



The Institute of International Container Lessors

IICL RTB 003, 17 January 2014

Title: "Recommended Cleaning Procedures for Reefer Machines"

## Recommended Cleaning Procedures for Reefer Machine Contaminated Refrigerant Systems

**NOTE: Refrigerant machines, systems and gas which contain R40 are excluded from this procedure. Any R40 contamination may be unsafe and at present not considered part of these cleaning procedures.**

*Please note that prior to applying these procedures the refrigerant gas must have a GCMS laboratory approved test in order to know the exact content of the gas contamination.*

### Special tool requirements

- A set of dedicated gauges labeled or marked, for cleaning must be used. It's important that they are thoroughly cleaned before and after each use.
- Dedicated and clearly labeled gas-reclaim bottles for contaminated gas must be used.
- Gas purity testing tools (e.g. gas halide or sniffer test kit).
- Nitrogen (oxygen free) for cleaning purposes.

**NOTE: Per owner's policy and procedures, highlighted items 9 and 10 would only be performed when more than 5% of R142B is detected by GCMS test results.**

### CLEANING PROCEDURES

1. Run unit in full heat mode for 30 minutes (+25 C) and then full cooling mode for at least one hour (-25 C). Monitor compressor temperatures and shut down if temperatures exceed normal operating temperatures.
2. Stop machine operation. Disconnect all electrical to machinery.
3. On the low and high pressure side, attach the dedicated cleaning gauges to the machine.
4. Evacuate the system to a minimum of 200 microns, hold deep vacuum for 20 minutes.
5. If system does not hold 200 microns of vacuum, check for leaks and/or repeat the process of evacuation and nitrogen injection and pressure test.
6. Break the vacuum with nitrogen, pressure machinery up to 100 psi (7 bar) and hold pressure for leak checking procedure.

7. Recover all refrigerant in labeled (chlorine specific) recovery cylinder. After 3<sup>rd</sup> shutoff on recovery unit vacuum switch, close connections and remove recovery machine and cylinder (gas to be disposed by EPA certified facility).
8. Remove compressor drain plug and drain oil from sump, flush sump to remove as much residue as feasible.
9. Refresh system with POE per machine specifications.
10. Disconnect contaminated gauge set (labeled) and fit clean R134A gauge set (labeled).
11. Install new filter drier.
12. Evacuate system using high and low side connectors and leave active for a minimum 4 hours @ 30" of vacuum.
13. Using virgin R134A refrigerant, certified and tested, scale in the charge as indicated on the machine identification plate.
14. Run the unit for a minimum of 2 hours in full cool (-25 C).
15. Turn off unit and allow to stand idle for one hour.
16. Perform flame halide test and advise results.

## Comments

- During repeated application of these procedures we have found the following:
  - The total time to perform this procedures takes approximately 3 to 4 hours, additional cleaning 1 hour (\*)
  - 10% or less contamination of the machine requires only 1 cleaning procedure (\*\*)
  - 11% or more contamination require at 2 or more cleaning procedures (\*\*)
  - Contamination greater than 25% requires 3 or more cleaning procedures (\*\*)

\*Excluding additional repairs,

\*\*cleaning cycle may slightly vary driven by the content of contamination.

## Note:

- *Local requirements or regulations may supersede (parts of) this procedure so please check with your equipment owner/vendor.*
- *This procedure should be considered generic to most machines. Please check with the machine manufacturer for any model specific requirements.*
- Please take note and view the attached link which demonstrates these cleaning procedures:  
**(to be released April 5, 2014)**