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To: DDG Headquarters and Branches and Jobbers	Category: Service
From: Steve Sigg, Product Service and Training	Line(s): 10 and 15

Subject: 2005 Air Conditioning Service Guidelines

Description

To assist our air conditioning service installers, attached are revised ACDelco Air Conditioning Service Guidelines, replacing the guidelines sent in 2004 with Bulletin 04D-J-030.

General Information

- These guidelines promote proper servicing to ensure the best possible air conditioning service experience for vehicle owners.
- These guidelines can be reproduced locally for counter handouts and air conditioning seminars.

Attachment



AIR CONDITIONING SERVICE REQUIREMENTS

Proper A/C service requires:

- Proper air conditioner service procedures.
- Proper training.
- The right tools, equipment, and parts.

RETROFITS

As long as there is an adequate supply of R-12 refrigerant or until economic situations warrant, General Motors and ACDelco do not recommend retrofitting an R-12 vehicle to R-134a. If retrofitting is being performed, please refer to the ACDelco Technician's Retrofit Guide on CD to verify that the particular vehicle has been approved for retrofit and established procedures are followed. To obtain a copy, contact your ACDelco Regional Sales Office. Incorrect retrofitting will not provide your customer with adequate air conditioning performance.

For non-GM applications, please follow each manufacturers' retrofit bulletins for their specific procedures. This information is also available in the Mobile Air Conditioning Society's A/C retrofit publication #44141.

REFRIGERANTS

The only refrigerants approved for General Motors vehicles are R-12 and R-134a. No other refrigerants or blends of any type are approved. The use of blends may result in personal injury to your technicians or the vehicle owners, or damage to the vehicle. **Such injuries or damage will not be covered by the warranty on the system components.**

REFRIGERANT CHARGING

Automotive refrigerant system capacities have reduced significantly from an average of 3 ½ to

1¼ pounds. Also, the charge variance (how much over or under that can be entered into the system and obtain satisfactory performance) has been reduced to as low as +/- one ounce. Attempting to charge a system with 12 ounce cans becomes extremely difficult to assure accuracy, and can leave residual refrigerant in the cans depending upon the technician's technique and the variation of charging hose lengths. Over or under charging may cause A/C system performance issues, as well as compressor noise.

To perform legal automotive air conditioning repair in the United States and Canada, technicians must have recovery equipment that has the ability to reuse the old refrigerant as well as refill from economical larger containers of new refrigerant. A properly calibrated scale is also important to insure an accurate system charge. Specific vehicle charge information is available through the OEM's or M.A.C.S. A/C & Cooling Specifications Reference Manual #44151B.

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REFRIGERANT IDENTIFICATION

Prior to performing any automotive A/C system service, it is highly recommended (mandated in California in Division 33 of Title 16 of the California Code of Regulation) that an electronic refrigerant identifier be utilized to verify refrigerant purity and air content. Air can be removed from refrigerant with proper recycling procedures. Recovery of other gases over 2% with an R134a system will contaminate the equipment and systems serviced in the future. **There is no assurance of receiving a contamination free vehicle. All vehicle A/C systems should be identified before and after service to verify the type and purity of the refrigerant.**

Vehicle diagnostic pressures are based upon pure refrigerant without air. Alternative refrigerants or excessive air will greatly shift published diagnostic values.

REFRIGERANT LUBRICANTS

The only refrigerant lubricants approved by ACDelco are:

R-12 Systems

- Mineral oil – ACDelco P/N 15-117 (GM P/N 12301108) - 525 viscosity universal oil for all Harrison/Delphi manufactured compressors.
- Mineral oil – ACDelco P/N 15-116 (GM P/N 12323913) - 300 viscosity for non-Harrison/Delphi manufactured compressors.

R-134a Systems

PAG lubricant – ACDelco P/N 15-118 (GM P/N 12356151) – 600 SAE or 150 ISO viscosity for all R4 and A6 compressors. For all other ACDelco supplied service replacement compressors, use the 46 ISO viscosity universal PAG oil, ACDelco Part Number 10-5040 (GM #89022191) in the 8 oz. bottle or Part Number 10-5026 (GM#88901445) in the 8 oz. cartridges. A/C oil injector #J45037 should be used with the 10-5026 cartridges.

There are no Ester lubricants approved by ACDelco for retrofitting R-12 systems or for use in R134a systems.

Use of the correct refrigerant lubricant and amount is necessary for proper air conditioning compressor operation and durability. **Incorrect lubricant will damage the air conditioning system and its components will not be covered by the ACDelco warranty.**

For vehicle applications with non-Harrison/Delphi manufactured compressors, follow the vehicle manufacturers' specifications for the correct viscosity of PAG oil.

ACDelco Air Conditioning Service Guidelines

A/C SYSTEM LUBRICATION BALANCING

Vehicle air conditioning systems require a given amount of lubrication dependent upon OEM manufacturer and model. Reference total system charge from a vehicle tag or service material. It is important that if a system is flushed or components replaced, the amount of overall lubrication charge is maintained.

New or Flushed Component	Amount of Oil	Procedure
Compressor	See procedure at right to determine amount for replacement compressor. (1)	Drain and measure amount of oil from old compressor. <i>(May require rotating compressor shaft and/or removing drain plug).</i> Drain new compressor <i>(Note: Amount of oil drained from service compressors varies with manufacturer and model),</i> If less than 2.5 oz. drained from old, add back 2.5 oz. to new compressor. If more than 2.5 oz. drained from old, add that amount back into the new compressor.
Condenser	1.0 oz.	Insert prior to assembly.
Evaporator	1.5 oz.	Insert prior to assembly.
Accumulator/Dehydrator	2.0 oz. + amount drained	Drain old A/D and measure amount removed. Add 2.0 oz. to the amount drained during recovery. <i>(2 oz. replaces oil saturated in oil desiccant bag).</i>
Receiver/Drier	1.0 oz. + amount drained	Drain old R/D and measure amount removed. Add 1.0 oz. to the amount drained during recovery. <i>(1 oz. replaces oil saturated in oil desiccant bag).</i>
Muffler/Hose Assembly	1.0 oz.	
TXV/Orifice Tube	See procedure to determine amount	Add back only amount removed in the refrigerant recovery process.

(1) Oil drained from new service compressors and recovered from old components should be disposed of per local environmental requirements.

FLUSHING

There are several A/C recovery equipment manufacturers that provide a refrigerant flush option. Use of refrigerant flush is ecologically and economically favored over solvent flush. Flushing is extremely effective for lubricant removal. Be sure to rebalance the refrigerant system lubrication charge after flushing.

ACDelco recommends flushing R-12 systems using only R-12 refrigerant. This procedure can be accomplished using the Kent-Moore R-12 charging cart (J-39770) and a special flush adapter (J-39807). Kent-Moore can be reached at 1-800-345-2233.

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ACDelco recommends flushing R-134a systems using only R-134a refrigerant. General Motor's service bulletin 83-12-21 should be referred to for flushing R-134a systems. This procedure requires use of a special Kent Moore flush adapter (J-42939), which can be employed with several recovery/recycling machines. Always follow the guidelines from the manufacturer of your particular equipment.

ACDelco does not approve the use of any other types of flush agents or solvents. It has been found that residual amounts of these flush agents may act as solvents and affect the integrity of seals, O-rings, and other components. **Residual non-approved flush agents when not properly removed dilute refrigerant lubricant. System components will not be covered by the ACDelco warranty if non-approved flush agents are used.**

Other vehicle manufacturers may specify non-refrigerant flush procedures for their A/C systems. Always follow the vehicle manufacturers' service procedures.

IN-LINE FILTERS

ACDelco recommends the use of in-line filters to capture contaminants within the air conditioning system. ACDelco has introduced a new universal in-line filter, Part Number 15-10413 (GM# 89016656) that can be used with any size air conditioning line. These filters are designed to fit in the liquid line and trap the contaminants that could be introduced into the system, which may result in damage to the air conditioning components.

COMPRESSOR SUCTION SCREEN

When compressors fail the debris can go toward both the condenser and the accumulator or evaporator. To protect replacement compressors without factory installed screens, installation of suction screens are strongly recommended. ACDelco has introduced a complete suction screen kit, Part Number 15-21184. Replacement screens are also available.

ACCUMULATORS/RECEIVER DRYERS

These parts function as refrigerant drying agents with a normal design life of 5-7 years. Another function is as a debris accumulation receptacle. If severe contamination is suspected as a result of prolonged exposure to the environment and humidity or compressor debris, the accumulator/receiver dryer should be replaced.

Accumulators and receiver dryers do not need to be changed as part of the compressor replacement unless the vehicle is over five years old, if the system has been opened for an extended length of time, or the accumulator is damaged (punctured, damaged threads, broken desiccant bag). The accumulator or receiver dryer MUST be changed if the vehicle is found to be contaminated with sealants.

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LEAK DETECTOR

R134a is a smaller molecule, has no chlorine atom and the system requires smaller charge weights. Therefore, it requires tools specialized for the refrigerant and for both active and passive leaks.

Electronic Leak Detector

Active (continuous) refrigerant leaks are quickly located with electronic leak detectors meeting SAE J-1627. ACDelco recommends employing detectors, which include reference check fluids.

Leak Dyes

Intermittent or passive leaks require a dye to determine the location. These leaks can be temperature, pressure, or vibration related. ACDelco offers the following air conditioning dyes for use in R-12 and R-134a refrigerant systems. These professional dyes require UV light to locate leak site. **The use of non-approved tracer dyes may affect the integrity of seals and O-rings, causing leaks and other compressor complaints.**

R-12 Systems – Leak Dye

ACDelco P/N 12345926 (GM P/N 12345926)

R-134a Systems – Leak Dye

ACDelco P/N 15-120 (GM P/N 12346287)

A/C Sealants

No OEM manufacturer or compressor manufacturer recommends nor endorses sealant use in air conditioning systems. These chemicals have been found to adversely affect internal seals, screens and mechanical operation. Use of sealants will void the ACDelco warranty on system components.

AIR CONDITIONING REMINDERS

- Use PAG lubricant with R-134a or when retrofitting to R-134a.
- Use mineral oil with R-12.
- Lubricate O-rings and threads only with mineral oil (525 viscosity).
- Change the accumulator if over five (5) years old, damaged or the system is found to be contaminated with sealants.
- Keep PAG lubricant containers sealed. They absorb moisture quickly.
- Measure and replace the exact quantity of lubricant when replacing a compressor.
- If required, flush R-12 systems with R-12 and R-134a systems with R-134a.
- Install an in-line filter and suction screen if contamination is suspected.
- Insure less than 2% R-12 remains in the system when converting to R-134a.
- Use a full measure of PAG lubricant when converting the system from R-12 to R-134a.
- Evacuate the system of all air to eliminate oxidation of lubricating oil.
- Keep all foreign substances out of the system. Air over 3% can cause compressor noise and reliability problems.

ACDelco Air Conditioning Service Guidelines

AIR CONDITIONING REMINDERS - Continued

- Use new O-rings or seal washers if a connection has been disconnected.
- Use only approved leak detection dyes.
- Accurately weigh charge—Do not employ cans.

CAUTIONS

- Lubricating O-rings with PAG lubricant could corrode fittings.
- Leaving the air conditioning system open allows moisture in components.
- Ester oils do not provide proper lubrication and can cause system failures.
- R-134a systems cannot be retrofitted to R-12.
- Use of R-11 or R-22 will damage the compressor and contaminate refrigerant recovery equipment.
- Mixing refrigerants will damage the compressor.
- Blends require by law special fittings and dedicated equipment, and cannot be recycled.
- Blends are not approved by General Motors, and will void the warranty on system components.

WARRANTY RETURNS

All warranty air conditioning compressors returned to ACDelco must have the shipping plugs for the suction and discharge ports from the new compressor installed on the warranty compressor.

ACDelco is concerned about the integrity of air conditioning systems and components, and the safety of technicians and vehicle owners. By following the recommendations discussed here and in the other bulletins listed in this document, you will be providing the best possible service for your customers.

GM and ACDelco bulletins are intended for use by professional technicians, NOT a “do-it-yourselfer”. They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions and know-how to do a job properly and safely.