

# ***PAC120 to PAC121***

***Torch Upgrade***

***Field Service Bulletin  
802020 - Revision 3***

***Hypertherm***  
*The world leader in  
plasma cutting technology*

# **PAC 120 to PAC 121 TORCH UPGRADE**

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# **PAC120 to PAC121 Torch Upgrade**

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## PAC120 to PAC121 Torch Upgrade

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### **WARNING INSTANT-ON TORCHES**



The PAC121 hand-held torches and machine torch are instant-on torches. These torches fire (produce a plasma arc) immediately after torch switch closure or remote switch closure for a machine torch. Always hold the hand torch away from your body as a precaution against accidental torch firing. Be aware of this hazardous potential, failure to do so can result in serious bodily injury.

# PAC120 to PAC121 Torch Upgrade

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## Introduction

The field upgrade kits listed below provide maintenance personnel with the improved PAC121 torch main bodies in order to replace the existing PAC120 main bodies in the trigger, pushbutton and machine torches. Also included in the kit are newly designed consumables for use with the PAC121 torches (Figure 4).

## PAC121T Trigger Torch Upgrade

### Kit, # 028763

Torch Main Body w/Switch, # 020932  
Retaining Cap, # 020930  
Swirl Ring, # 020361  
Tyrap, # 074005  
Terminal 10-12 gauge, quick disconnect male, yellow, # 074169  
Field Service Bulletin, # 802020

### Tools Required

5/16-inch Open-End Wrench  
7/16-inch Open-End Wrench  
#1 Phillips Head Screwdriver  
Crimp tool, T&B WT-145A or equivalent

### Procedure

Refer to the steps below and Fig.1 to install the PAC121T torch main body with switch (# 020932).

1. **Ensure the power switch is positioned to OFF (0), unplug the power cable, and disconnect the gas supply.**
2. Remove consumable parts from the torch. Keep the electrode and nozzle, but discard the old swirl ring and retaining cap.
3. Remove the five screws which secure the handle halves together.
4. Remove the torch main body and torch switch from the handle.
5. Remove the plastic Tyrap strip that holds wiring bundle together.

Note: Pull apart the connectors in the following steps. **Do not pull on wires.**

6. Disconnect the terminals between the black plunger wire and the two white wires from the torch lead.
7. Disconnect the bullet receptacles from plugs connecting the two blue wires from the torch lead to the white wires from the cap sensor microswitch.
8. Disconnect the red wire attached to the pilot arc tab.

## **PAC120 to PAC121 Torch Upgrade**

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9. Use both wrenches to disconnect the old torch main body from the torch lead gas fitting.
10. Cut the terminal off the two white wires between the wire crimp and insulation crimp. Remove the remainder of the insulation crimp. Strip insulation on white wires back  $5/16 \pm 1/32$  inch. Crimp on yellow terminal (# 074169) using appropriate crimping tool.
11. Connect the new torch main body to the torch lead gas fitting using both wrenches.
12. Connect the terminal of the two white wires from the torch lead to the black plunger wire terminal of the torch main body.
13. Connect the bullet receptacles and plugs connecting the two blue wires from the torch lead to the white wires from the cap sensor microswitch.
14. Connect the red wire from torch leads to the pilot arc tab.
15. Bundle the wires and secure with plastic Tyrap strip.
16. Install the torch main body and torch switch back in the handle half that also holds the trigger and spring. Be certain that torch switch slides into position above the trigger, and that moving the trigger activates and releases the switch.
17. While positioning the handle halves together, be careful not to pinch any wires.
18. Replace the five screws that hold the handle halves together.
19. Install consumable parts, using the electrode and nozzle removed in step 2 and the new swirl ring and retaining cap provided in the upgrade kit. When the retaining cap is tightened, the microswitch will click, indicating that the torch main body has been replaced correctly. See Figure 4 for PAC121 consumables diagram.

# PAC120 to PAC121 Torch Upgrade

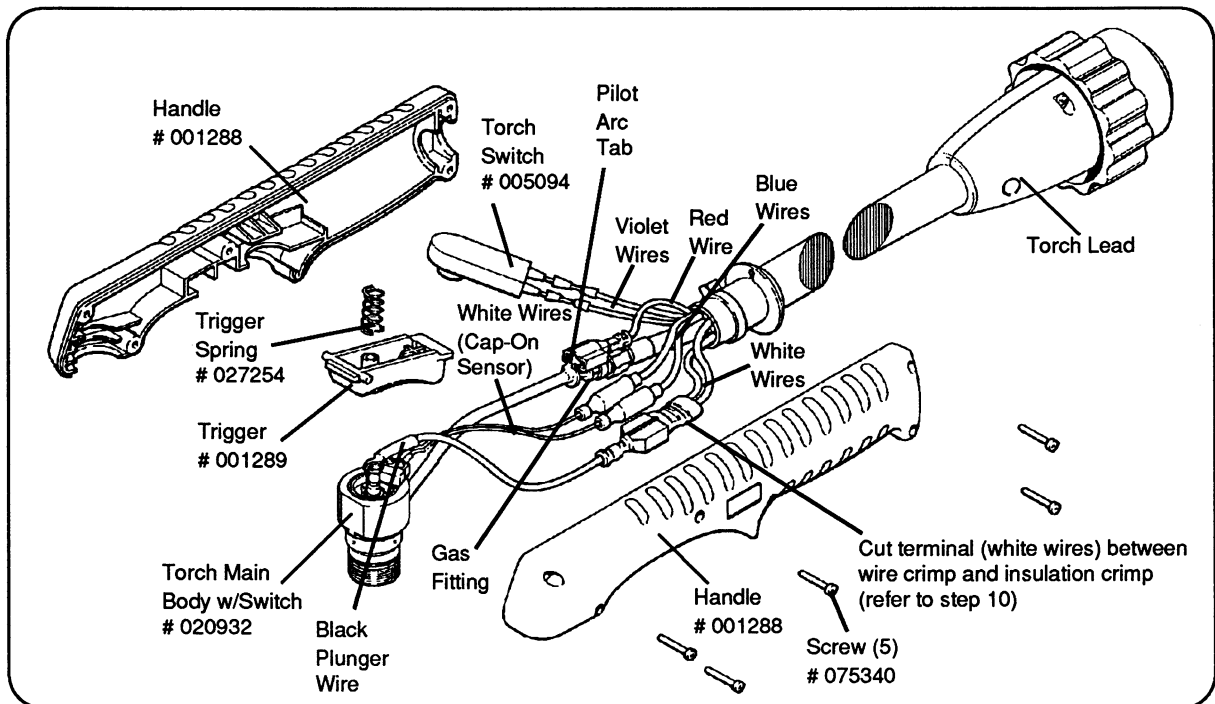


Figure 1 PAC121T Torch Assembly



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## PAC121P Pushbutton Torch Upgrade

### Kit, # 028765

Torch Main Body w/Switch, # 120013

Retaining Cap, # 020930

Swirl Ring, # 020361

Field Service Bulletin, # 802020

### Tools Required

5/16-inch Open-End Wrench

7/16-inch Open-End Wrench

#1 Phillips Head Screwdriver

### Procedure

Refer to the steps below and Fig. 2 to install the PAC121P torch main body with switch (# 120013).

1. **Ensure the power switch is positioned to OFF (0), unplug the power cable, and disconnect the gas supply.**
2. Remove consumable parts from the torch. Keep the electrode and nozzle, but discard the old swirl ring and retaining cap.
3. Remove the five screws which secure the handle halves together.
4. Remove the torch main body assembly and torch switch from the handle.
5. Slide the protective PVC tubing back away from the connections.

Note: Pull apart the connectors in the following steps. **Do not pull on wires.**

6. Disconnect the terminals connecting the two white wires from the torch lead to the black plunger wire from the torch main body.
7. Disconnect the bullet receptacle and plug connecting the red wire from the torch lead to the red wire from the pilot arc fitting.
8. Disconnect the bullet receptacles and plugs connecting the two blue wires from the torch lead to the white wires from the cap -on sensor microswitch.
9. Use both wrenches to disconnect the old torch main body from the torch lead gas fitting.
10. Connect the new torch main body to the torch lead gas fitting using both wrenches.
11. Connect the terminals connecting the two white wires from the torch lead to the black plunger wire from the torch main body.
12. Connect the bullet receptacle and plug connecting the red wire from the torch lead to the red wire from the pilot arc fitting.

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13. Connect the bullet receptacles and plugs connecting the two blue wires from the torch lead to the white wires from the cap sensor microswitch.
14. Slide the protective PVC tubing back over the connections.
15. Install the torch main body and torch switch into one of the handle halves. While positioning the handle halves together, be careful not to pinch any wires. Be especially careful around the torch switch retainers.
16. Replace the five screws that hold the handle halves together.
17. Install consumable parts, using the electrode and nozzle removed in step 2 and the new swirl ring and retaining cap provided in the upgrade kit. When the retaining cap is tightened, the microswitch will click, indicating that the torch main body has been replaced correctly. See Figure 4 for PAC121 consumables diagram.

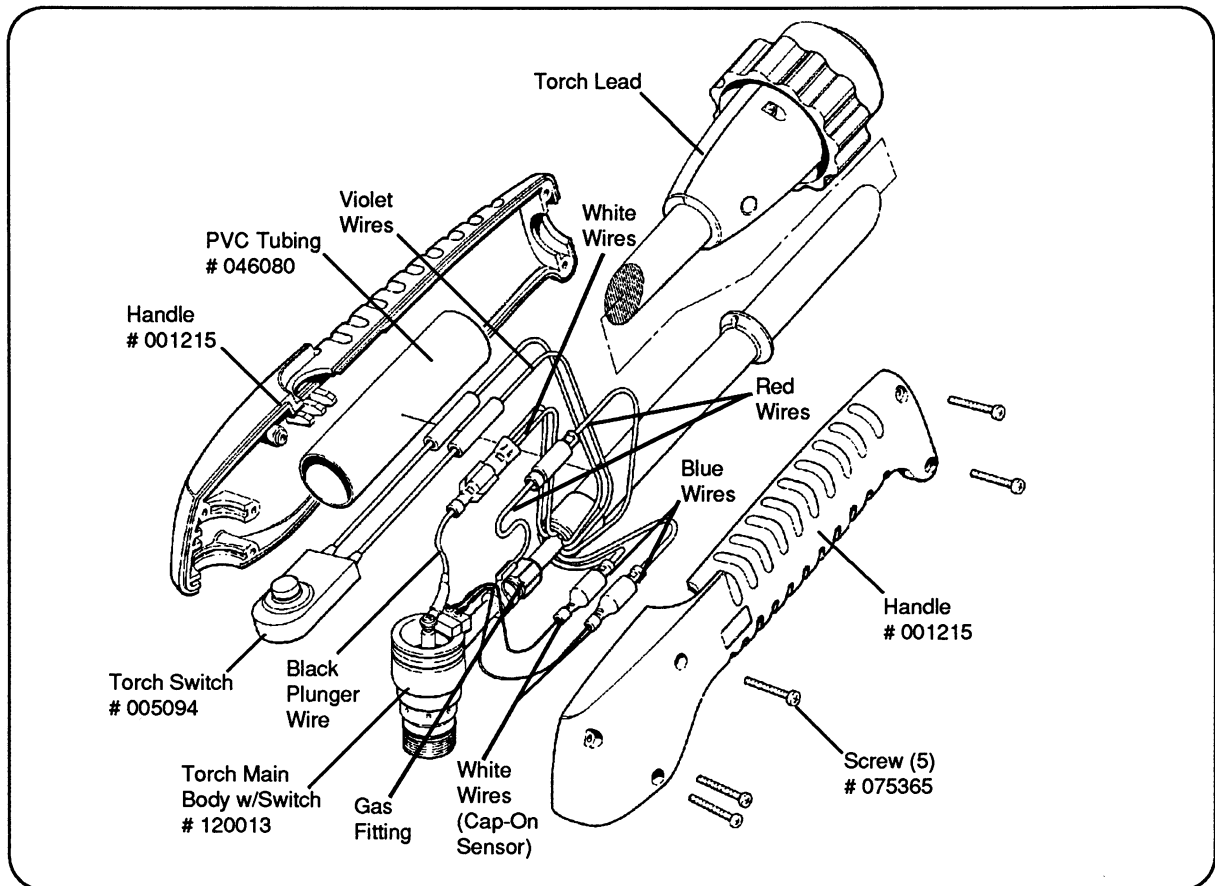


Figure 2 PAC121P Torch Assembly

# PAC120 to PAC121 Torch Upgrade

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## PAC121 M Machine Torch Upgrade

Kit, # 128235	Tools Required
Torch Main Body w/Switch, # 120554 O-Ring, # 044016 Retaining Cap, # 020930 Extended Electrode, # 120574 Extended Pipe Saddle Nozzle, # 120023 Swirl Ring, # 020361 Torch Sleeve, # 020559 Terminal 10-12 gauge, quick disconnect male, yellow, # 074169 Field Service Bulletin, # 802020	5/16-inch Open-End Wrench 7/16-inch Open-End Wrench #1 Phillips Head Screwdriver 3/32-inch Hex Wrench Crimp tool, T&B WT-145A or equivalent

### Procedure

Refer to the steps below and Figure 3 to install the PAC121M torch main body with switch (# 120554).

1. **Ensure the power switch is positioned to OFF (O), unplug the power cable, and disconnect the gas supply.**
2. Remove and discard consumable parts from torch.
3. Remove the 3 screws (# 075321) securing the torch sleeve to the torch main body using hex wrench. Retain screws.
4. Unscrew the torch sleeve from the torch sleeve insulator. Discard torch sleeve.
5. Remove the screw (# 075322) securing the red wire from the torch lead to the PAC120 torch main body. Retain screw.

Note: Pull apart the connectors in the following steps. **Do not pull on wires.**

6. Disconnect the terminals between the black plunger wire and the 2 white wires from the torch lead.
7. Disconnect the terminals between the 2 white wires from the microswitch and the blue wires from the torch lead.
8. Use the wrenches to disconnect the PAC120 torch main body from the torch lead gas fitting. Discard PAC120 torch main body.
9. Cut the terminal off the 2 white wires between the wire crimp and insulation crimp. Remove the remainder of the insulation crimp. Strip insulation on white wires back  $5/16 \pm 1/32$  inch. Crimp on yellow terminal (# 074169) using appropriate crimping tool.
10. Connect the torch main body and torch lead gas fitting using both wrenches.
11. Connect the terminals from the 2 blue wires from the torch lead to the 2 white wires from the cap-on sensor microswitch.
12. Connect the terminals from the 2 white wires from the torch lead and the black plunger wire from the torch main body.

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13. Secure the red wire from the torch lead to the torch main body with screw (# 075322).
14. Tie the plunger wire back on the torch lead as shown in Figure 3. With the ties in place and snugged down, adjust the wire so that there is 1/4 inch (6 mm) of slack between the wire and the gas nut. Tighten and trim ties.
15. Position the new torch sleeve (# 020559) on to the torch main body and secure it with the three (3) screws (# 075321) using hex wrench. Torque to 7 in. lb.
16. Screw the torch sleeve (# 020559) and the torch sleeve insulator together.
17. Install consumable parts provided in upgrade kit and as shown in Figure 4. When the retaining cap is tightened, the microswitch will click, indicating that the torch main body has been replaced correctly.

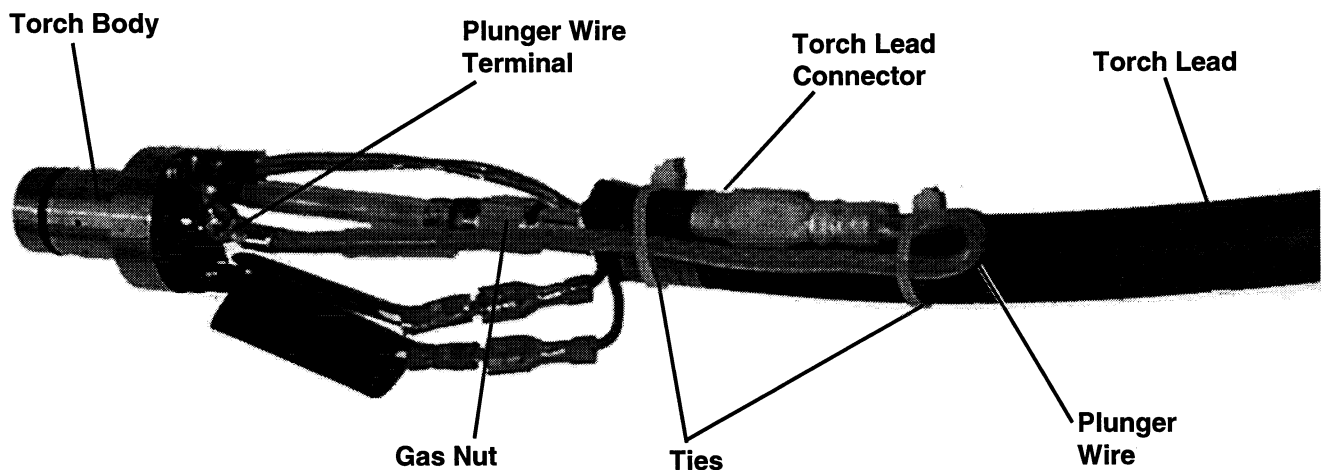
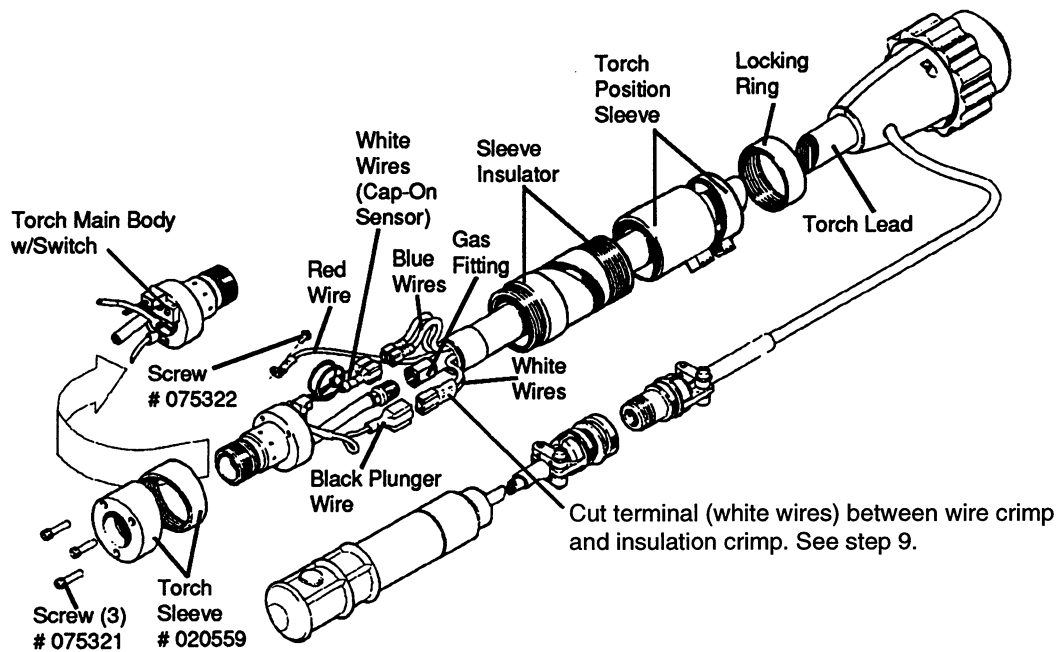


Figure 3 PAC121M Torch Assembly

# PAC120 to PAC121 Torch Upgrade

## Summary of Consumable Changes from PAC120

- The new swirl ring (# 020361) has been redesigned to be more resistant to mechanical stress. The old swirl rings, which have the same part number, can continue to be used in the new PAC121 torch.
- The new extended pipe saddle nozzle (# 120023) has been designed to provide better access and visibility and now must be used with the extended electrode (# 120574). The old pipe saddle nozzle (# 020542) cannot be used in the new PAC121 torch, but the new extended pipe saddle nozzle can be used in conjunction with the extended electrode in the old PAC120 torch.
- The new retaining cap (# 020930) has been made slightly longer and now replaces retaining cap (# 020364). This new retaining cap can be used with the old PAC120 torch, but the old retaining cap (# 020364) cannot be used in the new PAC121 torch.
- All other consumables can continue to be used as before.

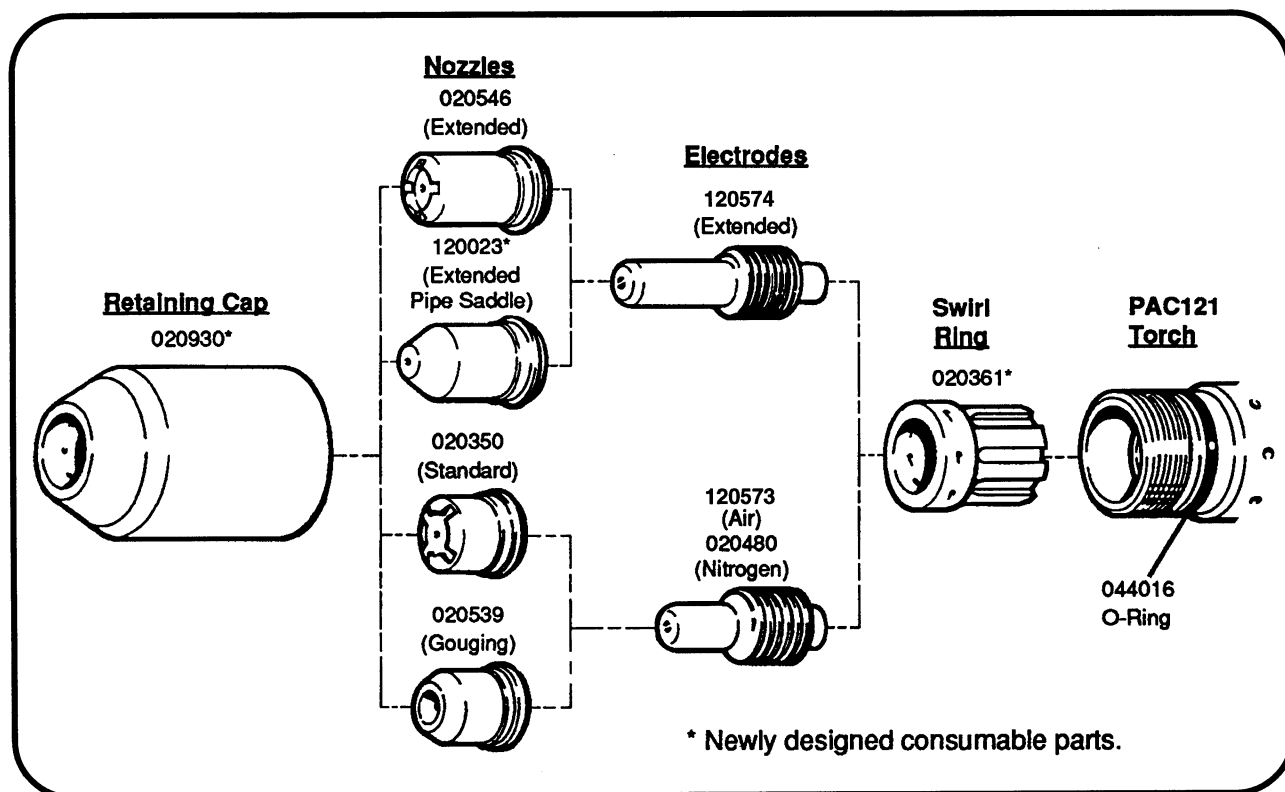


Figure 4 PAC121 Torch Consumables Parts