Introduction

Table of Contents

Introduction ................................................................................................................. 2
Identification .................................................................................................................. 3
Tools Required .............................................................................................................. 3
Exploded View Drawing ............................................................................................... 4
Parts List ........................................................................................................................ 5
Disassembly ................................................................................................................... 5 & 6
Reversibility ................................................................................................................... 7
Inspection ....................................................................................................................... 8
Reassembly ..................................................................................................................... 9 & 10
Specific Backplate Parts List ...................................................................................... 11 & 12
Placing Pump Back into Operation .............................................................................. 13
Trouble Shooting ......................................................................................................... 14
Ordering Information ..................................................................................................... 16

Introduction

This manual provides service information for the Eaton model 26000 single gear pumps. Step by step instructions for the complete disassembly, inspection, and reassembly of the pumps are included.

The following recommendations should be followed to insure successful repairs.

- Remove the pump from the application.
- Cleanliness is extremely important.
- Clean the port areas thoroughly before disconnecting the hydraulic lines.
- Plug the pump ports and cover the open hydraulic lines immediately after they’re disconnected.
- Drain the oil and clean the exterior of the pump before making repairs.
- Wash all metal parts in clean solvent.
- Use compressed air to dry the parts. Do not wipe them dry with paper towels or cloth.
- The compressed air should be filtered and moisture free.
- Always use new seals when reassembling hydraulic pumps.
- For replacement parts and ordering information refer to parts list 6-634.
- Lubricate the new rubber seals with a petroleum jelly (vaseline) before installation.
- Torque all bolts over gasket joints, then repeat the torquing sequence to makeup for gasket compression.
- Verifying the accuracy of pump repairs on an authorized test stand is essential.
### Identification and Tools Required

**Product Number:** 260 01 - RZA

**Series**
- 26 = Gear Pump (SAE "A" Mount)

**Features**
- 0 = Standard Single Pump
- 1 = Standard Single W/ Relief
- 2 = Flow Divider Backplate
- 3 = Flow Divider W/ Load Sense
- 4 = Tandem Backplate
- 5 = Multiple Pumps

**Displacement cm³/r [in³/r]**
- 01 = 6.6 [0.40]
- 02 = 8.2 [0.50]
- 03 = 9.5 [0.58]
- 04 = 10.8 [0.66]
- 05 = 13.8 [0.84]
- 06 = 16.7 [1.02]
- 07 = 19.7 [1.20]

**Input Rotation**
- R = Right-hand (clockwise)
- L = Left-hand (Counterclockwise)

**Catalog / Non-Catalog**
- Z = Cataloged Pump
- A-Y = Non-Cataloged Pump

**Tools Required**
- 3/8 in. socket and ratchet wrench
- Internal Retaining Ring Pliers (straight .090 tip)
- O-ring Pick
- Thread 3/8 dla. UNC bolt/screw
- Torque Wrench (135.6 N m [100 lbf ft] capacity)
- Hammer (soft face)
- Light Petroleum Jelly
- Seal Driver
- Arbor Press

**Serial Number Code:**
- Testers Initials
- Day of Month (two digits)
- Month (two digits)
- Last two digits of year built. (95 for 1995 etc.)
- Revision level of parts list.
Disassembly

Repair Information - Model 26000

Work in a clean area; cleanliness is extremely important when repairing hydraulic pumps. Before disconnecting the lines, clean port area of pump. Disconnect hydraulic lines, removing pump assembly from vehicle and plugging ports. Thoroughly clean the outside of pump. After cleaning, remove port plugs and drain oil.

Disassembly

1. Remove key from drive shaft if keyed drive gear assembly is used.

2. Put a location mark across front plate, body and backplate to assure proper reassembly.

3. Clamp pump in vise, shaft end up.

4. Remove cap screws (eight each) and washer (four each).

5. Remove pump from vise, hold pump in hands and tap shaft with plastic hammer or rawhide mallet to separate front plate from backplate. Body will remain with either front plate or backplate.

6. Remove o-ring seal from backplate.

7. To disassemble the relief valve backplate, flow divider backplate, and tandem flow divider backplate see page 11 & 12.

Parts List

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front plate Assembly</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Backplate</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Body Assembly</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Drive Gear Assembly</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Idler Gear Assembly</td>
<td>1</td>
</tr>
<tr>
<td>~</td>
<td>Wear Plate</td>
<td>1</td>
</tr>
<tr>
<td>~</td>
<td>O-ring</td>
<td>2</td>
</tr>
<tr>
<td>~</td>
<td>Shaft Seal</td>
<td>1</td>
</tr>
<tr>
<td>~</td>
<td>Washer</td>
<td>1</td>
</tr>
<tr>
<td>~</td>
<td>Cap Screw</td>
<td>1</td>
</tr>
<tr>
<td>~</td>
<td>Backup Gasket</td>
<td>1</td>
</tr>
<tr>
<td>~</td>
<td>Seal</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Key for Straight Shaft</td>
<td>1</td>
</tr>
<tr>
<td>~</td>
<td>Washer</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>Retaining Ring (optional)</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>Plug</td>
<td>1</td>
</tr>
<tr>
<td>~ Seal Kit</td>
<td>26000-901 for Single Pumps</td>
<td>1</td>
</tr>
</tbody>
</table>
Disassembly

8. Remove idler gear assembly from body.

9. To separate body from the plate it remained with, place drive gear assembly in gear pocket and tap protruding end with plastic hammer or rawhide mallet. Remove drive gear assembly.

10. Remove wear plate and o-ring seal, noting position of open side of wear plate.

11. Remove back-up gasket and seal from wear plate by extracting with a o-ring tool.

12. Remove snap ring (if applicable) from the front of the front plate shaft seal area.

13. Remove shaft seal and washer from front plate with a blunt punch from the back side.

14. Removing the plug in front plate is not necessary, unless you intend to change rotation. See Reversibility - Changing Input Rotation of Pump.
Reversibility

Changing Input Rotation of Pump

1. Place pump in a protected jaw vise with shaft end up. Remove the eight cap screws.

2. Remove front plate, noting orientation of drive shaft through bearing in reference to the backplate.

3. Notice the location of the open side of wear plate and remove wear plate.

4. Switch drive gear and idler gear within gear pockets. Do not flip idler gear end for end.

Note: Gear housing body and backplate do not need altering.

5. Re-install wear plate into gear pockets over the gears with seal and backup gasket up. (Same orientation as removed)

6. Front plate disassembly and assembly:
   - Thread 3/8 UNC threaded bolt into plug cavity. Start with fingers, then place bolt head in vise and turn front plate to engage threads 2-3 turns.
   - Holding bolt in vise, tap front plate with rubber hammer to disengage plug.
   - Remove plug from bolt.
   - Install plug in the other casting cavity and tap flush with rubber hammer. Note L or R at bottom of cavity.

7. Hold o-ring in groove of front plate with petroleum jelly. Reassemble front plate over drive shaft end, being careful not to damage shaft seal.

8. Torque 8 cap screws 34 to 38 N•m [25 to 28 lb•ft].

9. Lubricate gears and mating surfaces with hydraulic oil through ports.

10. Rotate shaft (manually) to ensure proper assembly of components.

- Ensure that bearing drain holes are free of debris.

- Note proper placement of o-ring in groove of front plate.
Inspection

Inspect Parts for Wear

General

1. Clean and dry all parts.
2. Remove all nicks and burrs from all parts with emery cloth.

Gear Assembly Inspection

1. Check spline drive shaft for twisted or broken teeth or check keyed drive shaft for broken or chipped keyway.
2. Inspect both the drive gear and idler gear shafts at bushing points and seal area for rough surfaces and excessive wear.
3. Replace gear assembly if shaft measures less than 19 mm [.748 in] in bushing area. (One gear assembly may be replaced separately; shafts and gears are available as assemblies only.)
4. Inspect gear for scoring and excessive wear.
5. Replace gear assembly if gear width is below the following dimensions. Refer to chart on this page.
6. Assure that snap rings are in grooves on either side of drive and idler gears.
7. If edge of gear teeth are sharp, break edge with emery cloth.

Front plate and Backplate Inspection

1. Oil groove in bushings in front plate should be in line with dowel pin holes and 180° apart. The oil grooves in the backplate bushings should be at approximately 37° to the pressure side.
2. Replace the backplate or front plate if I.D. of bushings exceed 19.2 mm [.755 in] (Bushings are not available as separate items).
3. Bushings in front plate should be at 3.20 mm [.126 in] above surface of front plate.
4. Check for scoring on face of backplate. Replace if wear exceeds .038 mm [.0015 in.].

Body Inspection

1. Check body inside gear pockets for excessive scoring or wear.
2. Replace body if I.D. of gear pockets exceeds 43.7 mm [1.719 in].

<table>
<thead>
<tr>
<th>Model Number</th>
<th>26001</th>
<th>26002</th>
<th>26003</th>
<th>26004</th>
<th>26005</th>
<th>26006</th>
<th>26007</th>
<th>26008</th>
<th>26009</th>
<th>26010</th>
<th>26011</th>
<th>26012</th>
<th>26013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Disp. (\text{cm}^3/\text{r})</td>
<td>[6.6]</td>
<td>[8.2]</td>
<td>[9.5]</td>
<td>[10.8]</td>
<td>[13.8]</td>
<td>[16.7]</td>
<td>[19.7]</td>
<td>[22.5]</td>
<td>[24.3]</td>
<td>[25.2]</td>
<td>[27.7]</td>
<td>[29.0]</td>
<td>[30.6]</td>
</tr>
<tr>
<td>Gear Width (\text{mm} [\text{in}])</td>
<td>[7.85]</td>
<td>[9.75]</td>
<td>[11.20]</td>
<td>[12.95]</td>
<td>[16.15]</td>
<td>[19.35]</td>
<td>[22.56]</td>
<td>[25.76]</td>
<td>[28.12]</td>
<td>[28.96]</td>
<td>[32.16]</td>
<td>[33.78]</td>
<td>[35.36]</td>
</tr>
</tbody>
</table>
Reassembly

General Information

It is important that the relationship of the backplate, body, wear plate and front plate is correct. You will note two half moon cavities in the body. Note: The smaller half moon port cavity must be on the pressure side of the pump. The side of wear plate with midsection cut out must be on suction side of pump. Suction side of backplate is always side with larger port boss.

Reassembly

1. During the reassembly replace the wear plate, seal, back-up gasket, shaft seal and o-rings as new parts.
2. Install o-ring in groove of front plate.
3. Apply a thin coat of petroleum jelly or hydraulic oil to both milled gear pockets of body. Slip body onto front plate with half moon port cavities in body facing away from front plate.
   Note: The small half moon port cavity must be on the pressure side (the plugged side of the front plate) of pump.
4. Install new seal and new backup gasket into wear plate. Note in the middle of the backup gasket a flat section or support. This area must face away from the wear plate inside the seal.
5. Place new wear plate, seal, and backup gasket into gear pocket with seal and backup gasket next to front plate. The side of the wear plate with the mid section cut-away must be on the suction side of pump.
6. Dip gear assemblies into oil and slip into front plate bushings and gears into pockets of body.
Reassembly

7 Install new o-ring in groove of backplate.

8 Make sure port orientation is correct and then slide backplate over gear shafts until dowel pins are engaged.

9 Secure with cap screws and new washers. Tighten cap screws evenly in a crisscross pattern 34 to 38 N•m [25 to 28 lb•ft] torque.

10 Place washer over drive shaft into housing. Liberally oil shaft seal and install over drive shaft, carefully so that rubber sealing lips are not cut.

11 Place 1-5/16 in. O.D. sleeve over shaft and press in shaft seal until flush with front surface of front plate.

13 Install key on keyed shaft.

Note: Refer to Start-up Procedure and Trouble Shooting Procedure.
Specific Backplate Parts List

Relief Valve Backplate

Disassembly and Reassembly

1. After removing relief valve, remove and replace o-rings and backup ring with new parts.
2. Install relief valve and torque 41 to 46 N\(\cdot\)m [30 to 34 lbf\(\cdot\)ft]

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Relief Valve Backplate</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>O-ring</td>
<td>3</td>
</tr>
<tr>
<td>19A</td>
<td>Relief Valve Assembly</td>
<td>1</td>
</tr>
<tr>
<td>19A1</td>
<td>Relief Valve</td>
<td>1</td>
</tr>
<tr>
<td>~ 19A2</td>
<td>O-ring</td>
<td>1</td>
</tr>
<tr>
<td>~ 19A3</td>
<td>Backup Ring</td>
<td>1</td>
</tr>
<tr>
<td>~ 19A4</td>
<td>O-ring</td>
<td>1</td>
</tr>
<tr>
<td>19B</td>
<td>Plug Assembly</td>
<td>1</td>
</tr>
<tr>
<td>19B1</td>
<td>Plug</td>
<td>1</td>
</tr>
</tbody>
</table>

Flow Divider Backplate

Disassembly and Reassembly

1. After removing relief valve or plug, remove and replace o-ring and backup ring with new parts.
2. Install relief valve or plug and torque 41 to 46 N\(\cdot\)m [30 to 34 lbf\(\cdot\)ft]
3. Remove flow divider plugs, shims, spring, and spool from backplate. (Notice orientation of spool with cavity in backplate)
4. Install new plug seals on plugs. Install spool, spring, shims, and plug assemblies into backplate. Torque plugs 29 to 33 N\(\cdot\)m [21 to 24 lbf\(\cdot\)ft]

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2C</td>
<td>Flow Divider Backplate</td>
<td>1</td>
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<tr>
<td>19A</td>
<td>Relief Valve Assembly</td>
<td>1</td>
</tr>
<tr>
<td>19A1</td>
<td>Relief Valve</td>
<td>1</td>
</tr>
<tr>
<td>~ 19A2</td>
<td>O-ring</td>
<td>1</td>
</tr>
<tr>
<td>~ 19A3</td>
<td>Backup Ring</td>
<td>1</td>
</tr>
<tr>
<td>~ 19A4</td>
<td>O-ring</td>
<td>1</td>
</tr>
<tr>
<td>19B</td>
<td>Plug Assembly</td>
<td>1</td>
</tr>
<tr>
<td>19B1</td>
<td>Plug</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>Flow Divider Spool</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>Plug/O-ring Assembly</td>
<td>1</td>
</tr>
<tr>
<td>21A</td>
<td>Plug</td>
<td>1</td>
</tr>
<tr>
<td>~ 21B</td>
<td>O-ring</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>Plug/O-ring Assembly</td>
<td>1</td>
</tr>
<tr>
<td>22A</td>
<td>Plug</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>Spring</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Shim (.0239 inch thick)</td>
<td>A/R</td>
</tr>
<tr>
<td>A/R</td>
<td>As Required</td>
<td></td>
</tr>
</tbody>
</table>
**Disassembly and Reassembly**

1. Remove relief valve plug, shim, spring, and poppet from backplate. Do not remove internal relief valve seat. Seat is locitized to a predetermined depth. Remove o-ring from plug and replace with new o-ring.

2. Install poppet, spring, shim, and relief valve plug and torque 14 to 16 N*m [10 to 12 lbf*in]

3. Remove flow divider plugs, shims, springs, spool, and sleeve from backplate. (Notice orientation of spool with cavity in backplate) Remove o-rings from sleeve and replace with new o-rings.

4. Install sleeve, spool, springs, shims, and plug assemblies into backplate. Torque plug #27 48 to 54 N*m [35 to 40 lbf*in] and plug #28 29 to 33 N*m [21 to 24 lbf*in]

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2D</td>
<td>Tandem Flow Divider Backplate</td>
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</tr>
<tr>
<td>2E</td>
<td>Tandem Backplate</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>O-ring</td>
<td>3</td>
</tr>
<tr>
<td>20A</td>
<td>Spool for Tandem Flow Divider Backplate</td>
<td>1</td>
</tr>
<tr>
<td>23A</td>
<td>Spring for Tandem Flow Divider Backplate</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Shim (.0239 inch thick)</td>
<td>A/R</td>
</tr>
<tr>
<td>~ 26</td>
<td>O-ring</td>
<td>1</td>
</tr>
<tr>
<td>27</td>
<td>Plug</td>
<td>1</td>
</tr>
<tr>
<td>28</td>
<td>Plug/O-ring Assembly</td>
<td>1</td>
</tr>
<tr>
<td>28A</td>
<td>Plug</td>
<td>1</td>
</tr>
<tr>
<td>~ 28B</td>
<td>O-ring</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td>Plug/O-ring Assembly</td>
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<tr>
<td>29A</td>
<td>Plug</td>
<td>1</td>
</tr>
<tr>
<td>~ 29B</td>
<td>O-ring</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>Relief Valve Spring</td>
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<tr>
<td>32</td>
<td>Sleeve</td>
<td>1</td>
</tr>
<tr>
<td>33</td>
<td>Spring</td>
<td>1</td>
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<tr>
<td>34</td>
<td>Poppet</td>
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<tr>
<td>35</td>
<td>Shim Washer (.010 inch thick)</td>
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<td>36</td>
<td>Tandem Cover Plate</td>
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<tr>
<td>37</td>
<td>O-ring</td>
<td>1</td>
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<tr>
<td>38</td>
<td>Cap Screw</td>
<td>2</td>
</tr>
<tr>
<td>A/R</td>
<td>~ As Required</td>
<td></td>
</tr>
</tbody>
</table>
Placing Series 26 Gear Pump Back into Operation

When test stand is available.

Mount Pump on Test Stand → Connect to Fluid Supply → Start Pump and Run For 3 Minutes

At Zero Pressure → Load Intermittently to 500 lbf/in² → Remove from Test Stand → Check for Leaks
Load Intermittently to 1000 lbf/in² → Load Intermittently to 2000 lbf/in²

When test stand is not available.

Mount Pump on Machine → Connect to Fluid Supply → Start Pump and Run For 3 Minutes

At 1/2 Speed → At 1/2 Speed → At Full Speed
At Zero Pressure → Load Intermittently to 500 lbf/in² → Load Intermittently to 1000 lbf/in²
Pump Ready for Service → Check for Leaks
## Trouble Shooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Correction</th>
</tr>
</thead>
</table>
| Cavitation  | a. Oil too heavy.  
b. Oil filter plugged.  
c. Suction line plugged or too small. | a. Change to proper viscosity  
b. Clean filter.  
c. Clean line and check size of line. |
| Oil heating | a. Oil supply low.  
b. Contaminated oil.  
c. Setting of relief valve too high or too low.  
d. Oil in system too light. | a. Fill reservoir.  
b. Drain reservoir and refill with clean oil.  
c. Set to correct pressure.  
d. Drain reservoir and refill with proper viscosity oil. |
| Shaft seal leakage | a. Worn shaft seal.  
b. Worn shaft in seal area.  
c. Debris in shaft seal suction side drain holes. | a. Replace shaft seal.  
b. Replace drive assembly.  
c. Disassemble pump and inspect. |
| Foaming oil | a. Low oil level  
b. Air leaking into suction line  
c. Wrong kind of oil. | a. Fill reservoir.  
b. Tighten fittings.  
c. Drain and fill reservoir with non-foaming oil. |
Wear Plate Identification

A product improvement has been made to the Model 26000 gear pump with a new designed wear plate. To identify the new wear plate, look for grooves placed in the seal side of the wear plate as shown below.

This new wear plate enables better pressure clamping with aerated oil in pumps 1.37 cubic inch or smaller. Aerated oil may occur during a cold start-up in applications with long suction lines or when the mouth of the inlet line is temporarily exposed to air.
Order parts from 6-634 Parts Information booklet. Each order must include the following information.

1. Product and/or Part Number
2. Serial Number Code
3. Part Name
4. Quantity