

TECHNICAL BULLETIN

SAFE DE-BRAZING IN THE RACHP SECTOR

1 OBJECTIVE

The objective of this technical bulletin is to inform members of the health and safety implications and hazards when de-brazing welded joints in RAC systems for repair and/or component replacement.

It has been produced in response to recent accidents whereby de-brazing of compressor joints was carried out without proper consideration given to normal best practice resulting in hot oil from inside the compressor being ignited causing a flash fire and skin burns to the operative.

It should be noted that these incidents have not been confined to systems containing flammable gases – even non-flammable gases such as R22 can suffer as it is the oil NOT the gas which ignites.



2 CORRECT PROCEDURE

- 1 When a component within a refrigeration circuit has to be replaced it is essential as a first step that all refrigerant gas is safely isolated in a secure part of the system or fully recovered into a clearly marked reclaim bottle using a proprietary recovery machine suitable for the gas being decanted. This is a legal requirement under EC517/2014, Article 3 and will result in the internal pressure being reduced to zero gauge pressure.
- 2 If it is not possible to cut the pipes near the joint to de-braze safely out of the circuit then an inert gas should now be introduced to the system to purge any oxygen that may have entered after the recovery process is completed. Oxygen-Free Nitrogen (OFN) is the standard gas used for this purpose. This inert gas should then be purged until the pressure is just above atmospheric by 1 or 2 psi and maintained at that level.
- 3 The oxy-acetylene or equivalent brazing torch can then be applied to the joint being de-brazed with due care and attention being given to the internal pressure which may rise as heat is applied to the pipework or fitting. If the pressure rises then this should again be purged using the throttle valves on the manifold set before continuing to de-braze.

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3 DE-BRAZING HAZARDS

Even after a full and effective reclaim of the gas there may be a trace element of gas left in the compressor oil. When the heat is applied to the pipes and/or fittings the internal pressure will rise and the residual refrigerant will evaporate out of the oil and the oil itself will heat up and migrate towards the area being heated. When the brazed joint seal breaks there is a real risk of the hot oil being expelled out of the newly created hole in the circuit.

If you are using a naked flame torch such as oxy-acetylene then there is a significant risk of the oil igniting when it comes into contact with the flame. The pressure caused by the evaporating residual refrigerant can cause this flame to be ejected violently out of the pipework endangering the technician working on the system.

The flame emanating from the pipes may do any or all of the following:

- damage wiring looms in the vicinity of the component
- damage insulation jackets essential for the efficient running of the system
- ignite clothing worn by the operative or their assistant
- spit hot burning oil onto the technician or assistant's exposed skin causing severe burns
- cause further risk of fire or smouldering in surrounding area

When the component has been swapped over it is essential that the OFN is used again throughout the process to ensure no oxidization takes place and to continue suppressing any likelihood of flammability by purging the system of oxygen and maintaining a small positive pressure of around 1 or 2 psi again, as it was during the removal process.

4 PRESSURE AND LEAK TESTING

To comply with EC517/2014 Article 3, upon completion of the circuit and prior to any refrigerant being transferred into the system, all joints should be inspected and tested for strength and tightness in accordance with BS EN378-2:2008 prior to evacuation/dehydration in accordance with manufacturer's instructions and recommendations.

5 RECORD KEEPING

To comply with EC517/2014 Article 6 the system log book should now be updated to record the work completed including:

- date and result of the leak checks upon completion
- amount of gas recovered and either sent for treatment/destruction or re-charged on completion
- amount of any additional or new gas charged and the source bottle identifier
- destruction facility details if applicable
- name of operative and company carrying out the work complete with registration number

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