



OPERATING MANUAL

Los Angeles Abrasion Machine HM-70A & HM-70AF



Rev: 07/19/2012

SAFETY INSTRUCTIONS

Whether you are the owner, employer, operator, or maintenance person for this machine, safety is your responsibility. You are responsible for operating and maintaining this equipment in compliance with these instructions and for using common sense. Review and completely understand the operating and safety instructions before using this machine.

WARNING!

This machine operates on electric current. Improper operation could result in electric shock, electrocution, or an explosion!

1. **ALWAYS** ensure the motor and other electrical components are properly configured for your intended use and available power source. The Los Angeles Abrasion Machine comes with a 1hp motor single phase wired for 220V/60Hz. It can also be ordered with special wirings: 220/50. Motors are **NOT** explosion-proof.
2. **ALWAYS** check electrical wiring for loose connections and for pinched or frayed wiring.
3. **ALWAYS** use the factory-installed three-pronged plug. Connect the machine to a properly wired and grounded three-pronged receptacle. Make sure the cord is located where no one will trip or get tangled in it.
4. **ALWAYS** disconnect and lock out power supply before performing maintenance and repairs.

WARNING!

DO NOT use this machine in an explosive or hazardous atmosphere. It is NOT explosion-proof or approved for operation in hazardous locations.

WARNING!

WARNING: Only operate the machine in a properly ventilated area.

WARNING: **DO NOT** operate the machine without having all guards and covers in place.

WARNING: When loading or unloading your sample and abrasive charge, be aware that you are handling substantial weights. Take care to lift, pull and dump sample in a safe, ergonomic manner to avoid injury. Know sample and abrasive charge weights before testing.

WARNING: Keep all parts of your body away from moving parts of the machine while it is operating.

WARNING: **DO NOT** wear loose clothing which might be caught in or on moving parts of the machine.

WARNING: **ALWAYS** wear safety glasses, hearing protection, and other personal protective equipment when operating, maintaining, or repairing this machine.

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1.0 UNPACKING:

The Los Angeles Abrasion Machine weighs about 1,200lbs crated and 1,050lb uncrated. Use equipment to adequately to handle this weight safely. Wear safety glasses and work gloves.

1. Normally the LA Abrasion Machine will be shipped in a plywood crate. Disassemble the crate and remove the lag bolts holding the machine to the pallet. Use a fork lift of suitable capacity to remove the machine from the pallet.
2. Check your LA Abrasion Machine's electric motor and wiring to make sure it is what was ordered and is appropriate for your installation.
3. Check the machine for shipping damage. If you find concealed damage after you have signed for the LA, call the delivering carrier immediately for an inspection. Save all packing materials, and leave the LA as it is.
4. Check for any loose or missing parts and report any missing parts to Gilson.
5. Select an operating site which allows for electrical connection, proper grounding, access for opening, loading, and unloading of your LA Abrasion Machine, and access on the left side to perform necessary maintenance.

2.0 SET-UP:

NOTE: Please read and understand all safety and set-up instructions for the LA Abrasion Machine before putting it into service.

The Los Angeles Abrasion Machine is assembled and ready to use, once you have removed the packing materials and properly connected it to your electrical wiring. No permanent mounting is required, but holes are provided at the corners of the main frame for fastening the machine in place if you wish.

Electrical requirement is 230V, 60Hz, 1-phase for Model HM-70A, and 230V, 50Hz, 1-phase for model HM-70AF, unless special motor characteristics have been ordered. The motor is 1hp.

1. Connect a fused, grounded power line to the Disconnect Enclosure (#17A), using the access hole in the left side of the starter box. Follow National Electric Code recommendations.
2. Unpack the abrasive charge:
 - a. Lift the Safety Key (#39A) up out of its housing, and open the top cover and front doors.
 - b. Remove Drum Access Door (#1A) by loosening its upper knobs, removing its lower knobs and lifting out the door.
 - c. Remove the package of 12 steel balls which are the Abrasive Charge (HMA-130) used in the LA Abrasion Machine.
 - d. Replace drum access door and tighten knobs before proceeding. Close case doors and secure safety key.
3. Test the drum rotation:
 - a. Use the appropriate buttons to set the counter for 20 revolutions. Press the button below the column to be changed. Press the **up or down arrow** button to change the value of the digit. When done, press the reset button.
 - b. Position the selector switch to JOG. Momentarily press JOG push button and observe through the window to verify that top of the drum rotates away from the front of the machine. If not, reverse electrical connections at the motor controller to correct the rotation.

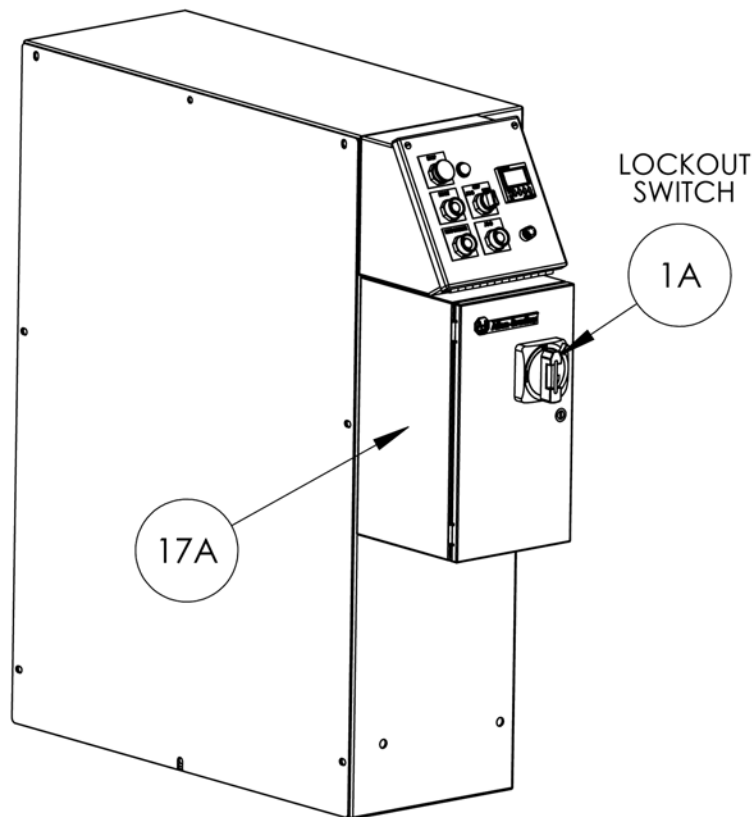


Figure 1
Disconnect Enclosure

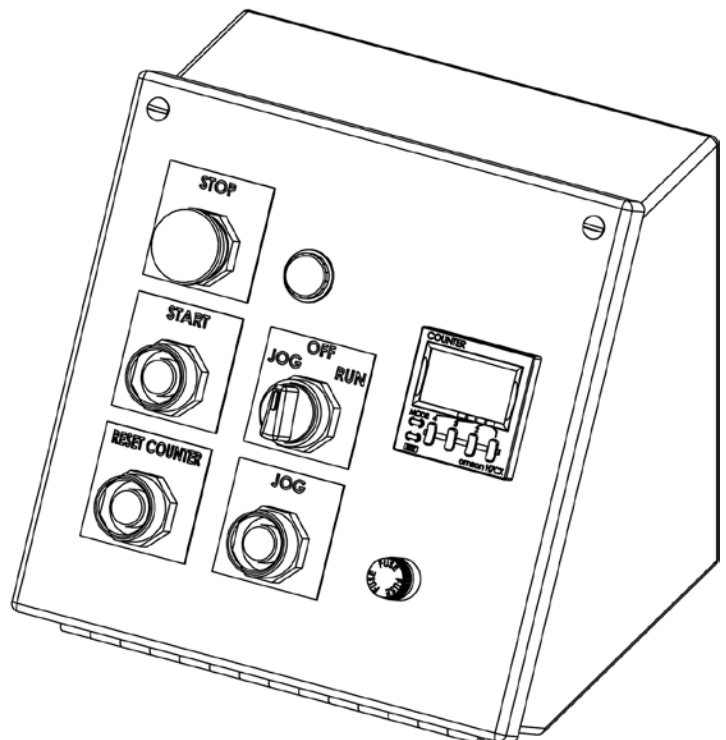


Figure 2
Control Console

3.0 OPERATING INSTRUCTIONS:

The following instructions pertain only to proper machine operation and maintenance. For guidance in test procedures, please refer to ASTM C 131 and C 535, available from ASTM, 1915 Race Street, Philadelphia, PA 19103. Also see AASHTO T 96, available from AASHTO, 444 N. Capitol St. NW, Washington, DC 20001.

NOTE: Please read and understand all safety and set-up instructions for the LA Abrasion Machine before putting it into service.

1. Make sure your LA Abrasion Machine is properly wired and connected to your power supply.
2. Use the appropriate buttons to set the counter for 500 revolutions. Press the button below the column to be changed. Press the **up or down arrow** button to change the value of the digit. When done, press the reset button.
3. Set the selector to JOG.
4. Look through the window in the top cover while you depress the JOG button to rotate the drum, which is marked at its DUMP and LOAD positions.

The LOAD position marked on the drum is preceded by an arrow. Use the LOAD position for loading the sample and the charge and for removing the door before dumping.

5. Jog the drum around to LOAD. If you rotate the drum too far and miss the position, continue to jog the drum another 360° to the proper position. This procedure may be difficult at first, but it becomes easy with experience.

NOTE: NEVER rotate the drum around by hand.

6. Turn selector switch to OFF. Lift the safety key up and out of its housing. Open cover and doors. Remove drum access door by loosening the upper two knobs, removing the lower two knobs, and lifting out the door.
7. Load sample and appropriate abrasive charge into drum. If you are working with a large, heavy sample, divide it and load it in stages. Install door and re-tighten all four knobs. Close cover and doors. Set the safety key in its housing.
8. Press the **reset counter** button to restore the counter setting.

9. Turn selector switch to RUN, and push START button. Drum will rotate according to the counter setting and stop automatically. If problems arise, use red emergency stop to shut off machine.
10. At completion of test, the drum should stop with the drum lid at approximately the working position. Turn selector switch to OFF. If the drum lid is not in the desired position, turn selector switch to OFF and then to JOG. Push JOG button to rotate drum to LOAD position. Turn selector to OFF. Open cover and doors and remove drum lid.
11. TIGHTEN THE TWO UPPER KNOBS WHICH REMAIN ON THE DRUM SO THAT THEY WILL CLEAR THE BACK OF THE MACHINE FRAME. Make sure pan is in position below drum. Close cover and doors. Set the safety key.
12. Move selector to JOG and push JOG button to rotate drum to DUMP position. Sample and charge will be discharged into pan.
13. After discharge is complete, JOG drum back to LOAD position. Turn selector to OFF.
14. Open cover and doors and remove pan. LOADED PAN WILL BE HEAVY. BE CAREFUL WHEN LIFTING. GET HELP IF NECESSARY. Dump pan and replace pan under drum.
15. If you are finished testing, replace the drum door. Close doors and cover and set the safety. Set selector to OFF. Throw machine lockout switch to OFF.

If an overload to the machine occurs, the drum will automatically stop rotating. After sufficient cool down time, you can resume operation:

- The motor controller will reset control to the motor after sufficient cool down time.
- Press START button. The LA Abrasion Machine will complete the number of revolutions remaining on the counter.

4.0 MAINTENANCE:

NOTE: Please read and understand all safety, operating and maintenance instructions for the LA Abrasion Machine before performing maintenance on it.

WARNING!

ALWAYS disconnect and lock out electric power before performing maintenance!

4.2 Gearmotor Brake

The LA Abrasion Machine is equipped with a gearmotor equipped with a brake. The brake holds the drum in location whenever the drum is not rotating. Note that the brake defaults to the "engaged" position when there is no power applied to the motor. **DO NOT** attempt to rotate the drum by hand, damage to the brake can result. Refer to the gearmotor owner's manual for more information on the brake.

4.1 Motor Controller

The LA Abrasion Machine is equipped with a motor controller (located in the motor housing compartment) that controls many aspects of the motor. Although the parameters of the motor controller have been set at the factory and should not need to be changed, they can be changed as required. It is not advised that these parameters be changed unless done by a qualified technician. The manufacturer will not be responsible for any damage to the machine after the factory parameter settings have been changed. A few of the aspects that are controlled by these parameters:

- Motor Speed & Direction (Proper drum speed & direction)
- Motor Voltage & Hz
- Motor Overload Settings
- Drum Speed Acceleration
- Drum Speed Deceleration
- Dwell Time to Stop (Drum lid location)
- Jog Speed & Direction

If the drum does not rotate, there may be a fault at the motor controller not allowing the motor to run. To check the controller for a fault, remove the Motor Housing Cover (#2A) and check to see if the screen of the motor controller is showing a fault code. Record the fault code and refer to the PowerFlex 40 owner's manual for the cause of the fault. Correct the condition causing the fault and press the red STOP button on the controller to clear the fault. Refer to the PowerFlex 40 owner's manual for more information.

4.0 MAINTENANCE:

4.3 Lubrication

1. The Gearbox of the Gearmotor (#14A) is filled with grease at the factory. It is not necessary to replace the grease. Refer to the gearmotor owner's manual for more information.
2. The Drive Chain (#13A) should have only a surface film of oil, just enough to prevent rust.
3. Grease the Drum Support Bearings (#10A) at six to eight month intervals. Use a multi-purpose industrial grease covering NLGI Nos. 1, 2, & 3.
4. The Motor (#16A) has sealed bearings. No lubrication is required.

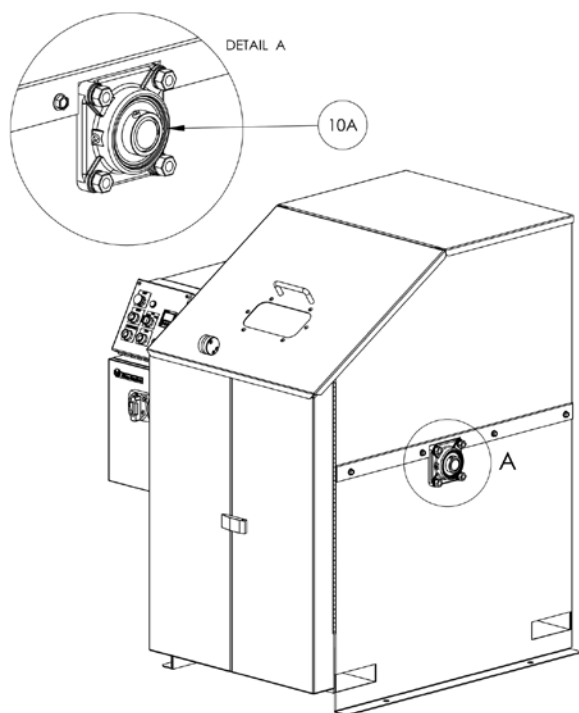


Figure 3
Drum Support Bearings

4.4 Drive Chain

Inspect the drive chain about every 100 hours of operation.

1. Disconnect and lock out electric power. Use lockout switch (#1A).
2. Remove the Motor Housing Cover (#2A).
3. Flex the section of Chain (#13A) toward the back of the machine. If there is more than 1/4in. of slack in the chain, tighten it to 1/4in. Locate and loosen the six motor mount bolts (#44A: 2 front, 4 side). This process requires two people: one working from the front of the machine, reaching under and to the left of the drum; and one working from the side of the machine, reaching under the flange of the motor and gearbox mount. Lower the platform to tighten the chain. Re-tighten all bolts securely.
4. Lubricate the drive chain at this time. Maintain a surface film of oil, just enough to prevent rust.
5. Reinstall motor housing cover. Reconnect power, but leave lockout switch off till ready to operate machine.

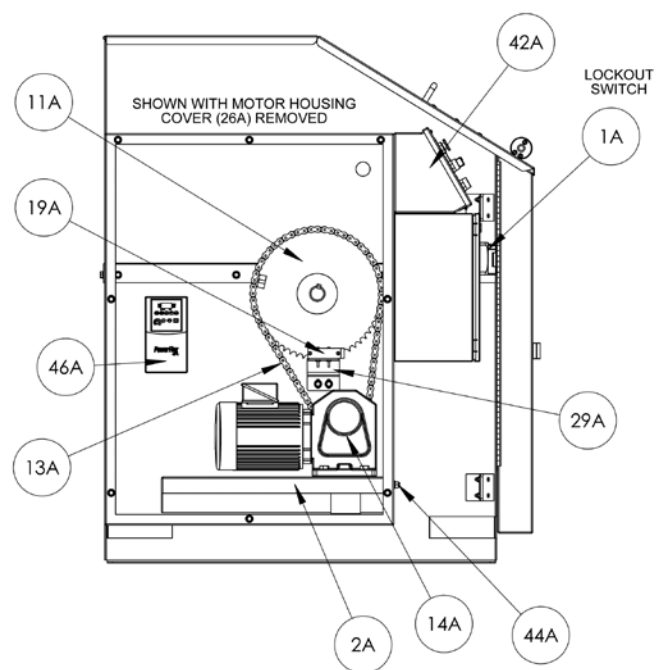


Figure 4
Drive Chain

5.0 PARTS LISTS & DIAGRAMS:

5.1 HM-70A & HM-70AF Outer Case & Frame Parts List & Diagram

Item No.	Description
OUTER CASE & FRAME PARTS	
1A	Machine Lockout Switch
4A	Door Latch
17A	Disconnect Enclosure
21A	Abrasive Charge: 12 Hardened Steel Balls Order separately as HMA-130
22A	Upper Main Case
23A	Lower Main Case
24A	Doors

Item No.	Description
OUTER CASE & FRAME PARTS	
25A	Motor Housing
26A	Motor Housing Cover
30A	Front Top Cover
31A	Front Top Cover Handle
32A	Back Top Cover
38A	Door Stops
39A	Safety Key
44A	Motor Mount Bolt (2 of 6)

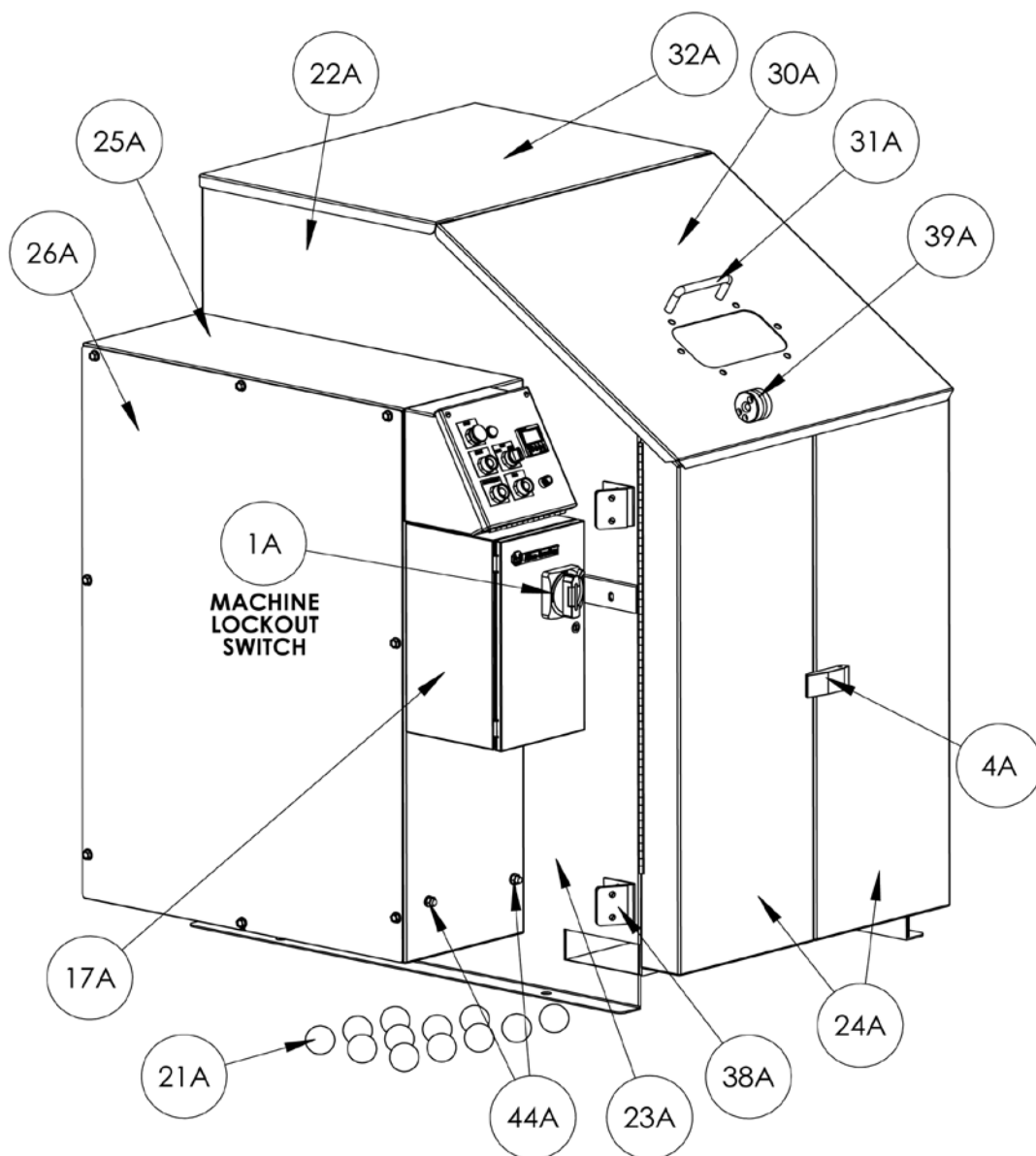


Figure 5
HM-70A & HM-70AF Outer Case & Frame

5.2 HM-70A & HM-70AF Inner Parts List & Diagram

Item No.	Description
INNER PARTS	
1A	Machine Lockout Switch
5A	Drum
7A	Drum Access Door
9A	Drum Access Door Knob
20A	Sample Catch Pan Order separately as HM-131

Item No.	Description
INNER PARTS	
27A	Base of Frame
37A	Gas Springs
39A	Safety Key
40A	Sound Dampening Material
44A	Motor Mount Bolt (2 of 6)

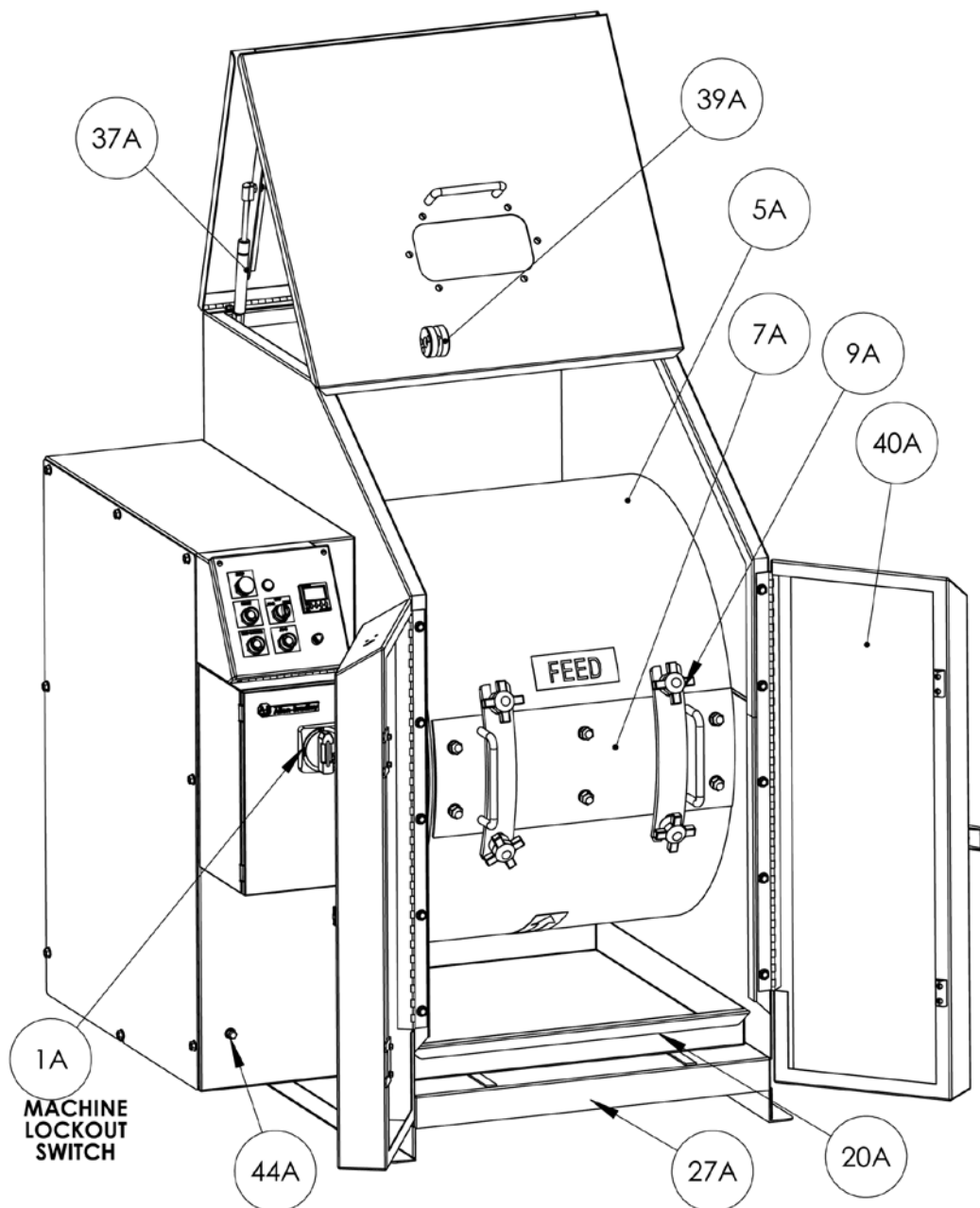


Figure 6
HM-70A & HM-70AF Inside View

5.3 HM-70A & HM-70AF Inner Parts List & Diagram

Item No.	Description
INNER PARTS	
28A	Pan Stop
41A	Wear Strips

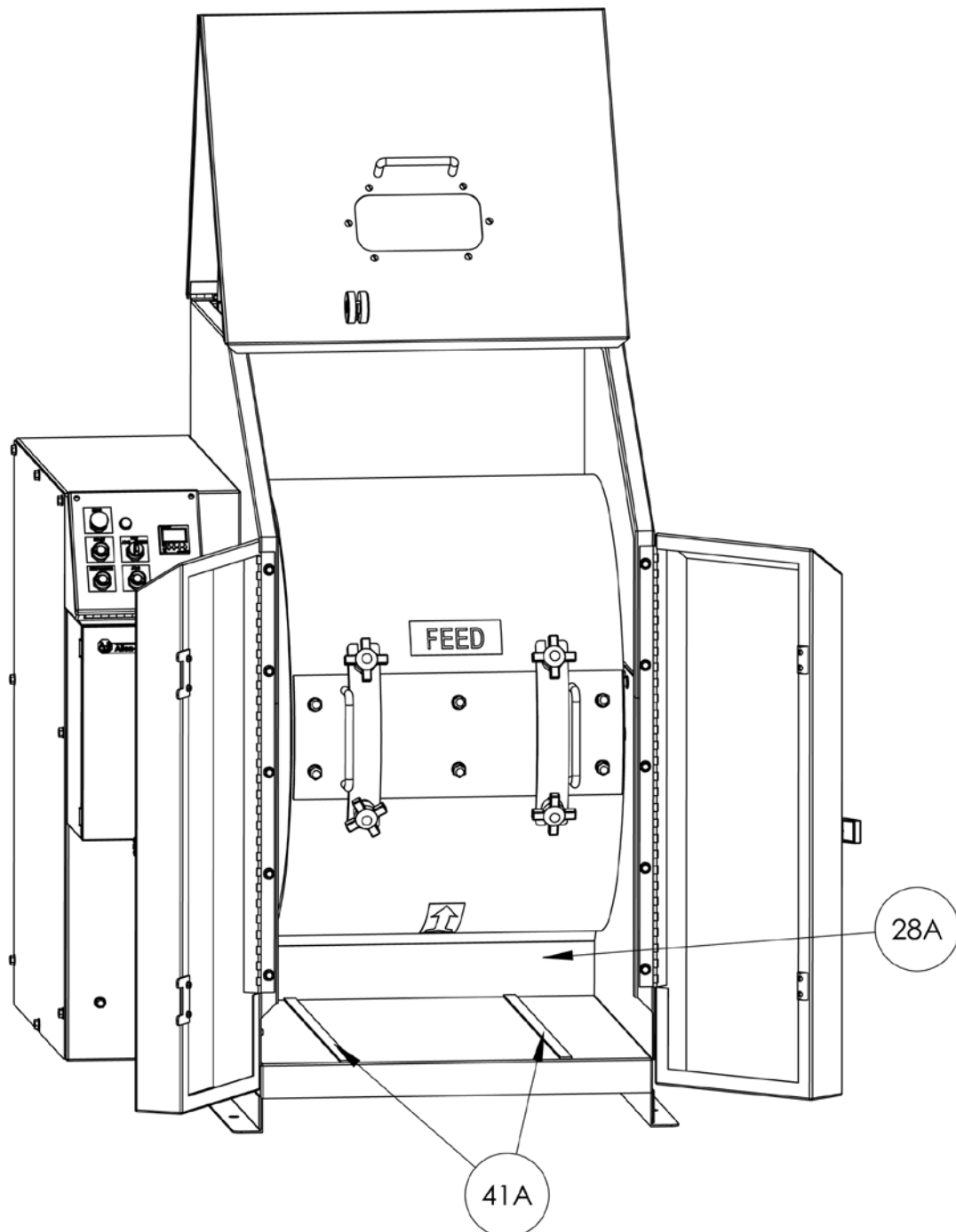


Figure 7
HM-70A & HM-70AF Inside View

5.4 HM-70A & HM-70AF Inner Parts List & Diagram

Item No.	Description
INNER PARTS	
2A	Motor & Gearbox Mount
11A	Driven Sprocket
13A	Drive Chain
14A	Gearmotor, 230V/60Hz, 3-Phase, 1,725rpm
19A	Revolution Sensor (Limit Switch)

Item No.	Description
INNER PARTS	
29A	Limit Switch Bracket
42A	Control Console
44A	Motor Mount Bolt (2 of 6)
46A	Motor Controller

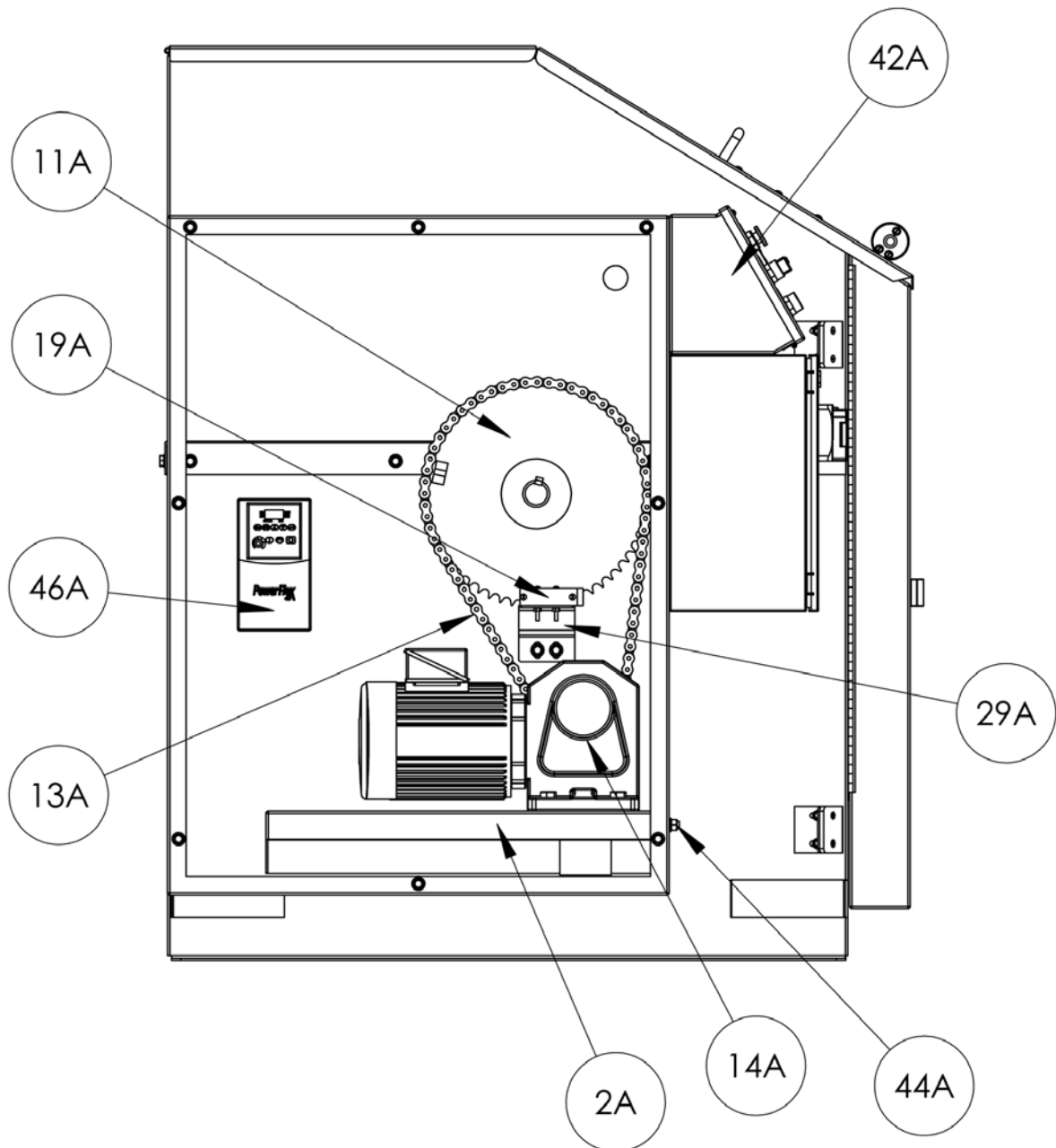


Figure 8
HM-70A & HM-70AF Inside View

5.5 HM-70A & HM-70AF Control Console Parts List & Diagram

Item No.	Description
CONTROL CONSOLE PARTS	
3A	Fuse
18A	Revolution Counter
33A	Stop Button
34A	Start Button
35A	Off-Jog-Run Button
36A	Jog Button
43A	Power-On Lamp
47A	Reset Counter Button

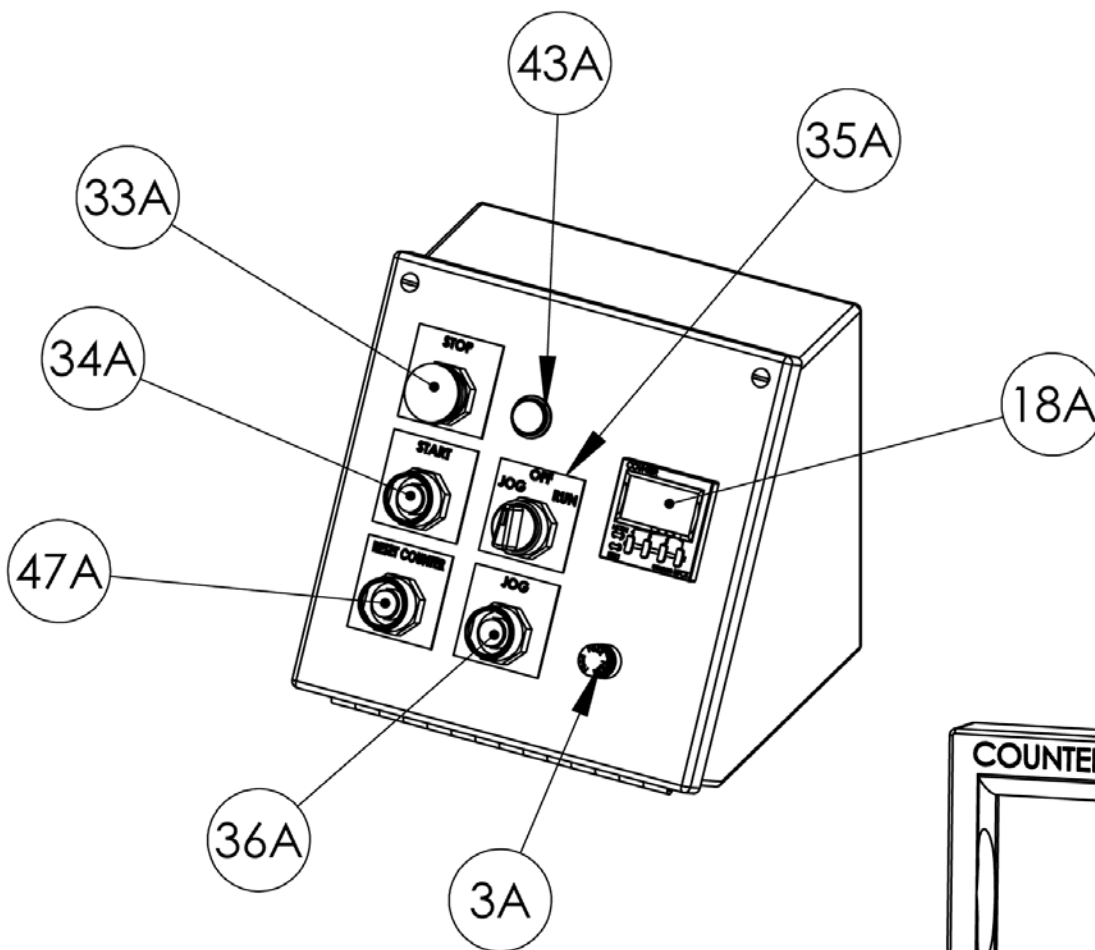


Figure 9
HM-70A & HM-70AF Control Console (42A)

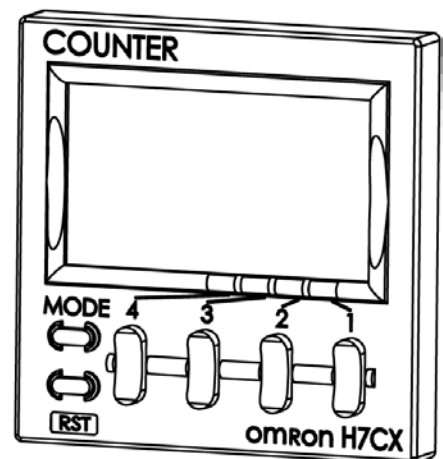


Figure 10
HM-70A & HM-70AF Revolution Counter (18A)

5.6 HM-70A & HM-70AF Drum Support Bearing Parts List & Diagram

Item No.	Description
10A	Drum Support Bearing

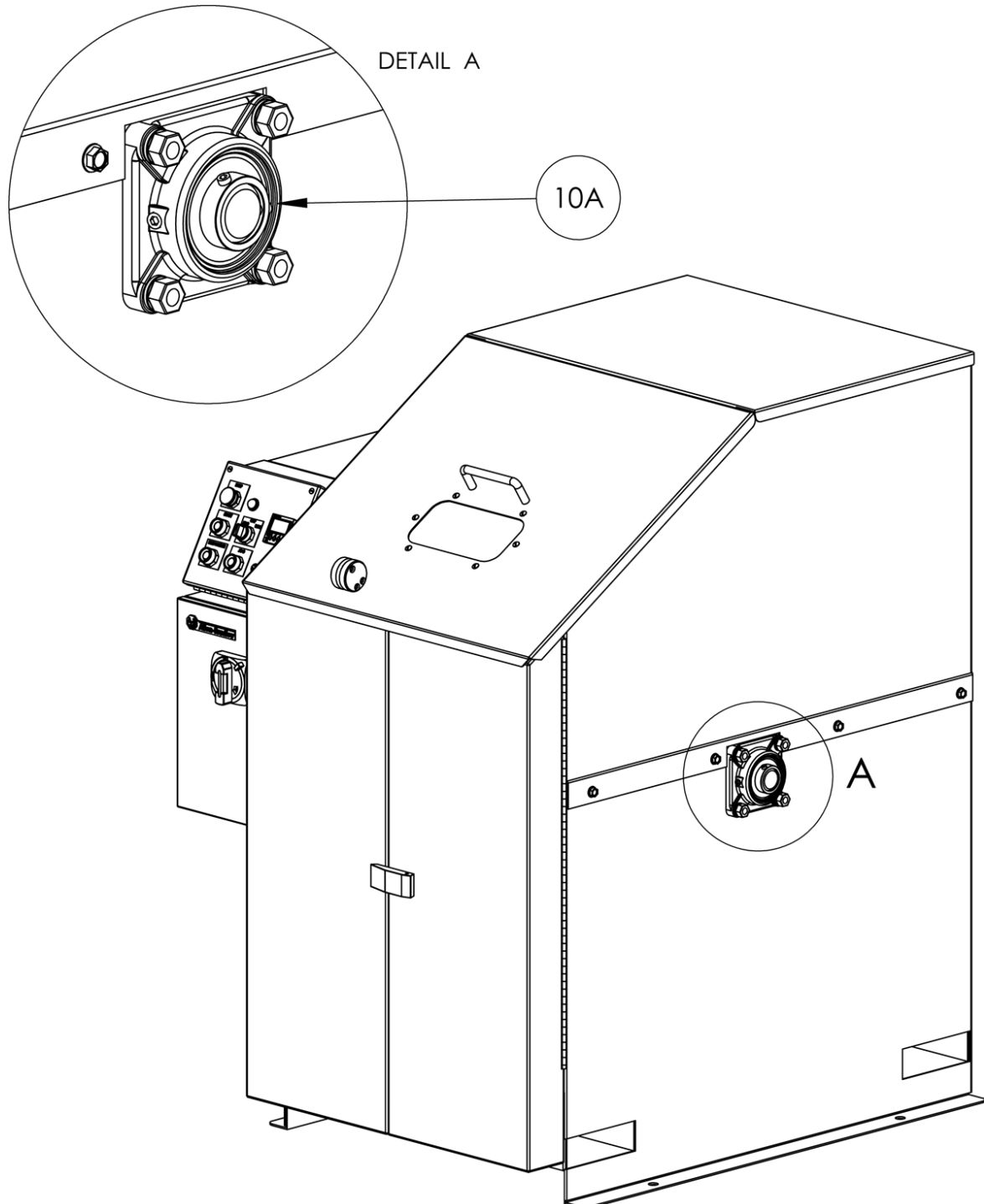


Figure 11
HM-70A & HM-70AF Drum Support Bearing (10A)

5.7 HM-70A & HM-70AF Drive Sprocket Parts List & Diagram

Item No.	Description
12A	Drive Sprocket

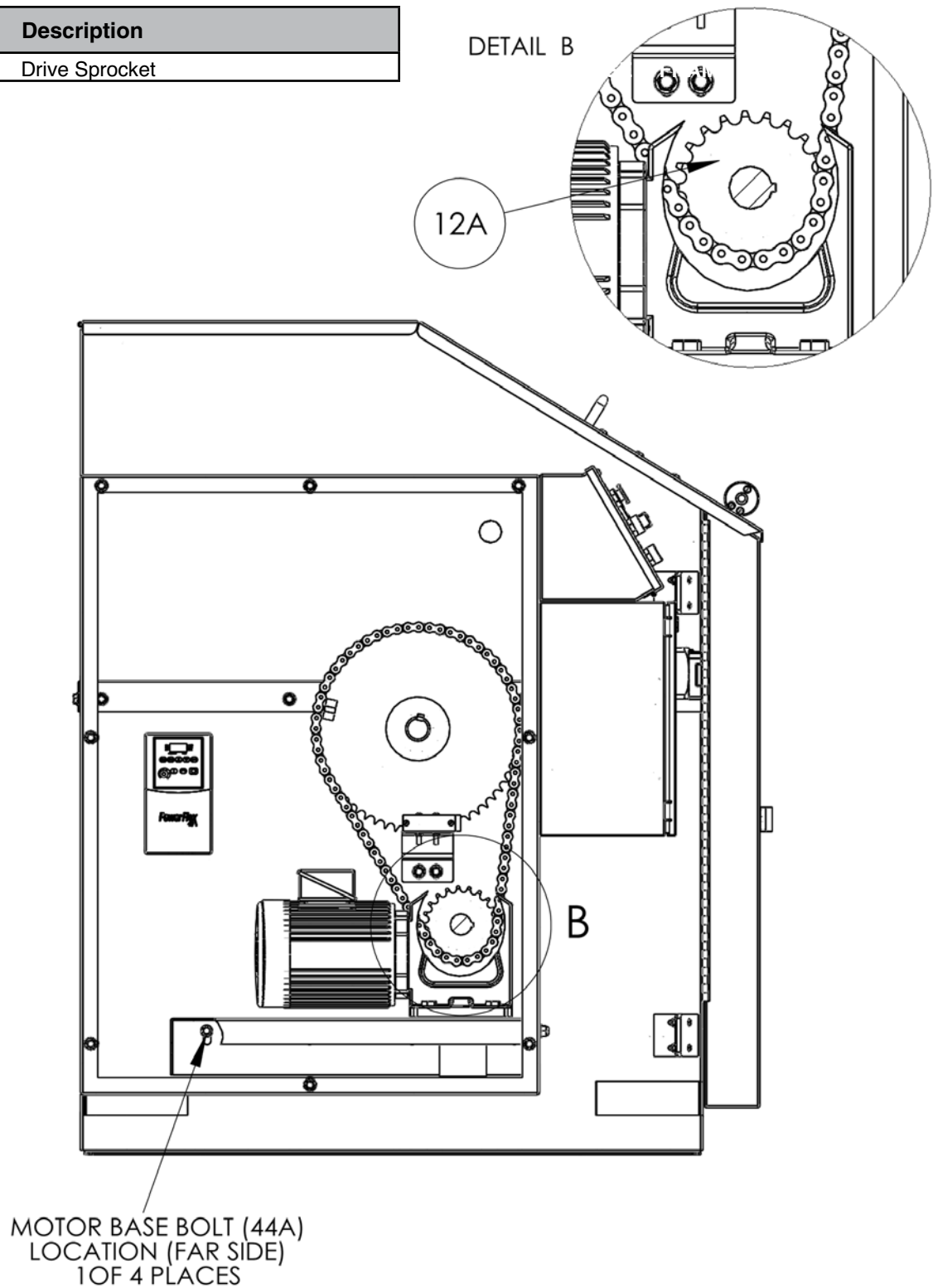


Figure 12
HM-70A & HM-70AF Drive Sprocket (12A)

5.8 HM-70A & HM-70AF Drum Parts List & Diagram

Item No.	Description
DRUM PARTS	
6A	Drum Shelf, Internal
7A	Drum Access Door
8A	Gasket
45A	Shelf Bolt (1 of 5)

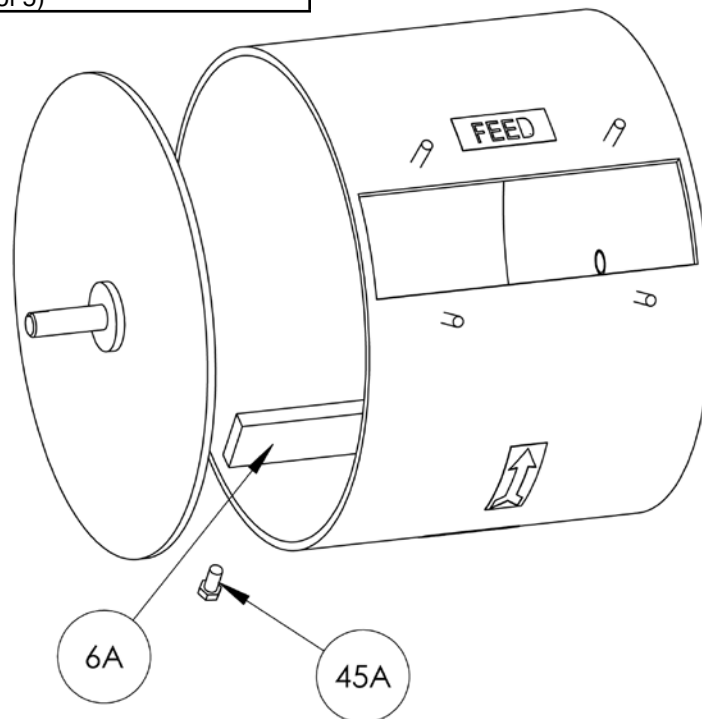


Figure 13
HM-70A & HM-70AF Drum Shelf & Bolt

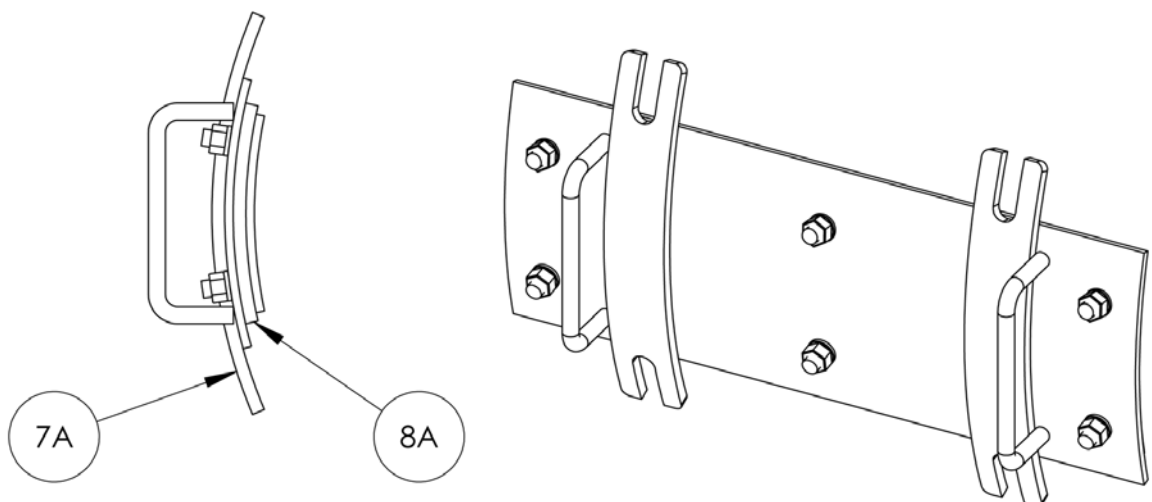


Figure 14
HM-70A & HM-70AF Drum Access Door & Gasket

6.0 MASTER PARTS LIST:

6.1 HM-70A & HM-70AF Master Parts List

Item No.	Description	Figure	No. Req'd
1A	Machine Lockout Switch	1, 4, 5, 6	1
2A	Motor and Gearbox Mount	4, 8	1
3A	Fuse	9	1
4A	Door Latch	5	1
5A	Drum	6	1
6A	Drum Internal Shelf	13	1
45A	Shelf Bolts	13	5
7A	Drum Access Door	6, 14	1
8A	Drum Access Door Gasket	14	1
9A	Drum Access Door Knob	6	1
10A	Drum Support Bearings	3, 11	2
11A	Driven Sprocket	4, 8	1
12A	Drive Sprocket	12	1
13A	Drive Chain	4, 8	1
14A	Gearmotor	4, 8	1
46A	Motor Controller	4, 8	1
17A	Disconnect Enclosure	1, 5	1
18A	Revolution Counter	9, 10	1
19A	Revolution Sensor (Limit Switch)	4, 8	1
20A	Sample Catch Pan, order separately as HM-131	6	1
21A	Abrasive Charge: 12 Hardened Steel Balls, order separately as HMA-130	5	1 Set
22A	Upper Main Case	5	1
23A	Lower Main Case	5	1
24A	Doors	5	1 Set
25A	Motor Housing	5	1
26A	Motor Housing Cover	5	1
27A	Base of Frame	6	1
28A	Pan Stop	7	1
29A	Limit Switch Bracket	4, 8	1
30A	Front Top Cover	5	1
31A	Front Top Cover Handle	5	1
32A	Back Top Cover	5	1
33A	Stop Button	9	1
34A	Start Button	9	1
35A	Off-Jog-Run Button	9	1
36A	Jog Button	9	1
47A	Reset Counter Button	9	1
37A	Gas Springs	6	2
38A	Door Stops	5	1
39A	Safety Key	5, 6	1
40A	Sound Dampening Material	6	1
41A	Wear Strips	7	1
42A	Control Console	4, 8	1
43A	Power-On Lamp	9	1
44A	Motor Mount Bolt	4, 5, 6, 8	6
48A	Brake Rectifier	—	1
49A	Relay	—	1