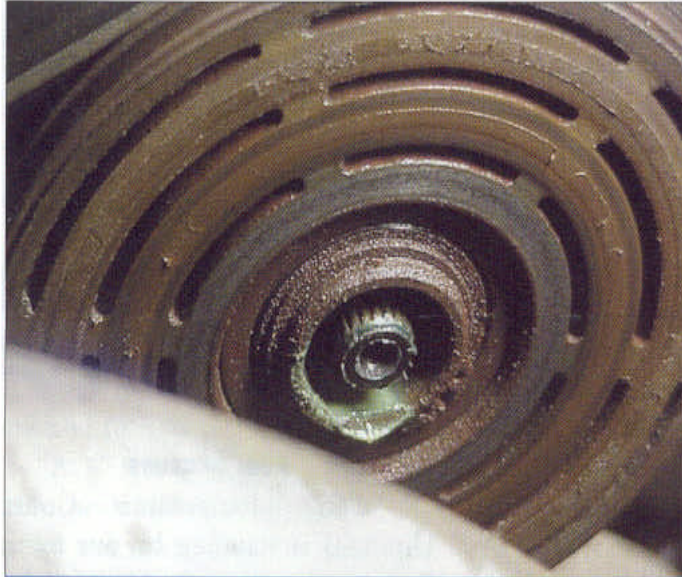


# Spring A/C Tune Up?



Green coating on Ford F-150 compressor clutch.



This compressor was disassembled and found to be full of green gel after return for warranty adjustment.

*Ward Atkinson, MACS Technical Advisor*

**E**very year there are new approaches being promoted on how to improve performance and fix problems in mobile air conditioning systems. Some of these approaches add to the "Buyer Beware" issues regarding the facts and fiction of maintaining mobile air conditioning systems.

#### Here are some facts to consider:

- The operating system refrigerant, whether CFC-12 or HFC-134a, does not need to be cleaned. Should an A/C system have an internal compressor failure, the refrigerant will be cleaned during normal refrigerant recovery/recycling procedures.
- An operating system does not need additional oil or "conditioner." In fact, additional oil can result in loss of cooling performance and the use of an incorrect lubricant may actually cause damage. Most systems require a specific lubricant, and a single universal lubricant may not meet all system manufacturer's requirements.
- HFC-134a system lubricants are generally PAG-based, and the use of ester (POE) lubricants is not approved by OEMs.
- Refrigerant leaks should be identified and the leaking parts replaced with quality components. Adding refrigerant to a leaking system does not make economic sense, and its release from an unrepaired system has negative environmental impact.
- Adding too much refrigerant to a mobile A/C system can also result in a reduction of cooling performance.
- Vehicle manufacturers install (and recommend for service purposes) only the correct refrigerant amount and the proper lubricant be used. They do not install any other chemicals for so-called improved performance, any type of system condi-

tioners or any product intended to stop leaks. In recent years, the addition of a trace dye material meeting the SAE J2297 compatibility criteria has been installed in some production A/C systems in order to help identify system leaks.

- Adding any chemical, other than the correct refrigerant and lubricant, to a mobile air conditioning system can create a chemical problem resulting in system damage, even if some initial system performance improvement is noted.

With the proliferation of small cans of chemicals being sold in the aftermarket by mass merchandisers containing sealers, conditioners and additives for use in mobile air conditioning systems, the SAE Interior Climate Control Standards Committee has addressed the compatibility issue with a new SAE standard.

The new standard, J2670, is "Stability And Compatibility Criteria For Additives And Flushing Materials Intended For Use In Vehicle Air-Conditioning Systems Using R-134a." The standard's scope: "applies to any and all additives and chemical solutions intended for aftermarket use in the refrigerant circuit of vehicle air conditioning systems. This standard provides testing and acceptance criteria for determining the stability and compatibility of additives and flushing materials (solution(s)) intended for use in servicing or operation of vehicle air conditioning systems. This standard does not provide test criteria for additive or flushing solution effectiveness; such testing is the responsibility of the additive and/or solution manufacturer/supplier."

SAE J2670, to be published later this year, provides current industry chemical compatibility requirements for mobile air conditioning systems in an effort to minimize



Internal compressor contamination.

system conflicts. Additional testing of chemical products may be required to assure complete customer satisfaction.

### Leaking System Components

As the A/C system ages, some parts can exhibit leaks, resulting in loss of refrigerant and the ability to provide cooling. The proper service procedure is to identify the leaking component and replace it with a quality part. By doing so, the system integrity should be returned to the original system design intent, resulting in the restoration of cooling performance and minimizing the environmental impact of leaking refrigerant.

Some consumers will elect the "lower cost" option; just keep adding refrigerant and failing to repair the leak. Now, with other chemical products available in the mass-merchandising marketplace, some may have

the impression that just adding a sealer to the refrigerant system will resolve problems.

However, industry experience has indicated that the addition of some aftermarket chemicals has resulted in damage to a mobile A/C system and some service equipment. The addition of chemicals to the A/C system may result in the need to replace A/C system parts.

### Industry Position

Concern about the potential impact of these chemical additives has prompted many vehicle manufacturers and system part suppliers to establish warranty positions on their products. In addition, service equipment manufacturers have also established warranty positions on these chemical additives that may affect their equipment.

### Industry Warranty Positions

The following are excerpts from some of the current warranty positions:

#### Chrysler Group

"DaimlerChrysler recommends the detection of A/C system leaks through the use of approved leak detectors available through Pentastar Service Equipment (PSE) and fluorescent leak detection dyes available through MOPAR Parts."

"Vehicles found with A/C system sealers should be treated as contaminated and replacement of the entire A/C refrigerant system is recommend[ed]."

"NOTE: A/C SYSTEMS FOUND TO BE CONTAMINATED WITH A/C SYSTEM SEALERS, A/C STOP-LEAK PRODUCTS, SEAL CONDITIONERS, COMPRESSOR OIL

OR REFRIGERANTS NOT APPROVED BY CHRYSLER VOIDS THE WARRANTY FOR THE A/C SYSTEM."

#### Ford Motor Company

"Ford Motor Company does not endorse or approve the use of any aftermarket A/C refrigerant system sealer. Vehicle A/C refrigerant systems determined to be contaminated with an aftermarket refrigerant sealers are not eligible for warranty coverage."

#### Four Seasons

"TCD [Temperature Control Division] is standing by our System Sealer policy. Use of any of these types of products will void our warranty. Extensive research has proven that these sealants are not an effective tool to remedy leakage in an AC System. Our recommendation has always been that a leaking component needs to be replaced."

#### Delphi

"... Delphi does *not* approve the use of any type of air conditioning system sealants. The use of any sealant immediately voids all warranties of compressors."



End view of an evaporator neck shows why there was no cooling. The evaporator is plugged with hardened sealer.



When this service hose from a recovery/recycling machine was cut open, it was found plugged with hardened sealer material.



End view of solenoid valve from a recovery/recycling machine shows plugging with hardened sealer.

### General Motors

"GM Service Operations DOES NOT endorse or approve the use of any aftermarket A/C system sealer, A/C stop-leak product or A/C seal conditioning product in any GM vehicle. The use of these aftermarket products may cause damage to A/C systems and to A/C service equipment.

"A/C systems found to be contaminated with A/C system sealers, A/C stop-leak products, or seal conditioners are not covered by the GM New Vehicle Warranty or the GM Replacement Part Warranty."

### Mazda

"Do not use any aftermarket A/C refrigerant system sealer in the repair of Mazda vehicles. The use of such aftermarket refrigerant sealers may result in damage to A/C refrigerant recovery/evacuation/recharging equipment and/or A/C system components.

A system found with or suspected of having an A/C refrigerant sealer in the system should be serviced as a refrigerant system containing a contaminant. Refrigerant system flushing equipment and agents may not remove the refrigerant system sealer from a contaminated system, and replacement of the entire A/C refrigerant system is recommended. These repairs will not be covered under the manufacturer's basic warranty."

### NAPA

NAPA Temp offers products and/or solutions that are intended to meet or exceed the demand of the market. Our mission is to provide our customers with a service level that is second to none and in doing so we perform



The particles below the tape measure were scraped from solenoid valves in a recovery/recycling machine. Lab tests showed the particles were a match for an A/C sealer.

extensive research and testing on those products offered in our line. In researching sealing products, we have found that there is a considerable objection from the OE system and equipment manufacturers on the use of "System Sealers". In fact, many of these manufacturers are voiding customer's warranties should such products be found within their systems. NAPA Temp's policy regarding the use of these products is that we DO NOT endorse its use and will deny all claims made against defective products returned for credit that are found to have been exposed to or suspected of containing said sealers."

### Nissan

The following statements are found in the Nissan Owner Manual:

**"AIR CONDITIONER SYSTEM REFRIGERANT AND LUBRICANT RECOMMENDATIONS:** The air conditioner system in your NISSAN vehicle must be charged with the refrigerant HFC-134a (R-134a) and the lubricant, NISSAN A/C system oil DH-PS or the exact equivalents.

**"CAUTION:** The use of any other refrigerant or lubricant will cause severe damage to the air conditioning system and will require the replacement of all air conditioner system components."

### Visteon

"Visteon Automotive does not endorse or approve the use of any aftermarket A/C refrigerant system sealer. The use of such aftermarket refrigerant sealers show evidence of damaging A/C refrigerant recovery/evacuation/recharging equipment, as well as possible damage to A/C refrigerant system components.

"Vehicles found or suspected of having an A/C refrigerant sealer in the system should be serviced as a refrigerant system containing a contaminate. Visteon approved refrigerant system flushing equipment/agents may not remove the refrigerant system sealer from a contaminated system, and replacement of the entire A/C refrigerant sys-



This clutch was removed from the Ford F-150 truck compressor. Sealer buildup on the clutch hub was substantial.

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tem is recommended.

"Vehicle A/C refrigerant systems determined to be contaminated with an aftermarket refrigerant sealer may affect A/C refrigerant system components warranty."

### Service Equipment Neutronics (Refrigerant Identifiers)

"Introduction of aftermarket

A/C sealants **MAY** cause damage to Neutronics Refrigerant Identifiers and A/C Diagnostic Tools.

"Neutronics engineers have tested Aftermarket A/C sealants with Neutronics A/C service products and determined that they may cure within the hoses or internally within the machines. Curing **MAY** cause plaque build up within the hoses, fouling of

internal solenoids and or damage to the infrared bench assembly."

"These sealants typically activate with the presence of moisture and air causing the material to crystallize and create unwanted restrictions within the instrument. Users should exercise caution when testing systems containing sealant, as any resulting damage is **NOT** covered under our standard warranty."

### SKYE

#### (A/C Service Equipment)

"Recovery of AC systems containing aftermarket leak sealants **MAY** cause damage to your SKYE AC service center."

"Recovery of AC systems containing aftermarket leak sealers with seal rejuvenators **WILL** cause damage to your SKYE service center."

### RTI Technologies

#### (Recovery/Recycling Machines)

"RTI recovery/recycling machines are not designed to recover and recycle refrigerant system sealers. The RTI Technologies Warranty may be considered void if evidence of any refrigerant system sealer is found in any of the internal components of an RTI recovery/recycling machine." ■

*Ward Atkinson retired from General Motors, Chevrolet Engineering, in March 1981, after thirty years with the company. As staff engineer, he directed divisional and corporate development activities for electrical, engine cooling, heating, ventilation and air conditioning systems for passenger cars and light trucks, including laboratory, wind tunnel, and road testing. He is currently chairman of SAE's Interior Climate Control Standards Committee, a position he has held for many years, responsible for many SAE documents, including the air conditioning documents identified in the U.S. Clean Air Act. He is also Chairman of the ISO TC22 Interior Climate Control Committee. As technical advisor to MACS since January 1990, Mr. Atkinson has been responsible for various technical activities including the Certification Training Manual for Refrigerant Recycling & Service Procedures, other training documents and informational reports. He is co-author of the mobile air conditioning section of the Technical Options Committee of The Montreal Protocol.*

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