

RS-51 (R470B)

RETROFIT PROCEDURE TO REPLACE R404A, R507, R448A & R449A

Replacing R404A, R507, R448A & R449A with RS-51 essentially will follow the procedure specified by the equipment manufacturer for a refrigerant change. Since RS-51 is zeotropic it is very important that liquid, not vapour, refrigerant be added to the system.

1. Ensure the right equipment is available, e.g. recovery unit and cylinders, container for recovered lubricant, vacuum pump, weighing scales, replacement drier etc.
2. Before removing the R404A, R507A, R448A or R449A, operate the unit under standard operating conditions and record the pressures, temperatures and any other relevant measurable data to establish unit performance. Typically, the appropriate standard conditions for setting up the unit will have already been specified by the equipment supplier.
3. Recover and weigh the R404A, R507A, R448A or R449A from the unit. The weight should be within the range specified by equipment manufacturer.
4. Replace the filter/drier and evacuate the system.
5. As in the case of R404A, R507, R448A or R449A, RS-51 should be used with a polyol ester lubricant.
6. Before operating the unit, charge the unit with **liquid** RS-51. The weight added at this stage should be approximately 10% lower than the R404A, R507, R448A or R449A charge specified by the equipment manufacturer.
7. Operate the unit under conditions similar to those used in Step 2, closely watching the liquid line sight glass, the compressor oil level sight glass and the suction superheat.
8. When replacing R404A, R507A or R407C then it may be recommended to change the TXV. If the system has an electronic expansion valve (EEV) then use the following Antoine Equation coefficients: $A = 11.393$, $B = -2754.4$, $C = 273.14$. If the EEV only allows selecting a refrigerant from a dropdown list then please use R22. If the system has a R22 or R407C valve then no change is required. If the system has a R134a, R448A or R449A valve then these can be used but may not result in optimum performance. Changing for a R22 TXV, R407C TXV or an EEV would be ideal. If the system has a R404A TXV then this will have to be changed for either a R22, R407C or EEV.
9. If a liquid line sight-glass is fitted, charge to a full glass gradually adding more liquid RS-51 until only liquid is passing through the expansion valve. **Do not overcharge the system.**
10. Check system thoroughly for leaks.

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11. Remove all R404A, R507A, R448A or R449A labels and clearly label system RS-51.

RS SERIES OF REFRIGERANTS PRESSURE/TEMPERATURE CHARTS

RS Series Pressure/Temperature charts indicate both liquid bubble point and vapour dew point of the RS Series Refrigerant.

Liquid Bubble Point: this is the temperature which the liquid refrigerant will begin to vaporize at the given pressure. Below this temperature the liquid refrigerant will be sub-cooled.

Vapour Dew Point: this is the temperature at which refrigerant vapour will begin to condense at the given pressure. Above this temperature the refrigerant vapour will be superheated.

Evaporator Vapour Superheat:

To determine evaporator superheat, measure the suction line temperature at the outlet pipe of the evaporator and measure the suction pressure at the outlet pipe of the evaporator. Using the Pressure/Temperature chart, determine the vapour dew point for the measured suction pressure. Subtract the determined dew point from the actual temperature and this difference is the evaporator superheat.

Condenser Liquid Sub-Cooling:

To determine condenser sub-cooling, measure the temperature of the outlet pipe of the condenser and measure the condenser pressure at the outlet pipe of the condenser. Using the Pressure/Temperature chart, determine the liquid bubble point for the measured condenser pressure. Subtract the measured temperature from the determined bubble point and this difference is the condenser liquid sub-cooling.

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