

The RV Refrigerator

Rebuild or Replace?

**GMC Eastern States
Fall Rally 2009**

*Elkhart, Indiana
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- *Leon Herschberger*
- *National RV Refrigeration*



Outline

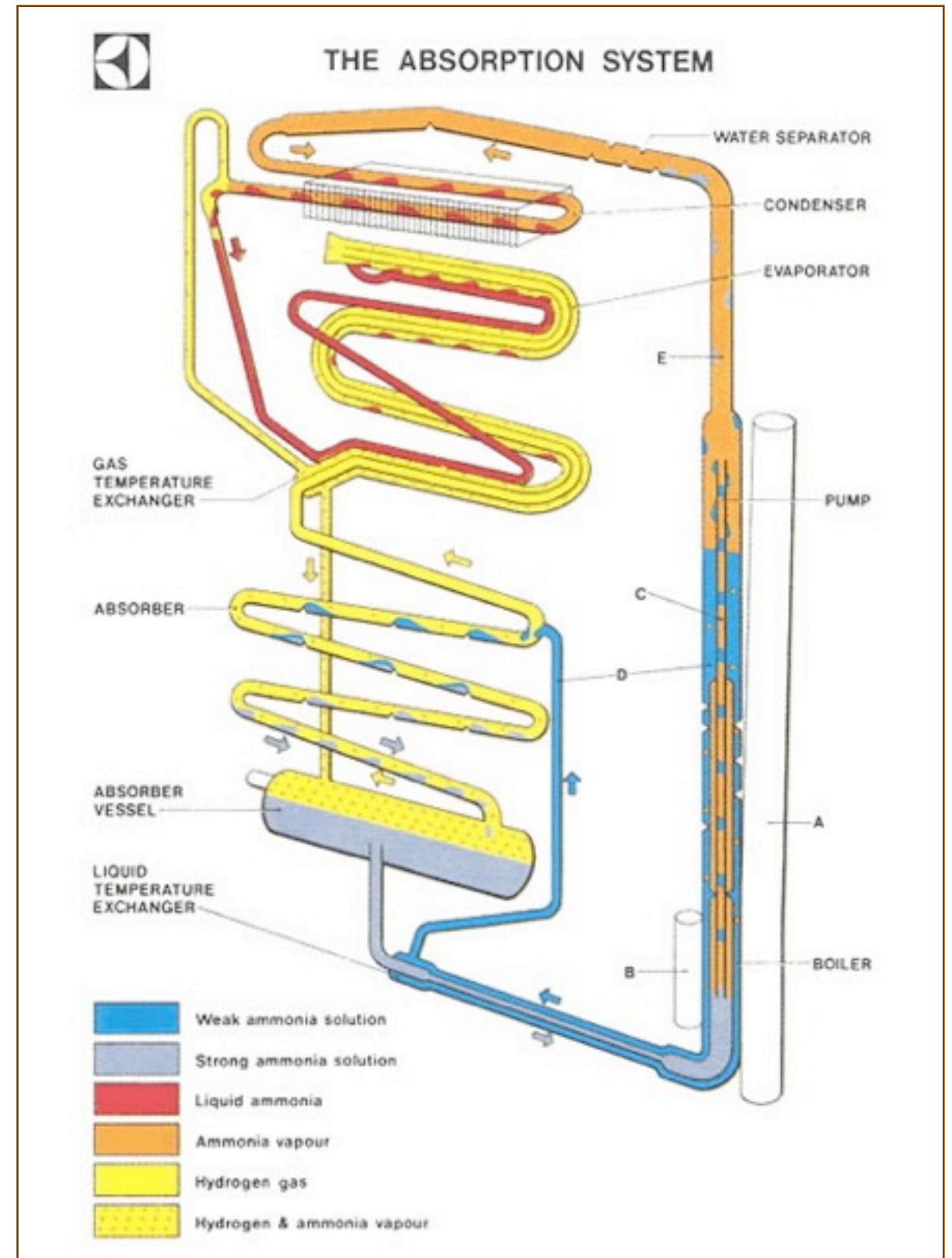
- How an RV Refrigerator Works
- Common Symptoms of a Bad Cooling Unit
- Replace or Rebuild
- Steps in Rebuilding
- Questions



How an RV Refrigerator Works

Continuous Absorption Cooling Unit

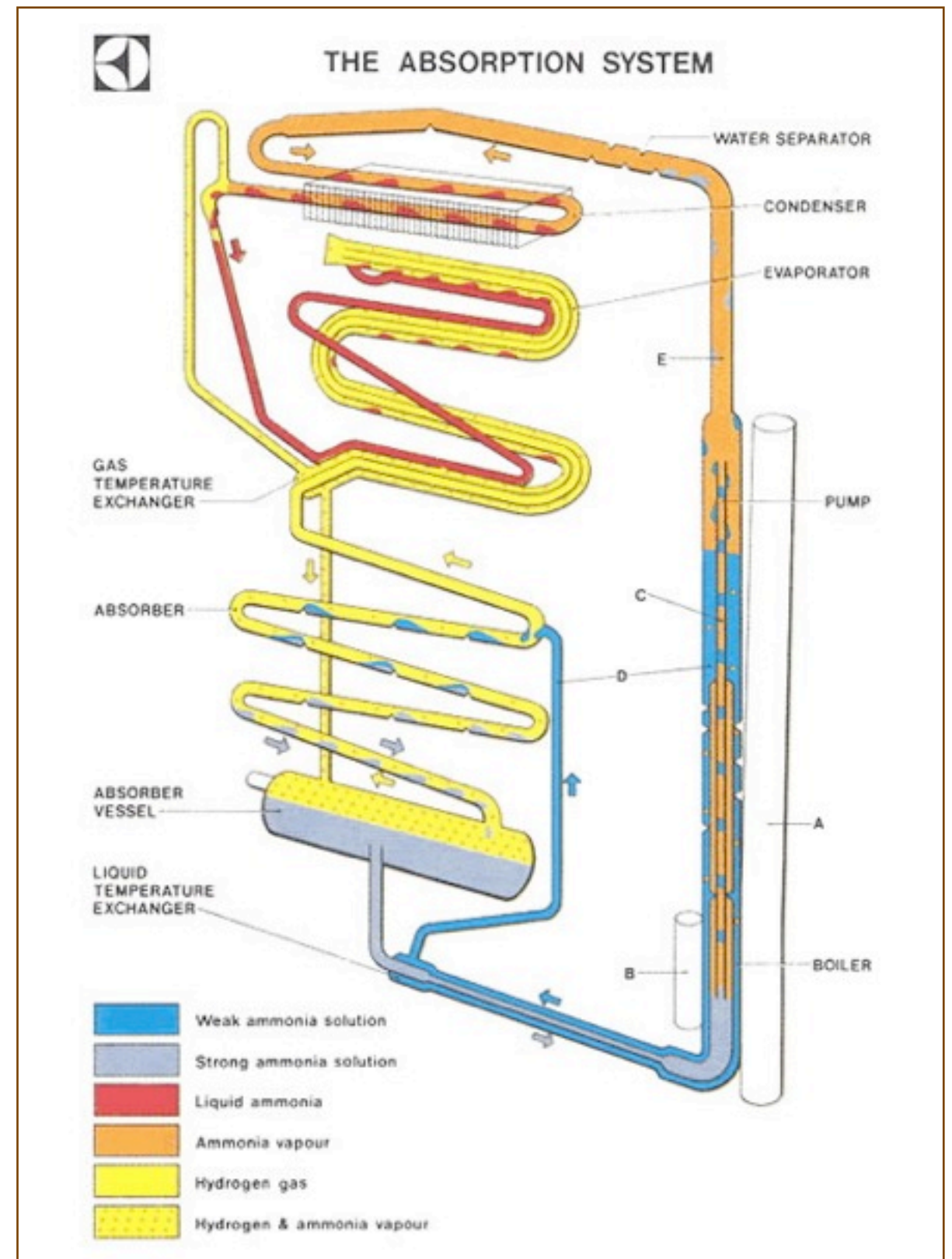
- Four Components
 - Boiler
 - Condenser
 - Evaporator
 - Absorber



How an RV Refrigerator Works

The Unit Charge

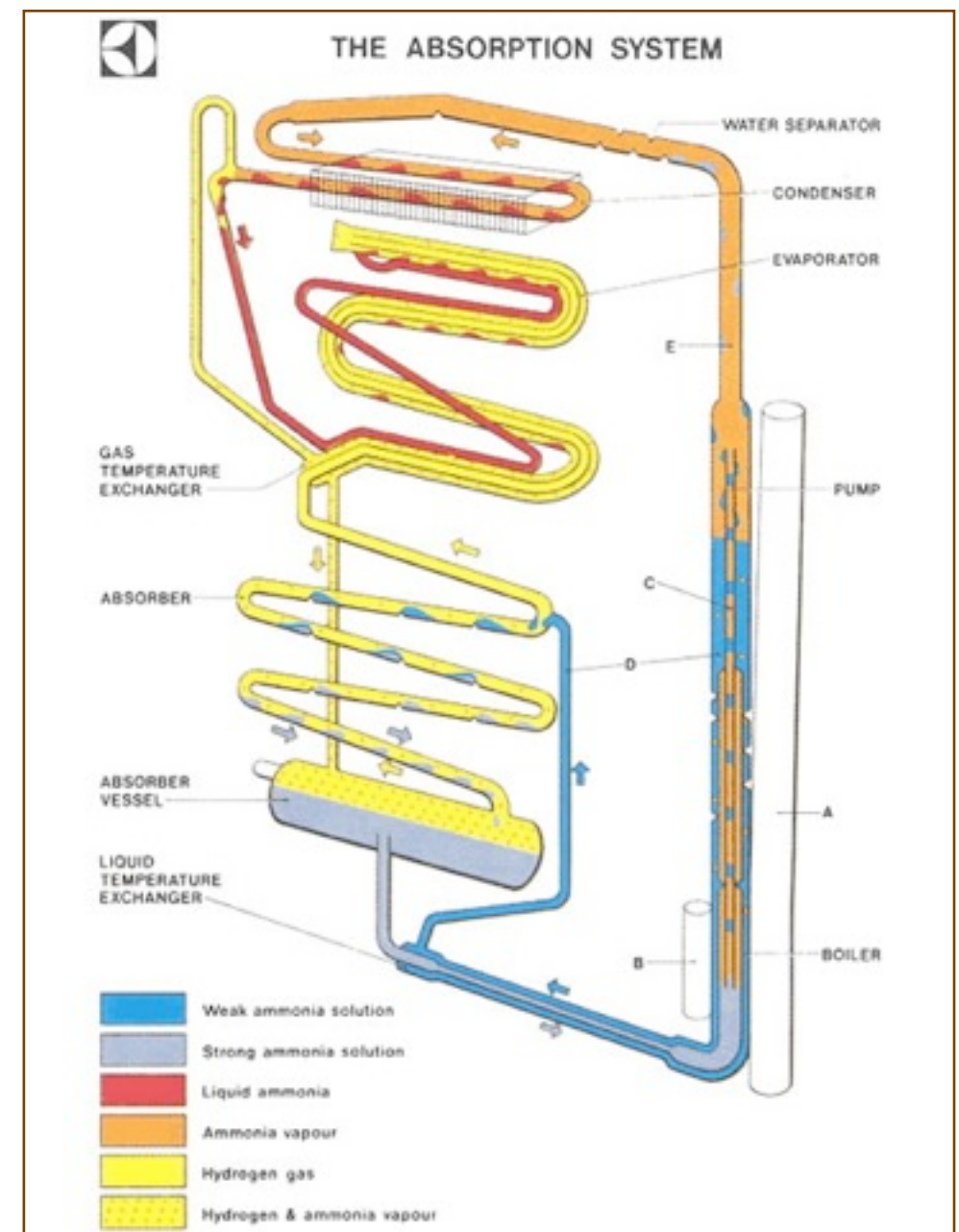
- Quantities of...
 - Ammonia
 - Water
 - Hydrogen
- Pressure condenses ammonia at room temperature



How an RV Refrigerator Works



- Heat vaporizes ammonia
- Fins cool ammonia vapor
- Condenses into liquid
- Flows to evaporator
- Evaporator supplied with hydrogen
- Hydrogen evaporates liquid ammonia
- Evaporation of ammonia extracts heat from food storage space



Common Symptoms of a Bad Cooling Unit



1. The lower part of the refrigerator doesn't cool but the freezer still works OK.
2. You can smell ammonia inside the refrigerator.
3. The cooling unit makes a gurgling sound.
4. The freezer gets hot instead of cold.
5. If you see any yellow residue on the outside of the cooling unit.
6. Does not cool after running for more than 2 hours on either gas or electric.
7. Momma's not a Happy Camper!



Replace or Rebuild??



-
- Normal unit lasts 15 years
 - Performance – cools better than new
 - Costs – new costs twice as much as re-built
 - Some Bargains – do they work?
 - Rebuild Cabinet – bargain may not fit
 - Discontinued Brand – who supports



Why Rebuild?



- Costs half as much as new
- In and out in as little as 4 hours
- Performs better than when new
- All rebuilt cooling units are backed with 3 year warranty



What Is a Rebuilt Refrigerator



- Complete rebuild of a refrigerator consists of:
 - Replacing the evaporator with all new tubing
 - Complete flush
 - Recharge.



NRVR Rebuild Process



A complete rebuild of your refrigerator consists of a proven 16 step process of replacing the evaporator with all new tubing, followed by a complete flush and recharge.

- | | |
|---|--|
| Step 1: Assess the unit | Step 9: Bend & install new liquid line |
| Step 2: Cut off the stem | Step 10: Reinforce braces and tack welds |
| Step 3: Weld in a new port | Step 11: Flush clean, vacuum dry |
| Step 4: Remove foam to examine evaporator | Step 12: Charge |
| Step 5: Determine damage | Step 13: Test for leak |
| Step 6: Sandblast the cooling unit | Step 14: Paint |
| Step 7: Cut out old evaporator | Step 15: Test for performance |
| Step 8: Weld in new evaporator | Step 16: Install new foam pack |



1: Assess the Unit



- The cooling unit before start
- Fits a Norcold 6 cu.ft. refrigerator
- Has some visible rust but in good condition otherwise
- 14 years old, has quit cooling



2: Cut Off Stem - Ouch!



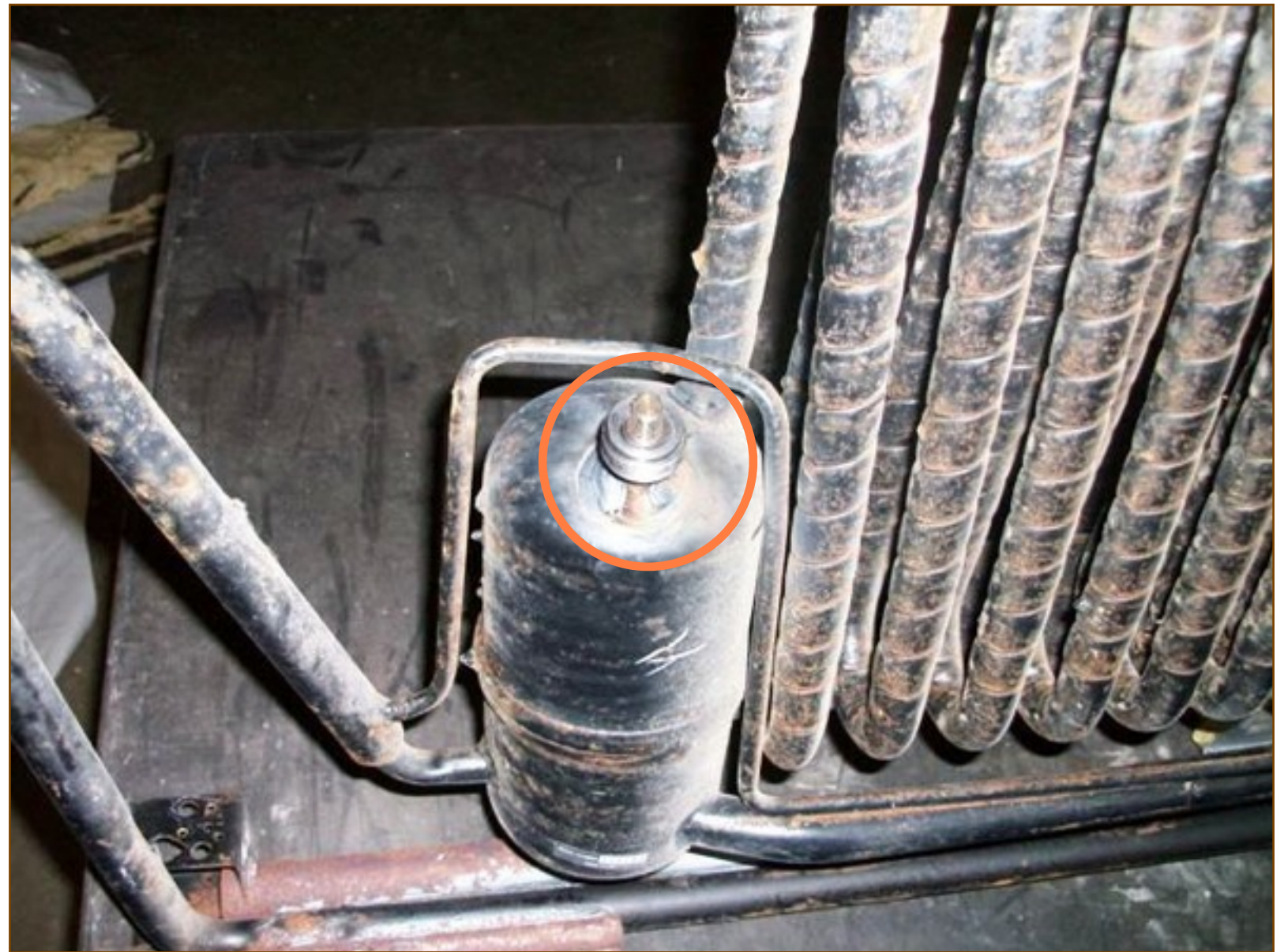
- On all Norcold refrigerator units – no charge port, just a stem welded shut
- Cut off stem and replace with new charge port



3: Weld in a New Port



- New port welded into place
- Unit completely drained of all coolant



4: Remove Foam to Examine Evaporator



- Foam pack removed
- Evaporator coils checked for damage



5: Determine Damage



- Here you can see...
the cooling unit
has extensive
rust damage
inside the foam
though it
looked good
outside



6: Sandblast The Cooling Unit



- Cooling unit is sandblasted in preparation for a new evaporator



7: Cut Out Old Evaporator



- Old evaporator has been cut out and removed



Comparing Old and New Evaporator



- Old and new evaporator side by side



New Evaporators In Stock



- New parts are made ahead and kept in stock



8: Weld In New Evaporator



- New evaporator is welded into place on cooling unit



9: Bend and Install New Liquid Line



- New liquid line is bent into shape and installed on new evaporator
- Evaporator coils complete



10: Brace and Tack Welds



- Reinforce old tack welds and brace to insure unit is extra sturdy



11: Flush Clean, Vacuum Dry



- Cooling unit is completely flushed out
- Vacuumed down
- Made ready to charge



12: Charged



- To insure the longevity of cooling unit, charge must be as perfect as possible

Our charging process has been perfected by years of experience and experimentation. This makes it possible for our rebuilt cooling units to outperform the original



13:- Test For Leaks



- Cooling unit tested for leaks
- If none found, ready to paint



14: Paint



- Unit is painted white



15: Test for Performance



- Tested for performance.



16: Install New Foam Pack



- Completed unit with new foam pack and ready for installation





Questions For Leon

National RV



Refrigeration

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Purchasing Cooling Unit Only

- Ship and return –
 - Single Door Models ... \$350.00 + Shipping
 - Two Door Models ... \$400.00 + Shipping
- Carry-in service, owner remove –
 - Single Door Models ... \$425.00
 - Two Door Models ... \$475.00
- Carry-in, remove and reinstall, new or rebuilt –
 - Single Door Models ... \$ 475
 - Two Door Models ... \$ 550

*Ice maker
\$50
additional*

