

**SL60 and SL100  
Replacement Plasma  
Cutting Hand Torches**

**Installation and Operation Instructions**

**General Information**

The 1Torch™ SL60 and SL100 Torches work with most plasma cutting power supplies. The Torches are equipped with either O2B connectors or the Thermal Dynamics ATC connector and are connected using various Adapter Kits sold separately.

A label on the torch handle indicates the torch model number. SL60 Torches provide cutting capabilities of up to 60 amperes. SL100 Torches provide cutting capabilities of up to 100 amperes. The torches use compressed air as both the plasma and secondary gas.

The torches are suitable for drag cutting (with the torch tip in contact with the workpiece, at up to 40 Amps output); 40-100 Amp shielded drag cutting (with shielded torch parts (cap, etc.) in contact with the workpiece); standoff cutting; or gouging.

Refer to the Complete Assembly Replacement page for configurations and catalog numbers.

These instructions are important for the proper installation of the Torches. Read the instructions thoroughly before attempting the installation. Keep these instructions for reference.

**Supplied Parts**

The Replacement Torches include:

- Torch With Leads - 1 each
- Installation Instructions - 1 each
- Consumables (Installed on the Torch): Electrode, Starter Cartridge, Tip, Shield Cup Body and Drag Shield Cap)

**NOTE**

*The consumable parts installed in the Torch may not necessarily be optimized for your Power Supply or cutting application. For best results, refer to the selection charts in this manual to choose the proper consumables for your application.*

**Options**

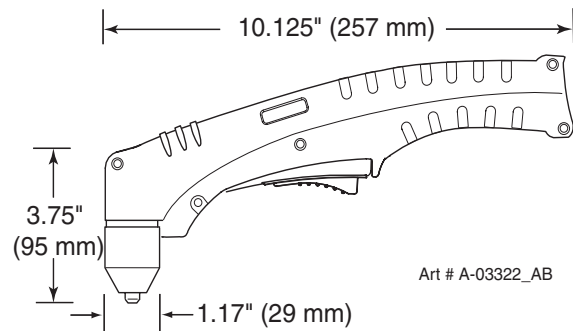
The following options are available. Refer to the complete assembly replacement list for catalog numbers.

- ATC Adapter Kit (for Torches with ATC Connectors)
- Leads extensions (for Torches with ATC Connectors)
- Cutting Guide Kits
- Leather Leads Covers
- Standoff Cutting Guide

**Torch Specifications**

**A. Torch Configurations and Dimensions**

The torch head is at either 75° or 90° to the torch handle. The torch includes a torch handle and torch trigger assembly.



**B. Torch Leads Lengths**

20 foot / 6.1 m, or 50 foot / 15.2 m

For torches with ATC Connectors, leads extensions are available to extend the leads to a maximum of 50 feet / 15.2 m. Total leads lengths must not exceed the power supply manufacturer's recommendations.

## C. Current Rating (Refer to Note)

| SL60 & SL100 Current Ratings |                                       |
|------------------------------|---------------------------------------|
| SL60 Torch & Leads           | Up to 60 Amps, DC, Straight Polarity  |
| SL100 Torch & Leads          | Up to 100 Amps, DC, Straight Polarity |

### NOTE

Power Supply characteristics will determine material thickness range.

## D. Torch Ratings

| SL60 Torch Ratings           |                           |
|------------------------------|---------------------------|
| Ambient Temperature          | 104° F<br>40° C           |
| Duty Cycle                   | 100% @ 60 Amps @ 400 scfh |
| Maximum Current              | 60 Amps                   |
| Voltage (V <sub>peak</sub> ) | 500V                      |
| Arc Striking Voltage         | 7kV                       |

| SL100 Torch Ratings          |                            |
|------------------------------|----------------------------|
| Ambient Temperature          | 104° F<br>40° C            |
| Duty Cycle                   | 100% @ 100 Amps @ 400 scfh |
| Maximum Current              | 100 Amps                   |
| Voltage (V <sub>peak</sub> ) | 500V                       |
| Arc Striking Voltage         | 7kV                        |

## E. Type of Cooling

Combination of ambient air and gas stream through torch.

## F. Gas Requirements

| SL60 and SL100 Torch Gas Specifications    |                                   |
|--|-----------------------------------|
| Gas (Plasma and Secondary)                 | Compressed Air                    |
| Operating Pressure<br><i>Refer to NOTE</i> | 60 - 75 psi<br>4.1 - 5.2 bar      |
| Maximum Input Pressure                     | 125 psi / 8.6 bar                 |
| Gas Flow (Cutting and Gouging)             | 300 - 500 scfh<br>(142 - 235 lpm) |



### WARNING

This torch is not to be used with oxygen (O<sub>2</sub>).

### NOTE

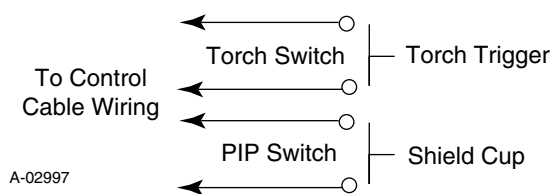
Operating pressure varies with torch model, operating amperage, and torch leads length. Refer to gas pressure settings chart for each model.

## G. Direct Contact Hazard

For exposed tip the recommended standoff is 1/8" - 1/4" (3 - 6.4 mm).

## H. Parts-In-Place (PIP) Circuit - 12 vdc

The torch and leads include circuitry called Parts-In-Place (PIP). This circuit includes a switch located at the torch head. The shield cup closes this switch when properly installed. The torch will not operate if this switch is open.



## Connecting Torch

There are two types of connection for the Torch Leads. One type uses the Thermal Dynamics ATC connector. The other uses O2B connections for gas and circuitry. Both types require an adapter kit sold separately.

### ATC Connectors

Follow the instructions provided with the adapter kit to connect the adapter to the power supply.

Inspect the halves of the ATC Connector. Align the male connector with the female receptacle and push them together by hand until they seat fully. Turn the Locking Ring until it pulls the halves of the connector together fully. Do not use tools to tighten the connector. If there is any resistance to the ring turning, pull the halves of the connector apart, realign the inner components, ensure that the threaded components are aligned, and push the halves of the connector together again.

### O2B Connectors

Leads with O2B connectors are connected to the power supply using adapter kits sold separately. Follow the instructions provided with the adapter kit to connect the gas and electrical lines to the power supply.

## Spare Parts Label

The parts kit provided with the torch includes an adhesive label. Select the small perforated section showing the appropriate pressure setting for the amperage output and leads length to be used with this torch. Refer to the charts. Apply this section in the 'Gas Supply' area of the label under the 'Recommended Operating Pressure' text. Discard any pressure setting sections of the label that will not be used. Apply the large label to the power supply, where the operator can see it for easy reference.

## Torch Parts Selection

Refer to the **Consumables Selection Chart** for the various torch parts for the application and operation.



### WARNINGS

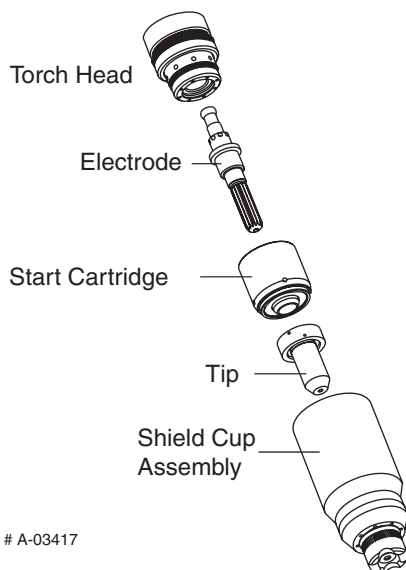
*Disconnect primary power to the system before disassembling the torch or torch leads.*

*DO NOT touch any internal torch parts while the AC indicator light of the Power Supply is ON.*

The shield cup (or shield cup body and shield cap or deflector) holds the tip and starter cartridge in place. Position the torch with the shield cup facing upward to keep these parts from falling out when the cup is removed.

Change the torch parts as follows:

1. Unscrew and remove the shield cup from the torch head.



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2. Tilt the torch head to remove the tip and starter cartridge.
3. Fit the desired starter cartridge and tip onto the electrode.

#### NOTE

*Refer to the consumables selection chart for the proper combination of torch parts, including shield cups and caps.*

4. Hand tighten the shield cup until it is seated on the torch head. **Do not use tools to tighten the cup.** If resistance is felt when installing the cup, check the threads before proceeding.

#### NOTE

*When operating the torch in a normal condition, a small amount of gas vents through the gap between the shield cup and the torch handle. Do not attempt to overtighten the shield cup as irreparable damage to internal components may result.*

## Gouging Parts Selection

Select gouging tips according to the desired gouge profile. Gouging parameters shown are based on a 35° approach angle.

| Gouging Profiles |              |          |          |
|------------------|--------------|----------|----------|
|                  | Output Range | Depth    | Width    |
| Tip A            | 40 Amps Max. | Shallow  | Narrow   |
| Tip B            | 40-100 Amps  | Deep     | Narrow   |
| Tip C            | 40-100 Amps  | Moderate | Moderate |
| Tip D            | 40-100 Amps  | Shallow  | Wide     |

## Operating Gas Pressure

Set gas pressure at the power supply regulator according to the following charts. These charts are a guide only; adjust as necessary for best performance.

| SL60 Gas Pressure Settings |                  |                  |
|----------------------------|------------------|------------------|
|                            | Leads Length     |                  |
| Tip                        | 20' / 6.1 m      | 50' / 15.2 m     |
| 30A, 40A, 50/55A, 60A      | 65 psi / 4.5 bar | 75 psi / 5.2 bar |

| SL100 Gas Pressure Settings     |                   |                  |
|---------------------------------|-------------------|------------------|
|                                 | Leads Length      |                  |
| Tip                             | Up to 25' / 7.6 m | 50' / 15.2 m     |
| 30A, 40A, 50/55A, 60A, 70A, 80A | 60 psi / 4.1 bar  | 65 psi / 4.5 bar |
| 90/100A                         | 65 psi / 4.5 bar  | 70 psi / 5.2 bar |

## Cutting or Gouging

The torch can be held comfortably in one hand or steadied with two hands. Choose the holding technique that feels most comfortable and allows good control and movement.

## Sequence of Operation

1. Turn on power and adjust gas pressure on the Power Supply pressure gauge. Refer to the charts for optimum pressure settings for the combination of torch tip and total leads lengths (including extensions) in use.
2. Adjust current output on the Power Supply to match the selected tip and attach the work clamp firmly to the work.



### WARNING

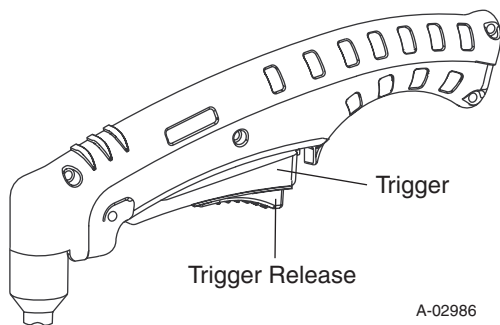
Maximum current for is 60 Amps for SL60 Torches, or 100 Amps for SL100 Torches. Operation of this torch at higher outputs may damage the torch, the leads, or the Power Supply. DO NOT operate the SL60 Torch at more than 60 Amps, or the SL100 at more than 100 Amps.



### CAUTION

Do not operate the torch with the torch tip in contact with the work at outputs greater than 40 amps. Drag cutting at higher output currents can cause irreparable damage to the torch parts. Use only shielded parts at output currents higher than 40 amps.

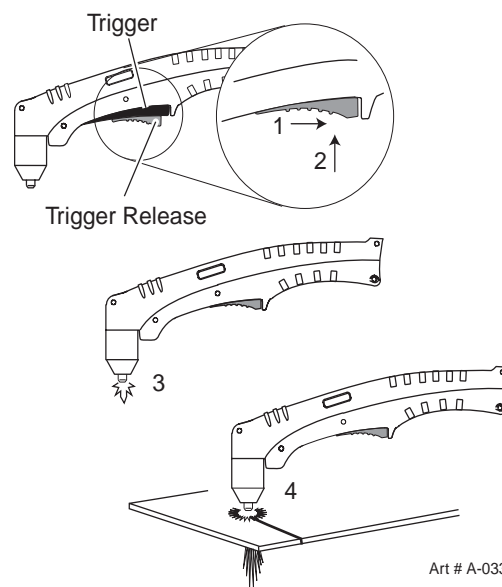
3. Hold the torch away from your body.
4. Slide the trigger release toward the back of the torch while simultaneously squeezing the trigger. The pilot arc will start.



5. Bring the torch within transfer distance to the work. The main arc will transfer to the work, and the pilot arc will shut off.

### NOTE

The gas preflow and postflow are a characteristic of the power supply and not a function of the torch.

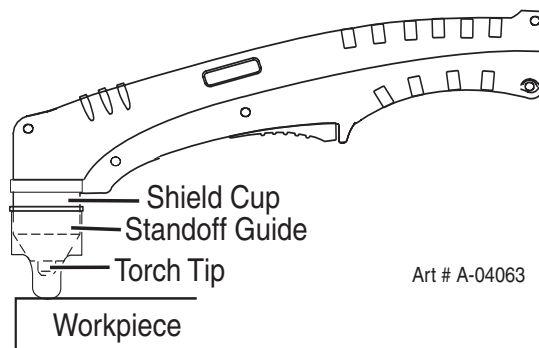


6. Cut as usual. Simply release the trigger assembly to stop cutting.
7. Follow normal recommended cutting practices as provided in the power supply operator's manual.

### NOTE

When the shield cup is properly installed, there is a slight gap between the shield cup and the torch handle. Gas vents through this gap as part of normal operation. Do not attempt to force the shield cup to close this gap. Forcing the shield cup against the torch head can damage components.

8. The optional Standoff Guide allows the user to easily adjust and maintain a consistent standoff height for most applications.



## Common Operating Faults

The following are the more common cutting faults and the possible causes:

### 1. Insufficient Penetration

- a. Cutting speed too fast
- b. Torch tilted too much
- c. Metal too thick
- d. Worn torch parts
- e. Cutting current too low
- f. Non-Genuine Thermal Dynamics Parts

### 2. Main Arc Extinguishes

- a. Cutting speed too slow
- b. Torch standoff too high from workpiece
- c. Cutting current too high
- d. Work cable disconnected
- e. Worn torch parts
- f. Non-Genuine Thermal Dynamics Parts

### 3. Excessive Dross Formation

- a. Cutting speed too slow
- b. Torch standoff too high from workpiece
- c. Worn torch parts
- d. Improper cutting current
- e. Non-Genuine Thermal Dynamics Parts

### 4. Short Torch Parts Life

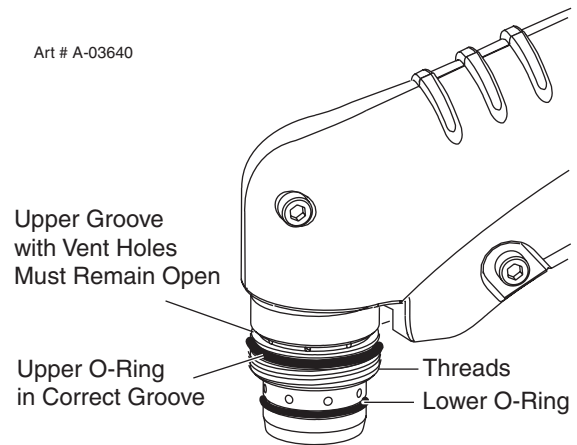
- a. Oil or moisture in air source
- b. Exceeding system capability (material too thick)
- c. Excessive pilot arc time
- d. Gas pressure too low
- e. Improperly assembled torch
- f. Non-Genuine Thermal Dynamics Parts

### 5. Difficult Starting

- a. Worn torch consumables
- b. Non - Genuine Thermal Dynamics Parts

### 6. Torch will not pilot when torch switch is activated

- a. Upper O-ring on torch head is in wrong position



## Inspection and Replacement of Consumable Torch Parts

### A. General Information



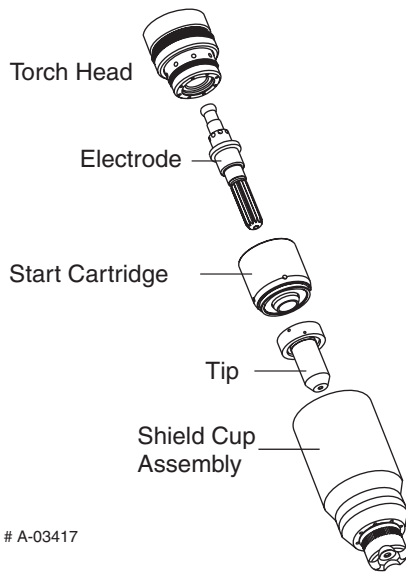
#### WARNINGS

Disconnect primary power to the system before disassembling the torch or torch leads.

DO NOT touch any internal torch parts while the AC indicator light of the Power Supply is ON.

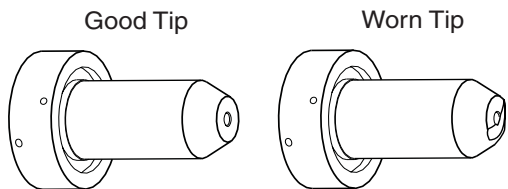
Unthread the shield cup assembly to remove the consumable torch parts.

1. Inspect the cup for damage. Wipe it clean or replace if damaged. Slag built up on the shield cup that cannot be removed may affect the performance of the system.



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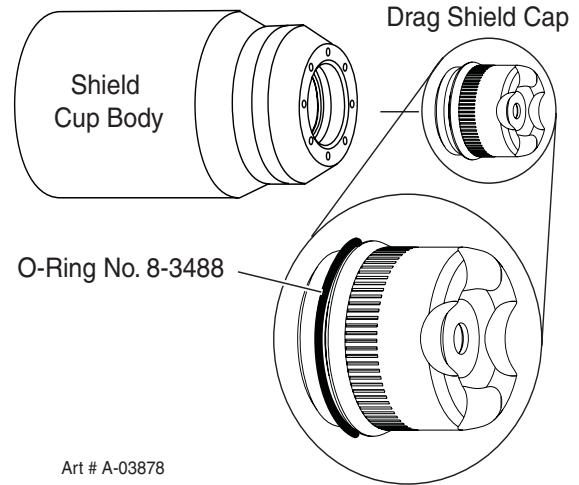
2. Check the tip for excessive wear (indicated by an elongated or oversized orifice). Clean or replace the tip if necessary.



A-03406

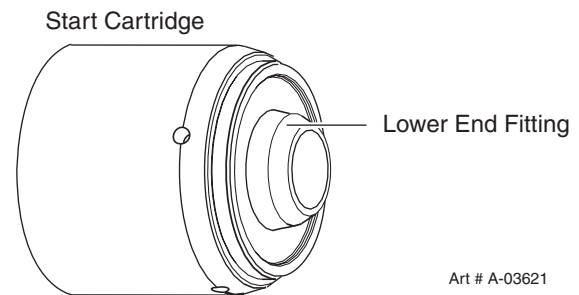
3. On torches with a shield cup body and a shield cap or deflector, ensure that the cap or deflector is threaded snugly against the shield cup body. In shielded drag

cutting operations (only), there may be an O-ring between the shield cup body and drag shield cap. Do not lubricate the O-ring.



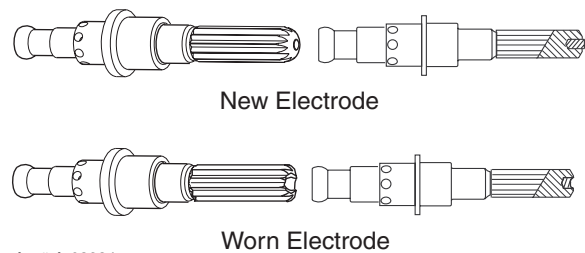
Art # A-03878

4. Check the starter cartridge for excessive wear, plugged gas holes, discoloration, and for free movement of the lower end plate. Replace if necessary.



Art # A-03621

5. Check the end of the electrode for excessive wear.



Art # A-03284



- Reinstall the Electrode by pushing it straight into the torch head until it clicks.



#### WARNINGS

*Refer to the consumables selection charts for the proper combination of torch parts, including shield cups and shield caps.*

*The use of any consumable parts other than those specified by the Manufacturer may cause irreparable damage to the torch head.*

- Reinstall the desired starter cartridge and tip into the torch head.
- Hand tighten the shield cup until it is seated on the torch head. If resistance is felt when installing the cup, check the threads before proceeding.

#### NOTE

*When operating the torch in a normal condition, a small amount of gas vents through the gap between the shield cup and the torch handle. Do not attempt to overtighten the shield cup as irreparable damage to internal components may result.*

### B. O-Ring Lubrication

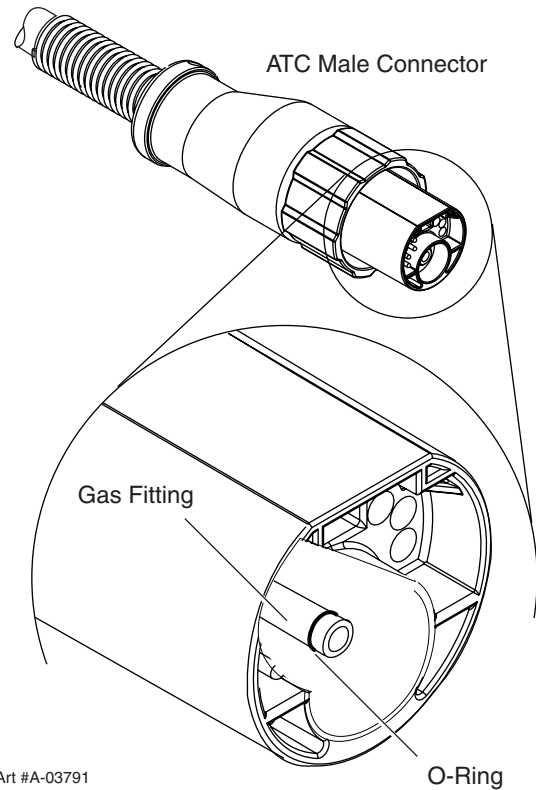
This section applies only to torches with ATC connectors.

An o-ring on the Torch ATC Male Connector requires lubrication on a regular basis, depending on how frequently the torch is disconnected and re-connected. This will allow the o-ring to remain pliable and provide a proper seal. The o-ring will dry out, becoming hard and cracked, if the o-ring lubricant is not used on a regular basis. This can lead to potential performance problems.

It is recommended to apply a very light film of o-ring lubricant (Catalog # 8-4025) to the o-ring on a weekly basis.

#### NOTE

*DO NOT use other lubricants or grease, they may not be designed to operate within high temperatures or may contain "unknown elements" that may react with the atmosphere. This reaction can leave contaminants inside the torch. Either of these conditions can lead to inconsistent performance or poor parts life.*



## Torch Consumables

The illustrations show all consumable parts for the SL60 and SL100 torches.

Various front - end torch parts are available for different applications.

**Drag Tip Cutting:** Use the single - piece shield cup for general purpose cutting operations with the torch tip in contact with the work (up to 40 amps). This is the preferred method of cutting sheet metal up to 3/16" or 4.8 mm thick.

**Standoff Cutting:** Also use the single - piece Shield Cup for 'standoff' cutting (with the torch tip 1/8" to 1/4" from the workpiece). This is the preferred method for cutting metal thicker than 3/16" / 4.8 mm and at current levels above 40 amps. This provides maximum visibility and accessibility.

Use the Shield Cup Body with the Deflector Shield Cap for extended parts life and improved resistance to reflected heat. This combination provides cutting results similar to the single-piece Shield Cup, as well as easy change-over to gouging or drag shield cutting.

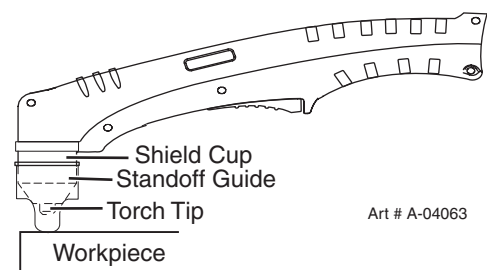
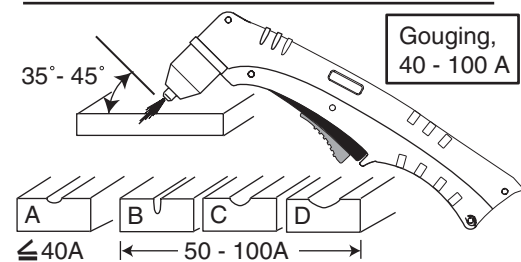
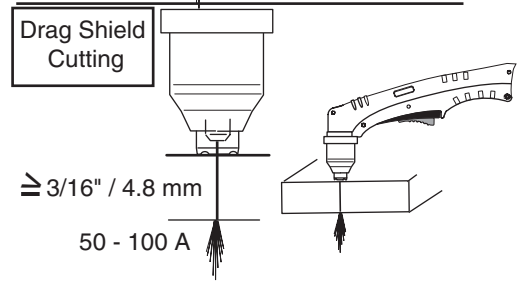
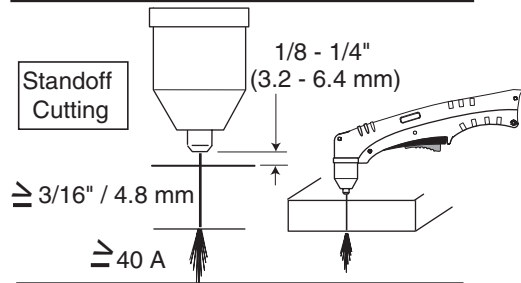
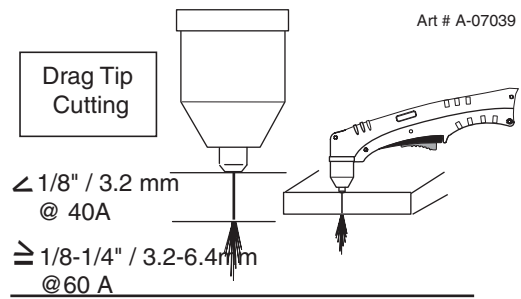
**Drag Shield Cutting:** Use the Shield Cup Body with the Drag Shield Cap for a consistent standoff distance with the drag shield in contact with the workpiece. This is a simple and operator-friendly method of cutting between 50 and 100 amps.

**Gouging:** Use the Shield Cup Body with the Gouging Shield Cap for excellent gouging performance and enhanced torch parts life.

The **Standoff Guide** fits all shield cup designs for the SL60 and SL100 RPT hand torches. The Guide allows the user to easily adjust and maintain a consistent standoff height for most applications. The Standoff Guide also fits Thermal Dynamics PCH-62 and PCH-102 hand torches.

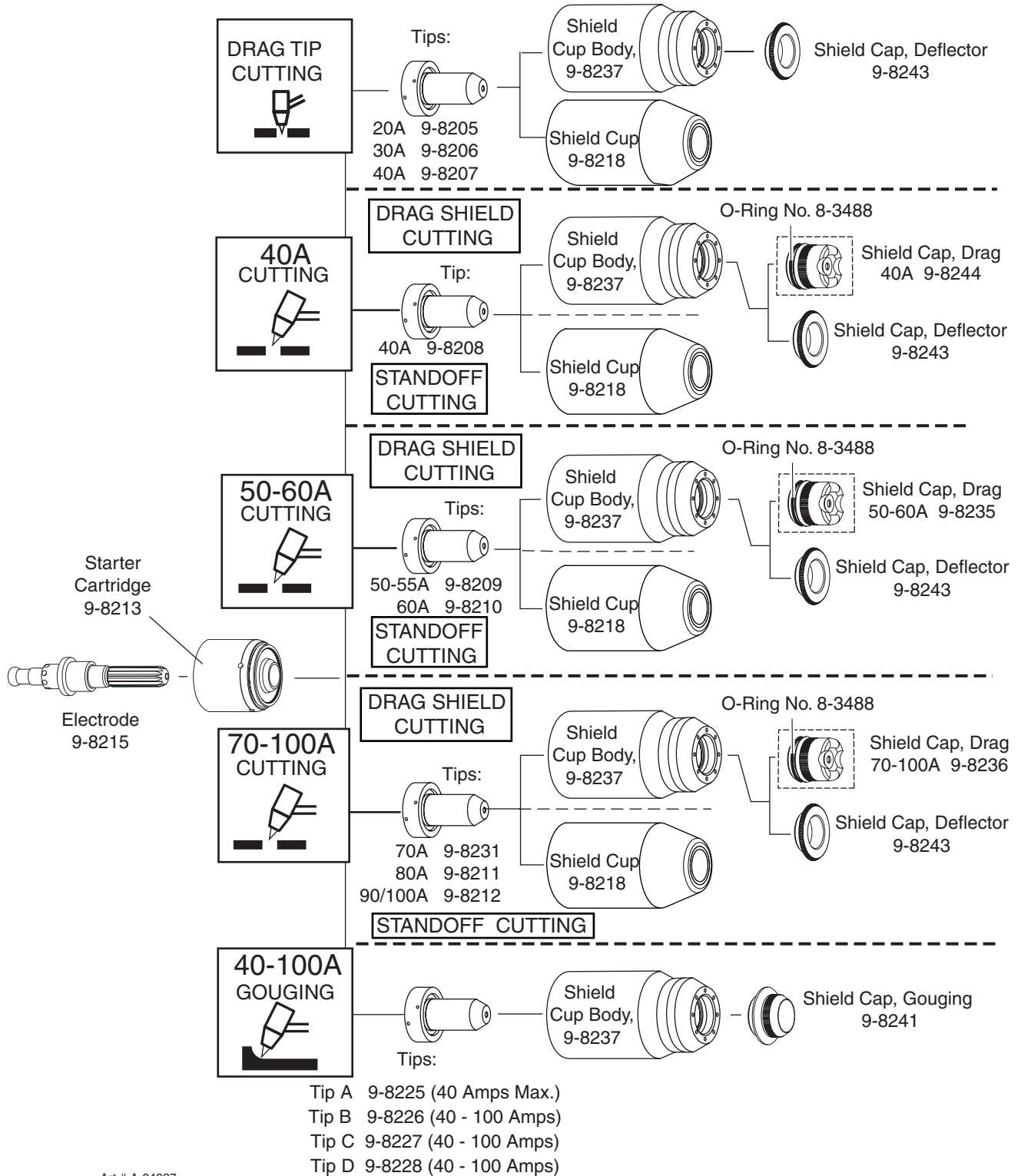
The electrode and starter cartridge are the same for all applications.

Use only Genuine Thermal Dynamics consumables with this torch. The use of any other consumables may irreparably damage the torch and/or void the warranty.



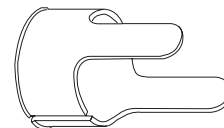


# Consumables Selection



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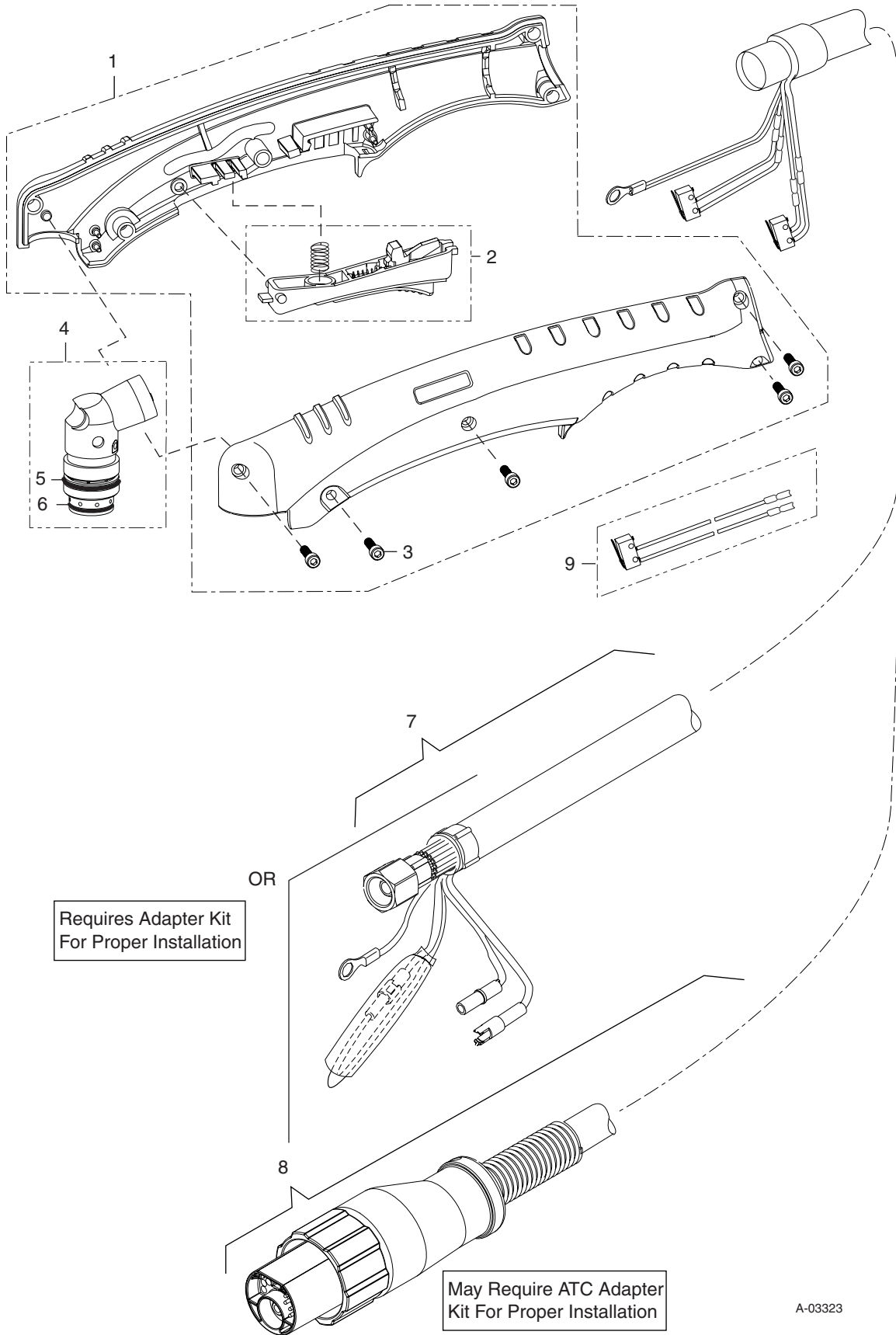
| Gouging Profiles |              |          |          |
|------------------|--------------|----------|----------|
|                  | Output Range | Depth    | Width    |
| Tip A            | 40 Amps Max. | Shallow  | Narrow   |
| Tip B            | 40-100 Amps  | Deep     | Narrow   |
| Tip C            | 40-100 Amps  | Moderate | Moderate |
| Tip D            | 40-100 Amps  | Shallow  | Wide     |



Standoff Guide  
for All Applications  
9-8422

## Replacement Hand Torch Parts

| Item #     | Qty | Description   | Catalog # |
|------------|-----|---|-----------|
| 1          | 1   | 75° Torch Handle Replacement Kit (include items no. 2 & 3)  | 9-7030    |
| 1          | 1   | 90° Torch Handle Replacement Kit (include items no. 2 & 3)  | 9-7037    |
| 2          | 1   | Trigger Assembly Replacement Kit  | 9-7034    |
| 3          | 1   | Handle Screw Kit (5 each, #6-32 x 1/2" cap screw, and wrench)   | 9-8062    |
| 4          | 1   | 75° Torch Head Assembly Replacement Kit (includes items No. 5 & 6)  | 9-8219    |
| 4          | 1   | 90° Torch Head Assembly Replacement Kit (includes items No. 5 & 6)  | 9-8260    |
| 5          | 1   | Large O-Ring  | 8-3487    |
| 6          | 1   | Small O-Ring  | 8-3486    |
| 7          |     | <b>Leads Assemblies with O2B Connectors (includes switch assemblies)</b>                                    |           |
|            | 1   | SL60 / 60 Amp, 20 - foot Leads Assembly with O2B connectors   | 4-7830    |
|            | 1   | SL60 / 60 Amp, 50 - foot Leads Assembly with O2B connectors   | 4-7831    |
|            | 1   | SL100 / 100 Amp, 20 - foot Leads Assembly with O2B connectors   | 4-7832    |
|            | 1   | SL100 / 100 Amp, 50 - foot Leads Assembly with O2B connectors   | 4-7833    |
| 8          |     | <b>Leads Assemblies with ATC Connectors (includes switch assemblies)</b>                                    |           |
|            | 1   | SL60 / 60 Amp, 20 - foot Leads Assembly with ATC connectors   | 4-7834    |
|            | 1   | SL60 / 60 Amp, 50 - foot Leads Assembly with ATC connectors   | 4-7835    |
|            | 1   | SL100 / 100 Amp, 20 - foot Leads Assembly with ATC connectors   | 4-7836    |
|            | 1   | SL100 / 100 Amp, 50 - foot Leads Assembly with ATC connectors   | 4-7837    |
| 9          | 1   | Switch Kit  | 9-7031    |
| Not Shown: |     |   |           |
|            | 1   | Starter Cartridge Restrictor Pin Kit (for use with certain power supplies with high - volt start circuitry) | 8-3440    |



A-03323

## Complete Assembly Replacement

### NOTE

All Complete Torch and Lead Assemblies require a Torch Adapter Kit for proper installation of the Torch.

| Description   | Catalog # |
|---|-----------|
| <b>60 - Amp Hand Torches with Ergonomic Handle 75°:</b>         |           |
| SL60 Hand Torch and 20 foot / 6.1 m Leads, with O2B Connector   | 7-5200    |
| SL60 Hand Torch and 50 foot / 15.2 m Leads, with O2B Connector  | 7-5201    |
| SL60 Hand Torch and 20 foot / 6.1 m Leads, with ATC Connector   | 7-5204    |
| SL60 Hand Torch and 50 foot / 15.2 m Leads, with ATC Connector  | 7-5205    |
| <b>60 - Amp Hand Torches with Ergonomic Handle 90°:</b>         |           |
| SL60 Hand Torch and 20 foot / 6.1 m Leads, with O2B Connector   | 7-5261    |
| SL60 Hand Torch and 50 foot / 15.2 m Leads, with O2B Connector  | 7-5262    |
| SL60 Hand Torch and 20 foot / 6.1 m Leads, with ATC Connector   | 7-5260    |
| <b>100 - Amp Hand Torches with Ergonomic Handle 75°:</b>        |           |
| SL100 Hand Torch and 20 foot / 6.1 m Leads, with O2B Connector  | 7-5202    |
| SL100 Hand Torch and 50 foot / 15.2 m Leads, with O2B Connector | 7-5203    |
| SL100 Hand Torch and 20 foot / 6.1 m Leads, with ATC Connector  | 7-5206    |
| SL100 Hand Torch and 50 foot / 15.2 m Leads, with ATC Connector | 7-5208    |
| <b>100 - Amp Hand Torches with Ergonomic Handle 90°:</b>        |           |
| SL100 Hand Torch and 20 foot / 6.1 m Leads, with O2B Connector  | 7-5264    |
| SL100 Hand Torch and 50 foot / 15.2 m Leads, with O2B Connector | 7-5265    |
| SL100 Hand Torch and 20 foot / 6.1 m Leads, with ATC Connector  | 7-5263    |
| <b>Options</b>  |           |
| ATC Adapter Kit   | 7-5207    |
| Leads extensions with ATC Connectors, 15 - foot / 4.6 m length  | 7-7544    |
| Leads extensions with ATC Connectors, 25 foot / 7.6 m length    | 7-7545    |
| Leads extensions with ATC Connectors, 50 foot / 15.2 m length   | 7-7552    |
| Leather Leads Cover, 20 foot / 6.1 m length                     | 9-1260    |
| Leather Leads Cover, 25 foot / 7.6 m length                     | 9-1270    |
| Leather Leads Cover, 50 foot / 15.2 m length                    | 9-1280    |
| Straight Line Cutting Guide                                     | 7-8911    |
| Radius / Roller Kit   | 7-7501    |
| Circle Cutting Guide  | 7-3291    |
| Deluxe Cutting Guide Kit  | 7-8910    |
| Standoff Guide  | 9-8422    |

### NOTE

Every effort has been made to provide complete and accurate information in this manual. However, the publisher does not assume and hereby disclaims any liability to any party for any loss or damage caused by errors or omissions in this Manual, whether such errors result from negligence, accident, or any other cause.

## Statement of Warranty

**LIMITED WARRANTY:** Thermal Dynamics® Corporation (hereinafter “Thermal”) warrants that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the Thermal products as stated below, Thermal shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with Thermal’s specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at Thermal’s sole option, of any components or parts of the product determined by Thermal to be defective.

**This warranty is exclusive and is in lieu of any warranty of merchantability or fitness for a particular purpose.**

**LIMITATION OF LIABILITY:** Thermal shall not under any circumstances be liable for special or consequential damages, such as, but not limited to, damage or loss of purchased or replacement goods, or claims of customers of distributor (hereinafter “Purchaser”) for service interruption. The remedies of the Purchaser set forth herein are exclusive and the liability of Thermal with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by Thermal whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based.

**This warranty becomes invalid if replacement parts or accessories are used which may impair the safety or performance of any Thermal Product.**

**This warranty becomes invalid if the product is sold by non-authorized persons.**

### **All SureLok™ RPT Torches have a one year Parts & Labor warranty**

Warranty repairs or replacement claims under this limited warranty must be submitted by an authorized Thermal Dynamics® repair facility within thirty (30) days of the repair. No transportation costs of any kind will be paid under this warranty. Transportation charges to send products to an authorized warranty repair facility shall be the responsibility of the customer. All returned goods shall be at the customer’s risk and expense.



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