Automation Devices, Inc.

GENERAL INSTRUCTIONS ON VIBRATORY FEEDER BASE UNITS

➢ *INSTALLATION*

All base units are factory adjusted and ready for assembly of the bowl to the base unit top casting. Assemble the rubber feet to the bottom of the base casting. The screws should be snug but not distort the rubber.

Assemble the feeder bowl to the base unit top casting. *Center-mounting* is the most common method; however, some units have provisions for *top-mounting* or *bottom-mounting* (using three to eight screws instead of one). Bowl mounting screws are provided with the bowl. Do not substitute other screws for those supplied.

NOTE: On bowls supplied by our PEECO division, an "X" has been stamped on the outer face of the bowl mounting ring. This mark must be aligned with a similar stamping on the base unit top casting. Blank cast bowls do not require such alignment since they do not have the added weight of the tooling.

The feeder stand must be rigid. Vibration should not be easily transmitted through its members. If other equipment occupies the same stand, it must not transmit vibration at a level great enough to affect the feeder. **CAUTION: Severe vibration can damage electrical controls.**

Align the feeder bowl discharge with any mating tracks, chutes, etc. Make sure there is a small gap between the bowl discharge and the track in order to avoid restriction of the movement of the bowl and base unit. Use foot locators or double-ended feet to maintain the position of the base unit. Never attach a track directly to the discharge area of the feeder bowl (an exception to this is flexible plastic tubing).

➢ *WIRING*

Base units without power cords must be connected to the feeder coil through a hole in the base casting. ADI recommends type SO or SJO three-conductor cord, from 16 gauge to 14 gauge, depending on the amperage of the feeder coil. Smaller feeders are factory wired with SJO cords. If the base unit has a hinged metal cover, put it back on after completing wiring. If left off, the feeder amplitude may be affected. To power our units, we manufacture controllers for all of our feeders. Refer to ADI's Model 6000 Series Controller instructions for more information and features.

➢ *OPERATION*

It is not necessary to have an in-depth knowledge of vibratory feeders to operate and maintain them. **Reading the balance of these instructions will provide information fundamental to your success with feeders.** Refer to the assembly drawing provided as we explain how a vibratory parts feeder works.

When power is applied to the coil, the armature is attracted to it. This pulls the top plate down and causes the springs to flex. Since the springs are on an angle, the top rotates as it moves down. A bowl secured to the top plate will follow the action of the top plate.

When power is removed from the coil, the springs return the top plate to its original position. This action is repeated 3600 times per minute – so fast you cannot see the bowl and the top plate move. Any parts placed in the bowl rotate around the inside floor of the bowl, work their way toward the outside wall, climb the track, and discharge from the bowl. The parts are oriented as they move up the track and pass through controlled obstructions (known as ***tooling***) attached to the walls and tracks of the bowl.

The springs on a base unit are selected at the factory to accommodate a given weight and size of bowl. Make sure you know which bowl goes on which base unit. With the controller power switch in the ON position, slowly turn the potentiometer clockwise. Watch the parts in the bowl. Parts should move through the bowl fast enough to meet requirements, but not fall off the tracks or constantly be rejected by the bowl tooling.

➢ *COIL ADJUSTMENT*

Adjustment of the coil is rarely necessary. *The armature should never be allowed to strike the coil.* There should always be a gap between the coil and the armature when the base unit is operating at maximum feed rate. Look at the drawing of your base unit. Models 3, 5, and 8 use a single screw to adjust the coil gap. Turning that screw clockwise moves the coil down, increasing the gap between the coil and the armature.

The coil assemblies on Models 10, 15, 20, 25, 30, and 35 sit on four threaded studs. Lock nuts, above and below the mounting plate, fix the position of the coil assembly on the studs.

➢ *CHECKING PERFORMANCE*

Vibratory parts feeders are reliable and generally give extended service without needing repairs. Periodic inspection will make a great deal of difference not only in feeder performance but, more importantly, in productivity. This section will help you detect problems and make lasting corrections.

If you are experiencing difficulty, try isolating the problem. Is it the bowl and base unit (a mechanical problem) or the controller (an electrical problem)? If the controller has even a small affect on the amount of vibration in the base unit, it is probably okay. When no vibration can be felt and no audible noise heard from the base unit, the problem is probably in the controller. Please consult the instruction sheet for the controller if you believe it is at fault.

Mechanical problems can be isolated to either the base unit or the bowl. Check the bowl mounting. Are the bowl screws tight? Is there any foreign matter between the bowl and the top plate that won't allow the bowl to set properly? Is the inside of the bowl dirty, oily, or sticky? Is any tooling loose? If there are no problems with the bowl, then check the base unit.

Start with the rubber feet – they should be soft and not cut up, and their movement should not be restricted by the foot locators. Remove the shell from the base unit and make the following inspections:

- **Check the spring banks for indications of wear.** This will show up as *red oxide* between the springs and the spacers. If it is present, the spring banks should be disassembled, the springs wire-brushed, and new spacers installed.

- **Is there evidence of the coil and the armature laminations striking each other?** Look at the corners of the laminations to see if they are peened over. There will be a very loud rapping sound at full amplitude if they are hitting. Refer to the coil adjustment section in these instructions.

It is possible to have good overall feeder performance while parts slow down or even go backward in one specific area of the bowl (especially noticeable when there is no part-to-part pressure pushing the parts along).

- First, note the exact position of this *dead spot* in the bowl.
- Next, estimate its position relative to the base unit. Now rotate the bowl by 90 or 120 degrees.
- Did the problem stay in the same place in the bowl or did it remain in the same position over the base? If it follows the bowl, check for dirt, loose tooling, or some other irregularity in the bowl.
- A broken weld in a fabricated bowl could cause a dead spot.
- Another possibility exists – someone may have added more tooling to the bowl. This creates an imbalance in the bowl and may call for a counterweight to be positioned directly across from the added tooling weight.
- When the dead spot stays with the base unit, look to see if a spring is broken.

If you suspect that the springing of the base unit is not correct, try this simple test: find two small "C" clamps (about $^1/_2$ pound each for a 12 to 18 inch bowl). Add one clamp to the bowl discharge and the other directly across from the discharge. If the parts in the bowl move faster with this added weight, the base unit is tuned **stiff**. Remove the clamps from the bowl, and slightly loosen the top screws that secure the springs to the top plate. Part feed rate will increase.

On the other hand, if you put the clamps on the bowl and part movement decreases, then the base unit is tuned **weak**. The remedy would be to slightly tighten the top screws on the springs. This concept would not work if a bowl and a base unit were poorly matched. Call the factory with the base unit model and serial number. Our records include the number and thickness of springs on the base unit and the series number of the bowl shipped with that base unit.

➢ *SPRINGING*

Do not add or remove springs unless performance checks indicate that springs are the source of the problem. Adding or removing springs may require that the base unit be completely retuned. Note the number and position of the springs before removal. The thickest springs are the ones closest to the mounting surfaces of the base casting and the top casting.

Spring spacers are placed on the base casting and the top casting prior to the first spring. There is a spacer between each pair of springs, both top and bottom. A spring pad is the last piece placed on the spring bank assembly. Align all spring spacers and pads. Then, systematically hand-tighten all spring bank screws, using care not to distort any spring bank.

It is common practice to readjust the coil-armature gap as a final step in spring replacement and tuning. The base unit drawing should be used as a reference when removing or assembling parts. Each drawing has a list of replacement parts. **When ordering parts, always specify the base unit model and serial number.**

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