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# Air Conditioning Service & Repair Tips. Edition 11.

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**In the last edition we talked about compressor failures and some of the cause that can easily be avoided. This edition we will cover in detail some of the causes and how to prevent some of these failures from happening.**

*Sanden warranty testing equipment.*

• **Poor servicing and lack of attention -**
This is a relative easy solution and you should be able to build a good relationship with your customer through good communication and correct servicing.
Too many times the customer does not get anything done to the air conditioning system until it stops working.
You should be getting your customers to have their system serviced every year, if not at least every 2nd year.
When your customer books his vehicle in for an A/C service it is not just a matter of topping the gas up and checking the temperature to see if it's cold.
A complete check of the system should be carried out as well and including a leak test.
A good practice to get into is to have a complete checklist or job card that you can work from and when you have finished you can provide your customer with a copy of this list.
On this check list you should be covering these items – cycling vent temperature before and after, operating pressures before and after, condition of condenser and clean, condition of belts, condition of A/C hoses and body retaining clips, radiator and condenser fans, internal fan for speeds and flow, amount of refrigerant used, oil and or dyes used, heater tap tested. Ingram can provide you with a CD with a service report sheet, job card and quotation sheet already formatted for you to use or print off. Just ask any of the Ingram staff at any of the training days when you attend.

• **Contaminated refrigerants -**
Unfortunately this is a little more of a complex problem and has been around since the phase out of R12 period and the introduction of R134a and the blend gases. This does not just apply to refrigerants, it can be flushing agents left in the system, and it can be moisture in the system by poor evacuation or contaminated oils.
Flushing agents left in a system can cause compressor seals and system "o" rings to swell up or start to break down. Moisture will cause corrosion inside the system, which will eat into compressor components, evaporators, condensers and other metal parts.
I have seen compressor valve plates severely pitted, condenser and evaporator tubes being eaten from the inside out. This can be caused by moisture and contaminates turning the refrigerant and oil into an acidic substance.
To have contaminated refrigerant in a system will give you poor performance and erratic gauge pressures. The only real way to avoid this is to either have a gas analyzer and to test every system that comes in to your work shop or do not use recycled refrigerant and to de-gas and re-gas every system that behaves erratically or performs badly or if you do not know what is in the system.

*Corrosion because of moisture.*

*Corrosion caused by moisture contamination.*

• **Insufficient oil return -**
This is a major problem for all concerned, compressor manufacturers, re builders, service technicians and the customers.
Poor or insufficient oil return is one of the main reasons for compressor failures. With out enough oil (lubricant) getting back to the compressor it is inevitable that the compressor will not last. The lack of oil can be caused by repeated leaks, replacing components without adding oil, system restriction or blockage, system getting too cold and the evaporator freezing, poor oil return to the compressor because of contaminates or not enough refrigerant. When a compressor fails you need to find out what has caused it

before you replace it, or at least test the system before you let the vehicle go. If you are replacing components the amount of oil you need to add will depend on what you are replacing. I will give you some examples of the amounts of oil you need to add when you are replacing components.

- **Condenser -** : 10 – 30ml.
  **Receiver Drier -** : 10 – 25ml.
  **Accumulator -** : 40 – 60ml,
  **Evaporator -** : 10 – 30ml.
  **Hoses and pipes -** : 10 – 30ml per meter

for the discharge or liquid lines. If there is a manufacturers recommended guide use this in stead.

*Disc and ball skidding, insufficient lubrication on the swashplate surface or foreign debris interrupting this process.*

*One disc fractured and matching ball damaged. The other disc almost fractured, skid marks on rear ball socket in piston out of shape.*

- **Incorrect oil used -**

The incorrect oil used is another problem, although not as big as some of the other problems that we have already covered or are still yet to cover.

When the compressor manufacturer recommends particular oil it is because that oil has been tested with that compressor. Delphi, Delco, Denso, Sanden, Unicla, York or any of the others all spend thousands of dollars doing testing with their compressors and oils.

Not only should you be using the recommend oil but also putting the recommended amount in unless it is a larger type system or extremely long hoses. When it is a larger than normal system or you have longer hoses you will need to use some discretion as to how much extra oil you will need to add.

When I say that you should be using the correct oil, it should be a well known brand at least the equivalent to what is recommend. If it says to use a particular grade of Pag or an Ester oil you should be using it. These oils are graded by the viscosity levels and the chemical additives to handle the heat loads or the chilling factor of the refrigerants.

- **High and Excessive Pressures -**

I am quite fond of this topic as I have heard many stories over the years about high head pressures and their cures. One of the main cures for this was to put less gas in the system and in some cases this would be the right decision. Now having said this, quite often this is not the right decision because all you are doing is starving the evaporator and reducing the heat load on the condenser. When you have this happening you are also causing problems for the compressor. The compressor relies on the refrigerant not only to carry oil back to it for lubrication but also the refrigerant provides cooling for the compressor.

This was a very common problem during the retrofitting days from R12 to R134a and the easy way to combat higher head pressures was to put less gas in the system. In some cases this would be a problem, the cause was over gassing which would cause the high pressure but in general it would be something else all together. High head pressures can be caused by poor or partially blocked condensers, lack of airflow because of fans or dirty condensers, moisture, damaged lines, too far open or stuck open TX valves, contaminated gases or overheating radiators and the list can go on. This again is where the good service technician will go over the system after gassing it and check that everything is working the way it should.

The next edition we will cover flushing, clutch slipping, liquid feedback and faulty TX Valves in more details.

*Valve plate discoloured from the black oil. Suction reed plate damaged from debris. Suction seats jammed with debris.*

*Piston damaged from 'grabbing' in the bore. Caused by insufficient ' barrier ' librication between piston and bore.*

**However should you require quality training in any of these areas, don't forget that Ingram are continuing to provide for all levels of training in air conditioning all around Australia and have done so for more than 10 years. Should you be interested or you know of some body that is, please contact your nearest Ingram Branch for information, or the Melbourne head office on 03 9926-1800 or visit the Ingram web page at, www.ingram.com.au and go to training for the dates and venues.**

**Sunday training is Assessment Certificate II Mechanical - Air Conditioning to enable you to apply for your new license.**