

DIAMOND WIRE | TROUBLESHOOTING

Two of the main problems associated with wire sawing are 'flatspotting' (uneven wearing of the diamond beads) and wire breakage / connector pull-out. Attention paid to the procedures outlined below will minimize the risk of these problems occurring.

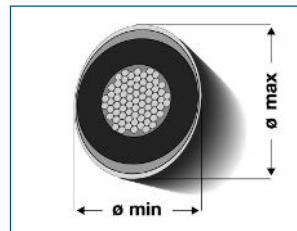
Please note the following most common faults and their most obvious causes. If these first measures do not correct the fault, please stop sawing and call the Diaquip Technical Services Dept. for advice on (US): +1 313-484-0038 | (UK): +44 (0) 161 406 0609 or email: technical@diaquip.com

A. FLATSPOTTING (ONE-SIDED WEAR OF DIAMOND BEADS)

Flatspotting can largely be prevented and/or cured by changing the amount of twist in the wire after every cut, i.e. changing the position of the diamond beads in relation to each other, as viewed by looking at the end of wire in cross-section.

If flatspotting is beginning to occur, re-twisting the wire effectively changes the position of the beads and makes the wire round again in cross-section. This is only likely to be an effective correction provided that the wire has not gone beyond 0.4mm out of round.

As a rule a wire should start with 1 twist per meter, adding 30% of twist after each large cut up to a maximum 2-3 twists per meter. If there is still life left in the wire at this point, start to decrease the number of cuts by 30% : thus, over a 10 meter length of wire, the twist progression would be 10 > 13 > 17 > 22, thereafter decreasing by 30%, 17 > 13 > 10.



CHECKING THE BEAD MEASUREMENT OF AN OUT OF ROUND WIRE



THE EFFECTS ON A WIRE AFTER RE-TWISTING WHERE BEADS HAVE BECOME FLATSPOTTED

B. CONNECTOR PULL OUT

These problems can be greatly reduced by paying attention to the following:

- Ensure the end of the wire to be crimped is cleanly and squarely cut;
- Clean all plastic or rubber residue off the wire where the connector is to be mounted;
- Use the correct hydraulic press – minimum of 5T for low pressure, pneumatic-feed machines and 8T for higher power machines;
- Use the correct pressing tool inserts, different for different types of connectors.
- Ensure that over-tensioning of wire is avoided by having the correct feed pressure control;
- Check that all sharp corners of the workpiece have been radiused off prior to the commencement of wire sawing and that the workpiece is wedged securely in position as cutting progresses, so that the wire is not trapped.



C. WIRE BREAKAGE

Wire breakage and connector pull-out are often confused as being the same thing, but can have quite separate causes:

Wire breakage can also be caused by inattention to some of the connection pull-out warnings, but, in addition, one of the most common causes of failure is a breakage immediately adjacent to the connector.

This breakage is due to the frequency of forward and backward deflection of the wire by the Wire Saw's pulleys, which will eventually fatigue the wire at its weakest point due to the lack of flexibility near to the connector joint. The length of time until the crimped wire breaks at this point depends on various factors, but in general a shorter connector, or ideally a flexible one, will have a longer life.

On smaller cuts, the connector will often last until the job is completed, but on larger ones it is advisable for the operator to monitor the length of time before a fatigue breakage occurs and, subsequently, to stop the wire and renew the connector within a safe margin of time before a further breakage is expected. This is extremely important, as when a breakage does occur, more damage is likely to be caused by the ruptured wire hitting sharp surfaces at high speed, which can in turn lead to further breakages.

In addition to the above, sawing will run more smoothly if narrow arcs of contact between wire and cut-piece can be avoided, using deflection or satellite pulleys where appropriate to do so. Instructions on connection assembly should also be followed closely. At all times vibrations on the wire during sawing should be kept to a minimum, by watching the process closely and keeping within the machine's operating parameters.

