

# HM-2600 Hotmelt Jet Maintenance and Repair

3A6328A

# **Diaphragm-Jet**<sup>™</sup> **Technology**

ΕN

For non-contact dispensing of hot melt material in industrial environments. For professional use only.

Kits - See page 3 for kits information



#### **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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# **Kits**

This manual accompanies these HM-2600 Jet Repair kits:

Part Number	Kit
BK-2001	Bushing Kit
HK-2600	Heater Kit
JK-9500	Jet Repair Kit

### **Related Manuals**

Manuals are available at <a href="www.graco.com">www.graco.com</a>. Component manuals below are in English:

Part Number	Manual
3A6327	HM-2600 Hotmelt Jet Setup and Operation
3A6166	HM-2600C Hotmelt Jet Controller Setup and Operation
3A5937	Jet Dispensing Parameters Supplement
3A5908	Jet Maintenance Tool Kits

#### **Warnings**

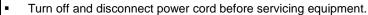
The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer 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.

# **WARNING**



#### **ELECTRIC SHOCK HAZARD**

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.



- Connect only to grounded electrical outlets.
- Use only 3-wire extension cords.
- Ensure ground prongs are intact on power and extension cords.



#### **TOXIC FLUID OR FUMES HAZARD**

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed

- Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers and dispose of it according to applicable guidelines.



#### **BURN HAZARD**

Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns: Do not touch hot fluid or equipment.



#### PERSONAL PROTECTIVE EQUIPMENT

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:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

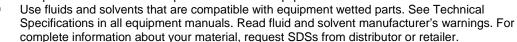


#### **EQUIPMENT MISUSE HAZARD**

Misuse can cause death or serious injury.



- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Specifications in all equipment manuals.



- Turn off all equipment and relieve air pressure when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which it is used.
- Use equipment only for its intended purpose. Contact your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.



#### 1. Required Tools and Parts

For optimal jet performance, it is suggested to perform periodic preventive maintenance. These HM-2600 jet maintenance kits are available for this purpose:

- BK-2001: Replaces just the heater block bushing, jet spring, washer, and heater seal.
- HK-2600: Replaces the heater block assembly (heater block with bushing and cable assembly). Also includes the jet spring, washer and heater seal.
- JK-9500: Replaces the jet hammer cylinder, lever, shoulder bolt, main air valve, muffler, and heater block assembly.

This document describes procedures for installing the HM-2600 jet maintenance kits. Whenever the jet hammer spring is removed, as in these maintenance kits, the jet hammer gap must be set before dispensing can proceed. The gap set fixture and specific tools required for this procedure are included in the Advanjet Jet Maintenance Kit (P/N JKT-2600).

#### 1.1 Maintenance Kits

1.1.1 Bushing Kit (P/N BK-2001)		
JET SPRING	P/N 60-2102	
WASHER	P/N 60-2116	0
HEATER SEAL	P/N 03-2261-00	
BUSHING	P/N 03-2162-00	

# 1.1 Maintenance Kits (continued)

1.1.2 Heater Kit (P/N HK-2600)					
HK-2600 (STANDARD, 40W)				77	
HEATER BLOCK	03-2214-02	_			
HEATER CABLE	06-1043-00	_		. (6)	
HEATER BLOCK SCREWS (2)	M3 X 25 FHMS				
- and –					
JET SPRING	P/N 60-2102	_			
WASHER	P/N 60-2116				7857
HEATER SEAL	P/N 03-2261-00		$\cup$		LIE
BUSHING	P/N 03-2162-00				

# 1.1 Maintenance Kits (continued)

1.1.3 Jet Repair Kit (P/N 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			
HEATER SEAL	P/N 03-2261-00			
WASHER	P/N 60-2116	0		
JET SPRING	P/N 60-2102			
BUSHING	P/N 03-2162-00			

# 1.2 Required Tools

Jet Maintenance Tool Kit (P/N JKT-2600)					
Loctite® 242 small screw threadlocker (P/N 113500)	THE STATE OF THE S				
5/64 in. hex wrench (P/N 60-2293)	88603 8.64 HEX				
0.050 in. hex wrench (P/N 60-2294)					
Torque tool (P/N 60-2264)	wiha •				
Awl (P/N 60-2296)	STANLEY 100 PLUS				
Gap Set Fixture (P/N 90-0010)	Sur six Fritzung				
Other Tools					
#1 Phillips screwdriver	wiha •				
#2 Phillips screwdriver	wiha				
2.5 mm hex wrench					
3 mm hex wrench (9 in.)					
150-mm adjustable wrench	e. Crescent' una )				
13 mm open end wrench	13 PILLERHOOM NO TO THE PROPERTY OF THE PROPER				

#### 2. Jet Disassembly

#### 2.1 Overview

Note: It is important to flush and clean the jet prior to making repairs. Follow the steps for cleaning the jet in the HM-2600 Jet Setup and Operation manual 3A6327.









To avoid personal injury:

- Move the nozzle close to the collection device so there is minimal misting of the solvent during flushing.
- Be sure there is proper ventilation and wear appropriate eye and skin protection as instructed by the solvent manufacturer.
- Material inside the applicator can be near setpoint temperature. Wear protective clothing to avoid severe burns.

Turn off the power switch and the air switch on the HM-2600C Jet Controller before beginning disassembly of the jet. Allow all parts of the jet to cool. Refer to the HM-2600C Jet Controller Setup and Operation manual 3A6166.

The extent of jet disassembly depends on which kits are being installed.

For all repair kits, remove and keep:

- Nozzle plate and two screws with two washers each
- Top cover and two screws
- Mounting plate and two screws

For the Bushing and Heater Kits (BK-2001 and HK-2600):

- Detach the Heater Block; keep for BK-2001, discard for HK-2600
- Remove and discard the heater seal, washer, and jet hammer spring

For the Jet Maintenance Kit (JK-9500), remove and discard jet parts in this order:

- Heater block and cable
- Heater seal, washer, and jet hammer spring
- Hammer air cylinder
- Pivot bolt
- Lever
- Bullet air valve
- Muffler

When noted, use the tool specified.

Section 2.7 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.

# 2.2 Disassembled Jet (Melter Cover Removed)



#### 2.3 Remove Syringe and Feed Tube Enclosure

**KEEP** these parts and screws to set aside and reinstall. A checklist is provided in section 2.7.



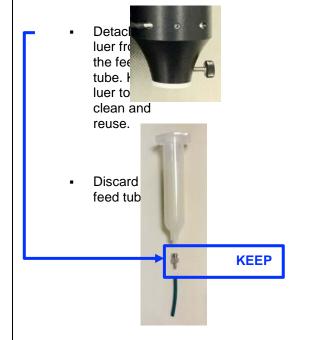
#### 2.3.2 Remove the Receiver Head

Loosen the receiver head thumbscrews and remove the receiver head.



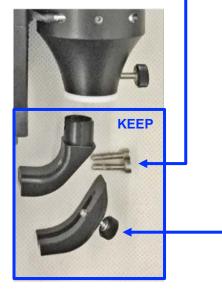
#### 2.3.3 Remove the Syringe

 Loosen the luer lock securing the feed tube.



#### 2.3.4 Remove the Feed Tube Enclosure

- Loosen the thumbscrew securing the lower feed tube enclosure.
- Use the 2.5 mm driver to remove and set aside the two screws securing the upper feed tube enclosure.



#### 2.4 Remove Mounting Plates and Top Cover

**KEEP** these parts and screws to set aside and reinstall. A checklist is provided in section 2.7.

**BK-2001 or HK-2600** kit replaces these parts.

#### 2.4.1 Remove Nozzle Plate (if present)

Going through the melter holder, use the 3 mm driver to loosen the two screws that secure the nozzle plate. Remove the nozzle plate and set aside; nozzle plate screws will be removed later.

#### 2.4.2 Remove the Dovetail Plate

Using the 3 mm driver, <u>remove and set aside</u> the four screws securing the dovetail plate.

#### 2.4.3 Remove the Mounting Plate

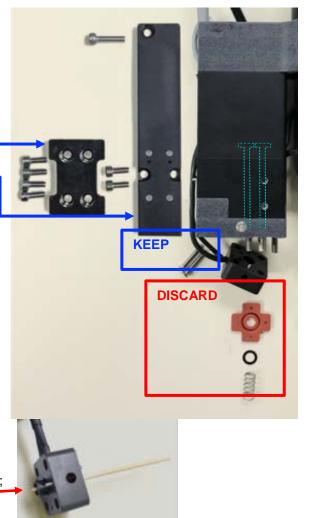
Using the 3 mm driver, <u>remove and set aside</u> the three screws securing the mounting plate.

#### 2.4.4 Disconnect Heater Block

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

#### 2.4.5 Remove Heater Bearing

- Use a cleaning swab or similar tool to push out the heater bearing.
- Leave any lubricant in place in the heater block;
   Discard the bearing.



#### 2.5 Remove Melter, Top Cover, and Heater Block

**KEEP** these parts and screws to set aside and reinstall. A checklist is provided in section 2.7.

**HK-2600** kit replaces these parts. Do not discard screws.

#### 2.5.1 Remove the Top Cover Screws

Use the 3 mm hex to loosen the two screws securing the top cover; <u>remove and</u> set aside.



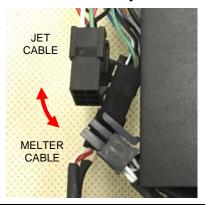
#### 2.5.2 Detach the Top Cover

Separate the top cover from the melter assembly, set aside



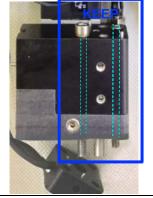
#### 2.5.3 Remove the Melter Assembly

Separate the melter connector from the end of the jet cable; remove the melter assembly and set aside.



#### 2.5.4 Remove the Nozzle Plate Screws

The loosened nozzle plate screws were captured in place by the melter holder. After the melter holder is removed from the top cover, remove and set aside the nozzle plate screws.

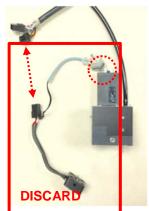


To replace the heater block, continue to step 2.5.5.

To keep the heater block, skip to step 2.6.1

# 2.5.5 Remove the Heater Assembly (HK-2600 only)

- Loosen the screw on the air valve cable connector and separate the connector.
- Separate the heater block connector from the end of the jet cable; remove and discard.



#### 2.6 Remove Spacer Assembly

**KEEP** these parts and screws to set aside and reinstall. A checklist is provided in section 2.7.

JK-9500 kit replaces these parts.

#### 2.6.1 Remove the Spacer

- Remove and set aside the spacer screws (#1 PH), the nylon spacer, and the automatic shutoff spring.
- Remove and discard the shoulder bolt (2 mm hex) and the lever.



#### 2.6.2 Remove the Air Cylinder

- Use the 2 mm hex driver to loosen the setscrew that locks the main air cylinder.
- Use the 13 mm wrench to <u>remove and discard</u> the air cylinder.





#### 2.6.3 Remove the Air Valve Mount and Silencer

- Use the 3 mm driver to <u>remove and set aside</u> the screws securing the valve mount to the jet body.
- If still attached, use a #1PH to loosen the screw on the jet cable connector.
- Loosen screws attaching the air valve to the valve mount.
   Remove and discard the air valve.
- Use a wrench to remove and discard the muffler.





#### 2.7 Check for Parts Set Aside

Check that these parts have been set aside. If necessary, remove built-up threadlocker.

FEED TUBE ENCLOSURE
(2) M3 X 14 SHCS

MELTER COVER (4) M4 X 8 BHCS

DOVETAIL PLATE (4) M4 X 10 SHCS

MOUNTING PLATE (2) M4 X 10 SHCS

NOZZLE PLATE (2) M4 X 55 SHCS

TOP COVER (2) M4 X 40 SHCS

HEATER BLOCK (2) M3 X 20 FHMS

SPACER (1) M3 X 16 (2) M3 X 25

SHUTOFF SPRING

JET VALVE MOUNT (2) M4 X 20 SHCS



#### 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 screws set aside as shown in Section 2.7.

Install the Main Air Valve and Hammer Cylinder

- Attach the air valve
- Attach the silencer
- Install the hammer air cylinder.

#### Assemble the Spacer

- Assemble the lever and lever spring
- Attach the spacer
- Align the lever
- Install the pivot (shoulder) bolt

#### Reassemble the Heater Block

- Install the heater seal, washer, and hammer spring
- Install the bushing
- Align and attach heater block

Attach the Valve Mount

(Optional) Replace Melter Cable

#### Reassemble the Jet

- Insert nozzle plate screws
- Position and attach melter assembly and top cover
- Tuck cables
- Attach air valve connector
- Attach the mounting plate
- Attach the dovetail plate

#### **NOTICE**

Use Loctite  $^{\$}$  242 threadlocker as indicated. To avoid damage to the jet, do not substitute with other products.

#### 3.2 Install the Main Air Valve and Hammer Cylinder

#### 3.2.1 Install the Air Valve

Apply a small amount of Loctite 242 to the air valve screws and install the new air valve on the valve mount as shown.

# NOTICE Over-tightening can easily break this plastic.

#### 3.2.2 Install the Silencer

Apply a small amount of Loctite 242 to the new muffler and install into the valve mount. The fit should be snug, but not so tight that it crushes the rubber washer.



#### 3.2.3 Install the Air Cylinder

Install the new air cylinder and use the 13 mm wrench to tighten the cylinder in place until it hard stops.



#### 3.2.4 Tighten the Air Cylinder Setscrew

Apply a small amount of Loctite 242 to the setscrew and use the 2 mm hex driver to tighten.



#### 3.3 Assemble the Spacer

#### 3.3.1 Assemble the Spacer Parts

Locate the new lever and shoulder bolt, and also the nylon spacer, spacer screws, and automatic shutoff spring that were set aside.



#### 3.3.2 Check the Lever Assembly

Observe the orientation of the lever and washers as shown:

- The bore in the lever faces the shutoff spring.
- There is <u>one</u> washer on the shutoff cylinder below the lever.

Proper positioning is critical.



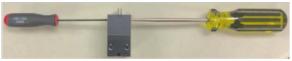
#### 3.3.3 Attach the Spacer

- With the spring resting in the bore of the lever, position the spacer over as shown.
- Locate the three spacer screws that were set aside. Apply a light coating of Loctite 242 to the threads. Firmly squeeze the spacer closed and install the spacer screws.





#### 3.3.4 Align the Lever with the Shoulder Bolt



Use an awl to line up the hole for the pivot (shoulder) bolt with the hole in the lever. Insert the 2 mm driver from the opposite side and line it up with the awl.



Push out the awl with the driver.

#### 3.3.5 Install the Shoulder Bolt

 Apply a light coating of Loctite 242 to the threads of the pivot bolt and wipe off any excess.

**Note:** Do not allow Loctite from the shoulder bolt tip to transfer to the lever.



- Push out the driver with the shoulder bolt.
- Screw in the shoulder bolt with the 2 mm driver until it is barely snug. Do not overtighten.



HAT MOVES UP & DOWN

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

#### 3.4 Reassemble the Heater Block

#### 3.4.1 Install New Heater Seal and Washer

Install the heater seal and washer on the tip of the air cylinder with the indent positioned as shown.



#### 3.4.2 Install New Spring

Install the new jet compression spring.



#### 3.4.3 New Heater Block Bearing

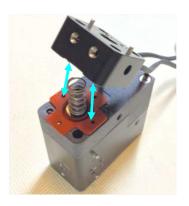
If a new heater block is being installed, the new bearing will be in place. If the existing heater block is being used, use a wooden cotton swab to push the new bearing into place, leaving any existing lubricant in place.

PUSH BEARING INTO PLACE



#### 3.4.4 Position Heater Block

Align the pins in the heater block with the heater seal as shown.



#### 3.4.5 Attach Heater Block

- Locate the two heater block screws that were set aside.
- Apply Loctite 242 to the tips of both screws and attach the heater block.



# **3.4.6 (Optional) Connect New Heater Block** If using the HK-2600 to install a new heater block, attach the heater block connector to the jet cable.



#### 3.5 Attach the Valve Mount

#### 3.5.1 Verify O-Rings

Check that the O-rings are in place on the Valve Mount.



#### 3.5.2 Install Valve Mount Screws

Locate the two valve mount screws that were set aside. Apply Loctite 242 to the tips and attach to the jet body.



To reinstall the melter using the same cable, skip to Step 3.7.

To install a new melter cable (Advanjet P/N 06-1042-00), continue to Step 3.6.

#### 3.6 (Optional) Replace Melter Cable

# **3.6.1 (Optional) Remove the Melter Cable** Use a 2 mm hex wrench to loosen the setscrews securing the heater cartridges

and the RTD. Remove and discard.





#### 3.6.2 (Optional) Identify Cartridges on New Melter Cable

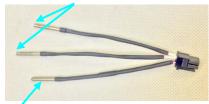
If you are installing a new melter cable (Advanjet P/N 06-1042-0-0), it is extremely important to identify the cartridges before proceeding.

ONE HEATER CARTRIDGE WIRE

THE HEATER CARTRIDGES ARE INSCRIBED WITH "WATLOW 24V"



ONE HEATER CARTRIDGE WIRE IS LONGER THAN THE OTHER



THE RTD CARTRIDGE IS THE SAME LENGTH AS THE SHORTER HEATER CARTRIDGE BUT HAS NO INSCRIPTION

#### 3.6.3 (Optional) Shorter Heater Cartridge

The <u>shorter</u> heater cartridge is inserted on the side of the melter that has <u>one setscrew</u>, in the lower slot.



#### 3.6.4 (Optional) Longer Heater Cartridge

The <u>longer</u> heater cartridge in inserted on the side of the melter that has <u>two setscrews</u>, in the upper slot.



The RTD cartridge is inserted on the side of the melter that has <u>two setscrews</u> in the <u>lower slot</u>.

#### 3.6.5 (Optional) Install Cartridges and Tighten Setscrews

- Insert the cartridge up to the edge of the heat shrink.
- Apply a small amount of Loctite to the threads of the cartridge setscrews. Wipe off excess.
- Use a 2 mm hex wrench to tighten the setscrews just until the cartridges are secured in place.

#### **NOTICE**

To avoid damaging the cartridges, do not over-tighten the setscrews.

INSERT TO THE EDGE OF THE HEAT SHRINK



#### 3.7 Reassemble the Jet

# 3.7.1 Insert the Nozzle Plate Screws

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



# 3.7.2 Position the Melter Assembly

Set the melter assembly on the top cover, using the alignment pins as a guide.



# 3.7.3 Position the Top Cover

Set the top cover (and melter assembly) on the jet body. Make sure that the melter cable is not pinched by the top cover.



#### 3.7.4 Attach Top Cover

Apply Loctite 242 to the tips of the top cover screws. Carefully insert top cover screws through the melter holder into the jet body and use the 3 mm hex wrench to tighten.







#### 3.7.5 Connect the Melter

Attach the melter cable and jet heater cable connector to the jet cable.





#### 3.7.6 Install Feed Tube Spacer

Position the hole in the spacer over the notch in the upper feed tube enclosure.

The luer lock thumbscrew passes through this opening.



TOP VIEW



FRONT VIEW

# 3.7.7 Attach Upper Feed Tube Enclosure

Use the 2.5 mm driver to install the two upper feed tube enclosure screws.



#### 3.7 Reassemble the Jet, continued

#### 3.7.8 Tuck the Cables

Press the main air valve cable into the slot in the back of the top cover, followed by the heater/melter cable. Fasten with a cable tie as shown.



#### 3.7.9 Trim the Cables

Trim the cable tie end and press the fastener until it is fully seated in the top cover slot. Carefully tuck the wires and connectors into the top cover.



#### 3.7.10 Connect the Air Valve

- Attach the air valve cable connector as shown.
- Carefully tighten the screw.

#### **NOTICE**

Over-tightening can easily break this plastic.



# 3.7.11 Position Mounting Plate

- Use the alignment pins to position the mounting plate.
- Take care that the cables are not pinched between the mounting plate and manifold.



# 3.7.12 Attach the Mounting Plate

Locate the three mounting plate screws that were set aside. Apply Loctite 242 to the tips and attach as shown.



# 3.7.13 Attach the Dovetail Plate

Locate the four dovetail plate screws that were set aside. Apply Loctite 242 to the tips of and attach as shown.



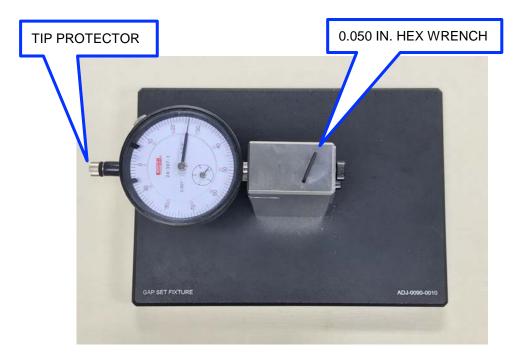
Continue to the next section—Set the Jet Hammer Gap.

### 4. Set the Jet Hammer Gap

#### 4.1 Using the Gap Set Fixture

The following equipment is required:

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



#### **NOTICE**

The Gap Set Fixture is a sensitive calibration tool for maintaining the jet.

<u>Except</u> for calibrating the tool to zero and taking the measurement, the tip protector should remain in place <u>at all times</u>. Without the tip protector in place, the tip can be easily damaged, which would result in inaccurate measurements.

#### 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 secured tight.



#### 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.

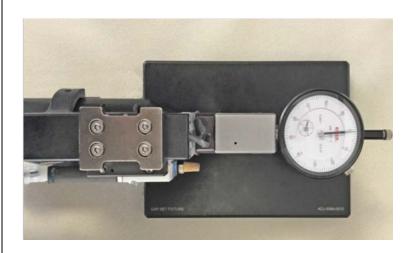
# 4.2.3 Remove the Zeroing Plate

Loosen the two thumbscrews securing the zeroing plate.



#### 4.2.4 Attach the Jet

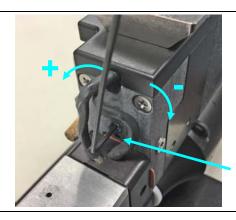
With the mounting plate facing up, use the nozzle plate screws and the torque tool to secure the jet body to the tool.



#### 4.3 Measure the Gap

#### 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 SETSCREW

#### 4.3.2 Reading the Dial

One unit on the small hand is 0.100" One unit on the large hand is 0.001"

#### 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

For <u>most</u> hotmelt applications, the recommended hammer gap is 0.110 inches; the optimal position will depend on the jetting material and dispensing requirements.

- 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.
- Replace the tip protector and the zeroing plate on the Gap Set Fixture.
- "CLOSE" the jet and remove.

The jet is ready to use.

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