

Klea® 456A

Technical Data Sheet

Introduction

Current and new regulations are making R-134a availability and pricing turbulent. Klea® 456A was designed to extend the service life of automobiles designed with R-134a in automotive MVAC. R-456A is a direct replacement, no oil changes or other changes are required. R-456A lowers the GWP of the R-134a system by over 50% (from GWP 1,430 to GWP 687* or 685**) giving vehicle and fleet owner peace of mind that the existing R-134a fleet will “age out” gracefully.

Application

R-456A is an ASHRAE A1 classified refrigerant (same as R-134a) that was tailored to be a direct replacement for R-134a in automotive air conditioning. It delivers the same energy efficiency (fuel consumption) for which the vehicle was designed by the automaker. Where port adapters are not required, Orbia Fluor & Energy Materials suggests they are used along with vehicle R-456A labeling.

Benefits

Direct replacement capability in R-134a auto

- Same efficiency as R-134a.
- Same cooling capacity boost.

Over 50% reduction in GWP

More than doubles future availability to service R-134a fleets.

Non-flammable

Easy conversion, same safety classification as R-134a.

Ability to up-sell

By co-selling with value added solutions for HFO refrigerants.

*UK regulation (EU) No 517/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006.

**EU Regulation (EU) 2024/573 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 7 February 2024 on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014

R-456A Retrofit

Composite Refrigerant Retrofit Instructions

R-134a (A1) to R-456A (A1)

01	Using certified Refrigerant Recovery Recycling device for the refrigerant to be replaced, remove the refrigerant from the vehicle per proper device operation. Note the amount of oil removed.	06	Vacuum leak test for 5 minutes. Continue to (7) if vacuum drops less than 3 in/Hg, otherwise, repeat step 6.
02	Adapt low and high side service port to those designed for the new refrigerant.	07	Using the same equipment charge vehicle with new refrigerant by weight. By weight: Set charging scale to either the R-134a or R-1234yf weight indicated on the J639 label or directed by OEM service information. Charge from virgin R-456A cylinder in liquid state. Start vehicle and turn A/C on Max. Observe pressures and ensure center vent temperature meets specification. Close the high side coupler and allow the pressures to stabilize. Close low side coupler and disconnect from the vehicle.
03	Place label for new refrigerant on the SAE J639 label per local regulations.		
04	Add specified oil based upon amount removed during recovery, or as prescribed by the refrigerant manufacturer.		
05	Using dedicated equipment (may be repurposed from R-134a) for the new refrigerant, connect to vehicle and vacuum system for 10 minutes.		

Composite Refrigerant Service Instructions

R-456A (A1)

01	Assuming R-456A refrigerant is to be removed, connect R-456A Service Station to the vehicle.	05	Set scale on Service Station to desired charge weight per J639 label or OEM repair information. Open liquid valve on recovery tank to allow the recovered gas to charge first, then if needed, open the virgin tank liquid valve to complete the charge. The use of computer-controlled solenoids is recommended to assure accurate (+/- 15g) charge.
02	Set for recovery. The recovery process should remove oil and particulates from the refrigerant, condense the refrigerant and store in a standard recovery tank.	06	Start vehicle and observe high and low side pressure and confirm desired center vent temperature is achieved. Close high side coupler allowing the pressures to stabilize. Close low side and remove couplers.
03	Complete A/C system repair and leak check.		
04	Using refrigerant specific Service Station, connect to high and low side service ports; set vacuum time to 10 minutes, or until it holds vacuum for 5 minutes dropping less than 3 in Hg/770 mm Hg.		

Leak Detectors

Leak detectors that are designed and qualified to detect R-134a and/or R-1234yf leaks will detect R-456A leaks. R-456A is non-flammable and leaks should be treated the same as R-134a.

***Special Note:** Best practice is to keep refrigerants separate. However, R-456A is compatible with R-134a, and the lubricants used in R-134a systems. Vehicle warranties and local regulations should be consulted.

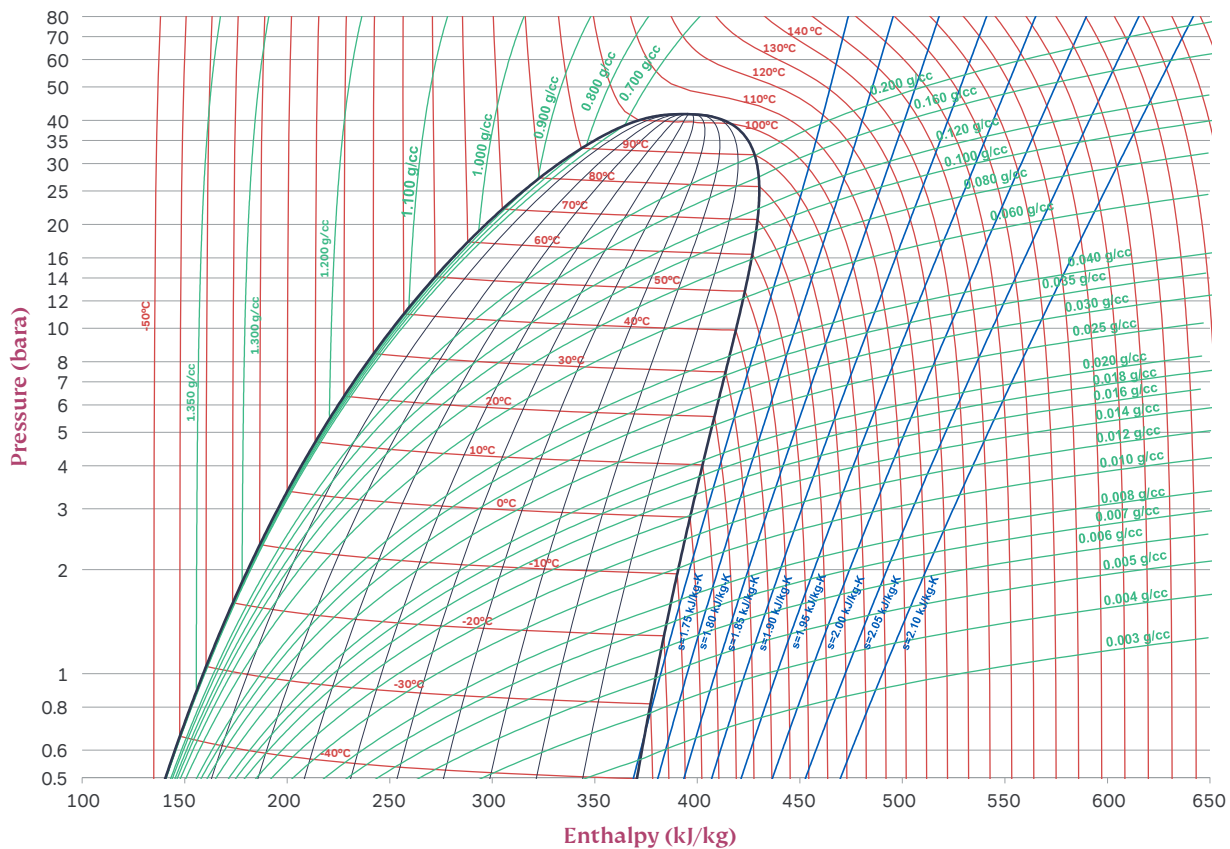
Oils, Polymers, Desiccants and Additives

R-456A is designed to work with OE grade R-134a and R-1234yf lubricants. There is no need to change the oil when converting a system from R-134a to R-456A. Optional dosing of stabilizing additives is recommended, such as Shrieve's Zero[®] HFO which is designed as a stabilizer booster for automotive HFO-based refrigerants. If the system needs additional lubricant, R-1234yf OE oils such as Denso's ND-12, Shrieve's HD-46, or Sanden's SP-A2 are recommended. For R-134a electric systems, use the OE recommended lubricant.

O-rings, hoses, and seals that are compatible with R-134a and R-1234yf are compatible with R-456A. EPDM and HNBR are the preferred seals for all automotive systems with polyether (OE named "PAG") lubricants. Hoses do not need to be changed from the original R-134a system, but if a hose must be changed, hoses for R-1234yf are reverse compatible with R-134a and R-456A.

Use OE replacement desiccants if replacement is necessary. R-1234yf aftermarket additives can be used with R-456A; aftermarket R-134a additives are not recommended. R-134a is a very stable refrigerant that has led to some additives on the market that can only be used with R-134a –these additives can cause damage if used in R-456A or R-1234yf systems.

PH Chart for R-456A



PT Table

Metric			Imperial		
Pressure	Bubble Temperature	Dew Temperature	Pressure	Bubble Temperature	Dew Temperature
barg	for condenser subcooling °C	for evaporator superheat °C	psig	for condenser subcooling °F	for evaporator superheat °F
0.0		-25.7	0.0		-13.7
0.5		-16.4	7.5		3.4
1.0		-9.3	15.0		16.4
1.5		-3.5	22.5		27.0
2.0		1.5	30.0		36.1
2.5		5.9	37.5		44.1
3.0		9.8	45.0		51.2
3.5		13.4	52.5		57.7
4.0		16.7	60.0		63.7
4.5		19.7	67.5		69.2
5.0		22.5	75.0		74.4
6.0	23.3	27.7	90.0	75.8	83.8
7.0	28.0	32.3	105.0	84.4	92.2
8.0	32.3	36.6	120.0	92.3	99.9
9.0	36.3		135.0	99.5	
10.0	40.0		150.0	106.2	
11.0	43.4		165.0	112.4	
12.0	46.6		180.0	118.3	
13.0	49.7		195.0	123.9	
14.0	52.6		210.0	129.1	
15.0	55.3		225.0	134.2	
16.0	58.0		240.0	138.9	
17.0	60.5		255.0	143.5	
18.0	62.9		270.0	147.9	
19.0	65.3		285.0	152.1	
20.0	67.5		300.0	156.2	
21.0	69.7		315.0	160.2	
22.0	71.8		330.0	164.0	
23.0	73.8		345.0	167.6	
24.0	75.7		360.0	171.2	

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