State of the Industry with Ward Atkinson

Ward Atkinson has been part of the mobile air conditioning industry for almost 40 years. Currently he serves with several research/engineering organizations and on government advisory panels that are shaping the future of mobile A/C. His State of the Industry presentation has become a staple at the MACS convention; when Atkinson speaks, the service industry listens.

This year he focused mainly on regulations and refrigerants. Regulations in Europe require the total phase-out of R-134a, beginning with totally new vehicles introduced for the 2011 model year. Because of production lead times, European manufacturers must soon commit to a replacement refrigerant now, and Atkinson reports they are currently looking at two choices. One is carbon dioxide (CO_2) gas, a.k.a. R-744. Although it's classified as a greenhouse gas, CO_2 obtained as a by-product of other industrial processes is actually the least damaging refrigerant possible.

However, the operating pressures needed to make it work are very high, and the A/C system's cost and complexity will significantly increase the production costs of the finished vehicle. The service industry would also be significantly affected by both the need for specialized training and equipment, and by strict safety protocols. At this time it appears the auto manufacturers in Germany have committed to CO_2 refrigerant for at least the next generation of new models. However, Atkinson hinted they would be happier with a less-demanding alternative that may eventually be used in other markets.

HFO-1234yf is currently being developed jointly by Honeywell and DuPont as an automotive refrigerant. Its global warming potential (GWP) of 4 falls well below the limit of 150 set by the European Union (R-134a has a GWP of 1410, R-744 has a GWP of 1). Operating pressures, chemistry and other qualities of R-1234yf are so similar to those of R-134a that it can be used with almost all of the industry's existing mobile A/C technology.

There is one problem; it is classified as "mildly flammable." This means it can be ignited and it will burn, but the conditions required for ignition are very specific and the flame temperature is relatively low. It is far less dangerous than other hydrocarbon refrigerants, particularly R-152a.

Atkinson says the safety systems that would be required in the vehicle and in the service bay are very manageable and quite adequate. Although he flatly stated, "We don't have a universal refrigerant yet," it was implied that many people in the industry would like to see HFO-1234yf pass all the necessary tests and become approved for use in mobile A/C systems as soon as possible. No schedule for this has been announced.

No matter which refrigerant is chosen to replace R-134a, Atkinson assured the audience that there will be no retrofit program. In addition to the fact that the current fleet is not equipped to use a mildly flammable refrigerant (assuming the new refrigerant is HFC-1234yf), Atkinson called the previous effort to retrofit R-12 cars to use R-134a "a fiasco" for the service industry and one that he will argue against repeating.

So far only Europe is requiring a new mobile A/C refrigerant, but the U.S. is expected to follow suit during the current President's administration. No matter which technology is chosen, Atkinson assured us that new service equipment will be required. He also noted that many states are passing their own mobile A/C regulations.

Minnesota has just begun requiring disclosure of A/C system leakage rates for all new cars and posts the results on their consumer web site. New Jersey may add A/C leakage rate testing to their emissions inspections, and is also planning to require A/C techs to become state-certified. The Garden State may also adopt California's new regulations regarding 12-ounce cans of refrigerant sold to consumers: the can must have a self-sealing valve and enhanced labeling, and the product manufacturer must establish a deposit and return program.

In other industry news, Atkinson announced a revised Section 609 Technician Certification Program, named for the section of the Clean Air Act in which it appears. When first introduced, the program required A/C service technicians to be trained and certified in the proper handling of refrigerants to prevent their release into the atmosphere. The program is being updated to include Best Practices training for service and repair of mobile A/C systems. Techs who already hold Section 609 Certification will be 'grandfathered' and not required to recertify.

Before concluding his presentation, Atkinson introduced William Hill, a senior engineer with General Motors. Hill presented a detailed description of HFO-1234yf, its performance characteristics and its progress through the various tests necessary for certification as a refrigerant.

In general, his presentation reinforced Atkinson's information, and the audience was left with the impression that "twelve thirty four" is very likely to become our next automotive refrigerant.

– Jacques Gordon