

**Sharpie™**

# Operations Manual

## SHARPIE GRINDER MODELS:

- A-PTGK-DXCL DELUXE CORDLESS
- A-PTGK-SDCL STANDARD CORDLESS
- A-PTGK-DX DELUXE
- A-PTGK-SD STANDARD
- A-PTGK-DHD HEAD ONLY



## Table of Contents:

Care and Operation of your Sharpie™ Tungsten Grinder. . . . .	3
<i>Inspect Before You Grind</i>	
<i>Safety Information</i>	
<i>Adjusting the Tungsten Contact Point on the Wheel</i>	
<i>Replacing or Flipping the Wheel</i>	
<i>Regular Maintenance Tips</i>	
Selecting the Grind Angle. . . . .	4
Grinding the Electrode Taper. . . . .	4
<i>Changing the Diameter of the Tungsten</i>	
Adjustable Collet Instructions . . . . .	4
<i>Adjusting the Grinder Angle (on DX Model only)</i>	
<i>When the Outer Diameter of the Wheel is Worn</i>	
<i>For A Long Taper</i>	
Grinding a Tip Flat . . . . .	5
Cutting the Tungsten . . . . .	5
Exploded Parts View for SD™ Models. . . . .	6
Exploded Parts View for DX™ Models. . . . .	7
Tungsten Selection . . . . .	9
Tungsten Material Blend Guide . . . . .	10
Determining the Proper Tungsten Size . . . . .	11
Tungsten Electrode Diameter Rating for Welding Currents. . . . .	11
Tungsten Grinder Color Options. . . . .	12



# A-PTGK-DXCL™

*SHARPIE DELUXE CORDLESS GRINDER  
ADJUSTABLE 15°-45° GRIND ANGLE*



# A-PTGK-SDCL™

*SHARPIE STANDARD CORDLESS GRINDER  
FIXED 20° GRIND ANGLE*



# A-PTGK-DX™

*SHARPIE DELUXE GRINDER  
ADJUSTABLE 15°-45° GRIND ANGLE*



# A-PTGK-SD™

*SHARPIE STANDARD GRINDER  
FIXED 20° GRIND ANGLE*



# A-PTGK-DHD™

*SHARPIE DELUXE HEAD ONLY  
ADJUSTABLE 15°-45° GRIND ANGLE*



## Inspect Before You Grind

- Visually inspect the grinder to ensure the motor, power cord, grinding head and related components are all in good working condition.
- Ensure the proper collet size is selected for the diameter of tungsten to be ground; for your convenience, two collets are stored in the top of the head assembly.
- Take care when grinding tungsten electrodes to ensure your safety and the safety of others in adjacent areas.

## Safety Information

Avoid breathing grinding dust. Use a mask while grinding or cleaning the machine.



Wear safety glasses and gloves when grinding or cutting tungsten.



Avoid electric shock. Do not operate grinder in or around water.



Dispose of tungsten dust regularly and at an approved location.



Grinder is designed to grind tungsten electrodes only.



Do not plug grinder into an electrical outlet if cord is frayed or cut.



Do not unscrew grinder head while the machine is in operation.



Remove plug from electrical outlet when changing the diamond wheel or cleaning the grinder.



Use qualified electrical technicians only to repair the unit.



## Adjusting the Tungsten Contact Point on the Wheel

- Make sure the unit is unplugged and loosen the disc screw.
- Rotate the collet disc so the tungsten will contact another spot on the diamond wheel.
- To locate the spot where the tungsten meets the wheel, insert tungsten and look through the viewing slot located in the lower housing.
- When the tungsten contact position has been set, tighten the disc screw to lock the disc in place.
- When the top diamond surface of the wheel has been worn-out, flip the wheel over and adjust as noted above.

## Replacing or Flipping the Wheel

- Make sure the motor is unplugged or battery disengaged.
- Remove the two lower housing screws and lift the upper housing assembly off the lower housing, exposing the diamond wheel.
- Lock head stock in place and loosen mandrel screw.
- Remove the screw and washer from the mandrel, reverse sides or replace wheel as needed.
- Tighten mandrel screw, replace the upper housing and tighten head screws.

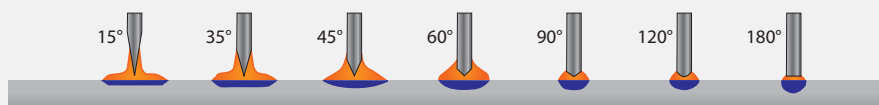
## Regular Maintenance Tips

- Use compressed air to clean the grinder head of tungsten dust or debris after every 8 hours of use.
- Be sure all screws and collets are tight.
- Check the power cord for wear or breakage periodically.
- Check collets for excessive wear.

## Selecting the Grind Angle

Follow your equipment supplier's suggested grind angle specifications or perform tests to determine the optimal electrode preparation for your application.

Refer to the chart below for general guidelines.



Sharper Electrode (Narrow Angle)		Blunter Electrode (Wider Angle)	
Wider weld bead	Improved arc stability	Narrower weld bead	Increased potential for arc wander
Easier arc starting	Less weld penetration	Harder arc starting	Better weld penetration
Less amperage	Shorter electrode life	More amperage	Longer electrode life

## Grinding the Electrode Taper

With the correct collet in the angle disc, insert the tungsten electrode into the collet (SEE FIGURE-1) and rotate for one 360° rotation while exerting consistent pressure so the tungsten is contacting the grinding wheel. Repeat until tungsten reaches desired taper.

Release pressure from grinding wheel after each rotation of the tungsten electrode.

Releasing in this way allows wheel to cool and greatly extends wheel life.

### Changing the Diameter of the Tungsten

Identify the proper size collet from the two stored in the top of the head assembly. Your grinder was shipped from the factory with 1/16" (1.6mm), 3/32" (2.4mm) and 1/8" (3.2mm) collets. A .040" (1.0mm) collet is available as an option.

Remove collet using wrench supplied with your grinder, and switch with the desired collet in the angle disc assembly.

FIGURE-1



## Adjustable Collet Instructions

### Adjusting the Grinder Angle (on DX Model only)

Loosen set screw to allow the brass collet holder to pivot for grinding different taper angles. (SEE FIGURE-2)

Once desired angle is located, tighten set screw in the collet holder and grind tungsten to desired taper.

### When the Outer Diameter of the Wheel is Worn

Loosen set screw and turn the brass screw to advance the collet (and corresponding tungsten contact point) toward the center of the wheel. (SEE FIGURE-2)

FIGURE-2



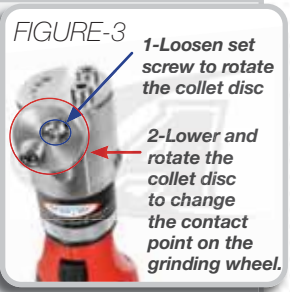
Note: Reset grind angle after adjusting the contact point to an unused surface of the grinding wheel.

For A Long Taper

Loosen the collet disc screw and lower the collet disc so the point of entry of the tungsten is closer to the diamond wheel.  
( SEE FIGURE-3 )

Note that the lower the disc, the longer the point. Conversely, the higher the disc, the shorter the angle.

Note: For a longer angle taper, the tungsten must contact the outer most diameter of the wheel because a longer taper requires more contact with the grinding surface.



## Grinding a Tip Flat

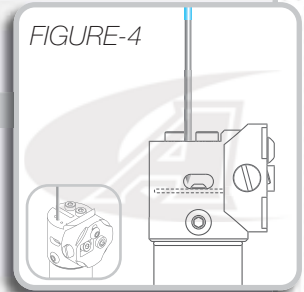
Electrodes with tip flats deliver improved arc characteristics, longer tip life, improved arc starting, and reduced tungsten contamination.

The grinder is equipped with four holes: .040" (1.0mm), 1/16" (1.6mm), 3/32" (2.4mm) and 1/8" (3.2mm) in the top housing to produce a tip flat on the end of the tungsten electrode.

To Produce a Tip Flat:

Insert the tungsten into the correct size hole in the top of the housing. ( SEE FIGURE-4 )

Gently press the tungsten into the diamond wheel and rotate for one 360° rotation while exerting pressure so the tungsten touches the wheel. Remove electrode and check for desired tip flat. Repeat as needed.



## Cutting the Tungsten

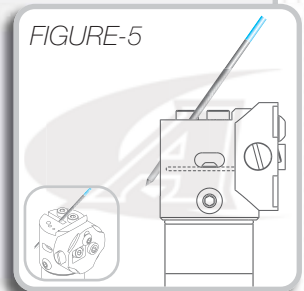
The grinder is equipped with a slot for cutting tungsten to length or for cutting off contaminated portions.

Note: To ensure the highest-quality welds, cut contaminated portions of the electrode prior to sharpening so as not to contaminate the diamond wheel.

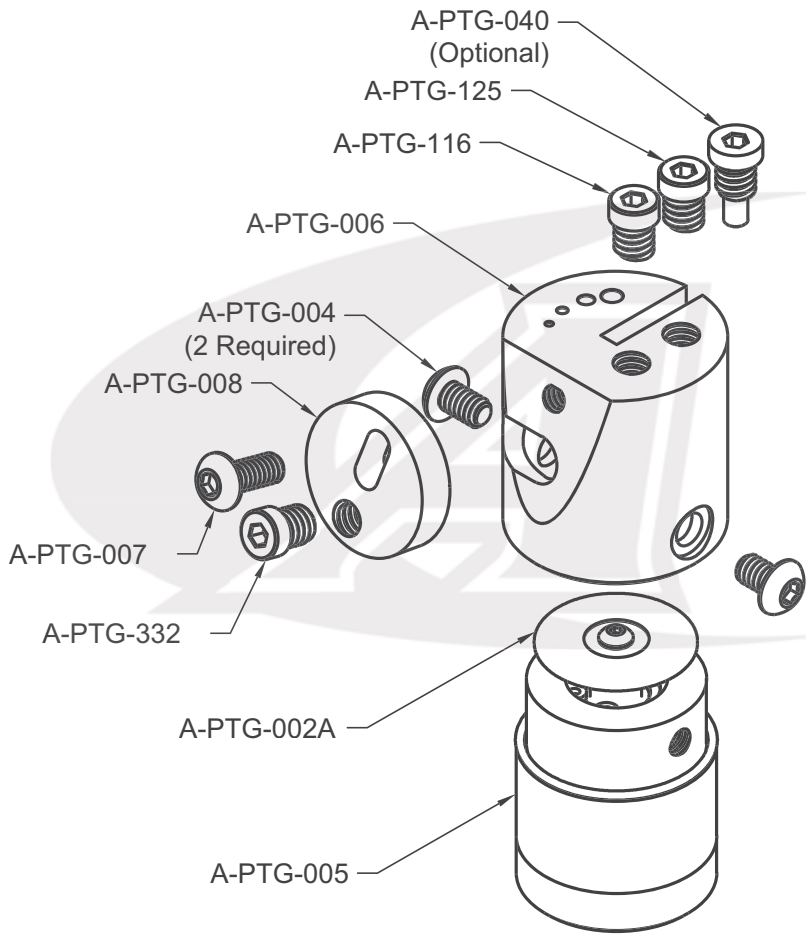
Place electrode in the angle slot so the desired portion of the tungsten to be cut lines up with the edge of the diamond wheel.  
( SEE FIGURE-5 )

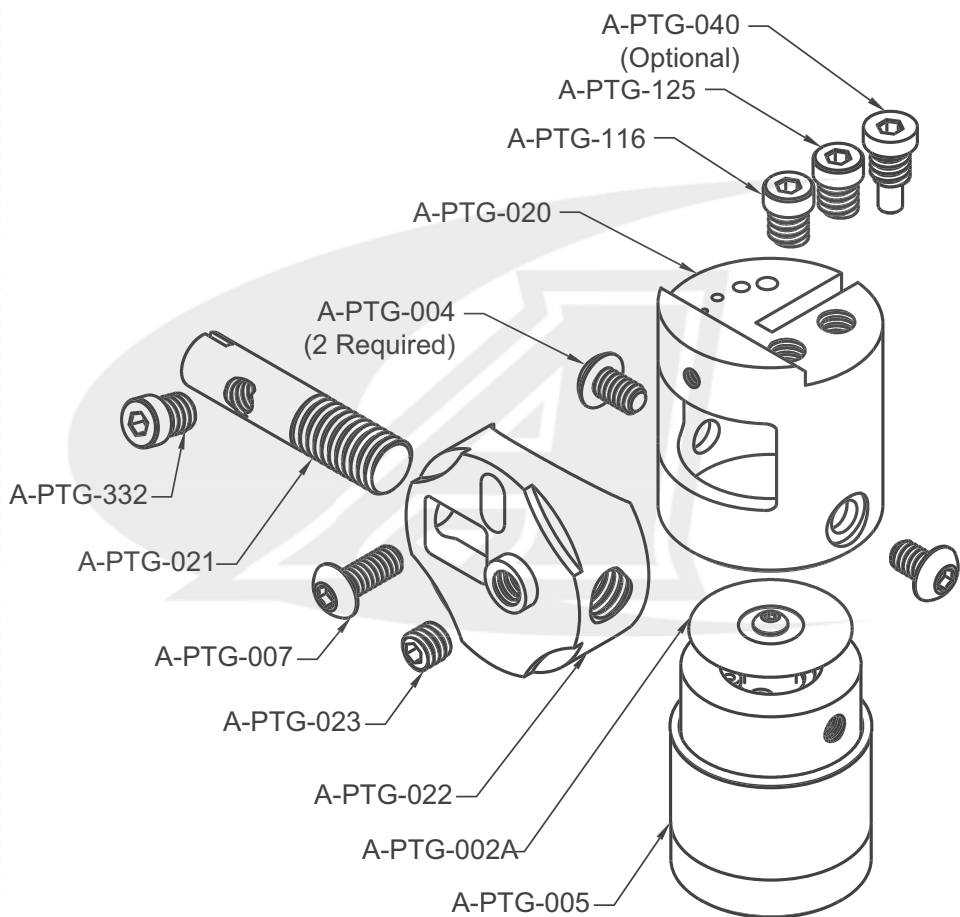
Gently press electrode until it contacts the grinding wheel rotating it to form a groove completely around the tungsten.

While you can cut the electrode in half from one side it will cause excessive wheel wear and shorten wheel life. Instead, cut a groove around the electrode approximately half the thickness of the material. Turn unit off, insert electrode into the appropriate size collet and gently snap the tungsten in two. Done properly, this procedure won't splinter or damage the integrity of the electrode material.



Note: Take care when cutting electrodes so as not to bind the tungsten by wedging it between the wheel and the machine housing.









# SD/SDCL PARTS LIST

Standard Model



-  A-PTG-002  
Coarse Diamond Wheel
-  A-PTG-002A  
Medium Diamond Wheel
-  A-PTG-002B  
Premium Diamond Wheel
-  A-PTG-006  
Upper Housing
-  A-PTG-008  
Collet Disc
-  A-PTG-005-LBK  
Lower Housing
-  A-PTG-005-K  
Wheel Mandrel Kit
-  A-PTG-004 (2 req d)  
Lower Housing Screws
-  A-PTG-007  
Collet Disc Screw
-  A-PTG-116  
1/16" (1.6mm) Collet
-  A-PTG-332  
3/32" (2.4mm) Collet
-  A-PTG-125  
1/8" (3.2mm) Collet
-  A-PTG-010 / A-PTG-010-564  
Allen Wrench
-  A-PTG-001-D  
Motor
-  A-PTG-001CL  
Cordless Motor

# DX/DXCL PARTS LIST

Deluxe Model



-  A-PTG-002  
Coarse Diamond Wheel
-  A-PTG-002A  
Medium Diamond Wheel
-  A-PTG-002B  
Premium Diamond Wheel
-  A-PTG-020  
Upper Housing (Adjustable Angle)
-  A-PTG-022  
Adjustable Collet Disc
-  A-PTG-021  
Adjustable Arm
-  A-PTG-023  
Set Screw
-  A-PTG-005-LBK  
Lower Housing
-  A-PTG-005-K  
Wheel Mandrel Kit
-  A-PTG-004 (2 req d)  
Lower Housing Screws
-  A-PTG-007  
Collet Disc Screw
-  A-PTG-116  
1/16" (1.6mm) Collet
-  A-PTG-332  
3/32" (2.4mm) Collet
-  A-PTG-125  
1/8" (3.2mm) Collet
-  A-PTG-010 / A-PTG-010-564  
Allen Wrench
-  A-PTG-001-D  
Motor
-  A-PTG-001CL  
Cordless Motor

# tungsten selection

MAXIMIZE ARC STARTS AND IMPROVE ARC TIME  
WITH HIGH-QUALITY TUNGSTEN ELECTRODES



Selecting the proper tungsten electrodes greatly improves weld quality and productivity while lowering costs for your Gas Tungsten Arc Welding (GTAW/TIG) and Plasma Arc Welding (PAW) operations.

## Choose Electrodes from a Trusted Source

Although tungsten electrodes may look the same from one company to another, high-quality tungsten has been manufactured to ensure a dense grain structure which allows for better migration of oxides to the tip of the electrode.

With high-quality tungsten, you'll experience easier arc starting, improved arc time and better weld quality with minimized contamination. Arc-Zone.com's ArcTime™ and Amplify™ brand electrodes are sourced from the world's finest producers and meet or exceed ISO 6848 and AWS A5.12 standards. Arc-Zone.com® delivers the industry's most complete line of premier tungsten electrodes including: ArcTime™, Amplify™, CK Worldwide™, DGP® Multi-Strike™, Miller®, and Wolfram®.



## Determine the Best Tungsten for Your Application

Since the development of the TIG welding process, many improvements have been made in the production of electrodes. Most significant is the addition of oxides to pure tungsten, creating tungsten alloys that provide the same level of emission as pure tungsten at much lower temperatures, improving starting performance of the electrode, arc stability, and tip life.

Each oxide has a different physical characteristic affecting tungsten performance. Electrodes are color coded, indicating the type of oxide used in the mix. Note: Color-coding is not standardized for all mixes, and it varies from the U.S., Europe, and Japan.

For most hand-held welding operations, Arc-Zone® recommends the ArcTime™ Hybrid Tungsten Electrode. For other applications, particularly automated welding, the best way to determine which tungsten alloy is best suited for your application is through testing. The list on the following page is provided as a guide.



## ArcTime™

### Hybrid All Purpose Tungsten Electrodes

This non-radioactive performance proven formula combines rare earth materials with tungsten to produce the best all-purpose tungsten electrode on the market. Experience reliable arc starting even after numerous ignitions.

Color Code: Sky Blue™ (US). Not std in Europe or Japan.



## 2% CERIATED

Suitable for low-amp, DC orbital tube, pipe, thin sheet, and small part applications. This formula offers low current capacity, low arc ignition, good arc stability and is non-radioactive.

Color Code: Gray  
(US, Europe and Japan)



## 2% ICE-T™

Radioactive tungsten formula for easy arc starting, good arc stability and current capacity, and resistance to weld pool contamination. Vapors, grinding dust and disposal of thorium dioxide raise health, safety and environmental concerns. Use only when contractually required by FAR specification.

Color Code: Pink



## 1.5% LANTHANATED

Another good general purpose non-radioactive replacement for 2% Thoriated, and similar in performance to 2% lathanated. It features excellent ignition and re-ignition properties and good service life.

Color Code: Gold (US).

Not std. in Europe or Japan.



## 2% LANTHANATED

This formula is a good general purpose non-radioactive replacement for 2% Thoriated. It has excellent ignition performance, low-burn-off rate, excellent re-ignition, and good service life.

Color Code: Blue (US).

Not std. in Europe. Yellow-Green (Japan).



## 2% THORIATED

This formula is a popular general purpose electrode due to the excellent arc behavior and good tip life. This is a radioactive formula, however. Vapors, grinding dust and disposal of thorium dioxide raise health, safety and environmental concerns. Use only when contractually required by FAR specification.

Color Code: Red

(US, Europe and Japan).



## 1% ZIRCONIATED

Used for radiographic-quality welding where tungsten contamination must be minimized. Balls-up easily in AC applications, good arc starting and current capacity. Non-Radioactive.

Color Code: Brown (US) White (Europe).

Not std. in Japan.



## PURE TUNGSTEN

Pure tungsten has a high work-function which makes it difficult to start and maintain a stable arc. High burn-off rate results in short service life.

Color Code: Green

(US, Europe and Japan)



## Determining the Proper Tungsten Size

Tungsten is generally sold in packages of 10 pieces in a variety of standard diameters from .020" (0.5mm) to .250" (6.4mm). The most common length is 7.00"(175mm) in the U.S. and 6.00" (152mm) in Europe. The most common diameters are: 1/16" (1.6mm), 3/32" (2.4mm), 1/8" (3.2mm). Electrode diameter affects welding performance and weld bead shape. Again, testing is the best way to determine which tungsten is suited for your application. However, the following chart may serve as a general guide.

## Tungsten Electrode Diameter Rating for Welding Currents

Electrode Diameter	Direct Current		Alternating Current	
	Straight Polarity	Reverse Polarity	Unbalanced Wave	Balance Wave
	DCEN	DCEP		
.020" (0.5 mm)	5-2	n/a	5-15	10-20
.040" (1.0 mm)	15-80	n/a	10-60	20-30
1/16" (1.6 mm)	70-150	10-20	50-100	30-80
3/32" (2.4 mm)	150-250	15-30	100-160	60-130
1/8" (3.2 mm)	250-400	25-40	150-210	100-180
5/32" (4.0 mm)	400-500	40-55	200-275	160-240
3/16" (4.8 mm)	500-750	55-80	250-350	190-300
1/4" (6.4 mm)	750-1100	80-125	325-450	325-450

Different electrode materials will vary slightly from these guidelines. Use of gases other than Argon will also change the recommended currents. Use this chart as a general guide. Also keep in mind that for a given amount of amperage, larger diameter electrodes will last longer but will be harder to start. Excessive current will cause the electrode to melt and drop out. Insufficient current will lead to an unstable arc.

For further assistance in selecting the correct tungsten electrode for your welding application, refer to the Arc Zone Pro TIG Calculator, or contact an Arc-Zone.com® technician via email at [sales@arc-zone.com](mailto:sales@arc-zone.com), or call worldwide: 760-931-1500.