

THERMAL DYNAMICS[®]

ESAB

SL60, SL60QD and SL100 Replacement Plasma Cutting Hand Torches

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Installation and Operation Instructions

General Information

The 1Torch[®] SL60, SL60QD[™] and SL100 Torches work with most plasma cutting power supplies. The SL60QD[™] is for use on non-high frequency units only. 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. The SL60 and SL60QD[™] Torches provide cutting capabilities of up to 80 amperes. SL100 Torches provide cutting capabilities of up to 120 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 60 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.

Supplies

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

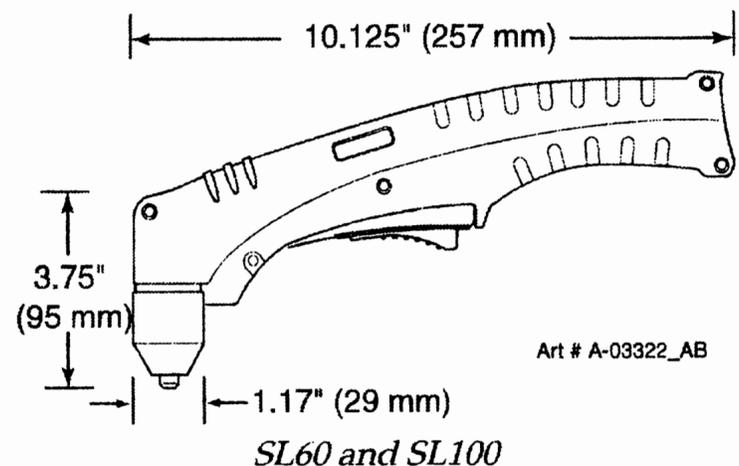
The following options are available. Refer to the complete assembly replacement list for catalog numbers.

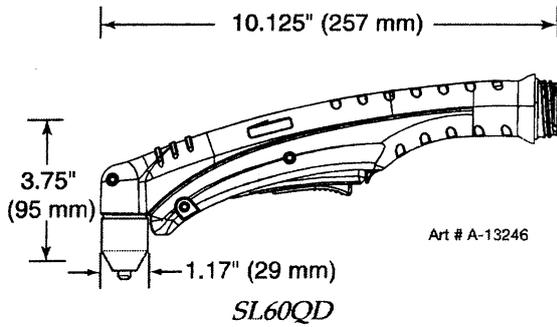
- ATC Adapter Kit (for Torches with ATC Connectors)
- Leads extensions (for Torches with ATC Connectors)
- Cutting Guide Kits
- Leather Leads Covers
- Standoff Cutting Guide

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)

SL60QD™, SL60 & SL100 Current Ratings	
SL60 and SL60QD™ Torch & Leads	Up to 80 Amps, DC, Straight Polarity
SL100 Torch & Leads	Up to 120 Amps, DC, Straight Polarity



NOTE!

Power Supply characteristics will determine material thickness range.

D. Torch Ratings

SL60QD™ & SL60 Torch Ratings	
Ambient Temperature	104° F 40° C
Duty Cycle	100% @ 60 Amps @ 400 scfh
Maximum Current	80 Amps
Voltage (V _{peak})	500V
Arc Striking Voltage	7kV

SL100 Torch Ratings	
Ambient Temperature	104° F 40° C
Duty Cycle	100% @ 100 Amps @ 400 scfh
Maximum Current	100 Amps
Voltage (V _{peak})	500V
Arc Striking Voltage	7kV

E. Type of Cooling

Combination of ambient air and gas stream through torch.

F. Gas Requirements

SL60QD™, SL60 and SL100 Torch Gas Specifications	
Gas (Plasma and Secondary)	Compressed Air
Operating Pressure Refer to NOTE	60 - 75 psi 4.1 - 5.2 bar
Maximum Input Pressure	125 psi / 8.6 bar
Gas Flow (Cutting and Gouging)	300 - 500 scfh (142 - 235 lpm)



WARNING

This torch is not to be used with oxygen (O₂).



NOTE!

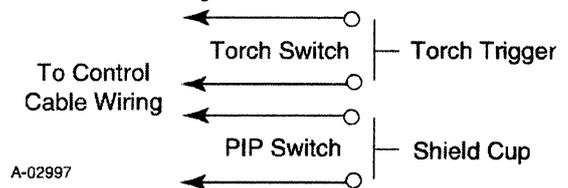
Operating pressure varies with torch model, operating amperage, and torch leads length. Refer to gas pressure settings chart for each model.

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 - 12-15 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.



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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.

SL60QD Torch Handle Connection

The new SL60QD™ (Quick Disconnect) torch allows for a quick change of the torch handle assembly from the leads. To change the torch handle assembly do the following.

1. Remove the torch handle assembly by grasping the torch handle in one hand and the coupler nut and leads in the other.
2. Rotate the nut a minimum of one full turn to the left (counter clockwise) and pull the torch handle assembly out from the leads in a straight line.
3. To reattach, grasp both as before and carefully align the internal connecting parts.
4. Carefully press the two together in a straight line.
5. Align the mark on the coupler nut with that on the top of the torch handle and rotate to the right (clockwise) drawing the two together and seating the connections inside. Do not use tools to tighten.

Size - Part 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.



WARNING

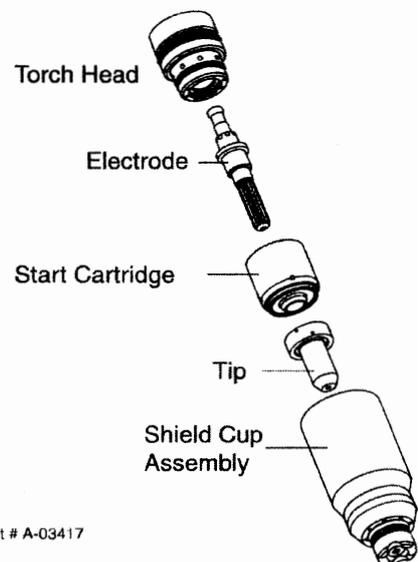
Disconnect primary power to the system before disassembling the torch or torch leads.

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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- Tilt the torch head to remove the tip and starter cartridge.
- Inspect the two O-rings on the torch head. Ensure they are undamaged and seated in the O-ring grooves.
- Fit the desired starter cartridge and tip onto the electrode.

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

- 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.

i **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			
Tip	Output Range	Depth	Width
Tip A	40 Amps Max.	Shallow	Narrow
Tip B	50-100 Amps	Deep	Narrow
Tip C	60-120 Amps	Moderate	Moderate
Tip D	60-120 Amps	Shallow	Wide
Tip E	120 Amps	Moderate	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.

SL60QD™, SL60 Gas Pressure Settings		
Tip	Leads Length	
		20' / 6.1 m
30A, 40A, 50/55A, 60A	65 psi / 4.5 bar	75 psi / 5.2 bar

SL100 Gas Pressure Settings		
Tip	Leads Length	
		Up to 25' / 7.6 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
120A	75 psi / 5.2 bar	80 psi / 5.5 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

- 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.
- Adjust current output on the Power Supply to match the selected tip and attach the work clamp firmly to the work.

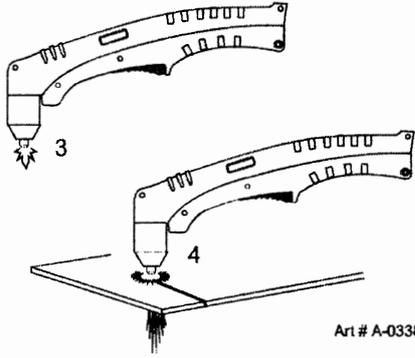
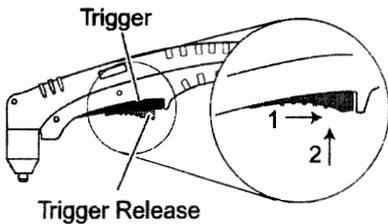


WARNING

Maximum current is 80 Amps for SL60 and SL60QD™ Torches, or 120 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 or SL60QD™ Torch at more than 80 Amps, or the SL100 at more than 120 Amps.

 **WARNING**
 This Torch is not to be used with oxygen (O₂).
 The SL60QD torch should not be used on an HF system.

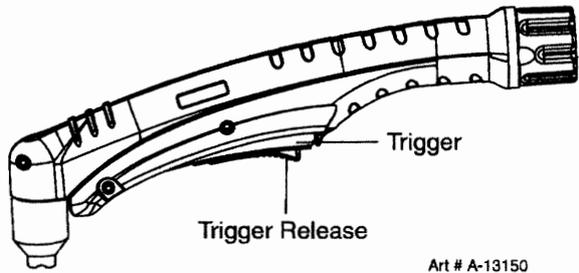
 **CAUTION**
 Do not operate the torch with the torch tip in contact with the work at outputs greater than 40 amps, or greater than 60 amps is using the 60 amp drag tip. Drag cutting at higher output currents can cause irreparable damage to the torch parts. Use only shielded parts at output currents higher than 40 amps.



Art # A-03383

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.

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.



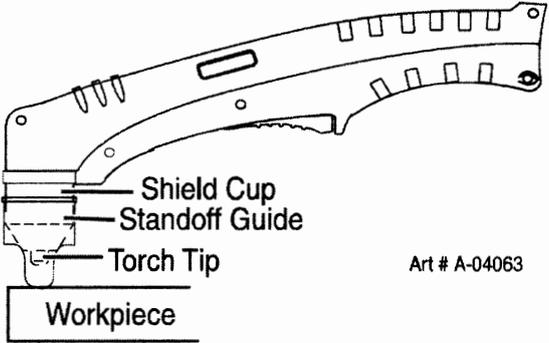
Art # A-13150

 **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.

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.

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

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



Art # A-04063

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

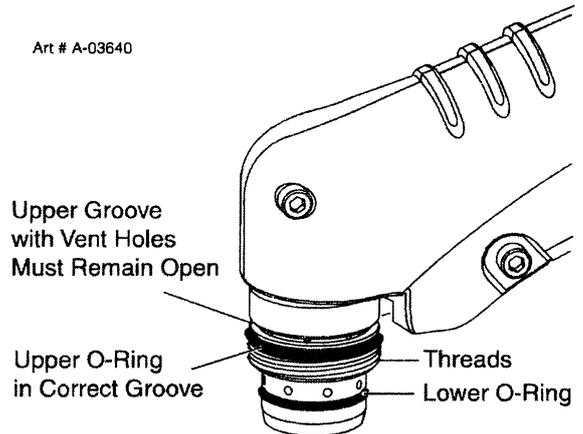
5. Difficult Starting

- 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

Art # A-03640



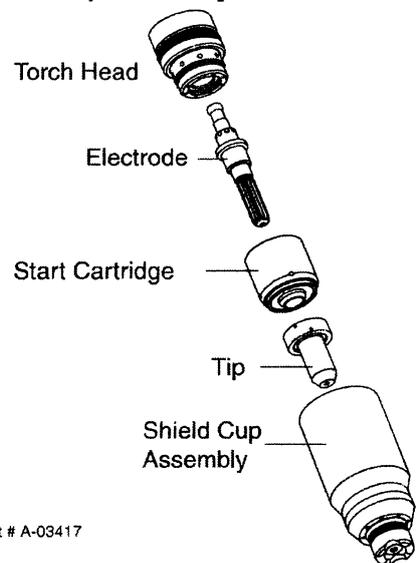
Inspection and Replacement of Consumable Torch Parts

A. General Information

	<p>WARNING</p> <p>Disconnect primary power to the system before disassembling the torch or torch leads.</p> <p>DO NOT touch any internal torch parts while the AC indicator light of the Power Supply is ON.</p>
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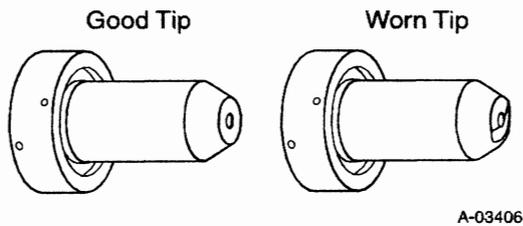
Unthread the shield cup assembly to remove the consumable torch parts.

- 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.

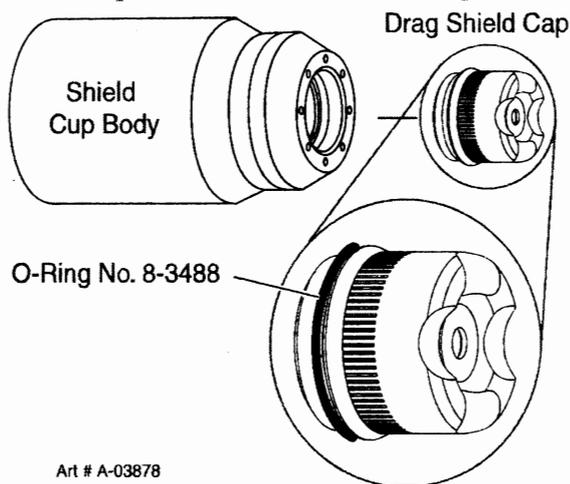


Art # A-03417

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

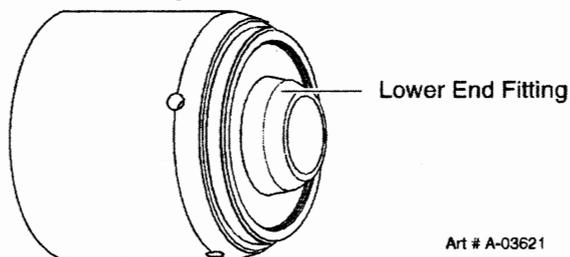


3. On torches with a shield cup body and a shield cap or deflector, ensure that the cap or deflector is threaded snugly against the shield cup body. In shielded drag cutting operations (only), there may be an O-ring between the shield cup body and drag shield cap. Do not lubricate the O-ring.

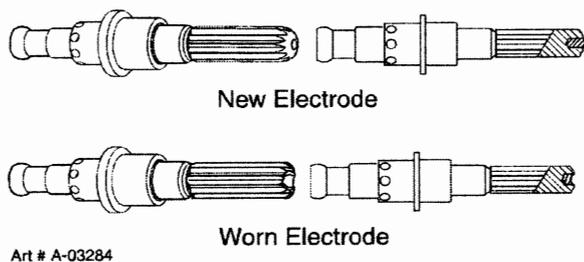


4. Check the starter cartridge for excessive wear, plugged gas holes, discoloration, and for free movement of the lower end plate. Replace if necessary.

Start Cartridge



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



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



WARNING

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.

7. Reinstall the desired starter cartridge and tip into the torch head.
8. 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.

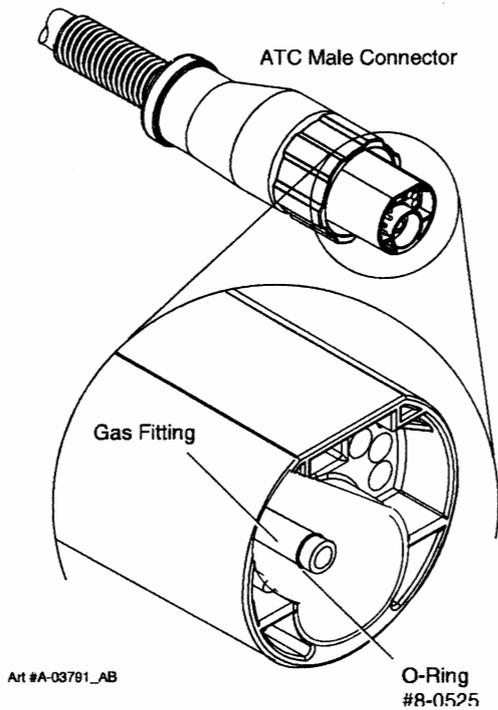
An o-ring on the Torch ATC Male Connector requires lubrication on a regular basis, depending on how frequently the torch is disconnected and re-connected. This will allow the o-ring to remain pliable and provide a proper seal. The o-ring will dry out, becoming hard and cracked, if the o-ring lubricant 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.



CONSUMABLES

The illustrations show all consumable parts for the SL60, SL60QD™ 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 60 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.

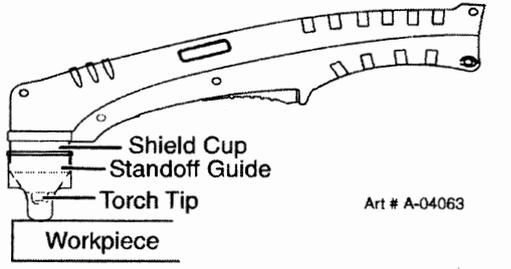
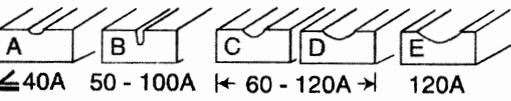
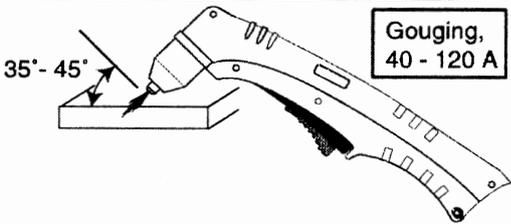
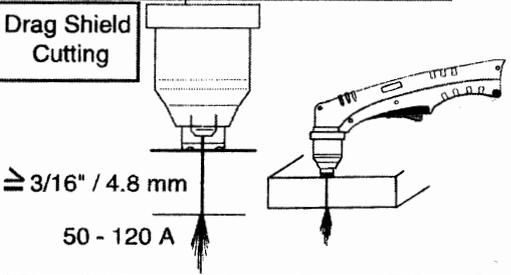
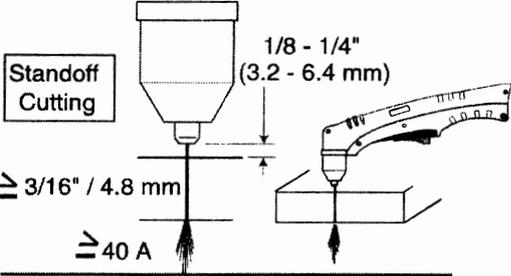
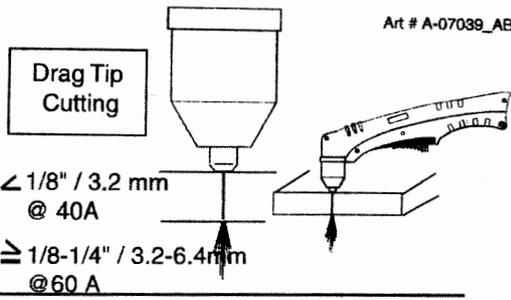
Drag Shield Cutting: Use the Shield Cup Body with the Drag Shield Cap for a consistent standoff distance with the drag shield in contact with the workpiece. This is a simple and operator-friendly method of cutting between 40 and 120 amps.

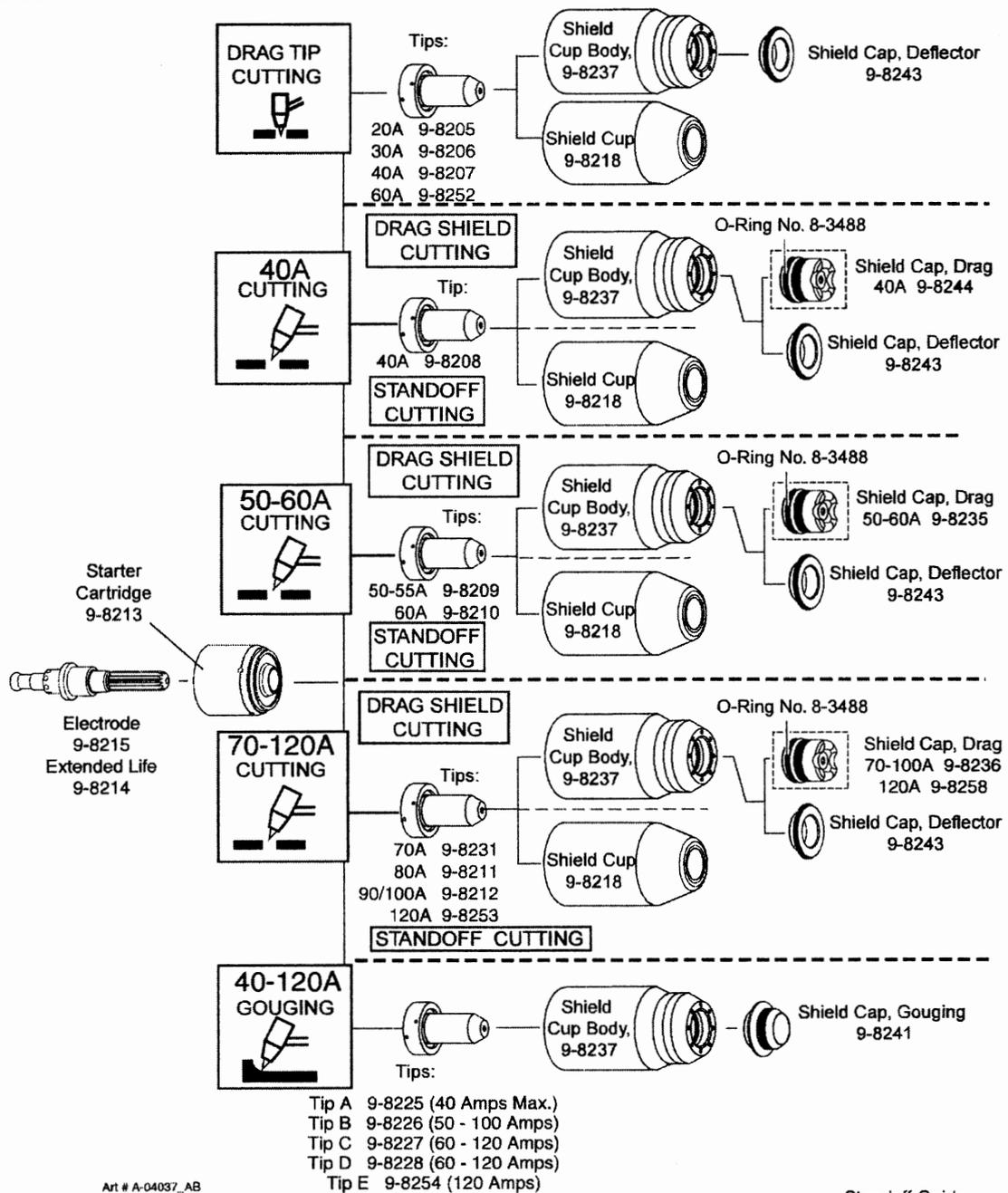
Gouging: Use the Shield Cup Body with the Gouging Shield Cap for excellent gouging performance and enhanced torch parts life.

The Standoff Guide fits all shield cup designs for the SL60, SL60QD™ 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.

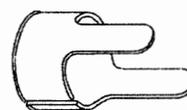
The electrode and starter cartridge are the same for all applications.

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.





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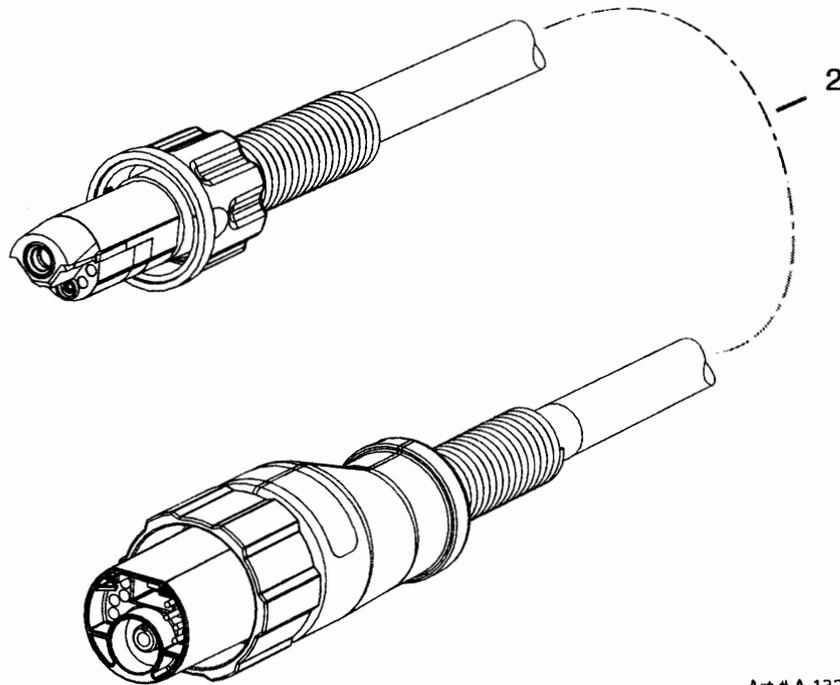
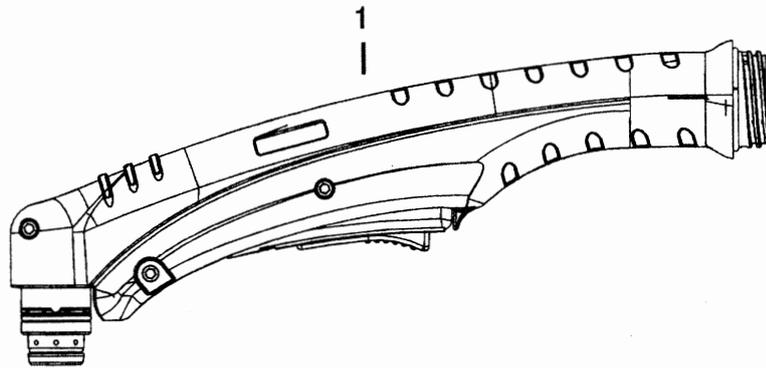


Standoff Guide
 40 Amp Tip - 9-8251
 60 Amp Tip - 9-8281
 for All Applications
 9-8422

Gouging Profiles			
	Output Range	Depth	Width
Tip A	40 Amps Max.	Shallow	Narrow
Tip B	50-100 Amps	Deep	Narrow
Tip C	60-120 Amps	Moderate	Moderate
Tip D	60-120 Amps	Shallow	Wide
Tip E	120 Amps	Moderate	Wide

SL60QD™ Replacement Hand Torch Parts

Item #	Qty	Description	Catalog #
1	1	Torch Handle Assembly Replacement	7-5680
2		Leads Assemblies with ATC connector and Quick Connectors	
	1	SL60QD™, 20 - foot Leads Assembly with ATC and QD connectors	4-5604
	1	SL60QD™, 50 - foot Leads Assembly with ATC connector	4-5605
1&2	1	Torch and Leads Assembly, 20 - foot	7-5604
1&2	1	Torch and Leads Assembly, 50 - foot	7-5605



Art # A-13248

Complete Assembly Replacement

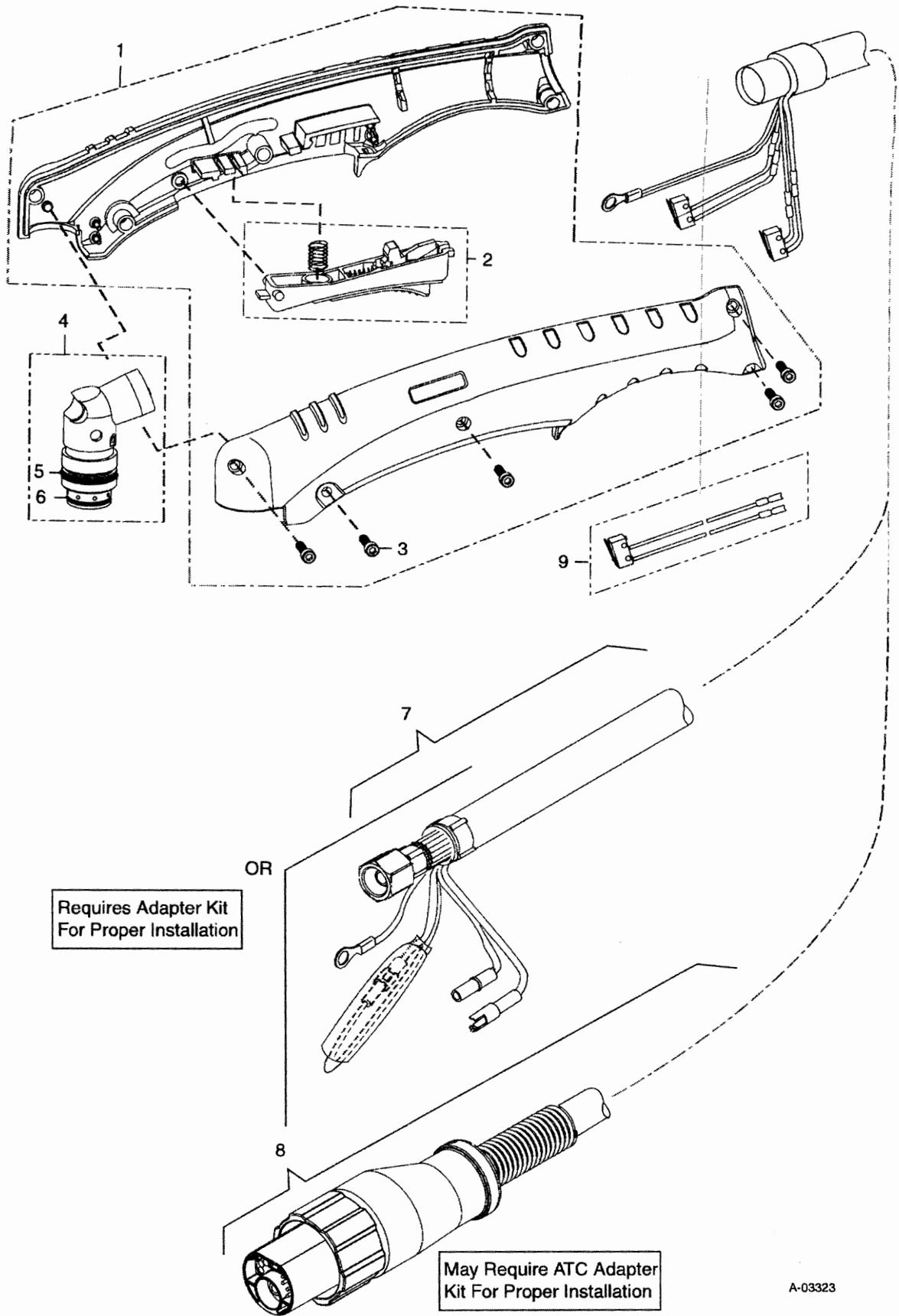
Torch Handle Torch Parts

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		Leads Assemblies with O2B Connectors (includes switch assemblies)	
	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		Leads Assemblies with ATC Connectors (includes switch assemblies)	
	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



NOTE!

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



Requires Adapter Kit
For Proper Installation

OR

May Require ATC Adapter
Kit For Proper Installation

A-03323

SL60, SL100 Replacement Hand Torch Assemblies

Description	Catalog #
60 - Amp Hand Torches with SL60QD Quick Disconnect Ergonomic Handle 75 deg:	
SL60QD Hand Torch and 20 foot / 6.1 m Leads, with ATC Connection	7-5604
SL60QD Hand Torch and 50 foot / 15.2 m Leads, with ATC Connection	7-5605
SL60QD Torch Handle Assembly	7-5680
SL60QD Lead only 20 foot, 6.1 m, with ATC Connection	4-5604
SL60QD Lead only 50 foot, 15.2 m, with ATC Connection	4-5605
60 - Amp Hand Torches with Ergonomic Handle 75°:	
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
60 - Amp Hand Torches with Ergonomic Handle 90°:	
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
120 - Amp Hand Torches with Ergonomic Handle 75°:	
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
120 - Amp Hand Torches with Ergonomic Handle 90°:	
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
Options	
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 General use	9-8422
Standoff Guide 40A Tips	9-8251
Standoff Guide 60A Tips and higher	9-8

**NOTE!**

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

All SureLo[®] RPT[®] Torches have a one year Parts & Labor warranty

Warranty repairs or replacement claims under this limited warranty must be submitted by an authorized ESAB 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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