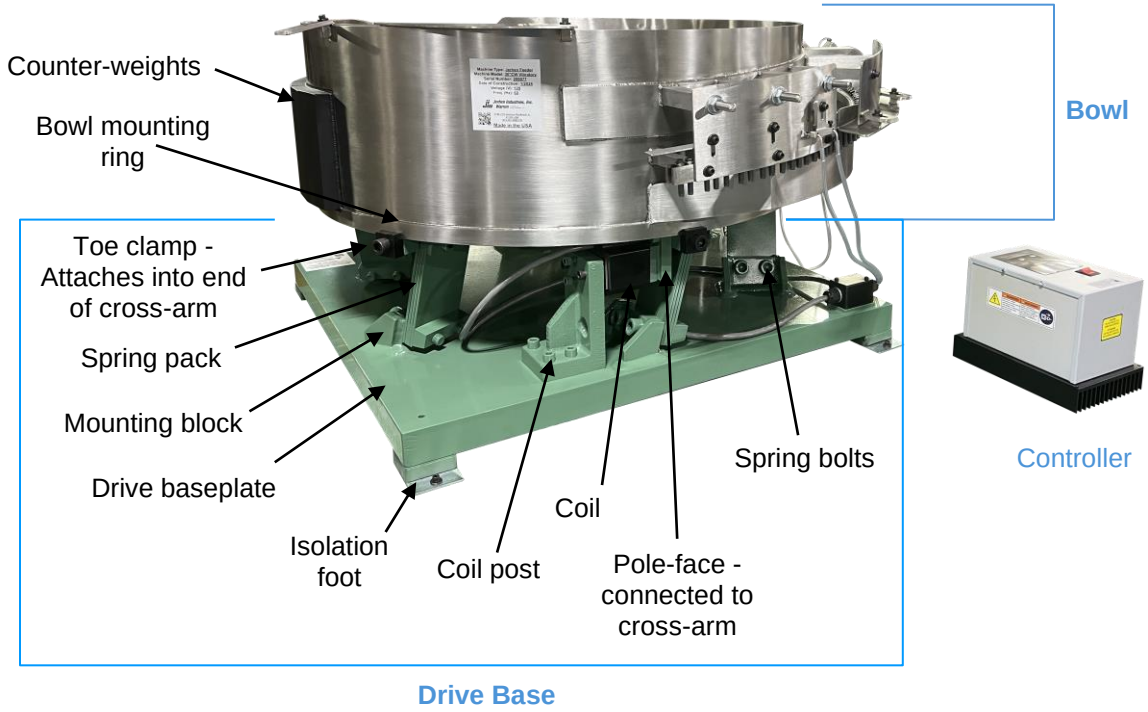
Jerhen Industries, Inc.
Warren A Division of Jerhen Industries, Inc.

TROUBLE SHOOTING
AND TUNING GUIDE FOR VIBRATORY FEEDERS

Your vibratory feeder system was expertly tuned at the factory and ready for use. However, factors such as mounting methods, floor thickness, and installation errors can affect the performance of a feeder system. Dirt build-up, wear, and fatigue can happen over time and will appear as reduced rates or inefficient parts feeding. This guide will help keep your feeder system healthy and happy until it gets old and tired. If this guide doesn't correct your symptoms, please call 815-397-0400 to schedule an on-site visit with one of our technicians.

This is a representation of a typical vibratory feeder bowl, your system may differ in looks, but the terminology is the same.

Typical Feeder Bowl Assembly



Cleaning your feeder system:

Regular cleaning is important to keep your vibratory feeder working its best. Daily inspection of the drive base should include removing any stray parts and checking to make sure all bolts are tight. Remove any debris between the coils and pole-faces.

Cleaning the feeder bowl (including vibratory inline feeders):

If you are running plated, plastic or nylon parts: Remove all parts from the bowl. Vacuum any debris from the interior of the bowl, outside tooling/tracks, and the drive base. Wipe all running surfaces with a clean rag.
If you are running wet, oily, or parts with protective coatings: Remove all parts from the bowl. Gently use a scraper to remove any heavy build-up of grime. Use a multi-surface degreaser-type cleaner on all running surfaces, making sure to remove all residue. Thoroughly clean the drive base using the same degreaser-type cleaner. Avoid using heavy abrasives on the bowl or tooling as this may damage the running surfaces.

Troubleshooting your feeder bowl and drive base:

(refer to Operators Quick Reference Troubleshooting Guide for corrective actions)

No vibration:

1. The control switch may be in the “Off” position.
2. Setting on controller may be set to zero or at too low of a setting.
3. The power input to the controller may be inadequate.
4. The cord from the feeder to the control may be unplugged or damaged.
5. A fuse may be blown in the controller.
6. A coil may be shorted out.
7. The gap between the coil and the pole-face may be closed or damaged.
8. The controller may have shorted out from contamination.
9. A part, or foreign object, may be lodged between the coil and pole-face.
10. The feeder bowl and/or drive base unit may be in contact with other equipment.
11. If equipped, the track shut-off sensor may be triggered by parts in the track, or the photo eyes may be misaligned or dirty.
12. Part or parts may be lodged between the drive base and the tabletop.

Insufficient vibration, parts moving slowly, or parts moving erratically:

1. Setting on controller is set too low.
2. Feeder bowl may be mounted on a base that is not sturdy enough, causing it to flex and absorb vibration. The base should include a substantial steel top, heavy-walled steel legs and be fully welded. In the case of a base that is over 3ft tall, there should be cross-bracing supporting each leg.
3. If mounted to a sub-base plate, the sub-base plate may be mounted improperly, causing insufficient transfer of vibration. For example, if the sub-base plate sits beyond the edge of the base it may reduce the amount of vibration being transferred to the feeder bowl.
4. The base may not be level or anchored properly to the floor.
5. The coil gap may be improperly set. The pole-face should be parallel to the face of the coil, set approximately .025” apart for 120-cycle systems and .035-.045” for a 60-cycle system.
6. The voltage to the controller may be fluctuating.
7. The drive unit may need re-tuning to the local power supply.

8. One or more springs may be cracked or broken.
9. Broken weld on the drive base.
10. Broken cross arm.
11. Bowl mounting ring may be cracked near the toe clamp.
12. The parts you are sorting may be in a condition beyond the scope of the feeder design. Excessive deformations, flash from the molding process, or lubricants used in the manufacturing process can prevent proper movement of parts in the system.
13. The bowl is not secured to the drive base properly. Check that the bowl is seated fully into the toe clamps and that all bolts are properly tightened.
    NOTE: If the bowl being used is not part of the original system, the drive base may not function properly. The drive base was tuned for a specific bowl/part weight per the design directive.
14. The bowl has too many/too few parts. When overloaded, the bowl will slow down due to excessive weight. When underloaded, the parts will not feed up the track due to lack of back pressure (parts available to push the parts forward). **NOTE:** If a feeder bowl is designed with interchangeable tooling to run different parts, the optimal level of parts may vary to achieve the best rates.
15. The controller is set too high. A bowl running at high settings can cause parts to be knocked from the feeder tracks.

Indications your feeder bowl may be out of tune

1. Having to run the controller at a higher setting to maintain proper rate.
2. Parts are not moving as smoothly as when the system was new.
3. Unusual noise or “banging” caused by the coil hitting the pole-face.
4. The feeder slows down when full of parts and speeds up as it empties.

Tuning procedures for feeder bowl drives

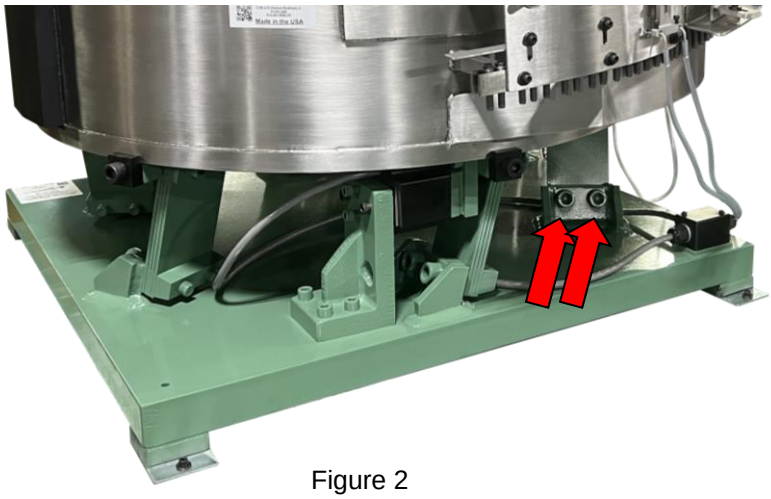


Figure 2

A vibratory feeder bowl is built slightly over-tuned. This delivers the best performance and reduces stress on the feeder bowl and drive. To test your system, load the feeder bowl with an acceptable/normal quantity of parts. Turn on and set the controller at 35% - 40% of the input voltage. Parts should be moving. Slowly increase the controller setting until the desired feed rate is attained. Listen for unusual sounds and watch for violent vibration. If sounds or vibrations appear, look for any points where the bowl or drive base might be in contact with an object. Move the objects so there is no longer contact. If by 80% of the input voltage the desired feed rate has not been met, proceed to the tuning procedures below.

NOTE: It is not uncommon for a newer bowl, that has been in use for over a year, to develop a highly over-tuned condition.
NOTE: If it is determined that your system is under-tuned, contact Jerhen Industries, with your serial number, to order the correct springs and spacer for your drive base.

Tuning a feeder bowl drive base is not an exact science. Each system is hand-crafted, so no two drive bases are tuned the same. If at any time you feel uncertain about the tuning process, contact Jerhen Industries and schedule to have your feeder bowl tuned by one of our technicians.

1. Visually inspect the drive base cross arms, welds and springs for visible cracks or breaks. Inspect the bowl mounting ring for cracks or deformations near the toe clamps.
2. Check that all spring bolts, pole-face bolts, coil mount bolts and toe clamps are tight.
3. Check that the coil gap is parallel to pole-face and free of debris. (optional: check that the gap is approximately .025” apart for 120-cycle systems and .035”-.045” for a 60-cycle system. This is only a reference as your drive may have been set differently from the factory.)
4. Loosen any one lower bolt securing the springs to the drive base (Red arrow, fig 2). Loosen the bolt until you see a change in the speed of the bowl. If no change is seen loosen the second bolt. If you see a large increase in speed, go to step 5. If you see a decrease in speed, or the bowl stops, go to step 6.
5. If the unit speeds up, it is considered over-tuned. An over-tuned condition is good, it indicates that all bolts are properly tightened, and all the springs are in good condition. However, a highly over-tuned bowl needs to be slowed for optimum performance.
   Begin by removing the thinnest spring from the drive base. Reinstall and tighten the bolts. Perform step 4 again, noting the change in speed. It may be necessary to remove additional springs to achieve a slightly over-tuned condition.
6. If the system slows down or stops all together, your base is under-tuned. This is an indication that additional springs are needed. Add a 1/8” or a 3/16” thick spring and spacers to the spring pack with the least amount of thickness of springs. Tighten the bolts and perform step 4 again. If you see a slight increase in speed no further adjustment is needed. If the system slows to the same speed as originally seen, move to step 8.
7. If no change in speed is seen after a spring has been added, inspect all springs for cracks. You may not see a crack while the springs are mounted to the drive base, in which case you will need to remove a spring pack completely to visually inspect each spring. **Only remove one spring pack at a time.**
8. When adding springs or reinstalling springs, there are two things that you must do properly for predictable results: use of spacers and using the proper length bolt.
   a. Spacers must be placed between each spring. Without the spacers the springs will have the same effect as one thick spring.
   b. Bolts must be long enough than when sufficient tightness is applied the threads will not strip. For bolts that go through the mounting block, make sure the end of the bolt is flush to, or extends past, the back of the mounting block. The bolts that secure the springs to the cross arms at the pole-face are blind, meaning the bolts don’t go all the way through. For these bolts, you must get a new bolt that will make up only the difference in the thickness of the spring being added or removed. If the bolt is too long, you may tighten it against the bottom of the hole or back of the pole-face thinking the springs are tight, but they are not. Double check to make sure the springs are tight. Stripped or improperly tightened bolts will throw off tuning.
9. The bolts securing the springs also affect tuning. The threads of the bolts have been known to stretch under constant vibration. Remove and compare the bolts to new bolts to make sure the threads are not damaged.

Other causes of reduced rates

1. The bolts securing the rubber isolation feet to the drive baseplate have become loose or have fallen out. These bolts have been known to back out from the constant vibration. If the bolts have backed out far enough, you may hear them rattling against the base or sub-base plate when the feeder bowl is on. To check if the isolation feet bolts are loose, remove the bolts securing the isolation feet to the base or sub-base and lift the feeder. Confirm that the bolt on every foot is secure.
2. Bolts holding the isolation feet of the feeder to the base are loose or missing. Check that all the rubber isolation feet of the drive base are securely bolted to base.
3. The rubber isolation feet are stretched to reach a mounting hole. Check to make sure the feet are not being stretched to reach a mounting hole. Stretched or distorted isolation feet can cause binding that will lead to reduced feed rates and difficulty in tuning. Drill and tap new mounting holes as needed.
4. Toe clamp bolts are not tight. Confirm the bowl is fully seated into the toe clamps and level. Bolts over ½" must be tightened, using a torque wrench, to specific torques. Tighten ½" bolts to 125 ft/lbs, 5/8" bolts to 250 ft/lbs, and ¾" bolts to 400 ft/lbs. Smaller feeders, using bolts smaller than ½", are not subject to specific torque values. Just make sure they are very tight.
5. Customer modifications to the bowl have created an unbalanced condition. Adding or removing counterweight to the bowl can cause erratic vibration and poor performance.
6. Using unfiltered, dirty, wet air in a system designed with air jets. Contaminated air will cause fluctuations in pressure, contaminate the parts, cause reduced feed rates, or cause a buildup of grime on the feeder. Always use filtered dry air. Use only the regulators supplied on the manifold and set to the pressures prescribed by Jerhen Industries. The use of smart air to assist orientation of parts is determined by the bowl builder during design and fabrication and should not be modified. Improper use of air jets can disrupt the feeding of parts through the system.
7. The gravity or inline track has been directly connected to the feeder by the customer. If your system requires vibration to move parts after the bowl discharge, contact Jerhen Industries for potential solutions.
8. Broken weld, broken cross arm, broken spring, shorted coil, or cracked mounting ring on bowl near toe-clamp. A "Dead spot" typically appears directly across the bowl (180 degrees) from the failure point. If your parts stall while moving up the inside track, look for any of the failures listed here.

Tuning procedures for inline drives

NOTE: If your inline drive came with a controller it was configured for a 60-cycle drive. If you are using your own controller, confirm it is configured for a 60-cycle drive.
NOTE: If it is determined that your system is under-tuned, contact Jerhen Industries to order the correct springs and spacers for your drive base. We will need the serial number of your system to provide the correct parts.

1. Check to see if the controller and coils are plugged in.
2. Mount the inline base plate solidly to a level table to check tuning.
3. Check the gap between the coil and pole-face, which should be set at .020" - .025" for mini in-lines, .055" - .065" for standard in-lines.

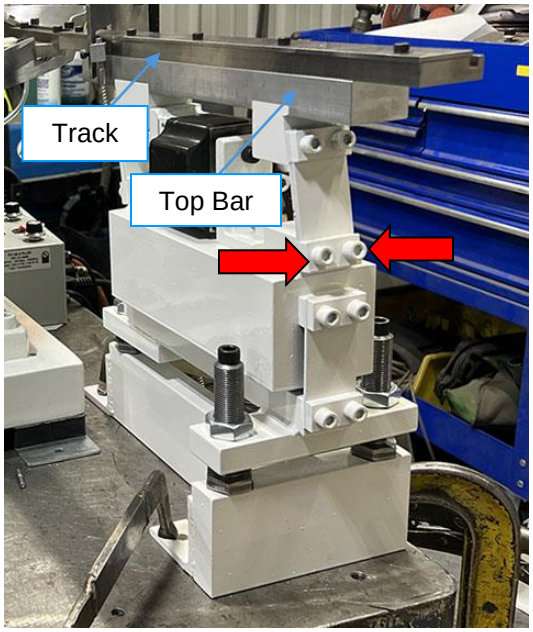


Figure 3

4. Check to make sure all bolts are properly tightened.
5. Make sure that there is clearance between the inline track and any other close object (ie: feeder bowl discharge). There should be a minimum of.020” clearance.
6. Place parts in the track.
7. Turn on the controller, set to normal operating speed. (to a setting of approximately 35% to 45% of the input voltage)
8. At the discharge end of the inline loosen one lower bolt on the spring pack just enough to see a change in speed of the moving parts. (red arrow, fig 3) If the parts speed up it is over-tuned, go to step 9. If they slow down it is under-tuned, go to step 10.
9. Loosen the second lower bolt. If the movement of the parts increase slightly no further tuning is needed. If movement of the parts increases sharply the inline is highly over-tuned. Remove one spring from the spring pack with the most springs. After the bolts are tightened, turn on the inline to see change. Repeat the bolt loosening procedure to confirm tune.
10. Loosen the second lower bolt. If the parts in the track stop moving the inline is under-tuned. Add one spring and 2 spacers to the spring pack with the fewest springs. After the spring and spacers have been added and the bolts are tightened, turn on the inline to see any change. Repeat the bolt loosening procedure to confirm tune. When part movement speeds up slightly as second lower rear bolt is loosened, the inline is tuned properly. If the drive remains under-tuned contact Jerhen Industries for assistance.

PLEASE NOTE: A length of track should be mounted on the top bar of the inline base drive unit as follows: If the dimensions do not meet the criteria below, tuning is not the issue.

A. A track section, which is longer than the mounting bar, should be mounted per B and C below.
B. On the receiving, or entrance end, it should overhang the mounting bar a minimum of one inch.
C. On the discharge, or exit end, it should overhang a minimum of two inches but no more than the space between two spring packs.

Tuning procedures for storage hoppers

NOTE: If your storage hopper came with a controller it was configured for a 60-cycle drive. If you are using your own controller, confirm it is configured for a 60-cycle drive.
NOTE: If it is determined that your system is under-tuned, contact Jerhen Industries to order the correct springs and spacers for your storage hopper. We will need the serial number of your storage hopper to provide the correct parts.

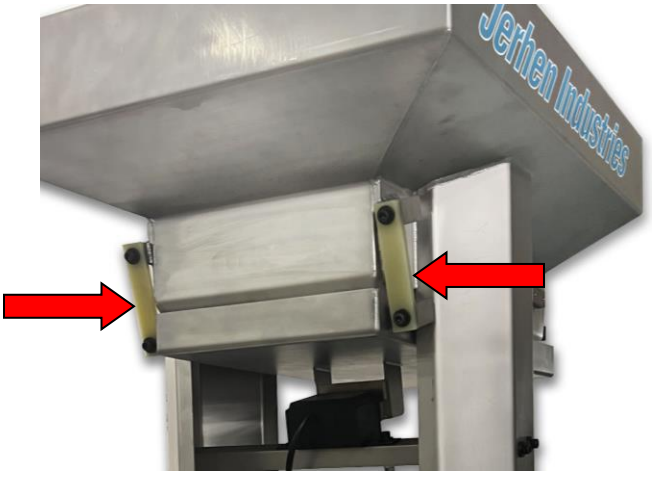


Figure 4

1. Fill the hopper with parts.
2. Check the power supply is plugged in.
3. Check the gap between coil and pole-face, which should be set between .055” and .065”. The pole-face should be parallel to the coil face.
4. Set the paddle arm in the feeder bowl so that the hopper will supply one to two layers of parts in the bowl.
5. Check and adjust the tuning as follows:

A. Make sure all bolts are tight.
B. Turn on controller, set to normal operating speed.
C. Loosen one lower bolt on the spring pack at the rear of the tray then lightly tighten it (Red arrows, fig 4). Loosen the second lower bolt. If the parts speed increases slightly, no further tuning is needed. If it increases sharply, go to step D. If the parts stop, go to step E.
D. If movement of the parts increases sharply when the second lower bolt is loosened, the hopper is over-tuned. Remove one spring from one of the front spring packs. Tighten all bolts, turn on hopper and repeat bolt loosening procedure to confirm tune. When part movement speeds up slightly as second lower rear bolt is loosened, the hopper is tuned properly.
E. If the parts in the hopper tray cease moving, the hopper is under-tuned. Add one spring and 2 spacers to both rear tray spring packs. After the spring and spacers have been added and the bolts are tightened, turn on the hopper and repeat the bolt loosening procedure. When part movement speeds up slightly as second lower rear bolt is loosened, the hopper is tuned properly. If the drive is still under-tuned contact Jerhen Industries for assistance.

If this guide doesn't correct your symptoms, please call 815-397-0400 to schedule an on-site visit with one of our technicians.