

VIII. RETROFIT PROCEDURES

The following procedures for retrofitting from a given CFC to one of the alternative refrigerants are intended to serve as a general basis for the overall procedure involved. Use of the guidelines along with any pertinent manufacturers' recommendations should assure a successful retrofit. Due to the great number and complexity of systems used within the HVAC&R community it is impossible to cover every application. Should a particular system not be covered contact the equipment manufacturer or Elf Atochem's technical support number at 1-800-RETRO95 for assistance. Certain manufacturers require specific lubricating requirements to maintain warranties, consult them for assistance when necessary. Elf Atochem believes that the following procedures are correct and in accordance with most manufacturers' guidelines. Elf Atochem reserves the right to update these procedures as deemed necessary, and makes no implied warranty for retrofitted equipment. Should Elf Atochem's guidelines conflict with original equipment manufacturers' guidelines, it is recommended that the OEM's guidelines be used.

A. HERMETIC RECIPROCATING/SCROLL

RETROFIT PROCEDURE

R-502 to Forane 408A (FX-10)

Step 1.

Gather baseline data from R-502 system to be used to optimize the system with R-408A. Note the current R-502 charge, lubricant charge, existing operating temperatures and pressures, and overall system performance (Refer to Retrofit Checklist included in Appendix A). Leak check system.

Step 2.

Recover the existing R-502 charge using standard industry recovery equipment and guidelines. Elf Atochem has a refrigerant reclamation service available to handle the recovered R-502 (refer to Forane Rollover Program).

Step 3.

Removal of existing mineral oil from the system is not necessary because R-408A is compatible with mineral oil, polyolesters, and alkylbenzenes. (Some OEM's may require the use of some alkylbenzene with the mineral oil.)

Step 4.

Replace filter driers and repair any leaks found during the initial leak check.

Step 5.

Evacuate the system using a deep vacuum (at least 500 microns) to insure that remaining traces of moisture have been removed.

Step 6.

Charge system with Forane 408A refrigerant in the liquid phase only. The approximate R-408A charge for most applications will be 85% of the original R-502 charge. Refer to the pressure temperature charts for final adjustment of charge. Note: refrigerant only needs to leave the cylinder in the liquid phase and can be "flushed" into the system for final charging if necessary.

Step 7.

Place proper markings and identification on the system to indicate that the system has been retrofitted to R-408A and appropriate lubricant. Indicate the new charge of R-408A in a visible location.

Step 8.

Start the system and make final expansion valve adjustments to achieve proper superheat settings. Normal operating pressures of R-408A vary from 0-10% higher than R-502 systems.

B. SEMI-HERMETIC RECIPROCATING

RETROFIT PROCEDURE

R-502 to Forane 408A (FX-10)

Step 1.

Gather baseline data from R-502 system to be used to optimize the system with R-408A. Note the current R-502 charge, lubricant charge, existing operating temperatures and pressures, and overall system performance (Refer to Retrofit Checklist included in Appendix A). Leak check system.

Step 2.

Recover the existing R-502 charge using standard industry recovery equipment and guidelines. Elf Atochem has a refrigerant reclamation service available to handle the recovered R-502 (refer to Forane Rollover Program).

Step 3.

Removal of existing mineral oil from the system is not necessary because R-408A is compatible with mineral oil, polyolesters, and alkylbenzenes. (Some OEM's may require the use of some alkylbenzenes with the mineral oil.)

Step 4.

Replace filter driers and repair any leaks found during the initial leak check.

Step 5.

Evacuate the system using a deep vacuum (at least 500 microns) to insure that remaining traces of moisture have been removed.

Step 6.

Charge system with Forane 408A refrigerant in the liquid phase only. The approximate R-408A charge for most applications will be 85% of the original R-502 charge. Refer to the pressure temperature charts for final adjustment of charge. Note: refrigerant only needs to leave the cylinder in the liquid phase and can be "flushed" into the system for final charging if necessary.

Step 7.

Place proper markings and identification on the system to indicate that the system has been retrofitted to R-408A and appropriate lubricant. Indicate the new charge of R-408A in a visible location.

Step 8.

Start the system and make final expansion valve adjustments to achieve proper superheat settings. Normal operating pressures of R-408A vary from 0-10% higher than R-502 systems.

B. SEMI-HERMETIC RECIPROCATING

RETROFIT PROCEDURE

R-502 to Forane 404A (FX-70)

Step 1.

Gather baseline data from R-502 system to be used to optimize the system with R-404A and polyolester lubricant. Note the current R-502 charge, lubricant charge, existing operating temperatures and pressures, and overall system performance (Refer to Retrofit Checklist included in Appendix A).

Step 2.

Removal of existing mineral oil from the system. It is important that the existing mineral oil used in the current system be removed and that the remaining residual mineral oil content left in the system be reduced to a level of 5% or less. This can best be accomplished by draining the mineral oil from all accessible points in the system (compressor, oil separator, low spots in the evaporator) and replacing with an equivalent charge of polyolester lubricant. Once this has been done operate the system with the R-502 for a period of time to insure proper miscibility of the two lubricants. Test for mineral oil residual content and repeat step 2 if necessary until the desired 5% level is obtained. Experience has shown that for most systems the desired levels are reached within three cycles operating at 24 hour intervals.

Step 3.

Recover the existing R-502 charge and lubricant charge using standard industry recovery equipment and guidelines. Elf Atochem has a refrigerant reclamation service available to handle the recovered R-502 (refer to Forane Rollover Program).

Step 4.

Replace filter driers with new cores or compacted bead desiccant and examine sight glass for compatibility to new moisture level indication levels necessary (150 ppm). Due to the ability of the new line of refrigerants to retain moisture it is highly advised that this step is not omitted.

Step 5.

Evacuate the system using a deep vacuum (at least 500 microns) to insure that remaining traces of moisture have been removed.

Step 6.

Charge compressor with proper polyolester lubricant charge and Forane R-404A refrigerant. Charge in the liquid phase only in order to assure that the composition integrity remains intact. The approximate R-404A charge for most applications will be 85-90% of the original R-502 charge. Refer to the pressure temperature charts for final adjustment of charge. It is not recommended to charge by visual indication through the sight glass due to the nature of

the refrigerant and lubricant to appear “cloudy” in the liquid portion of the system, even at the proper charge.

Step 7.

Place proper markings and identification on the system to indicate that the system has been retrofitted to R-404A and polyolester lubricants. Indicate the new charge of R-404A in a visible location.

Step 8.

Start the system and make final expansion valve adjustments to achieve proper superheat settings. R-404A's normal operating pressures vary from 4-6% higher on the low-side and 8-10% higher on the high-side of most refrigeration applications.

NOTE: Due to the higher operating pressures associated with the use of R-404A, as opposed to R-502, consult OEM product specific retrofit requirements for any and all pressure relief modifications and/or requirements.

C. SCREW

RETROFIT PROCEDURE

R-502 to Forane 408A (FX-10)

Step 1.

Gather baseline data from R-502 system to be used to optimize the system with R-408A. Note the current R-502 charge, lubricant charge, existing operating temperatures and pressures, and overall system performance (Refer to Retrofit Checklist included in Appendix A). Leak check system.

Step 2.

Recover the existing R-502 charge using standard industry recovery equipment and guidelines. Elf Atochem has a refrigerant reclamation service available to handle the recovered R-502 (refer to Forane Rollover Program).

Step 3.

Removal of existing mineral oil from the system is not necessary because R-408A is compatible with mineral oil, polyolesters, and alkylbenzenes. (Some OEM's may require the use of some alkylbenzene with the mineral oil.)

Step 4.

Replace filter driers and repair any leaks found during the initial leak check.

Step 5.

Evacuate the system using a deep vacuum (at least 500 microns) to insure that remaining traces of moisture have been removed.

Step 6.

Charge system with Forane 408A refrigerant in the liquid phase only. The approximate R-408A charge for most applications will be 85% of the original R-502 charge. Refer to the pressure temperature charts for final adjustment of charge. Note: refrigerant only needs to leave the cylinder in the liquid phase and can be "flushed" into the system for final charging if necessary.

Step 7.

Place proper markings and identification on the system to indicate that the system has been retrofitted to R-408A and appropriate lubricant. Indicate the new charge of R-408A in a visible location.

Step 8.

Start the system and make final expansion valve adjustments to achieve proper superheat settings. Normal operating pressures of R-408A vary from 0-10% higher than R-502 systems.

C. SCREW

RETROFIT PROCEDURE

R-502 to Forane 404A (FX-70)

Step 1.

Gather baseline data from R-502 system to be used to optimize the system with R-404A and polyolester lubricant. Note the current R-502 charge, lubricant charge, existing operating temperatures and pressures, and overall system performance (Refer to Retrofit Checklist included in Appendix A).

Step 2.

Removal of existing mineral oil from the system. It is important that the existing mineral oil used in the current system be removed and that the remaining residual mineral oil content left in the system be reduced to a level of 5% or less. This can best be accomplished by draining the mineral oil from all accessible points in the system (compressor, oil separator, low spots in the evaporator) and replacing with an equivalent charge of polyolester lubricant. Once this has been done operate the system with the R-502 for a period of time to insure proper miscibility of the two lubricants. Test for mineral oil residual content and repeat step 2 if necessary until the desired 5% level is obtained. Experience has shown that for most systems the desired levels are reached within three cycles operating at 24 hour intervals.

Step 3.

Recover the existing R-502 charge and lubricant charge using standard industry recovery equipment and guidelines. Elf Atochem has a refrigerant reclamation service available to handle the recovered R-502 (refer to Forane Rollover Program).

Step 4.

Replace filter driers with new cores or compacted bead desiccant and examine sight glass for compatibility to new moisture level indication levels necessary (150 ppm). Due to the ability of the new line of refrigerants to retain moisture it is highly advised that this step is not omitted.

Step 5.

Evacuate the system using a deep vacuum (at least 500 microns) to insure that remaining traces of moisture have been removed.

Step 6.

Charge compressor with proper polyolester lubricant charge and Forane R-404A refrigerant. Charge in the liquid phase only to insure composition integrity. The approximate R-404A charge for most applications will be 85-90% of the original charge. Refer to the pressure temperature charts for final adjustment of charge. It is not recommended to charge by visual indication through the sight glass because of the nature of the refrigerant and lubricant to appear "cloudy" in the liquid portion of the system, even at the proper charge.

Step 7.

Place proper markings and identification on the system to indicate that the system has been retrofitted to R-404A and polyolester lubricants. Indicate the new charge of R-404A in a visible location.

Step 8.

Start the system and make final expansion valve adjustments to achieve proper superheat settings. R-404A's normal operating pressures vary from 4-6% higher on the low-side and 8-10% higher on the high-side of most applications.

NOTE: Due to the higher operating pressures associated with the use of R-404A, as opposed to R-502, consult OEM product specific retrofit requirements for any and all pressure relief modifications and/or requirements.