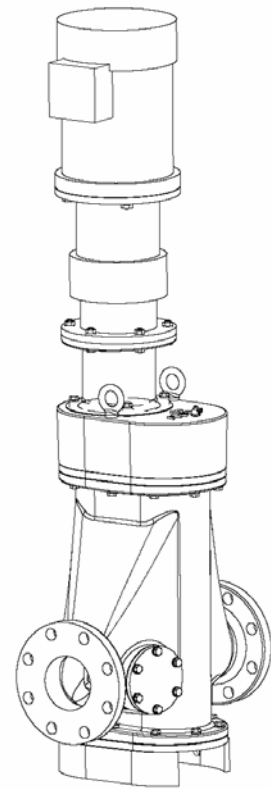


SERVICE MANUAL  
**MOYNO®**  
**Annihilator™**  
**Series 4**



*Always the Right Solution™*

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# SERVICE MANUAL

# Moyno® Annihilator™

## Series 4

### 1-1. INTRODUCTION

#### 1-2. GENERAL

The Moyno® Annihilator, twin shaft grinder, is a rugged and reliable grinder designed to efficiently reduce the size of large solids typically encountered in raw wastewater, primary thickened sludge, digested sludge, slaughterhouse waste, and pulp and paper recycling. The grinder has been tested to assure consistent performance in the most difficult of applications. It represents the next generation of the world's most reliable grinder.

The Moyno® twin Annihilator utilizes an improved version of the counter-rotating shaft design that has proven to be a reliable method of shredding large solids (pieces of wood, plastic bottles, cloth towels and rags, and aluminum cans, etc.) into smaller pieces. The slow rotating shafts are ideal for shredding solids that are large and dense. By utilizing a slow speed gear motor, the cutters have high torque capability and low impact while severing debris.

The Moyno Annihilator is designed with cutting teeth on both the cutters and spacer cutters which increases the cutting capability of rags over other twin shaft grinders and eliminates the greatest cause of failure – that of stringy material wrapping around the spacers.

The Moyno Annihilator product line is modular in concept allowing for optimal utilization of cutters for channel or in-line units to meet the requirements of the application. The cutter cartridge assembly allows for the removal and replacement of the entire cutting assembly as a single unit. The cutter cartridges consist of a top and bottom housing, side rails, seal assembly, hex shafts, cutters, and spacer cutters (Figure 1-1.).

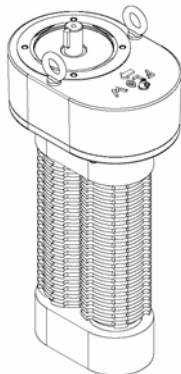


Figure 1-1. Cutter cartridge.

The complete Annihilator unit consists of the cutter cartridge assembly, reducer adapter, gearbox, motor, and flange housings on in-line units (Figure 1-2).

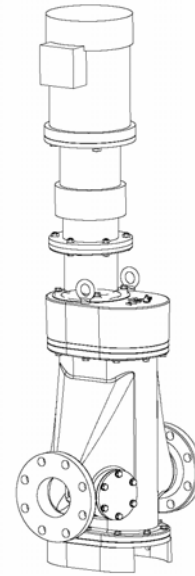


Figure 1-2. Complete unit.

#### 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.

Model:	M06F4 CEA5R7R
MFG Serial:	0004XXXXXX
Date:	10/09

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 M06F4 CE5R7R as shown on the nameplate in Figure 1-3.

**1-5. Frame Designation.** The five characters in the frame designation describe the particular combination of construction and cutter height.

The first character in the frame designation, always a letter, indicates the construction as either a complete unit (M) or replacement cartridge (C).

The second and third characters, always numbers, indicate either the flange size or cutter stack height.

The fourth character is a letter indicating whether it's a flange unit (F) or channel unit (C). If the fourth character indicates a flange unit, the second and third characters indicate the flange size in inches. If the fourth character indicates a channel unit, the second and third characters indicate the cutter stack height.

The fifth character indicates the series of the unit:

Series 2 -- 2½" hex shaft

Series 3 – 2" hex shaft, design after July 2003

Series 4 – 2" hex shaft, one-piece flange housing design

**1-6. 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

S -- Stainless steel

X -- Special

The second letter identifies the type of drive utilized.

E -- Electric motor and gear box

S -- Submersible motor and gear box

H -- Hydraulic motor with power package

X – Special

The third character identifies the revision level.

A—October 2009

The fourth and fifth 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 sixth and seventh 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.

## 1-7. EQUIPMENT DESCRIPTION

**1-8. Grinder Unit.** The Moyno Annihilator is a motor driven, double shaft design stacked with intermeshing cutters and spacer cutters positioned on the shafts. The shafts are constructed of a hexagonal, 4140 steel and counter-rotate at 60 and 36 RPM. The shafts contain intermeshing cutters and spacer cutters.

The Moyno Annihilator series 4 product line, consists of five flanged, in-line models from 4 to 12 inch flanged.

**1-9. Motor.** Each Moyno Annihilator is equipped with a motor:

- TEFC or Explosion proof design
- 3 or 5 HP
- 1725 RPM, 3/60/230/460V
- Baldor or Moyno choice

**1-10. Reducer.** Each Moyno Annihilator is equipped with a cycloidal speed reducer:

- 29:1 ratio
- 60 RPM output
- Sumitomo or Moyno choice
- Model 6125Y...3HP and 5 HP

Note: See manufacturer's service manuals for more details.

## 2-1. INSTALLATION

### 2-2. GENERAL

Moyno Annihilators are lubricated and tested at the factory prior to shipment and require minimum pre-start up maintenance.

Accessibility to the grinder and adequate clearance should be a prime consideration in any installation. Enough space should surround the unit so that maintenance can be carried out with ease.

**2-3. Piping.** For in-line flanged units, piping should generally be the same size as the flange and supported, not applying vertical or horizontal forces to the grinder flanges. **Be sure to mount the unit in the piping in the proper flow direction. Check the flow direction arrow on the grinder.**

### 2-4. FOUNDATION

Flanged units should be mounted on a concrete base. The base should be 4-8 inches wider than the Grinder base. Anchor bolts are not required to attach the grinder to the concrete base.

Check the base surface with a carpenter's level and shim under the grinder at the places necessary to make the unit level. Care should be exercised to ensure the grinder flanges are mounted in line and without piping strain.

Channel units should be mounted in a suitable framework for support.

**2-5. Motor Controls.** To protect the Moyno Annihilator from potential damage, all Grinder units should be wired to a Moyno control panel. In the event an unusually difficult material engage the cutting chamber, the automatic controller senses the overload and reverses the rotation of the cutters to clear the object. The controller then returns the Grinder to the forward direction of rotation. It is highly recommended that this type of overload protection be provided for all grinders to prevent damage to the unit.

**Caution:**

- **Cutters and spacer cutters are very sharp. Keep personnel clear of cutting chamber.**

- Do not lift heavy equipment over the head of personnel.
- Electrical hazard...Be sure power is off and locked out.

### 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.
- Recheck for proper line voltage connections at the control panel and control transformer. Check the transformer for continuity.
- Set the programmed controller (inside the door of the Annihilator control panel) to the number of attempts desired to clear jams or overloads before automatic shutdown. The programmed controller is normally set at 3 reversals when shipped from the factory.
- Energize the incoming power lines by closing the disconnect device. The amber light ["POWER ON"] illuminates, indicating power is available to the control circuitry.
- Turn the Selector Switch to the "LOCAL" position. Depress the "Start" pushbutton. The blue light ["GRINDER ENABLED"] will illuminate to indicate that the control circuits are energized and the green light ["GRINDER RUNNING"] will illuminate indicating the drive motor should be operating.
- 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.

**CAUTION: Using a volt meter double-check that the incoming power lines L1, L2, and L3, as well as the motor lines T1, T2, and T3 in the control panel all indicate that the power is OFF.**

Interchange any two of the motor leads in the control panel at Terminal Blocks T1, T2, or T3. Do not change the connections at the contactors. Repeat Steps 3, 4, and 5, above.

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.

- To test the reversing function of the programmed controller, it is not necessary to attempt to physically jam the grinder. Simply depress the "Test" button on the controller inside the door of the panel. Each activation of the "Test" pushbutton will initiate a reversal of the grinder.

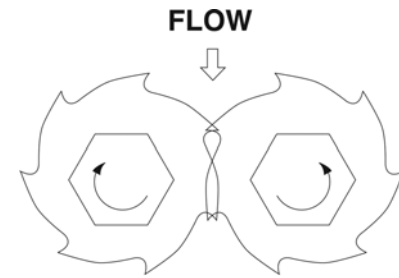


Figure 3-1. Cutters rotating inward.

### 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

**4-3. Motor Bearings.** The motor bearings are lubricated at the factory and will need to be re-lubricated after 12,000 hours of operation. See your motor maintenance manual for details.

**4-4. Gear Reducer.** The gear reducer is filled with grease at the factory and will require re-lubrication every 3-5 years. See your reducer maintenance manual for details.

**4-5. Cartridge Assembly.** The grinder top housing is half full of ACG-2 grease prior to shipment and is ready for operation. The top 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 (30). The pressure release grease fitting is pre-set 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.

List of Lubricants (or Equivalents)	
Motor Bearings	See Mfg Recommendation
Gear Reducer	See Mfg Recommendation
Top Housing	ACG-2 (Dubois Chemical)

#### 4-6. DISASSEMBLY

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

#### 4-7. 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.

#### 4-8. Cartridge Replacement

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, nuts and washers, connecting the gear reducer to the reducer adapter (7). Remove the motor / reducer by lifting up with a hoist. Be careful not to allow the assembly to tip over.
3. Loosen the jaw coupling (18) set screw and remove the coupling half and key from the drive shaft (8).
4. Remove the bolts and lock washers that connect the top portion of the cartridge assembly to the flange housings (1).
5. Remove the button head screws 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.
7. Reassembly in reverse of disassembly.

#### 4-9. Motor Removal

The grinder's unibody casting may remain in line during motor removal and replacement.

Open and tag power disconnect in the control panel.

Disconnect and tag motor leads in the motor conduit box.

Remove the bolts connecting the motor (45) to the gear reducer (44). Some gentle prying may be necessary to remove the motor from the reducer.

Remove the key from the motor drive shaft.

#### 4-10. Gear Reducer Removal

1. Remove the bolts connecting the gear reducer to the reducer adapter (42). Pry the gear reducer off the reducer adapter.
2. Loosen the jaw coupling (43) set screw and remove the coupling and key from the reducer shaft.
3. Remove cap screws connecting the reducer adapter (42) to the housing adapter (9). Remove the reducer adapter.

#### 4-11. Cartridge Disassembly

1. Install the two eyebolts (24) in the top housing (6). Remove screws (48) from unibody (1) & top housing (6). Remove screws (43) from bottom support (2) and bearing housing (5). Remove using a hoist. Securely place the cartridge unit on the floor or work bench.
2. Find a way to support the assembly upside down on the work bench. 4 X 4 Inch blocks can be placed on either side of the driveshaft in order to accomplish this.
3. Remove adjustment screw (44) and Flat washer (52).
4. Remove Bearing Sleeve Collar (11) and jib key (20) from each shaft.
5. Remove bearing housing (5) as an assembly. The housing will contain item (22) and (53). Caution should be used, so you do not damage the mechanical seal faces during removal.
6. Carefully press seal assembly (22) and bearing (53) out of bearing housing (5).
7. Carefully remove bearing (53) from seal assembly.
8. Remove excluder plates (17).
9. Remove cutters (13) and spacer cutter (12). **Caution: cutters and spacer cutters are very sharp.**
10. Remove screws (42) from intermediate plate (10) and top housing (6). Remove top housing intermediate plate gasket (4).
11. Remove retaining rings (32) from each shaft. The gears (items 14 & 15), should now be able to be removed
12. Remove intermediate plate (10). Remove bearing housing gasket (3).
13. Remove Bearing Spacer (36) from each shaft.
14. Remove Shaft Collar (31) from each shaft.
15. Remove bearing sleeve collar (11) and jib key (20) from each shaft.
16. Remove bearing housing (5) as an assembly. The housing will contain item (22) and (53). Caution should be used, so you do not damage the mechanical seal faces during removal.
17. Carefully press seal assemblies (22) and bearings (53) out of bearing housing (If necessary).

18. Remove Bearing (53) from seal assemblies (22).
19. Remove excluder plates (17).

#### 4-12. INSPECTION

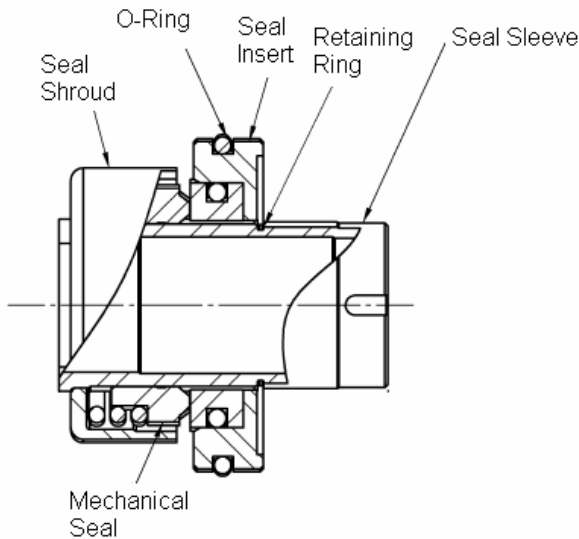
1. Inspect all parts for wear and corrosion. Replace any parts that worn.
2. Replace all seals, bearings, O-rings, and gaskets.

#### 4-13. ASSEMBLY

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

#### 4-14 Seal Assembly

The seal assembly (22) 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.



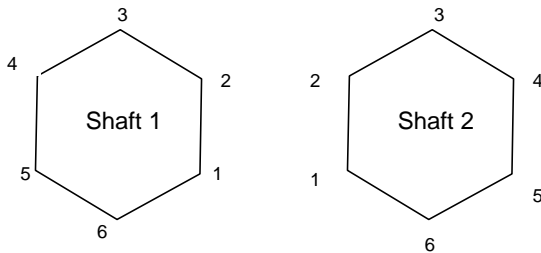
#### 4-15. Cartridge Assembly

1. Place one of the bearing housings (5) bore-side up on the work bench and place one spacer (23) at the bottom of each bore. Insert the seal assembly (22) into the bore being careful to not damage the O-ring on the seal assembly.
2. Apply red thread locker adhesive to the ID of the bearing (53).
3. Place the bearing (53) into the bore and onto the seal sleeve. A C-Clamp and the bearing sleeve collar can be used to hold the bearing in place until the adhesive cures or a large bolt, flat washers, and the bearing sleeve collar can be used. This can also be done before the assembly is inserted into the bore.

4. Install O-rings (34) into O-ring grooves on the drive shaft and idler shaft.
5. Install excluder plates (17) on the drive end/gear side of both the drive shaft (8) and idler shaft (9).
6. Carefully slide the drive side/gear side of the drive shaft (8) and idler shaft (9) into the bearing housing. Care should be taken to prevent damage to the mechanical seal faces.
7. Align the key way on the seal sleeve to the keyway on both the drive shaft (8) and idler shaft (9). Insert Jib Key (20) into both shafts. The thin section of the Jib Key (20) should be installed towards the seal and bearing assembly.
8. Slide Bearing Sleeve Collar (11) over the Seal Sleeve on both the drive shaft (8) and idler shaft (9).
9. Install the shaft collar (31) on the drive shaft (8) and idler shaft (9). Shaft collar should be installed in the groove on each shaft. Tighten socket head screws evenly in shaft collar.
10. Slide the Bearing Spacer (36) onto the Drive Shaft and Idler Shaft bearings (53).
11. Press two dowels (41) into the holes in the intermediate plate (10). Both dowels should be positioned in the middle of the plate with equal lengths on each side. Dowels should be positioned to coordinate with counter bores in the Top Housing (6) around the outer bolt pattern.
12. Press two dowels (54) into the intermediate plate into the inner bolt patten. Dowels should be positioned to coordinate with the counter bores in the bearing housing.
13. Place a bearing housing gasket (3) on top of the housing then place the intermediate plate (10) on top of the gasket and secure in place with four hex screws (qty of 2 of item 46 and quantity of 2 of item (36)) and washers (50).
14. Place the key (38) in the drive shaft (8) and slide the small gear (14) onto the drive shaft. Secure in place with a retaining ring (32). Place the second key (38) in the idler shaft (9) and slide the large gear (15) on the idler shaft and secure it with a retaining ring.
15. Place the intermediate plate gasket (4) on the intermediate plate.
16. Carefully press the grease seal (33), spring side down, in the bore in the top housing (6)
17. Wipe a liberal amount of ACG-2 grease on and around each gear. Lower the top housing down onto the intermediate plate gasket and secure in place with four button head screws and washers (42).
18. Install grease zirc (30) in the top and finish filling the top housing approximately half full of grease.

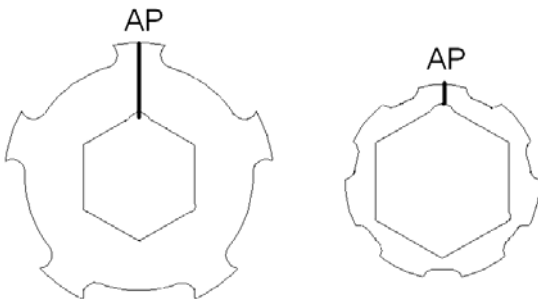
19. Find a way to support the assembly upside down on the work bench. 4 X 4 Inch blocks can be placed on either side of the driveshaft in order to accomplish this.
20. Align both shafts so that the point of the hex is facing toward you and perpendicular to the long edge of the bottom housing. It does 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.

Figure 4-1



Each cutter and spacer 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.

Figure 4-2



21. Place a large (L) cutter on Shaft 1 with the AP positioned at Point 6 on the shaft 1 (See figure 4-1.). Place a small (S) spacer cutter on Shaft 2 with the AP positioned at Point 3.

Place a small (S) spacer cutter on Shaft 1 with the AP positioned at Point 3, then place a large (L) cutter on Shaft 2 with the AP positioned at Point 6.

Follow the pattern below dependent on Cutter Configuration. Look at nameplate in order to see what cutter configuration you have. Follow Pattern until all cutters and spacer cutters have been installed.

Cutters and spacer cutters are very sharp. Be careful handling them.

### 5 Tooth 7 Tooth (5R7R) Pattern

Shaft 1	Shaft 2
6L	3S
3S	6L
1L	4S
4S	1L
2L	5S
5S	2L
3L	6S
6S	3L
4L	1S
1S	4L
5L	2S
2S	5L
6L	3S
3S	6L

← Repeat Starts

### 5 Tooth 5 Tooth (5R5R) Pattern

Shaft 1	Shaft 2
6C	3S
3S	6C
1C	4S
4S	1C
2C	5S
5S	2C
3C	6S
6S	3C
4C	1S
1S	4C
5C	2S
2S	5C
6C	3S
3S	6C

← Repeat Starts

### 7 Tooth 7Tooth (7R7R) Pattern

Shaft 1	Shaft 2
6C	3S
3S	6C
1C	2S
2S	1C
2C	1S
1S	2C
3C	6S
6S	3C
4C	5S
5S	4C
5C	4S
4S	5C
6C	3S
3S	6C

← Repeat Starts

22. Place an excluder plate (17) over the top of each shaft down on top of the last cutter and spacer cutter.
23. Place the second bearing housing (5) bore-side up on the work bench. Insert the seal assembly (22) into the bore being careful to not damage the O-ring on the seal assembly.
24. Apply red thread locker adhesive to the ID of the bearing (53).

25. Place the bearing (53) into the bore and onto the seal sleeve. A C-Clamp and the bearing sleeve collar can be used to hold the bearing in place until the adhesive cures or a large bolt, flat washers, and the bearing sleeve collar can be used. This can also be done before the assembly is inserted into the bore.
26. Apply thread locker adhesive to the ID of the bearing (53).
27. Gently lower the bearing housing assembly down over the ends of each shaft being careful not to damage the mechanical seals.
28. Align the key way on the seal sleeve to the keyway on both the drive shaft (8) and idler shaft (9). Insert Jib Key (20) into both shafts. The thin section of the Jib Key (20) should be installed towards the seal and bearing assembly.
29. Slide Bearing Sleeve Collar (11) over the Seal Sleeve on both the drive shaft (8) and idler shaft (9).
30. Place a plain washer (52) on top of each shaft. The washer should rest on top of the sleeve portion of the Seal Sleeve. Apply red thread locker type adhesive to the threads of Adjustment screw (44) and install the adjustment screw in each shaft.
31. Carefully lay the unit down on its side. Before you completely tighten the two socket screws, it will be necessary to hold the drive shaft to prevent it from turning. You can either hold the shaft by temporarily mounting the coupling half (18) or by carefully wedging a small piece of soft metal between the teeth of the two gears. After you have secured the shafts, tighten both socket screws to 70 ft-lbs torque. Carefully stand the assembly upright.
32. Install the two eyebolts (24) in the top housing.

#### 4-16. Flange Housing / Cartridge Assembly

1. Place a flange gasket (27) on the bottom flange of the flange housing (1). Place the bottom support (2) on top of the gasket and secure in place with ten cap screws and washers (46).
2. Place the assembly upright on the support. Place a bearing housing gasket (3) 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 (48). Secure the bottom portion of the cartridge to the support with four button head screws and washers (43). Be careful not to damage the gaskets.
4. Install the clean-out plugs (25) in the bottom support.
5. Attach both inspection plates (16) to the flange housing with cap screws and washers (45).

#### 4-17. Reducer / Motor Assembly

1. Install the Spring Disc (35) into the shaft bore of the cartridge drive shaft coupling half (18). Slide the key (39) and coupling half (18) down on the drive shaft. Coupling half and Spring Disc should bottom out on the top of the drive shaft.
2. Place the reducer adapter (7) over the coupling half and secure the adapter with four hex head screws (47) and lock washers (50).
3. Insert Flat Washer (28) into Gear Reducer Coupling Half (19). Slide the key (39) and coupling half (19) on the gear reducer shaft, until coupling half (19) bottoms out on the top of the gear reducer drive shaft.
4. Lower the gear reducer (29) onto the reducer adapter carefully aligning the coupling halves. Align the holes in the flanges and install and tighten the six hex screws (47), lock washers (50) and nuts (40).
5. Repeat the process for the motor (21). Attach the motor to the reducer with four hex screws and washers.

#### 4-18. TORQUE GUIDELINES CHART

Stainless Steel Bolts		Carbon Steel Bolts	
Size	Max Torque	Size	Max Torque
NO. 10-24	22.8 in. lb.	5/16 - 18	10 ft. lb.
1/4 - 20	75.2 in. lb.	3/8 - 16	21.7 ft. lb.
5/16 - 18	132 in. lb.	1/2 - 13	43.5 ft. lb.
3/8 - 16	236 in. lb.	5/8 - 11	86 ft. lb.
1/2 - 13	517 in. lb.	3/4 - 10	152 ft. lb.

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

#### 4-19. STORAGE

**4-20. 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.

**4-21. 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 120F, minimum temperature 30F.
4. Relative humidity should not exceed 60%. Provide desiccation for moisture control above the maximum.
5. Vibration levels should not exceed 2 mils at 60 hertz.

#### 4-22. Hardware List

Your Moyno Annihilator has been designed and built to minimize overall operating cost. All wearable parts are replaceable. A recommended inventory of spare parts is dependent upon the application and the importance of continued operation.

#### 4-22 HARDWARE LIST

ITEM	DESCRIPTION		LOCATION	P/N	QTY
36	HEX SCREW	.375 x 1.00 LG	INTERMEDIATE PLATE/BEARING HSG.	6191532160	2
40	HEX NUT	0.375	RED/RED ADP	6140012110	6
41	SPRING DOWEL	.375 X 1.25 LG	INTERMEDIATE PLATE	6160100731	2
42	SCREW	.375 X 1.00 LG	INTERMEDIATE PLATE/TOP HOUSING	6191232160	4
43	SCREW	.375X 1.50 LG	BOTTOM SUPPORT	6191232240	2
44**	ADJUSTMENT SCREW	.625 X 1.25 LG	DRIVE/IDLER SHAFT END	6191490243	2
45	HEX SCREW	.375 X .875 LG	INSPECTION PLATE	6191532140	12
46	HEX SCREW	.375 X 1.5 LG	INTERMEDIATE PLATE/BEARING HSG.	6191532200	2
			RED/RED ADP FLANGE HSG/BOT SUP		
47	HEX SCREW	.375 X 1.5 LG		6191532240	20
48	HEX SCREW	.375 X 2 LG	FLANGE HSG/ INTERMEDIATE PLATE	6191532000	10
49	HEX SCREW	.50 X 1.25 LG	MOTOR/REDUCER	61915522000	4
50	LOCK WASHER	.375"	ON ALL .375" SCREWS	6230012410	52
51	LOCK WASHER	.50"	MOTOR/REDUCER	6230012430	4
52	FLAT WASHER		ADJUSTMENT SCREW	4220827001	2
54	SPRING DOWEL	.375 X .75 LG	BOTTOM SUPPORT	6160100711	6
56	LOCK WASHER	.375"	HI-COLLAR LOCK WASHER	6230011051	2

\*\* To Tighten item 44 (if needed) you must remove item 25 first

## PARTS LIST

REF. NO.	DESCRIPTION	PART NUMBER	QTY
1	FLANGE HOUSING	SEE TABLE 1	1
2	BOTTOM SUPPORT	4251988002	1
3	BEARING HOUSING GASKET	4230878001	2
4	INTERMEDIATE PLATE GASKET	4230880001	1
5	BEARING HOUSING	4251663001	2
6	TOP HOUSING	4251664001	1
7	REDUCER ADAPTER	4251673701	1
8	DRIVE SHAFT	SEE TABLE 2	1
9	IDLER SHAFT	SEE TABLE 2	1
10	INTERMEDIATE PLATE	4241610001	1
11	BEARING SLEEVE COLLAR	4220942004	4
12	SPACER CUTTER	4231161001	TABLE 5
13	CUTTER	SEE TABLE 3	TABLE 5
14	GEAR	4230728002	1
15	GEAR	4230729002	1
16	INSPECTION PLATE	4230870001	2
17	EXCLUDER PLATE	4241952001	4
18	COUPLING HUB	4230871001	1
19	COUPLING HUB	4230871002	1
20	JIB KEY	4220941001	4
21	MOTOR	SEE NAMEPLATE	1
22	SEAL ASSEMBLY	4231145001	4
23	SPACER	4220752001	2
24	SHOULDER EYEBOLT	4220762001	2
25	CLEANOUT PLUG	4220763001	2
26	INSPECTION PORT GASKET	4230867001	2
27	FLANGE GASKET	4230868001	2
28	FLAT WASHER	4231007000	1
29	GEAR REDUCER	SEE NAMEPLATE	1
30	ZERKE FITTING	4220692001	1
31	SHAFT COLLAR	4241609008	2
32	1.250 EXTERNAL RETAINING RING	4220691001	2
33	GREASE SEAL	6030021001	1
34	-216 O-RING I	3207905216	4
35	SPRING DISC	4231008000	1
36	BEARING SPACER	4220950001	2
38	GEAR KEY	6110040240	2
39	DRIVESHAFT KEY	6110060200	1
53	BALL BEARING	6300502081	4

**Table 1 (Ref. No. 1) — Flange Housing**

Model	Part Number
M04F4	4251682001
M06F4	4251665001
M08F4	4251683001
M10F4	4251684001
M12F4	4251685001

**Table 2 (Ref. No. 12) — Drive and Idler Shafts**

Model	Drive Shaft	Idler Shafts
M04F4, M06F4, M08F4	4252553001	4252555001
M10F4, M12F4	4252554001	4252556001

**Table 3 (Ref. No. 13) — Cutter**

Style	Part Number
5R, 5 Tooth Reversible	4231159001
7R, 7 Tooth Reversible	4231160001
7C, 7 Tooth Cam	4231163001
11C, 11 Tooth Cam	4231162001

**Table 4 - Gasket Kit**

All Models	4230974104
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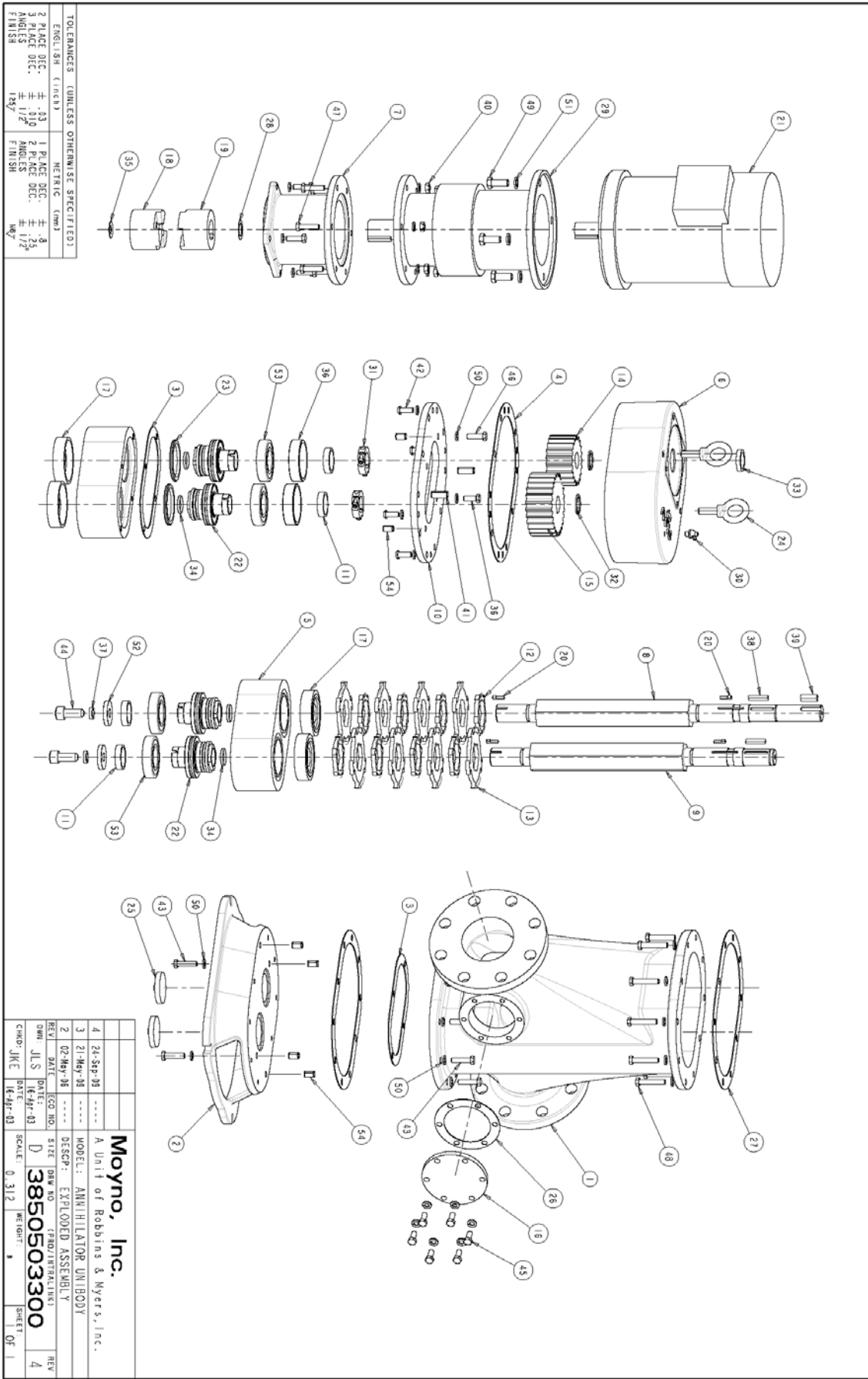
Includes Items 3 (qty of 2), 4 (qty of 1), 26 (qty of 2), and 27 (qty of 2)

**Table 5 -Cutters and Cutter Spacers Required**

Model	Qty of Cutters Required	Qty of Spacer Cutters Required
M04F4, M06F4, and M08F4	39	39
M10F4 and M12F4	79	79

**NOTE: For units containing different types of cutters on each shaft, 20 Cutter should be ordered for the Drive shaft and 19 Cutters for the Idler shaft. For 5R7R configuration 20 5R cutters should be ordered and 19 7R Cutters.**

**Pre-assembled replacement cutter cartridges are available. Consult your local Moyno Representative for details.**



TOLERANCES (UNLESS OTHERWISE SPECIFIED)	
ENGLISH (INCH)	METRIC (MM)
3 PLACE DEC. ± .010	1 PLACE DEC. ± .8
ANGLES ± 1/2°	2 PLACE DEC. ± .25
FINISH 1257	FINISH 1257

<b>Moyno, Inc.</b>	
A Unit of Robbins & Myers, Inc.	
4 24-Sep-93	MODEL: ANNIHILATOR UNIBODY
3 21-Mar-93	DESCR: EXPLODED ASSEMBLY
2 02-May-95	SIZE: 3850503300
1 02-May-95	PROJ/REVISION: D
REV: JLS	DATE: 16-Apr-03
DRW: JLS	SCALE: 0.312
CMDR: JMC	DATE: 16-Apr-03
WEIGHT: *	SHEET 1 OF 1

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