ACURA Service Bulletin

September 29, 1992

YEAR	MODEL	VIN APPLICATION	BULLETIN NO.
1993	NSX LEGEND	ALL	92-027

R-134a Refrigerant A/C System

Starting with the 1993 NSX and Legends, Acura will begin equipping cars with R-134a refrigerant A/C systems. The refrigerant R-12 used in car air conditioners contains CFCs. Consequently, R-12 refrigerant will be phased out and replaced with the new refrigerant, R-134a, which does not contain CFCs.

Air conditioners using R-134a look similar to the existing R-12 air conditioners in terms of system structure. The most significant difference is the refrigerant itself. This Service Bulletin explains the differences between R-12 and R-134a air conditioner systems, how to identify the system components, and how to service the R-134a air conditioner system.

NOTE: Always refer to the service manual for specific model information and procedures.

Service Precautions

Observe the following service precautions carefully when servicing R-134a air conditioner systems:

Only use service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 (1991) to remove R-134a from the air conditioner.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose, and throat. Avoid breathing air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharging occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from the refrigerant manufacturers.

Refrigerants and Oils

Refrigerants R-12 and R-134a are not compatible with each other; do not mix them. Mixing R-12 and R-134a together even in the smallest quantities can result in air conditioner system and service equipment failure.

The refrigerant oils are also not compatible. R-12 refrigerant oil is mineral based. R-134a refrigerant uses a Polyalkylene glycol (PAG) synthetic-based oil. Mixing refrigerant oils will cause compressor failure. Use only the recommended oil for the compressor. Refer to the appropriate year and model of service manual for the specific type of refrigerant oil.

R-134a refrigerant and oil both have high hygroscopic properties, meaning they attract and absorb moisture rapidly. Observe the following instructions carefully:

1. When replacing or disconnecting refrigerant lines, be sure to plug or cap the lines and ports immediately to keep moisture and dust out of the system.
2. Before recharging the system, add the same amount of refrigerant oil removed during the recovery procedure. Always use new oil from a sealed container. Do not put used oil back in the container or the A/C system.
3. Immediately after using the refrigerant oil, replace the cap on the container to avoid moisture absorption.

Service Equipment

R-134a service equipment or vehicle air conditioner systems should not be pressure-tested or leak-tested with compressed air.

WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion, causing injury or property damage. Never use compressed air to pressure-test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

Always use a recovery/recycling/charging system that is U.L.-listed and certified to meet the requirements of SAE J2210 (1991) when servicing R-134a air conditioner systems.

If a vacuum pump is used for evacuation in place of a recovery/recycling/charging system, the vacuum pump must be equipped with a check valve to prevent the pump oil from backflowing into the air conditioner system.

Only use manifold gauges and related parts that are specially designed for R-134a (pressure gauges, hoses, joints, fittings, etc.). Do not try to interchange parts from R-12 equipment.

Refrigerant Comparison

R-134a

International Designation
HFC-134a
Hydrofluorocarbon

Chemical Formula
CH_2FCF_3

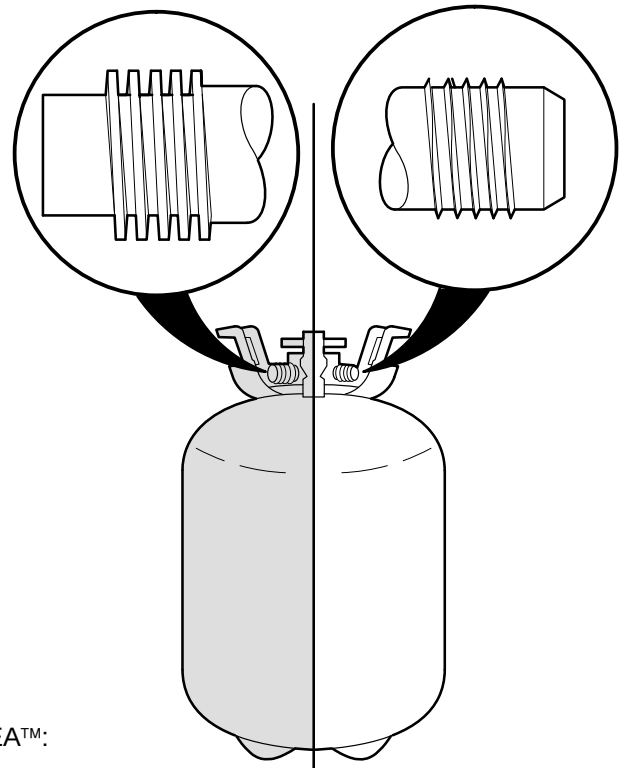
Container Fitting Size
1/2” - 16 ACME

Container Color
Light Blue

Boiling Point
-15.07°F (-26.3°C)

Ozone Depletion Potential
0.0

Global Warming Potential
Less than 0.3



R-12

International Designation
CFC-12
Chlorofluorocarbon

Chemical Formula
CCl_2F_2 (contains chlorine)

Container Fitting Size
1/4” Flare (7/16” - 20 UNF)

Container Color
White

Boiling Point
-21.62°F (-29.8°C)

Ozone Depletion Potential
1.0

Global Warming Potential
3.0

R-134a Refrigerant Suppliers

SUVA™ TRANS A/C:

DU PONT SUVA TRANS A/C
REFRIGERANT FOR AUTOMOTIVE AIR CONDITIONERS

IG-LO, INC.
3499 Dabney Drive,
Lexington, KY 40509
1-800-354-9061 or
1-606-264-7208
FAX 1-606-264-7914

KLEA™:

KLEA

ICI Chemicals & Polymers
Technical Chemical Co.
10737 Spangler Road
Dallas, TX 75220
1-800-527-0885
FAX 214-506-7493

NOTE: Only use automotive-type R-134a refrigerants to ensure hardware compatibility.

R-134a Service Tools

Refrigerant Recovery/Recycling/Charging Center:

Minimum Requirement
The equipment must be U.L.-listed and certified to meet the requirements of SAE J2210 (1991) for servicing R-134a air conditioner systems.

Reason for New Tool
Refrigerants are not compatible, requiring separate equipment. Service couplers, thread diameters, and purity standards for recycled refrigerant are all different.

Known Suppliers and Model Numbers
White Industries #01090; Kent-Moore #ACR4; Robinair #34700; Sun #MRC450

Leak Tester:

Minimum Requirement
The leak tester must be able to detect a leak as small as 0.5 oz. per year or better.

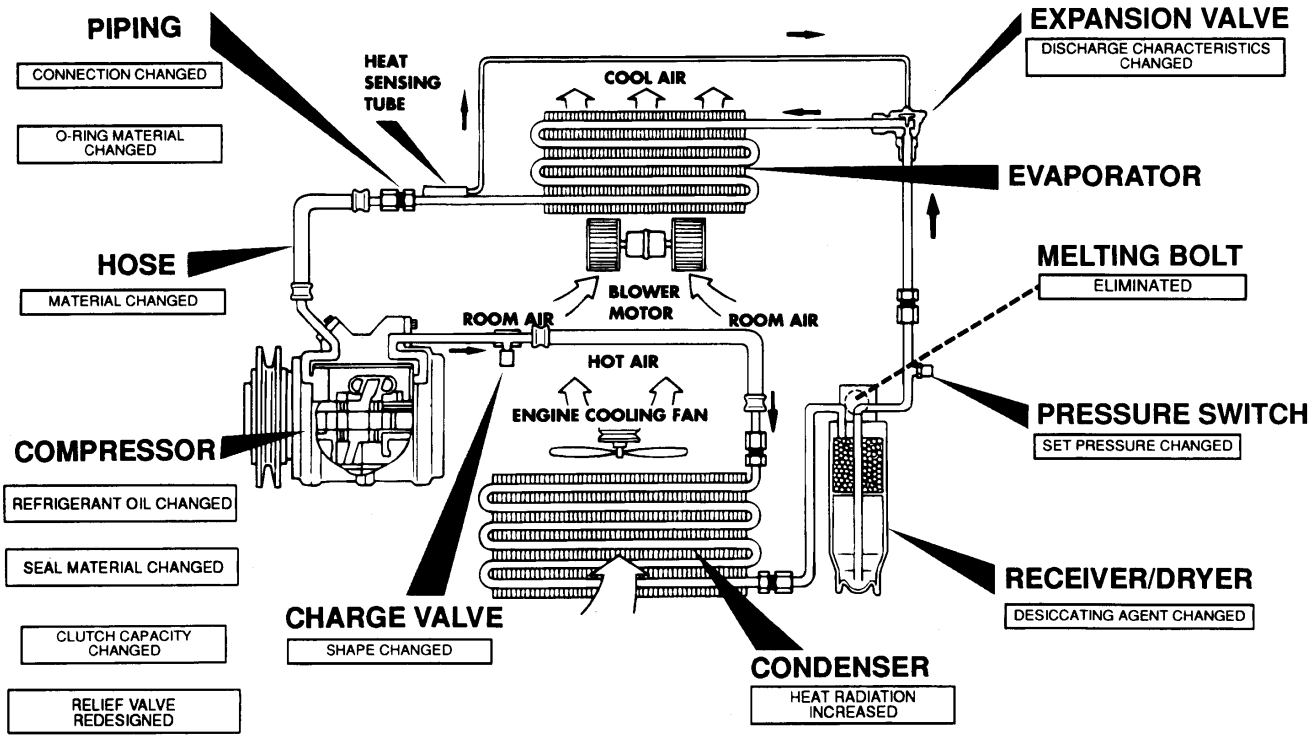
Reason for New Tool
R-134a refrigerant cannot be detected with an R-12 type leak tester. R-134a refrigerant can only be detected with a high-sensitivity tester.

NOTE: Most leak testers for R-134a refrigerant can be used for R-12 refrigerant as well.

Known Suppliers and Model Numbers
CPS #L-780a (Matco Tools #AC-750) & #L-790a; Hitech #HI300TEL & #HI400ATEL; TIF #5050, #5550, & #5650

R-134a / R-12 Air Conditioning Comparison Chart

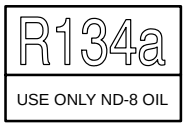
NOTE: R-134a and R-12 parts are not interchangeable. Be sure to use the correct parts for the specified refrigerant to avoid refrigerant leaks or A/C system failure.



Compressor

R-134a

Identification



NOTE: The compressor used on the R-134a air conditioning system has an identification label. Do not substitute R-12 parts for R-134a parts; you may damage the A/C system.

R-12

Compressor Seal

R-134a

Seal Material
H-NBR
(Hydrogenated Nitryl Butadiene Rubber)

Reason for Change
The NBR type seals used on the R-12 compressors will swell and deteriorate rapidly with R-134a refrigerant, causing refrigerant leaks.

R-12

Seal Material
NBR
(Nitryl Butadiene Rubber)

Compressor Refrigerant Oil

R-134a

Compressor Manufacturer
Nippondenso (ND)

Refrigerant Oil Type
Polyalkylene glycol (PAG)
Synthetic oil

Oil Name
ND-8

Reason for Change
The oil used for R-12 type compressors does not mix with R-134a refrigerant, causing poor lubrication and compressor failure.

NOTE:

- Refer to the appropriate year and model of service manual, or the compressor for the specific type of refrigerant oil.
- Replacement compressors are prefilled with R-134a refrigerant oil. Additional refrigerant oil is not necessary.

R-12

Compressor Manufacturer
Nippondenso (ND)

Refrigerant Oil Type
Mineral oil

Oil Name
R-12 refrigerant oil

Compressor Clutch

R-134a

Increased capacity

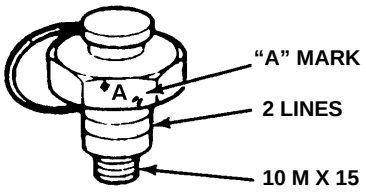
Reason for Change
The normal operating pressure for R-134a is higher than R-12, requiring a larger force to compress the refrigerant.

R-12

Compressor Relief Valve

R-134a

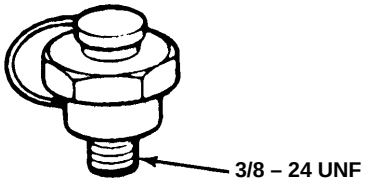
Identification



Reason for Change
The pressure setting was changed because R-134a has a higher operating pressure than R-12. The relief valve only releases refrigerant when the pressure is abnormally high, then resets itself to prevent total discharge of refrigerant into the atmosphere.

R-12

Identification

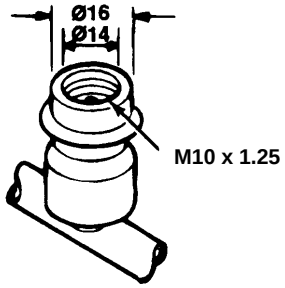


Charge Valve

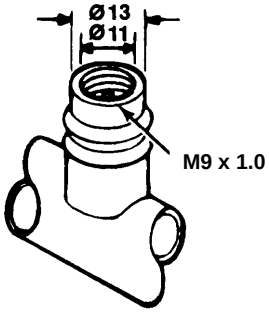
R-134a

Dimension

High-pressure side

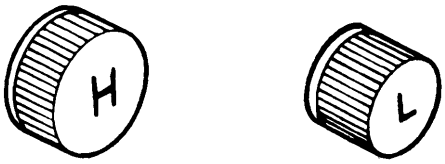


Low-pressure side

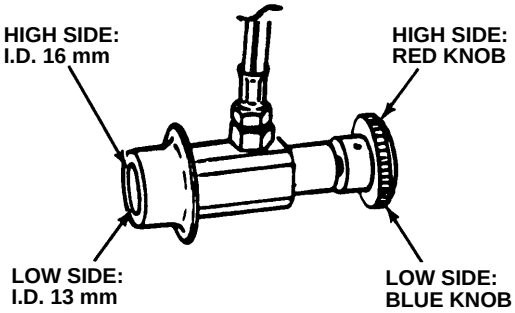


Identification

Cap color: light blue



Service Hose Couplers



Reason for Change

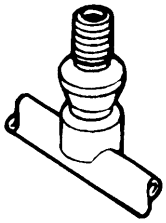
To prevent charging the system with the wrong type of refrigerant.

R-12

Dimension

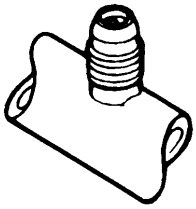
High-pressure side

3/8 – 24 UNF



Low-pressure side

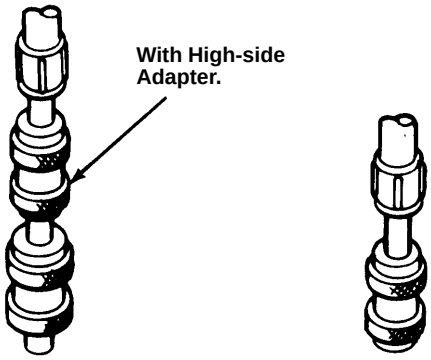
7/8 – 24 UNF



Identification

Cap color: dark red or black

Service Hose Couplers



Condenser

R-134a

The heat exchange performance of the condenser was increased by decreasing the tubing thickness and increasing the number of loops in the metal tubing.

Reason for Change

Because the boiling point for R-134a is lower than R-12, the cooling capacity of the condenser was increased.

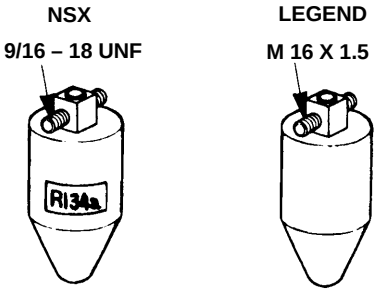
R-12

Receiver/Dryer

R-134a

Desiccating Agent
Improved Zeolite or XH-9

Identification



NOTE:

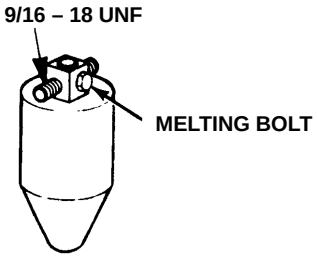
- The NSX R-134a receiver/dryer has inch threads, therefore requiring an identification label. The Legend receiver/dryer has metric threads with no label. Do not substitute R-12 parts for R-134a parts.
- The desiccant absorbs moisture rapidly, do not remove the plugs from the receiver/dryer until just before replacement; keep the plugs on during disassembly.

Reason for Change
R-134a absorbs more moisture than R-12. The desiccant material was changed to achieve better water absorption capacity. The melting bolt was also eliminated to prevent a total discharge of refrigerant into the atmosphere.

R-12

Desiccating Agent
Silica gel or XH-5

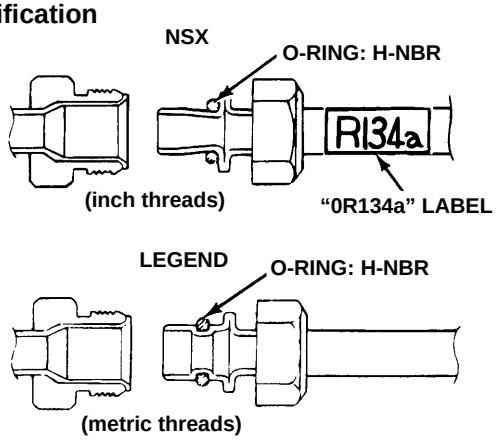
Identification



Piping

R-134a

Identification

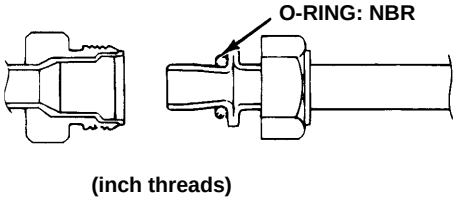


NOTE: The NSX R-134a piping has inch threads, therefore requiring an identification label. The Legend piping has metric threads with no label. Do not substitute R-12 parts for R-134a parts.

Reason for Change
R-134a refrigerant requires the H-NBR type O-rings to to seal the pipe fittings.

R-12

Identification



Sealing O-rings

R-134a

O-ring Material
H-NBR
(Hydrogenated Nitryl Butadiene Rubber)

NOTE: The replacement O-rings have an R-134a identification label on the parts package only. Keep the O-ring in the parts package until just before installing to avoid confusion. Do not substitute R-12 parts for R-134a parts, you may damage the A/C system.

Reason for Change
The NBR type O-rings used on the R-12 systems will swell and deteriorate rapidly with R-134a refrigerant, causing refrigerant leaks.

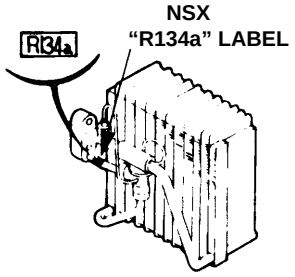
R-12

O-ring Material
NBR
(Nitryl Butadiene Rubber)

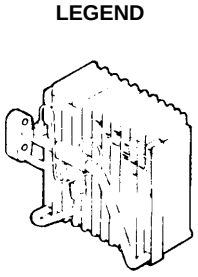
Evaporator

R-134a

Identification



(inch threads)



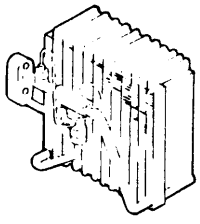
(metric threads)

NOTE: The NSX R-134a evaporator has inch threads, therefore requiring an identification label. The Legend evaporator has metric threads with no label. Do not substitute R-12 parts for R-134a parts.

Reason for Change
Because R-134a has a higher pressure load than R-12.

R-12

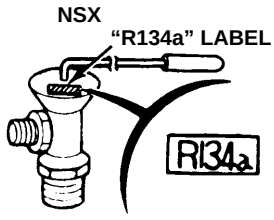
Identification


(inch threads)

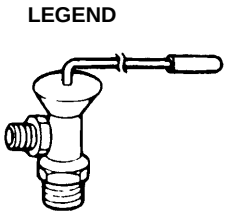
Expansion Valve

R-134a

Identification



(inch threads)



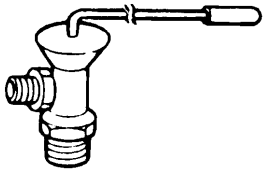
(metric threads)

NOTE: The NSX R-134a expansion valve has inch threads, therefore requiring an identification label. The Legend expansion valve has metric threads with no label. Do not substitute R-12 parts for R-134a parts.

Reason for Change
The set pressure for the expansion valve was changed because R-134a has a higher operating pressure.

R-12

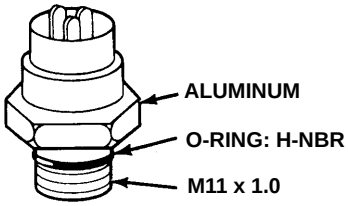
Identification


(inch threads)

Pressure Switch

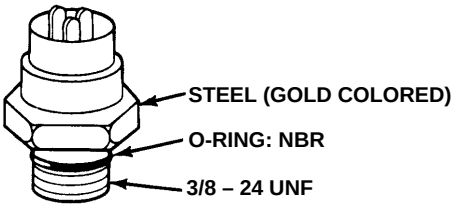
R-134a

Identification



R-12

Identification

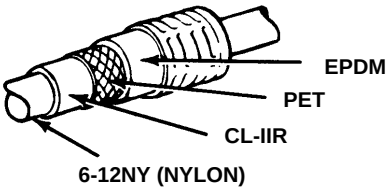


Reason for Change
R-134a's normal operating pressure is higher than R-12. The opening pressure for the valve was changed so the cooling of the R-134a A/C system would equal an R-12 system.

Hose

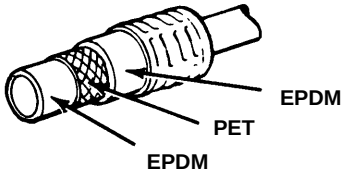
R-134a

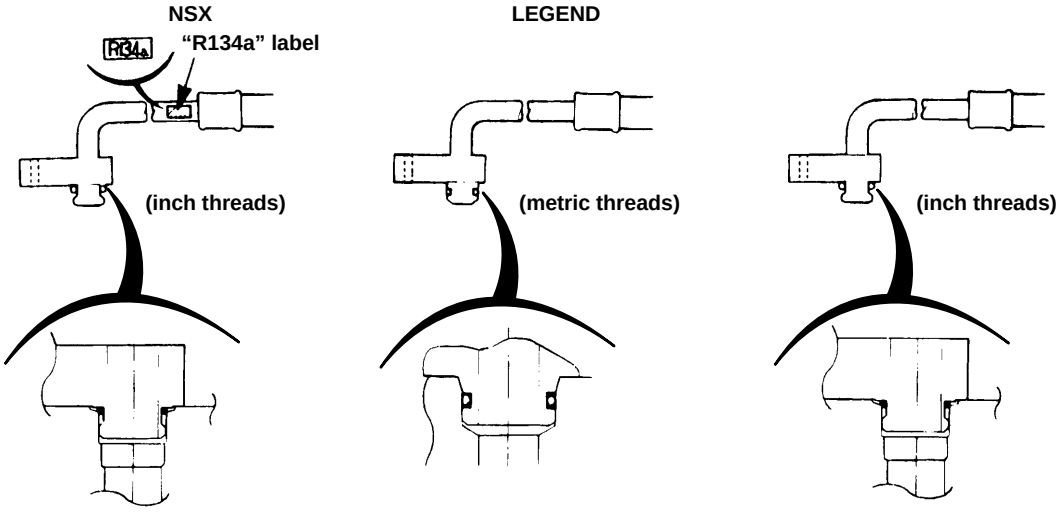
Identification



R-12

Identification





NOTE: The NSX rubber hoses (suction and discharge) for the R-134a air conditioning system have inch threads, therefore requiring identification labels. The Legend rubber hoses have metric threads with no labels. Do not substitute R-12 parts for R-134a parts, you may damage the A/C system.

Reason for Change
The material for the hoses was changed to reduce the escaping of refrigerant and the entry of moisture through the hose.