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BCGA Opinion

Acetylene Cylinders in Road Traffic Incidents (RTI) or found at the roadside

Police and Highways Agency staff should be aware that all gas cylinders can be punctured or ruptured by the impact of a road crash and can explode if exposed to the heat of a fire. If the gas is a fuel or oxygen it will significantly contribute to fire hazard.

Acetylene has a distinct property which requires special precautions. The heat of a fire may initiate a chemical reaction, the decomposition, or breakdown of acetylene. This is an exothermic (heat creating) reaction and the resultant risk is that acetylene cylinders, if not properly dealt with, can, in some circumstances reheat and even explode some hours after the fire is extinguished. The Fire and Rescue Service are fully aware of this and have a protocol for dealing with it.

It is the considered expert opinion (without prejudice and without liability) of BCGA that the **mechanical shock alone** of an RTI **to a cold acetylene cylinder which remains intact and has not been exposed to fire,** will not initiate decomposition. Such a cylinder may be safely lifted and removed to quickly clear the RTI.

This opinion is supported by much empirical evidence from cylinders which have suffered impacts. More significantly, BAM (the German Federal Materials Test Institute, who are renowned experts in acetylene) have conducted extensive testing and type approval of all acetylene cylinder types used in Europe. As part of their work, BAM has been conducting very severe “impact resistance testing” of acetylene cylinders on behalf of the CGA (Compressed Gases Association, USA).
This test is based on detonating an explosive charge, secured to the side of the cylinder, as an extreme and reproducible way of simulating impact/shock.
Cylinders so tested have been thoroughly examined and have shown no signs of acetylene decomposition.

HOWEVER – We emphasise that if the RTI includes an element of fire and acetylene cylinders are directly involved then they **MUST NOT be approached or moved.**

Also, if an acetylene cylinder has been punctured/fractured or the valve damaged such that gas is escaping, this could accelerate any decomposition as well as there then be risk of ignition of leaked gas (hot engines, electrical or mechanical spark sources, including equipment brought to the scene).

Information obtainable from drivers involved or witnesses to an RTI should, of course, be taken into account. They may have evidence that a cylinder has been exposed to fire which is not evident from the more obvious clues of blistered or blackened paint on the cylinder or fire damage to the road surface etc.
In any of these circumstances, or if the acetylene cylinder is found to be warm to the touch, **the Fire Service must be called immediately** to deal with the incident.

Another scenario which is faced is an acetylene cylinder simply found on or by the roadside with no obvious clues as to how it got there. This is sometimes the result of fly-tipping but may arise if the cylinder has fallen from a transport vehicle. Sometimes such a cylinder will have been reported by a member of the public and it may have been there some time. It must be assumed that such a cylinder still contains gas despite it may be punctured or the valve open or damaged and hence it could still be leaking gas.
If there are no signs of fire damage to the cylinder itself or surrounding ground/debris, then the cylinder may be approached to see if it is cool, whilst being careful to avoid introducing potential ignition sources as above. If the cylinder is cool and there are no signs of ongoing gas leakage it may be safely lifted and removed from the scene. If possible the relevant gas company should be contacted for recovery or see BCGA guidance on safe cylinder recovery/disposal.
BUT - if there are any signs that the cylinder has been exposed to fire, if gas is still leaking from it, or if in any doubt - then the Fire Service must be immediately called to deal with it.

Doug Thornton – Director
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