Section 9

Module

NOTE: This section applies to applicators with CF200PAD modules.

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WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others, and damage to the equipment.

Introduction

This section provides troubleshooting, repair, parts, and specification information for applicators with Controlled Fiberization pattern air diffuser (CF200PAD) modules. The CF200PAD module is designed to dispense adhesive in a spiral pattern. The pattern air diffuser, which is located in the module seat, diffuses the pattern air that is supplied to the module through the heated air manifold. The diffused air then flows through the air passages in the CF nozzle, causing the adhesive to form an even spiral pattern.

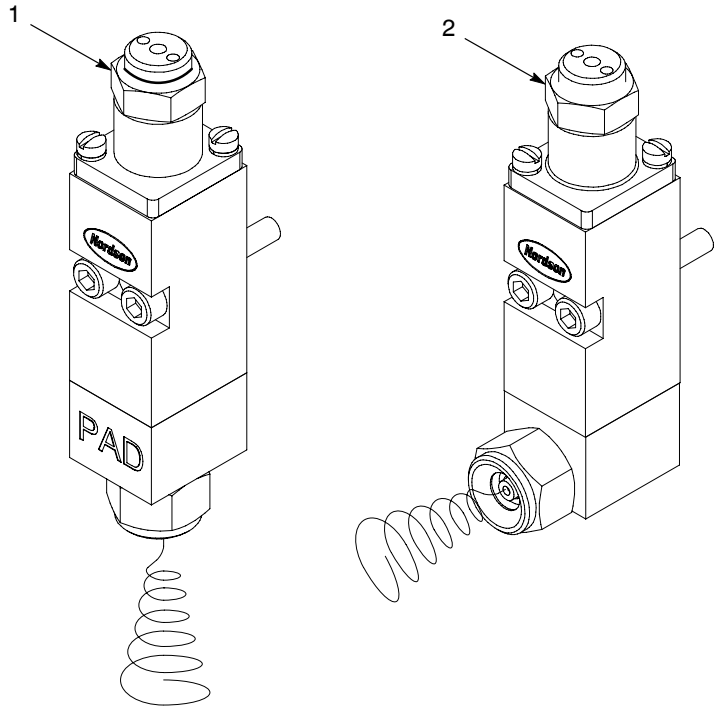


Figure 9-1 CF200PAD module

1. Standard module, adjustable
2. Right-angle module, adjustable

Module Overview

Dispensing modules apply adhesive to a product. All modules are air-actuated (or air-open), meaning that an air supply controlled by a solenoid valve is required to open the module. Modules are then spring-closed. In air-open, spring-close (AOSC) modules, the actuating air lifts a needle-and-piston assembly inside the module, thus opening the module and allowing adhesive to flow through the nozzle onto the product. When the actuating air shuts off, a spring returns the needle-and-piston assembly to the closed position, closing the module.

A separate air supply is used to supply pattern air to the module; this air enters the pattern air inlet and is directed onto the adhesive exiting the nozzle, creating the desired spray pattern.

Figure 9-2 shows the flow of adhesive and air through a standard and right-angle module. Figure 9-3 shows the key parts of a module.

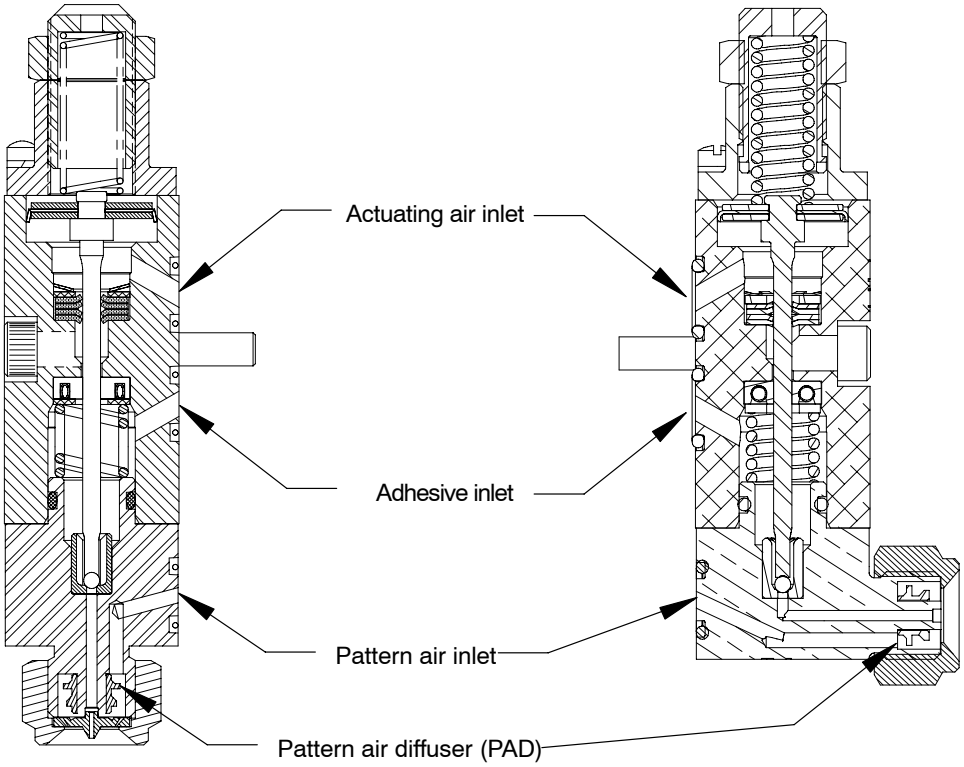


Figure 9-2 Flow of adhesive and air through a CF200PAD standard module (left) and right-angle module (right)

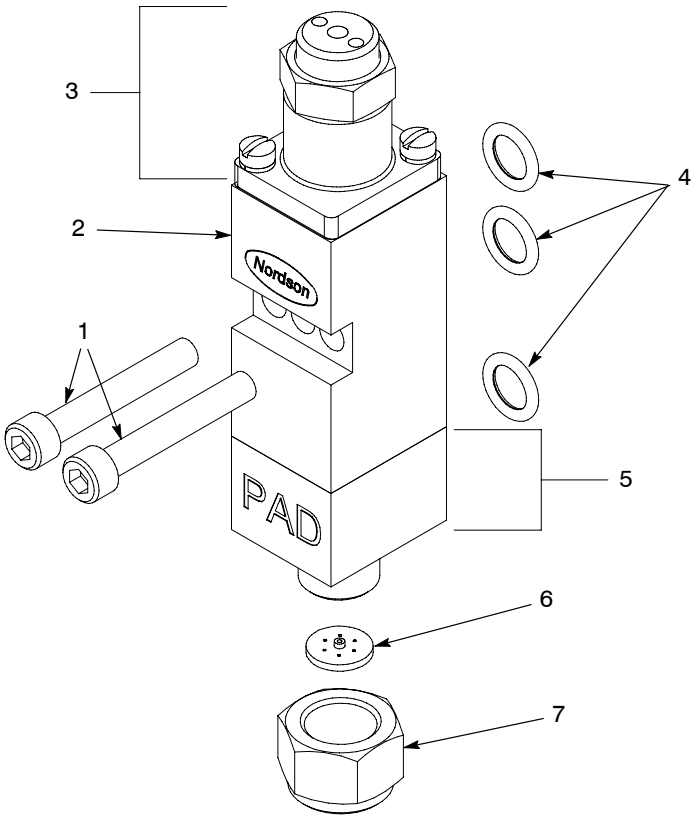


Figure 9-3 Key parts of a CF200PAD module (standard module shown)

1. Module mounting screws
2. Module body
3. Air cap assembly (adjustable)
4. Module O-rings
5. Module seat assembly
6. CF nozzle disk
7. Nozzle-retaining nut

Pattern Control Troubleshooting

To troubleshoot pattern control problems, obtain application-specific troubleshooting and application guides from http://emanuals.nordson.com/, or contact your Nordson representative for assistance. Available troubleshooting guides include the following:

- 1031781, *CF Applicator Troubleshooting*

Module Service

This part of Section 9 provides module-related service procedures.

Synchronizing Multi-Module Adhesive Output

A loading screw located in the top of the modules can be used to fine-tune the alignment of the adhesive patterns of multi-module applicators, as shown in Figure 9-4.

You will need the following items:

- $^{5}/_{8}$-in. wrench
- cap/nozzle/filter multi-tool (part 1059671)

NOTE: Refer to *Parts* for the part numbers of parts, tools, and supplies.

CAUTION: Do not use the loading screw to increase or decrease the amount of adhesive output (flow rate). To change the flow rate, adjust the melter pump speed.

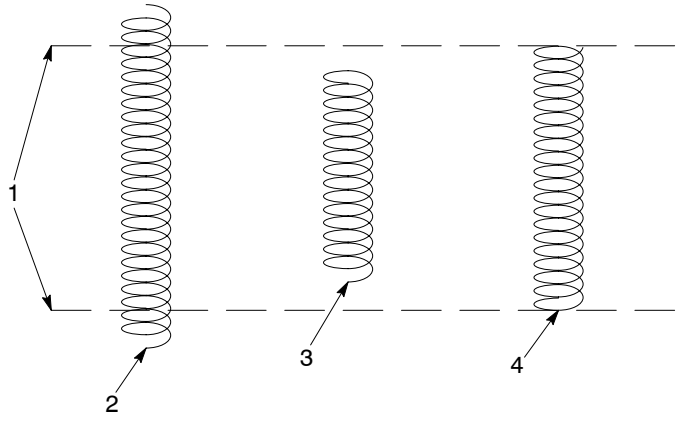
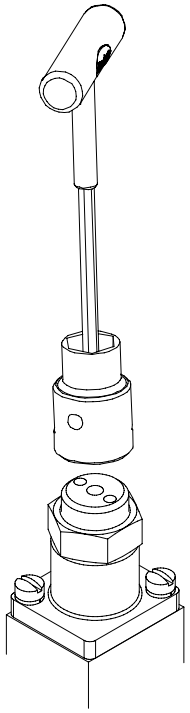


Figure 9-4 Results of module loading screw adjustments

1. Target area
2. Pattern too long
3. Pattern too short
4. Desired pattern length

Synchronizing Multi-Module Adhesive Output *(contd)*



Using the multi-tool, part 1059671, to adjust a module

See Figure 9-5. To adjust a loading screw, loosen the locking nut (2) at the top of the module and hold it loosely in place with a $^{5}/_{8}$-in. wrench while turning the loading screw (1) with the multi-tool; then tighten the locking nut. Turn the loading screw as follows:

- To decrease the length of a pattern, turn the loading screw clockwise. This shortens the length at both ends of the pattern.
- To increase the length of a pattern, turn the loading screw counterclockwise. This increases the length at both ends of the pattern.

  NOTE: If the module loading screw is tightened too much, the module will not dispense any adhesive.

To return a loading screw to the factory setting, loosen the locking nut, turn the screw clockwise until it bottoms out, back the screw out three full turns (counterclockwise), and tighten the locking nut.

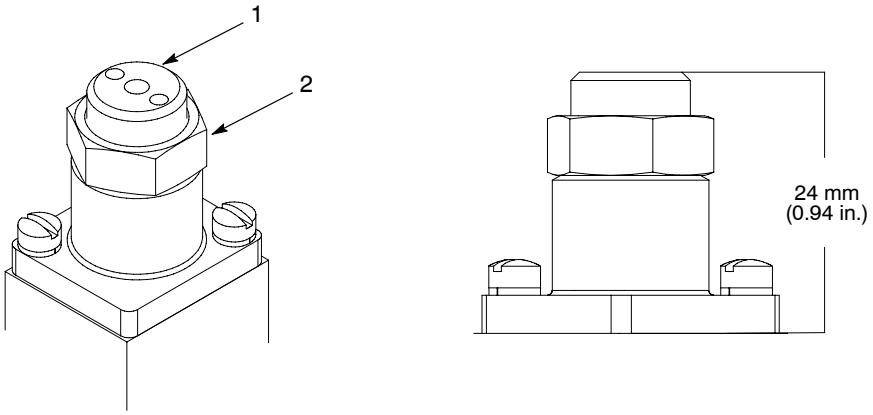


Figure 9-5 Location of the module loading screw and locking nut

1. Loading screw
2. Locking nut

Replacing a Module

You will need the following items:

- appropriate tools, including a torque wrench
- drain pans and disposable rags
- replacement module
- replacement O-rings (if needed)
- O-ring lubricant (if needed)
- anti-seize lubricant

NOTE: Refer to *Parts* for the part numbers of parts, tools, and supplies.

NOTE: Modules can be rebuilt. To rebuild a module, order the appropriate module rebuild kit and follow the instructions in the kit. For kit part numbers, refer to *Module Service Kits* under *Parts* later in this section.

Remove the Module

1. Heat the system to application temperature.
2. Relieve system pressure. Refer to *Relieving System Pressure* in Section 10, *Filter*.
3. Trigger the applicator solenoid valves to relieve any remaining pressure.
4. Shut off the module-actuating air.
5. Decrease the pattern air pressure. Leave just enough air pressure to prevent adhesive from entering the pattern air outlet.
6. See Figure 9-6. Remove the module mounting screws (1) and then remove the module. Remove the module O-rings (2) for inspection.

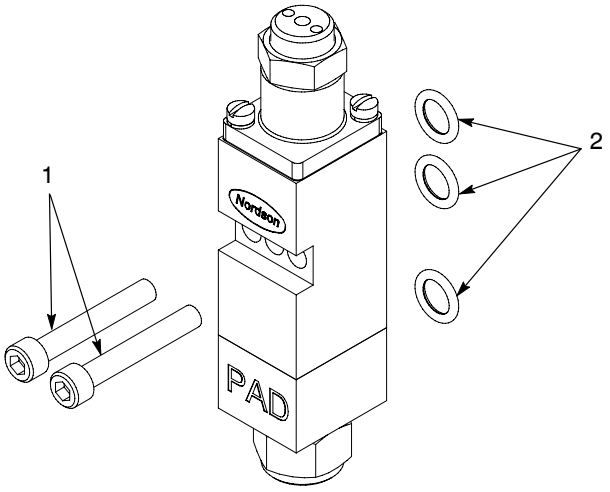


Figure 9-6 Replacing a module (standard module shown)

1. Mounting screws
2. O-rings

Install the Module

1. Wipe off any adhesive on the applicator, especially around the air passages.
2. Ensure that the module O-rings are lubricated and properly inserted in the O-ring bores on the back of the replacement module.
3. Coat the module mounting screws with anti-seize lubricant and use them to secure the new module to the applicator. Tighten the screws to 3.4 N•m (30 in.-lb).
4. Restore the system to normal operation. For best results, tighten the module mounting screws again after the applicator reaches application temperature.

Rebuilding a Module

To rebuild a module, order a module rebuild kit and follow the instructions provided in the kit. Refer to *Module Service Kits*. The CF200 module rebuild instruction sheet is P/N 1084074. This instruction sheet is also available at http://emanuals.nordson.com/.

Nozzle Service

This part of Section 9 provides nozzle-related service procedures.

Removing a Nozzle

There are two types of CF nozzle: disk and unibody. On disk nozzles, the nozzle disk and nozzle-retaining nut are two separate parts. On unibody nozzles, the nozzle disk and nozzle-retaining nut are one piece. Follow these procedures to remove or install either type of nozzle. You will need the following items:

- appropriate tools, including a torque wrench
- drain pans and disposable rags
- replacement nozzle (if needed)

NOTE: Refer to *Parts* for the part numbers of parts, tools, and supplies.

1. Heat the system to application temperature.
2. Relieve system pressure. Refer to *Relieving System Pressure* in Section 10, *Filter*.
3. Trigger the applicator solenoid valves to relieve any remaining pressure.
4. Shut off the module-actuating air.
5. Decrease the pattern air pressure. Leave just enough air pressure to prevent adhesive from entering the pattern air outlet on the module.
6. See Figure 9-7. Use a wrench to loosen the nozzle-retaining nut.

   NOTE: Do not use a torque wrench to loosen or remove a nozzle. Doing so will cause the torque wrench to become uncalibrated.

7. Remove the nozzle by hand.

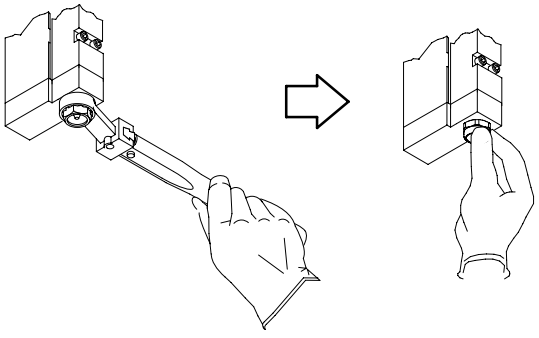
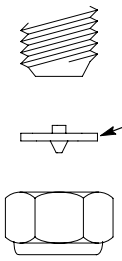
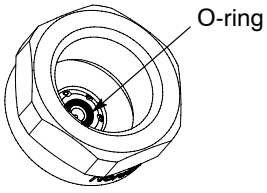


Figure 9-7 Removing a nozzle

Installing a Nozzle

1. Clean the mating surface where the adapter or nozzle will be seated.
2. Install the nozzle as shown in the following table.

Nozzle Type	Installation Procedure
Disk nozzle 	a. Orient the nozzle disk as shown at left and place the disk inside the nozzle-retaining nut; then hand-thread the nut onto the module. b. Use a wrench to tighten the nut to no more than 3.4 N•m (30 in.-lb).
Unibody nozzle 	a. Inspect the nozzle O-ring, replace if necessary, and ensure that the O-ring is lubricated and properly positioned. b. Hand-thread the nozzle onto the module. Use a wrench to tighten the nozzle to no more than 0.6 N•m (5 in.-lb).

NOTE: Nordson offers special torque wrenches for CF disk and unibody nozzles. Refer to *Recommended Spare Parts and Supplies* under *Parts*.

Cleaning Nozzles

To clean nozzles, obtain the nozzle-cleaning instruction sheet (P/N 1053097) from http://emanuals.nordson.com/, or contact your Nordson representative for assistance.

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Parts

This part of Section 9 provides detailed parts lists for the module and nozzles. For other applicator parts, including a reference drawing and bill of materials specific to your applicator, refer to Section 8, *Parts*. The following chart provides guidance for reading the parts lists.

The number in the *Item* column corresponds to the circled item number in the parts list illustration. A dash in this column indicates that the item is an assembly.

The number in the *Part* column is the Nordson part number you can use to order the part. A series of dashes indicates that the part is not saleable. In this case, you must order either the assembly in which the part is used or a service kit that includes the part.

The *Description* column describes the part and sometimes includes dimensions or specifications.

The *Note* column contains letters that refer to notes at the bottom of the parts list. These notes provide important information about the part.

The *Quantity* column tells you how many of the part is used to manufacture the assembly shown in the parts list illustration. A dash or AR in this column indicates that the amount of the item required in the assembly is not quantifiable.

Item	Part	Description	Quantity	Note
—	0000000	Assembly A	—	
1	000000	• Part of assembly A	2	A
2	- - - - - -	• • Part of item 1	1	
3	0000000	• • • Part of item 2	AR	
NS	000000	• • • • Part of item 3	2	

NOTE A: Important information about item 1

AR: As Required

NS: Not Shown

Standard CF200PAD Module Parts

See Figure 9-8.

Item	Part	Description	Quantity	Note
—	144906	Module, CF200, spray, pattern air diffuser (PAD), standard	—	A
1	1051132	• Screw, spring loading	1	
2	272289	• Nut, locking	1	
3	1051133	• Air cap, adjuster	1	
4	144892	• Spring, compression, 0.420 x 0.500 in.	1	
5	- - - - - -	• Needle with piston	1	
6	940111	• O-ring, Viton, 0.313 x 0.438 x 0.063 in.	3	
7	- - - - - -	• Body, module	1	
8	- - - - - -	• Seat, with pattern air diffuser	1	
9	119202	• Nut, nozzle-retaining	1	B
10	860258	• Screw, fillister, 8-32 x 0.875	4	
11	982871	• Screw, socket, cap, 10-32, with O-ring	2	
12	1051134	• Screw, fillister, 6-32 x 0.50 in., with lock washer	2	
13	900223	• Lubricant, O-ring, Parker, 4 oz	AR	
14	117544	• Seal, spring, $^{1}/_{8}$ X $^{7}/_{16}$ X $^{3}/_{32}$ in., PTFE	1	
15	940121	• O-ring, Viton, 0.364 ID x 0.070 W in.	1	
16	986502	• Retaining ring, internal, 43, push-on	1	
17	983012	• Disc, seal support	2	
18	- - - - - -	• Seal, hat, unformed	4	C
19	—	• Item no. not used	—	
20	987022	• Spring, compression, 1.146 x 0.360 OD. x 0.065 in.	1	
21	- - - - - -	Disk, nozzle	1	B, D

NOTE A: Order this part for a complete replacement module. Modules can also be rebuilt. For module rebuild kit part numbers, refer to *Module Service Kits* later in this section.

B: This part is required only if a two-piece disk nozzle is used. This part is not required if a unibody nozzle is used. Refer to *Nozzle Parts Numbers* later in this section for unibody nozzle part numbers.

C: For a formed hat seal, order part 750553.

D: Nozzle disks must be ordered separately. Refer to *Nozzle Part Numbers* later in this section.

AR: As Required

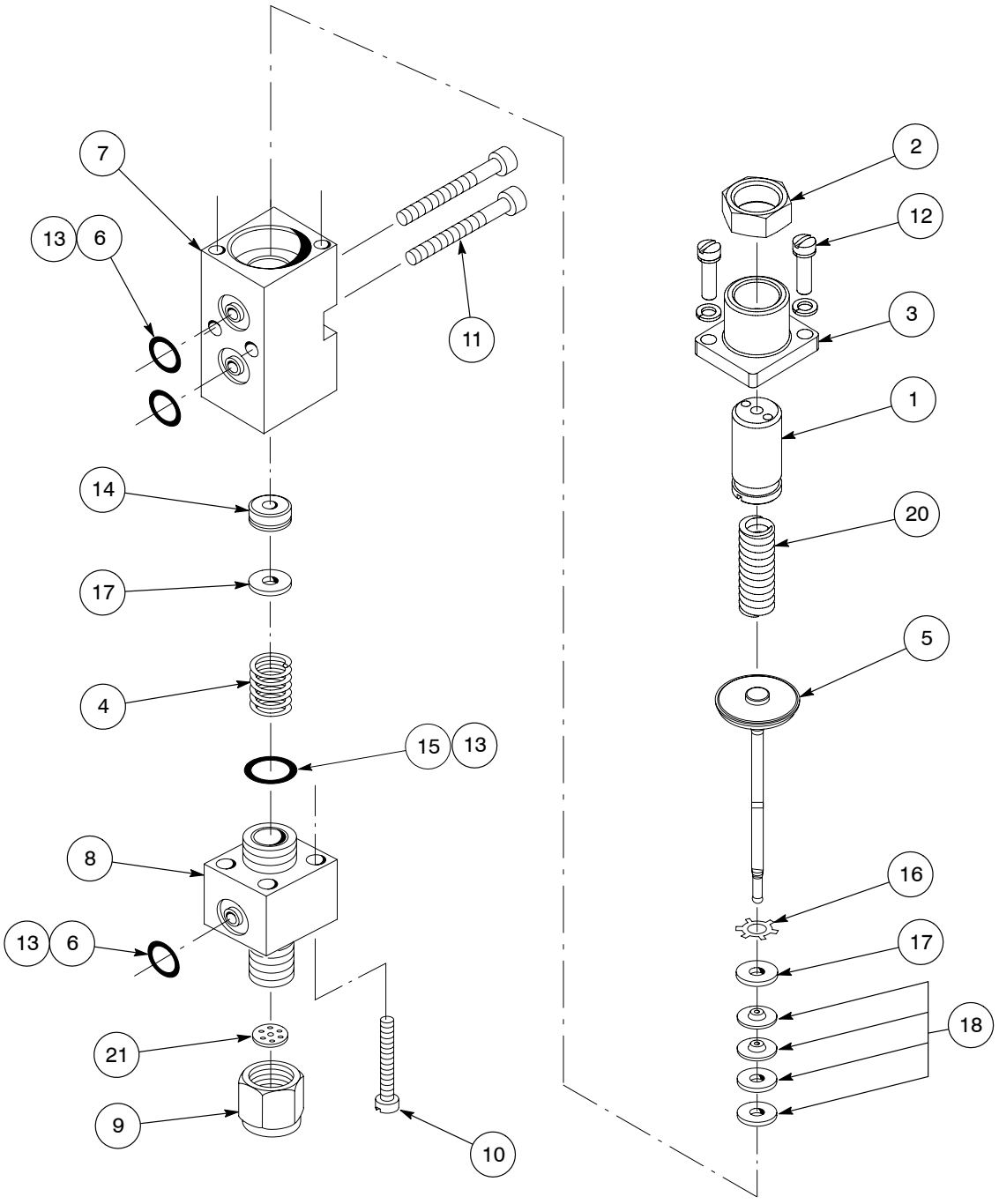

Figure 9-8 Standard CF200PAD module parts

Right-Angle CF200PAD Module Parts

See Figure 9-9.

Item	Part	Description	Quantity	Note
—	753166	Module, CF200, spray, pattern air diffuser (PAD), right-angle	—	A
1–3	—	• Item nos. not used	—	
4	144892	• Spring, compression, 0.420 x 0.500 in.	1	
5	—	• Item no. not used	—	
6	940111	• O-ring, Viton, 0.313 x 0.438 x 0.063 in.	3	
—	- - - - - -	• Module, H200, 90-percent	1	
7A	- - - - - -	• • Body, module	1	
7B	750553	• • Seal, hat, formed	4	
7C	983012	• • Disc, seal support	1	
7D	986502	• • Retaining, internal, 43, push-on	1	
7E	150170	• • Needle with piston	1	
7F	987022	• • Spring, compression, 1.146 x 0.360 OD x 0.065 in.	1	
7G	1051133	• • Air cap, adjuster	1	
7H	1051134	• • Screw, fillister, 6-32 x 0.050 in., with lock washer	2	
7I	272289	• • Nut, locking, $^1/_2$-28	1	
7J	1051132	• • Screw, spring loading	1	
7K	117544	• • Seal, spring, $^1/_8$ X $^7/_{16}$ X $^3/_{32}$ in., PTFE	1	
8	- - - - - -	• Seat, with carbide, pattern air diffuser, 90-degree	1	
9	119202	• Nut, nozzle-retaining	1	B
10	860258	• Screw, fillister, 8-32 x 0.875	4	
11	982871	• Screw, socket, cap, 10-32, with O-ring	2	
12	—	• Item no. not used	—	
13	900223	• Lubricant, O-ring, Parker, 4 oz	AR	
14	—	• Item no. not used	—	
15	940121	• O-ring, Viton, 0.364 ID x 0.070 W in.	1	
16	—	• Item no. not used	—	
17	983012	• Disc, seal support	1	
18	- - - - - -	Disk, nozzle	1	B, C

NOTE A: Order this part for a complete replacement module. Modules can also be rebuilt. For module rebuild kit part numbers, refer to *Module Service Kits* later in this section.

B: This part is required only if a two-piece disk nozzle is used. This part is not required if a unibody nozzle is used. Refer to *Nozzle Parts Numbers* later in this section for unibody nozzle part numbers.

C: Nozzle disks must be ordered separately. Refer to *Nozzle Part Numbers* later in this section.

AR: As Required

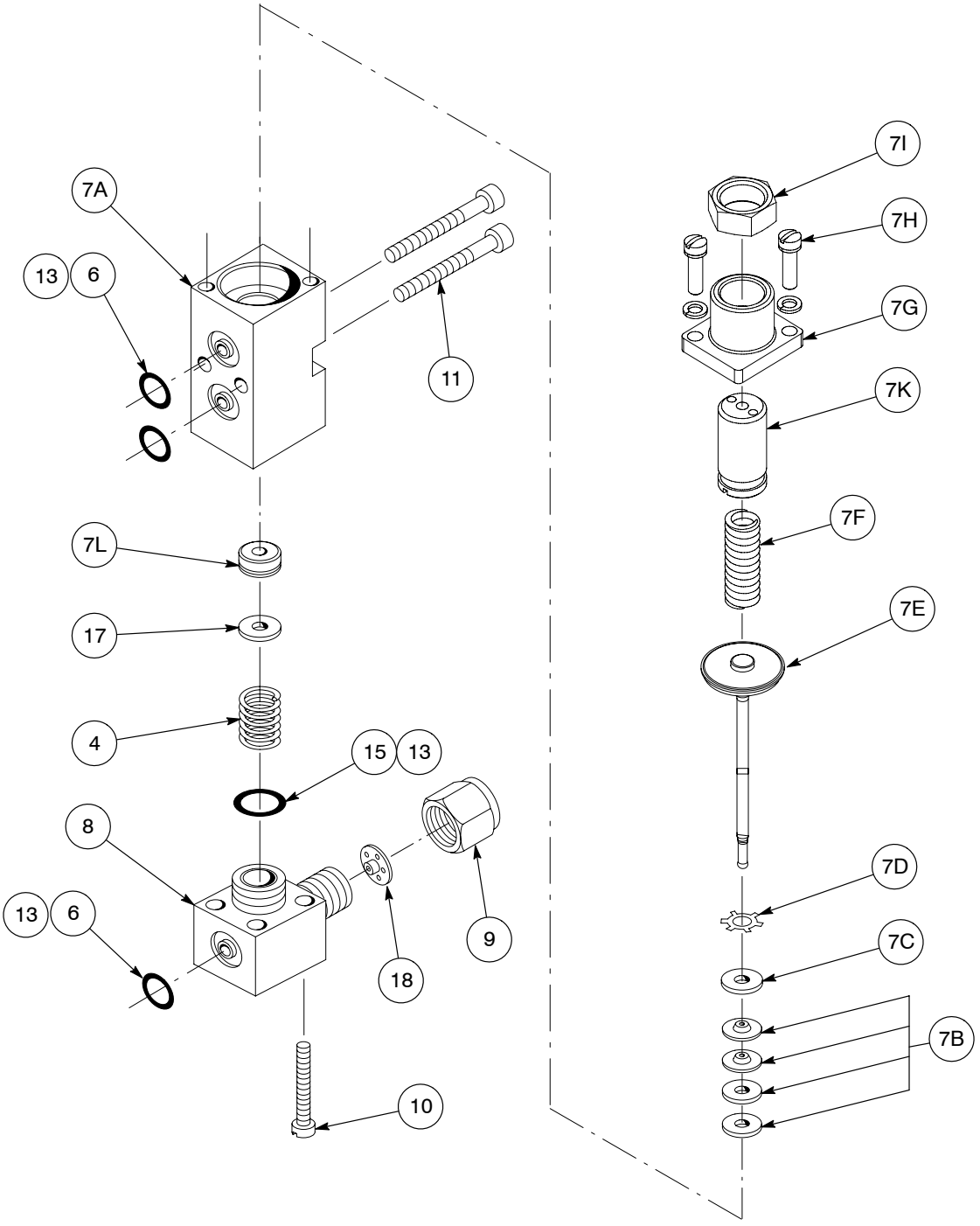

Figure 9-9 Right-angle CF200PAD module parts

Nozzle Part Numbers

Normally, the choice of nozzle for your applicator will have already been made by you and your Nordson representative. Refer to your sales order to determine what nozzle choices were made. The part numbers for the most commonly used nozzles are provided here.

There are two types of CF nozzle, as shown in Table 9-1. CF nozzles may have either 6 air openings or 12 air openings. Nozzles with 12 air openings are referred to as high-frequency nozzles.

Table 9-1 Types of CF Nozzle

CF Nozzle Type	Description
Disk	The nozzle disk and the nozzle-retaining nut are two separate parts. The disk is held onto the module by the nozzle-retaining nut and is protected from damage because it is recessed inside the nut.
Unibody or steel unibody	The nozzle disk and the nozzle-retaining nut are a single assembly. This design makes the nozzles easier to clean because there are no recessed surfaces (as on disk nozzles). However, the nozzle disks may be more susceptible to damage. The nozzle-retaining nuts on unibody nozzles are color-coded for ease of identification. Steel unibody nozzles are also available.

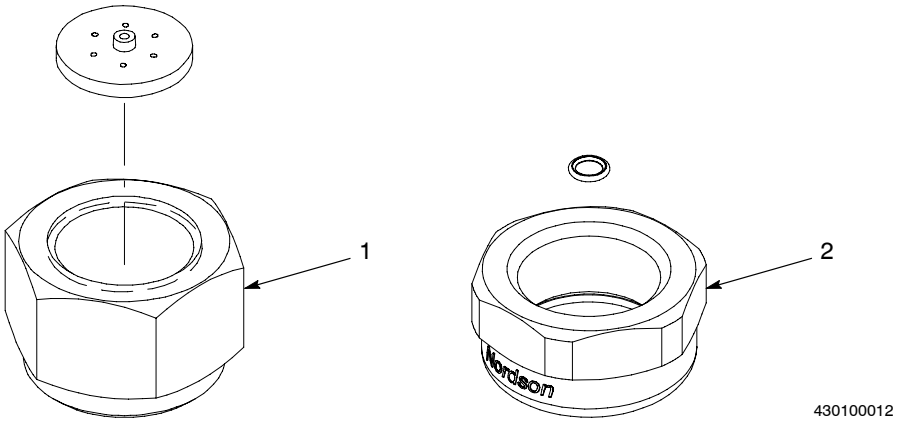

Figure 9-10 CF nozzles

1. CF disk nozzle (disk exploded)
2. CF unibody nozzle (O-ring exploded)

Table 9-2 CF Disk Nozzles (6 Air Openings)

Orifice Diameter	Pattern Width	Part Number
0.012 in.	Standard	860548
0.014 in.	Standard	860574
0.016 in.	Standard	860575
0.018 in.	Standard	860226
0.018 in.	Wide	1047073
0.018 in.	Wide	1047060
0.020 in.	Standard	860435
0.025 in.	Standard	100728
0.030 in.	Standard	810381
0.030 in.	Wide	1047075
0.050 in.	Standard	810300
NOTE: Use nozzle-retaining nut part 119202 with these nozzles.		

Table 9-3 High-Frequency CF Disk Nozzle (12 Air Openings)

Orifice Diameter	Pattern Width	Nozzle Part Number
0.018 in.	Standard	755316
NOTE: Use nozzle-retaining nut part 119202 with these nozzles.		

Table 9-4 CF Unibody Nozzles (6 Air Openings)

Orifice Diameter	Pattern Width	Nozzle Part Number
0.012 in.	Standard	152168
0.012 in.	Wide	1046126
0.014 in.	Standard	152169
0.016 in.	Standard	152170
0.018 in.	Standard	152171
0.018 in.	Wide	1046150
0.020 in.	Standard	152172
0.020 in.	Wide	1046151
0.025 in.	Standard	156698
0.025 in.	Wide	1046152
0.030 in.	Standard	152173
0.030 in.	Wide	1046156
0.040 in.	Standard	162500
NOTE: All nozzles include O-ring part 940031.		

Nozzle Part Numbers *(contd)*

Table 9-5 High Frequency CF Unibody Nozzles (12 Air Openings)

Orifice Diameter	Pattern Width	Nozzle Part Number
0.012 in.	Standard	755957
0.012 in.	Narrow	757537
0.014 in.	Standard	756306
0.016 in.	Standard	756307
0.018 in.	Standard	755530
0.018 in.	Wide	1046128
0.020 in.	Standard	756308
0.025 in.	Standard	756309
0.030 in.	Standard	756115
0.030 in.	Wide	1046154
0.046 in.	Standard	757399
0.046 in.	Wide	757469
NOTE: All nozzles include O-ring part 940031.		

Table 9-6 CF Steel Unibody Nozzles (6 Air Openings)

Orifice Diameter	Pattern Width	Nozzle Part Number	Color
0.012 in.	Standard	753488	Brown
0.014 in.	Standard	753489	Grey
0.016 in.	Standard	753491	Green
0.018 in.	Standard	753492	Blue
0.020 in.	Standard	753493	Red
0.025 in.	Standard	753494	Pink
0.030 in.	Standard	753495	Black
0.018 in.	Wide	1046158	Yellow
0.030 in.	Wide	1046160	Purple
0.040 in.	Standard	753496	Maroon
NOTE: All nozzles include O-ring part 940031.			

Module Service Kits

Part	Description	Note
1055414	Kit, module rebuild, one module, with needle-and-piston assembly	A
1055411	Kit, module rebuild, ten modules, with needle-and-piston assembly	B
1055413	Kit, module rebuild, ten modules, without needle-and-piston assembly	B
272822	Kit, needle-and-piston assembly and seals	
147473	Kit, compression springs and seal support discs	
272290	Kit, needle-and-piston assembly	

NOTE A: This kit allows you to rebuild one module.
B: This kit allows you to rebuild ten modules.

Recommended Spare Parts and Supplies

For a general spare parts and supplies list, refer to *Recommended Spare Parts and Supplies* in Section 8, *Parts*.

Part	Description	Note
144906	Module, CF200, spray, pattern air diffuser (PAD), standard	
753166	Module, CF200, spray, pattern air diffuser (PAD), right-angle	
940111	• O-ring, Viton, 0.301 ID x 0.070 W in. (for the back of the module)	
982871	• Screw, socket, 10-32, with O-ring (for securing the module to the applicator)	
- - - - - -	Module rebuild kits	A
- - - - - -	Nozzles	B
119202	• Nozzle-retaining nut (for disk nozzles)	
940031	• O-ring, Viton, 0.087 x 0.127 x 0.020 in. (for unibody nozzles)	
133665	Kit, CF unibody nozzle O-rings (contains 10 part 940031 O-rings)	
133664	Kit, CF unibody nozzle O-rings (contains 25 part 940031 O-rings)	
133663	Kit, CF unibody nozzle O-rings (contains 100 part 940031 O-rings)	
901915	Kit, nozzle cleaning, small orifice	
231100	Kit, nozzle cleaning, large orifice	
1059671	Kit, multi-tool, cap/nozzle/filter (for adjusting a module)	
754766	Wrench, torque, CF disk nozzles	
754767	Wrench, torque, CF unibody nozzles	
900223	Lubricant, O-ring, Parker, 4 oz (for lubricating O-rings)	
900344	Lubricant, Never Seez, 8 oz can (for the module socket-head screws)	
900236	Sealant, paste, Teflon (for the seat and air cap screw threads)	

NOTE A: Refer to *Module Service Kits* for part numbers.
B: Refer to *Nozzle Part Numbers*.

Technical Data

Applicator Specifications

Table 9-7 provides specifications for an applicator with CF200PAD modules. Refer to *Applicator-Specific Reference Drawings* in Section 8, *Parts*, for the following information about your applicator:

- dimensions
- cordset style
- number and orientation of filters
- number of modules
- type and number of solenoid valves

Table 9-7 CF200 Applicator Specifications

Item	Specification
Operating temperature	70–230 °C (160–450 °F)
System hydraulic pressure	14–55 bar (200–800 psi); 103.4 bar (1,500 psi) maximum
Module-actuating air pressure	4.1–6.2 bar (60–90 psi) typical
Pattern air pressure	0.3–3.4 bar (5–50 psi); 0.8–1.2 bar (12–18 psi) typical
Pattern air temperature	9–15 °C (15–25 °F) above the adhesive application temperature; 15 °C (25 °F) typical
Air consumption	~28.3 nlm (~1 scfm) per module
Adhesive viscosity	500–10,000 cps
Adhesive pattern capability	Continuous or intermittent
Adhesive fiber size	10–200 microns
Adhesive add-on weight	1–2 gsm @ 300 m/min (984 ft/min)
Nozzle selection	CF disk, unibody, and steel unibody
Coating width (see Note)	Standard nozzle: 6–32 mm (0.25–1.25 in.) Wide nozzle: 25–51 mm (1.0–2.0 in.)
Size of nozzle openings	Refer to *Nozzle Part Numbers*.
Mounting height	19–51 mm (0.75–2.0 in.) typical
NOTE: The adhesive pattern width is affected by the viscosity of the adhesive. Lower-viscosity adhesives may not produce patterns as wide as those listed.	

Torque Specifications

These torque specifications are also stated within the appropriate procedures.

Item	Torque Specification
CF disk nozzles	3.4 N•m (30 in.-lb)
CF unibody nozzles	0.6 N•m (5 in.-lb)
Module mounting screws	3.4 N•m (30 in.-lb)
Air cap screws	1.5–1.7 N•m (13–15 in.-lb)
Seat retaining screws	1.8–2.0 N•m (16–18 in.-lb)