SERVICE MANUAL

MOYNO®

Edge

Always the Right Solution™
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1-1. INTRODUCTION

1-2. General

The Moyno® Edge, twin shaft grinder cartridge, is a rugged and reliable replacement grinder cartridge designed to efficiently reduce the size of large solids typically encountered in raw wastewater, primary thickened sludge, digested sludge, animal waste, and pulp and paper processing.

The Moyno® Edge cartridge is a high quality replacement unit that is interchangeable with Muffin Monster® cartridge number 3CC04T-1200. There are no modifications to make, adapters or any special tools. Simply remove your worn cartridge and reuse the existing Muffin Monster® main flange housing, gear reducer and motor.

The Moyno® Edge utilizes the field-proven counter-rotating, hexagonal shaft design with intermeshing cutters and spacers. It also includes a patent pending, proven mechanical seal design for superior performance and long service life.

1-3. NAMEPLATE DATA

The grinder nameplate, located on the top housing, contains important information relating to the operation and servicing of the grinder. This information includes the model and serial numbers (see Figure 1-3.). The grinder model number must be used for reference when ordering a replacement cartridge or spare parts.

<table>
<thead>
<tr>
<th>Model:</th>
<th>ME12C C-A7R11C</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFG Serial:</td>
<td>0004XXXXXX</td>
</tr>
<tr>
<td>Date:</td>
<td>07/10</td>
</tr>
</tbody>
</table>

Figure 1-3. Typical nameplate data

1-4. Model Number. The grinder model number consists of two component parts: Frame Designation and a Trim Code. A typical model number, for example, might be ME12 C-A7R11C as shown on the nameplate in Figure 1-3.

1-5. Trim Code. Also included in the Model Number is the six character Trim Code which is used to identify grinder construction.

The first letter identifies the materials of construction.
C -- Cast iron, ductile iron, and alloy steel

The second character, the underscore (_), designates no motor or gear reducer was supplied.

The third and fourth characters identify the type of cutters on the drive shaft:
5R -- 5 tooth reversible
7R -- 7 tooth reversible
7C -- 7 tooth cam
11C -- 11 tooth cam

The fifth and sixth characters identify the type of cutters on the idler shaft:
5R -- 5 tooth reversible
7R -- 7 tooth reversible
7C -- 7 tooth cam
11C -- 11 tooth cam

If the trim code of your grinder is other than the variations listed above, contact your nearest Moyno representative for clarification. Do not modify your grinder with any variations unless you have determined that it is compatible with your application.
2-1. INSTALLATION

2-2. GENERAL

The Moyno Edge is lubricated and tested at the factory prior to shipment and requires minimum pre-start up maintenance.

2-3. Piping. No piping changes are necessary. The Moyno Edge cartridge simply drops in to replace the JWC 3CC04T-1204 cartridge.

3-1. OPERATION

3-2. INITIAL CHECK / START-UP CHECKLIST

Before putting the grinder into operation, the following items should be checked to ensure that each piece of equipment is installed correctly:

- Be sure the unit is mounted in the piping in the proper flow direction. Check the flow direction arrow on the grinder.
- Check the direction of cutter rotation.

Reversible cutters denoted as 5R or 7R, can operate in either direction of rotation. The cutters should rotate with the teeth rotating inward, towards one another on the inlet side of the flow. If the motor is rotating in the reverse direction, disconnect the power to the control panel.

However, cam cutters denoted as 7C or 11C, can only operate in one direction of rotation. The cutters should also rotate with the teeth rotating inward, towards one another on the inlet side of the flow. With cam cutters you must first install the unit in the piping in the correct flow orientation. Interchange motor leads if the cutter direction is wrong.

4-1. MAINTENANCE

Note: In this section, a number or a letter in parentheses will follow the first reference to each grinder part ( ). These numbers and letters are those used to identify the grinder parts and hardware items in the section view diagram.

4-2. LUBRICATION

Cartridge Assembly. The Edge’s gear housing is half full of ACG-2 grease prior to shipment and is ready for operation. The gear housing contains two gears that only need to be re-lubricated when the assembly is being repaired. You can re-lubricate the housing via the pressure release grease fitting (37). The pressure release grease fitting is preset at 10 psi. At pressures greater than 10 psi, the grease will be observed exiting the grease fitting via the bypass. This feature prevents over packing the bearings with grease and is available through Alamite.

The bottom bearing housing is sealed and gasketed and requires no lubrication.

4-3. DISASSEMBLY

Note: The following instructions cover grinder disassembly. Grinder disassembly is generally the reverse of assembly.

4-4. Disconnect Grinder

1. Flush the grinder (preferably with clean water) to remove all debris from the unit.
2. Shut off grinder.
3. Close suction and discharge valves.
4. Disconnect power source.
   Caution: Electrical hazard…Be sure power is off and locked out.
5. Open and tag power disconnect in the control panel.
6. Disconnect and tag motor leads in the motor conduit box.
7. Drain any fluid in grinder.

4-5. Cartridge Removal

Note: The following instructions cover the removal of the motor and gear reducer as an assembly to facilitate replacement of the grinding cartridge. This can be completed without removing the flange housing from the pipe line.

1. Secure the motor/reducer with a nylon sling and support with a hoist.
2. Remove cap screws and lock washers, connecting the drive adapter to the gear housing. Remove the motor, reducer, and drive adapter by lifting up with a hoist. Be careful not to allow the assembly to tip over.
3. Remove the coupling half and key from the drive shaft.
4. Remove the ten bolts and lock washers that connect the top portion of the cartridge assembly to the flange housings.
5. Remove the six bolts and lock washers connecting the bottom portion of the cartridge assembly to the bottom support.
6. Remove and replace the cartridge assembly with a new or rebuilt cartridge from an authorized Moyno Representative.

4-6. Cartridge Disassembly

1. Lay the cartridge assembly on its side, using 4x4 blocks on the bearing housing to support the unit and elevate the gear housing above the work surface.
2. Remove ten hex head screws (25) and lock washers (24) from the gear housing cover (18).

3. Remove gear housing cover (18) from the gear housing, being careful not to damage the grease seal (33) in the gear housing cover.

4. Remove socket head cap screw (31), lock washer (30), and washer (29) from the top of the idler shaft (17). Significant torque may be required to break the cap screw free as Loctite is used in the assembly. Ensure the cartridge assembly is secure in place before trying to break the cap screw free.

5. Remove hexagon nut (15) from the drive shaft (16).

6. Remove driver gear (13) and driven gear (14) from the drive shaft (16) and idler shaft (17). Remove square keys (34) from both shafts.

7. Remove six hex head screws (26) and lock washers connecting the gear case (10) to the top bearing housing (1). Remove the gear case (10).

8. Remove the gear spacer (12), seal sleeve collar (11), and jib keys (19) from both the drive shaft (16) and idler shaft (17).

9. Remove spacer (9) from the top of each bearing (8).

10. Bearing housing assembly which, includes the bearing housing (1), seal sleeve (2), shaft seal (3), seal insert (4), seal retainer (6), bearings (8), and wave springs (35), can now be removed as a complete assembly from the drive shaft (16) and idler shaft (17).

11. Remove excluder plates (7) from both shafts.

12. Remove cutters (21 and 23) and spacers (22) from each shaft. **Caution: cutters and spacers are very sharp.**

13. Remove the shaft collars (20) from the bottom of each of the shafts. To accomplish this remove the two socket head cap screws from each shaft collar (20). A flat headed screw driver may be necessary to pry the shaft collar halves from the machined groove in each of the shafts.

14. Remove shaft bearing seal sleeve collar (11) and jib keys (19) from each shaft.

15. Remove drive shaft (16) and idler shaft (17) from bearing housing assembly.

16. Remove O-rings (5) from each shaft.

17. Remove bearing, mechanical seal and sleeve assembly from the bores in each bearing housing (1).

4-7. **INSPECTION**

1. Inspect all parts for wear and corrosion. Replace any parts that worn.

2. Replace all seals, bearings, O-rings, and gaskets.

4-8. **ASSEMBLY**

During the assembly process, cleanliness is important. To avoid premature failure, bearings, and seal components must be handled with care and kept clean.

4-9 **Seal Assembly**

The seal assembly consists of the mechanical seal, seal sleeve, seal insert, and retaining ring. The bearing is shipped with the assembly, but is not coupled to the seal.

4-10. **Cartridge Assembly**

1. Place one of the bearing housings (1) bore-side up on the work bench and place one wave spring (35) at the bottom of each bore. Carefully install the seal insert (4) with O-ring (5) into the bearing housing bore being careful not to damage the O-ring.

2. Then press bearing (8) into the bore.

3. Install O-rings (41) into O-ring grooves on the drive shaft (16) and idler shaft (17) on both sides of the hex section of the shaft.

4. Install excluder plates (7) on the drive end/gear side of both the drive shaft (16) and idler shaft (17).

5. Apply Locktite to the ID of the bearing (8).

6. Slide the seal sleeve (2), containing the mechanical seal (3) onto the drive side/gear side of the drive shaft (16) and idler shaft (17). The square end of the seal sleeve should engage with the square counter bore in the excluder plate (7).

7. Place the bearing housing assembly on its side with the diverter (triangular shaped section) flat against your work table top.
8. Carefully slide the non-drive side/bearing only side of the drive shaft (16) and idler shaft (17) into the bearing housing. Care should be taken to prevent damage to the mechanical seal faces. With the bearing housing assembly flat against the work surface and the bore side of the housing facing you, the drive shaft (16) should be on the right and idler shaft (17) on the left.

9. Align the keyway on the seal sleeve to the keyway on both the drive shaft (16) and idler shaft (17). Insert jib key (19) into both shafts. The thin section of the jib key (19) should be installed towards the seal and bearing assembly.

10. Slide bearing sleeve collar (11) over the seal sleeve on both the drive shaft (16) and idler shaft (17).

11. Install the shaft collar (20) on the drive shaft (16) and idler shaft (17). Shaft collar should be installed in the groove on each shaft. Tighten socket head screws evenly in shaft collar.

12. Find a way to support the assembly upside down on the workbench. 4 x 4 Inch blocks can be placed on either side of the drive shaft in order to accomplish this.

13. Align both shafts so that the point of the hex is facing toward you and perpendicular to the long edge of the bottom housing. It does not matter which side the drive or idler shaft is on, right or left. Please refer to the trim code Section 1-6 to identify the type of cutters to be placed on the drive and idler shafts.

14. Place a cutter on Shaft 1 with the AP positioned at Point 6 on the shaft 1 (see figure 4-1). Place a spacer on Shaft 2. For cam cutters (7C or 11C), make sure the cutter teeth are facing the diverter per the below figure.

```
Each cutter has only 1 of the 5 cutting teeth radially in line with one point of the hex ID hole (see figure 4-2). This tooth is denoted as the Assembly Position (AP). To expedite the cutter/spacer stacking process, all cutters and spacers should be separated into separate piles for the drive shaft cutters, idler shaft cutters, and spacer. Time should also be taken to clearly mark and identify the AP for all cutters/spacers.
```

15. Place the other bearing housing (1) bore side up on the workbench and place one wave spring (35) at the bottom of each bore. Carefully install the seal insert (4) with O-ring (5) into the bearing housing bore being careful to not damage the O-ring.

16. Then press bearing (8) into the bore.

17. Install excluder plates (7) on the drive end/gear side of both the drive shaft (16) and idler shaft (17).

18. Apply Locktite to the ID of the bearing (8).

19. Slide the seal sleeve (2), containing the mechanical seal (3) onto the drive side/gear side of the drive shaft (16) and idler shaft (17). The square end of the seal sleeve should engage with the square counter bore in the excluder plate (7).
20. Install the bearing housing assembly onto the drive (16) and idler shaft (17), making sure that the diverter (triangular shaped section) of the bearing housing is facing the same direction as the bottom bearing housing.

21. Align the keyway on the seal sleeve to the keyway on both the drive shaft (16) and idler shaft (17). Insert jib key (19) into both shafts. The thin section of the jib key (19) should be installed towards the seal and bearing assembly.

22. Slide bearing sleeve collar (11) over the seal sleeve on both the drive shaft (16) and idler shaft (17).

23. Place bearing spacer (9) on top of bearing.

24. Place gear spacer (12) on top of bearing sleeve collar (11).

25. Install two dowel pins (39) into the bottom of the gear housing (10). Dowel pin holes are the only two holes in the bottom of the casting that are not counter-bored on the inside of the housing.

26. Place the gear housing (10) on top of the bearing housing (1), aligning the dowel pins in the gear housing with the dowel pin holes in the bearing housing. Secure into place using six hex screws (26) and lock washers (24).

27. Place square key (34) in keyways on the drive shaft (16) and idler shaft (17).

28. Install the driver gear/smaller gear (13) on the drive shaft (16) and the driven gear/larger gear (14) on the idler shaft (17). Gears should sit on the gear spacers. Grease each of the gears liberally with grease and fill housing approximately half full.

29. Fill the threaded section of the idler shaft with red Loctite. Place a plain washer (29) and lock washer (30) on top of the idler shaft (16). Secure into place using socket head cap screw (31). Cap screw should be tightened down to 70 ft-lbs using a torque wrench.

30. Apply red Loctite to the threads of the hexagon nut (15) and install on the driveshaft (16). Nut should also be tightened down to approximately 70 ft-lbs of torque.

31. Install dowel pins (38) into the top of the gear housing (10). Dowel pins go in the only two non-threaded holes in the gear housing.

32. Install drive adapter dowel pins (40) into the top of the gear housing cover. Dowels go in the only two holes in the top housing that are not threaded.

33. Install grease seal (33) into the gear housing cover (18). The spring in the grease seal should be facing the top of the housing.

34. Install gear housing cover (18) onto the gear housing (10), making sure to align the dowel pin holes in the cover with the pins in the gear housing and being careful not to damage the grease seal. Secure into place using ten hex screws (25) and lock washers (24).

35. Install grease zirc fitting (37) and eyebolts (36) into the top of the gear housing cover (18).

4-11. Cartridge Installation.

1. Place a flange housing gasket (42) on the top of the flange housing.

2. Place the assembly upright on the support. Place a bearing housing gasket (27) in the bottom of the flange housing on top of the bottom support. Align the holes in the gasket over the holes in the bottom support.

3. Carefully lift the cartridge assembly and slide it down inside the flange housing. Secure the top portion of the cartridge to the flange housing with ten cap screws and washers. Secure the bottom portion of the cartridge to the support with six hex head screws and washers. Be careful not to damage the gaskets.

4. Attach both inspection plates to the flange housing with cap screws and washers.

4-12. Reducer/Motor Assembly

1. Install the cartridge drive shaft coupling half. Slide the key and coupling half down on the drive shaft. Coupling half should bottom out on the top of the drive shaft.

2. Place the reducer adapter over the coupling half and secure the adapter with four hex head screws and lock washers.

3. Slide the key and coupling half on the gear reducer shaft, until coupling half bottoms out on the top of the gear reducer drive shaft.

4. Lower the gear reducer and motor onto the reducer adapter carefully aligning the coupling halves. Align the holes in the flanges and install and tighten the six hex screws, lock washers, and nuts.

4-13. TORQUE GUIDELINES CHART

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<tr>
<th>Stainless Steel Bolts</th>
<th>Carbon Steel Bolts</th>
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<tr>
<td><strong>Size</strong></td>
<td><strong>Max Torque</strong></td>
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<tr>
<td>NO. 10-24</td>
<td>22.8 in. lb.</td>
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<tr>
<td>1/4 – 20</td>
<td>75.2 in. lb.</td>
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<tr>
<td>5/16 – 18</td>
<td>132 in. lb.</td>
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<tr>
<td>3/8 – 16</td>
<td>236 in. lb.</td>
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<tr>
<td>1/2 – 13</td>
<td>517 in. lb.</td>
</tr>
</tbody>
</table>

Note: Torque values are from the Industrial Fasteners Institute and Craftsman Corp.

4-14. STORAGE

4-15. Short-Term Storage. Storage of 6 months or less will not damage the grinder. However, to ensure the best possible protection, the following is advised:
1. Store grinder inside whenever possible, or cover with some type of protective covering. Do not allow moisture to collect around the unit.

2. See OPERATION Section before startup. Be sure all lubricants are in good condition.

4-16. **Long-Term Storage.** If grinder is to be stored for up to three years, perform the above short-term storage procedures plus the following:

1. Apply rust inhibitor to all unpainted cast iron and machined carbon steel surfaces.

2. Store in a dry area with dust cover.

3. Maximum temperature 120°F, minimum temperature 30°F.

4. Relative humidity should not exceed 60%. Provide desiccation for moisture control above the maximum.
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<tr>
<th>Reference Number</th>
<th>Part Number</th>
<th>Description</th>
<th>Quantity</th>
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<td>Seal Retainer</td>
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<td>7</td>
<td>4241956001</td>
<td>Excluder Plate</td>
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<td>8</td>
<td>6300502081</td>
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<td>4252669004</td>
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<td>19</td>
<td>4220941001</td>
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<td>20</td>
<td>4241609008</td>
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<td>21</td>
<td>See Table 1</td>
<td>Drive Shaft Cutters</td>
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<td>4231151001</td>
<td>Spacer</td>
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<td>See Table 1</td>
<td>Idler Shaft Cutters</td>
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<td>6230012400</td>
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* Seal Sleeve Assembly-Part Number 4231145001 Includes items 2, 3, 4, 5, and 6

**Table 1— Cutters**

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<th>Part Number</th>
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<tr>
<td>7R, 7 Tooth Reversible</td>
<td>4231202001</td>
</tr>
<tr>
<td>7C, 7 Tooth Cam</td>
<td>4231150001</td>
</tr>
<tr>
<td>11C, 11 Tooth Cam</td>
<td>4231164001</td>
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