

# GMAW Wire Feedability

Some insights on common wire feedability problems



**H**ow many times have you had problems with wire feedability, such as birdnesting at the drive roll or burnback at the contact tip? Probably more than you wish to count. Poor wire feedability would lead to loss of productivity, and could affect weld quality. Rest assured, however, that if you take a few precautionary steps, you could increase your productivity, saving time and money, which are scarce resources during these tough economic times.

To understand better, let's look at each step along the path that the wire travels:

- a) drive roll
- b) gun support at the wire feeder
- c) conduit liner
- d) gun layout

## How can the drive roll in the wire feeder affect feedability?

The drive roll, as the name implies, drives or feeds the wire through the gun by applying pressure on the wire. It, therefore, is important to check the drive roll tension. If the tension is set too low, the wire can slip, resulting in shaving or flat spots on the wire that will produce erratic feed speed and inconsistent arc

lengths. If the tension is set too high, it can cause the wire to be flattened and out of shape, preventing it from passing through the contact tip.

## Gun support at wire feeder end

If the gun support at the wire feeder end is bent too much or if it has weak spots, wire will not travel through the rear entrance of the gun. It is, therefore, important to have a strong rear strain relief at the feeder end of the gun, and it should be able to take the abuse of being continually bent up and down, common during the welding process.

## Are all conduit liners made equal?

Let's begin with the proper installation of the conduit liner.

First, match the size of conduit used with the size of wire being used. For example, using an oversized conduit can cause bunching or surging of wire at the contact tip. On the other hand, too small or too hard a conduit can create more friction and drag that also can affect the weld.

Second, have the proper liner length in the gun. If the conduit is too short, the wire may not line up properly

with the contact tip and create more friction, resulting in abnormal wear of the contact tip and increased feed resistance. If the conduit is too long, the conduit would be forced into a wave-type pattern inside the gun, resulting in resistance in the wire feed.

Third, when inserting the conduit liner, make sure the gun is laid out as straight as possible, and that it is not looped or kinked. And slowly insert the conduit in the gun. A kink in the conduit can cause more friction for the wire as it travels through the conduit, resulting in increased wear on the conduit.

### Gun layout

Similar to the above discussion on preventing kinks while installing the conduit, you should take precaution to lay the gun straight while feeding the wire through it. If the wire has to travel through many loops in the gun, it can affect the speed at which the wire travels through the conduit, causing erratic wire feed. Draping the gun over tools or other fixtures that cause changes in the elevation of the gun could potentially lead to inconsistent wire feed speed.

Well, now that you followed all the proper procedures, you also need to look for symptoms, and correct them to prevent problems down the road.

### Debris build-up

One such symptom is debris build-up at the inlet side of the contact tip. It appears as metal shavings or particles, or lubricants, from the wire, from normal friction and abrasion in the wire feeding process. If not cleared out, it could potentially result in buildup in the tip causing arcing at various points inside the tip. This buildup will continue to impede smooth wire feed and current transfer, resulting in inconsistent wire feed

speeds and possibly wire burnback. Using shop air can help clear the conduit of debris.

### Grooving in the conduit

As discussed earlier, having proper length of the conduit and matching the size of the conduit to the wire are important. If not, grooving could occur in the conduit. This causes increased friction on the wire, which in turn can cause buildup of debris inside the conduit. If it becomes excessive, there is no alternative but to replace the conduit.

### Various other common symptoms

Various other common indicators of failure include, but are not limited to, inconsistent arc length, poor contact tip life, discoloration of liners, or noticeable vibration in the handle of the gun. Each one of these may not seem to be a major issue but together can seriously affect your ability to produce a quality weld.

### Additional care tips

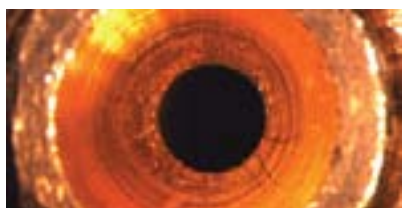
Other factors related to poor wire feedability include a naturally worn out conduit, misalignment of the gun at the wire feeder, and the presence of burrs from wire and from the ends of the conduit. Each of these can be avoided and corrected just by taking proper care during setup.

As with anything, proper care and maintenance of the gun, the conduit liner, and the feed rolls will help you maintain your productivity uptime, saving time and money.

*Send your comments to Thermadyne Products Line Management C/O:*

*indy\_datta@thermadyne.com or to*

*jeff\_henderson@thermadyne.com.*



**Debris accumulated in the interior of the tip with welding wire over time can build up and become very heavy.**



**A clean drive roll surface. If particulate debris builds up it can be carried into the gun with the welding wire and cause feed inconsistencies or wire burnbacks in the tip.**



**A damaged conduit can cause friction between the wire and the conduit and lead to friction and debris.**