

## III PREPARATION FOR USE AND INSTALLATION

Before using the SLICE Torch, carefully follow the procedures noted in this section.

### **3.1 READ THIS MANUAL COMPLETELY**

#### **NOTICE**



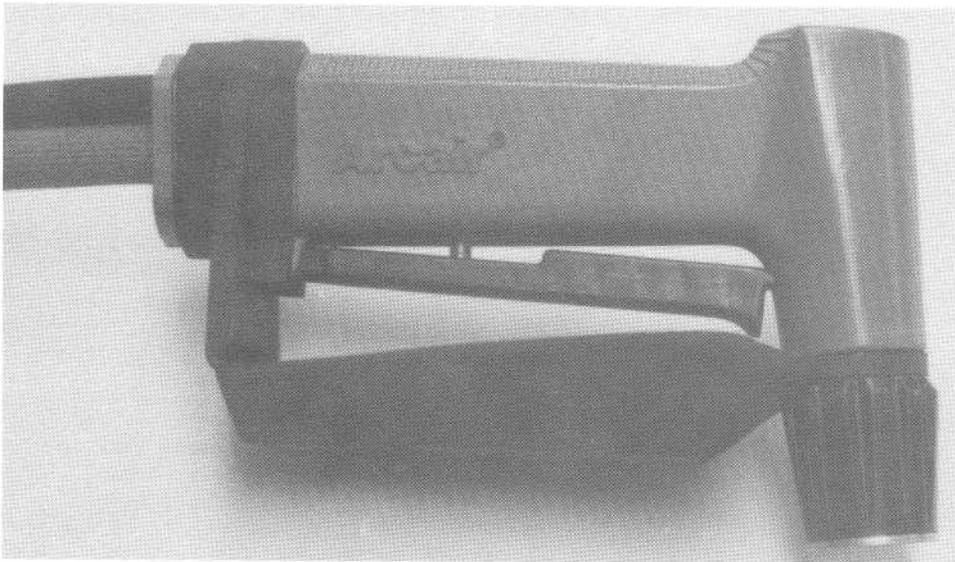
This manual describes for the operators of SLICE equipment and their supervisors the proper and safe operation of SLICE equipment. Before operating this equipment, be sure you are familiar with this manual's contents.

### **3.2 UNPACKING THE SLICE TORCH**

#### **3.2.1 Unpacking Your SLICE Fleet Pack PECU**

Save the boxes so you can store or ship the PECU. It has been shipped fully assembled (oxygen cylinders are not charged). Check the cartons for parts that may have come loose in packing or shipping. See the parts lists in the rear of this manual to identify parts. Any loose parts should be re-assembled by an Arcair distributor unless the user is fully familiar with parts placement. Your assembled torch should look like this:

**FIGURE 2: SLICE TORCH**



### **3.3 OUT-OF-CARTON INSPECTION**

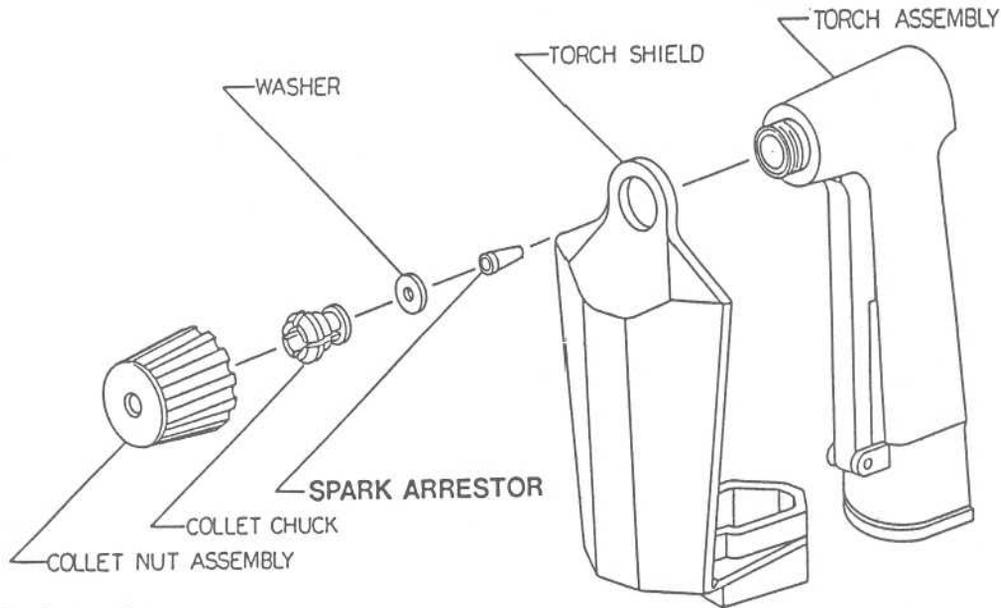
#### **3.3.1 Inspections**

Inspect torch, striker, electric cables, and oxygen supply hose. Check to see that electric cables to the torch and striker are tightly attached. Check to see that the oxygen line is tight in the torch. Also be sure the protective hose end cap is intact. **DO NOT REMOVE CAP NOW!**

Inspect to ensure that the spark arrestor is properly positioned as follows: (SEE FIGURE 3)

- 1) Remove collet nut assembly (over bench or work surface).
- 2) Remove collet chuck and washer
- 3) Inspect for presence of spark arrestor (need not remove)

**FIGURE 3: SPARK ARRESTOR INSPECTION**

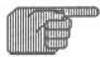


### 3.3.2 Post Inspection

Once the spark arrester's presence is verified, reassemble the torch as follows:

- 1) If removed, replace arrester, pointed end in first.
- 2) Seat washer in torch body.
- 3) Replace collet chuck.
- 4) **HAND TIGHTEN** Collet Nut Assembly.

### CAUTION



Never use this torch without the spark arrester in place. The torch body, hose, and oxygen regulator may be damaged if the spark arrester isn't in place.

## 3.4 MATERIAL REQUIREMENTS

The following is a description of the equipment used with the SLICE Torch.

### 3.4.1 Cutting Rods

Use only Arcair SLICE cutting rods. Always store unused SLICE cutting rods separate from other cutting rods.

Inspect all cutting rods for damage. Do not use a cutting rod that is cut or has holes in the sides of the outer steel wall.

### 3.4.2 Oxygen Supply

#### WARNING



As with any oxygen cutting system, **NEVER** connect the SLICE torch to anything other than oxygen. **Never use air to blow out the oxygen supply lines.**

Never connect the SLICE Torch to air or other gas lines. An oxygen regulator must be used. It must supply at least 60 psi. Do not change hose fittings. Always keep the tank end of the oxygen hose capped when the SLICE torch isn't in use.

### 3.4.3 Electricity

Use an Arcair Battery Assembly or other 12-volt battery capable of a 100A surge (e. g., auto, motorcycle or similar lead-acid battery).

## 3.5 COMPONENTS

### 3.5.1 Battery

When using the SLICE Torch, use the SLICE Battery Assembly. This battery assembly is designed to be used with the SLICE Fleet Pack PECU. It contains a charging unit and quick disconnect for the SLICE Torch and Striker. Do not use any torch that does not have a connection that mates with this battery assembly.

## IV OPERATING INSTRUCTIONS

### 4.1 CARE AND USE OF THE SLICE BATTERY ASSEMBLY

Use the charger/battery assembly for brief emergency repairs or rescue operations. If you need to cut daily on construction or production operations, use a heavier duty battery, such as a car battery. An appropriate charger and jumper cable are recommended.

#### NOTICE



The casual user will average between 30 and 40 strikes from a fully charged battery. If attempts to ignite a rod are continued after the battery won't ignite one, the battery will be over-discharged, resulting in shorter battery life and a longer recharge time. (UP TO 24 HOURS)

#### 4.1.1 Charging The New Battery

The battery assembly is tested and fully charged before it is shipped. However, to ensure that the battery is at peak performance, the charger should be connected to 120 volt AC line voltage using the charge cord supplied, and allowed to charge for at least 12 hours before use.

##### 4.1.1.1 Mode Switch Charging Position

Place the mode switch on the face of the battery assembly in the "CHARGE" position.

The RECHARGE/GOOD meter's pointer will read well into the green area while charging. This reading shows the relative output of the charger **not the state of the battery**. It will, however, read higher as the battery becomes fully charged. (*At full charge the meter reads near the "D" in good*). After removing from the charge position and setting for a while the pointer will fall back to the "G" in good.

To check the battery, press the mode switch to "TEST".

The charger will not harm the battery by over-charging if left on for up to 72 hours continuously. However, for general safety purposes, the battery should not be left on the charger for more than sixteen hours. The battery will gradually lose its charge over a period of time, so to ensure peak performance when needed, place the battery on charge 4 to 6 hours per week while inactive.

#### 4.1.2 Battery Assembly Cycle/Float Life

##### 4.1.2.1 Cycle Life

The cycle life of the battery depends on the depth of discharge before recharging. This life can vary widely based on the type of job and skill of the operator. Typically, cycle life will range from approximately 200 cycles if 100 percent discharged (11.0 volts) to 2000 cycles if only 30 percent discharged (12.0 volts). This calculation assumes a 100 percent recharge in each cycle.

##### 4.1.2.2 Float Life

The float life expectancy is 8 years if held at the manufacturer's recommended 13.6 to 13.8 VDC at 68°F.

#### 4.1.3 Discharged Battery

The meter will read "RECHARGE" when the unit needs recharging. Do not try to ignite a rod if the needle does not read in the green when tested. A normally discharged battery will recover to about 80 percent of capacity after 6 hours on the AC charger.

#### CAUTION



Repeated attempts to ignite a cutting rod from a discharged battery can result in permanent damage to the battery.

#### 4.1.4 Recharging Criteria

ALWAYS recharge the SLICE battery assembly after use and before storage, even if only one or two rods were ignited, or at any time the meter test indication is at or near the RED recharge area. (*The battery will not develop a "memory", an event typically associated with nickel cadmium cells: In such cases, a battery partially discharged and then recharged many times, develops the capacity of the partially discharged level.*)

#### 4.1.5 Battery Rotation

It is also necessary to replace the battery in the battery assembly with the battery that comes in the spare parts package. Failure to change the batteries around at the quarterly inspection will allow the battery in the spare parts package to fail. By switching these batteries quarterly, you can maintain both at acceptable charge levels. Be sure that both batteries are at full charge before storing. Figure 10 shows how to change the batteries.

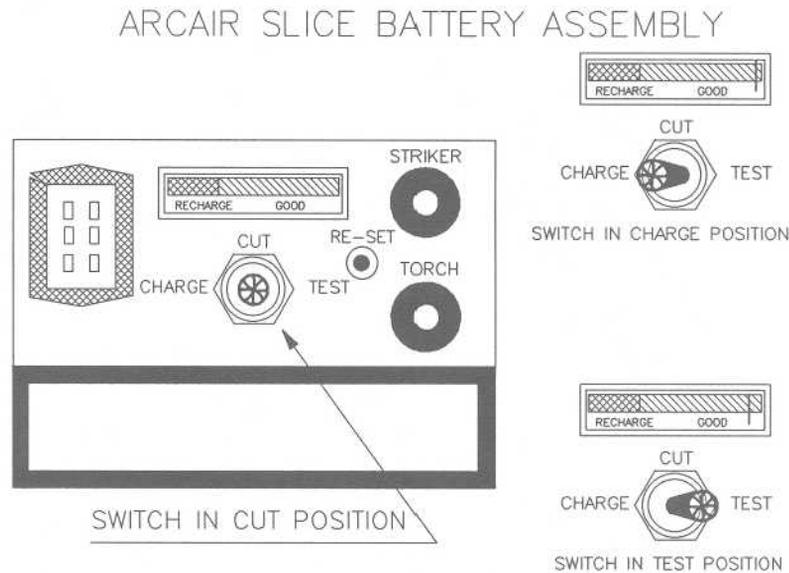
#### 4.1.6 "Cut Mode" Switch Position

Never try to ignite a rod with the mode switch in any position other than "CUT," or with the charging cable connected. An attempt to do so will trip the circuit breaker designed to protect the charge circuit. This prevents the charging system from working when igniting the rod, but does not prevent rod ignition. If this breaker is tripped, reset it prior to attempting to recharge the battery.

#### Breaker Failure Indication

Failure has occurred when the test meter needle moves in the "CHARGE" mode, but doesn't move in the "TEST" mode.

**FIGURE 4 BATTERY ASSEMBLY LAYOUT**



## 4.2 CUTTING

The SLICE Equipment's ability to cut without using a welding power supply means versatility and portability. Because this new cutting system is unlike other methods of cutting, be sure to review the information below before beginning to cut.

### 4.2.1 Getting Ready To Cut

#### Connections

To connect the SLICE Cutting Torch and SLICE Striker:

1. Wipe clean all fittings and cables.
2. Connect the oxygen hose to the oxygen regulator provided, checking to see that oxygen is off.
3. Connect the SLICE Torch and SLICE Striker electrical leads to the battery.

#### CAUTION



The quick disconnects on the SLICE battery assembly are color coded red and black. When using a battery other than the SLICE battery assembly, connect the torch lead to the positive and the striker lead to the negative.

4. Open the oxygen cylinder valve SLOWLY!
5. Regulators supplied with the SLICE Fleet Pack are preset at 60 PSI.

#### To prepare the Torch and Rod

1. Select proper size collet and collet nut for either 1/4" (as shipped) or 3/8" diameter cutting rods.
2. Loosen collet nut assembly, but do not remove it.
3. Insert a SLICE cutting rod into the hole in the Collet Nut Assembly.
4. Tighten the collet nut by hand.
5. Firmly tap the end of the cutting rod on a hard surface not grounded to the battery. This action will seat the rod against the washer inside the torch.
6. Inspect the cutting rod. If oxygen leaks at collet nut, STOP. NEVER use a damaged cutting rod.

### CAUTION



If there is nothing wrong with the rod, tap it again. If the collet nut still leaks replace the seat washer and repeat steps 1 thru 6 above. If it leaks after this remove torch from service immediately for repair.

#### 4.2.2 Igniting The Rod

##### Holding The Torch And Striker

Hold the torch in your cutting hand and the striker in your opposite hand. (SEE FIGURE 5)

**FIGURE 5 IGNITING ROD**

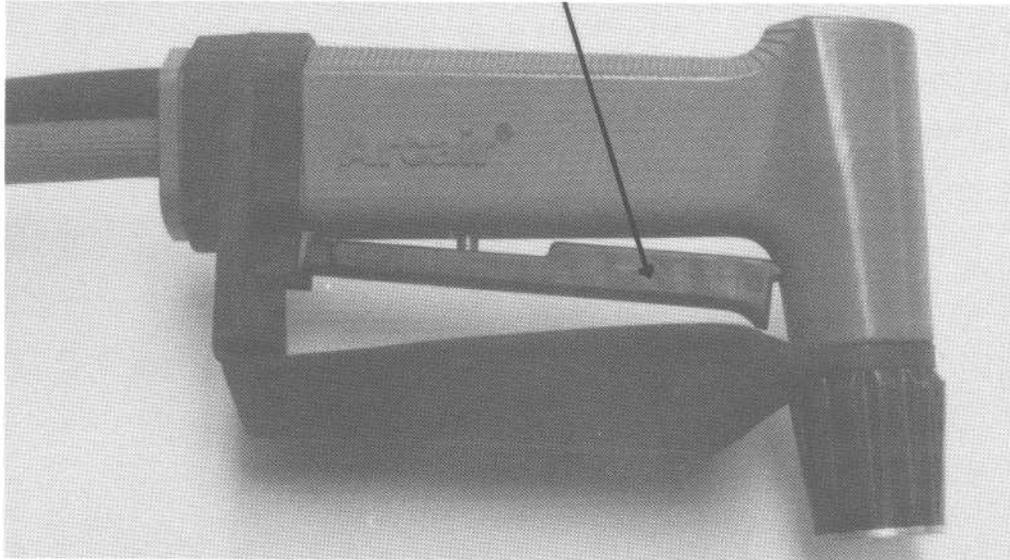


##### Starting Oxygen Flow

Start oxygen flow by squeezing oxygen lever on the torch handle located behind the hand shield (SEE FIGURE 6). This lever has a two stage operation, low oxygen flow and high flow. When igniting the 1/4" diameter rod the first stage, or low flow, will ignite the rod as readily as full flow. This allows a slower consumption of oxygen. The 3/8" diameter rod requires the second stage or full flow for ignition. This two stage lever also slows oxygen consumption when cutting things that require moving from one cut to another, such as rods, bars etc.. Simply go from the second stage to the first stage while moving from one cut to the other. This reduces rod and oxygen consumption.

**\*\*BE SURE HAND SHIELD IS IN PLACE\*\***

**FIGURE 6: OXYGEN LEVER**



#### Getting Rod Ignition

Ignite the cutting rod by touching it to the exposed metal surface (striker bar) on the striker. At the same time, rotate your wrist and use a slight back-and-forth motion against the metal surface. This technique promotes fast ignition of the rod and increases the number of strikes between battery charges. **THE RESULTING ARC WILL IGNITE THE CUTTING ROD.**

#### 4.2.3 Restart Procedures

You may need to restart the SLICE SYSTEM:

- 1) After replacing the cutting rod
- 2) After experiencing cutting rod "Blow Out" (Igniting Side of Cutting Rod)
- 3) After experiencing cutting flame "Blow Out".
- 4) When restarting a job.
- 5) After replacing the oxygen supply

#### Replacing The Cutting Rod

##### 1. Rod Is Consumed.

If the cutting rod is shorter than three inches (7.5 cm) or is defective, it must be replaced. After the cutting rod cools loosen the collet nut by hand until the old cutting rod can be pulled free. (Do not use bare hand) Insert a new cutting rod and push it firmly into the collet (inside handle) and tighten the collet nut. Tap cutting rod on hard ungrounded surface to seat cutting rod on washer.

Follow standard ignition procedure.

##### 2. Side Of Cutting Rod Blow Out.

If the side of a cutting rod is struck against a grounded surface, it may ignite. Oxygen flow should be stopped right away. This damaged cutting rod **MUST** be replaced. **DO NOT** reuse a damaged cutting rod.

##### 3. Sealed Cutting Rod.

A cutting rod may seal shut during use, especially if oxygen flow is stopped before removing the cutting rod from the work piece. To correct this problem, touch the tip of the rod to the striker. When the arcing begins, turn on the oxygen flow. You may need to repeat this procedure to completely clear the cutting rod.

#### 4. Blow Out Of Cutting Flame.

The flame may go out while you're cutting, especially on ungrounded materials. To restart the rod, simply follow standard ignition procedures. If the cutting rod continues to go out during use:

A. Try a slower cutting speed. Moving the torch too fast may create an incomplete cut which can result in blowing out the flame.

B. Be sure there is oxygen in the cylinder.

#### 5. Need To Replace Oxygen Supply.

If the oxygen supply must be replaced:

A. Turn off the oxygen at torch by releasing the lever in the handle.

B. Shut off the oxygen line pressure at the supply valve.

C. Blow off the oxygen line pressure by squeezing oxygen lever in the handle of the torch.

D. Replace empty cylinder with full cylinder.

#### 4.2.4 Beginning The Cut

IMMEDIATELY remove the cutting rod from the striker. Rest the striker on a safe surface away from the work piece AND MOVE THE ROD QUICKLY TO THE CUTTING SURFACE.

#### 4.2.5 Cutting Technique

Cutting procedures will vary from job to job. Normal cutting is done by using a drag technique. Once the rod is in contact with the piece to be cut, drag the rod in the direction of the cut. If the operator can't see the kerf, the speed of cut is too fast. If the rod is being used too rapidly the progress of the cut is too slow and the rod is being used without cutting. REMEMBER, the cutting rods consume as long as the oxygen is flowing. Maintain the proper travel speed at all times. NOTE: Use a sawing motion when material to be cut is thicker than 1-1/2 to 2 inches to ensure a complete melt through.

Use a smooth motion to complete the cut. Be careful not to hit nearby material with the rod when cutting in "close quarters." After completing the cut, release the oxygen control lever in the handle. THE CUTTING ROD WILL CONTINUE TO BURN AS LONG AS OXYGEN IS SUPPLIED. Hold the torch safely away from you until the rod cools.

#### 4.2.6 Piercing Techniques

The SLICE Torch can be used to pierce solids. Special procedures must be used when piercing. When piercing, use a collet extension (and shield). This extension adds life to the torch and hand shield, and greatly improves operator safety and comfort.

#### Special Precautions

Always hold the torch at arm's length and wear protective clothing, eye and ear protection. Cutting rods can get stuck inside the pierced hole. If possible, remove the cutting rod from the hole before releasing the oxygen lever. Ensure the safety of whatever is being pierced.

#### Pierce Procedure

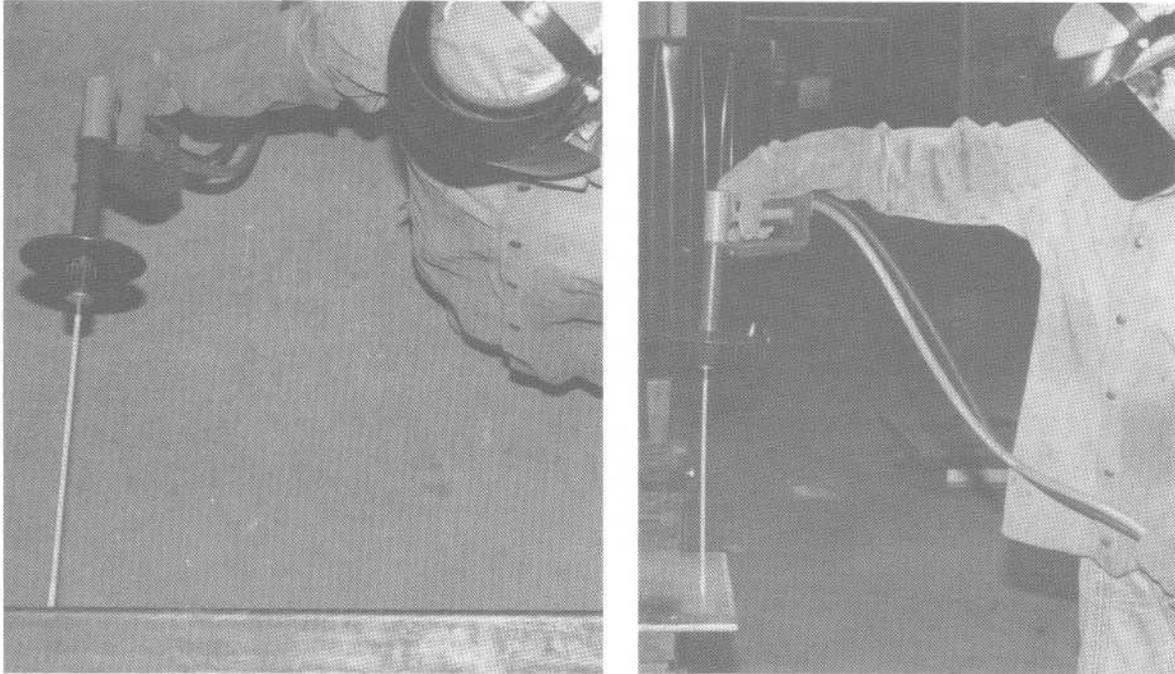
#### WARNING



With any thermal cutting equipment blowback is most likely to occur when the user's piercing holes. Cutting rods may burn unevenly, burn out the side or get stuck in the hole. Slowly swirl the cutting rod as it enters a pierced hole to help avoid these problems. Correct any problem by removing the cutting rod from the pierce point, shut the oxygen off, and replace the cutting rod.

Follow these procedures when piercing. Strike cutting rod on striker igniting the rod. Hold torch at arm's length. (SEE FIGURE 7)

**FIGURE 7: PIERCE PROCEDURE**



Keep the cutting rod at a 90° angle (perpendicular) to the pierce point. Slowly push cutting rod in at pierce point until you're at proper depth or until you've achieved burn through.

#### Stuck Cutting Rod

The cutting rod may get stuck in the hole. If it does, try to swirl the rod loose. If the cutting rod won't come out, stop the burn. Remove the cutting rod from the torch, and pull the cutting rod free from the hole. If necessary, leave the cutting rod in the hole and cut it free with another cutting rod.

#### Completing The Pierce

**\*\*DO NOT SHUT OFF THE OXYGEN WHILE THE CUTTING ROD IS INSIDE THE PIERCED HOLE\*\***

Carefully pull the cutting rod out of the pierced hole WHILE IT IS STILL BURNING. STOP CUTTING (REMOVE FROM WORK PIECE) AND RELEASE OXYGEN. DO NOT TRY TO RE-START THE CUTTING ROD WHILE IT IS STILL INSIDE THE HOLE.

### **4.3 NORMAL SHUT DOWN**

Follow these procedures after using the PECU:

#### Oxygen Shut Down

1. Shut off oxygen at the bottle.
2. Clear the oxygen lines to the torch turning the torch away from you and squeezing the oxygen lever.

**\*\*NEVER BLOW OXYGEN TOWARDS HEAT OR FLAMES\*\***

#### **CAUTION**



Never keep oxygen pressure on a portable torch when it is not attended.

3. Always remove the cutting rod by loosening the collet nut and pulling the rod free. **WEAR PROTECTIVE GLOVES!**  
Re-tighten collet nut by hand.

4. Put all PECU parts back in carrying case.

#### After Use Inspection

Inspect the torch for:

1. Contaminants

Dirt, oil or grease on cables or hoses. Wipe clean.

Inspect striker (or ground clamp) for any build up of slag, ash, or dirt. Clean with a wire brush or tap off the loose material.

2. Damage

Check the torch and striker for burned or worn cables or fittings.

Inspect the shield for burns or other damage.

**4.4 EMERGENCY SHUT DOWN**

**\*\*STOP OXYGEN FLOW\*\*** In case of an emergency or error, do these things:

Basic Fault - Standard Shut Off

Possible faults

1. Cutting rod blows out of torch.
2. Cutting rod sticks to work piece
3. Side of cutting rod blows out.

Release the oxygen lever on the handle, disconnect the battery. Locate and correct the fault.

Failure In Oxygen Shut Off (Lever) - Internal Burn.

In the unlikely event that the oxygen lever fails to stop the flow of oxygen or a fire develops in the handle of the oxygen hose, do the following.

1. Shut down the oxygen supply at the cylinder.
2. Remove the rod from the work piece.
3. Find the cause of the problem and correct it.
4. Replace all damaged parts.

## V INSPECTION AND MAINTENANCE INSTRUCTIONS

### 5.1 DAILY MAINTENANCE

The equipment should be inspected daily so it is ready when needed.

#### 5.1.1 Oxygen Supply System Inspection

Check these items daily:

1. Be sure there is a full cylinder of oxygen.
2. Inspect connections to make sure there are no leaks.
3. Verify that cutting rods are available.

#### 5.1.2 Battery Assembly Inspection

Push the mode switch on the face of the battery box assembly to the "TEST" position and note that the meter indicates an acceptable charge level.

#### NOTICE



The heart of the SLICE cutting system is a properly charged battery. Be sure to establish procedures to inspect the battery's charge.

In cold climates, keep the unit at room temperature during the winter months. Like the battery in your car, the SLICE battery's efficiency is reduced in cold weather.

### 5.2 INSPECTION AND CLEANING AFTER NORMAL USE

The system should be cleaned and inspected for any damage that may have occurred in the field.

Follow these steps:

1. Inspect the hoses and cables for cuts or burns.
2. Be sure the unit is dry before storing.
3. Remove the collet nut and inspect the collet for damage.
4. Be sure the washer that seats the rod is not cut or worn. If it shows signs of cutting or wear, replace the washer. A worn washer can block the oxygen flow preventing the rod from burning properly. A cut washer can allow oxygen to leak around the rod preventing proper operation.
5. Inspect the spark arrestor to be sure it is clean. Smoke, dirty water, ash and debris can plug the spark arrestor. If plugged the rod won't get enough oxygen to burn right. If the spark arrestor is damaged or dirty, replace it.

### 5.3 INSPECTION AND CLEANING THE TORCH AFTER HEAVY USE

The SLICE unit is in "heavy use" when it is exposed to mud, dirty water, salt water or if the unit is dropped, left in a fire, or exposed to other possible harm.

#### CAUTION



Do not use soap or solvents to clean the parts. Use only clean, fresh water and be sure the parts are dry before re-assembly.

Do the steps in 5.2 and also:

1. Disconnect the torch from the battery assembly.
2. Remove the collet nut, collet, washer, spark arrestor and the extension if in place. Wash in clean water and dry. Inspect for damage. If the spark arrestor is coated with mud or other substance replace it with a new arrestor. A plugged spark arrestor could keep your unit from working right.
3. Remove the hand shield from the torch handle and wash in clean fresh water.
4. Disassemble the torch handle and wash in clean fresh water.
5. Before removing the oxygen hose, clean the remaining parts in plain water and dry well.
6. Remove the oxygen hose and inspect it to ensure there is no water, soot, mud etc. in the hose or oxygen valve. If the hose shows signs of contamination remove it from the regulator and replace it with a new hose. There is no way to clean the inside of this hose. If mud or soot remains in the hose it could plug the spark arrestor and prevent the rod from burning well.
7. If you see any dirt during your inspection of the oxygen valve assembly replace the torch head assembly.
8. After all components have been cleaned or replaced put the torch back together. Be sure all parts are dry before re-assembly.