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## **Cleaning Up - Before Installation**

“Disassemble, clean, inspect, obtain necessary replacement parts, reassemble, and test”. This basic process holds true for any type of component remanufacturing as it should for most vehicle repair processes done in the service bays. But we are seeing an alarming trend, which is affecting the reputation of many component suppliers, both new and reman.

We are talking about the heat exchangers, the component that supplies the necessary thermal transfer required for proper system performance and the components longevity. Heat exchangers have been our focused study for 26 years, and as we have watched the simple single pathway of the tube and fin design go away in favor of the more compact and more efficient serpentine and parallel flow heat exchangers; we have also watched the problems grow.

So what's the problem? It is the “I blew it out with air”, pour in-blow out chemicals, aerosol cans, the little low flow 1qt. flush guns, and even professional equipment that just circulates a cleaner. Many of these simple processes did work in the past with single path tube and fin components, but with the advent of the multiple small pathways connected by common chambers in today's heat exchangers, these products no longer work. Evidence that they no longer work is why Nissan says you cannot flush their parallel flow transmission oil cooler, and why many A/C professional proclaim that you cannot flush a parallel flow condenser. It is because of too many failed attempts with inferior products & methods.

In order to perform an effective flush on today's complex heat exchanger designs, it takes a properly selected cleaner for the task that can be introduced with volume, velocity, and some form of agitation. A chemical must be chosen for its ability to dissolve and remove the harmful residues that build up inside; thus the concept of cleaning oil coolers with heated oil or A/C components with the standard refrigerants (very low boiling points), is ludicrous. There must be enough volume of the chemical supplied to perform effective cleaning. The chemical must be introduced with enough velocity to provide the necessary energy to carry away the weighted debris; and finally, enough agitation (more energy action) to clean into the corners and crevices where the wastes tend to accumulate. In parallel flow components, it takes such energy to overcome the fluid flow “path of least resistance” rule; to be able to effectively clean the multiple pathways.

We apply these proven basic chemistry and physics principles to the worst of the worst contaminated parallel flow components, sent to us by automotive and aviation OEM's; and we can clean them. “Old school” products, methods, and the phobias they have created must be set aside, as many other older techniques have. We must adapt and change.

So how is this effecting the reputation of component suppliers? Reports are coming to us that A/C compressors are seeing as much as a 30%+ return rate to the parts chain counters. Can any of us believe that the failure rate of new, reman, domestic, or even import can be this high? But the blame game starts to tarnish the brands reputation with customer comments like “that brand is junk, get me something else”. Then the parts chain eventually drops brand A for brand B, only to find they have a similar return rate. Why? It is because of improper installation practices that include ineffective heat exchanger cleaning or no cleaning at all.

OEM prescribed A/C compressor “oil balancing” installation procedures work with a high degree of success for the dealers working on low mileage warranty vehicles with virgin systems. But the older cars being serviced in the aftermarket are much more likely to have been topped off more frequently with can products containing oils, seal swellers, and sealants. If the system is already overcharged with oil and other products; how is oil balancing going to work? What about debris from the previous destructive failure? Filters are great insurance, but they will just quickly clog up with all the junk left in there, if effective flushing is not employed first.

Replacing the A/C condenser is an option today because it is still fairly easy to change and somewhat inexpensive. But one just need to search out the one piece “modular cooling” systems that Valeo, Visteon, Delphi, and others are producing for current OEM production streamlining; to see that this option is coming to end in the near future. Effective heat exchanger flushing equipment, chemicals, chemical removal procedures, and confirmation testing has to be done.

Automatic transmission and torque converter brands suffer similar tarnishing of their reputation, when the oil cooler is not properly cleaned and rapid debris or overheat related failure occurs. Installers will send back the transmission and reconsider using that brand again regardless of how many replacements are sent at no charge. Independent transmission builders that find metal in the pan on a comeback inspection, instantly blame and return the torque converter; because of the belief that the problem surely cannot be related to their work. Torque converter suppliers know this to be true based upon the small percentage of defects found in the huge number of returns.

Another “Old school” answer is to just hang an auxiliary oil cooler, but this is causing more and more problems. Some auxiliary coolers are creating an overflow problem, which allows the oil to pass through the cooler too quickly to perform adequate cooling; and the transmission overheats. This usually occurs when the auxiliary is used to bypass the OEM cooler rather than being used in conjunction with the OEM cooler. Another problem with hanging the auxiliary cooler is related to the computer thermal management, monitoring, and compensating processes going on inside late model transmissions. It’s going to take an engineering degree in thermal management to select an auxiliary cooler that will match the OEM designed flow and heat transfer performance; failure to do so could cause the computer to make faulty adjustments based upon temperature readings or begin setting codes and a potential nightmare of troubleshooting.

The warranty reducing solution is going to require us to work together and take a stronger stand; insisting on proper cleaning practices, by advocating effective processes and procedures. Just having the statement “to flush” in the A/C compressor installation and or warranty paperwork, or dropping the aerosol can cleaner or auxiliary oil cooler in with the ship out transmission, is just not working; is it?

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