Nordson

Instruction Sheet
P/N 334679–05

Flowmeter Service Kits

Introduction

See Figure 1. This instruction sheet provides repair procedures for flowmeters that use either pressed or screw-in shafts.

Refer to the applicable repair procedure:

- *Pressed Shaft Flowmeters*
- *Screw-in Shaft Flowmeters*

WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

WARNING: System or material pressurized. Relieve pressure. Failure to observe may result in serious injury.

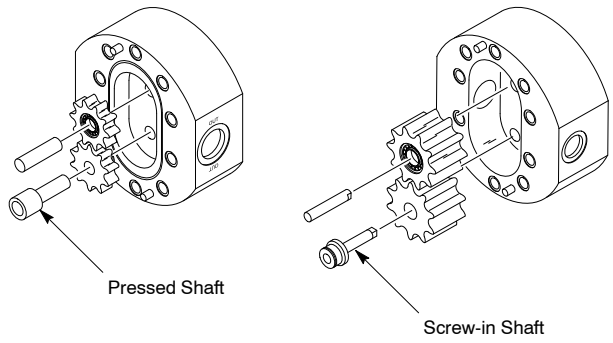

Figure 1 Flowmeter Shaft Types

Pressed Shaft Flowmeter

This section provides procedures for repairing flowmeters that use pressed shafts.

Disassembly

1. See Figure 2. Remove the flowmeter from the system and place it on a clean level workbench.
2. Remove the case nuts (11) and case bolts (7).
3. Insert a flat blade screw driver into the pry slots (2) and separate the front cover (1) from the flowmeter body (6).
4. Remove and discard the old impellers (4, 8).
5. Remove the case O-ring (10).
6. Clean the body and the front cover with a suitable solvent.

Idler Shaft Removal

1. See Figure 2. Lubricate the threads of the socket head cap screw (14) with grease.
2. Thread the screw into the jack screw hole (13) in the front cover.
3. Push the idler shaft (3) out and discard.
4. Remove the socket head cap screw.

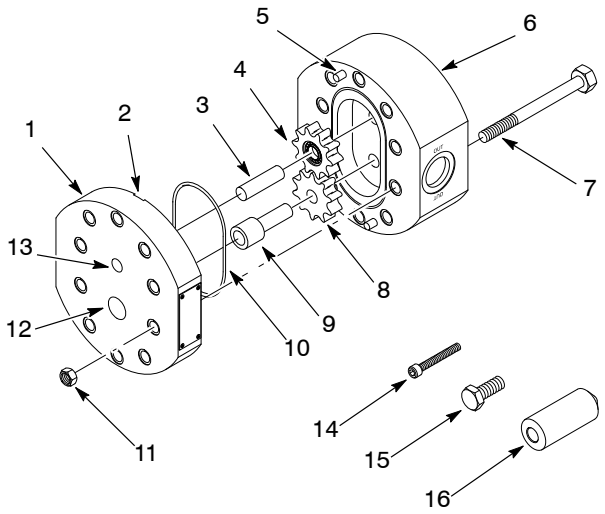

Figure 2 Typical Pressed Shaft Flowmeter

1. Cover
2. Pry slot
3. Idler shaft
4. Non-magnetic impeller
5. Guide pin
6. Body
7. Case bolt
8. Magnetic impeller
9. Shaft
10. Case O-ring
11. Case nut
12. Jack screw hole (shaft)
13. Jack screw hole (idler shaft)
14. Socket head screw
15. Hex head cap screw
16. Aluminum drive bushing

Pressed Shaft Removal

1. See Figure 2. Lubricate the threads of the hex head cap screw (15) with grease.
2. Thread the screw into the jack screw hole (12) in the front cover.
3. Push the shaft (9) out and discard.
4. Remove the hex head cap screw.

Assembly

Perform these steps to install the new shafts and to assemble the flowmeter.

Idler Shaft Installation

1. See Figure 2. Lubricate the end of the new idler shaft (3) to be pressed into the housing with a light film of grease.

   NOTE: Insert the idler shaft perpendicular to the front cover. Let the idler shaft bottom. Maximum protrusion of the shaft from the cover is 36.32 mm (1.43 in.).

2. Use an Arbor press to insert the new idler shaft into the front cover (1).
3. Wipe off the remaining grease from the shaft and the cover.

Shaft Installation

1. See Figure 2. Lubricate the large diameter end of the new shaft (9) with grease.
2. Insert the small diameter of the shaft into the aluminum drive bushing (16), so that the aluminum drive bushing bears on the shaft shoulder.

   NOTE: The shaft must be perpendicular to the front cover and the drive bushing must bottom out on the cover when inserted.

3. Press the new shaft (9) into the front cover (1).
4. Remove the aluminum drive bushing.
5. Verify that the face of the shaft shoulder is flush with the face of the cover. If it is not, continue to apply pressure using the drive bushing until a flush fit is achieved.
6. Wipe off remaining grease from the shaft and the cover

Final Assembly

1. See Figure 2. With the magnetic face against the shaft shoulder, slide the magnetic impeller (8) onto the shaft (9).

   NOTE: For ball bearing gears, the magnetic face of the magnetic impeller can be recognized by the absence of a ball bearing. For sleeve bearing gears, the gear can only install one way because the shaft diameter is stepped.

2. Install the non-magnetic impeller (4) onto the idler shaft (3). Orientation does not matter.

   NOTE: Use enough lubricant to retain the case O-ring in the groove.

3. Lubricate the case O-ring (10) with Parker O-ring lubricant or equivalent, and place the case O-ring in the groove on the cover (1).
4. Align the the guide pins (5) and press the cover and the body (6) together.
5. Install the case bolts (7) and nuts (11). Refer to *Torque Specifications* for bolt torques.

Screw-In Shaft Flowmeter

This section provides procedures for repairing flowmeters that use screw-in shafts.

Disassembly

1. See Figure 3. Unscrew the cable from the electro-optic encoder (13).

CAUTION: Do not bump or bend the magnet end of the electro-optic encoder shaft.

2. Unscrew the electro-optic encoder from the cover (1). The encoder O-ring (12) may fall loose when the electro-optic encoder is removed.

   NOTE: Disassembling the electro-optic encoder will void the warranty.

3. While holding the cover in place, loosen and remove the case bolts (6).

   NOTE: If necessary, use a small screwdriver to lightly pry off the cover using the pry slots (2) on the top and bottom of the flowmeter.

4. Carefully pull the cover off so that the impellers (4, 8) are not damaged.

5. If the case O-ring (7) or the impellers do not fall out when the cover is removed, take them out by hand.

   NOTE: The non-optical shaft has left-hand threads.

6. Remove the shafts (3, 9) using wrench flats to unscrew them.

7. Remove the encoder shaft O-ring (10).

Assembly

NOTE: During assembly, make sure that the case O-ring remains completely within the groove of the cover or the O-ring will be damaged. Use a compatible O-ring lubricant to help keep the O-ring in the groove.

1. See Figure 3. Insert the case O-ring (7) into the groove on the cover (1).

2. Install the encoder shaft O-ring (10) onto the electro-optic encoder shaft.

   NOTE: The non-optical shaft has left-hand threads.

3. Thread both of the shafts (3, 9) into the cover, and use wrench flats to tighten the shafts.

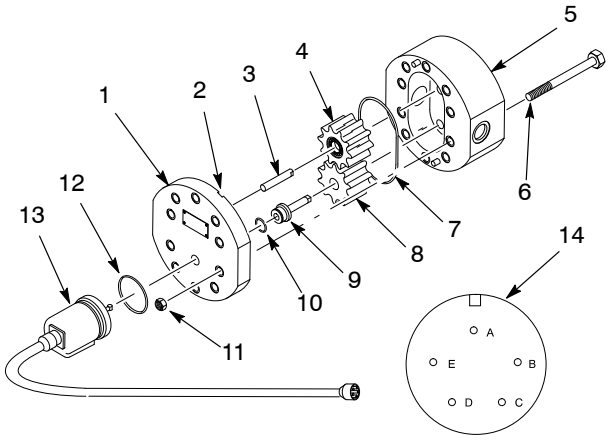

Figure 3 Typical Screw-in Shaft Flowmeter

1. Cover
2. Pry slot
3. Non-optical shaft
4. Non-magnetic impeller
5. Body
6. Case bolt
7. Case O-ring
8. Magnetic impeller
9. Shaft
10. Encoder shaft O-ring
11. Case nut
12. Encoder O-ring
13. Electro-optic encoder
14. Electro-optic encoder connector pin-outs

Assembly *(contd)*

4. Carefully slide the non-magnetic impeller (4) onto the non-optical shaft and the magnetic impeller (8) onto the shaft. The bearings in the impellers should be visible after the impellers are placed on the shafts.

   NOTE: The shaft sizes are different so the impellers will only fit into them one way.

5. Line up the cover so that the larger shaft diameter mates with the larger bore in the body (5). Press the cover and the body together.

   NOTE: The shafts extend into holes in the body.

6. Hold the cover in place and install two of the case bolts (6).

   CAUTION: While installing the cover, make sure that the case O-ring does not fall out of its groove in the cover and that you handle the impellers carefully so they do not become damaged.

7. Install the remaining case bolts and tighten according to the bolt torques referenced in *Flowmeter Specifications*.

   NOTE: During assembly, make sure that the encoder O-ring remains completely within the groove of the electro-optic encoder base.

8. Apply a compatible O-ring lubricant to the O-ring (12). Insert the encoder O-ring in the groove of the electro-optic encoder base (13).

   CAUTION: When screwing the encoder into the cover, do not bend or jar the shaft extending from the electro-optic encoder.

9. Carefully screw the electro-optic encoder into the cover until the its base is flush with the surface of the cover. Hand-tighten the electro-optic encoder. Do not use tools.
10. Plug the cable into the electro-optic encoder and tighten the locking nut. The electro-optic encoder connector pin-outs (14) are designated as follows: A: VCC, B: Output A, C: Common, D: Case Ground, E: N/C.

Torque Specifications

Use the following torque specifications when tightening flowmeter case bolts.

Nominal Size in.	Case Bolt Torque N•m (ft-lb)
1/4	21.7 (16.0)
3/8	40.6 (30.0)
1/2	40.6 (30.0)
1	67.8 (50.0)
1 1/2	94.9 (70.0)

Parts

To order parts, call the Nordson customer service center or your local Nordson representative. Use this parts list and Figures 4 and 5 to locate parts.

Pressed Shaft Flowmeters

See Figure 4 and refer to the following parts lists.

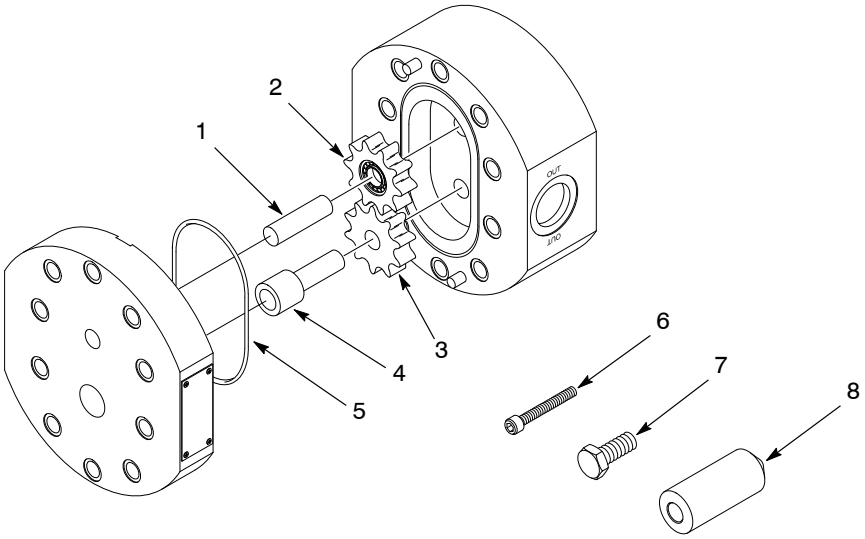

Figure 4 Typical Pressed Shaft Flowmeter

Refer to this table when ordering kits:

Order kit...	To repair flowmeter...
320934: Kit, service, flowmeter, $^3/_8$-in., nitrided	**320834:** Flowmeter, $^3/_8$-in., nitrided
1006097: Kit, service, flowmeter, $^3/_8$-in., high resolution, heated, nitrided	**320829:** Flowmeter $^3/_8$-in., high resolution, heated, nitrided
1004440: Kit, service, flowmeter, $^1/_2$-in., high resolution, nitrided	**1002557:** Flowmeter, $^1/_2$-in., high resolution, nitrided
1004442: Kit, service, flowmeter, $^1/_2$-in., high resolution, heated, nitrided	**1003025:** Flowmeter, $^1/_2$-in., high resolution, heated, nitrided

Parts:

Item	Description	Quantity	Note
1	Shaft, idler	1	
2	Impeller, non-magnetic, idler	1	
3	Impeller, magnetic	1	
4	Shaft	1	
5	O-ring, case	1	
6	Cap screw, socket head $^1/_4$-20 x 1.25	1	A
7	Cap screw, hex head $^5/_8$-18 x 1.5	1	A
8	Bushing, drive, aluminum	1	A
Note A: Use as a tool.			

Screw-In Shaft Flowmeters

See Figure 5 and refer to the following parts lists. Kits are available either with or without the shafts.

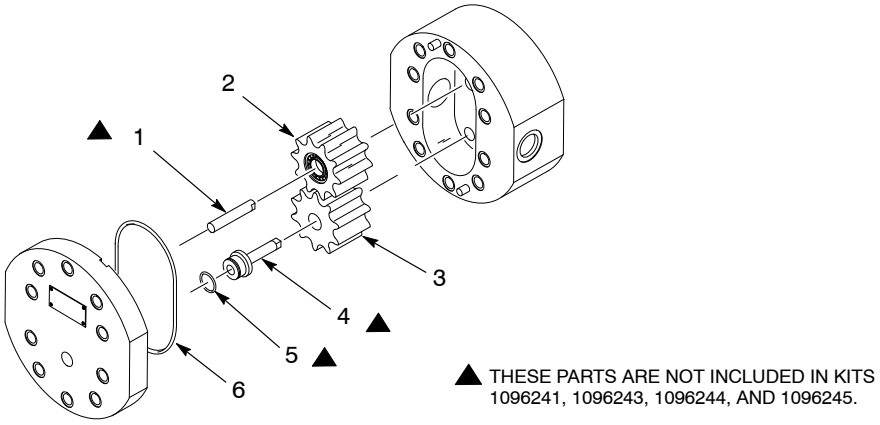

Figure 5 Typical Screw-In Shaft Flowmeter

Items 1 and 4 are included in the following kits:

Order kit...	To repair flowmeter...
223202: Kit, service, flowmeter, $^1/_2$-in.	**164451:** Flowmeter, $^1/_2$-in.
223204: Kit, service, flowmeter, $1^1/_2$-in.	**146155:** Flowmeter, $1^1/_2$-in.
223205: Kit, service, flowmeter, $^3/_8$-in.	**174448:** Flowmeter, $^3/_8$-in.
1019489: Kit, service, flowmeter, $^1/_4$-in.	**1018017:** Flowmeter, $^1/_4$-in.
1601357: Kit, service, flowmeter, $^1/_4$-in., nitride	**1601146:** Flowmeter, $^1/_4$-in., high resolution nitride

Items 1, 4, and 5 are not included in these kits:

Order kit...	To repair flowmeter...
1096241: Kit, flowmeter, $^1/_2$-in., w/o shaft.	**164451** and **1002557** (A): Flowmeter, $^1/_2$-in.
1096244: Kit, flowmeter, $1^1/_2$-in., w/o shaft.	**146155:** Flowmeter, $1^1/_2$-in.
1096245: Kit, flowmeter, $^3/_8$-in., w/o shaft.	**174448** and **320834** (A): Flowmeter, $^3/_8$-in.
1606590: Kit, flowmeter, $^1/_4$-in., w/o shaft.	**1018017:** Flowmeter, $^1/_4$-in. high resolution
(A) Kit can be used on this Pressed Shaft flowmeter.	

Parts:

Item	Description	Quantity
1	Shaft, idler	1
2	Impeller, non-magnetic, idler	1
3	Impeller, magnetic	1
4	Shaft	1
5	O-ring, encoder shaft	1
6	O-ring, case	1

Issued 11/18