

# THEME CONDENSER MECHANICAL DAMAGES

## REDUCED SYSTEM PERFORMANCE

### BACKGROUND

The condenser is placed in the front of the car and is typically attached to other heat exchangers in the engine compartment. The condenser is crucial for the AC system operation. It ensures that the refrigerant changes from a gas to a liquid form. This is achieved through the condensation process, where the refrigerant heat is extracted, which cools the condenser. The airflow then passes the colder air through to the cabin.

### PROBLEM

Mechanical damages to the condenser are often disregarded as reasons for reduced system performance or for compressor failure.

In many cases, failures that are recorded and considered as common reasons for system failure are leakages and surface perforations. However, light mechanical deformations of the condenser tubes and fins can result in serious system performance limitations. Only one deformed condenser tube is needed to restrict refrigerant flow inside the unit, thus reducing system performance significantly.

Furthermore, limited flow will cause an abnormal high pressures and temperatures in the loop. These will increase the compressor workload and effectively reduce its lifespan or, in worst cases, cause it to break down.

### RECOMMENDED SOLUTION

Always handle the condenser with proper care and do not disregard any light damages on its surface. If the tubes and/or fins are visibly damaged, replace the condenser with a new intact unit.

Nissens' condensers are always thoroughly packed, in order to ensure a maximum protection during storage and transportation. Nissens' sturdy cardboard boxes, with re-opening/closing lid, protects the condenser carefully – from leaving the factory to the final destination. Inner protective inserts wrap the condenser tight inside the box, while specially designed U-profiles eliminate any strapping strain impacts.

## MOST COMMON MECHANICAL DAMAGES



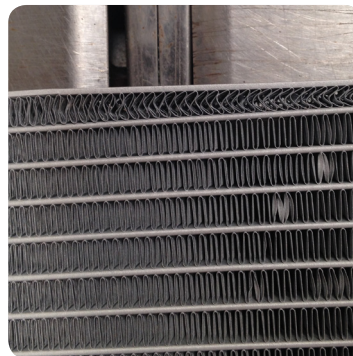
**Poor quality packing** – Too tight condenser strapping inside the box will often crush its top and bottom tubes. As the tube is flat, with a small diameter, the flow in a crushed tube will extremely be limited or completely disabled. Furthermore, most of modern condenser tubes are produced in so called microtube design and with inner partitioning walls, making them very sensitive on bends or crushes.



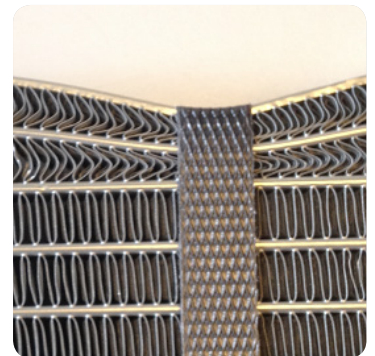
**Transport damages** – The thin aluminum, which the condenser is made of, makes the construction fragile. This requires handling with significant care. Throwing the condenser box, or improper handling during installation, will quickly spoil the fragile parts. Even small surface dents or seemingly light bends can impair or limit the condenser inner flow, thus reduce operation capacity. Other areas exposed to mechanical damages are mounting brackets and connection sockets.



**Spoiled condenser fins** – The thin aluminum fins between the condenser tubes are easily spoiled by bending, hitting, crushing or high-pressure surface cleaning. If the fins are spoiled, the condensation process will become significantly less effective, as the heat exchanging surface of the unit is reduced. Reduced condensation will cause the inner temperature and pressures to raise and the overall system performance to weaken.



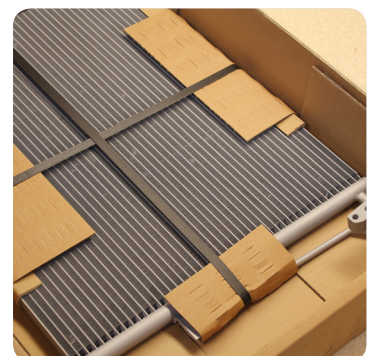
*Bent top tube by improper product handling*



*Top tubes bent by too tight strapping*



*Poor quality packaging cannot ensure a proper damage protection during transportation and storage*



*High-quality Nissens' condenser packaging system with U-profiles protecting top and bottom tubes*

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