

Getting tooled up

– reciprocating saws and their blades

This month the UK Rescue Organisation looks specifically at reciprocating saws in the context of road traffic incidents – are you aware of the implications of modern car materials?

We have so far looked at the ongoing designs and constructions of modern day vehicles and considered the range of new materials that are being included by manufacturers. With such a diverse range of materials being used on the majority of new vehicles there will be a requirement for professional rescuers who are undertaking the tooling practices to reconsider their choice of toolings, or at least the implications for continuing with existing practices.

Many rescuers will have available to them, and have regular use of:

- Reciprocating saws
- Hydraulic Extrication Tooling, e.g. cutters, rams and spreaders
- Rotary disk cutters

This article will look specifically at reciprocating saws.

Reciprocating saws have been used within the fire service for over 20 years but have evolved from air-driven types through to battery and 110v generator-fed models. The method and safety considerations for use have changed very little, but this tool option is heavily impacted by the growth of new metal usage within vehicles.

There are two key elements to the reciprocating saw; the saw mechanism, and the cutting blade. Both of these elements need to work in harmony to ensure that the saw can be used effectively as intended by the tool operator.

In order to control the saw mechanism when tackling modern



vehicle materials, a saw should feature some level of speed control. This is of primary importance, as too fast a speed choice for the material being cut can result in the overheating of a blade and the subsequent loss of blade tempering.

This leads to a severe softening of the teeth and flattening of the blade, and such blades do not cut and are rendered ineffective (see above).

The speed control found on saws generally depends on the amount of depression on the power trigger, or a speed-setting limiting wheel which maintains a maximum speed regardless of the position of the power trigger. This feature is hugely important, as it is the working speed of the mechanism that dictates both the work speed of the blade and also the effort imposed upon the saw motor.

This blade working speed has a significant impact upon the productivity of the cut which the blade is undertaking.

A blade is made generally of two parts; the main body which is a cheaper more flexible material which then receives (through laser welding) a high tensile strip of teeth.

These teeth come in a range of designs dependent upon the intended application of the blade eg wood, plastics, metal. Its shape, length, thickness, number of teeth per inch (TPI), and tooth angle are all considerations which need to be understood by tool operators.

An understanding of this blade performance allows operatives to use low-TPI, wider blades for glass management in an effort to reduce glass dust, and adapting their choice to very thin, high-TPI, mid-length, high performance blades for dealing with boronated steels. Where wanting to cut harder materials it is necessary to do so smoothly, and by removing as little material as possible whilst successfully achieving a cut.

Although the use of reciprocating saw blades has become largely confined to glass management as well as third-door creation techniques in vehicle extrication, it is of note that their use should be considered for dealing with boronated steels where there is a requirement to reduce likely energy travel around the vehicle.

It is possible with hydraulic tooling to inject additional energy levels into a cut when dealing with boronated steels, and consideration should be given to where this energy will travel to, and what effect it will have. The use of reciprocating saws has the advantage of undertaking a cut without this energy injection. However to be efficient with such a cut the operator should understand the choice of blade, the use of the blade, speed of the saw and the type of material being cut.

Next issue we will look at the range of cutter blade designs and their performance both when undertaking penetrating cuts and surrounding cuts.

Find out more about UKRO

The UKRO was formed in 2002 to address the growing diversity of rescues that emergency services in the UK were requested to undertake and which now form a statutory duty.

UKRO is a fast moving dynamic organisation that is determined to push vehicle extrication to its professional pinnacle, to drive the national agenda on road death reduction and to showcase other rescue disciplines including trauma, line rescue and urban search and rescue.

UKRO is also engaging and influencing organisations such as the World Health Organisation and the European based Global Road Safety Partnership in the field of vehicle extrication and rescue.

The UKRO currently runs projects in two other European countries with a further eight planned.

For more information visit www.ukro.org.