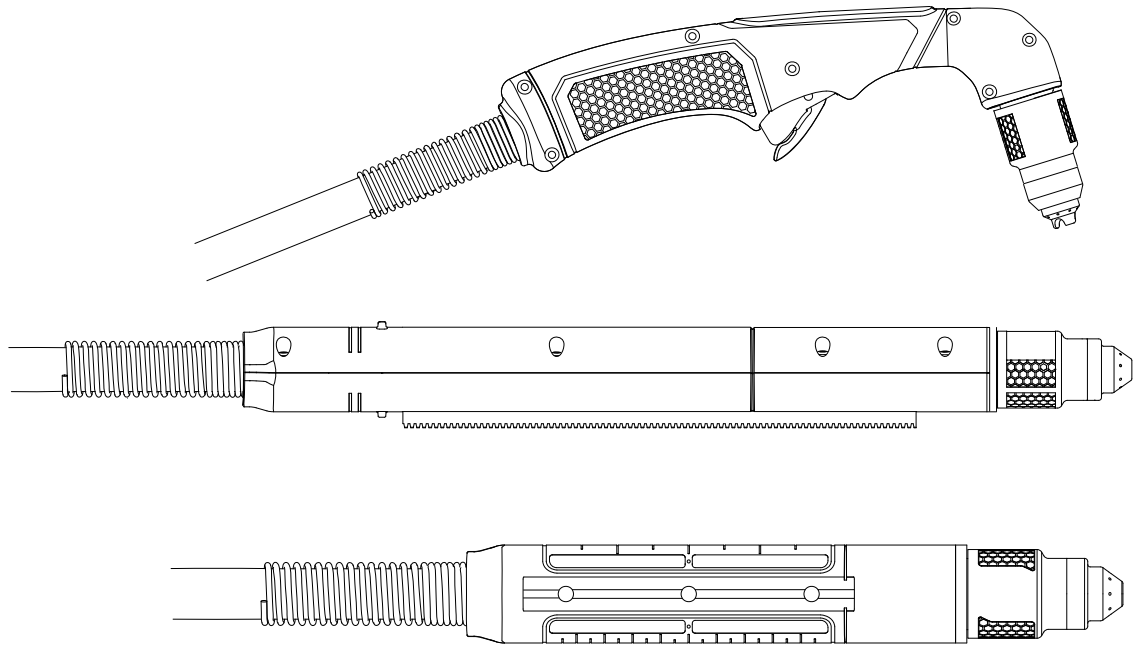
Powermax125 Cartridge Retrofit Torches

Operator Manual



811550 - Revision 0
July 2026

English
Original Instructions

Warranty information

You can find warranty information for your product at www.hypertherm.com/warranty.

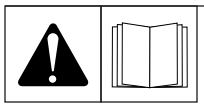
Recycling information

You can find recycling information for your product at www.hypertherm.com/resources/system-support/recycling/.

Contact us

hypertherm.com/contactus


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Safety information

WARNING! Before operating any Hypertherm equipment, read the safety instructions in your product's manual, the Safety and Compliance Manual (80669C), Waterjet Safety and Compliance Manual (80943C), and Radio Frequency Warning Manual (80945C). Failure to follow safety instructions can result in personal injury or in damage to equipment.

Copies of the manuals can come with the product in electronic and printed formats. Electronic copies are also on our website. Many manuals are available in multiple languages at www.hypertherm.com/docs.

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Environmental stewardship is one of Hypertherm's core values, and it is critical to our success and our customers' success. We are striving to reduce the environmental impact of everything we do. For more information: www.hypertherm.com/environment.

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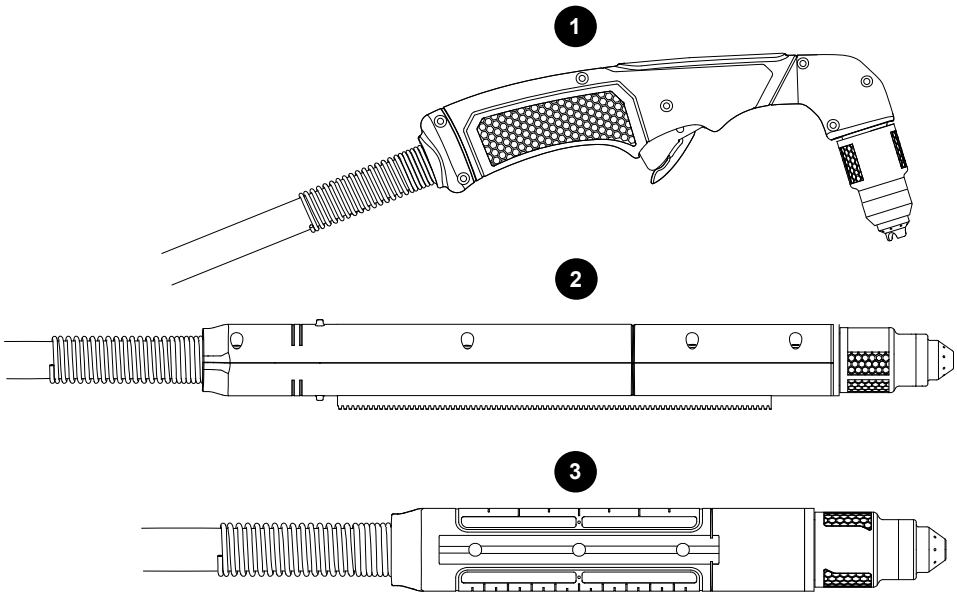
Chapter 1: Introduction

Powermax Hyamp cartridge retrofit torches (RT)

This operator manual includes the following information about the Powermax® Hyamp™ retrofit torches (RT):

- Specifications for the torches
- Specifications for the cartridge consumables
- Instructions for installing a cartridge on a torch
- Maintenance and troubleshooting information for the cartridges
- Cut charts

Powermax Hyamp retrofit torches (RT) use a 1-piece consumable cartridge. There are three RT torches:



1 Cartridge RT - 75-degree hand torch (059920)

2 Cartridge RT - Full length machine torch (059930)

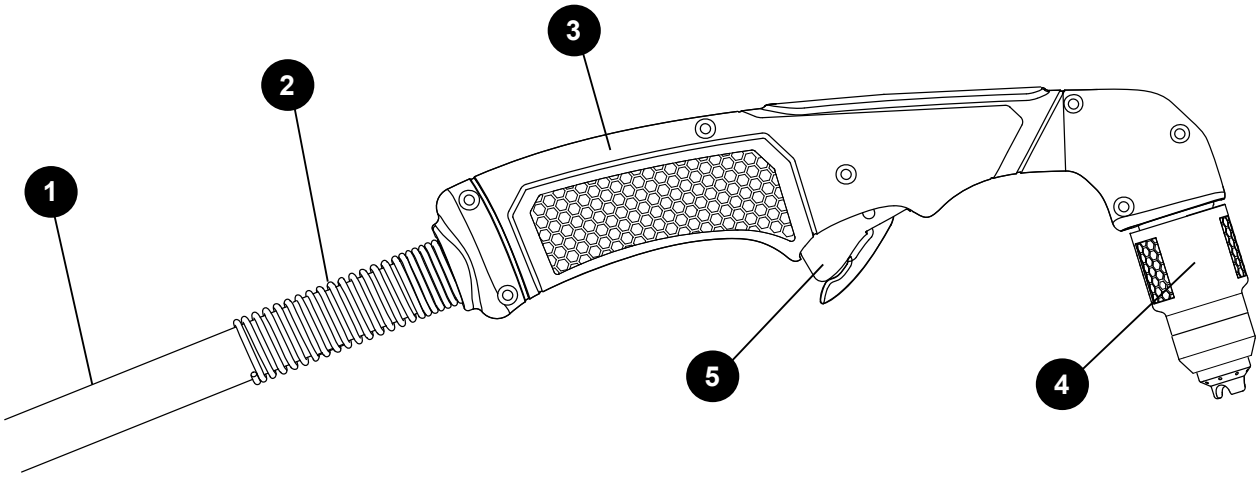
3 Cartridge RT - Mini robotic torch (059940)

The retrofit torches connect to the plasma power supply using the same FastConnect™ system as standard Duramax® Hyamp torches. Refer to the *Powermax125 Operator Manual (808080)* for information about connecting the torches to the plasma power supply.

Chapter 2: Retrofit torches

Cartridge HRT hand torch specifications

Cartridge HRT hand torch components



1 Torch lead

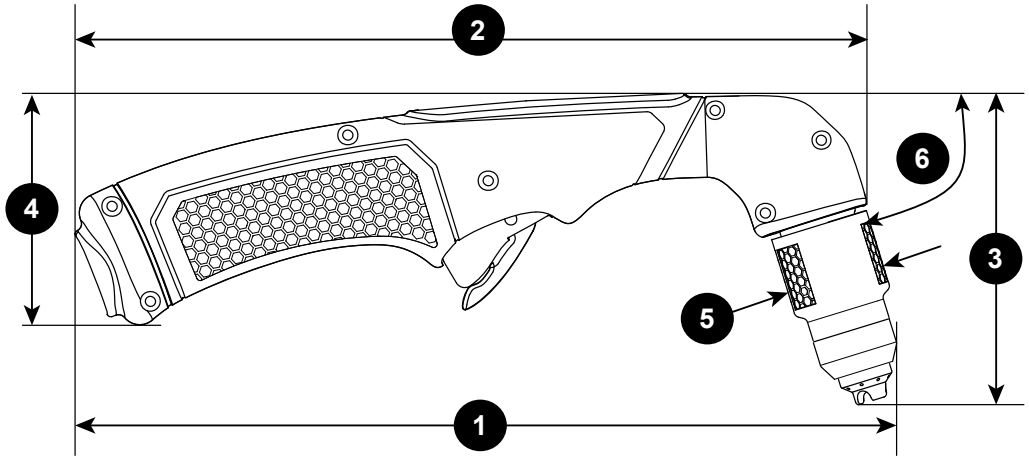
2 Strain relief for torch lead

3 Shell

4 Cartridge

5 Safety trigger

Cartridge HRT hand torch dimensions



1 267 mm (10.5 inch)

2 250 mm (10.2 inch)

3 99 mm (3.9 inch)

4 70 mm (2.75 inch)

5 32 mm (1.25 inch)

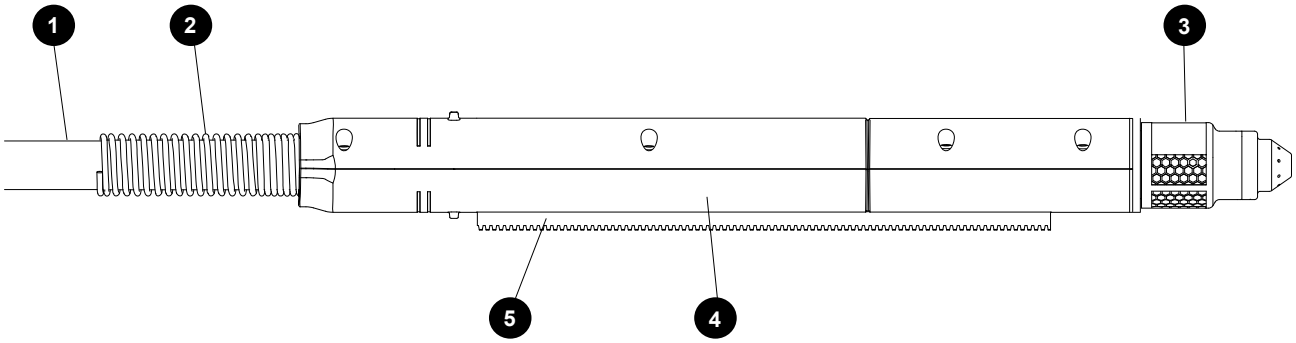
6 75°

Cartridge HRT hand torch weights

Torch	Weight (without a cartridge installed)
Hand with 7.6 m (25 foot) lead	3.4 kg (7.5 lb)

Cartridge MRT machine torch specifications

Cartridge MRT machine torch components



1 Torch lead

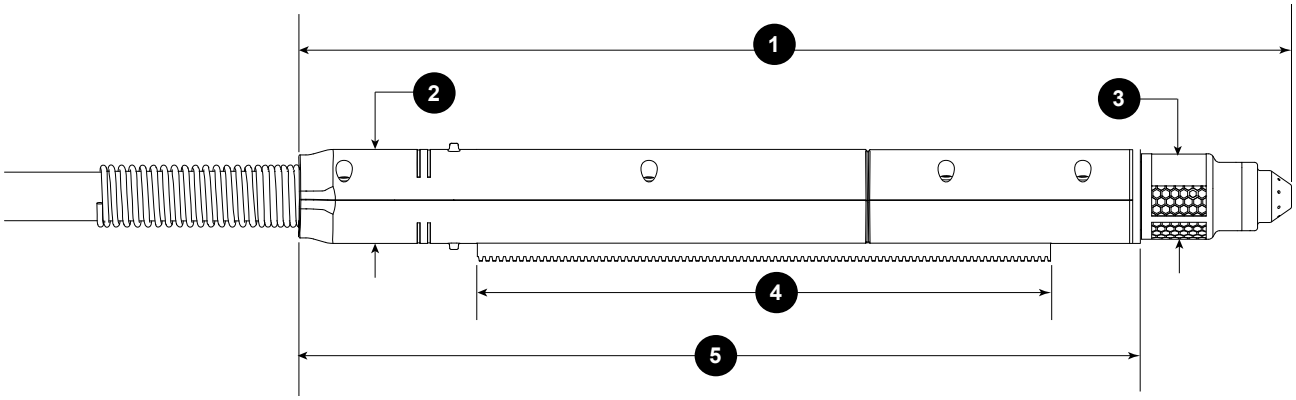
2 Strain relief for torch lead

3 Cartridge

4 Shell

5 32-pitch removable gear rack

Cartridge MRT machine torch dimensions



1 368 mm (14.5 inch)

2 35 mm +- 0.5mm (1.37 inch +- 0.02 inch)

3 32 mm (1.25 inch)

4 212 mm (8.3 inch)

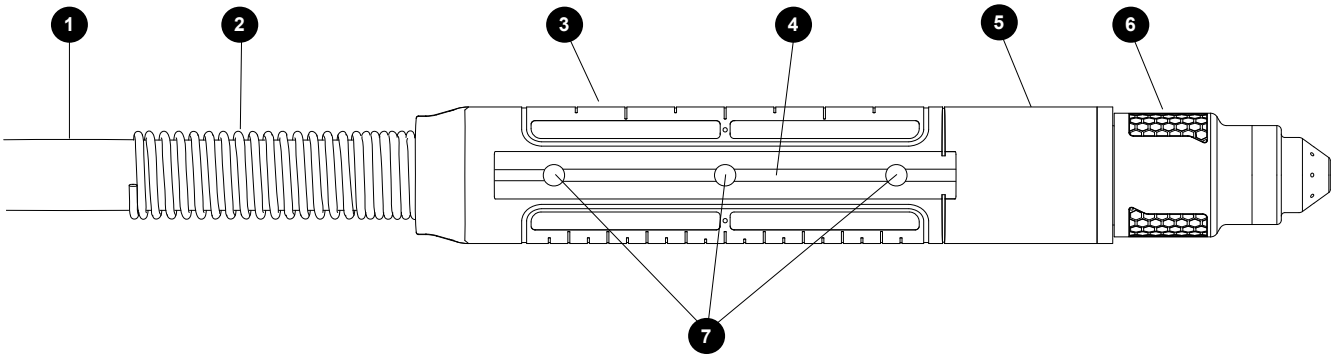
5 312 mm (12.3 inch)

Cartridge MRT machine torch weights

Torch	Weight (without a cartridge installed)
Machine with 15 m (50 foot) lead	6.1 kg (13.5 lb)

Cartridge RT robotic torch specifications

Cartridge RT robotic torch components



1 Torch lead

2 Strain relief for torch lead

3 Increment markings

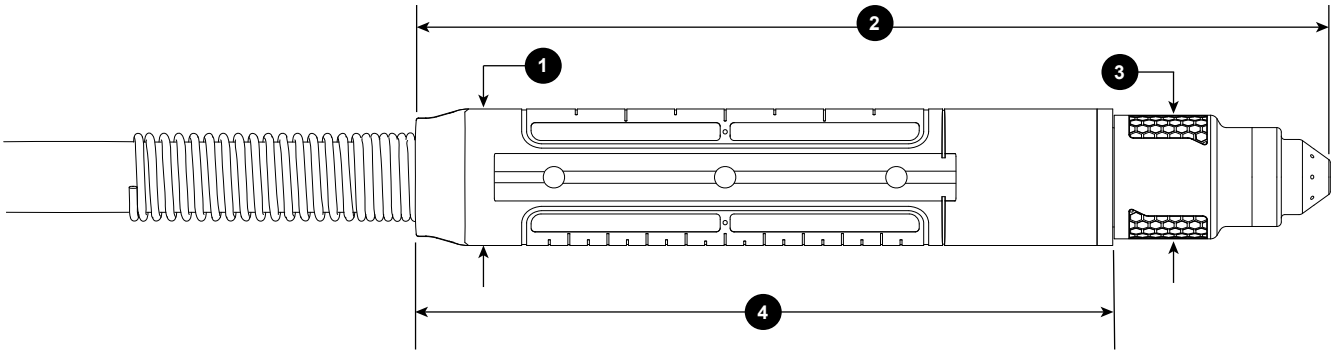
4 Anti-rotational slot

5 Shell

6 Cartridge

7 Positioning holes (3)

Cartridge RT robotic torch dimensions



1 35 mm +- 0.3 mm (1.37 inch +- 0.01 inch)

2 235 mm (9.25 inch)

3 32 mm (1.25 inch)

4 180 mm (7.08 inch)

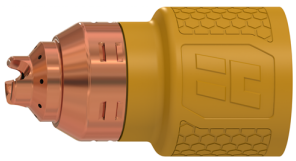
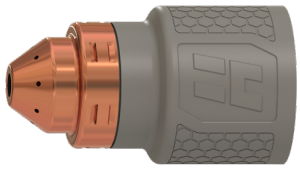
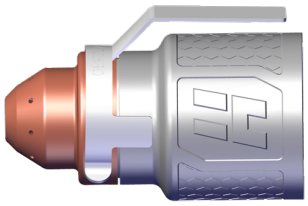
Cartridge RT robotic torch weights

Torch	Weight (without a cartridge installed)
Robotic torch with 15 m (50 foot) lead	6.1 kg (13.5 lb)

Chapter 3: Retrofit cartridges

Available cartridges

Hypertherm® offers the following cartridges for use with the retrofit torches:

Cartridge Type		Part number	Purpose
	Drag-cutting (yellow)	528162	Use these cartridges with the hand torch to drag the torch on the workpiece (drag-cut).
	Machine cutting (gray)	528161	Use these cartridges with the machine and robotic torches.
	Ohmic ring	428895	Use this cartridge accessory with torch height controls (THCs) that support ohmic contact to find the surface of the workpiece before each cut.

- For help installing the cartridge, refer to Install the cartridge on page 13 .

Install the cartridge

Follow these steps to install a cartridge on a torch.

Before you begin:

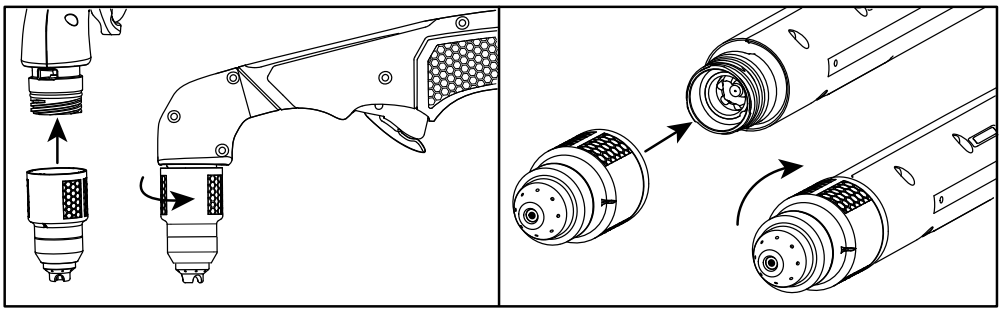
⚠ WARNING



INSTANT-ON TORCHES – PLASMA ARC CAN CAUSE INJURY, BURNS

Ignition of the plasma arc occurs immediately when you pull the torch trigger on a hand torch or send a start signal to a mechanized torch. Before you change the cartridge or consumables on the torch, set the power switch on the plasma power supply to OFF (**O**).

1. Turn off the plasma power supply.
2. If this is a new torch, remove the vinyl cap from the torch.
3. Select the correct cartridge for your cutting application.
4. Place the cartridge on the torch, and tighten it 1/4 of a turn.



The Torch Cap Liquid Crystal Display (LCD) on the front panel comes on when you remove the consumables while the plasma power supply is still ON. It extinguishes after you install the consumables.



Get the most out of your cartridges

- **Gas supply quality**
  - It is extremely important to keep the gas supply line clean and dry.
  - Oil, water, vapor, and other contamination in the gas supply can decrease cut quality and cartridge life.

- Refer to the *Powermax125 Operator Manual (808080)* for more information about gas filtration.

- **Cutting technique**
  - Whenever possible, start cuts from the edge of the workpiece. This helps to extend the life of the cartridge. Refer to the *Powermax125 Operator Manual (808080)* for information about cutting techniques.
  - Use the correct piercing method for the thickness of the workpiece that you are cutting. In many conditions, a rolling pierce method is an efficient way to pierce the workpiece while also decreasing the cartridge wear that naturally occurs during piercing. Refer to the *Powermax125 Operator Manual (808080)* for information about piercing techniques.
- **Thickness of the workpiece being cut**
  - In general, the thicker the workpiece being cut, the more quickly the cartridges become worn. Do not cut material that is thicker than what is specified for this system and cartridge.
- **Expanded metal cutting and pilot arc time**
  - Expanded metal has a slotted or mesh pattern. Cutting expanded metal wears out cartridges more quickly because it requires a continuous pilot arc. A pilot arc occurs when the torch is fired but the plasma arc is not in contact with the workpiece.
  - Fire the torch only when necessary to keep pilot arc time to a minimum. Frequent pilot arcs cause the nozzle in the cartridge to wear more quickly.
- **Arc stretch when cutting**
  - To get maximum cartridge life, only stretch the arc when it is necessary.
  - Drag the hand torch on the workpiece whenever possible.

Signs that a cartridge is near end-of-life

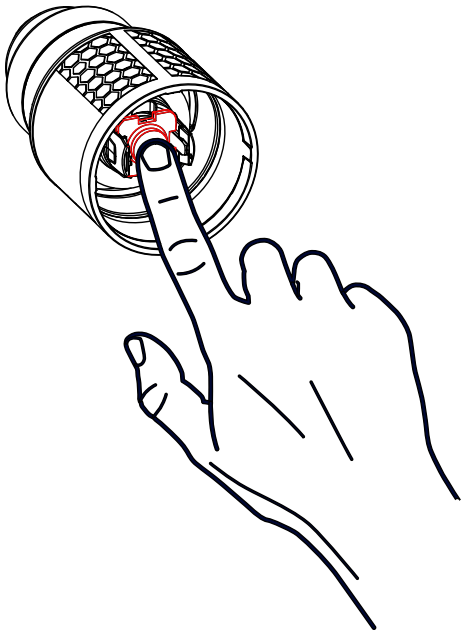
There are various indicators that a cartridge is near end-of-life.

Usually, the best indication of when to install a new cartridge is when the cut quality is no longer satisfactory. When it is necessary to replace a cartridge, replace the full cartridge with a new one. **Do not try to disassemble the cartridge.**

The following signs can be indications that a cartridge is near or at end-of-life:

- **Examine the nozzle hole.** A nozzle hole in good condition is circular. If the nozzle hole is not circular, replace the cartridge.

- **Look for a higher rate of Torch Stuck Open (TSO) or Torch Stuck Closed (TSC) errors.** As a cartridge wears, unwanted material can collect inside the cartridge and cause TSO and TSC faults to occur. In some conditions, you can remove this material by carefully shaking the cartridge.
- **Examine the crown.** The crown is the square copper piece inside of the cartridge. Push down the crown and then release the spring tension.



A crown in good condition goes back to its start position. If the crown stays in the down position, carefully shake the cartridge. If the crown continues to stay in the down position, replace the cartridge.

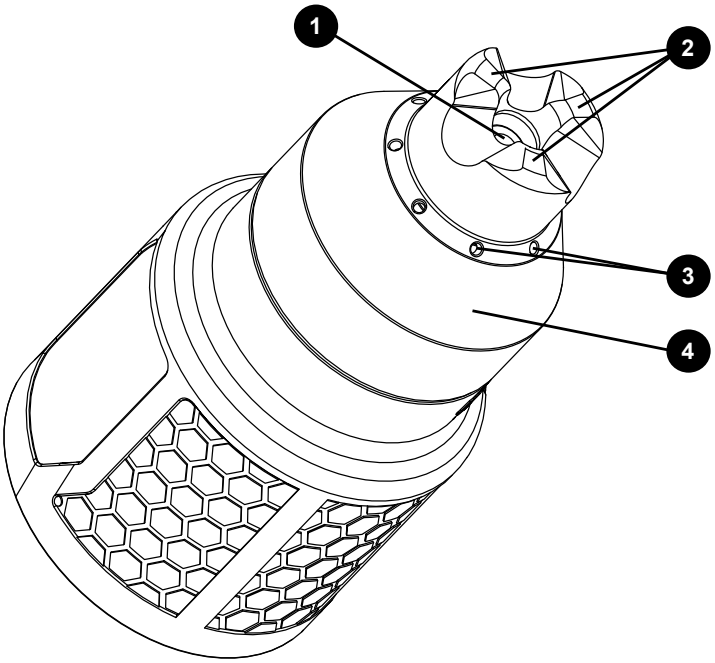
If you do a lot of piercing, it is possible to see black marks on the retaining cap. Usually this is not a sign that the cartridge is at end-of-life. Continue to cut with the cartridge until the cut quality is no longer satisfactory.

Maintenance for the cartridge

Do the recommended steps to help keep a cartridge operating correctly.

- Carefully remove molten metal that collects in the castellations of the drag-cutting cartridges.

  Do not push the unwanted material inside the nozzle or shield.



1 Nozzle

2 Castellations

3 Holes for airflow

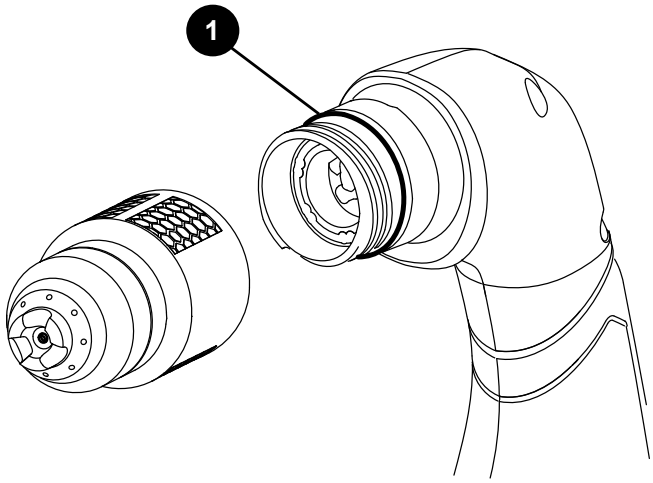
4 Shield

- Carefully remove molten metal that causes a blockage of the airflow holes in the shield.

  Do not push the unwanted material inside the nozzle or shield.

- Examine the O-ring on the torch body.

If the O-ring is cracked or worn	Replace the O-ring.
If the O-ring is dry, or if it is not easy to install the cartridge	Apply a thin layer of silicone lubricant on the O-ring and the threads. Make sure that the O-ring is shiny, but do not apply too much lubricant.



1 O-ring

Chapter 4: Cut charts

How to use the cut charts

The cut chart provides Hypertherm recommended settings for cutting mild steel with the retrofit machine and robotic torches.

The cut chart contains the following information:

Material thickness	Thickness of the workpiece (metal plate being cut).
Cut height	Distance between the shield and the workpiece during the cut.
Initial pierce height	Distance between the shield and the workpiece when the torch is triggered, before it moves to the cut height.
Pierce delay	Length of time the triggered torch remains stationary at the pierce height before the torch starts the cutting motion.
Best quality settings (cut speed and voltage)	Provides a starting point for finding the best cut quality (best angle, least dross, best cut-surface finish). Adjust the speed for your application and table to obtain the desired result.

Highest production settings (cut speed and voltage)	Are 70% to 80% of the maximum speed ratings. These speeds result in the greatest number of cut parts, but not necessarily the best possible cut quality. The arc voltage increases as the consumables wear, so you may need to increase the voltage setting to maintain the correct torch-to-work distance. Some Computer Numerical Control systems monitor the arc voltage and adjust the torch height automatically.
Kerf width	The width of the cut. Hypertherm obtained the kerf width data using the Best Quality settings. Differences in installation conditions and material composition can change your actual results.

Mild steel - 125 A - air cut chart

125 A air shielded cutting settings for mild steel.

Gas flow rate - slpm / scfh

227 / 480	Hot (cutflow)
304 / 645	Cold (postflow)

Metric

Material thickness	Cut height	Initial pierce height		Pierce delay	Best quality		Highest production		Kerf width
					Cut speed	Arc voltage	Cut speed	Arc voltage	
mm	mm	mm	%	seconds	mm/min	volts	mm/min	volts	mm
6	4.6	9	200	0.2	4980	160	5960	160	1.0
8	4.6	9	200	0.3	3800	161	4570	161	1.1
10	4.6	9	200	0.4	2750	162	3330	161	1.1
12	4.6	9	200	0.5	2050	164	2510	163	1.3
16	4.6	10	225	0.8	1260	166	1660	165	1.9
20	4.6	10	225	1.3	980	170	1140	168	2.3
25	4.6	10	225	2.4	610	175	780	173	2.6
30	4.6	Edge Start			580	179	510	177	2.8
32	4.6	Edge Start			400	181	500	178	2.9
35	4.6	Edge Start			340	184	430	181	3.0
40	4.6	Edge Start			240	189	310	186	3.2

English

Material thickness	Cut height	Initial pierce height		Pierce delay	Best quality		Highest production		Kerf width
					Cut speed	Arc voltage	Cut speed	Arc voltage	
inches	inches	inches	%	seconds	in/min	volts	in/min	volts	inches
1/4	0.18	0.36	200	0.2	188	160	225	160	0.040
3/8	0.18	0.36	200	0.4	114	162	138	161	0.042
1/2	0.18	0.36	200	0.5	75	164	93	163	0.051
5/8	0.18	0.40	225	0.8	50	166	66	164	0.075
3/4	0.18	0.40	225	1.0	42	169	48	168	0.090
7/8	0.18	0.40	225	2.0	31	171	37	170	0.095
1	0.18	0.40	225	2.5	23	176	30	173	0.105
1-1/4	0.18	Edge Start			16	181	20	178	0.114
1-1/2	0.18	Edge Start			11	187	14	184	0.122