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HVA/C COMMON PROBLEMS, QUICK FIXES

In the collision world, it is hard not to encounter HVAC related problems. In fact, most collision shops have a stack of condensers a few feet high tucked away waiting for the scrap man. Sometimes, however, HVAC problems post collision are a bit more technical than replacing a condenser. Sometimes the HVAC repair is due to the collision itself; sometimes it's due to a mistake made in the repair process or even others that are completely not related to anything done with the collision repair. A collision shop is wise to brush up on its HVAC knowledge in order to stay profitable.

Diagnosing any vehicle's problems without properly testing and evaluating the system is not a responsible repair technique and is asking for trouble. Understanding common problems, the tips and techniques to verify the cause and then being able to fix it accurately really does save time and money for everyone involved. Simply put, accurate testing is the best overall value for your customer and your shop.

Many heating, cooling and A/C problems tend to be caused by repetitive failures that can be easily verified and repaired by understanding what they are, then checking them correctly. There is no substitute for proper diagnostic technique, but being able to utilize technical service bulletins (TSB) and understand common problems and solutions reduces the number of things to test and to save time.

Customers sometimes look up their vehicle's symptoms on the internet before they come in for service. They might have an opinion on how the problem should be fixed. You need to be ready to handle those suggestions and explain why online advice might not apply. Like TSB's, these should be considered, but always remember who the service professional is so that you do not get sidetracked chasing a red herring.

With that in mind, here is a list of some common heating, cooling, and A/C problems, with successful techniques to repair them quickly and effectively the first time. As well as which ones may legitimately tie in to a post-collision complaint from your customer.

Problem: Fan inoperative

When diagnosing a complaint of no heat or A/C, it is a good idea to check that the problem simply isn't that the blower motor doesn't work-especially if the complaint is that the heat or A/C stopped working suddenly. Blower motors tend to fail suddenly rather than stop working slowly over time. It is also not unheard of for a blower motor to fail immediately after a serious collision.

Blower motor diagnosis involves inspecting the fuse, inspecting for power and ground at the motor (using voltage drop) and checking for motor operation either by supplying power or by removing the motor to see if it turns by hand. Even if the motor does suddenly operate when power is applied, it's still a good idea to spin the motor by hand to check for any binding issues.

Blower motors often are located in areas that allow water, debris or other material to get inside them and cause them to fail. That also means they're susceptible to creating problems with wiring, fuses and fuse blocks and connectors. If you discover a faulty wire or connection has caused the motor to stop working, make sure you test the motor once it is operational by using an amp clamp and a scope to measure current. The resulting pattern will give you a very accurate indication of the motor's state of health.

Problem: Noisy blower motor

Noisy blower motors often can be caused by leaves or debris that get into the motor through the air intake cowling. This can sometimes start out of nowhere post collision due to the debris getting jostled around in the fan during the collision. The existence of debris can be verified by removing the blower motor and simply checking inside (it doesn't take much to cause a terrible noise and vibration.) Cleaning out the foreign material and reinstalling the motor is often all it takes to fix the problem.

Noise problems can also be caused by the motor itself, failing bearings and loose fans can make an awful lot of racket. In these cases, the solution is to replace the motor and make sure the housing is free of dirt and debris or leaks that may cause repeat failure.

Problem: Blower motor inoperative on certain speeds

A blower motor that works only on high has problems with the blower resistor, and the typical solution was to replace the faulty blower resistor, which was typically a relatively cheap task. Faulty resistors usually showed obvious signs of damage when removed so confirmation of your diagnosis is really simple and straightforward. If you wanted to check the resistor before removing it, you could test that there was power and ground and that its resistance wasn't 0 ohms. If it is zero, there is a problem.

Newer vehicles often use solid state controllers rather than a clunky resistor pack to vary the voltage sent to the motor to control the speed. These control systems still go bad. In these cases, check for power, a good ground at the motor and varying voltage when directed by the controller to verify your suspicions.

Problem: Insufficient air flow from air vents, but temperature is correct

Vehicles often use cabin air filters to help clean the air passing through the HVAC box. A clogged cabin air filter can and does cause this low air flow problem. This low flow complaint can arise shortly after a customer has received their vehicle back from a collision repair due to the collision shaking internal dash debris down on the filter and/or dust from the dusty environment in which the car was repaired.

Cabin filters use a very fine filtration filter and they can get extremely dirty quite quickly and reduce the air flow into the vehicle to the point where it's really noticeable. The solution is to replace the filter. Most manufacturers suggest a specific interval of time or mileage to replace cabin air filters.

Be careful not to get any dirt or debris into the housing since this will cause more problems down the road. Move objects out of the way and wipe down the housing before removing the filter to prevent problems.

Problem: Air conditioning inoperative

If a vehicle comes in with a complaint of no air conditioning at all, quickly check to see if the A/C compressor engages. If it doesn't, check to see if there's actually any refrigerant in the system by attaching the gauges and noting the system's resting pressure. If the system is empty or extremely low, there is likely a leak in the system that will need to be fixed before any further diagnosis can be done. Test for leaks using dye and UV light, a refrigerant sniffer or by looking for oil stains on the components.

Problem: A/C not cold enough

This can be caused by low refrigerant level, which results from a slow leak in the system. The fix is to repair the leak and charge the system to the correct level.

If the refrigerant level and system pressures are fine, the problem might be that the air mix door is binding or its controller is malfunctioning. Depending on the age of the vehicle, diagnostic codes may not be retrievable with a conventional scanner and may need to be manually read from the HVAC system controls after initiating the proper processor. It is always best to check the service information if you're unsure.

Problem: Not cold enough in one zone or area

If the blend doors aren't binding and the controller is OK, check the refrigerant level carefully. Modern R134a and 1234yf systems will not operate properly unless the exact amount specified for the system is in the system.

Problem: Bad smell from the A/C

A bad smell when the A/C is turned on usually comes from the evaporator core due to mold growth. There are excellent products that kill the mold, deodorize the components and eliminate the smell permanently, but in severe cases the fix is replacing the evaporator core. This is rarely a collision related issue but actually a hyper sensitive customer

that had not noticed the smell until after the collision because they were no longer accustomed to the smell. In this case, it is pretty easy to explain that the issue is caused by a build up over a longer period of time, not a short time.

Problem: No heat

Low or no heat conditions are often caused by low coolant levels and, if so, the customer also might notice a gurgling or sloshing sound from the dashboard; often more noticeable when the vehicle is steered hard in one direction or the other. Generally, you will lose good heat at the vents prior to overheating if the overheat is caused by low coolant. If the system is low on coolant, look for leaks.

Problem: Too long to provide heat

This problem often caused by a thermostat stuck open. This can be checked quickly by feeling the upper and lower radiator hoses to see if they're the same temperature after the vehicle has been running for a few minutes. If both hoses are the same temperature, the thermostat may well be stuck open and the coolant (and engine) isn't getting to warm up properly. Note, though, that this problem tends to develop over time, not suddenly developing on the first cold morning of the year. And, of course, at below freezing temperature it does take a while for most vehicles to get any heat at all, so caution is needed. It is possible for a thermostat to fail during a collision due to the shock of the impact or debris in the cooling system lodging into the thermostat. The fix in this case would be to replace the thermostat and flush the cooling system until it is clean. A clogged heater core could also cause this problem, in which case, the engine could be at operating temperature quickly, the system filled properly with coolant but there's still no heat inside the vehicle. A quick check of the temperature gauge will show if the vehicle has warmed up or not. If you can safely access the heater core hoses, they should be about the same temperature going in and out of the heater core. A substantial variation indicates a lack of flow through the core due to internal plugging. The fix is to replace the heater core. A plugged up heater core is rarely caused by a collision; however, it may only be realized post repair due to the vehicle owner having been in a perfectly operating rental car.

Coolant

Coolant now comes in many colors and chemical combinations. Always rely on your service information to guide you to the correct type of antifreeze. Never mix types. Mixing different antifreeze types can cause serious damage to the cooling system in a short period of time.

Whatever color you are working with, it should be clean and consistent. Not murky, muddy or full of sediment. Unclean coolant should be flushed out of the system promptly to ensure reliable operation. Some antifreeze formulas are also affected by exposure to the air and must be stored in a sealed, clearly marked container and discarded within a week of being opened.

It's important to note that using distilled water alone to top up the reservoir is not recommended since it can affect the coolant's freezing point and life expectancy. Always mix antifreeze with distilled water to the manufacturer's recommended amount.

Refrigerant

Long gone are the days of R12, though some of us still see one or two roll in our bays each year. Most of the vehicles we see use R134a, but keep an eye out for R1234yf. Many manufacturers now have models using this new refrigerant. Best practices and EPA guidelines are to utilize separate recovery and charging stations for R1234yf. For most body shops, R1234yf is something you will be dealing with very soon if you haven't already. The good news is the rules we learned for diagnosing R134a systems mostly apply to R1234yf, though you will need to upgrade some tooling.

Conclusion

There is no substitute for properly diagnosing a vehicle. Having a few diagnostic tricks up your sleeve and understanding the common causes of problems can reduce your diagnostic time, keep customers happy and work profitable. This is where you and your customer will realize the greatest value.

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