

# Tips on Improving Plasma Torch Consumable Life

## 1. KEEP THE CONSUMABLES CLEAN

Buildup of dirt, grease, and metal dust from daily use can easily clog the small holes in the swirl ring and inner retaining cap. These holes are of a specific diameter and direction as to create a vortex of plasma and shielding gas in order to constrict the arc. Once the holes are contaminated, the plasma arc will become skewed, resulting in poor cut quality. Wipe down each piece with a clean shop towel every time you remove them from the torch. When not being used, ensure they are properly stored away from these hazards.



**Clean**



**Clogged Holes**



**Clean**



## **Clogged Holes and Dirty O-Rings**

### **2. ENSURE THE PLASMA GAS PRESSURE IS CORRECT**

The plasma gas pressure setting must remain as close to the prescribed cutting charts as possible. If the pressure is increased by more than 5 psi, the electrode will wear significantly faster. If the pressure is more than 5 psi lower, the nozzle orifice will rapidly become out of round and reduce cut quality.

### **3. VERIFY PROPER PIERCING HEIGHT**

The time it takes the plasma arc to pierce through the plate can be as long as 4.5 seconds. During that time, the molten steel is being forced upwards by the intense gas pressure. Piercing too close to the plate can damage or destroy a shield cap after as little as one pierce. Conversely, using a pierce height that is too far away from the plate will cause a misfire, which will diminish the electrode life. Always ensure you are using the correct pierce height for the material thickness as prescribed in the owner's manual.



**Correct Pierce Height**



**Pierce Height Too High**

**4. DON'T FORGET THE O-RING LUBE**

Use just enough to put a slight sheen on the o-rings. Too much lube will attract dirt and dust particles like a magnet, while too little can result in a damaged o-ring. With a damaged o-ring, gas and coolant can mix inside the consumable chamber of the torch resulting in reduced cut quality.



**Correct Amount**



**Too Much**

**5. DO NOT ADD A CIRCULAR LEAD-OUT WHEN CUTTING HOLES**

Once the torch has completed cutting the perimeter of a hole, the leftover center "slug" will drop out. On holes with a lead-out, this happens before the plasma power supply is able to perform an orderly shutdown of the arc. The arc instantly "snaps off" when the cutting current loses its path to ground, resulting in a significant reduction in electrode life. Instead, use your nesting software to include a small amount of overburn to clean-up the hole.



**Correct**



**Incorrect - Do Not Include A Circular Lead-Out on Holes**

#### **6. MAINTAIN YOUR AIR FILTRATION**

Air supplied from a shop compressor can often be contaminated with dirt particles, water, oil particulates and oil aerosol. Proper filtration is paramount to achieving optimum cut quality and consumable life. Moisture in the air can disrupt the plasma gas mixture, resulting in a deformed arc, while oil particulates and oil aerosols can cause electrode, nozzle, or even torch failure. Refer to this article for more information.

#### **7. REMOVE MATERIAL BUILDUP FROM THE SHIELD CAP**

If the torch drops down from pierce height too soon or inadvertently pierces too close to the plate, molten splatter can attach itself at or around the orifice of the shield cap. Most times

it can be removed easily using an abrasive hand pad (not sand paper). If this splatter is not removed, it can lead to double arcing which can damage the electrode and nozzle.



**Correct**



### **Shield Cap With Splatter**

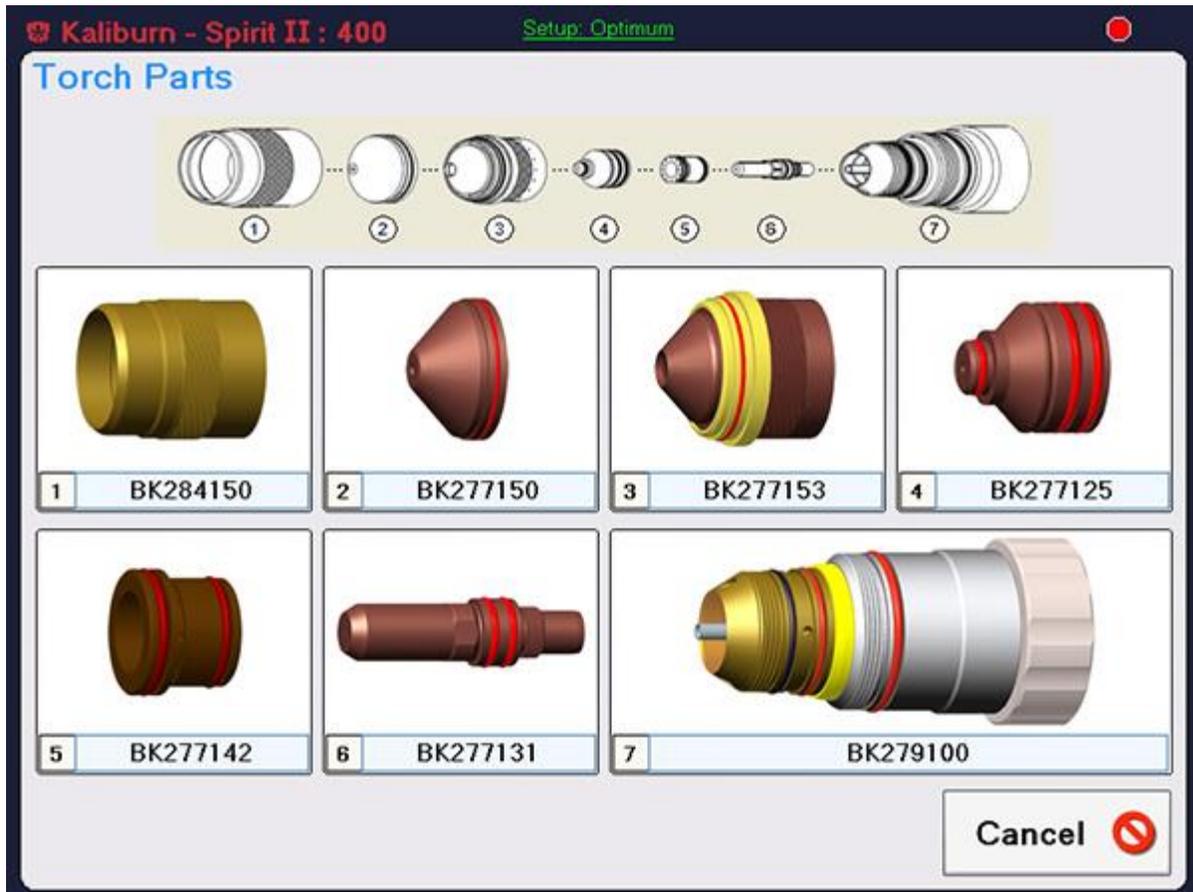
#### **8. STAY WITHIN PRESCRIBED PARAMETERS**

Do not attempt to pierce or cut material that is outside the capability of the selected amperage. This will greatly reduce the life of the shield cap, and possible destroy the nozzle and electrode in as little as one pierce.

#### **9. VERIFY ALL CONSUMABLE PART NUMBERS**

Mixing up consumables from different amperages will result in poor cut quality, misfires, or can cause immediate damage. The Plasma Console on the Spirit® II system automatically displays the necessary consumables for the selected process, material, thickness and

amperage. The owner's manual also contains the correct part numbers and pictures of each consumable.



## Spirit II Plasma Console - Consumables Screen

### 10. READ THE OWNER'S MANUAL

Often overlooked by operators, the owner's manual provides a wealth of valuable information on proper use and care of your equipment. There you will find expert advice on subjects such as piercing thick material, moving pierces and edge starts, cut quality, maximizing consumable life, and inspecting consumables for damage, just to name a few.