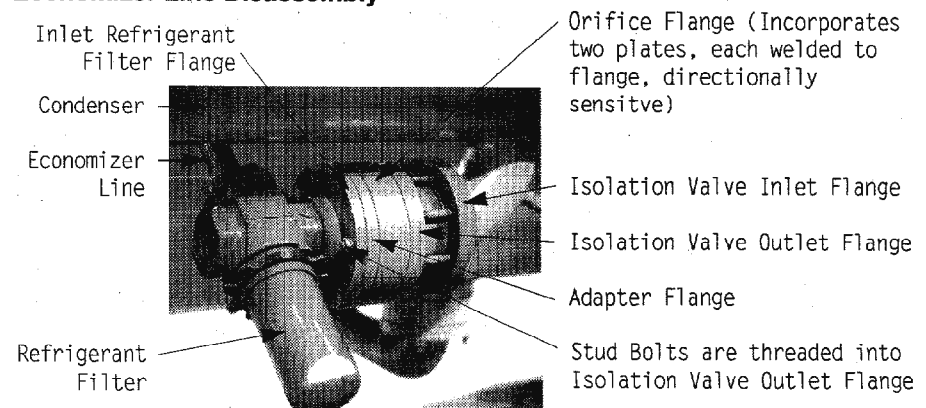


Figure 4
Economizer Line Disassembly



Note 1. Replace all O-Rings with new O-Rings after disassembly.
Note 2. Special gaskets are required for the isolation valve.

2. Attach the lifting flange (Figure 1) onto the economizer flange on top of the motor housing (See Figure 2). No O-Ring is required at this time.

WARNING: Do not perform the following Steps until the A-frame setup procedures have been completed.

3. Remove, from the economizer cover, the three bolts located at the 3 o'clock, 6 o'clock and 9 o'clock positions. Insert the three 5-inch guide pins into these positions.

4. Remove the remaining bolts. Be sure the economizer cover is secured to the A-frame at this time.

5. Slowly slide the economizer cover back approximately 2 inches and insert an eye-bolt in the bolt hole at the 12 o'clock position. Attach the cover to the A-frame, slide the cover off and set it aside.

Note: Once the economizer cover is removed, attach the safety harness to the motor housing.

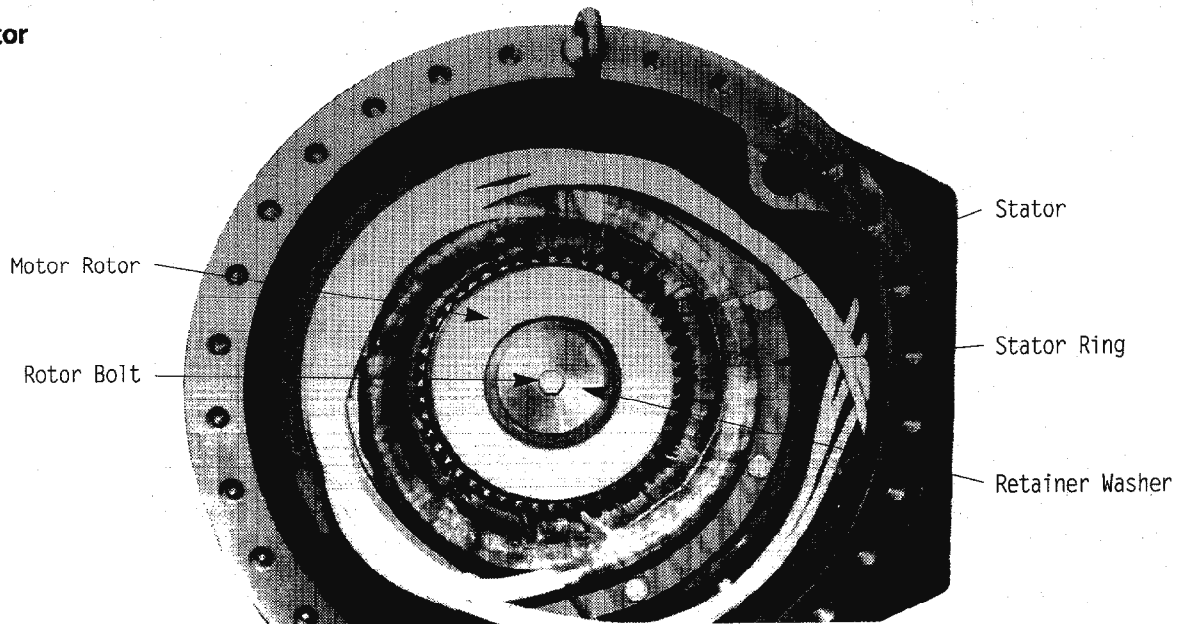
Note: On RTHA-130, 150, 180, 215, 380 and 450 units, the economizer plate is bolted to the economizer cover. This plate will be removed with the cover. The economizer pipe is located at approximately the 1 o'clock position on the economizer plate. This pipe attaches via a compression fitting and may fall out when the cover is removed. Make sure this pipe is installed and seated correctly upon reassembly. This pipe is not installed on the RTHA-380 and -450 units. Instead, this port is machined into the casting.

Note: On RTHA-255 and -300 units, the economizer plate must be removed from the motor housing after the economizer cover is removed. The economizer port is machined into the housing on these units. A bead of Gasket Eliminator 515 must be applied between the plate and motor housing upon re-installation.

Caution: Cover the liquid sump outlet to the evaporator inside the motor housing. This will prevent debris from getting into the opening. See Figure 6.

6. With a pneumatic impact wrench, remove the bolt on the end of the male rotor. This bolt has Loctite-271 on the right-handed threads. The rotors will turn while the bolt is being removed. Remove the bolt and the retainer washer that it holds in place, as shown in Figure 5.

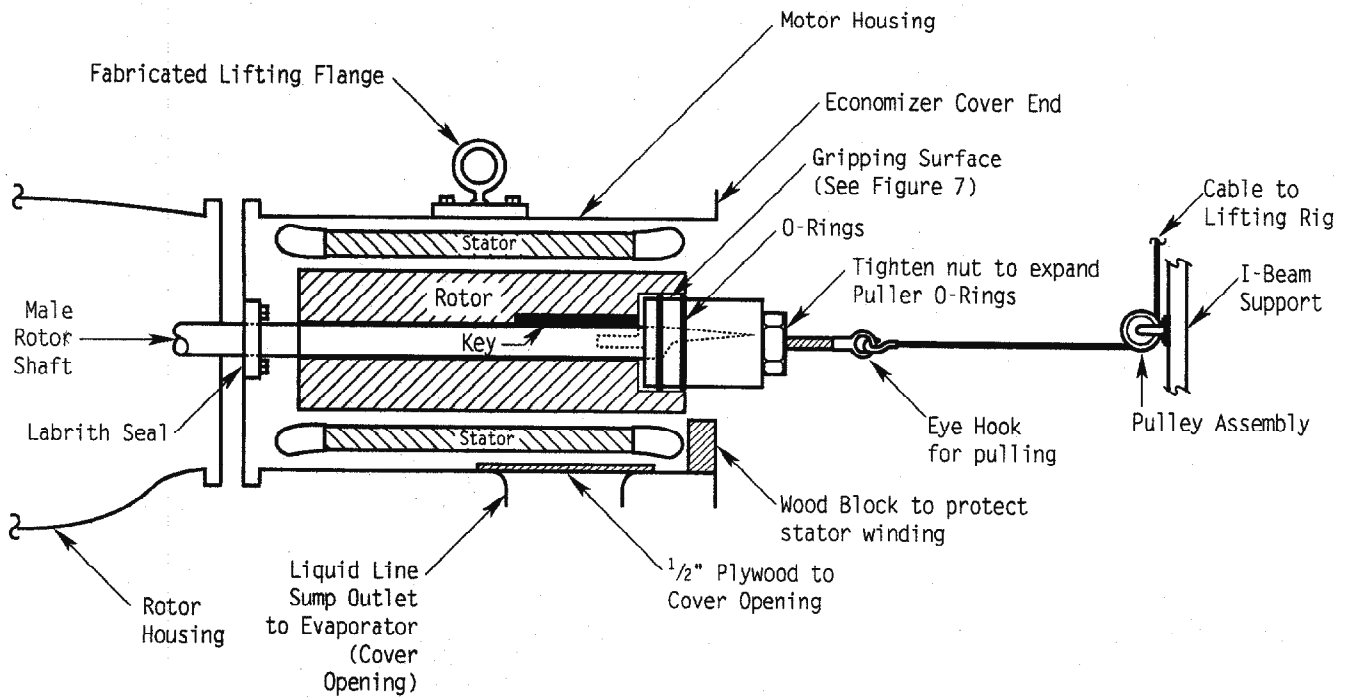
Figure 5
Motor Rotor



7. The rotor is keyed and the orientation of the key must be noted to insure correct positioning during reassembly. The fabricated rotor puller (see Figure 6) will fit inside the I.D. of the rotor and is expanded to clamp onto the rotor internal diameter. Refer to Figure 7. Apply a horizontal force to the rotor puller to withdraw the rotor from the motor housing. Rotor weights are listed in Table 3.

Caution: Extreme care must be taken to protect the stator windings when removing the rotor.

**Figure 6
Rotor Puller**



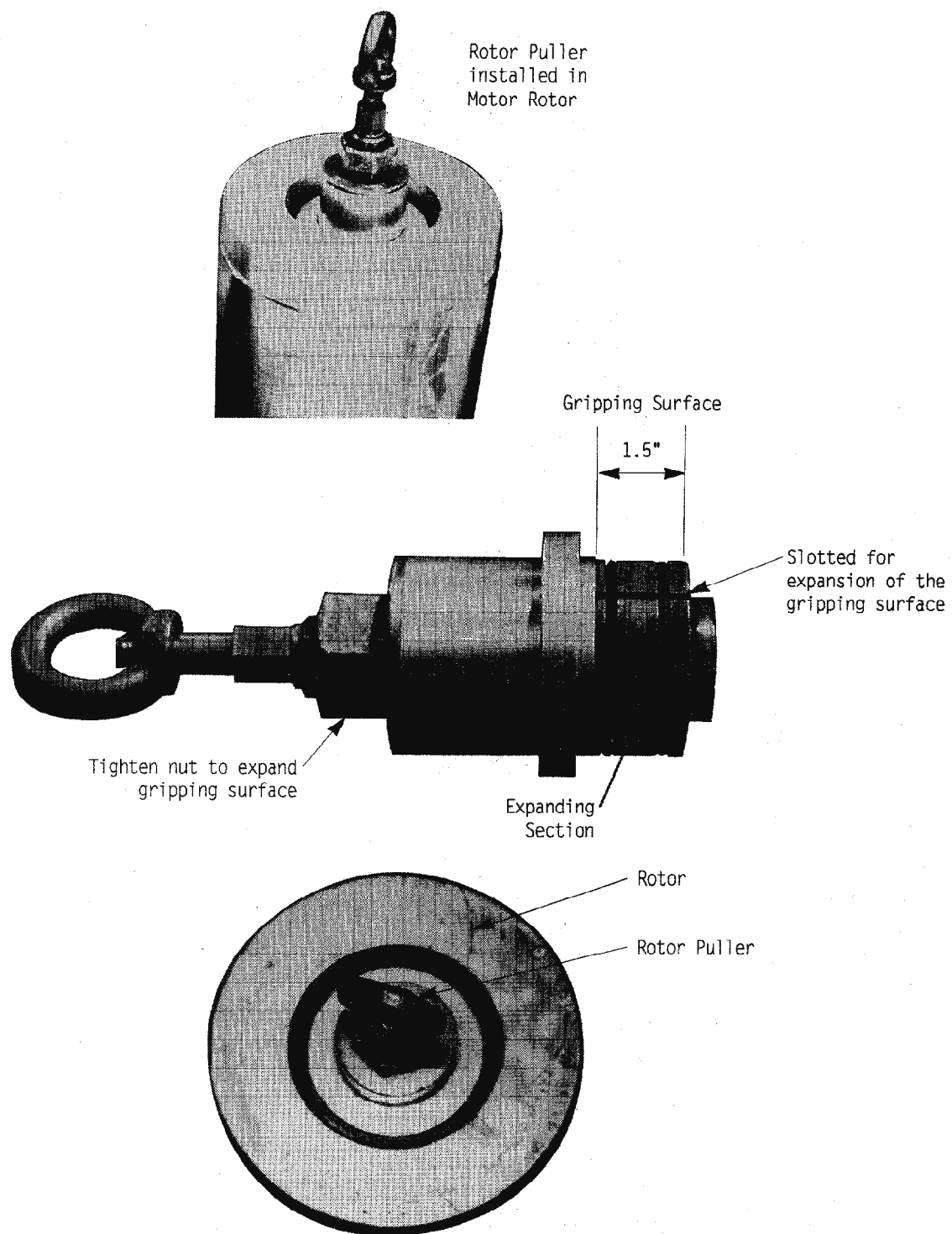
Notes:

Rotor puller must be capable of expanding from 3 inches to 4.5 inches diameter.
Gripping surface is 1.5 inches.
I.D. of rotors range from 3 inches to 4 inches.

**Table 3
RTHA Motor Rotor Weights**

Tonnage	Rotor Weight (Lbs.)	Tonnage	Rotor Weight (Lbs.)
130	65	255	115
150	72	300	125
180	75	380	183
215	83	450	200

Figure 7
Rotor Puller



8. Remove and discard the labrith seal. A new seal is required during reassembly. To reinstall the labrith seal, wipe the I.D. of the seal with emery cloth. The seal does not require any clearance measurement. Move the seal down the shaft with both hands, keeping the seal as straight as possible. The seal is machined for a close tolerance fit over the shaft with respect to the bolt holes. Refer to Figure 6.

9. With the lifting flange secured to the overhead A-frame and the safety harness attached to the motor housing, remove the bolts from the liquid line sump flange and the motor housing support bracket.

10. Remove the three bolts located at the 3 o'clock, 6 o'clock and 9 o'clock positions of the motor housing. Insert the three 5-inch guide pins into these positions and remove the remaining bolts.

11. Slide the motor housing away from the unit on the guide pins until it is clear of the male rotor shaft. Lower the motor housing to a secure location.

Note: The male rotor and female rotor suction bearings remain attached to the motor housing end. Care must be taken to avoid disruption of these bearings during removal and storing.

12. After completion of inspection and necessary repairs, reassemble the unit, following the above steps in reverse order.

RTHA Oil Tank Housing Removal and Replacement

Removal and replacement of the oil tank housing is accomplished by following the procedures outlined below.

WARNING: Do not perform the following Steps until the A-frame setup procedures have been completed.

1. If the unit is equipped with condenser isolation valves, perform the "Refrigerant Pumpdown Evacuation" procedure described in the updated Section 7.1 of Literature File # RLC-SG-1.

Caution: These instructions must be performed exactly. Failure to do so can result in catastrophic damage to the compressor. Do not pump down the unit more than one time in succession.

Note: If the unit is not equipped with condenser isolation valves, a recovery process will be required to recover all refrigerant. Be sure to comply with all federal, state and local codes.

Caution: Water must be flowing through the tube bundles during the above process. Refrigerant pressures below 65 psig can cause freezing and rupturing of the heat exchangers.

2. Remove all remaining oil from the oil tank, via the oil charging valve.

3 Disconnect and remove the following:

Caution: Be sure to lock "open" all electrical disconnects prior to performing any electrical tests. Failure to do so may result in electrocution.

- a. High discharge temperature sensor
- b. Oil heaters
- c. Oil distribution lines
- d. Discharge line
- e. Oil cooler lines (If applicable)

Note: All piping and wiring must be clear of the oil tank prior to removal.

Note: Oil coolers are not installed on all units. The oil cooler is standard on RTHA 380 and 450 units and on special application chillers. See Figures 8 and 9. Take necessary precautions when disconnecting these lines.

Warning: Be sure that the system is at "0" psig before removing the oil cooler.

Figure 8
Oil Cooler
Note: See Figure 9 for applicable connection locations.

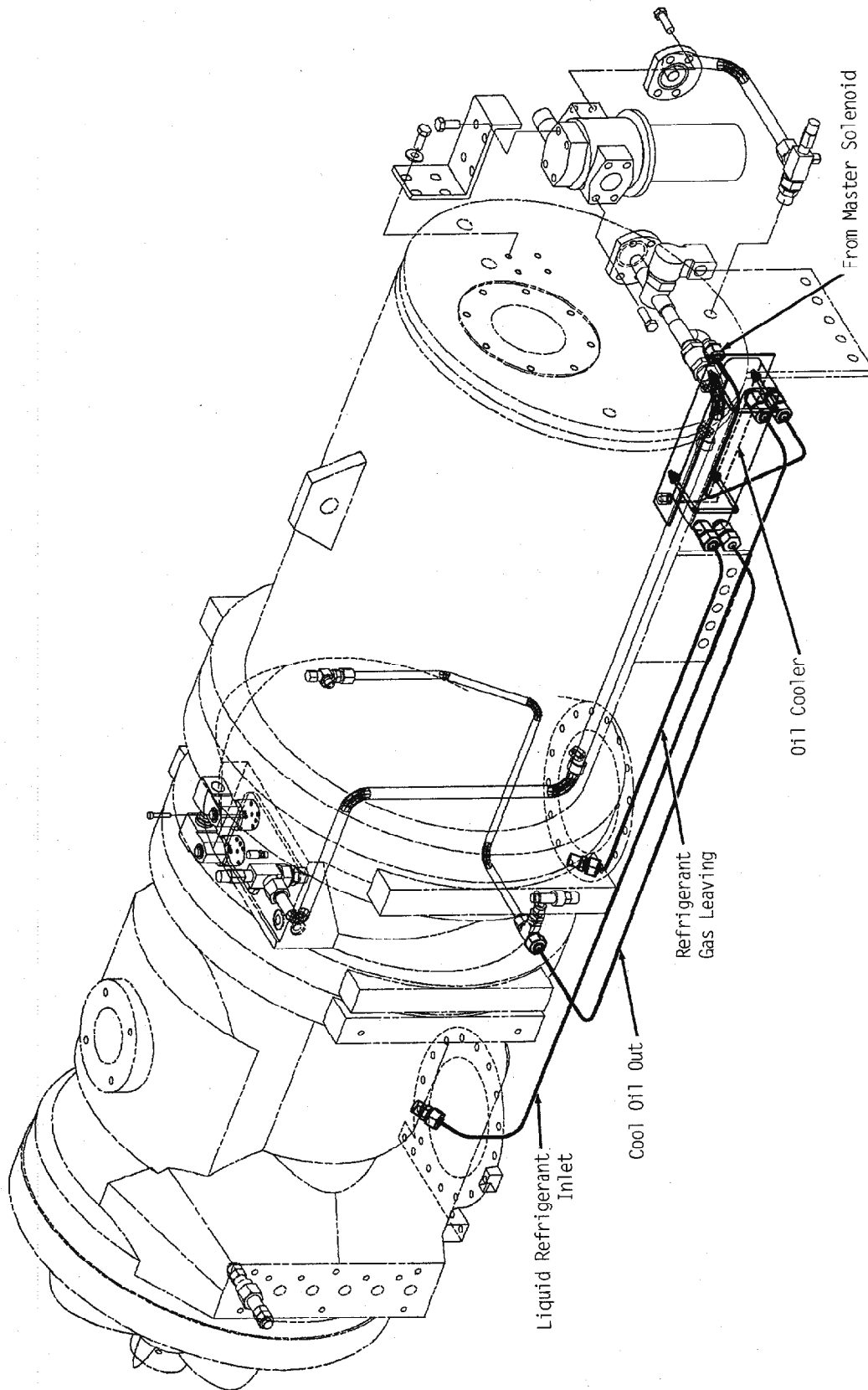
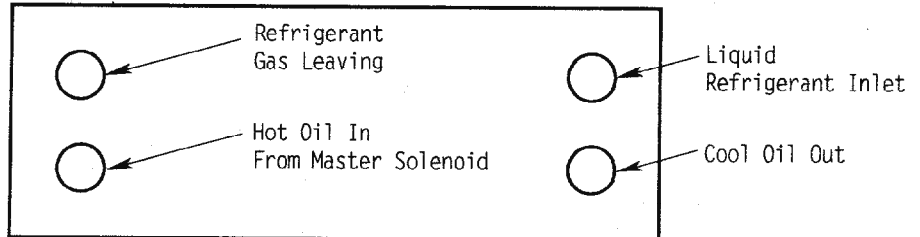
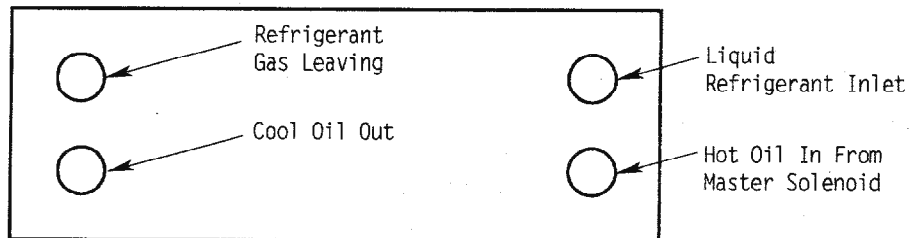


Figure 9
Oil Cooler Connections

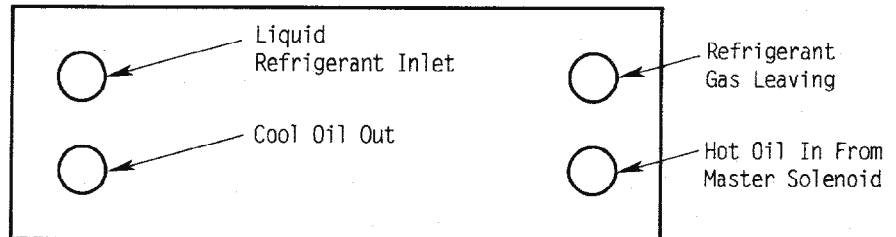
130 to 300 Ton Units
(Manufactured prior to August 1992)



130 to 300 Ton Units
(Manufactured after September 1992)



380 to 450 Ton Units



4. Secure the oil tank to the lifting mechanism of the A-frame. Secure the safety harness between the oil tank and the overhead beam of the A-frame. Remove all slack between the oil tank and the A-frame.

5. Remove all bolts from the support brackets below the oil tank housing which are attached to the oil tank.

Caution: Be sure that the weight of the oil tank is being supported by the A-frame.

6. Loosen (approximately 1 turn) each of the bolts which attach the oil tank housing to the rotor housing. Then remove only the bolts that are in the 3 o'clock, 9 o'clock and 12 o'clock positions.

Note: The 3-foot long extension is required to reach the bolts that are behind the control panel.

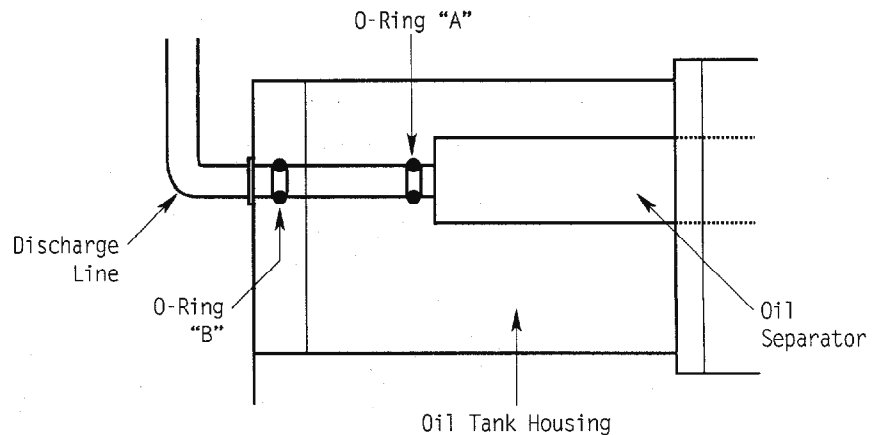
Caution: Do not remove any of the other bolts at this time.

7. Into each of the three bolt holes (3 o'clock, 9 o'clock and 12 o'clock), insert one of the 5-inch guide pins.

Steps 8a and 8b, for RTHA models 130, 150, 180 and 215 only:

8a. As shown in Figure 10, there is a "dimple pipe" installed between the oil separator and the discharge opening in the oil tank. The pipe fits into the oil separator and into the oil tank housing. Each end is sealed by an O-Ring.

Figure 10
Dimple Pipe



8b. The dimple pipe must be pulled away of the oil separator housing before proceeding with Step 9. Reach through the discharge line opening in the oil tank housing, to the far end of the dimple pipe. Pull the dimple pipe until it is clear of the separator. The dimple pipe cannot be removed through the discharge line opening until O-Ring "A" is removed. Refer to Figure 10.

Caution: The dimple pipe must be clear of the oil separator housing before removal of the oil tank housing or damage to the equipment may occur.

Step 8c, for RTHA models 255, 300, 380 and 450 only:

8c. The discharge line has an extension, rather than a dimple pipe. This extension is welded to the discharge line and therefore is removed when the discharge line is removed. There are no O-Rings on this extension.

9. Once the dimple pipe or extension is clear of the separator, the oil tank housing can be removed. Take out the remaining bolts which attach the oil tank housing to the rotor housing.

Caution: Be sure that the guide pins are in place and the weight of the oil tank is being supported by the A-frame.

10. The oil tank may now be moved away from the rotor housing, along the horizontal axis of the unit, until it clears the oil separator. Once clear, the oil tank can be lowered onto a pallet and secured.

Note: There are magnets on the base of the oil tank. Before reassembly, clean the magnets and place them back in the tank.

11. Prior to reassembly, inspect the oil separator, dimple pipe and hydraulic lines, if applicable.

Note: Replace all O-Rings upon reassembly, as required.

12. After completion of inspection and any necessary repairs, reassembly can begin. If applicable, insert the dimple pipe with its O-Rings into the oil separator. Then perform Steps 1 thru 11 in reverse order. Be sure that the dimple pipe is in the proper position, with its O-Ring sealing at the oil separator and the oil tank housing.

Caution: To prevent loss of discharge pressure and possible damage to the compressor, the dimple pipe O-Rings must be reinstalled in their proper positions.

Note: To reassemble units without a dimple pipe, follow Steps 1 thru 11 in reverse order, disregarding procedures that pertain to dimple pipes.

13. Tighten all bolts to the torque values shown in Table 2.

14. As described in Section 7.1 of RLC-SG-1, perform steps 1 thru 3 of the evacuation procedures. Then, to recharge the system, perform steps 1 thru 4 of the recharging procedure.

Note: For units with no condenser isolation valves, refer to Section 7.5 of RLC-SG-1 for recharging.

Oil Separator Removal and Replacement

Removal and installation of the oil separator is accomplished by following the procedures outlined below.

Note: The "Oil Tank Housing Removal" procedures must be completed before removing the oil separator.

1. Once the oil tank has been removed, support the oil separator discharge end and remove the bolts attaching the separator to the piston housing. The bolts are located in the discharge opening of the oil separator, recessed approximately 4 inches inside the discharge end.

Note: Before removing the separator, note the position of the oil separator. The unit tonnage reflects the necessary position of the oil separator.

130 to 215 Ton Units	There is only one way to install the separator. See Figure 11.
255 to 300 Ton Units Design Seq. A-L	The shroud on the separator is facing downward, toward the evaporator. See Figure 12.
255 to 300 Ton Units Design Seq. M-later	The shroud on the separator is facing 180 degrees from the control panel (not shown).
380 to 450 Ton Units	The shroud on the separator is facing downward, toward the evaporator. See Figure 12.

Figure 11
130 to 215 Ton Oil Separator

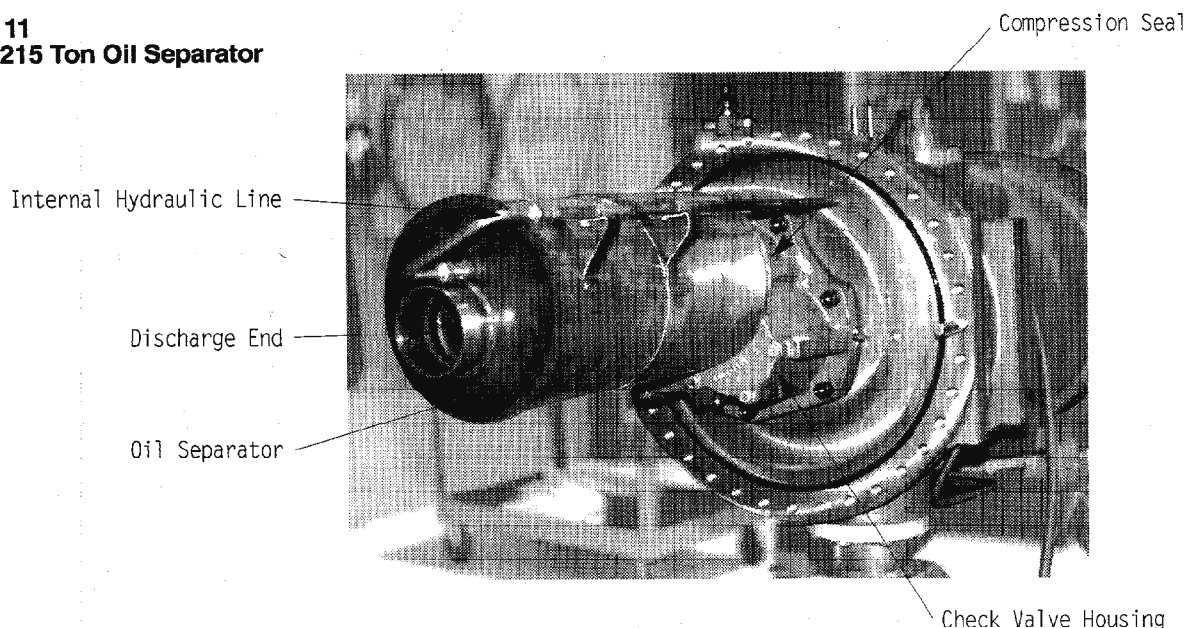
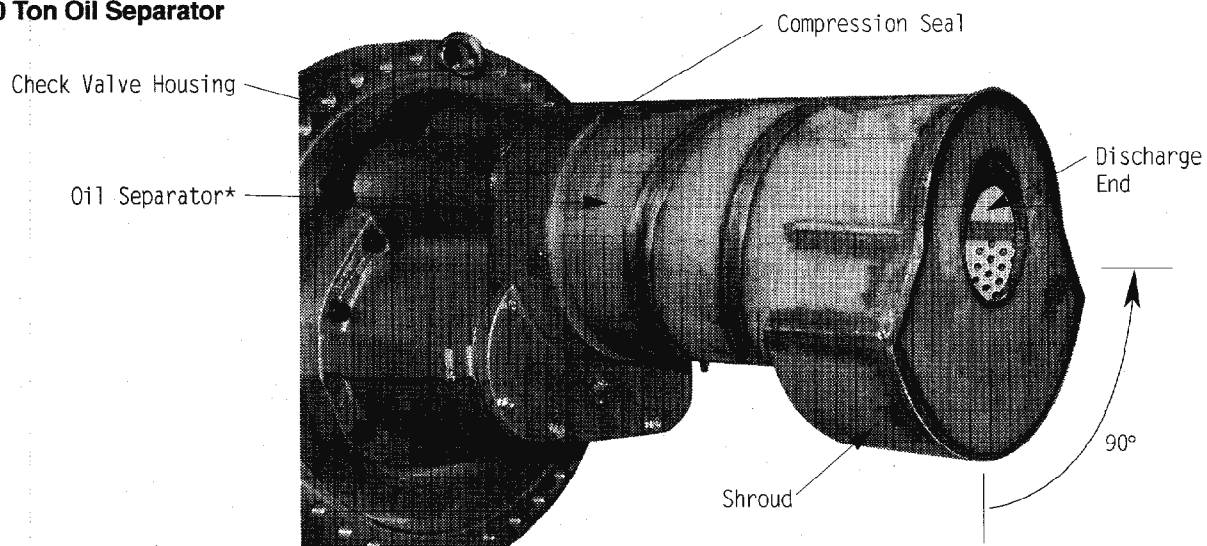


Figure 12
255 to 450 Ton Oil Separator



* On 255 and 300 Ton Units, Design Sequence M and later, shroud is rotated 90° counter-clockwise. Refer to the note at the bottom of page 17 for positioning of shroud.

2. While continuing to support the separator, break the compression seal between the check valve housing and the oil separator. Compression seals are broken by tapping the oil separator with a rubber mallet at the discharge end. See Figures 11 and 12.

Note: The compression seal between the check valve housing and the oil separator is a metal-to-metal type seal. Avoid deforming the seal during disassembly. There are no O-Rings or gaskets.

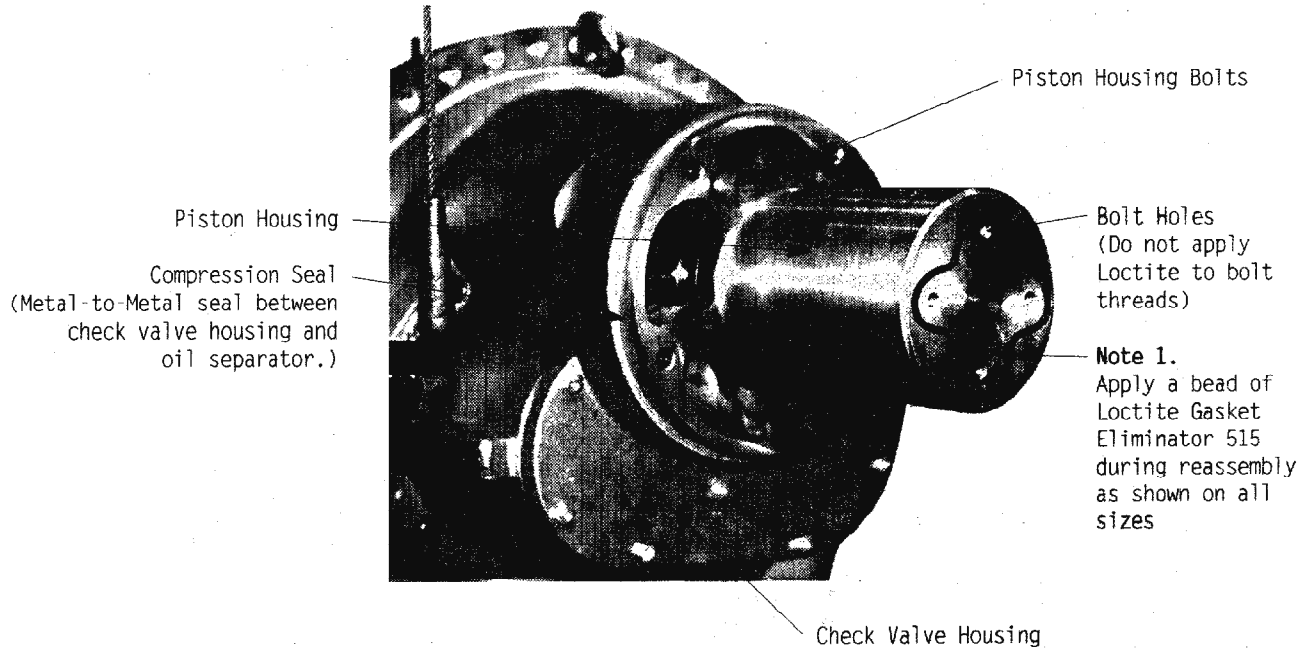
Note: Loctite Gasket Eliminator 515 is used to seal between the oil separator and the piston housing. See Figure 13, Note 1.

Note: To reseal the oil separator during reassembly, use Loctite Gasket Eliminator 515 on the end of the piston housing. See Figure 13. Avoid getting gasket eliminator on the bolt threads.

Note: To reassemble the compression seal between the check valve housing and the oil separator on models 255, 300, 380 and 450, tap the end of the oil separator with a rubber mallet. The separator will slide into place on 130 to 215 units and no tapping is required.

3. Reassembly is accomplished by following Steps 1 thru 2 above, in reverse order.

Figure 13
Piston Housing



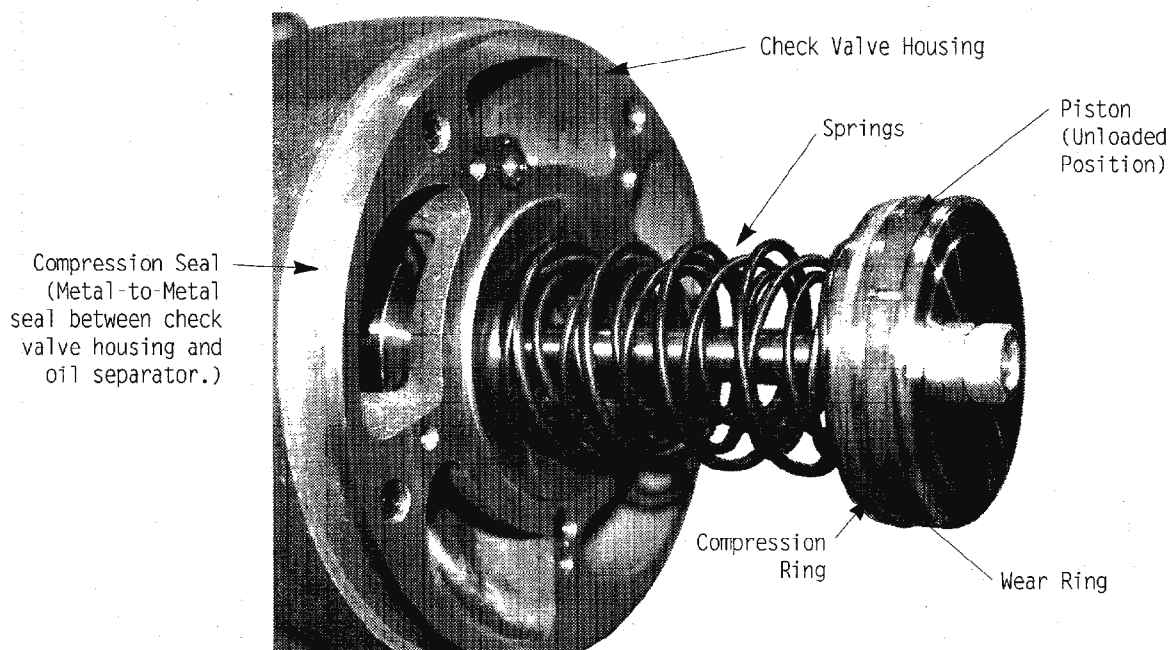
Piston Housing Removal

The "Oil Separator Removal" procedures must be accomplished prior to removal of the piston housing.

WARNING: When removing the piston housing, make sure that the piston/slide valve is fully retracted. Tap the piston to relieve the spring tension on the slide valve. The piston is capable of accelerating to the fully unloaded position while removing the piston housing. See Figure 14.

1. While supporting the piston housing, remove the bolts that attach the piston housing to the check valve housing. See Figure 13.
2. Slide the piston housing horizontally, being careful to avoid disturbing the piston springs.
3. Reassembly is accomplished by following Steps 1 and 2 above, in reverse order.

Figure 14
Piston



Parts and Ordering Information

This Service Bulletin is informational only and does not authorize any parts or labor. Order all parts from "La Crosse Service Parts" in La Crosse, Wisconsin.