



ROTODRAWER™ - ROTARY STYLE DRAWER-IN-HOUSING INSTALLATION MANUAL

OVERVIEW & OPERATING PRINCIPLE

The RotoDrawer™ is a rotary style Drawer-In-Housing Magnet designed to rid ferrous metal from powder & bulk processed products that have difficult flow characteristics and a tendency to bridge and choke when using traditional, stationary tube style magnetic separators. The magnet is ideal for products that have a higher moisture content or particle size, such as flours, cake mixes or corn starch, and require a high degree of product purity

The Rotary Style Drawer-In-Housing Magnet (RDH series RotoDrawer™) features a motorized, cylindrical configuration of Rare Earth magnetic tubes on a horizontal plane that continually rotate through a gravity fed product stream. The rotational design of the magnet, together with unique splitter bars, serve to break up any clumps of product and keep the product flowing through the housing while capturing any ferrous metal contamination and purifying the product.

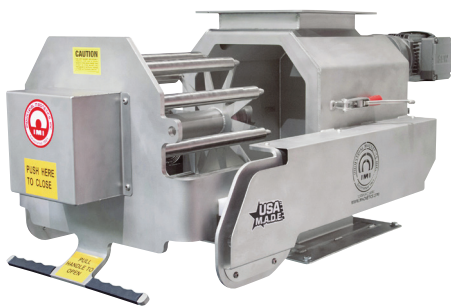


OPTIONAL CONFIGURATIONS

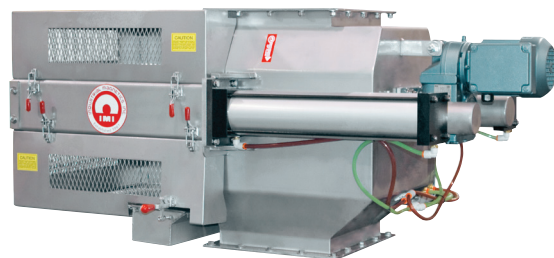
Rare Earth RotoDrawer™ is available in two different cleaning styles. The SimpleClean™ model features an innovative design that makes it easy for the operator to perform routine cleaning of the magnet. The magnetic drawer glides open and rotates into vertical orientation for easy removal and disposal of captured metal, preventing recontamination in the processing line.

The Self-Cleaning model automates the cleaning process and requires little to no operator intervention. Pneumatic cylinders open the drawer and pull the magnetic tubes through a seal plate that wipes the collected contaminants from the tubes. Debris is collected into a catch pan for periodic disposal.

Standard sizes range from 8"x8" to 18"x18" inlets and outlets, with custom designs and sizes available to fit exact application requirements.



SimpleClean™



Self-Cleaning



HEALTH AND SAFETY WARNINGS

MOTOR DRIVEN ROTATING EQUIPMENT



Rotating shafts, gears, sprockets and drawer components can present hazards when running, keep hands and feet clear; equipment should only be serviced by trained service personnel.



Electric shock hazard - observe all local plant Lockout/Tagout procedures before removing any guards or initiating service or cleaning activity.



GENERAL



Please be advised that in and around the application of magnetic equipment, there are potential safety concerns that can arise with sensitive medical devices:



- » Pacemaker behavior can be affected when they are near strong magnetic fields
- » Medical implants and external fixation systems can be influenced by magnetic fields
- » Hearing aid behavior may be affected when exposed to strong magnetic fields

Any individual that carries the above equipment or other sensitive medical devices should use caution when they are around or handling magnets. For more specific information the wearer should contact their physician.



Beware of pinch points from sudden attraction and unexpected movement between magnets and ferrous metal equipment components or tools.

MAGNET DEGRADATION

The force of a permanent magnet can degrade over time and when subjected to external influences. The most common factors for loss of performance or failure include:

- » Blunt force impact such as dropping or banging on a magnet which can cause fractures
- » Temperatures exceeding the operating range of the magnet material
 - » 180°F for neodymium material
 - » 480°F for ceramic grade 8
 - » High temperature options are available
- » Exposure to electrical fields, like generators, lightning or welding ground circuits, can result in loss of magnetism

It is recommended that magnetic devices are audited annually. IMI can provide a Magnet Audit and Plant Survey to evaluate magnetic equipment performance and assist with compliance to global industry standards; Pull Test Kits are available for self-auditing plant activity.





INSTALLATION

The Rotary Style Drawer-in-Housing magnetic assembly is delivered ready to install.

The top and bottom flanges allow for the unit to be welded or bolted into the product flow. If the unit is to be bolted into place, either mild steel or stainless steel bolts can be used. If the flanges have not been pre-drilled by the factory for bolt installation, any drill bit suitable for 304 stainless steel will do a quality job. A minimum 3/8" diameter bolt is recommended.

The RotoDrawer™ must be installed to allow sufficient space for preventive maintenance and tramp metal removal. Allowance must be made for the drawer movement during the cleaning cycle and removal of the tramp metal catch pan.

The gear motor must be connected to a properly sized motor starter or other control furnished by others. Consult the nameplate of the gear motor for voltage and full load current data. A wiring diagram, showing motor connections, is located inside the motor terminal box.

Self-Cleaning Specifics

The air actuated Self-Cleaning unit requires 80 to 100 psi of shop air to operate. The filter regulator is located on one side of the housing assembly. The standard, electrically operated solenoid valve requires a 120 VAC/60 Hz single phase power source to operate. The solenoid is energized via a user supplied, normally open (NO) switch. A momentary push-button is typically used in many applications; pushing the button opens the drawer, cleaning the unit. Releasing the button removes power from the solenoid, allowing the drawer to close.

The cable from the solenoid contains three conductors: blue, brown & green/yellow. To be connected as follows:

Brown - Connected to switched leg of 120 VAC supply circuit

Blue - Connected to neutral leg of 120 VAC supply circuit

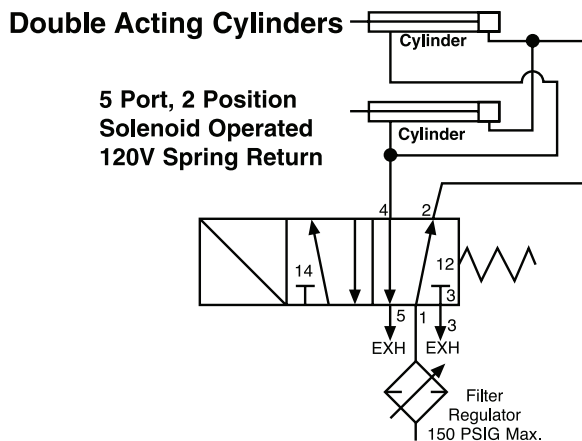
Green/Yellow - Connected to ground bus of circuit

Solenoid Specifications: Coil -120V/60 Hz - 110V/50 Hz, 1.07 VA, Rated for continuous duty at 85%-105% of rated voltage. Enclosure rated for NEMA 4/IP65. Molded with three pin plug-in connector.

Cable - 6 ft lg., 3 conductor cord, equivalent to 20/3 SVT (.14 in. dia. (3.5mm) - .28 in. dia. (7mm)) O.D.

Coil Resistance: 6.6 MEGOhms cold, DC resistance, Measure with a Digital Multimeter (DMM) connected to brown & blue leads

Self Cleaning Pneumatic Schematic



Self Cleaning Electrical Schematic

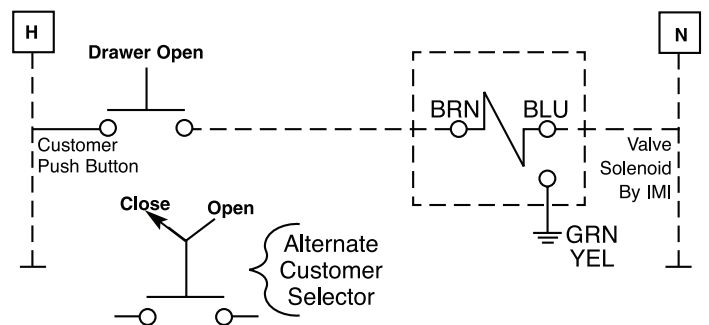
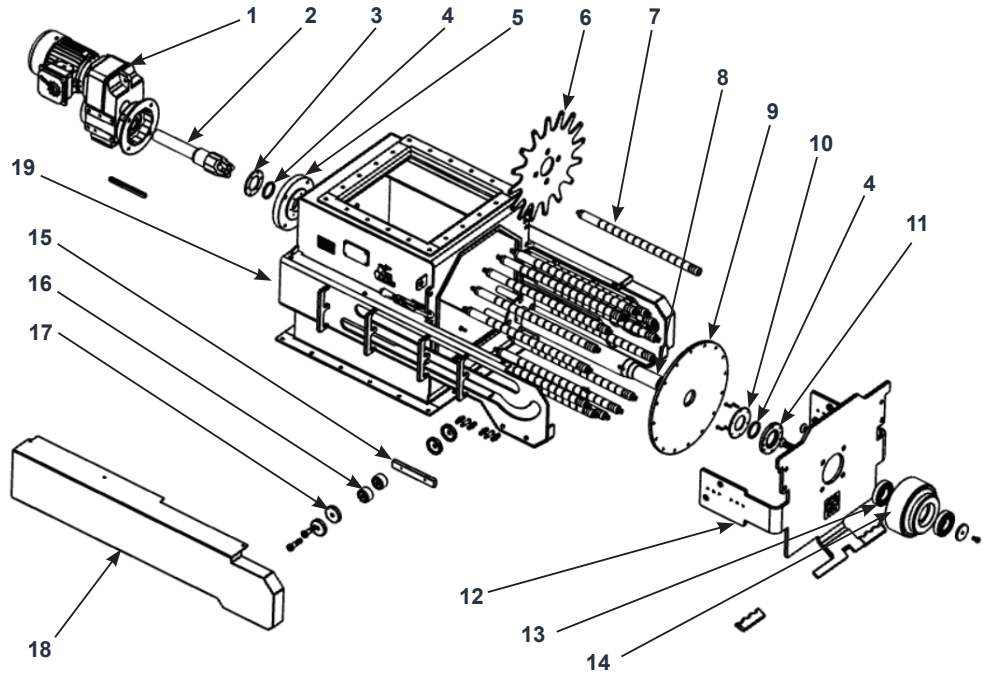




ILLUSTRATION & PARTS

----- SimpleClean™ (Manual) -----

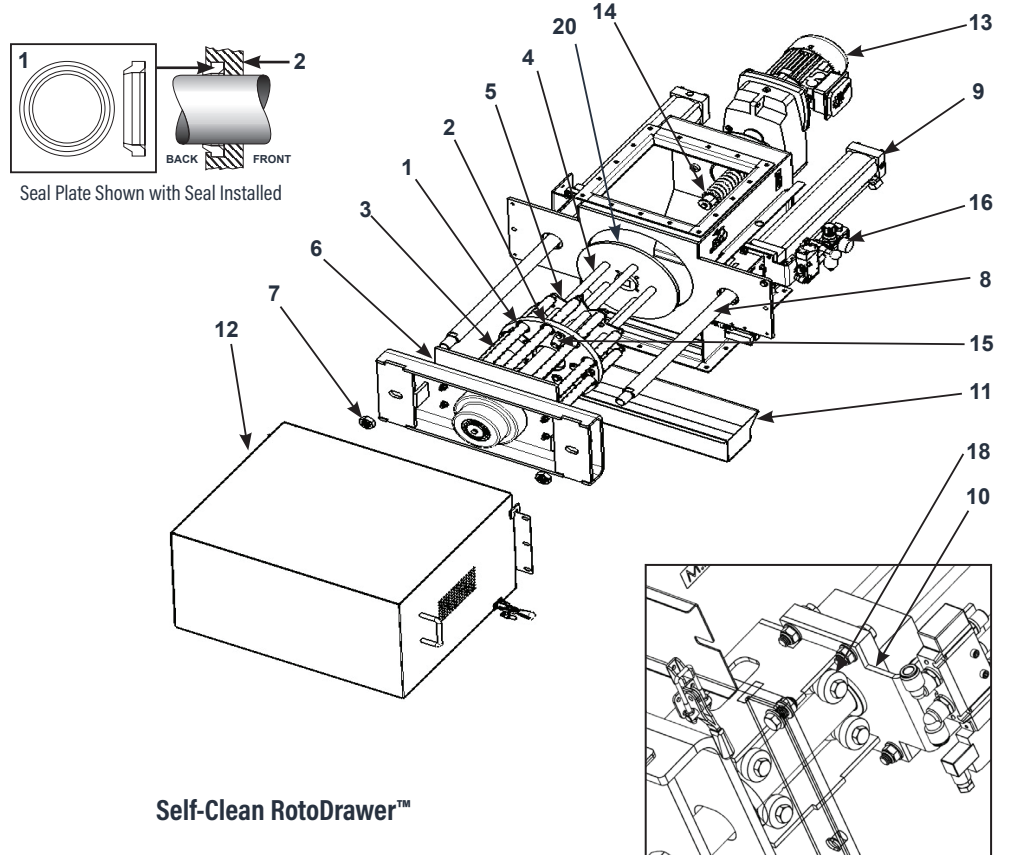
- | Ref. No. | Description |
|----------|------------------------|
| 1. | Gear Motor |
| 2. | Drive Shaft and Key |
| 3. | Seal Cover |
| 4. | Shaft Seals (2) |
| 5. | Motor Spacer |
| 6. | Tube Spoke |
| 7. | Magnet Tube Assemblies |
| 8. | Driven Shaft |
| 9. | Tube Plate |
| 10. | Bearing Seal Cover |
| 11. | Front Seal Holder |
| 12. | Magnet Door |
| 13. | Sealed Bearing |
| 14. | Bearing Housing |
| 15. | Slack Plate |
| 16. | Cam Followers |
| 17. | Bearing Spacer |
| 18. | Track Cover |
| 19. | Housing Body |



SimpleClean™ RotoDrawer™

----- Self-Clean -----

- | Ref. No. | Description |
|----------|---------------------------|
| 1. | Wiper Seal |
| 2. | Seal Plate |
| 3. | Tube Assembly |
| 4. | Splitter Bars |
| 5. | Tube Mounting Plate |
| 6. | Door Assembly |
| 7. | Rod End Jam Nuts |
| 8. | Cylinder Rods |
| 9. | Cylinder |
| 10. | Cylinder Mount |
| 11. | Catch Pan |
| 12. | Guard Assembly |
| 13. | Gear Motor |
| 14. | Rotator Shaft |
| 15. | Rod Keeper and Bolts |
| 16. | Air Valve / Regulator Set |
| 17. | Door Gasket (not shown) |
| 18. | Rod Bearings |
| 19. | Tube Assembly Bolts |
| 20. | Housing Body |



Self-Clean RotoDrawer™

Not Shown

Door Gasket, Tube Assembly Bolts



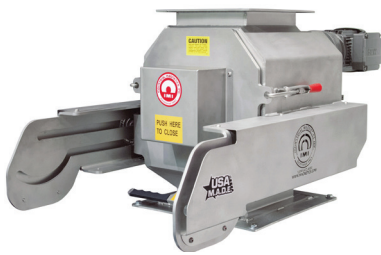
CLEANING GUIDELINES



Ensure that the product flow has been shut off and that the drawer assembly is empty of product. The recommended cleaning interval is at least twice in an 8 hour shift. However, cleaning is dependent on the amount of tramp metal being separated from your particular product. If you see heavy concentrations of metal, additional cleaning is necessary. **The drive motor must be turned off during the cleaning operation.** Magnet is not to be cycled in an attempt to clean to either the open (cleaning) or closed (operating) position with any material being metered, choke, or flood fed through the body of the unit. Magnet is only to be cycled for cleaning when upstream equipment cannot introduce material to the unit.

----- SimpleClean™ (Manual) Procedures -----

1. Ensure that the product flow has been shut off and that the drawer assembly is empty. Ensure that the motor is off.
2. Release *door clamps* on side of housing.



OPERATING POSITION

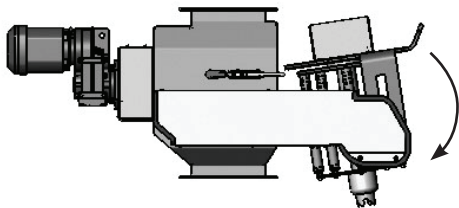


UN-CLAMP AND PULL TUBES OUT

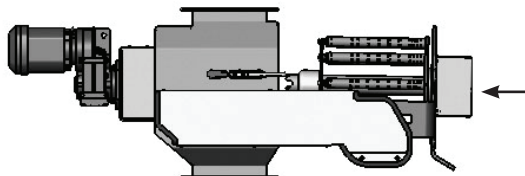


SWING TUBES DOWN FOR CLEANING

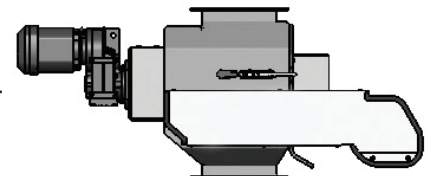
3. Open door & pull drawer *Tube Assembly (1)* out using the *handle bars* on the *Magnet Door front plate (8)*.
4. Rotate the *handle bars* upward to place the *Tube Assembly (1)* in the cleaning position.
5. Use an air hose to blow the collected tramp metal off the *Tube Assembly (1)* or a rag/gloved hand to wipe the collected tramp metal down to the back end of the tubes where a non-magnetic area allows for most collected material to easily fall away or to be wiped off of the tubes.



ROTATE HANDLEBARS DOWN



PUSH TUBE ASSY INTO HOUSING



RECLAMP THE DOOR CLOSED

6. Rotate the *handle bars* down to place the tube assembly into the operating orientation.
7. Push the *Tube Assembly* back into the housing.
8. Re-clamp the door into the closed position.
9. Restart the motor, then restart the product flow.

----- Self-Clean Procedures -----

1. Ensure that the product flow has been shut off and that the drawer assembly is empty of product. **Ensure that the motor is off.**
2. Activate the air cylinders by energizing solenoid valve. This opens the drawer, sliding the tube assembly through the wiper seals located in the seal plate. The wiper seals clean the collected metal off the tubes while the drawer opens, by pushing it on to a non-magnetic section at the ends of the tubes. The metal then falls off the tubes and into the provided catch pan.
3. After the drawer is fully extended and stops, de-energize the solenoid valve. The air cylinders will then close the drawer for operation.
4. Restart the motor, then restart the product flow.



IMPORTANT NOTE: COMPRESSED AIR MUST BE SUPPLIED TO THE FILTER-REGULATOR AT ALL TIMES TO ENSURE THAT THE DRAWER REMAINS IN THE CLOSED POSITION DURING BOTH OPERATION (PRODUCT FLOWING) AND IDLE TIMES. FAILURE TO SUPPLY COMPRESSED AIR DURING THESE TIMES CAN RESULT IN POSSIBLE PRODUCT ESCAPING THE UNIT AND/OR CONTAMINATES ENTERING THE PRODUCT FLOW AREA. CONSULT OUR ENGINEERING DEPARTMENT IF THE AIR SUPPLY CANNOT BE GUARANTEED SUCH THAT THE DRAWER CANNOT REMAIN CLOSED.



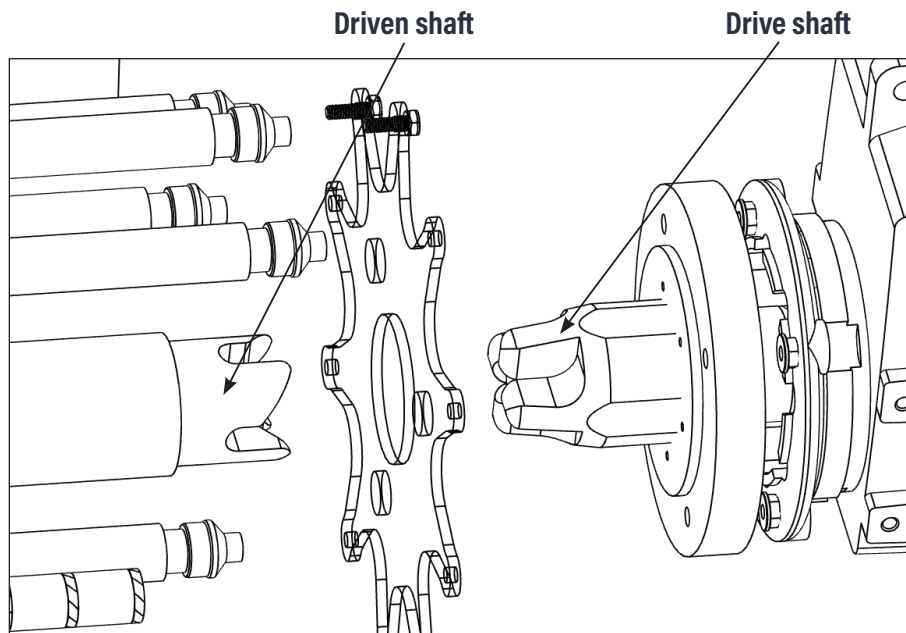
CLEANING GUIDELINES (DRIVE SPLINES)

1. Turn off the power to the RDH unit and unplug it from the power source.

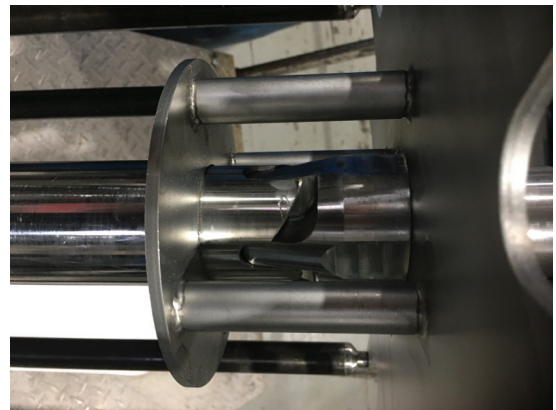


Follow your company's lock out tag out procedure as required.

2. Follow cleaning guidelines for simple clean steps 1-5 (page 5).
3. Use an air hose to clean both drive splines, one on the drawer tube assembly (driven shaft), and one on the motor end (drive shaft), being sure to remove any buildup on mating surfaces. In tough cases, a mild detergent solution may be required to remove any buildup. (See photo's below for dirty example, and clean example)
4. Inspect the RDH drawer for any signs of damage, such as cracks or chips. If the RDH drawer is damaged, it will need to be serviced or replaced.
5. Once the unit is clean, follow the cleaning guidelines for Simple Clean steps 6-8.
6. Verify drawer tube assembly is fully closed and seal has no gaps to ensure the drive splines are fully engaged. If not, repeat steps 2-6.
7. Power on the RDH unit, and restart product flow.



DIRTY (NOT FULLY ENGAGED)



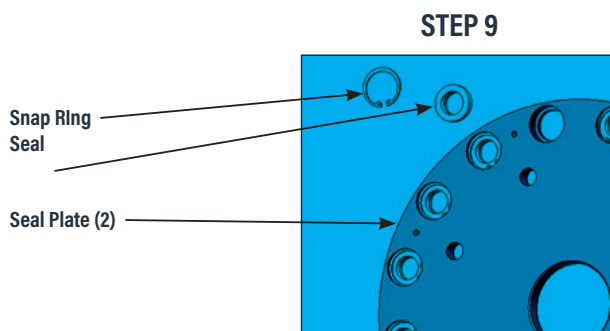
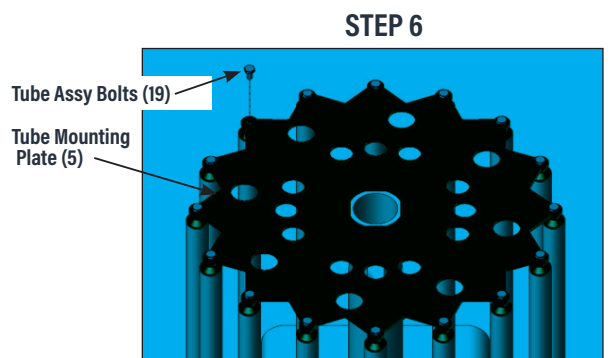
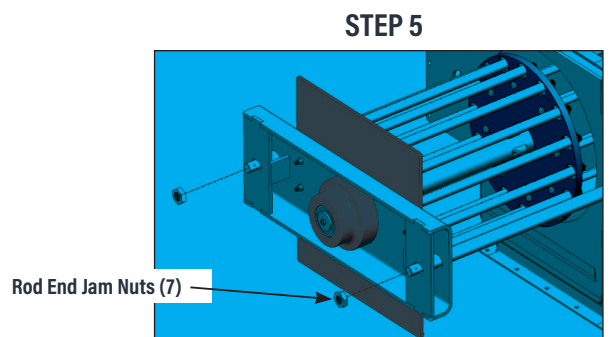
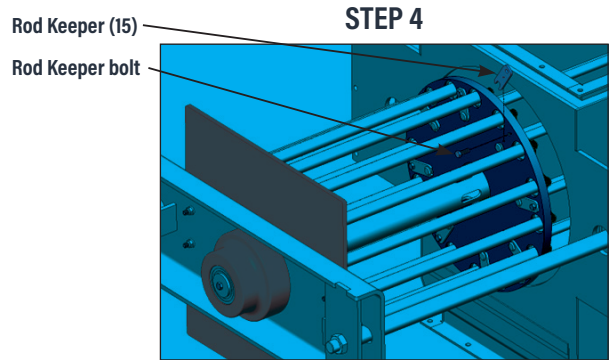
CLEAN (FULLY ENGAGED)



WIPER SEAL REPLACEMENT (SELF-CLEAN MODELS)

Wiper seals should be inspected for normal wear every three to six months to ensure the integrity of the seal is intact. To replace worn out or damaged washer seals:

1. Turn off power to the *Motor (13)* for safety.
2. Activate *Air Cylinders (9)* to open the drawer until it stops. For safety, turn off air supply to *Regulator Valve Assembly*. Disconnect supply tubing from all cylinder ports.
3. Remove *Guard Assembly (12)*.
4. Remove bolts from the *Rod Keepers (15)* and set aside bolts and Rod Keepers.
5. Remove the *Cylinder Rod End Jam Nuts (7)* from the *Door Assembly (6)*. This separates the drawer assembly from the housing. Fasteners have been installed using thread locker; the use of a heat gun may be required to break loose the nuts.
6. Set the drawer assembly on a non-ferrous work surface. Unbolt the *Tube Assembly Bolts (19)* and remove the *Tube Mounting Plate (5)* from the tubes.
7. Use a non-ferrous wire or spacer to support the magnetic tubes and to keep them from being attracted to each other before removing the *Seal Plate (2)*.
8. Slide the *Seal Plate (2)* off the tubes. Magnet tubes may repel or attract each other when the seal plate is removed. Use extreme caution to avoid injury.
9. Optional seals, for challenging applications such as high temperatures, may be utilized with materials such as brass or PTFE (Teflon). These may be retained with snap rings or seal retainer plates. Remove retaining snap rings.
10. Push the worn out or damaged *Wiper Seals (1)* out of the Seal Plate. Remove snap ring and seal.
11. Gently push in new *Wiper Seals (1)*. Install new snap ring and seal.
12. After new seals are installed in the *Seal Plate (2)*, reassemble the unit by reversing the previous steps. Check drawer travel to assure proper operation. Note: Magnet tubes are intended to have some movement to prevent binding. Apply thread locker on the *Tube Assembly Bolts (19)*, snug them up to the *Tube Mounting Plate (5)*, then loosen them each a quarter-turn. This will allow slight movement of the tube to prevent binding.



COMMENTS OR CONCERNS

We believe Industrial Magnetics, Inc. offers the finest Rotary Style Drawer-in-Housing available today. Great pride has gone into the design and manufacture of this unit. Any comments or concerns should be directed to our Customer Service Department at 1-888-582-0821. **We appreciate the opportunity to serve you!**