

Repair



# HV-9500 Maintenance and Repair

Diaphragm-Jet™ Technology

3A5910A

EN

For non-contact dispensing of viscous material in industrial environments.  
For Professional Use only.



## Important Safety Instructions

Read all warnings and instructions in this manual and all related manuals before using this equipment. Save these instructions.



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PROVEN QUALITY. LEADING TECHNOLOGY.

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## Related Manuals

Manuals are available at [www.graco.com](http://www.graco.com). Component manuals below are in English:

3A5928	HV-9500 Standalone Jet Setup and Operation
3A5908	Advanjet Jet Maintenance Tool Kit (JKT-9500)

## Technical Assistance

For technical assistance:





Phone: +1 760-294-3392

Web: [www.advanjet.com](http://www.advanjet.com)

E-mail: [info@advanjet.com](mailto:info@advanjet.com)

## Safety Guidelines

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

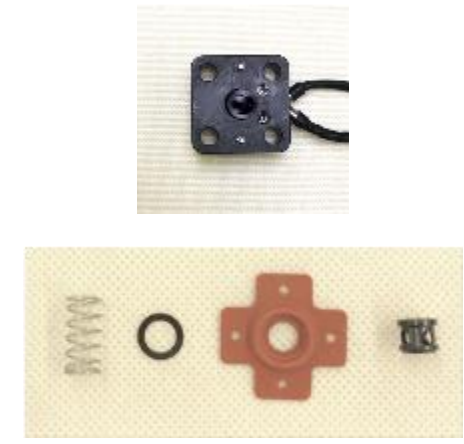
 <b>WARNING</b>	
	<ul style="list-style-type: none"><li>• <b>TOXIC FLUID OR FUMES HAZARD</b></li><li>• Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.<ul style="list-style-type: none"><li>• Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using.</li><li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li></ul></li></ul>
	<ul style="list-style-type: none"><li>• <b>BURN HAZARD</b></li><li>Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:<ul style="list-style-type: none"><li>• Do not touch hot fluid or equipment.</li></ul></li></ul>
	<ul style="list-style-type: none"><li>• <b>PERSONAL PROTECTIVE EQUIPMENT</b></li><li>• Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:<ul style="list-style-type: none"><li>• Protective eyewear, and hearing protection.</li><li>• Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.</li></ul></li></ul>

# 1. Required Parts and Tools

This document describes procedures for installing HV-9500 jet maintenance kits. For optimal jet performance and to prevent damage to the jet, the cylinder assembly, the solenoid assembly, and the heater block assembly should be periodically replaced. Whenever the jet hammer spring is removed, the jet hammer gap must be set before dispensing can proceed.

## 1.1 Maintenance Kits












1.1.1 Bushing Kit (BK-2001)		
JET SPRING	P/N 60-2102	
WASHER	P/N 60-2116	
HEATER SEAL	P/N 03-2261-00	
BUSHING	P/N 03-2162-00	

1.1.2 Heater Kit (HK-9500)																	
<p><b>HK-9500 (STANDARD, 10W)</b></p> <table border="1"> <tr> <td>HEATER BLOCK</td> <td>03-2358-00</td> </tr> <tr> <td>HEATER CABLE ASSEMBLY</td> <td>06-1043-00</td> </tr> <tr> <td>HEATER CABLE SETSCREW (2)</td> <td>M3 X 3</td> </tr> <tr> <td>HEATER BLOCK SCREWS (2)</td> <td>M3 X 30 FHMS</td> </tr> </table> <p style="text-align: center;">- and -</p> <table border="1"> <tr> <td>JET SPRING</td> <td>P/N 60-2102</td> </tr> <tr> <td>WASHER</td> <td>P/N 60-2116</td> </tr> <tr> <td>HEATER SEAL</td> <td>P/N 03-2261-00</td> </tr> <tr> <td>BUSHING</td> <td>P/N 03-2162-00</td> </tr> </table>		HEATER BLOCK	03-2358-00	HEATER CABLE ASSEMBLY	06-1043-00	HEATER CABLE SETSCREW (2)	M3 X 3	HEATER BLOCK SCREWS (2)	M3 X 30 FHMS	JET SPRING	P/N 60-2102	WASHER	P/N 60-2116	HEATER SEAL	P/N 03-2261-00	BUSHING	P/N 03-2162-00
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## 1.1 Maintenance Kits (Continued)

1.1.3 Jet Repair Kit (JK-9500)		
MAIN AIR VALVE	P/N 60-2105	
MAIN AIR (JET HAMMER) CYLINDER ASSEMBLY	P/N 60-2266	
SILENCER	P/N 60-2107	
LEVER	P/N 03-2281-00	
PIVOT BOLT	P/N 60-2104	
JET SPRING	P/N 60-2102	
WASHER	P/N 60-2116	
HEATER SEAL	P/N 03-2261-00	
BUSHING	P/N 03-2162-00	

## 1.2 Required Tools

<b>Jet Maintenance Tool Kit (JKT-9500)</b>	
Loctite® 243 small screw threadlocker (P/N 60-2292)	
5/64-inch hex wrench (P/N 60-2293)	
0.050-inch hex wrench (P/N 60-2294)	
Awl (P/N 60-2296)	
Gap Set Fixture (P/N 90-0010)	
<b>Other Tools</b>	
#1 Phillips screwdriver	
#2 Phillips screwdriver	
3-mm hex wrench	
2.5-mm hex wrench	
150-mm adjustable wrench	
13-mm open end wrench	

Loctite® is a registered trademark of Henkel.



## 2. Jet Disassembly

### 2.1 Overview

**Note:** *It is important to flush and clean the jet valve prior to making repairs. Follow the steps for cleaning the jet valve in the HV-9500 Standalone Jet Setup and Operation manual 3A5928.*

This manual presents repair procedures for the HV-9500 jet series:

- HV-9500 standard jet
- HV-9500R – right side valve mount
- HV-9500-60Z –large capacity syringe option
- HV-9500HF –optional heated feed tube for high flow dispensing

The extent of jet disassembly depends on which kits are being installed. When noted, use the tool specified.

For all jet kits, remove and keep:

- Nozzle plate and two screws with two washers each
- (HV-9500HF) Upper and lower feed tube enclosures and two screws.
- Syringe holder and two screws
- Top cover and two screws
- Dovetail plate and four screws
- Mounting plate and two screws

For the Bushing Kit and Heater Kit (BK-2001 and HK-9500):

- Detach the heater block (keep for BK-2001; discard for HK-9500)
- Remove and discard the heater seal, washer, bushing, and jet hammer spring

For the Jet Repair Kit (JK-9500):

- Detach the heater block (keep unless also installing HK-9500)
- Remove and discard the heater seal, washer, bushing, and jet hammer spring
- Remove and discard these jet parts:
  - Main (jet hammer) air cylinder
  - Pivot bolt
  - Lever
  - Solenoid valve
  - Silencer

Section 2.6 provides a checklist of parts and screws that should be set aside. Take care to set aside screws as they are removed so they can be easily located for installing the new parts. Remove built-up threadlocker as necessary.

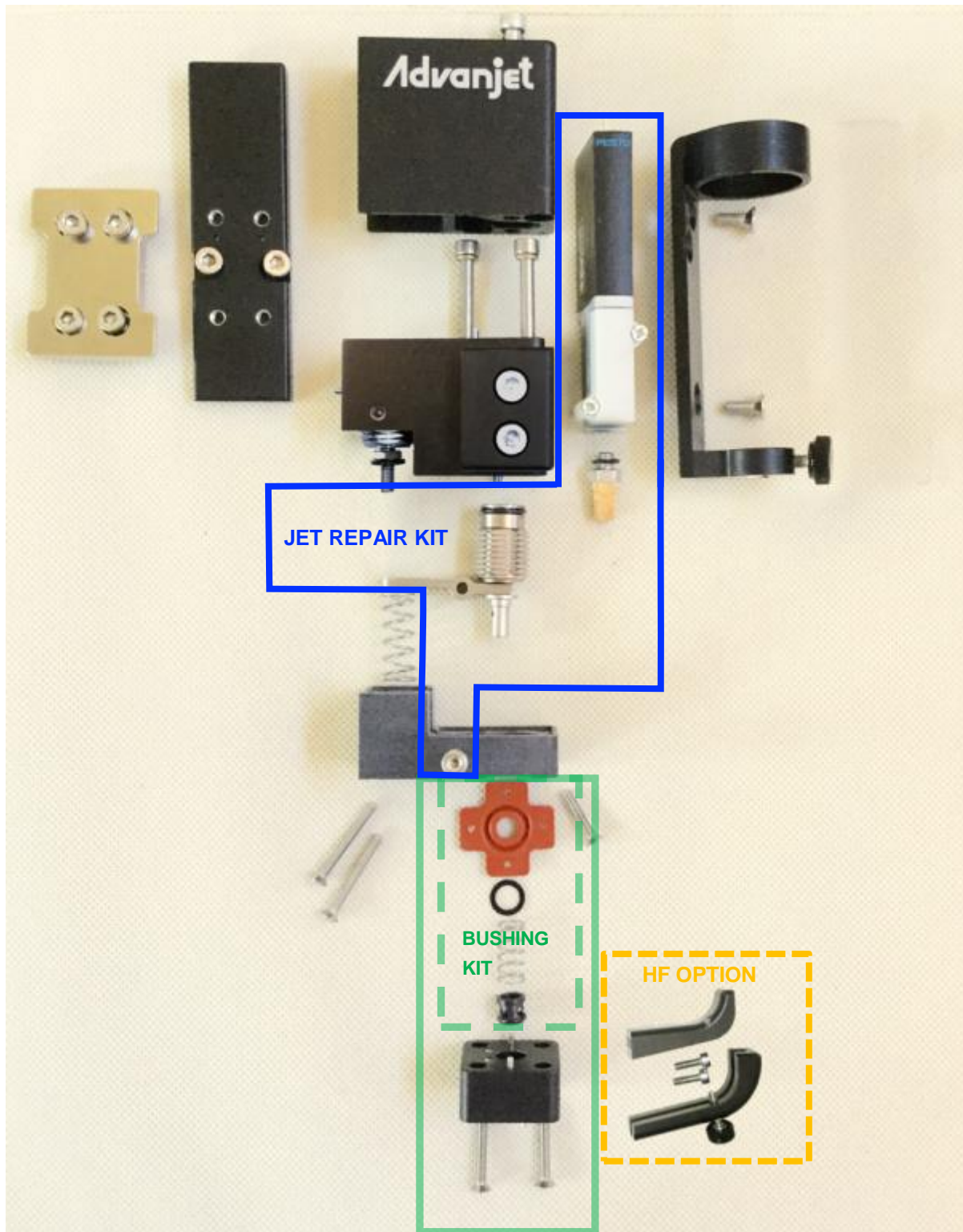
After reassembling the jet, the jet hammer gap must be set using the procedure in Section 4.

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## 2.2 Disassembled HV-9500 Jet

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(HV-9500R with HF option jet shown)



## 2.3 Remove Top Cover, Syringe Holder, and Plates

**KEEP** these parts to reinstall. Do not discard screws.

A checklist of saved parts and screws is provided in section 2.6.

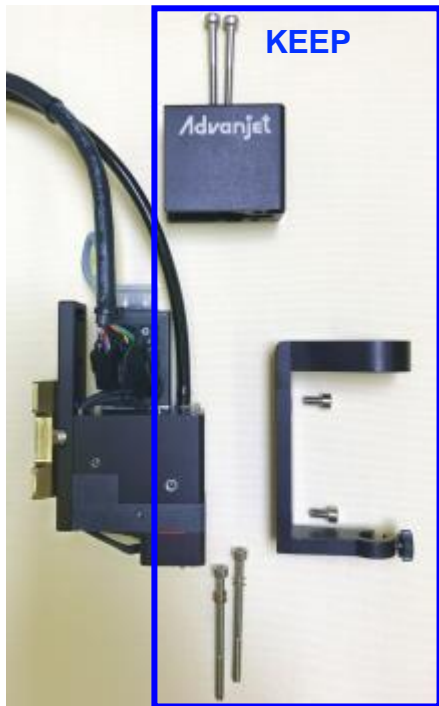
### 2.3.1 Remove the Top Cover, Syringe Holder and Nozzle Plate

If a heated feed tube enclosure is installed, loosen the thumbscrew to remove the lower feed tube enclosure. Use the 2.5mm driver to remove and set aside the two screws securing the upper feed tube enclosure.

If a syringe is still in place, remove the feed tube from the nozzle plate fluid barb, loosen the syringe holder thumbscrew, and remove the fluid syringe.

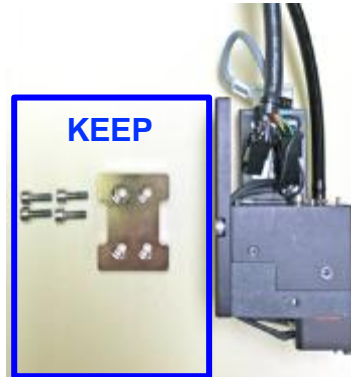
Using the 3mm driver, remove and set aside:

- The two screws securing the top cover
- The two screws securing the syringe holder
- The two screws that secure the nozzle plate



### 2.3.2 Remove the Dovetail Plate

Use the 3mm driver to remove the four screws securing the dovetail plate; set aside.



### 2.3.3 Remove the Mounting Plate

Use the 3mm driver to remove the two screws securing the mounting plate; set aside.



## 2.4 Remove Heater Block Assembly

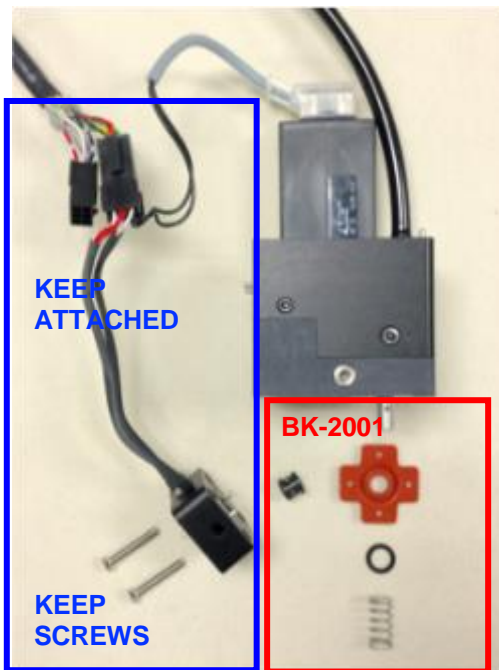
**KEEP** these parts to reinstall. Do not discard screws.

A checklist of saved parts and screws is provided in section 2.6.

**BK-2001/HK-9500** kit replaces these parts.

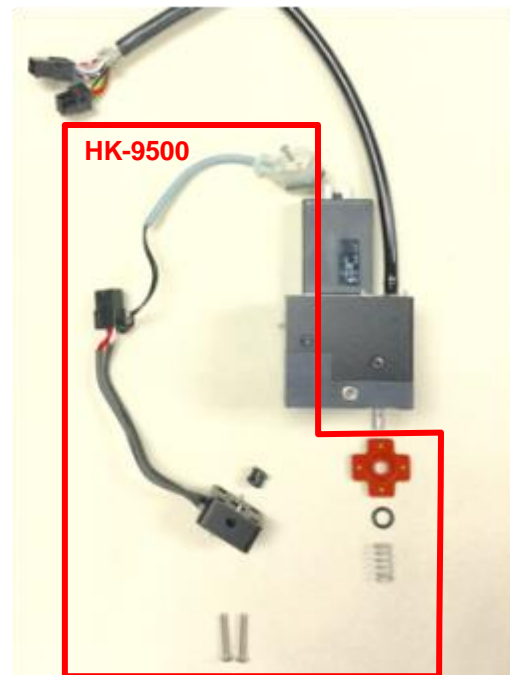
### 2.4a BK-2001 Heater Bushing Kit

- Use the #1 PH to remove the two screws securing the heater block; set the screws aside. Keep the heater block attached.
- Remove and discard the jet hammer spring, the heater block bushing, and the heater seal and washer.



### 2.4b HK-9500 Heater Block Kit

- Use the #1 PH to remove the two screws securing the heater block.
- Remove and discard the jet hammer spring, the heater block bushing, and the heater seal and washer.
- Disconnect the heater cable from the solenoid and the jet cable and remove.



*If only the BK-2001 or HK-9500 kit is being installed, skip to section 3.3.*

## 2.5 Remove Spacer Assembly

**KEEP** these parts to reinstall. Do not discard screws.

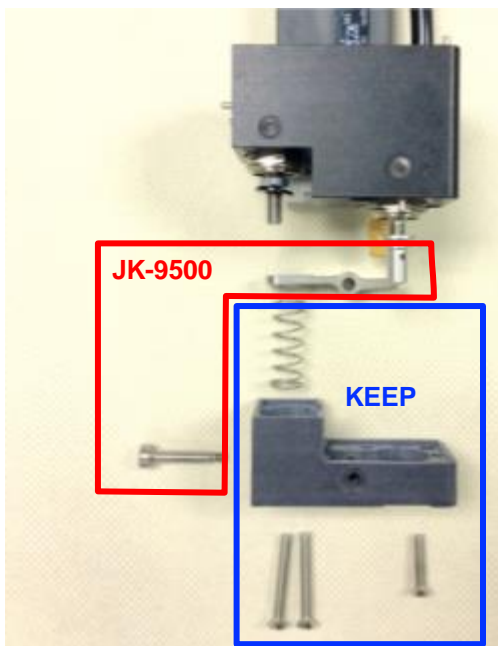
A checklist of saved parts and screws is provided in section 2.6.

**JK-9500** kit replaces these parts.

*If the JK-9500 Jet Repair kit is not being installed, skip to Section 3.*

### 2.5.1 Remove the Spacer

- Use the #1 PH to remove and set aside the three screws securing the spacer to the jet body.
- Use the 5/64" driver to remove and discard the shoulder bolt.
- Remove and set aside the shutoff spring and the spacer.
- Remove and discard the lever.



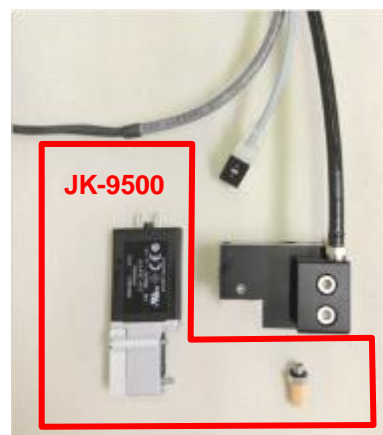
### 2.5.2 Remove the Air Cylinder

Use the 5/64" hex driver to remove the setscrew that locks the hammer (jet) air cylinder in place; set the screw aside. Use the 13-mm wrench to remove the air cylinder.



### 2.5.3 Remove the Solenoid and Silencer

- Use the #1PH to loosen the screw on the solenoid connector and the screws securing the solenoid to the valve mount. Remove and discard the solenoid.
- Use a wrench to remove the silencer; discard.



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## 2.6 Check for Parts/Screws Set Aside

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**Note:** *When disassembling the spacer, take care to set aside the shutoff spring as it is removed from the lever. A new shutoff spring is not included with the JK-9500 kit, and the shutoff spring is not interchangeable with the jet hammer spring.*

Check that these parts and screws have been set aside as specified below. If necessary, remove built-up threadlocker on screws.



## 3. Install New Parts and Reassemble the Jet

### 3.1 Overview

In general, parts are reinstalled in the reverse order that they were removed.

Gather the saved screws and parts shown in section 2.6.

#### **NOTICE**

Use Loctite 243 threadlocker as indicated. To avoid damage to the jet, do not substitute with other products.

#### Install Jet Hammer Cylinder

- Install the jet hammer air cylinder and tighten the setscrew.
- Assemble the lever and lever spring
- Attach the spacer
- Align the lever
- Install the pivot bolt

#### Install Heater Block Bushing

- Install the heater seal, washer, and hammer spring
- Install the bushing

#### Install Heater Block Bushing

- Connect heater cable (HK-9500)
- Align and attach heater block

#### Install Solenoid and Silencer

- Attach the new solenoid to the valve mount
- Attach the new silencer to the valve mount

#### Reassemble the Jet

- Insert the nozzle plate screws
- Attach the top cover
- Fasten the cable ties and bundle the wiring
- Attach the mounting plate
- Attach the solenoid connector
- Attach the dovetail plate and syringe holder

After the jet is assembled, follow the procedures in Section 4 to set the jet hammer gap.

## 3.2 Install Jet Hammer Cylinder

### 3.2.1 Install the Jet Hammer Cylinder

Install the cylinder. Use the 13mm wrench to tighten to a hard stop.



### 3.2.2 Install the Air Cylinder Setscrew

Apply a small amount of Loctite 243 to the air cylinder setscrew and tighten with the 5/64" hex driver until the setscrew is tight against the air cylinder.



### 3.2.3 Check the Lever Assembly

Observe the orientation of the lever and washers as shown below. Proper positioning is critical.



THERE IS ONE WASHER ON THE SHUTOFF CYLINDER BELOW THE LEVER



THE SPRING BORE IN THE LEVER FACES UP

### 3.2.4 Attach the Spacer

Position the shutoff spring in the spacer so that it rests in the lever spring bore. Attach the spacer.



### 3.2.5 Install the Spacer Screws

Apply a light coating of Loctite 243 to the threads of the spacer screws and install (#1PH).





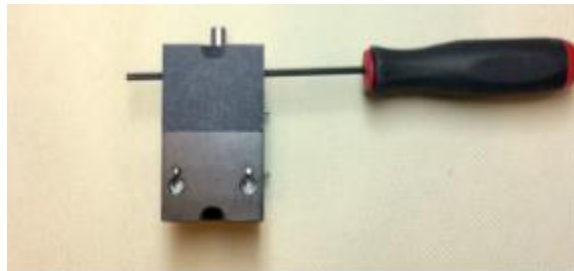
## 3.2 Install Jet Hammer Cylinder (Continued)

### 3.2.6 Align the Lever

- Use an awl to line up the hole for the pivot (shoulder) bolt with the hole in the lever.
- Insert the 5/64" driver from the opposite side and line it up with the awl.



Push out the awl with the driver.



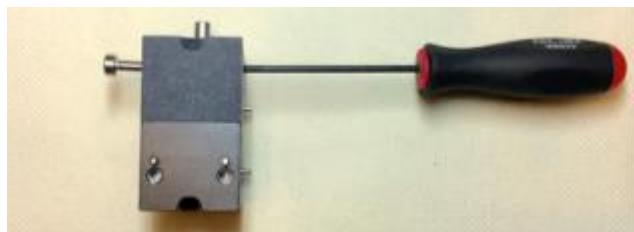
### 3.2.7 Install the Pivot Bolt

- Apply a light coating of Loctite 243 to the threads of the pivot bolt and wipe off any excess.

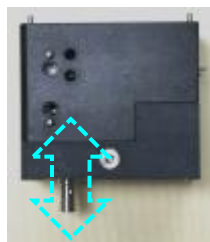
#### NOTICE

To prevent damage to the machine, do not allow Loctite from the bolt tip to transfer to the lever. Do not over-tighten the bolt.

- Push out the driver with the pivot bolt.
- Screw in the pivot bolt with the driver until it is barely snug.



- Verify that the lever is not binding—the hammer cylinder hat should move up and down freely.



HAT MOVES UP  
AND DOWN

### 3.3 Install Heater Block Bushing

#### 3.3.1 Install the Heater Seal

Position the heater seal on the tip of the air cylinder with the indent positioned as shown.



#### 3.3.2 Install the Washer

Position the washer over the air cylinder tip.



#### 3.3.3 Install the Jet Spring.

Place the hammer spring on top of the washer.



#### 3.3.4 Heater Block Bushing

Leave grease in place. Press in new bushing. (If installing a new heater block, the bushing is pre-installed.)



## 3.4 Attach Heater Block

### 3.4.1 Heater Block and Cable

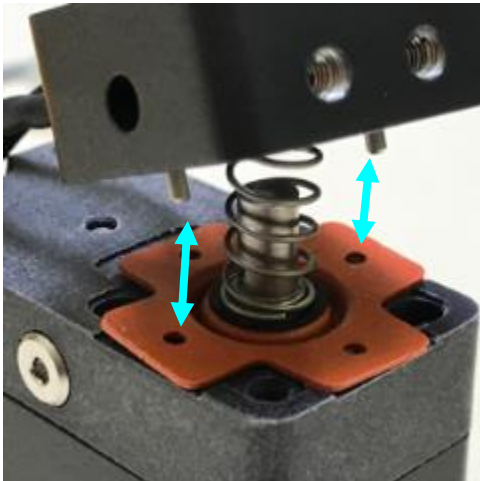
3.4.1a **BK-2001 (Existing Heater Block)**  
Locate the existing heater block and screws.



3.4.1b **HK-9500 (New Heater Block)**  
Connect the heater cable assembly of the new heater block to the jet cable.



3.4.2 **Position the Heater Block**  
Align the pins in the heater block with the heater seal as shown below.



3.4.3 **Attach the Heater Block**  
Apply Loctite 243 to the tips of the two heater block screws and attach the heater block (#1PH).

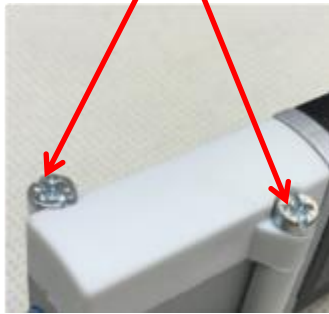


## 3.5 Install Solenoid and Silencer

### 3.5.1 Attach the Solenoid

Use a #1PH to attach the solenoid to the valve mount. Do not over-tighten the screws.

OVER-TIGHTENING CAN  
EASILY BREAK THIS PLASTIC



### 3.5.2 Install the Silencer

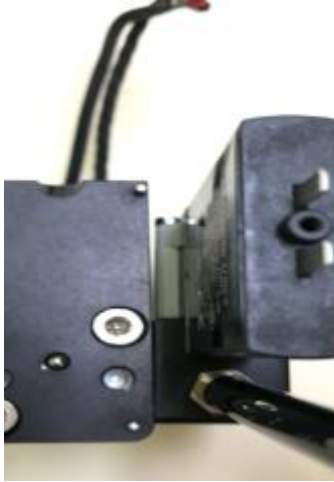
- Apply a small amount of Loctite 243 to the silencer.
- Install the silencer into the valve mount and finger-tighten.
- The fit should be snug, but not so tight that it crushes the rubber washer



## 3.6 Reassemble the Jet

### 3.6.1 Insert the Nozzle Plate Screws

Drop the nozzle plate screws (2 washers each) into the jet body.



### 3.6.2 Attach the Top Cover

Apply Loctite 243 to the tips of the top cover screws and attach the top cover (3mm).



### 3.6.3 Tie the Cables (if necessary)

- Press the gray solenoid cable into the slot in the back of the top cover.
- Press in the heater cable on top of the solenoid cable.
- Thread a cable tie around cables and fasten.



### 3.6.4 Tuck the Cables

- If a new cable tie was attached, trim as shown and press the trimmed end firmly until it is fully seated in the top cover slot.

PRESS  
FIRMLY



- Carefully tuck the wires and connectors into the lower portion of the top cover.



### 3.6 Reassemble the Jet (Continued)

#### 3.6.5 Attach the Mounting Plate

- Position the heater block cables so they pass through the mounting plate groove.
- Use the alignment pins to position the mounting plate. Check that the cables are not pinched.
- Apply Loctite 243 to the tips of the screws and attach to the jet back (3mm).



#### 3.6.6 Attach the Solenoid Connector

If the solenoid connector was removed, use a #1PH to install as shown. Do not over-tighten the screws.



#### 3.6.7 Attach the Dovetail Plate and Syringe Holder

Apply Loctite 243 to the tips of the four dovetail plate screws and attach to the mounting plate (3mm). Flip jet over. Apply Loctite 243 to the tips of the two syringe holder screws and attach to the jet front (3mm).



#### 3.6.8 (Optional) Attach the Feed Tube Enclosure

*AFTER the jet hammer gap has been set:*

Apply Loctite 243 to the tips of the two upper feed tube enclosure screws and attach to the heater block (2.5mm).



*AFTER the feed tube has been installed:*

Position the lower feed tube enclosure and tighten the thumbscrew to attach.



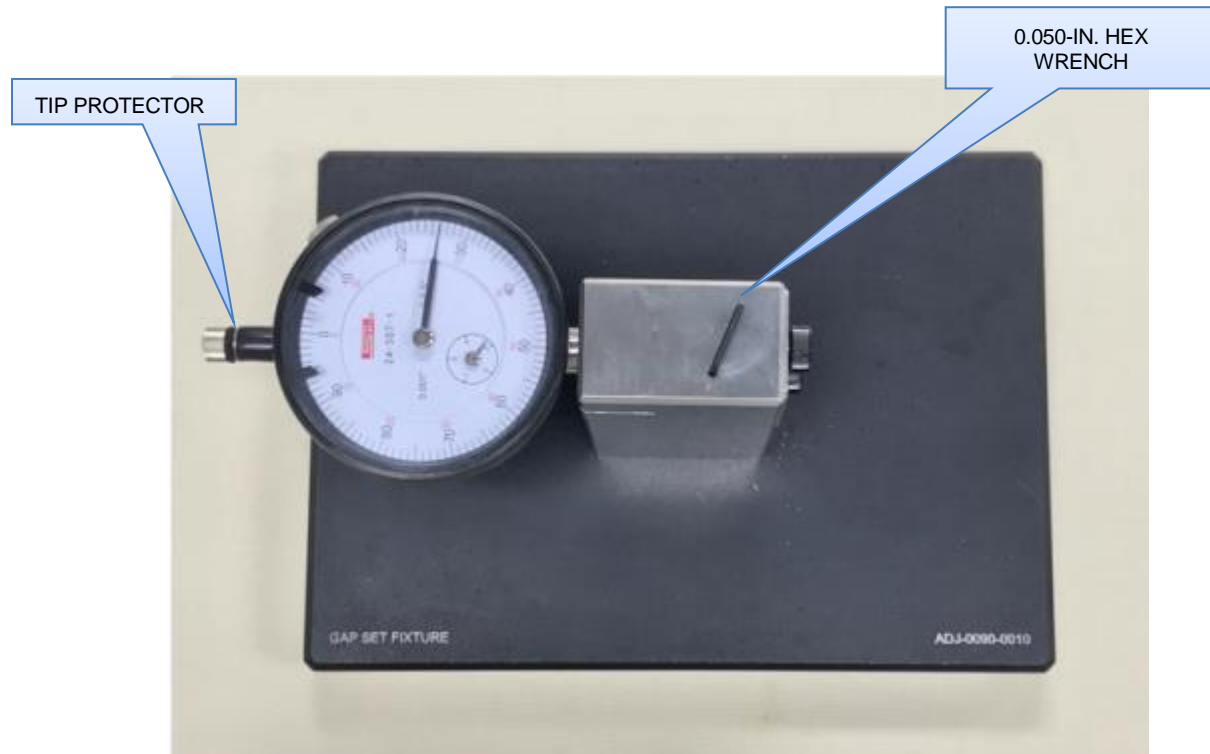
*Continue to the next section—Set the Jet Hammer Gap.*

## 4. Set the Jet Hammer Gap

### 4.1 Using the Gap Set Fixture

The following equipment is required:

- Gap Set Fixture
- 0.050-inch hex wrench (stored in tool)
- 3mm hex driver
- Jet controller



**Note:** The Gap Set Fixture is a sensitive calibration tool for maintaining the jet. The spacer protecting the tip should remain in place at all times except for calibrating the tool to zero and taking the measurement.

## 4.2 Prepare the Gap Set Fixture

### 4.2.1 Check the Zeroing Plate

Make sure the zeroing plate is in place and both screws are tightly secured.



### 4.2.2 Zero the Micrometer

With the zeroing plate tightly secured, remove the tip protector.

- The large dial should read 0.000
- The small dial should read 0.300



If large hand does not read zero:

- Loosen the bezel lock.
- Rotate the outside bezel until the large hand needle is aligned with zero.
- Tighten the bezel lock.
- Replace the tip protector.

### 4.2.3 Remove the Zeroing Plate

Loosen the two thumbscrews securing the zeroing plate.



### 4.2.4 Attach the Jet

With the mounting plate facing up, use the nozzle plate screws to secure the jet body to the fixture.





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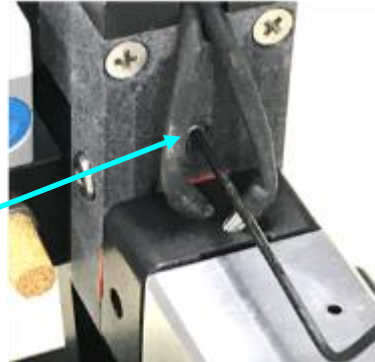
## 4.3 Measure the Gap

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### 4.3.1 Connect the Jet

- Connect the jet to a controller.
- Turn on the controller and “OPEN” the jet.
- Remove the tip protector and observe the needle position.
- Insert the hex wrench into the adjustment setscrew.

ADJUSTMENT SET SCREW



### 4.3.2 Reading the Dial

One unit on the small hand is 0.100”

One unit on the large hand is 0.010”

On the dial below:

The small hand is between 0.100” and 0.200”

The large hand is at 0.042”

The reading would be 0.142”



On the dial below:

The small hand is between 0.100” and 0.200”

The large hand is at 0.036”

The reading would be 0.136”



---

## 4.4 Adjust the Gap

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The recommended hammer gap for the HV-9500 jet is 0.150 in.

- If an adjustment is necessary, turn the adjustment setscrew with the hex wrench until the preferred value is displayed on the dial.
- Cycle the jet several times (OPEN-CLOSE) and validate that the gap is stable.
- “CLOSE” the jet and remove.
- Replace the tip protector and the zeroing plate on the Gap Set Fixture.

The jet is ready to use.

# Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

**THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

**GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO.** These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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## Graco Information

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### Sealant and Adhesive Dispensing Equipment

For the latest information about Graco products, visit [www.graco.com](http://www.graco.com).

For patent information, see [www.graco.com/patents](http://www.graco.com/patents).

For customer service and technical assistance, e-mail [info@advanjet.com](mailto:info@advanjet.com)

**TO PLACE AN ORDER**, contact your Graco distributor, go to [www.graco.com](http://www.graco.com) and select "Where to Buy" in the top blue bar, or call to find the nearest distributor.

If calling from the US: 800-746-1334

If calling from outside the US: +1-760-294-3392

*All written and visual data contained in this document reflects the latest product information available at the time of publication.*

*Graco reserves the right to make changes at any time without notice.*

Original instructions. This manual contains English. MM 3A5910

**Graco Headquarters:** Minneapolis

**International Offices:** Belgium, China, Japan, Korea

**GRACO INC. AND SUBSIDIARIES • P.O. BOX 1441 • MINNEAPOLIS MN 55440-1441 • USA**  
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